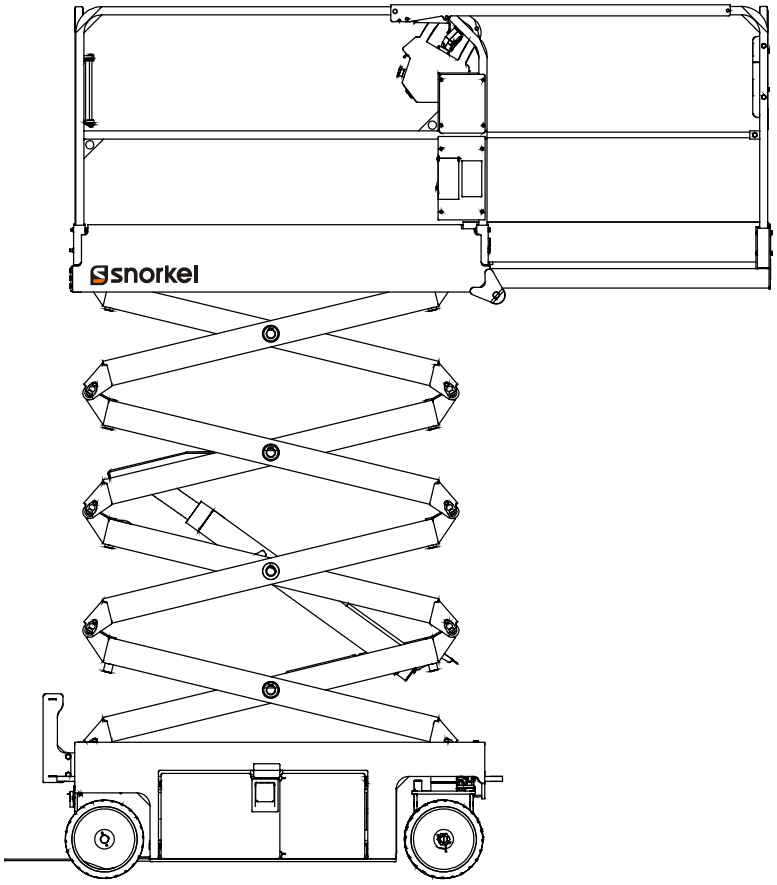
snorkel

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

S3215L
S3215E
S3219E
S3220E
S3226E
S4726E
S4732E



OPERATOR'S MANUAL

Part Number 1500834
June 2018

Serial number 000017, 000019 and after
Replaces 1500834 April 2018

DANGER

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

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

Regard all conductors as energized.

Allow for electrical wire sag and aerial platform sway.

If the platform, scissors structure, 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, scissors structure, 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.

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Limited Warranty

PART OF ASPIRE GROUP

Chapter 1 – Introduction

Aerial Platform Features

The aerial platform is a self-propelled scissors lift that has been designed to raise personnel, their tools, and material to the workstation. The aerial platform has been designed for use on hard surface floors such as concrete.

The S3215L/S3215E/S3219E uses a single hydraulic cylinder to raise and lower the platform. The S3226E/S4726E/S4732E machines have two hydraulic cylinders to raise and lower the platform. A hydraulic motor on each of the front drive wheels provides power to move the aerial platform.

The standard machine includes the following features:

- Proportional drive and lift up control
- Driveable at full height
- Two speed drive
- Drive motion alarm
- Non-marking tires
- Automatic pothole protection system
- Level sensor with drive/lift interlock
- Diagnostic center display
- Battery condition indicator
- Manual lowering valve
- Lockable battery disconnect switch
- Tie-down/lifting lugs
- Heavy duty battery charger
- Swing-out hydraulic component and battery trays
- Non-slip metal platform floor
- Platform extension
- 125 volt AC electrical outlet with GFCI
- Scissor arm safety support prop
- Lowering alarm
- Horn
- Rear forklift pockets
- Saloon style entry doors
- Five year limited warranty

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)
- Canadian Standards Association (CSA)

Options

The following options may be provided on the machine:

- Flashing light

Operator's Manual

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

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

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

Safety Alerts

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

⚠Danger

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

⚠Warning

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

⚠Caution

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

Notes

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

Operation

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

⚠Warning

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

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

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

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

Maintenance

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

⚠Caution

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

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

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

Manual of Responsibilities

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

ANSI publications clearly identify the responsibilities of all personnel who may be involved with the aerial platform. A reprint of the "Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors and Lessees of ANSI/SIA A92.6-2006 Self-Propelled Elevating Work Platforms" is available from Snorkel dealers or from the factory upon request.

Copies are also available from:

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

Additional Information

For additional information contact your local dealer or Snorkel at:

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

http://www.snorkellifts.com

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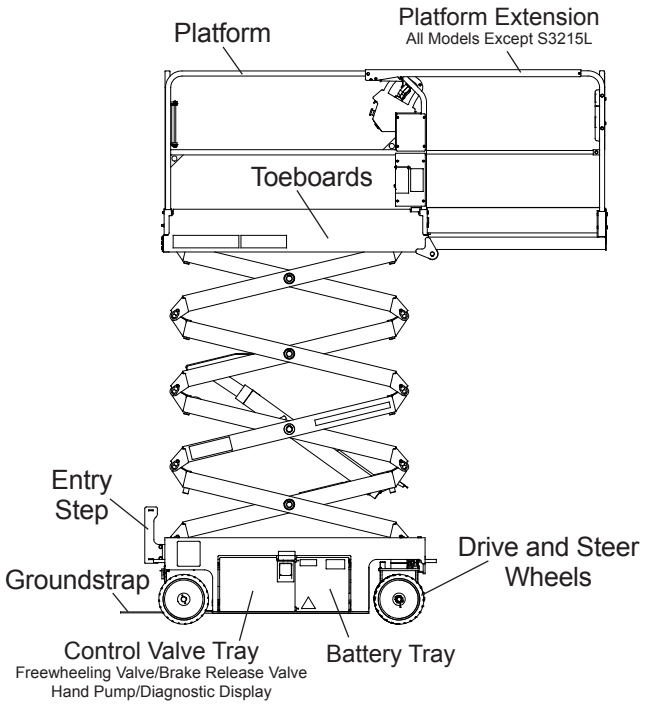
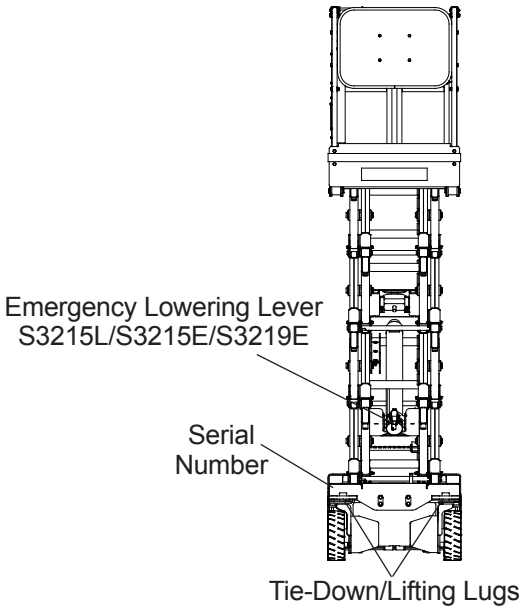
Chapter 2 – Specifications

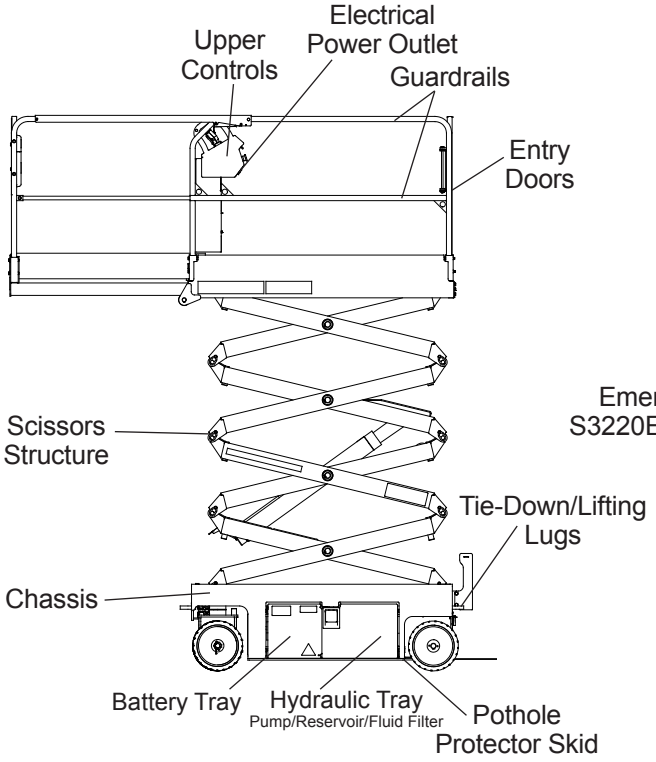
Component Identification



Right Side



Front



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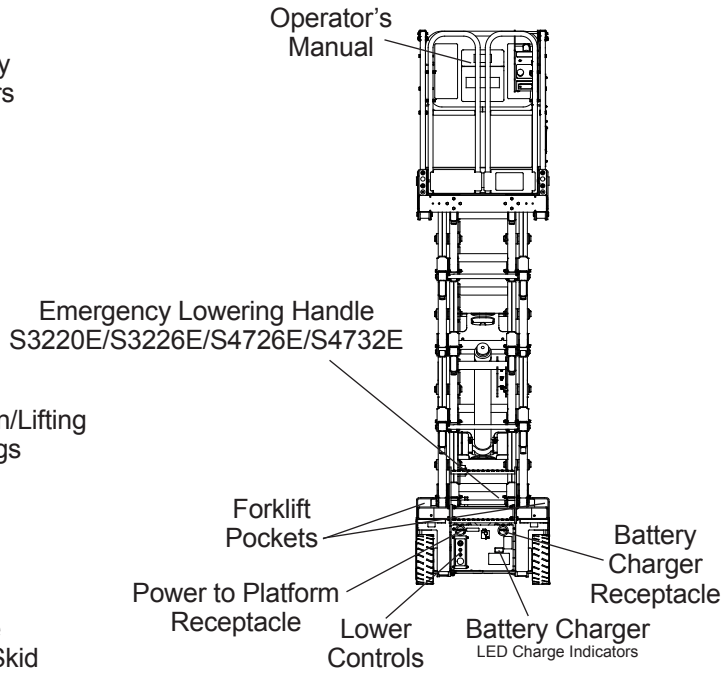

Rear

General Specifications – S3215L

Aerial Platform

Working height	21′ (6.6 m)
Maximum platform height	15′ (4.6 m)
Turning radius	
Inside	4″ (10.16 cm)
Outside	64.25″ (1.63 m)
Wheelbase	52″ (1.32 m)
Ground clearance	
Pothole protector raised	2.63″ (6.68 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	980 lbs (445 kg)
Maximum ground pressure	160 psi (11.2 kg/cm²)
Weight, EVW	
Approximate	2,100 lbs (955 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	32″ (81.3 cm)
Stowed length	81.4″ (2.07 m)
With step removed	79.4″ (2.02 m)
Stowed height	76″ (1.93 m)
With rails folded	65″ (1.65 m)

Platform

Dimensions	28.25″ x 73.5″ (71.6 cm x 186.5 cm)
Guardrail height	39″ (0.99 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	670 lb (305 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	16 to 20 seconds
Platform lower	30 to 36 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	15′ (4.6 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	12″ x 4″ (30.5 cm x 10.2 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 220 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	3 US gal (11.35 l)
System capacity	3.5 US gal (13.2 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S3215E

Aerial Platform

Working height	21′ (6.6 m)
Maximum platform height	15′ (4.6 m)
Turning radius	
Inside	4″ (10.16 cm)
Outside	64.25″ (1.63 m)
Wheelbase	52″ (1.32 m)
Ground clearance	
Pothole protector raised	2.63″ (6.68 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	1,450 lbs (659 kg)
Maximum ground pressure	175 psi (12.3 kg/cm²)
Weight, EVW	
Approximate	2,700 lbs (1227 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	32″ (81.3 cm)
Stowed length	70.4″ (1.79 m)
With step removed	68.25″ (1.73 m)
Stowed height	76″ (1.93 m)

Platform

Dimensions	28.25″ x 63.75″ (71.6 cm x 161.9 cm)
Extension	28.25″ x 36″ (71.6 cm x 91.4 cm)
Total length with extension	99.75″ (253.4 cm)
Guardrail height	39″ (0.99 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	600 lb (273 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	16 to 20 seconds
Platform lower	30 to 36 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	15′ (4.6 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	12″ x 4″ (30.5 cm x 10.2 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 220 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	3 US gal (11.35 l)
System capacity	3.5 US gal (13.2 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S3219E

Aerial Platform

Working height	25′ (7.6 m)
Maximum platform height	19′ (5.8 m)
Turning radius	
Inside	4″ (10.16 cm)
Outside	64.25″ (1.63 m)
Wheelbase	52″ (1.32 m)
Ground clearance	
Pothole protector raised	2.63″ (6.68 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	1,450 lbs (659 kg)
Maximum ground pressure	175 psi (12.3 kg/cm²)
Weight, EVW	
Approximate	2,900 lbs (1318 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	32″ (81.3 cm)
Stowed length	70.4″ (1.79 m)
With step removed	68.25″ (1.73 m)
Stowed height	79.25″ (2.01 m)

Platform

Dimensions	
Main	28.25″ x 63.75″ (71.6 cm x 161.9 cm)
Extension	28.25″ x 36″ (71.6 cm x 91.4 cm)
Total length with extension	99.75″ (253.4 cm)
Guardrail height	39″ (0.99 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	550 lb (250 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	16 to 20 seconds
Platform lower	30 to 36 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	19′ (5.8 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	12″ x 4″ (30.5 cm x 10.2 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 220 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	3 US gal (11.35 l)
System capacity	3.5 US gal (13.2 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S3220E

Aerial Platform

Working height	26′ (8.1 m)
Maximum platform height	20′ (6.1 m)
Turning radius	
Inside	30″ (76.2 cm)
Outside	93″ (2.36 m)
Wheelbase	69.72″ (1.77 m)
Ground clearance	
Pothole protector raised	3.75″ (9.53 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	2,050 lbs (932 kg)
Maximum ground pressure	215 psi (15.1 kg/cm²)
Weight, EVW	
Approximate	4,500 lbs (2045 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	32″ (81.3 cm)
Stowed length	90.6″ (2.3 m)
With step removed	88.7″ (2.25 m)
Stowed height	85.25″ (2.16 m)
With rails folded	67.75″ (1.72 m)

Platform

Dimensions	
Main	28.25″ x 84.38″ (71.6 cm x 214.3 cm)
Extension	28.25″ x 36″ (71.6 cm x 91.4 cm)
Total length with extension	102.38″ (305.8 cm)
Guardrail height	43.3″ (1.1 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	900 lb (409 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	30 to 34 seconds
Platform lower	37 to 43 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	20′ (6.1 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	15″ x 4″ (38.1 cm x 10.2 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 240 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	4.5 US gal (17 l)
System capacity	5 US gal (19 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S3226E

Aerial Platform

Working height	32′ (9.8 m)
Maximum platform height	26′ (7.9 m)
Turning radius	
Inside	30″ (76.2 cm)
Outside	93″ (2.36 m)
Wheelbase	69.72″ (1.77 m)
Ground clearance	
Pothole protector raised	3.75″ (9.53 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	2,350 lbs (1068 kg)
Maximum ground pressure	245 psi (17.2 kg/cm²)
Weight, EVW	
Approximate	5,500 lbs (2500 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	32″ (81.3 cm)
Stowed length	90.6″ (2.3 m)
With step removed	88.7″ (2.25 m)
Stowed height	90.6″ (2.30 m)
With rails folded	73.13″ (1.86 m)

Platform

Dimensions	
Main	28.5″ x 84.38″ (71.6 cm x 214.3 cm)
Extension	28.25″ x 36″ (71.6 cm x 91.4 cm)
Total length with extension	102.38″ (305.8 cm)
Guardrail height	43.3″ (1.1 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	500 lb (227 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	46 to 50 seconds
Platform lower	50 to 56 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	26′ (7.9 m)

Drive/Lift Level Sensor Interlock

Side-to-side	1.5 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	15″ x 4″ (38.1 cm x 10.2 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 240 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	4.5 US gal (17 l)
System capacity	5 US gal (19 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S4726E

Aerial Platform

Working height	32′ (9.8 m)
Maximum platform height	26′ (7.9 m)
Turning radius	
Inside	21″ (53.3 cm)
Outside	95″ (2.41 m)
Wheelbase	69.72″ (1.77 m)
Ground clearance	
Pothole protector raised	2.63″ (6.68 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	2,540 lbs (1155 kg)
Maximum ground pressure	190 psi (13.3 kg/cm²)
Weight, EVW	
Approximate	4,750 lbs (2159 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	47″ (1.20 m)
Stowed length	90.6″ (2.30 m)
With step removed	88.7″ (2.25 m)
Stowed height	90.2″ (2.29 m)
With rails folded	72.88″ (1.85 m)

Platform

Dimensions	
Main	43″ x 84.38″ (109.2 cm x 214.3 cm)
Extension	43″ x 48″ (109.2 cm x 121.9 cm)
Total length with extension	132.38″ (336.2 cm)
Guardrail height	43.3″ (1.1 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	1,000 lb (455 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 3 indoors

Function Speed

Platform raise	46 to 50 seconds
Platform lower	52 to 58 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	26′ (7.9 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	15″ x 5″ (38.1 cm x 12.7 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 240 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	4.5 US gal (17 l)
System capacity	5 US gal (19 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

ASPIRE PLATFORMS
PART OF ASPIRE GROUP

General Specifications – S4732E

Aerial Platform

Working height	38′ (11.6 m)
Maximum platform height	32′ (9.8 m)
Turning radius	
Inside	21″ (53.3 cm)
Outside	95″ (2.41 m)
Wheelbase	69.72″ (1.77 m)
Ground clearance	
Pothole protector raised	2.63″ (6.68 cm)
Pothole protector lowered	0.75″ (1.9 cm)
Maximum wheel load	2,730 lbs (1241 kg)
Maximum ground pressure	225 psi (15.8 kg/cm²)
Weight, EVW	
Approximate	5,700 lbs (2591 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	45 lbs (200 N)
Stowed width	47″ (1.20 m)
Stowed length	90.6″ (2.30 m)
With step removed	88.7″ (2.25 m)
Stowed height	94.2″ (2.39 m)
With rails folded	76.88″ (1.95 m)

Platform

Dimensions	
Main	43″ x 84.38″ (109.2 cm x 214.3 cm)
Extension	43″ x 48″ (109.2 cm x 121.9 cm)
Total length with extension	132.38″ (336.2 cm)
Guardrail height	43.3″ (1.1 m)
Toeboard height	6″ (15.2 cm)
Rated work load	
Total	700 lb (318 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	1 outdoors 2 indoors

Function Speed

Platform raise	46 to 50 seconds
Platform lower	52 to 58 seconds
High Drive	
Platform lower than 6′ (1.8 m)	0 to 2 mph (0 to 3.2 km/h)
Low Drive	
Platform higher than 6′ (1.8 m)	0 to 0.4 mph (0 to 0.6 km/h)

Drive System

Standard	Two-wheel drive
Gradeability	25%
Maximum drive height	32′ (9.8 m)

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	4 degrees

Tires

Nonmarking solid rubber	15″ x 5″ (38.1 cm x 12.7 cm)

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 240 amp hour batteries
Fluid recommended	distilled water
Charger	25 amp
Input	120/240 V

Hydraulic System

Maximum pressure	3,300 psi (22,750 kPa)
Reservoir capacity	4.5 US gal (17 l)
System capacity	5 US gal (19 l)
Maximum operating temperature	160°F (71°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

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)

Sound Pressure Level

At work station	below 70 dB(A)

Group Classification

Heavy Duty – intended life	100,000 load cycles

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Chapter 3 – Safety

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

Safety devices reduce the likelihood of an accident.

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

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

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

Electrocution Hazards

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

Minimum Safe Approach Distance

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

⚠Danger

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

ANSI publications define minimum distances that must be observed when working near bus bars and energized power lines. Table 1 and Figure 3 are reprinted courtesy of Scaffold Industry Association, ANSI/SIA A92.6.

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

Table 1 – Minimum Safe Approach Distance

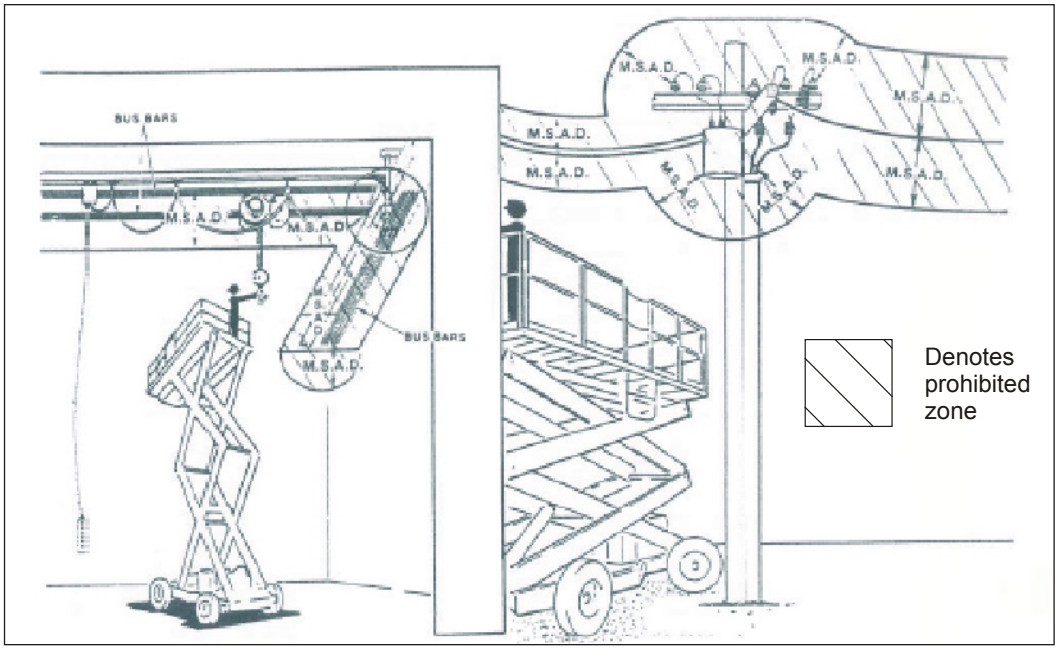

Figure 3 – Minimum Safe Approach Distance

Prestart Inspection

Perform a prestart inspection before each shift as described in Chapter 8. Do not use the aerial platform on the job unless you are trained and authorized to do so.

Work Place Inspection and Practices

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

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

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

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

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

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

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

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

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 drive/lift level sensor interlock information. Raise the platform 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. Do not raise the platform outdoors in wind speeds above 28 mph (12.5 m/s).

Do not operate the aerial platform within 4′ (1.2 m) of any drop-off or hole.

Do not raise the platform in winds above 28 mph (12.5 m/s). Do not add anything to the aerial platform that will increase the wind loading such as billboards, banners, flags, etc.

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

Do not exceed the platform capacity nor the platform-extension 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 scissors structure 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.

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. If you are using a fall restraint, transfer your anchorage from one structure to the other before stepping across.
2. Remember that you might be transferring to a structure where *personal fall arrest* is required.
3. Use the platform entrance, do not climb over or through the guardrails.

Electrical System

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

⚠Warning

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

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

- Batteries contain sulfuric acid that can 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.

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, damaged, or illegible.


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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 red push button (refer to Figure 4.1).

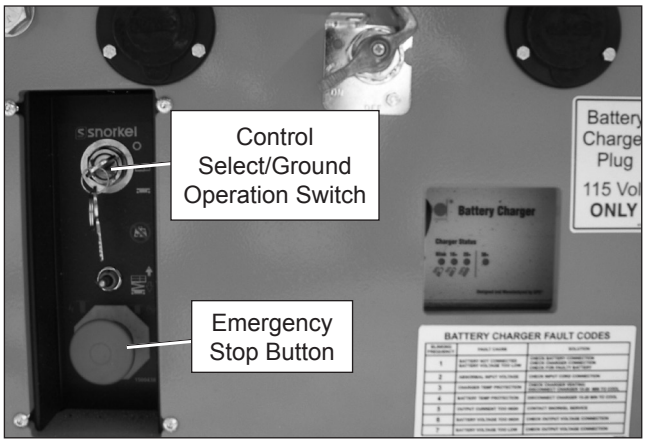


Figure 4.1 – Lower Controls

- 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 red push button (refer to Figure 4.2).

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

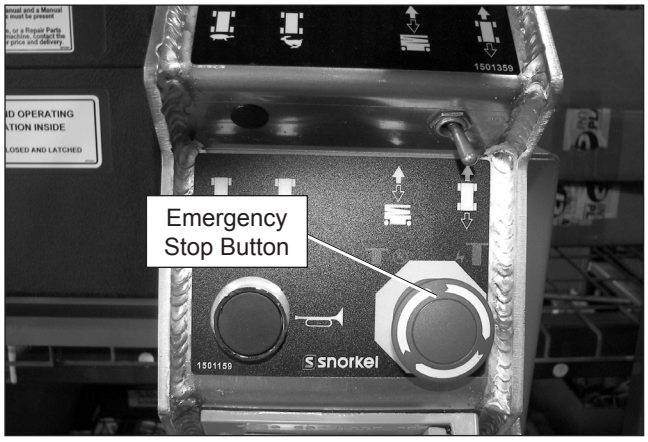


Figure 4.2 – Upper Control Panel Front

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

Control Select/Ground Operation Switch

The control select/ground operation switch (refer to Figure 4.1) prevents platform movement if the platform raise/lower switch on the lower control panel is accidentally moved.

Hold the switch downward continually in the lower control position to enable the platform raise/lower switch functions.

Upper Control Interlock Switch

The interlock switch (refer to Figure 4.3) prevents platform movement if the joystick on the upper control panel is accidentally moved.

Engage the interlock by grasping the joystick and pulling the switch toward the handle to activate the steering, drive, lift and lower functions.

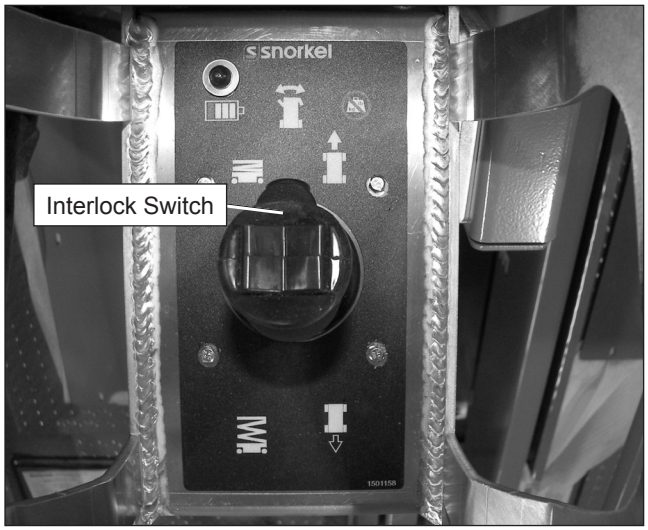


Figure 4.3 – Upper Control Panel Top

Drive Motion Alarm
When the joystick is moved out of neutral to drive the aerial platform, the alarm emits a loud beeping sound to warn personnel in the work area to stand clear.

Pothole Protector Skids
The pothole protector skids automatically lower when the platform is elevated approximately 24″ (61 cm). Ground clearance is reduced from 2.63″ (6 cm) to 3/4″ (1.9 cm) when the skids lock into position (refer to Figure 4.4).

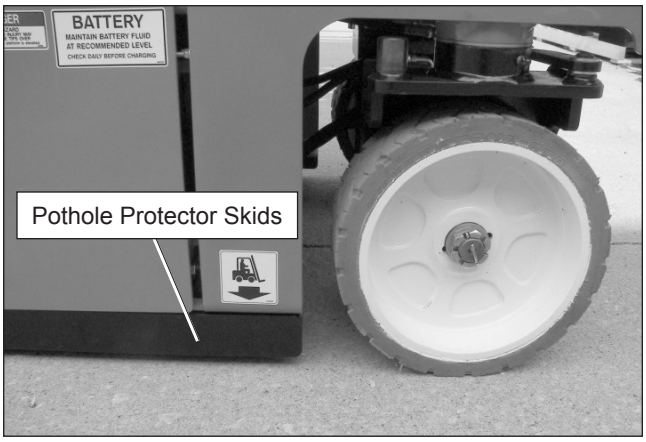


Figure 4.4 – Pothole Protector Skids

⚠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 within 4′ (1.2 m) of any drop-off, hole, or other tip-over hazard.

This protection system limits the tilt angle if a wheel is driven into a drop-off or hole. This greatly reduces the likelihood of the aerial platform tipping over.

The pothole protection system is for added protection and does not justify operating near drop-offs or holes.

Drive/Lift Pothole Protector Interlock
The aerial platform drive and lift functions are interlocked through a limit switch that senses whether or not the pothole protection linkage is locked into position. The drive/lift pothole interlock operates when the platform is elevated approximately 6′ (1.8 m).

If an obstruction under the skids, or some other impairment prevents the skids from locking into position, the drive and steer functions will not operate.

Lower the platform and remove the obstruction when the drive/lift pothole protector interlock is engaged.

Drive/Lift Level Sensor Interlock
The aerial platform drive and lift functions are interlocked through a level sensor system. The drive/lift level sensor interlock operates when the platform is elevated approximately 6′ (1.8 m).

The drive and lift functions will not operate and an alarm will sound if the chassis is tilted more than:

S3226E
1.5° side-to-side and 4° front-to-rear

S3215L/S3215E/S3219E/S3220E/S4726E/S4732E
2° side-to-side and 4° front-to-rear

Lower the platform and drive to a level surface when the drive/lift level sensor alarm sounds.

The drive/lift level sensor system is for added protection and does not justify operating on anything other than firm, flat, level surfaces.

Lowering Alarm
When the joystick is moved out of neutral to lower the platform, the alarm emits a loud beeping sound to warn personnel in the work area to stand clear.

⚠Danger
Pinch points exist on the scissors structure. Death or serious injury will result if the scissors structure lowers onto personnel within the scissors arms or under the raised platform. Stand clear while raising and lowering the platform.

Be careful when lowering the platform. Keep hands and fingers away from the scissors structures components.

Emergency Lowering Lever/Handle
The emergency lowering lever/handle may be used to lower the platform if there is a malfunction in the hydraulic or electrical system.

The lever for the S3215L/S3215E/S3219E is mounted at the front of the aerial platform (refer to Figure 4.5).

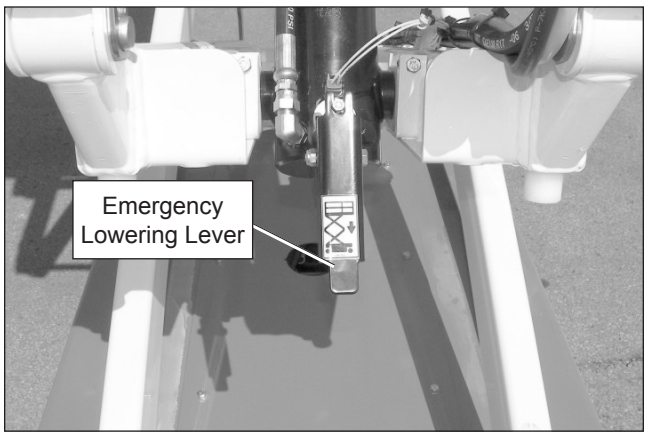


Figure 4.5 – Front of Machine

The handle for the S3220E/S3226E/S4726E/S4732E is mounted at the rear of the aerial platform (refer to Figure 4.6).

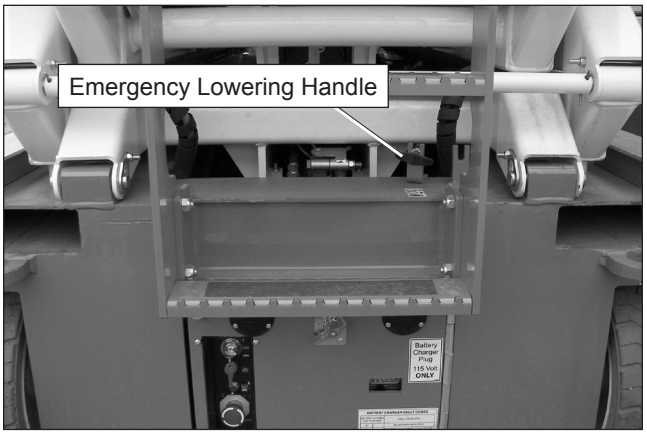


Figure 4.6 – Rear of Machine

⚠Danger

Pinch points exist on the scissors structure. Death or serious injury will result if the scissors structure lowers onto personnel within the scissors arms or under the raised platform. Stand clear while operating the emergency lowering lever/handle to lower the platform.

- Keep hands and fingers away from the scissors structure components.
- S3215L/S3215E/S3219E – push downward on the emergency lowering lever at the front of the machine to lower the platform.
- S3220E/S3226E/S4726E/S4732E – pull outward on the emergency lowering handle at the rear of the machine to lower the platform.

Safety Prop

The safety prop (refer to Figure 4.7) is used to support the scissors structure when access to the scissors arm components or the chassis is required. Always use the safety prop when the platform is raised during inspection and maintenance.

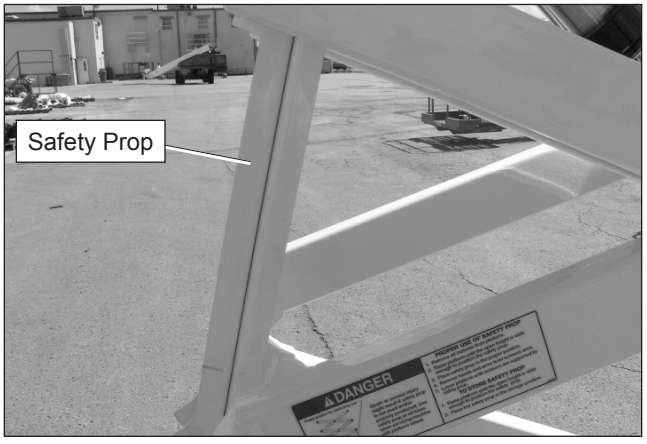


Figure 4.7 – Safety Prop

Guardrails

The guardrails (refer to Figure 4.8) help protect personnel from falling off the platform.

The guardrail system includes:

- A top rail
- A mid rail
- Saloon style entry doors
- Toeboards around the sides of the platform.

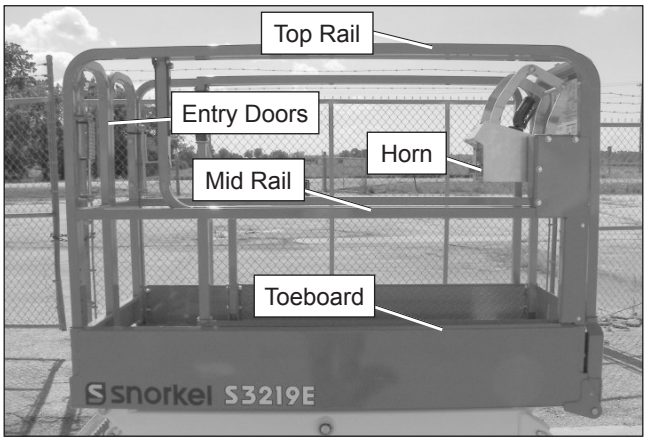


Figure 4.8 – Platform

The entry doors allow for access to the platform. The doors must be securely closed except when personnel are entering or leaving the platform.

Ground Fault Circuit Interrupter

The electrical power outlet (refer to Figure 4.9), at the platform contains a ground fault circuit interrupter (GFCI) to provide protection for personnel.



Figure 4.9 – Upper Controls

Tilt Alarm

An alarm will sound if the aerial platform chassis is out of level when the platform is raised. Refer to the machine general specifications for the specific level sensor settings.

⚠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 platform and drive to a level surface when the tilt alarm sounds.

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

Horn

The horn may be used to warn personnel on the ground. The horn is operational when the machine is set up for operation from the upper controls.

The horn button is located on the front of the upper control panel (refer to Figure 4.2).

Flashing Light

An optional amber flashing light may be located under the upper control box. The flashing light warns personnel that the aerial platform is in the area.

The light flashes at about one flash per second when the machine is set up for operation from the upper controls.

Chapter 5 – Gauges and Displays

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

Battery Charge Indicator – ProCharger

The battery charger has three LED's (refer to Figure 5.1) which indicate the charger status.

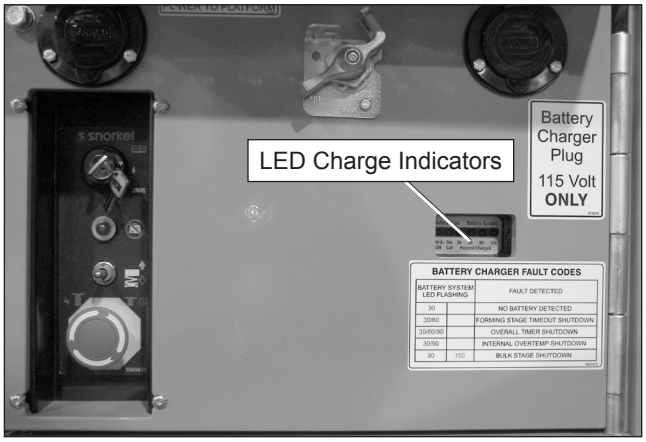


Figure 5.1 –Rear of Chassis

The LED's are visible on the battery tray.

- 30% red LED blinking – indicates that the batteries are 0% to 30% charged.
- 60% red LED blinking – indicates that the batteries are 30% to 60% charged.
- 90% red LED blinking – indicates that the batteries are 60% to 90% charged.
- 100% green LED solid On – indicates that the charge cycle is complete.

Battery Charge Indicator – Pylon

The battery charger has three LED's (refer to Figure 5.2) which indicate the charger status.

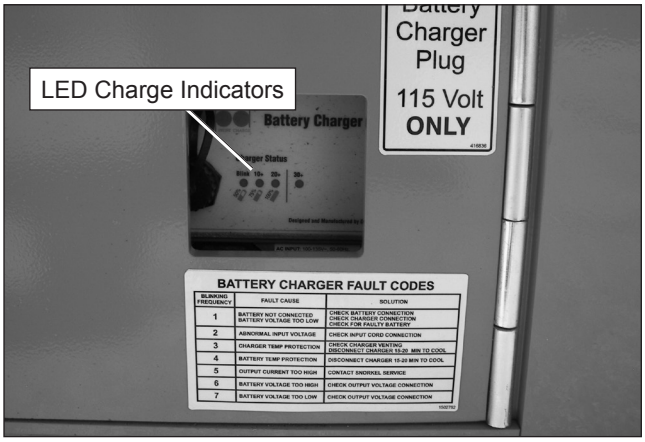


Figure 5.2 – Rear of Chassis

The LED's are visible on the battery tray.

- 50% LED blinking – indicates less than 50% capacity.
- 50% LED solid On – indicates more than 50% capacity.
- 75% LED solid On – indicates more than 75% capacity.
- 100% LED solid On – indicates 100% capacity.

Battery Condition Indicator

The battery condition indicator (refer to Figure 5.3) is located on the top of the upper control panel. When the light comes on, the lift function is cut out and drive speed is reduced to slow.

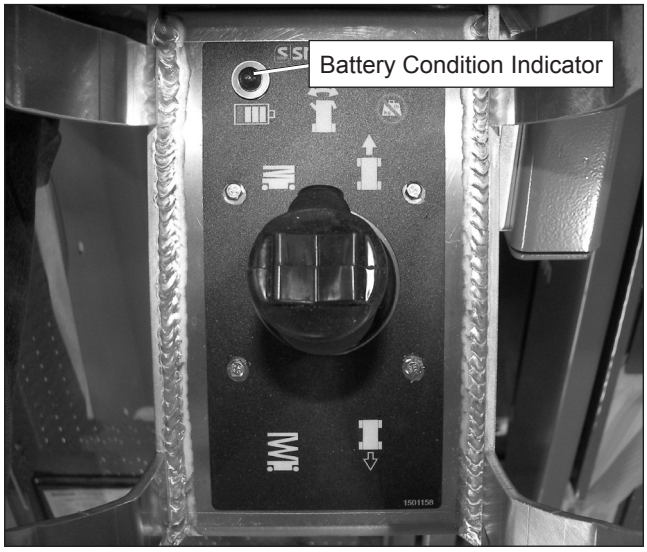


Figure 5.3 – Top of Upper Controls

Diagnostic Center Display

The diagnostic center LCD display (refer to Figure 5.4) is located in the control valve tray on the right side of the machine.

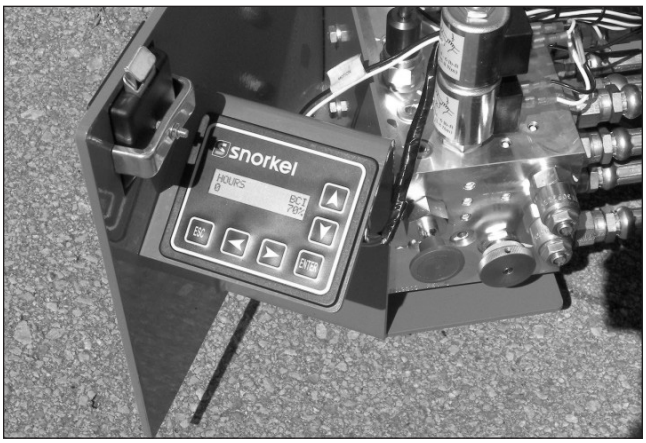


Figure 5.4 – Diagnostic Center LCD Display

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

- The accumulated aerial platform operating time
- The available battery power to operate the machine.

Chapter 6 – Batteries

Each battery tray contains two, 6 volt batteries. These batteries supply 24 volt DC electrical power to operate the aerial platform drive and platform control systems. Proper machine operation depends on well maintained and charged batteries.

General Maintenance

Always keep the batteries clean, free of dirt and corrosion. A film on top of the battery can accelerate discharge.

⚠Warning

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

Use distilled water to refill the batteries. Avoid water containing metallic solids such as iron which can reduce the life of the batteries.

Consult a battery charger specialist if extreme temperature use is unavoidable.

- Cold reduces battery capacity and retards charging.
- Heat increases water usage and can result in overcharging.
- Very high temperatures can cause thermal run away which may lead to an explosion or fire.

Charging

The aerial platform is equipped with an automatic battery charger that will completely recharge the batteries and turn off after the charge cycle is completed.

⚠Warning

Batteries give off hydrogen and oxygen that can combine explosively. Death or serious injury can result from a chemical explosion. Charge the batteries only in a well ventilated area away from sparks or flame.

⚠Caution

The batteries can be overcharged and/or damaged if the charger fails to shut off automatically. Do not leave the battery charger on for more than two days.

It may take from 1 1/2 to 16 hours to recharge the batteries depending on the amount of discharge. If the charging cycle exceeds 16 hours without the batteries being fully recharged, shut off the charger and have the batteries checked.

Fully recharge the batteries, immediately after use.

- One charging cycle per day is preferred.
- Fully charged batteries perform best.
- The deeper the discharge, the fewer number of cycles a battery will deliver. Deep discharges deteriorate the battery quicker than light shallow cycles.
- An overly discharged battery may need to be cycled a few times before it can fully recover.
- If a battery begins to heat before becoming fully charged, it may be necessary to recharge and discharge the battery a few times.

Use the following procedure to charge the batteries.

1. The battery disconnect switch is at the rear of the chassis, below the entry step (refer to Figure 6.1). Turn the battery disconnect switch off.

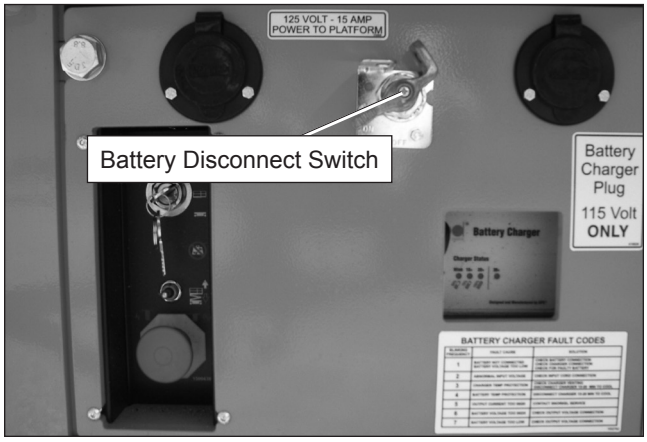


Figure 6.1 – Rear of Chassis

2. Check the battery water level. Add water to individual cells only if the plates are exposed. Replace the battery caps.
3. Plug the charger into a properly grounded AC outlet using a 3 conductor, 12 gauge or larger extension cord. The extension cord must be as short as possible and in good electrical condition.
4. Leave the charger plugged in until it shuts itself off.
5. Unplug the extension cord after the charger turns itself off. Allow the batteries to cool off after charging.
6. Check the battery water level. Add water to individual cells only if the plates are exposed. Replace the battery caps.

Chapter 7 – 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 chassis 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

The battery disconnect switch is at the rear of the platform, below the entry step (refer to Figure 7.1).

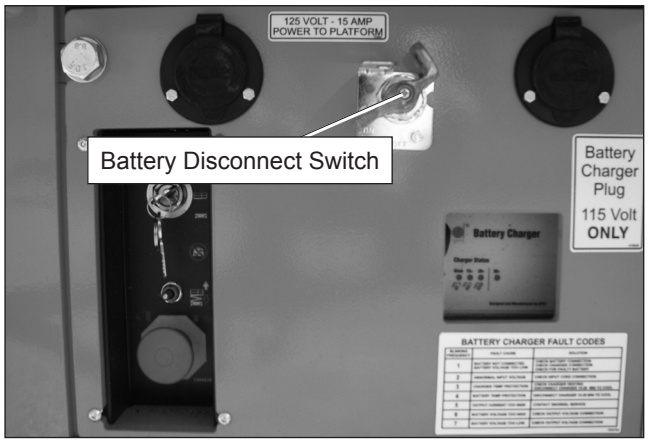


Figure 7.1 – Rear of Chassis

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

- Place the switch in the on position to operate any electrically controlled function.

⚠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 7.2) are located at the rear of the chassis. Only platform functions can be operated from the lower controls.

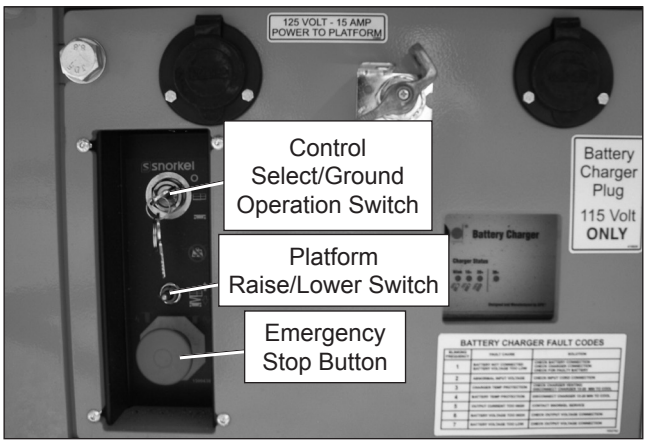


Figure 7.2 – Lower Controls

The following are located on the lower control panel:

- Emergency stop button
- Control selector/ground operation switch
- Platform raise/lower switch

Emergency Stop Button

The emergency stop 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.

Control Selector/Ground Operation Switch

Insert the key into the control selector/ground operation switch.

- In the upper position, aerial platform functions will not operate from the lower or upper controls.
- Turn the switch to the upper controls position to operate the aerial platform functions from the upper controls.
- Hold the switch downward continually in the lower controls position to enable the platform raise/lower switch functions. The switch is spring returned to the upper controls position.

  The upper controls will not operate while the control selector is in the lower position.

Platform Raise/Lower Switch

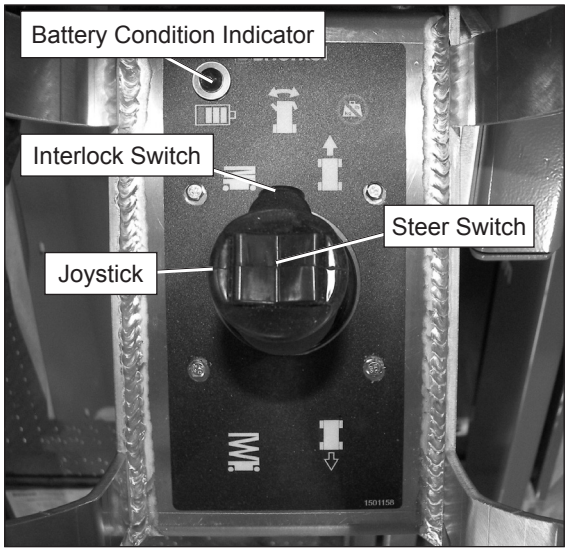
The platform raise/lower switch is used to raise or lower the platform. The switch is spring returned to the center off position.

- Hold the switch upward to raise the platform.

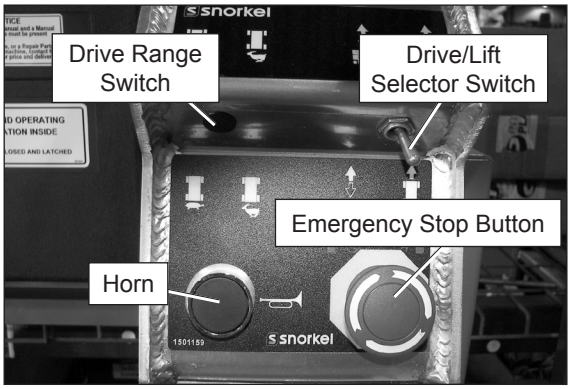
- Hold the switch downward to lower the platform.
- An alarm will sound as the platform lowers.

Upper Controls

The upper controls (refer to Figure 7.3) are located on the control panel in the platform. Platform and drive functions can be operated from the upper controls.



Upper Controls – Top



Upper Controls – Front

Figure 7.3 – Upper Controls

The following are located on the upper control panel:

- Emergency stop button
- Drive/lift selector switch
- Drive range switch
- Joystick to control platform lift, drive, and steer
- Horn button
- Battery condition indicator

Emergency Stop Button
The emergency stop (refer to Figure 7.3) is a two-position, red push button on the front of the upper control panel.

- Push the button inward to disconnect power from all control circuits at the upper controls.
- Pull the button outward to restore power.
- **Push the emergency stop button inward when the upper controls are not in use to protect against unintentional operation.**

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

Drive/Lift Selector Switch
The drive/lift selector switch (refer to Figure 7.3) is used to select either machine drive or lift functions. Both functions can not be operated at the same time.

- Place the drive/lift selector switch in the drive position to drive the aerial platform using the joystick. The platform will not raise or lower while driving.
- Place the drive/lift selector switch in the lift position to raise and lower the platform using the joystick.

Joystick
Use the joystick (refer to Figure 7.3) to operate the following functions:

- Aerial platform steering
- Aerial platform drive and speed
- Platform raise/lower and speed

Movement of the joystick in a given direction produces a corresponding movement of the aerial platform. The steering and drive functions may be operated separately or simultaneously.

Interlock Switch
The joystick has an interlock switch in the handle (refer to Figure 7.3).

- Engage the interlock by grasping the joystick and pulling the switch toward the handle.
- Engage the interlock to activate the steering, drive, or lift functions.

Steer Switch
The steer switch (refer to Figure 7.3) 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, engage the interlock switch on the joystick and hold down the right side of the steer switch.

- To steer to the left, engage the interlock switch on the joystick and 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 has two positions to select drive wheel operation:

- High (Rabbit) – for normal driving conditions
- Low (Turtle) – for driving on grades up to 25 percent that require low speed and high torque operation, where high range is not sufficient to climb the grade.

Note
Some early model S3219E and S3220E machines were not equipped with a drive range switch.

Horn Button
The horn button (refer to Figure 7.3) is on the front of the upper control panel.

Press the button to sound the horn.

Battery Condition Indicator
The battery condition indicator (refer to Figure 7.3) is located on the top of the upper control panel. When the light comes on, the lift function is cut out and drive speed is reduced to slow.

Loading Controls

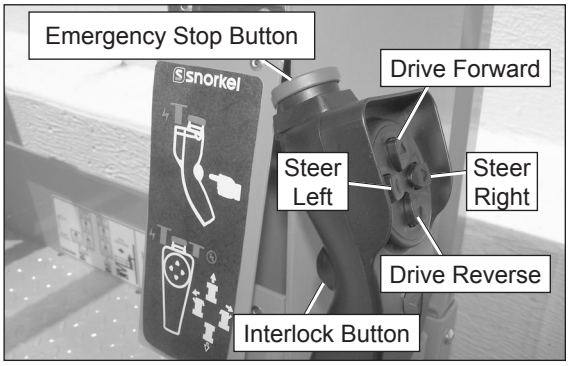
The loading controls are located beneath the upper control box on the platform guardrail. Drive functions may be operated from this location when loading the machine. The loading controls may be a fixed side drive or a corded pendant (refer to Figure 7.4). Pull the upper control emergency stop button outward to activate the loading controls.

The following are located on the loading controls:

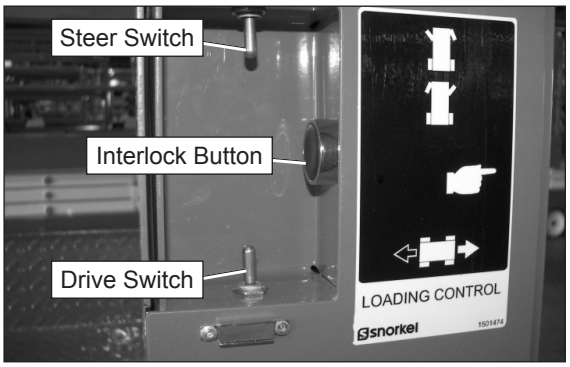
- Emergency stop button – pendant only
- Interlock button
- Drive forward/reverse control
- Steer left/right control

Emergency Stop Button
The emergency stop (refer to Figure 7.4) is a two-position, red push button on the top of the pendant.

- Push the button inward to disconnect power from the pendant.
- Pull the button outward to restore power.
- **Push the emergency stop button inward when the pendant is not in use to protect against unintentional operation.**



Pendant



Fixed Side Drive

Figure 7.4 – Loading Controls

Interlock Button
The controls have an interlock button to activate drive functions (refer to Figure 7.4). Press and release the interlock button to activate the loading controls.

Note
You have five seconds to activate a drive or steer control after pressing the interlock button. After five seconds, the interlock button will have to be pressed again.

Drive Switch
The drive switches (refer to Figure 7.4) are momentary contact. These switches control the two front wheels to drive the aerial platform.

- On the pendant – engage the interlock button and hold down either the drive forward or drive reverse button.
- On the fixed side drive – to drive forward, press the interlock button inward and hold the switch forward. To drive in reverse, press the interlock button inward and hold the switch rearward.

Steer Switch
The steer switches (refer to Figure 7.4) are momentary contact. These switches control the two front wheels to steer the aerial platform.

- On the pendant – press the interlock button and hold down either the steer left or steer right button.
- On the fixed side drive – press the interlock button and hold the switch in the appropriate direction to steer either left or right.

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

Chapter 8 – 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 this chapter to ensure that no areas are overlooked.

⚠Warning

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

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

Operator's Manual

The manual holder is located on the floor of the platform (refer to Figure 8.1).



Figure 8.1 – Operator's Manual Holder

To inspect the operator's manual and 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/SIA A92.6-2006 Self-Propelled Elevating Work Platforms" is in the manual holder.

Electrical System

Electrical power is supplied from four, 6 volt batteries. The batteries supply 24 volt DC electrical power to operate the aerial platform drive and control system. There is a battery tray on each side of the machine. Each tray contains two batteries.

⚠Warning

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

⚠Caution

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

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

Battery Fluid Level

To inspect the battery fluid level:

1. Remove the caps from the batteries (refer to Figure 8.2).

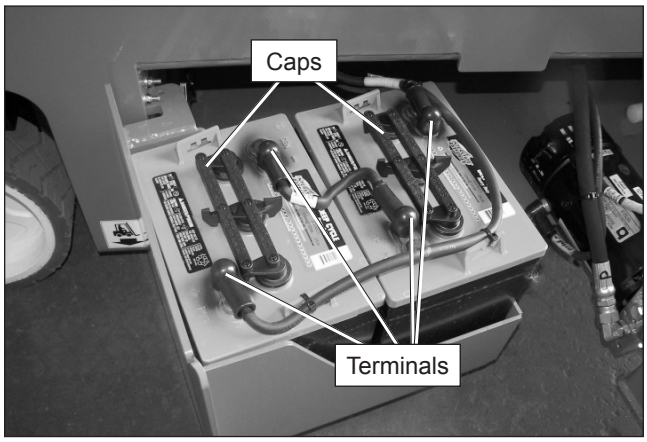


Figure 8.2 – Battery Tray

2. Visually check the battery fluid level making sure the level is ¼″ (6 mm) above the plates.

3. If necessary, add distilled water.

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

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

Battery Terminals
To inspect the battery terminals:

1. Check the top of the battery, the terminals, and cable ends (refer to Figure 8.2). They should be clean and free of corrosion.

2. If necessary, clean the top of the battery. Clean the terminals and cable ends with a wire brush or terminal cleaning tool.

3. Make sure all cable ends are securely fastened to the terminals.

Battery Charger
Inspect the battery charger (refer to Figure 8.3) to ensure that it is operating properly.

1. Turn the battery disconnect switch off.

2. Plug the charger into a source of power.

3. Observe the LED's on the charger to determine the charger status. If necessary, refer to the charger decal or to Battery Charge Indicator in Chapter 5 to determine when the batteries are fully charged.

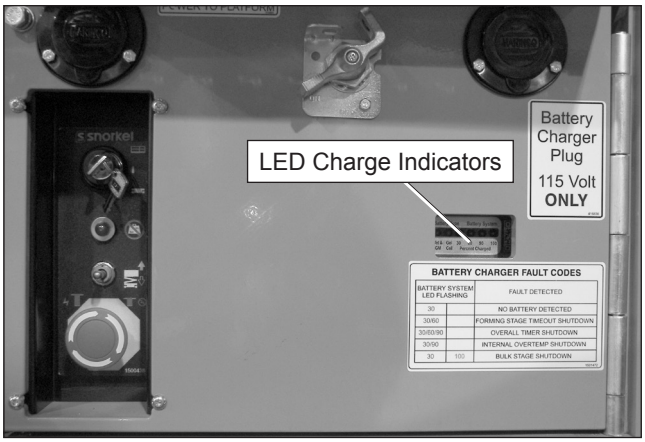


Figure 8.3 – Rear of Chassis

4. Unplug the charger.

Safety Prop

Always use the safety prop when the platform is raised before inspecting or performing service or maintenance procedures on the machine.

⚠Danger

Pinch points exist on the scissors structure. Death or serious injury will result if the scissors structure drops onto personnel working within the scissors arms or under the raised platform. Properly position the safety prop before reaching through the scissors structure.

Use the following procedure to properly position the safety prop:

1. Remove all tools and material from the platform.

2. Using the lower controls, raise the platform until the open height between the arm pins is wide enough to position the safety prop.

3. Rotate the safety prop downward from the storage position to the support position (refer to Figure 8.4).

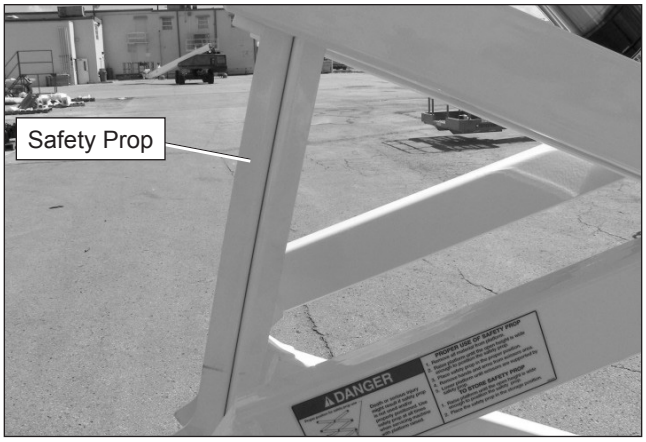


Figure 8.4 – Safety Prop in Support Position

4. Remove hands and arms from the scissors structure area.

5. Lower the platform until the scissors are supported by the safety prop.

Use the following procedure to stow the safety prop:

1. Using the lower controls, raise the platform until the open height between the arm pins is wide enough to move the safety prop.

2. Rotate the safety prop upward to the stowed position (refer to Figure 8.5).

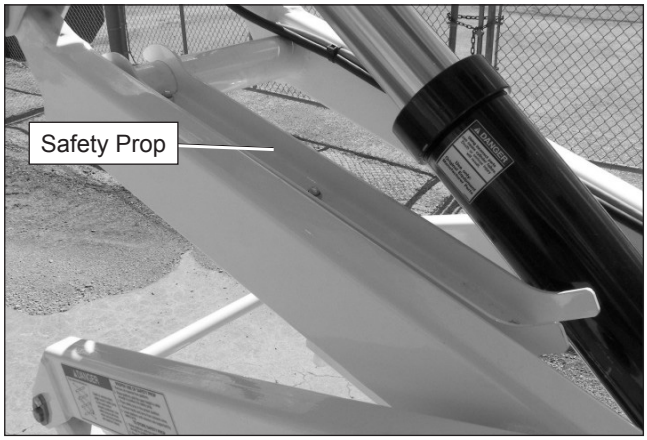


Figure 8.5 – Safety Prop in Stowed Position

3. Using the lower controls completely lower the platform.

Cables and Wiring Harness

To inspect the cables and wiring harness:

1. Visually inspect all cables and wiring for wear and/or physical damage such as loose connections, broken wires, and frayed insulation.

2. Check the wiring in areas where a change in routing direction may cause them to become pinched.

3. Make sure the cables and wires are properly routed to avoid sharp edges, pinching, and scuffing.

Hydraulic System

Hydraulic power is supplied from a single stage hydraulic pump with a 4.25 horsepower DC electric motor.

⚠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, pump, and filter are located in the hydraulic tray on the left side of the chassis. Unlatch and swing out the tray to inspect the hydraulic components.

Fluid Level

To inspect the fluid level:

1. Make sure the aerial platform is fully stowed on a level surface. Swing out the hydraulic tray and visually check to make sure the fluid is visible in the sight gauge (refer to Figure 8.6). Some machines may have a fill cap with a dipstick. The fluid must be visible on the dipstick.

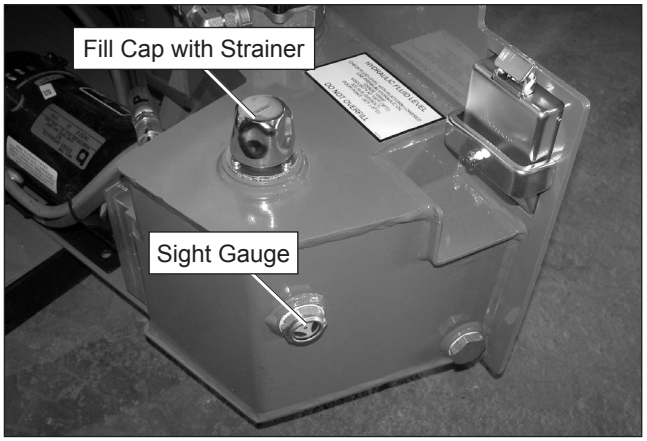


Figure 8.6 – Hydraulic Tray

⚠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.

2. If necessary, add fluid of the proper type.

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.

3. Replace the cap making sure it is secured in place.

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 8.7).

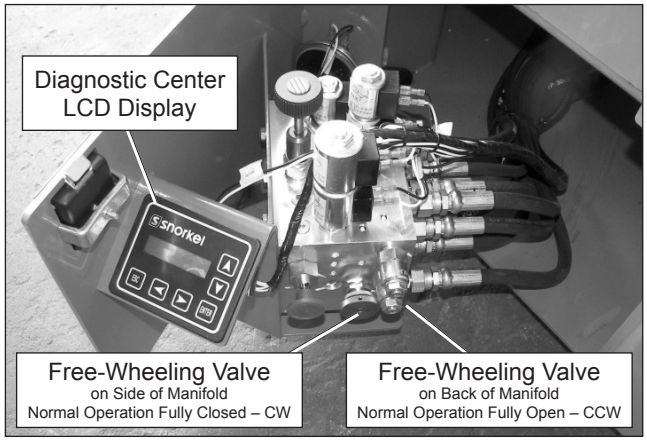


Figure 8.7 – Control Valve Tray
Right Side of Chassis

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.

Free-Wheeling Valve

The free-wheeling valve is on the hydraulic manifold in the control valve tray. On some manifolds the valve is on the side and on others it is on the back (refer to Figure 8.7).

Check the free-wheeling valve to make sure it is in its normal operation position.

Diagnostic Center Display

To test the diagnostic center display in the control valve tray (refer to Figure 8.7), from the lower controls:

1. Turn the battery disconnect switch to the on position.
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.
   - The available battery power to operate the machine.

Tires and Wheels

Visually inspect the tires and wheels (refer to Figure 8.8) to make sure they are suitable for service.



Figure 8.8 – Tires and Wheels

To inspect the tires and wheels:

1. Visually inspect the tires. They should be smooth without any cuts, gouges, or missing rubber that might affect aerial platform stability.
2. Check the wheels to see that the fasteners are in place and are not damaged or loose.

Ground Strap

Make certain the ground strap (refer to Figure 8.9) is securely fastened to the chassis. It should be long enough to contact the ground surface to eliminate static electricity from the machine.

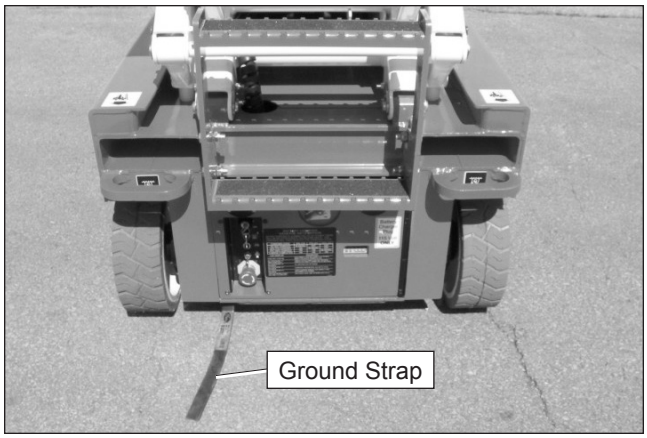


Figure 8.9 – Rear of Chassis

Lower Control Station

With no personnel or materials in the platform, test the operation of each control from the lower controls (refer to Figure 8.10).

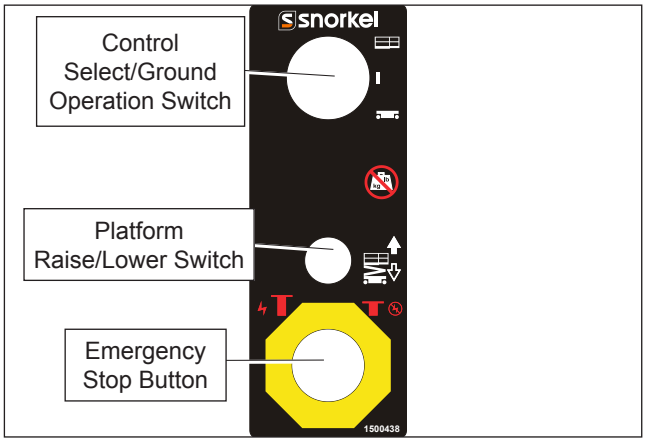


Figure 8.10 – Lower Controls

Operating Controls

Use the following procedure to operate and test the machine from the lower controls:

1. Turn the battery disconnect switch on.
2. Pull the emergency stop switch outward to the on position.
3. Hold the control select/ground operation switch downward in the lower controls position.

⚠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.

4. Test the operation of the platform raise/lower switch in both directions.

5. Place the battery disconnect switch in the off position. The platform should not raise or lower with the disconnect in this position.

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 with the emergency stop in this position.

Lowering Alarm
To test the lowering alarm from the lower controls:

1. Raise the platform approximately 10′ (3 m).

2. Lower the platform and make sure the alarm sounds.

Pothole Protector Interlock
Perform this test using the lower controls.

1. Stow the aerial platform on a smooth, flat, level concrete slab.

2. Remove all persons and materials from the platform.

3. With the trays closed, check the ground clearance under the pothole protector skids (refer to Figure 8.11). Clearance should be at about 2.63″ (6.68 cm) on both sides of the aerial platform.

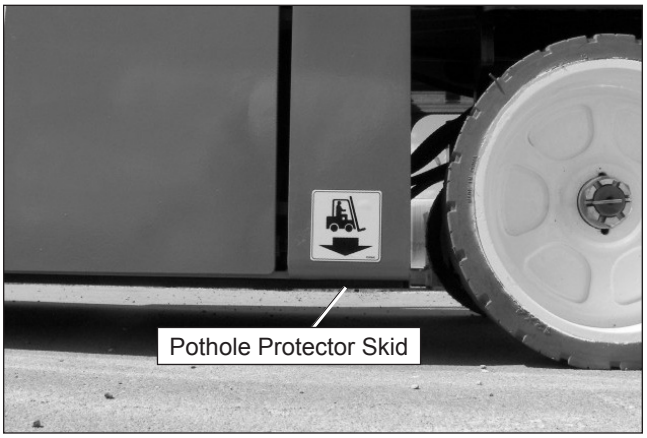


Figure 8.11 – Pothole Protector Skid

4. Raise the platform while watching movement of the skids. The skids should lower to approximately 3/4″ (1.9 cm) ground clearance when the platform is raised approximately 24″ (61 cm).

5. Fully lower the platform while watching movement of the skids. The skids should raise to their stowed position, with about 2.63″ (6.68 cm) ground clearance when the platform is fully lowered.

6. Place a 1 1/2″ (3.8 cm) thick board, such as a 2 x 4, under the skid on the left side (refer to Figure 8.12).

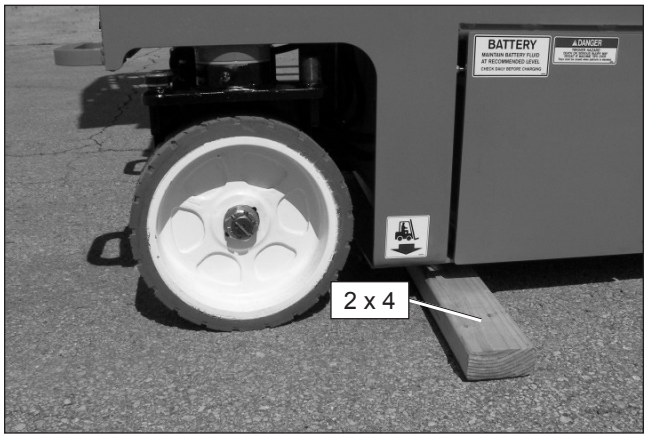


Figure 8.12 – Pothole Protector Skid

7. The board will prevent the skid from lowering fully. Raise the platform. When the skid contacts the board, an alarm should sound at approximately 7′ (2 m) platform floor height. The alarm should then sound when the platform lift switch is activated.

8. Lower the platform. Place the board under the skid on the right side.

9. Raise the platform. When the skid contacts the board, an alarm should sound at approximately 7′ (2 m) platform floor height. The alarm should then sound when the platform lift switch is activated.

⚠Warning

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

10. If the platform raise function is not disabled, or the alarm does not sound remove the aerial platform from service until the problem is corrected.

Emergency Lowering System

Use the following procedure to test the emergency lowering system:

⚠Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components. Stand clear of moving components while test operating the machine.

1. Use the lower controls, fully raise the platform. Push the emergency stop button inward.

2. Locate the emergency lowering control.

The lever for the S3215L/S3215E/S3219E is mounted at the front of the aerial platform (refer to Figure 8.13).

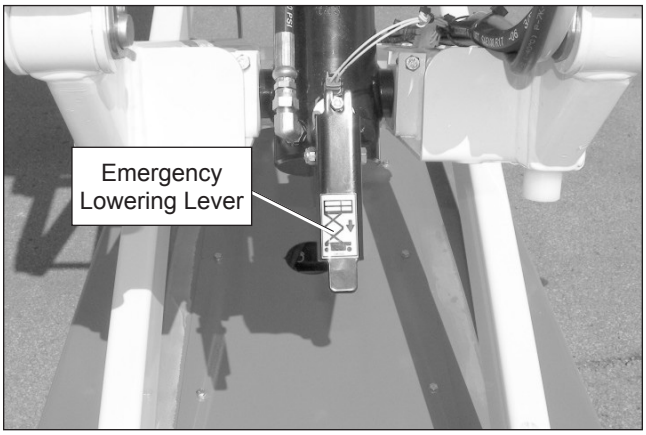


Figure 8.13 – Front of Machine

The handle for the S3220E/S3226E/S4726E/S4732E is mounted at the rear of the aerial platform (refer to Figure 8.14).

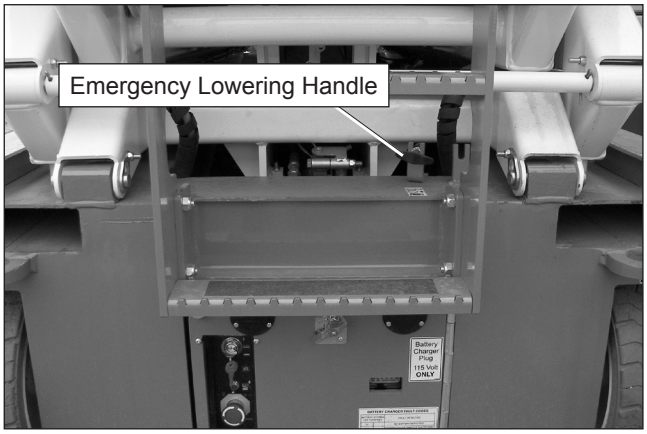


Figure 8.14 – Rear of Machine

⚠Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components. Make sure all personnel stand clear while lowering the platform with the emergency lowering lever/handle.

3. Make sure there is nothing in the way to obstruct the platform when it lowers. Stand clear of the scissors structure.

4. Stand clear of the scissors structure.

   - S3215L/S3215E/S3219E – push downward on the emergency lowering lever at the front of the machine to lower the platform.

   - S3220E/S3226E/S4726E/S4732E – pull outward on the emergency lowering handle at the rear of the machine to lower the platform.

5. The platform will begin to lower as the lever/handle is actuated. Release the lever/handle to stop the platform from lowering.

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. 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.

4. Pay close attention to welds in areas where changes in cross section take place and near the attachment points of highly loaded components.

Rollers and Slide Blocks

To inspect the rollers and slide blocks:

1. Visually inspect the scissors arm rollers and slide blocks (refer to Figure 8.15). They must be free to move without obstruction. There is one roller and slide block on each side of the chassis.

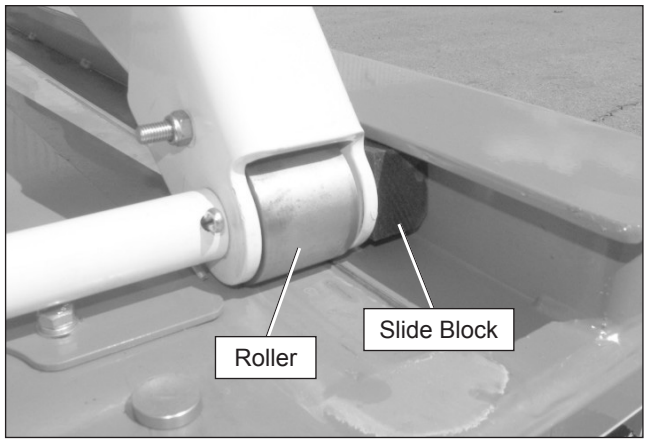


Figure 8.15 – Front of Chassis

2. Raise the platform from the lower controls and visually inspect the slide blocks underneath the front of the platform (refer to Figure 8.16). There is one slide block on each side of the platform. The slide blocks must be in good condition and free to move without obstruction.

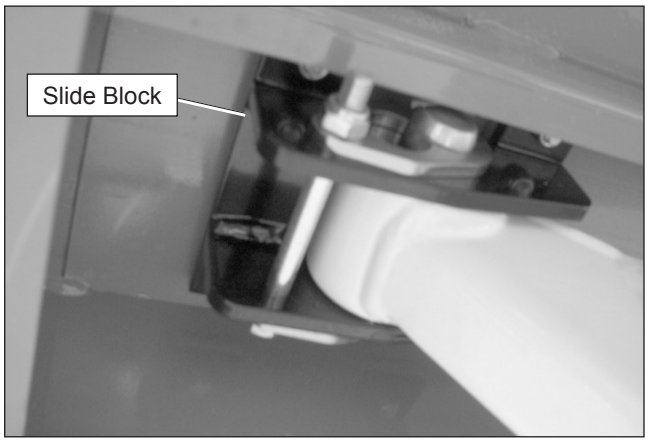


Figure 8.16 – Underneath Front of Platform

Fasteners
To inspect the fasteners:

1. Visually inspect all fasteners to see that none are missing or loose.

2. Inspect all of the bolts, nuts, rollpins, collars, and snap rings. They should all be present, tight, and not damaged in any way.

Upper Control Station

Inspect the platform and upper controls only if all functions operated properly from the lower controls.

Guardrail System
The guardrail system includes (refer to Figure 8.17):

- A top rail
- A mid rail
- Saloon style entry doors
- Toeboards around the sides of the platform.

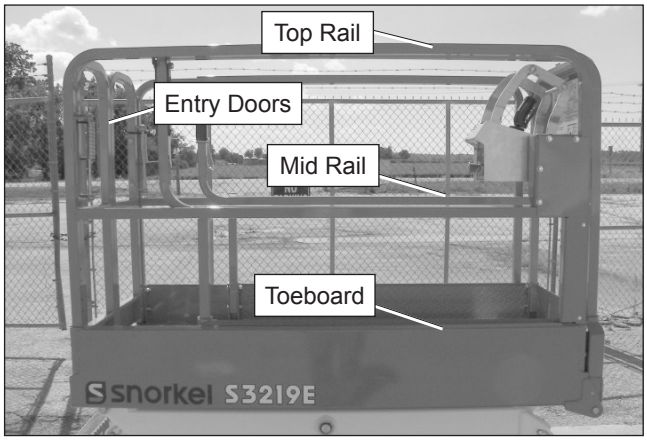


Figure 8.17 – Upper Controls

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 check the rail and toeboard welds for cracks.

3. Visually check all bolts and nuts fastening the platform and guardrails in place. They must be present and not show any signs of looseness.

4. Inspect the entry doors to see that they swing freely and are not deformed in any way. Make sure the doors are secure when they are closed.

Platform Extension
Latch handles on each side of the extension deck secures the extension deck to the main platform deck.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

To inspect the platform extension:

1. Inspect the extension handles and locks (refer to Figure 8.18) on each side of the platform to ensure they release to extend the platform.

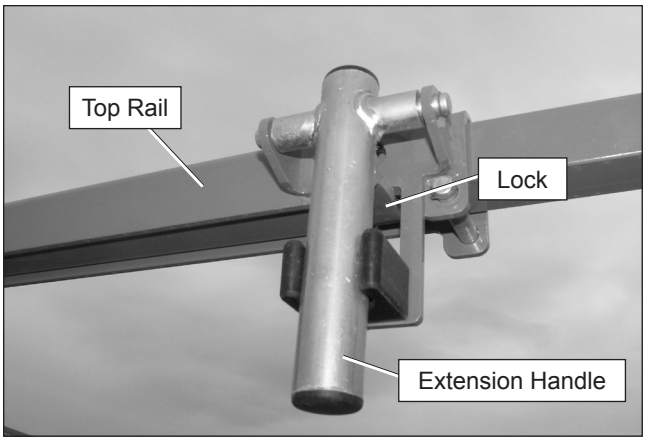


Figure 8.18 – Platform Extension Handle

2. While facing the front of the platform, grasp the platform extension handles, raise them and push the extension deck forward to extend the deck. Fully lower the handles at the mid or front position and ensure they are locked in their lowered position (refer to Figure 8.18).

3. Inspect the rollers on the platform extension. They must be in place, in good condition, and free to move without obstruction.

4. Inspect the weldments for deformation and damage. Try to move the rails back and forth to make sure the platform extension deck fully locks in position.

5. Visually check the platform welds for cracks.

6. While facing the front of the platform, grasp the platform extension handles, raise them and pull the extension deck backward to retract the deck. Fully lower the handles at the stowed position and ensure they are locked in the lowered position (refer to Figure 8.18).

7. Make sure the platform extension deck is locked in position.

Operating Controls

⚠Warning

The potential for an accident increases from improperly driving or steering the aerial platform. Death or serious injury could result from such accidents. Make sure the upper control panel is securely fastened inside the platform and facing the front of the machine.

Avoid driving the platform with the upper controls facing the rear or side of the machine. In this position the machine is difficult to control because the drive and steer control movements and their resulting machine movements will not correspond.

Only operate the upper controls when the upper control panel is securely fastened inside the platform and facing the front of the machine.

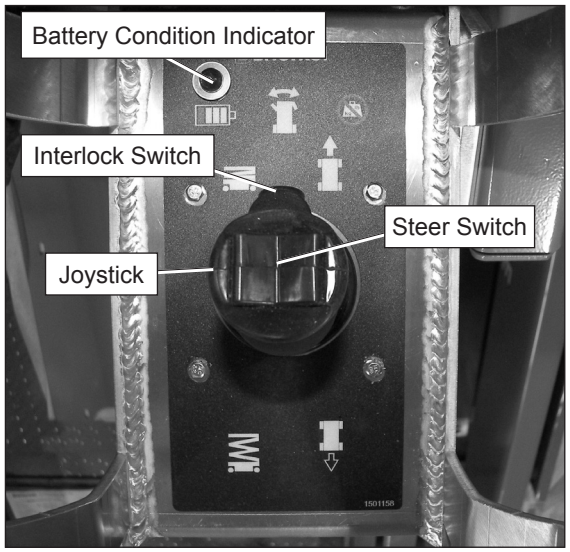
Use the following procedure to operate and test the machine from the upper controls:

1. Make sure the battery disconnect is turned on.

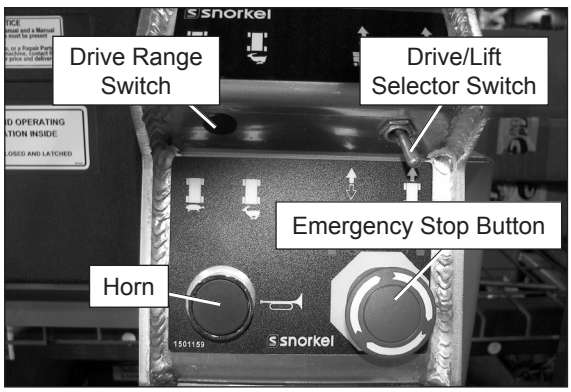
2. At the lower controls, pull the emergency stop button outward.

3. Turn the control select/ground operation switch to the upper control position.

4. At the upper controls (refer to Figure 8.19), pull the emergency stop button outward.



Upper Controls – Top



Upper Controls – Front

Figure 8.19 – Upper Controls

⚠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.

5. Test the interlock switch by moving the joystick without engaging the interlock switch.

   If movement occurs, the interlock is not functioning properly. Do not operate the machine until the problem is corrected.

6. Place the drive/lift selector switch in the drive position and test the operation of the joystick in both directions. The lift functions should not operate with the selector in the drive position.

   Squeeze and hold the interlock switch against the joystick. Test the steer switch in both directions using the steering switch.

   - 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.

7. Test the operation of the brakes while operating the aerial platform from the upper controls. The brakes are engaged when:

   - the joystick interlock is released.
   - the drive/lift selector switch is in the lift position.
   - the emergency stop button is pushed down.

   Placing the drive/lift selector in the drive position, engaging the interlock and moving the joystick, releases the brakes.

8. Place the drive/lift selector switch in the lift position and test the operation of the joystick in both directions. The drive functions should not operate with the selector in the lift position.

   Squeeze and hold the interlock switch against the joystick. Test the joystick in both directions.

   - To raise the platform, pull the joystick backward.
   - To lower the platform, push the joystick forward.

Emergency Stop
To test the emergency stop button from the upper controls:

1. Push the emergency stop button inward to turn off electrical power.
2. Verify that the upper control platform and drive functions do not operate.

Horn Button
The horn is operational when the machine is set up for operation from the upper control panel (refer to Figure 8.19).

Press the horn button to ensure that it sounds to warn personnel in the area.

Lowering Alarm
To test the lowering alarm from the upper controls:

1. Raise the platform approximately 10′ (3 m).
2. Lower the platform and make sure the alarm sounds.

Drive Alarm
Drive in both the forward and reverse directions to ensure that the alarm sounds to warn personnel in the area that the aerial platform is in motion.

Electrical Power Outlet

Connect a source of 125 volt AC power to the power-input connector at the rear of the chassis. Plug an electrical tool into the receptacle and try to operate the tool to verify proper operation of the outlet.

Use the following procedure to test the ground fault circuit interrupter GFCI.

1. Push the test button (refer to Figure 8.20).

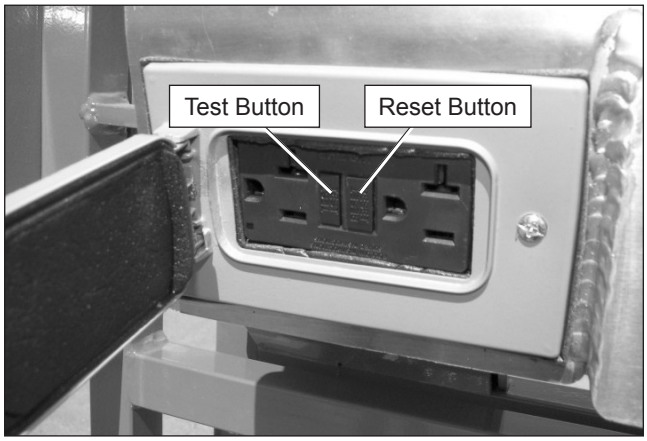


Figure 8.20 – Electrical Power Outlet

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.

Flashing Light

The machine may be equipped with an optional flashing light located under the upper control box.

To inspect the flashing light:

1. At the lower controls, pull the emergency stop button outward and turn the control select/ground operation switch to either the lower or upper control position.

2. Operate any control function and visually check to see that the light is flashing approximately one flash per second.

Note
There is not an off switch for the flashing light.

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

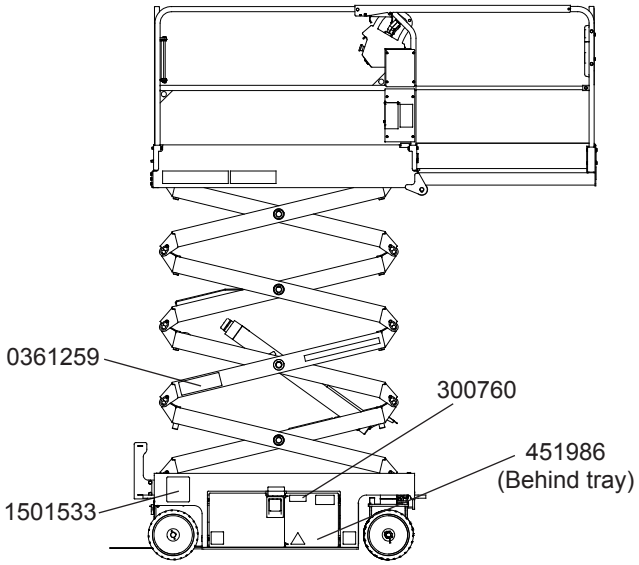
Solvents may contain hazardous ingredients. Follow the manufacturer's label for proper use and disposal. Wear protective gloves and splash-proof safety glasses when using solvents.

3. Remove wet paint overspray with a natural biodegradable solvent and a soft cloth.

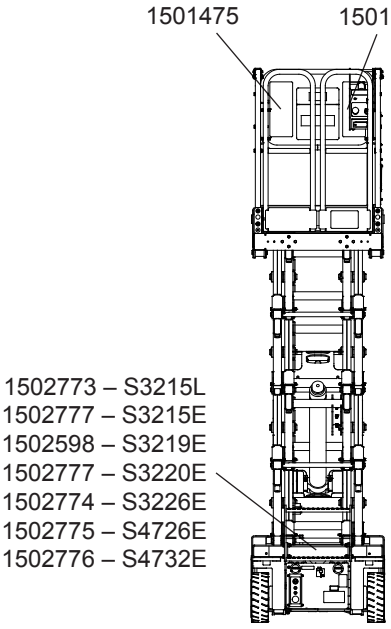
4. Replace any missing, damaged, or illegible placards or decals before operating the aerial platform.

Placard and decal kits are available from Snorkel.

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



Right Side



Rear



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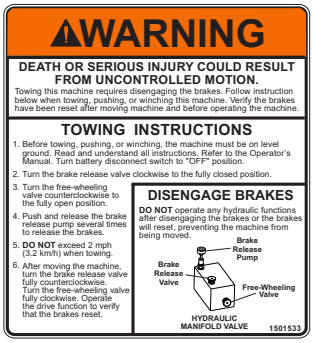

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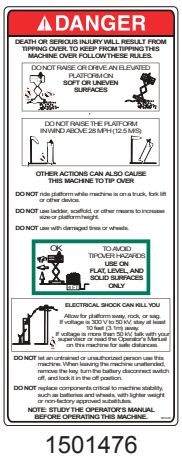

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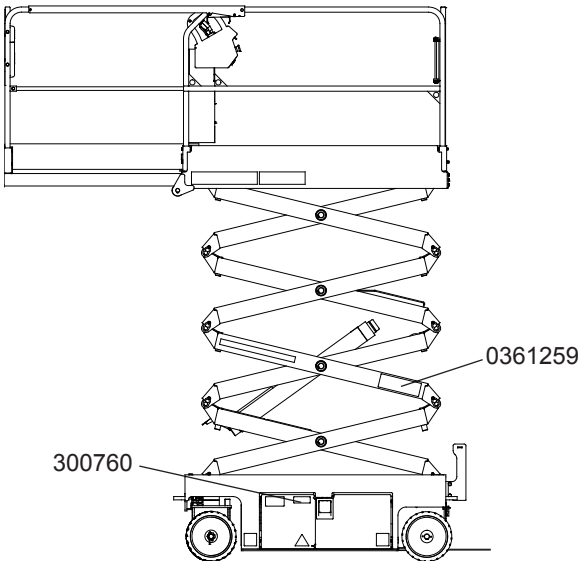

Left Side



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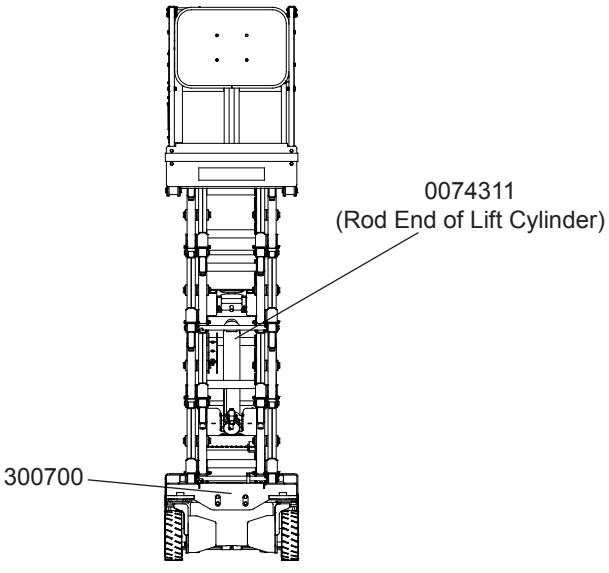

Front



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Prestart Inspection Checklist

Item	Inspect For	OK
Operator's Manual	In manual holder, all pages readable and intact	
Electrical System		
Battery fluid level	Proper level	
Battery terminals	Clean, connectors tight	
Battery charger	Proper operation	
Cables and wiring harness	No wear or physical damage	
Hydraulic System		
Fluid level	Visible in sight glass/on dipstick with platform stowed	
Hoses, tubes and fittings	No leaks, all fittings tight	
Free-wheeling valve	In normal operation position. Side mount CW/Back mount CCW	
Diagnostic Center Display	Displays operating time/battery power	
Tires and Wheels	Good condition	
Ground Strap	In place and securely fastened	
Lower Control Station		
Operating controls	Proper operation	
Emergency stop	Shuts off lower controls/proper operation	
Lowering alarm	Sounds when platform lowers	
Pothole Protection Interlock	Proper operation	
Emergency Lowering	Proper operation	
Safety Prop	No damage or deformation	
Flashing Light	Proper operation	
Structures		
Weldments – Chassis, platform, etc.	Welds intact, no damage or deformation	
Rollers and slide blocks	In place, no damage or deformation	
Fasteners	In place, tight, and no damage	
Upper Control Station		
Guardrail system	Welds intact, no damage or deformation	
	All fasteners in place, no loose or missing parts	
Platform extension/latch handles	Proper operation, no damage or deformation	
Brakes	Proper operation	
Operating controls	Proper operation	
Emergency stop	Shuts off upper controls	
Lowering alarm	Sounds when platform lowers	
Drive motion alarm	Sounds when aerial platform drive function is operated	
Battery condition indicator	Proper operation	
Horn	Sounds when activated	
Placards and Decals	In place and readable	

Chapter 9 – Operation

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

⚠Danger

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

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components, buildings, structures, or other obstacles. Make sure there is sufficient clearance around the machine before moving the chassis 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. Do not raise the platform in wind speeds above 28 mph (12.5 m/s).

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

The work loads are stated on the platform rating placard at the entrance to 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 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.

Preparing for Operation

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

1. Perform a prestart inspection (refer to Chapter 8).
2. Place the battery disconnect switch in the on position.
3. Close and latch the swing-out trays.

Lower Controls

Only the platform raise and lower 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 raise or lower the platform using the lower controls.

1. Pull the emergency stop button outward (refer to Figure 9.1).

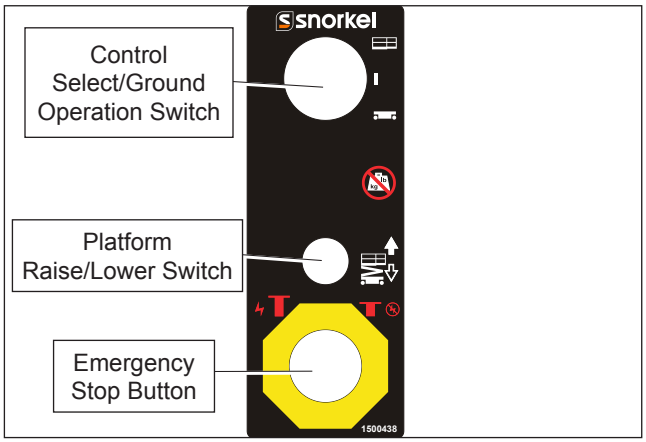


Figure 9.1 – Lower Controls

2. Hold the control select/ground operation switch downward in the lower controls position.
3. Hold the platform raise/lower toggle switch up to raise the platform and down to lower it.
4. Release either switch to stop movement.

Upper Controls

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

Before operating the upper controls, properly set up the aerial platform as described under Preparing for Operation.

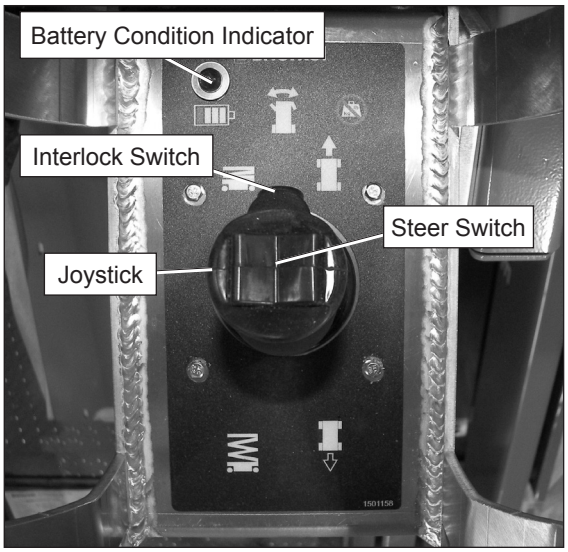
Use the following procedure to operate the aerial platform from the upper controls:

1. From the lower controls, pull the emergency stop button outward (refer to Figure 9.1).
2. Switch the control select/ground operation switch upward to the upper controls position.

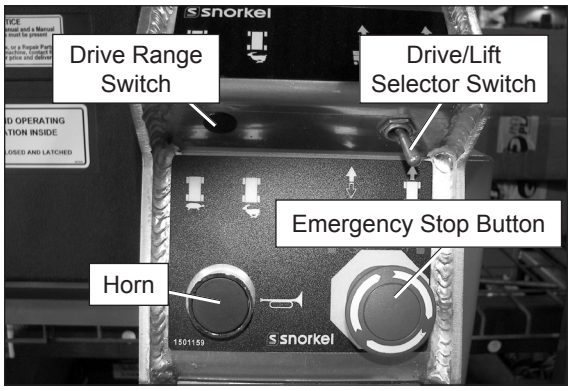
Note
The upper controls will not operate while the control selector is in the lower position.

3. Enter the platform and secure the doors.

4. From the upper controls, pull the emergency stop button outward (refer to Figure 9.2).



Upper Controls – Top



Upper Controls – Front

Figure 9.2 – Upper Controls

5. The aerial platform may be driven and the platform may be raised and lowered from the upper controls.

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

Platform

Use care when entering and exiting the platform to avoid slipping and/or falling. Securely close the entry doors when the platform is occupied.

Raising and Lowering

The raise speed is proportional to the joystick position. The farther the joystick is moved, the faster the platform raises. There is only one lowering speed.

1. Place the drive/lift selector switch (refer to Figure 9.2) in the lift position.
2. Squeeze and hold the interlock switch against the joystick.
   - To raise the platform, slowly pull the joystick backward until the desired height is reached.
   - To lower the platform, push the joystick forward.

Extending

The platform can be extended and securely locked into position.

Use the following procedure to extend the platform:

1. Enter the platform and secure the doors.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

2. While facing the front of the platform, grasp the platform extension handles, raise them and push the extension deck forward to extend the deck. Fully lower the handles at the mid or front position and ensure they are locked in their lowered position (refer to Figure 9.3).

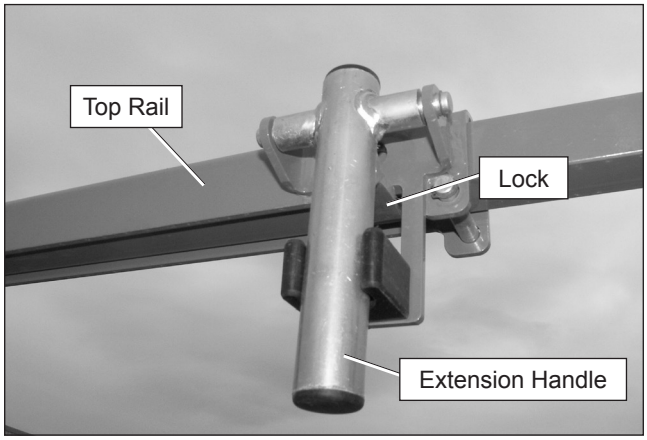


Figure 9.3 – Platform Extension Handle

3. Try to move the rails back and forth to make sure the platform extension deck is locked in position.

Use the following procedure to retract the platform:

1. Enter the platform and secure the doors.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may

result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

2. While facing the front of the platform, grasp the platform extension handles, raise them and pull the extension deck backward to retract the deck. Fully lower the handles at the stowed position and ensure they are locked in the lowered position (refer to Figure 9.3).

3. Try to move the rails back and forth to make sure the platform extension deck is locked in position.

Fold Down Guardrails

The platform may have fold down guardrails to pass the machine under low height obstructions.

⚠Danger

The potential for an accident increases when the fold down rails are lowered. Death or serious injury can result in such accidents. Do not elevate the platform with the fold down rails lowered. Use extreme care when moving the aerial platform while the fold down rails are lowered.

Use the following procedure to lower the platform guardrails.

1. Remove all materials from the platform floor and slightly extend the extension deck.

2. Remove the pin from the hinged top rail on the extension deck. Fold the hinged rail in as far as it will go.

3. Lift the left hand extension deck rail up and fold it down inwards.

4. Remove the pin from the hinged top rail on the main deck. Fold the hinged rail in as far as it will go.

5. Lift the left hand main deck rail up and fold it inwards.

6. Lift the right hand extension deck rail up and fold it down inwards.

7. Lift the right hand main deck rail up and fold it inwards.

8. Reverse this procedure to reposition the rails.

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 on grades that exceed 25 percent.

A fully stowed machine may be operated on grades up to 25 percent. A grade of 25 percent is a 30″ (0.76 m) vertical rise in 10′ (3.05 m) horizontal length.

⚠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.

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

1. Place the drive/lift selector switch (refer to Figure 9.2) in the drive position.

2. Squeeze and hold the interlock switch against the joystick.

3. Push the drive joystick forward to move the chassis forward. Pull the joystick backward to move the chassis backward. The drive speed is proportional to the joystick position.

4. To stop drive motion, return the joystick to neutral.

Note
To make an emergency stop push the emergency stop button inward to apply the parking brakes.

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
Holding the steer switch down too long may result in a sharp turn. This is especially true when driving and steering at the same time. It may be easier to turn the wheels in small increments using a series of quick taps on the steer switch.

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

Drive Range Switch
The drive range switch has two positions to select drive wheel operation:

- High (Rabbit) – for normal driving conditions.

- Low (Turtle) – for driving on grades up to 25 percent that require low speed and high torque operation, where high range is not sufficient to climb the grade.

Note
Some early model S3219E and S3220E machines were not equipped with a drive range switch.

In high the machine will travel up to 2 mph (3.2 km/h) when the platform is raised less than 8′ (2.4 m) and up to 0.5 mph (0.8 km/h) when the platform is raised above 8′ (2.4 m). Place the drive range switch in high for normal machine operation.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

Place the drive range switch in low, with the platform fully lowered and the extension deck locked in the stowed position, before driving up a ramp to load the machine for transport.

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 before traveling over rough terrain or any sloped surface.

Drive speed ranges are interlocked through limit switches that sense the platform position.

- When the platform is elevated below approximately 6′ (1.8 m) the aerial platform may be driven with the full range of drive speeds.
- When the platform is elevated above 6′ (1.8 m) only the slowest drive speed will work.

⚠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 0.4 mph (0.6 km/h), which is 7′ 7″ (5.3 m) in 30 seconds, when elevated above 6′ (1.8 m).

Drive/Lift Level Sensor Interlock
When the platform is elevated above 6′ (1.8 m), lift and drive functions are interlocked through a level sensor system.

Platform raise and drive functions are disabled and an alarm sounds when those controls are activated if the chassis is tilted more than:

S3226E
1.5° side-to-side and 4° front-to-rear

S3215L/S3215E/S3219E/S3220E/S4726E/S4732E
2° side-to-side and 4° front-to-rear

If the drive/lift level sensor interlock shuts off the platform raise and drive functions, lower the platform and drive to a level surface.

Swing-Out Trays

Batteries and hydraulic components are enclosed in swing-out trays (refer to Figure 9.4) on each side of the chassis.

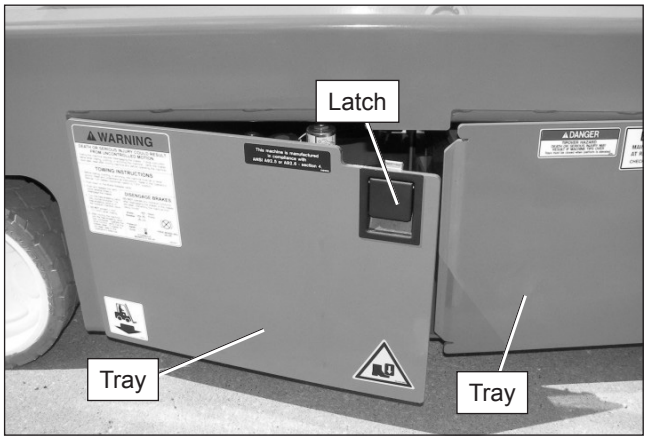


Figure 9.4 – Swing-Out Trays

- The battery trays each contain two batteries. There is a battery tray at the front of the machine, both sides of the chassis.
- The control valve tray on the right side of the chassis contains the hydraulic control valve with the free-wheeling valve, brake release valve and the brake hand pump. The diagnostic center LCD display is also in this tray.
- The hydraulic tray on the left side of the chassis contains the hydraulic pump, reservoir and fluid filter.

⚠Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury can result from a tip-over accident. Do not open the trays when the platform is raised more than eight feet.

- To open a tray, pull upward on the latch and swing the tray open.
- The latched tray must be opened first, before the battery tray can be opened.
- When closing the trays, close the battery tray first. The latched tray holds both trays in the closed position.

Electrical Power Outlet

The electrical power outlet has two, 3-prong, 125 volt AC electrical connectors (refer to Figure 9.5).



Figure 9.5 – Electrical Power Outlet

Power is supplied to the outlet by connecting an external power source to the power-input connector at the rear of the chassis (refer to Figure 9.6).

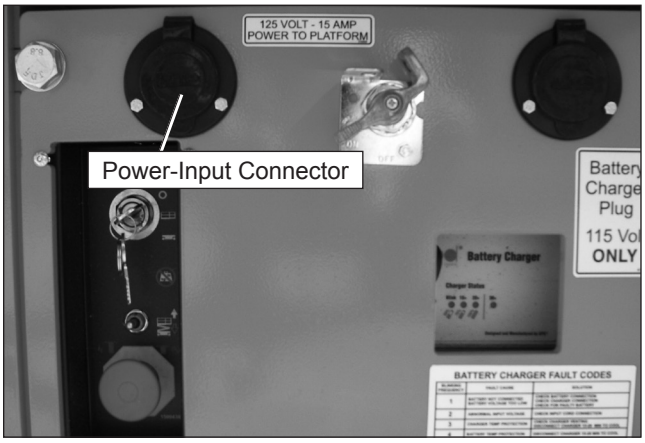


Figure 9.6 – Rear of Chassis

To use the outlet, plug a source of power into the power-input connector. Unplug the source of power before moving the aerial platform.

Chapter 10 – 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

Use the following procedure to properly stow the aerial platform.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

1. Fully retract the platform extension deck and ensure that it is secured in position, with the latch handles fully lowered and the locks fully engaged.
2. Fully lower the platform.
3. Push the emergency stop button inward on the lower control panel.
4. Turn the battery disconnect switch off and lock it.
5. Securely close the swing-out trays.

Transporting

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

The equipment used to load, unload, and transport the aerial platform must have adequate capacity. The empty vehicle weight is listed in Chapter 2 and is stamped on the serial number placard.

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 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.

Lifting With a Forklift

Use the following procedure to lift the aerial platform with a forklift.

1. Properly stow the aerial platform.
2. Remove all personnel, tools, materials, or other loose objects from the platform.
3. Insert the forklift forks into the pockets at the rear of the machine (refer to Figure 10.1).

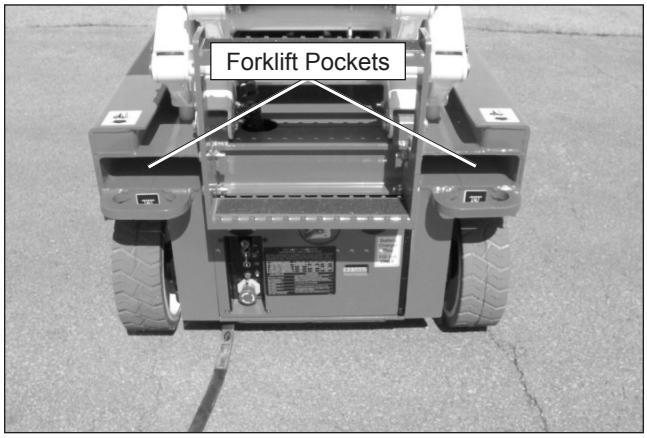


Figure 10.1 – Rear of Chassis

4. Do not raise the aerial platform higher than necessary to transport it. Drive the forklift slowly and carefully when transporting the aerial platform.

Winching

Use a winch to load and unload the aerial platform on ramps that exceed the machine gradeability specification. A winch may also be used when poor traction, uneven surfaces, or stepped ramp transition make driving hazardous.

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

1. Position 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. Properly stow the aerial platform.

⚠Warning

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

5. Chock the wheels to prevent uncontrolled motion of the aerial platform.

Valves with Brake Release Valve on Side of Valve

1. Unlatch and swing out the control valve tray on the right side of the machine. The brake release valve and free-wheeling valve are located on the side of the hydraulic manifold. The brake release pump is on the top of the valve (refer to Figure 10.2).

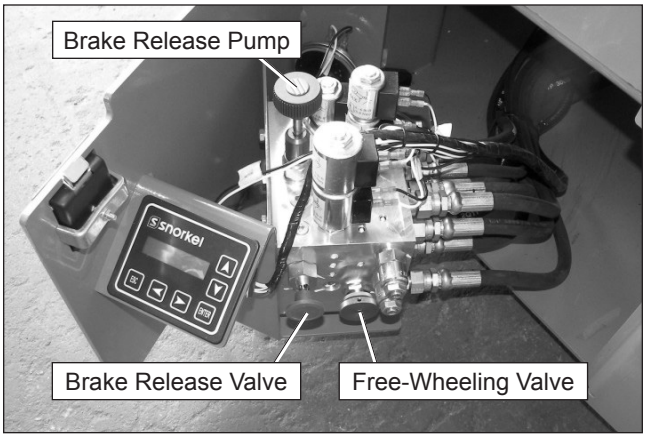


Figure 10.2 – Hydraulic Tray

2. Turn and depress the brake release valve to the fully open position.

3. Turn the free-wheeling valve counterclockwise to the fully open position.

4. Push and release the brake release pump knob until it can no longer be pumped.

5. Attach the winch line to the tie-down lugs (refer to Figure 10.3) on the front of the chassis.

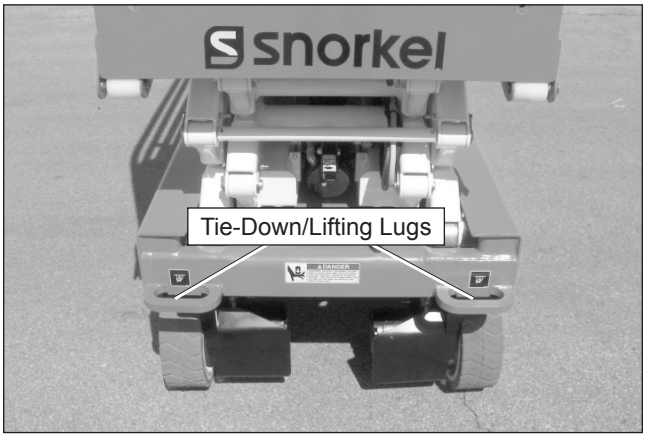


Figure 10.3 – Front of Chassis

6. Remove the wheel chocks and use the winch to position the aerial platform on the transport vehicle.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

7. Close the free-wheeling valve.

8. Drive the aerial platform forward or reverse and then stop to reset the parking brakes. The brake release valve can be heard when it resets, as the machine is driven.

9. Verify that the drive system and brakes operate properly before operating the aerial platform.

Valves with Brake Release Valve on Top of Valve

1. Unlatch and swing out the control valve tray on the right side of the machine. The brake release valve and brake release pump are located on the top of the hydraulic manifold. The free-wheeling valve is on the side of the valve (refer to Figure 10.4).

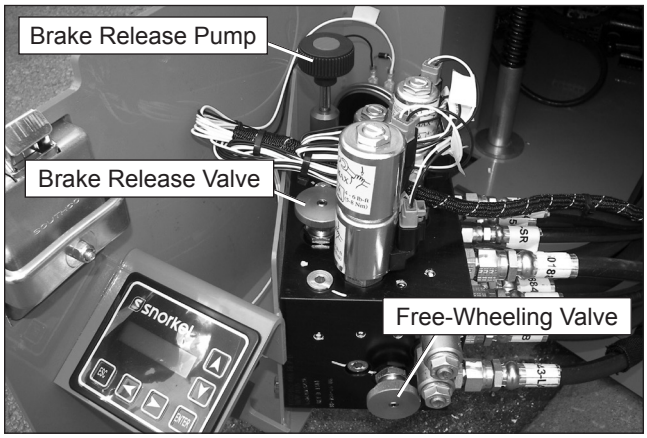


Figure 10.4 – Hydraulic Tray

2. Turn the brake release valve clockwise to the fully closed position. Turn the free-wheeling valve counter-clockwise to the fully open position. Push and release the brake release pump knob several times, until it becomes hard to push, to release the brakes.

3. Attach the winch line to the tie-down lugs (refer to Figure 10.3) on the front of the chassis.

4. Remove the wheel chocks and use the winch to position the aerial platform on the transport vehicle.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

5. Turn the brake release valve counterclockwise to the fully open position. Turn the free-wheeling valve clockwise to the fully closed position.

6. Drive the aerial platform forward or reverse and then stop to reset the parking brakes.

7. Verify that the drive system and brakes operate properly before operating the aerial platform.

Valves with Brake Release/Free-Wheeling Valve on Back of Valve

1. Unlatch and swing out the control valve tray on the right side of the machine. The brake release/free-wheeling valve is located on the back of the hydraulic manifold (refer to Figure 10.5).

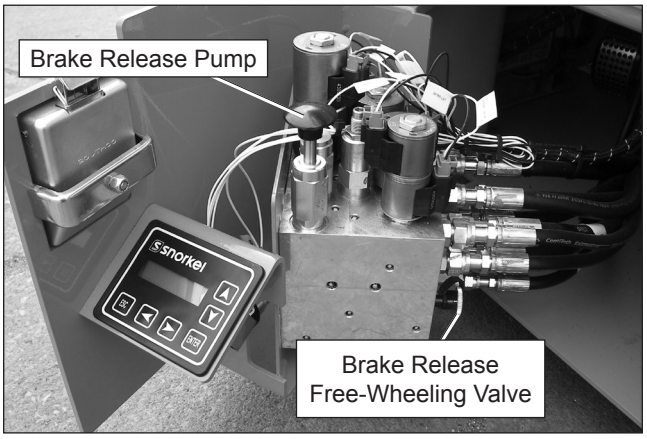


Figure 10.5 – Hydraulic Tray

2. Turn the brake release/free-wheeling valve clockwise to the fully closed position. Push and release the brake release pump knob several times, until it becomes hard to push, to release the brakes.

3. Attach the winch line to the tie-down lugs (refer to Figure 10.3) on the front of the chassis.

4. Remove the wheel chocks and use the winch to position the aerial platform on the transport vehicle.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

5. Turn the brake release/free-wheeling valve fully counterclockwise to the fully open position.

6. Drive the aerial platform forward or reverse and then stop to reset the parking brakes.

7. Verify that the drive system and brakes operate properly before operating the aerial platform.

Driving

⚠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 the machine gradeability specification, or where conditions of the ramp could cause driving to be hazardous.

Use a winch to load and unload the aerial platform on ramps that exceed the machine gradeability specification. A winch may also be used when poor traction, uneven surfaces, or stepped ramp transitions make driving hazardous.

Drive the aerial platform onto the transport vehicle if a winch is not available and the ramp incline is within the 25 percent grade capability of the aerial platform.

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

1. Position the transport vehicle so the aerial platform will not roll forward after it is loaded.

2. Chock the vehicle wheels so it cannot roll away from the ramp while the aerial platform is loaded.

3. Remove any unnecessary tools, materials, or other loose objects from the platform.

⚠Caution

The extension deck is free to move when the extension handle locks are disengaged. Personal injury may result from accidentally extending or retracting the deck. Make certain both extension handle locks are fully engaged when the deck is extended in the working position and when it is stowed. Do not attempt to extend or retract the platform unless the aerial platform is on a level surface.

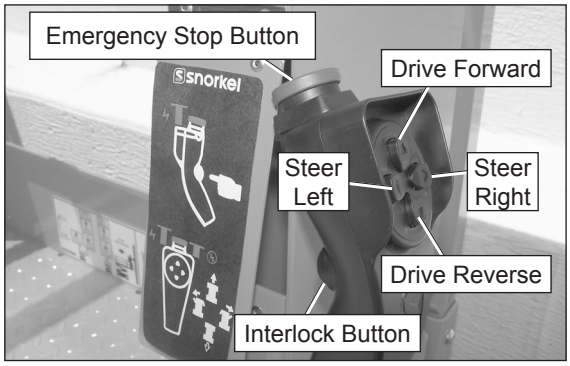
4. Fully retract the platform extension deck and ensure that it is secured in position, with the latch handles fully lowered and the locks fully engaged. Fully lower the platform.

5. Drive the aerial platform to the foot of the loading ramp with the rear wheels nearest the ramp. Make sure the aerial platform is centered with the ramps and that the steering wheels are straight.

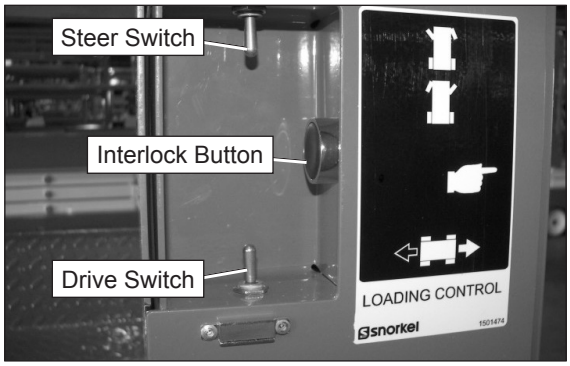
6. Place the drive range switch in low (turtle) for climbing or descending a ramp.

7. Drive the aerial platform on or off the transport vehicle in a straight line through the grade transitions with minimal turning.

The machine may be equipped with a loading control station beneath the upper control box on the platform guardrail. Drive functions may be operated from this location when loading the machine. The loading controls may be a fixed side drive or a corded pendant (refer to Figure 10.6).



Pendant



Fixed Side Drive

Figure 10.6 – Loading 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 there is sufficient clearance around the machine before moving the chassis. Allow sufficient room and time to stop movement to avoid contact with structures or other hazards.

Maintain at least 3′ (1 m) between yourself and the aerial platform when operating either the removable upper controls or the loading controls from the ground outside of the platform.

The loading controls allow for driving the machine while standing on the ground, outside of the platform. Always look in the direction of movement when operating the loading controls.

Use the following procedure to operate the drive and steer functions from the loading controls.

1. From the upper controls, pull the emergency stop button outward.

2. Raise the door on the right side of the platform to access the loading controls (refer to Figure 10.6).

3. Push and release the interlock button.

Note
You have five seconds to activate a drive or steer control after pressing the interlock button. After five seconds, the interlock button will have to be pressed again.

4. The drive switches (refer to Figure 10.6) are momentary contact. These switches control the two front wheels to drive the aerial platform.

   - On the pendant – engage the interlock button and hold down either the drive forward or drive reverse button.

   - On the fixed sided drive – to drive forward, press the interlock button inward and hold the switch forward. To drive in reverse, press the interlock button and hold the switch rearward.

Note
To make an emergency stop push the emergency stop button inward to apply the parking brakes.

5. The steer switches (refer to Figure 7.4) are momentary contact. These switches control the two front wheels to steer the aerial platform.

   - On the pendant – press the interlock button and hold down either the steer left or steer right button.

   - On the fixed side drive – press the interlock button and hold the switch in the appropriate direction to steer either left or right.

Note
Holding the steer switch too long may result in a sharp turn. This is especially true when driving and steering at the same time. It may be easier to turn the wheels in small increments using a series of quick taps on the switch.

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

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 anywhere else.

⚠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 and the rear lifting lugs (refer to Figures 10.3 and 10.7) to make sure they are free of cracks and are in good condition. There are two lugs on the rear of the chassis and two on the front. Have any damage repaired by a qualified service technician before attempting to hoist the machine.



Figure 10.7 – Rear of Chassis

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

   Do not run the sling cable through the lifting lugs.

   - Cable damage and/or failure can result from the cable contacting the sharp corners of the lug.
   - There is no effective way of putting a corner protector in the hole of the lug.
5. Use spreader bars of sufficient length to keep the chains, straps, or cables from contacting the scissors structure or platform.

   - When using cables, use rigid corner protectors at any point where the cable contacts on 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. Properly stow the aerial platform.
4. Place wood blocks under the front ends of the pothole protection skids to limit excessive loading on the front drive wheel bearings.
5. Place the lower controls emergency stop switch in the off position.
6. Turn the battery disconnect switch off.

⚠Caution

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

7. Use chains or straps to securely fasten the aerial platform to the transport vehicle using the front and rear tie-down lugs as attachment points. Proper tie-down and hauling is the responsibility of the carrier.

Chapter 11 – Emergency Operation

If the main hydraulic system fails:

- The aerial platform may be lowered using the emergency lowering lever.
- The machine may be towed if the drive system fails.
- Refer to Emergency Lowering, or Towing for the appropriate procedure.

Emergency Lowering

Use the following procedure to operate the emergency lowering system.

⚠Warning

The potential for an accident increases when safety devices do not function properly. Death or serious injury can result from such accidents. Immediately push the emergency stop button inward to disable the control system before using the emergency lowering system in the event of an emergency.

1. Immediately push the emergency stop button inward to disable the control system in the event of an emergency.
2. Retract the platform extension, if possible.
3. Locate the emergency lowering control.

The lever for the S3215L/S3215E/S3219E is mounted at the front of the aerial platform (refer to Figure 11.1).

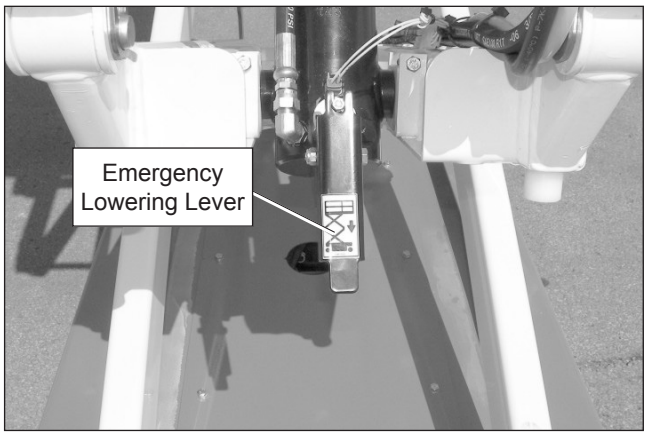


Figure 11.1 – Front of Machine

The handle for the S3220E/S3226E/S4726E/S4732E is mounted at the rear of the aerial platform (refer to Figure11.2).

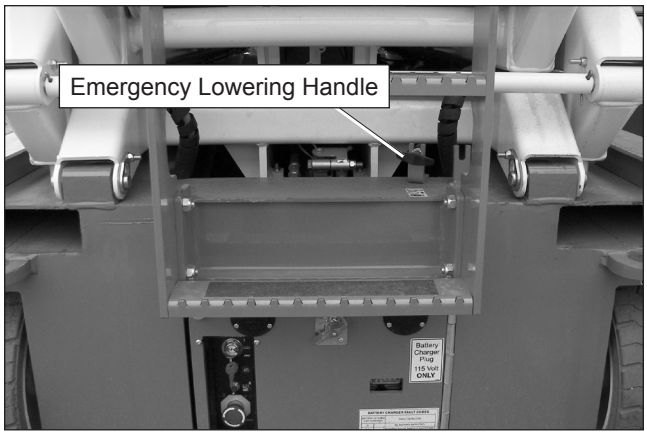


Figure 11.2 – Rear of Machine

⚠Danger

Pinch points may exist between moving components. Death or serious injury will result from becoming trapped between components. Make sure all personnel stand clear while lowering the platform with the emergency lowering system.

4. Make sure there is nothing in the way to obstruct the platform when it lowers.
5. Stand clear of the scissors structure.
   - S3215L/S3215E/S3219E – push downward on the emergency lowering lever at the front of the machine to lower the platform.
   - S3220E/S3226E/S4726E/S4732E – pull outward on the emergency lowering handle at the rear of the machine to lower the platform.
6. The platform will begin to lower as the lever/handle is actuated. Release the lever/handle to stop the platform from lowering.

⚠Warning

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. Fully close the emergency lowering valve before operating the aerial platform.

7. Make certain the lever is fully released and the emergency lowering valve is fully closed before operating the aerial platform.

Towing

The aerial platform may be pushed or pulled after properly stow the aerial platform and disengaging the brakes. Use the following procedure to manually disengage the brakes.

Valves with Brake Release Valve on Side of Valve

1. Chock the wheels to prevent uncontrolled motion of the aerial platform and turn the battery disconnect switch off.

2. Unlatch and swing out the control valve tray on the right side of the machine. The brake release valve and free-wheeling valve are located on the side of the hydraulic manifold. The brake release pump is on the top of the valve (refer to Figure 11.3).

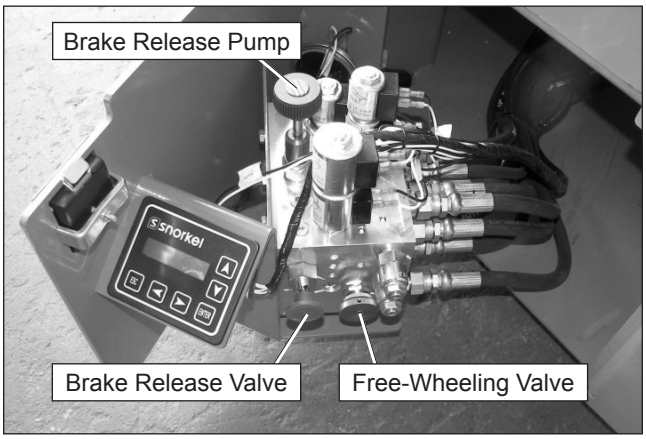


Figure 11.3 – Hydraulic Tray

3. Turn and depress the brake release valve to the fully open position.

4. Turn the free-wheeling valve counterclockwise to the fully open position.

5. Push and release the brake release pump knob until it can no longer be pumped.

6. Remove the wheel chocks.

7. Do not exceed 2 mph (3.2 km/h) when towing.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

8. Close the free-wheeling valve.

9. Drive the aerial platform forward or reverse and then stop to reset the parking brakes. The brake release valve can be heard when it resets, as the machine is driven.

10. Verify that the drive system and brakes operate properly before operating the aerial platform.

Valves with Brake Release Valve on Top of Valve

1. Chock the wheels to prevent uncontrolled motion of the aerial platform and turn the battery disconnect switch off.

2. Unlatch and swing out the control valve tray on the right side of the machine. The brake release valve and brake release pump are located on the top of the hydraulic manifold. The free-wheeling valve is on the side of the valve (refer to Figure 10.4).

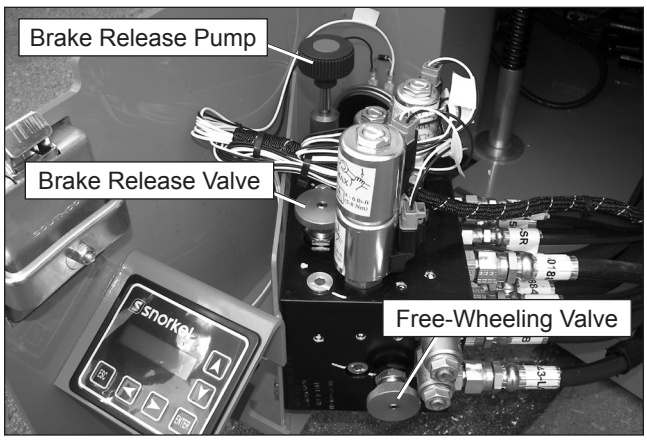


Figure 11.4 – Hydraulic Tray

3. Turn the brake release valve clockwise to the fully closed position. Turn the free-wheeling valve counter-clockwise to the fully open position. Push and release the brake release pump knob several times, until it becomes hard to push, to release the brakes.

4. Remove the wheel chocks.

5. Do not exceed 2 mph (3.2 km/h) when towing.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

6. Turn the brake release valve counterclockwise to the fully open position. Turn the free-wheeling valve clockwise to the fully closed position.

7. Drive the aerial platform forward or reverse and then stop to reset the parking brakes.

8. Verify that the drive system and brakes operate properly before operating the aerial platform.

Valves with Brake Release/Free-Wheeling Valve on Back of Valve

1. Chock the wheels to prevent uncontrolled motion of the aerial platform and turn the battery disconnect switch off.

2. Unlatch and swing out the control valve tray on the right side of the machine. The brake release/ free-wheeling valve is located on the back of the hydraulic manifold (refer to Figure 11.5).

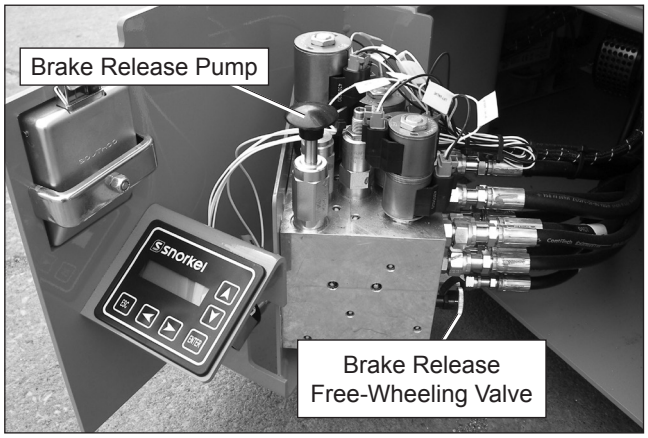


Figure 11.5 – Hydraulic Tray

3. Turn the brake release/free-wheeling valve clockwise to the fully closed position. Push and release the brake release pump knob several times, until it becomes hard to push, to release the brakes.

4. Remove the wheel chocks.

5. Do not exceed 2 mph (3.2 km/h) when towing.

⚠Warning

The aerial platform is free to move when the brakes and free-wheeling valve are disabled. Death or serious injury could result. Close the free-wheeling valve and reset the brakes before operating the aerial platform.

6. Turn the brake release/free-wheeling valve fully counterclockwise to the fully open position.

7. Drive the aerial platform forward or reverse and then stop to reset the parking brakes.

8. Verify that the drive system and brakes operate properly before operating the aerial platform.

Chapter 12 – 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
All functions stop working.	Motor or pump failure.	Manually stow the machine using the emergency lowering lever.
	Low fluid level in reservoir.	Check hydraulic fluid level. Add correct type of fluid if necessary.
	Batteries discharged.	Recharge batteries.
	Electrical system malfunction.	Stow the machine and do not operate until repairs are made.
Platform will not raise or lower from lower controls.	Control select/ground operation switch is in the upper control or the off position.	Place the switch in the lower control position.
	Battery disconnect is turned off.	Place the switch in the on position.
	Emergency stop button is pushed inward to the off position.	Pull the emergency stop button outward to the on position.
	Emergency lowering lever is not properly disengaged.	Make sure the lever returns to the normal operating position.
Platform will not raise or lower from upper controls.	Drive/lift selector is in the drive position.	Place switch in the lift position.
	Emergency lowering lever not properly disengaged.	Make sure the lever returns to the normal operating position.
Platform will not raise and alarm is sounding.	Machine is not on a level surface.	Lower the platform and drive to a level surface.
Platform will not raise, or raises slower than normal.	Emergency lowering lever not properly disengaged.	Make sure the lever returns to the normal operating position.
	Platform capacity has been exceeded.	Remove load from platform. Refer to platform capacity placard for maximum capacity.
	Low battery charge.	Check the battery charge indicator and recharge the batteries if necessary.
Platform drifts down.	Emergency lowering lever not properly disengaged.	Make sure the lever returns to the normal operating position.
	Hydraulic system malfunction.	Stow the machine and do not operate until repairs are made.
Platform will not lower.	Safety prop in place.	Stow the safety prop.
Platform will not extend.	Extension handle is not fully engaged, releasing the lock.	Squeeze both extension handles firmly to fully disengaged the locks, before extending the platform.
Drive functions don't work.	Drive/lift selector is in the lift position.	Place the switch in the drive position.
	Machine is not on a level surface or too steep a grade.	Lower the platform and drive to a level surface.
	Free-wheeling valve is open.	Fully close the free-wheeling valve.
	Load capacity exceeded.	Remove load from platform. Refer to platform capacity placard for maximum capacity.
	Low hydraulic system pressure.	Stow the machine and do not operate until repairs are made.

Symptom	Possible Cause	Corrective Action
Drive functions don't work, continued.	Pothole interlock engaged.	Clear obstruction.
Machine will not climb a 25 percent grade – S3226E/S4726E/ S4732E.	Drive range selector is not in the low position.	Place the switch in the low (turtle) position.
Only slow drive speed works.	Platform elevated above 7 to 8 feet (2.1 to 2.4 m).	Normal operation, lower platform to drive machine at faster speed.
	Drive range selector is in the low (turtle) position – S3226E/S4726E/ S4732E.	Place the switch in the high (rabbit) position.
Machine will not steer.	Joystick interlock switch not engaged.	Engage the interlock switch before operating the steer switch.
Wheels won't turn when winching or pushing.	Brakes are engaged.	Manually release the brakes using the hand pump. Refer to Towing, Chapter 11.
	Free-wheeling valve not in proper position.	Refer to Winching, Chapter 10.
Tilt alarm does not work.	Platform is not raised more than 6′ (1.8 m).	Normal operation. The tilt alarm is not active until the platform is raised more than 6′ (1.8 m).
Battery charger does not indicate a reading when charging batteries.	No source of power.	Make sure power source is plugged in and turned on.
	Faulty batteries or charger.	Stow the machine and do not operate until repairs are made.
Hydraulic fluid temperature of 160°F (71°C) or more.	Prolonged driving or platform operation.	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 resuming operation.
	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.	Stow the machine and do not operate 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, stabilizers).

battery tray – a swing-out compartment that holds all, or some, of the machine batteries.

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 scissors structure.

control valve tray – a swing-out compartment that holds the control valve, freewheeling valve, hand pump, and the diagnostic display.

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. Although federal regulations, OSHA, ANSI, and Snorkel do not require the use of additional fall protection beyond the platform guardrails on scissor lift aerial platforms, local, state, or employer rules may require their use.

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

free-wheeling valve – a needle valve that, when adjusted open, allows hydraulic fluid to flow through the wheel drive motors. This allows the aerial platform to be pushed or towed without damage to the drive motors.

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.

hydraulic tray – a swing-out compartment that holds the hydraulic pump, fluid reservoir and the fluid filter.

l**evel 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.

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

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

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

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

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

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.

pothole protection interlock – a safety feature that sounds an alarm and automatically stops the platform raise function if the pothole protection skids are prevented from lowering properly.

pothole protection system – a mechanical tip-over prevention system consisting of skids along the bottom of both sides of the chassis which lower as the platform is raised.

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

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

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

safety prop – a bar that when properly positioned mechanically prevents the platform from lowering.

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

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.

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

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

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

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

working height – platform height plus six feet (1.8 meters).

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 to 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**

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

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