snorkel

A46JRT

CE

OPERATOR MANUAL

Part Number 0260228
June 2010

Serial number 000000 and after

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EC DECLARATION OF CONFORMITY FOR MACHINERY

MACHINERY:

Powered Aerial Platform known as:

Type: Snorkel A46JRT

Serial Number: A46JRT-04-XXXXXX

The machine specified above conforms to the following provisions:
Machinery directive 2006/42/EC (using document **EC Community Legislation on Machinery** and taking guidance from EN280:2001 + Amendment A2:2009)
Council Directive 2004/108/EC on Electromagnetic Compatibility
Council Directive 2006/95/EC on Low Voltage Equipment Safety
Council Directive 2000/14/EC on Noise Emission in the Environment by Equipment for use Outdoors

As performed in accordance with EN 3744:1995	
Measured sound power level	91 dB Min 100 dB Max
Guaranteed sound power level	100 dB

Type approval in accordance with 2006/42/EC performed by:
Powered Access Certification LTD
P. O. Box 98, Windermere
Cumbria, LA23 1WF, UK
Notified Body Identification Number: 0545

E. C. Type Examination Certificate No:

CE

Authorized Representative in European Union:
The Tanfield Group, PLC
Vigo Centre, Birtley Road
Washington, Tyne & Wear
NE38 9DA, UK

Note: Modification of the specified unit renders this declaration invalid.

SAFETY RULES

⚠Warning

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

Electrocution Hazard	Tip Over Hazard	Collision Hazard	Fall Hazard
			
THIS MACHINE IS NOT INSULATED!	**NEVER** elevate the platform or drive the machine while elevated unless the machine is on a firm, level surface	**NEVER** position the platform without first checking for overhead obstructions or other hazards.	**NEVER** climb, stand, or sit on platform guardrails or midrail.

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

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

Exceeding the specified permissible maximum load **is prohibited!** See “Platform Capacity” on page 5 for details.

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

NEVER exceed the manual force allowed for this machine. See “Manual Force” on page 5 for details.

DISTRIBUTE all platform loads evenly on the platform.

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

OPERATE machine only on surfaces capable of supporting wheel loads.

NEVER operate the machine when wind speeds exceed this machine’s wind rating. See “Beaufort Scale” on page 5 for details.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

In the event of an accident or breakdown see “Emergency Lowering” on page 17, 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.

Introduction

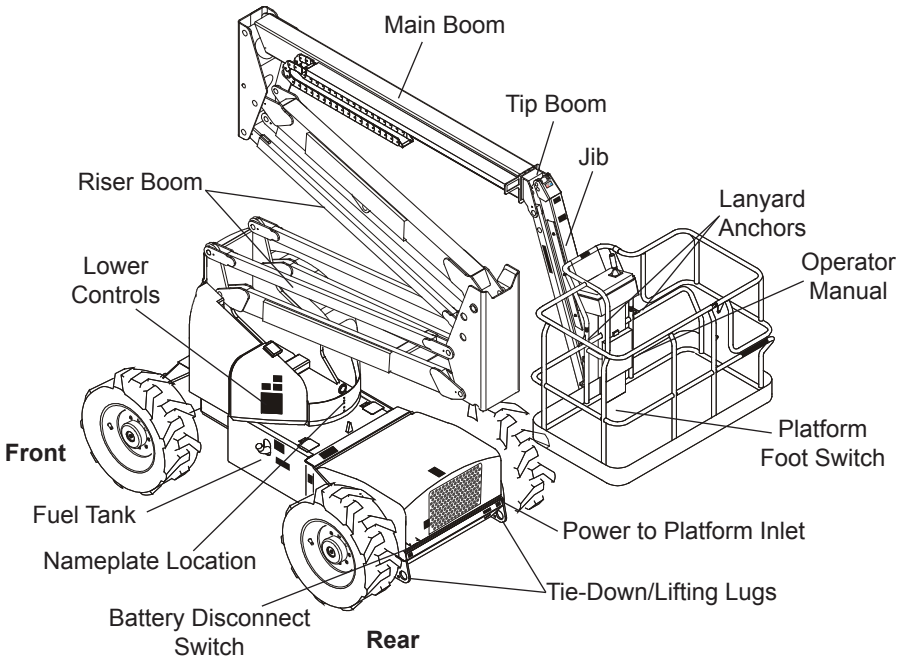
This manual covers the A46JRT Aerial Work Platform.

This manual must be stored on the machine at all times.

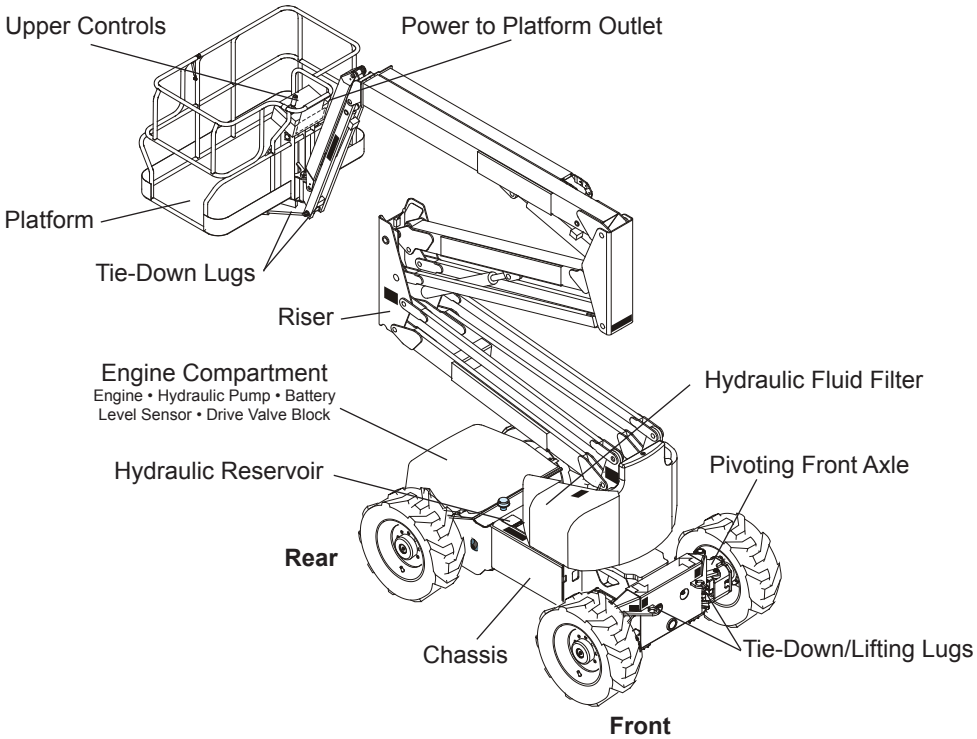
Read, understand and follow all safety rules and operating instructions before attempting to operate the machine.

When contacting Snorkel for service or parts information, be sure to include the MODEL and SERIAL NUMBERS from the equipment nameplate. Should the nameplate be missing, the SERIAL NUMBER is also stamped on top of the chassis at the front of the machine.

Component Identification



Left Side



Right Side

Special Limitations

Travel with the platform raised is limited to creep speed range. Elevating the platform is limited to firm, level surfaces only.

⚠Danger

The elevating function shall ONLY be used when the work platform is level and on a firm surface.

Platform Capacity

Two people and tools may occupy the platform. The maximum platform capacity for the aerial platform is stated in the “Specifications” on page 23.

⚠Danger

DO NOT exceed the maximum platform capacity or the platform occupancy limits for this machine.

Manual Force

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

The maximum allowable manual force is limited to 200 N (45 lb) of force per occupant, with a maximum of 400 N (90 lb) for two occupants.

⚠Danger

DO NOT exceed the maximum amount of manual force for this machine.

Platform Overload Sensing System

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

⚠Caution

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

If the platform overload sensing system is tripped while operating the machine, the emergency power system may still be used for emergency machine operation.

⚠Danger

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

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

Beaufort Scale

Never operate the machine when wind speeds exceed 12.5 m/s (28 mph) [Beaufort scale 6]. Refer to Figure 1.

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

Figure 1 – Beaufort Scale

Controls and Indicators

The operator shall know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the machine.

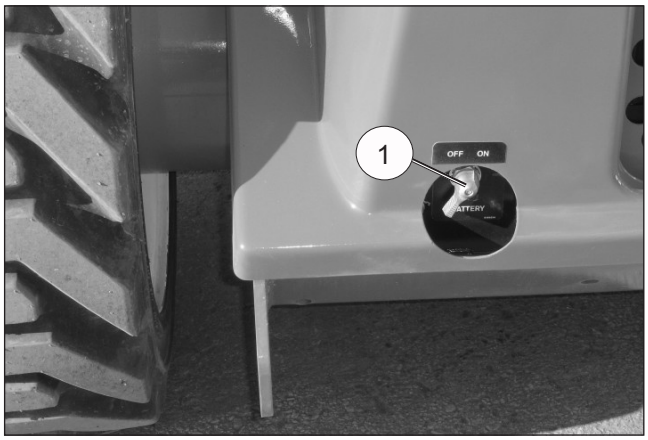


Figure 2 – Battery Disconnect Switch

1. Battery disconnect switch

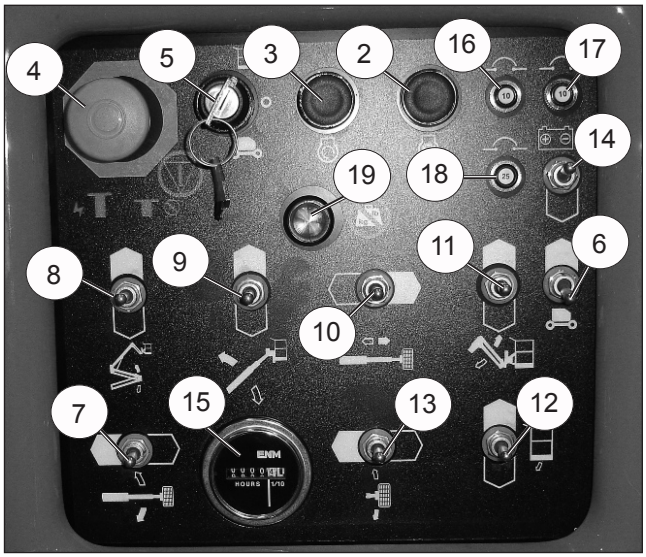
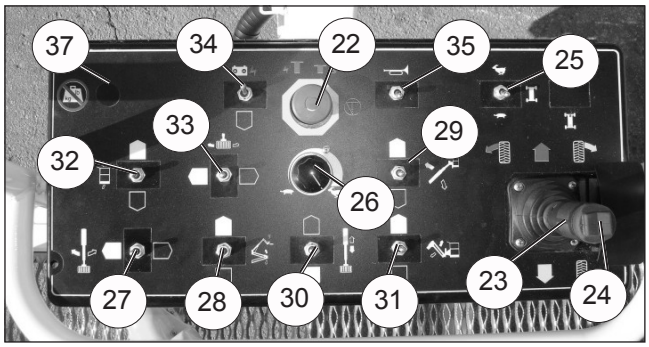


Figure 3 – Lower Controls and Indicators

2. Preheat button
3. Start button
4. Emergency stop button
5. Controls selector switch
6. Ground operation switch
7. Rotation switch
8. Riser switch
9. Boom elevation switch
10. Boom extension switch
11. Jib articulation switch
12. Platform level switch
13. Platform rotation switch
14. Engine/emergency power switch
15. Hour meter
16. Relays circuit breaker
17. Switches circuit breaker
18. Main control circuit breaker
19. Platform overload light



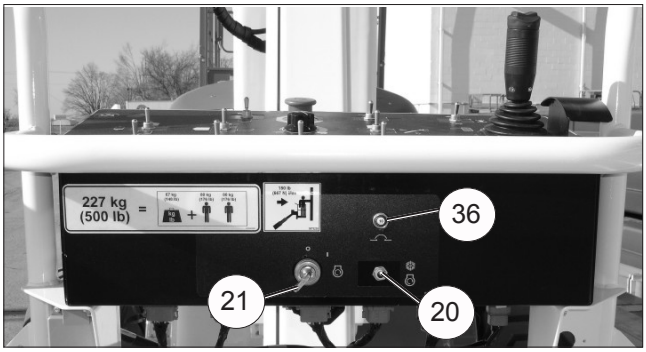


Figure 4 – Upper Controls and Indicators

20. Preheat switch
21. Start switch
22. Emergency stop button
23. Drive joystick
24. Steer switch
25. Drive range switch
26. Boom speed knob
27. Rotation switch
28. Riser switch
29. Boom elevation switch
30. Boom extension switch
31. Jib articulation switch
32. Platform level switch
33. Platform rotation switch
34. Engine/Emergency power switch
35. Horn
36. Upper control circuit breaker
37. Platform overload light

⚠Danger

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

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

Battery Disconnect Switch

The battery disconnect is located at the left rear of the chassis (refer to Figure 2).

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

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

⚠Caution

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

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

Lower Controls

The lower controls (refer to Figure 3) are located on the left side of the turntable. Boom and platform functions can be operated from the lower controls.

Preheat Button

The preheat button (refer to Figure 3) is a two-position, black push button. This button operates the glow plugs to aid in starting the engine when the start switch is in the on position.

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

Start Button

The start button (refer to Figure 3) works like an automobile ignition switch.

- Push the start button until the engine starts, then release it to on.
- If the engine dies, the control switch must be turned to off before the engine can be restarted.

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

Emergency Stop Button

The emergency stop (refer to Figure 3) is a two-position, red push button.

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

Controls Selector Switch

Use the controls switch (refer to Figure 3) to select between lower control and upper control operation.

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

Ground Operation Switch

Hold the ground operation switch (refer to Figure 3) upward continually to operate the machine from the lower controls. The engine speed increases when the switch is held upward. This switch is spring returned to the off position.

Rotation Switch

The rotation switch (refer to Figure 3) is used to rotate the turntable in a clockwise or counterclockwise direction. The switch is spring returned to the center off position.

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

Riser Switch

The riser switch (refer to Figure 3) is used to raise or lower the riser booms. The switch is spring returned to the center off position.

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

Boom Elevation Switch

The boom elevation switch (refer to Figure 3) is used to raise or lower the main boom. The switch is spring returned to the center off position.

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

Boom Extension Switch

The boom extension switch (refer to Figure 3) is used to extend or retract the booms. The switch is spring returned to the center off position.

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

Jib Articulation Switch

The jib switch (refer to Figure 3) is used to raise or lower the jib. The switch is spring returned to the center off position.

- Hold the switch upward to raise the jib.

- Hold the switch downward to lower the jib.

Platform Level Switch
The platform level switch (refer to Figure 3) is used to level the platform floor with respect to the ground. The switch is spring returned to the center off position.

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

Platform Rotation Switch
The platform rotation switch (refer to Figure 3) is used to rotate the platform relative to the end of the tip boom. The switch is spring returned to the center off position.

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

Engine/Emergency Power Switch
The engine/emergency power switch (refer to Figure 3) is used to operate turntable, boom, and platform functions using the emergency power system. The switch is spring returned to the engine position for aerial platform engine operation.

⚠Caution

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

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

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

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

⚠Caution

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

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

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

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

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

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

Circuit Breaker Reset Buttons

The lower control panel electrical system has a 10 amp circuit breaker for both the internal relays and the toggle switches, and a 25 amp circuit breaker for the main control system circuit. There is a reset button for each circuit breaker at the top of the lower control panel (refer to Figure 3).

The upper control panel has a 10 amp circuit breaker for the upper control system circuit, with the reset button on the front of the upper control panel (refer to Figure 4).

The electrical power outlet at the platform has a 15 amp circuit breaker. The reset button is on the left side of the electrical box.

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

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

⚠Caution

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

Push the button to reset the circuit breaker.

Upper Controls

The upper controls (refer to Figure 4) are located on the control panel at the platform. Boom, platform, and drive functions can be operated from the upper controls. The following controls are located on the upper control panel.

Preheat Switch

The preheat switch (refer to Figure 4) is a momentarily on toggle switch. This switch operates the glow plugs to aid in starting the engine when the start switch is in the on position.

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

Start Switch

The engine can be started from the platform using the start switch on the front of the upper control panel (refer to Figure 4).

This switch is similar to an automobile ignition switch.

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

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

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

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

Emergency Stop Button

The emergency stop is a two-position, red push button on the top of the upper control panel (refer to Figure 4).

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

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

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

Drive Joystick

The drive joystick (refer to Figure 4) is used to control forward and reverse motion of the aerial platform. The distance the joystick is moved is proportional to the machine drive speed.

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

Drive and steer functions may be operated simultaneously.

Steer Switch

The steer switch (refer to Figure 4) is a momentary contact, rocker switch on top of the drive joystick. This switch controls the two front wheels to steer the aerial platform.

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

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

Drive Range Switch

The drive range switch (refer to Figure 4) has two positions to select drive wheel operation when the booms are in the stowed position; tip boom fully retracted and main boom fully lowered.

- High range (rabbit) – high speed drive 7.2 km/h (4.5 mph) with booms in the stowed position.
- Low range (turtle) – creep speed 1.2 km/h (0.8 mph) with high torque drive operation with booms in any position.

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

Boom Speed Knob

Use the boom speed control knob (refer to Figure 4) to control the speed of the following boom functions:

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

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

Rotation Switch
The rotation switch (refer to Figure 4) is used to rotate the turntable in a clockwise or counterclockwise direction. The switch is spring returned to the center off position.

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

Riser Switch
The riser switch (refer to Figure 4) is used to raise or lower the riser booms. The switch is spring returned to the center off position.

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

Boom Elevation Switch
The boom elevation switch (refer to Figure 4) is used to raise or lower the main boom. The switch is spring returned to the center off position.

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

Boom Extension Switch
The boom extension switch (refer to Figure 4) is used to extend or retract the booms. The switch is spring returned to the center off position.

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

Jib Articulation Switch
The jib articulation switch (refer to Figure 4) is used to raise or lower the jib. The switch is spring returned to the center off position.

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

Platform Level Switch
The platform level switch (refer to Figure 4) is used to level the platform floor with respect to the ground. The switch is spring returned to the center off position.

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

Platform Rotation Switch
The platform rotation switch (refer to Figure 4) is used to rotate the platform relative to the end of the tip boom. The switch is spring returned to the center off position.

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

Engine/Emergency Power Switch
The engine/emergency power switch (refer to Figure 4) is used to operate turntable, boom, and platform functions using the emergency power system. The switch is spring returned to the engine position for aerial platform engine operation.

⚠Caution

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

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

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

Horn Switch
The horn switch is to the right of the emergency stop button on the upper control panel (refer to Figure 4).

Hold the switch upward to sound the horn.

Platform Foot Switch
The upper controls are interlocked through the platform foot switch.

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

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

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

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

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

⚠Caution

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

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

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

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

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

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

Pre-Operation Safety Inspection

Note

Carefully read, understand and follow all safety rules, operating instructions, labels and National Safety Instructions/Requirements. Perform the following steps each day before use.

1. Open the turntable covers and inspect for damage, fluid leaks or missing parts.

2. Check the level of the hydraulic fluid with the platform fully lowered. The fluid level must visible in the sight glass. Add recommended hydraulic fluid if necessary. See “Specifications” on page 23.

3. Check that the engine oil and coolant levels are correct.

4. Check that all guardrails are in place and all fasteners are properly tightened.

5. Inspect the machine thoroughly for cracked welds and structural damage, loose or missing hardware, hydraulic leaks, damaged control cable and loose wire connections.

System Function Inspection

Refer to “Controls and Indicators” on page 6 for the locations of various controls and indicators.

⚠Warning

STAND CLEAR of the work platform while performing the following checks.

Before operating the machine, survey the work area for surface hazards such as holes, drop-offs, bumps and debris.

Check in ALL directions, including above the work platform, for obstructions and electrical conductors.

1. Move the machine, if necessary, to an unobstructed area to allow for full elevation.
2. Pull the Lower Control Emergency Stop Switch to the ON position.
3. Pull the Upper Control Emergency Stop Switch to the ON position.
4. Visually inspect the elevating assembly, lift cylinder, and hoses for cracked welds and structural damage, loose hardware, hydraulic leaks, loose wire connections, and erratic operation. Check for missing or loose parts.
5. Test each machine function from the lower control station by holding the ground operation switch up while operating the control toggle switches (ref: Figure 3 on page 6).
6. Test the engine/emergency power switch for proper operation.
7. Push the Lower Control Emergency Stop Button to check for proper operation. All machine functions should be disabled. Pull the Lower Control Emergency Stop Button outward to resume.
8. Enter the platform and close the gate.
9. Check that the route is clear of obstacles (persons, obstructions, debris), is level, and is capable of supporting the wheel loads.
10. Test each machine function from the upper control station by stepping on the platform foot switch and operating the function controls (ref: Figure 4 on page 6).
11. Push the Upper Control Emergency Stop Button to check for proper operation. All machine functions should be disabled. Pull the Upper Control Emergency Stop Button outward to resume.

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 national safety regulations.

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

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

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

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

- rear of the platform
- lower controls
- upper controls

⚠Danger

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

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

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

Cold Weather Start-Up

If the ambient temperature is 0°C (32°F) or below, the engine and hydraulic system oil may need to be warmed before operation. Do not operate the engine at more than a fast idle until the engine and hydraulic oil has had a chance to warm.

Cold, thick hydraulic oil does not flow well and may cause delay in response to control movement. Cold hydraulic oil may also cause cavitation and pump damage.

Hydraulic System Cold Weather Warm-Up

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

⚠Caution

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

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

Hydraulic System Warm-Up Switch

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

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

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

To operate the warm-up system:

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

Manually Warming The Hydraulic System

The hydraulic oil may be warmed by bottoming out the boom extension cylinder. Raise the main boom so it is horizontal and operate the boom retract function while the machine is stowed. With the cylinder bottomed out the oil flow will produce heat to warm the hydraulic oil.

⚠Caution

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

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

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

1. Perform a prestart inspection as described in the “Daily Preventative Maintenance Checklist” on page 22.

2. Place the battery disconnect switch in the on position.

3. Close and latch the cowling doors.

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

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

Use the following procedure to operate boom, turntable, or platform functions using the lower controls (ref: Figure 3 on page 6).

1. Place the emergency stop switch in the on position. Insert the key into the controls switch and turn the switch to the ground position.

2. Operate the preheat button if required.

   - When the engine is warmed up or the ambient temperature is above 10°C (50°F), it is not necessary to operate the glow plugs before starting the engine.

   - When the ambient temperature range is 10°C (50°F) to -5°C (23°F), press and hold the preheat button for five seconds before starting the engine.

   - When the ambient temperature is below -5°C (23°F), press and hold the preheat button for ten seconds before starting the engine.

3. Press the start button until the engine starts, then release. The engine will not start if the control selector switch is left in the lower control position for 30 seconds or longer before starting the engine. The control selector switch must be turned back to off before the engine will start.

4. Let the engine warm to operating temperature.

5. Hold the ground operation switch in the on position while operating the boom and turntable control toggle switches.

6. Release the function toggle switch to stop movement.

7. Place the ground operation switch in the off position when no functions are being operated.

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

Use the following procedure to operate machine functions using the upper controls (ref: Figure 4 on page 6).

1. At the lower controls, place the emergency stop switch in the on position and place the controls switch in the platform position.

2. Enter the platform and securely close the gate.

3. Attach the fall restraint lanyard to one of the anchor points.

4. Pull the emergency stop outward.

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

   - When the engine is warmed up or the ambient temperature is above 10°C (50°F), it is not necessary to operate the glow plugs before starting the engine.

   - When the ambient temperature range is 10°C (50°F) to -5°C (23°F), press and hold the preheat button for five seconds before starting the engine.

   - When the ambient temperature is below -5°C (23°F), press and hold the preheat button for ten seconds before starting the engine.

6. Turn the switch to start, then release it to on. The engine will not start if the switch is left in the on position for 30 seconds or longer before turning it to start. The switch must be turned back to off before the engine will start.

7. Let the engine warm to operating temperature.

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

1. Step down on the platform foot switch. This switch must be held down to operate the upper controls.

2. Hold the appropriate control in the desired direction. Always look in the direction of movement.

3. To stop movement release the control to its neutral position or release the foot switch.

Driving and Steering

⚠Danger

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

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

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

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

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

⚠Warning

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

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

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

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

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

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

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

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

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

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

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

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

- When either boom is elevated or extended, only the slowest drive speed will work regardless of the drive range switch position.

- To avoid a sudden speed change from high to low elevated boom speed, always bring the machine to a stop before raising the booms from the stowed position.

⚠Warning

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

Do not use the aerial platform if it drives faster than 1.28 km/h (0.8 miles per hour) [10.6 m (35 feet) in 30 seconds] when any of the booms are out of the stowed position.

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

While driving between work site, the pivoting axle:

- Improves traction
- Reduces ground pressure

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

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

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

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

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

⚠Caution

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

Do not operate the generator unless the hydraulic oil is at operating temperature. Refer to “Cold Weather Start-Up” on page 14 for a hydraulic oil warm-up procedure.

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

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

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

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

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

⚠Caution

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

Use the following procedure to drain the air line.

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

Emergency Lowering

⚠Warning

If the platform should fail to lower, NEVER climb down the elevating assembly.

Stand clear of the elevating assembly while operating the Emergency Power System.

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

⚠Caution

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

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

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

1. Place the battery disconnect switch in the on position.
2. Place the key in the control selector switch and turn it to the ground position.
3. Pull the emergency stop button outward.
4. Hold the ground operation switch in the on position while holding the engine/emergency power switch in the emergency power position.
5. Hold the appropriate function toggle switch in the desired direction.

Upper Controls
For the upper controls to be operational:

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

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

1. Pull the emergency stop button outward.
2. Turn the start switch on.
3. Step down on the platform foot switch.
4. Hold the engine/emergency power switch in the emergency power position.
5. Hold the appropriate function toggle switch in the desired direction.

After Use Each Day
1. Ensure that the platform is fully lowered.
2. Park the machine on a firm level surface, preferably under cover, secure against vandals, children and unauthorized operation.
3. Turn the Chassis Key Switch to OFF and remove the key to prevent unauthorized operation.

Transporting the Machine

Preparing for Transportation

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

1. Remove any unnecessary tools, materials, or other loose objects from the platform.
2. Close and latch the battery trays and cowling doors.

By Crane

⚠Danger

Lifting by Crane is for transport purposes only. Stand clear of the machine when lifting.

See Specifications for weight of machine and be certain that the crane is of adequate capacity to lift the machine.

1. Insure that the boom is fully lowered.
2. Attach straps to the chassis lifting lugs only. Insure that the straps are adjusted properly to keep the unit level when lifting.

By Transport Vehicle

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

1. Chock the wheels.
2. Remove all personnel, tools, materials, or other loose objects from the platform.
3. Raise the main boom about 0.3 m (1′).
4. Place a large wood block under the platform support braces (refer to Figure 5). Lower the platform so it rests on the wood block.
5. Place the lower controls emergency stop switch in the off position. Turn the start switch off and remove the key.

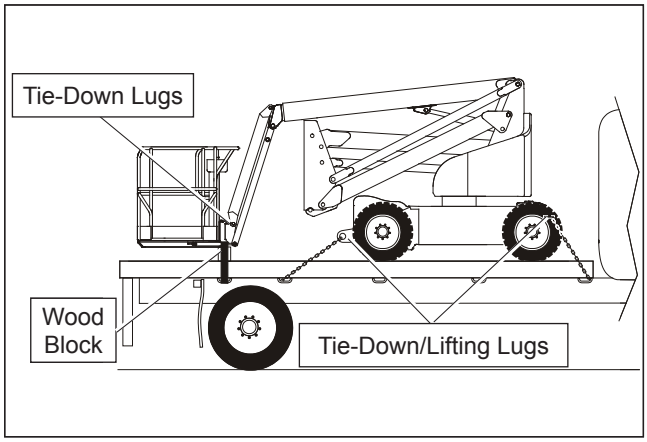


Figure 5 – Platform

6. Turn the battery disconnect switch off and close and latch the battery trays and cowling doors.
7. Use wire-ties to fasten the gravity gates to the guardrails to prevent the them from bouncing. Also, use wire-ties to fasten the platform foot switch to the platform floor.

⚠Caution

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

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

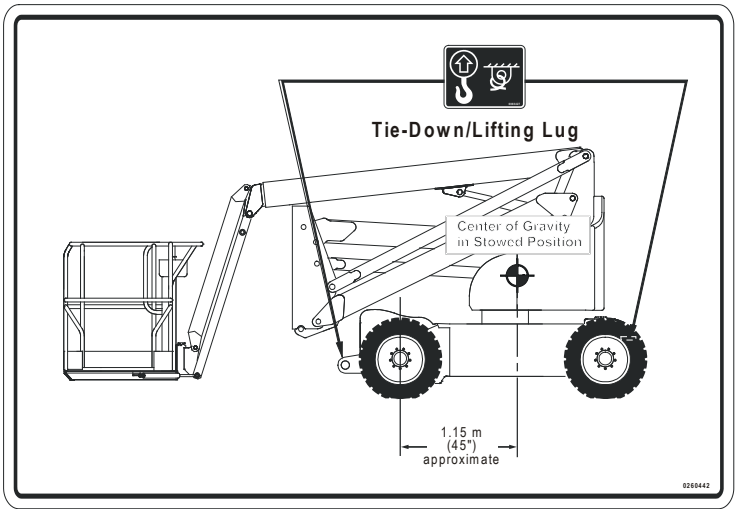


Figure 6 – Center of Gravity

Maintenance

⚠Warning

Always block the elevating assembly whenever it is necessary to perform maintenance while the platform is elevated.

Hydraulic Fluid
The hydraulic fluid reservoir is located in the engine compartment. Refer to Figure 7.

Figure 7 – Hydraulic Fluid Reservoir

Note
Never add fluid if the platform is elevated.

Check Hydraulic Fluid

1. Make sure that the platform is fully lowered.
2. Remove the engine cover to access the engine compartment.
3. Visually check to make sure the fluid is visible in the sight glass.
4. If necessary, remove the filler cap and add fluid of the proper type. Replace the cap making sure it is tightly in place. See “Specifications” on page 18.

Engine
Remove the keeper pins and release the latches on either side of the engine cover and visually inspect the engine and its components with the engine off.

Oil Level
Check the engine oil level before starting the engine so the oil has drained to the pan. The proper oil level is between the add and full marks on the dipstick.

The distance between the top and bottom dipstick marks corresponds to about 1 l (1 quart US). Add oil, if necessary, before starting the engine.

Battery Maintenance

⚠Warning

Hazard of explosive gas mixture. Keep sparks, flame, and smoking material away from batteries.

Always wear safety glasses when working near batteries.

Battery fluid is highly corrosive. Thoroughly rinse away any spilled fluid with clean water.

- Check the battery fluid level daily, especially if the machine is being used in a warm, dry climate.
- If electrolyte level is lower than 6 mm (¼″) above the plates add distilled water only. DO NOT use tap water with high mineral content, as it will shorten battery life.
- Keep the terminals and tops of the batteries clean.

⚠Warning

Always use manufacturer approved replacement parts.

Inspection and Maintenance Schedule

⚠Caution

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

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

⚠Warning

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

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

Daily Preventative Maintenance Checklist

Preventative Maintenance Report

Date: _____ Serial No: _____

Owner: _____ Serviced By: _____

Model No: _____

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

Maintenance Table Key: Y = Yes/Acceptable, N = No/Not Acceptable, R = Repaired/Acceptable

Specifications

Aerial Platform

Working height	16.3 m (53′ 6″)
Maximum platform height	14.3 m (46′ 10″)
Up and over height	7.8 m (25′ 8″)
Maximum horizontal reach	7.4 m (24′ 6″)
Main boom	
Articulation	0° to +72°
Extension	2.0 m (80″)
Jib	
Articulation	-70° to +70°
Extension	1.5 m (5′)
Tail swing	0
Turntable rotation	360° non-continuous
Turning radius	
Inside	0.8 m (32″)
Outside	3.1 m (10′ 5″)
Wheelbase	2.5 m (8′ 6″)
Ground clearance	33 cm (13″)
Maximum wheel load	4,470 kg (9,850 lb)
Maximum ground pressure	8.8 kg/cm² (125 psi)
Weight, EVW	
Approximate	6,622 kg (14,600 lb)
Width	2.1 m (6′ 10″)
Stowed length	5.6 m (18′ 8″)
Stowed height	2.1 m (7′ 2″)

Platform

Dimensions	
Standard steel	99 cm x 183 cm (39″ x 72″)
Rated work load	227 kg (500 lb)
Optional Aluminum	76 cm x 244 cm (30″ x 96″)
Rated work load	227 kg (500 lb)
Optional Aluminum	76 cm x 153 cm (30″ x 60″)
Rated work load	250 kg (550 lb)
Toeboard height	15.2 cm (6″)
Rotation	80° CW to 80° CCW
Maximum number of occupants	2 people
Optional AC generator	220 V, 2,000 W

Function Speed

Turntable rotation	65 to 85 seconds
Riser	
Up	35 to 40 seconds
Down	20 to 25 seconds
Main boom	
Up	25 to 30 seconds
Down	20 to 25 seconds
Extend	20 to 25 seconds
Retract	22 to 27 seconds
Platform rotation	16 to 20 seconds
Jib	
Up	20 to 25 seconds
Down	30 to 35 seconds
Drive	
High, booms stowed	7.2 km/h (4.5 mph)
Low, booms raised/extended	1.2 km/h (0.8 mph)

Drive System

Standard	Four wheel drive
Gradeability – theoretical	45%

Tires

Bar lug	355/55D625NHS, 14 ply

Electrical System

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

Hydraulic System

Drive circuit max. pressure	34,473 kPa (5,000 psi)
Boom circuit max. pressure	18,960 kPa (2,750 psi)
Reservoir capacity	94 l (25 US gal)
System capacity	162 l (43 US gal)
Maximum operating temperature	93°C (200°F)
Hydraulic fluid recommended	
Above -12°C (10°F)	Mobil DTE-13M (ISO VG32)
Below -12°C (10°F)	Mobil DTE-11M (ISO VG15)

Engine

Diesel	Kubota V1505-T

Fuel Tank Capacity

Diesel	94 l (25 US gal)

Ambient Air Temperature Operating Range

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

Maximum Wind Speed

Gust or steady	45 km/h (28 mph) 12.5 m/s – Beaufort scale 6

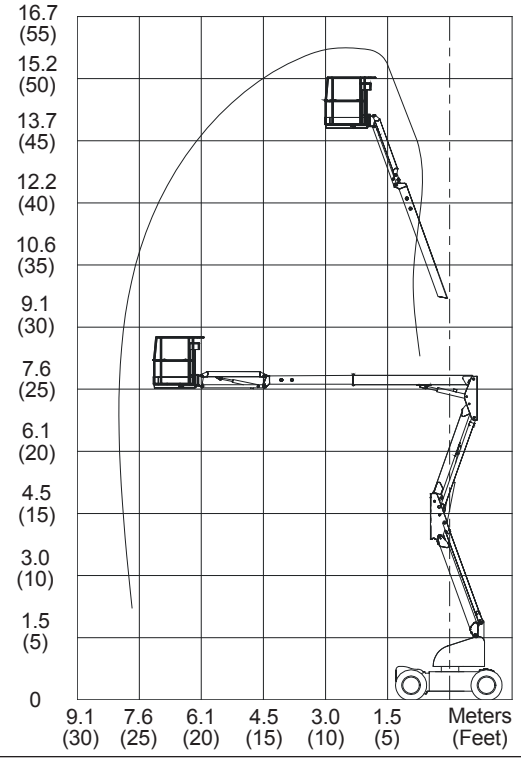
Vibration less than 2.5 m/sec²
0.3 m/sec² (measured)

Sound Power Level below 107 dB(A)

Sound Pressure Level

At work station below 100 dB(A)

Working Envelope



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