



Seagrave
Since 1881

OPERATION AND MAINTENANCE MANUAL

AERIALSCOPE

#56223

**Rockville Vol. Fire Department Inc.
Rockville, MD**

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AERIALSCOPE OPERATION AND MAINTENANCE MANUAL

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1-1. FORWARD

The purpose of this manual is to provide information to personnel directly responsible for the operation and maintenance of the apparatus and platform. The material, as presented, is divided into sections providing a general description of the equipment, descriptions of the various systems and major components, detail specifications, description of the operator's instruments and operation, servicing and lubrication.

It is extremely important that operating and maintenance personnel become familiar with the apparatus, its systems and components before operation.

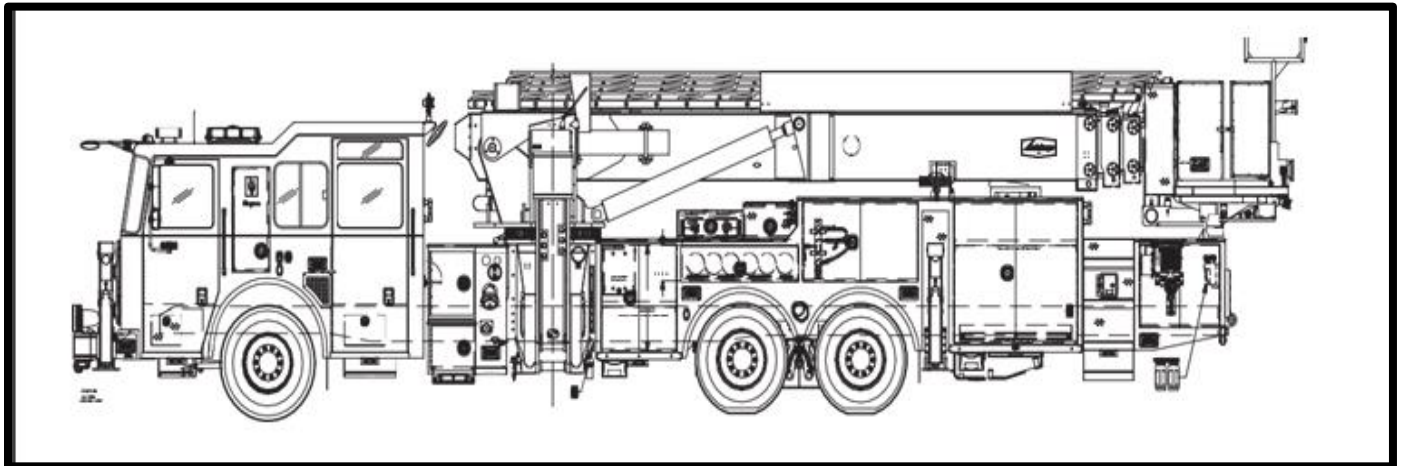
Attention must be given by the operator to the safety precaution section and specific cautions and warnings given throughout the manual. Failure to observe these cautions and warnings could result in severe damage of the equipment and bodily injury or death to the operating personnel.

This unit is designed to provide a safe and stable structure from which rescue and firefighting operations can be performed. The platform provides access to elevated positions allowing ascent and descent of personnel and equipment. The platform provides a secure work surface for rescue and firefighting operations.

It can, provide up to 2000 gallons of water for use as a standpipe or directly discharged from the various nozzles and outlets provided.

The platform can serve as an observation station or used for rapid evacuation of personnel. This may be performed by lowering platform to the ground.

This device is to be operated only by personnel trained in its operations.



Seagrave Aerialscope

1-2. GENERAL

This manual describes the construction and operating procedures of an Aerialscope Elevating Platform.

The aerial consists of a four (4) section telescoping boom assemblies with a self-leveling platform attached to the fly section. The fixed section of the boom assembly is constructed of steel and the three telescoping sections are made of aluminum.

A hydraulic/electric waterway swivel with 360⁰ rotation capabilities is mounted between the torque box and turntable mounting support. All electrical, hydraulic and water systems are routed through this swivel from the chassis to the platform.

Two (2) double-acting hydraulic lift cylinders provide smooth, precise elevation from -5° to 80° above horizontal.

The apparatus is equipped with four (4) corner jacks and two (2) hydraulically extended stabilizers. The stabilizers provide a 19.4-foot stance when fully extended. This adds a firm operational base to the unit for platform operation. The outriggers and jacks are operated by individually controlled valves. “All Jacks” function operates all jacks and outriggers simultaneously.

The functions and controls of the Seagrave/Aerialscope elevating platform are designed and manufactured to provide an efficient, dependable apparatus for firefighting and rescue service.

Throughout the following pages of this manual are guidelines, cautions, warnings and operational procedures which should be strictly followed for safe operation of the platform. Consideration must be given to the tip-over stability of the truck in addition to the safe loading of the platform itself.

1-3. DIMENSIONAL DATA

75' AERIALSCOPE

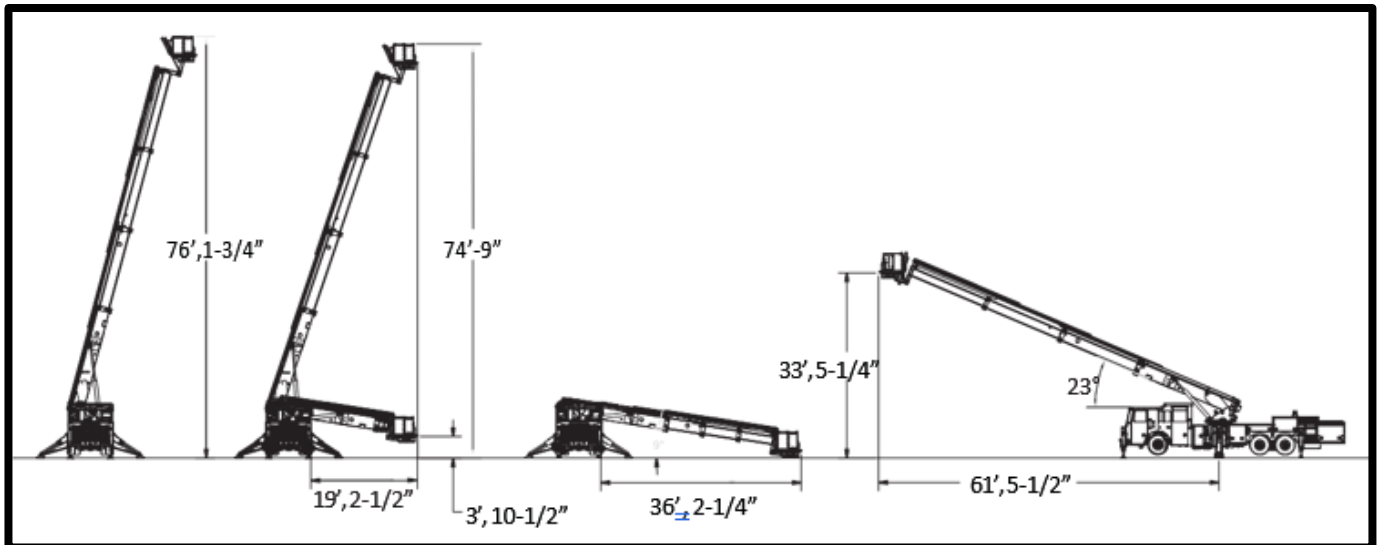
Maximum Working Height	75'
Height to Bottom of Platform	6.7'
Horizontal Reach with Booms Extended.....	66'
Boom Arc of Travel	Approximately 80°
Rotation	Continuous (360°)
Platform Capacity in All Positions	1000 Pounds *
Maximum Lateral Outrigger Spread (edge of pad to edge of pad)	19.4'
Maximum Lateral Jack Spread (edge of pad to edge of pad)	8'
Maximum Longitudinal Jack Spread (edge of pad to edge of pad)	33' **
Platform Size (inside of frame)	43" x 71"
Maximum Length	47' ***
Maximum Height	11'4" ****
Maximum Width	102" (8.5')

* Platform capacity may be de-rated depending on optional equipment that is mounted.

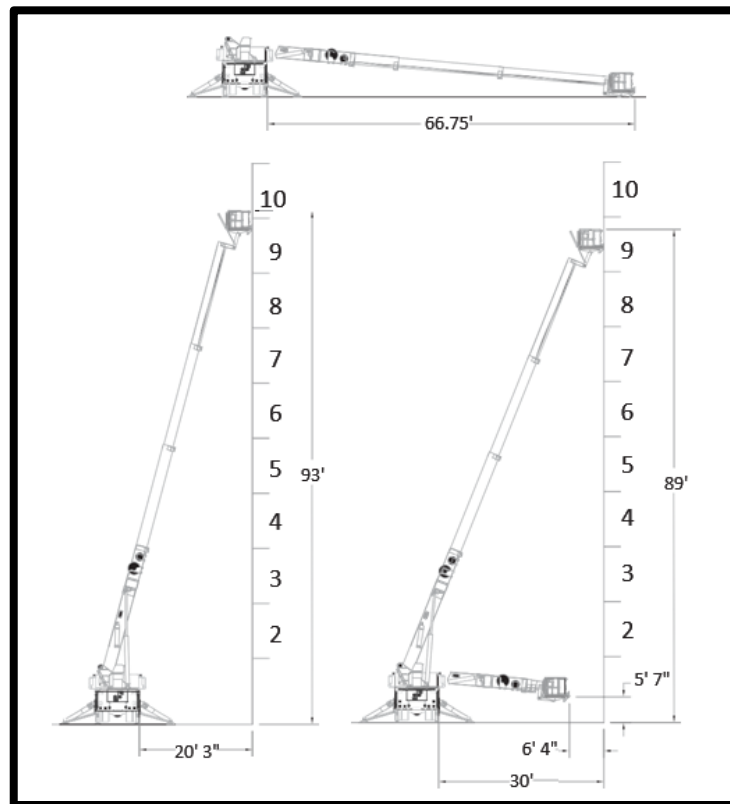
** Jack spread will vary depending on style and make of chassis used.

*** Length of truck will vary depending on style and make of chassis and optional equipment.

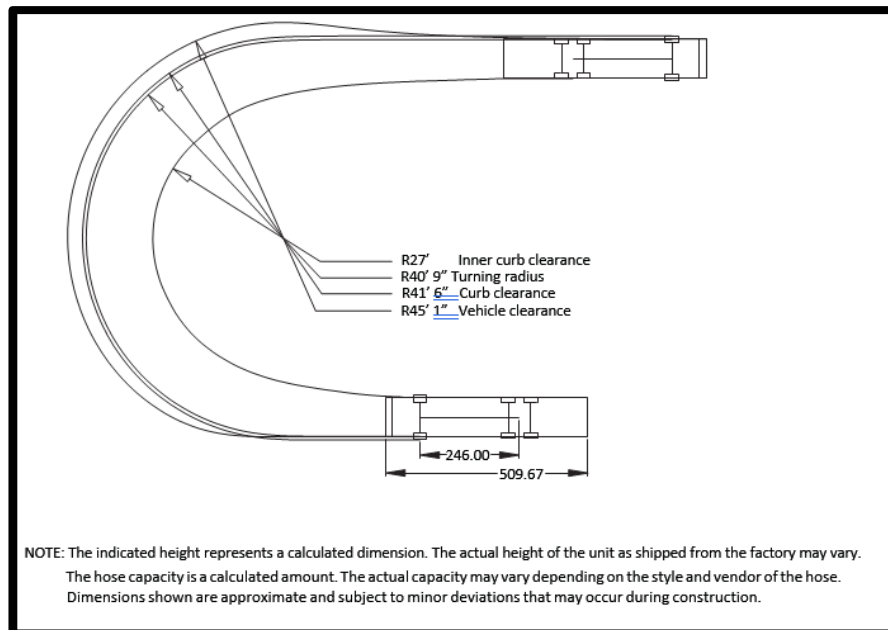
**** Height of truck will vary depending on optional mounted equipment.



Boom Limit - 75' Aerialscope



Scrub Area - 75' Aerialscope



Turning Radius - 75' Aerialscope

95' AERIALSCOPE

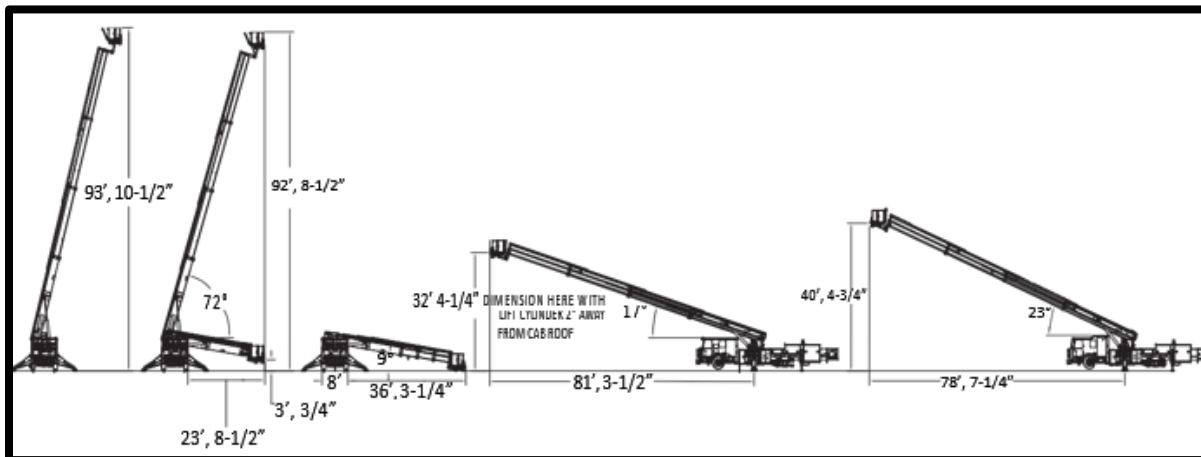
Maximum Working Height	95'
Height to Bottom of Platform	8.7'
Horizontal Reach with Booms Extended	82'
Boom Arc of Travel	Approximately 80°
Rotation	Continuous (360°)
Platform Capacity in All Positions	1000 Pounds *
Maximum Lateral Outrigger Spread (edge of pad to edge of pad)	20.75'
Maximum Lateral Jack Spread (edge of pad to edge of pad)	8'
Maximum Longitudinal Jack Spread (edge of pad to edge of pad)	33' **
Platform Size (inside of frame)	43" x 71"
Maximum Length	47' ***
Maximum Height	11'4" ****
Maximum Width	102" (8.5')

* Platform capacity may be de-rated depending on optional equipment that is mounted.

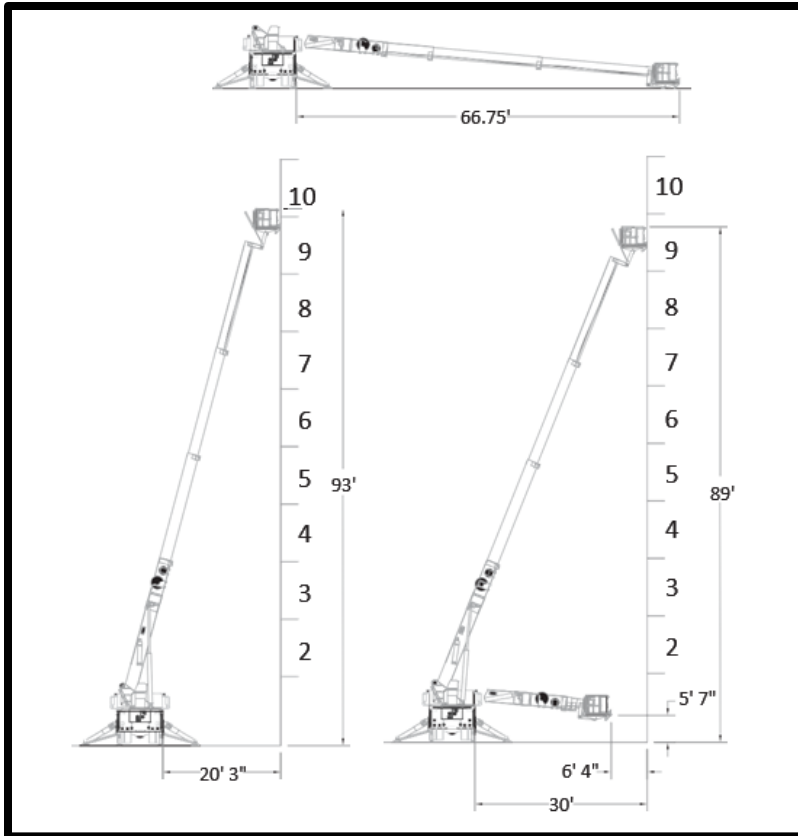
** Jack spread will vary depending on style and make of chassis used.

*** Length of truck will vary depending on style and make of chassis and optional equipment.

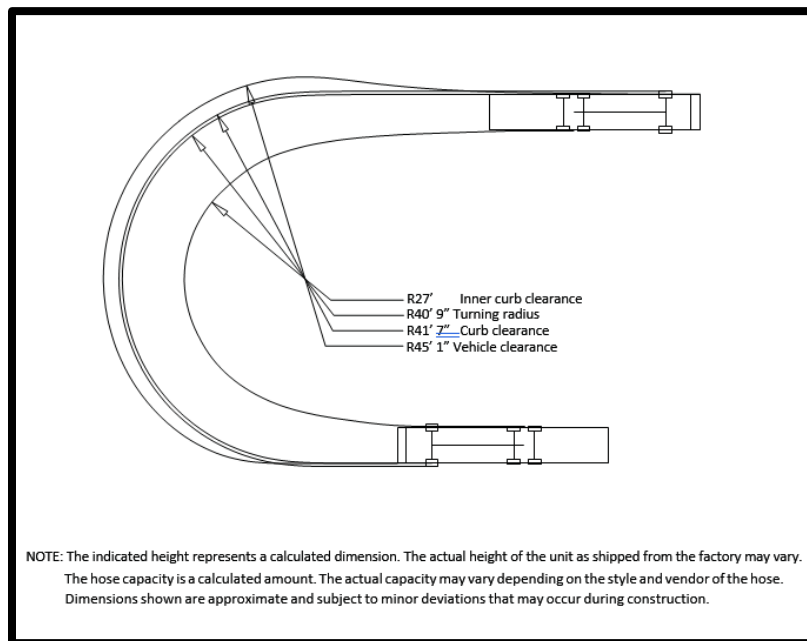
**** Height of truck will vary depending on optional mounted equipment.



Boom Limit - 95' Aerialscope



Scrub Area - 95' Aerialscope



Turning Radius - 95' Aerialscope

2-1. SAFETY PRECAUTIONS

GENERAL



**THIS SYMBOL MEANS ATTENTION!
BECOME ALERT. YOUR SAFETY IS INVOLVED.**

Improper or incorrect operation of any equipment on this unit, including driving of the truck, can be extremely hazardous, especially under the emergency and/or adverse conditions in which this equipment is operated.

To avoid injury to personnel and/or damage to equipment, it is the responsibility of the owner and/or jurisdiction within which the equipment operates to thoroughly train all operating and maintenance personnel in the proper and correct use of the equipment and make certain these personnel have read and understand the various equipment manuals furnished with this unit before being allowed to operate the equipment.

DANGER, WARNINGS, CAUTIONS AND NOTES

"**Danger**", "**Warnings**", "**Cautions**", and "**Notes**" are included in areas of the equipment manuals where it is desired or necessary to call attention to specific procedures. In addition to the Warnings, Cautions, and Notes in this manual, operating personnel should read and understand all Warning and Caution plates or decals on the equipment itself.

The notices are described as follows:



Attention is called to the performance of operation, maintenance, or overhaul, normally in a sequence or manner. Deviation from, or disregard of these instructions will lead to serious personnel injury or death of personnel.



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NOTE: Attention is called to the performance of operation, maintenance, or overhaul, normally in a sequence or manner. Deviation from, or disregard of these instructions will lead to serious personnel injury or death of personnel.

These notices are not to be considered as all inclusive, not as a substitute for knowledge or training, and not as a substitute for the manuals or operating procedures of the jurisdiction in which the unit operates.

The following warnings and cautions are common to all engine powered fire-fighting apparatus.

▲ WARNING

- Before operation, visually check the machine for leaks, broken, missing or damaged parts. Make sure all caps, dipsticks, battery covers, etc., are in place. A part failure during operation can cause injury.
- To prevent eye injury, wear eye protection when doing maintenance on this machine.
- Stop the engine before doing any maintenance or adjustments.
- Hydraulic systems are highly pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing severe injury. Use a piece of wood or cardboard, or other material to locate leaks - never use the hands or other parts of the body to detect leaks.
- Relieve hydraulic pressure before disconnecting circuits. When reassembling, make certain that all connections are tight.
- If injured by hydraulic oil escaping under pressure, serious complications may arise. Seek medical attention immediately.
- To avoid personal injury, keep clear of all moving parts of the apparatus.
- Always keep turntable, steps, running boards and access ladders clean of oil, grease, ice and snow and debris.

2-2. PRIOR TO OPERATION

▲ WARNING

Make certain the equipment is secure and in proper operating condition in accordance with the instructions contained in this manual. Be sure to check all separate warnings and precautions.

- All hardware must be fastened securely, and all preliminary checks and services must be accomplished prior to operation.
- Operator and service/maintenance personnel must have a basic understanding of the equipment and the function of the numerous controls and instruments.
- The operator must be thoroughly familiar with the apparatus height, width and road clearances, operating capabilities and limits.
- When performing pre-operation checks and services be sure there are no open flames that might ignite the fluid vapors during filling undeserving operation.
- If the truck is being removed from storage, brakes must be readjusted for road operation. See section on brake adjustments.
- Keep shoreline electrical power connected when not in use to maintain charge to apparatus batteries.

2-3. DURING OPERATION

▲ WARNING

Pay attention to other moving apparatus when operating.

- Do not dismount from apparatus while it is in motion. Make sure the parking brakes are applied and disengage the transmission whenever leaving the cab. Place wheel chocks at the front and rear of the front tires.
- Maintain complete control of the apparatus always. The apparatus should not be left unattended with component controls in operating mode or for extended periods of time with power on.
- Always correct or report any faulty condition that may cause injury to personnel or result in damage to the equipment.
- When operating during a platform operation, maintain a constant monitor on all gauges.
- Maintain constant surveillance on water pipe and hoses for cracks, leaks, or signs of possible failure when operating as a water tower.

2-4. PLATFORM OPERATION SAFETY PRECAUTIONS

The platform device is only as good or as safe as the operator is competent. Allow only qualified operators with good fire service background and a cool-headed nature to operate a platform device. Only assigned operators should be permitted to operate the equipment.

▲ WARNING

- Never use the platform as a battering ram. This may result in damage that could cause failure later in an emergency.
- At night, keep the top of the platform device well lit.
- Do not forcefully extend the end of the boom against a structure.
- Operate the platform with deliberate motions and smooth application of power. Jerky or erratic application of power is dangerous. Do not slam controls, as this will create erratic operation and induce severe stresses in the platform.
- Never allow a platform to be used for stunting.
- Do one thing at a time, and in the proper operating sequence. Don't try to hoist, rotate, and extend the platform simultaneously.
- Always make certain that the truck is properly set for platform operations before leaving the cab. See that the parking brakes and the steering axle brake locks are applied; see that wheel chocks are properly positioned at the front and rear of the front tires. This is extremely important on hills.
- Never use the platform for pulling down walls or structural members. Make certain that the truck is in a safe location where it will not be struck by debris. Use a winch or other proper source of power for demolition. The platform is not constructed for this purpose.
- Never willingly or intentionally abuse an aerial device by careless handling, overloading, or use for something which it was not designed.
- Adhere to the load capacity charts furnished in this manual.

- Take care when working around electrical wires. In case of contact with live wires do not allow anyone standing on the ground to touch the truck as they may provide an electrical path to ground.
- Keep unauthorized personnel off the truck during operations. The operation of a platform involves moving machinery and is no place for children or spectators.
- Always have the operator at the pedestal while the platform is in use and the engine is running. This is necessary to protect persons using the platform, to prevent destruction of the platform if flames suddenly burst around it, or to prevent un authorized movement of platform controls.

IN FREEZING WEATHER

▲ WARNING

- Keep the hydraulic circuits operating to prevent sluggishness or freezing. Always use the proper hydraulic fluid, and check it regularly as noted on the fluid and capacity chart.
- Exercise great care when the boom is coated with ice as this may cause failure of the boom if moved before defrosting. To remove excessive ice from boom, best results will be obtained with a steam hose. If equipped with an escape ladder, free the rungs first, then free the boom sections, then free the main beams.
- Never attempt to move the aerial truck with the stabilizers in contact with the ground.
- Use sand under the stabilizers and wheels when operating on ice and snow.
- In elevated waterway service, control the nozzle from the turntable whenever possible. Take care not to expose persons at the top of platform to flame and heavy smoke.
- Use special caution in needlessly stationing personnel atop the platform during severe cold and windy weather.
- Exercise extreme caution and reduce the load when operating in a strong or gusty wind. In severe cases use guy lines from the top of the platform.
- Be sure that all emergency controls are in the "off" or "neutral" position except when needed. If these are left on, the equipment may be damaged or rendered inoperable.
- Promptly report any difficulty with the platform, including inadequate hydraulic power, to the responsible officer.
- After any exposure to flame or fire damage, however slight, and after all major repairs are completed, periodically test each platform device as outlined in the N.F.P.A. Standard "Inspecting and Testing Elevating Platforms" (See N.F.P.A. Bulletin 1914.)

2-5. SETTING THE JACKS AND OUTRIGGERS

▲ WARNING

- Never operate the platform without first setting the jacks and outriggers and leveling the apparatus. Always use chocks at front wheels.
- Be sure the area on both sides of the apparatus is clear of people or obstructions which could result in injury or damage before operating the ground stabilizer.
- Never set out riggers/jacks on curbs, sidewalks, man hole covers, storm drains or unstable ground.
- Always use the stabilizer ground pads supplied with your apparatus underneath each out rigger/jack.

2-6. SAFETY PRECAUTION LABELS

The following safety precaution labels are placed in pertinent areas of the apparatus and serve as guidelines for safe operation of the unit. Damaged or lost safety precaution labels should be replaced immediately. Order by part number listed below label.



Damaged or lost safety precaution labels should be replaced immediately. Order by part number listed below the image of the label.



In the cab, everything must be secured. All internal body contents or equipment stored in a body compartment over 25 pounds should be securely fastened.



P1234400



P0640600



P0636600



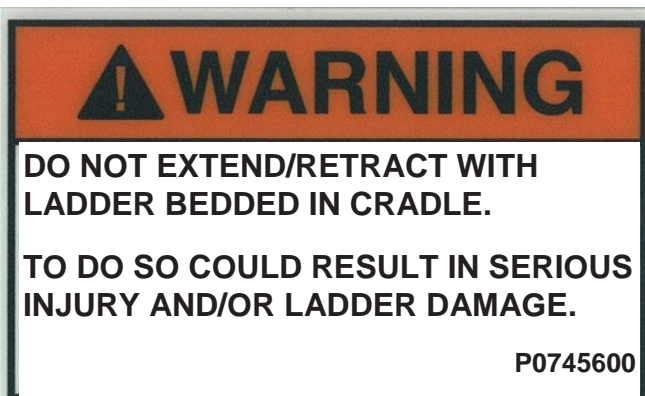
P0640800



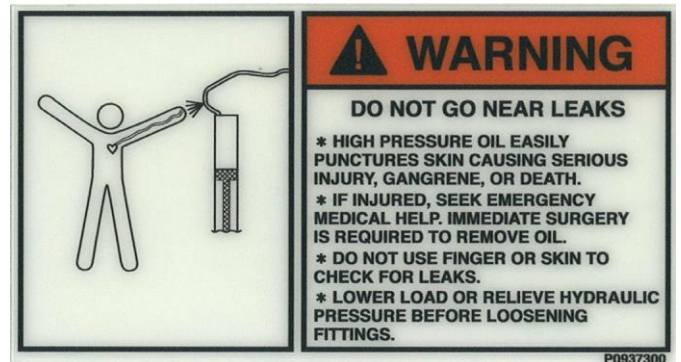
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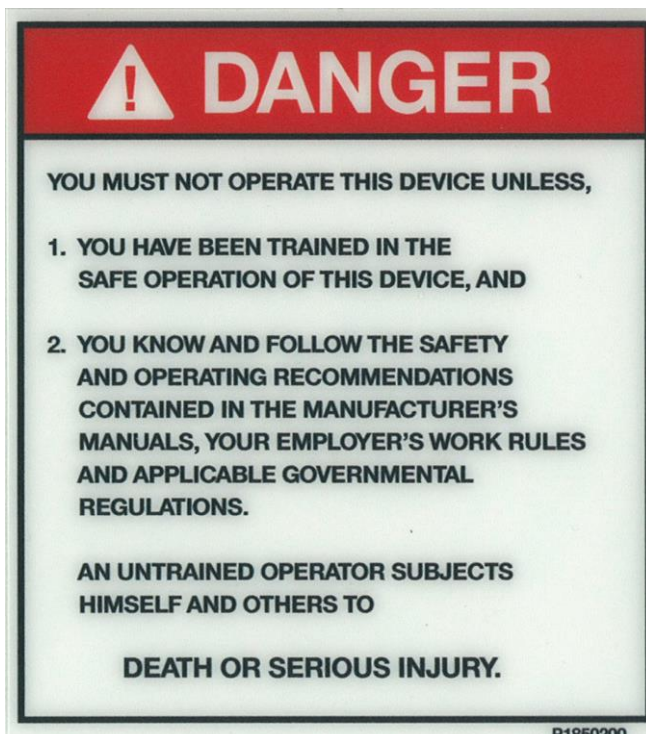
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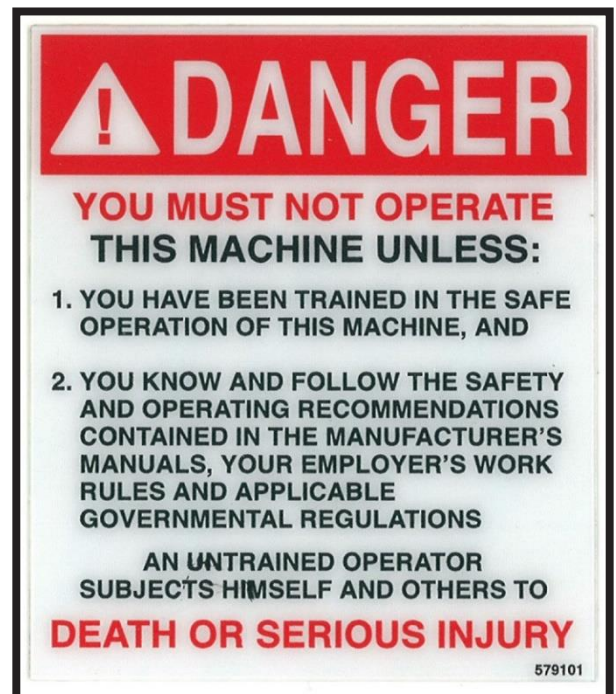
P1850100



P1850300



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P0795000



100643

3-1. MAJOR COMPONENTS AND CONTROLS

DESCRIPTION OF MAJOR CONTROLS

Body Assembly: A welded stainless-steel assembly designed specifically for this type of fire apparatus. It consists of two (2) sections; a forward body section, mounted just forward of the superstructure and the main body, mounted just rearward for the superstructure. The forward body section houses the stabilizer control valves, the emergency power motor and hydraulic high-pressure filter and waterline components. The center section of the main body is designed for storage and easy removal of the ground ladder complement. Also included are several various compartments. Lights are provided to illuminate each compartment when the doors are opened.

Cable Track: A cable track assembly is mounted on the officer's side of the boom. This assembly has the cable for the 12 VDC, 120/240 VAC power to the platform, intercom, control system wires to the platform, hydraulic lines and breathing air.

Escape Ladder (optional): An optional, four section aluminum extension ladder is permanently mounted along the top of the boom assembly as to provide a route for emergency evacuation from the platform.

Hydraulic Oil Tank: The capacity of the hydraulic oil tank is approximately 85 gallons. It is located near the left-hand frame, directly behind the superstructure along with the return filter. Due to the shape of the tank, an auxiliary cooler is not required. A dipstick is provided in the tank. The oil should only be checked when the boom is stowed, and the unit is ready for road travel.

Hydraulic System: The hydraulic system is powered by a single hydraulic pump. This pump, combined with a PTO, is mounted directly to the truck transmission. Two (2) circuits are used in the system, both of which are controlled from a selector valve. One (1) circuit powers the stabilizers, the other the boom.

- A six (6) section hydraulic valve controls the jacks and the outriggers.
- An interlock diverter valve (IDV) is incorporated into a seven (7) section valve with six (6) sections for the
- outriggers. It is recommended that all six (6) stabilizers be operated at once to induce as little stress on the unit as possible. Each jack or outrigger can be operated independently as there may be instances where not all six (6) can be operated simultaneously, this will not cause any harm to the unit.
- It should be noted that due to manufacturing tolerances, all the stabilizers might not move at the same
- rate of speed. This is normal and should not be considered a malfunction.
- A three (3) section valve controls the boom functions - elevation, extension, and rotation. Operation is by the electric signals sent from the joystick in the platform or by the levers directly mounted to the valve on the turntable control station.

Also included among the components of the hydraulic system is the oil tank, hoses and various filters and shut off valves.

Jacks: A type of stabilizer. A jack will primarily work going up and down in a vertical fashion. The four (4) vertical jack assemblies are positioned in front of the truck cab and just behind the rear tandem axle. These electrically operated stabilizers are used in conjunction with the above outriggers to provide a stable base for operating the boom. All four (4) jacks can be simultaneously controlled to best meet the ground conditions. Holding valves lock the jacks in any of the up and down positions. Mechanical safety locks are also provided as a back-up for the hydraulic system.

(NOTE: All jacks may be operated independently.)

Main Boom Section: The main steel section of the boom assembly is hinge pinned to the turret. The boom is raised and lowered by two (2) double acting hydraulic cylinders. Position is held by pilot operated counter- balanced holding valves. These valves also prevent the boom from lowering in case of a hydraulic hose failure.

Outriggers: A type of stabilizer. An Outrigger will primarily work by going in/out and up/down. The outriggers provide stabilization to the aerial. Hydraulically operated from the jack/outrigger controls, the outriggers can be independently operated to best meet the ground condition. Holding valves lock the outriggers in any of the up and down positions. A mechanical safety lock is also provided as a back-up for the hydraulic system.

Pedestal Controls/Console: The console is located on the street side of the rotating turntable. It contains the hydraulic valves for control of the boom movement. It is activated by electric signals from the platform or it can be controlled manually with the valve levers. Also included is an intercom system, an air system monitor (if truck has air to the platform), a waterflow gauge, an MD3 display, a hydraulic pressure gauge, an emergency power switch and various other 12 VDC and 120/240 VAC switches. The safety interlock includes a foot pedal at the base of the console.

Platform: All aluminum construction with two (2) access gates. Curved doors with slam latch that opens inward or outward. Rated capacity in all positions is *1,000 lbs. This capacity is to include both personnel and equipment. This capacity is not reduced due to water flow. The platform is hinge pinned to an “L” bracket bolted to the third aluminum boom section or fly section. The platform is equipped with a durable rubber rub rail around the basket perimeter to protect the walkway, and durable plastic skid plates underneath to protect items below.

** May be de-rated for optional equipment that has been mounted.*

Platform Controls: The platform control (driver’s side) is a single handle control mounted on the street side of the platform. All boom functions can be used simultaneously, i.e., raise, rotate, extend, retract.

Platform Leveling: A hydraulic system maintains the platform in a true level position always. The platform will stay level regarding gravity and not parallel to the road or the truck’s turntable. The leveling system consists of an electronic level sensor, a proportional hydraulic valve, and two (2) double acting cylinders mounted between the fly section and the platform. A battery backup system is provided in the event of an electrical failure.

Superstructure Assembly: This welded steel structure is attached directly to the truck chassis frame and provides the base for the boom and turret attachment. Outriggers are mounted to the superstructure sides, integrating ground stability to the boom.

Telescoping Boom Sections: The second, third and fly (4th) stage boom sections are aluminum alloy fabricated tubes. The boom sections are extended and retracted with a 3-section hydraulic cylinder. The booms slide on a series of wear pads mounted between, and on the end of, each section.

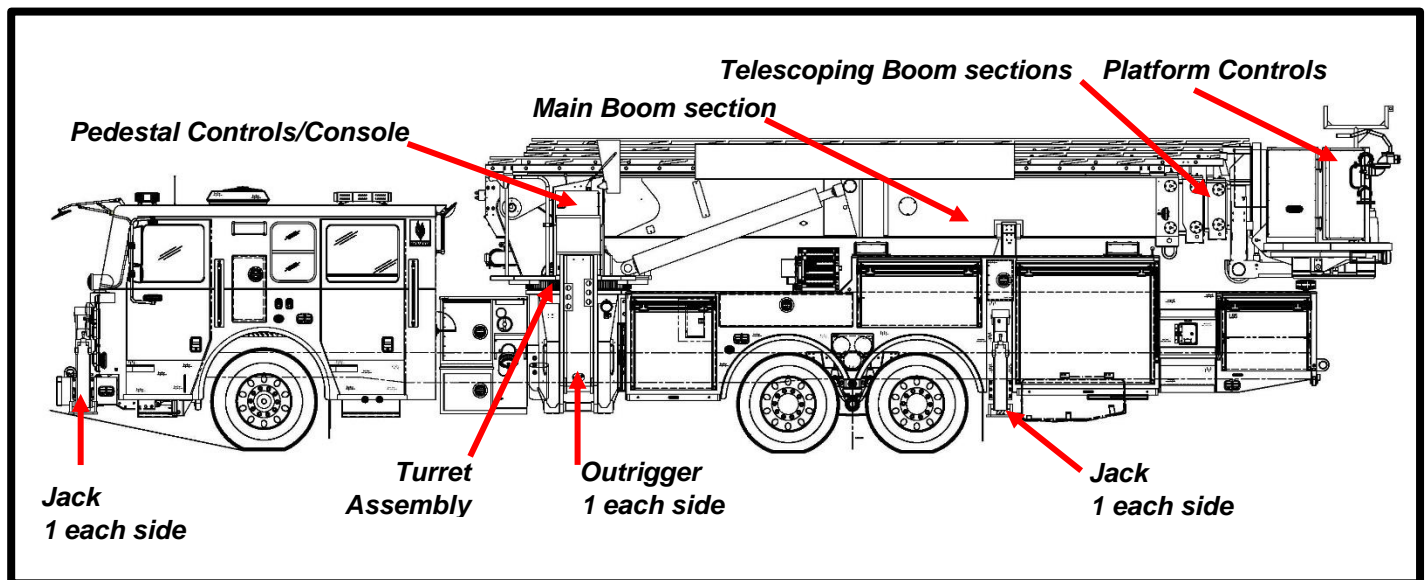
Torque Box: Main body mounts to provide structural integrity and ladder storage.

Turret Assembly: This welded steel structure supports the boom assembly above the truck chassis. A turntable rotation bearing is located between the turret and the superstructure. A hydraulically driven planetary gear box provides power for rotation.

Water Delivery System: The water system consists of inlet connections on either side of the truck, the rotating swivel within the superstructure, a four (4) section telescoping aluminum pipe, and up to one (1) or two (2) platform mounted deluge guns capable of flowing **2,000 GPM. Suitable swivel elbows, fittings and additional piping connect all the mentioned components.

*** May vary depending on customer requested deluge gun.*

3-2. MAJOR COMPONENTS DIAGRAM



Aerialscope Major Components

3-3. AERIAL CONTROLS

▲ WARNING

- Manual Override switches should ONLY be used in emergency situations.
- Any Seagrave aerial device is non-insulating.

GENERAL AERIAL OPERATIONAL INFORMATION

▲ CAUTION

The ladder must be raised out of cradle prior to engaging rotate or extension functions, to prevent damage to cradle or body.

NOTE: If the “Stabilizer Down” signal is lost to the system while operating the ladder over one side or the other, the ladder movement will be stopped from going over the side of the apparatus that has lost the “stabilizer down” signal. The “Rotation Override” switch can override this condition. Activation of this switch will allow movement of the ladder over the side of the apparatus that is missing the “stabilizer down” signal but should be used only in an emergency.

▲ DANGER

- Overriding of any interlock system must only be done when all consideration is taken for the stability of the apparatus and safety of all personnel and equipment. Stability of the apparatus must be a major safety concern of the operating personnel always. If the apparatus must be used with the stabilizers not fully extended, special attention must be paid to the stability of the apparatus.
- If the ladder is out of the cradle, and stabilizer operation is required, use the Manual Override Control Levers located at the stabilizer control panel to manually override the normal system control, and allow for stabilizer functions.
- Using the overrides can be very dangerous. Use only when it is necessary. The rotation override should be used only in an emergency after all consideration is taken for the stability of the apparatus and safety of all personnel and equipment.

3-4. ROTATION INTERLOCK SYSTEM

The system is equipped with a rotation limiting device which is activated when the stabilizers have not been properly deployed or a stabilizer signal is lost. The device limits the range of rotation to 15° from the center line of the apparatus on the side which is considered “short jacked” condition.

If the stabilizers are properly deployed but, due to mechanical/electrical malfunction, the Rotation Interlock System would not allow aerial rotation, the Rotation Interlock System can be overridden using the “Ladder Override” switch located on the aerial pedestal control panel.

NOTE: After the jacks and stabilizers are properly deployed, the operator must move to the pedestal to operate the aerial device from that position. The pedestal is the primary operating station for the aerial. Even when the aerial is operated from the platform, the pedestal must be manned with the pedestal’s cover up always during aerial operation.

3-5. CAB AVOIDANCE ALARM



The Cab Avoidance Alarm and light will stop the boom operation from moving any closer to the cab. The Cab Avoidance alarm and light that will illuminate during a rotation/lowering if the boom/ladder is within the cab area at a low elevation.

3-6. POST OPERATION

NOTE: An “Aerial Aligned” indicator light on the back side of the pedestal will illuminate when the aerial is aligned with the boom support (cradle).

NOTE: If the normal hydraulic system is non-functional, an emergency hydraulics pump is available for temporary operation of the boom/ladder, jacks and stabilizers. To activate the emergency hydraulics, see the 12 Volt DC Emergency Pump Unit (EPU) section.

TO SECURE THE APPARATUS FOR ROAD TRAVEL

STEP 1: The operator must retract and rotate the aerial to a position over the cradle. The operator must verify alignment with cradle while lowering aerial.

STEP 2: Center the aerial over the cradle and lower the aerial until it stops on the bumpers.

- STEP 3:** When stowing the aerial, allow the aerial to lower until it reaches the Boom Cradle Proximity Switch. The switch will stop lowering of the aerial to the appropriate bedding pressure.
- STEP 4:** Remove the stabilizer/jack's safety pins.
- STEP 5:** With the aerial cradled, use the stabilizer controls to raise the jacks and stabilizers to their stowed positions.
- STEP 6:** The aerial is disabled completely once the stabilizers are no longer planted, and the aerial is at the Cradle switch.

3-7. AERIAL PEDESTAL CONTROLS

ITEM	INSTRUMENT /INDICATOR	FUNCTION
1	2-Way Intercom System	System designed to communicate between the turntable and basket.
2	Optional Switching	Air Horn, Engine Start, etc. based on customer option.
3	Aerial Override	Momentary toggle switch to override aerial interlocks.
4	HI Idle Request Switch/Indicator Light	Momentary push switch which activates HI idle request when illuminated green.
5	Platform Controls Switch	Switch must be on in addition to Master Control to allow operation or aerial boom from basket.
6	Aerial Information Center	Digital display where aerial information is located.
7	Aerial Lighting	Boom, Flood, etc. based on customer option.
8	Ladder Control Handles	Extend/Retract, Left/Right, Raise/Lower control handles for aerial operation.
9	Flowmeter	Displays water flow in gallons per minute.
10	Air Minder	Displays percentage of breathing air in the system.
11	Emergency Pump Switch	Momentary switch that activates the 12-volt emergency hydraulic pump.
12	IQAN Diagnostic Port	Terminal to hook up diagnostic cable with laptop for the IQAN system.
13	Work Light Switch/Light	Illumination for inside the operators console.
14	Aerial Interlock Solenoid Valves	Solenoid valve assembly that controls fluid for aerial operation and aerial interlock's.
15	Hydraulic Fluid Test Port	Diagnostic port for hooking up an external pressure gage.



3-8. DEADMAN FOOT CONTROL

Deadman Foot Control

The Deadman Foot Control enables the boom controls and disables the platform controls.

The Deadman foot switch has three main functions:

- Allows the hydraulic fluid to travel up to the control valve in the pedestal.
- Allows the engine high idle to activate if the High Idle switch is in the ON position.
- Enables tip controls in conjunction with Tip Enable switch (if so equipped for ladders).

3-9. AERIAL INFORMATION CENTER**OVERVIEW**

The Aerial Master Control Display consists of several informational, touch display screens. It also provides system diagnostics.

This system is connected directly to the apparatus features and enables it to provide real-time information about the apparatus status.

Some of the items included on the Aerial Information Center:

- Rotation Limit reached
- Stabilization of the apparatus
- Ladder in cradle
- Elevation and rotation angle
- Water flow at nozzle
- DEF and Fuel level









Aerial Information Center on the Pedestal Control Panel

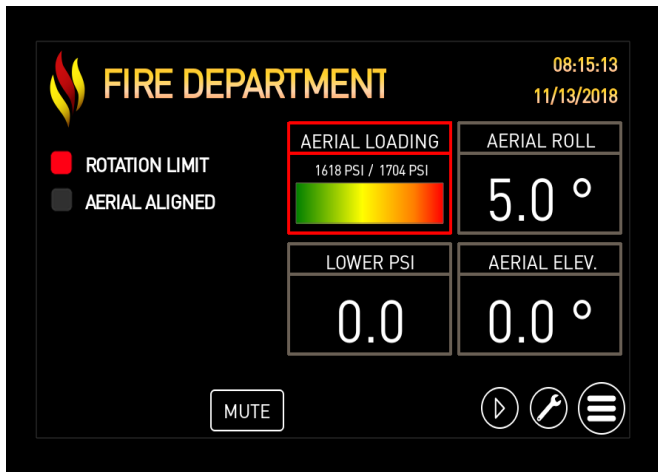
All these features can be accessed by pressing the appropriate area on the MD4 display.

NOTE: The screens can change depending on your apparatus specific options. Refer to your Schematics in your apparatus Electronic Manual for more detailed information.

The following images are examples of the Aerial Information Center screens:

ICONS

ICON	ICON NAME	FUNCTION
	Wrench	Pressing the Wrench Icon takes you to the display/navigation control set up screen.
	Main Menu	Pressing the Main Menu Icon will take you to the Main Menu Screen
	Back	Pressing the Back Icon allows you to cycle through main screens and back out of the menu screen.
	Forward	Pressing the Forward Icon allows you to cycle through main screens.
	Cancel	Pressing the Cancel Icon will back you out of the screen your currently on.
	Mute Alarm	Pressing the Mute Icon will temporarily mute the audible alarms. This will only show up on the display with an active alarm.

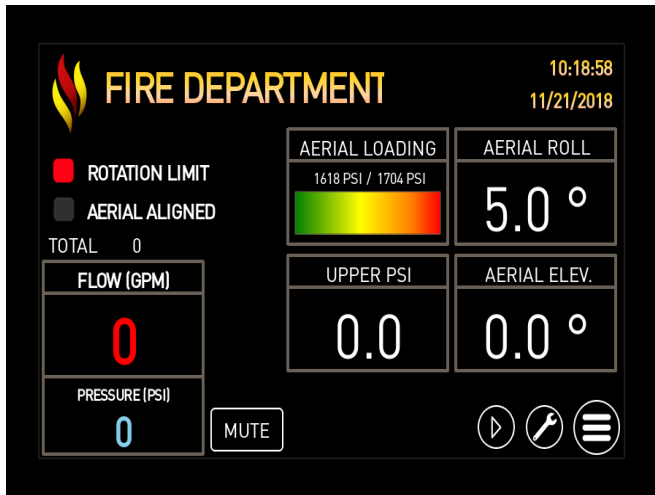


a sample screen shot

MAIN STARTUP SCREEN

This is the default display screen. The HOME screen displays the current time and date, and features icons for:

- WRENCH
- ARROW
- MENU
- MUTE



a sample screen shot

Aerial Loading – Depicts loading of the platform.

Aerial Roll – Depicts side to side angle of the apparatus.

NOTE: If the angle is greater than 5 degrees you will not get planted signal on the downhill side.

Aerial Elevation – Displays real time elevation angle of main boom.

Lower PSI/Upper PSI/Hydraulic Temp – This box will cycle through all three options.

NOTE: If the hydraulic oil temperature gets above 180 degrees there will be an audible alarm.

Rotation Limit – When box is lit means the aerial can no longer rotate. Will show up in a short jack scenario.

Aerial Aligned – When box is lit means the aerial is aligned with the boom support.

Runs Aligned – When box is lit means the escape ladder rungs are aligned.

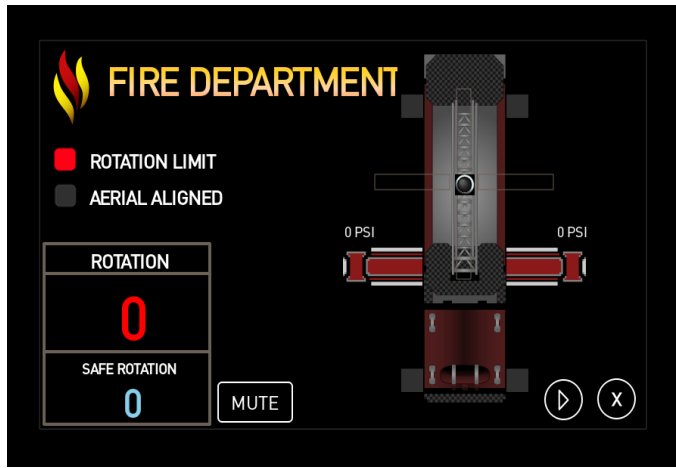
At Cradle - When box is lit means the ladder is in the boom support.

NOTE: The display will cycle through all three options depending on position of device.

Flow (GPM) – Displays real time flow through the aerial waterway.

Pressure (PSI) – Displays real time pressure in the aerial waterway.

Total – Records total flow through the waterway between Aerial Master cycles.

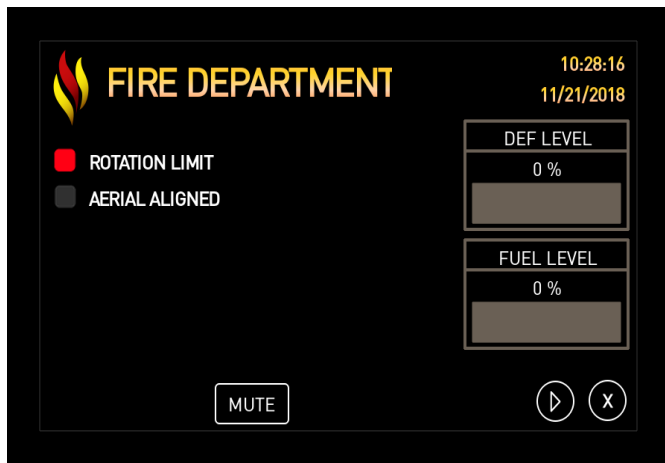


a sample screen shot

Stabilizer/Jacks Planted – Once illuminated depicts that the stabilizers/jacks are firm on ground.

Rotation Angle – Displays real time rotation angle of the aerial (0 - 360).

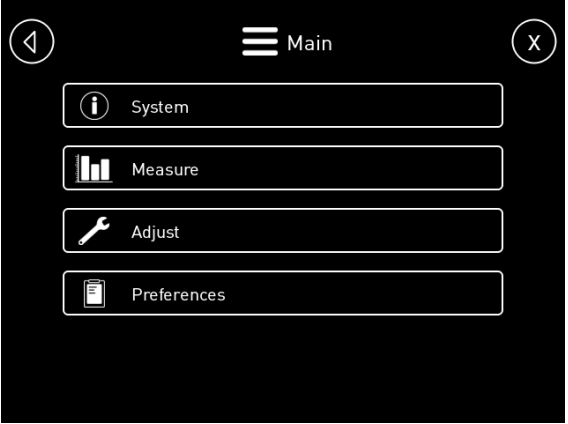


Safe Rotation – Displays the amount of safe rotation until rotation limit.



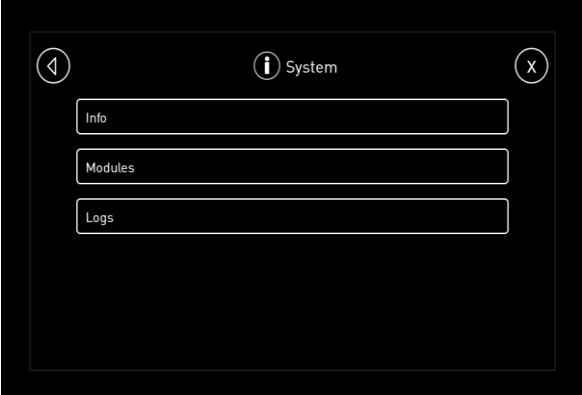
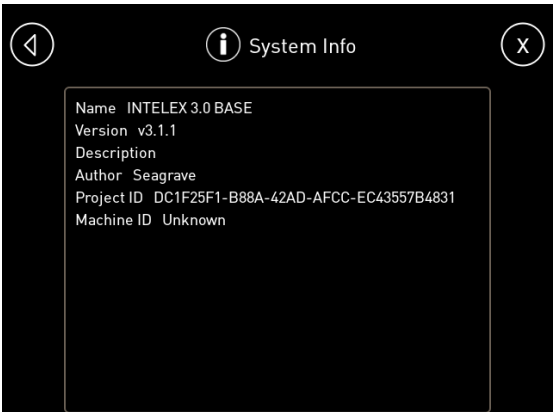
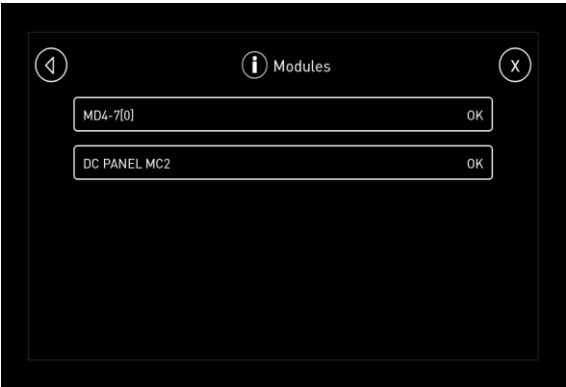
a sample screen shot

DEF Level / Fuel Level – Gages are tied to the chassis ICAN system and will alert below 15 % and alarm below 10%.

MAIN MENU

 <p><i>a sample screen shot</i></p>	<p>MAIN MENU SCREEN</p> <p>This is the main menu screen. By pressing the screen box, you can access.</p> <ul style="list-style-type: none"> • System • Measure • Adjust • Preference <p>Also, the buttons listed below can be used in any of the menu screens.</p>
 <p>Back one screen button</p>	 <p>Cancel Screen button</p>

SYSTEM

 <p><i>a sample screen shot</i></p>	<p>SYSTEM SCREEN</p> <p>This screen displays the options available:</p> <ul style="list-style-type: none"> • Info • Modules • Logs <p>The information can be accessed by touching the box on the screen.</p>
 <p><i>a sample screen shot</i></p>	<p>INFO</p> <p>This screen lists the aerial IQAN system information.</p> <ul style="list-style-type: none"> • Name • Version • Description • Author • Project ID • Machine ID
 <p><i>a sample screen shot</i></p>	<p>MODULES</p> <p>This screen displays the different modules that are connected to the aerial system.</p> <ul style="list-style-type: none"> • MD4-7[0] • DC PANEL MC2 <p>The information can be accessed by touching the box on the screen.</p>



a sample screen shot

LOGS

The stored information of system operation.

- MAD4-7[0] log
- DC PANEL MC2 log

Under **Logs** there is one module for each application in the project. Each application module in turn contains the logs belonging to that application. Select a log module to view log items and records for that log. You will only be able to see those logs that you have sufficient access rights to view.

MEASURE



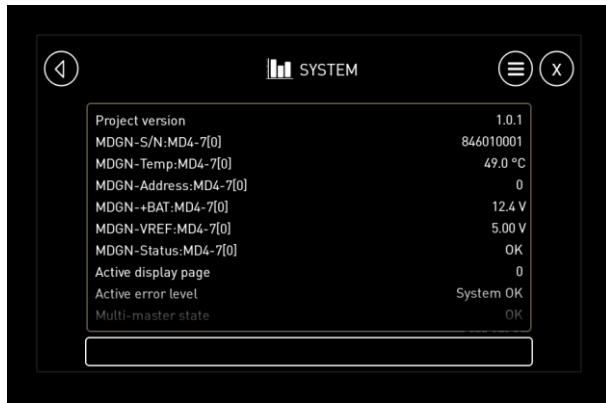
a sample screen shot

MEASURE SCREEN

This screen lists the various areas of the apparatus that are being measured.

- SYSTEM
- HOURS
- OUTRIGGERS

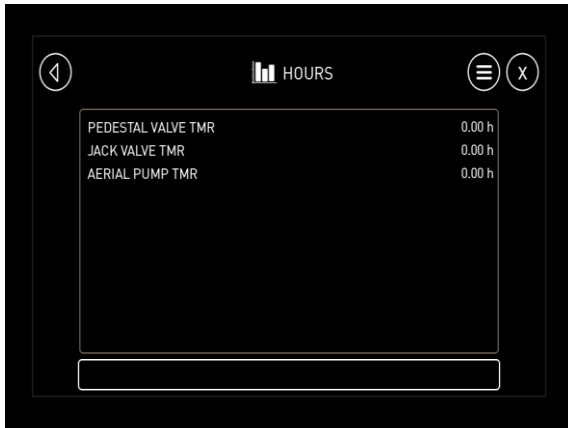
By touching the listed item, you will be taken to a new screen listing the specific items in that area being measured.



a sample screen shot

SYSTEM

This screen lists the various system and diagnostic information.

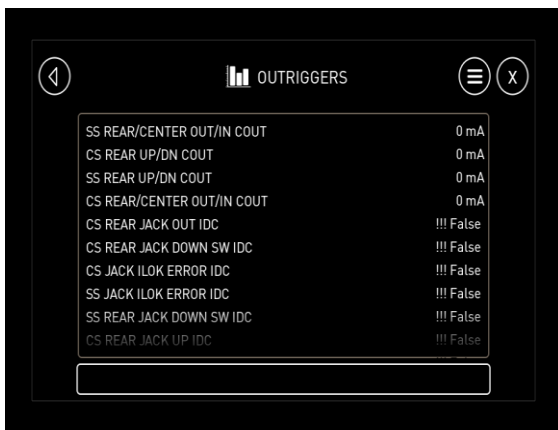


a sample screen shot

HOURS LISTING SCREEN

This screen lists the running hours of various areas of the apparatus. There may be additional items listed here that are being measured by hour meters.

- PEDESTAL VALVE TMR
- JACK VALVE TMR
- AERIAL PUMP TMR

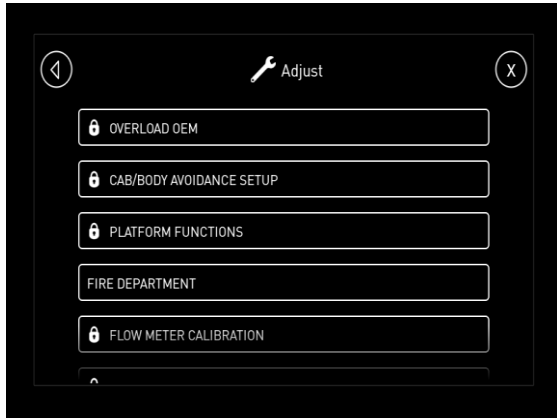


a sample screen shot

OUTRIGGERS

This screen lists the outrigger sensor status.

ADJUST



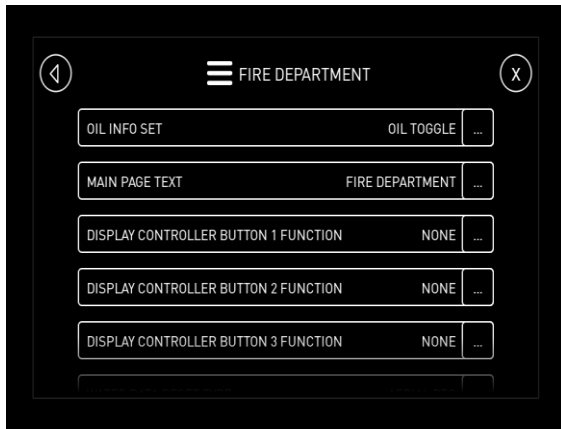
a sample screen shot

ADJUST MENU SCREEN

This screen displays the options available for Adjusting.

The items with pad locks are only accessible by authorized Seagrave service representatives.

By touching the listed item, you will be taken to a new screen listing the specific items.

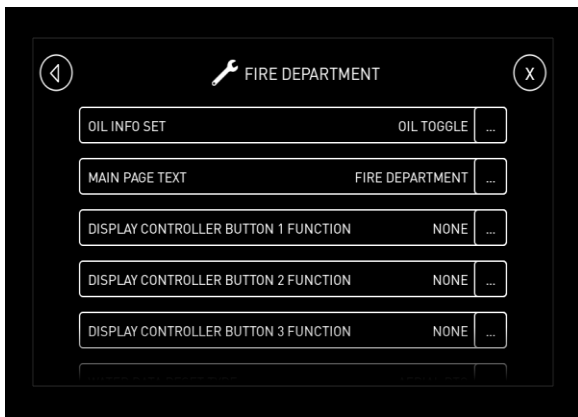


a sample screen shot

FIRE DEPARTMENT

- OIL INFO SET
- MAIN PAGE TEXT
- DISPLAY CONTROLLER BUTTON 1 FUNCTION
- DISPLAY CONTROLLER BUTTON 2 FUNCTION
- DISPLAY CONTROLLER BUTTON 3 FUNCTION
- WATER DATA RESET TYPE

By touching the listed item, you will be taken to a new screen listing the specific items.



a sample screen shot

MAIN PAGE TEXT

This screen displays changing the main screen fire department listing.

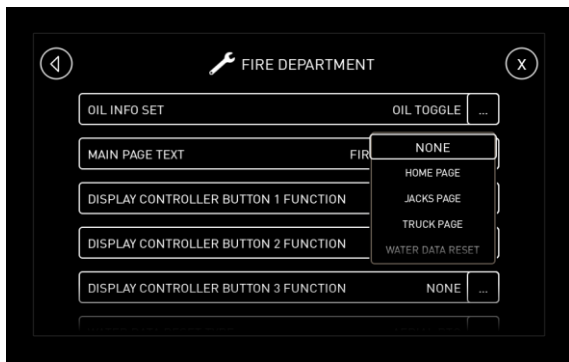
By pressing the ... on the screen, it will bring up a keyboard for making the changes for that area.



a sample screen shot

KEYBOARD SCREEN

This screen displays the keyboard used to change the main screen fire department listings.



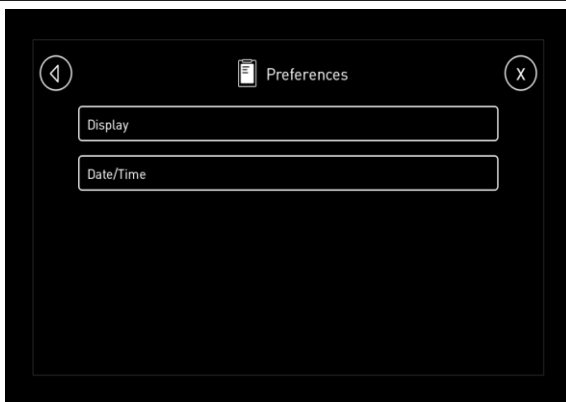
a sample screen shot

DISPLAY CONTROLLER BUTTON

- NONE
- HOME PAGE
- JACKS PAGE
- TRUCK PAGE
- WATER DATA RESET
- ALARM MUTE
- GEN START – Program required
- ENGINE START – Program required
- AIR HORN – Program required

By pressing on the item box you wish to change, it will expand the settings where the particular items can be changed.

PREFERENCES

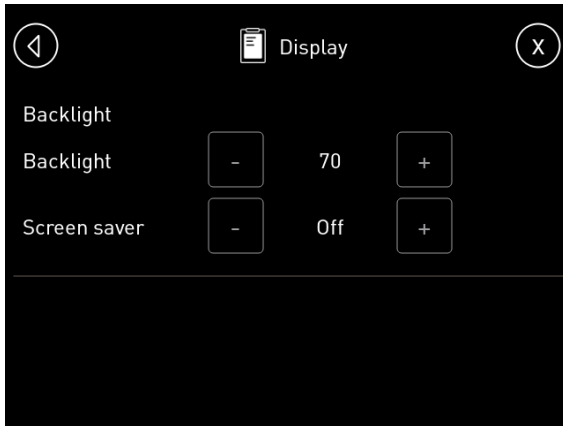


a sample screen shot

PREFERENCES MENU SCREEN

This screen displays the options available for setting

- Display
- Date/Time

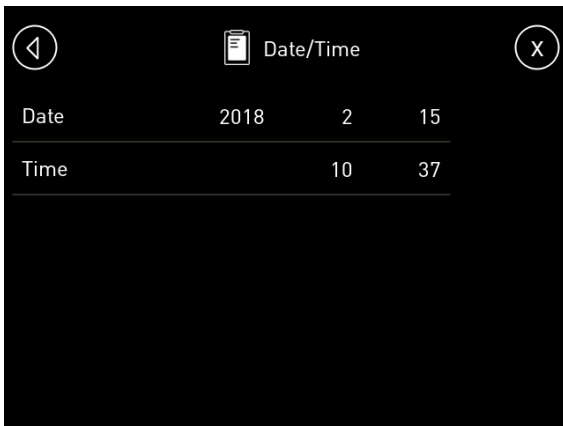


a sample screen shot

DISPLAY

This screen displays adjusting the backlight and the screen saver.

By pressing the screen on the + or -, it will change the brightness of the item being changed accordingly.



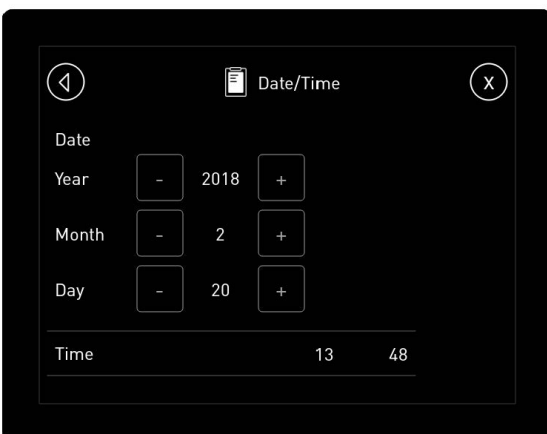
a sample screen shot

DATE-TIME MENU SCREEN

This screen allows you to change the date and the time that the system uses.

- Year
- Month
- Day
- Hour
- Minutes

By pressing on the item box you wish to change, it will expand the settings where the particular items can be changed.



a sample screen shot

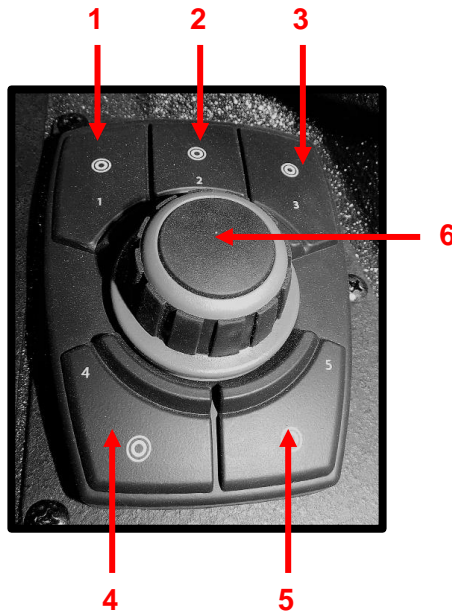
DATE-TIME EXPANDED MENU SCREEN

This screen allows you to change the date or time.

By pressing on the + or -, the display can be changed.

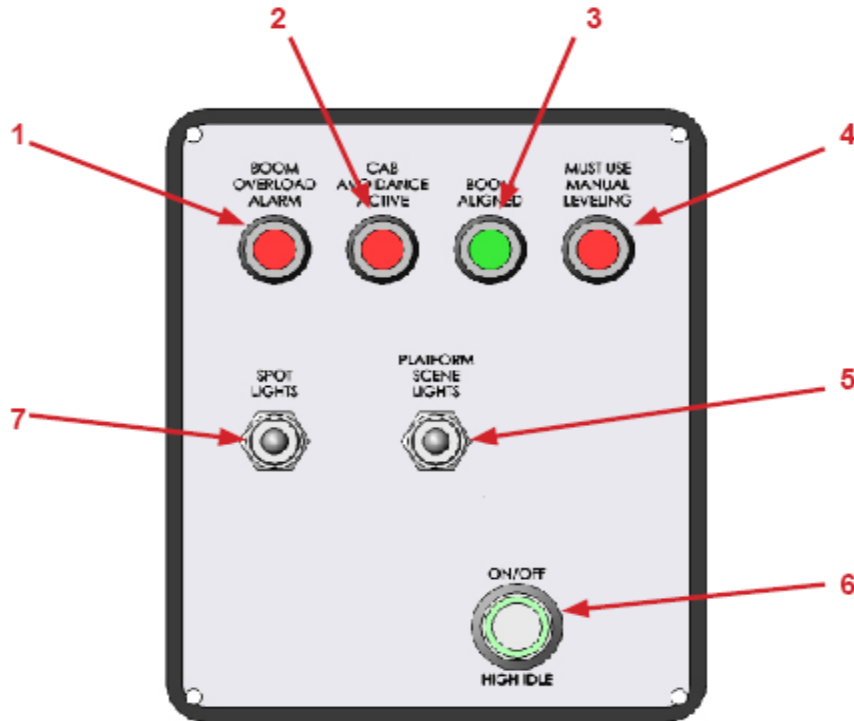
3-10. DISPLAY NAVIGATION CONTROL

There are times when using the Aerial Information Center touch screen is difficult, such as having gloves on. The Display Navigation Control then assists the operator in monitoring the screen functions of the system.



ITEM	DESCRIPTION
1	Programed per customer.
2	Programed per customer.
3	Programed per customer.
4	Rotate button to change to go back to previous screen, push button to select items in the menu screen.
5	Push button to change to the MAIN MENU SCREEN.
6	Push knob to ENTER the chosen selection on the screen. Turn knob to SCROLL up or down in a screen.

3-11. AERIAL CONTROLS FROM PLATFORM



Platform Control Instrument Panel

ITEM	INSTRUMENT - INDICATOR	FUNCTION
1	Boom Overload Alarm	Alarm will sound, and the indicator illuminates up when the boom load limit is exceeded.
2	Cab Avoidance Active Indicator	Audible alarm and indicator light lights up when the boom is near of the cab and is nearing the possibility to cause damage to the apparatus.
3	Boom Alignment Indicator	When illuminated, indicates that the boom is aligned with the cradle.
4	Manual Leveling Indicator	When illuminated, indicates that manual leveling must be performed.
5	Platform Scene Lights	Momentary On/Off switch, for DC lights under the platform.
6	High Idle Button	Push to activate, push again to deactivate the High Idle request.
7	Spot Lights	Momentary On/Off switch, for DC lights on the side of the base section of the aerial.



**Aerial Joystick
from top looking down
over control panel**



Aerial Joystick – side view

NOTE: If the aerial function must be stopped abruptly, the trigger (Deadman) on the joystick must be released.

NOTE: The boom is equipped with an overload alarm to indicate when the platform is overloaded.

The Platform Controls consist of a single handle “joystick” with a trigger type safety interlock. This trigger switch must be pressed and held to activate the hydraulic system during all boom movements. The trigger must only be depressed or released when the handle is in the neutral position. Erratic boom movement will occur if this is not done.

- To raise or lower the boom, pull up or push down on the handle.
- To extend or retract the boom, move the handle forward or backward.
- To rotate the boom, move the handle to the right or left.
- Up to three boom movements can be operated simultaneously.
- Optional speed selector switch on some joysticks, allowing for three different speed settings for each function in the basket.



Only squeeze and release the trigger when the handle is in the neutral position, or erratic and uncontrollable boom movement will occur.

3-12. PLATFORM LEVELING SYSTEM

Hydraulic lines connect to a proportional control hydraulic valve. The output of an electronic level sensing device controls the proportional valve to position the leveling cylinders and the maintain level of the platform.

The platform leveling system incorporates an electronic level sensing device that controls a proportional hydraulic valve. This system levels the forward-rearward tilt of the platform regardless of the truck orientation. Leveling is functional with the auxiliary back-up hydraulic system.

When the aerial is going into the cradle (boom support) and is below 3° from the basket, the basket will level with the truck.

If the primary power is lost, the leveling electronics will be powered with an auxiliary back-up battery system that automatically engages. The auxiliary backup battery system has a gauge and test switch located on the control station.

NOTE: The two leveling switches do not move fluid up to the platform, the foot switch (Deadman) at the pedestal or the trigger (Deadman) at the basket must be depressed and held down for the fluid.

Platform Leveling Controls



MANUAL LEVELING

STEP 1. Open basket console door to access the leveling switches.

STEP 2. Depress and hold the momentary Auto/Manual switch to the manual position.

STEP 3. Pull out the center locking directional (Up/Down) switch and deflect and hold the switch in direction required.

STEP 4. Depress the trigger (Deadman) on joystick or have someone at the turn table step on the footswitch (Deadman) until the desired angle is achieved.

NOTE: When Indicator light is illuminated, manual leveling is required.

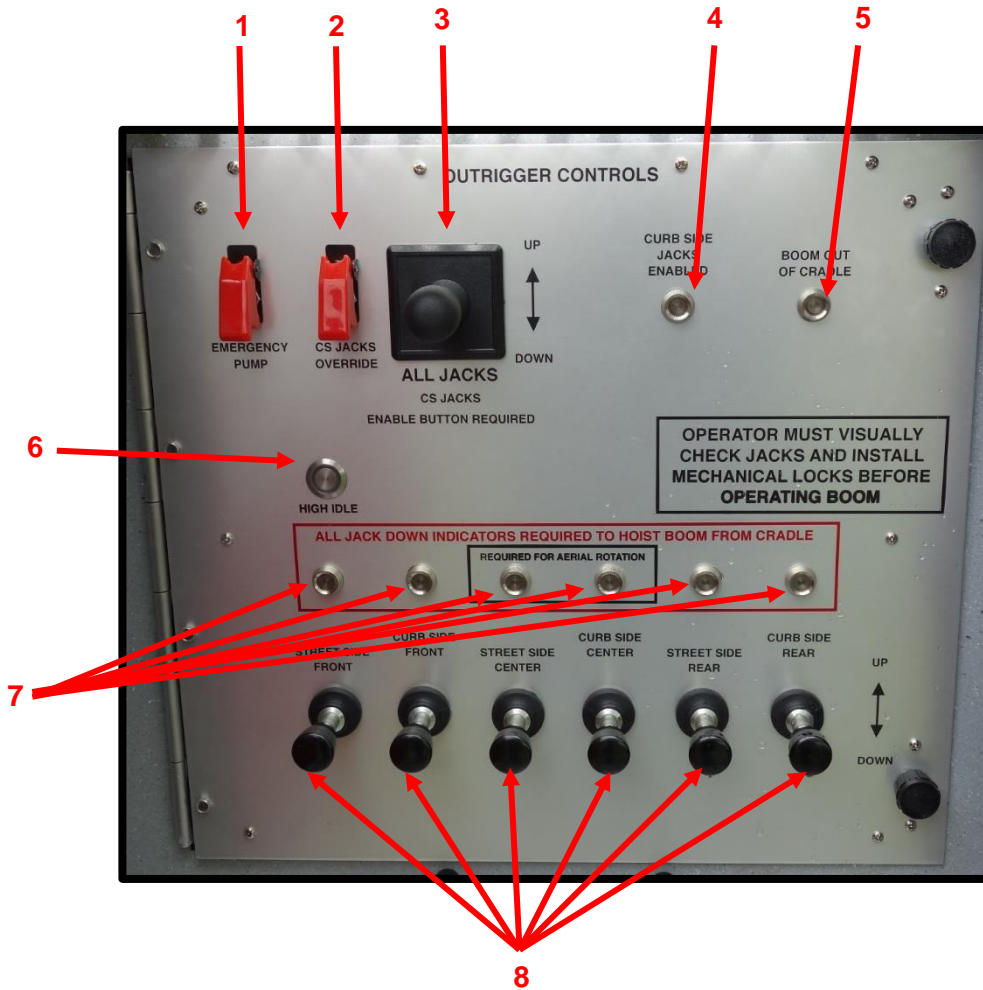
NOTE: You may also need to move the joystick at the basket or a valve lever at the pedestal to get enough fluid out to the leveling cylinders. (Just crack the function 'extend, retract, raise or lower' to increase the main system pressure)

3-13. OUTRIGGER CONTROLS

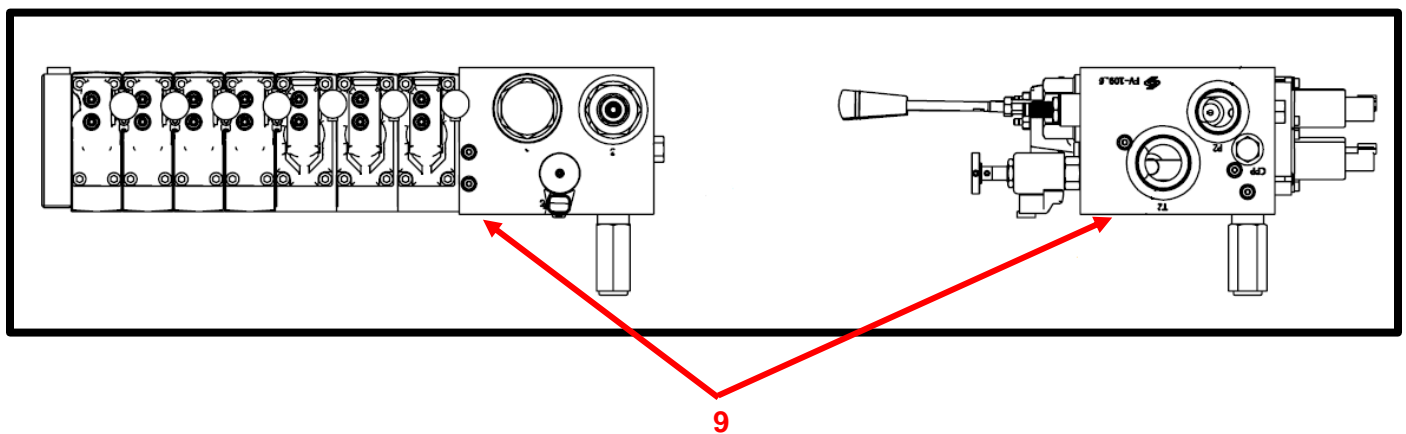
▲ WARNING

- Overriding of any interlock system must only be done when all considerations are taken for the stability of the apparatus and the safety of all persons and equipment.
- Stability of the apparatus must be a major safety concern of the operating personnel always.
- If the apparatus must be used with the stabilizers not fully extended, special attention must be paid to the stability of the apparatus.

OUTRIGGER CONTROLS

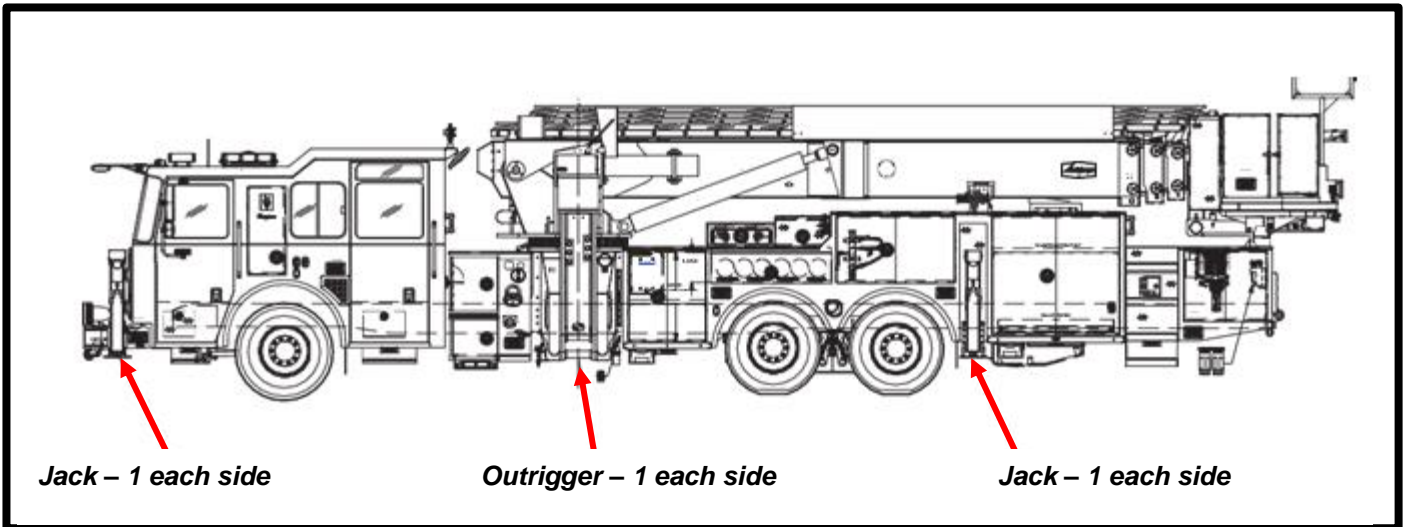


ITEM	INSTRUMENT-INDICATOR	FUNCTION
1	12 Volt Emergency Pump Switch	Activates the auxiliary electric hydraulic pump circuit.
2	“CS Jacks Override” Switch	Must depress and maintain pressure of momentary switch to operate CS jacks or “All Jacks” controls.
3	“All Jacks” Stabilizers Control	Allows for deployment of all six (6) stabilizers simultaneously.
4	“Curb Side Jacks Enabled” Indicator light	Illuminates when “CS Jacks Override” is depressed.
5	“Boom Out of Cradle” Warning Light	When illuminated, indicates that the aerial boom is not bedded in the cradle.
6	High Idle/Auto-Low Idle Switch	Activates the engine throttle system to increase the speed of jack and stabilizer operation when the lever is moved.
7	Jacks Down Indicator Light	When Illuminated, the jacks have contacted the ground.
8	Individual Stabilizer/Jack Controls	Operates individual jack function, each control is labeled above the controller.
9	Manual Overrides	Allows for operation of stabilizers in emergency situations. The Manual Override Compartment is located behind the Stabilizer Control Panel.



3-14. APPARATUS STABILIZERS LOCATIONS

The apparatus stabilizers consist of four jacks (two fronts and two rear) and two center outriggers.



3-15. ACCESSORIES

**WHEN APPLICABLE*

▲ WARNING

- The Auxiliary Air Outlet does not provide breathable air and must not be used to fill any sort of container that may be used as such.
- Pressure and return lines must be connected properly to avoid equipment damage. Do not cross the pressure and return lines. Failure to follow proper procedures could result in severe property damage or injury to personnel.

ITEM	INSTRUMENT-LOCATOR	FUNCTION
1	Compartment Light	Illuminates stabilizer control compartment when “Compartment Light” switch on the dash panel is on.
2	Tank Monitor – AMBER Oil Level Indicator Light	Illuminates when the stabilizers and boom are in operation, and the oil level in the tank has dropped but is still within working range.
3	Tank Monitor – RED Oil Level Indicator Light	Illuminates when the stabilizers and boom are in operation, and the oil level in the tank has approached a level where oil may need to be added. This light may illuminate if the truck is not on level ground and the oil has accumulated on one side of the tank away from the float sensor. If light illuminates while operating the truck, verify that the green light was on before the stabilizers were deployed. If so, then there is adequate oil left in the tank for all tower operations.
4	Hydraulic Pressure Gauge	Indicates the hydraulic pressure in the hydraulic system. System pressure is approximately 3200 psi (standby by pressure is 400 psi).
5	F.R.O.G. Meter *(optional)	Frequency Regulation of Generator (FROG) Meter is used to display the frequency voltage and amperage of a hydraulic generator. Once the generator has adequately warmed up, the frequency should be between 58-62 hertz and the voltage between 230-250 volts. The amperage will vary depending on which accessories are being used.
6	External Auxiliary Emergency Power: Pressure *(optional)	A quick disconnect connection for the pressure line from a secondary hydraulic power source that would operate the unit should a complete and total hydraulic failure occur. See Emergency Hydraulic System Operation section
7	External Auxiliary Emergency Power: Return *(optional)	A quick disconnect connection for the return line from a secondary hydraulic power source that would operate the unit should a complete and total hydraulic failure occur. This quick disconnect can be used to fill the tank. See Emergency Hydraulic System Operation section.
8	Auxiliary Air Outlet *(optional)	A quick disconnect connection plumbed into the air brake system of the apparatus. Used primarily for filling extinguishers and tires. WARNING! This is not breathable air and must not be used to fill any sort of container that may be used as such.
9	Breathing Air *(optional)	A storage tank, regulators and air minder that provides breathing air up to the platform through a quick connect manifold.
10	Electric Water Monitor *(optional)	Electric monitors that are controlled electronically through switch panels located at the control stations.

4-1. PRE-DRIVING CHECKLIST

▲ WARNING

Operation of this apparatus must not be undertaken unless the following criteria has been met:

- All operators have been trained in the safe operation of the apparatus.
- All operators have read and understand the safety recommendations contained in this manual.
- All operators are familiar with, and understand, all applicable federal, state, and local government regulations.
- Apparatus is being operated within the rated load capacity.
- Apparatus has been visually inspected for defects before operation and use.
- All jacks and stabilizers are properly stowed for travel.
- Death or severe injury may result if these precautions are not met.

4-2. PRE-OPERATION VISUAL INSPECTION

Hydraulic Lines and Hoses:

- Check ALL connectors for tightness.
- Check ALL hoses for cracks, twists, or kinks.

Jacks:

- Check the operation of ALL warning lights.
- Check the condition of proximity switches for operation and condition.
- Check the extension cylinders for leakage at all connections, fitting and seals.
- Check that sliding surfaces are clean and no abnormal wear is detected.

Turntable and Pedestal:

- Check the area around the heads of mounting bolts for cracked paint which would indicate the bolt has moved.
- Check the hydraulic swivel, hoist cylinders and control valves for external leaks.

Aerial Escape Ladder:

- Check the handrails for misalignment or dents.
- Check the base rails for straightness and signs of wear or ironing (deformation) of the metal.
- Check all rungs for straightness and damage, the integrity and signs of cracking of the rung covers.
- Check the slides for signs of wear and cracking, for free-movement and proper alignment.

Boom:

- Check the guides for cracked welds, alignment and any irregularities.
- Check the cradle points for wear or damage caused by improper bedding.
- Check the guides for cracked welds, alignment and any irregularities.
- Periodically check the tip rollers and the slide blocks for wear, gouging and improper mounting.
- Check the cradle points for wear or damage caused by improper bedding.

4-3. POSITIONING THE APPARATUS AT THE SCENE

The purpose of this section is to give basic instructions on how to properly set up the apparatus for tower operation. Though it is impossible to create a procedure to handle every situation encountered at a fire scene, following these instructions will give the operators a solid, safe base to start.

The apparatus can be positioned facing uphill or downhill. In either condition, the apparatus must be capable of being leveled to within the following safe operating limits:

Safe Operating Angles at Full Load	
-5° to 5°	Side-to-Side (Slope)
-5° to 5°	Front-to-Back (Grade)

▲ WARNING

- Surface must be firm and capable of supporting 75 psi to support stabilizers. Do not set up over manhole covers, storm drains or underground parking facilities that do not meet these requirements.
- Never set up stabilizers across ditches, culverts or any other surface opening.
- Operating the aerial device on road grades greater than $\pm 8^\circ$ could cause severe injury to the operators and personnel or equipment near the apparatus.

4-4. SET UP FOR OPERATION

▲ CAUTION

- The Boom must be raised out of cradle prior to engaging rotate or extension functions, to prevent damage to cradle or body.
- Only squeeze and release the trigger when the handle is in the neutral position, or erratic and uncontrollable boom movement will occur.

▲ DANGER

- Overriding of any interlock system must only be done when all consideration is taken for the stability of the apparatus and safety of all personnel and equipment.
- Stability of the apparatus must be a major safety concern of the operating personnel always.
- If the apparatus must be used with the stabilizers not fully extended, special attention must be paid to the stability of the apparatus.

NOTE: When the boom is raised beyond the cradle limit switch, the stabilizer functions are disabled. Raising the stabilizers can be done with the use of the “Manual Override” switch located at the driver’s side Outrigger Control Panel. The boom controls are now fully functional when either the “dead man” or the “trigger” switch are activated.

SET UP PROCEDURE

- STEP 1:** Position the apparatus in a location free of overhead obstructions and best suited for ladder operation.
- STEP 2:** Check both the longitudinal and lateral level-indicators. Both bubbles must be in the green zone. If either bubble is in the red zone, the apparatus must be repositioned.
- STEP 3:** Place the transmission in neutral and set the parking brakes including front wheel brake lock.
- STEP 4:** Set wheel chocks in position.
- STEP 5:** The “Aerial Activate” switch located in the cab must be in the on position to engage the hot shift PTO and the hydraulic pump. The indicator light next to the switch must be lit at this time.
- STEP 6:** Make sure all ground areas to support the stabilizers are firm and capable of supporting a minimum of 75 psi. Heed all warnings on this page regarding positioning the apparatus.
- STEP 7:** Position the six (6) ground plates in the stabilizer contact areas.
- STEP 8:** When an individual stabilizer control joystick is actuated, the hydraulic system goes into high pressure. Stabilizers are individually lowered into contact with the ground plates, and switches deliver signals to the IQAN system indicating stabilizers are lowered.
- When the “All Jacks” control joystick, and the “Operate Jacks” switch are activated, the hydraulic system goes into high pressure, and the engine throttle increases to 1525 RPM (if the “High Idle” switch is ON). All stabilizers lower into contact with the ground, and switches deliver signals to the LED lights, indicating stabilizers are down.
 - With “All Jacks” activated, and stabilizers contact the ground, each individual jack will stop until all are in contact with the ground, then all will activate simultaneously.
 - Apparatus must be lifted enough to fully unload chassis suspension, i.e., bulges out of tires, while maintaining tire contact with ground to aid side stabilizers and fore/aft stability.
- STEP 8:** Install the outrigger lock pins in the hole closest to the center outrigger foot. Insert the jack locks in the highest position possible on the front and rear jacks.
- STEP 9:** Reposition wheel chocks with the downhill-side against the tire(s) and the uphill side approximately 2” from the tire(s).

Once all stabilizers are down, as indicated by the “Down” indicator lights above the joystick, the boom is ready for operation.

After the stabilizers are fully deployed, the operator must move to the operator pedestal. The pedestal is the primary operating station for the aerial. While the aerial can be operated from the platform, the pedestal must be manned always during aerial operation.

The boom can be raised out of the cradle if the pedestal “Dead Man” (foot switch), or the basket “Trigger” (joystick) switch are activated. The “trigger” switch also activates the high idle when activated at the pedestal. Either switch activation will divert hydraulic fluid from the stabilizers valve bank to the pedestal valve bank and will only allow raising of the boom (not lowering) until the boom exceeds the boom staged limits. The pedestal “dead man” foot switch overrides the base controls when depressed.

Study and select the platform travel movement required to reach the work location. Follow the handle decal for desired boom motion. The first motion must be to raise the boom to clear the boom rest and body structure. When operating the control levers at either the console or from the platform, always use a feathering technique to ease the tower for smoother starts and stops.

OPERATING THE BOOM

STEP 1: To operate the boom from the platform, grab the handle and squeeze the trigger. First, this raises the engine RPM’s and secondly, it brings the hydraulic system to operating pressure.

STEP 2: With the trigger squeezed, move the handle “UP” to raise the boom.

STEP 3: When clearance of the cradle is obtained, the control handle may be positioned to give movement (or a combination of movements) to put the platform at the desired location. A combination of movements will provide the shortest amount of time to reach the point destination. Move the handle back towards the neutral position as the destination is being reached.

- If the “Stabilizer Down” signal is lost to the system while operating the boom over one side or the other, the boom movement will be stopped from going over the side of the apparatus that has lost the “stabilizer down” signal. The “Rotation Override” switch can override this condition. Activation of this switch will allow movement of the boom over the side of the apparatus that is missing the “stabilizer down” signal but should be used only in an emergency.
- If the boom is out of the cradle, and stabilizer operation is required, use the Manual Override Control Levers located at the stabilizer control panel to manually override the normal system control, and allow for stabilizer functions. These switches should only be used in emergency situations.

4-5. POST OPERATION

NOTE: A “Boom Aligned” indicator light on the back side of the pedestal will illuminate when aligned.

TO SECURE THE APPARATUS FOR ROAD TRAVEL

STEP 1: The pedestal operator must retract and rotate the boom to a position over the boom cradle.

- The pedestal operator must verify alignment with cradle prior to lowering boom.
- Do not attempt to store the boom from the platform controls.
- Center the boom over the rest and lower the boom until it stops on the bumpers.

STEP 2: When stowing the boom, allow the boom to lower until it reaches the Boom Cradle proximity switch.

- The switch will stop lowering of the boom but will allow raising of the boom.
- With the boom cradled, use the stabilizer controls to raise jacks and outriggers to the stowed position.
- The boom is disabled completely once the stabilizers are no longer planted, and the boom is at the Boom Cradle switch.

STEP 3: If, for any reason, the normal hydraulic system is non-functional, an emergency hydraulics pump is available for temporary operation of the boom, jacks and outriggers. To activate the emergency hydraulics:

- The “Emergency Hydraulics Enable” switch in the cab must be ON, **and**
- Either the “Emergency Hydraulics” switch at the pedestal or the stabilizers control panel must be activated.

STEP 4: Remove all mechanical locks from the outriggers and jacks and place in their holders.

STEP 5: At the stabilizer controls, raise the stabilizers to their fully raised position.

STEP 6: Place all ground pads in their holders.

STEP 7: Turn the “Aerial Activate” switch in the cab to the OFF position.

4-6. EMERGENCY HYDRAULIC SYSTEM OPERATION

12-VOLT DC EMERGENCY PUMP UNIT (EPU) OPERATION

▲ CAUTION

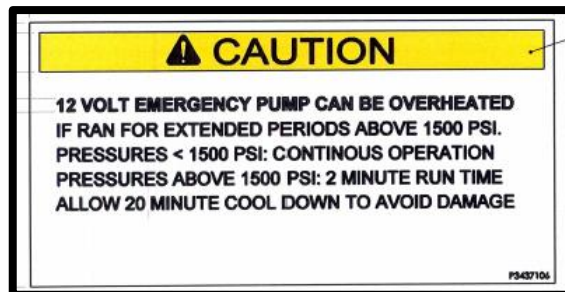
Follow the given procedure for returning the aerial device and stabilizers to “Road Ready” position using the 12 Volt DC Electric Pump (EPU), in precise order, to prevent the 12-volt DC auxiliary motor from stalling and building up heat. Failure to follow these steps could cause premature failure of the auxiliary motor.

▲ WARNING

- Operators must use extreme caution before retracting the hydraulic stabilizers.
- Be certain that all personnel are a respective distance away from the vehicle before retracting the stabilizers. The vehicle body may have been elevated a few inches from the ground when the stabilizers were set in place and the truck was raised.
- When the stabilizers are retracted, the vehicle body may settle down quickly and could severely injure anyone in the path of travel when lowering the vehicle.
- When overrides are used there may or may not be interlocks included with the operation, so extreme caution is required. There are electronically controlled over-rides that require the use of a switch to activate. These types of overrides are a momentary operational switch. Some, but not all, have a cover that can be moved before using. For example, the aerial override has a cover.

NOTE: The 12-Volt DC Emergency Pump Unit (EPU) only to be operated from pedestal or ground jack control stations.

The emergency pump switches at each location will activate the Emergency Power Unit (EPU). A cool down period is required. (See 12-Volt Emergency Pump Operation Label below).

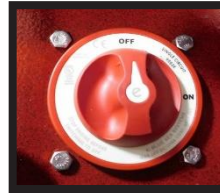


12-Volt EPU label

4-7. OPERATING THE 12-VOLT DC ELECTRIC PUMP (EPU) IF THE TRUCK ENGINE STOPS OR THE HYDRAULIC PUMP FAILS WHILE USING THE APPARATUS

All the following switches are in the cab.

STEP 1. Turn the Battery switch ON (rotate clockwise).



STEP 2. Turn the Ignition switch ON (push up).



NOTE: Do not start the engine.

STEP 3. Turn the Aerial Master switch ON (push up). The system is now able to function using the 12-volt Emergency Pump.



NOTE: With Aerial Master switch ON, all interlocks and electric controls (stabilizers joysticks, and rotation interlocks) are functional while using the 12-Volt DC Emergency Pump (EPU). The boom cannot be operated if the stabilizers are not set.

FOR AERIAL OPERATION

STEP 1. Step on the aerial foot switch “Deadman” (located on turntable).



STEP 2. Activate the Joystick for the direction you would like the aerial to go, one direction at a time.



STEP 3. Turn Emergency Pump Unit (EPU) switch on, located in the turn table console. To avoid overheating the 12-Volt Emergency Pump (EPU), see the caution label for the 12-Volt Emergency Pump Operation (shown previously).

STEP 4. When the aerial is completely in the nested position, release the Emergency Pump switch in the pedestal over ride compartment and the ladder function handle.

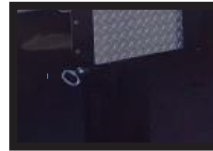


NOTE: In emergency situations, first rotate the aerial away from the hazard, then retract the aerial, make sure to center the aerial to the cradle before completely lowering, and then finally lowering the aerial.

FOR STABILIZER/JACK OPERATION

NOTE: The stabilizer/jacks will not operate unless the aerial is completely stowed.

STEP 1. Remove and stow all lock pins from the stabilizers.



STEP 2. Operate the stabilizers with the electric joysticks on the stabilizer control panel, one direction at a time.



STEP 3. Turn the Emergency Pump Unit (EPU) switch on the stabilizer control panel to the ON position.



STEP 4. When all stabilizers are completely in the nested position, release the Emergency Pump switch at the stabilizer control panel.

To avoid overheating the 12-Volt Emergency Pump (EPU), see the caution label for the 12-Volt Emergency Pump Operation (shown previously).

NOTE: There is a red warning light located in the cab and message on the display, that will indicate if any one of the stabilizers or the aerial are not in the fully stowed position once the parking brake is released and ready for transport.

4-8. WHEN THERE IS NO PTO OPERATION OR AERIAL MASTER, BUT THERE IS 12-VOLT BATTERY POWER AVAILABLE



When overrides are used there may or may not be interlocks included with the operation, so extreme caution is required. There are electronically controlled overrides that require the use of a switch to activate. These types of overrides are a momentary operational switch. Some, but not all, have a cover that can be moved before using. For example, the aerial override is one.

FOR AERIAL OPERATION

This override procedure will require two people to operate the boom:

1. One at diverter valve by manual stabilizer valve.
2. One at turntable control station.

STEP 1. Locate the 12-volt electrical emergency pump switch on the stabilizer joystick panel.



STEP 2. Open the door at the stabilizer joystick panel.



STEP 3. Go to the outrigger manual override (interlock) valve and move the diverter handle upward to the aerial position.

STEP 4. Open the door on the pedestal above the Deadman switch. Locate the upper aerial manual override (interlock) valves at the lower right of the door opening. (These valves are labeled with the boom direction engraved on them).



STEP 5. Press and hold down the appropriate valve for the function needed.

STEP 6. Reach up to the main control valve handles and move the corresponding valve handle on the pedestal, for the direction needed.



STEP 7. Toggle the 12-Volt Emergency Pump Switch at the stabilizer joystick panel to the on position activate the emergency pump.



To avoid overheating the 12-Volt Emergency Pump (EPU), see the caution label for the 12-Volt Emergency Pump Operation (shown previously).

FOR STABILIZER OPERATION

When using the 12-Volt Emergency Pump Unit (EPU) with the engine off, this procedure will take more time than the normal operation time.

STEP 1. If the stabilizer joysticks are not operational, open the stabilizer control panel and use the manual overrides.

STEP 2. Go to the outrigger interlock valve and move the diverter handle down to the stabilizer position.



STEP 3. Move the appropriate stabilizer valve handle to the requested position.

STEP 4. Then turn on the Emergency Pump Unit (EPU) switch on the stabilizer control panel.



To avoid overheating the 12-Volt Emergency Pump (EPU), see the caution label for the 12-Volt Emergency Pump Operation (shown previously).

4-9. OPERATING THE AERIAL IF NO ELECTRIC POWER IS ABOVE THE SWIVEL

There are valves located inside the pedestal (upper aerial interlock valve), behind the door just above the Deadman switch. These valves are for aerial clockwise, counter clockwise, lower and retract movements. If all electrical power is interrupted above the swivel, there would be no power to the Deadman switch and no signal that the stabilizers are down, so there are no rotation interlocks. There would not be any boom functions without manual override operations. The extend, retract, and raise functions do not require the use of the valves (upper aerial interlock valve), only the manual override at the outrigger interlock valve is required.

This override procedure will require two people to operate the boom:

1. One at diverter valve by manual stabilizer valve.
2. One at turntable control station.

IF THE TRUCK WAS RUNNING AND THE PTO WAS WORKING

NOTE: If the truck is not running or the PTO has failed, follow the same procedure but add on using the EPU switch activation at the end.

STEP 1. Open the access door for the stabilizer manual override (interlock) valves.

STEP 2. Go to the outrigger manual override (interlock) valve and move the valve handle at the far right upwards. This will allow the hydraulic fluid to go up to the pedestal.

STEP 3. Open the door on the pedestal above the Deadman switch and Locate the upper aerial manual override (interlock) valves at the lower right. These valves are labeled with the aerial/ladder direction engraved on them.



STEP 4. Press and hold the appropriate manual override (interlock) valve for the function needed. Now reach up to the main control valve handles and move the corresponding valve handle on the pedestal for the direction needed, while holding the appropriate manual override (interlock) valve in the pedestal.



To avoid overheating the 12- Volt Emergency Pump (EPU), see the caution label for the 12-Volt Emergency Pump Operation (shown previously).

RETURNING THE AERIAL PLATFORM TO THE NESTED POSITION

STEP 1: Depress and hold the “Aerial Enable” foot switch located at the lower opening of the aerial pedestal.

STEP 2: Pull back slowly on the extension/retraction lever.

STEP 3: Activate the “Emergency Pump” switch momentarily on the aerial pedestal.

STEP 4: When platform is fully retracted, release both the rotation lever and the “Emergency Pump” switch.

STEP 5: If necessary, rotate the platform into position over the cradle using the “Rotation Lever” and the “Emergency Pump” switch.

STEP 6: When the platform is positioned over the cradle, release both the rotation lever and the “Emergency Pump” switch.

STEP 7: Once the platform is in its nested position, release the rotation lever, “Emergency Pump” switch and the “Aerial Enable” foot switch.

RETURNING THE JACKS AND OUTRIGGERS TO THEIR NESTED POSITION



Operators must use extreme caution before retracting the hydraulic ground jacks and outriggers. Be certain that all personnel, operator, firemen and spectators are a respectable distance away from apparatus before retracting the ground jacks and outriggers. The apparatus body may have been elevated a few inches from the ground when the jacks and outriggers were set in place. When retracted, the apparatus body may settle down quickly and could severely injure anyone in the path of travel when lowering the apparatus.

STEP 1: Remove lock pins from jacks and outriggers, and then stow the pins aboard the apparatus.

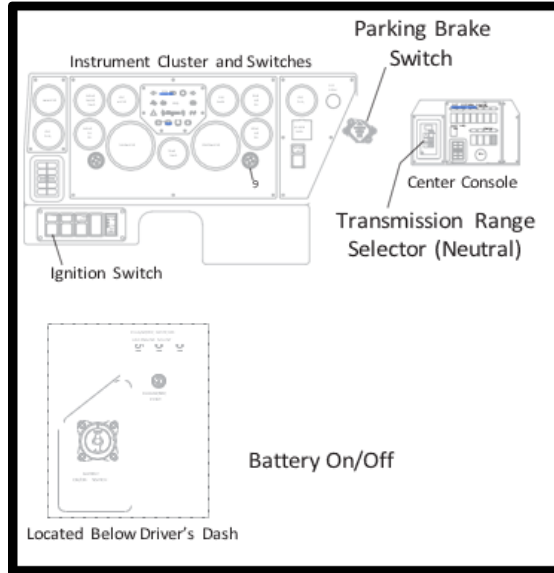
STEP 2: Move the “All Jacks” control (preferred) or each individual control to the UP position.

STEP 3: Hold the “High Idle/Emergency Pump” switch in the ON position.

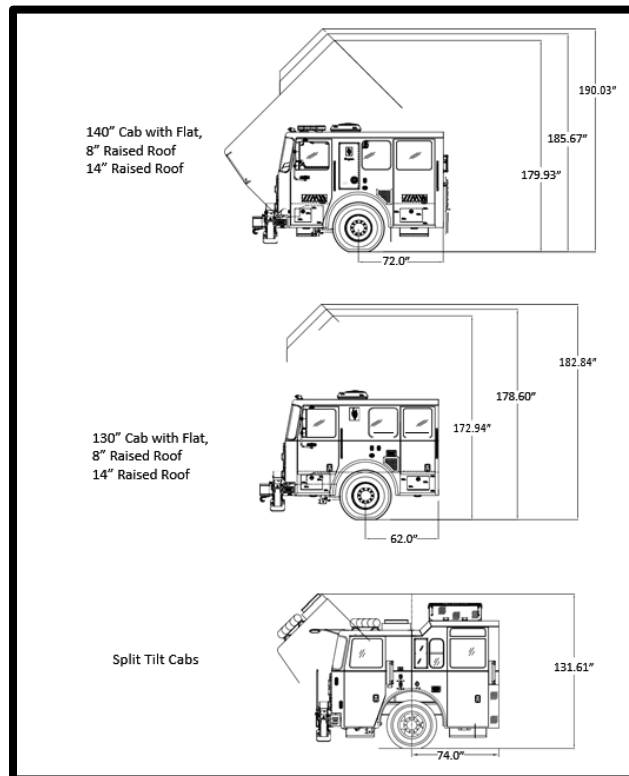
STEP 4: Release the “All Jacks” control and the “High Idle/Emergency Pump” switch once all the jacks and outriggers are raised and fully nested.

NOTE: A red warning light is lit whenever jacks and outriggers are not in fully stored (nested) position and ready for transporting. The indicator light is located on the cab instrument panel to warn the driver.

4-10. CAB TILT OPERATION



Ignition Switch, Transmission Neutral Switch, Parking Brake Switch, Battery Switch



Cab Tilt Clearances

▲ WARNING

- These procedures must be carefully read and understood prior to performing cab tilt operation. Cab tilting and lowering must always be done slowly in a well-lit area. Failure to comply could result in injury or death to personnel.
- Do not attempt to perform maintenance with the cab only partially tilted and the safety lock not in place against the tilt cylinder. Failure to comply could result in injury or death to personnel.
- If the apparatus has an aerial device, it must be moved to provide adequate clearance to tilt the cab. Refer to Aerial Operation section of this manual for proper procedures.
- Keep all personnel clear of pinch points when lowering the cab to prevent injury.
- Do not move the apparatus unless the cab is in the fully lowered position and locked.
- Failure to comply with these warnings could result in injury or death to personnel.

▲ CAUTION

- Ensure that there is adequate forward and overhead clearance when the cab is tilted. Failure to comply could result in damage to the cab.
- Ensure that front stabilizers are tilted completely outward before tilting cab.
- Ensure there are no loose tools, equipment or any other miscellaneous items in cab, on the cab roof, or on the bumper when cab is tilted. Failure to comply could result in damage to the cab or equipment.

The cab tilt circuit contains a proximity switch to prevent tilting the cab until both front stabilizers have been fully tilted outward. A stabilizer lock pin located on the front of each stabilizer must be removed to tilt the stabilizer out and away from the cab. Tilting the stabilizers away from the cab will disengage the proximity switch and allow the cab to be tilted.

All Cab tilt/lowering procedures are to be performed by authorized maintenance personnel only.

TILTING THE CAB ELECTRONICALLY

NOTE: Make sure there is adequate space to re-position the aerial device before tilting the cab. Refer to Return Aerial Platform to the Nested Position.

NOTE: Before proceeding to tilt cab, make sure Q2B tilt bracket (if equipped) is tilted to the side.

NOTE: Split cabs have a 5-10 second delay before cab raises.

▲ WARNING

Tilt front jacks before tilting cab. Do not stand directly in path of jacks when positioning to tilt cab. Jacks are heavy. Be careful when lowering.

-
- STEP 1:** Ensure there is adequate forward and overhead clearance for the cab when fully tilted. For example, the extended raised roof tilt cab requires 15'8" of overhead clearance.
- STEP 2:** Clear all personnel from cab area.
- STEP 3:** Ensure there are no loose items in the cab, on the cab roof, or on the cab bumper, that would fall or make contact when the cab is tilted.
- STEP 4:** Confirm parking brake is engaged and transmission is in neutral.
- STEP 5:** Place wheel chocks at front and rear wheels.
- STEP 6:** On split tilt cabs with center rear facing seats and air bottle, the center seats must be tilted \ or slid rearward before the cab can be tilted.
- STEP 7:** Pull lock pin and tilt both front jacks out.



Pull lock pin



Front jacks tilted out

- STEP 8:** Turn on Battery Disconnect Switch.
- STEP 9:** Plug the hand control into the outlet at the front left-hand corner of the cab.
- STEP 10:** Shut all cab doors.
- STEP 11:** Stand clear of the cab and push up on the momentary switch on the hand control. Continue to hold switch until cab is in the maximum tilted position.
- STEP 12:** Make sure the safety lock slides into place and cab is secured in tilted position.

LOWERING THE CAB ELECTRONICALLY



- Severe damage may result if the safety lock mechanism is not released prior to attempting to lower the cab.
- Do not attempt to drive the unit when the "Cab Not Locked" message is displayed on the Intelex® Plus information center screen. The cab is not locked when this message is displayed.

NOTE: If unable to release the safety lock from the cylinder, the cab may need to be slightly raised.

- STEP 1:** Clear all personnel from the cab area.
- STEP 2:** Pull safety lock cable to release safety lock off the cylinder.
- STEP 3:** Hold safety lock cable until cab moves downward enough so the lock bar won't catch the end of the cylinder.
- STEP 4:** Stand clear of the cab and push down on the momentary switch on the hand control. Continue to hold down the momentary switch until the cab is returned to its normal locked position.
- STEP 5:** If the "Cab Not Locked" message appears in the Intalex® Plus display screen after lowering the cab, repeat steps 1 - 4.
- STEP 6:** Turn off ignition switch and battery disconnect switch.

TILTING THE CAB MANUALLY

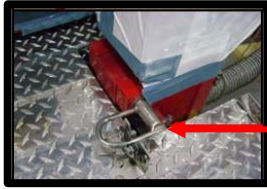


Tilt front jacks before tilting cab. Do not stand directly in path of jacks when positioning to tilt cab. Jacks are heavy. Be careful when lowering.

NOTE: Make sure there is adequate space to re-position the aerial device before tilting the cab. Refer to Return Aerial Platform to the Nested Position.

- STEP 1:** Ensure there is adequate forward and overhead clearance for the cab when fully tilted. For example, the extended raised roof tilt cab requires 15'8" of overhead clearance.
- STEP 2:** Clear all personnel from cab area.
- STEP 3:** Ensure there are no loose items in the cab, on the cab roof, or on the cab bumper, that would fall or make contact when the cab is tilted.
- STEP 4:** Confirm parking brake is engaged and transmission is in neutral.
- STEP 5:** Place wheel chocks at front and rear wheels.
- STEP 6:** On split tilt cabs with center rear facing seats and air bottle, the center seats must be tilted or slid rearward before the cab can be tilted.

STEP 7: Pull lock pin and tilt both front jacks out.



Pull lock pin



Front jacks tilted out

STEP 8: Turn on battery disconnect switch and ignition switch.

STEP 9: Shut all cab doors.

STEP 10: Make sure the bleeder screw is turned clockwise until tight.

STEP 11: Raise the cab by inserting the pump extension handle into the manual cab tilt valve and pumping the handle until the cab is fully tilted.

STEP 12: Make sure safety lock slides into place and cab is secured in the tilted position.

LOWERING THE CAB MANUALLY



- Full tilt cabs will begin lowering without the use of the cab tilt valve pump mechanism extension handle. Lowering of the cab may be stopped by turning the bleeder screw clockwise. Keep all personnel clear of pinch points when lowering the cab to prevent injury.
- Do not attempt to drive the unit when the “Cab Not Locked” message is displayed in the Intelex[®] Plus information center display screen. The cab is not locked when this message is displayed.

STEP 1: Clear all personnel from the cab area.

STEP 2: Pull safety lock cable to release safety lock off cylinder.

STEP 3: Hold safety lock cable while turning the bleeder screw counter clockwise until the cab starts to lower.

STEP 4: Hold safety lock cable until cab has moved downward enough so the lock bar won't catch the end of the cylinder.

STEP 5: If the “Cab Not Locked” message appears in the Intelex[®] Plus information center display screen after lowering the cab, raise the cab by following the “**Tilting the Cab Manually**” procedure then repeat steps 1 through 4.

STEP 6: Make sure the cab is fully lowered, then turn the bleeder screw clockwise until tight.

APPARATUS MAINTENANCE

WHEN TO CONTACT YOUR SERVICE DEPARTMENT

Contact your authorized Seagrave Service Representative for service checks, preventive maintenance and vehicle or apparatus adjustments.

Prior to putting a new vehicle into service, after any incident that might cause structural damage, and after any repairs to the hydraulic components, the following checkout is to be performed in addition to following the Preventive Maintenance schedule on the following pages.

<h3>5-1. PREVENTATIVE MAINTENANCE</h3>

GENERAL

The preventative maintenance charts in this manual are provided to keep the equipment in good working order.

The charts include a DATE column for tracking when items have been checked and/or repaired. These pages may be photocopied for reuse. The charts should be completed each time an inspection is performed and kept as a permanent apparatus maintenance record.

This section is not intended to replace any routine pre-operation safety inspections. Operator's must be aware of the condition of all equipment before operation. A pre-operational visual inspection must always be performed, including checking stabilizers, aerial pivot pins and retaining hardware, cables, etc.

EXTREME ENVIRONMENTS

The type of service and regional area conditions could be a detriment to the operation and longevity of the apparatus.

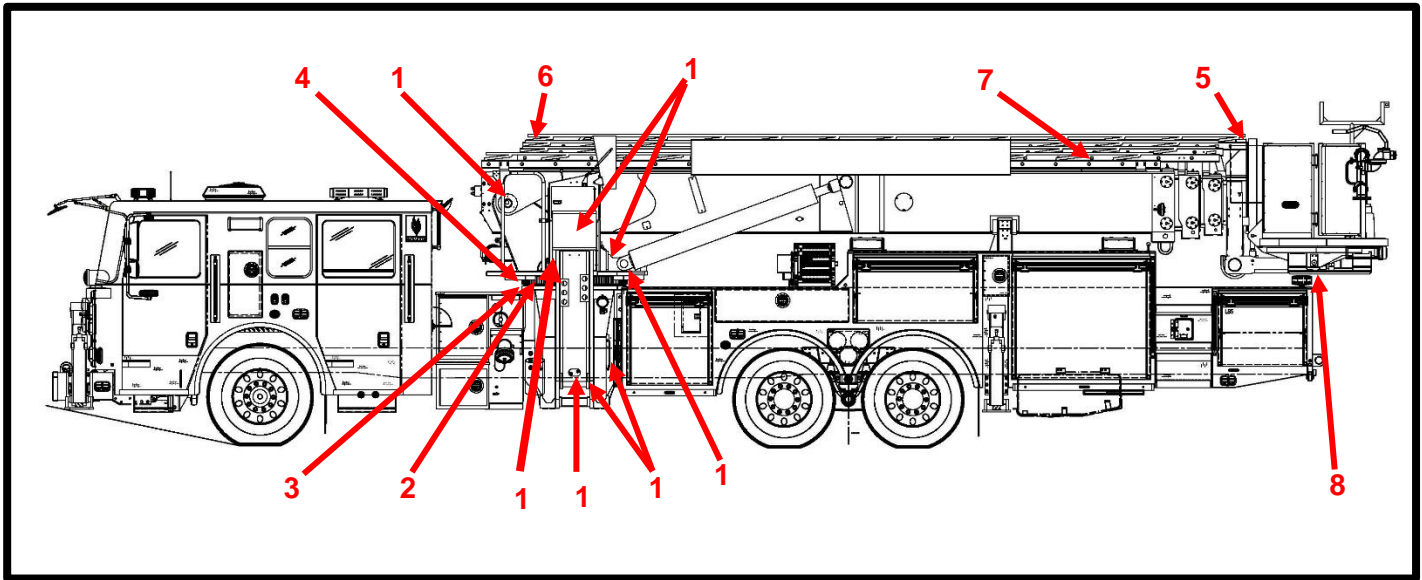
During elevated temperature periods, check the hydraulic oil temperature more often and avoid an unnecessary use of the aerial. Continued use above the maximum recommended operating range may reduce the life of some aerial components.

In elevated temperature climates where low temperatures are unlikely, use grease with a high melting points for the rotation gear/pinion to provide extended coverage.

During freezing weather periods, monitor the hydraulic oil temperature at more frequent intervals.

Do not allow a heavy buildup of grease on the aerial operating components.

5-2. LUBRICATION POINTS



Lubrication Points

CODE	ITEM	LUBRICATION	PERIOD	APPLICATION
1	Pins & Bushings	Polygon™ Bushing No lube required	N/A	N/A
2	Rotation Bearing	Extreme Pressure HD Lube Magnaplex #1	Yearly	Pressure Gun**
3	Spur Gear	DRI-Slide, Multi-Dry Film Lubricant	30 days	Spray Can or Brush
4	Rotation Gear Box	80W90 Gear Oil	Yearly	Fill Plug**
5	Waterway	NLGI Class 00 and 0001 Mobilux EP-023	30 days	Automatic Dispenser***
6	Hydraulic Oil	Shell Tellus-22	30 days	Through Dipstick Filler Tube
7	Boom Ladder	Spray-on food-based lubricant	30 days	Spray Can
8	Leveling Cylinder Pivot	NLGI Class 02 NAPA Bearing Grease	30 days	Pressure Gun***

* Two (2) grease fittings located at top of interlock manifold at rear of apparatus. Elevate platform to 85° and grease both fittings. Stand clear, rotate turntable 180° and grease again. Repeat two more times.

** Remove plug in top of gear box and fill to within 1½" on top of hole.

*** Wipe grease fittings clean before applying grease. Do not over lubricate.

5-3. HYDRAULIC COMPONENTS

- Relieve hydraulic pressure before disconnecting circuits.
- When reassembling, make certain that all connections are tight.
- If injured by hydraulic oil escaping under pressure, serious complications may arise. Seek medical attention immediately.
- Should any minor leaks develop in the hydraulic tubing or connections, they can usually be corrected by tightening the connections. If a seal needs to be replaced, be sure the replacement seal is appropriate for the application.

A hydraulic system maintenance program must be followed to help ensure trouble-free operation.

NOTE: A hydraulic fluid sample should be taken annually and analyzed by an independent laboratory. When changing a filter, components or lines in the hydraulic system, extreme care must be taken to prevent contamination.

NOTE: Hydraulic function may operate slower in lower temperatures.

Seagrave installs a pressure line filter and a return line filter to remove contaminants from the hydraulic system.

HYDRAULIC OIL

The recommended start-up temperatures for the hydraulic system depend on the viscosity grade of hydraulic oil installed in aerial system.

A label on the driver's side door (lube chart) indicates the grade of oil installed on the vehicle and is also located in the Lubrication Chart in your electronic manual in the Parts Book Drawing section.

FILTER ELEMENT CHANGING

NOTE: Check the oil level in the hydraulic tank frequently while purging the system of air. Do not run the aerial hydraulic pump with insufficient oil in the tank.

When removing element, check for metal particles. If excessive particles are found, this could be an indication of possible component failure.

When excessive particles are found, proceed as follows:

STEP 1: Determine what the failed component is. Repair or replace as needed.

STEP 2: Drain all oil from the hydraulic tank.

STEP 3: Remove old filter.

STEP 4: Install a new filter.

STEP 5: Refill hydraulic oil tank with enough oil to the normal operating level approximately 30 gallons) before operating all aerial functions

STEP 6: Perform all functions of the jacks and all functions of the ladder a minimum of ten complete cycles:

Raise and Lower
Extend and Retract
Rotate both direction

STEP 7: Operate all jacks and aerial functions and recheck hydraulic tank oil level.

STEP 8: Confirm oil cleanliness by ISO oil laboratory test.

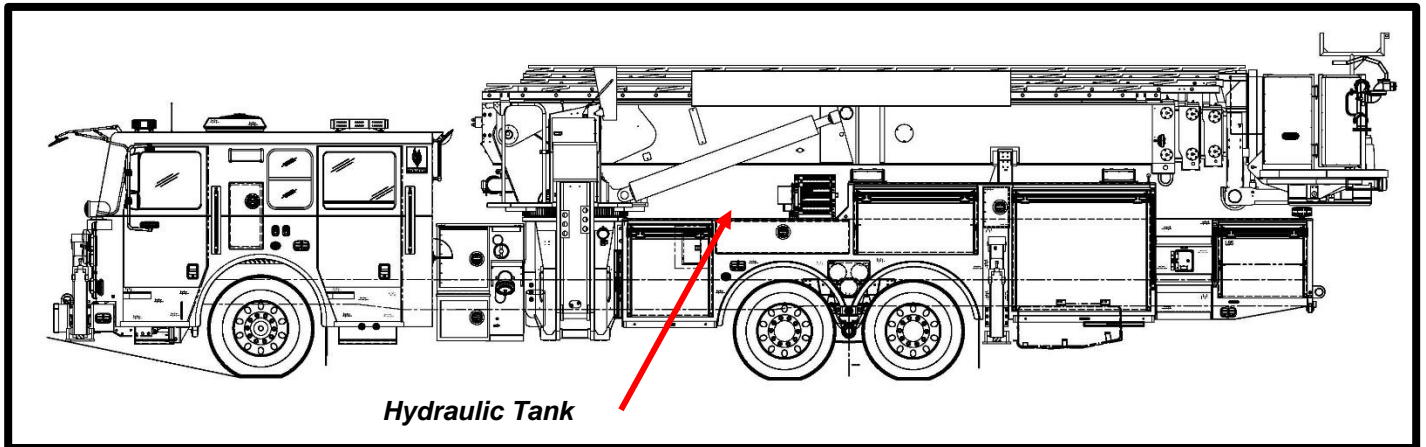
5-4. HYDRAULIC ADJUSTMENTS

Most of the valves, pressure controls and flow controls are factory preset and should not be readjusted. Contact your authorized Seagrave service representative if a malfunction occurs.

5-5. STABILIZERS

The jack assembly contains shim adjusted, Nylatron/stainless steel guide pads to provide a low friction guide action, along with a means of controlling excessive play. These blocks have an extremely long-life span. If excessive play is noted in the jack assemblies, they should be shimmed or replaced as needed.

**5-6. CHECKING THE HYDRAULIC OIL LEVEL AND ADDING ADDITIONAL
HYDRAULIC OIL**



Access panel for hydraulic reservoir



Reservoir cap with dipstick underneath

PROCEDURE:

- STEP 1:** Have the apparatus parked on a flat, level surface, with the aerial and the stabilizers in the stowed position.
- STEP 2:** Remove the reservoir cap-dipstick from the reservoir fill hole in the access panel to the hydraulic reservoir.
- STEP 3:** Remove old hydraulic oil from the dipstick. Replace the dipstick back into the reservoir.
- STEP 4:** Remove the dipstick and now check the hydraulic oil level.
- STEP 5:** If the reservoir needs additional hydraulic oil, add the additional hydraulic oil to the tank thru the reservoir fill hole with enough hydraulic oil until the dipstick reads full.
- STEP 6:** Replace cap-dipstick securely.

5-7. REPAIRS

**NO unauthorized repairs shall be made.
Contact your authorized Seagrave Service Center for authorization.**

▲ WARNING

If the aerial ladder is involved in an incident that causes structural deformation or is subjected to a load outside those specified in your manual, or on any of the plates, decals and stickers on the vehicle, it should be taken out of service and your nearest Seagrave factory service representative should be notified immediately.

NOTE: All records of inspections, repairs and malfunctions shall be maintained by the aerial ladder owner and authority under which the ladder is operated.

5-8. TORQUE VALUES

▲ CAUTION

- Observe all torque values shown in the Torque Tables 1 and 2 on the following pages.
- Erratic or jerking motions of wrenches can easily result in excessive torque values.
- Always use a slow, even wrench movement and stop when the predetermined value has been reached. When multipliers and/or special tools are used to reach hard to get at spots, assure that torque readings are precisely calculated.

NOTE: When maximum torque values have been exceeded, the fastener must be replaced.










Proper torque values of all the bolts used in the assembly of modern equipment, are not only extremely important for structural strength but they can seriously affect performance and reliability. Variation in torque might cause distortion, binding or fatigue failure. The Torque Tables on the following pages are provided as an example. These tables include the torque value for the following fasteners used on aerial device structures:

- Fasteners lubricated and with washers
- Fasteners not lubricated
- Identification of the bolt's grade is always necessary.
- When marked as a high-strength bolt (SAE grade 5, 8, etc.), the technician must be aware that he is working with a highly stressed component and the fastener must be torqued accordingly.
- Special attention should be given to the existence of a lubricant, plating or other factors that might dictate a variation from the standard torque values.




- It is important to note that temperature variation, vibration and elasticity of metal usually result in gradual reduction of bolt torque.
- When using the applicable torque chart, values as close as possible to the mid-range are recommended, to allow for wrench calibration tolerance. Always check with the manufacturer if the bolt or torque are unknown.
- Torque wrenches are precision instruments. Maintain torque wrenches with frequent calibration checks.

TORQUE TABLE 1 (Lubricated)

For nut-bolt combinations that have been plated or have had lubrication applied in conjunction with the use of flat-type or split ring type washers.










FINE OR COURSE THREAD FASTENER	GRADE DESIGNATION	TENSILE STRENGTH MINIMUM	MATERIAL	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/4	1-1/2
				TORQUE FOOT/POUNDS (MIN.-MAX.)									
 CAP SCREW	S.A.E.2 A.S.T.M. A-307 STEEL	64,000 P.S.I.	LOW CARBON STEEL	17	26	41	56	83	140	182	270	449	718
				19	30	45	66	93	150	202	300	500	797
 CAP SCREW	S.A.E.3 STEEL	10,000 P.S.I.	MEDIUM CARBON STEEL	26	43	59	93	135	214	332	491	822	1327
				30	47	69	103	145	234	372	551	922	1471
 CAP SCREW	A.S.T.M. A-449 S.A.E.5 STEEL	105,000 P.S.I.	MEDIUM CARBON STEEL OR LOW ALLOY HEAT TREATED	27	46	65	100	140	220	338	523	747	1194
 CAP SCREW	A.S.T.M.354BB STEEL			31	50	75	110	150	250	378	583	833	1323
 CAP SCREW	A.S.T.M.A-325			-	-	90	-	180	305	465	710	1019	1771
						100		200	355	525	790	1134	1973
 CAP SCREW	A.S.T.M. A-354-BC STEEL	125,000 P.S.I.	LOW ALLOY OR MED. CARB. QUENCHED TEMPERED	30	50	71	109	147	239	377	574	1024	1522
				34	54	81	119	167	269	427	644	1053	1695
 CAP SCREW	S.A.E.6 STEEL	133,000 P.S.I.	MED. CAR- BON STEEL QUENCHED TEMPERED	39	59	96	140	189	310	490	735	1242	1989
 CAP SCREW	S.A.E.7 STEEL		MED. CAR- BON ALLOY QUENCHED TEMPERED ROLL THREADED	43	69	106	150	209	350	550	825	1372	2205
 CAP SCREW	S.A.E.8 STEEL	150,000 P.S.I.	MED. CAR- BON ALLOY QUENCHED TEMPERED	42	65	105	145	185	330	531	803	1331	2153
				46	75	115	165	225	370	591	893	1486	2383




TORQUE TABLE 1 (Lubricated) – Continued

 SOCKET CAP SCREW	SOCKET HEAD CAP SCREW ALSO N.A.S. AIR- CRAFT STD.	160,000 P.S.I.	HIGH CAR- BON ALLOY QUENCHED TEMPERED	46	71	111	156	210	345	569	864	1804	2947
 CAP SCREW	N.A.S.144 AIRCRAFT STD. MS20000 MIL.STD.		HIGH CAR- BON ALLOY QUENCHED TEMPERED	50	81	121	176	240	395	629	964	1964	3147
 CAP SCREW	N.A.S.624 NATIONAL AIRCRAFT STANDARD STEEL	180,000 P.S.I.	HIGH CAR- BON ALLOY QUENCHED TEMPERED	52	81	126	188	255	419	668	1025	2105	3355
				56	91	136	198	270	444	708	1085	2255	3855

TORQUE TABLE 2 (Non-Lubricated)

Torque values shown in Table 2 are for nut-bolt combinations that have not been plated and have not had special lubrications applied to them. (Discount the residual lubrication present, that was applied at the time of manufacture.)

FINE OR COURSE THREAD FASTENER	GRADE DESIGNATION	TENSILE STRENGTH MINIMUM	MATERIAL	3/8	1/2	9/16	5/8	3/4	7/8	1	1-1/4	1-1/2	
				TORQUE FOOT/POUNDS (MIN.-MAX.)									
 CAP SCREW	S.A.E.2 A.S.T.M. A-307 STEEL	64,000 P.S.I.	LOW CAR- BON STEEL	15	23	39	50	74	126	163	242	384	617
				17	27	41	60	93	136	183	272	435	703
 CAP SCREW	S.A.E.3 STEEL	100,000 P.S.I.	MEDIUM CARBON STEEL	23	39	53	83	122	193	298	447	705	1148
				27	43	63	93	132	213	338	507	806	1292
 CAP SCREW	A.S.T.M. A-449 S.A.E.5 STEEL	105,000 P.S.I.	MEDIUM CARON STEEL OR LOW ALLOY HEAT TREATED	24	41	61	90	126	197	303	486	680	1098
 CAP SCREW	A.S.T.M.354BB STEEL			28	45	71	100	136	227	343	536	766	1228
 CAP SCREW	A.S.T.M.A-325			-	-	81	-	162	272	418	657	937	1629
						91		182	322	478	737	1052	1831
 CAP SCREW	A.S.T.M. A-354-BC STEEL	125,000 P.S.I.	LOW ALLOY OR MED. CARBON QUENCHED TEMPERED	27	45	63	98	132	223	338	522	942	1400
				31	49	73	108	152	253	388	592	1042	1573
 CAP SCREW	S.A.E.6 STEEL	133,000 P.S.I.	MED. CAR- BON STEEL QUENCHED TEMPERED	35	52	86	126	170	278	439	558	1143	1830
 CAP SCREW	S.A.E.7 STEEL		MED. CAR- BON ALLOY QUENCHED TEMPERED ROLL THREADED	39	62	96	136	190	318	499	758	1272	2046
 CAP SCREW	S.A.E.8 STEEL	150,000 P.S.I.	MED. CAR- BON ALLOY QUENCHED TEMPERED	38	58	94	130	164	305	477	721	1235	1980
				42	68	105	150	204	345	537	811	1379	2210

TORQUE TABLE 2 (Non-Lubricated) - Continued													
 SOCKET CAP SCREW	SOCKET HEAD CAP SCREW ALSO N.A.S. AIR- CRAFT STD.	160,000 P.S.I.	HIGH CAR- BON ALLOY QUENCHED TEMPERED	41	64	100	140	188	309	511	775	1623	2657
 CAP SCREW	N.A.S.144 AIRCRAFT STD. MS20000=MIL. STD.		HIGH CAR- BON ALLOY QUENCHED TEMPERED	45	74	110	160	218	359	571	875	1783	2857
 CAP SCREW	N.A.S.624 NATIONAL AIRCRAFT STANDARD STEEL	180,000 P.S.I.	HIGH CAR- BON ALLOY QUENCHED TEMPERED	46	73	113	170	230	378	603	925	2898	3028
				51	83	123	180	245	403	643	985	2048	3228

DAILY CHECKLIST & MAINTENANCE LOG		
AERIALSCOPE		
Key: OK = Okay, X = Repairs Required, O = Repairs Made		
ITEM	PROCEDURE	STATUS
Visual Inspection	Stabilizer sliding surfaces.	
	Aerial sliding surfaces.	
	Corrosion and/or damage to the stabilizers and the Aerial device.	
Outrigger and Jack Cylinders	Check for proper operation.	
Aerial Active Switch in Cab	Check for proper operation.	
Pressure Lines	Inspect for security and leakage.	
	These lines should be checked for leakage at the fitting and at crimped ends.	
	Inspect hose routing for any chafing.	
Outrigger High Idle Switch	Check for proper operations.	
	Record the engine RPM's with the high Idle engaged. _____ RPM's	
Outrigger Pads	These are the feet the outriggers sit on, attached to the bottom of the jack beams.	
	Inspect the pads for impairment and freedom of movement.	
Electrical Cables and Hydraulic Lines	Visually inspect for proper operation and/or damage.	
Waterway	Inspect for proper alignment, attachment and lubrication.	
	Check for scoring - IF scoring occurs, use fine grit emery cloth to remove and sharp edges.	
	Wipe area clean to remove and metal particles from sanding. DO NOT try to totally remove score marks. This will cause a flat spot.	
Boom Control	Perform boom control operation at the turntable console and platform.	
Aerial High Idle Switch	Check for proper operation at the pedestal and platform.	

TEN (10) HOUR OR WEEKLY CHECKLIST & MAINTENANCE LOG		
AERIALSCOPE		
Key: OK = Okay, X = Repairs Required, O = Repairs Made		
ITEM	PROCEDURE	STATUS
Perform Daily Check List	All items on Daily check list.	
PTO	Check for proper engagement, there should be no excessive gear meshing when engaging.	
	Check that neutral safety is operating properly, Shift the transmission to drive and reverse. The PTO should engage in both functions. Also, put transmission back to neutral and release the parking brake. The PTO should disengage.	
Aerial Hydraulic Oil Level	Check oil level. Aerial must be cradled, and all jacks and outriggers stowed to get proper oil level.	
Safety Interlock and Indicators	Check that proximity switches are functioning and securely mounted.	
Outrigger/Aerial Swing Brake	Check for proper operation and holding ability at full extension.	
	While swinging the aerial left or right, it should come to a complete stop and hold there.	
Lift Cylinders	Check for synchronized operation.	
	Lift the Aerial from the cradle, both sides should raise together.	
Safety Decals	Make sure safety decals and all other operation decals are in place and not damaged.	
	See "safety precaution labels" in the front of the Chassis Maintenance Manual.	
Intercom System	Check for proper operation.	
Breathing Air System (If Equipped)	Check for proper operation and leakage.	
	Open tank valve and set to approximately 60 psi on tank gauge. Level system set for one hour, after one hour, check for any pressure drop	
Manual Overrides	Check for proper operation at both the aerial and stabilizers.	
Emergency Hydraulic Pump	Check for proper operation for stabilizers and elevating platform.	
Boom Controls from Platform	Check that all functions start and stop, and that all operations are smooth.	
Platform	Inspect platform controls, lights, switches, and doors for damage or defect.	

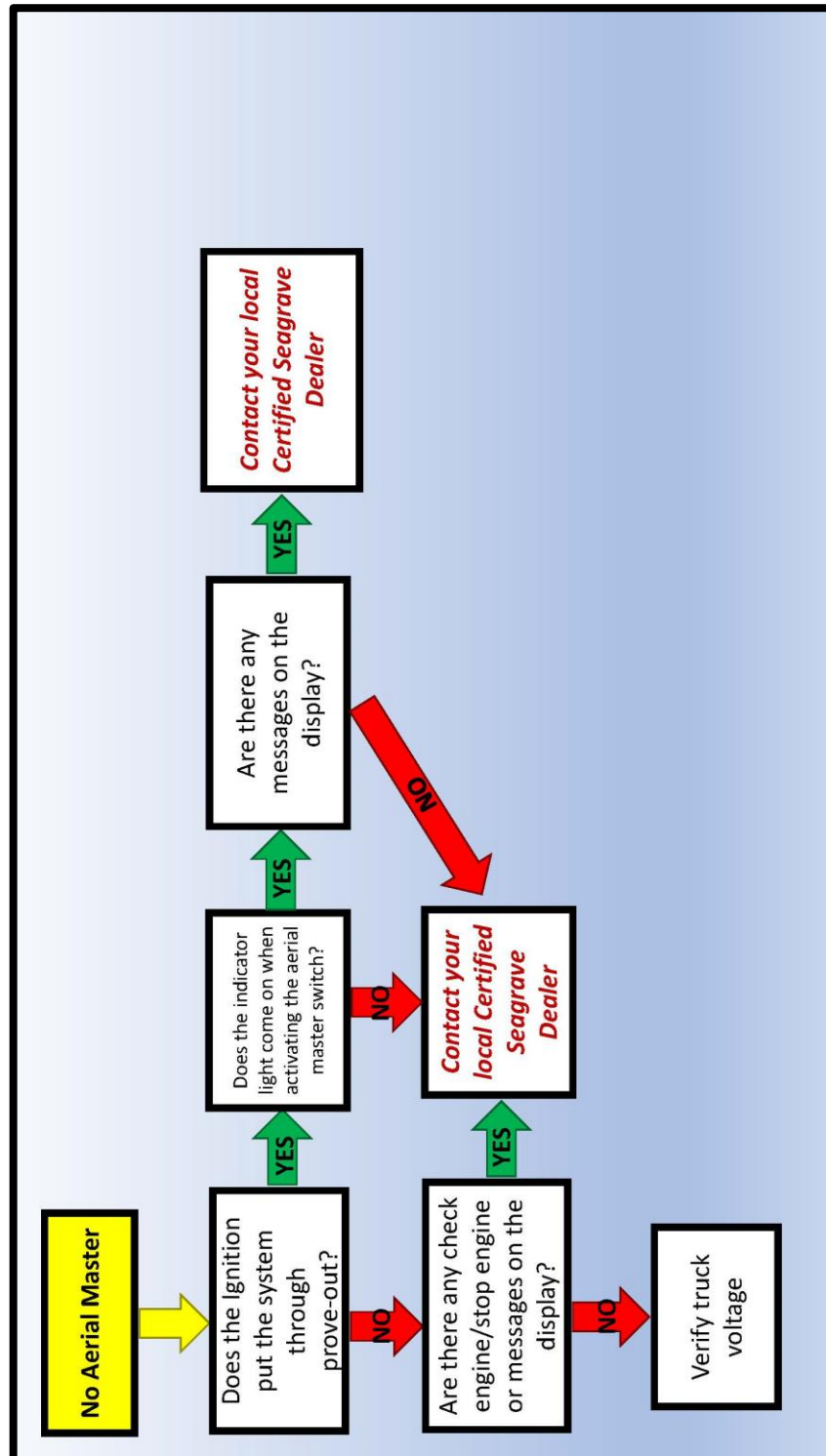
FIFTY (50) HOUR OR MONTHLY CHECKLIST & MAINTENANCE LOG		
AERIALSCOPE		
Key: OK = Okay, X = Repairs Required, O = Repairs Made		
ITEM	PROCEDURE	STATUS
PERFORM 10 HOUR CHECKLIST	All items on 10 Hour Check List.	
Hydraulic Pump and PTO	Inspect PTO mounting to transmission.	
	Inspect Pump mounting to PTO.	
	Check all hoses and mounting flange for leakage.	
Boom Cradle	Check Boom cradle for secure mounting, defective welds, structural cracks and cradle rest pads damaged.	
Outrigger and Jack Cylinders	Inspect for chafing or leakage of hoses and fittings.	
	Check for any signs of binding.	
Electric-hydraulic Swivel	Inspect for mounting tightness or leaks.	
	Check electrical wire connection for wear or damage.	
Rotation Drive Motor	Check oil level.	
	Remove fill plug from swing drive gear box. If oil is within 1 ½" from plug the system has sufficient oil. If oil is required, use SAE 90 gear oil.	
Platform Lift Beam and Cylinders	Check cylinder mounting bolts on lifting beam for tightness.	
	Check pins at turntable base section for tightness as well as the lock bolts.	
	Check all hoses to the cylinder for leakage, proper routing and chafing.	
Slide Block Mounting	Inspect and adjust as necessary. Contact Seagrave Customer Service Department for proper adjustment procedures.	
Base Section Heel Pins	Check for security and cracking.	
Lift Cylinder Pins	Check for security and cracking.	
End Caps	Check for security and cracking.	

FOUR HUNDRED (400) HOUR OR YEARLY CHECKLIST & MAINTENANCE LOG AERIALSCOPE		
		Page 1
KEY: OK = Okay, X= Repairs Required, O= Repairs Made		
ITEM	PROCEDURE	STATUS
PERFORM 100 HOUR CHECK LIST	All items on check list.	
Hydraulic Oil	Take a sample of oil from hydraulic oil reservoir.	
	Take a sample after approximately 30 hours of operation from the top of the reservoir or from the drain outlet provided on the discharge side of the pressure line.	
Turntable Mounting Bolts	Retorque mounting bolts both top and bottom.	
Swing Drive Bolts	Retorque swing drive bolts on turntable.	
Frame Mounting Bolts	Retorque frame mounting bolts.	
Outrigger Cylinders and Drift Down	Perform drift down check on all outrigger cylinders with engine off: <ul style="list-style-type: none"> • Deploy outriggers and jacks then WAIT 15 min • Using a marking pencil, mark all four inner jack boxes, just under the outer box. • Let the unit set for one hour, then make another mark. • Raise the outriggers to check distance between marks. • IF the distance exceeds 1/2", cylinders are drifting and must be repaired by a certified Seagrave repair facility. 	
Hydraulic System Pressure	Check stand-by pressure.	
	Check system pressure relief.	
Operating Pressure	Check and record operating pressure. _____ PSI	
	Lower system relief pressure should be taken with the boom fully retracted and control held in the fully lowered position, with the cylinders fully bottomed out.	
	Upper system relief pressure should be taken with the boom fully retracted and control.	
	Elevated to 45°, Extend pressure relief should be taken with the boom fully extended and the control held in the fully extended position with the cylinder fully extended.	
	Elevated to 45°, retraction pressure should be taken with the boom fully retracted and the control held in the fully retracted position with the cylinder fully retracted.	
	Left and right swing pressure can be checked at 20° elevation and fully extended.	
	1-1/3 load capacity must rotate 360° on a 5° slope in both directions.	

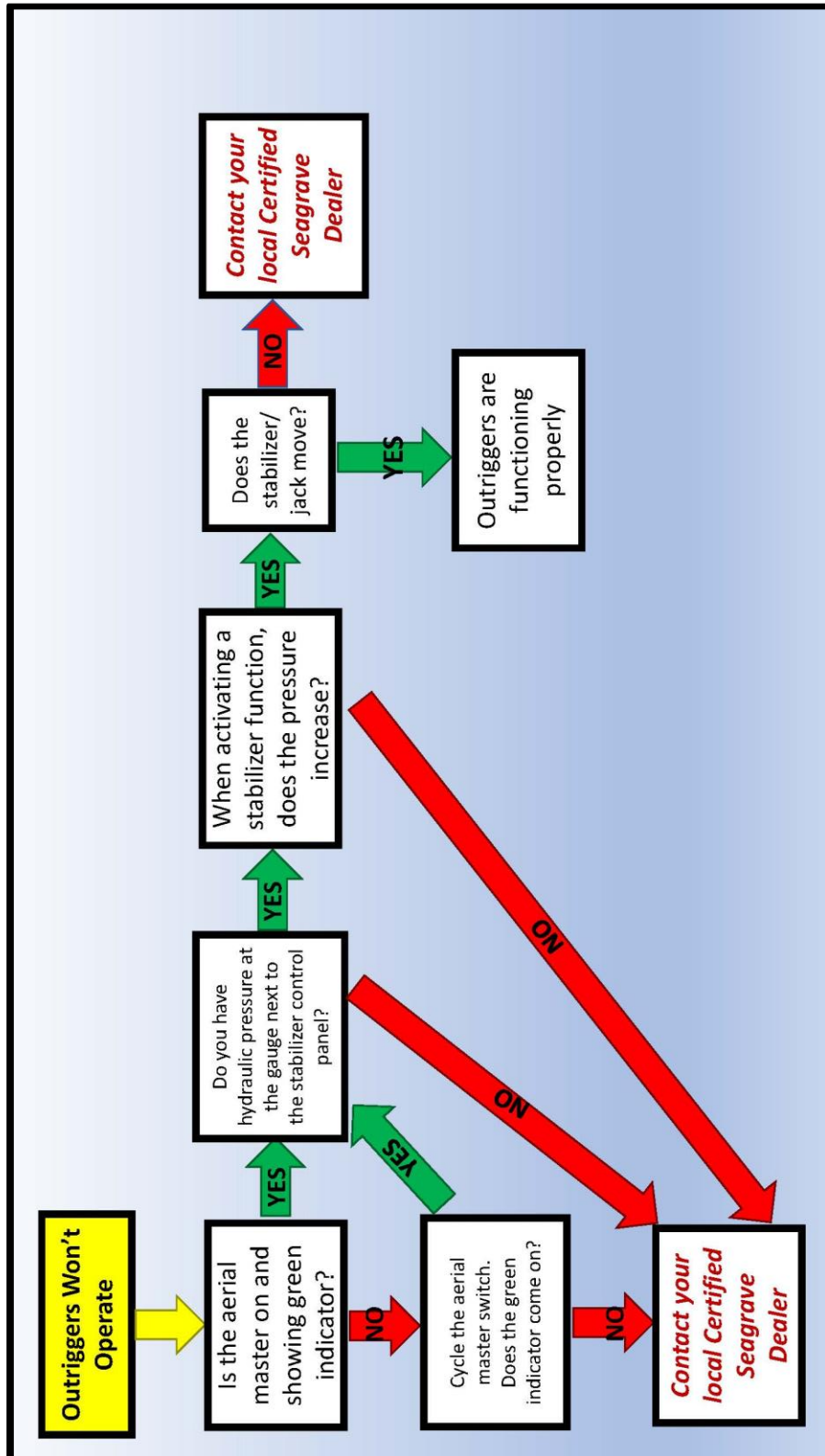
FOUR HUNDRED (400) HOUR OR YEARLY CHECKLIST & MAINTENANCE LOG		
Aerial		Page 2
KEY: OK = Okay, X= Repairs Required, O= Repairs Made		
ITEM	PROCEDURE	STATUS
Aerial Function	Perform aerial function time checks: <ul style="list-style-type: none"> • Aerial fully retracted elevate from -8° to +80° and record ground to full height time. _____ • Aerial fully retracted lower from +80° to -8° and record time. _____ • Elevate aerial to 45° fully retracted, extend fully and record time. _____ • Elevate to 45° fully extended, fully retract and record time. _____ • Rotate 360° to the left at +80° and record time. _____ • Rotate 360° to the right at +80° and record time. _____ • Differences in time to raise, lower, extend and retract functions are to be expected. However, the time required to rotate 360° to the right and left should be approximately the same. A difference of 10 sec is allowable. 	
Rotation Backlash	Check for rotation back lash If this occurs, contact your nearest authorized Seagrave Service Center.	
Cab Avoidance Alarm	Check rotation interlock on both sides of the apparatus for all outriggers/jacks	
Rotation Interlock	Clockwise and counter-clockwise for each side of the truck.	
Turntable Foot Switch	Check that switch interrupts platform controls.	
	Check that high idle engages when switch is illuminated.	
Turntable E-Stop	Check that switch interrupts platform controls.	
	Check message displays on the Aerial Information Center screen.	
Overload Alarm	Install the proper tip load for your device. Verify overload alarm is functioning when over-weighted.	
Bedding Pressure	Check max pressure when the ladder is lowered into cradle. _____ PSI (Should be approximately 450 PSI)	
Aerial Waterway	Inspect for damage, scratches, and abnormal wear.	
	Lube all components accordingly	
	Pressurize waterway. Inspect for leaks.	
	Make sure relief valve opens at correct psi pressure	

6-1. TROUBLE SHOOTING

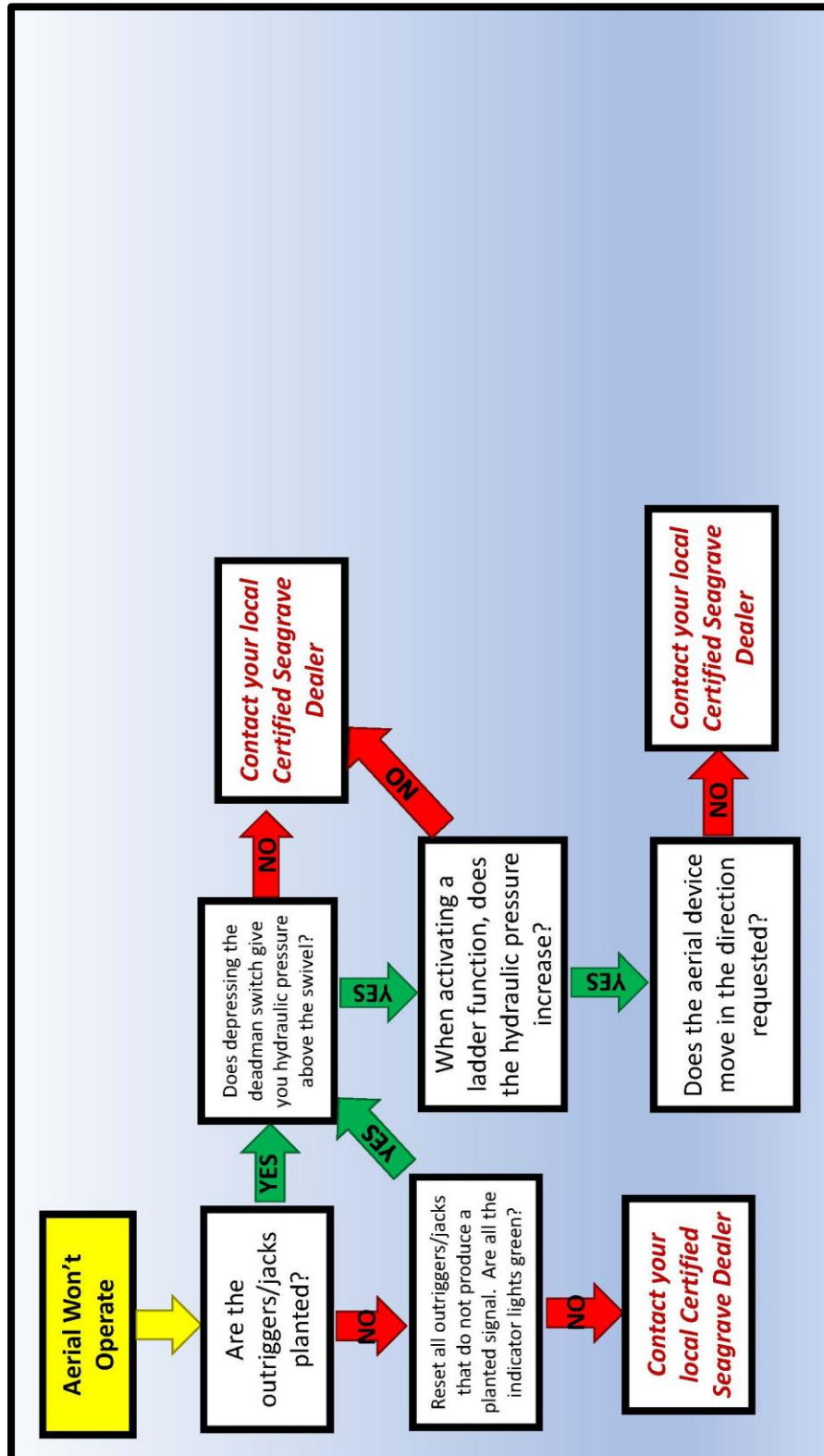
NO AERIAL MASTER



OUTRIGGERS WON'T OPERATE



AERIAL WON'T OPERATE



START UP ALARMS

