Operator's Manual

Rear Mount Steel Aerial Ladder

Standard Controls

500 - 750 Lb Tip Load

75 ft, 100 ft, 105 ft

Part No. PM-A-OM043-1118a

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Equipment Inspection and Maintenance Worksheet

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1. Purpose of Manual

The information in this manual is for the operation and maintenance of Pierce aerial apparatus. It is intended to serve as a guide to assist qualified operator's and service personnel in the operation and maintenance of Pierce apparatus.

Keep this manual with the apparatus at all times.

NOTE: Some of the details of your apparatus's design and construction may be unique to your department alone. For this reason, information contained in this manual may be generic at times. Questions on major inconsistencies between your apparatus's configuration and the information contained in this manual should be directed to your Pierce Dealer or Sales Representative.

2. Scope

This operator's manual provides operating and maintenance instructions for apparatus manufactured by Pierce Manufacturing Inc.

This manual provides information under the following headings:

Safety. Contains important safety information, requirements before placing a apparatus in service, and information on installing custom equipment and accessories.

General. Includes equipment identification, location and description of major components.

Operation. Contains procedures on normal equipment operation and special operating procedures.

Maintenance. Contains scheduled maintenance and lubrication information.

To order a replacement manual or replacement safety warning labels, call Pierce Manufacturing Inc. at 1-888-974-3723.

3. Who Should Use, Service, and Maintain This Equipment

This manual explains the operation and maintenance of this apparatus and equipment.

The manual provides basic principles of operation, highlights common safety concerns and procedures, and gives recommendations for using and maintaining the apparatus and equipment.

This manual assumes that you:

• Have already been fully trained to operate the apparatus and equipment.

• Have demonstrated the effectiveness of your training and the extent of your knowledge.

BEFORE operating this apparatus and equipment, you, the operator or maintainer, must read, understand, and follow the instructions found in this operator and maintenance manual and the operator and maintenance manuals from the manufacturers of major components used on this apparatus or equipment.

Proper tools and service equipment must be used, taking appropriate precautions as required by accepted safety practices, to prevent personal injury and/or equipment damage.

If you are uncertain about the safe operation of any aspect of this apparatus or equipment, stop immediately and seek further training.

You are the only person who knows what you don't know. You must speak up about the things you don't know, so you can learn about them before someone is injured or killed because of your lack of knowledge.

You are responsible for learning how to operate this apparatus and equipment under all conditions without having to pause to read this manual.

⚠WARNING

Only trained personnel should operate this apparatus and equipment.

Do not operate or service until you have read and understood the operation and service manual supplied with this equipment.

Manuals can be obtained from manufacturer's website or by contacting customer service.

Operating this equipment without knowledge or training may lead to injury or death for you or others.

4. Before Placing the Aerial in Service

4.1. Hydraulic Oil Analysis

Pierce Manufacturing Inc. recommends taking a hydraulic oil sample and having it analyzed before putting the aerial in service. This analysis serves as a baseline for future oil sample analyses taken at subsequent maintenance inspections. Comparing results with the original oil test data will help determine the condition and requirement for additional filtering or fluid replacement. The minimum analysis should include spectrochemical, particle count, viscosity, and water content. The oil sample should be taken from the oil sample port (also used as the load sense test nipple) located on the control valve, after the oil has warmed to normal system temperature (115°F or higher), using oil sample kit (Pierce part number 1483503).

4.2. Inspecting the Aerial

Before the aerial is put into service, a primary inspection should be performed. The primary inspection is part of the preventive maintenance forms provided with your new truck. The reason for this inspection is to check for proper operation and adjustment of components, along with cleaning and lubrication, after initial training use and delivery travel.

The operators of the aerial should also become familiar with the inspection process. Their knowledge of a properly adjusted and maintained aerial could prevent a failure or accident by something that has become loose or damaged.

5. Customer Assistance Information

Your satisfaction with your Pierce apparatus is important to your dealer and Pierce Manufacturing Inc. Normally, any question or concern you may have with your apparatus can be handled by your selling or servicing dealer. Your dealer has the facility, trained technicians, special tools, and up-to-date information to promptly address any issue that may arise. Pierce Manufacturing Inc. has empowered dealers to make decisions and repair apparatus, and they are eager to resolve your issues to your complete satisfaction. Should you encounter an issue with your Pierce apparatus that requires service, take the following steps:

Step 1.) Contact your authorized Pierce selling or servicing dealer. They will make the necessary arrangements to order the necessary parts and make the required repairs.

Step 2.) If they are not able to repair the problem to your satisfaction, discuss your concern with a member of dealer management. Normally, concerns can be quickly resolved at that level. If the matter has already been reviewed with the Sales, Service, or Parts Manager, contact the owner of the dealership or the General Manager.

Step 3.) If, after contacting a member of the dealership management, it appears your question or concern cannot be resolved by the dealership without further help, you may contact Pierce Manufacturing Inc. at 888-Y-PIERCE (888-974-3723).

6. Accident Reporting and Investigation

The Product Safety Department at Pierce Manufacturing must be notified immediately in all instances where a Pierce aerial product has been involved in an accident resulting in personal injury or death, when property damage has occurred or when a regulatory investigation is involved. A plan will be established to investigate as deemed necessary. Never remove, damage, or modify products involved in an accident investigation.

Pierce Manufacturing
2600 American Drive
PO Box 2017
Appleton, WI 54912

Telephone: 1-888-Y-PIERCE (1-888-974-3723)

SECTION 1 SAFETY

1-1. Introduction

This Safety Section provides instructions that are essential to the safe operation of your aerial apparatus.

Watch for the safety alert symbol for times when you need to refer to instructions in this section. While other sections of this manual may refer you to specific parts of this safety section, you must read, understand, and follow all of the instructions in this safety section to keep you and others safe during operation.

The safety signs depicted in this section are representative of those you may find on your apparatus. Safety signs are a reminder to you of safety instructions that you will already have learned by studying this manual. The absence of a sign on your apparatus does not mean the absence of a hazard.

1-1.1 To the Owner

This manual instructs operators in the proper operation of this equipment and warns of improper procedures or potentially dangerous situations.

Only personnel who are totally familiar with this manual and have completed training are qualified to operate this aerial. It is the responsibility of the Authority Having Jurisdiction (AHJ) to permit only qualified personnel to operate this aerial.

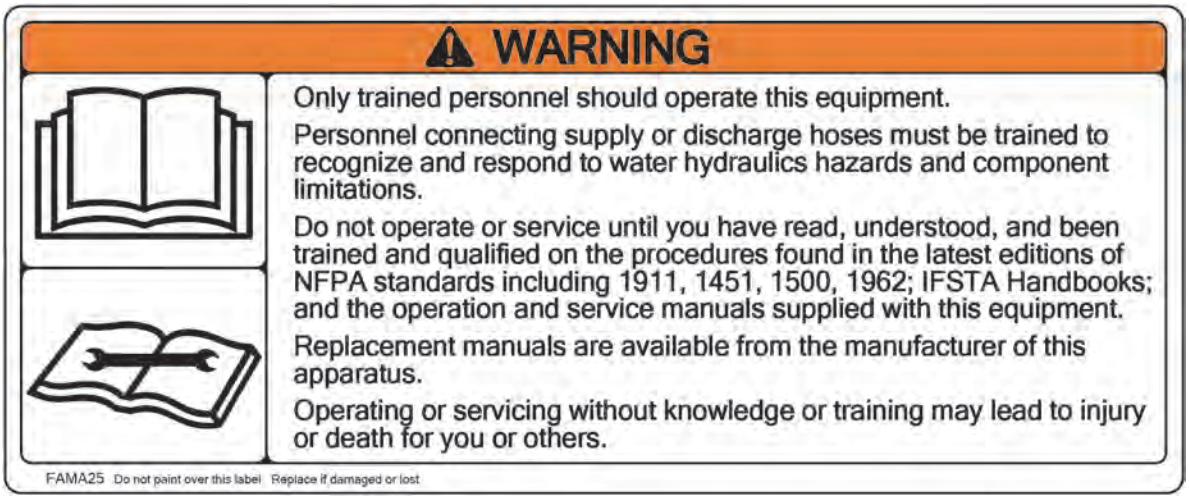
Pierce Manufacturing Inc. provides the services of a delivery technician to demonstrate the safe and proper method of operation. The name of each trainee is recorded as proof of participation in this demonstration, however this demonstration does not qualify personnel as an aerial operator on this apparatus. It is the department's responsibility to provide comprehensive training, supervised practice, and qualification testing before personnel should be authorized to operate this aerial apparatus.

Personnel must never be allowed to operate or maintain an aerial apparatus unless they:

- Have been thoroughly trained in its safe operation.
- Are sufficiently experienced and skilled to operate or perform maintenance safely without supervision.
- Are conscientious enough not to cut corners, not to operate the apparatus in ways it was not intended, and not to be careless in the operation and use of the aerial apparatus with regards to the safety of themselves or others.

1-1.2 To the Operator

Figure 1-1: FAMA25 Warning Label



FAMA25

This Aerial Apparatus is not a consumer product; it is a complex piece of industrial equipment. It has the potential to cause harm to you or those around you if you use it improperly. Its safe operation requires you to be trained, be experienced, be smart, and use your common sense. It is essential that you be careful, physically and mentally qualified, trained in the safe operation of this equipment, and authorized by your employer to do so. You are responsible for learning how to operate this apparatus and equipment under all conditions without having to pause to read this manual.

Never work on or around this equipment, operate it, or maintain it unless you have:

- Read and understood this manual
- Read and understood the operation manual(s) of components supplied with this equipment
- Watched and understood any safety video(s)
- Have been trained in and have practiced safe operation
- Are an authorized operator

If you are uncertain about the safe operation of any aspect of this vehicle or equipment, stop immediately and seek further training.

1-1.3 Multiple Manuals Required

Your fire apparatus is composed of several main parts. This manual is only one of the Operator's Manuals that you will need to inform you about how to operate your apparatus properly and safely. You must refer to each of the following manuals as applicable to your apparatus:

1-1.3a Chassis

Your Pierce apparatus will be manufactured on either a custom or a commercial chassis. Pierce publishes a manual for each custom chassis model. If your apparatus is manufactured on a commercial chassis, Pierce publishes a commercial chassis manual that covers the information that will be unique to fire apparatus application. In addition, a manual is provided by your commercial chassis manufacturer (Freightliner, Ford, International, etc…). You need both these manuals to fully inform you of safe and proper vehicle operation.

1-1.3b Aerial Device

If your apparatus includes an aerial device you will need the appropriate manual. Pierce publishes a manual for each model of aerial device.

1-1.3c Pump & Body

Every apparatus, whether a pumper, aerial, or rescue, will have an applicable pump and body manual. Use the PUC manual if your apparatus includes a PUC pump. Select the pumper manual for all other apparatus.

1-1.3d Foam

If your apparatus is equipped with a foam system you must select the appropriate manual. Pierce publishes manuals for Husky® and Hercules® foam systems. For other foam systems see your foam system manufacturer.

1-1.3e All-Steer

If your apparatus is equipped with All-Steer® it will have a dedicated manual that covers the important operational and safety information unique to this system.

1-1.4 Intended Use

This aerial apparatus has been designed and manufactured for the sole purpose of being used to perform emergency response rescue and fire suppression operations. Any other use without written consent from the manufacturer constitutes misuse of this product and may lead to personal injury or death.

1-1.5 FAMA Safety Guide

The Fire Apparatus Manufacturer's Association (FAMA) Apparatus Safety Guide provided with your apparatus should be used as a supplement to this manual. Extra copies can be purchased from the FAMA website at fama.org.

1-1.6 Parades and Public Events

You and your department are understandably proud of your apparatus and there may be times when you may like to share it with the community. This may involve using the apparatus in parades, educational demonstrations, charitable fundraisers, or other community events where you may wish to allow civilians be in, on, or around your apparatus while it is operating. Keep in mind that there have been many examples of tragic events where fire apparatus caused injury or death to civilians during otherwise well intentioned actions. Before allowing anyone other than a trained and experienced member of your department near your apparatus you should consult with your fire department safety officer and plan for safety. Be sure to follow all the safety procedures in this guide and ensure that the event will be conducted in a manner that is safe for everyone involved.

1-2. Safety Alerts

1-2.1 Description of “DANGER,” “WARNING,” and “CAUTION”

THIS SAFETY SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL.

WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS THIS SYMBOL.

BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

Warning labels located on the vehicle and warning statements contained in this manual all use the same terminology to warn of potential hazards. Each of these potentially harmful conditions is described below:

DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

WARNING

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

CAUTION

Indicates a hazardous situation that, if not avoided, could result in property damage.

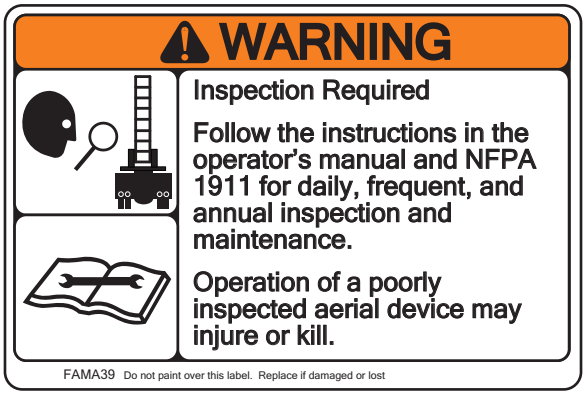
1-3. List of Abbreviations

TERM	DEFINITION
AC	Alternating Current
AHJ	Authority Having Jurisdiction
CFM	Cubic Feet per Minute
CZIC	Command Zone Information Center
DC	Direct Current
ECU	Electronic Control Unit
EPU	Emergency Power Unit
FT	Feet
GAL	Gallons
GPM	Gallons Per Minute
I/O	Input/Output
IN	Inches
ISO	International Organization for Standardization
LB	Pound
MPH	Miles Per Hour
NC	National Coarse
NF	National Fine
NFPA	National Fire Protection Association
NHTSA	National Highway Traffic Safety Administration
OEM	Original Equipment Manufacturer
PSI	Pounds per Square Inch
PTO	Power Take-Off
SAE	Society of Automotive Engineers
SUS	Saybolt Universal Second

1-4. Prepare for Safe Operation

1-4.1 Aerial Device Inspection

Figure 1-2: FAMA39 Warning Label



FAMA39

Your aerial device is a complex machine that requires constant care and thorough inspection. Study the requirements found in the maintenance section of this manual and NFPA 1911, "*Standard for the Inspection, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus"* to determine the critical points on the device that should be regularly inspected. Inspect these points and look for signs of wear, corrosion, or damage.

The operator is responsible for knowing the condition of the aerial device before operation. Each aerial operator should be trained on the inspection process so that they can recognize signs of problems during operation and understand when operation should be ceased if repairs are required. Inspect the apparatus and aerial device thoroughly before the start of every shift. If your apparatus is not operated regularly, inspect it at least weekly. Record any deficiencies and have them corrected immediately. Review the records from the previous shift to ensure that any deficiencies identified have been corrected.

Before the aerial is put into service, a primary inspection must be performed. Follow the inspection and maintenance schedule in this manual thereafter.

1-5. Secure Your Equipment

1-5.1 Aerial Apparatus Hose Chutes

⚠WARNING

Whipping Hose Hazard:

- **Pack hose so that couplings are pulled out straight without flipping around during deployment.**
- **Pack hose so that it never crosses over itself during deployment.**
- **Maintain vehicle speed of 5 MPH or less while deploying hose.**
- **Keep personnel clear of exiting hose and couplings during deployment.**

Whipping hose or couplings can injure or kill.

Certain aerial apparatus may carry hose on the top of the body using a “trough” or “chute” to guide the hose on its way out the back of the truck. While this method has many operational advantages, the hose must be packed carefully to ensure that hose connections do not get caught as the hose is exiting through the chute. Operators of this type of device must take special care to lay the hose in a manner conducive to the chute design, and keep apparatus speeds very slow during deployment. Hose couplings that jam or catch on corners or other obstructions may cause the deploying hose to pull taught or whip, possibly damaging equipment or injuring bystanders. Keep personnel clear of exiting hose and couplings during deployment.

1-5.2 Hose Restraint

Figure 1-3: FAMA22 Warning Label

FAMA22

This vehicle may be provided with a means to store fire hose. Any time hose is stored on this vehicle it must be restrained to ensure that it does not fall out of its storage area while the vehicle is in motion. NFPA standards state that “any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, sides, front, and rear of the hose storage area while the apparatus is underway in normal operations”.

Operational methods vary between fire departments, and methods of restraining the hose may vary as a result. Whether you use the hose restraint feature provided with your apparatus, or develop your own means, it is your responsibility to ensure that whatever method you employ will adequately restrain the hose in those working environments the apparatus will be exposed to. Always restrain hose properly before placing the vehicle in motion.

1-5.3 Equipment Mounting and Storage

Your aerial device or apparatus body may have axes, ladders, pike poles, hose boxes, or other equipment mounted to the aerial ladder, platform, or vehicle body. Inspect equipment mounting devices frequently to insure they are properly adjusted, in good repair, and will retain the equipment securely on the apparatus or aerial device.

1-6. Access Your Apparatus Safely

1-6.1 Climbing and Working on the Apparatus

Figure 1-4: FAMA23 and FAMA26 Warning Labels

FAMA23, FAMA26

Your aerial apparatus will be provided with access steps or ladders so that you can ascend to the control platform or other access points using three points of contact. Three points of contact means that you have one hand and two feet, or two hands and one foot in contact with the apparatus at all times. To maintain three points of contact you may need to kneel, crawl or move on your hands and feet to navigate safely.

Always face the apparatus when climbing or descending. Always make sure that any folding step or ladder is in the deployed position and secure before using it. Failure to exercise due care when entering and exiting the apparatus can result in personal injury. Entry and exit should be made slowly, deliberately, and carefully.

Always keep steps, rungs and handholds in good repair. Keep them free of grease, mud, dirt, fuel, ice, snow, etc... Make sure all attaching bolts and hardware are tight, thus eliminating any movement of steps and handholds. Use extra care during inclement weather. Do not step or climb upon any vehicle surface unless it is slip resistant and handholds are provided. Take special care when walking on surfaces where railings are not provided.

Areas not provided with slip resistant surfaces should not be walked on. In addition, certain areas may be indicated as No-Step areas. If it is necessary to gain access to an area where slip resistant surfaces and handhold are not provided, use rubber matting, fall protection devices, or other means to safeguard personnel before attempting to step, stand, or walk on this area.

Avoid the need to access locations on your apparatus other than a control platform by locating items you need to access in compartments that can be reached from the ground. Do not locate equipment on the top of the apparatus unless you can reach them safely. If you must climb to or walk on the top of the apparatus, recognize that railings may not be provided, and it is your responsibility to proceed with extreme caution at all times. Stay away from the edge when possible and always hang on to something sturdy.

1-6.2 NFPA Designated Walkways

If your apparatus was contracted for after January 1, 2016, it will have designated standing or walking surfaces at any location above 48 inches from the ground where you may need to access during normal operation. You can tell which surfaces are designated for standing or walking as follows:

- The surface will have a slip resistant surface. (Except for hose storage areas).

AND….

- The surface will have a yellow or orange line surrounding it.

OR…

- The surface will have railings or structure at least 12 inches high surrounding it.

Do not stand or walk on any feature of your apparatus that is over 48 inches above the ground unless it meets these criteria.

Any surface over 48 inches high that does not meet these criteria must only be accessed using service ladders and a fall protection system or other safe means as determined by your fire department safety management personnel.

1-6.3 Compartment Doors

Always close swing-up or swing-out compartment doors to reduce the potential for personnel to be injured from accidentally walking into or onto doors left open.

When climbing or walking on the vehicle, never step on a horizontally hinged cover or compartment door that has been left open. Hold-open devices are not designed to support more than the weight of the door itself. Also, never step on the edge of a vertically hinged door that has been left open. In either case the doors will move and you are likely to fall.

1-7. Ride Safely

1-7.1 Riding on Exterior

Figure 1-5: FAMA24 Warning Label

FAMA24

This vehicle is not designed for personnel to ride anywhere other than inside the vehicle in a seated and belted position. Exterior handles are provided to assist in entry and exit only, they are not to be used for hanging on to a moving vehicle.

1-8. Know Your Aerial Device

1-8.1 Emergency Stop

Your aerial device will have method of stopping all aerial functions. On Command Zone equipped aerials this will be an emergency stop (E-Stop) at each control station. For direct hydraulic valve devices, all aerial functions will be stopped by removing your foot from the operator presence switch.

If something goes wrong or the aerial is behaving in a manner you do not understand, stop all aerial functions. Clear personnel from the area and determine what is wrong before resetting the E-Stop or depressing the operator presence pedal and continuing operation. Be sure that all controls are in the neutral position before resuming operation.

Practice stopping all aerial functions on your supervisor's command until it becomes second nature so that your mind will react quickly in an emergency.

1-8.2 Emergency Power Unit

Your aerial device is a complicated machine with many moving parts. The power for movement is supplied by a hydraulic pump that is driven by a power-take-off from the engine. It is always possible that a mechanical, electrical or hydraulic failure can occur that will interfere with the operation of your aerial device. The Emergency Power Unit (EPU) will provide back-up power and, in most cases, allow you to continue operation until you can recall personnel from harm's way, stow the device and remove it from the emergency scene for repair. Study the operation of the EPU so you are prepared if you need to use it during an emergency. Do not rely on the EPU for extended use as it is not designed for continuous operation.

1-8.3 Manual Valve Controls

Figure 1-6: M0343 Warning Label

M0343

Your apparatus allows you to control the motion of the aerial device and the stabilizers by manually operating the control valves. During this operation, all safety systems are overridden. Manual valve operation must be done with extreme care and only by a trained operator who understands the load charts thoroughly and has calculated the safe operating conditions at the scene. Manual valve control will allow the device to move into areas where the device may become unstable and tip over. Other disabled interlocks may allow the device to make contact with the body or cab. Only use manual valve controls in an emergency or in completely controlled conditions.

You must learn where these manual valve controls are located and how to operate them. Practice using them under supervision and in controlled conditions until you are just as proficient with them as you are with the normal controls.

If the normal control system malfunctions, remove personnel from harm's way immediately and take the device out of service until it can be repaired. Use emergency manual valve controls with extreme caution and only when all non-essential personnel are well clear of any hazard.

1-8.4 Aerial Interlocks

WARNING

Interlock Failure Hazard

- **Understand your device and how it is intended to function**
- **Never rely on interlocks to ensure safe functioning**
- **Check interlock functions frequently**

This aerial device is equipped with a number of interlock functions, many of which are required by NFPA 1901. Interlock devices are intended to reduce the possibility of unsafe actions, but they should never take the place of careful, thoughtful, and prudent operation. Department procedures should identify each interlock and provide a procedure on how to safely ensure that each is functioning.

Aerial device interlocks may include:

Aerial/Stabilizer

The aerial device function must not activate unless the stabilizers are fully deployed.

Body Collision

The device will not move into regions where it would make contact with the apparatus body or cab.

Rotation Interlock (Short-Jack)

The aerial device will not rotate over the side of the apparatus where the stabilizers are not fully extended.

Maximum Elevation Slow-Down

The device will slow down prior to reaching maximum elevation or extension.

Nozzle Stow

Device will not drop into the cradle if the master stream nozzle is not properly positioned.

Aerial Function Interlocks

The aerial device will not operate until the parking brakes have been set and the transmission has been placed in neutral or the transmission is in the drive position with the driveline to the rear axle disengaged.

1-9. Safe Aerial Set-Up

1-9.1 Aerial Apparatus Positioning

Selecting the right location to set up your aerial apparatus when arriving on scene is one of the most important decisions you will make. You must anticipate what you will be doing with your apparatus and identify areas where it can be positioned so that the aerial can reach the final position without exceeding its reach and capacity. Your aerial apparatus is very heavy, and it must have ground under it that will support its weight during all operations. Your selected position must meet all of the following safe positioning criteria:

- Surface must be firm and stable. Stability cannot be assured on grass, dirt, hot asphalt, etc… Avoid loose objects, underground utility access covers, chambers, pipes, culverts, broken pavement and areas that drop off suddenly.
- Apparatus must be able to be leveled within the safe operating limits.
- Set-up area should ensure clearance from power lines during operation.

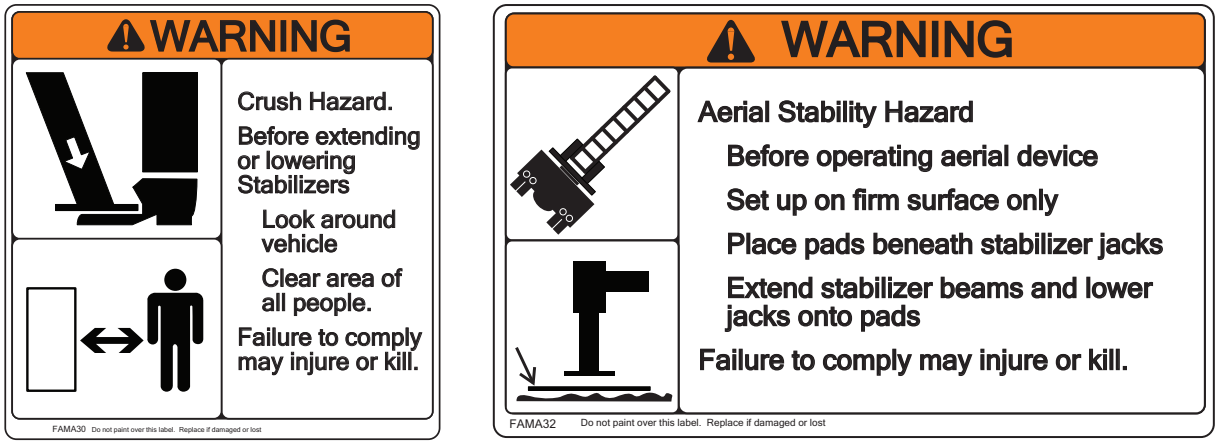
- Position clear of areas exposed to fire or falling debris.
- Always use warning lights when positioning in traffic.
- Never position on or near a railroad track or an active airport runway.

1-9.1a Ground Bearing Support

Every aerial apparatus designed in compliance with NFPA 1901; *"Standard for Automotive Fire Apparatus"* must not exceed 75 pounds per square inch (psi) of pressure between each stabilizer pad and the ground. This means that the ground you set up on must be able to support 75 pounds per square inch. The pressure that ground will support depends on many factors including the soil type (clay, loam, sand, etc…) and the moisture content. When planning for emergencies in your response area, consider engaging an engineering firm who can measure the load-bearing capability of typical soils in your area so that you are prepared to select a safe location when the time comes to respond.

1-9.2 Aerial Stabilizer Deployment

Figure 1-7: FAMA30 and FAMA32 Warning Labels



FAMA30, FAMA32

Your aerial device requires the use of stabilizers to avoid tipping. Once you have selected a set-up location, clear the area of personnel and use spotters to maneuver your apparatus into position. Engage parking brake, auxiliary front wheel lock (if equipped) and deploy wheel chocks.

Determine where the stabilizer jacks will be placed and set out stabilizer pads so they will be centered under the jacks.

Walk around the vehicle, looking around and beneath the vehicle to ensure that there are no people in the area. If there are people anywhere in the area, warn them that you will be operating devices on the vehicle that are a crush hazard and command them to move to a safe location. When you are sure the area is clear, shout out your intention to deploy the stabilizers. Deploy stabilizers and level the apparatus, keeping the stabilizers in your sight at all times. Secure jacks with pins if equipped.

Deploy ground pads every time you set up your aerial, even when setting up on concrete or other firm surfaces.

1-9.3 Stabilizer Short-Jack Deployment

Your apparatus may allow for partial extension of the stabilizer beams (short-jacking). This capability allows your apparatus to be set up in an area where obstructions or surface conditions do not allow them to be fully extended. Set up the apparatus so that the stabilizers can be completely extended in the direction that you will be working and extend them as far as possible on the opposite side. You will NOT be able to safely rotate the device over the side where the stabilizers are not fully extended. Study the rest of this manual, and your load chart, for instructions on safe operating limits. An Incident Safety Officer should observe aerial operations when you are using short-jack procedures.

1-9.4 Cribbing and Blocking

Aerial Stabilizer Cribbing and Blocking

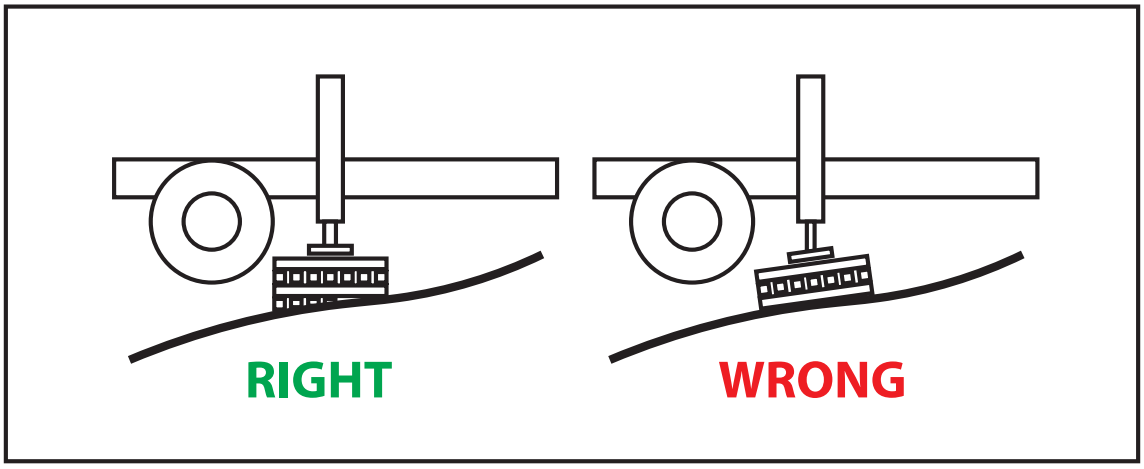
You may set up your aerial on a surface that requires cribbing or blocking to maintain the apparatus within the safe level limits.

- Blocking - Provides a foundation that spreads the load from an outrigger pad or foot over a larger area than the foot itself.
- Cribbing - Blocking materials that are used to increase the bearing area and height.

Only use cribbing or blocking if you are trained in the proper methods, have cribbing that will support at least 100 psi of ground contact pressure, and follow these guidelines:

- Place cribbing or blocking material on a firm level base or foundation to properly disperse the weight of the load.
- Ensure no debris is under the cribbing or blocking which may prevent it from resting firmly on the ground or surface.
- Place cribbing or blocking directly beneath the outrigger and stacked to avoid slipping.

Figure 1-8: Blocking and Cribbing on a Sloped Surface

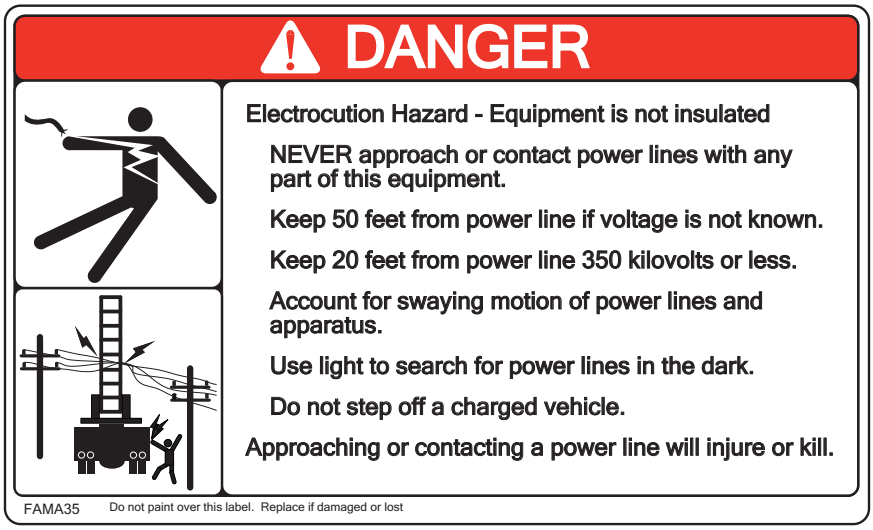


RL010

- When using cribbing or blocking on a sloped surface, level the stack on the first layers so that the jack foot sits on a level surface.
- Always use the apparatus stabilizer pads as the top layer of the block, directly under the jack foot.
- Cribbing and blocking should cover at least as much areas as the stabilizer pads.
- Frequently inspect cribbing and blocking during operation for settling, slippage, cracking, bending, crushing or shear failure.
- Cribbing should never be taller than twice the width of the blocking base.
- Use only undamaged hardwood blocking appropriate for the load.

1-9.5 Electrocution Hazard from Overhead Power Lines

Figure 1-9: FAMA35 Danger Label



FAMA35

Overhead power lines are not insulated. Some lines have a weather resistant covering and appear to be insulated, they are not. The apparatus or parts of the apparatus do not need to touch the power line for the apparatus to become energized. Electricity will arc across a gap and all overhead wires or cables should be considered hazardous and dangerous. Follow these guidelines when working in the vicinity of power lines.

- Do not work within 20 feet of power lines energized up to 350kV.
- Do not work within 50 feet of high-voltage transmission lines if the voltage is unknown. These are the high-tension wires that transport electricity over long distances. They are at greater distance from the ground than lower voltage lines, but still may be within the reach of an aerial ladder or platform. Contact the utility company in your response area and learn to recognize the difference.
- Only operate in conditions where the apparatus and equipment can be stabilized. Do not set up or operate on soft soil, mud, snow or other unstable ground conditions that could allow the apparatus or equipment to shift and move within 20 feet of a power line.
- Look up and Live. Always check the operating area for power lines before you drive into it. Tree branches can hide power lines or cables from view. If operating at night, use powerful lights to search for power lines or poles.

1-9.5a Power Line Contact Emergency Procedure

If you are on or inside a apparatus that contacts or is energized by a power line, stay where you are. Unless the apparatus is on fire, it is safer to stay in the apparatus than to attempt an exit. Stay in or on the apparatus until a power company representative informs you that the line has been de-energized and that the area is safe.

If it is critical that you leave the apparatus, JUMP as far away as possible landing with both feet together. Do not fall back towards the apparatus which could result in your body becoming a pathway between the apparatus and the ground. Allow no part of your body to touch the apparatus and the ground at the same time.

If you are outside of the apparatus that contacts or is energized by a power line, move away from the apparatus by shuffling your feet, keeping both feet on the ground at the same time. The ground becomes charged in concentric circles around the apparatus with varying voltage potential. Straddling these bands can result in serious injury or death as the current passes through your body. Warn others to stay away. Do not approach the apparatus until a power company representative informs you that the line has been de-energized and that the area is safe

1-10. Safe Operation

1-10.1 Operator Requirements

Figure 1-10: FAMA47 Warning Label

FAMA47

Your aerial device must only be operated by someone who is trained and authorized. This operator must stay at the primary control station any time there are people on the ladder or platform.

Never climb the ladder or operate in the aerial platform alone. Fall restraint harnesses and tethers are not designed for self-rescue. If you fall while tethered, you may be suspended without the ability to climb back onto the device. Being suspended for extended periods can cause injury or death. Prepare a plan that will ensure that personnel who hang from safety harnesses and tethers are rescued immediately.

1-10.1a Primary Control Operator

Your primary aerial operator must be thoroughly trained, experienced and authorized by your department to perform primary control operation. This is crucial so that the aerial can be moved out of danger immediately if there are changes in factors such as:

- Heat
- Flames
- Wind speed
- Icing conditions
- Wind and smoke direction
- Vehicle stability

1-10.1b Secondary Control Operator

Your apparatus may have secondary controls at the tip of the ladder or at the platform. These controls are only meant to be used for final positioning and with an authorized operator at the primary controls. The primary operator must be prepared to override the tip operator if unsafe conditions are encountered. Both operators should be in communication with each other and with other personnel on the device at all times.

1-10.1c Operating at the Ladder Tip

It is essential that an operator at the tip of the ladder keeps the ladder extended when operating from the tip. Use the fold-down steps with toe-guards while operating at the tip. Use the extend or retract functions with extreme caution and only to make small adjustments. Do not operate tip controls with anyone else on the ladder.

1-10.1d Communications

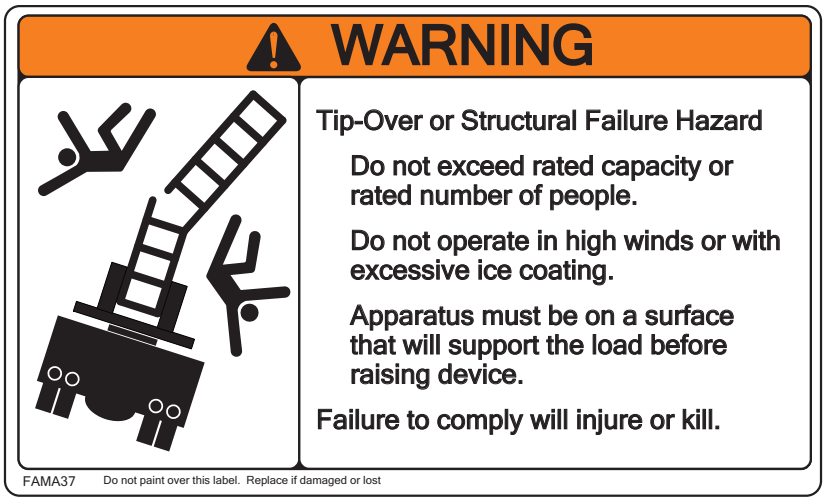
Your aerial apparatus will include a means of communication between the primary and secondary control positions. It may also include communications with the pump panel when aerial controls are provided there. In addition, you may have a headset system for communications. It is essential that you maintain communications between the primary and secondary operators at all times. Check your communication system before every use. If the system does not function, discontinue aerial operation and have it repaired, or use an alternate means of communication and have the system repaired before the next use.

1-10.2 Use of a Spotter

During operation you may find that you are not able to see clearly through smoke or fog, or due to obstructions located on the far side of the device from where the controls are positioned. In situations such as these, you must use a spotter. Agree upon and train using standard verbal commands and visual signals until the team can perform operations safely and efficiently. If multiple spotters are required to ensure that all blind spots are covered, practice methods of ensuring that only one spotter at a time is giving directions.

1-10.3 Operating within Safe Load Limits

Figure 1-11: FAMA37 Warning Label



FAMA37

Your aerial device will have a load chart that is specific to your device make and model. Always operate within the safe limits as specified by your load chart. You must study and memorize your load chart so that you will not need to refer to it constantly during operation. Your load chart will tell you how many people or how much load you can have in various locations on the device depending on extension and elevation. Your aerial is rated at higher capacities as elevation angles increase. The load chart criteria should be so familiar that you can instantly recognize when the device is nearing a critical or overload condition.

You must be familiar with conditions that will reduce the capacity of your device such as:

- High winds
- Ice build-up on the device
- Water monitor reaction forces

- Out-of-level apparatus
- Short-jacking

Stay alert to changes in these situations.

Always operate the device slowly, carefully and cautiously. The load ratings on the chart are static ratings. This means that they assume only the weight of the personnel or equipment is acting on the device without bouncing or other sudden changes. Dynamic loading will be much higher than a static load. Do not allow personnel to bounce, swing or jump onto the device.

Avoid sudden reversal of direction when operating as this may damage the device structure or cause personnel on the aerial to fall.

1-10.4 Aerial Operation around Structures

1-10.4a Approaching Structures

Your aerial is designed to handle loads in only the downward direction. It will be damaged if it is loaded by resting the tip on a structure and then depressing the aerial, or by using it to span a structure like a bridge. It will also be damaged if it is rotated into a structure.

During rescue operations, always aim the tip of your device above the victim and the structure and slowly lower toward the target. Stop the device four to six inches above the target. Personnel weight on the device will then cause the device to settle onto or just above the structure without risking a reverse-loading condition.

1-10.4b Operating above Structures

There are times when you may wish to extend your aerial device over the top of a structure. Do not do this if there is a risk of a flashover or sudden roof ventilation. You should never position the device over high heat or open flame as exposure to high temperatures will weaken structural members, melt wires and hoses, and present a hazard to personnel on the device.

If your aerial device is exposed to flames or excessive heat, remove it from service and have it inspected and repaired.

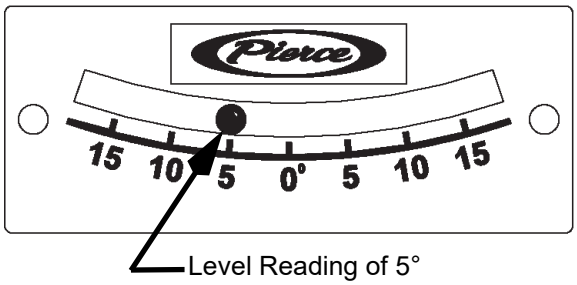
Figure 1-12: Heat Indicator Disc

1387421

If your aerial ladder is constructed from aluminum it will have a heat indicator disc on each ladder section. This disc has a dot that will turn black if exposed to high heat. While a black dot is an indication that the ladder has been exposed to excessive heat, an orange dot is not a guarantee of a safe ladder if the flames or heat occurs in a local area of the ladder away from the disc. Always keep your aluminum ladder away from high heat and have it inspected if there is any doubt about possible heat damage.

1-10.5 Operating within Safe Level Limits

Figure 1-13: Level Indicator at 5 Degrees



1585

Your aerial device must be within a few degrees of being level for safe operation. Safe values are provided for grade angle (front to back) and slope angle (side to side). Always observe the apparatus angle indicators before operating your aerial to ensure that you are within safe limits. Read the level indicators by looking straight-on at them. The center of the ball indicates the correct reading.

If you set up your apparatus with a grade (front to back), but you are still within the safe limits, then you should operate your aerial off the front or back of the apparatus. If you set up your apparatus with a slope (side to side lean), but you are still within the safe limits, then you should operate your aerial directly off the side. These methods will keep the ladder from having a tilt to it while personnel are climbing, and it will keep the rungs parallel to the ground.

If you set up your apparatus on a slope you must be certain that the ground will hold the apparatus stationary and keep it from slipping down the hill. With the tires raised, the only surfaces holding the apparatus on the slope will be the stabilizers. Any of the following conditions may be cause for concern:

- Mud
- Loose gravel
- Loose dirt
- Snow or ice
- Trash
- Fallen leaves
- Any other surface that does not provide good friction

1-10.6 Aerial Device Fall Protection

Figure 1-14: FAMA34 Warning Label

FAMA34

WARNING

Fall Hazard:

Use fall protection:

- **On Ladder**
- **In Platform**
- **When device is in motion**

Fall protection equipment must be available for any personnel who will be climbing the ladder or riding in the platform.

Personnel must be safely anchored to a structural feature of the ladder or platform:

- Any time they are not climbing or descending the ladder
- Any time they are not entering or exiting the platform
- Any time the device is in motion

Fall Protection Equipment

Each person climbing the ladder or riding in the platform must use either a fall restraint harness and tether that meets the requirements of ANSI Z359 Fall Protection Code or a ladder belt and tether that meets the requirement of NFPA 1983; "*Standard on Life Safety Rope and Equipment for Emergency Vehicles*". Select the length of the tether based on the operational needs of your department.

Safety Tether Anchor Points

Use only structural features of the ladder or platform for anchor points. Never use a feature that will allow the clip to slide vertically. Never anchor onto cables, wires, lights, or any other feature that is not a permanent structural element of the aerial device.

Never tether more than one person to an anchor point unless it is clearly labeled that it is designed for that purpose.

1-10.7 Ladder Base Pinch and Crush

Figure 1-15: FAMA46 Warning Label

FAMA46

Your ladder consists of heavy structural parts moving past one another that create dangerous pinch or crush hazards. Personnel must be kept clear of these parts while the ladder is moving. Study your device carefully and keep yourself and others well clear of these areas during operation. Any person standing on the turntable platform should be kept away from the ladder. Never allow people to hold onto or lean against the device while they are waiting for you to position it.

1-10.8 Rungs Aligned

Before allowing personnel to climb a telescoping aerial ladder or the ladder section of an elevating platform, you must ensure that the rungs are aligned. This will allow personnel to maintain proper foot placement while climbing and reduce the possibility of slipping, tripping, or getting feet caught between misaligned adjacent rungs. Observe both your rung alignment indicator and your ladder rungs directly to ensure that they are aligned.

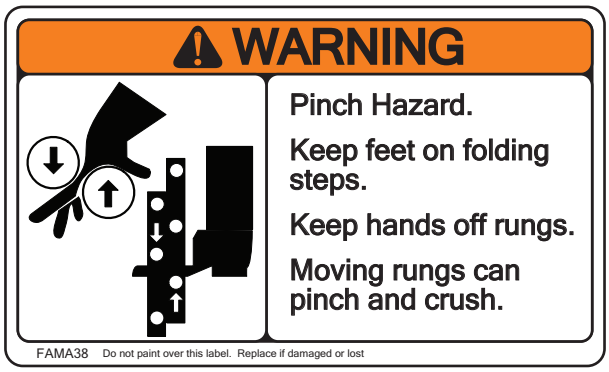
1-10.9 Operating with Personnel near the Aerial Apparatus

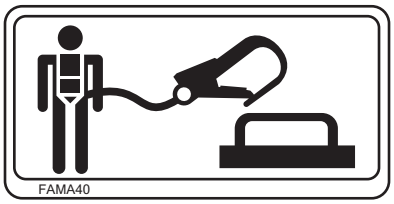
There may be times during operation when other personnel are working in the same vicinity. Instruct and train your department personnel that they should approach a working aerial apparatus only after getting the all-clear from the primary control operator.

Keep personnel clear of swinging structures and other moving parts. Keep them away from the area beneath the device and from around the apparatus. Items accidentally dropped by personnel on the device may injure or kill those below. Falling items may bounce off the ladder, turntable or other parts of the apparatus and strike personnel at some distance from the apparatus. Take extra precautions during icing conditions to keep personnel from being injured by ice falling from the device.

1-10.10 Operating with Personnel on the Aerial Device

Figure 1-16: FAMA38 and FAMA40 Warning Labels





FAMA38, FAMA40

Follow these practices when operating on you aerial ladder.

- Never allow people to climb, ride or work on your aerial device unless they are thoroughly trained in safe operation and the importance of using the three points of contact method of climbing.
- Personnel climbing with equipment must have that equipment tethered to themselves in a way that allows them full use of both feet and both hands.
- Never elevate or rotate the device unless personnel on the ladder or in the platform are secured to a structural feature with a ladder belt and tether.
- Never extend or retract with people on the ladder. If you do so you may crush their hands, feet, or other body parts.

1-10.11 Climbing the Aerial Ladder

Climb your aerial ladder if you are climbing with the ladder at a steep angle, using three points of contact. Grasp the rungs as you climb. Grasping the rungs has several safety advantages over holding onto the rails:

- Your hands have more holding power when they are grasping a horizontal bar than when they are grasping a vertical feature.
- If your feet slip and you are holding onto the rails, your hands may slide down the rails, and you may fall. If you are holding on to the rungs, it is more likely that your hands will have enough grip force to help you recover.
- If your feet slip and you are holding onto only one rail at the time, the weight of your body will be offset from your line of grip and your body will twist. If you are holding onto the rung, your grip force is lined up with your body, and your chance of staying in control is much greater.

1-10.12 Aerial Tiller Operations

1-10.12a Tiller Steering Lock

If your apparatus is a tractor-drawn tiller there are two ways in which the trailer can be towed, with the rear steering functional or with it locked. During operation in non-congested conditions, or while delivering the apparatus between locations, you may wish to drive with the rear tiller steering locked out. Follow the steering lock-out instructions carefully, making sure that the steering retaining pin is secured in place. This will retain the trailer axle in a straight-ahead direction, allowing the tractor operator to drive the apparatus as if it were a conventional semi-tractor and trailer.

Always check the steering lock before placing the vehicle in motion unless you have a tiller operator at the wheel. Driving without a tiller operator while the steering is unlocked will cause the trailer to steer uncontrollably.

Never attempt to lock or unlock the steering with the apparatus in motion.

1-10.12b Tiller Steering

If you choose to operate your aerial tiller with the rear steering unlocked, you must have a tiller cab operator seated and belted prior to placing the apparatus in motion. The tiller operator must be alert at all times to keep the trailer tracking behind the tractor, or to avoid traffic and other road hazards.

1-10.12c Tractor Operator Training

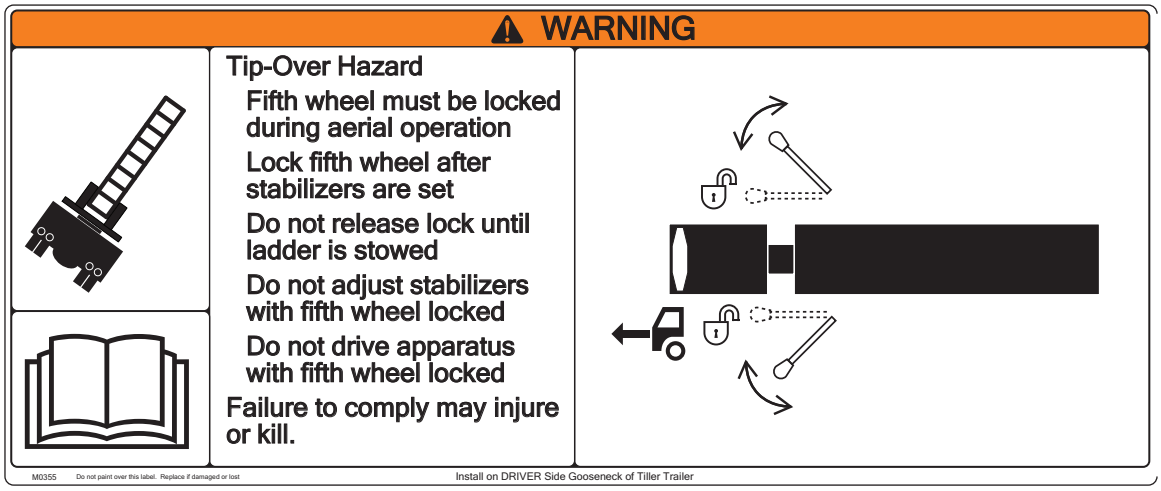
Obtain a Class-A Commercial Driver's License or the equivalent fire department training and authorization prior to driving from the tractor position. This training must include the special aspects of driving a heavy combination vehicle.

1-10.12d Tiller Operator Training

The tiller operator must be trained, experienced, and authorized to occupy this role. Training should be conducted under supervision and in a controlled location.

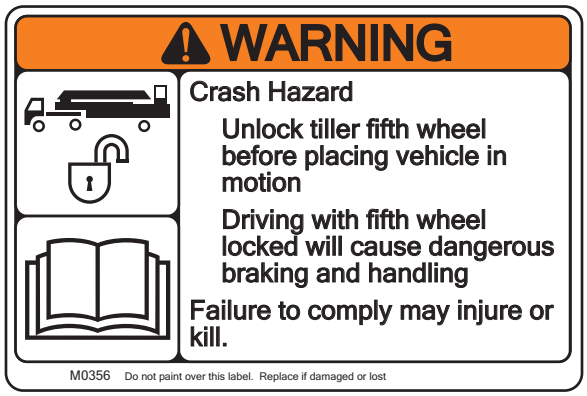
1-10.12e Fifth Wheel Lock

Figure 1-17: M0355 Warning Label



M0355

Figure 1-18: M0356 Warning Label



M0356

Your tiller aerial apparatus may include a feature to lock the tiller trailer turntable connection (fifth wheel) from articulating up and down. It does not lock the connection from rotating. This locking feature is critical to providing stability while the ladder is being operated. This lock allows the weight of the tractor to contribute to stability. If you attempt to operate the ladder without the fifth wheel locked, the ladder could tip over.

The fifth wheel must be unlocked before moving your apparatus. Driving your apparatus with the fifth wheel locked would cause uneven loading on the axles. This could lead to serious driving hazards including reduced steering control, reduced braking control, and poor handling. Never place your apparatus in motion unless the fifth wheel is unlocked.

1-10.13 Aerial Water Flow Operation

1-10.13a Aerial Water Monitor Operation

Your aerial device may include the option to flow water through a pre-piped telescopic waterway and out a water monitor. The reaction force created by the water leaving the water monitor nozzle is very great, and increases with the pressure and the flow rate. This reaction is similar to the reaction you get from holding a hand line. For this reason, be very careful when operating your aerial water monitor. Begin with the nozzle pointed in-line with the ladder, open control valves slowly, and change nozzle direction slowly. Sudden changes in flow will cause the ladder to whip.

1-10.13b Above Elevation Operation (Ladders Only)

Figure 1-19: M0354 Warning Label

M0354

Your water monitor may be capable of directing a stream higher than the elevation of your ladder. Directing the stream at a greater angle of elevation than the ladder creates a downward force on the ladder tip, decreasing the load capacity of the ladder. Before using this capability, remove all personnel from the aerial device, and do not use the device for other load-bearing operations.

1-10.13c Aerial Ladder Water Pipe Operation

CAUTION

Improper methods of attaching water pipe and hose may cause damage to aerial ladder. Use extreme care. Do not extend or retract with a charged hose. Do not allow hose, couplings, tie-straps, etc… to become trapped between the rungs or equipment damage may result. If aerial device is damaged, remove it from service and have it inspected and repaired.

If your aerial apparatus does not include a pre-piped telescoping waterway and water monitor, you may choose to use a water pipe nozzle supplied by a fire hose. This practice must be done with extreme care and under the supervision of trained personnel who understand the extra loads created by the weight of the hose and the reaction forces of the nozzle. Use only water pipes designed for the application and follow all ladder pipe manufacturer operator instructions and fire industry best practices.

Lay the hose along the middle of the ladder so that it rests on the rungs only. Tie off the hose so that it stays in the middle of the ladder when charged. Never hang the hose off the side of the ladder. Never use more than one ladder pipe nozzle and hose on your aerial ladder. Do not use an aerial ladder pipe and fire hose on an apparatus that is equipped with a pre-piped waterway and water monitor.

1-10.14 Severe Weather

Your aerial apparatus is not intended to be operated in severe weather conditions such as damaging hail, icing, lightning, tornadoes, hurricanes, tropical storms, floods, or flash floods. Monitor weather alerts so that you have time to stow your aerial device and seek shelter before severe weather conditions occur.

1-10.14a Lightning Threat

Your aerial device does not act as a lightning rod and will not protect from lightning strikes. If lightning is in the area:

- Lower your aerial apparatus.
- Keep personnel inside a building or inside the enclosed cab of an apparatus.

1-10.15 Aerial Operation in Cold Weather

1-10.15a Slow Operation Possible

Your aerial device relies on hydraulic oil flow to raise, extend, and rotate. Stabilizer deployment and retraction also depends on hydraulic oil flow. Oil flows more slowly and creates greater pressure loss when it is cold. Be aware of potentially slower operation in extremely cold weather and plan for this possibility.

1-10.15b Icing Conditions

If you are operating your aerial device in freezing temperatures, you must be alert to the possibility of ice forming on the device. This can happen from freezing rain, freezing fog or snow that melts and then re-freezes. You must use extreme caution when retracting or extending an aerial device that is coated with ice, both for the safety of personnel and to protect the device from damage. Keep personnel clear of the path of falling ice. Move the device slowly to allow ice to fall away. Inspect the device thoroughly after operation in an icing condition as the operation with an ice coating can damage many components of the device and render it unsafe for future use.

Do not allow personnel to climb an aerial ladder if the rungs or handrails are ice-covered and slippery.

1-10.15c Ice Build-up Limit

With any amount of ice beginning to form on your device you must use the “Ice Conditions” load chart found in this manual. The ice rating of your device assumes that no portion of the aerial device has more than 0.25 inches (6 mm) of ice built up on it. If any portion of the aerial device is covered with more than this depth of ice, the device must be removed from service until the ice can be removed. Pay special attention to the higher portions of your device as ice load will have greater impact on stability the higher up it accumulates on the device.

1-10.16 Aerial Operation in High Winds

High winds can tip over any aerial device. Study your aerial device load chart to determine what wind speed your device's design has accounted for, and in what wind conditions you can safely operate. You must then select a method that you will use to determine the wind speed while you are operating. Possible methods include:

- A wind speed indicator mounted at the tip of the device (available as an option on your apparatus).
- A wind speed indicator mounted on a light tower or other extendable device on another apparatus at the scene.
- Local weather reporting from a reliable nearby source.

Wind speeds usually increase the higher up you climb, and the wind speed at the tip of the device will have the greatest over-turning impact. Retract and stow your device before the wind conditions increase above your device's safe limit.

Never operate in wind conditions that exceed the wind rating on the load chart.

Table 1-1: Beaufort Scale (For Reference Only)

Beaufort Number	Wind Speed (mph)	Description	Land Conditions
0	0	Calm	Calm. Smoke rises vertically.
1	1-3	Light Air	Wind motion visible in smoke.
2	4-7	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	Moderate Breeze	Dust and loose paper raised. Small branches begin to move.
5	19-24	Fresh Breeze	Smaller trees sway.
6	25-31	Strong Breeze	Large branches in motion. Flags waving near horizontal. Umbrella use becomes difficult.
7	32-38	Near Gale/Moderate Gale	Whole trees in motion. Effort needed to walk against the wind.
8	39-46	Fresh Gale	Twigs broken from trees. Cars veer on road.
9	47-54	Strong Gale	Light structure damage.

1-10.17 Aerial Device Wire Rope Cable

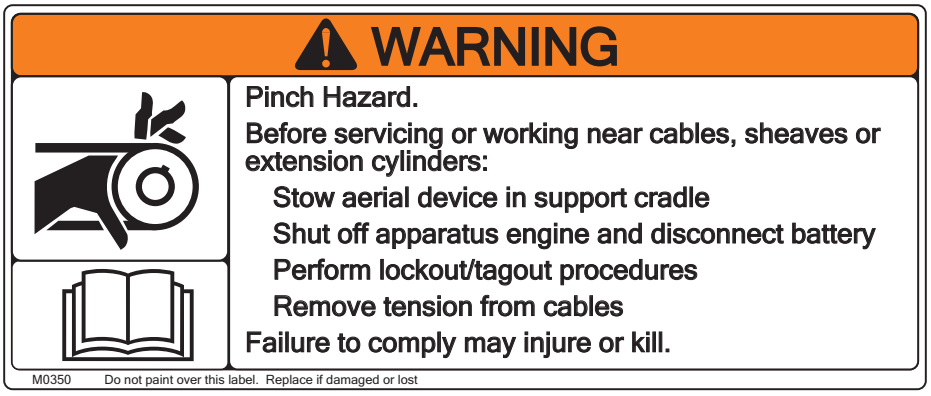
A pinch hazard may exist wherever wire rope cables contact other mechanical parts such as hydraulic cylinders, pulleys, sheaves, roller guides, or features on the load. Wire rope cables under tension are a source of stored energy. If they break, they can injure or kill.

Follow these safe practices during aerial operation:

- Always stay clear of wire rope during operation.
- Never touch wire rope while in tension or under load.
- Never touch wire rope while someone else is at the controls or during operation.
- Never operate a device that has damaged wire rope.
- Keep cutting tools clear of wire rope.

1-10.17a Gloves and Clothing

Figure 1-20: M0350 Warning Label



M0350

WARNING

Pinch Hazard.

Keep hands away from cable, sheaves and other moving parts. Pinching fingers or body parts may injure or kill.

Wire rope, through use, will develop “barbs” which can slice skin. It is extremely important to wear protective gloves while handling the wire rope. Avoid loose fitting clothes or anything that could become entangled in the wire rope and other moving parts.

1-10.17b Sheave or Cable Failure

Your aerial device is extended and retracted using a series of sheaves and cables. There are two separate sheave and cable systems. These separate systems are redundant. If one side fails, the other side is capable of keeping the device from retracting uncontrollably. If a sheave or cable fails while you are operating the device, remove all personnel from the device immediately, stow the device in the cradle, and take the device out of service until the damage can be repaired. The redundancy is intended to allow safe retraction and stowing of the device only and is not intended to allow continued operation with only one sheave and cable system functioning.

1-11. Safe Use of Optional Equipment

1-11.1 Rope Rescue

Your aerial device may be equipped with an attachment point for rope rescue operations. Refer to this manual to determine the weight of the load that can be safely lifted. To ensure that the capacity is not exceeded, it is essential that you lift in a smooth manner, without causing the device or the load to bounce, jerk or sway. Use appropriate methods to stabilize the load while it is being lifted. Most attachment points are intended to be used as a single anchor for a single rescue rope only. Never use a pulley or block and tackle as the load on the device will be multiplied. You must make sure that the rope and fittings you use are appropriate for the load being lifted. They should comply with NFPA 1983; “*Standard on Life Safety Rope and Equipment for Emergency Services”* and should be rigged by an individual trained in proper rope rescue techniques such as those found in NFPA 1670; “*Standard on Operations and Training for Technical Search and Rescue Incidents*”.

1-11.2 Lifting Eye

Your device may be equipped with a lifting eye that may be used for rescue operations. The eye is for use with rope type rescue operations that never load the lifting eye over 500 lbs (225 kg). To ensure that this load is not exceeded, it is essential the lifts be made in a smooth manner, without causing the device or the load to bounce, jerk, or sway. Use appropriate methods to stabilize the load while it is being lifted.

The lifting eye is intended to be used as a single anchor for a single rescue rope only. Never use a pulley or block and tackle on this eye as the load on the device may become twice the load being lifted. Anchor the working end of the rope to the eye and use the boom to lift or lower the load.

Rope and fittings used with the lifting eye should be appropriate for the load being lifted, should comply with NFPA 1983; "*Standard on Life Safety Rope and Equipment for Emergency Services"*, and should be rigged by an individual trained in proper rope rescue techniques such as those found in NFPA 1670; "*Standard on Operations and Training for Technical Search and Rescue Incidents*".

1-11.2a Lifting Pulley

⚠WARNING

Lift-Eye Overload Hazard:

- **Stabilize vehicle before lifting.**
- **Do not exceed 500 lbs (225 kg) load.**
- **Do not exceed the rated capacity.**
- **Raise and lower loads smoothly.**
- **Do not flow water while using lift-eye.**
- **Do not multiply rope load with pulleys or block and tackle.**
- **User must determine required rope strength and safety factors.**

If a pulley is provided on the aerial device, the working end of the rope should only be anchored to a lower section of the ladder. In this configuration, the rope will be raised when the device sections are extended, and lowered when the device sections are retracted. The working end of the rope should never be anchored to other parts of the apparatus, to static structures, or to objects on the ground. If the rope is passed through the pulley with the working end anchored to the ground, then the load on the device becomes twice the weight of the load on the running or free end of the rope. This load multiplication may overload the device and risk device damage, tipping, or collapse.

1-11.3 Quick-Lock® Waterway

Figure 1-21: M0213 Warning Label

M0213

The Pierce Quick-Lock® Waterway allows you to secure the master stream monitor to either the mid-section or the fly section of the ladder. You can choose to keep the monitor anchored to the mid-section so that it does not get in the way when the ladder is used for rescue operations. The monitor can be used from this lower elevation. Or you can move the anchor point to the tip of the ladder if water flow from a higher elevation is desired.

You must always be sure that the master stream monitor is secured in its anchor. If water pressure is applied when the monitor is not securely anchored, the pressure will cause the waterway to extend rapidly. This rapid movement can damage equipment or harm people who may be on the ladder at the time. Study the waterway on your device, understand the monitor anchoring mechanism, and always be sure the monitor is secured before charging the waterway.

1-12. Perform Maintenance and Service Safely

1-12.1 Modification

⚠WARNING

Equipment Failure Related Hazards:

- **Never change, alter, or modify this original equipment.**

Unauthorized changes, modifications or alterations may affect the safety or reliability of this vehicle which may lead to personal injury or death.

This vehicle has been designed and manufactured to conform to criteria including government regulations, industry, and company standards. Any change, alteration, addition to, or removal from the original equipment or components, made in such a manner that the changed or altered portions or functions of the equipment or components are different from the manufacturer's original design, specification, or use requires written consent from this manufacturer.

1-12.2 Aerial Mounted Equipment Additions

Your aerial device may have come from the factory with provisions for equipment mounting on the aerial ladder or platform. These OEM options were determined by factory engineering personnel to be appropriate for your device. Never add any equipment or mounting provisions that adds weight to the device without written permission from Pierce Manufacturing, Inc.

All Pierce aerial apparatus are stability tested prior to delivery. Any changes or additions in equipment (lighting changes/additions, equipment changes/additions, etc.) to an aerial device requires the unit to be retested at an authorized Pierce facility or the additional weight added must be removed from the allowable tip load and the load charts updated appropriately.

NFPA 1911; "*Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus"* requires that the inspection should determine that no extra equipment has been added to the aerial device without subtracting the weight of such equipment from the rated capacity. Any details of structural modification, improper repairs, or added weight need to be added to the required inspection record.

1-12.3 Drilling Holes or Welding

Drilling, welding, grinding, cutting, or otherwise compromising any structural components of the aerial device is not permitted. Non-structural sheet metal components may be modified. If in doubt, contact Pierce Manufacturing Inc. for approval and assistance. Pierce Manufacturing Inc. is not responsible for structural failures or corrosion caused by unauthorized modifications to the aerial device.

1-12.4 Dissimilar Metals

Consider the type of metal for the application whenever mounting accessories. Dissimilar metals such as aluminum, steel, stainless steel, brass, etc., when placed in direct contact with each other and subjected to moisture can form a galvanic reaction leading to rapid corrosion and possible failure of the mounting components, fasteners, or base materials. Select mounting material and fasteners to avoid dissimilar metals, or coat all mounting surfaces, base materials and fasteners with a commercial grade rust-proofing agent (such as those conforming to MIL-C-0083933A specification).

1-12.5 Control of Hazardous Energy (Lockout/Tagout)

⚠ DANGER

Stored Energy or Start-Up Hazard.

Follow OSHA lockout/tagout standard 29 CFR 1910.147 before:

- **Maintaining or servicing**
- **Working in, on, under or around vehicle or equipment**

Failure to comply may result in serious injury or death.

Certain features on this vehicle may require lockout or tagout (LOTO) prior to maintaining or servicing. Each employer should consider the manner in which they will be using this vehicle and its associated equipment, identify potential hazards, and then require LOTO procedures as necessary.

LOTO refers to specific practices and procedures to safeguard employees from the unexpected energizing or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

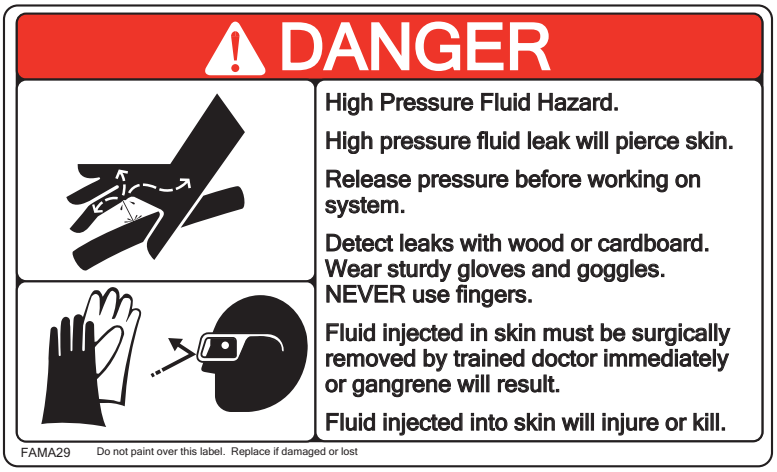
OSHA lockout/tagout standard 29 CFR 1910.147 applies to the control of energy during servicing and/or maintenance of machines and equipment. This standard requires employers to establish a program and utilize procedures for affixing appropriate lockout devices and tagout devices, and to otherwise disable machines or equipment to prevent unexpected energizing, start-up or release of stored energy in order to prevent injury to employees.

LOTO procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- A specific statement of the intended use of the procedure;
- Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
- Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them
- Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

1-12.6 High Pressure Hydraulic Fluid

Figure 1-22: FAMA29 Danger Label



FAMA29

Certain equipment on this apparatus is powered by high pressure hydraulic fluid. If you see a hydraulic leak, shut down the equipment and call a service technician trained in safe methods of trouble-shooting and servicing hydraulic power equipment.

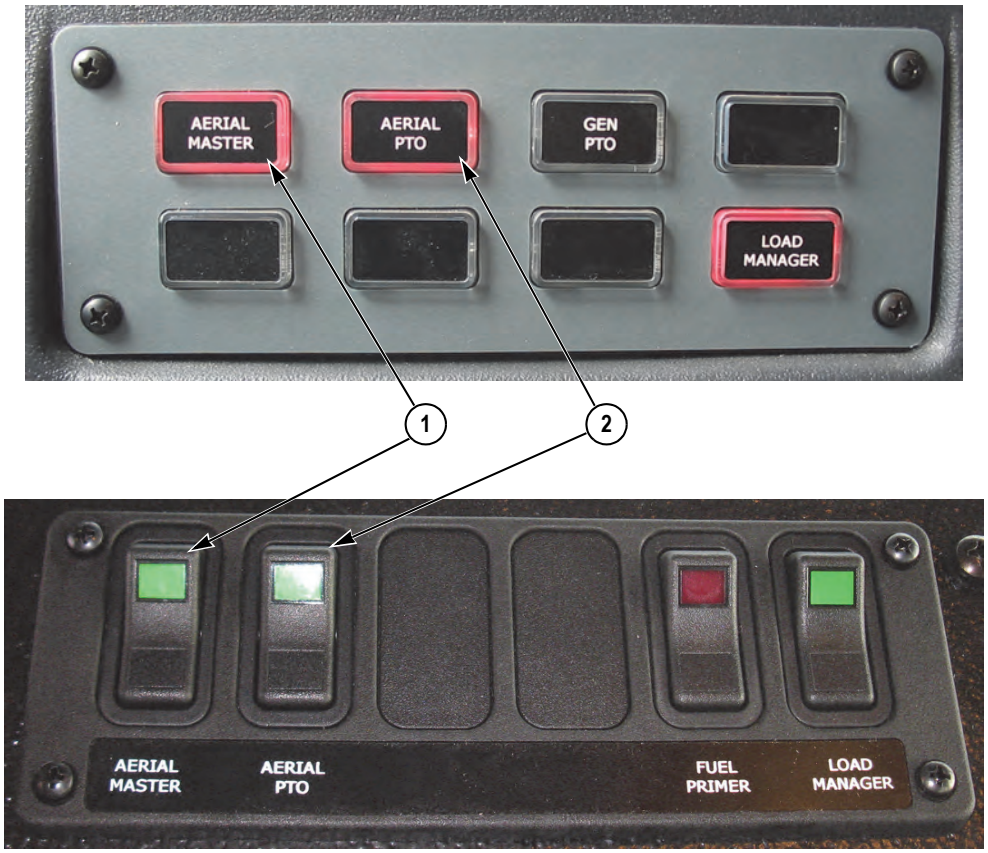
Never search for leaks with your hands or other body parts. High pressure hydraulic fluid at pressures as low as 100 psi can penetrate skin. Use a piece of wood or cardboard to detect leaks, keeping hands and other body parts well away from the potential source of a leak.

If you suspect that you have been exposed to a high pressure hydraulic skin penetration, seek medical help immediately. The high pressure injection of a fluid such as hydraulic oil, grease and paint constitutes a medical and surgical emergency, requiring access to appropriate specialist surgical expertise as soon as possible. Fluids injected under the skin are highly toxic. The injury will lead to more serious health concerns and possibly death if not treated promptly. See appropriate medical care knowledgeable in the treatment of these injuries.

2-1. Location and Description of Major Components

2-1.1 In-Cab Power Controls

Figure 2-1: Cab Controls



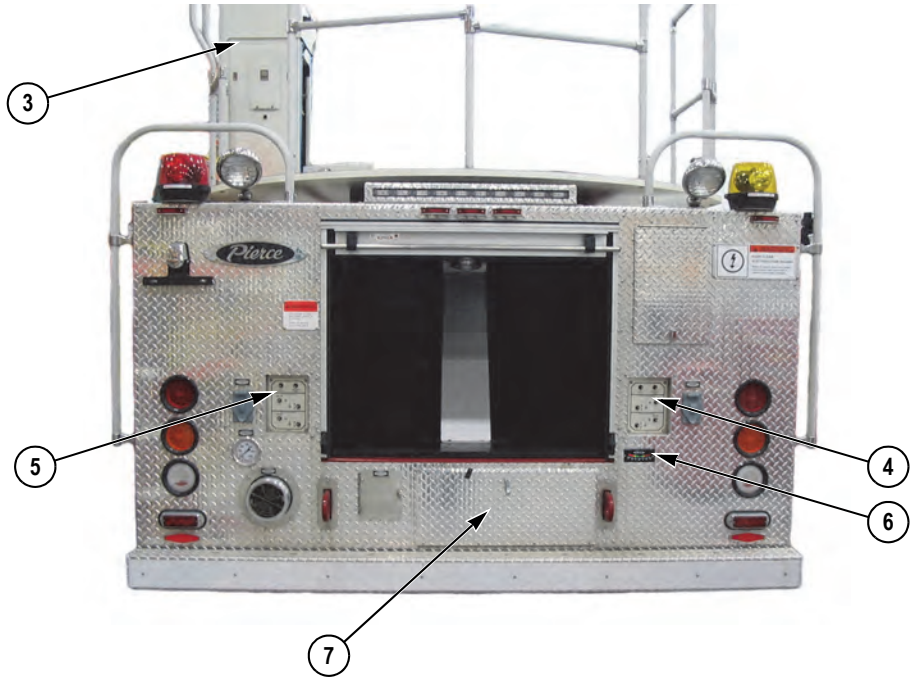
1192, 1408

Item #	Description and Function

1. **AERIAL MASTER SWITCH.** Two position switch; activates the aerial electrical circuits. Depress the switch to turn on power to the aerial; press again to turn off. The AERIAL MASTER switch will illuminate when the electrical circuits are active.
2. **AERIAL PTO SWITCH.** Two position switch; activates the transmission mounted power take-off (PTO), providing rotational input for the hydraulic pump. Depress switch to turn on power to the PTO; press again to turn off. The AERIAL PTO switch will illuminate when the PTO has successfully engaged.

2-1.2 General Control Locations

Figure 2-2: Aerial Controls

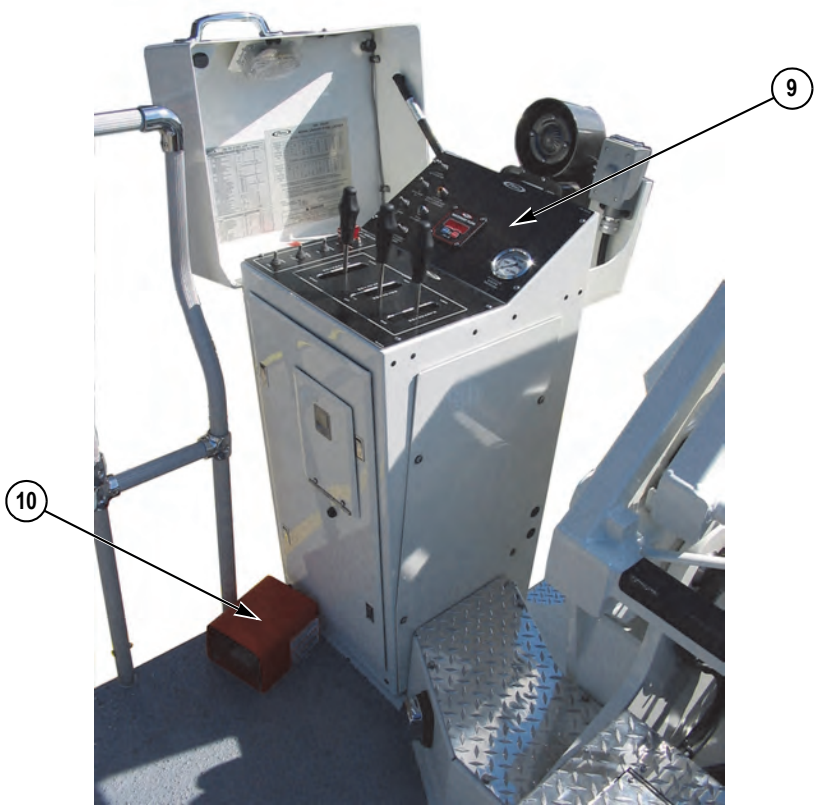


1058

Item #	Description and Function
3.	**TURNTABLE CONSOLE CONTROLS.** Contains most controls and indicators needed to operate the aerial.
4.	**RIGHT STABILIZER CONTROLS.** Contains right side stabilizer beam and jack controls.
5.	**LEFT STABILIZER CONTROLS.** Contains left side stabilizer beam and jack controls.
6.	**ANGLE INDICATOR (SIDE SLOPE).** Indicates apparatus side slope in degrees.
7.	**MANUAL OVERRIDE CONTROLS.** Contains stabilizer and aerial override controls.
8.	**AERIAL DRAIN VALVE.** Used to drain water from the aerial waterway.

2-1.2 General Control Locations *(Continued)*

Figure 2-3: Aerial and Ladder Controls

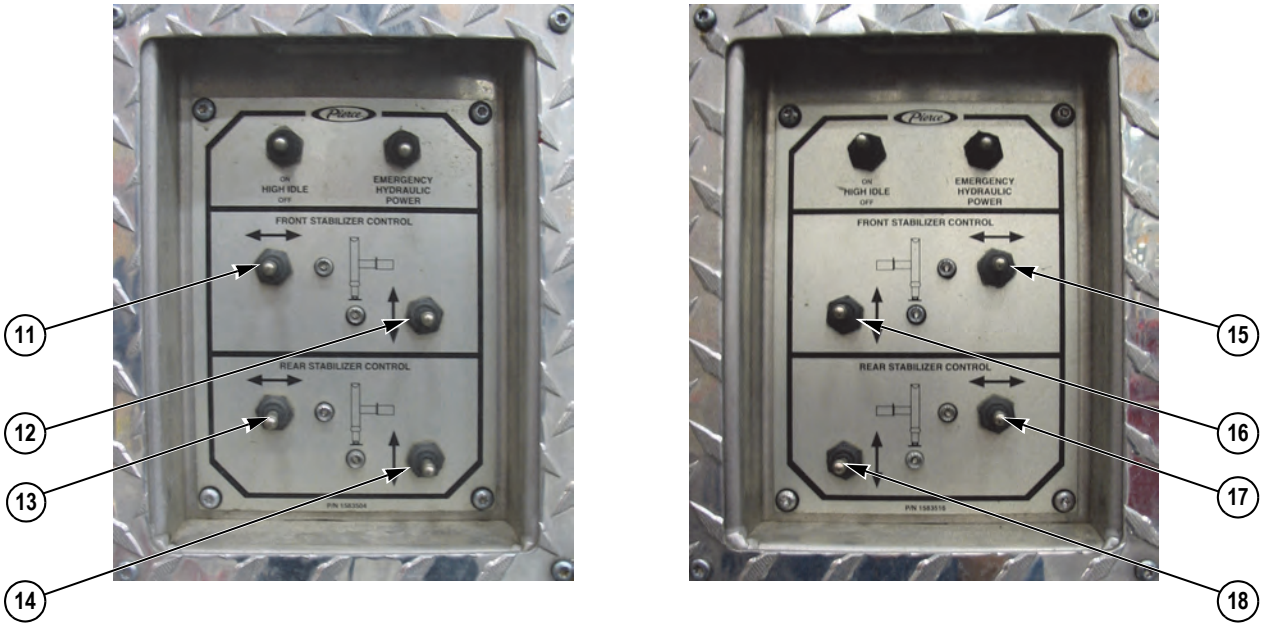


1113

Item #	Description and Function
9.	**TURNTABLE CONSOLE CONTROLS.** Contains most controls and indicators needed to operate the aerial.
10.	**AERIAL OPERATOR PRESENCE CONTROL.** This switch must be depressed for the ladder controls to operate.

2-1.3 Stabilizer Controls

Figure 2-4: Stabilizer Controls



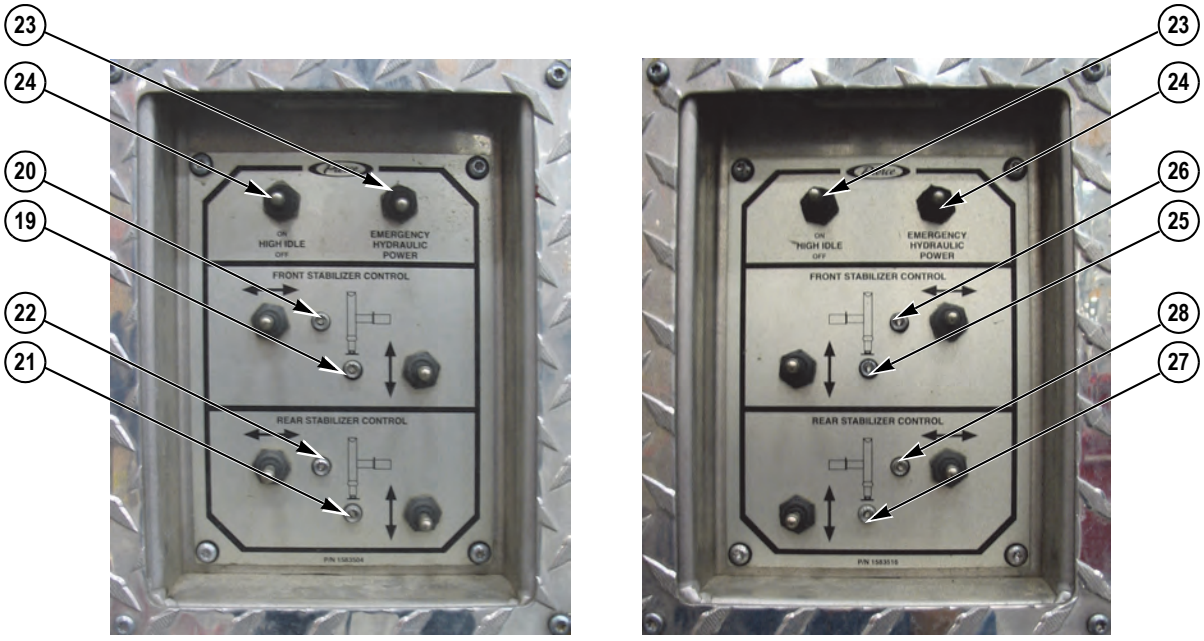
1060, 1061

Item #	Description and Function
11.	**LEFT FRONT STABILIZER BEAM IN/OUT CONTROL [1].** Controls the operation of the left front stabilizer beam. Push switch left to extend the beam; push switch right to retract the beam.
12.	**LEFT FRONT STABILIZER JACK UP/DOWN CONTROL [1].** Controls the operation of the left front stabilizer jack. Push switch down to lower the jacks; push switch up to raise the jacks.
13.	**LEFT REAR STABILIZER BEAM IN/OUT CONTROL.** Controls the operation of the left rear stabilizer beam. Push switch left to extend the beam; push switch right to retract the beam.
14.	**LEFT REAR STABILIZER JACK UP/DOWN CONTROL.** Controls the operation of the left rear stabilizer jack. Push switch down to lower the jacks; push switch up to raise the jacks.
15.	**RIGHT FRONT STABILIZER BEAM IN/OUT CONTROL [1].** Controls the operation of the right front stabilizer beam. Push switch right to extend the beam; push switch left to retract the beam.
16.	**RIGHT FRONT STABILIZER JACK UP/DOWN CONTROL [1].** Controls the operation of the right front stabilizer jack. Push switch down to lower the jacks; push switch up to raise the jacks.
17.	**RIGHT REAR STABILIZER BEAM IN/OUT CONTROL.** Controls the operation of the right rear stabilizer beam. Push switch right to extend the beam; push switch left to retract the beam.
18.	**RIGHT REAR STABILIZER JACK UP/DOWN CONTROL.** Controls the operation of the right rear stabilizer jack. Push switch down to lower the jacks; push switch up to raise the jacks.

1. Front stabilizers are used on the 100-ft & 105-ft ladders; they are not used on the 75-ft ladder.

2-1.3 Stabilizer Controls *(Continued)*

Figure 2-5: Stabilizer Controls



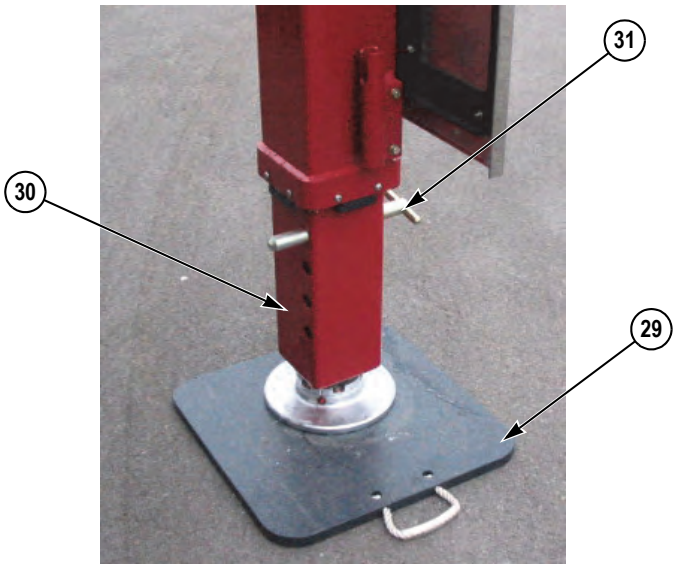
1060, 1061

Item #	Description and Function
19.	**LEFT FRONT STABILIZER FIRM ON GROUND INDICATOR [1].** When lit, indicates that the stabilizer jack is down.
20.	**LEFT FRONT STABILIZER EXTENDED INDICATOR [1].** When lit, indicates that the stabilizer beam is fully extended.
21.	**LEFT REAR STABILIZER FIRM ON GROUND INDICATOR.** When lit, indicates that the stabilizer jack is down.
22.	**LEFT REAR STABILIZER EXTENDED INDICATOR.** When lit, indicates that the stabilizer beam is fully extended.
23.	**EMERGENCY HYDRAULIC POWER SWITCH.** Switch is used to operate the Emergency Hydraulic Pump.
24.	**HIGH IDLE SWITCH.** Switch is used to enable the engine high idle circuit.
25.	**RIGHT FRONT STABILIZER FIRM ON GROUND INDICATOR [1].** When lit, indicates that the stabilizer jack is down.
26.	**RIGHT FRONT STABILIZER EXTENDED INDICATOR [1].** When lit, indicates that the stabilizer beam is fully extended.
27.	**RIGHT REAR STABILIZER FIRM ON GROUND INDICATOR.** When lit, indicates that the stabilizer jack is down.
28.	**RIGHT REAR STABILIZER EXTENDED INDICATOR.** When lit, indicates that the stabilizer beam is fully extended.

1. Front stabilizers are used on the 100-ft & 105-ft ladders; they are not used on the 75-ft ladder.

2-1.4 Stabilizer Jacks and Ground Pads

Figure 2-6: Stabilizer Jack and Ground Pad



1088

Item #	Description and Function
29.	**STABILIZER GROUND PAD.** Used to dissipate the weight and footprint of the vertical jack.
30.	**VERTICAL JACK.** Used to raise, level and stabilize the apparatus during aerial operations.
31.	**STABILIZER JACK SAFETY PIN *(If Equipped)*.** Used to prevent vertical jack from retracting in case of system failure.

2-1.5 Turntable Console Controls

Figure 2-7: Turntable Console

1062

Item #	Description and Function

32. **WATER FLOWMETER.** During normal operation, the 4-digit LED display indicates the current gallons per minute (GPM) flow rate. Additional functions are also available using the MENU and TOTAL buttons:

a. MENU - used in conjunction with the TOTAL button to access display module and program access modes. For additional programming information, refer to service group 8750-V-001, FRC/Pierce Digital Flowmeter, which can be found in the service manual for this apparatus.

b. TOTAL - when pressed, the X 100 LED is illuminated and the value shown on the display (multiplied by 100) is the total flow. Press the button again to return to the current flow rate. Press and hold to reset to 0.

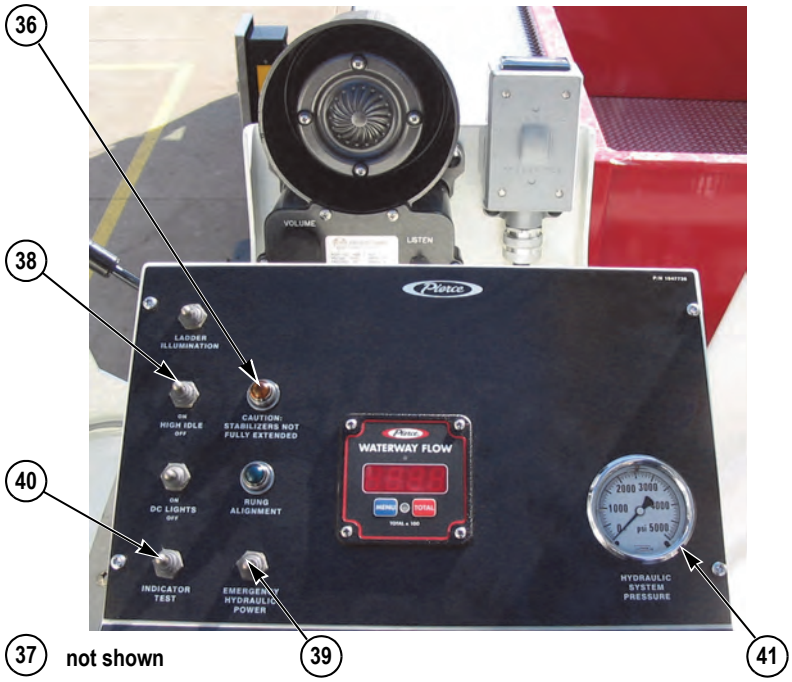
33. **INTERCOM.** The aerial has an intercom system with stations located at the turntable console and the tip. All intercom functions are controlled from the console or pump control panel units. The console station has a volume control to adjust incoming transmissions at the console. Turn knob clockwise to increase intercom volume; turn knob counterclockwise to reduce intercom volume. Press the “press-to-talk” switch to talk to other intercom stations; release to receive communications from other intercom stations. The tip station is hands-free, which means all the operator has to do is talk to be heard at the console.

34. **TIP TRACKING LIGHTS SWITCH (12-Volt).** When activated, switch energizes the spotlight(s) located on each side of the ladder tip and the lower tracking lights.

35. **RUNG ALIGNMENT INDICATOR.** When illuminated, indicates that the overlapping ladder sections have their rungs in proper alignment.

2-1.5 Turntable Console Controls *(Continued)*

Figure 2-8: Turntable Console



1062

Item #	Description and Function

36. **STABILIZER NOT FULLY EXTENDED INDICATOR.** When illuminated, indicates that one (or more) of the stabilizer beams is not fully extended.

37. **REMOTE AERIAL CONTROL ACTVATION SWITCH *(Optional)*.** Allows the aerial to be operated with the remote control.

NOTE:

- The EPU should be used only when the main system hydraulic pump is not operating.
- The EPU has a limited run time before possible overheating. DO NOT run the EPU for more than 30-minutes without allowing at least 30 minutes for cooling down. Limiting loads and pressures will allow for more efficient use of the EPU and will also generate less heat.
- The EPU should only be activated after the desired function is selected.
- If the electronic system has failed and the manual aerial or stabilizer controls are being used, the EPU switch located at the manual stabilizer controls will be the only one active.

38. **HIGH IDLE SWITCH.** When activated, energizes the engine high idle circuit to take the engine to a preset rpm.

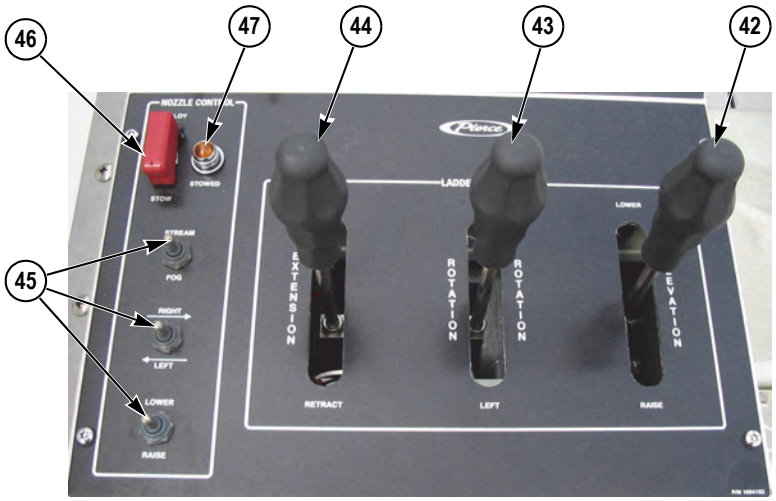
39. **EMERGENCY HYDRAULIC POWER SWITCH.** When activated, switch energizes the EPU. Used in the event of the loss of main system hydraulics.

40. **INDICATOR TEST SWITCH.** When activated, momentarily activates all indicator lights and alarms.

41. **SYSTEM PRESSURE GAUGE.** This gauge indicates the hydraulic pressure available to operate the aerial. The system standby (bias) pressure is 340–360 psi. The maximum system pressure is 2800psi.

2-1.5 Turntable Console Controls *(Continued)*

Figure 2-9: Turntable Console Controls



1110

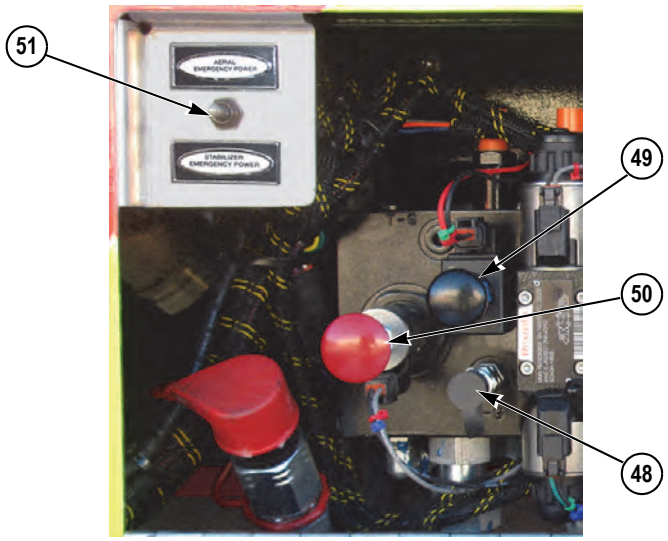
Item #	Description and Function
42.	**ELEVATION CONTROL LEVER.** Depress the operator presence control to activate hydraulic controls. Pull back on the lever to raise (elevate) the boom. Push forward on the lever to lower the boom. When the lever is released, it will return to the neutral or center position.
43.	**ROTATION CONTROL LEVER.** Depress the operator presence control to activate hydraulic controls. Pull back on the lever to move the boom counterclockwise (to the left). Push forward on the lever to move the boom clockwise (to the right). When the lever is released, it will return to the neutral or center position.
44.	**EXTENSION CONTROL LEVER.** Depress the operator presence control to activate hydraulic controls. Pull back on lever to retract the boom. Push forward on the lever to extend the boom. When the lever is released, it will return to the neutral or center position.
45.	**NOZZLE CONTROL SWITCHES.** Used to control the operation of the water monitor:
a.	LEFT/RIGHT - push right to move the nozzle right; push left to move the nozzle left.
b.	LOWER/RAISE - push up to move the nozzle down; push down to move the nozzle up.
c.	STREAM/FOG - push up for stream; push down for fog.
46.	**MONITOR DEPLOY AND STOW CONTROL SWITCH.** Used to position the monitor. Lift cover and move switch forward to deploy monitor. Lift cover and move switch back to stow monitor.
47.	**MONITOR STOWED/FAULT INDICATOR.** When indicator remains lit, the monitor is fully stowed. The indicator goes out whenever the monitor is moved from the stowed position. The indicator also goes out when the aerial is stowed in the cradle. Indicator also flashes for specific faults.

2-1.6 Manual Override Controls and Pressure Test Ports

WARNING

Read and follow the Manual Valve Controls Safety Instructions in the Safety section of this manual.

Figure 2-10: Manual Override Controls and Pressure Test Ports



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Item #	Description and Function

48. **MAIN HYDRAULIC PRESSURE TEST PORT.**

49. **STABILIZER HYDRAULIC POWER OVERRIDE KNOB.** Used in the event of the loss of aerial electric power. Stabilizer hydraulic power can be obtained by pulling and holding this knob.

50. **AERIAL HYDRAULIC POWER OVERRIDE KNOB.** Used in the event of the loss of aerial electric power. Aerial hydraulic power can be obtained by pulling and holding this knob.

NOTE:

- The EPU should be used only when the main system hydraulic pump is not operating.
- The EPU has a limited run time before possible overheating. DO NOT run the EPU for more than 30 minutes continuous without allowing 30 minutes for cooling down. Limiting loads and pressures will allow for more efficient use of the EPU and will also generate less heat.
- The EPU should only be activated after the desired function is selected.
- If the electronic system has failed and the manual aerial or stabilizer controls are being used, the EPU switch located at the manual stabilizer controls will be the only one active.

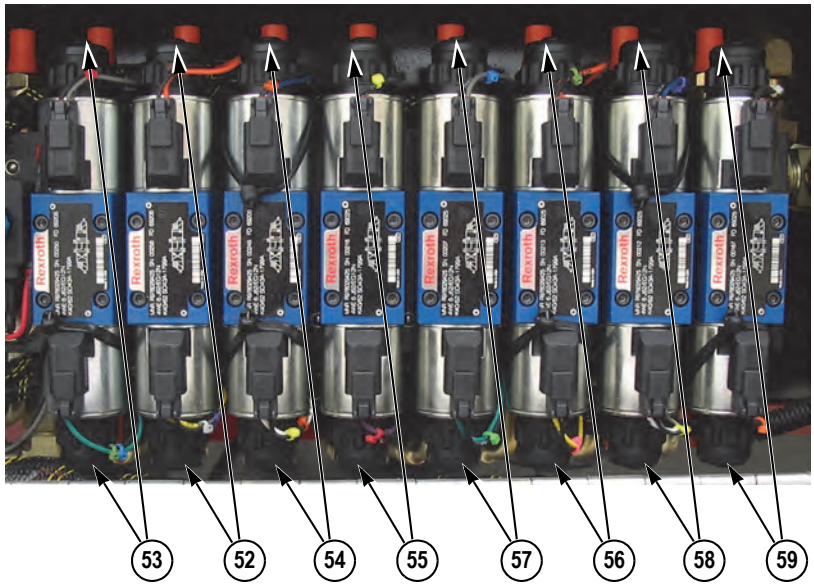
51. **AERIAL/STABILIZER EMERGENCY HYDRAULIC POWER SWITCH.** This switch engages the secondary hydraulic system. The position of this emergency power unit (EPU) switch is not dependent on other electrical circuits. Push UP to provide EPU power for the aerial functions; push DOWN to provide EPU power for the stabilizer functions.

2-1.6 Manual Override Controls and Pressure Test Ports *(Continued)*

⚠WARNING

Read and follow the Manual Valve Controls Safety Instructions in the Safety section of this manual.

Figure 2-11: Manual Stabilizer Override Controls



1111

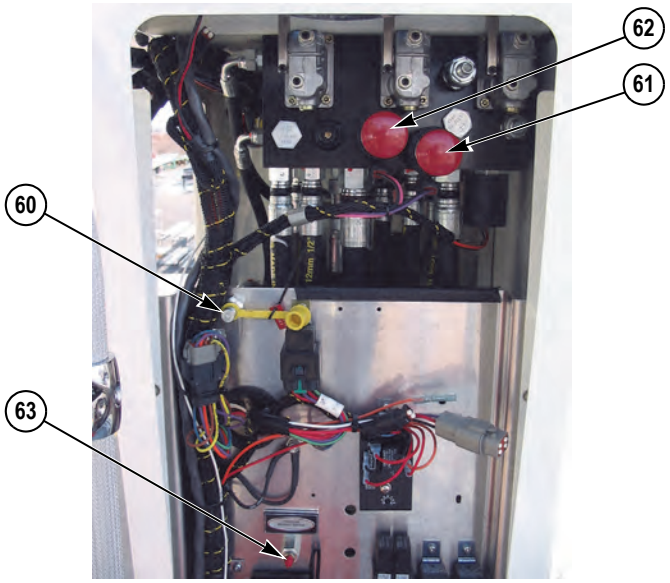
Item #	Description and Function
52.	**LEFT REAR STABILIZER JACK CYLINDER MANUAL OVERRIDE CONTROL.** Manually controls the operation of the left stabilizer jack cylinder.
53.	**LEFT REAR STABILIZER BEAM MANUAL OVERRIDE CONTROL.** Manually controls the operation of the left stabilizer beam cylinder.
54.	**RIGHT REAR STABILIZER JACK CYLINDER MANUAL OVERRIDE CONTROL.** Manually controls the operation of the right stabilizer jack cylinder.
55.	**RIGHT REAR STABILIZER BEAM MANUAL OVERRIDE CONTROL.** Manually controls the operation of the right stabilizer beam cylinder.
56.	**LEFT FRONT STABILIZER JACK CYLINDER MANUAL OVERRIDE CONTROL.** Manually controls the operation of the left stabilizer jack cylinder.
57.	**LEFT FRONT STABILIZER BEAM MANUAL OVERRIDE CONTROL.** Manually controls the operation of the left stabilizer beam cylinder.
58.	**RIGHT FRONT STABILIZER JACK CYLINDER MANUAL OVERRIDE CONTROL.** Manually controls the operation of the right stabilizer jack cylinder.
59.	**RIGHT FRONT STABILIZER BEAM MANUAL OVERRIDE CONTROL.** Manually controls the operation of the right stabilizer beam cylinder.

2-1.6 Manual Override Controls and Pressure Test Ports *(Continued)*

⚠WARNING

Read and follow the Manual Valve Controls Safety Instructions in the Safety section of this manual.

Figure 2-12: Manual Aerial Override Controls & Test Port

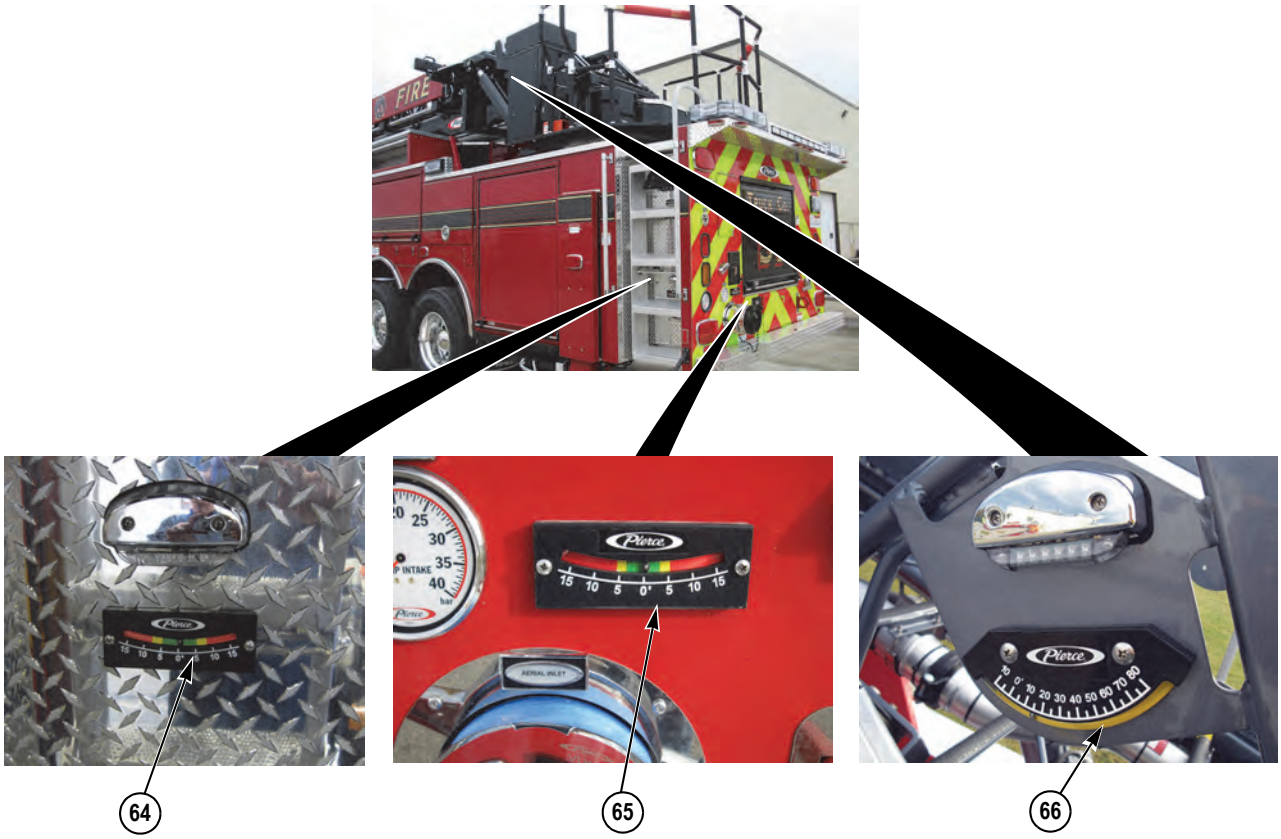


1080

Item #	Description and Function
60.	**HYDRAULIC SYSTEM LOAD SENSE PRESSURE & OIL SAMPLE PORT.**
61.	**BOOM COUNTERCLOCKWISE ROTATION EMERGENCY OVERRIDE KNOB.** Used in the event of the loss of aerial electric power. Boom counterclockwise hydraulic power can be obtained by pulling and holding this knob.
62.	**BOOM CLOCKWISE ROTATION EMERGENCY OVERRIDE KNOB.** Used in the event of the loss of aerial electric power. Boom clockwise hydraulic power can be obtained by pulling and holding this knob.
63.	**ROTATION BEARING GREASE FITTING.** Used to provide grease to the rotation bearing.

2-1.7 Manual Angle Indicators (Bubble Gauges)

Figure 2-13: Manual Angle Indicators - Typical Installation



1476, 1299, 1409, 1410

Item #	Description and Function

64. **APPARATUS ANGLE INDICATOR (GRADE - FRONT TO BACK).** Located on the side in the rear step well, indicates grade in degrees.

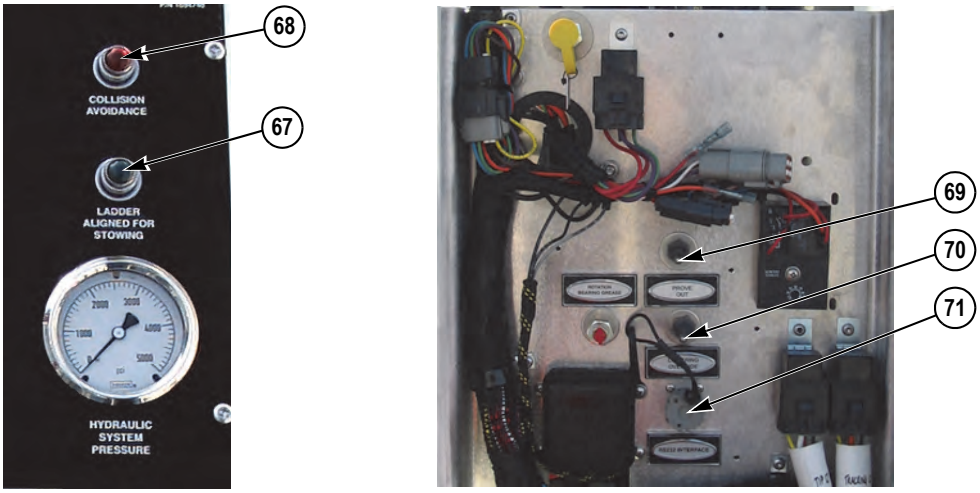
65. **APPARATUS ANGLE INDICATOR (SLOPE - SIDE TO SIDE).** Located at the rear of the truck, indicates side slope in degrees.

66. **LADDER ANGLE INDICATOR (ELEVATION).** Located on the side of the aerial, indicates the aerial elevation in degrees.

2-1.8 Collision Avoidance System *(Optional)*

System Operation: The Collision Avoidance system will be calibrated so that the aerial does not make contact with any part of the fire apparatus during normal operation.

Figure 2-14: Collision Avoidance System



1079/1219

Item #	Description and Function

67. **LADDER ALIGNED FOR STOWING INDICATOR.** When illuminated, indicates that the aerial is positioned between the cradle ears and is below a minimum elevation angle.

68. **COLLISION AVOIDANCE INDICATOR.** When illuminated, indicates that motion using the lower or boom rotation control levers has been limited. Once the Collision Avoidance mode has been entered, the aerial will need to be raised several degrees to allow rotation to resume.

69. **PROVE OUT SWITCH.** Used as a momentary test switch for the mini-multiplex system. When the switch is held on, The COLLISION AVOIDANCE red indicator light should flash indicating that there is good communication between the various multiplex components.

CAUTION

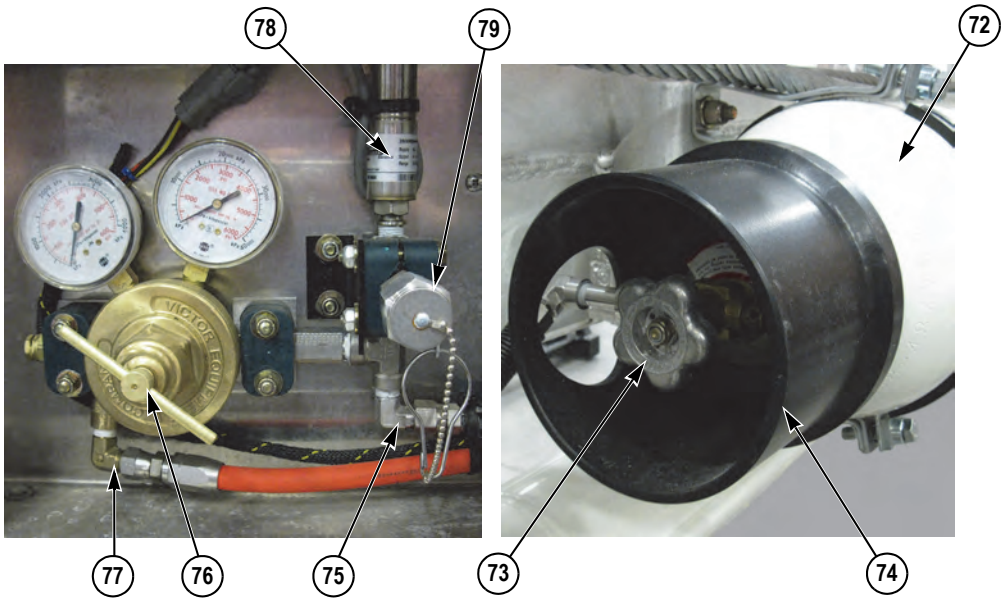
When the Lowering Override Switch is activated, all Collision Avoidance Safety features are deactivated. The aerial will be able to contact the truck body in this mode. Use extreme caution.

70. **LOWERING OVERRIDE SWITCH.** When activated, it allows the aerial to be lowered during a collision avoidance system/mini-multiplex system malfunction. The momentary switch must be engaged continuously to lower the aerial.

71. **RS232 INTERFACE CONNECTOR.** Used with the serial interface cable (RS232 cable) to connect a personal computer (PC) to the system.

2-1.9 Breathing Air System *(Optional)*

Figure 2-15: Breathing Air System - Typical Installation



1271, 1274

Item #	Description and Function
72.	**AIR BOTTLE.** High-pressure breathing air storage bottle.
73.	**SHUT-OFF VALVE WITH RELIEF VALVE.** Controls air flow to regulator with safety relief.
74.	**VALVE GUARD.** Protects valve. **Must be in place at all times.**
75.	**HIGH-PRESSURE HOSE ASSEMBLY.** Rated for maximum storage bottle air pressure.
76.	**REGULATOR AND GAUGES.** Regulates supply line pressure to respirator disconnects. Normal setting is 80-100 psi.
77.	**LOW-PRESSURE HOSE ASSEMBLY.** Supplies breathing air to respirator disconnects.
78.	**PRESSURE TRANSDUCER.** Monitors pressure (volume) in air storage bottle.
79.	**FILL ADAPTER.** Connection point to refill air storage bottle.

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SECTION 3 LOAD AND LEVEL CHARTS

3-1. Load Chart and Level Chart Information

IMPORTANT: Selecting the proper load chart for your device is essential to safe operation. Load charts are developed considering many factors including the device design, stabilizer spread, stabilizer configuration, counterweight, etc. Load charts for common configurations are provided in this section, but the exact chart for your device will be the chart located at the control platform. Check the load chart part number on your device and match it to the part number in this manual to be sure you are using the correct load chart and the correct corresponding ice conditions load chart.

3-1.1 75-Foot Steel Aerial Ladder - (Maximum Tip Capacity 500-lb Dry / 500-lb Wet)

3-1.1a Load Charts

⚠WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-1: 75-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS
(500-lb dry / 500-lb flowing water - maximum tip load capacity)

Pierce

75 FOOT STEEL AERIAL LADDER LOAD CHART
500# WET/500# DRY RATED TIP CAPACITY

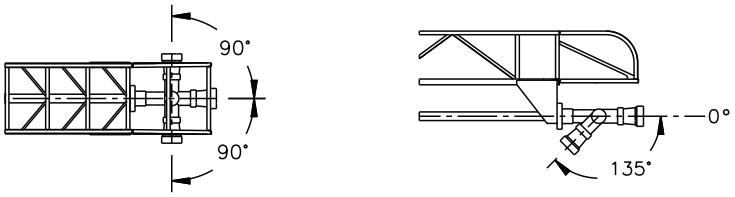
WATERWAY DRY 50 MPH Wind Condition								
	Aerial Elevation							
	-5° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	250#	500#	750#	1000#
Mid	–	–	250#	500#	500#	750#	1000#	1000#
Base	–	250#	500#	500#	750#	1000#	1000#	1000#

WATERWAY CHARGED 50 MPH Wind Condition								
	Aerial Elevation							
	-5° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	250#	250#	500#	750#
Mid		–	–	250#	250#	500#	750#	1000#
Base	–	–	250#	500#	500#	750#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, mid section or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 75 feet
Rated horizontal reach at: 0° = 69 feet – 2 inches
45° = 48 feet – 8 inches
75° = 17 feet – 6 inches

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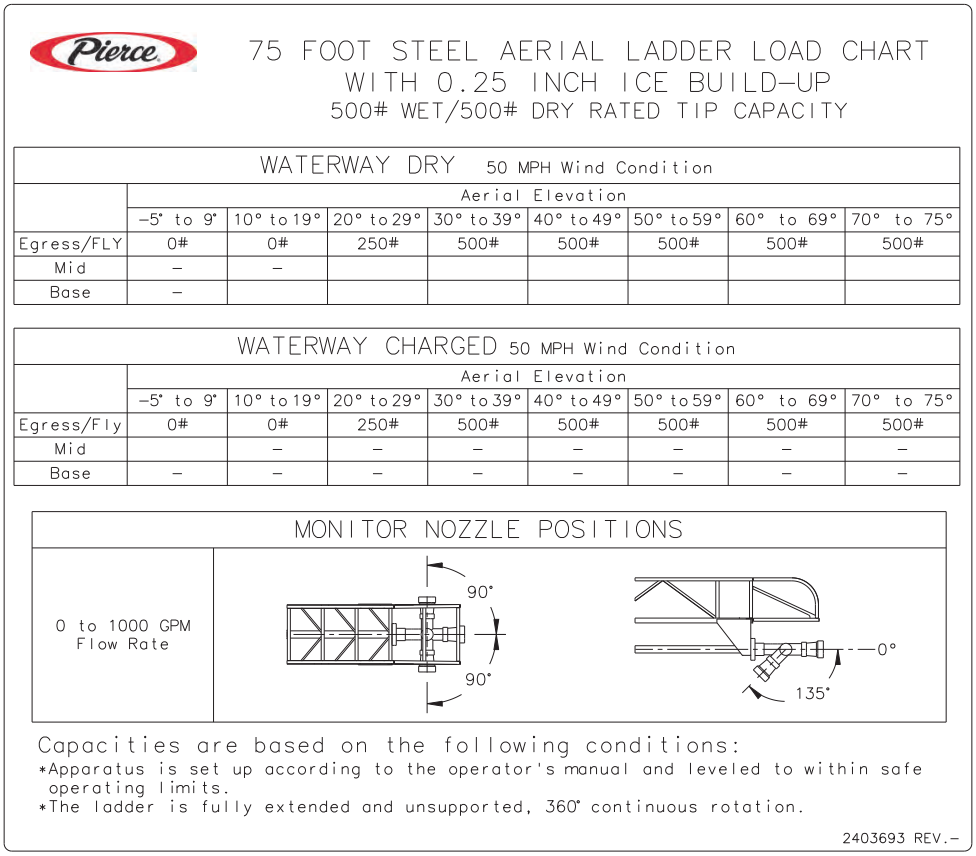
⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-2: 75-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (500-lb dry / 500-lb flowing water - maximum tip load capacity)



75 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
500# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	-5° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/FLY	0#	0#	250#	500#	500#	500#	500#	500#
Mid	–	–						
Base	–							

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-5° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	250#	500#	500#	500#	500#	500#
Mid		–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate

90°
90°
0°
135°

Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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3-1.1b Level Charts

Table 3-3: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-4: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.2 100-Foot Steel Aerial Ladder - (Maximum Tip Capacity 500-lb Dry / 250-lb Wet)

3-1.2a Load Charts

⚠WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-5: 100-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS (500-lb dry / 250-lb flowing water - maximum tip load capacity)

Pierce

100 FOOT STEEL AERIAL LADDER LOAD CHART
250# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	–8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	–	250#	500#	750#
Upper Mid	–	–	–	–	250#	500#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	–8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	250#	250#	250#	250#	500#	500#	500#	500#
Fly	–	–	–	–	–	250#	500#	500#
Upper Mid	–	–		–	–	250#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate

Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 100 feet
Rated horizontal reach at: 0° =94 feet – 1 inches
45° = 66 feet – 0 inches
75° = 23 feet – 8 inches

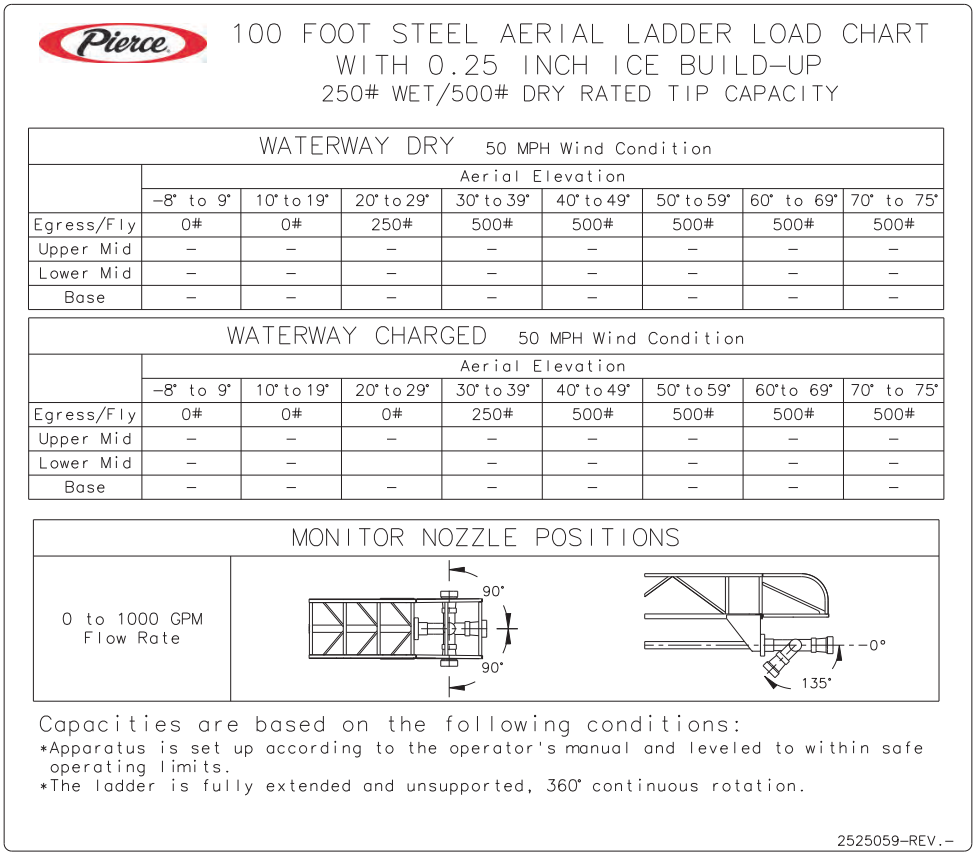
2354865–REV.B

2354865B

⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-6: 100-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (500-lb dry / 250-lb flowing water - maximum tip load capacity)



100 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
250# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	250#	500#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	0#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–		–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate

Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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2525059

3-1.2b Level Charts

Table 3-7: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-8: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.3 100-Foot Steel Aerial Ladder - (Maximum Tip Capacity 500-lb Dry / 500-lb Wet)

3-1.3a Load Charts

WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-9: 100-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS (500-lb dry / 500-lb flowing water - maximum tip load capacity)

100 FOOT STEEL AERIAL LADDER LOAD CHART
500# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	250#	250#	750#	1000#
Upper Mid	–	–	–	250#	250#	500#	1000#	1000#
Lower Mid	–	–	250#	250#	500#	750#	1000#	1000#
Base	–	250#	500#	500#	750#	1000#	1000#	1000#

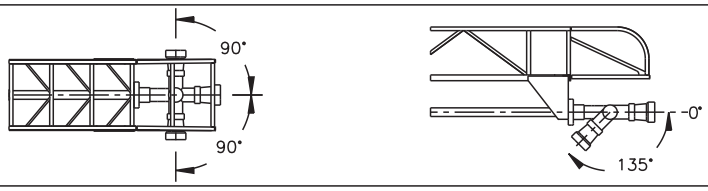
WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	–	250#	500#	750#
Upper Mid	–	–		–	250#	500#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:

*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 100 feet
Rated horizontal reach at: 0° = 95 feet – 1 inches
45° = 66 feet – 9 inches
75° = 23 feet – 11 inches

2354865–REV.B

2354863B

⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-10: 100-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (500-lb dry / 500-lb flowing water - maximum tip load capacity)

100 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
500# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

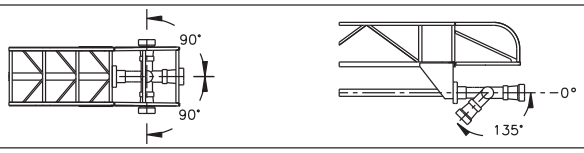
	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	250#	250#	500#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	0#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–		–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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3-1.3b Level Charts

Table 3-11: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-12: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.4 100-Foot Steel Aerial Ladder - (Maximum Tip Capacity 750-lb Dry / 500-lb Wet)

3-1.4a Load Charts

⚠WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-13: 100-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS (750-lb dry / 500-lb flowing water - maximum tip load capacity)

Pierce

100 FOOT STEEL AERIAL LADDER LOAD CHART

500# WET/750# DRY RATED TIP CAPACITY, 14' STABILIZER SPREAD

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	–8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	750#	750#	750#	750#	750#	750#	750#	750#
Fly	–	–	–	–	–	250#	250#	250#
Upper Mid	–	–	–	–	250#	500#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

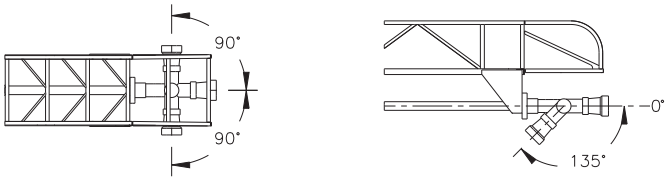
WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	–8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	750#	750#	750#	750#
Fly	–	–	–	–	–	–	250#	250#
Upper Mid	–	–		–	–	250#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:

*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 100 feet
Rated horizontal reach at: 0° =94 feet–1 inches
45° = 66 feet–0 inches
75° = 23 feet–8 inches

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2354869B

⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-14: 100-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (750-lb dry / 500-lb flowing water - maximum tip load capacity)

100 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
500# WET/750# DRY RATED TIP CAPACITY, 14' STABILIZER SRPREAD

WATERWAY DRY 50 MPH Wind Condition

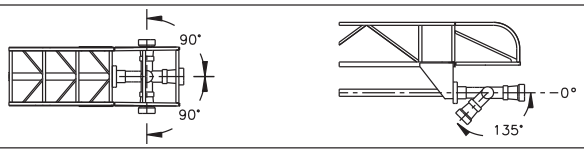
	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	250#	250#	500#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	0#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–		–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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2525060

3-1.4b Level Charts

Table 3-15: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-16: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.5 105-Foot Steel Aerial Ladder - (Maximum Tip Capacity 500-lb Dry / 500-lb Wet)

3-1.5a Load Charts

WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-17: 105-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS
(500-lb dry / 500-lb flowing water - maximum tip load capacity)

Pierce

105 FOOT STEEL AERIAL LADDER LOAD CHART
500# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	250#	250#	750#	1000#
Upper Mid	–	–	–	250#	250#	500#	1000#	1000#
Lower Mid	–	–	250#	250#	500#	750#	1000#	1000#
Base	–	250#	250#	500#	750#	1000#	1000#	1000#

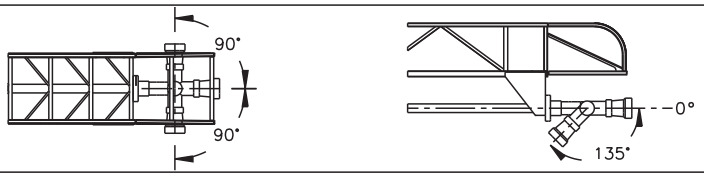
WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	–	250#	500#	750#
Upper Mid	–	–	–	–	250#	500#	750#	1000#
Lower Mid	–	–		250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section, or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 105 feet
Rated horizontal reach at: 0° = 100 feet–7 inches
45° = 70 feet–8 inches
75° = 25 feet–6 inches

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⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-18: 105-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (500-lb dry / 500-lb flowing water - maximum tip load capacity)

105 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
500# WET/500# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

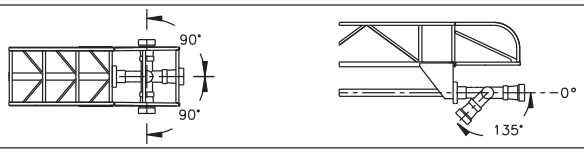
	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	250#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	0#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–		–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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3120130

3-1.5b Level Charts

Table 3-19: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-20: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.6 105-Foot Steel Aerial Ladder - (Maximum Tip Capacity 750-lb Dry / No Waterway)

3-1.6a Load Charts

⚠WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-21: 105-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS (750-lb dry / No Waterway - maximum tip load capacity)

105 FOOT STEEL AERIAL LADDER LOAD CHART

750# RATED TIP CAPACITY

50 MPH WIND CONDITION

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	750#	750#	750#	750#	750#	750#	750#	750#
Fly	-	-	-	-	-	-	250#	750#
Upper Mid	-	-	-	-	250#	250#	500#	750#
Lower Mid	-	-	-	250#	250#	500#	1000#	1000#
Base	-	-	250#	250#	250#	750#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section or base section as needed.

Capacities are based on the following conditions:

* Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
* The ladder is fully extended and unsupported, 360° continuous rotation.
* For icing conditions, refer to the operator's manual.

Rated vertical height: 105 feet
Rated horizontal reach at: 0° = 100 feet-7 inches
45° = 70 feet-8 inches
75° = 25 feet-6 inches

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⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

NOTE: The following capabilities shall be based upon continuous 360° rotation and aerial at full extension, with 0.25 in. of ice build-up.

Table 3-22: 105-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (750-lb dry / No Waterway - maximum tip load capacity)

Waterway Dry and 50 mph Wind Condition								
Degree of Elevation	–8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	450	500	500	500	750	750	750	750
Fly	—	—	—	—	—	—	500	500
Upper Mid	—	—	—	—	—	250	500	500
Lower Mid	—	—	—	250	250	250	1000	1000
Base	—	—	250	250	250	500	1000	1000

3-1.6b Level Charts

Table 3-23: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-24: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

3-1.7 105-Foot Steel Aerial Ladder - (Maximum Tip Capacity 750-lb Dry / 500-lb Wet)

3-1.7a Load Charts

⚠WARNING

Read and follow all the instructions found in the Safety section of this manual prior to operation

Table 3-25: 105-FOOT STEEL AERIAL LADDER - NORMAL CONDITIONS (750-lb dry / 500-lb flowing water - maximum tip load capacity)

105 FOOT STEEL AERIAL LADDER LOAD CHART
500# WET/750# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	750#	750#	750#	750#	750#	750#	750#	750#
Fly	–	–	–	–	–	250#	500#	750#
Upper Mid	–	–	–	–	250#	500#	750#	1000#
Lower Mid	–	–	–	250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

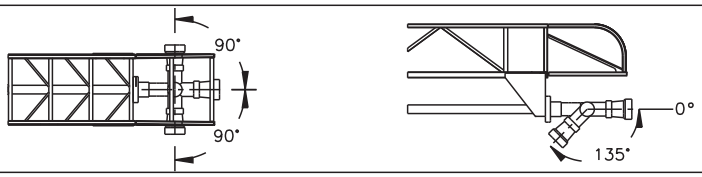
WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress	500#	500#	500#	500#	500#	500#	500#	500#
Fly	–	–	–	–	–	250#	500#	750#
Upper Mid	–	–	–	–	250#	500#	750#	1000#
Lower Mid	–	–		250#	500#	750#	1000#	1000#
Base	–	–	250#	500#	750#	1000#	1000#	1000#

Reduced loads at the tip can be redistributed in 250# increments to the fly section, upper mid section, lower mid section, or base section as needed.

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.
*For icing conditions, refer to the operator's manual.

Rated vertical height: 105 feet
Rated horizontal reach at: 0° = 100 feet–7 inches
45° = 70 feet–8 inches
75° = 25 feet–6 inches

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⚠WARNING

Read and follow all the Aerial Operation in Cold Weather Safety Instructions found in the Safety section of this manual prior to operation

Table 3-26: 105-FOOT STEEL AERIAL LADDER - ICE CONDITIONS (750-lb dry / 500-lb flowing water - maximum tip load capacity)

105 FOOT STEEL AERIAL LADDER LOAD CHART
WITH 0.25 INCH ICE BUILD-UP
500# WET/750# DRY RATED TIP CAPACITY

WATERWAY DRY 50 MPH Wind Condition

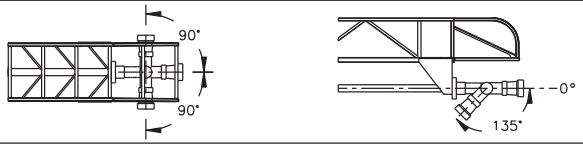
	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	250#	250#	500#	500#	750#	750#	750#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–	–	–	–	–	–	–
Base	–	–	–	–	–	–	–	–

WATERWAY CHARGED 50 MPH Wind Condition

	Aerial Elevation							
	-8° to 9°	10° to 19°	20° to 29°	30° to 39°	40° to 49°	50° to 59°	60° to 69°	70° to 75°
Egress/Fly	0#	0#	0#	250#	500#	500#	500#	500#
Upper Mid	–	–	–	–	–	–	–	–
Lower Mid	–	–		–	–	–	–	–
Base	–	–	–	–	–	–	–	–

MONITOR NOZZLE POSITIONS

0 to 1000 GPM Flow Rate



Capacities are based on the following conditions:
*Apparatus is set up according to the operator's manual and leveled to within safe operating limits.
*The ladder is fully extended and unsupported, 360° continuous rotation.

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3-1.7b Level Charts

Table 3-27: Apparatus Leveling Safe Operating Limits for Full Load Chart Capacity Operating Conditions

Level Limits for Full Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	3.5°	**GREEN**
Grade (Front-to-Back)	5.5°	**GREEN**

Table 3-28: Apparatus Leveling Safe Operating Limits for 50% Load Chart Capacity Operating Conditions

Level Limits for 50% Load Chart Capacity Operating Conditions		
Direction	**Maximum Safe Operating Angle (degrees)**	**Color**
Slope (Side-to-Side)	5.5°	**YELLOW**
Grade (Front-to-Back)	6.5°	**YELLOW**

4-1. Preparing for Operation

NOTE: This manual may provide information that will not apply to your apparatus because it does not include a particular option or feature. Read this manual carefully to be sure you are referencing information that is applicable to your particular apparatus and aerial device configuration.

4-1.1 Pre-Driving Checks

WARNING

Read and follow the safety instructions in your Pierce Chassis operator manual corresponding with your apparatus prior to driving.

WARNING

Read and follow the Riding Safely instructions found in the safety section of this manual.

In addition to the chassis pre-trip related safety instructions found in your apparatus chassis manual, perform the following checks on your aerial apparatus prior to driving.

- The device is properly in its cradle with sufficient downward pressure to ensure it will not bounce during travel
- All Stabilizers are completely retracted
- All compartment doors are closed and latched
- Stabilizer pads are properly restrained in their storage brackets
- Wheel chocks are properly restrained in their storage brackets
- The AERIAL MASTER Switch is in the OFF position
- The AERIAL PTO Switch is in the OFF position

4-1.2 Response Scene Location Planning

WARNING

Read and follow the Safe Aerial Set-Up instructions found in the safety section of this manual.

Your aerial apparatus is larger than most other vehicles on the road. You therefore need to know your response area well and plan ahead for tight areas, low obstructions, bridges, power lines, and other potential hazards. Consult your department standard operating procedures and the *IFSTA Pumping and Aerial Apparatus Driver/Operator Handbook* to learn about the many factors involved in properly positioning your apparatus at the scene. These considerations should include but not be limited to:

- Fire location
- Water source location
- Other apparatus positioning

- Optimal access to potential rescue sites on a structure
- Wind direction
- Ground stability
- Structure collapse zone
- Power lines
- Escape route

4-1.3 Response Scene Position Planning for Terrain

⚠WARNING

Read and follow the Safe Aerial Set-up and Operating within Safe Level Limits instructions found in the safety section of this manual.

Level Terrain

Always position your aerial apparatus on the most even terrain possible. Your apparatus must be capable of being leveled to within the safe operating limits as described in *Load Chart and Level Chart Information* of this manual. The area around the apparatus must be clear of obstructions so that the stabilizers can be deployed.

Uneven Terrain

Your apparatus may be set up on sloped terrain as long as it can still be leveled to within the safe operating limits as described in *Load Chart and Level Chart Information* of this manual. You may wish to consider the following when positioning on uneven terrain.

4-1.3a Advantages of positioning your apparatus on an uphill grade:

- Compartments and other items on the rear of the apparatus will be higher and may require a ground ladder or stepping stool to reach.
- It may not be possible to lower the tip of the aerial or platform enough to reach the ground.

4-1.3b Advantages of positioning your apparatus on a downhill grade:

- The cab doors and other items at the front of the apparatus will be higher and may require a ground ladder or stepping stool to reach.
- For apparatus with only two stabilizers at the rear it may not be possible to level the apparatus.

4-2. Apparatus Leveling Safe Operating Limits

4-2.1 Safe Operating Limits for Leveling

Your apparatus should be as level as possible prior to operation. It must be leveled within the limits shown in the “Apparatus Leveling Safe Operating Limits” tables found in *Load Chart and Level Chart Information* of this manual for the load chart values to be valid. In these conditions the apparatus angle indicators will be within the green range.

If you are unable to level your apparatus within the green range, you may set up within the yellow range, but only with reduced load chart capacity. If either the Grade or Slope apparatus angle indicators are outside the green range but still within the yellow range, then the device can be operated at 50% (half) capacity. This means that you must cut each of the load values in the load chart in half. For example, if the load chart indicates an acceptable load with 500 lbs at the mid and 250 lbs on the base, then the half-capacity values when operating in the yellow range would be 250 lbs at the mid and 125 lbs on the base. This 50% capacity condition is only safe if the apparatus is leveled within the limits shown in *Load Chart and Level Chart Information* of this manual.

If you are unable to set up your apparatus with the apparatus angle indicators within either the green or yellow safe limits, then the apparatus must be repositioned until it can be.

4-3. Stabilizing the Apparatus

⚠WARNING

Read and follow the Safe Aerial Set-up and Operating within Safe Level Limits instructions found in the Safety section of this manual.

4-3.1 Aerial Set-Up Preparation

1. Using a spotter, position the apparatus in the selected location
2. Place the transmission to NEUTRAL.
3. Apply the PARKING BRAKE
4. Apply the FRONT WHEEL LOCK *(if equipped).*
5. Provide electrical power to the aerial system by moving the AERIAL MASTER switch to the ON position
6. Provide hydraulic power to the aerial system by moving the AERIAL PTO switch to the ON position.
7. Ensure that the AERIAL PTO switch indicator light is illuminated indicating that the PTO has engaged.
8. Exit the cab.
9. Chock the apparatus wheels properly for the apparatus position as follows:

   Apparatus Equipped with Four Stabilizers;

   Place chocks in back of the front wheels if facing uphill

   Place chocks in front of the rear wheels if facing downhill.

   Always place the wheel chocks where they will give the most resistance to truck movement.

   Apparatus Equipped with Two or Three Stabilizers;

   Place chocks on both sides of the front axle wheels.

4-3.2 Stabilizer Deployment

WARNING

Stabilizers must be fully extended for safe operation through 360 degrees of rotation.

WARNING

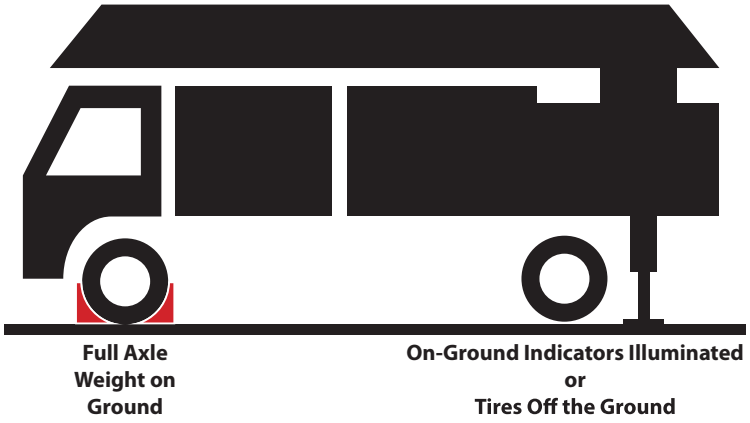
Apparatus must be stabilized within the safe level range before operation.

1. Locate the stabilizer controls.
2. Ensure that the stabilizer area is clear of all personnel.
3. Shout your intention to deploy stabilizers.
4. Move the HIGH IDLE switch *(if equipped)* to the ON position.
5. Use the stabilizer controls to extend the stabilizer beams completely.
6. Locate and place the stabilizer ground pads centered beneath the stabilizer jacks.

4-3.3 Leveling Apparatus Equipped with Two Stabilizers

1. Lower each jack until its on-ground indicator is illuminated.
2. Lower each jack further keeping the apparatus within the safe level limits in slope and grade.

Figure 4-1: Wheel Chock Placement - Two Stabilizers



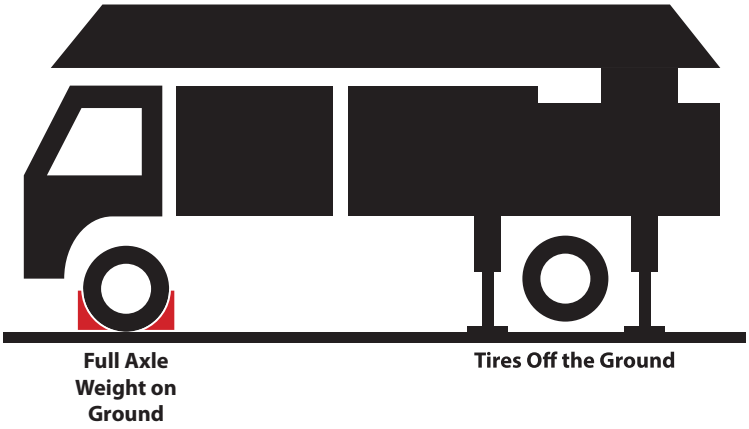
RL006

3. Install wheel chocks on both sides of the front axle tires.

4-3.4 Leveling Apparatus Equipped with Three Stabilizers

1. Lower each front jack until its on-ground indicator is flashing.
2. Lower each jack further keeping the apparatus within the safe level limits in slope and grade until the rear tires are off the ground.
3. Lower the rear center down rigger until the on-ground indicator lamp has a steady glow.

Figure 4-2: Wheel Chock Placement - Three Stabilizers



RL005

4. Install wheel chocks on both sides of the front axle tires.

4-3.5 Leveling Apparatus Equipped with Four Stabilizers

Tip Hazard

⚠WARNING

The front tires MUST be in contact with the ground for stability over the front of the apparatus. Apparatus tipping or sudden movement may injure or kill.

For Multiplexed Rear Mounted Aerial Devices - Front axle sensor detects when front axle weight is off ground, limiting aerial device reach over front of apparatus. The system will restrict horizontal reach of the device over the front of the apparatus unless the sensor indicates there is sufficient weight on the front axle to remain stable. This sensor is not active in the manual over-ride mode. Never use the manual controls to rotate the aerial device over the front of the apparatus unless the full weight of the front axle is firmly on the ground. Apparatus tipping or sudden movement may injure or kill.

For Non-Multiplexed Aerial Devices - Never rotate the aerial device over the front of the apparatus unless the full weight of the front axle is firmly on the ground. Apparatus tipping or sudden movement may injure or kill.

Apparatus on Level Terrain

1. Lower each jack until the on-ground indicator is illuminated for all stabilizers.
2. Lower each jack further until the apparatus angle indicators show that the apparatus is within the safe level range in slope and grade.
3. The #2 and #3 axle tires can be on or off the ground so long as the on-ground indicators are illuminated.

Figure 4-3: Wheel Chock Placement - Four Stabilizers and Level

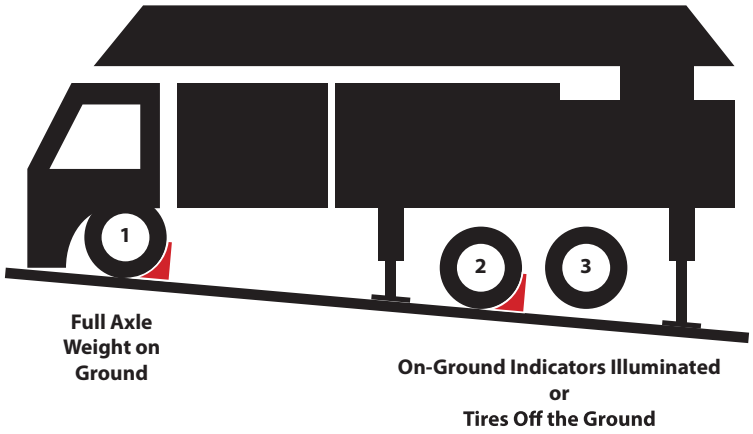
RL001

4. Install wheel chocks on both sides of the front axle tires.

Apparatus Pointed Up-Hill

1. Lower each REAR jack until the apparatus is within the safe level range in slope and grade.
2. Lower each FRONT jack until its on-ground indicator is illuminated.
3. Lower each jack further keeping the apparatus within the safe level range until the #3 axle tires are off the ground.

Figure 4-4: Wheel Chock Placement - Four Stabilizers Pointed Up Hill



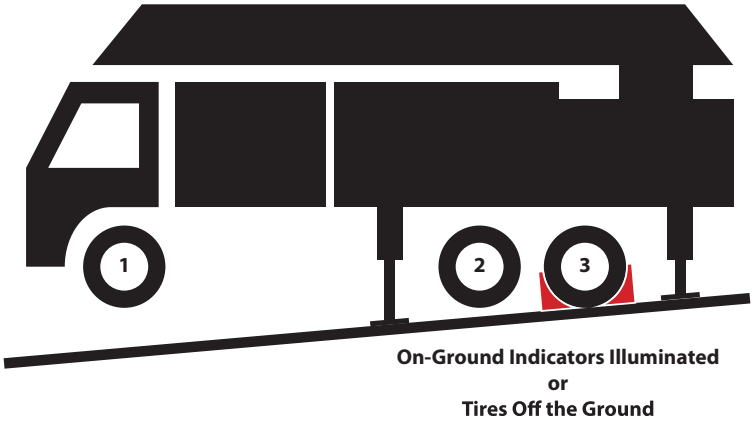
RL002

4. Install wheel chocks on the downhill sides of the #1 and #2 axle tires.

Apparatus Pointed Down-Hill

1. Lower each front jack until the apparatus is level in slope and grade.
2. Lower each REAR jack until its on-ground indicator is illuminated.
3. Lower each jack further keeping the apparatus level in slope and grade until the #2 axle tires are off the ground.

Figure 4-5: Wheel Chock Placement - Four Stabilizers Pointed Down Hill



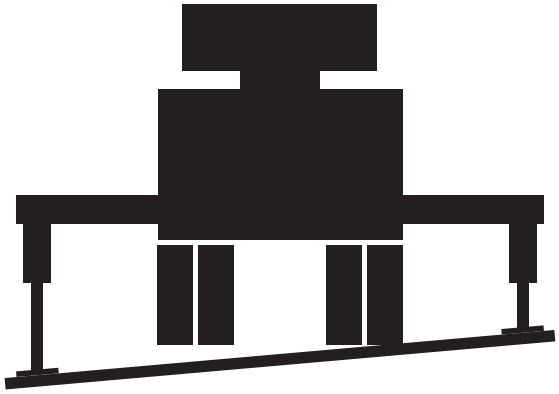
RL003

4. Install wheel chocks on both sides of the #3 axle tires.

Apparatus on Side-Slope

1. Lower each low-side jack until the apparatus is level.
2. Lower each high-side jack until its on-ground indicator is illuminated
3. Lower each jack further keeping the apparatus within the safe level limits in slope and grade until the low-side tires are off the ground.

Figure 4-6: Slide Slope



RL004

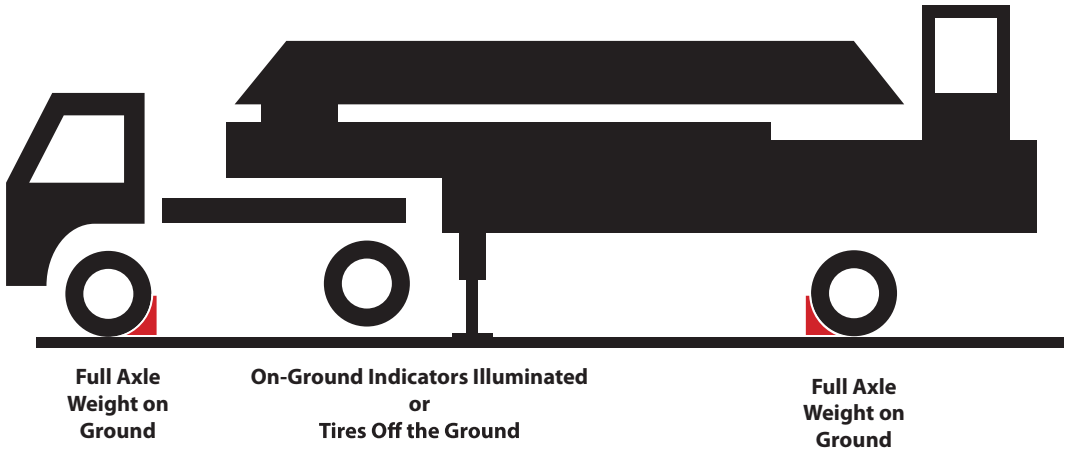
4-3.6 Leveling Tiller Apparatus

Level Terrain

NOTE: Your tiller apparatus can maintain stability with the trailer in a straight or jackknifed condition.

1. Lower each jack until the on-ground indicator is illuminated.
2. Lower each jack further until the apparatus angle indicators show that the apparatus is within the safe level range in slope and grade.
3. The rear tractor axle tires can be on or off the ground so long as the on-ground indicators are illuminated.

Figure 4-7: Wheel Chock Placement - Tiller on Level Ground

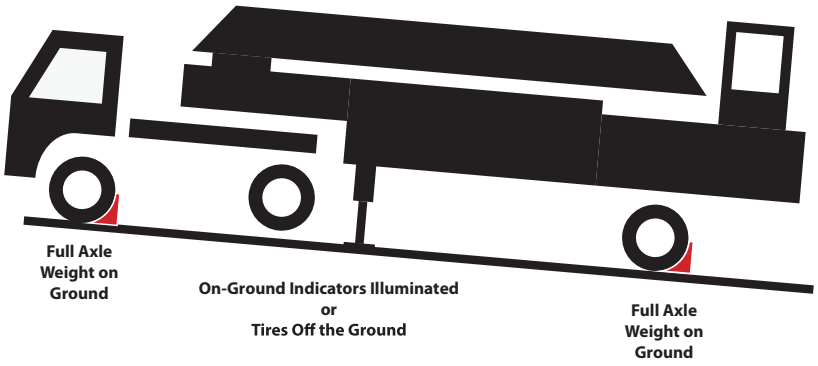


RL007

4. Move the fifth-wheel lock-out control lever to the LOCKED position *(if equipped)*.
5. Observe the fifth-wheel lock-out control lever to make sure the retaining latch will hold the lever in the LOCKED position *(if equipped)*.
6. Install wheel chocks on the BACK side of the front axle tire and the FRONT side of the tiller trailer axle tire.

Tiller Apparatus Pointed Up-Hill

Figure 4-8: Wheel Chock Placement - Tiller Pointing Up Hill

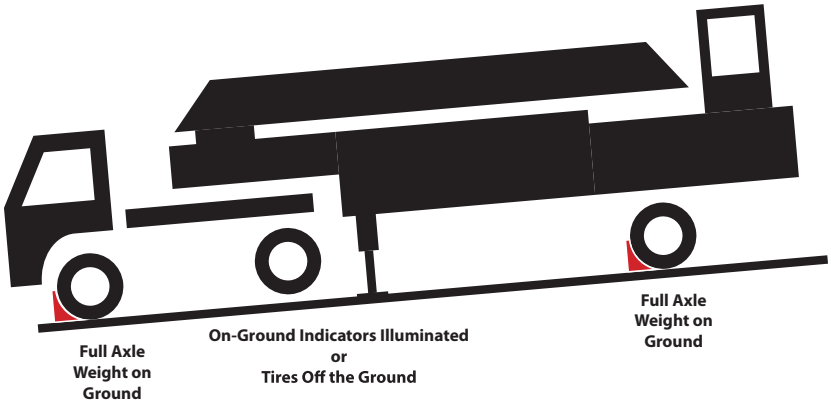


RL008

1. Install wheel chocks on the BACK side of the front axle tire and the tiller trailer axle tire.

Tiller Apparatus Pointed Down-Hill

Figure 4-9: Wheel Chock Placement - Tiller Pointing Down Hill



RL009

1. Install wheel chocks on the FRONT side of the front axle tire and the tiller trailer axle tire.

Tiller Jackknife Condition

⚠WARNING

If your tiller aerial apparatus includes a kingpin lockout feature, do not operate the aerial when the tiller tractor is jackknifed in excess of 30 degrees for a non-Ascendant aerial or in excess of 60 degrees for an Ascendant aerial of being in line with the tiller trailer. The apparatus is unstable in this condition and could tip over causing serious injury or death to personnel.

With Kingpin Lockout (Non-Ascendant Aerial)

If your tiller aerial apparatus includes a kingpin lockout feature, then it is designed to allow 360 degrees of ladder rotation with the tractor in-line with the trailer, or jackknifed up to 30 degrees. Observe the arrow indicators on the turntable and make sure that the arrow on the tractor is between the arrows on the turntable. This will ensure that your apparatus is within the 30 degree jackknife criteria.

With Kingpin Lockout (Ascendant Aerial)

If your tiller aerial apparatus includes a kingpin lockout feature, then it is designed to allow 360 degrees of ladder rotation with the tractor in-line with the trailer, or jackknifed up to 30 degrees. Note that there is limited ladder rotation when the trailer is jackknifed between 30 degrees and 60 degrees. Observe the arrow indicators on the turntable and make sure that the arrow on the tractor is between the arrows on the turntable. This will ensure that your apparatus is within the 60 degree jackknife criteria.

Without Kingpin Lockout (Non-Ascendant Aerial)

If your tiller aerial apparatus DOES NOT include a kingpin lockout feature, then it is designed to allow 360 degrees of ladder rotation with the tractor in-line with the trailer, or jackknifed at any angle.

4-3.7 Level Assist

NOTE: Your apparatus may be equipped with a Level Assist feature.

4-3.7a Level Assist for Three Stabilizer System

1. To use Level Assist, lower the front stabilizers on both sides of the apparatus until the on-ground indicators begin to flash.
2. Engage the Level Assist switch to have the Command Zone system bring the apparatus into a near-level condition. The rear axle will be off the ground and the on-ground indicators will be illuminated without flashing.
3. Check display for error message. If there is insufficient travel to level the apparatus, the alarm will sound and the on-ground indicators will continue to flash. Reposition apparatus or add cribbing or blocking and repeat leveling procedure.
4. Lower the center downrigger until the on-ground indicator is illuminated without flashing.

NOTE: The system will monitor the position of the front jack cylinders. When “Firm on Ground” is detected, the system knows if it can extend the front jack cylinders the additional 6 inches needed to raise the rear axle off the ground.

The center rear jack cylinder cannot be moved until both front stabilizer on-ground indicators are illuminated without flashing.

If the rear axle has not been lifted off the ground but all three jack cylinders have established a “Firm on Ground” set up with the front stabilizers fully extended, the ladder will be allowed to operate with limited horizontal reach. The reach will be limited when operating over the side of the apparatus.

For full aerial reach over the front of the truck, the front tires must remain in firm contact with the ground. Setting the truck up with the front tires off the ground will result in limited reach over the front of the truck.

4-3.7b Level Assist for Four Stabilizer System

1. To use Level Assist, follow the manual leveling procedure until the on-ground indicator is illuminated for all stabilizers.
2. Engage the Level Assist switch to have the Command Zone system bring the apparatus into a near-level condition.
3. Make final adjustments until the apparatus is in the proper condition of level as described in *“Apparatus Leveling Safe Operating Limits”* on *page 4-2*.

4-3.8 Final Setup - All Apparatus

1. Check the apparatus angle indicators in Slope and Grade to be sure that the apparatus level is still in the safe zone. If it is not, stow the stabilizers and reposition your apparatus.
2. Check to ensure that each stabilizer pad is centered under the stabilizer jack foot
3. Move the HIGH IDLE switch *(if equipped)* to the OFF position
4. Install all stabilizer jack safety pins *(if equipped)* into the highest available hole on the jack.
5. Adjust each pin so that the handle is about 1 inch from jack. This will ensure that if a jack settles it will rest on both sides of the pin evenly.
6. Reposition wheel chocks so that the downhill chock is against tire and the uphill chock is approximately 2 inches from tire.

4-3.9 Short-Jack Stabilizer Set-Up

⚠WARNING

Read and follow the Stabilizer Short Jack Deployment instructions found in the Safety section of this manual.

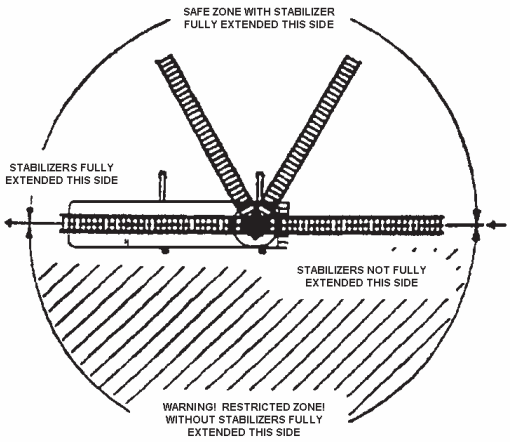
⚠WARNING

Your aerial device is equipped with a safety interlock that will prevent aerial operation over the short-jacked side. Do not rely on this interlock. Never attempt to rotate the device past the centerline of the apparatus over the short-jacked side.

Your apparatus has the option of setting up with the stabilizers only partially extended on one side of the apparatus (short-jacking). This option should only be used when absolutely necessary when you are forced to set up in tight quarters. In the short-jacked condition you must only operate your aerial device over the side where the stabilizers are fully extended and set. Follow the procedure for stabilizer setup with the following exceptions.

- On the short jack side, it will be necessary to extend the beam far enough to remove the stabilizer jack safety pin (if equipped) from its storage bracket and install it into the jack assembly.
- If your apparatus is equipped with Command Zone control system a short-jack graphic indicating the short-jack condition will appear on the CZIC display when the procedure is complete.

Figure 4-10: Short Jacking Diagram



POM0267

4-4. Aerial Operations

WARNING

Read and follow all the safety instructions found in the Safety section of this manual before operating.

4-4.1 Pre-Operation Checks

1. Review the maintenance log from the previous shift. Ensure that any deficiencies have been corrected.
2. Review the inspection records to ensure that any scheduled inspections have been performed (see maintenance section of this manual).
3. Visually inspect the aerial device for any damage, wear, corrosion, frayed cables, loose hardware, and other signs that the device may not be safe to operate.
4. Inspect all equipment mounting brackets to ensure they will securely retain the equipment as the aerial is raised.

4-4.2 Primary Operator

The primary control position is at the control console located at the turntable. A trained, experienced, and authorized operator must be stationed at these controls during the entire time your aerial device is being operated, and any time there are personnel on the ladder or in the platform. During operation one of the responsibilities of the primary operator is to watch and warn of any obstruction the aerial may contact and be ready to override any potentially dangerous movement.

4-4.3 Primary Operation

1. Deploy the turntable access ladder and ascend to the turntable platform using the three points of contact method.
2. Clip the safety chain or other device to close off the turntable platform railing entrance.
3. Open the control console cover.
4. Activate the alarm/indicator test switch for a pre-operation check.
5. Ensure that the waterway (if equipped) is either drained or that the discharge valve at the monitor is open to allow the waterway to extend or retract freely without stressing the seals.
6. Activate the LADDER ILLUMINATION lights *(if equipped)*.
7. Activate scene lighting or obtain scene lighting from another source or apparatus so that the operating scene is illuminated sufficiently for hazards within the operating area to be identified.
8. Determine the wind speed and ensure that it does not exceed the maximum allowable wind speed (see load chart).
9. Consider the following conditions and determine if the load chart provided at the console is applicable, or if an alternate chart is required or if the chart values need to be adjusted. Monitor these conditions continually during operation and adjust your aerial device loading accordingly.
   - — Wind speed
   - — Icing conditions
   - — Short-Jack configuration
   - — Apparatus set-up angle (green or yellow zone on the apparatus angle indicators)
10. Identify any obstructions in the area and plan how you will move the aerial device to avoid obstructions and maintain safe distance from power lines.

11. Order any personnel on the turntable to move away and stay away from the ladder and other parts that will move when the aerial device moves.
12. Communicate with spotters to be sure that there are no hazards that are not visible to you.
13. Shout out to spotters and personnel in the area that you intend to move the aerial device.
14. Engage the OPERATOR PRESENSE CONTROL (lifting up on the control lever collar, or pressing the foot switch).
15. Operate the elevation control to lift the aerial device out of the cradle.
16. Operate the elevate/depress, extend/retract, and rotate controls as required to move the aerial device to the desired position.
17. Approach the ground or any structure slowly and carefully, stopping motion before you make contact. Your aerial may make contact with the ground or structures if the weight of loading causes it to settle into contact. Your device is not designed for reverse loading and you should never power your device into the ground or onto a structure.

4-4.4 Secondary Operation at Ladder Tip *(If Equipped)*

Your aerial ladder may be equipped with tip controls. These controls are intended to be used by a trained, experienced, and authorized secondary operator at the tip of the ladder to make fine adjustments to the ladder position only. They should only be used with a primary operator at the main controls who is prepared to watch and warn of any obstruction the aerial may approach and be ready to override any potentially dangerous movement. Tip control allows the same position control functions as is available at the primary control position, but movement will only occur at reduced speed.

To make fine adjustments to the aerial ladder position from the ladder tip, use the following procedures:

- Ensure that the ladder rungs are aligned for climbing.
- Ascend the ladder to the tip control location.
- Clip your fall protection tether to a structural feature on the ladder.
- Deploy the folding steps.
- Place both feet on the folding steps.
- Establish communication with the primary operator.
- Request permission to operate the tip controls.
- Ask the primary operator to engage the momentary contact switch on the console that transfers control to the tip.
- Ask the primary operator to activate the OPERATOR PRESENSE CONTROL foot switch.
- Use the elevate, depress, and rotate controls to slowly and carefully make fine adjustments to the ladder position.
- If you find it necessary to extend or retract the ladder, do so only with extreme caution and with no other people on the ladder. Make sure both feet are completely on the folding steps and that nothing is positioned below the rungs of the section you are standing on. This includes your feet, toes, hands, other body parts, loose equipment, and clothing. Anything that is positioned between the rungs may be injured or damaged during extension or retraction. Do not extend or retract if the next lower ladder section is overlapping the fly section in the area where you are standing. Stop ladder retraction before any overlap occurs.
- Let the primary operator know that you are finished with your fine adjustments and that they can resume control by releasing the tip control switch.

4-4.5 Operating with Personnel on the Ladder

Allowing personnel onto the aerial ladder or aerial platform must be done in strict conformance to the applicable load chart based on the conditions present. Determine the safe load limits and plan to ensure that the load limits will not be exceeded as personnel or rescue victims move along the ladder or enter the platform.

Follow these procedures before allowing climbers onto your ladder!:

- Keep people away from the ladder and other moving parts until the aerial device is positioned and movement has ceased.
- Activate the breathing air valves at the air bottles and check the gauge(s) if breathing air will be used.
- Position the aerial device so that it will not need to be extended or retracted once personnel have begun their climb.
- Position the aerial device relative to the fire, smoke, or other hazard so that it can be moved out of harms way using ONLY the rotation, elevate, or depress functions. NEVER extend or retract with personnel on the ladder.
- Align the ladder rungs for climbing
- Ensure that climbing personnel are equipped with ladder belts and tethers.
- Ensure that climbing personnel have both hands and feet free for climbing. Keep loose equipment in pockets, packs, or otherwise securely tethered in ways that will not interfere with the climb.
- Ensure that rungs are free of ice or other slippery substances.
- Once personnel are on the ladder, never reposition without first ensuring that they have quit climbing and are properly tethered to a structural feature on the device.

4-4.6 Operating with Personnel in the Platform

Primary Operator

A trained, experienced, and authorized operator must be stationed at the primary controls at the turntable during the entire time your aerial platform device is being operated, and any time there are personnel on the ladder or in the platform.

Entering the Platform

If the platform has been positioned on the ground, you may enter through one of the gates at the front of the platform. Close and latch the gates once all personnel have entered. Never allow more personnel to enter than the load chart allows.

If the platform has been elevated, you may enter by climbing the ladder maintaining three points of contact at all times and entering through the back of the platform. If you need to pause to rest on your way up the ladder, be sure to clip your ladder belt tether to a structural feature. Unclip and proceed only after you are physically able. Lift the gate to enter the platform. Close and latch the gate once all personnel have entered. Never allow more personnel to enter than the load chart allows.

The horizontal area outside of the platform is intended to aid in entry or egress only. All personnel should be inside the platform or secured on a rescue basket using the LyfeSupport™ option any time the aerial device is off the ground.

Ladder Belt Anchors

Once you have entered the platform, locate a ladder belt anchor and clip your ladder belt tether to it. You should remained tethered to the platform until the aerial device has been properly positioned and you get the all clear from the primary and secondary operators that it is safe for you to unclip and proceed out of the platform.

Communication

Establish communication with the primary operator and be prepared to alert them immediately if you see anything that is unsafe.

Situational Awareness

Look above, below, behind, and all around the platform and ladder to become familiar with obstructions or hazards in the operating space. Maintain your situational awareness at all times. Alert the primary control operator of any approaching hazards and confirm with them that they are taking steps to avoid them.

Using the controls

Before using the secondary controls located in the platform:

- Ensure that there are no personnel on the ladder.
- Check that all personnel in the platform are properly secured using ladder belts and tethers.
- Look above, below, behind, and all around the platform and ladder to become familiar with obstructions or hazards in the operating space.
- Communicate with the primary control operator and ask them to make sure that all personnel are clear of the base section of the ladder

Use the elevate, depress, extend, retract, and rotate controls to slowly and carefully adjust the position of the platform. Operate controls smoothly to avoid jerking or sudden device motion.

Platform Leveling

Your platform is designed to stay level during operation. If you sense that the platform is not staying level, cease operation immediately and take the aerial device out of service until it is repaired.

4-4.7 Operating Suggestions

For single control lever operation, low engine idle speed is sufficient for acceptable performance.

For optimum performance, or simultaneous multiple control lever operation, (if equipped) the engine high idle switch may be activated. Using the engine high idle will provide the maximum hydraulic flow for any combination of aerial operations.

Any combination of positioning functions (elevate/depress, extend/retract, or rotate) may be operated at the same time. Operate one function at a time until you are sufficiently skilled and experienced to use multiple functions safely.

4-5. Post-Operation

4-5.1 Stowing the Aerial

CAUTION

If your waterway monitor and nozzle (if equipped) is positioned above the cab during travel it must be in stowed position before lowering ladder into boom support. Waterway and cab roof damage will occur if nozzle is not properly stowed.

CAUTION

If your tiller ladder waterway monitor and nozzle (if equipped) is positioned in front of the tiller cab during travel it must be in stowed position before lowering ladder into boom support. Waterway and cab damage will occur if nozzle is not properly stowed.

CAUTION

Failure to remove Lyfe options before stowing your aerial device may cause damage to the device, the equipment, or other parts of the apparatus.

1. Return the waterway monitor and nozzle *(if equipped)* to the stowed position.
2. Remove any Lyfe options.
3. Remove personnel from the aerial device.
4. Clear the area.
5. Locate a primary operator at the turntable control console.
6. Retract the ladder sections.
7. Rotate the ladder until it lines up with the support cradle.
8. Lower the ladder and continue to adjust the rotation so that the ladder is accurately aligned between the cradle support ears (use LADDER ALIGNED FOR STOWING INDICATOR if so equipped)
9. Lower the ladder gently until it rests on the cradle and the lift cylinders are no longer supporting the aerial.
10. Gently lower the ladder further into the cradle to apply only enough down pressure to prevent aerial movement during road travel.
11. Turn off lighting, intercom, and breathing air valve as applicable.
12. Close console cover.

4-5.2 Stowing the Stabilizers

CAUTION

Stabilizer jack safety pins (if equipped) must be removed prior to retracting the jacks. Failure to comply may damage jacks and pins.

1. Remove the stabilizer jack safety pins *(if equipped)* and place them in their storage brackets.
2. Reposition the wheel chocks so that they will not be pinched when the jacks are retracted.
3. Locate the stabilizer controls.
4. Move the HIGH IDLE switch *(if equipped)* to the ON position.
5. Ensure that the stabilizer area is clear of all personnel.
6. Shout your intention to stow stabilizers.
7. Use the stabilizer controls to retract the stabilizer jacks completely.
8. Use the stabilizer controls to retract the stabilizer beams completely.
9. Return the stabilizer ground pads to their storage brackets.
10. If your apparatus was set up on uneven terrain, the frame may have relaxed after the stabilizers were stowed. Ensure that the device is properly stowed with sufficient pressure for road travel by following this procedure.
    a. Position an assistant at the AERIAL HYDRAULIC POWER OVERRIDE KNOB.
    b. Instruct the assistant to PULL and HOLD the AERIAL HYDRAULIC POWER OVERRIDE KNOB while you raise the device slightly from the cradle.
    c. Push forward momentarily on the aerial lowering control to apply only enough down pressure to prevent aerial movement during road travel.
    d. Instruct the assistant to release the AERIAL HYDRAULIC POWER OVERRIDE KNOB.
11. Move the HIGH IDLE switch *(if equipped)* to the OFF position.

4-5.3 Pre-Driving Checks

⚠WARNING

Read and follow the Safety instructions in your Pierce Chassis operator manual corresponding with your apparatus prior to driving.

⚠WARNING

Read and following the Riding Safely instructions found in the Safety section of this manual.

In addition to the chassis pre-trip related safety instructions found in your apparatus chassis manual, perform the following checks on your aerial apparatus prior to driving.

- The device is properly in its cradle with sufficient downward pressure to ensure it will not bounce during travel.
- All Stabilizers are completely retracted.
- The Fifth Wheel Lock-Out Control Lever is in the UNLOCKED position (Tiller Apparatus Only).
- All compartment doors are closed and latched.
- Stabilizer pads are properly restrained in their storage brackets.

- Wheel chocks are properly restrained in their storage brackets.
- The AERIAL MASTER Switch is in the OFF position.
- The AERIAL PTO Switch is in the OFF position.

4-6. Emergency or Malfunction Operations

⚠WARNING

Override controls are for use to safely stow a malfunctioning device and remove it from service for repair only.

⚠WARNING

Read and follow the Know Your Aerial Device Safety instructions found in the Safety section of this manual.

If your aerial apparatus or device malfunctions, cease operations and prepare to remove it from operation immediately. Your apparatus has features that will then allow you in most cases to return your aerial device and stabilizers to a stowed configuration so that the apparatus can be moved to a service facility for repair.

4-6.1 Emergency Shut-Down

4-6.1a Hydraulic Controls

The Emergency Stop function on your aerial device is performed by removing your foot from the OPERATOR PRESENCE CONTROL. Removing your foot from the OPERATOR PRESENCE CONTROL will also shut down all aerial device motion. Aerial motion can also be stopped by returning the motion control levers to their neutral position. If you encounter a situation where you feel the need to be completely sure that no powered function will operate, shut the engine OFF and disconnect electrical power to the apparatus using the BATTERY DISCONNECT SWITCH.

4-6.1b Electric Controls

If you feel that something is wrong with your aerial device and/or you feel the need to cease all aerial functions, PUSH the EMERGENCY STOP SWITCH located on the primary operator console, or the EMERGENCY STOP SWITCH located on the stabilizer console. Aerial motion can also be stopped by returning the motion control levers to their neutral position and releasing the locking collars. If you encounter a situation where you feel the need to be completely sure that no powered function will operate, shut the engine OFF and disconnect electrical power to the apparatus using the BATTERY DISCONNECT SWITCH.

4-6.2 Aerial Interlock Override

4-6.2a Hydraulic Controls Override

Your apparatus includes aerial interlock devices, sensors, and other electrical devices that may malfunction and require repair. A malfunction may prevent further aerial operation. If this happens, you can override the interlocks as follows:

1. Position an assistant at the AERIAL HYDRAULIC POWER OVERRIDE KNOB.
2. Instruct the assistant to PULL and HOLD the AERIAL HYDRAULIC POWER OVERRIDE KNOB.

3. Use the aerial motion control levers at the primary control station to return the device to a stowed condition.
4. If the rotation control lever does not respond, pull and hold the BOOM ROTATION EMERGENCY OVERRIDE KNOB for the direction you wish to rotate while operating the rotation control lever.
5. Instruct the assistant to release the AERIAL HYDRAULIC POWER OVERRIDE KNOB.

4-6.2b Electronic Controls Override

Your apparatus includes aerial interlock devices, sensors, and other electrical devices that may malfunction and require repair. A malfunction may prevent further aerial operation. If this happens, you can override the interlocks as follows:

1. Position a first assistant at the AERIAL HYDRAULIC POWER OVERRIDE KNOB or AERIAL EMERG POWER toggle switch (as equipped).
2. Instruct the assistant ENGAGE and HOLD the control to provide hydraulic power.
3. Position a second assistant at the MANUAL AERIAL CONTROLS.
4. Stand at the primary control station and maintain view of the operating area.
5. Communicate instructions to the second assistant to use the Extension, Rotation, and Elevation controls on your direction to stow the aerial.
6. Instruct the first assistant to release the AERIAL HYDRAULIC POWER OVERRIDE KNOB or AERIAL EMERG POWER toggle switch (as equipped).

4-6.3 Aerial Rotation Interlock Overrides (Hydraulic Controls Only)

Your apparatus includes rotation interlocks that will not allow you to rotate over the short-jacked side. If these interlocks fail, the failure may prevent operation over one side or the other even though your stabilizers are completely deployed. If this occurs, you can override the rotation interlocks by using the BOOM ROTATION EMERGENCY OVERRIDE KNOBS located inside the control console front panel.

- To rotate clockwise, PULL and HOLD the BOOM CLOCKWISE (Left) ROTATION EMERGENCY OVERRIDE KNOB while at the same time pulling back on the ROTATION CONTROL LEVER.
- To rotate counterclockwise, PULL and HOLD the BOOM COUNTERCLOCKWISE (Right) ROTATION EMERGENCY OVERRIDE KNOB while at the same time pushing forward on the ROTATION CONTROL LEVER.

4-6.4 Stabilizer Interlock Override

The switches that control your stabilizers use solenoid operated hydraulic valves. In the event of an electrical system malfunction you can stow the stabilizers by using the manual buttons on each of the stabilizer valves. This operation requires a minimum of two personnel, one to operate the valves, and another to watch the stabilizer motion and make sure no other personnel are in the area of stabilizer motion. Follow these procedures for stowing the stabilizers.

1. Stow the aerial device using the procedures in this manual.
2. Remove the jack pins *(if equipped)*.
3. Locate the primary operator at the stabilizer valve bank.
4. Locate an assistant in full view of both the primary operator and the stabilizer to be stowed.
5. PULL and HOLD the STABILIZER HYDRAULIC POWER OVERRIDE KNOB or PUSH and HOLD the STABILIZER EMERG. POWER toggle switch (as equipped).
6. Select the valve for the desired stabilizer and motion by referencing the instruction placard.
7. Shout your intention to the assistant and ensure that the stabilizer area is clear of personnel.
8. PRESS the button on the valve or use the tool provided to engage the desired stabilizer and direction of motion.
9. Repeat this process until all stabilizers are stowed.

4-6.5 Hydraulic Power Supply Failure

CAUTION

Follow these instructions to avoid EPU system damage

- **Only use the EPU when the main hydraulic system is not operating.**
- **DO NOT run the EPU for more than 30 minutes without allowing 30 minutes for cooling down. Limiting loads and pressures will allow for more efficient use of the EPU and will also generate less heat.**
- **Only activate the EPU after the desired function is selected.**

If your apparatus engine, power take-off, or hydraulic pump fail, your apparatus includes a source of backup power. The Emergency Power Unit (EPU) provides sufficient power to store the aerial device and stabilizers. The EPU runs off battery power and motions will be much slower than during normal operation. Use the following procedure to operate using the EPU.

4-6.5a Aerial EPU Operation

NOTE: If the electronic system has failed and the manual aerial or stabilizer controls are being used, the EPU switch located at the manual stabilizer controls will be the only one active. For aerial EPU operation, locate an assistant at the manual stabilizer control area who can activate the EMERGENCY HYDRAUL POWER switch at the direction of the primary operator.

1. Remove personnel from the ladder.
2. Select the desired aerial motion by moving one of the motion control levers at the control console.
3. ENGAGE and HOLD the EMERGENCY HYDRAULIC POWER switch to begin and sustain motion.
4. When desired motion in the selected direction is complete, RELEASE the EMERGENCY HYDRUALIC POWER switch.
5. RELEASE the motion control lever.
6. Repeat these steps until the aerial is properly stowed.

4-6.5b Stabilizer EPU Operation

1. Stow the aerial device in the cradle
2. Select desired stabilizer motion by moving one of the motion control levers at the control console.
3. ENGAGE and HOLD the EMERGENCY HYDRAULIC POWER switch to begin and sustain motion.
4. When desired motion in the selected direction is complete, RELEASE the EMERGENCY HYDRUALIC POWER switch.
5. Release the motion control lever.
6. Repeat these steps until the stabilizers are properly stowed.

4-7. Optional Equipment Operation

Your apparatus may be equipped with optional functions or features. The following instructions are included for popular options. Custom features or functions specific to your department may not be covered by the instructions included in this manual. Instructions for the use of any custom option not covered by the manual should be created by your organization under the supervision of a Fire Department Safety Officer or other authority prescribed by the Authority Having Jurisdiction (AHJ) and in consultation with Pierce Manufacturing as required.

4-7.1 Collision Avoidance System *(If Equipped)*

CAUTION

When the Lowering Override Switch is activated, all Collision Avoidance safety features are deactivated. The aerial will be able to contact the truck body in this mode. Use extreme caution to avoid equipment damage.

If your apparatus is equipped with a properly calibrated Collision Avoidance System, aerial movement operations will cease to function if you attempt to move the device into a position where it would make contact with other parts of the apparatus.

Be aware of the collision avoidance indicator. It will illuminate when the system has deactivated a movement function that would have caused a collision.

If you experience a malfunction with the Collision Avoidance System, use the LOWERING OVERRIDE SWITCH to deactivate the system. During this time the Collision Avoidance System will not keep you from potential zones of collision and you will need to do this without the aid of the system.

4-7.2 Water Pump Operation *(If Equipped)*

⚠WARNING

Read and follow the Safe Pump Operation instructions found in the your Pierce pump Operators Manual.

If your apparatus is equipped with a water pump and you intend to pump water during your response, you may wish to engage the pump at the same time you engage the aerial PTO, prior to exiting the cab. Refer to your Pierce pump operator manual for instructions.

4-7.3 Quick-Lock® Waterway Operation *(If Equipped)*

WARNING

Read and follow the Quick-Lock® Waterway Operation Safety instructions found in the Safety section of this manual.

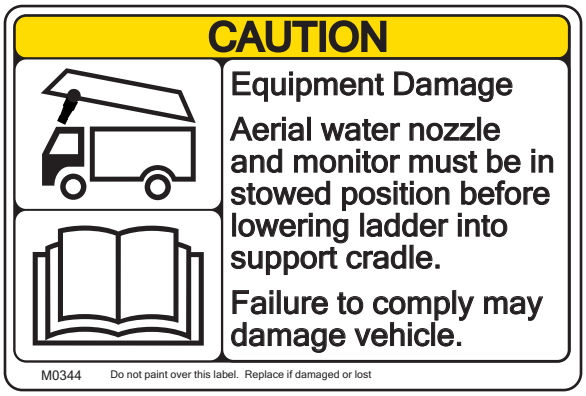
WARNING

- **Do not attempt to change the attachment location of the Quick-Lock® waterway when the aerial waterway is pressurized.**
- **Do not pressurize the aerial waterway at any time when the connecting link is not securely connected to one of the hooks. A pressurized aerial waterway may cause the waterway to move suddenly and violently, causing bodily injury and severe damage to the aerial device.**

CAUTION

Do not extend or retract the aerial device when connecting link is not securely fastened to one of the hooks. The Quick-Lock® waterway bracket can come off of its guide track, resulting in damage to the waterway system or other components.

Figure 4-11: M0344 Safety Label

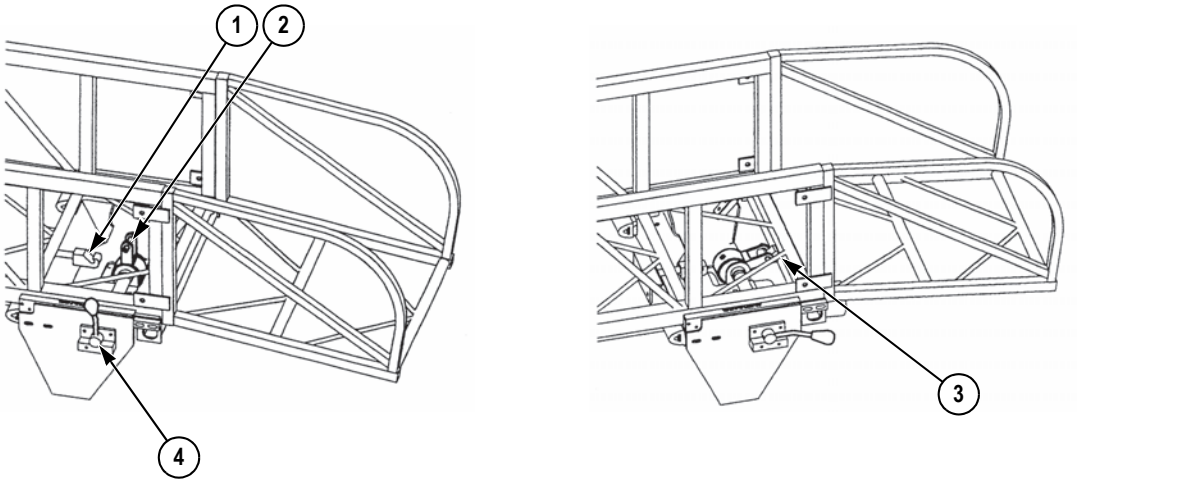


M0344

4-7.3a Pinning the Waterway to the Fly Section

1. When the aerial is fully retracted, rotate the control lever (4) to the forward position to disengage the middle section hook (1).
2. Rotate the connecting link (2) from the middle section hook (1) toward the fly section hook (3).
3. Rotate the control lever (4) to the rear position to give enough extension for the connecting link (2) to reach the fly section hook (3).
4. Secure the connecting link (2) in the fly section hook (3) and rotate the control lever (4) fully forward to lock the waterway to the fly section.

Figure 4-12: Pinning the Waterway to the Fly Section



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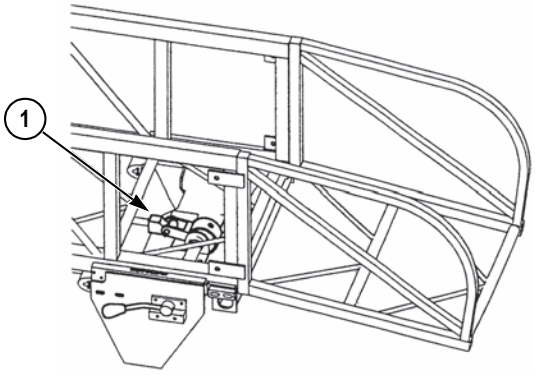
Item #	Description
1.	Middle Section Hook
2.	Connecting Link
3.	Fly Section Hook
4.	Control Lever

4-7.3b Pinning the Waterway to the Middle Section

1. When the aerial is fully retracted, rotate the control lever (4) to the rear position to disengage the fly section hook (3).
2. Rotate the connecting link (2) from the fly section hook (3) toward the middle section hook (1).
3. Rotate the control lever (4) to the forward position to give enough extension for the connecting link (2) to reach the middle section hook (1).
4. Secure the connecting link (2) to the middle section hook (1) and rotate the control lever (4) fully rearward to lock the waterway to the middle section.

Figure 4-13: Pinning the Waterway to the Middle Section



POM0212

4-7.4 Lyfe Pulley System *(If Equipped)*

WARNING

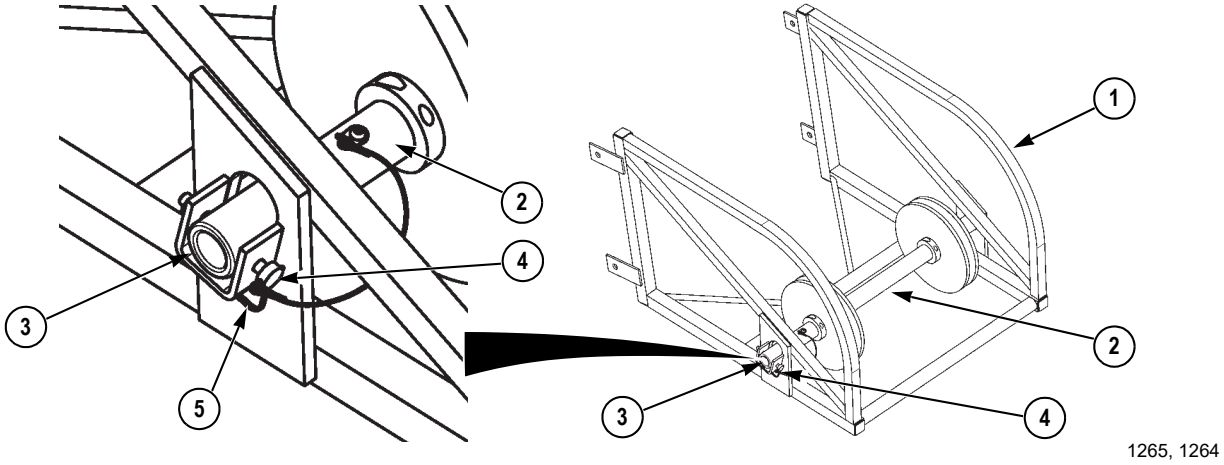
Read and follow the Rope Rescue Safety instructions found in the Safety section of this manual.

4-7.4a Installation

WARNING

- **Use pulley system only when lock pin is properly installed. The lock pin securing the shaft and pulley assembly must pass through both the egress bracket and the shaft. The lock pin safety latch must be secure.**
- **Use only original equipment lock pin with safety latch; never use a substitute lock pin.**
- **Properly support the Lyfe pulley system during installation and removal.**
- **Failure to comply may result in death or serious injury**

Figure 4-14: Lyfe Pulley System



Item #	Description
1.	Egress
2.	Shaft and Pulley Assembly
3.	Egress Bracket
4.	Lock Pin
5.	Lock Pin Safety Latch

1. Facing front of egress (1), position shaft and pulley assembly (2) through slotted hole in right side of egress.
2. Position other end of shaft and pulley assembly (2) through hole in left side of egress (1).
3. Align hole on end of shaft and pulley assembly (2) with hole in egress bracket (3) and install lock pin (4).
4. Position lock pin safety latch (5) over end of lock pin (4) to secure.

4-7.4b Pulley Use Guidelines

WARNING

- **The capacity of the pulley system is 500 pounds or the remaining tip load, whichever is lower. To lift a 500-lb load, the working end of the rope must be secured to the aerial ladder handrail. Working ends secured to anything other than the ladder handrail will limit the capacity to 250 pounds, or one-half of the remaining tip capacity.**
- **Do not allow the pulley system to come in contact with walls, windows, etc.**
- **Do not allow rescue safety rope to come in contact with abrasive surfaces. Ladder rungs are abrasive and will cause damage to rescue safety rope.**
- **Failure to comply may result in death or serious injury.**

NOTE:
- Personnel using the Lyfe pulley system should be familiar with and follow the guidelines contained in the IFSTA Fire Service Rescue Manual and/or the CMC Rope Rescue Manual.
- The suggested tie off location is the ladder handrail.

If a pulley is provided on the aerial device, the working end of the rope should only be anchored to a lower section of the ladder. In this configuration, the rope will be raised when the device sections are extended, and lowered when the device sections are retracted. The working end of the rope should never be anchored to the other parts of the apparatus, to static structures, or to objects on the ground. If the rope is passed through the pulley with the working end anchored to the ground, then the load on the device becomes twice the weight of the load on the running or free end of the rope. This load multiplication may overload the device and risk device damage, tipping, or collapse.

Figure 4-15: Pulley Use

1266B

1. Pulleys may be positioned in any location along the shaft. To reposition pulleys, loosen collar setscrews, relocate pulley and tighten setscrews.
2. Observe NFPA 1670, *"Standard on Operations and Training for Technical Search and Rescue Incidents"* and all department operating procedures concerning the use of rescue equipment.

4-7.4c Removal

1. Facing front of egress (1), unhook lock pin safety latch (5) over end of lock pin (4).
2. Remove lock pin (4) from egress bracket (3) and shaft and pulley assembly (2).
3. Slide shaft and pulley assembly (2) from hole in left side of egress (1).
4. Remove shaft and pulley assembly (2) from slotted hole in right side of egress (1).

4-7.5 Egress Lift Eye *(If Equipped)*

Figure 4-16: M0349 Safety Label

M0349

WARNING

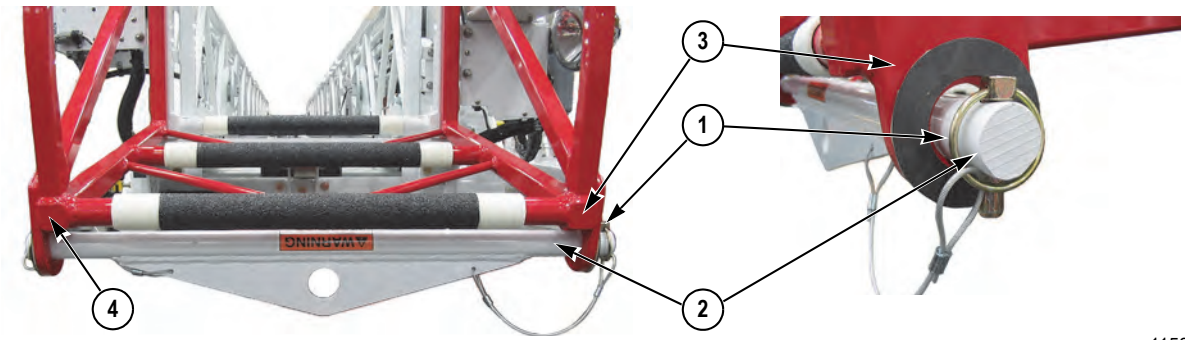
Read and follow the Egress Lifting Eye Safety instructions found in the Safety section of this manual.

4-7.5a Lift Eye Installation

WARNING

- **Use the egress lift eye only when pins and fasteners are properly installed. Pins must be installed through the holes in the top of the shaft, with the lock ring completely encircling the shaft and touching the bottom of the pin.**
- **Use only original equipment fasteners; never use substitute pins or fasteners.**
- **Properly support the egress lift eye during installation and removal.**

Figure 4-17: Egress Lift Eye



1158, 1159

Item #	Description
1.	Lock Pin & Lock Ring
2.	Lift Eye Shaft
3.	Egress Left Mounting Bracket
4.	Egress Right Mounting Bracket

1. Remove two lock pins (1) from lift eye shaft (2).
2. Slide lift eye shaft (2) through hole in left mounting bracket (3). Slide other end of lift eye shaft into right mounting bracket (4) until lift eye shaft is centered in egress.
3. Secure lift eye shaft (2) in egress with two lock pins (1).

4-7.5b Lift Eye Use Guidelines

WARNING

- **Do not exceed aerial capacity when using the egress lift eye. Death or serious injury may occur.**
- **Do not allow the lift eye to come in contact with walls, windows, etc.**
- **Lift vertical hanging loads only, no side loads.**

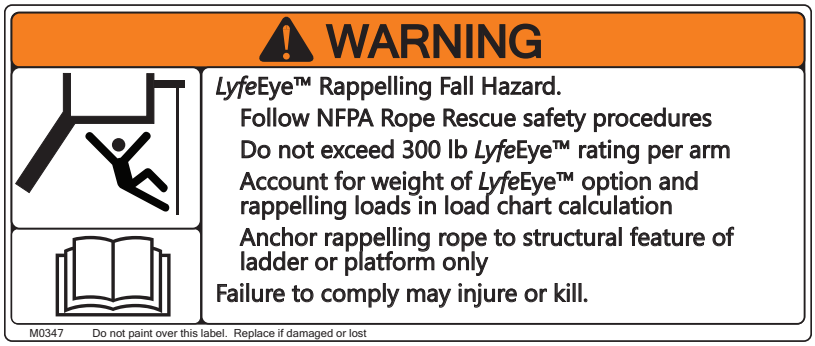
1. Observe all department operating procedures concerning the use of rescue equipment.
2. All rope and hardware must be appropriate for the load being lifted and comply with NFPA 1983, *"Standard on Life Safety Rope and Equipment for Emergency Services"*.
3. Rigging should be performed only by personnel authorized by the AHJ in compliance with NFPA 1670, *"Standard on Operations and Training for Technical Search and Rescue Incidents"*.

4-7.5c Lift Eye Removal

1. Remove two lock pins (1) from lift eye shaft (2).
2. Slide lift eye shaft (2) to the left, out of right mounting bracket (4). Slide lift eye shaft back to the right, out of left mounting bracket (3) and remove from egress.
3. Install two pins on shaft.

4-7.6 LyfeEye™ Rappelling *(Platform Option)*

Figure 4-18: M0347 Safety Label



M0347

When properly installed, each rappelling arm has a rated capacity of 300 lbs.

1. Attach rappelling arm to bracket at front of platform with pins.

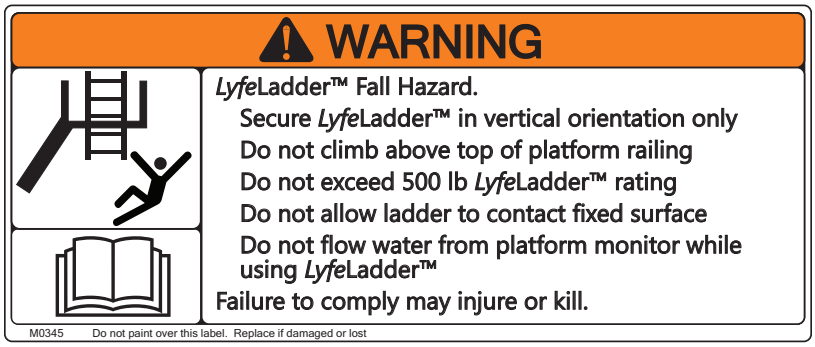
   NOTE: If additional lifting capacity is required, rings are provided under the basket and are rated at 500 lbs each. All additional weight must be subtracted from the platform capacity.*

2. Attach rope and rigging to eye at the end of the rappelling arm.

1,000 lbs	Rated Platform Capacity
(-XXX lbs)	Weight of Rope and Rigging
(-250 lbs)	NFPA Fire Fighter (Load)
(-XXX lbs)	*Additional Weight
XXX lbs	Remaining Platform Capacity

4-7.7 LyfeLadder™ *(Platform Option)*

Figure 4-19: M0345 Safety Label



M0345

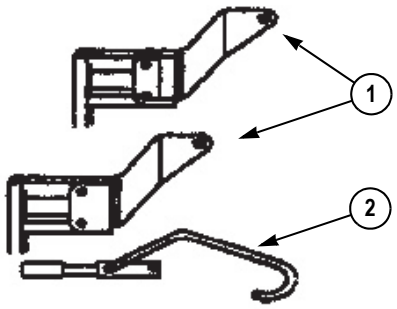
WARNING

The Duo-Safety Model 875A and 878DR Ladder up to 20 feet long are the only ladders certified for this operation.

NOTE: The Duo-Safety Model 875A (19-inch) Ladder is the only ladder certified for this operation.

The LyfeLadder™ can be attached to the basket for external entrance to the basket or descending to a lower surface. When properly installed, it has a rated capacity of 500 lbs.

Figure 4-20: LyfeLadder™ Brackets and Pins



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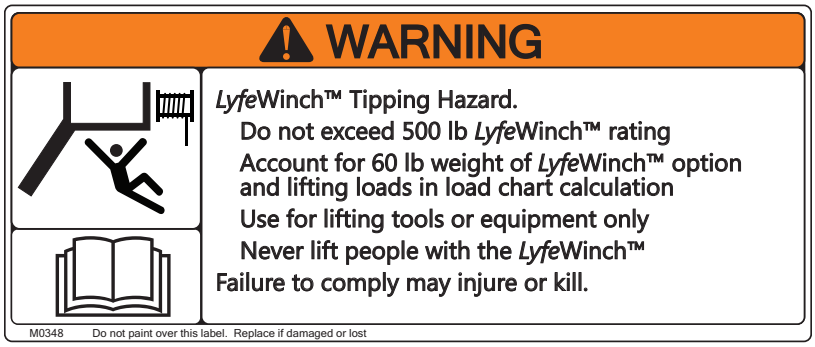
1. Attach two LyfeLadder™ brackets (1) to mounting brackets at front of platform with pins.
2. Position cross rod in hole and place ladder between mounting brackets.
3. Slide ladder out to the desired rung for length of ladder and push cross rod through both ladder rung holes and opposite mounting brackets.
4. Secure lynch pin to cross rod.
5. With the ladder hanging in the vertical position, secure the rung latch (2) to the appropriate ladder rung.
6. LyfeLadder™ brackets should be stored in a body compartment before driving the apparatus. If the LyfeLadder™ brackets are left pinned to the platform, they will increase the overall height of the truck.

4-7.8 LyfeWinch™ *(Platform Option)*

Figure 4-21: M0348 Safety Label



M0348

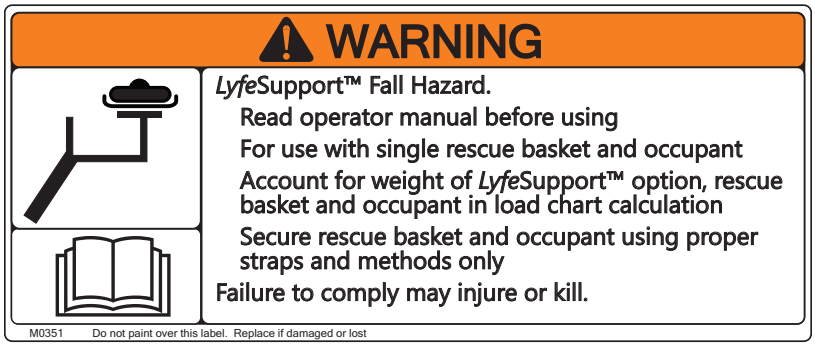
The LyfeHoist™ winch is used for lifting tools and supplies. It is NOT rated for any type of human support or transportation. When properly installed, it has a rated capacity of 500 lbs.

1. Attach the LyfeHoist winch bracket to the mounting brackets at the front of the platform with pins.
2. Plug the winch electrical cord into 110-volt receptacle.
3. For further instructions on the operation of the winch, refer to the Operator's manual supplied with the winch.

1,000 lbs	Rated Platform Capacity
(-500 lbs)	Maximum Load Weight
(-60 lbs)	Weight of Winch
440 lbs	Remaining Platform Capacity

4-7.9 LyfeSupport™ Rescue Basket *(Platform Option)*

Figure 4-22: M0351 Safety Label



M0351

When properly installed, the LyfeSupport™ rescue basket supports will support a rescue basket for patient transport.

1. Attach LyfeSupport™ rescue basket arms to mounting brackets at the front of platform with pins.

- The belt straps must pass through the side openings on the rescue basket.
- The belt straps must be latched to each other straight across the basket.
- The belt straps must be properly tensioned to prevent basket movement.

2. Make sure each belt strap is fastened through the holes at each end of the LyfeSupport™ rescue basket arms.

4-8. Cold Weather Operation

WARNING

Read and follow the Aerial Operation in Cold Weather Safety instructions found in the Safety section of this manual.

CAUTION

- **Operation in extreme cold weather may overload and/or damage the aerial.**
- **Do not use multiple functions at the same time until the temperature is above the recommended minimum start-up temperature, or pump cavitation and damage may occur.**
- **Ice build up on the aerial waterway can cause damage to the seals, wear bands and main tubes during extension and retraction.**
- **Ice can form inside and between the waterway tubes. During freezing conditions it is best to maintain water flow while extending or retracting the aerial. After flowing water when temperatures are below freezing, immediately elevate and drain the aerial waterway. If ice exists between the waterway tubes, extending or retracting the aerial will damage the waterway.**
- **The Pierce Manufacturing warranty does not cover damage caused by extending or retracting a frozen aerial.**

During extreme cold weather, certain precautions must be applied to the operation and use of aerial devices. When operation is necessary in extreme cold temperatures, use the following precautions:

- Continued use of the aerial functions will circulate the oil, delaying the ambient temperature cooling effect.
- Slow, attentive operation after a period of non-use will be less harmful to the device and may allow the operator time to react to potential problems.
- Continually monitor the hydraulic oil pressure gauge to warn of excessively high pressures that are building during the operation of a function.
- Pay particular attention to electric cables and hoses that are running up the aerial sections. These will become stiff and want to take a set, causing them to track improperly.
- During cold-weather periods, monitor the hydraulic oil temperature. If it falls slightly below the recommended operating range, the function speed may diminish. The continuous running of an aerial function will help to warm the oil. (See *"Hydraulic Oil Recommendations"*, to determine the temperature range of hydraulic oils used in Pierce aerial units.)
- The recommended minimum start-up temperature for the hydraulic system will vary according to the viscosity grade class oil that is installed in your aerial. A label located on the hydraulic reservoir indicates the grade of oil that is installed in your unit.

5-1. Maintenance Introduction

⚠WARNING

Read and follow the Perform Maintenance and Service Safely found in the safety section of this manual.

This maintenance section provides criteria that must be followed to inspect, maintain, and document the condition of your aerial device on a regular schedule. This schedule is intended as a minimum and is greatly dependent on operating conditions. Heavy use and extreme environmental conditions such as heat, cold, sand, or salt spray will demand increased inspection and maintenance.

This preventive maintenance section is not intended to replace or negate any routine pre-operation safety inspections. The aerial operator must be aware of the condition of the aerial equipment before operating. A pre-operational visual safety inspection should always be performed, which may include stabilizers, aerial pivot pins and retaining hardware, cables, sheaves, basket pivot pins, retaining hardware, and other components.

During the warranty period and thereafter, inspections and maintenance schedules must be performed according to the specified Pierce Manufacturing Inc. standards.

Failure to comply with these requirements place your operators and emergency victims at risk and will be considered grounds or conditions that may void the warranty on individual components, assemblies, or the entire Pierce aerial device.

5-2. Troubleshooting

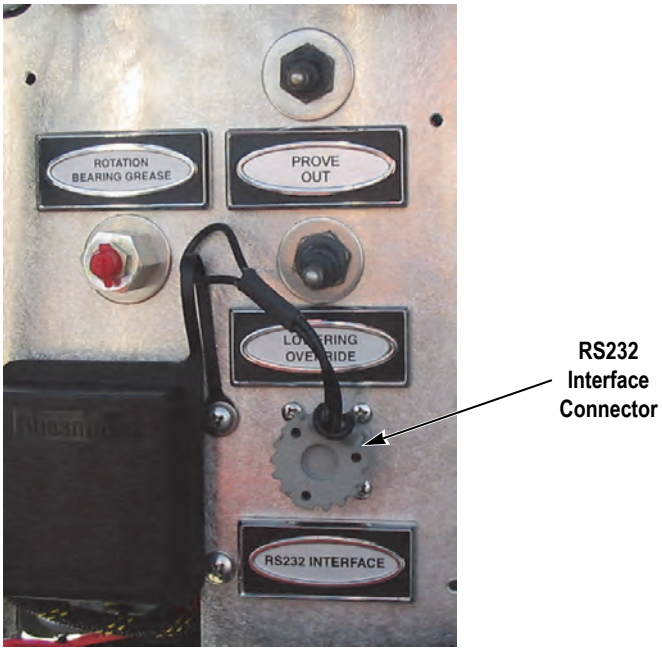
The following outline represents operational difficulties that may arise during the deployment of the Pierce aerial. It is not a comprehensive list meant to exhaust every possible malfunction of the equipment; rather it is a quick checklist to allow operating personnel to ensure operator error is not preventing the safe deployment of the unit.

Malfunction Possible Problem
1. PTO Will Not Engage.
• Aerial master switch is not energized.
• Transmission range selector is not in neutral, or water pump engaged and transmission in drive.
• Parking brake is disengaged.
2. Stabilizer Circuit Will Not Operate.
• Locked in aerial mode.
• PTO is not engaged (see above).
3. Aerial Controls Are Inoperative.
• PTO is not engaged (see above).
• Aerial operator presence control is not depressed.
• Stabilizer is not set.

5-3. Collision Avoidance System *(Optional)*

5-3.1 RS232 Interface Connector

Figure 5-1: RS232 Interface Connector



1081

This connector, located inside the turntable console, is used to connect a personal computer (PC) to the system. All that is needed is Command Zone Diagnostic (CZD) software and Slope Offset Tool (SOT) software installed on a PC and a serial interface cable (RS232 cable) to connect to the device. CZD is a tool used to assist in troubleshooting the Command Zone™ system. The Command Zone™ system uses inputs, outputs, and communications for control. System inputs and outputs can be monitored using CZD.

Table 5-1: System Inputs

Input	Description
Rotary Encoder	This gives the rotation angle of the aerial.
Single Axis Senor	Sensor is mounted on the aerial to give the elevation angle of the ladder.
Dual Axis Sensor	Sensor is mounted on the turntable to give reference angles of the truck.
Prove-out Switch	This is for testing the indicator lights.
Short jack Left Switch	This is to indicate the status of the stabilizers on the left side, and whether the aerial can be rotated to that side.
Short jack Right Switch	This is to indicate the status of the stabilizers on the right side, and whether the aerial can be rotated to that side.

Table 5-2: System Outputs

Output	Description
Align for Stowing Indicator	Indicates when the aerial is aligned with the cradle and will allow the aerial to be lowered.
Collision Avoidance Indicator	Indicates that the aerial movement will be halted to prevent moving into an unsafe area.
Down Solenoid	This output will be on to prevent the aerial lowering.
Left Solenoid	This output will be off to prevent rotating the aerial left.
Right Solenoid	This output will be off to prevent rotating the aerial right.

5-3.2 Additional Information

The Collision Avoidance System is based on the Pierce Command Zone multiplex system. For additional information concerning the Command Zone system, refer to service group 0950-P-009, Command Zone™ Advanced Electronics, which can be found in the service manual for this apparatus.

5-4. Hydraulic System

5-4.1 Hydraulic System Components

The hydraulic system consists of a reservoir that supplies oil to a PTO-driven, variable-displacement, piston pump. The hydraulic oil supplied from the pump pressurizes two electric-over-hydraulic closed-center valves. One valve controls the oil flow to the stabilizer system components including the beam extension cylinders and the jack support cylinders. The second valve operates the ladder lift cylinders, extension cylinders, and the rotation drive unit.

A smaller emergency power unit containing a gear pump provides backup hydraulic power in the event of the failure of the main system.

5-4.2 Hydraulic Oil Recommendations

Hydraulic Oil Recommendations, shows six grades of hydraulic oil recommendations for aerial devices. Each grade has a minimum start-up and normal operating range. Check the oil tag next to the reservoir fill cap for the initial fill grade. Your normal start-up and operating temperature should most closely match the initial fill oil chosen for your unit.

The minimum start-up column shows an oil temperature where the viscosity is at its highest value (thickest point). This is the minimum operating temperature authorized by the pump and valve manufacturers for the given grade of oil. Start-up below this temperature should be infrequent and carefully executed.

The operating range listed provides the optimum oil viscosity for the hydraulic system. Operation below this range may result in slower aerial operation, while operating above this range will reduce system efficiency and may increase component wear.

Table 5-3: Hydraulic Oil Recommendations

Oil	ISO Grade	Minimum Start-Up Temperature	Operating Range
Mobil DTE 10 Excel	100	44°F	81° to 201°F
Mobil DTE 10 Excel	68	27°F	65° to 184°F
Mobil DTE 10 Excel	46	14°F	49° to 167°F
Mobil DTE 10 Excel	32	3°F	37° to 148°F
Mobil DTE 10 Excel	22	-8°F	23° to 127°F
Mobil DTE 10 Excel	15	-24°F	7° to 107°F

NOTE:

- The above minimum start-up is based on a viscosity of 4000 SUS. The operating range is based on a viscosity range from 1000-80 SUS. When choosing an alternate oil, the temperature values in the above chart will change. Ask your oil supplier what temperature the oil will be for 4000, 1000, and 80 SUS viscosity.
- Mobil Oil is shown in *Table 5-3,* but other high-quality comparable oils may be substituted. Substitute oils should have multi-grade viscosity characteristics, with low-temperature flow properties and high anti-wear protection.
- We recommend taking an initial sample of hydraulic oil and having it analyzed to serve as a baseline for future oil analysis results.
- Your Pierce aerial was shipped with a hydraulic oil cleanliness level of 18/15/13, per the latest ISO standard 4406. Any changes of, or additions to, the aerial hydraulic oil should be with the appropriate type - filtered to the same cleanliness level. Unfiltered oil may have an affect on the life or operation of some components.

5-4.3 Hydraulic Oil Filter Recommendations

The following hydraulic filters are used in the aerial hydraulic system of your Pierce apparatus. Used oil and filters should be carefully collected and disposed of properly as required by law.

Table 5-4: Hydraulic Oil Filter Recommendations

Item Description	Pierce Part Number
Parker Desiccant Filter	1604768
Pressure Filter Assembly	1805470
Return Filter Assembly	2018575
Pierce Pressure Filter Element	1805482
Pierce Return Filter Element	1805483

5-5. Preventive Maintenance Checks and Service

5-5.1 Introduction

These checks and services have been provided to help you keep your equipment in good operating condition and in service.

The preventive maintenance section is intended to formally maintain and document the aerial device on a regular schedule. This schedule is intended as a minimum and is greatly dependent on operating conditions. Heavy use and extreme environmental conditions such as heat, cold, sand, or salt spray will demand increased inspection and maintenance.

This preventive maintenance section is not intended to replace or negate any routine pre-operation safety inspections. The aerial operator must be aware of the condition of the aerial equipment before operating. A pre-operational visual safety inspection should always be performed, including checking stabilizers, aerial pivot pins & retaining hardware, cables, sheaves, basket pivot pins, retaining hardware, etc.

An Equipment Inspection and Maintenance Worksheet should be completed each time an inspection is performed. A blank worksheet follows this section of the manual. (Additional worksheets may be photocopied.) A copy of the completed worksheet should be retained by the customer as a permanent record of the maintenance actions performed.

During the warranty period, and thereafter, inspections and maintenance schedules must be performed according to the specified Pierce Manufacturing Inc. standards.

Failure to comply with these requirements will be considered grounds or conditions that may void the warranty on individual components, assemblies, or the entire Pierce aerial device.

5-5.2 Explanation of Columns

Item No.	Numbers in this column are to be used as a source of the item number for the “Item No.” column on the Equipment Inspection and Maintenance Worksheet.
Item to Check/Service	This column tells you the item to be checked or serviced.
Procedural Steps	This column tells you how to perform the required check or service.

5-6. Primary Inspection

NOTE:
- Perform this inspection before placing into service and with each inspection thereafter.
- We recommend taking a sample of hydraulic oil and having it analyzed and retained as a base for future oil sample analyses.

Table 5-5: Primary Inspection

ITEM NO.	ITEM TO CHECK/SERVICE	PROCEDURE
1	PTO Switch in Cab	Check that switch operates properly—this includes the aerial PTO switch and aerial master switch. Check that PTO indicator light is functional. Check that no excessive gear mesh noise is present during engagement of PTO. Verify the operation of the neutral safety interlock. This is checked by shifting the transmission into drive or reverse—the PTO should disengage in both gears. Also, check for PTO disengagement with the transmission in neutral and the parking brake released. Disengage PTO and engage high idle. Perform above test with the transmission engaged or the parking brake released—engine rpm should return to idle.
2	Hydraulic Oil Level	**NOTE:** The aerial must be cradled with all stabilizers in the stowed position to obtain a proper oil reading. Check the oil level gauge. The proper oil level is full “F.”
3	Hydraulic Pressure Lines, Hoses, and Fittings	Inspect all lines for security and leakage. These lines should be checked for leakage at fittings and at crimp-on ends. Also, inspect hose routing and check for any signs of hose chafing.
4	High Idle Switch *(if equipped)*	Check operation of high idle switch. Indicate if switch operates properly. Also, verify the rpm’s at which the engine runs with the high idle engaged.
5	Interlocks and Indicators	With the stabilizers stowed, depress the aerial operator presence control. Using the lower control, try to operate the aerial down. If there is no pressure increase on the system pressure gauge, the interlock is functioning properly. Set the stabilizers to verify that the interlock indicator lights illuminate. Check that the switches, which activate these lights, are functional, mounted properly, and secure.
6	Stabilizer Pads	Inspect the stabilizer pads for proper installation and freedom of movement. These are the feet attached to the bottom of the jack cylinders, on which the stabilizers sit.
7	Stabilizer Lights	Check stabilizer work lights and flashing lights for proper illumination. Work lights are the white lights up under the stabilizer wells. Jack flashing lights are located on the side of the jack beam. Also, check lenses for any damage.
8	Stabilizer Jack Safety Pins *(if equipped)*	Check the stabilizer safety pins for proper fastening to the beam and for proper insertion into the holes on the inner jack box.
9	Electrical Lines and Hoses	Inspect electrical lines and hoses, which provide service to the ladder tip. Inspect at exposed areas for any chafing or wear.
10	Sheaves and Carrier Assemblies	Check the sheaves and carrier assemblies for any damage and if they travel properly through the guide brackets while the aerial is extending and retracting.
11	Wire Rope (Cable)	Check for proper tension, see service group 8300-P-033, Wire Rope (Cable) Replacement/Adjustment.
12	Waterway	Check waterway for proper alignment and lubrication.
13	Quick-Lock® Waterway	Check Quick-Lock® waterway engagement and disengagement on both mid and fly sections. Inspect base pipe, mid pipe, and fly pipe for proper alignment, attachment, and lubrication. Check waterway for scoring. If scoring occurs, a fine grit emery Scotch-Brite cloth should be used to remove the sharp edges. Wipe area clean. Remove any metal particles. DO NOT try to totally remove the score mark. This will cause a flat spot.

Table 5-5: Primary Inspection (Continued)

ITEM NO.	ITEM TO CHECK/SERVICE	PROCEDURE
14	Swing Brake	Check the operation and holding ability of the swing brake when at full extension. While swinging the aerial right or left, release controls—aerial should come to a complete stop and hold there.
15	Lift Cylinders	Check lift cylinders for synchronized operation. Raise the aerial from the cradle. Both sides should raise together. Watch for either side to raise first. A 1/16-in. deviation is allowable. Measure the difference between sides of cradle. The same applies to lowering.
16	Safety Decals	Check installation of safety decals. Make sure that all safety decals and other operational decals are in place.
17	Intercom System	Check intercom system at tip and turntable. Check intercom system for proper operation. If there is a pump-mounted intercom, it should also be inspected.
18	Rung Covers	Check that rung covers are secure and do not turn.
19	Breathing Air System	Check breathing air system *(optional)* for leakage and proper operation. If applicable, open tank valve to charge low-pressure side. Close tank valve and note the pressure on the low-pressure gauge. Let system sit for a one-hour period. After a one-hour period, check for pressure drop.
20	Equipment Mounting	Check that equipment mounted on ladder is secure. Check for cracks, wear, or other damage to mounting devices. Ensure that unauthorized equipment mounting has not been added.
21	Function Check	Perform aerial function check from the turntable console and from the tip (if applicable).
22	Aerial Indicators	Check operation of aerial indicators. Check operation of rung alignment light. Check rung alignment switch at front of base section for proper alignment. Check angle indicator on the end of the base section for damage. Check operation of all other gauges, switches, and indicator lights on all control panels.
23	Manual Overrides	Check operation of manual override controls.
24	EPU Operations	Check emergency hydraulic pump operation for stabilizer and aerial functions.
25	Lubrication	Lubricate complete aerial unit. Refer to the lubrication chart. (See *Table 5-10; "Lubrication Specifications"*.)
26	Torque Box Mounting Bolts	Check the torque and condition of the torque box mounting bolts. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.

5-7. Twenty-Five (25) Hour/Quarterly Inspection

NOTE: Every 25 hours of aerial operation or quarterly (whichever occurs first), perform the primary inspection, then the following maintenance procedures:

Table 5-6: 25-Hour/Quarterly Inspection

Item No.	Item to Check/Service	Procedure
1	Electro-Hydraulic Swivel	Check the desiccator plug indicator(s) on the swivel. If the center of the indicator is pink, replace the desiccator plug.
2	Hydraulic Reservoir Desiccant Breather Filter	A desiccant breather filter is located at the oil fill location. The desiccant breather filter removes moisture and contamination particles from air being exchanged in the reservoir. As moisture is removed, the filter’s desiccant material changes color. Check the color of the desiccant material in the bowl. If the color is blue, the desiccant breather filter is OK. If the color is pink, replace the desiccant breather filter.

Table 5-6: 25-Hour/Quarterly Inspection (Continued)

Item No.	Item to Check/Service	Procedure
3	Rotation Bearing Seals	Inspect the main rotation bearing for missing, damaged, or deteriorated seals. Promptly replace as needed.

5-8. Fifty (50) Hour/Annual Inspection

NOTE: Every 50 hours of aerial operation or annually (whichever occurs first), perform the primary inspection, the 25-hour/quarterly inspection, then the following maintenance procedures:

Table 5-7: 50-Hour/Annual Inspection

Item No.	Item to Check/Service	Procedure
1	Hydraulic Pump and PTO Installation	Check PTO-to-transmission mounting. Also, check pump mounting. Check all hoses and mounting flanges for leakage.
2	Aerial Cradle	Check aerial cradle for secure mounting or structural cracks.
3	Stabilizer Extension Cylinders	Inspect the inside of the stabilizer beams for any chafing or leakage of hoses and fittings. Check for tangled or damaged electrical coil cords.
4	Stabilizer Jack Cylinders	**NOTE:** • If the system oil temperature differs from the ambient temperature, an additional wait time is required for the oil temperature to equalize. This will prevent drift errors due to the expansion or contraction of the oil. • This check may be performed together with the elevation cylinder drift test and extension cylinder drift test. Perform drift-down check on all stabilizer jack cylinders. Set the unit up with the stabilizers as described in the normal setup procedures. Using a marking pencil of some type, mark all four of the inner jack boxes, 1/2 inch under the outer box. Let the unit sit for a one-hour period. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
5	Electro-Hydraulic Swivel	Check the electro-hydraulic swivel for mounting security and check for leaks. Also, check electrical wires for wear.
6	Rotation Gear Box Oil (1 or 2)	**NOTE:** • 75ft & 100ft models have one (1) rotation gear box; 105ft models have two (2) rotation gear boxes. • The rotation gear box oil ONLY has to be changed after the initial (first) 50 hours of operation or the first year (whichever comes first). Once the oil has been changed, it only needs to be checked for the proper level. See *Table 5-8; "400-Hour/Annual Inspection"*. • If the bottom drain plug is not accessible, the side drain plug may be used. Change the oil in the rotation gear box after the aerials first 50 hours of operation. Remove the drain plug from the rotation gear box and drain oil. Install the drain plug. Remove the fill plug from the rotation gear box and fill with oil as specified in *“Recommended Lubricants”* on *page 5-13*. The oil level should be 1.25 to 1.50 in. below the top of the fill hole. See *Figures 5-3* or *5-4*, and *5-5*.
7	Elevation (Lift) Cylinders	Inspect the lift cylinders for proper mounting. Check cylinder pins and retaining bolts for security. Check cylinder rod for any unusual leakage. Check pins at turntable and on the aerial base section for security, as well as their lock bolts. Check all hoses to the cylinders for any leakage, proper routing, and chafing.

Table 5-7: 50-Hour/Annual Inspection (Continued)

Item No.	Item to Check/Service	Procedure
8	Extension Cylinders	Inspect extension cylinders for proper mounting and rigging. Check cylinder rod for any unusual leakage. Check security of all cylinder mounting bolts and pins. Check all hoses to the extension cylinders for proper routing, leakage, and chafing.
9	Wire Rope Cables	Adjust extension and retraction cables, see service group 8300-P-033, Wire Rope (Cable) Replacement/Adjustment.
10	Electrical Cables	Check and adjust electrical cables if necessary. Monitor these cables and readjust the tension if necessary.
11	Base Section Side and Bottom Pads	Inspect base side and bottom pads for proper adjustment. To check adjustment on side thrust pads be sure that pads are making contact with sides of mid rung rails and that the mid section is centered in the base section. A 0.06 inch total clearance is desirable. Check bottom pads to verify if the mid section is traveling on top of these pads and not on the base section itself. The minimum clearance to the base section is 1/8 inch.
12	Mid Section Side and Bottom Pads	Inspect mid pads, side pads on underside of mid at the rear. Also, check pads on either side of mid located at the rear of mid. Check side pads to ensure there is no metal-to-metal contact between mid and base. Check adjustment on side pads to ensure that the mids are centered in the base section and that there is no metal-to-metal contact.
13	Fly Section Pads	Inspect fly pads, slide pads mounting on forward end of mid that the fly runs on. Also, check pads on either side of fly, located at the rear of fly section. Check slide pads to ensure there is no metal-to-metal contact between fly and slide pad bracket. Check adjustment on side pads to ensure that the fly is centered in the mid section and that there is no metal-to-metal contact.
14	Base Section Pivot Pins and Lift Cylinder Pins	Check base section pivot pins and lift cylinder pins for security or cracking.
15	Aerial Function Time Checks	**NOTE:** Differences in times to raise, lower, extend, and retract functions are to be expected. However, times required to rotate 360° to the right and left should be approximately the same. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial. Perform aerial function time checks: Aerial fully retracted, elevate from 0° to 75°—record time. Aerial fully retracted, lower from 75° to 0°—record time. Elevate aerial to 75°, fully retracted, extend ladder fully—record time. With aerial remaining at 75°, retract ladder fully—record time. Rotate 360° to left, with aerial raised 75°—record time. Rotate 360° to right, with aerial raised 75°—record time.
16	Aerial Hydraulic System Main Relief Pressure	Check and record aerial pressures at high idle: Main relief pressure is checked by dead heading against a function and recording the pressure registered on the console control gauge. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
17	Waterway and Water Monitor	Check waterway and water monitor for security and leakage.
18	Rotation Bearing Bolts	Check rotation bearing bolts.
19	Stabilizer Beams	Check stabilizer beams for scoring.

Table 5-7: 50-Hour/Annual Inspection (Continued)

Item No.	Item to Check/Service	Procedure
20	Stabilizer Jacks	Check stabilizer jacks for tightness and clearance between guide pads.
21	Jack Cylinder	Check the security of the bottom bolts on the jack cylinders.
22	Elevation (Lift) Cylinders Drift-Down Check	**NOTE:** • If the system oil temperature differs from the ambient temperature, an additional wait time is required for the oil temperature to equalize. This will prevent drift errors due to the expansion or contraction of the oil. • This check may be performed together with the extension cylinder drift test and stabilizer jack cylinder drift test. Perform elevation cylinder drift-down check on both cylinders together: Fully extend and elevate the aerial to 60° elevation; turn truck off. Toggle the manual control valve handle to remove pressure and wait 10 minutes. Measure from rod gland to a mark on the piston rod. Allow aerial to remain at this elevation for a period of one hour. Re-measure. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
23	Extension Cylinders Drift-Down Check	**NOTE:** • If the system oil temperature differs from the ambient temperature, an additional wait time is required for the oil temperature to equalize. This will prevent drift errors due to the expansion or contraction of the oil. • This check may be performed together with the elevation cylinder drift test and stabilizer jack cylinder drift test. Perform extension cylinder drift-down check on both cylinders together: Fully extend and elevate the aerial to 60° elevation; turn truck off. Toggle the manual control valve handle to remove pressure and wait 10 minutes. Mark end of the mid section rung rails in relation to the base section. Allow aerial to remain at this elevation for a period of one hour. Re-measure. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
24	Exterior Finish (Painted Surfaces)	Apply touch-up paint to all damaged paint and other corrosion areas.

5-9. Four-Hundred (400) Hour/Annual Inspection

NOTE: Every 400 hours of aerial operation or annually (whichever occurs first), perform the primary inspection, the 25-hour/quarterly inspection, the 50-hour/annual inspection, then the following maintenance procedures:

Table 5-8: 400-Hour/Annual Inspection

Item No.	Item to Check/Service	Procedure
1	Hydraulic Filters	Replace hydraulic return and pressure filters. Emphasis should be made that dirt is a major factor in hydraulic system failures.
2	Hydraulic Oil	Pierce Manufacturing Inc. recommends taking a sample of hydraulic oil and having it analyzed by a local company. The sample should be taken following 30 minutes of aerial operation.
3	Rotation Gear Box Oil Level (1 or 2)	**NOTE:** 75ft & 100ft models have one (1) rotation gear box; 105ft models have two (2) rotation gear boxes. Remove the fill plug from the rotation gear box. The oil level should be 1.25 to 1.50 in. below the top of the fill hole. See *Figures 5-3* or *5-4*, and *5-5*.
4	Electro-Hydraulic Swivel Bolts	Re-torque the electro-hydraulic swivel mounting bolts. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
5	Rotation Bearing Bolts	Re-torque the rotation bearing to torque box and turntable mounting bolts (top and bottom).For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
6	Pinion Gear Backlash	Check the pinion gear backlash and adjust if necessary. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
7	Boom Support	Re-torque the boom support mounting bolts. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.
8	Rotation Gear Box Bolts	Re-torque the rotation gear box bolts on the turntable: • Pedestal-to-planetary drive bolts. For specifications related to your apparatus, see the “Specifications for Setup and NFPA Testing” data placard located on the aerial.

5-10. Extreme Environment Maintenance Precautions

The type of service and regional area could be detrimental in the operation and longevity of this device. Both temperature and environmental conditions are significant.

5-10.1 General Temperature Concerns

The recommended start-up temperatures for the hydraulic system depend on the viscosity grade of hydraulic oil installed in your aerial. A label located on the hydraulic oil reservoir indicates the grade of oil installed in your unit.

5-10.2 Extreme High-Temperature Concerns

- During high-temperature periods, monitor the hydraulic oil temperature and avoid any unnecessary use of the aerial. Continued use above the maximum recommended operating range might reduce the life of some aerial components. (See *Table 5-3*., Hydraulic Oil Recommendations, at the beginning of this maintenance section to determine the temperature range of hydraulic oils used in Pierce aerial units.)
- In high-temperature climates where low temperatures are unlikely, use grease with a high melting point for the rotation gear/pinion to provide extended coverage of these areas.

5-10.3 Extreme Low-Temperature Concerns

Maintain only a thin film of low melting point grease on the ladder section guide pad areas and on the rotation gear/pinion. Allowing a build-up of heavy grease will degrade the aerial operation.

5-10.4 Extreme Wind-Swept Sand and Dirt Concerns

In environments where wind-swept sand and dirt find their way into all areas of the aerial, more frequent cleaning is required.

- Remove contaminated grime from the telescopic waterway tubes. They should be clean at all times. A light coat of very thin oil will improve the lubricity, however too much oil will only attract more contamination.
- The wire rope cables should be clean. DO NOT use solvents on the cables. Using solvent on the cables will remove the internal lubrication from the cables. Use only a “penetrating” cable lubricant when lubricating the cables.
- Clean and remove contaminated grease from the rotation bearing gear and pinion gear. These should have only a light coating of clean grease.

5-10.5 Salt-Air Environment Concerns

- Touch up painted areas showing signs of rust to prevent further corrosion.
- Clean and lubricate unpainted areas such as pins and cables. Use only a “penetrating” cable lubricant when lubricating the cables.

5-11. Lubrication Instructions

5-11.1 Recommended Lubricants

Synthetic Grease

- Cartridge, Pierce Manufacturing Inc. Part No. 1003040; SYNCO Super Lube #41150
- 5 LB pail, Pierce Manufacturing Inc. Part No. 1003044; SYNCO Super Lube #41050
- 30 LB pail, Pierce Manufacturing Inc. Part No. 1003046; SYNCO Super Lube #41030

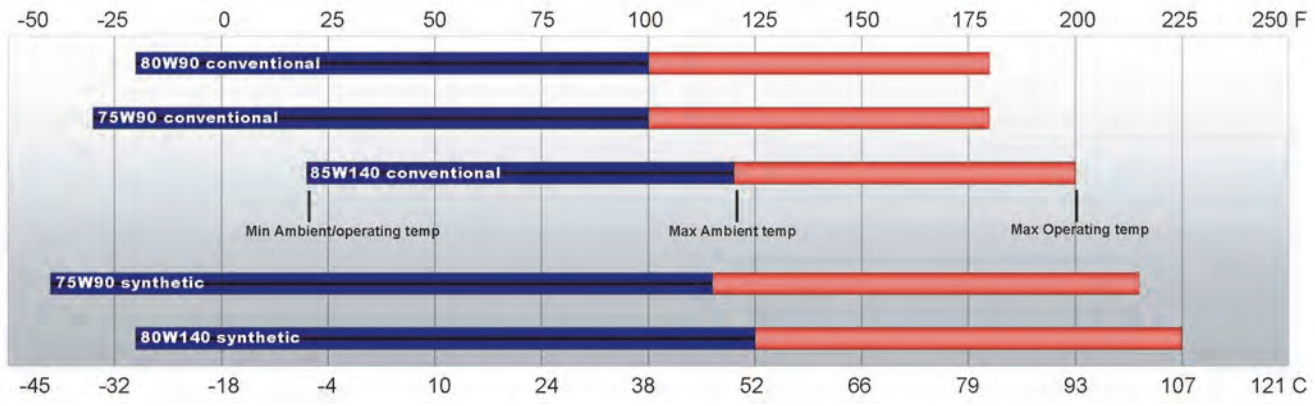
Rotation Gear Box Lube

As recommended by the planetary gear box manufacturer, all planetaries (rotation gear boxes) are filled and shipped with “API GL5 80W90 gear oil”.

Using the chart below, determine an appropriate lubricant viscosity. Use only premium EP (extreme pressure) or API GL-5 designated lubricants. Change the lubricant after the first year of operation and check it annually thereafter.

NOTE: Ambient temperature is the air temperature measured in the immediate vicinity of the gear box. A gear box exposed to the direct rays of the sun or other radiant heat sources will operate at higher temperatures and therefore must be given special consideration. The maximum operating temperature must not be exceeded under any circumstances, regardless of ambient temperature.

Table 5-9: Recommended Ambient and Operating Temperatures for Conventional and Synthetic Gear Lubricants



5-11.2 Lubrication Chart

Table 5-10: Lubrication Specifications

ITEM#	QTY	ITEM TO CHECK/SERVICE	NOTES	TYPE OF LUBRICANT
1	4 or 6	WATERWAY BEARINGS	**DO NOT** over grease!	Pierce Manufacturing Inc. Cartridge #1003040 - or - SYNCO Super Lube #41150
2	1	WATER SWIVEL (rear of ladder)	**DO NOT** over grease!	Pierce Manufacturing Inc. 5 lb tub #1003044 - or - SYNCO Super Lube #41050
3	-	LADDER SECTION SLIDING SURFACES	Brush on outside and bottom of fly and mid base rails, inside base and mid (where guide pads rub)	Pierce Manufacturing Inc. 30 lb pail #1003046
4	2	MONITOR		Pierce Manufacturing Inc. Cartridge #95-0903 - or - Exxon NLGI No. 2 Grade Grease with Moly - or - Equivalent Heavy-Duty No. 2 Grade Grease with Moly
5	1	TURNTABLE ROTATION BEARING	Pump grease into the bearing while the bearing is being rotated. Greasing is considered complete when the grease overflows from the seal, forming a light film which also serves as a seal.	
6	-	ROTATION BEARING TEETH	Brush on	
7	2 or 4	STABILIZER BEAMS	Brush on bottom surface of stabilizer beams and inside (top surface) of torque box stabilizer housings.	
8	4 or 8	STABILIZER PAD SWIVEL JOINTS		
9	-	WATERWAY TUBES (wipe on)	Wipe on	Automatic Transmission Fluid
10	1	HYDRAULIC SYSTEM RESERVOIR		See Hydraulic Tag on Reservoir
11	1 or 2	ROTATION GEAR BOX (on turntable)	See *Figures 5-3* or *5-4*, and *5-5* for specific instructions.	API-GL5 80W90
12	-	WIRE ROPE CABLES	Spray on & penetrate wire rope cables	Lubriplate Chain and Cable Fluid or equivalent

Figure 5-2: Lubrication Points

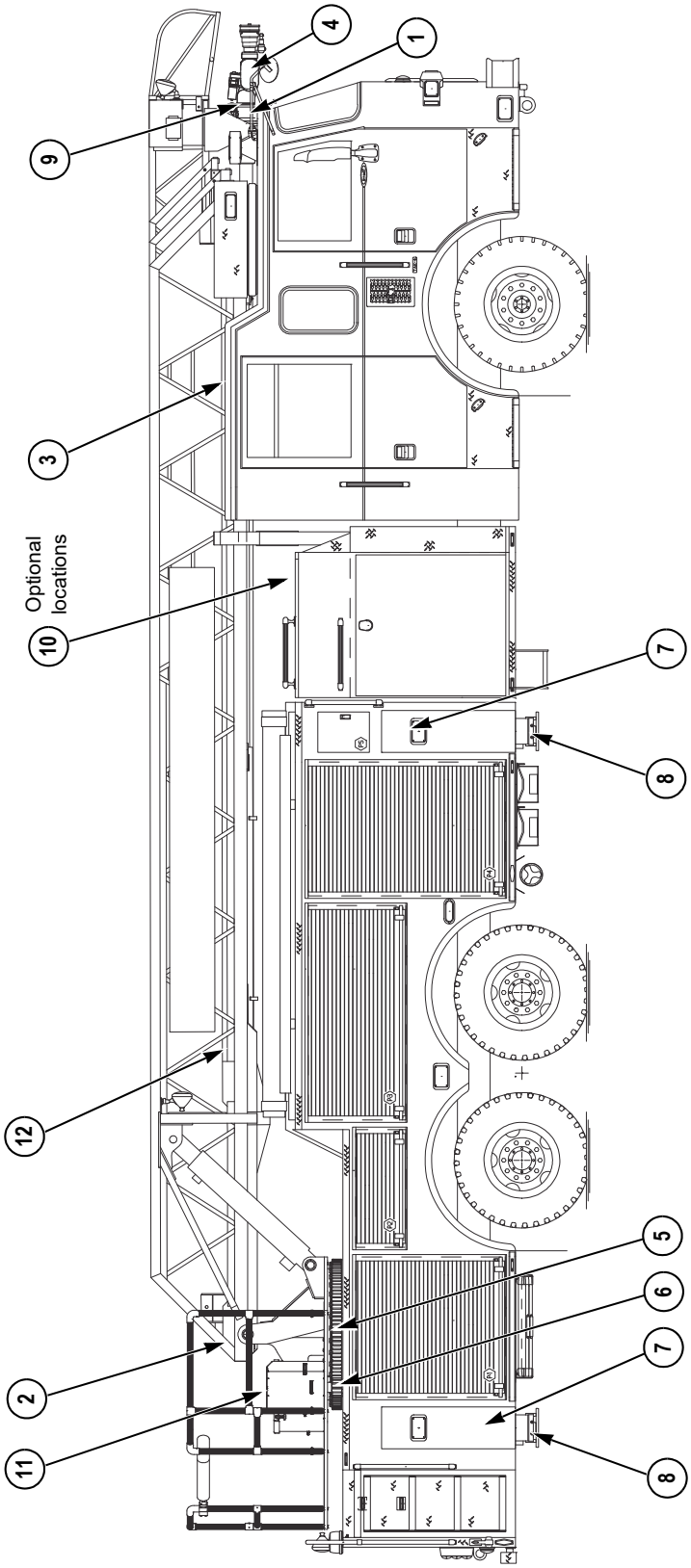


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Figure 5-3: Rotation Gear Box (Qty 1) Fill Plug and Drain Plug Locations

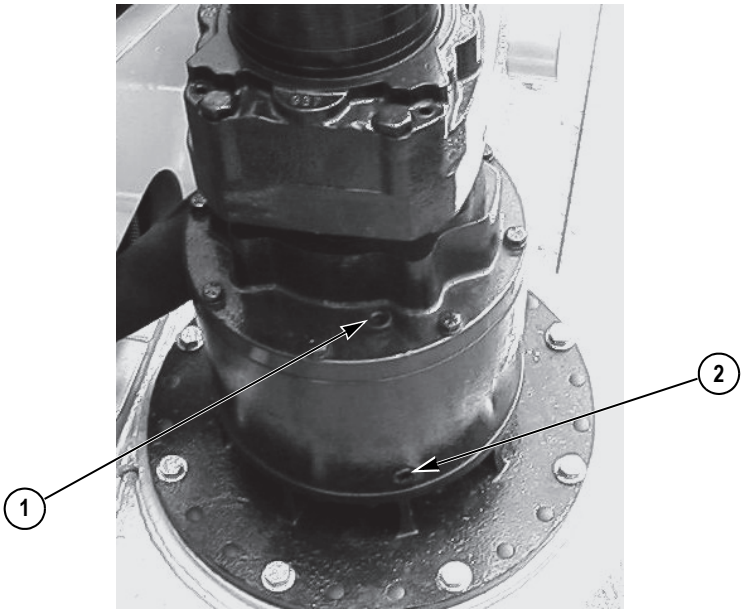

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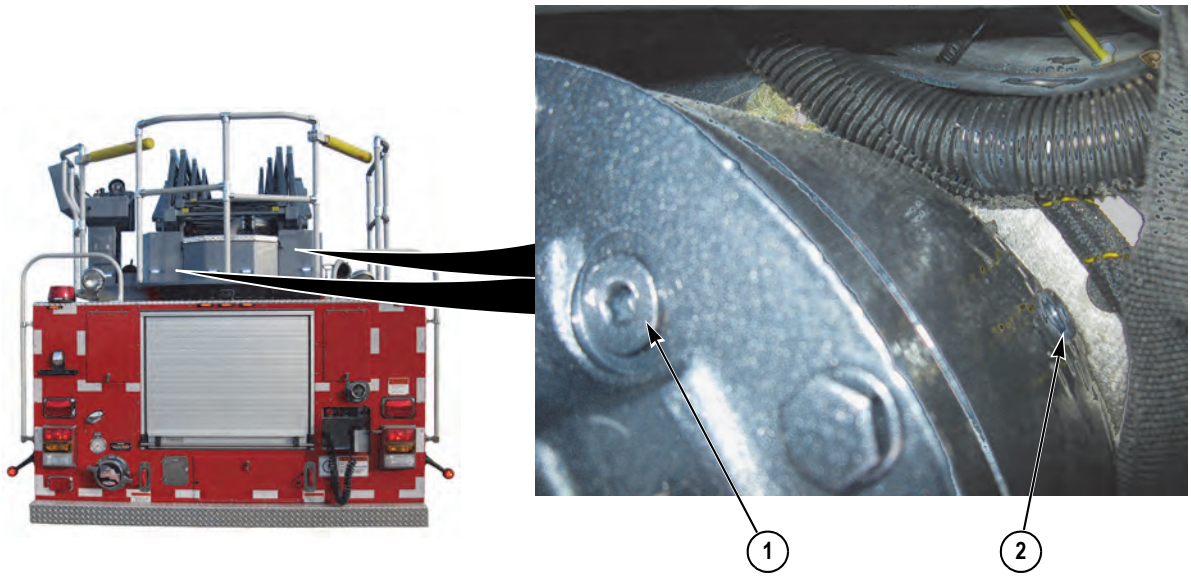
Figure 5-4: Rotation Gear Box (Qty. 2) Fill Plug and Drain Plug Locations



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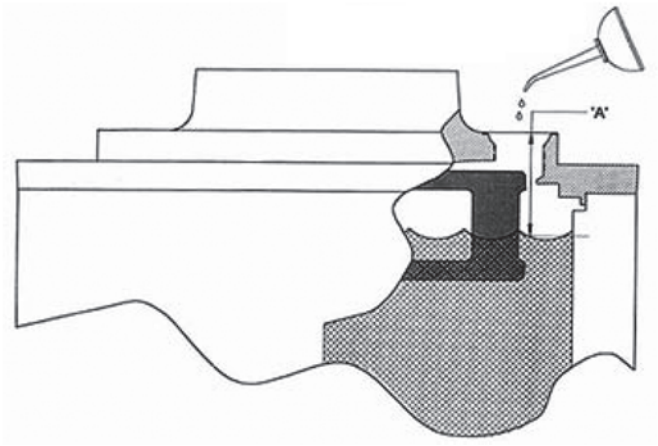
Item #	Description
1.	Fill Plug
2.	Drain Plug

Figure 5-5: Rotation Gear Box Correct Oil Level



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If necessary, rotate the aerial until the planetary sun gears are clear of the fill hole and a measuring device can be inserted between the planetary gears.

The correct oil level should reach the middle of the primary planetary gear face *(see Figure 5-5)*.

When properly filled, the oil level should be 1.25–1.50 in. below the top of the fill hole (measurement “A”).

The rotation gear box oil capacity 5.0 pints (2.4 liters).

Equipment Inspection and Maintenance Worksheet

Organization		Equipment Model		
Pierce Job No.	Miles	Hours	Date	Type of Inspection
Manual Publication Number		Publication Date		

Column Descriptions

Column A - Enter TM Item Number from Procedure.	Column D - Show corrective action performed for deficiency or shortcoming listed in Column C.
Column B - Enter the applicable condition status symbol (see below)	Column E - Enter initials in the column of individual who completed corrective action.
Column C - Enter a description of deficiencies and shortcomings.	

Equipment Status Symbols

"X" - Indicates a deficiency in the equipment that places it in an inoperable condition.	DIAGONAL "(/)" - Indicates a material defect, other than a deficiency, which must be corrected to increase efficiency or to make the item completely serviceable.
CIRCLED "X" - Indicates a deficiency; however, the equipment may be operated under specific conditions as directed by the authority having jurisdiction, until corrective actions can be accomplished.	LAST NAME INITIAL - Indicates that a completely satisfactory condition exists.
HORIZONTAL DASH "(-)" - Indicates that a required inspection, component replacement, or maintenance operation check is due but has not been accomplished, or an overdue inspection has not been accomplished.	

All inspections and equipment conditions recorded on this form have been determined in accordance with the inspection procedures and standards contained in the accompanying manual.

Signature	Date/Time

ITEM NO. (A)	STATUS (B)	DEFICIENCY/SHORTCOMING (C)	CORRECTIVE ACTION (D)	INITIAL WHEN CORRECTED (E)

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