

1. INTRODUCTION

1.1 Aerial ladders may be used to accomplish rescue, entry, search, and ventilation. They may also be used to stretch hose lines to upper floors or roof; bridge a gap; operate hose lines from the ladder; ladder pipe operations; and as observation posts to assess conditions. When their need is evident upon arrival, they should be raised immediately. When their need is anticipated for later use, ladders shall be positioned and set up as described in this SOG. The driver shall remain in the vicinity of the turntable until it is evident that the aerial ladder will not be required.

1.2 These guidelines are intended to communicate to members the preferred methods of operating and using aerial devices safely and efficiently. They are based on generally-established methods and practices in the fire service. Each emergency is unique, often requiring the company officer to make on-the-spot decisions. Company officers may deviate from these guidelines, if a situation warrants. However, a company officer's decision to deviate from these procedures should always be based on the safety of firefighters, the public and fire department equipment. Deviations from these guidelines should only be made to enhance life-saving or other safety efforts.

1.3 A primary concern when raising any ladder must be the location of power lines. No aerial shall be raised within 10 feet of power lines, unless a power company crew is on-scene to ensure that lines are not energized.

2. SAFETY & TRAINING

- All operators will go through initial ladder training and must re-qualify every 12 rolling calendar months.
- Personnel must be a current qualified engine operator to be eligible for training to be a ladder truck driver (the ladder may operate as an engine at some incidents).
- There will be a qualified operator list posted in the station and on the truck at all times.
- The ladder must be a minimum of 10 feet from any electric wire. All electric wires should be considered energized unless the driver / operator has been informed otherwise by a power company employee. The ladder can be operated closer than 10 feet from telephone or television cables. ***If you are in doubt about what a wire is, consider it an electric wire and maintain a 10-foot clearance.***
- Safety belts must be worn by all firefighters when they are working from the ladder. **Any time a firefighter stops climbing to perform a task, he/she must hook in to the ladder rung.** Engine crews advancing a line up the ladder do not need ladder belts as long as they will not be working from the ladder. An engine crew member who stays on the ladder to help advance hose through a window must wear a ladder belt and hook in to a ladder rung.
- If the aerial device must be moved, the turntable operator must verify that all firefighters are hooked in to the ladder before moving it. **The ladder should not be retracted by the turntable operator with firefighters on it because of the danger of firefighter's feet being caught between the rungs.**
- A firefighter working at the tip of the ladder may use the creeper controls to move the ladder if needed. If the ladder needs to be retracted, the firefighter operating the creeper controls must verify that the feet of other firefighters are not in a position where they could be crushed when ladder is retracted.

- When used for water tower operations, no firefighters should be on the ladder if possible. The nozzle should be operated using the remote controls on the turntable pedestal or on the pump panel. The ladder captain or IC may authorize having a firefighter on the ladder during water tower operations.
- Mutual aid firefighters may climb and work on or around the ladder truck, but they are not permitted to operate the ladder.
- All training will be documented and kept in the firefighter's personal file.

3. RESPONSES

- The ladder will respond only if a qualified driver and one qualified ladder operator are available. The driver and operator must be on the list of qualified ladder drivers and operators – no exceptions. Refer to Appendix A for driver and ladder operator qualifications.
- The ladder will respond first-out on all types of structural-related fires in Chicora Borough or in any neighboring boroughs, or for any type of commercial or industrial building regardless of location, unless otherwise directed by the IC.
- The first alarm mutual aid response in the designated areas will be: ladder, engine & rescue.
- The ladder truck will respond with the rescue on all rescue calls except for motor vehicle accidents. The rescue will also respond on all ladder-only assists.

4. LADDER CAPTAIN

- The ladder captain will be the primary driver / operator of the truck.
- The ladder captain will be in charge of all ladder company operations and will report directly to the chief officer or IC.
- The ladder captain has the authority to stop all ladder operations if safety is a concern.
- The ladder captain will help to oversee that all firefighters are working in a safe manner during ladder operations.
- The ladder captain may appoint an assistant known as the "engineer" to assist with maintenance and training. The engineer will not be a line officer and will have no command authority. The engineer will be considered the primary operator of the ladder truck after the ladder captain.

5. GENERAL OPERATING CONSIDERATIONS

- No one shall be in contact with the truck and the ground when the ladder is being raised into position (electrical shock hazard). Firefighters should climb to the turntable before the operator begins raising the ladder or after the ladder is in position. No one should attempt to get equipment from the truck while the ladder is being raised or lowered. If it is necessary to operate the pump while the ladder is being positioned, the pump operator should stand on the pull-out platform under the pump panel.
- The officer or driver in charge shall point out any potential hazards to firefighters before they climb or work from the ladder. Crew members should always check for any wires or other overhead obstructions before they begin climbing the ladder. The apparatus officer or driver is responsible for making sure firefighters are wearing ladder belts if they will be working from the ladder.
- The ladder should never be rested against the wall or roof of buildings or other structure. The ladder is designed to be used unsupported at the tip. Maintain about 2-4 inches between the ladder and any part of a structure.
- A spotter shall be used to help the ladder operator in positioning the ladder. The spotter shall take a position that has a good, unobstructed view of the structure and the tip of the ladder.
- A spotter shall be used when backing up the apparatus.
- When the ladder truck is parked in-service at the station, the waterway shall be placed in the "rescue" position. If the ladder truck is used for water tower operations, the waterway shall be returned to the rescue position after the ladder is bedded at the incident.
- Any mechanical issues with the truck or the aerial device shall be reported immediately to the ladder captain, captain or other line officer. If repairs are beyond our in-house capabilities, the proper service center should be notified to schedule repairs.
- If there are any mechanical issues with the apparatus that affect safe operation, the truck will be taken out of service immediately, and a notice shall be placed in the driver's position in the cab and on the white board in the radio room.

6. REQUIREMENTS FOR DRIVERS & AERIAL DEVICE OPERATORS

6.1 The department qualifies individuals for operating the ladder truck and aerial device in two ways: driver-operators and aerial device operators. Driver-operators must be able to safely drive the vehicle, operate the fire pump on the apparatus, correctly position the vehicle for aerial device operation and operate the aerial device on the apparatus.

6.2 *Driver-operator:* To qualify, you must meet all department requirement for apparatus drivers, you must qualify as a pump operator and you must complete qualification as an aerial device operator. See Appendix A for complete requirement for driver-operators.

6.3 *Aerial device operator:* Aerial device operators are trained to safely operate and position the aerial device on the apparatus. At incidents where both the aerial and apparatus pump are being used, having an aerial device operator to operate the aerial allows the driver to concentrate on operating the

pump. All members who ride the ladder are required to qualify as aerial device operators. See Appendix A for complete requirement for aerial device operators.

7. TRUCK COMPANY DUTIES

There are seven basic duties usually assigned to a truck company:

- 1) Search and Rescue
- 2) Forcible Entry
- 3) Ventilation
- 4) Ground/aerial ladders
- 5) Salvage/overhaul
- 6) Ladder pipe operations
- 7) Utilities

Except for rescue, the duties may not necessarily be performed in the given order, and it may not be necessary to perform all of the duties at every fire. Engine companies or another truck company may perform some duties as needed.

Search and rescue should, ideally, be done in conjunction with the engine company making the initial fire attack. However, the truck company may make entry first, utilizing a search rope. This rapid entry and search may be necessary to preserve life, especially if an engine's arrival or the hose evolution is delayed.

Prior to performing forcible entry on a closed door to an involved or suspected involved area, members shall consider the interior conditions. The probability of survival should dictate the need for a rapid search without a hoseline. The time of day, possibility of occupants, and the stage of fire should dictate the attack mode. When in doubt, a hoseline should be used as a precaution.

8. PLACEMENT OF AERIAL LADDER - GENERAL

8.1 In the event an engine arrives on-scene at a structure fire or rescue, the engine company officer is responsible for positioning all apparatus to allow space for the ladder to operate. Engine company officers must ensure that access for the ladder is not blocked.

8.2 For efficient and safe fire control, apparatus drivers must work together to ensure apparatus are positioned for maximum use and minimum stress to the aerial device. In most cases, there are no hard and fast rules for the positioning of aerial apparatus. Though the basics of proper positioning can be formed into loose standard operating procedures, the final process of positioning the apparatus at an actual fire incident will be a judgment call by the incident commander or truck company officer.

8.3 For any given situation, the proper distance from the objective is the distance which affords maximum stability and the best climbing angle. This should be consistent with the height of extension required, the planned use of the ladder, and the conditions at the emergency. Long extensions at low angles place the maximum amount of stress on an aerial device and, in some cases, reduce the load-carrying capacity of that device. Whenever possible, long extensions at low angles should be avoided.

This can be done by getting as close to the desired objective as possible without placing the apparatus in danger zones.

8.4 Possible stress to the aerial device can also have an impact on where the apparatus should be positioned. Stresses are those factors which work against the strength of the aerial device. Stress may be imposed in both static (at rest) and dynamic (in motion) operation. The stress tends to be greater when the ladder is in motion.

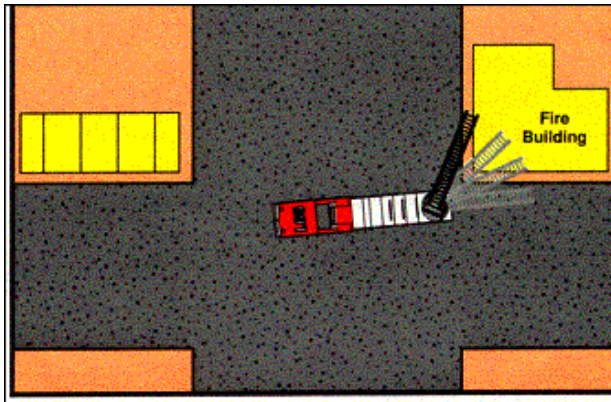
Ladder stress can occur from one or a combination of the following conditions:

- Excessive degree of angle, both horizontal and vertical, measured from the truck's center line axis
- Operation in nonparallel positions (hilly terrain)
- Operation in supported vs. unsupported positions
- Length of aerial device extension
- Personnel on the aerial device
- Nozzle reaction from elevated master stream
- Weight of hose, water, and equipment
- Wind reaction
- Improper operation of the aerial device
- Heat exposure
- Ice on ladder or platform

8.5 When positioning the aerial ladder for window entry, place the ladder 2 to 6 inches out from the bottom of the windowsill, even with the bottom, and toward the leeward, or upwind, side. This allows for easier access by firefighters wearing SCBA. Make sure to completely clean the glass out the window with a tool.

8.6 When operating the aerial ladder with the nozzle in the rescue position, the ladder can be used to ventilate windows. Place the tip of the aerial at the top one-third of the window and extend it through the window a few inches. Once the tip is through the glass, bring it down to the bottom of the sill. This will keep glass from riding down the rails of the aerial. Never use a side-to-side motion as aerial devices are not built to take these lateral loads. This type of ventilation can be very effective and is a quick way to assist interior crews on upper floors with horizontal ventilation.

8.7 The best rescue approach is made from upwind. If an approach is made from downwind, the aerial device operator may have difficulty seeing the objective, and crews and victims will have to deal with the products of combustion. If possible, aerial apparatus used for rescue should be placed at the corner of the building. This allows rescuers to use the aerial device to reach victims on two sides of the building.



Positioning the turntable at the corner of a building gives access to two sides of the building

8.8 Ventilation is a very important function of the truck company. Proper placement of the aerial device can make the ventilation process quicker and safer. Aerial apparatus should be positioned as close as possible to the area being ventilated. This minimizes the travel distance between the work area and the aerial device. This could be important in the event of roof failure. The apparatus should be positioned so the aerial ladder extends above the roof level. This allows personnel to safely enter and exit the aerial device and makes the aerial device easier to find once the firefighters are on the roof. Aerial ladders should be extended at least 6 feet above the roof level so they can be seen by personnel operating on the roof.

8.9 Elevated master streams can be used in both offensive and defensive attacks. When used in an offensive attack, the apparatus should be positioned to give the fire stream as much reach into the fire areas as possible.

WARNING: External fire attacks utilizing master streams should never be done when interior crews are working in the same area. The disturbance of the interior thermal balance and large volume of steam created by external master stream attacks pose a serious safety threat to firefighters working in the area.

8.10 Regardless of apparatus position, drivers must observe safety precautions anytime the aerial device is used. The following aerial device safety factors should be considered when determining the aerial apparatus position:

Surface conditions (soft pavement or soil)
Weather and wind conditions
Electrical or other overhead obstructions
Angle and location of aerial device operation
Fire building conditions

8.11 The aerial device on the ladder is designed to be used in a cantilever mode (tip not resting against anything), Aerial devices allowed to rest against a wall can support a greater load than cantilever positions. The maximum loading for an unsupported aerial device occurs when operated at angles between 70 and 80 degrees from horizontal. The amount of extension affects aerial device stress. As extension increases, aerial loading must be decreased. Aerials operating at a low angle of elevation and at long extensions are at their weakest operational position. This type of operating position should be avoided if at all possible.

8.12 Another consideration for placing apparatus is the debris that can fall from the fire building. This is of particular concern at high-rise fire incidents. Large pieces of glass and other debris may be falling from many stories above street level. This can pose a serious hazard to personnel operating off the apparatus and to the apparatus itself. In these situations the apparatus should be positioned away from the area in which debris is falling and all personnel should be kept safe of the falling debris zone.

8.13 One of the ladder crew members shall assist the driver in proper placement of the apparatus before carrying out his other assigned duties. The apparatus shall not be backed up unless the driver has the assistance or at least one spotter.

8.14 The aerial operator shall remain on the turntable when members have entered the building by aerial ladder and are in precarious positions such as a floor over a fire or ventilating the roof of a building with a heavy fire condition. The operator must be alert to who ascended the ladder, when, and where the members are operating. The operator must not move the aerial once firefighters have dismounted the ladder, as doing so may disorient them if a rapid evacuation is necessary.

9. APPENDIX A

Ladder Truck Driver-Operator Qualification Requirements

See evaluator's checklist in Appendix B for specific evaluation points.

1. Watch the EZ EVOC DVD (about 1/2 hour).
 2. Complete a modified version of EVDT competency course.
 - Straight line station (station 1 of EVDT competency course)
 - Confined space turn-around (station 2 of EVDT competency course)
 - Alley dock station (station 3 of EVDT competency course)
 - Serpentine station (station 4 of EVDT competency course)
 - Lane change station (station 5 of EVDT competency course)
 - Ladder tip awareness station (new station demonstrating awareness that tip of ladder extends past the front of truck)
- Complete a road test with an evaluator. Course will consist of driving on these streets/ roads:
- Exiting from and backing into station
 - Driving on selected streets in the borough
 - The loop from Chicora Road to Kittanning Pike to Fairmont Road to Chicora Road
 - Rural road (e.g.: Medical Center Road)
4. Complete aerial device operation qualification.
 5. Complete pump operator qualification. Current pump operators will not need to perform the complete pump operator qualification procedure, but they must demonstrate working knowledge of ladder pipe controls and operation (see checklist).

Aerial Device Operator Qualification Requirements

See evaluator's checklist in Appendix B for specific evaluation points.

1. Complete an aerial device orientation session.
 2. Position and stabilize aerial apparatus. *Note: Because aerial device operators may not be drivers, those seeking qualification as aerial device operator are only expected to describe proper positioning of ladder truck. However, they must correctly stabilize vehicle as required in evaluator's checklist.*
 3. Position ladder for roof operations.
 4. Position ladder for rescue from window.
 5. Position ladder for firefighter entry into window.
 6. Change position of waterway from rescue to master stream.
 7. Position aerial for master stream operations.
 8. Return waterway to rescue position.
 9. Demonstrate knowledge of how to use emergency operating system for aerial device.
- Demonstrate proper technique and control for bedding ladder.
11. Return apparatus to service (road).

10. APPENDIX B

Checklist for Aerial Device Operator Qualification

Name: _____ Date: _____ Evaluator: _____

Checks that transmission is in Neutral.

Checks that parking brake is set.

Checks that front wheels are straight and adjusts as required.

Applies front axle brake.

Turns on PTO switches and verifies indicator lights.

Sets wheel chocks on front wheel.

Positions diverter valve switch to "stabilizer."

Places truck in high idle.

Places stabilizer pads.

Extends stabilizers.

Lowers stabilizers demonstrating proper leveling of apparatus and positions of stabilizers for inserting safety pins. Demonstrates knowledge of restrictions on angles for safe operation of ladder.

Correctly inserts safety pins in stabilizers.

Places truck in low idle.

Positions selector switch to "aerial."

Closes and latches control doors.

Goes to turntable and enables controls needed for operating ladder, lighting on ladder, and intercom on ladder.

On command of evaluator operates ladder as directed. When ordered to stop by evaluator, correctly positions ladder so rungs are aligned.

On command of evaluator, demonstrates knowledge of locking down ladder in current position.

At direction of evaluator, correctly operates and positions ladder for these situations:

Positions ladder for roof operations.

Positions ladder for rescue of civilian in window.

Positions ladder for firefighter entry into window.

20. Demonstrates knowledge of using creeper control override and creeper controls.
21. On command of evaluator, correctly changes position of waterway from rescue to water tower.
22. Demonstrates knowledge of and correct use of master stream controls.
23. On command of evaluator, correctly returns position of waterway from water tower to rescue.
24. On command of evaluator, demonstrates proper technique and control for bedding ladder.
25. Correctly returns all controls on pedestal to the correct position for taking ladder out of service.
26. Returns to rear of truck and prepares to retract stabilizers.
27. Sets diverter valve switch to "stabilizer."
28. Removes safety pins from stabilizers.
29. Correctly raises and retracts stabilizers. Candidate is able to identify potential problems with excessive torsion force on truck when raising stabilizers.
30. Sets diverter valve switch to neutral position.
31. Closes and latches control panel doors.
32. Turns off PTO switches in cab of truck.
33. Correctly identifies location of ladder and master stream controls at pump panel.
34. Describes "short jacking," including when it would be used, the technique and all safety concerns (verbal description only).
35. Describes emergency system for bedding ladder (verbal description only).

REVISION HISTORY

3/28/2014

General formatting changes

Added sections 7 & 8

Formal approval by Chief J. Miller and release to department (previous edition was a preliminary SOG)

05/22/2016

Changed number of SOG from 2009-001 to 200-0005 to reflect new numbering system. Changed title of to "Aerial Apparatus Operations."

12/31/2018

Changed to new format for SOGs.