

LADDER COMPANY OPERATIONS

Saving of life is the primary ladder company role. The functions of ventilation, entry, and search (VES) implement that role, and at the same time facilitate confinement and extinguishment of the fire by engine companies. Ladder companies do not operate autonomously, but in coordination with engine companies in carrying out a joint aggressive interior attack.

FDNY ladder company doctrine is based on multiple dwelling operations in general and tenements in particular. Although both post-1929 apartments and projects are larger, the narrow but deep tenement with its wood interior, limited fire stopping, lessened likelihood of building stability, and open stairway construction in older buildings presents the greatest problem to firefighters. Ladder company operations in other building types are variations of tenement basics.

Until October, 2000, ladder company operation at structural fires employed both team and semi-individual operations. However, implementation of Federal OSHA safety rules at that time required that firefighters enter the fire structure only in teams of two or more except when there is a known life hazard. This change impacts operations of the Outside Vent, Roof, and Chauffeur firefighters, who previously operated semi-independently and who made individual entry into the fire building. They must now team up with one another or another member before making entry except when there is a known life hazard. The new procedures also require that a safety team be available. See "IDLH Operations" for further details.

Truck work is demanding and dangerous. At a recent annual Medal Day, 33 awards were made for heroic actions. Twenty-three went to ladder company personnel and four to rescue personnel performing ladder company-type functions. Eleven went to Outside Vent firefighters.

LADDER COMPANY RESPONSIBILITIES

The first-arriving ladder is responsible for:

- operations on the fire floor;
- determining the life hazard and making rescues as required;
- venting the roof and checking rear and sides from the roof;
- laddering as needed;
- search and rescue above the fire if the second ladder is not on the scene.

The second-arriving ladder handles:

- operations above the fire floor including search, removal, ventilation, and checking for extension of the fire;
- assisting in roof ventilation if needed;
- checking sides and rear of the building;
- augmenting ladder and removal operations if needed.

STAFFING and EQUIPMENT

Ladder company staffing is one officer and five firefighters, comprising an inside team and outside team. Riding positions and equipment are standardized:

Inside Team	Officer	Hand light, officer's tool
	Forcible Entry (Irons)	Axe or maul, Halligan, Rabbit tool
	Extinguisher (Can)	6-foot hook, Extinguisher
Outside Team	Outside Vent	6-foot hook, Halligan, saw on top floor fires
	Roof	6-foot hook, Halligan, life-saving rope
	Chauffeur	Tool(s) as required

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All ladder company members have a flashlight, safety harness, and a 25-foot utility cord. All but the Extinguisher and Forcible Entry firefighters have radios, although some battalions have radios for one or both of those positions. A 40-foot personal rope is not now carried, pending changes in guidelines.

ENROUTE PROCEDURES

While responding to the scene, the officer monitors the borough radio channel while the chauffeur monitors the tactical channel on a handheld radio. The inside team generally rides on the right side of the apparatus, the OV (on rearmounts and tower ladders) and Roof on the left.

When possible, the first-arriving ladder company follows the first engine to the front of the fire building. The engine passes the building entrance allowing the ladder to position itself as required by immediate needs. If the first-due engine and ladder come from opposite directions, the ladder stops short of the intended engine company hydrant, the crew (less the driver and tiller man) proceeds to fire building on foot, and the ladder moves into position once the engine connects to the hydrant. Meanwhile, instructions are radioed to the second ladder company if its standard operations must be altered.

Upon arrival, company officers conduct their sizeup using the 13 factors shown in "Engine Company Operations." All members do a visual check as they approach the fire building noting visible life hazards, number of floors, adjoining buildings, number of front windows on each floor, party balconies, fire escapes, and the location of the fire floor and the fire.

IMMEDIATE RESCUE

If a rescue must be attempted immediately upon arrival, the company officer directs the chauffeur to place the apparatus at the proper distance from the building and to align the turntable with the objective. The chauffeur is assisted in placing the apparatus by the Outside Vent firefighter (OV). Once the ladder is in place, the chauffeur and OV use the ladder to effect the rescue. When more than two occupants require rescue, one member of the forcible entry team assists. Meanwhile, the officer and the remainder of the company enter the building to attempt an interior rescue. The preferred order for occupant removal is interior stairs, horizontal exits, fire escapes, ladders, and last, life saving rope.

When entry must be made and the only company on the scene is a ladder, the OV and FE firefighters constitute the safety team. When only an engine and ladder are on the scene, the safety team is the Control FF and the OV. Entry is then made by other members in both cases.

VENTILATION

The first element of VES is ventilation, which is carried out for two purposes: venting for fire to make it possible for engine company personnel to enter and extinguish the fire, and venting for life to facilitate entry when there is a known or suspected life hazard. The latter may involve "pulling the fire" to facilitate search and rescue operations, and is often hazardous. Prevention of explosions and control of the spread of the fire are also recognized as reasons to ventilate.

Vertical ventilation starts with opening the roof bulkhead door, scuttle, and skylights. It is normally carried out by the Roof firefighter, who may be assisted by the Roof firefighter of the second arriving ladder company. Additional openings are made as necessary, and may include roof cuts, usually 3x6-feet, and perpendicular to supporting cross members. Top floor ceilings below must be pushed down to complete the opening. At advanced top floor fires, an entire ladder or rescue company may be deployed to the roof, especially in buildings with "energy efficient" windows. Initial roof operations are not considered "entry" for safety purposes.

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Lateral ventilation focuses on venting the windows on the fire floor. It is normally carried out by the OV firefighter and is managed by the truck officer inside. The OV advises the officer of delay of water or gaining entry, wind conditions, life hazards, and special considerations such as energy efficient windows. The OV is usually ordered to vent from the outside when the hose line is ready to advance into the fire apartment. Uncontrolled venting may result in either backdraft or flash-over. Windows are not vented that would impact use of fire escapes.

FIRST-ARRIVING LADDER

When immediate rescue is not an apparent factor, the first-arriving ladder company operates on the fire floor. The inside team goes to the fire floor via interior stairs if possible, performs forcible entry as needed, does an immediate search, removes victims, and locates the fire and direction of extension. The search is conducted, to the extent possible, toward ventilation and an escape route. The fire is confined by shutting doors and the portable extinguisher is used as appropriate. The officer coordinates lateral ventilation with the outside team.

The chauffeur remains in the front of the fire building. If required, he works with the OV when the fire and fire escape are in the front of the building. In other situations he readies the aerial ladder for operation, and is prepared to either move it to the roof to provide access for the RM, or to vent the fire floor using the tip of the ladder. He remains at the turntable when the ladder is used by members or may be needed for egress. If not needed at the apparatus, and the second ladder is not in service or expected in a reasonable time, he teams up with another member to enter above the fire.

The RM proceeds to the roof via an adjoining building, aerial ladder, or rear fire escape, but for safety reasons, not interior stairs in the fire building. The RM does his own sizeup and informs the officer (or incident commander directly) of his observations. These include building configuration and height variation, roof loading, fire showing from areas not visible to the incident commander, roof and cockloft condition, fire escape location, and location of trapped persons. The RM quickly opens bulkheads, scuttles, skylights and carries out other roof ventilation if necessary. If a top floor fire, he vents the top floor windows from the roof. He then teams up with the OV to begin VES operations on the fire floor or floors above the fire, or with the second RM for VES on all floors above the fire.

The OV uses the fire escape drop ladder or a portable ground ladder, then the fire escape, and lower or adjacent windows if necessary, to get to the exterior of the fire apartment. In coordination with the company officer inside, the OV ventilates the fire area from the exterior. The OV may be directed to assist the RM.

The OV's duties differ in two instances. At a store fire, he ventilates the rear unless venting would expose persons on a fire escape. At a top floor fire, he goes to the roof with a saw and Halligan, and then goes down the fire escape to vent from the exterior. If entry is required, he teams up with either the second OV or another member.

TOWER LADDER as FIRST-ARRIVING LADDER

The inside team operates as outlined above.

The chauffeur stays on the tower ladder pedestal. OV ventilates from the basket.

The RM operates per doctrine, but after basic roof ventilation, may proceed to the fire floor, by-passing floors above the fire, to vent from the fire escape. If he must enter, he teams with the second RM, an inside team member, or another FF. If the latter actions are taken, the second-arriving ladder is advised that VES has not been carried out above the fire.

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SECOND-ARRIVING LADDER

This company, after sizing up conditions on the fire floor, operates on all floors above the fire, conducting search, occupant removal, ventilation, and determining fire extension. Both companies perform laddering as required. Equipment is as outlined in basic doctrine except that Extinguisher takes two six-foot hooks for top floor fires.

Care is taken to ensure that companies operating on the fire floor are aware that operations above are being initiated, and that integrity of stairs and hallway is maintained. Those on the fire floor must advise those above of situations requiring withdrawal. Members operating above may force one or more doors on each floor to provide a safe refuge area, however, that tactic has been downplayed in newer procedures for high-rise multiple dwellings. If members cannot establish a refuge area and the engine company's hose line is ready to attack, the ladder members return to the fire floor.

The chauffeur, if not needed for ladder operations in the front, teams with the second OV or other member and goes above the fire floor for VES taking whatever tools are appropriate.

OV assists with laddering if needed, then goes above the fire using basic doctrine routes for venting operations. If the fire is in the rear or there is only a rear fire escape, OV and RM team up and enter. When there is a front fire escape and the fire is in the front, OV and the Chauffeur or other member team up and enter.

RM assists the first RM if necessary. He then teams up with the first RM or the second OV or other member for VES above the fire.

SECOND-ARRIVING LADDER at TOP-FLOOR and COCKLOFT FIRES

Fires involving the top floor and/or cockloft pose a major life safety threat for occupants, which must be located and evacuated quickly. Therefore, the inside team of the second ladder goes directly to the top floor and works with the first ladder in entering and searching the entire floor.

The RM goes to roof with a saw to work with the first ladder RM.

OV vents the fire apartment from the fire escape in coordination with the inside team, or if that was done by the first OV, the second OV vents the adjoining apartment. If entry is required, he teams with the first OV or other member. Entry is made from the fire escape from below.

The chauffeur, if not needed in front of the building, goes to the roof and assists with vertical or lateral ventilation or other duties assigned by the officer.

Top floor and cockloft fires may require opening the roof before lateral ventilation is accomplished. The presence of a flammable membrane-covered roof will require a hose line to protect members on the roof.

SEARCHES

The primary search is a rapid effort to locate occupants in the fire area and includes the area where occupants may have jumped or fallen. Special attention is given to areas near exit doors and behind draperies and curtains. The incident commander is kept apprised of the progress of all searches, and bases many of his tactical decisions on those reports.

When an area is untenable, it is probed with a hand or tool, the door is closed, and entry is delayed until an engine company goes in with a hose line. Ladder members then follow to search and ventilate when entry is gained. The ladder company OV will not attempt VES without ap-

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proval from the officer inside. Members ventilate as they search where the action will not draw fire to the vent.

The secondary search, utilizing members who did not make the primary search in the same area, includes the entire building perimeter, stairways, shafts, basements and cellars.

OVERHAULING

This function includes "precontrol" overhaul which is begun as soon as possible after the fire is knocked down. The first-arriving ladder checks for extension from the fire area. All six sides are checked, and openings made as necessary. This process includes checking walls, ceilings, pipe recesses, and voids, and may be accomplished by touch in some cases, checking for heat. The purpose is to find any extension of fire as soon as possible

The second ladder company checks for extension above the fire floor. Special attention is given to vertical routes of possible extension such as interior shafts and ducts.

PORTABLE LADDER OPERATIONS

The department uses a 20-foot straight ladder, 12- and 20-foot straight hook ladders, and 16, 24, 25, and 35 foot extension ladders. Smaller collapsible and folding ladders are also used. All are aluminum. Thirty-five foot ladders are rated at 600 pounds load, collapsible ladders at 300 pounds, and all others at 500 pounds.

The desired angle for climbing is 65-75 degrees. Placement guidelines include level with the sill at a window, two feet above a roof or parapet, slightly above a fire escape railing or one to three feet above a fire escape railing when placed against the building wall. All ladders are "butted" when in use.

When there is fire in the cellar, first, or second floors of a tenement or multiple dwelling without front fire escapes, portable ladders are placed adjacent to and above the fire area even when an aerial ladder may be in use at the upper floors. To facilitate evacuation at buildings with front fire escapes, a portable ladder is raised to the lowest escape balcony at the side opposite the drop ladder. At buildings with rear fire escapes, occupants may be assisted to roof via the gooseneck ladder from the top fire escape balcony, or portable ladders may be taken through the building to the rear yard.

AERIAL LADDER OPERATIONS

Aerials are usually placed in the center of the street, 25-35 feet from the building wall, with the turntable directly opposite the objective, or centered between two objectives. Aerials are placed on the least exposed side, other requirements permitting. When no condition requiring use is apparent at a building with a large frontage, the apparatus is placed so that the turntable is 15 feet past the side of the building passed on approach. Placement, however, is dependent on four factors: immediate rescue needs; extent of building frontage; heat, fire, or smoke endangering the public or departmental personnel; and area or street conditions. Aerials are generally not put into operation when the fire building and exposures are under four stories.

When the aerial is used for rescue, the OV assists the chauffeur in getting the ladder in operation. The OV goes up first, followed by the chauffeur. The OV gets the victim out the window. The chauffeur assists the victim down the ladder while the OV, if necessary, searches the room. Additional victims require manpower from the inside team.

The aerial is often used to vent windows by extending the ladder through the upper glass, then lowering the ladder to break the horizontal sash and the lower glass.

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Because of the flexibility and ease of operation provided by tower ladders, aerial ladders are seldom used for ladder pipe operations. However, every aerial carries a Akron model 1496 ladder pipe, 100 feet of 3½-inch hose with three-inch fittings, and a 3-inch valve and a 3x3-inch siamese. When that evolution is performed, two water sources are utilized when possible. The "70/80/90" rule guides initial operations i.e. the ladder is elevated to 70 degrees, extended to a maximum of 80 feet, and 90 psi water pressure is supplied to the ladder pipe. Horizontal movement of the stream is accomplished by rotating the turntable; elevation is managed by two ropes attached to the ladder pipe.

TOWER LADDER OPERATIONS

The tower ladder provides increased capability in three areas: rescue, access to building interiors, and elevated master stream operation. The working height limitation is 70 feet (90 feet for some models). All members are trained in pedestal and basket control operations. In extreme situations, there is an approved evolution which provides for a 20-foot portable ladder to be placed in the tower ladder basket, and 25- and 35-foot extension ladders may be used when no other alternative is available.

The tower ladder is generally controlled from the pedestal by the chauffeur, but may be operated from the basket. An intercom system is provided, but members use handi-talki radios extensively.

When possible in rescue operations, the basket is positioned so that the Akron nozzle at the front does not interfere with movement to and from the fire building. A Stokes basket can be placed upright, leaned against the basket rail, or lashed horizontally on top the basket railings.

Operation on both flat and peaked roofs is facilitated by tower ladders. In addition to rapidly moving personnel and equipment to and from roofs, venting by means of power saw may be accomplished from the basket in some situations. Similarly, basket personnel can open and/or remove cornices. One evolution provides for a length of hose line to be taken into the building from the basket. Such an operation allows members to avoid unsafe stairs and fire escapes as well as long stretches.

The Akron Apollo monitor (frequently but incorrectly referred to as a "Stang") with its stream shaper and stacked 1-3/8, 1½, 1¾, and 2-inch tips is mounted on the tower ladder basket waterway. Twelve-hundred gpm flow is available with the two-inch tip and two 3½-inch supply lines. Supply pressure at the base of the tower ladder is 200-250 psi. A straight stream is often used to quickly move from window to window to knock down fire that is threatening exposures. There is major emphasis on coordinating external stream application with personnel operating in the fire building, so that they are not exposed to either smoke or fire pushed toward them, or the direct force of the large caliber stream. The master stream capability is used extensively in vacant building operations in order to reduce the hazards associated with aggressive interior attack necessary in occupied buildings.

The Akron Turbomaster model 1755 fog nozzle (500-1250 GPM at 100 psi) carried on each tower ladder can replace the stream shaper and stacked tips on the monitor. Fog application into a building requires adequate venting on the opposite side to allow the air being moved to leave the building. The fog nozzle on a tower ladder is especially effective in protecting occupants while moving in to effect rescue with the basket and for mass decontamination operations. The fog nozzle is also used in mass casualty decontamination procedures. The Akron monitor may be partially disassembled to permit attachment of the Argus Foam Cannon, one of which is carried on each satellite of the Satellite Water System.