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I. INTRODUCTION

- A. <u>Purpose</u>: To provide Department personnel with the basic techniques and evolutions for safe ground ladder operations.
- B. <u>Scope</u>: This instruction applies to all personnel when ground ladders are required for use in emergency or nonemergency.
- C. <u>Author</u>: The Deputy Fire Chief of the Administrative Bureau, through the Training Section, shall be responsible for the content, revision and annual review of this instruction.

II. RESPONSIBILITY

A. <u>All Personnel shall use ground ladders properly.</u>

III. POLICY

A. It is the policy of the Department that the first person to climb a ground ladder shall secure it to the structure.

IV. APPENDIXES

A. <u>Appendix I</u> - Techniques and evolutions for ground ladders.

APPENDIX I TECHNIQUES AND EVOLUTIONS FOR GROUND LADDERS

Ladder Commands

The majority of ladder work is performed by two or more personnel and requires teamwork. One key item in teamwork is the use of proper nomenclature and commands. Commands must be clear and concise and issued in two parts; a preparatory command and an action command.

In the preparatory phase, personnel place themselves in the proper position to start an evolution. On the action part of the command the evolution is begun. An example would be the command "pick up (pause) ladder." On the words "pick up" personnel would place their hands on the beam of the ladder. On the action command "ladder," the ladder would be picked up.

The person who normally gives the command is the one facing the rest of the personnel involved in the evolution. The only exception to this rule is when the order for the type of raise to be used is given. The person at the base of the ladder shall issue this command. The command must be given in a clear, sharp manner as the base person has their

back to the rest of the personnel, making voice contact more difficult.

General Ladder Techniques

- 1. When the spurs can be placed in a crevice or crack by moving the ladder a few inches it should be done to provide additional stability.
- 2. The top of the ladder should not be scraped along a window or ledge when being shifted to a new position. The correct technique is to bring the ladder to the upright position and then reposition. On long ladders it may be necessary to lower the fly(s).
- 3. When extending or retracting the fly(s) the personnel securing the ladder are to support it by placing their hands on the beams, never reaching through the rungs for any reason. Care should be taken to be sure the hands are not exposed to guides or stops which could cause injury. Feet should never be placed between the beams because of the danger of a halyard breaking, allowing the fly section to fall.

- 4. When lowering a ladder into a window, avoid knocking the glass from the frame, which might fall on the personnel below.
- 5. Ladders should not be placed in areas where ingress and egress to a structure might be obstructed.
- 6. When removing ladders from apparatus they shall be carried around the front of the apparatus to avoid interference with the unloading of hose.
- 7. When performing rescue operations involving a timid person, personnel are to take a position on the ladder with their feet one rung below the feet of the person being rescued; with the victim between rescuer and ladder, the rescuer's arm should go under the armpits of the victim and grasp the rungs. Descent is made one rung at a time. A ladder belt should be placed on a victim to assure the victim can be locked to the ladder in case of panic.
- 8. Should you lose control of the ladder when performing evolutions with the ladder in the vertical position, the ladder is to be pushed toward the buildings to limit the fall, thus minimizing ladder damage and injuries to personnel.

<u>Removing Ladders From Apparatus Engine Companies - Wooden</u> <u>Ladders - Two Personnel - 24 -Foot Extension</u>

- 1. Remove protective cover from spurs, release securing clamp(s), personnel position themselves at first varnished rung from each end.
- Grasp ladder with one hand on the second painted rung, the other hand on the second varnished rung from the tip and base. (Figure 1).
- 3. Remove ladder by pulling it from the mounting brackets away from the apparatus. Personnel are to stand upright, doing all lifting with the arms. (Figure 2).
- 4. As the ladder nears the body, personnel pivot in the direction the ladder is to be carried, placing the arm nearest the ladder through the rungs so that the first varnished rung from tip and base rests tightly against the inside bend of the elbow, the hand grasps the lower beam. The outside hand is used to maintain balance. (Figure 3).
- 5. Carry ladder to desired location.
- 6. When removing roof ladder use Steps 1 through 4. If roof ladder is to remain on apparatus, engineer shall secure roof ladder before moving apparatus.





<u>Removing Ladders From Apparatus</u> Engine Companies - Wooden Ladders - 24-Foot Extension Removal for Ground Placement</u>

When the ladder is removed from the apparatus during the unloading of equipment and is temporarily stored on the ground on the same side of the apparatus as it is mounted, the following method will be used:

- Remove protective cover from spurs. Release securing clamp(s). Personnel position themselves facing one another at the tip and base of the ladder. Personnel grasp ladder by placing outside hand on end of top beam, inside hand on end of bottom beam. (Figure 1).
- 2. Remove ladder by sliding it outward. When ladder is clear of mounting brackets, lower to a comfortable carrying position, pivot ladder, placing working side down, walk laterally from apparatus to desired storage location. (Figure 2).
- 3. Place ladder on ground with the working side down. (Figure 3).
- 4. When removing roof ladder use Steps 1 and 2. If roof ladder is to remain on apparatus, engineer shall secure roof ladder before moving apparatus.





<u>Removing Ladders From Apparatus</u> Engine Companies - Metal Ladders - Three Personnel - 35-Foot

- 1. Remove protective cover from spurs; release securing clamp(s).
- 2. Personnel position themselves as follows: Base person and tip person stand at ends of ladder facing one another, outside hand grasping ends of upper beam, inside hand the ends of the lower beam. Middle person positions themself one-third from tip, hands grasping rungs. (Figure 1). Remove ladder from bed until clear of apparatus by approximately four feet.
- Personnel pivot ladder into a flat position, working side down. (Figure 2). Middle person supports ladder by outside beam as tip person repositions themself on the inside of the ladder, opposite middle person. (Figure 3).
- 4. Base person commands "shoulder ladder." Personnel lift ladder to shoulder height, pivot body in direction ladder is to be carried, place ladder on shoulder, inside hand supporting beam to relieve weight from shoulder, outside hand used to maintain balance. (Figure 4).
- 5. Carry ladder to desired location.
- 6. Engineer shall secure roof ladder before moving apparatus.



Removing Ladders From Apparatus

Aerial Ladder Companies With Wooden Ladders - Three Personnel 35-Foot

- 1. Personnel position themselves as follows: One person stands at the rear of the ladder bed, facing the ladders. Other personnel take positions on either side of ladder bed facing one another.
- 2. Release clamp securing ladders in bed. End person grasps beams of bed ladder, begins to pull ladder from bed. (Figure 1).
- 3. When ladder is two-thirds out of the bed the other personnel grasp the beam nearest them, assist in the final removal of the ladder. (Figure 2).
- 4. When the ladder is clear of the bed and truck the end person commands "lower ladder." (Figure 3). With the ladder grounded, personnel remove any ladder temporarily stored between the beams of the 35-foot ladder, place in a safe location.
- 5. Pick up and carry ladder to desired location.



<u>Removing Ladders From Apparatus</u> <u>Aerial Ladder Companies With Wooden Ladders –</u> <u>Six Personnel – 50-Foot</u>

1. Personnel position themselves as follows: Base personnel stand at end of ladder bed facing the side of beams. Middle personnel stand on each of ladder bed facing one another. Tip personnel position themselves directly behind middle personnel. Tip person releases clamp securing ladders bed, base personnel grasp rungs and beams of bed ladder, begin sliding ladder from bed. (Figure 1).





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2. When ladder is approximately halfway out of the bed, middle personnel grasp

> beam nearest them, palms up to support ladder weight, aid base personnel in

(Figure 2).

3. Tip personnel move into position on either side of ladder, grasping beam of bed ladder even with the third rung from the top as soon as it clears the ladder bed. (Figure 3).





- When ladder is clear of the bed and overhanging equipment, one of the tip personnel commands, "clear." Personnel raise ladder to shoulder height, pivot body in direction to be carried, place ladder on shoulder. The inside hand is placed palm up on the beam to relieve weight from the shoulder. The outside arm is used to maintain balance. (Figure 4).
- 5 Carry ladder to desired location.

Removing Ladders From Apparatus

Aerial Ladder Companies With Metal Ladders - Three Personnel 35 - Foot

- Personnel position themselves as follows: Tip person and base person stand at ends of ladder. Middle person, after releasing securing clamp(s), takes position one-third from the tip. (Figure 1).
- 2. Personnel grasp outside beam, slide ladder from bed. While ladder is sliding from bed, tip person and base person reposition to ends of ladder, facing one another, grasping the ends of the inside beam as it clears the bed. (Figure 2).
- 3. Base person repositions themself, while supporting base of ladder, to the opposite beam middle person is supporting. Tip person repositions to inside beam, opposite middle person. (Figure 3).
- 4. Personnel pivot body in direction ladder is to be carried, place ladder on shoulder, inside hand placed palm up on lower beam to relieve weight from shoulder. The outside hand is used to maintain balance. Base person supports both beams. (Figure 4).
- 5. Carry ladder to desired location.



<u>Removing Ladders From Apparatus</u> <u>Aerial Ladder Companies With Metal Ladders - Four Personnel</u> <u>40 - Foot</u>

- Personnel position themselves as follows: Tip person and base person stand at ends of ladder. Middle person, after releasing securing clamp(s), takes position one-third from the tip. (Figure 1).
- 2. Personnel grasp outside beam, slide ladder from bed. While ladder is sliding from bed, tip person and base person reposition to ends of ladder, facing one another, grasping the ends of the inside beam as it clears the bed. (Figure 2).
- 3. Base person repositions themself, while supporting base of ladder, to the opposite beam middle person is supporting. Tip person repositions to inside beam, opposite middle person. (Figure 3).
- 4. Personnel pivot body in direction ladder is to be carried, place ladder on shoulder, inside hand placed palm up on lower beam to relieve weight from shoulder. The outside hand is used to maintain balance. Base person supports both beams. (Figure 4).
- 5. Carry ladder to desired location.



<u>Removing Ladders From Apparatus</u> <u>Aerial Platform Companies With Metal Ladders</u> <u>Three Personnel – 35-Foot</u>

- 1. Release clamp(s) securing ladder to apparatus.
- 2. Personnel position themselves facing one another at tip or base of ladder, the inside hands grasping the tip or spur of the lower beam. The outside hands grasp the tip or spur of the upper beam. (Figure 1).
- 3. Personnel slide ladder from mounting, carrying ladder on edge until clear of apparatus by approximately four feet.
- 4. Personnel pivot bodies to the working side of the ladder. The forward person, when facing in the direction the ladder will be carried, while pivoting, removes the hand grasping the lower spur and places it through the ladder between the second and third rung from the tip or base (Figure 2). The hand grasps the lower beam, the second rung resting tightly against the inside bend of the elbow.

The rear person, when facing the direction the ladder will be carried, removes lower hand from tip or spur, places it, palm up, against bottom of upper beam near the second rung. (Figure 3). The outside hand supporting tip or spur of upper beam is removed and the arm placed through the ladder between the first and second rung. (Figure 4). The hand grasping the lower beam with the second rung resting tightly against the inside bend of the elbow.

5. Carry ladder to desired location.



<u>Removing Ladders From Apparatus</u> <u>Aerial Platform Companies With Metal Ladders</u> <u>Three Personnel – 35-Foot</u>

- 1. Personnel position themselves at the end of the ladder bed as follows: Base person stands at base of ladder facing spurs. Tip personnel stand, one on each side of the ladder bed, facing each other.
- 2. Base personnel removes pin securing ladder in bed; grasps ladder with the lower hand on the first rung from the base, the heel of the hand against the lower beam, the upper hand supporting the upper beam at the spur. Base person pulls ladder directly back from bed, maintaining it in a level position (Figure 1).
- 3. When two-thirds of the ladder is out of the bed, tip personnel grasp ladder with one hand supporting lower beam, the other hand on the upper beam to maintain ladder balance. Personnel carry ladder, on edge, clear of the bedded platform. (Figure 2).
- 4. With the ladder clear of the platform, base person pivots body in the direction the ladder is to be carried, places lower beam on shoulder leaving hand on upper beam for ladder stability. Tip personnel face in the same direction as base person. The tip person on the same side of the ladder as the base person places the lower beam on their shoulder.
- 5. On command "shoulder ladder," the outside tip person turns lower beam of ladder on shoulders of other personnel (Figure 3), placing upper beam on their shoulder (Figure 4).
- 6. Carry ladder to desired location.



<u>Removing Ladders From Apparatus</u> <u>Aerial Platform Companies – Metal Ladders</u> <u>Four Personnel – 45-Foot</u>

1. Release clamps securing ladder to apparatus. Personnel position themselves as follows: Inside personnel face the ladder, positioning themselves even with the third rung from tip and base, grasp the lower beam with one hand, top of rung with the other hand.



FIGURE 1

Outside personnel stand at the ends of the ladder facing the inside personnel, grasping the lower beam with the outside hand, the upper spur with the inside hand. (Figure 1).

Personnel remove ladder from bed by lifting straight out, keeping ladder on edge. When ladder is cleared of bed by approximately four feet, personnel raise ladder to shoulder height. Inside personnel Pivot bodies in direction ladder is to be carried, place lower beam on shoulder. (Figure 2).





FIGURE 2

3.

Outside personnel reposition themselves even with inside personnel, continue supporting ladder on edge while repositioning, face in same direction as inside, personnel. (Figure 3).

FIGURE 3

 Outside personnel lower top beam onto shoulder, the lower beam turning on the shoulder of the inside personnel. (Figure 4).

Carry ladder to desired location.



FIGURE 4

Pick Up and Carrying Extension Ladders One Person - Ladders To an Including 24 -Foot

- 1. With the ladder in the flat position, working side down, squat at the tip, body facing down the ladder, hands grasping the tips of both beams. (Figure 1).
- 2. Lift top portion of ladder keeping upper part of body straight, doing majority of lifting with the legs. When tip. is chest high, pivot ladder onto one spur, working side toward body. (Figure 2).
- 3. With ladder on beam, remove hand from the upper beam and place on rung next to upper beam. Walk ladder into a semivertical position by an alternating method of grasping every other rung with one hand, the beam with the other hand. (Figure 3).
- 4. With the ladder in a semi-vertical position, place upper or rear hand on beam at the balance block, forward or lower hand grasping the second rung below the balance block. (Figure 4).
- 5. To place ladder on shoulder, take on step to the rear with the rear foot, dip by bending knees slightly, pulling ladder toward shoulder. When beam touches shoulder, straighten legs and raise base of ladder by extending forward arm. (Figure 5).
- 6. Carry ladder to desired location.



Raising Extension Ladders One Person – Ladders T and Including 24-Foot

- 1. Select the correct location for placement of base of ladder.
- 2. To set spur of lower beam on ground, bend knees, draw the hand grasping the rung down toward the body. The hand grasping the beam is pushed up and away from the body as the knees are straightened. (Figure 1).
- 3. Allow spur of lower beam to touch ground when approximately six inches ahead of the forward foot. Place ladder in semivertical position by pushing ladder away from body. (Figure 2).
- 4. With ladder in semi-vertical position, release hand holding rung, grasp the other beam, pivot ladder on grounded spur placing working side away from building. When ladder is parallel to the building, allow it to rest on both spurs. (Figure 3).



Extending Ladders One Person - Ladders To and Including 24-Foot

- 1. Brace ladder prior to extending by placing the instep of foot against the outside of one of the spurs with the knee on the inside of the beam on the working side of the ladder. The shin should rest against the beam. (Figure 1).
- 2. Grasp halyard with hands one to two feet apart, the lower hand even with face, elbows extended laterally from body. The ladder is now kept from inward travel by tension on the halyard; outward travel is reduced by elbow and knee pressure. (Figure 2).
- 3. Extend fly by pulling straight down on halyard using the alternating hand method. When fly is extended to desired height, lock pawls by the following method: Maintain the fly position with continued tension on halyard with upper hand. Grasp the halyard at or below the waist with the lower hand. Pull up on the halyard, pivoting pawls over a rung. Release tension slightly with upper hand lowering fly until pawls are secure over a rung. (Figure 3).
- 4. Visually check pawls for locking before completely releasing tension on halyard.





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Lowering in Ladders One Person – Ladders To and Including 24 – Foot

- 1. With the ladder in the vertical position, fly extended and pawls locked, place the instep of one foot in center of the bottom rung, extend the other leg back and away from ladder for leverage, pressing the spurs firmly against the ground. Grasp both beams with hands at a height slightly below the shoulder. (Figure 1).
- Push ladder away from body to start tip traveling toward building. As tip of ladder approaches structure, redis tribute body weight away from the structure to slow rate of travel until tip makes soft contact with building. (Figure 2).
- 3. Brace ladder for climbing.



Pick Up and Carrying Extension Ladders Two Personnel - Ladders To 30 - Foot

- 1. Place ladder on beam. Personnel position themselves on the working side, even with the first varnished rung from tip and base, facing the opposite direction the ladder is to be carried. Rear person gives command "pick up," both personnel grasp upper beam with hand nearest ladder, palm toward body, keeping upper portion of body straight and bending knees. (Figure 1).
- 2. Rear person gives command "ladder." Personnel lift ladder, pivot bodies in direction ladder is to be carried. Both personnel place free arm through ladder (Figure 2), the first varnished rung resting tightly against the inside bend of the elbow. Personnel grasp the lower beam on the outside of the ladder. (Figure 3).
- 3. The hand that was grasping the upper beam is removed and arm is now used to maintain balance.
- 4. Carry ladder to desired location.


<u>Raising extension Ladders</u> <u>Two Personnel – Beam Raise – Ladders To 30 – Foot</u>

- 1. Base person selects correct location for ladder placement. Commands "beam raise," place free hand over-top spur of ladder. (Figure 1).
- 2. Base person commands "ladder," places lower spur on ground, steps to end of ladder, placing nearest foot on grounded spur, extends other leg to the rear to give added leverage; leaving hand on upper spur, extend other arm and grasp upper beam to aid in raising. (Figure 2).
- 3. Tip person raises tip above head, walks ladder into vertical position by alternating hand position on lower beam. (Figure 3).
- 4. With ladder in near vertical position, both personnel grasp beams, pivoting the ladder on the grounded spur to place working side away from building. When ladder is parallel to building, allow it to rest on both spurs.







Raising Extension Ladders Two Personnel – Flat Raise – Ladders to 30 – Foot

- 1. Base person selects correct location for placement of base of ladder, orders "flat raise," place free band on upper spur of ladder.
- 2. Base person commands "ladder," sets base on ground, pivots, takes position at end of ladder. Top person pivots ladder over onto both spurs with working side down. (Figure 1).
- 3. Base person places one foot on each spur, squats and grasps both beams. (Figure 2).
- Tip person raises ladder to vertical position by alternating band positions on rungs while walking toward base of ladder. (Figure 3).



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<u>Raising Extension Ladders</u> Two Personnel – Flat Raise – 35 – Foot Aluminum Ladder

- 1. Base person selects correct location for placement of base of ladder, orders "flat raise," places free hand on upper spur of ladder.
- 2. Base person commands "ladder," sets base on ground, pivots, takes position at base of ladder. Tip person pivots ladder over onto both spurs with working side up. (Figure 1).
- 3. Base person places one foot on each spur, squats and grasps both beams. (Figure 2).
- Tip person raises ladder to vertical position by alternating hand positions on rungs while walking toward base of ladder. (Figure 3).



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<u>Extending Ladders</u> Two Personnel – Ladders To 30 - Foot

- 1. With ladder in vertical position, working side away from building, base person positions themself opposite the working side of ladder; grasps ladder by placing one hand on each beam-,at different levels, the hands spanning the beams; places the instep of one foot against spur. When ladder is stable, base person notifies tip person, "ready to extend." (Figure 1).
- 2. Tip person places instep of one foot against the spur that the base person has not secured. Extends arms above head, grasps halyard with hands, pulls halyard straight down using alternating hand method until fly is, extended to desired height. (Figure 2).
- 3. Tip person locks pawls by maintaining a downward tension on halyard with the upper hand to hold fly in position while the lower hand reaches down below waist, grasps halyard, pulling it straight up, pivoting pawls over a rung. (Figure 3).

Note: Pawls on aluminum ladder lock automatically.

4. Tip person visually checks pawls for locking before releasing the halyard.



<u>Extending Ladders</u> Two Personnel – 35 – Foot Aluminum Ladder

- 1. With ladder in vertical position, working side towards building, tip person positions themself opposite the working side of the ladder. Tip person grasps ladder by placing one hand on each beam at a different level, the hands spanning the beams. Place the instep of one foot against the spur. When ladder is stable, tip person notifies base person, "ready to extend." (Figure 1).
- 2. Base person places instep of one foot against the spur that tip person has not secured. Extends arms above head, grasps halyard with hands, pulls halyard straight down using alternating hand method until fly is extended to desired height. (Figure 2).
- 3. Base person visually checks pawls for locking before releasing halyard.

NOTE: Pawls on aluminum ladders lock automatically.





<u>Lowering In Ladders</u> Two Personnel – Ladders to 30 - Foot

- 1. With the ladder in the vertical position, fly(s) extended, pawls locked, tip person positions themself on the working side of the ladder, places foot on each spur, hands spanning beams for balance. Base person positions themself between ladder and building, places palms against beams, elbows locked, arms high for leverage, feet spread, one leg extended back toward building. (Figure 1).
- 2. When ready to lower ladder into building, base person commands, "lowering in," slightly releases tension holding ladder in vertical position to allow tip of ladder to move toward building.
- 3. As tip of ladder approaches structure, tip person calls off distance from building. When tip is within six inches of building, base person increases tension against beams to make a soft contact with the structure. (Figure 2).
- 4. Brace ladder for climbing.





<u>Lowering Ladders</u> <u>Two Personnel – 35 – Foot Aluminum Ladder</u>

- 1. With the ladder in the vertical position, fly(s) extended, pawls locked, tip person positions themself opposite the working side of the ladder, places foot on each spur, hands spanning beams for balance. (Figure 1).
- 2. When ready to lower ladder into building, base person commands, "lowering in," slightly releases tension holding ladder in the vertical position to allow tip of ladder to move toward building.
- 3. As tip of ladder approaches structure, tip person calls off distance from building. When tip is within six inches of building, base person increases tension against beams to make a soft contact with the structure. (Figure 2).
- 4. Base person ties off halyard.
- 5. Brace ladder for climbing.





Picking Op and Carrying Extension Ladders Three Personnel - 35-Foot

1. With the ladder in the flat position, working side down, personnel position themselves as follows facing in the opposite direction the ladder is to be carried.

Base person stands next to a beam, beside the third rung from the base. Tip personnel stand, one on each side of the ladder, next to the first rung above the balance point of the ladder.

- 2. One of the tip personnel commands "pick up," both tip personnel squat, grasp beam of fly ladder with inside hands, palms toward body. (Figure 1). Tip person commands "ladder." Tip personnel lift ladder, pivot bodies in direction ladder is to be carried, place ladder on shoulder. (Figure 2).
- Base person squats, grasps beam of fly ladder, lifts base of ladder, pivots body, places beam of bed ladder on shoulder. (Figure 3).
- 4. Personnel remove outside-hands from ladder using arms to maintain balance: the inside hands are placed, palms up, against bed ladder beam and are used to relieve weight from shoulder. (Figure 4).
- 5. Carry ladder to desired location.



Raising Extension Ladders Three Personnel – 35 - Foot

- 1. Base person selects correct location for placement of base of ladder. Orders "flat raise," places arm over beam resting on shoulder, grasping the beam of the fly ladder. (Figure 1).
- 2. Base person commands "ladder," sets spurs of ladder on ground, pivots body, takes position at base of ladder. Foots ladder by placing feet on spurs, squats, grasps ladder by beams, palms toward rungs. (Figure 2).
- 3. Tip personnel walk ladder into vertical position by alternating hands in a rung/beam manner. (Figure 3).
- 4. When ladder is in the vertical position, one of the tip personnel and the base person support the ladder while the other tip person moves around to the base person's position to aid in supporting ladder while extending.



<u>Extending Ladders</u> Three Personnel – 35 – Foot

- 1. With the ladder in a vertical position, base and third person brace ladder by assuming positions in line with beams, between structure and ladder.
- 2. The outside foot of each person is placed with the instep against the outside of the spur, the inside legs are extended back for leverage. The outside hands grasp the outside of the beam, spanning it with palms turned toward rungs at a height slightly above the head. Inside hands grasps the opposite beams at chest height. (Figure 1).
- 3. Tip person takes a position facing the working side, feet spread with one leg slightly to the rear to brace themself and arms extended above head, hands apart grasping halyard. (Figure 2).

4. When ladder is stable, base person notifies tip person "ready to extend."

5. Tip person extends fly(s) by pulling straight down on halyard using alternating hand method until desired height is reached, locks pawls, visually observes pawls before releasing tension on halyard.





<u>Lowering in Ladders</u> Three Personnel – 35 - Foot

- 1. With the ladder in a vertical position, fly(s) extended, pawls locked, the tip person places foot on each spur, hands spanning beams for balance. (Figure 1).
- 2. Base personnel place palms of outside hands against the beam at a height slightly above head, arms extended, elbows locked. Feet should be spread, inside legs extended back for leverage. (Figure 2).
- 3. When ready to lower tip of ladder into building, base person commands "lowering in." Base personnel lower tip of ladder into building by moving feet backwards, keeping arms locked. Tip person maintains pressure on spurs to prevent ladder from walking.
- 4. As tip of ladder approaches structure, tip person calls off distance from building. When tip is within six inches of building, base personnel increase tension against beams to make soft contact with structure.
- 5. Base person ties off halyard.
- 6. One base person braces ladder for climbing.



Picking Up and Carrying Extension Ladders Four Personnel – 40 and 45 – Foot

- 1. With ladder in flat position., working side down, personnel position themselves as follows, facing in opposite direction ladder is to be carried: Base personnel, one on each side of ladder, even with third rung from base. Tip personnel, one on each side of ladder, even with third rung from tip.
- 2. One of the rear personnel gives command "pick up." Personnel squat, grasp beam of upper fly with the hand nearest ladder, palm toward body. (Figure 1).
- 3. Rear person gives command "ladder." Personnel lift ladder, pivot bodies in direction ladder is to be carried, placing ladder on shoulder. Place free hand, palm up, on beam of bed ladder to aid in relieving weight from shoulder. (Figure 2).
- 4. The hand grasping the fly beam is removed and arm is now used to maintain balance. (Figure 3).



Fig 2.



<u>Raising Extension Ladders</u> Four Personnel – 45 – Foot

- 1. One of the base personnel selects correct location for placement of the base of ladder; orders "flat raise." Base personnel grasp beam of top fly with the outside hands. (Figure 1).
- 2. Base person commands "ladder," base personnel pivot bodies and squat, setting spurs on ground, take position at base of ladder. Each base person places their outside foot on tormentor spikes, inside leg extended back for leverage. Majority of weight is transferred to base of tormentors to prevent ladder from walking. (Figure 2).
- 3. Tip personnel walk ladder into vertical position by alternating hands in a rung/beam manner. (Figure 3).



<u>Extending Ladders</u> Four Personnel - 40 and 45 - Foot

1. With the ladder in the vertical position, personnel prepare the ladder for extending the fly by positioning themselves as follows:

Each person rotates one-quarter position counter-clockwise, i.e., #1 tip person rotates to halyard position; #2 tip person rotates to the tormentor position, etc.

One tip person and one base person unlock tormentor poles, positioning one 90 degree from building, the other parallel to the building. The tip of tormentor is grasped in rear hand; the spike placed between middle finger, the other hand extended on pole so it rests against the chest. (See Figure 4).

Remaining tip person and base person brace ladder by placing instep of one foot against outside of a beam, grasping both bed ladder beams, arms extended above shoulder height. (Figure 1).

- When all personnel are in position, base person commands "ready to extend." Tip person extends ladder to desired height as indicated by tormentor personnel at 90 degree position. (Figure 2).
- 3. Tip person visually checks to see that pawls are locked.

NOTE: Tormentor personnel shall notify each other as to the vertical position of the ladder over which their tormentor has control.



<u>Lowering In Ladders</u> Four Personnel – 40 and 45 - Foot

- 1. Personnel position themselves as follows: Tormentor person moves from parallel to the building to 90 degrees position parallel with the other tormentor. Both personnel on outside of poles. Tip person places foot on each spur, grasps outside of beams, hands at chest height. Base person places palms against beams, elbows locked, feet spread, one behind the other. (Figure 1).
- 2. Tormentor personnel start top of ladder toward structure by exerting inward pressure on tormentors and control speed of travel by pulling back on the poles. Base person aids tormentor personnel in lowering in by maintaining an even pressure against the beams. (Figure 2).
- 3. Tip person calls off distance from building. When tip is within six inches of structure, tormentor personnel and base personnel slow speed of travel so soft contact is made with structure. (Figure 3).
- 4. Tormentor personnel arc in tormentor poles.
- 5. Tie off halyard brace ladder for climbing.



Pick Up and Carrying Extension Ladders Six Personnel – 50 - Foot

- Personnel position themselves as follows: Two personnel, one on each-side, even with third rung from base. Two personnel, one on each side of ladder, one half the distance between tip and base. Two personnel, one on each side, even with third rung from the tip.
- 2. One of the rear personnel gives the command "pick up." Personnel squat, grasp beam of top fly with the hand nearest ladder, palm toward body. (Figure 1).
- 3. Rear person commands "ladder." Personnel lift ladder, pivot bodies in direction ladder is to be carried, placing ladder on shoulder. Place free hand, palm up, on beam of bed ladder to aid in relieving weight from shoulder. (Figure 2).
- 4. Remove hand from top fly beam, place arm in position to aid in maintaining balance. (Figure 3).
- 5. Carry ladder to desired location.







<u>Raising Extension Ladders</u> <u>Six Personnel – 50 – Foot</u>

1. Base person selects location for the placement of the base of the ladder. Gives preparatory command "lower." Personnel grasp beam of top fly with free hand. Base person commands "ladder." Personnel pivot bodies, squat, while supporting ladder with hand grasping fly beam. Place ladder on ground.

Base personnel and middle personnel remove tormentor poles from bed of the ladder, middle personnel insert tormentor pins in the receptacles in beam of bed ladder. Visually check for pins being locked securely.

Base personnel raise poles up and over to middle personnel who in turn pass them down to topmen who have placed themselves in a direct line with the ladder, eight to ten feet out. (Figure 1).



Fig 1.

- 2. Personnel take position as follows: Base personnel foot ladder by placing outside feet on spurs; inside legs extended back for leverage; hands on knee of leg placed on spurs. Base personnel lean forward to transfer weight to spur. (Figure 2).
- 3. Middle personnel take position even with second rung below tormentor swivels, facing tip of ladder, squat, grasping beam of fly ladder with inside hand, palm toward body. (Figure 3).
- 4. Tip personnel stand on outside of tormentor poles, tip of tormentor grasped in rear hands, the spike placed between middle fingers. (Figure 4).
- 5. Personnel must be evenly spaced, approximately three feet to the outside of the ladder beams, so the tormentor poles exert an even pressure to eliminate side drift.

The forward hand is extended sufficiently along tormentor pole to allow pole to cross middle of chest. (Figure 5).


- 6. With all personnel in position, base person commands "raise ladder." Middle personnel pick up ladder, pivot bodies facing the base. (Figure 6).
- 7. Ladder is raised to the vertical position by the rung/beam method. (Figure 7).
- 8. Tip personnel aid in raising by exerting even pressure against the tormentor poles. (Figure 8).
 - Note: It is important that tip personnel maintain even pressure to eliminate side drift that will be magnified at base making it difficult for base personnel to keep spurs grounded.



<u>Extending Ladders</u> Six Personnel – 50 -Foot

- With ladder in the vertical position, brace for extending in the following manner: Base personnel place the instep of their outside foot against the spur. Inside foot back for leverage. Outside hand grasping bed ladder beam slightly higher than shoulder height. Inside hand grasp opposite beam slightly lower than shoulder height. Middle personnel place outside feet in front of beams, inside legs extended back for leverage, hands grasping halyard. Tip personnel position one tormentor pole at 90 degrees, directly out from building, the second pole parallel to the building. (Figure 1).
- 2. With personnel properly placed, base person commands "ready to extend." Middle personnel, one or both depending upon ladder weight, extend ladder by pulling straight down on halyard using the alternating hand method. .(Figure 2).
- 3. Extend ladder to desired height. Tormentor person at 90 degree position indicates when ladder is at desired height. Middle personnel visually check that pawls are locked.



<u>Lowering In Ladders</u> Six Personnel – 50 - Foot

- Personnel position themselves as follows: Tip person on tormentor placed parallel to building moves tormentor to original 90-degree position with the other tormentor. Middle personnel place instep of outside feet on lower rung against beam, inside legs extended back for leverage hands placed on knee of foot which is on the rung, transferring the majority of weight to the rung. (Figure 1). Base personnel place palms of outside hands on beams at a height slightly above the shoulder, inside arms hanging free, outside feet in line with beams, inside feet extended back for leverage.
- 2. Base person commands "ready to lower in; lower in." Tormentor personnel start top of ladder toward building by pushing slightly on tormentors. Speed of movement of ladder is controlled by tormentor personnel pulling back on tormentors, and base personnel keeping outward pressure on beams.
- 3. Tip person calls off distance from building; when ladder is within six inches of building, personnel increase tension against tormentors and beams so a soft contact is made with structure. (Figure 2).
- 4. Tormentor personnel arc in tormentor poles tie off halyard.



Reversing Ladders - Beam Method

1. When ready to reverse ladder, rear person commands "reverse ladder." (Figure 1).



- Fig 2
- 2. Personnel pivot bodies 180 degrees, placing free arm through ladder. (Figure 2).

 Grasping the lower beam with the other hand, the rung resting tightly against the inside bend of the elbow, the other arm is now used to maintain balance. (Figure 3).



4. Carry ladder to desired location.

Reversing Ladders - Flat Method

1. When ready to reverse ladder, rear person commands "reverse ladder."



2.



Personnel, place free hand, palm up, against bottom of beam in front of the other hand.

 Personnel pivot bodies 180 degrees, remove other hand from beam, using it to maintain balance. (Figure 3).



Placement of Ladders

The angle which will provide the best ladder stability and climbing angle is between 65 and 70 degrees. To achieve the correct angle when placing ladders, personnel should determine the height of the sill or roof on which the ladder will rest, divide this figure by three. The resulting total will be the distance in feet that the base of the ladder should be placed from the object. For example, height equals twenty-one feet; divided by 3 is 7; - the base of the ladder should be seven feet from the object. (Figure 1). A quick method of determining if the ladder is placed at the correct climbing angle is to stand facing the ladder with toes touching the spurs, arm extended horizontally from shoulder. If palm of hand rests on a rung the angle is correct for the height of that person.

Firefighting Operations

Correct ladder placement for firefighting is to place the ladder against the building to the side of a window. Extend the ladder to a height which will allow personnel to properly lock in on the ladder and direct a hose stream at an angle that will obtain maximum penetration. (Figure 2).

Access and Rescue

Place ladder directly in the window, against one side of casing, at a height that will allow personnel to step from ladder onto the sill. (Figure 3).



Temporary Storage of Ladders

When placing ladders on ground they shall be laid flat with the working side down. Ladders are never to be left unattended resting on the beam.

When transferring the ladder from the flat position onto the beam, personnel shall place themselves next to a beam, opposite the third rung from the tip and base of the ladder facing in the opposite direction the ladder is to be carried.

Personnel squat, grasp ladder by beam nearest body (Figure 1), stand, pivoting ladder onto the beam furthest from body. (Figure 2).

Ladder is now in the correct position for beam method pick up.



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Bracing Ladders for Climbing Ladders Up To and Including 35 - Foot

Until ladders are secured to the structure by ladder straps, they shall be braced when climbing.

Base person bracing:

1. Base person braces ladder by grasping the outside of both beams, palms toward rungs, arms extended slightly above shoulder level, feet spread, one leg extended back toward structure. Inward tension is maintained on beams to hold ladder tip firmly against building. (Figure 1).



Bracing Ladders - "U" Poles

"U" poles are used to absorb inward stress on the beams of 35 - foot ladders during climbing. The following method of placement shall be-used:

 Raise, extend and lower in ladder. Place "U" Poles under a rung of the bed ladder that has a metal tierod. The metal "U" is positioned next to beam. (Figure 1).





2. Swing an arc with the base of the pole. Place base of pole at furthest point of the arc. Do not wedge poles as it is possible to spring the beam to the point that the tip lifts away from the building. (Figure 2).

Bracing Ladders - Tormentor Poles

Tormentor poles are used to provide stability to ladders while climbing. The following method of placement shall be used:

- 1. Tormentor personnel bring poles in from 90 degrees to a position parallel with the ladder at a distance from the beams where the spike is just clearing the ground.
- 2. Tormentor personnel swing an arc toward the building maintaining the spike just above the ground.
- 3. Determine the point of the arc that is furthest from the ladder. (Figure 1).
- 4. Set spike on ground at this point. (Figure 2).



<u>Climbing</u>

When climbing fire department ladders the body should be in an upright position. The arms should be outstretched with the elbows remaining straight to aid in keeping the body away from the ladder. This method is necessary to provide sufficient room for the knees to properly bend without striking the rungs when climbing. (Figure 1).

The hands are placed on every other rung, palms down, working through an arc between shoulder and waist level. (Figure 2).

The balls of the feet should be placed as near the center of the rungs as possible to minimize ladder sway. Feet are placed on every rung and the leg muscles are used to propel the body. (Figure 3).

The arms are used to steady or guide the climber. The eyes should be directed ahead or slightly higher than the climber, never at the feet. A visual inspection of ladder condition should be made as the climber progresses up the ladder to insure that the climb can be made safely.



Locking In

1. Climb ladder to desired location. Place one leg through ladder, over a rung. (Figure 1).



2. Return foot back through the ladder, under the rung, in a manner so as to place the rung in the curve of the knee joint.

> Hook foot over beam or rung, step down one or two rungs with the other leg to a comfortable position for the individual. (Figure 2).



Ladder Straps

It is the policy of the department .that the first person to climb a ground ladder shall secure it to the structure. To accomplish this two types of ladder straps are provided. One type is the belt style which is constructed of leather with a buckle on one end. This strap is also used to bind ladder sections together as a safety precaution. The second type is a combination hose and ladder strap which all uniformed personnel receive as personal issue and are-to be carried in the turnout coat. This strap consists of a metal hook having a two-inch opening on one end. To the other end is attached a one-inch by seven-foot nylon strap with the ends overlapped and sewn to provide a continuous strap three feet, six inches long.

To secure the top of a ladder to a structure, the following method shall be used:

1. Secure the opening of the hook over a window ledge, railing of a fire escape or similar object that is firmly attached to the structure.

> Place the strap over a ladder rung that is even with or slightly lower than the object the hook is attached to. The strap should be in the center of the rung. (Figure 1).



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2. Pass the end of the strap under the rung, up, over and down the other side of the strap. (Figure 2).





3. Bring the strap back under and over the rung. Pass the end of the strap between. the standing part and the piece cross ing over it at 90 °. (Figure 3).

4. Tighten strap by pulling end toward building. (Figure 4).



Halyard Tieoff For All Ladders Not Having A Continuous Running Halyard

The halyard tieoff is essentially two half-hitches around the working end of the halyard. The instructions given are for a 50 - foot ladder, fully extended. In cases where the ladder is not completely extended it may be necessary to adjust the number of rungs looped to remove slack.

- 1. Working from the backside of the ladder, one person removes slack until halyard is tight against the bottom of the second rung. (Figure 1).
- 2. Inside person forms a bight, passes bight over fifth rung. Outside person receives bight, pulls excess halyard through the ladder, passes bight back through ladder under second rung. (Figure 2).
- Personnel continue looping rungs until excess slack not needed for knotting, is used. (Figure 3).



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 Place bight through ladder, over a rung with one hand. Maintain tension on the standing part with the other hand. (Figure 4).





 Pass the bight around the halyard on the working side of the ladder and back through the standing part held in the other hand. (Figure 5).

6. Grasp the bight on the back side of the standing part, draw the hitch tight against the top of the rung. (Figure 6).



 With one hand, grasp the rope coming from the hitch to form a standing part. Pass the bight through the ladder underneath the rung. (Figure 4).





Circle the halyard on the working side and back through the standing part. (Figure 8).

 Grasp the bight on the back side of the standing part, draw the hitch tight against the bottom of the rung. (Figure 9).



Ladders Above Ground Root Ladder Carried-Aloft

- 1. Carry roof ladder to base of ground ladder that has been previously placed at desired location-. Place bottom rung of roof ladder against beam of ground ladder, working side up. Roof ladder is normally placed on the right side of the ground ladder since the majority of personnel carry the roof ladder on the right shoulder. (Figure 1).
- 2. Place roof ladder in a semi-vertical position braced against body and supported by grasping second rung from tip. Grasp hook with other hand, press in to unlock; pivot hook so it is facing away from working side of ladder. Release inward pressure on hook allowing spring to push hook out, thus locking in position. (Figure 2).
- 3. Place ladder on ground, working side up. Place ladder strap around the first varnished rung from the tip that has a metal tierod underneath it. (Normally the fourth rung from the tip.) (Figure 3).





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- 4. Form a loop on one end by separating the strap, form a bight with the opposite end. Pass the bight through the loop. (Figure 4).
- 5. Grasp the bight on the back side of the loop, draw the hitch tight, placing it against the beam that will be nearest the building when climbing the ladder. (Figure 5).
- 6. Raise the roof ladder into a vertical position, readjust base allowing top rung to rest against beam of bed ladder. Climb ground ladder, place ladder strap over shoulder, continue climbing ground ladder to desired location. (Figure 6).



Ladders Above Ground Placing Roof Ladder In Operation On Pitched Roof

- 1. Lock in on ground ladder. Remove roof ladder from shoulder, extend ladder toward ridge of roof by sliding tip of ladder up roof on the hooks, the hands alternating on the rungs. (Figure 1).
- 2. Extend roof ladder until hooks drop over the roof ridge, pull ladder back toward ground ladder thereby setting points of hooks into roofing material. (Figure 2).

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Straight Ladders - Method of Carrying

Straight ladders shall be carried in the same manner as extension ladders when performing two-person evolutions.

When performing a one-person evolution with a 24-foot straight ladder, the following techniques will be used:

- 1. With the ladder in the flat position, working side down, stand next to the balance point facing in the opposite direction the ladder is to be carried.
- 2. Grasp beam nearest body at the balance point, pivot ladder onto opposite beam, pick up ladder, pivot body, place free arm through the rungs at the balance point. Position ladder with the top beam resting on the shoulder, the rung tight against the front of the shoulder. Grasp the lower beam with the hand. (Figure 1).
- 3. Release grasp on the upper beam, place hand on the second rung in front of the one against the shoulder. Grasp the rung with the hand placed high on the rung, against the upper beam. (Figure 2). -





Straight Ladders - Method of Raising

- 1. Place the base of the ladder against building or other object. Remove hand supporting lower beam, grasp rung that was tight against the shoulder at a point next to the lower beam. (Figure 1). Remove hand grasping second rung; place hand, palm out, on the rung ahead of the one held by the other hand.
- 2. Push. lower beam away from body, pivoting it on the upper beam that is resting on the shoulder until the ladder is horizontal, working side down. (Figure 2).
- 3. Place both spurs against the building or other object, raise ladder into the vertical position by alternating the hands on the rungs. (Figure 3).
- 4. With the ladder in the vertical position,-squat, grasp a rung that is slightly lower than the hand when standing upright. Place the other hand on a rung higher than the head. (Figure 4).
- 5. Raise the spurs off the ground by straightening legs. Move the base away from the structure until ladder is at correct climbing angle ground the spurs.



Collapsible Ladders

Collapsible or attic ladders are generally constructed in 10-foot lengths. They are designed to be used in confined spaces or for attic access.

The method of carrying the collapsible ladder is to position the ladder horizontally, waist high, with the tip forward.

- 1. Place the tip of the ladder against the edge of the cover board. Push the tip of the ladder into the attic between the board and the access frame. (Figure 1).
- 2. Open the ladder (Figure 2), position the adjustable feet for stability.
- 3. Climb ladder, remove cover. (Figure 3).


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