

Belcore

 Bell Communications Research

BELLCORE PRACTICE
BR 081-740-105
Issue 4, December 1992

Extension Ladders and Attachments Description and Use

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This document replaces:

AT&T Section 081-740-105
Extension Ladders and Attachments, Description and Use
Issue 3, July 1979, and its associated addenda.

Prepared for Bellcore
by the Information Management Services Department

For further information, please contact:

Director, Network Facilities Physical Standards and Corrosion Control
(201) 829-2437

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Extension Ladders and Attachments, Description and Use

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1. Introduction

This document describes extension ladders, ladder attachments, and accessories, and how they are used. It also discusses safe methods for using the ladders, attachments, and accessories.

This document replaces predivestiture Bell System Practice 081-740-105, *Extension Ladders and Attachments Description and Use*, Issue 3, July 1979, and its associated addenda. Major changes to the document include

- Information on modifications to the physical configuration of the E extension ladder (fiberglass), based on updates to ladder specification CA08616
- Revised information regarding the inspection, care, and use of the E extension ladder (fiberglass) to agree with current industry practice
- Information on the description and use of new ladder accessories that are currently available
- Deletion of references to accessories that either were previously rated MFR DISC (manufacturer discontinued) or are no longer available or in use.

2. General Description

Extension ladders and their features are listed in Table 2-1 and are illustrated in Figures 2-1 and 2-2.

Table 2-1. Extension Ladders and Their Features

Ladder Type	Rating	Material		Available Sizes (In Feet) (Note 1)							Fig. No.
		Rails	Rungs	16	20	24	28	32	36	40	
C	STD	Solid wood	Solid wood	X (Note 2)	X	X	X	X	X	X	2-1
E	STD	Fiberglass	Aluminum	X (Note 2)		X	X	X			2-2

Note 1: Each size given in the table is the sum of the lengths of the two sections, not the height the ladder is designed to reach.

Note 2: Rope for raising the top section is not provided with the 16-foot ladder.

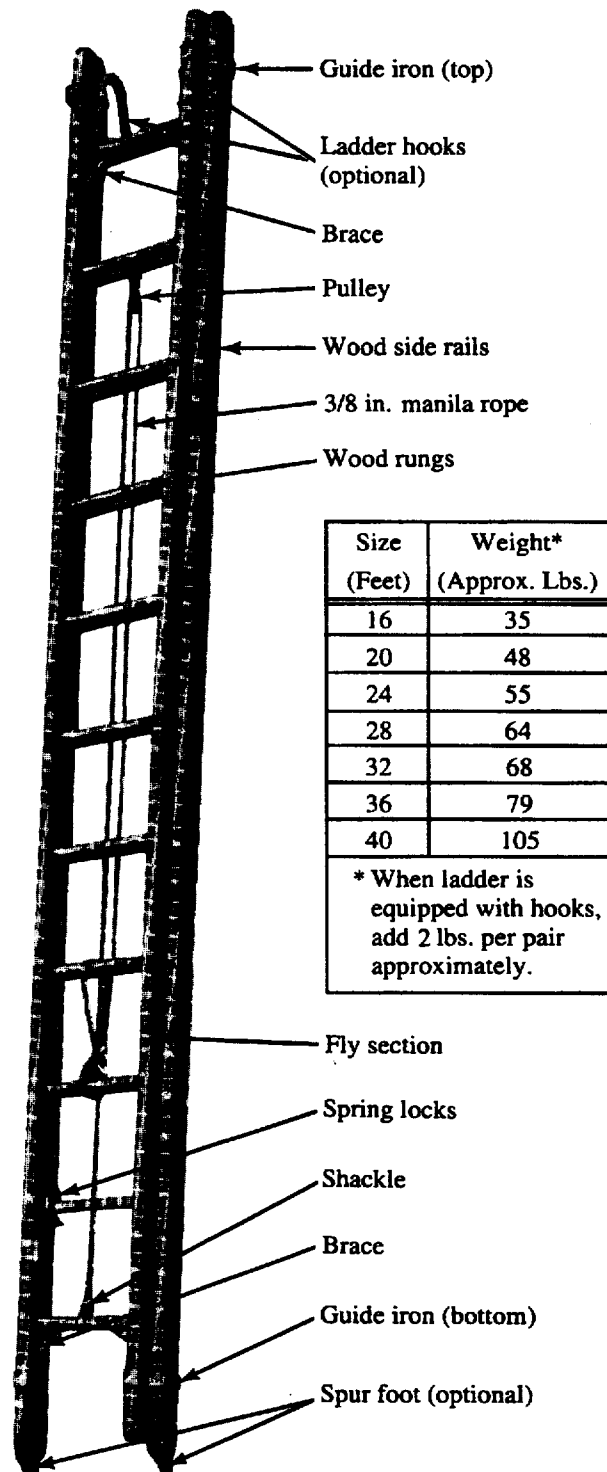


Figure 2-1. C Extension Ladder (CA07245)

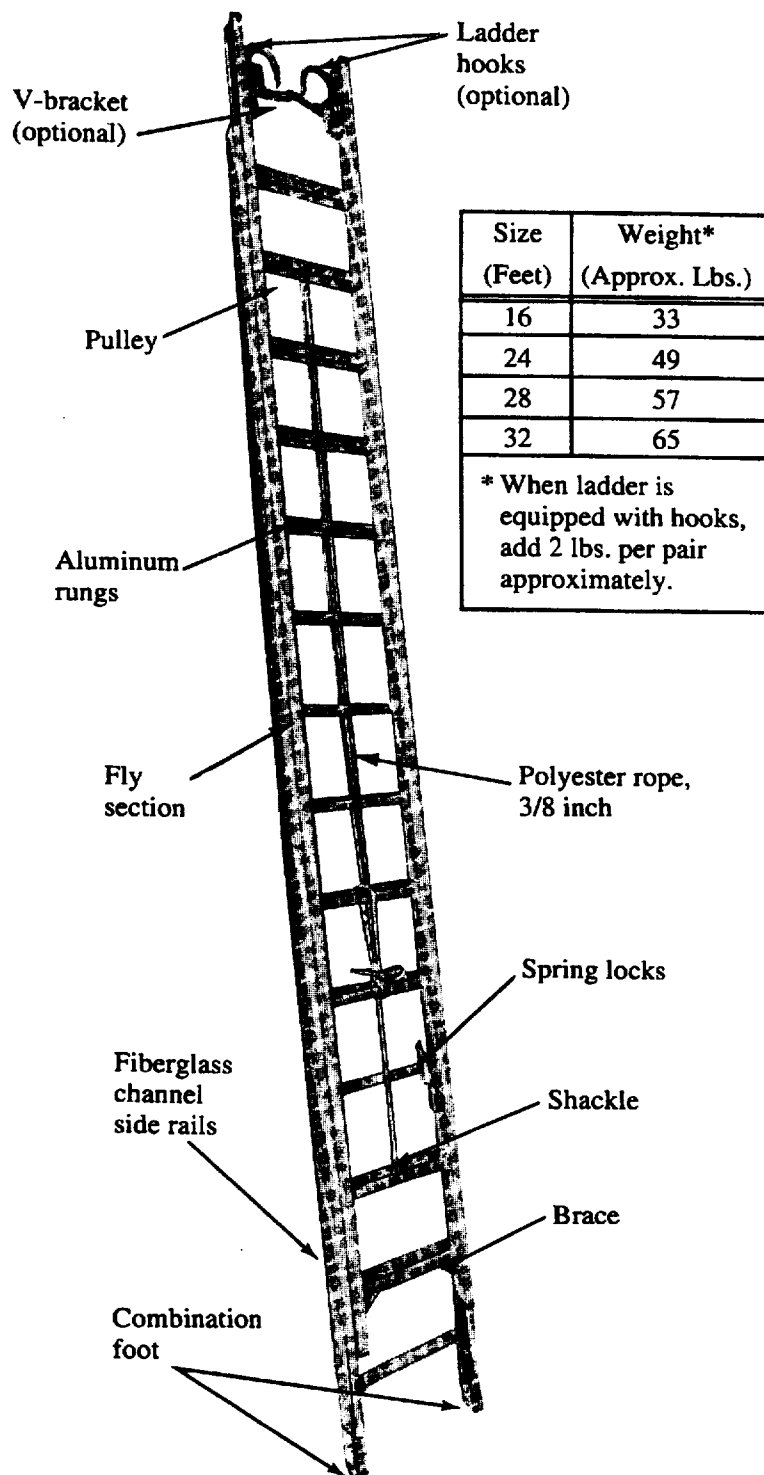


Figure 2-2. E Extension Ladder (CA08616)

3. Ladder Options and Accessories

The options and accessories available for use with extension ladders are listed in Table 3-1 and are shown in Figures 3-1 through 3-21. The installation and uses of extension-ladder accessories, where applicable, are contained in Section 9 of this document.

Table 3-1. Extension-Ladder Accessories (Part 1 of 2)

Accessory	BOC Spec. Number	Fig. No.	To Use with Extension Ladder	Comments
Rail coating (protective finish)	CA08616	—	E	Factory option — protects against prolonged adverse environmental effects.
Ladder hooks	CA07245 CA08616	3-1, 3-3	C E	Factory option — enables ladder to be used for work on aerial cables.
V-bracket	CA08616	3-2, 3-3	E	Factory option — centers ladder on pole.
Double-pulley arrangement	CA07245 CA08616	3-4	C E	Factory option — provides an increased mechanical advantage in raising or lowering the fly (top) section of the ladder.
Combination foot	CA08616	3-5	E	Factory installed — provides secure footing on various surfaces.
Pole lashing kit	CA08616	3-8	E	Factory option — secures top section of ladder to pole.
B ladder pulley kit	CA08864	3-6	All 20-foot through 40-foot	Same as double-pulley arrangement, installed locally (see Figure 3-7).
B ladder leveling wedge	CA08889	3-9	C and E	Provides level footing on uneven surfaces.
B ladder pad	CA08804	3-10	C and E	Improves stability, and protects siding such as aluminum, asbestos, and vinyl against scratches and dents.
C ladder platform	CA08002	3-11	C and E	Provides a seat for the craftsman while aloft. (Used with D or E ladder support.) (Note 1)
D ladder platform	CA08002	3-12	C and E	Reduces fatigue for person working at constant height for an extended period of time. (Note 1)

(Continued)

Note 1: If the platform support hooks or lower supports and their associated latches do not slip readily over the rungs of the fiberglass ladder, they may be adjusted by spreading with a standard 1-inch iron pipe (1-5/16 inch outside diameter). The platform must fit freely at all bearing points, and the latches should readily engage.

Table 3-1. Extension-Ladder Accessories (Part 2 of 2)

Accessory	BOC Spec. Number	Fig. No.	To Use with Extension Ladder	Comments
D ladder support	CA08634	3-13, 3-14, 3-15, 3-16	C	Clamps to strand to support upper end of ladder, providing area for sitting or standing between ladder and cable (see Figures 3-13 through 3-16). Cannot be used with E Extension Ladder (fiberglass).
E ladder support	CA08635	3-17, 3-18, 3-19	C and E	Clamps to strand to support upper end of ladder, providing area for sitting or standing between ladder and cable. (See Figures 3-18 and 3-19.)
Top ladder lashing device	Commercial	3-20	C and E	Used to secure upper end of ladder to pole or strand. (<i>Note 2</i>)
Bottom ladder lashing device	Commercial	3-21	C and E	Used to secure lower end of ladder to pole before climbing. (<i>Note 2</i>)

Note 2: Refer to company practices regarding specifically approved lashing devices.

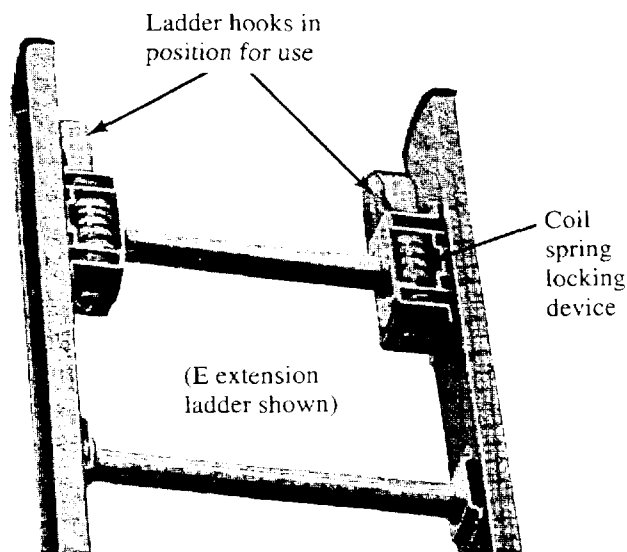


Figure 3-1. Ladder Hooks

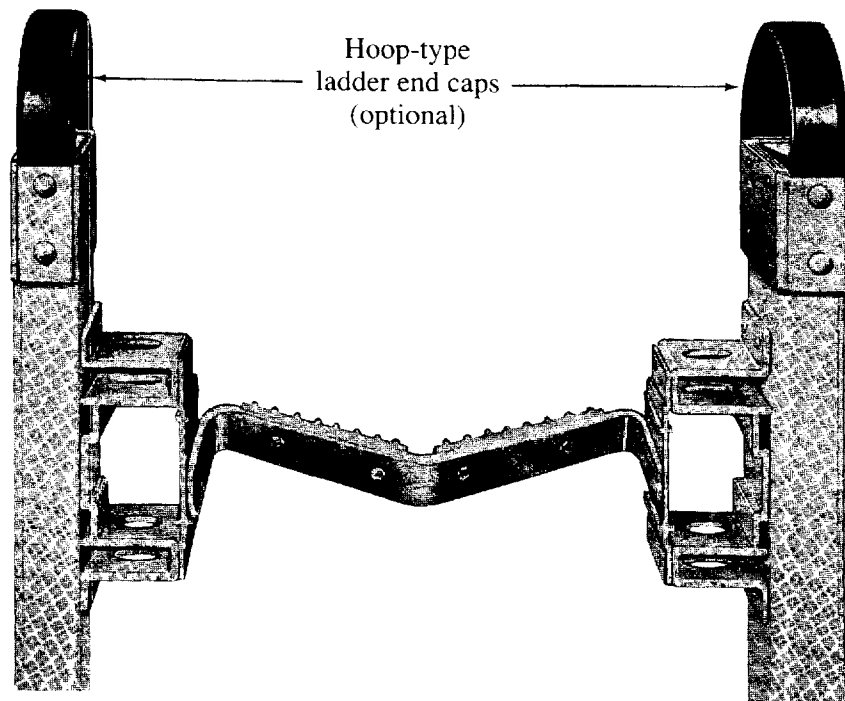


Figure 3-2. V-Bracket Assembly

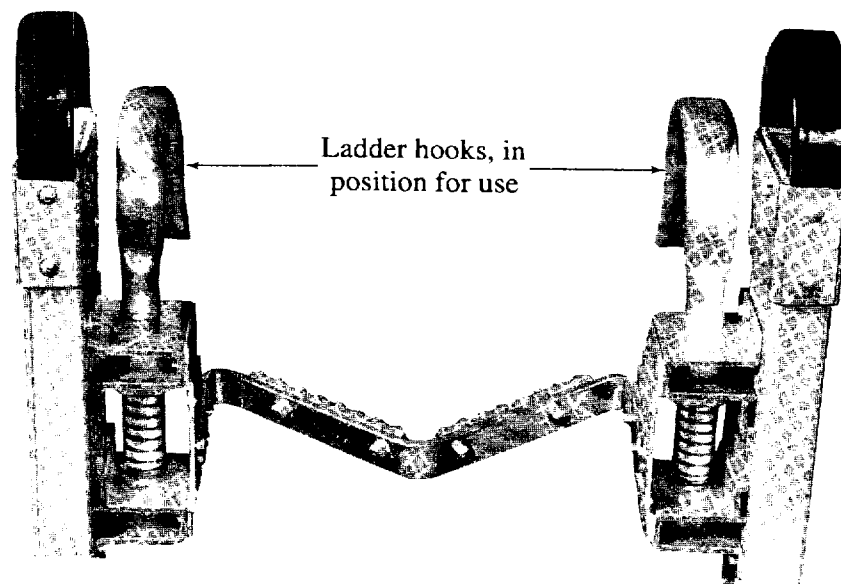


Figure 3-3. Ladder Hooks with V-Bracket Assembly

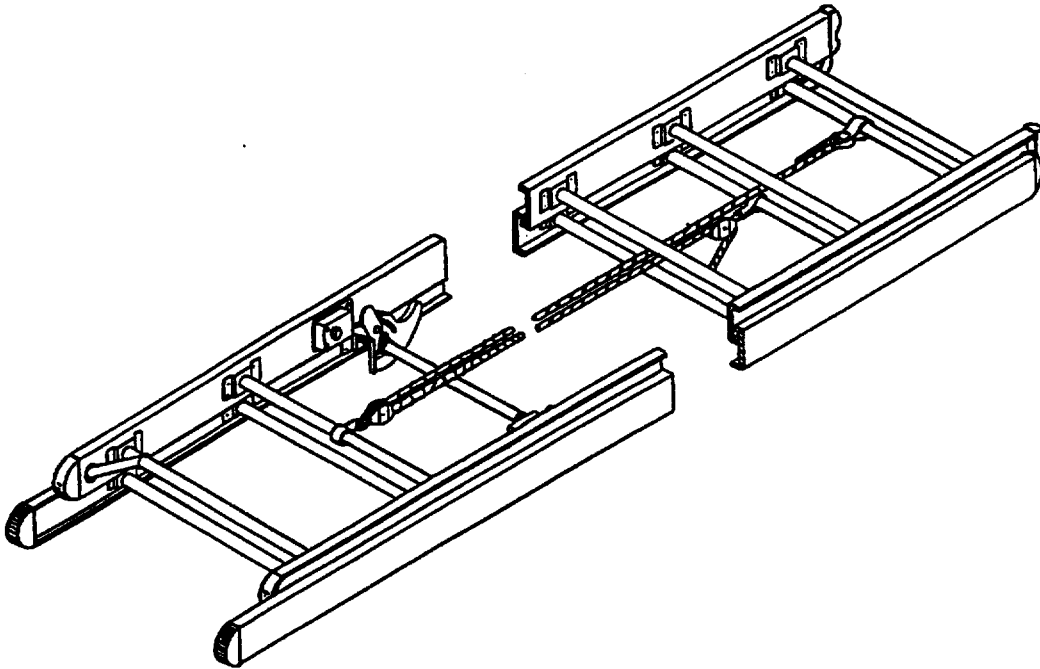


Figure 3-4. Double-Pulley Arrangement for E Extension Ladder (Fiberglass)

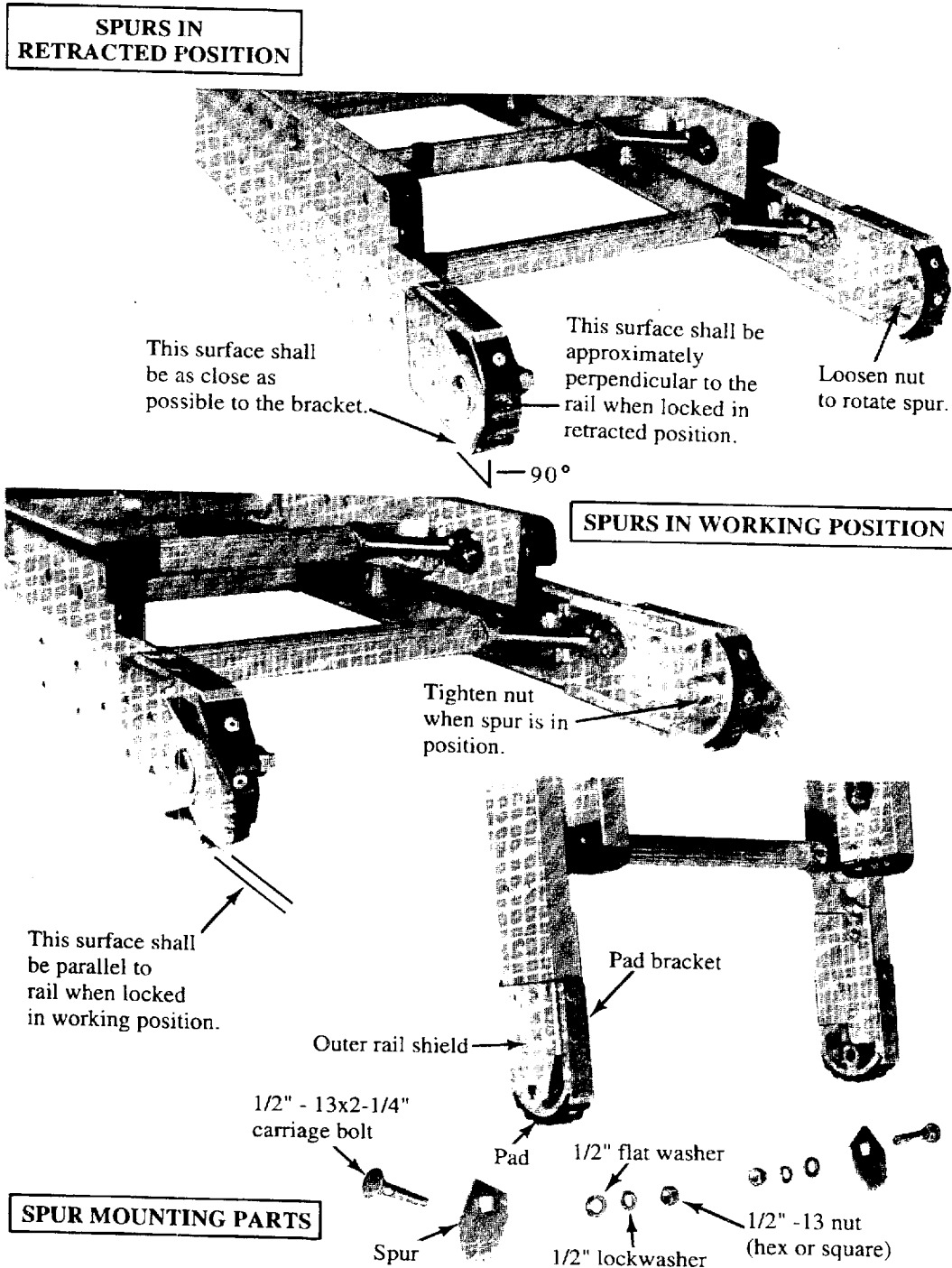


Figure 3-5. Combination Foot with Spur (E Extension Ladder Only)

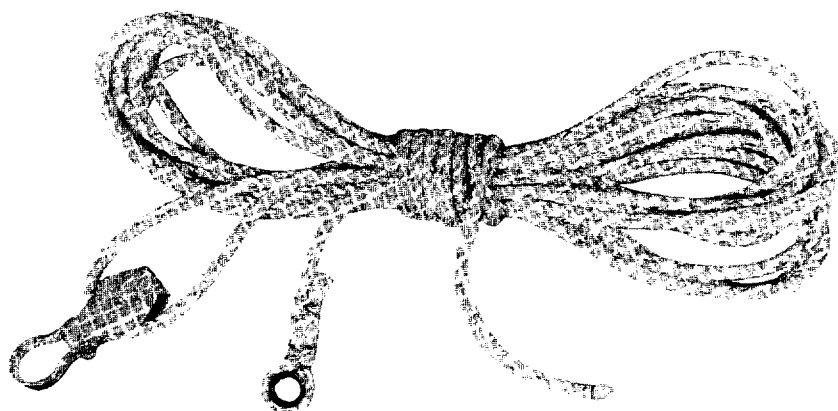
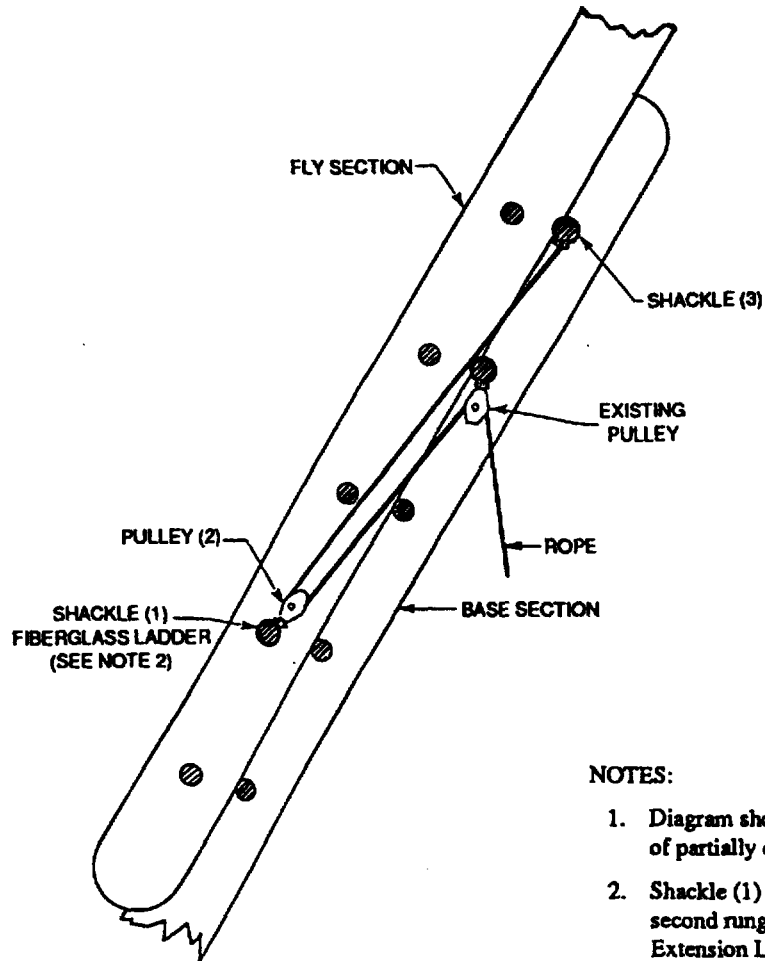


Figure 3-6. B Ladder Pulley Kit



NOTES:

1. Diagram shows inside of left-hand rails of partially extended ladder.
2. Shackle (1) is shown installed on the second rung from the bottom on an E Extension Ladder (fiberglass). It will be installed on the first rung from the bottom on C Extension Ladders.

Assembly Procedure for B ladder pulley kit:

1. Remove existing ladder rope by removing nut and bolt from shackle (1).
2. Install pulley supplied in kit (2) in shackle (1).
3. Install shackle supplied in kit (3) on top rung of base section, and attach the rope to this shackle with the 1/4-20 nut and bolt provided.
4. Thread the rope through the pulleys as shown above.

Figure 3-7. Installing B Ladder Pulley Kit

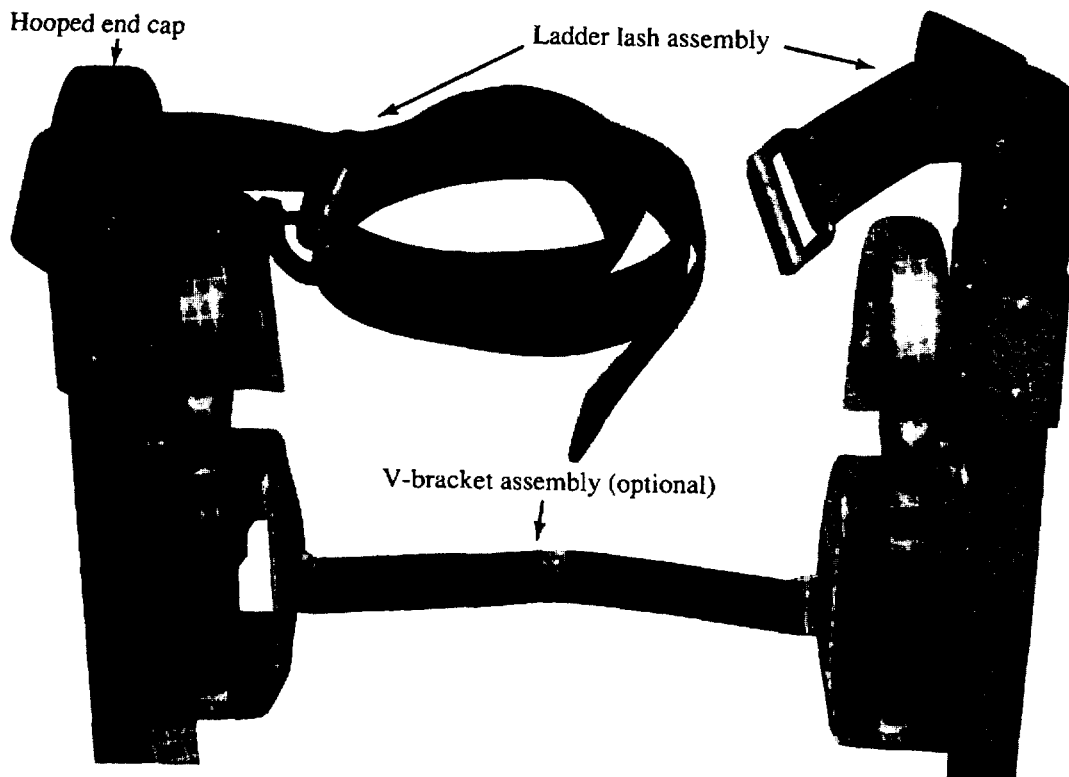


Figure 3-8. Pole Lashing Kit (E Extension Ladder Only)

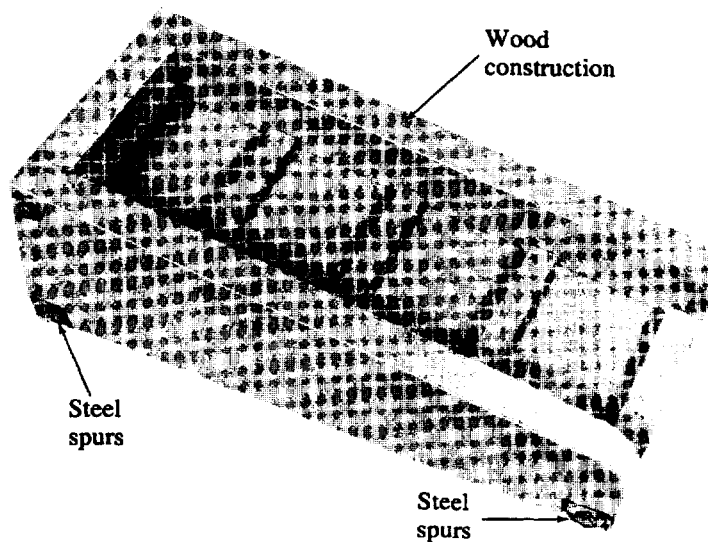


Figure 3-9. B Ladder Leveling Wedge

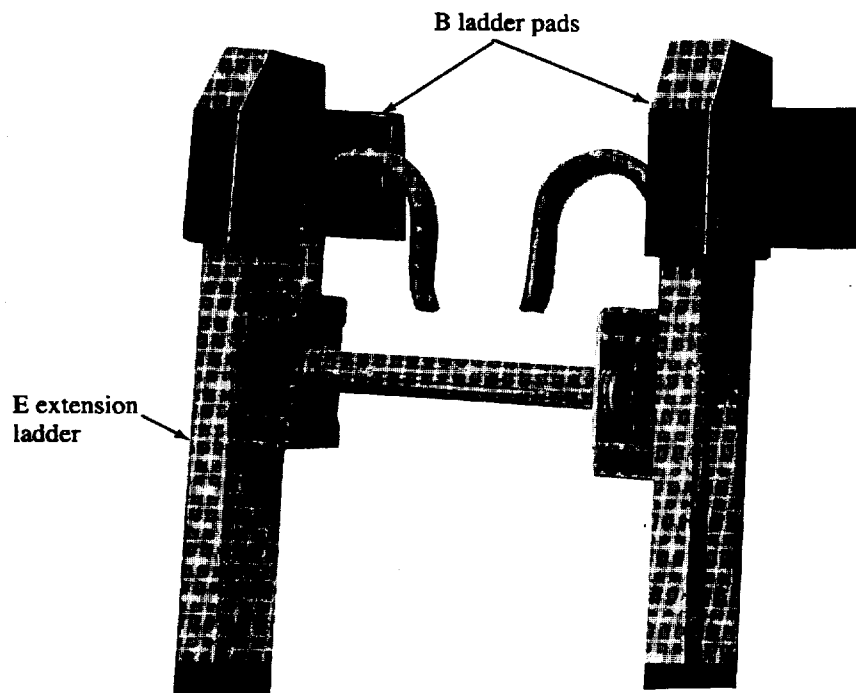
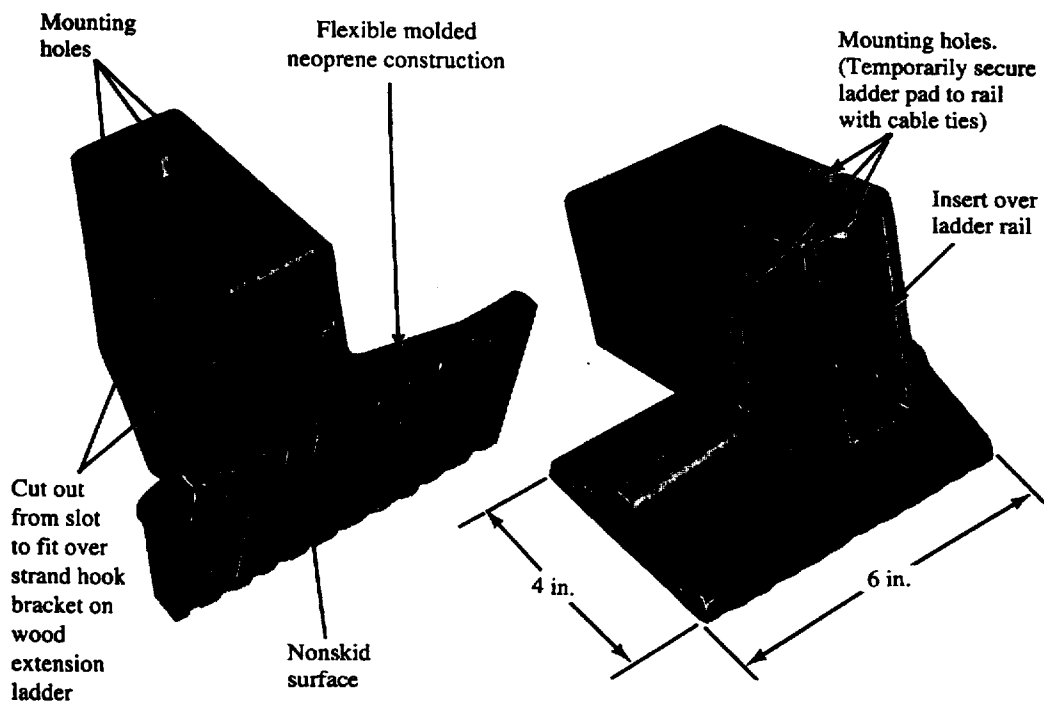


Figure 3-10. B Ladder Pads — Structure (top) and Use (bottom)

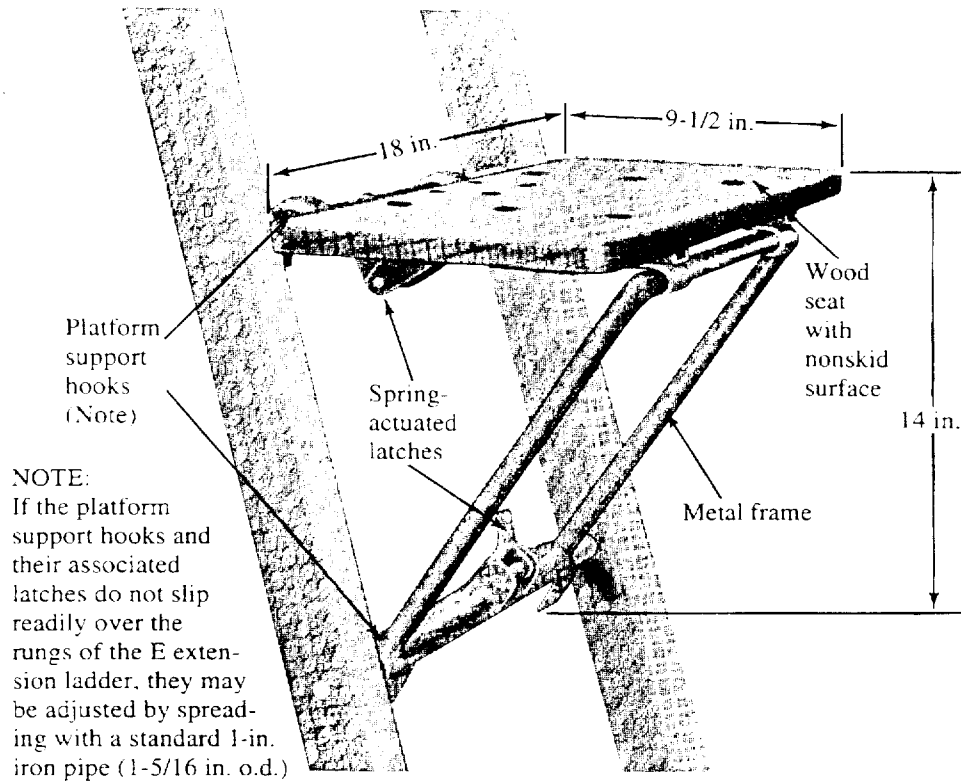


Figure 3-11. C Ladder Platform

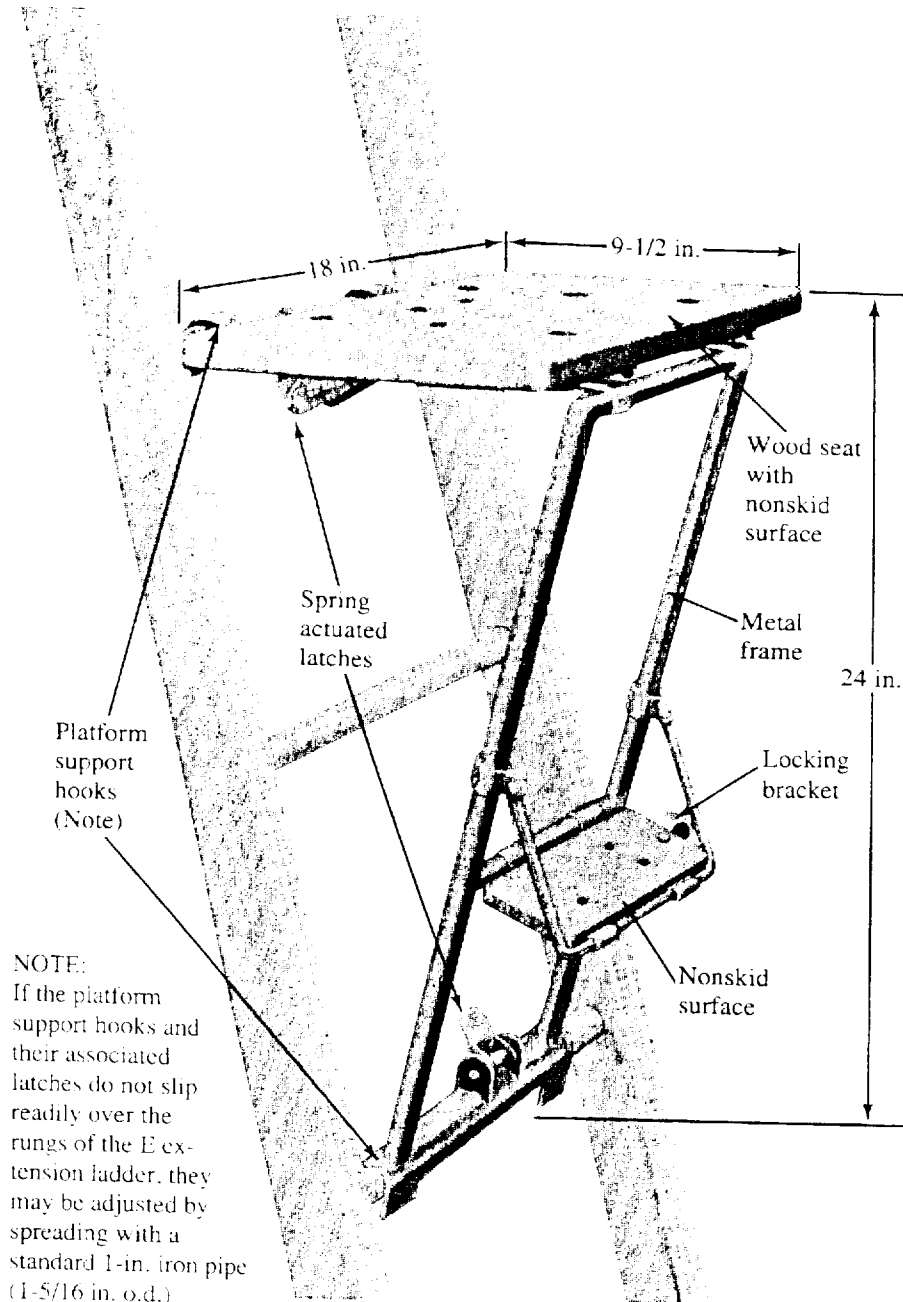


Figure 3-12. D Ladder Platform

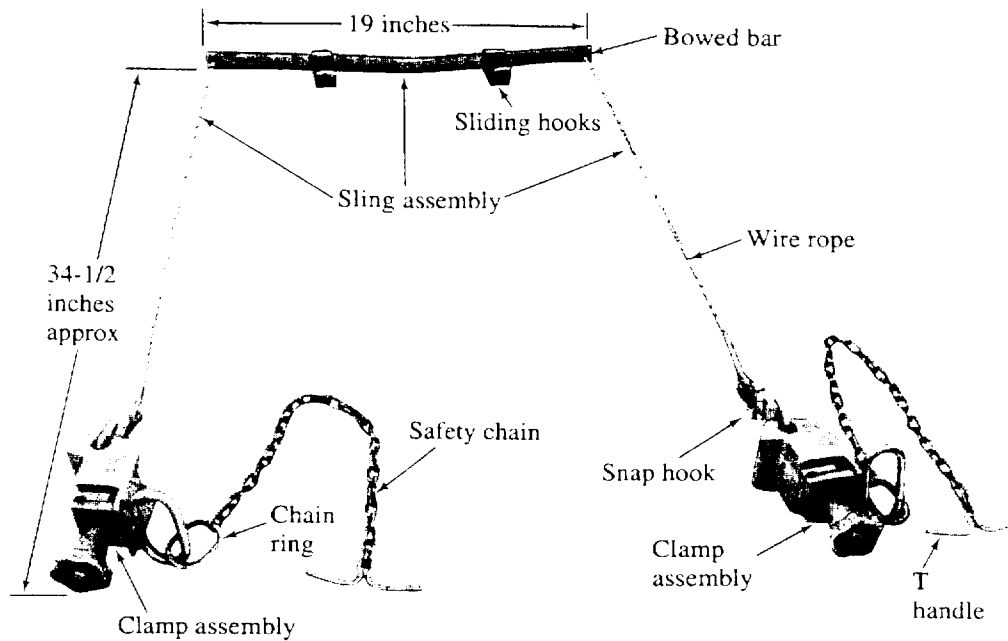


Figure 3-13. D Ladder Support (C Extension Ladder Only)

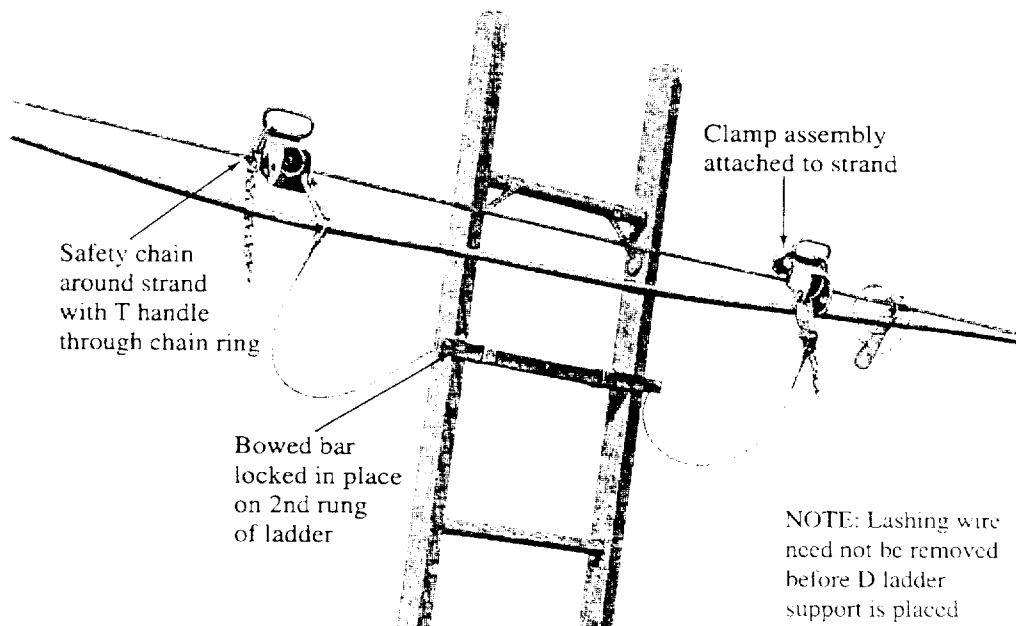


Figure 3-14. D Ladder Support Attached to Strand

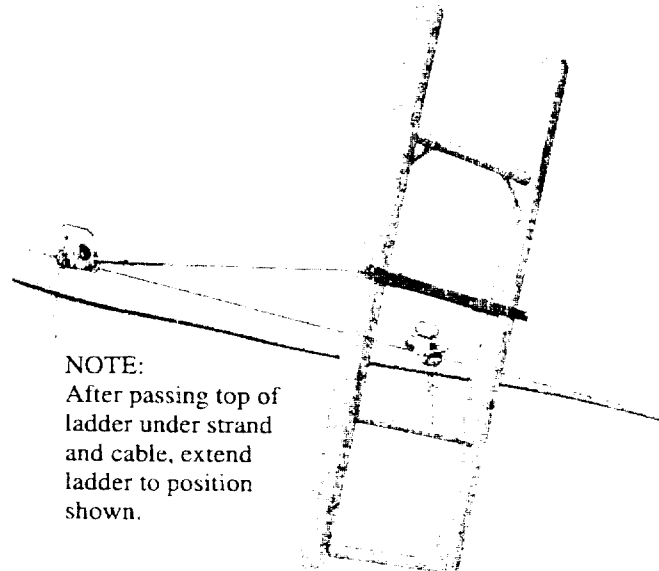


Figure 3-15. D Ladder Support In Use

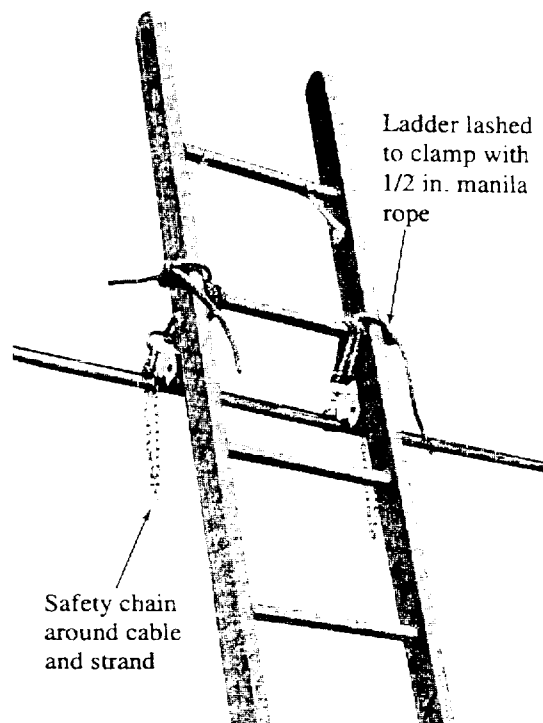


Figure 3-16. Ladder Attached to Strand with D Ladder Support Clamps

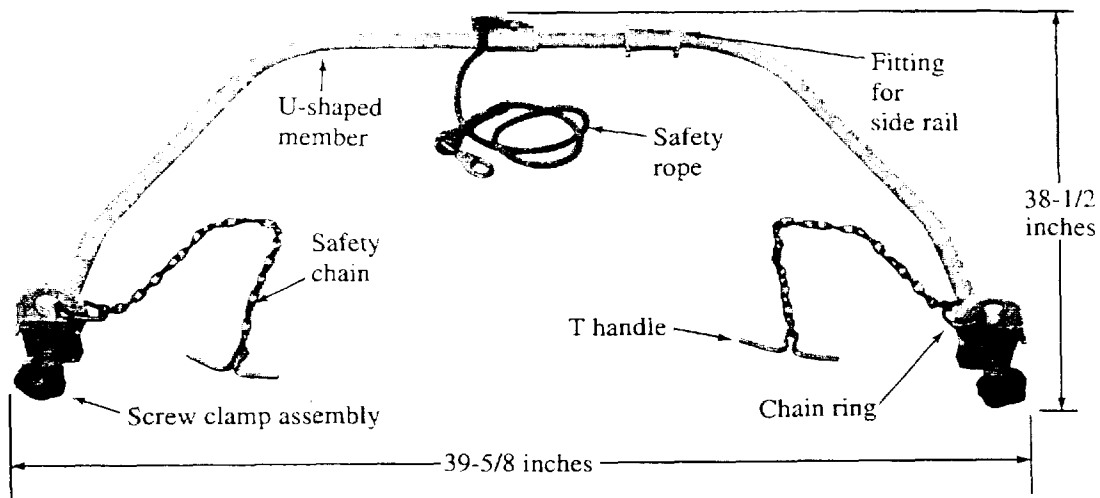


Figure 3-17. E Ladder Support

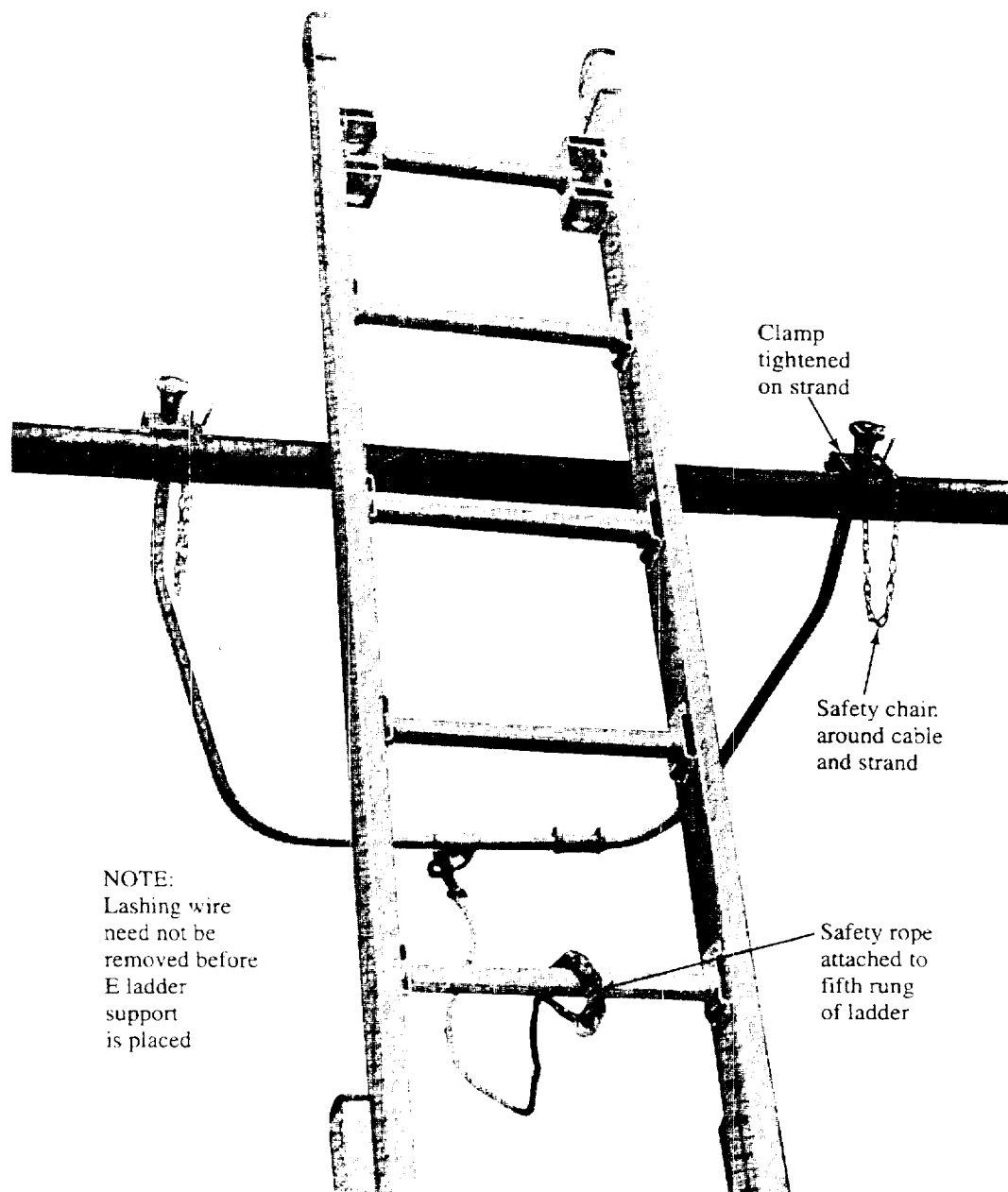


Figure 3-18. E Ladder Support in Position on Strand

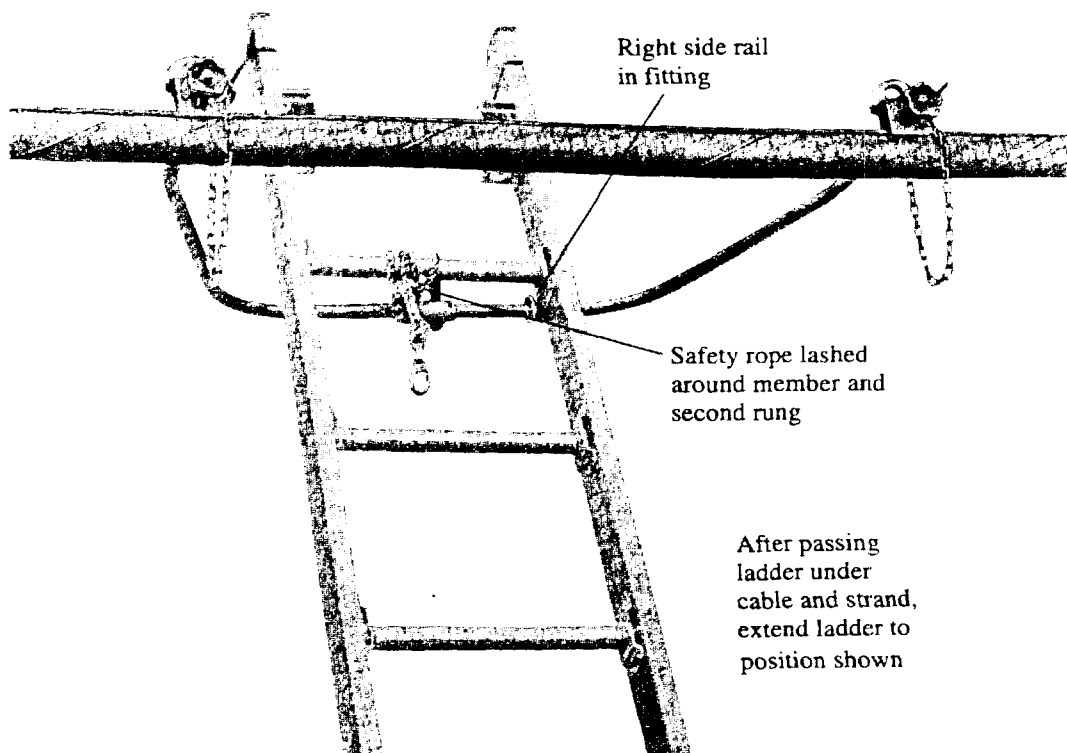


Figure 3-19. E Ladder Support in Use

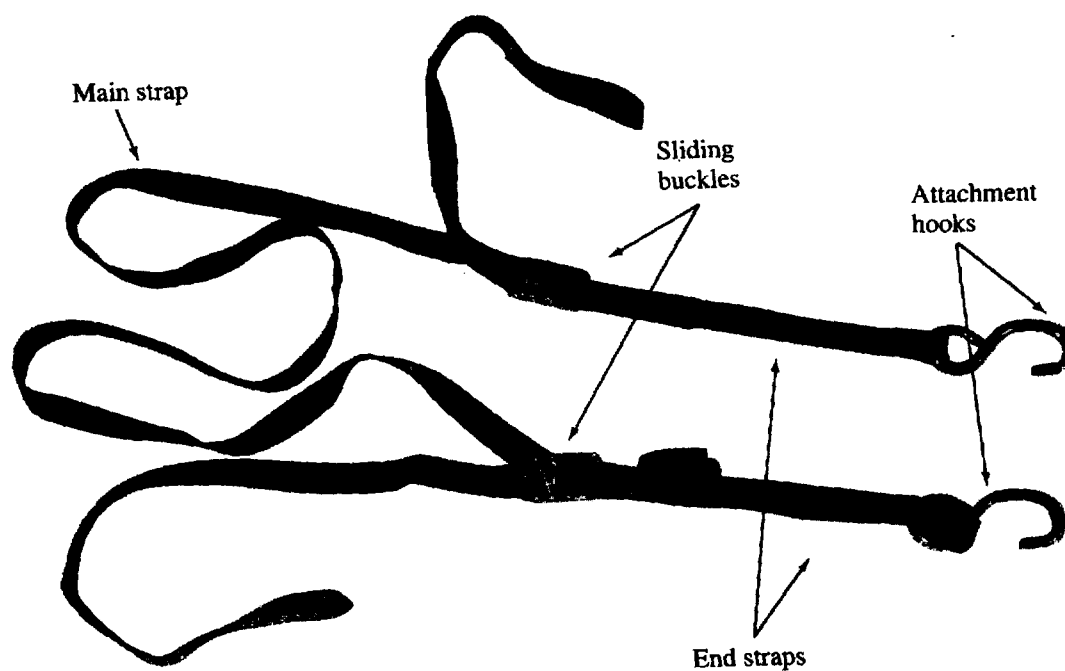


Figure 3-20. Typical Top Ladder Lashing Device

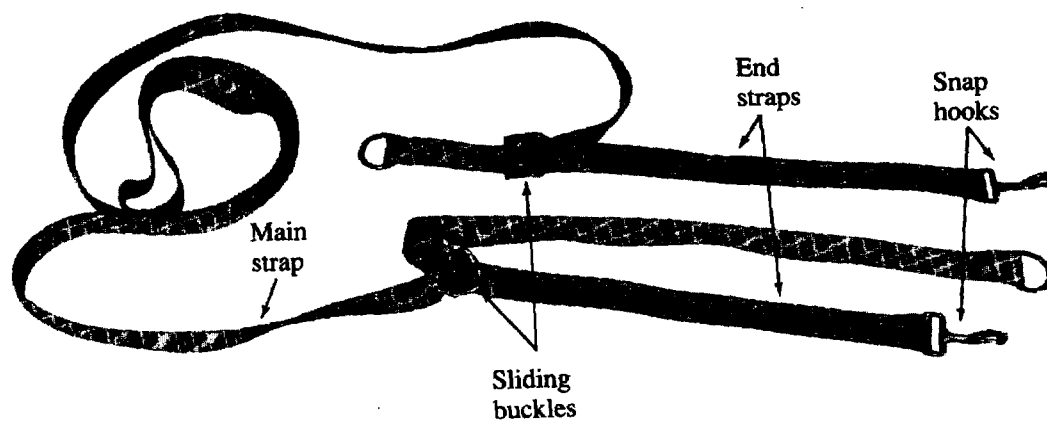


Figure 3-21. Typical Bottom Ladder Lashing Device

4. Ladder Terms and Definitions

Table 4-1 lists terms that describe areas or conditions associated with the routine inspection of wood and fiberglass extension ladders.

Table 4-1. Ladder Terms and Definitions (Part 1 of 2)

Term	Applicable Ladders	Definition
Check	wood	Separations of the wood along the fiber direction, usually extending across the annual growth rings, usually resulting from stresses during seasoning.
Chip	fiberglass	Small piece of resin broken off an edge or surface.
Compression failure	wood	Buckling of fibers due to excessive compression along the grain, which may appear as a fine crack, a fold or crease in the wood fibers, or as splintering of the wood fibers. (See Figure 4-1.)
Crack	wood	A fracture across the grain of the wood, usually resulting from mechanical stress.
Through crack	fiberglass	A separation of the laminate, visible on opposite surfaces, and extending through the thickness.
Surface crack	fiberglass	A line-type crack in the resin surface that does not penetrate the subsurface glass layer.
Crazing	fiberglass	A pattern of fine hairline-type cracks on the surface or just below the resin surface, with the appearance of a random spiderweb.
Decay	wood	Disintegration of the wood due to action of wood-destroying fungi.
Delamination	fiberglass	Separation of layers or strands of material exposing loose "white" glass fibers — when internal, it could resemble a blister.
	wood	Separation of the plies in the laminated wood side rails due to failure of the glue bond.
Flange	fiberglass	Narrow part of the channel-shaped fiberglass rail — also known as a "leg." (See Figure 4-2.)
Gouge	fiberglass	A deep groove penetrating the laminate and visible from the opposite side.
Open Gouge	fiberglass	A see-through gouge.

(Continued)

Table 4-1. Ladder Terms and Definitions (Part 2 of 2)

Term	Applicable Ladders	Definition
Leg	fiberglass	Narrow part of the channel-shaped fiberglass rail, also known as a "flange." (See Figure 4-2.)
Scratch	fiberglass	A shallow groove in the resin surface that does not penetrate the subsurface glass layer.
Scuff	fiberglass	A mark in the surface resin caused by rubbing or scraping.
Split	wood	Separations of the wood fibers, extending in the direction of the grain, usually resulting from mechanical stresses.
Toe	fiberglass	Very narrow area at edges of the channel next to the flange. (See Figure 4-2.)
Weathering	fiberglass	Erosion of the surface resin due to environmental exposure.
Web	fiberglass	Wide section of the channel between flanges. (See Figure 4-2.)

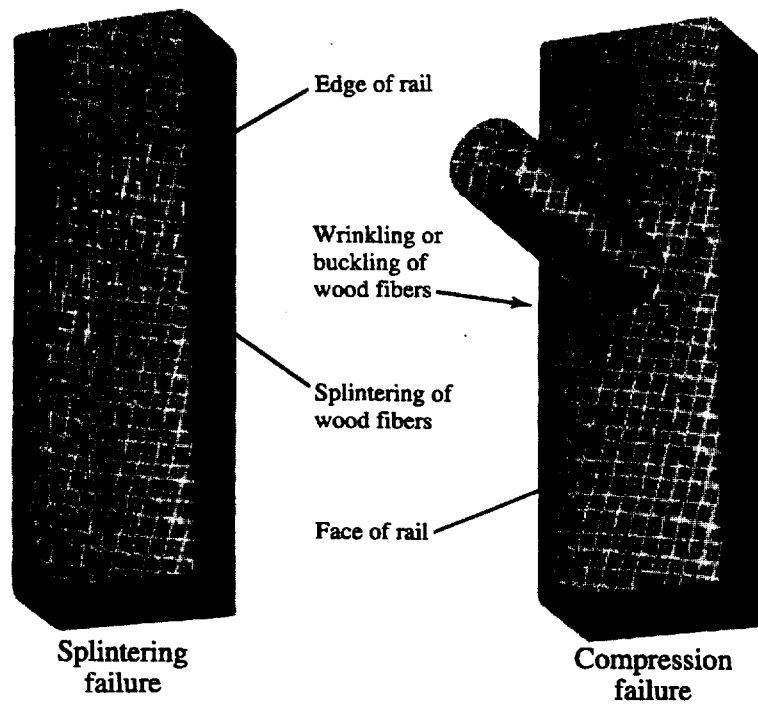


Figure 4-1. Defects in Side Rails — Wood Ladder

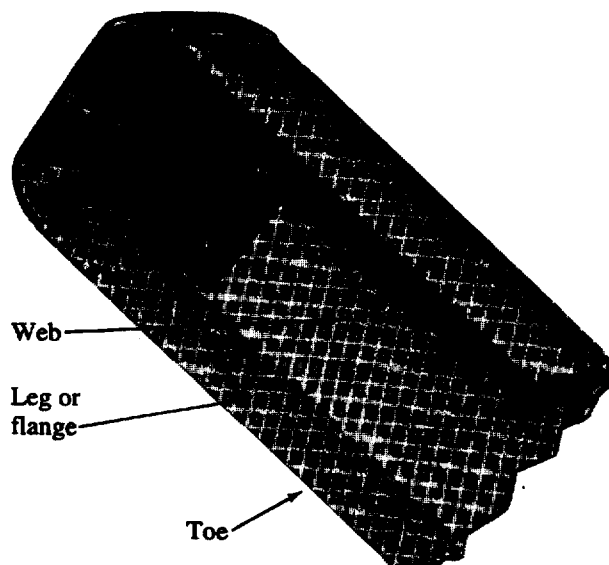


Figure 4-2. Section of Ladder Rail — Fiberglass Ladder

5. Inspection of Ladders and Accessories

5.1 General Considerations

Before beginning any work with an extension ladder, it shall be determined that the ladder and all of its parts are in satisfactory condition, with no indication of deterioration or damage that could affect safe use of the ladder.

To make careful inspection easier, the ladder shall be placed at a convenient height in a well-lighted area. If any defects are found that cannot be corrected by the employee, or if the condition is such that there is doubt about the ladder being safe to use, it shall be exchanged in accordance with company procedures.

Supervisors shall inspect ladders used by their forces as required by company practice.

5.2 Inspection of Wood Ladders

Wood extension ladders shall be inspected when the wood is dry. Absorption of moisture may cause swelling of the wood, which could tend to conceal defects.

Minor defects are to be corrected when detected. Wood may be dressed by using a wood rasp, file, sandpaper or other suitable means. Significant amounts of wood must not be removed.

When any of the limits of defects listed in Tables 5-1 through 5-3 are exceeded, the ladder shall be removed from service.

NOTE — Hardware items may be repaired or replaced before the ladder is used. If not repairable, the ladder must be removed from service.

Ladder sections shall be examined under the prescribed dead-weight load inspection at the following times:

- At regular 6-month intervals
- Anytime if the ladder has been dropped, abused, damaged
- To determine if an apparent defect discovered in an inspection is within acceptable limits.

Table 5-1. Wood Ladder Inspection — Side Rails

Inspect For	Limit of Defects (Notes 1 & 2)	
	Condition	Maximum
Checks Cracks Splinters (Note 3) Splits Decay Compression failure (Note 5) Protruding nails (Note 6) Delamination	Reduction at corner	3/8 in.
	Reduction other than corner	1/4 in.
	Delamination	(see "splits")
	Crushed or depressed	1/4 in.
	Decay	Unacceptable
	Checks (Note 4)	6 in. long, 1/2 in. deep
	Cracks	Unacceptable
	Splits	
	1 – End splits:	
	Stop riveted	2 in. beyond rivet
	Not stop riveted	2 in.
	2 – Splits due to nailing	2 in. beyond each side of nail
	3 – Splits from rung or rivet hole	2 in. each side of hole
	4 – Through split	2 in.
	Longitudinal play (Note 7)	3/4 in.

(Notes are listed after Table 5-3.)

Table 5-2. Wood Ladder Inspection — Rungs

Item	Inspect For	Limit Of Defects (<i>Notes 1 & 2</i>)
Wood	Cracks Splits Splinters Checks (<i>Note 4</i>) Looseness Missing Decay Excessive wear	Cracks – unacceptable Splits – 2 inch maximum beyond tenon Checks – 6 inches long, 1/2 inch deep maximum Decay at joints – unacceptable (<i>Note 8</i>) Wear – diameter less than 7/8 in. Looseness – unacceptable Splinters – acceptable if removable by dressing without exceeding minimum diameter limit
Metal	Cracks Bending Looseness Excessive wear	Cracked Severely bent Loose Excessively worn

Unacceptable

(Notes are listed after Table 5-3.)

Table 5-3. Wood Ladder Inspection — Hardware

Item	Inspect For	Limit Of Defects (<i>Notes 1 & 2</i>)
Braces Brackets Rivets	Cracks Looseness Missing parts	Missing Broken Cracked Defective } Unacceptable
Hooks Locks Shackle Pulley	Cracks Security Proper operation (<i>Notes 10 and 11</i>) Distorted, bent	Bent Broken Cracked Defective Distorted Loose (<i>Note 9</i>) } Unacceptable
Guide- irons	Cracks Bending Security	Bent Broken Defective } Unacceptable
Rope	Security Fraying Rot (especially at pulley)	Excessive fraying or wear Rotted } Unacceptable (<i>Note 12</i>)
Spurs	Cracks Security Worn edges	Badly worn (<i>Note 13</i>) Broken Cracked } Unacceptable

Notes for Tables 5-1 through 5-3:

Note 1: A ladder having a condition exceeding these limitations shall be removed from service.

Note 2: Defective hardware exceeding these limitations may be repaired or replaced. If the condition cannot be corrected, the ladder must be removed from service.

Note 3: Splinters shall be removed by dressing the rail with a wood rasp, file, knife, sandpaper, or other suitable means, subject to the minimum dimensions for side rails.

Note 4: Superficial checks caused by weathering, not exceeding 1/8 inch in depth, are permissible in any number.

Note 5: Compression failure in the wood fibers is most likely to occur at a rung location. The wrinkles or creases may appear alone or with some splitting of the wood fibers on the opposite side of the rail. Ladders with this condition shall be removed from service.

Note 6: Protruding nails shall be driven flush and set with a nail set.

Note 7: Longitudinal play is due to looseness of the rungs and rung braces; it shall not be greater than 3/4 inch.

Note 8: Decay at joints may be detected by tapping the rung near the side rail with the *handle* of a hammer and comparing the sound with that from rails known to be free of decay. Do not strike rungs with the *head* of a hammer.

Note 9: Where practical, loose rivets shall be tightened. Place the head of a lineman's hammer, or equivalent, against the head of the loose rivet, then peen the other end of the rivet with a ballpeen hammer until tight. If this does not correct the condition, replace the ladder in accordance with company procedures.

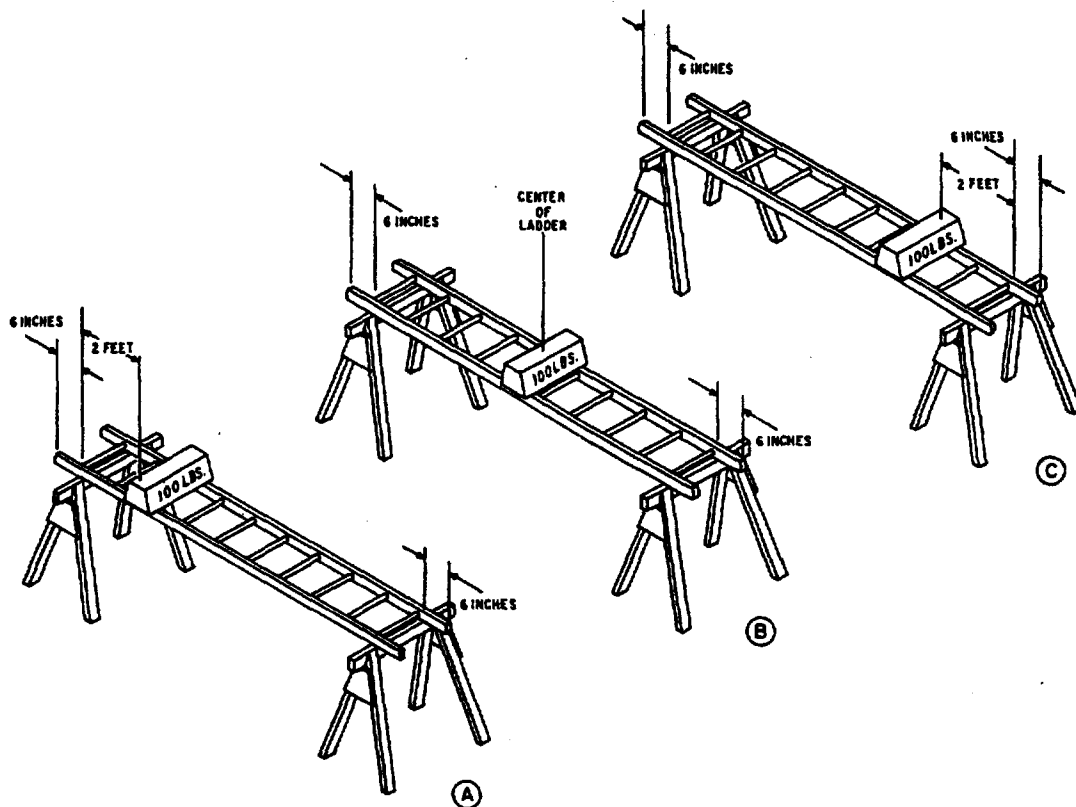
Note 10: Locksprings shall function to keep the hooks in position to engage the rung.

Note 11: The pulley sheave shall revolve freely.

Note 12: A replacement rope assembly is available.

Note 13: Spurs shall either be rotated to make use of new teeth, or replaced.

The dead-weight load inspection, illustrated in Figure 5-1, is not a strength test of the section but a means for disclosing defects, and therefore is of no value unless a careful visual examination is made while the section is under load. This test is for only a single section of an extension ladder; **under no circumstances shall an assembled or extended ladder be inspected in this manner.** Do not apply a weight appreciably over 100 pounds (such as the weight of a person) to the ladder section.



1. STEP 1 — Position one section of an extension ladder on supports of sufficient height so the underside of each side rail may be examined thoroughly, as shown in A above.
2. STEP 2 — Place the weight on the ladder as shown in A above, making sure that the weight is equally supported by the two side rails.
3. STEP 3 — Examine the under-edges and faces of each side rail carefully for signs of defects (see Table 5-1). **NOTE** — The area around the junction of the rungs and side rails is the most susceptible area for fractures.
4. STEP 4 — Reposition weight to center of ladder (see B above); repeat Step 3.
5. STEP 5 — Reposition weight as shown in C above, and repeat Step 3.
6. STEP 6 — Turn ladder section over, and repeat Steps 1 through 5.
7. STEP 7 — Repeat Steps 1 through 6 using other section of extension ladder.

Figure 5-1. Dead-Weight Inspection — Wood Ladder

5.3 Inspection of Fiberglass Ladders

Fiberglass ladders in service shall be examined in accordance with Tables 5-4 through 5-7. Suspend the ladder on supports or on a flat surface so the inside and outside side rails and corners can be inspected. The conditions listed in Tables 5-4 through 5-7 for the fiberglass rails may occur at various locations along the rail, but are more prevalent around rung attachments, rivet locations, and at or near points of concentrated stress, such as inside and outside corners of the channel, especially at guide locations.

Areas on the ladder that are especially prone to damage in use and/or during transit on specific types of motor vehicles should be identified. These areas may vary, depending on the design of the vehicle-mounted ladder rack.

A fiberglass ladder shall not be subjected to any weight test while being inspected.

Table 5-4. Fiberglass Ladder Inspection — Side Rails

Inspect For	Limit Of Defects (Notes 1 & 2)			
Chips Cracks Dents Fractures Gouges Splits Scratches Scuffs (Note 4)	Condition	Maximum Limit		
		Width (Inches)	Length (Inches)	Depth (Inches)
	Scratches, scuffs	—	No limit	1/32
	Dents, gouges (on long edge of toe)	—	1	1/16
	Dents, gouges (across flange or web)	—	1	1/32
	Chips	1	1	1/32
	Pinholes, pits	1/32 × 1/32		
Weathering — Acceptable (Note 3)				
Surface Crack — 6 inches long				
Gouge (Web) — 5/8 inch square by 1/8 inch deep				
Gouge (Flange) — 3/8 inch long by 1/8 inch deep				
Open Gouge (Web) — 1/2 inch square				
Open Gouge (Flange) — 1/4 inch square				
Through Crack (Web) — 1 1/2 inches long				
Through Crack (Flange) — 3/4 inch long				

(Notes are listed after Table 5-7.)

Table 5-5. Fiberglass Ladder Inspection — Rungs

Inspect For	Limit Of Defects (Notes 1 & 2)		
Cracks (Note 5) Bending Looseness Excessive wear (Note 6)	<table> <tr> <td>Cracked Severely bent Loose Excessively worn</td> <td>Unacceptable</td> </tr> </table>	Cracked Severely bent Loose Excessively worn	Unacceptable
Cracked Severely bent Loose Excessively worn	Unacceptable		

(Notes are listed after Table 5-7.)

Table 5-6. Fiberglass Ladder Inspection — Hardware

Item	Inspect For	Limit Of Defects (Notes 1 & 2)
Braces Brackets Rivets	Cracks Looseness Missing parts	Missing Broken Cracked Defective Unacceptable
Hooks Locks Shackle Pulley	Cracks Security Freedom of operation (Notes 7 and 8) Deformation Bending	Cracked Broken Bent Defective Distorted Unacceptable
Guide Brackets	Cracks Bending Security Wear	Bent Cracked Broken Loose Defective Excessively worn (Note 9) Unacceptable
Rope	Security Fraying Rot (especially at pulley)	Excessive fraying or wear Rotted Unacceptable (Note 10)

(Notes are listed after Table 5-7.)

Table 5-7. Fiberglass Ladder Inspection — Foot Assembly

Item	Inspect For	Limit Of Defects (Notes 1 & 2)
Spurs	Cracks Security Worn edges	Worn in excess of 3/16" Cracked Broken } Unacceptable (Note 11)
Pads	Rips Security Wear	Missing tread material Tread worn even with attachment rivets Wear } Unacceptable
Outer rail shields Pad brackets Bolt assemblies	Bending Looseness Wear Missing parts Deformation (Notes 12 and 13)	Loose, incorrect, or missing hardware and rivets Excessively bent or worn Distorted } Unacceptable (Note 14)

Notes for Tables 5-4 through 5-7:

Note 1: A ladder having a condition exceeding these limitations shall be removed from service.

Note 2: Defective hardware exceeding these limitations may be repaired or replaced. If condition cannot be corrected, the ladder must be removed from service.

Note 3: Acceptable unless exposed glass fiber becomes objectionable from a handling standpoint. (See Section 6, paragraph 3).

Note 4: Cracks and splits can generally be identified by stressing with the hands.

NOTE — Through-cracks of any length in the junction of the flange or web on the parts of the ladder sections subject to high stress (approximately the upper two-thirds of the base section and the lower two-thirds of the fly section) are prohibited. A crack in this area will be visible as a dark line on the outer corner of the rail (or whitish if the damage is recent). Some loose glass fiber may be present.

To determine the extent of the damage, squeeze the flange inward next to the affected area. If the crack opens farther, this indicates damage that is more than just a surface scratch or crack.

While the rail is being stressed, inspect both the inside and outside of the rail at the junction of the web and flange. A crack that is visible from both sides is a *through crack*. Severe damage of this nature may also be accompanied by visible cracking and/or delamination in the flange or web next to the affected area.

Note 5: Rungs may have longitudinal cracks along ribbing, or they may have cracks around the crimping that joins the end plates.

Note 6: Rung wear shall be considered excessive when ridges are completely worn away.

Note 7: Lock springs shall function to keep the hooks in position to engage the rung.

Note 8: The pulley sheave shall revolve freely.

Note 9: Wear shall be considered excessive when the raised sliding surface is worn as illustrated in Figure 5-2.

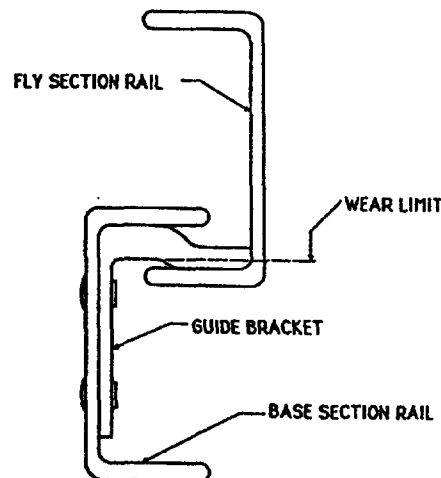


Figure 5-2. Guide-Bracket Wear Limit

Note 10: A replacement rope assembly is available.

Note 11: Round spurs shall be rotated to make use of new teeth, or replaced. Square spurs shall be replaced.

Note 12: Carriage bolts shall be inspected for wear on their flat surfaces. The corners of the bolt shoulder (square portion under the head of the bolt) shall be well-defined for a minimum of 5/16 inch from the lower surface of the head.

Note 13: The foot assembly shall be capable of being tightened to the extent that all movement of the spur is prevented under normal conditions of use.

Note 14: Outer rail shields having significant wear or deformation of the square bolt shoulder hole to the extent that the spur cannot be tightened and held in place shall be replaced. Wing nuts shall be replaced with 1/2"-13 hex or square nuts.

5.4 Inspection of Ladder Lashing Devices and Pole Lashing Kits

Inspection of ladder lashing devices and pole lashing kits must be performed at the following times:

- Upon receipt
- Before being placed in service
- Before each use
- At other intervals as required by company practice.

The entire strap assembly must be inspected whenever there is suspicion of physical damage (cuts, abrasion, excessive strain, or contact with acids, solvents, or other chemicals).

Main straps must be inspected on both sides along their entire lengths, especially the areas near pole contact surfaces and near metal buckles, slides, and fasteners.

End straps should be inspected on both sides along their entire lengths, with extra attention to the areas near hardware and where they contact a ladder side rail.

If inspection reveals any physical damage, the device *must not be used*, and must be replaced immediately. **Do not attempt to repair any defective ladder lashing device or pole lashing kit.** Table 5-8 details the criteria for inspection.

Table 5-8. Inspection Criteria for Ladder Lashing Devices and Pole Lashing Kits

Fabric Straps	Metallic Parts
• Burn marks • Unauthorized attachments • Nonfactory modifications • Cut or rotten webbing • Broken or rotten stitching • Excessive wear or fraying of webbing • Evidence of chemical damage	• Worn, cracked, bent, or binding buckles, fasteners, or rings • Bent or worn hooks • Binding, sticking, or inoperative keepers on snap-hooks • Excessive rust, corrosion, or pitting • Nonfactory modifications

6. Maintenance of Ladders and Accessories

6.1 General Considerations

If properly handled and maintained, an extension ladder can be used for a considerable time without repairs or replacement. When required, replacement parts such as ropes, pulleys, and spurs are available as noted in Section 5. Extension ladders requiring repairs that cannot be made locally shall be returned to a designated location and repaired under the company's established routine. Ladders withdrawn from service for repair or destruction shall be tagged or marked "**Dangerous, Do Not Use.**"

Depending on the type and extent of exposure, weathering of fiberglass ladders can cause erosion on the surface of the rails sufficient to expose the ends of the fiberglass fibers. "Dusting" produced by normal weathering will be washed off by rains or rubbed off by normal use. The ladder shall be kept clean by wiping with a clean cloth to remove any buildup of grease, grime, or other conductive materials. Rungs shall also be kept free of dirt, paraffin, oil, tar, etc. A ladder with foreign material on the rungs is dangerous (see Section 8.2).

For more severe weathering or use resulting in significant exposure of glass fiber, the rails should be treated with B ladder varnish (UV).

B ladder varnish (UV) is applied as follows:

1. Remove localized loose fibers that resulted from abrasion, rack damage, etc., by lightly touching up with emery paper or fine sandpaper.
2. Thoroughly clean the affected side rail surface of all oil, grease, wax, etc., using a stiff brush and a suitable detergent and water. Allow to dry thoroughly.
3. Apply the coating material to the rails with a brush. Allow a minimum of 4 hours drying time before use. For best results, two coats should be applied. When using this material, take the same safety precautions that are applicable for any oil-based paint or varnish.

Locks, springs, and pulleys on extension ladders in use shall be lubricated at least once a month by applying oil *sparingly* on the movable parts.

Worn or dull round wheel spurs may be adjusted as follows:

1. Remove nut, lockwasher, and shoulder bolt.
2. Rotate the toothed wheel 90 degrees, bringing the unused portion of the wheel into position for use.
3. Replace the bolt with the shoulder properly seated in the plate and wheel.
4. Replace the lockwasher and nut, and tighten securely. **NOTE** — Do not change the position of a wheel spur on only one side of the ladder; always change both, even though one may not be badly worn. Spurs on convertible ladder feet shall be replaced when excessively worn.

6.2 Storing Ladders

Ladders that are not being used shall be stored where they will be dry and have good ventilation. Ladders shall not be stored near radiators, stoves, or steam pipes, or in any location where they will be subjected to excessive heat or dampness, as this will appreciably shorten the life of the ladder.

Store ladders to provide easy access for inspection and to prevent danger of accident when a ladder is withdrawn for use.

Ladders stored horizontally on ladder racks shall be supported at a sufficient number of points (a minimum of 3 points for 20- and 24-foot ladders and 4 points for longer ladders) to avoid sagging and permanent set.

Where ladder storage racks have not been provided, try to store ladders vertically. If this is not practical, the ladders may be stacked flat in a horizontal position. Place wooden spacers between the floor and the lower ladder and between ladders to prevent side rails from being damaged by guide irons. Do not store ladders in any position where pressure could be placed on them that might cause warping or twisting. Do not permit more than six ladders to be placed in one stack. Do not permit heavy objects to rest on ladders in storage.

6.3 Care of Ladder Lashing Devices and Pole Lashing Kits

Field repairs of defective ladder lashing devices and pole lashing kits shall not be attempted.

If a lashing device becomes soiled, clean it with mild soap and water, and allow it to dry fully.

Avoid exposure to excessive heat, acid, solvents, or corrosive agents.

Never leave a ladder lashing device or pole lashing kit on a ladder between uses. Store the device in the carrying case or storage bag provided, to prevent weathering. Continued exposure to the elements (such as direct sunlight or rain) can reduce the service life of these items.

7. Transporting Ladders

7.1 Transporting Ladders on Vehicles

When transporting ladders on trucks or other motor vehicles, always fasten them securely in their proper position in the brackets or racks provided for that purpose. Never use wire to secure a ladder to the brackets of a truck. A ladder hanging loosely on the brackets of a truck will be marred, cracked, and weakened by road shocks.

WARNING — The E extension ladder (fiberglass) shall be transported only on vehicles equipped with brackets or racks that have been designed for, or modified to accept, the fiberglass ladder. If proper brackets or racks are not used, the ladder may be damaged.

NOTE — Ladder brackets designed to be used with both wood and fiberglass ladders shall be adjusted to fit the type of ladder being transported.

Figures 7-1 and 7-2 show one method of mounting a ladder on a vehicle equipped with a roof-type ladder rack.

Figures 7-3 and 7-4 illustrate a method of mounting a ladder on a vehicle equipped with a roof-type ladder rack containing rollers for rear access.

When removing a ladder from a motor vehicle, control the ladder so that the ladder foot will not suddenly strike the ground hard, thus preventing possible damage to the foot and lower side rail.

When placing a ladder on a motor vehicle, do not allow the ladder to make sharp contact with the ladder rack or the vehicle, which could result in damage to the fiberglass side rails.

Drivers of motor vehicles transporting ladders shall be careful to avoid letting the ladder strike trees, posts, walls, or other objects, especially when backing or turning corners. Any ladder that strikes any such object shall be carefully inspected before use, in accordance with Section 5.

If an extension ladder extends an excessive distance (3 feet or more in most cases) beyond the rear of a motor vehicle, attach an appropriate warning device (flag or light) to the projecting end of the ladder.

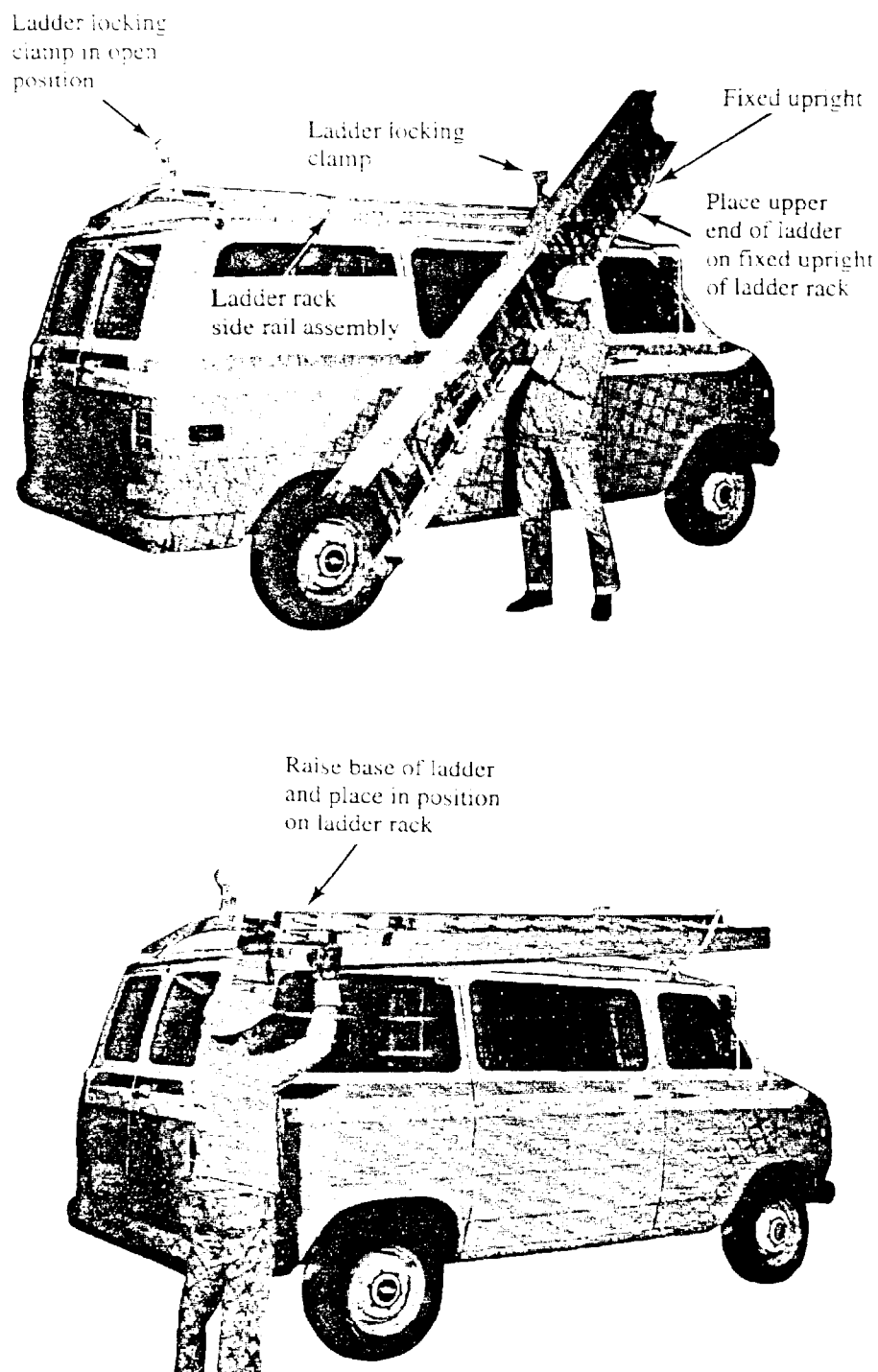
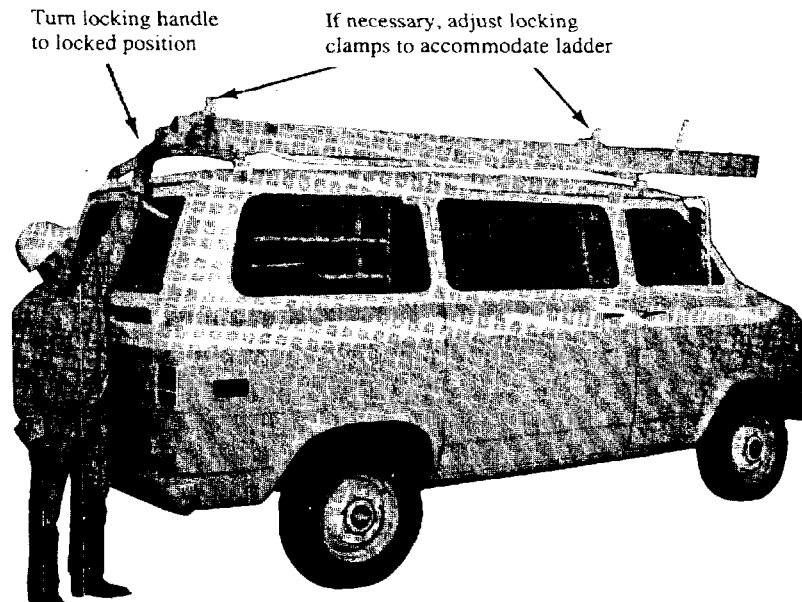


Figure 7-1. Mounting Ladder on Roof-Type Ladder Rack, Sequences 1 and 2



NOTE:
If ladder extends an excessive distance beyond rear of vehicle, attach an appropriate warning device to the projecting end of the ladder.

Figure 7-2. Mounting Ladder on Roof-Type Ladder Rack, Sequence 3

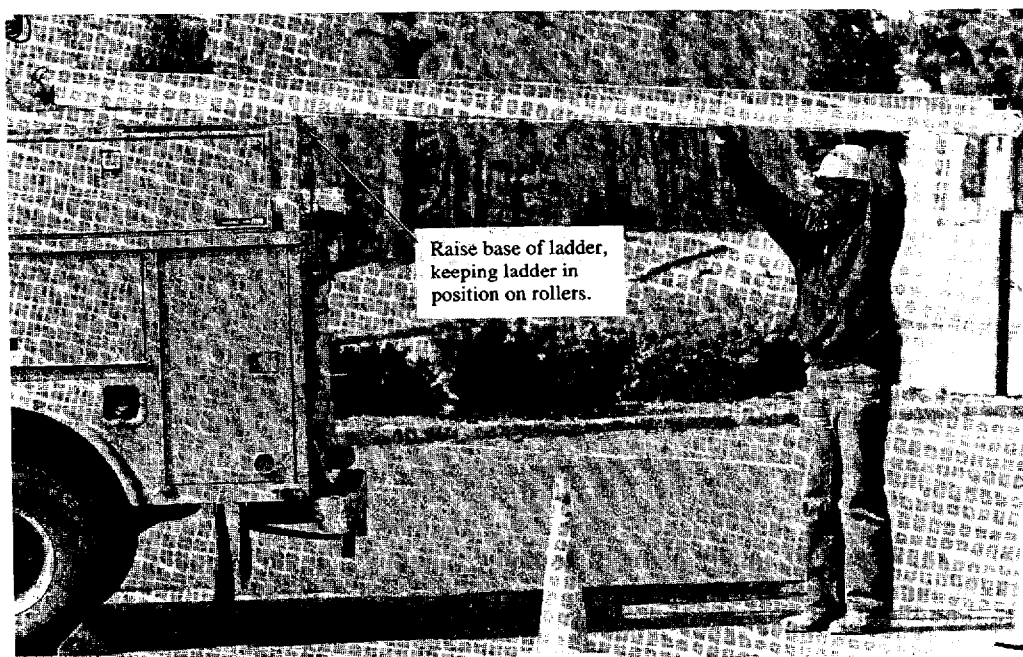
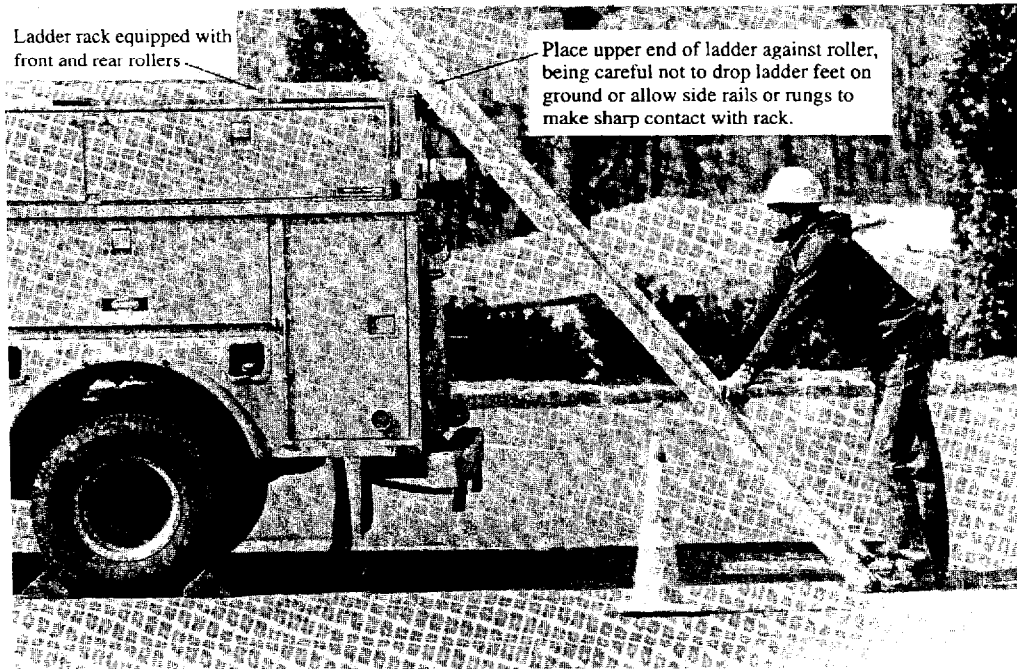


Figure 7-3. Mounting Ladder on Roof-Type Ladder Rack with Rollers, Rear Access, Sequences 1 (top) and 2 (bottom)

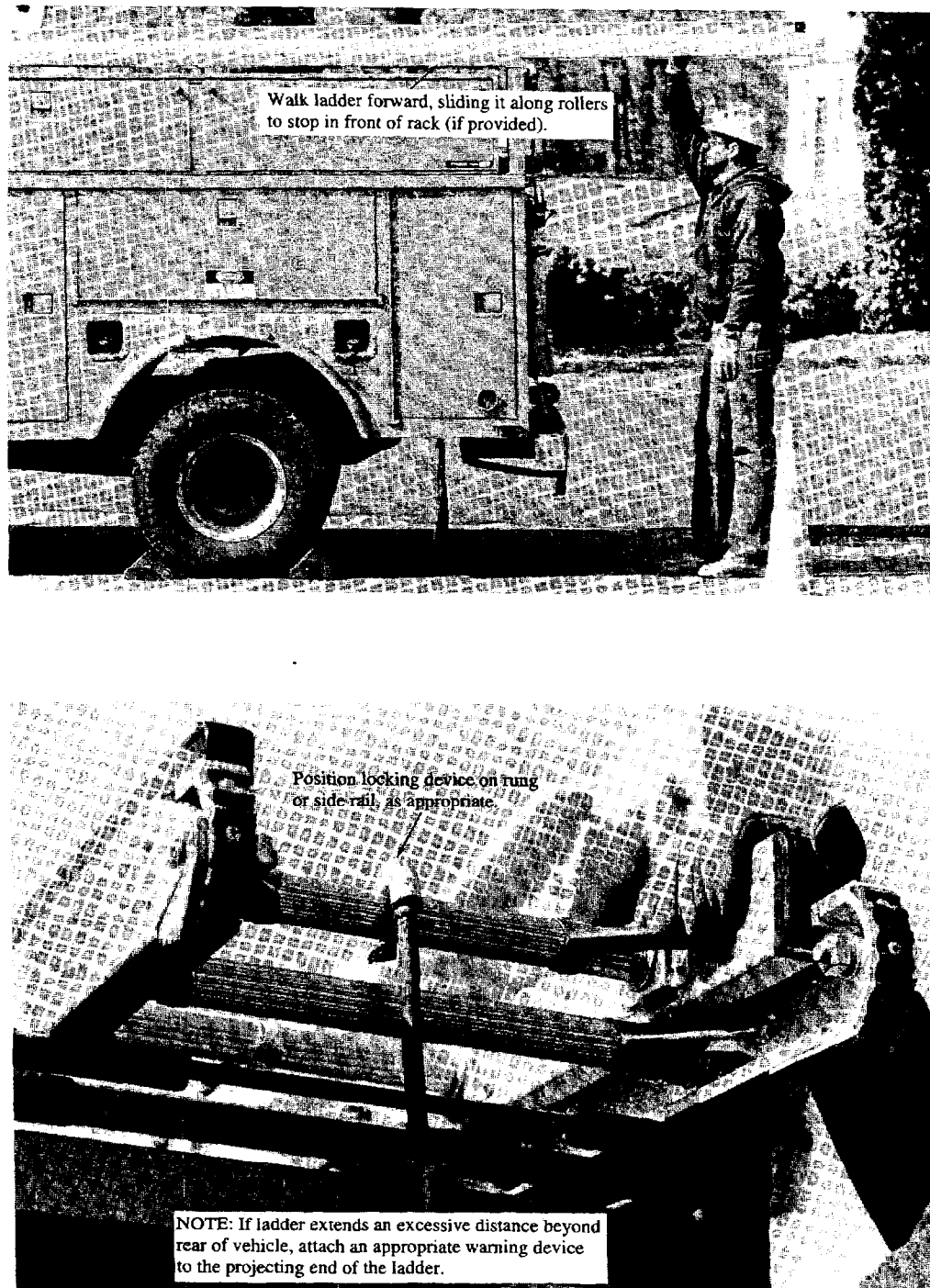


Figure 7-4. Mounting Ladder on Roof-Type Ladder Rack with Rollers, Rear Access, Sequences 3 (top) and 4 (bottom)

7.2 Transporting Ladders by Hand

Extension ladders should be carried as shown in Figure 7-5 (one-person method) or 7-6 (two-person method). An alternate one-person method of carrying an extension ladder is shown in Figure 7-7.

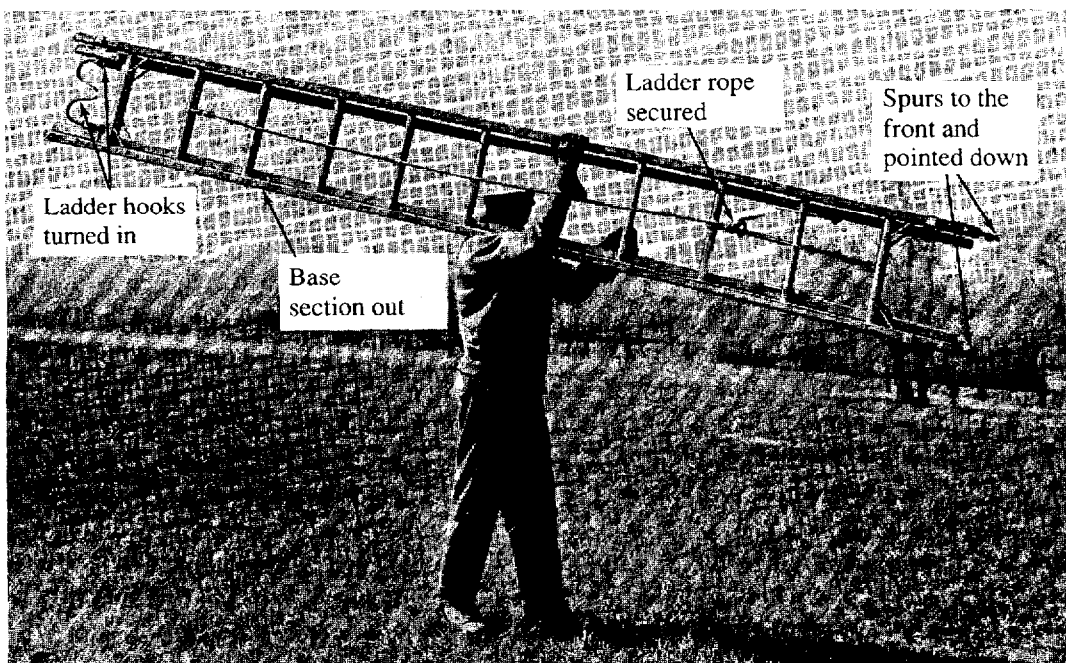


Figure 7-5. One-Person Method of Carrying an Extension Ladder

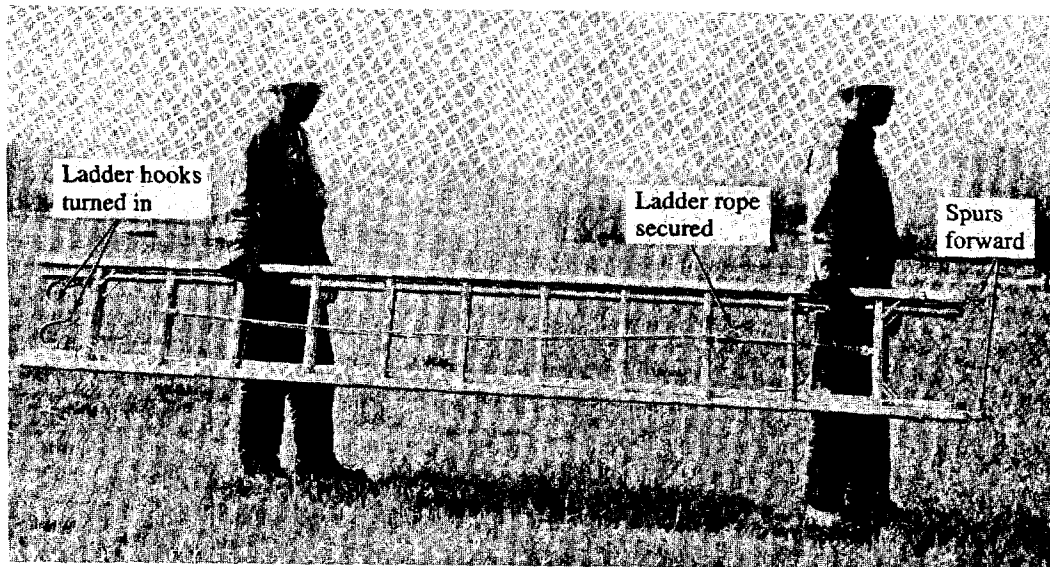


Figure 7-6. Two-Person Method of Carrying an Extension Ladder

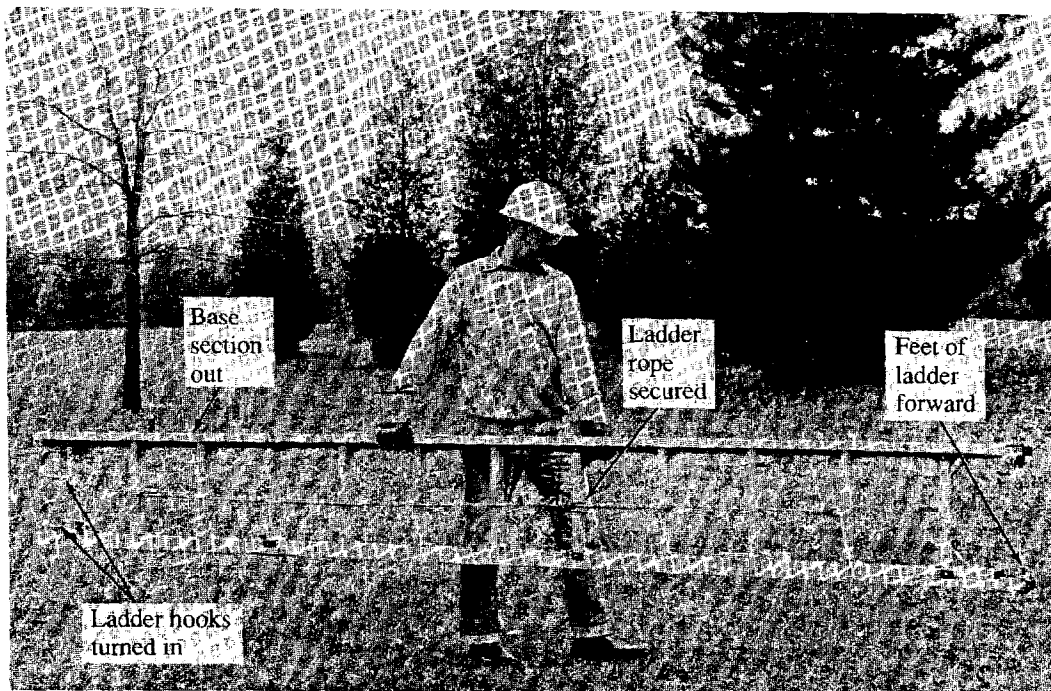


Figure 7-7. Alternate One-Person Method of Carrying an Extension Ladder

8. Safety Precautions

8.1 Locating Ladders

Where possible, locate ladders on the strand from the field side of the cable to avoid vehicular traffic.

If the ladder must be placed on the strand from the street side of the cable, the truck shall be parked in gear with the parking brake set and wheels chocked to provide maximum protection for the ladder without obstructing traffic. Also, warning signs, flags, traffic cones, or flashing signals shall be placed to divert traffic. Consult federal, state, local, and company requirements for work-area protection as appropriate.

Avoid placing a ladder in front of a doorway, especially where the door opens toward the ladder. If this is unavoidable, place barricades and block the door open or lock the door closed.

Avoid placing a ladder near passageways, moving machinery, or where pedestrians or any type of vehicles may strike or displace it. If this is unavoidable, place warning devices or barricades at these locations.

Do not place a ladder inside or opposite an angle formed by wires or cables where loosening of the wire or cable attachments might cause the ladder to move or fall.

Do not place a ladder against a suspension strand that is held under tension by a strand puller only.

Do not place a ladder against the support wire of multiple drop wire.

Do not place a ladder where it may come in contact with power lines.

8.2 Defective Ladders

Use only approved types of extension ladders.

Do not use ladders with defective or missing rungs, defective side rails, or defective hardware items. (See Section 5.)

Defective ladders must be marked or tagged, and removed from service immediately.

Do not spill or splatter substances such as encapsulants, lubricants, or paraffin on a ladder. Wood or aluminum coated with these materials is very slippery and can cause an accident.

8.3 Handling Ladders

Do not carry an extension ladder from one location to another while it's extended. Fully retract the fly (top) section and secure the ladder rope for carrying, then extend the fly section at the new location.

Point the spurs forward and downward when carrying a ladder on your shoulder.

Do not swing the ladder into the path of passing vehicles or pedestrians when carrying a ladder or removing it from a vehicle.

Extension ladders shall be erected with the fly section on top (toward the climber) of the base (bottom) section in the overlap area.

Except as described in Section 9.2, keep hands and feet off the rungs when raising or lowering the fly section. Stand clear when the fly section is being lowered so it will not strike your feet.

CAUTION — Do not let the fly section free-fall while it is being lowered.

When moving a ladder from place to place or storing it on a vehicle, make certain that the ladder hooks are turned in.

8.4 Securing Ladders

Ladders shall not be used to gain access to a roof unless the top of the ladder is extended at least 3 feet above the point of support, at an eave, gutter, or roofline.

Make certain that ladder locks are engaged properly and the ladder rope is tied securely to one of the rungs of the bottom section of an extension ladder before anyone climbs.

If the ladder is equipped with ladder hooks and the ladder is to be used on aerial cable, turn the hooks to the working position before the ladder is raised. Ladder hooks shall be placed on the cable strand unless the ladder is to be lashed as covered in Section 9. Do not turn the hooks in before climbing down the ladder.

Ladders not equipped with ladder hooks shall be positioned against the strand with a minimum of 2 feet of ladder length extending above the strand when a craftsperson is in position on the ladder.

8.5 Precautions While Using Ladders

Always select a ladder of sufficient length for the work to be done. The ladder shall be long enough so that a person can do the work while standing no higher than on the fourth rung from the top, thus permitting the person to grasp the side rails conveniently. Do not place a ladder on boxes, barrels, or other objects to obtain additional height. If the ladder is too short for the work at hand, get a longer ladder. The maximum working lengths for the various sizes of ladders are listed in Table 8-1.

Table 8-1. Working Lengths of Extension Ladders

Size of Ladder (Feet)	Maximum Working Length (Feet)	Minimum Number of Rungs Overlap
16	12	4
20	16	4
24	20	4
28	24	4
32	28	4
36	31	5
40	35	5

Always wear a hardhat and protective gloves when handling extension ladders.

Do not climb a ladder while wearing climbers.

Be especially careful when going up or down ladders during wet or icy weather.

Do not hurry when going up or down a ladder. Take one step at a time. Always face the ladder when going up or down, and be sure to have both hands free to hold onto the ladder.

Only one person at a time is permitted on a ladder.

Do not stand above the fourth rung from the top of the ladder.

When the top end of the ladder is secured to a strand, pole, or some other support, pass the safety strap around one or two rungs and around one side rail.

When the ladder hooks are engaged on the strand, pass the safety strap around the strand and one side rail between two rungs.

The craftsperson shall always remember to first make the ladder secure, then secure oneself on the ladder, to avoid falling in the event of slipping or loss of balance, or if something else goes wrong.

If the ladder cannot be secured, such as when it is placed against a building, do not secure yourself to the ladder.

Do not throw tools or materials to a craftsperson working on a ladder; instead, raise them by means of a handline. Be careful that tools or materials being used aloft cannot fall on persons below.

Do not attempt to lean to the side so far that your outside shoulder is more than 12 inches beyond the side rail when working on a ladder that is not lashed. Loss of footing in this position may cause loss of balance. The weight being shifted to one side of the ladder may cause it to slip at the top. Descend and move the ladder to the proper location.

When working from ladders, do not allow drop wires, lashing wires, handlines, or ladder ropes to dangle to the ground where they may be struck by passing vehicles. A wire or rope caught on a passing vehicle may pull the ladder, causing it to fall, or it may pull the craftsperson off the ladder. The handline, when not in use, shall be tied to the lower portion of the ladder or pulled aloft.

Do not slide down an extension ladder.

Do not tie drop wires or pulling lines to ladders.

Do not use a ladder in a horizontal position as a platform, runway, scaffold, or bridge.

8.6 Extension Ladders Used in Conjunction with Aerial Platforms

A single extension ladder that is secured to a strand for the purpose of accessing an aerial platform may be subjected to loads that exceed the duty rating (working load limit) of the ladder.

This situation may occur in longer spans when the platform is located significantly beyond the strand-support attachment and is loaded with more than 300 pounds. Usually a large horizontal or vertical strand displacement results, which decreases the ladder angle of inclination and causes a reduction in the allowable load rating of the ladder. To avoid this condition, the following guidelines are recommended.

- Limit two-person platform work to no more than 10 feet from a supporting structure (such as a pole). This will safely accommodate two craftspersons whose weight, tools, and materials do not exceed 300 pounds each. The second person can be located at any position on the ladder or platform.
- When work is being done at distances greater than 10 feet from a supporting structure, the platform may be occupied by one craftsperson whose weight, tools, and materials do not exceed 300 pounds. A second person should not climb the ladder.

9. Using Ladders

9.1 Selecting Footing for Ladders

Before attempting to position a ladder, select the appropriate position (spur or pad) of the combination feet to provide maximum security of the base (see Figure 3-5).

Be careful when positioning ladders before climbing. The proper procedure for positioning a ladder is known as the *firefighter's method*, which is illustrated in Figures 9-1 and 9-2. In using this method, you obtain the correct angle when you face the ladder with your toes placed against the side rails; you should be able to grasp the side rails with your hands by reaching straight out. The ratio of distance B to distance A should be about 1 to 4.

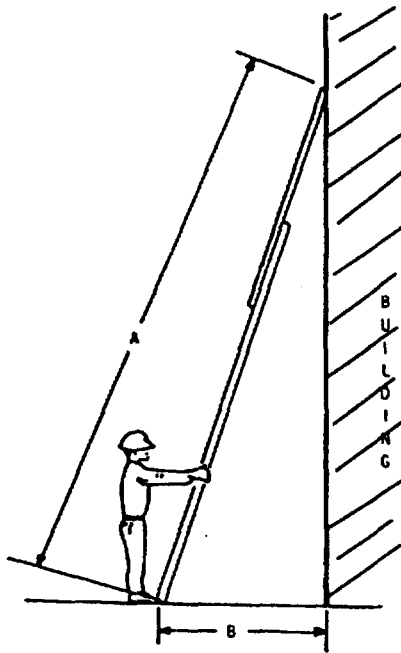


Figure 9-1. Ladder Against Wall

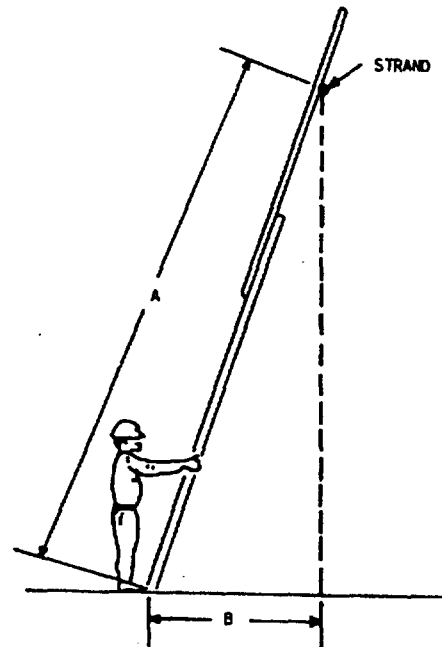
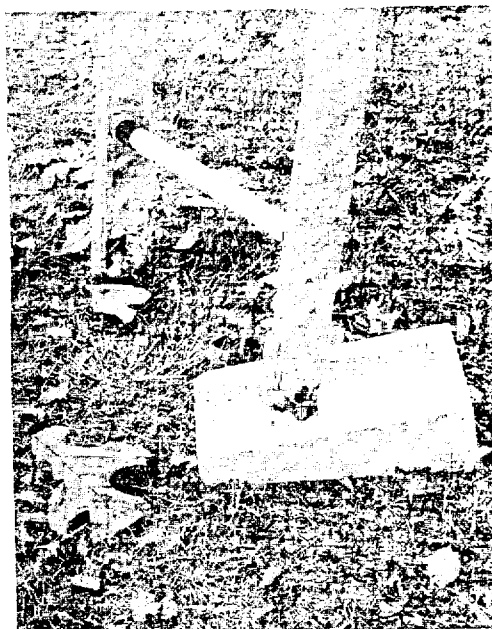
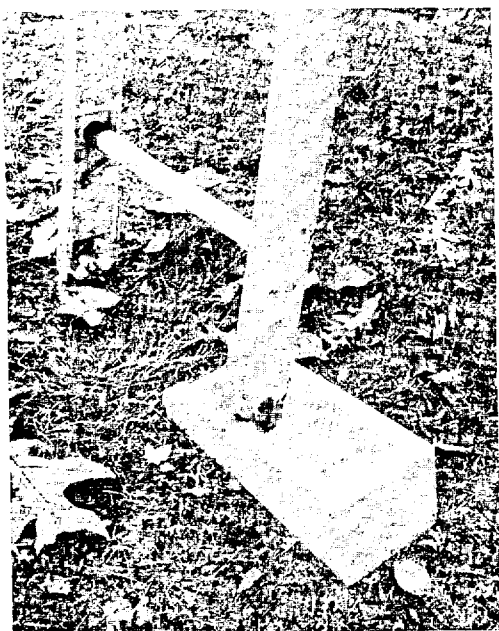


Figure 9-2. Ladder Against Strand

Set the ladder only on secure footing. Set both feet of the ladder at the same level and on a line parallel to the surface on which the top of the ladder rests. If necessary, you can use a B ladder leveling wedge to level the base of the ladder (Figures 3-9 and 9-3), or you might remove some earth from under the higher side of the ladder to bring it to the level of the lower side. Do not increase the length of a side rail by nailing, clamping, or tying a board to it. If a ladder leans to the right or left, it is not properly placed. Figure 9-4 shows a ladder with its base properly placed.



Rotate wedge
to provide level
footing on sloped
terrain.

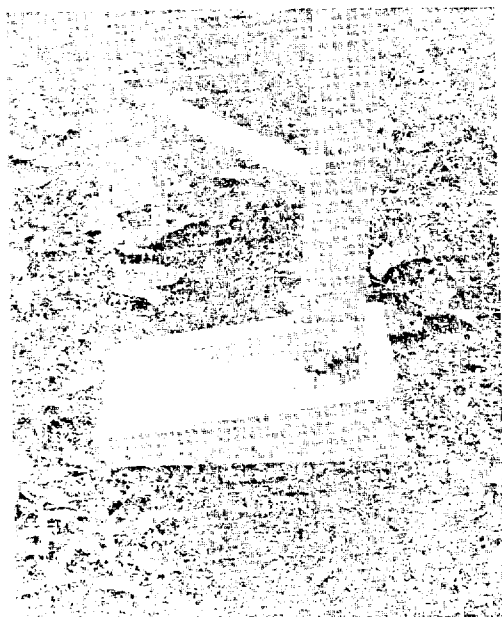
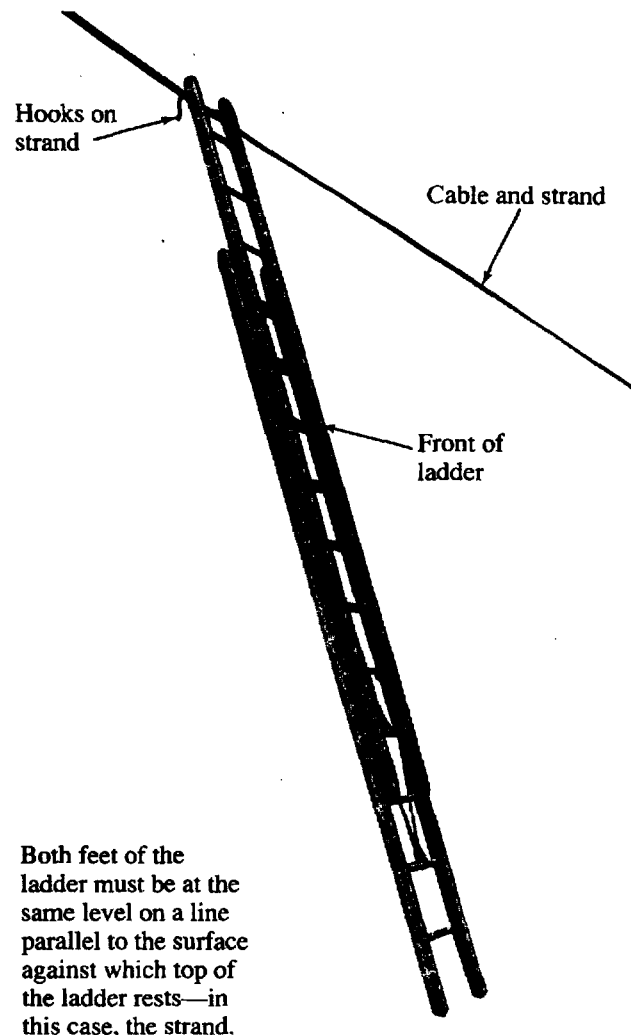


Figure 9-3. B Ladder Leveling Wedge in Use



Both feet of the ladder must be at the same level on a line parallel to the surface against which top of the ladder rests—in this case, the strand.

Figure 9-4. Base of Ladder Properly Positioned

When it is impossible to avoid placing the base of the ladder on a surface where it might slip, such as on wet or oily pavement, a smooth floor, or icy or metal surfaces, the best procedure is to tie the base of the ladder securely in place. If this is not practical, the ladder must be held by another craftsperson. The person holding the ladder must be alert at all times to protect the person on the ladder and anyone passing below. Never leave a raised ladder unattended under these conditions — the ladder might slip and cause injury, damage, or both.

9.2 Raising Ladders (One-Person Method)

The following procedures apply to raising a 28-foot or shorter extension ladder to a strand, pole, wall, or building.

1. If the ladder is to be used on a strand, first place the ladder hooks in the working position. (Section 9.6.1 gives procedures for securing the ladder in conjunction with raising it to the strand.) If the ladder is to be used on a pole and is equipped with a V-bracket (Figure 3-3), also place the ladder hooks in the working position; this will allow the V-bracket to rest correctly on the pole.
2. Place the ladder upright, with the base section close to and facing the strand, pole, or wall.
3. Face the fly section.
4. Place one foot at the outside of the base section to steady the ladder, but not where it could be struck by the fly section.
5. Bring the rope around the side rail; use one hand to pull the rope, and the other hand to lift a rung of the fly section.
6. Extend the fly section one or two rungs at a time, and engage the locks after each pull. **NEVER place the free hand between the rungs where it can touch rungs on the base section.**
7. After the fly section is raised beyond the reach of the free hand, steady the ladder by holding the side rail, and continue to extend.
8. After the ladder is extended, place it at the proper angle, using the "firefighter's method" illustrated in Figures 9-1 and 9-2, and secure the rope.

The one-person method of raising a 28-foot or shorter extension ladder to a wall or building is illustrated in Figures 9-5 through 9-7.

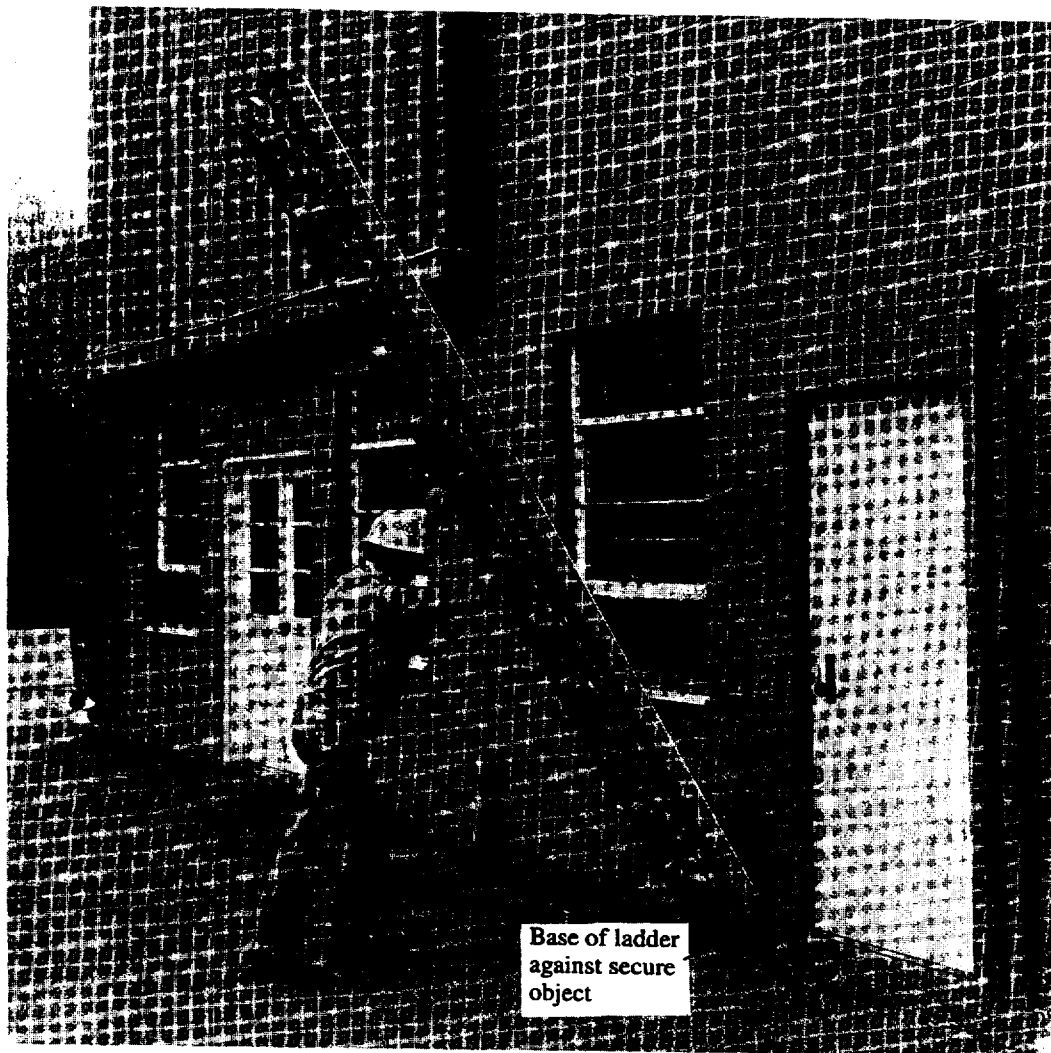


Figure 9-5. One Person Raising Ladder to a Building

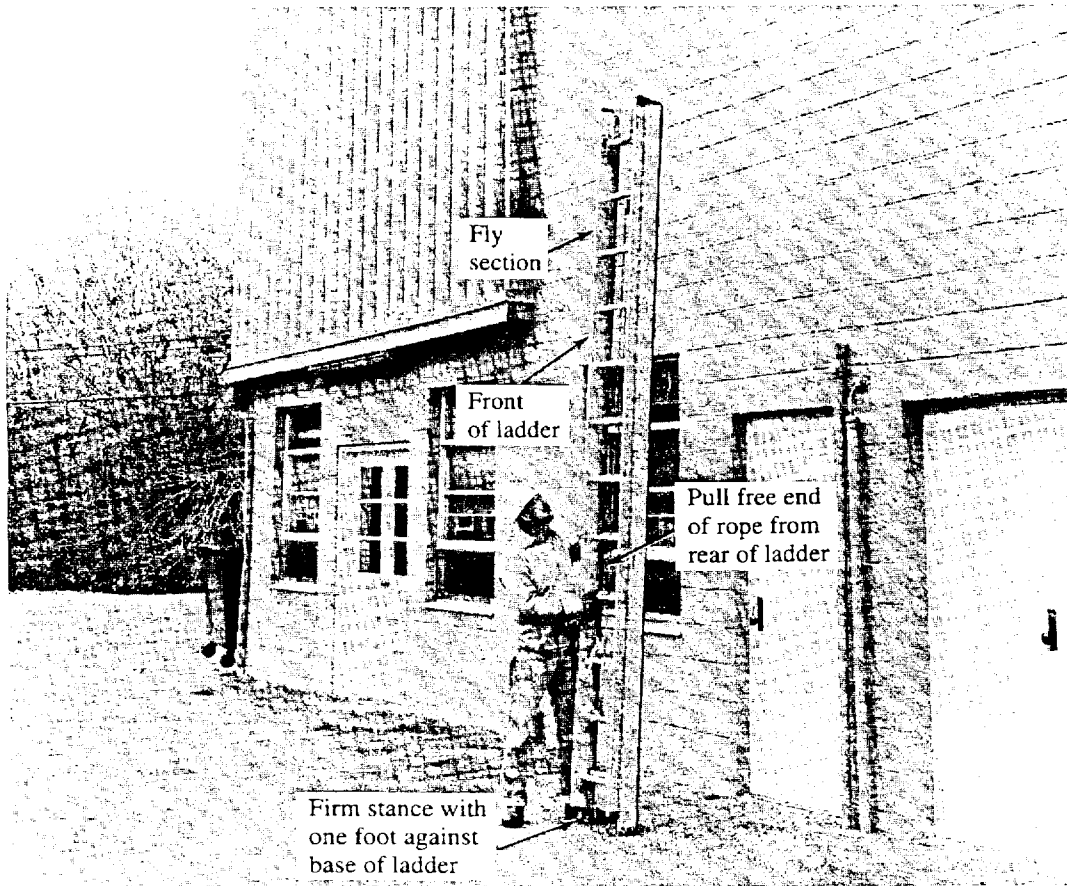


Figure 9-6. Preparing to Extend Fly Section to a Building

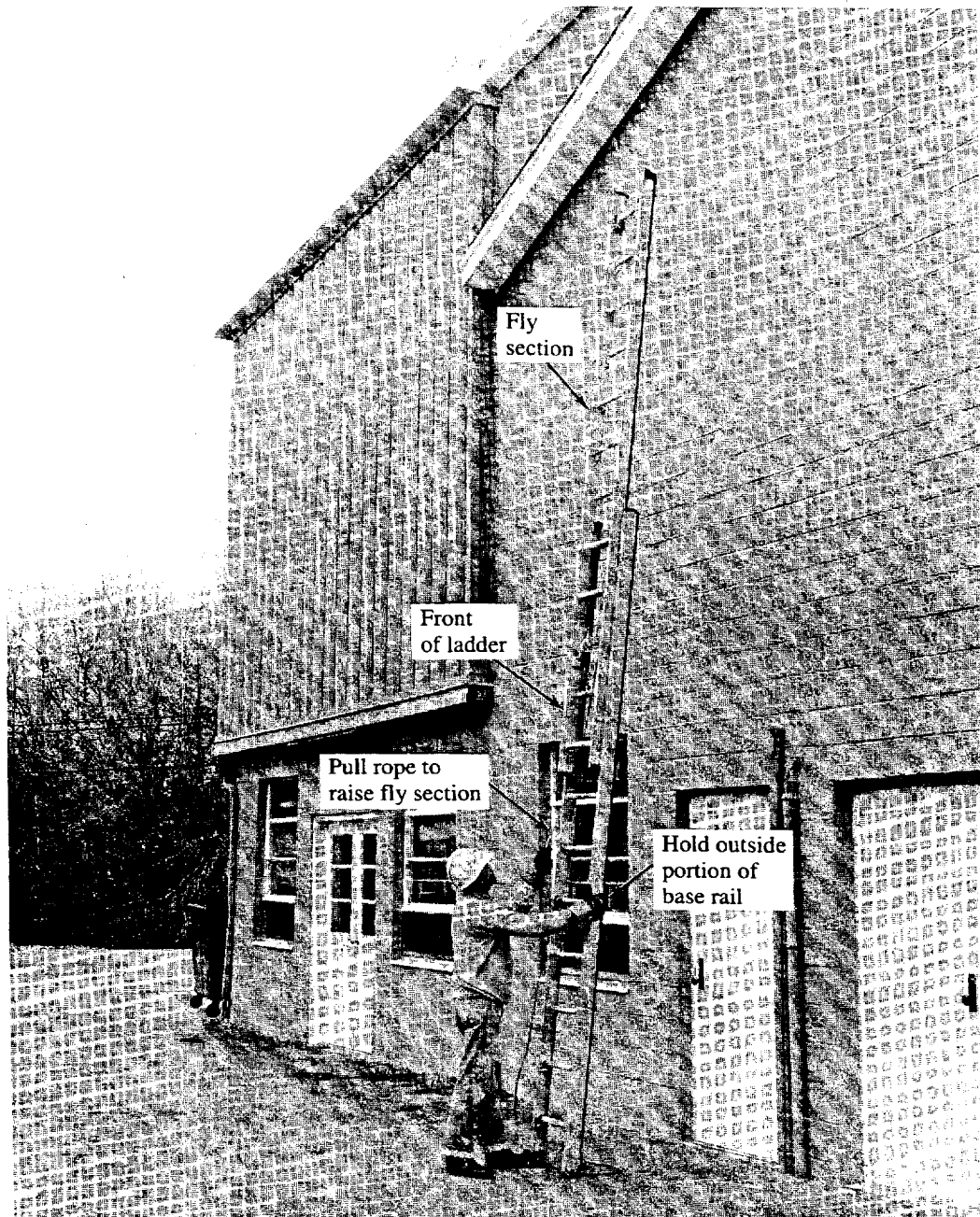


Figure 9-7. Fly Section Extended Toward a Building

A recommended one-person method of raising an extension ladder to a strand is shown in Figures 9-8 through 9-12. This method can be employed in any situation, but is especially useful under adverse conditions such as high winds or when a ladder longer than 28 feet is being raised. Alternative company methods may also be available.

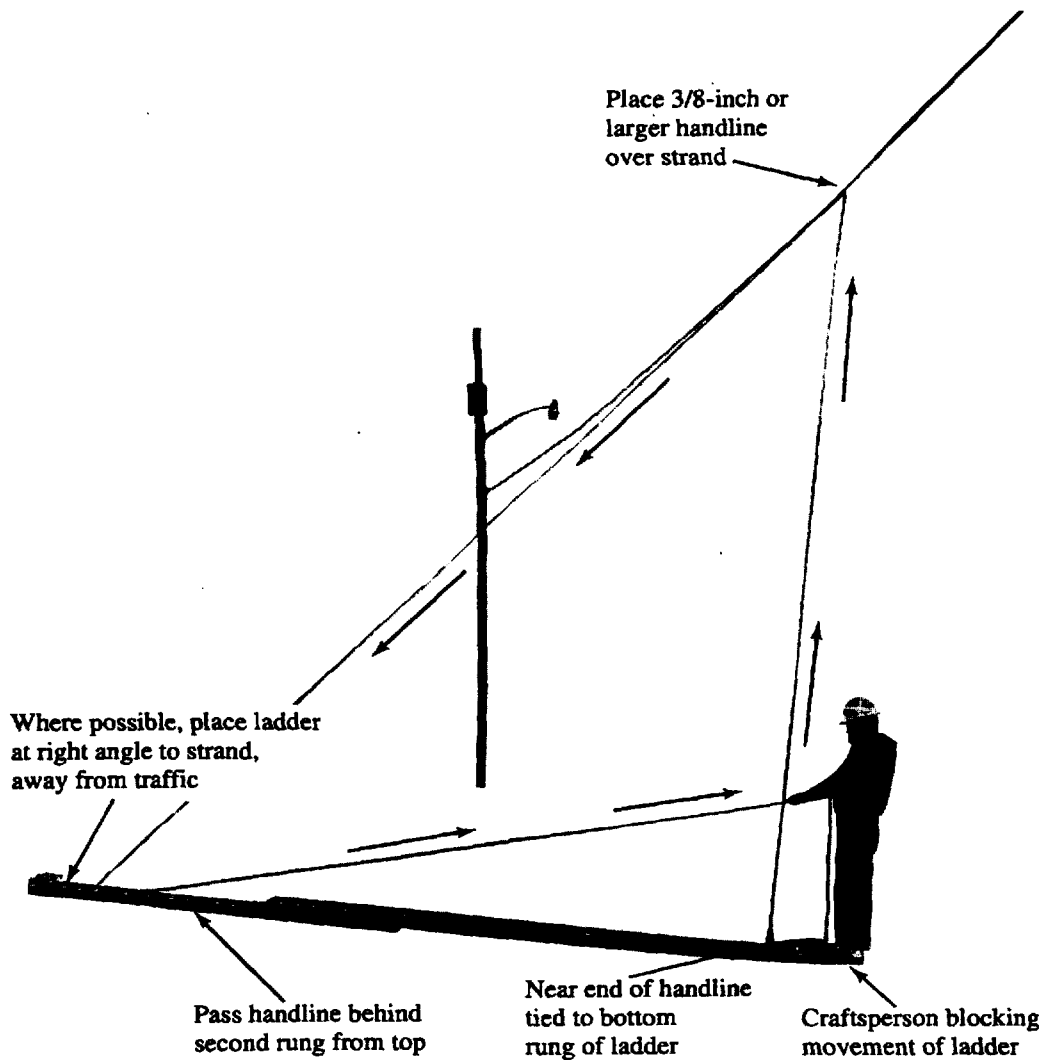


Figure 9-8. Preparing to Raise Extension Ladder to Strand

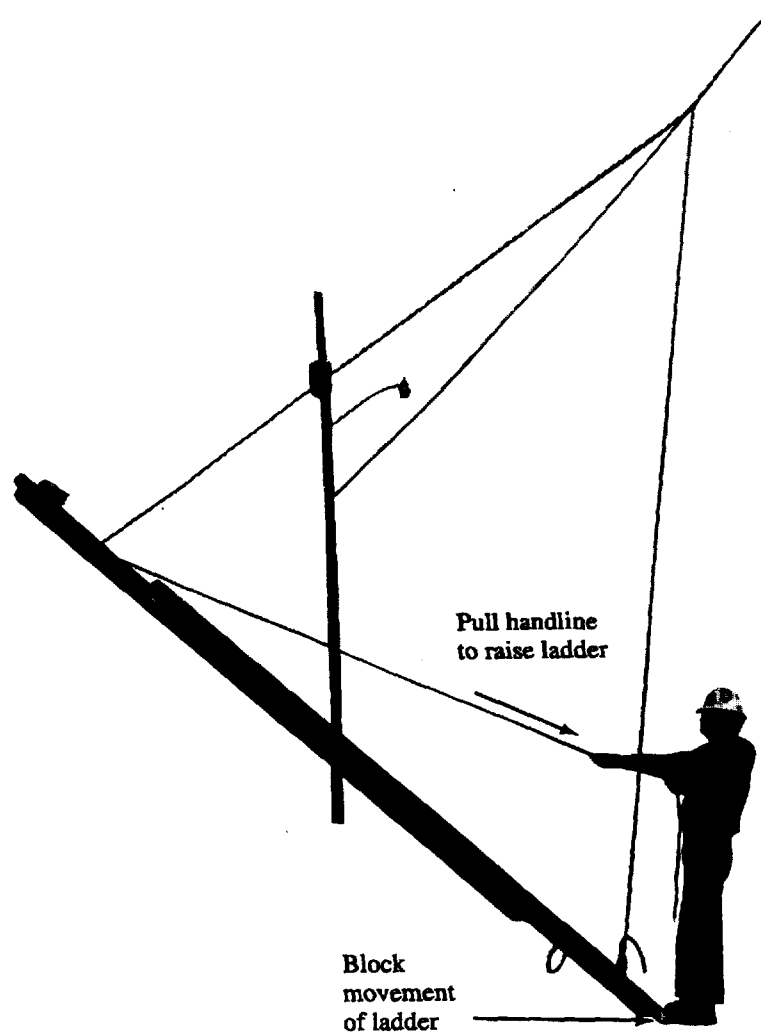


Figure 9-9. Ladder Partially Raised to Strand

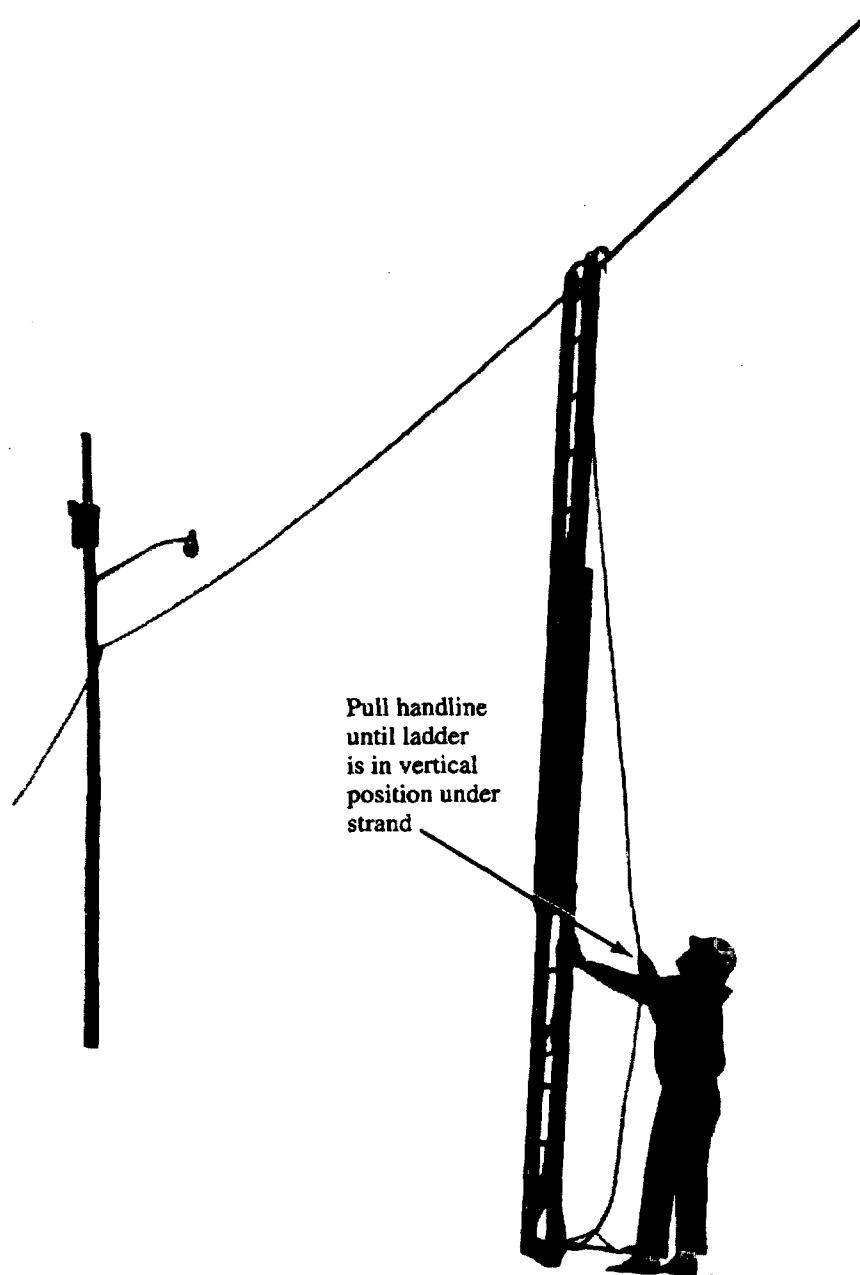


Figure 9-10. Ladder in Vertical Position on Strand

Leave enough
slack in
handline (about
1 foot) to
allow ladder
to be extended
without having
to untie the handline

Clove hitch
and two
half-hitches

NOTE:
The ladder
extension
rope has
been removed
for clarity

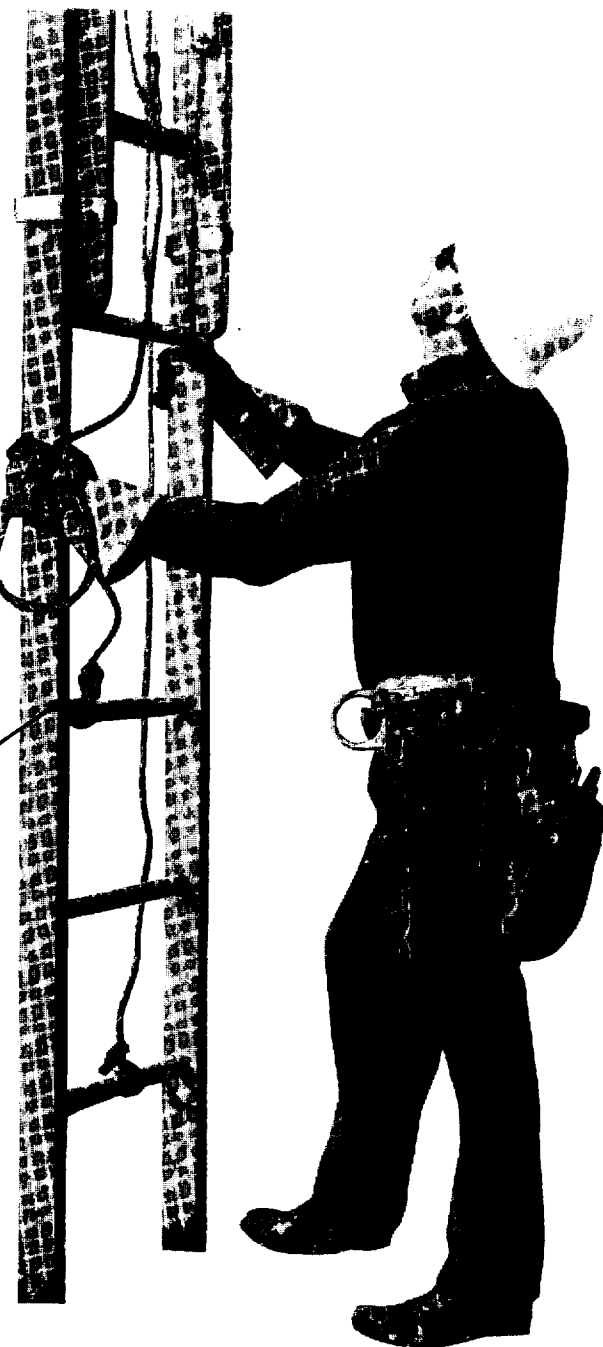


Figure 9-11. Method of Securing the Handline

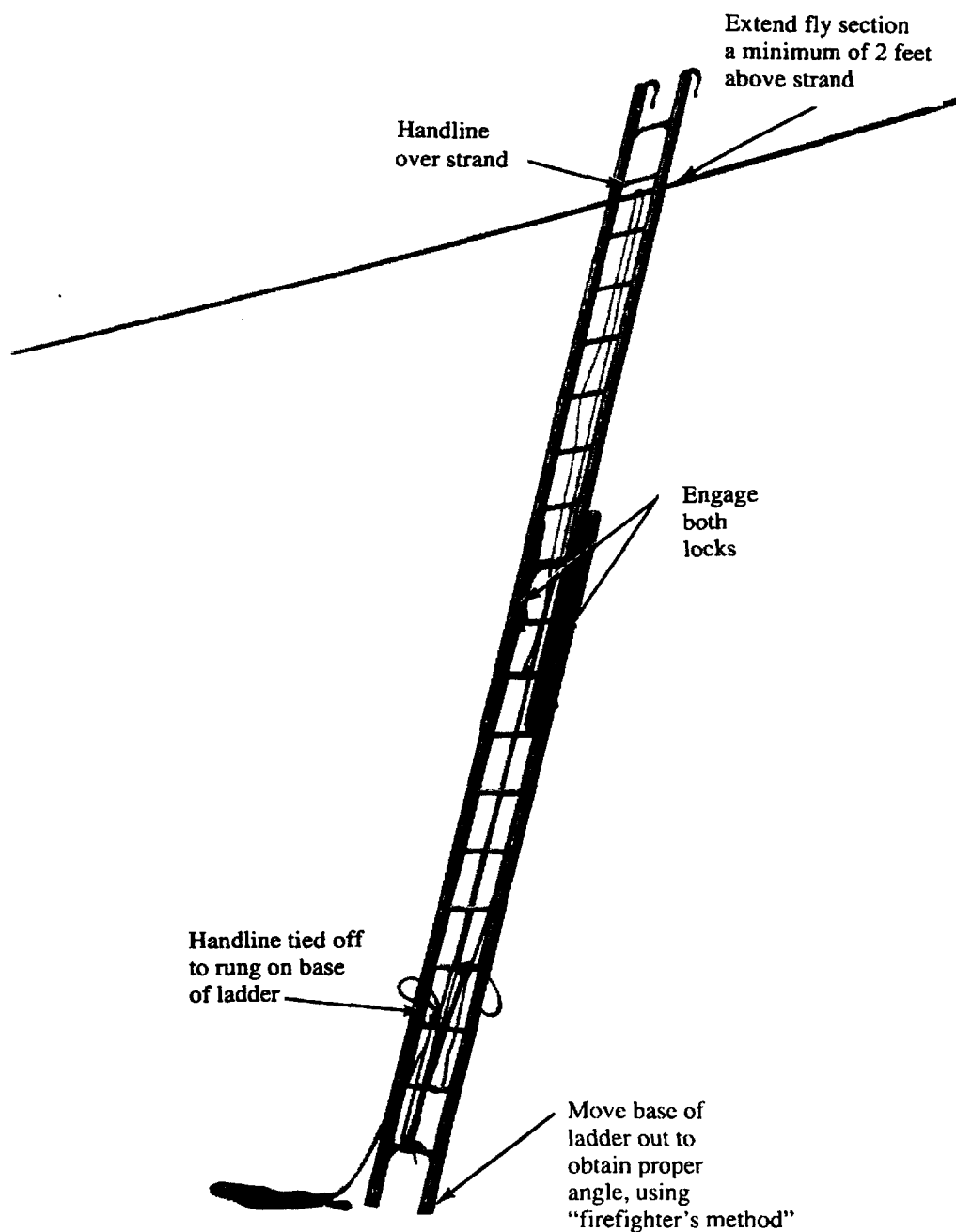


Figure 9-12. Ladder in Working Position on Strand

9.3 Lowering Ladders (One-Person Method)

To lower the fly section, move the base close to the strand, pole, or wall, and reverse the raising procedure by lowering one or two rungs at a time.

CAUTION — Position your body in such a way that the fly section will not strike your feet when it is lowered. Never let the ladder rope slip through your hand and allow the fly section to free-fall.

The one-person method of lowering an extension ladder is illustrated in Figures 9-13 and 9-14.

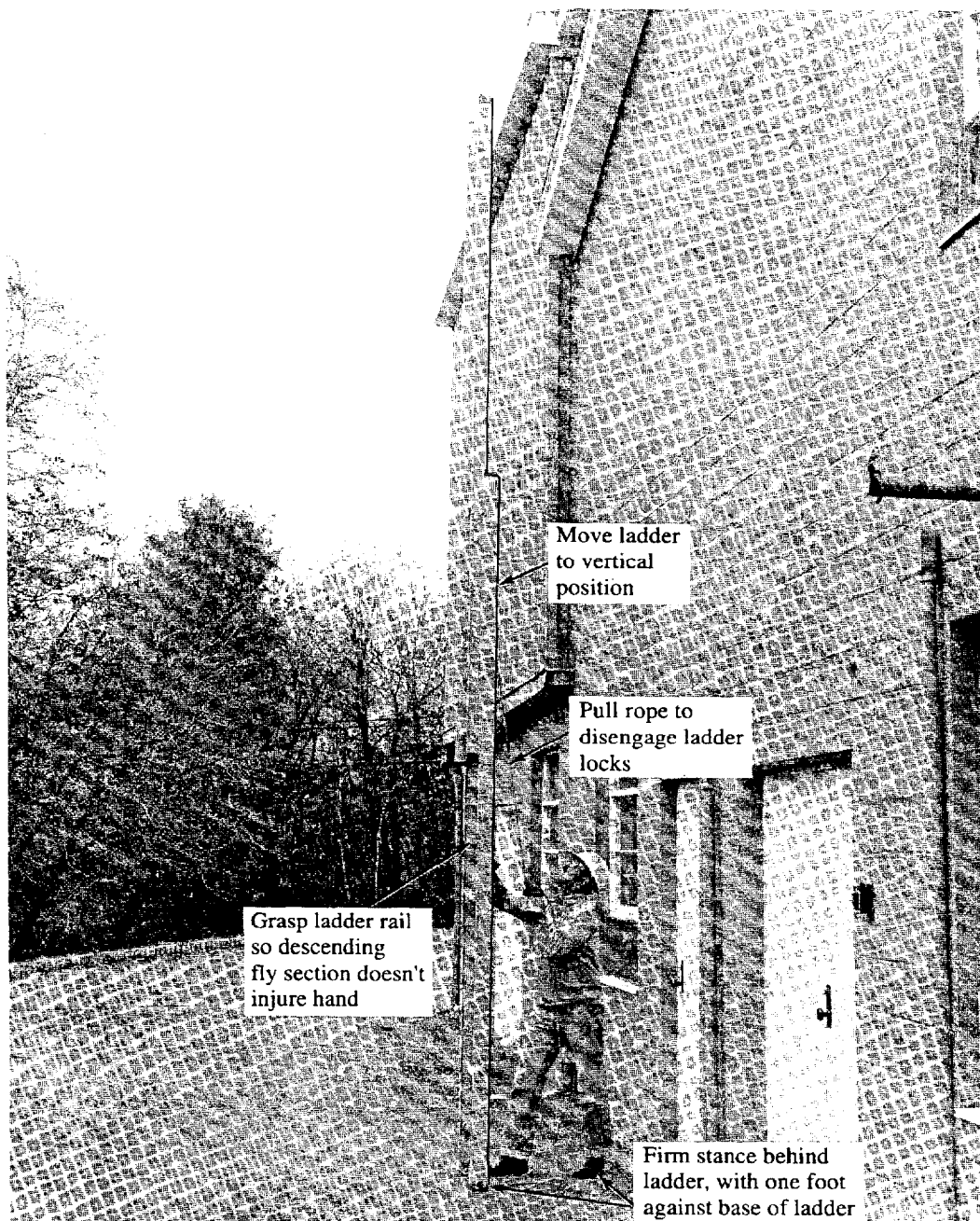


Figure 9-13. Preparing to Lower the Fly Section

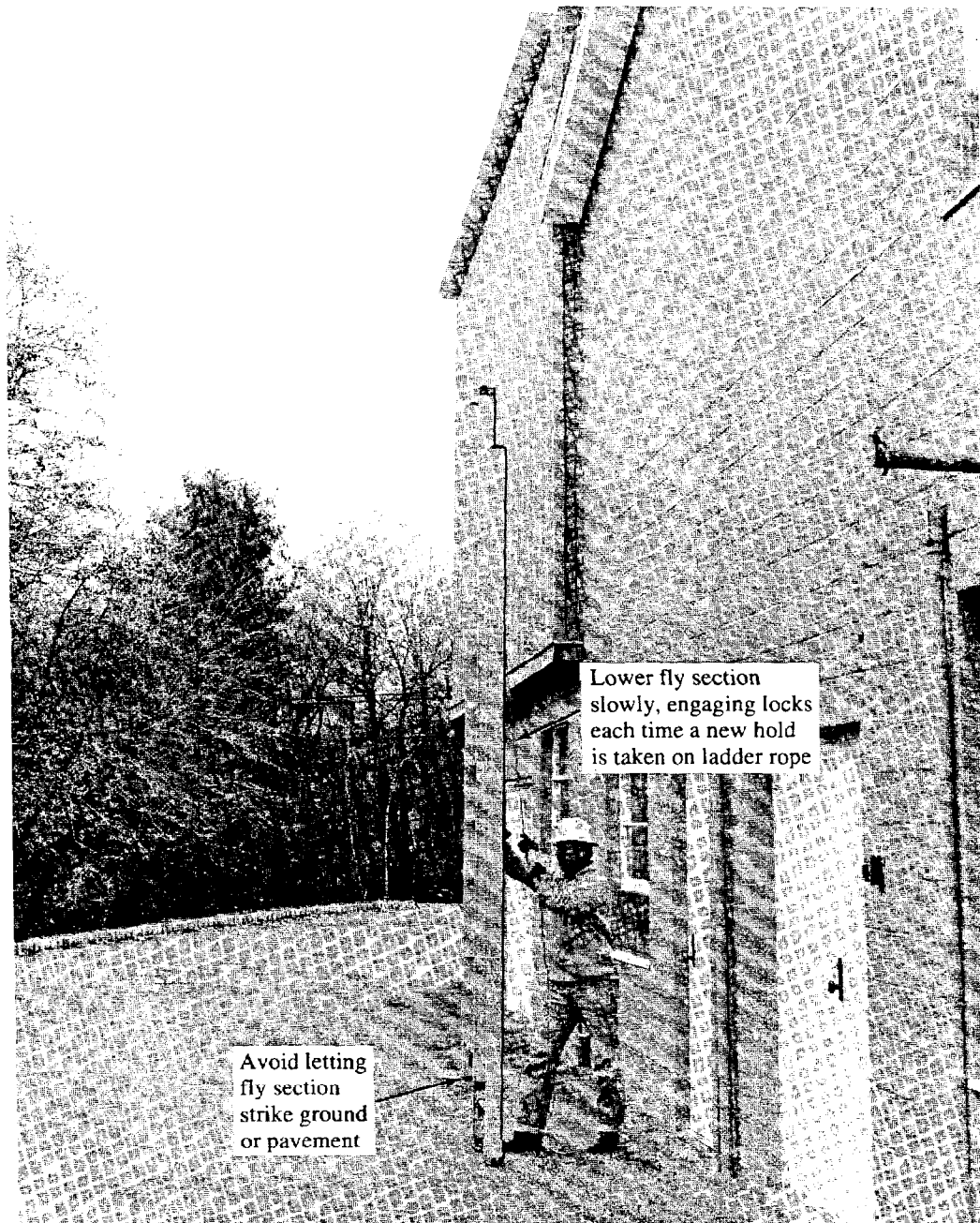


Figure 9-14. Fly Section Lowered

9.4 Raising and Lowering Ladders Longer Than 28 Feet

Under certain conditions, it may be possible for one craftsperson to safely raise and lower ladders longer than 28 feet, using the methods previously described in Sections 9.2 and 9.3.

However, for these longer ladders the two-person method of raising a ladder as shown in Figures 9-15 and 9-16 is preferred in most cases.



Figure 9-15. Two Persons Raising a Ladder

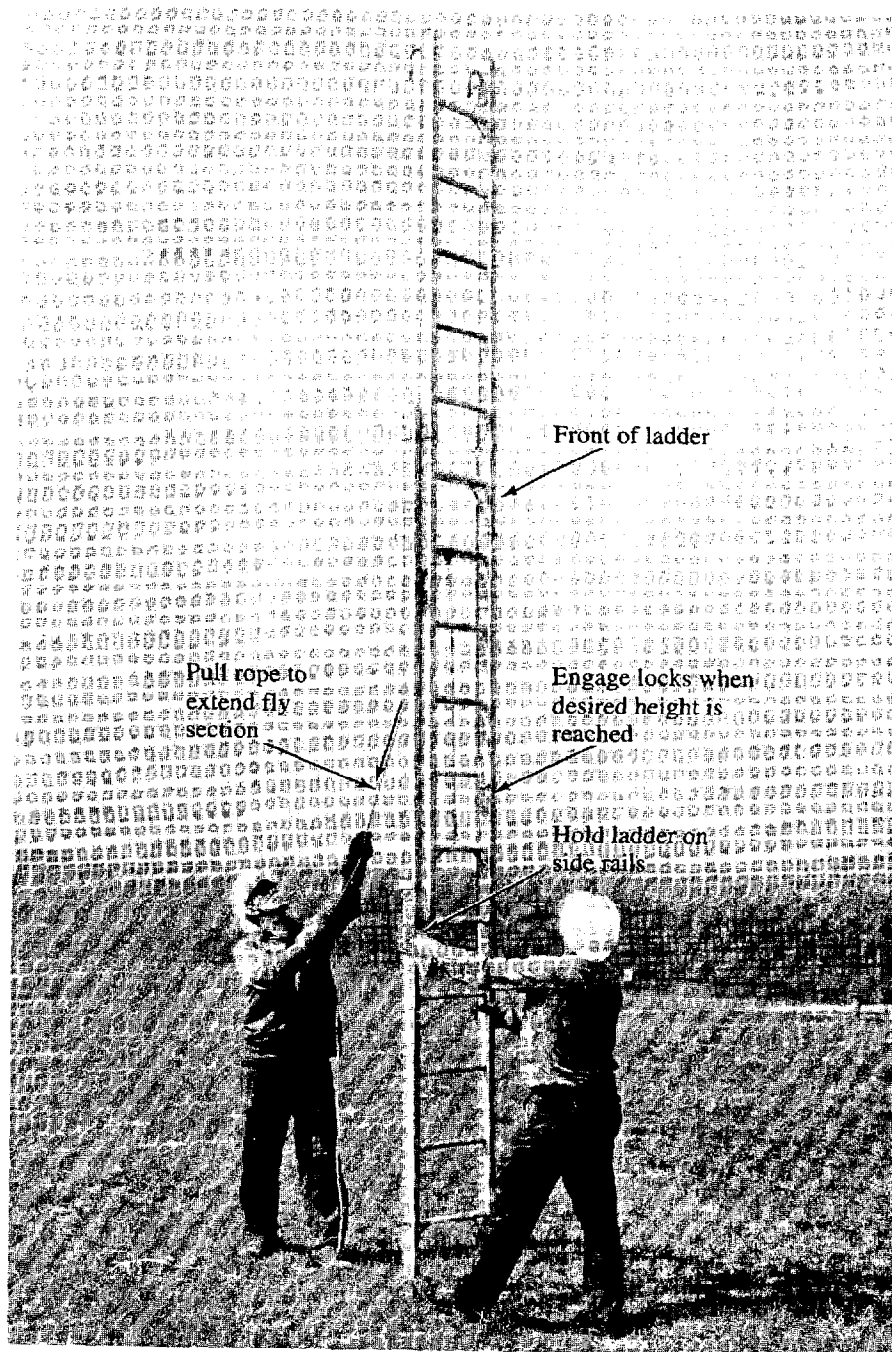


Figure 9-16. Two-Person Method of Extending the Fly Section

9.5 Supporting Lower End of Ladder

When a ladder is placed against a pole, make certain that the ladder is properly extended, is positioned at the correct angle to the pole, and is on solid footing as described in Section 9.1.

The base of the ladder shall be secured to the pole before anyone climbs.

Figure 9-17 illustrates an approved method of using a lashing rope or handline to secure C and E Extension Ladders up to 28 feet long. About 50 feet of rope made of 3/8-inch polypropylene (B Plastic), manila, or stranded nylon is required to make the lash. Use longer rope for ladders longer than 28 feet.

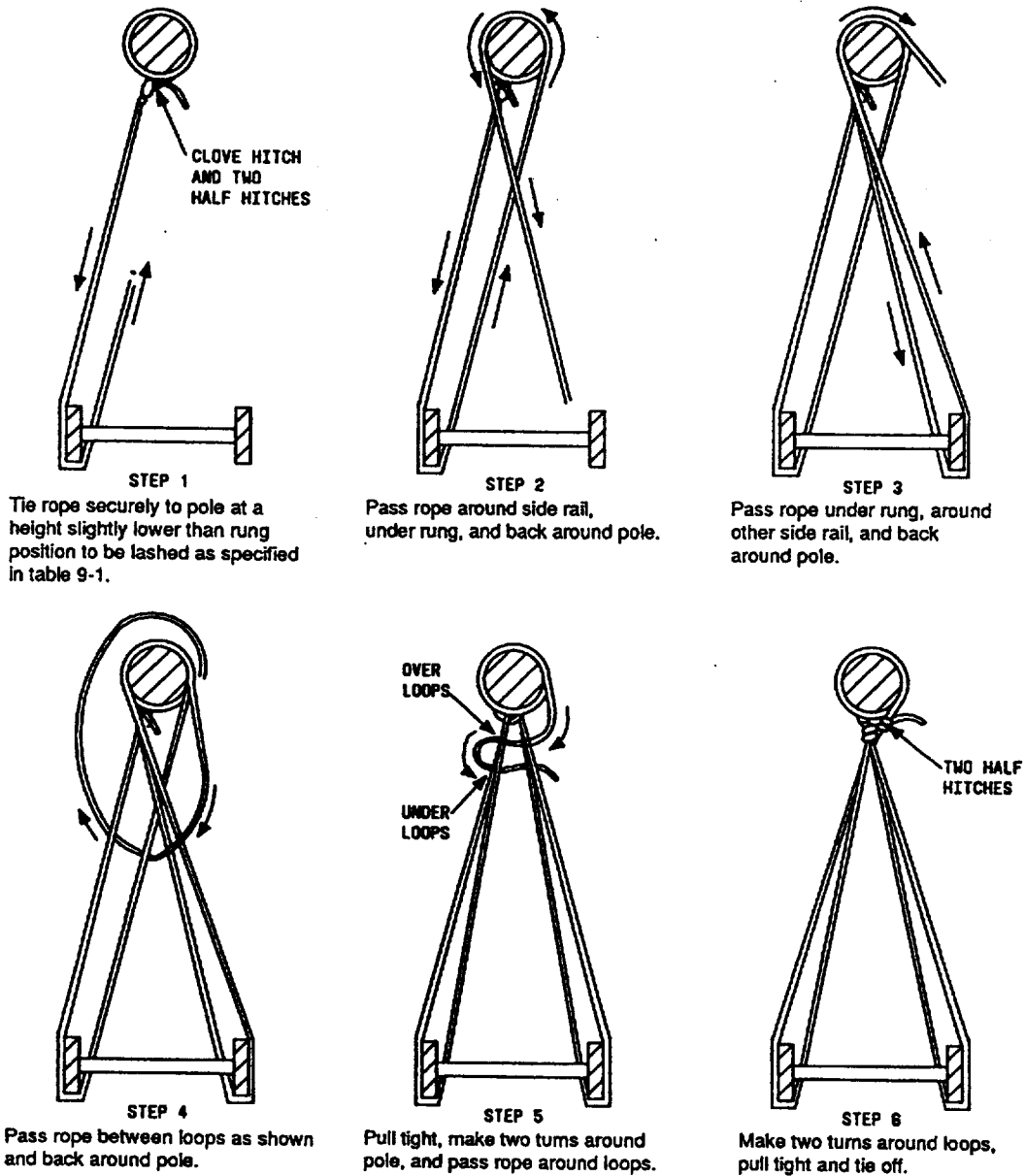


Figure 9-17. Lashing Base of Ladder to Pole, Using Lashing Rope

A bottom ladder lashing device may also be used to secure the base section of an extension ladder, as shown in Figure 9-18.

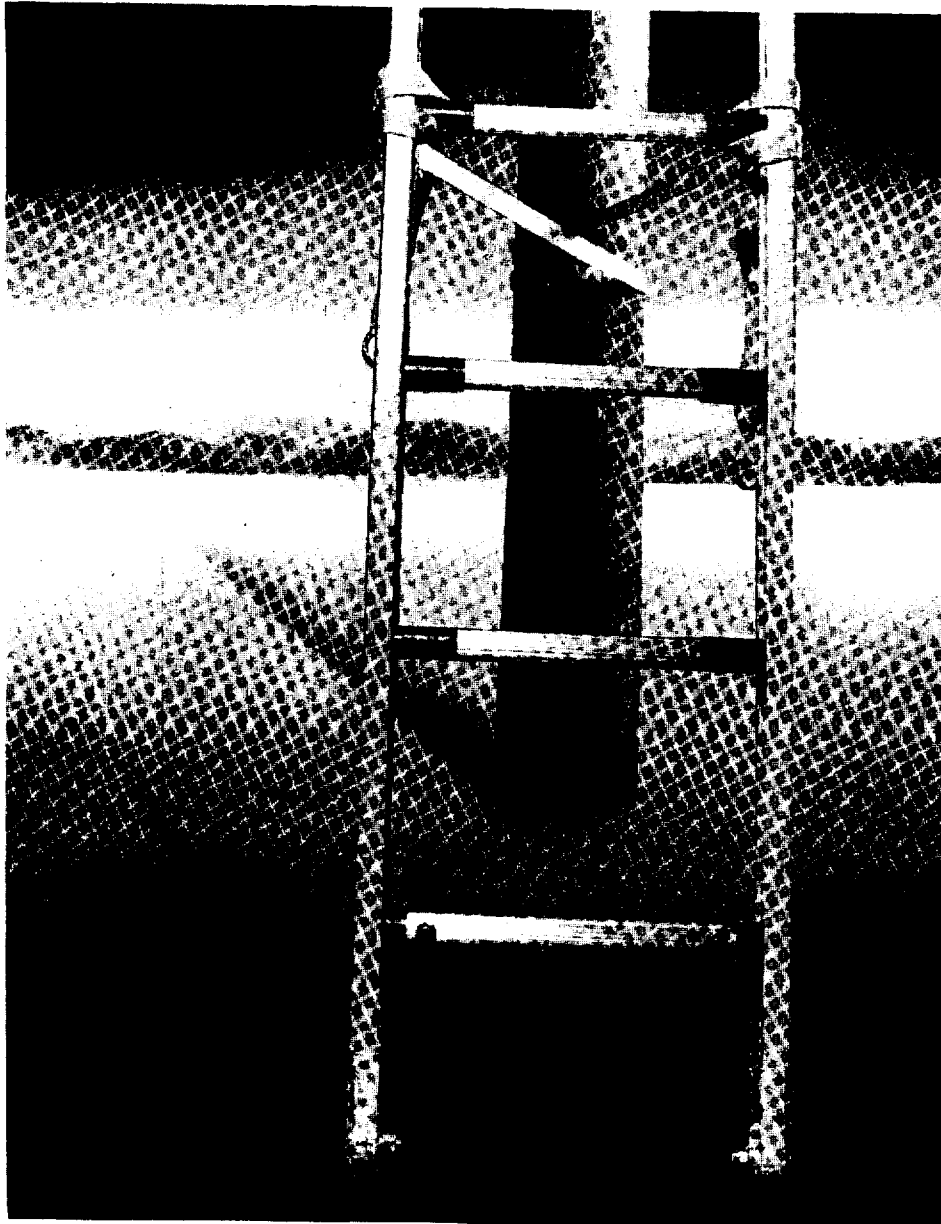


Figure 9-18. Base of Ladder Secured to Pole by Use of a Typical Bottom Ladder Lashing Device

Because designs of bottom ladder lashing devices vary, users should make certain that the particular device in use is appropriate for the size of the ladder being secured.

Although specific installation procedures for these devices vary by manufacturer, the following general guidelines should be followed to maximize restraint and not overstress the ladder.

1. Attach one end of the device to the side-rail location of the ladder as indicated in Table 9-1. Secure the strap to the side rail in such a way that a rung is included in the tie. This will prevent the strap from slipping down the rail (see Figure 9-18 on the previous page). Make certain that no contact occurs between the metal parts of the device and the fiberglass, aluminum, or wooden parts of the ladder that could result in structural damage to the ladder (Figure 9-19A).

Table 9-1. Side-Rail Attachment Locations for Lashing Base of Ladder to Pole

Size of Ladder (Length In Feet)	Attach at Rung Position
40	7
36	7
32	6
28	5
24	5
16	4

2. Extend the strap component to the side of the pole opposite the initial side-rail attachment, slightly below the height of attachment to the rail (at a downward angle), as shown in Figure 9-19B.
3. Pass the strap to the rear of the pole for 1-1/2 turns if the straps are made of canvas, or for 2-1/2 turns if the straps are made of nylon (Figure 9-19C). Be sure to overlap the straps at the rear of the pole.
4. Secure the free end of the strap to the opposite side rail so that the straps cross between the ladder and the pole, forming a figure-8 design (Figure 9-19D).
5. Tighten the device, following the manufacturer's recommendations or company practices (Figure 9-19E). The strap should be tightened only snug enough to restrict movement; excessive force can overstress the ladder. Figure 9-19F shows an overall side view of the secured ladder.
6. After the bottom of the ladder is secured, the top should also be secured as described in Section 9.6.2.

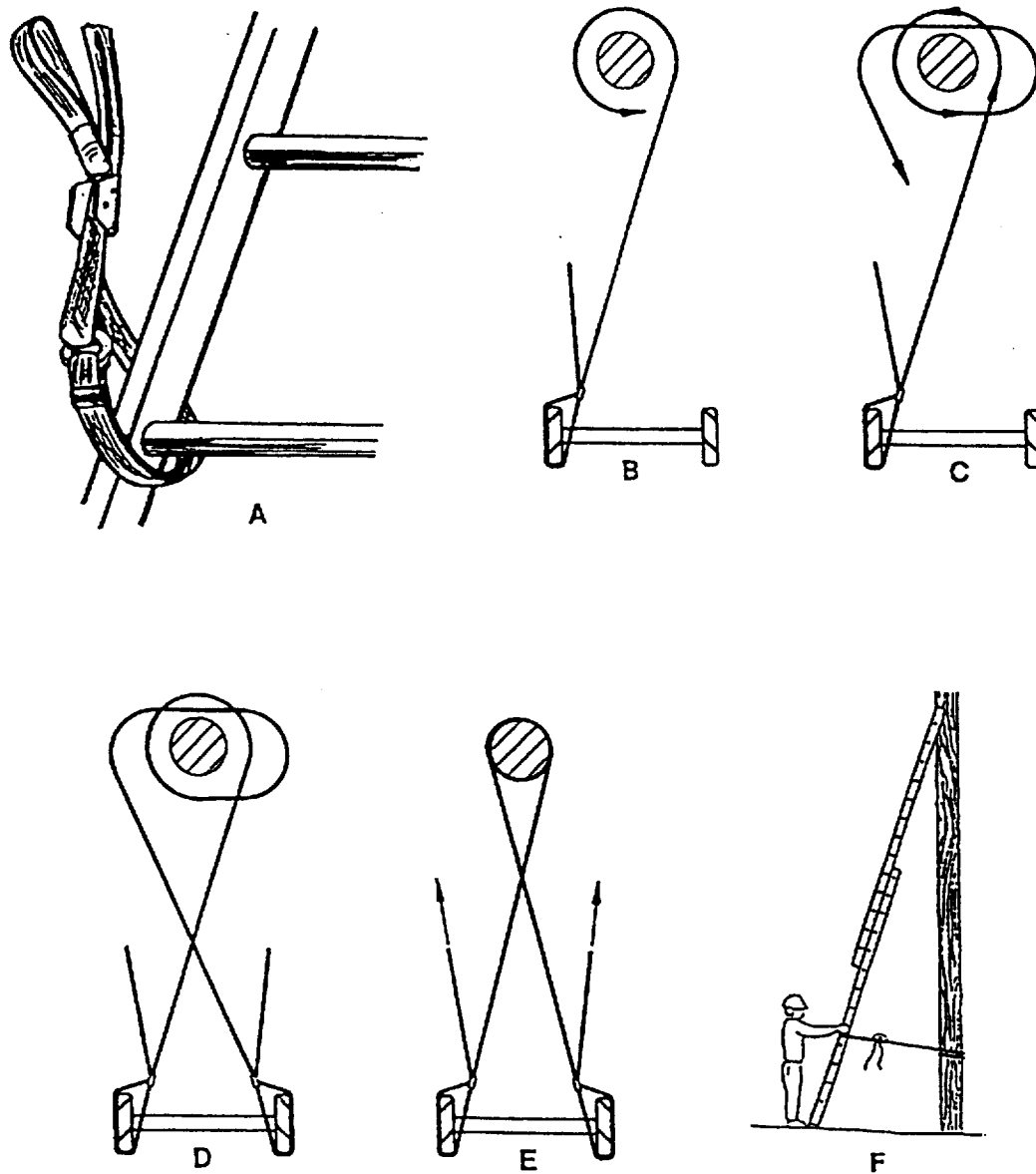


Figure 9-19. Securing Base of Ladder to Pole, Using Bottom Ladder Lashing Device

9.6 Supporting Upper End of Ladder

Objects against which the top of the ladder will be placed shall be sufficiently rigid and have ample strength to support the ladder and the craftsperson performing necessary work operations.

9.6.1 Supporting a Ladder on a Strand

Before placing a ladder against a suspension strand, test the strength of the strand and its supports as outlined in predivestiture Bell System Practice 627-295-500.

Secure the ladder with rope to prevent the top of the ladder from sliding along the strand or being pushed away from it. Before raising the ladder, throw or place a handline over the strand and secure one end of the handline to the second rung from the top of the fly section. After placing the ladder on the strand, pull the other end of the handline taut and secure it to an adequate support located on the uphill side of the ladder, such as a pole, tree, or digging-bar firmly anchored in the ground. If no such anchorage is available, secure the ladder to the cable and strand by throwing the handline over the strand again, so the rope passes twice around the cable and strand. Then tie the rope securely to a rung on the base section of the ladder.

Ladder hooks (Figures 3-1 and 3-3) shall be used on lashed, ring-supported, and self-supporting cable when the ladder is not lashed to the strand.

CAUTION — When using ladder hooks on aerial cable, make certain that the ladder is placed on firm and level footing so that it will not twist or slide along the strand.

A greater margin of safety is provided with the hooks in the working position even if the ladder is lashed to the strand and especially when the ladder is being placed and removed.

When a ladder is placed against the strand and ladder hooks are not engaged, secure the ladder to the strand with a short length of rope, D ladder support, or an approved ladder lashing device. Where the cable is supported in rings, pass the lashing rope or device strap around the strand only. Where the cable is lashed, pass the lashing rope or device strap around the strand and the cable.

Figure 9-20 shows how to secure a ladder to the strand, using a lashing rope.

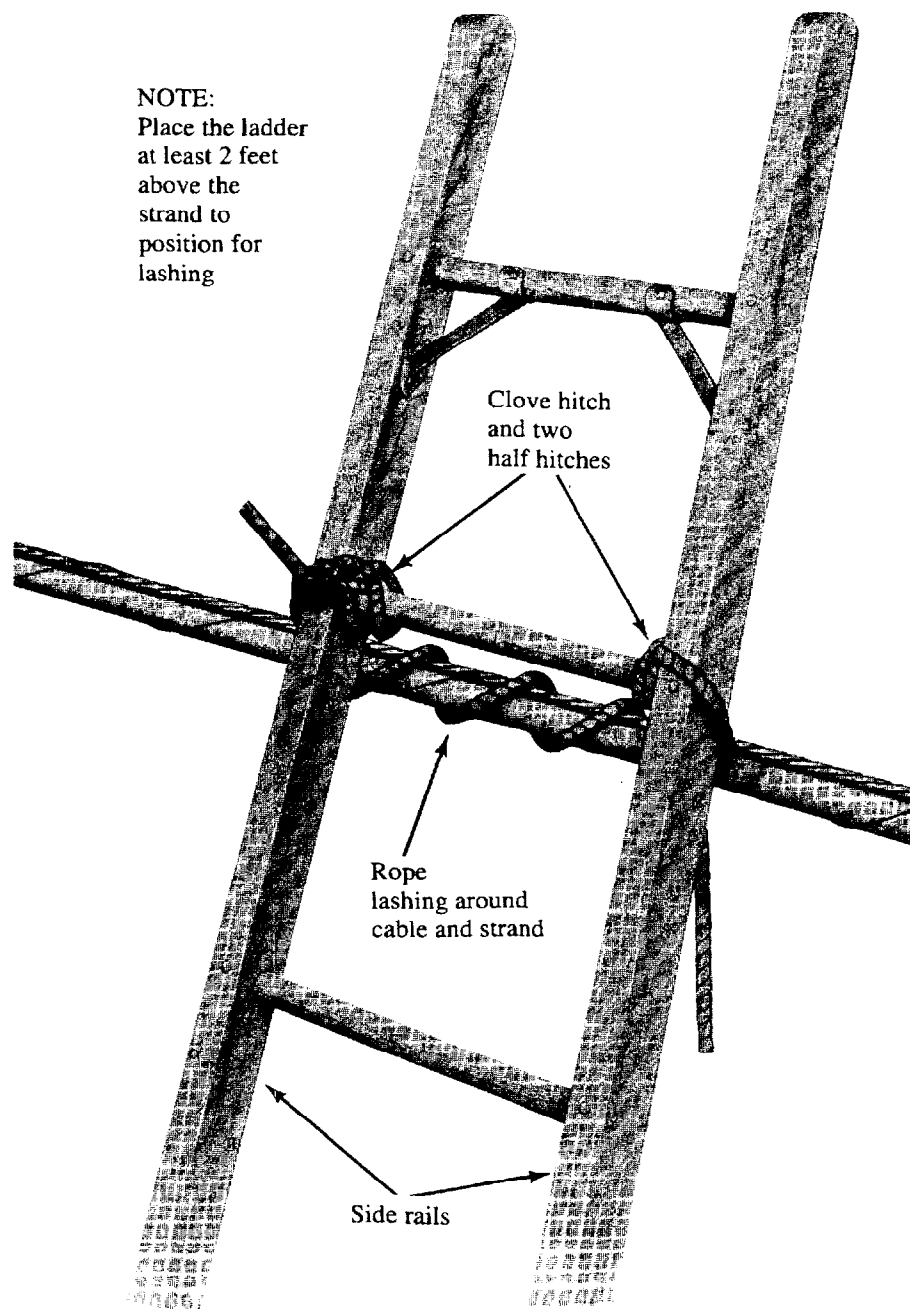


Figure 9-20. Lashing Ladder to Strand, Using Lashing Rope

An alternative means of securing the upper end of a ladder to the strand is with a top ladder lashing device, as shown in Figure 9-21.

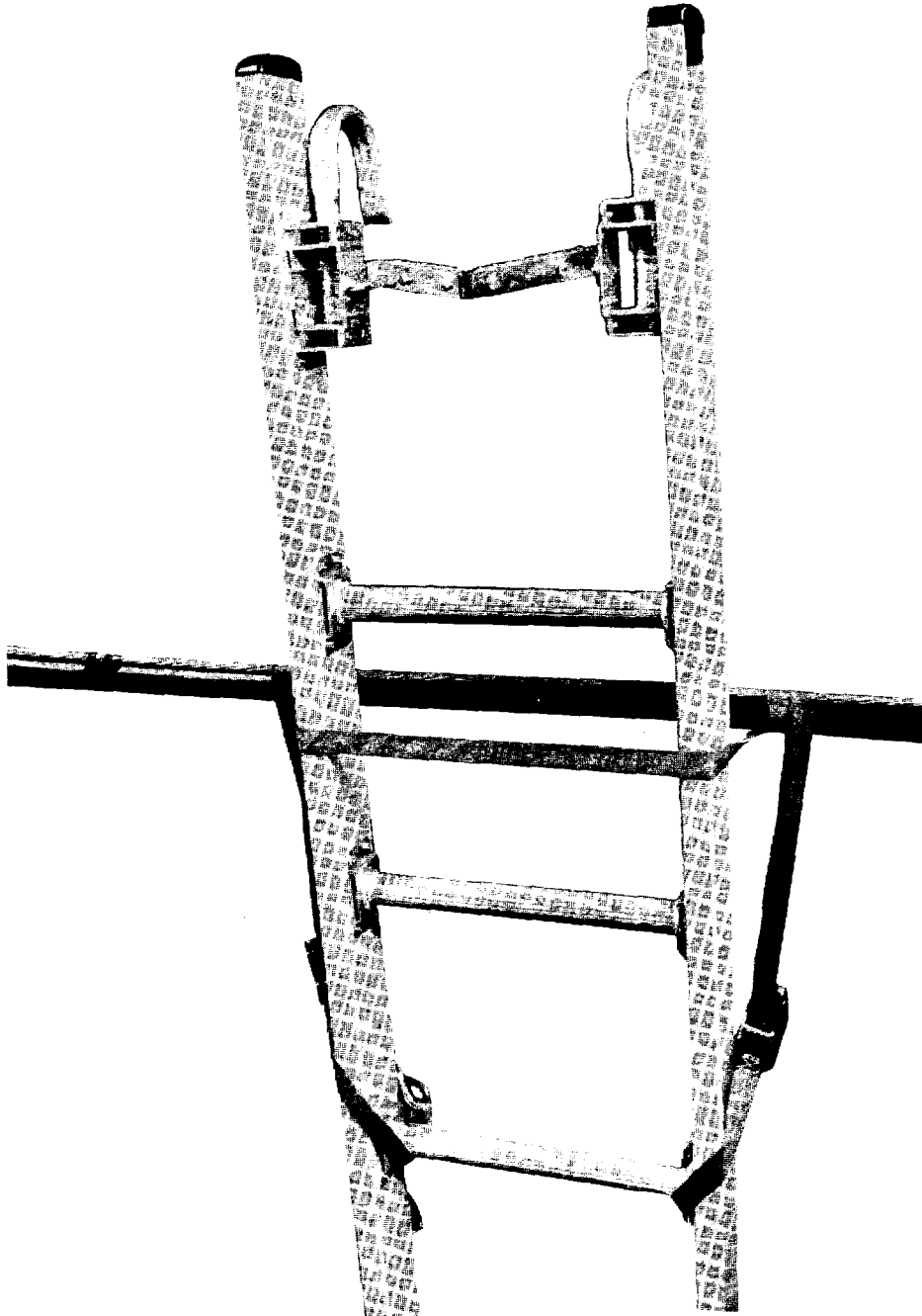


Figure 9-21. Ladder Secured to Strand by Use of a Typical Top Ladder Lashing Device

Although the design of these devices varies by manufacturer, the following installation guidelines should be used for maximum upper-end restraint, as illustrated in Figure 9-22.

1. Place the top of the ladder at least 2 feet above the strand (Figure 9-22B).
2. Attach one end of the device around the side rail, beneath the second rung, below the strand (Figure 9-22, A and B).
3. Extend the strap up from behind the side rail to the front of the strand, and wrap it over and around the strand twice (Figure 9-22B).
4. Pass the strap across the face of the ladder, and repeat two wraps under and around the strand on the opposite side (Figure 9-22C).
5. Route the loose end of the strap down to the same rung position as the initial attachment, and attach it around the side rail as specified in Step 2 (Figure 9-22C).
6. Tighten the strap ends, following the manufacturer's recommendations or company practices, being careful not to unbalance the load on the ladder during the tightening process (Figure 9-22C).

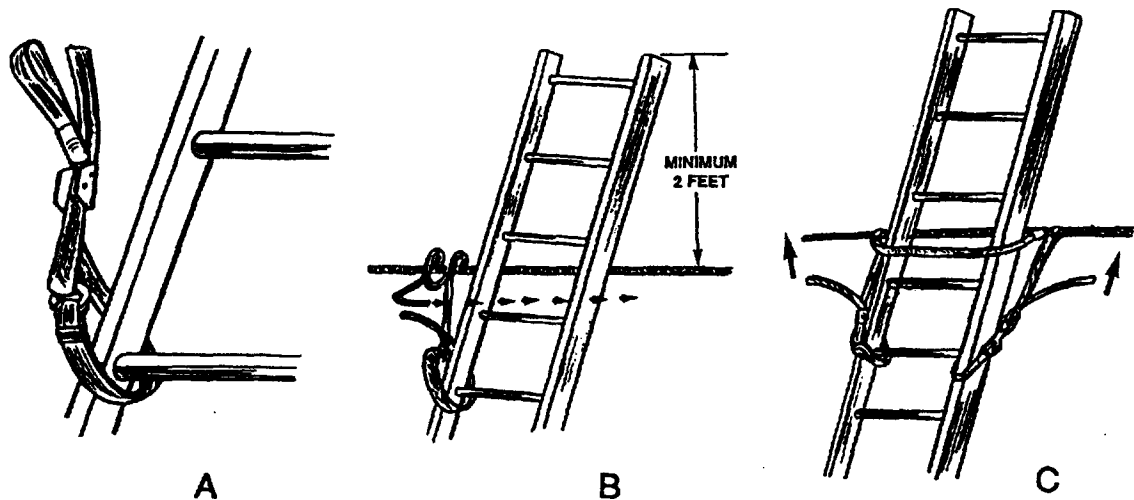


Figure 9-22. Securing Ladder to Strand, Using Top Ladder Lashing Device

Do not move the base of the ladder after the upper end has been secured to the strand.

When pushing or pulling heavy loads from a working position on a ladder, be careful not to laterally load the ladder to the extent that it may become dislodged.

The D and E ladder supports (Figures 3-13 through 3-19) are used to support the upper end of the ladder, permitting the craftsperson to sit or stand between the ladder and the cable, using the C or D ladder platform (Figures 3-11 and 3-12).

When using a ladder on a suspension strand that is attached to a building wall, wherever possible place the ladder so that it will tend to push the wall attachment against rather than away from the building wall.

9.6.2 Supporting a Ladder Against Trees or Poles

When placing a ladder against a tree, select the tree trunk or its larger limbs for support. When a ladder must be placed so the top rung rests against a tree trunk or similar object, a handline may be thrown or placed with a wire-raising tool or tree pruner handle over a tree limb, tied to the top rung of the ladder, and used to assist in raising the ladder. After the ladder has been placed, tie the free end of the handline to one of the lower rungs, thus holding the ladder until a more secure lashing is made. The ladder shall be lashed securely at one or two points to prevent the ladder from twisting or sliding when the craftsperson's weight is put on one side. The lashing can be made in the following manner with a second rope, as illustrated in Figure 9-23.

1. Make a slip noose about 15 feet from the free end of the rope so the noose will tighten when the free end of the rope is pulled.
2. Place the slip noose over the top end of one side rail.
3. Pass the free end of the rope down behind and under the top rung, then toward the front of the ladder, around the rail, and then back of the tree or pole.
4. Make two complete wraps around the tree or pole, then pass the rope twice around the opposite rail, below the first rung, and then up behind the rung.
5. Reverse the direction of wrapping, and make two half-hitches on the rail so that the ladder is lashed tightly to the tree or pole.

When placed against a pole, a ladder equipped with a V-bracket has increased stability, since the V-bracket minimizes lateral movement of the upper end of the ladder.

NOTE — The fly section must be extended at least one rung to allow the V-bracket to engage the pole.

Always secure the upper end of a ladder to a pole to prevent the ladder from twisting, sliding, or becoming dislodged during work operations.

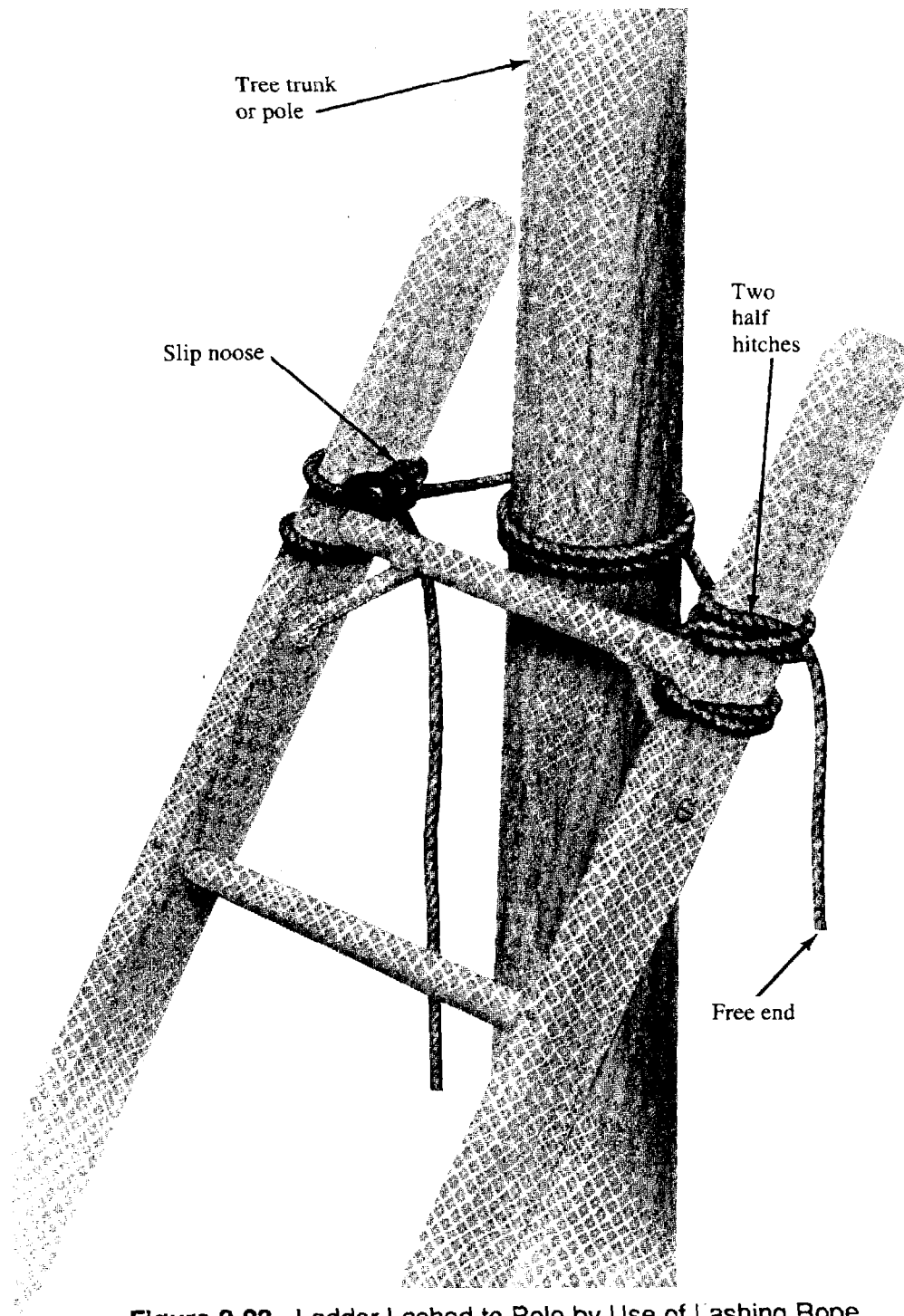


Figure 9-23. Ladder Lashed to Pole by Use of Lashing Rope

The top section of a ladder may also be secured to a pole by using the pole lashing kit as shown in Figure 9-24.

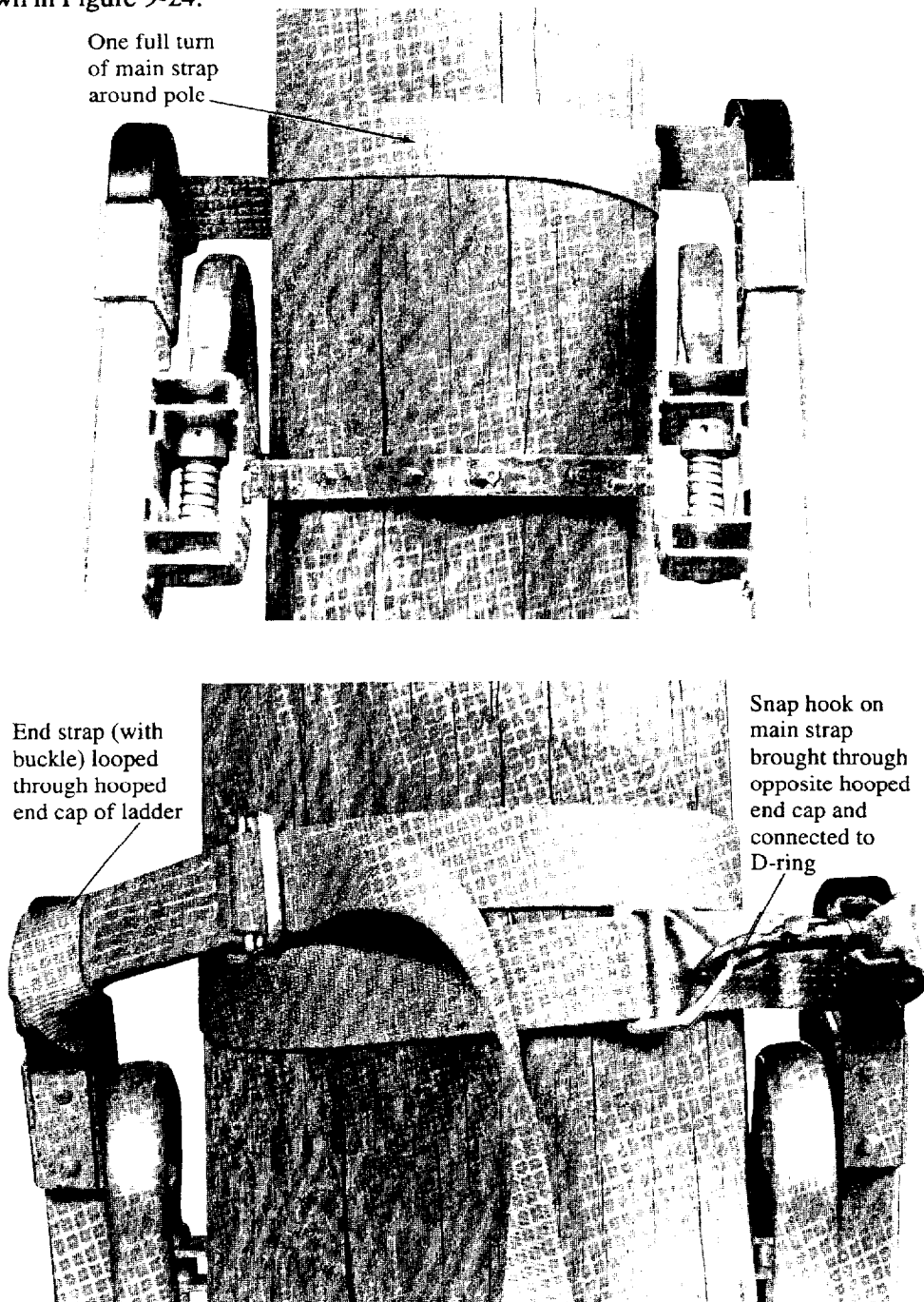


Figure 9-24. Ladder Lashed to Pole by Use of a Pole Lashing Kit
Front View (top) and Rear View (bottom)

An alternative means of securing the upper end of a ladder to a pole is with a top ladder lashing device, as shown in Figure 9-25.

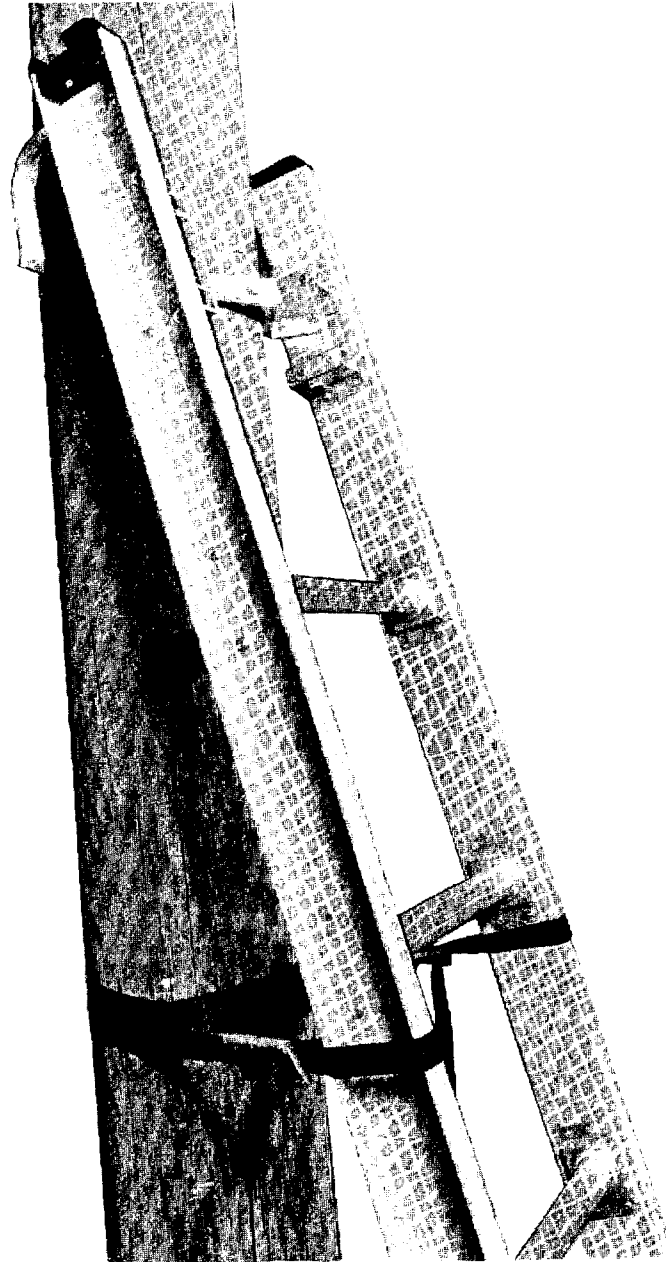


Figure 9-25. Ladder Secured to Pole by Use of a Typical Top Ladder Lashing Device

Specific installation procedures for these devices vary, depending on the manufacturer's instructions and/or company practice. However, the following general guidelines can be applied to restrict upper-end movement of the ladder against the pole, as illustrated in Figure 9-26.

1. Attach one end of the device around the side rail under the second or third rung from the top of the ladder (Figure 9-26A).
2. Extend the strap to the same side of the pole as the side-rail attachment and pass it to the rear of the pole for 1-1/2 turns, being certain to overlap the straps at the rear of the pole (Figure 9-26B).
3. Attach the loose end of the strap to the opposite side rail at the same rung position as the initial attachment (Figure 9-26C).
4. Tighten the strap ends, following the manufacturer's recommendations or company practices, being careful not to unbalance the load during the tightening process (Figure 9-26C).

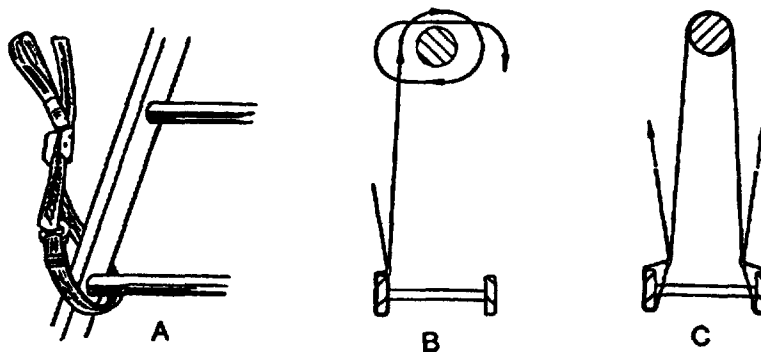


Figure 9-26. Securing Ladder to Pole, Using a Top Ladder Lashing Device

Figure 9-27 shows a ladder with both top and bottom lashing devices in place.

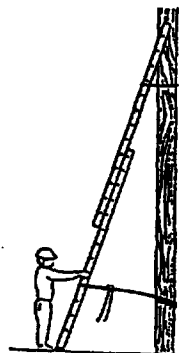


Figure 9-27. Ladder Secured to Pole with Top and Bottom Ladder Lashing Devices

9.6.3 Ladder Against Buildings

Turn ladder hooks in between rails when the ladder is to be placed against building walls or other flat surfaces, carried on truck ladder racks, or stored.

Do not place an extension ladder against a window sash. If it is impractical to avoid a window, lash a board to the ladder as shown in Figure 9-28 to provide support on each side of the window frame.

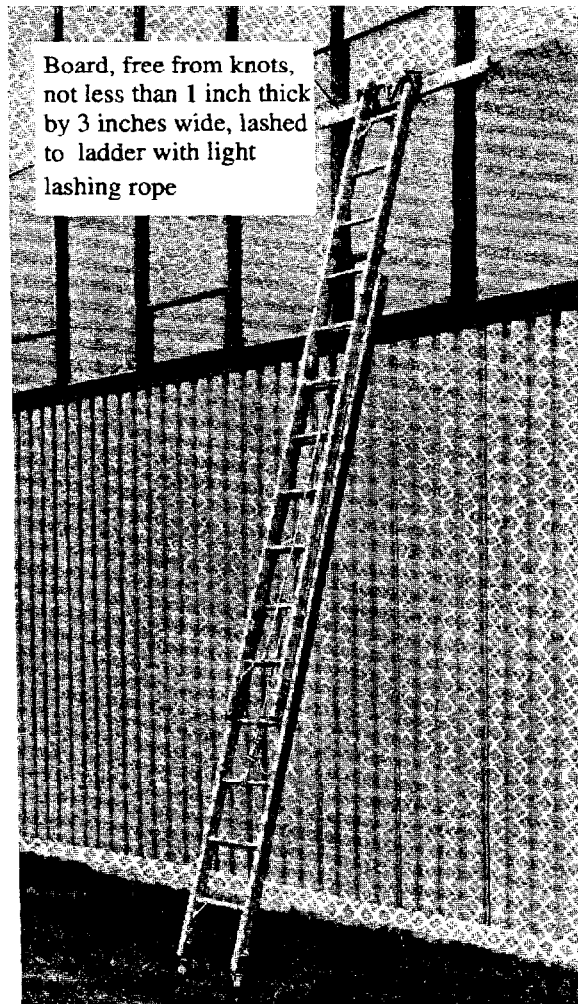


Figure 9-28. Ladder Placed in Front of Window

To prevent possible damage to a building that has fragile siding such as enameled aluminum or asbestos, attach a **B ladder pad** (Figure 3-10) to the top section of the ladder before placing it against the structure. Do not place the V-bracket of a ladder against building corners.

