Essentials of Fire Fighting

6th Edition

Certified Volunteer Firefighter

Chapter 15 — Fire Hose

Learning Objectives

- Explain basic fire hose characteristics.
- Describe different causes of and prevention methods for hose damage.
- Identify basic inspection, care, and maintenance methods for fire hose.
- Compare various uses for hose appliances and tools.
- Describe basic hose rolls.
- Explain basic hose loads and finishes.

(Cont.)

Learning Objectives

- Compare various methods to make preconnected hose loads for attack lines.
- Explain the methods used for supply hose lays.
- Recognize different methods for handling hoselines.
- Describe methods for advancing hoselines in various ways.
- List the considerations that can impact operating attack hoselines.
- Couple and uncouple a hose.
- Inspect and maintain a fire hose.

(Cont.)

Learning Objectives

- Make a straight hose roll.
- Make a donut hose roll.
- Make the flat hose load.
- Make the accordion hose load.
- Make the horseshoe hose load.
- Make a finish.
- Make the preconnected flat hose load.
- Make the triple layer hose load.
- Make the minuteman hose load.

(Cont.)

Learning Objectives

- Make a hydrant connection from a forward lay.
- Make the reverse hose lay.
- Advance a hose load.
- Deploy a wye-equipped hose during a reverse hose lay.
- Advance a charged hoseline using the working line drag method.
- Advance a line into a structure.
- Advance a line up and down an interior stairway.

(Cont.)

Learning Objectives

- Connect to a stairway standpipe connection and advance an attack hoseline onto a floor.
- Advance an uncharged line up a ladder into a window.
- Advance a charged line up a ladder into a window.
- Operate a charged attack line from a ladder.
- Operate a small hoseline – One-firefighter method.
- Operate a large hoseline for exposure protection – One-firefighter method.

(Cont.)

Learning Objectives

- Operate a large hoseline – Two-firefighter method.
- Extend a hoseline.
- Replace a burst hoseline.

Each type of fire hose transports water for on-scene operations.

Supply	Attack
• From hydrant/water supply to apparatus	• Water or other agents at increased pressure

To be reliable fire hose must be constructed, used, and maintained appropriately.

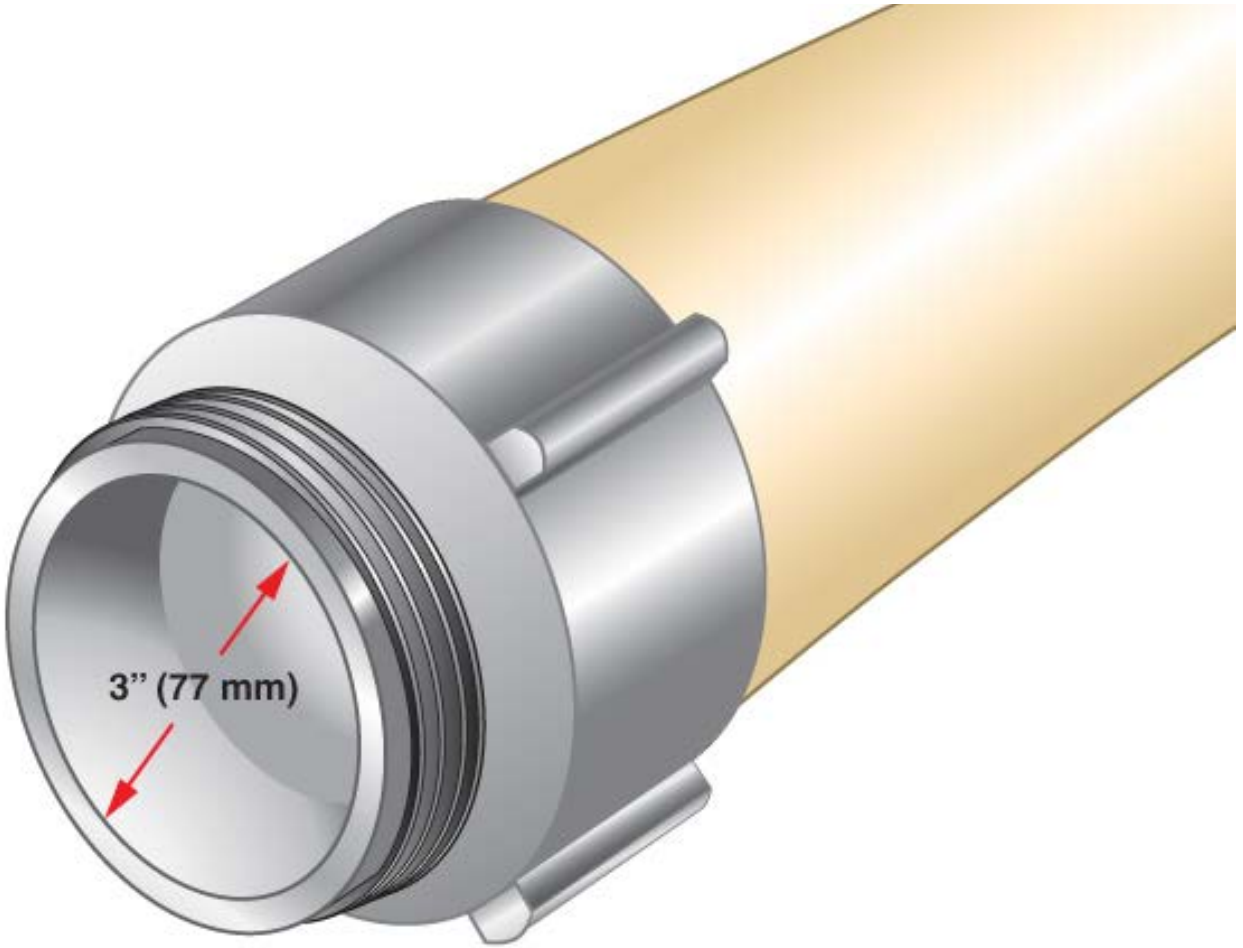
Common Construction

- Flexible
- Watertight
- Smooth rubber or neoprene lining
- Covered by durable jacket

Common Configurations

- Single-jacket
- Double-jacket
- Rubber single-jacket
- Hard-rubber or plastic noncollapsable

Hose size measurements in diameter refer to the internal diameter.



Hose size measurements in length refer to a manufactured section of hose.

- Suction supply
- Soft sleeve hose
- Hard suction

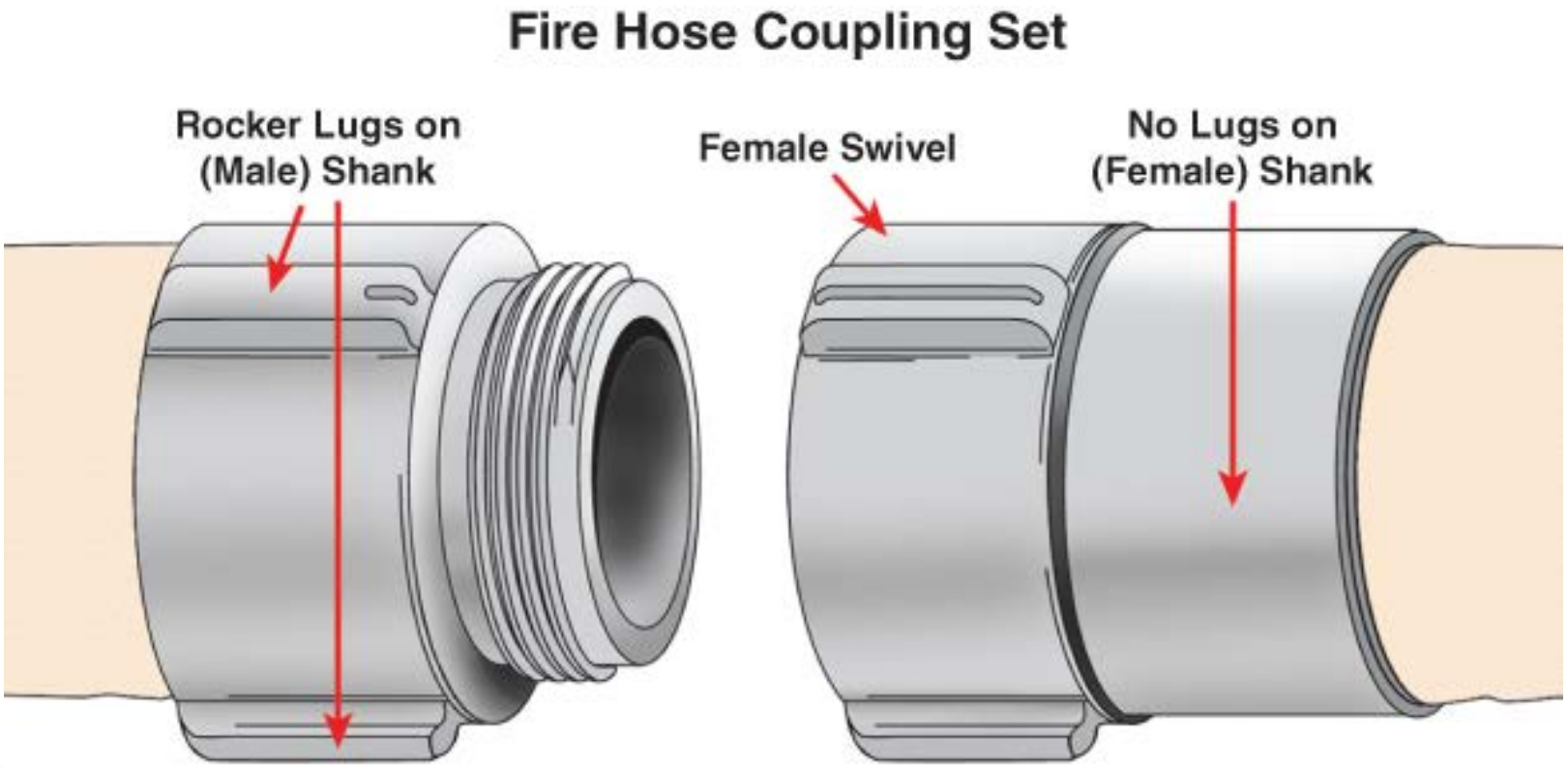
Fire hose couplings are used to make connections to hose and equipment.

Designed to	National Standards	Made of
Form continuous hoseline	NFPA® 1963	Durable, rustproof materials
Connect hoses to nozzles, hydrants	Can share between departments	Various alloys
Connect to pumper connections and FDCs		

Fire hose couplings are categorized by the way they are manufactured.

- Cast
- Extruded
- Drop forged

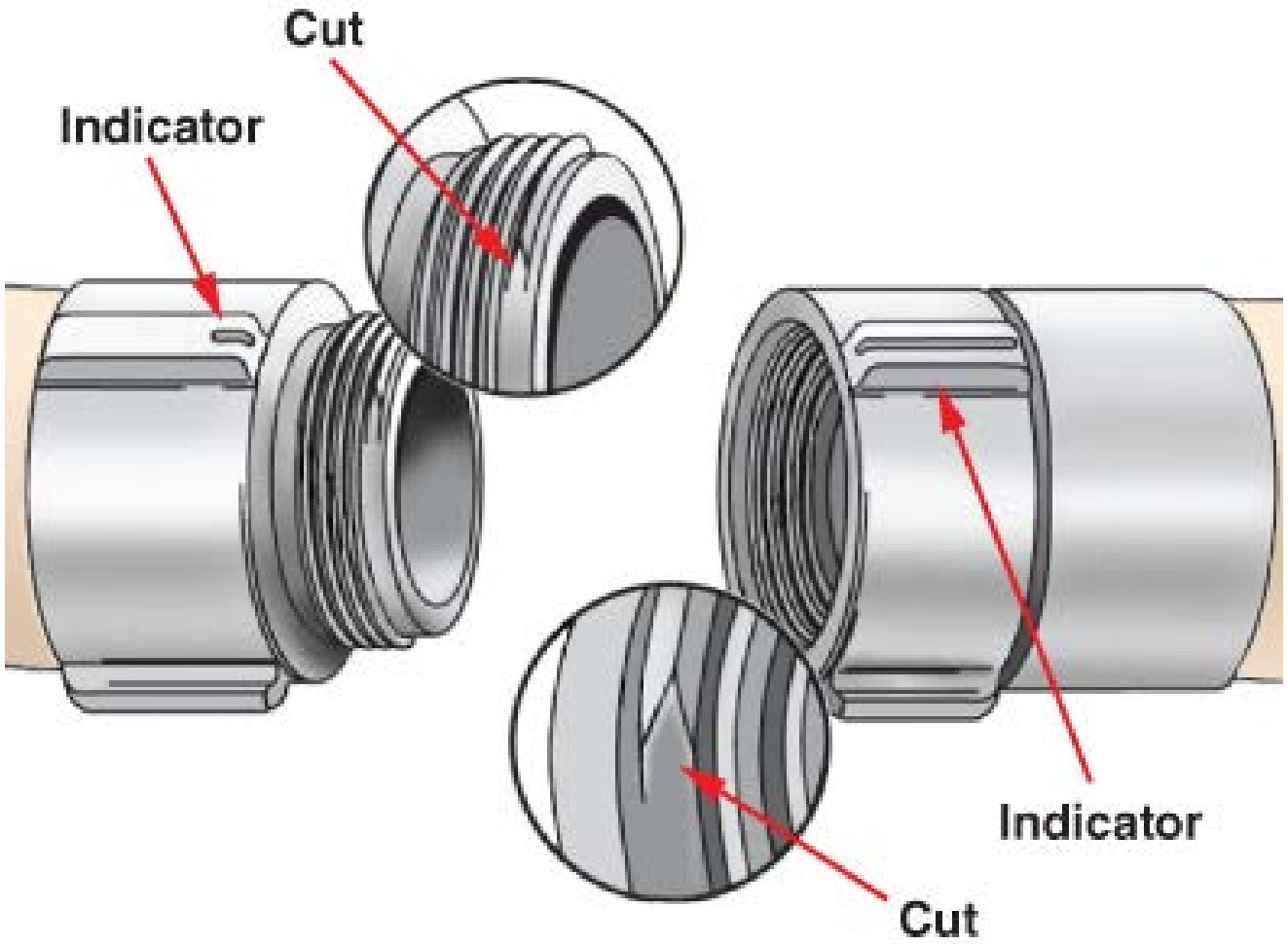
Threaded couplings have male and female parts.



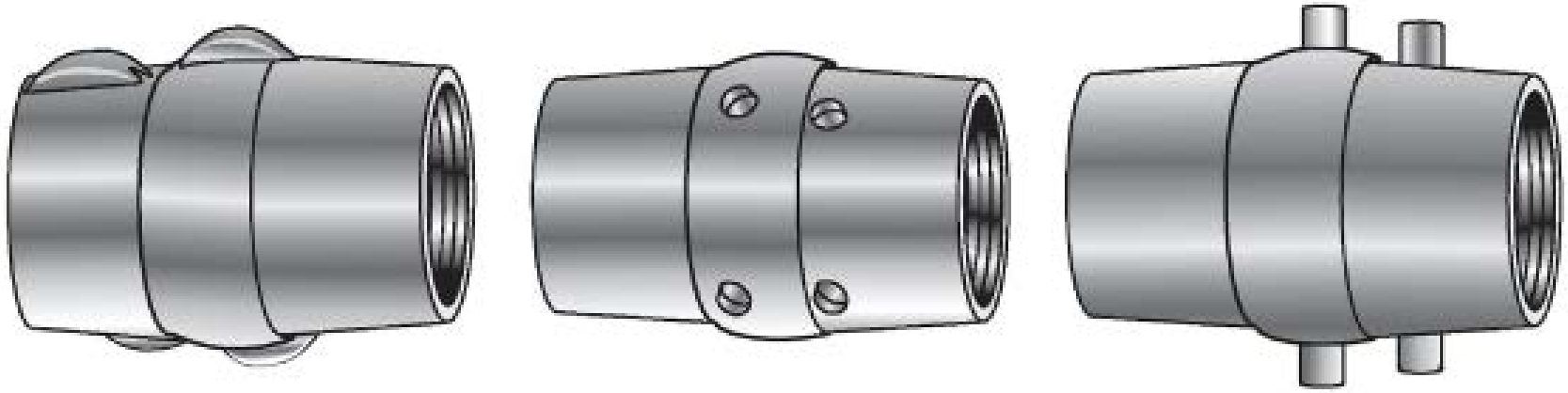
CAUTION

Connect couplings hand tight to avoid damage to the coupling and gasket.

Couplings have other parts including different cuts, sizes, and gaskets.



Lugs and handles help to tighten and loosen hose connections.

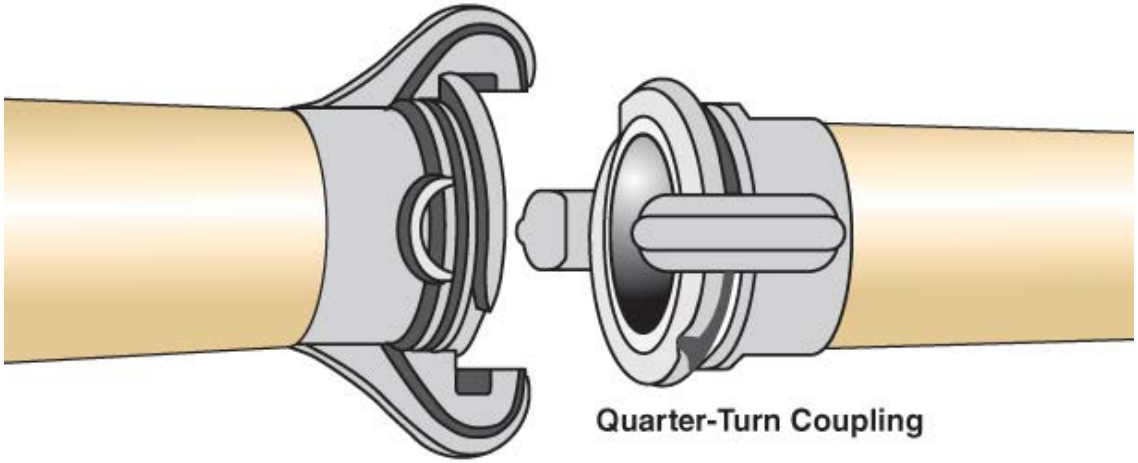


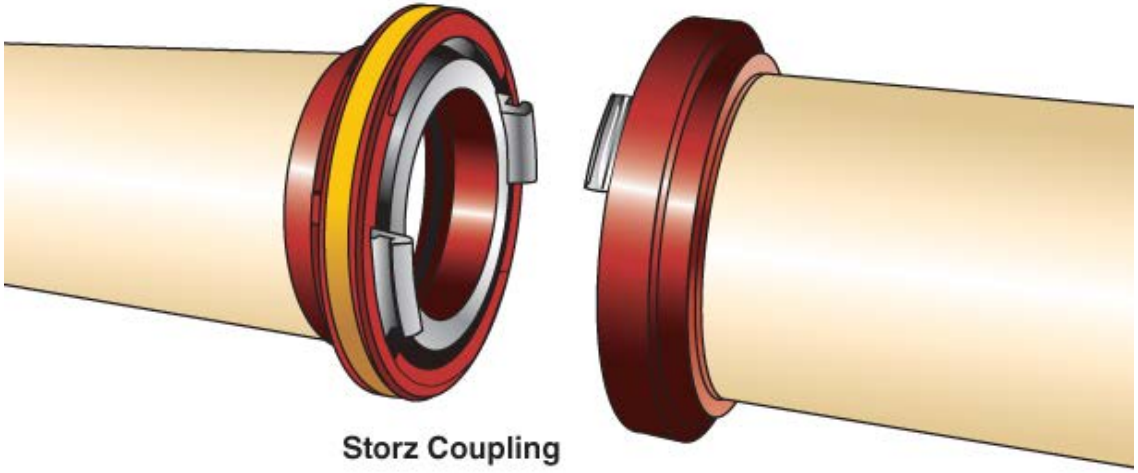
Rocker Lug

Recessed Lug

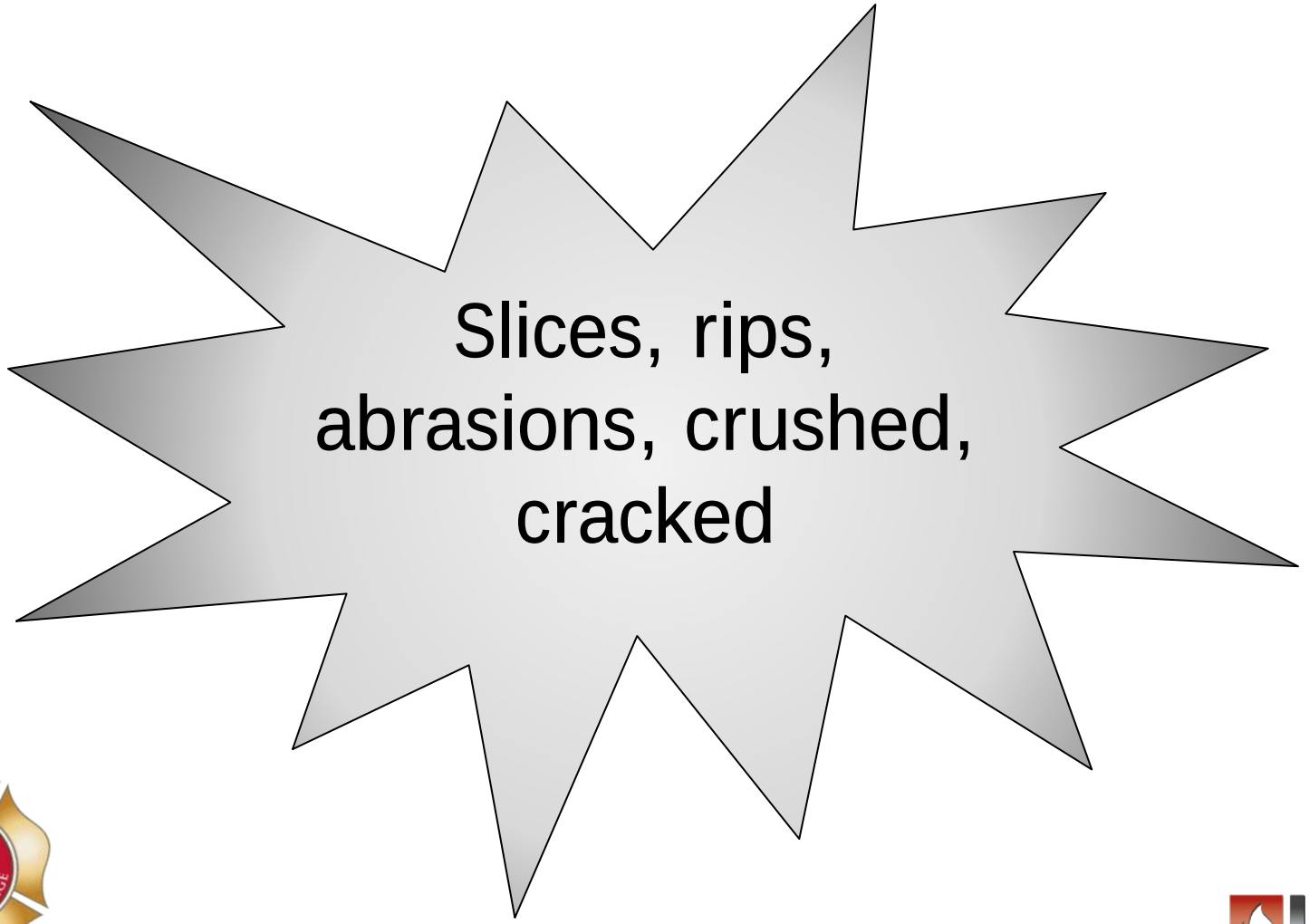
Pin Lug

Nonthreaded couplings are connected with locks or cams.





Mechanical damage can occur in several ways to a fire hose.



There are many ways to prevent mechanical damage.

- Avoid contact with rough, sharp objects
- Protect with hose roller or folded salvage cover
- Clear broken glass from window sills
- Prevent vehicles from driving over hose
- Use hose ramps or bridges

(Cont.)

There are many ways to prevent mechanical damage.

Open, close slowly to avoid water hammer	Use chafing blocks	Avoid excessive pressure
Deploy away from debris	Change position of folds	Clean hose before reloading

Thermal damage can result from exposure to excessive temperatures.

Caused by excessive heat/cold, direct flame contact

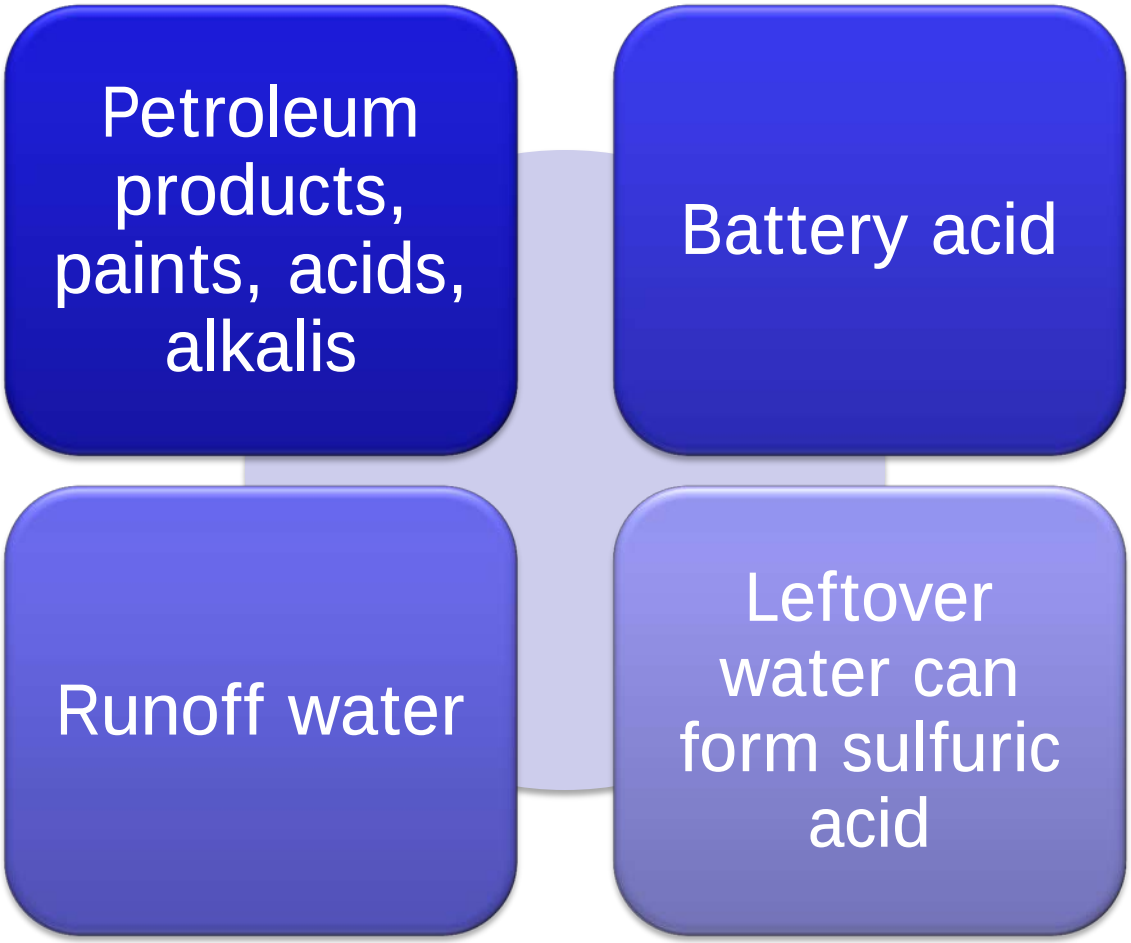
Can char, melt, weaken, dehydrate linings

There are may ways to prevent thermal damage to fire hose.

Organic damage to fire hose can weaken the jacket and lead to ruptures.

Firefighters should know the methods to prevent organic damage.

There are several types of chemical damage that may occur to fire hose.



Preventing chemical damage requires following specific cleaning practices.

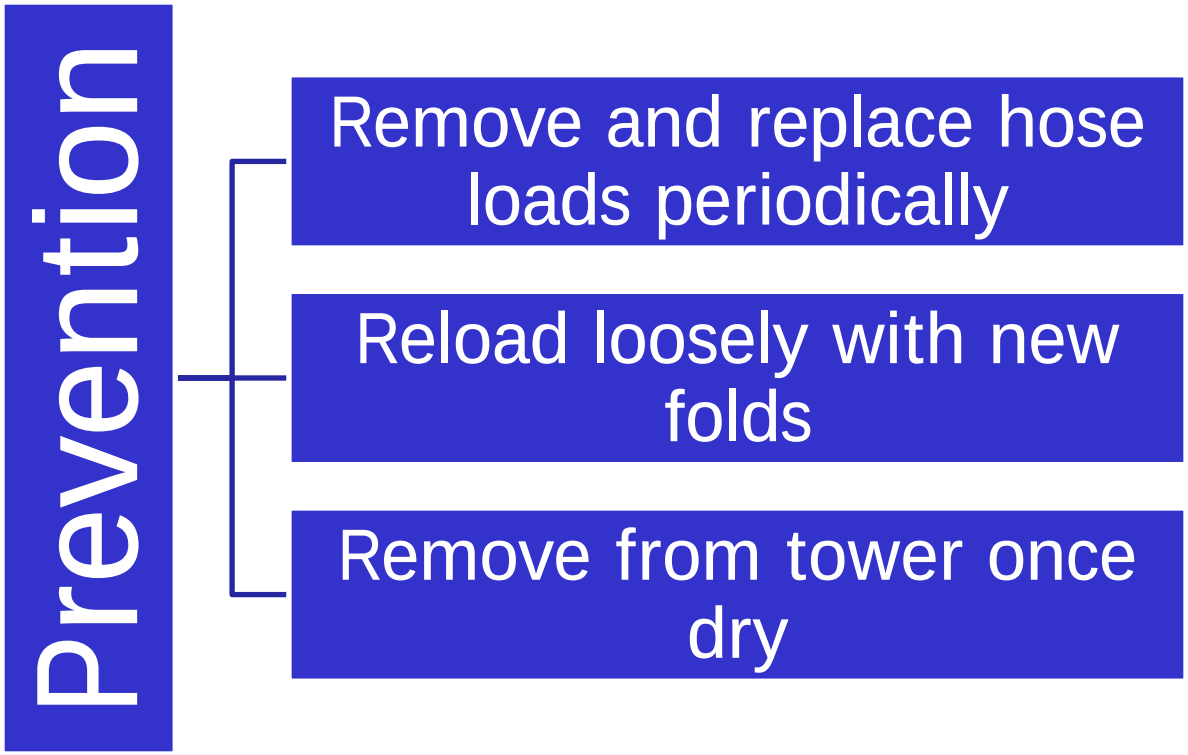
- Avoid chemical exposure
- Scrub, wash contaminated hoselines
- Test periodically
- Dispose of according to local SOPs

Corrosion is a type of damage that weakens or destroys metal hose parts.

Brass coupling

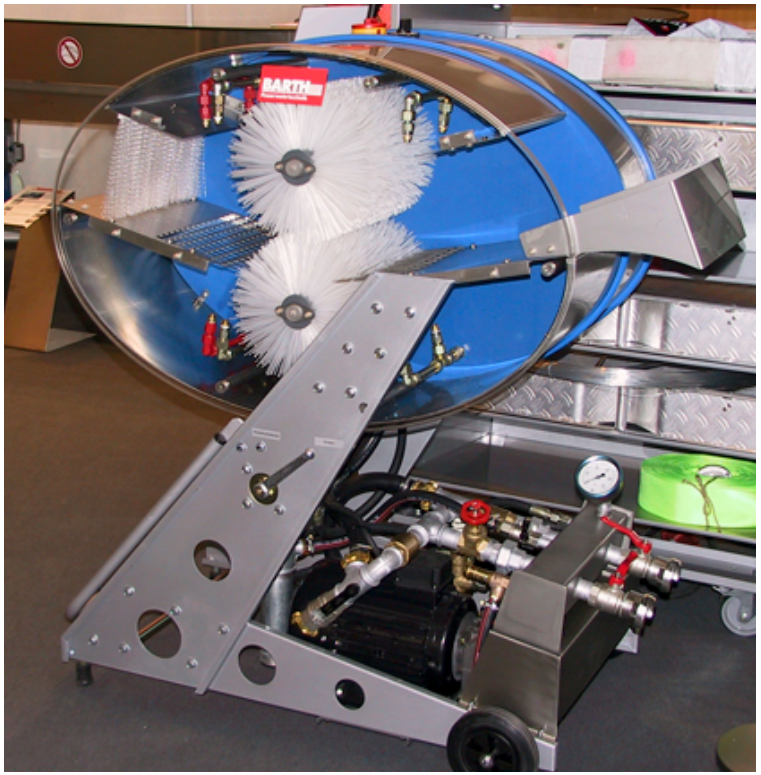
Aluminum coupling

Age deterioration is caused by leaving a hose in an apparatus for a long time.



Inspecting a fire hose requires following a schedule and reporting process if deficiencies are found.

The method of washing a hose will depend on the type of hose.



Drying a hose also requires different methods for various types of hose.

Storing hose is usually done on racks that may be mounted or stand free.

CAUTION

Never store solvents, petroleum products, or other chemicals close to fire hose and couplings.

There are several methods to prevent damage to stored hose stored in racks.

- Store in clean, well ventilated room
- Avoid exposure to sunlight, pack loosely
- Protect couplings, roll hose with male end inside
- Prevent dirt from collecting in sexless couplings

Fire hose couplings can be damaged even though designed to be durable.

Male

Female

When caring for fire hose couplings you should follow these guidelines.

General

- Avoid dropping, dragging
- Do not drive over
- Inspect when washing
- Twist swivel in soapy water
- Clean threads
- Inspect, replace gaskets

If coupling swivel difficult to spin

- Washing machine insufficient
- Submerge in warm, soapy water
- Clean male threads with brush
- Lubricate
- Replace damaged gaskets

Hose appliances include a variety of hardware used in conjunction with hose.

Valves

- Ball
- Gate
- Butterfly
- Clapper

Valve Devices

- Wye
- Siamese
- Water thief
- LDH - thief and manifold
- Hydrant valve

Fittings

- Adapters
- Reducers

Intake strainers

- Attached to drafting end of hard suction when pumping
- Designed to keep debris from entering
- Preventing from resting on bottom

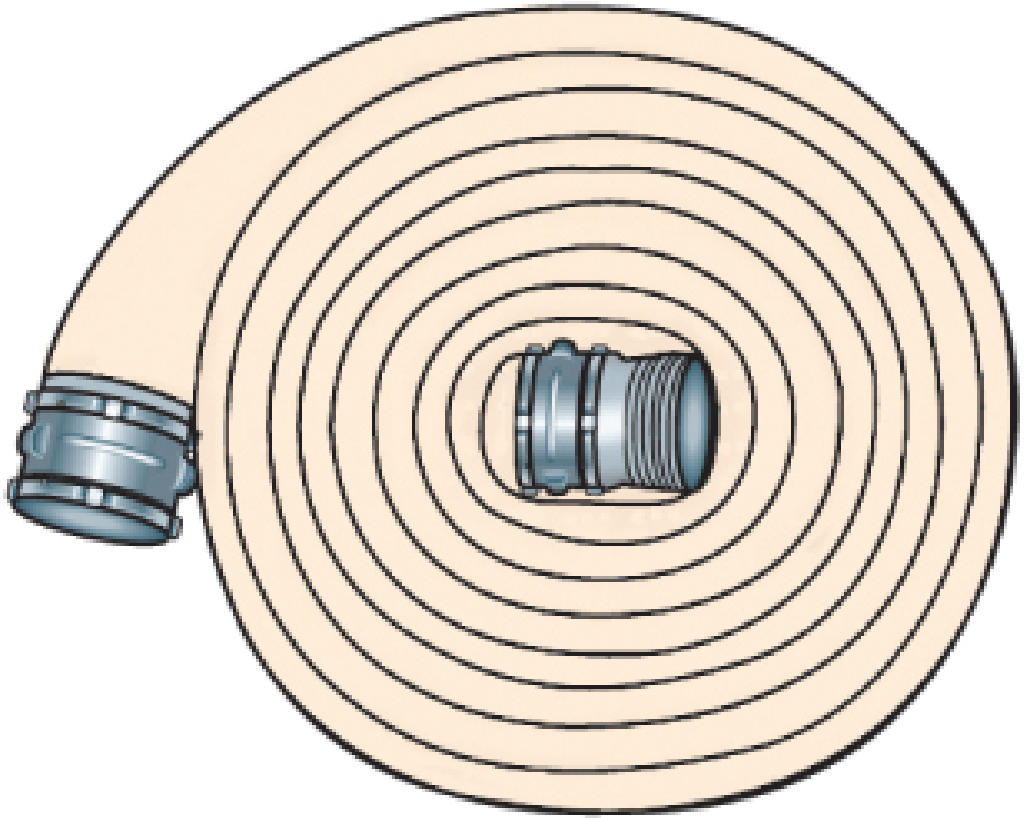
There are several types of hose tools that firefighters should know about.

- Hose roller
- Hose jacket
- Hose clamp
- Spanner, hydrant wrench, rubber mallet
- Hose bridge/ramp
- Chafing block
- Hose strap, rope, chain
- LDH roller

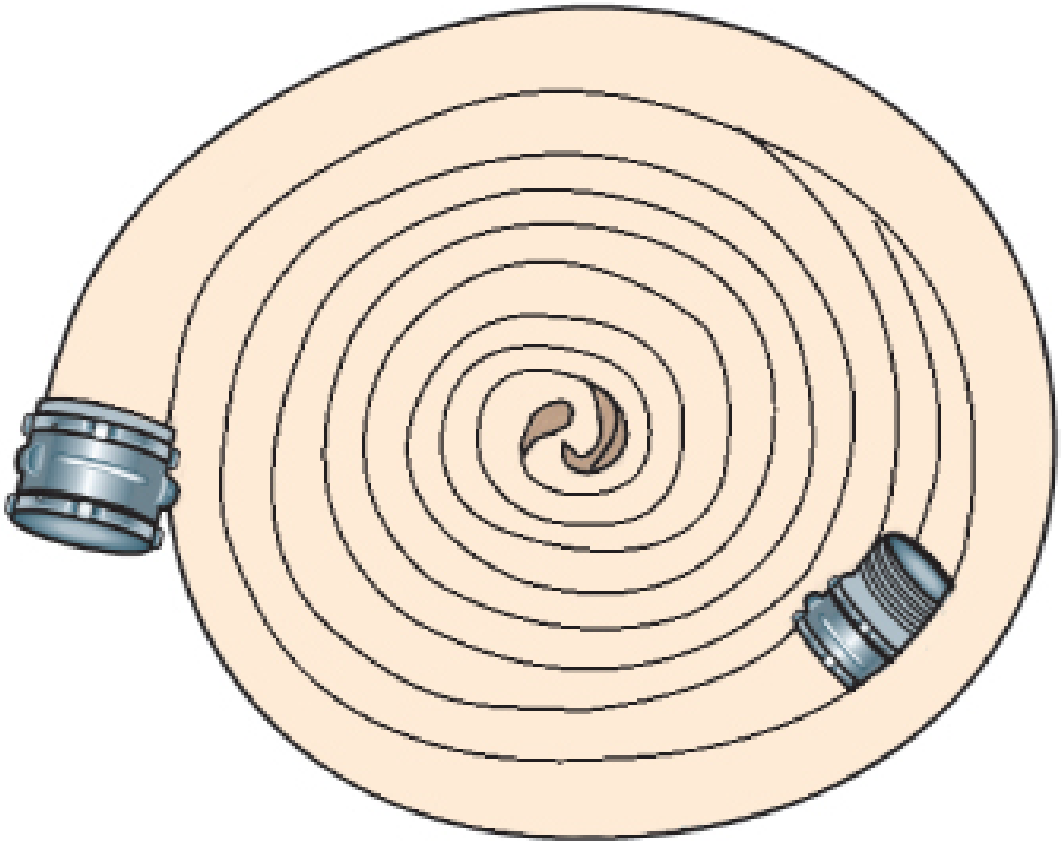
CAUTION

Never stand over the handle of a hose clamp when applying or releasing it. The handle or frame may pop open and swing upward violently.

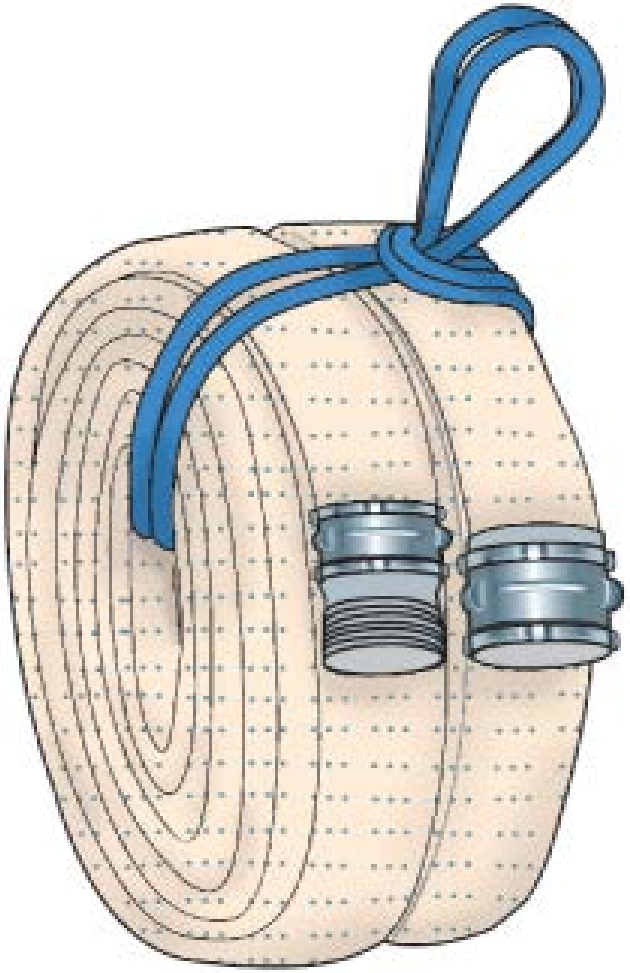
The straight roll is the simplest of all hose rolls.



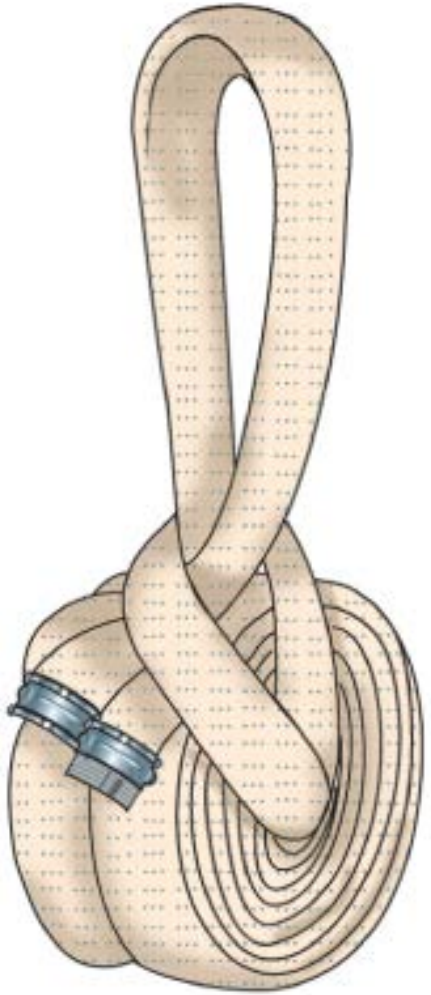
The donut roll is used in situations where the hose will likely be deployed for use directly from a roll.



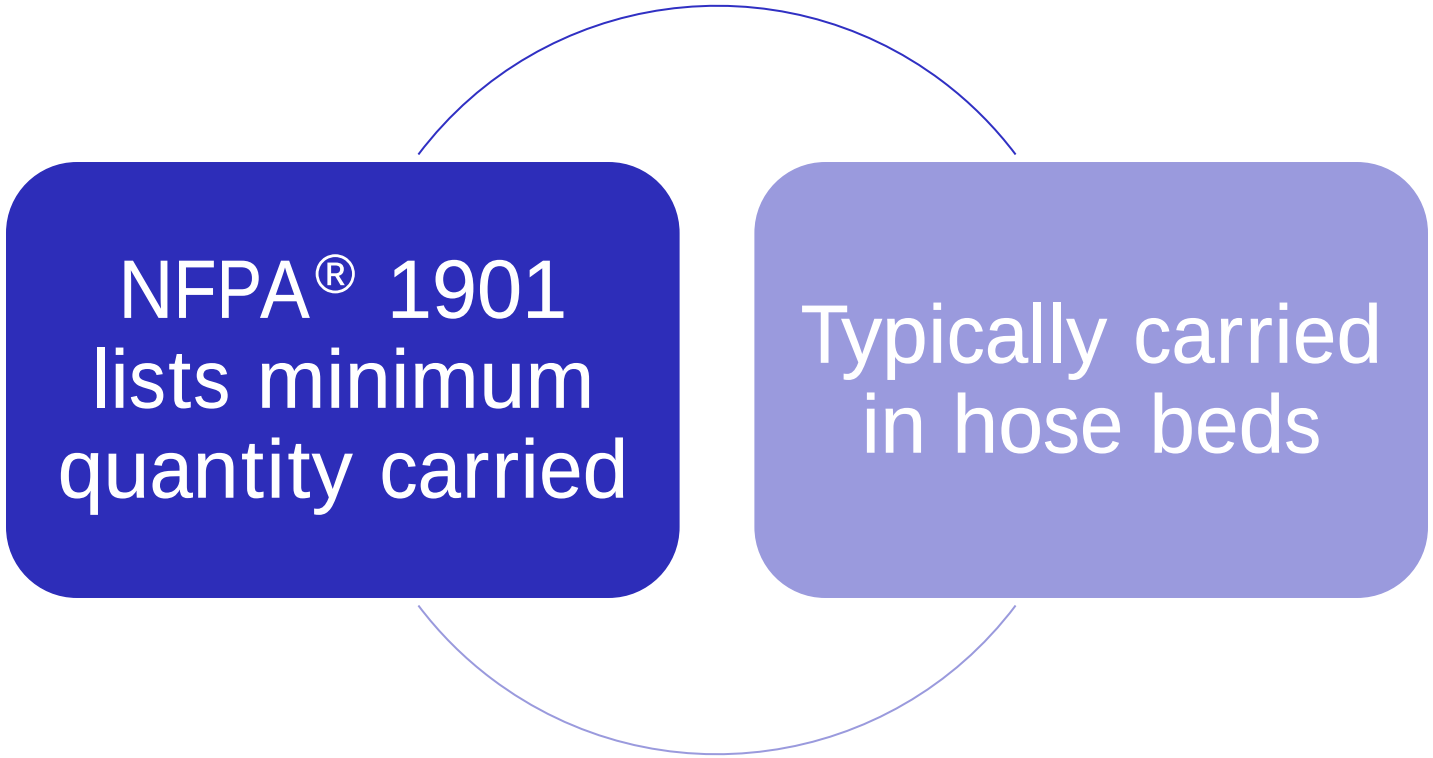
The twin donut roll creates a compact roll that is easily transported.



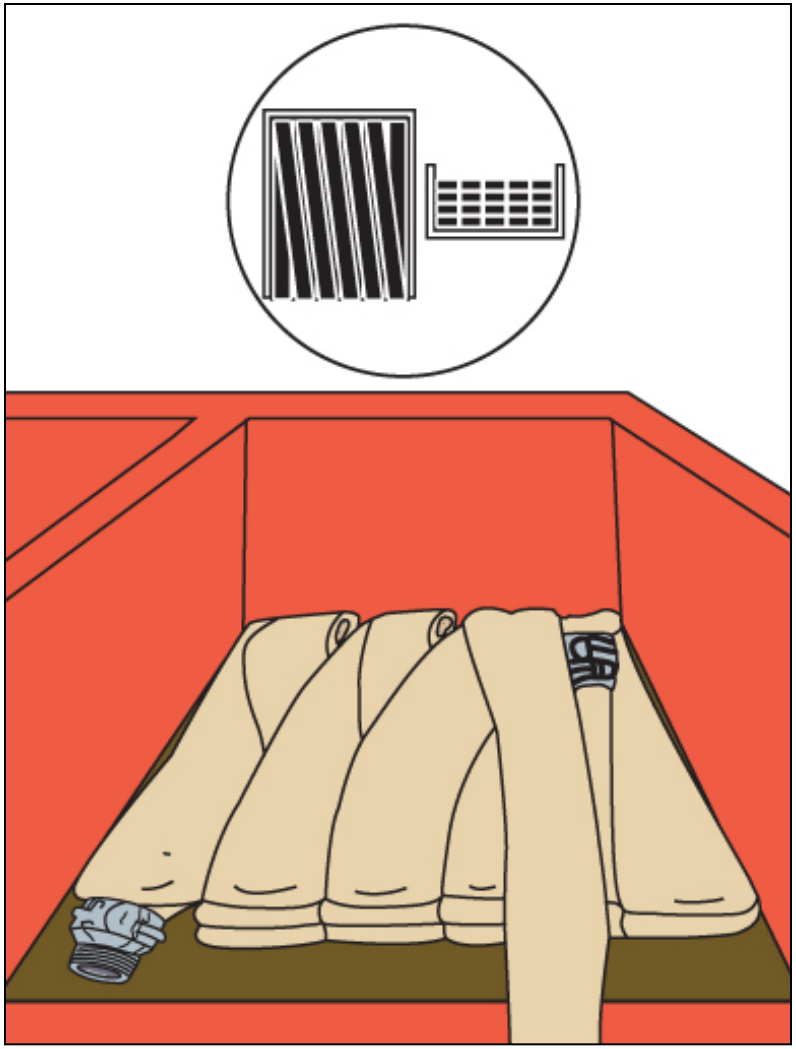
The self-locking twin donut roll adds a built-in carrying loop for the hose.



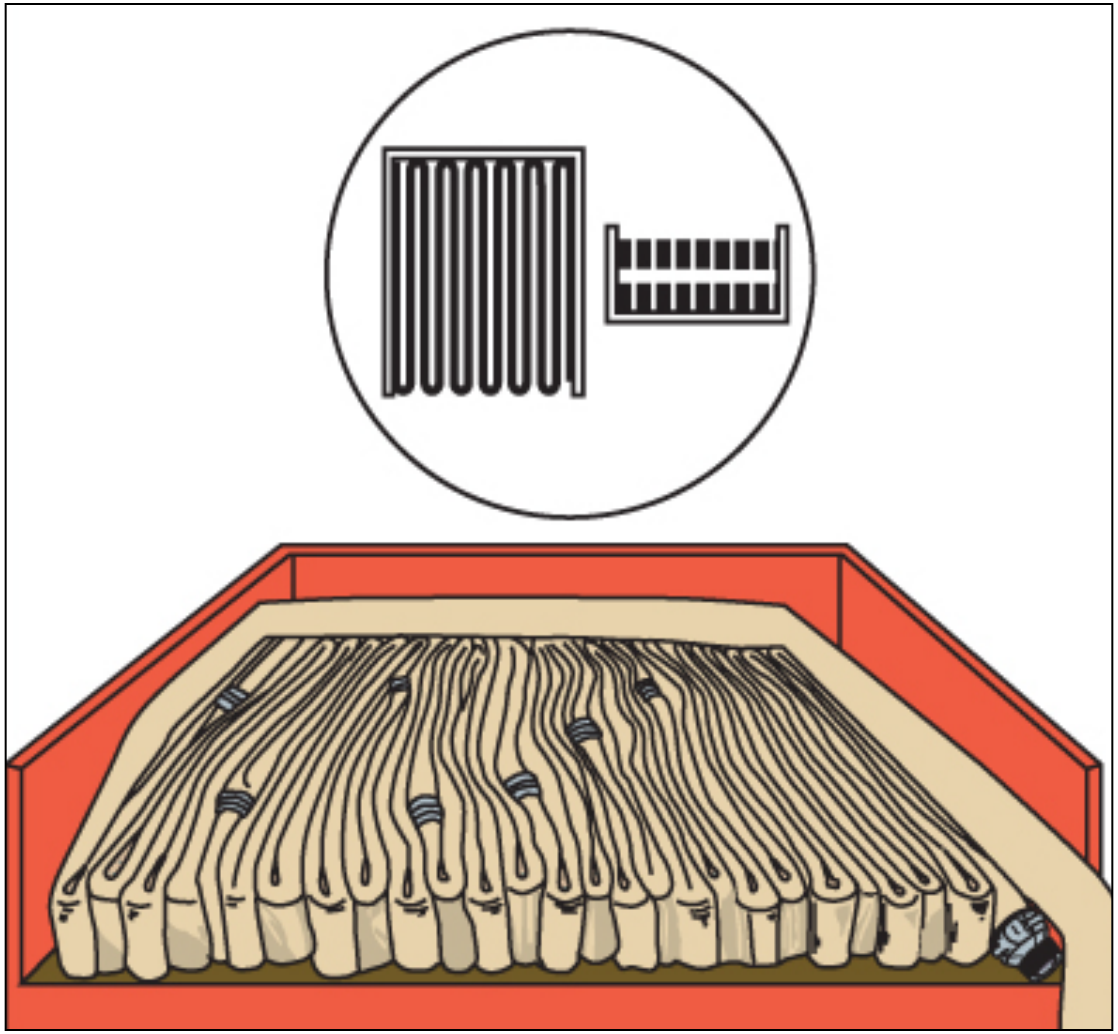
There are several basic facts about hose that firefighters should know.



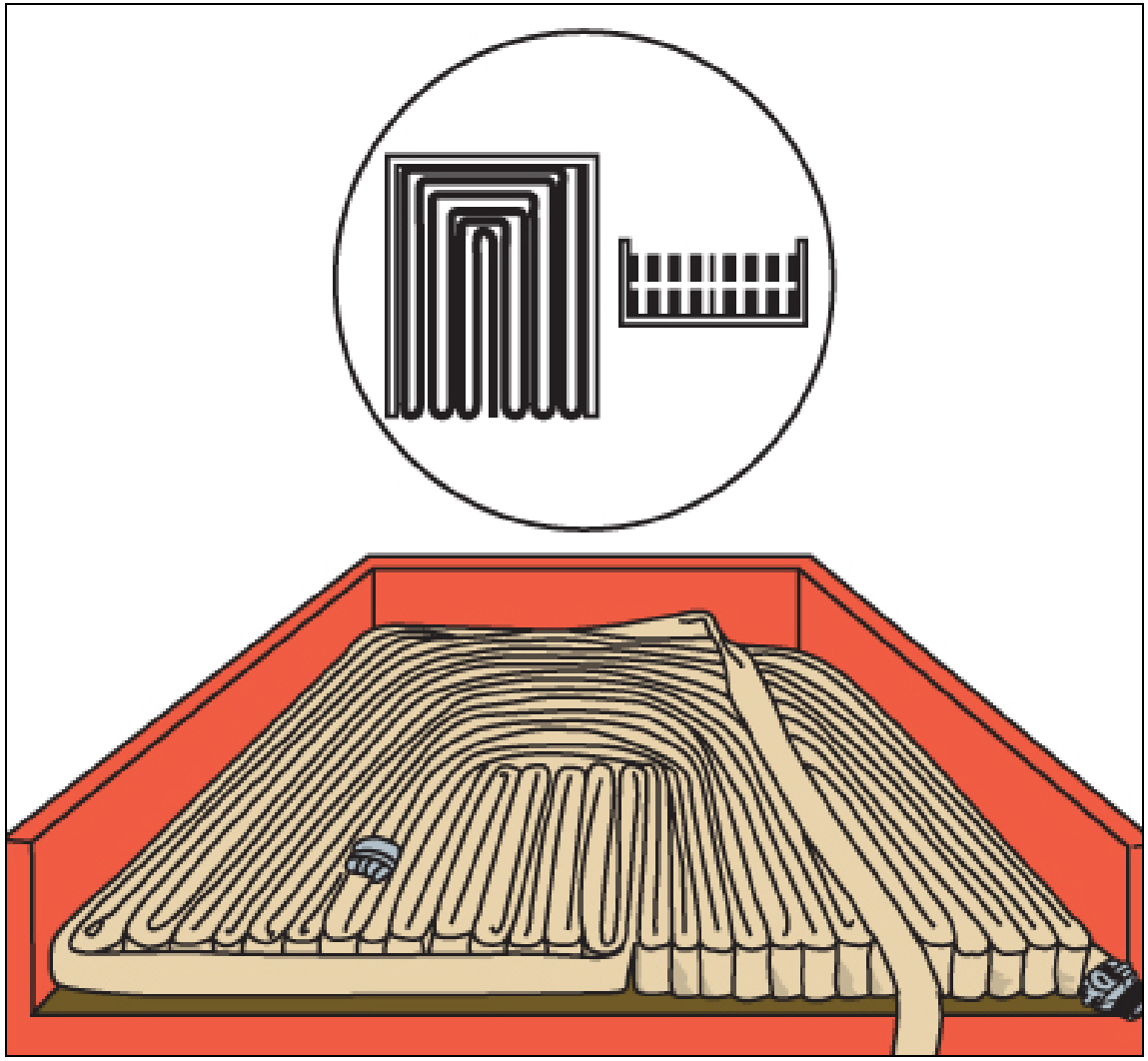
A flat load is the easiest way to load fire hose and is suitable for any size.



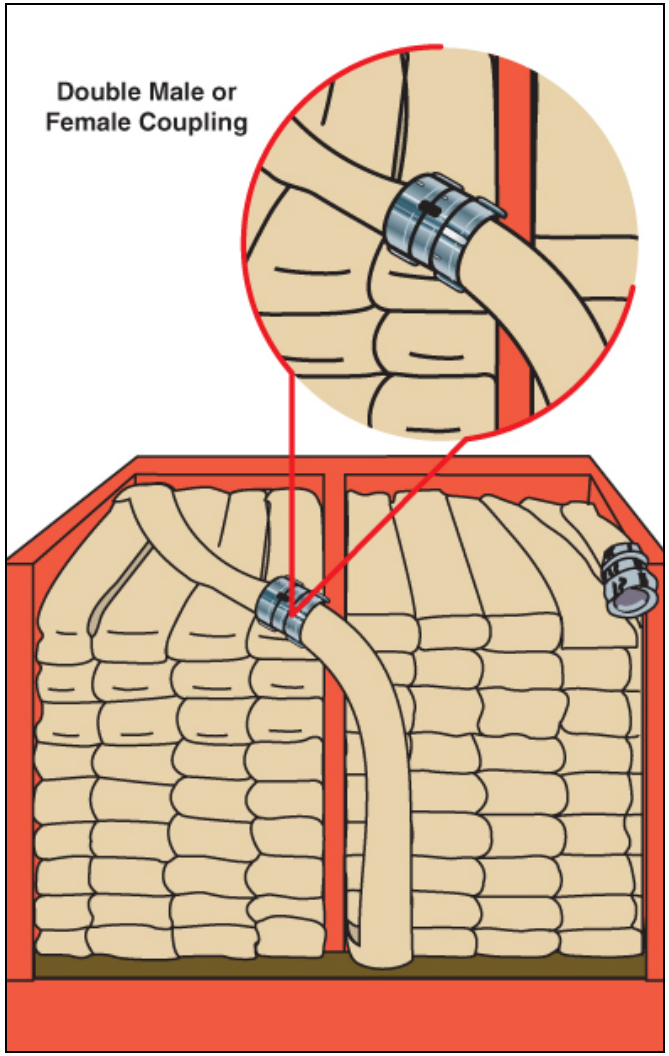
The accordion load is named for how the hose appears after it is loaded.



A horseshoe load is loaded in a U-shape around the perimeter of the hose bed and works toward the center.

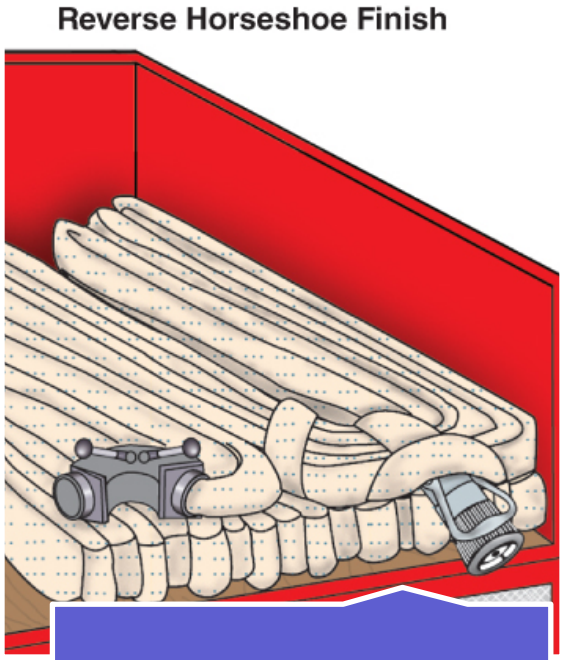


A combination load is used with split hose beds loaded with threaded-coupling hose.

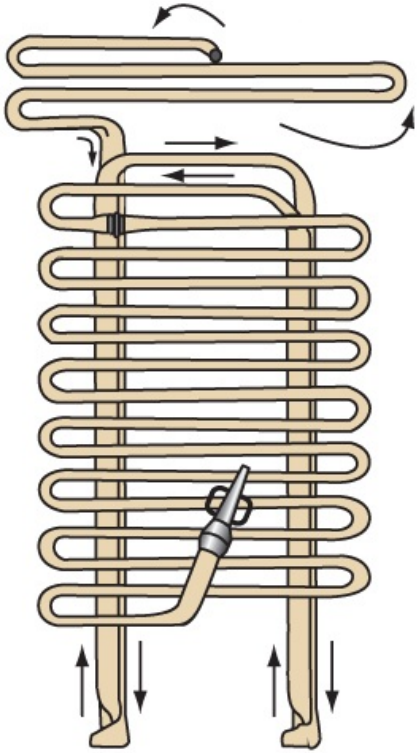


Hose load finishes can also be added to increase the versatility of a load.

Straight



Reverse horseshoe



Skid load

A high-rise pack provides enough attack hose to operate from a standpipe connection and can be carried alone.

Courtesy of Rick Montemorra, Mesa (AZ) Fire Department

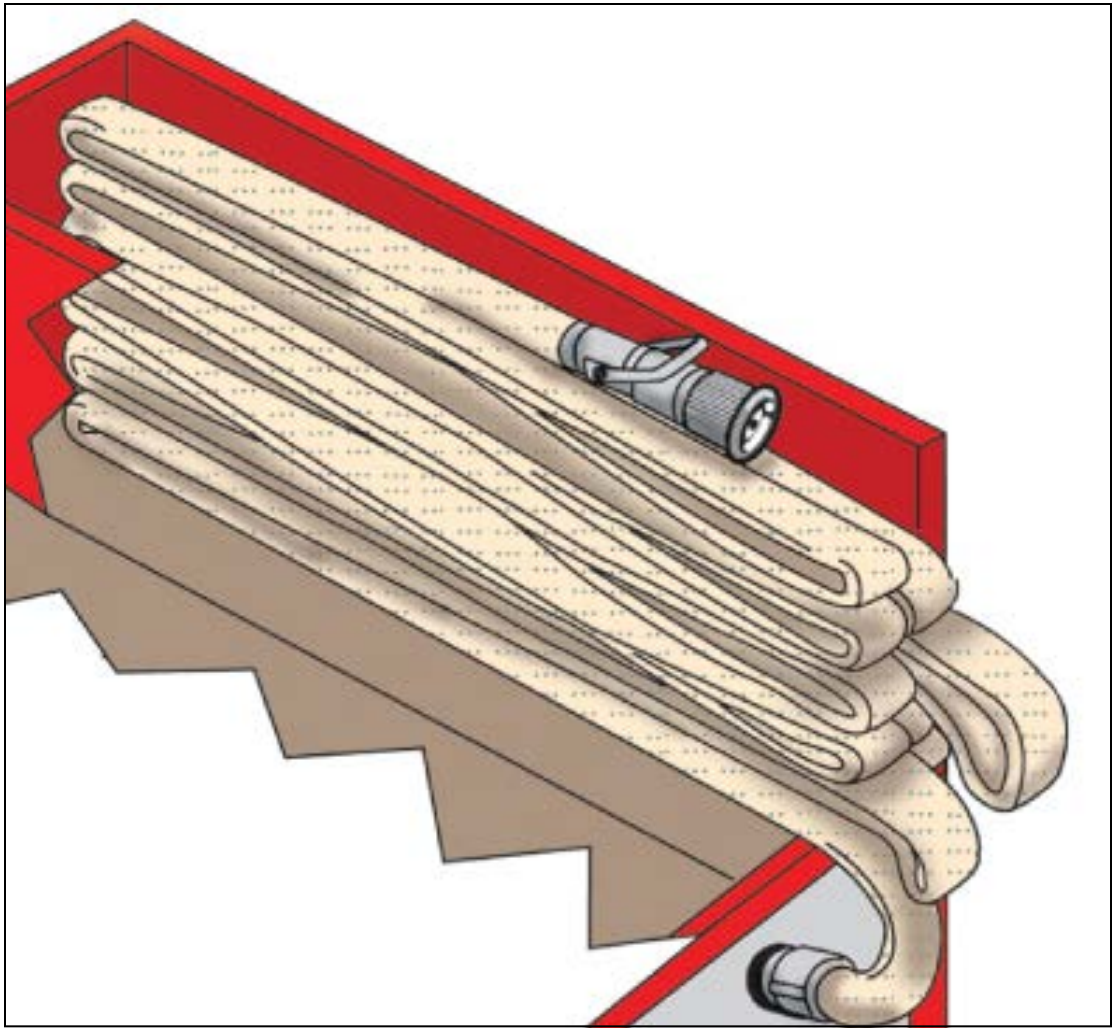
There are several hose loading guidelines firefighters should follow.

- Check gaskets, swivel before connecting couplings
- Keep flat sides of connected hose in same plane
- Tighten couplings hand-tight
- Remove kinks and twists
- Use Dutchman to position hose
- Load LDH couplings near front
- Do not pack too tightly

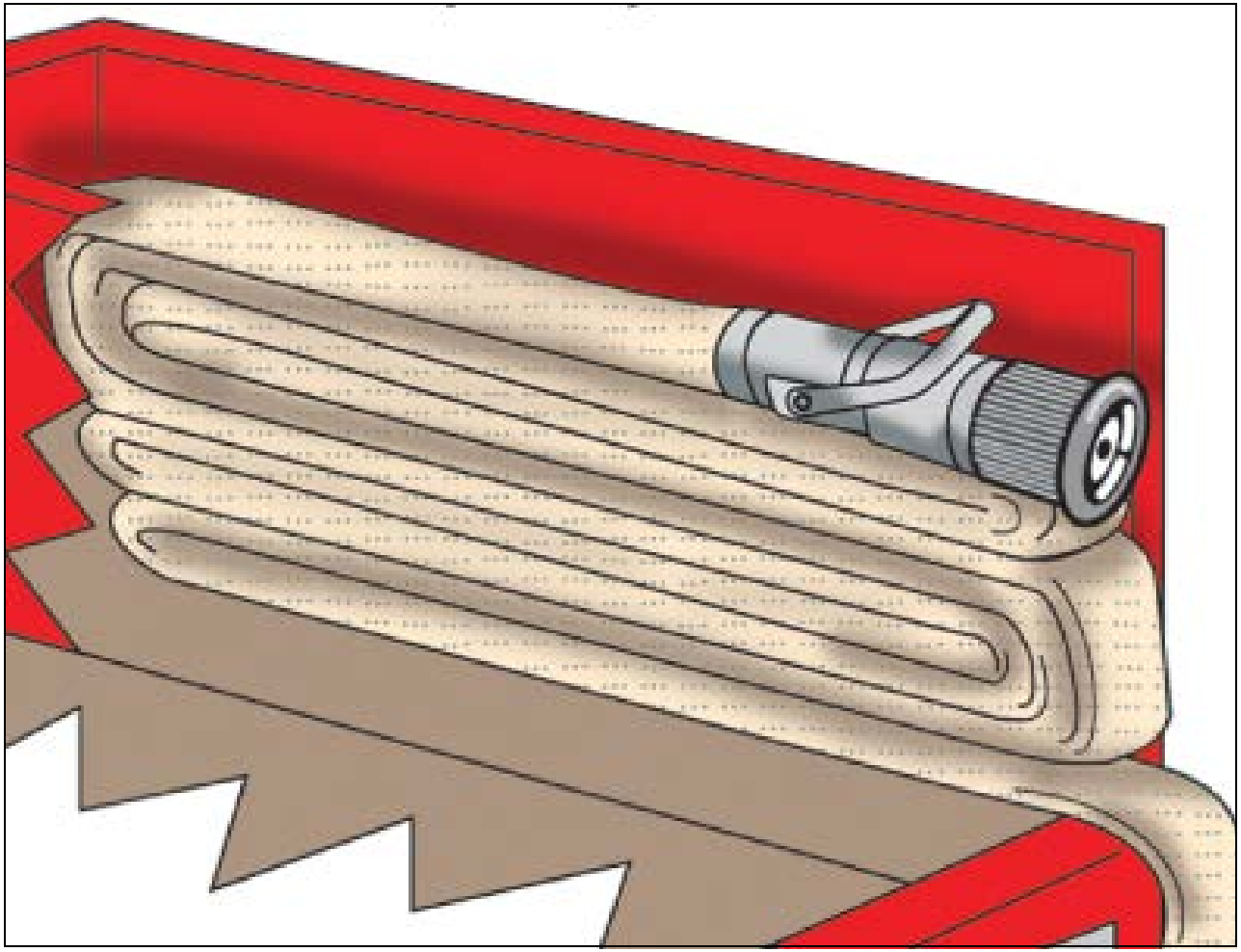
Preconnected hose loads are usually the primary lines used for fire attack.

- Longitudinal beds
- Raised trays
- Transverse beds
- Tailboard compartments
- Side compartments or bins
- Front bumper wells
- Reels

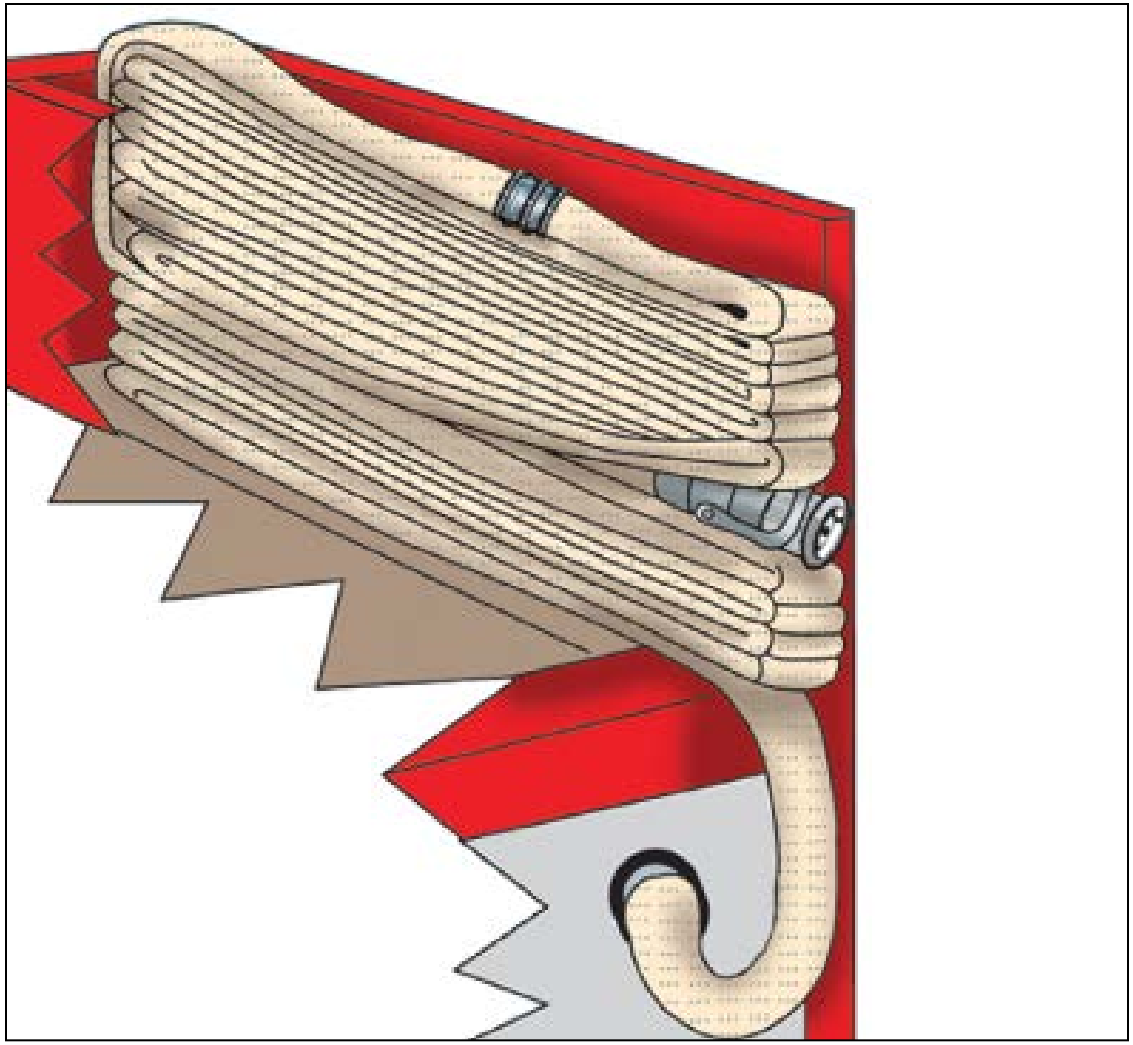
A preconnected flat load is adaptable for varying sizes of hose beds.



The triple layer load is designed to be pulled by one person.



The minuteman load is designed to be pulled and advanced by one person.



Booster hose reels carry preconnected rubber-covered hose.

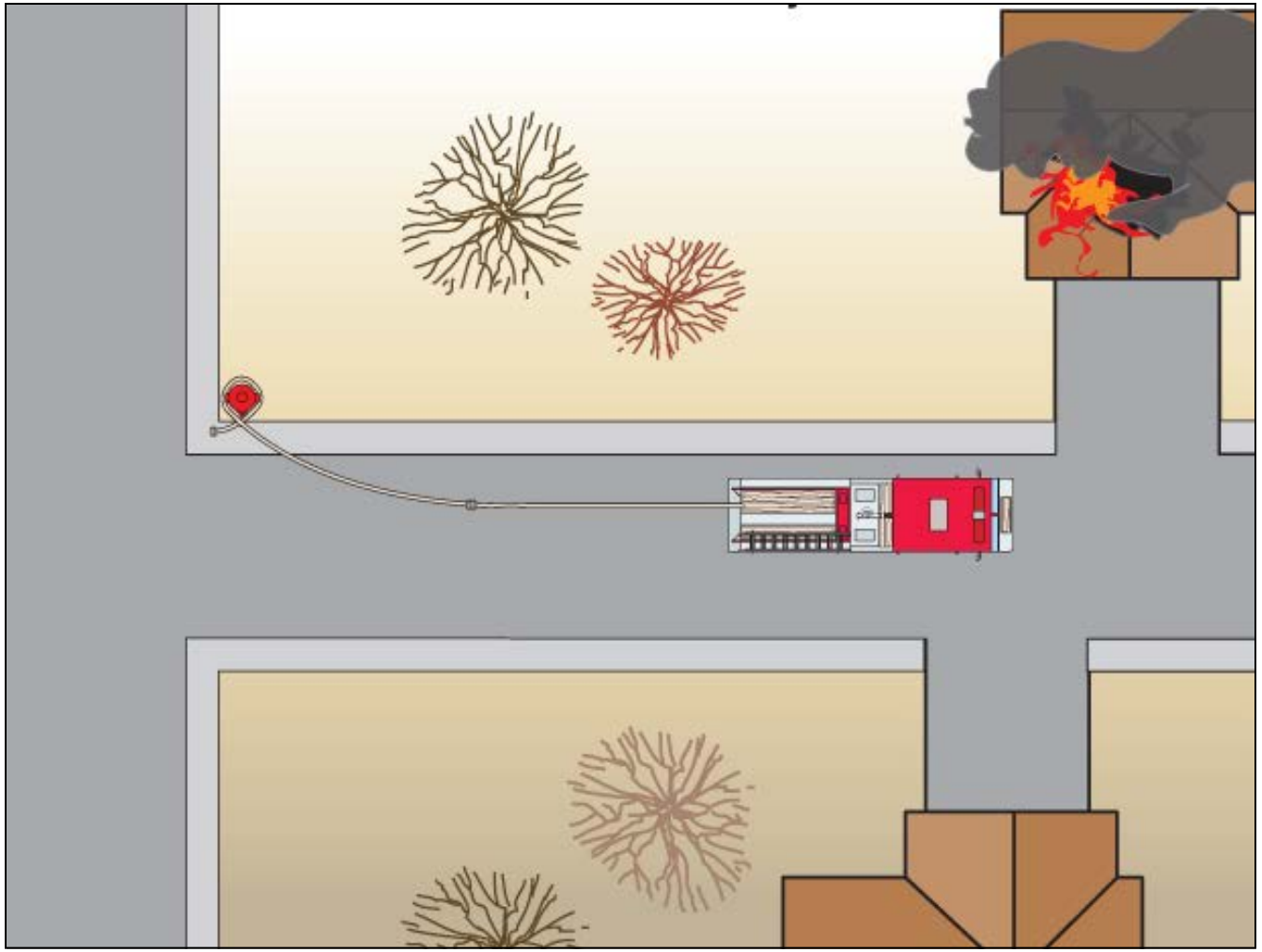
WARNING

Booster lines are not appropriate for interior fire fighting operations or for vehicle fires because they do not deliver a sufficient volume of water to protect firefighters if conditions suddenly deteriorate.

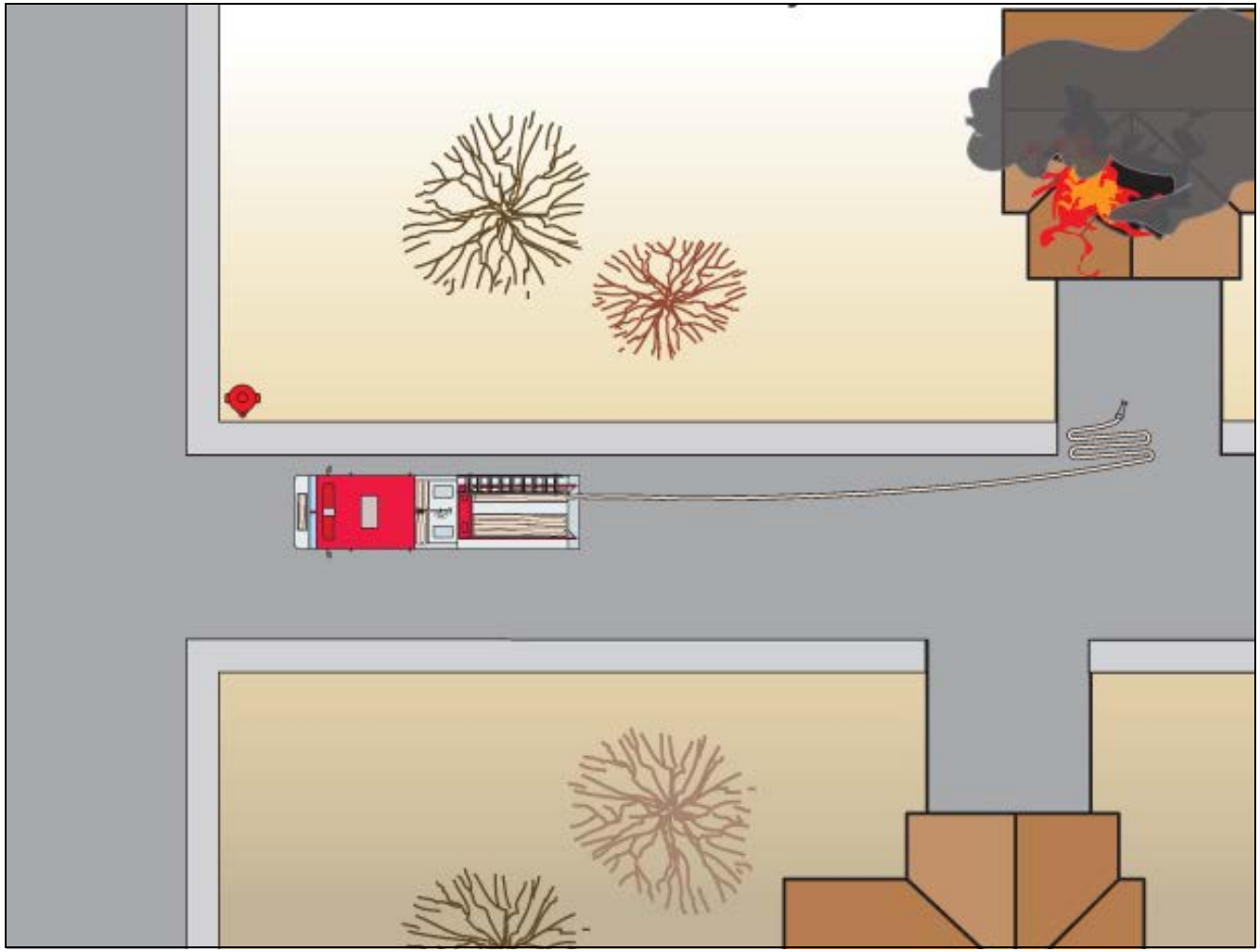
Hose lay procedures will vary from department to department.

- Do not ride standing while apparatus is moving
- Drive no faster than 10 mph (16 km/h) so couplings can clear tailboard
- Deploy hose to one side of road so not driven over

When hose is deployed from a water source to the incident, this is a forward lay.



The reverse lay is used when a pumper must go to the fire location before laying a supply line.



A combination lay is any of the different methods to lay multiple supply hose with a single engine.

- Two lines laid forward
- Two lines laid reverse
- Forward lay followed by reverse lay
- Reverse lay followed by forward lay
- Two lines laid forward followed by one or two lines laid reverse
- Two lines laid reverse followed by one or two lines laid forward

There are several methods that can be used to deploy preconnected hoselines.

- Flat load
- Minuteman load
- Triple layer load

Different types of hoselines can be deployed with other methods as well.

Supply hose as attack line

Equipped with wye appliances

Individual sections from flat, accordion, horseshoe

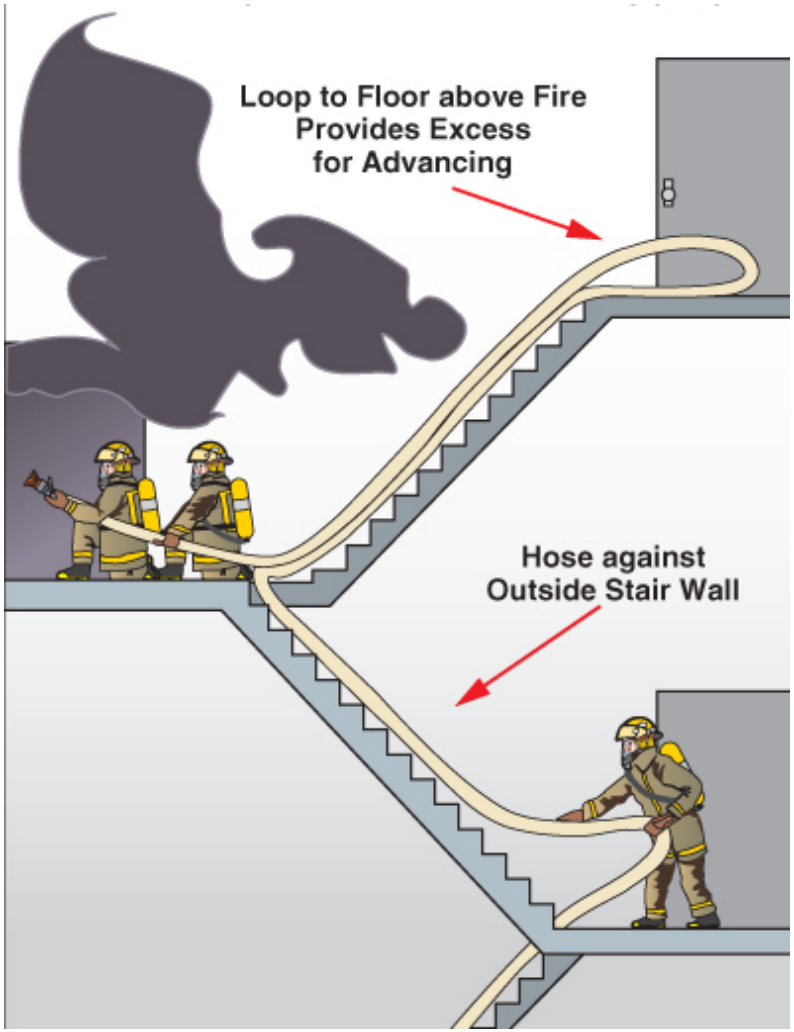
Advancing a charged hoseline can be done using the working line drag.

You should be alert for potential dangers when advancing hose into a structure.

Follow these safety guidelines for advancing hose into a structure.

- Remove kinks and bends while advancing
- Bleed air from hoseline before entering
- Entire team on one side of hoseline
- Check for heat before opening doors
- Stay low and avoid blocking ventilation
- Chock self-closing doors

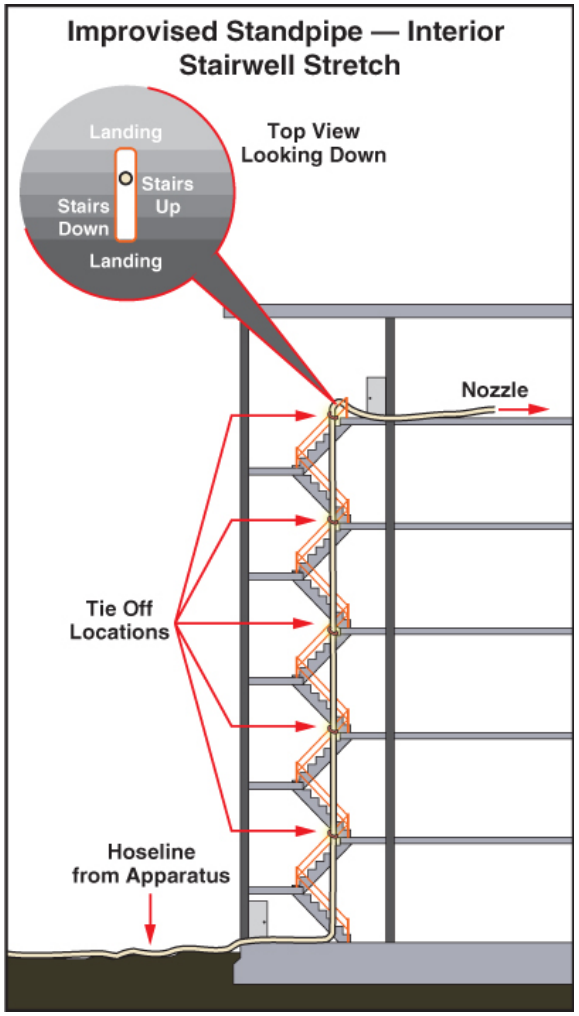
Advancing hoseline up and down a stairway can be very difficult.



Advancing hose from a standpipe is easiest with preassembled hose.

Courtesy of Rick Montemorra, Mesa (AZ) FD

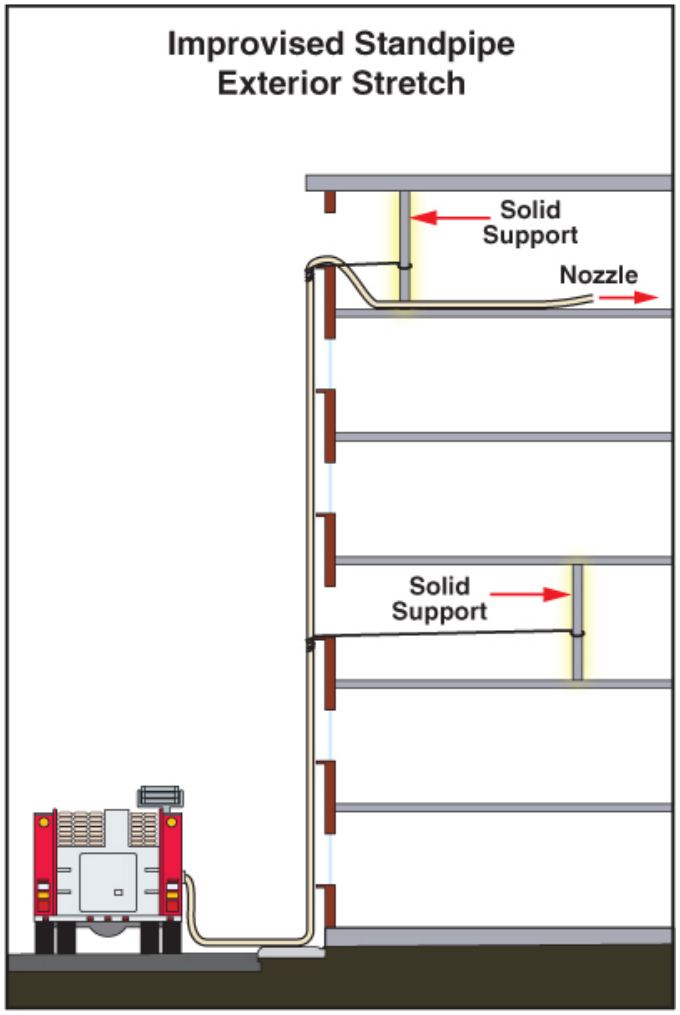
Improvising a standpipe may be necessary under certain conditions.



CAUTION

When firefighters must improvise a standpipe system, there will be a delay in applying water to the fire. This delay must be considered in planning the overall fire fighting strategy.

There are several methods to use when improvising a standpipe.



Advancing hose up a ladder is easier and safer with an uncharged line.

Uncharged

Charged

WARNING

Do not exceed the rated weight capacity of the ladder. If the hose cannot be passed up the ladder without exceeding the load limit, it should be hoisted up.

It may be necessary to operate a hoseline from a ladder.

There are two methods to consider when operating small hoselines.

One-firefighter

Two-firefighter

Courtesy of Shad Cooper, Wyoming State Fire Marshal's Office

Operating large hoselines may also be accomplished with different methods.

One-firefighter

Two-firefighter

Three-firefighter

Extending a section of hose may be necessary during operations.

Requires

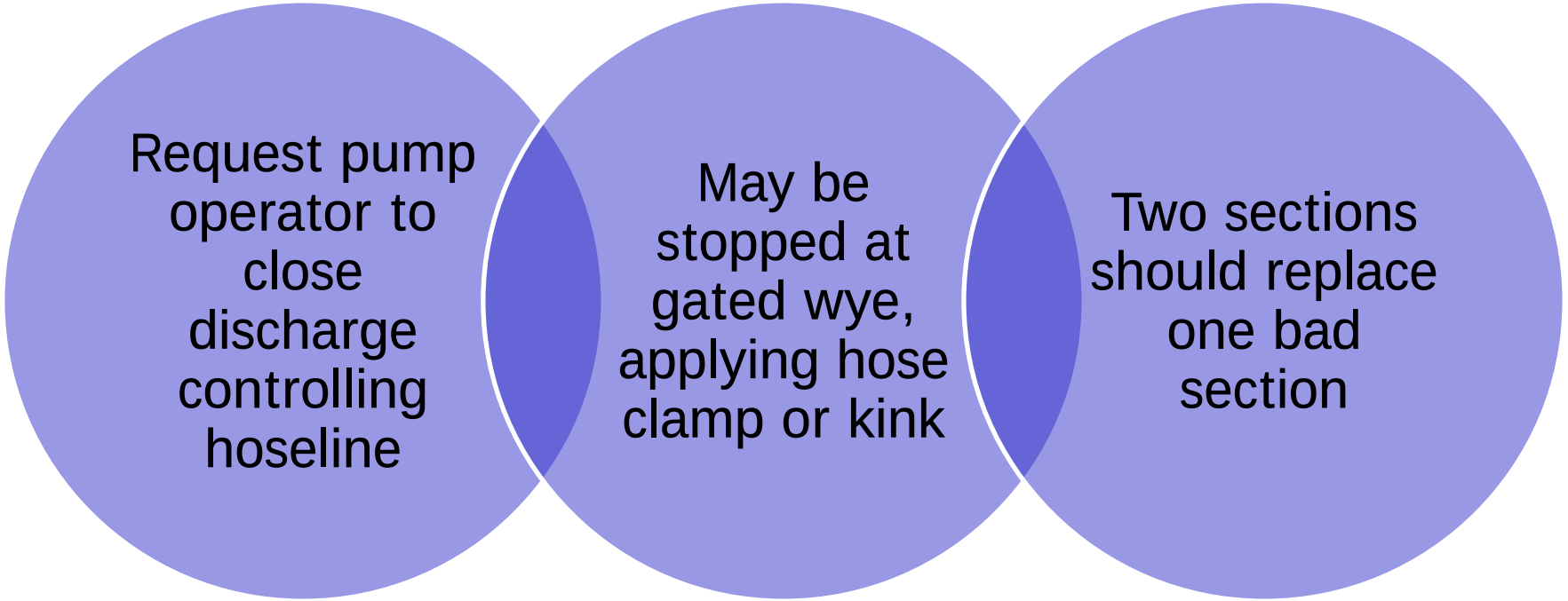
- Hose clamp
- Spanner wrench
- Hose rolls or bundles

There are several methods that can be used to control a loose hoseline.

Safest Method—Close valve to stop water flow

- Apply hose clamp
- Put kink in hose if possible

The task of replacing a burst section of hoseline may also be needed on scene.



Summary

- Fire hose is a basic tool used to carry water from its source to the point it is needed to extinguish a fire.
- Firefighters must know the types of hose their department uses, how it is constructed, the way hose can be damaged, and how to care for it.

(Cont.)

Summary

- Firefighters must know the differences between supply and attack hose, and how to deploy, advance and operate both kinds of hose.
- It is critical that firefighters know the types of fire hose loads and finishes and how they relate to various hose deployments.

(Cont.)