STANDPIPE OPERATIONS

9 STANDPIPE OPERATIONS

9.1 The City of New York is the Nation's foremost "vertical" city with over one thousand high rise buildings. Firefighting in these buildings is challenging and success depends upon both the condition of the standpipe system and our skill and efficiency in using it. Tall buildings, however, are not the only structures equipped with standpipes. Requirements for the installation of standpipe systems are predicated on several factors. The primary factors are the **height** and **area** of the structure. Standpipe systems are often installed in locations with no access for fire department vehicles (such as parking garages) or where excessive distance precludes the stretching of hoselines directly from engine apparatus (such as on bridges).As such, standpipes may be found in any of the following places:

- High Rise Residential and Office Buildings
- Large Area Buildings such as Hospitals, Terminals, Warehouses, and Industrial Buildings
- Enclosed Shopping Malls
- Theaters, Stadiums, and Arenas
- Parking Garages
- Bridges and Tunnels
- Limited Access Highways
- Piers and Wharves

9.1.1 Pre-incident Planning

Engine and ladder companies should be familiar with the standpipe systems found in their response areas and any special characteristics or problems with these systems. Many buildings and other structures equipped with standpipes are already included in CIDS for various reasons, but CIDS information related to the standpipe system itself may not be available. Buildings that require a stretch of more than three lengths of hose should be included in CIDS for this specific reason. Engine company chauffeurs should pay particular attention to the location and condition of siamese connections and nearby hydrants.

9.2 TYPES OF STANDPIPE SYSTEMS

9.2.1 Standpipe systems can be categorized in one of two ways:

A. By whether or not the system riser contains water.

Standpipe systems can be broadly classified as wet, dry, or combination.

- Wet systems contain water in the riser at all times supplied by city main, gravity tank, pressure tank, and/or fire pump (see Fig. 9-1).
- Dry systems may be equipped with an automatic source of supply, but many contain no water and the only supply is from fire department pumpers. This latter type is called a “manual dry” standpipe system.
- Combination systems consist of sprinklers interconnected with a standpipe system. Most of these systems are "wet" and are of special concern because the water flow demands of both sprinkler heads and hose lines attached to the standpipe system requires prompt augmentation by fire department pumpers.

B. By the size (diameter) of the hose outlets.

- Standpipe systems may contain only 2 1/2-inch outlets, both 2 1/2-inch and 1 1/2-inch outlets, or 2 1/2-inch outlets reduced to 1 1/2-inch with a removable fitting. In many cases, 1 1/2-inch unlined, linen hose designed for “occupant use” will be encountered.

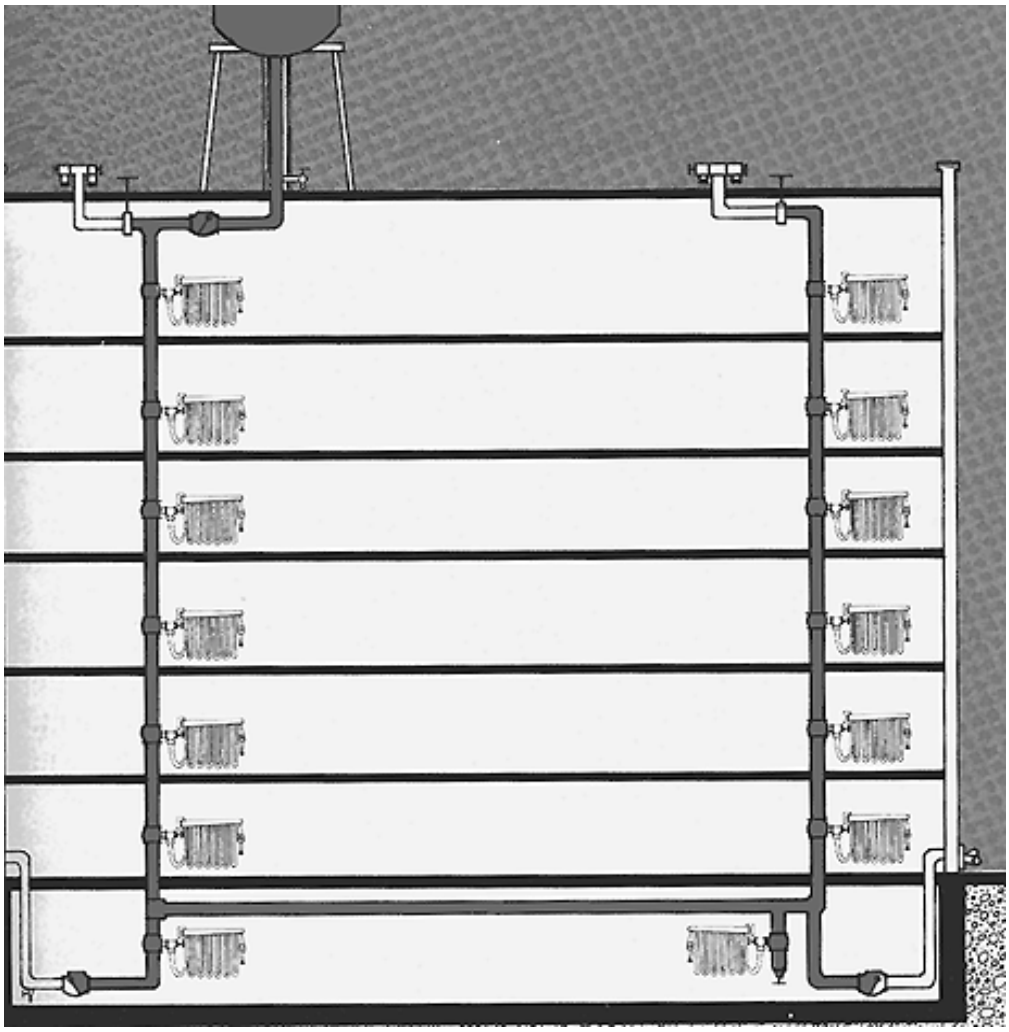


Fig. 9-1

9.2.2 Engine companies shall utilize only Department issued hose for standpipe firefighting. Engine companies shall not attempt to use the "occupant use" hose sometimes provided with these systems, even in those instances when the hose is 2 1/2-inches in diameter. Occupant use hose may not be maintained properly, is often old, and may fail under Department operating pressures. If a reducer is encountered, it must be removed to permit attachment of our 2 1/2-inch hose to the standpipe outlet. (The stretching of occupant use hose by ladder and rescue companies operating remotely from an engine company while performing searches, may be justified in an attempt to save lives.)

9.3 SUPPLYING STANDPIPE SYSTEMS

9.3.1 Standpipe systems may be supplied through siamese connections and/or floor outlets. Floor outlets are often used when siamese connections are vandalized or to reinforce augmentation with additional supply lines.

9.3.2 Siamese connections are color coded for ease of identification. Either the caps or the entire siamese connection may be painted. Standpipe siamese connections are painted **red**. For reference, the other colors used and what they indicate are as follows:

Red	Standpipe
Green	Automatic Sprinkler System
Aluminum	Non-automatic Sprinkler or Perforated Pipe
Yellow	Combination Sprinkler/Standpipe

If no color coding is present, each siamese connection should be identifiable as to the type of system it supplies. This information is usually embossed or stamped on a plate or the siamese connection itself.

9.3.3 Standpipe systems should **always** be supplied with 3 1/2-inch hose.

9.3.4 Whenever possible, standpipe systems should be supplied by at least two different pumpers.

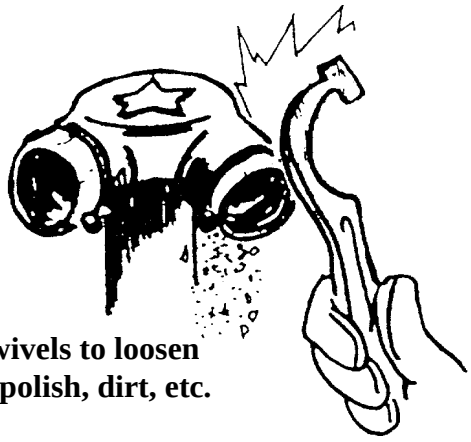
9.3.5 Whenever possible, standpipe systems should be supplied through at least two independent siamese connections. If there is only a single siamese connection, a second supply line can be attached to the first floor outlet. Additional floor outlets can be supplied if required.

9.3.6 If a standpipe system is to be supplied via a floor outlet, proper fittings must be employed to attach the 3 1/2-inch hose to the 2 1/2-inch outlet threads. In addition, if a pressure regulating device (PRD) is installed on the standpipe outlet, it must be removed or adjusted to the fully open position before charging the supply hose. One type of PRD called a "Pressure Reducing Hose Outlet Valve" cannot be backfed, negating the use of floor outlets for supply. (Refer to Section 9.4.7 for more information on pressure regulating devices).

9.3.7 As a general rule, there should be a separate engine company supplying the standpipe system for each hoseline placed in service.

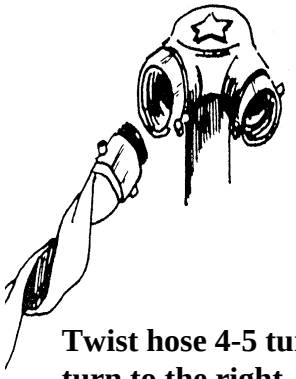
9.3.8 If a building is equipped with both a standpipe system and automatic sprinklers, the first supply line must be attached to the standpipe siamese. The ECC supplying the system must verify that it is attached to the correct siamese connection. If the first due engine is supplying both the standpipe and sprinkler systems, the second and third due engine companies **must** stretch additional lines to augment **both** systems.

9.3.9 Difficulties may be encountered with siamese connections. These difficulties include missing caps, defective threads, debris stuffed into the connection, tight caps, female swivels out-of-round, frozen female swivels, and clappers either broken or jammed open. Never insert any part of your hand inside the connection to clear debris. In addition to broken glass and sharp metal edges, junkies have been known to store or discard hypodermic needles inside siamese connections. A spare 3-inch male cap should be carried by all engine companies in the event it becomes necessary to cap one side of the siamese connection to prevent an outflow of water due to a malfunctioning clapper valve. Immediately stretching and connecting a second 3 1/2-inch line is another remedy for this problem. Fig. 9-2A to 9-2D illustrates various solutions to the problem of caps stuck in place, defective threads, and frozen female swivels.



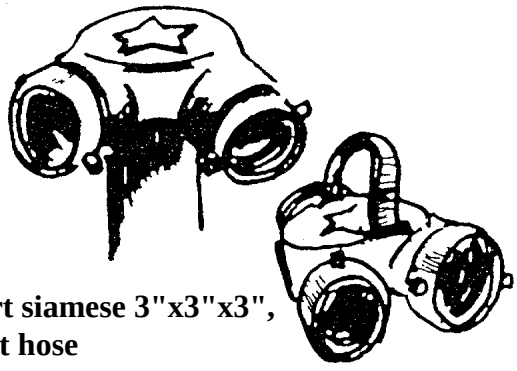
Tap swivels to loosen paint, polish, dirt, etc.

Fig. 9-2A



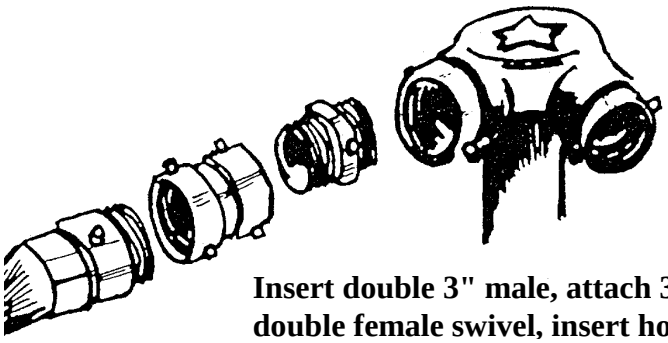
Twist hose 4-5 turns, insert, turn to the right

Fig. 9-2B



Insert siamese 3"x3"x3", insert hose

Fig. 9-2C



Insert double 3" male, attach 3" double female swivel, insert hose

Fig. 9-2D

9.3.10 Many siamese connections are equipped with either metallic or plastic vandal proof caps. These caps are usually attached with screw eyes placed over the pin lugs on the female swivel (see Fig. 9-3). Both metal and plastic caps are removed by striking the center of the cap with a tool. Caps can also be removed by prying one of the screw eyes off the pin lug.

Fig. 9-3

9.3.11 The pump discharge pressure for each hoseline attached to a standpipe system is 100 psi plus 5 psi for each floor above grade. This assumes two lengths of 3 1/2 inch hose between the pumper and the siamese, three lengths of 2 1/2 inch hose attached to the standpipe outlet, and the use of a controlling nozzle with a 1 1/8 inch MST.

9.3.12 High-pressure pumping operations are described in Firefighting Tactics and Procedures, High Rise Office Buildings, Section 5.

9.4 OPERATING FROM STANDPIPE SYSTEMS

9.4.1 Required Equipment

A. Standpipe Kit. Each engine company shall carry a "standpipe kit" with the following minimum basic complement of tools:

- 2 1/2-inch controlling nozzle with 1 1/8-inch main stream tip and 1/2” outer stream tip.
- Hand control wheel(s) for outlet valve.
- 2 1/2-inch x 2 1/2-inch in-line pressure gauge.
- Pipe wrench (minimum 18 inches in length).
- Spanner wrenches.
- Door chocks.
- Special adapters as required. For example, some buildings may contain floor outlet valves with non-New York City threads. Adapters for connecting FDNY 2 1/2-inch hose to National Standard Thread or National Pipe Thread may be required.

B. Four lengths of folded 2 1/2-inch hose. In most instances, three lengths will be brought into the building by each engine company. Some companies may opt to keep a 2 1/2-inch controlling nozzle pre-connected to one of the folded lengths as this is an acceptable practice.

9.4.2 Due to the complexity of supplying and stretching from standpipe systems, the first and second due engine companies will **always** operate together in order to ensure prompt and efficient placement of the first hoseline.

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9.4.3 The first hoseline should normally be attached to an outlet on the floor immediately below the fire (see Fig. 9-4). In buildings of fireproof construction with properly functioning stairway doors (including view glass intact), an outlet on the fire floor may be used if it will facilitate operations. Hose outlets located in corridors on the fire floor should **never** be used.

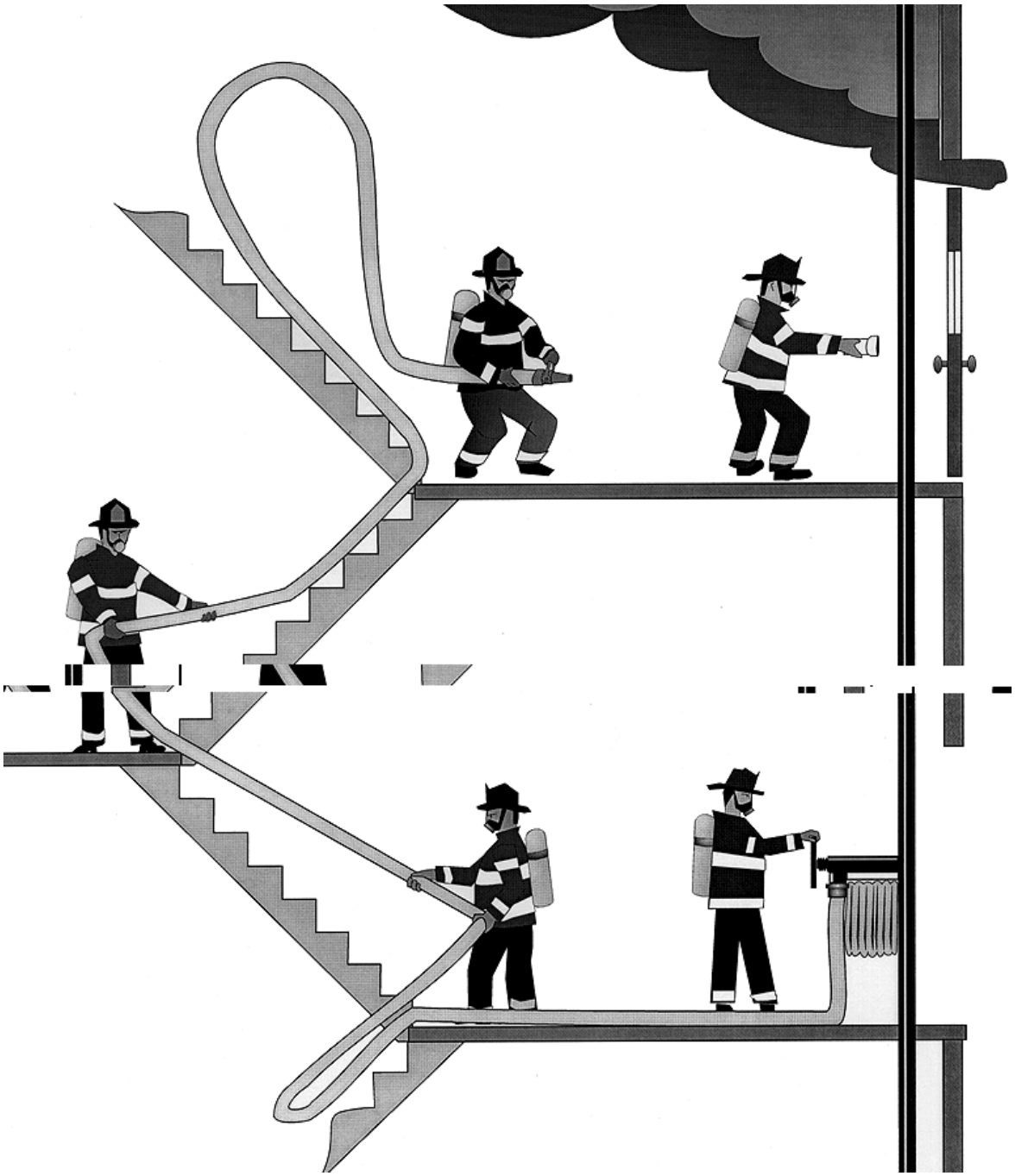

Fig. 9-4

9.4.4 The officer and control firefighter from the second due engine company should relieve the first due control firefighter at the hose outlet and communicate with the first due engine officer to ensure that adequate pressure is supplied to the nozzle. It remains the first due engine control firefighter's responsibility to ensure a proper hook-up to the hose outlet, including connection of any necessary fittings and adapters, as well as deactivation or removal of the PRD. The in-line pressure gauge should **always** be used to ensure correct nozzle pressure and a good fire stream (see Fig. 9-5).

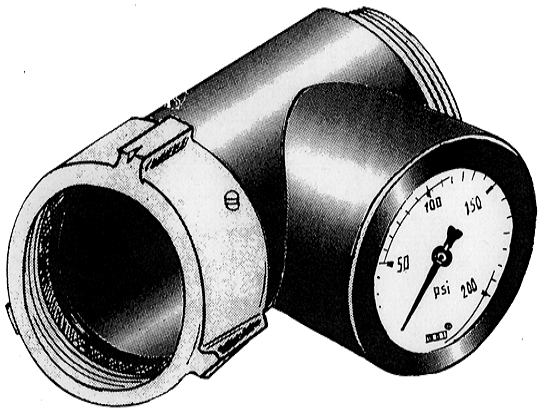

Fig. 9-5

9.4.5 If a second line is required on the fire floor, it may have to be stretched from a hose outlet two (2) floors below the fire or from another standpipe riser. Both of these situations often require at least four lengths of hose.

9.4.6 Scissor stairs create additional complexities and will usually require the stretching of four or more lengths of hose (see Fig. 9-6). This information should be included in CIDS.

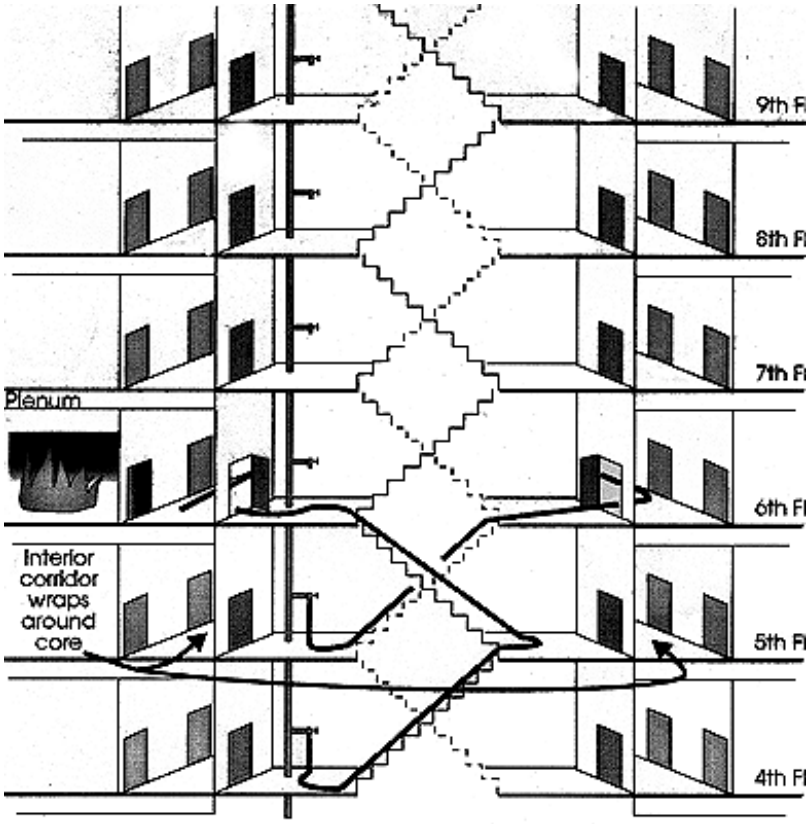

Fig. 9-6

9.4.7 In tall buildings, pressure regulating devices or PRDs may be installed. PRDs are designed to reduce, restrict, or otherwise control the pressure available at the standpipe hose outlet. Several types produced by various manufacturers may be encountered in the field and it is important to know beforehand how each individual PRD works. See Fig. 9 -7A to 9-7D for several illustrations of PRDs that are in use within the City of New York. Some types are removable. Others may be overridden or adjusted, but this may require special tools. Others are **not** field adjustable and **cannot** be removed or adjusted. This information should be placed in CIDS. At fire operations, every effort must be made to remove the PRD, or ensure it is fully open. Due to the potential for pressure problems when operating from standpipe systems, the FT-2 tip should **not** be used because it requires a high nozzle pressure to produce an effective fire stream.

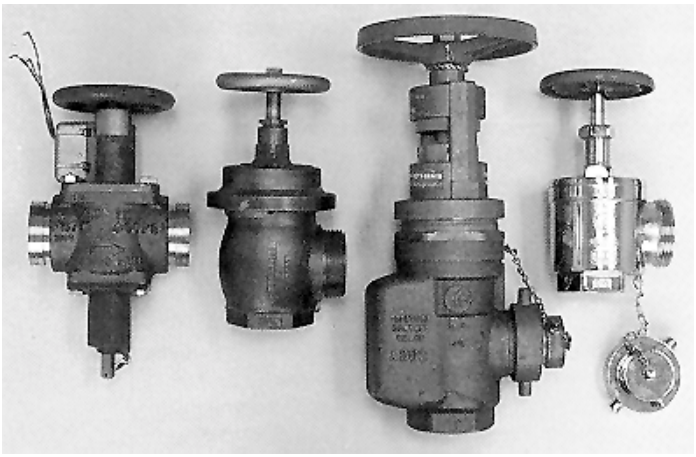

Fig. 9-7A

Fig. 9-7B

9.4.8 Prior to attaching the in-line pressure gauge, flush the standpipe system thoroughly through the floor outlet. It is difficult to clog a controlling nozzle, but rubber balls and soda cans lodged within a standpipe riser or piping certainly can do it.

9.4.9 Nozzle pressure is to be adjusted by use of the hand wheel at the hose outlet valve and by observing the in-line gauge. This requires coordination between the engine company officer supervising the advance of the nozzle and the officer and control firefighter of the second due engine company at the hose outlet valve. Handie-talkie communications are essential. It should be noted here that the in-line gauge reading is only accurate when the nozzle is open fully and water is flowing. If the gauge is read after opening the hose outlet valve, but before the nozzle is opened, the reading will not be accurate. When the nozzle is finally opened, there will be a dramatic drop in pressure and an ineffective fire stream will result. It is important to monitor the in-line gauge closely after the nozzle is opened and adjust the valve wheel sufficiently to provide the proper pressure. As a rule of thumb three lengths of 2 1/2 inch hose requires 70 psi at the outlet and four lengths of 2 1/2 inch hose requires 80 psi at the outlet **WITH WATER FLOWING**.

9.4.10 When attaching lengths of hose together, especially in a smoke condition, be careful not to connect the hose in a loop or to create excessive knots or twists in the line.

9.4.11 As with the advance of any hoseline, ensure the line is charged and bled before entering the fire area. Sometimes this may require charging and bleeding the line in the stairway, such as when an apartment door is left open and high heat conditions exist in the hallway or at commercial building fires with large, open floor areas. Other times, the line can be stretched dry to the apartment door, and charged and bled in the public hallway.

9.4.12 As the first due engine company begins its advance on the fire, the second due engine must assist with line movement and be prepared at any moment to relieve the first engine company. Air conservation is an important consideration for the second due engine. If it is not possible to conserve air due to smoke and heat conditions, additional engine companies may be utilized by the Incident Commander to reinforce the critical position of the first hoseline.