MONTGOMERY

FIRE / RESCUE

DEPARTMENT OF PUBLIC SAFETY

Fire Hose

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FIRE HOSE

The term "fire hose" identifies a type of flexible tube used by firefighters to carry water under pressure from the source of supply to a point where it is discharged to extinguish fire. In order to be reliable, fire hose should be constructed of the best materials and it should not be used for purposes other than fire fighting. Fire hose is the most used item in the fire service and the way in which it is used requires it to be flexible, water tight, and have a smooth lining and a durable cover.

Within the Montgomery Fire/Rescue there is a standard amount of hose to be carried on all pumper apparatus. Every pumper carries 700' of 5" supply hose, 700' of 3" supply hose and 700' of 2½" hose to be used as supply hose or for making up attack lines.

All pumpers are also equipped with a standard amount of 1¾" and 2½" hose loaded in a fashion to allow for quick fire attack, these lines are often referred to as jump lines. This includes three pre-connect 1¾"lines 200' long and a 2½" pre-connect 200' long. The first 1¾" jump line is further designated as the foam line due to its specific use. The first 1¾" is connected to a permanently mounted foam eductor and therefore is often referred to as the foam line.

HOSE MARKINGS

Each Engine Company has an assigned color. This color will be used to mark all hose and equipment assigned to that company.

The procedure for marking hose will be as follows:

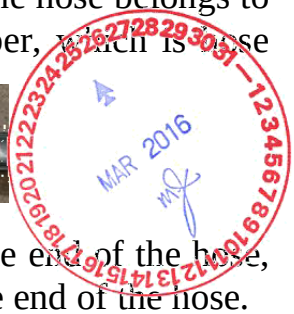
1. Paint a 12" band around the hose, using the assigned color.

2. This band will be three feet behind the coupling on each end of the hose.

3. Numbers will be assigned to each section of hose; these numbers will identify the company and the hose.

Example:

The first two digits represent the company number. In this case the hose belongs to Engine 2. The second two numbers represent the section number, which is hose number 03.



*** Note**: Paint the I.D. number inside the painted area on the male end of the hose, turn the hose over and paint the I.D. number on the female end of the hose.

HOSE RECORD

Each section of hose is numbered and a record of the hose's history is maintained and kept at the assigned station and Supply. Information on each card consists of the date of manufacturer, date of purchase, date and results of the annual test, repairs, unusual features, causes of failure etc. The record will be a case history of the section of hose from the time it is purchased until it is taken out of service.

FIRE HOSE TESTING PROCEDURE

When new fire hose is received it should be tested by the company receiving the hose. 1¾", 2½", 3" and 5" are all tested by the same procedures. Although 5" is tested as the other hose, the test pressure is 200 lbs. for 5 minutes.

Fire hose that has been in service should be subjected to an annual service test to assure its dependability. An annual test represents a maximum length of time that hose should be used without a test. A section of fire hose that shows signs of damage or has been repaired should be tested before it is placed back in service.

After the prescribed test pressure has been reached, it should be maintained on the hose for a minimum period of five minutes. Experience has shown that some types of defects will show up after prolonged application of pressure, and would not be found if the pressure is immediately released after the test pressure has been reached.

Most authorities recommend that the length of the hose line to be tested should not exceed 300 feet. The reason for this recommendation is that it permits those doing the testing to be fairly sure that all the air has been expelled from 300 feet of hose before the test pressure is applied. All the air must be expelled from the hose because air is compressible while water is incompressible under normal conditions.

The sudden release of expanding air when a hose bursts under air pressure may also result in serious injury or fatal accident. A fire hose test and the steps for conducting the test are described as follows:

1. Lay out all hose to be tested in lines not more than 300 feet long. Make sure the lines are without kinks. Record identifying numbers of each section of hose to be tested.

2. Connect a pumper to a hydrant to supply the water for the test.

3. Connect all lines to be tested to the pumper discharges. Attach a shut-off type nozzle to the discharge end of each hose line. Mark the hose at the end of each coupling shank with a soft pencil. (This procedure is necessary to determine if there is any slippage of the coupling during the test.)

4. Using hydrant pressure, fill each hose line with water and make sure that each nozzle is open and elevated during the filling process. Exhaust all the air from each line by permitting a normal water flow. (The nozzles may be held by personnel or placed on something to raise them.)

5. After all the air has been expelled, leave the nozzles open and gradually raise the pressure at the nozzle to approximately 50 psi for solid streams or 100 psi for fog streams. (A defective lining is more likely to pull loose during a flow of water under pressure than it is under static pressure. Pressure alone may not show up a defective lining.)

6. Reduce the pump pressure, close each nozzle slowly, and place each nozzle either on an elevated block or on the ground. Check all couplings for leakage and tighten those that are loose.

7. Gradually raise the pump pressure to the recommended 250 psi; gate down the discharge on each line to a minimum after reaching the proper pump pressure of 250 psi. Hold this test pressure for (5) five minutes. (This is to insure the presence of a small amount of water in case there is a burst section or run away line of some nature.) Observe all hose under pressure for any defects. (***200 psi test pressure on 5" hose***)

8. After five minutes reduce the pump pressure slowly, close discharges, disengage the pump and open each nozzle.

9. Observe all marks on the hose behind the coupling shanks. If any of the couplings have moved or if any section develops a leak, this section has failed the test. If a section bursts during the test, all other sections in the line must be retested. Tag or mark all defective sections.

NOTE: Any section of fire hose needing repair will be marked by wrapping a rag at the point of the damage. A work request will be completed specifying location of damage and/or coupling needing repair.

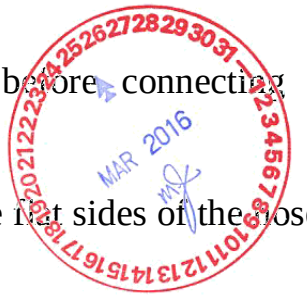
Hose Loads

Training in fire hose practices cannot be complete without a study of the basic hose loads, special adaptations to loads, making hose layouts, and advancing fire hose. Some of the methods and techniques, herein discussed and illustrated, may not lend themselves to procedures in some areas, but the basic concepts can be used whenever applicable. Loading fire hose is one of the preparation steps of the use of fire hose at fires. It is not necessary to develop speed for the loading process but time is an important factor when making layouts and advancing fire hose.

Terminology and basic understanding of hose loading procedures is vital if the hose is to be an asset on the fireground. For MFR purposes some basic guidelines should be understood. The term hosebed is designated for the area of the apparatus used to carry supply hose. The area of the hosebed towards the cab of the truck is the front of the bed. Left and right sides of the hosebed are determined as you stand at the rear and face the apparatus.

Basic rules must also be followed in the loading of the hose. These are:

- Check gaskets and swivel before connecting the couplings.



- When coupling hose, keep the flat sides of the hose in the same plane.

- Make the couplings hand tight, do not use wrenches.

- For Montgomery Fire/Rescue, the hose load of choice for the 2½" and 3" is known as the horseshoe load. This load is desired due to the narrow long design of our hosebeds. The 5" hose is stack loaded.

Loading Procedure:

For safety reasons a minimum of three personnel should be used for loading the horseshoe load, one in the hosebed and two at the rear of the bed. It is easiest if one person is positioned on the ground and the second on the tailboard.

1. **3" Hose** - Start the male coupling extended beyond the rear edge of the hosebed. This will be the connection point between the 2½" and 3" hose.

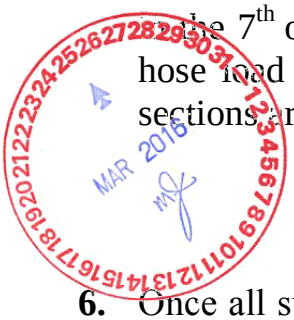
2. Following the outer contour of the hosebed, stand the hose on edge and extend it to the front and along the opposite side of the bed. Fold the hose back toward the front and continue to load the hose in a horseshoe fashion.

3. Once a tier of hose is completed a crossover is needed to allow the hose to be stacked, starting another tier. To make the crossover for the next tier, fold the hose coming from the center of the load, to one side between the completed tier and the hosebed wall. Form a short fold at this point by bending the hose toward the side of the bed instead of toward the open bed. This short fold prevents the forming of a kink when the hose is pulled from the bed.

4. The hose is then continued by folding the hose against the bed wall on top of the first tier. The second hose tier is loaded in the same manner as the first tier. This procedure continues until all hose is loaded.

5. The half-way mark in the hose is identified by a "dog ear"; it is placed at the 7th or 8th section of hose. The hose load is then continued until all sections are loaded.

Dog Ear



6. Once all supply hose is loaded, the 2½" female coupling is connected to the 3" male coupling and the 3" female coupling is connected to the 3" to 5" adapter.

2½" connected to 3" hose

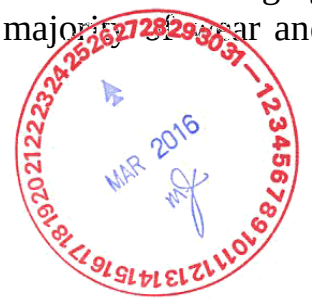
3" connected to 5" hose

As a tier fills toward the center, a coupling may be in a position that hinders the loads ability to easily pay out. To allow for easy payout it may be necessary to place a "DUTCHMAN" in the load. Make sure the coupling and hose are positioned so the coupling is not required to make a turn as it is pulled from the hosebed. A Dutchman may also be used to change the location of a coupling.

- The folds of the hose may be staggered at each turn to allow for a more uniform appearance and easier load.

- When loading the 2½" hose, the load will begin with the male coupling being placed at the front and to one side of the hosebed. The hose will then be loaded in the same manner as the 3" hose load.

As part of hose maintenance, 2½" and 3" synthetic hose should be changed every sixty (60) days. Do so by removing all 2½" and 3" hose from the truck and disconnect all couplings. Reload the hose starting with the first sections laid off. (The last section off will be the last section reloaded.) This method of changing the hose will prevent the same sections from receiving the major [illegible] ear and tear from constant use.



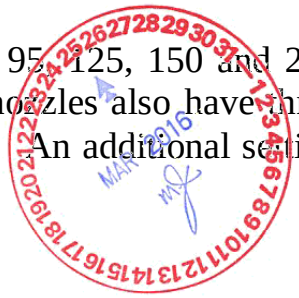
PRECONNECT HOSE LOADS

1¾" PRE-CONNECT

This load is a concept that significantly increases ease and efficiency with which a fast initial fire attack can be made requiring only one man to advance the load.

The 1¾" pre-connect is loaded with 4 sections of hose in each line and one 10' or 4' section. The short section is added to prevent the couplings from scraping the side of the apparatus. The design enables the entire load to be laid on the fire ground or disconnected at the coupling of the short section to be used away from the apparatus.

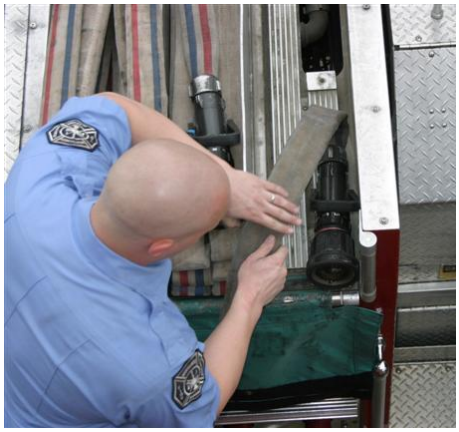
It is equipped with adjustable fog nozzles with settings of 95, 125, 150 and 200 gpm. The 1¾" settings are 30, 60, 95 and 125 gpm. The nozzles also have three different degree settings: narrow, wide and straight stream. An additional setting is flush, which is used to clear the nozzle of debris.



1¾" CROSS-LAY

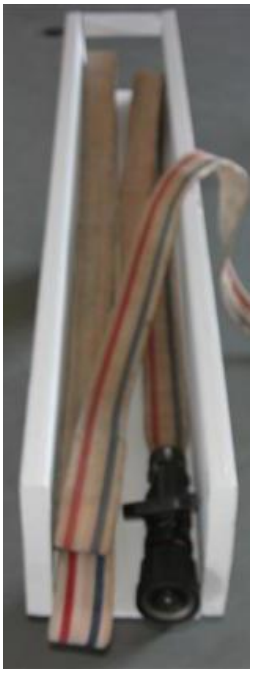
This section will then be laid out the opposite side from nozzle to be connected later. All 1¾" lines will be loaded using the cross lay method, unless truck configuration prevents this type of load.

1. Connect female coupling of the 4' section to the 1¾" discharge outlet. This section will then be laid out of the hosebed opposite the side from where the nozzle begins its load.

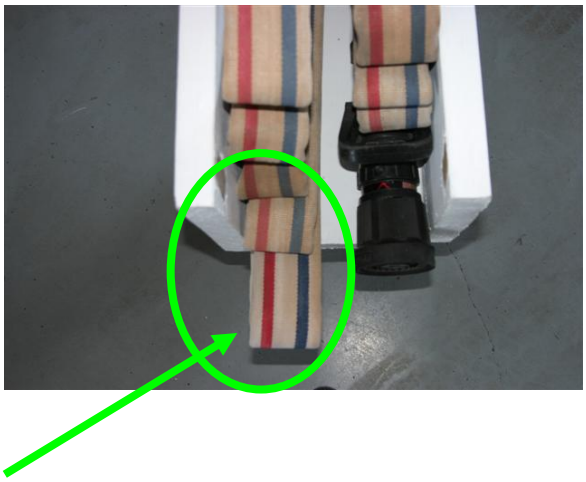


2. Start with the 1¾" nozzle attached to one section of hose. Lay the nozzle at the right rear edge of the compartment. (Nozzle may be extended beyond the edge of the hose compartment. This provides a handhold for pulling the load out.)

3. With the hose laying flat in the compartment, lay the hose back towards the front of the hosebed. Once the hose is laid the length of the compartment, fold the hose to allow it to fold back towards the nozzle. Proceed back down the opposite side of the hose compartment, crossing at the halfway point. The first crossover fold will be extended beyond the edge of the compartment. This will allow for a handle for the nozzleman.



4. Fold the hose over and proceed back in the same direction, crossing over at approximately halfway. Continue alongside existing hose until you reach the nozzle tip. Fold the hose over and Repeat fold and cross over procedure. Remaining sections of hose are loaded in this manner with the folds at the side of the hosebed.



Hand Hold

5. The 4' section is attached to the last section of 1 ¾" hose.

6. The completed load should fit easily in the hosebed and the canvas cover should be securely fastened.

NOTE:
Some companies may ride with the 1¾" jump line loaded in a stack load instead of the cross lay. This line is generally used as a quick attack line for small fires.

2½" PRECONNECT

This load increases the efficiency with which a fast initial fire attack with a 2½" firefighting line can be performed. The advancement of this load requires two personnel for a safe and effective lay.

The 2½" pre-connect is loaded with four sections of hose. It is equipped with an adjustable 120, 150, 200, 250 GPM fog nozzle.

1. Start with nozzle and one section of hose; opposite the side of the discharge if possible. With the nozzle placed in the compartment, fold the hose in a stacking manner, back and forth the length of hose compartment.

2. The second section of hose is laid out and halved, with the female coupling on top.

3. The folded section of hose is placed on the front edge of the hosebed next to the nozzle.

4. The female section is to be stack loaded in the same manner as the nozzle section.

5. Attach the third section of hose to the second section and stack load the third section of hose on top of the second section.

6. The forth section of hose is attached to the third section and is stacked loaded on top of the third section.

7. At this time, attach the forth section of hose to the rear discharge.

The nozzle and one section of hose is stacked on the right side of the bed and three sections of hose on the left side of the bed. The male end of the hose, that was halved, should still be unattached and extending behind the truck.

8. Attach the male end of the section laid behind the truck to the female section of hose of first section that has the nozzle. Stack the remaining hose on top of the nozzle stack.

DRAGS AND CARRIES

Certain drags and carries benefit those on the fireground by utilizing techniques, which have proven to work under unusual conditions. From time to time situations will arise where a hose needs to be extended or a few sections may need to be carried into a tight area. Either way, we must be able to do this quickly and safely. The drain and carry, shoulder fold and street drag are the most used techniques in MFR.

SHOULDER FOLD CARRY

This carry provides a system and means whereby a firefighter can secure either a section of hose or a section of a working line and carry it in a systematic and usab1e manner.

1. Stretch a section of fire hose into a straight line, clearing the tailboard by at least three (3) feet. Allowing the coupling to clear the tailboard of the truck approximately 3 feet, allows for ample working room to complete the fold.

2. Carry one coupling end toward the other until approximately the middle of the section is reached. Pick up the hose near the center with the same hand and advance to the coupling attached to the hosebed.

3. Pull and adjust the inside loop until the two loops at the opposite end are even. Pull both male and female couplings together.

4. Move to the center of the folded hose, stand the hose on edge, and hold the hose close together at this point.

5. While facing the couplings, place the foot closest to the hose across the hose and use it as a pivot point for the hose.

6. Swing the folds from the back around to the couplings. Pick up the new fold at the center and allow both ends to rest on the ground.

7. Place the U-fold on the shoulder and lift with the legs. Use care when laying this bundle down so as not to damage the couplings.

STREET DRAG

The street drag is an easy method of moving a single section of fire hose for quick use almost any place around the fireground area. This drag works best in flat smooth areas such as fields and roads. Steps for arranging the hose for the drag are as follows:

1. With a section of hose stretched in a straight line, pick up one coupling and advance to the approximate center of the hose. Bend down and pick up the hose, placing it on the shoulder closest to the hose.

2. As you stand, permit the hose to cross the chest and advance to the other coupling. This coupling may be attached to the hosebed.

3. Pick up the remaining coupling end with the free hand and walk to drag the hose.

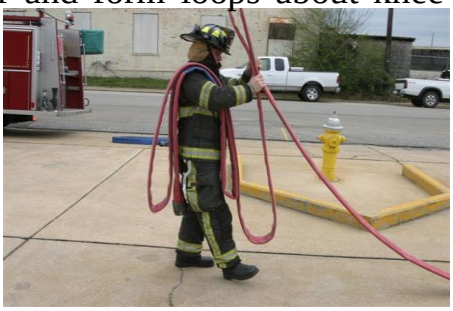
If the hose is to be pulled from the hosebed, the hose will be pulled off straight behind the apparatus until the coupling hits the tailboard. The coupling will remain on the tailboard until the hose is dragged back to the apparatus to disconnect the hose to be dragged.

SINGLE SECTION DRAIN AND CARRY

It frequently becomes necessary to drain excess water from a section of fire hose and to carry it a reasonable distance. Draining the hose is one task and preparing it to be carried is another. The following technique is a way by which both tasks can be performed at the same time for an accordion style shoulder carry. The hose does not necessarily need to be in a straight line but sharp bends should be avoided.

1. Pick up either end to allow the water to flow forward; place the coupling behind the body near the hips with the hose looped over one shoulder.

2. Fold the hose in front of the body with both hands, walk slowly forward, and form a loop in front of the body. Continue to walk slowly down the hose line, place the gathered hose over the same shoulder and form loops about knee high in front and behind the body.



3. Continue to walk slowly down the entire hose section, guide the hose over the shoulder, and form additional loops in front and behind the body until the section of hose has been drained and loaded on the shoulder.

Note: Use caution when laying this bundle down so as not to damage the couplings.

FIRE HYDRANTS

Fire hydrants that are constructed with a valve assembly to drain the hydrant after use are generally equipped with a pentagon shaped operating nut on top of the hydrant. Regardless of the location of the operating nut, most fire hydrant valves turn counterclockwise to open and clockwise to close. Hydrants usually have an arrow cast on the hydrant bonnet to indicate the direction of valve operation. Most hydrants in Montgomery are equipped with two 2½" and one 4½" outlet and are color-coded for the amount of water they will deliver per minute.

Class	Flow	Color
AA	1500 GPM or greater	silver
A	1000-1500 GPM	green
B	500-1000 GPM	orange
C	Less than 500	red

When operating a fire hydrant that is equipped with draining facilities, the first opening turns close an underground drain valve before the main valve is completely opened. This feature accounts for the ease with which the first few turns are commonly made on most hydrants. The number of turns necessary to open a fire hydrant may vary with the make. It is common for 15 to 20 turns to completely open a fire hydrant but some hydrant valves may open completely with six to eight turns. To obtain the best flow and to prevent water from the hydrant drain from washing out and undermining the hydrant, the hydrant valve must be completely opened. If a hydrant cannot be opened with reasonable force, the direction of operation should be checked before additional leverage is used.

Catching Hydrants

The phrase "Catching a Hydrant" is commonly used by fire service personnel to designate the activities of a firefighter when safely removing sufficient hose and tools from the apparatus and making the necessary connections at a fire hydrant. Although this operation is a one-man job, the hydrant catcher or plugman must have the cooperation of the officer and driver of the apparatus in order to safely perform this duty.

It is the pumper company officer's responsibility to determine the size and number of supply lines needed for an emergency incident. This decision should be made with all available information and conditions considered. As a standard rule it is recommended that a 3" line be laid on any structure of 1500 square feet or less. A

five (5”) supply line should be laid on any structure exceeding 1500 square feet, used as a business or containing possible hazardous materials.

If there is a question as to the size of supply line needed, it is best to lay the 5” line and ensure a sufficient water supply. There may also be a need for laying two lines in the place of a 5” line. This should be considered in the event that a company is second in and the first in unit has connected to their 5” intake.

When preparing to catch a hydrant, the apparatus driver should pull the apparatus close to the curb and come to a complete stop before the hydrant man leaves the truck. The hydrant-catcher will step from the truck when given the order to catch the hydrant.

Although it is important to complete all steps of hydrant catching, the steps for attaching lines and gates to the hydrant can be performed in any order. This applies to all hydrant catching operations.

Catching With One 3” Line

1. Once the apparatus has stopped- carry the hydrant wrench and 2½” gate valve to the rear of the truck. The gate valve should be in the hand closest to the hydrant.

2. Stand on the tailboard of the truck facing the hosebed. Grasp and pull the 3” hose using the hand farthest from the hydrant with the other hand used to carry the hydrant wrench and the 2½” gate valve.

3. Turning in the direction of the hand with the gate and facing away from the truck, step off the tailboard starting with the foot opposite of the hand with the hose. (As you proceed to the hydrant, the hose should be between you and the hydrant.)

4. Loop the hose around the hydrant bringing the female coup1ing toward you and crossing over the hose line near the hydrant. Place one foot on the hose where it crosses and signal for the driver to proceed to the fire.

5. Remove both 2½" hydrant caps with your hydrant wrench. Place the hydrant wrench on the operating stem, with the wrench handle pointing away from you. (At no time should you place the hydrant wrench on the ground.)

6. After the apparatus has advanced sufficiently, remove the hose from around the hydrant and attach the 3" hose to the hydrant nearest the direction of travel of the apparatus.

6. Attach the 2½" hydrant gate to the other outlet. Make sure the hydrant gate is in the closed position and all connections are secure before opening hydrant.

7. Proceed to the truck checking for and correcting kinks and leaks in the line.

CATCHING WITH TWO LINES

When a large supply of water is needed the 5" supply line is the line of choice, but circumstances may prevent the use of a 5" supply line. In this case two (2) lines will be laid in place of the 5"; this will include the use of the 2½" and 3" hose. The procedures for catching a hydrant with two lines are as follows:

1. Once the apparatus has stopped, carry the hydrant wrench and 2½" gate valve to the rear of the truck. The gate valve should be in the hand closest to the hydrant. The 4½" butterfly valve will be set off near the hydrant by a person other than the hydrant man.

2. Stand on the tailboard of the truck facing the hosebed. Disconnect the 2½"coupling from the 3". Grasp and pull the 2½" and 3" hose using the hand farthest from the hydrant with the other hand used to carry the hydrant wrench and the 2½" gate valve.

3. Turning in the direction of the hand with the gate and facing away from the truck, step off the tailboard starting with the foot opposite of the hand with the hose. (As you proceed to the hydrant, the hose should be between you and the hydrant.)

4. Loop the hose around the hydrant bringing the female coup1ing toward you and crossing over the hose line near the hydrant. Place one foot on the hose where it crosses and signal for the driver to proceed to the fire.

5. Remove both 2½" hydrant caps and the 4½" steamer cap with the hydrant wrench. Place the hydrant wrench on the operating stem with it pointing away from you. (At no time should you place the hydrant wrench on the ground.)

6. After the apparatus has advanced sufficiently, remove the hose from around the hydrant and attach the 3" hose to the hydrant nearest the direction of travel of the apparatus. Attach the 2½" hydrant gate and the 4½" butterfly valve to the other outlets. Make sure the hydrant gate is in the closed position and all connections are secure before opening hydrant.

7. Open the hydrant and supply truck with water from the 3" hose. Connect 2½" hose and open the 2½" gate valve to allow water to flow into the 2½" hose.

8. Proceed to the truck checking for and correcting kinks and leaks in the line.

NOTE: The procedures for catching with two lines is not sequential as to which line must be attached first.

CATCHING WITH A 5" LINE

The procedure for catching a hydrant with a 5" line is as follows:

1. Using the 5" supply hose, bring hose, hydrant wrench, and 2½" gate valve off the truck and wrap the hydrant in same manner as catching with a 3" line.

2. Remove one 2½" cap and the 4 ½" butterfly steamer connection cap.

3. Connect the 2½" gate valve and 4½" butterfly valve. Make sure all connections are secure and 2½" gate valve is closed.

4. Connect the 5" hose and make sure 4½" inch butterfly valve is open.

5. Open the hydrant (slowly) and supply truck with water from the 5" hose, making sure connections are secure and not leaking.

6. Proceed to the truck checking for and correcting kinks and leaks in the line. (Be careful when working with the 5" hose. The weight of this hose could cause serious injury.)

SNUBBING A HYDRANT

The term "Snubbing" a hydrant refers to wrapping the hydrant and not connecting the lines because the apparatus will be returning to that hydrant to pump. When laying hose for a long lay, it is beat to start by laying the 5" hose first. This will allow a larger quantity of water to be moved further with less friction loss. The 3" and/or 2½" hose may be added to complete the lay.

"Snubbing" One Line Long Lay

1. Bring the 5" hose, hydrant wrench and 2½" gate valve off truck and wrap the hydrant. (Use the same technique as catching with one line.)

2. Set the 4½" butterfly valve and 5" suction hose off at the hydrant. The 4½" butterfly valve and hose will be set off near the hydrant by a person other than the hydrant man.

3. Connect the 2½" gate and 4½" butterfly valve to the hydrant. Make sure the connections are secure and 2½" gate valve is closed.

4. Connect the 5" soft suction to the butterfly valve and roll it out to help spot the truck. (Roll the hose out in the direction of the fire.)

5. Connect the 5" suction hose to the truck and open the gate valve at the truck and hydrant.

6. Open the hydrant, making sure connections are secure and not leaking.

7. Assist the Engineer in making remaining hook-ups. The 5" supply line will be connected to a discharge of the pumper. (Three way Siamese and additional hose may be needed.)

8. Proceed to the truck checking for and correcting kinks and leaks in the line. (Be careful when working with the 5" hose. The weight of this hose can cause serious injury.)

5” LINE - LONG LAY

During long lays the best source of water is the 5” supply line. This allows a greater water supply with minimal friction loss. When long lays are needed, we often consider snubbing as our first option. From time to time this is not feasible. There are times when the second in pumper is delayed, a company responds alone or the fire size and situation requires an immediate water supply. In these situations catching for a long lay is needed. If a decision is made to carry out any of these operations, all units must be made aware of the officer’s choice. Once a second Pumper arrives, depending on the water supply available, it may be necessary for a Pumper to return to the water supply and act as a support Pumper.

5” Supply Line with Additional 5” Supply Line

1. The first in pumper catches the hydrant with a 5” line using normal procedures.

2. The pumper proceeds to fire area laying the 5” hose until all 5” is laid out.

3. Once the last coupling has hit the ground, the apparatus stops. The 1¾” man applies the 5” shutoff to the open end of the 5” hose.

4. The second pumper connects their 5” hose to the open end of the laid 5”

5. The second pumper proceeds to the fire area laying their 5” line.

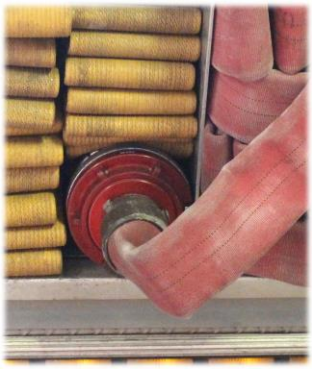
5” Supply Line with 3” Supply line

1. The first in pumper catches a hydrant with a 5” line using proper procedures.

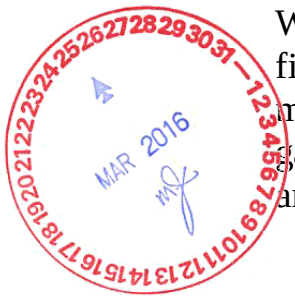
2. The pumper proceeds to fire area laying the 5” hose until all 5” is laid out.

3. There are now two options for continuing with smaller diameter hose.

   a. First option is to continue the lay using the 5” to 3” reducer connecting the 5” hose to the 3” hose. This will require no modification to hose lay process.



b. Second option is, once the last 5" coupling has hit the ground, the apparatus stops. The 1¾" man connects the three-way gated siamese to the open end of the 5" hose. Utilizing the double males, the 3" hose (and 2½" hose if distance allows) is connected to the siamese. When connections are made, proceed to the fire area laying desired hose. The hydrant man will charge the hydrant and open the gates on the siamese as he proceeds to the fire area.



MAKING UP FIREFIGHTING LINES

When making up or extending a firefighting line, you should use 2½" hose whenever possible. The 3" hose should be considered a supply line and not an attack line. The 3" hose is used for; catching hydrants, supplying standpipes, sprinkler systems and master stream appliances such as a water tower or deluge sets.

In Montgomery Fire/Rescue the terminology used for getting a firefighting line made up is referred to as "Making up a line" or "Flaking hose". Both terms are considered correct.

When making up a firefighting line the determining factor of how much hose to pull off will be left to the judgment of the individual responsible for flaking the line. As a rule of thumb, it is best to figure the distance from the truck to the fire area, and then add at least one section of hose to work at the fire. If there is any doubt on the amount of hose needed, it is best to have more than not enough.

When making up a line it is important to keep up with the number of sections pulled off the truck. One method of determining the proper number of sections is to count the number of whole couplings (couplings connected). Example: If you wanted 150 foot, you count two whole couplings and disconnect hose at the third whole coupling. (3 sections - 3 whole couplings)

ADVANCING PRECONNECT HOSE LOADS

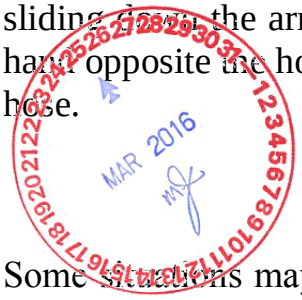
1¾" Preconnect

1. Stand on the ground or sideboard of the apparatus. Grasp the nozzle and extended fold, pull approximately half the load out.

2. Turn your back to the apparatus and situate the hose load on your shoulder with nozzle next to your neck.

3. Advance the hose, tossing and alternating flakes from the stack.

The shoulder carrying the hose should be raised slightly to prevent the hose from sliding down the arm; the hose should be flaked off, not allowed to pull off. The hand opposite the hose should be used to hold the hose, as the other hand flakes the hose.



Splicing 1¾" Preconnect

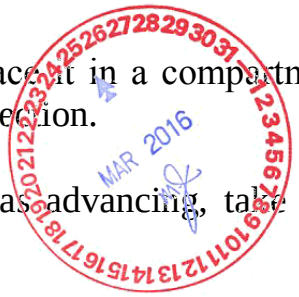
Some situations may require the splicing or connecting of both 1¾" lines in order to reach the objective. There are two methods of accomplishing this inline splicing and splicing at the truck.

If there is a doubt as to whether or not one 1¾" preconnect will reach the objective, it is best to lay one line and splice afterwards. This will prevent tying up two attack lines unnecessarily.

Inline Splice

The foam line should be advanced first to maintain foam capabi1ities. If the inline splice is needed, it is best to have another person bring the second 1¾" line.

Perform the steps in the following manner:



1. Disconnect the nozzle of 1¾" line not laid and place it in a compartment; disconnect coupling on top separating load from 4' section.

2. Load hose on shoulder using the same procedure as advancing, take hose clamp and proceed to nozzle of first laid 1¾" line.

3. Apply the hose clamp approximately 6 foot behind the nozzle of first laid 1¾" line.

4. Nozzleman of first laid 1¾" opens the nozzle, bleeds the pressure off and removes his nozzle.

5. Second man connects the nozzle to his line while first nozzleman pulls first couple of flake of hose off, stands on it and connects both lines.

6. Second nozzleman advances his line as the first nozzleman stands by the hose clamp. Once the line is advanced he opens the clamp to charge the line.

Splicing at the Truck

This method should be employed where it is evident that one 1¾" line will not reach the objective. This method is accomplished in the following manner:

1. Remove nozzle of the 1¾" foam line. (Foam capabilities will always be maintained.)

2. Disconnect the female coupling, on top of the second 1¾" line, separating the load from the shortened section.

3. Connect the female coupling of the second 1¾" line to the male coup1ing of the 1¾" foam line.

4. Both firefighters position loads on their shoulders (same side) and proceed to the objective, with the first (foam) 1¾" firefighter behind the second 1¾" firefighter. The rear 1¾" firefighter begins flaking the hose from their shoulder first, then advises the second 1¾" when to begin flaking.

2½" Preconnect

1. First man stands on the ground or tailboard of the apparatus. Grasp folded sections with nozzle and pull the load outward.

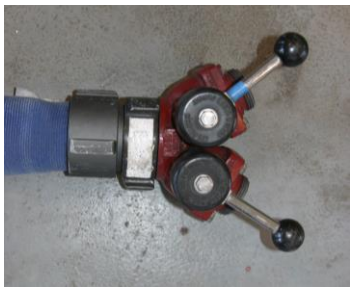
2. Turn your back to the apparatus and situate approximately one-third of the hose load onto your shoulder with nozzle on the bottom. Walk forward clearing the tailboard so the second man can approach.

3. The second man stands on ground or tailboard of the apparatus. Grasp folded sections of the remaining hose and pull the load outward.

4. The second man turns his back to the apparatus and situates approximately one-third of the hose load length on the same shoulder as the first man. Place hand under top fold. (Hand on same side hose is loaded) Both men walk toward the objective with the second man flaking the hose from his shoulder first.

SUPER SPLICE

The purpose of a super splice is to allow a rapid splice with the ability to utilize two 1¾" lines for fire fighting. This operation is used when distance and fire involvement are beyond normal expectations. When this operation is to be carried out, other units should be notified in advance.



1. Remove nozzle from 2½" preconnect and attach the 2½" gated wye to the hose. (store nozzle in a compartment)

2. Disconnect the first 1¾" at the 4' section.

3. Connect the 1¾" line to the 2½" gated wye of the 2½" preconnect.

4. The 1¾" man will lead the two men laying the 2½" preconnect as they advance towards the fire area. The man in the rear will began laying his hose first. The middle man will lay his hose second and advise the 1¾" man when to begin flaking.

5. The 2½" man will make sure the gate valves are closed and notify the officer when it is ready to be charged. The gates will then be opened when the 1¾" man is prepared and the officer has commanded.

6. The second 1¾" line may be connected by either the first or second in company depending on manpower.

MAKING AND ADVANCING FIREFIGHTING LINES

When flaking 2½" or 3" hose, the flakes may be pulled from the hosebed to the ground in either direction.

When flaking hose for fire fighting lines with the horseshoe load, it does not matter which side of the center you start flaking, as long as you continue flaking from the same side. To utilize the accordion load, flaking the hose off will depend on the direction in which the hose was loaded on the truck. If the hose is loaded from right to left, flakes will have to be pulled off left to right and vice versa.

For safety reasons, it is important to remember that you should never step off the

tailboard backwards. After grabbing the hose turn away from the truck before stepping off the tailboard.

Once the decision is made, as to which side to flake the hose, the procedures are:

1. If the 2½" hose is still connected to the 3" hose, disconnect it and take the female coupling of the 2½" hose and connect it to a discharge. It does not matter which side of the truck you hook to.

2. Stand on the ground or tailboard; grasp two or more folds or flakes, pulling them off the truck and to one side instead off directly behind the truck. This will clear the way for additional flakes to be pulled.

3. Again, remove two or more flakes from the hosebed, placing them beside the first flakes. If additional flakes are needed, remove them in the same manner.

4. When the desired amount of hose needed for the operation has been removed, disconnect the coupling of the last section from the hosebed. The coupling coming from the hosebed is placed back in the hosebed.

5. Connect the proper nozzle to the coupling of the last section needed for the layout and place it even with the folds; in the direction of travel. Facing the direction of travel, kneel on the knee closest to the hose. Pick up an odd number of folds and place them on your shoulder with the nozzle against your body. With hose on the shoulder and stepping backwards, stand up. (This utilizes the leg muscles instead of the back.) Walk forward enough to enable the second man to pick up additional hose.

SPECIAL MANEUVERS

The various basic hose loads, special loads, and load finishes have all been designed to enable fire fighters to more easily and effectively unload fire hose and advance it where it can be used. The previously discussed hose line-advancing techniques are basically for ground level operations from any one of the varied hose loads. Ground level operations bring the fire fighter only to the building entrance at which point he must apply what he has learned to those areas and obstacles inside the building. Hose lines must sometimes be elevated on the outside or inside of buildings to entrances that are higher than ground level, by means of ladders, ropes or existing stairways.

Advancing Hose Up A Stairway

Advancing hose up a stairway presents several conditions that hinder the operation. Hose is difficult to drag in an open space and is exceedingly difficult to drag around the obstructions offered by a stairway. Hose lines should be advanced before they are charged with water and this technique is particularly important for stairway advancement.

The ideal situation would be for the apparatus to be located near the point of entrance to a stairway but street conditions as well as fire conditions will not always allow this. So, when making up a fire fighting line for advancing up a stairway, one must allow for the distance from the apparatus to the entrance of the building plus additional hose to the designated fire floor. The rule of thumb for figuring the amount of hose needed for advancing hose up a stairway is one (1) section per floor plus at least a section of hose to work with on the fire floor. The size of the fire floor may require more hose to work with. In some cases, entrance to the fire floor may not be possible. So, excess hose should be flaked in an accordion manner on the stairway below the fire to eliminate possible kinks in the line when it is charged.

This procedure involves the same steps required for making up fire fighting lines at ground level. When advancing the hose up a stairway, each carrier should have the hose on a common shoulder and to the outside. When entering a building and the stairway turns to the left, the outside would imply the right shoulder for carrying hose and vice versa.

Advancing Hose up a Ladder

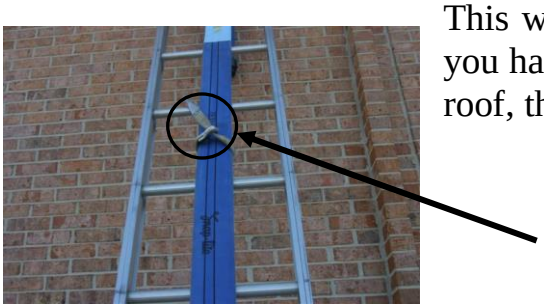
Advancing fire hose up a ladder should be done with a line that is not charged. If the hose is already charged with water, it will be safer, quicker and easier to relieve the pressure and drain the hose before the advancement is made.

Here again the ideal situation would be for the apparatus to be located near the base of the ladder, but conditions will not always warrant that. So, when making up a fire fighting line to advance up a ladder, one must allow for the distance from the apparatus to the ladder plus additional hose to the designated fire floor. The rule of thumb for figuring the amount of hose needed is one (1) section per three (3) floors plus at least one (1) section of hose to work with on the fire floor. Once again, the size of the fire floor should be considered when determining the amount of line to work with.

This procedure involves the same steps required for making up fire fighting lines at ground level. The ladder should be positioned with at least two rungs in the window. Set the top of the ladder inside the window frame, and against the frame on the same side the hose is coming from. If the window is too small, consider setting the ladder under the window to allow room for entry.

If the apparatus is any distance from the ladder the men will have to carry their respective folds stopping short of the ladder. Folds will then be arranged on the ground where the nozzle goes up first. Whenever possible, it is best to have one man at the base of the ladder to help feed hose to carriers and to have one man foot the ladder during advancement. The man with the nozzle begins his climb with the hose passing under the arm in the direction the hose is coming from, crossing the chest and over the opposite shoulder with the nozzle resting on the upper portion of the back.

The remaining men should climb the ladder about 10 feet apart; there should be about 20 to 25 feet of hose between each man. The 20' to 25' loop of hose between the men should be to the outside of the ladder beam. The nozzleman should communicate to the other men on the ladder when he is about to enter the window so they can tie in and pass the hose upward. Once the hose is in place it should to be secured to the ladder using rope hose tools or straps. They should be placed behind each coupling and every 20' of hose. This technique will take the weight off the couplings and prevent the hose from pulling out of the coupling. The hose should also be centered on the ladder to allow for an increased and safer climbing area on the ladder. It is also a good practice to run the hose through the rungs when entering the window. This will make sure the ladder is not removed once you have entered the building. (If the ladder is to the roof, the hose will be secured in the same manner.)



Hook facing away from climber to avoid being unhooked accidently.

FIRE STREAM NOZZLES

Basically, fire hose nozzles can be divided into specific groups:

- Hand-line nozzles and master stream nozzles, determined by the amount of GPM flow and the specific use.

- Open tip and fog/straight stream nozzles, determined by the design of the nozzle opening. A straight stream is created by narrowing the fog stream as much as possible. An open tip nozzle is one with a smooth open bore tip.

ADJUSTABLE PATTERN HANDLINE FOG NOZZLES

These nozzles are used on 1 ¾" and 2½" hose and are used as hand line nozzles or for use on hose lines that are directly controlled by fire fighters. They have three pattern settings, narrow, wide and straight.

The 1¾" fog nozzle has settings of 30, 95, 125, 150, 200 gpms and FLUSH.

The 2½" fog nozzle has settings of 125, 150, 200, 250 gpms and FLUSH. All fog tip nozzles have a nozzle pressure of 100 psi.

Turbine teeth spin on a swivel joint and give a fog pattern stream uniform shape and better dispersion which increases efficiency and steam production. They should be checked during normal apparatus checks and after every use to ensure they have not been damaged. If three (3) or more in a row, or five (5) total teeth are damaged or missing, the nozzle should be taken out of service and repairs made.

OPEN TIP HAND LINE NOZZLES

Open tip hand line nozzles ride on pumpers in sizes of 1⅛" and 1¼" and produce a solid stream. Open tip hand line nozzles have a nozzle pressure of 50 psi. The 1¼" nozzle has an output of 326 gpms and the 1⅛" open tip nozzle generates 265 gpms.

MASTER STREAM NOZZLES

Master stream nozzles may be mounted on aerial devices or deployed on monitor / deck guns as permanent or portable devices. The Monitor set can be put in service on the ground; they can be detached from the pumper and placed on a portable base.

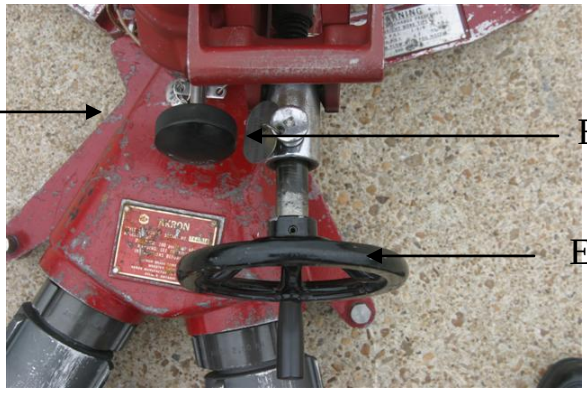
Aerial Mounted Master Stream Nozzles

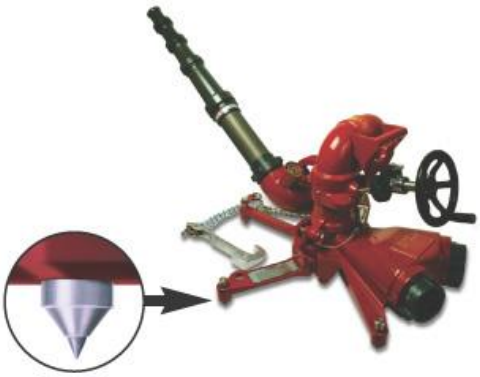
Portable Monitor Device

Unit on the ground

Portable base

Elevation is controlled by an adjustable wheel crank, a pull pin can allow the unit to drop below ground level, this feature should be activated when attached to the pumper and not on the ground, as the unit may get unstable and ultimately unsafe due to the force of the nozzle pressure. It has a turn radius of 180 degrees that is controlled by a screw knob that locks into place.





The portable base has spikes that are designed to be forced into the pavement or ground to help secure the unit when it's put into operation on the ground. The hammer hook on the chain can be used to secure the unit to a stake or stationary object or used for a hammer to set the base spikes.

The Master fog nozzle that rides on monitor guns has settings of 500, 750, 1000, and 1250.

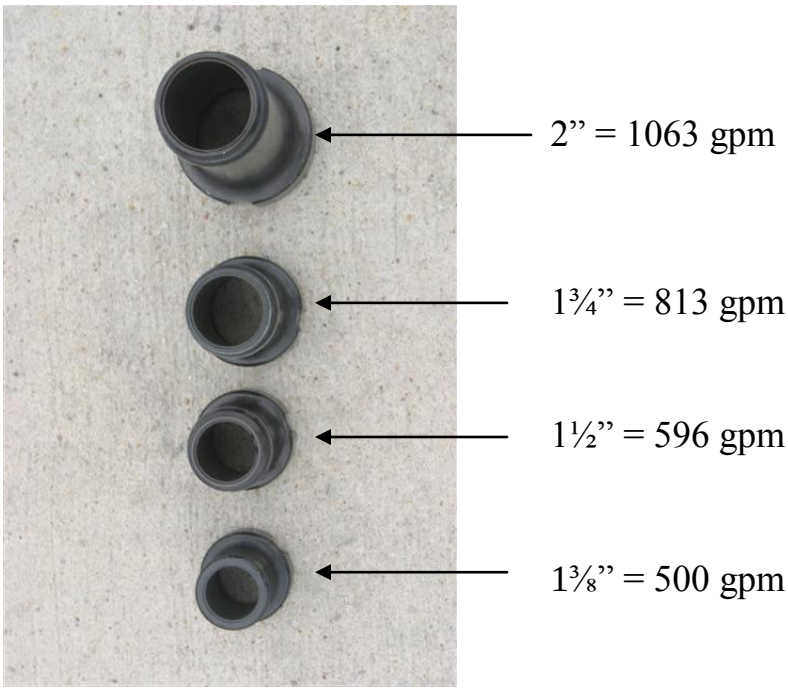
Several Engine Companies have remote controlled deck guns; they can be controlled from the pump panel or up to 300 feet away with a remote controller.

Pump Panel Control

Remote Control

The above controls are mounted on apparatus that did not come from the factory equipped with remote controlled monitor nozzles. Apparatus constructed with remote controlled monitors are similar in operation but the pump panel control is mounted not attached by cable.

The Monitor / deck gun Master fog nozzle can be detached and solid stream stack tip nozzles attached for added reach and penetration. Master stream open tip nozzles have a nozzle pressure of 80 psi.



Water flow in a hand line nozzle is controlled by the user, the handle moves back and forth and controls a ball valve assembly inside the nozzle that disrupts the water flow. Master stream nozzles do not have local shut off handles so they must be shut down at the water source or pump.

BAKER V. CELLAR PIPE

The Baker V. Cellar Pipe is designed to fight fire in concealed, hard to access areas such as cellars, basements, heavy stock rooms etc. A supply line is attached to the unit and then a hole is cut in the floor above the fire large enough to accommodate the nozzle. The water is turned on and flows through two 1 inch tips, delivering 500 gpms at 70lbs. nozzle pressure. It generates 40 lbs. friction loss per 100 feet of hose. This nozzle rides on Truck 45 and Truck 42.

The same detachable handle controls the up and down action of the nozzles and the water control mechanism.

WATER CONTROL

R-200 CELLAR PIPE

This nozzle is put into operation similar to the Baker V. nozzle; it is equipped with four 1½" fog tips. It generates 40 lbs. friction loss per 100 feet of hose and delivers 440 gpms at 125 lb. nozzle pressure. It is carried on Truck 41, 44, and Truck 46.

DISTRIBUTOR NOZZLE

This nozzle is designed to be used in similar situations as the R-200 nozzle. Water is dispersed through 9 off set openings causing the nozzle to spin 360 degrees. A hole is cut above the fire and the nozzle, attached to supply hose it is then dropped down, lowered all the way to the floor then elevated approximately half-way back up. The discharge will cover a diameter of approximately 56 feet. It operates with a nozzle pressure of 40 psi. and generates friction loss of 40 psi. per 100 feet of hose and can deliver 271 gpm. This nozzle is carried on all pumpers.

FRICTION LOSS

Friction loss is defined as the loss of pressure in the hose, pipe, and fittings. The actual friction loss is due to resistance to motion between the water and the inside of the hose or fittings. The friction loss increases as the GPM needs are increased. Therefore, as you adjust your nozzle GPM setting up or down or you change to a larger or smaller open tip nozzle, you must adjust your friction loss calculations and pump pressure.

HAND LINES

To standardize and simplify initial pump operations, all Montgomery Fire / Rescue Pumpers have pre-determined pump pressures for the pre-connected hand lines; this should include all 1¾", and 2½" lines. The friction loss in these hose lines has been figured and added into the final pump discharge pressure. (Be aware that as the nozzle's valves, turbines and waterways become worn, the pressure required to maintain an effective water stream will increase.)

Predetermined Pressures

1 ¾ Pre-connect	200 Feet	95 GPM	PDP = 130 psi
1 ¾ Pre-connect	200 Feet	125 GPM	PDP = 145 psi
1 ¾ Pre-connect	200 Feet	150 GPM	PDP = 170 psi
1 ¾ Pre-connect	200 Feet	200 GPM	PDP = 225 psi
1 ¾ Spliced	400 Feet	95 GPM	PDP = 155 psi
1 ¾ Spliced	400 Feet	125 GPM	PDP = 195 psi
1 ¾ Spliced	400 Feet	150 GPM	PDP = 240 psi
1 ¾ Spliced	400 Feet	200 GPM	Not Recommended

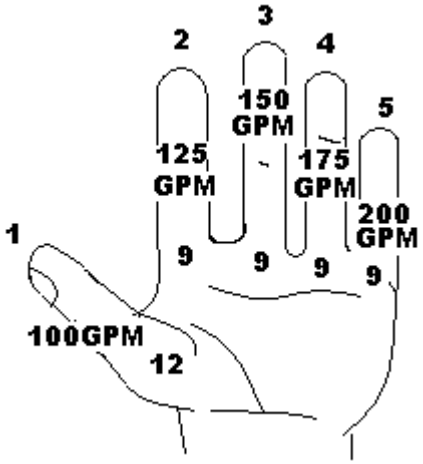
1 ¾ Foam operation	200-400 Feet	95 GPM	PDP = 200 psi
2 ½ Pre-connect	200 Feet	250 GPM	PDP = 125 psi
Super Splice	400 Feet	250 GPM	PDP = 175 psi

If a 2½ firefighting line is to be made up from the hose carried on the apparatus, the type of nozzle used will determine the friction loss in the hose line. If an $1^{1}/_{8}$" open tip nozzle is used, the friction loss can be calculated at 15 psi per 100 feet. If

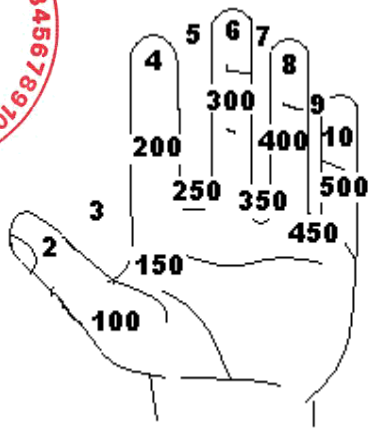
a fog nozzle set on 250 GPM is used, the friction loss can be calculated at 10 psi per 100 feet. These guidelines for figuring the friction loss can only be used with these nozzles because the friction loss is calculated by the gallons per minute flowing through the hose line assembly.

HAND METHODS

Since the friction loss is dictated by the GPM flowing, the hand methods can be used to determine the friction loss in other hose lines with different amounts of water flowing. These can be used with 1¾ and 2½ hose lines. Using either of the hand methods below will help you calculate the friction loss per 100 feet of the appropriate size hose being used.



1 ¾ METHOD



2 ½ METHOD

Once the friction loss has been calculated for the total length of the hose assembly, the nozzle pressure can then be added to it to find the Pump Discharge Pressure.

NOZZLE PRESSURES

To calculate the Pump Discharge Pressure of a given hose assembly, the friction loss has to be calculated and then added to the nozzle pressure. The nozzle pressures are:

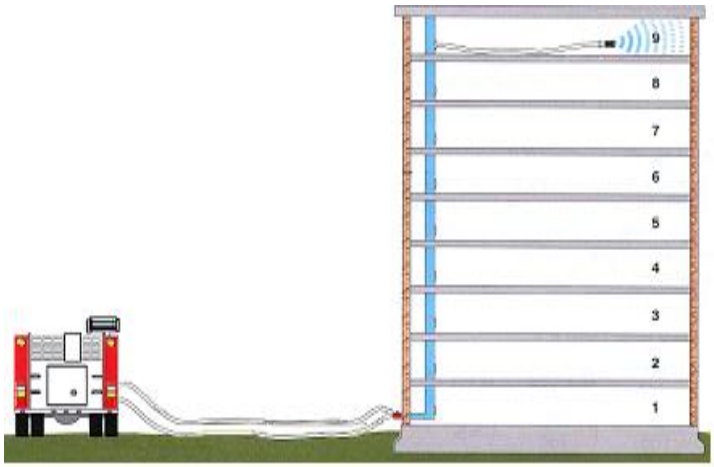
Open Tip (Hand Line)	50 psi
Open Tip (Master Stream)	80 psi
Fog Nozzle	100 psi

NOZZLE PRESSURE + FRICTION LOSS = PUMP PRESSURE

ELEVATION PRESSURE

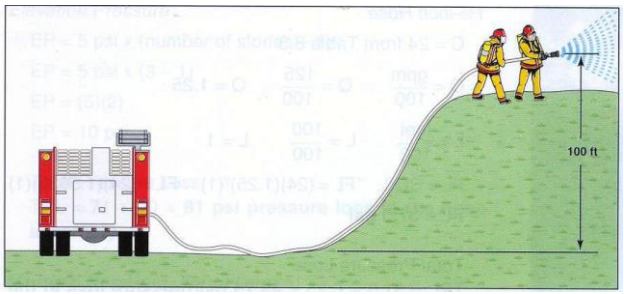
Elevation differences such as hills, aerial devices, or multi-storied buildings create a pressure loss known as elevation pressure. For a multi-story building, figure 5 lbs. of pressure per floor (10-12 feet) up to the fire floor and then subtract one floor. The answer will then be multiplied by 5 to find the friction loss due to elevation.

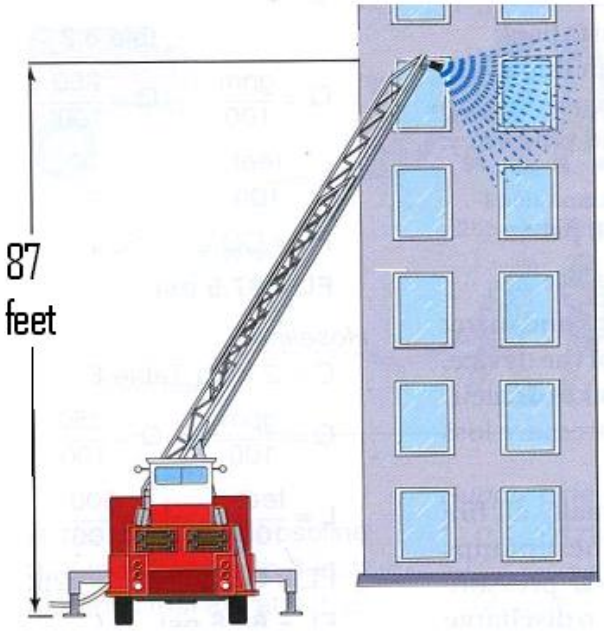
EP=5psi x (number of stories – 1)
EP=5psi x (9-1)
EP=(5) (8)
EP=40psi



If an aerial device is used as an elevated master stream or the hose line is laid up a hill, the friction loss due to elevation must be figured. The height of the nozzle or the hill will be multiplied by 0.5 or divided by 2 to determine the friction loss due to elevation.

EP= 0.5H
EP=(0.5) (100)
EP=50psi





EP= 0.5H
EP=(0.5) (87)
EP=43.5psi

NOZZLE PRESSURE + FRICTION LOSS + ELEVATION = PUMP PRESSURE

PACKAGE DEALS

When figuring pump pressures for different operations, a pre-set number is used to compensate for the friction loss due to piping, valves, and equipment. A package deal of 25 psi should be used when pumping to any master stream device regardless of the gallons per minute flowing.

WATER TOWERS

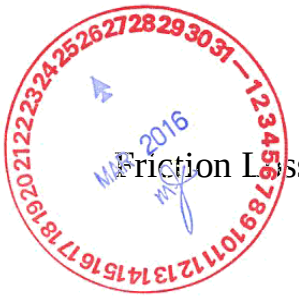
The flow capacities for the tower nozzles vary from 250-1250 GPMs. The water pressure at the pump panel should read approximately 180-200 PSI to maintain the rated capacity at the nozzle. To calculate needed water tower flow, a 25 psi package deal is used to include the intake, internal piping, and the nozzle. Friction loss due to elevation will be determined by the height of the nozzle allowing 5 psi per 12' of elevation. The pump pressure on a water tower should be controlled by communication between the aerial ladder operator and the pump operator. The gauges should be monitored until the correct pressure is achieved for the desired flow, not to exceed 200 psi when utilizing 5" hose.

FRICTION LOSS

When figuring pump pressures you have to consider the amount of pressure that is lost in the hose while the water is passing through it. Generally, when figuring the friction loss on 100ft. of hose while using an open tip nozzle, it is 15lbs. When using a fog tip nozzle its 10lbs. per 100ft. of hose. When using multiple supply lines to a master stream the following applies.

Friction Loss, Open tip nozzle — 80 lbs. Nozzle pressure

Number of lines
- 2 – 40 lbs. per 100 feet of hose
- 3 – 30 lbs. per 100 feet of hose
- 4 – 20 lbs. per 100 feet of hose



Friction Loss, Fog tip nozzle — 100 lbs. Nozzle pressure

Number of lines
- 2 – 30 lbs. per 100 feet of hose
- 3 – 20 lbs. per 100 feet of hose
- 4 – 10 lbs. per 100 feet of hose

Nozzle pressure + friction loss = Engine pressure

SPRINKLER SYSTEMS

When pumping to a sprinkler system the pump operator should maintain 150 lbs. engine pressure. The more heads that activate, the more the pressure will drop. The pump operator must continue to adjust the throttle until the max RPM's of 2500 is obtained.

STANDPIPE OPERATIONS

Friction loss in supply lines up to the Siamese is 15 lbs. per 100 feet. For lines of unequal lengths, always pump to the longest line. The package deal for the standpipe is 25 lbs. to account for the friction loss in the riser.

Figure 5 lbs. of pressure for each floor to compensate for back pressure generated by each 12' of elevation. Do not add 5 lbs. for the first floor or the fire floor. Example: Twelve (12) stories require 5 lbs. of pressure for ten (10) floors between first and fire floors – or 50 psi of elevation pressure added to pump pressure.

Supply hose friction loss should be figured at 15 lbs. per 100 feet of hose, inside and outside of the structure, regardless of the nozzle type. This requires totaling hose from the truck to the siamese and from the standpipe to the nozzle. Add 10 psi for an odd section (50' section) of hose.

HANDLINES

When figuring pump pressure for hand lines, Montgomery Fire Department pumpers have pre-designated pump pressures for most hose lays and initial attacks. Elevation can be considered if lines are advanced up multiple stairs or elevated terrain.

Fog tip nozzles have a nozzle pressure of 100 lbs.
Open tip nozzles have a nozzle pressure of 50 lbs.

Nozzle pressure + friction loss + elevation = Engine pressure

FOAM SYSTEMS

In using our foam there are several rules that should be adhered to. Our foam that is carried on pumpers is called Universal Gold, which is effective on hydrocarbon and polar solvent fires. A pumper normally has 15 gallons in a twenty gallon hopper; there is an additional 15 gallons that is carried in the basket in 5 gallon buckets. Universal Gold has a smothering and cooling effect on fire. The Foam levels in the hopper have to be visibly inspected, every Saturday and after every foam use, to make sure the foam level is maintained at full capacity. A wood paddle is supplied the every pumper to check the level and to periodically stir the foam.

One of the 1¾" lines is pre-connected to flow foam from the hopper. When splicing 1¾" lines (350-450ft) the steps are the same.

1) Have the nozzle set for 95 gpms.
2) Use the 3% setting for the eductor.
3) Pull water supply handle.
4) Pull eductor handle.
5) Pump [illegible] psi pump pressure.

PUMPER/ FOAM SELECTOR KNOB

Portable Foam Eductor

The 2 ½" foam eductor is designed to be used as an in-line operation or may be attached directly to a discharge gate.

1) Nozzle will be set at 120 gpm.
2) Pump pressure will be maintained at 200 psi.
3) Metering valve on the eductor will be set to correspond with the foam Concentrate being used.
4) No more than 1200 feet of hose will be used on the discharge side of the eductor.

EDUCTOR AT DISCHARGE **EDUCTOR INLINE**

Due to the corrosive effects of foam concentrate, certain precautions should be observed. The eductor should be disassembled, inspected, and cleaned after every use. Hoses and pick up tube should be thoroughly flushed with water and care should be taken to prevent concentrate from coming in contact with the truck, related equipment, and civilian property.

TACTICAL OPERATIONS

Montgomery Fire/Rescue employs tactical operations designed to enable us to make a quick attack on fires and at the same time have the capability of supplying enough water to handle large fires. The Chief Officer will be the officer to call for a tactical operation most of the time, there will be times that the first in officer will have to relay information and request a particular operation before the Chief is on the scene.

THINK FOUR

The **think four** operation utilizes four 1¾" hose lines on a fire. It is useful when there are multiple fire origins in a structure, when speed is a factor, and when added maneuverability and multiple points of access are needed.

A **think four** can be put in operation three different ways. The first way is utilizing both first and second in pumpers, laying off two 1¾" lines off each one. Both engines pump independently of each other. Both pumpers establish their own water supply.

The second is using the attack pumper, laying two 1¾" lines to the fire. The second in pumper brings a gated 2½ to 1½ wye and hooks to the attack pumper's discharge. They also disconnect two 1¾" lines from their pumper and re-attach them to the gate valve.

The third is utilizing the second in pumper as an appliance. Bringing a supply line from the attack pumper and pumping through the second in pumper, utilizing it as an appliance, using the two 1¾" hose lines already attached to fight fire.

TACT 1

The **TACT 1** Operation has been developed to boost pressure from the hydrant when there is an extremely long lay of supply hose or there is inadequate hydrant pressure available to make up for friction loss in the hose. It will also allow a pumper to exceed its rated capacity by increasing the available water supply pressure.

The **TACT 1** Operation begins with snubbing the hydrant, the 1¾" man sets off the fifty foot 5" section of hose along with the 4½" gate valve.

The hose remains wrapped around the hydrant and the pumper advances; laying off hose and spotting the apparatus.

There are times it might be necessary to kneel on hose to advance a lay; different situations might dictate a reverse lay from the fire to the hydrant.

The coupling should always be in front of the firefighter's knee to avoid injury in the event the hose binds and pull free.

The Hydrant is caught and the 50ft. section is hooked to the hydrant and to the intake of the second arriving pumper providing a water supply. The hydrant man will help spot the support pumper and flake the 50ft. section to assist with its hook-up.

The 5” hose laid by the first in pumper is attached to the discharge of the second arriving or support pumper.

The support pumper then pumps to the first in unit or the attack pumper, maintaining 150 psi in capacity. Although the easiest, most efficient way is to use 5” hose, alternate sized hose can be used if the situation called for it. To make up for the volume lost compared to the 5” hose, 2 lines can be layed down and back or one line, depending on the length of the lay and the amount of hose available.

INITIAL ATTACK

Initial attack can be described as the actions of the first arriving units to a working fire. Basically speaking, its putting two 1 ¾" lines in service and in to position and charge the 2 ½ pre-connect. The purpose is to deliver 400 gpm on a dwelling fire as fast and safe as possible. Two 1¾" hose lines are put in to operation within the first 60 seconds and the 2½" pre-connect within 2 minutes. Time restraints and expectations are when situations are ideal and conducive for speed. ISO requirements (Insurance Service Offices) dictate time allocations, and generally it's reserved for the drill field although the quick control of fire is always a factor, safety should never be sacrificed for speed. The best way to describe an Initial attack is to outline responsibilities.

Officer's duties:

Size up and advance a firefighting line that he deems necessary. The Officer directs fire ground operations or until relieved by a higher ranking officer and continue command assigned company. The second in Officer ensures that both 1¾" hose are laid off the first in pumper and the 2½" pre-connect is laid. Normally in a structure fire this Officer will assume command of the second 1¾" line.

Engineer duties:

1) Set emergency brake
2) Place chock blocks against the proper wheels.
3) Place pumper in pump gear.
4) Open valve to the first laid 1¾" line.
5) Open water valve
6) Advance throttle
7) Place a shutoff on the supply hose.
8) Break hose, and attach the supply line into an intake.
9) Charge second 1¾" line
10) Remove shut off.
11) Close tank to pump valve.
12) Obtain proper pressure and adjust relief valve as needed.
13) Charge 2½" back-up line when ordered.

These steps do not have to be sequential, but it's important that there is no disruption of the water supply.

The second in pumper Engineer will secure his apparatus and follow orders.

Hydrant Catcher: (Attack and Support Pumper)

1) Secure hydrant.
2) On the way to the fire check the supply line for kinks or leaks.
3) Check with the Engineer and assist if needed.
4) Obtain an SCBA and report to assigned officer.

Nozzlemen: (Attack and Support Pumper)

Nozzle men advance lines as directed by the Officer, they need to survey their route and make sure its clear of hazards (holes, debris, power lines etc.)