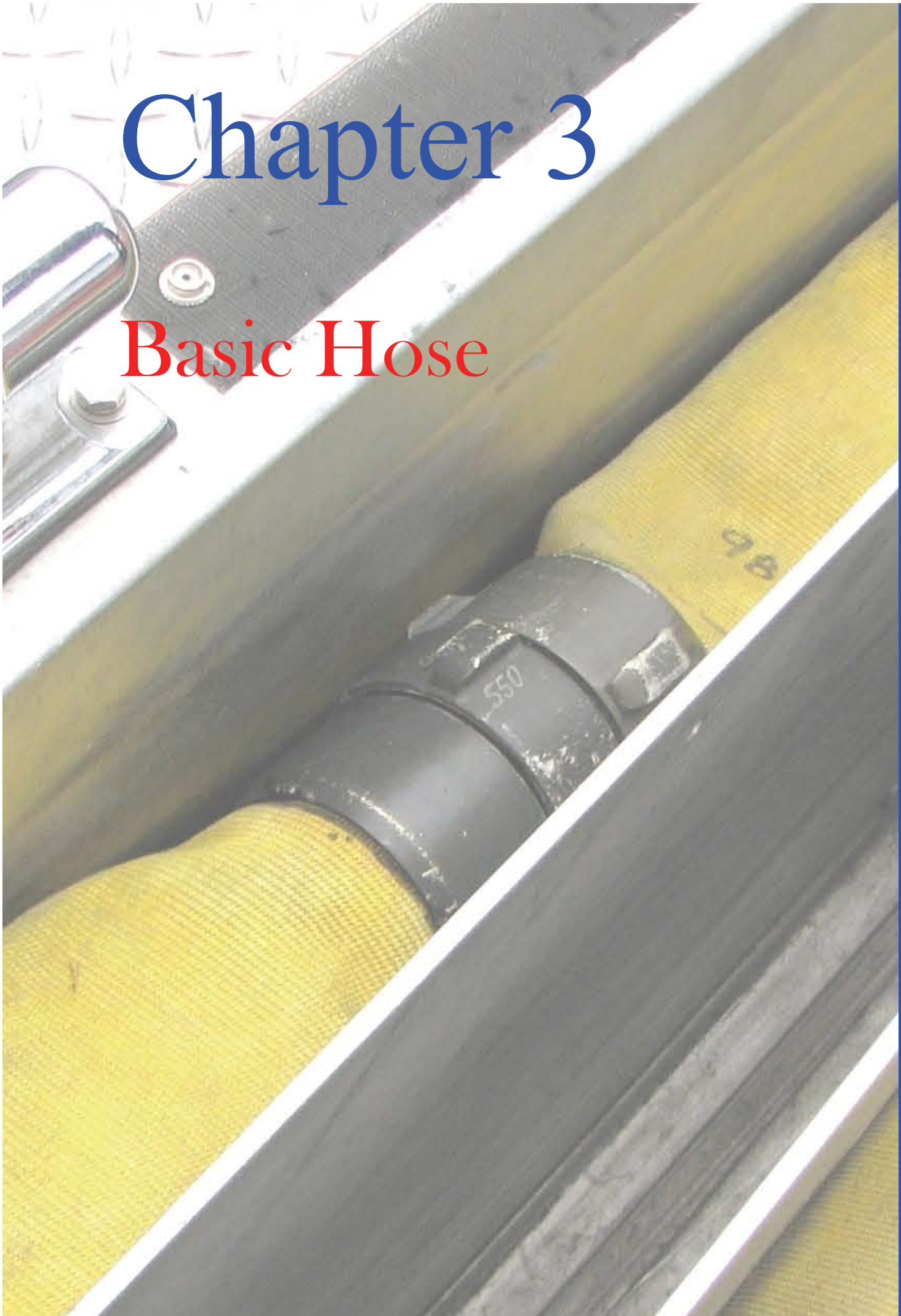


Chapter 3

Basic Hose

Chapter 3 – Basic Hose



BASIC HOSE INTRODUCTION

Simply stated, the mission of our organization is to save lives and protect property. The application of water on fire is a direct action that allows us to meet our goals and produce a successful outcome for those in danger during a fire.

A competent and well-organized deployment of fire hose is essential.

Any number of firefighters, in any combination, must be able to work in concert to make the appropriate hose lays quickly. Every second counts at a fire scene. There is no substitute for teamwork and there's nothing worse than a mistake in execution. The hose laying operation is often the most visible part of our job at a fire. Effective and coordinated execution gives the public a positive perception of our department and its members.

This section contains the information and techniques necessary for the loading and deployment of both supply and attack lines used in the Seattle Fire Department. These are among the most basic of firefighting skills and the foundation upon which all hose operations are built. A diligent study of these concepts will aid in the development of the necessary confidence needed to work with a first-line team.

BASIC HOSE GLOSSARY

AERATION-

A process by which air is introduced into a liquid, either by bubbling the air through it or by spraying the liquid into the air at normal pressures.

APPLIANCE-

Any variety of tools or devices carried on an engine that connect hoses or stream devices together.

APPARATUS-

A fire engine or ladder truck of any variety used in the fire service.

ATTACK LINES-

Hose lines or fire streams used to attack, contain, or prevent the spread of fire.

BALE-

The lever shut-off device on nozzles.

BIGHT-

Refers to a bend or a fold in a hose or a rope.

BODY LOOP-

A one inch piece of nylon sewn into a 51 inch continuous loop with all safe working loads computed at a 5:1 design failure. The vertical weight load limit is 300 pounds, choke weight load limit is 225 pounds and basket weight load limit is 600 pounds.

BOOSTER TANK-

An engine mounted water storage tank, with a minimum of 500 gallons. Same as “water tank.”

BRASS-

A copper-zinc alloy. Also a term used to describe hose couplings, whether or not they are made of brass or the lighter and stronger composite material, pyrolite.

BUNKER GEAR-

An entire set of firefighter’s protective clothing that includes helmet, coat, pants, boots, and gloves. Same as “turnouts.”

CENTRIFUGAL PUMP-

Pump with one or more impellers that utilizes centrifugal force to move the water. Most modern fire pumps are of this type.

CHARGE-

To pressurize a fire hose or fire extinguisher.

COMPOUND GAUGE-

A pressure gauge that is capable of measuring positive and negative pressures.

CROSS LOT-

An individual or group technique used to deploy hose over distance from the engine to an objective.

DUTCHMAN-

A short fold or reverse bend used to allow couplings to pay out without them turning over. Same as a “dog-leg.”

ENGINE PORT-

The largest discharge opening on a fire hydrant. Same as “steamer port.”

FLAKES-

Each single fold in a hose load.

FLOW-

The motion characteristics of water.

FORWARD LAY-

Hose laid from the water source to the fire.

G.P.M.-

Gallons per minute. A measurement used to describe the rate of flow.

GASKET-

A thin rubber O-ring that allows couplings and appliance to seat firmly and prevent leakage.

GATED WYE-

An appliance, equipped with manual valves, that allows a single hose to be split into two hoses.

HIGBEE CUT-

A machined 45 degree angle, cut into the threaded portion of couplings that allows for quick and easy threading.

HIGBEE MARKER/NOTCH-

An indentation in the rocker lug of a coupling that indicates the location of the Higbee cut.

HOSE PORT-

The smaller (2 ½”) discharge openings on a fire hydrant.

HOSE BED-

The main hose-carrying area of a fire engine.

IDLH-

Immediately Dangerous to Life and Health.

KEYSTONE-

The main intake valve located midship on both sides of a fire engine that may be manually or mechanically operated.

LDH-

Large Diameter Hose.

MARKER BIGHT-

A bight that extends four inches beyond the 2 ½” accordion hose load to serve as a reference for locating the couplings.

MASTER STREAM DEVICE-

An appliance that delivers a large quantity of water (at least 500 GPM) such as a deck gun, ground monitor, or ladder pipe.

OVERHAUL-

When referring to hose, means to carry or drag supply hose to a specific location.

P.T.O.-

Power take-off. Rotating shaft that transfers power from the engine to auxiliary equipment (fire pump).

PRESSURE GAUGE-

A gauge that measures the fire pump discharge pressure.

PRESSURE RELIEF VALVE (PRV)-

A device designed to release excess pressure from the fire pump.

PRIMING PUMP-

A small positive-displacement pump used to evacuate air from a centrifugal pump housing and hard suction hose.

P.S.I.-

Pound(s) per square inch. A measurement of pressure used in pumping, hydraulics, pneumatics, and operating hose streams.

REVERSE LAY-

Hose laid from the fire to the water source.

ROSS DUMP VALVE-

An adjustable valve plumbed into the intake side of the fire pump to mitigate any excess intake water pressure.

SEXLESS COUPLING-

Coupling with no distinct male or female components. Same as “Storz.”

SHAPER-

The front (rubber bumper) part of a nozzle that rotates and determines the shape and pattern of a water stream. Turn clockwise for a straight stream and counter-clockwise for a fog stream.

SHOULDER-LOAD-

A stack of hose flakes carried on the right shoulder.

SIAMESE-

An appliance that makes two hose lines into one.

SPANNER WRENCH-

A rigid or folding wrench used to tighten or loosen couplings.

STORTZ COUPLING-

A sexless coupling.

SUCTION-

Refers to an intake port or the intake side of an appliance.

TAILBOARD-

Back step of fire engine.

TRI-GATE-

Hose appliance that divides one larger hoseline into three or more smaller hoselines. Same as a “tri-gated wye.”

WATER HAMMER-

Force created by the rapid deceleration of water.

ROLLING AND UNROLLING HOSE

Seattle Fire Department hose is rolled into a single roll for storage and into a double roll to transport for repair. Hose is also rolled, when necessary, to purge the air so that the hose will load more compactly. The single and double rolls are to be done with the hose stretched straight, without turns or twists, and laid flat on the ground. Hose rolling is usually a one-person operation and best performed from the highest grade of land to the lowest to facilitate water drainage. A second member, when available, can expedite the operation by assisting with stretching and laying the hose.

Rolling Hose

The Single Roll - Storage

Figure 3.1 – Facing the open end of the male coupling, grasp the coupling with both hands and roll it away from the body and tightly into the hose.

Figure 3.2 – Continue to roll the hose until the roll reaches the female coupling, making an effort to keep the edges even, and to keep the roll tight.

Figure 3.3 – Roll until the female coupling is reached, lay the roll on its side and stamp out any protruding coils down into the roll. Carry the rolled hose on the shoulder, in both arms, or by inserting the fingers of one hand into the center of the roll, near the male coupling.



Figure 3.1



Figure 3.2



Figure 3.3

NOTE: Hose must be cleaned and thoroughly dried before single rolling the hose and placing into storage.

The Double Roll - Transport for Repairs

Figure 3.4 – Beginning with the hose stretched flat, grasp the male coupling and carry it back toward the female coupling. Lay the male coupling on top of the hose about six feet from the female coupling; then walk back to the bend (bight) in the hose, centering the top layer of hose over the bottom layer.

Figure 3.5 – Straddle the hose at the bight, facing the couplings. Pick up the bight of the hose with both hands and fold it over and away from the body. Keep the two layers in line and on top of one another, and continue to roll toward the couplings.



Figure 3.4



Figure 3.5

Figure 3.6 – The top layer of hose will move forward as the roll progresses toward the couplings, moving the male coupling closer to the female coupling. When the roll reaches the male coupling, stop. The female coupling should be sticking out a foot or two beyond the male coupling at the base of the roll.

Figure 3.7 – Next, lay the roll on its side and connect the two couplings. A layer of hose should now protect the couplings.



Figure 3.6



Figure 3.7

Figure 3.8 – The double roll should be secured with three lengths of heavy duty twine. Begin by threading one length down through the center of the roll and out to the side, coming back up between the couplings and the bight and between the two outermost layers of hose.

Figure 3.9 – Finish securing the roll by running two more lengths through the center and back around the outermost layers of hose. The three lengths should be evenly spaced about the circumference of the roll.



Figure 3.8



Figure 3.9

NOTE: If the hose has been damaged, a rag should be tied around the hose at the point of damage. Information should be written on the repair tag (F14) and attached to the hose. The damaged area should be indicated on the repair tag by noting the number of feet from the male coupling.

Unrolling Hose

Traditional method

The traditional method to unroll hose is to grasp the outside coupling and to push the rest of the roll away, allowing the roll's own inertia to unwind it. However, the problem with this method is that the male coupling at the other end could become damaged as it snaps downward against the ground from the momentum of the unrolling action. When couplings are not "coupled" they can become "out of round" when violently handled. The following method avoids this problem and works especially well when space is limited.

Butterfly Method

Figure 3.10 – Begin by unwinding one layer of hose and standing the roll on edge. Next, grasp the first layer of hose on the roll, lift it enough to create some slack, and move it to one side of the roll.

Figure 3.11 – Grasp the next layer (now the top layer) in the same manner and move it to the opposite side. Continue pulling successive layers to alternate sides until the roll is deployed.

Figure 3.12 – Finally, grasp the male coupling from the center of the roll and walk away, stretching the hose out on the ground.



Figure 3.10



Figure 3.11



Figure 3.12

MAKING AND BREAKING COUPLINGS

The following instructions include directions for making and breaking hose using one and two person methods. Couplings are normally made (coupled) hand-tight against the gasket. Over-tightening of a connection by two members should be avoided since the connection may have to be broken (uncoupled) by one member. With couplings and gaskets in good repair, a hand-tight connection is enough to prevent leakage under pressure.

Before connections are started, the female coupling should be checked to ensure the gasket is in place.

The general rule is that couplings are made or broken while facing the male coupling and turning the female swivel.

From the perspective of “looking at the male coupling”, the female swivel is turned right (clockwise) to make, and turned left (counter-clockwise) to break connections. By keeping the crease of the female end of the hose slightly out of line counter-clockwise from the crease on the male end, you can turn the swivel of the female coupling in a clockwise direction until seated and finish the tightening by grasping both the female swivel and bowl firmly and turning clockwise to align the creases on both sections of coupled hose.

The exceptions to this rule occur when attaching lines to fixed appliances with swivels (building FDC's), to portable appliances, and female engine connections. In this case, the swivel must be faced and will be operated from the opposite side of the swivel.

NOTE: Start couplings quickly, and easily, by aligning the Higbee markers. The Higbee marker identifies a point on the coupling where the first full thread starts. When coupling hose without the Higbee marker, turn the female swivel counter-clockwise against the male coupling until a slight click is felt between the two couplings. At that point, the threads of both couplings are aligned.

One Member (Standing Method)

Figure 3.13 – Begin by holding the hose between the legs, near the female coupling. (An acceptable change would be to hold the hose at the female coupling slightly below the waist.) Grasp the bowl of the male coupling with the left hand, palm up, with the left elbow resting against the left thigh.

Figure 3.14 – To make the coupling, grasp the swivel of the female coupling with the right hand and align the two couplings in the same plane. The swivel should be turned clockwise. To break the coupling, the swivel should be turned counter-clockwise.



Figure 3.13



Figure 3.14

One Member (Stepping on Hose Method)

Figure 3.15 – With the hose on the ground, face the male coupling and place one foot directly behind the bowl of the male coupling. The action of stepping in this location should change the angle of the coupling with relation to the ground making the connection easier.

Figure 3.16 – To make the coupling, grasp the swivel of the female coupling with both hands, align with the male coupling, and turn in a clockwise direction. To break the coupling, turn the swivel in a counter-clockwise direction.



Figure 3.15



Figure 3.16

One Member (Alternate Stepping on Hose Method)

Figure 3.17 – Place the coupling on the end of a short double fold to aid in tilting it upward. Step on the short double fold with the left foot (or knee) and rotate the coupling with both hands.

Figure 3.18 – To make the coupling, grasp the swivel of the female coupling with both hands, align with the male coupling, and turn in a clockwise direction. To break the coupling, turn the swivel in a counter-clockwise direction.



Figure 3.17



Figure 3.18

Two Members

Figure 3.19 – To make the coupling, begin with one member holding the male coupling and the second member holding the female coupling. The member with the male coupling grasps it with both hands around the bowl and holds it in a horizontal plane allowing the other member to align the couplings. It is important that the member with the male coupling look completely away to eliminate the tendency to assist.

Figure 3.20 – The member with the female coupling then grasps the bowl with the left hand and the swivel with the right hand, aligning the female coupling with the male coupling. This member then turns the female swivel in a clockwise direction with the right hand until the couplings are seated. Finish by grasping both the swivel and bowl with both hands and turning clockwise, aligning the creases.

To break the coupling, the member with the male coupling grasps it firmly while the other member turns the swivel counter-clockwise until the coupling is broken.



Figure 3.19



Figure 3.2

Two Members Un-Coupling Hose (Spanner Wrenches)

Figure 3.21 – The two members begin by facing each other with the member on the side of the male coupling positioning a spanner wrench on the lug of the bowl, applying force in a counter-clockwise direction.

The member on the female coupling side then positions a spanner wrench on the lug of the female swivel and turns in a counter clockwise direction until the connection is broken.



Figure 3.21

A single member can complete this by kneeling at the hose and alternating the spanner wrenches in the same fashion as described above.

ATTACHING AND REMOVING NOZZLES

One Member (Standing Method)

Figure 3.22 – To attach the nozzle, face the male coupling and grasp the bowl of the coupling with the left hand palm up while bracing the left forearm against the left thigh. Grasp the nozzle by the barrel with the right hand at a point where the nozzle is in balance.

Figure 3.23 – Align the couplings and turn the nozzle in a clockwise direction to start the connection. Continue to rotate the nozzle until the coupling is seated and hand tight.

To remove the nozzle, rotate the nozzle counter-clockwise while bracing the male coupling with the left hand.



Figure 3.22



Figure 3.23

One Member – (Stepping on Hose Method)

Figure 3.24 – To attach the nozzle, fold two short double flakes ending with the male coupling on top.

Figure 3.25 – Step on the folds, just behind the male coupling, with the left foot. Align and attach the nozzle with both hands rotating clockwise. Continue to rotate the nozzle until the coupling is seated and hand tight.

To remove the nozzle, rotate the nozzle counter-clockwise with the left foot stepping on the hose, just behind the male coupling.



Figure 3.24



Figure 3.25

NOTE: If the female coupling of the nozzle has a moveable swivel (like the TFT[®] Midmatic or Handline nozzles), grasp the barrel with the left hand and turn the swivel with the right hand.

Two Members

Figure 3.26 – The two members begin by facing each other, one member with the male hose coupling and the other member with the nozzle. The member with the male coupling grasps the bowl with both hands, holding the coupling in a horizontal plane. This member makes no attempt to align the couplings and needs to look away completely to avoid the tendency to assist. The member with the nozzle then grasps the barrel of the nozzle with both hands, aligning the coupling of the nozzle with the coupling on the hose. Turn the nozzle in a clockwise direction until seated hand tight. If the female coupling of the nozzle has a movable swivel, grasp the barrel with the left hand and turn the swivel with the right hand in a clockwise direction until tightly seated.



Figure 3.26

STRETCHING AND CARRYING HOSE

A shoulder-load is a method of carrying hose to an objective. Remember to pull and lift the shoulder-load with the arm and leg muscles, not the back muscles. Maintain the flakes of the shoulder-load in an upright position with the arms and hands providing support. The flakes should be positioned with one-third of the length in front of the body and two-thirds in back with the nozzle or coupling at slightly above the waist.

Adjust the load, if necessary, to prevent the hose from dragging on the ground. Always exercise caution when stepping away from the tailboard with a shoulder-load of hose.

Shoulder-loading Hose from the Ground After Use

Shoulder-loading Stretched Hose

Figure 3.27 – After the hydrant has been shut down, pressure has been released, and all couplings have been broken, straighten the hose line and eliminate all kinks to allow drainage. When the hose is laid out on level ground, start with the coupling farthest from the engine.

NOTE: Consider starting with the coupling at the highest elevation when shoulder-loading on a grade.

To begin, face the hose and place the initial coupling against the front of the body about chest high. The hose should then be passed over the right shoulder with the hose laying flat on the shoulder. This will form a flake with the bight behind the knee joint.

Figure 3.28 – Form another flake in front of the body with the bight slightly above the waist.

Figure 3.29 – Continue to form flakes in the same manner while keeping each flake flat, the same length, and on top of the previous flake. When the other coupling is reached, lift it from the ground and press it onto the top of the shoulder-load at chest height. Carry the shoulder-load to the engine and lay it on the ground in position for loading, parallel to the tailboard and three feet away.



Figure 3.27



Figure 3.28



Figure 3.29

Shoulder-loading a Flaked Bundle

Figure 3.30 – “Dress” the hose on the ground so that the flakes are parallel and free of entanglement. Stand alongside the hose, adjacent to the nozzle, or the male coupling, or the last flake to be extended, whichever is appropriate.

NOTE: If the bundle is significantly “messy” and you are in a hurry to accomplish a hose lay, the front third of the bundle is the most important part of the bundle to “dress” prior to attempting to shoulder-load the bundle.



Figure 3.30

Figure 3.31 – Kneel down next to the hose while facing the nozzle or the front of the hose bundle. Using both hands, gather and squeeze the flakes together, lifting the forward bights from the ground.

Figure 3.32 – Lift the bundle and place it flat on the shoulder with the other flakes stacked vertically on top of it. Then stand, taking care to use the leg muscles and to avoid twisting the back. All hose will be shoulder-loaded in this manner, regardless of diameter.



Figure 3.31



Figure 3.32

Shoulder-loading hose from the Engine

1 3/4" Preconnect Shoulder-load

Figure 3.33 – Begin by facing the open end of the hose slot. When necessary, stand on the tailboard to reach the hose with good body mechanics. Grasp the entire bundle with both hands and pull it one-third of the way out of the slot.

Figure 3.34 – Pivot toward the hose, turning the back toward the hose slot, and placing the bottom flake of the bundle on the right shoulder. The nozzle and front flake should be at the belt line.



Figure 3.33



Figure 3.34

Figure 3.35 – Hold the bundle tightly in front of the body with both hands. Step away from the engine in a straight line and pull the remainder of the bundle completely out of the slot. Continue to move away from the engine stretching out the slack behind the shoulder-load. The hands should grip the hose flakes so as to allow the hose to pay out gradually from the top, one flake at a time.

Figure 3.36 – Continue in this manner until the objective is reached. The tie-rope will have to be removed once about 25 feet away from the tailboard. Any excess working line is then arranged so as to be free of kinks and is placed into a configuration (large flakes or a coil) that will allow for easy advancement



Figure 3.35



Figure 3.36

1 3/4" Wye Bundle Shoulder-load

Figure 3.37 – Begin by facing the open end of the hose slot. When necessary, stand on the tailboard to reach the hose conveniently. Grasp the top bundle (consisting of 100 feet of hose and the nozzle) and pull it one-third of the way out of the slot.

Figure 3.38 – Pivot toward the hose, turning the back toward the hose slot, and placing the bottom flake of the top bundle onto the right shoulder. The nozzle and front flakes should be at the belt line.



Figure 3.37



Figure 3.38

Figure 3.39 – Hold the bundle tightly in front of the body with both hands. Step away from the engine in a straight line and pull the remainder of the bundle completely out of the slot. The member with this shoulder-load then moves away from the tailboard in a straight line until the slack in the line is stretched taut (six to eight feet) and waits.

Figure 3.40 – The second bundle is then shoulder-loaded by the second member in a manner identical to the shoulder-loading of the first bundle. The two members then proceed to the water source, taking care not to drag the length of hose between them on the ground.



Figure 3.39



Figure 3.40

Figure 3.41 – Once the connection is made between the wye and the water source, the team will advance together to their objective. The rear member grips the hose flakes to allow the hose to pay out gradually from the top, one flake at a time. As the rear member notices the last flake of the shoulder-load is about to pull off, he/she shouts for the member ahead to “stretch” and allows the last flake to drop from the shoulder. The forward member then stretches the shoulder-load in an identical manner until the objective is reached. Any excess working line is then arranged so as to be free of kinks and in to a configuration (large flake or a coil) with allows for easy advancement.



Figure 3.41

2 ½” Hose Shoulder-load

Figure 3.42 – Begin by facing 2 ½” hose bed from the tailboard. Grasp the top bundle (the first 100 feet tied together with the nozzle attached) with the right hand just behind the nozzle and the left hand on top of the bundle. Lift the bights slightly and pull the shoulder-load about one-third of the way out of the bed.

Figure 3.43 – Turn toward the hose and twist the flakes into an upright position with the nozzle on the bottom. The couplings should be positioned on top of the hose bundle. Continue to pivot toward the hose, turning the back toward the hose bed and placing the bottom flake flat onto the right shoulder.



Figure 3.42



Figure 3.43

Figure 3.44 – Hold the bundle tightly in front of the body with both hands. Step away from the engine and pull the remainder of the bundle completely out of the hose bed. The nozzle and bottom flakes should end up at the waist line.

Figure 3.45 – Additional shoulder-loads, if necessary, are removed in a similar manner. The hose should not be broken until it is determined that the amount removed is sufficient, until the stretch has been completed, or if the hose is to be connected to a water source separate from the engine.



Figure 3.44



Figure 3.45

Additional 100 foot Section of 2 ½” (single firefighter operation)

Figure 3.46 – The first member shoulder-loads the top most section of hose, then turns back toward the engine and grasps the center flake bight of the next section. The member then steps away from the engine, pulling the second section onto the ground until it is completely removed from the hose bed.



Figure 3.46

Large Diameter Hose Shoulder-load

Figure 3.47 – Begin by uncoupling the large diameter hose (LDH) from the tri-gate. While facing the LDH bed, place the coupling against the front of the body just above the waistline.

Figure 3.48 – The hose should then be passed over the right shoulder with the hose laying flat on the shoulder. This will form a flake with the bight behind the knee joint.



Figure 3.47



Figure 3.48

Figure 3.51 – Continue to form flakes, keeping the bights in front of the body above the waist. Each flake should be flat, the same length, and on top of the previous flake.

Figure 3.52 – When the first section (50 feet) has been shoulder-loaded and is within 10 feet of the coupling, move back several steps to allow a second member to shoulder-load the next section.



Figure 3.51



Figure 3.52

Figure 3.53 – The second member takes a position facing the hose bed, the coupling in front of him/her, with the hose lead running alongside his/her left side.

Figure 3.54 – The member picks up and passes the hose coupling across the body (from the left foot and over the right shoulder) and shoulder-loads the hose as the previously described. The coupling should now be at the small of the back.



Figure 3.53



Figure 3.54

Figure 3.55 – Additional members continue shoulder-loading hose in this manner until the designated amount has been acquired and the final coupling has been broken. The members then turn away from the hose load (a counter-clockwise pivot 180 degrees to the left), allowing the top flake to drop from their shoulder-loads. The rear-most member should be holding the final coupling in front of the body at about chest-level.

The members should then be facing away from the engine with the hose running continuously between the members and flaked on the members' right shoulders. Keep the slack between the members off of the ground.



Figure 3.55

Overhauling Large Diameter Hose (LDH)

Crosslotting LDH

Figure 3.56 – Uncouple the large diameter hose from the tri-gate. Grasp the female coupling with both hands and pull about ten feet of hose from the bed.

Figure 3.57 – While turning away from the engine, form a bight in the hose about four feet behind the coupling. Place the newly formed flake flat on the right shoulder with the bight in front of the body and the coupling against the back.



Figure 3.56



Figure 3.57

NOTE: It is unsafe to place an arm through the bight formed in front of the body.

Figure 3.58 – The member then moves quickly away from the engine, pulling the hose from the hose bed. The member should look backward frequently and should pause slightly when the next coupling emerges from the hose bed.

Figure 3.59 – As the coupling emerges, a second member, facing away from the engine, grasps the hose and places it flat on their shoulder with the coupling along their back. Additional hose is removed in the same manner until the objective is reached. With limited staffing, each member may stretch two sections, with members spaced at every other coupling.



Figure 3.58



Figure 3.59

Crosslotting LDH with the Tri-Gate Attached

Figure 3.60 – Two members begin by picking the tri-gate up by the handles and advancing toward the objective. As the coupling emerges from the hose bed, the two members pause slightly. Another member, facing away from the engine, then places the hose flat on their right shoulder with the coupling to the rear. Additional hose is removed in the same manner until the objective is reached. With limited staffing, two sections may be stretched by each member, with members spaced at every other coupling.



Figure 3.60

LOADING HOSE ONTO THE ENGINE

Loading 2 ½" Hose (Accordian Load)



Figure 3.61 – Begin preparing the hose for loading by; arranging it in flakes near the rear of the engine. The flakes should run parallel to the tailboard with the female coupling nearest the engine. Neatly arrange each additional section against the previous section and progressively away from the engine, keeping them free from twists and entanglements. Bring the last coupling around the ends of the hose to be loaded and place it on the ground at the tailboard. Do not make any coupling connections at this time.

Figure 3.62 – Place the female coupling at the far left side of the open end of the 2 ½" hose bed. Hold the coupling in place and pass the hose, on edge, toward the closed end of the compartment.



Figure 3.61



Figure 3.62

Figure 3.63 – Near the closed end of the bed, make a bight in the hose to form a flake of the desired length (about seven feet). Press the hose on its edge (on the fold) tightly against the left side of the compartment.

Figure 3.64 – Bring the hose, still on its edge, back to the open end of the bed. Form a bight in the second flake, keeping the end of the bight even with the open edge of the compartment bottom. Repeat this operation until the first section is almost loaded.



Figure 3.63



Figure 3.64

Figure 3.65 – Connect the male coupling of the first section to the female coupling of the second section. Continue loading, adjusting the previous flake to keep the coupling within 18 inches of the open end of the hose bed. The hose must be arranged so that the coupling pulls straight out of the hose bed.

Figure 3.66 – Continue to form accordion folds, adjusting the length and number of flakes to control the snugness of the bottom layer in the hose bed. All layers should be tight enough between the sides of the bed to prevent shifting of the hose during movement of the engine and yet permit removal of the hose without extreme effort. Complete the bottom layer to within 14 feet of the male coupling.



Figure 3.65



Figure 3.66

Figure 3.67 – The next layer is begun with the 14 feet of hose remaining from the first layer. Feed it, on edge, a short distance (about one foot) toward the closed end of the bed. Then bring it up and lay it flat so that it runs diagonally across the width of the bottom layer.

Figure 3.68 – Twist the hose back upon itself so that it is on edge again and start the new layer on the left side of the compartment. Make sure that this beginning turn is placed down at the closed end of the hose bed.



Figure 3.67



Figure 3.68

Figure 3.69 – Continue to form flakes on the second layer in the same manner as the bottom layer, except the second and each subsequent layer will now contain marker bights. The marker bight will extend 4 inches beyond the others to serve as markers for locating couplings.

Figure 3.70 – Additional layers are formed in this manner. The last section of hose loaded will be prepared as a 100 foot bundle. Attach the nozzle to the final male coupling and place the nozzle against the last bight formed and even with the open end of the hose bed.



Figure 3.69



Figure 3.70

Figure 3.71 – Finally, secure this section of hose and the nozzle together with a tie rope. The bights of the hose flakes should all be in even alignment with each other and with the bottom edge of the open end. The marker bights should be stacked vertically, lined up one on top of the other, and should all extend the same distance from the rest of the load. Each layer should be packed snugly between the side walls of the hose bed.



Figure 3.71

Loading LDH (Flat Load)

Figure 3.72 – Begin by placing the male LDH coupling, with a 4" to 2½" reducer coupling attached, on the right side of the hose bed, just past the open end of the hose bed. Pass the hose straight back into the bed, lying flat, all the way down to the closed end of the compartment.

Figure 3.73 – At the closed end of the bed a bight will be formed in the hose and lead the hose back up toward the open end. Keep the hose directly on top of the first flake for about half the distance to the open end and then adjust it so that it runs against and parallel to the first flake for the remainder of the distance to the open end.



Figure 3.72



Figure 3.73

Figure 3.74 – Form a bight in the hose and keep it even with the open end of the hose bed. Then pass the hose back toward the closed end with the hose running against and parallel to the initial flake, once again forming a bight at the closed end.

Figure 3.75 – Continue to form flakes in this manner, moving over one hose width at the halfway point when returning to the open end. Upon reaching the left side of the bed, form flakes in the opposite direction back toward the right side. When the next coupling is reached, connect the next section of hose and position the coupling within three feet of the open end. Form additional layers in the same manner, keeping the couplings within three feet of the open end, until the full complement of hose has been loaded.



Figure 3.74



Figure 3.75

Figure 3.76 – Connect the final coupling, a female, to the tri-gate. To minimize the “flipping-over” effect on the tri-gate when it is charged with water, a half twist must be introduced into the LDH before it attaches to the tri-gate. To create this, face away from the tailboard with the female coupling of the LDH in both hands. Turn 180 degrees to your right, while keeping the LDH on the same plane and attach the female coupling of the LDH to the tri-gate. The bights of the hose flakes should all be in even alignment at both the open end and the closed end of the hose bed. Coupling markers are not used.



Figure 3.76

Loading the 1 ¾" Wye (Slot Load)

Figure 3.77 – Begin preparing the hose for loading by arranging the two unconnected bundles of 1 ¾" hose at the rear of the engine. The flakes should run parallel to the tailboard with the male coupling of the first bundle nearest the tailboard.

Figure 3.78 – Measure off 15 feet from the male end of the first bundle. This is approximately twice the width of the tailboard or three wingspans (as shown.)



Figure 3.77



Figure 3.78

Figure 3.79 – Leave the 15 feet of hose extending out from the open end of the slot. Load the remainder of the 100 foot bundle into the hose slot in a vertical stack.

Figure 3.80 – The flakes at the open end of the slot should extend 6 to 9 inches from the slot opening with the female coupling located right at the slot opening.



Figure 3.79



Figure 3.80

Figure 3.81 – Connect the 1 ½” wye to the female coupling and secure the bundle and wye with a tie rope at the slot opening.

Figure 3.82 – Pass the 15 feet of slack with the male coupling over the loaded bundle and then up and out the back of the slot at the closed end.



Figure 3.81



Figure 3.82

Figure 3.83 – Attach the nozzle to the second bundle and begin loading the second 100 feet by placing the nozzle in the slot with the tip even with the protruding folds of the first bundle.

Figure 3.84 – The hose of the second bundle is then passed back into the hose slot and flaked in vertical stacks. The flakes will continue to extend 6 to 9 inches from the open end of the slot.



Figure 3.83



Figure 3.84

Figure 3.85 – Grasp the male coupling of the first bundle which was left leading out of the back of the hose slot and connect it to the female coupling on top of the second bundle.

Figure 3.86 – Finish the load by tying both individual sections together with a tie rope. The tie rope should be tight and tied with a quick-release knot. The bundles stay together best if the tie rope is tied “hose to hose”. Do not incorporate any of the 15 foot section that was initially measured off to separate the bundles in the tie ropes. The flakes, the wye, and the nozzle should all be protruding an identical distance from the open end of the slot.



Figure 3.85



Figure 3.86

Loading the 1 ¾" Preconnect (Slot Load)

Figure 3.87 – Begin preparing the hose for loading by arranging the two unconnected bundles in flakes at the rear of the engine. The flakes should run parallel to the tailboard with the male coupling of the first bundle nearest the tailboard. Attach the nozzle to that first coupling.

Figure 3.88 – Start the load by placing the nozzle in the slot and allow it to extend 6 to 9 inches out from the open end of the slot. (Different brands of nozzles may need to extend slightly farther.)



Figure 3.87



Figure 3.88

Figure 3.89 – Pass the hose toward the back of the slot and form a series of vertically stacked flakes until the first 100 foot section is loaded. The folds at the open end should be aligned with each other, 6 to 9 inches from the slot opening.

Figure 3.90 – Connect the male coupling from the second bundle to the female coupling on top of the first bundle. Continue to flake the second bundle in a vertical stack on top of the first bundle until the full 200 feet have been loaded.



Figure 3.89



Figure 3.90

Figure 3.91 – Finish the load by connecting the final female coupling to the preconnect discharge outlet. Then tie the 200 foot load and nozzle with a tie rope at the slot opening. Leave the top three bights untied to allow for slack while shoulder-loading and advancing the line.

Tuck the hose, leading from the discharge outlet, between the hose bundle and the left side wall of the slot (driver's side of the engine). Wedge just the top few inches to keep the top flakes securely in position.



Figure 3.91

Loading the 2 ½” Preconnect (“Blitz Line” - Slot Load)

Figure 3.92 – Begin preparing the hose for loading by arranging the two unconnected bundles in flakes at the rear of the engine. The flakes should run parallel to the tailboard with the female coupling of the first bundle nearest the tailboard.

Figure 3.93 – Connect the female end of the 2 ½” hose to the appropriate discharge port. Load the hose into the hose slot in a vertical stack.



Figure 3.92

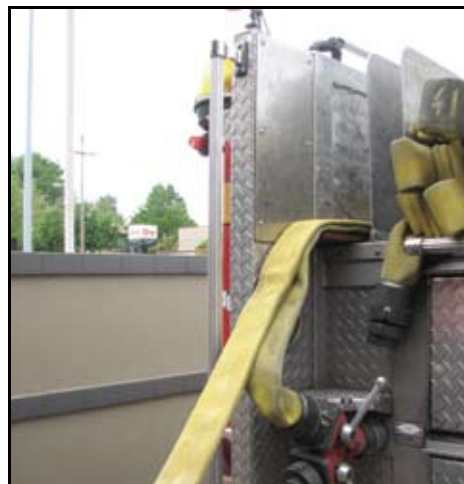


Figure 3.93

Figure 3.94 – The flakes at the open end of the slot should extend 6 to 9 inches from the slot opening. The bottom and/or middle flake, of the bottom 100 feet, may be kept intentionally long to facilitate a single member reaching back to stretch the entire 200 feet.

Figure 3.95 – Continue loading the hose in this manner until there is 10 feet or less remaining when measured from the open end of the hose bed. This hose and the male coupling are passed on top of the previously loaded hose and out of the closed end of the hose bed.



Figure 3.94



Figure 3.95

Figure 3.96 – Attach the nozzle to the second bundle and begin loading the second 100 feet by placing the nozzle in the slot with the tip even with the protruding folds of the first bundle.

Figure 3.97 – The hose of the second bundle is then passed back into the hose slot and flaked in vertical stacks. The flakes will continue to extend 6 to 9 inches from the open end of the slot.

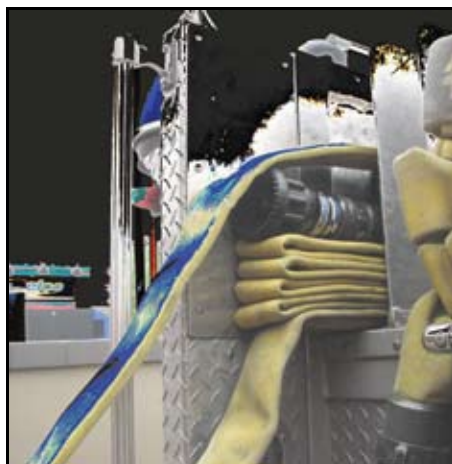


Figure 3.96



Figure 3.97

Figure 3.98 – The male end of the first section of hose and the remaining female coupling from the second section are connected and placed on top of the hose bundle.

Figure 3.99 – The bundle is now correctly loaded and ready for deployment. Do not tie or otherwise secure any portion of this load.



Figure 3.98

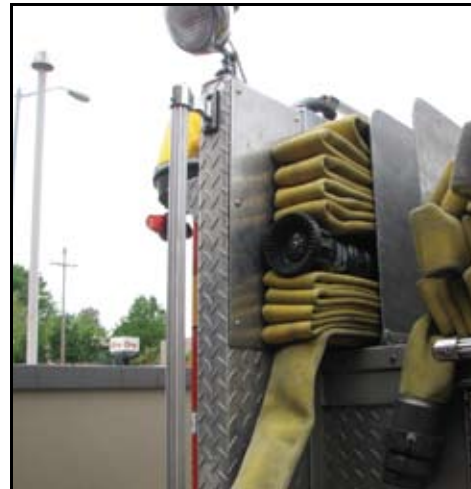


Figure 3.99

Loading the High Rise Bundle

Figure 3.100 – The high rise bundle consists of two 100 foot sections of 1 ¾" hose, two low-pressure/variable stream nozzles, one 15/16" smoothbore tip, one 2 ½" to 1 ½" gated wye, eight 1" nylon straps with quick release buckles, and four 1 ½" nylon straps with quick-release buckles.

Figure 3.101 – **1st Section:** Begin by attaching the wye, with smoothbore tip attached, to one section of 1 ¾" hose at the female coupling. Lay the hose with the wye to the left of the member and measure the first length at 6 feet. The first fold will be made away from the member and flaked back toward the wye.



Figure 3.100



Figure 3.101

Figure 3.102 – Continue to flake the remainder of the hose away from the member. Attach a nozzle and place on the same end of the bundle as the wye.

2nd Section: This section of the bundle is identical to the first with the exception of starting with the female coupling (no appliance attached).

Figure 3.103 – A 10 foot piece of hose is added for standpipe access and is normally stored with the high rise bundle. A 2 ½" to 2 ½" wye is attached to this short section of 2 ½" hose.



Figure 3.102



Figure 3.103

Figure 3.104 – Form the flaked hose into a horseshoe with the nozzle to the inside and strap the hose into a bundle with four of the one-inch nylon straps. Make sure the nozzle is secured with one of the straps to prevent it swinging loose in the hose bundle. The remaining 1 ½" straps are used to bind the two bundles together.



Figure 3.104

ATTACK LINES PRACTICES

A fire stream emerging under pressure from a nozzle always exerts force in the opposite direction of the water flow. The greater the pressure and the larger the nozzle's tip, the more severe the nozzle reaction will be. The member on the nozzle, along with any back-up members, must be prepared to control this nozzle reaction before opening the bale of any nozzle. They must also be prepared for the reaction caused by changing the direction of the stream. Always carry the bale in the closed position and operate it gradually to prevent surges of pressure in the line and damage to equipment. A 2 ½" attack line requires a minimum of two members to operate, but for increased safety and mobility, three or four members are recommended.

Regardless of whether the attack line connection is being made from an engine, a tri-gate, a standpipe, or a 2 ½" supply line, there are a few rules which always apply:

- Do not release the bundle tie ropes until you are ready to either make the connection or stretch the line.
- After making a connection, check the valves or gates to be sure that they are either open or closed, whichever is required.
- If a quarter-turn wye valve is intended to be kept open and the hose line it serves will be used in an IDLH atmosphere, the quarter-turn wye valve must be tied in the open position.
- As soon as the line has been connected or anchored, and the valves checked, carry and stretch the shoulder-load to the objective.

After the stretch has been completed, the necessary valves or gates should be opened. Members following the line to the nozzle should check the position of the valves or gates to be sure they are open or they should be prepared to open them at the proper time. Any quarter-turn wye valve that is opened on an attack line should be tied in the open position to eliminate the possibility of the valve being accidentally closed while the firefighting team is in the IDLH atmosphere. Lines should be free of kinks and arranged for easy advancement.

Stretching from a Tri-gate or 2 ½" Reverse Supply

The gate on the tri-gate or wye connected to the attack line may be left either open or closed, depending on the officer's decision. The decision will depend on the type of evolution being performed.

Stretching from a Standpipe Outlet

With two members present, the wye and the top two flakes of the wye bundle are dropped at the interior standpipe connection. The line is stretched to the objective and then a member returns to make the connection. With three members present, the third member anchors the line and makes the connection to the standpipe while the other two members make the stretch. The member making the connection then closes the valves on the 1 3/4" line and opens the standpipe valve. The valve on the wye is opened at the call for water and is tied open during use.

Stretching from the Engine

The pump operator will open the appropriate discharge valves at the call for water, or as directed by the officer.

Operating Attack Lines using Body Loops

Figure 3.97 – The member on the nozzle takes a position with the feet and lower body parallel to the hose. The upper body should be facing forward at a 45-degree angle and at a place where the member can reach the shaper (rubber bumper) with the forward arm extended and can reach the bale with the opposite hand, arm slightly bent. The body loop is then secured to the hose with a hose knot near the inside hip. Place the other end of the body loop over the outside shoulder and then adjust the position of the hose knot to take all of the slack out of the body loop. Leaning forward keeps the body loop taut and absorbs the back thrust of the nozzle in operation. The member can then hold on to the hose with the inside hand and control the stream pattern with the outside hand.



Figure 3.97

Figure 3.98 – The second and third members, standing on opposite sides of the hose, secure their body loops to the hose at intervals of approximately three feet behind the first member. They then turn their upper bodies 45 degrees forward and slip the end of their body loops around their outside shoulders. Leaning forward to absorb the nozzle reaction, they grip the hose with both hands and, when possible, hold the hose in the same plane as the nozzle.



Figure 3.98

Figure 3.99 – As the direction of the nozzle is changed side to side, the members move with the hose. As the nozzle elevations are changed, the members stand or crouch, as necessary, to keep the attack line straight and in line with the stream.



Figure 3.99

Operating Attack Lines without Body Loops

Figure 3.100 – The first member takes a position behind the nozzle where he/she can easily reach the shaper (rubber bumper) with the forward arm extended and can reach the shut off with the other arm slightly bent. The member stands with the feet aligned parallel to the hose and the upper body facing forward at a 45-degree angle.



Figure 3.100

Figure 3.101 – The second and third members grip the hose by wrapping the inside arm around the hose, passing the hand under the hose to grasp the other arm. The hand of the other arm grasps the top of the hose with the palm down.



Figure 3.101

Figure 3.102 – The second and third members take positions on alternating sides of the hose and at about three foot intervals. Their feet are placed in such a way that the rear foot of one member is braced upon the forward foot of the member behind him/her.



Figure 3.102

NOTE: On a 1 3/4" attack lines, the backup member(s) may simply grip the line with their hands. One or two members can normally handle an attack line of this size without an arm lock.

Figure 3.103 – When the nozzle direction is elevated, it may be necessary to release the previously described locking grip in order to maintain proper control and balance. The arms and hands can be adjusted to a more practical grip, but the hose should never be completely released.



Figure 3.103

Operating a Single Person 2 ½" Line

Figure 3.104 – Begin by stretching the 2 ½" attack line to the objective. Form a loop in the nozzle end of the line approximately 18 feet in diameter, bringing the nozzle back around to a point where it is once again aimed toward the objective. Then cross the nozzle under the hose allowing it to extend approximately 30 inches beyond the loop. The hose behind the crossing point should be running in a straight line from the nozzle for at least 10 feet. The hose should then be secured to itself at the crossing point with a body loop using a round turn and two half-hitches. The operator then sits on the hose at the crossing point. The operator's weight and the secured body loop will hold the nozzle in place. While operating the attack line in this configuration, the operator must never remove his/her hands from the bale.



Figure 3.104

ADVANCING ATTACK LINES

Regardless of whether the line being advanced is charged or uncharged, or being advanced to an upper, main, or lower floor, there are three rules that always apply:

- A minimum of two members shall be assigned to any hose line entering a building.
- Upon arrival at the objective, any remaining hose line must be arranged to be free of kinks and easily advanced - stacked into coils or flaked out.
- Control of the nozzle must be maintained at all times.

Flaking Hose

If there are no obstacles or the attack line is being charged outside a building, the most efficient way to deploy the final sections of hose, prior to charging the hose with water, is to create large flakes.

Begin by laying down the excess hose that is intended to enter the structure or be used outside in a neat bundle. Grab one, or two, center flakes from the neat bundle (depending on how much hose is remaining). Stretch the hose straight back from the intended objective. When the hose charges, it will be in an orientation that will allow easy deployment.

Be mindful of equipment and personnel that will need to use the entrance. Considering this, it is usually a best practice to avoid setting down a hose bundle directly in front of the entry point. Try to prepare and charge your hose 10 or more feet away from the front door and to one side or another when possible. Pay attention to the building you are entering and orient your long flakes to ensure that the front door is not the first “pinch” point that will create excess friction.

Coiling Hose

There are situations that will require a neat and compact charged handline (highrise, numerous obstacles present, etc.). A coil will allow the nozzle (and subsequent hose) to “pay off” the top of the bundle and easily be deployed to a desired location. Stairwells and tight hallways will make good use of this technique. Coils will also allow the firefighter to carry a charged coil on their shoulder for a period, until stretching is required.

Figure 3.105 - Lay the excess hose down on the ground in a neat bundle. The bundle should remain tied, if possible, until it is on the ground. This will help with keeping the hose as orderly as possible.



Figure 3.105

Figure 3.106 - Kneel at the bundle and untie it, if necessary. Slide the nozzle close to your knees. Beginning with the second flake of hose, pick up every other flake until the last flake is reached.



Figure 3.106



Figure 3.106 (cont.)

Figure 3.107 - When every other flake has been gathered, lift and separate them from the rest of the bundle.



Figure 3.107

Figure 3.108 - Place the hose gathered in your arms away and to the front of the rest of the hose to create a coil. The nozzle end of the hose must be coming off the top of the coil.



Figure 3.108

Charge the line.

Advancing Uncharged Attack Lines

Figures 3.109 and 3.110 – Avoid pinch points. An uncharged line may fit through places which will restrict or halt the flow of water when the line is charged (ie. under doors, between heavy furniture, etc.). Make sure that every door passed through is securely wedged into an open position.



Figure 3.109



Figure 3.110

Advancing Charged Attack Lines

Using either an arm lock or a body loop can be effective in advancing a charged line.

Position members at areas that make it difficult to advance the hose line. These areas include corners, stairways, and other friction points. The strategically positioned members can assist with the advancement by “shuffling” the hose past these areas greatly accelerating the attack.

Advancing Attack Lines – Up or Down Stairs

If possible, advance the line on the stairwell before it is charged. The line should be laid against the outside wall to avoid sharp bends and pinch points on the landings.

In buildings with no wall separating the staircases, it is sometimes more effective to run the hose straight up or down the well opening. If this method is used, be sure to anchor the line to the railing on the appropriate landing, using a body loop. This method can only be used for short distances (100 feet or less), because of the weight of the water and hose.

Advancing Charged Attack Lines – From a Stairway Landing

The hose is connected to the standpipe on the floor below the fire then laid to the fire floor. After reaching the fire objective, it may be desirable to coil the excess hose remaining in the shoulder-load. Once charged with water, these coils may be easily leaned against a hallway wall to conserve space. If this is done, ensure that the hose is leaned against the wall so that the hose will advance easily.

Extending Charged Attack Lines

If advancing the charged line becomes impossible due to obstacles or a lack of hose, the stretched and charged hose line must be extended. Most SFD nozzles provide a 1 ½" male coupling after the shaper tip is removed from the nozzle. The extension hose and nozzle can be attached directly to the nozzle's bale after the tip is removed. It is essential that the bale be tied in the open position if this type of hose line extension is performed.

If extending 2 ½" hose, extending the line should be done using a hose clamp behind the nozzle. The hose line will be clamped off, the nozzle unattached, and a new section of hose and a nozzle added to the existing attack line. The hose clamp may then be opened.

Hoisting or Lowering a Hose Line using a Rope

Figure 3.111 – Tie the end of the roof (or utility) rope to the hose four feet behind the nozzle using a hose knot, then place a half-hitch on both sides of the shutoff. Shoulder-load the hose as it comes up (or down). If the hose is being hoisted, tie the roof rope off inside the window (or on the roof). Remove the half-hitches and spread the hose knot while the line is fed through it and to the objective.

Allow the hose knot to tighten and hold the attack line in place. This procedure is reversed for lowering.



Figure 3.111

Carrying a Hose Line Up or Down a Ladder

Uncharged Line up a Ladder - With Body Loops

Figure 3.112 – Begin by placing the shoulder-loads of hose on the ground near the right beam of the ladder. The nozzle will be next to the ladder and each bundle placed progressively to the right and slightly behind.



Figure 3.112

Figure 3.113 – The first member grasps the nozzle and, facing the ladder, places the nozzle over the left shoulder with the hose crossing the front of the body to the right side. The member then secures a body loop to the hose, using a hose knot at about knee height. The member places the other end of the body loop over the right shoulder and immediately begins to climb.



Figure 3.113

Figure 3.114 – The second member secures a body loop to the hose at either a 50 or 100 foot interval (depending on the staffing and the amount of hose). The member then places the body loop over the right shoulder and begins climbing.



Figure 3.114

Figure 3.115 – Additional members then proceed in an identical manner. If there is a coupling at the designated interval, fasten the hose knot just behind the coupling to support it while climbing.

Figure 3.116 – When the first member reaches the top of the ladder, the member steps over the hose and the sill with the right foot. The member tests the floor for structural integrity by stomping the floor with his foot. The member then steps into the room.

Figure 3.117 – The first member steps on the hose to counteract the weight of the line while removing the body loop from the line. The nozzle is moved from the back to the chest, and the foot is removed from the hose as the member faces the ladder and begins to shoulder-load the first section.



Figure 3.115



Figure 3.116



Figure 3.117

Figure 3.118 – The second member continues to climb, keeping the hose in a loop at the right side of the ladder. Upon reaching the top of the ladder, the member stops and grasps the hose leading up to the first member with the left arm between the rungs and passes the line hand over hand to the first member.

Figure 3.119 – When the first bundle has been shoulder-loaded, the second member steps in off the ladder into the room. The member crosses over the hose, turns to face the ladder, and brings the incoming hose across the chest from the left hip to the right shoulder. The second member then shoulder-loads the hose on the right shoulder as it comes in the window (or onto the roof).



Figure 3.118



Figure 3.119

Figure 3.120 – The third and any additional members follow the same procedures until the required amount of hose has been carried up and shoulder-loaded. The last member uses a body loop and secures the hose to the ladder with a clove hitch on the first rung above the windowsill.



Figure 3.120

Figure 3.121 – The members then start the stretch by turning to the left and dropping off the top flake. This will allow proper spacing and will result in the hose running from right shoulder-load to right shoulder-load in a continuous line as the members face into the building and advance toward the objective.



Figure 3.121

Uncharged Line up a Ladder – Without Body Loops

Figure 3.122 – The hose is carried up the ladder or the straight ladder fire escape in the same manner as with a body loop, with the following exceptions: The first member places the nozzle over the left shoulder onto the back, with the lead running across the chest from the left shoulder to the right hip.

The second, third, and any additional members place the hose on their right shoulder(s), at designated intervals.



Figure 3.122

Uncharged Line up a Fire Escape

Figure 3.123 – Begin by placing the initial shoulder-load of hose to the right of the fire escape, with all remaining shoulder-loads placed progressively to the right and slightly behind the first.

Figure 3.124 – The first member secures a body loop to the nozzle, using a hose knot directly behind the nozzle shut off, places the body loop over the right shoulder, and immediately begins to climb with both hands on the beams of the fire escape ladder.

Figure 3.125 – The second member, standing to the left of the hose and facing the ladder, secures a body loop 15 feet behind the first member.

Additional members, also standing to the left of the hose, attach their body loops to the hose at appropriate intervals (which will depend upon the length of the lay and the available staffing).

NOTE: If a roof ladder is used in this evolution to gain access to the fire escape ladder, set the hooks, if possible, over a rung on the fire escape.



Figure 3.123



Figure 3.124



Figure 3.125

Figure 3.126 – After stepping onto the fire escape landing the first member steps on the hose while removing their body loop and preparing to shoulder-load.

Figure 3.127 – The second member then passes the hose hand over hand to the first member, who places the nozzle on the chest and shoulder-loads the hose onto the right shoulder.

Figure 3.128 – After the first member has shoulder-loaded the first bundle, the second member steps into the building and, if necessary, stands facing the landing with the hose to his/her left, bringing the hose across the chest from the left hip to the right shoulder, and begins shoulder-loading.

The third and any additional members follow the same procedure until the required amount has been shoulder-loaded. The last member ties the hose to the rung of the ladder above the landing, using a clove hitch around the rung, and all members pivot to the left, dropping a flake, and stretching the hose to the objective.



Figure 3.126



Figure 3.127



Figure 3.128

Uncharged Line down a Ladder (or Fire Escape)

Figure 3.129 – After the hose in the building is shoulder-loaded and carried to the window (or to the fire escape opening), the body loop is released from the ladder and the member climbs down the ladder. The member then breaks the hose at the first coupling on the ground.

Figure 3.130 – The member at the top then lays the shoulder-load on the floor next to the opening and feeds one section to the member on the ground, who shoulder-loads it at the base of the ladder.

This continues until the nozzle reaches the top of the ladder. The last member then secures a body loop to the nozzle behind the shut off or places the nozzle over the shoulder with the lead across the chest. He then climbs down.



Figure 3.129



Figure 3.130

Carrying and Operating a Charged Line from a Ladder

Figure 3.131 – The first member attaches a body loop to the line with a hose knot 12 inches behind the coupling to which the nozzle is attached. The second and third members attach their loops at 10 foot intervals behind the first member.



Figure 3.131

Figure 3.132 – After placing the body loops over their right shoulders, the members approach the ladder at a 45-degree angle and start climbing.

The second and third members keep the hose clear of the ladder and to the right side.



Figure 3.132

Figure 3.133 – The first member stops when the head is even with the first opening above the windowsill. The first member then grasps the beam of the ladder with the left hand and guides the nozzle over the first rung above the sill with the right hand and slips out of the body loop allowing the weight of the hose

to rest on the second and third members. The members below, upon the command of the first member assist in the placing of the nozzle by lifting on the hose. Ensure the ladder tip is secured to the building.

Figure 3.134 – The first member then secures the line to the ladder, using a clove hitch around the rung above the hose. The slack is adjusted out of the body loop so that it can compensate for the nozzle reaction. This leaves the first member free to manipulate the hose and nozzle.



Figure 3.133



Figure 3.134

Figure 3.135 – The first member then straddles the line and reaches through the rungs with both hands, placing one hand on the shut off and the other hand on the barrel. At the first member's command, the second and third members climb down one rung and tie their body loops to the ladder, adjusting them so as to take a strain on the line.

Figure 3.136 – The second member then climbs up the ladder to a position one rung below the first member, reaching around the body of the first member and grasps the beams with both hands to hold both members safely on the ladder.

The third member climbs down and foots the ladder.



Figure 3.135



Figure 3.136

Charged Line down a Ladder

NOTE: For safety, both the bale and the shaper of the nozzle should be closed while climbing a ladder. When drilling, only operate the nozzle bale at one-quarter of its open position.

Figure 3.137 – Lowering a charged line down a ladder is accomplished in the same way that the charged line was taken up the ladder, except in reverse order.



Figure 3.137

OPERATING HYDRANTS

Safety Practices

Always operate the hydrant in a fully opened or fully closed position.

Always open and close hydrants slowly. Fast operation causes water hammer and could result in a broken water main, broken water meter, etc. Do not over tighten while closing hydrants, it may contribute to breaking the main stem of the hydrant.

Stand behind the hydrant when opening the main stem. Always stand clear of the caps because water pressure in hydrants can be as high as 150 p.s.i. Caps have been known to blown off during the operation of the main stem.

Use caution and common sense when operating the main stem. It can be broken by rough usage and over exertion.

Figure 3.138 – Don't be alarmed by water coming up from the base when the main stem is operated. Hydrants must be opened approximately three to five turns before the drain valve closes. If the hydrant is left to drain out from the base for a length of time with the drain valve running, it may damage the drip valve rubber and necessitate valve replacement.



Figure 3.138

CLEANING AND INSPECTING

Cleaning and Inspecting Equipment

Hose

Seattle Fire Department hose is removed from the engine and dried after it has been charged, and is cleaned and changed whenever it becomes soiled. Mild soap or detergent may be used for hose that has been in contact with oils, tars, or chemicals. Hose that has been used to pump salt water shall be thoroughly washed and flushed with water before drying. Before flushing, the couplings should be left loosened with the gaskets removed to allow for complete flushing. Any hose not used for thirty days shall be rotated. Complete instructions for the testing of fire hose and appliances are included in the SFD Policy and Operating Guidelines.

Couplings

The female hose couplings should be checked for gaskets after each use and before loading on the engine. Files are stored in engine toolboxes for removing burrs from coupling threads. Support Services provides the only lubricant to be applied to these couplings and swivels.

Nozzles

Nozzles should be visually inspected after each use to be sure that the molded rubber fog teeth are undamaged. The rubber bumper is screwed forward to protect the tip and to avoid dirt and grime accumulation inside the shaper. As always, the coupling gasket must be present.

The bale should be manipulated to test for smooth operation of the ball valve (or slide valve.) On nozzles, the screen (Gasket Grabber) inside the barrel should be checked and any trapped particles and debris should be removed.

BASIC COUPLINGS

Hose and couplings get their name based on the inner diameter of the hose. In the Seattle Fire Department, we carry 4", 2 1/2", and 1 3/4" hose.



The following pictures show many of the common hose couplings you will use. *In general*, we refer to them as couplings, not adapters.



2 1/2" Double Male



2 1/2" Double Female



4" Double Male



4" Double Female



2 1/2" to 4" Increaser



4" to 2 1/2" Reducer



2 1/2" to 1 1/2" Reducer



2 1/2" to 3/4" Reducer (for 'Jiffy-hose')



'Brother Coupling' (2 1/2" to 4")



'Sister Coupling' (2 1/2" to 4")



Storz to 4" (NST) Adapter



4" NST to 4" ST Double Female



Hydrant Adapter (4" ST to 4" NST)



'Red Dot Coupling' (4" NST to 4" ST)

If a coupling has the same thread, orientation (ie. male or female), and size on both ends, we refer to it as a double female or a double male. If a coupling has the same thread and orientation on both ends but they are of unequal size (ie. 2 1/2" female on one end and 4" female on the other end) we refer to it as either a sister coupling or brother coupling.

When a coupling is described, it is referred to from the female end to the male end. It is also indicated whether the coupling is reducing or increasing the size of the hose/connection. An example would be a 2 ½" to 4" increaser. This coupling is named this way because the female end is 2 ½" and the male end is 4". In most of the engine evolutions water flows from the female end to the male end. So, if water flows from the female end to the male end through this coupling, the size of the hose is increased. Therefore, we refer to this coupling as an increaser.



Hydrant Adapter

Notice the hydrant adapter in the picture above. This coupling is used to connect the 4" hose to a hydrant. Seattle hydrants have a 4" port that has ST threads. All 50 foot sections of 4" hose carried on Seattle fire engines have 4" NST threads. Therefore, this coupling is used to adapt the male ST threads from the hydrant to the female NST threads of the hose. The reverse is also true. There are some situations where it is necessary to adapt male NST threads to female ST threads. This is where the "soft suction adapter" (aka 'Red Dot Coupling') is used.