

Blackwood Fire Company



Ladder Company Operations Book 3

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Table of Contents

Introduction	3
Truck Company Organization and Assignments	3
Riding Assignment Descriptions	4
Inside Team Operations	5
Forcible Entry	
Search	
Assisting Engine	
Outside Team Operations	7
Ground Ladder Operations	7
Positioning Ground Ladders	8
Vent Enter Search	8
Roof Operations	9
Roof Size Up	9
Flat Roof Operations	10
Peaked Roof Operations	10
Roof Rope	11
Special Call Operations	12
Rescue Applications	12
Chauffeurs Guide	13
Apparatus Vital Statistics	13
Apparatus Positioning	14
Apparatus Set Up	15
Hand Signals	16
Turntable Functions	16
Platform Functions	17
Breathing Air System Operation	18
Master Stream Operations	18

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Introduction

Members assigned to the Truck Company are responsible for a wide variety of fire ground functions. Unlike the Engines, who primarily work together to advance a hose line, the Truck Company members may be independently working at up to 3 locations at once.

Tower Ladder 84 is an extremely versatile piece of apparatus. The Tower Ladder is equipped to function primarily as a ladder company with its tool and equipment inventory reflecting that assignment. The truck is also well equipped for fire attack as engine, providing its own attack and supply lines. The 2500 GPM pump, multiple large pump outlets and 4 master stream devices make it ideal for delivering massive quantities of water on the fire ground. The power plant and lighting capabilities are invaluable in providing a safe work environment to the interior and exterior of the building. The value of this apparatus on the fire ground cannot be underestimated and it should be placed with care, assuring maximum versatility. **The ability that the apparatus provides to “multi-task” should never be misunderstood by members.** The apparatus can only do as much its crew can support. Members of the initial crew should always understand that they are either functioning as an engine OR a ladder, deviations should be kept to a minimum. To handle multiple functions, additional crews may be assigned to augment the truck crew, allowing it to work as an engine AND a truck.

Truck Company Organization and Assignments

The Truck is generally responsible for the following fire ground tasks:

- Forcible Entry
- Search (for victims and fire)
- Rescue of trapped occupants
- Ventilation
- Placement of ladders
- Control of utilities
- Overhaul (determining extent of fire)

To accomplish these tasks rapidly, a two-team concept is used. The crew is divided into 2 teams to rapidly complete their assignments. The inside team is responsible for forcible entry, search (locating the fire and any victims), removal of occupants, assisting the engine crew in opening up around the fire. The inside team consists of up to 3 personnel including; the officer, search and the can. The outside team provides horizontal vent ahead of the hose line establishes secondary egress routes for interior crews (ground ladders and rear doors) and provides VES as required. The outside team is part of the initial FAST. The outside team consists of the driver, the OV and roof positions.

Blackwood Fire Company
Book 3
Ladder Company Operations Manual

Each member will carry a personal light and a portable radio, using Ladder 84 plus his assignment as a radio designator (i.e. Ladder 84's driver from Ladder 84 OV). The officer will respond as Ladder 84. The following are tool assignments and general duties. Note that these assignments may be changed by the company officer or the IC to support specific incident needs.

Driver

Drive and position the apparatus operate the ground controls. The driver is responsible for overall safe operation of the apparatus and main. The driver will work as part of the outside team and maintain company accountability.

Officer

Supervise the operations of the truck company; assume other ICS position as required (usually interior). The officer leads the inside team.

Tool Assignments

- Hand light
- Thermal imaging camera (TIC)
- Search rope (as required)

Seat 1 - Forcible Entry and Search (Search)

The search position is responsible for the initial forcible entry tasks and primary search as part of the interior team.

Tool Assignments

- Irons
- Hydra Ram

Seat 2 - Outside Vent (OV)

The OV is responsible for completing the size up to the rear of the building. The OV provides horizontal ventilation after communication with the nozzle crew. The OV reports fire conditions and other pertinent information to the IC that he may not see due to his position. The OV is part of the outside team and should be the basket operator if the tower is placed in service.

Tool Assignments

- Hook
- Irons
- Ladder as needed

Seat 3 - Can

The can position is part of the interior team and assists the officer and search in completing the search, knocks down or attempts to control fires ahead of the hose line and assists the engine crew in opening up after the fire is extinguished.

Tool Assignments

- PW Extinguisher
- 6' Hook

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Seat 4 - Roof

The roof position is part of the outside team and is responsible to access the roof where indicated (flat roofs, most commercial buildings and some residential buildings). The roof man provides for vertical ventilation as required, checks conditions to the rear and sides and reports to the IC. The roof man will be paired with the OV or extra personnel to complete his assignments. The roof man should gather needed equipment and be ready to make the roof as soon as he has a partner. Roof operations will not be conducted with a single FF team.

Tool Assignments:

- Saw
- Hook
- Roof Rope
- Ladder

Seat 5 – Extra

As directed by company officer. Generally assist in truck set up or throw ladders.

Seat 6 – Extra

As directed by company officer. Generally assist in truck set up or throw ladders.

Team Approach

Inside Team Operations

Forcible Entry

The standard tools assigned to the Inside Team allow for forcible entry:

- Via conventional means of striking and prying
- Via hydraulic power
- Through the lock

The inside team will size up doors to determine the most efficient entry method in conjunction with the urgency of the need for entry. The inside team and officer should start the forcible entry size up while responding and prepare for the possible requirement of additional tools such as:

- Bolt Cutters for fences and gates.
- Power saw with metal blade for roll down gates, overhead doors, fences and padlocks
- Chainsaw for boarded up openings
- Sledgehammer for additional striking power
- Long halligan for greater leverage on outward opening doors

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Search

On gaining entry, the inside team has 2 primary goals:

- Locate the fire
- Locate victims

These tasks must remain in this priority as operations can not continue safely with fire in an unknown location.

On larger commercial structures the Inside Team should operate with the first engine to maintain an exit route from the building via the hose line. If it is not feasible to work with the hose line, the officer should consider use of a guide rope.

The inside team will notify the IC or engine company officer of the fastest, most direct route to the fire and provide specific instruction as required.

The inside team will attempt to contain the fire by closing doors to the fire area, limiting ventilation and use of the assigned PW can until a hose line is in place and charged. While a search for victims is obviously taking place simultaneous to locating the fire, the primary search should rapidly cover the area between the fire and exits and areas above the fire which may have cut off victim escape routes.

The inside team may vent in the fire area or in remote areas to assist in firefighting efforts once lines have been charged or at any point to locate or sustain a trapped victim. Caution must be applied to ventilation when a line is not in service on the fire.

Assisting the Engine

The inside crew should assist the engine once an “all clear” is given on the primary search.

The primary task of the inside crew at this point is to expose areas where fire may be hidden in void spaces. Duties then turn to providing interior lighting and overhaul.

The Truck Officer may consider additional tool assignments based on the type of building and probability that these tools may be required. A long hook for commercial buildings, extra hooks for apartment fires and a search rope for large open areas or an extra PW can if the line may be delayed are among the many possibilities for the Truck Officer. The Truck Officer should limit removal of burning materials, walls, etc to only what is necessary to control the fire until the

Blackwood Fire Company

Book 3

Ladder Company Operations Manual

fire investigation is complete. After completion of the fire investigation the Truck Officer will ensure that all burned areas are completely exposed and burned materials removed from the building.

Outside Team Operations

As stated previously for the inside team, the outside team's first priority is to locate the fire from the outside and prepare to ventilate the fire area either horizontally or vertically as requested. The outside team should **specifically check for the presence of a basement fire** using side or rear windows. These conditions may not be evident from the IC position on Side Alpha.

A crucial and primary role for the outside team is to get to the rear of the building and report fire conditions, trapped occupants and possible fire locations and other significant features such as basement access. Any secondary egress routes should be forced open and gas utilities controlled.

The outside team must consider the use of exposures when making the rear of townhomes, apartments, strip malls or similar structures. The outside team should be prepared to defeat or maneuver over fences as required.

The outside team will affect rescues via ground ladder if victims are present in elevated areas and will provide ground ladders as detailed below.

The outside team should locate utilities such as gas meters and external fire switches or electrical disconnects and be ready to control them.

Ground Ladder Guidelines

Ground ladders should be placed at every fire scene. Members assigned to the outside team should prioritize ground ladder placement as follows:

- Immediate rescue of civilians
- Vent / Enter / Search operations to likely locations of trapped occupants
- Firefighter egress
- Roof access

Ground ladders on the TL are marked with their length visible while bedded. It is important that all ladders be restored with this marking in the UP position.

When deploying ladders members will find the "balance point" marked which will assist in single person carries.

Blackwood Fire Company
Book 3
Ladder Company Operations Manual
Positioning Ground Ladders

- Do not place ladders in front of entry or exit points on lower levels.
- Do not place over lower floor windows where fire may vent when accessing the roof or upper floors.
- Place ladders away from venting fire
- Place in areas where firefighters are operating on upper floors
- Place as high as possible over the roof line / parapet (>5 rungs if possible, if no obstructions raise the ladder fully)
- Place at an area such as a porch roof, or lower roof where multiple windows can be accessed.
- Always place at the base of the window for firefighter entry or egress. Do not extend the ladder into the window opening
- Consider a lesser angle for ladders placed for firefighter egress.
- High and to the side (wind at back) for window ventilation
- Completely clean out the window where the ladder is placed. Leave the center sash for windows that are opened for vent, but not ladder egress.
- Be aware of high parapets and facades when placing ladders. Many commercial occupancies will have a significantly lower roof line in the rear which may provide the best access.

Vent Enter Search (VES)

Certain situations dictate the need for the outside team to perform VES. VES is utilized to directly enter and search probable areas with victims trapped via windows. This operation is high risk as it places the crew directly in line with fire travel in many cases. The operation should be coordinated with interior crews and status communicated frequently. Porch roofs provide an excellent access point in most cases but direct entry via ladder is required as well. VES should follow the steps outlined below:

- Identify high probability areas for search such as bedrooms.
- Set ladder for entry / rescue
- Clear window of all glass, sashes and curtains, etc...
- Allow time for the smoke to vent remaining alert for conditions which may indicate rapid fire growth.
- Probe for victims and a sound floor beneath the sill.
- One firefighter will then enter and immediately locate the interior door to the room and ensure it is closed.
- The firefighter will then search back toward the entry window.
- The second firefighter should not enter but maintain contact via voice or light to ensure the first firefighter can exit the room quickly and assist in removal of victims.
- This procedure is repeated for each area to be searched.

Roof Operations

Prior to accessing the roof, ensure members have harnesses or life belts and the following equipment is in the basket:

- Saw (s) for roof type
- Saw Bag
- Appropriate length hook
- Irons
- Roof Rope
- Utility Rope

The following sections contain references for accessing the roof and working from the platform. Roof operations should never be delayed waiting for the tower. Initial access via ground ladder may be backed up positioning of the platform to provide 2 paths of egress.

Roof Size Up

Extreme caution must be exercised when operating on any roof, however certain construction types pose additional hazards:

Lightweight Metal – Heavy, uncontrolled fire conditions under lightweight metal roofs (common in Type II Non Combustible Construction) can lead to early failure. Operations on these roofs should be limited to removing burning insulation or opening up to stop roof involvement after the fire below is controlled.

Lightweight Truss – Significant involvement of the truss space dictates exterior operations. Assessment of smoke and fire conditions from gable vents should indicate extent of involvement.

Bowstring Truss – Distinctive arch shape may only be seen in some cases from side and rear. Potential for massive failure and wide spans between trusses preclude operations on these roofs.

Rain Roofs – Generally refer to a peaked roof placed over an existing flat roof. Cutting the peaked roof will not provide effective ventilation.

Flat Roof Operations

When accessing a flat roof:

- Almost any parapet over 2' will not allow the TL basket to reach the roof.
- Place the basket along the parapet edge to allow members to step from the catwalk to the parapet
- If the basket can not be placed along the building, place head on to the parapet and either position ON the parapet so members may step off, or with the top bar at the parapet top so members may climb over.
- Use extreme caution when exiting the basket, especially at night or in smoky conditions. Use tools to sound and light the area sufficiently.
- Sound the roof prior to exiting.
- When exiting onto a high parapet utilize the roof ladder or life rope as necessary to safely access the roof.
- The basket should not be moved without the approval of the roof crew.
- When ventilation is necessary:
 - Start with openings such as skylights and attic ventilators
 - Attempt to locate the fire by visualizing before going to the roof and use the following other indicators:
 - Temperature of vent pipes, etc...
 - Bubbling tar, melted snow, dry spots during rain, etc.
 - Divide the roof into quadrants, pick the most likely quadrant the fire is in and cut at least 5 feet away from outside walls.
- When ventilation is complete or if ventilation is not immediately required:
 - Check over the perimeter of the building for hazards, victims or construction features not visible to the IC.
 - Vent upper floor windows as necessary and possible by reaching over with long hook or swinging halligan through window on rope.

Peaked Roof Operations

When accessing a peaked roof for ventilation:

- Position as near to objective as possible
- Exit on the "uphill" side of the basket
- Sound the roof prior to exiting
- Utilize the roof ladder installed in the upper fly for stability.

If there is a concern about roof stability, or the pitch is very steep or slippery:

- Utilize a lanyard / harness to secure a member to the platform while making cuts.
- Position as close to the roof deck and the ridgepole as possible.
- Start the saw in the basket and then keep outside until complete.
- Move the basket to facilitate completing the cut.

Blackwood Fire Company
Book 3
Ladder Company Operations Manual

- The cut will be generally more triangular in nature. Longer hooks may be needed to push down ceiling materials when cutting a high peaked roof.

Roof Rope

The roof rope is a 150' section of 9/16" life safety rope. The roof rope is equipped with locking snap hooks on each end. An anchor strap, extra carabiner and a Figure 8 descender are stored with the rope for extra versatility. A rope pad is stored on the working end of the rope. When used in conjunction with the Gemtor 541 harness or the CMC harnesses, a number of options are possible.

- Lowering an injured firefighter from a roof top
- Lowering an injured firefighter or civilian from an upper floor window
- Performing a window rescue where ladder access is not possible or practical.
- Used as a guide or assist line for accessing the tower from the roof top
- Used as a safety line while cutting a roof or performing rescue operations
- Used to secure the roof ladder when utilized for roof access from the bucket.

The roof rope should be placed in the basket or taken to the roof via ground ladder during applicable fire ground operations

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Special Call Operations

When called as a special unit (i.e. elevated stream use) the members should remain with the apparatus and work as a unit instead of the normal inside / outside team approach. The company officer should supervise all activities and should work closely with the command staff to ensure the capabilities of the Tower Ladder are fully utilized. When responding on a special call for primarily water tower operation the following positions would be filled

- Turntable Operator
- Pump Operator
- Bucket Operator
- Firefighter to operate streams
- Officer supervising and interfacing with command staff

Rescue Applications

The tower may be used as a high point anchor or to move an injured victim via stokes basket. Both lifting eyes under the basket must be used for this job. When attaching a pulley or securing a rescuer, utilize 2 slings to share the load between the eyes. When utilizing a stokes basket, secure $\frac{1}{2}$ of the bridle to each lifting eye. A firefighter may also be attached via a strap to the head end lifting eye as an attendant. A spotter with direct communications to the operator shall be utilized. Where the turntable operator has a direct line of sight to the basket and stokes, he should operate the tower controls. If the turntable operator can not monitor the basket and stokes, the company officer will designate the more appropriate point of operations and insure the direct line of communications is established.

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

Chauffeurs Guide

Apparatus

2002 Spartan Gladiator Chassis
KME 95' Aerialcat Tower Ladder

Vital Statistics

Overall Height – 11'2"
Overall Length – 44'
Wheelbase – 258"
Gross Vehicle Weight Rating – Approximately 80,000 lbs
Engine – Detroit Diesel Series 60 rated @ 470 HP

Aerial

Horizontal Reach – 85'
Elevation - -12 to + 80 degrees
Vertical Reach – 95'
Basket Capacity
 Dry – 1000 lbs.
 While flowing water – 500 lbs.
Waterway Capacity – 1500 GPM

Fire Pump

Hale 8FG 2500 GPM

Water Tank

300 gallons

Hose Load

150' 1 ¾" bumper line
300' 1 ¾" cross lay
150' 2 ½" blitz
700' 5" LDH
250' spare 3" hose w/ bomb line nozzle
100' spare 1" line and nozzle

Ground Ladders

2 – 35' 2 section
1 – 28' 2 section
1 – 20' roof
1 - 16' roof
1 – 16' roof mounted in fly section of ladder
1 – 10' folding ladder

TOWER LADDER PLACEMENT

SLOW down while entering the fire block. Consider walking into the scene and checking for best spot as remainder of the crew deploys. Stop short, the rig can usually be maneuvered forward, but backing into a position on the fire ground, particularly after the crew is involved in the fire is extremely difficult. In short, take time to find the BEST spot.

Consider most likely tasks:

Rescue – Immediate access to trapped victims.

Roof Access – May have a specific or general objective. Consider later use for firefighter egress or firefighting positions.

Master Streams – Pick an area with openings into the building for low-level operations.

Quint Operations – When placing for hand line operation, consider potential use during the incident and position for truck work where possible, using longer hose stretches if necessary.

General Placement Considerations

- Consider building construction and condition (collapse zone)
- Consider extent of fire and potential fire load (collapse zone and radiant heat) Attempt placement in likely area of fire spread.
- Check for overhead obstructions. When wires are on the fire side, positioning under them removes them as obstructions. Consider possibility of venting fire affecting this placement.
- Check for wires, trees and other obstructions between your position and objective.
- Allow for clearance of main between apparatus and building.
- Position for maximum “scrub” area. Position for greatest coverage area (L / W/ H of buildings). This will involve placing the apparatus further (approximately 45 feet), rather than closer to the building. Placing the turn table center line with the fire objective is generally the best option. Consider other responding truck companies. Towers and straight sticks will have different priorities.
- Position for greatest tactical advantage as a Truck Company; utilize longer hose lines as needed for quint ops.
- “Jackknife” cab slightly away from objective. Where cab cannot be jackknifed, continue past objective until cab position is irrelevant
- Allow for full outrigger deployment to operations side. A 6’ hook may be used as a quick placement guide.
- Attempt to position outriggers between parked cars where practical to extend usable reach.
- Avoid soft ground, manhole covers, storm sewers, etc.. Utilize cribbing to spread load as needed. Consider positioning main over front or rear of apparatus in this situation to limit point loading on outriggers.

SPECIFIC ASSIGNMENTS

Rescue Positioning

- Position parallel to objective
- Position basket in line with victim
- This position ensures that the basket approaches the victim on an angle reducing basket gun interference and placing the basket door closer to the victim.
- This position also reduces travel time / distance of the main to the objective.

Firefighting Positions

- Seek a position which will allow the basket to reach a maximum number of building openings or the longest side of the building.
- Consider the arrival of a 2nd tower ladder and its placement as well.
- Position to allow basket to reach the ground on the fire side of the apparatus.
- For buildings with long dimensions and peaked roofs, consider positioning a tower at the far gable vent from the fire, their objective would be to open the end of the attic/truss space to provide access for their elevated stream.

GENERAL APPARATUS SETUP

Position the apparatus as required for the task. This will be discussed in more detail later, but the positioning must at a minimum avoid:

- Power lines (**maintain 10' clearance and all lines MUST be considered ENERGIZED**)
- Trees (consider removing small trees if they prevent the best spot)
- Signs and other overhead obstructions
- Any obstructions between the turntable and the building objective

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

HAND SIGNALS and VOICE COMMUNICATIONS

To facilitate clear communications and safe operation, the following standard hand signals and terminology shall be used to convey direction to the turntable or basket operator. When giving a verbal order such as "Rotate Boom Left", it is always to the turntable operator's perspective, facing up the boom toward the basket.

Boom Up – Arm outstretched, thumb pointing UP

Boom Down – Arm outstretched thumb pointing DOWN

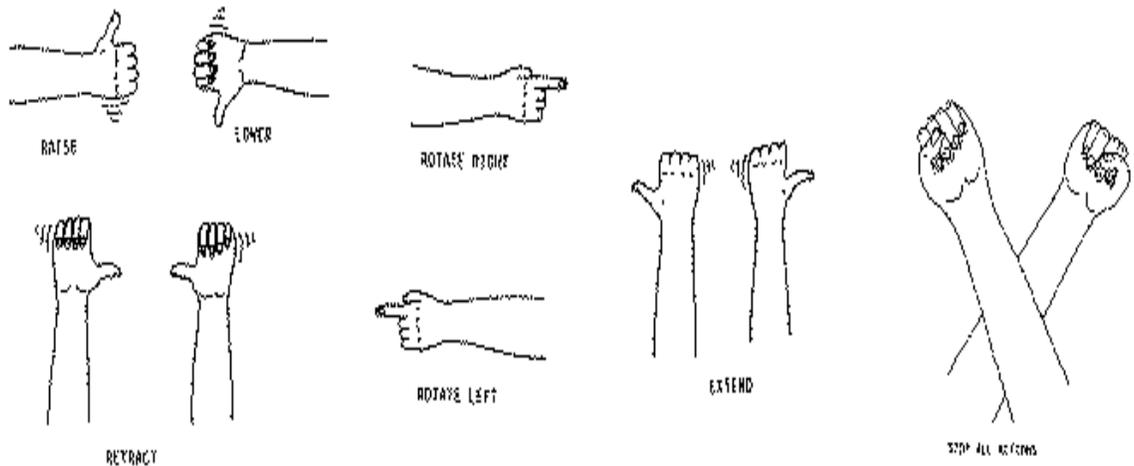
Extend Boom – Hands held in front of body, thumbs pointing out to sides

Retract Boom – Hands held in front of body, thumbs pointing inward .

Rotate Boom – Arm outstretched with finger pointed in direction of travel.

Stop Movement – Both arms outstretched with palms down

Stop and Secure Ladder Power – Arms over head and crossed.



TURNTABLE FUNCTIONS

Safety

- The turntable operator must remain vigilant at all times while the main is in operation.
- The turntable operator will watch for safety hazards and advise / override the basket as required.
- The tower shall be kept at least 10' from any power line
- Use caution when placing over parapets to avoid damage to the waterway. The reflective stripes on the back of the basket designate the low point for striking the waterway.
- The basket should be kept outside the collapse zone of any structure when designated for other firefighting operations.

Blackwood Fire Company
Book 3
Ladder Company Operations Manual

- The turntable operator may regulate tower speed in 2 ways. The turntable control levers provide power from 0 to 100 percent when activated; the levers may be feathered to provide precise movement. The high idle function will increase ladder speed across the entire range of movement.
- The turntable controls will override the basket controls. The turntable operator is responsible for continuous monitoring of the basket while in use. The turntable operator should alert the basket crew when possible of hazards, but should not hesitate to remove the basket from an imminent hazard.

BASKET FUNCTIONS

Safety

- Personnel in the basket should be equipped with SCBA when deployed for firefighting duty.
- Personnel in the basket should be equipped with appropriate harness / ladder belt.
- Personnel in the basket should be secured for fall protection to one of the retractable lanyards.
- Personnel should position themselves to limit visual obstruction of the basket operator. The basket operator is in charge while making any movements.
- Equipment in the basket should be minimized where possible and should not be placed to interfere with the main ladder. Always consider how the ladder will change position with the angle of the basket.
- The basket operator has 4 combinations available to manage tower speed. The high/low ladder speed either limits or allows 100 percent operation. When low ladder speed is selected the palm control may be moved to 100 percent in any function but the tower is limited to 50 percent speed. High speed allows for 100 percent operation. The high idle used in conjunction with the ladder speed provides the final combinations.
- Operators should use EXTREME caution when selecting High speed / High Idle. It is not recommended to use this function when the tower is in the proximity of ANY obstructions or when operating at or near full extension due to whipping.

Blackwood Fire Company

Book 3

Ladder Company Operations Manual

BREATHING AIR SYSTEM OPERATION

- The breathing air system supplies air to the basket via a piping system from the large cylinders on the main section of the ladder.
- Turn the main storage cylinders ON.
- The basket is equipped with 4 airline hook up ports.
- Each of our SCBA is capable of accepting an airline connection.
- Utilize the extension hoses stored in the basket.
- Do not turn on your SCBA cylinder.
- Connect the extension hose to your airline whip.
- If air is lost, or you need to exit the basket, turn your main cylinder valve on to over ride the installed system.



Master Stream / Elevated Stream Operations

NOTE: The direction to start master stream operations may only be made by the IC

- Master streams should generally not be directed into occupied buildings. Some exceptions do exist and must be approved by the IC:
 - Fire in cockloft, top floor untenable and no crews are present on that floor.
 - When crews cannot advance to the fire floor and the fire area is easily accessible by window.
 - Interior crews will be contacted by radio and location confirmed prior to master stream operation.
- Anticipate possible master stream use early and provide for 1 or 2 5" supply lines as required.
- Prior to starting master stream operations, the basket crew should open the desired gun and allow the pump operator to control all further on/off actions from the pump panel.
- DO NOT retract the main while the waterway is charged.
- Where fire is present on multiple floors, the stream should start on lower levels and work toward the roof to protect the crew from fire venting below.



Blackwood Fire Company

Book 3

Ladder Company Operations Manual

- Position the stream low in the window to:
 - Allow the stream to penetrate the ceiling, extinguishing fire in the attic or cockloft.
 - Allow for maximum stream penetration.
 - Provide deflection off of partition walls and ceiling.
 - Remove partitions or move stock in order to reach the fire.
 - Openings made in exterior walls may permit access to seat of fire; consider use of power tools to accomplish this.
 - Increasing pressure to the gun and use of smaller tips may allow partition and sidewall penetration (Stream master gun is rated at 200 PSI)
 - Maintain a collapse zone for the basket crew. The basket should generally be placed at least as far away from the building as it is below the roofline.
 - When using deck guns in addition to the basket gun(s), the deck gun operator must be cognizant of the basket position and movements at all times and avoid striking the crew with his stream. **EXTREME caution must be exercised in this case.**

When utilizing hand lines from the tower:

- Secure the master stream shut off valves if the line alone will be used.
- DO NOT retract the main while the water way is charged.
- Utilize short length of small diameter line for firefighting from basket.
- For more versatility, consider using a line from the ground. This allows for more movement with the waterway not charged.
- When firefighting lines are needed inside of the structure it is generally preferred to use the tower to drop a rope and haul a hand line into position. Using the tower ladder as a standpipe removes a valuable tool from the fire ground and delays its use in an immediate emergency elsewhere on the scene.

At the conclusion of waterway operations:

- The pump operator should close the tower discharge and open the drains.
- The basket operator should open the basket guns fully.
- The basket operator should raise the main to >60 degrees to fully drain the waterway.
- Do not close drains and basket guns until the tower is bedded.

**Blackwood Fire Company
Book 3
Ladder Company Operations Manual**

SOLID BORE NOZZLES																	
NOZZLE PRESSURE*	GALLONS PER MINUTE (GPM)								POUNDS REACTION FORCE† (RF)								
	SOLID BORE DIAMETER (INCHES)																
	3/8"	1/2"	5/8"	3/4"	7/8"	15/16"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 3/4"	2"	2 1/4"	2 1/2"	2 3/4"	
40	26 9	47 16	73 25	106 35	144 48	165 55	188 63	238 79	294 98	355 119	423 141	575 192	752 251	951 318	1174 393	1421 475	gpm rf
45	28 10	50 18	78 28	112 40	153 54	175 62	199 71	252 89	311 110	377 134	448 159	610 216	797 283	1009 358	1246 442	1507 534	gpm rf
50 Handline	30 11	53 20	82 31	118 44	161 60	185 69	210 79	266 99	328 123	397 148	473 177	643 240	840 314	1064 397	1313 491	1589 594	gpm rf
55	31 12	55 22	86 34	124 49	169 66	194 76	220 86	279 109	344 135	417 163	496 194	675 264	881 345	1115 437	1377 540	1666 653	gpm rf
60	32 13	58 24	90 37	129 53	176 72	202 83	230 94	291 119	360 147	435 178	518 212	705 288	921 377	1165 477	1438 589	1740 712	gpm rf
65	34 14	60 26	94 40	135 57	183 78	211 90	240 102	303 129	374 159	453 193	539 230	734 313	958 408	1213 517	1497 638	1811 772	gpm rf
70	35 15	62 27	97 43	140 62	190 84	218 97	249 110	315 139	388 172	470 208	559 247	761 337	994 440	1258 556	1554 687	1880 831	gpm rf
75	36 17	64 29	101 46	145 66	197 90	226 103	257 118	326 149	402 184	486 223	579 265	788 361	1029 471	1303 596	1608 736	1946 890	gpm rf
80 Master Stream	37 18	66 31	104 49	149 71	203 96	234 110	266 126	336 159	415 196	502 237	598 283	814 385	1063 502	1345 636	1661 785	2010 950	gpm rf