

VERTICAL

Vertical ventilation for residential application will involve a minimum of two personnel with two ladders raised on the structure as soon as operationally possible. There are three positions that shall be filled by ventilation team members. Delegation of these positions is up to the discretion of the company officer one member can fulfill two positions (ex... sounder can become safety).

Sounder- Aggressively sounds path of travel. Louvers hole and punches through ceiling.

Sawyer- Operates saw and performs CRL.

Safety (or Roof Division)- Maintains situational awareness and watches for signs of structural instability. Communicates with interior crews and IC.



The 5 Cut Center Rafter Louver (CRL) is the preferred method and shall be used when construction features allow. Alternate methods for residential vertical ventilation ie; dicing should be utilized when construction features make louvering difficult or impossible.

Effective vertical ventilation decreases the likelihood of hostile fire events such as flashover, backdrafts and smoke explosions. It increases survivability of potential victims and aids interior attack crews with locating and extinguishing the fire.

A minimum of two ladders shall be raised on the structure (as soon as operationally possible) and ventilation team members shall go on air prior to getting on the roof.

The minimum size hole for a residential roof is 4x4. The hole shall be located as close to the fire as safely possible. Companies cutting a CRL shall notify the interior suppression crews prior to punching through the ceiling.

The North Zone performs the 5 Cut Center Rafter Louver in a “C your way out” fashion. The technique was developed for speed and safety. When performed correctly the economy of motion minimizes the need for changing your grips on the saw and footing.

The first 4 cuts in the 5 Cut CRL should result in the sawyer standing on the non-fireside of a large 4x4 "C".

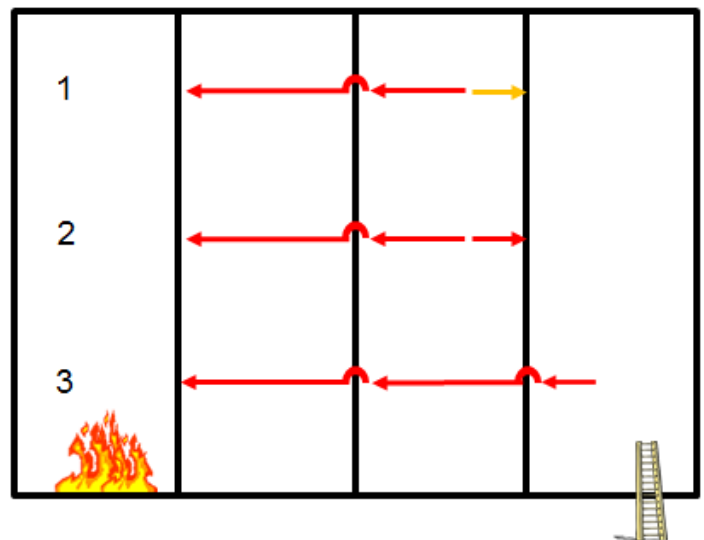
The CRL involve crews identifying three separate rafters at the highest portion of the roof. First, the saw operator will complete an ID CUT Followed immediately by a head cut. These are the first 2 cuts in the 5 cut sequence. There are three acceptable techniques for identifying rafters and performing these cuts.

(1) The sawyer back cuts utilizing the top of the bar until rafter #1 is located (ID cut). The sawyer changes direction utilizing the bottom of the bar to roll across rafter #2 and stops at rafter #3 (head cut).

(2) The sawyer back cuts utilizing the bottom of the bar until rafter #1 is located (ID cut). The sawyer withdraws and reverses the saw utilizing the bottom of the bar to roll across rafter #2 and stops at rafter #3 (head cut).

(3) The Sawyer forward cuts utilizing the bottom of the bar to roll rafter #1 (ID cut). The sawyer continues cutting and rolls rafter #2 and stops at rafter #3.

Examples of Head Cuts

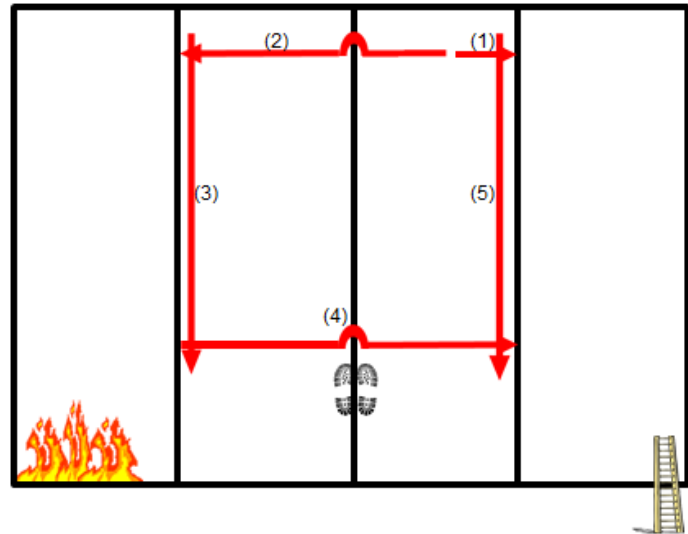


The 3rd cut in the 5 cut sequence is the fireside parallel cut. This cut is made parallel to the rafter and should be approximately 4ft in length.

The 4th cut is the bottom cut. The sawyer cuts back toward the starting point rolling the center rafter and stopping at the next resulting in a large "C" shaped cut.

The 5th and final cut is the non-fireside parallel cut. The cut is made parallel to the rafters and ties all the cuts together resulting in a louverable 4x4 heat hole

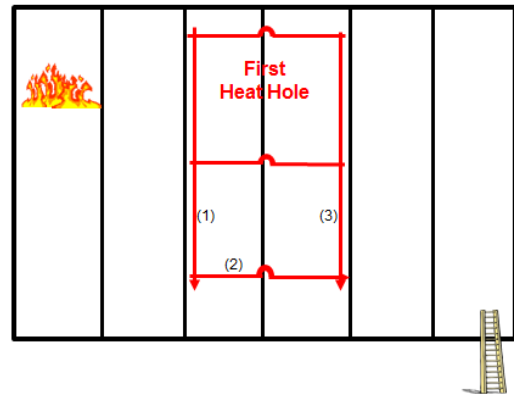
Center Rafter Louver



Extending the 5 Cut Center Rafter Louver

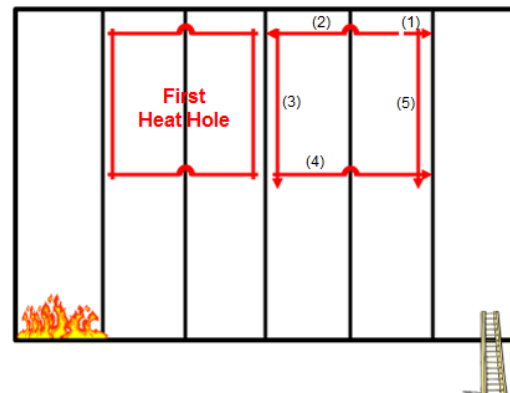
With Construction

Extend the fireside cut an additional 4'
Perform a bottom cut away from the fire
Finish with a non-fireside parallel cut



Against Construction

Simply perform another 5 Cut CRL



Roof Ladder Operations

VENTILATION USING A ROOF LADDER

When needed roof ladders can provide additional safety when performing ventilation on a pitched roof. The ladder serves to disperse a firefighter's weight load over more square footage of the roof's surface. All roofs are not built the same and some are in poor condition well before the fire.

Roof ladders provide a stable platform from which to work on steep, slippery or weak roofs. Keep in mind that pitched/sloped roofs are always steeper than they look from the ground.

They also provide an area of refuge when conditions change. It is not if the conditions change, but when. Remember opening the roof will draw the smoke, heat, fire out of the hole creating a changed condition to the work area.

PRODEDURE

A three-person crew should be used, while this procedure can be performed by two personnel in full PPE, with donned breathing apparatus and on air.

The sounder/sawyer will be the lead firefighter, followed by the safety member. If a third member is used, they should ascend the ladder only far enough as a safety and provide a visual look out for hazardous condition. There is no need for a third person to follow up to the operation and create ladder congestion.

Once the sounder/sawyer exits the primary ladder to the roof ladder utilizing good sounding technique, the second firefighter ascends the up the roof ladder. While traveling up the roof ladder to the area of operation, smoke indicator holes can be used to help determine fire conditions.

Foot Hold

A rubbish hook or pick-head axe into the deck can be utilized to provide a foothold to use while performing the cut. Either person will secure a foot hold into the deck with a downward strike. If using a rubbish hook, then only one tine (uphill) is placed into the deck. A pick-head axe handle should be rotated 90 degrees, so the handle is perpendicular to the ridge and on the downhill side. This will give support to the axe head and prevent it from sliding down the roof.



Tool Swap

Once the location is identified, the firefighters safely “Tool Swap” while remaining on the roof ladder and eliminate the need to change positions.

The initial sounder, or person in front, should pass the rubbish hook or pick head axe to the back-up person by placing the tool to the side opposite of) of the operations (outside) and the chainsaw pass on the inside of the operations (inside). Tools passed to the outside – saws passed to the inside. Saws are always passed with the chain break in the on position and the body of the saw first.

Cut Sequence

While keeping one foot on the roof ladder, the sawyer moves into position and steps out to the established foot-hold. The sawyer/lead firefighter then begins his head cut. Getting into a safe position the initial cut will be against construction, toward the fire to the primary outside rafter (**1st cut**). This outside rafter can also be identified by your sounding tool and should be properly marked.

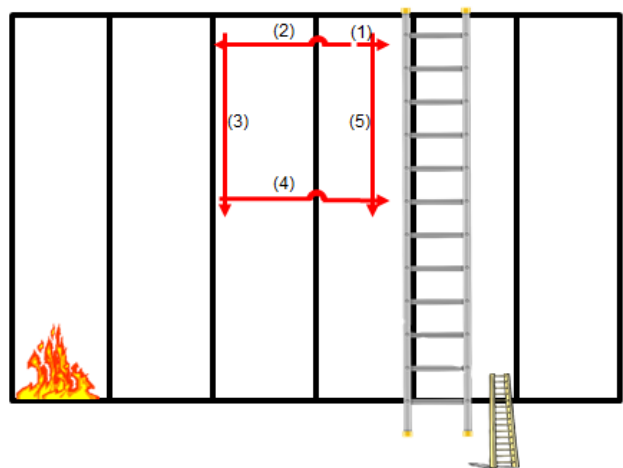
Once the outside rafter is identified, the saw is turned around and the head cut is established by reversing the direction, rolling the center rafter and stopping at the next rafter or before you cut into your roof ladder (**2nd cut**).

The next step (**3rd cut**) in the sequence is to establish the outside cut. Be sure to intersect your head cut and outside cut (cross your cuts) with enough completion to completely cut through the roof decking.

The next step (**4th cut**) is to make the bottom cut. Intersect the outside cut with the bottom cut, cut back toward the safety of your ladder, rolling the center rafter, and stopping before your ladder or at the inside rafter.

Then, the final cut (**5th cut**) is to complete the ventilation opening. Step back completely onto the ladder and intersect the head cut, cutting down the inside of the inside rafter. Please note that when making cuts that are parallel to rafters, make sure you don't rub or cut into the rafter as the operation is being accomplished.

The back-up person then removes the rubbish hook or pick head axe from the deck and readies himself to swap tools to accomplish the operation.



Again, the “tool swap” occurs with the saws to the inside, and tool to the outside. Once the swap has occurred, the sawyer person utilizes the hook to louver the roof material, clear the ceilings and vent the structure from heat, smoke and other hazards. It’s important to keep your hand on the D-handle portion of the hook while clearing the ceilings. This will limit the chances of the hook sliding through your hands and into the structure. If you find that the hook tines are catching or other entanglement hazards, turn the hook over, grasp the straight edge of the hooks, and utilize the D-handle as a clearing mechanism. If the initial vent hole is not sufficient and additional ventilation needs to be accomplished, simply perform the “Tool Swap” again and continue to expand the original ventilation opening in a horizontal fashion. Since a bottom cut is already complete, there is no need to reestablish the identification or head cut. Continue with the outside (fire side) cut in a downward fashion. *(Consider time, risk versus reward and exit the roof immediately when the operation is complete. “GO-CPT-GO” - Get On, Cut-Punch-Through, Get Off)*



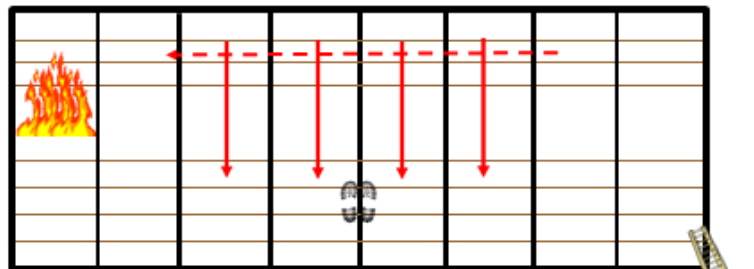
Dicing and J Hooking

**(can be used in residential or non-panelized flat roof with conventional construction)*

Roofs with straight 1x4 or 1x6 sheeting

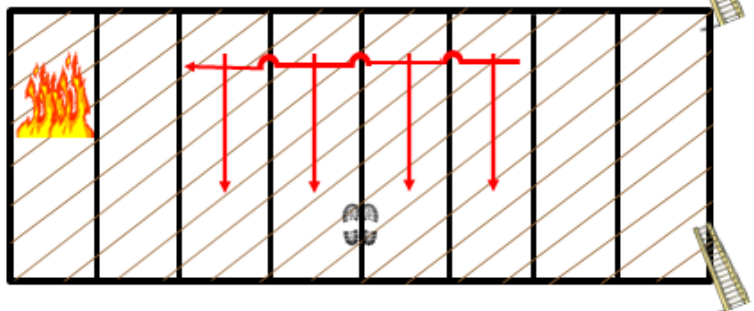
Perform a score cut 6-8 ft. in length along the ridge. It is only necessary to cut through the roofing material not the decking.

Next perform 2 ft. dice cuts parallel to the rafters. Cuts should be approximately 2 ft. apart and made without consideration of rafter location. **A bottom cut may, but not always be needed as you will be pulling decking material back rather than louvering.**



Roofs with diagonal or tongue and groove sheeting

Roll 3-4 rafters along the ridge. Next perform dice cuts in the same fashion as above.



Head cuts should be done toward the fire. Dice cuts should be made while moving toward egress.

Sounder will then pull boards up with the hook in a “J” like fashion.

A bottom cut may, but not always be needed as you will be pulling decking material back rather than louvering.