Heavy Leaner Bore Cut Safe Work Procedure

The following safe work procedure was developed by subject matter experts representing the forest industry, wildfire, oil and gas, and WorkSafeBC.

Heavy leaners require alternative safe work procedures to manage the increased risks associated with falling these trees.

A heavy leaning tree is created from an excess of lean, branch weight or tree hung up in another tree where the traditional cutting method may cause the tree to fall prematurely and/or split vertically. This can cause a significant risk to the faller. If the tree splits vertically, the butt can move up and back along the escape route. This is known as a barberchair. The root structure can also be lifted out of the ground, potentially cutting the faller off from the escape route.

Hazards

Hazards associated with heavy leaners include:

- Difficulty with directional control
- Increased risk of the tree splitting (barberchair)
- Root mat lifting or root pull
- Debris being thrown back
- Chainsaw getting pinched in the undercut
- Early and rapid fall of the tree



CAUTION!

If any of the following hazards exist, **STOP**, and seek qualified assistance:

- Signs of advanced decay of the stem and/or roots
- Lifted root mat
- Lack of adequate escape route(s)
- Lack of proper footing
- Extensive splitting
- Lack of adequate opening or options for tree placement
- Heavy uphill lean

Cutting guidelines

Assessing Tree as a Heavy Leaner:

All Heavy Leaner trees are required to have a full assessment before starting any cuts

- Why is the tree leaning?
  - Assess the tree from the top down
  - What is contributing to the lean
  - Check for rotten top
  - Broken/hung up branches
  - Fungus and indications of rot
  - Is there evidence of top/growth correction
- Look for cracks in the ground around the base of the tree
- Look for signs of decay or fungal conks on the roots

- Remove loose bark, if possible, sound tree with axe, and/or vertical bore the tree with the chainsaw to test for stem integrity
- Assess root system stability, both visually and with an axe
- Ensure escape routes are available
- Ensure the length and direction of the escape route(s) clears the risk of a pulling root mat

Construct the undercut as deep as the tree will allow, preferably up to 25% of the tree diameter, slightly offset from the direction of lean. This is used in all heavy leaner situations to prevent excess tension being placed on the backstrap and root system. Caution is used when making the undercut as heavy leaning trees can pinch the chainsaw bar in the undercut, causing additional hazards. **The preferred undercut opening should be 1-to-1**.

To prevent the tree from falling prematurely, a backstrap is required to hold the tree in place while backcuts are placed to leave the appropriate amount of holding wood before releasing the tree. There are a few different versions of this technique, based on various timber types, sizes and conditions, however the basic principle is the same.

Consider the reason the tree is leaning in the first place.

- A ***recent lean*** can be an indication of a compromised root system or soils that are not holding the tree up sufficiently
- Trees that have been brushed or have hang ups in them can have enough weight imposed on them to become a heavy leaner
- Internal decay or damage can cause the tree to lose structural integrity, resulting in a heavy lean
- Snow and branch loads on one side of the tree can cause offset weight distribution, creating a heavy lean
- Wind events can create heavy leaners
- Natural offset growth patterns of both conifers and deciduous trees, competing for light, can result in a leaning tree

Seek qualified assistance and consider alternate falling methods such as blasting, or machine assist if there is any doubt as to the condition of the tree or your ability to complete the SWP.

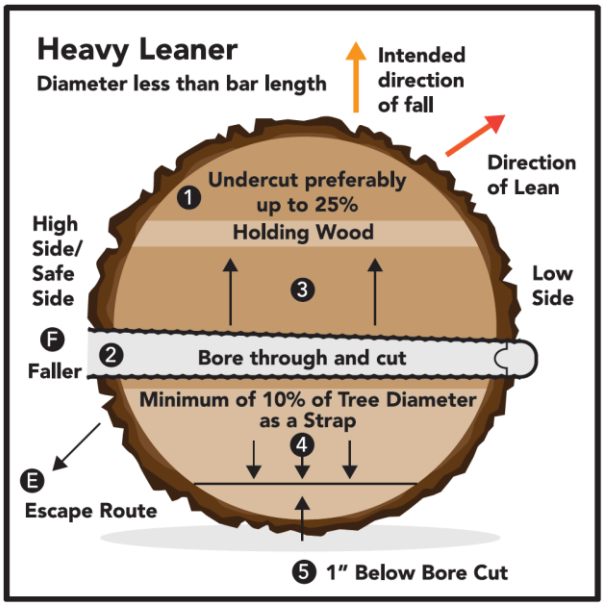


CAUTION!
Complete a full tree assessment on heavy leaners as they can pose an extreme risk.

Heavy leaner safe work procedures

Bore In Procedure – Medium Diameter Tree

Can be used in medium (under bar length) diameter trees in which the tree is small enough to accommodate the width of the bar boring through between the holding wood and the backstrap. This procedure enables the faller to stay on the safe side of the tree during all the cuts.



Heavy lean, bar width diameter tree

1 To prevent the bar from being pinched, construct the undercut as deep as the tree will allow, preferably up to 25% of the tree diameter.

- Move the chainsaw in the cut as required to feel for pinching of the bar
- Aim the undercut slightly off the lean to help avoid root pull and splitting

2 Bore through the tree center from the high side/safe side above the undercut, to maintain anti-kickback step (Reference 1028.5.5 Operate Chainsaw).

3 Cut towards the undercut to set holding wood thickness.

- Sight your holding wood through the undercut
- Avoid going to the low side as the back of the tree and the low side is a hazard zone
- Extra care should be taken to feel for pinching of the bar and ensure holding wood is evenly aligned

4 Cut towards the back of the tree and leave a backstrap.

- Look up and listen carefully for tree movement
- Cut to leave a minimum of 10% of the tree diameter, excluding the bark thickness, ensuring that the entire sapwood is used as a backstrap; however, width will vary depending on the tree condition and species.

CAUTION!
Once this cut is complete you must never expose yourself to the back of the tree due to risk of barberchair or root pull.

5 Shoulder check your escape route.

- Refresh your mental plan to move away from the tree

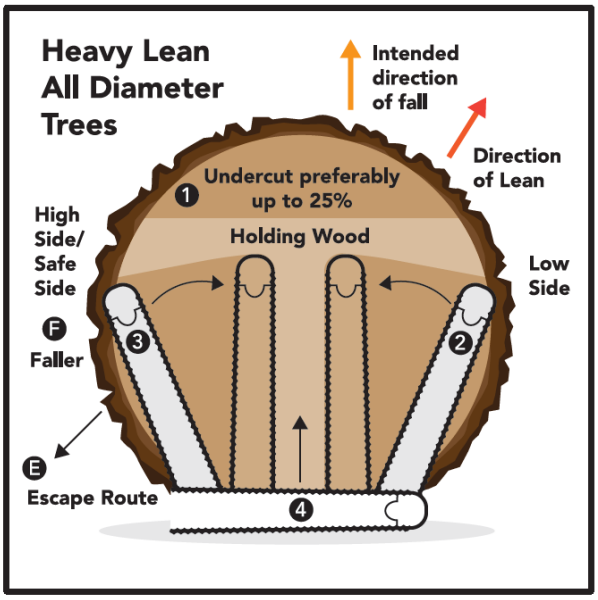
6 Cut the backstrap a minimum 1” below the bored in backcut in the tree.

- Cut through the backcut at full throttle until the tree commits to the fall
- Maintain a defensive position away from the back of the tree to avoid any kickback from the tree
- Be prepared to move away quickly and take cover at the first sign of the tree falling

7 When the tree commits to the fall, follow safe escape procedures, watching for potential root pull, barberchair, or overhead hazards.

T-strap procedure – All Diameter Trees

This procedure can also be used in hollow or deciduous trees.



Heavy lean all diameter trees

1 Construct undercut, as deep as the tree will allow, preferably up to 25% of the tree diameter.

- Move the chainsaw in the cut as required to feel for pinching of the bar
- Aim the undercut slightly off the lean to help avoid root pull and splitting

2 Side cut towards the center of the tree on the low side.

- Use the bar tip to line up holding wood thickness
- Ensure outside corner holding wood and anti-kickback step is maintained
- Cut with the bar tip pointing in the direction of fall from the back of the tree
- Be aware of your body position in relation to the danger zone on the back side of the tree
- If low side puts the faller in an unsafe position, seek qualified assistance

3 Side cut towards the center of the tree on the high side.

- Use the bar tip to line up holding wood thickness
- Ensure outside corner holding wood is maintained
- Cut with the bar pointing in the direction of fall from the back
- Avoid standing directly behind the tree in case the tree barberchairs
- Leave a minimum of 10% of tree diameter, excluding the bark, as a t-strap (post), including intact sap wood



CAUTION!
Once this cut is complete you must never expose yourself to the back of the tree due to risk of barberchair or root pull hazards. Monitor tree for increased lean and signs of failure.

4 Shoulder check your escape routes.

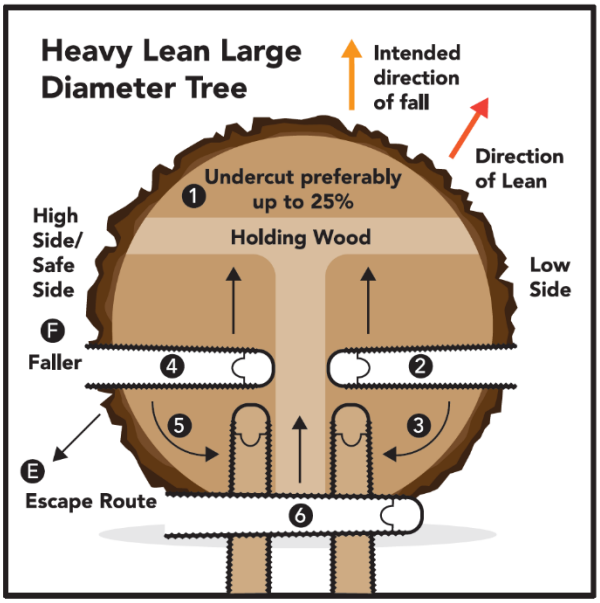
- Refresh your mental plan to move away from the tree

5 Cut the t-strap below the two side cuts, using the lowest cut as a guide.

- Look up and listen carefully for tree movement
- Maintain a defensive position away from the back of the tree to avoid any kickback from the tree
- Keep cutting through the backcut, as quickly as possible, until the tree commits to fall
- Watch for potential root pull
- Be prepared to move away quickly and take cover at the first sign of the tree falling

6 When the tree commits to fall, follow safe escape procedures.

T-strap procedure – Large Diameter Trees



Heavy lean large diameter tree

1 Construct undercut, as deep as the tree will allow, preferably up to 25% of the tree diameter

- Move the chainsaw in the cut as required to feel for pinching of the bar
- Aim the undercut slightly off the lean to help avoid root pull and splitting

2 Bore in and make a partial cut on the low side towards the holding wood.

- Use the bar tip to line up anti-kickback step height
- Ensure holding wood on outside corner is maintained
- If low side puts the faller in an unsafe position, seek qualified assistance

3 Turn chainsaw over and cut towards the center on the low side leaving adequate center holding wood strap.

- Cut with the bar pointing in the direction of fall from the back

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CAUTION!
Once this cut is complete you must never expose yourself to the back of the tree due to risk of barberchair or root pull hazards.

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4 Bore in and make a partial cut on the high side towards the holding wood.

- Use the bar tip to line up anti-kickback step height
- Ensure holding wood on outside corner is maintained

5 Turn the chainsaw over and finish the cut on the high side keeping the center holding wood t-strap intact.

- Cut with the bar pointing in the direction of fall from the back
- Leave a minimum of 10% of tree diameter, excluding the bark, as a t-strap (post), including intact sap wood

6 Shoulder check your escape route.

- Refresh your mental plan to move away from the tree

7 Cut the t-strap below the two side cuts, using the lowest cut as a guide.

- Look up and listen carefully for tree movement
- Watch the cut closely
- Watch for potential root pull
- Be prepared to move away quickly and take cover at the first sign of the tree falling

8 When the tree commits to fall, follow safe escape procedure.

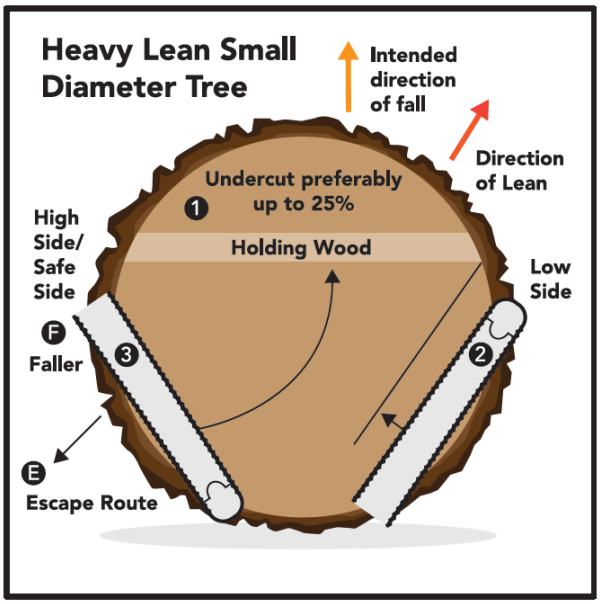


IMPORTANT!
Cutting on very large trees is a slow process and constant monitoring of the tree for subtle signs of root pull and early fall are critical to safety.

Triangle/Cornering Up Procedure

This procedure can also be used in small diameter trees. It requires commitment to complete the backcut procedure quickly while reducing exposure to the back of the tree in case of barberchair.

This is a secondary option to the T-strap and bore-cutting method. The tree may be more prone to barberchair if cuts meet at the back of the tree before completing the backcut. Often used for frozen or deciduous trees, this cutting practice requires the faller be prepared for early fall of the tree at all times.



Heavy lean small diameter tree

1 Construct undercut, as deep as the tree will allow, preferably up to 25% of the tree diameter

- Move the chainsaw in the cut as required to feel for pinching of the bar
- Aim the undercut slightly off the lean to help avoid root pull and splitting

2 Make a partial cut towards the center on the low side.

- Leave sapwood at holding wood corner and cut to the backstrap location

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CAUTION!

Be careful not to cut the back of the tree which could cause the tree to fall prematurely with a greater chance to barberchair.

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3 Shoulder check your escape route.

- Refresh your mental plan to move away from the tree

4 Cut towards the center on the high side. Continue to cut the center holding wood quickly to finish the backcut, finishing from the high side/safe side.

- Look up and listen carefully for tree movement.
- Keep cutting through backcut until the tree commits to the fall
- Maintain a defensive position away from the back of the tree to avoid any kickback from the tree
- Be prepared to move away quickly and take cover at the first sign of the tree falling

5 When the tree commits to the fall, follow safe escape procedures, watching for potential root pull, barberchair, or overhead hazards