

'Chain Shot' Can Kill!

Attention: Logging companies, loggers, equipment manufacturers, and sales reps

A logger was killed by chain shot while operating a mechanical harvester and another logger was seriously injured by chain shot from a processor. Several other chain shot events and **near misses** involving other types of log processing equipment have been reported in recent years across Washington State.

Minimizing the risk for chain shot requires the combined efforts of equipment manufacturers, logging contractors, logging equipment operators, and safety professionals.

What is chain shot?

Chain shot are pieces of a saw chain released when a chain breaks while in use. Chain shot can travel at the speed of a bullet and forcefully strike anybody or any object in its path. Chain shot can even penetrate through windshields, injuring or killing those inside.

Who is at risk?

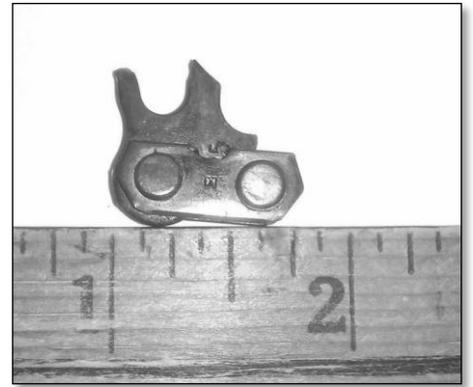
Risk for chain shot is present during operation of any kind **of logging machinery equipped with a guide bar and saw.**

Operators of harvester heads, stroke delimiters, or dangle-head processors are most at risk for serious injury or death. Anyone else working near such equipment can also get struck by flying chain pieces, including operators of other logging machinery, chasers, truck drivers, sales representatives, and bystanders.

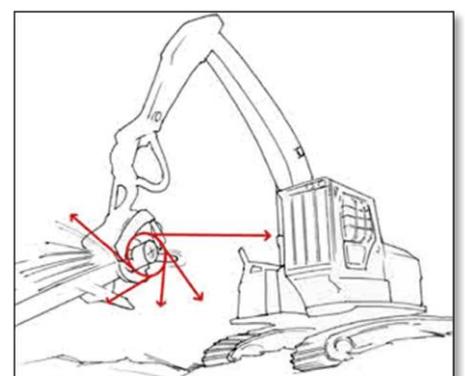
What can I do about chain shot?

You can **reduce the possibility** for chain shot by improving use and maintenance practices.

- Reduce the danger of chain shot from the drive sprocket area:
 - Close all snow holes on harvester and processor heads.
 - Retro fit cutting heads with a shot guard and chain catcher (deflector), when these safe guards are available from the equipment manufacturer.
 - Check with equipment manufacturers for information about these safety features and make sure modifications won't create other safety hazards.
- Inspect chains **before** operating or using them, looking for cracks, worn parts, and poor riveting.
- Use the right type and amount of lubricant on chains. Hydraulic fluid isn't adequate for bar and chain lubrication. During start up, allow enough time to gradually increase chain speed to ensure the lubricant reaches the entire chain, especially in winter.
- Don't repair or use a chain that has broken two times; replace it.
- When operating equipment:
 - Position the saw head in a direction that, should the chain break, the shot would not travel towards any person. When available and safe, take advantage of berms and other obstacles that could block the path of any possible chain shot.



A small size but a deadly threat: chain shot from harvester or processor heads and stroker-log merchandisers or delimiters can maintain lethal velocity after **penetrating ½-inch thick polycarbonate windshields.**



Chain shot is thrown in multiple directions along the plane of the saw bar. It can also ricochet off objects.

Photo courtesy of Oregon Chain

- Don't "pump up" or boost chain speed beyond the manufacturer's recommendations.
- Check to make sure the chain isn't overheating; this is often caused by a dull chain or poor lubrication.
- Keep bystanders and other non-essential personnel **at least 230 feet away** (the length of about 4 logging trucks) when mechanical harvesting equipment is in operation.
- When an automatic chain tensioner is used, make sure the pressure adjustment meets manufacturer specifications.
- Keep chains sharp and make sure anyone expected to maintain chains is adequately trained and follows proper filing and grinding guidance. Use only chain, sprockets, and other saw components that are in good repair and meet the manufacturer's specifications.
- Train operators to properly inspect and report specific problems with saw chains, bars, sprockets, and other saw head components. Make sure all safety problems are fixed.

Resources you can access online

To find an electronic copy of this Hazard Alert with active links to the following resources, go to www.Lni.wa.gov/Safety/Basics/HazAlerts/

Rules:

Rules that address work site hazard prevention can be found in [Safety Standards for Logging Operations](#), Chapter 296-54 WAC. To find other related rules, contact your local L&I office or visit the [Safety Rules](#) webpage.

Training materials:

- Videos
 - [Broken chain link almost kills worker](#) (WorkSafeBC video, 2 minutes)
 - Visit L&I's [Logging](#) topic page to find more safety videos and training resources.
- Publications on chain shot incidents (from www.worksafebc.com):
 - [2011 Safety Alert of the Month](#) (4 pages)
 - [Operator escapes injury when chain shot misses cab of log processor](#) (1 page, 2008)
 - [Broken chain drive link penetrates protective window, striking feller processor operator](#) (1 page, 2004)
- www.oregonchain.com/harvester/service/chain_shot.htm features a chain shot computer simulation, a handbook that provides safety and chain maintenance guidance and tips for harvesting equipment operators, and other useful training resources.

How can I get help from Labor & Industries?

The Department of Labor & Industries provides consultations, training, and technical assistance at no cost to employers. Call today to schedule a free confidential consultation or go to www.SafetyConsultants.Lni.wa.gov for more information. You may also call 1-800-423-7233 or visit a local L&I office and ask for the Consultation Manager.

This bulletin was developed by L&I's Division of Occupational Safety and Health (DOSHS) to alert employers, labor groups, and employees to potential hazards associated with work activities. This is not a rule and creates no new legal obligations. The information provided includes suggested guidance on how to avoid workplace hazards and describes relevant mandatory safety and health rules. DOSHS recommends you also check the related rules for additional requirements.