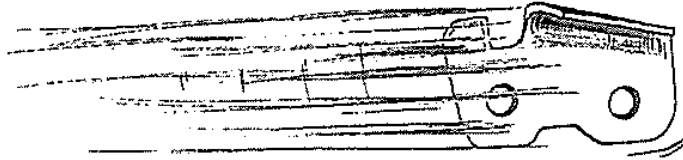


SAFETY RED ALERT

CHAIN SHOT HAZARD



BACKGROUND:

A near miss was recently reported in an HFM Central mechanised harvesting operation in which a section of harvester chain was ejected from the processing head and shot across the road. The harvester was feeding the logs from right to left across the front of the machine and the links were fired directly away from the machine in line with the guide bar. The QC workers on the landing were located out to the left side of the machine (at 90° to the direction of the guide bar) and heard the chain go before witnessing the point at which the links entered the trees on the opposite side of the road.

The operator thought it was simply a regular case of a broken chain until he saw the shocked faces of nearby workers. Chain breaks are a regular occurrence in mechanised operations and follow up discussions with processor and harvester operators have raised serious questions. Quite often operators have found that when taking a broken chain in for repairs it is in fact shorter than it should be. **Where have the missing links gone???** Most assume they have dropped to the ground. This incident is unique in the fact that the skidworkers were able to identify where the missing piece had gone and the reality was quite alarming.

INFORMATION:

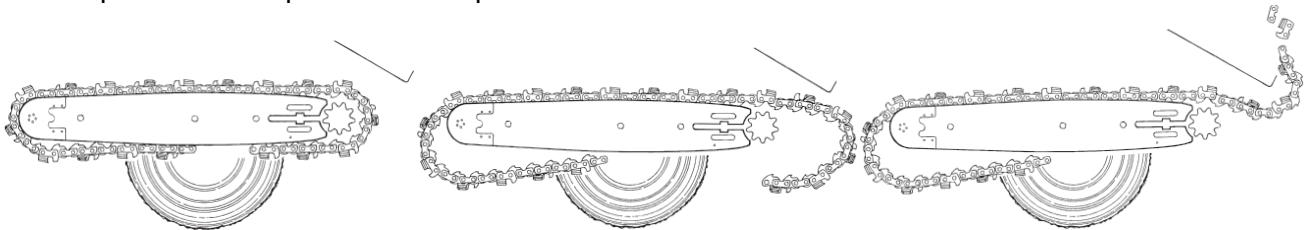
What is chain shot?

Chain shot is the high velocity separation and ejection of a piece or pieces of cutting chain from the end of a broken chain in mechanised timber harvesting. Chain shot typically occurs near the drive end of the cutting system but can also come from the bar tip area.

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How does chain shot occur?

- A chain shot consists of two breaks in a chain. First, the loop of chain breaks and forms two ends. One end moves past the drive sprocket or bar nose and is rapidly accelerated due to a whip-like motion of the chain end. The "whip action" causes the second break releasing small parts at super sonic speed.



Where can it go?

Chain shot can cause chain parts to be thrown in many directions, especially those along the plane of the guide bar.

But I thought chain guards fixed the chain shot problem?

Chain guards are a tool to aid in minimising instances of chain shot. Chain shot itself cannot be eliminated but the hazard it poses in our operations can be if managed efficiently.

SOLUTIONS:

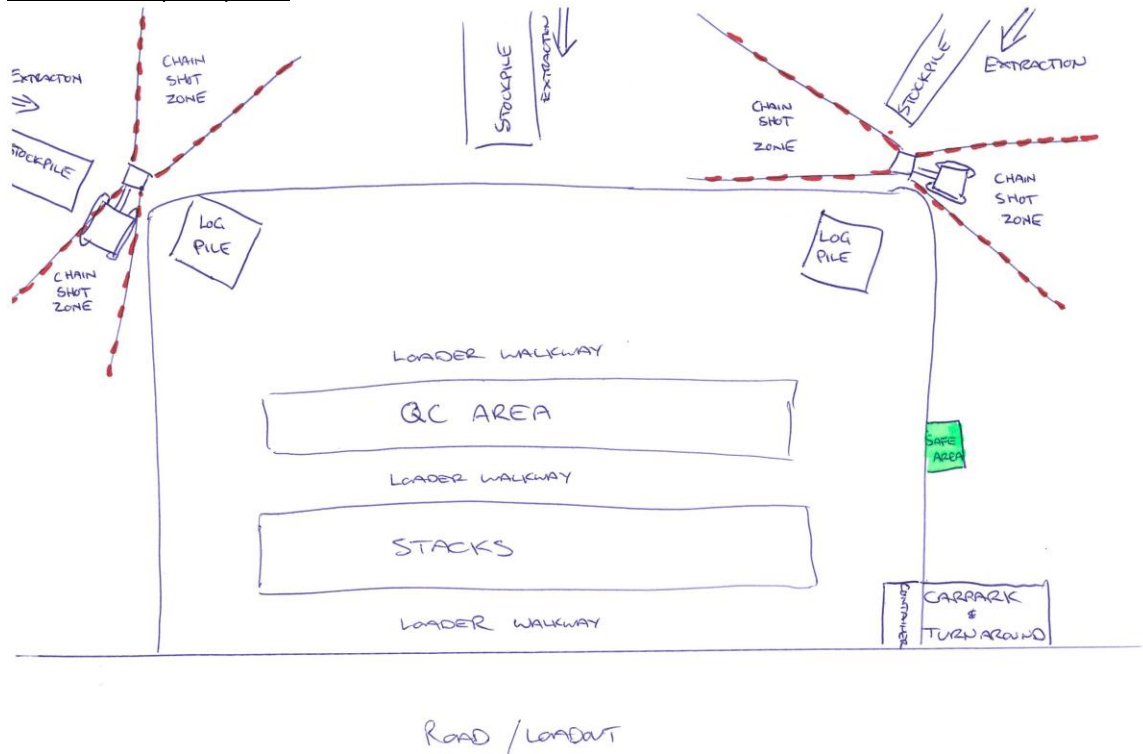
What can we do?

- First and foremost, treat the harvester head as if it were a loaded firearm – **ALWAYS POINT IT IN A SAFE DIRECTION**
- Isolate the main chain shot zones. These are out both directions from the head in line with the guide bar, including the topping saw (refer to the diagram attached to the back of this Safety Alert). No person or machine should enter this zone while the saw is working. Processor and harvester operators must keep in mind that they are possibly the only person in the operation protected by a polycarbonate shield. Most other machines are fitted with glass or Perspex that will offer no protection whatsoever.
 - To isolate this area all personnel and visitors must be aware of the hazard and exclusion zones.
 - Chain shot zones must be identified on your landing layout plan (example of basic skid below). Any changes made to processing areas must be documented and the plan amended

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- Your landing diagram should be prominently displayed (on whiteboard in smoko shelter is ideal) not tucked away in a folder somewhere.

Basic skid layout plan:

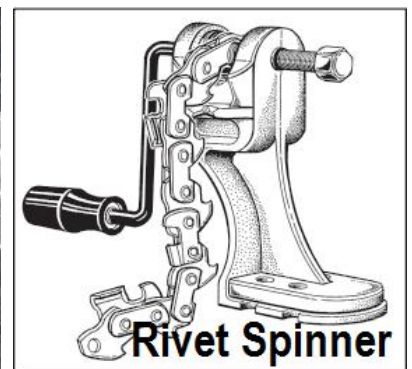
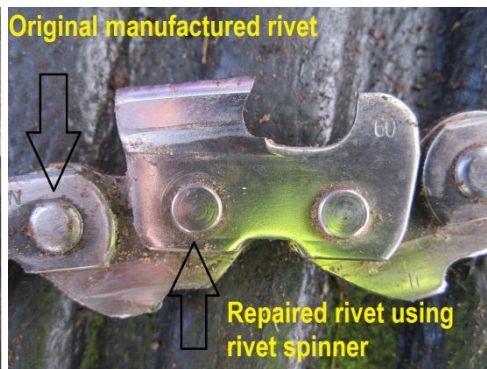


- If the extraction route is through the chainshot zone there must be a plan of communication between both machine operators so that the processor can pause while the extraction machine passes through
- Some crews have set up an exclusion zone using cones, markers, or goalpost system at which the processor aims for and no person or machine is permitted to enter. This is a good idea and helps to isolate the chain shot hazard.
- Inspect your bar, chain, drive sprocket and chain guard daily. Make it part of your maintenance routine when you grease the machine. Look closely for cracked links and tie straps, loose or broken rivets (if you can rotate the rivets with your fingers, they're too loose). Look for wear on the bar or sprocket. Does the gauge of the drive links still fit snugly in the guide bar? These are leading contributors to chain failure.

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- Ensure the chain tension is compliant with the manufacturers specifications and the chain well lubricated with good quality oil.
- Ensure the speed rating of the chain matches the speed of the harvester head.
- Correct chain repair is critical in reducing chain shot.
 - Always use new parts from the chain's manufacturer, do not use second-hand or cheap parts
 - Always follow the manufacturer's guidelines for chain repair
 - Ensure your repair agent is repairing the chain correctly and forming rivet heads properly with a rivet spinner. Rivets that are simply hammered in will fail. They will become the weakest link in the chain and have been identified in chain shot investigations as a leading contributor.



- If your repaired links look like the first picture **take your chains somewhere else** to get fixed.
- It is highly recommended that chains be discarded following the second break.

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DIAGRAM OF CHAIN SHOT ZONES

