

# Cool Cuts

**Fundamental maintenance practices and troubleshooting tips to help achieve problem-free sawing.**

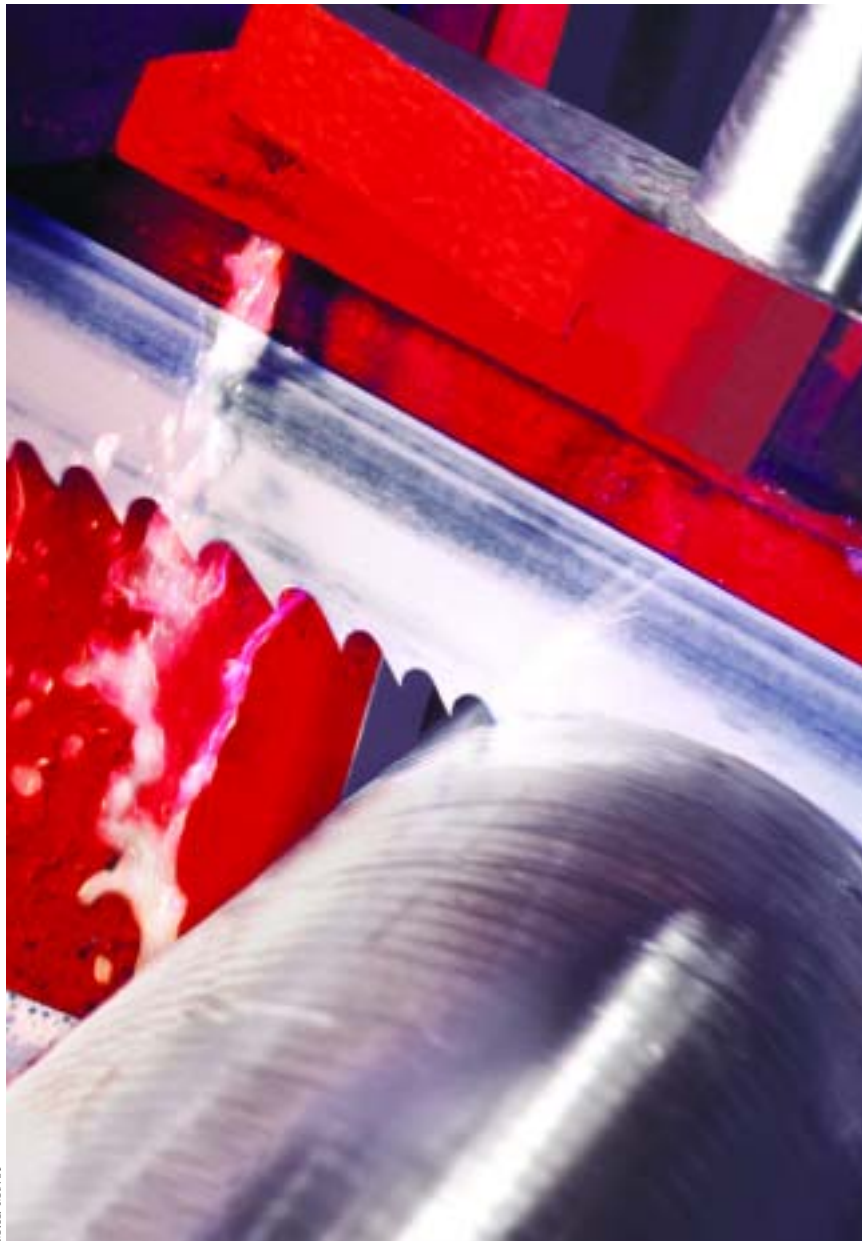
**A**ny number of factors can cause poor bandsaw blade performance. That's why when a bandsaw technician visits a customer for service support, he usually follows an inspection checklist.


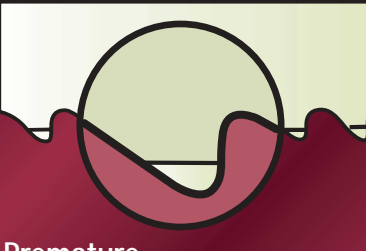
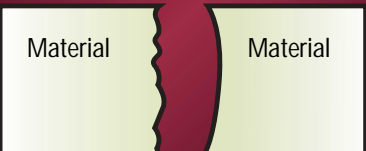


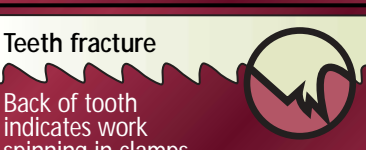

He'll check the guides, blade tension, guide-arm positioning, drive idler wheel condition, horizontal and vertical alignment, chip brush condition, vises, speed and feed indicators, blade tracking, belts and drives, and hydraulic oil levels. He'll also check coolant condition, concentration and flow, because heat is the main killer of tooth sharpness, and these factors make or break successful sawing. (See "Troubleshooting Guide," following pages.)

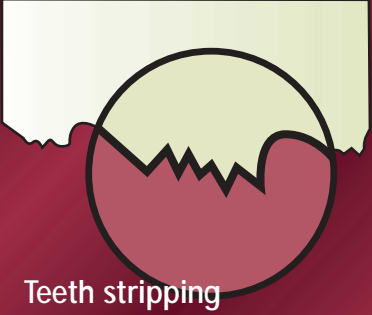


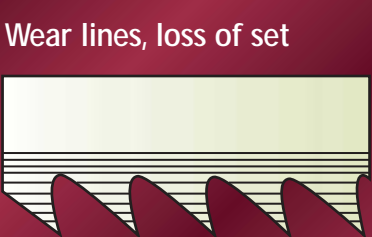


## Keep It Clean

With the water-soluble cutting fluids most end users apply, an odor is an easy-to-notice indicator for an idle or infrequently used machine that the coolant might be causing a problem. The odor and a visible layer of "scum" on the coolant indicate bacteria growth. Foul coolant can clog hoses, restricting the flow and adversely altering the concentration ratio. The problem can be corrected by flushing the coolant system and adding new fluid to it.

An unchecked concentration ratio can lead to a mixture that's too lean or too rich. A lean mixture doesn't remove heat properly and a rich mixture impedes the penetration of the tooth into the workpiece. Premature tooth wear results from both scenarios.



Problem	Cause	Solution
 <p><b>Premature blade breakage</b> Straight break indicates fatigue</p>	<ul style="list-style-type: none"> <li>• Incorrect blade; teeth too coarse</li> <li>• Blade tension too high</li> <li>• Side guides too tight</li> <li>• Damaged or misadjusted blade guides</li> <li>• Excessive feed</li> <li>• Incorrect cutting fluid</li> <li>• Wheel diameter too small for blade</li> <li>• Blade rubbing on wheel flanges</li> <li>• Teeth in contact with work before the cut</li> <li>• Incorrect blade speed</li> </ul>	<ul style="list-style-type: none"> <li>• Use finer tooth pitch</li> <li>• Decrease blade tension</li> <li>• Check side guide clearance</li> <li>• Check all guides for alignment or damage</li> <li>• Decrease feed pressure</li> <li>• Check fluid</li> <li>• Use thinner blade</li> <li>• Adjust wheel alignment</li> <li>• Allow 1/2" clearance before starting the cut</li> <li>• Increase or decrease blade speed</li> </ul>
 <p><b>Premature dulling of teeth</b></p>	<ul style="list-style-type: none"> <li>• Teeth pointing in wrong direction; blade mounted backwards</li> <li>• Improper or no blade break-in</li> <li>• Hard spots in material</li> <li>• Material workhardened</li> <li>• Improper coolant</li> <li>• Improper coolant concentration</li> <li>• Speed too high</li> <li>• Feed too light</li> <li>• Teeth too small</li> </ul>	<ul style="list-style-type: none"> <li>• Install blade correctly; if teeth are facing wrong direction, flip blade inside out</li> <li>• Break in blade properly</li> <li>• Check for hard spots like scale or flame-cut areas</li> <li>• Increase feed pressure</li> <li>• Check coolant type</li> <li>• Check coolant mixture</li> <li>• Check recommended blade speed</li> <li>• Increase feed pressure</li> <li>• Increase tooth size</li> </ul>
 <p><b>Inaccurate cut</b></p>	<ul style="list-style-type: none"> <li>• Tooth set damage</li> <li>• Excessive feed pressure</li> <li>• Improper tooth size</li> <li>• Cutting fluid not applied evenly</li> <li>• Guides worn or loose</li> <li>• Insufficient blade tension</li> </ul>	<ul style="list-style-type: none"> <li>• Check for worn set on one side of blade</li> <li>• Decrease feed pressure</li> <li>• Check tooth size</li> <li>• Check coolant nozzles</li> <li>• Tighten or replace guides and check for proper alignment</li> <li>• Adjust to recommended tension</li> </ul>
 <p><b>Band leading in cut</b></p>	<ul style="list-style-type: none"> <li>• Over-feed</li> <li>• Insufficient blade tension</li> <li>• Tooth set damage</li> <li>• Guide arms loose or set too far apart</li> <li>• Chips not being cleaned from gullets</li> <li>• Teeth too small</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce feed force</li> <li>• Adjust to recommended tension</li> <li>• Check material for hard inclusions</li> <li>• Position arms as close to work as possible; tighten arms</li> <li>• Check chip brush</li> <li>• Increase tooth size</li> </ul>
 <p><b>Chip welding</b></p>	<ul style="list-style-type: none"> <li>• Insufficient coolant flow</li> <li>• Wrong coolant concentration</li> <li>• Excessive speed and/or pressure</li> <li>• Tooth size too small</li> <li>• Chip brush not working</li> </ul>	<ul style="list-style-type: none"> <li>• Check coolant flow and level</li> <li>• Check coolant ratio</li> <li>• Decrease speed and/or pressure</li> <li>• Use coarser tooth pitch</li> <li>• Repair or replace chip brush</li> </ul>
 <p><b>Teeth fracture</b> Back of tooth indicates work spinning in clamps</p>	<ul style="list-style-type: none"> <li>• Incorrect speed and/or feed</li> <li>• Incorrect blade pitch</li> <li>• Improper saw-guide adjustment</li> <li>• Chip brush not working</li> <li>• Work spinning or moving in vise</li> </ul>	<ul style="list-style-type: none"> <li>• Check and adjust speed and/or feed</li> <li>• Check tooth size</li> <li>• Adjust or replace saw guides</li> <li>• Repair or replace chip brush</li> <li>• Check bundle configuration and adjust vise pressure</li> </ul>
 <p><b>Irregular break</b> Indicates material movement</p>	<ul style="list-style-type: none"> <li>• Indexing out of sequence</li> <li>• Material loose in vise</li> </ul>	<ul style="list-style-type: none"> <li>• Check proper machine movement</li> <li>• Check vise or clamp</li> </ul>

Problem	Cause	Solution
 <p><b>Teeth stripping</b></p>	<ul style="list-style-type: none"> <li>• Feed pressure too high</li> <li>• Tooth stuck in cut</li> <li>• Improper or insufficient coolant</li> <li>• Incorrect tooth size</li> <li>• Hard spots in material</li> <li>• Work spinning in vise; loose nest or bundle</li> <li>• Blade speed too slow</li> <li>• Blade teeth running backwards</li> <li>• Chip brush not working</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease feed pressure</li> <li>• Do not enter old cut with a new blade</li> <li>• Check coolant flow and concentration</li> <li>• Check tooth size</li> <li>• Check material for hard inclusions</li> <li>• Check clamping pressure; be sure work is firmly held</li> <li>• Increase blade speed</li> <li>• Turn blade inside out</li> <li>• Repair or replace chip brush</li> </ul>
 <p><b>Wear on back of blades</b></p>	<ul style="list-style-type: none"> <li>• Excessive feed pressure</li> <li>• Insufficient blade tension</li> <li>• Frozen, damaged or worn backup guide roll</li> <li>• Blade rubbing on wheel flange</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease feed pressure</li> <li>• Increase blade tension and readjust guides</li> <li>• Repair or replace backup roll or guide</li> <li>• Adjust wheel cant</li> </ul>
 <p><b>Rough cut</b> Washboard surface, vibration and/or chatter</p>	<ul style="list-style-type: none"> <li>• Dull or damaged blade</li> <li>• Incorrect speed or feed</li> <li>• Insufficient blade support</li> <li>• Incorrect tooth pitch</li> <li>• Insufficient coolant</li> </ul>	<ul style="list-style-type: none"> <li>• Replace with new blade</li> <li>• Increase speed or decrease feed</li> <li>• Move guide arms as close as possible to the work</li> <li>• Use finer-pitch blade</li> <li>• Check coolant flow</li> </ul>
 <p><b>Wear lines, loss of set</b></p>	<ul style="list-style-type: none"> <li>• Saw guide inserts or wheel flange riding on teeth</li> <li>• Insufficient blade tension</li> <li>• Hard spots in material</li> <li>• Worn backup guide</li> </ul>	<ul style="list-style-type: none"> <li>• Check machine manual for correct blade width</li> <li>• Adjust blade tension</li> <li>• Check material for hard inclusions</li> <li>• Replace guide</li> </ul>
 <p><b>Twisted blade</b> Profile sawing</p>	<ul style="list-style-type: none"> <li>• Blade binding in cut</li> <li>• Side guides too tight</li> <li>• Radius too small for blade width</li> <li>• Work not firmly held</li> <li>• Erratic coolant flow</li> <li>• Excessive blade tension</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease feed pressure</li> <li>• Adjust side guide gap</li> <li>• Use narrower blade</li> <li>• Check clamping pressure</li> <li>• Check coolant nozzles</li> <li>• Decrease blade tension</li> </ul>
 <p><b>Blade wear</b> Teeth blue</p>	<ul style="list-style-type: none"> <li>• Incorrect blade</li> <li>• Incorrect feed or speed</li> <li>• Improper or insufficient coolant</li> </ul>	<ul style="list-style-type: none"> <li>• Use coarser tooth pitch</li> <li>• Increase feed or decrease speed</li> <li>• Check coolant flow</li> </ul>

The operator should check the coolant level daily to make sure none has been lost. Users tend to lose quite a bit when sawing structurals, because the coolant collects in workpiece cavities.

Even if the coolant condition, concentration and level are OK, the operator needs to position the coolant nozzles so they direct the optimal amount of fluid to the tool/workpiece interface. Generally, a full-flow system incorporates nozzles that direct coolant at the blade as it enters the cut, is in mid-cut and exits the cut.

## Chip Cleaning

Chip brushes help prevent chip welding and should be replaced when damaged or missing. A chip brush is run through the blade's gullet to remove chips. The cleaning process prevents the blade from carrying chips up into the machine, where they can cause damage, or travel-

ing with the blade and re-entering the cut, where they impede tooth penetration.

The chips themselves provide information about whether the speed and feed are correct. The desired chips are silver, thin and loosely curled. If the curl is too tight, decrease the feed. In addition to decreasing the feed, decrease the blade speed when the chips are thick, short and discolored. A blue or brown discoloration indicates the chips are being burned.

On the other hand, if the sawing application generates powdery chips, the speed is too high and the feed is too light. This means the blade is taking little bites rather than forming a full chip.

Not all maintenance and related process-optimization practices are technical, though. It's a good idea to wipe and spray the machine at the end of every

shift to remove chips, grime, fluid and debris. The practice not only keeps a machine looking good, it also makes it easier for an operator to pinpoint and troubleshoot a problem if one arises.

Roller guides should also be cleaned on a regular basis to keep them free-moving and clear of debris. "Flossing" with a heavy cloth towel run through the guides during blade changeover is a good practice.

These practices help to keep a bandsaw running problem-free—and the service technician at bay.

*This article was written with the assistance of Steve Rearick, a technical specialist at The M.K. Morse Co., Canton, Ohio. For more information about the company's line of industrial bandsaw blades, call (800) 733-3377 or visit [www.mkmorse.com](http://www.mkmorse.com).*