

SPIN GRINDING

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REEL GRINDING

Spin grinding has taken off in the past few years as an alternative to proper reel grinding, offering "time savings" and "increased accuracy". The trend toward spin grinding is a result of the efforts of a few self-serving manufacturers telling you what you want to hear. Unfortunately, the whole story is seldom told for fear of rejection of the spin grind concept.

Everyone understandably looks for ways around undesirable tasks. Reel grinding has been in the undesirable category since day one, and finding a better way of sharpening has been a constant consideration.

Flat or spin ground reels have a tendency to be more accurate if they are set up properly. With the design of most reel mowers in the U.S. today, it is imperative that the reel be brought back to as perfect a cylinder shape as possible. Short cuts in this area (i.e., Touch Method from end to end) take away any benefits offered by the Spin Grind Method. NOTE: Touch Method may be used on units which adjust reel to bed knife since cutting is always done at the same point due to stationary bed knife.

Relief Angle: A question that comes up frequently in grinding conversations is, "Why is relief necessary?", or "Why is no relief required?"

No matter what your beliefs - spin grinding offers only a "flat" grind with no relief, it simply cannot be any other way. The manufacturers of most reel cutting units design relief into their mowers for the following reasons.

1) Ease of manufacture and assembly. 2) Ease of sharpening between grindings (lapping or back lapping). 3) Minimal contact between reel blade and bed knife.

DISCUSSION: POINT #1 - During assembly of reels, a perfect cylinder shaped reel is desired for proper reel to bed knife contact. To achieve this, Spin Grinding is

used to true the reel containing pre-relieved reel blades before assembly. This virtually eliminates lapping when done correctly.

POINT #2 - Since the relief, which is built into each reel blade offers a smaller "land" or "flat" to be lapped during between grindings sharpenings, every bed knife and reel combination wears or dulls to some degree during use. The Back Lapping procedure is the procedure of applying fine compound while the reel is being turned backward (Back Lapped), and the bed knife is adjusted for contact with the reel. The Lapping Compound, along with contact between the reel and bed knife, removes a certain amount of steel on both cutting surfaces to expose a sharp cutting edge once again. With a relief grind on the reel blade, the process of lapping a reel unit is easily achieved. Without relief, the lapping process takes much longer since more surface to lap translates into more time to lap.

The statement came up, "With a flat grind your cutting edge holds up better and doesn't need lapping." Now we know better than that. Anything that cuts anything gets dull. If you're expected to spin grind when you're supposed to lap, where is the savings.

POINT #3 - Minimal contact between bed knife and reel is desirable. "Zero clearance" when the bed knife and reel are sharp is the ultimate goal.

Naturally it is impossible unless grinding or lapping has just been done. After the two cutting surfaces start to dull, slight contact between the bed knife and reel is required to cut. A new cutting unit has no more than a narrow "land" on the reel blade to make contact with the bed knife. A half worn reel (flat on half the thickness of the reel blade) has half the blade in contact with the bed knife which also has a flat on it.

If all the relief is worn off, the full contact of the reel blade is in contact with the flat of the bed knife which is exactly what you start out with on a spin ground reel.

Minimal contact between the mating parts is desirable because of reduced heat build up, lower power requirements to drive reels and

to help maintain a sharp cutting edge in addition to minimizing the wear of gears, bearings and seals. Excessive wear may not show up at first, but in the long run noticeably higher repair costs will be evident when a flat grind is used.

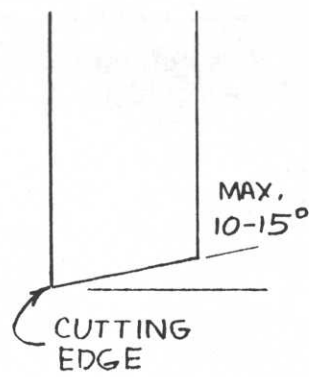
How much relief is enough? Too much?

Since there is no way of measuring precisely the amount of relief on a reel blade, it is enough to say that any relief is better than none. Conversely, too much relief will have adverse results including: a) Weak cutting edge and blade. b) Fast reel wear. c) Frequent bed knife to reel adjustment.

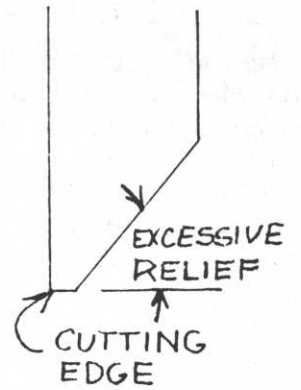
Too much relief is usually a result of placing a double relief on the reel blade.

Examples of reel cross sections - correct and incorrect applications.

CORRECT RELIEF GRIND



INCORRECT RELIEF GRIND



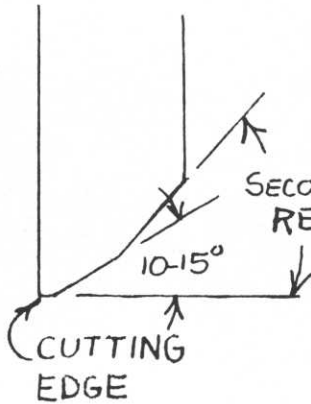
BED KNIFE GRINDING

How the bed knife is ground does make a difference in overall performance of your cutting unit. When grinding (sharpening) a worn bed knife, always make sure that the relief angle is taken from the existing worn surface, 5° is usually adequate.

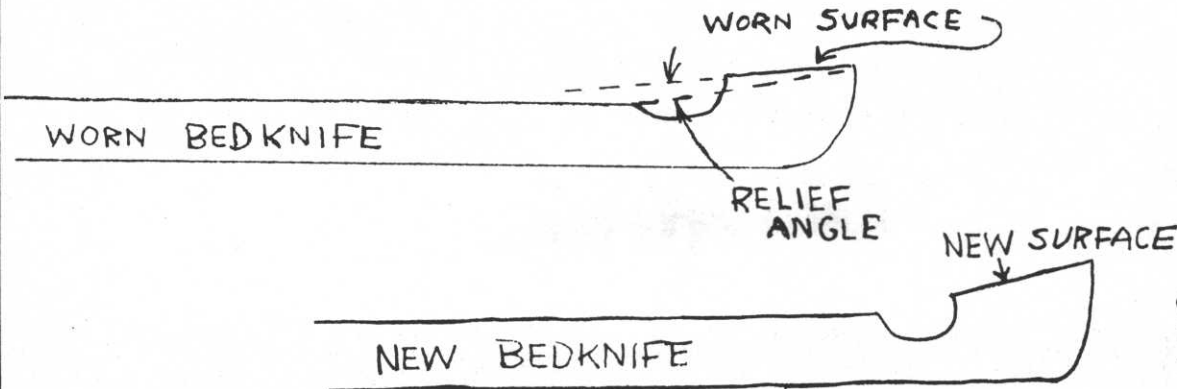
Grinding a new bed knife is very simple. After mounting the knife to the bed bar, a few passes are necessary to make sure the cutting edge is true before installation into the cutting unit. Follow the existing angles since relief has already been ground in at the manufacturer. Changing the relief angle is unnecessary and results in shortening the bed knife's useful life.

In a nutshell, spin grinding does have its place when used with RELIEF. It has been proven as an excellent way of truing a reel (when proper set up is used). Relief is important for prolonging cutting unit life right down to the bearings and seals. Relief is and always has been a necessary part of PROPER mower maintenance. Shortcuts taken in this area will mean higher costs in the future. Don't settle for half the job. Insist on relief.

INCORRECT DOUBLE RELIEF GRIND



INCORRECT FLAT GROUND



GRIND AT EXISTING ANGLE TO TRUE TOP SURFACE - DO NOT CHANGE RELIEF.