

GOLF & ATHLETIC TURF

Reel mower sharpening:

Two months ago, one industry expert gave his analysis of reel mower sharpening. Here are some alternatives to consider.

by Paul Fox

■ When grinding the faces of bedknives on reel mowers, make your angle measurements from the center of the axle shaft to the longest radius of the blade tip. (This is the leading edge of the blade. The shorter radius is the back side of blades.) At the perpendicular point where the longer radius meets the top edge of the bedknife, add an extra 5° to determine grinding angle. The relief angle on the back side of the bedknife, meanwhile, will differ depending on the size of the reel and the amount of grass being cut.

On greens mowers and walkers, the most often used grinding angle is 7° plus a "dirt factor" of 2°. For tee and collar mowers, it is usually 9° with a dirt factor of 3°. Large fairway and pull gang units use 11° with a dirt factor of 4°. This relief angle on the bedknife is for ejecting the grass clippings and debris. When this angle is worn away by lapping, grass builds up on the back of the bedknife, causing it to rifle, which in turn leads to poor ejection of clippings and loss of cut quality.

Spin grinders achieve what is known as a convex grind. Over a three- to eight-week period, blade tips wear 60 to 100 percent, causing excessive drag. Thus, reducing the blade thickness by relief grinding is a correctly recommended solution.

An Express Dual gives a hollow (concave) grind. This is achieved by the stone

another spin



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hitting the back side of the blade and then grinding forward to the blade tip. This gives anywhere from 2° to 4° relief in the reel. Over the same three- to eight-week period, the blade tip wears only 15 percent.

Once the reel and bedknife are ground, the clearance should be anywhere from .002 to .003 inch. Greens and tee mowers should cut a piece of paper that has been folded in half and pinched. Light fairway

and larger units should cut a business card.

Regular maintenance of the bedknife is essential to keep acceptable cut quality. This is done by facing the bedknife with a file or a die grinder. A product from Precision Small Engine, Pompano Beach, Fla., will be on the market soon that will face bedknives on the traction unit.

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ELSEWHERE

Another course goes Audubon, page 3G

Watch air, water to cure black layer, page 6G

Follow a plan to survive summer, page 10G

Creative 'scapes at Oregon course, page 14G

Jacaranda's program

■ Our equipment consists of four Toro 3100s with S.P.A. reels, two Jacobsen Greensking IV greensmowers, four Jacobsen Greensking IV tee mowers, two Jacobsen 3810 fairway units, two John Deere 3325 slope mowers with old-style beaver reels, two seven-gang Toro Reelmaster rough units and two spare sets of 3100 S.P.A. reels.

All cutting units have regular bedknife maintenance, facing the bedknife. For other specifics, please consult the accompanying chart.

Modifications to the reels and frames of our 3810 fairway units made by head mechanic Jim Wicklein and myself make the reels much easier to grind and remove from the traction unit.

John Deere 3325s with the old beaver reels take 8-10 hours due to

the amount of work to remove the bedknife. We have just modified the bedknife holders on these reels that could cut grinding time by up to two hours.

All spare reels are ground and ready to go whenever needed.

In seven months, I have only replaced two 3810 reel bearings on two cutting units. I haven't had to replace any on greens, tees or rough units. I've only had to replace three cutting units on slope mowers, due to factors other than grinding or lapping reels.

If you are interested in the modifications we made on the Jacobsen 3810 or John Deere 3325, contact me at Jacaranda Golf Club, 9200 W. Broward Blvd., Plantation, FL; (305) 472-5251.

—Paul Fox

surfaces are mirrored and curved to the shape of the reel blade. The grass is rolled over the bedknife (even with a faced front edge), pinched, dragged, ripped and torn, leaving a ragged cut that shows up in the afternoon as pale or white-colored grass.

Also, with this braking effect, contact must be tighter and tighter for the reel to cut properly. It also makes the mower or traction unit work harder—meaning the engine and hydraulic pumps must work harder.

Bearings on mowers with lapped reels don't last as long as on mowers with spun-ground reels because lapping creates a vertical stress on the bearings. With the reduced contact area from relief grinding, a much higher vertical thrust will oval the bearings. (On a 3/4 tip reduction, vertical stress is 16 times greater.) The bearing wear creates a fine vibration, which rounds off the blade tips, creating more bearing wear, more vertical stress, more vibration, etc.

Finally, while the amount of metal removed during backlapping is small, over a period of time it adds up to a lot more than is removed during a regular grinding program.

—The author is reel technician at Jacaranda Golf Club, a 36-hole semi-private club in Florida whose superintendent is Randy Jacobson. Fox is a former employee of Bernhard & Co. Ltd., manufacturer and marketer of Express Dual and Anglemaster.

GRINDING from page 1G

Cutting units will not need to be removed.

After relief grinding, if the reel and bedknife are properly set, there will be no friction. But a thinner blade is not as strong because of less blade area being removed during relief grinding, and it will not take a "hit" as well as a thicker blade.

The thicker blades of spin grinding on an Express Dual will usually pass the object through the reel or cut it with min-

imal damage to the bedknife or no damage at all. (This depends on the size of the reel and object being hit.) If that should happen, you can grind the reel or take the bedknife out and also regrind it.

Backlapping is not necessary after spin grinding because the burr that is left after grinding will go away on its own during mowing. Backlapping removes the relief angle that is ground into the bedknife and flattens out the reel blades, creating a braking effect. As the reel is lapped, both

Jacaranda's Maintenance Program

EQUIPMENT	GRINDING INTERVAL ¹	OUT OF SERVICE ²	BEDKNIFE LIFE
Toro 3100	6-8 wks.	40-45 mins.	4-4.5 mos.
Jacobsen Greensking IV	6-8 wks.	60 mins.	6 mos.
Jacobsen 3810	8-10 wks.	4.5-5 hrs.	>10 mos.
John Deere 3325	8-10 wks.	8-10 hrs.	1.5 yrs.
Toro Reelmaster	16-18 wks.	8-8.5 hrs.	1.5-2 yrs.

¹Time between grinds

²Time out of service during grinding

Source: Paul Fox