

# Greensmower Maintenance

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*"Putting greens are to golf courses what faces are to portraits."*

—C. B. Macdonald,  
Golf Course Architect

Regardless how well-designed or maintained a golf course may be, the feature most remembered after the round likely will be the putting greens. It is a fact that 50 percent to 75 percent of golf is played on the putting surface, so the importance of following through with correct maintenance practices for greens cannot be over-emphasized. Before a single blade of grass is cut, however, proper care and maintenance of the mowing unit itself must receive first priority.

## The Mechanic

The pressure to produce a quality putting surface at cutting heights as low as 1/8", and occasionally less, can be enormous. The long-term effects of agronomic practices and player responses to course conditions suggest that not just anyone should be assigned the responsibility of repairing and adjusting a cutting unit. Your mechanic must have a thorough understanding of what will occur if the greens aren't up to speed, so to speak. When hiring or training a mechanic, consider that he must be well rounded in his understanding of the job. This should include:

- An understanding of the principles of mowing and its effects on the turfgrass.
- A basic knowledge of putting green agronomics.
- The ability to instruct personnel to properly use and care for mowing equipment.
- Having the "golfer's eye" and realizing the premium placed on putting quality.
- Being conscientious and taking pride in the results.

## The Operator

When the mowing unit goes from the mechanic to the operator, proper training will avoid mechanical failures and minimize the risk of poor mowing quality. Initial training should take place on a nursery green or a secondary practice green. Learning on the nursery green allows the new operator time to get the feel of the machine and to react when there is trouble with the cutting unit. He also learns to visually distinguish between a good and bad quality cut. An experienced operator accompanying a trainee can point out common problems and potential mistakes.

Cutting greens daily eventually wears out most working parts of any cutting unit. Prior to cutting a green, the operator should go through a routine look, listen and feel checklist involving several items:

- With the unit OFF, visually inspect the reel and bedknife for chipped, bent or damaged sections resulting from mowing or transporting the unit.
- With the unit OFF and stationary, close the fuel line and tilt back the cutting unit, exposing the underside of the bedknife. Inspect the mounting screws to be sure none are missing or loose.

- Inspect the unit for excess or dripping oil, grease, or fuel.
- Visually inspect the green and remove any debris.
- Pole or whip the surface to locate and remove small stones, sticks, ball markers, and golf spikes.
- While cutting, listen for irregularities in the sound of the motor or for poor contact between the reel and bedknife.
- An off-key sound indicates worn bushings, bad bearings, or loose bolts and belts.
- Don't allow the catch baskets to overflow with clippings. The added weight can lower the effective mowing height.

## Grinding and Sharpening

Producing the correct reel-to-bed-knife relationships is the key to a successful mowing operation. Grinding and sharpening to mate the reel and the bedknife are the two most important processes in the mower maintenance program.

The bedknife is the stationary bottom blade of a reel mower against which the reel blades turn to produce a shearing cut. Bedknife maintenance includes proper grinding and filling of the front and top faces to an angle determined by the manufacturer. Grinding takes place whenever a new knife is used, after topdressing, and on a biweekly schedule throughout the mowing season. Grinding should be followed by backlapping, the fine sharpening and mating of the bedknife to the reel using a fine grit, emory-based compound. Filing the lead face produces a sharp edge that allows the turf to be sheared rather than torn. The life of a bedknife is related directly to the height of cut and the cultural practices utilized. When purchasing bedknives, consider the following:

- There are three levels of bedknife thickness; regular, thin and championship. Selection is dependent on your mowing requirements. The lower the cutting height, the thinner the knife you should purchase.
- Use bedknives made of factory-recommended hardened steel.
- Check for bends in the bedknives prior to purchase.
- Match the mower brand with the bedknife. A proper fit between the two reduces wear and produces a finer cut.
- Remove the paint on the bottom of the bedknife prior to mowing to avoid drags.
- Check that all mounting screws are flush with the bottom of the bedknife prior to mowing to avoid streaking or dragging.

## Reel Grinding and Sharpening

Proper and consistent grinding and sharpening of the reel blades is the second step in developing a clean, shearing cut. During the manufacturing stage, reels are ground to be perfect cylinders. Heavy use throughout the season, as well as improper adjustment procedures, cause this cylinder to become tapered at each end, thereby shrinking the reel diameter. Sharpening the reel by grinding restores this cylinder, eliminates imperfections, and extends the life of the reel.

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- Use one of the newer automatic spin grinders, which produce a consistent and true grinding effect. Human error is eliminated, and the reel will live a longer life.
- Avoid excessive grinding, for it shortens the life of the reel blades.
- Use a “softer” stone for grinding to extend the life of the reel.
- A light backlapping after grinding removes the burr produced along the blades, providing a better mating between the reel and the bedknife.
- Consistency is the key. One or two individuals should perform and monitor the grinding to prevent errors and keep the operation moving smoothly.

### Reel-to-Bedknife Adjustment

After the mower is cleaned and brought to the mechanic, servicing and adjustments can begin. The most important adjustment is matching the reel to the bedknife. This mating determines the quality of cut, with the reel rotating across the stationary bedknife blade that is fixed to the bottom of the mower frame.

Use the *cut and crimp method* to check the reel and bedknife sharpness as well as the side-to-side adjustment. This ensures one side is not cutting more than the other. Fold a strip of newspaper in half, place it between the reel and bedknife, and check the quality of cut from side to side. The blades should *cut* the top section of the paper and *fold* (crimp) the bottom piece. If the reel does not cut the top piece, it may be adjusted too tight. If both pieces fold over, both the reel and the bedknife may need resharpening. Use the newspaper to check the quality of cut at all points between the reel and bedknife. The paper should have a clean, crisp cut and not be shredded or torn.

### Cutting Height Adjustment

Cutting height adjustments should be performed daily by the mechanic, after the reel-to-bedknife mating is complete. Before setting the cutting height, inspect the roll drum and front roller for damage or end play. These components must be aligned and uniform to ensure that the height setting is correct and permanent. Check that the height is correct at each end of the bedknife, and gradually tighten the lock-down bolts. Always *recheck* the height to be sure tightening the lock-down bolts did not cause a change in the cutting height.

Another technique used is the *bar and screw method*. The mechanic sets the height, primarily by feel, by pushing and pulling the adjustment bar between the reel and bedknife. The more recent Accu-Gage is a precision measuring instrument for making highly accurate height-of-cut adjustments on greensmowers in decimal readouts. There is still room for error, though, because different people will adjust the units differently. The same person should set and change the cutting height throughout the season to ensure consistent results.

There are several items that should be checked to ensure the height consistently remains the same.

- Provide your mechanic with a large enough, well-lighted area to facilitate maintenance and adjustment.
- Check the cutting height when the reel and bedknife are cold. Heat expands metal and can cause a misreading of the cutting height.

- Inspect the lock-down bolts and adjusting nuts at each end of the unit to be sure they are working correctly.
- Periodically check the cutting height each morning while the machines travel from green to green. Bumpy terrain and off-loading from a transport trailer can cause a change in the reel-to-bedknife adjustment.

### Off-Season Maintenance

During the off-season, a total breakdown of each machine and servicing of all working parts should take place. This consists of:

- A complete unit breakdown and assessment of all working parts, including the replacement of bearings, seals, and all nuts and bolts.
- Remove the engine from its mounting, dismantle, and re-ring the motor, de-carbon the heads, and rebuild the carburetor.
- Reassemble the motor, run a compression check, and bench test by letting it run.
- Prior to reassembling the entire unit, steam clean all the parts, apply a fresh coat of paint, and store in a clean, dry location until needed.

Proper maintenance throughout the year can save many breakdowns or accidents at unwanted times. Maintaining a consistent routine results in a longer and more satisfactory mower life, and can save money along the way, too.

—USGA Green Section Record

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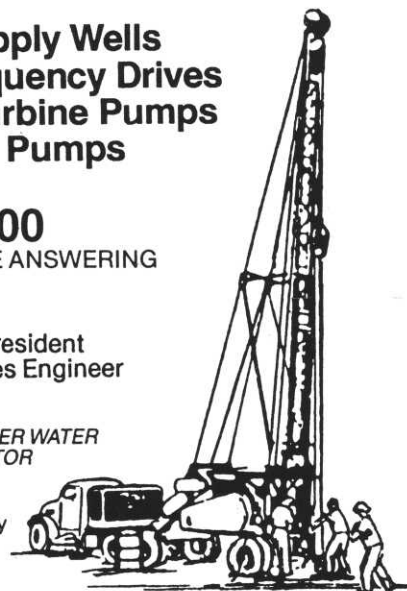
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