

So, just how long does it take to grind a cylinder? This is the question most frequently asked by anyone looking to purchase their own mower grinder because, as we all know in business, 'Time is money'.

IAN ROBSON, Operations Manager for Hunter Grinders, examines the variables

ALL three major manufacturers of grinding equipment offer machines or accessories to allow the operator to both spin and relief grind to lesser or greater degrees of accuracy. Hunter Grinders Ltd combines spin and relief operations in one machine, although both methods can be used independently if desired.

Ian Robson, Operations Manager for Hunter Grinders Ltd examines the variables that effect the time required to sharpen a unit and explains how, despite the grinding being only one part of the process, the method of grinding adopted can have a huge impact on the amount of time you spend in a season keeping your mowers sharp. He also examines how choosing the right grinding methods to tackle particular sharpening problems can make life a lot easier for the Workshop Manager or Head Greenkeeper.

Calculating the time required to keep a cutting unit sharp

A simple basic formula has been devised to allow you to calculate this for yourself, which is described as Value A + Value B + Value C = Total Time to sharpen each unit

Value A - Time required to remove the cutting unit from the mower and prepare it for grinding.

Value B - Time required to mount the cutting unit in the grinder, sharpen it and remove it from the the grinder.

Value C - Time required to reassemble, set up and refit the cutting unit to the mower.

For the purpose of illustration I have used typical values in the equation but you may prefer to use values for A or C based on your own experiences.

Example 1 represents a unit which has only recently gone off cut requiring only a small amount of grinding to return it to sharp again.

Using Spin Grind Mode (grinding segment is floor to floor in 10mins)

Value A: 20mins
Value B: 10mins
Value C: 20mins

Calculation 20+10+20= 50mins

Using Spin & Relief Grind Mode (grinding segment is floor to floor in 20mins)

Value A: 20mins
Value B: 20mins
Value C: 20mins

Calculation 20+20+20= 60mins

Example 2 represents a unit requiring more intensive sharpening due to extended usage.

Using Spin Grind Mode (grinding segment is floor to floor in 20mins)

Value A: 20mins
Value B: 20mins
Value C: 20mins

Calculation 20+20+20= 60mins

Using Spin & Relief Grind Mode (grinding segment is floor to floor in 30mins)

Value A: 20mins
Value B: 30mins
Value C: 20mins

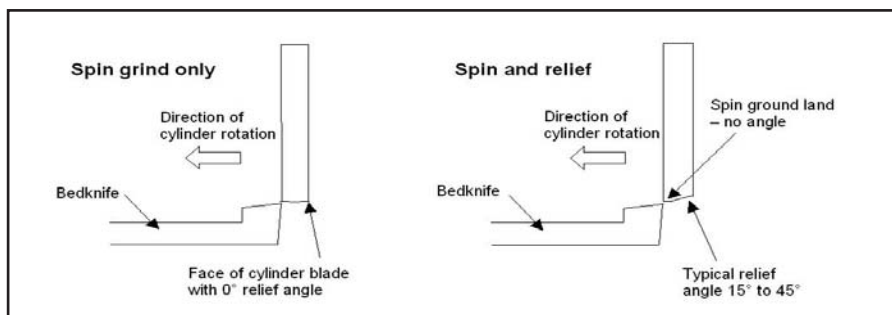
Calculation 20+30+20= 70mins

Looking at these figures in isolation it would appear that there are small time advantages to be gained from spin grinding only! However, there is another extremely important value to be added to the equation which is invariably overlooked and yet has a dramatic effect on the calculation. That is, that a spin & relief ground unit will stay sharp at least three times longer than a spin ground only unit and, indeed, some operators claim their units will stay sharp five or six times longer when the relief angle is added. On average a spin & relief ground unit will stay sharp for approximately 12 weeks compared to a spin ground unit which will only stay sharp for around 4 weeks.

Verification of this comes from mower



**How long
does it take
TO GRIND A CYLINDER?**



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manufacturers such as John Deere, Jacobsen and Toro who between them spend millions of pounds every year on research and development. Their published conclusions are that the extra time required to manufacture a unit with a relief angle is essential if you want your units to stay sharp, essential if you want your units to cut correctly.

If we revisit our earlier examples we can now add the missing value which radically alters the time scale required to sharpen the units. During a typical growing season a spin ground unit will need to be sharpened on average at least six times whereas the spin and relief ground units need only be sharpened twice. Incorporating this value as the number of times the unit is sharpened per season gives the following results:-

Example 1 - Spin Grind all season: Total time per unit 50mins x 6 grinds = 300mins

Example 1 - Spin & Relief Grind all season: Total time per unit 60mins x 2 grinds = 120mins

Example 2 - Spin Grind all season: Total time per unit 60 mins x 6 grinds = 360mins

Example 2 - Spin & Relief Grind all season: Total time per unit 70mins x 2 grinds = 140mins

Now the true picture as to how much time is required to keep your cutting units sharp is beginning to emerge.

And of course the time frame has to be multiplied by the number of cutting units you might have!

On the basis that an average working day is 8 hrs, if you owned 24 cutting units and chose to spin and relief as example 1, you would only spend 6 working days (48hrs) sharpening your units compared to 15 working days (120hrs) if you chose to spin grind only. A saving of 9 days!

If you owned 24 cutting units and chose to spin and relief more thoroughly as example 2, you would only spend 7 days (56hrs) sharpening your units in a season as opposed to 18 days (144hrs) with spin grinding. A significant saving of 11

working days. And of-course the figures increase proportionally for any club owning more than 24 units.

So back to the original question - How long does it take to grind a cylinder? It could be floor to floor in 10mins, it could be floor to floor in 30mins. However, the true answer is that depending on the method of grinding you choose you could reduce your grinding time from a month to less than a week! Method of grinding is of much greater significance than the actual speed of grinding! In addition with an accurate spin and relief grinder you can be confident that you are returning the cylinders to the original manufacturer's specification, which has to be the optimum level of sharpness.

Further benefits of relief and spin grinding

There are occasions when a cutting unit has been damaged from contact with debris for example, or heavily coned, when it would take considerably less time to grind if it was first relief ground and then spun ground! This is because you can remove far more metal when relief grinding using coolant than you can drying on how heavy a cut you can take. Relief grinding without the benefit of coolant creates a build up of heat which will cause the metal to lose its hardness making it impossible to retain a sharp edge. Also, when you relief grind, there is not the impacting effect on the grinding wheel which you experience when spin grinding which, again, reflects on how heavy a cut you can take.

Another advantage of relief grinding is that your cylinders will last considerably longer than they would if they were spun ground only. When you grind a relief on a unit you are removing metal from the back of the blade therefore the diameter of the cylinder is not effected. The cylinder diameter is only affected when you spin the cutting land onto it, as already established a unit which has been spun ground only, has to be ground at least 3 times more often, which equates to them wearing out 3 times more quickly.

To B or not to B (Back lap that is)?

Back lapping is one of those contentious areas where some people champion its merits and some bemoan. Like spin grinding it can be a quick, albeit temporary, fix! However one point that should be made is that if you do back lap as part of your cylinder maintenance programme then your units must have a relief angle. The relief angle is essential to force the cutting paste to the cutting edge; without it you will only succeed in sharpening the back of your cylinder blade, in other words its non-cutting edge.

Setting Up Your Units

On the recommendation of some manufacturers, such as John Deere and Jacobson, units should be set up to have no contact between the cylinder and the bedknife. Other manufacturers, including Toro, suggest that set up should, ideally, have very light contact between the cylinder and bedknife. Unfortunately, if you only spin grind, this very light contact is almost impossible to achieve! This is because the cutting land is the full width of the blade, unlike the small land which is achieved when you relief grind. This has a very undesirable effect on the bedknife because contact generates heat which, in turn, produces even greater contact. In other words the bedknife loses its sharpness far quicker and, therefore, needs to be ground more often and replaced far more frequently.

Spin grinding is only a quick fix and like all quick fixes it has its limitations! Short term gains are nearly always long term pains. Don't lose sight of a very important point here. You only need to regrind a unit when it's no longer sharp, not because the grinding method you've chosen dictates it!

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