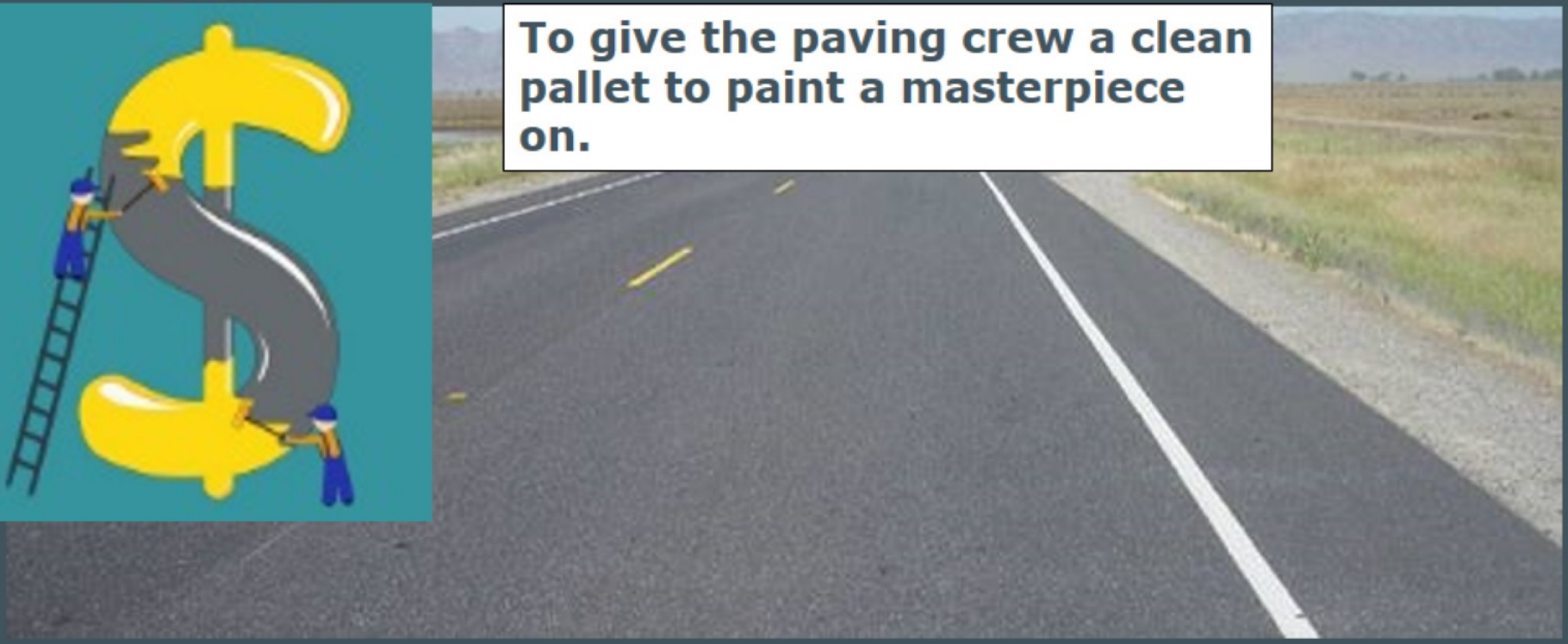
WIRTGEN

BEST PRACTICES FOR MILLING AND PROFILING

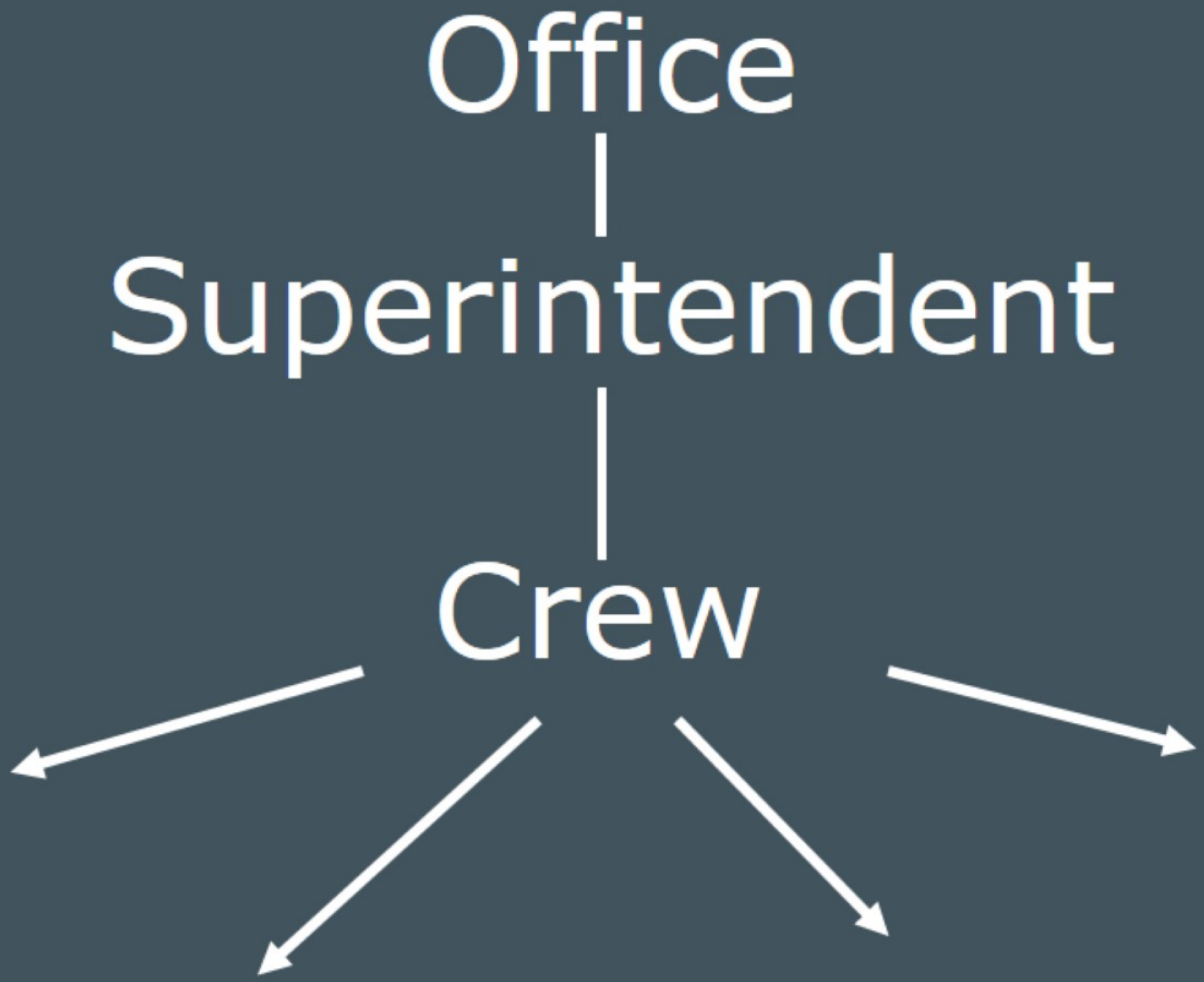
Tom Chastain
Application Specialist
Wirtgen America

Why use a Milling Machine?



To give the paving crew a clean pallet to paint a masterpiece on.

Communication


Office
Superintendent
Crew

Production!

Production!

Production!


19mm
17mm

Grade Controls

Control panel

Cylinder sensor

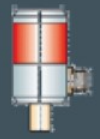
Wire-rope sensor

Slope sensor

Ultrasonic sensor

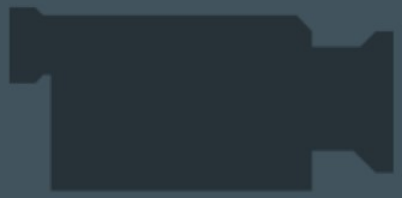
Sonic Ski sensor

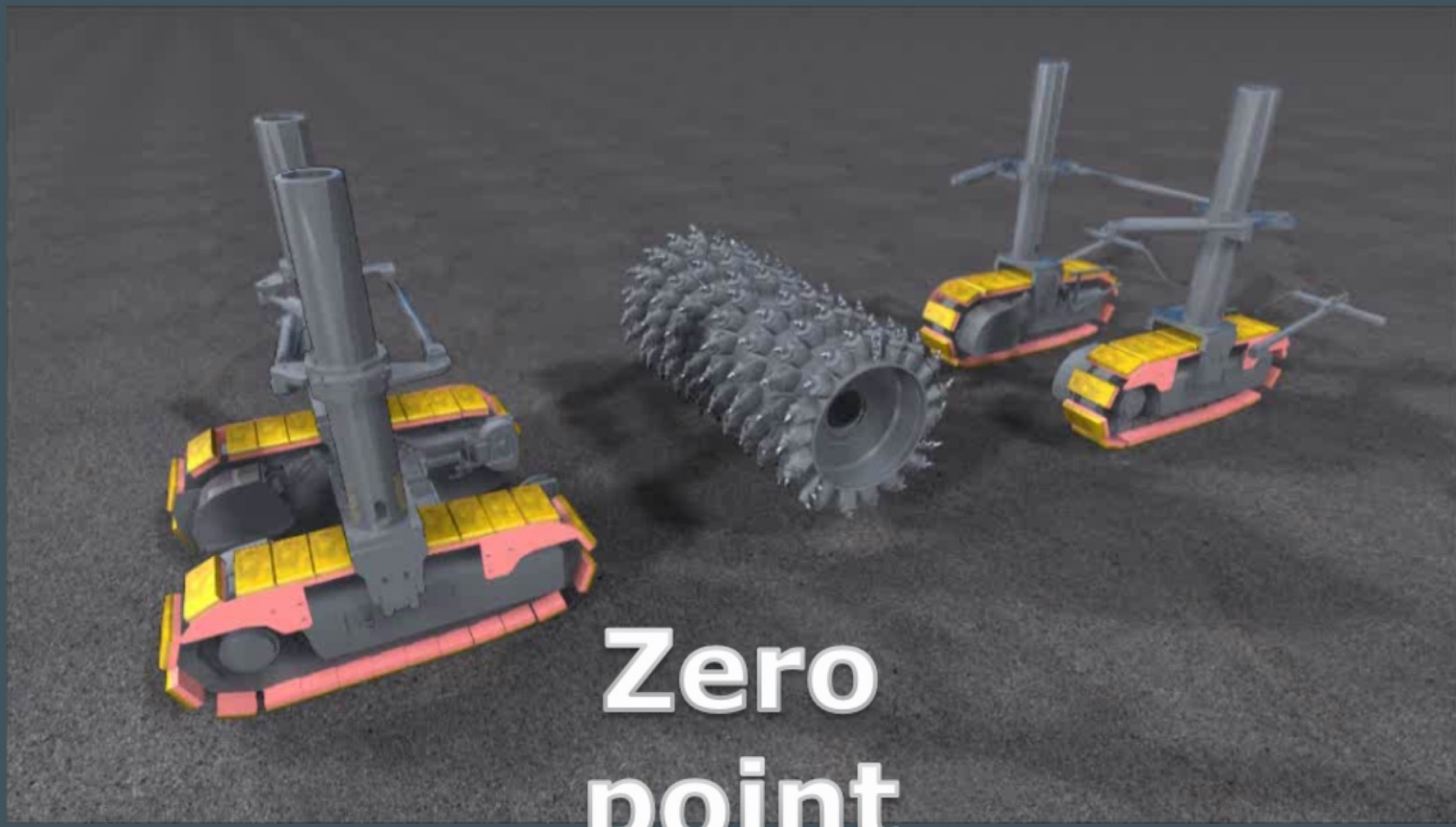
Rotary angle sensor



Laser sensor

3D sensor




Zero
point


1 mm

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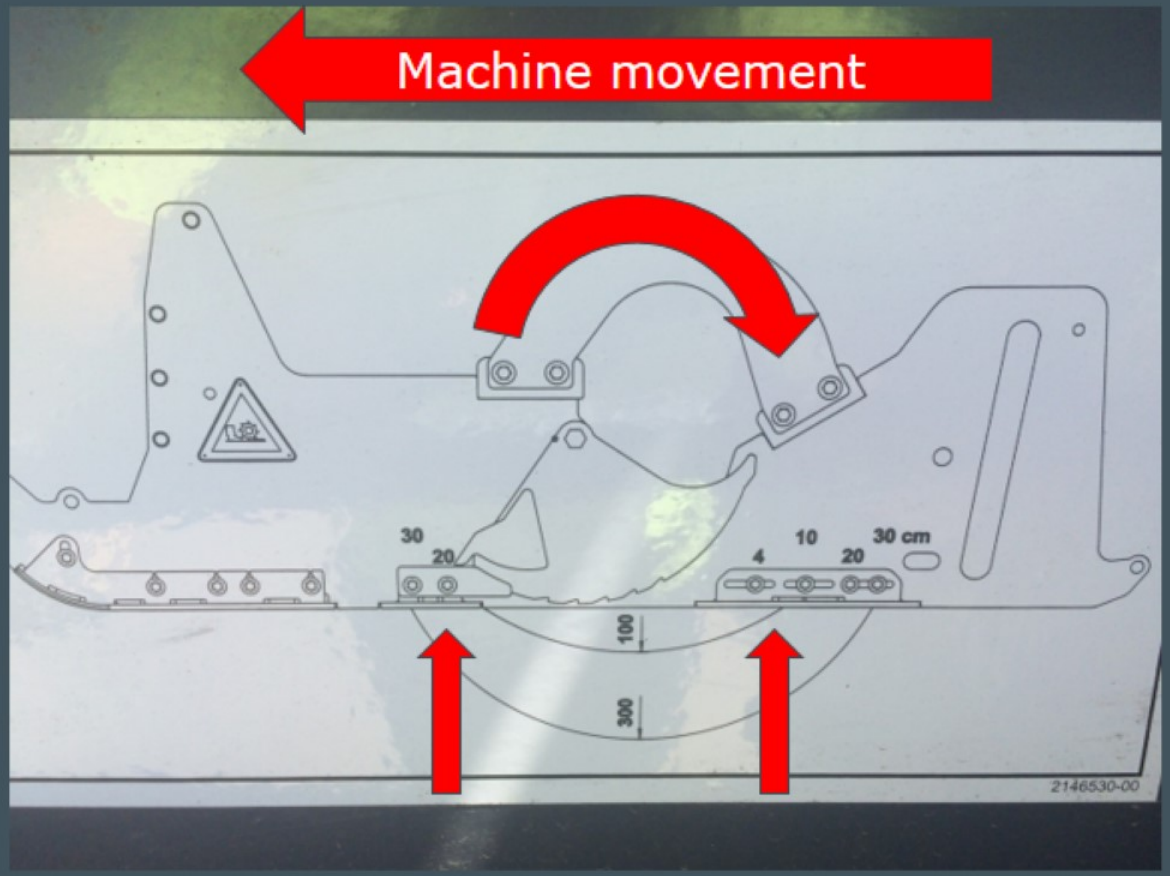
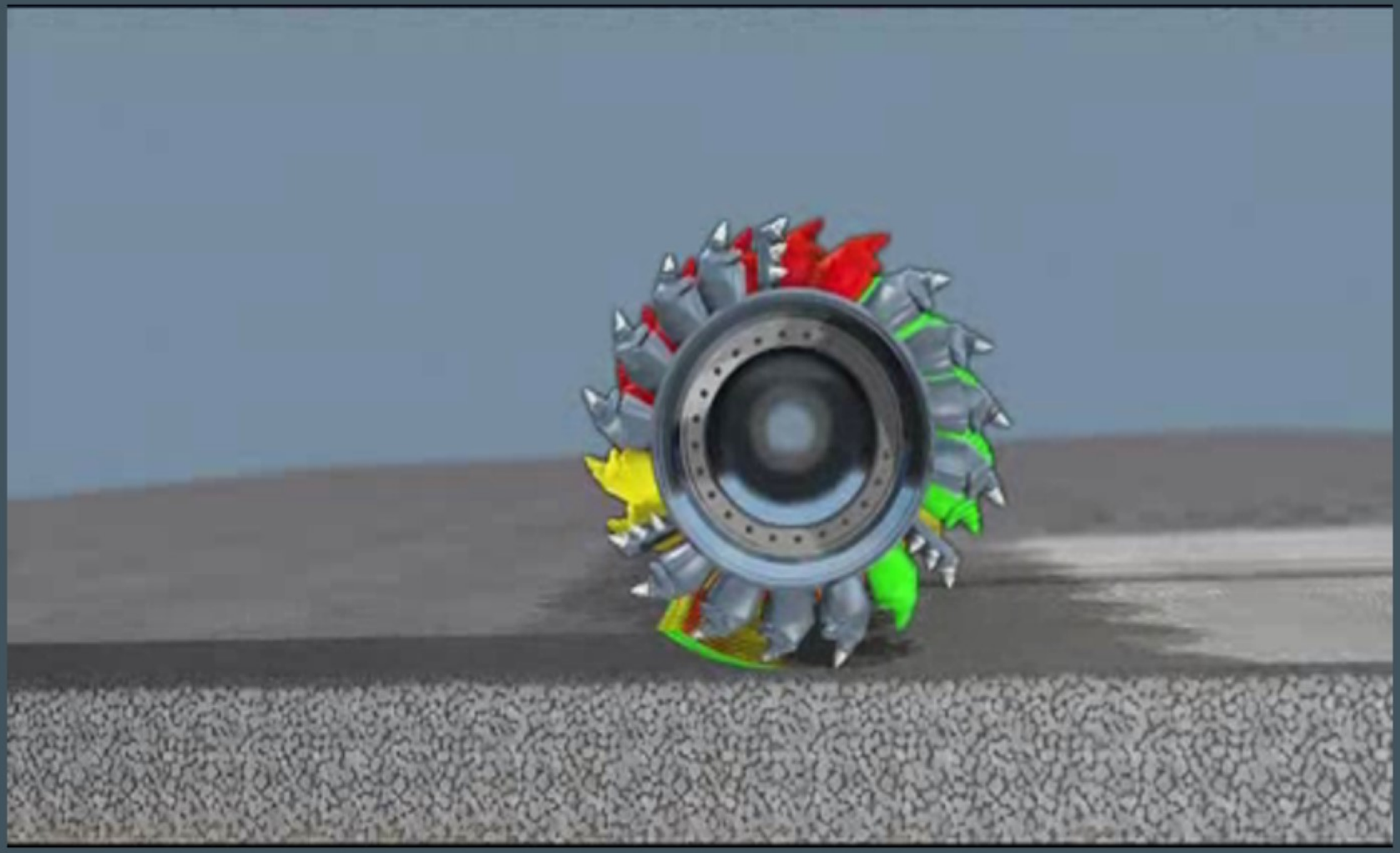
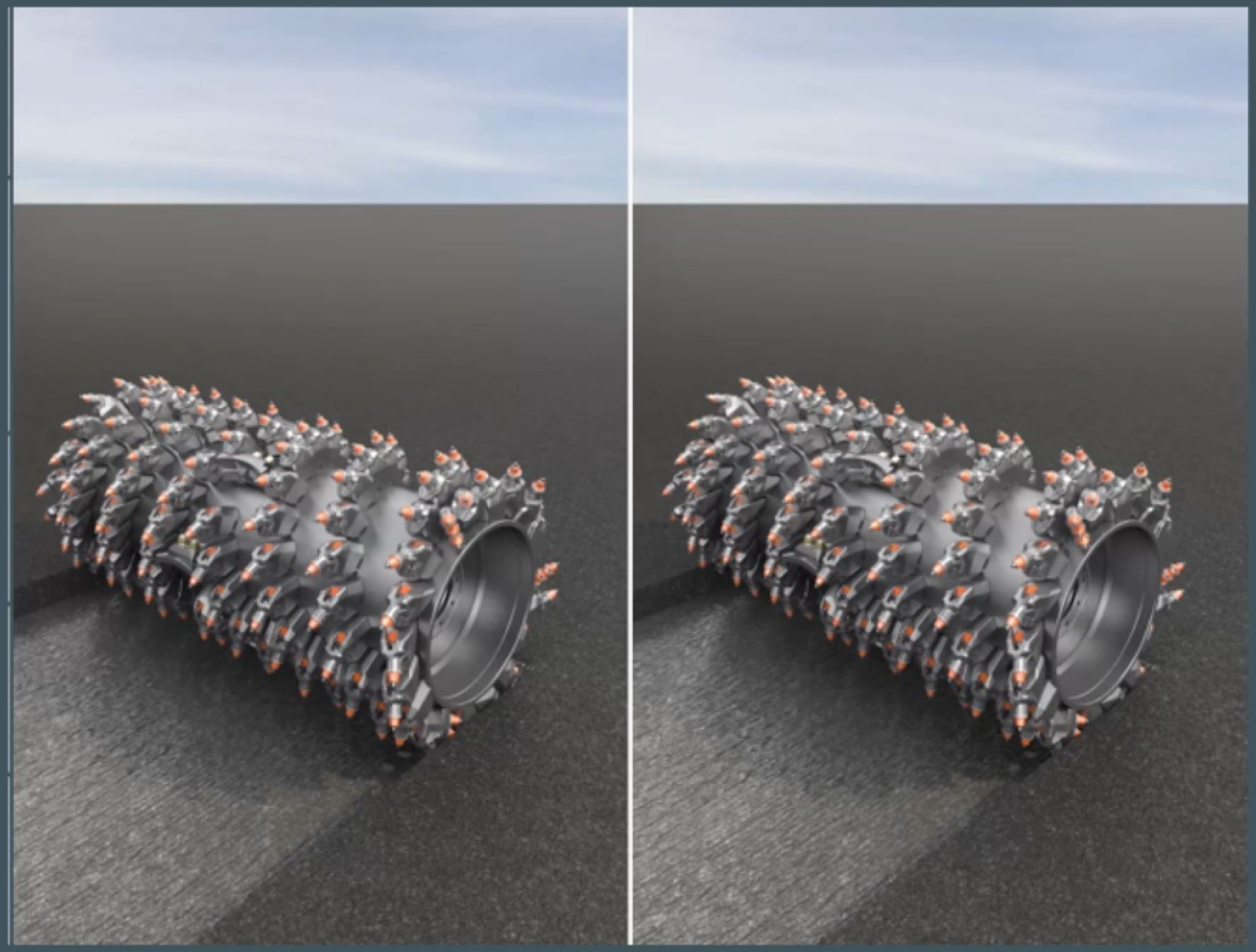
Where to Start…and Where to Stop

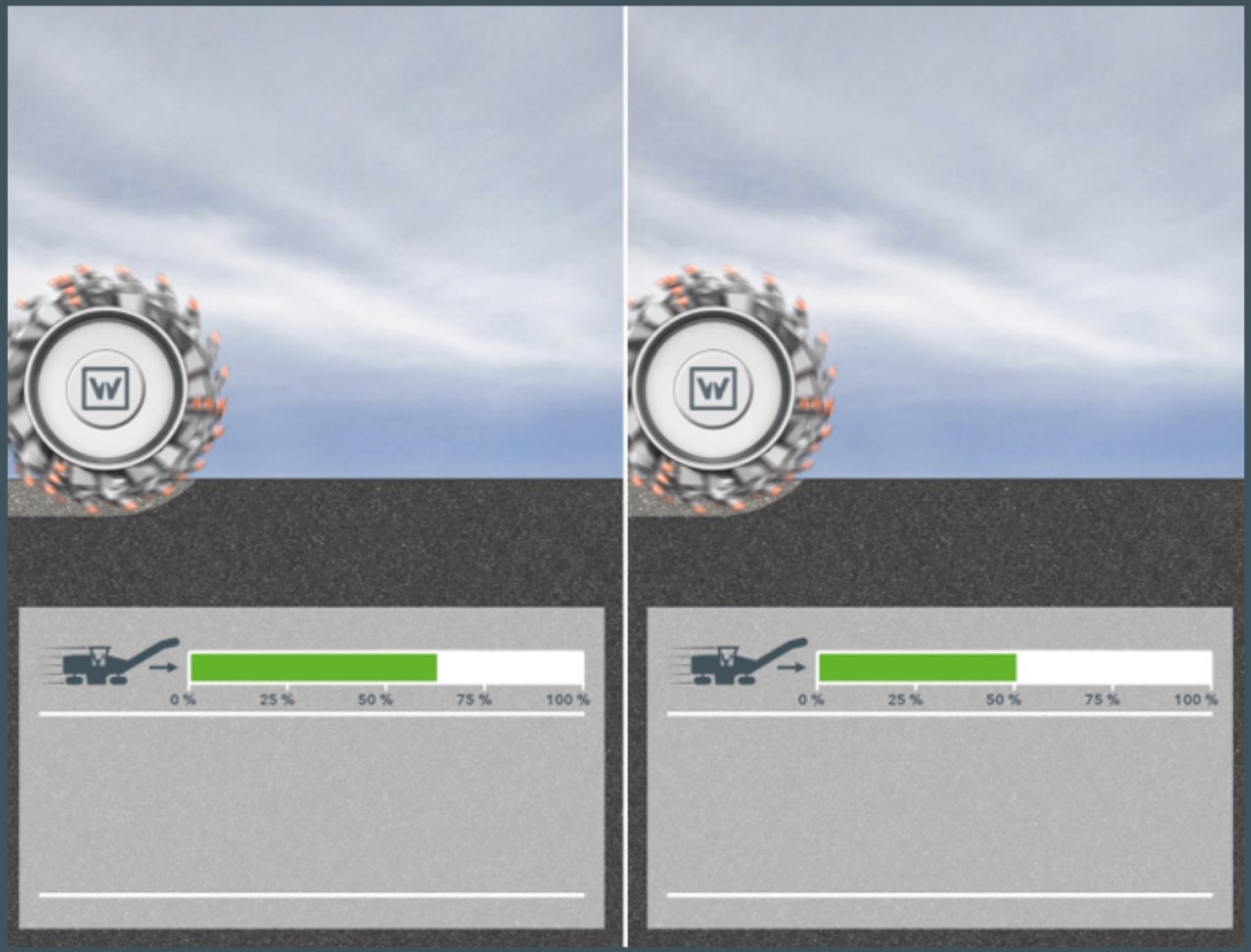


Starting off

Cutter line spacing





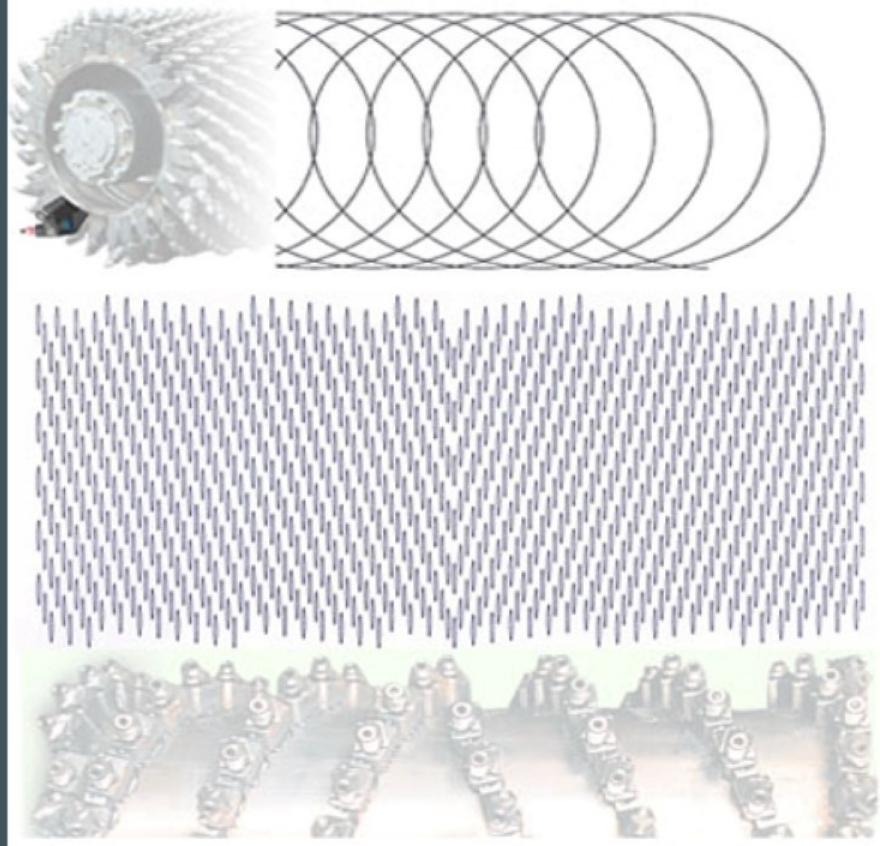

0 %
25 %
50 %
75 %
100 %
0 %
25 %
50 %
75 %
100 %


0 %
25 %
50 %
75 %
100 %
1
2
0
0 %
25 %
50 %
75 %
100 %
1
2
0

60 FPM

Standard milling drum FB 2000_LA 15

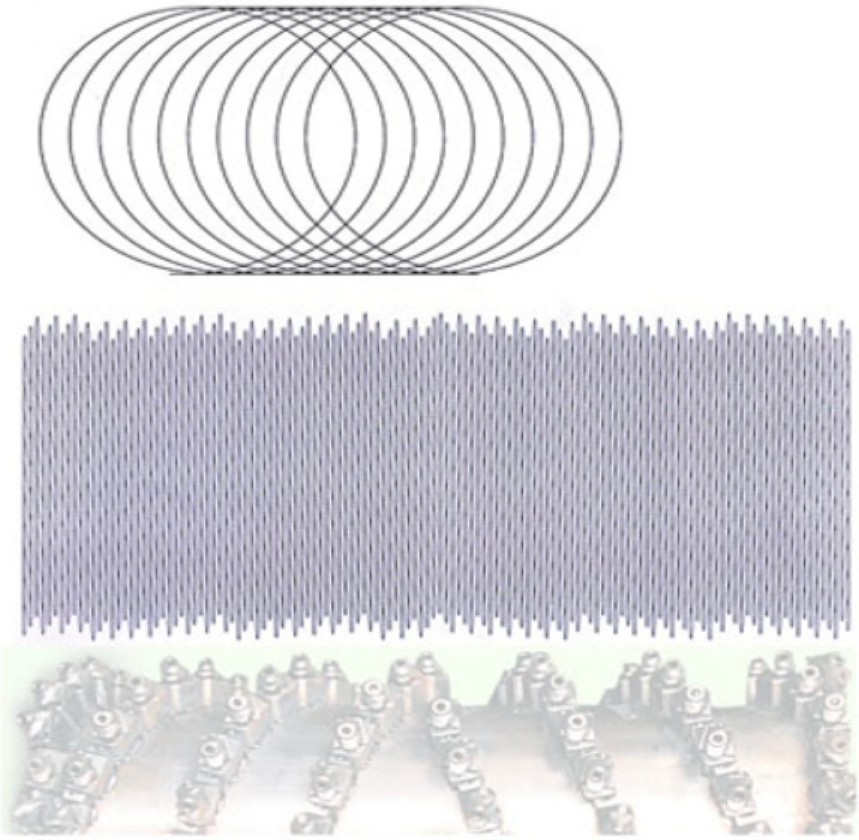
Advance speed: 16 m/min



30 FPM

Standard milling drum FB 2000_LA 15

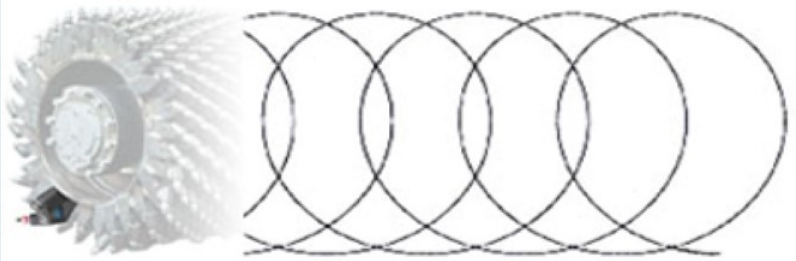
Advance speed: 8 m/min

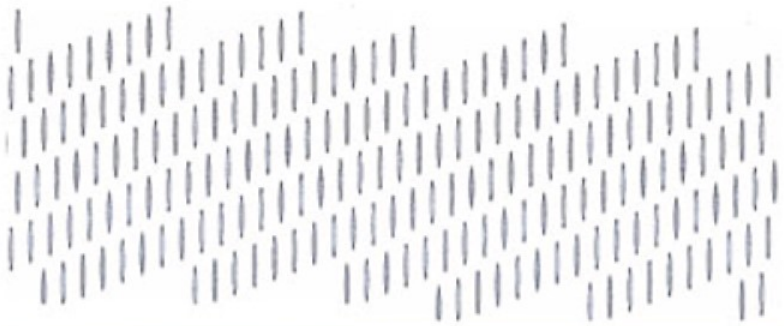


130 FPM

Standard milling drum FB 2000_LA 15

Advance speed: 40 m/min (theory)

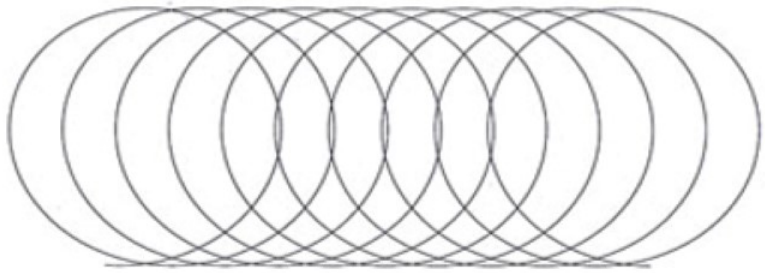


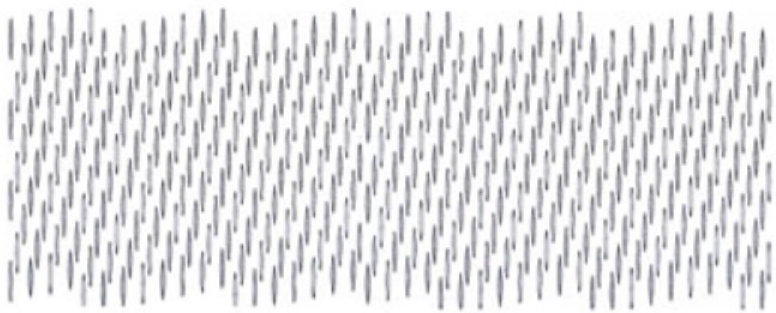


85 FPM

Standard milling drum FB 2000_LA 15

Advance speed: 20 m/min (theory)





Drum rotation = const.


Wirtgen

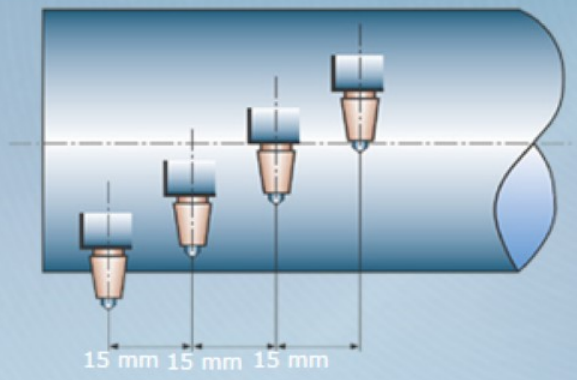

Wirtgen
NO STUDENT
PICK-UP OR
DROP-OFF

Testing Equipment

The trade off milling at high speeds

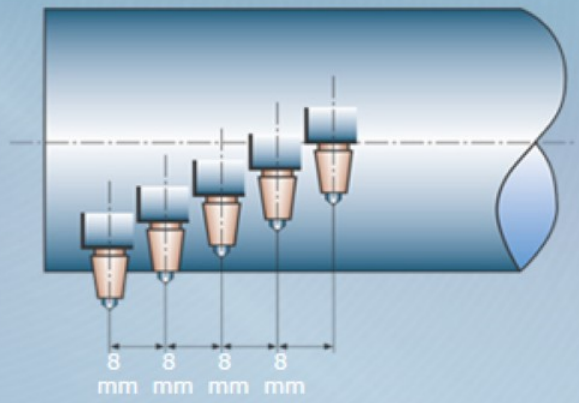
- Not actually cutting the depth you have set. Machine cant keep up.
- Poor pattern. Means lessened interlocking of new pavement to milled surface.
- Due to erratic depth, our asphalt tonnage is now off.
- Compaction numbers will fluctuate.
- Put unneeded amount of wear on machine.
- Sizing of material.
- This equals low quality, wasted materials, loss of money.

5/8″

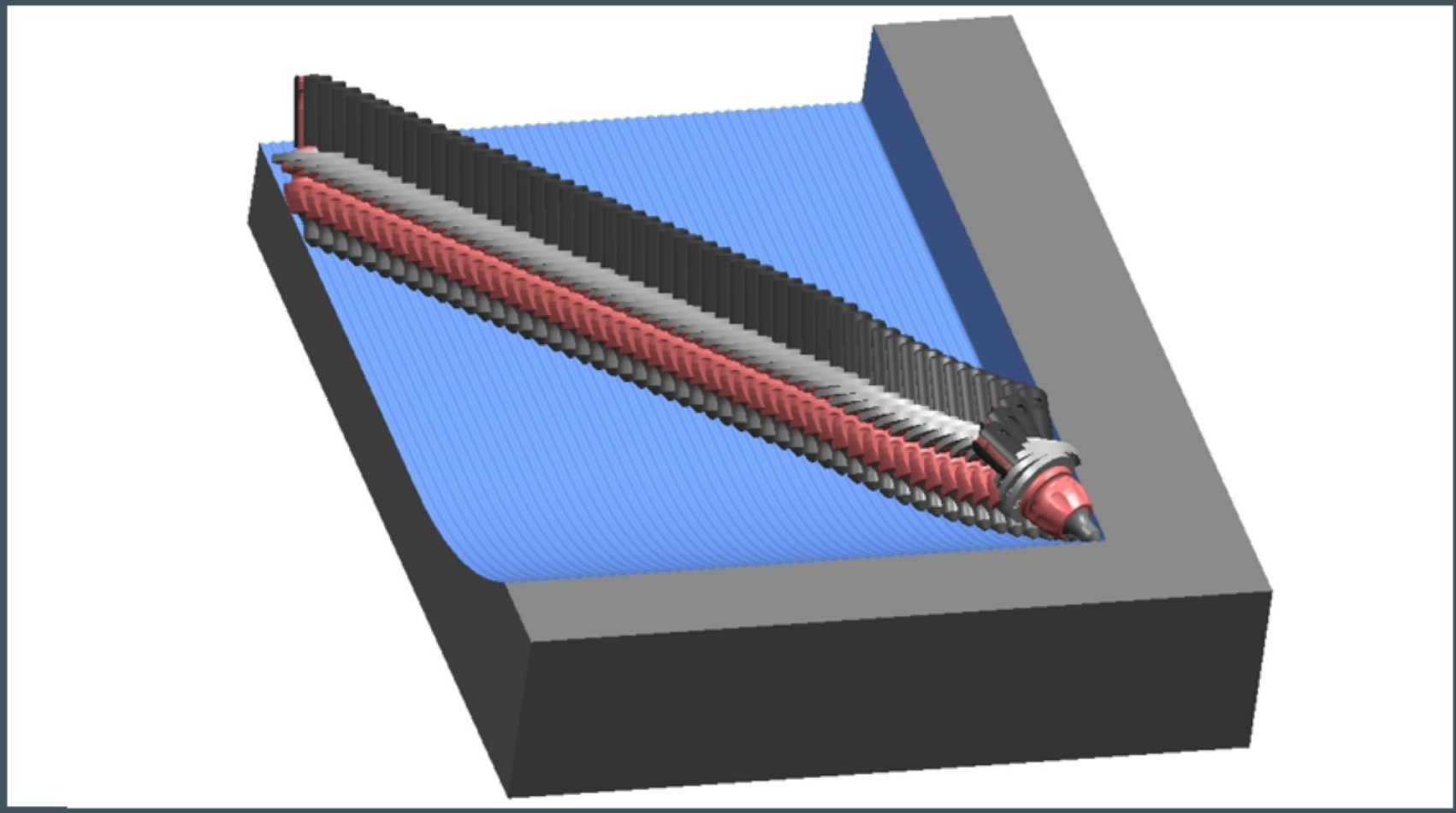


Standard milling drums with a spacing of 15 mm are eminently suitable for removing complete road pavements.

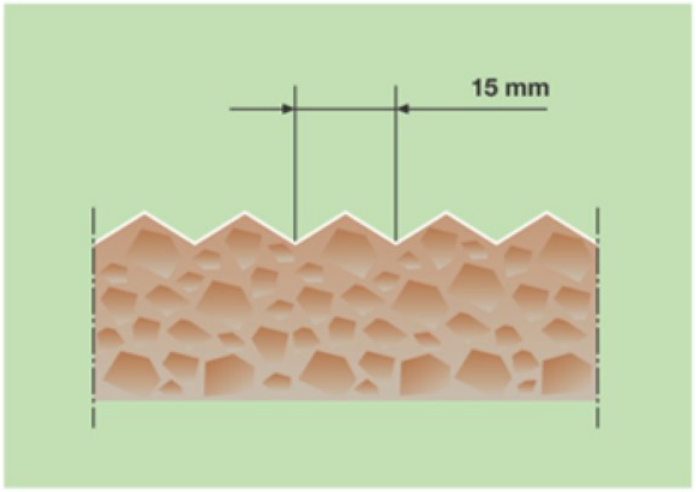
5/16″



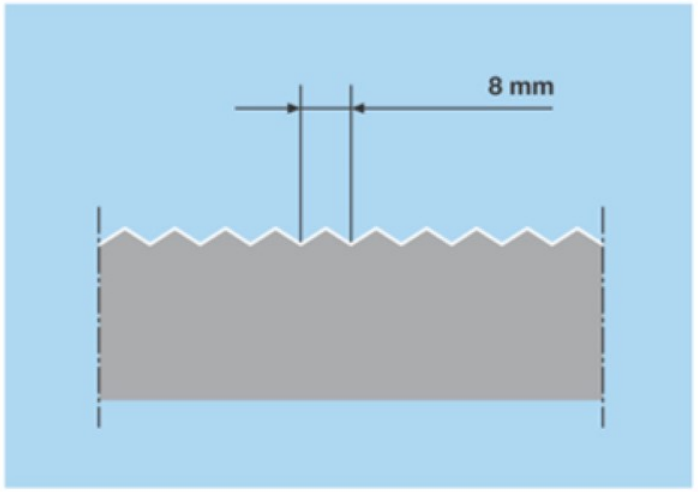
Fine milling drums with a spacing of 8 mm are ideal for treating the surface of pavement courses.



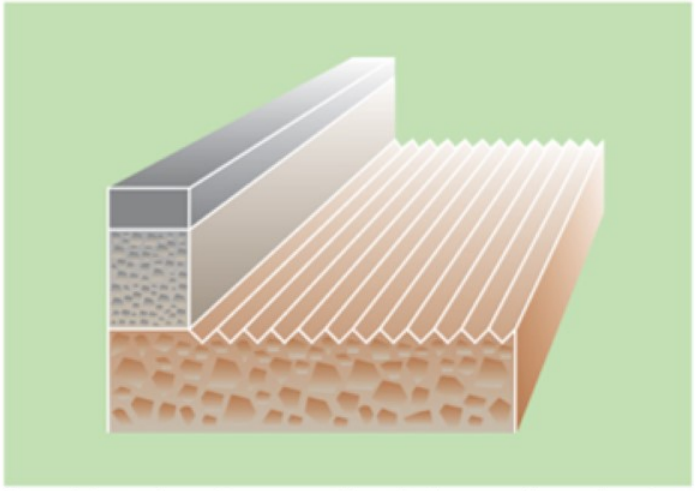
Standard drum = maximum depth of machine.
Fine texture/micro drum = 1 ½ inch max



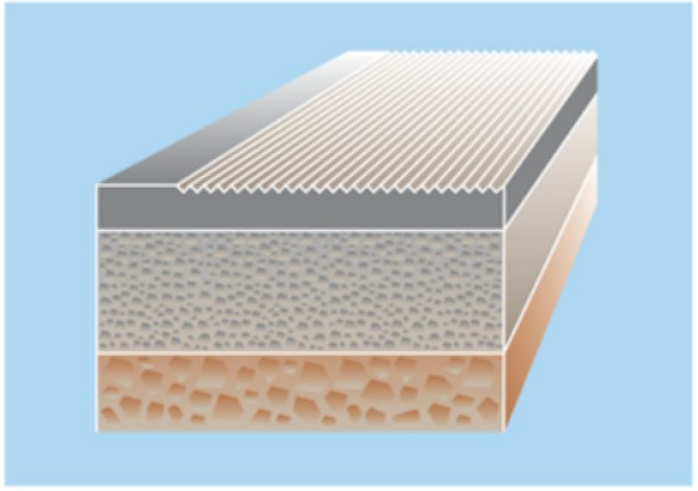
Standard milling operations with a spacing of 15 mm produce a roughly textured milled surface.



The milled surface produced by fine milling with a spacing of 8 mm is very finely textured.

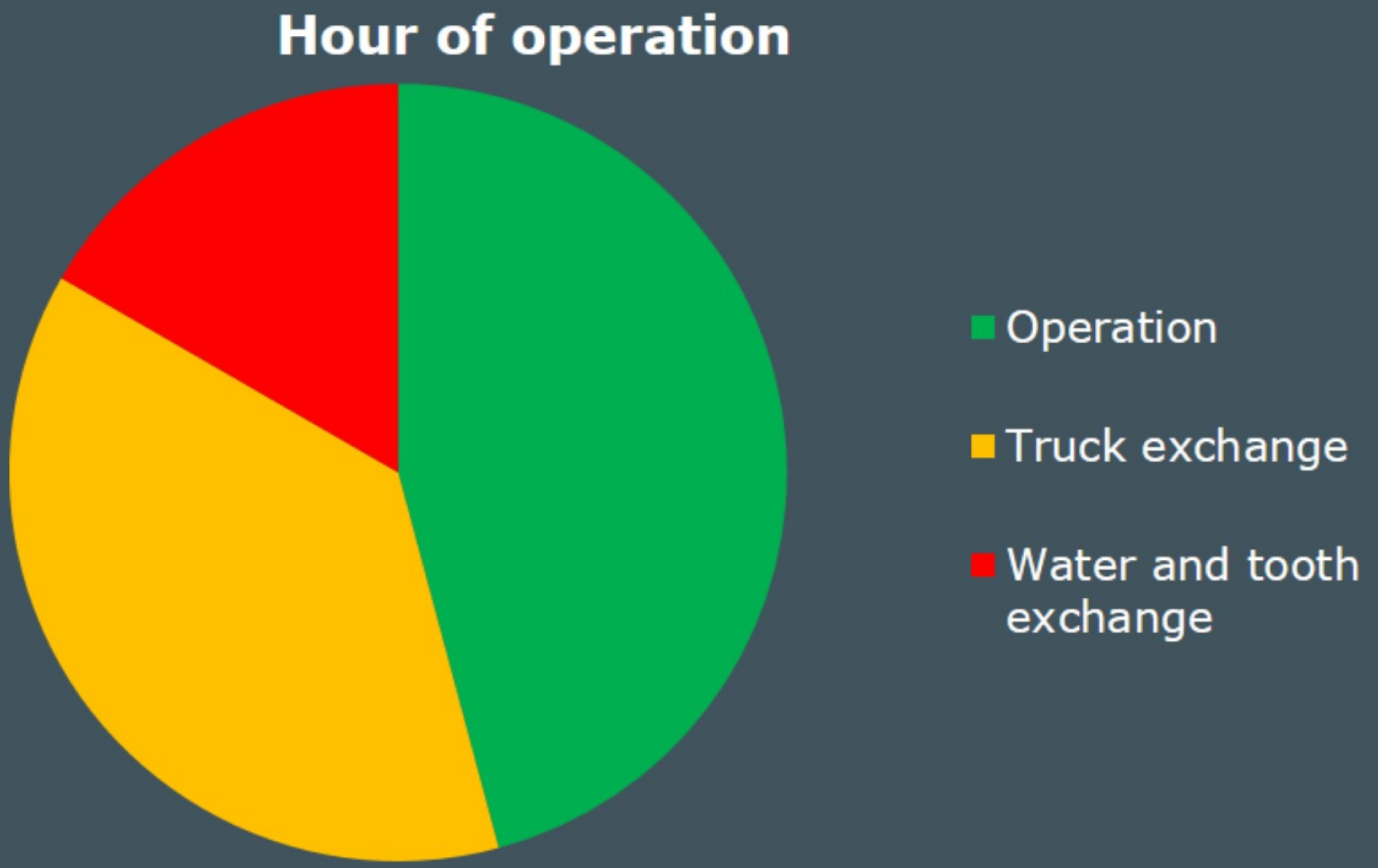


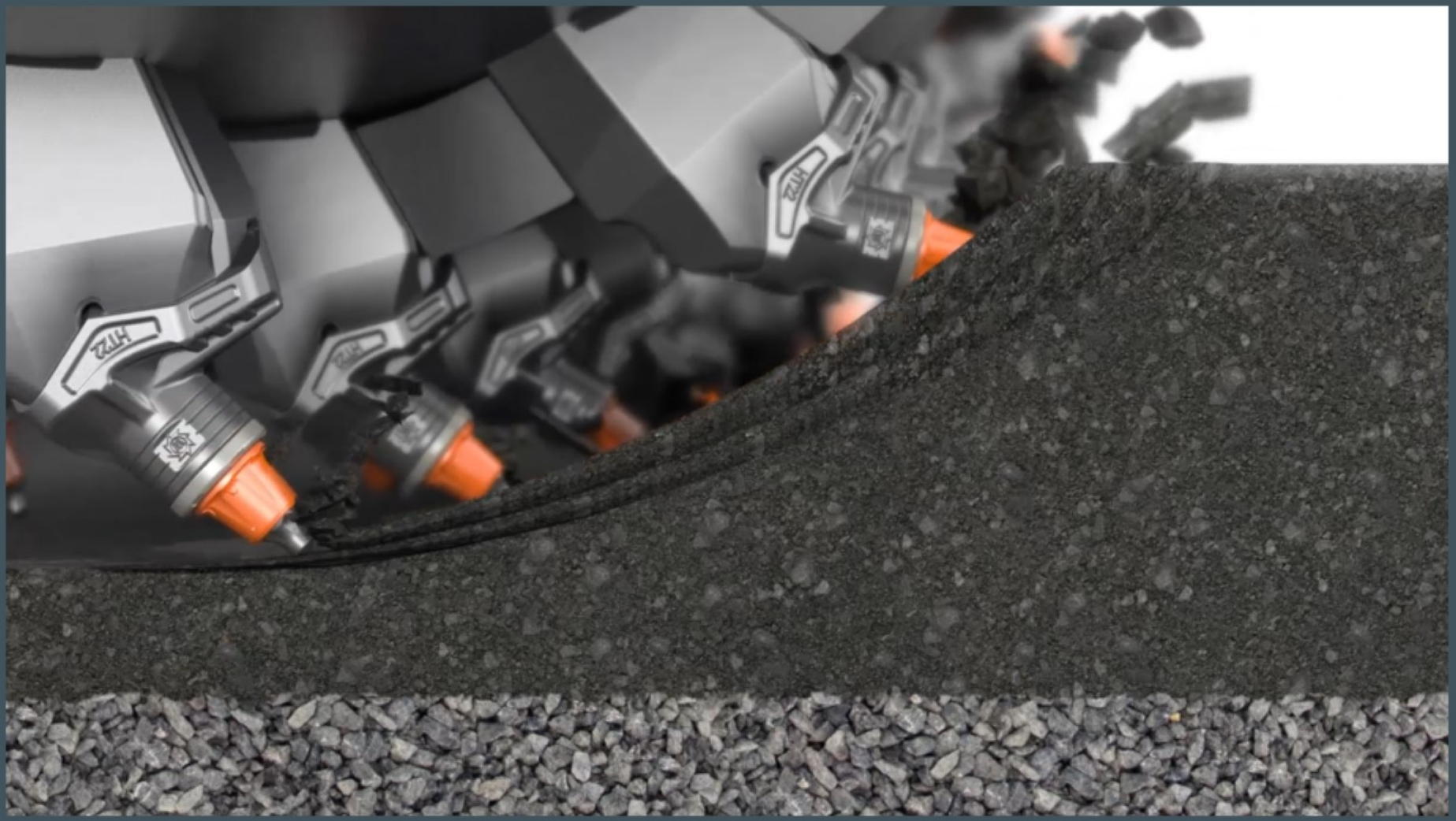
Complete roads can be removed in a single pass when using standard milling drums (milling depths up to 35 cm).



Fine milling drums remove a few millimetres or centimetres of the surface course, depending on requirements.

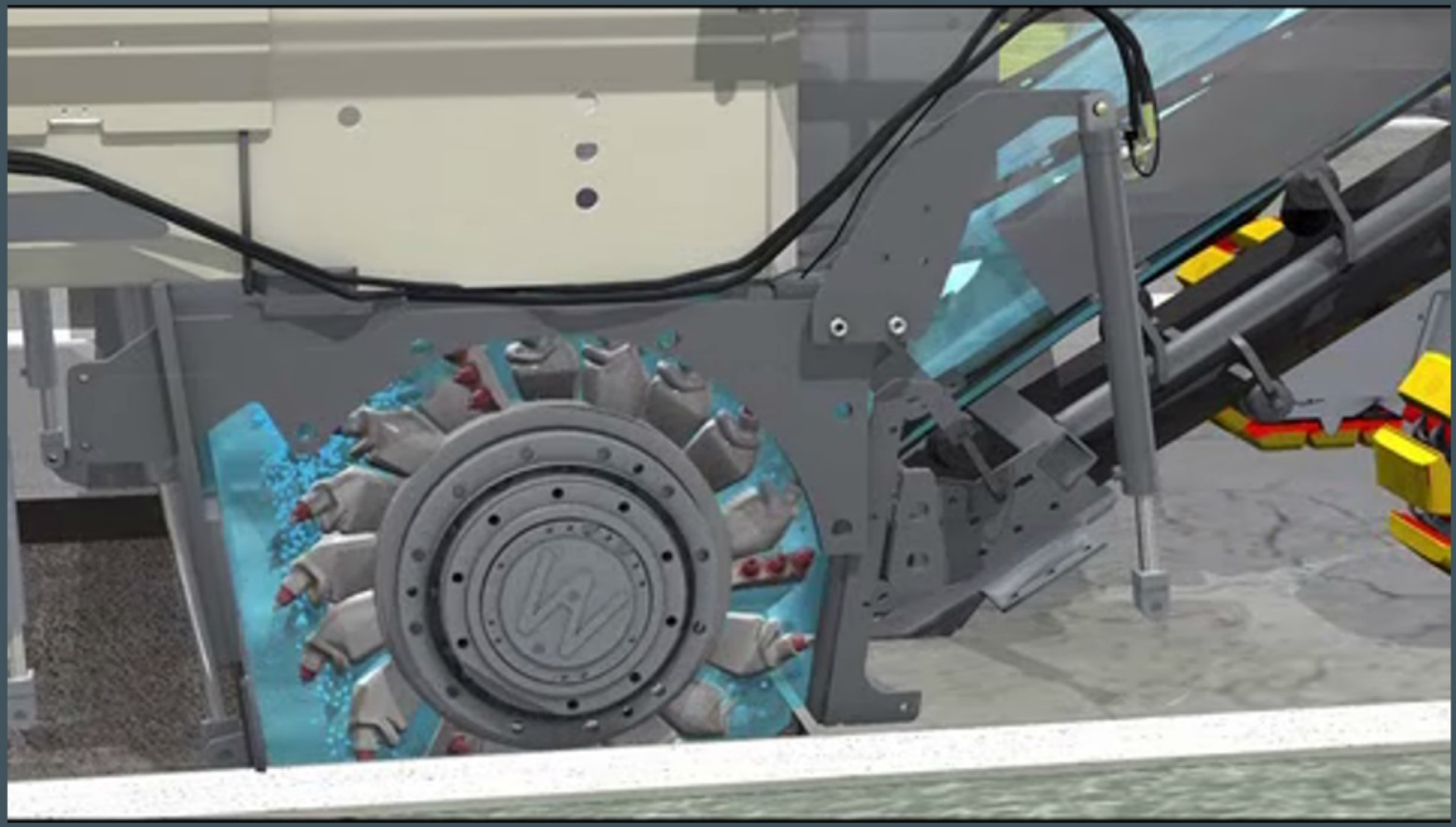
Can I mill for quality and achieve the quantities?

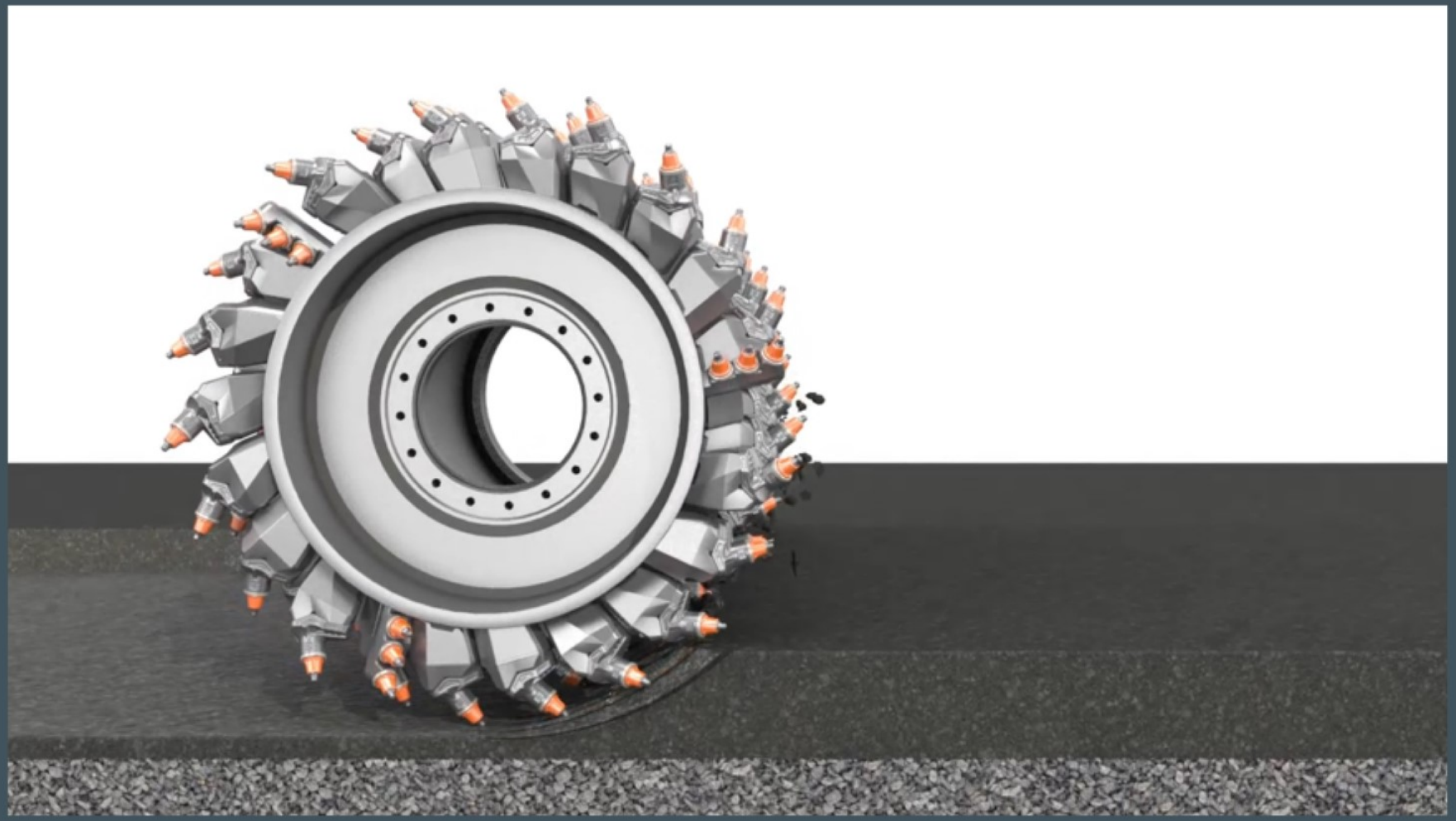


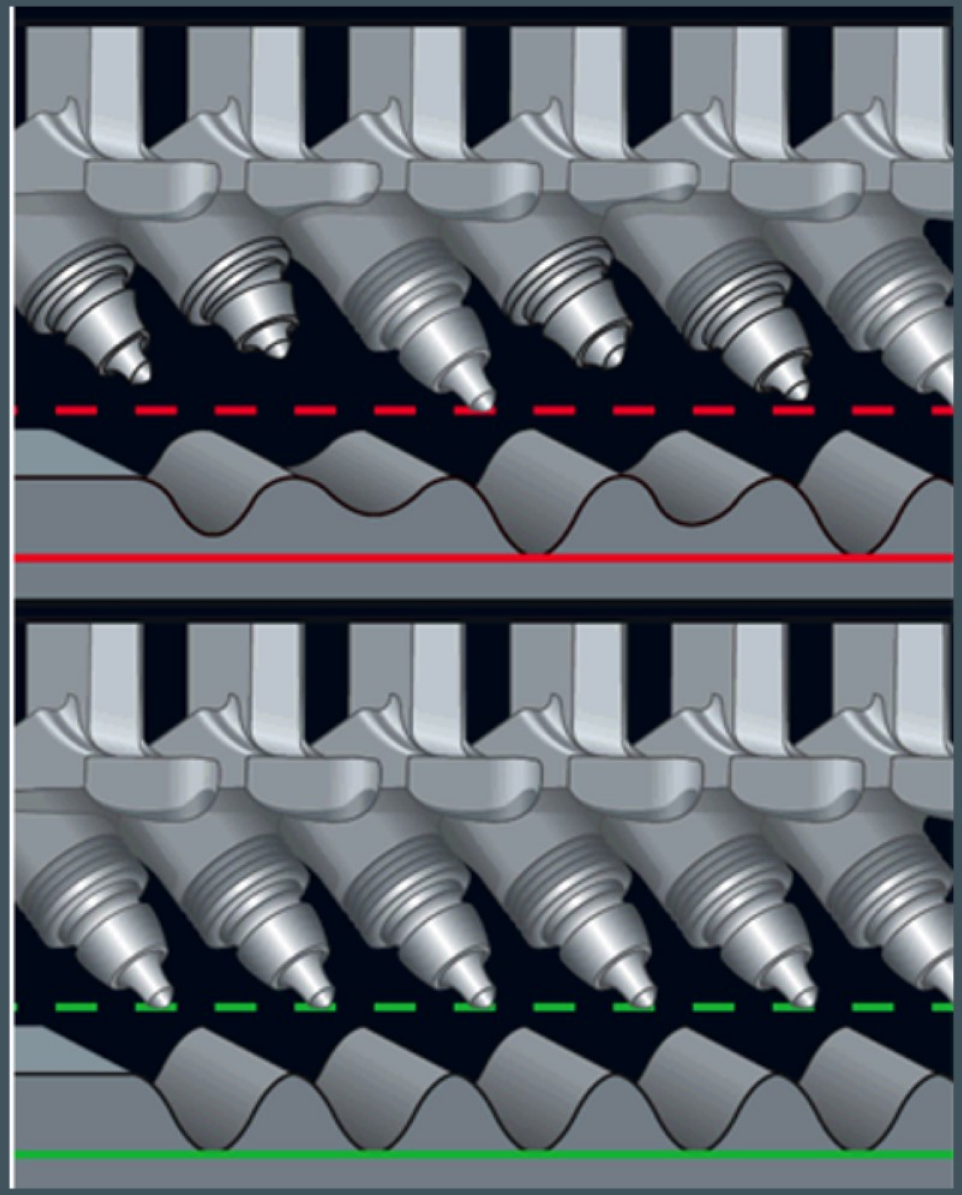

HT2

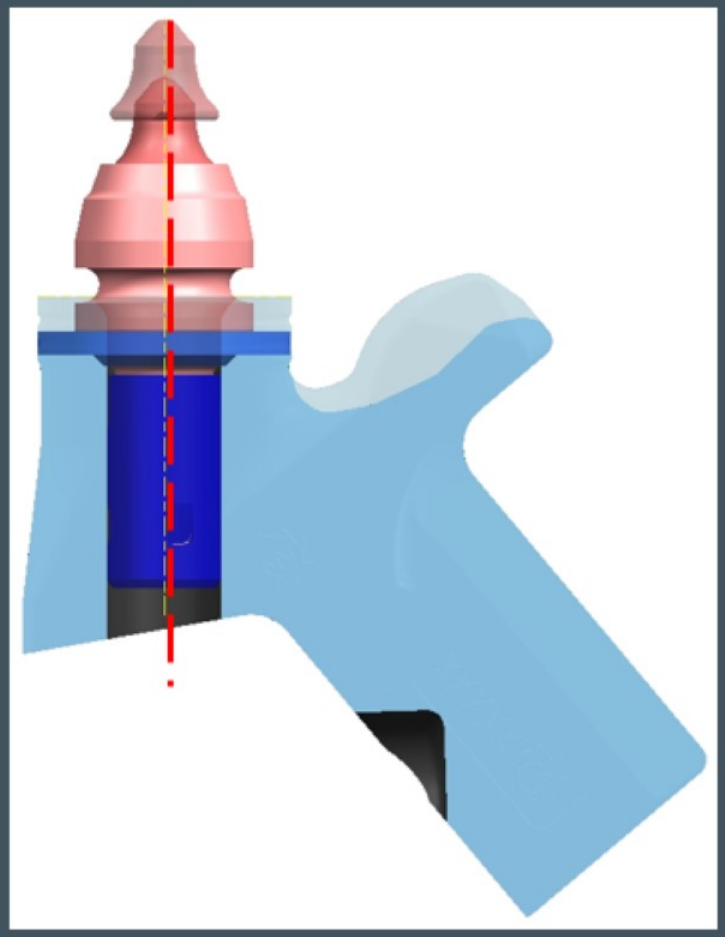
Water is your friend

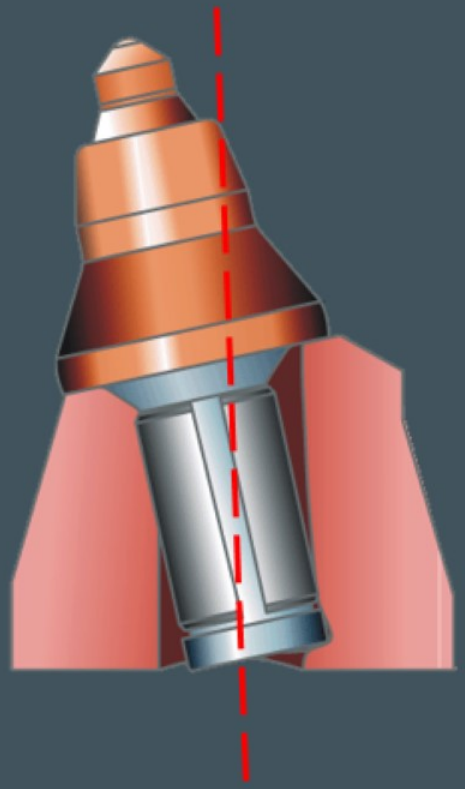
- Cutting tool coolant
- Cutting tool lubricant
- Dust suppression
- Prevents build up on components












Drove my cost of operation up
Drove my quality down
2002 9 26

Conclusion

If we maintain our machine, we have bettered our chances to achieve quality.

If we slow our fpm down, we have bettered our chances to achieve quality.

If we communicate with our team regarding the job, we have bettered our chances to achieve quality.

If we do all of these things while putting SAFETY first, we WILL achieve quality.

Thank You

WIRTGEN GROUP

CLOSE TO OUR CUSTOMERS

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Break

LEVEL PRO BASICS

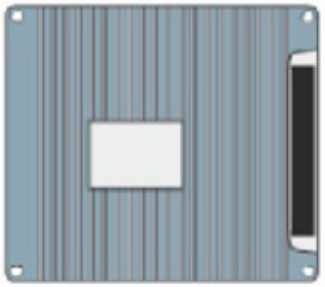
What are the benefits of Level pro System?

The benefits to Level pro are precise control of depth and the ability to make adjustments while milling without stopping the machine.

What are the basic componets In a LEVEL PRO SYSTEM?

LEVEL PRO control panel

Three-column panel with displays for controlling the right side and left side. The middle display can be used for preparing the setting for the right or left side.



LEVEL PRO controller

Permanently installed controller. This digital controller is the central station of the LEVEL PRO system.

		Hydraulic cylinder sensor	Height sensor

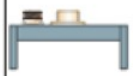
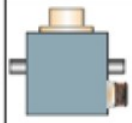
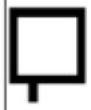
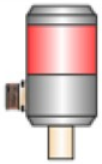
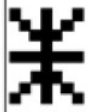
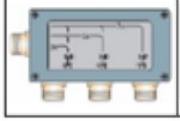
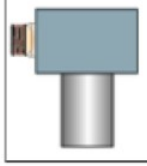
How many level pro displays do we need to operate Level Pro?

Only 1 level pro display is needed. you can have up to 3 level pro display’s connected at the same time.

How many sensor's do we need per side to use A Level pro system?

We only need 1 sensor per side to use level pro. It is ideal to use both front and back cylinder sensor's on side plate for a better average but not necessary to work.

How many potential sensor's can we use with Level Pro?

Sensors	Sensor symbols	Name	Sensor type
		Ultrasonic ski sensor	Height sensor
		Rotation angle sensor	Height sensor
		Slope sensor	Slope sensor
		Laser sensor	Height sensor
		3D sensor	Height sensor
		Hydraulic cylinder sensor	Height sensor
		Multiplex box	Height sensor
		Ultrasonic sensor	Height sensor

As you can see there are multiple sensor possibility.

What sensor's are most commonly used with Level pro?

1.5. Cylinder sensor

The cylinder sensor is the most common sensor used. There is a cylinder sensor located in front and rear side plate on the right side and left side of the machine.

1.6. Slope sensor

The slope sensor is also commonly used during milling process as well.

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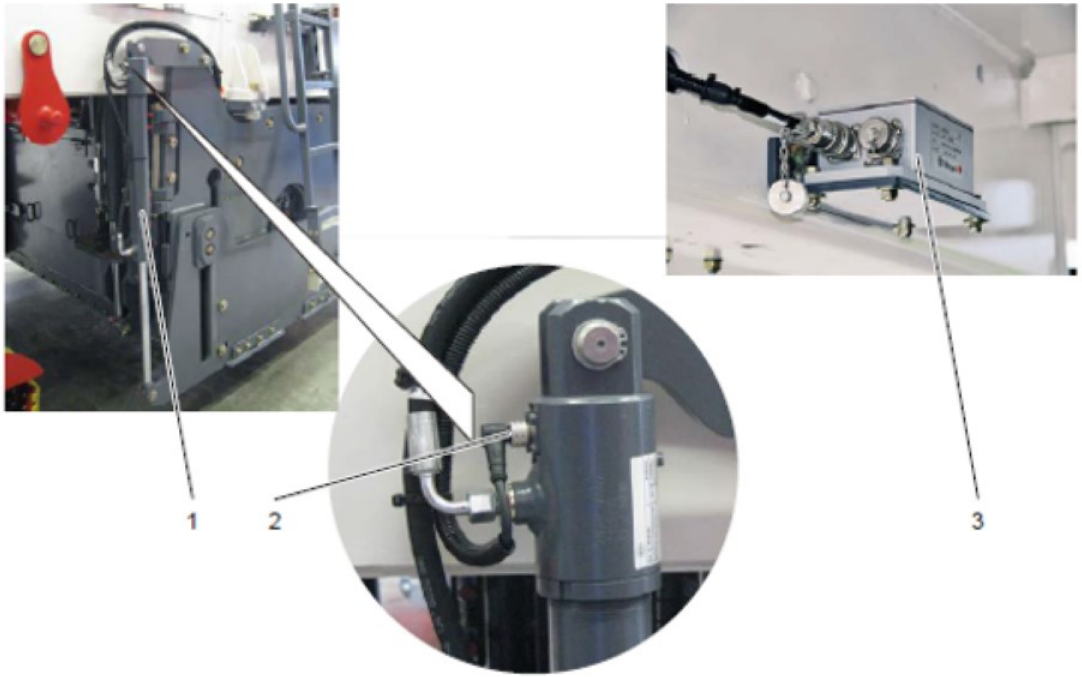
SENSOR LOCATION

2.11.02 Sensors



[1] Hydraulic cylinder for side plate

[2] Sensor connection

[3] Slope sensor

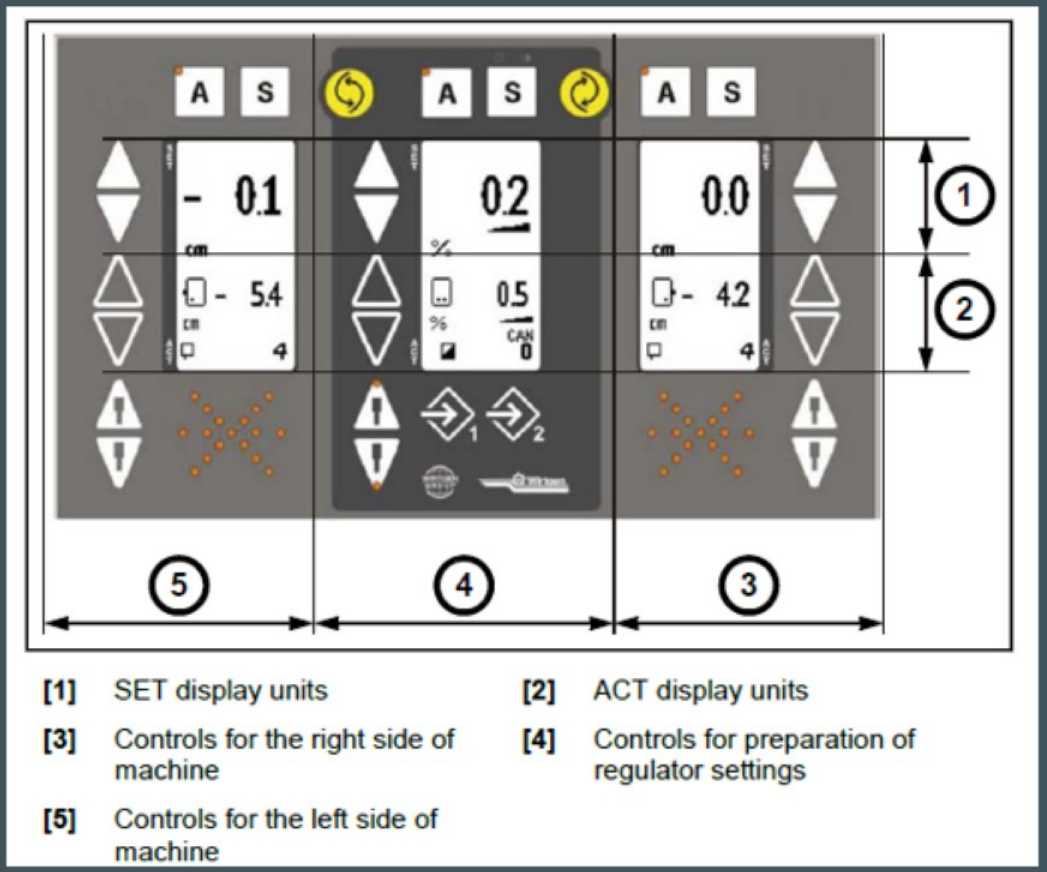
The sensors for the height levelling system are integrated into the hydraulic cylinders for the side plate.

Additional sensors can be attached for Multiplex operation.

Now that you have a basic understanding of what Level Pro is and why it is useful. Lets discuss how to use it.

Understanding Level Pro display

As you can see you have several columns that have different functions and purpose with the level pro screen. First we will discuss the difference between the SET and ACT screen.



[1] SET display units

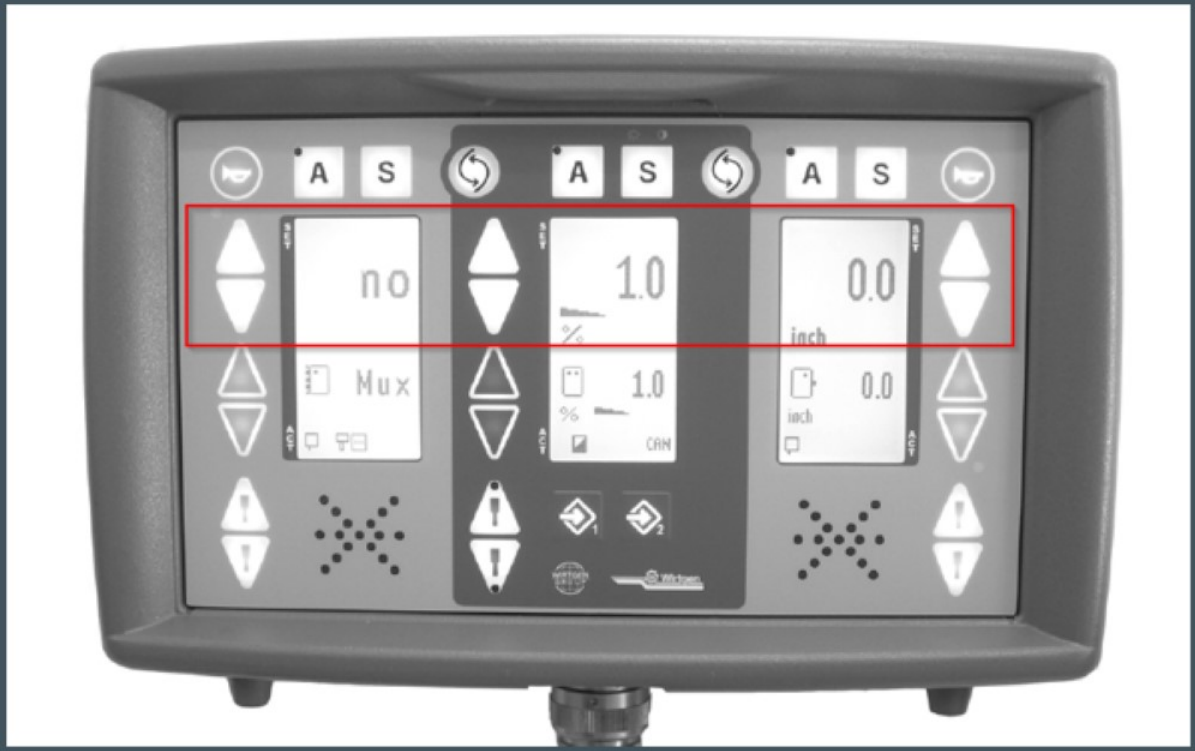
[2] ACT display units

[3] Controls for the right side of machine

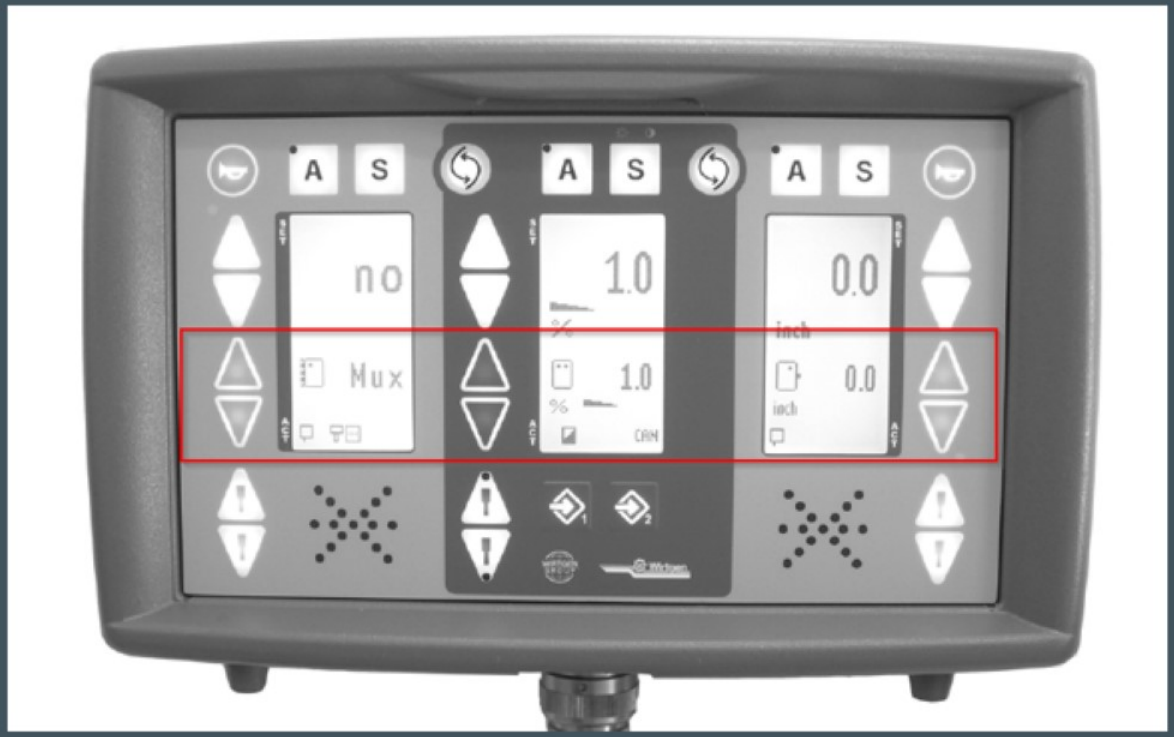
[4] Controls for preparation of regulator settings

[5] Controls for the left side of machine

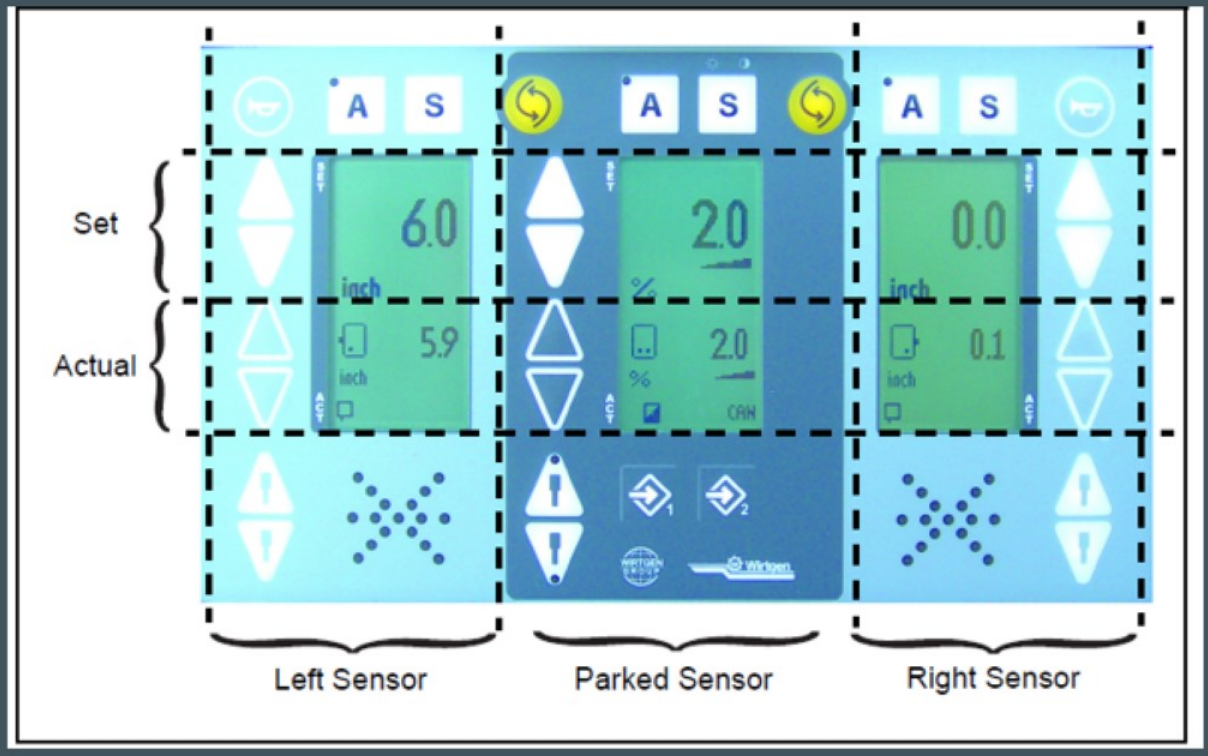
The “SET” screen on the left and right side of the LEVEL PRO display is the milling depth the operator has selected.



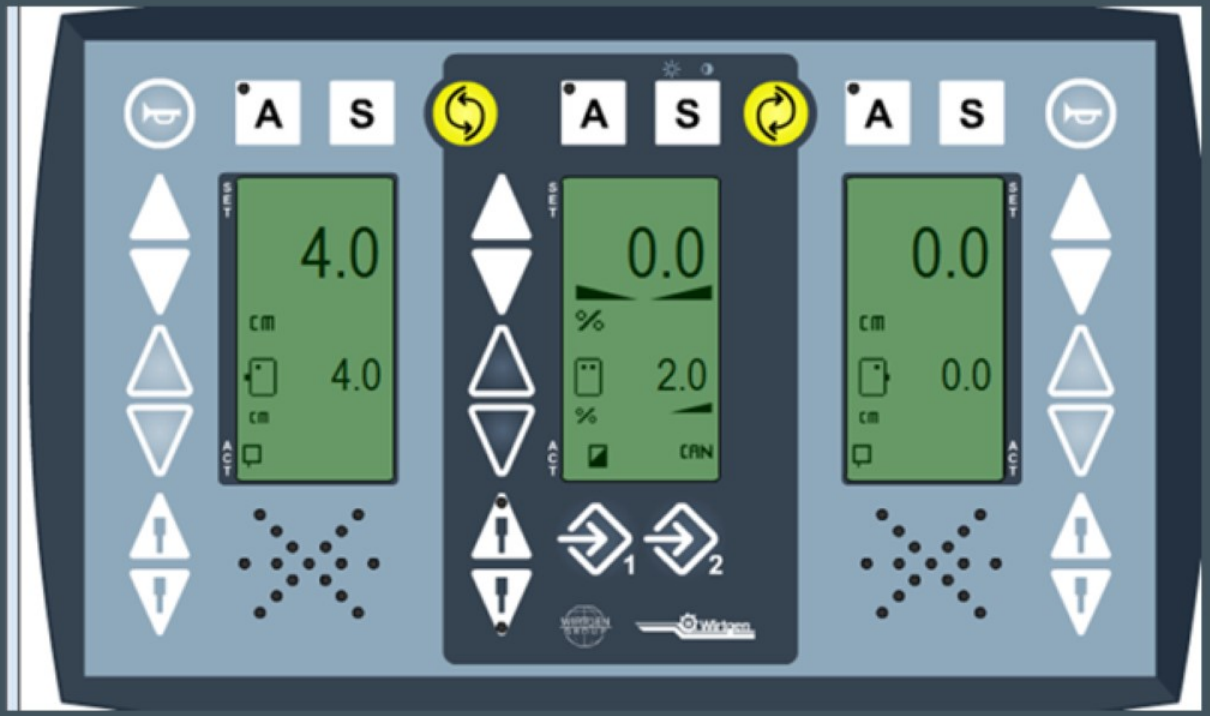
The ACT is the Actual Value after the machine Has been zeroed out. Meaning the drum and Side plate's zero has been Determined. We will come Back to the zero process Later in the presentation.

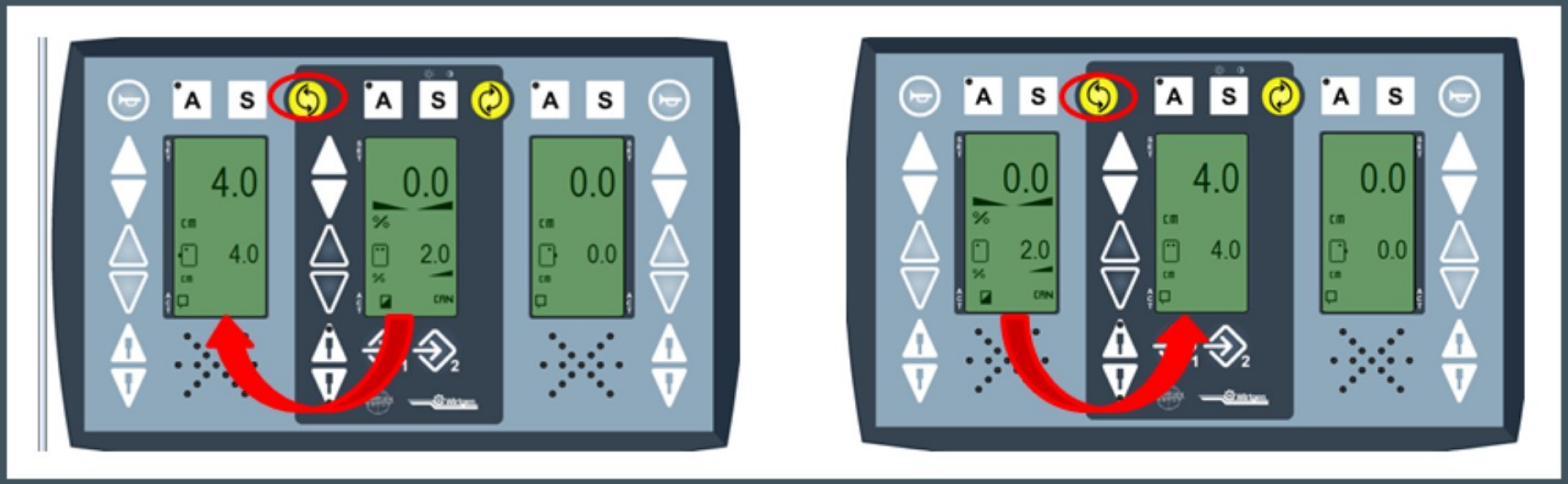


There are 3 columns that are used on Level Pro. left sensor, parked sensor, and right sensor. When looking at the graph it Is pretty simple to see left sensor is for left side of the machine and right sensor for the right side of machine. But what is the center screen used for?

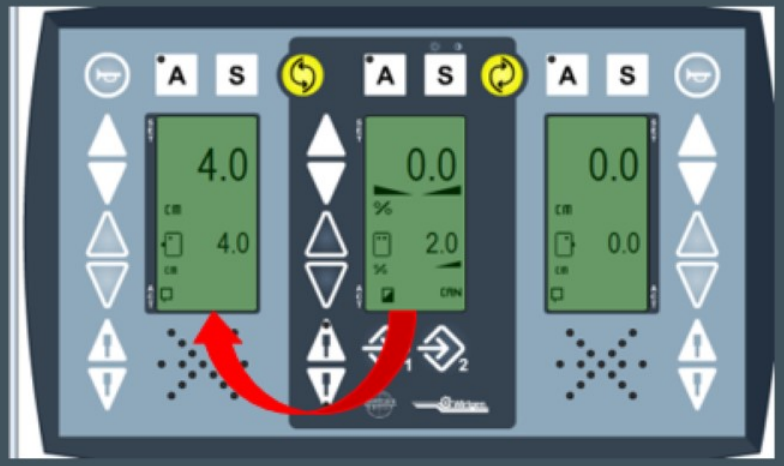


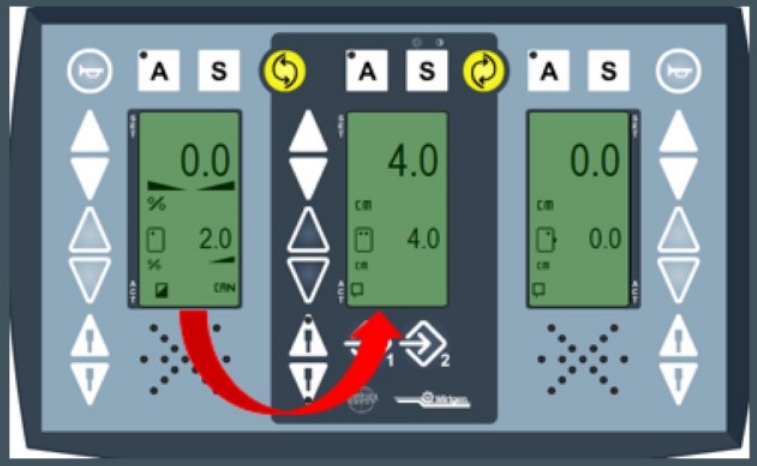
What is the benefit of the center Screen in the Level Pro?





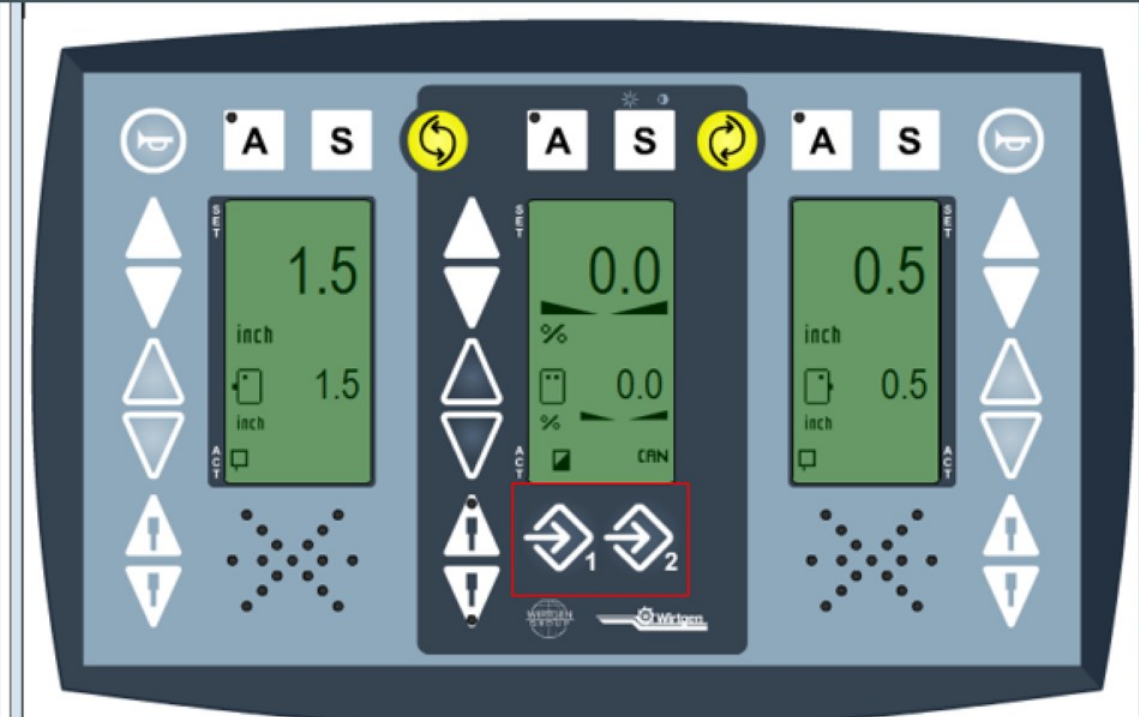
The benefit of the center screen is to give you the ability to select sensor and swap with either right or left side of machine while milling.



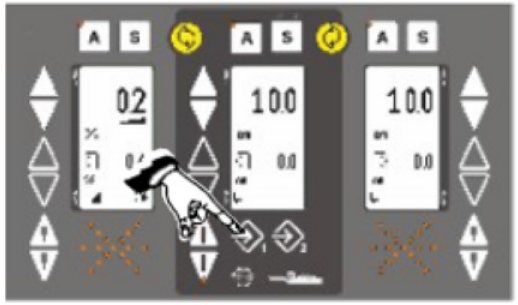


As you can see the slope is in the center screen (parked screen).
When pushing
Yellow switch over button the slope sensor swaps from the center screen to left
Screen. The side plate sensor in return goes from the left screen to center screen.
This is also possible to swap from center screen to right screen as well.

Memory Keys 1 and 2



SETUP-Modus: Aufruf der SETUP-Seiten (Blättern zwischen den Menüs durch mehrmaliges Betätigen)



Memory keys "1" and "2"

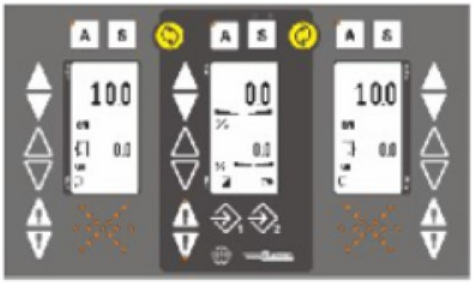
The memory keys can be used for storing frequently used nominal values and calling them up again conveniently. The time required for setting up the milling depth can be significantly reduced in this way.

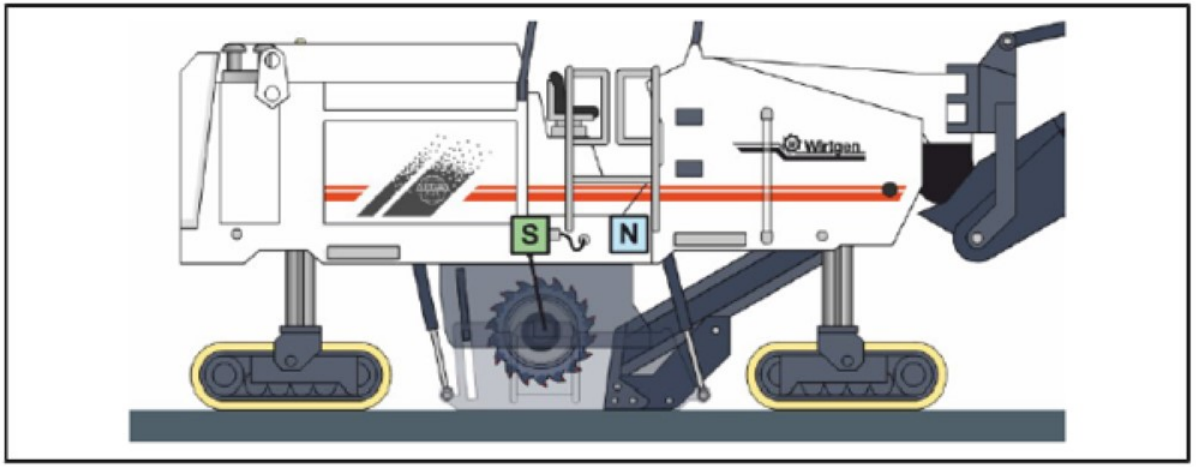
Default values on delivery

Memory 1 → value 4 (4 cm or 4%, depending on sensor)
Memory 2 → value 8 (8 cm or 8 %, depending on sensor)

Zero out milling

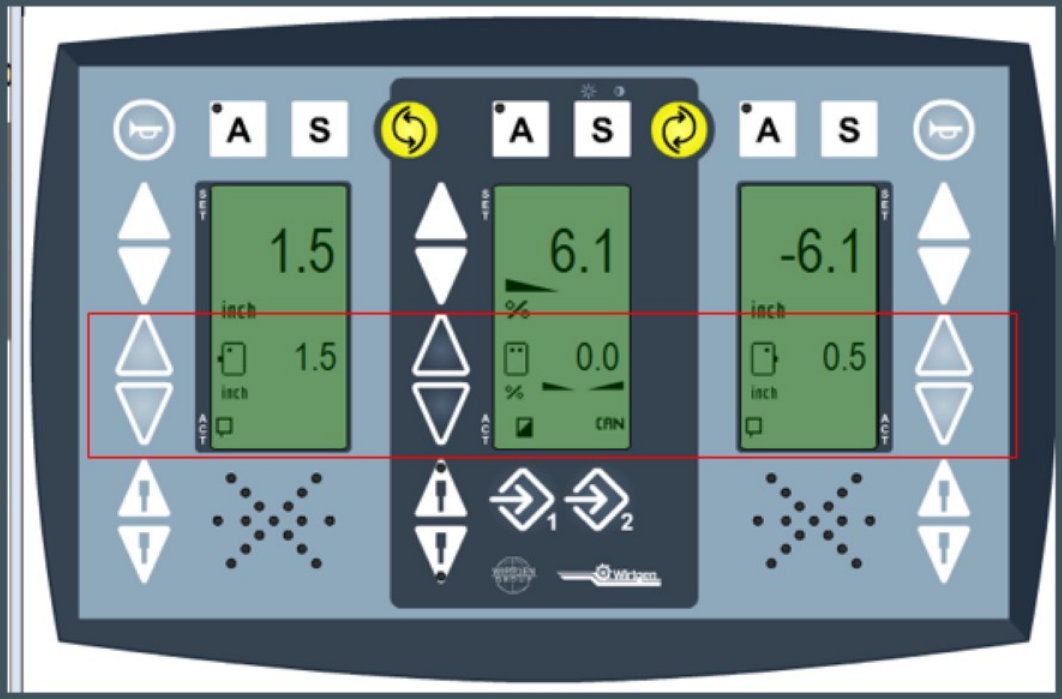
3.00.02 Setting up the zero setting



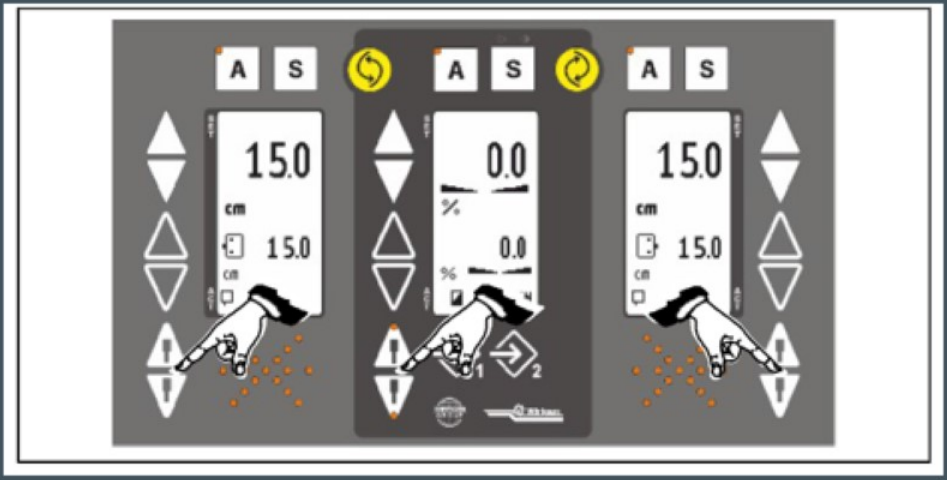


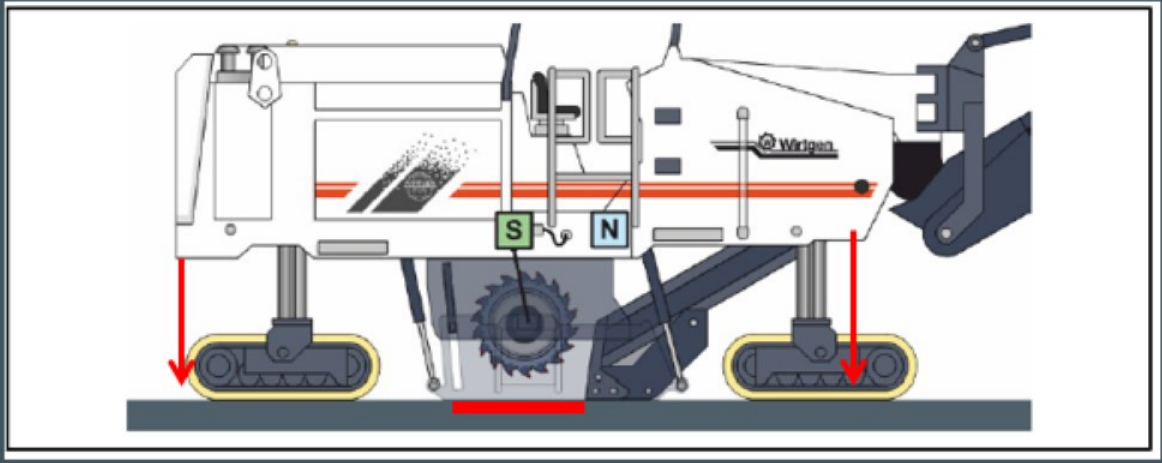
- Raise the machine until the milling drum can rotate freely.
- Switch on milling drum drive.

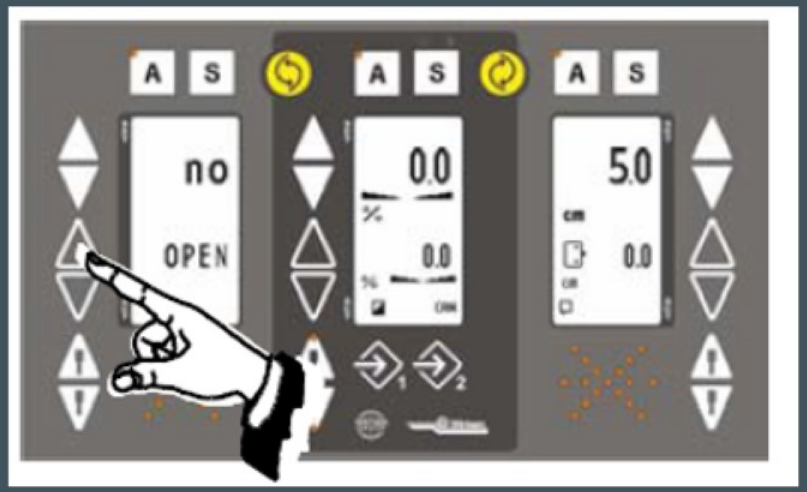
When zeroing out drum it Is important to understand that you are setting the ACT (actual) to zero on the left and right side of the LEVEL PRO display when the drum is barely scratching top of asphalt.

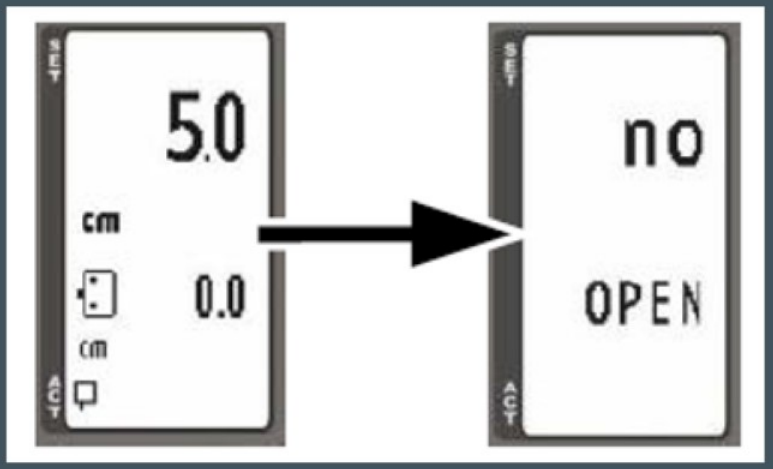


Lower machine by pressing down on left and right cylinder buttons until drum makes barely makes contact to the top of asphalt.

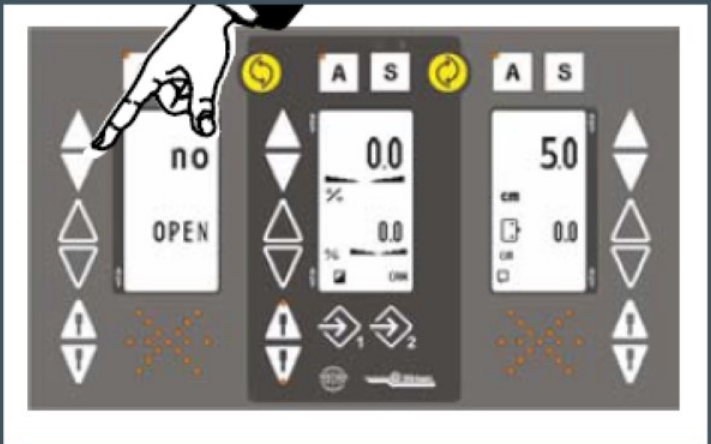


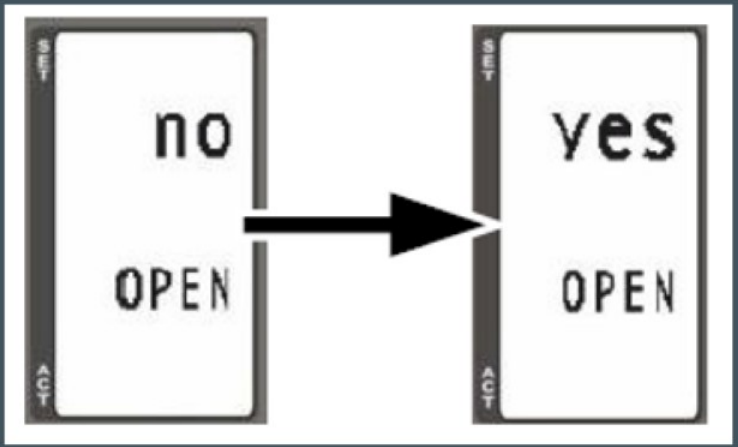






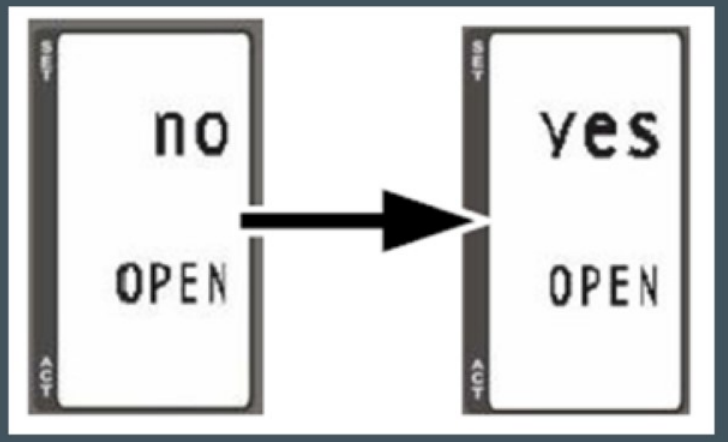
Press up or down on the ACT you will See “NO OPEN”.

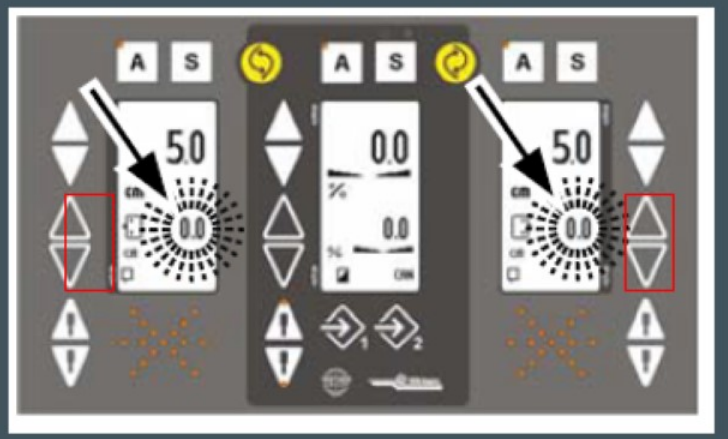




Press up or down on the SET screen will change to “yes open”.

The “0” will Blink for 15 seconds then hold down both ACT up and down on the left and right side. the LEVEL PRO display “ACT”is now Set to ZERO!





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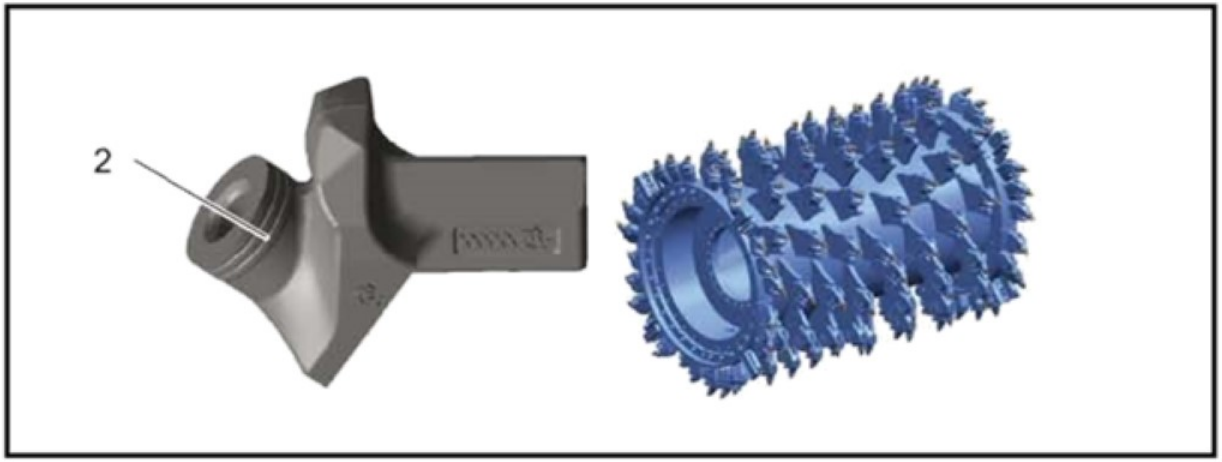
CUTTER DRUM MAINTENANCE

4.03.05 Quick-change toolholder system

Check on the pick supports Daily (frequently)



- Check frequently for signs of wear.
- If necessary, replace pick supports.
- Position milling drum using milling drum rotation device (hand crank if necessary) such that the picks / pick supports are accessible.

It is imperative to ensure the pick supports are in good condition.

When Should Holders Be Replaced?

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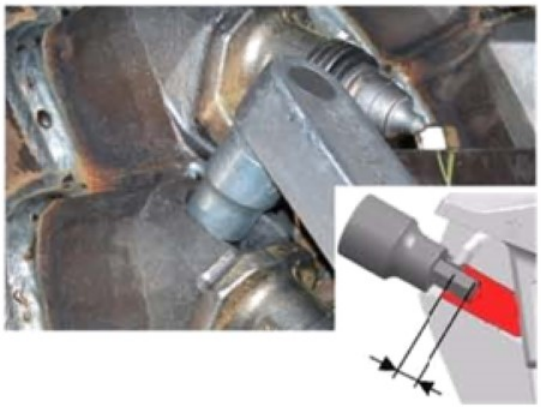
- Holders should be replaced when they are worn down to the last wear groove on the barrel of the holder.
- Holders should be replaced when rear edge of face has been worn away due to running with a broken bit or without a bit altogether (see below). A holder in this condition does not properly support the bit and can lead to poor rotation or bit shank failure.
- Holders should be replaced when the face is worn unevenly. Ideally, the face should be parallel to the wear grooves on the barrel of the holder. Grossly uneven wear can lead to bit shank failure.

Changing the Pick Supports

- Clean access hole for Allen screw.
- Remove hex plug.



- Carefully clean hex socket.
- Undo Allen screw by hand using an Allen key.
- Completely unscrew Allen screw and remove.

The full depth of the hex socket must be available. Do not use worn tools!

Changing the Pick Supports

➢ Remove pick support.

➢ Carefully clean threaded hole and five-sided guide, and check for damage.

Changing the Pick Supports

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- Provide good contact surface.
- Fit lower seal.

- Grease pick support shaft using temperature-resistant grease.
- Fit pick support.

Changing the Pick Supports

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- Grease Allen screw using temperature-resistant grease and fit. Do not use worn screws.
- Screw in Allen screw approx. 3 turns by hand. If it is only possible to screw in the Allen screw using a large amount of force, the thread must be re-cut using a tap.

- Screw in Allen screw by hand and tighten to a torque of 500 Nm.

Only use a manually-operated torque wrench for tightening the Allen screws.

- By hitting the pick support with a hammer (1 kg copper hammer) check whether the pick support settles further (sound test).
- Then tighten Allen screw to a torque of 500 Nm again.

Changing the Pick Supports

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➢ Fit new hex plug.

It is imperative the Allen screws are re-tightened after the 1st on-site operation (approx. 10 operational hours) to 500 Nm, then every 250 operational hours. If a screw can be tightened by more than one turn, the bottom piece must be checked.

Note: 500 Nm = 368 lb-ft

Note: For HT22, service interval after break-in torque is 500 operational hours.

Troubleshooting

WIRTGEN

If toolholders will not stay tight, the cause will be one of three possible problems…

1. Improper maintenance and tightening procedure.
-Correct tightening procedure and torque as outlined must be utilized for reliable operation.

-Break-in torque step after one full day operation is absolutely necessary for reliable operation.

-250 hour (monthly) torque check maintenance is required for reliable operation.

2. Contamination or debris in the bolted joint.
- A reliable bolted joint must have clean, flush, metal-to-metal contact surfaces and clean proper threads for the screw. Contamination in the joint will break down causing loss of clamping load in the screw. Contamination in the thread will not allow proper axial, load in the screw for the torque specified - resulting in insufficient clamping load.

-If holder comes loose it is not enough to simply re-tighten it! That holder must be removed and all joining surfaces and threads of holder and base must be thoroughly cleaned. The holder can then be re-installed utilizing correct tightening procedure. Do not forget the break-in torque step after one full day of operation.

3. Poor fit between holder and base.
-Aftermarket holders are not manufactured to same tolerances as genuine Wirtgen holders.Installing aftermarket holders can damage bases so that even when switching back to Wirtgen holders, they will not stay tight. All guarantees are off after using aftermarket holders!

-Fit can be checked using a thin layer of ink or paint on the supporting face of the holder and mounting the holder into position. After removing the holder, the raised contact points will be marked on the base. Sometimes, high points can be carefully sanded down with a flexible sanding wheel.

CONTROLS

1. Emergency stop
2. Rear leg raise/lower
3. LH front leg raise/lower
4. RH front leg raise/lower
5. PTS (parallel to surface)
6. All leg raise
7. Water auto/manual
8. Rear moldboard float/fix
9. Rear moldboard raise/lower
10. Front moldboard raise/lower
11. RH side plate raise
12. Drum engagement
13. Rear steer/steering mode
14. Favorites/front scanner
15. Cruise control
16. For./rev./steering/work,travel speed
17. Horn
18. Favorites/truck counter/mirror light
19. Conveyor raise/lower/swing
20. Conveyor on/off

1. Conveyor reverse
2. Conveyor fold/unfold
3. Work lights
4. Beacon light
5. Generator
6. VCS
7. Front scanner LH/RH
8. Regen bypass
9. Fold out mirrors
10. Key position
11. Manual throttle
12. Engine stop
13. Engine ignition

1. Auto center rear tracks on/off
2. Rear steer
3. PTS
4. PTS OFF: LH front leg side raise/lower
   PTS ON: LH side raise/lower
5. Rear raise/lower
6. PTS OFF: RH front leg side raise/lower
   PTS ON: RH side raise/lower
7. Rear moldboard raise/lower
8. Rear moldboard float/fix
9. Sideplate raise/lower
10. Emergency stop
11. Water on/off
12. Horn for operator
13. FCS segmented rear moldboard float
14. Rear door open/close

1. Front moldboard raise
2. Front moldboard lower/float
3. Wash down
4. High pressure wash down
5. Emergency stop

Thank You

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