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OPTIMISING OUTPUT FROM YOUR COMBINE

CLAAS



Introduction

- Grain output is a balance between grain sample and grain losses
- Decide on what is an acceptable loss for you. Many factors will determine the 'right' loss (crop/variety options, weather conditions, length of harvest, etc.)
- The crop settings in CEBIS are a guide only
- To get the best from the machine, the operator should adjust the settings to suit the conditions
- In any crop, an even feed is essential. Adjusting the knife position on a Vario header, to suit the crop, will maximize the feed

Downtime costs output

To get the most from the machine, the wheels/tracks must be turning. In order to keep downtime to a minimum, it's vital that routine maintenance is not neglected. As well as servicing the machine according to the operator's manual, a good check of the machine is essential.

It is false economy to put off the replacement of worn parts until they break. For example, a cracked knife section will take 5 minutes to change before starting work, but usually a minimum of 10 minutes output will be lost, once work has begun.





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Threshing

- Look at threshing next and thresh the crop 'just enough'
- In fit wheat concave gaps of 25-45mm are quite common
- By threshing only as hard as is needed, you generate less chaff and broken straw. This in turn does not block the concave or sieve openings, allowing more grain to pass through
- The aim is to keep the entire length of straw intact, with all the chaff still attached.
- Only use de-awners when absolutely necessary
- You can loose up to 30% of output by using de-awners

ALWAYS DO 'JUST ENOUGH'

TO INCREASE THRESHING

- Increase drum speed
- Reduce concave gap
- Increase Rotor speed (if fitted)
- Install threshing segment
(see pages 9.2.13 in operator's manual)
- Use de-awners

TO REDUCE THRESHING

- Decrease drum speed
- Increase concave gap
- Reduce Rotor speed (if fitted)
- Remove threshing segment
(see pages 9.2.13 in operator's manual)
- Remove de-awners

In most cases, if you have sieve losses, reduce threshing.



Unthreshed Wheat



Correctly threshed Wheat



Slightly Over-threshed Wheat



Over-threshed Wheat



Cleaning

- The sieves need to be wide enough to cope with a large volume of grain. 16mm plus is common
- With wide sieves comes a need for a high fan speed
- In some cases you will need to run the fan at maximum speed. But what speed is maximum? There is no set speed, as it depends on how the drive belt is adjusted

TO CHECK FAN SPEED ADJUSTMENT (NOT 570/600)

Firstly check the condition of the fan drive belt. If it is badly worn or cracked then replace it.

Run the cleaning fan speed up to maximum by engaging threshing and using the rotary knob to increase the fan speed.

Stop the combine and switch off the engine.

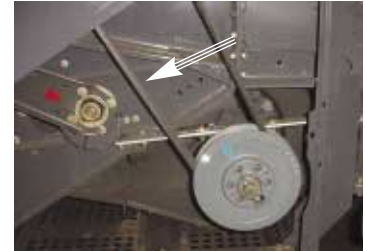
Move around to the right hand side of the machine and look at the top fan drive pulley. The belt should not protrude more than 1-2mm over the edge of the pulley.



On the bottom pulley, the belt should not be bottomed out on the shaft, but still gripped by the sides.

As long as neither of the above is true, the belt can be adjusted to give an increased fan speed.

Pull the front part of the belt towards the back of the machine to produce some slack.



Loosen the drive belt to the rotary screen suction fan. The top fan drive pulley is fixed to the side of the machine on a slide. Loosen the four bolts fixing it and push the pulley up a few mm.

Retighten the bolts and run the machine up again. Decrease and then increase the fan speed.

Recheck the adjustment as before.





Pre-separation Wind Duct Lever

When the belt is adjusted correctly, then retighten it and adjust the suction fan drive belt.

Finally re-tension the intermediate drive belt to the top pulley.

The pre-separation wind duct lever must be adjusted to suit the amount of grain on the sieves. The more grain, then the further back the lever needs to be. With high outputs in wheat, hole 7 is not uncommon.

For machines with MSS (Evolution or 510-560) adjust the tines to suit the volume of straw. The more straw there is, the earlier the tines need to come into work. This way they grab the straw and pull it under the rotor.

It is then just a matter of balancing threshing and forward speed to produce the desired output/sample/losses.



MSS Lever

Tines come into
work earlier

Tines come into
work later



Returns

Excess returns, reduce output and damage sample quality.

- The returns should be checked regularly, both for volume and composition
- By opening the R.H.S window, a door opens allowing the returns to be visible from the driving seat
- The centre tube of the returns auger should always be visible
- To reduce the volume of clean grain, open the bottom sieve 1mm at a time
- To reduce the volume of chaff, reduce threshing and/or close 'bomb doors' on rotors (570/600)
- To reduce the volume of unthreshed heads, increase threshing



If the returns belt keeps slipping

Are the returns full?

If they're full of grain, reduce them by opening the bottom sieve 1mm at a time.

If they are full of chaff and/or broken straw, reduce threshing and/or reduce rotor speed and/or close 'bomb doors' on rotors (570/600).

If they're not full and the belt is slipping, check the tension of both belts. Do not forget to undo the nuts, which hold the pulleys to the LHS of the machine.

Pulley



Rotor speeds (on Rotary combine)

Dry Crop

In normal, dry conditions, the correct rotor speed is a balance between having enough speed to separate the grains from the straw and being gentle enough so as not to overload the sieves with broken straw and chaff.

Damp Crop

In damp conditions straw will only travel along the rotor at one speed. This speed is different for every crop and machine. The speed will be in the range of 600-960rpm.

To find the correct speed, start with a rotor speed of about 750rpm and see how the machine 'feels'.

If the wrong speed is chosen, a vibration can be felt through the machine. If this is the case, the correct speed can be found by altering the speed in steps of 50rpm.



- Start at 750rpm
- Increase speed in 50rpm steps for better separation
- Decrease speed in 50rpm steps for better straw quality
- If no vibration felt, increase/decrease speed as required (Max 960rpm-Min 400rpm)
- If a vibration is felt when changing speed, move back, 50rpm at a time, until the vibration stop
- It is then just a matter of balancing concave gap and rotor speed to produce the desired output/sample/losses

Chopper

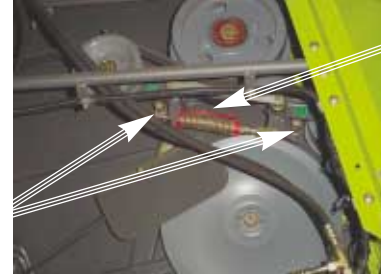
- Chop only 'Just Enough'. The shorter the crop, the more power required
- Check that the shear bar above the stationary knives is out of work (Lexion 480/580)
- Back off stationary knives until the required chop is achieved
- Check that the stops on the chopper drive belt are pushed up tight
- Only use the Fine Chop Step when necessary (not 580)

On a Lexion 480/580, check that both the unispreader belts are tight. Do not forget the one on the bottom (underneath).

Where should the spouts be on the Unispreader?

- When you're chopping they should be folded out and free to waggle
- When you are laying a swath they should be folded in as if for transport. This allows the chaff to spread out evenly behind the combine

Chopper Stops



Chopper Belt Adjuster



To get Maximum Output

- Thresh 'Just Enough'
- Set the concave gap as wide as practicable (Maximum 45mm)
- Adopt a suitable Rotor speed or MSS position according to the prevailing crop conditions
- Run with the Sieve openings as large as you're willing to tolerate
- Keep the Returns under control
- Operate the cleaning fan at high speeds
- Chop 'Just Enough'
- Keep the machine FULL



Notes
