



TECHNICAL REPORT

MACHINE MAKE:	XXXXX	REPORT DATE:	23 rd July 2012
MODEL:	XXXXXX	LOCATION:	Hoopstad
INSURED:	XXXXX	CLAIM / POL No:	XXXXX
INSURER:	XXXXX	CONTACT:	XXXXX



The machine as it stood on the premises of the Insured in Hoopstad

Dear Jaco,

As you are aware, I travelled to the premises of the Insured in Hoopstad to examine the above mentioned combined harvester with a view to establishing the cause of the fire broke out on the right hand side of the machine whilst in operation.

PRIOR CONDITION:

The machine is virtually new having accumulated less than 250 hours and not yet having been due its first service.

DAMAGE TO MACHINE:

There was light thermal damage caused to many of the components that are mounted close to the grain elevator chute. The chute itself suffered severe thermal damage in its lower sections as can be seen here to the right.

Note the dark spread marks made by the combustion gases.

Light thermal damage and large areas of charring were noted on the covers of the right side of the machine as well as to the exterior of the cab.

Wiring harnesses on the right side of the machine have been exposed to extreme temperatures as have several bearings and seals, the condition of these parts will have to be assessed once the vehicle has been stripped. I believe the machine is repairable.



CIRCUMSTANCES OF THE INCIDENT:

Having the Insured who was also operating the machine at the time of the loss as well as the representatives from XXXXX present during my inspection was extremely valuable, thank you for arranging this for me.

The Insured's description of events is that whilst operating the vehicle, stripping a field of mielies, he became aware of an alarm advising him that the engine temperature was increasing. He suspected that as it is common for the engine's radiator to become clogged with chaff, that this was the problem and he stopped the machine to investigate.

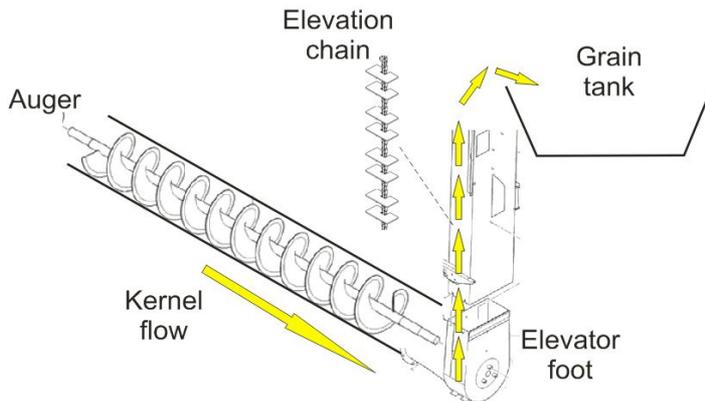
He exited the cab and looked around the machine and could see nothing wrong, but as he was climbing up onto the machine to where the engine is situated, one of his farm workers alerted him about a fire that had started on the right hand side of the machine.

He climbed down to discover that the elevating chute that transports the kernels from the processing section of the machine up to the hopper was on fire.

He managed to extinguish the fire and moved the vehicle to an empty part of the field to protect his crops.

SOURCE OF IGNITION:

In order to understand how the fire started, you have to understand the process taking place in what is known as the elevator foot.



After being stripped in the processing plant, the corn kernels drop down into a tube that contains an auger, a large screw that feeds them along to the elevator foot.

In the elevator foot, a chain rotates with elevating paddles attached, these paddles lift the kernels carrying them up the chute and throwing them into the grain tank.

The first thing to be seen inside the elevator chute housing was that all of the paddles were missing from the chain; they appeared to have been burnt or broken off as can be seen here in the photo to the right.

The chain was damaged all along its length, which takes it up to the grain tank and back down again.

The chain was stationary when the fire was noticed yet the damage and discoloration is uniform over the length of the chain.



Whilst examining the rest of the machine, I noticed that the chains driving sections of the processing plant at the front were all very clean, stainless steel chains, and I had noticed that the elevator chain was badly tarnished.

I assumed as the elevator chain was in contact with the product that it too should be a stainless steel chain, which it didn't appear to be from first glance, the XXXXX technician confirmed that it started off its service in this machine looking like all the rest.

This prompted me to examine the elevator chain more thoroughly, which revealed that the discoloration is in fact the slight tint of blue that appears as the metal is heated and is caused by a very small layer of oxidization on the surface of the chain.



Drive chain at front of machine



Elevator drive chain

Along its whole length it was varying colours of blue, a closer examination of the chain revealed that the blue was in fact due to the heat the entire chain had reached, not just normal charring from the fire.

There is not enough thermal damage to the rest of the components that are in the vicinity of the chain for it all to have been heated to a temperature in excess of 300° C by an open flame fire. I deduced the chain must be part of a situation where a tremendous amount of friction was being generated.

Closer examination of the auger tube and elevator foot revealed just that.



Bottom of auger tube



Magnified

The damage to the bottom of the auger tube appeared at first glance to be a crack caused in the fire, if we look closely, it is the metal actually worn right through around the edge that mates with the elevator foot.

Similarly, the elevator foot itself has also worn a hole through the side of its housing. There appears to be a problem with the ratio between the amounts of product coming from the auger to how much the elevator paddles can lift which is causing a bottle neck which is resulting in a build-up of friction between the kernels, the auger and the elevator chain and its paddles.



Hole in elevator foot housing



Kernels that have ignited towards the end of the auger tube



The replaceable lock plate



The end of the auger tube underneath

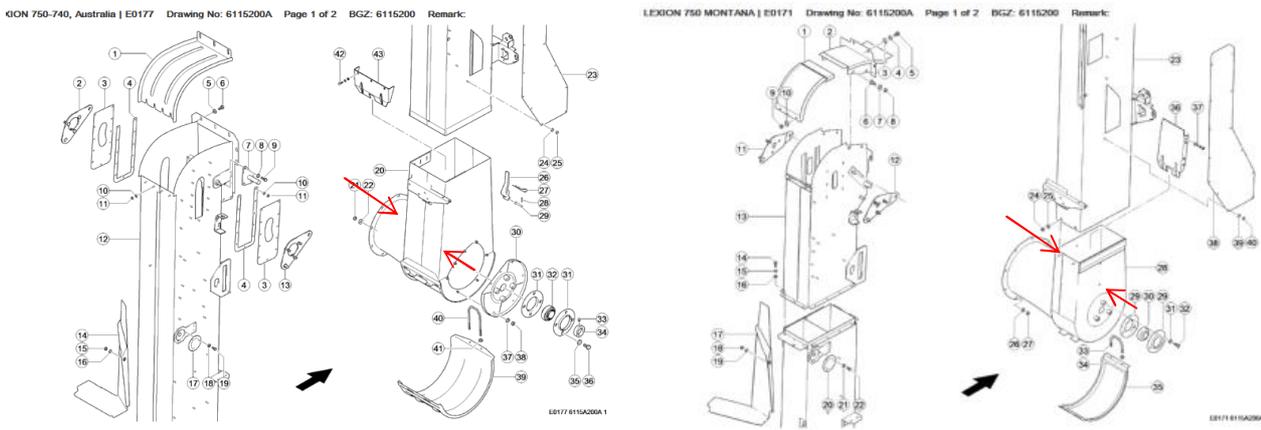
The effect of this build-up of heat in this area can be seen both inside the machine and outside. Inside, apart from the elevator chain and its components that have been damaged, the final scroll of the auger can be seen to have also suffered from excessive heat build-up. He outside of the auger tube shows clearly that the fire emanated from within this section of the machine. The thermal effect on the paint could not have been caused any other way.

CONCLUSION:

The forensic evidence shows clearly that there has been a severe build-up of product that has resulted in the generation of enough heat to ignite the kernels and chaff that is in abundant supply all over the machine.

I am certain that the technical staff from XXXXX is aware of what exactly is wrong. It is my opinion that this machine's grain elevating system cannot cope with the volume of grain coming through the auger system.

What I did find interesting when researching information on this machine is that there are at least two different models, there is the XXXXX Australia and the XXXXX Montana. The most notable difference as far as we are concerned is that the "Australia" has a much higher capacity grain elevating system than the "Montana"



The drawing from the XXXXX parts catalogue shows the difference between the two, the insured's machine is the same as the narrower one on the right. The two sets of arrows are the same distance apart.

I asked the technical staff that were present during my visit to the machine if there was any way that the Insured could have been operating the vehicle incorrectly, maybe trying to work the machine too hard, but they assured me that the cutting and processing is all carefully computer monitored and that this could not have been a factor in the overloading of the elevator system.

The findings within my report lead me to the opinion that this incident is the manufacturer's problem as the elevator system was inadequate to move the amount of grain being fed to it and therefore I am confident in saying that the Insurers, should they wish to do so, would be fully justified in repudiating this claim and referring the Insured to the manufacturer's warranty department.

I trust this report is satisfactory, covering all the pertinent points of this matter and meets your requirements. Please feel free to call me for any further assistance should it be required.

Kind regards,

Peter Banbury
0760126162