Pre Work

The Mill Team did far more than just build the brake wheel, in preparation for the installation they:- Brake Wheel Installation October 2012

- Produced an installation plan.
- Assessed the risks and tested the pre-positioned hoists were strong enough.
- Cut a new trap door in the cap floor.
- Removed the eight segments of cast iron teeth from the wheel.

Day One

By 9am the team was already in full flow with multiple socket sets to undo the 80+ nuts on the bolts and studs that held the brake wheel components together.

The studs, nuts and washers were carefully collected and stored in boxes for transit to the top of the mill.

As soon as the first four sections of the central framework were free they were individually carried to the mill and carefully attached to the rope hoist.

Who needs to go to the gym when hauling timber to the top of the mill keeps you in tip top condition!!!

Hauling heavy timbers to the top of the mill required a substantial rope and pulley held in place on a solid structure on the cap floor.

Meanwhile some of the team continued work on dismantling the brake wheel.

Once the nuts had been taken off, to remove the studs that went through the timbers, the highly skilled team used one of the foremost engineering techniques known to man – hit it with a heavy hammer.

This worked well and all the studs and bolts were removed without damage. The welded bolts were put aside for painting with an oxide solution.

Concurrently the woodwork specialists were in the cap floor at the top of the mill fitting the first four central timbers onto the square part of the wind shaft.

The wind shaft is 10 degrees off horizontal so spirit levels could not be used normally to ensure the wheel is level.

The team had already marked lines on the wind shaft to highlight the position for the wheel framework.

As the dismantling of the brake wheel continued in the Neaverson Centre, the four central parts of the outer wheel became available for transit.

The four muscle men carefully lifted and carried each piece across to the mill.

On reaching the mill the usual challenge occurred of getting both timber and carriers through the doorway. A bit of expert communication and the challenge was overcome.

The side parts of the outer rim were stacked in the Jerry Leakins as they would be the last large wooden parts to be attached to the wheel.

With floor space on the cap floor being very limited they were kept out of the way until needed.

All of the timbers and joints were numbered, as were the wedges which held the wheel segments together. The wedges were bagged ready for transit.

A side view of one of the rim timbers shows the range of holes drilled through it. Some were to hold the timbers together, then there were separate holes for the sections of cast iron teeth.

Even four year old seasoned oak can crack, so a temporary patch was added to keep this segment in one piece. After it was fitted on the wheel the patch was removed as the bolts held it in place.

Bacon sandwiches helped keep up the team's strength, as well as providing a welcome break from the hard work.

By the end of the day the brake wheel was looking good, with the central part of the outer rim having been fitted to the square inner framework.

Space in the cap was so tight that the only way to photograph the brake wheel was to climb the steps to the platform just inside the fan tail.

Each of the holes had required a team member to stand on the wheel during construction and drill into the wood.

A close up of the wedges that ensured the brake wheel was positioned squarely on the wind shaft with an equidistant gap on each side.

The side parts of the outer rim were carried from the Jerry Leakins into the mill and securely attached to the rope hoist.

The holes in the timbers were used to securely attach the heavy duty rope and shackle.

Day Two

The team was again in full flow by 9am with multiple sockets and other tools needed to fit the 80 or so nuts that held the brake wheel components together.

Such was the precision of the work that only one hole needed to be drilled again; quite remarkable when considering the different stresses on the timbers.

Even without the cast iron teeth the brake wheel looked awesome.

The castings had been pre-positioned in the ground floor of the mill, just to the side of the space below the hatch.

As each segment weighed 90kg (198 pounds = 14 stone 2 pounds) the pulley and rope were replaced by two chain hoists. Two were needed to cope with the height of the mill.

As well as being stronger the chain hoists provided a mechanical advantage which made it easier to lift such heavy weights.

The holes in the castings which enabled them to be bolted onto the wooden wheel were ideal for attaching the chain and shackle.

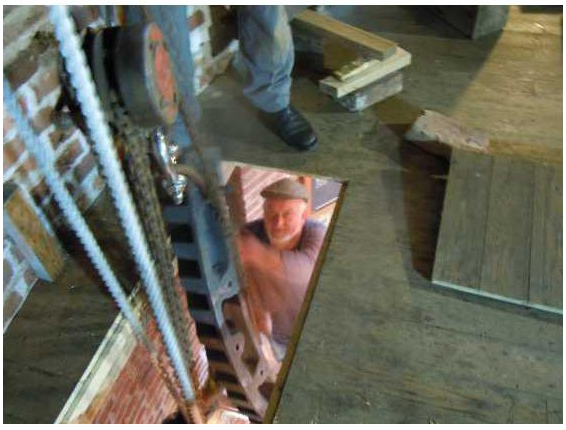
Ground Floor - Team members carefully guided the castings as they were lifted off the floor, then watched as they rose through the trap doors.

Stone Floor – Going up as the chains were pulled.

Stone Floor – The casting continued its ascent. Although it was hard work the team were thoroughly enjoying themselves, building a brake wheel was a once in a lifetime experience.

The weight and shape of the casting put a distortion on the chain hoist and periodically the system jammed. This required careful communication between the floors to ensure that the correct chains were pulled to release the jam.

Dresser Floor – The casting still going up, not a lot of room to work in.



Cap Floor – The casting emerged into the cap from the dresser floor.

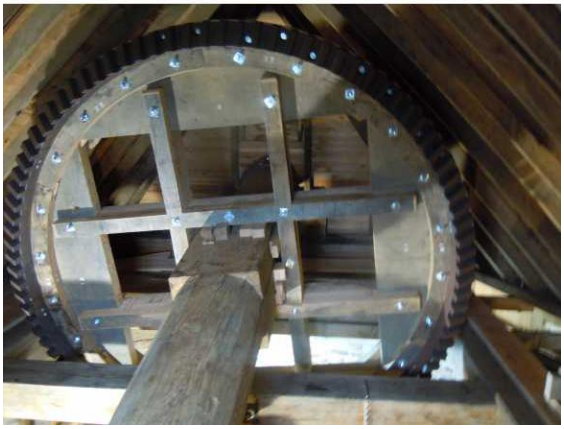
Cap Floor – the casting was carefully landed and manipulated to the storage area, two supports were used to spread the weight.

Landing the casting required lots of communication between the floors as the casting has to be raised and lowered without causing damage to person or property.

Adding The Castings

The cast iron teeth were bolted in position. It was heavy work lifting each segment up to the wheel and holding it in place.

Each segment of cast iron teeth was fitted to the bottom of the brake wheel. The brake wheel was heavy to turn with just the wood, but the task was now harder as with its cast iron teeth on only part of the structure it was out of balance.



The almost finished brake wheel. After a year of work it is hard to believe that it is almost complete. The Trust spent £5,000 on materials and was very appreciative of a £1,500 grant from the Helen Jean Cope Trust towards the cost of the castings.

Final adjustments took place to ensure that the brake wheel was properly balanced. The whole project was a marvellous achievement by the volunteers. Very few new brake wheels are made and they are virtually all made by millwrights, joiners and contractors.

The Team

The super six, left to right:

- John Tilley
- Mike Luff
- Geoff Lingham
- John Wilkins (Dilk)
- Rick Mulleneux
- Cliff Aris