

Fantail Drive Mechanism

Replacing the Curb Drive Pinion



When the wind changes direction it turns the fantail sails, which turn a drive shaft.



Inside the cap, the drive shaft turns a number of gears.



The internal gears turn another drive shaft and the final gear (the curb drive pinion). This small gear works its way along the curb (the circle of

cast iron teeth at the top of the mill's brickwork) to turn the cap.



In 2015 the Mill Team noticed that the pinion was damaged. It had only lasted five years. Sadly, they tied off the fantail to stop them turning and removed the curb drive pinion. The team felt that a different engineering solution was needed.



Millers were always inventive and adapted to new technologies. So our Mill Team asked R D Moore Ltd, sheet metal fabricators, on the Stephenson Industrial Estate in Coalville.

The result was a multi-layered pinion. Because it was produced by a computer driven laser cutter, new layers can be fitted if any become worn.



The coach bolts on the pinion shaft lower bearing bracket had sheared or were loose. The team had to fabricate a beam supporting bracket and fit studs through the wooden beam to hold the bearing in place.



Since identifying the issue it had taken more than a year to devise and install a solution.

The team untied the fantail sails, it was all systems go. The fantail sails would again turn the cap so that the main sails, if obtained, would be in position to use the wind.

Fantail Drive Shaft

Imagine the team's horror and frustration when almost immediately they identified another problem.



The exterior drive shaft meets the internal drive shaft just outside the cap roof. They were held together by a muff coupling which had failed and was very difficult to remove as it had to be cut off.



Once removed the reason for the failure was apparent as it was in several pieces.

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The team wanted to check that over a number of sessions the cap rotated a full circle. However on Friday mornings the wind tended to blow from the same one or two directions.



The keyway in the exterior drive shaft was damaged and the shaft sections were out of alignment. A new muff coupling had to be made and fitted.

Because of the problems, the Mill Team tested the whole mechanism very carefully. They did this by untying the fantail sails at the start of a Friday morning session and observing the fantail's operation as it turned the cap. At the end of the session the sails were retied.



After more than a year of intermittent work, the fantail sails were fully operation and the fantail drive was again turning the cap when the wind changed direction.