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Report on the Hydraulic Engine & Blowing Unit at St. Michael and All Angels, Moccas.

Dear Rachel

Hydraulic General Inspection

The engine is of unusual design, compared to the five others we have rebuilt, having a rigid slide bar connected to the piston rod, to keep the action straight, and what appears to be cast iron cylinder end plates and ports. Beyond that the design has all the typical parts including throttle valve, piston valve actuator, piston valve and main cylinder. The original connection rods and levers for the throttle control seem to be missing and this could require a more circumspect survey to assess for replacements.

Main areas of concern with the engine are the cast iron parts and the old guide rod. The guide rod appears to have had a hole bored for it in the floor so that at the lowest position the rod can travel down far enough. The hole has become filled with accumulated debris with the rod part way down so I suspect there will have been considerable corrosion and hence the rod may well have to be replaced. It is impossible to tell the general condition of the internal

parts of the engine and the presence of so much cast iron may mean that valve gear has suffered.

Costing to Reinstate Engine

The hydraulic part of the project will require the following:-

- Covered stainless steel tank. As there is on water supply to the church it will be necessary to manually fill the tank and keep it filled. A safety device would be incorporated into the system to ensure the pump remains primed and cannot be actuated if the water level drops below a certain level.
- Centrifugal pump with flat performance curve, pressure vessel to regulate supply and bespoke control mechanism.
- General plumbing including all fixed pipework in large bore copper, reinforced flexible pipework for pump isolation and associated isolation valves and additional safety valves and controls for pump protection.
- General rebuild of hydraulic engine with all new stainless fixings machined to match the original, new leather seals throughout, new gaskets throughout, new gland packings and pattern made parts to replace defective items and new control rods and levers for the throttle connection to the reservoir.

Total Cost to Complete the Above - £11,270.00

General Blower Inspection

The blower on the organ is a small suspended Discus from the 1930's. At some point in its history the motor has been replaced with a modern equivalent. Unfortunately, the new motor does not the same slip speed as the original and hence the output, both CFM and static pressure, is reduced. It is currently in a old enclosure of all timber construction and, typically for the age, this structure has been lined with a thin, friable and damaged material, which I strongly suspect is asbestos bearing. In all cases where asbestos is suspected we would recommend testing of a small sample and if necessary disposal of the enclosure. Due to the nature of the material, if it were found to contain asbestos, further testing of the organ

winding system should be carried out to ensure contamination has not spread. This is not an onerous task requiring only small dust samples to be gathered from the main reservoir, additional reservoir in the job and the soundboards. Four or five samples should be sufficient. Test kits are available through UKAS approved laboratories on line and your organ builder should be able to assist with gathering the samples as parts of the organ will require opening up to gain access.

The blower itself can be removed, bagged and then dealt with separately. We would recommend rebuild of the original motor found on site, cleaning and overhaul of the blower and reinstatement of the original motor. We could then provide a new enclosure to mate up with the existing trunking.

Costing for General Overhaul and Reinstatement of the Blower

- Removal of blower from site and sealing of original blower enclosure for disposal.
- Rebuild of original Century motor.
- Cleaning and dynamic balancing of original blower.
- Manufacture of new enclosure with suitable fire and sound proof lining material to match external dimensions of original enclosure.
- Reinstatement on site.

Total Cost to Complete the Above in Conjunction with the Hydraulic Project - £1457.00
Total Cost to Complete the Above as a Stand Alone Item - £2027.00

General Electrical Matters

The hydraulic side of the project includes the provision of a bespoke built control for the pump unit with all suitable protection and safety devices. Since neither hydraulics nor blower should be allowed to run at the same time the unit would incorporate the control for the blower, with suitable protection for that motor, and an interlock to prevent both items being run at the same time. If the hydraulic side of the project was not carried out then we would recommend that a control be put in place for the blower alone. It was not clear on site what the current control is but we suspect it is just a basic switch with only supply fuse protection. Ideally this should be replaced with a contactor incorporating thermal protection for the motor and interlocked with thermal cut outs in the motor windings. Control of such a contactor could be by push buttons provided at the console, console key switch or a basic switch but current electrical safety requires that remote controls should be low voltage and if required to supply a stand alone blower control we would incorporate this into the control as a matter of course.

Cost to supply a stand alone blower control, console remote and install on site - £748.00

N.B. All prices quoted do not include VAT @ 20%

Conclusion

The engine at St. Michael and All Angels is an interesting early example but certain features have not combined well with the situation it is in and the materials used in part of the manufacture make it more susceptible to corrosion. Certainly the situation has to be taken into account, were it to be reinstated, to ensure corrosion is not going to effect the long term operation of the unit. Unfortunately, this makes costs somewhat less predictable.

Where the blower is concerned it is a pity the replacement motor was not checked for slip speed as the effect of the reduced speed is more than evident on the organ. The asbestos issue is a common and tiresome problem that simply needs dealing with and, if dealt with in a controlled way, it should not present any great issue.

If there are any questions regarding any of the above or if we can be of any further assistance please get in touch at your convenience.

With all best wishes

Mr. James Richardson-Jones(Director)