

Press Information

METALLOCK CLAIMS THE FIRST SUCCESSFUL BEARING POCKET TRANSPLANT IN ALUMINIUM ALLOY GEARBOX CASING

Metallock Engineering has broken through the casting repair barrier with what is believed to be the first successful substantial repair of its kind on an aluminium gearbox casing for Allen Gears. The cold Metallock process has been used mainly for iron and steel casting repairs for years but the company had never been asked to carry out a bearing pocket transplant on an aluminium alloy casting.

Allen Gears had a new build gearbox casing for a main propulsion system for an overseas navy vessel. In service the gearbox would be driven either by two gas turbines or a diesel engine, as circumstances required. On receipt of the expensive aluminium casting, porosity was discovered on the sidewall of one of the bearing pockets. Attempts were made to machine it away but this did not cure the problem. Having used the company on previous occasions, Allen Gears called in Metallock Engineering whose solution was to remove the pocket and replace it with a specially made insert secured into place using the Metallock process.

The casing was transferred to Metallock's well equipped Coventry workshops and a template made enabling a new insert to be manufactured by machining from a solid block of similar material. The area to be removed was marked out and the casing machined to the predetermined dimensions. As well as the area to accept the main body of the insert, slots were machined into either side of the joint face to accept lugs on the insert which add strength and aid location. Once the insert was machined it was placed into the pre machined aperture in the casing. The casing was now ready for repair by Metallocking.

The Metallock process – approved by Lloyds of London - is accepted as a method of repairing cracked and broken castings across a wide range of industries. One of the main advantages of the process is that it is heat free and can be carried out in-situ or one of the company's workshops. Apertures are jig drilled across the crack to accept multi-dumbbell shaped keys manufactured from a ductile high tensile nickel alloy. The keys are peened into the apertures to become integral with the parent metal. Holes are then drilled and tapped along the line of the fracture/joint and filled with studs, each one positioned to overlap its neighbour. This combination of keys and studs produces a rigid and pressure tight repair. Final peening and hand dressing completes the operation.

To secure the new insert Metallock used over 100 dumbbell shaped keys and nearly 200 Metaloy screw studs over almost 1¼ metres of joint interface. On completion of the repair, the bore and journal pocket sidewall and the joint face were machined to the customer's specification. The casing was taken back to Allen Gears and the whole process from delivery at Coventry to completion had taken less than fifteen days. The gearbox was subsequently built, put into service and has operated trouble free for over 10 months.

Metallock has since carried out another repair on a similar casing for Allen Gears in quick time. A 15cm crack on a 20mm thick corner flange was repaired using a specially prepared 'L' shaped insert made from matching material.



On completion of the Metallock repair, the bore, journal pocket sidewall and joint face were machined to the customer's specification.

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