

INFLUENCE OF CRACK LENGTH IN AIRCRAFT CYLINDER HEAD ON EFFECTIVE STRESS VALUE AROUND CRACK TIP

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ABSTRACT

The appearance of cracks in the cylinder head of aircraft piston engines is a common occurrence in practice. Determining the stress state of the cylinder head with a crack is of great importance and enables the assessment of the integrity of the same. In this paper a structural analysis of the cylinder assembly without crack I and with cracks of different lengths is performed. Values of the effective stress of the cylinder assembly at room I and at an elevated temperature corresponding to the operating temperature of the cylinder assembly were obtained. The influence of the crack length in the cylinder head on the value of the effective stress in the vicinity of the crack tip is presented. Research has shown that with crack growth above 3 mm the slope of the effective stress growth line increases with maximum values of effective stress occurring around the cracks tip.

Key words: crack, cylinder head, thermomechanical load, effective stress