



Grinding cast crankshafts

Situation

Cast crankshafts are made of ductile cast iron. This is a type of cast iron with strength properties similar to those of steel in which the carbon is precipitated in nodular form.

Problem

When grinding grey cast iron crankshafts, metal flaps and sharp grinding burr (Fig. 1) form on grinding the surface of the nodular graphite beds. For this reason, cast iron crankshafts

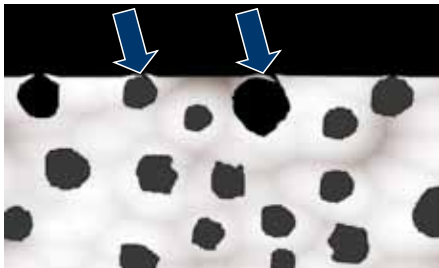


Fig. 1: structure with machining burr after grinding

must be ground such that the burr and metal flaps face away from the direction of rotation of the crankshaft. They are then held down by the oil film during engine operation. This effectively prevents the metal flaps opening up and causing premature bearing wear.

To minimise the amount of grinding burr at the edges of the graphite beds, the crankshaft journals have to be polished after grinding. Sharp edges which may result in premature wear at the anti-friction bearings are thus somewhat reduced.

Machining operations and directions of rotation

1. Grinding

When grinding, the crankshaft must turn in the direction of engine rotation and the grinding wheel in the opposite direction (Fig. 2).

2. Polishing

The crankshaft turns in the direction of engine rotation and the polishing belt in the opposite direction (Fig. 3).

In contrast to grey cast iron shafts, forged steel crankshafts must always be polished in the direction of engine rotation.

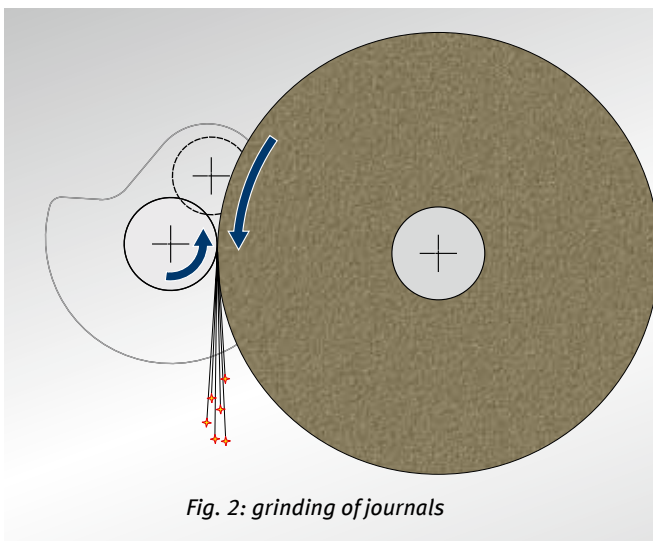


Fig. 2: grinding of journals

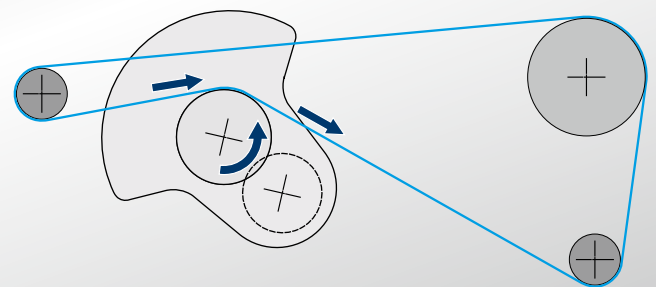


Fig. 3: polishing of journals

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