Technical Messenger

MAHLE

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It's not alternator bearing damage

Customers often complain about alternators that appear to have bearing damage after just a short period of operation. But when inspected the bearings are perfectly fine.

When customers complain about running noises from a recently installed alternator and the workshop subsequently detects play between the alternator shaft and bearing, everything seems to point to bearing damage. However, we often come to a different conclusion when testing alternators and would like to share two important tips.

Check the distance washer

A closer inspection reveals that there is play between the drive shaft and the front bearing. This play is caused by a missing distance washer between the pulley cover and the overrunning alternator pulley, resulting in a lack of contact pressure between the bearing and the pulley. As a result, the inner ring does not move with the shaft, causing the shaft to grind against it. The play between the shaft and the bearing can become so great that the rotor and stator come into contact. Alternators can be used with either a solid pulley or with an overrunning alternator pulley, however, a distance washer must be installed if the latter is used.

Observe the specified torque

When using a solid pulley, a similar damage scenario may occur, but with a different cause. If the assembly torque is not observed, there will also be insufficient contact pressure on the bearing. The shaft is not driven and grinds against the inner ring. However, due to the guiding force from the belt, the pulley remains on the shaft even if the nut falls off and there is noticeable damage to the shaft and thread.

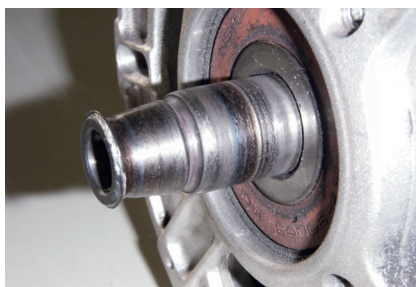Figure 1: Ground-down shaft in the bearing area
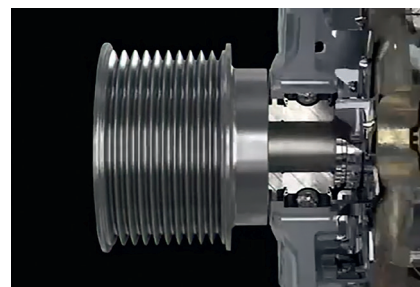

Figure 2: Thread damaged by loose pulley

Figure 3: Tensioning the pulley, shaft, and ball bearing

Important!

When using an alternator with an overrunning alternator pulley, always check whether an additional distance washer is required.
When fastening the pulley, always observe the specified assembly torque.