# Camshaft Gears

**William L. Janninck**

One of our readers in England has asked for our help in locating published technical data and information on the design, manufacture, and inspection of camshaft gears. Although millions of these gears have been made and are in constant use, we are not aware of any formal material having been published. We would be pleased to hear from anyone who has knowledge of such information.

The camshaft gear gets its name from the fact that it is located on an engine camshaft where it is usually nested tightly between the cam lobes or bearing journals. The gear is of a high helix angle and drives a much smaller diameter gear which turns a distributor or oil pump. Both gears have the same number of teeth, rotating on a 1-to-1 ratio. Since these gears operate at a 90°-axis angle, the distributor gear has a complementary helix angle to the camshaft gear helix. Fig. 1 illustrates the arrangement of these gears.

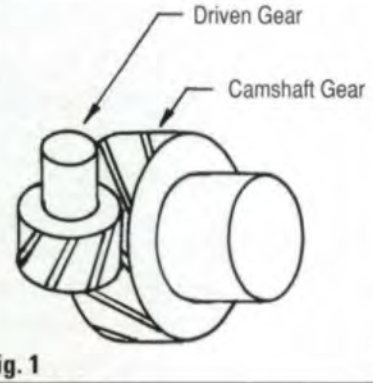

**Fig. 1**

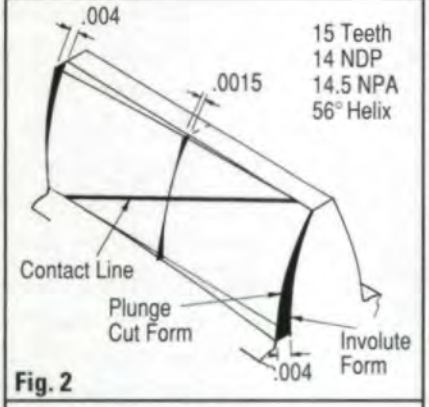

**Fig. 2**

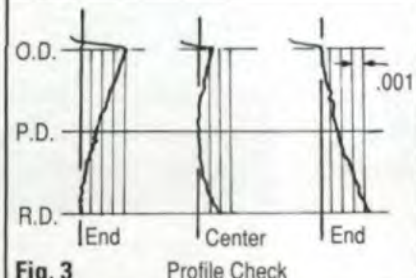

**Fig. 3**

Since the distributor gear is a conventional helical gear, it is usually manufactured by the finish hobbing process. The camshaft gear, however, being confined to available space on the shaft, poses a special problem. There is usually insufficient space for tool travel to completely generate a true helical gear, and the compromise is to plunge cut the gear with as large a hob as possible without damaging the adjacent cam or journal surfaces. This leaves a non-involute gear which is totally functional in use, but presents another problem, that of gear inspection.

Fig. 2 shows a comparison of the true involute helicoid surface with that actually cut by infeed hobbing. The dimensions shown on the sketch show the material that is left on the gear relative to the involute helicoid form. Along the diagonal line of contact swept out, the form is correct, and the set functions properly. Fig. 3 shows the involute trace on the gear flank at end, center, and end. The center plane will show a slight hollow form, not a true involute. Lead checks will also reflect the variations along the flank from top to root. The same geometry occurs on the opposite flank. ■

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