

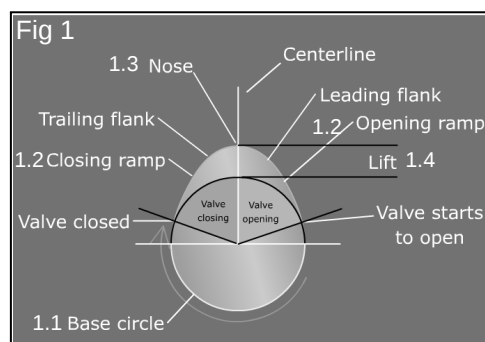
Supplemental Information for 451-260 Camshaft, Modern Design, by Crane Oversized Base Circle, Tapered Lobes MGT (Use with 433-365 Tappet Set ONLY)

What You Must Know About This Cam

The Crane cam is very different from a stock T-Series cam in several ways. First the material is superior to the original cam, which is not surprising given the advances in steel alloys and manufacturing in the last 60 years. Second, Crane increased the base circle. Third, Crane tapered the cam lobes. Let's consider the consequences of these changes.

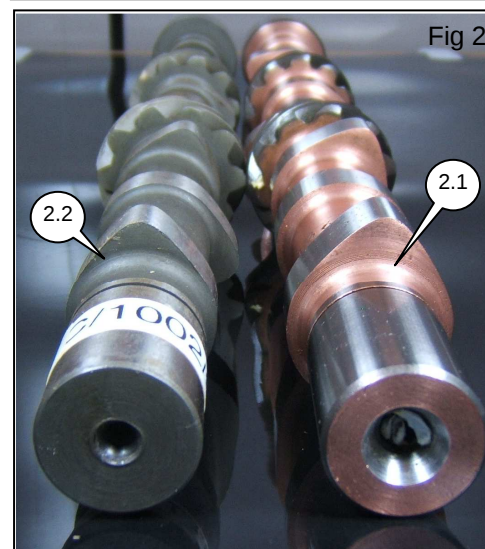
Base Circle, Ramp Angles, and Nose Radius

The Crane cam (2.1) has a larger base circle (1.1) than the stock cam (2.2). That allows the cam to have a higher lift (1.4) while maintaining modest ramp angles (1.2) and a more gently radiused nose (1.3). Crane did this to reduce wear and increase the longevity of the cam and tappets. It is an effective strategy, but there are consequences.



Base Circle & Cam Lubrication

The tappets used in the T-Series have holes in the sides. The hollow body of the tappet fills with oil from the rocker gallery. As the tappet drops down in the lifter bore, the lower holes are uncovered, and oil drains out of the tappet body, flowing over the camshaft. However, when a cam with a larger base circle is used with tappets that have the holes in the side, the tappets may not drop down far enough in the tappet bore to expose the oil holes. The oil will not drain out, and that reduces the oil flowing over the cam, decreasing lubrication and increasing heat build-up in the tappet and the cam. This is especially critical in the T-Series because the connecting rods, which squirt oil on the cam in every other MG engine, squirt oil on the thrust side of the cylinder wall (away from the cam) instead. We have elongated the lower oil holes (3a) in the Moss 433-365 T-Series tappets so the oil can drain out onto the cam lobes. While it is true that tappets without modified oil holes have been used with the Crane cam for years with reasonable results, improving the oil flow to the cam cannot hurt and may significantly increase tappet life. This issue was discussed at length in the December 2003 "Sacred Octagon", pages 26-28.



Base Circle & Pushrod Length

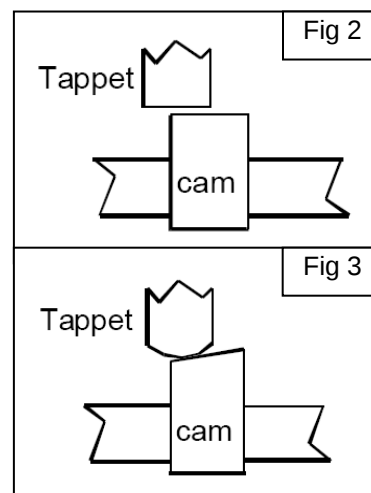
If the head has been shaved, the stock pushrods may be too long. Crane used to supply us with sets of short pushrods, which we sold as 433-335.

Fig 3



Tapered Lobes

The original cam lobes were “flat”, (Fig 2) meaning the individual lobe was not “tapered” or “crowned”. The bottom surface or “foot” of the tappet was dead flat as well (Fig 2). Stock type tappets are called “flat bottom tappets” for that reason. With the stock cam and tappets, the tappets rotate because they are offset with respect to the center of the cam lobe. (Fig 2) T-Series engines are known (or notorious) for wearing out tappets much sooner than other cars, and part of the reason is inadequate tappet rotation. To promote tappet rotation, Crane “tapers” each lobe 0.0011”, meaning the lobe is higher by 0.0011” on one side than the other. (Fig 3). If the lobes of a cam are tapered, the foot of the tappet **must** be crowned (rounded) as well. If you run flat bottom tappets with a cam that has tapered lobes, the cam/tappets will wear much faster, and the chance of a catastrophic failure is very high. The correct curvature for the tappet depends on the cam; for the Crane cam, a 0.0005 to 0.0008” crown is correct. We have our tappets crowned to those specifications. If you hold them face to face there's just a hair gap on one edge. The new crown of the lifter foot matches the cam lobe (Fig 3) and together they cause the tappet to rotate properly, at an optimal rate (assuming the lifter bores are where they should be).



Why We Recommend the 433-365 Tappets for the Crane Cam

This is a special set of tappets that have been

- Measured to ensure they are within factory spec for the outside diameter
- Checked for ovality
- Rockwell hardness tested (54HRC minimum)
- Crowned to match the taper of the lobes on the Crane Cam
- Micro-polished
- Parkerized (phosphate etching that improves oil retention and wear resistance)
- Machined to elongate the oil holes

These are the only tappets available for this application designed specifically to be used with the Crane cam.

More Information

There is a great deal of information in the instruction pamphlet that we include with the 433-365 tappet set. It explains all the work done to the tappets and it has a wealth of tips on building a T-series engine to minimize the chance of a cam/tappet failure. We also have a great deal of information available about modern oil, the loss of ZDDP and the importance of ZDDP with flat-tappet engines, especially during break in. Please go to our website and search using the cam part number 451-260.

Although every effort has been made to ensure the accuracy and clarity of this information, errors and/or omissions on our part are almost inevitable. Any suggestions that you may have that will improve the information (especially detailed installation notes) are welcome. Please use the simple email form on the “Contact Us” page on the Moss website: <http://www.mossmotors.com/AboutMoss/ContactUs.aspx> If you prefer, you may call our Technical Services Department at 805-681-3411. So many people call us for help that we are often not able to answer the calls as fast as we'd like, and you may be asked to leave a message. We apologize in advance for the inconvenience. We will get back to you within 2 business days.



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