

## Distributors That Drown in Oil

by Carl Cederstrand of the *Vintage MGs of Southern California*

The Archimedean screw pump is an ancient machine attributed to Archimedes. These pumps have been used in the Near East for lifting irrigation water for more than two thousand years. They consist of a spiral passage (groove) cut into an enclosed rotating cylinder. The wiping of the entrained liquid by the spiral wall of the groove drags the liquid from one end on the screw to the other. Mr. Archimedes' pumps are low pressure low volume pumps. Their advantage is that they consist of a single moving part - a rotating cylinder.

The two Archimedean Screw Pumps incorporated in our T-Series engines are used to control oil. The first one, on the rear of the crankshaft, continually pumps errant oil back into the engine. The second one, on the distributor shaft, continually pumps oil back into the sump. Unfortunately neither of these Archimedean pumps work reliably. Many T-Series engines dribble oil from their rear crankshaft 'seals' and fill their distributors with oil. Oh me!

This is how I eventually dispatched the problem of oil accumulating in the distributor. As John Seim pointed out at the May club meeting, Lucas added drain holes in the bottom of their distributor castings to drain off any accumulated oil. The oil drain(s) worked satisfactorily and in doing so poured oil down the left side of the engine. I drilled my distributor casting and accomplished the same result. The drain hole worked to a degree but it was an inadequate solution to the oiling problem. My distributor points still drowned in oil and the oil honeying down the left side of the engine bothered me. A length of 1/8" diameter tygon tubing was later added to connected the distributor drain hole to a hole drilled in the side of the dip stick tube. This kept the block tidy. My conclusion was that the drain hole reduced the degree of oiling and slowed down the rate of oiling. It didn't stop it.

The next modification put this problem to bed 'in perpetuity'. Forget about that 'Mickey Mouse' drain hole in the distributor. Instead,

add a hole and slot to the pipe cast into the bottom of the distributor. Inspect the included drawing. The added hole and slot provides an, in the block, drainage system for the oil being pumped upward into the distributor body. Oil exits through the internal drain hole and then drains down the slot and back into the sump. It never reaches the distributor casting. This system works - cheers! This hole and slot may be incorporated in any T-Series distributor. The VMG contains club members with machine shops, both commercial and home, that can tend to distributor modifications for you. I originally observed this hole and slot system in a Lucas distributor that had been forwarded to Jerry Felper for rebuilding.

I also had Phil Marino turn out a 'one of a kind' aluminum-bronze thrust washer for fitting between the drive gear and the end of the distributor. Both the drive gear and the distributor end were lapped smooth on a surface plate. This thrust washer controls the end float in the distributor shaft. Its thickness was adjusted to provide the 0.002" end float that Lucas recommends. Tight control of the end float of the distributor shaft reduces the rate of oil pumping. It cannot stop it.

My, now dry, distributor housing has a disadvantage. The elimination of the accumulating oil requires that I remember to lubricate the upper distributor bearing. Oiling this upper bearing (bronze bushing) is accomplished through the center drilled screw hidden under the distributor rotor.

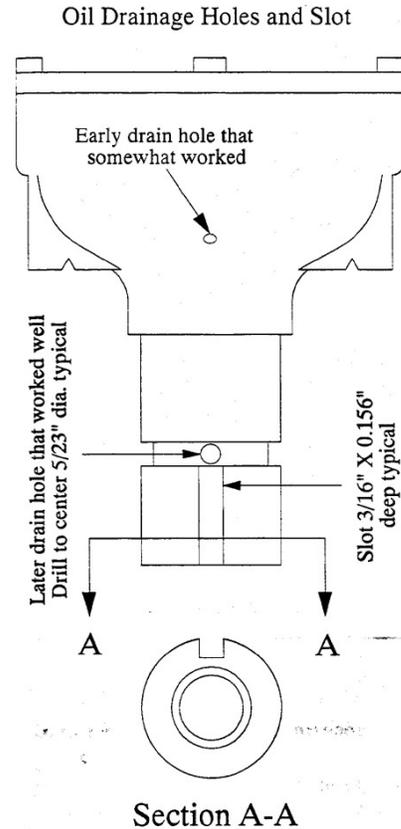
Another solution to this oiling problem is the Butch Taras 'O' ring. An 'O' ring groove is machined into the body casting where the distributor shaft enters the body of the distributor. An 'O' ring fitted into this counterbore prevents the entry of oil into the body casting. Talk to Butch about the details of this 'O' ring installation and his field experiences with this modification.

For decades I casually viewed the Archimedian spiral cut into the distributor shaft and blithely assumed that it was

responsible for pumping oil up into the distributor body. After all, how otherwise could so much oil end up in the distributor casting? Well, I was totally wrong. I have only now taken note of the direction of the Archimedean spiral and, "Good grief Charlie Brown", the spiral is cut in that direction to pump oil down and out from the distributor. Forget the hare brained idea that the Archimedian screw forces oil up into the distributor body - it doesn't. Since an oil pumping mechanism obviously exists, let me propose the following physical picture for review by the MG gurus in the VMG.

The oil pumping is probably due to capillary movement of oil up through the lower bearing followed by centrifugal oil slinging. The centrifugal slinging of oil by the rotating distributor shaft (say, 2000 rpm) serves as a very primitive centrifugal pump. The annular space between the two distributor bushings eventually contains a rotating cylindrical shell of oil - what a nice thought! This primitive centrifugal pump spreads oil up toward the distributor body and evidently overwhelms the even more primitive Archimedian screw pump that is attempting to pump oil down toward the drive gear.

As a concluding thought, the pressure of rotating oil against the inner wall of the pipe may very well be the reason the drain hole and slot system works so well. If anyone has words of wisdom on this topic, please submit a companion article.



With both the early and late distributors, think of how the added hole and slot interact with the distributor clamping device before starting machine work. Rotate the hole and slot to an appropriate position for your distributor.