TO FIND T.D.C.

We recently acquired a crankshaft degree wheel (or plate) manufactured by Iskenderian Cams. Isky cams have always been highly regarded, especially in racing circles.

The face of the disc is printed with detailed instructions on 'How to Find ABSOLUTE TOP DEAD CENTER.' The instructions begin, "*It is a common error to miss top dead center (T.D.C.) by a few degrees due to the piston dwell at this point....*" The instructions continue, and are reproduced in their entirety.

The face of the disc is meticulously divided into degrees, from 0° (Top Center) to 90°, to 0° (Bottom Center) and then 90°. Each of these quadrants is further divided into one degree marks, each progressing from 0 to 90 degrees.

The reverse of the disc has printed instructions on 'POSITIVE STOP METHOD OF FINDING TDC.'

We have reproduced the face of the disc on a following page, but have had to reduce the image from the actual disc diameter of 8 1/16". to 7 19/32". The difference in size should not affect the application which follows. In addition, we have reproduced the text in its entirety below:

How to Find ABSOLUTE TOP DEAD CENTER

It is a common error to miss top dead center (T.D.C.) by a few degrees due to the piston dwell at this point. Inasmuch as this inaccuracy will substantially affect subsequent timing, the following procedure is suggested to correct this error.

1. Mount degree wheel or degree plate on the front of the crankshaft. Now bolt a stationary pointer on the cylinder block. Pointer can be made of metal strip or heavy wire.
2. Mount a dial indicator securely to the cylinder block. Now adjust dial so that at maximum piston rise the indicator sweep hand travels through approx. .025" of movement. The dial indicator contact point should rest on the center of the piston.
3. Now to turn crankshaft over, use a long handle wrench or lever so as to get an even, steady movement and not a jerky motion. Sometimes a round steel bar can be inserted into the crankshaft balancing holes to rotate the crankshaft. The crankshaft should always be rotated in the normal running direction.
4. Holding your thumb down on No. 1 piston (to eliminate all lash) come up slowly to T.D.C. until you reach what you guess to be the middle of T.D.C. dwell. Set your stationary pointer at T.D.C. on the degree plate.
5. Now rotate crankshaft one more revolution and this time on the way up to T.D.C. stop exactly .020" (dial indicator reading) below the maximum piston travel which is T.D.C. – For example say it reads 10 degrees before T.D.C. – Continue slowly on up to T.D.C. over the hump and down the other side, keeping thumb firmly on piston – Watch dial indicator closely, and when it reads exactly .020" down from T.D.C., stop and note reading on degree plate. If you have a perfectly split overlap, it should read 10 degrees after T.D.C. If it doesn't, you have not hit T.D.C. exactly and must try again.

Making Corrections:

Split the difference (your error in degrees) by either bending the pointer slightly or moving the degree plate radially on the crankshaft. – After you have made the adjustment come around with the crankshaft as before, stopping .020" below each side of T.D.C. When you get exactly the same degree readings .020" below each side of T.D.C. you have found absolute top dead center.

The degree plate pictured above may be copied or cut out and pasted onto a disc of metal or cardboard, and then used as instructed.

The reverse side of the disc has instructions for 'POSITIVE STOP METHOD OF FINDING TDC.' An accompanying simple diagram shows the application of the 'stop bar.' It does seem though that the instructions have omitted the very important length of the center bolt. If the bolt is too short, the crown of the piston will not contact it. If it is too long, the piston will not be at top dead center when it makes positive contact with the center bolt.

We leave it to you to determine how far below the surface of the head the piston rises to T.D.C. It will probably require some adjustments on your part so that the piston just 'kisses' the center bolt when it is at T.D.C.

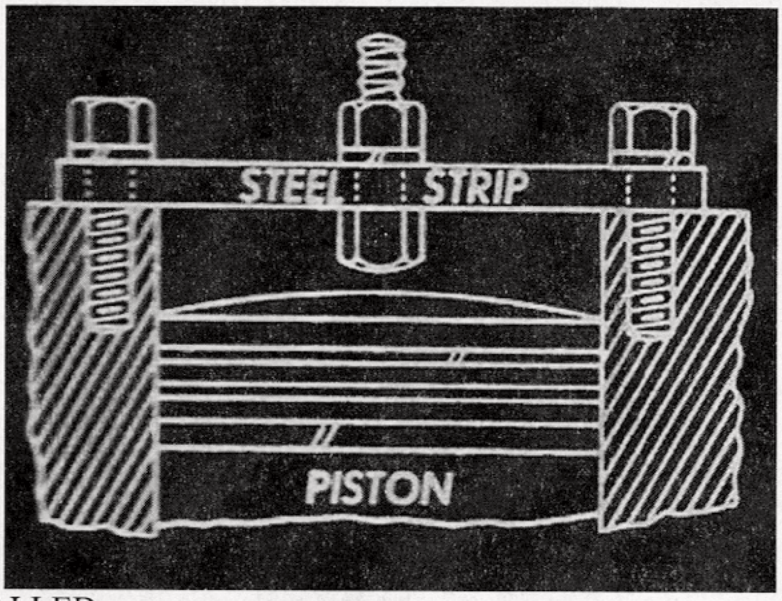
POSITIVE STOP METHOD OF FINDING TDC

A. HEADS REMOVED

Another convenient method of finding TDC can be performed as follows: affix the degree plate onto the crankshaft but not necessarily to what we estimate to be TDC. The next thing we'll take is a rigid strip of steel (about seven inches long) in which three holes are drilled. The strip is placed across the center of one of the cylinder bores and bolted to a head stud on each end of the cylinder bore. The accompanying illustration shows the simple set-up of this method. It is important to use a rigid piece of steel (or angle iron) that will not bend when it is struck by the piston. Rotate the crankshaft slowly in a clockwise direction until the piston crown lightly strikes the center bolt head. Note the reading on the degree plate. Now rotate the crankshaft in a counter-clockwise direction until the piston again strikes the bolthead. Again carefully note the reading on the degree plate.

TDC SHOULD BE EXACTLY HALF-WAY BETWEEN OUR TWO READINGS: IN OTHER WORDS, IF THE ANGLE BETWEEN THE TWO STOPS AS INDICATED ON THE DEGREE PLATE IS 70 DEGREES, EXACT TDC IS AT 35 DEGREES FROM EITHER STOP.

Now re-locate the pointer or the degree plate to the halfway mark, whichever is more convenient. After this re-adjustment, double-check TDC by again going through the routine outlined above.



B. HEADS INSTALLED

If the engine is assembled, the following is a way to use the positive stop method. Bring the piston up to what you assume to be approximately the top of the stroke. Measure the distance from the top of the piston to the bottom of the spark plug thread. Add to this figure ¼ inch. Locate a bolt or cut a piece of rod to the above length. Weld or braze this piece to the bottom of the spark plug (be sure to round off the end that will contact the piston). This will simulate the strap and bolt as described in paragraph A. Now proceed with instructions as outlined in that paragraph.

Our thanks to Iskenderian Racing Cams for making this information available to us.