

Converting a Harbor Freight Compression Tester for Aircraft Engine Use

Vince Homer

I bought a Harbor Freight compression tester only to find out that it wasn't designed to do the type of test that we require for aircraft engines. Currently, I see on their website that Item #94190, "Compression Tester Kit," is for sale for \$21.95. When I tried to use the tester right out of the box it didn't work in the usual 80/xx mode as required for aircraft engines. I disassembled the unit and found that it had a .080 orifice in it instead of the .040 orifice specified for aircraft engines with a bore of less than 5.00 inches or .060 for engines with bores of over 5.00 inches. I have shown a .040 orifice because I am flying a Jabiru with a bore or less than 5.00.



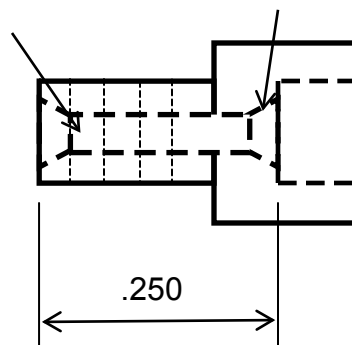
The .080 orifice in the block was drilled out with a No. 36 drill, the proper size for a 6-32 tap. The drilled out hole was then tapped through with a 6-32 tap.



.080 Orifice As Supplied

Drilling #36 Hole For 6-32 Tap

DRILL .040 OR .060 60 DEGREE ANGLE



Make From a 6-32 Socket Head Cap Screw

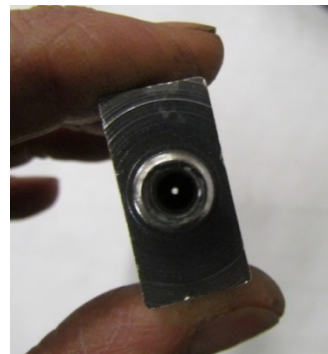
Tapping For 6-32 Cap Screw

Next, a 6-32 socket head cap screw was cut off so that the distance from the bottom of the socket in the head to the end of the bolt was .250 inches. A .040 hole was then drilled lengthwise through the screw. This is done most easily in a lathe, but if you're careful it can be done by hand with the screw held in a vice. The entrance and exit of the .040 hole were tapered with a larger drill bit that was reground to a 60 degree point angle. The cap screw head was too large to fit into the orifice block and the diameter must be ground to fit. I did this on my 1" belt sander or, if you have access to a lathe it can be turned to size.



Cap Screw Head Ground To Fit

.040 Drill Through



Inserting the New .040 Orifice

Thread sealer was applied to the cap screw threads and it was inserted into the orifice block. Be careful to not get any thread paste or tape in the orifice.

The leak down gauge supplied from Harbor Freight must be replaced with a 0 – 100 psi range gauge.

As shown below the supplied gauge has been moved to the cylinder pressure side of the orifice.



Complete Compression Tester

To make using the tester easier to use I added a shut off valve on the air supply.