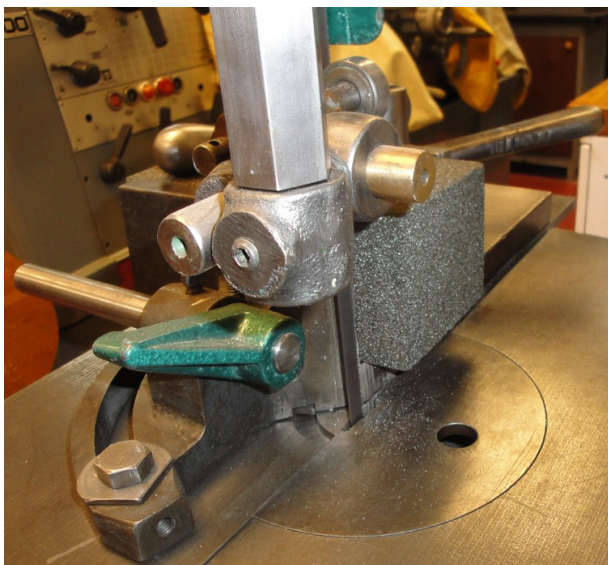
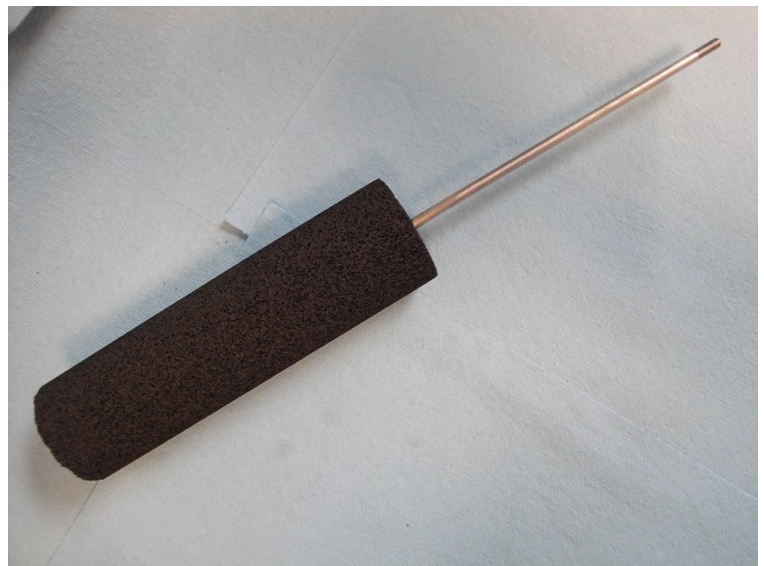
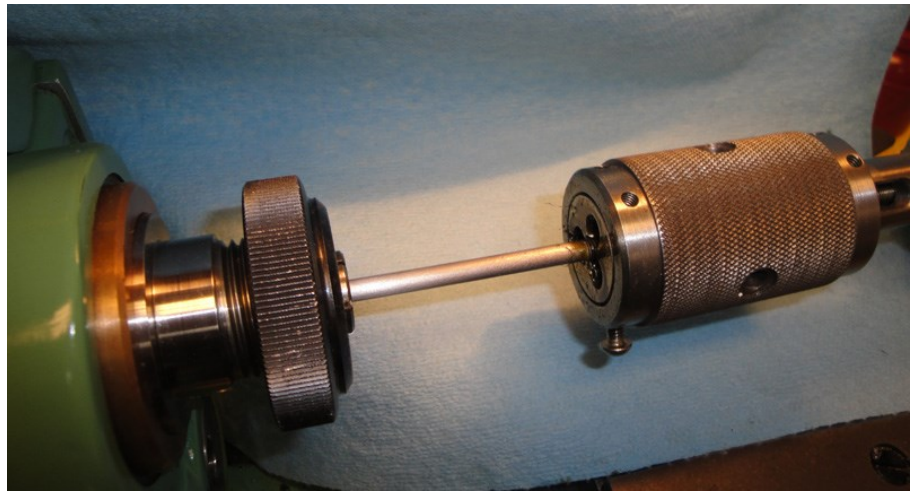
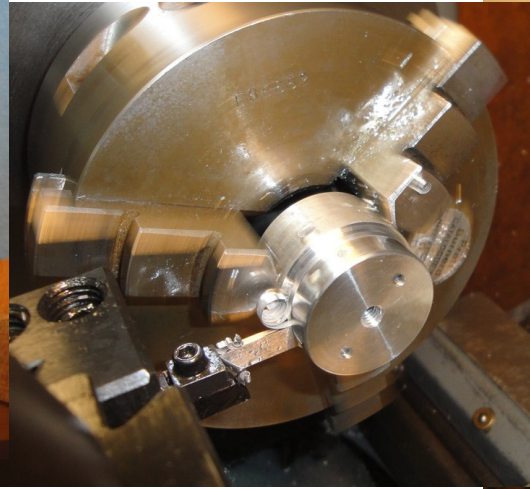


Displacer Piston

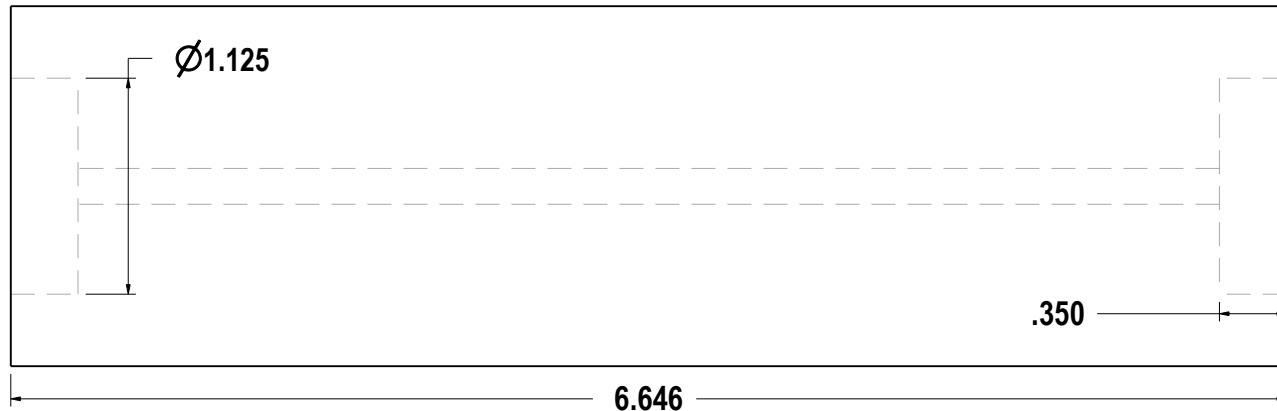
As I mentioned on the first page of this build there were a number of things I was going to try differently from the original plans. The displacer piston is one of those parts. I am making it out of a commercial grill block. This was suggested to me by a fellow modeler Brad Smith. He had a sketch and at the time used a product called "Sand No Mor" a sanding block. The point of using this is to reduce the weight of the displacer piston and make the engine run easier. From the pictures you can get an idea of the size of the blocks I have, about 4 x 3.5 x 8. First I cut it to length plus a little bit for trimming. The piston rod is one long rod that is threaded the length of the piston. There are two end caps tapped for the rod. The block is drilled with a recess for the end caps using a Forstner bit. Next a .187 hole is drilled through the length. It was flipped over and another recess drilled where the hole came out. I then trimmed the sides down to get close the 1.875 diameter I used before mounting in the lathe. I mounted the piston using Permatex to hold all in place. I had drilled a center in the lower threaded end of the rod so the assembly could be supported in the tailstock. The lathe needed lots of covering. I also used a vacuum while cutting which collected 99% of the dust. When finished it was given a coat of High Temp black paint. This is done to minimize any flaking of the material. I screwed up the first block when trying to trim it down to a rough diameter so I had to start over. If you take this approach make sure you get several blocks just in case. I have attached a PDF file with the drawing for this. The dimensions are for my engine and you would need to make sure your engine is measured. Even when you make the Displacer Piston from the drawings you need to do some measuring for clearances. In the book the author recommends not finishing the Displacer Cylinder until the Displacer Piston is completed and fitted. The author then recommends trimming the Displacer Cylinder to give slight clearance to the piston.

This part took me about 5 hours.



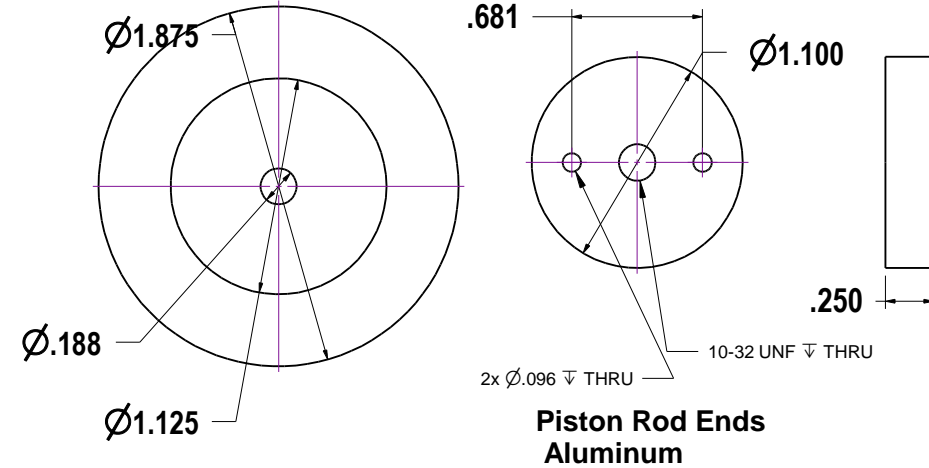


Note:
 To machine the Grill Block rough shape by hand, drill hole through and make recess. Make up a temporary rod that is inserted using the end caps to hold rough block in place. Chuck one end in lathe chuck, and other end centered with tailstock. Make sure the one end cap is glued in place first. Turn with carbide cutter and really cover lathe bed well. Turn to .125 less than ID of Displacer Cylinder.

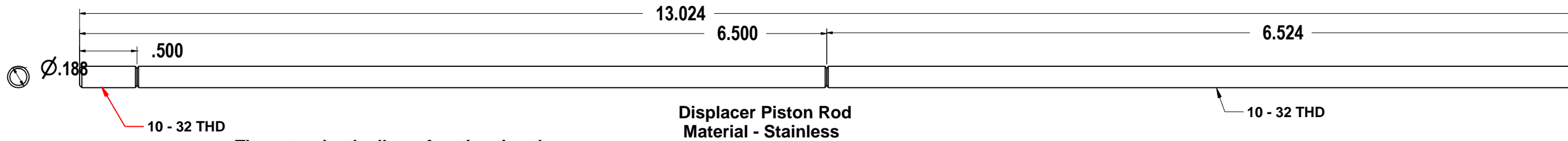


Displacer Piston
 Material - Grill Block

Length is determined at assembly by insuring top clears Power Piston by .031 at the Power Pistons lowest position. When Displacer Piston is at its lowest position it sould clear End Cap of Displacer Cylinder by .031. The objective is to reduce dead air space to minimum.

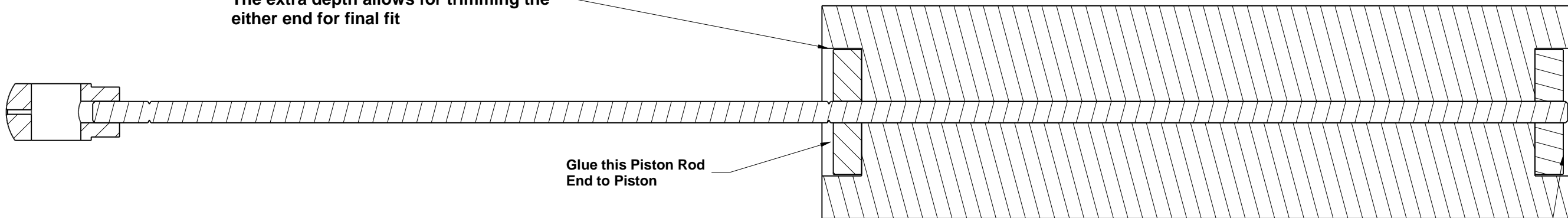


Piston Rod Ends
 Aluminum

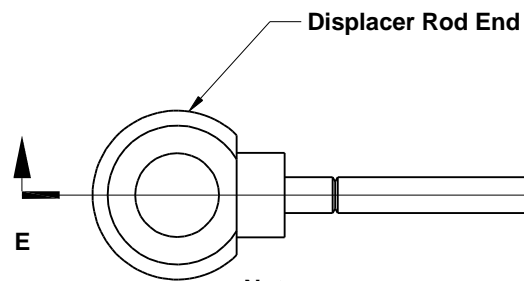


Displacer Piston Rod
 Material - Stainless

The extra depth allows for trimming the either end for final fit



Section E-E



Note:
 When assembling and fitting to the engine mount everything together (make sure the gaskets are all on as they add length) you will turn the Displacer Piston onto the rod until it bottoms on the Power Piston at its lowest position. Back off one turn. Lower the Displacer Piston to its lowest point and insure .031 clearance. You may need to use the adjustment with the Displacer Rod End to get final placement.

Assembly View

1/4 Scale Rider-Ericsson Displacer Asm		SUBASSEMBLY	
PART	DWG NO.	REV	
Displacer Piston, Nut Rod		1	
SCALE	DATE	DRAWN BY:	
1	02 / 20 / 2015	Bob Nawa	