

Turbogenerator Construction

Assemblies—Bottom Plate

Ken Rieli, Instructor

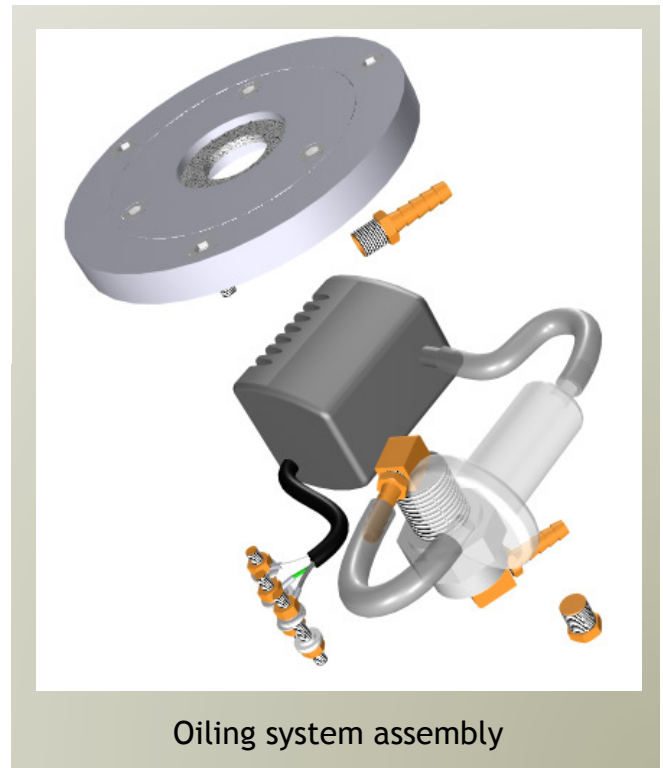
Now that we have completed the Inlet system assembly, and the Hotrotor assembly, let's move on to the others. In the Turbogenerator Web, 7-inch turbogenerator section, open up 3D Photos, Assemblies. Click on the *Oiling system Assembly*.

Click on the oiling system photo to enlarge it. We see in the photo the upper oil seal, oil pump, filter, oil plate nut, brass fitting, plastic tubing, and electrical studs - all in their relative positions.

Click your browser's "Back" button twice, then pull up Exploded Views & Subassemblies, *Oiling system assembly*.

Oil Nut

Click on part #54 *Oil nut*. We see a photo of the finished part along with the machine drawing.



Oiling system assembly

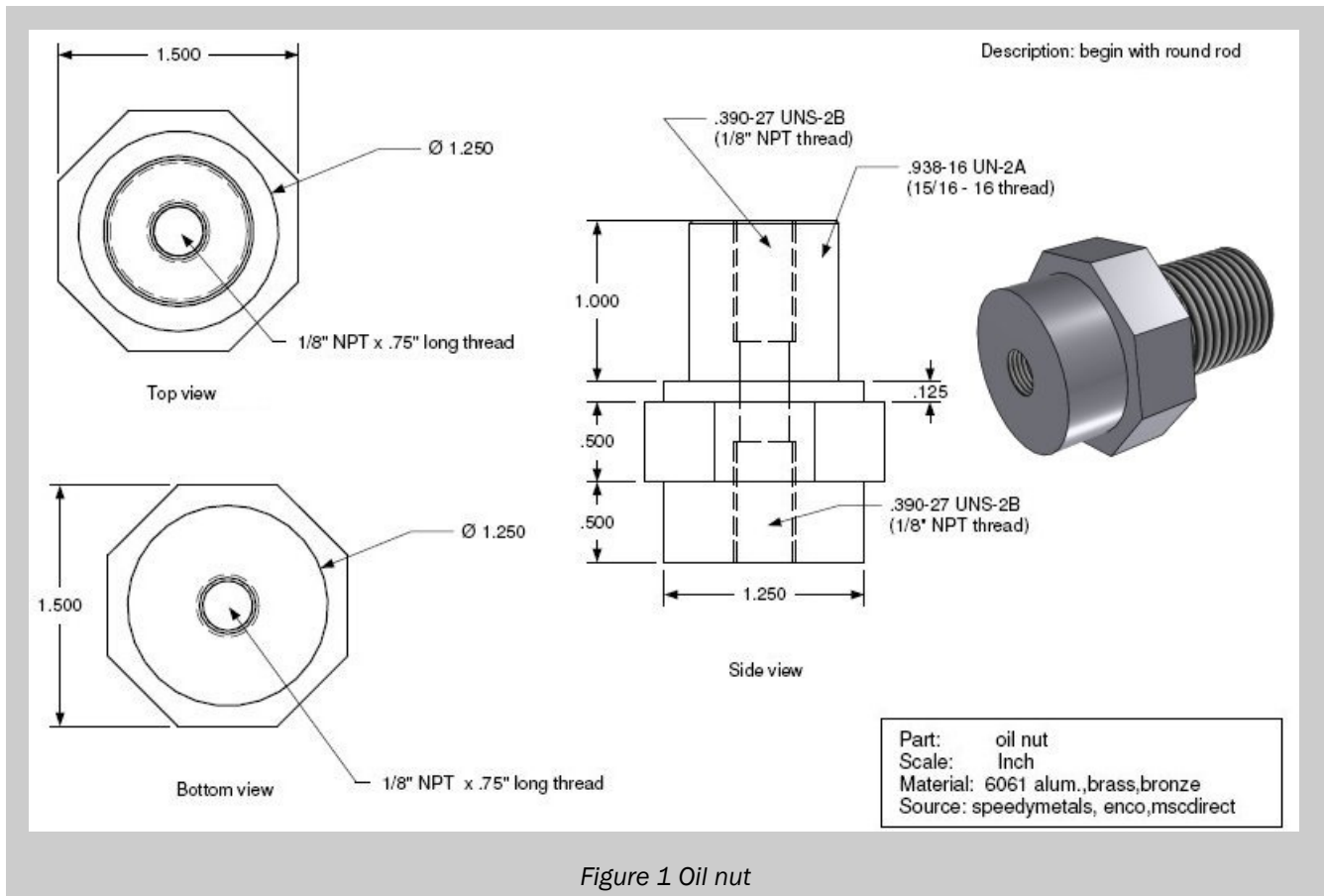
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Materials you will need:

Felt fabric	4" diameter x 0.125" thick
Plastic/metal oil filter	Standard part
#6061 aluminum, brass or bronze round rod	2" diameter x 2.25" long
#6061 aluminum round plate or rod	5" diameter x 0.625" thick
Standard fountain pump	18"-40" head
Flexible plastic tubing	3/8" OD x 1/4" ID
Stainless steel screws	#10-32 x 3/8" thread
Stainless steel screws	#10-32 3/4" thread
#6061 aluminum round plate	4" diameter x 0.125" thick
#6061 aluminum plate	5" x 5" x 1/2" thick
Threaded brass rod	(3) 10-32 x 36" long
Brass pipe plug .390-27 UNS-2A	(1/8" NPT thread)
Silicone sealer	

Step-by-step:

- *Cutting & threading oil nut*
- *Oil seal assembly*
- *Cutting & mounting power studs*
- *Assembling oil pump system*
- *Connecting pump power leads*
- *Plugging the oil drain hole*



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Start out with a piece of 2" aluminum round rod, or octagonal or hexagonal rod. Mount the work piece in the lathe and begin turning down the outer dimensions as indicated.

The 15/16-16 thread is cut on the lathe by finish-turning the 1" long section to a 0.938" dimension, then set the lathe thread cutting mechanism to 16 threads per inch.

After cutting the thread to the desired depth, use the bottom plate to check it for fit - while the nut remains in the chuck - that way you can make another pass if necessary.

An alternative to using a nut on the bottom plate is to simply weld a 1" piece of round rod to the inside or outside of the plate, then through-bore with a 0.3125" drill bit, and tap 1/8" pipe threads to accept the brass fittings.

NOTE:

Both upper and lower 1/8" threads in the bore are tapered pipe threads tapped from each end after boring a 0.3125" through-hole.

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Oil Seal Assembly

Next, let's make the oil seal assembly. Pull up part #60 *Oil seal flange*. The photo and machine drawing are self-explanatory.

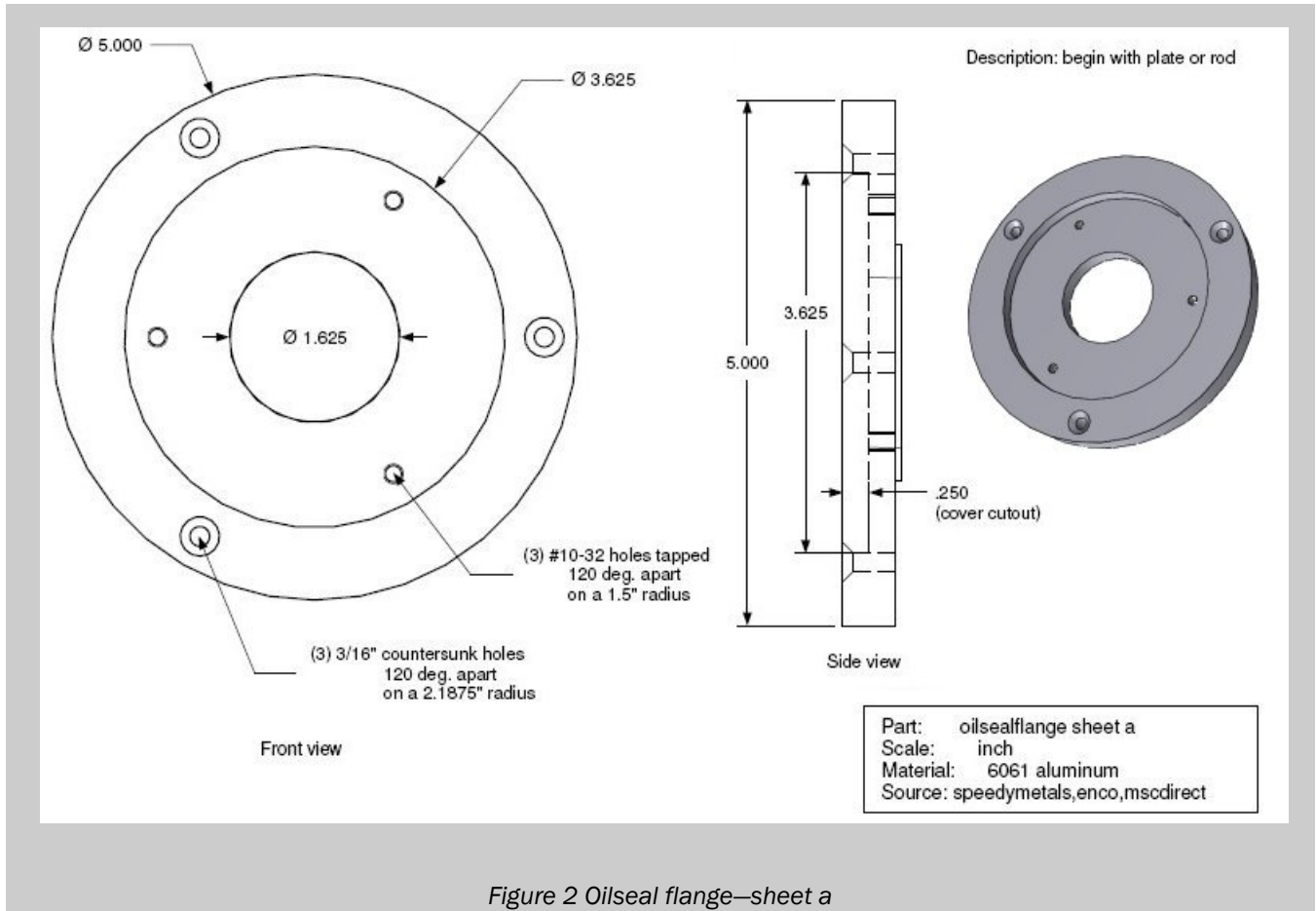
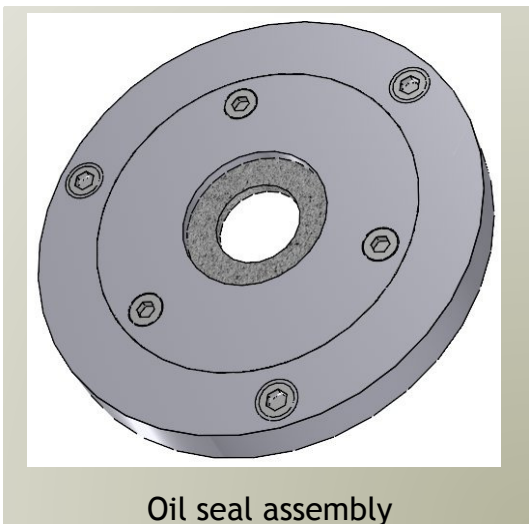


Figure 2 Oilseal flange—sheet a



Oil seal assembly

Start with a section of 5" round rod, or a round piece cut out of 0.625" thick plate with a bandsaw or mill. This piece can be finished either on a lathe or a mill - if your mill has a rotary table.

I usually do most of the work on my lathe first, then move the work piece to the mill rotary table to complete the holes.

Take note that the (3) tapped holes start with a #25 drill hole.

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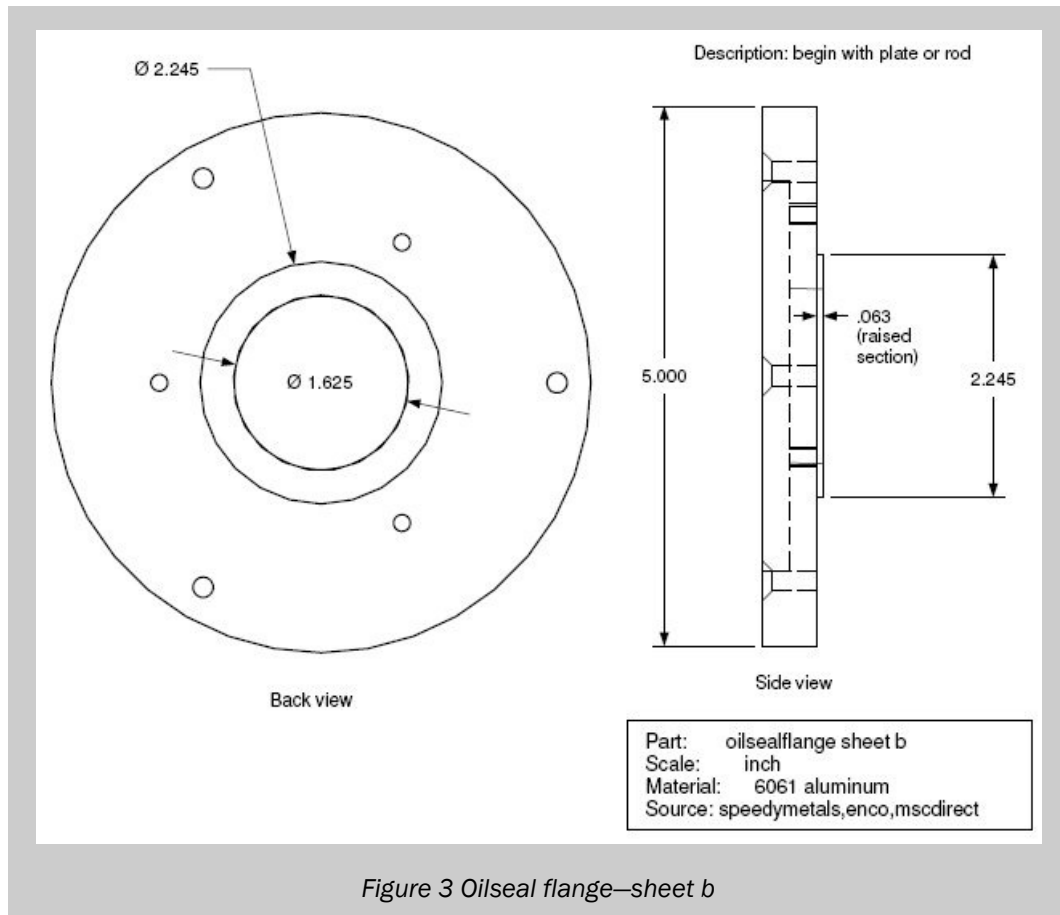


Figure 3 Oilseal flange—sheet b

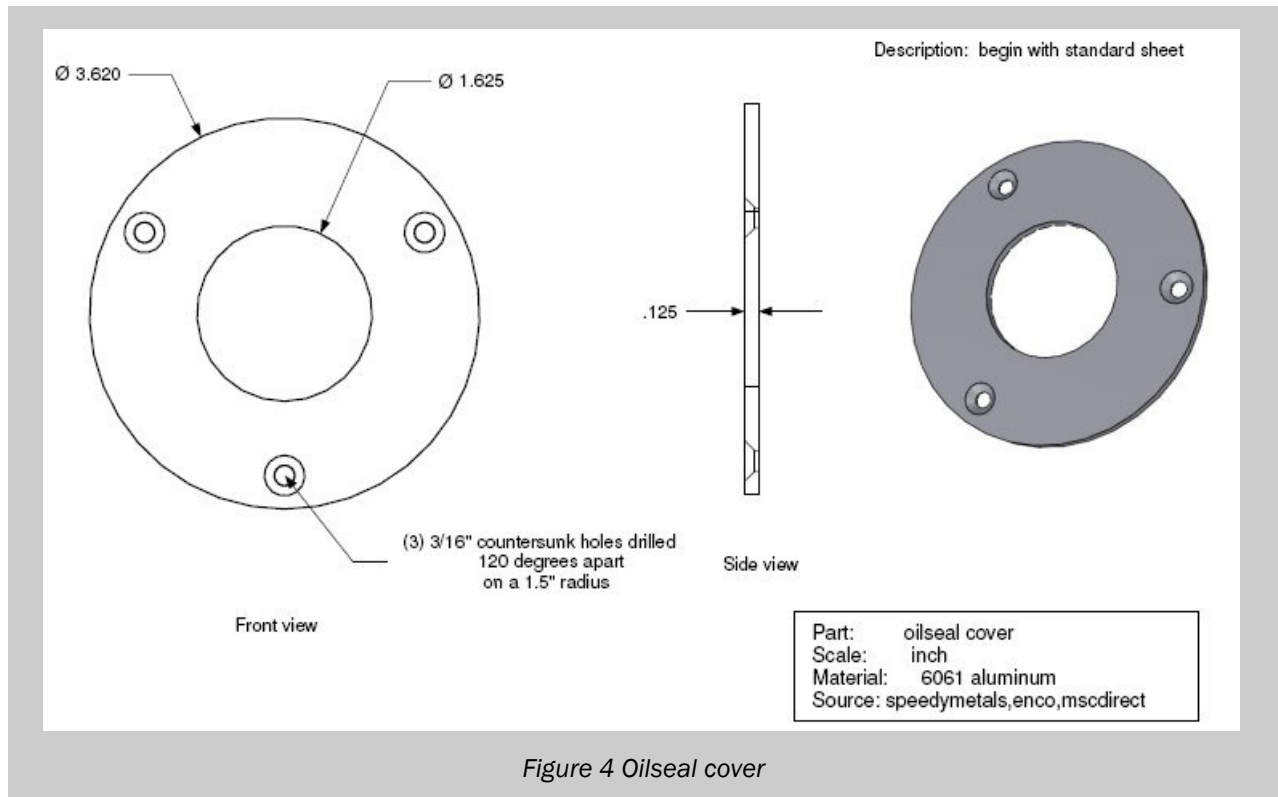
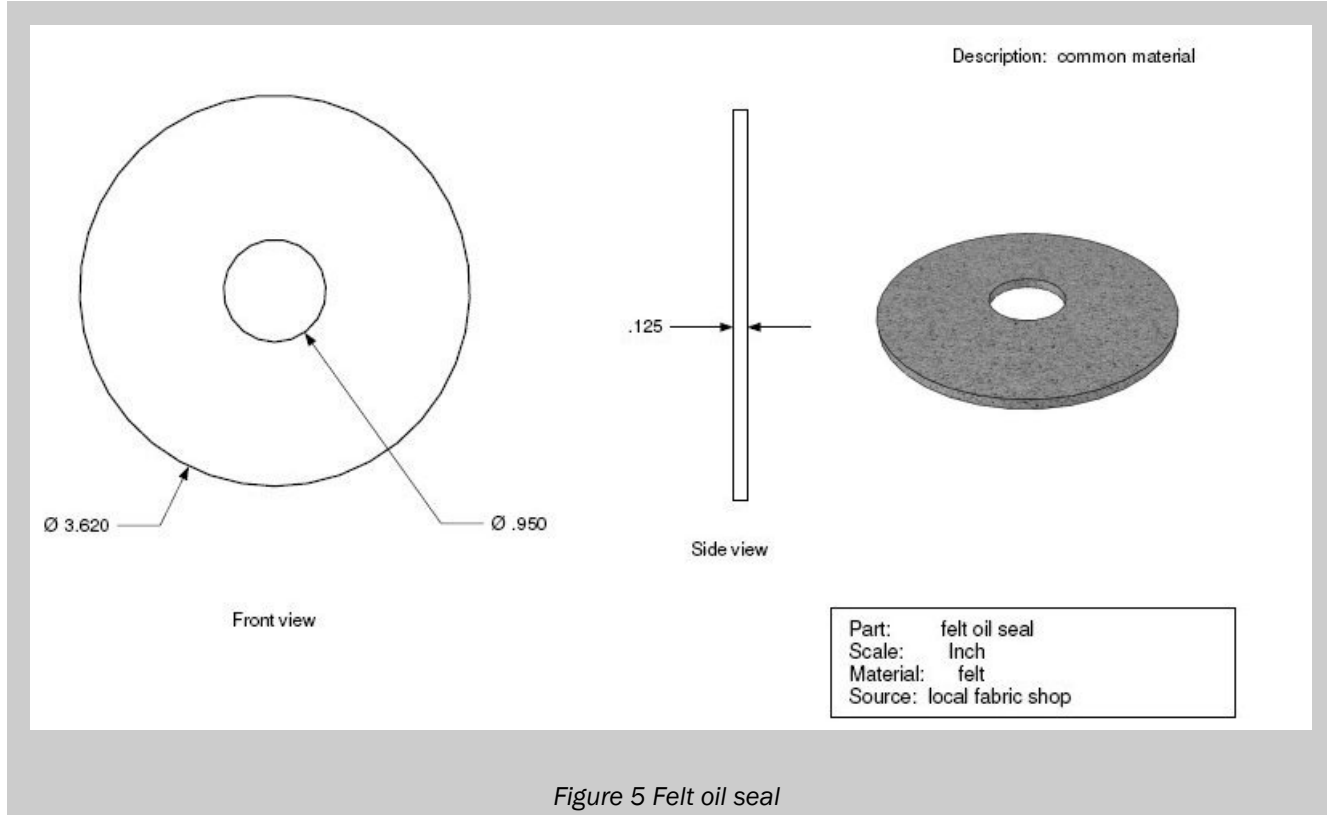


Figure 4 Oilseal cover



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Drawing #58 Oil seal cover can also be made on your lathe or mill.

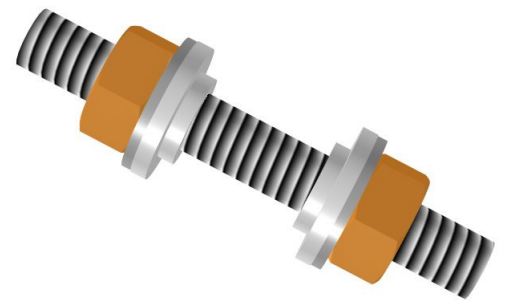
Part #50 Felt oil seal may be cut from a sheet of felt using scissors or an Xacto knife. Other materials may be used such as neoprene, silicone sheet, etc. but the end result should be to create a seal without shaft drag.

Power Studs

Turning our attention now to the power studs, I cut these 1.5" studs from threaded brass rod. After cutting the (3) studs, use a thread chaser to fix the end threads.

To mount the studs on the bottom plate, screw a brass nut about 3/8" from one end of 2 studs, place a stainless washer on the upper faces of the nuts, followed by a stud insulators (small ring up).

Next, push these studs up through the bottom of the bottom plate. If assembled correctly, the insulators should snap into place and about 1/2" of brass rod should protrude above the bottom plate.



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With the 2 rods held in place, mix up a small amount of epoxy glue and fill the 2 plate holes with the glue to seal the studs to the case. With the holes filled, slip insulators onto the studs from the top and snap into the plate. (Some of the glue should seep out of the hole.)

Finish the (2) studs by placing stainless washers and brass nuts on the studs, tighten, and set aside to allow the glue to set up.

The center or ground stud is then secured to the bottom plate with Loctite. Once the glue is set, complete the assembly by threading the oil nut and brass fittings into the bottom plate - securing the threads with Loctite.

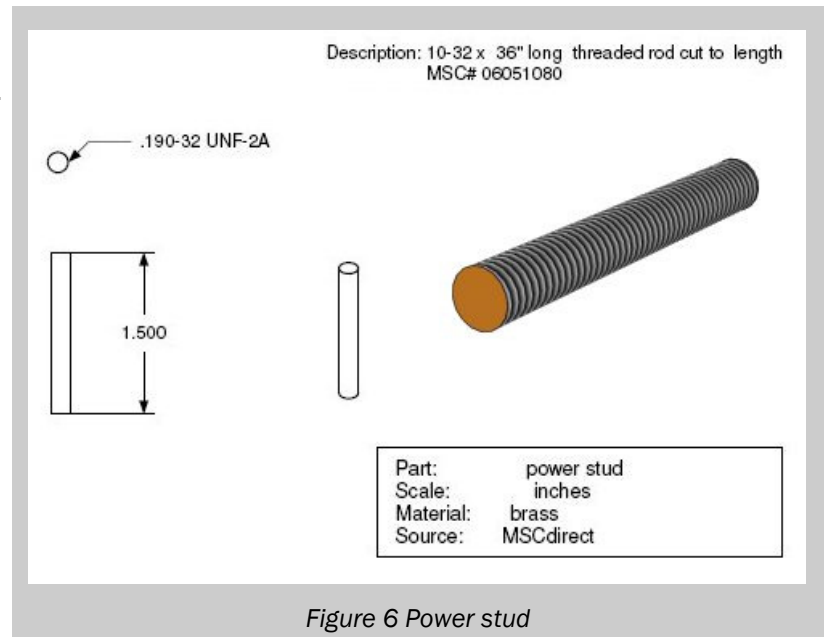


Figure 6 Power stud

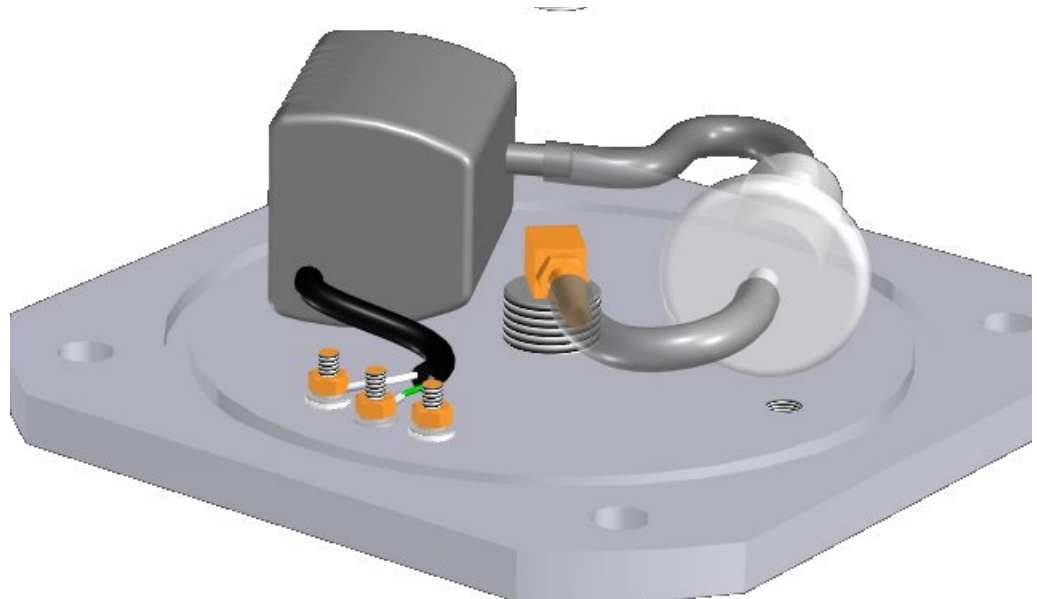
Oil Pump System

The #55 Oil pump and #51 Oil filter may now be fitted to the bottom plate.

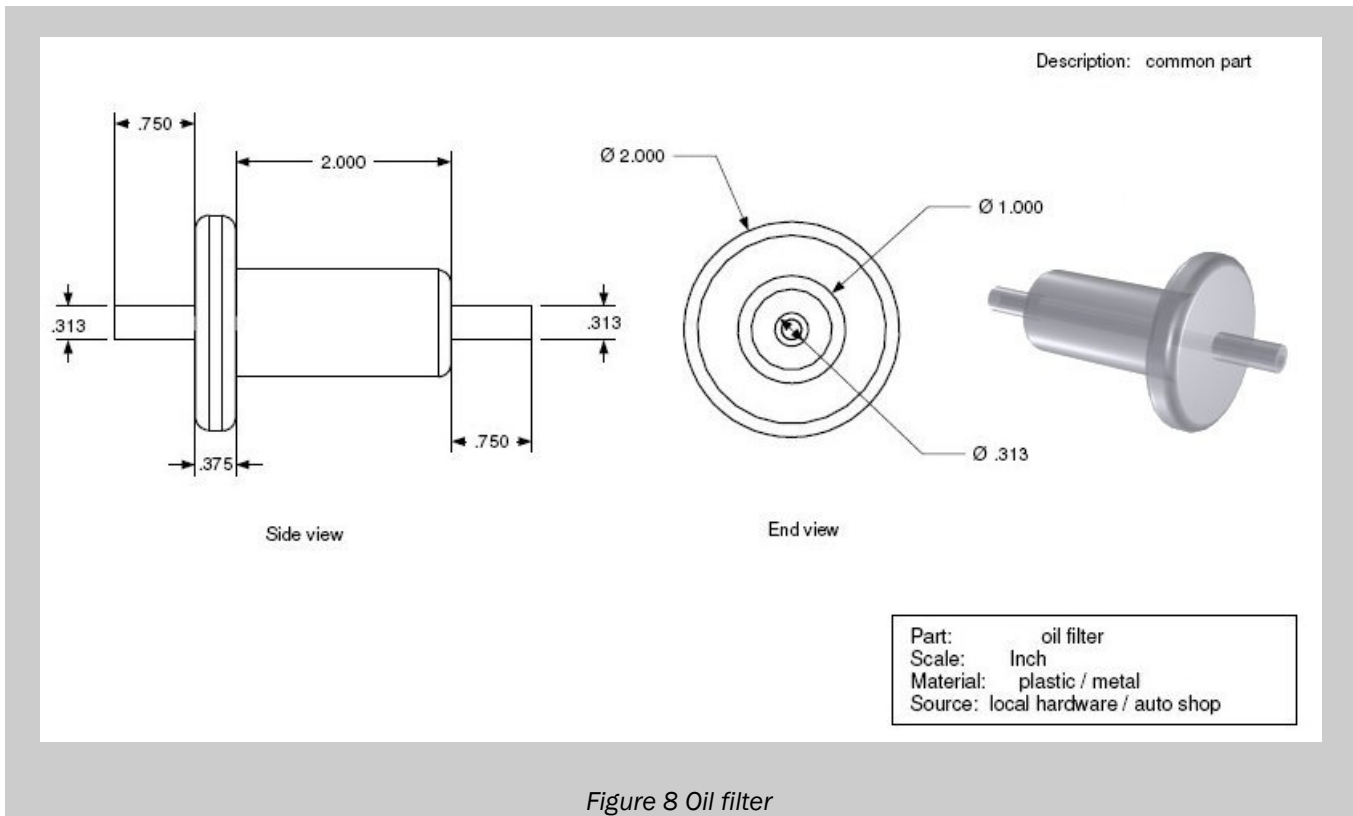
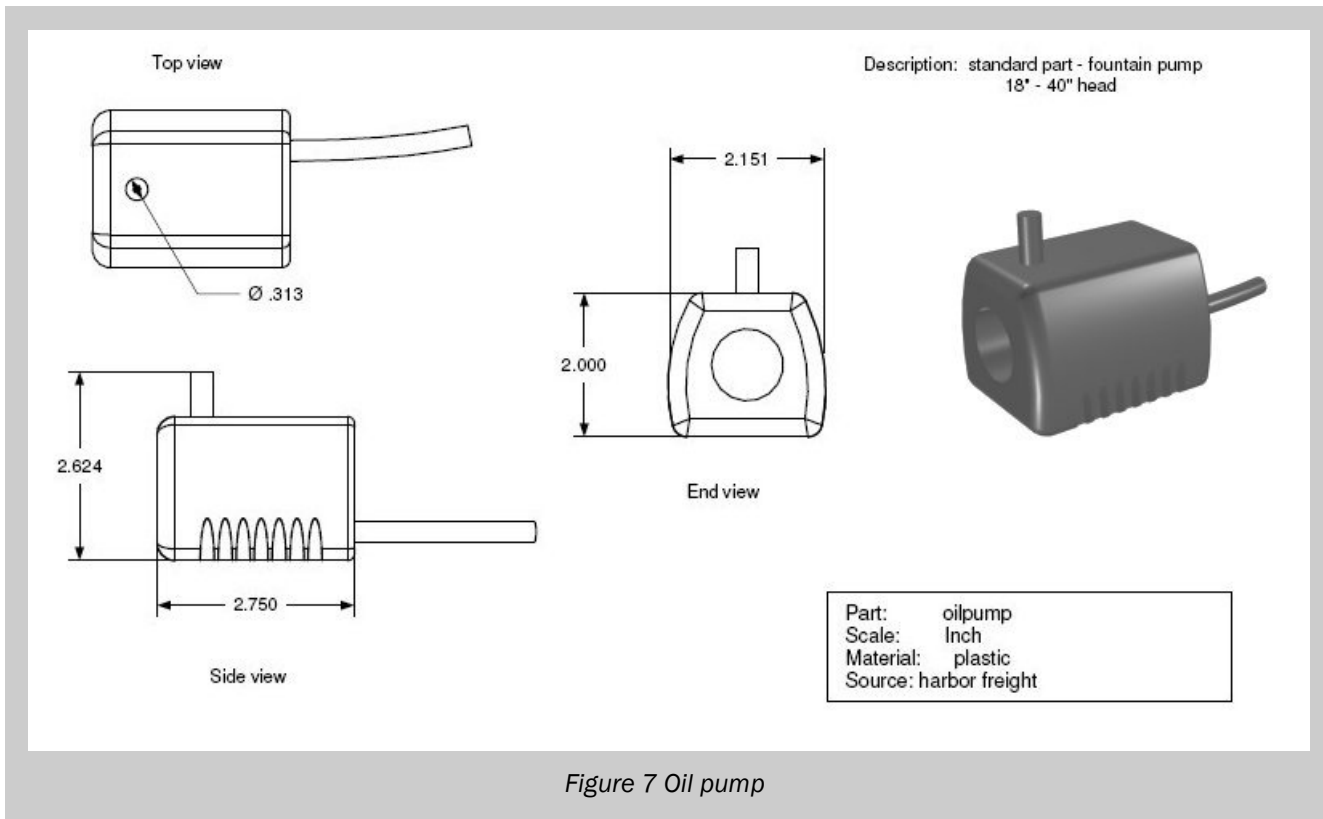
After cutting the pump power cord to about 6”-8” long, solder wire eyes to the three wires. Secure the pump power leads to the brass studs with lock washers and brass nuts. Completely cover the power studs with silicone sealer.

Make sure that the green ground lead only is secured to the center stud - since this stud is grounded to the plate. Mark the studs on the outside of the bottom plate (hot, ground, return).

Connect the pump outlet to the oil filter with one piece of vinyl tubing, then connect the oil filter to the oil nut brass fitting with the other length of vinyl.



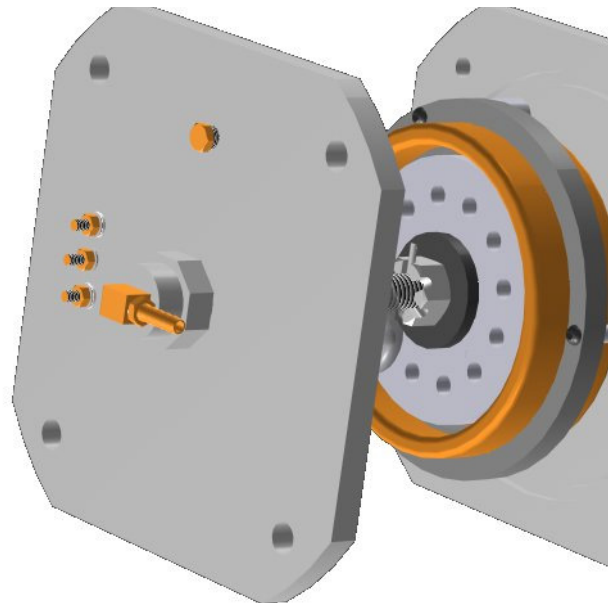
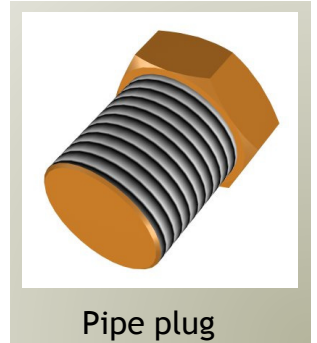
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Finally, plug the oil drain hole with a brass pipe plug - from the outside only.

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NEW TURBINE WORKSHOP

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Questions?

Discuss this class on the NTW Forum!

Ken Rieli, expert disc turbine designer/builder & multi-physicist, has developed a hands-on approach to learning about 21st century turbomachinery & how to harness eternal energy sources—Sun, Wind & Biofuels.

Building your own closed-loop solar turbogenerator system is more than a valuable independent study course. Students at the New Turbine Workshop learn about the scientific process as they develop the power of self-determination through Liberation technologies.