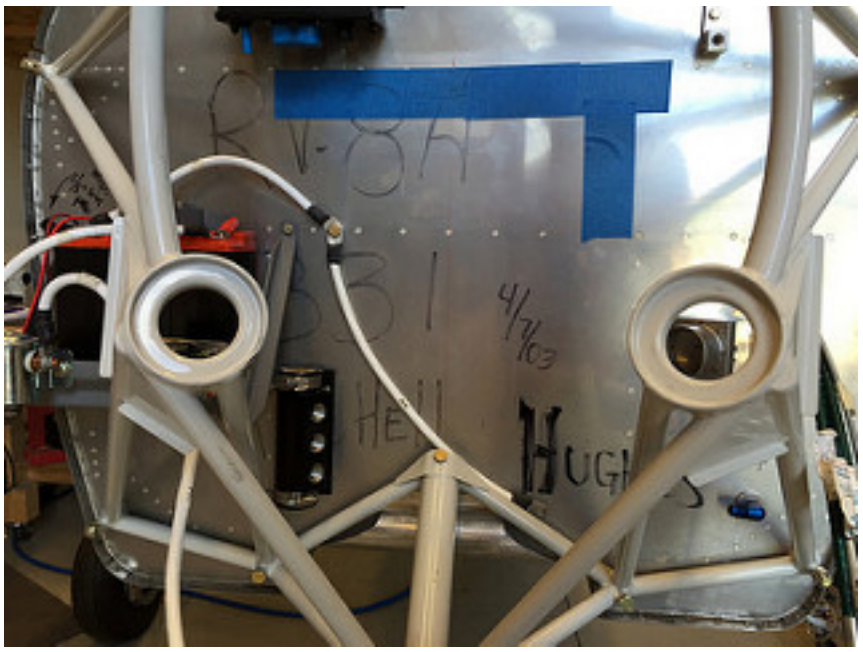
Hanging the engine

Let’s face it. Many people have similar stories about hanging Lycoming engines on the dynafocal engine mounts. Not often easy, despite what you read online with regard to recommended approaches. And, as I found out, the recommended approaches don’t really always work. So we have to adapt.

Case in point: My RV-8A engine mount was on the airplane and ready for the powerplant. The firewall was cut and drilled. Stuff was mounted in place. I read a few accounts of “how to hang your engine” and prepared to follow those recommendations. The stuff I read had all sorts of great advice about what order to do things in, what to make sure you finish before you hang the engine, what to wait on, etc. But some of the mechanics just didn’t work in my situation.



Now, don't read any one part of this post and take it as the definitive word and try to hang your engine. As you'll see, the best approach seems to depend on the person and likely the specific mount and maybe even aircraft model.

Most of the recommended approaches I found and tried to follow say essentially this: Get the engine hanging on your engine hoist, move it to the mount, and then attach the right top mount and tighten it down. This supposedly brings the left top mount into alignment, so you can slide the bolt and spacer in and attach it. Only it didn't come anywhere near close to working that way for me. The rubber Lord mount isolators were so far out of alignment with the hole in the engine block as to make it impossible to get the second mount in, no matter how hard I pried, tapped, hammered, etc.

I happen to have a very, very, very experienced Vans RV builder, modifier, etc. type person whom I can walk to pretty much any day to get the real-world, practical advice I need. I only go to him when I really need to since I do want to figure this out on my own, and he's patient and kind to me. He's also an incredible professional airplane mechanic and good guy. After a couple days of trying and failing to come close to getting things to work, it was apparent my plan of attack wasn't going to work. So off I went to ask for advice.

He happened to have a RV-6A in the shop so we walked over. The shop owner, a friend of mine, joined us. I explained what I had tried, starting with attaching the upper mounts and that it hadn't lined up. They looked at me like I was a little crazy, did what good, practical, experienced mechanics did: Shook their heads and said, "No no no no… Come over here, I'll show ya."

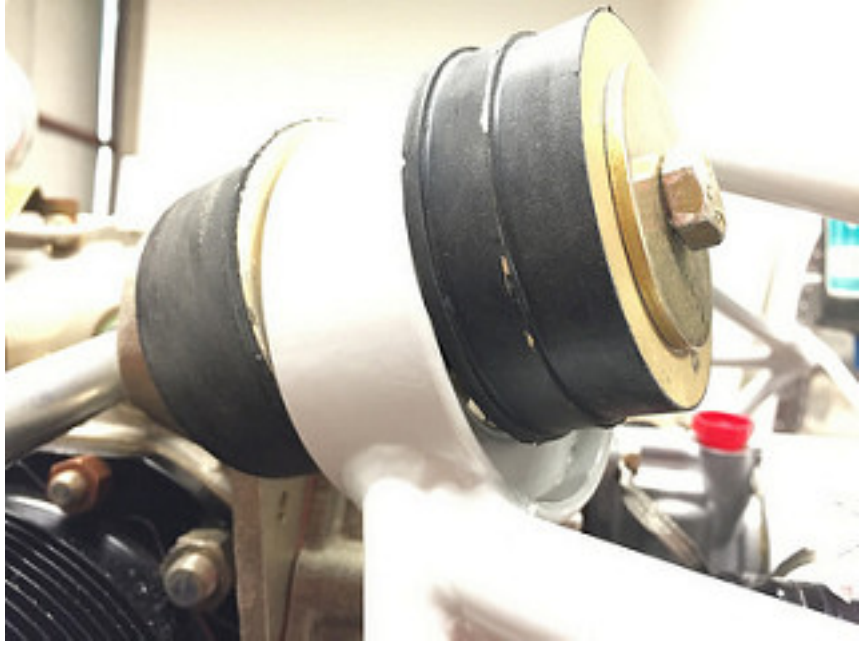
Short version is this: Their advice was to forget the procedure I'd been trying. Instead, they said, mount the two bottom bolts and isolators first. Only after

that, use the lift to manipulate the engine and get the top ones in with the bolts lined up, and the isolators will be offset to the outside of the "cups" in the engine mount. Get a good heavy rubber mallet or a piece of 2×4 and heavier hammer, and start tapping the mounts to get them to slide laterally into the cups on the mount. Then move the engine relative to the air frame to get things to move into place and together, and get the bolts in. "You'll never get it the way you've been trying," I was told. Use the bottom-first method and I'd be done in a handful of minutes.

I liked that idea. Done in a few minutes? Nice.

So, off to work I went, since I needed to be there. After work I headed to the hangar, and in a matter of minutes the engine was hung. Here's what I did that worked in my case:

1. Prepare all the hardware. Make sure the (slightly) longer bolts will be used on the bottom mounts. The shorter ones go on top.
2. Note that the mount biscuits are of two types – one is a little less think and is harder, and the other is slightly thicker and a softer rubber. They look different. Refer to the drawing. Also, refer to the drawings, and then do so again. Don't get this wrong. The engine's weight load goes on the harder halves, meaning at the top mount points they are closest to the firewall/on the back side of the mount points, and on the bottom they are located on the front side of the mount, between the mount and the engine block. The side that gets squished by the weight when the engine is hanging on the mount in a positive-g, upright position is where the thinner/harder ones go.
3. Refer to the drawings. Know them well.
4. There are metal spacers tubes in the kit which you will use. Don't forget them like I did with one. They slide onto the both in the gap between the mount halves and prevent the rubber mounts from squeezing too close together, and prevent them from bottoming out.
5.



Hang your engine on the hoist. Remove any hoses or items that might get in the way.

6. Make sure you have inserted the oil pressure line's restrictor AN fitting at the right top rear of the engine. It faces outboard and the 45-degree fitting needs to be inserted before you mount the engine or else you won't be able to get it in there. Some engines (mine included) have a second port that faces directly aft, and you can put a straight restrictor fitting in there if you like. But check and make sure. Best to install it permanently before you mount the engine.
7. Move the engine into place on the hoist. Insert the lower mount rubber biscuits *and the thick washers* used on the lower mount points between the engine mount and the engine block first (these are the thinner/hard ones). Don't forget those two washers that go on the bottom, and be sure to put the spacer sleeves on the bolts when you insert the bolts, the larger washers and the other half of the shock mounts on the aft side of the engine mount.
8. In my case, it was pretty easy to get the bottom mounts in place. Don't worry about getting the rubber biscuits centered in the cups on the engine mount. Just get the bolts through them and into the holes in the engine. If they line up, great. If not, use a rubber mallet or a piece of 2×4 or similar block of wood with a hammer to tap the mounts in to place. Start with the ones on the engine side of the metal engine mount, then the ones on the aft side.

9. Tighten both bolts and nuts until they tighten down on the spacers.
10. Next, use the hoist to move the engine up and about level. Try to insert the bolts through the large washers/rubber pieces/spacers and the holes in the engine block. The last part will likely be difficult and there's a very good chance that when you get the bolts just barely inserted in the engine, the rubber pieces will sit quite a bit outboard and not in the cups. Do your best to get things lined up and as pushed together as you can along the bolt axis.
11. Use the lift to raise and lower the engine a little bit at a time. Try to get things to further come together. In my case, I lifted the engine until the nose gear on the 8A was several inches off the ground, and all of a sudden things started to fit better. I was able to slide the rubber biscuits together more and the bolt went in just a little further. Not all the way, but enough to lower the whole things somewhat and have things stay in place.
12. Once back on the nose gear (and with the wheel barely touching the ground) I again took the 2×4 section and hammer and started working the rubber pieces into the centerline, tapping until they popped into place in the engine mount cups. Them some more raising and lowering to get things further aligned, and finally dropped the hole thing onto the gear, keeping just some weight on the hoist chain.
13. At this point I was able to get a socket wrench out and turn the bolt, which immediately threaded its way through the engine case holes and

out the other side. Then came washers and nuts, and all was done.

Hopefully that procedure helps someone else. I felt pretty smart once I accomplished it. :)