

# 200Z GEARED DRIVE PSRU INSTALLATION ON SUBARU H-6

Bud Warrens -GearedDrive propeller  
Speed Reduction Unit  
[www.geareddrives.com](http://www.geareddrives.com)

# Eggenfellner H6/E6 Subaru based engine package

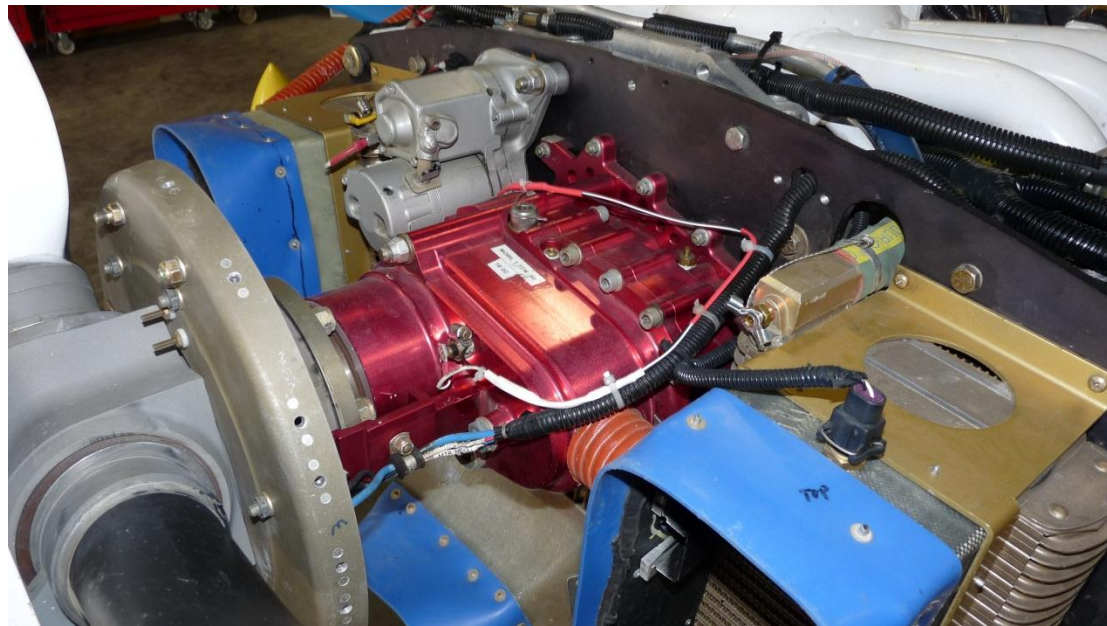
- This will document what was needed to be done to convert my RV-7 aircraft with a Eggenfellner Subaru based H-6 engine package with a Gen3v4 PSRU & a MT constant speed electric propeller over to Bud Warrens GearedDrive PSRU 200Z & a full Hydraulic constant speed Whirlwind 151 propeller.
- See the GearedDrives web site for the latest information
- <http://www.geareddrives.com/>

# Put your toy in a Hanger!



# Level it out & pull the cowlings

- Drain all the coolant from the block & radiators
- Drain the PSRU of oil
- Pull the propeller & save the hardware



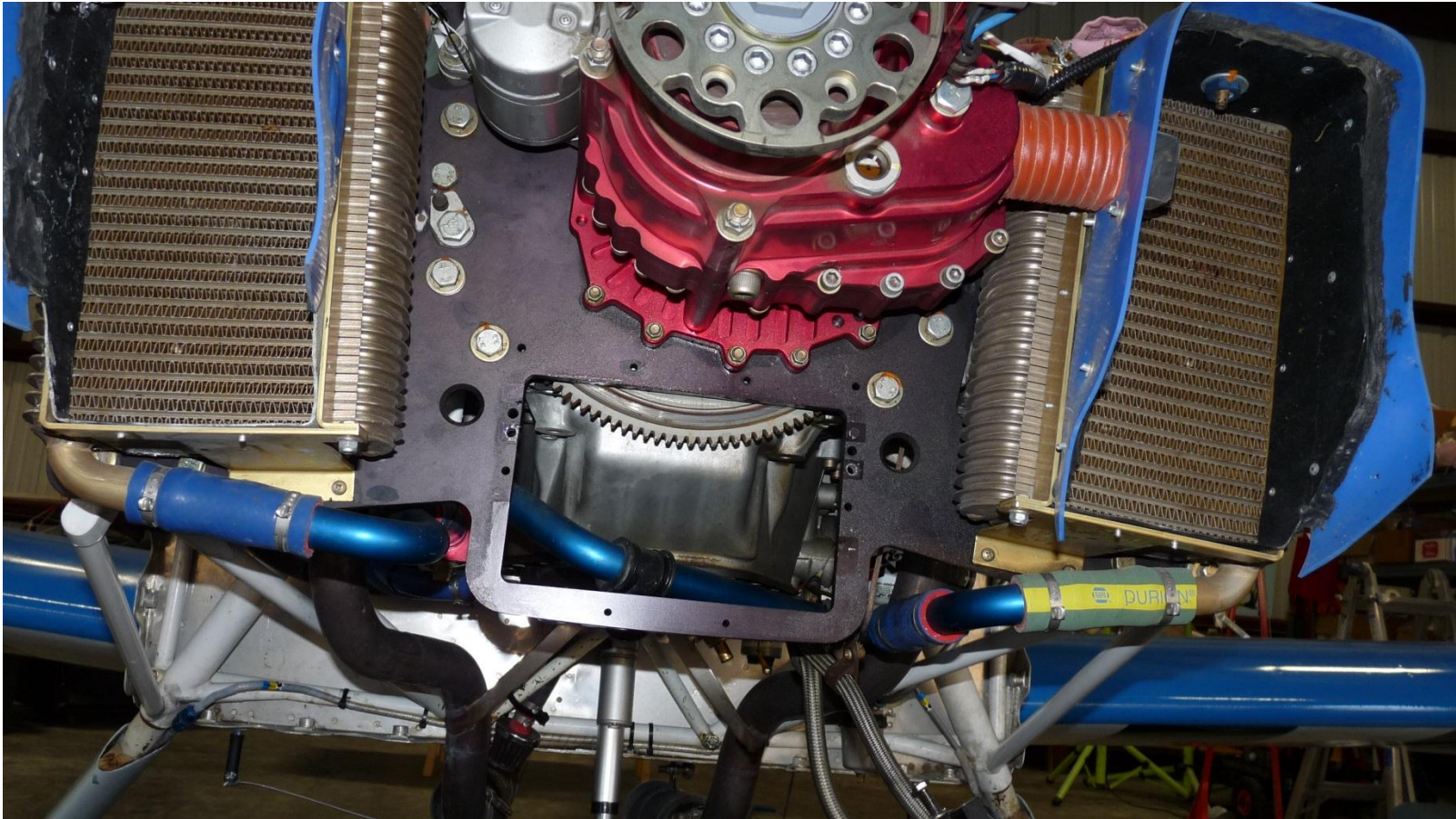
# Engine Hoist required

- You'll need some nylon straps or similar to connect the hoist to the engine for support, then jack it up just to unload the weight on the mount plate. Remove the starter/PSRU/Radiators/oil cooler

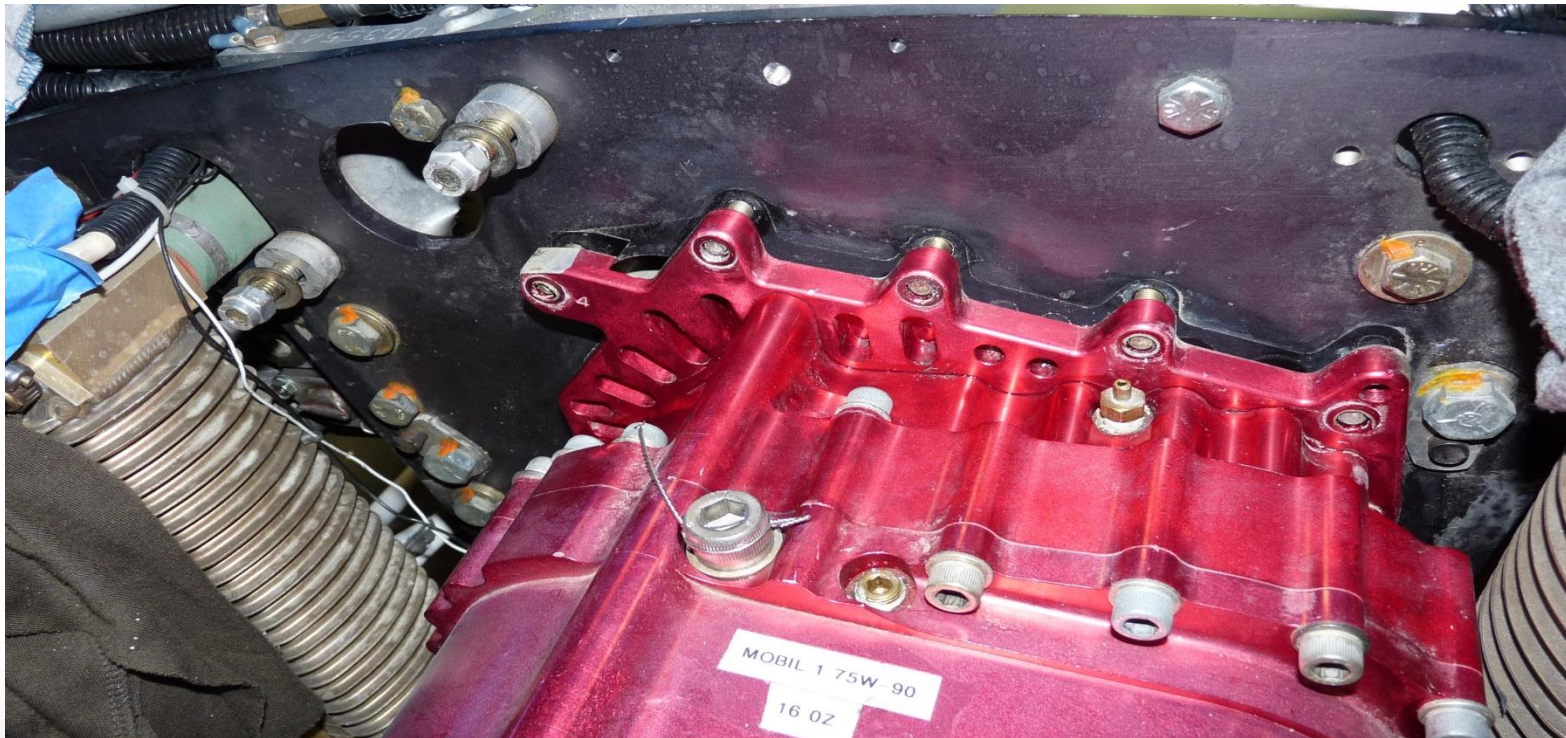


# Oil cooler removed in the middle

Drain the engine oil.. So it won't make a mess

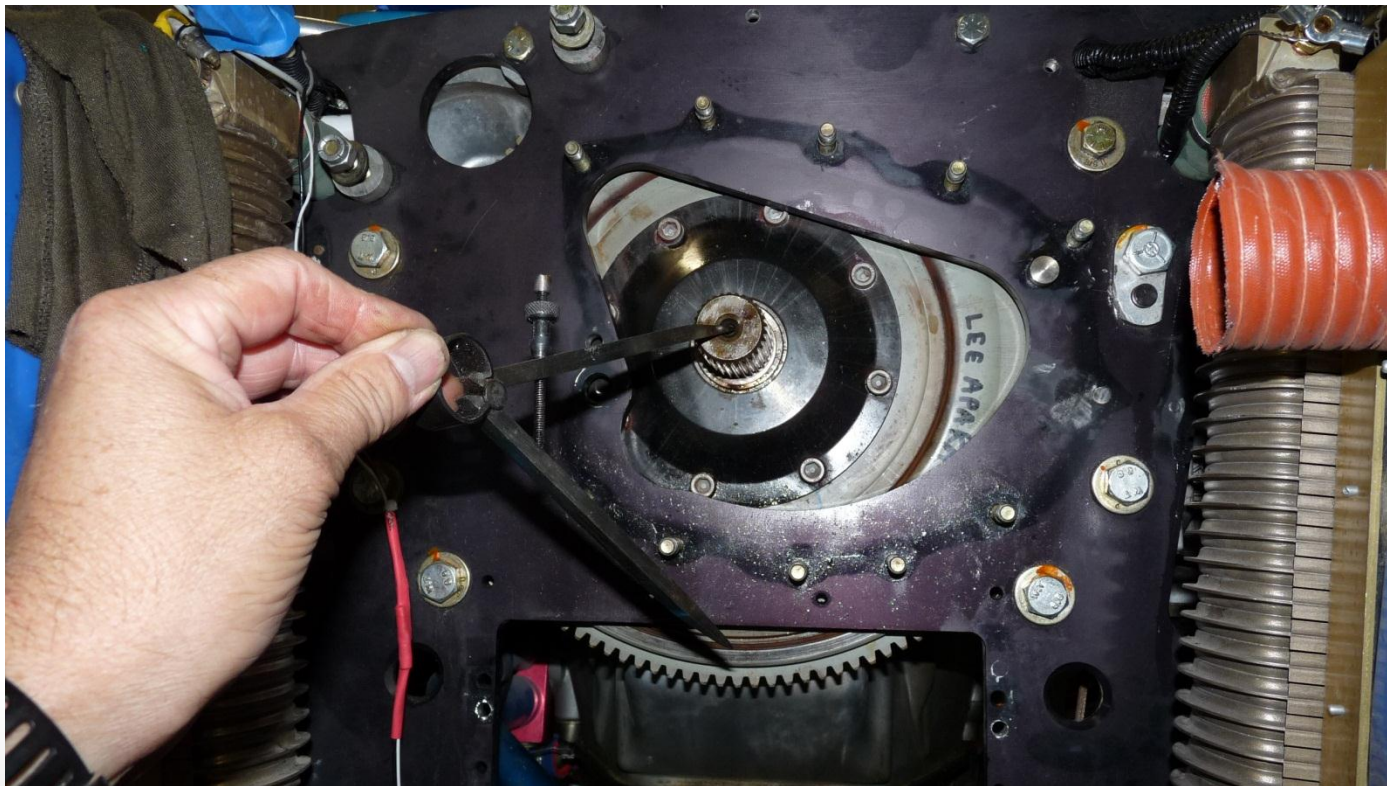


Starter LH side-removed and with Nuts removed from the old Gearbox you can remove it..heavy so get help or support it with jack..



# Find the center of the cutout-10.5” I used the old spline shaft and marked it out with a paint pen

Old spline shaft used with old flywheel mounted before pulling plate off..centers up wing dividers nicely for the layout





# Here it is with the cut out marked in yellow

Area in yellow was cut out & hole cut thru the oil cooler cut out,  
So I added a piece of ½" 6061 T6 alum strap to the top side of  
the cooler hole- then plasma cut the hole out.. Added stiffness  
to the plate again



Added  
stiffener  
here along  
the top  
edge

With the Rad's removed & engine supported remove the plate



# With plate off the old dual mass flywheel-which needs to come off



Call GearedDrive on recycling these ring gears they are hard to find, might get a reward for the old one?

# Mount plate waiting to get cut with a plasma torch!

This hole goes away for starter install-mount hole

Same for this plate I cut off the extra pin that stuck thru when new psru was mounted so it was flush on the front side

Plate turned around & mounted on back side



# Geared Drive Box!



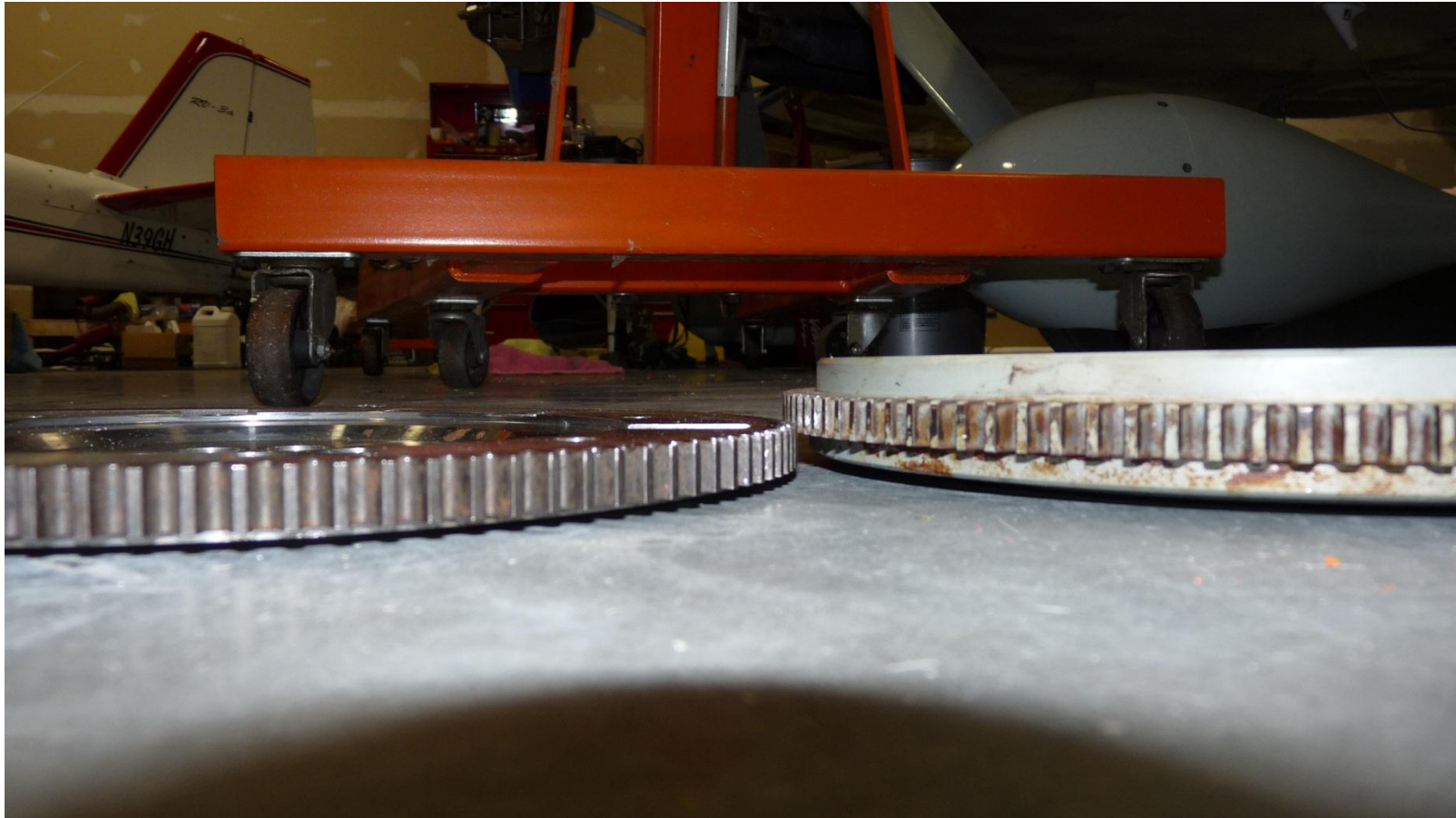
# NewFlywheel & pressure plate



# Old (LH) & new ring gear



See the height differences  
old-RH new LH





# Plate cut out and stiffener added in on the bottom top where oil cooler is

Some of my work  
buddies helping out  
with the weld job  
Thxs Dan & Bob



Added  
Stiffener  
Then cut  
Out hole

# Starter Hole need's Modifying

- You'll have to make the starter hole larger so the starter can fit flush..no spacers used.



This mount bolt will get cut Out when the starter hole is enlarged, also you might have to grind the ears a bit for clearance

# Starter hole mod in plate

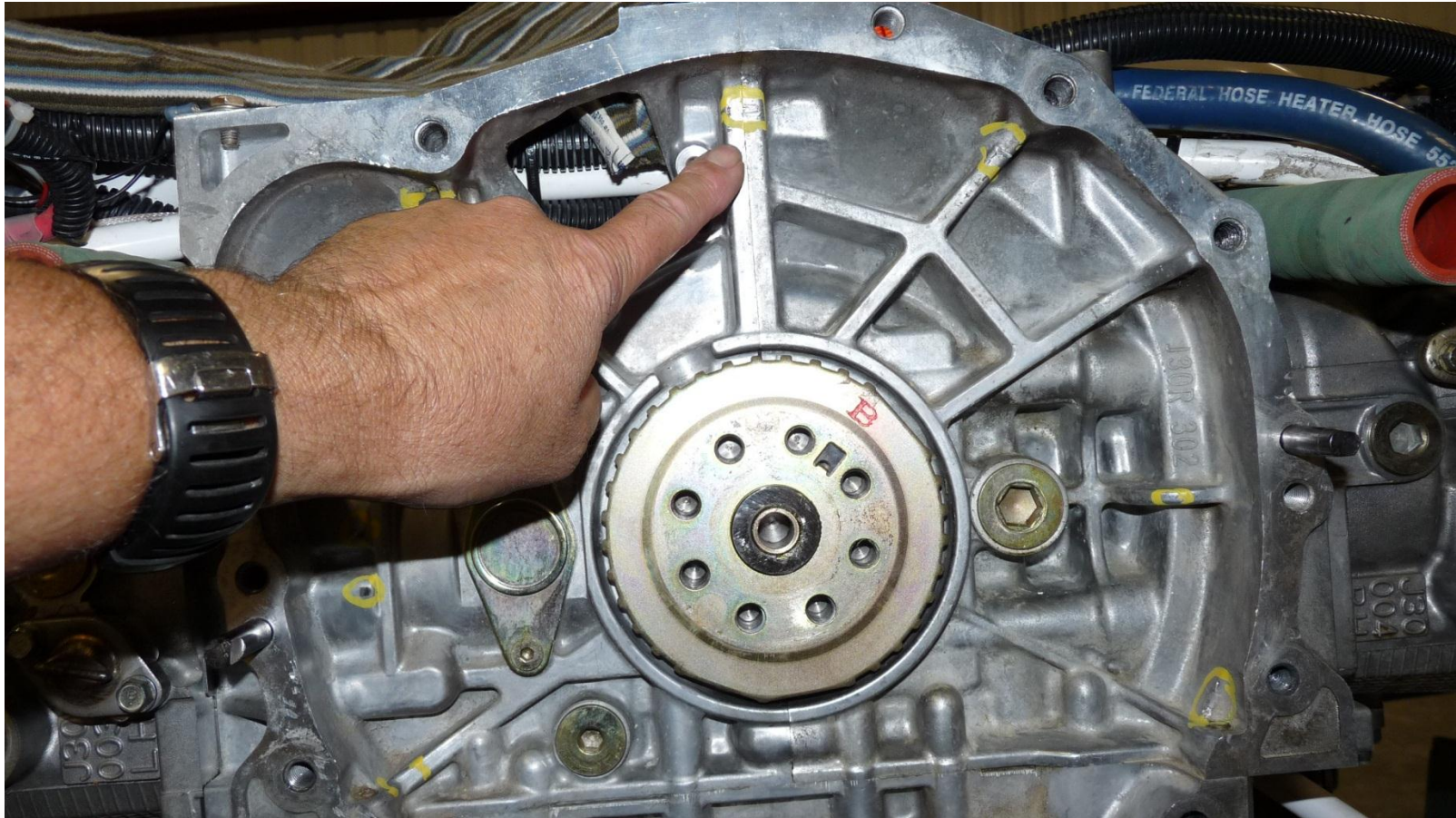
This hole goes away when starter hole enlarged

Needed Grind here To fit starter



Need to grind Here also

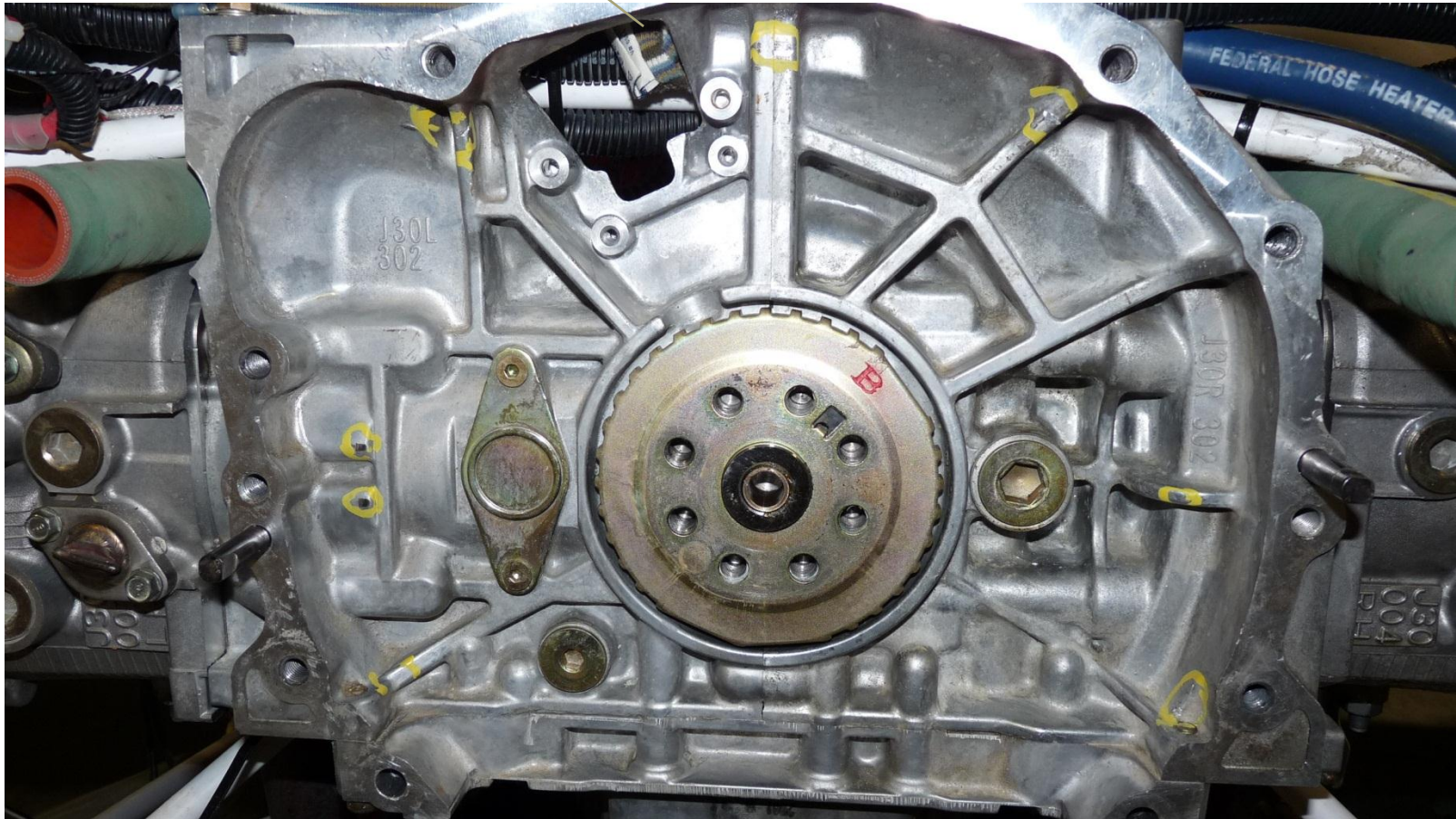
# Bell Housing webs grind down in yellow



# Install flywheel& pressure plate

- Follow the instructions that Larry & Bud send out with the unit for installing the flywheel and pressure plate..not hard but you'll need to
- Remove the crank trigger sensor & use that hole to install the allen bolts that come with the unit plus a cut down  $\frac{1}{4}$  allen wrench to make it easier

# Crank sensor hole



# Mount up the plate

- Mount up the plate but leave it loose so you can wiggle it..the next step will install the new
- PSRU
- You'll need longer bolts to mount up the PSRU

# New Plate polyurethane bushing added at the 4 corners





# Mount the PSRU

Randy Crothers stopped in to QC the work!



# Secure the Plate & PSRU

- Tighten up the hardware and move on to the
- Radiators & Prop governor if installing a full
- Hydraulic prop
- If you're going to use your electric MT you'll have to make your own brush mount

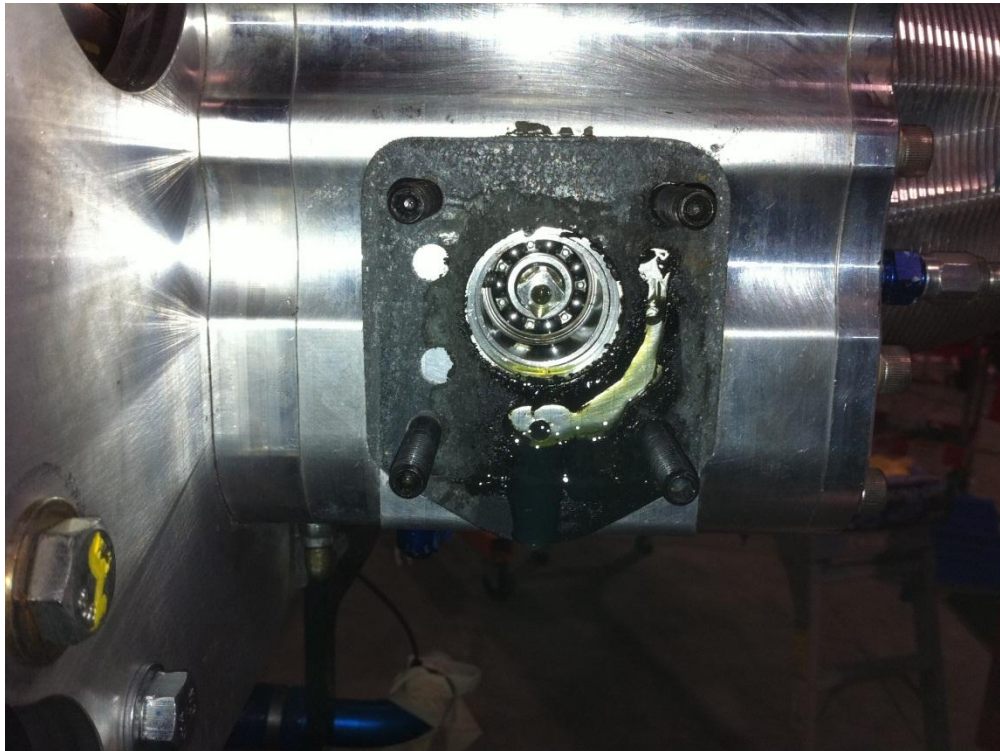
# Prop gov & Rh Radiator interference



As you can see the Big Egg rad's don't give you any clearance for the Prop gov arm. You need 6" min clearance area marked in yellow is what you need to remove to fit a governor..

I had new radiators made with the tanks on the top

Prop Governor Pad-CW rotation  
needed for governor-9/16 adaptor with  
unit to fit spline drive on governor in box



# Oil filter interference LH side

Michael Obrien & Boyd Blue take a peek



Need to use a remote oil filter mount

# Remote filter location back of plate longer lines needed



# PSRU oil pump/filter assy LH side-filter removed

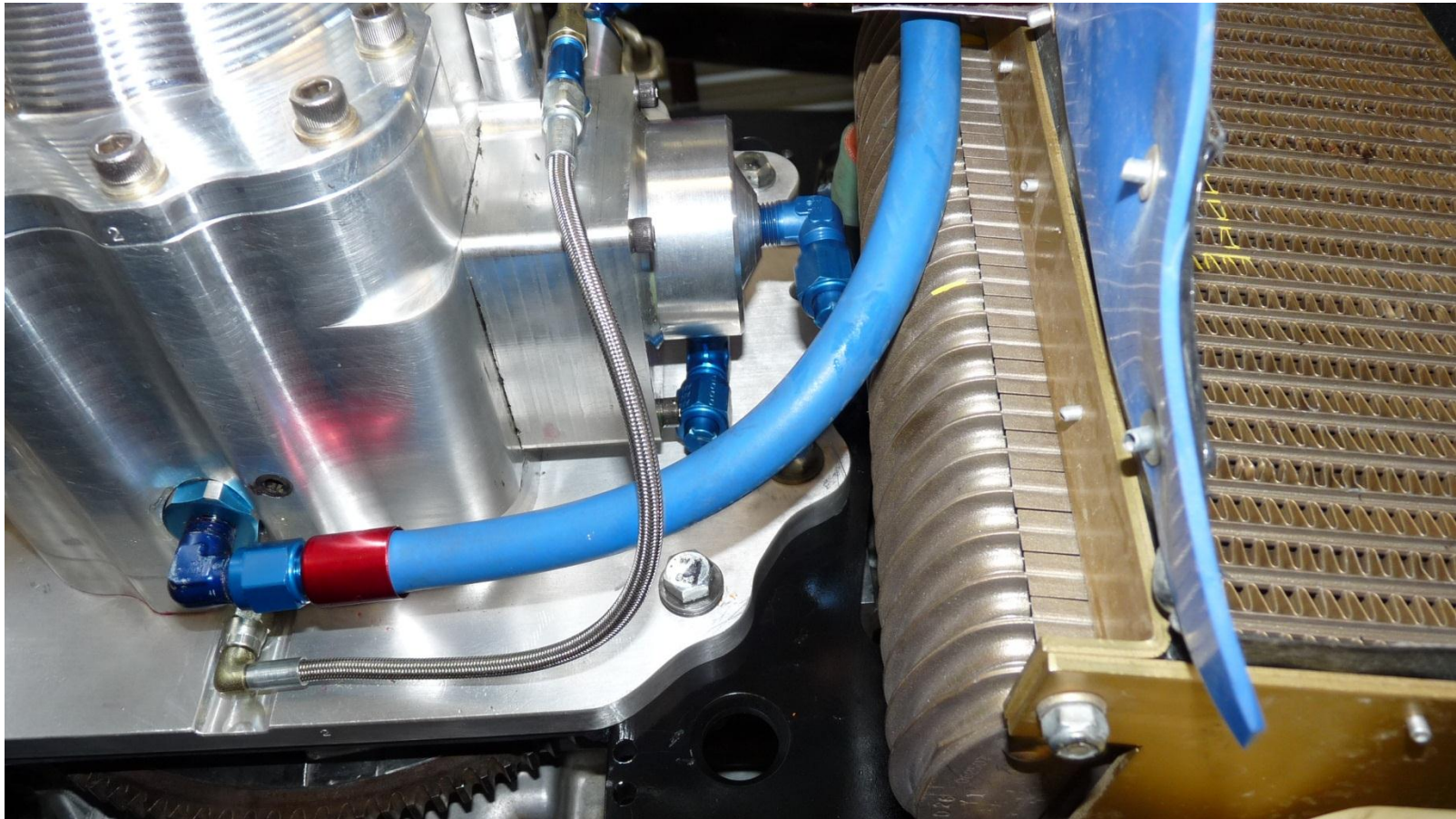


# Spin on filter adaptor with 90 AN fittings





LH Radiator clearance  
need to grind fins or make new  
radiator which is what I did



# Cowling fit for radiator mockup

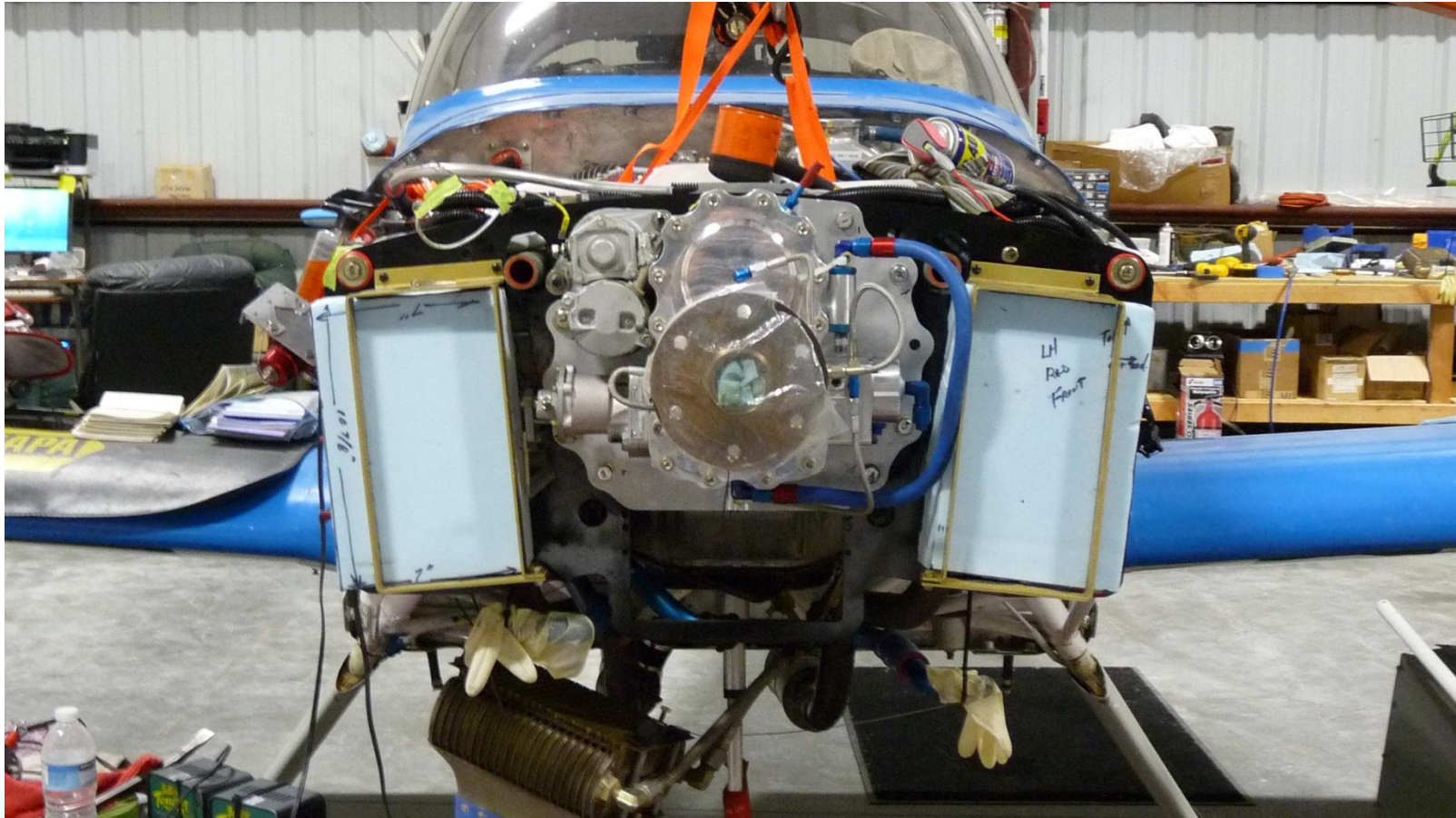


LH Rad needs to fit in here -:0

James cowl is what I have on my plane



# Foam core mockup's over stock frames for sizing new Rad's & locations



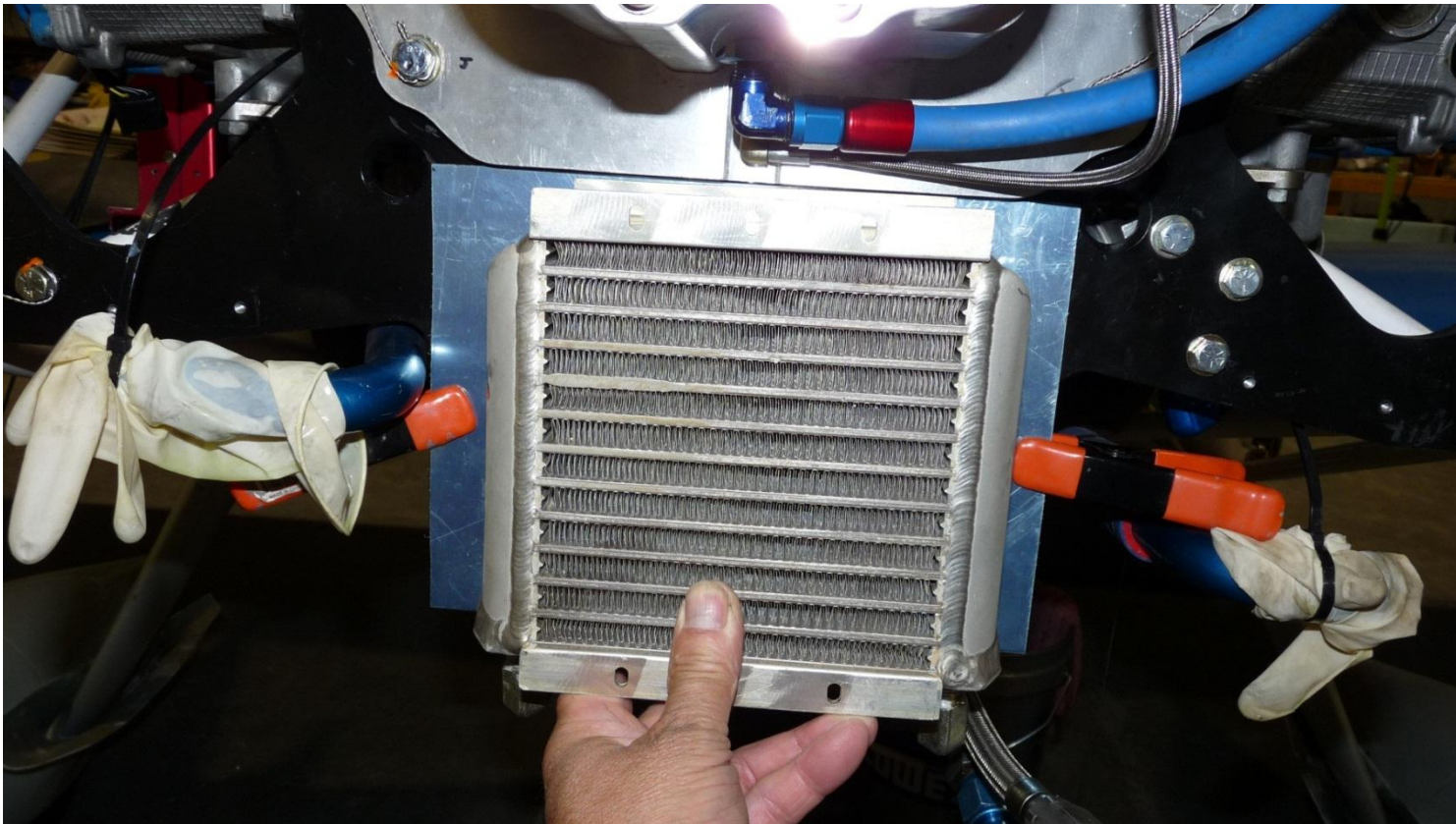
What the new Rad's look like..

<http://techwelding.com/index.html>



# Oil cooler- Positech sized for a IO540 added new cooler

PSRU is now lower so the stock oil filter Won't fit in my James cowling..Positech cooler has press/return lines on bottom sides..better fit in my cowling. I had longer lines made up -8 in size around 28" end to end for the oiler cooler to hook up to the oil filter make a new mounting plate for the cooler to bolt up or mod the old Egg cooler mount brackets to fit the new cooler



Remote oil PSRU for spin on filter  
uses oil filter oil ring in groove  
you need to get AN fittings -6

Bud supplies this part



# New Rad's in cowling test fit





# Prop governor mounted

Tight fit for  
prop gov  
see the arm  
Very close  
fit ←



# Fab up a bracket for the prop control cable you'll need to add

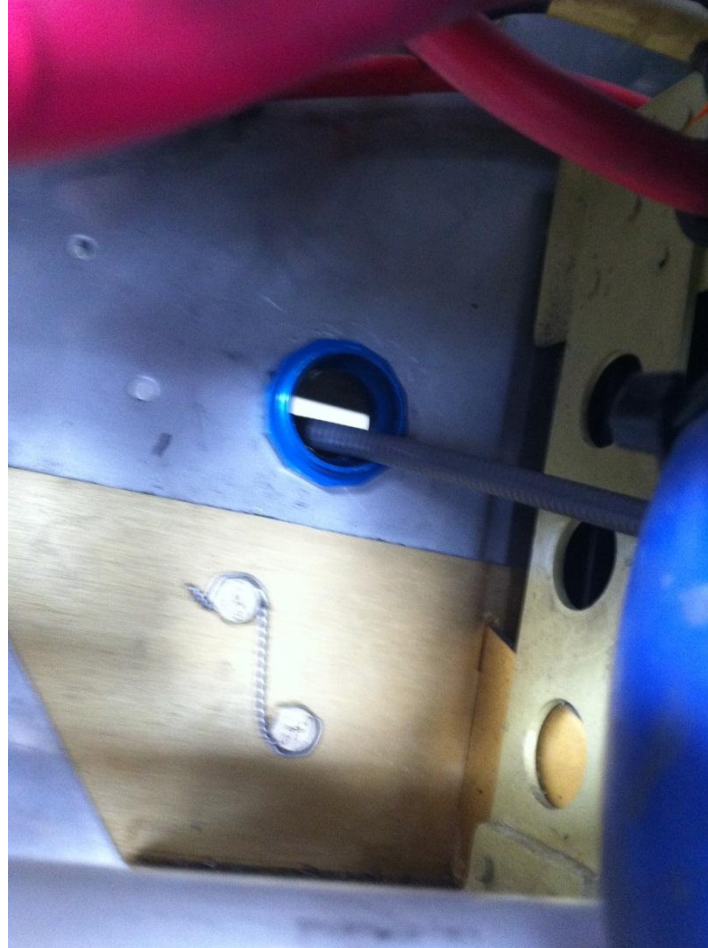


Got the prop Cable From vans For a Io540

Prop arm rotates to the top side when mounted for correct orientation  
Loosen slot screws and rotate the whole housing to relocate arm

# Added ball eye for prop controll cable in firewall RH side

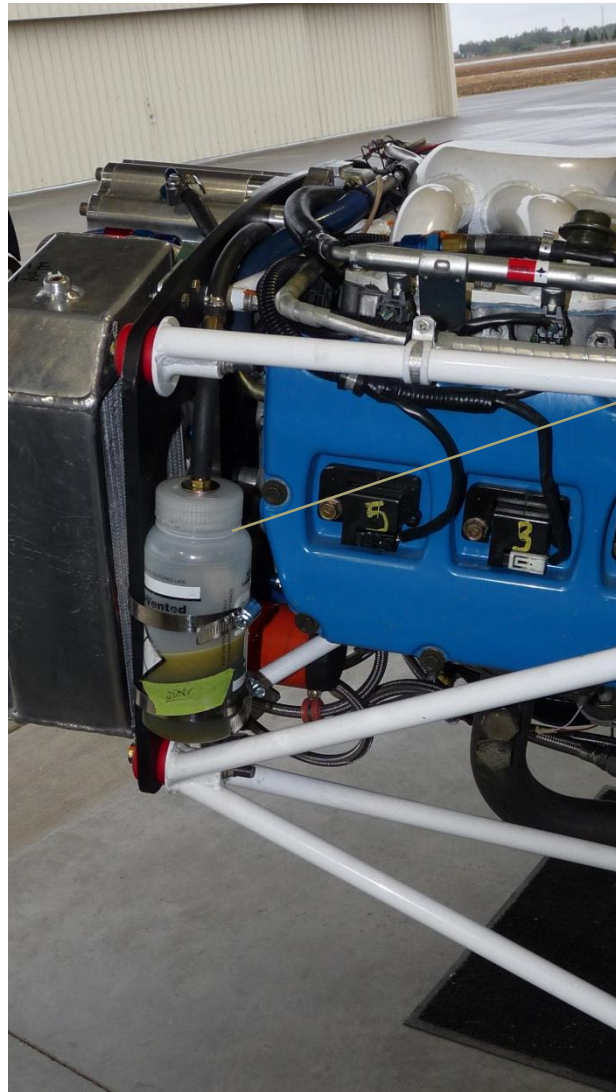
Eye ball  
removed  
in this  
photo



Add you're choice of propeller  
I went with a whirlwind 151 69"  
diameter three blade composite job



# Add a burp bottle to catch overflow flow on 1<sup>st</sup> runups



½ full after a couple of runs  
Yellow looking means air in oil-  
needed to add some anti  
foaming additive

# Enjoy your new ride

- I hope this slide show will give you some insight on what it takes to swap out your PSRU from the Eggenfellner to the new GearedDrive unit
- It starts smoother/runs & shuts down like a turbine
- Faster then my MT prop/Gen3 setup
- Full Hydraulic instant action and a wider choice of props
- Not quite plug & play-yet- but Hey you built a plane..no big deal!

# The finished product

Contact me if you have any questions : Lee Apaka... [rv7subi@gmail.com](mailto:rv7subi@gmail.com)

