



## DLE 20: Carburetor equalization

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A few months ago I came across the topic of carburetor equalization. In a nutshell, the Walbro and Walbro-like carburetors that are typical to gas airplane engines were originally designed for things like chainsaws and weed whackers. The flow of fuel is regulated by a diaphragm in the carburetor that's activated by air pressure entering through the metering cover vent - a small hole in the metal plate that covers the diaphragm. This system is fine on the ground where the carb doesn't get moved around a lot but flight - especially aerobatic flight - can cause swirling air inside the cowl. The moving air can change the pressure on the diaphragm, causing the engine to run too rich or too lean.

Enter carburetor equalization, which relocates the source of the air pressure to somewhere more stable. In this case, inside the fuselage. To the shop!

### You will need:

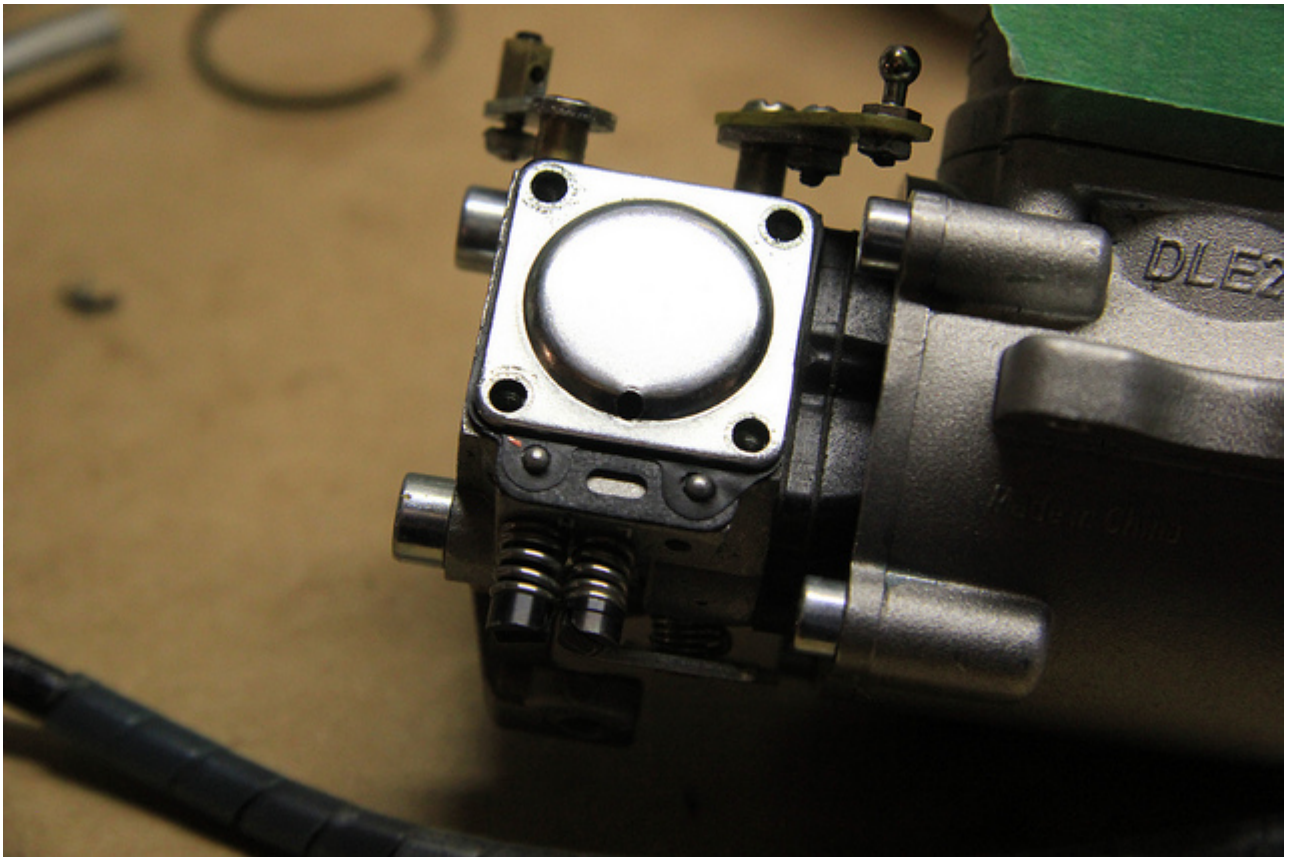
- Rotary tool with grinding bit
- 6-32 tap
- Drill
- 7/64" (#35) drill bit

- Drill bit for pressure line grommet
  - Razor blade or hobby knife
  - #3 Phillips screwdriver
  - 6-32 pressure fittings (2)
  - 5/32" fuel tubing
  - JB Weld
  - Coarse sandpaper (~80 grit)
  - 7/32" ID grommet
  - Small zip ties (2)
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## Remove the metering cover

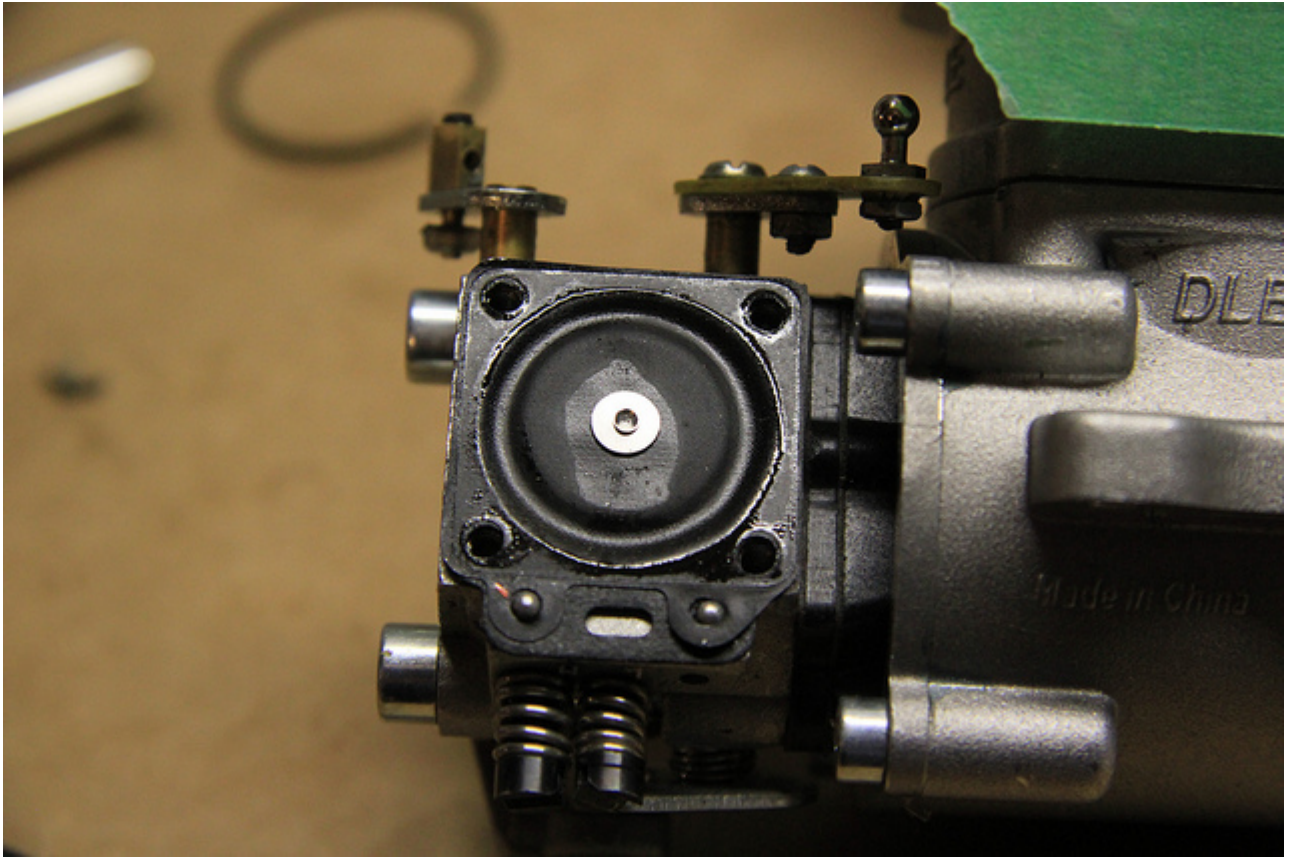
*For these steps it was necessary in my case for the engine to be out of the plane.*

Remove the bolts from the metering cover:



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Gently remove the metering cover from the carburetor, ensuring the diaphragm stays in place:

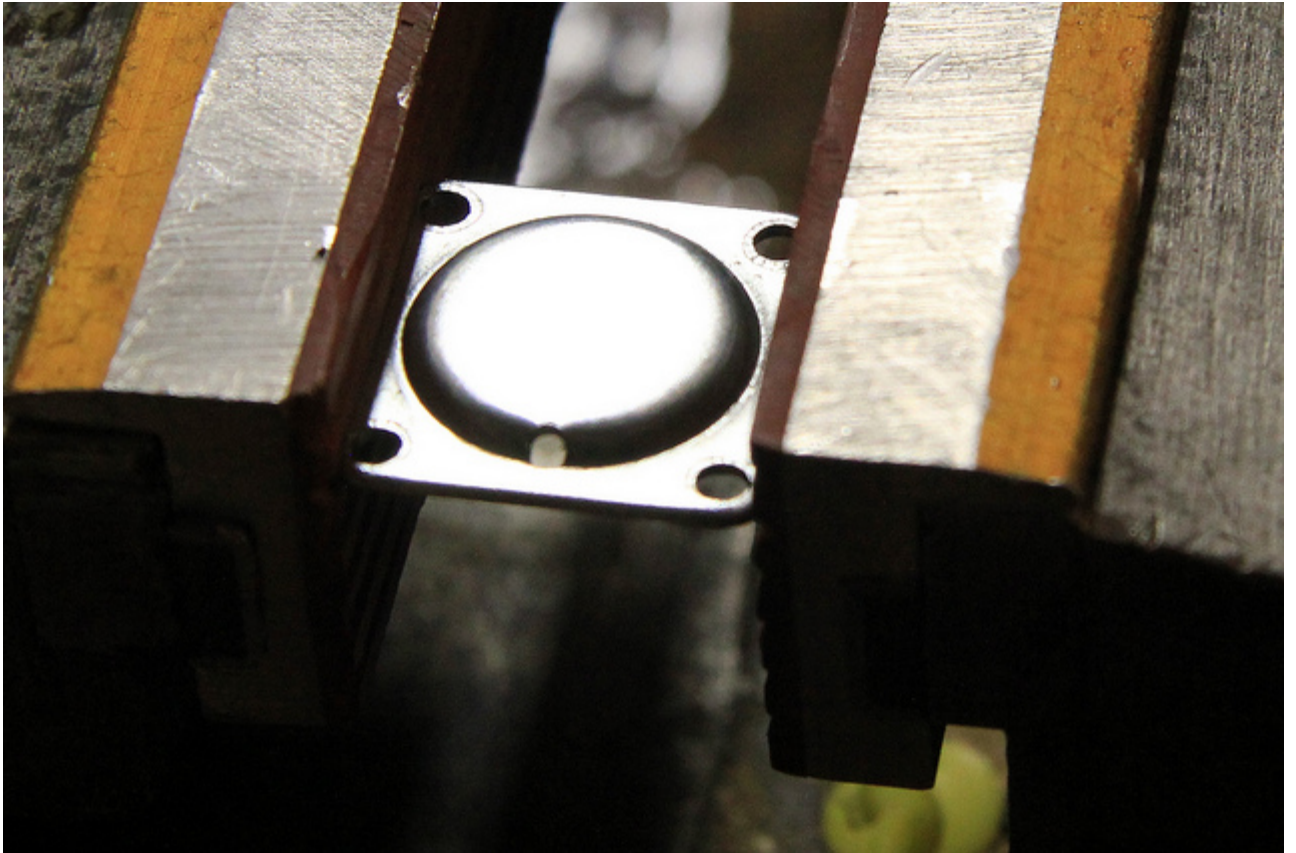


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## **Drill and tap the metering cover**

Secure the metering cover and drill out the vent with a 7/64" (#35) drill bit:



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Tap the vent with a 6-32 tap:

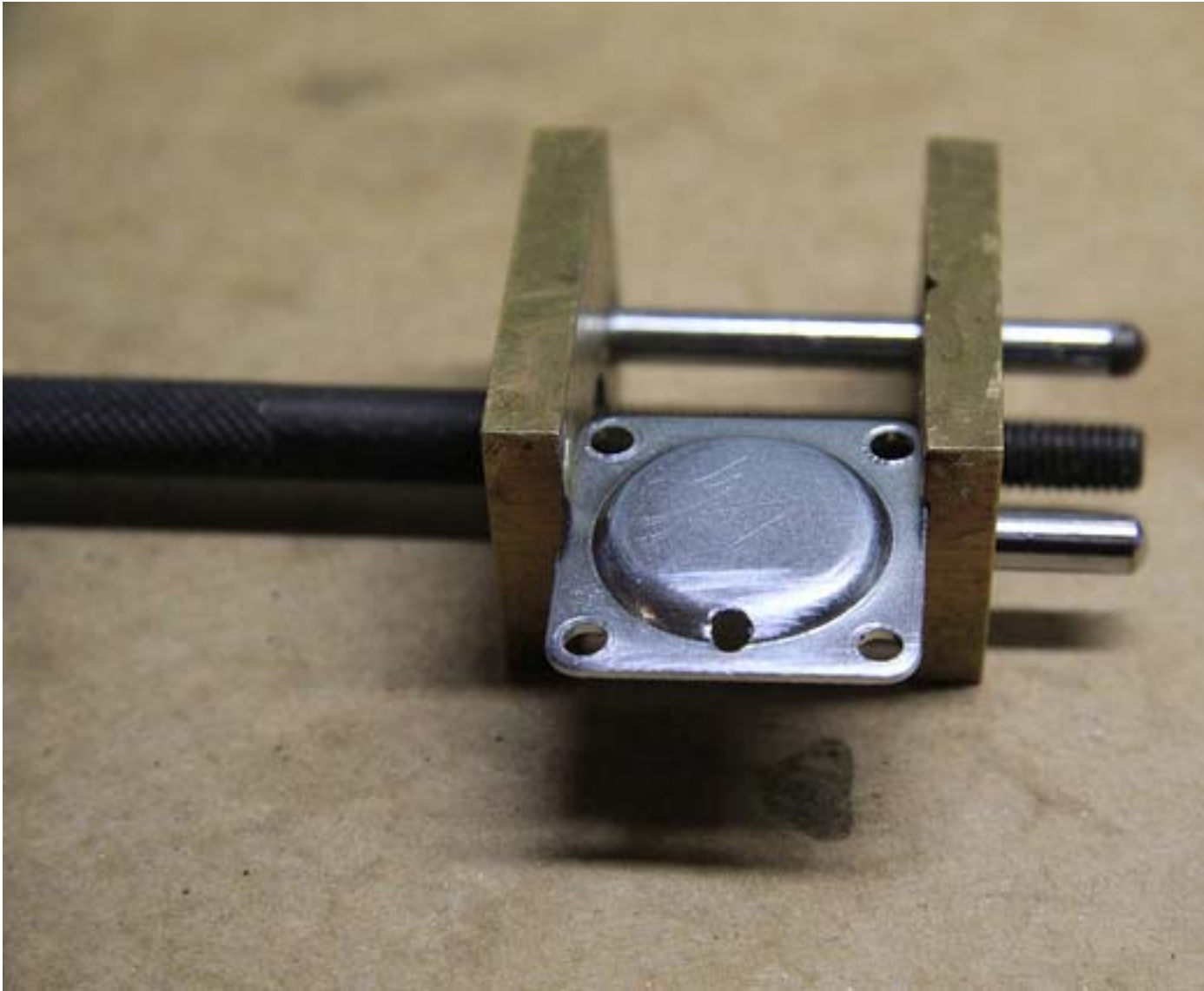


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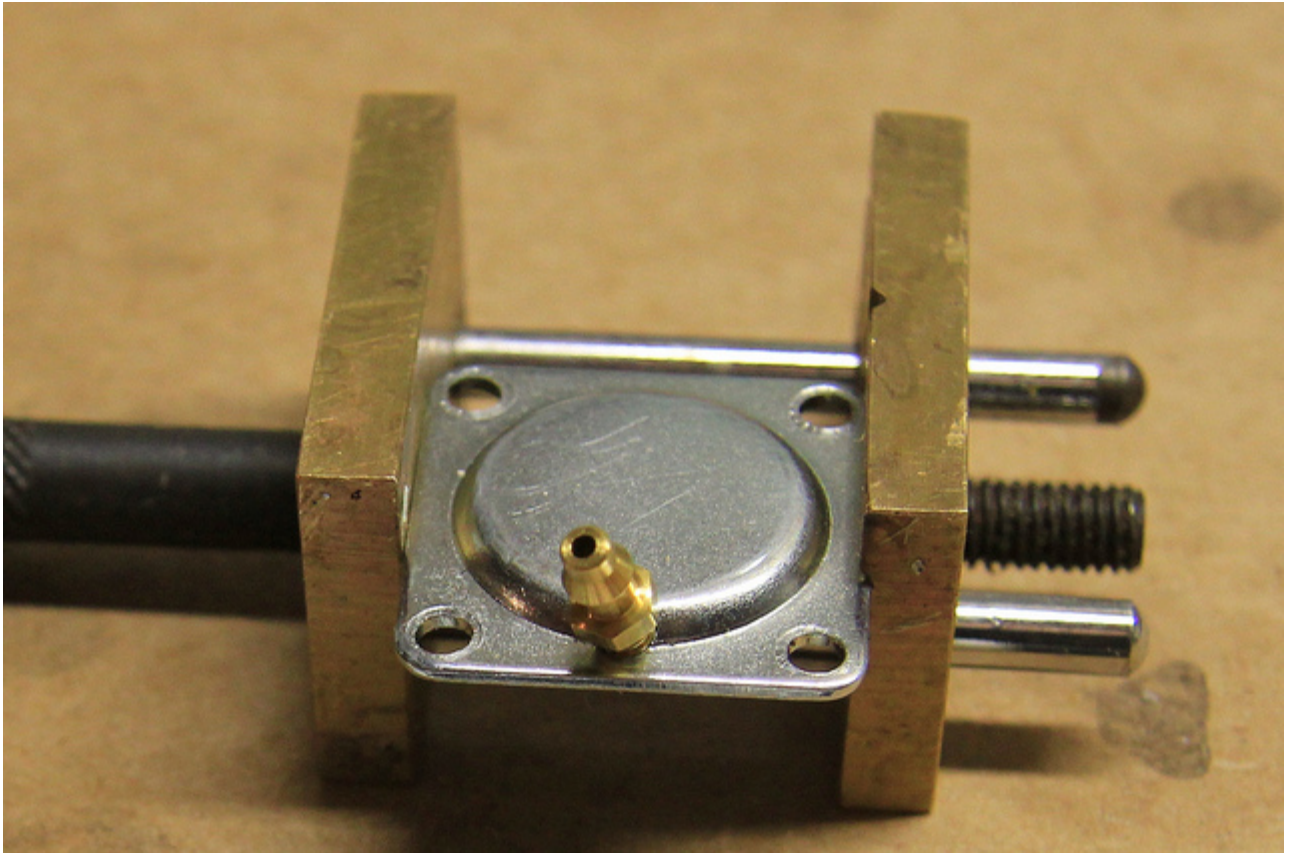
## **Install and secure the pressure fitting**

Scuff the area around the vent with some course sandpaper:



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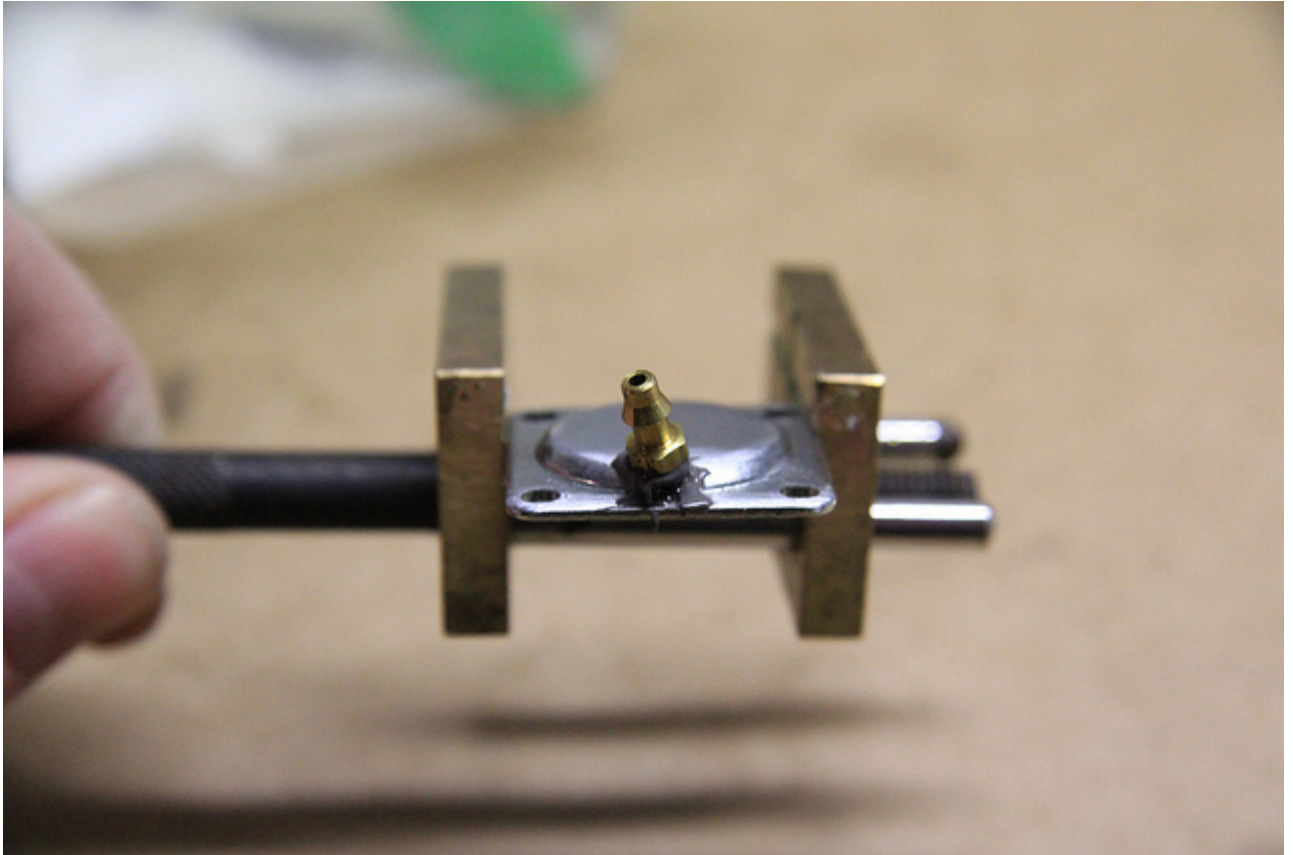
Thread a 6-32 pressure fitting part way into the vent:



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I tapped the fitting a little crooked - not a problem

Mix some JB Weld, apply it around the base of the pressure fitting and tighten the fitting:



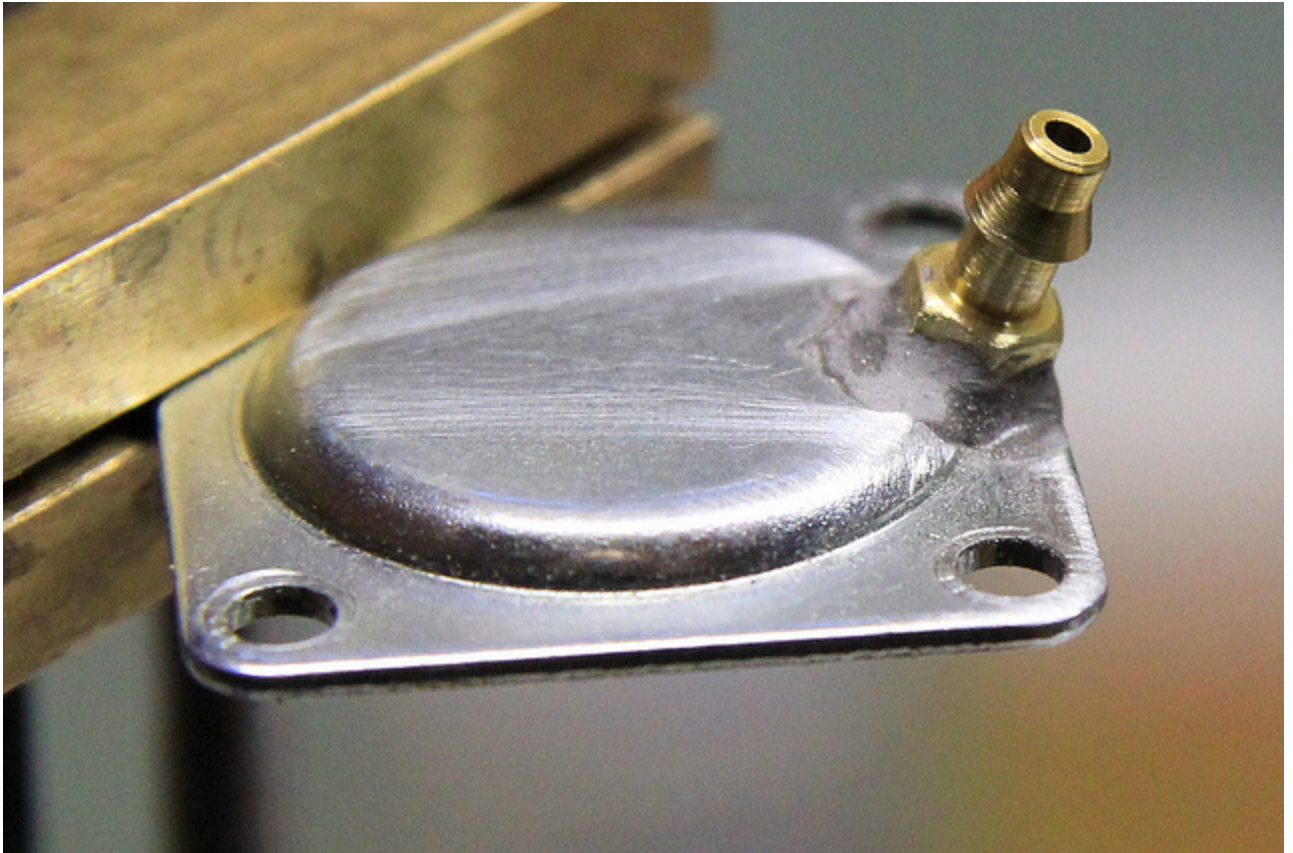
Allow the JB Weld to cure for 24 hours.

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## **Grind the pressure fitting**

If necessary, sand off any extra JB Weld:



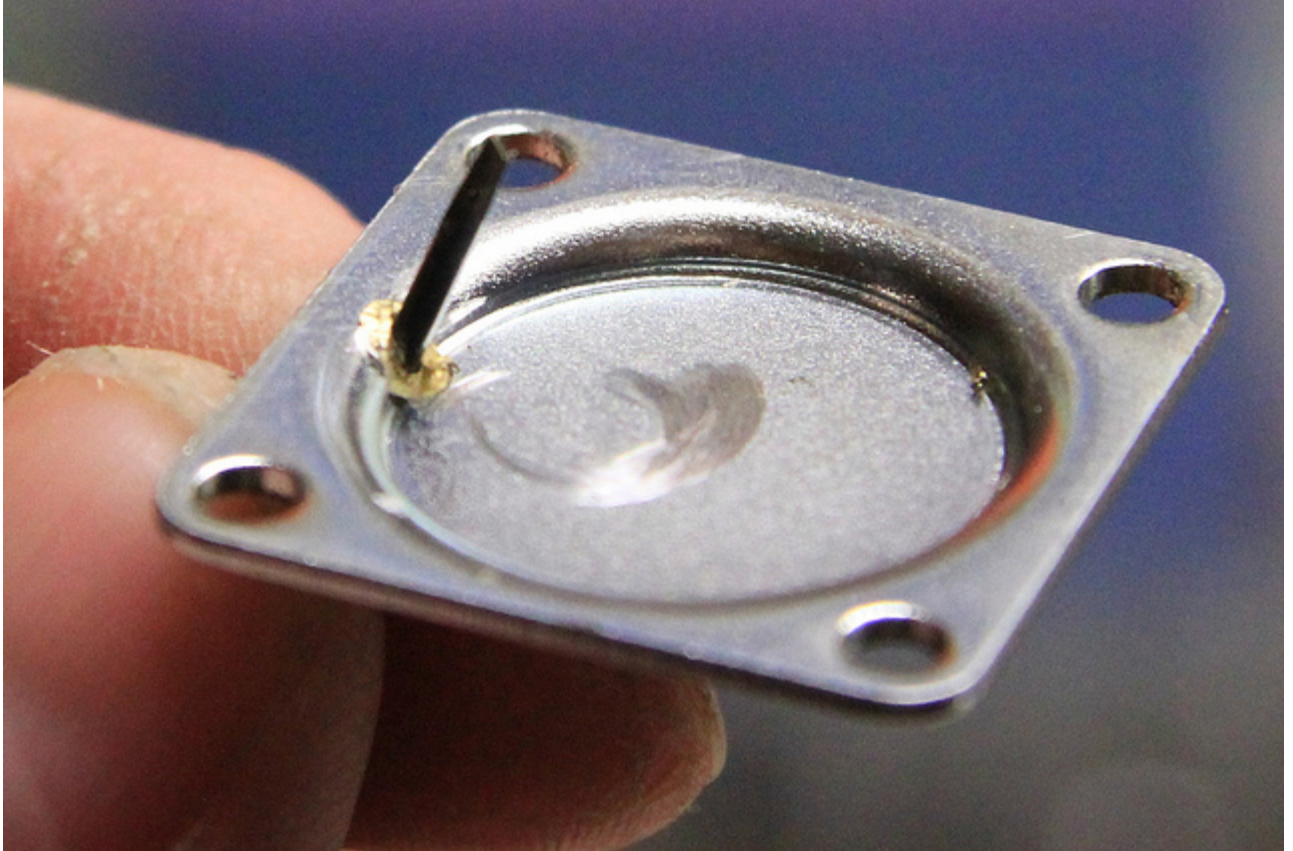
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With a rotary tool and grinding bit, carefully grind off the part of the pressure fitting that extends inside the metering cover:



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Clear any debris from the bore of the pressure fitting with a small screwdriver or a piece of wire:

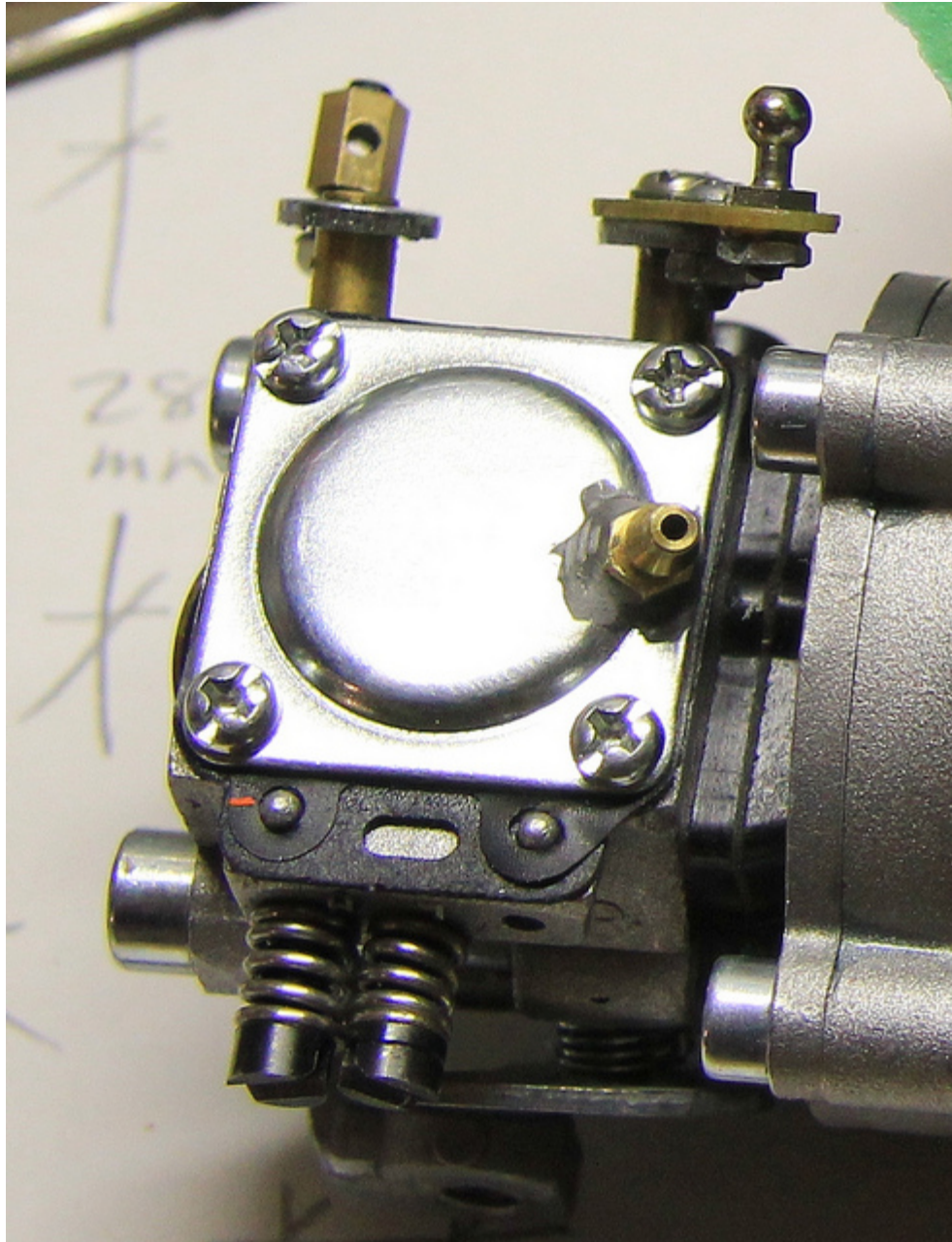


Clean the inside of the metering cover thoroughly.

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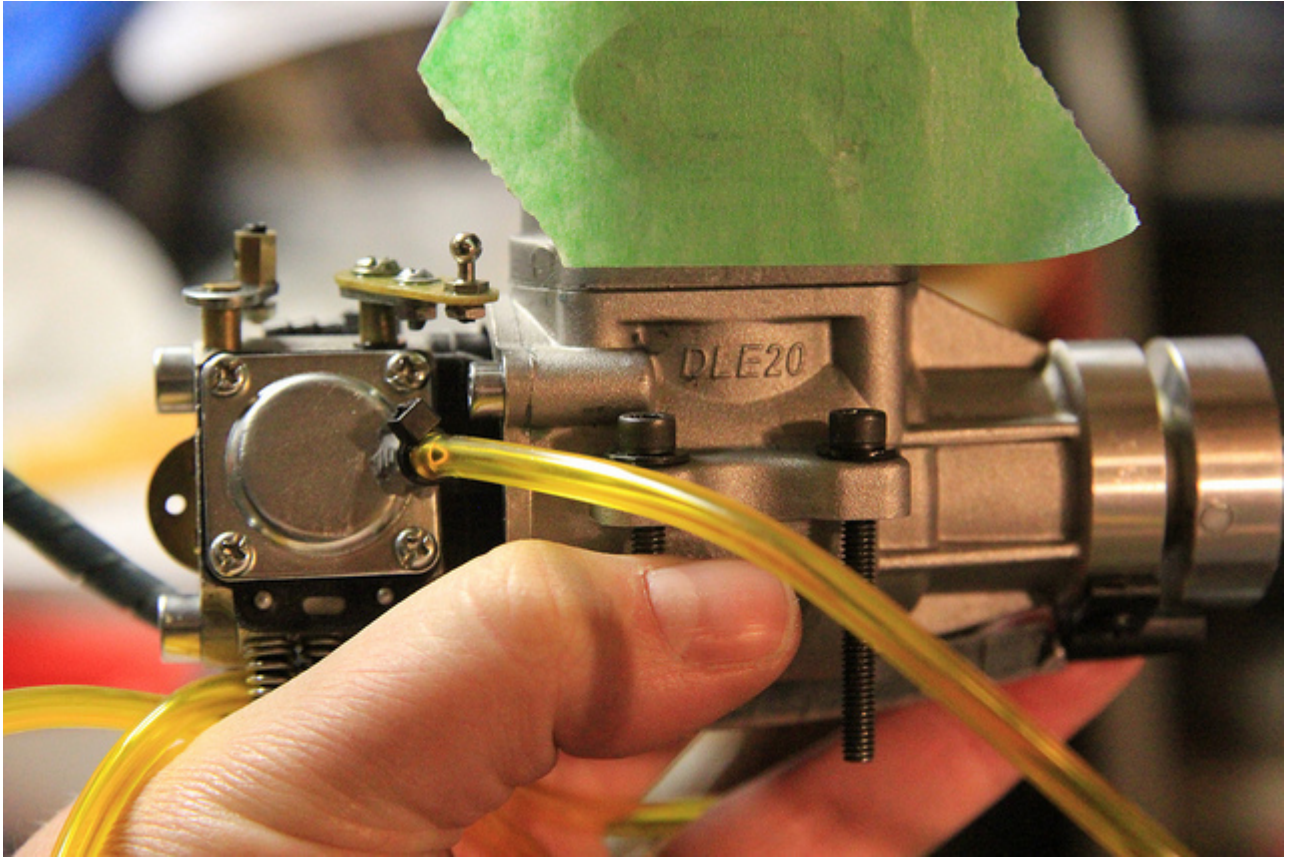
**Reinstall the cover and connect the pressure line.**

Reinstall the metering cover on the carburetor:



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Connect the pressure line to the fitting on the metering cover and secure it with a zip tie:

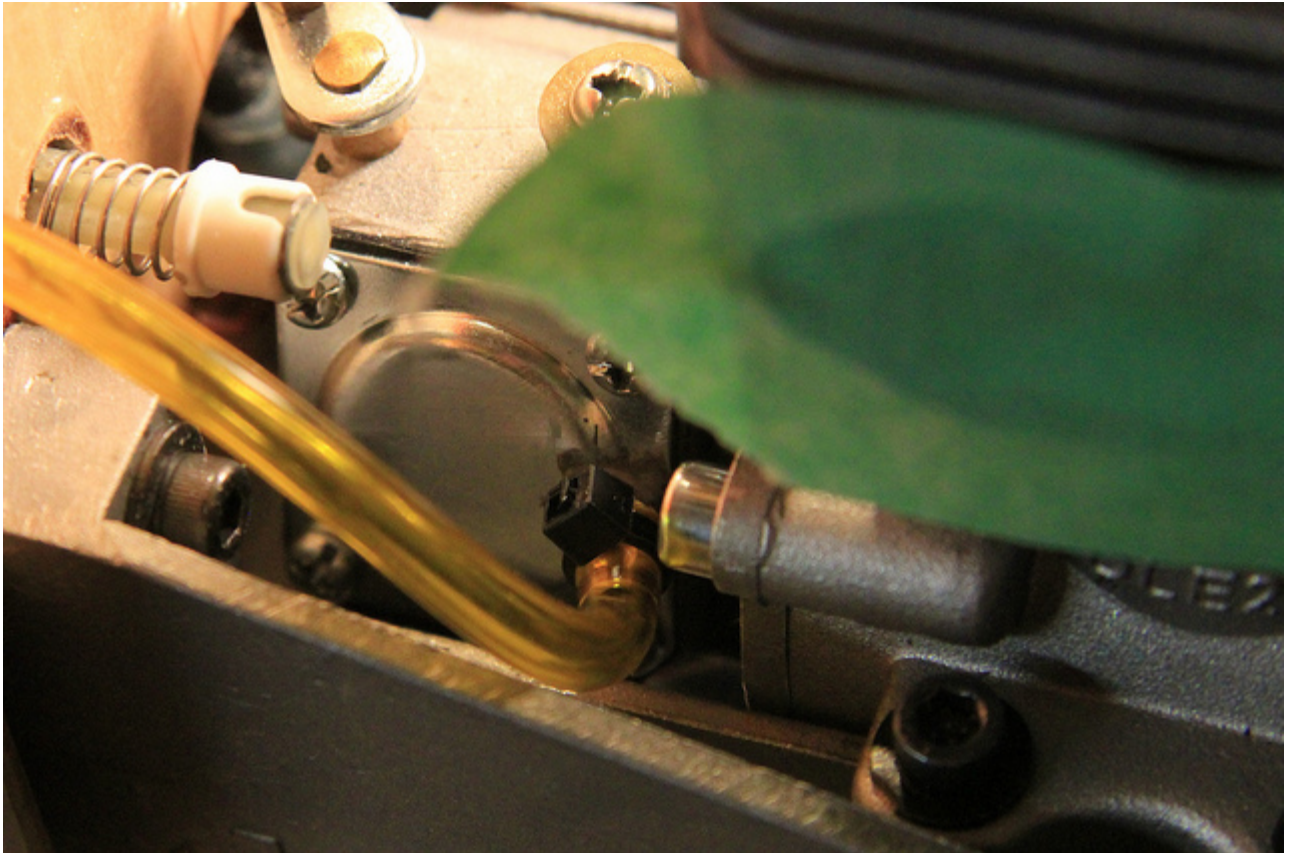


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## **Create a passage for the pressure line**

Place the engine on the mount:

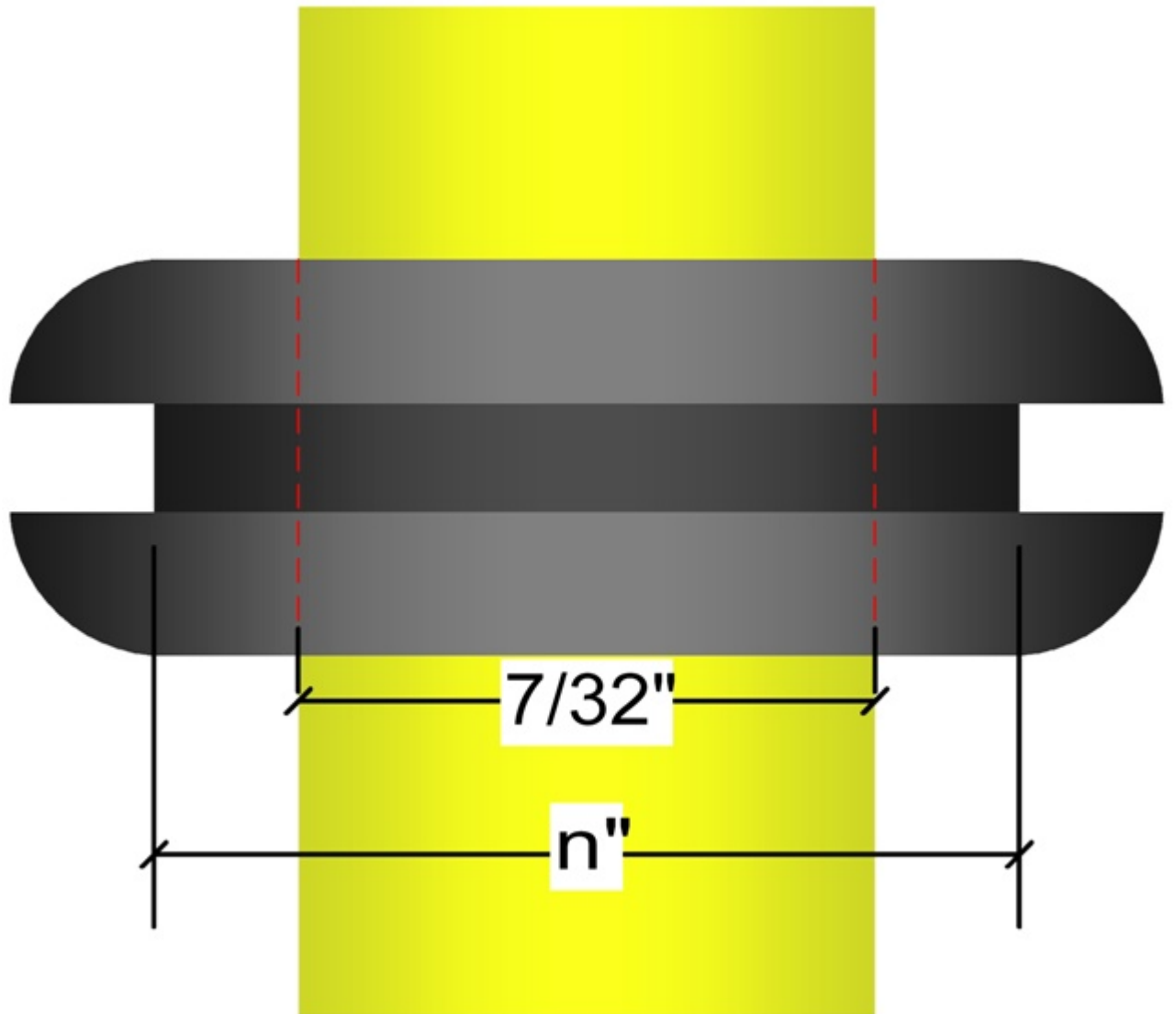


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Select a location on the firewall for the pressure line to pass through and mark it.

Remove the engine from the mount.

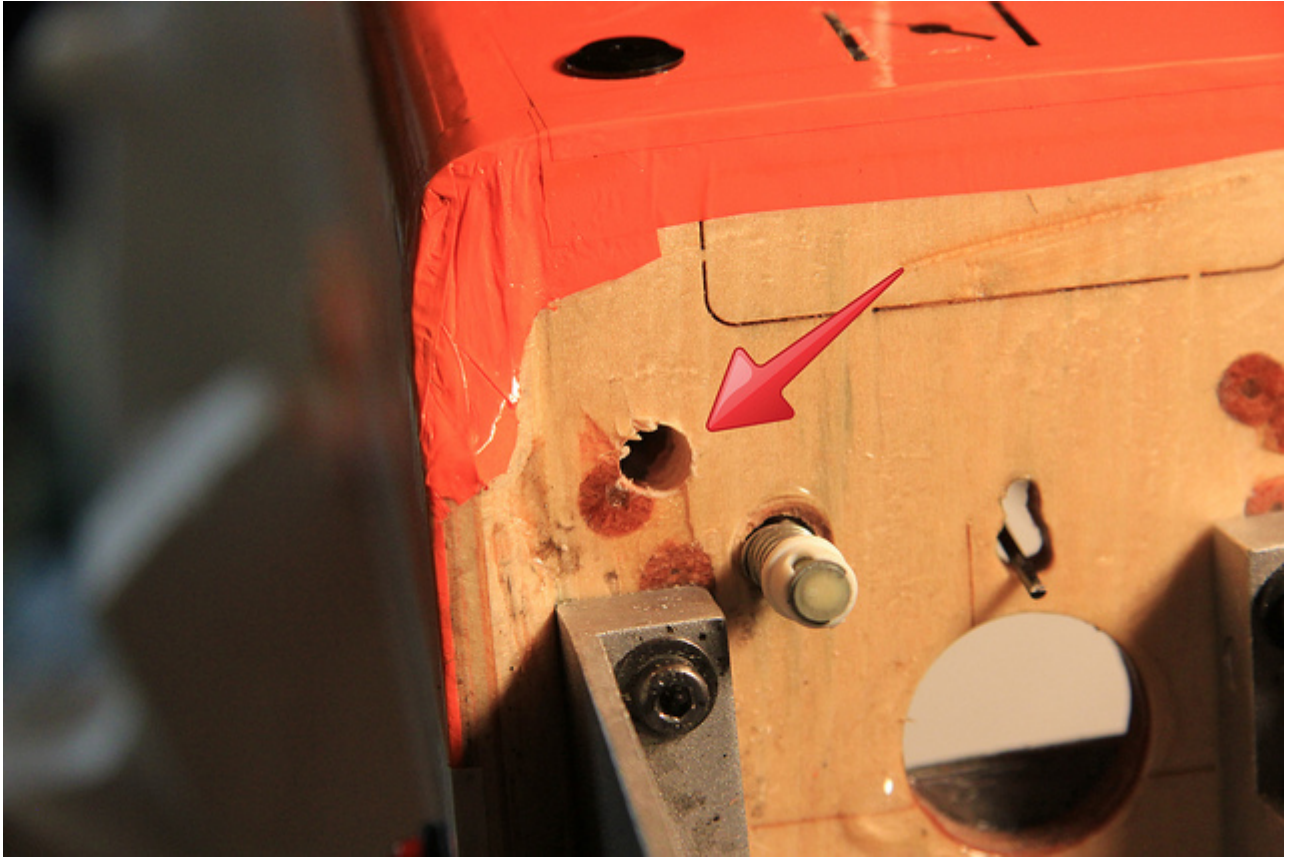
Determine the size of the hole required for the grommet by measuring the panel diameter (the diameter of the groove, n"):



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For the grommet I used, the panel diameter was  $9/32''$

Drill a hole to accommodate the grommet:



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Using a razor blade or hobby knife, carefully cut one flange off of the grommet:



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Apply some glue to the remaining flange (I used medium CA) and fit it into place:



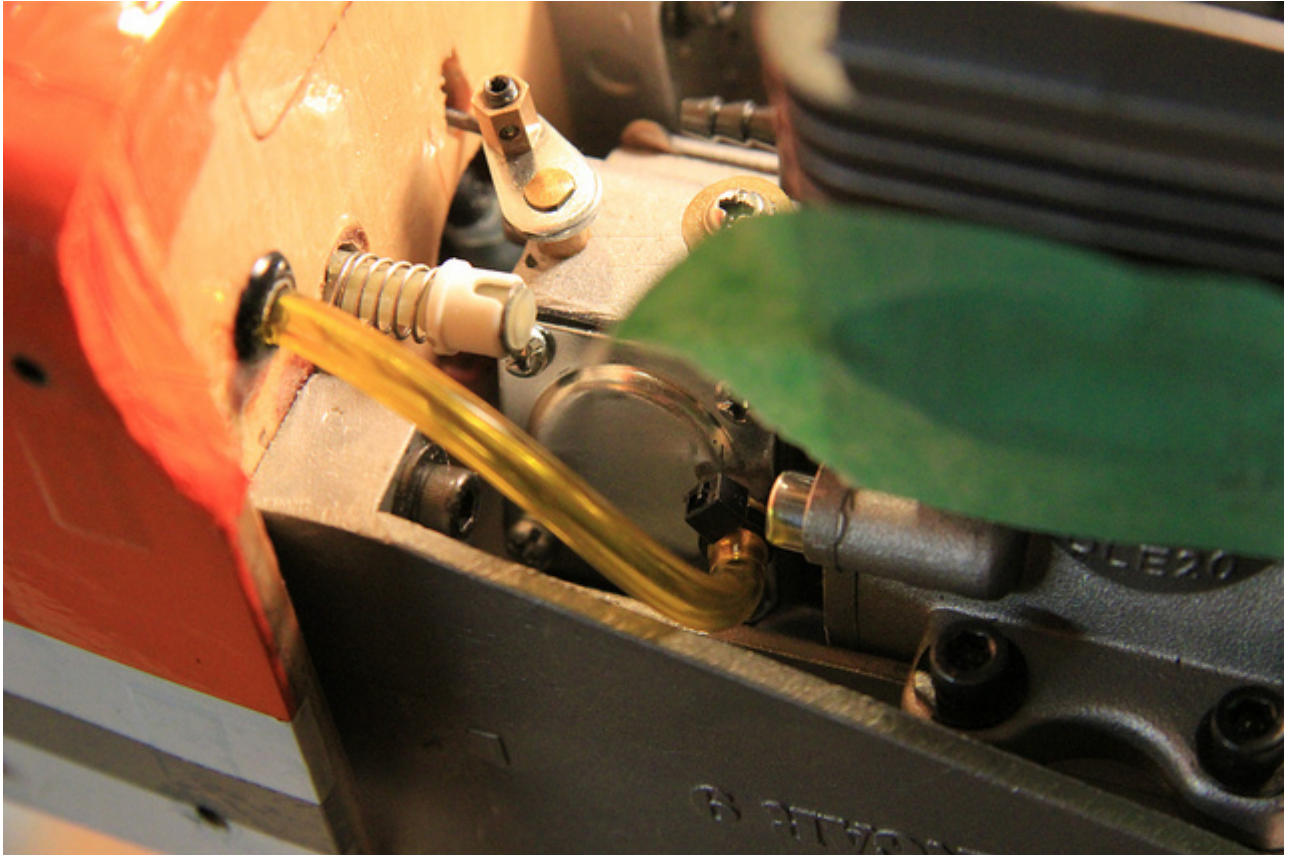
Allow the glue to cure.

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## **Route and secure the pressure line**

Reinstall the engine in the mount and pass the pressure line through the grommet:



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*There are a lot of options for securing the pressure line. I chose to anchor mine with a pressure fitting bolted into an existing hole in the fuselage structure*

Secure the pressure line:

