

plug and using a large socket to seat the plug in a bed of Permatex, not really wanting to cause any problems with the plug and damage it. Jack informed me that the actual seal is made as the concave plug is inserted in the hollow crank and then expanded by using a hammer and something strong to flatten the plug. He said that with a proper installation as the plug is flattened, the seal is made and the plug will stay in place. My engine lost about 2 quarts of oil in about 5 minutes. I don't know how little oil an O-320 needs to run and generate power and don't really care to find out. When that plug opened up, I know that it sure made a big hole for oil to leak out.

Those homebuilders using a fixed pitch prop – either wood or metal – with an engine that has a hollow crankshaft may want to inspect the crankshaft oil plug the next time you have the prop off the engine. Those installing the plug need to be less timid than I was and make sure that the plug is well seated and flat, neither concave nor convex.

Addendum: several years ago Lycoming required crankshafts running behind fixed pitch props to be inspected for pitting. This required pulling the front crank plug. I enlisted Phil Duyck, who has patiently instructed me about the proper way to maintain airplanes on more occasions than I can count, to walk me through the procedure. We drilled a hole in the crank plug, threaded in a meaty sheet metal screw and used a slap-hammer to pull the plug. After the inspection, (we removed about two film canisters full of creamy sludge) Phil took the new, concave plug, put a bead of ProSeal around the edge, and carefully lined it up inside the crankshaft. Then he put a heavy cylindrical bucking bar up against the forward face the plug and picked up a really big hammer.

I closed my eyes.

There was a big bang and when I opened them again, the plug was no longer concave and there was line of ProSeal all the way around the circumference. These plugs need to be set with authority.

This is a point that any builder buying new engine needs to be familiar with, because no matter what prop is to be installed, the front plug on the crank will have to be removed. If a fixed-pitch prop is going on, it will have be replaced, and replaced correctly. Otherwise... well, talk to Doug.

SLOSH IN THE TANKS

Evan Johnson, of Redding, CA, assembles and repairs RV fuel tanks as a business. Here's his take on that subject:

In the early days of RV building, Van's recommended the accepted practice of "sloshing" fuel tanks. This entailed pouring a sloshing compound, about the consistency of latex paint, into a finished tank and rotating the tank so the slosh spread itself evenly across every surface and joint. The idea was that it would seal

any pinhole leaks.

Then stories about the slosh coming loose and floating around the tanks began to surface and Van's reviewed the situation. The result was that Van's changed the recommendation, and stopped selling sloshing compound. An aluminum tank, properly assembled with tank sealant, would not leak and, improperly applied, the slosh could cause more problems than it solved.

Recently several of my clients admitted that they had been flying with peeling slosh in their fuel tanks. I find this truly alarming.

In my experience, properly applied sloshing compound sticks very well to the insides of an aluminum tank. Adhesion problems arise mostly on very smooth surfaces. If you scuffed up the entire inside surfaces of your tank with a scotchbrite pad or used slosh only in cracks or on top of rivet heads, you very likely have no worries. The areas where it seems to be having trouble sticking are typically the smooth underside of the skins and rear baffle.

When it does come off, you will start to see small white particles in your quick drain and in your gascolator. If nothing is done about it, the slosh will start to peel in larger and larger pieces. I have seen sheets of it as large as a business card waving around in the fuel like sea kelp. A piece the size of a corn flake is large enough to wrap over the fuel pick up and starve your engine. I hate to imagine that on climb out.

If you have slosh inside your tanks, you have several options:

- Monitor it carefully and keep flying.
- Get it out of your tanks.
- Buy or build new tanks (my favorite).

If you are fairly confident that your slosh is applied properly then by all means keep flying. My suggestion is to be extremely vigilant in monitoring its condition. Watch for particles during your fuel inspection at each pre-flight (gascolator and water check). Periodically use a flashlight to look for loose material inside the tank through the fill up. No smoking please! It is very important to remove the tank and inspection plate to check your fuel pick up, make this at the very least a part of your annual inspection. Small flakes of slosh can slowly build up in the slots cut into the pick up. If you have gone this far, the screened fuel pick-up in Van's catalog is a bargain. You get a much larger open area to draw fuel through and a pre-filter to catch small particles, all at a price that's less than you could build the part for yourself. I encourage all of my clients to use them.

Removing the sloshing compound is possible. I have done this on several occasions, but it wasn't fun. It is a nasty process, requiring a good respirator, a well-ventilated area and several layers of alcohol resistant gloves. I use blue or green Nitrile exam gloves available at most local pharmacies. Do NOT use standard "turn your head and cough" white latex gloves. MEK



(methyl ethyl ketone) will melt latex immediately. The Nitrile gloves will hold for a few minutes. You will have to cut a large hand hole into the rear baffle centered in each bay, and build a cover plate to reseal them when finished. The slosh can be dissolved using an MEK soaked rag. Wipe it over a small area of slosh, give it a few seconds to soften, then scrub it with a scotchbrite. I have considered just dumping a gallon of MEK in a tank and shaking it around for a while, but to be honest I don't know how it will affect the sealant. I consider this too large a risk. After about two days of this, you should have the tank pretty well cleaned out. The areas where the slosh does not release will be in the cracks and over the rivet heads. At this point you can seal any residual particles in these areas with a thin layer of sealant. Use sealant and closed-head pop rivets (AD 41H) to reseal the rear baffle with your cover plates. Pressure check with balloons and soapy water, and you are done. Your wrists will be cut and sore and you will have an imprint of a respirator mask on your face, but you won't have to rebuild your tanks, and you won't have to repaint (unless you melted your paint with the MEK).

The last option and by far the safest, is to replace your fuel tanks with new ones. Those of you willing to take on the task are encouraged to do so.

If a repair seems too unpleasant or intimidating, I can build you brand new slosh-free tanks (check out my new website www.evansaviationproducts.com.) You will receive pressure checked tanks with 1/4" oversized trailing edges on the top and bottom and none of the tank attach points drilled. This will allow you to fit the tank, trim off the extra material and match drill all of the attach points to your existing wing. For those of you who are lucky enough to have bought your wing kits after Van's started pre-punching the ribs, I can use the pre-punched, standard sized skins so there's no trimming. These are provided for the RV-7, RV-9, and the newer RV-8. The RV-4, RV-6 and early RV-8 do not apply here.

The last bit of preachy wisdom I have on the subject is this:

We all take enough risks without knowing about them. If you know that you have loose slosh in your tanks, do something about it!

TANK REPAIR

David Welsh

Hey, you guys have always given me good advice and tech help, so I thought I would try to reciprocate. Here's something to put in your "bag of tricks" when a fuel tank has leaks. I had two leaks on one of my RV-7 tanks where the baffle meets the skin. Rather than cutting open the baffle and reaching in to re-apply sealant, I used a telescoping 1" inspection mirror and a Bend-a-Light (both from Sears) to look in to see where the leak might be coming from. After seeing that the suspect area was somewhat accessible, I bought a regular automotive grease gun, some 1/4" copper tubing and a 1/8" NPT x 1/4" tubing fitting to connect the tubing to the gun. I mixed up about 5 ounces of sealant, bent the copper tubing around to where it needed to go into the tank, then slowly pumped out until the area in question had a nice fillet glob covering it. All this while watching the tip of the tubing with the inspection mirror and the light to make sure it was going in the right place.

This required another person to hold the gun and pump the handle, but it works. The tank passed both the soapy water and manometer pressure tests. Of course, the grease gun and tubing were useless when we were done, but I had less than \$15 in them so it was no big deal. Much easier than cutting a hole and installing new mounting rings with nutplates, etc. Now this won't work on all areas of the tank, but at least four of the six bays can be accessed this way through either the inspection hole or the fuel filler cap. My leaks were in the second bay in from each end. A challenge, but doable. Just thought you might be interested and could pass the tip along to somebody else if it ever comes up.