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Inherit the Wind: RV-12 Style

by Ryan Stark

I have been a pilot since 2005, and while I have done a fair amount of flying since that time, I have always rented the planes I have flown. This has both advantages and disadvantages, but for me the advantages have always been greater. Since earning my license, I have never really had any place I needed to fly. I have taken trips to see my in-laws around the Chicago area. I have picked up my Mom from various business trips that she's taken, and I've done a few business flights, but none of these needs were consistent enough need to warrant my own plane.

The Ownership Dream

It's not that I haven't been tempted, mind you. Like most pilots, I have my favorite aircraft (Republic SeaBee, Lake LA-4, Cessna Skymaster, to name a few) and have often dreamed of driving to the airport, opening up the hangar, and seeing my own aircraft sitting right there just waiting to be fired up. Having a window in my office doesn't help either. Looking out on a nice sunny day, I feel a strong pull to stop when I'm doing, head to the airport, and take off, knowing that my airplane will be ready to go. However, obligations to family and business have kept those dreams at bay.



Photo courtesy of Van's Aircraft

It helps that I can rent possibly the nicest Cessna 172SP in the tri-state area virtually anytime I like, so I can satisfy my flying itch when it needs scratching. I can also say that I have really appreciated not having to deal with the hassles that inevitably go along with ownership, like oil changes, annuals, and the guilt I'd feel when I go three to four months between flying. Working in the oil analysis business, I can see the problems that develop in aircraft engines when they aren't flown enough. Still, when you rent an aircraft, you never really know it like you would as an owner. All the little quirks that might identify a particular airplane are lost on me and if something changes in the one I fly, I don't know if it's a normal occurrence or possibly a problem.

Enter the RV-12

All of this changed with the unfortunate passing of my father Jim Stark back in November. You might remember from his newsletter article back in February of 2015 ([you can read it here](#)) that he was assem-

bling a Van's RV-12 kit plane. It was always his dream to build an airplane, but until he retired and moved to a different house where he actually had some room to work, building an airplane was never in the cards.

I was the prime motivator in getting him working on an airplane, though I was never really interested in building one myself. If I were to ever get a plane, I would just bite the bullet and buy one, skipping all of the time it takes to assemble one, which can easily stretch out into a multiple-year endeavor. However, when Dad died I suddenly found myself with a half-finished airplane and a bunch of tools I don't know how to use. So after some discussion with my wife, we decided to jump in and start building.



Photo courtesy of Van's Aircraft

One of the big factors in this decision was how fun the RV-12 is to fly. I took a demo flight at Oshkosh last summer and decided that this was a plane I could easily get used to. The only downfall was that it only had two seats, so I couldn't take my wife and kids anywhere at the same time. But I could see that this was a good introduction to aircraft ownership and also fun to build.

The up-side to building your own plane is you will know exactly how it all goes together and you can also do all of your own maintenance, which can be a big time- and money-saver down the road. Plus, depending on how the building goes, I could make a 4-seat RV-10 my next project and then I'd have something the whole family could take somewhere. But that's getting ahead of myself.

Attacking the learning curve

I have what I consider to be a fairly strong mechanical background, but I've never done anything on an aircraft other than fly it. So far, building the RV-12 has been an adventure. The laboratory business is all metric, but I quickly learned that the metric system has no place in the aircraft industry. In fact, in some areas like drill bits, they don't even use standard measurements, so buying my drill bits at the hardware store is out.

It also appears that deburring parts will be a large part of my life for the next few years. Fortunately my wife is ready and willing to help and will probably be the driving force in getting this project done. Deburring parts is a good place to start, at least until she is strong enough to run the rivet squeezer (better start hitting the gym, baby!).

Van's sells a few practice kits (a tool box and a section of wing), so I bought those and have been trying my hand at riveting. The results weren't pretty, but I keep saying to myself that I'll be more careful when it comes time to actually work on the plane. At least I hope I will.



Photo courtesy of Van's Aircraft

I also bought a set of DVDs that show exactly how to build the RV-12 step by step. I know this is something Dad wouldn't have approved of (he never met a set of instructions he didn't throw away), but I don't have the advantage of having an A&P license like he did, so I'll take any help I can get. At this point, I'm just getting started, but with any luck the project will move quickly. Now if you'll excuse me, I've got a fuselage to finish!

Report of the Month

This IO-550-N has seen better days. Can you tell what's going on?

To learn more about where the elements are coming from, [click here](#).

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	21	UNIT/ LOCATION AVERAGES	22	34	21	34	UNIVERSAL AVERAGES
	MI/HR on Unit	443		423	401	367	346	
	Sample Date	3/29/16		9/19/15	5/1/15	1/15/15	9/21/14	
ALUMINUM	18	15	26	23	14	13	8	
CHROME	11	12	15	18	12	13	8	
IRON	70	68	120	118	57	68	49	
COPPER	16	19	18	19	11	12	6	
LEAD	4120	4511	6066	7723	3855	4253	5883	
TIN	1	3	5	3	2	0	1	
MO LYBDENUM	4	4	6	7	5	5	3	
NICKEL	9	7	20	29	15	14	11	
POTASSIUM	0	1	0	1	0	0	1	
BORON	1	2	2	2	0	0	1	
SILICON	20	14	27	28	23	19	6	
SODIUM	2	3	0	1	1	1	1	
CALCIUM	12	20	3	5	3	2	39	
MAGNESIUM	2	2	3	0	1	1	1	
PHOSPHORUS	958	552	316	630	86	170	487	
ZINC	35	10	9	6	6	4	7	
BARIUM	0	0	0	0	0	0	0	

Values
Should Be*

PROPERTIES	SUS Viscosity @210°F	94.3	89-105	103.8	95.7	99.5	95.3
	cSt Viscosity @ 100°C	19.02	17.7-21.8	21.25	19.35	20.24	19.25
	Flashpoint in °F	490	>445	485	470	505	530
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-	-	-	-	-	-
	Water %	0.0	0.1	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.6	0.4	0.4	0.2	0.3
	TBN						
	TAN						
	ISO Code						

*THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

Every superhero has a weakness--Superman has Kryptonite, Iron Man has a bad heart, Wonder Woman can get caught in her own lasso, and aircraft engines are no different. For Lycomings, it's the piston pin plug, for Continentals it's the starter adaptor. Albeit a bit Rube-Goldbergish, the starter adaptor is a fairly simple device. An electric motor spins a spring at high speed; when the spring turns, it elongates and the inside diameter contracts around a steel drum. This drum is connected to the crankshaft via a set of gears in the accessory case. This system can work perfectly for many years but when the starter starts slipping, it can cause big problems. Sometimes we don't see any signs of it, but in the case of this engine, the owner let us know the starter adaptor was bad when the sample was submitted, which made our job easier. If you look back between January 2015 and May 2015, we saw a significant jump in wear, so we suspected the problem may have started there. Since there are a lot of steel parts in the adaptor, iron is the most common metal we see when one goes bad, though we might also see some copper and aluminum as well.