International Cessna 120/140 Association

Issue 415 Summer 2020 May/June/July

Jack Fleetwood gave us permission to raid his flicker account when we have need – thanks Jack!!

In this issue

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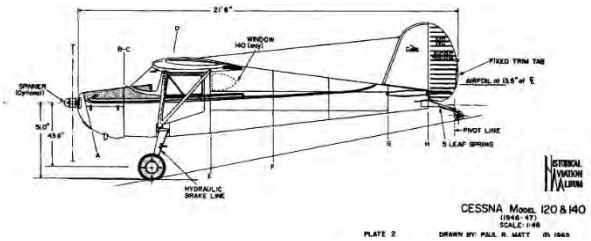
Off Field Landings

Scott McPhillips



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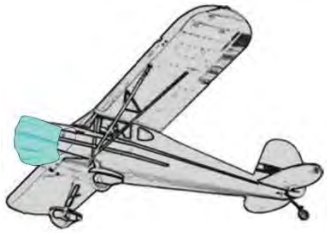
A note from the Editor; my personal COVID update



I started this page as an apology for being late on this issue… OK , so there it is.

However, in speaking with friends, family, work associates and the local Rotary Club (?) it just seemed like everyone wants to know what it is like having the COVID 19 virus. Of course, my family's experience is not intended to provide any medical advice or information so please don't throw rocks at me if my experience doesn't match the many sources of excellent information that is available. It's just what happened to me.
Let me also acknowledge the severe cases that have happened, perhaps to someone you know, and offer my sympathy to you and your loved ones. I can appreciate how serious this can get.

I have been traveling to the desert storage facilities in California, Alabama and Arizona. First, to park and preserving the aircraft. The aircraft were being parked due to the dramatic reduction in flights and revenue associated with the pandemic. As the summer continued, we returned to the sites to pull them back into service as the demand for flying increased. This was shaping up to be an interesting summer of unique opportunities.

This is me in the high desert of Victorville, California.

This year I am 59 years old. I don't exercise much and have an occasional fondness for desserts (not deserts). I guess the only thing any of us know is when we start feeling the symptoms – although some folks don't even have those. My worst days were 2-5 when I experienced extreme fatigue, moderate body aches and light-headedness. I started regaining some strength on day 6 going forward. Nausea, diarrhea and coughing began on day 8 and the diarrhea left after only two days. The nausea was pretty mild the whole time and lasted until day 22. I decided to get tested again on day 22, hoping for a negative test result. The second test came back positive as well. The last of my symptoms were fatigue and coughing which left me on day 32.
I never had a fever, being checked countless times.
My wife Heidi got it from me, and her symptoms included fatigue, fever, loss of taste and muscle aches. She turned the corner at day 12 and considered herself fully recovered at day 15, now being day 24.

Pepto Bismol, Advil PM, Vitamin C and Theraflu. Our blood oxygen levels stayed above 95%.
My two teenagers seem to be bullet-proof. I can't see how they could have avoided exposure having been living with two positive test patients for a month. We'll get tested before school starts and hope for the antibodies.

We regret to inform you that our 2020 convention has been canceled this year due to the continuing impact of the COVID 19 virus.

2020 INTERNATIONAL CESSNA 120/140 CONVENTION (KDVN) DAVENPORT, IOWA SEPTEMBER 8-12, 2020

Primary Hotel
Best Western Plus Steeplegate Inn
100 W 76th St, Davenport, Iowa 52806
(563) 386-6900
Cessna 120/140 Group Rate $90/night
http://www.steeplegateinn.com/

Please ensure that you cancel your room reservations at the hotel.

With deep sadness had to make this decision due to the mounting difficulties that we were encountering trying to secure our best laid plans. The environment had been constantly changing, and we finally exhausted all our possibilities to bring this convention to you.

A huge thank you to our Hosts Vince and Denise for the hard work they have put forth during this whole year. Our Officers and Board Members worked in support to overcome the many difficulties encountered this summer, but ultimately is was clear that this unfortunate outcome was the wise choice.

It is our hopes that these plans may still be realized as we continue to explore several options for 2021.

Scott McPhillips

Freeport Illinois

… Christian Vehrs

In this issue, we pick up where we left off recounting the early years and initial business model of Hooker Harness. Today I'd like to finish the rest of the story about the transition of the company to one of its former employees and now owner, Scott McPhillps.

This is such a great story that I had to ask Scott if he would be willing to let me come to the facility and let me interview him. I asked Lorraine Morris to tag along so I wouldn't get lost on the way. Since she was in the process of purchasing a set of harnesses for the UNO project that she and Ken are restoring, this could be an opportunity to save some shipping.

As you can see on the background display, Scott has elevated the company's product line to include some of the finest harnesses for the race car industry while still providing the same excellent aviation harnesses that we have all come to love.

Scott's relationship with Hooker Harness goes back to his teenage years when he began working part time. In those years, he was cutting webbing material, assembling hardware, sewing various webbing configurations and producing the final assembly of aircraft harnesses. Still a teen, Scott made his first trip to Oshkosh in 1987.

During his first trip to Oshkosh Scott helped support the Hooker Harness booth. He also found time to provide help in the warbird area by marshalling aircraft to the ramp, provide parking and additional ground support. Hooker Harnesses were already known in the warbird community and Scott's help was a natural extension of that relationship.

Scott began his college education at the University of Illinois in Champaign. He continued working during summer vacations and breaks throughout the year. He graduated with his degree and transitioned to full time employment with Hooker Harness in 1993.

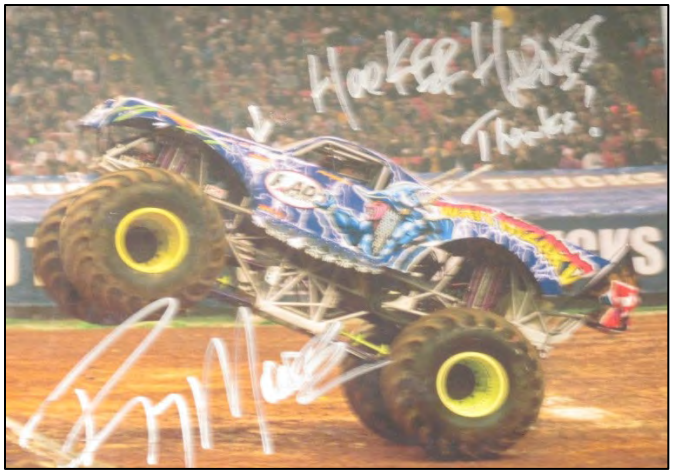
Scott's role in the company grew to increasing prominence as he provided coverage in the manufacturing facility during staff vacations and various road trips. Scott himself made a number of trips to Oshkosh and the Reno Air Races where the Hooker Harness product line continued to grow.

Speaking of product line, Scott was the key leader who was instrumental in bringing Hooker Harnesses to the auto racing industry.

As I look back on the photo files from my visit, I remember being overwhelmed by the huge number of autographed photos (mementoes of thanks) from the race car teams that are relying on Hooker Harnesses. And, just like the aviation product line, Hooker Harness has garnered some of the most prestigious clients in the auto racing industry.

Racing teams from dirt track Sprint cars all the way up to NASCAR have sought Scott's help keeping their drivers safe.

NASCAR Driver Greg Biffle with his Jack Roush Ford and pit crew set eight rookie records, including most wins, most races led (19) and most money won.



I'm not sure how Monster trucks rate on your cool meter, but they're pretty high on mine.

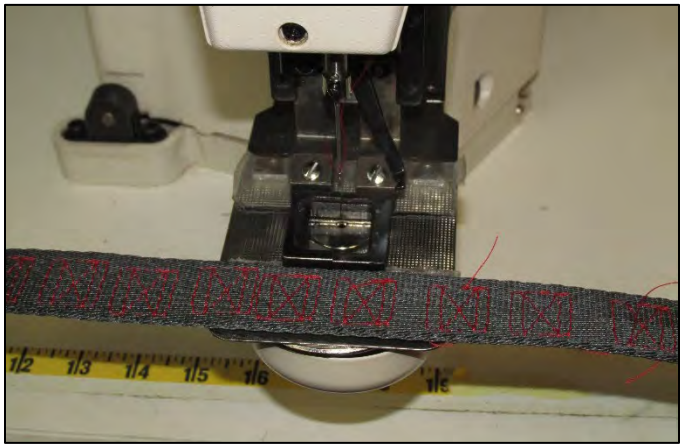
Scott began our tour by showing us where a harness begins its life – the webbing material. I never imagined all of the different material used to produce harnesses. Each application has its own specifications, ranging from race cars, vintage warbirds, unlimited class aerobatics, experimentals and even our beloved Cessnas, as well as many other factory aircraft.

With such a large variety of webbing material comes an even larger variety of sewing thread in various weights, colors and strengths.

Of course, no harness can be assembled without the unique hardware and fittings that bring it all together. Hooker Harness stocks an amazing inventory of ratcheting devices, clasps, buckles and anchors for each application.

Putting it all together requires some interesting processes. Scott showed us the wide variety of different machines used to manufacture Hooker Harnesses. He even demonstrated the ones that we were interested in.

All of the commercial grade sewing machines can produce a consistent and accurate pattern for securing the webbing and hardware. Each machine has a unique job to perform during the manufacturing process.



Scott and Lorraine viewing the pull testing device.

Hooker Harness has proven the strength of the seam patterns, webbing materials and attachments through rigorous tensile testing. This machine is used to pull test the materials to gain FAA approval for the supplemental type certificates when installing these harnesses on factory certified aircraft like our Cessna 120/140s.

As the company grew, it was necessary to find a building that could accommodate the expanding manufacturing and inventory. Scott was instrumental in locating and securing the building that is now their headquarters in Freeport Illinois.

January 2018, Jack Hooker retired, and Scott took over the ownership role. Thank you again Scott for such a wonderful look into Hooker Harness, and your generous support of our beloved Cessna 120/140s!

Photo courtesy of John Kliewer

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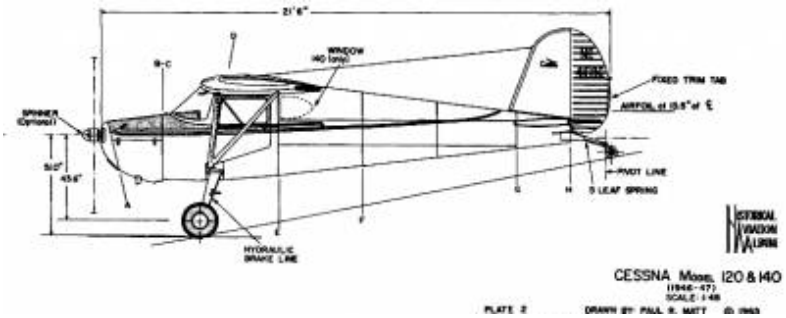
International Cessna 120-140 Association

December 2019

2020 Wall Calendar

We are always looking for some good resolution photos for our calendar!! Please send photos to Blake Mathis
blakemathis@yahoo.com



Tech Talk ...by Christian Vehrs

Propeller Position Vibration

Many thanks to our California State Representative Randy Thompson for sending us the above photo from his recent Cessna 120/140 fly-in on the west coast. Randy affectionately calls this photo the *Cessna Tri-motor* ☺ Randy also wanted to share some insight of the importance for the proper positioning in regards to the orientation when mounting the propeller on the crankshaft flange. I told Randy that I would do some research with our Technical Advisor (Victor Grahn) and gather some photos to illustrate how the orientation of the propeller can affect vibrations.

This isn't the first time I have seen this topic addressed. My fist exposure to this came from reading an article by Doug Hurd in a March 2015 issue of *Coupe Capers*, the newsletter from the Ercoupe club. Ercoupes utilize the same four-cylinder continental engine type that our airplanes originally had from the factory.

Luckily for me, several of us maintenance instructors in my office have just been volunteered to serve as Adjunct Professors at a local A&P school in the Atlanta area. This allows me access to a huge hangar with tons of equipment, various aircraft, and free labor.

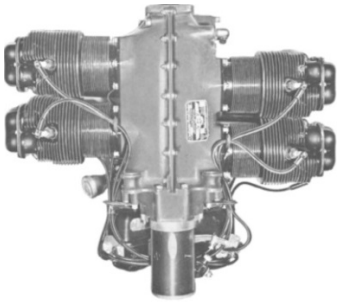
Professor Vehrs says…

The propeller will come to rest in-between compression strokes of the four cylinders. As the photo above illustrates, the most common position for the propeller at rest will be in what is commonly known as the 10 and 4 position.

This position is really convenient when using the old-fashion hand-prop method for starting the engine. But it turns out that there is more science to the position of the propeller – especially to reduce or eliminate engine vibration during cruise power settings.

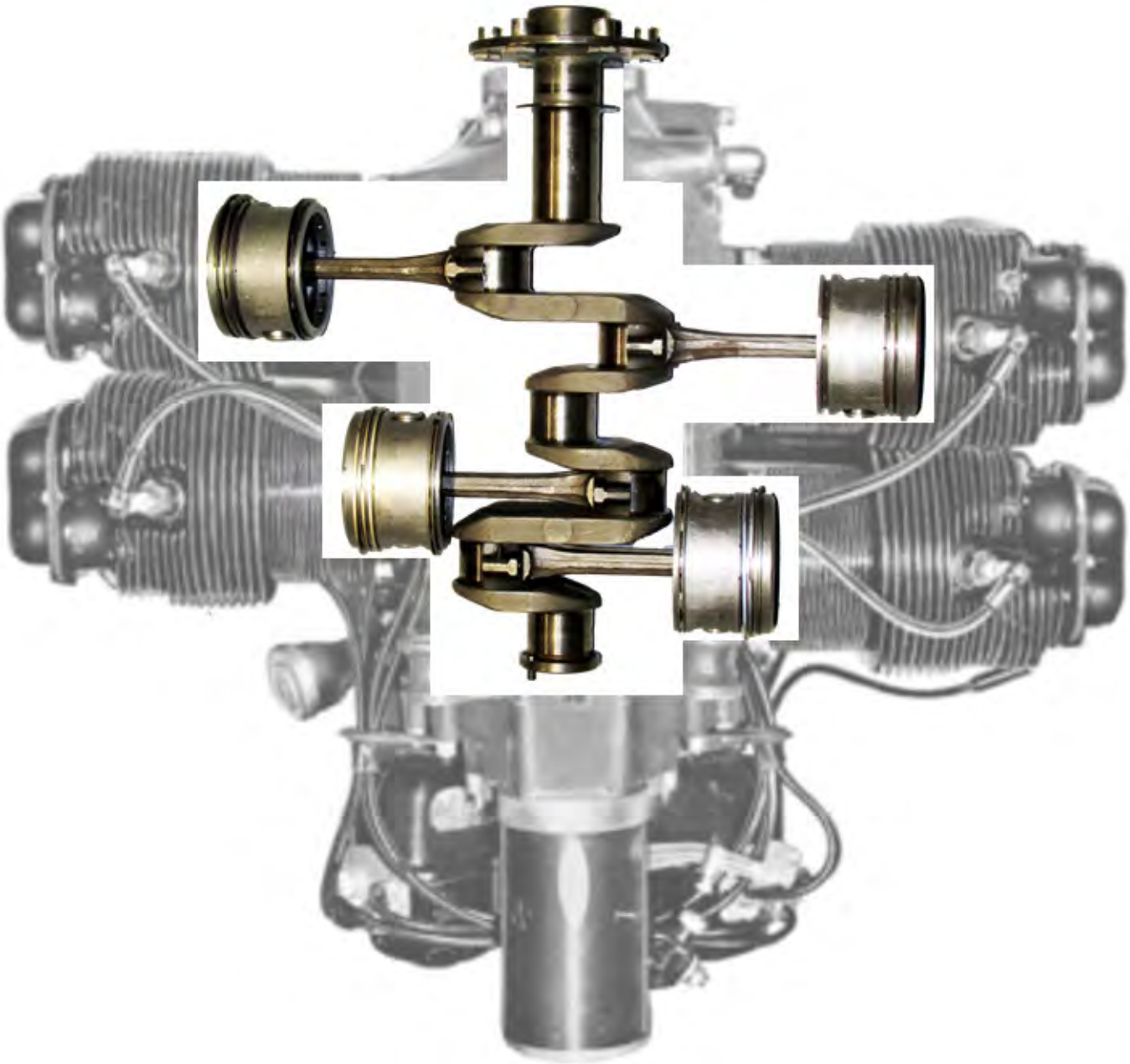
Let's start with a basic four cylinder, horizontally opposed, normally aspirated, air cooled engine like the ones we find in our Cessna 120/140s.

The three most common are the Continental C85, the C90 and the Continental 0-200.



This picture from the Continental overhaul manual shows our engine from the top view.

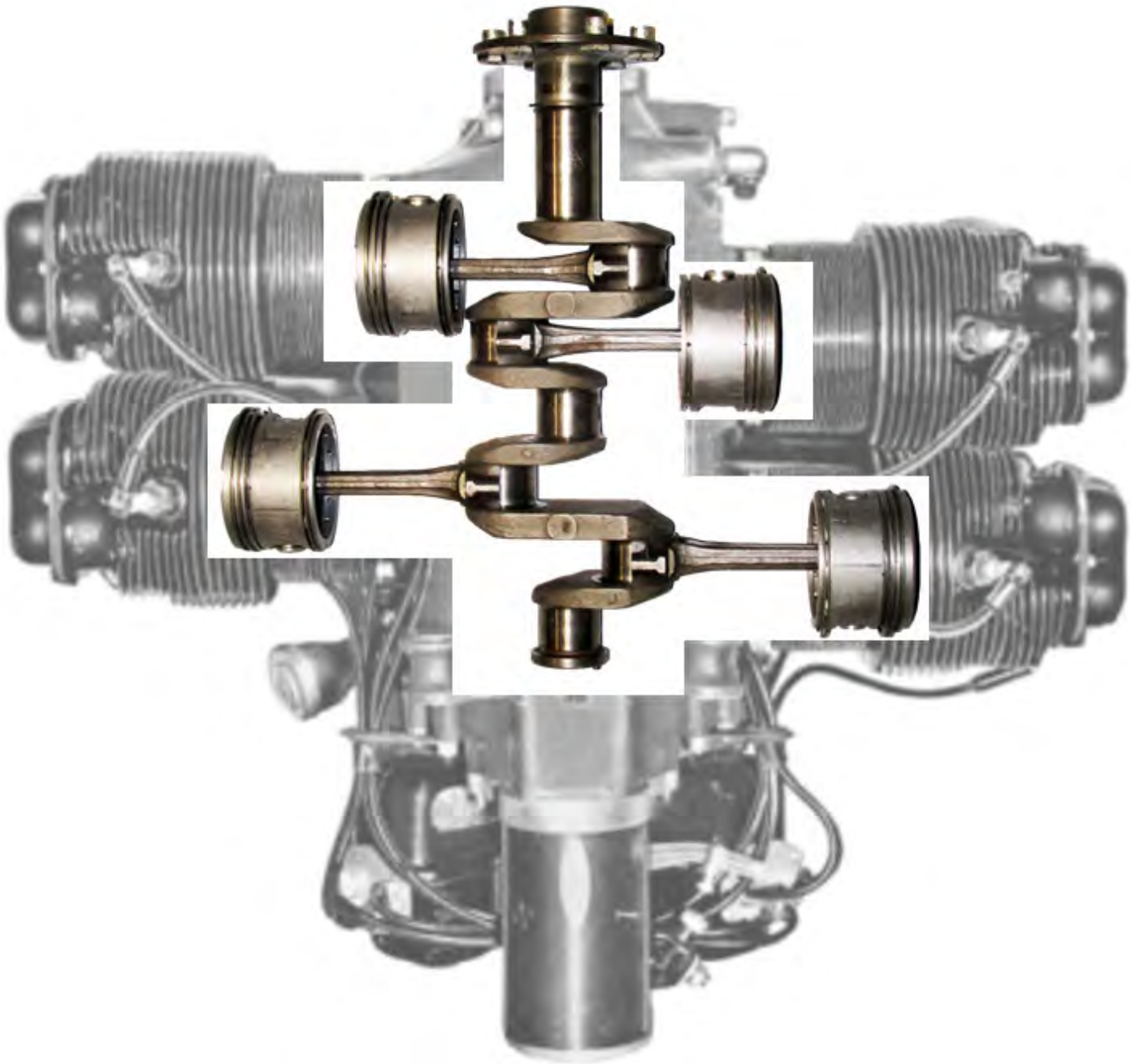
Before we get to the science of propeller positioning, I'd like to take a moment for a review of internal combustion engine basics. If we look at the cutaway image (with a little magic from Photoshop), we see the relationship of the pistons on opposing cylinders. The pistons on the front two cylinders move outward together to reach top dead center at the same time. One cylinder is reaching the top of its compression stroke while the opposing cylinder reaches the top of its exhaust stroke.



As the propeller rotates, the pistons on the front two cylinders move inward together to reach bottom dead center at the same time. It is this symmetrical motion, combined with the opposite travel of the two rear pistons moving outwards, which provide balance to the internal forces of the engine. In this position, one of the front cylinders is completing its power stroke.

Of course, other factors play a role in balancing the forces inside the engine. The pistons and connecting rods are moving pretty fast, so it sure would be good if they all weighed exactly the same ☺. Also, in an ideal world, each cylinder would have exactly the same compression, resulting in exactly the same power stroke for all cylinders. And it would be great if all bearings had perfect tolerances and the crankshaft was perfectly straight with no runout. Lastly, since we have a 69”-71” long aluminum propeller spinning over 2,000 rpm, it would be great if the propeller was perfectly balanced, straight, and had exactly the same pitch on each blade.

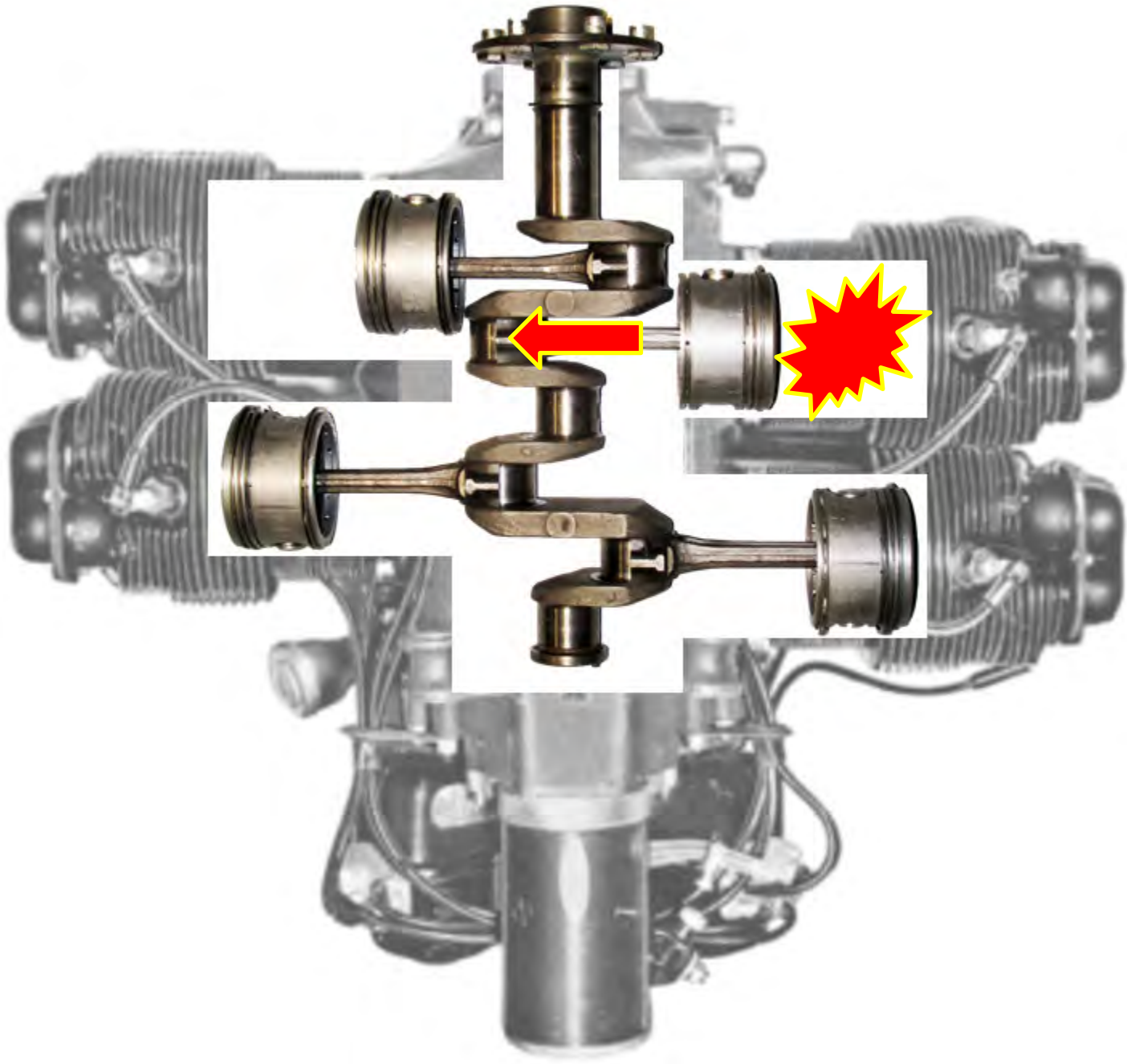
Now let’s say that all those things are true.
What is the science of mounting that propeller at the 10 and 4 position?



The answer to that question lies in the fact that only one cylinder is going through its power stroke at any given time. This means that there is a great deal of energy traveling through *one* of the connecting rods and being applied to the bearing journals of the crankshaft for a short portion of the propeller rotation.

Of course, within a fraction of a second, one of the opposing cylinders fires and the forces applied to the crankshaft are coming from the other side. It's a pretty tough life. Now, we'd like to think that our crankshaft is completely rigid and does not flex, even by the slightest of margins. However, this is not true.

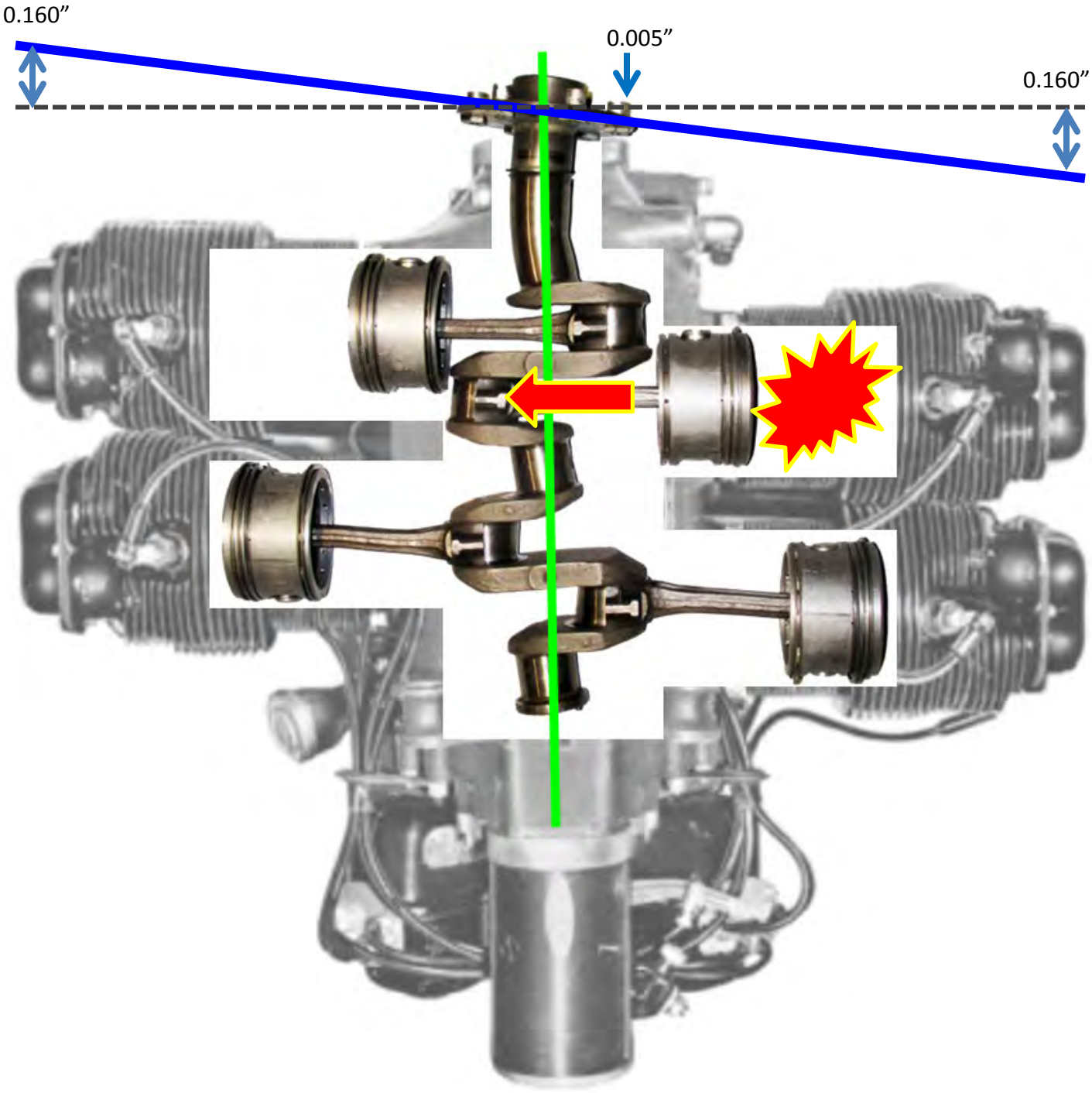
Actually the crankshaft flexes in two directions. The first is *rotational flex* due to the torsion produced by the power stroke, and much has been written about this. However this is not the kind of flexing we are concerned with today. It's the *crankshaft centerline flexing* that can cause the vibrations we are interested in reducing.



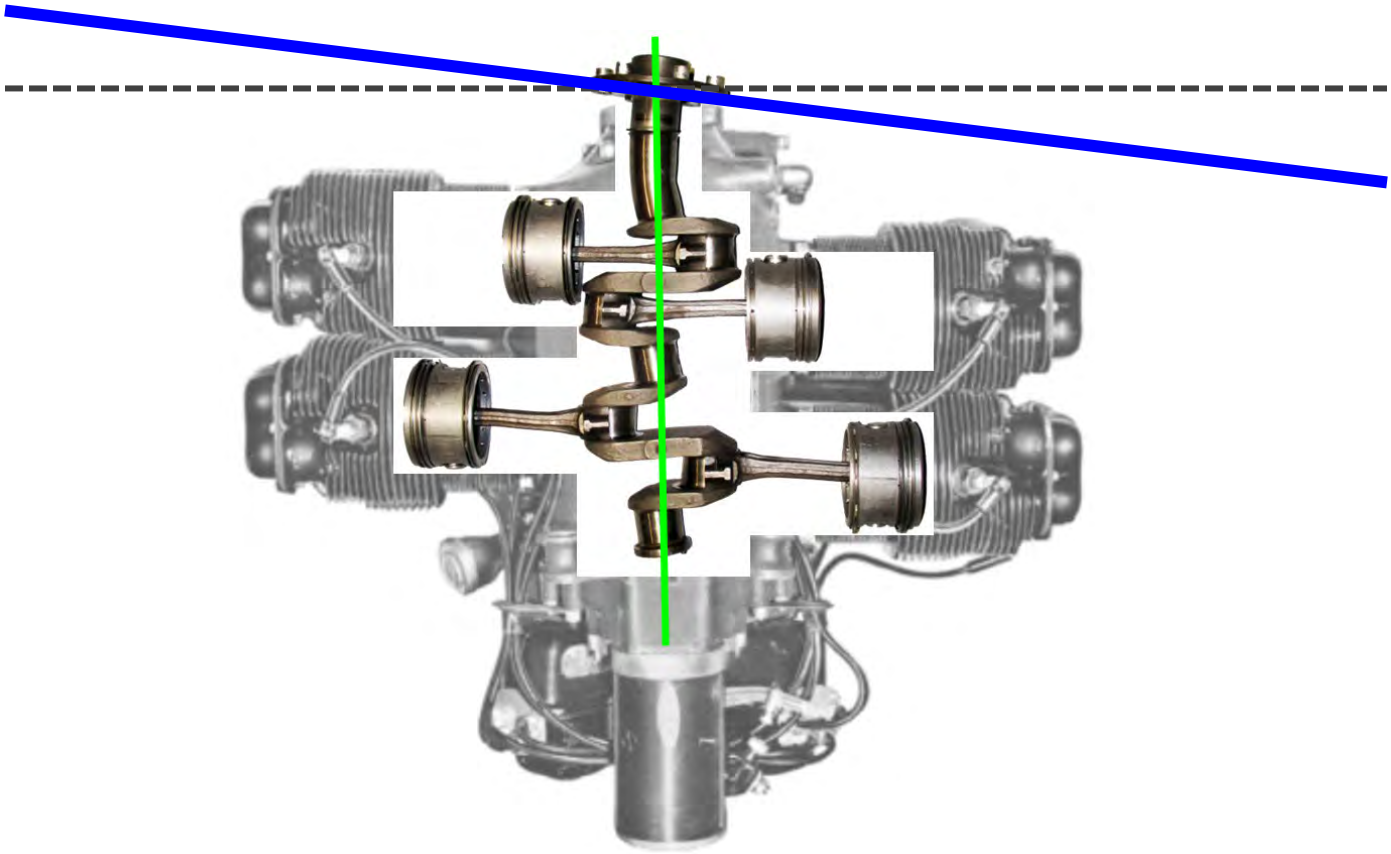
Obviously, we have exaggerated the deflection represented here to illustrate our point. But some very simple math reveals that just a little deflection of the crankshaft flange can result in enough propeller movement to cause noticeable vibration.

If the flange is deflected just 0.005” (which is 1/10 the thickness of a human hair), the resulting deflection at the tip of a 69” propeller (32” from the flange) would be 0.16”.

Since the flange/propeller deflection will alternate in both directions as opposing cylinders fire, the combined deflection would be .320” (or more than one quarter inch). We can easily imagine that even 0.001” or 0.002” crankshaft flange deflection could cause a noticeable vibration at cruise power settings. Because of the inertia of the spinning propeller, the tips will resist forward and aft movement, and simply send the energy back through the engine and airframe (known as torque-induced precession) resulting in that annoying vibration.



Now that we understand some of the forces acting on our propeller, let's see how that 10 and 4 position works in our favor to eliminate or reduce vibration. The crankshaft flange deflection will always be on the horizontal plane since our cylinders are mounted in the horizontally opposed configuration. If the propeller is orientated so that the blades are traveling at, (or around) horizontal during the power stroke (as in the photo below), then the crankshaft flange deflection will have it greatest negative impact. Consider that the propeller in this configuration is 69" – 71" wide.

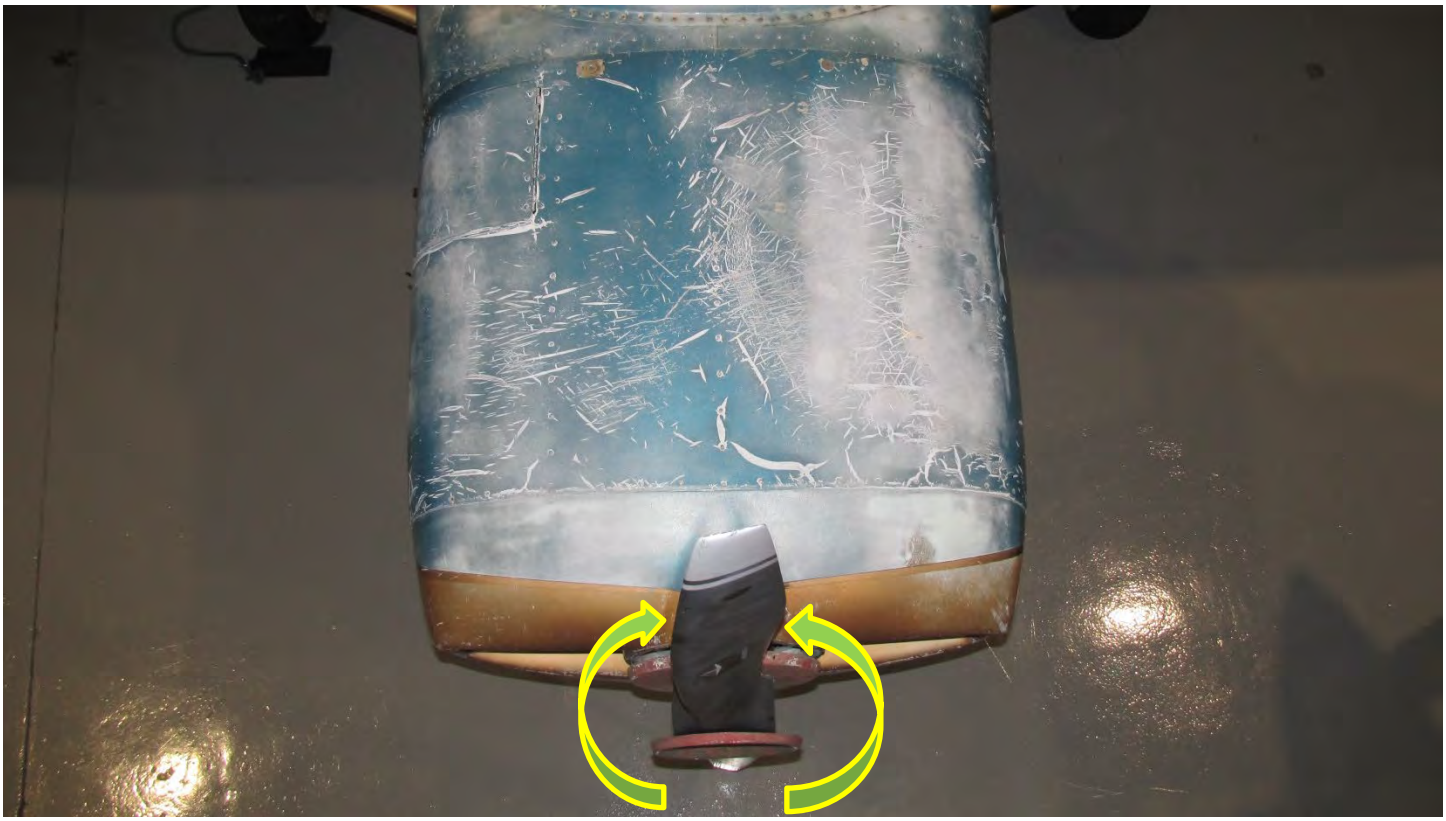


This orientation is seen when the propeller is mounted so that it comes to rest in-between compression strokes at a place somewhere *other than* our favored 10 and 4 position as seen in the photo below.

We can greatly reduce the effects of the crankshaft deflection when we mount the propeller in our favored 10 and 4 position as in the photo below.

When we do that, the propeller will be traveling at (or near) vertical as the crankshaft receives the power stroke. This will not cause the propeller tips to be moved forward and aft, rather, will only cause a very mild twisting force on the blade since the propeller tips are on the same vertical plane as the crankshaft flange. Also, since the width of the propeller now equals the width of the flange (not 69" - 71") the deflection experienced will be only be the few thousands of an inch (associated with the flange deflection) and will be virtually undetected at cruise power settings.

We could write an entire textbook chapter on the topic with greater depth of the technical information.
But for our purposes, I figured a couple of pictures are worth a thousand words.



Notice I have been very careful not to say that the 10 and 4 position is the ***correct position.***
This is because it is common to change the position of the propeller whenever you are trying to diagnose vibrations. It is the quickest and easiest (and cheapest) thing you can try to reduce vibrations.
Often, you can reduce or eliminate a pesky vibration simply flipping the propeller 180°
Some aircraft are flying with the propeller mounted in other than 10 and 4 simply because this position yielded the smoothest operation in real life. Choose whichever position yields the smoothest operation.

Our International Rep in Germany regrets to inform us that the 5th Nostalgic Air Picnic in **Wershofen Germany, September 5-6**

Canceled due to COVID 19

In Loving Memory
Dorchen Rubel Forman (Dorchen Rubel Van Dyke**)**
March 28, 1930 - June 1, 2020

From the obituary provided by her daughter Jennifer…

Daughter of Dorothy and Heinz Rubel, Dorchen was born in Berwyn, Illinois, and grew up in Glendora, California. Over the course of fifty years of marriage to her husband John Forman, she lived in Ojai, Ventura, South Pasadena, Anchorage, Boulder, Lake Dallas, and Goleta. Dorchen raised four children: James, Jennifer, Peter, and George. When they moved, she eagerly explored each new place, pulling in a net of fish each morning in Alaska and camping all across the West with her children and a dog in her VW Microbus. She wrote and edited *Rocks in Her Head*, memoirs of what it was like to be married to a geologist during that era. After John's death in 2000, she later married Bruce Van Dyke in 2003, taking on his passion for gardening, orchids, and rare fruit.

Dorchen was an avid pilot and loved meeting up with pilots and friends flying cross country to Oshkosh and other fly-ins in her bright yellow Cessna 140 tail-dragger (*4239 "No-wonder"*). She flew in all 50 states as well as Puerto Rico, Germany, and New Zealand. Her solo flight from Texas to Alaska to celebrate her 60th birthday illustrates her great sense of adventure. She was a proud member of The Ninety-Nines International Organization of Women Pilots, The Experimental Aircraft Association, and eventually became a member of the United Flying Octogenarians (UFO). She enjoyed editing the International Cessna 120-140 Association newsletter for years and self-published *The Cessna 120/140 Story Book*.

Music was her other defining interest. She played jazz piano by ear, sang in many musicals and choirs, and studied choral conducting. She taught and played guitar—including on her weekly television show while in Alaska. If anyone named a tune or hummed a few bars, she could find a key and play along. No gathering was complete until she played the piano and sang while others played or sang along.

Dorchen loved people. She threw parties at the flimsiest excuse and opened her home for meals and overnights to extended family, friends, and strangers. She remembered everyone's names and birthdays, as well as embellished versions of their connections, exploits, and accomplishments.

Dorchen is survived by three of her four children, Jennifer Mawhorter, Peter Forman, and George Forman; her children's spouses, Lisa Forman, Richard Mawhorter, Marilyn Forman, and Deirdre Forman; and ten grandchildren, Olivia Forman; Sarah, Peter, John, and Ross Mawhorter; James and Charles Forman; and Elena, Tova, and David Forman. She is recently predeceased by her husband Bruce Van Dyke, her son James Forman and her brothers Chris Rubel & Michael Rubel. She counted Bruce's children and grandchildren as family, including Peter and Sharon Van Dyke with son Nicholas, Kath and Steve Beltran with daughters Mari and Kate, granddaughter Papaya and her husband Mark Aspromonte with their four children: Lily, Josie, Matteo, & Alex.

Off Field Landings… Christian Vehrs

These two images were given to us from Ibu Alvarado Kinkead in Panama and Gaia Marrs. They prompted me to think about all the fun I have had doing off field landings in our rugged little taildraggers.
After contacting of few of my friends (like Blake from Alabama, and Brett Swartzendruber from Kansas) I realized that there might be several of us who have ventured outside of the pavement. So, I thought it might be fun to **put out a request for photos and a couple of paragraphs** to see who else out there thinks like me 😊

One of my favorite experiences came during July of 2012 in Newton Kansas. I had made a special trip to meet with the original owner of our airplane who purchased it from the factory in Wichita back in 1947. Who could resist all those beautiful Kansas wheat fields? After meeting with one of the original owners (17 at the time of purchase, 82 at the time of our meeting) I went flying around the area with Dennis Rief, the grandson of the other original owner in the partnership. Dennis took me around to all the farms that are still in the family and we made several landings to see the old homesteads.

The landings above were in the wheat fields. I can neither confirm nor deny taking off from the gravel road. A note of caution – I landed on the pathway used by the tractors and farm implements. You can taxi in this tall stubble, but do not try to takeoff or land in growth this tall or you will have a bad ending to your day.

The landing below was especially fun since they had burned the wheat stubble and were plowing it under before planting the next crop.

Send in your photos and we'll keep this one going !

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