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October 2022

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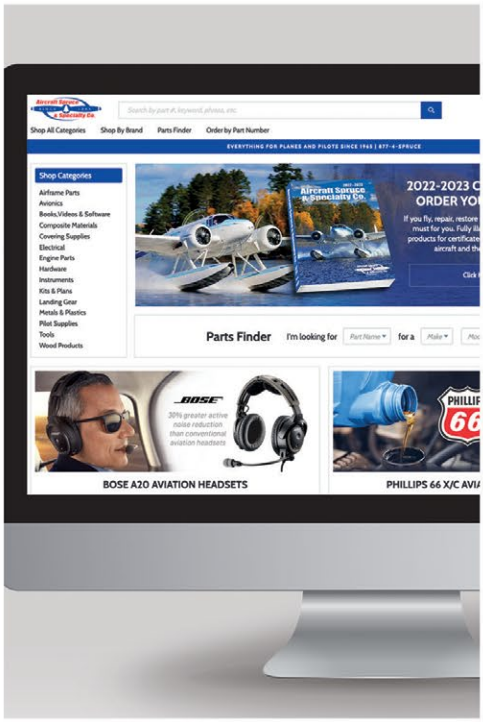

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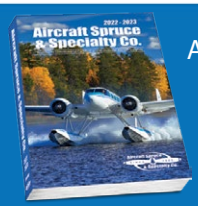

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October 2022

PIPERS MAGAZINE

Vol. 35 No. 10

On the cover
Photos of Lance Clinton's Cherokee 140 Cruiser by Jack Fleetwood (*www.JackFleetwood.com*). Read more about this plane starting on page 8.

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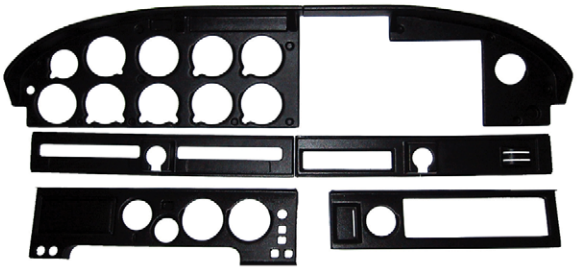

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Photos of Lance Clinton's 1977 Piper Cherokee by Jack Fleetwood (*www.JackFleetwood.com*). Read more about this plane on page 8.

A Community to Be Proud Of

I'm pleased to join the Pipers Owner Society team and to be a part of the aviation community. It's a highly professional group of people. In this field, the margin for error is small and the credentials and licenses reflect that. The training is demanding and requires discipline and attention to detail. It has to be; lives depend on it. And just like in the military, that builds a strength of character that lasts a lifetime. The habits I learned in boot camp and on active duty are still with me after four decades.

That character isn't limited to the cockpit. It shows up in every part of life. For example, when I was at EAA AirVenture several weeks ago, a friend lost his cellphone. He was understandably distraught. After all, so much of our lives are stored in these digital devices. He probably had little hope of ever seeing it again. What would the chances be of getting back a phone at an event with 600,000-plus attendees?

But the next day, he visited Lost and Found, and it was there waiting for him. That reminded another friend of a similar story at AirVenture several years ago. She knew a woman who had lost a purse with several hundred dollars in it, but she got it back with all the cash still there. I also heard that the day after AirVenture was over that the grounds were so clean that it was like no one had been there. What a testament to the integrity of aviators!

With all the depressing headlines we hear day after day, wouldn't life be so much better if all of society conducted itself this way? Unfortunately, it doesn't. The positive interaction in the aviation community is a perk. Let's be thankful that we're surrounded by people who are so diligent and respectful of others. It's a community to be proud of!

Thanks to all those who stopped by our booth at AirVenture to say hello and pick up your T-shirt. It was great to meet you in person. I look forward to seeing you again next year and to meeting even more of you and hearing about your goals and projects.

The sky's the limit!

Dan Brownell
Editor

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Lance Clinton's 1977 Cherokee 140 Cruiser

A Reliable, Easy-to-Fly, Recreational Favorite

By Dan Brownell

Lance Clinton has been flying on and off for more than three decades. He didn't inherit the flying bug from his family, but rather from an experience he had as a teen that lit his fire. "I remember I was in middle school in North Carolina, and I took an aptitude test that tells you what your career should be," he said. "It said I should be an air traffic controller; I had no interest in that, but part of that program was we got a free airplane ride. So the people who were air traffic controllers and pilots who were in this program got us our first airplane ride." That was a life-changing event for him.

Lance is an IBM software engineer, and like many pilots, job and family responsibilities — and the ever-increasing cost of aviation — have kept him on the ground more than he would like. "I got licensed when I was 19 years old, and I just turned 50," he said. "So it's a little over 30 years that I've been flying." But those years included long stretches in which he was flying little to none. "I wouldn't fly for three or four years, and some years I'd be lucky enough to get 10 hours in a year. But now I'm over 900 hours over 30 years. Not a ton of hours, but in this aircraft, since I bought it about four years ago, I've been putting on average about 150 to 160 hours a year on it.

"My original goal when I got my license 30 years ago was to be a commercial pilot, but life happens, and you have kids and things don't go exactly the way you wanted, but it's been a great hobby over the years for me and I use it to decompress. You go up high and all you see is clouds all around. It's pretty therapeutic for me."

Photos of Lance Clinton's 1977 Piper Cherokee by Jack Fleetwood (*www.JackFleetwood.com*).

Great for Recreation

Lance flies purely for pleasure, and the plane he owns, a 1977 Piper Cherokee, fits his mission well. "This is the second airplane I've owned. Both of them happen to be Piper Cherokee 140s. I'm a really big fan of the PA-28.

"My first airplane was a 1969 Cherokee 140 that I purchased in the 2003-ish time frame, so it was quite a while ago. I really enjoyed the plane, but it gets expensive when you have young kids like I did at the time. I only kept it for about three years, then I sold it. And then I bought this one about four years ago. I'm still a big fan of the Cherokee. I love them to death."

SPECIFICATIONS & PERFORMANCE

1977 PA-28-140 Cherokee Cruiser

All vintage planes are different. Do not use these to plan a flight. Source: *Standard Catalog of Piper Single Engine Aircraft (*Piper Owner Society).

Production Run:	291
Engine:	Lycoming O-320-E3D
Horsepower:	150
Top Speed:	143 mph (124 kts)
Cruise Speed:	136 mph (118 kts)
Economy Speed:	123 mph (107 kts)
Fuel Capacity:	50 gal (80-87 oct)
Range:	610 nm (@ cruise)
	679 nm (@ economy)
Gross Weight:	2,150 lbs
Empty Weight:	1,290 lbs
Ave. Useful Load:	860 lbs
Takeoff Ground Roll:	800 ft
Takeoff Over 50 ft Obstacle:	1,700 ft
Landing Ground Roll:	535 feet
Landing Over 50 ft Obstacle:	1,080 ft
Rate Of Climb:	631 fpm
Ceiling:	10,950 feet
Doors:	1 passenger, 1 cargo
Seats:	2 standard, 4 total (optional)

Dimensions (all approx.)

Fuselage Length	23 ft, 5 in
Fuselage Height	7 ft, 4 in
Total Wingspan	30 ft

At more than four decades old, his 140 is definitely a legacy Piper, but as Lance pointed out, "It's the newest Cherokee 140 you could get back in '77, the last year they actually made that particular model before they went up to the Warriors."

An Excellent Buy

Lance considers himself fortunate to have found his current plane locally and in such good condition. "It was purchased from my home airport," he said. "I was a member of the local flying club at the Rusty Allen Airport outside of Austin, Texas. And this one gentleman who was elderly, lost his medical and was looking to sell it. He didn't really want to because you know he loved his airplane, but he didn't really fly it for like a year. So I was able to pick it up from him.

"I had some mechanic friends take a look at it. I think I had to replace a cylinder because it sat for a year. But other than that, the plane has been just beautiful to fly. And no real mechanical problems, just normal maintenance."

A Fuel-Efficient Machine

Lance gets excellent fuel burn with his Cherokee. "When I'm in cruise, it's probably 8 to 8-½ gallons an hour. I usually plan for 9 gallons and I'm way under so, it's usually pretty good for that." The plane isn't very fast, though, which is what you would expect from a machine that just sips gas. But since he's just flying for fun and not in a hurry, it doesn't matter. "I usually cruise about 105 knots. Not crazy fast, but it gets me where I want to go. I would love to upgrade to an Archer or even an Arrow in the future. It's kind of my goal."


uAvionix SkyBeacon

But for now, since he loves his 140 so much, he's content with what he has because it makes flying simple. "One of my favorite trips is to fly down to the Texas coast, the Gulf Coast, and the little Barrier Islands and head off to Galveston or South Padre Island, things like that. Nice flight. Easy flight."

Lance likes the predictability of the Cherokee. "I could say it's a boring airplane. There are no surprises, but that's kind of the point for me. I mean, I do this for fun. I don't want anything to surprise me. I try to make this as safe as possible. What I want it to do, it does it."

Only Modest Upgrades — So Far

"I have a lot I want to do with my plane; I just haven't got around to it yet," Lance said. But for now, he's had at least one major upgrade done. "I did add ADS-B, which is a requirement, and I love it. And I added a new ADS-B In antenna, which I was able to hook up to the Garmin 696 that was already in the plane. I was able to upgrade the operating system on the Garmin to accept ADS-B input. ADS-B is a game changer when it comes to flying. When I learned 30 years ago there was no such thing as GPS. Having the ability to see other airplanes around you while you go flying is just outstanding from a safety aspect."

Lance had to replace one of his Narco units because the digital readout on it was going bad, and he added a digital USB charging port, which he finds handy. But that's about it. "The plane hasn't been changed much since I purchased it," he said. "It was like that when I bought it. I think the paint scheme is original. I couldn't find anything in the logbooks that talked about it being painted."

One downside to Lance's plane — considering that he lives in Texas — is that it doesn't have air conditioning, although it used to. "The air conditioner has actually been removed from the airplane," he said. "I wish it did work. It's hot down here."

Lance's Pre-Buy Advice

Lance doesn't have a lot of warnings or advice to offer about a 140 pre-buy inspection, but he did point out one thing to keep in mind. "I think the one biggest problem, at least what I've noticed, has been the struts. Make sure that the main landing gear struts have been serviced recently. They wear through the seals quite a lot. The reason I'm saying that is that I'm actually having to rebuild my strut right now. It started to leak on me, and it leans to the left, and I think that's a normal Piper issue, but if you can get one with a strut recently overhauled, that would be a good idea.

The Pilot and A&P – A Relationship Rooted in Trust

Lance isn't a DIY mechanic. He wants to leave maintenance to the experts. "I'd rather have someone who knows exactly what they're doing work on my plane," he said. He is grateful for the work that his A&P, Mike LaPlant, does for him. "As a pilot, one thing that's important is trust. You're trusting your life to your mechanic, so if you don't trust them, that's not good. But I trust this guy with my life. He does a hell of a job for me, and I appreciate everything he's done making sure my plane is up to snuff."

A Tip from Lance's A&P

The way you operate your plane can have a big impact on performance, wear and tear, and maintenance. That's why Mike LaPlant, Lance's A&P, harps on him about watching his mixture. Mike often reminds Lance to "lean, lean, lean the airplane." It just doesn't come naturally for him. "I'm never really good at leaning," Lance said. "I do it after you pound me in the head over the years. You know, in Texas, it's very hot here. You want to make sure you have the best performance for the airplane at all times, and leaning has a lot to do with that."

Lance Clinton and his Cherokee Cruiser.

Owners' Top Tips

We asked our Cherokee 140 owners for tips about their planes last year, resulting in the extensive 140 Market Report in the October 2021 issue. Here are some of those tips. Quotes here are not meant to indicate the person still owns their 140. Read more at *piperowner.org/oct21*.

We start with a list of things that you should typically upgrade or avoid from A&P/IA John Schreiber.

Plan to upgrade upon purchase: Copper battery cables, AGM battery, lightweight starter.

Things to avoid: E-Drive, NL model starter.

Other notes from Schreiber:

- The original Chrysler alternator is top quality, and more reliable than the late, new units.
- Have at least one of your magnetos serviced every 500 hours and do the other one next year.
- The Challenger air filter is of good value, in my opinion.

140 Owner Tips

Replace the hoses. Several members said this, including Bill Wenner, owner of a 1973 140. "The O-320 is a great engine, but usually mags need to be replaced, as well as hoses." Added Doug Bowen, owner of a 1972 140D, "Make sure all soft hoses have been replaced and the fuel quantity transmitters are overhauled."

Appreciate the speed (or lack thereof). If you want a fast plane, you're not looking in the right place. But Chris Chicoine, owner of a 1969 140, and others said that can be a benefit. "The speed of a 140 can work to your advantage," he said. "It gives you time to react and correct. If you're a great 140 pilot and always grease your landings and IFR approaches, you'll be less overwhelmed when flying a faster plane."

Parts availability makes it a great starter plane. In large part because parts are plentiful, this is a great starter plane in that it typically won't often surprise with expensive fixes. "Parts are plentiful," Chicoine said. "One of the best reasons to buy this plane is the ease of finding parts. Everyone wants the Ferrari until they get the bill to repair it or maintain it, then they reconsider the Honda Civic."

It drops like a rock. With the Hershey bar wings and other factors, several owners said "be prepared to drop like a rock." The 140 does not coast. "It falls out of the sky," said one owner. Said another, "It glides like a rock. You need to learn to drive it on the runway."

Favorite member upgrades: PowerFlow exhaust, battery compartment with Bogert kit, four-point seat belts, propeller. Schreiber: "If your 140 still has a 60-inch pitch prop, the 160-hp STC increases horsepower by 20. You will be amazed at the performance increase."

Not for you … if you live in the mountains. Several owners said this plane does not climb well at altitude.

Pre-Buy Tips

Check the landing gear. "Make sure there are no bends of the main landing gear or struts," said Dennis Bentley, owner of a 1967 140.

Current value vs. Cessna 172. The secondary market is off the charts for most planes, especially those that are light on fuel. But that is especially true for the 172. "In my opinion the Cherokee 140 can provide the best bang for the buck," said John Schreiber, owner of a 1966 140. "The Cessna 172 is a nice entry-level airplane that has gotten very expensive."

Pre-Buy Checklist (again from Schreiber): "Check static rpm, as it effects maximum gross weight, per the TCDS. If rpm is low, a non-sealing carb heat valve, late ignition timing, or restricted muffler could be the cause. A smooth idle at 500-600 rpm within 30 seconds of starting cold indicates a high probability of good valve health. Bring the rpm back up to above 1,000 after checking, until the oil temp gauge starts to move, for improved cam lubrication."

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Digital Autopilots Five Years Later

Bendix King AeroCruze 100 and 230

The summer of 2017 brought what I described as some of the best news I had heard in my 20-plus years as an avionics consultant on behalf of legacy aircraft owners. That was the announcement by four companies that they were now offering new digital autopilots for the GA market. While I recognized that the Garmin GFC 500 and GFC 600 and the Genesys/S-TEC 3100 were a step up for the more serious IFR crowd, it was the announcement by Trio and TruTrak that an affordable, digital autopilot was now available for the VFR and light IFR pilot.

Before this, upgrading a tired legacy autopilot was financially out of reach for many. Trio and TruTrak changed that in 2017. That was five years ago, and I thought it might be a good time to revisit these autopilots. While I have my own observations and opinions, I decided to reach out to a few avionics shops that I know well for their opinions and experience, and I was surprised to find some strong opinions, both positive and negative. That encouraged me to reach out further to get a broader perspective.

When I write, I tend to keep it positive; however, the shops I spoke to — some smaller shops, some high volume — have had some less-than-positive experiences with these autopilots, and I feel I would be remiss if I didn't include these comments in the article. So, let's look at each manufacturer in alphabetical order, and I'll share the feedback I received when I asked shops how they felt about the new digital autopilots introduced in 2017.

Bendix King: AeroCruze 100 (formerly TruTrak) and the AeroCruze 230

TruTrak has been making autopilots for the experimental-light sport market for years, and through the efforts of EAA STC, they received the STC for certified aircraft in 2017. The autopilot was well received by legacy aircraft owners, and much to my surprise and that of the industry, Bendix King announced that it was buying TruTrak in 2019. Frankly, this announcement was not as well received. The first year of transition from TruTrak to Bendix King was not as smooth as would have been desired. It took Bendix King a while to assimilate TruTrak and get the customer service, product knowledge, and supply chain in order.

Dynon SkyView

While the shops I spoke to were generally OK with installing the AeroCruze 100, I found no enthusiasm for Bendix King, and most shops were no longer Bendix King dealers. I would suggest that most pilots who have the AeroCruze or TruTrak installed, who made it through the haze, are happy with their AeroCruze 100. It's a full-featured, digital autopilot designed for the VFR or light IFR market. The AeroCruze 100 is about $5,900 with STC, and I've seen installation labor discussions from 20 hours (ridiculous) and up. I would suspect that 40 to 50 hours will be a typical shop labor quote for the AeroCruze 100 with removal of a legacy autopilot.

The AeroCruze 230 was also introduced in 2017 by Bendix King, as an upgrade to their KFC 150 (and now the KFC 200). The KFC 150/200 were popular OEM autopilots found in many new aircraft and generally had a good reputation. One weakness, which showed up later, was the vacuum, mechanical KI 256 attitude indicator that provided position sensing for the autopilot.

Bendix King introduced an electronic alternative to the KI 256 in 2017 in the form of the KI 300, made for Bendix King by Sandia Aerospace, that has been less than stellar. Unfortunately, the Sandia Aerospace attitude indicator got shot down by an AD, which the company couldn't control. The concept of the AeroCruze 230 is as a direct replacement for the original KFC 150/200 controller reusing the existing servos and harness to provide a simple, affordable digital upgrade.

Only one of the shops I spoke with has installed an AeroCruze 230, and it's not yet performing as advertised. If I have had any concern about the AeroCruze 100 autopilot, it is about the future of Bendix King and the support that might not be there in the future for AeroCruze owners. STC's for new models of aircraft seem to be moving slow.

A few of the shops mentioned the Dynon Autopilot, and their only complaint was that STCs were not coming fast enough. I said it in my previous articles, and I'll say it again: if you are in the market for large format EFIS (Electronic Flight Information System) and need engine management and a modern, digital autopilot, the Dynon SkyView system is a great value. These shops agree, and they see the quality in the equipment. It was not one of the autopilots introduced in 2017, but I would be remiss if I did not include it here.

Garmin: GFC 500 Autopilot

Unlike the Light IFR AeroCruze 100 I mentioned above, the Garmin GFC 500 is "state of the art" in a true IFR autopilot, and all the shops I spoke with agree it's leading the pack. However (and we don't really expect this from Garmin), the path has not been without some bumps, and in the case of the GFC 500, that has come in the form of significant servo failures. Every shop I spoke with has had servo failures with the GFC 500. One shop did a GFC 500, three-servo installation (with autotrim) and saw all three servos fail in the first six months. Garmin issued a Mandatory Service Bulletin in February 2022 that resulted in the exchange or repair of their GSA28 servos in the field, and shops report that this is no longer an issue.

It was also reported that even with Garmin's supply-chain issues that are delaying delivery (at the time of this writing)

Garmin GFC 500 from a Piper Dakota (photo by Jack Fleetwood, *www.JackFleetwood.com*).

of some of their most popular products, the GFC 500 is available, but the G5's and GI 275's that are required to drive the autopilot (in lieu of a G3X or G500Xi), not so much. All in all, Garmin's GFC 500 is the popular choice between the new digital autopilots targeting the true IFR pilot as confirmed by all the shops I spoke with. What stands out for me, versus the Genesys 3100, is the value. At approximately $26,000 installed, including autotrim (with a third servo), the GFC 500 upgrades your autopilot and your attitude indicator and HSI. The Genesys 3100 requires you to address these important instruments separately, which is very desirable in true IFR.

Genesys/S-TEC 3100 Autopilot

Genesys/S-TEC 3100 Autopilot

Genesys also introduced its new 3100 Digital Autopilot at Oshkosh 2017, and while the autopilot stands alone, with all new servos and harness, Genesys is also marketing it as an upgrade to the System 55X (and previous models), where you keep your original servos and modify the harness. The same shop that has had issues with the Bendix King AeroCruze 230 (using original servos) is also less than enthusiastic about the 3100 installation when using original servos. He had two installations in which the 3100, installed with original servos, were removed and replaced with the Garmin GFC 500. He also noted that he had two clients who were happy with their 3100, but in both of those cases, new servos were installed.

More than one dealer mentioned that Genesys had requested that the aircraft owner fly the plane to Mineral Springs, Texas, in order to get the system working correctly. Unlike the GFC 500, which uses external solid-state position sensors (either the G5 or the GI 275), the Genesys 3100 has an internal AHRS and requires no external sensors. It also appears that Genesys is backing away from its popular analog System 20 single-axis autopilot and its System 30 with altitude hold (about $18,000 installed). It appears that the Bendix King AeroCruze 100 and the Pro Pilot from Trio Avionics have had a significant effect on that segment of the market which, simply stated, is legacy aircraft owners flying affordable airplanes upgrading their legacy autopilots.

Trio Pro Pilot comes in panel mount and 3-inch versions.

Trio Pro Pilot Autopilot

Both the Trio and TruTrak autopilots came to market at the same time in 2017, but it appears that Trio was a little slower getting the message out and that TruTrak had the early marketing advantage. Unlike TruTrak, which manufactured and marketed its autopilot in 2017, Trio uses two entities. Trio manufactures and supports the autopilot while the STC Group is responsible for engineering, including the original certified STC and subsequent STCs, and they also handle sales for Trio. Trio had some issues early with servos that needed a boost in certain airframes, but that was addressed a few years ago.

New management at the STC Group seems more aggressive at building new dealerships and is moving forward with adding STCs. One shop I spoke to has chosen to stay away from the Bendix King AeroCruze and recommends the Trio for those pilots looking for an affordable, digital autopilot. This was based on a general concern about Bendix King and what he described as a lack of dealer support. He went out of his way to point out that his support from Trio and the STC Group had a lot to do with that decision. Regarding price, the Trio Pro Pilot and the Bendix King AeroCruze are about the same at about $6,000 for equipment and STC.

A comparison of features and benefits of the two autopilots is similar, with the Trio offering a few features not found in AeroCruze like "track offset." Some pilots prefer to offset their track on busy airways and the Trio can do this. Trio's "straight and level" button can also be programmed to do a coordinated 180-degree turn, a feature that a VFR pilot might like if they mistakenly enter IFR conditions. In my consulting work with pilots planning an avionics upgrade with Light IFR in mind, I recommend the Trio Pro Pilot for the same reasons.

Conclusion

Any pilot who will find themselves in IFR conditions, especially low-time light IFR pilots with their families, who occasionally fly IFR, should have an autopilot.

I used to say, "at least a basic autopilot," but that situation has changed. The legacy aircraft owner upgrading from a tired factory installed, single-axis autopilot with plans to fly light IFR now has the choice of two very sophisticated options in either the Trio Pro Pilot or the Bendix King AeroCruze 100. Oddly, Honeywell, the parent company of Bendix King, in its marketing, refers to the AeroCruze 100 as "basic." The AeroCruze and Trio Pro Pilot are anything but basic. The legacy S-TEC System 20 "wing leveler" and even the System 30 with altitude hold could easily be defined as basic by today's standards.

Pilots flying true IFR have the Garmin GFC 500, including solid-state electronic flight instruments and the Genesys/S-TEC 3100 option. Whether in marketing, overall performance, or value, it appears that the GFC 500 and the Bendix King AeroCruze 100 are leading the pack today. I expect the Dynon SkyView system with autopilot (and engine management) to be a serious contender as more STCs for their autopilot become available. Frankly, I'm rooting for Trio, and I think in time, its customer support will make the difference.

Until Next Time … Safe and Happy Flying!

Bob Hart purchased his first airplane in 1971 at age 21. He's owned five others since. As a Senior Avionics Consultant at Eastern Avionics, Bob has personally sold over $20 million in Avionics. Bob now offers avionics advice through many online forums and through his website: *www.AvionixHelp.com* and is semi-retired. After living in Colombia, South America, for a few years, he is now back in sunny Florida.

Editor's Note: Bob Hart is a regular participant on the Piper Owner Society's forums and is available to answer your avionics-related questions. To contact him, visit *www.PiperOwner.org*, click the Forums tab, and scroll down to the "Avionics" forum. Piper Owner Society membership is required.

by Scott "Sky" Smith

Prop Strike Damage

When Do I Need an Engine Teardown?

Recently, I had a call from a customer. In this case, the customer had an issue with a propeller. The customer's aircraft was parked and not moving, and a Cessna aircraft passed by too close. The high wing impacted the top end of the vertical blade on his three-blade propeller. No real visible damage. The engine wasn't running, and the other pilot had insurance to take care of any damage.

This seemed like a very simple claim. But it has turned out to be a bit more complicated than we expected. But before I get into that, let's talk about claims and propellers. If you happen to be the unfortunate person to have a propeller damaged, what can you expect your aviation insurance company to do?

Should I Submit a Prop Strike Claim?

Should you submit an insurance claim for a prop strike? Well, it depends. There are a number of variables that can affect the claims department's decision. Some of those would be the kind of damage, the severity of the damage, the age and the hours on the propeller, and the propeller and engine factory guidelines. My disclaimer: I'm just sharing my experience. I'm not a mechanic, and I don't work for the FAA. So, talk to your mechanic and/or the FAA before you do anything.

Let's start with the minor nicks. Often, a propeller is damaged by debris or rocks on the runways, causing nicks and scratches. If you fly off grass or gravel, expect them. Don't worry; many of these small nicks can be removed or filed out by the mechanic. But be careful with this. Through the years I have seen many propellers "repaired," yet end up being damaged beyond repair.

Years ago, I had a friend who bought an aircraft that had a propeller that was filed below minimums. When the mechanic at the next annual (my friend's first annual) tried to check a nick, it was below allowable minimums. That meant a new propeller and an unexpected expense! It's very difficult to determine if you have a propeller that's within limits when you purchase an aircraft. Few people give it much thought, especially when dealing with a fixed-pitch prop. I doubt most pre-buy inspections would have found the prop issue.

It's a little easier with a constant-speed propeller. Buying or owning an aircraft with a constant-speed propeller usually means having the prop overhauled or maintained throughout its life. This means more attention is paid to the constant-speed propeller compared to a fixed-pitch propeller. Additionally, ADs that come out on the propellers have put emphasis on checking their condition.

If your prop has minor nicks and chips, the mechanic will likely try to fix the problem, and the cost will be below the deductible of the policy. If the nick creates enough damage to the blade that it needs to be replaced or needs a new prop, I think I would contact the claims department about filing a claim. This doesn't mean they'll do anything, but if the nick is substantial and needs to have the prop replaced, you could have a claim.

Typically, this type of damage — especially if it's a big nick — would warrant some concern about the engine and the integrity of the prop. But nothing really needs to be done unless the FAA or manufacturer guidelines warrant it. Don't jump the gun and contact claims and try to get a new prop. Remember, most small nicks and repairs won't pass the deductible in cost, and if you file a claim, you now have a claim history and probably a premium increase at renewal.

Sudden Stoppage

We've all seen pictures of props with "Q-tips," the bends or curls at the tips that prevent usage. A rule of thumb I have heard is that if the propeller is evenly bent on all blades, there is less chance of crankshaft damage. But, in my thinking, if the prop hit the ground and the engine stopped, I want a mechanic to check it. Call me a coward, but I would expect no less than a dial indicator on the crank flange. Dial indicators will probably be the first thing that a claims department will request. If there's nothing out of round, they might just repair or replace the prop, depending on the manufacturer guidelines.

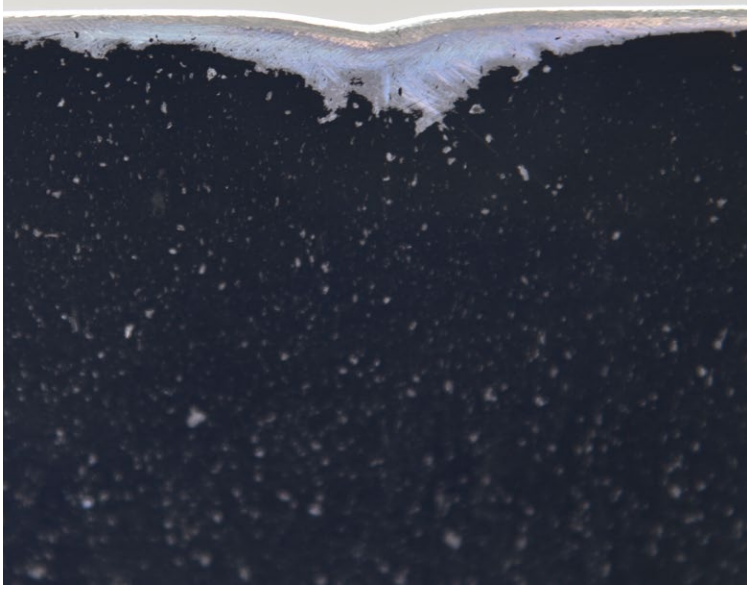
The insurance company doesn't want to send the pilot out with a propeller and engine that might fail and cause a bigger claim, so don't worry about being at risk because the company is cheap. If the blade damage warrants it, the claims adjuster will request that the engine be torn down and inspected for damage. But it goes further than just the claims adjuster.

I Don't Need No Stinkin' Teardown!

Many engine manufacturers require that the engine be torn down for any impact to a propeller. I have been told a few different things. One is that if the propeller needs to be removed from the engine to be repaired, the engine needs to be torn down. I have also heard that if the engine wasn't turning, it doesn't need to be torn down. What's the correct answer? The engine manufacturer will be the best source.

A good example is the Lycoming Service Bulletin No. 533C, which describes when the Lycoming engine should be torn down for inspections

This photo is a closeup of the photo on page 22. It is from Piper Owner Society Aviation Director Scott Sherer's Arrow, which wound up getting a new prop because of this prop ding, presumably from a rock. Read a review of his new prop at *piperowner.org/sep22*.



from a prop strike and what they consider a prop strike. Part of the Service Bulletin is below.

Service Bulletin No. 533C
(Supersedes Service Bulletin No. 533B)

SUBJECT: Recommended Action for Sudden Engine Stoppage, Propeller/Rotor Strike or Loss of Propeller/Rotor Blade or Tip

MODELS AFFECTED: All Lycoming reciprocating aircraft engines

This Service Bulletin identifies propeller/rotor damage conditions and gives corrective action recommendations for aircraft engines that have had propeller/rotor damage as well as any of the following:

- Separation of the propeller/rotor blade from the hub
- Loss of a propeller or rotor blade tip
- Sudden stoppage

A propeller strike includes:

- Any incident, whether or not the engine is operating, where repair of the propeller is necessary
- Any incident during engine operation where the propeller has impact on a solid object. This incident includes propeller strikes against the ground. Although the propeller can continue to turn, damage to the engine can occur, possibly with progression to engine failure
- Sudden RPM drop on impact to water, tall grass, or similar yielding medium where propeller damage does not usually occur

To read the complete 553C service bulletin, see the PDF at *piperowner.org/oct22*.

In the case of my customer's aircraft, his propeller was dinged by another aircraft's wing. His engine wasn't running, the other plane didn't hit it at high speed, and there was no real visible damage. The complications came from the fact that the insurance company claims department wanted to tear the engine down for the inspection, but the mechanic and the owner didn't think it was necessary in this situation. The claims department noted that the Lycoming service bulletin also included the following:

"A propeller strike can occur at taxi speeds and during touch-and-go operations with propeller tip ground contact. In addition, propeller strikes also include situations where an aircraft is stationary and a landing gear collapse occurs, causing one or more blades to be bent, or where a hangar door (or other object) hits the propeller blade. These instances are cases of sudden engine stoppage because of potentially severe side loading on the crankshaft propeller flange, front bearing, and seal."

This description of the "prop strike" pretty much includes any kind of impact. The comment of "hangar door or other object," seems to be inclusive and warrant the engine needs to be torn down for an inspection.

On a side note, this particular Lycoming engine had been modified for an experimental aircraft and did not have the Lycoming data plate installed anymore. It has a custom engine data plate instead, which opens up another whole set of questions as to what's required, since it's no longer a "certified" Lycoming engine.

My take on this situation is to take the side of caution. Even if it isn't required because it is experimental, wouldn't you still want it done? What makes the engine different when it comes to precautionary teardown? Just the data plate? If the engine was modified by porting and polishing and whatever else the custom company does, is it really a different engine inside? If it still uses the same crankshaft, connecting rods etc., wouldn't the risk of damage still be there?

Who Pays for the Teardown?

Most companies will pay for the teardown and repair or replacement of the damaged part. Remember a small point here. An insurance policy is only required to return the aircraft to the condition that it was in before the damage occurred. What does that mean in a prop strike? If the crank was damaged, the insurance company does *not* have to buy you a *new* crank, especially if the crank was past TBO (Time Between Overhauls) or worn out.

Another factor would be any ADs that require replacement of parts. An example would be if you have an aircraft that is affected by the VAR/Airmelt crankshaft controversy. If I'm correct, the AD requires that if you open the case, the crank must be replaced. In the case of the teardown, if the crank is not damaged, *you* will have to pay for the new style crank. If the crank was damaged, the insurance company should pay for it. But again, it depends on the AD and the condition of the parts.

Don't go into this with the grandiose idea of getting an overhaul for the cost of the prop ... it doesn't work that way. But I have not had any companies deny the repairs of the damaged parts, or the cost of the teardown or reassembly. Everyone that we have worked with has been very helpful. Disputes started when the insured felt that his aircraft engine, which was 200 hours over TBO, should be replaced. That is not, in my opinion, reasonable to expect from the insurance.

One positive example was the owner of a Cessna 210 that had a nose gear collapse on his aircraft. The engine was at TBO and the propeller damaged. The insurance company paid for the teardown and the reassembly. The owner decided to have the engine overhauled at this time and paid for the additional labor and the additional parts. He got a cheaper overhaul and the insurance company covered, indirectly, part of the cost.

This thought can be of concern if you have an aircraft needing repair. You might get your engine disassembled and find that there are a few things that need repair (rings, camshaft, cylinders, etc.), things that will not be covered by insurance because of normal wear and tear. This could increase the cost of your repairs, but don't blame the insurance company. They haven't been flying your aircraft and putting on hours. That's your cost of ownership. The unexpected damage from an accident is the insurance company's responsibility.

Scott "Sky" Smith is a nationally recognized writer and speaker. He is the author of "How to Buy a Single-Engine Airplane," "How to Buy a Skymaster," "Ultimate Boat Maintenance Projects" and "How to Build a Hot Tuner," (published by Motorbooks International). Smith's background includes: aircraft and avionics sales, boat dealership and fiberglass manufacturer. He is a single and multi-engine pilot with over 30 years' experience. Smith is also owner of Sky Smith Insurance Agency, a nationally recognized specialty insurance agency, insuring boats, custom vehicles, and aircraft since 1985.

Above: Scott Sellers' borescope and case. Scott has been borescoping his planes for nearly 10 years and has found it to be an invaluable owner maintenance practice.

Introduction to BORESCOPING · PART 1

Use Inspection Photos to Lower Maintenance Costs and Improve Safety

By Scott Sellers

Given the value and safety borescope imaging brings to monitoring the health of our aircraft engine cylinders and airframe, we will explore the subject here. This Part 1 article's objective is to explain how borescoping can help you reduce the cost of maintenance while improving the reliability and safety of operating your airplane. Part 2 of this topic will include instructions on how to perform cylinder inspections with a borescope.

Also check out the fourth episode of the *Beyond the Hundred Dollar Hamburger* podcast (*cessnaowner.org/scott-sellers-podcast*), where my brother Mark and I discuss borescoping with Dave Pasquale of Pasquale Aviation. Dave is an early adopter, longtime user, and innovator with the borescope, who spoke on the subject at AirVenture this year. Note that while I own both a Piper and a Cessna, the podcast is found on our COO website.

What Is a Borescope and Why Is it a Valuable Tool?

According to the former advisory circular AC 43-204 Visual Inspection of Aircraft (pg. 127), a borescope is a long, tubular, precision optical instrument, with built-in illumination, designed to allow remote visual inspections of internal surfaces or otherwise inaccessible areas. Borescopes allow us to see areas we otherwise have no access to inspect and create a digital history, allowing comparisons to be made as conditions change.

TCM's Service Bulletin SB03-3 explains, "The purpose of the borescope cylinder inspection is to provide a visual method of examining the internal cylinder components and must be used in conjunction with the differential (compression) pressure test."

Borescopes allow for viewing of the following key maintenance items:

- Cylinders, including valve faces, valve seats, valve stems, and cylinder walls and piston top surface
- Cam and lifter surfaces on some engine models
- For compliance with the PA-28 spar AD 2020-24-05

The borescope images we shot for this article were taken with a Vividia Ablescope VA400. We have used it since 2013 on our airplanes, with good results.

Borescoping Cylinders

Borescoping permits the mechanic and owner to view the conditions inside a cylinder. This is a much better way to evaluate how valves are performing than a compression test alone because combustion leaves different-colored heat signatures on steel valves depending on temperature and how the heat is being distributed around the valve.

Above: Borescoping is a better way to evaluate how valves are performing than a compression test alone because the visual inspection, recorded by photos, reveals colored heat signatures that reveal damage earlier than a compression test. If the heat is being distributed uniformly around an exhaust valve, it will result in a "bullseye" appearance. Concentric rings will show that the heat is being dissipated from the center of the valve to the edges.

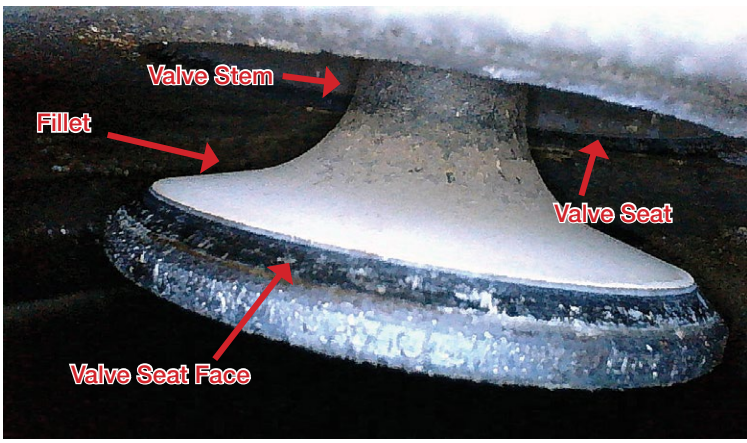
If the heat is being distributed uniformly around an exhaust valve, it will result in a "bullseye" appearance. You will see even concentric rings, which indicate that the heat is being dissipated from the center of the valve to the edges, and then onto the valve seat when the valve closes and makes contact with the seat.

When this transfer of heat is interrupted, the heat begins to concentrate in certain sections of the valve edge, and that additional heat changes the color of the top of the valve and may even alter the shape of the valve by warping it. If allowed to progress, this will result in a "burned" valve that will not hold any compression. In the most extreme cases, it can cause pieces of the valve edge to come off, or even for the valve stem to break catastrophically.

Because valves have a life cycle, and the end of that life cycle can be expensive or dangerous, borescoping permits an owner to intervene to take a valve out of service or lap it at the right moment. Such timing avoids the financial risk of taking an acceptable cylinder out of service too early, or the risk of flying on a cylinder near destruction. Early detection of valve issues changes the way we maintain cylinders and allows us to take corrective action before the valve becomes unairworthy.

Uneven heat signatures appearing on valves will occur well before compression drops off, so compressions tests are not necessarily an accurate measure of cylinder health. Because cylinder compression numbers can vary widely for many reasons, some GA industry experts suggest borescope images are a better measure of cylinder health than compression tests alone.

A lot like oil analysis, which is about identifying trends, a single picture of a valve has limited value. A skilled mechanic will prefer to look at a series of borescope images at various intervals. A borescope report at annual inspection is a best practice for tracking cylinder condition.



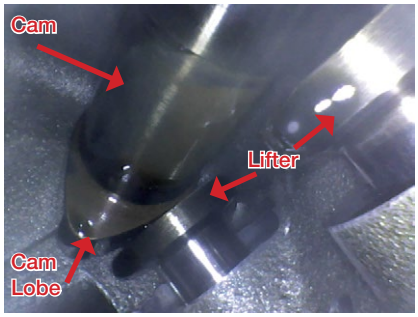
Above: Healthy valves will not be warped, so it will seal tightly To prevent loss of compression.

Dave Pasquale, of Pasquale Aviation, was an early adopter of borescoping and is now considered a leading expert in the field.

Borescoping Cams and Lifters

All is not the same for Continental and Lycoming engines when it comes to borescoping. Because Lycoming cams and lifters are on top of the engine above the crankshaft, while TCM engines locate the cam and lifters below the crankshaft, access for borescoping varies by brand and engine model. Cam inspection is possible on sandcast Continental engines and Lycoming engines with the short oil filler/dipstick tube in the top of the engine case. Many Lycoming 540 versions have this oil filler tube. The small oil filler tube needs to be removed for better access.

With the small oil filler tube removed on the top of our Lycoming IO-540-K1G5, here is a borescope shot of the cam and lifters:



Picture quality is crucial for borescoping, as the photos can reveal small but important details. An initial set of borescope images creates a baseline to which subsequent sets can be compared for telltale changes. This is also why it's important for the images to be taken the same way each time.

The four-cylinder Lycomings (320 and 360 series) can be difficult to borescope the cam and lifters due to poor access for positioning the scope. The 0-320 on our TriPacer does not allow such access.

Borescoping Takeaways

- **Request a cylinder inspection report from your A&P/IA at your next annual inspection**

Your mechanic should provide photos at a minimum. Photos should match a standard set of photos as closely as possible. The goal in the borescope inspection is to take the same set of photos in the same way every time. This will allow the photos to be shared with people who are able to interpret them. This is similar to what is done in the medical industry. For example, an ultrasound tech will take a standard set of images for a specific reason and a doctor will review those images.

- **Interpreting borescope images**

Technicians who are unsure how to interpret borescope images should seek assistance from those with experience. Resist the temptation to pull a cylinder after discovering an unknown visual anomaly, as it may be unnecessary.

- **How often should you borescope your cylinders?**

Dave Pasquale recommends 100-hour inspection intervals for normally aspirated engines. Consider 50-hour inspection intervals for turbocharged engines. Any valve or cylinder that has anomalies should be inspected at no more than 25 hours.

You Can Do This!

Borescoping is an ideal owner-performed preventative maintenance item. I've successfully used a borescope on cylinders, cam and lifters, and airframe items since 2013. Give yourself some time to learn — about three +/- hours. Once you have some experience, you can share images with your mechanic to improve your airplane's preventative maintenance.

Borescoping Is a Key Pre-Purchase Inspection Tool

Knowing the condition of cylinders, cam and lifters can be important for price negotiation and confirming the value of an airplane you are looking to purchase.

For hands-on owners, borescoping is a worthwhile practice for monitoring engine health to greatly increase safety and reliability. For those who prefer not to participate in your airplane's maintenance, request your shop and A&P/IA use a borescope. We will get into the details of cylinder borescoping in Part 2.

TIPS FROM THE PODCAST

Scott Sellers, owns both a Cessna and a Piper, and his brother Mark periodically record podcasts (*cessnaowner.org/scott-sellers-podcast*). A recent one featured Dave Pasquale of Pasquale Aviation, and member of Savvy Aviation's account management team. Here are some tips from that podcast.

Continental Quoted at Event in 2014: "If your mechanic isn't borescoping your engine, you need to get a new mechanic." Mark Sellers was at AirVenture in 2014 (or so) and, as he typically does, he went to the talk by Continental. He distinctly remembers the speaker saying that quote.

Mark then nudged Dave Pasquale into borescoping Mark's engine. Pasquale has since developed report templates and become an expert on the practice. "If it has an uneven heat signature on the exhaust valve, you're going to want to recommend lapping the valve, or depending on how bad it is, recommend cylinder replacement, or inspect again in 25 hours," Pasquale said. "These cylinder inspections have completely changed the way that I change or maintain cylinders."

Year-over-year pictures are great for trend monitoring, but picture quality is crucial. The patterns and trends that develop in the pictures are a great predictor of where your engine is headed, but you need a mechanic who knows how to get good pictures. "You'll get pictures of half a spark plug, half a valve, or just the head, or just a picture of the cylinder wall," Pasquale said. "And it's blurry. And they're charging the owner $200 to do it." So, find a mechanic who's good at this, then keep your photos on your computer.

Example of what you can learn: Hidden problem with bad lifters. "We had a friend with a Bonanza, whose oil analysis was fine," Scott Sellers said. "Turned out his lifter faces were all pitted, while everything seemed normal." That's a condition that Dave Pasquale said is common and is something that can be caught by a borescope. "I would guess that probably 30 to 40% of the airplanes out there, at least in my area on the East Coast, are flying around with undetected damage to cams and lifters." As a result of borescoping, Pasquale has "changed quite a few lifters to try to prolong the life of the cam lobes in a lot of airplanes. A lifter is maybe $100 to $130 range. Compared to an engine teardown..."

How often do you need to borescope your engine? "For most engines, annual inspection or 100 hours is going to be sufficient," Pasquale said. "If you're running a turbo, they seem to burn valves quicker than normally aspirated engines, so we recommend borescoping every 50 hours. And it's super-important to do one during a pre-buy."

Can active, DIY, owner-assisted-annual types do their own borescoping? Yes. "As long as you are capable of getting the cowling on and off correctly, and pulling spark plugs and putting spark plugs back in correctly, I think it's a great idea," Pasquale said. "Most pictures that I get from people are from owners, and in general, those look better than what I get out of mechanics."

Scott Sellers Scott Sellers grew up flying Piper Cherokees and Comanches and currently owns a PA-22 TriPacer along with a Cessna 182RG, all thanks to his wife, Cindy, who tolerates, supports and still enjoys flying after all these years.

Piper Avionics and Autopilot Upgrade

1964 Cherokee Pathfinder Gets New Garmin Instruments and Servos

Compiled by Piper Owner Society staff

Joseph Smith-Steward, known as *Joe8120* on the *PIPERS* member forum, recently posted an account of autopilot and avionics upgrades to his 1964 PA-28-235 Cherokee Pathfinder. The following is an article based on those posts, followed by a helpful sidebar compiled from related posts by one or our most prolific contributors.

Joseph had never flown with an autopilot before having a new one installed. "The previous one in my plane was a legacy Century that never worked correctly, so I never used it," he said. Now that he has one, he's planning to take full advantage of it for flying IFR when he gets certified. "I plan to be really careful using it and will plan the IFR training to fly the approaches with and without the autopilot to develop proficiency with either. I do appreciate the reduction in workload the autopilot provides during higher workload situations."

But the autopilot wasn't the only new addition to his ship. He decided to make a bigger investment with improved avionics as well. "The other avionics were ancient, and we decided to spend the coin to get the best setup for my IFR training and beyond."

Joseph decided to use Av-Com Avionics at Columbia Gorge Airport, Washington State, to take on the project, and he is pleased with the result. The following photos capture the process step-by-step. Quotes in the captions are from Joseph.

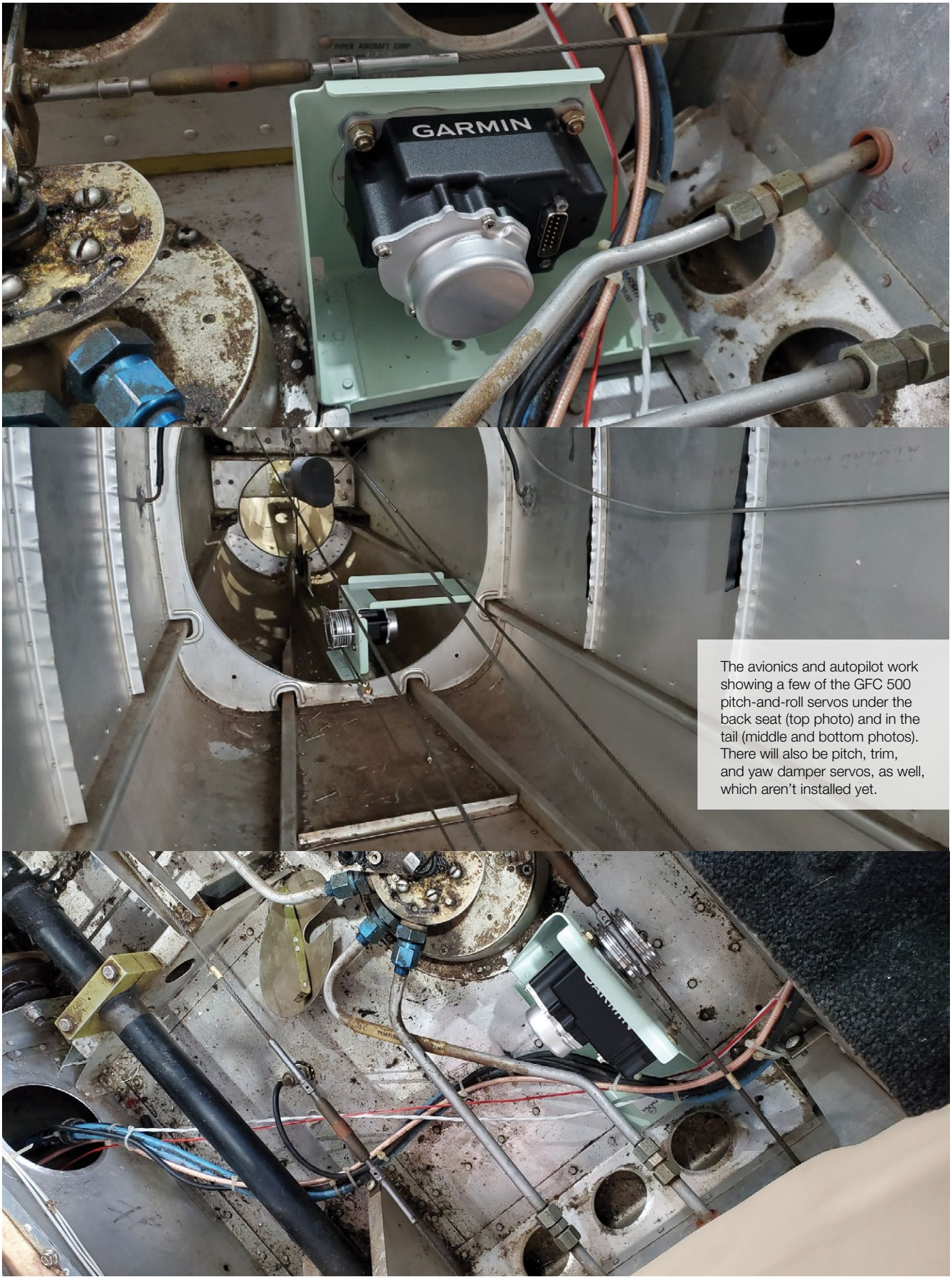
The Post-Upgrade Test Flight

The plane needed a shakeout flight after the project was finished. So Joseph incorporated that into a carefully planned trip back to his home airport, putting the upgrades (and his own skills) through the paces on the way.

"To pick up my plane, I took my CFII with me, as the entire panel was new, and he has much more experience managing these systems. We flew to PDX (Portland International Airport), then took ground transportation up the Columbia Gorge valley to the shop. They were finishing up a few minor items, but they completed it that afternoon.

"On the way home, we had a route with several different waypoints, and each time there was a turn, we watched it carefully to make sure it was doing what it was supposed to do. As we proceeded, he gave me tips during certain phases of flight. I had not done any night flying since my private pilot training, so it was good that I had a CFII onboard. For me, I probably will treat future night flights as IFR, regardless of the weather.

"Everything worked fine on the way as we tested out the functions and features of the various systems. I had reviewed Garmin's training app for the GPS series, so I was familiar with the way the menus flowed and presented information. It worked great, providing lots of options on how to present the screen and intuitive interface.



The avionics and autopilot work showing a few of the GFC 500 pitch-and-roll servos under the back seat (top photo) and in the tail (middle and bottom photos). There will also be pitch, trim, and yaw damper servos, as well, which aren't installed yet.

Left: The whole panel disassembled.

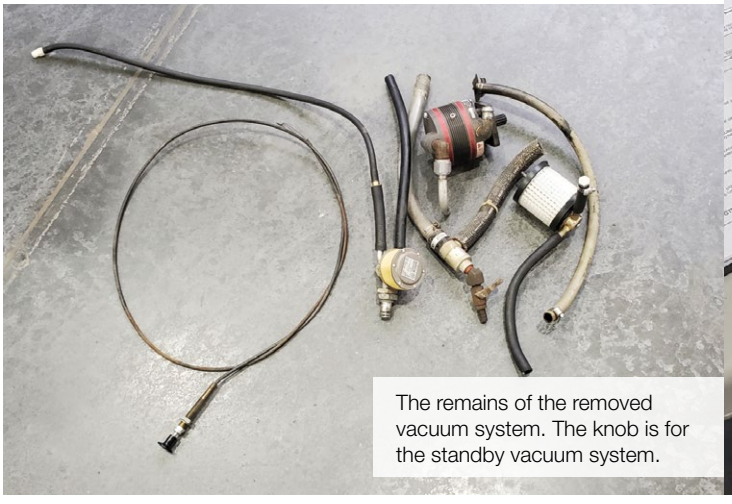
Below: Avionics stack is being wired to be followed by power up and testing.

"The Connext interface worked flawlessly between the navigator and ForeFlight on my iPad. Any time we changed the routing on ForeFlight or on the navigator, the iPad annunciated to ask if we wanted to send or receive the new flight plan, depending on where the changes originated.

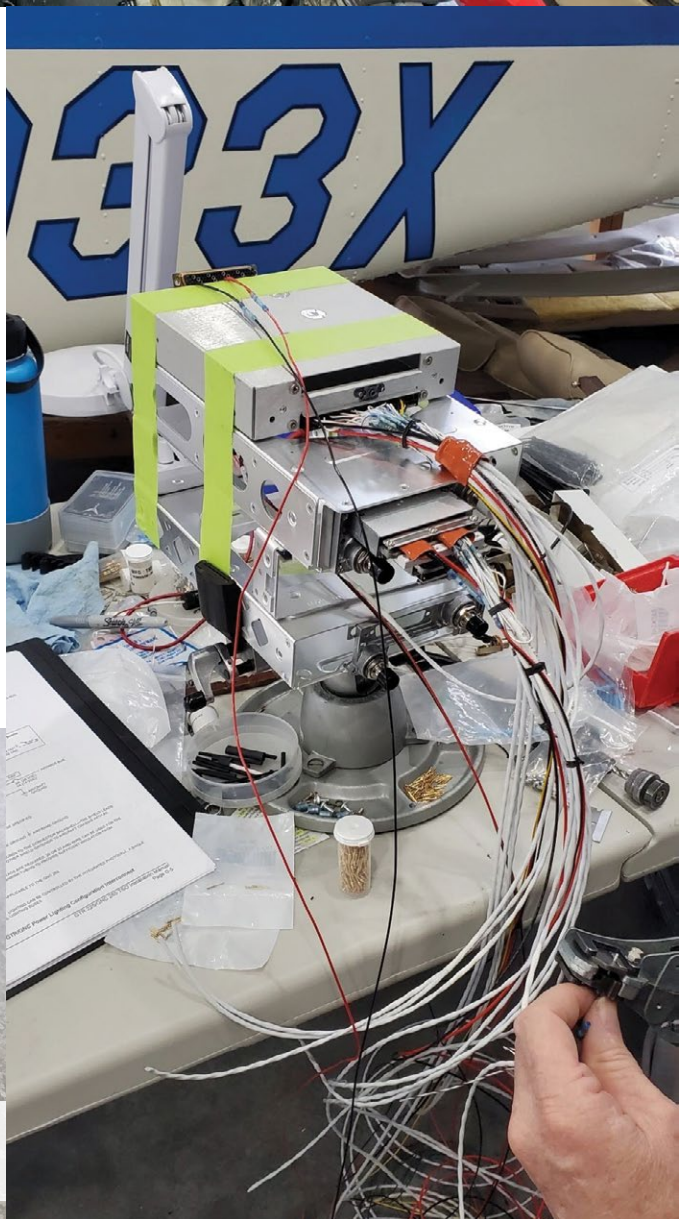
"As I didn't get the larger 650 or 750 navigator, I don't have the integrated GPS and radio nav in one box. The advantage was that I could save funds on the installation, as the shop could use the current center panel spaces with no cutting. The disadvantage is that I wanted to have a separate nav/comm for ILS, LOC, and VOR approaches, so I had to get a separate nav/comm (the 255) to replace the KX-155 for these procedures. It's a simple matter of switching the nav source on the G5 to select either the GPS or the 255 as the source.

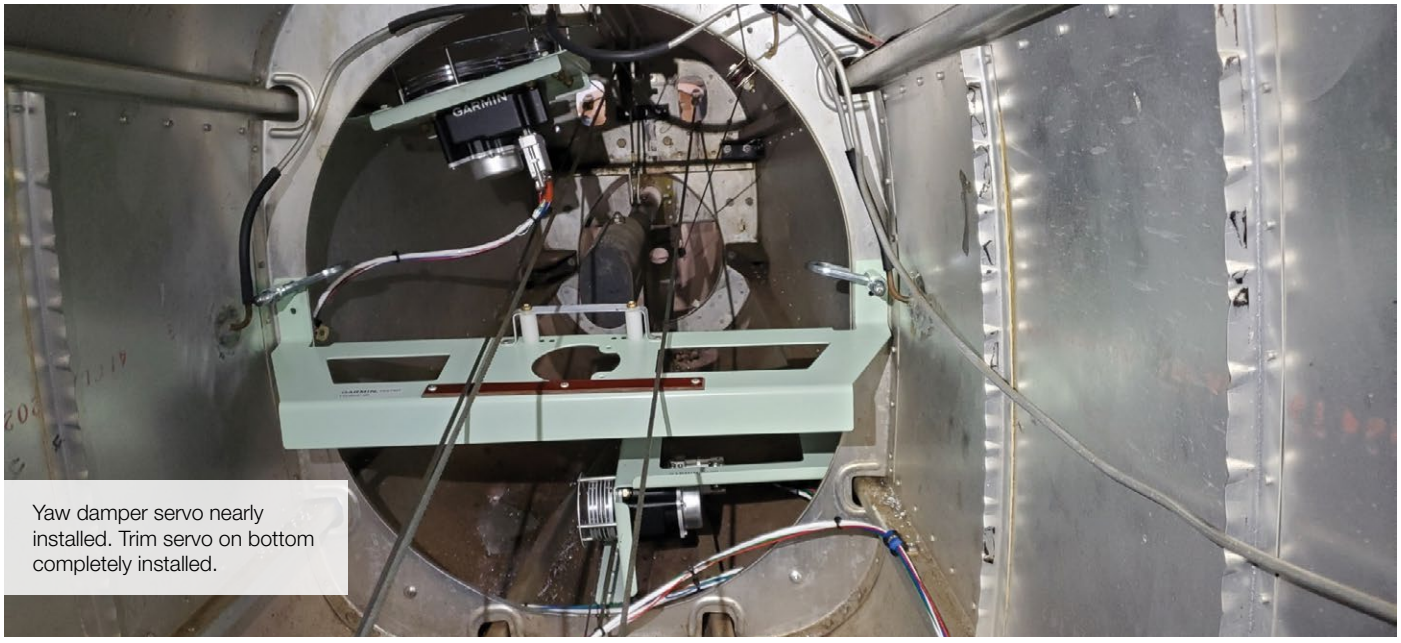
"The 255 has many features that my KX-155 didn't have and, of course, it's digital and can talk to the G5. But you have to switch the display between comm or nav with a push of a button, whereas the 155 displays nav and comm frequencies at the same time. It's a minor issue, and I just need a little time to get used to it.

"The transponder is the existing GTX 327, so no change there. It worked fine, as usual.



The remains of the removed vacuum system. The knob is for the standby vacuum system.





Yaw damper servo nearly installed. Trim servo on bottom completely installed.

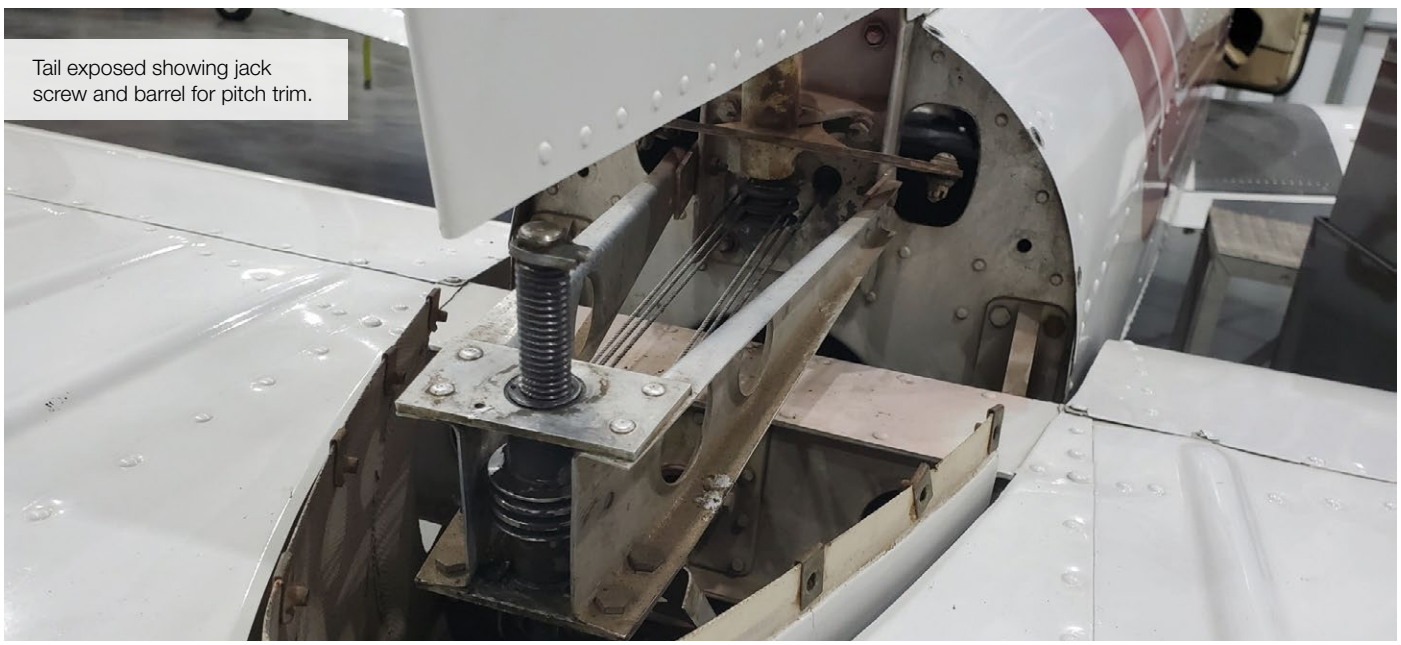
"The KMA 24 audio panel was replaced with the PS Engineering 7000B. That was quite an upgrade from the KMA. It has an intuitive button interface. I wasn't planning on the shop wiring up the included intercom wiring because I knew it was a big job (the 7000 is slide-in/pin compatible with the KMA), but they said it was fairly straightforward and included it for no extra labor cost. There was quite a difference in performance over the legacy unit. It has a very clear sound; it's a real nice intercom. I finally have two radios, so I can transmit/listen to ATC on the GPS comm No. 1 and get weather, etc. on the 255 nav/com comm No. 2. It's pilot bliss! I haven't explored all the features yet, but it seems like a solid unit.

"Finally, the GFC 500 AP was a full four-servo installation, and I've documented the issues with the trim servo the shop had but resolved. It's a fantastic unit in all modes. It held altitude rock solid with no deviation. Altitude capture also worked great. Turns on course were very smooth. Climbs were done with IAS mode with a minor issue on initial climbout that required a slight hunting on the airspeed sometimes but not a big deal.

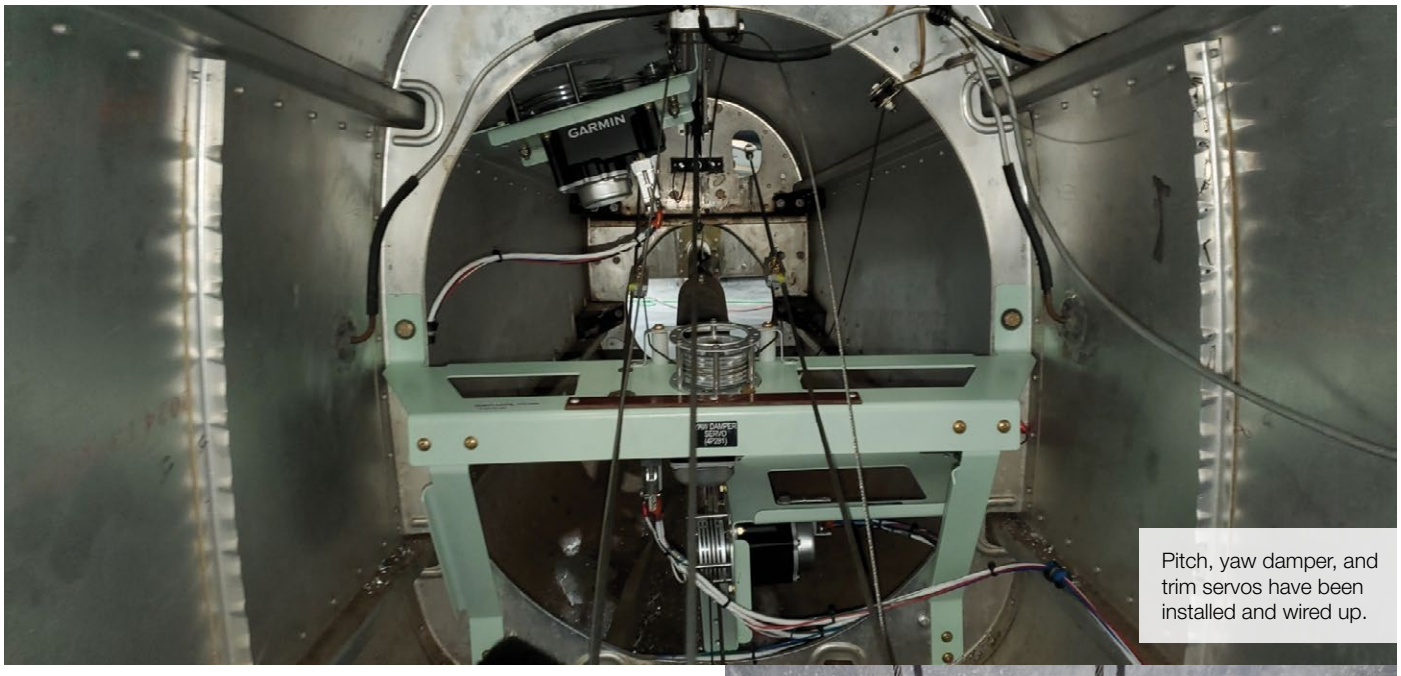
"Coming back into the home airport, we set up a descent from 9,500 feet down to 1,500 feet 40 miles out and used vertical speed mode set at 500 fpm. We reduced rpm to about 2,000 and flew a rock-solid descent on course to capture 1,500.

"Because the home airport doesn't have an ILS or RNAV approach, we could not test a coupled IFR approach. However, it does have software that will give an advisory VFR straight-in approach with lateral/vertical guidance just like an instrument approach. We tried this to give me some practice following the needles (in the G5 case, magenta diamonds on the lateral/vertical scales), while my instructor watched for traffic, etc. This worked fine.

"For our upcoming instrument training, I don't have any doubt that the autopilot will perform well with coupled approaches. There is a flight director as well, which will give cues on the G5 from the navigator when flying approaches by hand in addition to the lateral/glideslope indicators.



Tail exposed showing jack screw and barrel for pitch trim.



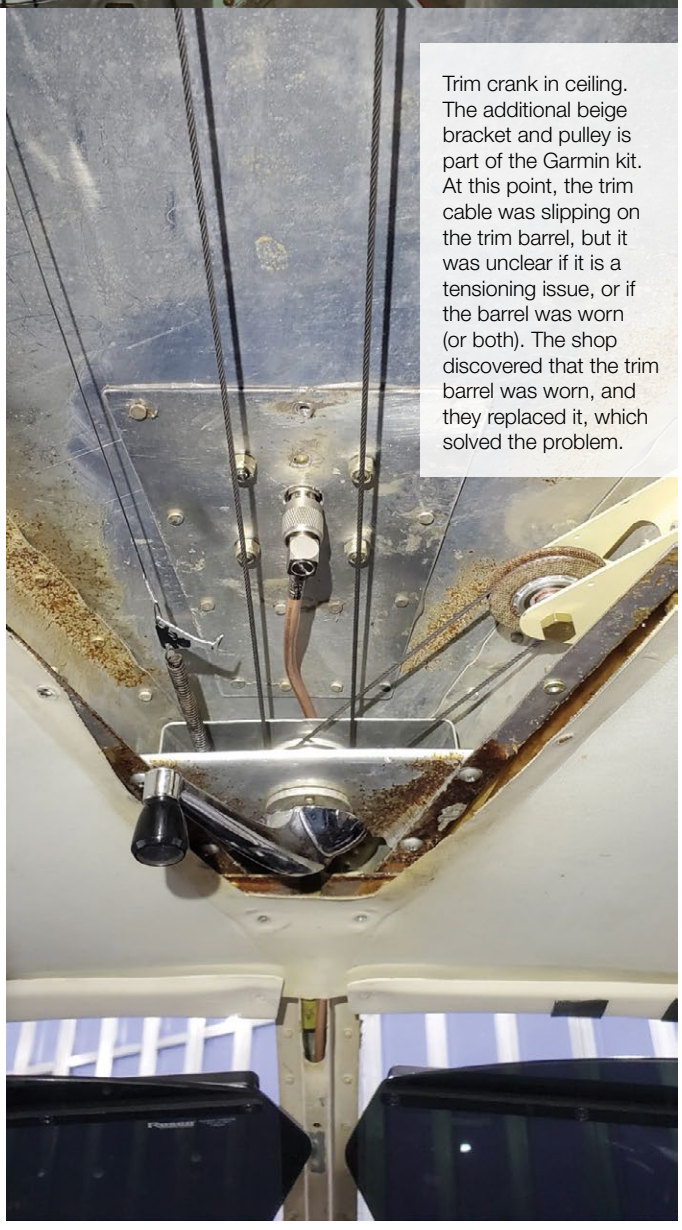
Pitch, yaw damper, and trim servos have been installed and wired up.

"In summary, I'm very happy with the installation. The final piece will be the Electronics International 30P engine monitor and the 30C gauge replacement to replace the tach, oil pressure, oil temp, fuel pressure, and fuel tank level gauges, plus the functions of the existing JPI 700 (EGT, CHT, and fuel flow). Those units were built to the 235 specs and my A&P will install them this coming October.

"Since the install has been completed, I've flown nearly 40 hours of IFR training with my CFII and the new avionics. They work every bit as well as I anticipated prior to beginning this project. Hand flying approaches work very well using the indications from the navigator and the G5s. Where the avionics really come into their own is flying coupled approaches (and missed approaches to holds) with the GFC500 autopilot. It's really an amazing system."

Lessons Learned From the Upgrade

- Moving the navigation, radios, and transponder to the center section from the far right of the panel makes it much easier to access these systems while flying.
- The Garmin GFC 500 autopilot is the best addition to the new panel, by far, both for flying VFR and IFR.
- The system coordination between the Garmin GNC 355 navigator and the two Garmin G5s is outstanding.
- Swapping flight plans between my iPad running ForeFlight and the Garmin GNC 355 navigator is simple and extremely useful.
- Complete any desired upgrades all at once rather than piecemeal. The addition of two Garmin G5s was an initial upgrade I had another shop complete. It would have ended up less expensive overall if I had included this installation along with the other items.
- Upgrade your autopilot, especially if replacing a legacy autopilot (mine was inoperative). Garmin's GFC 500 autopilot has transformed my flying, especially while I train for the IFR rating. It is a fantastic system for those high-workload situations found in IFR flying, as well as reducing fatigue on long VFR cross-country flights.



Trim crank in ceiling. The additional beige bracket and pulley is part of the Garmin kit. At this point, the trim cable was slipping on the trim barrel, but it was unclear if it is a tensioning issue, or if the barrel was worn (or both). The shop discovered that the trim barrel was worn, and they replaced it, which solved the problem.

A FORUM CONTRIBUTOR'S INSIGHT

Frequent forum contributor Eric Panning offered helpful tips on adapting to upgrades and flying at night and in IMC.

"My advice for anyone when learning new avionics is doing as many things wrong as possible and understanding recovery," he said. "This is so important, as often errors are made when you are already task-saturated in IMC. If there is confusion on the recovery you can get farther behind the plane.

"Recovery is maintaining positive control too — not just recovering the avionics. For example, if you accidentally deleted your active flight plan out of your GPS, the right response is not frantically typing it back in. Make the system work for you. Call ATC to help you get back on track. A simple request will buy you the time you need to get the situation sorted out: 'Center XYZ, N123 lost flight plan. Request vector to next waypoint.' They will likely have you identify (even though ADS-B shows where you are), state the next waypoint and distance and give you a vector. Then you have time and bandwidth to input the rest of the plan. They are happy to provide services like this. It is much preferable to wondering why you have suddenly drifted off course. For autopilot systems, you should always know what it is going to do next and when it is going to do it.

"Night flight should be approached with caution. On a clear night with city lights, it is some of the most enjoyable flying out there. On a moonless night cross country over uninhabited areas, it is legal VFR in the U.S., but it's essentially IMC. The longer you stare outside at distant city lights and lines of car lights, the more likely you will end up in an unusual attitude. When flying passengers, be selective on the weather you will fly in and flexible on time. When you have passengers in IMC, it's a good idea to remind them to focus on the cockpit and maybe give them a small job to keep them occupied because if they're not experienced, it may seem to them that you're going too fast into a solid fog bank."

1. uAvionix AV-20 MFD (clock replacement)
2. Turn Coordinator retained due to STC for Garmin G5s
3. Garmin G5s; top is configured as primary AI; bottom left G5 configured as DG/HSI.
4. JPI EDM-700 engine monitor (will be removed with addition of EI instruments)
5. Sensorcon CO detector
6. PS Engineering PMA7000B audio panel
7. Garmin GNC 355 GPS/comm
8. Garmin GNC 255 nav/comm
9. Garmin GTX 327 transponder
10. Garmin GFC 500 autopilot

Before (below) and After (above)

- Consider adding both yaw damper and auto-trim options when looking at autopilots. Garmin offers both for the GFC 500.
- Consider upgrading your nav/comm. Replacing my failing KX-155 with the Garmin GNC 255 nav/comm was worth it, since I can shoot ILS/VOR approaches. Plus it gives me a second radio to get airport weather without having to switch frequencies on the GPS/comm.
- Avionics upgrades typically take more time than initial estimates. I found our installation to be fairly trouble free, and yet it still took two to three weeks longer than first anticipated. Also, I found that installation slots at most shops to be many months into the future, so plan accordingly.
- Seek the advice of other pilot/airplane owners (online forums or in-person). Being a new plane owner, I found this advice invaluable as I planned the upgrades.

IT'S YOUR TURN

Have an upgrade or restoration to share with your fellow Piper owners? Email us at *editor@piperowner.org*.

AWI, ACORN MERGER CREATES ONE-STOP EXHAUST SHOP

By Rocky Landsverk

AWI (Aerospace Welding Minneapolis, Inc.) and Acorn Welding of Edmonton, Canada, have merged under the roof of Hartzell Aerospace Welding, creating a one-stop shop for owners of legacy Cessna and Piper planes to source all their exhaust, engine mounts, and air box needs.

Aerospace Welding and Acorn are a part of Hartzell Aviation, which is the umbrella holding company for Hartzell Propeller, Hartzell Engine Tech (H.E.T.), and Quality Aircraft Accessories (QAA). A press conference was held at AirVenture 2022 in Oshkosh to announce the rebranding of these companies now operating as one unified group.

"The Hartzell Aviation umbrella brings together an outstanding array of firewall-forward products. The creation of Hartzell Aviation reinforces the three organizations' core competencies and their joint pursuit of improving General Aviation," states a press release.

What it means for pilots is that if (well ... *when*) you need a new exhaust part, your mechanic will likely be dealing with AWI, which has relationships with virtually every mechanic and shop in the US, and now with the merger of Acorn Welding, that also applies to Canada.

When you put AWI's 450-plus PMAs together with Acorn's 200-plus, you wind up with just about any product you're ever going to need. PMA means "Parts Manufacturer Approval" and it means the FAA has approved the product.

Tom Heid, the Founding Partner of AWI and its sister company AMI, said one perfect example of the merged PMAs benefiting the US customers of AWI is Acorn's specialty in carburetor air boxes.

Carb airboxes like these are a specialty of Acorn.

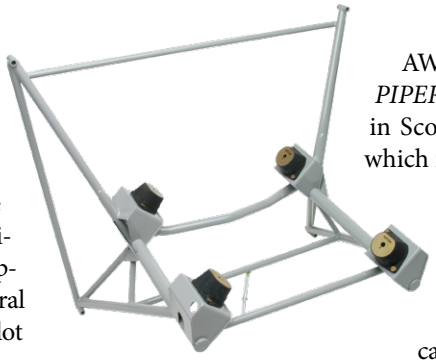
"Acorn has a Cessna 172 and 182 carb airbox PMA and they are working on several more models including Piper models," Heid said. "You can buy the whole brand-new replacement air box, or you can buy the individual components if you want to repair and overhaul your own box. We (AWI) repaired air boxes through our repair station, but we had no PMAs on any of them until now."

Another example: "Is in the turboprop market, where Acorn has a line of PMA exhaust stacks for the PT6 engine on a variety of different aircraft models." With now more than 650 PMAs combined, there are a lot more examples.

What should be encouraging and comforting for pilots is that a wealth of knowledge in the area of exhaust and engine mounts has been merged under one roof, so when your A&P needs to work on your plane, their support will be the best in the industry. And the breadth of that knowledge takes even more explaining, because the companies listed above are further supported by Quality Aircraft Accessories (*www.qaa.com*),

which has offices in Tulsa, Oklahoma, and Fort Lauderdale, Florida. So, you can also buy products directly from AWI's sister company, QAA.

Further, Acorn owns Seaplanes West, and that brings more STCs like heavy-duty engine mounts for Cessna 180, 182, and 185, and obviously a lot of products and support for float operators. Seaplanes West has an STC for several Cessna engine mounts that Heid said "gives a lot better isolation for vibration and support, especially when installing an engine with increased horsepower, or when installing an upgraded three-blade prop." This is just another example of how the mergers create a one-stop shop.



Seaplanes West brings some unique engine mounts to the merger.

AWI was already the world's largest exhaust and engine mount shop; it crossed that threshold 10 years ago. AWI is based in Eagan, Minnesota, with 135 employees along with AMI, which supplies OEM parts directly to manufacturers. AWI will be celebrating its 30th anniversary in 2023.

The first layer of support that a pilot and/or their mechanic is going to get is an expert who can identify what their plane needs, which can be harder to identify than you'd think.

"Based on the make and model of airplane, there can be a variety of options for exhaust because of STCs and engine upgrades, even the OEMs have changed part numbers over the years," Heid said. "So, when a customer calls in, we're going to go through a series of questions with the customer to make sure they are ordering the right parts for their current installations. Our experienced customer service personnel will also give inspection tips on what to look for on a specific exhaust system, areas that tend to wear out the most, and what makes something airworthy or not airworthy."

RESOURCES

Hartzell Aerospace Welding
hartzellaerospacewelding.com

AWI
awi-ami.com

Acorn Welding
www.acornwelding.com

AMI
www.aerospacemanufacturing.com

AWI has a full suite of Piper exhaust parts.

AWI has been featured in numerous articles in *PIPERS* magazine through the years, most recently in Scott Sherer's story "New Step for Your Piper," which ran in the July 2022 issue.

Heid is himself an A&P and pilot, and obviously knows a lot about airplane exhaust, so we asked him for his advice in that area. What are the few things that he's had to explain to plane owners most often in those decades of experience?

"First, if you ever have a backfire, you need to have a mechanic look at that muffler as soon as possible," he said. "A backfire is basically a disruptive explosion inside your muffler. There's baffling or flame tubes or flame cones inside the mufflers, and that explosion can literally shatter those parts. The chunks can be big enough to where they can get lodged in the tailpipe and can't make it out. It'll cause you to lose power in the worst situation, which is usually on takeoff."

"My other advice is also about the baffling, which is inside the muffler for a reason. It reduces noise and helps disperse the heat throughout the muffler more evenly. It is the first part of the muffler that typically burns out or goes bad. People complain that the baffles always burn out, but they're there for a reason. There are some mufflers out there that never had baffles from the OEM, so they don't have to have baffles, but if the muffler originally had baffles inside, then it needs to be in there and intact.

"And you should use it as a barometer of the health of your exhaust system. If the baffle starts to burn out or warp, it's time to also take a look at the whole body of the muffler to make sure it's sound, because you'll eventually wind up with a hole or a crack in the body of the muffler, and then you will get carbon monoxide."

That leads to the #1 piece of advice that Heid gives.

"Make sure you get some form of a CO detector in your airplane," he said.

Again, from the press release, "Hartzell Aerospace Welding, established as Aerospace Welding Minneapolis, is a world leader in general aviation aircraft exhaust systems and engine mount repair. Its core competencies include certified welding, precision machining, and sheet metal fabrication."

The Ultimate Piper Owner Discussion on Replacing Original Piper Door and Cargo Locks

What follows is published in near entirety from the Piper Owner Society forum because of the depth of its advice. Thank you to our members for taking the time to contribute such thoughtful tips and tricks for their fellow members. The original discussion is at *piperowner.org/talk/discussion/155499/keys.*

Q When I bought my 1973 Arrow, the former owner said he only had one key. He had misplaced the other. He has not been able to find any way to get a copy made for a number of years. Does anyone know of a place to get Piper keys made?

—Resq5hvy

A I've had eight plane keys made at my local hardware store. The door locks that Piper uses are not airplane specific and, at least in my experience, they're the same locks used in some desks. Last year, I replaced my cheap, pickable locks with real airplane locks. Here's a link: *aircraftsecurity.com*. Read a complete article on this installation at *piperowner.org/aug21*.

—Scott Sherer, Piper Owner Society Aviation Director

A That is good news. I was under the impression that they were special keys. I will likely put real locks on it once I get the un-refurbished radios, seats, carpet, and instruments replaced by glorified iPads and carpet with less dirt.

—Resq5hvy

A Years ago, I had the exact same experience as Scott. I went to a locksmith to have the original lock rekeyed. He confirmed what Scott said, that the factory Piper lock is an office drawer lock. Then he proved it by pulling out a brand new one. They were identical. I replaced both my cabin door and cargo hatch locks with units from Medeco. They are stronger and more secure. At aircraftsecurity.com, the Medeco lockset price for pre/post 1976 PA-28s is $219.90. [Ed. Note: price as of September 2022]. This includes both cabin and cargo door locks with matching keys.

—Jim "Griff" Griffin

A Looks like they exclude the nose baggage lock. I wonder if there was an incident? The Piper lock prevents you from releasing the key if it is unlocked.

—Eric Panning

A Eric, that's for the PA-32. Resq5hvy has a PA-28 Arrow, so I think he'll be in the clear. A lock that prevents you from removing the key unless it's locked seems like a great safety feature for the forward baggage door. I don't know if there were any incidents, but I suspect it's a liability issue? Are the PA-32 forward baggage door locks still available from Piper?

—Jim "Griff" Griffin

A Jim, yes, I agree it's OK for the PA-28. Could be just the perceived liability vs. an actual incident. Most nose baggage doors have multiple latches, but for the Piper 32/34 series, it is a single point of failure. If it was closed but not locked, it would inevitably pop open (at the first possible time).

A general note: Passengers are always looking for something to help with. Loading baggage and closing doors should not be one of them. I would say few pilots weigh pieces of luggage, but you should lift all pieces and make an assessment as well as personally close all doors and hatches. It is like delegating putting the boat hull plug in before launching. If you are motoring away and ask them if they did it, they will say, "Yes," and if you ask, "Are you sure?," they will say, "I think so...."

—Eric Panning

A My Seneca baggage door popped open on the takeoff roll after liftoff. I went around at 500 feet and landed with the baggage door fully open. The baggage door and nose fiberglass areas were damaged around the hinge. I had it repaired, and I've been paranoid during my preflight ever since. A passenger distracted me while doing preflight, and I left the keys in the nose baggage compartment and the door unlocked. Lessons learned. I never let anyone distract me anymore during a preflight, runup, or takeoff. In case you're wondering, after landing the keys were still hanging out of the baggage door.

—Scott Sherer, Piper Owner Society Aviation Director

A Eric and Scott absolutely nailed it. No matter what anyone says, or how good their intentions, due diligence is ultimately our responsibility. Distractions can lead to damage or fatalities. None of us are immune, me included. I've been fortunate to stay out of the fatality column (else this post would be blank). A few years back, I was waiting to take off and witnessed a baggage door whip open and the interior panel get ripped off a PA-28 with two instructors aboard during their takeoff roll. It damaged the airplane skin, the baggage door, and, of course, the interior panel (which was now runway FOD). I don't know what their distraction was during the preflight, but it was an expensive mistake.

I keep my ignition key on the same keyring as the baggage door key. It forces me to lock and remove the key from the baggage door before I can start the engine. Of course, that procedure does no good if your plane doesn't require a key to start.

I also keep a bathroom scale in my hangar. I weigh and record everything that goes into the plane before a flight. Makes it easy to move baggage or passengers as needed to stay within the weight and balance envelope and has been very valuable during ramp checks.

—Jim "Griff" Griffin

A I think I will likely upgrade soon. Is it your policy to fly with the baggage door locked (in a PA-28)?

—Resq5hvy

A My checklist states that the baggage door is to be locked before flight.

—Jim "Griff" Griffin

A The PA-31 has a placard that deals with this and a warning light in the overhead panel. But the failsafe is you lock it yourself or check that it is locked every time. That way, no

passenger can open it and not have it properly closed. An Aztec guy might correct me here, but when I rated on that many years ago, I recall that if the nose door opens on takeoff, you are going down.

—johnsouthworth

A Yes, and I think Medeco wanted to avoid all this by not providing a lockset for the nose baggage (for the Pipers that have nose baggage).

—Eric Panning

A I've owned a variety of Pipers. As far as I know, and two different mechanics have said the same thing, there are only four different Piper door/luggage keys. My experience verifies this! I left keys at home one day. I used my wife's metal fingernail file to open the luggage lock to retrieve a headset.

I'm hoping Santa leaves new Medeco locks under my tree, or in my mantel stocking! They're great, but pricey. As I typed this, the thought of the price of the lockset vs. the price of four headsets in each of my Pipers … you get the drift.

—JustJess

A If you have the Medeco locks, you will have to contact the Medeco dealer that sold the locks and provide a key code. A local locksmith can't help. When I had my Medeco locks installed, I recorded the key code and invoice number in my logbook so I could get additional keys if I needed them.

—kentshaw

A I would go ahead and replace the locks with the kit from the Aircraft Security website. I just did the baggage door on my 235 and after some adjustment, now it works one handed. The OEM lock, probably original, was stiff and the tumbler allowed it to be turned around as it was worn. Scott has a very good writeup that I followed from the August 2021 magazine issue. I have not done the entry door yet, as I have not had the time to figure out how to remove the VW-style door-opener handle so I can remove the door trim to get at the lock. I found the new locks to be very solid and well made.

—Joe8120

A Joe8120, in a previous life, I used to be a Porsche/VW mechanic, so I hope this helps you out. In many aircraft, Piper used (circa) mid- to late-1960s VW interior door latches. Pull the chrome door lever out, and look for a small slot in the "cupped" portion of the black plastic bezel behind the lever. Put a small flat head screwdriver in the slot, and pop the bezel out. Once out, you should have access to the mounting screws of the handle.

—Jim "Griff" Griffin

A Griff, thanks for the tip! When I replace the door panel (and side panels), I will now know how to access the latch mechanism. I had heard that the latch was VW and checked with a friend who has a '69 VW and, sure enough ... there was my Arrow door latch!

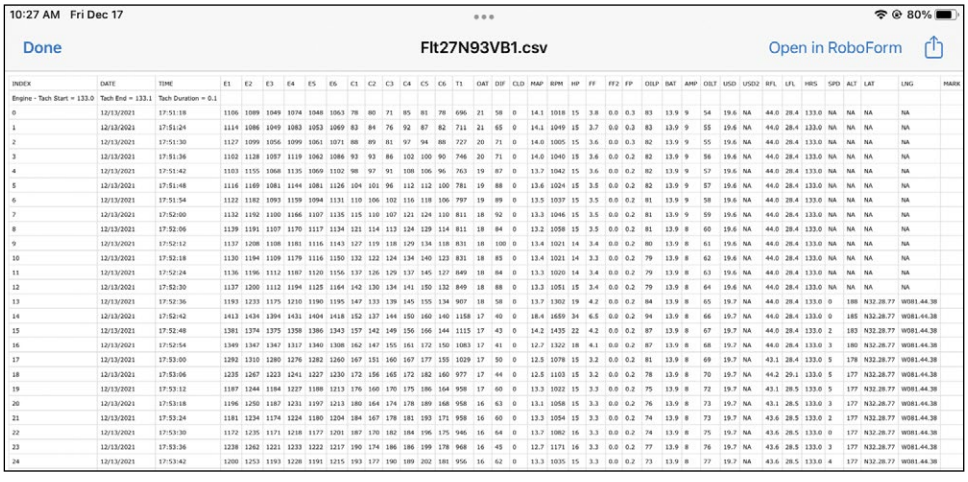
—arrow76r

A All the aircraft manufacturers used some automotive parts back then, not just Piper. Armrests, alternators, fan belts, voltage regulators, door handles, cigarette lighters, ashtrays, wheel bearings, latches, etc. were automotive parts from various makes and models. Why reinvent the wheel when you can buy it off the shelf?

—Jim "Griff" Griffin

A My door key cross-referenced to a 1960s padlock. The ignition switch came back as a multiuse lock key with crossovers to Cessna aircraft. My Arrow is having an identity crisis. I have extra keys now. I think at some point a new ignition switch was installed. The door key is much older, so the locksmith says.

—Resq5hvy



Read more on this discussion including this chart at *piperowner.org/talk/discussion/155520/high-egt-at-map-18.*

High EGT at MAP 18

Q My PA-32RT-300T is running high EGT at the 18 MAP area. I have the JPI 900 and the data and charts. After having my JPI 900 installed, I took my 1978 Turbo Lance up for a test flight. The climb out to 6,000 feet was normal. I leveled off and all temperatures were normal. I reduced MAP to about 20 to begin my descent and my EGT jumped to the high 1600s across all cylinders. We checked fuel pressure, checked for dirt, and sent the servo out to be bench checked. The above numbers are a ground run up test after the mentioned work had been done. What I'm looking for is a readout of my same plane and engine to do a comparison. The high EGT is seen in the MAP range of 16.5 to 22.

—Hand1978

A Piper friends, a printout showing RPM/MP/FF and EGTs from idle to at least 2,500 rpm should be a great help. The headings are on top. [See screenshot on above.]

—Hand1978

A This is just a thought, but since it is across all cylinders and it happens during a power reduction, I would be looking at your alternator output or the resistance in the ground wire to your EGT monitor. With respect to the alternator, the field coil output may be varying at a lower engine (not prop) RPM. An accurate galvanometer and ammeter to the closest 0.1 VDC and 0.1 amp would clarify the situation.

—bearair70

A I think you may have an induction air leak. I personally would look at cylinder 3 first.

—John Schreiber, A&P/IA, CMEL

A Use Savvy's data chart service (*www.savvyaviation.com*). It's free to create an account and upload data. Then you can use it to trend and such. If so inclined, you can also pay for analysis to help diagnose issues. I use it; it's great.

—akattamu

A Flyin' my PA32-301T, I had a problem on final approach where all my EGTs spiked into the red zone. I pushed up the mixture to full rich and they settled back into the green. I continued on final, monitoring the readings and watching for smoke and fire. On landing, the engine ran rough, and I had to keep playing with the throttle to keep the engine idling to get the short distance back to the hangar. After getting out, I found fuel dripping from the vent tube at the bottom of the intercooler. The intercooler upper-deck air lines feed a manifold tube to inject air into the injection jets, and the other line connects to the engine-driven fuel pump. Turns out the fuel pump diaphragm had a hole/crack and was leaking fuel into the upper deck air pressure line, hence out the bottom of the intercooler. We replaced the fuel pump, and it works well now. The upper-deck air pressure has to feed both the injectors and the fuel pump to keep the fuel pressure equalized with the pressure at the injectors, or fuel can't be injected into the cylinders.

—piperarcherr47

Send Us Your Maintenance Questions

Names in this section are forum usernames. If you have a question that you and/or your A&P can't answer or if you're looking for a second opinion, take advantage of your membership. Contact us at *tech@piperowner.org* to get help from our staff or post your question at *piperowner.org/talk*

Disclaimer: We provide help to our members with maintenance questions, but since every plane problem is unique and we are unable to visually inspect your plane, we advise you to consult your A&P/IA.

Uneven Fuel Consumption in Left and Right Tanks

Q When we fly the Apache for 1.5 to 2 hours, the fuel consumption out of the left tank is always noticeably more than the right tank. Not sure how this is happening. Both engines have been topped with new cylinders, and each has been rigged by the book. Any ideas on why the left tank always requires more fuel than the right tank? There is no evidence of leaking from the tank or around any of the fuel fittings.

—Member

A Are you learning by the book or by EGT? Sounds like a gauge error causing you to run at different fuel flows. How much different are we talking? A gallon or 5? You can go by the old standby of leaning until rough/power loss and then sweetening it up a little from there and see what you get when you do that on both sides. Another possibility is that at full rich, one flows more at TO power than the other. A fuel flow computer would be of value to troubleshoot this if that's on your radar to add.

—Erich Rempert, A&P/IA Consultant

Best Repair for Motor Mount After Prop Strike?

Q I had an unfortunate prop strike taxi incident that required engine tear down inspection on my 1946 PA-12 SuperCruiser. After removing the engine, we noticed that the top support arm engine frame had slight bow, with evidence of stress trauma. I have the STC for O-320, 150 hp Lycoming that required "beefing up" the engine frame that complied with lower support tube, but the top arm did not require that. I called Wag-Aero but they no longer repair and recertify frames, and the new frames they do sell do not comply with STC (replacement for original lower hp engine). I'm wondering if you would share information on what options I have. If in-field repairs would cause concern (questionable compliance with STC alterations?). Would replacement of that tube or reinforcement to existing tube be a better choice?

—Member

A Call Aerospace Welding (651) 379-9888. They should be able to repair your mount.

—Erich Rempert, A&P/IA Consultant

How to Fix Strut Leak

Q I have a left main strut leak on a PA 28-181. The mechanic has replaced the seals twice but there has been no success in an effective long-term repair. He thinks the cylinder may be cracked and has explained that the next course of action would be replacement (P/N 65319-04). Is anyone aware of where I can purchase this part rebuilt and its hardware? Or maybe there is some additional advice or similar experiences out there?

—Member

A Have someone else rebuild it. Confirm the leak (find the crack) before replacing, and if you do replace it, search the salvage yards for a replacement.

—Erich Rempert, A&P/IA Consultant

Daniel Chapman
1965 PA-32-260 Cherokee Six
California

"Prepping plane for flight at KCCB. Photo reminds me of an old retro advertisement. My son and I co-own this airplane. Just purchased two months prior to this picture being taken."

What are your three top tips for people who own, or are considering buying, your plane model?

1. Learn all the systems thoroughly.
2. Set up a fuel consumption / power setting log (paper).
3. Power off 180s.

Special or Unique Features

First year built. All the old knobs are still in place. They haven't been replaced yet but may in the future. It's our first airplane, so we love it. It's easy and fun to fly.

What was your most recent upgrade?

A recent upgrade was installing a Garmin GNC 355. I'm still working out some bugs with the autopilot but love the unit so far. Any avionics upgrade to keep skills sharp and plane value up is always good in my opinion.

What is the biggest ongoing challenge with this aircraft?

We've owned it for less than a year so far, but we're embracing challenges as they come.

What is the best reason to fly this aircraft?

It's roomy, flies great, and you can't beat the useful load.

What is your advice to somebody who is considering buying this model, or who recently purchased this model?

Absolutely have the wing spar paperwork checked out thoroughly. Do an owner-assisted annual to learn your airplane. Determine your approach speeds and power settings, compared to the POH. Talk to other Cherokee Six owners. That's invaluable!

David Piersma
1973 PA-28R-200 Arrow II
Indiana


Ready to launch on a perfect day to fly!

What are your three top tips for people who own, or are considering buying, your plane model?

1. Address minor squawk/maintenance items as they come up. Don't put them off.
2. If considering a purchase, check into the wing spar issue and the factored hours on the Arrow you are considering.
3. If at all possible, keep it hangared, and wipe it down after each flight for bug splatter, etc. It will draw your attention to anything that you may need to address.

Special or Unique Features

- 600 hours on overhauled Lycoming IO-360-CIC.
- About 200 hours on new scimitar Hartzell prop.

What was your most-recent upgrade?

- Waiting on delivery of two AV-30Cs to replace AI and DG.
- Will be removing vacuum system and also adding a JP Instruments CGR-30P engine monitor.

What is your advice to somebody who's considering buying this model, or who recently purchased this model?

Check into wing spar AD/factored hours and most recent AD on washer outer edge radius required due to proximity to inside radius of structure.

CYJA Jasper, Alberta, Canada, July 2022.

Ken Zachkewich
1965 PA-28-180C
Alberta, Canada

What are your three top tips for people who own, or are considering buying, your plane model?

1. It is a good "compromise" aircraft, ie reasonable speed and load capability.
2. It is a relatively common aircraft for parts availability and mechanics to work on.
3. In my opinion, the low-wing style looks and handles better.

What was your most recent upgrade?

Fuel flow and totalizer gauge. An excellent way to manage fuel with much more accuracy than factory gauges. Highly recommended.

What is the biggest ongoing challenge with this aircraft?

Keeping up with ADs and Service Bulletins. These aren't too bad with this aircraft, but when you are not anticipating additional maintenance/expenses, it can be a challenge budgeting the inspections. I don't think this aircraft is any worse than other aircraft for mandated inspections.

What is the best reason to fly this aircraft?

The best reason is the same as flying any aircraft — freedom! This particular aircraft is sportier than comparable other brands. It is very easy to fly with no real bad habits.

What is your advice to somebody who is considering buying this model, or who recently purchased this model?

If budget is a concern, find one that someone has already spent the money to upgrade. I bought a plane that was original and spent buckets of money to upgrade. Pros: It is a personalized aircraft. Cons: It is very costly. If you choose to buy a "fixer-upper," invest in the airworthy items first, build some time, and add your personalizations bit by bit. I did paint and speed mods one year, interior a couple years later, and a few years after that came the full avionics upgrade.

Remember, we are stewards of these aircraft, and investing in them ensures they will still be flying long after our medicals ground us.

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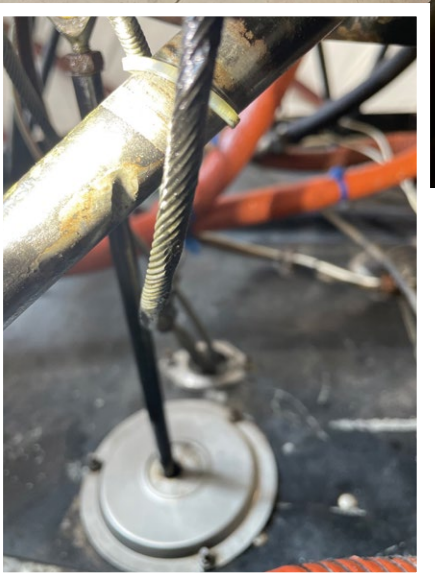

Above: Kay Hall had an annual go bad and it wound up totaling $18,000.

FlyWithKay

Pilot Blogging for Piper Owner Society

We've started a blog on the Piper Owner Society website detailing the travels and plane upkeep of pilot Kay Hall. Here's the start of her story from her first blog.

"My name is Kay Hall and I own a 1968 Piper Cherokee 180D that I fly all over the country. I'll be talking a lot about my airplane and travels in future posts, but I thought I would kick this this one off with a bit of information about my journey so far.

"Back in 2018 I really didn't know what I wanted to do for a living and was working as a server at a restaurant. I've always had a very supportive family so when my father (I call him Pops) called me and told me he had spoken to a female friend that worked for Delta Airlines, he asked if I'd be interested in becoming a flight attendant. I said yes and had a great conversation with her. She said she'd be happy to give Delta a referral for me.

"I called Pop back and told him about the conversation. He could detect that I didn't have the enthusiasm he expected so he asked me point blank, 'If you could do anything you want, what would it be?'

"I told him that I'd rather be the pilot flying the airplane! He said, "then that's what you should do. We'll figure it out!'"

Kay has now blogged several times, focusing on what you can learn from her extensive travels, which obviously puts her plane through a lot. She told us about her "Runaway Annual" that wound up costing $18,000, and about a rebuilt strut seal that taught her a few important lessons.

Follow along at *piperowner.org/fly-with-kay*.

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