The TWIN CESSNA Flyer

JANUARY 2013

FEATURING:

O&N TURBINE 340 SILVER EAGLE

ICE, WIND, CLOUDS AND MOUNTAINS

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The TWIN CESSNA Flyer℠

FEATURES

THE TWIN CESSNA FLYER℠
P.O. Box 12453
Charlotte, NC 28220
Phone: 704-910-1790
Email: editor@twincessna.org
Website: www.twincessna.org

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Cover article photo by Bob Nicholas. Editing Assistance provided by Madeline Frank.

FROM THE EDITOR

By Bob Thomason, President TTCF

SEMINAR UPDATE

We'll be back at Continental Motors in February for our first 2013 Twin Cessna Systems & Engine seminar. Don't miss this one, which will include a tour of the factory.

There are a few seats still available for our first 2013 Engine & Systems Seminar to be held next month at Continental Motors in Fairhope, AL (KCQF). The last one held at Continental was one of the best ever and this one promises to be even better. Continental is providing all our lunches and a special dinner on Friday night. We'll have a factory tour Friday afternoon at 1 PM. If you're coming just for the weekend Systems seminar, try to arrive on Friday and make the tour. Time permitting, we'll try to get out to the airport Friday or Saturday afternoon to look over the Twin Cessnas on the flightline. Don't delay. Sign up now and get one of the remaining seats. Join us in Fairhope and learn all about your airplane, and especially your engines. You can sign up on the website, or just call me at 704-910-1790.

Finally, be sure to check out a video of member testimonials recorded after our last seminar in Santa Barbara. The link is in the upper left corner of our homepage: www.twincessna.org

2013 FLY IN CONVENTION

Our Agenda for our 2013 Annual Fly In Convention is shaping up. It's going to be a blockbuster. Complete details are on the website but here are some highlights:

Sign up now for our 2013 Annual Convention!

Thursday June 27th - Erik Eliel of Radar Training International will be teaching his renowned Airborne Weather Radar course. Even if you only have Nexrad weather downlink, you'll find this course interesting.

Erik Eliel, President of Radar Training International.

Friday June 28th - Dr. Mark Rosekind, NTSB Board Member and expert on managing fatigue will present, Tony Saxton will hold a session on Twin Cessna technical issues, George Braly of GAMI will give us an update on 100LL issues and we'll have a panel of engine experts, including a Continental representative, hold an engine Q&A session.

That evening we'll have a live auction which will be a fun opportunity to pick up some wish list items at (hopefully) bargain prices.

Dr. Mark Rosekind, NTSB Board Member.

Saturday June 29th - Jerry Temple will speak on Twin Cessna market conditions, we'll get an update on Wireless Cockpit technology and ADS-B from Andrew Knott, Executive Director of the TBM Owners and Pilots Association and avionics guru, a Cessna rep will update us on goings on at the factory, Tony will conduct another technical session with Q&A, we'll review recent Twin Cessna accidents and get an update on TTCF. We'll close our convention with a final Dinner on Saturday evening.

Tony Saxton, TTCF Technical Advisor.

George Braly, Chief Engineer, General Aviation Modifications Inc.

Throughout the convention we'll have time built in to visit vendor booths for one-on-one product updates. And, although it's a full agenda, we hope to have time to visit the flightline as a group and admire each other's airplanes

Jerry Temple, JTA Twins President.

See the complete Agenda on our website. We will have several other speakers and events not listed here.

Do not delay. Register now. There are a limited number of rooms available at the Hilton Doubletree.

Andrew Knott, Executive Director of TBMOPA.

Early this month, I will be emailing all members a link to the Registration Packet. You"ll also be able to download it from the homepage of our website. And finally, to make it easy, feel free to just call me at 704-910-1790 and we'll handle your registration over the phone.

See you in Wichita for this first class event!

STRAKES NOW AVAILABLE FOR THE 335

The Cessna 335 was essentially an unpressurized version of the 340. It was introduced in 1980. The price differential between the two airplanes was not that great which resulted in disappointing sales. Cessna discontined production after only one year. Only 65 airplanes were produced. But if you own one, you now have the option of installing Aircraft Performance Modification's strakes.

Testimonials are universally postive for this mod. Steve Hinckley, APM's owner, tells me they don't see as much speed increase on aircraft with four-blade composite props but those owners still benefit from the improved climb, stability and single engine performance.

See APM's ad on page 27 as well as member Max Nerheim's article on page 26 about his strake/hubcap combination.

406 MHZ ELT'S WORK

When I renovated my panel in 2012, I installed an ACK E-04 406 MHz ELT. The installed cost ran about $980. While still not mandatory, it's clear these units are far superior to the old 121.5 MHz units. I can now attest- they work as advertised. No, I didn't crash, but here's what happened. I was eating lunch one day and saw my best friend's number ringing me on my mobile phone. I answered and his breathless voice exclaimed, "Thank God you're OK! I got a call from someone that your emergency beacon went off." I knew immediately what had happened. My airplane was in the local shop for some maintenance that day and I was sure they had accidentally set it off. I called the SARSAT number and to explain the situation and they said, "We've already talked to your shop." They were able to pinpoint the location of the beacon because the GPS coordinates are transmitted the instant the beacon is activated. And, by the way, the airplane

In the event of an accident, a 406 MHz ELT might save your life. Notification of Search & Rescue will occur within minutes vs. hours or longer for an old 121.5 MHz unit.

was inside a hangar. Needless to say, I was impressed.

$1,000 is a lot of money to spend on something you'll probably never use, but if you ever need it, you'd pay any price. Personal 406 MHz PLB's are less expensive and they do not require

(continued on page 15)

O&N TURBINE 340 SILVER EAGLE

By Bob Thomason, TTCF Editor

Who among us hasn't made a dream list of improvements we'd like to make to our airplane. "If only Cessna had done 'this' or 'that'." Once upon a time, back in the 60's, 70's and 80's, there was a small industry devoted to this precise concept- modifying GA airplanes to improve the performance of stock models. For Twin Cessna owners, names like Colemill and Riley come to mind. Many of the men from this era are no longer with us, but one is and he has staked a claim in the turboprop conversion arena. Myron Olson is the President of O&N Aircraft, makers of the Silver Eagle 210 and, now, the Silver Eagle 340. Both airplanes are turboprop conversions using Rolls Royce (formerly Allison) turboprop engines.

The 340 was a natural addition to the original O&N 210 Silver Eagle. The 340 has always been a step up, entry level cabin class twin. Plus, it's just a darn good looking airplane!

O&N (www.onaircraft.com) was founded in 1986 by Myron "Ole" Olson and Richard Newell. Both men had aviation modification experience, having worked with the likes of Jack Riley and other well know mod companies. They founded O&N to specialize in auxiliary fuel tanks. They developed, and still sell, a number of different aux tanks for Twin Cessnas. In 1989, O&N launched its first turboprop conversion program with a Cessna P210. In 1992, the Silver Eagle 210 was certified by the FAA. Since that time 114 210's have been converted to Silver Eagles.

Of interest to us, of course, is the new Silver Eagle 340- O&N's latest project, which received FAA certification in July of last year. I recently spoke to aircraft dealer, Robert Nicholas, who sells Silver Eagles for O&N.

TTCF: Why did O&N decide on the 340 for its second turboprop conversion project?

Robert: *Silver Eagle 210 owners love their airplanes but for many there comes a time when they want to move up to a twin. What aircraft could be better for them than the 340? It's a Cessna and the piston version is the natural step up for a piston-powered 210 owner. Plus, it's a great airframe- well built and easy to work with. All this made the 340 the natural choice for us.*

TTCF: What particular technical challenges did O&N encounter during the certification?

Robert: *Very few. The FAA requires dual elevator trim tabs so those were added. We also had to add a spring to the elevator to meet pitch stability requirements but that was about it. The airframe is well suited for the conversion. We were even able to use the stock engine rails, although we shorten them a little.*

The Rolls Royce 250-B17F/2 is tried and true with over 200 million flight hours. At 450 shaft HP at sea level, it's one of the smallest turbine engines available for GA aircraft and perfect for the 340.

TTCF: Since the Rolls Royce engines are 270 lbs. lighter than their piston counterparts, didn't that create some weight and balance issues?

Robert: *As you know, turboprops require a large battery for starting. The one for the Silver Eagle 340 weighs 85 lbs, so we put it in the nose under the baggage compartment, along with the air conditioner. That helped offset the CG impact of the much lighter engines.*

TTCF: One of the problems with other turboprop conversions has been range. The smaller airframes just can't hold enough fuel to get decent range. What about the Silver Eagle 340?

Robert: *Remember, O&N is the expert in fuel tankage for Cessna twins. We reengineered the fuel system so it holds 258 gallons giving the airplane a 1,300+ nautical mile range. Not only that, but there is no need for complicated tank switching anymore. There are two fuel tanks on each wing- the tip tank (main) and a single O&N designed fuel bladder inside the wing. Fuel is always drawn from the tips. Once the pilot starts the engines, he turns on a fuel pump and the fuel inside the wing tank is pumped into the tip tank. That's it. There is a backup pump in case of a pump failure.*

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O&N TURBINE 340

(continued from page 6)

TTCF: How does all that fuel impact the useful load?

Robert: *Check the numbers. Lighter engines plus stronger performance gives the Silver Eagle 340 a useful load of 2,175 lbs which is a considerable improvement over the piston version.*

It wouldn't make much sense to engage in such a major renovation without installing the latest and greatest avionics. It's included in the Silver Eagle package. Note the absense of mixture levers.

TTCF: Other than current 210 Silver Eagle owners, who is your target market for the Silver Eagle 340?

Robert: *Our conversion runs $1.6 million, plus the owner has to supply the 340. So you're looking at $1.7 or $1.8 million total. In that price range, you can buy some older twin turboprops but you have to remember the Silver Eagle 340 will essentially be a brand new airplane. We don't just screw on a couple of turboprop engines. We take apart and rebuild the entire aircraft. Everything comes off. The end result is as close to a new airplane as you can get. We install strakes. The panel has the latest technology glass panel with all new wiring throughout. It has a brand new heater which burns Jet A and and electric air conditioner. And*

340 Twin Turbine Specifications

Engine:	Rolls-Royce 250-B17F/2 (450 hp each)
Propeller:	Hartzell 3-blade reversible with de-ice
TBO (Engine & Prop):	3500 hours (hot section 1750 hours)
Rate of Climb:	3500 ft/min
Take-0ff Distance:	500-600 Feet
Landing Distance:	500 feet
Cruise Speed	240 Kts
Fuel Capacity	258 Gallons
Fuel Flow @ 22,000	44 gal/hour
Range (as equipped)	1326 Nautical Miles
Maximum Altitude	25,000 feet
Max Gross weight (w/gross weight increase)	6300 lbs.
Useful Load	2,175 lbs
Useful Load w/full fuel	400 lbs
Passengers	6-place cabin class

Complete Standard Conversion: Includes all Materials, Labor, and Warranty (Customer Provides or Funds Purchase of 340 or 340A Airframe)

2012 Positions.....$1.6 MILLION

- **New Custom All-Metal Instrument Panel**
- *S-TEC 55 Autopilot with Altitude Preselect , GPSS*
- **New Air Conditioning & Gas Heater (Jet A)**
- *Auxiliary Fuel - 96 Gals Added – Total 258 Gals.*
- **Super Sound Proofing**
- *Dual Elevator Trim Tab Actuators*
- **New Wiring Throughout Aircraft**
- *Emergency Standby Radio Master Switch*
- **New Tires, Brakes & Rotors**
- *New Clock - OAT & Volts*
- **Low Fuel Quantity Warning system**
- *Low Voltage System*
- **New Annunciator**
- *Overhaul Landing Gear*
- **Factory Training**
- *New Custom Paint & Clear Coat of Complete Aircraft*
- **New Interior ~~ Side Panels / Headliner / Carpet / Seats – Customer's Choice**
- *Current Annual Inspection*

GLASS ENGINE GAUGES
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Propeller RPM
Volt/Amp Indicator
Oil Pressure/Oil Temp
Fuel Flow/Totalizer
Fuel Pressure Gauge
Annunciator Lights
Gas Gen RPM
Overspeed Warning

Basic Avionics Package *(Included):*

- Garmin G600 Flight Display System
- Garmin 430 #1 & # 2 Nav/Com/GPS WAAS
- Garmin GTX-330 Transponder
- Garmin GDL69A with Down-link Weather and Audio
- GTS-800 Traffic System
- L3 Avionics ESI-1000 Trilogy Standby Instrument System
- Castleberry Emergency Battery System
- GMA-347 Audio Panel
- S-Tec 55 Yaw Damper
- Wire Harness / Antenna Package

of course we redo the interior and paint the airplane according to the customer's specifications. And one final thing: the quality of O&N's work exceeds anything you'll see come out of a big factory. Just ask any Silver Eagle 210 owner. They love their airplanes.

We think anyone wanting to step up to a twin turboprop from whatever airplane is in our target market. We expect that might include some of your members.

TTCF: Did the uncertainty around the future of 100LL factor into O&N's assessment of the market for turboprop conversions?

Robert: *Of course, but equally important is the price differential between 100LL and Jet A. It's currently about 50 cents on average but with fuel discount programs, it can be as much as $1.50/ gallon. Jet A is cheaper than avgas and we think the differential will only increase over time.*

TTCF: How long does a conversion take, start to finish?

Robert: *We can do the complete coversion within 5 months. That includes new paint and interior.*

TTCF: Most of our members have no experience with turbine engines. How difficult would the transition be.

Robert: *Turbines are easier to operate and fly than piston engines. They are much simplier with fewer moving parts. What piston owners who transition to turbines love most is the fact that unscheduled engine maintenance simply goes away. You fly them to 1,750 hours, get a hot section inspection, and then fly to the TBO of 3,500 hours. That's pretty much it. No replacing cylinders or cracked crankcases or any of the other common issues piston engines have.*

TTCF: Thanks Robert.

Check out the company provided specs on the facing page. If you are comtemplating a move up, have the financial resources, and love your 340, this would be an option to get into a turboprop while keeping your familiar and trusted airframe.

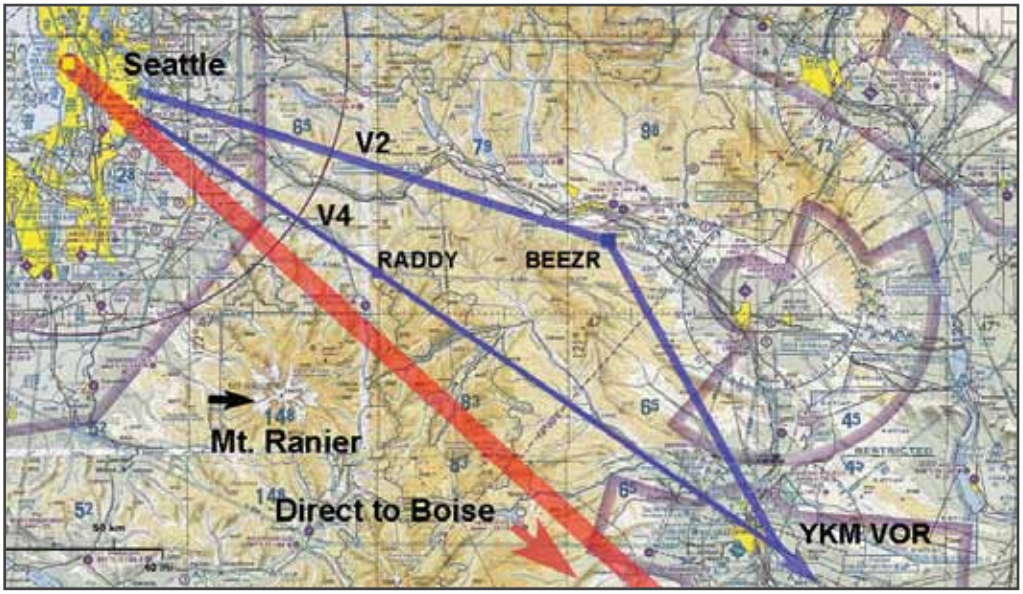
Experimentation continues on the 340 turbine Silver Eagle. Here's one installed with five-bladed composite props. Phenominal climb rates of 3,500 fpm or higher are available. Naturally, most pilots prefer lower rates that allow them to see over the nose, but the performance is there if needed. For more information visit O&N's website at www.onaircraft.com.

ICE, WIND, CLOUDS & MOUNTAINS

by Kevin Ware, TTCF Member ATP/CFI MEII

Twin Cessna winter operations in the Pacific Northwest

It was mid-December and for several days there had been a typical low pressure system moving into the North West from the Gulf of Alaska. The weather at BFI, the passenger pick-up point in Seattle, was 1800 overcast, with visibility 4 miles in light rain. Temperature on the surface was 43 deg. F, and winds were 130 at 10. The passenger drop off point was Boise, Idaho (BOI), which was reporting a 2000 overcast, visibility 4 – 6 with occasional blowing light snow, and a 28 deg. F. surface temp. Enroute weather showed tops in the Seattle area at 14,000. Over the Cascades tops were at FL180, and at BOI 8,000 feet. Winds aloft were from the west at 30 knots at 12,000 feet, and 50 knots at FL180. As is usually the case, light to moderate rime icing in clouds was forecast for the entire route, and this was being confirmed by pilot reports.



A direct flight from SEA to BOI would take us over some of the highest mountains in the Northwest. A C340 can top this terrain without difficulty, but not with an engine failure or load of ice. To be safe, we elected to fly V4 and then only after getting above the ice.

Winter weather like this frequently presents a real dilemma for general aviation pilots, particular on West and East bound flights over mountainous terrain; and this trip was going to be no exception. The severity of the almost certain airframe ice is probably the most difficult hazard to predict, but high MEAs, frequent IFR conditions and generally strong westerly winds aloft are also concerns. I professionally fly a variety of turbine aircraft in this setting, but on this trip I was volunteering as an Angel Flight West (AFW) pilot operating my own Cessna 340A, and for some reason this increases my already considerable conservatism. This particular AFW trip involved a flight from Seattle, (BFI) to Boise (BOI) taking a young mother, and her 3 year old son being treated for a lung condition at Children's Hospital back home just before Christmas, and it typifies the decision making process required of pilots operating in this area in the winter.

There are often "rocks in clouds" when flying in the Pacific Northwest. Careful flight planning can considerably reduce the risk.

Flight Planning

The flight distance was 350 nm, which given a TAS of 210 knots, plus a tailwind of about 50 knots, would take just under 1.5 hours in the C340. The airplane easily carries four hours of fuel plus the listed passenger load. The lowest mountain crossing MEA is 6500 and involves using V2 from SEA to BEEZR intersection and from there direct to Yakima (YKM), which is slightly out of the way. An alternative would be to use V4 from SEA to YKM, which is direct but with an MEA of 10,000 feet. From YKM, V4 goes more or less direct to BOI with MEAs on the order of 9,000 feet. The airplane can maintain 14,000 feet on one engine, so I decided either route would work for us in this aircraft, providing we were above the icing level by the time we are established on course. A direct route, at least from SEA to YKM, would not be advisable, as the MEAs and terrain would be much higher.

Given the cloud tops of 18,000 feet over the Cascades, I would choose an initial cruise altitude of FL190. The airplane will readily climb to FL250, but we are carrying a toddler who has a breathing disorder. By using FL190 we will be on top of the clouds, and out of the icing, but still able to maintain a fairly low cabin altitude (about 4 - 5,000 feet), which should benefit our small passenger.

The Flight

Takeoff: Given the winds, BFI would be using runway 13 for departures, and a turn to the east could be expected

(continued on page 12)

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FACT:
Most overhaul shop QUOTES will be less than a Factory Rebuilt Engine, BUT... the average FINAL price of a comparable overhaul is considerably MORE than a Factory Rebuilt Engine.

FACT:
With an overhaul, FINAL price is determined AFTER engine has been inspected and commitment HAS been made.

FACT:
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EXAMPLE: IO550B	CONTINENTAL FACTORY REBUILT		BOUTIQUE OVERHAUL SHOP	
INITIAL QUOTE	**$35,000****		**$31,000****	
CYLINDERS	NEW	INCLUDED	OVERHAULED STD. UPCHARGE FOR NEW OEM	$4,000**
CRANKCASE	REBUILT LATEST IMPROVEMENTS	INCLUDED	REPAIR OR REPLACEMENT NOT INCLUDED	?*
CRANKSHAFT	REBUILT LATEST IMPROVEMENTS	INCLUDED	REPAIR OR REPLACEMENT NOT INCLUDED	?*
CAM	REBUILT LATEST IMPROVEMENTS	INCLUDED	RECONDITIONED; REPLACEMENT NOT INCLUDED	?*
LIFTERS	NEW	INCLUDED	RECONDITIONED; REPLACEMENT NOT INCLUDED	?*
ALTERNATOR	REBUILT	INCLUDED	NOT INCLUDED	$1,500**
ACTUAL FINAL PRICE	**$35,000****		**$36,500** OR HIGHER?***	

*? = "Although these items are not quoted, bear in mind that they are common areas of concern ad may represent a considerable expense." *Actual quote from Boutique Overhaul Shop*

** Prices showen are averages and may be reounded up or down for simplicity.

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ICE, WIND, CLOUDS & MOUNTAINS

(continued from page 10)

shortly after takeoff, and (unless I say something) we will probably be cleared direct to the RADDY intersection, (which is about 40 east of SEA on V4) by the departure controller.

Getting on top before crossing high terrain is the best strategy. Some of the worst icing is found in the cloud tops.

Ice Avoidance Climb: With a TAS of about 140 knots in the climb, and an average vertical speed of about 700 fpm, we would expect to arrive over RADDY at about 14,000 feet some 20 minutes after takeoff. This is definitely above the MEA and would satisfy the controller, but if given this clearance I will probably refuse it. The problem is we might still be in icing as we begin transitioning over the Cascades, and that is definitely not the safest thing to do.

A better procedure would be to make sure we are above the icing (that is on top of the clouds), before departing the safety of sea level terrain, with surface temperatures of 45 degrees. For this reason, on my first call to departure control I would request vectors "for ice avoidance" that keep the airplane over or near Puget Sound until we are on top. Upon hearing my request, the controller would probably extend our departure leg to the NW, and clear us direct to SEA as we reach the cloud tops, then clear us to the flight plan route.

Airframe ice buildup in the Pacific Northwest can rapidly overpower the de-icing and anti-icing systems and climb capability of any turbocharged piston powered airplane, two engines or not. The worst situation is to be in severe icing in an airplane that will no longer maintain altitude, while heading into frozen and rising terrain. Most departure controllers in the Northwest understand this problem and will be very cooperative helping the pilot to avoid it. The "ice avoidance" request, however, needs to originate with the pilot. Making such a request is the professional thing to do as it shows you are planning well ahead of the aircraft. If you are fortunate enough to have Nexrad or onboard weather radar and are concerned about ice, avoid flying through any returns if possible, however light (green) the returns may be. Again, if you need a deviation, ask for it.

Ice contingency planning: If I encountered ice that stopped the airplane from climbing while still over sea level terrain, (and this really does happen even in turbocharged, pressurized piston twins), I could always quite safely descend to non freezing conditions without hitting anything, and without even requesting much special handling from ATC. When flying near or over salt water on the West Coast, it is helpful to know that ocean temperatures from the Gulf of Alaska to Northern California rarely are colder than 45 degrees F. This 'heat source' almost always produces ice free air below 3,000 or 4,000 feet when over or near the water.

Regardless of forecast, occasionally the cloud tops exceed the altitude capability of the airplane. If this happens while still over sea level terrain, the flight to that point would have had to have been pretty much ice free for me to feel comfortable continuing eastbound and away from the safety of the lower terrain and higher temperatures below while still in clouds. Frequently the worst icing is found just near the cloud tops. If I had been fighting ice all the way up, and was unable to get or stay on top, even though in a de-iced and turbocharged airplane, I would not go further east. Fortunately, this does not happen that often, because the winter cloud tops along the West Coast rarely exceed the low to mid 20s, an altitude turbocharged piston airplanes can reasonably manage.

Another reason for my caution about proceeding eastbound has to do with the winds aloft. Remember, they were (and almost always are) quite strong and from the west. The problem with this is that if I am not on top, and/or encounter worsening ice further east while over high terrain, I may have no option but to turn around and retreat westbound. With the westerly winds aloft at FL 180 of 50 knots, my return ground speed will drop by 100 knots. Assuming an iced up 150 knot TAS airplane, this doubles the amount of time spent in the ice during the westbound retreating leg. There was a fatal accident in the NW several years ago, wherein the ground speed problem alone precluded the pilot from reaching warmer air and lower terrain before his impossibly iced up twin, still descending even at full power, crashed into a mountainside. My rule is: With winds from the West, do NOT proceed eastbound until certain there will be no need to return.

> *"Airframe ice buildup in the Pacific Northwest can rapidly overpower....any turbocharged piston powered airplane, two engines or not."*

Enroute: Once east of the Cascade crest (about 100 nm and 30 minutes into the flight), I would most likely be flying toward progressively colder and dryer air, which reduces the probability of significant icing as the trip progresses. Also, because the temperatures would now be lower, the tops would also probably be lower. All this makes things somewhat easier and the 45 minute enroute portion of the flight would go by quickly.

Descent: Some ice could be expected during the descent into BOI. Given the 28 deg. temperature at the surface, if that ice was bad enough, it could force the airplane all the way to the ground

even with the FIKI system running full blast. For this reason, I would not want to start my descent from on top, until relatively close to BOI and would so notify the controller (again a professional thing to do).
Before starting the descent I would make sure the cabin pressure rate controller was set to no more than 500 feet per minute, but would plan on a good 1,000 foot per minute aircraft descent all the way to the final approach point, keeping the TAS up and the engines warm by carrying power.

One of the reasons for the high airspeed is that air moving across the wing is warmed a bit from higher speeds. Sometimes just a 20 knot change in TAS will stop ice from forming in conditions that are otherwise identical. Another reason for the high descent rate is it means I will pass through whatever icing layers exist much more quickly. Basically, if I encounter cloud tops on the way down at the forecast 8,000 feet, and the altitude at the IAF (initial approach fix) is say 4,000, I would spend no more than a total of three or four minutes in the potential ice.

Approach and Landing: In spite of our careful 'ice avoidance' descent, it is possible that with the 28 deg. temperature on the ground at BOI, whatever ice accumulated could still be present upon landing. Making sure windshield de-ice is working is important in these conditions. Even in a FIKI airplane with boots and hot props all working, ice tends to cling to the wing in areas you cannot see, and raises the stall speed by an unknown amount. For this reason, I would keep my airspeed higher than normal until close to the runway. Under these circumstances, a pilot with a professional mind set would only flight plan into airports with long runways (BOI has 10,000 feet). Additionally, some inquiry as to braking conditions would be in order before landing. If I had departed a wet runway at BFI and then climbed into freezing conditions, it's possible the brakes could be frozen and not working initially after landing. (King Airs have a special hot air hose to the brakes for this very reason, Twin Cessnas do not).

Most likely, I would land uneventfully and clear the runway, but near taxiways in the winter there can be piles of snow that can be a problem for low wing twin engine airplanes. Although I know exactly where I am going on the airport, if there is any question about the best route to take to the FBO, I would ask for progressive taxi instructions.
When finally arriving at the FBO and taxiing toward that lineman with the flags, I would keep my right hand on the mixture controls. You never know if a patch of ice will magically appear under your main gear when it comes time to stop. You definitely do not want to make this small final portion of the flight unforgettable for the lineman.

Conclusion

After I opened the door at the end of this flight last December, the two pax carefully made their way down the stair/steps, then walked across the slippery ramp into the warm FBO to where several family members were anxiously waiting. They were asked how their flight had gone and with relaxed smiles replied the trip was no problem at all…it was just a beautiful, sunny and relaxing flight. Nice to hear.

At this point, all I had to worry about was getting back to BFI. This would be a 'cold to warm' ice threatened flight into a significant headwind. Slightly different thinking would be required than on the way out, but that is another story.

Kevin Ware is a TTCF member with ATP and CFII ratings who owns a C340. He also flies professionally as a contract pilot in various turbine and piston aircraft based in the Northwest. He has been flying for over 30 years and has over 9,000 hours total time. When not flying, he works part time as an Urgent Care and Emergency Medicine physician.

A YEAR WITH MY 303

by Bob Thomason, Editor

Background: My T303 is my third Twin Cessna. I started with a '78 T310R in the late '90's and moved up to a 421C in 2005. I used the 421 in a part time Part 135 business I started in 2002. I enjoyed charter flying immensely but after taking over The Twin Cessna Flyer from Larry Ball a couple of years ago, I decided to exit the charter business and focus on TTCF. Since most of my flying would now be by myself, downsizing made sense.

As I mentioned, I had owned a T310R and it was a great airplane, but the 303 had always intrigued me. Cessna developed it as a replacement for the 310. Only about 300 were made before Cessna halted all piston production the the early '80's, so it is not a widely known airplane. Plus, it doesn't look like any other Twin Cessna. But 303 owners really seemed to like their airplanes and it had some traits that really attracted me. For starters, the engines have a 2,000 hour TBO and a reputation for making it. They are TSIO 520's derated to 250 HP. Max RPM is limited to 2400. Takeoff MP is 32.5 inches and cruise is 24 inches. These engines are literally loafing. My hope was that, in addition to making TBO, I might have fewer problems along the way compared to the more highly boosted engines in other Twin Cessnas.

Second, I liked the handling qualities which a Cessna test pilot described as "an order of magnitude better than the 310." It really is a sweetheart to hand fly. It's also got simple systems. For example, there are only two fuel tanks, left and right, so there' s no switching unless you're crossfeeding. It's also a great short field airplane due to a high lift wing, fowler type flaps and trailing link landing gear. This would open up airports as short as 2,000 feet. 3,000 was my minimum in both the 310 and 421. Yet it still has an air stair door and cabin, albeit unpressurized.

And best of all, after selling the 421, I would have enough money to buy a 303 and redo the entire panel and interior. I have always enjoyed owning best-in-class airplanes and my goal was to make my 303 one of them.

New Panel & Interior: After bringing my airplane home from Wisconsin in Sept. 2011, where is was based for the prior 15 years, I flew it for about a month and then put it in the shop for 10 weeks for a new panel and interior. See the April 2012 issue for a complete description of the upgrade but here is a partial list:

- Garmin G500 with synthetic vision
- Garmin GTN 750/650 navcoms with remote audio panel & transponder
- GLD 69 satellite datalink receiver for XM weather
- Garmin GWX 68 digital color weather radar
- Garmin GI106A GPS/VOR/ILS
- STEC 55X autopilot with Altitude
- AuRacle 2120 Engine Monitor

This was about as close as I could get to an all glass panel and I have to say, it has really boosted my enthusiasm for flying (not that I really lacked any). No, I can't fly anywhere I couldn't fly before or fly approaches any lower, but I now feel like I'm in the 21st century with safer and easier to use systems. Plus, these gadgets are fun!

Getting the Bugs Out: Anybody who's done a major upgrade will tell you that it takes weeks or even months to work the bugs out of a panel makeover. Here is what I've experienced:

Garmin: G500, GTN 750, 650, GTX 330, GWX68. These units have worked almost flawlessly from Day One. We had to realign the G500 once due to the occasional loss of Heading mode, but everything works perfectly now.

STEC 55X: Ughh. You've read some of this story in past issues. I'll give the short version here. The first autopilot didn't work. It pitched wildly on the test flight. The next one had the usual porpoising problem that many STEC's have. We troubleshot it as much as we could locally with no success so I flew it to STEC in Mineral Wells, TX. They made some adjustments. It worked fine on the 30 minute test flight at STEC but began porpoising again about an hour into my next flight. Our theory was that a worn control column was causing some "catching" that the autopilot was working to overcome with sudden pitch movements. Then I got a call from Robin Howard of Howard Avionics in LaVerne, CA. He had a customer with a 303 who had the exact same problem. On a whim, Robin put an STEC 55X from a 310 in the 303 and it worked perfectly. He sent me the unit to test in my airplane. It worked perfectly in it as well. I told STEC and they invited me to fly down to get the settings on my unit changed to 310 settings, explaining that they must have used a 303 during certificatoin that, for whatever reason, was not an accurate representative of the entire fleet. So my autopilot is now fixed - I think. I'm reluctant to declare complete victory until I have flown it over the entire weight and balance envelope. But, so far so good.

In spite of the usual post-upgrade troubleshooting, I really love my new instrument panel.

AuRacle CRM2120: I've had multiple issues with this unit as well. It's a beautiful instrument but I have already replaced four or five sensors. It seems that as soon as I replace one, another one fails. These have mostly been oil and fuel

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FROM THE EDITOR

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installation, but to my knowledge they all require manual activation. In an accident, this may not be possible. Panel mounted ELT's are automatically activated by the G-forces of an accident.

406 MHz's are still not mandatory but will be someday, probably worldwide. The Bahamas were supposed to mandate them in February, but extended the deadline for two more years. Mandatory or not, in my opinion they are a worthwhile safety device every pilot should have.

My wife was an Emergency Room nurse in her younger days. From her, I learned that time is everything if you are seriously injured in an accident. She used to talk about the "Golden Hour" - the first hour after a serious injury, after which chances of survival start to drop dramatically. If you are unfortunate enough to be in a serious accident, imagine the relief you'll feel when rescue personnel arrive within minutes- or the remorse you'd feel after several hours of waiting and wishing you'd sprung for a 406 MHz ELT.

POST MAINTENANCE TEST FLIGHTS - PART 2

Last month, I mentioned the importance of doing post-maintenance test flights. Shortly after, the EAA conducted a webinar on the topic which you can view here: http://www.eaavideo.org/video.aspx?v=2016238711001. Listening to this webinar made me glad I own a Twin. Most of the examples of post-maintenance accidents highlighted in the webinar, some with graphic pictures, were engine failures in singles. They all resulted in off airport landings or crashes, several of which were fatal.

We have an advantage in our twins for post-maintenance test flights- if we plan them carefully!

In our twins, we have ways to make post-maintenance test flights safer than in a single. For example, I recently had an engine fuel pump replaced in my 303. For the test flight, the airplane was light, the weather good (including cool temps early in the morning) and I was using a 10,000 foot runway. No matter where the engine might have failed during that test flight, I am confident I could have safely landed the airplane. Not so in a single.

Be smart about your post maintenance test flights. Stack the odds in your favor- and be glad you're not flying a single!

IN THIS ISSUE

O&N Turbine 340 Silver Eagle: What's an article about a turboprop doing in The Twin Cessna Flyer? We only represent piston twins, right? True, but I bet every one of us at some point or another has wondered what it would be like if we could replace our finicky old piston engines with sleek modern turboprops. Well now we have the answer to that question, thanks to O&N Aircraft and their Turbine Silver Eagle 340.

If I owned a 340 and my pockets were a lot deeper, I'd look long and hard at this conversion. Owners of O&N's Silver Eagle 210's (its first conversion) are an enthusiastic bunch and they rave about the quality of O&N's work. Just imagine replacing your TSIO-520's with engines that weigh 270 lbs. less each yet produce over 100 HP more!

Ice, Wind, Clouds and Mountains: The title of this article says it all. Winter flying in the Pacific northwest is a nice tidy package of potentially lethal weather

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pressure sensors. I also had some erroneous readings after flying through some heavy rain - not immediately but on the next few flights. We rechecked the installation and all was in order. My shop did a little resealing around some of the components. Hopefully that will help. While AuRacle has bent over backwards to get my unit functioning properly, it's clear to me they have a problem with some of their sensors. They say they are working to resolve this. Believe it or not, in spite of these problems, I really like my AuRacle. The display is beautiful and very well thought out. It cleaned up the panel immensely by replacing 13 mechanical gauges. As soon we get the sensor issues solved, I'll be a very happy customer.

What I Like and What I Miss: Here are my observations after about 150 hours of flying behind this panel:

Touch screen is the way to go. The GTN 750 and 650 are a dream to operate. There's just no comparison between touching a screen and scrolling with a knob. Turbulence is not a problem once you learn how to grab the bezels with your thumb and a few fingers and touch the screen. The units have back up knobs, but I have never used them. No need to.

Being able to load airways into a flight plan is a huge improvement. Unlike the GNS 530 and 430, the 750 and 650 allow you to load airways into your flight plan. You can select both the entry and exit points.

The ability to call up data on the 750/650 and use it is remarkable. Here's one example. All the current frequencies are loaded in the Garmin units and updated each cycle. Once you've loaded your flight plan and the satellites have identified your location, just touch the Frequencies button and then touch the one you want, for example "Ground Control", and it is automatically loaded in your radio. No need to twist a dial or punch in numbers, minimizing the chance for an error and greatly simplifying the workload. Here's another example. Want to know the weather at a nearby airport? Touch the airport on the map screen and then select "Waypoint Info". Up pops everything you might want to know about that airport including weather, frequencies, runway information and whether or not they sell fuel. Who knew flying could be so easy? And just in time for us aging pilots!

Being able to "pan" on the map screen makes planning ahead much easier. You can go anywhere on the map page of the 750 and 650 with ease. (You can do it on the G500, but it's more work to scroll using the knobs). Just swipe the screen with your finger and the map moves or simply touch a spot on the map and the screen recenters. Exactly where is that cell approaching my destination? Scroll over and see. It's a breeze.

Charts on the panel are of limited value. At least to me anyway. The iPad is a far superior way to display charts. The screens on both the G500 and GTN750 are just not big enough to show charts without a lot of scrolling, which is not something you want to be doing during a low approach. Plus, like a lot of pilots, I'm used to having the chart right in front of me on a yoke mount which is where I now mount my iPad. And now, with my Gamin GLO bluetooth GPS, the chart on the iPad displays my aircraft position.

I miss the old steam gauges at night. That's right and it's the lighting. I have struggled to get the lighting correct for night flying with this glass panel. Even on the lowest settings, it's just a tad too bright. We installed NuLite rings on my backup steam gauges and I love them. That warm, soft blue glow is beautiful and doesn't hurt my outside vision. No, I don't want to go back to steam gauges, but I do miss them at night.

I want a Stormscope. I have lightning data via XM satellite downlink but, like the Nexrad radar, it is delayed (as we now know by up to 20 minutes or more). I have real time weather data via my GWX 68 radar but I want real time lightning data as well. I hope to remedy this omission by next Spring.

The Crusader After a Year: I am really happy with my 303. It fits my mission better than the 421. Performance is less, of course. Here is a comparison:

	T303	**421C**
Economy Cruise	165 KTAS	190 KTAS
Fuel Burn	22 GPH	38 GPH
NMPG	7.5	5.0
Normal Cruise	185 KTAS	210 KTAS
Fuel Burn	28 GPH	41 GPH
Fuel Capacity (Usable)	153 gal.	206 gal.
Range (Economy Cruise no res.)	1,155 nm	1,030 nm
Takeoff Distance to Clear 50 ft. (Max. gross, SL, 10C)	1,670 ft.	2,200 ft
Useful Load:	1,597 lbs	2,167 lbs.
Full Fuel Payload:	679 lbs.	931 lbs.

My 303 is no 421, but it fits my mission profile and is a joy to fly.

I like the better economy of the T303 and the ability to use shorter runways. I've already flown into one airport that I wouldn't have in the 421 - W29 in Stevensville, MD - a very cool airport with a 2,700 ft. runway just across the Chesapeake Bay from Annapolis.

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READERS WRITE

Tony Saxton, TTCF Director of Technical Support

Tyco Circuit Breaker Switches

Tony, I read recently about an AD on Tyco circuit breaker switches. I understand they can fail resulting in smoke or fire. Can you tell me about this AD and how to determine if I have these CB switches in my airplane?

Jim, TTCF Member

Jim, the AD you're referring to is 2005-20-25, applicable to all 400 series Cessna twins. The specific concern in the AD is for the main and standby avionics circuit/breaker switch (TYCO model) and it requires a change in the switch if the installed switch is a certain part number, time in service, and manufacture date. Lots of these style switches were installed in other applications in the aircraft. And to complicate things further, just installing a new switch of the same type does not alleviate the failure mode. It was a poor design. Recently, some better designed substitutes have become available.

These TYCO circuit breaker switches are the subject of an AD. There is a better design available but they are expensive to replace.

This AD is only for the toggle style switch/breaker combination and does not apply to other switches or pull type circuit breakers.

These switches could be on any of 400 series models and could also be installed on any of the 300 series. To identify, you would need to look at the switch. They would be ones that control various items like, but not limited to, avionics, prop heat, taxi lights, landing lights, stall heat, strobes, etc. Many of came from Cessna with the toggle covered by a white nylon boot. To identify the affected ones you would need to slide off the boot an look at the end of the toggle switch. If it is flat and has the amperage stamp in the end of the toggle then it is an affected switch.

These switches (especially high cycle time ones) have had a very high failure rate and the replacement style offered is much better. Remember, however, that to individually change just one is rather difficult due to the vastly different size of the unit behind the panel. They are not inexpensive so a complete change could be a rather high price event.

Tony, Director of Tech Support TTCF

Bouncing Fuel Needle on a 340

Tony, on a recent flight, I observed strange primary fuel flow gauge behavior. In level flight with stable MP and tach needles, the fuel flow needle for the right engine was bouncing. It was continuously lower than the left engine needle (and has been that way for the 2 years I've owned the airplane) but now it is jumping around. Engine output seems steady and the JPI fuel flow also seems steady, so I'm pretty sure it is just instrumentation. Should I be worried about something else? Should I point my mechanic toward the gauge, the sending unit or something else?

Thanks! Couldn't maintain this airplane without you!

Nick, TTCF Member

Nick, this is a common phenomenon in these old needle style gauges. The dampening mechanism in the needle movement gets worn and allows some movement when shaken. This oscillation gets larger in amplitude as swing momentum builds. The JPI (or Shadin) is multiple times more accurate than this old style gauge, even though in many applications it cannot be used as a stand alone, primary unit. Regardless, once you get a JPI or Shadin initially set up for proper K factor it should be the preferred indicator for fuel flow.

Tony Saxton - Director of Tech Support TTCF

Exhaust Stack Springs on '56 310

Tony, the springs that support the exhaust stacks at the rear of the engine nacelles where they enter the over-wing tubes on my 1956 C-310 break frequently. It has gotten better with time and with shop adjustments on the clamping tension. My mechanics also have a few other ideas they want to try if this persists. But I was wondering if anybody has found a more permanent solution, other than ordering these springs by the gross?!!

Thanks, Guy - TTCF Member

Guy, I have seen various schemes to help support these stack ends and none of them have worked very well. When the springs are installed, make sure they do not have a lot of tension on them in the static state. Finding one or two broken at each annual is not uncommon but if you have lots of trouble with them take a look at the rear motor mounts. Badly sagging mounts allow the engine to move a great deal and will eventually break the springs. They could also wind up breaking the very expensive engine control cable conduits.

Tony Saxton - Director of Tech Support TTCF

421 Engine RPM Pauses on Way to Takeoff Power

Tony, I have a client with a '82 C421C with an engine issue. When bringing up power for takeoff, the LH engine RPM sticks at about 1400-1500 rpm until the MP gets up above 30", then seems to "pop through" whatever is blocking it and spools on up. The RH engine spools up normally.

The local mechanic cannot find anything out of whack and the airplane has had two annuals since this problem first appeared.

RAM suggested the engine would need to be torn down to diagnose the problem. Since the engines are very near TBO, the owner declined, preferring to spend his money on overhauls instead. What could be causing this?

Gerry - TTCF Member

Gerry, I have seen this before and it centers around the fuel system. As the engine transitions from the normally aspirated (below 30" MAP) mode and moves into the actual boosted mode, increase in power is heavily dependent on a rather delicate, ever changing balance of fuel, MAP, RPM. Each of these items needs to be continuously in balance with the others in order to accelerate smoothly.

In these later serial number 421C's Cessna installed the GTSIO-520N engine, replacing the previously installed GTSIO-520L. The only difference in the newer version -N engine was a change in the fuel system. The fuel pump was changed to a "simpler" unit that was more of a straight pump and all of the fuel adjustments, and reference androids were moved to the fuel controller. They also did away with the additional unit of the fuel limiter. In my opinion, this fuel system was a step backwards and NOT an improvement. In the -L engine there was a lot of wiggle room to adjust mid range fuel flow, and a talented mechanic could finesse fuel at the mid-range and still have proper fuel flows at idle and at max power.

With the -N system this just isn't possible. Very limited adjustments only result in linear up and down scale fuel flows over the entire range. If you set the max fuel flow to match and it is adequate, and the mid range is to high or low - tough luck. The only thing you can do is adjust the top end or bottom end which will then most likely put it out of the operating range at that position.

The switch from the GTSIO-520 "L" engine to the "N" engine in the later 421's made fuel flow adjustment much more difficult.

Make sure that the turbo absolute pressure controller/throttle interconnect arms are not worn and working properly and that they are properly set for "alpha angle" (defined in the M.M.). Double check for induction leaks and if the max and min fuel flows are OK then mitigate this with slower throttle ups (power to about 28"-29" and pause for a couple of seconds to allow turbo system to stabilize and then smoothly advance power to takeoff level.

Tony Saxton - Director of Tech Support TTCF

Extended Baggage Compartment STC for 310D

Tony, I own a 1960 310D (it's a Riley Turbo Rocket conversion). It has an extended baggage compartment back to F.S. 130. I'm not finding any STC's or record in the log books pertaining to this mod. It was done either by Riley or at least before the plane was modified. FAA/ACOs are no help. Any ideas?

Thanks, Larry - TTCF Member

Larry, I'm not sure of any STC for this mod and I am positive that none is currently active. Have you tried getting the 337 history file for

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303 *(cont. from p. 17)*

Of course, I miss the pressurization of the 421 but the Mountain High OxyArm and O2D2 pulse demand system have really eased the pain of breathing oxygen (see June 2012 issue of *The Twin Cessna Flyer*). But here is what I really miss most about the 421: those smooth running, quiet GTSIO's. The 421 cabin was so comfortable. Long trips in the 303 are much more draining and it's primarily due to vibration. Because the engines on the T303 are derated and turn at lower RPM, Continental removed some of the crankshaft counterweights as a weight saving measure. The result was increased vibration. It takes its toll after a couple of hours. Headsets take care of the noise, but the vibration is a drawback.

If I were flying a lot of passengers, I would not have downsized to the T303. The 303 is more of a pilot's airplane. There is simply no comparison between "the ride in the back" of a 421 and the 303. But most of my flights are by myself these days and the Crusader is working out very nicely for that mission.

With every airplane I've ever owned, it's taken about a year to sort out the mechanical bugs and the Crusader has been no exception. I've had fuel tank leaks sealed, landing gear work, exhaust system work, heater work and I've replaced both an electrical and engine-driven fuel pump. Plus my first annual ran a little over $10,000. But I'm confident we'll have the bugs out soon and I'm looking forward to a long relationship with what I'm now sure will be one of the best airplanes I've ever owned.

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the aircraft through the Aircraft Registry Branch of the FAA?

This sounds like a possible Riley conversion but as was his typical operation he would do additional items on individual aircraft. These may have been a field approval or, like many, just a tongue-in-cheek natural extensions of other mods. Even if you find out the STC number it is very unlikely that you will get anything like drawings, weight and balance info, operations supplements, etc. These things are just gone with inactive STC's and mods.

Unfortunately the FAA is beginning to take a dimmer view of these older types of "It'll fly" certified mods/repairs and have recently been taking some mechanics and owners to task to prove initial and ongoing airworthiness of the mod. In a few cases it has taken field approvals and or mod removal to satisfy these questions.

Buyers should look carefully during a prebuy evaluation for such gottcha's.

Tony Saxton - Director of Tech Support TTCF

303 Electric Air Conditioner Drawing Too Much Current

Tony, we have run into an issue with the electric motor that drives the factory installed (JB Air or now Keith/Meggitt) air-conditioning system on our Cessna 303 Crusader. The load from this motor is dragging the bus voltage down to below 22VDC (using the aircraft 95Amp Alternators)and we are concerned about high charging current (to recharge the new Gill G-247 battery) after using the air during ground taxi and during the initial takeoff with the air off. The P.O.H. states that @ 1200rpm there should be no discharge on the ammeter but in our case it is pegging the bottom end of the meter no matter what power source or engine rpm we use. We have used a 220VAC@20Amp/28VDC@100Amp GPU as well as our golf cart (tapped for 30VDC) in the hangar and the best we can get is 24VDC on the bus.The current draw according to the P.O.H. is 80 Amps + or - 5amps so, we suspect the motor is just drawing more current than the system is capable of delivering. We have tried to use our amp clamp with the fluke meter to measure the actual current but, the current is all over the map and not steady.

We have checked all connections and for voltage drops/line losses across all connectors and the most we have noted is .5 ohms and a 1 VDC difference between the main bus and at the load side of the A/C motor connector. We attribute this to the 15 foot long 4 AWG lead from the current limiter. None of the wires are overheating or are corroded. The system has sort of a "part winding start" dual connector w/ resistor system and we have verified that the resistor ohms and the timer relay all work as required.

We feel like we are at a point where we are going to pull the motor and consider rebuilding the brushes and springs. As you know, removing the motor is a big pain because it is in the nose bay and we have to recover the refrigerant, disconnect all the refrigerant lines, wires and remove the entire pallet...We just wanted to check in with you to see if you have experienced symptoms like this on any of the electric air conditioning systems you have worked on? Thanks for your support.

Robert, TTCF Member

Robert, the voltage drop of the 1 VDC is normal for this length of run. It is unfortunate that such a heavy draw motor is mounted so far from the voltage source but installation room just dictates that it be mounted that way.

Like you, I feel that the most likely problem is the motor. These motors have very high wear rates due to load, and heat. If you overhaul or repair the motor it is a good idea to hook it up to a 27 volt source and run it for several hours prior to installation and then blow out as much carbon dust as possible. The first runs before the brushes wear-in have a very high load. While just free running the motor is not the most effective way of doing this, it is better than nothing. Also make sure of adequate cooling (a fan) during this run.

Tony Saxton - Director of Tech Support TTCF

Tony, just wanted to let you know, before we pulled the A/C motor, we pulled the alternators and had them tested and found out that the left alternator had one of the stator wires open and was only capable of about 60% of output. After we re-installed the alternators, problem fixed. Everything works as stated per the maintenance manual/ P.O.H.

Just wanted to thank you and follow up with our results for any future issue's from members regarding electric driven A/C system problems. So, the moral to the story here is; check those alternators for correct output.

Robert

421 Fire Extinguishing System

Tony, I have been shopping for a 421C to replace our B36TC Bonanza off and on for over 2 years now. I have always immediately eliminated any candidate that does not have the fire detection and extinguishing (FDE) system. I was very close to having a perfect candidate purchased this week but at the last minute someone else swooped in and got it. Finding the ideal aircraft for our mission has been very difficult, especially with my mindset regarding the FDE system. You have written in a past Readers Write column that the detection system is ineffective and not worth maintaining. I am curious if you feel the same way regarding the extinguishing part of the system; not only regarding effectiveness, but also its necessity in the first place.

Thank you again for your time and for all you do to promote Twin Cessna aircraft.

Todd, TTCF Member

Todd, this is just my experience and does not reflect any research or FAA data so please "take it for what it's worth". In 37 years of working primarily on twin Cessna's I am not aware of a single instance when the engine fire extinguisher was ever actually used. In that time I have seen numerous engine fires, both in aircraft with and without

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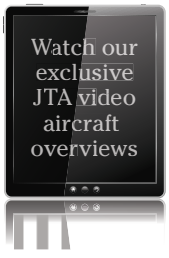

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the optional fire extinguisher system installed. In several instances (especially when the FDE is installed) the pilot did not identify the presence of fire and it self-extinguished or was inadvertently extinguished when some additional operational problem prompted the pilot to shut down the engine.

Primary engine fires center around exhaust related releases, which in most cases can be controlled by shutting down the engine, or flammable fluid releases' of oil, fuel, and in some installation hydraulic fluid. These fluid releases are more problematic. In the engine compartment firing the FDE may put out the fire but with this one-shot-system it would be critical to stop the fluid release as well or it will simply reignite. Most times stopping the fluid release alone is all that is necessary to stop the fire.

The most dangerous problem is if the fluid release fire spreads beyond the engine bay area into the surrounding wing/aft nacelle structure. If this occurs, the fire can gain a "life of it's own" and may continue even when not feed directly from the original fluid source. In any case, when the fire spreads within the wing structure the release of the FDE centered in the engine compartment would be of little use as it is not capable of getting into the compartment.

Top Left Inset: Fire Control Panel. Bottom: Engine fire extinguisher bottle in the right wing of a 421. Known instances of this system actually detecting a fire and extinguishing it are few.

It is critical to identify engine fires early, and don't hesitate to shut off fuel and shut down the engine (this is why we fly TWIN Cessna's) before fire spreads.

Another point is that the control panel for the fire extinguisher system is the same unit that is used in the detection system and the lack of repair support of this combined unit can make both systems un-maintainable.
Do you currently have an engine fire extinguisher system in the B36TC? The basic structure and engine layout is nearly identical to a Twin Cessna nacelle and the fire related danger potential is virtually the same. My point is that if you have accepted the risk of no FDE in the Bonanza why not in the 421C? The 421C, in reality, has no more inherent fire risk than that of any other Continental equipped turbocharged model aircraft. The 421C also has the huge advantage of being able to shut down one of the engines with minimal impact to control a fire, which in the Bonanza would result in a much more dire emergency.

My final words are to inspect and maintain the exhaust system in tiptop shape (regardless of the aircraft), change fluid hoses on some type of recommended schedule, and conduct regularly scheduled engine inspections. Be ever watchful regarding the indications of engine fires particularly sudden unexplained MAP drops (failed exhaust), unexplained sudden fluid loss from cowling, smoke, and any areas of discoloration on cowlings.

Tony Saxton - Director of Tech Support TTCF.

Problem Tightening 340 Cowl Flap Control

Tony, the cowl flap plunger for the right engine on my 340A doesn't seem to tighten enough to keep the flaps entirely open or closed. My mechanic has taken a pass with minimal improvement. Is there something I can point him to for how they should be maintained or adjusted so I get proper airflow control?

Nick, TTCF Member

Nick, the locking mechanism is inside the cable. I have tried several things to "fix" these and have only been mildly successful. The only real answer is a cable replacement, new available from Cessna or FAA/PMA replacement from RAM Aircraft. Current prices are:

RAM: Part # 1820-3 $960 each
Cessna: Part # 9910269-30 $1,443 each

Tony Saxton - Director of Tech support TTCF

Uneven Fuel Flow Increases with Boost Pump Use

Tony, I own a1968 310N N204DF with an IO470VO engine. When I turn my fuel boost pumps on low when switching tanks or in preparation for landing- my right fuel flow increases about 1 gal to 1.3 gph while the left only climbs 0.3 to maybe 0.5 gph higher. Should I suspect a weak or failing left boost pump?

Thanks, Kyle - TTCF Member

Kyle, your fuel boost pumps are fine. The low pressure is determined by running the same pump as is used on "High" as well as prime only in a lower voltage mode. The voltage runs through a large dropping resistor that is in the flap well and it is adjustable (per Cessna MM). What you are seeing is not really the boost pump output, but rather the engine driven pump reaction (increase) to the electric boost pumps increase in inlet pressure.

The engine driven pumps response will be different depending on their own settings, as well as the normal input difference in range of the boost pump. Your indication is well within the normal range and unless it gets rich enough to adversely affect engine operations, it will be fine.

Tony Saxton - Director of Tech Support TTCF

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(cont. from page 15)

hazards for a pilot to deal with. In this article, we hear from a pilot who has years of experience in these exact flight conditions in a variety of airplanes, including his 340.

Member Kevin Ware explains how he plans a flight across the Cascade mountains in the winter, using an actual Angel Flight as an example. His analysis shows that the safety of a flight depends on the amount and quality of planning that went into it. That's why I really liked his article. Safe flying begins on the ground.

A Year With My 303: Not a week goes by that I don't get a call from someone asking, "How do you like your 303 Crusader?" This article only partially answers that question. I faced a real challenge in keeping it short enough to fit in the magazine. There is just a lot to talk about, particularly considering the extensive panel renovation I did.

But the bottom line is that I love my 303. It's not an airplane for everyone. It's the slowest Twin Cessna, for example, but it makes up for this in other ways. As the last piston twin ever designed by Cessna, it includes some of the best features of the Twin Cessna line, such as trailing link landing gear, and it has a lot of refinements other Twin Cessnas lack, such as a true dual bus electrical system. I really appreciate these features but most importantly, the 303 fits my mission needs perfectly right now.

Pirep- Strakes and Hubcaps: Seldom do airframe mods get the positive endorsements that these two do. APM's strakes have been available for a couple of years now and I have yet to hear an owner say they were not a worthwhile investment. The hubcaps, or "wheel covers" to be technically correct, from Premiere Aviation are relatively new, but they are getting the same high level of member endorsement. Member Max Nerheim owns a very nice 421C with all the bells and whistles. He recently added both strakes and hubcaps and in this article he gives a detailed report on how they improved both his speed and, especially, his climb rate. The results are truly remarkable. If and when they become available for the 303, I'm getting both.

Until next month, fly safely!

Bob

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PIREP: STRAKES & HUBCAPS

by Max Nerheim, TTCF Member

I installed APM's strakes on my 1980 421C during its annual this fall. Prior to this, my airplane had always been slower than book, both in climb and cruise. After the strakes, the speed improved by several knots, but the climb speed improved dramatically. Also, in descent, I now have to use my speed-brakes, as 25 inches plus flaps and gear does not slow the airplane down like it used to!

	Old No strakes/Hubcaps	With Strakes/Hubcaps	Increase [fpm]	%increase
average fpm to 20,000 ft	636	868	233	36.6
avg fpm 20,000ft to 25,000ft	393	648	255	65.0

It's obivious from this picture of my airplane on jacks how the open wheel could disturb the airflow under the wing, particularly during climb.

The wheel covers are slightly convex, a shape that was determined to best smooth the airflow. Plus, they look good.

Right after installing the strakes, I installed the Premiere Aviation Wheel Covers (hubcaps), a 30 minute procedure per side. The test flight was very impressive with cruise climb and the cruise speeds improving significantly. For example, in cruise I saw these numbers: 1800 RPM, 29 inches, 42 GPH ROP, 15500 feet, -7C, 30.03in barometric, 201 KTAS (POH is 195 KTAS). At a lower power setting: 1700 RPM, 27 inches, 29.5 GPH ROP, 15500 feet, -7C, 30.03 barometric, 189 KTAS (POH is 179 KTAS). These results have held true in a number of subsequent flights. At 25,000 feet at approximately 34 GPH the cruise speed is now around 200 Knots, or around 220 Knots at 42 to 46 GPH. Needless to say, getting 10 KTAS above POH numbers, when before I could not even get to book values is amazing. I have never seen these climb rates or cruise speeds in the 5+ years I have owned it. I suspect the added climb and cruise performance also means better single engine performance, which is what I am really after.

I installed strakes first and they boosted speed slightly and climb performance dramatically.

Since the subjective performance increase (especially in climb) seemed too good to be true, I went to www.flightaware.com and used the historic flight data to calculate as objectively as possible my average climb rates with and without strakes and hubcaps. (Since there is no way of accurately estimating the winds aloft for each flight, I did not try to use this method to calculate average speed increases.) I always use the same cruise climb power setting (35 inches and 1900 RPM) and most of my flights are at about the same weight. I recognize that variations in temperature and other factors could have affected performance but the Flightaware data should provide some confirmation of my inflight measurements, subject to a margin of error. Based on my calculations, the average climb rate with strakes and hubcaps below 20,000 feet increased by 233 fpm from 636 to 868 fpm, a 37% increase from the earlier flights. From 20,000 feet to 25,000 feet the average climb rate improved by 253 fpm from 393 fpm to 648 fpm, a 65% improvement from stock. (See table above.) Subjectively, the performance increase is

(continued on page 29)

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PIREP: STRAKES & HUBCAPS

(continued from page 26)

consistent with how the plane feels: the effort to get up to the flight-levels seems greatly reduced, and the plane is more stable in yaw (especially when heavy).

I called Peter Danto at Premier Aviation (the maker of the Hubcaps) and asked if they might get an STC for increasing the maximum gross weight with strakes and hubcaps since the climb performance has increased so much. Peter replied that it would be very hard, as FAA regulations would require them to prove the strength of the airframe at the increased GW. A quick calculation shows the improved climb rate is the rough equivalent of adding 5% more horsepower or 2 inches of MP. Does this imply the airplane might be able to handle 5% more gross weight? That would be 378 lbs, an 18% increase in useful load!

The strakes added stability and climb performance. The hubcaps added more to the climb and cruise speeds. Given the cost of the modifications and the installation time, my opinion is that every 421C should have the hubcaps. If there is money left in the budget, I am super pleased with the combined performance of both strakes and hubcaps, and recommend them both for speed and single engine safety margin. My expectations have been exceeded. The performance improvements allow the airplane to get up to the flight levels efficiently and fast, saving a lot of fuel and thus increasing the range. And if increased speed is needed, 220 KTAS can be achieved on approximately 45 GPH around FL250, giving the 421C similar performance to some (smaller) twin turboprops!

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1979 Cessna 340A RAM VI - 4617 TT, 868/600 SMOH, 575/575 SPOH, G530/430, GTX 330, Radar Alt, Color Radar/Stormscope/WX Data Link, 400B AP, 183-Gals, Air, VGs, Known Ice, Hoskins, JPI 760 (MN) Asking Price $259,000. Jerry Temple (972) 712-7302, www.jerrytemple.net

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