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A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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‘Beech Style’ Transformation

A look at LA-190’s makeover



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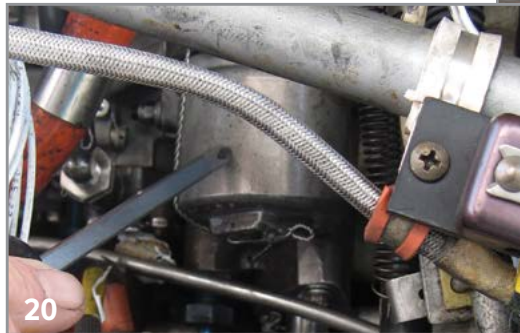
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'This Aircraft Deserved It'

Commemorative 1982 Model F90 Gets Full Makeover

by MeLinda Schnyder



David Edgington wanted a “Beech style” refurbishment of his 1982 Beechcraft King Air F90 and chose to work with Textron Aviation. The company’s service center in Tampa, Florida, handled everything except the full paint, strip and refinish that was completed in Wichita, Kansas, just before staging the airplane for the delivery ceremony.

(Photo credit: Ricardo Reitmeyer for Textron Aviation)



LA-190 came with a 50th anniversary plate signed by Olive Ann Beech still in place on the panel as well as several celebratory medallions from the original 1982 cabin. The Edgingtons are proud to keep them with the F90.

(Photo credit: Ricardo Reitmeyer for Textron Aviation)

Are they making the Beechcraft King Air F90 again?

That’s the question David and Shawn Edgington hope to inspire when you see N721RF/serial number LA-190 sitting on the ramp. A gleaming paint scheme with a playful color palette, BLR Aerospace five-bladed Whisper Props, American Aviation’s Pitot Cowling System and Aerodynamic Speed Stacks – the airplane looks like it rolled off the assembly line this year.

It sorta did.

David spent eight years looking for just the right F90 and got everything he wanted with LA-190: 5,200 hours (the average for a 1982 F90 is 13,000 hours), three prior U.S.-based owners, no damage history and solid maintenance records including recent engine overhauls by Dallas Airmotive. He was patient because he hoped to find a model from 1982, when they were delivered

with the commemorative insignia of Beechcraft’s 50th anniversary. LA-190 came with an anniversary plate signed by Olive Ann Beech still in place on the panel as well as several celebratory medallions from the original cabin.

He felt like the only thing to do with an airplane with such a stellar pedigree was to modernize it. “This aircraft deserved it,” the 8,000-hour pilot and Beechcraft enthusiast said. “It is a special aircraft delivered during a special year in Beech history. You’ll never find another one like it.”

The F90 went to Textron Aviation’s Tampa Service Center immediately after acquisition in September 2023, embarking on what would be an eight-month complete interior and exterior refurbishment. The Edgingtons



David and Shawn Edgington pose with their 1982 Beechcraft King Air F90 and their 2017 Cessna Citation CJ4 at Textron Aviation headquarters in Wichita, Kansas. The aircraft share a patented paint scheme first designed in 2017 for the Citation.

(Photo credit: Ricardo Reitmeyer for Textron Aviation)

“I wanted to do everything that we could do to modernize this aircraft to today’s time. I knew it would be a major project, and I wanted to do it Beech style.” - David Edgington

live in the San Francisco Bay area and chose a shop on the opposite coast because of the Tampa team’s history of working on Beechcraft King Air products.

“I have a friend in the business and I’ve been fortunate to go with him to pick up and deliver airplanes all over the world. Not only has that given me the opportunity to fly a whole bunch of different kinds of aircraft, I’ve also visited a lot of shops across the country with him,” David said. “I wanted to do everything that we could do to modernize this aircraft to today’s time. I knew it would be a major project, and I wanted to do it Beech style.”

Why the F90?

David said he’s always been an aviation enthusiast but couldn’t afford it as a hobby when he was young. “Being able to afford to fly motivated me,” the 62-year-old said. David operates businesses in the construction

industry; Shawn is CEO of a national insurance brokerage specializing in business insurance. Together they work in residential and commercial real estate investment, development and design of high-end properties.

David’s been flying for more than three decades and the Edgingtons have owned several aircraft over the years starting with a V-tail Beechcraft Bonanza purchased in 1994 to fly for business and recreationally with their family of four and two golden retrievers. They’ve also owned a conventional-tail Bonanza, a King Air C90, a previous F90 (N188BF/serial number LA-78) and a Dassault Falcon 10 jet. They purchased a Citation CJ4 jet new from Textron Aviation in 2017, which they continue to operate, with David flying it alongside corporate pilot Stephen Harden.

“I truly loved my first F90 aircraft – to me it was the coolest looking airplane out there,” David said of LA-78. “At that time in my flying career, though, I was moving up and transitioning to flying jets.”

The F90 stayed on his mind, though he was willing to wait for the right one to come along. Beechcraft manufactured just a few more than 200 F90s from 1979 through 1985. Known for its ramp presence due to the distinguishing T-tail from the King Air B200, the model features a C90 fuselage combined with an A100 wing. David’s research showed about 172 F90s still flying per FAA records, though he estimates there are likely half that many truly in use.

‘An Amazing Transformation’

About a month before he finalized the purchase of the F90, David reached out to Textron Aviation’s **>**

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LA-190's interior before (inset) and after (top) it was completely reconfigured and updated by the Tampa Service Center with new cabinetry, window shades and seats, with fabrics and finishes representing a custom mix from Textron Aviation's King Air Refresh packages.

(Before photos courtesy of Textron Aviation; after photos by Ricardo Reitmeyer for Textron Aviation)



Jennifer Harden, senior manager of Aftermarket Sales for Southeast U.S., who started to coordinate with the company’s service centers in Tampa and Wichita.

“From first contact, our team was excited about the scope of the project and the fact that it was a 50th anniversary edition,” said Dan Lyon, vice president of Aftermarket Sales, Textron Aviation. “We recognized it right away as a cool opportunity to get to take a commemorative aircraft some 40 years after it rolled off the assembly line and make it new and vibrant again.”

He added: “We’ve done some big projects but I don’t believe we’ve done this big of a modification on an airplane that’s 42 years old. The Edgingtons pretty much went all in, and the result is an amazing transformation.”



The flight panel before (bottom) and after updating it (top) with the Garmin G600 TXi and G750 TXi and making it lighter after 350 pounds of wiring was removed. (Before photos courtesy of Textron Aviation; after photos by Ricardo Reitmeyer for Textron Aviation)



Shawn Edgington took the lead on the interior plan for the remodel. She chose contrasting color combinations of grays, beiges, off whites and blacks, as well as an open layout and design. (Photo credit: Ricardo Reitmeyer for Textron Aviation)



The F90 before (left) and after (right) a full refurbishment at Textron Aviation's Tampa Service Center and Wichita Service Center. (Before photos courtesy of Textron Aviation; after photos by Ricardo Reitmeyer for Textron Aviation)

“My goal was a look that was beautiful and luxurious, something that 99.9% of people would instantly love. I think we achieved that with both the interior and exterior designs.”

- Shawn Edgington



Tampa Service Center handled all the work except the paint; Wichita is one of two Textron Aviation Service Centers to offer full paint, strip and refinish capabilities (Indianapolis is the other).

Lyon said it was a complex job because of the amount of work being done, the age of the aircraft and the fact that tweaks and mods in the past four decades meant it was no longer a standard configuration airplane. David said all those reasons were why he wanted the OEM to handle the project.

“It really worked out well having the Beechcraft team’s deep understanding of the airplane and having them orchestrate getting all the parts and keeping such a major project flowing,” David said. “One of the biggest benefits was that normally when we’ve done this kind of project, on a smaller scale, we have a representative there the whole time with the aircraft. We didn’t have to do that because they took on that responsibility on our behalf.”

Shawn agreed: “It was nice to have such a great team that we could trust and work together so well, despite being on opposite coasts.”

The Edgingtons said it was heartwarming to see how personally involved in their F90 the employees became, with everyone working toward “what can we do to build this aircraft the best way possible” whether it was avionics, cabin or exterior updates.

“Joe Clark was head of the project in Tampa and as we got to know each other, he caught on to my thought process behind building this airplane, which was ‘don’t leave anything behind,’” David said.

That was especially helpful when redesigning the flight deck.

“We were not saying throw money out the window, because you can spend a lot of money and have the panel still not look right,” David said. “I wanted to know with all their talent and experience, what would they do when building a new panel. We tried to not look at it as a dollar value but instead look at it as a clean palette and figure out how to make the panel flow correctly. As an example, when we pulled the GPS antenna off, for dollars you could patch it but we went ahead and removed the antenna and reskinned that area.”

David spent weeks working with the Tampa team on creating a pilot-friendly panel that flowed well aesthetically and functionally, testing it out with pilots of varying skill levels to gather feedback before finalizing the design.

“We couldn’t put the Garmin G1000 NXi in it because they don’t have certification for it, so we did G600 TXi and G750 TXi and then we put everything internal. There’s nothing on the panel, everything went remote. With autopilot, weather and turbulence avoidance, the avionics are as good as what we have in our Citation CJ4,” he said, adding that 350 pounds of wiring was removed from the F90.

Shawn put her passion for interior design to use throughout the interior as well as on the exterior paint.

“We wanted this to feel like a brand-new airplane, from the second you walked up to it to climbing into it,” she said. “My goal was a look that was beautiful and luxurious, something that 99.9% of people would instantly love. I think we achieved that with both the interior and exterior designs.”

They completely reconfigured the cabin, redoing the bulkhead, installing a side-facing fifth seat and adding a flushing water closet in the back. All soft goods were replaced along with new cabinetry, window shades and seats featuring the design and materials of current

production aircraft plus hidden headrests and double diamond quilt inserts. The Edgingtons chose a custom mix from Textron Aviation’s King Air Refresh interior schemes, from a carpet with a subtle square pattern to help hide wear to a window line and headliner in custom-colored urethane that brings brightness to the cabin.

“We use our airplanes for mostly business so we also wanted all the conveniences of an office to extend into the aircraft while traveling,” said Shawn, mentioning LED lighting and AirText connectivity as examples.

Exterior upgrades included installing the American Aviation Pitot Cowling System and Aerodynamic Speed Stacks and painting the aircraft to match the patented scheme and color palette the Edgingtons designed for their 2017 CJ4.

Enjoying a ‘New’ Airplane

The Edgingtons’ children are grown and they now have Kahoots the French bulldog and Max the golden retriever who is the insurance agency’s mascot known as Lightning Max. They flew their CJ4 to Wichita in mid-April for a LA-190 delivery ceremony. David and Harden had flown the airplane from Tampa to Wichita, but this was the first time they were seeing the airplane in person since it was painted.

Textron Aviation’s sales and marketing teams positioned the F90 inside a hangar at their west Wichita headquarters, with dramatic lighting including the aircraft’s original Beechcraft 50th anniversary insignia projected onto a nearby wall. The couple walked into the hangar with their French bulldog while the song “Hell of a View” by Eric Church played. They circled the airplane and said they were in absolute awe.

“It looks perfect to me,” David told those gathered. “This is better than taking delivery of a brand-new airplane.”

The airplane had one more stop – back to Tampa for the installation of the flushing water closet custom built by AvFab – and by the end of April, the Edgingtons were able to start flying the F90.

After looking for the right King Air for eight years, David said waiting eight months to start flying it regularly wasn’t a problem.

“Being in construction, I was realistic about the timeframe,” he said. “Everything had to be built and they had to search for the materials, which today isn’t easy no matter what industry you’re working in. I was very happy with the timeframe, and beyond happy with the final result.”

He noted that they had just two minor squawks when they picked up LA-190 in Tampa before flying it to Wichita for paint.

“They did an incredible job,” David said. “To make something that old look brand-new is incredible.” **KA**

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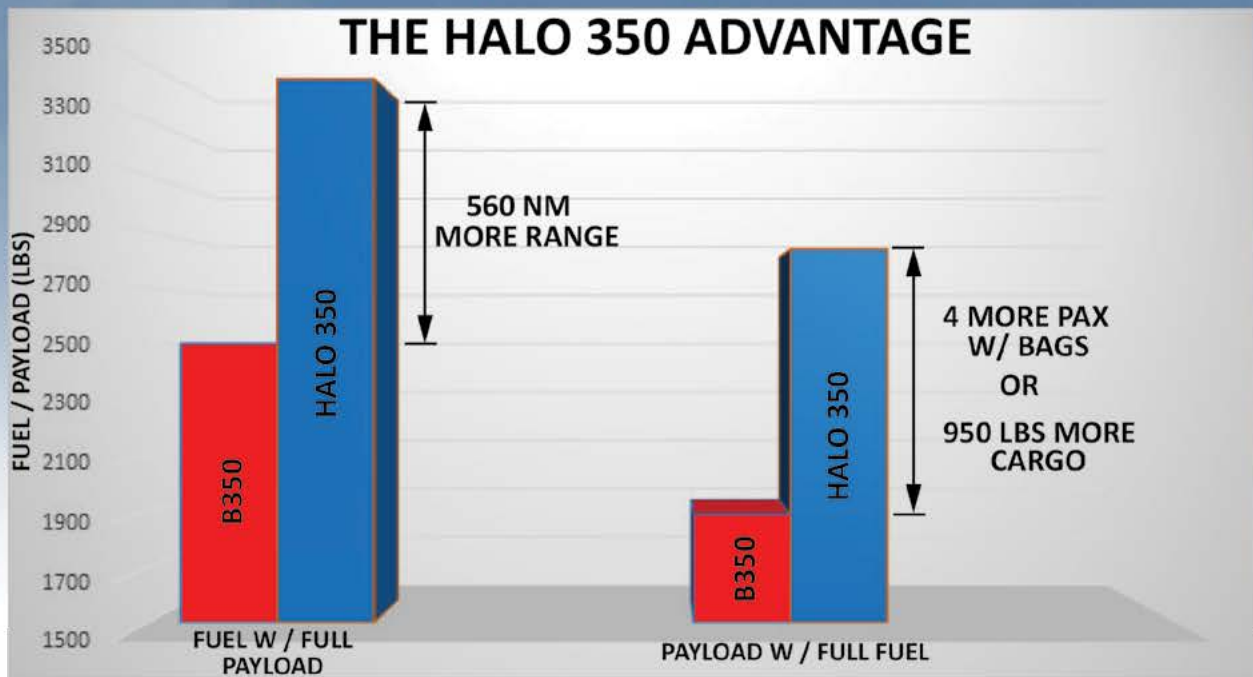
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Tracing Our Roots

Flying and Touring the Natchez Trace, Part 2

by Matthew McDaniel

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The entryway into the Vicksburg National Military Park is a preview of the grand scale of the Park and the Siege of Vicksburg that it commemorates.

Author's Note: In Part 1, we explored many sites along the northern three-quarters of the Natchez Trace full of rich history. In this final installment, we'll wrap up the tour, covering the southernmost 100 miles of the route, some nearby attractions and the city for which the Trace is named.

If you recall from Part 1 of this series, we left off in Mississippi by either departing Tupelo Regional Airport (TUP) or Houston Municipal Airport (M44) for one of the three airports available in the capital city of Jackson – the Class C, Jackson-Medgar Evers International (KJAN), the downtown Class D Hawkins Field (KHKS) or the pilot-controlled Bruce Campbell Field (KMBO). All are within a short drive of the Natchez Trace Parkway (NTP). Then, we drove north to tour some of the Natchez Trace inns (stands), trading posts and the Cypress Swamp. We now drive the short distance back toward Jackson and resume our tour.

The Capital City

As in most U.S. capital cities, there is too much to do and see in Jackson to detail here. In relation to the NTP, those things are limited to some stands, scenic viewpoints and visitor/information centers. Within Jackson, the most popular sites are mainly unrelated to the trace. For civically minded tourists, however, Jackson is steeped in eye-opening history.

Of course, when in a capital city, a visit to the capitol building is always popular. If traveling with children, Jackson presents a perfect opportunity to teach your kids/grandkids about the struggle for racial equality. The Mississippi Civil Rights Museum's stated mission is to

“ ... document, exhibit the history of, and educate the public about the American Civil Rights Movement in the U.S. state of Mississippi between 1945 and 1970.” Inside, visitors will learn about such tragic American history as segregation, Jim Crow laws, lynchings, landmark court cases dealing with racially motivated murders and school integration lawsuits, and historical details about the opposing forces of the Ku Klux Klan and the Freedom Riders. Going back even further, the museum touches on the history of the first enslaved people brought to Mississippi in 1721 from the Caribbean. For information on the native peoples, the many sacred mounds they built and left behind, and their way of life, the separate Museum of Mississippi History covers 15,000 years of native history.

Detour to Vicksburg

A few detours off the NTP to take in some nearby famous places are recommended. One such place is Vicksburg, Mississippi. Vicksburg has two pilot-controlled airports, each with a single 5,000-foot runway, Jet-A fuel and cars available. Vicksburg Municipal (KVKS) is south of the city, while Vicksburg Tallulah Region (KTVR) is west, just across the Mississippi River in Louisiana. Both are certainly capable of accommodating most King Air operations. However, Vicksburg is less than 50 miles from Jackson, making it simpler to leave the aircraft at your chosen Jackson airport and make the 45-minute drive down I-20 to Vicksburg instead.

There, one of the largest and most strategically critical campaigns of the Civil War unfolded the Siege of Vicksburg. The Union needed to control Vicksburg to keep crucial Mississippi River supply lines open. By seizing it, they also hoped to bisect the Confederacy geographically. It was no easy victory, requiring a 47-day siege, multiple battles won and lost by both sides and the engagement of 110,000 soldiers. After over 37,000 casualties

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A portion of the original Natchez Trace, within the Rocky Springs Section of the Natchez Trace National Scenic Trail. This area is between mile markers 52 and 59 of the NTP, near the Rocky Springs townsite.

(approximately 32,000 south and 5,000 north), the Union secured victory on July 4, 1863. Combined with the Union victory at Gettysburg, Pennsylvania, the day prior, the tide of the war turned.

The Vicksburg National Military Park (VNMP) consists of the main battlefield, Vicksburg National Cemetery, Grant's Canal and the U.S.S. Cairo Gunboat & Museum. Hundreds of monuments and markers pay homage to the various regiments, commanders and troops that fought and/or died. Much like Gettysburg, the sheer number is a bit overwhelming. A loop drive allows you to cover the acreage quickly (in your car or via NPS tour vehicle), with frequent opportunities to stop and walk among the monuments, artillery pieces and markers denoting the battle lines and troop movements. A few monuments are truly colossal, erected by states with the greatest presence in the battle (such as Illinois, whose troops comprised around 20% of the Union Army at Vicksburg).

Downtown Vicksburg also gives a good sense of the town's historical roots and present status. Several quaint cafes, restaurants and watering holes offer a welcome return to the present after such a somber (but important) tour through the past.

Triangulation

Leaving Vicksburg, consider a different route that takes you farther from Jackson but back to the NTP. Take US-61 to the southeast, toward the hamlet of Port Gibson. Unlike so much of the antebellum South that was ravaged during the Civil War, Port Gibson survived largely intact. It is said that after the Union victory in the Battle of Port Gibson, Gen. Grant proclaimed the town "too beautiful to burn." Thus, many historic buildings remain, reflecting the multifaceted past of the village first settled by the French in 1729.

A brief but beautiful drive southwest of Port Gibson will get you to the Windsor Ruins. There, 23 Corinthian columns stand; all that remains of the largest Greek Revival antebellum home ever built in Mississippi. It was completed just as the war began and stood for 25 years after; fire destroyed it in 1890. However, the ruins reveal many fascinating details about the unique engineering incorporated and the construction methods employed by the enslaved laborers who built it. Upon returning to Port Gibson, get on the NTP around mile marker 40 and travel north to complete the third leg of this driving triangle.



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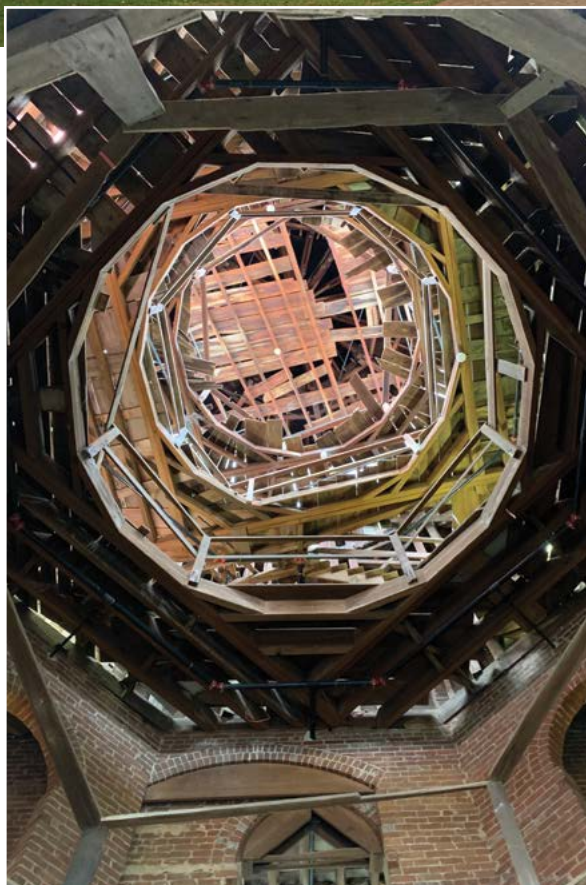
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The largest octagon house in the U.S. The exterior (top) was completed around 1861, but only the first floor was finished by the time the Civil War reached it. Looking up at the upper levels (inset) you will see they are preserved almost exactly as they were when the workers left to escape the war.



Progressing back toward Jackson, the Rocky Springs section of the Natchez Trace National Scenic Trail is worth a stop or two (mile markers 52 through 59). This section of trail is 6 miles long, but sections of less than a mile are all that is required to reach the Rocky Springs ghost town. Founded in 1790, around 4,600 people lived there by 1860. After that, the population steadily declined in the wake of the Civil War, crop failure due to boll weevil infestation and a yellow fever epidemic. The sole remaining building is the Methodist church, which no longer has regular services but is usually unlocked for touring and is still used for special services. Scattered around the trails are a few remnants of the townsite. Via the NTP, you'll be back in Jackson in under an hour.

Antebellum Mansions

Anyone who loves architecture, engineering, antiques, history, fine dining, unique accommodations or any combination thereof will enjoy a stay in Natchez, Mississippi. The flight down from Jackson will be a quick 75-mile hop to Natchez Adams County, Hardy-Anders Field (KHEZ). The county-run FBO provides parking, fuel and rental cars. More beauty remains in the final 40 miles of the NTP between Port Gibson and Natchez, with

many bluffs, creeks and burial mounds to see. Natchez State Park is also accessible at mile marker 11. Natchez is the official southern terminus of the NTP and the Old Trace. Near mile marker zero is “The Forks of the Road.” It is there that Natchez became the second most prolific slave trading city in the U.S. (only surpassed by New Orleans) due to its proximity to the Trace, the river trade routes and the cotton and tobacco croplands. Today, it is where the difficult history and suffering of enslaved people are detailed and recognized. While the Natchez Trace tour ends there, this quaint city will hold your attention, eliminating any rush to return to the airport.

Founded by French colonists in 1716, Natchez was controlled by France, Great Britain and Spain before the American Revolution. Natchez would prove vital in the development of the entire region. Especially as the Trace was developed and steamboats began transporting the region’s crops upriver. Enslaved were, of course, the heart of the economy, making so many cotton growers in the area exceedingly wealthy. So much so that in the 1850s, Natchez had more millionaires than any city in the U.S. and half of all U.S. millionaires lived there! Thus, the proliferation of mansions in the area.

Antebellum means “Before [a specific] war.” In this case, the U.S. Civil War. Life after the war could not exist

the way it had before. Many of the wealthiest growers in the area were secretly aligned with the North to protect their property holdings. Many knew their business models would have to change in a post-slavery economy but also felt the Confederacy could not prevail. Those who cooperated with the North often carried secret papers to that effect, which they hoped would save their homes and crops when the time came. Of course, it did not in many cases, as war is ruthless. However, more than any other Southern city of wealth, Natchez did escape the scorched-earth devastation that engulfed so many others. As a result, today it contains one of the most representative collections of antebellum mansions, homes and buildings in the South. The preservation of this has become a point of pride for Natchez.

It is the antebellum mansions people come to see. The grand homes built by the wealthiest 1% in the decade preceding the war. Many were lost, of course, after the war, when their owners lost their fortunes. The owners who were able to adapt their business models remained successful and many were able to stay for generations to come. However, these homes require massive resources to own, maintain, power and improve. Thus, today, most are either a museum or a business. Lucky for travelers, the most common business is bed-and-breakfast (B&B) style lodging. There are dozens to choose from and we

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The author's chosen lodging for the tail end of the Natchez Trace tour was Brandon Hall (circa 1856).

picked Bradon Hall (completed 1856) mainly because it is immediately off the NTP. Brandon Hall's owner lives there and interacts with guests throughout the tourist season. Everything about the experience was charming, from the delightfully mixed company at the breakfast table to strolling the rolling grounds to evening drinks on the upper veranda with the owner and/or fellow guests. Many such mansions are available for guided tours, whether museums or B&Bs. Some are opulent beyond description, while others are more subdued. Our favorite one was never even finished.

Longwood Mansion is the largest octagon house in the U.S., containing six levels and 30,000 square feet of living space, topped by an onion dome. The exterior was completed during 1860-1861. Artisans from the northeast were in the early stages of interior work when word of the war reached them. The men dropped their tools and escaped north while they still could. Only the first floor (a semi-basement level) was completed. Owner Haller Nutt lost much of his fortune in the war years and died in 1864. His widow lived in the finished first floor until her death in 1897 and her children for decades more. The upper five levels were never finished and are preserved almost exactly as they were the day the workers left. Today, the living level remains much as it was in the 19th century. The unfinished upper levels offer a fascinating glimpse into the engineering and architectural genius designed into the unique mansion, with all the exposed structures (consisting of 1 million bricks) in full view. Any tour of Natchez history would be incomplete without a visit to Longwood.

The food choices in Natchez will not disappoint either. Enough options of local, non-chain restaurants exist to

allow you never to need to eat at the same place twice. From casual fare to fine dining, palate-pleasing meals are the norm in Natchez.

A tour of the Natchez Trace is a fascinating trip through history. It covers an area not normally thought of as "touristy." However, that is part of the appeal of the Natchez Trail Parkway: no throngs of tourists, quiet and natural places and nearly constant opportunities to learn things new to you while seeing things quite old. Whichever direction you decide to tour the trace and however you decide to subdivide the trip into air versus ground movements, you will almost certainly discover things that appeal to your particular interests and curiosities. 

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Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI, & IGI and Platinum CSIP. In 35 years of flying, he has logged over 22,000 hours total, over 6,000 hours of instruction-given, and over 2,500 hours in various King Airs and the BE-1900D. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he is also a Boeing 737-Series Captain for an international airline, holds eight turbine aircraft type ratings, and has flown over 140 aircraft types. Matt is one of less than 15 instructors in the world to have earned the Master CFI designation for 11 consecutive two-year terms. He can be reached at matt@progaviation.com or 414-339-4990.



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Summer Heat and Engine Problems

by Dean Benedict

Recently, hot weather has been a top news story all over the United States. Areas that don't normally see triple-digit temperatures have been getting a taste of what we deal with every summer in the desert Southwest. This got me thinking about an engine problem that can crop up when the OAT is scorching hot. And with all this talk about heat waves and high temperatures, it seemed like a good idea to revisit this situation.

Back when I had my shop, I got an urgent call from a King Air pilot at an airport not far from me. It was a very hot day with triple-digit temperatures. He was trying to take off and return home, but one of his engines would not accelerate when he took the runway. He said he “fire-walled the power lever” but nothing happened. Adding to his concern was the idle starting to decrease. He definitely had a problem. He returned to the ramp and conferred with a couple mechanics from a local tour operator. They had suspicions about his fuel control unit (FCU), but they suggested he give me a call.

As soon as he told me what he had observed, and the steps he had taken, I knew exactly what was wrong. It happens every summer around here, and it's not the FCU; rather, it's a problem with the oil-to-fuel heater that's throwing the FCU off. Yes, you read that right, it's the oil-to-fuel *heater*. Trust me – I have seen this happen many times.

When an engine won't accelerate, most people would immediately suspect a problem with the FCU; they might also suspect a P3 problem (bleed air going into the FCU) or possibly a Py problem (air going from the FCU to the prop governor). But experience has taught me not to dig into the FCU without first going “upstream” to the oil-to-fuel heater and look there.

Inside the oil-to-fuel heater is a vernatherm which shuts the oil-to-fuel heater off during extreme heat conditions. If this vernatherm goes bad, then the oil-to-fuel heater

doesn't get the message to shut off. It continues to heat the fuel as if the aircraft is at altitude instead of on the ground with a triple-digit OAT. Super-heated fuel lacks the correct viscosity, and the FCU does not know what to do with this hot fuel. The FCU cannot function properly, therefore the engine does not make power.

There are a number of factors that contribute to this scenario: (A) You are on the ground, it's really hot outside and the heat radiating off the ramp can be 140°F, so your oil temperature is already on the high side. (B) If you are in a King Air 200 with 4-blade props, you no doubt have your ice vanes deployed (down) to protect against FOD; however, this also opens the rear bypass door and prevents airflow across the oil-cooler, causing your oil temp to climb even higher. (C) You taxi out, maybe you sit in line waiting to take off, and if the vernatherm in your oil-to-fuel heater is not working, the fuel becomes super-heated and the engine won't make power. So, you

taxi back to the ramp in hopes of finding some maintenance.

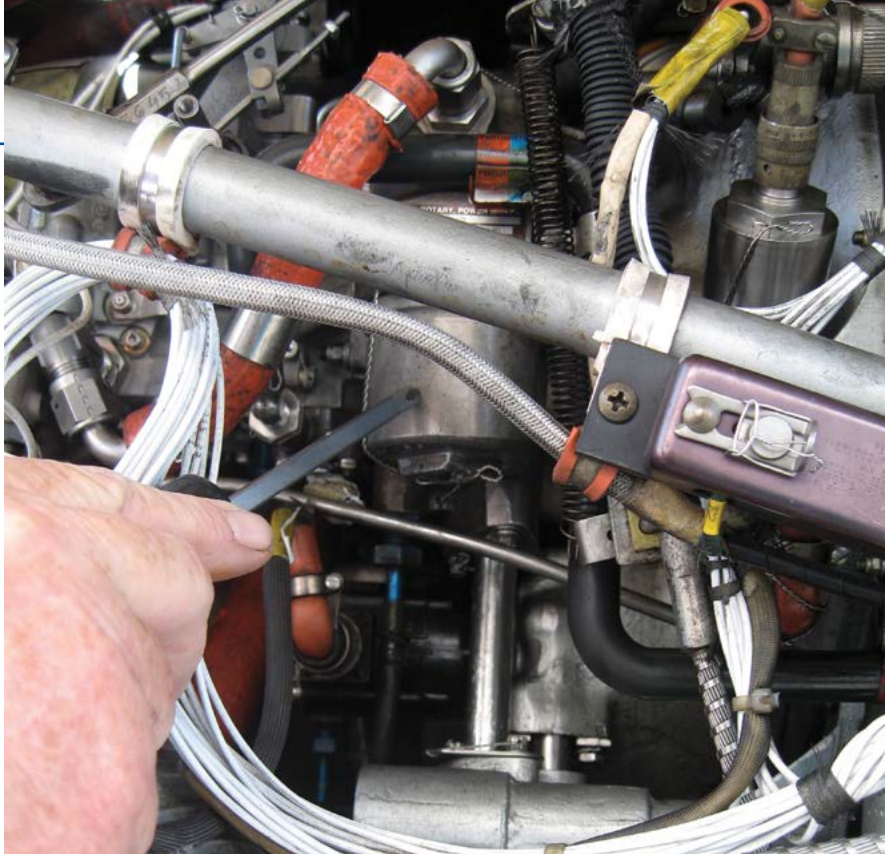
To make matters worse, the problem often appears intermittent, because by the time you taxi back, shut down and go look for help, everything has cooled off just enough to work properly. You find a mechanic, drag them over to your King Air to diagnose the situation, you fire up the problem engine and everything works just fine! OK, chalk it up to some odd glitch, load everyone back in the aircraft, taxi back out to the runway and once again no power on that engine! It's a maddening situation on a boiling hot day.

Troubleshooting

The most expedient way to troubleshoot the oil-to-fuel heater is to run that engine for about 10 minutes; shut down and open up the R/H rear cowl door. You are going to check the temperature of the fuel bowl on the high pressure fuel pump. The HP fuel pump will be just forward of the FCU and its fuel bowl is above the oil-to-fuel heater (see photo, top right). BE CAREFUL! If the vernatherm in the oil-to-fuel heater is not working, this fuel bowl will be hotter than a poker! Use great caution in checking the fuel bowl or you will erase your fingerprints in the process. Warm is normal. If it's too hot to touch, then your oil-to-fuel heater is the likely culprit.

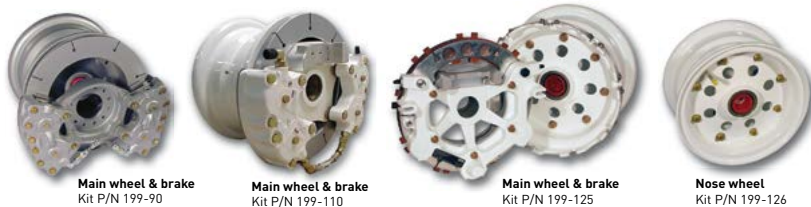
Now what? Well, unfortunately for all of us, Pratt & Whitney does not allow the vernatherm to be changed in the field. The oil-to-fuel heater unit must be removed and exchanged. Once you find a suitable exchange unit and get it shipped to wherever you are, then it's about a four-to-five-hour job for an experienced mechanic to change it out.

If you are in the boondocks, however, there is one other option. *Keep in mind that this problem only*



The author pointing to the fuel bowl of the high-pressure fuel pump; the oil-to-fuel heater can be seen below it, behind a wire bundle. The most expedient way to troubleshoot the oil-to-fuel heater is to check the temperature of the fuel bowl after the engine has run for 10 minutes.

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happens on the ground, and that if you are able to get fuel streaming through the FCU, it will keep going. In other words, if you can keep your oil temperature from going too high, you'll keep your fuel temperature in a viable range for proper FCU function. Once the FCU gets going, it won't quit.

Inside the FCU is a labyrinth of diaphragms that cannot operate properly with super-heated fuel. The goal is to keep the fuel from becoming too hot before the engine is asked for full takeoff power. Once the FCU gets going, there is so much fuel going through the oil-to-fuel heater that the fuel cannot become super-heated.

So what happened to that King Air pilot with the urgent call? Here is what he did: He asked the tower for at least one minute after receiving clearance to take off. He taxied out on one engine only with his ice vanes stowed (up). After receiving clearance for takeoff, he started his "problem" engine. In doing so, he kept the oil temp down enough for the fuel temp to be acceptable to the FCU. The engine came up to full power and he was good to go.

He had suggested flying over to my shop but I told him he would be better off flying home and having his oil-to-fuel heater addressed there. Once safely home, he called me and thanked me profusely.

A Safe Work-Around

Before I go any further, let me stress here that I am all about safety. I do not advocate risky procedures or maverick bravado in the cockpit in any way, shape or form – period. That said, if you understand the systems that operate your King Air, there are certain instances where you can safely work around a problem until proper maintenance can be done. This is one of those instances, *provided you diagnose it correctly.*

First you must troubleshoot the fuel bowl on the HP fuel pump. *Do not, under any circumstances, simply assume that you have an oil-to-fuel heater problem.* You must check that fuel bowl after a 10-minute ground run. If it's boiling hot, you've got a bad vernatherm in your oil-to-fuel heater. Next, you let everything sit and cool down. Your oil temp needs to get down to at least 40°C.

Let the tower know that once you receive clearance for takeoff, you'll need an additional minute to get going. Taxi out on your "good" engine only, with the ice vanes up (this helps keep your oil temp from red lining, which in turn keeps your fuel from super heating). Once you receive clearance, fire up the other engine. If you get all the proper indications, and you see that engine is now making power, it means you have ample fuel streaming

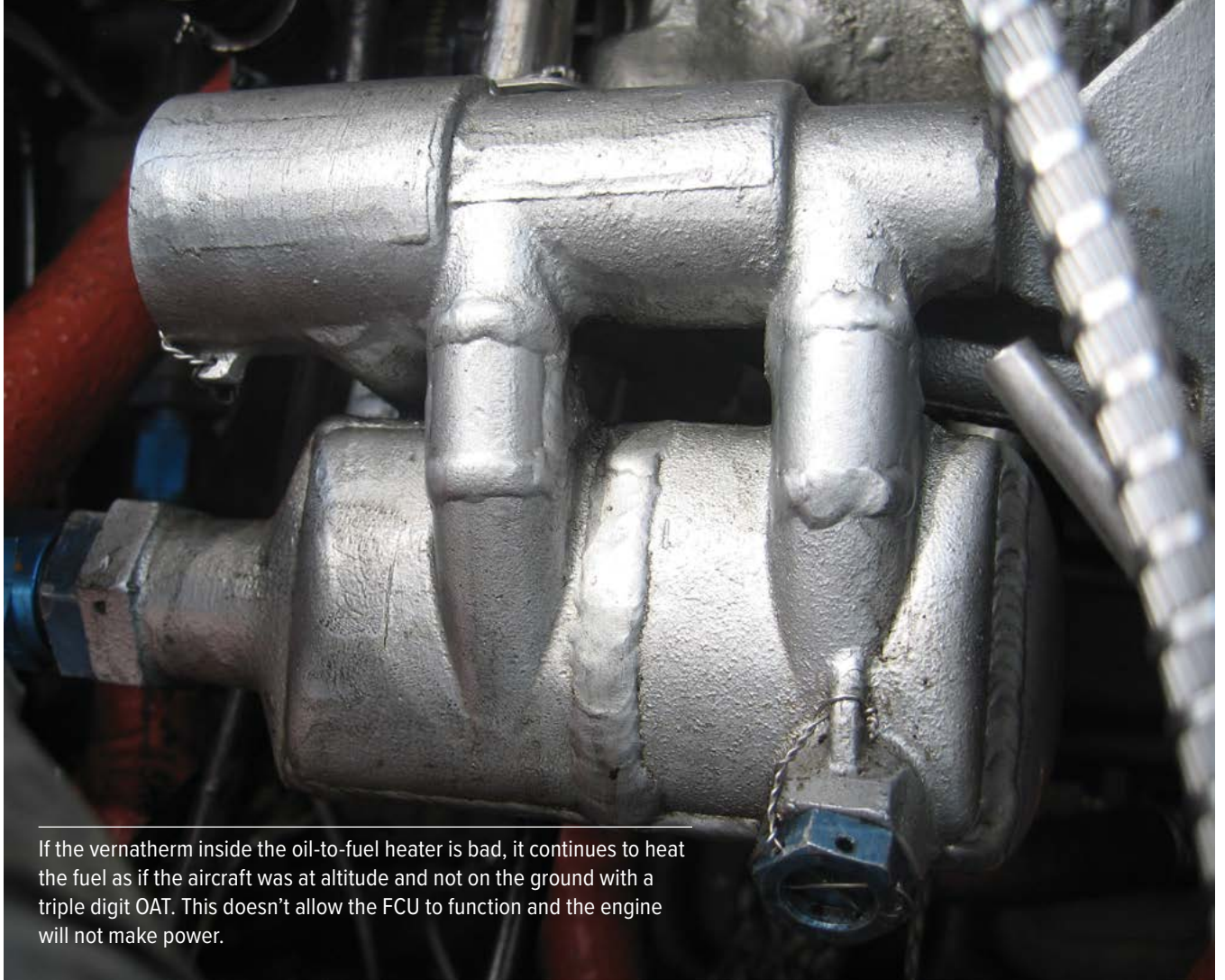


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If the vernatherm inside the oil-to-fuel heater is bad, it continues to heat the fuel as if the aircraft was at altitude and not on the ground with a triple digit OAT. This doesn't allow the FCU to function and the engine will not make power.

through the oil-to-fuel heater and it won't have time to super heat on its way to the FCU. Once airborne, the air going over the oil cooler will keep the oil temp down and the engine will operate normally.

Many of you who operate routinely in cooler climates could have a bad vernatherm in an oil-to-fuel heater and have no clue. It will never rear its ugly head until you get into really hot conditions on the ground.

When In Doubt, Don't Go


A little knowledge can be a dangerous thing, and so it is with a measure of trepidation that I even address this topic of working around a bad vernatherm in an oil-to-fuel heater.

My mantra is "When in doubt, don't go." If you are unclear about how an FCU operates – don't go. If you do not understand exactly what the oil-to-fuel heater does and why – stay put. If you cannot describe how the oil cooler works, please, stay on the ground.

Imagine that you encountered a no-power situation on the ground in hot weather, you felt certain it was correctly identified as an oil-to-fuel heater problem, but you still

don't feel comfortable with the work-around procedure; again, I say don't go! Wait until early the next morning when the OAT is at its lowest. Check the problem engine to see if it fires up normally. If it does, then use your best judgment on how to proceed at that point. If you have any doubts, anywhere along the line, then don't go. Do whatever it takes to get a knowledgeable mechanic on the aircraft to take care of things.

The good news is: It's fixable. It's a King Air. They've been around for a while.

Keep cool and fly safely. 

Dean Benedict is a certified A&P, AI with 50 years experience in King Air maintenance. He was an inaugural inductee to the King Air Hall of Fame. He owned and ran Honest Air Inc., a "Beechcraft maintenance boutique" with a strong following of King Airs, for 15 years. Currently, with BeechMedic LLC, Dean and his wife, Lisa, consult with owners, pilots and mechanics on King Air maintenance issues, troubleshooting and pre-buys. Dean performs Expert Witness work on request. He can be reached at 702-524-4378, or via email at dr.dean@beechmedic.com.

The History of King Air Chip Detector Annunciator Lights

by Tom Clements

In the early days of the King Air and PT6 engines, back in the '60s and early '70s, there was no such thing as chip detectors. The low spot near the bottom of the reduction gearbox (RGB) at the front of the engine had a drain plug only. The plug was not fitted with any device that would check for metal particles in the RGB housing.

But a few of those early PT6s had RGB failures that led to the power turbine (PT) being “uncoupled” from the propeller. Realize that all of the various propeller governors are connected to the output shaft of the RGB – the shaft to which the propeller is bolted. Nothing directly monitors the speed of the PT, the input shaft. So, when the disconnect occurs, the PT has almost no rotational resistance and it runs away to extremely high speeds, causing the turbine blades on the PT disk to be “liberated.” That’s a fancy way of saying that the PT catastrophically fails, sending some of the PT blade fragments out through the exhaust stacks (Wow! What an expensive sparkler show!) and also sending some blade fragments right through the engine casing. These fragments sometimes made their way through the fuselage skin and even occasionally into the crew’s legs. Yuck!

The first step taken to deal with this obvious weakness was to add the PT containment ring that all PT6s now have. This heavy band of metal surrounds the PT disk – or disks, in the larger models that have a two-stage PT – and prevents the liberated blades from exiting tangential to the axis of rotation. Now the exhaust stack sparkler show is even more impressive!

The second step was to add the chip detector, so that the pilots could be informed that the RGB was “making metal.” The detector is quite simple, comprised of two magnetic probes close together but not touching. If ferrous metal (ferrous means iron-based, which is an electrical

conductor) bridges the gap, then the completion of the circuit advises the crew that all is not right in the RGB’s world.

Somewhat surprisingly, when chip detectors were first installed, no annunciators were associated with them. Instead, the detectors had to be tested with an ohmmeter every 25 hours. If continuity was discovered, then further flight was prohibited until the RGB and the engine filters were checked for metal. Yes, 25 hours between checks means that a lot of hours could be flown before a fault was discovered. But, hey, it was better than never even having the ability to test! Quite a number of A90, B90 and early C90 and E90 King Airs are still operating with the detector test points inside their cowlings and no chip annunciators.

The 200, receiving its Federal Aviation Administration (FAA) certification in late 1973, was the first King Air to have the left and right engine chip detectors wiring into the annunciator panel circuitry. The annunciators were in the warning panel – the one with all the red lights. Red implies “emergency,” so they are very important lights that almost always involve some checklist steps that should be memorized.

So, what did the emergency checklist tell the pilot to do? Absolutely nothing! Why? Because the first 200 checklists had no procedure whatsoever dealing with this newly-installed annunciator! It appears the design

engineers snuck an annunciator in without bothering to notify the POH writers.

Dave Simon, one of Beech Aircraft's marketing staff on the international sales team, was the first pilot to experience the illumination of a chip light while flying one of the early 200s. He dutifully searched the checklist and, as I've made obvious, found nothing! The engine was running just fine, so he chose to continue the flight. Yes, you guessed it: Within about 30 minutes the engine blew up! Dave made a successful single engine landing and the Beechcraft team quickly verified that indeed the RGB had uncoupled. Hmmm ... perhaps we'd better address that annunciator in the POH!

A POH and checklist revision was quickly forthcoming. In fact, all of the King Air models then being produced – C90, E90, A100 and 200 – started being equipped with the annunciators and their POHs/checklists had the procedure added. And what was the procedure? “If conditions permit, shut down the engine.” In fact, some models merely added “Chip Detector Illumination” to the title of the already existing checklist “Engine Fire in Flight.” Pull the condition lever and shut that sucker down!

As Mr. Simon's incident (and now some others) showed, there could be no abnormal engine indications

whatsoever making themselves known before the engine turned into a bomb. “If conditions permit” has never been clearly defined. The consensus seems to be that shutting down an engine because of a chip light would not be wise if the other engine had already been shut down for some other reason! Likewise, perhaps waiting to either land or execute a successful two-engine missed approach might be the wise course of action if the light illuminated while inside the FAF while executing an ILS or LPV approach with the weather hovering right at minimums.

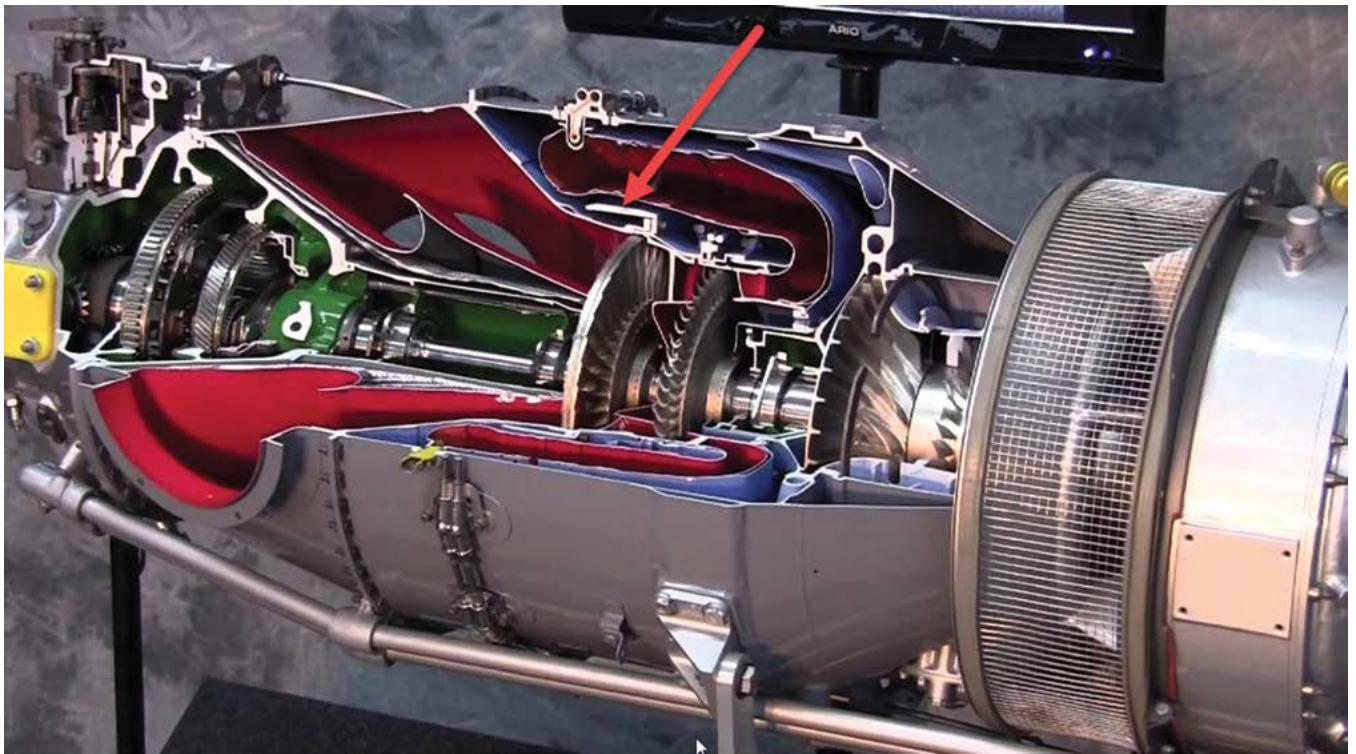
I have two personal experiences to tell you about. One of my clients with whom I conducted recurrent training had the light illuminate on a sunny day while departing Rock Springs, Wyoming, on a flight back to Portland, Oregon. The annunciator appeared just as they were leaving the Rock Springs' airspace. The 200 they were flying was used as a corporate shuttle and most seats were filled. Being in such good conditions, the crew went ahead and secured the engine. As they returned to Rock Springs for an uneventful single-engine landing, they hoped that the light had been triggered by some metallic “lint” instead of a significant piece of metal. This mysterious lint has indeed been the cause of some chip lights. In these cases, usually the main oil filter is inspected and if nothing significant is

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A cut-away view of a PT6 engine with an arrow pointing to the containment ring – a heavy band of metal that surrounds the PT disk(s) and protects against PT disk blade fragments being released.

found, the aircraft is authorized to fly 10 hours more before another check. If things are still copacetic on the follow-up check, then no further action is required. (One theory is that this lint may be manufacturing residue that was not thoroughly flushed away after the engine was manufactured or overhauled.)

Well, the crew's hopes of "nothing major" were dashed when, in their words, "We could do chin-ups on the prop blade!" The gearbox had frozen solid with contamination.

A year or two after this incident, I was conducting recurrent training for the pilots of an early C90 based at Gillespie Field (KSEE), near San Diego, California. We flew east to avoid the busy San Diego area, and while doing air work near Thermal, California, the chip detector on the left side came on. The weather was perfect, we were light with only about half fuel and three people (all pilots) on board, so we went ahead and shut the engine down. Being close to Gillespie, we decided to return to that airport where they had their own mechanic available. As we flew, having declared an emergency with ATC, I was pleased to see that occasionally the three-blade prop would turn slightly as we changed speed or configuration. "At least the gearbox isn't frozen, unlike the Rock Springs case" I thought to myself. "Probably gonna be a little lint."

In the hangar, the mechanic quickly pulled the forward cowling to gain access to the detector. He positioned a metal pan to catch the oil and removed the detector.

As the oil fell into the pan, I swear we could hear metal hitting metal! Maybe not, but that oil was thick with metal contaminants. Have you heard the line about "Pieces being big enough to have part numbers on them?" That's about what we had here! I'm sure glad we shut it down expeditiously!

By the way, both this engine and its partner on the other side were very close to the suggested 3,600-hour TBO, so both were sent out for overhauls.

The F90 model made its appearance in 1978. Like the other models being produced then, it also had the chip detector on the red, warning annunciator panel. As time passed, it became obvious that some chip light illuminations were indeed a precursor or indicator of major engine damage whereas other cases simply were lint-related.

At some point a meeting of Beechcraft engineers, pilots and lawyers was held and the issue was discussed in-depth. I was not in attendance, but I am guessing it may have gone something like this: "Should we really treat this basically equivalent to an engine fire, even when there may be no immediate problem? Aren't we exposing our company to possible legal action if a pilot were to botch a single-engine approach and landing, when in fact the airplane didn't need to be single-engine at all?"

Based on this type of concern, decisions were made to (1) change the annunciator in forthcoming models from red warning to yellow caution, and (2) insert a

checklist step demanding/suggesting the pilot not shut down the engine unless abnormal engine instrument readings were observed.

Having the annunciator red in some models and yellow in others has been a head-scratcher for many pilots and training-providers for a long, long time. Realize that there is no difference in the installation whatsoever except for where the light is placed and what color it is. If your flight department has, say a straight 200 and a 350, the light will be a warning in the 200 and a caution in the 350. Therefore, should you actually react differently depending on which airplane you are flying that day?

We each must answer that question for ourselves. Based on what I have presented here, I imagine you can guess my personal position. Yes, so long as “conditions permit,” I will be pulling the condition lever and feathering the prop quite rapidly. Now, granted, I have lots of single-engine time in King Airs because of the thousands of hours spent instructing in them. Since your level of one-engine-inoperative experience may be significantly less, I can appreciate your possible reluctance to do an immediate shutdown. That’s understandable and just fine. After all, there is a reasonable chance that the illumination does not indicate that a catastrophe is imminent. And if the engine does indeed blow up? Well, that’s a time to call the insurance agent.

I’ll wrap this up by giving you, as Paul Harvey used to say, “The Rest of the Story” concerning the scenario at Rock Springs. When the engine was sent in for repair, the shop reported this interesting bit of news: They said they had never seen an engine with so much destruction in the power section and yet the compressor section was fine. The engine had been shut down before the contaminated oil had clogged the main oil filter enough to cause its bypass to open. Hence, the No. 1 and No. 2 bearings – the ones that support the aft and forward ends of the N1 or Ng gas generator shaft – came through unscathed. Food for thought, eh? **KA**

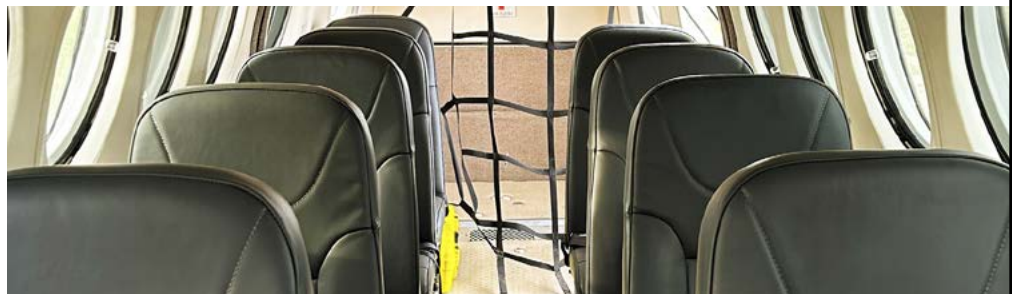
King Air expert Tom Clements has been flying and instructing in King Airs for over 50 years and is the author of “The King Air Book” and “The King Air Book II.” He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his books, contact Tom direct at twcaz@msn.com. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

If you have a question you’d like Tom to answer, please send it to Editor Kim Blonigen at editor@blonigen.net.



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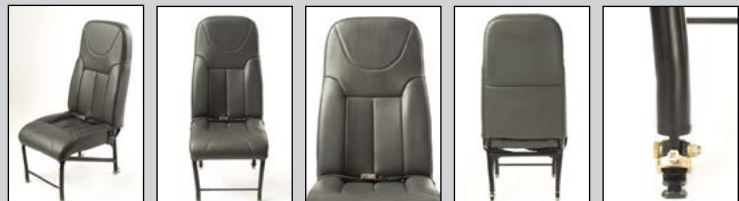
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SmartSky® Receives STC for King Air Models B200 through 360

SmartSky, provider of the most advanced inflight air-to-ground (ATG) connectivity for business aviation, announced the issuance of an FAA Supplemental Type Certificate (STC) for SmartSky LITE on the King Air 350i. The certificate covers installation of the award-winning inflight Wi-Fi system for King Air models B200, B200C, B200GT, 250, 250C, 250EP, 260, 260C, 300, 350, 350C, 350CER, 350i, 350iER, 360, 360C and 360CER representing over 2,000 in-service aircraft.

The first article installation was completed by Davinci Jets Services, a full-service MRO and FAA Part 135 charter firm operated in North Carolina. As part of previously announced plans to equip the majority of its managed fleet with SmartSky connectivity – due to SmartSky’s ability to deliver the connected experience inflight customers have been demanding for years – Davinci has already completed first-of-type installations of SmartSky systems on a Citation CJ4, Citation Latitude and Pilatus PC-12.

The award-winning SmartSky LITE™ system has received multiple industry accolades including a 2024 Aviation Week Laureate award and just last month was named Robb Report’s first-ever Best of the Best in aviation for cabin connectivity.

Textron Aviation Bolsters Support in the United Kingdom and Ireland through Gama Aviation (UK) Limited

Textron Aviation Inc. announced recently that it is expanding its relationship with longtime channel partner Gama Aviation. Newly designated as an Authorized Sales Representative (ASR) for Textron Aviation Special Missions aircraft in the United Kingdom and Ireland, Gama Aviation will now feature special missions variants of the entire portfolio of Beechcraft and Cessna aircraft.

This authorization allows customers to engage with Gama Aviation on their total needs, from developing their requirements through turnkey solutions of missionized aircraft with full in-country support.

“We are delighted to be extending our relationship with Textron Aviation as an Authorized Sales Representative for Special Missions aircraft,” said Mark Smith, managing director of Special Missions, Gama Aviation. “As a long-term design, embodiment, maintainer and operator of Textron Aviation platforms for Air Ambulance and Intelligence, Surveillance and Reconnaissance missions, we feel ideally placed to advise end users and operators in their Special Missions configuration. Working with Textron Aviation in this way will strengthen the total support we can collectively provide in the UK and Ireland.”

New TC-Approved King Air Flap Roller Bearings Improve Aviation Safety and Reliability

Marsh Brothers Aviation (MBA), a leading manufacturer of advanced polymer seal and bearing solutions for the aviation industry, has received Transport Canada approval for its innovative new King Air Flap Roller Bearing.

The revolutionary new product – the first polymer bearing solution Marsh Brothers Aviation has developed for commercial aircraft – solves a critical maintenance issue faced by operators of the popular Beechcraft King Air series of aircraft.

OEM greased needle flap rollers are prone to seizing up over time as the grease ages and stiffens. This then causes the flap rollers to slide in the track instead of rolling, leading to abnormal track wear and damage resulting in unscheduled downtime and costly repairs.

“The style of roller currently used is a traditional sealed grease packed needle roller that relies on supplemental lubrication,” says Director Business Development at Marsh Brothers Aviation, Nicholas Choo-Son. “Grease does not respond effectively to the lower outside air temperatures at flight altitudes, so the rollers can slide in the track rather than roll.”

Choo-Son says this is a well-known problem amongst the King Air community, with mandatory 3,000-hour inspections frequently revealing bearing wear and aluminum track damage. “Unscheduled maintenance from a seized flap roller can easily cost operators in excess of US\$20,000 in parts and labor, plus substantial revenue losses from aircraft downtime,” he said.

MBA’s proprietary AeroTough® material, the self-lubricating polymer on which the new roller bearing is cited as having greater durability than other materials, including Teflon®. What’s more, compared to the original greased metal bearings used in these and other aircraft,

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the rollers last considerably longer. The single-piece design of the King Air Flap Roller Bearing also simplifies installation compared to the OEM system.

For U.S. registered King Air 200/300 series aircraft, pending an FAA STC, the Field Approval (FAA Form 337) process may be used to secure aircraft serial number specific approval for installation of the Marsh Brothers Aviation Grease-Free flap rollers.

Conidia Debuts Jet Fuel Contamination Test Kit

Conidia Bioscience has introduced a test kit that will rapidly detect microbial contamination in jet fuel. The Fuelstat One test can be used throughout the entire fuel supply chain, from storage terminal to wing tank, offering a comprehensive overview of the fuel's quality.

The simple, rapid lateral flow test can be conducted on free water or fuel phase samples to detect a broad range of microorganisms, with results in less than 30 minutes.

Fuelstat One detects markers of bacteria and fungi that can grow in jet fuel, leading to biofilms and sludge formation that can clog fuel filters and obstruct fuel lines, causing engine malfunctions or failures.

Conidia's test kit is supported by an app that provides results and generates a shareable PDF report. Users can

“Fuelstat One detects markers of bacteria and fungi that can grow in jet fuel, leading to biofilms and sludge formation that can clog fuel filters and obstruct fuel lines, causing engine malfunctions or failures.”

manage results from all tests conducted by their team globally at the touch of a button.

“After years of development, the introduction of Fuelstat One represents a significant advancement in microbial detection for aviation fuel and redefines the industry benchmark,” said Jay Patel, Conidia’s head of innovation. “Fuelstat One test kits enable a single person to conduct tests at the tank using just four drops of fuel sample, following step-by-step video test instructions via the app.” **KA**



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Cancer Patients Fly Free

Can You Spare a Seat?

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CAN works closely with over 500 of America's top corporations, including half of the Fortune 100, to match empty seats with patient flights. Thanks to the generous support of these companies, CAN has coordinated more than 67,000 flights since its founding in 1981.

Contact CAN to learn more about registering a cancer patient or to donate an empty seat on an aircraft.

corpangelnetwork.org



It's wonderful that organizations like the Corporate Angel Network are able to help connect those most in need of flights to those who are flying.

-Henry Maier, President and CEO, FedEx Ground

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