

PIPER FLYER

SARATOGA SCHOOL:
THE PA-32 AND ITS SYSTEMS
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SARATOGA SCHOOL: What you need to know about the PA-32 and its systems

Buying and maintaining a Saratoga doesn't have to be confusing, provided you have all the facts.

By Heather Skumatz

As Jennifer Dellenbusch writes in her model history “Saratoga Tale: PA-32 tangents” featured in the October 2013 issue of this magazine, the Saratoga has a confusing history. It evolved from two other Piper PA-32 models—the Lance and the Cherokee Six—but the company later adopted the Saratoga name for all PA-32s.

Today, prices for a Saratoga can range anywhere from \$100,000 for early 1980s models to over \$350,000 for a glass panel Saratoga. When you have this kind of price spectrum, it’s probably a good idea to find someone who knows the model very well to ensure a rewarding acquisition experience.

Meet The Saratoga King

Bartelt Aviation in Sturgis, Mich. is widely known for specializing in the PA-32 line, and is the world’s leader for Piper Saratoga sales. When we spoke in late January, Bartelt himself—who’s known as “The Saratoga King”—was preparing the delivery of the company’s 428th Saratoga.

Bartelt has found that having aircraft sales associated with his maintenance business makes each segment stronger—a checks-and-balances approach, if you will. He and his staff of three IAs have surveyed a lot of Saratogas, and they often find that maintenance practices on the aircraft are not up to par. “The single biggest issue [in the inspection of a Saratoga] is the quality of the maintenance,” Bartelt said.

When an aircraft meets or exceeds the maintenance standards, and the sales price is fair to all parties involved, Bartelt said, it can be a win-win. “Our Aircraft Acquisition Consulting Program ensures our clients get a solid aircraft that’s airworthy at the correct entry point,” he explained. That strategy has worked—428 times.

Pre-purchase and annual costs

The typical Saratoga buyer is a small business owner or an executive buying for personal use. Bartelt advises not to buy this airplane on your own. He encourages the use of an acquisition specialist that is seasoned in dealing with pre-owned aircraft.

Bartelt also cautioned me that “just because a seller’s asking price is attractive, it might not be a good deal.” Any buyer needs to bear in mind that the cost to buy and repair a particular airplane may exceed the cost of a completely different aircraft with all of that work already accomplished.

And even if the logs show that a lot of work is already done, it takes time to evaluate an aircraft properly. “A pre-buy



Photo courtesy Bartelt Aviation, Inc.



01

Photo courtesy Bartelt Aviation, Inc.



02

Photo courtesy Bartelt Aviation, Inc.



03

Photo courtesy Bartelt Aviation, Inc.

When you have this kind of price spectrum, it’s probably a good idea to find someone who knows the model very well to ensure a rewarding acquisition experience.

01 A closeup of the TIO-540-AH1A engine installed in a 2001 PA-32R-301T Saratoga II TC.

02 The panel of this 2002 PA-32R-301T Turbo Saratoga II TC has been heavily updated with several products from Garmin, including a G500 PFD with synthetic vision, a GMA-35 audio panel with six-place intercom, plus GPS, transponder, XM weather and a collision avoidance system.

03 A view of the club seating offered in the rear cabin of a 2001 PA-32R-301T Saratoga II TC.

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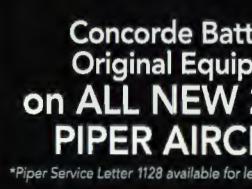
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Photo courtesy Bartelt Aviation, Inc.

If you're considering a Saratoga, it's a good idea to have an understanding of the common service issues so that the aircraft is as safe and sound as possible.

isn't a six or eight-hour deal; it's more like two or three days," Bartelt explained. "On average, we find \$15,000 to \$25,000 wrong with a single-engine aircraft."

Keep in mind, the average annual inspection and maintenance on a Saratoga can cost \$5,000 to \$8,000—and that's if the aircraft is "already straightened out," Bartelt said. Beware of any mechanics who want to charge too-good-to-be-true prices for an annual, he cautioned. "I can tell you, that aircraft probably won't pass the pre-buy inspection process."

Common service issues

If you're considering a Saratoga, it's a good idea to have an understanding of the common service issues so that the aircraft is as safe and sound as possible.

John Bartelt was very willing to pass along his findings about certain systems in the Saratoga and share cost information with *Piper Flyer* readers. Some of these areas are the subject of Service Bulletins, while some are not. Each of the issues along with general prices for repair are listed below.

Cracked oxygen support brackets

Bartelt is finding cracks in oxygen supports, prompting the need for replace-

ment. "We find these brackets cracked on many of the 1980 to 1987 Turbo Saratoga SPs," Bartelt informed me. If it's not fixed, you risk cracking of the fuselage side skins.

It takes about eight hours of labor to drill out the cracked brackets and rivet new units in place. Each vertical bracket costs about \$70, and there are four brackets. Additional labor is needed to remove and replace the rear bulkhead and oxygen bottle to gain access.

Landing gear

Bartelt and his crew often find that landing gear bushings, bolts, and bearings are out of tolerance. When this occurs it should be addressed, or you increase your chances of a gear collapse and/or retraction issues.

The cost to rebuild the main landing gear is around \$2,500 per side; \$1,500 for the nosegear. To avoid frequent replacement of parts, Bartelt recommends that the landing gear be serviced and lubricated every 100 hours.

Nosegear trunnions

A nosegear trunnion with excessive play can sometimes be adequately greased and/or shimmed in order to eliminate excessive forward and aft play, but not

Cracked Oxygen Support Brackets



Photo courtesy Bartelt Aviation, Inc.

Bartelt Aviation is finding cracks in oxygen support brackets on 1980 to 1987 Turbo Saratoga SPs. To fix the issue, old brackets need to be drilled out and new ones riveted in place.

01 The left-hand inside support bracket.

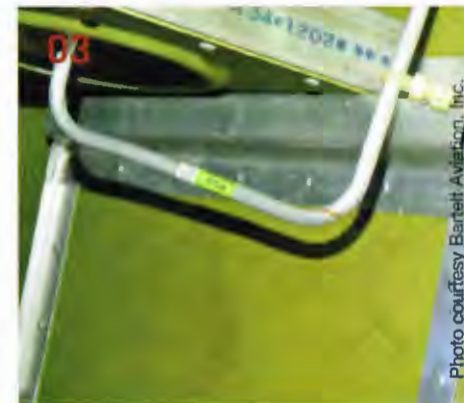


Photo courtesy Bartelt Aviation, Inc.

02 The right-hand inside support bracket.

03 This photo shows the vertical crack in the support on the pilot's side from the forward end.

04 A photo illustrating the view from the aft side.

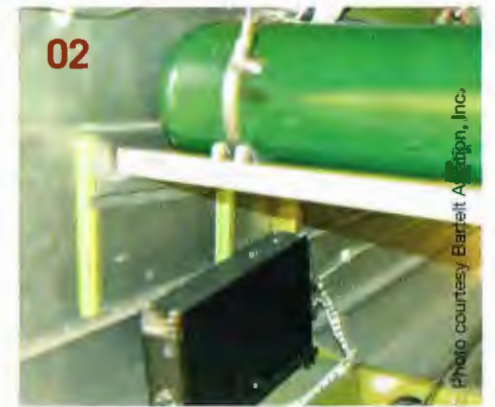


Photo courtesy Bartelt Aviation, Inc.

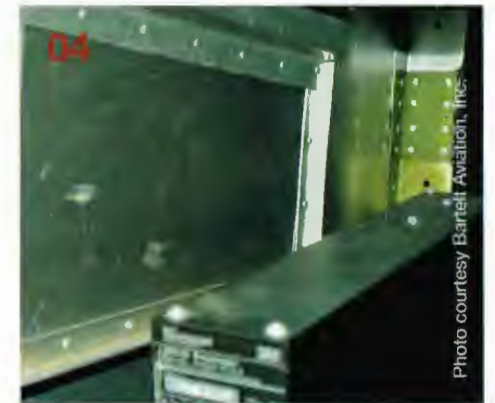


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Photo courtesy Bartelt Aviation, Inc.

always, according to Bartelt. If not, a set of new inner and outer nose trunnions can cost nearly \$4,000.

Service Bulletin 1006

In 1997, Piper Aircraft issued a Service Bulletin directing service professionals to inspect for corrosion of the main spar behind the fuel tanks. This recurring inspection was prompted by "reports of corrosion on the spar cap due to fuel leaks behind the fuel tanks in PA-28 and PA-32 series aircraft," according to the bulletin.

Bartelt says he has never found significant issues with a spar when complying with this bulletin, but did say SB 1006 is worth doing because it allows the owner to replace the rubber fuel interconnects, replace fuel vent lines and protect the spar with a rust protection product like Dinotrol. It also allows the service facility to repair any leaking rivets on the back of fuel tanks that are impossible to see unless the fuel tank is removed. Cost to repair is about \$500 in parts and about 25 to 30 hours of labor.

Service Bulletin 1161

Not everyone completes the work on this Service Bulletin that was issued on March 8, 2006, even though it covers the majority of the retractable Piper aircraft, Bartelt told me.

This document was prompted after the finding that "the rib assembly on the aft side of the main wing spar at wing station

49.25 may develop a crack, located vertically along the bend radius of the flange common to the main wing spar and the side brace attach fitting."

Bartelt says he has seen evidence of these ribs cracking, and if it's not addressed, the crack could exceed the effectiveness of the repair kit. The kit costs less than \$350, but between 12 and 16 hours of labor per side are needed in order to complete the installation.

The price of *not* doing it? "If the crack goes too far, you're looking at wing specialist work," says Bartelt. "The whole rib might require replacement."

Service Bulletin 1216B

Piper considers this inspection for aileron rib cracks mandatory. The document states, "over time, cracks may develop in the aileron nose rib common to the out-board aileron hinge fitting. Left undetected, these cracks may lead to separation of the hinge fitting from the nose rib...". The inspection (and, if needed, replacement) is for both the left and right sides.

Bartelt explains further. "There are two rivnuts—female receptacles for bolts—these go in to the rib for the aileron attach arm mounting. The majority of the Saratoga aileron ribs we inspect are cracked," he said. To change the rib, the cost is about \$900 per side, plus two hours per aileron.

"We've [even] found them cracked where the Service Bulletin doesn't cover

Service Bulletin 1006 – Corrosion Inspection of Main Spar



Photo courtesy Bartelt Aviation, Inc.

Reports of significant corrosion on the spar cap behind the fuel tanks in PA-28 and PA-32 series aircraft prompted the issuance of Service Bulletin 1006 in 1997.

01 This bulletin requires around 25 hours of labor to complete. If corrosion is missed, a loss of structural integrity in the spar can result.

02 The fuel tanks are removed as part of this recurring inspection.

03 The left hand fuel tank removed from a 1985 PA-32R-301T.

04 The right hand fuel tank removed from a 1985 PA-32R-301T.



Photo courtesy Bartelt Aviation, Inc.



Photo courtesy Bartelt Aviation, Inc.



Photo courtesy Bartelt Aviation, Inc.

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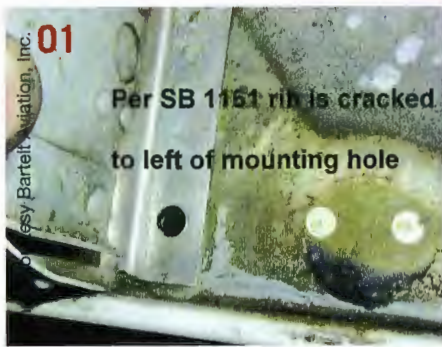
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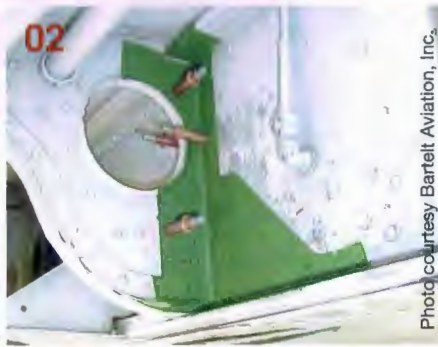
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Service Bulletin 1161 – Rib Assembly Inspection & Modification



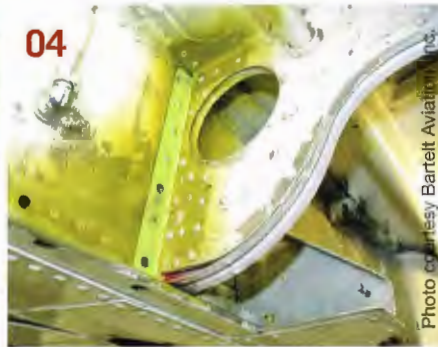
01 Per SB 1161 rib is cracked to left of mounting hole



02



03 Left Rib Cracked



04

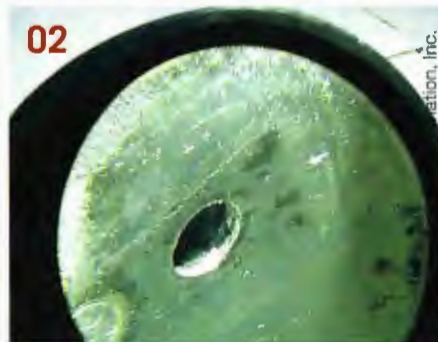
According to Service Bulletin 1161, "The rib assembly on the aft side of the main wing spar at wing station 49.25 may develop a crack, located vertically along the bend radius of the flange..."

01 This photo clearly illustrates the rib crack on the right hand side. 02 If the crack is small enough, it can be repaired with a bracket. 03 A crack detected in the left hand side of this rib assembly. 04 This left hand kit requires 12 to 16 hours to install.

Service Bulletin 1216B – Aileron Rib Inspection



01



02



03



04

A mandatory inspection for aileron rib cracks is detailed in Service Bulletin 1216B issued in 2012. 01 A closeup of an aileron rib crack. 02 The crack is more easily seen when magnified. 03 A shot of the aircraft with a cracked aileron rib. 04 In this photo the aileron rib has been replaced.

it—and the only way to see it is to remove bolts and paint at the focus area," Bartelt explained. The aileron rib can also be cracked at the inside location, which is not visible. "If the aileron attach arm were let loose," he said, "the aileron would most likely leave the aircraft!"

Overhauled engines

The quality of an engine overhaul is extremely important. Bartelt advises that you make sure to get a two- or three-year warranty and stresses the use of a new camshaft, not a regrind. This practice, he says, can mean the engine has better odds of not making metal before the recommended TBO.

He finds that many engine overhaul issues are often due to the use of reworked cylinders and can be avoided by spending an extra \$3,000 for the factory-new cylinder kits. Bartelt also finds issues with engine mounts, including cracks in the welds.

Bartelt Aviation sends engines out to a specialty shop for overhaul, and then installs them in-house. "Larry Russell, our director of maintenance and Vice President of Aircraft Sales, does the best engine install I've ever seen. The engine compartment looks brand-new after he is done!" A quality engine overhaul with a detailed installation by an experienced team can run \$55,000 to \$70,000.

After every overhaul, Bartelt's staff flies the aircraft an additional seven to 10 hours. This is part of the company's QC Program and it ensures their clients are not the test pilot after major work is performed on their aircraft. A flight test should be done as part of returning the aircraft to service, according to the FARs.

"Many maintenance facilities do not perform flight test after working on aircraft," Bartelt said. The reasons for that can vary. Perhaps the shop doesn't carry the necessary insurance, or maybe they don't have a pilot that's current on their staff. Bartelt recommends you make sure any shop you choose for services has a pilot on staff that can perform the necessary flight tests. He also recommends that you confirm with the facility that its insurance policy includes non-owned coverage.

Though the Saratoga may have had a confusing chronology, it can be sorted out with a little patience, and a lot of resourcefulness. And good airplanes are definitely out there. If you're in the market for a six-seat workhorse with a comfortable ride, I recommend you do your research, ask questions, read all of the documentation, and find an expert to guide you. ■■■

Sources: "Saratoga Tale: PA-32 tangents," by Jennifer Dellenbusch, Piper Flyer October 2013; "Piper Saratoga: 1980–Present," Plane & Pilot online, pub. 2001.

Heather Skumatz is managing editor for Piper Flyer. Send questions or comments to editor@piperflyer.org.

RESOURCES >>>>

Bartelt Aviation, Inc.
BarteltAviation.com

Service Bulletins
SB1006, "Corrosion Inspection of Main Spar Behind Fuel Tanks"
PiperFlyer.org/SB1006

SB1161, "Rib Assembly Inspection and Modification, Aft Wing WS 49.25"
PiperFlyer.org/SB1161

SB1216B, "Aileron Rib Inspection"
PiperFlyer.org/SB1216B

SARATOGA II TC SPECIFICATIONS



PA-32R-301T

GENERAL CHARACTERISTICS

Engine: (1) Lycoming T10-540-S1AD or -AH1A, 300 hp (1,800/2,000 TBO)

No. of seats: 7

Wingspan: 36 feet, 2 inches

Length: 28 feet, 4 inches

Height: 9 feet, 6 inches

MTOW: 3,600 pounds

PERFORMANCE

Cruise speed: 177 knots

Range: 730 nm

Takeoff run: 960 feet

Takeoff (over 50-foot obstacle): 1,420 feet

Landing roll: 1,700 feet

Source: Vref



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PA-32 VARIANTS

PA-32-260 (1965-1978)

Piper's original PA-32 was a significantly modified version of the PA-28 Cherokee.

PA-32-300 (1966-1977)

Piper's new Cherokee Six sported a 300 hp Lycoming IO-540-K1A5 engine.

PA-32R-300 (1976-1978)

The Piper Cherokee Lance was the first of the retractable PA-32s and had a conventional tail.

PA-32RT-300 (1978-1979)

The Lance II had a T-tail design.

PA-32RT-300T (1978-1979)

The Turbo Lance II was the first turbocharged single in the PA-32 line.

PA-32-301 (1980-1991)

A fixed-gear version of the Saratoga was manufactured for 11 years.

PA-32-301T (1980-1984)

A turbocharged Saratoga with a fixed gear was produced only in the early to mid-1980s.

PA-32R-301T (1980-1987)

Introduced as the Turbo Saratoga SP, only 13 of the more than 400 aircraft were made with de-ice boots. Production stopped from 1988 to 1997.

PA-32R-301 (1980-1992)

The retractable Saratoga SP was in production for 12 years, but none were produced in 1991.

PA-32R-301 (1994-2006)

The Saratoga II HP model debuted in 1994 and was in production for 12 years.

PA-32R-301T (1998-2008)

The Saratoga II TC had the option of a TKS system for de-icing.

PA-32-301XTC (2003-2006)

Piper's 6XT, a turbocharged fixed-gear aircraft, was produced for three years.

PA-32-301FT (2003-2008)

The Piper 6X is a non-turbocharged fixed-gear aircraft. Like its predecessors, the Saratoga HP, Saratoga TC and 6XT, it has a 2,000 hour TBO.

Source: Bartelt Aviation, Inc.

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