Pre-Purchase Report

Baron N[REDACTED]

2000 Beechcraft B58 Baron
S/N TH-[REDACTED]

Airframe Total Time: 1234.1

- Left Engine Total Time: 1234.1
  - Engine new in Sept. 1999
- Left Propeller Total Time: 1234.1
  - TSMOH: 1046.4
- Right Engine Total Time: 1234.1
  - Engine new in Sept. 1999
- Right Propeller Total Time: 1234.1
  - TSMOH: 1046.4

Logbook/Airworthiness Review

- Annual due 12/01/2013. Last annual was completed 11/26/2012.
- No accident/incident reports on file with the NTSB or the FAA.
- Aircraft registration will expire on 09/30/2013. If the sale is not completed by this date, it may be difficult to register the aircraft under a new owner. If the owner renews the registration, it will assure a smooth and easy transition when the aircraft is sold.
- AD 2008-13-17, replacement of defective toggle switch circuit breakers, was complied with at annual in 2009. This is a very expensive AD to comply with.
- AD 2004-21-05, inspection by pressure decay test of combustion heater, was complied with at annual in 2012. This airworthiness directive requires that the heater be tested for leaks from the combustion chamber every 100 hours of heater time in service or every 24 calendar months.
- AD 2012-10-02, inspection and replacement of oversized or deformed clamps on fuel tank vent lines, has not been complied with. The aircraft is unairworthy without the compliance of an airworthiness directive.
- AD 90-08-14, inspection of wing spar structure, does not apply to this aircraft based on serial number and manufacturing date. This is a costly repetitive inspection and very expensive if any cracks were found.
- AD 2007-08-08, lubrication of the landing gear uplock rollers, is an AD that must be complied with on an annual basis, or every 100 hours whichever occurs first. The logbooks make no mention of ever complying with this airworthiness directive.
- “Overhauled” landing gear motor installed at 131.8 hours by Woodland Aviation (Beechcraft service center). Recommend 2000 hour proactive replacement to prevent damage to the landing gear system. (Roughly 1100 hours on the current motor since installed).
- Last Pitot-Static/ Transponder check (FAR 91.411/ FAR 91.413) 10/2012 next due 11/2014. Must be completed every 24 calendar months to be IFR legal.
- Fuel cells are the original fuel cells from the Beechcraft factory. Except for some torqueing of interconnects and fuel drains, no repair work has been completed on the fuel cells. Fuel cells usually need replacement every 20 years, but may be replaced on condition. If fuel is left in the tanks, the bladders may last longer.

Aircraft Inspection

- ENGINES & PROPELLERS
  - The engines are factory new engines from Continental. They were installed on the aircraft by Beechcraft when the aircraft was assembled. Continental specifies and 1700 hour or 12 year TBO on these engines (Continental SIL98-9B).
  - The engines were fairly inactive from 2002 to 2007, only flying 96.8 hours, until the aircraft changed owners. At that time the engines were given a complete top overhaul due to rust on the top section of the cylinders. The accumulation of rust is most likely due to the inactivity of the airplane. Since then the aircraft has flown 1046.4 hours.
  - Logbooks state that the left engine had the #5 cylinder replaced at the 2012 annual inspection. Inspection of the aircraft shows that the #6 cylinder is the newest cylinder on the engine. The right engine also had three cylinders, #1 #2 and #4, replaced at this time as well. All cylinders were replaced with new ECI cylinders.
  - The propellers were overhauled in 2007 after 187.7 hours in service. Hartzell recommends a 2400 hour or 72 month TBO on these propellers (Hartzell HC-SL-61-61Y).
  - Both engines have Champion fine wire spark plugs that were installed into the engines when the engines were installed on the aircraft. There are a few replacement spark plugs installed in the engines over the years, but it is not unusual for this type of spark plug to last all the way to TBO on the aircraft.
  - All 4 magnetos were replaced with new magnetos at the last annual. That would put 61 hours on the magnetos.
- Compressions
  - Hot
    - Left Engine
      - #1 62/80 #3 66/80 #5 60/80
      - #2 49/80 #4 64/80 #6 73/80
    - Right Engine
      - #1 64/80 #3 72/80 #5 72/80
      - #2 72/80 #4 50/80 #6 61/80
  - Orifice reading: 39/80 psig. This is the lowest that Continental will allow the compression of the engine to be before repair action must be taken. This reading is taken during the compression check and varies as weather conditions change. This does not apply for exhaust valve leakage.
  - Exhaust valve leakage is indicated by highlighted red with yellow text, while piston ring leakage/wear is indicated by highlighted yellow and black text. Both conditions should be addressed before the sale of the aircraft is completed.
  - Exhaust valve leakage is more serious and indicates that the exhaust valve is not sealing correctly with the cylinder head. If this leakage persists, hot exhaust gases can erode away the exhaust valve and the valve will eventually fall into the cylinder. This is known as “swallowing” a valve. Serious damage to the engine will occur in this instance.
- ENGINE SQUAWKS
  - Right engine fuel controller is leaking out the mixture control shaft. The cause of this is a worn O-ring on the shaft inside the fuel controller. When this O-ring does not seal correctly it allows air to enter into the fuel system and cause fuel flow fluctuations in worse cases. This should be repaired immediately to prevent damage to the engine or a fire in the engine compartment.
  - Both engines are leaking a fair amount of oil. Most of the oil leaks are propagating from the valve cover gaskets and the pushrod tube seals. Replacing these seals and gaskets should take care of the majority of the oil leakage.

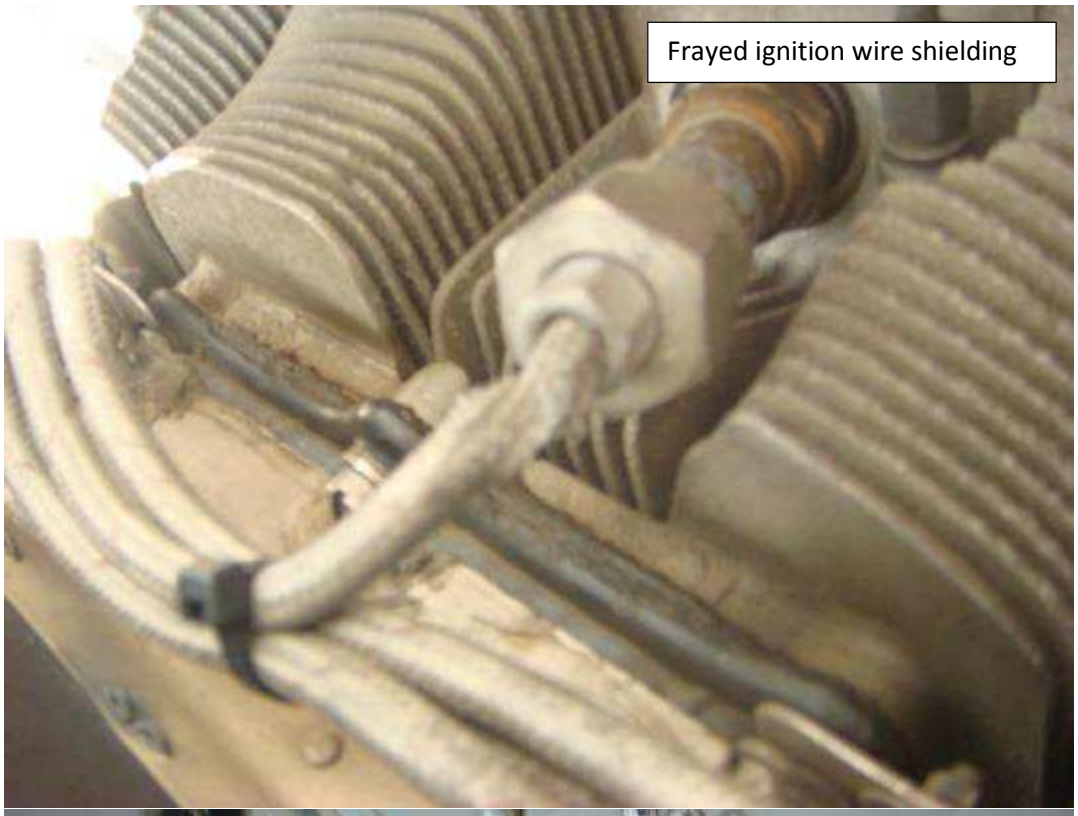
- Both engines have leaks from the oil pressure relief valve gaskets. Common on continental engines with over 1000 hours SMOH and an easy repair for any shop to deal with.
- The lower engine mounts on both engines are cracking. The engine mounts will normally last all the way to engine overhaul but since this aircraft has a few oil leaks that have not been addressed, the oil has soaked the mounts and caused the mounts to begin cracking. These should be replaced before a sale is completed on the aircraft. Keeping the new mounts clean and dry will extend their lives.
- The fuel strainers on the throttle bodies of both engines are leaking fuel. These fuel strainers are removed every annual for cleaning. The gaskets that seal the strainer should get replaced at this time, but sometimes may get reused depending on condition. Replacing these gaskets should stop the fuel leak.
- All fuel and oil hoses are original from Beechcraft. That would make them 13 years old. The FAA and Beechcraft specify a 5 year replacement schedule. Replacing them on condition is at the signing mechanics discretion. All hoses (accept the A/C hoses) were fire sleeved for protection, which also extends their life. Normally most shops will replace the hoses at 10 years old. All the engine hoses should be replaced as part of the sale.
- #5 cylinder exhaust stack on the left engine has an excessive leak on the slip joint where it joins the rest of the exhaust system. While slip joint leakage is normal, the joints should seal up as they expand when the engine warms up. This exhaust slip joint has begun to be eroded away by the hot exhaust gasses. This part can be sent to an exhaust specialty shop for repair.
- The left propeller is mounted to the crankshaft 180 degrees of the correct mounting position. Since the propellers are statically balanced at the propeller shop, mounting these propellers on the aircraft incorrectly will result in vibrations. Vibrations from the propeller increase wear on critical components on the engine and the airframe. This should be corrected before a sale is completed.
- The left and right propellers look as though they have been operated out of the Sahara desert. The leading edges have been completely striped of paint from mechanics dressing out rock chips. The face of the blade (which is the side that faces the pilot) has lost almost all of the flat black paint. The prop heating elements have cracked in several places and are beyond repair. The props will meet their 72 month time limit at the end of August 2013. Based on the condition of the propellers, it may be wise to have the propellers overhauled rather than repair the propellers at the next annual.
- The ignition harnesses on both engines were replaced at the annual in 2011. The harnesses look fairly new except for some torn shielding at the top plugs on the #4 cylinders of both engines. The shielding usually tears when mechanics twist the leads as they are installing the lead to the spark plug. There are repair kits available to replace the torn leads without replacing the entire harness. This should be done to prevent the insulation from wearing through and arcing the magnetos directly to ground.
- On the flight test and the static ground runs it was noted that both engines were running about 25 GPH at takeoff power settings. At this fuel flow, the cylinder head temperatures were running around 380-420 degrees. Continental recommends that the cylinders run around 360-380 degrees for maximum life expectancy. Adjusting the fuel flow to around 29 GPH on takeoff power settings will help cool the cylinders and extend their lives on the engines.
- During the flight test, the left engine was only running around 2600 RPM. Maximum RPM on this engine is 2700 (which can vary by as much as 3% or 81 RPM). The low RPM is an immediate loss of power. This should be adjusted before a sale is completed and before any fuel flow adjustments are made to the engines.
- Right and left mixture and propeller controls are very stiff and difficult to operate, even with the friction lock loosened. With the controls this stiff, it is difficult to make fine adjustments on the propeller and mixture settings. This problem is usually caused by corrosion on the cable. A pressure lubrication procedure should clean the cable and make them much easier to operate. This should be resolved before a sale is completed on this aircraft.

- AIRFRAME
- Paint in in good condition with some chips and touch up spots noted throughout the aircraft. About a 6/10 on condition. Aircraft is painted with a black, white, grey and blue in a very modern paint scheme. Paint appears to be the original paint from the factory. There are no indications in the logbooks to indicate that the aircraft was ever painted.
    - Some touch-up paint used in various places around the aircraft. Also several chips on flight controls and around the top surface of the wing that could use some touch up paint.
    - Paint looks like as though the aircraft sat outside for some period of time. The paint still retains most of its shine but has oxidation on the surface that makes the paint shine to appear very spotty. A good polishing job should bring back the original shine in the paint.
    - Paint is peeling away in the gear wells. The original primer is still adhering to the metal underneath so corrosion of the gear well area is not likely.
    - A couple vortex generators are missing on the right wing.
- Interior is in average condition. It does not appear that very much care was taken to keep the leather on the seats clean. Some of the wood trim around the side panels has come unglued. Interior rates 6/10 on current condition
    - Seat belts are dirty. The right middle seat shoulder harness is missing. This is a safety item and should be fixed as a condition of the sale.
    - Aft door latch lock is improperly positioned. This lock prevents accidentally opening the aft door from the inside without pressing the button on the handle first.
- Landing Gear Inspection
    - Tensions. This is the pressure required to push the down lock spring off the gear. These are very important and determine the health of the landing gear retract system. Too low can eventually lead to a gear collapse, too high puts unnecessary wear on vital gear components.
        - Right Main 51 lbs. (Recommended 45 lbs. - 65 lbs.)
        - Left Main 49 lbs. (Recommended 45 lbs. - 65 lbs.)
        - Nose 56 lbs. (Recommended 55+ lbs.)
    - All lift leg knee joint bushings and lift leg attach bushings are worn (usually a 2000-2500 hour airframe time replacement). This is a fairly low time aircraft to have this type of wear. It appears that some of the bolts that hold these bushings may have been over-tightened which wore the bushings faster. Extending the gear above gear operating speed will cause excessive wear on these bushings as well.
    - No indications that the nose gear retracts rod ends have ever been replaced. Beechcraft recommends a 2000 hour replacement schedule to prevent nose gear collapse.
    - Nose gear doors do not close completely flush with the airframe. This can cause excessive drag and reduced speeds. These should be adjusted at the next annual inspection.
    - Main Landing gear uplock springs are corroded. These springs move the uplock, during extension and retraction of the gear, clear of the gear. If these springs were to break, either when the gear is retracted or extended, serious damage to the landing gear transmission can occur the next time the gear is operated. These springs should be replaced before the sale of the aircraft is completed.
    - Steering stop cone bolt has been over-tightened. The cone should be able to spin freely to prevent excessive wear on the nose gear steering components. A critical item that needs to be addressed before the aircraft is sold.
    - The right inner gear door is rigged too tightly when the gear is retracted.
    - Both uplock cables for the uplock mechanism appear very tight. These cables should be checked and adjusted as soon as possible. The cables will break if allowed to operate with tensions that exceed the factory limitations.
    - Left brake caliper is leaking hydraulic fluid. Although the brakes worked properly, this problem needs to be address immediately to prevent air from entering into the brake lines.

- GENERAL SQUAWKS
    - The air conditioner is not producing cold air. The air conditioning system was recently worked on by a local shop. It was most likely improperly serviced during this maintenance procedure. If the air conditioner is serviced correctly, it may function correctly.
    - A crack is developing in the left cowling where the air conditioner compressor is mounted. Not a serious problem, just not aesthetically pleasing to look at. Stop drilling the crack will prevent it from spreading any further.
    - The right fuel tank inboard sump drain is leaking fuel. Removing the drain and replacing the internal O-rings will stop the leak.
    - Fuel cap seals are cracked. These are items that normally get overlooked but should be replaced every annual.
    - Pilot side vent window is difficult to operate. Adjustment of the locking mechanism will allow the window to open and close more freely.
    - The step courtesy light bulb is burnt out
    - Rear reading lamp bulb is burnt out.
    - Fire extinguisher is out of inspection date. The extinguisher is also not charged completed. This item needs to be addressed before the aircraft is sold.
    - The right flap inboard rib has begun to crack. This is the point where the actuator attaches to the flap. The crack is caused by people stepping on the flap as they enter and exit the aircraft. If passengers are informed to step only on the wing surface, the life of the flap rib can be extended without repair.
    - All elevator and rudder trim actuator bolts are over torqued. This causes unnecessary wear in the trim system. This also causes the autopilot servos to work harder and wear out quicker.

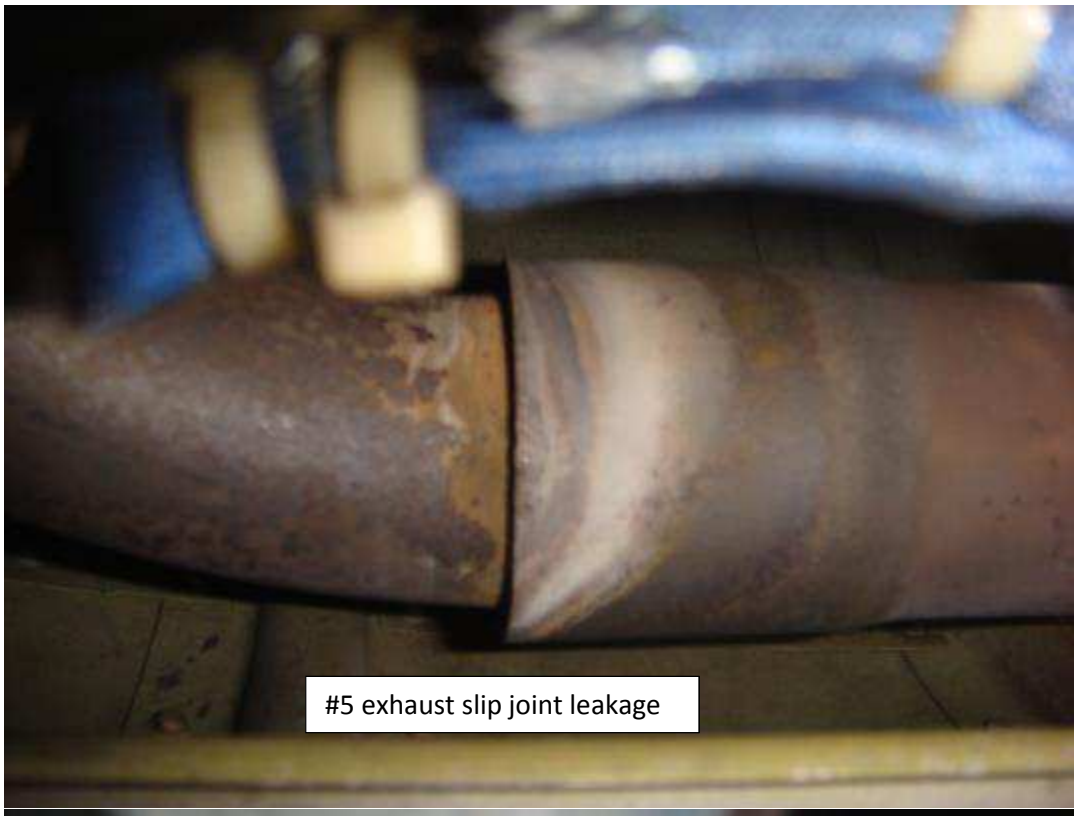
Flight Test

- Initial flight test results
    - Left engine will only produce 2600 rpm.
    - Fuel flow between both engines totals to 50 gallons per hour. This is about 10 gallons an hour lower then spec. During the climb and the cruise the cylinders on the engine were running in the high 300 to low 400 degree range. The high CHTs were most likely contributed to the low fuel flow. Increasing the fuel flow will help cool the cylinders.
    - The radar altimeter tests OK on the ground; however there is no altitude readout or warning.
    - Stormscope was working but was very dim. The dimmer switch had no effect on the brightness of the screen.
    - GPS version mismatch. Both Garmin 430 units have different software versions loaded. This prevents the two units from talking to each other.
    - Copilot HSI cannot acquire a heading from the flux gate compass. The HSI will hold a setting if the HIS is switched over to “free” mode. The CDI on the HSI is stuck all the way to the left.
    - Autopilot bank is far too steep. It should not go past 30 degrees. The bank angle reaches 33 degrees to help maintain a standard rate turn. The autopilot also has trouble adjusting the pitch trim quickly (such as needed when the flaps are extended). This causes the aircraft to balloon upwards as the servos fight to adjust the aircraft. This problem may be caused by the over-tighted bolts on the elevator trim tab.



Frayed ignition wire shielding

Right tank fuel sump leak


#5 exhaust slip joint leakage


Leaking left brake caliper

Left cowling crack near AC

Staining on inboard left gear door from leaking brake caliper

Nose gear doors not closing completely

Aircraft with the gear retracted


Right Inboard flap rib crack


le cylinder 1 piston
le cylinder 1 exhaust


le cylinder 3 piston
le cylinder 3 exhaust


le cylinder 5 exhaust
le cylinder 5 exhaust


le cylinder 2 piston


le cylinder 2 exhaust


le cylinder 4 piston


le cylinder 4 exhaust


le cylinder 6 piston
le cylinder 6 exhaust


re cylinder 1 piston


re cylinder 1 exhaust


RE cylinder 3 piston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