BLACKHAWK MODIFICATIONS, INC.™

Instructions for Continued Airworthiness

FAA-STC SA5460SW
Beechcraft King Air
Model 65-A90 and B90 Aircraft
with Pratt and Whitney PT6A-21 Engines
in Place of P&W PT6A-20 Engines

DOCUMENT NO. : 19010-30-1
REV. IR

NOTICE

This document must be referenced on Block 8 of FAA form 337 and added to the aircraft permanent record as required by 14 CFR Part 91, §91.417(a)(2)(vi) when the reference FAA-STC modification is accomplished on eligible aircraft. This document complies with the requirements of 14 CFR Part 23, §23.1529, in accordance with 14 CFR Part 23, Appendix G.

Aircraft Model No. _____

Aircraft Serial No. _____

Aircraft Registration No. _____

LOG OF REVISIONS

Rev No.	Revision Date	Review	Affected Pages	Description of Revision
IR	Mar 3 2006		All	Initial Release

Table of Contents:

1. INTRODUCTION:

This document provides instructions for the continued airworthiness (ICA) for Blackhawk Modifications, Inc. FAA-STC SA5460SW. This STC installs two Pratt & Whitney (P&W) PT6A-21 engines with any of the following applicable propellers listed in Section 2 on Beechcraft King Air 65-A90, B90, and C90 aircraft that were originally equipped with P&W PT6A-20 engines.

NOTICE:
Section 15, titled "Airworthiness Limitations" is FAA approved and specifies maintenance required under 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved. To remain in compliance with the STC, the aircraft shall be maintained in accordance with these limitations.

This document supplements or supersedes any King Air 90 Series Maintenance Manual, only in those areas listed herein for the appropriate aircraft model and serial number.

2. DESCRIPTION:

This STC installs two Pratt & Whitney PT6A-21 engines on Beechcraft King Air 65-A90, A90-1, A90-4, and B90 aircraft that were originally equipped with P&W PT6A-20 engines. The following propellers may be reinstalled or newly installed as approved under the original type certificate for the applicable model.

Aircraft	Propeller	Min. Dia. / Nominal Dia. (in.)
Originally equipped with Non-Reversing Prop (some Model 65-A90 & B90 aircraft)	HARTZELL 3-BLADED MODEL NO. HC-B3TN-2(,B, M)/T10173(B,NB)-8	90-3/8" / 93 3/8"
Originally equipped with Reversing Prop (all Models)	HARTZELL 3-BLADED MODEL NO. HC-B3TN-3(,B,M)/T10173(E,B,NB)-8	90-3/8" / 93 3/8"

3. SPECIAL PROCEDURES:

None

4. SERVICING INFORMATION:

Service Pratt and Whitney PT6A-21 engines in accordance with appropriate Raytheon Aircraft Beech King Air Model 90 Series Maintenance Manual for the aircraft serial number being serviced and appropriate Pratt & Whitney PT6A-21 Maintenance Manual.

5. MAINTENANCE INSTRUCTIONS:

Maintain Pratt and Whitney PT6A-21 engines in accordance with appropriate Raytheon Aircraft Beech King Air Model 90 Series Maintenance Manual for the aircraft serial number being serviced and appropriate Pratt & Whitney PT6A-21Maintenance Manual.

6. TROUBLESHOOTING:

Troubleshooting guidance may be found in the documents listed in section 4. Otherwise, contact Blackhawk Modifications, Inc. for assistance.

7. REMOVAL AND REPLACEMENT:

Removal of new parts is the opposite of installation detailed in Blackhawk Installation drawing 003-02, Rev. IR, dated Mar 9, 2006 or later FAA approved revision. For replacement

- Standard AN, MS, AE Parts listed with the installation can be obtained from appropriate and suitable vendor.
- Beechcraft parts listed with the installation can be obtained from Beechcraft.
- All other parts required for replacement should be fabricated or obtained per installation drawing listed using appropriate material as called out in material specification provided in list of materials. If you have any questions, contact Blackhawk Modifications, Inc. for assistance.

8. DIAGRAMS:

Installation Dwg No. 03-002, Rev. IR, dated Mar 9, 2006 or later FAA approved revision, titled “Installation Engine, PT6A-21 Beech A90 and B90”

9. SPECIAL INSPECTION REQUIREMENTS:

Conduct routine inspections on the PT6A-21 engines in accordance with appropriate Raytheon Aircraft Beech King Air Model 90 Series Maintenance Manual for Serial Number being serviced and per appropriate Pratt & Whitney PT6A-21 Maintenance Manual.

10. APPLICATION OF SPECIAL TREATMENTS:

None

11. DATA:

Installation Dwg No. 03-002, Rev. IR, dated Mar 9, 2006 or later FAA approved revision, titled “Installation Engine, PT6A-21 Beech A90 and B90”

12. SPECIAL TOOLS:

In accordance with appropriate Raytheon Aircraft Beech King Air Model 90 Series Maintenance Manual for Serial Number being serviced and per appropriate Pratt & Whitney PT6A-21 Maintenance Manual.

13. ADDITIONAL INFORMATION FOR COMMUTER CATEGORY AIRCRAFT:

Not Applicable

14. RECOMMENDED OVERHAUL PERIOD:

In accordance with appropriate Raytheon Aircraft Beech King Air Model 90 Series Maintenance Manual for Serial Number being serviced and per appropriate Pratt & Whitney PT6A-21 Maintenance Manual.

15. AIRWORTHINESS LIMITATIONS:

NOTICE:
This section is FAA approved and specifies maintenance required under 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved. To remain in compliance with the STC, the aircraft shall be maintained in accordance with these limitations.

INSTRUMENT MARKINGS

Interstage Turbine Temperature (ITT)
- Dashed Red-Line (Radial) ..... 1090°C (Starting)
- Solid Red-Line (Radial) ..... 695°C
- Normal Operating Range (Green-Arc) ..... 400°C to 695°C

Oil Pressure
- Red-Line (Radial) Maximum ..... 100 psi
- Normal Operating Range (Green-Arc) ..... 80 to 100 psi
- Red-Line (Radial) Minimum ..... 40 psi

CENTER OF GRAVITY LIMITS (LANDING GEAR EXTENDED)

Aft Limit ..... 160.0 inches aft of datum at all weights

15. AIRWORTHINESS LIMITATIONS (CONTINUED):

ENGINE OPERATING LIMITS (Model 65-A90 originally rated to 500 SHP per engine)

The following limitations are to be observed in the operation of this airplane equipped with two Pratt and Whitney PT6A-21 engines that have been de-rated to 500 SHP using the torque limit. Each column is a separate limitation. The limits presented do not necessarily occur simultaneously.

POWER SETTING	SHP	TORQUE FT. LB. (1)	ITT °C	GAS GEN RPM % N_1 (9)	PROP RPM N_2	OIL PRESS PSIG (2)	OIL TEMP °C (3)
Start	-	-	1090 (4)	-	-	-	-40 (min)
Low Idle	-	-	660 (5)	51 (min)	-	40 (min)	-40 to 99
High Idle	-	-	-	70 (approx)	-	-	0 to 99
Takeoff and Max Continuous	500	1192	695	101.5	2200	80 to 100	10 to 99
Cruise Climb and Max Cruise	470 (10)	1192 (6)	695	101.5	2200	80 to 100	10 to 99
Max Reverse (7)	-	-	695	88	2100	80 to 100	0 to 99
Transient (Acceleration)	-	1500 (4)	825 (4)(8)	102.6	2420	-	0 to 99

(1) Maximum permissible sustained torque is 1192 ft-lbs. Propeller speeds (N_2) must be set so as not to exceed power limitation.
(2) When gas generator speeds are above 72%N_1 and oil temperatures are between 60°C and 70°C, normal oil pressure is between 80 and 100 psi. Oil pressure between 40 and 80 psi is undesirable; it should be tolerated only for completion of the flight, and then only at a reduce power setting. Oil pressure below 40 psi is unsafe; it requires that either the engine be shut down, or that a landing be made at the nearest suitable airport, using th eminimum power require to sustain flight.
(3) For increased service life of engine oil, and oil temperature of between 74 °C and 80°C is recommended. A minimum oil temperature of 55°C is recommended for fuel heater operation at takeoff temperature
(4) These values are time limited to two seconds.
(5) High ITT at ground idle may be corrected by reducing accessory load and/or increaseing N_1 RPM
(6) Cruise torque values vary with altitude, temperature, and RPM.
(7) If installed, reverse power operation is limited to one minute.
(8) High generator loads at low N_1 speeds may cause the ITT transient temperature limit to be exceeded. Observe generator load limits provided in SECTION IV LIMITATIONS of the basic AFM.
(9) For every 10°C below -30°C OAT, reduce maximum allowable N_1 by 2.2%.
(10) Observe Torque and RPM indications provided in basic AFM performance sections.

15. AIRWORTHINESS LIMITATIONS (CONTINUED):

ENGINE OPERATING LIMITS (Model 65-A90 and B90 originally rated to 550 SHP per engine)

The following limitations are to be observed in the operation of this airplane equipped with two Pratt and Whitney PT6A-21 engines. Each column is a separate limitation. The limits presented do not necessarily occur simultaneously.

POWER SETTING	SHP	TORQUE FT. LB. (1)	ITT °C	GAS GEN RPM % N_1 (9)	PROP RPM N_2	OIL PRESS PSIG (2)	OIL TEMP °C (3)
Start	-	-	1090 (4)	-	-	-	-40 (min)
Low Idle	-	-	660 (5)	51 (min)	-	40 (min)	-40 to 99
High Idle	-	-	-	70 (approx)	-	-	0 to 99
Takeoff and Max Continuous	550	1315	695	101.5	2200	80 to 100	10 to 99
Cruise Climb and Max Cruise	495 (10)	1315 (6)	695	101.5	2200	80 to 100	10 to 99
Max Reverse (7)	-	-	695	88	2100	80 to 100	0 to 99
Transient (Acceleration)	-	1500 (4)	825 (4)(8)	102.6	2420	-	0 to 99

(1) Maximum permissible sustained torque is 1315 ft-lbs. Propeller speeds (N_2) must be set so as not to exceed power limitation.
(2) When gas generator speeds are above 72%N_1 and oil temperatures are between 60°C and 70°C, normal oil pressure is between 80 and 100 psi. Oil pressure between 40 and 80 psi is undesirable; it should be tolerated only for completion of the flight, and then only at a reduce power setting. Oil pressure below 40 psi is unsafe; it requires that either the engine be shut down, or that a landing be made at the nearest suitable airport, using the minimum power require to sustain flight.
(3) For increased service life of engine oil, and oil temperature of between 74 °C and 80°C is recommended. A minimum oil temperature of 55°C is recommended for fuel heater operation at takeoff temperature
(4) These values are time limited to two seconds.
(5) High ITT at ground idle may be corrected by reducing accessory load and/or increasing N_1 RPM
(6) Cruise torque values vary with altitude, temperature, and RPM.
(7) If installed, reverse power operation is limited to one minute.
(8) High generator loads at low N_1 speeds may cause the ITT transient temperature limit to be exceeded. Observe generator load limits provided in SECTION IV LIMITATIONS of the basic AFM.
(9) For every 10°C below -30°C OAT, reduce maximum allowable N_1 by 2.2%.
(10) Observe Torque and RPM indications provided in basic AFM performance sections.

16. REVISION:

Each time this ICA is revised or reissued, the revised ICA will be distributed to operators using a Service Letter/Bulletin by Blackhawk Modifications. This revision will include a new Log of Revisions page along with the revised pages. The lower right hand corner of each revised page will reflect the revision letter. That portion of text or an illustration, which has been revised by the addition of, or change in, information is denoted by a solid revision bar located adjacent to the area of change, and placed along the outside margin of a page. Revision bars show only information changed within latest revision.

17. ASSISTANCE:

For assistance with ICA issues not addressed herein, contact Blackhawk Modifications, Inc. at the following address or phone number.

Blackhawk Modifications, Inc.
1800 E. Sahara Dr.
Las Vegas, NV 85108
(831) 624-6996