



DOCUMENT NUMBER: ICA-150-5b

DOCUMENT TITLE: Instructions for Continued Airworthiness for the Pratt & Whitney Canada PT6A-135/-135A Turbo-prop Engine and Hartzell Three or Optional Four Blade (optional) Propellers on the PA-31T, PA-31T1, and PA-31T2 Turbo-Prop Airplanes.

STC NO: SA00863SE

ORIGINAL DATE: 30 May 2001

REVISION DATE: 05 June 2008

REVISION: A

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 Number _____

Aircraft Serial Number _____

Aircraft Registration Number _____

PROPRIETARY INFORMATION

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**Instructions for Continued Airworthiness
PA-31T, PA-31T1, and PA-31T2 airplanes
with PT6A-135(A) engines**

LIST OF EFFECTIVE REVISIONS

Always destroy superseded pages when you insert revised pages

| REVISION | DATE | CHAPTERS AFFECTED |
|-----------------|--------------|--------------------------|
| IR | 30 MAY 2001 | ALL |
| A | 05 JUNE 2008 | ALL |

This revision also supercedes ICA-150-5



**Instructions for Continued Airworthiness
PA-31T, PA-31T1, and PA-31T2 airplanes
with PT6A-135(A) engines**

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**Instructions for Continued Airworthiness
PA-31T, PA-31T1, and PA-31T2 airplanes
with PT6A-135(A) engines**

1. INTRODUCTION:

THESE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS WERE DEVELOPED FOR THE PIPER PA-31T, PA-31T1, AND PA-31T2 CHEYENNE AIRCRAFT MODIFIED PER STC SA00863SE. THIS STC INSTALLS THE PRATT & WHITNEY PT6A-135/-135A TURBO PROP ENGINES AND THREE BLADE HARTZELL HC-B3TN-3B/T10178B-8R OR FOUR BLADE HARTZELL HC-E4N-3N/D8990SB PROPELLER.

Keep these instructions with the aircraft service information manuals or with the aircraft logbooks for reference during maintenance. The maintenance instructions in this manual supplement the latest revision of the Piper Cheyenne Service Manual and Pratt & Whitney Canada PT6A-135/-135A Service Manuals, Hartzell Propellers installation and maintenance manuals and Service Publications for maintaining the modified Piper PA-31T, PA-31T1, or PA-31T2 aircraft.

2. DESCRIPTION:

The following engines and propellers are eligible for installation in accordance with Blackhawk Modifications STC SA00863SE Master Drawing List MDL-87120.

Engines:

| | |
|----------------------------|-------------------------------------|
| (a) Number of engines | 2 |
| (b) Engine Manufacturer | Pratt and Whitney Canada (UACL) |
| (c) Engine Model Number | PT6A-135 or PT6A-135A |
| (d) Rated Horsepower | 500 |
| (e) Propeller Speed (rpm) | 1900 |
| (f) Engine Type | Free Turbine, Reverse Flow, 2-Shaft |
| Compressor stages and type | 3 axial stages, 1 centrifugal stage |
| Turbine stages and type | 1 stage compression, 1 stage power |
| Combustion chamber type | annular |

NOTE: STC SA00863SE installs PT6A-135 on PA-31T and PA-31T1 airplanes or installs PT6A-135A engines on PA-31T, PA-31T1, and PA-31T2 airplanes. THE CHEYENNE IIXL was originally type certified with PT6A-135 engines.

Propellers:

| | |
|---------------------------------|----------------------|
| (a) Number of propellers | 2 |
| (b) Propeller Manufacturer | Hartzell |
| (c) Blade Model | T10178B-8R |
| (d) Number of Blades | 3 |
| (e) Hub Model | HC-B3TN-3B |
| (f) Propeller Diameter (inches) | 93 inch Max and Min. |



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PA-31T, PA-31T1, and PA-31T2 airplanes
with PT6A-135(A) engines**

- | | |
|--|---|
| (g) Propeller Pitch Limits | 88.2°±.5° Feather -11° ± .5° Reverse |
| (h) Propeller Type Speed, Full Feathering, Reversible | Hydraulically Operated, Constant |

NOTE: STC SA00863SE installs the above propeller on PA-31T and PA-31T1 airplanes with the PT6A-135(A) engines. This propeller was already type certified on the PA-31T2 airplanes.

Optional:

- | | |
|--|---|
| (a) Number of propellers | 2 |
| (b) Propeller Manufacturer | Hartzell |
| (c) Blade Model | D8990SB |
| (d) Number of Blades | 4 |
| (e) Hub Model | HC-E4N-3N |
| (f) Propeller Diameter (inches) | 90 |
| (g) Propeller Pitch Limits | 85.8°±.5° Feather -10.0° ± .5° Reverse |
| (h) Propeller Type Speed, Full Feathering, Reversible | Hydraulically Operated, Constant |

NOTE: STC SA00863SE optionally installs the above propeller on PA-31T, PA-31T1, and PA-31T2 airplanes with the PT6A-135(A) engines. STC SA001248SE installs this propeller on PA-31T airplanes with the stock PT6A-28 engines and the PA-31T1 airplanes with the stock PT6A-11 engines.

3. SPECIAL PROCEDURES:

Refer to the Normal and Emergency Procedures Section in Blackhawk Modifications Document No. AFMS-150T, AFMS-151T, or AFMS-152T Aircraft Flight Manual Supplements, as applicable, regarding operating procedures for this STC installation.

4. MAINTENANCE, REMOVAL AND REPLACEMENT, SERVICING, TROUBLESHOOT, AND SCHEDULED INSPECTIONS:

Aircraft modified per STC SA00863SE should be maintained in accordance with the scheduled time limits and standards outlined by the latest revision of the Piper Continuous Inspection Program or Approved Aircraft Inspection Program (AAIP). The maintenance requirements will be the same as the originally certificated airplane.



**Instructions for Continued Airworthiness
PA-31T, PA-31T1, and PA-31T2 airplanes
with PT6A-135(A) engines**

Engine:

Details of the engine installation are addressed in one of the applicable installation instructions:

| <u>Document No.</u> | <u>Aircraft Model</u> | <u>Engine Type</u> |
|---------------------|--------------------------------------|--------------------|
| 150-4-0-5 | PA-31T (Cheyenne and Cheyenne II) | PT6A-135 |
| 150-4-0-5A | PA-31T (Cheyenne and Cheyenne II) | PT6A-135A |
| 150-4-1-5 | PA-31T1 (Cheyenne I and Cheyenne IA) | PT6A-135 |
| 150-4-1-5A | PA-31T1 (Cheyenne I and Cheyenne IA) | PT6A-135A |
| 150-4-2-5A | PA-31T2 (Cheyenne IIXL) | PT6A-135A |

PT6A-135A engine rigging is addressed in Blackhawk Modifications Document No. 200710-30. PT6A-135 engine rigging is addressed in Piper Service Manual for a Cheyenne IIXL.

Propellers:

Installation of the Hartzell Four Blade HC-E4N-3N/D8990SB Propellers is addressed in Blackhawk Modifications Doc 158-4b.

Routine maintenance and inspections on the propellers in accordance with Piper Service Manual for the 3-blade propellers or Hartzell Propeller Maintenance Manual.

The HC-E4N-3N/D8990SB propellers are shot peened between station 7.0 and 30.0 on both face and camber sides. Blades having damage to the shot peened areas exceeding 0.015 inch deep (including material removal necessary to blend out such damage) must be removed from service and the reworked area shot peened before further flight. NOTE: For leading and trailing edge damage, a 0.250 inch deep rework limit applies before shot peening is required.

5. REPLACEMENT PARTS:

Replacement parts are addressed in the following applicable installation instructions.

| <u>Document No.</u> | <u>Aircraft Model</u> | <u>Engine Type</u> |
|---------------------|--------------------------------------|--------------------|
| 150-4-0-5 | PA-31T (Cheyenne and Cheyenne II) | PT6A-135 |
| 150-4-0-5A | PA-31T (Cheyenne and Cheyenne II) | PT6A-135A |
| 150-4-1-5 | PA-31T1 (Cheyenne I and Cheyenne IA) | PT6A-135 |
| 150-4-1-5A | PA-31T1 (Cheyenne I and Cheyenne IA) | PT6A-135A |
| 150-4-2-5A | PA-31T2 (Cheyenne IIXL) | PT6A-135A |



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6. RECOMMENDED TIME BETWEEN OVERHAULS:

EnginesSee Pratt & Whitney Service Bulletin SB 1803 R2 or later revision

PropellersSee Hartzell Service Letter HC-SL-61-61Y or later revision

7. 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.

Refer to the Limitation Section in Blackhawk Modifications Document No. AFMS-150T, AFMS-151T, or AFMS-152T Aircraft Flight Manual Supplements, as applicable, for specific limitations regarding this STC installation.

8. 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, Inc. This revision will include a new Log of Revisions page along with the revised pages. The upper left 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 inside margin of a page. Revision bars show only the information changed within the latest revision.

9. ASSISTANCE:

For assistance with anything, contact Blackhawk at the following address or phone number:

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