

PRATT & WHITNEY CANADA
SERVICE BULLETIN

P&WC S.B. No. 1669R9

BULLETIN INDEX LOCATOR
72-50-02

TURBOPROP ENGINE
COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

MODEL APPLICATION

PT6A-114, PT6A-114A

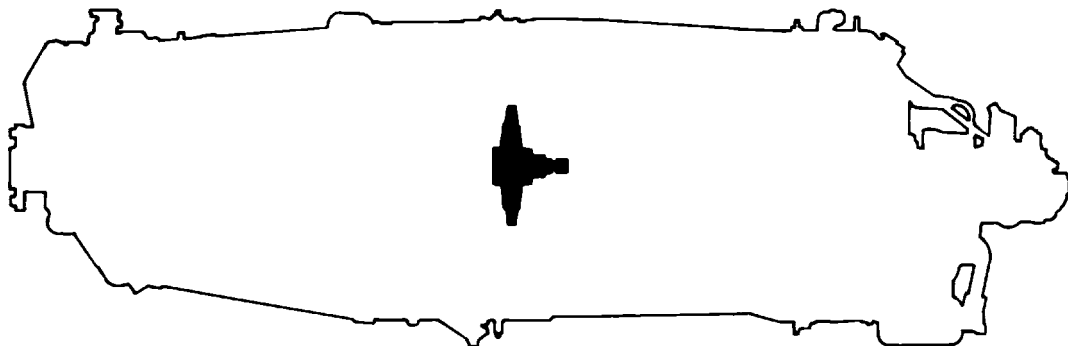
Commercial Support Program No: 1004551

Compliance: 3, 3, 3

Summary: There can be blade creep at the compressor turbine area when the engine is operated at higher temperatures and power than the Pilot Operating Handbook (POH) recommended power settings.

To prevent creep-related events, this service bulletin introduces:

- a borescope inspection for Pre-SB1669 blades.
- a metallurgical evaluation of a sample of Pre-SB1669 blades at HSI; or
- a new compressor turbine disk balancing assembly which incorporates redesigned turbine blades made from a different material.



Jul 22/2008
Revision No. 9: Jun 28/2013

PT6A-72-1669
Cover Sheet

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28 June 2013

P&WC S.B. No. 1669R9

REVISION TRANSMITTAL SHEET
TURBOPROP ENGINE MODEL PT6A

SUBJECT: Pratt & Whitney Canada Service Bulletin No. PT6A-72-1669, Rev. No. 9, dated Jun 28/2013 (P&WC S.B. No. 1669R9) COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

Replace your existing copy of this service bulletin with the attached revised bulletin. Destroy the superseded copy.

Please retain this Revision Transmittal Sheet with the revised bulletin.

SUMMARY: This revision is issued to:

- add the Engine Serial Numbers in Para. 1.A., Effectivity.
- add CT Blade Trailing Edge Borescope inspection;
- add a two-CT blade sample for metallurgical evaluation at an overhaul facility.
- modify the compliance code to read 3.
- change the part replacement code from the disk to read 07 in lieu of 02.

EFFECT OF REVISION ON PRIOR ACCOMPLISHMENT:

None.

NOTE: A black bar in the left margin indicates a change in that line of text or figure.

REVISION HISTORY:

Original Issue:	Jul 22/2008	Revision No. 7:	Jun 19/2012
Revision No. 1:	Jul 25/2008	Revision No. 8:	Jan 17/2013
Revision No. 2:	Aug 15/2008	Revision No. 9:	Jun 28/2013
Revision No. 3:	Sep 08/2008		
Revision No. 4:	May 05/2009		
Revision No. 5:	Jun 11/2009		
Revision No. 6:	Jul 14/2009		

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TURBOPROP ENGINE

COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

1. Planning Information

A. Effectivity

PT6A-114 Engines which include Serial No. PCE-17001 thru PCE-17495.
PT6A-114A Engines Serial No. which are before and include PC1611, PCE-19101 thru PCE-19402 and excluding PCE-PC0463, PC0720, PC1266, PC1382, PC1476 and PC1563.

B. Concurrent Requirements

None.

C. Reason

(1) Problem

There can be blade creep at the Compressor Turbine (CT) area.

(2) Cause

The engine may have been operated at a higher temperature and higher power than the recommended power settings in the pilot operating handbook.

(3) Solution

Introduce an inspection and a metallurgical evaluation of Pre-SB1669 blades or incorporate a new CT disk balancing assembly which incorporates redesigned turbine blades made from a different material.

D. Description

This service bulletin is:

- (Part A) For engines not incorporating Part C, perform a borescope inspection of the CT blades trailing edge at each fuel nozzle inspection to a maximum of 400 Hrs.
- (Part B) For engines not incorporating Part C, submit a two-CT blade sample for metallurgical evaluation at an overhaul facility at HSI (Ref. P&WC SB No. 1703).
- (Part C) Replacing the CT disk balancing assembly or replacing the compressor turbine blades with new ones and re-identify the CT disk balancing assembly.

E. Compliance

For CT Blade Trailing Edge Borescope inspection of (Part A):

CATEGORY 3 - P&WC recommends to Inspect in conjunction with each fuel nozzle inspection, to a maximum of 400 hrs.

NOTE: Accomplishment of the borescope inspection is recommended within 150 Hrs of issuance of this revision, if not conducted at previous nozzle inspection.

P&WC No. D9297J, D9297K, DCR5948, DCR5994, DCR6780, D9297R, DCR18946, E5427A, DCR21872, DCR22576, DCR23014

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1. Planning Information (Cont'd)

For engines at HSI (Part B):

CATEGORY 3 - P&WC recommends to submit a two-CT blade sample for metallurgical evaluation at an overhaul facility (Ref. P&WC SB No. 1703).

For CT blades replacement of (Part C):

CATEGORY 3 - P&WC recommends to do this service bulletin when the engine is disassembled and access is available to the necessary subassembly (i.e. module, accessories, components, or build groups). Do all spare subassemblies, but not to exceed 36 months from the date of issue of this revision.

F. Approval

D.O.T./D.A.A. approved.

G. Manpower

For CT blades borescope inspection:

Once you have access to the part, an estimate of 4.0 man-hours is required to include this service bulletin at maintenance.

For engines at HSI:

Once you have access to the part, an estimate of 4.0 man-hours is required to include this service bulletin at maintenance.

For CT blades replacement:

Once you have access to the part, an estimate of 8.0 man-hours is required to include this service bulletin at maintenance.

For Disk Balancing Assy-Compressor Turbine replacement:

Once you have access to the part, an estimate of 1.0 man-hours is required to include this service bulletin at maintenance.

H. Weight and Balance

None.

I. Electrical Load Data

Not changed.

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TURBOPROP ENGINE
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1. Planning Information (Cont'd)

J. Software Accomplishment Summary

Not applicable.

K. References

Illustrated Parts Catalog P/N 3043514 (PT6A-114, PT6A-114A, PT6A-135, PT6A-135A)
Maintenance Manual P/N 3043512 (PT6A-114, PT6A-114A, PT6A-135, PT6A-135A)
Overhaul Manual P/N 3021243 (PT6A-34, PT6A-34AG, PT6A-34B, PT6A-35, PT6A-36,
PT6A-114, PT6A-114A, PT6A-135, PT6A-135A)
P&WC S.B. No. 1703

L. Publications Affected

Illustrated Parts Catalog P/N 3043514 (PT6A-114, PT6A-114A, PT6A-135, PT6A-135A)

M. Interchangeability and Intermixability of Parts

Interchangeability - Refer to Para. 2.C.

Intermixability - Not intermixable, must be replaced as a complete set.

2. Material Information

A. Industry Support Information

Refer to Commercial Support Program Notification 1004551.

B. Material - Cost and Availability

You can get the procurable parts listed in Para. 2.C. from any Pratt & Whitney Canada Parts Distribution Center.

The estimated total cost of new parts needed to replace old parts is \$Quote (US, 2008).

The new parts are scheduled to be available in (June 2009).

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C. Material Necessary for Each Engine

The quantity of materials listed in this section is on a per Engine basis.

<u>New P/N</u>	<u>Keyword</u>	<u>Old P/N</u>	<u>Qty</u>	<u>Est. Unit List Price (\$US, 2008)</u>	<u>Instructions Disposition</u>
3072801-01	Disk Balancing Assy- Compressor Turbine	3045761-01	1	Quote	(A)(B)
3072791-01	. Blade-Turbine	3045741-01	58	Quote	(C)(D)
For post P&WC S.B. No. 1455 engines.					
3072801-01	Disk Balancing Assy- Compressor Turbine	3102421-01	1	Quote	(A)(B)
3072791-01	. Blade-Turbine	3039901	58	Quote	(C)(D)
For pre P&WC S.B. No. 1521 engines.					
3072801-01	Disk Balancing Assy- Compressor Turbine	3102421-01	1	Quote	(A)(B)
3072791-01	. Blade-Turbine	3102401-01	58	Quote	(C)(D)

- (A) RESTRICTED INTERCHANGEABILITY - (ATA 200 Explanation Code 07):
The old and the new part must be replaced by the new part.
- (B) To get the new part it is possible to make a modification to the old part, or you can get the new part from any Pratt & Whitney Canada Distribution Center.
- (C) INTERCHANGEABLE AS A SET - (ATA 200 Explanation Code 06):
When the replacement set is a single part number, the old and the new parts are interchangeable in complete sets only.
- (D) Subject to metallurgical evaluation, blades removed in compliance with Part B may be replaced with the same Part Number prior to incorporation of Part C.

D. Reidentified Parts

The following list of parts can be reworked:

<u>OLD P/N</u>	<u>NEW P/N</u>
3045761-01	3072801-01
3102421-01	3072801-01

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E. Tooling - Price and Availability

<u>Tool No.</u>	<u>Nomenclature</u>	<u>Est. Price</u> <u>(\$US.)</u>	<u>Delivery</u>
PWC71903	Blade Stretch	Quote	

3. Accomplishment Instructions

A. **For CT Blade Trailing Edge Borescope inspection of (Part A):**

NOTE: This inspection is not required if the blades have been replaced with Post-SB1669 blades in accordance with Part C.

- (1) Do the borescope inspection of the CT blades (Ref. MM 72-00-00. Table 601 Borescope inspection).
- (2) Write accomplishment of P&WC S.B. No. 1669 Part A in the applicable engine module log book.

TABLE 1, Compressor Turbine Blades Serial Numbers

Blade Position		Serial No.	Blade Position		Serial No.	Blade Position		Serial No.
1			21			41		
2			22			42		
3			23			43		
4			24			44		
5			25			45		
6			26			46		
7			27			47		
8			28			48		
9			29			49		
10			30			50		
11			31			51		
12			32			52		
13			33			53		
14			34			54		
15			35			55		

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COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

3. Accomplishment Instructions (Cont'd)

TABLE 1, Compressor Turbine Blades Serial Numbers (Cont'd)

Blade Position		Serial No.	Blade Position		Serial No.	Blade Position		Serial No.
16			36			56		
17			37			57		
18			38			58		
19			39					
20			40					
Engine Serial:								
C.T. Disk S/N:								
CT Blades P/N								

B. For engines at HSI (Part B):

NOTE: This inspection is not required if the blades have been replaced with Post-SB1669 blades in accordance with Part C.

- (1) Submit a two-CT blade sample for metallurgical evaluation at an overhaul facility (Ref. Pratt & Whitney Standard Practices Manual PN 585005) (Ref. P&WC SB No. 1703).
- (2) If the metallurgical evaluation is not acceptable, replace the complete set of CT blades with Post-SB1669 blades in accordance with Part C.
- (3) Write accomplishment of P&WC S.B. No. 1669 Part B in the applicable engine module log book.

C. For the CT blades replacement of (Part C):

- (1) Remove the CT Blades P/N 3039901 or P/N 3102401-01 or 3045741-01 and discard. Refer to the applicable maintenance or overhaul manual instructions.
- (2) For the Disk Balancing Assy-Compressor Turbine reidentify as follows:

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COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

3. Accomplishment Instructions (Cont'd)

CAUTION: MAKE SURE THAT THE REMAINING ELECTROLYTE (ETCH SOLUTION) IS FULLY NEUTRAL AFTER YOU WRITE ON THE PART. ELECTROLYTE CAN CAUSE CORROSION ON THE PART.

- (a) Put a line across the old part number. Use the electrolyte etch procedure, 0.002 in. (0.05 mm) deep maximum, and write the new part number in the same area.

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COMPRESSOR TURBINE BLADES - INSPECTION/REPLACEMENT OF

3. Accomplishment Instructions (Cont'd)

- (3) Implement conical grinding of the new CT blades per the applicable overhaul manual instructions with the differences that follows:
 - (a) Incorporate 0°43' taper (Ref Fig. 1).
 - (b) If necessary replace the segments to get the correct Fit and Clearance No. 318. Refer to the applicable maintenance or overhaul manual instructions.
- (4) Install the parts listed under New P/N in Para. 2.C., Material Information. Refer to the applicable maintenance or overhaul manual instructions.

NOTE: Record the CT Blades Serial Numbers (Ref. Table 1)

- (5) Write accomplishment of P&WC S.B. No. 1669 Part C in the applicable engine module log book.

D. **For Disk Balancing Assy-Compressor Turbine replacement:**

- (1) Remove the Disk Balancing Assy-Compressor Turbine in accordance with the Maintenance Manual or Overhaul Manual instructions.
- (2) Write accomplishment of P&WC S.B. No. 1669 Part C in the applicable engine module log book.

4. Appendix

A. Refer to the Fits and Clearances Fig. No 2.

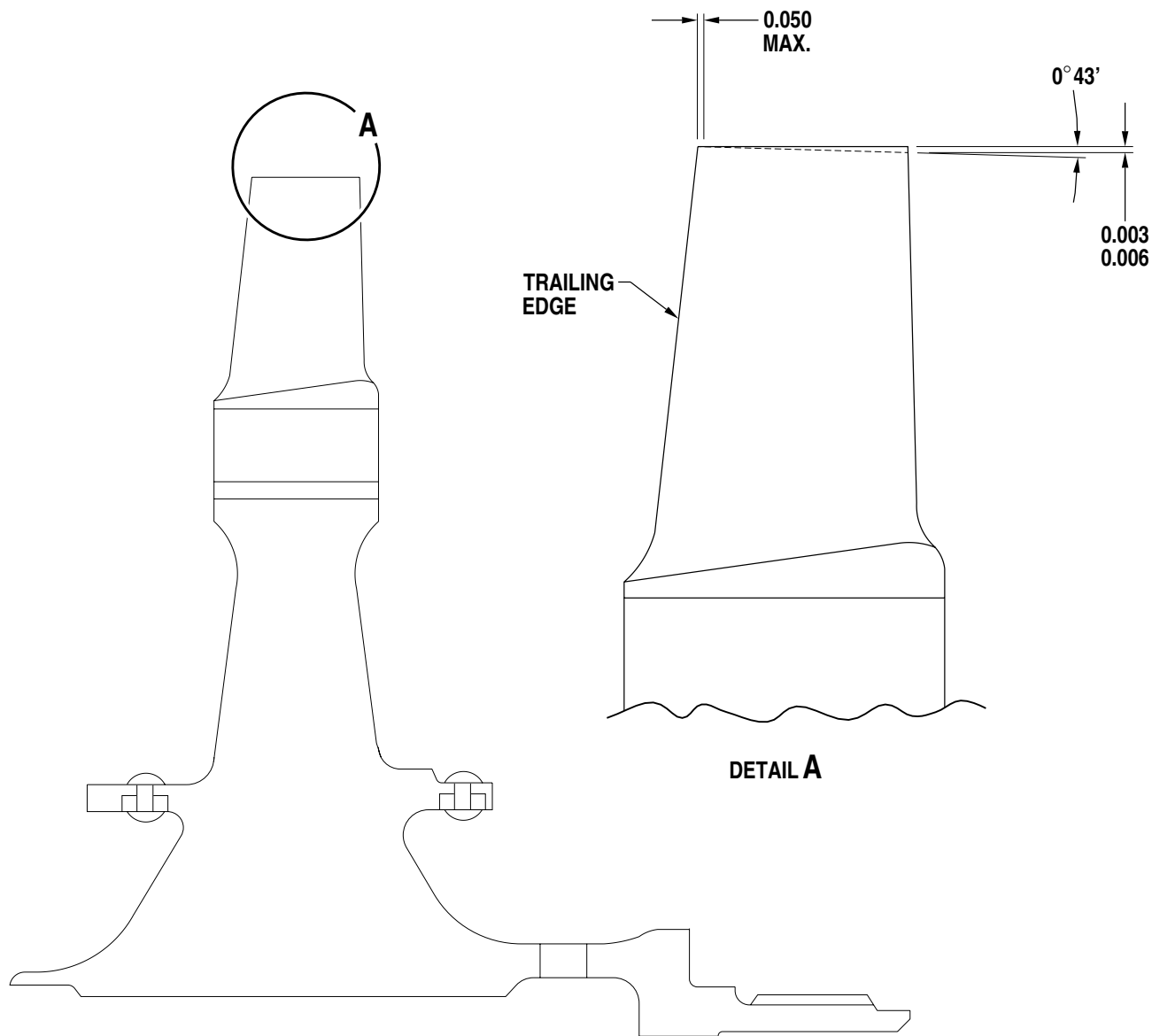
TABLE 2, CT Disk - Fits and Clearances No. 509

REF. NO.	IFR	Name	Dim. for Ref. inches (mm)		Limits inches (mm)		Replace
			Min.	Max.	Min.	Max.	
Post-SB1669							
509		Turbine Rotor Diameter (Green Run)			8.526 (216.56)	8.536 (216.81)	
509		Turbine Rotor Diameter (Overhaul)					8.496 (215.80)

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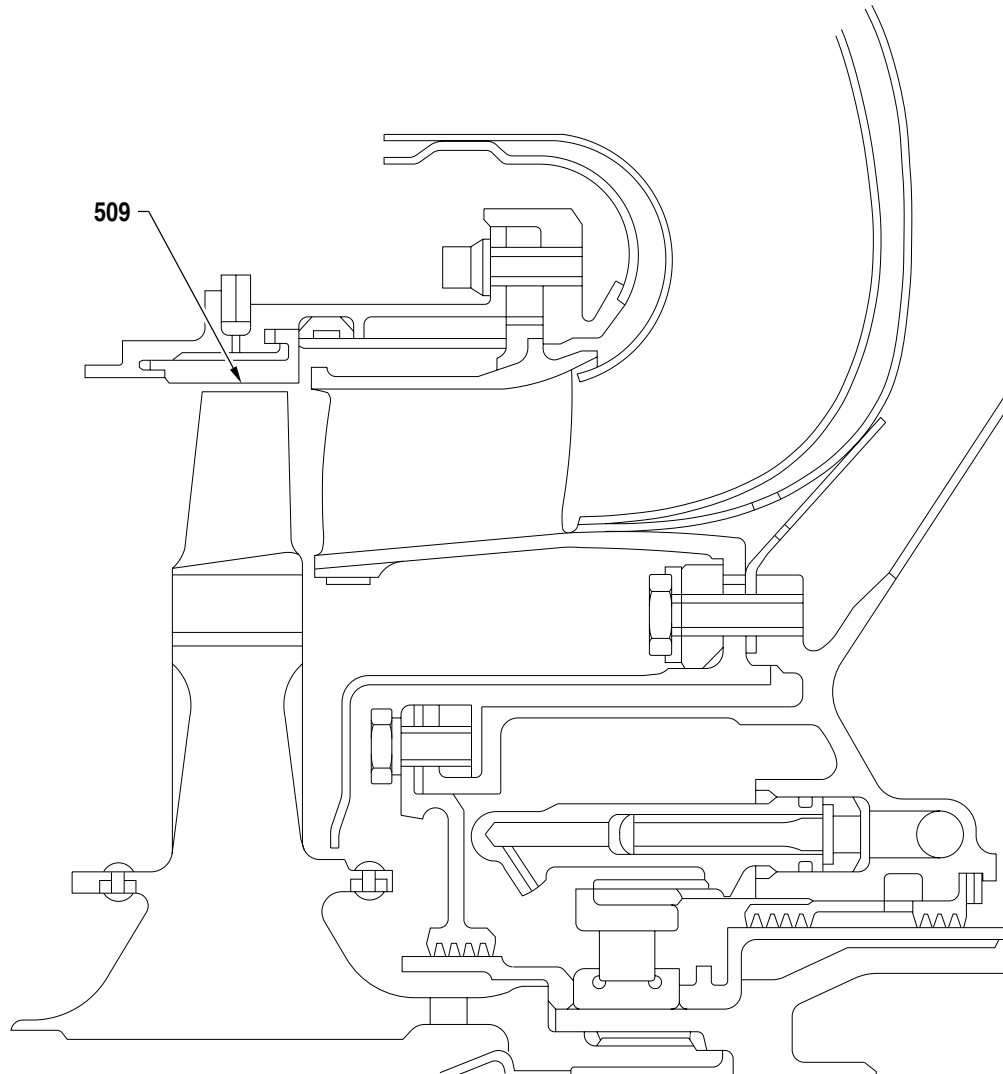
C145847

CT Blade Tip Grinding
Figure 1

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C145801

CT Disk - Fits and Clearances
Figure 2