

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ANC24LA064

EXAMINATION SUMMARY

December 3, 2024

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A. ACCIDENT

Location: Petersville, Alaska
Date: July 12, 2024
Time: 1700 Alaska daylight time
Aircraft: DeHavilland DHC-2T, N535KT

B. PARTICIPANTS

Investigator	Timothy Sorensen Aviation Accident Investigator National Transportation Safety Board Denver, Colorado
Party Representative	Jim Rosplock Engineer Woodward, Inc. Loves Park, Illinois
Participant	Nate Bogdonas Engineer Woodward, Inc. Loves Park, Illinois

C. ACCIDENT SUMMARY

On July 12, 2024, about 1700 Alaska daylight time, a turbine-powered DeHavilland DHC-2T (Beaver) airplane, N535KT sustained substantial damage when it was involved in an accident near Petersville, Alaska. The pilot and 8 passengers were not injured. The airplane was operated by the pilot as a Title 14 *Code of Federal Regulations* Part 135 air tour flight.

Examination and testing of the propeller governor was conducted on December 3, 2024, at Woodward (Loves Park, IL).

D. COMPONENT EXAMINATION SUMMARY

1.0 Propeller Governor

Woodward 8210-002-01 (s/n 1580340)

The propeller governor was received in a sealed carton. The housing appeared intact and undamaged. The drive shaft, speed setting shaft, and air bleed lever appeared undamaged and rotated freely using hand pressure. The levers (air

bleed and max speed), caps (relief valve and air bleed orifice), and max speed stop displayed a gold finish which appeared different from the manufacturer's parts. Similarly, installed lockwire, lockwire seals, and torque sealant were not from the manufacturer.

The data plate was denoted as Woodward which included the part and serial numbers. The revision noted was "New" and the assembly date was "01/2024". A repair station label was affixed to the housing which denoted "IGS" and "FAA IG0R976N/EASA".¹

The unit had a solenoid installed which provided a secondary beta valve pressure shutoff.

Bench testing was within specification except at two of the data points. First, the overspeed setting was 6 psi at 4,590 rpm. The maximum per the specification was 5 psi. Second, the underspeed setting was 6 psi at 3,983 rpm. The maximum per the specification was 4 psi.

The governor was not disassembled.

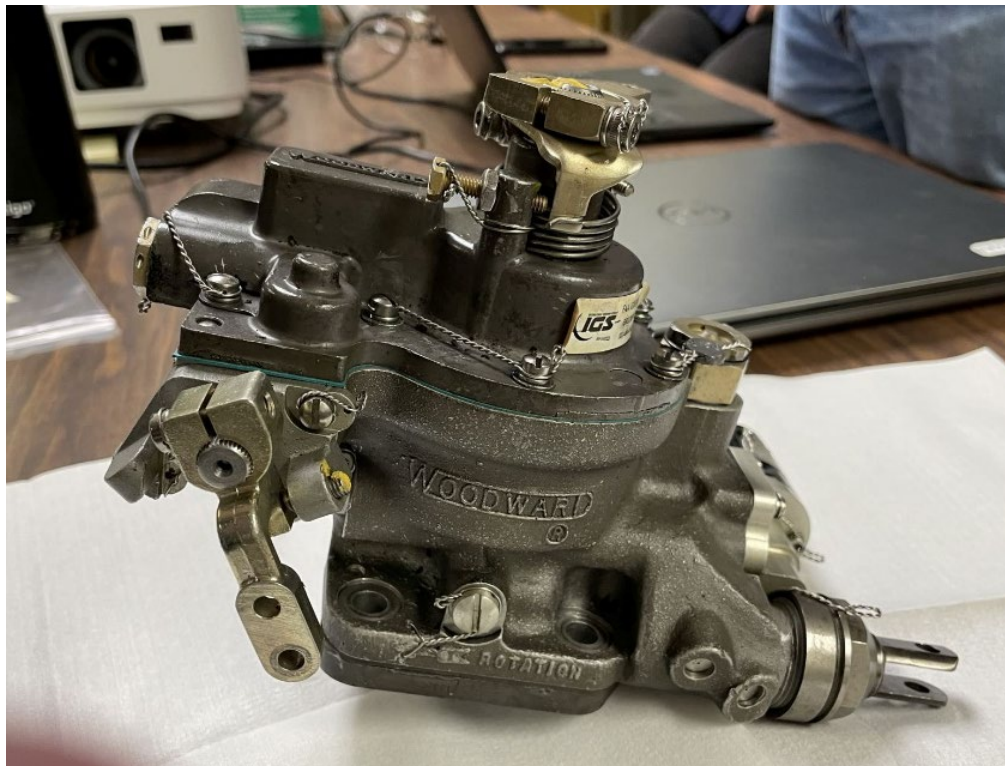


Figure 1 - Propeller Governor (As Received)

¹ Federal Aviation Administration certificate IG0R976N corresponds to International Governor Services, LLC, of Broomfield, Colorado.



Figure 2 - Propeller Governor (As Received)



Figure 3 -- Propeller Governor (As Received)

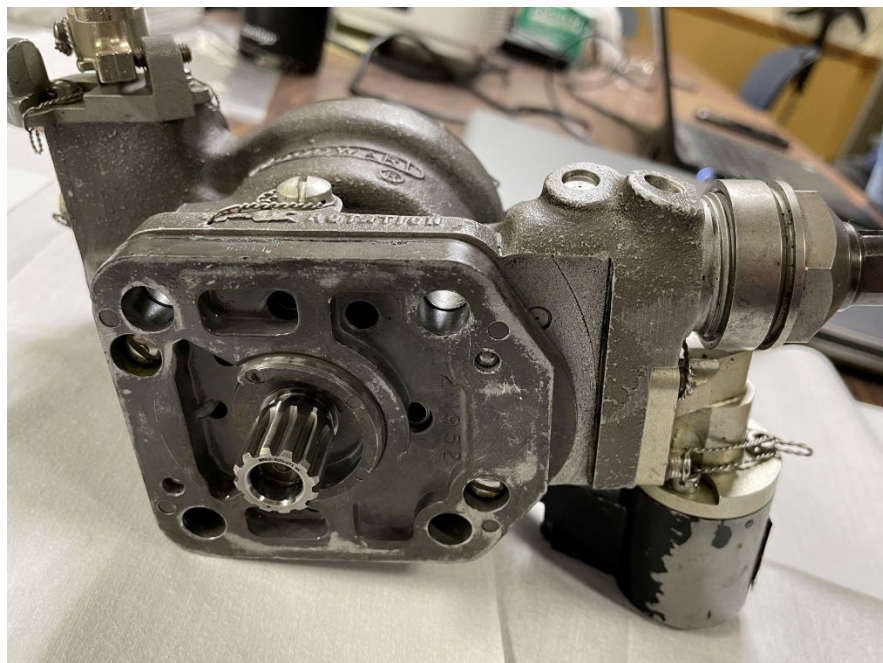


Figure 4 -- Propeller Governor (As Received)



Figure 5 -- Propeller Governor (Dataplate)

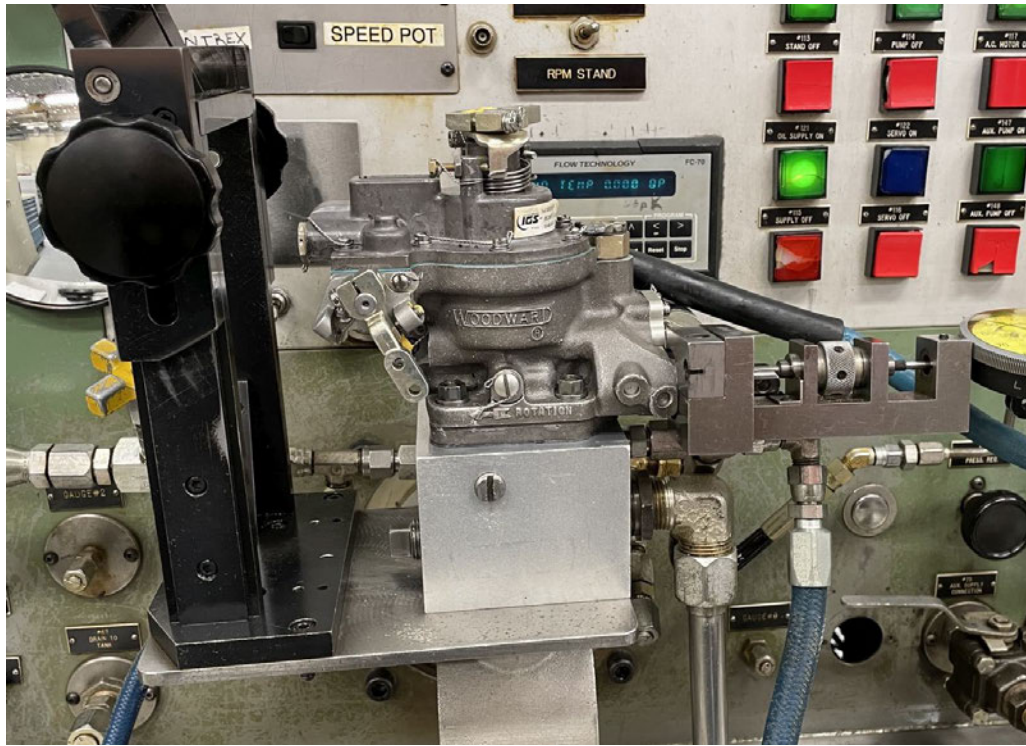


Figure 6 -- Propeller Governor (Installed on Test Bench)

WOODWARD GOVERNOR COMPANY
Rockford, Illinois
CAGE 66503

AS RECEIVED

TSP-810
Page 10
Rev. AH

TEST RECORD FOR TURBOPROP GOVERNOR WITH PNEUMATIC OVERSPEED LIMITER

Woodward I/N 8210-002 (P&WC P/N CPW 3035926) Woodward I/N 8210-002-01 (P&WC P/N CPW 3074154-01)
Woodward I/N 8210-003 (P&WC P/N CPW 3035927) Woodward I/N 8210-003-01 (P&WC P/N CPW 3074153-01)

Woodward I/N 8210-002-01 Woodward Serial No. 1580340 Sales Order No. N/A

Technician [REDACTED] Test Stand No. 119 Date 12/03/2024

1. Supply Pressure 40 PSIG. Limits: 40 +/- 5 PSIG (Mobil Jet II)
2. Relief Valve Pressure at 3000 +/- 10 RPM 395 PSIG. Limits: 385 +/- 10 PSIG
3. Speed Setting: Maximum Speed 4251 RPM. Limits: 4246 +/- 5 RPM
Control Lever Angle 212 deg. Limits: 210 +/- 2.5 deg.
4. Speed setting lever travel from 3200 to 4200 RPM 73 deg. Limits: 73 +/- 3 deg.
5. Feather Stop 93 deg. Limits: 92.5 +/- 2.5 deg. travel at 119 deg.
6. Feather 150 PSIG at 127 deg. lever angle (deg. under item 5 +8 deg.)
7. Pneumatic Control Valve:
Overspeed Setting: 6 PSID. Limits: 5 PSID at 4590 +/- 10 RPM
28 PSID. Limits: 21 PSID Min. at 4930 +/- 10 RPM
1 inches. Limits: 12 inches of water Max. 4246 +/- 10 RPM
Underspeed Reset Setting:
Test Point Only N/A PSID. Limits: 10 PSID Min. at 3983 +/- 10 RPM
with eccentric at lowest point.
Then Calibrate to 6 PSID. Limits: 4 PSID at 3983 +/- 10 RPM
7 inches. Limits: 12 inches of water Max. 3818 RPM
Leakage at Feather Stop 1 inches. Limits: 12 inches of water Max. 2000 +/- 10 RPM
8. Pump Capacity 4.2 qt./min. Limits: 5.5 qt./min. Min. at
150 +/- 5 PSIG & 3000 +/- 10 RPM
9. Internal Leakage 2.0 qt./min. Limits: 2.5 qt./min. Max.
10. Control Arm set at 212 deg. Limits: 210 +/- 2.5 deg.
11. Beta Valve travel from null: In .142 inch. Limits: 0.140 +/- 0.010 inch
Out .036 inch. Limits: 0.040 +/- 0.010 inch
12. Torque Check (on test stand, prior to removing) per Sections 3.1.
13. Solenoid Valve Check Serial Number 6662939 (8240-003-Only)
10 50 PSIG Max. at 100 RPM below governor setting
✓ (Zero pressure at 100 RPM above governor setting)
✓ (Zero flow when solenoid energized)
14. Check for external leaks NONE

Retain one copy for permanent record.

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Figure 7 -- Bench Test Record



ENGINEERING INVESTIGATION REPORT

EIR PT6A 2024-116

INVESTIGATION TOPIC: PROPELLER STRIKE

Engine S/N:	RB0388	Engine Model:	PT6A-34
A/C Tail No.	N535KT	A/C Pos.	Nose
Customer:	RUST'S FLYING SERVICE, INC.	Work Order:	44-45257 GG 44-45258 PS

GAS GENERATOR SECTION RB0388:

TSN:	25473.70	TSO:	1193.90	TSR:	N/A	TSHSI:	N/A
CSN:	26257	CSO:	832	CSR:	N/A	CSHSI:	N/A

POWER SECTION RB0388:

TSN:	25473.70	TSO:	1193.90	TSR:	N/A
CSN:	26257	CSO:	832	CSR:	N/A

BACKGROUND INFORMATION:

Engine PT6A-34 S/N RB0388 was removed from the aircraft (N535KT; DHC-2 MKIII) for repair. It was reported that: "The aircraft's propeller became uncontrollable in flight over mountainous terrain. Aircraft was not able to maintain altitude and descended into thick vegetation on mountain side".

Prepared By: [REDACTED]
Technical Support Engineer

Approved By: [REDACTED]
Manager of Technical Support

Signature:

[REDACTED]

[REDACTED]

RECORD OF REVISIONS:

Revision 0 - Original Issue.

SUMMARY OF FINDINGS:

The engine was completely disassembled. There was no buckling damage on the gas generator case and the exhaust duct. The GG case was found with one fractured bolt at one of the engine mounting pads. The exhaust duct was found with a bent exhaust port flange on the right side of the engine. The power turbine shroud housing and the power turbine disk assembly were found with blade tip and path rub.

The engine was received with no propeller governor. There were no fractured flanges on the engine accessories.

ACTIONS TAKEN:

1. The engine was completely disassembled in accordance with the sudden stoppage workscope in the light overhaul section of the P&WC Overhaul Manual.
2. PWC was contacted for workscope due to the nature of the incident.
3. PWC provided a combined workscope of sudden stoppage and hard landing for the engine repair.

PREVIOUS MAINTENANCE ACTIVITY S/N RB0388

Module	Date	Location	TSN	CSN	Work Scope
GGs & PS	2021-12-21	SAL, PE	4680.70	5756.0	O/H

TEARDOWN FINDINGS AND OBSERVATIONS:

Engine: The engine was involved in an incident where the aircraft landed on a hillside in a thick vegetation. See photographs #1 and #2.

General External Appearance: No buckling damage was found on the GG case and the exhaust duct. The GG case was found with one fractured bolt at one of the engine mounting pads. The exhaust duct was found with a bent exhaust port flange on the right side of the engine. See photographs #3 to #9.

Power Turbine Disk
And PT Shroud Housing: Blade tip and blade path rub. See photographs #10 and #11.

DISCUSSION AND CONCLUSIONS:

StandardAero found damage consistent with the reported incident. The exhaust duct was found with distortion on the exhaust port flange. The gas generator case had a fractured bolt in a mounting pad. There was no buckling damage found on both, gas generator and exhaust cases. The power turbine shroud housing and the power turbine disk assembly were found with heavy blade tip/path rub.

The cause of the propeller “becoming uncontrollable” was not obvious and could not be determined.

The engine serviceable condition can be restored thru the PWC’s provided combined workscope of sudden stoppage and hard landing, listed in the light overhaul section of the P&WC’s engine Overhaul Manual.

The repair will also include a test cell run to ensure the engine is operating properly.

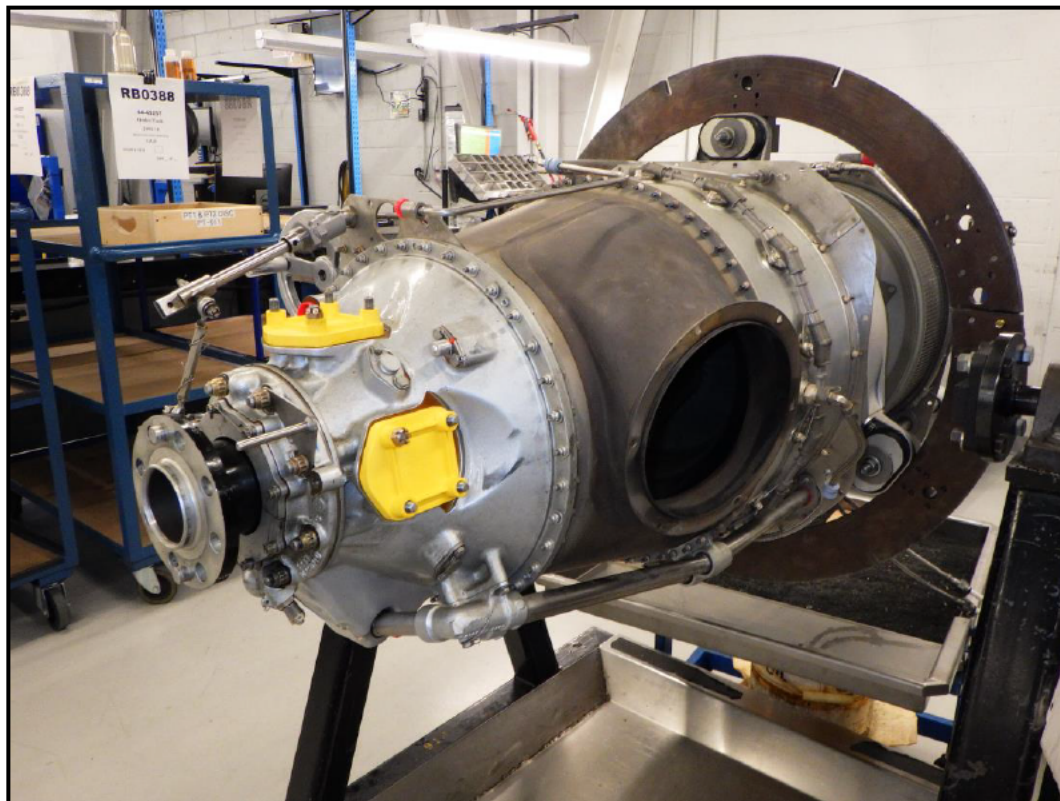
Photograph #1: Operator supplied photo.



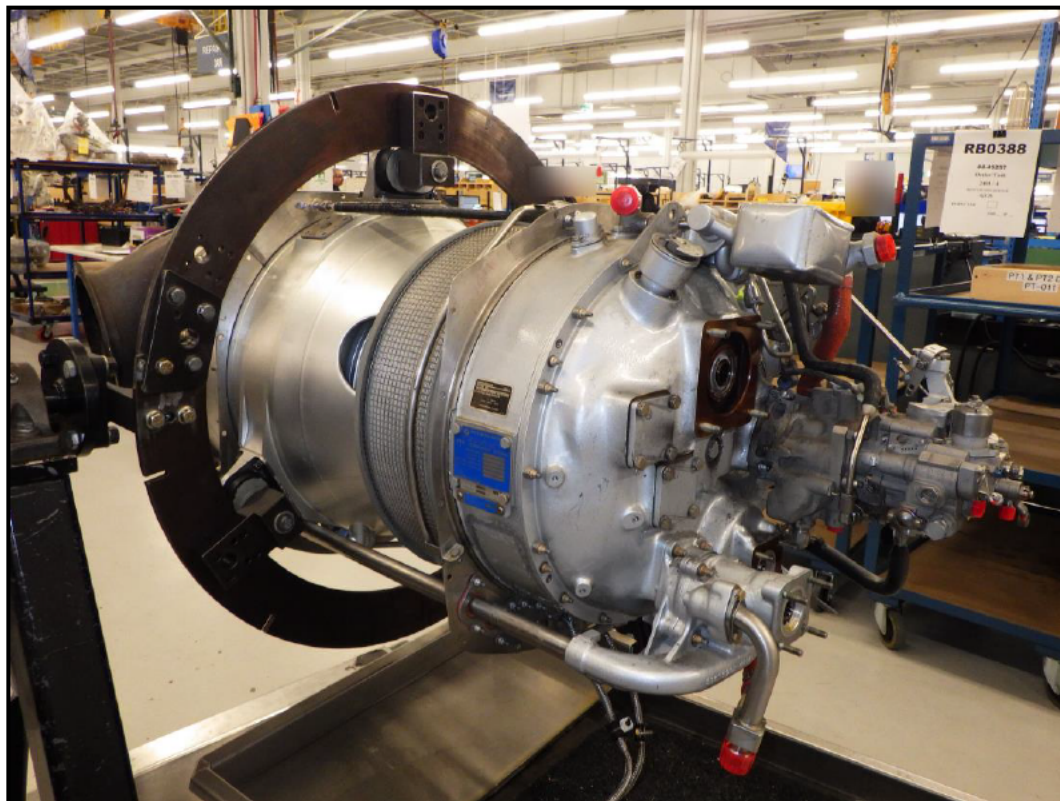
Photograph #2: Operator supplied photo



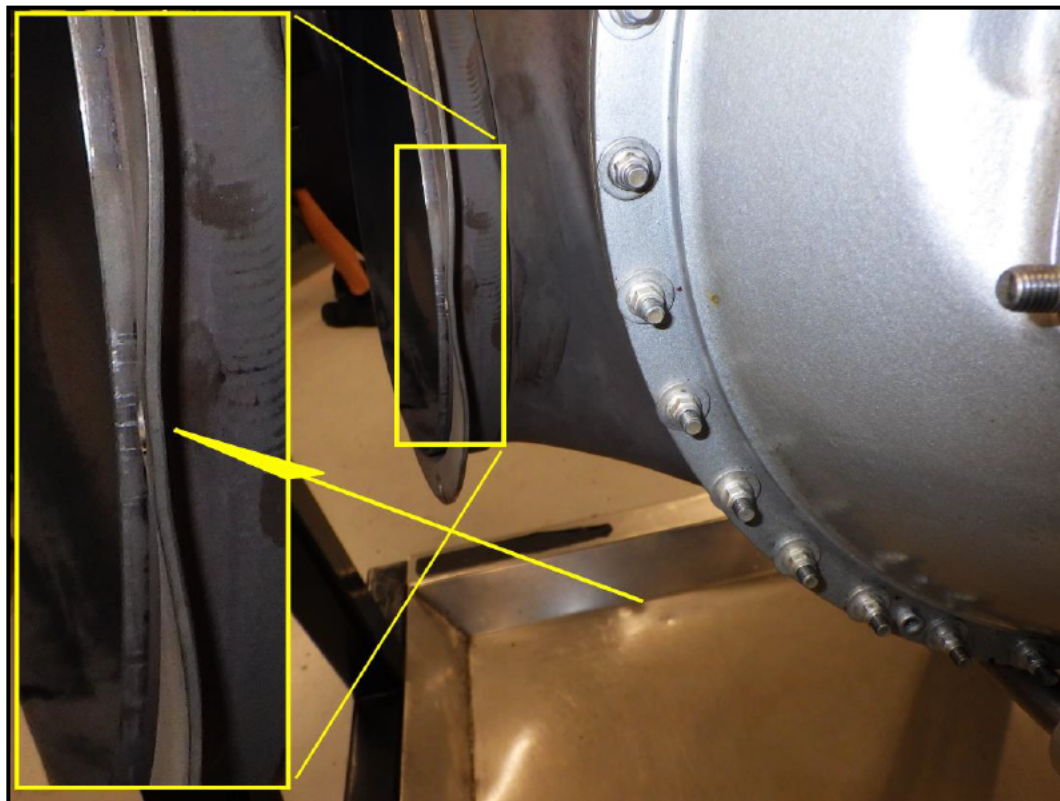
Photograph #3: Engine front left side view (at receiving).



Photograph #4: Engine rear left side view (at receiving).



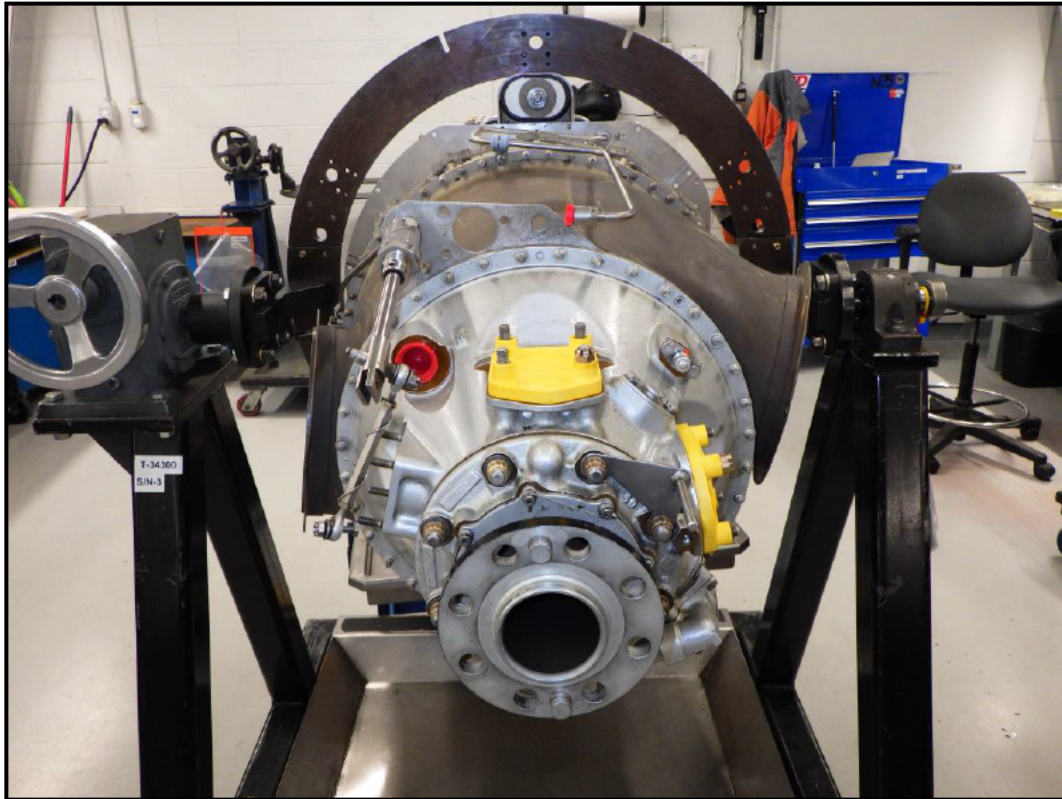
Photograph #5: Engine front right side view (at receiving) bent exhaust flange



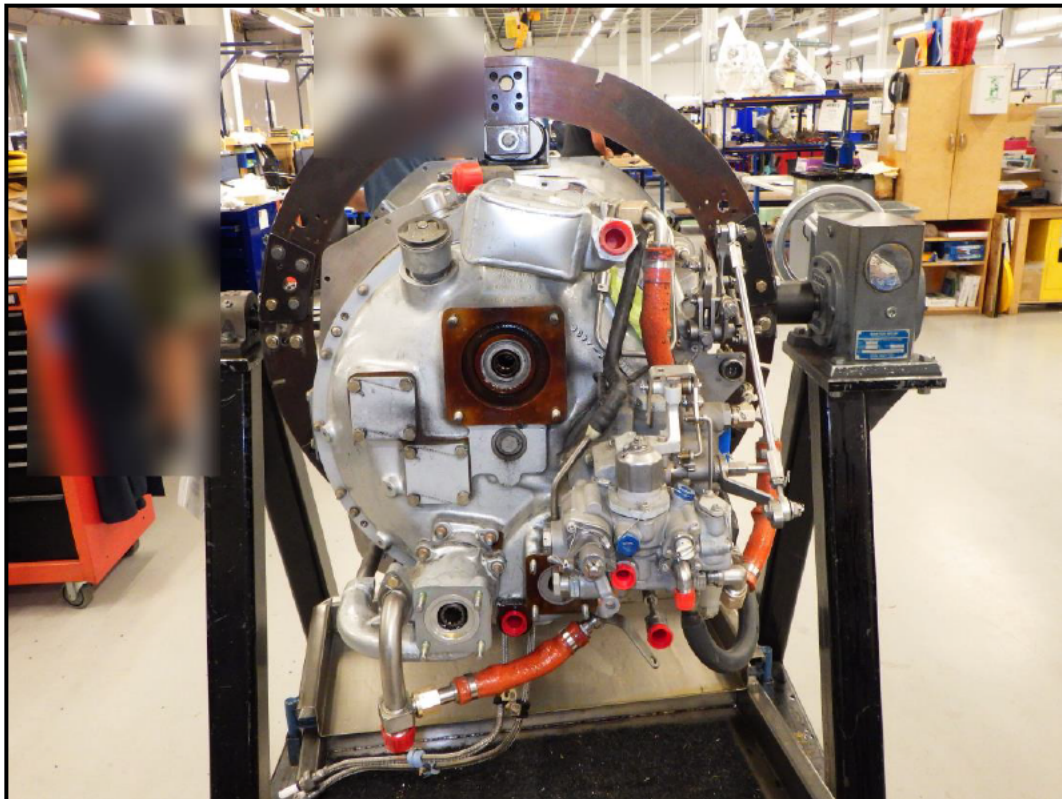
Photograph #6: Engine rear right side view (at receiving).



Photograph #7: Engine front side.



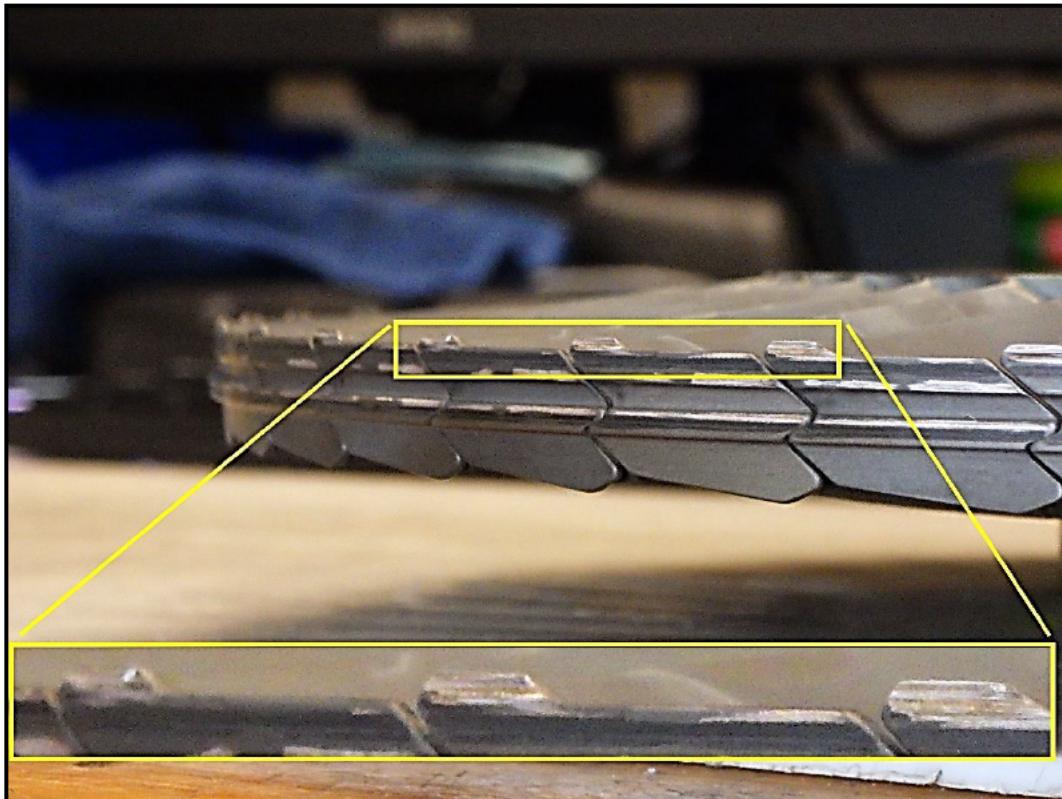
Photograph #8: Engine rear side.



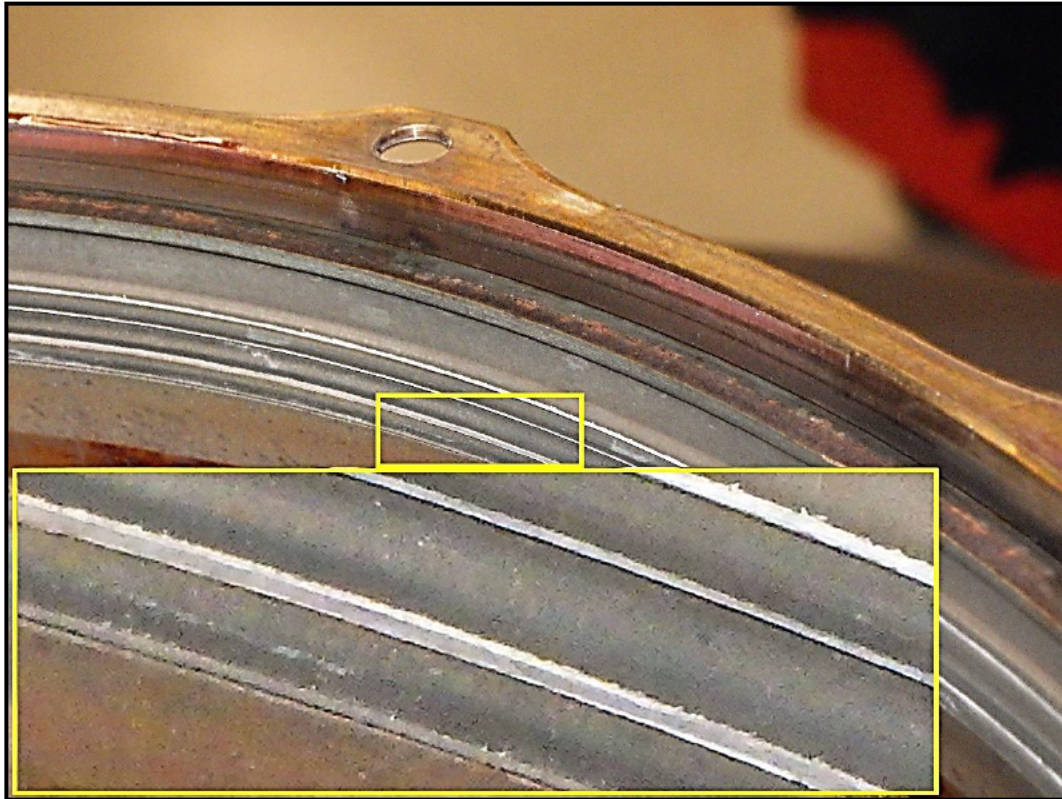
Photograph #9: GG case with a fractured mounting pad bolt.



Photograph #10: PT disk blade tip damage.



Photograph #11: PT shroud housing damage. Blade path's knife edge rubs.



TEST RECORD FOR TURBO-PROP OVERSPEED GOVERNORS
(See WGC and Customer Chart for applicable governors)

1. Max. Speed (Section 2.2.1) (Test Schematic valve positions 2 open, 1,3,4, 5,6 closed)
 - a) Set point RPM at flow (*) at 150 +/- 10 PSI inlet. (Application information column on applicable drawing) 4390 +/- 10 10 gpm *RECORD RPM 4403 rpm
2. Reset, Min. Speed. (Section 2.2.2) (Test Schematic valve positions 2 open, 1,3,4,5,6 closed)
 - a. Energize reset solenoid valve with 18 +/- 1 VDC, increase or decrease speed to obtain flow (*) at 150 +/- 10 PSI inlet pressure. 2970 +/- 40 7 gpm *RECORD RPM 2965 rpm
3. Internal leakage. (Section 2.2.3) (Test Schematic valve positions 2 open, 1,3,4,5,6 closed)
 - a. Set RPM to that specified. (Application information column on applicable drawing). With inlet pressure at 60 +/- 5 PSI, internal leak should be no more than (*).
4200 +/- 10 2.33 gpm Max. *RECORD FLOW 2.20 gpm
4. Feather Solenoid Check. (Section 2.2.4) (Test Schematic valve positions 2,4,5,6 open, 1,3, closed)
 - a. With stand speed at zero, energize feather solenoid with 22 +/- 1 VDC, increase or decrease inlet pressure to obtain the Delta P specified in Section 2.2.4. Flow should be as specified in Section 2.2.4.
RECORD FLOW N/A
 - b. Feather leak check. (Section 2.2.4.3) (Test Schematic valve positions 2,4,5, open, 1,3,6 closed)
Reduce voltage to .750 + 0-.1 with no undershoot. If flow is more than 2 QPM reject valve.
RECORD FLOW N/A
5. Magnetic Pick-up Voltage. (Section 2.2.5) (Test Schematic valve positions 2, open, 1,3,4,5,6 closed)
 - a. Set stand speed to 3200 +/- 10 RPM, magnetic Pick-up output voltage should be (*).
*RECORD VOLTAGE N/A
 - b. Magnetic pick-up indicated RPM. Set stand speed to 3200 +/- 10 RPM. Indicated RPM should be as specified in Section 2.2.5.1.2.
RECORD RPM N/A
6. External Unfeather Adapter. (Section 2.2.6.1 & 2.2.6.2)
(Test Schematic valve positions 1,3 open, 2,4, 5,6 closed)
 - a. Supply oil to the external connection at 200 +/- 10 PSI. Flow must be 4 QPM Min.
RECORD FLOW N/A
 - b. Unfeather Adapter leak check. (Test Schematic valve positions 2 open, 1,3,4,5,6 closed)
With oil inlet pressure at 150 +/- 10 PSI. Leakage past the check valve shall not exceed 1 ounce per minute, Max.
RECORD LEAKAGE N/A

7. External Leakage Check. (Section 2.2.7) (Test Schematic valve positions 2, open, 1,3,4,5,6 closed)

NONE ALLOWED NONE

8. Torque Check. (Section 2.3)

9. Woodward I/N 210428 S/N 1149397

Reset Solenoid P/N 1310-105 S/N WWC99031

Feather solenoid P/N N/A S/N N/A

Technician's name and date [REDACTED] 03/04/2025

Sales Order No. 4000791

RETAIN ONE COPY FOR PERMANENT RECORD

(*) As specified on the applicable assy drawing.

From: [REDACTED]
Subject: Re: Beaver DHC-2 Mk.3, N535KT, Tokositna Glacier, AK. 13 July 2024
Date: Thursday, October 2, 2025 11:53:04 AM
Attachments: [image001.png](#)
[image002.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)
[image009.png](#)
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[image011.png](#)
[image012.png](#)
[image013.png](#)
[image014.png](#)
[image015.png](#)

Understood Dennis.

The measurement noted in our lab report states an approximate total length of 4.8 inches and 4.6 inches minus the chamfered end, so it's pretty close to nominal.

We're unlikely to determine how or why the cam rod has a chamfered end and am also not confident that the cam rod and prop being jammed up occurred before ground impact. I think it's more likely that it occurred during and as a result of the impact sequence but unfortunately that still doesn't explain why there was a loss of blade pitch control.

Mark.

I think we're in the category of undermined at this point and don't see any other obvious paths to pursue so what's the next step going forward.

Tom

Thomas Driscoll

Aerospace Engineer – Powerplants
National Transportation Safety Board
Office of Aviation Safety | 490 L'Enfant Plaza [REDACTED]
[REDACTED]

From: Dennis [REDACTED]
Sent: Thursday, October 2, 2025 9:49 AM
To: Thomas [REDACTED]
Cc: Mark [REDACTED]
Subject: RE: Beaver DHC-2 Mk.3, N535KT, Tokositna Glacier, AK. 13 July 2024

[CAUTION] This email originated from outside of the organization. Do not click any links or open attachments unless you recognize the sender and know the content is safe.

Hi Tom

Apologies for the delay.

Attached is the cam rod drawing.
You will see the dimension references.
Please treat it as confidential and do not distribute.

Let me know if you have any questions.

Regards

[Redacted]

NOTE: De Havilland Canada amalgamation is effective August 1, 2024. Click [here](#) for information for our suppliers and customers.
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From: Dennis [Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]

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[Redacted]

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[Redacted]

[Redacted]

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in

Appears to be a length of 3 13/16" from the nut to the end, and a total length of 4 5/8".
The end of rod has a 45 degree face; these measurements are to the 'bottom end' of that face.

[Redacted]

From: [Redacted]
Sent: Monday, June 2, 2025 10:57 AM

[Redacted]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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