



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 19, 2021

Maintenance Records – Factual

NTSB No: CEN20FA022

A. ACCIDENT

Location: Chamberlain, South Dakota
Date: November 30, 2019
Time: 12:30 Central Standard Time
Aircraft: Pilatus PC-12/47E N56KJ

B. MAINTENANCE RECORDS

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National Transportation Safety Board
Washington, D.C.

C. SUMMARY

On November 30, 2019, about 1230 central standard time, a Pilatus PC-12/47E airplane, N56KJ, was destroyed during an impact with terrain near the Chamberlain Municipal Airport, (9V9), Chamberlain South Dakota. The pilot and 8 passengers were fatally injured. Three passengers sustained serious injuries. The airplane was registered to Conrad & Bischoff, Inc. and operated by the pilot as a Title 14 Code of Federal Regulations Part 91 personal flight. Instrument meteorological conditions prevailed, and the flight was operated on an instrument flight rules flight plan. The flight originated from 9V9 shortly before the accident and was destined for Idaho Regional Airport (IDA), Idaho Falls, Idaho.

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LIST OF ACRONYMS

AD	AIRWORTHINESS DIRECTIVE
ADAHRS	AIR DATA ATTITUDE HEADING REFERENCE SYSTEM
AGB	ACCESSORY GEAR BOX
AMM	AIRCRAFT MAINTENANCE MANUAL
CFR	CODE OF FEDERAL REGULATION
ELT	EMERGENCY LOCATOR TRANSMITTER
EMM	ENGINE MAINTENANCE MANUAL
ESIS	ELECTRONIC STANDBY INSTRUMENT SYSTEM
FAA	FEDERAL AVIATION ADMINISTRATION
FCS	FUEL CONTROL SHUTOFF
FWD	FORWARD
GCU	GENERATOR CONTROL UNIT
MAC	MEAN AERODYNAMIC CHORD
MLG	MAIN LANDING GEAR
No.	NUMBER
O2	OXYGEN
PN	PART NUMBER
PSI	POUNDS PER SQUARE INCH
REV	REVISION
RGB	REDUCTION GEAR BOX
SDR	SERVICE DIFFICULTY REPORT
SN	SERIAL NUMBER
TC	TYPE CERTIFICATE

D. DETAILS OF THE INVESTIGATION

1.0 Aircraft Information

Pilatus Aircraft Ltd. manufactured the airplane, model PC-12/47E, serial number 1431 and an Export Certificate of Airworthiness was issued on September 16, 2013. FAA issued a Standard Certificate of Airworthiness on September 27, 2013. The registered owner of the airplane is listed as Conrad & Bischoff, Inc.

According to the most recent aircraft maintenance logbook entry dated November 14, 2019, the airplane had 1,725.0 total hours and 1,219 total cycles.

The airplane was equipped with a Pratt & Whitney Canada PT6A-67P engine and a Hartzell Propeller. The engine and propeller had accumulated the following operating times as of November 14, 2019, the most recent logbook entry:

Table 1 - Engine and Propeller Information

	Engine
Manufacturer	P&W Canada
Model Number	PT6A-67P
Serial Number	PCE-RY0454
Date Manufactured	June 24, 2013
Time Since New	1,725.0
Cycles Since New	1,219
	Propeller
Manufacturer	Hartzell
Model Number	HC-E4A-3D/E10477SK
Serial Number	KX1163
Time Since New	1,911.6
Date of Overhaul	August 23, 2019
Date Installed	November 14, 2019
Time Since Overhaul	0 ¹

2.0 Type Certificate Data Sheet

The Type Certificate Data Sheet (A78EU) prescribes conditions and limitations under which the product for which the Type Certificate (TC) was issued meets the airworthiness requirements of the Federal Aviation Regulations. According to the document, Pilatus Aircraft Ltd is the holder of the TC.

3.0 Maintenance

The owner, Conrad & Bischoff, Inc. is responsible for all maintenance, preventive maintenance, rebuilding, and alteration of the aircraft, airframe, aircraft engines, appliances, and component parts of such aircraft in accordance with 14 CFR Parts 43 and 91. This includes all life-limited parts that are removed from a type certificated product, segregated and controlled as defined in 14 CFR §43.10. The aircraft, engine, propeller and components must be maintained in accordance with manufacturer instructions.

The Pilatus PC-12/47E Aircraft Maintenance Manual (AMM) chapters 4 and 5 contain the maintenance intervals for each airworthiness limitation item, 100-hour inspection, annual inspection, supplemental structural inspections and progressive inspection requirements.

¹ Most recent logbook entry is dated November 14, 2019 when propeller was installed.

The following is the most recent routine maintenance inspections and tasks accomplished on airplane N56KJ on November 14, 2019. Maintenance was performed by Western Aircraft Inc., located in Boise, Idaho. Aircraft total time 1,725.0 hours and total cycles 1,219 at the time of the maintenance.

Completed 300 hour, 12 month/300 hour, 12 month/600 hour, 12 month/1,200 hour airframe and engine periodic inspections: reference Pilatus PC-12/47E document No. 02300 Rev No. 21, dated May 17, 2019, AMM 12-B-05-10-20-00A-281A-A, and Pratt & Whitney Canada Model PT6A-67B/P Maintenance Manual, part No. 3038336, Rev. 49, dated April 8, 2019, EMM 72-00-00, table 601 (periodic, minor, routine inspection items).

Table 2 lists the AMM chapter 4 and 5 items addressed at the November 14, 2019 maintenance visit.

Table 2 - Maintenance Tasks Completed

TASK
6 Month airfoil de-icer surface treatment application of Age Master No.1.
12 Month internal corrosion preventative inspection & reapplication.
12 Month external corrosion prevention inspection & reapplication.
12 Month main landing gear shock strut top & bottom attachment bolt & nut inspection.
12 Month emergency power supply capacity check.
12 Month landing gear wheel bearing lubrication
12 Month cockpit portable fire extinguisher inspection and contents check.
12 Month Western Aircraft Inc. recommended landing gear shock strut hydraulic and nitrogen service check.
12 Month vapor cycle compressor condenser module cleaning.
12 Month/300 hour engine linkage examination.
12 Month/300 hour magnetic chip detector(s) continuity check.
12 Month/400 hour propeller inspection.
12 Month/400 hour propeller lubrication.
12 Month/600 hour Bridge of RGB & AGB chip detector inspection.
12 Mont/600 hour forward lead acid battery service and capacity check.
12 Month/600 hour aft lead acid battery service and capacity check.
12 Month/1,000 hour autopilot servo mount clutch check
12 Month/1,200 hour ELT inspection SN: 2621312-0018
12 Month/2,400 hour main landing gear axles and bushing inspections
12 Month/3,000 hour propeller feathering micro-switches function test.
12 Month/3,000 hour horizontal stabilizer trim runaway aural warning system functional test.

Table 2 - Maintenance Tasks (cont.)

12 Month/3,000 hour pressurization dump switch operational test.
12 Month/3,000 hour FCS emergency shut off lever pull force check.
12 Month/3,000 hour GCU No.1 and No.2 over and under-voltage trip protection functional test.
24 Month/3,000 hour cabin positive pressure relief functional test.
24 Month/3,000 hour pressurization safety valve cleaning.
24 Month ESIS system check swing (if installed).
24 Month standby magnetic compass swing check.
6 Year MLG actuator top & bottom attach bolts & nuts inspection.
6 Year MLG leg forward attachment bolt and rear attachment bolt & nut inspection.
6 Year/4,000 hour propeller overhaul.
6 Year/6,000 hour “mild/moderate/severe corrosive environment” wing internal inspection and flap compartment inspection.
300 hour P3 air filter cleaning.
300 hour oil filter inspection.
400 hour operational test of the passenger oxygen system.
400 hour inspection of ignition system, exciter, cables and ignitors.
600 hour heat exchanger matrix inspection.
600 hour fuel pump inlet screen cleaning.
900 hour P3 air filter replacement.
900 hour engine oil filter element replacement.

In addition to the routine maintenance and inspections tasks, discrepancies (non-routine items) were generated and corrected at this visit. The following items were noted:

- Adjusted flight idle to within limits, reference AMM 12-B-71-00-00-00A-903P-A.
- Adjusted torque limiter down to within limits, reference AMM 12-B-71-00-00-00A-903G-A.
- Replaced two each, ignitors with new, part number CH34055, reference EMM 74-20-00.
- Installed overhauled propeller PN HC-E4A-3D, SN KX1163 reference AMM 12-B-61-10-01-00A-920. Balanced to 0.14 IPS. The propeller was overhauled by Precision Propeller Service. According to the 8130-3 form dated August 23, 2019 the propeller was overhauled in accordance with Hartzell manual 143A-R21, 133C-R38, and 202A. Complied with service bulletins 136-R1, 276-R6, 346-R2, 374-R1, service letters 160, 187-R3, 217, 267, 282-R1, 348, and 354. Blade model E10477SK, Blade S/N’s installed, L32048, L32049, L32054, L32059.
- Pitot 1 heat amber advisory immediately comes on as soon as switch is turned on. Found loose left-hand pitot electrical connection. Reseated connector and operational check pitot heat operation, ref AMM 12-B-30-30-20-00A-903A-A.

- Service O2 system.
- Left and right-hand fuel caps O-ring replaced due to cracking.
- Engine prop shaft seal replaced due to leaks.
- Stick pusher computer failure. Installed repaired stick pusher computer PN 975.44.23.104, SN8546 ref AMM 12-B-22-20-01-00A-920A-A.
- Left main landing gear actuator lower attach bolt corroded, replaced.
- Adjusted rudder cable tension ref AMM12-B-27-20-00-00A-903A-A.
- Transponders No.1 and No.2 removed for upgrade. Installed PN 066-01198-0102 SN M2074 in position No.1 and SN M2077 in position No.2. Tests required by 14 CFR 91.413 completed successfully.

The logbook was reviewed prior to November 2019 and the following entries are noted.

- October 10, 2018 – Pitch Servo Actuator, PN 065-00190-0101 SN KSA2700-1326 removed and replaced with SN KSA2700-1988 IAW with AMM 12-B-22-10-02-00A-920A-A.
- September 21, 2018 – Replaced elevator autopilot servo actuator. PN 065-00190-010 SN KSA2700-1326, reference AMM 12-B-22-10-00-00A-920A-A.
- July 2, 2018 – Nose landing gear shimmy. Replaced shimmy damper assembly PN 532.20.12.215 SN IL-256, flanged bushing, pin, and D-ring on the nose landing gear.
- November 10, 2017 – Replaced No.1, No.9, and No.12 engine fuel nozzle assemblies, ref. EMM 73-11-05. Replaced leaking landing gear position selector valve PN 960.30.01.274 SN 1132C installed. SN 1227 was removed.
- November 9, 2017 – Troubleshoot Yaw Damper message. Replaced ADAHRS unit per AMM 12-B-34-25-00-00A-903A-A.
- May 25, 2017 – Replaced left hand exhaust stack de-ice lip tube. Replaced by JC Associates, exhaust stack reinstalled, ref. AMM 12-B-78-10-01-00A-920A-A. Replaced forward and aft batteries (PN RG380E-44, FWD SN 40861964, AFT SN 40592084 installed). Generator one and two have frayed wires. Replaced generator PN23085-301, No1. SN 2017 and No.2 SN P1275 installed. Left ignitor and ignitor lead replaced. AD 2016-26-08 MLG bolt inspections complied with this visit.

4.0 Airworthiness Directive (AD)²

Logbooks and work order records for the airplane, including appliances, engine and propeller were reviewed. No discrepancies were found during the review. All AD's were either completed or not due at the time of the accident. The following AD's are noted:

- AD 2016-26-08 MLG Bolt inspection - 6 year forward and rear leg attach bolt and nut inspection.
- AD 2016-18-05 To detect and correct material separation on the internal surface of the engine mounting frame. Not due until 11,000 flight hours or 13,500 flight cycles.

² Airworthiness Directive (AD) is a regulatory notice sent out by the FAA informing the operator of an action that must be taken for the aircraft to maintain its airworthiness status.

- AD 2016-12-01 Identify and correct incorrectly installed Torlon plates in the wing to fuselage attachments.
- AD 2015-14-10 Aileron tab counter-balance weight.
- AD 2001-25-10 Flap system actuator backlash inspection.
- AD 2014-22-01 Incorporate AMM chapter 4-time limitations revision.

5.0 Service Difficulty Reports (SDR)³

A query of the FAA SDR data base was conducted for N56KJ from January 1, 2014 to November 30, 2019. There were no SDR found on file for the accident aircraft. While not required for general aviation, reporting a service difficulty is recommended by the FAA.

6.0 Weight and Balance Summary

The aircraft was weighed November 14, 2013 after the eight passenger seat installation, the installation of the passenger entertainment system with XM radio and the passenger door stairway lighting system installation. The figures from the weigh are shown below which include unusable fuel (14.9 kg):

Basic Empty Weight:	6,682.03 lb
Arm:	234.60 in
Moment:	1,567,604.15 lb-in
%MAC	33.56 %MAC

7.0 Major Alterations and Major Repairs

A review of the FAA Airworthiness file for major repairs and major alterations was conducted. There were no major repairs on file for the accident airplane. The following major alterations were reviewed.

- November 14, 2013 - Installation of Passenger Door Stairway Lighting System.
- November 14, 2013 - Installation of Flight Display Cabin Entertainment System with XM Radio and Moving Map, reference STC SA00737DE.
- October 22, 2013 - Installation of Reading Light Power, Relay Panel Wiring, Cabin Entertainment, Flight Display.

8.0 Time Limited Components

A review of the maintenance records for time limited components for the airplane, the powerplant, and the propeller was completed. No discrepancies were noted.

³ A Service Difficulty Report (SDR) is a report of the occurrence or detection of each failure, malfunctions, or defects.

9.0 Method of Record Keeping

Per CFR parts 43 and 91, maintenance records for the PC-12/47E are maintained with the use of Aircraft, Engine and Propeller Logbooks.

Submitted by: Gregory Borsari
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Maintenance