



Continental Motors

ENGINE EXAMINATION REPORT LEFT

ENGINE MODEL	IO520C (15B)
ENGINE SERIAL NUMBER	287461-R
AIRCRAFT MAKE & MODEL	Beechcraft D55 Baron
AIRCRAFT SERIAL NUMBER	TE-616
AIRCRAFT REGISTRATION	N533Q
FILE NUMBER	18-366

NAME	SIGNATURE	DATE
Mike Council		4-17-2019

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PAGE 2 of 15**GENERAL INFORMATION****EXAMINATION****ACCIDENT DATA****DATE** 2-23-2019**NTSB ACCIDENT #** WPR19FA086**FACILITY** Accident site**NTSB INVESTIGATOR** Jack Vanover**ADDRESS** Cummings Mountain
Tehachapi, CA**FAA INVESTIGATOR** NA**ACCIDENT DATE** 2-21-2019**ACCIDENT LOCATION** *Cummings Mountain,
Tehachapi, CA**ENGINE INFORMATION****ENGINE POSITION** Left**TOTAL TIME** Undetermined due to inconsistencies of hobbs times in logbooks. The final log entry for the last 100-hour inspection dated 4-4-2018. Hobbs: 618.9 indicated 653.9 hours TSN. (Unverified)**TIME SOH** NA**TYPE & TIME SLI** Undetermined**BUILD DATE** 11-28-1995 according to Continental Motors Serial data.**IN SERVICE DATE** 12-25-1995 according to engine logbook entry (unspecified airplane)

*The accident site was near the top of Cummings Mountain, part of Tehachapi Mountains, in a remote area of privately-owned land. The only access to the accident site was by escort with the Kern, Mono and Fresno County Sheriff's Search and Rescue team using snow-cat vehicles. The wreckage was covered in snow in an area that had approximately 4' of snowfall accumulation. The search and rescue IIC required all teams to be back at the SAR base camp before dark for safety reasons. After a two-and-a-half-hour snow-cat ride, the teams arrived at the accident site and had approximately 2.5 hours to complete all tasks before zero hour to depart.

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Significant logbook information:

The Continental Motors Engine logbook which accompanied engine serial number **287461** assembled as a factory rebuilt engine 11-28-1998 acknowledge installation in an unspecified airplane at hobbs 2396 dated 12-25-1995. After an oil change was recorded 9-10-1997, an entry indicates "See AD-Log for year 1998 entries". The Ad Log book marked "LEFT" begins with engine serial number **126306-8-C** and begins on page one, 1-25-1984. The last maintenance entry for this serial number engine is dated 12-16-1986 and indicated that Windham Aircraft Engines overhauled the engine (serial 126306-8-C) on Job Number 1735. The very next entry on an unnumbered page is dated 5-20-2003 at hobbs 496.6. No engine serial number is specified.

The first time that the accident engine (serial number 287461) is mentioned in this same "Left" Ad Log Maintenance logbook is dated April 4, 2018. See the entry below:

Left Engine Log Entry

Continental IO-520-C15B S/N 287461-R
HOBBS 0618.9 TSN 653.9

N533QApril 4th, 2018

11. Complied with 100 hour inspection IAW 14 CFR part 43 appendix D.
12. Drained oil and removed filter, installed Champion oil filter p/n CH48109-1 and serviced with (12) qts of Aeroshell 100W engine oil. Took oil sample and sent for analysis.
13. Engine compression: #1: 68/80 #2: 70/80 #3: 73/80 #4: 66/80 #5: 73/80 #6: 70/80
14. Removed injectors and installed after cleaning.
15. Replaced spark plug copper gaskets with new p/n AN4027-1
16. AD 2014-05-29 does not apply, affected cylinder assemblies not installed.
17. AD 2016-16-12 does not apply, affected cylinder assemblies not installed.
18. Applicable engine airworthiness directives have been complied with through 2016-16-12. See compliance checklist for details. Ran engine and leak checked, OK.

I certify that this ENGINE has been inspected in accordance with a 100 hour inspection and has been determined to be in airworthy condition.


Michael Fuller A&P 

Report Summary:

Search Code(s):

Examination of the engine was performed by the CMI Investigator under supervision of the NTSB Investigator. The inspection of this engine did not reveal any pre-impact anomalies that would have prevented its ability to produce rated horsepower.

NOTE: According to the engine logbooks, this engine accrued only 13.8 hours between 100-hour inspections dated 8-28-2008 and 4-4-2018. There are no other recorded maintenance entries in the logbook between those dates.

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Disposition of engine following exam: At the time of this writing, there is no plan to recover the wreckage from the accident site. The airplane was not insured, and no recovery business was willing to pick up the wreckage from this isolated site.

*The accident site was near the top of Cummings Mountain, part of Tehachapi Mountains, in a remote area of privately-owned land. The only access to the accident site was by escort with the Kern, Mono and Fresno County Sheriff's Search and Rescue teams using snow-cat vehicles. The Investigation teams traveled as a group which included the Coroner's office Investigators. The wreckage was covered in snow in an area that had approximately 4' of snowfall accumulation. The search and rescue IIC required all teams to be back at the SAR base camp before dark for safety reasons. After a two-and-a-half-hour snow-cat ride, the teams arrived at the accident site and had approximately 2.5 hours to complete all tasks before zero hour to depart.

INSPECTION WITNESSES

NAME	Mike Council	NAME	Jack Vanover
ADDRESS	[REDACTED] Mobile, Alabama	ADDRESS	Western Pacific Region Seattle, WA
ORGANIZATION	Continental Motors	ORGANIZATION	NTSB IIC
PHONE	[REDACTED]	PHONE	[REDACTED]
NAME	Andrew Hall	NAME	NA
ADDRESS	Wichita, KS	ADDRESS	
ORGANIZATION	Textron Aviation	ORGANIZATION	
PHONE	[REDACTED]	PHONE	

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EXTERNAL ENGINE CONDITION

The engine separated from its nacelle and was found forward of the main wreckage in the snow. The engine was inverted, and the engine oil sump exhibited impact damage. The rear portion of the oil sump was crushed upward, and a hole was present. The shape of the puncture was consistent with an undetermined object pushing inward from the outside surface of the sump. The right and left oil drain plugs were present and remained secured with safety wire.

The fuel component-throttle body-mixture control remained attached but exhibited impact damage. The throttle and mixture control arms were intact and properly secured. The throttle control cable and mixture control cable were both attached but were separated at approximate mid-length.

Cylinders 1, 3, and 5 remained attached and exhibited damage to cooling fins and rocker box covers. Cylinders 2, 4, and 6 remained attached but all three rocker covers were impact damaged or missing.

The engine was manually rolled over, right side-up. The left forward crankcase half exhibited heavy impact damage. The right upper crankcase was intact and exhibited an engine data plate identifying the engine as a Continental Motors model IO-520C, serial # 287461-R. The fuel manifold remained attached and the assembly screws were secured. No lead seal was attached.

The left and right magnetos separated and were not recovered. The impact damaged ignition leads exhibited cuts and individual leads were broken with missing ends.

The forward mounted engine driven alternator separated and was not recovered. The instrument air pump separated at its mount and was not recovered. Only the mounting ring and plastic shear-drive coupling remained attached. The plastic drive gear was intact.



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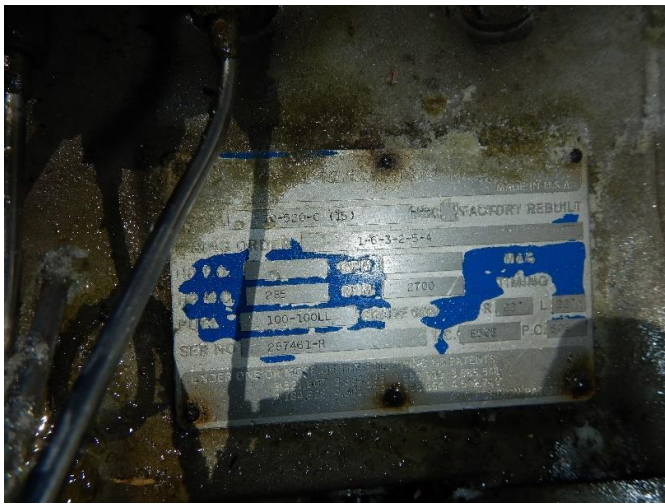
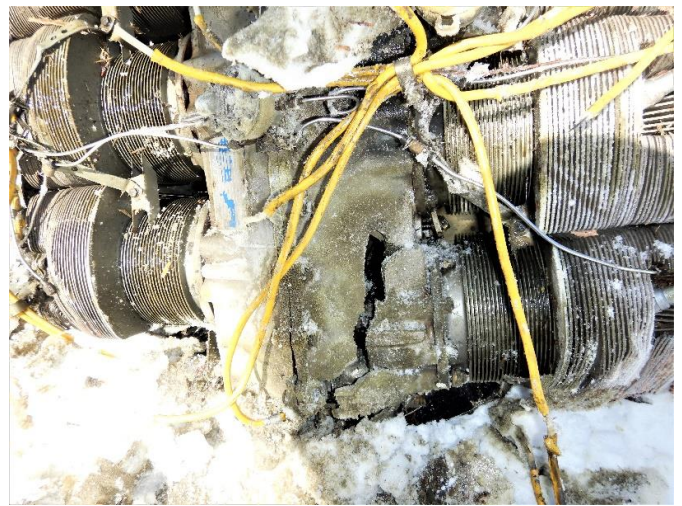
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ENGINE COMPONENT EXAMINATION

EXHAUST SYSTEM

Condition: The left side exhaust components were impact damaged and separated from the engine due to impact forces. The right exhaust collector and risers remained attached to cylinder ports but was impact damaged.



INDUCTION SYSTEM

Condition: The left induction intake tube elbows and hoses separated, and the forward balance tube assembly was crushed.



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IGNITION SYSTEM

LEFT MAGNETO	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	Separated from engine and not recovered.		
RIGHT MAGNETO	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	Separated from engine and not recovered.		
IGNITION HARNESS	Manufacturer: TCM	P/N: Undetermined	S/N: Undetermined
Condition:	Individual ignition leads were cut and pinched due to impact forces.		



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Manufacturer: Undetermined

P/N: Undetermined

S/N: Undetermined

Condition: Undetermined

**THROTTLE
BODY
METERING UNIT**

Manufacturer: TCM

P/N: 6299?4-2

S/N: J179524AR

Condition: The fuel component-throttle body-mixture control remained attached but exhibited impact damage. The throttle and mixture control arms were intact and properly secured. The throttle control cable and mixture control cable were both attached but were separated at approximate mid-length.

**FUEL MANIFOLD
VALVE**

Manufacturer: TCM

P/N: 63?427-1

S/N: A188121R

Condition: The manifold valve was intact and attached at its mount. The assembly screws were properly secured.



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LUBRICATION SYSTEM

OIL SUMP

Condition: The rear portion of the oil sump was crushed upward, and a hole was present.



OIL FILTER

Manufacturer: Undetermined

P/N: Undetermined

Condition: Undetermined. The oil filter separated and was not found in the wreckage.

OIL COOLER

Manufacturer: Undetermined

P/N: Undetermined

S/N: Undetermined

Condition: One oil cooler which had separated was found in the wreckage. Orientation could not be determined.

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CYLINDERS

CYLINDERS

P/N: Undetermined

S/N:
Undetermined

Head Date: Undetermined

Condition: All cylinders remained attached to their respective mount. Cylinders 1, 3, and 5 received minor impact damage to lower cooling fins but rocker covers on cylinders 2, 4, and 6 were impact damaged.

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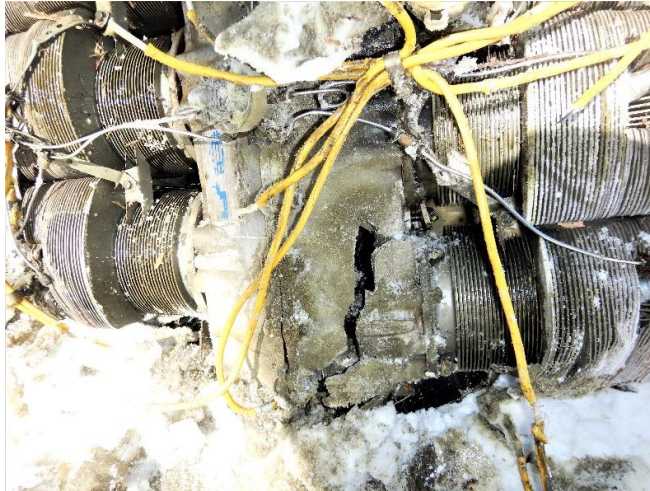
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CRANKCASE ASSEMBLY

CRANKCASE

Condition:

The left forward crankcase half was impact damaged.



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ACCESSORIES

STARTER	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The starter separated and was not located in the wreckage.		
STARTER ADAPTER	P/N: Undetermined		
Condition:	The starter adapter remained attached but was impact damaged.		
ALTERNATOR	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The forward mounted alternator separated and was not recovered.		
VACUUM PUMP	Manufacturer:	P/N:	S/N:
Condition:	The vacuum pump separated and was not recovered. An intact vacuum pump drive spline was found still engaged in the accessory gear.		



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PROPELLER

PROPELLER	Manufacturer: Hartzell	P/N: See note below	S/N: See note below
Condition:	Both propellers exhibited impact damage with rotational scoring on the cambered surfaces and torsional bending of the propeller blades. Damaged trees in the area of initial impact with propeller cuts exhibited 45-degree cuts.		

NOTE: Two propellers were found in the wreckage. Orientation was not possible. The letters A & B are arbitrary and do not indicate orientation.

A-Hartzell three blade full feathering propeller model: PHC-C3YF-2UF, hub serial number EB4535A



B- Hartzell three blade full feathering propeller model: PHC-C3YF-2UF, hub serial number EB4536A



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