



# ENGINE EXAMINATION REPORT

## RIGHT

<b>ENGINE MODEL</b>	IO520C (15B)
<b>ENGINE SERIAL NUMBER</b>	240456-R
<b>AIRCRAFT MAKE &amp; MODEL</b>	Beechcraft D55 Baron
<b>AIRCRAFT SERIAL NUMBER</b>	TE-616
<b>AIRCRAFT REGISTRATION</b>	N533Q
<b>FILE NUMBER</b>	18-366

<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>
Mike Council		4-17-2019

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**GENERAL INFORMATION**

EXAMINATION		ACCIDENT DATA	
<b>DATE</b>	2-23-2009	<b>NTSB ACCIDENT #</b>	WPR19FA086
<b>FACILITY</b>	Accident site	<b>NTSB INVESTIGATOR</b>	Jack Vanover
<b>ADDRESS</b>	Cummings Mountain Tehachapi, CA	<b>FAA INVESTIGATOR</b>	NA
		<b>ACCIDENT DATE</b>	2-21-2019
		<b>ACCIDENT LOCATION</b>	Cummings Mountain, Tehachapi, CA

**ENGINE INFORMATION**

<b>ENGINE POSITION</b>	Right
<b>TOTAL TIME</b>	3422.2 at last 100-hour inspection dated 4-4-2018. Hobbs: 618.9
<b>TIME SOH</b>	1374.0 at last 100-hour inspection dated 4-4-2018. Hobbs: 618.9
<b>TYPE &amp; TIME SLI</b>	Undetermined-Hobbs meter was not found in the wreckage.
<b>BUILD DATE</b>	2-2-1982
<b>IN SERVICE DATE</b>	5-21-1982

**Significant logbook information:**

**Right Engine Log Entry**

**Continental IO-520-C S/N 240456-R**  
**HOBBS 0618.9 TSMOH 1374.0 TSN 3422.2**

**N533Q**

April 4<sup>th</sup>, 2018

1. Complied with 100 hour inspection IAW 14 CFR part 43 appendix D.
2. 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.
3. Engine compression: #1: 76/80 #2: 77/80 #3: 79/80 #4: 69/80 #5: 76/80 #6: 78/80
4. Removed injectors and installed after cleaning.
5. Replaced spark plug copper gaskets with new p/n AN4027-1
6. AD 2014-05-29 does not apply, affected cylinder assemblies not installed.
7. AD 2016-16-12 does not apply, affected cylinder assemblies not installed.
8. 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 

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DATE	TOTAL TIME IN SERVICE	TOTAL TIME SINCE OVERHAUL	TACH OR RECORDING METER TIME	DESCRIPTION OF WORK PERFORMED— SIGNATURE & CERTIFICATE NO. OF PERSON PERFORMING WORK
TOTALS brought forward from previous page				
5/25/93		"0"	16658	ENGINE REMOVED FOR OVERHAUL, RE-INSTALL ENGINE WITH NEW HOSES, ENGINE MOUNTS, OVERHAUL OIL COOLER, OVERHAUL PROP & GOVERNOR, NEW RAFFLE SEALS INSTALLED SERVICES ENGINE WITH 12 QTS AERO 100W50 BREAK-IN OIL, GRND RUN, LEAK CHECK AND RETURNED TO SERVICE  [REDACTED] LTD
Date <u>5/25/93</u> Tach <u>16658</u> Hrs. I certify this <u>ENGINE</u> has been inspected in accordance with the manufacturer <u>100 HPA</u> inspection criteria and have found it to be in airworthy condition. Applicable Airworthiness Directives thru <u>8-10</u> have been complied with.				

TTAF 3591.7

**WESTERN CYLINDER OVERHAUL, INC.**  
 F.A.A. Repair Station #VA3R912L  
 15942 Arminta Street  
 Van Nuys, California 91406

Make Continental Model IO-520-C  
 Serial # 240456-R Date March 15, 1993

Engine major overhauled this date. Pertinent details of this overhaul are on file at this Agency under Work Order # E1678. Work has been performed according to current F.A.A. regulations. Applicable airworthiness directives complied with. This engine has been approved for return to service. Fits and clearances are at Factory "Zero Time" specifications. TSMOH 00.0 hrs.

All AD's complied with thru this date. **WESTERN CYLINDER OVERHAUL, INC.**  
 By [REDACTED] C.I.  
 Chief Inspector

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

<b>Report Summary:</b>	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.	

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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.

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### INSPECTION WITNESSES

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

### EXTERNAL ENGINE CONDITION

The engine separated from the airframe during the impact sequence and was discovered in an inverted position partially covered in snow. The engine mounts were broken, and the engine exhibited heavy impact damage. Cylinder heads received impact damage and exhaust and induction components separated.



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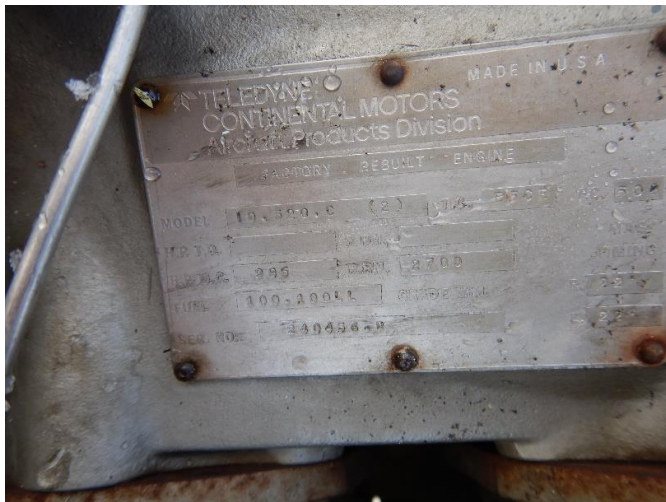
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**ENGINE COMPONENT EXAMINATION**

**EXHAUST SYSTEM**

**Condition:** The exhaust collector and risers for cylinders 1, 3, and 5 remained attached but received impact damage. The exhaust collector and riser for cylinders 2, 4, and 6 separated.



**INDUCTION SYSTEM**

**Condition:** The induction elbows and tubes remained attached to the cylinder attach points on cylinders 1, 3, and 5. See photo above. The induction elbows separated from the cylinder attach points on cylinders 2, 4, and 6. The balance tube assembly was impact damaged.

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**IGNITION SYSTEM**

**LEFT  
MAGNETO**

Manufacturer: TCM

P/N: 10-349220-5

S/N: 8116203

**Condition:** The left magneto remained attached and intact.



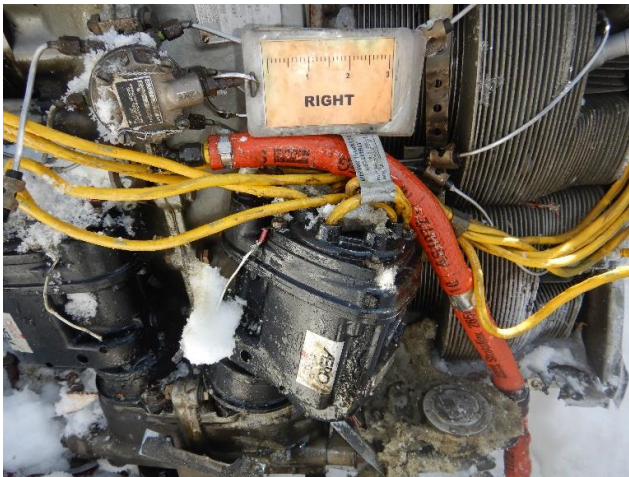
**RIGHT  
MAGNETO**

Manufacturer: TCM

P/N: 10-349260-6

S/N: 8110299

**Condition:** The magneto was intact, but the mounting ring was impact damaged.





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**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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### FUEL SYSTEM

<b>FUEL PUMP</b>	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The engine driven fuel pump separated was not recovered		
<b>THROTTLE BODY METERING UNIT</b>	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The throttle body separated and was not recovered.		
<b>FUEL MANIFOLD VALVE</b>	Manufacturer: TCM	P/N: 631427-2A22	S/N: 7179519CR
Condition:	The fuel manifold was intact, and all assembly screws were present and secured properly.		



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**LUBRICATION SYSTEM**

**OIL SUMP**

**Condition:** The oil sump was impact damaged



**OIL COOLER**

**Manufacturer:** Undetermined

**P/N:** Undetermined

**S/N:** Undetermined

**Condition:** The oil cooler separated and was discovered in the wreckage path. Orientation could not be verified.



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## CYLINDERS

**CYLINDERS**

P/N: Undetermined

S/N: Undetermined

Head Date:  
Undetermined

Condition: All six cylinders remained attached to the crankcase mounting bases. Cylinders 1, 3 and 5 were intact. All sparkplugs and ignition leads remained in place. Cylinders 2, 4, and 6 received heavy impact damage and #2-cylinder head separated. Rocker covers on cylinders 4 and 6 separated and rocker arms, valve springs and valve stems were damaged.



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**CRANKCASE ASSEMBLY**

<b>CRANKCASE</b>	Casting Number:	1-3-5: Undetermined	2-4-6: Undetermined	S/N:1A917P
Condition:	The crankcase was intact.			



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**CRANKSHAFT ASSEMBLY**

**CRANKSHAFT**

Forging Number:  
Undetermined

S/N: Undetermined

Heat code:  
Undetermined

Condition:

The crankshaft propeller flange was intact with propeller hub studs in place. The crankshaft was manually rotated through a partial rotation.



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### ACCESSORIES

<b>STARTER</b>	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The starter motor separated and was not found in the deep snow.		
<b>STARTER ADAPTER</b>	P/N: Undetermined		
Condition:	The starter adapter remained attached, but the starter motor mount separated.		



<b>ALTERNATOR</b>	Manufacturer: Aero Electric	P/N: 1100723ECH	S/N: A125497 6031339
Condition:	The front mounted alternator remained attached and intact.		



<b>VACUUM PUMP</b>	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The vacuum pump separated and was not recovered.		

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**PROPELLER**

**PROPELLER GOVERNOR**

Manufacturer: Undetermined

P/N: Undetermined

S/N: Undetermined

Condition:

The propeller governor separated and was not recovered.

**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 exhibited propeller cuts at 45-degree angles.

**NOTE:** Two propellers were found in the wreckage. Positive 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**





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

