Continental Motors

ENGINE FIELD INSPECTION REPORT

ENGINE MODEL	E225-8
ENGINE SERIAL NUMBER	35818-D-0-8-R
AIRCRAFT MAKE & MODEL	Beechcraft 35G Bonanza
AIRCRAFT SERIAL NUMBER	D-4863
AIRCRAFT REGISTRATION	N394CW
CMI FILE NUMBER	15-238

NAME	SIGNATURE	DATE
Mike Council		11-17-2015

GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	10-13-2015	**NTSB ACCIDENT #**	CEN16FA011
FACILITY	Beegles Aircraft Services	**NTSB INVESTIGATOR**	Josh Lindberg
ADDRESS	[redacted]	**FAA INVESTIGATOR**	Wesley R. Dollahite
		ACCIDENT DATE	10-13-2015
		ACCIDENT LOCATION	Eaton, Colorado

ENGINE INFORMATION

ENGINE POSITION	Single
TOTAL TIME	5288.19 according to NTSB
TIME SOH	479.5 according to NTSB
TYPE & TIME SLI	100 Hour Inspection 5/17/2015
BUILD DATE	Not in record
IN SERVICE DATE	Not in record

Significant logbook information:

Subject:	AIRFRAME	ENGINE	PROPELLER
Make:	Beechcraft	Continental	Hartzell
Model:	G-35	E225-8	HC-A2V20-4A1
Serial Number:	D-4863	35818-D-O-8-R	AK837
Times as of Date:	May 7, 2015	May 7, 2015	May 7, 2015
Times Verified By:	Logbook Entry	Logbook Entry	Logbook Entry
Tach Time	778.60	778.60	778.60
Total Time:	5091.00	5288.19	UNK
TSOH:	NA	778.60	70.50
OH Date:	NA	July 7, 1992	December 8, 2011
TSLightOH:	NA	479.50	NA
TSTOH:	NA	87.00	NA
TOH Date:	NA	January 25, 2011	NA
Last Inspection:	Annual	100 Hr.	100 Hr.
Last Inspection Date:	May 7, 2015	May 17, 2015	May 17, 2015

ENGINE NOTES:			
	Major Overhaul	*July 7, 1992*	*0.00*
	#4 Cyl replaced	*May 3, 1996*	*147.90*
	R&R All Cyl.	*June 20, 1997*	*270.50*
	Engine Teardown	*February 2, 1999*	*299.10*
	Engine Teardown	*February 28, 2002*	*454.30*
	#1 & 3 Cyl replaced	*November 11, 2004*	*556.10*
	#6 Cyl replaced	*March 3, 2006*	*566.00*
	R&R All Cyl.	*November 15, 2007*	*599.80*
	Rehoned All Cyl.	*June 19, 2009*	*626.50*
	R&R All Cyl.	*January 25, 2011*	*691.60*
	#4 Cyl replaced	*April 1, 2013*	*763.00*

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 which would have prevented Its ability to produce rated horsepower.

Disposition of engine following exam: The engine remains at Beegles Aircraft Services until released by the NTSB IIC to the insurance company.

INSPECTION WITNESSES

NAME	Mike Council	**NAME**	Paul Yoos
ADDRESS	[redacted] Mobile, Alabama	**ADDRESS**	[redacted] [redacted] Wichita, KS 67206-2556
ORGANIZATION	Continental Motors, ASI	**ORGANIZATION**	Textron ASI
PHONE	[redacted]	**PHONE**	[redacted]
NAME	Wesley R. Dollahite	**NAME**	Brad Bigelow
ADDRESS	[redacted]	**ADDRESS**	[redacted]
ORGANIZATION	FAA, Safety Inspector	**ORGANIZATION**	NTSB, ASI
PHONE	[redacted]	**PHONE**	[redacted]

EXTERNAL INSPECTION OF ENGINE

The engine data tag remained attached to the crankcase. The data tag indicated that the engine was a model E225-8 engine, serial number 35818-D-0-8-R. No mechanical or impact damage was noted on the crankcase halves.
The combination oil tank/ cooler was impact damaged and was removed to gain access to the remaining engine components. The engine oil rod was removed, wiped and reinserted into the oil rod sleeve. The oil rod indicated approximately five quarts of dark, oily substance was contained in the oil sump.

Right and left exhaust components were impact damaged and crushing was noted to the mufflers. The induction system exhibited impact damage. The air box and induction filter separated and were impact damaged.

The engine driven fuel pump separated from the accessory case but remained attached by a fuel hose. The fuel pump housing was impact damaged and could not be rotated manually. The drive coupling and gear were separated and not recovered.
The pressure carburetor was intact and in place with damage noted to the attach pad. The carburetor throttle control and mixture arms remained attached and secured.

The aftermarket propeller governor and “T” pad adapter separated from the accessory case due to impact forces. The accessory case housing exhibited impact damage.

The electric starting motor remained attached with a slight amount of impact damage to the rear casing. The engine driven generator remained attached and intact. The engine driven “wet” type vacuum pump remained attached and intact. The air/oil separator was impact damaged.
Right and left magnetos remained intact and mounted to the accessory case.

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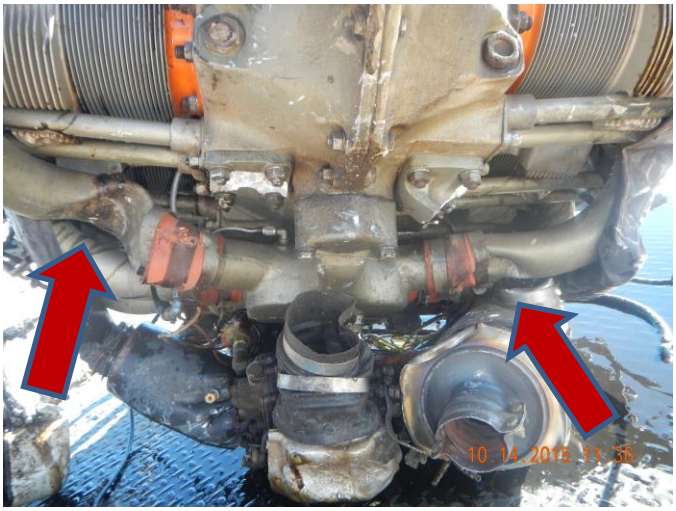
ENGINE TEARDOWN AND COMPONENT EXAMINATION

EXHAUST SYSTEM	
Condition:	Right and left mufflers and right tailpipe were crushed by impact forces but remained attached. The left tailpipe separated. Muffler flame cones were intact.

INDUCTION SYSTEM	
Condition:	The induction system was impact damaged but remained attached. The front mounted air box and induction filter was impact damaged

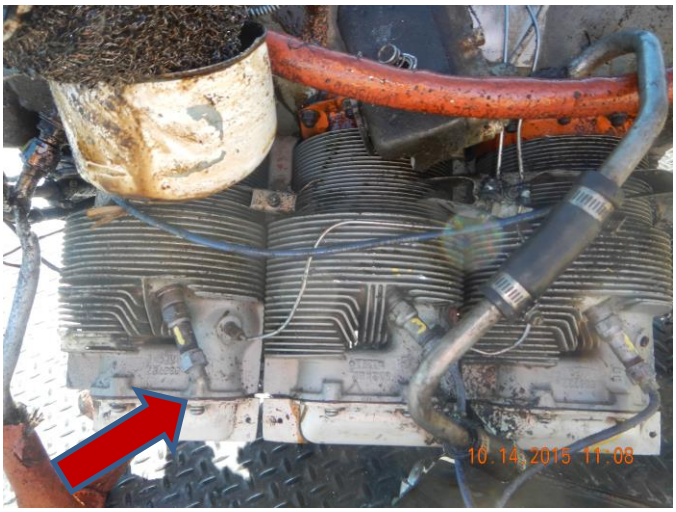


IGNITION SYSTEM

LEFT MAGNETO	Manufacturer: TCM	P/N: S6LN-21	S/N: E189201DR
Condition:	The magneto received impact damage. The bushing cup was cracked. The magneto was removed and manually rotated using a drill motor. Spark was produced to each ignition lead.		

RIGHT MAGNETO	Manufacturer: TCM	P/N: S6LN-???	S/N: Undetermined
Condition:	The magneto did not display damage. The magneto was removed and manually rotated using a drill motor. Spark was produced to each ignition lead. The data decal was damaged and the serial number was not legible.		

IGNITION HARNESS	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The ignition harness remained intact with the exception of leads to cylinders one and six which were separated. (top sparkplugs)		



SPARK PLUGS	Manufacturer: Champion	P/N: REM40E
Condition:	When compared to a Champion “Check A Plug” chart, sparkplugs from cylinder one was “worn out severe”, while sparkplugs from cylinders 2, 3, 4, 5 and 6 exhibited “normal” wear signatures. Sparkplugs from cylinders 2, 4, and 6 were wet with oil. Note: the engine was positioned with cylinders 2, 4, and 6 positioned downward for nearly 24 hours.	


2
4
6
10.14.2015 11:16


1
3
10.14.2015 11:16


FOLD
5
2
10.14.2015 11:16


4
6
10.14.2015 11:17

FUEL SYSTEM

FUEL PUMP	Manufacturer: Thompson Products, Inc.	P/N: M128983A	S/N: 444249W
Condition:	The engine driven fuel pump separated from the accessory case but remained attached by a fuel hose. The fuel pump housing was impact damaged and could not be rotated manually. The drive coupling and gear were separated and not recovered.		

CARBURATOR	Manufacturer: Bendix	P/N: PS-5C	S/N:772805
Condition:	The pressure carburetor was intact and in place with damage noted to the mounting flange. The fuel screen was removed and a small quantity of contamination was noted. No fuel was released from the carburetor during the bench inspection. The carburetor throttle control and mixture arms remained attached and secured.		

LUBRICATION SYSTEM

OIL SCREEN	Manufacturer: TCM	P/N:A25131
Condition:	A small amount of carbon was found on the screen surface.	

OIL TANK/ COOLER	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The combination oil tank and cooler was impact damaged		

CYLINDERS

Condition:	All six cylinders remained intact and in place with little or no impact damage. All six cylinders displayed orange paint on each mounting pad indicating that the internal cylinder barrels were “channel chrome” plated. All six cylinders achieved thumb compression when the engine was manually rotated. . A lighted borescope inspection was performed and all exhaust and intake valves were noted to be intact. Cylinder rocker covers were removed and rocker arm movement was noted when the crankshaft was manually rotated.


10.14.2015 11:55


10.14.2015 11:08


10.13.2015 17:03


10.14.2015 11:08

CRANKSHAFT ASSEMBLY

CRANKSHAFT	Forging Number: Undetermined	S/N: Undetermined	Heat code: Undetermined
Condition:	The crankshaft appeared to be undamaged. Continuity was established by manually rotating the engine and observing timing gear, magneto and camshaft rotation.		

ACCESSORIES

STARTER	Manufacturer: Delco Remy- Serviced by EMI Aviation Parts	P/N: Undetermined	S/N: Undetermined
Condition:	The starter motor was impact damaged.		

ALT/GEN #1	Manufacturer: Delco Remy	P/N: 11018885	S/N: 5428
Condition:	The engine driven generator remained attached and intact		

VACUUM PUMP	Manufacturer: Garwin	P/N: G45?	S/N:2260
Condition:	The engine driven “wet” type vacuum pump remained attached and intact. The air/oil separator was impact damaged.		

PROPELLER

PROPELLER GOVERNOR	Manufacturer: Undetermined	P/N: Undetermined	S/N: Undetermined
Condition:	The aftermarket propeller governor and “T” pad adapter separated from the accessory case due to impact forces.		
PROPELLER	Manufacturer: Hartzell	M/N: HC-A2V20-4A1/V8433	S/N:AK847
Blade 1 S/N:	87993		
Blade 2 S/N:	85703		
Condition:	Blade A remained attached to the propeller hub but was loose in the hub assembly. Blade A displayed heavy scratching and scoring on the cambered face and the blade displayed a smooth rearward bending signature beginning approximately 16 inches from the blade root. Blade B separated from the hub and exhibited a smooth forward bending signature beginning approximately eight inches from the blade hub. There was a deep gouge on the trailing edge approximately five inches from the blade tip.		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