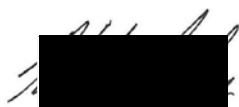




Continental Motors

ENGINE FIELD INSPECTION REPORT

ENGINE MODEL	IO-550-B
ENGINE SERIAL NUMBER	675847
AIRCRAFT MAKE & MODEL	Beechcraft A36
AIRCRAFT SERIAL NUMBER	E-2816
AIRCRAFT REGISTRATION	N8283D
FILE NUMBER	16-149

NAME	SIGNATURE	DATE
Kurt Gibson		09/30/2016

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GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	09/01/2016	NTSB ACCIDENT #	CEN16FA341
FACILITY	Bentonville Municipal Airport	NTSB INVESTIGATOR	John Brannen
ADDRESS	2500 SW Aviation Dr. Bentonville, AR 72712	FAA INVESTIGATOR	Matthew Disch
		ACCIDENT DATE	08/31/2016
		ACCIDENT LOCATION	Bentonville, AR

ENGINE INFORMATION

ENGINE POSITION	Single Engine
TOTAL TIME	1514.7 Hobbs (time taken at last engine maintenance entry)
TIME SOH	25.2 Hobbs (time taken at last engine maintenance entry)
TYPE & TIME SLI	Unknown
BUILD DATE	06/22/1993
IN SERVICE DATE	Unknown

Significant logbook information:

The engine was overhauled by Powermaster Aircraft Engines on 03/04/2016 under work order 16-118. The engine was then installed on N8283D on 03/14/2016 at a Hobbs time of 1489.5 by Summit Aviation LLC. The annual inspection of the aircraft was performed on 08/10/2015.

Report Summary:

Search Code(s):

15-12-68

There were no anomalies noted that would have prevented normal operation or production of rated horsepower.

Disposition of engine following exam:

The engine was recovered to Dawson Aircraft Inc.

INSPECTION WITNESSES			
NAME	Kurt Gibson	NAME	John Brannen
ADDRESS	Mobile, Alabama	ADDRESS	NTSB Central Region
ORGANIZATION	Continental Motors	ORGANIZATION	NTSB
PHONE		PHONE	
NAME	Jan Smith	NAME	
ADDRESS	Wichita, Kansas	ADDRESS	
ORGANIZATION	Textron Aviation	ORGANIZATION	
PHONE		PHONE	
NAME		NAME	
ADDRESS		ADDRESS	
ORGANIZATION		ORGANIZATION	
PHONE		PHONE	

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PAGE 4 of 23**EXTERNAL INSPECTION OF ENGINE**

The engine and a portion of the airframe had broken free from the rest of the airframe and was found resting against a hangar adjacent to the hangar that was impacted by the aircraft. The engine displayed impact damage signatures concentrated to the bottom of the engine. There were some thermal damage signatures at the rear of the engine that were concentrated around the fuel pump. The crankcase remained intact and displayed thermal damage signatures at the rear of the crankcase. All of the cylinders remained attached to their cylinder bays and displayed minor impact damage signatures. The three blade, constant speed propeller remained attached to the crankshaft and displayed impact damage signatures. All three propeller blades remained within the propeller hub and displayed impact damage signatures. One blade displayed leading edge gouging, aft bending deformation. Another blade displayed a significant leading edge gouge and a portion of the blade tip had broken free from the rest of the blade; the blade also displayed minor twisting deformation. The last blade displayed a significant amount of twisting deformation of the blade tip and a significant amount of blade polishing at the tip.

Both of the magnetos remained attached to their installation points and were undamaged. The ignition harness remained attached to both of the magnetos and to each of the spark plugs; the harness displayed minor impact damage signatures to some of the ignition leads. All of the spark plugs remained installed in their cylinders and were undamaged.

The fuel pump remained attached to its installation point; the fuel pump displayed thermal damage signatures. The throttle and fuel metering assembly remained attached to its installation point and displayed impact damage signatures. The fuel manifold valve remained attached to its installation point and was undamaged. All of the fuel nozzles remained installed in their cylinders and were undamaged.

The right side exhaust heat exchanger and tailpipe had broken free from the rest of the exhaust system and displayed impact damage signatures. The exhaust risers and the left exhaust heat exchanger and tailpipe displayed impact damage signatures. The induction system displayed impact damage and thermal damage signatures to the rear portion of the induction system. There were no anomalies noted with the induction system.

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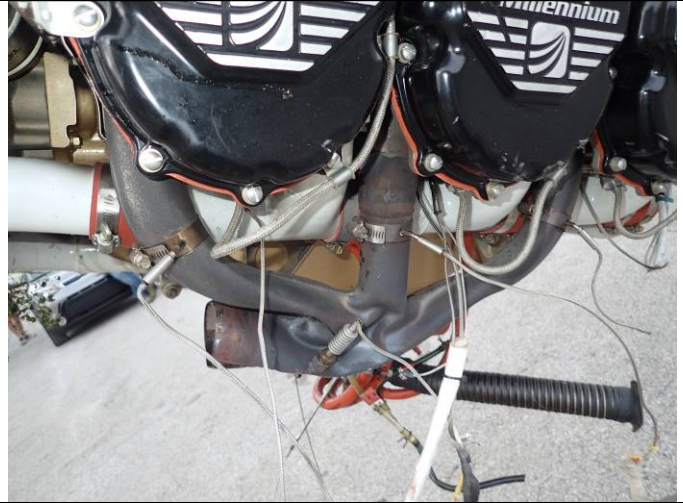
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ENGINE TEARDOWN AND COMPONENT EXAMINATION

EXHAUST SYSTEM

Condition: The exhaust system displayed impact damage signatures. The right heat exchanger and tailpipe had broken free from the rest of the exhaust system; the tailpipe was crushed and the heat exchanger displayed impact damage. The rest of the exhaust system remained attached to the engine and displayed impact damage signatures in the forms of bending and crushing. There were no anomalies noted with the exhaust system.



INDUCTION SYSTEM

Condition: The induction system displayed impact and thermal damage signatures concentrated to the rear induction components. There were no anomalies noted with the induction system.



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IGNITION SYSTEM

LEFT MAGNETO

Manufacturer: Slick

P/N: 6310

S/N: 05111171

Condition:

The magneto remained attached to its installation point and was undamaged. It was noted that during crankshaft rotation the impulse coupling would operate normally. During impulse coupling operation the magneto was observed to be capable of producing a spark to the end of each of the ignition lead in the proper order and at approximately the same time as the right magneto.



RIGHT MAGNETO

Manufacturer: Slick

P/N: 6310

S/N: 05041637

Condition:

The magneto remained attached to its installation point and was undamaged. It was noted that during crankshaft rotation the impulse coupling would operate normally. During impulse coupling operation the magneto was observed to be capable of producing a spark to the end of each of the ignition lead in the proper order and at approximately the same time as the left magneto.



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IGNITION HARNESS

Manufacturer: Slick

P/N: RH: M2379, LH: M2380

S/N: Not observed

Condition:

The ignition harness remained secured to both of the magnetos and to each of the spark plugs. The ignition harness displayed minor impact damage signatures to some of the leads. It was noted that during magneto impulse coupling operation that each of the ignition leads was capable of conducting a spark from the magneto to the spark plug.



SPARK PLUGS

Manufacturer: Tempest

P/N: URHB32E

Condition:

All of the spark plugs remained installed in their cylinders and the ignition leads were secured to each of the spark plugs. The spark plugs were removed and the electrodes were visually inspected. The #1, #2, #4, and the #6 bottom spark plugs were oil soaks which was consistent with post-accident accumulation. All of the spark plugs displayed normal operating and wear signatures. The spark plugs were reinstalled on their ignition leads and it was noted that all of the spark plugs were capable of conducting a spark between the center and ground electrodes during impulse coupling operation.



#1 Top and Bottom Spark Plugs



#3 Top and Bottom Spark Plugs

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#5 Top and Bottom Spark Plugs



#2 Top and Bottom Spark Plugs



#4 Top and Bottom Spark Plugs



#6 Top and Bottom Spark Plugs

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FUEL SYSTEM

FUEL PUMP

Manufacturer: CMI (overhauled by Great Planes)

P/N: 646766-8A1

S/N: B05GA072R

Condition:

The fuel pump remained attached to its installation point and displayed thermal damage signatures. The fuel pump was removed and it was noted that the fuel pump drive coupling remained intact. The fuel pump drive was rotated by hand; the fuel pump drive was capable of normal rotation. There were no anomalies noted with the fuel pump.



THROTTLE BODY METERING UNIT

Manufacturer: CMI (overhauled by Great Planes)

P/N: 646628A7

S/N: A05GA052R

Condition:

The throttle and fuel metering unit remained attached to its installation point and displayed impact damage signatures. It was noted that the throttle control arm was able to turn freely around the throttle control shaft. The throttle control arm was removed and it was noted that the knurls were smeared consistent with impact damage. The mixture control arm was secure on the mixture control shaft and was capable of normal movement. The fuel inlet screen was removed and there were no contaminants noted.

ENGINE FIELD INSPECTION REPORT

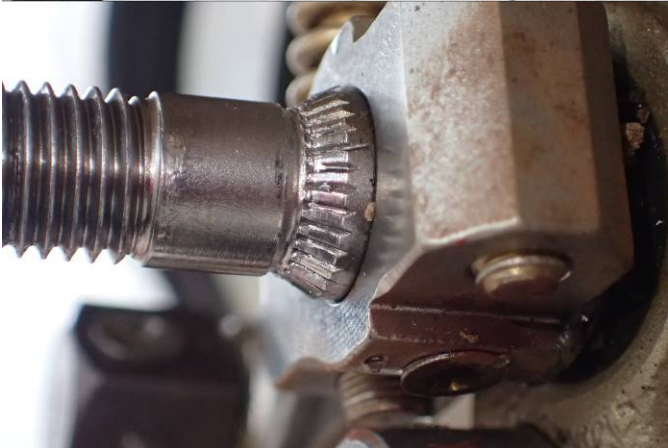
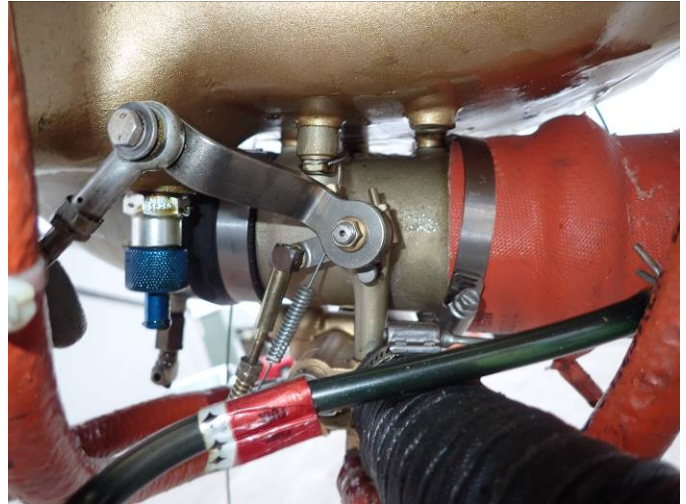
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FUEL MANIFOLD VALVE

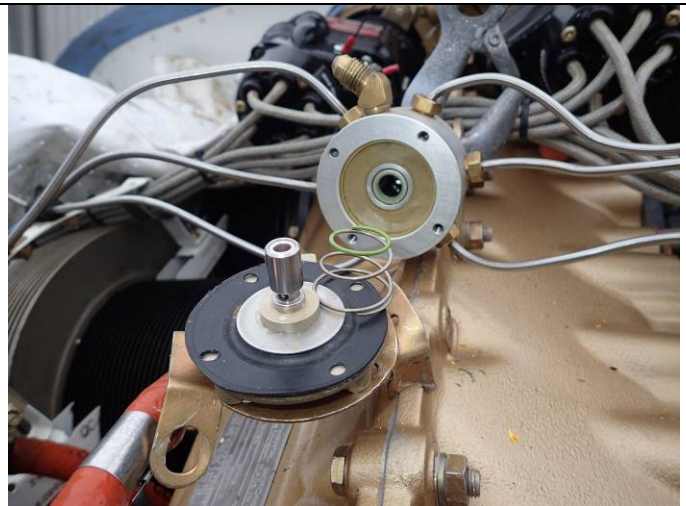
Manufacturer: CMI
(overhauled by Great
Planes)

P/N: 646508-6A10

S/N: E209306C

Condition:

The fuel manifold valve remained attached to its installation point and was undamaged. The manifold valve was disassembled and the internal components were visually inspected. There were no anomalies noted with the manifold valve.



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FUEL NOZZLES AND LINES

Manufacturer: GAMI

Position	#1	#3	#5	#2	#4	#6
Size	GA178	GM161	GF152	GA178	GM161	GF152
Condition:	All of the fuel nozzles remained installed in their cylinders and all of the fuel lines were secured to the nozzles. The fuel nozzles were removed and checked for blockages; all of the fuel nozzles were clear. There were no anomalies noted with the nozzles.					



#1 Fuel Nozzle



#3 Fuel Nozzle



#5 Fuel Nozzle



#2 Fuel Nozzle

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#4 Fuel Nozzle



#6 Fuel Nozzle

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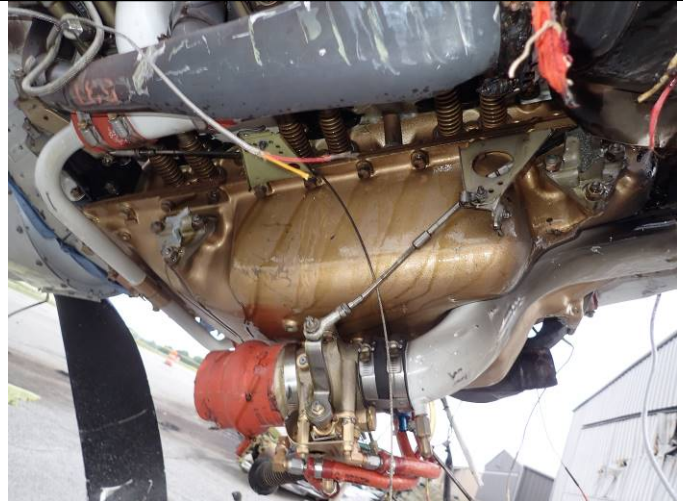
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LUBRICATION SYSTEM

OIL SUMP

Condition:

The oil sump remained intact and there were no breaches in the sump. There were no anomalies noted with the oil sump.



OIL PICK-UP TUBE & SCREEN

Condition:

Due to the type of inspection performed the oil pick-up tube and screen were not observed.

OIL PUMP

Condition:

The oil pump housing remained intact and displayed minor thermal damage signatures. Due to the type of inspection performed the oil pump was not disassembled.

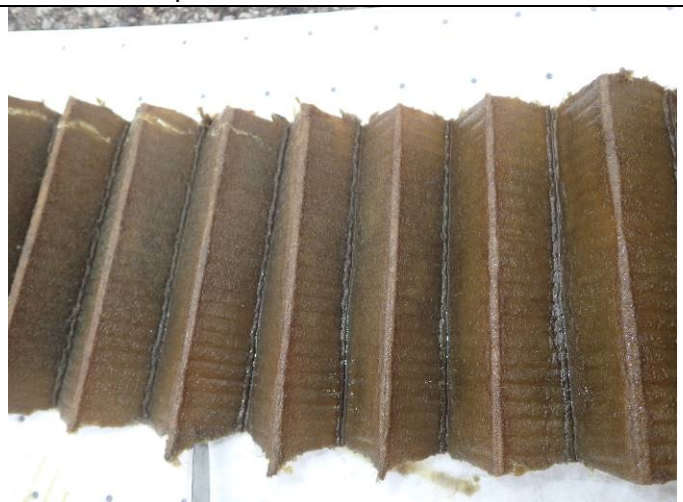
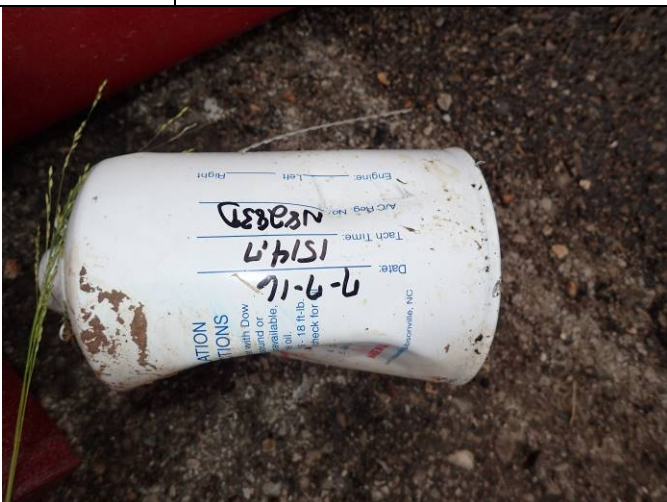
OIL FILTER

Manufacturer: Tempest

P/N: AA48109

Condition:

The oil filter had broken free from the oil filter adapter and was located along the wreckage path. The oil filter housing was cut open and the filter pleats were inspected. There were no anomalies noted with the oil filter inspection.



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OIL COOLER

Manufacturer: CMI

P/N: 654572

S/N: 136797

Condition:

The oil cooler remained attached to its installation point and displayed some impact and thermal damage signatures. There were no anomalies noted with the oil cooler.



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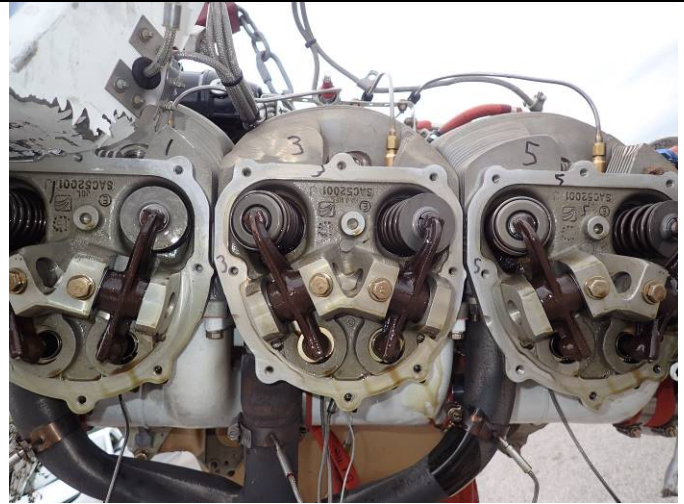
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CYLINDERS

CYLINDERS	P/N: No observed	S/N: Not observed
Condition:	All of the cylinders remained attached to their cylinder bays and displayed very minor impact damage signatures. All of the cylinders were inspected using a lighted borescope. The cylinder bores, piston faces, and valve heads displayed normal operating and combustion signatures. All of the overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures. The crankshaft was rotated by hand and it was noted that all of the cylinders displayed good thumb compression and suction. There were no anomalies noted with the cylinders.	



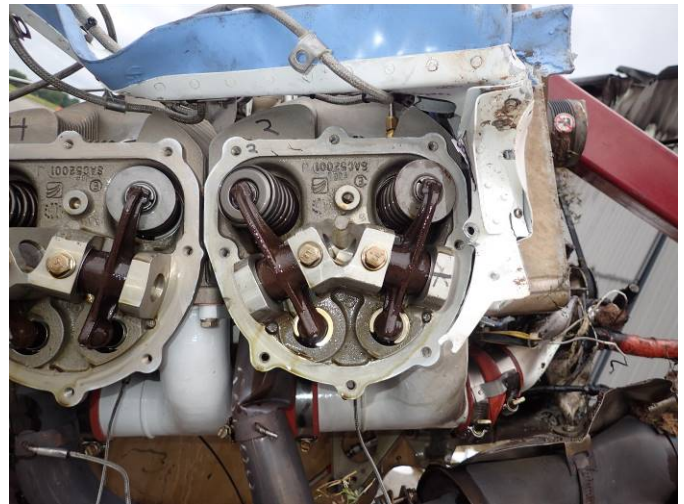
#1 Cylinder



#3 Cylinder



#5 Cylinder



#2 Cylinder

ENGINE FIELD INSPECTION REPORT

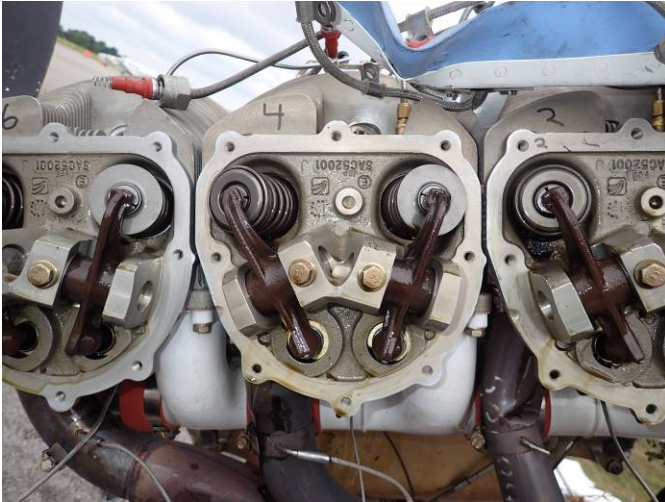
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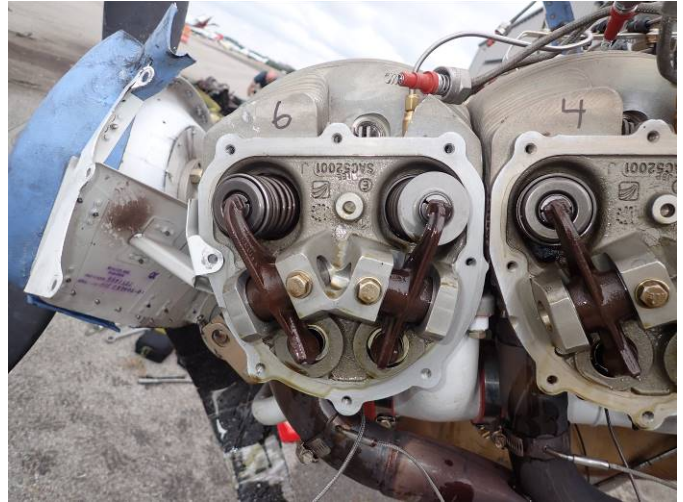
ENGINE S/N:

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#4 Cylinder



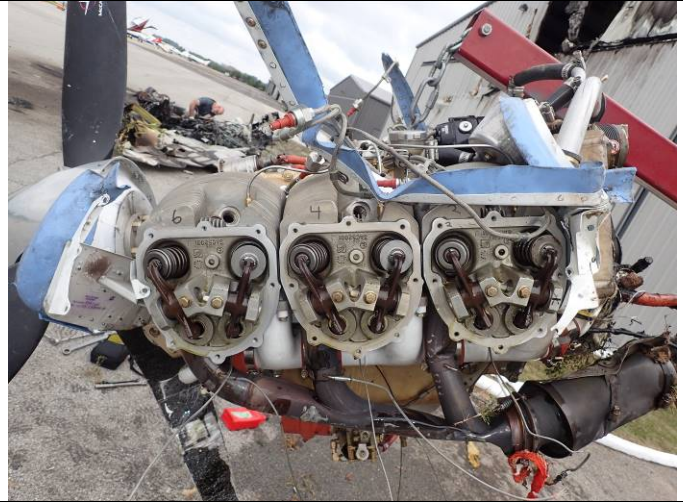
#6 Cylinder

VALVES AND GUIDES

Condition: All of the valve heads were inspected using a lighted borescope. The valve heads displayed normal operating and combustion signatures. During crankshaft rotation all of the valves operated normally. There were no anomalies noted.

ROCKER ARMS AND SHAFTS

Condition: All of the rocker arms displayed normal operating and lubrication signatures. During crankshaft rotation all of the rocker arms operated normally. There were no anomalies noted.



PISTONS

Piston P/N: Inaccessible

Condition: All of the piston faces were inspected using a lighted borescope. All of the piston faces displayed normal operating and combustion signatures. During crankshaft rotation all of the pistons operated normally. There were no anomalies noted.

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CRANKCASE ASSEMBLY

CRANKCASE

Casting
Number:

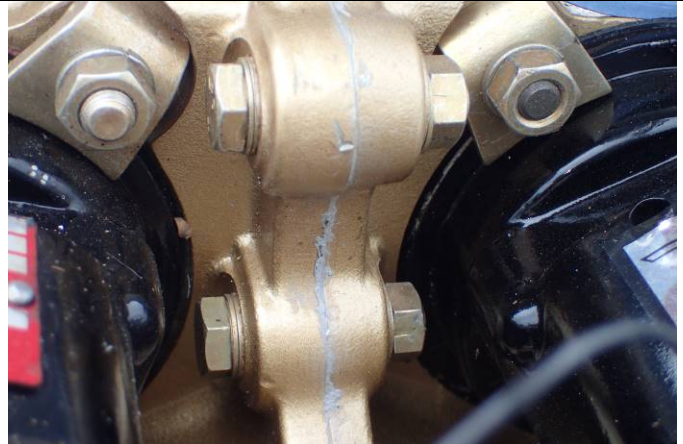
1-3-5: Not observed

2-4-6: Not observed

S/N: D279913R

Condition:

The crankcase remained intact and was undamaged. It was noted that there was a grey colored sealant between the two crankcase halves that could not be identified.



ENGINE FIELD INSPECTION REPORT**FILE NUMBER:**

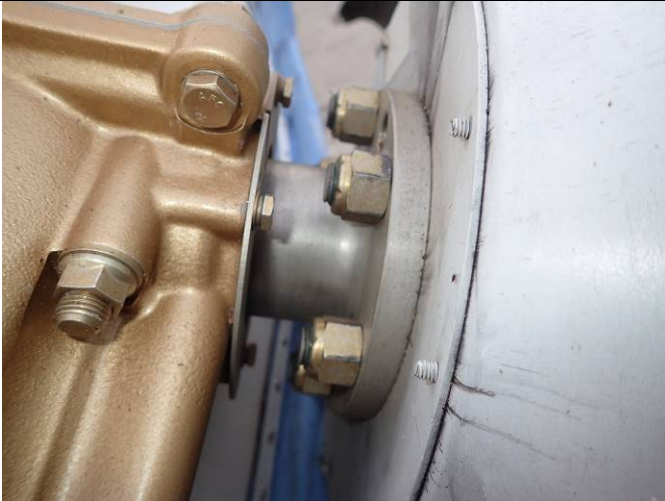
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PAGE 19 of 23**CRANKSHAFT ASSEMBLY**

CRANKSHAFT	Forging Number: Inaccessible	S/N: Not observed	Heat code: Inaccessible
Condition:	The propeller flange remained attached to the crankshaft and there were no signs of damage to the visible portion of the crankshaft. The crankshaft was rotated by hand and continuity was established between the crankshaft, camshaft, connecting rods, and associated components. The crankshaft gear was noted to be secured to the crankshaft and the bolts were properly safety wired. There were no anomalies noted with the crankshaft.		



CONNECTING RODS	P/N: Inaccessible	Forging or Serial Number: Inaccessible
Condition:	Operation of the connecting rods was verified by rotating the crankshaft and observing piston movement. All of the connecting rods operated normally.	

CAMSHAFT

CAMSHAFT	P/N: Inaccessible	S/N: Inaccessible
Condition:	Operation of the camshaft was verified by rotating the crankshaft and observing rocker arm movement. The camshaft operated normally.	
ACCESSORY GEARS		
Condition:	Operation of the magneto drive gears was verified by rotating the crankshaft and noting impulse coupling operation. The magneto drive gears operated normally.	

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ACCESSORIES

STARTER

Manufacturer: Kelly Aerospace

P/N: ES646279-1

S/N: F014645

Condition:

The starter remained attached to the starter adapter and was undamaged. There were no anomalies noted with the starter.



STARTER ADAPTER

P/N: Illegible

Condition:

The starter adapter remained attached to its installation point and displayed thermal damage signatures. There were no anomalies noted with the adapter.



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ALTERNATOR

Manufacturer: CMI

P/N: 649304

S/N: I025038.12

Condition:

The alternator remained attached to its installation point and displayed minor impact damage signatures. There were no anomalies noted with the alternator.



VACUUM PUMP

Manufacturer: Tempest

P/N: AA3216CW

S/N: N34453

Condition:

The vacuum pump remained attached to its installation point and displayed impact damage signatures. There were no anomalies noted with the vacuum pump.



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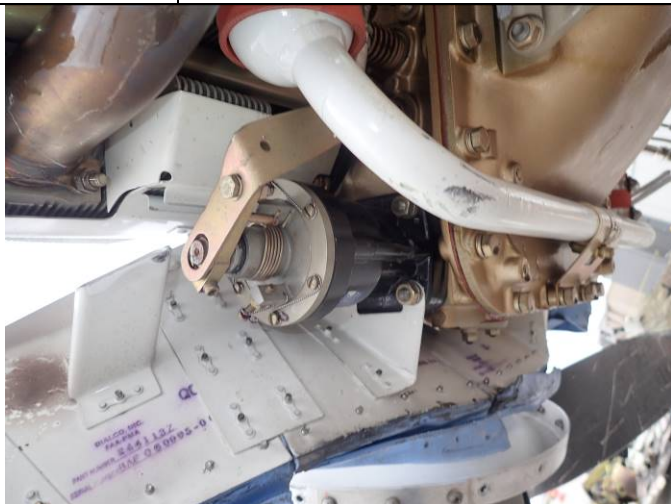
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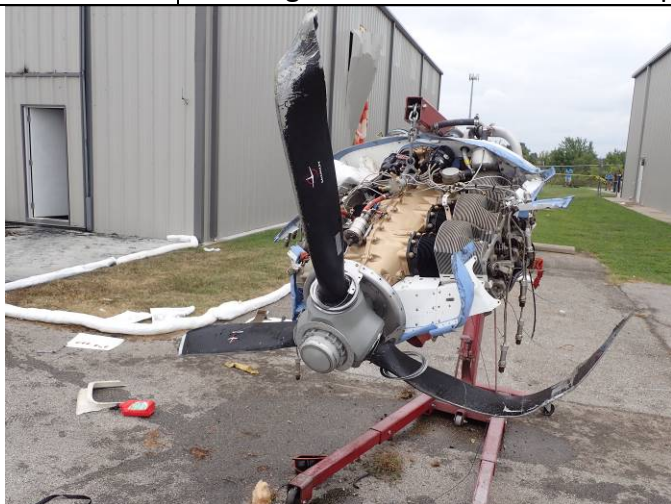
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PROPELLER

PROPELLER GOVERNOR	Manufacturer: Not observed	P/N: Not observed	S/N: Not observed
Condition:	The propeller governor remained attached to its installation point and displayed minor impact damage signatures. The propeller control rod end remained secure to the propeller control arm. There were no anomalies noted.		



PROPELLER	Manufacturer: McCauley	P/N: D3A32C409-C	S/N: 912714
Condition:	The three blade, constant speed propeller remained attached to the crankshaft and displayed impact damage signatures. All three propeller blades remained within the propeller hub and displayed impact damage signatures. The propeller blade marked "A" displayed leading edge gouging, aft bending deformation and twisting deformation. The blade marked "B" displayed a significant leading edge gouge and a portion of the blade tip had broken free from the rest of the blade; the blade also displayed minor twisting deformation. The blade marked "C" displayed leading edge gouges, a significant amount of twisting deformation of the blade tip, and a significant amount of blade polishing at the tip.		



Propeller



Blade "A"

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Blade "B"



Blade "C"