



ENGINE EXAMINATION REPORT

ENGINE MODEL	IO-470-L
ENGINE SERIAL NUMBER	CS232184.R
AIRCRAFT MAKE & MODEL	Beechcraft 95-B55
AIRCRAFT SERIAL NUMBER	TC-1256
AIRCRAFT REGISTRATION	N323MT
FILE NUMBER	18-373

NAME	SIGNATURE	DATE
Kurt Gibson		06/19/2019

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GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	06/11/2019	NTSB ACCIDENT #	ERA19LA136
FACILITY	Florida Air Recovery	NTSB INVESTIGATOR	Peter Wentz
ADDRESS	[REDACTED] [REDACTED]	FAA INVESTIGATOR	Conner McCauley
		ACCIDENT DATE	03/25/2019
		ACCIDENT LOCATION	Clewiston, Florida

ENGINE INFORMATION

ENGINE POSITION	Right
TOTAL TIME	1002.9
TIME SOH	88.0
TYPE & TIME SLI	15.6 hobbs hours since the last annual inspection
BUILD DATE	05/19/1979
IN SERVICE DATE	07/25/1979

Significant logbook information:

The last annual inspection was performed on 12/28/2018 at a hobbs time of 1195.3. The engine was disassembled and overhauled on 06/10/2018 at a hobbs time of 1122.9; according to the entry the following overhauled components were installed: "fuel spider" (manifold valve), the "fuel control" (throttle and metering assembly), fuel pump, magnetos and harness.

Report Summary:

Search Code(s):

15-12-68

There were no anomalies that would have prevented the engine from operating normally.

Disposition of engine following exam:

The engine remained at Florida Air Recovery in Fort Pierce, Florida.

INSPECTION WITNESSES			
NAME	Kurt Gibson	NAME	Peter Wentz
ADDRESS	Mobile, Alabama	ADDRESS	Eastern Region
ORGANIZATION	Continental Aerospace Technologies	ORGANIZATION	NTSB
PHONE		PHONE	
NAME	Conner McCauley	NAME	
ADDRESS	Miramar, Florida	ADDRESS	
ORGANIZATION	FAA	ORGANIZATION	
PHONE		PHONE	
NAME		NAME	
ADDRESS		ADDRESS	
ORGANIZATION		ORGANIZATION	
PHONE		PHONE	

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The engine had been removed from the airframe prior to the engine examination. The engine displayed impact damage signatures with most of the damage occurring to the forward portions of the engine. The three blade, constant speed propeller remained attached to the propeller flange; however, the propeller flange had broken free from the rest of the crankshaft. According to the FAA the propeller was found at the accident site. The crankcase displayed minor impact damage and there were no signs of a catastrophic internal engine failure. All six cylinders remained attached to their cylinder bays and were undamaged.

Both magnetos remained attached to their installation points and were undamaged. The ignition harness remained attached to both of the magnetos and to each spark plug and there was no damage noted to 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 and was undamaged; the fuel lines were secured to the fuel pump and there were no signs of fuel leaks around the pump. The throttle and metering assembly remained attached to its installation point and was undamaged; the fuel lines remained secured to the assembly and there were no signs of fuel leaks. The fuel manifold valve and nozzles remained attached to their installation points and were undamaged; there were no signs of fuel leaks and all of the fuel lines were secure.

The exhaust system remained attached to the engine and was undamaged; there were no signs of exhaust leaks noted. The induction system remained attached to the engine and displayed minor impact damage to the balance tube. There were no signs of induction leaks noted.

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ENGINE TEARDOWN AND COMPONENT EXAMINATION

EXHAUST SYSTEM

Condition:

The exhaust system remained attached to the engine and was undamaged. There were no signs of exhaust leaks noted with any of the exhaust components.



INDUCTION SYSTEM

Condition:

The induction system remained intact and displayed minor impact damage to the balance tube. There were no signs of induction leaks around any of the intake components. After the throttle and metering assembly was removed along with two induction pipes the internal portions of the induction system was inspected; there were no blockages or other anomalies noted.



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IGNITION SYSTEM

LEFT MAGNETO

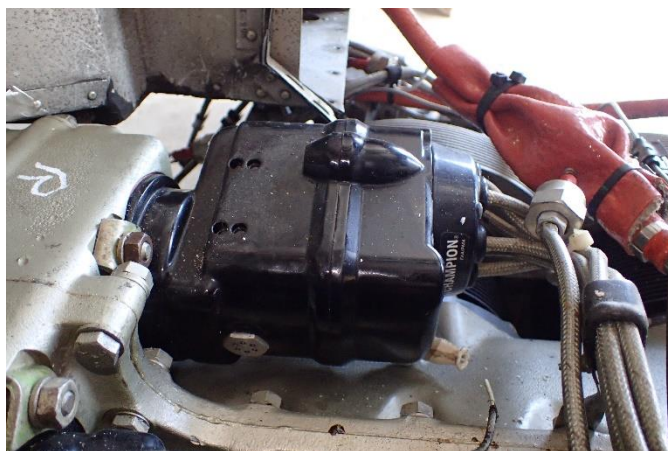
Manufacturer: Slick

P/N: Not observed

S/N: Not observed

Condition:

The magneto remained attached to its installation point and was undamaged. During crankshaft rotation it was noted that the impulse coupling would operate. During impulse coupling operation it was observed that the magneto was capable of producing a spark to each ignition lead end in the correct order and was in sync with the right magneto. There were no anomalies noted with the magneto.



RIGHT MAGNETO

Manufacturer: Slick

P/N: 6310

S/N: 16110297

Condition:

The magneto remained attached to its installation point and was undamaged. During crankshaft rotation it was noted that the impulse coupling would operate. During impulse coupling operation it was observed that the magneto was capable of producing a spark to each ignition lead end in the correct order and was in sync with the left magneto. There were no anomalies noted with the magneto.



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IGNITION HARNESS

Manufacturer: Slick

P/N: RH: M2379, LH: M2380

S/N: Not marked

Condition:

The ignition harness remained attached to both magnetos and to each spark plug. There were no signs of damage to the ignition leads. During magneto impulse coupling operation, it was noted that each ignition lead was capable of conducting a spark from the magneto to the ignition lead end. There were no anomalies observed.



SPARK PLUGS

Manufacturer: Champion

P/N: RHB32E

Condition:

All of the spark plugs remained installed in their cylinders and were undamaged. The top spark plugs were removed, and the electrodes were visually examined; the bottom spark plug electrodes were examined using a lighted borescope. All of the electrodes displayed normal operating signatures and most of the spark plugs were in a normal worn out condition. There were no anomalies noted that would have prevented normal operation.



#1 Top Spark Plug



#1 Bottom Spark Plug

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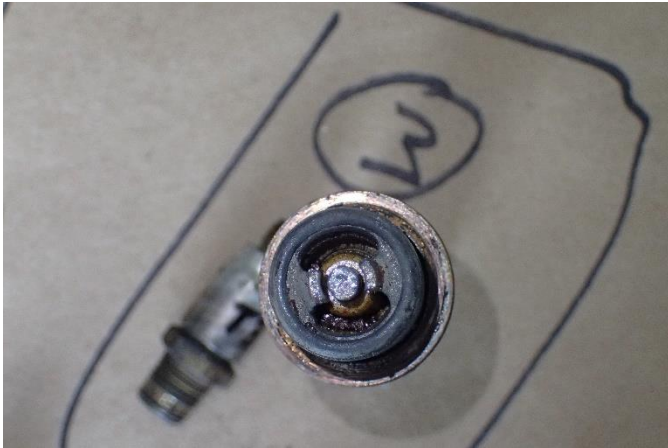
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#3 Top Spark Plug



#3 Bottom Spark Plug



#5 Top Spark Plug



#5 Bottom Spark Plug



#2 Top Spark Plug



#2 Bottom Spark Plug

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#4 Top Spark Plug



#4 Bottom Spark Plug



#6 Top Spark Plug



#6 Bottom Spark Plug

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FUEL SYSTEM

FUEL PUMP

Manufacturer: CMI

P/N: 646212-9

S/N: B00KA304R

Condition:

The fuel pump remained attached to its installation point and was undamaged. The fuel pump was removed, and it was noted that the fuel pump drive coupling remained intact. The fuel pump was primed using fuel and the fuel pump inlet fuel line was submersed in the fuel. The fuel pump drive shaft was then rotated using an electric drill and it was noted that the fuel pump was capable of pumping the fuel. There were no anomalies noted.



THROTTLE BODY METERING UNIT

Manufacturer: CMI

P/N: 625219-2

S/N: H099301AR

Condition:

The throttle and metering assembly remained attached to its installation point and was undamaged. The mixture control arm and the throttle control arms remained secured to their shafts and were capable of movement; it was noted that the full throttle stop pin was not installed and the brass housing was worn which allowed the throttle valve to move past the full throttle position. The fuel inlet screen was removed and was noted to be clear of contaminants.

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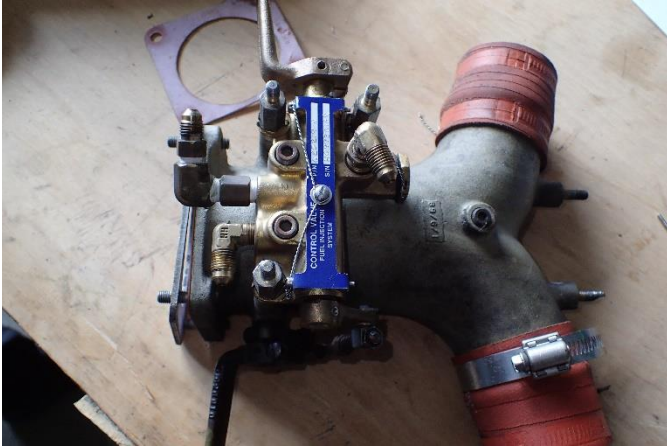
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FUEL MANIFOLD VALVE

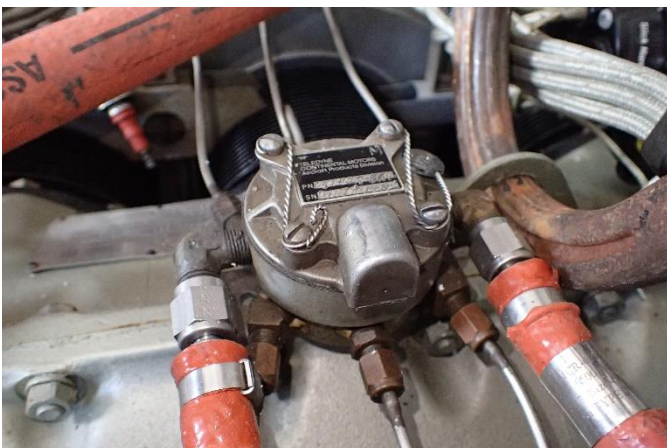
Manufacturer: CMI

P/N: 631427-3A4

S/N: D117904RC

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 examined. The spring, plunger, and diaphragm displayed normal operating signatures and the screen was clear of contaminants. It was noted that the housing displayed a significant amount of discoloration that was orange in color.



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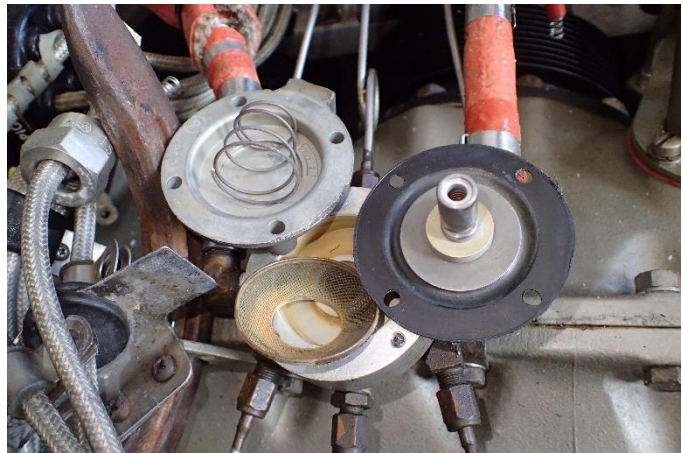
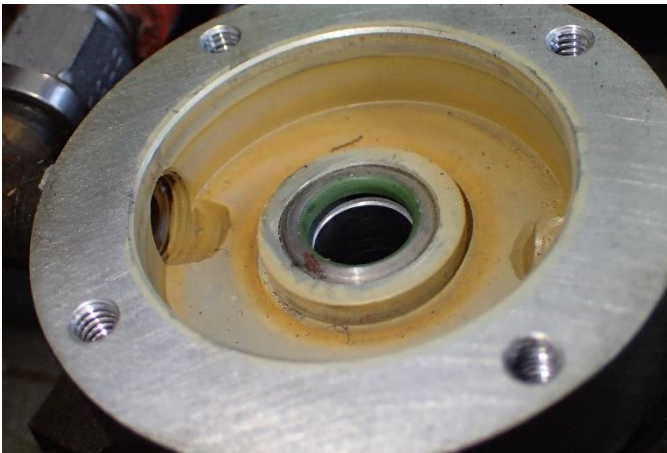
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FUEL NOZZLES AND LINES

Manufacturer: CMI

Position	#1	#3	#5	#2	#4	#6
Size	D12C	D12C	D12C	D12C	D12C	D12C
Condition:	All of the fuel nozzles remained installed in their cylinders and were undamaged. The nozzles were removed, and it was noted that all of the nozzles were unobstructed. There were no anomalies noted.					

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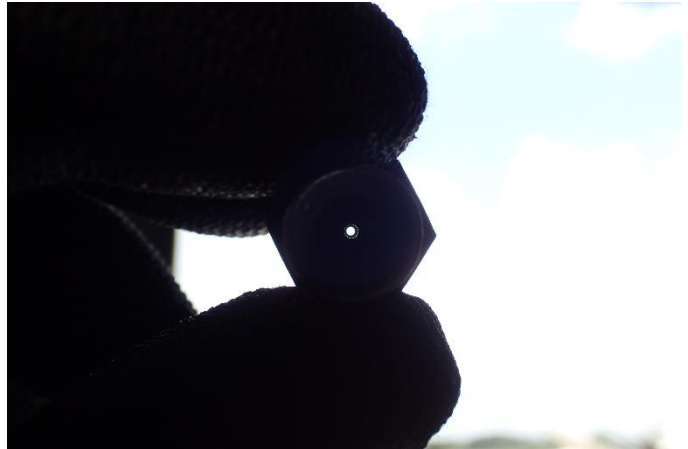
#1 Nozzle



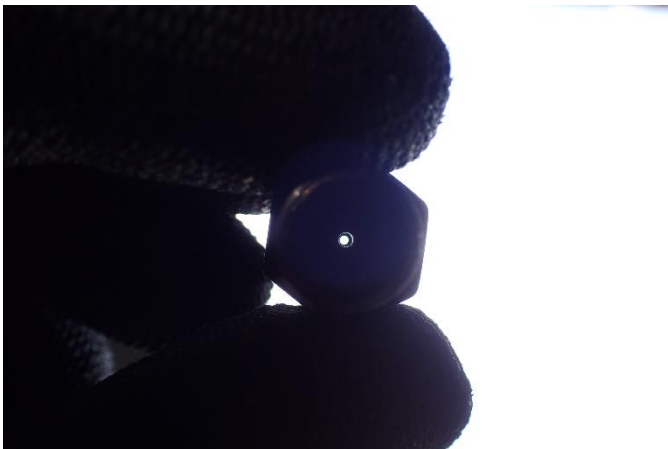
#3 Nozzle



#5 Nozzle



#2 Nozzle



#4 Nozzle



#6 Nozzle

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LUBRICATION SYSTEM

OIL SUMP

Condition:

The oil sump remained intact and displayed minor impact damage in the form of denting. There were no anomalies noted.



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 remained attached to its installation point and was undamaged. The oil pump was removed, and the oil pump drive gears and housing were visually examined; the components displayed normal operating signatures. There were no anomalies observed.



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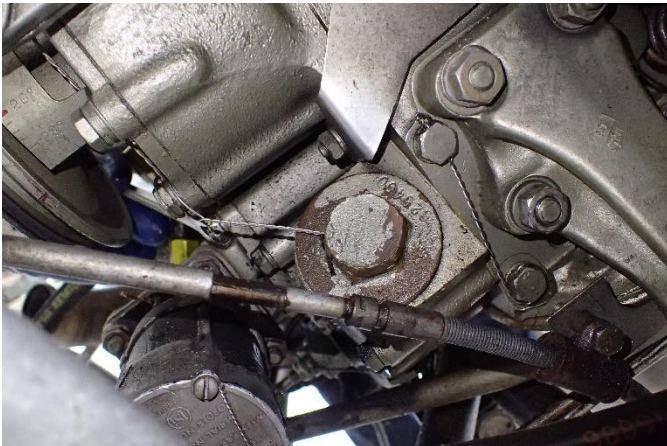
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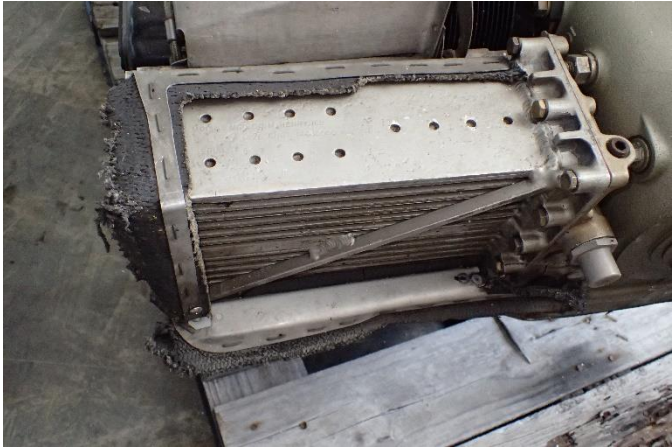
OIL SCREEN

Condition:

The oil screen remained secured in its installation point and there were no signs of impact damage. The oil screen was removed and visually inspected; the screen contained material consistent with carbon and there were no signs of metallic material within the screen. There were no anomalies noted.



OIL COOLER	Manufacturer: Modine	P/N: 630050	S/N: 867
Condition:	The oil cooler remained attached to its installation point and was undamaged. There were no anomalies observed.		



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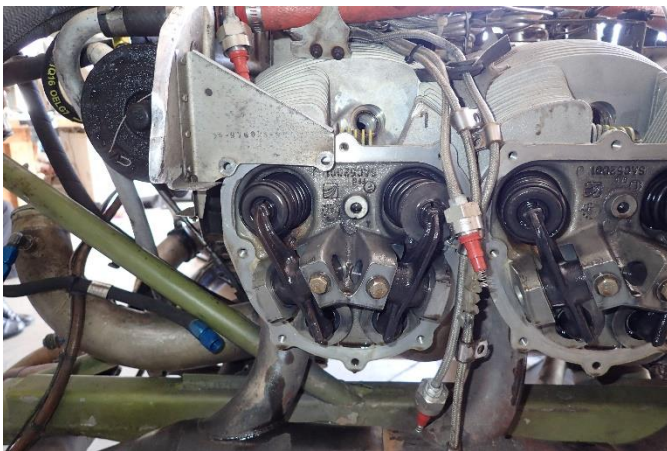
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CYLINDERS

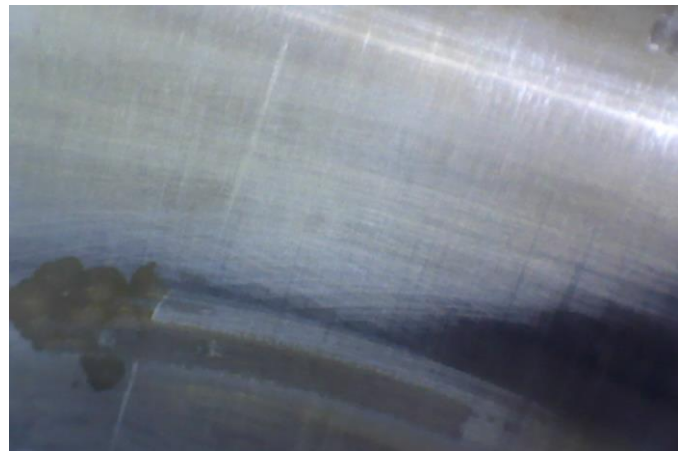
CYLINDERS

Condition:

All of the cylinders remained attached to their cylinder bays and were undamaged. The cylinders were inspected using a lighted borescope; the cylinder bores, piston faces, and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures. During crankshaft rotation all six cylinders displayed good thumb compression and suction and all of the rocker arms and valves operated normally during crankshaft rotation.



#1 Cylinder Overhead



#1 Cylinder Bore



#3 Cylinder Overhead



#3 Cylinder Bore

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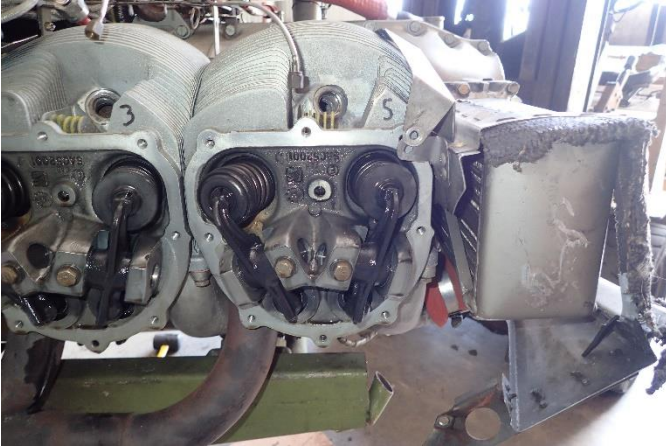
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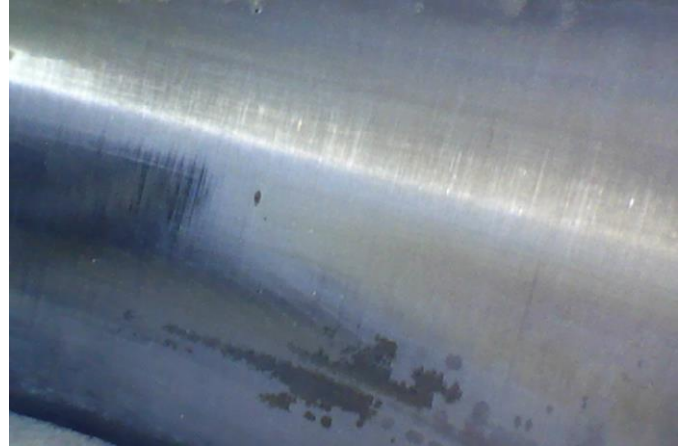
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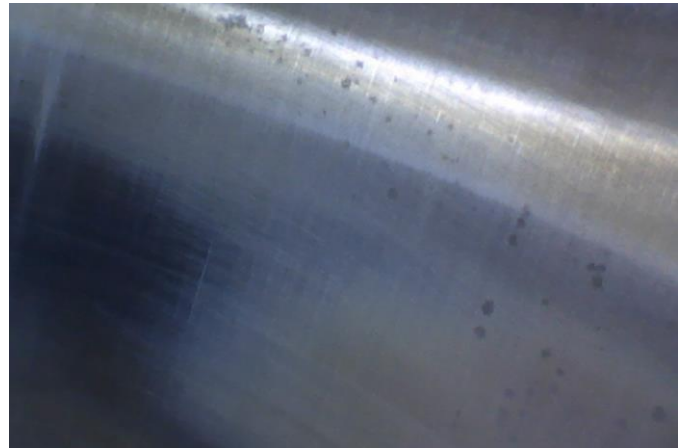
#5 Cylinder Overhead



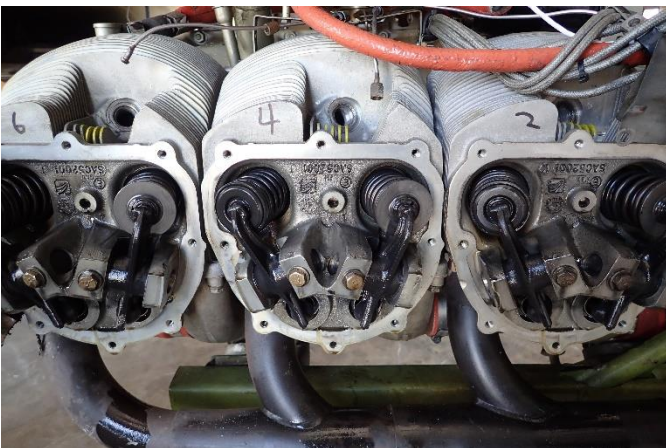
#5 Cylinder Bore



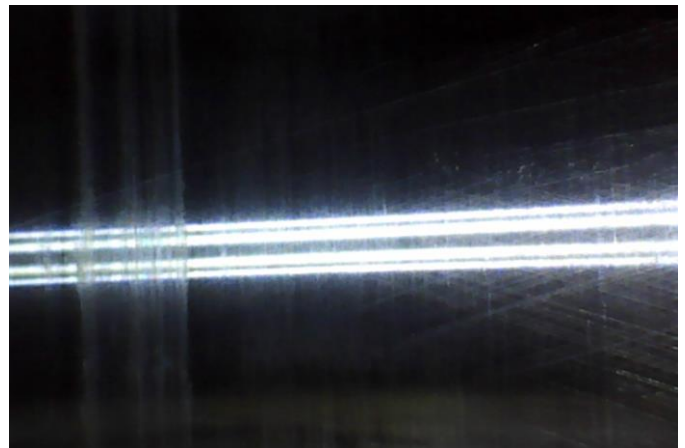
#2 Cylinder Overhead



#2 Cylinder Bore



#4 Cylinder Overhead



#4 Cylinder Bore

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#6 Cylinder Overhead



#6 Cylinder Bore

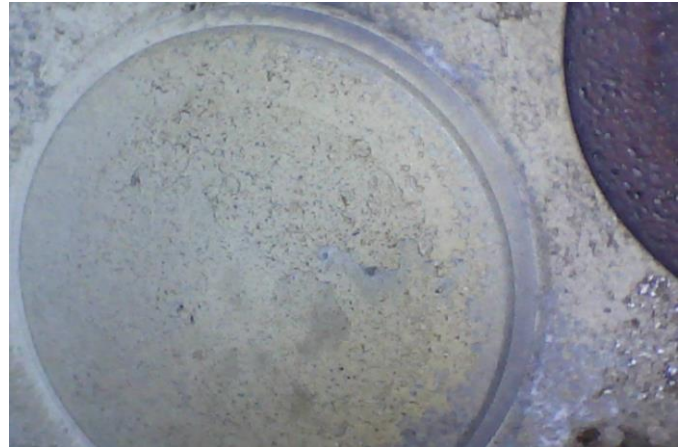
VALVES AND GUIDES

Condition:

The valve heads were inspected using a lighted borescope; the valve heads displayed normal operating and combustion signatures. The valve springs and stems displayed normal operating and lubrication signatures. During crankshaft rotation all of the valves operated normally. There were no anomalies observed.



#1 Exhaust Valve



#1 Intake Valve

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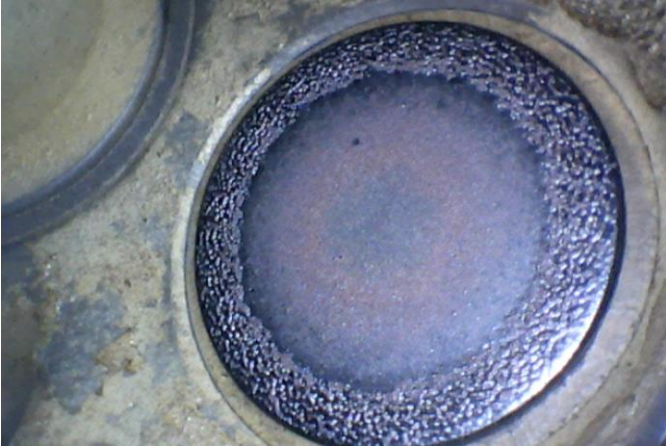
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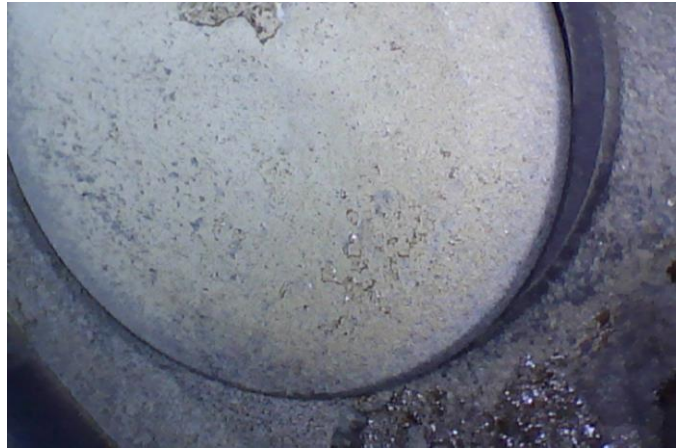
#3 Exhaust Valve



#3 Intake Valve



#5 Exhaust Valve



#5 Intake Valve



#2 Exhaust Valve



#2 Intake Valve

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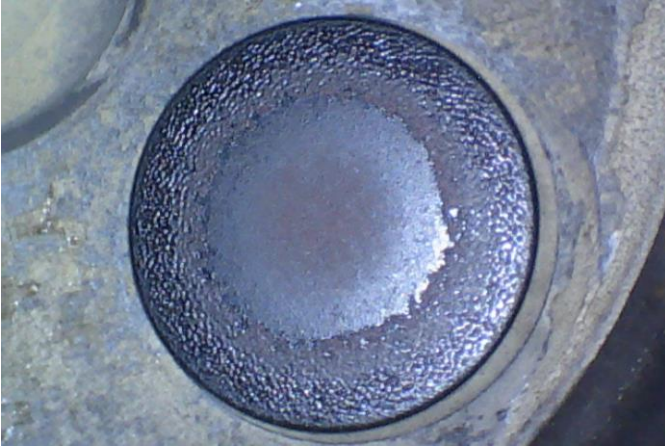
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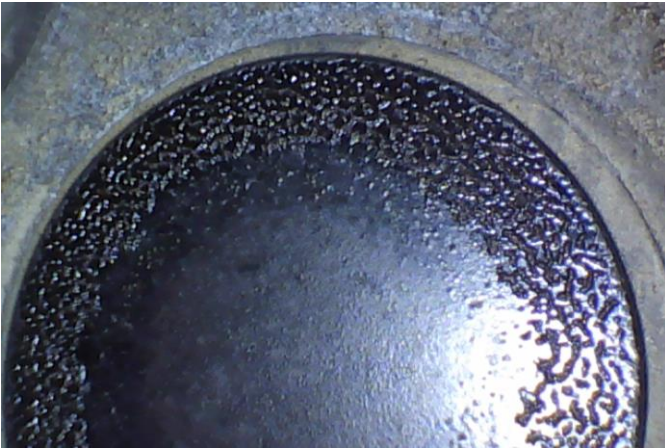
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#4 Exhaust Valve



#4 Intake Valve



#6 Exhaust Valve



#6 Intake Valve

ROCKER ARMS AND SHAFTS

Condition:

All of the rocker arms remained secured to their installation points and were undamaged. The rocker arms displayed normal operating and lubrication signatures. During crankshaft rotation all of the rocker arms operated normally. There were no anomalies observed.

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PISTONS

Piston P/N: Not observed

Condition:

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



#1 Piston



#3 Piston



#5 Piston



#2 Piston

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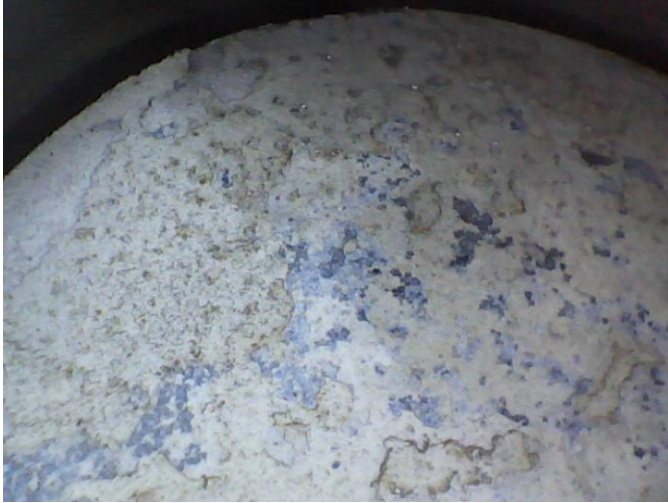
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#4 Piston



#6 Piston

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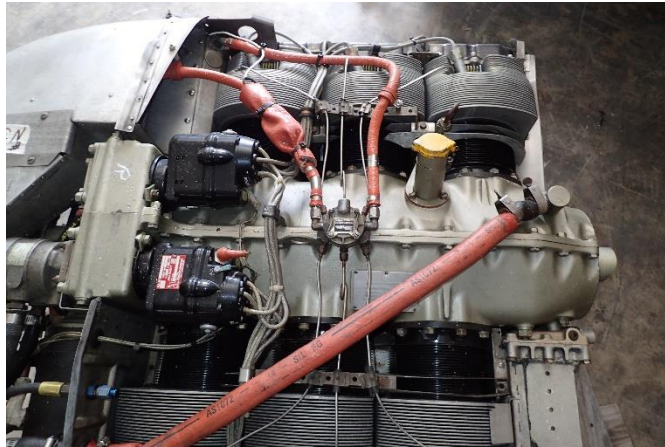
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CRANKCASE ASSEMBLY

CRANKCASE	Casting Number:	1-3-5: Not observed	2-4-6: Not observed	S/N: 4A117
Condition:	The crankcase remained intact and was undamaged. There were no signs of a catastrophic internal engine failure noted. There were no anomalies observed.			



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CRANKSHAFT ASSEMBLY

CRANKSHAFT

Forging Number:
Inaccessible

S/N: B588

Heat code: Inaccessible

Condition:

The propeller flange had broken free from the crankshaft and remained attached to the propeller; the damage was consistent with impact damage. The crankshaft was rotated using a tool inserted into one of the accessory drive gears; the crankshaft rotated normally, and continuity was established between the crankshaft, camshaft, connecting rods, and associated components. There were no anomalies noted.



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.

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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 observing magneto impulse coupling operation. The drive gears operated normally.

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ACCESSORIES

STARTER

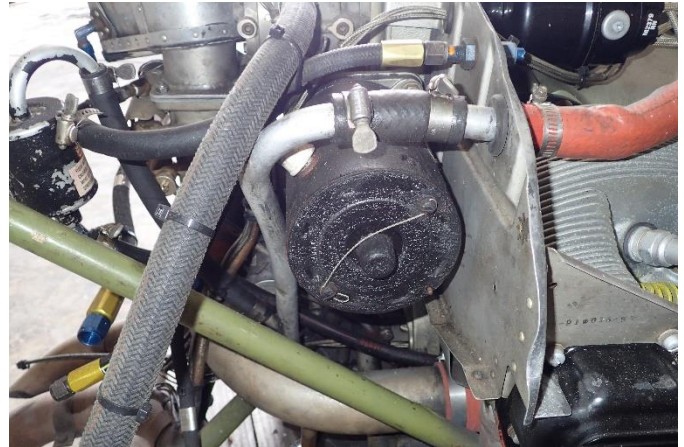
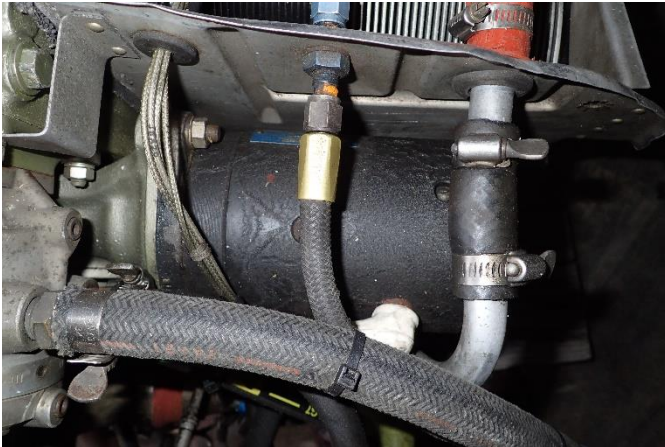
Manufacturer: Prestolite

P/N: H? 4003

S/N: D048158.23

Condition:

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

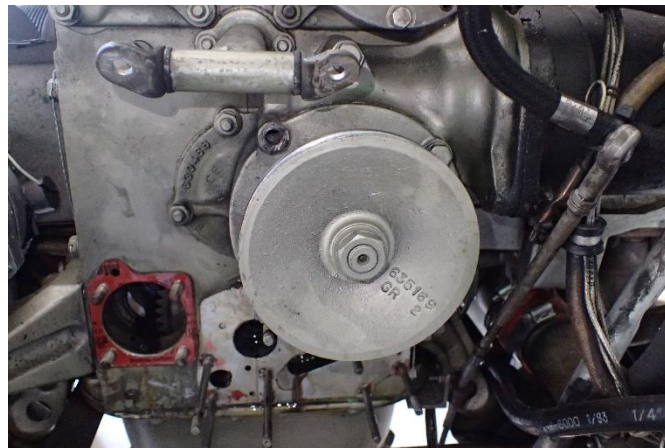


STARTER ADAPTER

P/N: Not observed

Condition:

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



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ALTERNATOR

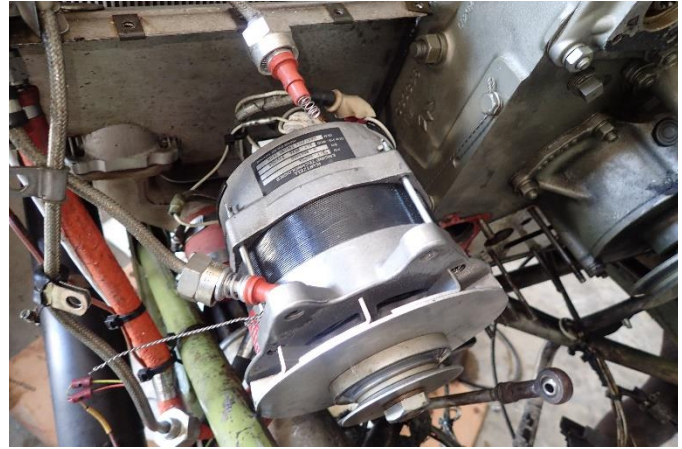
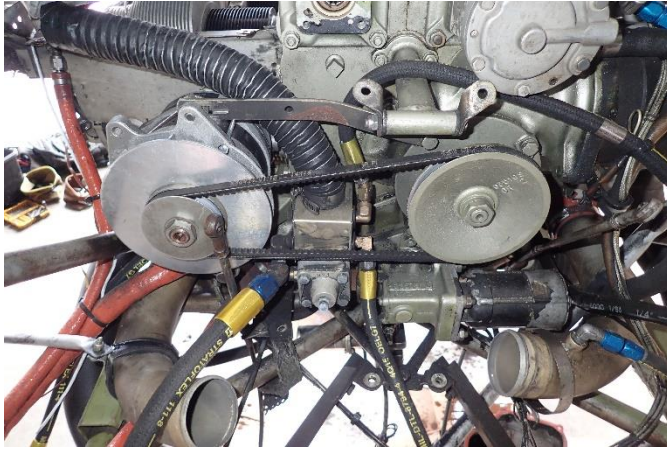
Manufacturer: Hartzell

P/N: ALT-8520R

S/N: H-S061066

Condition:

The alternator remained attached to its installation point and was undamaged. The alternator belt remained secured and the alternator drive rotated normally. There were no anomalies observed.



VACUUM PUMP

Manufacturer: Garwin

P/N: G455

S/N: 60435

Condition:

The vacuum pump remained attached to its installation point and was undamaged. There were no anomalies observed.



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PROPELLER

PROPELLER GOVERNOR	Manufacturer: Woodward	P/N: B210438	S/N: 1584612 M
Condition:	The governor remained attached to its installation point and was undamaged. The propeller control arm was capable of normal movement and there were no signs of oil leaks around the governor. There were no anomalies observed.		



PROPELLER	Manufacturer: Hartzell	P/N: Not observed	S/N: Not observed
Condition:	The three blade, constant speed propeller remained attached to the propeller flange; however, the propeller flange had broken free from the rest of the crankshaft which was consistent with impact damage. All three propeller blades remained within the propeller hub and the blades appeared to be in the feathered position. The propeller blade marked "A" displayed minor twisting and leading-edge polishing. The propeller blade marked "B" displayed minor aft bending deformation and the propeller blade marked "C" was undamaged.		



Propeller



Propeller blade "A"

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Propeller blade "B"



Propeller blade "C"