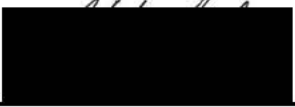




Continental Motors

ENGINE FIELD INSPECTION REPORT

ENGINE MODEL	TSIO-520-M
ENGINE SERIAL NUMBER	283183-R
AIRCRAFT MAKE & MODEL	Cessna TU206G
AIRCRAFT SERIAL NUMBER	U20604986
AIRCRAFT REGISTRATION	N206HL
FILE NUMBER	12-214

NAME	SIGNATURE	DATE
Kurt Gibson		11/02/2015

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GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	10/16/2015	NTSB ACCIDENT #	WPR16LA003
FACILITY	AvTech Services	NTSB INVESTIGATOR	Tealeye Cornejo
ADDRESS	506 23 rd St NE Auburn, WA 98002	FAA INVESTIGATOR	William Shinn
		ACCIDENT DATE	10/02/2015
		ACCIDENT LOCATION	Fall City, Washington

ENGINE INFORMATION

ENGINE POSITION	Single Engine
TOTAL TIME	Logbooks were not provided at the time of this report's writing
TIME SOH	Logbooks were not provided at the time of this report's writing
TYPE & TIME SLI	Logbooks were not provided at the time of this report's writing
BUILD DATE	09/14/1992
IN SERVICE DATE	08/13/1993

Significant logbook information:

The logbooks were not provided at the time of this report's writing

Report Summary:

Search Code(s):

50-02-03

The examination of this engine revealed the #2 top spark plug was inoperative and displayed a significant amount of combustion deposits on the electrodes. There were no further anomalies that would have prevented normal operation of the engine.

Disposition of engine following exam:

The engine was to be moved to the AvTech Services' storage facility.

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INSPECTION WITNESSES

NAME	Kurt Gibson	NAME	William Shinn
ADDRESS	Mobile, Alabama	ADDRESS	Seattle, Washington
ORGANIZATION	Continental Motors	ORGANIZATION	FAA
PHONE		PHONE	
NAME	Andrew Hall	NAME	Jon Hirsch
ADDRESS	Wichita, Kansas	ADDRESS	Wichita, Kansas
ORGANIZATION	Textron Aviation	ORGANIZATION	Textron Aviation
PHONE		PHONE	
NAME		NAME	
ADDRESS		ADDRESS	
ORGANIZATION		ORGANIZATION	
PHONE		PHONE	

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PAGE 4 of 26**EXTERNAL INSPECTION OF ENGINE**

The engine remained attached to the airframe through the engine mounts, cables, wires, and hoses. The engine remained intact and displayed minor impact damage signatures. All six cylinders remained attached to the engine and were undamaged. There were no holes noted in the crankcase and no impact damage noted to the crankcase. The three blade, constant speed propeller remained attached to the crankshaft and displayed damage consistent with impact damage. Two of the propeller blades displayed chordwise scratches and aft bending deformation; the third propeller blade was undamaged.

The fuel pump remained attached to its installation point and was undamaged. All of the fuel lines were secured and there were no signs of fuel leaks. The throttle and fuel metering assembly remained attached to its installation point and displayed some impact damage signatures. Both of the control arms remained secured to their shafts and the control cable rod ends were secured to their control arms. It was noted that the throttle control rod end was bent at an approximate 45° angle; the damage was consistent with impact damage. 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.

Both of the magnetos remained attached to their mounting locations and were undamaged. The ignition harness remained attached to both of the magnetos and to each of the spark plugs; the ignition harness was undamaged. All of the spark plugs remained installed in their cylinders and there was no damage noted.

The intake system displayed damage consistent with impact damage; there were no signs of intake leaks noted. The exhaust system displayed minor impact damage signatures and there were no abnormalities noted with the exhaust system.

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ENGINE TEARDOWN AND COMPONENT EXAMINATION

EXHAUST SYSTEM

Condition:

The exhaust system remained secured to each of the cylinders and to the turbocharger. The exhaust system displayed minor damage consistent with impact damage. There were no abnormalities noted with the exhaust system.



INDUCTION SYSTEM

Condition:

The induction system sustained some damage consistent with impact damage. All of the induction tubes and clamps were secure and there were no signs of induction leaks. There were no abnormalities noted with the induction system.



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IGNITION SYSTEM

LEFT MAGNETO

Manufacturer: CMI

P/N: 10-349350-4

S/N: F259239F

Condition:

The left magneto remained attached to its mounting location and was undamaged. During crankshaft rotation it was noted that the impulse couplings operated normally. During impulse coupling operation it was noted that the magneto was capable of producing a spark on all six posts and would fire in the correct order. It was noted that the left and right magnetos would produce a spark for the same cylinder at the same time.



RIGHT MAGNETO

Manufacturer: CMI

P/N: 10-349350-5

S/N: F299220F

Condition:

The right magneto remained attached to its mounting location and was undamaged. During crankshaft rotation it was noted that the impulse couplings operated normally. During impulse coupling operation it was noted that the magneto was capable of producing a spark on all six posts and would fire in the correct order. It was noted that the left and right magnetos would produce a spark for the same cylinder at the same time.



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**IGNITION
HARNESS**

Manufacturer: Skytronics

P/N: Not marked

S/N: Not marked

Condition:

The ignition harness remained secured to both of the magnetos and to each of the spark plugs. During magneto impulse coupling operation it was noted that all of the ignition leads were capable of conducting a spark from the magneto to the spark plug.

**SPARK PLUGS**

Manufacturer: Autolite

P/N: URHB32S

Condition:

All of the spark plugs were secured to their cylinders and to their ignition leads. All of the spark plugs were removed for inspection and testing. It was noted that the #2 top spark plug insulator was broken inside the spark plug and the spark plug electrodes displayed a significant accumulation of combustion deposits. The inside of the #2 top spark plug and insulator displayed discoloration consistent with the ignition lead arcing to the inside of the spark plug. All of the other spark plugs displayed normal operating and wear signatures. All of the spark plugs were reattached to their ignition leads. During impulse coupling operation it was noted that the #2 top spark plug would not conduct a spark between the center and ground electrodes; all of the other spark plugs were capable of conducting a spark between the center and ground electrodes. There were no further anomalies noted.

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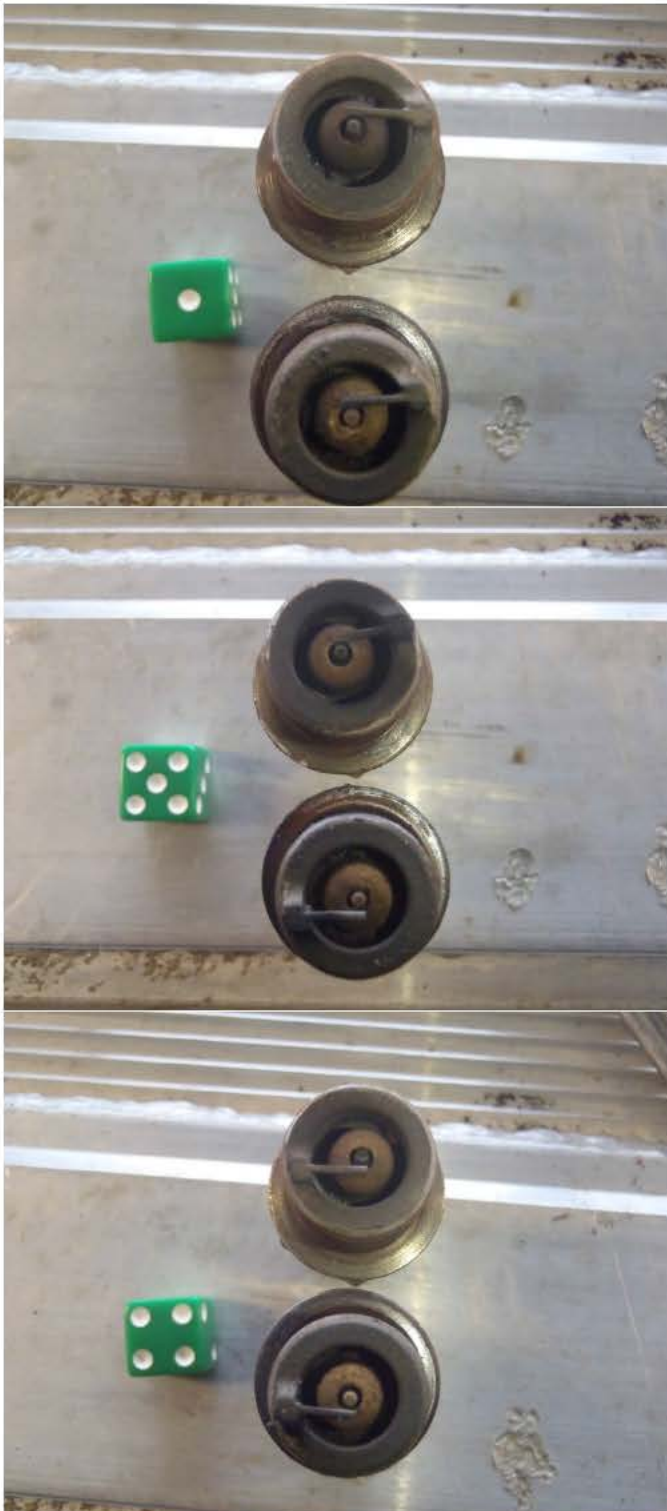
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#2 Top Spark Plug



#2 Top Spark Plug Insulator

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FUEL SYSTEM

FUEL PUMP

Manufacturer: CMI

P/N: 646768-1

S/N: 4249216BR

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 was intact and the fuel pump drive was capable of rotation by hand; it was noted that during hand rotation of the fuel pump drive a small amount of fuel was pumped out. The fuel pump was disassembled and the internal components were visually inspected. The internal components displayed normal operating signatures. There were no anomalies noted with the fuel pump.



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THROTTLE BODY
METERING UNIT

Manufacturer: CMI

P/N: 629703-11

S/N: H219213AR

Condition:

The throttle and fuel metering assembly remained attached to its mounting location and displayed some impact damage signatures. Both of the control arms remained secured to their shafts and the control cable rod ends were secured to the control shafts. The throttle control rod end was bent at an approximate 45° angle; the damage was consistent with impact damage. The throttle and fuel metering assembly was removed and disassembled for a visual inspection. The internal components displayed normal operating signatures and the fuel inlet screen was clear of any contaminants. There were no anomalies noted with the throttle and fuel metering assembly.



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Mixture Control



Throttle Fuel Control

FUEL MANIFOLD VALVE	Manufacturer: CMI	P/N: 6343274A22	S/N: H244208CR
Condition:	The fuel manifold valve remained attached to its installation point and was undamaged. The manifold valve was disassembled and the internal components were inspected. All of the internal components displayed normal operating signatures and the screen was clear of contaminants. There were no anomalies noted with the manifold valve.		



FUEL NOZZLES AND LINES	Manufacturer: CMI					
Position	#1	#3	#5	#2	#4	#6
Size	14C	14C	14C	14C	14C	14C
Condition:	All of the fuel nozzles remained installed in their cylinders and were undamaged. The fuel nozzles were removed and visually inspected; it was noted that the #6 fuel nozzle displayed a significant amount of oxidation on the outside of the nozzle. All of the nozzles were found to be clear of any blockages.					

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#1



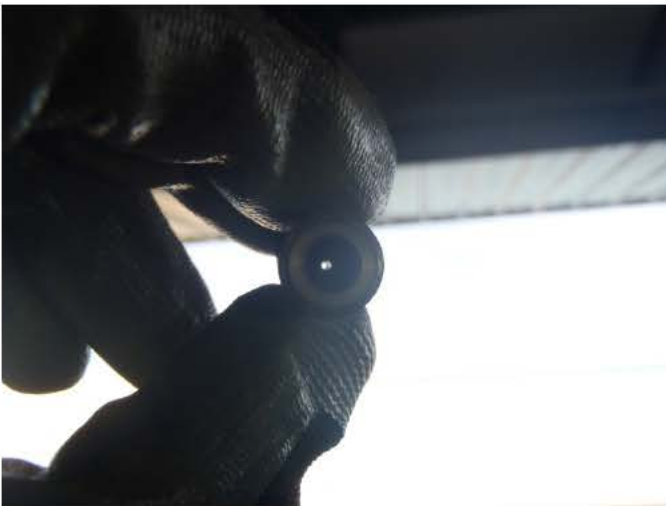
#3



#5



#2



#4



#6

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LUBRICATION SYSTEM

OIL SUMP

Condition:

Only a small portion of the oil sump was visible to the investigators. The visible portion of the oil sump was undamaged and there were no anomalies noted.



OIL FILTER

Manufacturer: Tempest

P/N: AA48109

Condition:

The remote oil filter was removed and the oil filter element was removed from the housing. There were no metallic particles or other abnormal contaminants noted in the oil filter pleats.



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OIL COOLER

Manufacturer: Illegible

P/N: Illegible

S/N: Illegible

Condition:

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



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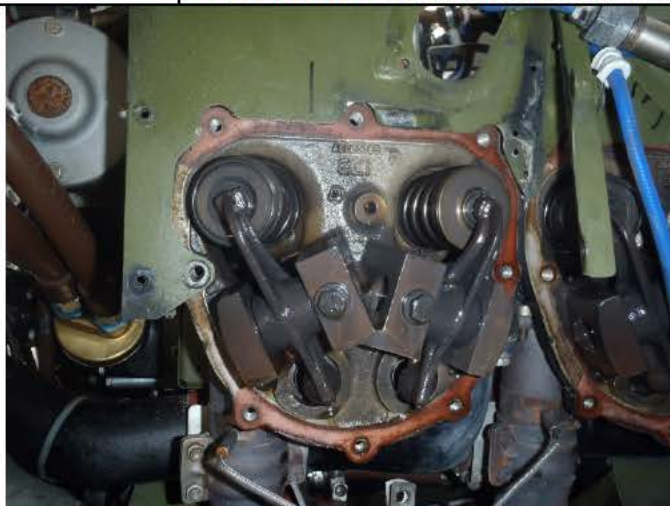
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CYLINDERS

CYLINDERS	Manufacture: ECI	P/N: Inaccessible	S/N: Inaccessible
Condition:	All of the cylinders remained attached to their cylinder bays and were undamaged. All of the rocker arm box covers were removed and the overhead components were inspected, the overhead components displayed normal operating and lubrication 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. During crankshaft rotation it was noted that all of the cylinders displayed good thumb compression and suction. There were no anomalies noted with any of the cylinders.		



#1



#3



#5



#2

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#4



#6

VALVES AND GUIDES

Condition: The valve heads were inspected using a lighted borescope, all of the valve heads displayed normal operating and combustion signatures. It was noted that during crankshaft rotation all of the valves operated normally.

ROCKER ARMS AND SHAFTS

Condition: All of the rocker arms displayed normal operating and lubrication signatures. It was noted that during crankshaft rotation all of the rocker arms operated normally.



PISTONS

Piston P/N: Inaccessible

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.

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CRANKCASE ASSEMBLY

CRANKCASE	Casting Number:	1-3-5: Inaccessible	2-4-6: Inaccessible	S/N: 87110?
Condition:	The crankcase was intact and undamaged. There were no anomalies noted with the crankcase.			



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CRANKSHAFT ASSEMBLY

CRANKSHAFT	Forging: Inaccessible	S/N: N08KA028	Heat code: Inaccessible
Condition:	The propeller flange remained attached to the rest of the crankshaft and there were no visible cracks in the crankshaft. The propeller was removed from the crankshaft and the crankshaft was rotated using a hand tool; continuity was established between the crankshaft, camshaft, connecting rods, and all associated components. It was noted that the crankshaft was significantly corroded aft of the propeller flange and forward of the crankshaft seal.		



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. The connecting rods operated normally.	

CAMSHAFT

CAMSHAFT	P/N: Inaccessible	S/N: Inaccessible
Condition:	The operation of the camshaft was verified by rotating the crankshaft and observing rocker arm movement. The camshaft operated normally.	

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ACCESSORIES

STARTER

Manufacturer: Lamar

P/N: PM2407-H

S/N: 85E89006

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 intact and undamaged. There were no anomalies noted with the starter adapter.



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ALTERNATOR

Manufacturer: Plane Power

P/N: AL24-F60C

S/N: 46-124203

Condition:

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



VACUUM PUMP

Manufacturer: Rapco

P/N: Inaccessible

S/N: Inaccessible

Condition:

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



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TURBO

Manufacturer: Inaccessible

P/N: Inaccessible

S/N: Inaccessible

Condition:

The turbocharger remained attached to the exhaust and induction system and was undamaged. The induction tubing going to the compressor section was removed and the compressor was inspected; the compressor blades displayed normal operating signatures and the compressor was capable of rotation by hand with no unusual resistance. There were no anomalies noted with the turbocharger.

**TURBO
CONTROLLER**

Manufacturer: Kelly Aerospace

P/N: 470688-9007

S/N: K0000179

Condition:

The turbocharger controller had broken free from its mounting location and displayed some impact damage signatures. All of the lines remained secured to the controller and there were no anomalies noted.



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WASTEGATE

Manufacturer: Inaccessible

P/N: Inaccessible

S/N: Inaccessible

Condition:

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

**OVERBOOST VALVE**

Manufacturer: Kelly Aerospace

P/N: 470944-9012

S/N: NBR0122

Condition:

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



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PROPELLER

PROPELLER
GOVERNOR

Manufacturer: McCauley

P/N: C290D4-F/T2

S/N: 811432

Condition:

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



PROPELLER

Manufacturer: Hartzell

P/N: PHC-J3YF-1RF

S/N: FP4182B

Condition:

The three blade, constant speed propeller remained attached to the crankshaft and displayed damage consistent with impact damage. Two of the propeller blades displayed chordwise scratches and aft bending deformation; the third propeller blade appeared undamaged.



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Blade "A"



Blade "B"



Blade "C"