



Continental Motors

ENGINE RUN REPORT

ENGINE MODEL	IO-520-CB7B
ENGINE SERIAL NUMBER	236887
AIRCRAFT MAKE & MODEL	Beech 95-C55
AIRCRAFT SERIAL NUMBER	TE-269
AIRCRAFT REGISTRATION	N88FL
FILE NUMBER	15-438

NAME	SIGNATURE	DATE
Nicole L. Charnon		06/14/2016

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EXAMINATION		ACCIDENT DATA	
DATE	June 14 and 15, 2016	NTSB ACCIDENT #	CEN16LA119
FACILITY	Mobile, Alabama	NTSB INVESTIGATOR	Dave Bowling
ADDRESS	2039 Broad Street Mobile, Alabama 36615	FAA INVESTIGATOR	Stephanie Williams
		ACCIDENT DATE	2/27/2016
		ACCIDENT LOCATION	Casey, Illinois

ENGINE INFORMATION

ENGINE POSITION	Right Engine
TOTAL TIME	Unknown
TIME SOH	125.8 hours
TYPE & TIME SLI	Annual Inspection 01/27/2016; Unknown time since last inspection.
SHIPPED DATE	11/10/1982
IN SERVICE DATE	Unknown

Significant logbook information:

Aircraft maintenance records were not received or reviewed. The pilot recorded the same serial numbers for both the left and right engines and it is not clear how much time each engine accumulated. The total time for each engine was not specified and the time since overhaul was reported as 125.8 hours for both engines. The airframe total time was recorded as 4,681.7 hours with the last annual inspection taking place on January 27, 2016.

Report Summary:

Search Code(s):

15-12-68

The engine was placed on the test stand with no modifications to the as-received condition, with the minor exceptions noted on page 5 of this report. The engine started and ran through a number of power settings with no signs of operational distress or anomalies. The engine was able to produce full power and there was no sign of hesitation or stumbling noted during the test run.

Disposition of engine following exam:

The engine was released by the NTSB investigator-in-charge and will be returned to the salvage facility that is storing the aircraft.

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INSPECTION WITNESSES			
NAME	Nicole Charnon	NAME	Greg Eastburn
ADDRESS	Washington, DC	ADDRESS	Mobile, AL
ORGANIZATION	Continental Motors	ORGANIZATION	Continental Motors
PHONE		PHONE	
NAME	Matthew Phillips	NAME	David Bowling
ADDRESS	Mobile, AL	ADDRESS	Denver, CO
ORGANIZATION	Continental Motors	ORGANIZATION	NTSB – Central Region
PHONE		PHONE	

EXTERNAL INSPECTION OF ENGINE

The top of the crate was removed and the engine was documented. The engine was removed from the crate and no external anomalies were observed with the engine components. The throttle body was covered with a bag and the oil seal retainer plates had been removed by the crating facility to facilitate crankshaft placement on a wooden crutch inside the crate.

The airframe components, such as the exhaust gas and cylinder head temperature probes/wires, airframe mount, and cooling baffles remained attached to the engine. The throttle body/fuel metering unit was removed to accommodate the removal of the airframe mount; however, no adjustments were made and the original components were reinstalled for the engine run. The throttle lever and mixture controls remained secured to their respective shafts.



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ENGINE PREPARATION PRIOR TO RUN

There were a number of airframe related items removed in preparation for operation on the CMI test bed, and they include:

Airframe Mount
Cooling Baffle
EGT/CHT probes/wires
Propeller Governor and Control Cable

The following substitute or repaired parts were required for engine operation:

Left and Right side front engine mounts
The oil sump quick drain plug was replaced with a conventional plug
Exhaust risers

The top sparkplugs were removed from their respective cylinders and the #6 top sparkplug was covered in black soot consistent with a carbon fouled condition. A lighted borescope was used to inspect and document the internal cylinder components. No pre-accident anomalies or signs of operational distress were noted on any of the components.

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NOTE: The photos that follow the cylinder number represent that cylinder's piston, intake valve, exhaust valve, and top sparkplug, in that order, unless otherwise specified.

Cylinder #1



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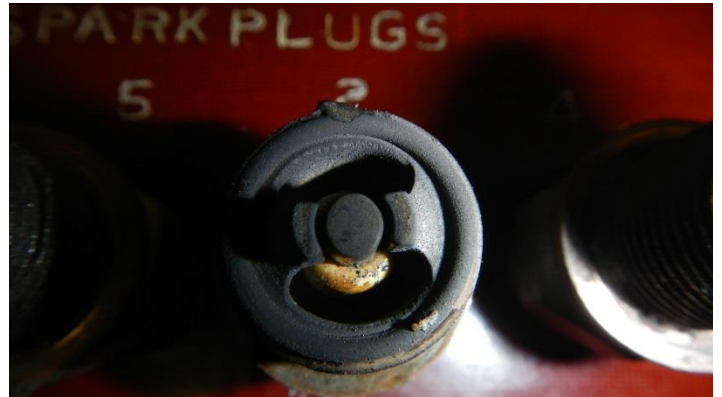
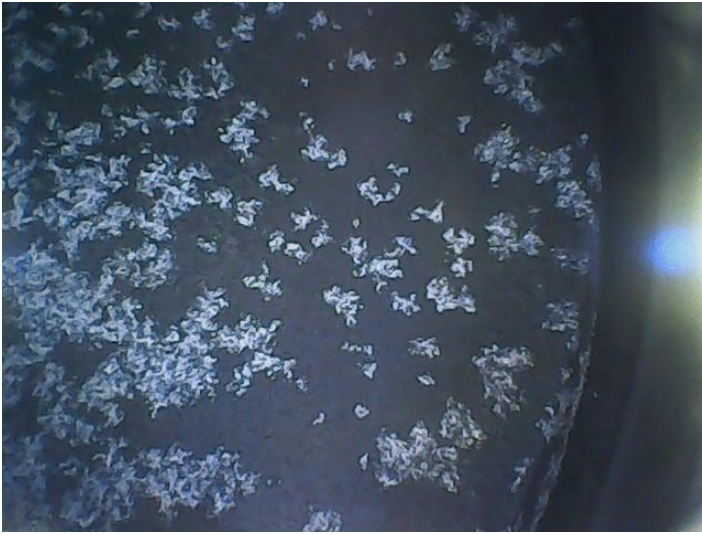
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Cylinder #2



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FILE NUMBER:

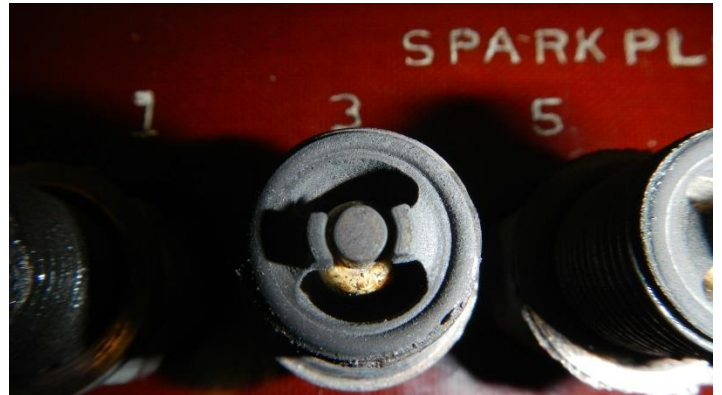
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Cylinder #3



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Cylinder #4



ENGINE RUN REPORT

FILE NUMBER:

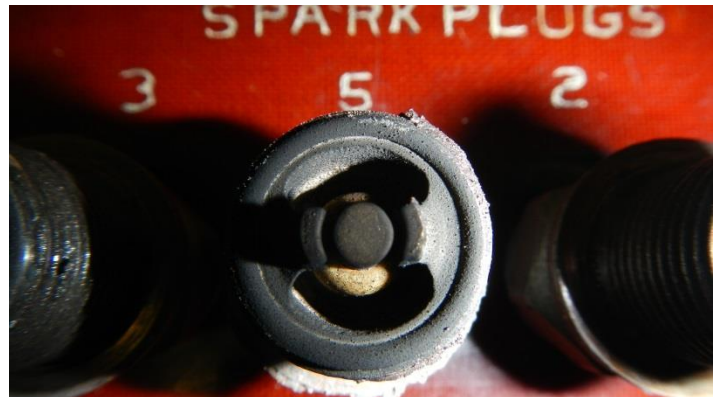
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Cylinder #5



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Cylinder #6



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The magneto-to-engine timing was checked and with the following results:

Magneto-to-Engine Timing (Specified):	Left Magneto:	Right Magneto:
22°BTDC	22°BTDC	23°BTDC

A cylinder leakage test was performed prior to the test run in accordance with the latest revision of CMI Service Bulletin SB03-3 with the engine at room temperature with the following results (master orifice reading – 44 PSI):

Cylinder #1 - 40/80 PSI (rings)

Cylinder #2 - 65/80 PSI (rings)

Cylinder #3 - 74/80 PSI (rings)

Cylinder #4 - 66/80 PSI (exhaust valve)

Cylinder #5 - 55/80 PSI (exhaust valve)

Cylinder #6 - 65/80 PSI (exhaust valve)

(*) – Leakage Source

The engine was not disassembled prior to the engine run. The crankshaft end-play measured 0.008" and the run-out was 0.010".

The engine was then prepared for operation by installing the appropriate thermocouples, pressure lines and test pads for monitoring purposes. The engine was then moved to CMI test cell number 43 and mounted for operation. The engine was fitted with a test club propeller for the IO-520 engine model.

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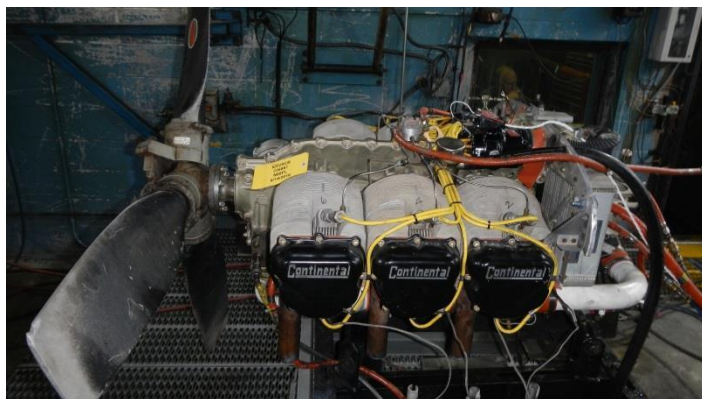
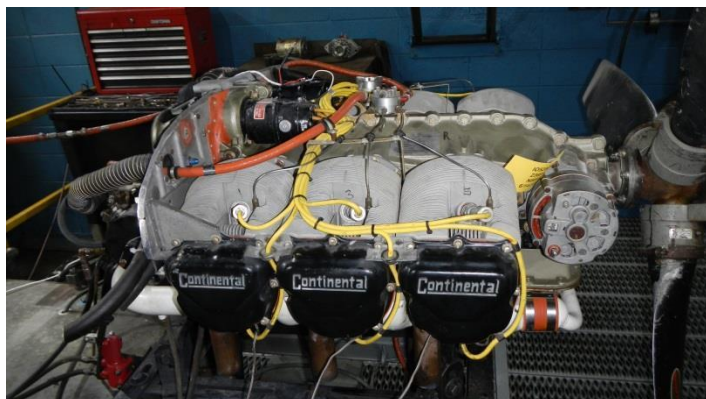
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DESCRIPTION OF RUN

The engine experienced a normal start on the first attempt without hesitation or stumbling in observed RPM. The engine RPM was advanced in steps for warm-up in preparation for full power operation. The engine throttle was advanced to 1200 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to 1600 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to 2450 RPM and held for five (5) minutes to stabilize. The engine throttle was advanced to full open position and held for five (5) minutes to stabilize. The engine throttle was rapidly advanced from idle to full throttle five times where it performed normally without any hesitation, stumbling or interruption in power.

Throughout the test phase, the engine accelerated normally without any hesitation, stumbling or interruption in power and demonstrated the ability to produce rated horsepower.



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A cylinder leakage test was performed after the test run in accordance with the latest revision of CMI Service Bulletin SB03-3 with the engine hot with the following results (master orifice reading – 44 PSI):

Cylinder #1 - 72/80 PSI

Cylinder #2 - 70/80 PSI

Cylinder #3 - 68/80 PSI (rings)

Cylinder #4 - 70/80 PSI

Cylinder #5 - 73/80 PSI

Cylinder #6 - 73/80 PSI

(*) – Leakage Source

The top sparkplugs were removed following the engine run to facilitate the compression test. No anomalies were noted with any of the sparkplugs.



ENGINE RUN PARAMETERS

Time		RPM	MP "Hg	Oil		Fuel				Cell °F	Cylinder Head Temperature ° F					
Reading	Minutes			PSI	° F	Lbs/Hr	Nozzle PSI	Pump PSI	Fuel ° F		# 1	# 2	# 3	# 4	# 5	# 6
1	5	1200	12.3	48	108	INOP	2.25	9.52	81	82	225	221	240	212	221	184
2	5	1600	16.2	46	162	INOP	3.23	13.67	82	82	282	299	277	243	251	207
3	5	2100	23.4	44	185	INOP	6.72	21.68	83	83	336	351	343	300	305	247
4	5	2450	25.2	42	221	INOP	9.91	27.56	89	83	337	435	380	367	342	286
5	5	F/T 2660	28.7	40	241	INOP	15.1	30.50	90	84	348	469	402	396	367	298
6	5	Idle 724	13.8	16	231	INOP	1.59	5.91	86	86	253	384	263	300	247	201
7	Throttle was cycled through idle to full power 5 times with no anomalies noted.															
Ambient Air Temperature °F		Ambient Air Pressure		Transfer Collar Δ P		Maximum Rated Power Engine Operational Parameters										
81.9		30.02		IN	OUT	RPM		“ Hg MP		Fuel Flow Lbs/Hr		Metered PSI		Unmetered PSI		
				26	28	2700		-		136-146		14.9-17.2		28.0-31.0		
Notes: Operator – Matthew Phillips. Transfer collar pressure delta measured at full throttle power setting.																
Engine Performance Test																
Test RPM	Left Magneto		Left Magneto		Right Magneto		Right Magneto									
	RPM		RPM Drop		RPM		RPM Drop									
2100	2056		44		2048		52									