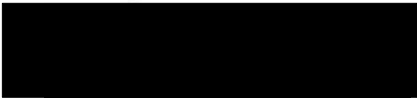




Continental Motors

ENGINE RUN REPORT

ENGINE MODEL	IO-520-CB9
ENGINE SERIAL NUMBER	298693
AIRCRAFT MAKE & MODEL	Beech 95-C55
AIRCRAFT SERIAL NUMBER	TE-269
AIRCRAFT REGISTRATION	N88FL
FILE NUMBER	15-438

NAME	SIGNATURE	DATE
Nicole L. Charnon		06/16/2016

ENGINE RUN REPORT**FILE NUMBER:**

15-438

ENGINE S/N:

298693

PAGE 2 of 15**GENERAL INFORMATION**

EXAMINATION		ACCIDENT DATA	
DATE	June 13 and 14, 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	Left Engine
TOTAL TIME	Unknown
TIME SOH	125.8 hours
TYPE & TIME SLI	Annual Inspection 01/27/2016; Unknown time since last inspection.
BUILD DATE	01/12/1996
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 run 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.

ENGINE RUN REPORT			
FILE NUMBER:	15-438	ENGINE S/N:	298693
			PAGE 3 of 15

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 crate was removed from the storage facility and it was apparent that oil had leaked from the bottom of the crate. The top of the crate was removed and the engine was documented. The engine was removed from the crate and the oil sump quick drain plug was found extended and residual oil was dripping from the plug. The oil dipstick registered only residual oil on the tip. No other 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.



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 4 of 15



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 5 of 15



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
- 12 quarts of oil were added to the sump
- Exhaust risers

The top sparkplugs were removed from their respective cylinders and a lighted borescope was used to inspect and document the internal components. No pre-accident anomalies or signs of operational distress were noted on any of the components.

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.

ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 6 of 15

Cylinder #1



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 7 of 15

Cylinder #2



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 8 of 15

Cylinder #3



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 9 of 15

Cylinder #4



ENGINE RUN REPORT

FILE NUMBER:

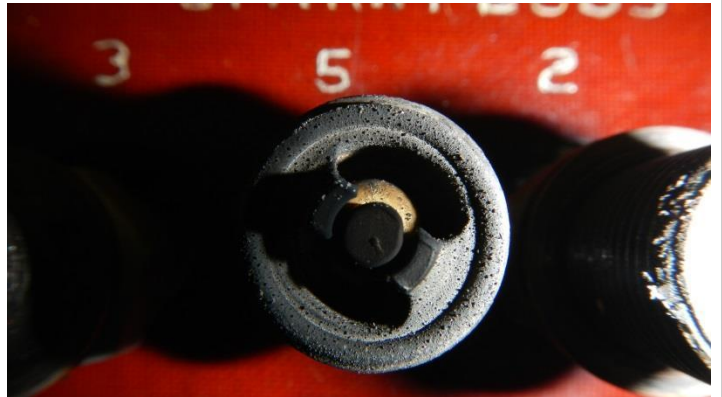
15-438

ENGINE S/N:

298693

PAGE 10 of 15

Cylinder #5



ENGINE RUN REPORT

FILE NUMBER:

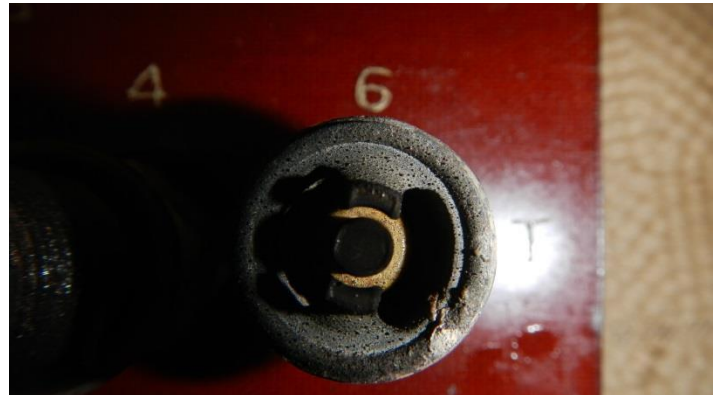
15-438

ENGINE S/N:

298693

PAGE 11 of 15

Cylinder #6



ENGINE RUN REPORT**FILE NUMBER:**

15-438

ENGINE S/N:

298693

PAGE 12 of 15

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	22°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 - 64/80 PSI

Cylinder #2 - 5/80 PSI (intake valve/rings)

Cylinder #3 - 19/80 PSI (exhaust valve)

Cylinder #4 - 36/80 PSI (rings)

Cylinder #5 - 42/80 PSI (exhaust valve)

Cylinder #6 - 63/80 PSI

(*) – Leakage Source

The engine was not disassembled prior to the engine run. The crankshaft end-play measured 0.02" and the run-out was 0.01".

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.

DESCRIPTION OF RUN

The engine was flooded during priming operations and engine start was difficult until fuel was cleared from the cylinders. Once the fuel was cleared the engine started with no anomalies noted. 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.

ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 13 of 15



ENGINE RUN REPORT

FILE NUMBER:

15-438

ENGINE S/N:

298693

PAGE 14 of 15

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 – 43 PSI):

Cylinder #1 - 55/80 PSI (exhaust valve)

Cylinder #2 - 65/80 PSI (exhaust valve)

Cylinder #3 - 63/80 PSI (exhaust valve)

Cylinder #4 - 70/80 PSI

Cylinder #5 - 76/80 PSI

Cylinder #6 - 62/80 PSI (exhaust valve)

(*) – Leakage Source

The sparkplugs were examined following the test run and no anomalies were noted.



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	12.7	50	101	INOP	3.02	10.8	79	80	225	258	250	224	226	180
2	5	1600	17.2	50	139	INOP	3.65	14.9	80	80	264	313	290	261	255	202
3	5	2100	21.2	50	169	INOP	6.09	23.8	84	80	284	398	320	327	309	250
4	5	2450	25.6	50	197	INOP	10.18	27.9	86	80	320	450	360	369	358	286
5	5	F/T 2630	28.8	50	220	INOP	18.01	30.3	88	81	334	467	377	391	360	300
6	5	Idle 808	13.3	20	232	INOP	2.00	6.5	87	81	253	390	270	292	254	195
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										
80		29.96		IN	OUT	RPM		“ Hg MP		Fuel Flow Lbs/Hr		Metered PSI		Unmetered PSI		
				32	34	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	2050		50		2048		52									