Continental Motors

ENGINE EXAMINATION REPORT

ENGINE MODEL	IO-550-N7B
ENGINE SERIAL NUMBER	686342
AIRCRAFT MAKE & MODEL	Cirrus SR22
AIRCRAFT SERIAL NUMBER	0293
AIRCRAFT REGISTRATION	N929DE
FILE NUMBER	17-022

NAME	SIGNATURE	DATE
Christopher Lang	[redacted]	October 25, 2017

GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	October 24, 2017	**NTSB ACCIDENT #**	CEN17LA263
FACILITY	Continental Motors	**NTSB INVESTIGATOR**	Aaron Sauer
ADDRESS	2039 S Broad St Mobile, AL 36615	**FAA INVESTIGATOR**	Katie Sample
		ACCIDENT DATE	July 9, 2017
		ACCIDENT LOCATION	Corydon, Iowa

ENGINE INFORMATION

ENGINE POSITION	Single, Front
TOTAL TIME	896.1 Hours
TIME SOH	N/A
TYPE & TIME SLI	34.3 hours since annual inspection
BUILD DATE	June 26, 2002
SHIP DATE	June 28, 2002

Significant logbook information:

Only partial logbooks were reviewed by this writer, no significant information was noted in the engine logbooks.

Report Summary: Search Code(s): 15-12-68

No preimpact anomalies were observed that would have prevented normal operation and the production of rated horsepower.

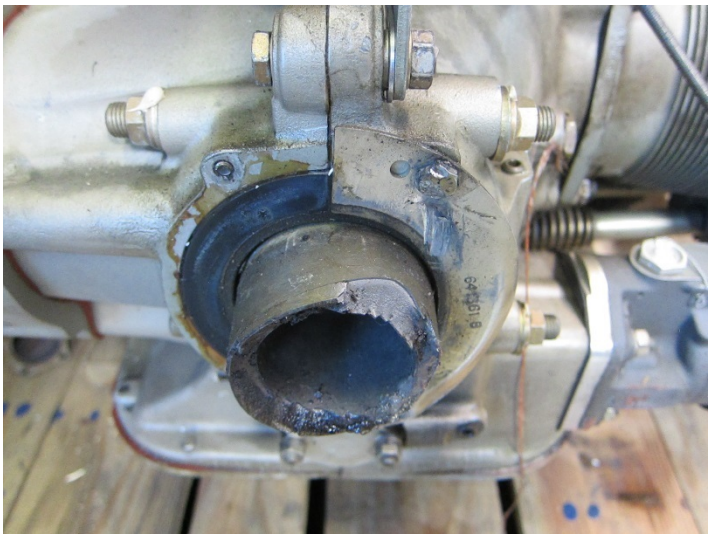
Disposition of engine following exam:

Returned to Wentworth Aircraft for storage by the insurance company.

INSPECTION WITNESSES

NAME	Phillip Grice	**NAME**	Greg Eastburn
ADDRESS	Mobile, Alabama	**ADDRESS**	Mobile, Alabama
ORGANIZATION	Continental Motors	**ORGANIZATION**	Continental Motors
PHONE	[redacted]	**PHONE**	[redacted]
NAME	Lisa Jersild	**NAME**	Chris Lang
ADDRESS	Mobile, Alabama	**ADDRESS**	Mobile, Alabama
ORGANIZATION	Continental Motors	**ORGANIZATION**	Continental Motors
PHONE	[redacted]	**PHONE**	[redacted]
NAME	Aaron Sauer	**NAME**	Brannon Mayer
ADDRESS	Denver, Colorado	**ADDRESS**	Duluth, Minnesota
ORGANIZATION	NTSB	**ORGANIZATION**	Cirrus Aircraft
PHONE	[redacted]	**PHONE**	[redacted]

EXTERNAL INSPECTION OF ENGINE

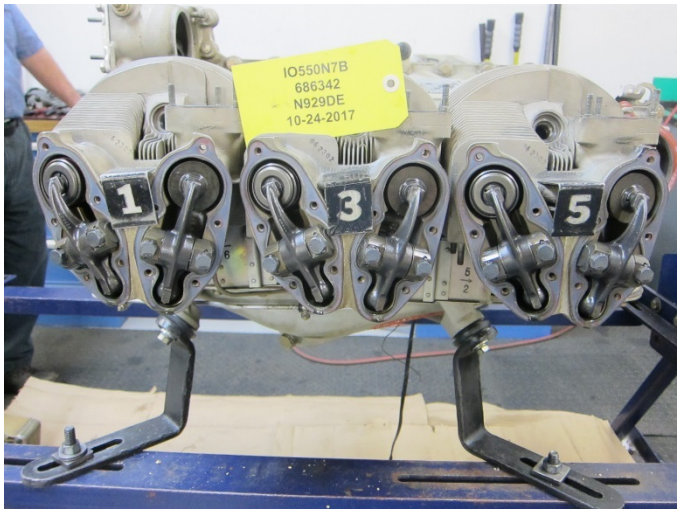


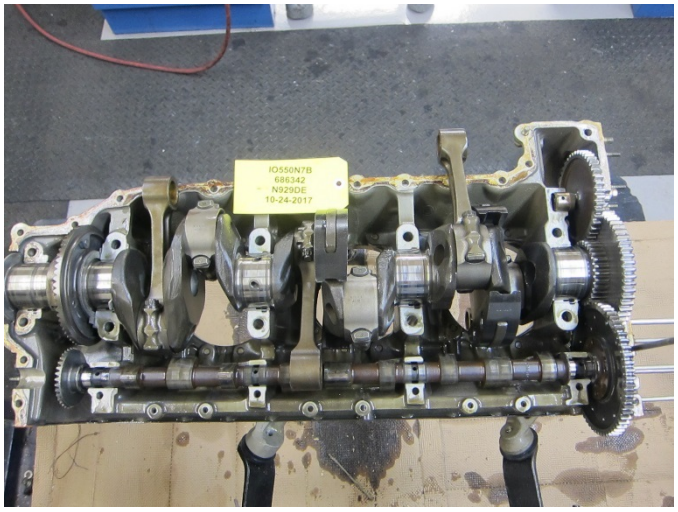
The engine shipping crate had been opened previously under the supervision of another NTSB investigator to assess and prepare the engine for a possible test cell run. However, during work to weld the propeller flange back onto the engine crankshaft, it was discovered that the crankshaft was bent which prevented a safe test cell run. The engine was subsequently torn down during an examination on October 24, 2017 under the supervision of the NTSB investigator in charge.

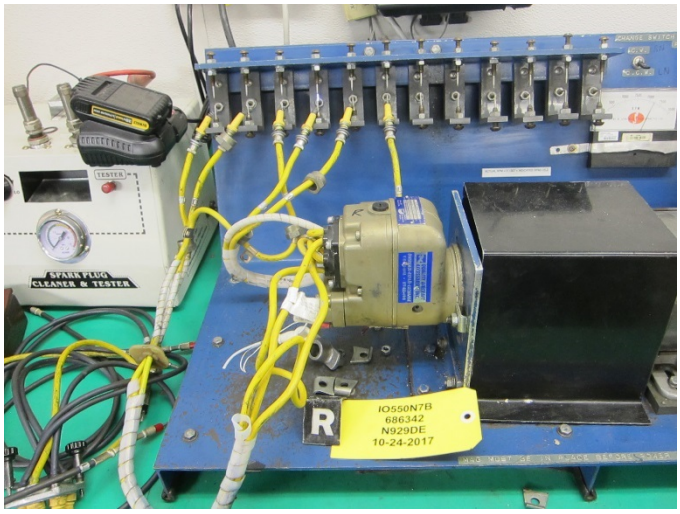
The magnetos, fuel pump and fuel nozzles had been previously removed at the accident site by this writer. The left-hand side engine mount legs were fractured. The crankshaft propeller flange was fractured from the crankshaft.

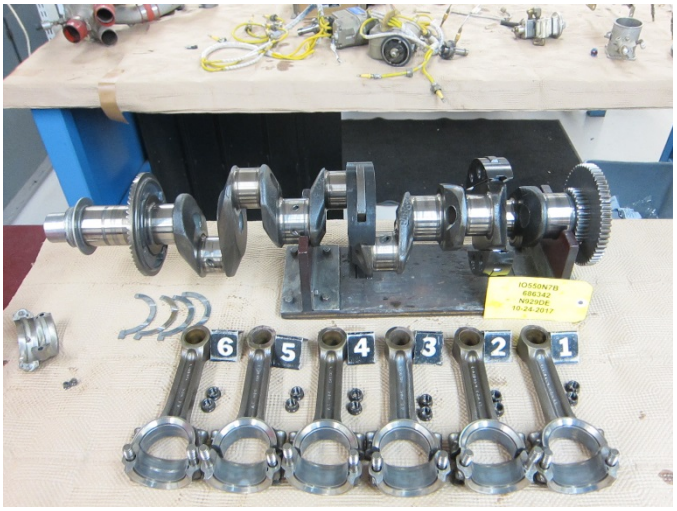
INTERNAL INSPECTION OF ENGINE

The engine was disassembled and no pre-impact anomalies were noted to any of the accessories or engine components. The magnetos and ignition harness were placed on a test bench and the magnetos produced spark on all twelve ignition leads. The fuel system components were placed on test benches.





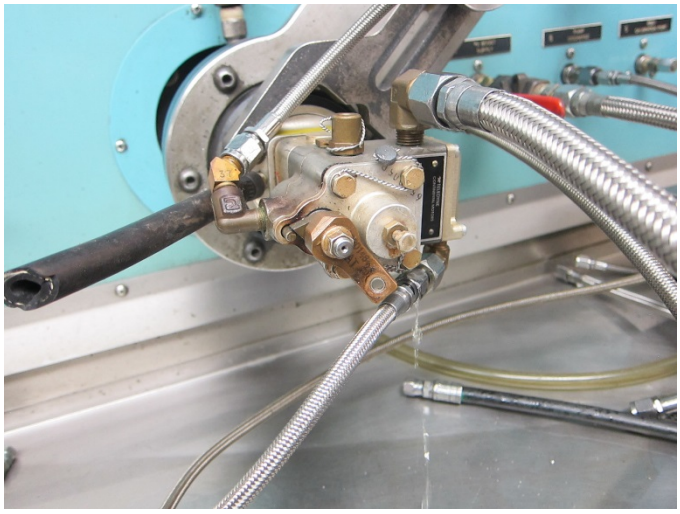


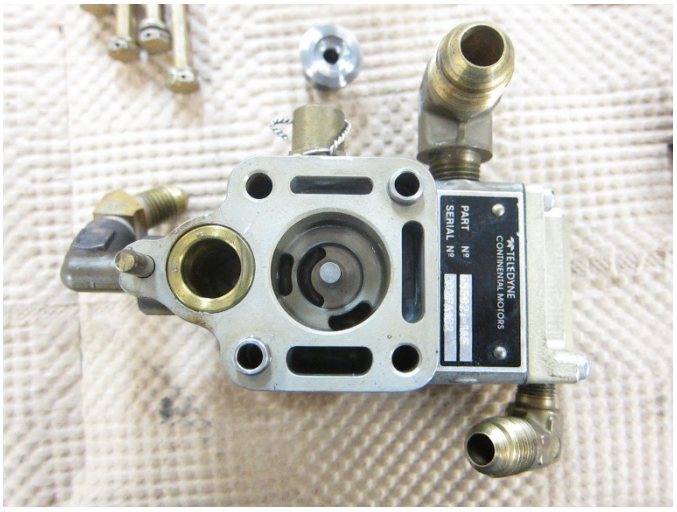


FUEL SYSTEM

**** - Fuel System Component(s) Flow/Pressure Test:*** *The "Observed" values (fuel flows and/or pressures) are recorded without adjustment (unless noted) of the fuel system component. The other values in each table are engineering specifications for the original calibration of the component to insure desired performance within the full range of operation. These tests and adjustments are carried out in an environment of controlled fuel supply pressures and calibrated test equipment.*
When engines are installed in aircraft, they are subjected to a different induction system, fuel supply system and operating environment and may require further adjustments to compensate for these differences. It is these differences that may be present in the following test bench recorded values and CMI flow/pressure specifications. These tests are conducted to confirm that the fuel system components will function adequately within its' designed limitations.

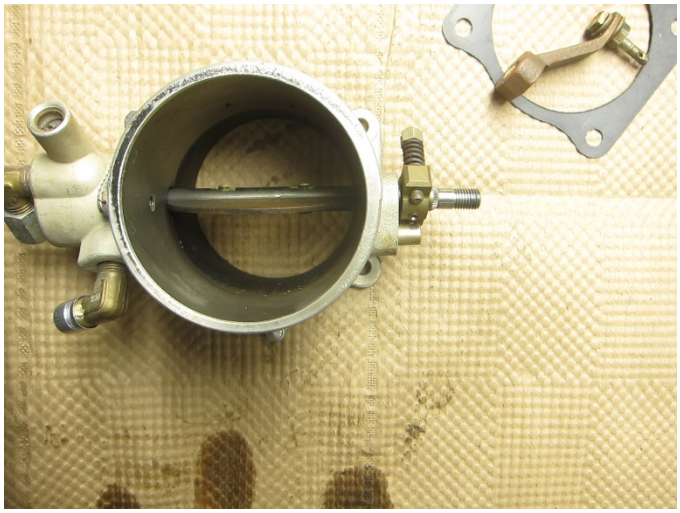
FUEL PUMP	Manufacturer: TCM	P/N: 655921-1A5	S/N: B02FA182
Condition:	The fuel pump was placed on a test bench. The mixture control arm had been bent from impact. A fuel leak was observed near the low pressure valve diaphragm. After the flow test, the fuel pump was disassembled with no pre-impact anomalies noted. There were questions about the diaphragm missing material on one edge of the diaphragm causing the fuel leak, however, it was later determined that the diaphragm was in the same shape as it was manufactured in. The cause of the fuel leak on the test stand was attributed to impact damage as there were no visible fuel stains on the fuel pump.		





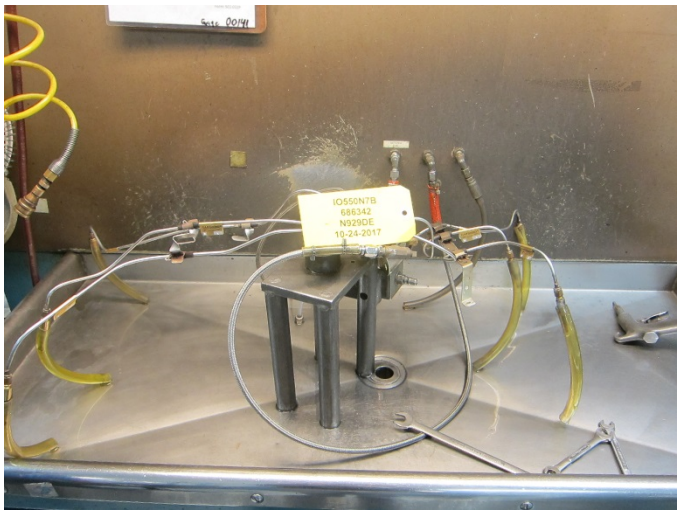
Fuel Pump Assembly Flow vs. Pressure Test			
RPM	Specified Pressure (PSI)	Specified Fuel Flow (PPH)	*Observed PPH @ PSI
599.6	7.00-8.00	6.500-7.000	6.960PPH @ 7.62PSI
2600.9	23.50-24.50	148.00-152.00	149.050PPH @ 43.60PSI
1599.8	15.00-16.50	37.000-38.000	37.530PPH @ 18.42PSI
600.8	7.00-8.00	6.500-7.000	6.650PPH @ 7.44PSI

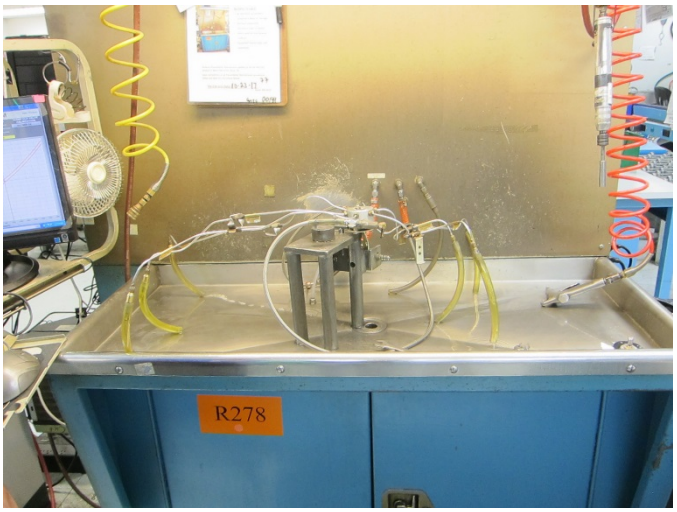
THROTTLE BODY METERING UNIT	Manufacturer: TCM	P/N: 653353-5A1	S/N: A02FA156
Condition:	The throttle control shaft was bent, but otherwise undamaged. The throttle body was placed on a test bench and flow tested.		



Throttle and Metering Unit Flow vs. Pressure Test			
Throttle Angle	Inlet Pressure (PSI) Specified: 15.000 PSI	Specified Fuel Flow (min – max) (PPH)	*Observed Flow (PPH)
.035	14.799	14.000-14.700	15.855
8.791	14.931	35.500-42.600	40.071
17.761	15.010	64.500-77.400	67.469
30.071	15.011	102.000-112.200	105.789
47.781	14.981	145.800-156.700	147.721
56.776	14.872	162.400-174.600	162.091
70.631	14.978	180.000-189.000	177.697

FUEL MANIFOLD VALVE	Manufacturer: TCM	P/N: 646433-5A2	S/N: C02FA166
Condition:	The fuel manifold valve was intact and undamaged. The manifold valve was placed on a test bench.		





FUEL NOZZLES AND LINES	Manufacturer: GAMI					
Position	#1	#3	#5	#2	#4	#6
Size	12E	12E	12E	12E	12E	12E
Condition:	The fuel nozzles were undamaged and free of obstructions.					

Fuel Manifold Valve, Lines and Nozzle Assembly Flow vs. Pressure Test		
Specified Fuel Flow (PPH)	Specified Pressure (PSI)	*Observed Pressure (PSI)
10	3.750-4.550	4.098
50	5.790-6.590	6.071
100	10.580-10.980	10.794
150	17.710-18.510	18.075