



ENGINE EXAMINATION REPORT

ENGINE MODEL	TSIO-360-LB1B
ENGINE SERIAL NUMBER	316050
AIRCRAFT MAKE & MODEL	Mooney M20K
AIRCRAFT SERIAL NUMBER	25-0822
AIRCRAFT REGISTRATION	N5756W
FILE NUMBER	18-319

NAME	SIGNATURE	DATE
Nicole L. Charnon		07/22/2019

ENGINE EXAMINATION REPORT**FILE NUMBER:**

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EXAMINATION		ACCIDENT DATA	
DATE	06/26/2019	NTSB ACCIDENT #	ERA19LA062
FACILITY	Continental Aerospace Technologies	NTSB INVESTIGATOR	Heidi Kemner
ADDRESS	[REDACTED] Mobile, AL 36615	FAA INVESTIGATOR	Christopher LaPenta
		ACCIDENT DATE	12/09/2018
		ACCIDENT LOCATION	Paramus, New Jersey

ENGINE INFORMATION

ENGINE POSITION	Single Engine
TOTAL TIME	2,440.8 hours
TIME SOH	255.8 hours
TYPE & TIME SLI	39.5 hours
BUILD DATE	03/09/1984
IN SERVICE DATE	Unknown

Significant logbook information:

The engine was overhauled at Pine Mountain Aviation on January 11, 2016 at an engine total time of 2,185 hours. The overhauled engine had an overhauled crankcase, crankshaft and connecting rods with a new Continental camshaft and new Continental cylinders. The last annual inspection took place on August 15, 2018, 216.3 hours since overhaul. According to that entry, the oil filter was removed and cut open for inspection with no anomalies found. The engine total time as recorded in the JPI engine monitoring instrument was 2,440.8 hours, or 255.8 hours since overhaul and 39.5 hours since the last annual inspection.

Report Summary:

Search Code(s):

12-16-14, 12-23-35, 12-21-21, 12-07-08,
15-08-18, 15-08-40, 10-10-03

The engine crankcase had a hole over the #2 cylinder. Disassembly of the engine revealed that the #1 connecting rod was separated from the crankshaft, and the #1 and #2 connecting rods displayed thermal discoloration associated with a lack of lubrication. The mating surfaces of the main bearing saddles displayed remnants of silk thread around the through-bolt holes, an area which is considered a "prohibited area" for silk thread and sealant as specified in the maintenance and overhaul manuals. Break-away torque was measured on the cylinder attaching hardware and found to be well below that specified in the maintenance and overhaul manuals for the through-bolts associated with the #2 and #3 main bearings. The #2 main bearing saddles showed signs of lock tab movement/impingement damage and the #2 bearing was partially rotated in a clockwise direction, which resulted in the blockage of the oil passage to the connecting rod bearings. The #2 and #3 main bearing surfaces displayed significant wear and material transfer. Additionally, the #1, #2, #3, #4, and #6 pistons and cylinders displayed significant scoring damage, and the camshaft bearing surfaces displayed significant material displacement and scoring damage. Approximately 8 quarts of oil was recovered from the engine.

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The engine components were boxed awaiting final disposition from the NTSB investigator-in-charge.

INSPECTION WITNESSES

NAME	Phillip Grice	NAME	Lisa Jersild
ADDRESS	Mobile, Alabama	ADDRESS	Mobile, Alabama
ORGANIZATION	Continental Motors	ORGANIZATION	Continental Motors
PHONE		PHONE	
NAME	Randy Bryant	NAME	Millicent Hill
ADDRESS	Mobile, Alabama	ADDRESS	Eastern Region
ORGANIZATION	Continental Motors	ORGANIZATION	NTSB – Aviation Safety
PHONE		PHONE	

EXTERNAL INSPECTION OF ENGINE

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INTERNAL INSPECTION OF ENGINE



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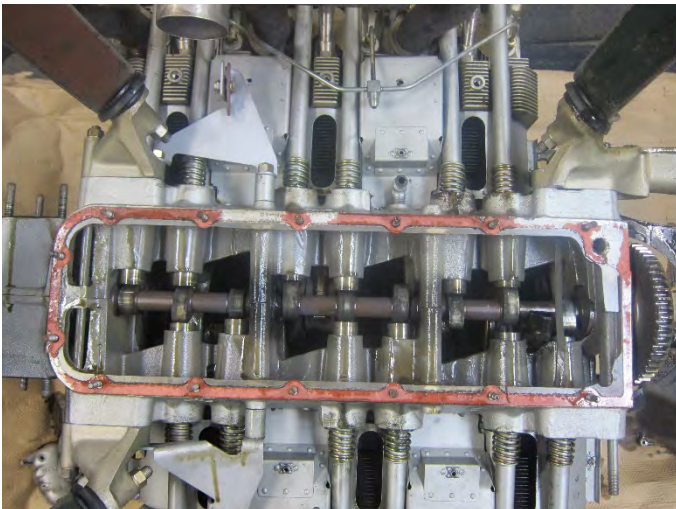
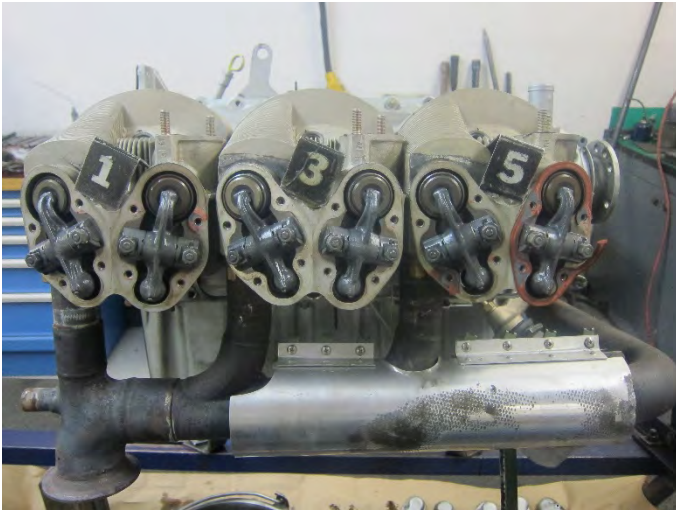
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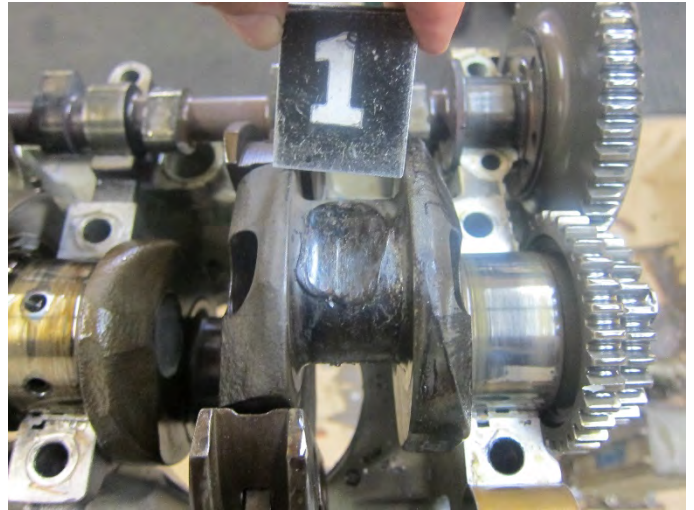
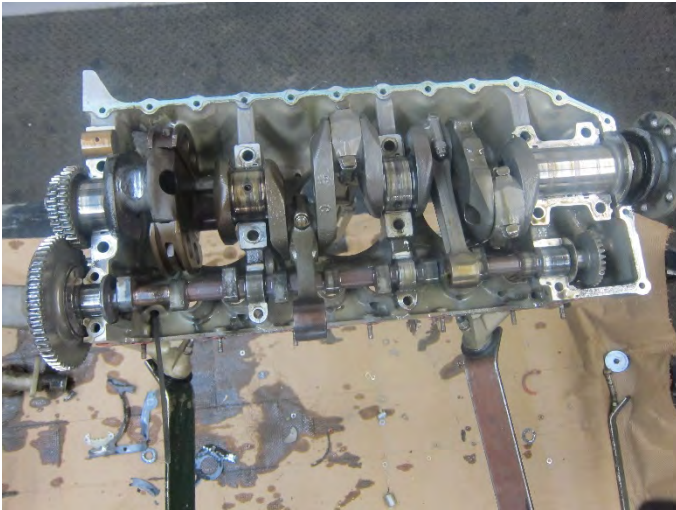
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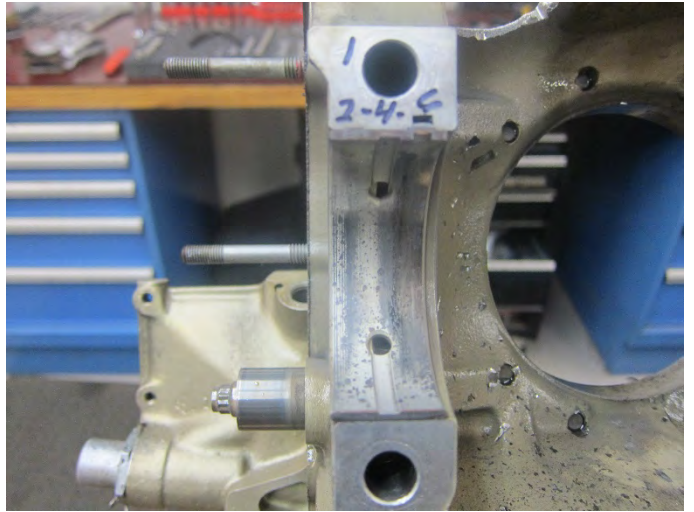
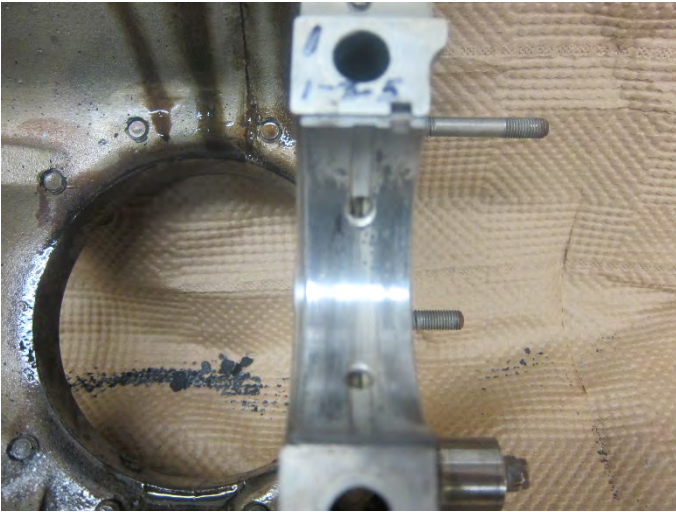
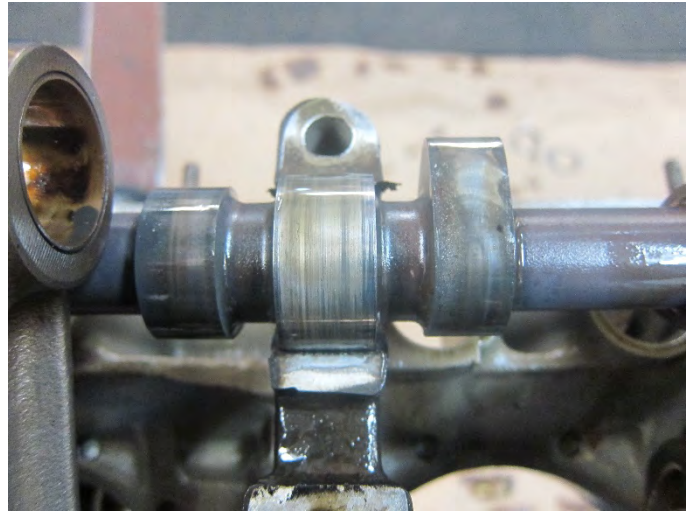
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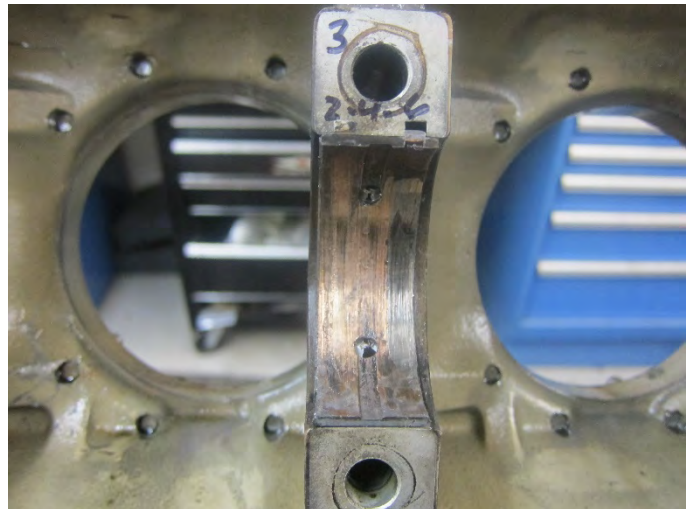
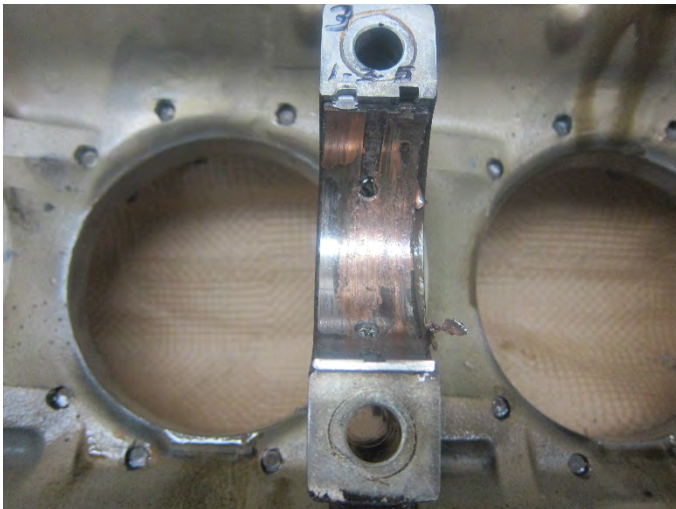
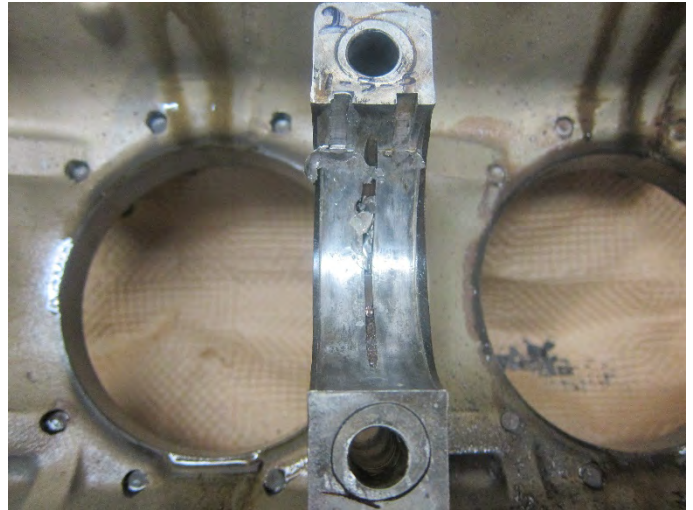
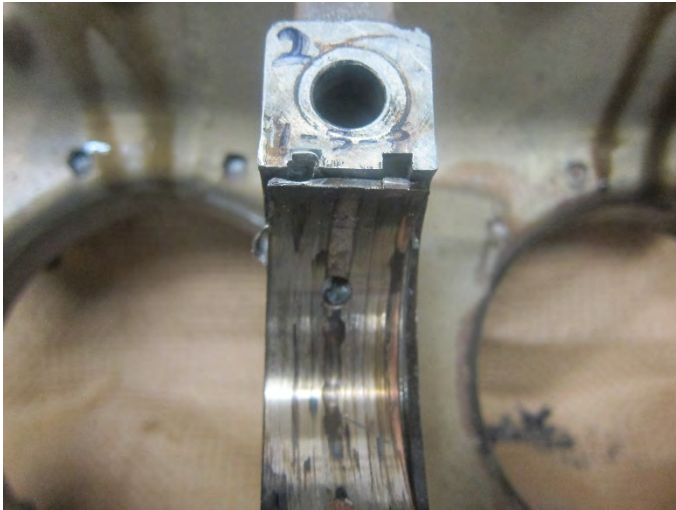
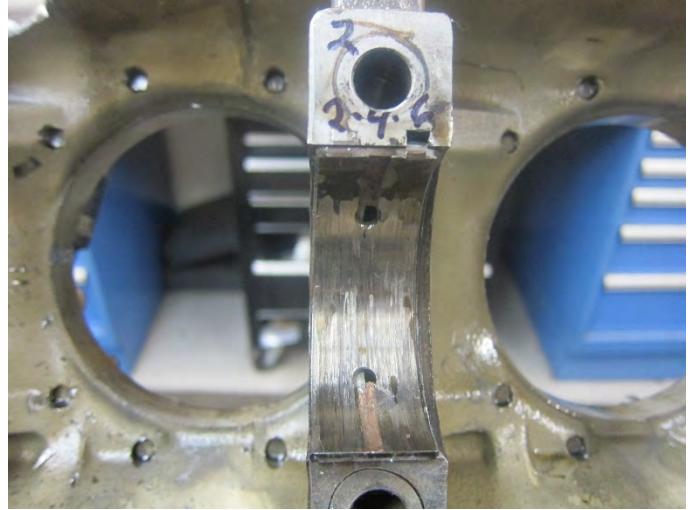
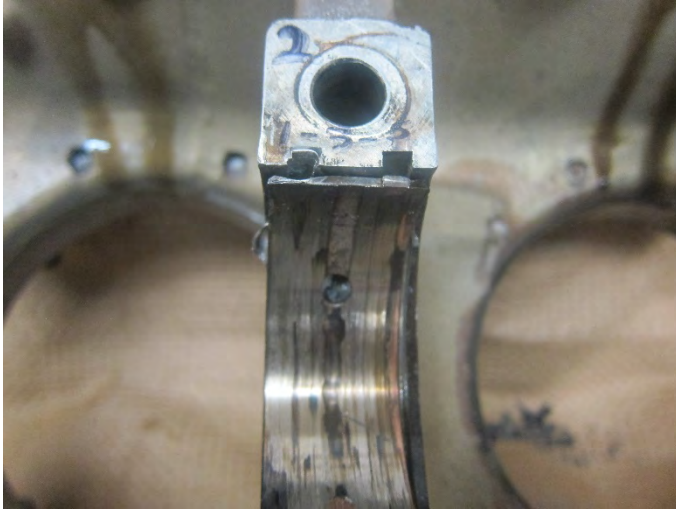
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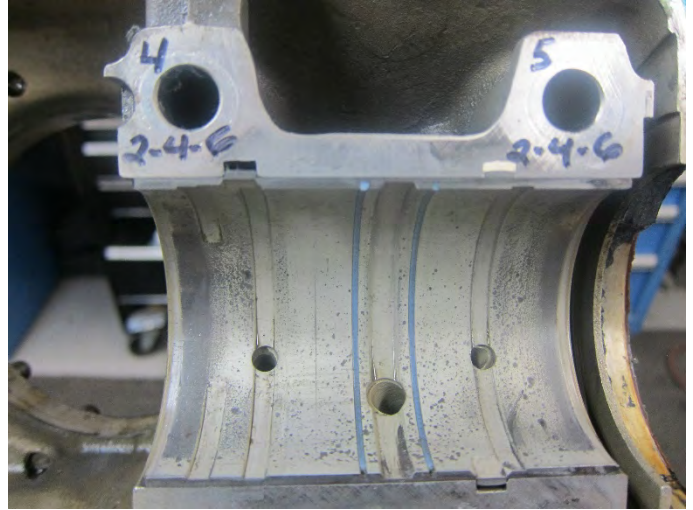
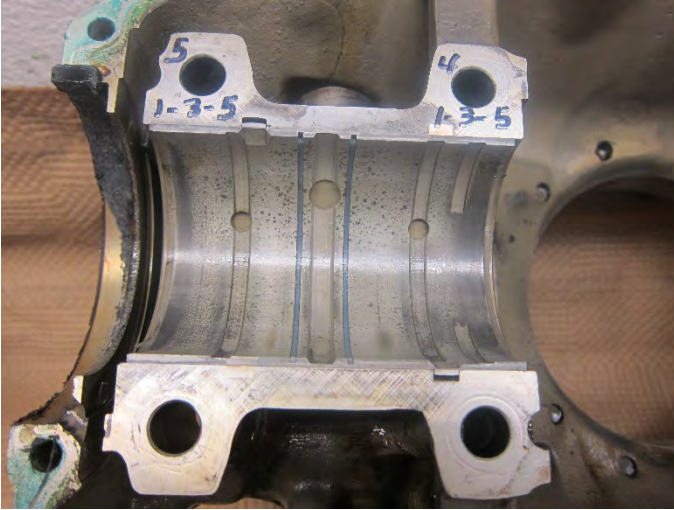
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Date	Engine Model	Engine Serial Number	REGISTRATION	Page
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Cylinder Through-Bolt and Deck Stud Break-Away (Tightening / Loosening) Torque Measurements (Inch-Pounds) (Position numbers 1 and 5 are through-bolts)									
12 Point Nuts on Through Bolts	Bolt 1	Stud 2	Stud 3	Stud 4	Bolt 5	Stud 6	Stud 7	Stud 8	Stud 9
	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose
Cylinder #2	314 / 201	543 / 450	703 / 575	514 / 430	239 / 203	549 / 470	570 / 467	494 / 403	N/A
Cylinder #4	490 / 343	506 / 440	559 / 487	651 / 481	246 / 189	548 / 476	587 / 468	564 / 452	N/A
Cylinder #6	756 / 561	531 / 449	556 / 463	665 / 559	656 / 542	552 / 474	577 / 458	541 / 429	N/A

Prop Flange

	Bolt 1	Stud 2	Stud 3	Stud 4	Bolt 5	Stud 6	Stud 7	Stud 8	Stud 9
	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose
Cylinder #1	610 / 414	532 / 428	532 / 450	470 / 378	642 / Error	565 / 456	591 / 463	523 / 409	N/A
Cylinder #3	172 / 0	701 / 564	720 / 603	490 / 409	395 / 264	524 / 454	560 / 455	560 / 439	N/A
Cylinder #5	340 / 269	541 / 454	538 / 463	577 / 480	371 / 269	580 / 495	568 / 484	579 / 481	N/A

Prop Flange