Continental Motors, Inc.

Magneto Analysis Report

N/R = Not Reported / N/A = Not Applicable

Date Received:	April 10, 2014			Analytical Date:	June 2, 2014		
Warranty Claim:	N/A			RGA Number:	N/A		
Engine Model:	Lycoming IO-540-K1B5			Engine S/N:	L-15134-48A C (converted)		
Aircraft Make/Model:	Piper PA-32-300		Aircraft S/N:	32-40641	Registration	N4267R	
Engine Position:	Single-Engine						
Engine Build Date:	1976	Date in Service:	Unknown		Date Removed:	Unknown	
Date of Occurrence:	11/19/2012			Magneto Hours:	Unknown		
Components Returned:	Left and Right magneto and ignition harness						
Returned By:	Shawn Etcher NTSB on behalf of Mike Huhn NTSB IIC						
Magneto Model/P/N:	Left Magneto S6LN-1227 BL-349370-4			Magneto S/N:	F12FA275R		
Magneto Model/P/N:	Right Magneto S6LN-1209 BL-349310-1			Magneto S/N:	F12DA166R		
Exam Witness:	Jack Clark – FAA Airworthiness Inspector; Birmingham FSDO						
Exam Witness:	Tim Davis – Sr. Project Engineer; Continental Motors, Inc.						
Exam Witness:	Nicole Charnon – Air Safety Investigator; Continental Motors, Inc.						
Reason for Return:	Examination of magnetos by the Lycoming Air Safety Investigations group determined that the right magneto's internal timing was off by three teeth. The magnetos were shipped to CMI for more detailed examination.						
Analytical Report: The examination revealed that the right magneto's internal timing was off by three distributor gear teeth. Examination of the distributor gear while the axle was installed in the distributor block bushing revealed there was a significant angular displacement between the gear and the block. The bushing that is normally bonded within the distributor block was loose. The loose bushing permitted the distributor gear axle to tilt far enough to disengage the distributor gear from the drive gear, permitting a migration of the internal timing. Maintenance history and magneto total time is unknown as of this report's writing.							
Exam Performed By:	Phillip Grice			Search Code:	28-06-08 28-02-36 28-02-28		


N. T. S. B.
(National Transporation Safety Board)
DO NOT OPEN
DATE: Friday, April 04, 2014
RGA NO.: 00.384.053
AIRCRAFT REGISTRATION: N4267R
ENGINE MODEL: MAGNETOS
ENGINE SERIAL NO.: Unknown
OM INVESTIGATOR: Nicole Charnon
NTSB INVESTIGATOR: Michael Huhn
AIR SAFETY FILE NO. 13-456


EVIDENCE
CHAIN OF CUSTODY


EVIDENCE
CHAIN OF CUSTODY


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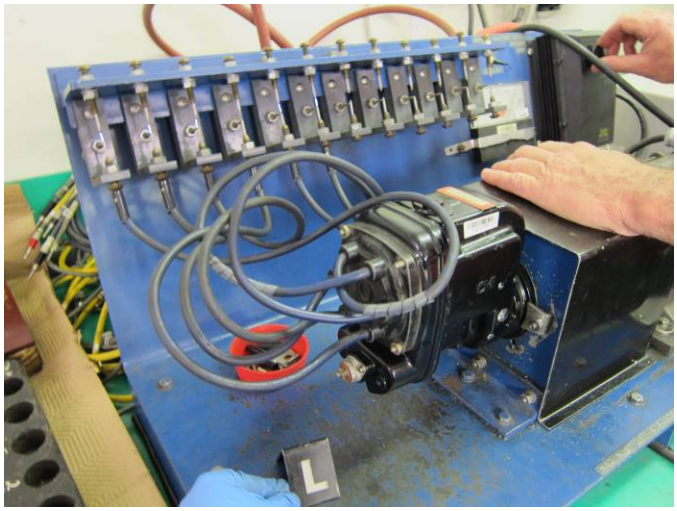
LEFT MAGNETO:

The left magneto's internal timing was checked using a magneto timing light and visually examining the distributor gear position through the timing port. The internal timing was correct. The magneto was placed on a test bench and each lead produced a spark across a 7mm gap throughout all operating speeds. The impulse coupling functioned properly.

The magneto was disassembled to examine the distributor gear. Examination of the distributor gear while the axle was installed in the distributor block bushing revealed no discernable radial or axial play. There were no anomalies noted with the left magneto's internal components.

The date stamp of the left magneto's distributor block indicated that it was from the third batch from 2012. The date stamp on the left magneto's distributor gear was from 2012.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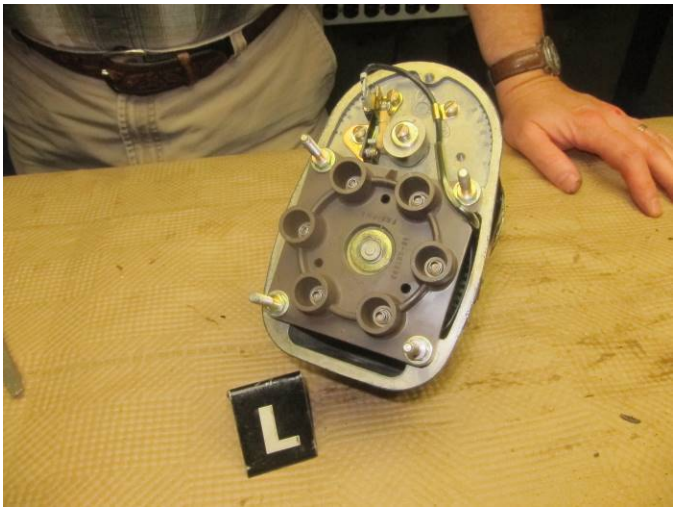
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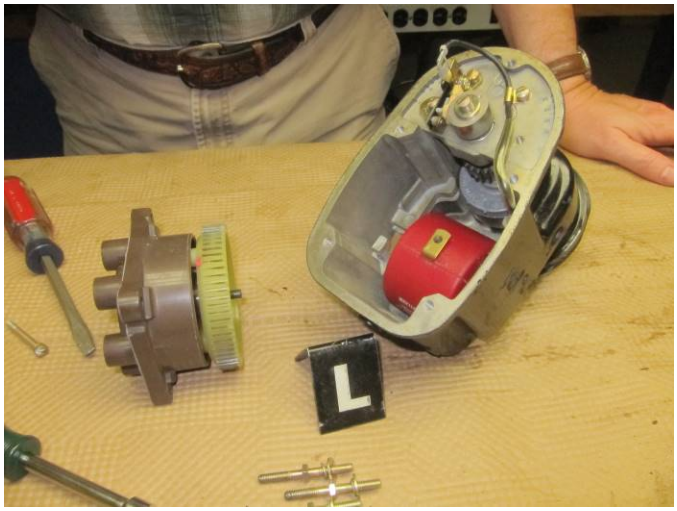
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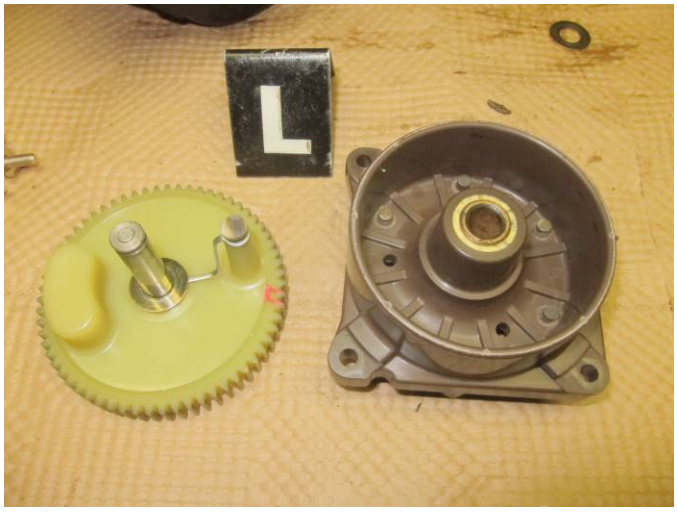
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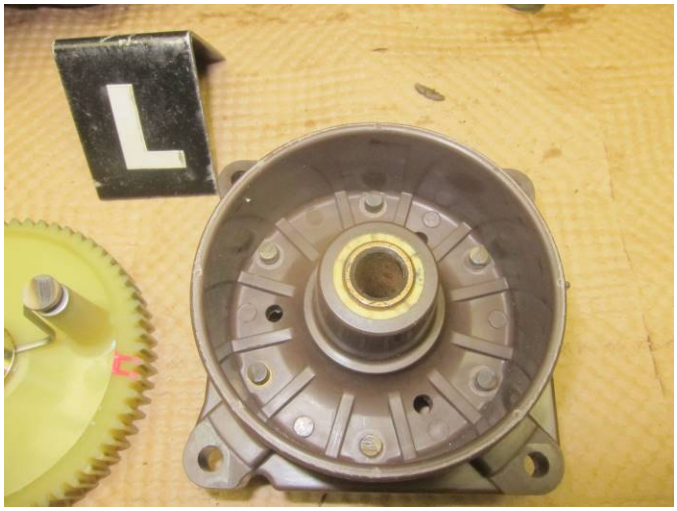
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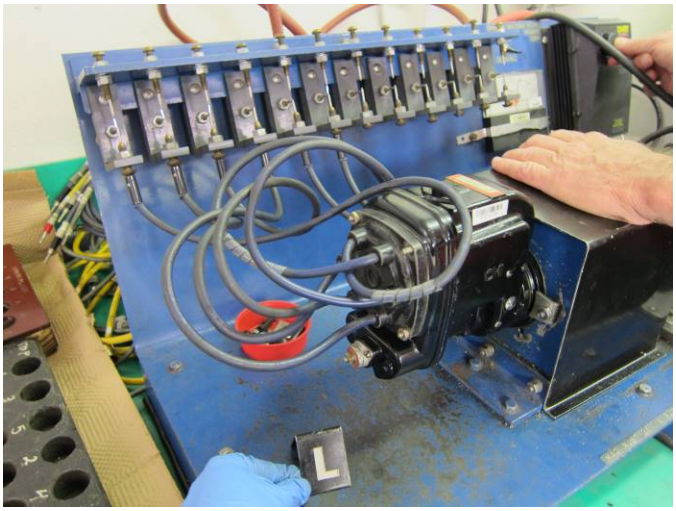
FAA-PMA
10-381586

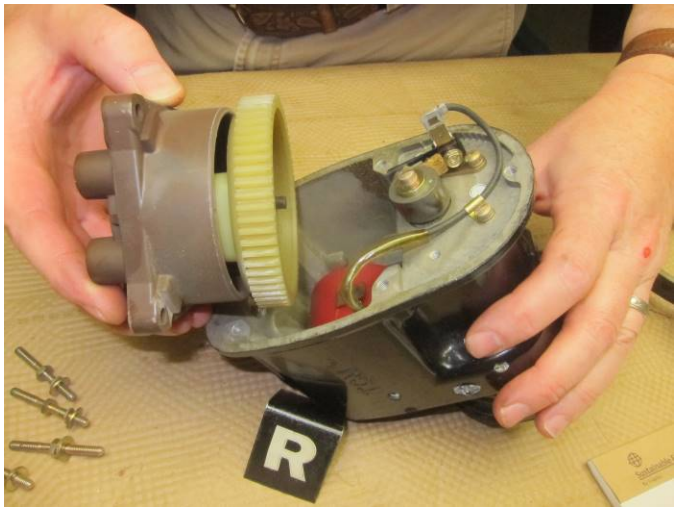

TCM
FAA-PMA
10-381586

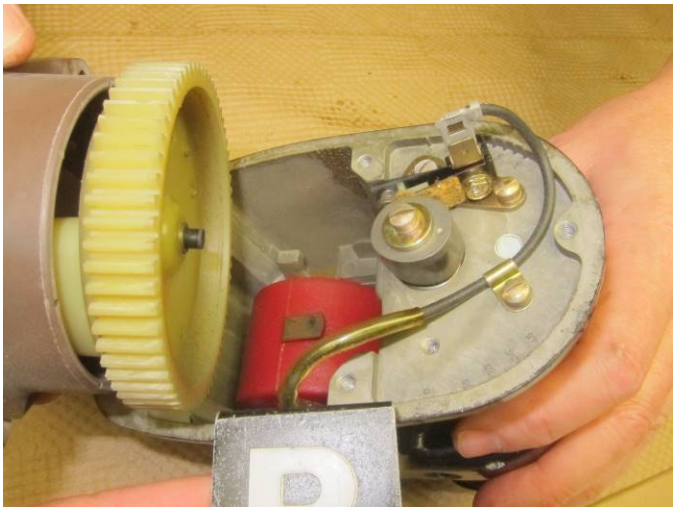
RIGHT MAGNETO:

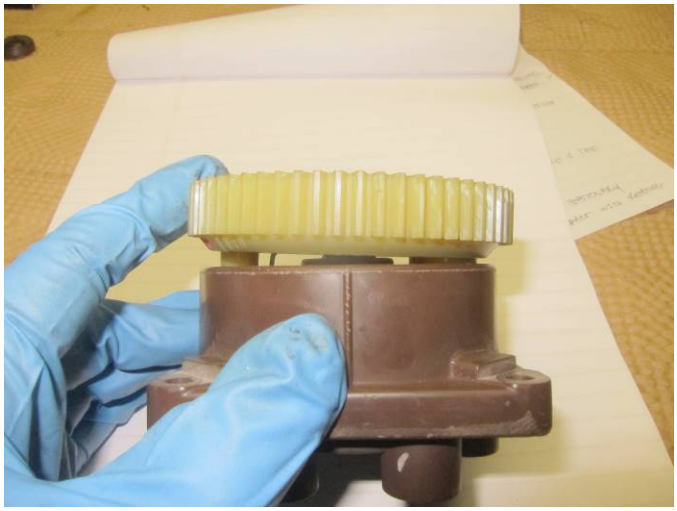
The right magneto's internal timing was checked using a magneto timing light and visually examining the distributor gear position through the timing port. The internal timing was trailing by three distributor gear teeth. The magneto was placed on a test bench and each lead produced a spark across a 7mm gap throughout all operating speeds and in firing order.

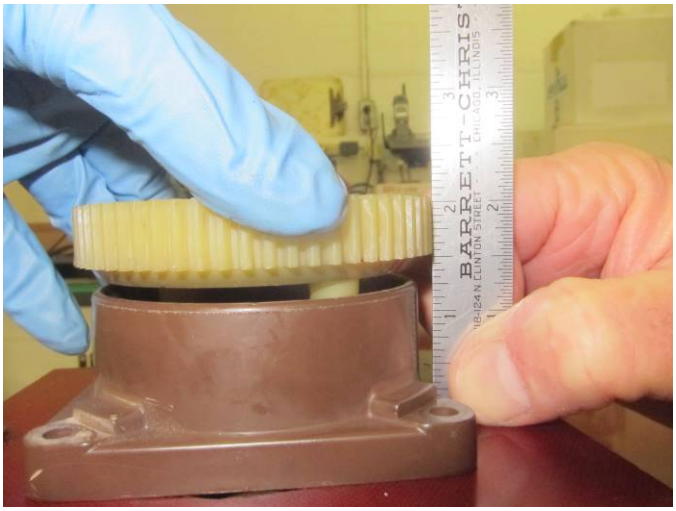


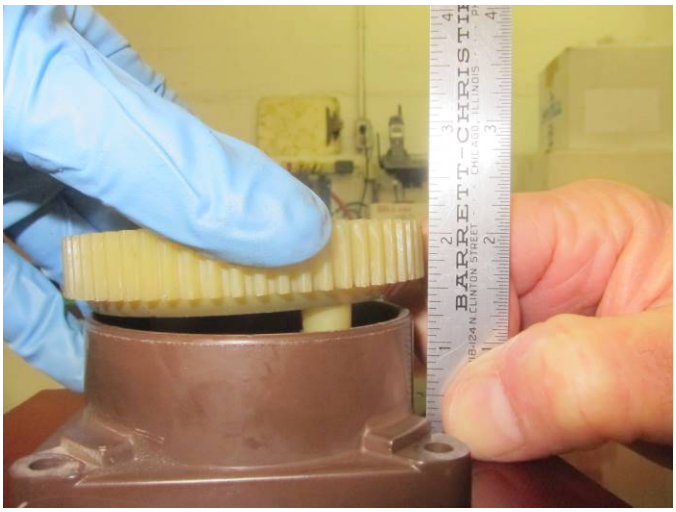
The magneto was disassembled to examine the distributor gear. Examination of the distributor gear while the axle was installed in the distributor block bushing revealed there was a significant angular displacement between the gear and the block.



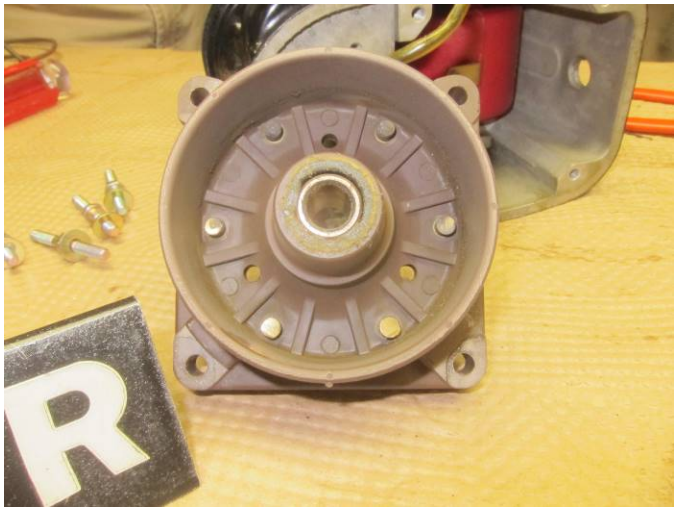


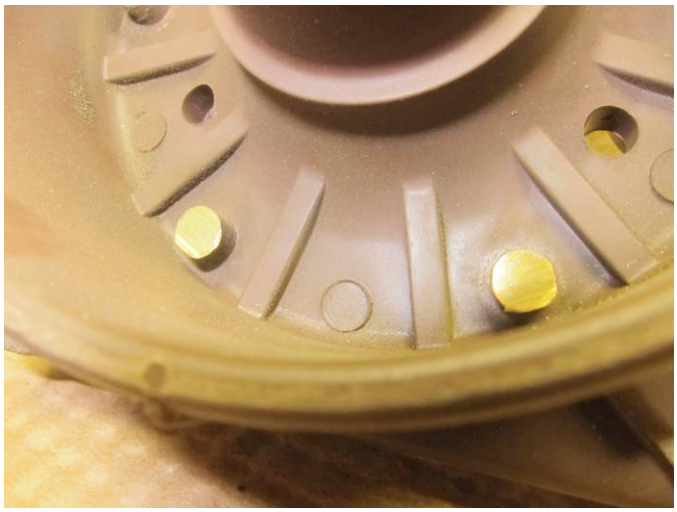




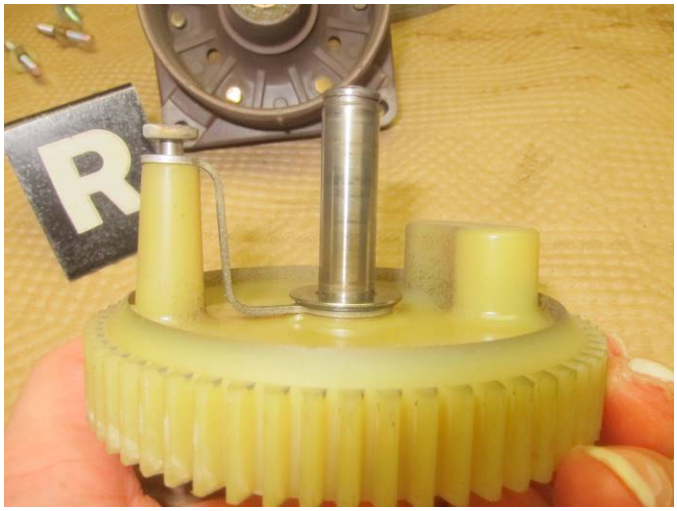


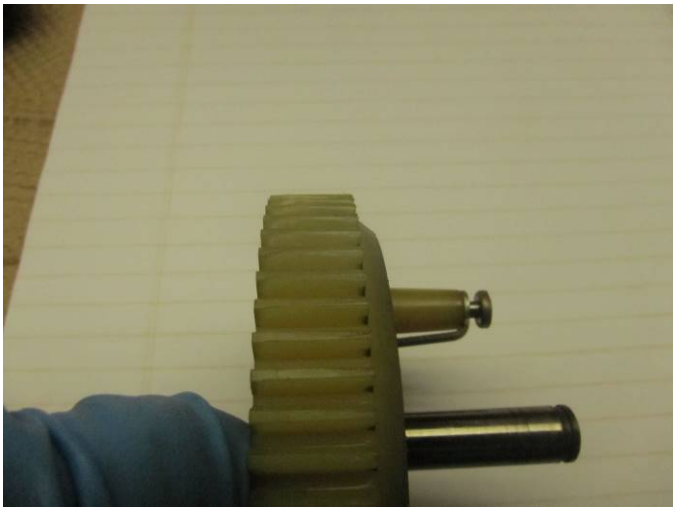
The distributor gear was removed from the distributor block. Four of the six fixed electrodes were mechanically damaged and some of the material had been shaved off of the electrodes. Some brass shavings/chips were found on the inside circumference of the distributor block.

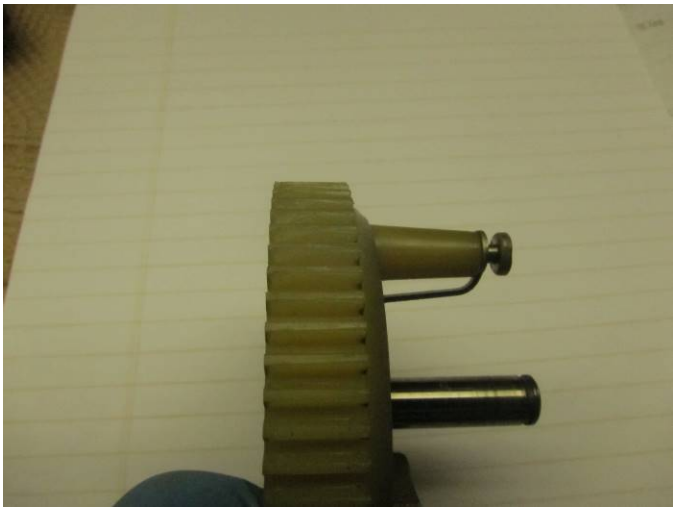




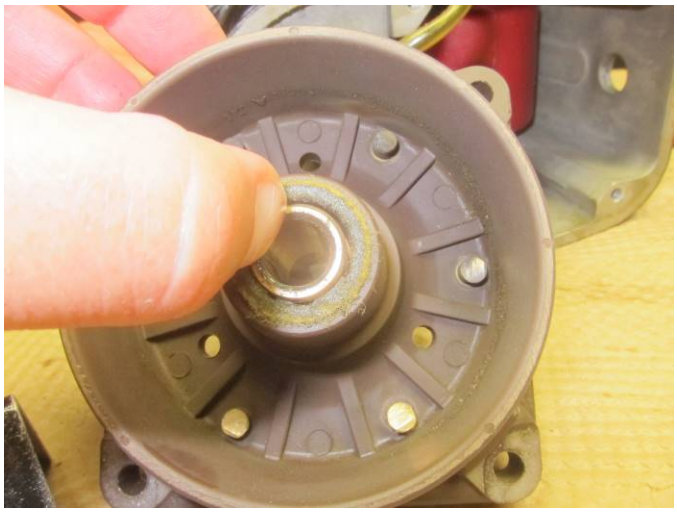
The distributor gear teeth displayed a worn condition on the carbon-brush-end of the gear. A number of the distributor gear teeth apexes displayed mechanical deformation damage consistent with imprints left from the drive gear teeth.



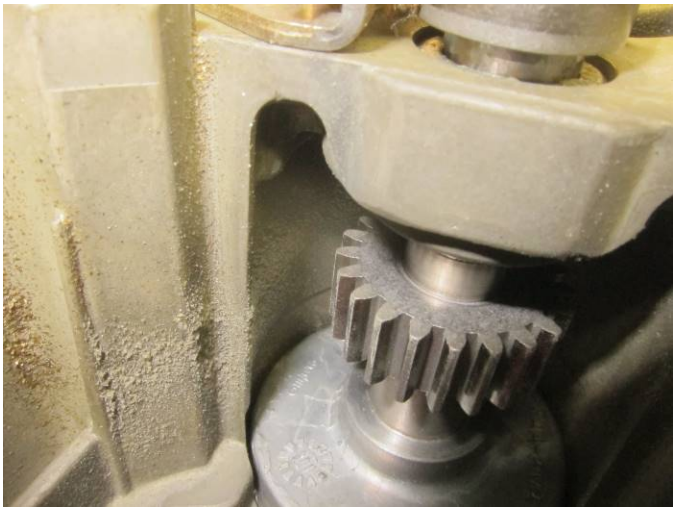




Examination of the distributor block revealed that the bushing, in which the distributor gear axle rides and which is normally molded into the block, was loose. Visible gaps were noted between the bushing and the housing and fragmented block material was noted under the felt strip and felt washer.



The magneto housing contained brass shavings/chips consistent with the material that had been removed from fixed electrodes. The drive gear was intact and did not display any discernable axial or radial play. A pale dust was noted on the magneto housing around the drive gear. The pale dust was consistent with material worn from the carbon-brush-end of the distributor gear teeth.



The date stamp of the right magneto's distributor block indicated it was from the fourth batch in 2012. The date stamp on the left magneto's distributor gear was indicated it was from 2011.

Component Disposition
The magnetos and ignition harness will be returned as per the NTSB IIC's instructions. As of this report's writing, the magnetos and ignition harness were retained in secure storage.