

MAGNETO TEARDOWN REPORT INSPECTOR STATEMENT

Engine Model: TIO-540

Engine Serial Number:

Aircraft Make: Piper

Aircraft Model: PA-32-300

Aircraft Serial Number: Unk.

Registration Number:

Date of Examination: June 2-4, 2014

Requesting FAA Office: NTSB—Michael Huhn

Accident/Incident Number: WPR 13 LA 045

Investigation Party:

Jack E. Clark---Birmingham, Al. FSDO SO-09

Phillip Grice, Nicole Charnon---Continental Motors, Mobile, Al.

Description of Engine:

540 cubic inch displacement, six cylinder air cooled, horizontally opposed, fuel injected engine, developing 300 horsepower at 2700 RPM (take-off).

Initial Inspection:

Both magneto's were located in the Analytical Department at Continental Motors, Mobile, Alabama. The magneto's removed from a shipping container and placed on an examination table. Visual inspection of both magnetos revealed no obvious external damage.

Accessory Testing:

- 1) Left Magneto: TCM/Bendix S6LN-1227, BL-349370-4 S/N F12FA275R
- 2) Right Magneto: TCM/Bendix S6LN-1209, BL-349310-1 S/N F12DA166R

Internal timing was checked with the following results:

- 1) Left Magneto—internal timing ok.
- 2) Right magneto—internal timing trailing approximately 15-20 degrees, internal timing mark was noted three teeth out of normal timing position.

Magnetos were prepared and test run with a spark gap of 7MM, test run satisfactory: This test run was performed before disassembly.

Magneto Disassembly:

- 1) Left Magneto--No abnormalities noted during disassembly.

- 2) Right Magneto—found distributor bushing loose in distributor block (P/N 10-391586). The bushing appeared to be canted approximately 15 degrees in the distributor block. Three (3) stationary electrodes in the distributor block were found severely worn, one (1) stationary electrode was noted slightly worn, and two stationary electrodes appeared to be in a normal configuration. The excessive wear was induced from the rotating electrode mounted on the distributor gear (P/N 10-349237). Brass filings were noted in the distributor block and internal the magneto housing. Further examination disclosed that there was no signature of cross firing internal of the magneto.

Added Information/Other:

Causal Factor/ Observations:

The distributor bushing was found loose and canted approximately 15 degrees from center, was initiated during the manufacturing process and not discovered by the manufactures quality control before releasing it to service. Continental Motor's Air Safety personnel initiated a report in accordance with 14CFR 21-3, reporting the non-conformity to the FAA.


Jack E. Clark
Aviation Safety Inspector, FSDO SO-09
June 12, 2014

Enclosures: Photographs one CD.

Copy of Parts Manual for S-1200 Magnetos, (3 pages).

Copy of Continental Motors Magneto Analysis Report, (11 pages).

System Support Manual S-1200 MAGNETO IGNITION SYSTEM

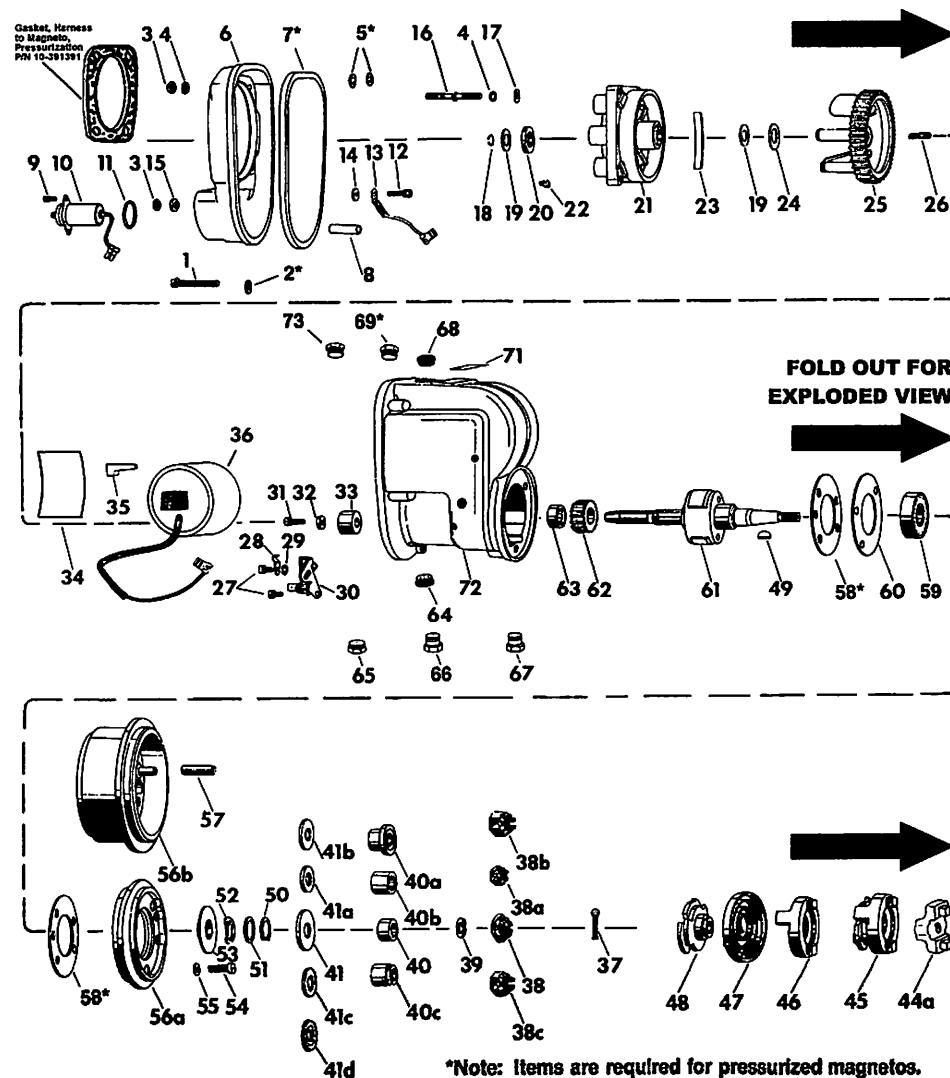
TABLE 1107: SUPERSEDED AND DISCONTINUED MAGNETOS

OLD PART NUMBER	SUPERSEDED BY	OLD PART NUMBER	SUPERSEDED BY
10-349215-1	.	10-349310-3	.
10-349215-2	.	10-349310-5	.
10-349220-1	10-349220-5	10-349310-6	.
10-349220-2	10-349220-4	10-349310-7	.
10-349235-1	.	10-349310-10	.
10-349235-2	.	10-349310-11	10-349310-4
10-349235-3	10-349285-7***	10-349320-6	10-349320-4
10-349235-4	10-349285-7***	10-349345-1	.
10-349235-5	10-349285-7***	10-349350-1	10-349350-4 Left ** or 10-349350-5 Right **
10-349235-6	10-349285-7***	10-349350-2	10-349350-6 Left** or 10-349350-7 Right **
10-349255-1	.	10-349365-2	10-349365-3
10-349255-2	.	10-349370-3	.
10-349260-1	10-349260-6	10-349370-5	.
10-349260-2	10-349260-7	10-349370-6	.
10-349260-3	.	10-349370-7	.
10-349260-4	.	10-349370-11	.
10-349285-2	.		
10-349285-3	.		
10-349285-4	.		
10-349285-5	10-349285-7		
10-349285-6	.		
10-349290-6	.		
10-349290-7	.		
10-349290-8	.		
10-349300-3	.		
10-349300-6	10-349300-4		
10-349305-2	.		
10-349305-4	.		
10-349305-6	.		

* Superseding part number will be supplied upon request.

** Position on engine

*** Reference Lycoming Service Letter 1346A for additional information.



IPL Figure 1. S-1200 Series Magneto Exploded View

System Support Manual

S-1200 MAGNETO IGNITION SYSTEM

**TABLE 1103: S6LN, S6RN-1201, -1205, -1208, -1209, -1225, -1227
MAGNETOS**

Ref. No.	Description	Part No.	10-349220-4	10-349220-5	10-349260-6	10-349260-7	10-349260-1	10-349260-2	10-349260-3	10-349260-4	10-349260-8	10-349260-17	10-349310-1	10-349310-2	10-349310-4	10-349310-8	10-349310-14	10-349350-4	10-349350-5	10-349350-6	10-349350-7	10-349370-1	10-349370-2	10-349370-4
-1	SCREW W/LOCK WASHER	10-35937-24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-3	NUT	10-92873-302	5	5	4	4	5	5	5	5	5	5	4	4	4	5	4	4	4	4	4	4	4	4
-4	WASHER	10-92879-43	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
-6	COVER - Magneto COVER - Magneto COVER - Magneto COVER - Magneto * Field modify as specified in REPAIR	10-349393-1 10-349393-2 10-349393-3 10-349393-4	1*	1*	1*	1*	1	1	1			1	1	1	1	1	1	1*	1*	1*	1*	1	1	1
-8	TUBING	10-180046-28	1				1	1			1	1				1								
-9	SCREW (Capacitor Securing)	10-35935-6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
-10	CAPACITOR	10-349276	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-11	PACKING (Capacitor Mounting)	10-349263	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-12	SCREW (Lead Securing)	10-35937-12	1	1			1	1	1	1	1	1				1								
-13	LEAD - Retard/Tach	10-400050	1	1			1	1	1	1	1	1				1								
-14	WASHER (Lead Securing Screw)	10-16092	1	1			1	1	1	1	1	1				1								
-15	BUSHING (Lead Securing Screw)	10-125996	1	1			1	1	1	1	1	1				1								
-16	STUD - Double End	10-349221	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
-17	WASHER (Stud Securing)	10-78655	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
-18	RING - Retaining (Gear Axle)	10-92815-37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-19	WASHER	10-349511	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
-20	WASHER - Felt (Gear Axle)	10-50752	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-21	BLOCK - Distributor	10-391586	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-22	. SPRING - Helical (Distributor Block)	10-50737	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
-23	. STRIP - Felt (Distributor Block)	10-163374	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-24	WASHER - Nylon (Gear Assembly)	10-391309	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-25	GEAR ASSEMBLY - Distributor	10-349237	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-26	BRUSH - Carbon	10-160844	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-27	SCREW	10-35936-7	4	4	2	3	4	4	4	4	4	4	3	3	2	4	3	2	2	3	3	3	2	3
-28	CLIP - Cable	10-5752				1							1	1			1			1	1	1		1
-29	WASHER	10-14268	2	2	1	1	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1
-30	CONTACT ASSEMBLY - RH (Tungsten) CONTACT ASSEMBLY - LH (Tungsten) CONTACT ASSEMBLY - LH (Tachometer)	10-382585 10-382584 10-349970	1 1	1 1	 1	 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
-31	SCREW (Cam Securing)	10-391213	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-32	WASHER (Cam Securing Screw)	10-51354	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-33	CAM (4 and 6 Cylinder)	10-349243-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-34	STRIP - Fish Paper	10-349326	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-35	WEDGE (Coil)	10-349219	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
-36	COIL - Magneto (High Tension)	10-391088-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-37	PIN - Cotter	10-90751-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-38a	NUT - Castellated (Drive Shaft)	10-163151							1	1	1	1		1	1									
-38b	NUT - Castellated (Drive Shaft)	10-51643	1	1	1	1												1	1	1	1	1	1	1
-38c	NUT - Castellated (Drive Shaft)	10-163178					1					1	1			1	1							1
-39	WASHER - Lock (Drive Shaft Nut)	10-3793	1	1	1	1												1	1	1	1	1	1	1

System Support Manual

S-1200 MAGNETO IGNITION SYSTEM

**TABLE 1103: S6LN, S6RN-1201, -1205, -1208, -1209, -1225, -1227
MAGNETOS (Continued)**

Ref. No.	Description	Part No.	10-349220-4	10-349220-5	10-349260-6	10-349260-7	10-349290-1	10-349290-2	10-349290-3	10-349290-4	10-349290-9	10-349290-17	10-349310-1	10-349310-2	10-349310-4	10-349310-8	10-349310-14	10-349350-4	10-349350-5	10-349350-6	10-349350-7	10-349370-1	10-349370-2	10-349370-4
-40c	BUSHING - Impulse Coupling	10-163048					1					1	1			1	1							1
-41	WASHER (Drive Shaft Nut)	10-4093	1	1	1	1		1	1	1				1	1									
-41b	WASHER (Drive Shaft Nut)	10-116860																						1
-41d	WASHER (Drive Shaft Nut)	10-52307																1	1	1	1	1	1	
-44a	PLATE (Magnet Drive)	10-163003	1	1	1	1													1	1	1	1	1	
-45	IMPULSE COUPLING, 30° CW	10-349367																1	1					
	IMPULSE COUPLING, 30° CCW	10-349368																			1	1		
	IMPULSE COUPLING, 45° CCW	10-349372																					1	
	IMPULSE COUPLING, 35° CW	10-349369																						1
	IMPULSE COUPLING, 35° CCW	10-349371																						1
-46	. BODY - Impulse Coupling	10-76232																1	1					1
	. BODY - Impulse Coupling	10-70371																		1	1	1	1	1
-47	. SPRING (Impulse Coupling)	10-51324																1	1	1	1	1	1	1
-48	. CAM ASSEMBLY - Impulse Coupling	10-349354-2																1	1					
	. CAM ASSEMBLY - Impulse Coupling	10-349354-4																					1	
	. CAM ASSEMBLY - Impulse Coupling	10-349357-3																		1	1			
	. CAM ASSEMBLY - Impulse Coupling	10-349357-4																						1
	. CAM ASSEMBLY - Impulse Coupling	10-349357-5																				1		
-49	KEY - Woodruff	10-90788-5	1	1	1	1	2	1	1	1	1	2	2	1	1	2	2	1	1	1	1	1	1	2
-50	RING - Retaining (Drive Shaft End)	10-92815-62	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-51	WASHER - Flat	10-349328	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-52	WASHER - Bowed	10-349249	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-53	SLINGER - Oil	10-349248	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-54	SCREW (Flange Securing)	10-349652	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
-55	WASHER (Flange Securing Screw)	10-53397	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
-56a	FLANGE - Short Round (Without Stop Pins)	10-349392-2					1	1	1	1	1	1	1	1	1	1								
	FLANGE - Short Round (With 2 Stop Pins)	10-349392-5																					1	
	FLANGE - Short Round (With 2 Stop Pins)	10-349392-6																				1		1
-56b	FLANGE - Long Round (Without Stop Pins)	10-349392-1	1	1	1	1																		
	FLANGE - Long Round (With 2 Stop Pins)	10-349392-3															1	1						
	FLANGE - Long Round (With 2 Stop Pins)	10-349392-4																	1	1				
-57	. STOP PIN - Flange	10-349438R																2	2	2	2	2	2	2
-59	BEARING (Magnet Drive End)	10-353056	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-60	PLATE (Bearing Retaining)	10-349247	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-61	MAGNET - Rotating	10-349351-1					1					1	1			1	1							1
	MAGNET - Rotating	10-349351-2	1	1	1	1												1	1	1	1	1	1	
	MAGNET - Rotating	10-349351-3					1	1	1	1				1	1									
-62	GEAR - Pinion Drive	10-349242	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-63	BEARING - Roller	10-353060	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-64	VENTILATOR	10-157134	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-68	PLUG - Timing	10-157135	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-71	PLATE - Identification	10-400009	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-72	HOUSING - Magneto	10-349394-2								1	1													
	HOUSING - Magneto	10-349394-3	1	1	1	1		1	1				1	1	1	1	1	1	1	1	1	1	1	1
	HOUSING - Magneto	10-349394-4					1					1												