



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

December 19, 2018

FUEL PUMP EXAMINATION

WPR18LA070

WPR18LA070

Reno, Nevada

January 17, 2018

1520 PST

Cessna 172P – N52492

EXAMINATION PARTICIPANTS

Stephen Stein (not present)
Air Safety Investigator (IIC)
National Transportation Safety Board
Federal Way, Washington

Jose Borges
Aviation Safety Inspector
Federal Aviation Administration
Cleveland, Ohio

Doug Wright
Field Service Engineer
Crane Aerospace and Electronics
Elyria, Ohio

HISTORY OF FLIGHT

On January 17, 2017, about 1520 Pacific standard time, a Piper PA-32-300, N4027W, was substantially damaged when it impacted the ground during a forced landing in Reno, Nevada. The private pilot and flight instructor were not injured. The airplane was operated as a personal flight, conducted under the provisions of *14 Code of Federal Regulations Part 91*. Visual meteorological conditions prevailed and a flight plan was not filed for the cross-country flight, which departed Reno/Tahoe International Airport (RNO), Reno, Nevada at 1520 and was destined for Hawthorne Industrial Airport (HTH), Hawthorne, Nevada.

According to the flight instructor, and pilot at the time of the accident, he was instructing the airplane owner to satisfy a checkout requirement imposed by the owner's insurance company. Prior to takeoff, the pilot and the owner performed a weight and balance computation, visually inspected the airplane for fuel quantity, verified oil quantity, and completed a walk-around inspection of the airplane's control surfaces. After an uneventful engine start, the pilot contacted ground control who instructed him to taxi to runway 16L. He followed the airplane's "before takeoff" checklist and performed an engine run-up to 2,000 rpm at which time he leaned the

fuel/air mixture about 50° rich of peak to accommodate a departure from a high field elevation. The pilot observed a drop of about 100 rpms when he selected each magneto. He then set 10° of wing flaps, verified the fuel selector was on the left main fuel tank and turned the auxiliary fuel pump on. The takeoff and initial climb were normal; however, the airplane experienced a total loss of engine power when it reached an altitude of approximately 300 ft. above ground level. According to the pilot, the engine stopped firing rapidly with no pre-indication. He started a turn to the right over runway 16R, but quickly determined the airplane would not be able to land on the remaining runway, but continued the turn. The airplane's stall warning horn annunciated during the descent, and the pilot responded by decreasing the airplane's pitch attitude. During touchdown, the airplane impacted gravel, slid, and came to rest between taxiways "A" and "B."

A postcident examination of the airplane by the Federal Aviation Administration revealed substantial damage to fuselage and wings.

Fuel Pump Examination and Test Results

The engine driven fuel pump, model RG17980D, serial no. D-1828 and manufactured by Lear Romec, was examined and tested by the manufacturer under the supervision of the FAA on May 18, 2018. The examination revealed wear on the drive shaft and pinion. Further, the drive pinion rotated freely about 40°; a newly manufactured pump would rotate less than 10°. The unit failed the external leakage and seal leakage tests, as flow testing showed that the seal behind the drive pinion leaked profusely. Other observations included an atypical spacer, which was an unusual discovery as the pump bolts directly to the gearbox with a gasket. The barb style fitting was irregular as was the radiator style hose clamps and the lock wire. While the pump failed two discharge pressure tests, it functioned during each test and failed by a margin of 3%. The test results are captured in Appendix A of this report.

Appendix A

Crane Aerospace: ATP-220-DATA-SHEET--15--1: Development: Released: 06/29/2004:

ACCEPTANCE TEST DATA SHEET

ATP 220

REV

BN

Para.	Description	Accept Limit	Actual Condition	Measure Units																												
1.3	Pump Rotation	Clockwise	OK	Visual																												
2.2/2.4	Flow and Pressure Performance																															
	<table border="1"> <thead> <tr> <th>Flow P.P.H.</th> <th>Speed RPM</th> <th>Inlet Pressure PSIA</th> <th></th> <th>Accept Limit</th> <th>Actual Condition</th> <th>Measure Units</th> </tr> </thead> <tbody> <tr> <td>225</td> <td>2650</td> <td>13.3-13.8</td> <td>Valve Setting</td> <td>24.0-28.0</td> <td>28.8</td> <td>PSIG</td> </tr> <tr> <td>360</td> <td>2650</td> <td>9.3-9.8</td> <td></td> <td>22.0 min</td> <td>21.3</td> <td>PSID</td> </tr> <tr> <td>10</td> <td>600</td> <td>9.3-9.8</td> <td></td> <td>16.0 min</td> <td>20.9</td> <td>PSID</td> </tr> </tbody> </table>	Flow P.P.H.	Speed RPM	Inlet Pressure PSIA		Accept Limit	Actual Condition	Measure Units	225	2650	13.3-13.8	Valve Setting	24.0-28.0	28.8	PSIG	360	2650	9.3-9.8		22.0 min	21.3	PSID	10	600	9.3-9.8		16.0 min	20.9	PSID			
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2.1	Seal Leakage	Visual	Fail	Accept																												
2.3	External Leakage Test	Visual	Fail	Accept																												
Barometer	29.2	In.HgA	Room Temp. 72 °F	Lear Romec	RG17980	RG17980A	RG17980D																									
MIL-C-7024 Type II	Temp. 70 °F		Part Nos.	RG17980B	RG17980C1	RG17980E																										
Recorder: 3581	Date: 5-18-18 09:30						RG17980J																									
Tag No.:	Serial No.: D-1828		CRANE	® LEAR ROMEC																												
Quality Assurance:																																

dah

10-Jul-04

JOHN GLASS: TESTER

DOUG WRIGHT: CRANE ENGR.

JOSE BORGES: FAA INSPECTOR

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