Aviation Investigation Final Report

Location:	Ramona, California	**Accident Number:**	LAX07LA234
Date & Time:	July 27, 2007, 13:12 Local	**Registration:**	N8637P
Aircraft:	Piper PA-24-260	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was performing a test flight to confirm the operation of newly installed avionics. During the return flight to the airport, the engine began to "backfire" and then lost all power. The pilot went through the emergency checklist, but was unable to restart the engine. The pilot force landed the airplane in a dirt field with the landing gear retracted. Both fuel tanks were found to be approximately 1/2 full. Further examination of the airframe revealed a short circuit of both magneto grounding leads in the electrical wiring between the magneto switch and the magneto. The investigation determined that he wiring harnesses were original to the airplane, which was manufactured in 1964. Investigators were able to successfully start the engine and perform a run-up under two separate conditions. The first engine start occurred after investigators disconnected both p-leads at their respective magneto terminals. The second engine start occurred after new electrical wire was connected from the magneto switch to both magnetos. Investigators noted the general overall poor condition of the p-lead electrical wiring. A review of the engine logbook revealed that the engine had been returned to service following a 100-hour inspection about a month prior to the accident. The engine logbook entry indicated that maintenance personnel checked wires, cables, and hoses for condition and security.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of engine power due to a short circuit between both magneto ground leads. A factor in the accident was the inadequate annual/100-hour maintenance inspection regarding the wires.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE

Findings
1. (C) ELECTRICAL SYSTEM,ELECTRIC WIRING - DETERIORATED
2. (F) MAINTENANCE,INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
3. (C) IGNITION SYSTEM,MAGNETO GROUNDING LEAD (P-LEAD) - SHORTED

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
4. TERRAIN CONDITION - ROUGH/UNEVEN

Factual Information

HISTORY OF FLIGHT

On July 27, 2007, at 1312 Pacific daylight time, a 1964 Piper PA-24-260, N8637P, collided with terrain following a forced landing near Ramona, California. The owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The private pilot, and one passenger were not injured; the airplane sustained substantial damage. The local area personal flight departed the Ramona Airport about 1215. Visual meteorological conditions prevailed; no flight plan had been filed.

The pilot submitted a written report, and was interviewed by a National Transportation Safety Board investigator. The pilot stated that he was performing a test flight to corroborate the glide slope operation of newly installed avionics. He departed from Ramona with the intention of conducting the tests at McClellan-Palomar Airport, Carlsbad, California. After confirming the correct glide slope operation, he began the return journey. As he headed east out of Palomar airspace, about 3,500 feet mean sea level (msl), the engine began to "backfire" and then lost all power. He applied full rich mixture, switched fuel tanks, and went through the emergency checklist, but was unable to restart the engine. He declared an emergency with Ramona Tower, but fearing he would not make the airport, elected to prepare for an off-airport landing.

The pilot guided the airplane towards a road, but on approach noticed obstructions. With options limited, he picked an area of farmland adjacent to the road. On final approach, he noted that power lines where obstructing his flight path, and rather than risk stalling by initiating a climb, he elected to fly below the lines, landing just beyond in a dirt field. In an effort to prevent the airplane from nosing over, the pilot stated that he landed the airplane with the landing gear retracted. The pilot secured the airplane by turning off the master switch, magnetos, and switching the fuel selector to the OFF position. The pilot and passenger then exited the airplane.

A Federal Aviation Administration (FAA) inspector checked the fuel tanks at the accident site, and found them both to be approximately 1/2 full.

AIRCRAFT INFORMATION

An inspection of the airframe and engine logbooks revealed that an airframe annual inspection and 100-hour engine inspection had been returned to service on June 22, 2007. The entry for the engine 100-hour inspection indicated that maintenance personnel had checked wires, cables, and hoses for condition and security. The engine logbook revealed that the engine had been reinstalled following a "prop strike inspection" approximately 3 hours prior to the

accident. The pilot stated the reason for the engine rebuild was due to a previous gear up landing, and subsequent propeller strike.

TESTS AND RESEARCH

Safety Board investigators examined the wreckage at Aircraft Recovery Service, Littlerock, California, on August 28, 2007.

The wings and electrically operated fuel pump were removed during the recovery. Investigators reconnected the fuel pump to the fuel system inside the cockpit. The left and right wing fuel selector inlets were connected to a fuel source, the electrical fuel pump was activated, and fuel was observed to flow with the selector set in both the LEFT and RIGHT tank positions.

The engine, a Lycoming model IO-540-D4A5, is a six cylinder, air cooled, direct drive, horizontally opposed, fuel injected, internal combustion engine. The engine remained attached to the airframe by the engine mount. The engine had sustained minor impact damage to the fuel injection servo airbox, and the exhaust outlet tailpipes. The fuel injection servo remained securely attached at the mounting pad on the plenum. Visual examination of the engine revealed no evidence of pre-impact catastrophic mechanical malfunction.

The top spark plugs were removed and examined. The spark plug electrodes remained mechanically undamaged and displayed coloration consistent with normal operation. Investigators manually rotated the crankshaft. The crankshaft rotated freely, and 'thumb' compression was obtained on all cylinders in firing order. The left and right magnetos remained securely clamped at their respective mounting pads. Both the left and right magneto grounding leads (p-lead) were observed to have cracked insulation throughout their length, from the firewall through to the magneto capacitors. The throttle/mixture controls were found securely attached, and full travel control continuity to the cockpit was established. All fuel lines in the engine compartment were found to be in place, and tight at their respective fittings. The fuel flow divider, associated fittings, and fuel injectors remained secure. The engine driven fuel pump was attached to the engine at the mounting pad.

An engine run was attempted, but investigators were unable to successfully start the engine. Investigators disconnected both p-leads at their respective magneto terminals. The engine was then successfully started and a run-up was completed with no mechanical anomalies noted. The p-leads were reconnected, and the magneto switch was inspected. The magneto switch was temporarily replaced, but investigators were unable to successfully start the engine. Investigators reinstalled the original magneto switch, but connected the left and right magneto p-leads directly to the switch using new electrical wire. The engine was then successfully started, and another run-up was completed with no mechanical anomalies noted.

Pilot Information

Certificate:	Private	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	February 1, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 1, 2007
Flight Time:	1134 hours (Total, all aircraft), 56 hours (Total, this make and model), 1068 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8637P
Model/Series:	PA-24-260	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-4078
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 1, 2007 Annual	**Certified Max Gross Wt.:**	3100 lbs
Time Since Last Inspection:	3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5435 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-540
Registered Owner:	On file	**Rated Power:**	260 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RNM,1395 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	13:53 Local	**Direction from Accident Site:**	120°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	24°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ramona, CA (RNM)	**Type of Flight Plan Filed:**	None
Destination:	(RNM)	**Type of Clearance:**	VFR
Departure Time:	12:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Ramona RNM	**Runway Surface Type:**	
Airport Elevation:	1395 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	Gregg Nolting; Federal Aviation Administration ; San Diego, CA Mark Platt; Textron Lycoming; Williamsport, PA Charles Little; Piper Aircraft; Vero Beach, FL
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66361