Aviation Investigation Final Report

Location:	Sparta, Illinois	**Accident Number:**	CHI02LA150
Date & Time:	May 31, 2002, 17:30 Local	**Registration:**	N5360P
Aircraft:	Piper PA-24-250	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was substantially damaged when the gear collapsed during a forced landing due to a total loss of engine power. The airplane was directly over the Festus Memorial Airport (FES), Festus, Missouri when the engine started to run rough. The pilot decided to return to the Sparta Community-Hunter Field Airport (SAR), Sparta, Illinois, approximately 35 nautical miles (nm) from FES. The engine experienced a total loss of engine power approximately eight nm from SAR and the pilot executed an emergency landing on a wheat field. The number five cylinder was found to have separated from the engine. The last major overhaul on the engine was conducted on November 1, 1988 and the engine had accumulated 526 hours since the overhaul. The engine manufacturer recommends the engine be overhauled every 12 years even if the engine does not meet the time between overhaul hours.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The total loss of engine power due to a separated cylinder and the failure of the pilot to perform a precautionary landing at the nearest suitable airport when the engine had a partial loss of engine power. The failure of the aircraft owners to perform an engine overhaul and the unsuitable terrain encountered during the emergency landing were contributing factors.

Findings

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

Findings
1. (C) PRECAUTIONARY LANDING - NOT PERFORMED - PILOT IN COMMAND
2. (C) MAINTENANCE,OVERHAUL - NOT PERFORMED - OWNER/BUILDER

Occurrence #2: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (C) ENGINE ASSEMBLY,CYLINDER - SEPARATION

Occurrence #3: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #4: GEAR COLLAPSED
Phase of Operation: EMERGENCY LANDING

Findings
4. (F) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - ENCOUNTERED - PILOT IN COMMAND

Factual Information

On May 31, 2002, at 1730 central daylight time, a Piper PA-24-250, N5360P, piloted by a private pilot, was substantially damaged when the landing gear collapsed during a forced landing on a wheat field following a total loss of engine power. Visual meteorological conditions prevailed at the time of the accident. The personal flight was operated under the provisions of 14 CFR Part 91 and was not on a flight plan. The pilot and three passengers were uninjured. The flight originated from the Sparta Community-Hunter Field Airport (SAR), Sparta, Illinois at 1700 and was en route to the Eldon Model Airpark Airport, Eldon, Missouri.

A witness reported that he observed the accident airplane during run-up and he stated that the airplane was idling very well prior to departure.

The pilot stated in his written statement that 15 minutes after departing SAR, at 6,500 feet, the engine, "...acted over-lean adjustments didn't seem to help. I then turned around to return to SAR. Lost electronics after turn around near Red Bud IL. I was holding 6,500 over Red Bud IL. Engine started running worst. But was still running somewhat. Over Ballwin IL I was down to around 4,000 ft. [and] preparing for landing and thought I located a good field, I then engaged landing gear manually, turned fuel off, master-switched to off and landed safely, however landing gear collapsed."

The pilot reported that when the engine started to run rough, the airplane was over the Festus Memorial Airport (FES), Festus, Missouri. FES is served by runway 18/36 (2,202 feet by 49 feet, asphalt) and is approximately 35 nautical miles to the west of SAR.

The Federal Aviation Administration inspector's examination of the Lycoming O-540-AID5 engine, serial number L-3749-40, revealed that the number five cylinder had separated from the engine, and the number two cylinder was loose. The number five cylinder's studs had remaining threads while the number two cylinder's studs were sheared.

The number three cylinder was replaced during its last annual inspection on October 5, 2001. No recorded maintenance on the number five cylinder had been done since the engine was installed on the accident airplane five years prior to the accident. Torque checks on all the cylinder studs were found to be within tolerances four years prior to the accident. The engine was last overhauled on November 1, 1988 and installed on the accident airplane approximately 10 years later with an accumulated time of approximately 100 hours since overhaul. At the time of the accident, the engine had a total of 526 hours since overhaul.

According to the Textron Lycoming Service Instruction number 1009AQ, Recommended Time Between Overhaul Periods:
"Engine deterioration in the form of corrosion (rust) and the drying out and hardening of

composition materials such as gaskets, seals, flexible houses and fuel pump diaphragms can occur if an engine is out of service for an extended period of time. Due to the loss of a protective oil film after an extended period of inactivity, abnormal wear on soft metal bearing surfaces can occur during engine start. Therefore, all engines that do not accumulate the hourly period of time between overhauls specified in this publication are recommended to be overhauled in the twelfth year."

Pilot Information

Certificate:	Private	**Age:**	45,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	November 28, 2000
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	June 1, 2001
Flight Time:	323 hours (Total, all aircraft), 120 hours (Total, this make and model), 262 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5360P
Model/Series:	PA-24-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-409
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 5, 2001 Annual	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:	30 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2720 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-540-AID5
Registered Owner:	Allen W. Brand	**Rated Power:**	250 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SAR,538 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	22:27 Local	**Direction from Accident Site:**	280°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.82 inches Hg	**Temperature/Dew Point:**	32°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sparta, IL (SAR)	**Type of Flight Plan Filed:**	Unknown
Destination:	Eldon, MO (H79)	**Type of Clearance:**	None
Departure Time:	22:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	SPARTA COMMUNITY-HUNTER FIELD SAR	**Runway Surface Type:**	
Airport Elevation:	538 ft msl	**Runway Surface Condition:**	Rough;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	38.149002,-89.709281(est)

Administrative Information

Investigator In Charge (IIC):	SILLIMAN, JIM
Additional Participating Persons:	Curt C Lindauer; Federal Aviation Administration; Springfield, IL
Original Publish Date:	April 18, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=54858