National Transportation Safety Board
Aviation Accident Data Summary

Location:	Strafford, MO	**Accident Number:**	CHI04LA144
Date & Time:	06/03/2004, 1215 CDT	**Registration:**	N693V
Aircraft:	Beech M35	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane collided with a fence and a guy wire during a forced landing following a loss of engine power. The pilot reported he was flying at 8,500 feet mean sea level when the number 2 cylinder departed the engine resulting in a total loss of engine power. He reported that with no airports within gliding distance, he elected to land in a farmer's field where the airplane contacted a fence and a guy wire. The number 2 cylinder and the left magneto were not located after the accident. Half of the crankcase, two fractured cylinder through-bolts, two cylinder through-bolt nuts with pieces of bolts inside, four cylinder hold down nuts with pieces of studs inside, a connecting rod cap with the connecting rod cap bolt, and a connecting rod nut were submitted for a metallurgical examination. The studs and through-bolts were arbitrarily numbered clockwise starting at the upper forward stud. All of the studs and through-bolts that were examined exhibited fatigue cracking with stud 3 exhibiting the largest fatigue region. A lip was observed on the surface of the crankcase which corresponded to the forward edge of the cylinder barrel flange, adjacent to the through-bolts. Linear marks aligned with the axis of the cylinder were observed at the aft side of the cylinder hole corresponding to sliding contact with the cylinder barrel skirt. Sectioning of studs 3 and 4 revealed cracks and/or rolling laps at the thread roots. On stud 4, many of the cracks extended radially then turned. Two studs were removed from cylinder #4 and one of them also displayed sharp thread radii and cracking. This cylinder did not fail. The engine was overhauled on July 6, 2000, at a tach time of 2440.33 hours. The engine had accumulated 194.03 hours since the overhaul.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
The improper installation of the cylinder during the engine overhaul which resulted in the fatigue failure of the cylinder studs and through-bolts and the subsequent separation of the cylinder. Factors associated with the accident were the fence and the guy wire which the airplane contacted during the forced landing.

Findings

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

Findings
1. (C) MAINTENANCE,OVERHAUL - IMPROPER - OTHER MAINTENANCE PERSONNEL
2. (C) MISCELLANEOUS,BOLT/NUT/FASTENER/CLAMP/SPRING - FATIGUE
3. (C) ENGINE ASSEMBLY,CYLINDER - SEPARATION

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

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING

Findings
4. (F) OBJECT - FENCE
5. (F) OBJECT - GUY WIRE

Pilot Information

Certificate:	Commercial	**Age:**	78
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Instrument Rating(s):**	Airplane
Other Aircraft Rating(s):	None	**Instructor Rating(s):**	None
Flight Time:	26000 hours (Total, all aircraft), 5000 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N693V
Model/Series:	M35	**Engines:**	1 Reciprocating
Operator:	Bernard A. Armstrong	**Engine Manufacturer:**	Continental
Operating Certificate(s) Held:	None	**Engine Model/Series:**	IO-470-C
Flight Conducted Under:	Part 91: General Aviation - Personal		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	
Observation Facility, Elevation:	SGF	**Weather Information Source:**	Weather Observation Facility
Lowest Ceiling:	None	**Wind Speed/Gusts, Direction:**	6 knots / , 360°
Temperature:	22°C	**Visibility**	10 Miles
Precipitation and Obscuration:			
Departure Point:	Tell City, IN (TEL)	**Destination:**	Tulsa, OK (TUL)

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	
Ground Injuries:	N/A	**Aircraft Explosion:**	
Latitude, Longitude:	37.244444, -93.386944		

Administrative Information

Investigator In Charge (IIC):	Pamela S Sullivan	**Adopted Date:**	06/08/2005
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		

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