



National Transportation Safety Board Aviation Accident Data Summary

Location:	BROOMFIELD, CO	Accident Number:	FTW94FA141
Date & Time:	05/01/1994, 1220 MDT	Registration:	N1905Y
Aircraft:	MOONEY M20E	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

SHORTLY AFTER TAKEOFF, THE PILOT REQUESTED CLEARANCE TO RETURN FOR AN IMMEDIATE LANDING. A WITNESS SAID THAT HE HEARD A METALLIC NOISE FROM THE PLANE AS IT PASSED OVERHEAD. HE SAID THE PILOT MADE A STEEP RIGHT BANK TO LAND ON RUNWAY 29L; HOWEVER, THE PLANE IMPACTED BETWEEN THE PARALLEL RUNWAYS. AN EXAM OF THE ENGINE REVEALED 2 FINGER-TIGHT CYLINDER BASE NUTS & UNDERTORQUED BASE NUTS & CRANKCASE THROUGH-NUTS. A TEARDOWN REVEALED THE CRANKSHAFT HAD FAILED FROM FATIGUE BETWEEN THE #3 & #4 CONNECTING ROD JOURNALS. A METALLURGICAL EXAM OF THE CRANKSHAFT REVEALED HIGH LOCALIZED STRESS-INDUCED FATIGUE CRACKS. THE ENGINE HAD ACCUMULATED 266 HRS OF FLIGHT TIME SINCE MAJOR OVERHAUL ON 1/11/91. THE PLANE HAD BEEN MODIFIED WITH 2 STC'S, 1 FOR INSTALLATION OF A RAYJAY TURBOCHARGER, ANOTHER FOR INSTALLATION OF A 'BLACKMAC' PROPELLER. THE HOLDER OF THE PROPELLER STC REPORTED THE COMPANY WOULD NOT HAVE INSTALLED THE PROPELLER ON A TURBOCHARGED ENGINE, SINCE CERTIFICATION VIBRATORY TESTS WERE ONLY MADE ON NORMALLY ASPIRATED ENGINES. AFTER INSTALLATION ON 1/17/91, THE PROPELLER WAS REMOVED ON 3/19/91 FOR STATIC BALANCE & 'RE-INDEX PROP #1 BLADE 180 DEGREES;' ON 3/28/91, IT WAS REMOVED FOR A BLADE ANGLE CHECK; AND ON 5/23/91, IT RECEIVED A DYNAMIC BALANCE.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: FATIGUE FAILURE OF THE ENGINE CRANKSHAFT; AND FAILURE OF THE PILOT TO MAINTAIN ADEQUATE AIRSPEED, WHILE MANEUVERING TO LAND, WHICH RESULTED IN A STALL AND COLLISION WITH THE TERRAIN. FACTORS RELATED TO THE ACCIDENT WERE: THE UNDESIRABLE ENGINE/PROPELLER VIBRATION, AND THE LOOSE CRANKCASE AND CYLINDER BASE NUTS.

Findings

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

Findings

1. MAINTENANCE,MODIFICATION - PERFORMED
2. (F) MISCELLANEOUS,ENGINE - VIBRATION
3. (F) PROPELLER SYSTEM/ACCESSORIES - VIBRATION
4. (F) MISCELLANEOUS,BOLT/NUT/FASTENER/CLAMP/SPRING - LOOSE

5. (C) ENGINE ASSEMBLY, CRANKSHAFT - FATIGUE

Occurrence #2: FORCED LANDING

Phase of Operation: MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Occurrence #3: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Findings

6. (C) AIRSPEED - INADEQUATE - PILOT IN COMMAND

7. (C) STALL/SPIN - INADVERTENT - PILOT IN COMMAND

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Pilot Information

Certificate:	Private	Age:	42
Airplane Rating(s):	Single-engine Land	Instrument Rating(s):	Airplane
Other Aircraft Rating(s):	None	Instructor Rating(s):	None
Flight Time:	560 hours (Total, all aircraft), 347 hours (Total, this make and model), 502 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MOONEY	Registration:	N1905Y
Model/Series:	M20E M20E	Engines:	1 Reciprocating
Operator:	VERBOSH, GEORGE M.	Engine Manufacturer:	LYCOMING
Operating Certificate(s) Held:	None	Engine Model/Series:	IO-360-A1A
Flight Conducted Under:	Part 91: General Aviation - Personal		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BJC, 5671 ft msl	Weather Information Source:	Weather Observation Facility
Lowest Ceiling:	Broken / 20000 ft agl	Wind Speed/Gusts, Direction:	7 knots / , 190°
Temperature:	14° C	Visibility	60 Miles
Precipitation and Obscuration:			
Departure Point:	(BJC)	Destination:	(BJC)

Airport Information

Airport:	JEFFERSON COUNTY (BJC)	Runway Surface Type:	Asphalt
Runway Used:	29L	Runway Surface Condition:	Dry
Runway Length/Width:	7000 ft / 75 ft		

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Latitude, Longitude:			

Administrative Information

Investigator In Charge (IIC):	ARNOLD W SCOTT,	Adopted Date:	07/31/1995
Investigation Docket:	NTSB accident and incident docket 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.nts.gov/pubdms/ .		

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