Aviation Investigation Final Report

Location:	SCOTTSDALE, Arizona	**Accident Number:**	LAX96LA280
Date & Time:	July 20, 1996, 08:57 Local	**Registration:**	N999FA
Aircraft:	Mitsubishi MU-2B	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The right engine lost power after an uncontained engine failure during the initial takeoff climb. The airplane would not climb and the pilot was forced to land. The pilot selected a street for a forced landing area. The pilot landed gear up while maneuvering to avoid hitting street light poles and automobiles. After touchdown, the airplane slid into a block wall. A fire erupted as a result of a postimpact fuel leak in the left wing. The airplane's engines were examined at the manufacturer's facilities. The right engine exhibited evidence of an uncontained separation of the second stage turbine rotor disk. Examination of the disk fragments revealed a low cycle fatigue fracture mode. The fatigue initiated from multiple areas at and adjacent to the inside diameter bore surface near the aft side of the disk. According to the engine manufacturer, the multiple indication areas were associated with uninspectable size porosity and the primary carbides in the cast material. There were no material or casting defects detected on any of the fractures through the wheel.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: an uncontained failure of the second stage turbine wheel due to fatigue. Factors were: obstructions in the forced landing area and the inability of the airplane to climb after the turbine wheel failure.

Findings

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

Findings
1. 1 ENGINE
2. (C) TURBINE ASSEMBLY,TURBINE WHEEL - FATIGUE
3. TURBINE ASSEMBLY,TURBINE WHEEL - SEPARATION
4. MISC,ENGINE UNCONTAINED FAILURE

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

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

Findings
5. (F) OBJECT - UTILITY POLE
6. (F) OBJECT - VEHICLE
7. MANEUVER TO AVOID OBSTRUCTIONS - PERFORMED - PILOT IN COMMAND
8. (F) OBJECT - WALL/BARRICADE

Factual Information

On July 20, 1996, at 0857 hours mountain standard time, a Mitsubishi MU-2B, N999FA, landed off the airport after a loss of power during the initial takeoff climb from the Scottsdale Municipal Airport, Scottsdale, Arizona. The airplane was subsequently destroyed by fire and the airline transport pilot was not injured. The airplane was being operated as a business flight under 14 CFR Part 91 when the accident occurred. The airplane was destined for the Phoenix Sky Harbor International Airport, Phoenix, Arizona. Visual meteorological conditions prevailed at the time.

The pilot told the Safety Board that the right engine sustained an uncontained engine failure after lift-off while the landing gear was being retracted. After the loss of power, the airplane would not climb. The pilot selected a street about 2 miles northwest of the airport for a forced landing area. The pilot elected to land gear up, while maneuvering to avoid hitting street light poles and automobiles. After touchdown, the airplane slid into a block wall. A fire erupted as a result of a postimpact fuel leak in the left wing destroying the airplane.

The airplane's engines were examined by the Federal Aviation Administration at manufacturer's facilities in Phoenix, Arizona. According to the manufacturer, the left engine damage was indicative of engine rotation and operation at the time of impact.

The right engine exhibited evidence of an uncontained separation of the second stage turbine rotor disk. Three fragments of the disk remained inside the engine and numerous other fragments exited. Not all of the fragments were recovered. Examination of the three disk fragments revealed a low cycle fatigue fracture mode. The fatigue initiated from multiple areas at and adjacent to the inside diameter bore surface near the aft side of the disk. According to the engine manufacturer, the multiple indication areas were associated with uninspectable size porosity and the primary carbides in the cast material. During the examination, there were no material or casting defects detected on any of the fractures through the wheel. According to the manufacturer, the rest of the damage to the right engine was secondary resulting from the fatigue separation of the second stage turbine wheel.

Pilot Information

Certificate:	Airline transport	**Age:**	34,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 28, 1995
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	4559 hours (Total, all aircraft), 81 hours (Total, this make and model), 4437 hours (Pilot In Command, all aircraft), 48 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mitsubishi	**Registration:**	N999FA
Model/Series:	MU-2B MU-2B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	676
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	July 7, 1996 AAIP	**Certified Max Gross Wt.:**	11575 lbs
Time Since Last Inspection:	5 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	8878 Hrs	**Engine Manufacturer:**	Garrett
ELT:	Installed, not activated	**Engine Model/Series:**	TPE-331
Registered Owner:	MED ARIZONA, INC.	**Rated Power:**	715 Horsepower
Operator:	D & D AVIATION	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	IMKA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FFZ ,1392 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	08:59 Local	**Direction from Accident Site:**	130°
Lowest Cloud Condition:	Clear	**Visibility**	60 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	35°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(SDL)	**Type of Flight Plan Filed:**	None
Destination:	PHOENIX , AZ (PHX)	**Type of Clearance:**	VFR
Departure Time:	07:55 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	SCOTTSDALE MUNICIPAL SDL	**Runway Surface Type:**	
Airport Elevation:	1508 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	21	**IFR Approach:**	None
Runway Length/Width:	8251 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	33.609806,-111.889656(est)

Administrative Information

Investigator In Charge (IIC):	Wilcox, Thomas
Additional Participating Persons:	WILLIAM J AKRIDGE; SCOTTSDALE , AZ
Original Publish Date:	August 25, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29515

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