



National Transportation Safety Board Aviation Accident Data Summary

Location:	GRAND JUNCTION, CO	Accident Number:	DEN91LA095
Date & Time:	07/01/1991, 1500 MDT	Registration:	N20703
Aircraft:	BELL 412	Injuries:	3 None
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

DURING CRUISE FLIGHT, THE ENGINE TO TRANSMISSION DRIVE SHAFT FORWARD COUPLING OVERHEATED AND FAILED. THE PILOT EXECUTE AN AUTOROTATION. DURING THE LANDING FLARE, THE PILOT DID NOT MAINTAIN ADEQUATE ROTOR RPM AND THE HELICOPTER LANDED HARD RESULTING IN SKID COLLAPSE. COMPANY MAINTENANCE PERSONNEL DISPATCHED THE HELICOPTER WITH A KNOWN DRIVE SHAFT COUPLING GREASE LEAK WHICH THEY HAD ATTEMPTED TO STOP BY USING AN UNAPPROVED SILICON SEALANT. THEY HAD REPACKED THE 500 PLUS HOUR COUPLING TWO TIMES PRIOR TO THE ACCIDENT. THE NORMAL REPACK INTERVAL WAS ONCE EVERY 600 HOURS. EXAMINATION OF THE FAILED DRIVE SHAFT DID NOT REVEAL ANY MISALIGNMENT, BUT DID ISOLATE HEAT RELATED FAILURE AREAS OF THE FORWARD COUPLING END.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: THE PILOT'S FAILURE TO MAINTAIN ADEQUATE MAIN ROTOR RPM PRIOR TO TOUCHDOWN. FACTORS WERE: THE DISCONNECTED ENGINE TO TRANSMISSION DRIVE SHAFT AND THE INADEQUATE INSPECTION BY COMPANY MAINTENANCE PERSONNEL.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings

1. (F) ROTOR DRIVE SYSTEM,ENGINE TO TRANSMISSION DRIVE - DISCONNECTED
2. (F) MAINTENANCE,INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL

Occurrence #2: FORCED LANDING

Phase of Operation: DESCENT - EMERGENCY

Findings

3. AUTOROTATION - PERFORMED - PILOT IN COMMAND

Occurrence #3: HARD LANDING

Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

4. (C) ROTOR RPM - NOT MAINTAINED - PILOT IN COMMAND

Pilot Information

Certificate:	Airline Transport	Age:	42
Airplane Rating(s):	Multi-engine Land	Instrument Rating(s):	Helicopter
Other Aircraft Rating(s):	Helicopter	Instructor Rating(s):	
Flight Time:	4010 hours (Total, all aircraft), 300 hours (Total, this make and model), 2500 hours (Pilot In Command, all aircraft), 40 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BELL	Registration:	N20703
Model/Series:	412 412	Engines:	2 Turbo Shaft
Operator:	AIR METHODS CORPORATION	Engine Manufacturer:	P&W
Operating Certificate(s) Held:	On-demand Air Taxi (135)	Engine Model/Series:	PT6T-3B
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Weather Information Source:	Pilot
Lowest Ceiling:	None / 0 ft agl	Wind Speed/Gusts, Direction:	7 knots / , 180°
Temperature:	-18° C	Visibility:	70 Miles
Precipitation and Obscuration:			
Departure Point:	GRAND JUNCTION, CO (GJT)	Destination:	MONTICELLO, UT (U43)

Wreckage and Impact Information

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Latitude, Longitude:			

Administrative Information

Investigator In Charge (IIC):	VERLIN B TRANTER	Adopted Date:	02/08/1993
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.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the

accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.