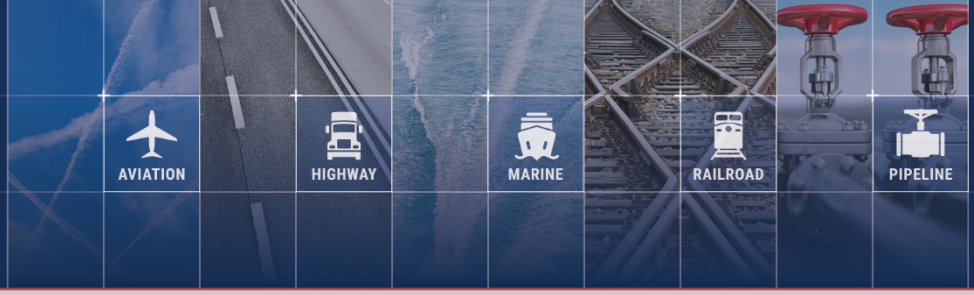

Aviation Investigation Final Report

Location:	HAYFORK, California	**Accident Number:**	LAX92LA319
Date & Time:	July 28, 1992, 08:00 Local	**Registration:**	N89NW
Aircraft:	BELL UH-1B	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Minor
Flight Conducted Under:	Part 133: Rotorcraft ext. load		

Analysis

THE PILOT HAD JUST DROPPED OFF A LOAD OF LOGS AND WAS EN ROUTE BACK TO THE CUTTING AREA WHEN HE HEARD A LOUD BANG CONCURRENT WITH A LEFT YAW AND A RAPID LOSS OF ROTOR SPEED. THE PILOT ENTERED AN AUTOROTATION AND COLLIDED WITH TREES DURING THE DESCENT. EXAMINATION REVEALED THAT THE MAIN ROTOR DRIVE SHAFT HAD FAILED. EXAMINATION OF THE SHAFT REVEALED EVIDENCE OF A LOSS OF GREASE FROM THE SHAFT'S BOOT, WHICH RESULTED IN AN OVERHEATING CONDITION AND CATASTROPHIC FAILURE OF THE UNIT. THE 'O' RING, WHICH PROVIDES THE GREASE SEAL FOR THE SHAFT BOOT, WAS FOUND DEFORMED WITH EVIDENCE THAT GREASE HAD BEEN SLUNG FROM THE BOOT. THE MAIN ROTOR DRIVE SHAFT HAD BEEN REMOVED FOR MAINTENANCE AND REPLACED THREE DAYS AND 6 HOURS PRIOR TO THE ACCIDENT. THE MAINTENANCE INSTRUCTIONS CALL FOR A NEW 'O' RING TO BE INSTALLED WHEN THE DRIVE SHAFT AND BOOT ARE REASSEMBLED. ACORDING TO THE BELL LABORATORY, THE 'O' RING APPEARED TO HAVE NOT BEEN REPLACED.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: THE FAILURE OF THE MAIN ROTOR DRIVE SHAFT DUE TO THE IMPROPER INSTALLATION BY COMPANY MAINTENANCE PERSONNEL OF AN 'O' RING SEAL, WHICH ALLOWED THE PACKING GREASE TO ESCAPE AND CAUSED THE OVER TEMPERATURE FAILURE OF THE DRIVE SHAFT. A FACTOR IN THE ACCIDENT WAS THE LACK OF SUITABLE TERRAIN IN WHICH TO PERFORM AN AUTOROTATION.

Findings

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

Findings
1. (C) LUBRICATING SYSTEM,OIL SEAL - LOOSE
2. (C) LUBRICATING SYSTEM,OIL SEAL - LEAK
3. (C) MAINTENANCE,INSTALLATION - IMPROPER - COMPANY MAINTENANCE PERSONNEL
4. (C) ROTOR DRIVE SYSTEM,ENGINE TO TRANSMISSION DRIVE - OVERTEMPERATURE
5. (C) ROTOR DRIVE SYSTEM,ENGINE TO TRANSMISSION DRIVE - FAILURE,TOTAL

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

Findings
6. AUTOROTATION - INITIATED - PILOT IN COMMAND
7. (F) TERRAIN CONDITION - NONE SUITABLE
8. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
9. (F) TERRAIN CONDITION - TREE(S)

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - EMERGENCY

Factual Information

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	41,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 18, 1991
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	13000 hours (Total, all aircraft), 3000 hours (Total, this make and model), 12700 hours (Pilot In Command, all aircraft), 300 hours (Last 90 days, all aircraft), 73 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BELL	**Registration:**	N89NW
Model/Series:	UH-1B UH-1B	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	62-4576
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	July 27, 1992 100 hour	**Certified Max Gross Wt.:**	8500 lbs
Time Since Last Inspection:	6 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	5496 Hrs	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	T53-L110
Registered Owner:	NORTHWEST HELICOPTERS, INC.	**Rated Power:**	1100 Horsepower
Operator:	NORTHWEST HELICOPTERS, INC.	**Operating Certificate(s) Held:**	
Operator Does Business As:		**Operator Designator Code:**	WYFL

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	20 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	27°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	07:20 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	40.500545,-123.18991(est)

Administrative Information

Investigator In Charge (IIC):	Rich, Jeff
Additional Participating Persons:	DEL PATNO; SACRAMENTO , CA JACK SUTTLE; FORT WORTH , TX
Original Publish Date:	September 14, 1993
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=27705