



Aviation Investigation Final Report

Location:	Morrilton, Arkansas	Accident Number:	CEN19LA146
Date & Time:	May 15, 2019, 18:33 Local	Registration:	N761AF
Aircraft:	Sikorsky S76	Aircraft Damage:	Substantial
Defining Event:	Powerplant sys/comp malf/fail	Injuries:	6 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Unspecified)		

Analysis

The pilot of the helicopter air ambulance flight reported that he experienced fumes in the cockpit while enroute, and shortly thereafter, received visual and aural warnings of smoke in the aft baggage compartment. The pilot initiated an emergency descent into an alternate airport, declared an emergency with air traffic control, and landed uneventfully.

Examination of the helicopter revealed that the No. 2 engine exhaust duct was disconnected and unseated, which resulted in engine exhaust entering the compartment containing the tail rotor drive shaft and substantial heat damage to the drive shaft and surrounding areas. Examination of the No. 1 engine exhaust duct revealed that its attach bolts were not tightened to the specified torque value. Additionally, examination of the operator’s other helicopter revealed that the bolts securing both of its two exhaust ducts were not tightened to the specified torque value. The maintenance history of these components was not determined, but given the available information, it is likely that they were improperly secured, which resulted in their loosening and subsequently allowed the exhaust duct to become unseated.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The improper securing of the exhaust duct bolts, which resulted in the duct becoming unseated and substantial heat damage to the tail rotor drive shaft.

Findings

Aircraft	Fasteners - Incorrect service/maintenance
Aircraft	(general) - Incorrect service/maintenance
Personnel issues	(general) - Maintenance personnel

Factual Information

History of Flight

Enroute-cruise	Powerplant sys/comp malf/fail (Defining event)
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On May 15, 2019, about 1833 central daylight time, a Sikorsky S-76D helicopter, N761AF, sustained substantial damage while in cruise flight near Morrilton, Arkansas. The pilot, 2 crewmembers, and 3 passengers were not injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 135 on-demand air medical flight.

The pilot reported that, 43 minutes into the flight, he experienced fumes in the cockpit. He turned the environmental control system off and immediately descended. Within seconds, he received visual and aural warnings of smoke in the aft baggage compartment. He initiated an emergency descent and declared an emergency with air traffic control and subsequently landed without further incident.

A postaccident examination of the helicopter by a Federal Aviation Administration inspector revealed that the exhaust duct from the No. 2 engine was disconnected and not in its seated position. Exhaust from the No. 2 engine entered the compartment containing the tail rotor drive shaft and resulted in heat damage to drive shaft and surrounding areas. The exhaust ducts are attached using two bolts secured at 110 ft-lbs of pressure. Upon inspection of the No. 1 engine, as well as the operator's second helicopter, all bolts were found partially disengaged and not tightened to the specified torque value.

Pilot Information

Certificate:	Airline transport; Commercial	Age:	50, Male
Airplane Rating(s):	Single-engine land; Multi-engine sea	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	5-point
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	April 29, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 28, 2019
Flight Time:	6518 hours (Total, all aircraft), 431 hours (Total, this make and model), 5165 hours (Pilot In Command, all aircraft), 32 hours (Last 90 days, all aircraft), 13 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Other flight crew Information

Certificate:	None	Age:	Male
Airplane Rating(s):	None	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Other flight crew Information

Certificate:	None	Age:	Male
Airplane Rating(s):	None	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Passenger Information

Certificate:		Age:	
Airplane Rating(s):		Seat Occupied:	Center
Other Aircraft Rating(s):		Restraint Used:	4-point
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Passenger Information

Certificate:	Age:	Female
Airplane Rating(s):	Seat Occupied:	Right
Other Aircraft Rating(s):	Restraint Used:	4-point
Instrument Rating(s):	Second Pilot Present:	No
Instructor Rating(s):	Toxicology Performed:	
Medical Certification:	Last FAA Medical Exam:	
Occupational Pilot:	Last Flight Review or Equivalent:	
Flight Time:		

Passenger Information

Certificate:	Age:	Male
Airplane Rating(s):	Seat Occupied:	Right
Other Aircraft Rating(s):	Restraint Used:	4-point
Instrument Rating(s):	Second Pilot Present:	No
Instructor Rating(s):	Toxicology Performed:	
Medical Certification:	Last FAA Medical Exam:	
Occupational Pilot:	Last Flight Review or Equivalent:	
Flight Time:		

Aircraft and Owner/Operator Information

Aircraft Make:	Sikorsky	Registration:	N761AF
Model/Series:	S76	Aircraft Category:	Helicopter
Year of Manufacture:	2013	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	761039
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	March 13, 2019 Continuous airworthiness	Certified Max Gross Wt.:	11875 lbs
Time Since Last Inspection:	205 Hrs	Engines:	2 Turbo shaft
Airframe Total Time:	2488 Hrs as of last inspection	Engine Manufacturer:	Pratt and Whitney
ELT:	C126 installed, not activated	Engine Model/Series:	PW210S
Registered Owner:	Arkansas Childrens Hospital	Rated Power:	1248 Horsepower
Operator:	Arkansas Childrens Hospital	Operating Certificate(s) Held:	On-demand air taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KRUE,403 ft msl	Distance from Accident Site:	25 Nautical Miles
Observation Time:	18:53 Local	Direction from Accident Site:	285°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	29°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Springdale, AR (14AR)	Type of Flight Plan Filed:	Company VFR
Destination:	Little Rock, AR (AR62)	Type of Clearance:	VFR flight following
Departure Time:	17:50 Local	Type of Airspace:	Class E

Airport Information

Airport:	MORRILTON MUNI BDQ	Runway Surface Type:	Asphalt
Airport Elevation:	321 ft msl	Runway Surface Condition:	Dry
Runway Used:	09/27	IFR Approach:	None
Runway Length/Width:	4000 ft / 75 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	6 None	Latitude, Longitude:	35.1018,-92.7652(est)

Administrative Information

Investigator In Charge (IIC):	Liedler, Courtney
Additional Participating Persons:	Matthew Disch; FAA; Little Rock, AR
Original Publish Date:	December 14, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99455

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).