



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Zeeland, Michigan	Incident Number:	CEN16IA238
Date & Time:	June 27, 2016, 14:30 Local	Registration:	N518EG
Aircraft:	Enstrom 280	Aircraft Damage:	Minor
Defining Event:	Fire/smoke (non-impact)	Injuries:	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and student conducted a preflight inspection of the helicopter in preparation for the student's first flight. The flight instructor reported that, after engine start and before takeoff, he saw the lights on the panel flicker and smelled smoke. About the same time, he noticed ground personnel running toward the helicopter. He and the student exited the helicopter, and ground personnel extinguished an engine fire.

Examination of the engine's exhaust band clamp assembly revealed that the clamp's two U-shaped retainer portions had fractured at spot weld locations. The incident is consistent with the failure of the exhaust band clamp, which allowed hot exhaust gases to enter the engine compartment and a fire to ensue.

Probable Cause and Findings

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

The exhaust band clamp failure, which resulted in an engine fire due to hot exhaust gases entering the engine compartment.

Findings

Aircraft	(general) - Malfunction
Aircraft	Fasteners - Not specified

Factual Information

History of Flight

Standing-engine(s) operating	Fire/smoke (non-impact) (Defining event)
------------------------------	--

On June 27, 2016, about 1430 eastern daylight time, an Enstrom 208FX helicopter, N518EG, experienced an engine fire while preparing for departure from the Ottawa Executive airport (Z98), Zeeland, Michigan. The flight instructor and student pilot were not injured and the helicopter sustained minor fire damage. The helicopter was registered to and operated by Blue Sun Air, LLC, Zeeland, Michigan, under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Day visual meteorological conditions prevailed at the time.

The flight instructor reported that the student pilot was on his first flight. After a preflight inspection, they started the helicopter's engine and prepared for takeoff. Before increasing collective, the instructor noticed the lights on the panel flicker and smelled smoke. About the same time, the instructor also observed ground personnel running toward the helicopter. Both he and the student exited the helicopter and ground personnel were able to extinguish an engine fire.

An examination by a Federal Aviation Administration (FAA) inspector noted that the exhaust pipe had separated from the engine turbocharger. The helicopter had sustained damage to the engine access door, electrical wires, and smoke/thermal damage to the engine compartment.

The helicopter's turbocharger, exhaust clamp, and scavenge pump were sent to the National Transportation Safety Board (NTSB) Materials Laboratory in Washington, DC for further examination.

The materials laboratory noted that the band clamp assembly contained a strap portion and two U-shaped retainers. The bottom end of each U-shaped retainer were joined by several spot welds to the inner side of the strap portion. Examination of the band clamp assembly revealed the two U-shaped retainer portions fractured at the spot weld locations.

The NTSB's Materials Laboratory's Factual report is located in the public docket for this accident.

Flight instructor Information

Certificate:	Airline transport	Age:	39
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	June 3, 2016
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 22, 2016
Flight Time:	6500 hours (Total, all aircraft), 150 hours (Total, this make and model), 5280 hours (Pilot In Command, all aircraft)		

Student pilot Information

Certificate:	Age:
Airplane Rating(s):	Seat Occupied: Left
Other Aircraft Rating(s):	Restraint Used:
Instrument Rating(s):	Second Pilot Present: Yes
Instructor Rating(s):	Toxicology Performed: No
Medical Certification:	Last FAA Medical Exam:
Occupational Pilot:	Last Flight Review or Equivalent:
Flight Time:	0 hours (Total, all aircraft), 0 hours (Total, this make and model)

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	Registration:	N518EG
Model/Series:	280 FX	Aircraft Category:	Helicopter
Year of Manufacture:	2003	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	2101
Landing Gear Type:	N/A; Ski	Seats:	
Date/Type of Last Inspection:	January 22, 2016 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	533 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	Installed	Engine Model/Series:	HIO-360 SER
Registered Owner:	BLUE SUN AIR LLC	Rated Power:	205 Horsepower
Operator:	BLUE SUN AIR LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	Z98	Distance from Accident Site:	
Observation Time:	13:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	13 knots / 21 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	26°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Zeeland, MI (Z98)	Type of Flight Plan Filed:	
Destination:	Zeeland, MI (Z98)	Type of Clearance:	None
Departure Time:		Type of Airspace:	

Airport Information

Airport:	Ottawa Executive Z98	Runway Surface Type:	
Airport Elevation:	740 ft msl	Runway Surface Condition:	Unknown
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Minor
Passenger Injuries:		Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	42.809444,-85.981666(est)

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig
Additional Participating Persons:	Michael Costallos; FAA FSDO; Grand Rapids, MI
Original Publish Date:	May 1, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this incident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=93509

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](#).