Aviation Investigation Final Report

Location:	Sealy, Texas	**Accident Number:**	CEN16LA221
Date & Time:	June 15, 2016, 14:30 Local	**Registration:**	N302CT
Aircraft:	FLIGHT DESIGN GMBH CTSW HXB	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

During the initial climb on an instructional flight, the light sport airplane experienced a total loss of engine power. The flight instructor initiated a 180-degree turn back toward the airport; however, the airplane impacted trees to the right of the runway. Postaccident examination revealed that the mechanical fuel pump diaphragm had deteriorated and was leaking fuel. A serviceable fuel pump was installed, and the engine operated normally and produced full power during a subsequent test run.

The fuel pump was subject to a mandatory service bulletin (SB) issued by the manufacturer about 3 years before the accident. The SB required replacement of the fuel pump at the next scheduled maintenance due to instances of mechanical failure. Although the accident airplane had received three annual inspections between the issuance of the SB and the accident flight, the fuel pump was not replaced at any of these inspections.

Probable Cause and Findings

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

Failure of maintenance personnel to comply with the engine manufacturer's mandatory service bulletin, which resulted in failure of the mechanical fuel pump diaphragm and a subsequent total loss of engine power.

Findings

Aircraft	Fuel pumps - Failure
Aircraft	Fuel pumps - Incorrect service/maintenance
Personnel issues	Lack of action - Maintenance personnel
Personnel issues	Lack of action - Pilot

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Landing-landing roll	Collision with terr/obj (non-CFIT)

On June 15, 2016, about 1430 central daylight time, a Flight Design GMBH CTSW HXB, N302CT, collided with trees during a forced landing at Gloster Aerodrome (1XA7), Houston, Texas. The student pilot and flight instructor both sustained minor injuries. The airplane was destroyed. The airplane was registered to and operated by the student pilot under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan had been filed. The local flight had just originated.

According to the flight instructor, the student pilot made the takeoff on runway 25. During the initial climb (about 500 feet AGL), the engine started running rough and lost all power. The instructor took control of the airplane and made a 180-degree turn back towards the airport. A forced landing to runway 07 was attempted but due to a strong tailwind, the airplane collided with trees to the right of the runway.

On October 20, under the auspices of a Federal Aviation Administration (FAA) inspector, the engine was examined at the facilities of South Mississippi Light Aircraft in Lucedale, Mississippi. A Rotax engine representative was also in attendance. Reportedly, the engine would not start on the first attempt. It was determined that the engine was not receiving fuel due to a leak in the fuel pump diaphragm. When an electric fuel pump on the engine test stand was turned on, fuel poured out of the fuel pump drain hole. Disassembly of the fuel pump confirmed that the rubber diaphragm had deteriorated and was leaking. When a serviceable fuel pump was installed, the engine operated normally and produced full power. No further anomalies were noted.

According to the engine logbook, Rotax Service Bulletin SB-912-053-UL (Replacement of fuel pump for Rotax Engine Type 912), dated April 13, 2007, had been complied with on May 24, 2006 (see page 5 of manual). However, Rotax Service Bulletin SB-912-063-UL (Replacement for fuel pumps for Rotax Engine Type 912), dated August 21, 2013, had not been performed. The fuel pump that was installed on the engine (part number 892 542, serial number 07.002314) was manufactured in 2009 and was affected by this service bulletin but it was not listed in the log book. The fuel pump was also affected by Bombardier's Recreational Products Maintenance Manual, requiring a mandatory replacement time of 5 years. Following the recommended replacement date of May 24, 2012, annual inspections of the engine were conducted on November 12, 2012, May 2, 2014, and June 6, 2016. A conditional engine examination was performed on June 13, 2015.

Flight instructor Information

Certificate:	Commercial; Flight instructor; Sport Pilot	**Age:**	70,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Glider; Sport pilot	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 4, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 8, 2014
Flight Time:	(Estimated) 2600 hours (Total, all aircraft), 75 hours (Total, this make and model), 2400 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 21 hours (Last 30 days, all aircraft)		

Student pilot Information

Certificate:	Student	**Age:**	63,Male
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 90 hours (Total, all aircraft), 60 hours (Total, this make and model), 1 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	FLIGHT DESIGN GMBH	**Registration:**	N302CT
Model/Series:	CTSW HXB	**Aircraft Category:**	Airplane
Year of Manufacture:	2007	**Amateur Built:**	
Airworthiness Certificate:	Special light-sport (Special)	**Serial Number:**	07-06-06
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	June 11, 2016 Annual	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	200 Hrs	**Engine Manufacturer:**	Rotax
ELT:	Installed	**Engine Model/Series:**	912 UL
Registered Owner:	On file	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KTME,166 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	14:15 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Clear	**Visibility**	9 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	34°C / 22°C
Precipitation and Obscuration:			
Departure Point:	Houston, TX (1XA7)	**Type of Flight Plan Filed:**	None
Destination:	Arcola, TX (KAXH)	**Type of Clearance:**	None
Departure Time:	14:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Gloster Aerodrome 1XA7	**Runway Surface Type:**	Grass/turf
Airport Elevation:	175 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:	07	**IFR Approach:**	None
Runway Length/Width:	3450 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 Minor	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	29.733333,-96.059165(est)

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	Carl C Thomas; FAA Flight Standards District Office; Houston, TX Jordan Paskevich; Rotech Flight Safety; Vernon
Original Publish Date:	January 26, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=93395