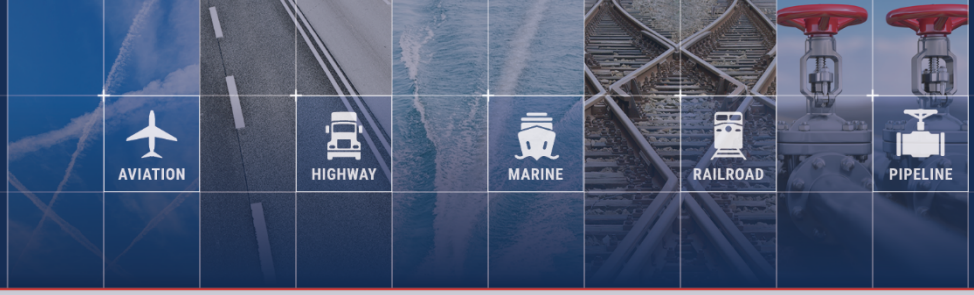

Aviation Investigation Final Report

Location:	Buckeye, Arizona	**Accident Number:**	WPR18LA006
Date & Time:	October 9, 2017, 16:16 Local	**Registration:**	N8NW
Aircraft:	NANCHANG CHINA CJ 6	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and passenger onboard the experimental airplane were descending toward the destination at the conclusion of a cross-county flight when the engine rpm began to vary and the engine eventually lost power. The pilot initiated a forced landing to a clearing at a nearby construction site, during which the left wing impacted an obstacle, resulting in substantial damage.

Postaccident examination of the engine revealed that the fuel pump's diaphragm, located on the drive shaft, was ruptured. The diaphragm was designed to prevent fuel system contamination. Remnants of the diaphragm were observed on the accessory side of the pump and the diaphragm was located inward from its original position on the drive shaft. It is likely that this ruptured diaphragm caused the fuel system to be contaminated with air and or oil and resulted in the loss of power to the engine. No other mechanical anomalies were revealed that would have precluded normal operation.

Probable Cause and Findings

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

The failure of the fuel pump's diaphragm which resulted in fuel system contamination from air and or oil and caused the engine to lose power.

Findings

Aircraft	Fuel pumps - Failure
Aircraft	Fuel - Fluid condition
Environmental issues	Wall/barricade - Effect on equipment

Factual Information

History of Flight

Enroute-descent	Loss of engine power (partial) (Defining event)
Landing-landing roll	Collision with terr/obj (non-CFIT)

On October 9, 2017, about 1616 mountain standard time, an experimental Nanchang China CJ-6, airplane, N8NW, was substantially damaged when it was involved in an accident near Buckeye, Arizona. The pilot sustained serious injuries and the passenger sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot stated that the takeoff, climb, and cruise were uneventful; however, after he initiated a descent toward the destination airport, the engine varied in pitch and rpm. He checked the fuel quantity and both main tanks indicated 60 liters. He enriched the fuel mixture and turned on the auxiliary fuel pump. He stated that the fuel pressure was "good", but as the airplane slowed, the engine eventually lost power.

Unable to glide to an airport, the pilot initiated a forced landing to a clearing at a construction site. During the landing, the airplane's left wing impacted an obstacle, which caused the airplane to veer out of control and resulted in substantial damage to the fuselage and wings.

Postaccident examination of the engine revealed that the crankcase sustained impact damage to the lower side. The propeller and spinner were attached to the crankshaft propeller shaft. The crankshaft was rotated by hand and rotational continuity was established throughout the engine. All cylinders exhibited compression and suction in the proper firing order.

The left magneto was removed and manually rotated. Spark was observed from the coil lead; however, when rotated, the mechanical advance was sticking. The right magneto was removed and during manual rotation, spark was observed on the coil lead. The forward spark plugs were removed, and the spark plug**s** electrodes exhibited an oil residue and evidence of normal wear.

The engine-driven, rotary gear fuel pump was removed and examined. Examination of the pump's vanes and drive shaft revealed no anomalies. The pump's drive shaft rotated freely by hand; however, fuel was noted on the accessory side of the pump. Further examination revealed that the pump's diaphragm, located on the drive shaft, was ruptured. The diaphragm was designed to prevent fuel system contamination. Remnants of the diaphragm were observed on the accessory side of the pump and the diaphragm was located inward from its original position on the drive shaft. Furthermore, the result of a ruptured diaphragm would/could be consistent with being a potential source of fuel system contamination from air and or oil.

The fuel header tank was empty. The fuel line from the gascolator to the engine was intact. The engine accessories mounted to the rear of the engine were intact with the exception of the oil reservoir, which had impact damage. The fuel lines were removed and were clear of debris.

The three-bladed propeller was examined. All blades had separated about 1 ft from the hub.

The examination of the engine revealed no additional evidence of pre-impact mechanical anomalies.

Pilot Information

Certificate:	Private	**Age:**	50,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	September 28, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 416.2 hours (Total, all aircraft), 27.8 hours (Total, this make and model), 338.2 hours (Pilot In Command, all aircraft), 11.2 hours (Last 90 days, all aircraft), 5.8 hours (Last 30 days, all aircraft), 1.5 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	36,Female
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	NANCHANG CHINA	**Registration:**	N8NW
Model/Series:	CJ 6 UNDESIGNAT	**Aircraft Category:**	Airplane
Year of Manufacture:	1992	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	4332016
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	Condition	**Certified Max Gross Wt.:**	3086 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Russia
ELT:	Installed, not activated	**Engine Model/Series:**	M-14P
Registered Owner:	On file	**Rated Power:**	
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:	BXK,1033 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	16:15 Local	**Direction from Accident Site:**	190°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	29°C / -7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LAS VEGAS, NV (VGT)	**Type of Flight Plan Filed:**	VFR
Destination:	Goodyear, AZ (GYR)	**Type of Clearance:**	VFR
Departure Time:	15:00 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	33.65889,-112.63695(est)

Administrative Information

Investigator In Charge (IIC):	Nixon, Albert
Additional Participating Persons:	Dan Gilligan; Federal Aviation Administration; Scottsdale, AZ
Original Publish Date:	May 6, 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=96165