



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Fresno, CA	<b>Accident Number:</b>	WPR16LA050
<b>Date &amp; Time:</b>	01/10/2016, 1135 PST	<b>Registration:</b>	N1950J
<b>Aircraft:</b>	MOORE ONEX	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The pilot/builder was carrying out the initial flight test after recently building the amateur experimental airplane. Shortly after takeoff, the airplane's engine experienced a total power loss and the pilot initiated a descending left turn in order to avoid an airport fence. Subsequently, the airplane impacted terrain, in a nose down attitude with the left wing low.

An examination of the engine revealed that the Force One Main Bearing seized to the crankshaft. Further, there were multiple circular impressions on the bearing surface. Based on this evidence, it is likely that while building the experimental engine, the pilot did not properly align the Force One Main Bearing, and the oil feed hole was inadvertently used as the dowel pin hole, which resulted in a blockage of the oil transfer hole, thus preventing oil into the bearing and resulted in engine seizure and total power loss.

## Probable Cause and Findings

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

The pilot/builder's failure to properly align the Force One Main Bearing, which resulted in a blockage of the oil transfer hole and culminated with a total engine power loss. Contributing to the accident was the pilot's failure to arrest the bank and sink rate prior to impact.

## Findings

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### Personnel issues

Installation - Owner/builder (Cause)

Aircraft control - Pilot (Factor)

Decision making/judgment - Pilot (Factor)

## Factual Information

On January 10, 2016, about 1135 Pacific standard time, an experimental amateur built airplane, Moore Onex, N1950J, experienced a loss of engine power shortly after takeoff from the Fresno Chandler Executive Airport (FCH), Fresno, California. The commercial pilot, who was the sole person on board, was fatally injured. The airplane sustained substantial damage during the forced landing. The airplane was registered to and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed and no flight plan was filed for the local flight.

The pilot received serious injuries during the accident and succumbed to his injuries several days after the accident.

At 11:24, airport security camera video showed the accident airplane taxi to the run-up area to prepare for its initial flight test. At 11:34, the video showed the airplane depart from runway 29 and climb out normally through about 200 feet above ground level (agl). Another video from a witness, who was located near the taxiway, depicts the engine failure. The video audio echoed a smooth and complete engine shutdown that occurred in about 1.5 seconds.

According to the pilot, shortly after the engine failure, he initiated a descending, left turn, in order to avoid an airport fence. Multiple witnesses, located at the airport, observed the airplane enter a steep left bank and rapidly descending as it pitched down. Subsequently, the airplane impacted terrain in a nose down, left wing low attitude.

The accident airplane was equipped with a Garmin GPS 296, which revealed the airplane's flight path. The data revealed that the accident flight was about 46 seconds in duration. During the last 13 seconds of recorded data, the airplane was initially at an airspeed of 72 knots. The data then showed a continuous and rapid loss of airspeed. Additionally, the data showed the airplane starting to descend at that time. About the last 7 seconds of recorded data, the airplane made a left turn off the runway centerline that continued to the accident site. The data stopped recording at 11:35.

Postaccident examination revealed that the airplane came to rest upright, nearly 180° from the runway heading and 800 ft from the runway threshold. The ground scars and airplane damage were consistent with the airplane impacting the ground in a nose down attitude, with left bank. The engine was partially attached to the airframe and found to be seized.

A disassembly was accomplished of the experimental engine. During the teardown examination, about 24 ounces of oil drained from the sump and internal portions of the engine. The oil screen was examined and was clear of metal contamination. The engine was disassembled and the center main bearing was galled, but was not seized, to the crankshaft journal. The force one main bearing was observed to be seized to the crankshaft.

According to the Airframe & Powerplant mechanic and the Federal Aviation Administration (FAA) inspector, during the assembly of the engine, improper indexing of the Force One Main Bearing to the crankcase resulted in a complete misalignment of the oil passages. This

misalignment blocked the oil transfer hole to the bearing, near the bearing retention dowel pin, thus preventing oil flow into the bearing. Circular impressions were observed on the force one main bearing crankshaft surface and on the crankcase bearing support, which would be consistent with the misalignment, where the oil feed hole was inadvertently used as the dowel pin hole.

In the airplane engine assembly manual, it states: "First, check the fit of the Force One Main Bearing. Take one dowel pin and place it in the engine case bearing dowel pin hole. You have to place the dowel pin at the end of a drill and use a file to remove several thousandths from it's diameter to get it to fully seat in the dowel pin hole. When the dowel pin is installed, place the bearing in position, lining up the dowel pin hole in the bearing with the dowel pin in the engine case. Make sure the bearing is not held from seating fully in the case by a down pin that is too "high" by completing a visual check." Following this passage, the manual states: "Be careful not to mistake the oil feed hole for the dowel pin hole!"

## History of Flight

Prior to flight	Aircraft maintenance event
Initial climb	Loss of engine power (total) (Defining event)
Landing-flare/touchdown	Collision with terr/obj (non-CFIT)

## Pilot Information

Certificate:	Commercial	Age:	70, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Sport Pilot	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 484 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	MOORE	Registration:	N1950J
Model/Series:	ONEX	Aircraft Category:	Airplane
Year of Manufacture:	2011	Amateur Built:	Yes
Airworthiness Certificate:	Experimental Light Sport	Serial Number:	ONX0118
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	12/30/2015, Condition	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	0 Hours as of last inspection	Engine Manufacturer:	VW
ELT:		Engine Model/Series:	Type 1VW
Registered Owner:	On file	Rated Power:	
Operator:	On file	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KFAT, 336 ft msl	Distance from Accident Site:	7 Nautical Miles
Observation Time:	1153 PST	Direction from Accident Site:	65°
Lowest Cloud Condition:	Few / 2200 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 3000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.22 inches Hg	Temperature/Dew Point:	12° C / 7° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Fresno, CA (FCH)	Type of Flight Plan Filed:	Unknown
Destination:	Fresno, CA (FCH)	Type of Clearance:	None
Departure Time:	1134 PST	Type of Airspace:	Class C

## Airport Information

Airport:	Fresno Chandler Executive Apt (FCH)	Runway Surface Type:	Grass/turf
Airport Elevation:	280 ft	Runway Surface Condition:	Dry
Runway Used:	29L	IFR Approach:	None
Runway Length/Width:	8008 ft / 150 ft	VFR Approach/Landing:	Forced Landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	36.732222, -119.820278 (est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Albert P Nixon	<b>Report Date:</b>	01/25/2018
<b>Additional Participating Persons:</b>	Fritz Bayer; Federal Aviation Administration; Fresno, CA		
<b>Publish Date:</b>	01/25/2018		
<b>Note:</b>	The NTSB did not travel to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92554">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92554</a>		

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