Aviation Investigation Final Report

Location:	Oregon, Missouri	**Accident Number:**	CEN15LA170
Date & Time:	March 10, 2015, 12:15 Local	**Registration:**	N55000
Aircraft:	Maule M 7-260C	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airline transport pilot was conducting a cross-country personal flight. The pilot reported that, after climbing the airplane to cruise altitude and leaning the fuel mixture, he noted an unusual engine vibration. He enriched the fuel mixture slightly, and the vibration seemed to lessen. After descending and increasing power to level off, the engine vibration worsened, and he chose to perform a precautionary off-airport landing. During the landing, the landing gear "dug in," and the airplane subsequently nosed over.

Testing of the engine's fuel system components revealed that the fuel servo fuel flow was slightly richer than the specified service limits. However, according to the pilot's report, the initial engine vibration did not occur until he leaned the fuel mixture at cruise altitude, indicating that the slightly rich calibration of the fuel servo likely was not associated with the engine vibration described by the pilot. Based on the available evidence, the reason for the engine vibration could not be determined.

Probable Cause and Findings

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

Engine vibration for reasons that could not be determined based on the available evidence.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (partial) (Defining event)
Landing-landing roll	Nose over/nose down

On March 10, 2015, about 1210 central daylight time, a Maule M7 airplane, N55000, sustained substantial damage when it nosed over during a precautionary landing near Oregon, Missouri, following a partial loss of engine power during cruise flight. The pilot was not injured. The airplane sustained substantial damage to the vertical stabilizer and rudder. The aircraft was registered to Aardvark Aircraft Acquisition LLC and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which was not on a flight plan. The flight originated from the North Omaha Airport (3NO), Omaha, Nebraska, about 1125 and was destined for the Rosecrans Memorial Airport (STJ), St Joseph, Missouri.

The pilot reported that after climbing to cruise altitude and leaning the engine he noted an unusual engine vibration. He responded by enriching the fuel mixture slightly above normal and the vibration seemed better. After descending and increasing power to level off, the engine vibration became "much worse", and he elected to perform an off-airport precautionary landing. He stated that the landing was normal but during the landing roll, the main landing gear "dug in" and the airplane nosed over.

Postaccident examination of the airplane did not reveal any preimpact anomalies. The engine fuel servo, flow divider and nozzles were sent to the manufacturer's facility for testing under the direct supervision of NTSB investigators. The flow divider was tested and met all production test standards. The fuel nozzles were not flow tested but did not have any evidence of obstruction. The fuel servo was tested on the manufacturer's flow bench. The measured fuel flow rates were about 1.5 pounds per hour (1/4 gallon per hour) leaner than specified service limits.

Pilot Information

Certificate:	Airline transport	**Age:**	70
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	January 13, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	18102 hours (Total, all aircraft), 16 hours (Total, this make and model), 12875 hours (Pilot In Command, all aircraft), 61 hours (Last 90 days, all aircraft), 17 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Maule	**Registration:**	N55000
Model/Series:	M 7-260C 260C	**Aircraft Category:**	Airplane
Year of Manufacture:	2003	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	30031C
Landing Gear Type:	Tailwheel	**Seats:**	5
Date/Type of Last Inspection:	March 1, 2014 Annual	**Certified Max Gross Wt.:**	2500 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	890 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated	**Engine Model/Series:**	IO-540 SER
Registered Owner:	On file	**Rated Power:**	0 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:	STJ,827 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	140°
Lowest Cloud Condition:	Clear	**Visibility**	7 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.01 inches Hg	**Temperature/Dew Point:**	13°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	OMAHA, NE (3NO)	**Type of Flight Plan Filed:**	None
Destination:	ST JOSEPH, MO (STJ)	**Type of Clearance:**	None
Departure Time:	11:25 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	39.986946,-95.144996

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Jim Wesley; FAA- Kansas City FSDO; Kansas City, MO
Original Publish Date:	April 26, 2016
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=90864