Aviation Investigation Final Report

Location:	Mack, Colorado	**Accident Number:**	CEN19LA313
Date & Time:	September 3, 2019, 10:00 Local	**Registration:**	N2XF
Aircraft:	Jackson Velocity	**Aircraft Damage:**	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The commercial pilot departed on a business flight in the experimental airplane in visual meteorological conditions. As the airplane was passing 15,000 ft en route to its assigned cruising altitude of 18,000 ft, the propeller started to overspeed. The pilot reduced the propeller rpm and manifold pressure but reported that he was unable to find a power setting that would allow the airplane to maintain level flight. Air traffic control provided the pilot with vectors to a nearby airport, where the pilot performed a power-off approach and waited until the landing was assured before lowering the landing gear. The airplane touched down halfway down the runway. The main landing gear was not completely extended, rendering the brakes inoperable, and during the landing roll, the airplane impacted an irrigation pipe, slid off the departure end of the runway, and came rest in a field.

Postaccident examination revealed no discrepancies with the propeller or governor. The screws securing the electronic ignition timing ring to the three brackets bolted to the crankshaft at the propeller stud flange had failed, damaging the timing disk and sensors. The damage caused by the loose screws caused the engine to slow from about 2,700 rpm to about 2,550 rpm. The propeller governor then decreased the propeller pitch to bring the propeller rotation back up to speed, but once the obstruction of the ingested screws cleared and the friction was released, the low-pitch blades allowed the propeller to overspeed. Thus, the overspeed was likely caused by the propeller governor's reaction to a slight slow down of engine speed when the timing ring attachment screws backed out and damaged the electronic ignition timing sensors.

Probable Cause and Findings

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

A propeller overspeed due to failure of the electronic ignition timing ring attachment screws, and a runway overrun during the subsequent forced landing.

Findings

Aircraft	Propeller controlling system - Failure
Aircraft	(general) - Damaged/degraded
Aircraft	Surface speed/braking - Attain/maintain not possible
Personnel issues	Delayed action - Pilot

Factual Information

History of Flight

Enroute-climb to cruise	Sys/Comp malf/fail (non-power) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-landing roll	Landing gear not configured
Landing-landing roll	Runway excursion
Landing-landing roll	Collision with terr/obj (non-CFIT)

On September 3, 2019, about 1000 mountain daylight time, a Jackson/Marini Velocity XL-RG, N2XF, was substantially damaged when it was involved in an accident at Mack Mesa Airport (10CO), Mack, Colorado. The commercial pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 business flight.

The airplane departed Grand Junction Regional Airport (GJT), Grand Junction, Colorado, at 0925, and was en route to Ravalli County Airport (6S5), Hamilton, Montana. According to the pilot's written statement, the airplane was climbing to its assigned cruising altitude of flight level (FL) 180 (18,000 ft). Climb power was set at 2,700 revolutions per minute (RPM) and 30 inches of manifold pressure (MAP) that resulted in a fuel flow of 34 gallons per hour (GPH).

As the airplane passed 15,000 ft, the propeller started to overspeed to about 3,450 RPM. The pilot reduced engine RPM and MAP and advised Denver air route traffic control center (ARTCC). He was given vectors to 10CO. The pilot made a power-off approach to runway 07 and waited until the landing was assured before lowering the landing gear. Because of excessive speed, the airplane touched down halfway down the runway. The nose gear was down but the main landing gear was not completely extended, negating the pilot's application of brakes. During the landing roll, the airplane slid off the departure end of the runway, struck an irrigation pipe that knocked off the left rudder, and came rest in a clover field.

The airplane was trucked back to the pilot's hangar at Orlando Apopka Airport (X04), Apopka, Florida, for repairs. Bench testing and disassembly of the MT propeller and governor by Air Prop Specialists, Inc., in Mariana, Florida, revealed no discrepancies. The screws that secured the timing ring to the three brackets that were bolted to the crankshaft at the propeller stud flange had failed, damaging the timing disk and sensors.

The pilot said that the damage occurred just prior to the overspeed and was not the result of the overspeed or landing rollout. He said the overspeed was caused by the propeller governor's reaction to the slight slow down of engine speed that occurred ten seconds prior to the overspeed when the timing ring attachment screws backed out, damaging the electronic ignition timing sensors. The interference to rotation and damage caused by the loose screws caused the slowdown from about 2,700 rpm to about 2,550 rpm. The propeller governor decreased propeller pitch to bring the propeller rotation back up to

speed but once the obstruction of the ingested screws cleared and the friction was released, the low pitch blades allowed the propeller to overspeed.

Pilot Information

Certificate:	Commercial	**Age:**	72,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3	**Last FAA Medical Exam:**	December 4, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 1, 2017
Flight Time:	3000 hours (Total, all aircraft), 1410 hours (Total, this make and model), 30 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Jackson	**Registration:**	N2XF
Model/Series:	Velocity XL-RG	**Aircraft Category:**	Airplane
Year of Manufacture:	2008	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	3RX029
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Condition	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1420 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed	**Engine Model/Series:**	TSIO-550-C
Registered Owner:	On file	**Rated Power:**	300 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:	GJT,4861 ft msl	**Distance from Accident Site:**	19 Nautical Miles
Observation Time:	09:47 Local	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	None /
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.26 inches Hg	**Temperature/Dew Point:**	27°C / 8°C
Precipitation and Obscuration:			
Departure Point:	Grand Junction, CO (GJT)	**Type of Flight Plan Filed:**	IFR
Destination:	Mack, CO (10CO)	**Type of Clearance:**	IFR
Departure Time:	09:25 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Mack Mesa 10CO	**Runway Surface Type:**	Asphalt
Airport Elevation:	4724 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	07	**IFR Approach:**	None
Runway Length/Width:	2600 ft / 60 ft	**VFR Approach/Landing:**	Forced landing

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:**	39.268054,-108.864166

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	
Original Publish Date:	January 28, 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=100232