



# Aviation Investigation Final Report

<b>Location:</b>	Gurdon, Arkansas	<b>Accident Number:</b>	CEN18LA189
<b>Date &amp; Time:</b>	May 21, 2018, 19:15 Local	<b>Registration:</b>	N138ZX
<b>Aircraft:</b>	M-SQUARED AIRCRAFT SPRINT 1000	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 Serious
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot reported that he and a passenger had just departed on a local, personal flight when the engine “suddenly stopped.” Shortly thereafter, the engine seized, and the airplane began to descend rapidly. The pilot deployed the airplane's ballistic parachute about 200 ft above ground level, and the airplane then landed hard in a residential area, which resulted in substantial damage to the wings and fuselage. The pilot recalled that, during the takeoff and climb, the instruments showed no unusual indications and that the engine made no unusual sounds.

Examination of the engine revealed that the top of the MAG piston ring had failed, which resulted in damage to the MAG piston and cylinder walls. Both rubber PTO and MAG carburetor intake sockets were worn and cracked. Complete engine records were not available, and no record was found indicating that the engine had been overhauled during its 23 years of operation. The engine manufacturer recommended that the engine should be overhauled every 300 hours or 5 years, whichever occurred first, and that the rubber carburetor intake sockets should be replaced every 5 years or as signatures of deterioration were detected. Cracked rubber carburetor intake sockets can result in a lean mixture and lead to a piston seizure. The inadequate maintenance of the engine likely led to the failure of the MAG piston ring and the subsequent loss of all engine power due to a piston seizure.

## Probable Cause and Findings

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

Inadequate engine maintenance, which resulted in the failure of the MAG piston ring and the subsequent total loss of engine power due to a piston seizure.

## Findings

<b>Aircraft</b>	Recip eng cyl section - Failure
<b>Aircraft</b>	Recip eng cyl section - Not serviced/maintained
<b>Personnel issues</b>	Scheduled/routine maintenance - Owner/builder

# Factual Information

## History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing

On May 21, 2018, about 1915 central daylight time, an M-Squared Sprint 1000 light-sport airplane, N138ZX, was substantially damaged when it was involved in an accident near Gurdon, Arkansas. The pilot and passenger were seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported to the Federal Aviation Administration (FAA) inspector that the airplane had just departed from runway 26 at Gurdon Lowe Field. When the airplane was about 800 ft above ground level (agl), "the engine suddenly stopped." As the pilot looked for a suitable landing site, the "engine seized up", and the airplane began to descend rapidly. The pilot deployed the airplane's ballistic parachute about 200 ft agl. The airplane descended and landing hard in a residential area. The airplane's wings and fuselage were substantially damaged.

The pilot recalled that during the takeoff and climb there were no unusual indications from the instruments, nor any unusual sounds from the engine.

The engine was examined by the FAA inspector with technical assistance from the engine manufacturer. Examination of the engine revealed that the top of the MAG piston ring had failed resulting in damage to the MAG piston and cylinder walls. The examination also noted vertical scoring on the PTO cylinder, and significant vertical scoring on the MAG cylinder. In addition, both rubber PTO and MAG carburetor intake sockets were worn and cracked.

Complete engine records were not available and there was no record that showed that the engine had been overhauled during its 23 years of operation. The manufacturer recommends an engine overhaul be performed every 300 hour or 5 years, whichever occurs first. The rubber carburetor intake sockets should be replaced every 5 years or when signatures of deterioration are detected.

## Pilot Information

<b>Certificate:</b>	Sport Pilot	<b>Age:</b>	50, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Sport pilot Unknown	<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	M-SQUARED AIRCRAFT	<b>Registration:</b>	N138ZX
<b>Model/Series:</b>	SPRINT 1000 NO SERIES	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2006	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	000582DT
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	
<b>Date/Type of Last Inspection:</b>	September 14, 2017 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	
<b>Airframe Total Time:</b>	285.7 Hrs as of last inspection	<b>Engine Manufacturer:</b>	
<b>ELT:</b>		<b>Engine Model/Series:</b>	
<b>Registered Owner:</b>		<b>Rated Power:</b>	
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KHOT, 535 ft msl	<b>Distance from Accident Site:</b>	23 Nautical Miles
<b>Observation Time:</b>	23:53 Local	<b>Direction from Accident Site:</b>	12°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	3 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	90°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.95 inches Hg	<b>Temperature/Dew Point:</b>	28°C / 22°C
<b>Precipitation and Obscuration:</b>	In the vicinity - Thunderstorm -		
<b>Departure Point:</b>	Gurdon, AR (5M8 )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Gurdon, AR (5M8 )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	19:00 Local	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Serious	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Serious	<b>Latitude, Longitude:</b>	33.923053, -93.157218(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Aguilera, Jason		
<b>Additional Participating Persons:</b>	Bill Kelly; FAA FSDO; Little Rock, AR		
<b>Original Publish Date:</b>	May 5, 2021	<b>Investigation Class:</b>	3
<b>Note:</b>	The NTSB did not travel to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=97304">https://data.nts.gov/Docket?ProjectID=97304</a>		

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).