



# Aviation Investigation Final Report

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<b>Location:</b>	Midland, Texas	<b>Accident Number:</b>	CEN19LA002
<b>Date &amp; Time:</b>	October 12, 2018, 10:45 Local	<b>Registration:</b>	N729TG
<b>Aircraft:</b>	Cirrus SR22	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (partial)	<b>Injuries:</b>	2 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

The pilot and passenger departed on a cross-country flight in a single-engine airplane. Shortly after takeoff and about 500 ft above ground level, the engine "surged." The pilot turned the airplane back toward the airport; however, the engine lost power. The pilot recognized the airplane would not make it back to the airport, so he deployed the airplane's parachute. The airplane descended under the parachute into a parking lot and impacted a parked automobile, which resulted in substantial damage to the airplane.

The engine examination and test run noted that the engine fuel flow was high and above specified engine and airframe manufacturers' limits.

Data from the airplane's data monitor also indicated that the airplane engine's fuel flow was high on the accident flight and on previous flights, although the maximum fuel flow recorded varied. A review of maintenance records revealed that the engine manifold pressure and fuel flow were adjusted in accordance with the manufacturer's maintenance manual about 3 months before the accident.

## Probable Cause and Findings

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

The loss of engine power due to excessive fuel flow.

## Findings

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<b>Aircraft</b>	(general) - Not specified
<b>Environmental issues</b>	Ground vehicle - Contributed to outcome

## Factual Information

### History of Flight

<b>Enroute-climb to cruise</b>	Loss of engine power (partial) (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing
<b>Emergency descent</b>	Collision with terr/obj (non-CFIT)

On October 12, 2018, about 1045 central daylight time, a Cirrus SR22 airplane, N729TG, impacted a parking lot shortly after departing the Midland Airpark (MDD), Midland, Texas. The pilot and passenger received minor injuries, and the airplane was substantially damaged. The airplane was registered to and operated by TJG Equipment, LLC under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a cross-country flight.

The pilot reported that after departure and about 500 ft above ground level, the engine "surged". He turned back toward the airport and the engine lost power. The pilot recognized the airplane would not make it back to the airport, so he deployed the Cirrus Airframe Parachute System (CAPS). The airplane descended under the parachute into a parking lot and impacted a parked automobile.

The airplane was recovered to a salvage facility. An engine examination was then conducted by the NTSB Investigator in Charge (IIC), and technical representatives from the engine and airframe manufacturers. A visual inspection and borescope examination of the engine was conducted: a damaged propeller and minor damage to the exhaust system was noted. In order to facilitate an engine test run, a replacement propeller was installed, and a fuel can was plumbed into the airplane fuel system. An engine run was then conducted, and the engine started without hesitation. The engine was operated about 1,000 rpm to bring the engine up to operation temperatures. During the engine test run, full throttle was applied: manifold pressure stabilized at 39 inHg and fuel flow reached 49 gph. [The engine manufacturer specifications are 36.6 inHg and 37.5 gph, with Cirrus specified a 40.5gph limit].

After the engine run, the turbocharger controller and wastegate actuator were removed from the airplane and sent to the manufacturer for additional testing. It was also noted that during the wastegate actuator removal, the wastegate valve appeared "stuck". After moving the valve, it appeared to move normally.

The airplane's parachute was also removed and sent to Cirrus for a performance and conformity inspections.

The airplane's recoverable data module (RDM) was downloaded, and a review of the data noted that on the accident flight and previous flights, the engine's fuel flow was high, including near or above the maximum limit. A review of the airplane's maintenance records revealed a maintenance entry dated July 18, 2018, that annotated the manifold pressure was set to 36.5, and fuel flow to 41gph, and rpm to 2,500, per Cirrus aircraft maintenance manual 5-30. There were no additional entries that indicated the fuel flow was later changed.

The wastegate actuator and turbocharger controller were bench tested at Hartzell's Engine Technologies (HET) facility, in Montgomery, Alabama, with representatives from the NTSB, FAA, and HET present. Both units operated normally, with no discrepancies noted that would have affected normal performance.

The engine was removed and shipped to the manufacturer's facility where it was placed in an engine test cell. The NTSB IIC and technical representative from the airframe and engine manufacturers conducted the test. The engine was started and ran at various power settings. It was noted that fuel flows were high, enough so that the engine would run rough, but did not experience a total loss of power. A small amount of black smoke was also observed during portions of the engine test run. Later during the test run, adjustments were made that lowered fuel flow; the engine appeared to run normally, without black smoke nor roughness.

A review of Cirrus support publications revealed two publications that address potential issues with engine high fuel flows:

Service Advisory SA19-01, Subject: High Boost/Prime Altitude Lockout Software Condition, which advises that high boost/prime mode be avoided in-flight, below 10,000 ft.

Service Bulletin SB2x-42-17, Subject: 42-20 INTEGRATED MODULAR AVIONICS - Perspective S/W Update, which provides a 10,000 ft altitude lockout feature; and a high fuel flow CAS message, at 42 gph.

## Pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	33
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	September 1, 2017
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	3979 hours (Total, all aircraft), 1468 hours (Total, this make and model), 3941 hours (Pilot In Command, all aircraft), 67 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cirrus	<b>Registration:</b>	N729TG
<b>Model/Series:</b>	SR22 T	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2016	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	1347
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	
<b>Date/Type of Last Inspection:</b>	June 26, 2018 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	Reciprocating
<b>Airframe Total Time:</b>	582.5 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	TIO-550
<b>Registered Owner:</b>	TJG Equipment LLC	<b>Rated Power:</b>	
<b>Operator:</b>	TJG Equipment LLC	<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>	KMDD	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	15:35 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	9 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	180°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	20°C / 19°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Midland, TX	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Andrews, TX (E11 )	<b>Type of Clearance:</b>	Unknown
<b>Departure Time:</b>		<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Minor	<b>Latitude, Longitude:</b>	32.034442,-102.104721(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Corey Wehmeyer; FAA FSDO; Lubbock, TX Brad Miller; Cirrus Aircraft; Duluth, MN Kurt Gibson; Continental Aerospace Technology; Mobile, AL Les Doud; Hartzell Engine Technologies, Inc; Montgomery, AL
<b>Original Publish Date:</b>	June 29, 2020
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<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=98461">https://data.nts.gov/Docket?ProjectID=98461</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).