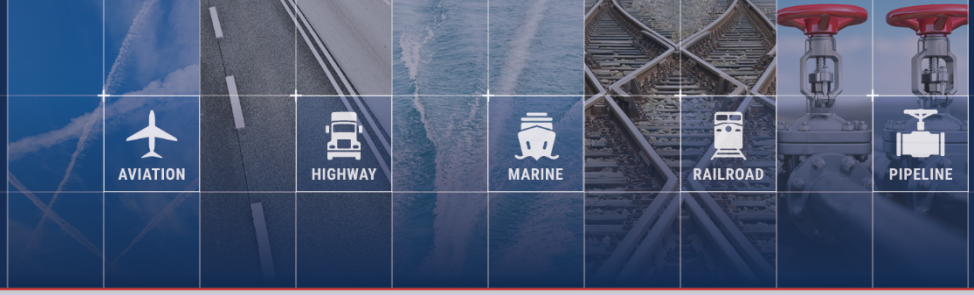

Aviation Investigation Final Report

Location:	Houston, Texas	**Accident Number:**	CEN15LA298
Date & Time:	July 7, 2015, 11:37 Local	**Registration:**	N422PB
Aircraft:	CIRRUS DESIGN CORP SR22	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation		

Analysis

Before the accident flight, maintenance personnel removed the airplane's propeller governor, checked it for proper operation, and reinstalled it on the engine. The airline transport pilot and passenger departed on the business flight. The pilot reported that, during initial climb, he noticed increasing engine temperature, so he reduced engine power to lower the engine temperature. When the airplane was about 900 ft above ground level, the engine lost partial power and, shortly thereafter, lost total power. With no suitable forced landing area, the airframe ballistic parachute system was deployed, and the airplane impacted terrain next to a residence and sustained substantial damage.

Postaccident examination of the engine found that the propeller governor drive gear was fractured, and the gear teeth exhibited damage consistent with the governor drive gear being misaligned. A bench test performed on the governor revealed that it operated within the specified parameters for the unit. The examination also noted the governor washers were improperly stacked; however, this likely did not contribute to the engine failure.

A review of engine performance data for the accident flight revealed that the engine rpm reached at least 3,500 rpm during initial climb, which is 800 rpm over the maximum engine speed; it is likely this overspeed condition occurred as a result of the governor drive gear fracturing. The governor drive gear was likely damaged during the installation of the propeller governor, which subsequently failed during takeoff and allowed the engine to overspeed and overheat to the point of losing power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Maintenance personnel's improper installation of the propeller governor, which resulted in damage to the governor drive gear and its subsequent failure and a subsequent loss of engine power.

Findings

Aircraft	Propeller governor - Incorrect service/maintenance
Personnel issues	Installation - Maintenance personnel
Aircraft	Propeller governor - Failure

Factual Information

History of Flight

Prior to flight	Aircraft maintenance event
Initial climb	Loss of engine power (partial)
Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Miscellaneous/other
Emergency descent	Collision with terr/obj (non-CFIT)

On July 7, 2015, about 1137 central daylight time, a Cirrus SR-22 single-engine airplane, N422PB, descended under the canopy of the cirrus airframe parachute system (CAPS) and landed in a residential neighborhood at Houston, Texas. The pilot and passenger sustained minor injuries, and the airplane was substantially damaged. The airplane was registered to and operated by AIRCCS, LLC; Humble, Texas, as a Title 14 *Code of Federal Regulations Part* 91 business flight. Day visual meteorological conditions (VMC) prevailed, and a flight plan had not been filed. The airplane departed George Bush Intercontinental/Houston Airport (IAH), Houston, Texas, at 1133, and was destined for Austin Bergstrom International Airport (AUS), Austin, Texas.

The pilot reported that during initial climb, he noticed increasing engine temperatures, so he reduced power in an attempt to lower the engine temperatures. When the airplane was about 900 feet above ground level (agl), the engine started to "detonate," and soon after, there was a complete loss of engine power. With no suitable forced landing area, the CAPS was deployed, and the airplane impacted terrain and came to rest upright next to a residence.

An on-scene wreckage examination showed there was adequate fuel on-board, consistent with aviation low-lead fuel. At the facility where the airplane had most recently been refueled, refueling unit records and a review of security camera video showed that the airplane had been refueled with aviation gasoline and not with jet fuel.

Avionics components containing non-volatile memory (NVM), which included engine performance data, were sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for download. A review of the data for the accident flight found the engine rpm reached at least 3,500 rpm (engine speed above 3,500 rpm would not be recorded, since the maximum valve for the sensor is 3,500 rpm). Per the engine's Type Certificate, the maximum engine speed is 2,700rpm.

A review of maintenance records for the airplane revealed the propeller governor had been removed and inspected for proper operation, prior to the accident flight. The records also noted that no defects were observed on the governor, and the governor was reinstalled by maintenance personnel.

During the post-accident examination, the governor was removed from the engine and tested at McCauley Propeller, Columbus, Georgia. The test revealed the governor operated within the specified parameters for the unit. The examination noted that the propeller governor attaching nuts were rounded off and the washers for the governor were improperly stacked.

The engine was also removed from the airframe and shipped to Continental Motors, Mobile, Alabama, for examination/disassembly. The examination found that the governor drive gear was fractured in half and located in the oil sump. The governor drive gear teeth exhibited damage consistent with the governor driven gear being misaligned. The governor drive gear teeth also exhibited damage. A broken governor drive gear would result in insufficient oil pressure to drive the propeller governor and cause an engine to over speed.

The pilot did not submit an NTSB Pilot/Operator Accident Report form (NTSB Form 6120.1).

Pilot Information

Certificate:	Airline transport	**Age:**	30
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):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	**Registration:**	N422PB
Model/Series:	SR22	**Aircraft Category:**	Airplane
Year of Manufacture:	2007	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2379
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed	**Engine Model/Series:**	IO-550-N
Registered Owner:	AIRCCS LLC	**Rated Power:**	310 Horsepower
Operator:	AIRCCS LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KIAH,105 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	10:55 Local	**Direction from Accident Site:**	85°
Lowest Cloud Condition:	Scattered / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	15 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	30°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX (IAH)	**Type of Flight Plan Filed:**	Unknown
Destination:	AUSTIN, TX (AUS)	**Type of Clearance:**	VFR flight following
Departure Time:		**Type of Airspace:**	Unknown

Airport Information

Airport:	GEORGE BUSH INTERCONTINENTAL/H IAH	**Runway Surface Type:**	Concrete
Airport Elevation:	96 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	15L	**IFR Approach:**	None
Runway Length/Width:	12001 ft / 150 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	29.972499,-95.45111(est)

Administrative Information

Investigator In Charge (IIC):	Latson, Thomas
Additional Participating Persons:	Christopher Cotton; FAA Houston FSDO; Houston, TX Bradley T Miller ; Cirrus Aircraft Corporation ; Duluth, MN Chris Lang; Continental Motors Inc; Mobile , AL Les Doud; Hartzell Propeller Inc; Piqua, OH Danny Ball; McCauley Propellers - Textron Aviation; Wiohata , KS
Original Publish Date:	June 25, 2019
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=91513