

This report was modified on 12/11/2019. Please see the docket for this accident to view the original report.

On September 19, 2018 at 1504 central daylight time, a Cessna 206H airplane, N247F, struck power lines and terrain after the engine lost power while on landing approach to Sugar Land Municipal Airport/Hull Field (SGR), Sugar Land, Texas. There were no injuries to the two pilots aboard. The observer sustained minor injuries. The airplane was registered to Silver Creek Aviation Services and was being operated as a 14 Code of Federal Regulations Part 91 by an entity of the United States Government, both of Fort Worth, Texas, as a public use instructional flight. Visual meteorological conditions prevailed at the accident site, and no flight plan had been filed. The local flight originated from Conroe-North Houston Regional Airport (CXO), Houston, Texas.

Information obtained from the operator indicated that the commercial-rated pilot, under the oversight of a flight instructor, had flown in the Houston Class B airspace for an hour, and was flying the area navigation (RNAV) global positioning system (GPS) instrument approach to runway 17 at SGR. After crossing CASOB, the final approach fix, and before arriving at the missed approach point (MAP), the engine lost power. The instructor took control and maneuvered the airplane over a set of power lines. He was attempting to maneuver under a second set of power lines when the right wing struck one of the lines. The airplane touched down on a roadway, but its left wing struck a passing vehicle. The landing gear then struck the concrete median, yawing the airplane clockwise, and the tail struck a second vehicle. According to the operator, the airplane had about 30 to 32 gallons of fuel in each fuel tank.

The airplane was transported to a secure facility in Alliance, Texas, where a cursory examination was made. The engine, a six-cylinder Lycoming IO-540, was installed new on February 2, 2005. Maintenance information revealed the engine had been overhauled between November 4, 2013, and March 17, 2014. At that time, the engine had accrued 1,983.9 hours. During the overhaul, all 12 hydraulic lifters were replaced. The intake and exhaust rocker arms were reworked and reused.

The engine was rotated manually by rotating the propeller. The propeller moved about 200-degree arc before coming to a stop. The engine was removed from the airframe and disassembled. Borescope examination revealed the no. 1 cylinder intake valve had failed. All the cylinders and pistons were removed. Fractured pieces of the intake valve had been drawn into the intake plenum. The no. 1 cylinder was extensively damaged by fractured intake valve pieces as was the no. 1 piston head. The other piston heads either had impact marks or pieces of valve embedded in their heads. No metal was found in the oil pump, but there were signs of blow-by on the piston skirts. Damage was noted to sparkplugs 1 and 2.

The no. 1 cylinder, no. 1 piston, its intake and exhaust valve train components (springs, pushrods, rocker arms) and 12 hydraulic lifters were sent to Lycoming Engines for metallurgical examination. According to their Materials Laboratory Investigation Report, the no. 1 intake valve had failed in fatigue that initiated from the key recess fillet radius surface, and the fatigue crack radiated across approximately 2/5 of the cross section. Both the intake and exhaust rocker arms had nonconforming gauge shoe heights after about 0.01" material had been removed from the shoe pads during their rework at overhaul. Except for the nos. 2 and 5 intakes and the no. 1 exhaust, the 9 hydraulic lifters failed the leak-down test, including the no. 1 intake. All other intake valve train components (valve springs, valve keys, spring seats, rotator cap) were undamaged.

According to the Lycoming report, ~~The~~ no. 1 intake valve failed in fatigue, but the root cause of the fatigue failure could not be determined with any degree of certainty. The intake lifter and ~~shoe height (valve stem tip) most likely~~ nonconforming rocker arm may have contributed to a malfunction in the No. 1 intake valve train ~~the failure~~. The valve stem tip had separated from stem at the keeper fillet radius. The stem was bent, and head was fractured into several pieces. Damage to the bent stem and fractured head seating was caused by post-fracture contacts with the piston and combustion chamber. The fracture surface of intake valve tip was severely smeared by secondary impact and imbedded with some bronze from the intake valve guide.

The propeller assembly was examined at McCauley Propellers in Wichita, Kansas, under FAA oversight. According to McCauley's Teardown Inspection Report, both blades sustained impact damage and bore indications consistent with "a low amount of rotational energy absorption." No indications of propeller failure or malfunction were found. The propeller governor (Model: DC290D1F-T37, P/N: D-20893-37, S/N: 090066) was sent to Textron Aviation-McCauley Propeller Systems in Wichita, Kansas. The governor was externally examined and functionally tested to manufacturing requirements.

The observer's seatbelt was found released despite her tightening it prior to impact. The seatbelt was sent to AMSAFE for evaluation. According to AMSAFE'S report, the system housing may have taken some crushing damage which created drag on the push button assembly, allowing a partial connection to be made with the pawl. This would only occur "when attempting to lightly engage the connector into the buckle assembly." The report concluded that the connector engaged 100% each time it was tested. "Abrasion was shown in the inner half of the top and side buckle covers as well as along the push button," indicating that the unit "may have been smashed or restricted at some point."

A fuel sample from the left wing was sent to Aviation Laboratories in Kenner, Louisiana, for testing. Their report indicated a slightly elevated water content, but "sample test results appear normal."