

National Transportation Safety Board

Office of Aviation Safety
Central Region



CEN23FA401

WRECKAGE EXAMINATION SUMMARY

ACCIDENT

Location: Huntsville, Texas
Date: September 6, 2023
Time: 1148 central daylight time (1648 UTC)
Airplane: Cessna 150K, Registration No. N6059G

PARTICIPANTS

Investigator-In-Charge	Andrew Todd Fox National Transportation Safety Board Denver, Colorado
Group Member	Brian C. Rutt National Transportation Safety Board Denver, Colorado
Group Member	Jeffrey S. Hayes Federal Aviation Administration - Houston FSDO Houston, Texas
Group Member	Ernest C. Hall Textron Aviation - Senior Air Safety Investigator Wichita, Kansas
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ACCIDENT SYNOPSIS

On September 6, 2023, about 1148 central daylight time, a Cessna 150K airplane, N6059G, was substantially damaged during an accident at Huntsville Municipal Airport (UTS), Huntsville, Texas. The flight instructor and student pilot were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to ADS-B flight track data, at 1027, the airplane departed from runway 14 at North Houston Regional Airport (CXO), Conroe, Texas. The airplane flew northeast about 6 nautical miles before it turned northwest toward UTS. About 1050, the airplane entered the traffic pattern for runway 36 at UTS. The airplane flew 6 traffic patterns consistent with touch-and-go landings on runway 36. The airplane would

descend below ADS-B coverage about 700 ft mean sea level (msl), or about 337 ft above airport elevation, while it operated in the traffic pattern at UTS. About 1128, the airplane switched landing direction to use runway 18. The airplane flew 3 additional traffic patterns consistent with touch-and-go landings on runway 18. At 1146:54, the last ADS-B return was recorded about 830 ft msl as the airplane descended on the base leg for runway 18.

Two witnesses reported that the airplane was flying in the airport traffic pattern before the accident. They were on the ramp preparing for an instructional flight when they heard a sudden decrease in engine rpm. They turned and saw the airplane flying south over runway 18, about 500 feet above the runway, in a level pitch attitude and with the wings rocking. The airplane then entered a left turn toward east in a nose down pitch attitude. The flight instructor believed that the pilot of the airplane was attempting a descending left 180° turn to land on runway 36. He stated that the airplane completed about 90° of turn when it entered an aerodynamic spin and descended to the ground in a nose down pitch attitude.

WRECKAGE EXAMINATION TIMELINE

The National Transportation Safety Board (NTSB) Investigator-in-Charge (IIC) traveled onsite and examined the wreckage September 7-8, 2023, with the assistance of another NTSB investigator, a FAA Airworthiness Inspector, and two Textron Aviation investigators. On September 8, 2023, the wreckage was recovered by Lone Star Retrieval, Red Oak, Texas, and was stored at Air Salvage of Dallas, Lancaster, Texas, until its release to the insurance company on September 18, 2025.

AIRPLANE DESCRIPTION

The airplane was a 1970 Cessna 150K, serial number (s/n) 15071559, registration number N6059G. A 100 horsepower Continental O-200-A engine, s/n 62499-5-A, provided thrust through a two-blade, fixed-pitch, Sensenich 69CK-0-50L propeller, s/n K6581. The high-wing airplane consisted of conventional aluminum construction and was equipped with a fixed tricycle landing gear and wing flaps. The airplane's empty and maximum takeoff weights were 1,125 lbs and 1,600 lbs, respectively.

The airplane was equipped with a 26 gallon capacity (22.5 gallons usable) fuel system, consisting of two 13 gallon main fuel tanks (11.25 gallons usable each). The two fuel tanks are combined before the fuel shutoff valve, as depicted in figure 1.

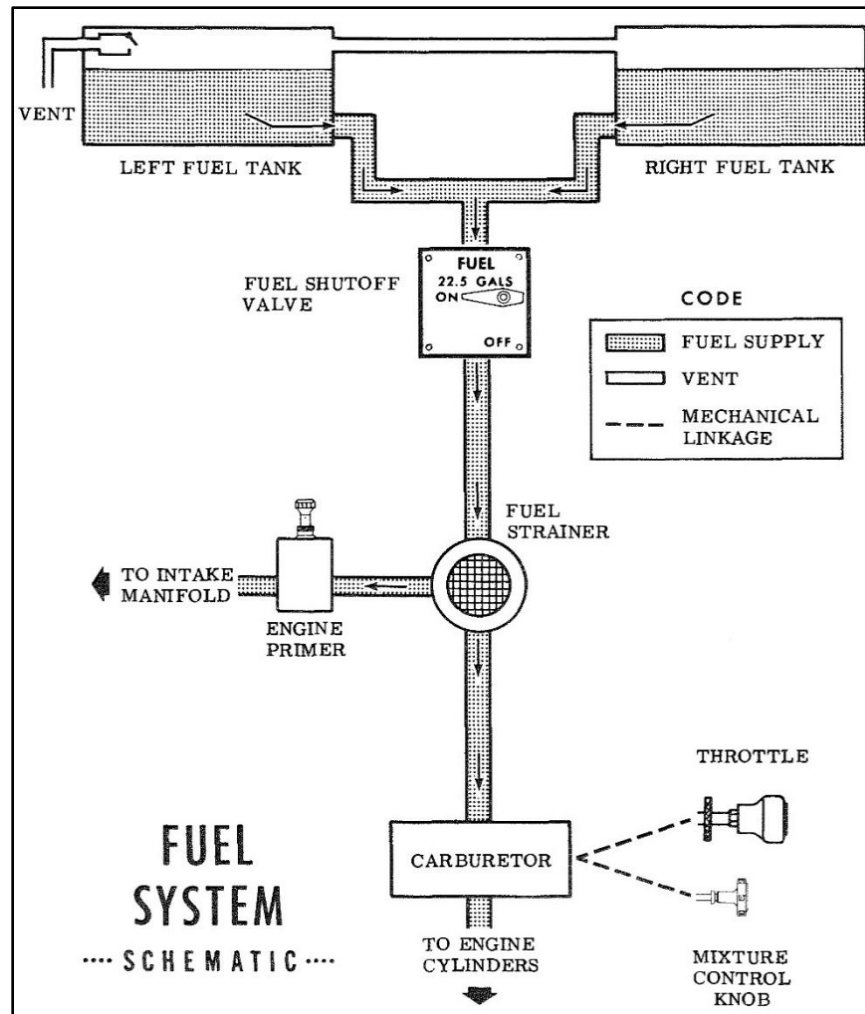


Figure 1. Fuel system schematic

MAINTENANCE SUMMARY

Recent Maintenance

According to maintenance documentation, on August 15, 2023, the last annual inspection of the airplane was completed at 8,029 total airframe hours and 2,723.2 hours since the last engine overhaul. A 100-hour inspection completed on August 23, 2023, after the airplane was painted.

The airplane's electronic tachometer was destroyed during impact. As such, the airplane's total airframe and engine times at the time of the accident could not be precisely determined. However, according to an airplane utilization log, the last recorded flight was completed on September 4, 2023, at 8,041.4 hours total airframe time. Based on ADS-B flight track data, the accident flight was about 1.4 hours in duration.

Recent Maintenance Discrepancies

On December 9, 2022, the flight instructor, who was also the airplane owner, made an entry in the airplane's discrepancy record that the airplane was using fuel from the left tank "slower" than the right tank, shown in figure 2. The airframe total time was 8,024.9 hours at the time of the discrepancy. The discrepancy was deferred until the next annual inspection. The discrepancy log entry further noted that the issue could not be duplicated during the annual inspection dated August 15, 2023. Comparing the signatures on the discrepancy entry to signatures found in the flight instructor's pilot logbook established that it was the flight instructor who entered and closed out the discrepancy entry.

Aircraft Discrepancy Record C150K – N6059G

Date: 12/9	Discrepancy + Hobbs/Tach: 8024.9 L side fuel tank burns slower than R side	PIC Signature: 
MEL Item? Y/N N/A	Differed? Yes - until next annual	Expected Repair Date: 1 MAR 23
Repair Date: 15 AUG 23	Corrective Action: CND during annual	MX Signature: 

Figure 2. Aircraft discrepancy record

On the morning of the accident, the flight instructor asked an aviation mechanic at Conroe/North Houston Regional Airport (CXO), Conroe, Texas, to examine the rudder cable connections at the rudder horn. According to the mechanic, a self-locking nut was found loose (backed off) almost completely from one of the two bolts that secured the rudder cables to the rudder horn. The mechanic and flight instructor discussed this and other discrepancies that the flight instructor had recently seen since the airplane was returned to service following it being painted during the prior month (August 2023). The mechanic recommended not flying the airplane until a thorough inspection of the airplane was completed. A review of the airframe logbook did not reveal a log entry detailing the rudder cable connection discrepancy or how it was resolved. However, based on the postaccident examination, all rudder horn and rudder control cables hardware were present and remained connected, as shown in figure 3.



Figure 3. Postaccident rudder bellcrank connections (left and right)

Fuel Shutoff Valve Maintenance

A postaccident review of the airplane maintenance logbooks revealed that the last maintenance of the fuel shutoff valve was completed on July 20, 2015, at 7,950.7 total airframe hours. The associated airframe logbook entry stated, in part, "Lubed fuel valve and installed new o-ring."

WRECKAGE EXAMINATION (SEPTEMBER 7-8, 2023)

General Wreckage Description

The airplane crashed into an open grass area at Huntsville Municipal Airport (UTS), Huntsville, Texas. The airplane came to rest nose down at 30.738928° north latitude, 95.587989° west longitude, at 362 ft msl. An on-scene survey revealed that the main wreckage was about 407 ft south of the end of runway 18 and about 40 ft east of the extended runway centerline. The aircraft wreckage was found about 15 ft east of the initial ground impact point. The airplane came to rest upright and nose down on a west heading, as shown in figures 4 and 5.



Figure 4. Airplane at accident site (front)



Figure 5. Airplane at accident site (rear)

All structural components and flight control surfaces were located at the accident site. The main landing gear remained attached to the fuselage. The nose landing gear partially separated from its attachment points and was found to the right of the engine.

The left and right wings and their wing struts remained attached to their attachment points. The leading edge of both wings were crushed aft to their respective main

spars. The tail was canted forward and to the right beginning about 3 ft aft of the rear cabin window. The empennage was relatively undamaged with minimal impact damage.

Flight Controls

The elevators, ailerons, rudder, trim tabs, and flaps were accounted for at the accident site. Continuity of the flight control cables was confirmed from the cockpit to the flight control surfaces. Continuity of the pitch trim control cables were confirmed from the cockpit to the trim surface.

The cockpit control column assembly exhibited impact related damage. The aileron control chain remained intact and partially attached to each control column sprocket. The aileron forward bellcrank/arm assembly remained attached to the control column with attached cables. The aileron balance cable remained continuous between the aileron bellcranks. The elevator control tube remained attached to the cockpit control column. The aft end of the elevator control tube was displaced aft about 6 inches and separated from the elevator forward bellcrank, which fractured into two halves with attached cables; the fracture exhibited signatures consistent with an overstress separation due to impact related damage. The rudder cables were continuous from the cockpit pedals to the rudder control horn, where all hardware was present and connected, as previously shown in figure 3.

The left and right ailerons remained attached to their wing attachment points. The rudder remained attached to its attachment points on the vertical stabilizer. The left and right elevators remained attached to their respective horizontal stabilizer. The elevator trim actuator extension measured 1.4 inches and was consistent with a neutral pitch trim tab position. Impact-related damage to the aft fuselage during impact could have altered the position of the elevator trim actuator position due to changes in cable tension.

The left and right flaps remained attached to their respective wing attachment points. The flap handle in the cockpit was found in the UP position. The flap actuator/motor was found in the fully retracted position and was consistent with fully retracted flaps at impact.

The wreckage examination did not reveal any preimpact flight control anomalies that would have prevented normal operation.

Fuel System

Examination of the left- and right-wing metal fuel tanks exhibited hydraulic deformation along the forward and top tank surfaces. The fuel tank finger strainer screens were not obstructed. The fuel lines from each wing fuel tank to the fuel

shutoff valve assembly remained intact. The fuel lines from each wing fuel tank combined through a Y-shaped fuel fitting upstream of the fuel shutoff valve, as previously shown in figure 1. The fuel line from the fuel shutoff valve assembly to the fuel strainer assembly was impact separated about 2 inches forward of the fuel shutoff valve assembly. The fuel strainer assembly was displaced aft through the firewall into the cockpit floor area. The filter bowl was separated from the fuel strainer assembly and was impact damaged. The fuel strainer screen filter remained attached to the fuel strainer and exhibited debris, as shown in figure 6. The fuel line from the fuel strainer assembly to the carburetor was separated and not observed.

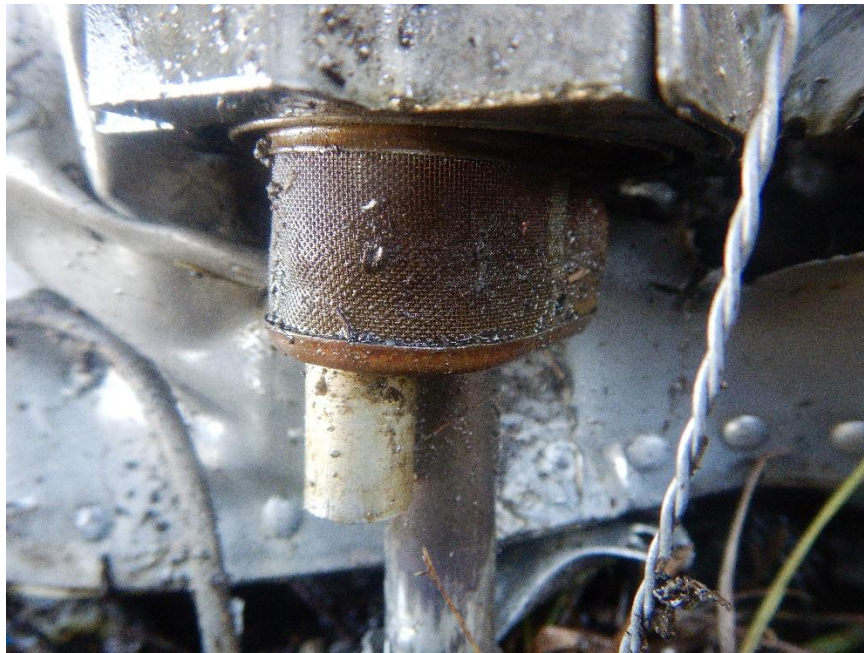


Figure 6. Fuel strainer screen filter

The fuel line connected to the inlet port of the fuel shutoff valve was removed to examine the shutoff valve. There was fuel-wetted debris present that obstructed the inlet elbow fuel fitting, as shown in figure 7. The fuel shutoff valve outlet port exhibited accumulated debris affixed to its inside diameter, as shown in figure 8. Additional debris was recovered from inside the fuel shutoff valve when tapped on a table, as shown in figure 9.



Figure 7. Inlet to fuel shutoff valve



Figure 8. Outlet of fuel shutoff valve



Figure 9. Fuel shutoff valve with debris from inlet port

The fuel line from each wing fuel tank was disconnected and air blown through the fuel line to the disconnected line at the fuel shutoff valve. Fuel and traces of debris were extracted from the left and right fuel lines. The recovered debris, as shown in figures 10 and 11, was consistent with the debris found in the inlet/outlet ports of the fuel shutoff valve. Borescope examination of the left- and right-wing fuel tanks revealed additional loose debris inside each fuel tank, as shown in figures 12 and 13.

The fuel shutoff valve and the recovered debris from the fuel lines were submitted to the NTSB Materials Laboratory, Washington, DC, for additional examination and testing. According to the x-ray fluorescence analysis, the elemental composition of

the submitted debris consisted mostly of silicon, iron, and lead. Silicon and iron are consistent with soil. The presence of lead was consistent with transfer contact with fuel system components where leaded fuel, such as aviation 100 low-lead fuel, had been present.



Figure 10. Debris from left fuel line



Figure 11. Debris from right fuel line



Figure 12. Debris in left fuel tank



Figure 13. Debris in right fuel tank

Engine

The engine was displaced upwards, compressed aft into the firewall, and was rotated/twisted to the left side of the aircraft. Three of the four engine mounts remained partially attached to the engine and the airframe. The oil pan was crushed up and aft and several push rod shrouds and valve covers were dented. The starter separated from the engine, but the remaining accessories remained attached to the engine. The right exhaust manifold separated from the engine while the left side remained attached but was crushed.

The propeller remained attached to the crankshaft flange, as shown in figure 13. The engine crankshaft did not rotate by hand through the propeller. The crankshaft was displaced aft about 0.5 inches, consistent with damage sustained during a nose down impact. The removal of the rear accessories revealed additional damage to the accessory gears consistent with the entire crankshaft being displaced aft of its normal position.

Borescope examination of each cylinder revealed no anomalies with the cylinders, pistons, valves, valve seats, or bottom spark plugs. There were no mechanical failures observed during a borescope examination of the drive train components. There was evidence of ample oil in the crankcase, accessory gearbox, valve covers, and the oil filter. The spin-on type oil filter was removed, cut open, and exhibited no evidence of debris.

Both magnetos produced spark at all four leads when rotated by hand. The impulse coupling for each magneto functioned normally. The spark plugs exhibited features consistent with normal engine operation.

The carburetor separated from the engine during impact. The engine control continuity to the carburetor could not be established due to impact related damage. The intake air box assembly remained attached to the carburetor but exhibited impact damage. The carburetor heat control cable separated from the intake air box.

The carburetor fuel inlet with inlet screen fractured from the carburetor body during impact and was not located during the investigation. The fuel line from the fuel strainer assembly to the carburetor was not located. The throttle valve did not rotate due to impact damage. The carburetor fuel bowl contained about 1 fluid ounce of uncontaminated 100 low-lead aviation fuel. There was no evidence of sediment or debris in the carburetor fuel bowl. The fuel metering float and float valve appeared intact and functional.

The engine examination revealed no evidence of a preexisting mechanical malfunction or failure that would have prevented normal operation.



Figure 13. Engine with attached propeller

Propeller

The fixed-pitch 2-blade propeller remained attached to the engine crankshaft flange, as shown in figure 13. Blade "A" exhibited a slight bend aft and in direction of blade rotation, and chordwise rotational scoring along the leading edge on the camber side, as shown in figures 14 and 15. The blade tip trailing edge exhibited gouge marks. Blade "B" did not exhibit any remarkable bend/twist but had chordwise rotational scoring along the leading edge on the camber side, as shown in figure 16.



Figure 14. Propeller overview



Figure 15. Blade "A"



Figure 16. Blade "B"