

National Transportation Safety Board

Office of Aviation Safety
Central Region



CEN24FA188

WRECKAGE EXAMINATION SUMMARY

ACCIDENT

Date: May 15, 2024
Time: 2039 central daylight time (0139 UTC)
Location: Godley, Texas
Airplane: Cessna 150L
Registration: N1701Q

PARTICIPANTS

Investigator-In-Charge	Andrew Todd Fox National Transportation Safety Board Denver, Colorado
Group Member	Fritz Bayer Federal Aviation Administration - North Texas FSDO Irving, Texas
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Group Member	Anthony M. Hershberger Textron Aviation - Air Safety Investigator Wichita, Kansas

ACCIDENT SYNOPSIS

On May 15, 2024, about 2039 central daylight time, a Cessna 150L airplane, N1701Q, was destroyed during an accident near Godley, Texas. The student pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

WRECKAGE EXAMINATION TIMELINE

The National Transportation Safety Board (NTSB) Investigator-in-Charge (IIC) traveled onsite and examined the wreckage May 16-17, 2024, with the assistance of two FAA Airworthiness Inspectors, and a Textron Aviation investigator. On the afternoon of May 17, 2024, the wreckage was recovered by Lone Star Retrieval, Red Oak, Texas, to Cleburne Regional Airport (CPT), Cleburne, Texas, where it was stored in the airplane owner's hangar. There was no hull insurance policy for the airplane. The NTSB

retained custody of the wreckage until it was released to the airplane owner on June 3, 2024.

AIRPLANE DESCRIPTION

The airplane was a 1971 Cessna 150L, serial number (s/n) 15073001, registration number N1701Q. A 100 horsepower Continental O-200-A engine, s/n 213889-71A, provided thrust through a two-blade, fixed-pitch, McCauley 1A102/OCM6948 propeller, s/n K20317. The high-wing airplane was of conventional aluminum construction with a fixed tricycle landing gear and wing flaps.

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.

The airplane's empty and maximum takeoff weights were 1,135.5 lbs and 1,600 lbs, respectively. The airplane's useful load was 464.5 lbs. The gross weight and center-of-gravity location at engine startup were calculated based on the reported pilot weight of 155 lbs, estimated 10 lbs of baggage, a full fuel load of 22.5 gallons (135 lbs), and 6 quarts of engine oil (11 lbs). The gross weight at engine startup was 1,446.5 lbs, center-of-gravity location was 34.6 inches aft datum, and the moment was 50,100 lbs-inches. Based on the Cessna 150L Owner's Manual, the airplane was within weight-and-balance limits at engine startup and at the time of the accident.

The wing flap position can be selected anywhere between flaps retracted (0°) to fully extended (40°).

According to the Cessna 150L Owner's Manual, the wings-level aerodynamic stall speed at maximum gross weight (1,600 lbs) with the flaps retracted (0°) is 55 mph. The aerodynamic stall speed decreases to 48 mph with the flaps fully extended (40°). The aerodynamic stall speed is reduced by the square root of the weight ratio when the airplane is operated at a weight less than the maximum gross weight.

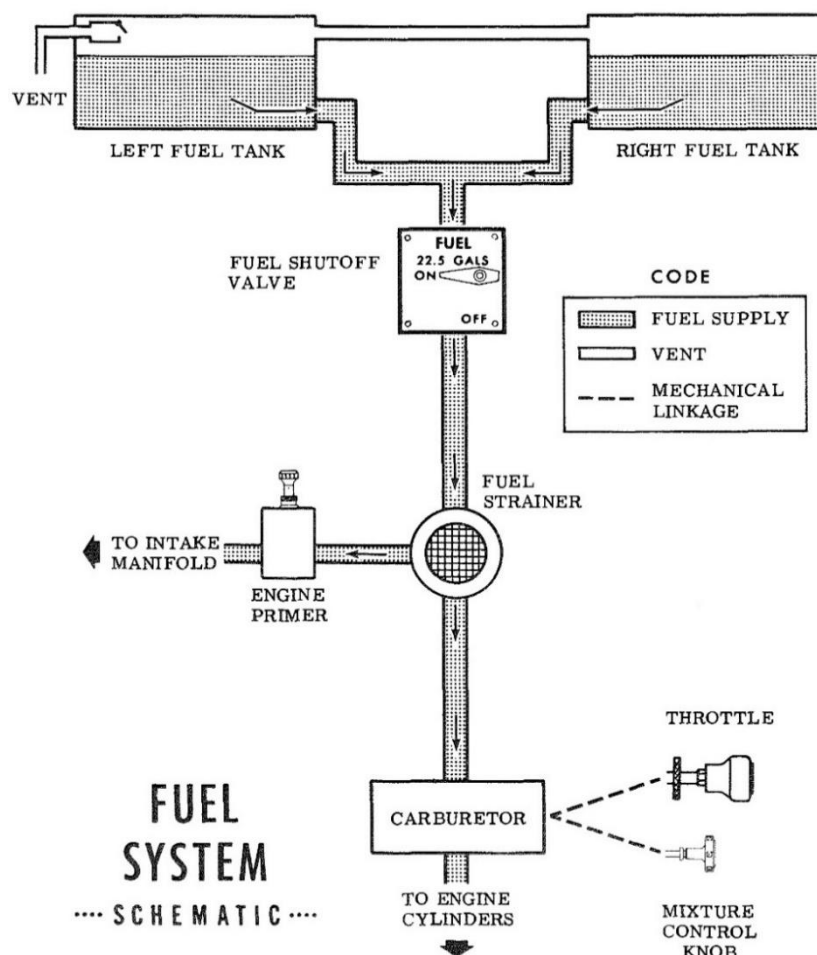


Figure 1. Fuel System Schematic

MAINTENANCE SUMMARY

Recent Maintenance

According to maintenance documentation, on July 25, 2023, the last annual inspection of the airplane was completed at 3,025.8 total airframe hours and 1,959.0 hours since the last engine overhaul. The airplane had a 50-hour inspection completed on April 9, 2024, at 3,073.6 total airframe time. The last logged maintenance was to replace the right fuel sender unit gasket, which was also completed on April 9, 2024, but at 3,075.8 total airframe time.

According to the airplane operator's dispatch system documentation, the airplane's recording tachometer indicated 3,085.5 hours at the beginning of the accident flight.

The airplane's recording tachometer was destroyed by the postimpact fire, which prevented calculation of the airplane's airframe and engine times at the time of the accident.

Recent Maintenance Discrepancies

A review of the airplane maintenance logbooks and a summary of recent pilot-reported discrepancies (squawks) did not reveal any unresolved maintenance issues.

WRECKAGE EXAMINATION (SEPTEMBER 7-8, 2023)

General Wreckage Description

The accident site was in an open grass pasture near Godley, Texas. The airplane came to rest at 32.3897361° north latitude, 97.5461639° west longitude, at 924 ft msl.

The airplane came to rest upright and wings level on a south-southeast (125° true) heading, as shown in figures 2-4. There was evidence of a significant postimpact fire that destroyed the entire cabin and cockpit. The cockpit and instrument panel, including all avionic devices, were destroyed during the fire, as shown in figure 5. There were no non-volatile memory components recovered. All flight control surfaces were located at the accident site. The fixed nose landing gear remained attached to the engine mount. The engine was canted down and to the right, as shown in figure 6.

The empennage was thermally separated from the aft fuselage but, otherwise, remained relatively intact and displayed minor impact-related damage, as shown in figures 7-8. The empennage was displaced to the right. The vertical stabilizer with attached rudder and the left and right horizontal stabilizers with attached elevators remained attached to their respective attachment points.

The steel frames of the left and right seats were damaged during the fire. The seat upholstery, seat belt webbing, and seat rails were destroyed during the fire.



Figure 2. Main wreckage, Front



Figure 3. Main wreckage, Right



Figure 4. Main wreckage, Left



Figure 5. Cabin and Cockpit



Figure 6. Engine



Figure 7. Empennage, Left



Figure 8. Empennage, Right

Flight Controls

All primary (elevators, ailerons, and rudder) flight control surfaces with their appropriate trim tabs and flaps were accounted for during the wreckage examination. Cable continuity of all primary flight control cables was confirmed from the cockpit to their respective flight control surface. Continuity of the elevator trim control cables were confirmed from the cockpit to the flight control trim surface. Continuity was confirmed by either visual and/or pulling the cable at one end to see the other same cable end and/or control surface move.

The cockpit control column (Y-shaped) assembly exhibited thermal damage associated with the postimpact fire. The aileron chain remained intact and on each control column sprockets. The aileron forward bellcrank/arm assembly remained attached to the control column with attached cables. The elevator push/pull tube remained attached to the control column. The elevator forward bellcrank was destroyed during the postimpact fire, only leaving the steel clevises and attaching hardware intact, including a small piece of the elevator forward bellcrank.

Both ailerons remained attached to their respective wing attachment points. The rudder remained attached to its attachment points. The rudder stop assemblies did not exhibit any evidence of overtravel. The rudder surface was displaced to the right due to impact-related damage.

The elevator trim actuator extension was about 1.8 inches, which corresponded to an elevator trim tab position about 7° trailing edge up. 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 elevator remained attached to its attachment points.

The flap handle was destroyed during the postimpact fire. The flap actuator/motor jackscrew was found extended 5.9 inches, consistent with the wing flaps fully extended (40° down) at impact. The wing flaps remained attached to their respective wing attachment points except for those areas that were destroyed by fire.

The flight control examination revealed no evidence of a preimpact mechanical malfunction or failure that would have precluded normal operation.

Fuel System

The left metal fuel tank remained attached to the left wing and exhibited hydraulic deformation along the forward and bottom surfaces. The left fuel tank was breached due to fire-related damage but contained a blue fluid consistent in odor to 100 low-lead aviation fuel. The right metal fuel tank was found separated from the right wing and exhibited impact and fire-related damage. The right fuel tank contained significant amounts of water from firefighting efforts and/or rain that occurred after the accident.

The fuel lines between the wing fuel tanks, fuel shutoff valve, and the engine were destroyed during the fire. The fuel strainer assembly was found separated from its mount and exhibited thermal damage from the fire. The fuel strainer assembly was not disassembled during the examination.

Engine

The engine was displaced down and to the right side of the airplane. The engine remained attached to the firewall through the engine mount. The oil kidney tank remained attached to the engine crankcase but exhibited impact and fire-related damage. The starter remained attached to the rear of the engine. The rear accessory section was destroyed during the postimpact fire. Both magnetos were destroyed during the postimpact fire. The exhaust manifold remained attached to the engine but was cut to facilitate the engine recovery and examination.

The engine was separated from the mounts during wreckage recovery, as shown in figure 9. The top spark plugs were removed and exhibited features consistent with normal engine operation, as shown in figure 10. The engine crankshaft rotated by hand through the propeller. Internal engine and valve train continuity were confirmed as the crankshaft was rotated through the crankshaft flange. Compression and suction were noted on cylinder nos. 2, 3, and 4 in conjunction with crankshaft rotation. No compression was noted on the no. 1 cylinder. The no. 1 cylinder exhaust valve did not move in conjunction with crankshaft/camshaft rotation. A borescope inspection of each cylinder did not reveal any anomalies with the cylinders, pistons, valves, valve seats, or bottom spark plugs. The spin-on type oil filter was found separated and thermally damaged. The oil filter was not disassembled during the examination.



Figure 9. Engine



Figure 10. Spark plugs, Top

The no. 1 cylinder was separated from the engine crankcase to remove the intake and exhaust valves and their associated spring assemblies, as shown in figure 11. The three exhaust valve springs were about 0.25 inch shorter than the intake valve springs, as shown in figure 12. The height difference was consistent with the exhaust springs being compressed at impact and taking a new set when they cooled after the postimpact fire. The shorter exhaust valve springs did not allow the exhaust valve to seat, which resulted in the lack of cylinder compression when tested.



Figure 11. Valves, No. 1 Cylinder



Figure 12. Valve Springs, No. 1 Cylinder

There was mechanical continuity between the throttle, mixture, and carburetor heat controls and their respective engine components. The carburetor and airbox exhibited significant thermal damage from the postimpact fire. The carburetor fuel bowl exhibited a half-dollar coin sized hole. The carburetor did not contain any residual fuel. The throttle valve did not rotate due to impact-related damage.

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

Propeller

The fixed 2-blade propeller blade remained attached to the engine crankshaft propeller flange and spacer, as shown in figure 13. Propeller blade "A", shown in figure 14, exhibited a slight bend/twist about 10 inches from the blade tip, a leading-edge gouge, shown in figure 15, and minor chordwise scratches. Propeller blade "B", shown in figure 16, was relatively undamaged and did not exhibit any bends, twists, leading edge damage, or chordwise scratches.



Figure 13. Propeller



Figure 14. Propeller Blade "A"



Figure 15. Blade "A" gouge and scrapes



Figure 16. Propeller Blade "B"