

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA199

NTSB ENGINE EXAMINATION REPORT

August 16, 2023

TABLE OF CONTENTS

A. ACCIDENT..... 3

B. PARTICIPANTS..... 3

C. SUMMARY 3

D. DETAILS OF THE INVESTIGATION 4

 3.0 ENGINE EXAMINATION 4

A. ACCIDENT

Location: Casa Grande, Arizona
Date: May 24, 2023
Time: 0900 mountain standard time
Airplane: Cessna 172S

B. NTSB ENGINE EXAMINATION REPORT

IIC	Stephen Stein National Transportation Safety Board Federal Way, Washington
Party Coordinator	Mark Platt Lycoming Engines Williamsport, Pennsylvania
Investigator	Scott Johnson National Transportation Safety Board Federal Way, Washington
Investigator	Paul Basti National Transportation Safety Board Federal Way, Washington
Investigator	Paul Rho National Transportation Safety Board Federal Way, Washington

C. SUMMARY

On May 24, 2023, about 0900 mountain standard time, a Cessna 172S, N60372, was substantially damaged when it was involved in an accident near Casa Grande, Arizona. The pilot and pilot-rated passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he was flying under simulated instrument flight rules using a view limiting device with a safety pilot (pilot-rated passenger) onboard. The safety pilot, who was also a certified flight instructor, stated that after one approach into Casa Grande airport (CGZ) they entered a hold at 5,500 ft mean sea level (msl). According to the safety pilot, they were operating in an area of uncontrolled airspace that was

popular for instrument training, and each aircraft used the Common Traffic Advisory Frequency (CTAF) at CGZ to report when they were established in the hold, when they were descending in the hold, and when they left the hold to begin an approach. During the accident flight, the accident pilot descended to 5,000 ft msl after the other aircraft had announced their movements over the CTAF. After the airplane leveled out, the safety pilot observed a decrease in airspeed and noted that the throttle was in the full open position, but the engine speed was only 1,900 rpm. The pilot then advanced the mixture to the full rich position, engaged the fuel boost pump, and cycled the throttle, but did not observe any changes in engine power. At this time, the safety pilot announced over CTAF that they had experienced an engine anomaly and were heading direct inbound to CGZ to land the airplane. They reached the airport at 3,000 ft msl at which point they started a circling descent.

The safety pilot reported that the engine speed was still about 1,900 rpm when they turned to the final approach leg of the airport traffic pattern. The pilot also attempted to reduce throttle, but was unsuccessful. They deployed flaps to slow the airplane while the safety pilot (who was now the pilot flying) started to assess landing options as they were unable to decelerate. After he decided to land in the dirt to the right of the runway, he reduced the mixture to idle/cutoff and the engine quit. The airplane touched down normally, but during the landing roll it impacted a fence and the left wing subsequently impacted a tree, which resulted in substantial damage to the left wing and fuselage.

Postaccident photographs of the fuel servo showed that the threaded end of the throttle linkage had separated from the throttle arm at the fuel servo.

D. DETAILS OF THE EXAMINATION

1.0 Maintenance History

Engine Model: Lycoming engines IO-360-L2A

Engine TT: 12994.1 hours

Engine TSMOH: 686.9 hours

A review of the engine and airframe logbooks revealed that the airplane had received its most recent engine overhaul on September 25, 2022. The engine logbook did not display any entries for a 100 hour inspection total accumulated time from the overhaul to the time of the accident.

1.1 Engine Examination

The engine remained attached to its engine mounts, which were connected to the engine firewall. Both propeller blades remained attached to the propeller hub and flange, which was connected to the crankshaft. The accessories and accessory case were unremarkable. No other discernible damage to the engine was noted.

Mechanical continuity was established throughout the rotating group, valve train and accessory section as the crankshaft was manually rotated by hand utilizing the propeller. Thumb compression was achieved in the proper firing order at all four cylinders. The magneto to engine timing was 25° before top dead center cylinder number one for both the right and left magneto. The spark plugs were all massive electrode plugs and displayed coloration consistent with normal wear. The electrodes coloration were symmetrical and free of mechanical damage.

1.2 Throttle Linkage

The throttle system is equipped with a push/pull handle that can be advanced and retarded for large power adjustments and rotated clockwise or counterclockwise for minor power adjustments. Throttle action is achieved through a cable that connects the throttle lever to the throttle arm of the fuel servo mounted at a plenum below the oil sump. The throttle cable is normally threaded into the rod end attached to the throttle arm. Two jam nuts are then tightened at the rod end to secure the linkage.

The throttle cable had separated from the rod end at the throttle lever. Both sets of threads were intact and unremarkable. The jam nuts were located about 3/4 inches from the end of the throttle cable. The linkage was threaded into the throttle arm and proper thread engagement was achieved as the throttle arm moved from idle to full power (stop to stop) without resistance.

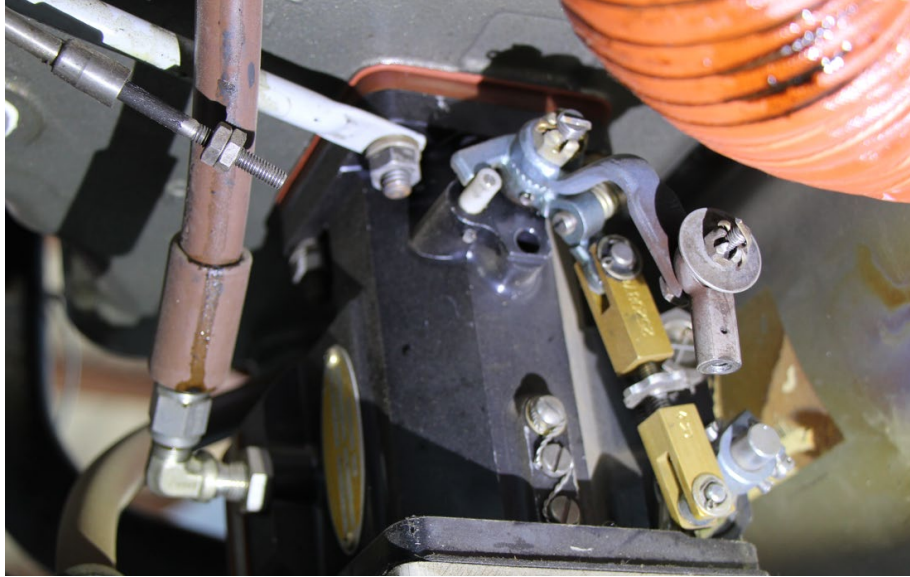


Figure 1: Throttle linkage and throttle arm



Figure 2: Threads at throttle arm

1.3 Engine Run

The engine was started using fuel drawn from a header tank that was plumbed into the fuel system and run at idle power (about 800 rpm) for several seconds before it was advanced to 1,650 rpm at which time a magneto check was completed. Each magneto exhibited a drop of about 50 rpms when selected. Engine power was then reduced to the idle position and rapidly advanced several times with a corresponding increase of power. Engine operation was smooth and continuous throughout the engine run.

Submitted by:

Stephen Stein
Senior Aviation Accident Investigator