

ACCIDENT REPORT

NTSB #: CEN15LA182

OWNER: [REDACTED] rs Inc.

[REDACTED] 88211

PILOT: [REDACTED] (Richie) Crockett

INSURANCE: None reported

SALVAGE: Richard Harvey, Levelland Aprt Manager LLN

INJURIES: Minor

LOCATION: On Levelland Airport Property
Lat/Long: N33.54851°, W102.37277°

DATE: 3/26/15 2:55 pm local

AIRCRAFT: AT-400 400-0504 N136DB

FAA INV: Bill Fitzgerald
Lubbock FSDO
5225 S. Loop 289, Suite 122

NTSB INV: Jennifer Rodi on

REPORT BY: Kyle Schroeder
Inc.

The information contained in this report is the result of travelling to the Levelland Airport to examine the wreckage after removal from the accident site. The wreckage was stored in a hangar with access by Richard Harvey, Airport Manager and also owner of HSI Turbines, Inc. HSI Turbines performed the maintenance immediately preceding the accident flight.

INITIAL OBSERVATIONS OF WRECKAGE:

Examination of the wreckage took place on the afternoon of 4/2/15 at the Levelland Airport in Levelland, TX. The wreckage was divided into two groups. The wings (still joined together at aircraft centerline) and the mid-fuselage were located on a trailer. The remainder of the wreckage (aft fuselage, firewall forward, empennage, and miscellaneous debris) were located in a separate area of the hangar.



**Condition of Wreckage As Examined
(Mid Fuselage and R/H Wing Shown)**



**Condition of Wreckage As Examined
(Mid Fuselage, L/H Main Landing Gear, and L/H Wing Shown)**



**Condition of Wreckage As Examined
(Aft Fuselage and Misc. Debris Shown)**

The fuselage had been broken/separated at the forward wall of the cockpit. This location is also the aft wall of the chemical hopper. The engine with partially attached engine mount structure was separated from the remainder of the wreckage.

The aircraft was confirmed to be N136DB (400-0504). This was an AT-400 manufactured by Air Tractor in 1983. The engine installed at the time of the accident was a PT6A-15AG with engine serial number PCE-PD0033.

The aircraft Hobbs meter reading was not observed

There was no evidence of post-crash fire.

FUSELAGE:

The fuselage was separated in two locations, at the forward wall of the cockpit and at the firewall. The aft end of the fuselage was damaged and bent to the right.

The mid-section of the fuselage (from the firewall aft to the rear spar of the wing) remained attached to wing structure. This section was damaged but remained in one piece.

The section of the fuselage forward of the firewall was broken into many pieces which were scattered and piled among the recovered wreckage.

The lefthand main landing gear remained in its properly installed position of the fuselage frame. The righthand main landing gear spring had become detached from the fuselage frame with the wheel still installed on the spring.

The aircraft was not equipped with the AmSafe airbag system.

WINGS:

Both wings were damaged. The outboard 75% of the right wing suffered crush damage to the leading edge skins. This crush damage was from the front toward the trailing edge.

The left wing was more intact with only the outboard 25% of the wing receiving damage. This portion of the wing suffered significant damage with the wingtip, ribs, and skins being stripped from the wing structure. The protruding portions of the front and rear wing spars were damaged.

Both ailerons and both flaps remained installed on the wings.

EMPENNAGE:

All pieces of the empennage had been removed from the aircraft and stacked separately in the hangar. All had some amount of damage, but were generally intact. No in-depth investigation of these surfaces was conducted.

CONTROL SYSTEMS:

Control continuity of the rudder control system was analyzed. All hardware and components of the rudder control system were properly installed. Both rudder cables showed signs of failure due to tensile overload. See figures below.



Ends of Rudder Cables

(Lefthand cable shown on left, righthand cable shown on right)

Control continuity of the elevator controls was established with all components installed correctly.

The aileron controls exhibited significant damage due to the impact and deformation of the fuselage. Many of the aileron control components had become separated from the rest of the wreckage. An evaluation of control continuity concluded the following:

The cockpit control stick remained properly installed on the aileron torque tube in the cockpit. Two pushrods connect to this torque tube. One is for the righthand aileron controls and the other for the lefthand aileron controls. Both of these pushrods had been cut during the wreckage recovery. These pushrods connect to a bellcrank that is mounted in a moveable frame. The moveable frame allows the ailerons to droop with flap deflection (more on this to be covered later in this section).

Both bellcranks, including the moveable frame, were laying separately in the wreckage, having been separated from the

fuselage by a combination of impact forces and wreckage recovery methods.

For the righthand aileron control system, all hardware was found properly installed on the bellcrank and moveable frame. There is a long pushrod that connects the bottom of this bellcrank and is routed through the wing toward the righthand aileron. The inboard rodend bearing of this pushrod was found with the outer race separated. The inner race remained installed on the pivot bolt on the bellcrank. From this pushrod to the aileron, control continuity was confirmed by observing proper aileron movement due to movement of the pushrod.



Righthand Aileron Bellcrank and Moveable Frame

For the lefthand aileron control system, the bellcrank and moveable frame were also found with all hardware installed, except for the lower clevis bolt connecting to the long aileron pushrod. The clevis bolt was not found installed or in the wreckage. The expected location for this bolt is circled in red in the following picture.



Righthand Aileron Bellcrank and Moveable Frame

There was no evidence on the aileron bellcrank or pushrod end of any stress large enough to fracture the bolt in question. The pushrod end was filled with dirt/debris during the inspection.



Closeup View of Righthand Aileron Bellcrank

From the long pushrod to the aileron, the control system was continuous and pushrod movement caused corresponding aileron movement.

The long pushrod was removed from the lefthand wing and examined. There were several fresh marks on the inboard end of the pushrod. These marks were spaced approximately the same as the inboard ribs that surround this pushrod. This is a possible indication that the inboard end of the pushrod was disconnected from the aileron bellcrank and chafed against the ribs as the lefthand aileron "flapped" up and down.



Inboard end of long aileron pushrod (p/n 70013-1) showing fresh chafe marks

The flap actuator was found to be extended $1 \frac{3}{8}$ inches. This extension corresponds to a flap deflection of about 10° . The maximum flap deflection for this aircraft is 26° .

Note that because this aircraft is equipped with a drooping aileron system (i.e.: ailerons that deflect downward with flap deflection) flap deflection would also change the aileron travels. For example, in a fully operational aileron control

system, deflecting the flaps 10°, would result in both ailerons being deflected downward about 5.7° with the control stick neutral.

With no flap deflection, each aileron has a full range of travel of about 19° upward and 14.5° downward. With the flaps deflected 10°, this full range of travel changes to roughly 14.5° upward and 20° downward. This is about 25% less upward aileron deflection.

With this in mind, and if the lefthand aileron were free to float because of a disconnection in the control system, the pilot would have significantly less control authority to keep the plane from rolling to the left when the flaps were deflected. In addition, having the flaps deflected would require a slower landing speed and therefore less airflow over the righthand aileron. This would have resulted in less control authority from the righthand aileron.

It was also noted that the lefthand flap pushrod was damaged (bent at roughly mid-length). This was inspected carefully due to the close proximity to the aileron controls. The damage to the flap pushrod had no corresponding damage or witness marks on the aileron controls that indicated these came into contact with each other. Also, contact in these controls would have caused the aileron controls to lock in place, a condition that was not reported by the pilot. It is suspected that the pushrod was bent during the impact sequence.

ENGINE AND PROPELLER:

The engine installed at the time of the accident was a PT6A-15AG with engine serial number PCE-PD0033. An in-depth analysis of the engine and propeller wreckage was not conducted, but both exhibited signs that were consistent with the engine making power at the time of impact.

DISTURBANCE OF WRECKAGE:

No portion of the wreckage was removed by me from the accident site or from the salvage company facilities during my involvement in this accident investigation. My disturbance of the wreckage was limited to handling components to the extent necessary for identification and documenting their condition, including removing inspection covers/access panels if necessary. I did not, nor did I witness, any modification to the aircraft wreckage or accident site that would result in loss of evidence.