

Wreckage examination notes

N221MC, PA32

Poolville, TX

10-12-2018

CEN19FA004

Wreckage exam convened on November 15, 2018 at Air Salvage of Dallas facility where the airplane had been moved to. Present were John Brannen (NTSB IIC), and Jon Hirsch (Piper ASI). Assistance for the examination was provided by ASOD employees.

The airplane wreckage was placed in a hangar type facility prior to NTSB and Piper arrival. The major airframe pieces were stacked on pallets and there were an additional 3 large Tyvek bags (about 3 to 4 feet on a side) containing additional debris from the accident site.

The wreckage was laid out on the concrete hangar floor in the relative positions as they would have been on the airplane. All major airframe pieces were located except for a portion of the right wing. The portion not located was the outboard 6 ft ahead of the aileron, and would have included the outboard fuel tank. However, the right aileron and the right fiberglass wingtip were found.

The engine was cut loose from the firewall. There was a break in the engine crankcase aft of the number 1 cylinder. The number 1 cylinder was displaced forward. The single drive dual ignition magneto was broken loose from the engine accessory case. The leads were cut close to the magneto caps. The impulse coupling operated when rotated and the magneto produced spark on all leads when rotated by hand. The vacuum pump was still attached to the accessory case and was removed. The drive coupling was intact. The pump body had visible crushing and displacement of the body segments. When disassembled, the internal vanes and core were broken. The upper spark plugs were removed and exhibited a normal appearance with slightly worn electrodes. The 2-blade propeller remained attached to the engine. Both blades were twisted toward low pitch and one had a 6-inch piece of the tip fractured off. The tip piece was located. Both blades had chordwise scratching and leading-edge polishing indicative of rotation during impact.

The fuselage of the airplane was fragmented and had accordion crushing of sections of the fuselage. The vertical tail had separated from the airplane and much of the rudder had separated from the vertical tail. The upper portion of the rudder remained attached at the top hinge location. The horizontal stabilator center section spar remained attached at the hinge to the top of the vertical tail. The left and right sections of the stabilator were located including pieces of the stabilator tip fairings. The left side of the stabilator remained predominately intact with the left side portion of the anti-servo tab still attached. This side of the stabilator spar had signatures that indicated an upward bending at failure. The right side stabilator leading edge remained attached to the stabilator spar. The skin pieces and anti-servo tab had separated from the leading-edge portion. The right side spar and leading-edge section exhibited signatures indicative of downward bending at failure.

The left wing was predominately intact from the root to the tip. The section of the wing leading edge outboard of the landing gear was bent downward relative to the inboard section. The fiberglass wingtip

was separated but found. The left landing gear remained attached to the wing. The wing spars were fractured at a point that coincided with the fuselage intersection. The aileron had separated and was located. The flap remained attached at the inboard hinge location.

The right-wing pieces found consisted of the inboard section from the root to a point about the flap/aileron joint, a few pieces of located wing skin, and the fiberglass wingtip. The aileron skin was found and was partially separated from its substructure and the skin was “unfolded” to an almost flat condition. The flap was in one piece and had separated from the wing. The inboard hinge had a portion of the wing structure still attached and the hinge was still attached to the flap.

The fuselage was fragmented and consisted of 4 major groups. The aft fuselage from the tail to the baggage compartment, the aft cabin floorboard, the forward cabin floorboard, and the forward fuselage from the instrument panel and forward.

Continuity of the control system was confirmed as follows:

Rudder – Cable continuity confirmed from the rudder pedal torque tubes aft to where the rudder bellcrank was located, except for cuts made during recovery from the site. The torque tube was partially attached to the rudder and a segment of the bellcrank was broken off.

Stabilator – The cables were intact from the T-bar in the cockpit aft to the bellcrank in the tail except for cuts made during recovery. The pushrod that attached to the aft bellcrank was fractured but the lower portion remained attached to the bellcrank. The upper portion of the pushrod remained attached to the stabilator balance tube. The stabilator balance weight was still attached to the tube.

Ailerons - The cable chain at the forward end of the system that runs around sprockets attached to the tee-bar had a section in the middle that was not located. The ends of the chain were still attached to the forward end of the aileron control cables. Except for cuts made during wreckage recovery, and 2 overload failure to be described, the aileron cables were intact. One overload failure was in the balance cable approximately where an end ball would have been swaged for the eye strap at the left aileron bellcrank. The strap remained attached to the bellcrank and the ball was not located. The second overload failure was in the left aileron control cable near the pulley aft of the main spar. The portion travelling forward in the fuselage was intact from this failure point to the cable chain, with the exception of the recovery cuts. The section of cable outboard of this failure was intact to the left aileron bellcrank.

Flaps – The flap torque tube was predominately intact from the left bellcrank to the right bellcrank with bending and impact damage. The up-return spring was still attached to the chain section, but the chain section had separated from the sprocket. The down-chain section remained attached to its sprocket and to the aft portion of the cable, which had been cut for recovery. The flap handle (manual flaps), was intact, but the detent assembly was bent. No determination of flap position could be made from the detent assembly, but the handle appeared to be in the flaps up (handle down) position.

The airplane throttle quadrant was located, and all handles were in the forward position and the assembly was crushed.

A vacuum operated directional gyro was found and the unit was partially disassembled. The gyro housing was broken loose from the gimbal. The housing was disassembled, and the spinning core

removed. Both the inside of the housing and the outside edge of the core exhibited rotational scoring indicating that the gyro was spinning during impact.

Another vacuum gyroscope housing was found and was believed to be from the artificial horizon instrument. Pieces of the gimbal and face assemblies were found in addition to the housing. The housing was broken loose from its gimbal. The housing was disassembled and there was evidence of rotational scoring on the end of the core and the corresponding bottom edge of the housing, indicating that the gyro was spinning at impact.

===== End of entries =====