



# The National Transportation Safety Board

Office of Aviation Safety  
Central Region  
Memorandum for the Record  
Airframe Examination  
Findings  
CEN18FA368  
St Ignace Michigan  
August 31 2018

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## General

Divers from the Michigan State Police (MSP) located the airplane wreckage in 44-feet of water, about 1-mile from the departure end of runway 7. They recovered the wreckage and it was transported to a secure facility at 83D for examination by the NTSB. Detailed examinations of the airframe, engine, and propeller were conducted on August 5-6. The airframe was severely damaged, and deformations were consistent with a slightly right wing down, nose low, high speed impact with the water.

## Airframe Examination Findings

### Fuselage

Observed during the post-recovery examination, the fuselage was separated on the forward side of the main spar carry through. The instrument panel and forward bulkhead remained attached to the cabin by flight control cables and electrical wire harnesses. The forward cabin door remained attached to the hinges. The hinges remained attached to a fragment of the forward fuselage. The forward baggage door was impact damaged and remained attached to the hinge. Both sides of the windshield and the center post were separated from the fuselage. The right side of the windshield remained in one piece and the left side was fragmented. The tailcone was partially separated from the cabin at the forward end of the vertical stabilizer and remained attached by flight control cables. The top of the aft cabin was crushed downward in a line slightly right of center and included red pain transfer marks consistent with impact by the vertical stabilizer.

The floor below seats #1 & #2 was separated from the wreckage and the seats were separated from their respective tracks. Seat #1 was impact damaged and the seat back was separated from the seat base. The lap belt for seat #1 was buckled and both ends remained attached to their respective attach points. The shoulder harness was not connected to the lap belt. The shoulder harness was able to extend and retract from the reel. Seat #3 & #4 were partially separated from their respective mounts. Seats #5 & #6 were intact. The lapbelts for seats #3, #4, #5, & #6 were in good condition. There were no shoulder harnesses for seats #3, #4, #5, & #6.

The instrument panel glareshield exhibited impact damage in line with seat #1. A small fragment, consistent with human bone, was found imbedded in the glareshield. This fragment was retained by the Mackinac County Sheriff for examination by the medical examiner. The throttle, propeller, and mixture control levers were impact damaged and in the full forward position. The pilot's side control column was separated from the tee-bar and the fuselage. The magneto switch was in the "BOTH" position. The

The stabilator flight control cables remained attached to the tee-bar and were continuous to the bellcrank in the tailcone. The rudder cables remained attached to the rudder torque tubes and were continuous to the rudder horn in the empennage. The aileron cable remained attached to the both ends of the aileron chain. The aileron cables were separated in the cabin with signatures consistent with overload. The flap handle was in the second detent

(25° flap extension). The cables from the flap handle to the torque tube were continuous. A measurement of the flap torque tube end was approximately 5.6” which is consistent with the flaps being extended 25°.

The fuel selector handle was impact damaged and the position could not be determined. The pushrod on the fuel selector valve was fracture separated near the torque tube. The fuel selector valve was in the “OFF” position. The fuel selector valve was moved to the left and right tank positions and was able to pass air under light pressure at both positions. A liquid, consistent with 100 LL, was expelled from the selector valve when the air pressure was applied. A liquid, consistent with 100 LL, drained from the fuel line going to the engine when it was disconnected from the selector valve. The fuel strainer bowl was intact with no damage observed. The bowl was removed and a few pieces of undetermined debris which was white in color were observed in the bowl. The fuel strainer screen contained a small amount of dark colored debris in one area of one screen.

The ELT was dislodged from its mount and found loose in the tailcone. The antenna cable was attached, and the switch was in the “ARM” position. The remote ELT switch in the cockpit was in the “AUTO/ARM” position. A 3-position toggle switch located on the instrument panel near a label which said “SPEED BRAKE” was in the middle position. The landing gear selector handle was impact damaged and observed in the “UP” position. The Attitude Indicator and Turn Coordinator were removed from the instrument panel and disassembled. Light scoring was observed in the housing of the both gyros.

### Left Wing

As observed during the post-recovery examination of the wreckage, the left wing was separated from the fuselage at the wing root. A portion of the leading edge, inboard of the inboard fuel tank, was separated from the wing. The outboard fuel tank exhibited impact damage and was breached. A portion of the upper wing skin, including the fuel filler opening was separated from the wing. The fuel filler cap remained intact in its opening. The flap remained attached to its hinges and exhibited impact damage. The aileron was separated from the wing and was bent about 90° approximately mid-span. The aileron balance weight was separated from the aileron and not located with the debris.

The landing gear was initially observed in the “UP” position. During the examination, the wing was moved and the landing gear partially extended from the wheel well due to gravity. The lower portion of the landing gear door was fracture separated from the upper portion.

The aileron cables remained attached to the bellcrank and the bellcrank remained attached to its mounting points. The aileron stops were intact and unremarkable. The aileron cables were separated on the inboard ends with separation signatures consistent with overload.

The aircraft had been modified to install speedbrakes. The speedbrake panels located in the upper surface of the wing were in the down or “stowed” position.

### Right Wing

As observed during the post-recovery examination of the wreckage, the right wing was separated from the fuselage at the wing root. A portion of the leading edge, inboard of the inboard fuel tank, was separated from the wing. The outboard fuel tank exhibited impact damage and was breached. The impact damage was to the centered on the tank. The fuel filler cap remained intact in its opening.

The flap remained attached to its hinges and exhibited impact damage. The aileron was separated from the wing. The aileron balance weight was separated from the aileron and was located with the debris. The landing gear was in the “UP” position. The landing gear door was fracture separated from the wing.

The aileron cables remained attached to the bellcrank. The bellcrank was separated from its mounting points and fractured. The aileron stops were separated from the wing. One stop was intact and one stop was broken. The aileron cables were separated on the inboard ends with separation signatures consistent with overload. The aircraft had been modified to install speedbrakes. The speedbrake panels located in the upper surface of the wing were in the up or “deployed” position.

#### Empennage

As observed during the post-recovery examination of the wreckage, the stabilator remained attached to the vertical stabilizer. The pushrod from the lower stabilator bellcrank to the stabilator tube was intact. The stabilator stops were intact and unremarkable. The stabilator trim tab remained attached to the stabilator. The stabilator trim actuator was observed with ~4 threads (~.5”) extended which corresponds to a neutral trim setting. The trim cables were continuous to the trim wheel/drum in the cockpit. The rudder remained attached to the vertical stabilizer. The rudder stops were intact.

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