



Aviation Investigation Final Report

| | | | |
|--------------------------------|---|-------------------------|------------|
| Location: | Oshkosh, Wisconsin | Incident Number: | CEN12IA498 |
| Date & Time: | July 26, 2012, 16:30 Local | Registration: | N60GK |
| Aircraft: | AMERICAN CHAMPION AIRCRAFT 8KCAB | Aircraft Damage: | None |
| Defining Event: | Sys/Comp malf/fail (non-power) | Injuries: | 1 None |
| Flight Conducted Under: | Part 91: General aviation - Air race/show | | |

Analysis

The pilot was performing at an air show and entered the aerobatic box with a 45 degree descending roll. At an airspeed of 150 mph, the pilot pulled up into a loop and then initiated a “snap-on-top-of-a-loop” maneuver. The pilot’s seat then broke, and the pilot and seatback fell backward onto the rear seat and rear control column, temporarily jamming the flight controls. The pilot was then able to recover the airplane to a “right-side-up” position with wings level. He flew away from the crowd to assess the situation and subsequently landed without further incident.

An examination revealed that the airplane’s seat bottom frame was not equipped with a required reinforcement truss stiffener. The manufacturer reviewed its production work orders and discovered that a batch of 10 seats were produced that were not constructed with the truss stiffener and, therefore, did not conform with the airplane’s production type certificate. As a result of this investigation, the manufacturer added steps to the seat production and inspection procedures to ensure proper seat assembly. Additionally, the manufacturer added to the seat welding fixture a locator (a visual cue) for the truss stiffener parts. Further, Service Letter 437 was published indicating that owners should perform a one-time inspection to ensure that the seat bottom frame contains the required reinforcement truss stiffener.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The failure of the pilot’s seat bottom frame due to the manufacturer’s improper production,

installation, and inspection of that seat bottom, which resulted in a temporary loss of control during an air show performance.

Findings

| | |
|------------------------------|--|
| Aircraft | Flight compartment equipment - Failure |
| Organizational issues | (general) - Manufacturer |

Factual Information

History of Flight

| | |
|-------------------------------|---|
| Prior to flight | Miscellaneous/other |
| Maneuvering-aerobatics | Sys/Comp malf/fail (non-power) (Defining event) |

On July 26, 2012, about 1630 central daylight time, an American Champion Aircraft model 8KCAB airplane, N60GK, had its seat tubing separate during an air show maneuver over the Wittman Regional Airport (OSH), near Oshkosh, Wisconsin. The airline transport pilot, who was the sole occupant, was uninjured and the airplane sustained no damage. The airplane's registration to the pilot was pending and the airplane was operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as an air show flight. Visual flight rules (VFR) conditions prevailed for the flight, which was not operated on a VFR flight plan. The local flight originated from OSH about 1625.

According to the pilot's incident report, he stated that he was cleared in to the air show box. He performed a roll on takeoff followed by a half Cuban eight, four point roll, hammerhead, and a one and a half roll to an inverted turn-out/climb away from the crowd. The pilot climbed the airplane to 1,300 feet above ground level and entered the aerobatic box from the south with a 45 degree descending roll. At 150 mph he pulled into a 4g loop and initiated a snap-on-top-a-loop at the 60 degree inverted climb point in the loop. At that time the seat broke, which "immediately" laid the pilot back onto the rear seat and rear control stick. The rear controls were temporarily jammed by the pilot and the broken seat back. The airplane recovered by itself after one and a half rolls to the "right-side-up" position with wings level. The pilot, in part, stated:

I established level flight away from the crowd to assess the situation.
Once I was confident I had good control I asked the air boss for landing clearance and landed on [runway] 36L without incident.

Federal Aviation Administration (FAA) inspectors examined the incident airplane and found the seat bottom frame had separated. Additionally, the seat bottom frame, serial number A02443, was not equipped with a reinforcement truss.

The manufacturer reported that the incident adjustable seat assembly part number was 7-1499, revision K. The bottom and back adjustable seat sub-assembly frame part number was 7-1513, revision D. The seat bottom sub-assembly was missing its reinforcement truss, which was a welded stiffener with part number 2-2166, revision C. The manufacturer reviewed production work orders and discovered that a batch of 10 seats were produced that were not constructed with the stiffener and were non-conforming in reference to the production type certificate. The non-conforming batch of seats were marked with serial numbers A02437

through A02446.

The manufacturer identified affected stock seats and identified which other airplanes were affected by the installation of non-conforming seats. The manufacturer made arrangements for the return of all installed non-conforming seats. According to the manufacturer, the nine remaining seats will be 'reworked' by welding on the reinforcement truss stiffener that was missing. With the stiffener in place, the seat bottom frame conforms to the type certificate design.

The manufacturer further indicated that steps were added to the paperwork for seat production as an effort to make sure the assemblers pull all the parts when they are making a batch of seat assemblies. Inspection has the same type of step added to their paperwork. Another change in manufacturing was that the seat welding fixture now has a locator for the reinforcement truss stiffener parts, which is a visual cue in addition to the paperwork. The manufacturer believes that this visual cue will reduce complacency in reference to memorized paperwork associated with an assembler's repetitive assembly operations.

Service Letter 437 was published indicating that owners should have a one-time inspection of the folding front seat bottom be conducted to ensure that the seat bottom frame contains the required 2-2166 reinforcement truss.

In follow-up communications with a manufacturer's representative in March 2013, he reported that the nine remaining seats were reworked and conformed with the type certificate. Additionally, by that time, the improved assembly and inspection paperwork and welding fixture locators had also been implemented.

Pilot Information

| | | | |
|----------------------------------|---|--|----------------|
| Certificate: | Airline transport; Commercial; Flight instructor | Age: | 58, Male |
| Airplane Rating(s): | Single-engine land; Multi-engine land | Seat Occupied: | Front |
| Other Aircraft Rating(s): | None | Restraint Used: | |
| Instrument Rating(s): | Airplane | Second Pilot Present: | No |
| Instructor Rating(s): | Airplane multi-engine; Airplane single-engine; Instrument airplane | Toxicology Performed: | No |
| Medical Certification: | Class 2 With waivers/limitations | Last FAA Medical Exam: | April 1, 2012 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | April 21, 2011 |
| Flight Time: | 23000 hours (Total, all aircraft), 5000 hours (Total, this make and model), 22700 hours (Pilot In Command, all aircraft), 120 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft) | | |

Aircraft and Owner/Operator Information

| | | | |
|--------------------------------------|-------------------------------|---------------------------------------|-----------------|
| Aircraft Make: | AMERICAN CHAMPION AIRCRAFT | Registration: | N60GK |
| Model/Series: | 8KCAB | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | |
| Airworthiness Certificate: | Normal | Serial Number: | 1115-2012 |
| Landing Gear Type: | Tailwheel | Seats: | 2 |
| Date/Type of Last Inspection: | | Certified Max Gross Wt.: | 1950 lbs |
| Time Since Last Inspection: | | Engines: | 1 Reciprocating |
| Airframe Total Time: | 11.2 Hrs at time of accident | Engine Manufacturer: | Lycoming |
| ELT: | C126 installed, not activated | Engine Model/Series: | AEIO-360-H1B |
| Registered Owner: | Pilot | Rated Power: | 180 Horsepower |
| Operator: | Pilot | Operating Certificate(s) Held: | None |

Meteorological Information and Flight Plan

| | | | |
|---|----------------------------------|---|------------------|
| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Day |
| Observation Facility, Elevation: | OSH,808 ft msl | Distance from Accident Site: | 0 Nautical Miles |
| Observation Time: | 15:53 Local | Direction from Accident Site: | 0° |
| Lowest Cloud Condition: | Clear | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 9 knots / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 60° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 29.68 inches Hg | Temperature/Dew Point: | 27°C / 21°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Oshkosh, WI (OSH) | Type of Flight Plan Filed: | None |
| Destination: | Oshkosh, WI (OSH) | Type of Clearance: | VFR |
| Departure Time: | 16:25 Local | Type of Airspace: | |

Airport Information

| | | | |
|-----------------------------|------------------------------|----------------------------------|-----------|
| Airport: | Wittman Regional Airport OSH | Runway Surface Type: | |
| Airport Elevation: | 808 ft msl | Runway Surface Condition: | |
| Runway Used: | | IFR Approach: | None |
| Runway Length/Width: | | VFR Approach/Landing: | Full stop |

Wreckage and Impact Information

| | | | |
|----------------------------|--------|-----------------------------|---------------------------|
| Crew Injuries: | 1 None | Aircraft Damage: | None |
| Passenger Injuries: | | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 None | Latitude, Longitude: | 43.984443,-88.556945(est) |

Administrative Information

| | |
|--|--|
| Investigator In Charge (IIC): | Malinowski, Edward |
| Additional Participating Persons: | Tim H Anderson; Federal Aviation Administration; Milwaukee, WI Jerry Mehlhaff Jr; American Champion Aircraft; Rochester, WI |
| Original Publish Date: | May 9, 2013 |
| Last Revision Date: | |
| Investigation Class: | Class |
| Note: | |
| Investigation Docket: | https://data.ntsb.gov/Docket?ProjectID=84523 |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).