



Department of the Interior Lessons Learned

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Subject: Improper Installation of Flight Controls

Area of Focus: Flight Control Checks

Distribution: All Aviation Operations

Discussion: Last fall, a Department of the Interior (DOI) pilot experienced a loss of control of a fleet CC18 Top Cub aircraft shortly after takeoff from Lake Hood Airport, Anchorage, Alaska. Immediately after takeoff, the aircraft nose pitched up rapidly, then stalled, descended, and impacted the runway. The pilot sustained serious injuries, and the aircraft sustained substantial damage. The National Transportation Safety Board (NTSB), in coordination with DOI's Office of Aviation Services (OAS), investigated the accident (report number [ANC25LA008](#).) A post-accident examination of the aircraft revealed that the rear flight control stick was installed backward, allowing it to become jammed in certain conditions.



Figure 1. Accident aircraft on the runway.

Background. The pilot received an initial evaluation flight in this CC18 two weeks prior to the accident and had never flown without an instructor in the rear seat. The pilot stated that the rear control stick was already installed when he conducted a preflight inspection, and he was unaware that it was installed backward or of the hazard it presented (refer to Figure 2 below). The pilot conducted two full flight control checks before the takeoff and the control responses were free and correct. After takeoff, the pilot attempted to apply forward stick pressure so that the aircraft would accelerate in ground effect, but the control stick became jammed and could not be moved. The aircraft climbed rapidly, and the pilot attempted to control pitch with the nose trim wheel. The aircraft nosed over but the pilot still could not move the control stick. In an effort to reduce the pitch attitude, the pilot reduced throttle. As the aircraft pitched down and rapidly approached the ground, the pilot began to increase pitch with nose trim which resulted in a slightly higher nose attitude during impact. After the accident, the pilot quickly egressed as fuel began leaking into the cockpit.

Investigation. The rear flight control stick was designed to be removed and stowed by the pilot. This prevents the rear occupant or cargo from interfering with the flight controls. According to experienced DOI fleet CC18 pilots, most flights are conducted with the rear control stick removed unless a second pilot is occupying the rear seat. When the stick is removed, a CubCrafters cover box is installed over the rear stick stub to prevent objects from falling into the rear flight control mechanisms and to prevent the stick stub from inadvertent movement. The rear stick should be installed with the compound bend toward the rear pilot, but can also be installed incorrectly facing the front seatback. The front seat can be adjusted to various

positions to accommodate pilot height, and clearance distance from the rear controls is dependant on that seat position. The accident aircraft's rear control stick had no placards indicating the proper installation direction, such as "This Side Aft", nor was it required by the aircraft manufacturer. The CubCrafter CC18 POH/AFM Supplement 9.15 Rear Stick Cover Installation does not describe the direction for stick reinstallation, but does state, "Ensure full range of motion (including trim) is met without the rear stick contacting anything."

Three post-accident ground reenactments were conducted with the rear stick installed backward and the pilot seat in the full aft position, as it was during the accident. The reenactments revealed that, during the flight control check for "free and correct" movement, the front seat pilot's forward stick control authority was partially limited, and some binding was experienced as the rear control stick contacted the front seatback. After simulating takeoff, when forward stick pressure was applied, the stick became lodged under the horizontal frame of the pilot's seatback and could not be moved in any direction until the pilot leaned forward and removed pressure from the seatback (refer to Figure 2). It is conceivable that the accident pilot did not perceive that the rear stick was hitting his seat back due to his lack of experience in this aircraft model.



Figure 2. Rear stick installed correctly (left), installed backward (center) and jammed under seatback frame (right).

Lessons Learned.

1. **The DOI Office of Aviation Services published Safety Alert 25-01** ([DOI Aviation Safety Alert 25-01 Top Cub Rear Flight Control Stick Installation](#)) which recommends POH/AFM Supplement 9.15 review, appropriate rear stick placarding, proper preflight inspections and flight control checks.
2. **Flight Control Checks.** Depending on your aircraft, the flight controls check might be listed in pre-flight, run-up, just before takeoff, or within multiple checklists. And when you get to it, here's what you should be looking for:
 - a. Check free and correct motion (flight controls are moving up, down, left, and right as they should). Many pilots use a box pattern for this check. It's important to check each corner of "the box" rather than a cursory sweep.
 - b. Make sure no unusual force is needed for movement (this means either abnormal pressure or looseness.)
 - c. Listen for unusual sounds from cables, linkages, and pulleys.

- d. Make sure no foreign object debris could jam your controls, especially in the rear seat area of a tandem aircraft. Rear stick covers should be installed when sticks are removed.
3. **Upset Prevention and Recovery Training (UPRT).** The pilot stated that when the control stick became unmovable, he recalled his UPRT training and attempted to control the pitch attitude with the nose trim wheel. His timely response may have prevented a much worse outcome. DOI pilots operating fixed-wing aircraft are required to attend UPRT within the first 12 months of employment and before approval to fly low-level flights.
4. **Training.** Utilizing standardized pilot training programs that cover all sections of an aircraft POH/AFM, supplements, and required maneuvers is particularly important in an environment of fewer pilots and decreasing resources. This accident pilot received no training on the rear control stick and cover. Relying on “corporate knowledge” and instructor pilot experience alone may leave critical gaps in a new pilot’s skill and knowledge base.
5. **Cargo.** During the accident sequence, the pilot was struck in the back of the head by loose cargo that flew forward from the rear baggage compartment. Securing cargo properly is vital for weight and balance, aircraft controllability, and injury prevention.
6. **Fire Hazard.** After impact with the runway, a significant fuel leak occurred that resulted in fuel entering the cockpit. Fuel leaks and fire are a common occurrence after accidents. This risk can be mitigated by wearing fire-retardant clothing (PPE), even when not required by policy. Luckily the pilot was able to egress the wreckage, and a fire never ensued.
7. **Safety Culture and Reporting.** During the investigation, it was discovered that similar events had occurred in DOI CC18s over the last decade but were not reported through the SAFECOM system therefore negating the opportunity to identify a critical safety issue and mitigate the hazard. The SAFECOM system is designed to identify and mitigate hazards, but also to share relevant safety information with others and we should encourage each other to use the reporting system to prevent future mishaps.

Summary. This accident underscores the importance of attention to detail in aircraft configuration, thorough training, and rigorous safety practices. Even seemingly small oversights — like the orientation of a removable stick — can result in critical system failures. Aviation safety relies on proactive hazard recognition, thorough checks, and an open safety reporting culture.

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