SAFO

Safety Alert for Operators

U.S. Department
of Transportation

**Federal Aviation
Administration**

SAFO 09010
DATE: 5/16/09

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Reversed Installation of Flight Control Components

Purpose: This SAFO emphasizes the need for increased awareness and makes recommendations to operators and maintenance personnel, about the potential dangers of improper procedures during installation of flight control systems.

Background: On September 1, 2008, a Convair CV-340-580 crashed during a return attempt after takeoff. Three persons on board sustained fatal injuries. This was the first attempted flight for the aircraft after a four-month maintenance procedure involving extensive rework to the tail section. Investigation revealed reversal of the elevator trim tab control cables during re-assembly. This incorrect rigging resulted in the aircraft being trimmed full nose down when the pilots attempted to trim it full nose-up. The resulting control wheel forces proved to be an unmanageable condition for the crew.

Discussion: Similar scenarios have been reported on various aircraft models and can occur with any flight control system, in any category, with design characteristics that depend on maintenance personnel using "best practices" and following maintenance manual procedures to ensure a correct installation of the system. Control cable, control rod, and bell-crank arrangements often allow for easy reversal or mis-rigging when manual procedures are not followed.

Many human factors come into play that can negatively influence the outcome of a maintenance procedure. Particularly, when extended periods of time elapse between removal and installation and/or when different personnel are performing various tasks. To mitigate the potential for a disastrous situation operators and mechanics alike should be constantly vigilant and aware of the possibility of an incorrect installation and develop written procedures to ensure proper installation.

Recommended Action: Operators should identify potential areas of concern with aircraft in their fleet and conduct a review of their maintenance procedures to ensure practices and inspection procedures are adequate to prevent improper installations. Written procedures should ensure qualified personnel are properly trained on critical maintenance procedures and clearly identify inspection requirements. Particularly with respect to correct control surface travel direction when selected from the cockpit.

Operators may find it useful to apply aircraft specific methods of marking potential problem areas by color coded paint, placard instructions, or explore the possibility of unique turnbuckle installations on cable pairs to name a few. Additionally, it is recommended that company culture provide communication of safety risks throughout its employees in a manner that does not isolate responsibilities between maintenance, operations, and management personnel.

Questions: For any questions pertaining to this SAFO, please contact the Aircraft Maintenance Division, General Aviation Branch, AFS-350, at (202) 267-1675.