



**SUBJ:** Navigation: Cirrus Aircraft Under-Glareshield GPS/WAAS Antenna Mount

**SAIB:** CE-09-32  
**Date:** May 29, 2009

*This is information only. Recommendations aren't mandatory.*

## **Introduction**

This Special Airworthiness Information Bulletin is being issued to alert owners and installers to an airworthiness concern regarding under-glareshield mounted antennas that may cause loss of Global Positioning System/Wide-Area Augmentation System (GPS/WAAS) navigation service on Cirrus Design Corporation (Cirrus) Models SR20 and SR22 airplanes. This Special Airworthiness Information Bulletin applies to all Cirrus aircraft with GPS/WAAS antennas installed using the original under-glareshield mounting location when replacing the non-WAAS GPS antenna.

The airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) Part 39.

## **Background**

Cirrus originally incorporated an internal mounting location under the aircraft glareshield for non-WAAS GPS antennas on the Models SR20 and SR22 airplanes as part of the aircraft type design. These antennas were secured using the 3M™ Dual Lock™ Reclosable Fastener SJ3552 (Type 170) engaged to 3M™ Dual Lock™ Reclosable Fastener SJ3551 (Type 400). This method to secure the antennas was evaluated during the type certification process and found satisfactory.

To upgrade the non-WAAS GPS equipment to GPS/WAAS capability requires new antennas that may be installed in the same location using the same fastener method as the non-WAAS antennas. There are two potential issues for GPS/WAAS service associated with the under-glareshield mounting location and fastener method: 1) robustness of the antenna mounting method; and 2) Localizer Performance with Vertical Guidance (LPV) service interruption due to signal loss from airframe shadowing. Both issues affect service availability and may ultimately result in loss of GPS/WAAS navigation capability. Loss of GPS/WAAS navigation capability requires the operator to rely on other on-board navigation equipment that may not have area navigation or LPV capability.

### Antenna Mounting Robustness

Two service difficulty reports (S8Y2008F00000 and 2007FA0000554) indicate the possibility for antennas secured using the 3M™ Dual Lock™ fastener system to detach, which would result in loss of navigation. A detached antenna will not have an adequate field of view to receive satellite signals resulting in loss of GPS/WAAS navigation.

### Airframe Shadowing

Cirrus airplanes use composite construction, which, unlike metal aircraft, is essentially transparent to radio signals. There is always concern that metal components such as engines, instrument panels, or embedded metal mesh for lightning protection can affect GPS/WAAS signal reception for internally mounted antennas. Antenna location, even on composite aircraft, can have an affect on GPS/WAAS

signal availability due to signal shadowing and/or attenuation effects. Shadowing and attenuation are more critical during LPV operations due to the more stringent requirements receivers must meet.

The current receiver and antenna performance standards use a conservative estimate for intra-system noise environment and antenna gain patterns that provides significant signal margin. However, the margin available today will gradually decrease as new systems, signals, and satellites come on-line over the next decade. This decrease could potentially cause decreased LPV availability or loss of GPS/WAAS navigation on Cirrus aircraft with antennas mounted under the glareshield.

### **Recommendations**

We recommend that owners and operators of Cirrus Models SR20 and SR22 airplanes using the under-glareshield location for GPS/WAAS antennas relocate the antennas to upper fuselage external locations following Cirrus Optional Service Bulletins SB 2X-34-23 R1 (for aircraft without a primary flight display) or SB 2X-34-24 R1 (for aircraft with a primary flight display). Relocating the antennas according to the Optional Service Bulletins provides a more robust antenna mounting; and assures maximum GPS/WAAS signal reception for optimum service availability when performing LPV instrument approaches.

To obtain copies of Cirrus Optional Service Bulletins SB 2X-34-23 R1 or SB 2X-34-24 R1, contact Cirrus Design Corporation, 4515 Taylor Circle Duluth, MN 5581-1548 or visit their website at [www.cirruslink.com/mycirrus/servicepubs.aspx](http://www.cirruslink.com/mycirrus/servicepubs.aspx).

### **For Further Information Contact**

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