FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-11-06
SUBJ: Main Landing Gear – Tires and Wheels **Date:** December 15, 2010

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts you, registered owners and operators of small airplanes, to follow established safety criteria, guidance, and data when modifying your aircraft with tires that are oversized compared to the original equipment Federal Aviation Administration- (FAA-) approved type design. Oversized tires have been FAA approved by supplemental type certificates (STC) and field approvals on numerous small aircraft types for an assortment of reasons, such as maintaining ground clearance when installing larger propellers or improving landing performance for unique conditions. These oversized tires have customarily been referred to as "Tundra" tires.

At this time, the FAA has determined that this 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. Investigation of a recent accident highlights the need for reminding operators of part 23 certificated airplanes that oversized tire modifications require analysis and substantiation as well as periodic inspections to prevent unsafe conditions. This SAIB reiterates the criteria to apply when evaluating the use of oversized tires and for determining the appropriate requirements to obtain necessary FAA approval.

Background

Recently, there was a non-fatal accident involving an Allied Ag Cat Productions, Inc. (Ag-Cat) (also known as Schweizer) Model G-164B airplane (Type Certificate Data Sheet 1A16) equipped with the larger 29x11-10 tires. The aircraft encountered a wheel failure that caused a wheel brake to lock up, which resulted in the aircraft departing the runway, coming to rest in a ditch.

An investigation determined the likely failure sequence of the accident was due to an initial crack of unknown origin in the inner flange. The weakened flange allowed the larger pressurized tire to fail the flange at the crack. The wheel flange broke into several pieces 360 degrees around the wheel assembly circumference. The broken flange pieces pressed inward by the existing tire/tube pressure, contacted the calipers, and caused the wheel brakes to lock up. The aircraft subsequently left the runway and came to rest in a ditch. The facts provided from the initial on-site investigation were insufficient to determine the precise failure scenario.

Some G-164B aircraft have been modified with "Geared" Pratt & Whitney R-1340 engines having larger diameter propellers. With the reduced ground clearance these propellers tended to siphon up debris on unimproved airstrips when at flight attitude during take-off, thereby damaging the propellers. To improve ground clearance, some operators replaced the standard 8.50x10 tires with the larger 29x11-10 tires on the original Cleveland Wheel and Brake wheel part number 40-101. This practice subsequently continued with the turbo propeller configured aircraft. The larger tires on the 40-101 wheels reduced the running clearance between the tire sidewalls and the wheel brake calipers.

We have not been able to identify a documented FAA approval to install these larger tires on the G-164B aircraft. However, an STC that authorizes the larger tire approval on similar aircraft (Air Tractor) has been issued. This STC has been used by operators and repair stations as a basis for field installations for the G-164B aircraft.

Recommendations

All operators of 14 CFR part 21, section 21.25 Restricted Category and 14 CFR part 23 Normal Category certificated airplanes that are currently operating with or may modify their aircraft to operate with oversized tires different from the aircraft's approved type design, should acquire an STC or field approval supported by FAA-approved data with similar original equipment manufacturer (OEM) restrictions for installation, pressure, etc. before doing so. The approved data should include flight test requirements and their results as well as system design and structural analysis. Guidance for replacing OEM tires with oversized tundra tires is provided in FAA Advisory Circular (AC) AC 23-17B. The AC summarizes the results of flight tests recommended by National Transportation Safety Board and conducted by the FAA for evaluation of tundra tires installed on a Piper PA-18. In addition, the AC provides information of these tires as well as testing of their installation. Although the guidance in the AC is based specifically on the Piper Aircraft, Inc. PA-18, it identifies issues and guidance that can be extended to other airplane types equipped with oversized tires. The AC also identifies the possible performance effects and flight and ground handling characteristics that may be altered with the installation of the tundra tires. Potential propulsion system effects such as unusable fuel may be affected by changes in normal flying attitude. Review of all these potential effects as identified in AC 23-17B should be evaluated.

Before installation of larger tires operators should do the following as a minimum:

1. Initially inspect wheels for cracks using an industry standard fluorescent penetrant process with annual inspections thereafter.
2. Install only approved vendor supplied tires.
3. Install new tubes.
4. Determine the appropriate tire pressure for your specific tire, aircraft, and aircraft operations in consultation with the approved tire manufacturer and FAA Advisory Circular, AC 23-17B.
5. Check for clearance between the tire and brake components.
6. Check the tire pressure and abnormal wear at 2 week intervals or less.

Additional safety information to the public of potential problems associated with aircraft with oversized tires is also provided in Safety Alert for Operations (SAFO) 10007, dated 5/24/10. The SAFO provides recommended actions for persons interested in operating aircraft with oversized tundra tires as well as with skis, or wheel/ski installations.

Owners and operators of Restricted Category and Normal Category airplanes who intend to modify their aircraft with oversized tires should review the above documents for guidance and the issues to consider and evaluate when replacing the manufacturer's recommended main landing gear wheels and/or tires with oversized replacements.

For Further Information Contact

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