Owner Service Advisory

SA 06-03

Issued: 30 Jan 2006

Model SR20 and SR22

TO: Owners, Operators, and Service Centers

SUBJECT: Discussion of Brake System Condition and Actions Taken

EFFECTIVITY: Cirrus Design SR20 serial numbers 1005 and subsequent
Cirrus Design SR22 serial numbers 0002 and subsequent

Recently, a number of reported incidents regarding overheated brakes have been reported. In response to these incidents, Cirrus has investigated possible causes and actions we can take in an effort to prevent incident recurrence. Items investigated include:

- Adherence to maintenance requirements
- Effects of normal and abnormal use
- Normal and abnormal temperature cycles
- Heat transfer characteristics of various lining materials
- Alternate brake piston O-ring materials
- Alternate brake fluids

As a result of these investigations, it is our conclusion that the two dominant factors that can lead to excessive brake temperature are ***improper operation*** and ***inadequate maintenance*** of the brake system.

To address this condition, the following operating practices, system maintenance, and modifications, have been developed and are being, or have been, distributed:

Operating Practices

Cirrus aircraft use a castering nose wheel and rely on aerodynamic forces and differential braking for directional control while taxiing. Proper braking practices are therefore critical to avoid potential damage to the brakes. The most common cause of brake damage and/or failure is the creation of excessive heat through improper braking practices. Pilots unaccustomed to free castering nose wheel steering may be inclined to “ride” the brakes to maintain constant taxi speeds and use the brakes excessively for steering.

When taxiing, directional control is accomplished with rudder deflection and intermittent braking (toe taps) as necessary. Use only as much power as is necessary to achieve forward movement. Deceleration or taxi speed control using brakes but without a reduction in power will result in increased brake temperature.

On flat, smooth, hard surfaces, do not exceed 1000 RPM maximum continuous engine speed for taxi. Power settings slightly above 1000 RPM are permissible to start motion, for turf, soft surfaces, and on inclines. Use minimum power to maintain constant taxi speed.

“Riding the brakes” while taxiing is similar to driving a car with one foot on the brake and one foot on the gas. This causes a continuous build up of energy that would otherwise be moving the airplane.

Observe the following operating practices:

1. Verify that the parking brake is completely disengaged before taxi.
2. The rudder is effective for steering on the ground and should be used.
3. Use only as much power (throttle) as is necessary to achieve forward movement.

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Operating Practices (Continued)

4. Use rudder deflection and the minimum necessary inputs of differential braking to achieve directional control.
5. Do not “ride the brakes”. Pilots should consciously remove pressure from the brakes while taxiing. Failure to do so results in excessive heat buildup, premature brake wear, and increased possibility of brake failure or fire.
6. Avoid unnecessary high-speed taxiing. High-speed taxiing may result in excessive demands on the brakes, increased brake wear, and the possibility of brake failure or fire.
7. Brakes have a large energy absorbing capacity; therefore, cooling time should be considered. Energy absorbed during a few seconds of deceleration can take up to an hour to entirely dissipate. Always allow adequate cooling time after brake use.

Inspection and System Maintenance

After Service Bulletin SB 2X-32-14: At ever preflight inspection the temperature indicators installed to the brake assemblies should be inspected. If an indicator center is black, the brake assembly has been overheated. The brake linings must be inspected and O-rings replaced.

The brake assemblies and linings should be checked at every oil change (50 hours) for general condition, evidence of overheating, and deterioration. In addition, at every annual/100-hour inspection the brakes should be disassembled, the brake linings should be checked and the O-rings must be replaced.

1. Improved O-Ring

   An O-ring with greater temperature resistance has been made available and will replaced the existing O-ring at the next brake maintenance, 100-hour inspection, or annual inspection whichever occurs first.

2. Approved Brake Linings and Condition Procedures

   Use only approved brake linings and conditioning procedures. Rapco brake linings (part number RA-66-XX) are not approved for use in Cirrus aircraft. These have been shown to result in significantly higher temperature brake caliper (and O-ring) temperatures.

3. Replenishing

   The brake system is filled with MIL-H-5606 hydraulic brake fluid. Do not use unapproved hydraulic brake fluid.

The aircraft should not be operated with overheated, damaged, or leaking brakes. Conditions include, but are not limited to:

1. Leaking brake fluid at the caliper. This can be observed by checking for evidence of fluid on the ground or deposited on the underside of the wheel fairing. Wipe the underside of the fairing with a clean, white cloth and inspect for red colored fluid residue.
2. Overheated components, indicated by discoloration or warping of the disk rotor. Excessive heat can cause the caliper components to discolor or cause yellowing of the part identification label.

Modifications

Mandatory Service Bulletin SB 2X-32-14 has been issued which provides for the installation of temperature indicators on the brake assemblies and modification of main landing gear fairings to include inspection holes that facilitate monitoring brake assembly temperature.

Optional Service Bulletin SB 2X-32-13 has been issued which allows for the installation of heavy duty brake systems for fleet operators, flying schools, and other instances where owners and operators wish to take additional steps to protect their investments from aggressive use, mis-use, or increased durability and wear life. Heavy duty brakes will not reduce the probability of fire, are not free from the effects of “riding the brakes”, and do not allow for great inspection and maintenance intervals.

Wheel fairing venting or operating without wheel fairings does not provide sufficient cooling for brake heating due to “riding the brakes”.