

AC NO: 20-99

DAVE:5/27/77



# ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

**SUBJECT:** ANTISKID AND ASSOCIATED SYSTEMS

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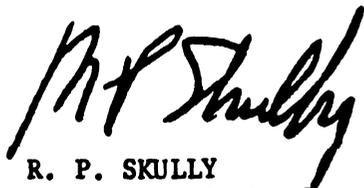
1. PURPOSE. This circular sets forth an acceptable means but not the only means of complying with the requirement that antiskid and associated systems must be designed so that no probable malfunction **will** result in a hazardous loss of braking or directional control of airplane.
  2. REGULATIONS AFFECTED. FAR 25.735(e).
  3. BACKGROUND. There have been accidents wherein multiple **loss** of tires has resulted in **loss** of braking ability and directional control of the airplane. One such condition of braking loss can occur on **airplanes** which have **antiskid** systems utilizing locked wheel protection **circuits**. The circuits compare one wheel's rotational speed with another one or more on the same and/or another gear to determine a locked wheel condition, **The** locked wheel protection feature is designed to prevent tire flat **spotting** and tire blowouts when braking on wet or icy runways. When the ratio of one wheel's speed compared to another as noted is less than a predetermined **min/max** value, brakes will be released on the low speed wheel. If a wheel continues to roll after losing its tires and rim **flanges**, as during a momentary **unbraked** airplane roll condition, its rotational speed versus the speed of other wheels being compared **could equal** a ratio indicative of a locked wheel(s) elsewhere. **This** would result in the locked wheel protection circuits preventing application of brake **pressure** to the compared and still **functionally** satisfactory wheel/tire position, thus **further** reducing braking capability.
  4. ACCEPTABLE MEANS OF COMPLIANCE.
    - a. A failure mode and effect analysis provide an acceptable method of **complying with FAR 25.735(e)**. The analysis should provide for failures of the antiskid and associated systems (tires, wheels, **brakes**, etc.) and effects on airplane safety and braking **performance**.
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- b. **The analysis** of antiskid systems utilizing locked wheel protection circuits should include a determination assuring that mechanical **faults** such as blown tires, broken wheel rims, etc., cannot **significantly** reduce the **braking** effectiveness of cross coupled wheels with **intact tires**.

Note: A tire or wheel failure that results in the **loss** of additional tires or wheels from overload, resulting from the initial failure, should be considered a single failure.



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