



U.S. Department of Transportation

Federal Aviation Administration

8042-2
Memorandum

Concurrence For 111
ACE 111 S. Anderson
Signature <i>S. Anderson</i>
DATE 4/13
ACE 111 Engineer
Signature <i>[Signature]</i>
DATE
ACE 111 D. Showers
Signature <i>D. Showers</i>
DATE 4/13/00
OTHER CONCUR
RTG SYM B. Seaman
Signature <i>B. Seaman</i>
DATE 4-13-00
RTG SYM
Signature
DATE
RTG SYM
Signature
DATE

Subject: **INFORMATION:** Request Assistance in Interpretation of Federal Aviation Regulations (FAR) 23.479(b)

Date: APR 13 2000

From: Manager, Regulations and Policy Branch
Small Airplane Directorate, ACE-111

To: Manager, Special Certification Branch
Seattle Aircraft Certification Office, ANM-190S

This memorandum is in response to your memorandum of April 5, 2000, asking for interpretation of FAR 23.479(b) as it relates to the tire peripheral speed (tire radius) that must be considered in meeting the drop test requirement. Compliance with FAR 23.479(b) can be accomplished by test, by a more rational analysis, or by use of the equations of Appendix D.

If the applicant chooses to show compliance by Appendix D, the drag force calculations are made assuming the tire is deflected to the radius it would have if the effective weight, multiplied by the total load factor, was applied vertically. This calculation assumes that the maximum drag force occurs when the tire is at its maximum deflection. Appendix D drag loads are usually conservative and need not exceed 0.8 of the maximum vertical load.

If the applicant chooses to show compliance by test, the drop test should simulate the spin-up and spring back load conditions as close to the actual landing condition as possible. Prior to Amendment 45, spring back loads were not included in Part 23. For pre-amendment 45 tests, the FAA has accepted methods where the landing gear and tire are dropped on an inclined plane to simulate the spin-up load. The inclined plane method does not simulate spring back loads. An acceptable method of compliance for Amendment 45 and subsequent certifications is to pre-rotate the tire to a rotation speed calculated using an undeflected tire radius, and then drop the gear on a flat surface. The rotation speed calculated using an undeflected tire more closely represents the actual landing condition. This method has been accepted by the FAA for Part 23 certifications and has resulted in successful landing gear designs.

The fact that Appendix D uses a different tire radius than the drop test method does not indicate a conflict between regulations. The analysis relies on certain conservative assumptions while the drop test method attempts to simulate the actual landing condition.

If you have any questions or need additional information, please contact me at 816-329-4111.

David R. Showers

K:ace111:sanderson:spinup2.doc:sa:329-4118:4-13-00