



AEROSPACE RECOMMENDED PRACTICE

ARP1786™

REV. C

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Superseding ARP1786B

(R) Wheel Roll on Rim Criteria for Aircraft Applications

RATIONALE

This document is intended to provide recommended practice for aircraft wheel roll on rim design criteria and validation test. This revision C is an update to revision B and incorporates an updated reference section.

1. SCOPE

1.1 Purpose

This SAE Aerospace Recommended Practice (ARP) is to provide a recommended minimum laboratory roll performance for main landing gear aircraft wheels without tires installed and applies to both bolted and lock-ring wheel designs for FAA Part 25 and military aircraft main wheels (not required for any nose wheels or main wheels on FAA Part 23, 27 or 29 applications).

1.2 Applicability

This document sets forth minimum roll performance capability for a main landing gear wheel to be rolled without tire installed. The recommended test requirements establish a laboratory dynamometer demonstration level to equate with satisfactory experience on aircraft.

1.3 Background

In any case where a flat tire occurs, the tire carcass may or may not become separated from the wheel. Relative to wheel structural capability, the most adverse occurrence is for the tire to be thrown from the wheel rim with the subsequent condition of the wheel flanges rolling in direct contact on the runway. Therefore, demonstration is recommended to verify that the wheel possesses the structural integrity to roll on the rim without the tire carcass under the most adverse loading condition.

Past tire incidents leading to wheel failures prior to the aircraft completing takeoff roll-out have been associated with main gear installations. Consequently, attention is focused toward improving main wheel capability and to minimize hazards should a main gear tire failure occur. It is recommended that the practices of ARP5265 be followed to help minimize the risk of tire failure.

It is recognized that prescribing a roll on rim criterion imposes constraints. Items such as foreign objects and bumps on the runway cannot feasibly be accommodated. Therefore, the subject roll-on-rim criterion does not attempt to simulate an actual on-runway occurrence, but rather establish a simple, but relevant, dynamometer test to verify the general robustness of the wheel when subjected to a roll-on-rim occurrence. The minimum requirements were originally established by running dynamometer tests both on wheels that had successfully completed actual roll-on-rim occurrences in service, and wheels that had not.

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