



AEROSPACE RECOMMENDED PRACTICE

ARP5911™**REV. A**

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Superseding ARP5911

Regional Aircraft Towbarless Tow Vehicle - Test Requirements

RATIONALE

ARP5911A has been reaffirmed to comply with the SAE Five-Year Review policy.

FOREWORD

Throughout this SAE Aerospace Recommended Practice (ARP), the minimum essential criteria are identified by the use of the keyword "shall". Other recommended criteria are identified by the use of the keyword "should" and, while not mandatory, are considered to be of primary importance in providing safe and serviceable towbarless tractors. Alternative solutions may be adopted only after thorough consideration and in-service evaluation have shown them to be equivalent.

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1. SCOPE

1.1 Purpose

The present Aerospace Recommended Practice specifies for airplane operator and tow vehicle manufacturers the basic testing requirements for towbarless tow vehicles to be used on the nose gear of conventional tricycle type landing gears of commercial civil transport aircraft with maximum ramp weight between 8600 kg (19 000 lb) and 50 000 kg (110 000 lb), commonly designated as “regional aircraft”.

Its purpose is to achieve testing results, or equivalent computer modeling, demonstrating that the loads induced by the tow vehicle will not exceed the design loads of the airplane's nose landing gear and associated structure, reduce the certified safe life limit of the nose landing gear, or otherwise compromise the airplane's structural integrity and airworthiness certification.

1.2 Field of Application

This document is intended to be applicable to all towbarless tow vehicles to be used for push-back and maintenance towing of commercial airplanes in the specified range. See Section 3 hereafter. It is not intended to apply to tow vehicles used for airplane operational (dispatch) towing.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

ARP4852	Design Specification for Towbarless Push-Back Tow Vehicles
ARP4853	Design Specification for Towbarless Tow Vehicles
ARP5283	Nose Gear Towbarless Tow Vehicle Basic Test Requirements
ARP5284	TLTV - Aircraft NLG Steering and Tractive Force Protection Systems or Alerting Devices - Inspection, Maintenance and Calibration Requirements
ARP5285	Towbarless Towing Vehicle Operating Procedure
ARP5916	Design Specification for Regional Aircraft Towbarless Tow Vehicle for Pushback and/or Maintenance Towing Operations

2.1.2 Regulatory (USA)

Available from United States Government Printing Office, 732 North Capital Street, NW, Washington, DC 20401, Tel: 202-512-0000, www.gpoaccess.gov.

Federal Aviation Regulations 14CFR Part 25, Airworthiness Standards: Transport category airplanes, paragraphs 25.301(a), Loads, and 25.509, Towing loads

2.1.3 Regulatory (Europe)

Available from European Aviation Safety Agency, Postfach 10 12 53, D50452 Koeln, Germany.

Certification Specifications for Large Aeroplanes CS-25 paragraphs CS 25.301(a) Loads, and CS 25.509, Towing loads

Certification Specifications for Large Aeroplanes CS-25, paragraph CS 25.745(d) Nose Wheel Steering and associated Advisory Material INT/POL/25/13

2.1.4 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 9001 Quality systems - Model for quality assurance in design, development, production, installation and servicing

ISO 20683-1 Aircraft ground equipment - Towbarless towing vehicle (TLTV) - Design, testing and maintenance requirements - Part 1: Aircraft with a maximum ramp mass over 50 000 kg (110 000 lb)

ISO 20683-2 Aircraft ground equipment - Towbarless towing vehicle (TLTV) - Design, testing and maintenance requirements - Part 2: Regional aircraft

2.1.5 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800, Place Victoria, P.O.Box 113, Montréal Québec H4Z 1M1, Canada, Tel: 1-514-874-0202, www.iata.org.

Airport Handling Manual AHM 957, Functional specification for aircraft nose gear controlled towbarless tractor

2.2 Terms and Definitions

For the purpose of the present document, the following terms and definitions apply:

COMPUTER MODELING: See NUMERIC SIMULATION.

DISPATCH (OPERATIONAL) TOWING: Towing a revenue aircraft, loaded with passengers, fuel, and cargo up to Maximum Ramp Weight (MRW), from the terminal gate/remote parking area, to a location near the active runway, or conversely. The movement may cover several kilometers (miles) with speeds up to 32 km/h (20 mph), with several starts, stops and turns. Replaces typical taxiing prior to take-off or after landing.

JERKING: Sudden application of push/pull forces from a complete stop.

MAINTENANCE TOWING: Movement of an aircraft for maintenance/remote parking purposes (e.g., from gate to maintenance hangar), typically unloaded, with speeds up to 32 km/h (20 mph).

MAXIMUM LIMITS: Limits (tow force, torsional, or angular) established by the airframe manufacturer as not-to-exceed values intended to preclude possible damage to nose landing gear or structure. Limits are established by airframe manufacturer's documentation and may be different for towbarless or towbar towing operations. All aircraft load limits are limit loads as defined in FAR Part 25/ EASA CS-25 paragraph 25.301(a).

MAXIMUM RAMP WEIGHT (MRW): The maximum mass allowable for an aircraft type or sub-type when leaving its parking position either under its own power or towed, comprising maximum structural take-off weight (MTOW) and taxiing fuel allowance.

NLG: Aircraft nose landing gear.