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WITHDRAWAL

December 2016

Lifting systems for aircraft boarding of passengers with mobility impairments

Following a review by the Committee on Small Aircraft Boarding Systems, the decision to withdraw is largely because this National Standard of Canada is time-dated and in need of a technical review. The necessary funding to allow the Canadian General Standards Board (CGSB) to update and maintain this National Standard of Canada does not exist.

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Décembre 2016

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Au terme d'un examen par le Comité des systèmes d'embarquement à bord des petits aéronefs, il a été décidé de retirer la Norme nationale du Canada mentionnée essentiellement parce qu'elle est chronomarquée et qu'elle a besoin d'être soumise à un examen technique. L'Office des normes générales du Canada (ONGC) n'a pas reçu les fonds nécessaires pour la mise à jour et le maintien de cette Norme nationale du Canada.

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Lifting Systems for Aircraft Boarding of Passengers with Mobility Impairments

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LIFTING SYSTEMS FOR AIRCRAFT BOARDING OF PASSENGERS WITH MOBILITY IMPAIRMENTS

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LIFTING SYSTEMS FOR AIRCRAFT BOARDING OF PASSENGERS WITH MOBILITY IMPAIRMENTS

PREFACE

The objective of this standard is to facilitate the safe, dignified and effective aircraft boarding for persons with mobility and agility impairments. This standard does not address other methods which may meet the intent of accessibility requirements or regulations. It is recognized that one system cannot address the needs of all passengers.

This standard is based on the U.S. Department of Transportation, Federal Aviation Administration Advisory Circular No. 150/5220-21, Guide Specification for Lifts Used to Board Airline Passengers with Mobility Impairments published 10 February 1993. The advisory circular was based on the Society of Automotive Engineers (SAE) Aerospace Recommended Practices with necessary clarification and additional requirements included.

Quantities and dimensions in this standard are given in metric units with yard/pound equivalents, obtained through soft conversion, given in brackets. The metric units shall be regarded as official in the event of dispute or unforeseen difficulty arising from the conversion.

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CANADIAN GENERAL STANDARDS BOARD

LIFTING SYSTEMS FOR AIRCRAFT BOARDING OF PASSENGERS WITH MOBILITY IMPAIRMENTS

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LIFTING SYSTEMS FOR AIRCRAFT BOARDING OF PASSENGERS WITH MOBILITY IMPAIRMENTS

1. SCOPE

1.1 This standard specifies the requirements for the design, construction, performance and testing of self-propelled and manually transported or towed lifting equipment used to assist in the boarding of aircraft passengers with mobility impairments.

1.2 For more detailed information on intended uses, see par. 8.2.

1.3 The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any existing applicable regulatory requirements prior to its use.

2. APPLICABLE PUBLICATIONS

2.1 The following publications are applicable to this standard:

2.1.1 Canadian Standards Association (CSA)

CSA C22 Series (1994) — Canadian Electrical Code

CSA W48 Series — Welding.

2.1.2 Department of Labour

Canadian Labour Code, Canada Occupational Safety and Health Regulations (COSHR).

2.1.3 Department of Transport

Motor Vehicle Safety Regulations (MVSR) Nos. 101, 103, 104, 205, 206, 207, 208 and 209

TP312E — Aerodrome Standards and Recommended Practices, 4th edition, March 1993

VHF Radio Regulations for Ground Support Equipment.

2.1.4 Society of Automotive Engineers (SAE)

Aerospace Recommended Practice (ARP)

ARP 1247 C — General Requirements for Aerospace Ground Support Equipment, Motorized and Non-Motorized.

2.1.5 United States Architectural and Transportation Barriers Compliance Board (ATBCB)

Guidelines for Aircraft Boarding Chairs.

2.2 The sources of these publications are shown in the Notes section.

3. TERMINOLOGY

3.1 **Highway Transportability** — The capability of self-propelled equipment to be licensed for operation on public highways.

3.2 **Horn** — A non-automated, noise-making warning device.

3.3 **Lifting Platform** — All surfaces traversed by the passenger using a wheelchair in boarding the aircraft.

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3.4 **Total Life** — The years of use of the equipment from time of delivery to the user until its identity is destroyed by classifying it as salvage and/or subjecting it to cannibalization, when the equipment is maintained and used according to manufacturer's recommendations.

3.5 **Self-propelled** — Motorized equipment that transports the operator and/or passengers.

4. CLASSIFICATION

4.1 Lifting equipment shall be supplied in the following classes, as specified (par. 8.1(a)):

Class A — Self-propelled (Note 1)

Class B — Manually transported or towed.

5. GENERAL REQUIREMENTS

5.1 **Functions** — The equipment must meet the requirements of par. 5.1.1 through 5.1.7 while maintaining a safe distance from any moving part of the aircraft. If the equipment approaches within 30 cm (12 in) of any moving part of the aircraft, the manufacturer shall demonstrate to the satisfaction of the airline operator that the equipment can perform all functions without undue risk of damage to the aircraft.

5.1.1 The equipment shall provide a means for boarding wheelchair users and other passengers with mobility impairments onto the lifting platform at ground level.

5.1.2 The equipment shall elevate the lifting platform to the aircraft doorsill height.

5.1.3 The equipment shall provide a means for transferring passengers using wheelchairs from the elevated lifting platform to and from the aircraft doorsill.

5.1.4 If specified (par. 8.1(b)), the manufacturer shall provide a boarding chair, compatible with the equipment and the aircraft to be served. Boarding chairs should meet the requirements of ATBCB document, Guidelines for Aircraft Boarding Chairs.

5.1.5 If specified (par. 8.1(c)), the equipment shall provide a stairway for the boarding of other passengers.

5.1.6 If specified (par. 8.1(d)), the equipment shall provide transportation to and from the aircraft. This shall be done in a safe, dignified and efficient manner.

5.1.7 ***Climatic Protection***

5.1.7.1 Equipment used to transport passengers to and from aircraft shall provide climatic protection for passengers. The degree of climatic protection provided shall be as specified (par. 8.1(e)).

5.1.7.2 If specified (par. 8.1(f)), equipment not used to transport passengers to and from aircraft shall provide climatic protection for passengers. The degree of climatic protection provided shall be as specified (par. 8.1(e)).

5.2 **Lifting Platform**

5.2.1 The lifting platform shall have a minimum capacity of 270 kg (600 lbs). If the equipment is to allow simultaneous boarding of two or more passengers, a higher capacity must be specified (par. 8.1(g)).

5.2.2 The ramp that bridges the gap between the equipment and the aircraft shall be designed so as not to damage the aircraft or dislodge when in use. It may rest on the doorsill but shall not induce unsafe loads on the aircraft. Protective railings on the ramp shall be marked with high-contrast chrome yellow.

5.2.3 The lifting platform shall be equipped with rigid protective railings or other barriers. Spaces between barrier members, and between the barriers and the aircraft, shall be sufficiently small to prevent injury and provide a feeling of confidence to the occupants.

Note 1: Self-propelled units may be operated hydraulically, pneumatically, electrically, or by internal combustion engines.

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5.2.4 The lifting platform on equipment used to transport passengers to and from aircraft shall include a system to immobilize the wheelchairs it is designed to transport. The system shall be easily operated by the attendant or equipment operator. If specified (par. 8.1(h)), equipment not used to transport passengers to and from aircraft must have a wheelchair immobilization system.

5.2.5 The interior width of the lifting platform shall be compatible with the boarding chair to be used and the aircraft to be served.

5.3 **Accelerations** — The equipment shall not subject passengers to acceleration/decelerations of more than 1.5 m/s/s/s (5 ft/s/s/s) in any direction. The equipment shall not subject passengers to changes in acceleration/deceleration of more than 2.4 m/s/s/s (8 ft/s/s/s) in any direction such that the occupants experience uncomfortable acceleration.

5.4 **Deployment Time** — The time required to deploy the equipment upon arrival at the passenger loading area or aircraft shall be 1 min or less.

5.5 **Enplaning/Deplaning Time** — The time required to convey a passenger onto the equipment and to the doorsill level shall be 2 min or less. The time to deplane a passenger, that is from the elevated position to ground level and off the equipment shall be 2 min or less.

5.6 **Aircraft Compatibility**

5.6.1 ***Aircraft Types*** — The aircraft to be accessed shall be as specified by the purchaser (par. 8.1(i)).

5.6.2 ***Design Considerations*** — If an aircraft to be served has a stairway which cannot be retracted while the door is open, the equipment shall be designed to operate with the stairway deployed. All aircraft models specified (par. 8.1(i)) to be served should be surveyed by the lifting equipment manufacturer for compatibility. The following aircraft size/configuration factors will have a significant impact on the design of the equipment:

a. Aircraft doorsill height

b. Aircraft door width

c. Aircraft door location

d. Aircraft components adjacent to the door constituting obstructions (wing, tail, engine nacelle, propeller, etc.)

e. Airstairs/airdoor

f. Airstair handrails

g. Vertical movements of the aircraft (doorsill) during enplaning/deplaning.

5.7 **Total Life** — The equipment shall be designed to perform its intended function for its "Total Life" period when maintained and used according to the manufacturer's recommendations. This period shall be a minimum of ten years, based on a frequency of use of 1000 cycles per year.

5.8 **Reliability**

5.8.1 The equipment and its accessories shall be designed and constructed with reliability of operation a primary consideration. The minimum reliability design requirement is that the equipment be designed to operate between periodic preventive maintenance periods (Note 2) of 100 lift cycles or four months, whichever occurs first. The above interval does not apply to components in those cases where the component manufacturer recommends more frequent maintenance intervals. The equipment shall incorporate a cycle counter or hour meter. The type of meter installed should be consistent with the maintenance intervals recommended by the manufacturer.

5.8.2 The equipment must be designed for easy removal in the event of an equipment failure while at the side of an aircraft.

Note 2: In this standard, normal servicing of fuel, oil, tire pressure, battery and water are not considered preventive maintenance.

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6. DETAILED REQUIREMENTS (Note 3)

6.1 **Serviceability and Accessibility** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.4.3.

6.2 **Environmental Conditions of Use**

6.2.1 The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.6 except as modified in par. 6.2.1.1 and 6.2.1.2 of this standard.

6.2.1.1 The temperature condition of -29 to 52°C (-20 to 123°F) specified in SAE ARP 1247 C, par. 3.6.1 may be modified (par. 8.1(j)) if the climatic conditions in which the equipment is to be used are extreme.

6.2.1.2 If the lower temperature specified in par. 6.2.1.1 of this standard is below -29°C, the manufacturer may provide, in agreement with the purchaser, procedures which will ensure compliance with SAE ARP 1247 C, par. 3.6.1.

6.2.2 After being started in accordance with manufacturer's instructions, the equipment shall be capable of 45 min of continuous operation consisting of any possible combination of passenger loading and manoeuvring cycles, at full load at the temperature ranges cited in par. 6.2.1 of this standard. For passenger loading, full load shall be considered to be applied during the ascent phase only.

6.2.3 Unless otherwise specified (par. 8.1(k)), both Class A and B equipment shall be capable of operating on a level surface in 5 cm (2 in) of snow.

6.3 **Highway Transportability**

6.3.1 If highway transportability is specified for Class A equipment (par. 8.1(l)), the equipment shall meet the requirements of SAE ARP 1247 C, par. 3.7.

6.3.2 If highway transportability is not specified (par. 8.1(l)), the provisions of SAE ARP 1247 C, par. 3.9.1 and 3.9.8 shall not apply.

6.4 **Safety** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.8. All design features intended to protect the equipment operator shall provide similar protection to the passenger(s). Where reference is made to applicable OSHA requirements in SAE ARP 1247 C, par. 3.8, the requirements of the COSHR shall apply.

6.4.1 ***Personnel Safety***

6.4.1.1 The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.9, except par. 3.9.5, 3.9.16, 3.9.17 and 3.9.22 and except as provided in par. 6.3.2 and par. 6.4.1.2 of this standard. The types of non-slip materials used shall be as specified (par. 8.1(m)). Where reference is made to FMVSS Nos. 104, 207, 208 and 209 in SAE ARP 1247 C, par. 3.9.1 and 3.9.8, the requirements of MVSR Nos. 104, 207, 208 and 209 shall apply. Where reference is made to applicable OSHA requirements in SAE ARP 1247 C, par. 3.9.14 and 3.9.20, the requirements of the COSHR shall apply.

6.4.1.2 For Class A equipment, for the purposes of compliance to SAE ARP 1247 C, par. 3.9.3, the horn control button may be mounted on the control console in an easily accessible location. The provisions of SAE ARP 1247 C, par. 3.9.2 through 3.9.4, shall not apply to Class B equipment.

6.4.1.3 Risers of variable riser stairs shall not be less than 10 cm (4 in). The angle of the stairs shall not be less than 15.5° and the width of the stairway shall not be less than 69 cm (27 in).

6.4.2 ***Equipment Safety***

6.4.2.1 The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.10.

6.4.2.2 Aircraft interface cushioning devices as specified in SAE ARP 1247 C, par. 3.10.3, shall be approved by the purchaser.

Note 3: Table A1 in Appendix A cross-references the sections in this standard with both the relevant sections of the SAE ARP 1247 C and the other applicable publications.

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6.4.2.3 A 5 lb ABC rated fire extinguisher shall be mounted on the equipment at a location easily accessible to the operator.

6.4.2.4 Stabilizing devices as specified in SAE ARP 1247 C, par. 3.10.9.3, shall be painted chrome yellow.

6.4.2.5 If the stabilizing devices are not interlocked to prevent the operation of the equipment or if the stabilizing devices are not in clear view of the operator, a light in accordance with SAE ARP 1247 C, par. 3.10.9.4 shall be mounted on the equipment.

6.4.2.6 If the stabilizing devices could impede the removal of the equipment in an emergency, the device must meet the requirements of SAE ARP 1247 C, par. 3.10.9.5.

6.5 **Noise and Vibration** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.11.

6.6 **Design and Construction** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13, except as modified herein.

6.6.1 ***Mechanical Design*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.1. Where reference is made to American Welding Society design codes in SAE ARP 1247 C, par. 3.13.1.1.4, the applicable requirements of CSA W48 Series of standards for welding shall apply.

6.6.2 ***Electrical Design and Equipment***

6.6.2.1 *General* — The device shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.2. Unless otherwise specified (par. 8.1(n)), the installation method for concealed wiring shall be as specified in SAE ARP 1247 C, par. 3.13.1.2.11.Where reference is made to NFPA 70, National Electrical Code in SAE ARP 1247 C, par. 3.13.1.2.8, 3.13.1.2.17 and 3.13.1.2.19, the requirements of CSA C22 Series of Standards shall apply. Where reference is made to FMVS Standards for lighting equipment and to FMVSS No. 108 in SAE ARP 1247 C, par. 3.13.1.2.21 and 3.13.1.2.22, the requirements for lighting equipment of MVSR standards and MVSR No. 108 shall apply.

a. When used for cranking engines of 30 hp or less, batteries referred to in SAE ARP 1247 C, par. 3.13.1.2.1, shall be as recommended by the engine manufacturer.

b. The equipment shall have the following lights:

   i) a headlight;

   ii) a beacon in accordance with the requirements of TP 312. The beacon shall not be located at eye-level for the operator or the passengers during normal operating procedures;

   iii) a rear, red reflector or light;

   iv) a suitable outdoor light at the entry/exit doorway of the aircraft; and

   v) a light for the lifting platform.

6.6.2.2 *Battery-Powered Devices*

a. Batteries shall be designed to have a minimum life of three years when maintained according to the manufacturer's instructions. For design purposes, a frequency of use of 1000 cycles per year shall be assumed.

b. A self-contained battery charger with automatic voltage control shall be provided. The charging process shall require the operator only to connect a readily-accessible plug to a standard 110 or 220 V receptacle, as specified (par. 8.1(o)).

c. The battery system shall incorporate a battery condition gauge. If a low-voltage condition could result in higher amperage flow and motor burnout, then the status monitoring device shall provide a time warning to the operator.

6.6.3 ***Hydraulic, Pneumatic Design*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.3. Unless otherwise specified (par. 8.1(p)), uncoated hydraulic fluid reservoir tanks in accordance with SAE ARP 1247 C, par. 3.13.1.3.5.7 shall be provided.

6.6.3.1 Hydraulic fluid shall be as recommended by the manufacturers of the hydraulic system components.

6.6.3.2 The materials used for each hydraulic line shall be consistent with its application.

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6.6.3.3 Hydraulic rams may be used to stabilize the equipment if all wheels remain firmly on the pavement surface.

6.6.4 ***Engines and Related Equipment*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.4, except that the provisions of SAE ARP 1247 C, par. 3.13.1.4.4, shall not apply to engines of 30 hp or less.

6.6.4.1 Alternators used on engines of 30 hp or less shall be as recommended by the engine manufacturer.

6.6.4.2 Oil pressure switches shall not be required on engines of 30 hp or less.

6.6.4.3 Engines used to drive other than the vehicle propulsion system shall be equipped with a tachometer which is green-lined within the correct operating rpm range and red-lined above this range, or be automatically governed to prevent over-revving.

6.6.5 ***Fuel System Design*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.5, except that the provisions of SAE ARP 1247 C, par. 3.13.1.5.1, shall not apply to engines of 30 hp or less.

6.6.5.1 Unless otherwise specified (par. 8.1(q)), the fuel tank shall have a minimum capacity for eight hours of operation.

6.6.5.2 Fuel tank fillers for engines of 30 hp or less shall be as recommended by the engine manufacturer, but shall include a flame-arresting cap.

6.6.6 ***Exhaust System Design*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.6. Engine exhaust systems shall be provided with flame and spark arrestors.

6.6.7 ***Class A Equipment — Self-Propelled Vehicles*** — Class A equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.7.

6.6.7.1 *Design Speed* — The vehicle design speed for Class A equipment shall be as specified (par. 8.1(r)).

6.6.7.2 *Braking Systems*

a. Braking systems for vehicles with a maximum speed of 32 km/h (20 mph) or more shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.7.2.

b. Braking systems for vehicles with a maximum speed of less than 32 km/h (20 mph) shall not exceed 30 cm (12 in) for every 1.6 km/h (1 mph) increment. The maximum stopping distance on clean, dry pavement in metres shall be numerically equal to the design speed in km/h/5.3; in feet shall be numerically equal to the design speed in mph.

6.6.7.3 *Vehicle Cabs* — On vehicles equipped with an enclosed operator's cab, the cab shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.7.3. Where reference is made to FMVSS Nos. 103, 205 and 206 in SAE ARP 1247 C, par. 3.13.1.7.3.9, 3.13.1.7.3.11 and 3.13.1.7.3.12, the requirements of MVSR Nos. 103, 205 and 206 shall apply.

6.6.8 ***Instruments and Controls*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.1.8 except 3.13.1.8.3. The design or location of the controls should be optimized so as to avoid being susceptible to inadvertent actuation. The positioning movement of the controls should not require any excessive or awkward motion.

6.6.8.1 Transmission selector levers should move and operate in the direction of travel of the equipment. Inclusion or deletion of "Park" position for equipment with automatic transmissions will be as specified (par. 8.1(s)).

6.6.9 ***Equipment Stability*** — The equipment shall meet the stability requirements of SAE ARP 1247 C, par. 3.13.1.9.

6.6.10 ***Options*** — The manufacturer shall not be required to offer the options referred to in SAE ARP 1247 C, par. 3.13.1.10 except as otherwise required in this standard.

6.6.11 ***Materials, Parts and Processes*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.2.

6.6.12 ***Standard and Commercial Parts*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.3.

6.6.13 ***Moisture and Fungus Resistance*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.4.

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6.6.14 ***Corrosion of Metal Parts*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.5. Unless otherwise specified (par. 8.1(t)), all unexposed surfaces shall be painted with one coat of primer.

6.6.15 ***Interchangeability and Replaceability*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.6.

6.6.16 ***Workmanship*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.7.

6.6.17 ***Electromagnetic Interference*** —The equipment shall be noise suppressed so that there is no interference with aircraft radios. If there is a radio on the equipment, it shall meet the Department of Transport requirements for VHF radio equipment on ground support equipment.

6.6.18 ***Identification and Marking*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.9 except 3.13.9.2 and shall be provided with a permanently affixed placard identifying the maximum number of passengers and maximum weight capacity of the lifting platform. For the purposes of compliance to SAE ARP 1247 C, par. 3.13.9.6, a permanently affixed shifting diagram placard lasting for the total life of the equipment may be provided in media other than metal.

6.6.19 ***Storage*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.10.

6.6.20 ***Exterior Finish*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.11.

6.6.20.1 The equipment shall be primed in accordance with accepted industry standards for heavy-duty industrial equipment intended for outdoor use.

6.6.20.2 The equipment shall be finished as specified (par. 8.1(u)).

6.6.21 ***Human Engineering*** — The equipment shall meet the requirements of SAE ARP 1247 C, par. 3.13.12.

6.7 **Manuals/Publications** — The following manuals shall accompany the delivered equipment. No special format is required.

a. Operator's handbook

b. Illustrated parts breakdown and list

c. Preventive maintenance schedule.

6.8 **Tools and Test Equipment** — The provisions of SAE ARP 1247 C, par. 3.12.4, shall apply.

6.9 **Training** — The manufacturer shall, at no additional cost, provide trained personnel at the time of delivery to place the equipment into operation, and provide training for airport and/or airline personnel in its operation and maintenance. Training shall include written operating instructions that depict the step-by-step operational use of the equipment. Written instructions shall include, or be supplemented by, materials which can be used to train subsequent new operators.

7. INSPECTION

7.1 **Quality Assurance Provisions** — Quality assurance provisions shall meet the requirements of SAE ARP 1247 C, section 4, as specified (par. 8.1(v)).

7.1.1 ***Specification Conformance Tests*** — The manufacturer shall perform any tests referred to in SAE ARP 1247 C, par. 4.6.1 through 4.6.10, on a representative sample, as specified (par. 8.1(w)).

7.1.2 ***Reliability Test and Analysis*** — A reliability test and analysis may be specified (par. 8.1(x)).

8. NOTES

8.1 **Options** — The following options must be specified in the application of this standard:

a. Class of lifting equipment (par. 4.1)

b. Whether a boarding chair is to be provided (par. 5.1.4)

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c. Whether a stairway is to be provided (par. 5.1.5)

d. Whether the equipment is to transport passengers to and from the aircraft (par. 5.1.6)

e. The degree of climatic protection to be provided for passengers (par. 5.1.7)

f. For equipment not used to transport passengers to and from aircraft, whether climatic protection for passengers is to be provided (par. 5.1.7)

g. Lifting platform capacity (par. 5.2.1)

h. For equipment not used to transport passengers to and from aircraft, whether a system for the immobilization of wheelchairs is to be provided (par. 5.2.4)

i. Type of aircraft to be served (par. 5.6.1 and 5.6.2)

j. Temperature range for operation (par. 6.2.1.1)

k. Type of surface the equipment is to operate on (par. 6.2.3)

l. If Class A equipment is to be highway transportable (par. 6.3)

m. Type of non-slip materials (par. 6.4.1.1)

n. Installation method for concealed wiring (par. 6.6.2.1)

o. Battery charging voltage (par. 6.6.2.2 (b))

p. If other than an uncoated hydraulic fluid reservoir tank is to be provided (par. 6.6.3)

q. Fuel tank capacity (par. 6.6.5.1)

r. Vehicle design speed (for Class A equipment) (par. 6.6.7.1)

s. If "Park" position on transmission selector lever is to be included (par. 6.6.8.1)

t. Treatment of unexposed metal surfaces (par. 6.6.14)

u. Type of finish (par. 6.6.20.2)

v. Quality assurance provisions (par. 7.1)

w. Specification conformance tests, if specific tests are required (par. 7.1.1)

x. Reliability test and analysis, if specific tests are required (par. 7.1.2).

8.2 **Intended Uses** — In specifying the type of lift, the purchaser should consider the frequency of use of the lift, the need to transport the device between widely separated gates or to transport passengers to boarding areas, and the increased cost of purchase and maintenance of a self-propelled unit. In specifying other optional equipment, the purchaser should consider not only the added cost of the additional equipment, but also the possibility that fewer manufacturers will be able to provide the unit. Above all, the purchaser should consider all aircraft serving the airport that are required to be accessible. Accessing all such aircraft may require more than one device, but should be accomplished in as cost effective a means as possible.

8.3 **Sources of Referenced Publications**

8.3.1 The publications referred to in par. 2.1.1 may be obtained from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale (Toronto), Ontario M9W 1R3.

8.3.2 The publications referred to in par. 2.1.2 and 2.1.3 may be obtained from the Canada Communication Group, Publishing, Ottawa, Canada K1A 0S9.

8.3.3 The publication referred to in par. 2.1.4 may be obtained from the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001, U.S.A.

8.3.4 The publication referred to in par. 2.1.5 may be obtained from the United States Architectural and Transportation Barriers Compliance Board, 1331 F. Street, NW, Suite 1000, Washington, DC 20004-1111, U.S.A.

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SUPPLEMENTARY INFORMATION — CROSS-REFERENCE TABLE

*(**Note:** This appendix is a non-mandatory part of CAN/CGSB-189.1-95, Lifting Systems for Aircraft Boarding of Passengers with Mobility Impairments.)*

The following table cross-references the sections contained in CAN/CGSB-189.1-95 with both the applicable sections of SAE ARP 1247 C and the other applicable publications relevant to the requirements cited in this standard.

TABLE A1

CAN/CGSB-189.1-95 Section/Paragraph	CAN/CGSB-189.1-95 Subparagraph	Applicable Section/Paragraph of SAE ARP 1247 C	Other Applicable Publications (see Note)
6.1 Serviceability and Accessibility		3.4.3	
6.2 Environmental Conditions of Use		3.6	
6.3 Highway Transportability		3.7 3.9 If, however, highway transportability is not specified, 3.9.1 and 3.9.8 do not apply	- Provincial highway safety legislation - See also requirements for par. 6.4.1 of this standard
6.4 Safety		3.8	- Canada Occupational Safety and Health Regulations (COSHR) - ANSI B56.1, Part II - ANSI A92.7
	6.4.1 Personnel Safety	3.9 except 3.9.5, 3.9.16, 3.9.17 and 3.9.22 3.9.2 through 3.9.4 do not apply to Class B equipment	- Motor Vehicle Safety Regulations (MVSR) Nos. 104, 207, 208 and 209 - SAE J377 (Class A equipment only) - Canada Occupational Safety and Health Regulations (COSHR) - SAE ARP P836
	6.4.2 Equipment Safety	3.10	
6.5 Noise and Vibration		3.11	- SAE J919 - SAE ARP 1801
6.6 Design and Construction		3.13	
	6.6.1 Mechanical Design	3.13.1.1	CSA W48 Series of standards for welding

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CAN/CGSB-189.1-95 Section/Paragraph	CAN/CGSB-189.1-95 Subparagraph	Applicable Section/Paragraph of SAE ARP 1247 C	Other Applicable Publications (see Note)
6.6 Design and Construction (continued)	6.6.2 Electrical Design and Equipment	3.13.1.2	- SAE J537 - MIL-STD-3950 - SAE J561 - SAE J858 - SAE J928 - SAE J878 - SAE J1127 - SAE J1128 - SAE J2031 - CSA C22 - Uniform Vehicle Code - Appropriate sections of MVSR concerning lighting - MVSR No. 108 - TP 312
	6.6.3 Hydraulic, Pneumatic Design	3.13.1.3	- SAE J514 - SAE 100R1 through 100R7 - SAE J517 - ASME Unfired Pressure Vessel Code, Section VIII
	6.6.4 Engines and Related Equipment	3.13.1.4 except that 3.13.1.4.4 do not apply to engines of 30 hp or less	- SAE ARP 1052 - Fed Spec O-A-548a
	6.6.5 Fuel System Design	3.13.1.5 except that 3.13.1.5.1 do not apply to engines of 30 hp or less	- Federal and provincial requirements for automotive equipment for fuel tank fillers - Title 49 CFR Sections 393.65 and 393.67
	6.6.6 Exhaust System Design	3.13.1.6	
	6.6.7 Class A Equipment — Self-Propelled Vehicles	3.13.1.7	
	6.6.7.2 Braking Systems	3.13.1.7.2	- Title 49 CFR Sections applicable to the class of motorized vehicle and Sections 393.41, 393.51 and 393.52 - SAE J1403 - SAE J844 - SAE J1402 - SAE J10 - SAE J1401 - SAE J1703 - SAE J524 - SAE J533 - SAE J512
	6.6.7.3 Vehicle Cabs	3.13.1.7.3	- MVSR Nos. 103, 205 and 206

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CAN/CGSB-189.1-95 Section/Paragraph	CAN/CGSB-189.1-95 Subparagraph	Applicable Section/Paragraph of SAE ARP 1247 C	Other Applicable Publications (see Note)
6.6 Design and Construction (continued)	6.6.8 Instruments and Controls	3.13.1.8 except 3.13.1.8.3	- MVSR No. 102 - MIL-STD-1472
	6.6.9 Equipment Stability	3.13.1.9	- SAE ARP 1328
	6.6.10 Options	3.13.1.10	
	6.6.11 Materials, Parts and Processes	3.13.2	
	6.6.12 Standard and Commercial Parts	3.13.3	
	6.6.13 Moisture and Fungus Resistance	3.13.4	
	6.6.14 Corrosion of Metal Parts	3.13.5	
	6.6.15 Interchangeability and Replaceability	3.13.6	
	6.6.16 Workmanship	3.13.7	- SAE ARP 1330
	6.6.17 Electromagnetic Interference	—	- Department of Transport VHF Radio Regulations for Ground Support Equipment
	6.6.18 Identification and Marking	3.13.9 except 3.13.9.2	
	6.6.19 Storage	3.13.10	
	6.6.20 Exterior Finish	3.13.11	- FED STD 595
	6.6.21 Human Engineering	3.13.12	
6.8 Tools and Test Equipment		3.12.4	
7. Inspection		4	

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Note: The titles of the standards listed are as follows:

1. **American National Standards Institute (ANSI)**

   ANSI B56.1 — Safety Standard for Powered Industrial Trucks

   ANSI A92.7 — Airline Ground Support Vehicle-Mounted Vertical Lift Devices

2. **American Society of Mechanical Engineers (ASME)**

   Unfired Pressure Vessel Code

3. **Canadian Standards Association (CSA)**

   CSA C22 Series — Canadian Electrical Code

   CSA W48 Series — Welding

4. **Federal Specifications/Standards**

   O-A-54B — Antifreeze, Ethylene Glycol, Inhibited

   FED STD 595B — Colors used in Government Procurement

5. **Military Standards**

   MIL-STD-1472 — Human Engineering Design Criteria for Military Systems, Equipment and Facilities

   MIL-STD-3950 — Switch, Toggle, General Specification for

6. **Society of Automotive Engineers (SAE)**

   100R1 through 100R7

   J10 — Automotive Air Brake Reservoir Performance and Identification Requirements

   J377 — Performance of Vehicle Horns

   J512 — Automotive Tube Fittings

   J514 — Hydraulic Tube Fittings

   J517 — Hydraulic Hose

   J524 — Welded and Cold Drawn Low Carbon Steel Tubing

   J533 — Flares for Tubing

   J537 — Storage Batteries

   J561 — Electrical Terminals: Eyelet and Spade Type

   J844 — Nonmetallic Air Brake System Tubing

   J858 — Electrical Terminals: Blade Type

   J878 — Low Tension Cable Thermosetting Insulation

   J919 — Sound Level Measurements at Operator Station

   J928 — Electrical Terminals: Pin and Receptacle Type

   J1127 — Battery Cable

   J1128 — Low Tension Primary Cable

   J1401 — Hydraulic Brake Hose Assemblies — Road Vehicles

   J1402 — Air Brake Hose — Automotive

   J1403 — Vacuum Brake Hose

   J1703 — Motor Vehicle Brake Fluid

   J2031 — High Tension Ignition Cable

   ARP 836 — Design and Safety Criteria for Passenger Boarding Systems

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ARP 1052 — Selection Criteria for Reciprocating Primer Movers

ARP 1328 — Aircraft Ground Support Equipment Vehicle Stability Analysis

ARP 1330 — Welding of Structures for Ground Support Equipment

ARP 1801 — Measurement of Exterior Sound Level of Specialized Aircraft Ground Support Equipment

Withdrawn/Retirée

SUPPLEMENTARY INFORMATION — LISTING OF ACRONYMS

*(**Note:** This appendix is a non-mandatory part of CAN/CGSB-189.1-95, Lifting Systems for Aircraft Boarding of Passengers with Mobility Impairments.)*

The following listing contains the acronyms used in CAN/CGSB-189.1-95.

ANSI	American National Standards Institute
ARP	Aerospace Recommended Practice (applicable to SAE documents)
ASME	American Society of Mechanical Engineers
ATBCB	United States Architectural and Transportation Barriers Compliance Board
CFR	Code of Federal Regulations (United States)
CGSB	Canadian General Standards Board
COSHR	Canada Occupational Safety and Health Regulations (Canadian Labour Code)
CSA	Canadian Standards Association
FED STD	Federal Standard (United States)
FMVSS	Federal Motor Vehicle Safety Standards (United States)
MIL-STD	Military Standards (United States)
MVSR	Motor Vehicle Safety Regulations (Canada)
NFPA	National Fire Prevention Association (United States)
OSHA	Occupational Safety and Health (United States)
SAE	Society of Automotive Engineers

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Notes

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