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AEROSPACE STANDARD

SAE AS 8043

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Submitted for recognition as an American National Standard

TORSO RESTRAINT SYSTEMS

1. SCOPE: This Aerospace Standard specifies laboratory test procedures and minimal requirements for the manufacturer of torso restraint systems for use in small fixed wing aircraft and rotorcraft. It is intended to establish a minimum level of quality which can be called upon by the designer of those systems. However, compliance with this standard alone may not assure adequate performance of the restraint system under normal and emergency conditions. Such performance requires consideration of factors beyond the scope of this standard, and must be demonstrated by a system evaluation procedure which includes the seat, the occupant, the specific restraint installation and the cabin interior configuration.

2. DEFINITIONS:

2.1 Torso Restraint Systems: Consists of any strap, webbing, or similar device designed to secure a person in an aircraft with the intention of minimizing injury, including all buckles or other fasteners, and all integral hardware.

2.2 Pelvic Restraint: That portion of a torso restraint system intended to restrain movement of the pelvis, commonly referred to as a lap belt, safety belt, or seat belt.

2.3 Upper Torso Restraint: That portion of a torso restraint system intended to restrain movement of the chest and shoulder region, commonly referred to as a shoulder harness.

2.4 Hardware: Any part of the torso restraint system, other than webbing.

2.4.1 Buckle: A quick release connector in a torso restraint system.

2.4.2 Attachment Hardware: Any hardware other than retractors designed for terminating the webbing of a torso restraint system.

2.4.3 Adjustment Hardware: Any hardware designed for adjusting the size of a torso restraint system to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

2.4.4 Retractor: A device for storing webbing in a torso restraint system.

2.4.4.1 Automatic Locking Retractor: A retractor incorporating adjustment hardware by means of a positive self locking mechanism which is capable, when locked, of withstanding restraint forces.

2.4.4.2 Emergency Locking Retractor (Inertia Reel): A retractor incorporating adjustment hardware by means of a locking mechanism that is activated by aircraft acceleration, webbing movement relative to the aircraft, or other automatic action during an emergency and is capable, when locked, of withstanding restraint forces.

2.5 Webbing: A narrow fabric woven with continuous filling yarns and finished selvages.

2.6 Strap: A narrow nonwoven material used in a torso restraint system in place of webbing.

2.7 Loop Load: The algebraic sum of the applied loads at the anchorages of a torso restraint system segment. A balanced loop load is achieved when the reaction loads at each lap belt anchorage are equal.

2.8 Laboratory Ambient Conditions: 18° - 24°C (65° - 75°F) and 45 - 55 percent relative humidity.

2.9 System Designation: A unique part number which identifies a torso restraint system and its separable sub-assemblies.

3. GENERAL REQUIREMENTS:

3.1 Single Occupancy: A torso restraint system shall be designed for use by one person at any one time.

3.2 Torso Restraint System: A torso restraint system shall consist of a pelvic restraint and an upper torso restraint. These components shall meet the appropriate requirements of Sections 3-6 inclusive.

3.2.1 Pelvic Restraint: A torso restraint system shall provide pelvic restraint whether or not an upper torso restraint is used. Pelvic restraint shall not incorporate emergency locking retractors (inertia reels).

3.2.2 Upper Torso Restraint: A torso restraint system shall be designed to provide upper torso restraint.

3.3 Hardware: All hardware parts shall be free from burrs and sharp edges, and shall be designed and located to minimize the possibility of injury to the occupant.

3.4 Release: A torso restraint system shall be provided with a single buckle having a single motion release which is readily accessible to the occupant to permit easy and rapid egress by the occupant from the assembly. The buckle release mechanism shall be designed to minimize the possibility of inadvertent release.

3.5 Adjustment: A torso restraint system shall be capable of snug adjustment, by the occupant, by a means easily within reach of that person and easily operable, or shall be provided with a locking retractor. The system shall maintain the adjusted position during flight.

Nonlocking retractors shall not be used.

A torso restraint system shall be capable of adjustment to fit occupants ranging from a small adult female [46.9 kg (103 lbs)] weight, [151.3 cm (59.6 inches)] stature, to those of a large adult male [102.6 kg (226 lbs)] weight, [186.4 cm (73.4 inches)] stature, wearing normal street clothing.

3.6 Webbing: All webbing shall be made from synthetic materials. The ends of webbing shall be protected or treated to prevent raveling, and shall not separate from the adjustment hardware.

3.7 Strap: A strap used in a torso restraint system to sustain restraint forces shall comply with the requirements for webbing in Section 4, and if the strap is made from a rigid material it shall comply with applicable requirements in Sections 4-6.

3.8 Marking: Each torso restraint system or separable sub-assembly shall be permanently and legibly marked or labeled with year of manufacture, system designation, name and address of manufacturer or distributor, and SAE AS 8043.

3.9 Workmanship: Workmanship shall be used in accordance with standard aircraft practices.

3.10 Flammability: All non self-extinguishing materials used in the torso restraint system must be at least flame resistant when tested in accordance with the procedure of Section 10, where the average burn rate of the specimen when tested horizontally, shall not exceed 63.5 mm (2.5 inches) per min.

3.11 Load Duration: Applied test loads shall be maintained for at least 3 seconds.

4. REQUIREMENTS FOR WEBBING:

4.1 Width: The width of the webbing in a torso restraint system shall not be less than 45.7 mm (1.8 inches) except for portions that do not touch an occupant.