SURFACE VEHICLE RECOMMENDED PRACTICE

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Seat Belt Hardware Performance Requirements

RATIONALE

This technical report is being stabilized because it covers technology, products, or processes for which technical expertise no longer resides in the owning committee.

STABILIZED NOTICE

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1. SCOPE

This SAE Recommended Practice describes performance requirements for hardware used in motor vehicle seat belt assemblies when tested in accordance with the test procedures specified in SAE J140.

Test procedures and performance requirements for retractors will be covered in separate SAE Recommended Practices to be issued later.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

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.

SAE J140 Seat Belt Hardware Test Procedure

3. DEFINITIONS

See SAE J1803

4. REQUIREMENTS FOR HARDWARE

4.1 General

4.1.1 Hardware

All hardware which contacts, under normal usage, an occupant, his or her clothing, or his or her seat belt assembly, webbing shall be free from burrs and sharp edges, and shall be designed and located in the assembly that the possibility of injury to the occupant shall be minimized.

4.1.2 Buckle Release Mechanism

The buckle release mechanism shall be designed to minimize the possibility of accidental release. A buckle, with the release mechanism in the normal position, shall have only one opening into which the latch plate can be inserted on the end of the buckle which is designed to receive and latch the latch plate.

4.1.3 Attachment Hardware

Attaching bolts shall be 7/16-20 UNF-2A or 1/3-13 UNC-2A or equivalent metric hardware. The hardware should be designed to prevent attachment bolts from becoming disengaged from the vehicle while in service.

4.2 Corrosion Resistance

4.3 Any hardware of a seat belt assembly shall be adequately protected by plating, paint, or other protective coating or made of a corrosion resistant material so that, after exposure to the conditions specified in 4.2 of SAE J140, it will not allow any ferrous corrosion or non ferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during the use of a seat belt assembly incorporating the hardware, and must still meet all functional and static strength requirements of SAE J140 and SAE J141. Temperature Resistance

Plastic or other nonmetallic hardware parts of a seat belt assembly, when subjected to the conditions specified in 4.3 of SAE J140, shall not deteriorate in any manner to cause the assembly to operate improperly or fail to comply with applicable requirements of Section 4.

4.4 Attachment Hardware Strength

Applicable test procedures of SAE J140 shall be used to determine attachment hardware strength. When more than one attachment bolt is used to secure a single piece of hardware to the vehicle, they shall be tested as a system and shall withstand the following applicable specified forces.

4.4.1 Attachment hardware other than the attaching bolts shall withstand the following tensile forces:

4.4.1.1 One end of the pelvic portion of a seat belt assembly, 11.1 kN

4.4.1.2 Common attachment for pelvic and upper torso portions of a seat belt, 13.3 kN

4.4.1.3 Upper torso portion of a seat belt assembly, 11.18 kN

4.4.1.4 Ends of two seat belt assemblies, 26.7 kN

4.4.2 Bolts used to secure the ends of seat belts to motor vehicles shall withstand the following forces:

4.4.2.1 One end of the pelvic portion of a seat belt assembly, 22.2 kN Common attachment for pelvic and upper torso portions of a seat belt assembly, 26.7 kN

4.4.2.2 Upper torso portion of a seat belt assembly, 22.2 kN

4.4.2.3 Ends of more than one seat belt assembly, 40 kN (9000 lbf).

4.5 Buckle Release

4.5.1 The buckle of a Type 1 or Type 2 seat belt assembly shall release when a force of not more than 133 N (30.0 lbf) is applied as prescribed in 4.4 of SAE J140.

4.5.2 A buckle designed for push button application of buckle release force shall have a minimum area of 45 mm^2 with no linear dimension less than 10 mm) for applying the release force. A buckle having other designs for release shall have adequate access for two or more fingers to actuate release.

4.6 Buckle Compression

A buckle shall not release under a compressive force of 1779 N applied as prescribed in 4.5 of SAE J140, and shall be operable and shall meet the applicable requirements of section 7, upon removal of the compressive force.

4.7 Buckle Latch Operation

4.7.1 The buckle-latch plate assembly of a seat belt assembly when tested by the procedure specified in 4.6 of SAE J140 shall not fail, gall, nor wear to an extent that normal latching and unlatching is impaired.

4.7.2 The buckle-latch plate assembly shall be separable by a force of not more than 22 N when tested according to the procedures in 4.6.2 of SAE J140.

5. SYSTEM REQUIREMENTS RELATED TO HARDWARE

5.1 Adjustment Force

The buckle or other manual adjusting device normally used to adjust the length of the assembly shall be subjected to the adjustment force test. This force shall not exceed 50 N when measured by the procedure specified in 5.1 of SAE J140.

5.2 Tilt Lock Adjustment

Buckles or other manual adjustment devices having tilt lock adjustment normally used to adjust the length of the assembly shall lock the webbing when tested by the procedure specified in 5.2 of SAE J140 at an angle of not less than 30 degrees between the buckle and the anchor webbing.

5.3 Webbing Abrasion

5.3.1 Webbing used in 3 point belt assemblies shall be tested per SAE J140 5.3.1. After abrasion test the abraded webbing shall have a breaking strength of not less than 75% of the breaking strength listed in 6.1 for that type of belt assembly.

5.3.2 Webbing intended for use in an adjustable latchplates used in 2 point seat belt shall be tested per SAE J140 5.3.2. After abrasion test the median abraded strength shall be not less than 20 KN.

5.4 General

Attachment hardware, adjustment hardware, buckles, and other parts of a seat belt assembly must comply with all applicable requirements of the assembly performance as described in Section 7 of this document.

6. REQUIREMENTS FOR WEBBING

6.1 Webbing Breaking Strength

The webbing in a seat belt assembly shall have not less than the following breaking strengths when tested by the procedure specified in Section 6 of SAE J140:

a. Type 1 seat belt assembly - 26.7 kN b.Type 2 seat belt assembly - 22.2 kN for pelvic restraint webbing, - 17.8 kN for upper torso restraint webbing.

6.2 Webbing Width

Portions of the webbing that contact the occupant shall be not less than 46 mm wide when under a tension of 9800N tested by the procedure specified in Section 6.1 of SAE J140

6.3 Web Light Resistance

The webbing in a seat belt assembly, after exposure to a xenon arc per the procedure specified in section 6.3 of SAE J140, shall have a breaking strength determined per section 6.1 of SAE J140 of not less than 60 percent of the strength before exposure to the xenon arc.