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Tractors and machinery for agriculture — Seat belts — Part 3: Requirements for assemblies

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This standard was reviewed for adoption by the ASABE Agricultural Machinery – Common Test Technical subcommittee, and has been formerly approved by the Power and Machinery Division. Adopted by ASABE May 2012; approved as an American National Standard July 2012.

Keywords: Seat belts, Anchorage, Tractors, Self-propelled machinery

0 Foreword

0.1 ANSI/ASABE AD3776-3:2009, Agricultural Tractors and machinery for agriculture—Seat belts—Part 3: Requirement for assemblies, is an adoption with deviations of the identically titled ISO standard ISO 3776-3:2009, Agricultural Tractors and machinery for agriculture—Seat belts—Part 3: Requirement for assemblies. Deviations noted in the following Foreword sections pertain to those provisions where harmonization could not be achieved between ASABE and the International Standard.

0.2 ANSI/ASABE AD3776-3:2009 specifies the requirements for pelvic restraint (seat) belt assemblies intended to be used by the operators of agricultural tractors and self-propelled machinery.

NOTE Seat belt assemblies that meet the requirements of UNECE R16:2000, Clause 6, but excluding 6.4 of that regulation, or seat belt assemblies complying with the requirements of SAE J386 are deemed to comply with the requirements of this part of ISO 3776.

0.3 Five normative references are listed in ISO 3776-3:2009. The responsible ASABE committee has reviewed these references and approved the following deviation:

0.3.1 Replace ISO 3776-1, Tractors and machinery for agriculture – Seat belts – Part 1: Anchorage location requirements, with ASABE/ISO 3776-1:2006, Tractors and machinery for agriculture – Seat belts – Part 1: Anchorage location requirements. Any reference to ISO 3776-1 in the printed portion of ISO 3776-3 shall be replaced by ASABE/ISO 3776-1:2006.

0.4 This standard has been approved as an American National standard by ANSI (American National Standards Institute).

0.5 This standard deviates from ISO 3776-3:2009 as follows:

0.5.1 See Section 0.3 for Normative reference deviations.

Text of ISO 3776-3:2009, Agricultural Tractors and machinery for agriculture—Seat belts—Part 3: Requirement for assemblies, follows.

1 Scope

This part of ISO 3776 specifies the requirements for pelvic restraint (seat) belt assemblies intended to be used by the operators of agricultural tractors and self-propelled machinery.

NOTE Seat belt assemblies that meet the requirements of UNECE R16:2000, Clause 6, but excluding 6.4 of that regulation, or seat belt assemblies complying with the requirements of SAE J386 are deemed to comply with the requirements of this part of ISO 3776.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3411, Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope

ISO 3776-1, Tractors and machinery for agriculture — Seat belts — Part 1: Anchorage location requirements

ISO 3776-2:2007, Tractors and machinery for agriculture — Seat belts — Part 2: Anchorage strength requirements

ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM D756:1993, Practice for Determination of Weight and Shape Changes of Plastics Under Accelerated Service Conditions

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

anchorage

provision to transfer forces applied to the seat belt assembly to the structure of the tractor or the machine

[ISO 3776-2]

3.2

creep

amount of unintentional lengthening of the seat belt assembly loop during use caused by motion of the machine, seat and seat-belted occupant

3.3

hardware

any metal or rigid plastic part of the restraint system

3.3.1

buckle and latch plate

quick release connector which fastens the belt assembly into a loop

3.3.2

attachment hardware

all load-bearing devices designed for securing the webbing portion of a seat belt assembly to a tractor or agricultural machine structure or intermediate structural component including but not limited to retractors, end fittings, bolts, studs, nuts or other attachment means, but not including those components permanently fixed to the tractor or agricultural machine

NOTE If the seat belt is attached to the seat, the seat is not considered to be attachment hardware.

3.3.3

adjustment hardware

mechanisms designed for adjusting the belt assembly to fit the user, including such devices that may be integral with a buckle, attachment mechanism, or retractor

3.4

loop

complete seat belt assembly as it would be installed around the seat occupant

3.5

polyester yarn

yarn spun from polyethylene terephthalate

3.6

retractor

device for storing all or part of the strap material of a seat belt assembly

3.7

roping

tendency of a piece of material to twist upon itself or roll up transversely, remaining in the form of a rope instead of staying in its original strap form

3.8

seat belt assembly

belt, including any buckle, length adjustor, retractor, and means for securing to an anchorage, that fastens across the pelvic area to provide pelvic restraint during operation and roll-over conditions

[ISO 3776-2]

4 Requirements

4.1 General

4.1.1 Single occupancy

A seat belt assembly shall be designed for use by only one person and at any one time.

4.1.2 Release

A seat belt assembly shall be provided with a buckle or latch readily accessible to the occupant, and designed to provide easy and rapid release of the assembly with a single motion. It shall also be capable of being released with either hand, bare or gloved. The buckle shall be designed to minimize the possibility of accidental release due to operator movement, inertia or external forces. Additionally, the buckle shall be in accordance with 4.3 and 4.4.

4.1.3 Adjustment

The seat belt shall be self-adjusting or readily adjustable by a means within easy reach of the seat occupant. Adjustment to a snug condition shall accommodate in all operating positions an operator in at least the 5th to 95th percentile as defined in ISO 3411.

4.1.4 Creep

4.1.4.1 General

Two seat belt assemblies of the same part number with adjusting devices shall be tested in accordance with 4.1.4.2 and 4.1.4.3.

The creep shall not exceed 25 mm for each adjusting device in the assembly.

The sum of creep amounts for all adjusting devices in the belt assembly shall not exceed 40 mm.

4.1.4.2 Conditions

Two seat belt assemblies of the same part number shall be conditioned for 24 h at a temperature of (20 ± 5) °C and (65 ± 5) % relative humidity. The test shall be conducted at a temperature between 15 °C and 30 °C. The test apparatus shall conform to that shown in Figure 1 for tests 1 and 2.

4.1.4.3 Test procedure

Before starting the tests, complete 20 cycles of the reciprocating motion described in c) to remove initial slack. Mark the force-bearing strap material at each adjuster in preparation for measuring creep.

- a) Mount the belts as shown in Figure 1 for tests 1 and 2.
- b) Apply a 5 kg mass to the lower end of each belt assembly. If there is a free end serving as a reserve strap, it shall not be fastened or clipped to the section subjected to the 5 kg mass.
- c) Apply a reciprocating-motion total amplitude of (300 ± 20) mm to the top end of each belt assembly.
- d) Ensure that the strap in the slack position maintains contact with the full length of the body block on the test bench.
- e) Guide the 5 kg mass vertically so as to prevent swaying of the mass and twisting of the belt during testing. The attachment shall be fixed to the 5 kg mass in the same manner as in the tractor or agricultural machine.
- f) Complete 1 000 cycles at a frequency of 0,5 Hz at the reciprocation motion of (300 ± 20) mm. The 5 kg mass shall be applied only during the time corresponding to a shift of (100 ± 12) mm of each half cycle. See Figure 1.
- g) Measure the distance the strap material has moved at each adjusting device.