
**Tractors and machinery for agriculture —
Seat belts —**

**Part 3:
Requirements for assemblies**

Tracteurs et matériels agricoles — Ceintures de sécurité —

Partie 3: Exigences relatives aux assemblages

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ISO 3776-3:2009

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3776-3 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 2, *Common tests*.

ISO 3776 consists of the following parts, under the general title *Tractors and machinery for agriculture — Seat belts*:

- *Part 1: Anchorage location requirements* [ISO 3776-3:2009](https://standards.iteh.ai/catalog/standards/sist/aa9af13e-69e3-438c-9d70-e52406de085c/iso-3776-3-2009)
- *Part 2: Anchorage strength requirements* <https://standards.iteh.ai/catalog/standards/sist/aa9af13e-69e3-438c-9d70-e52406de085c/iso-3776-3-2009>
- *Part 3: Requirements for assemblies*

Tractors and machinery for agriculture — Seat belts —

Part 3: Requirements for assemblies

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

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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.

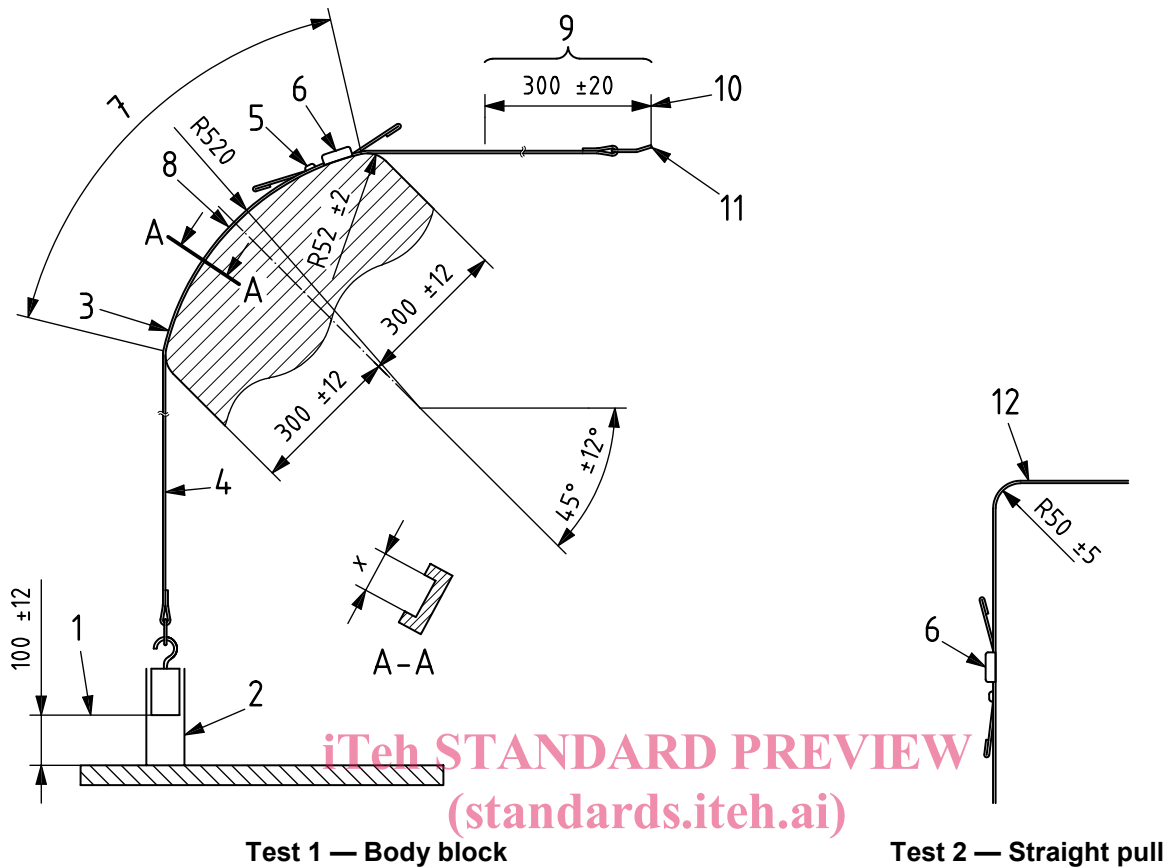
4.1.4.3 Test procedure

ISO 3776-3:2009

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.

Dimensions in millimetres



Test 1 — Body block

Test 2 — Straight pull

Key

- | | | | |
|---|--------------------------|----|-----------------------------------|
| 1 | start position | 7 | arc of travel — 30 cycles minimum |
| 2 | mass guide | 8 | steel surface |
| 3 | maximum travel point 2 | 9 | travel of point 1 |
| 4 | taut position | 10 | point 1 (start position) |
| 5 | point 2 (start position) | 11 | attachment to oscillating device |
| 6 | buckle assembly | 12 | fixed surface |

Figure 1 — Creep test apparatus

4.1.5 Breaking strength

4.1.5.1 Test procedure

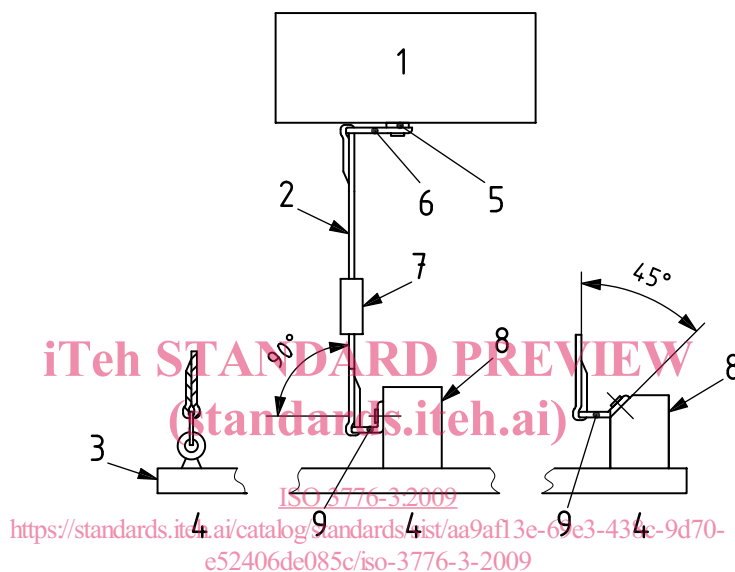
All the components of three seat belt assemblies shall be tested.

- Adjust the pelvic restraint between seat belt anchorages to a length between 914 mm and 1 219 mm, or as near to this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic locking or emergency locking retractor, when included in a seat belt assembly, shall be locked at the start of the test with a tension in the strapping slightly in excess of the retractile force, in order to keep the retractor locked.
- Orientate the attachment hardware to the strapping as specified in e) below and as shown in Figure 2.
- Apply a tensile force of $(11,1 \pm 0,1)$ kN to the components in any convenient manner: the extension between anchorages under this force shall not increase by more than 500 mm.

- d) Reduce the tensile force. The buckle release force shall be in accordance with 4.4.3.
- e) Attach the attachment hardware furnished with the seat belt assembly to the anchorage bar. The attaching bolt, with the listed exceptions, shall be parallel to or at an angle of 45° or 90° to the strapping, whichever results in the greatest angle between strapping and attachment hardware. Eye bolts shall be vertical, and the attaching bolts of a seat belt assembly designed for use in specific models of machines shall be installed to produce the maximum angle in use indicated by the installation instructions.

4.1.5.2 Acceptance condition

The complete seat belt assembly, including strapping, straps, buckles, adjustment and attachment hardware and retractors, shall withstand a tensile force of not less than 11,1 kN — i.e. each structural component of the assembly shall withstand a force of 11,1 kN when tested by the procedure of 4.1.5.1.



Key

1	testing machine	6	swivel plate
2	webbing	7	buckle
3	anchorage bar	8	rigid adapter
4	example attachment	9	angle bracket
5	space washer		

Figure 2 — Loop force testing machine

4.1.6 Marking (labelling)

Each conformant seat belt assembly and/or section of the seat belt assembly shall be permanently and legibly labelled with the following:

- reference to this part of ISO 3776 (i.e. “ISO 3776-3:2009”);
- year of manufacture;
- model or style number;
- name or trademark of the manufacturer or importer.