

# SURFACE VEHICLE STANDARD

J386™

**APR2022** 

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Superseding J386 AUG2012

(R) Occupant Restraint System for Off-Road Work Machines

# **RATIONALE**

Revision of this document includes updates for external document references to industry accepted ISO standards. Additional details were added to incorporate the current state of the art for restraint systems including retractor and latch plate specific requirements. Anchorage test requirements were updated to accommodate testing equipment. Center of gravity testing was added for seating systems with mass in excess of 70 kg.

## 1. SCOPE

This SAE Standard establishes the minimum performance requirements for pelvic restraint systems (seat belts, anchorages, and the fastening elements of seat belts) necessary to restrain an operator or rider within a roll-over protective structure (ROPS) in the event of a machine roll-over, as defined in ISO 3471, ISO 8082-1, ISO 8082-2, ISO 12117-2, and ISO 13459, or tip-over protection structure (TOPS), in the event of a machine tip over as defined in ISO 12117. This standard provides guidance and recommendations for information included in the machine operator manual.

NOTE: Upper torso restraint requirements are defined in SAE J2292.

## 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 +1 724-776-4970 (outside USA), <a href="www.sae.org">www.sae.org</a>.

SAE J2292 Combination Pelvic and Upper Torso Operator and Occupant Restraint Systems for Off-Road Work Machines

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#### 2.1.2 ISO Publications

SAE INTERNATIONAL

Copies of these documents are available online at <a href="http://webstore.ansi.org/">http://webstore.ansi.org/</a>.

ISO 3411	Earth-Moving Machinery - Human Physical Dimensions of Operators and Minimum Operator Space Envelope
ISO 3471	Earth-Moving Machinery ROPS - Laboratory Tests and Performance
ISO 5353	Earth-Moving Machinery - Seat Index Point
ISO 6683	Earth-Moving Machinery - Seat Belts and Seat Anchorages - Perfomance Requirements and Test
ISO 8082-1	Self-Propelled Machinery for Forestry - Laboratory Tests and Performance Requirements for Roll-Over Protective Structures - Part 1: General Machines
ISO 8082-2	Self-Propelled Machinery for Forestry - Laboratory Tests and Performance Requirements for Roll-Over Protective Structures - Part 2: Machines Having a Rotating Platform with a Cab and Boom on the Platform
ISO 11112	Earth-Moving Machinery - Operator's Seat-Dimensions and Requirements
ISO 12117	Earth-Moving Machinery - Tip-Over Protection Structure (TOPS) for Compact Excavators - Laboratory Tests and Performance Requirements
ISO 12117-2	Earth-Moving Machinery - Laboratory Tests and Performance Requirements for Protective Structures of Excavators - Part 2: Roll-Over Protective Structures (ROPS) for Excavators over 6 t

## DEFINITIONS

# 3.1 ADJUSTMENT HARDWARE

Hardware designed for adjusting the belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

# 3.2 SEAT BELT ANCHORAGE

The point where the seat belt assembly or extension (tether) belt is mechanically attached to the seat system or the machine.

# 3.3 ATTACHMENT HARDWARE

Hardware for securing a seat belt assembly to an anchorage on a seat system or on a machine.

# 3.4 STRAP (WEBBING)

A flexible belt to restrain the body and for transmission of the forces to the attachment hardware.

### 3.5 PELVIC BODY BLOCK

The test device used to apply the seat belt force to the seat system (see Figure 2).

## 3.6 BUCKLE

A quick release component of a seat belt assembly which accepts and connects to a latch plate, and is intended to facilitate wearing and removal of the seat belt by an occupant.

# 3.7 MICRO-SLIP (CREEP)

The amount of unintentional lengthening of the seat belt assembly loop during use that is caused by motion of the machine, the seat, and the seat belted occupant.

# 3.8 EXTENSION (TETHER) BELT

Any strap, belt, or similar device (webbing, wire cable, solid link, etc.) that aids in the transfer of seat belt forces.

#### 3.9 HARDWARE

Any metal or rigid plastic part of the occupant restraint system.

### 3.10 LATCH PLATE

A load bearing device through which the seat belt webbing either passes or is permanently attached. Allows the webbing to change direction and connect with the buckle. Also known as a Tongue, tip, or simply as a Latch. Latch Plate variants include free falling/dropping, sliding, cinching/locking, semi-cinching, sewn-in.

#### 3.10.1 SEWN-IN TYPE

A latch plate that is sewn directly to the lap portion of the webbing thus prohibiting webbing transfer through the latch plate.

# 3.10.2 LOCKING, OR CINCHING TYPES

A latch plate which limits transfer of the webbing through the latch plate in at least one direction in response to loading sufficient to meet the loop load requirements of this standard.

#### 3.10.3 SEMI-CINCHING TYPE

A latch plate which limits transfer of the webbing through the latch plate in at least one direction in response to loading sufficient to meet the requirements defined in this document, but is not intended to limit the transfer of webbing during dynamic (rollover or crash) loading.

# 3.10.4 FREE FALLING/DROPPING AND SLIDING TYPE

A latch plate which permits webbing transfer through the latch plate in two directions in response to loading and will fall under its own weight along a vertical length of webbing.

# 3.11 LOOP

The portion of the seat belt assembly as it would be installed around the seat occupant.

## 3.12 OCCUPANT RESTRAINT SYSTEM

The total system composed of the seat belt assembly, seat system, anchorages, and extension (tether) belts, if applicable, which transfers the seat belt force to a machine.

### 3.13 POLYESTER YARN

Yarns spun from polyethylene terephthalate.

## 3.14 RETRACTORS

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