ASABE/ISO 12003-2:2008 SEP2017
Agricultural and forestry tractors — Roll-over protective structures on narrow-track wheeled tractors — Part 2: Rear-mounted ROPS

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This standard was reviewed and approved for adoption by the ASABE Machinery System Agricultural Machinery Common Tests subcommittee. Approved as an ASABE standard and approved by ANSI September 2017.

Keywords: Roll-over, ROPS, Safety, Test procedure, Tractor

0 Foreword

0.1 ASABE/ISO 12003-2:2008 SEP2017, Agricultural and forestry tractors — Roll-over protective structures on narrow-track wheeled tractors — Part 2: Rear-mounted ROPS, is an adoption without modification of the identically titled ISO standard ISO 12003-1:2008, Agricultural and forestry tractors — Roll-over protective structures on narrow-track wheeled tractors — Part 2: Rear-mounted ROPS.

0.2 ASABE/ISO 12003-2:2008 SEP2017 specifies procedures for both the static and dynamic testing of roll-over protective structures (ROPS) rear-mounted on narrow-track wheeled agricultural and forestry tractors. It defines the clearance zone and acceptance conditions for rigid or tiltable, rear, two-post roll bar, frame and cab ROPS, and is applicable to tractors so equipped having the following characteristics.

— A ground clearance of not more than 600 mm beneath the lowest points of the front- and rear-axle housings (not considering lower points on the axle differential).

— A fixed or adjustable minimum track width of one of the two axles of less than 1 150 mm when fitted with the widest specified tyres, and with the overall width of the other axle being less than that of the first axle.

— A mass greater than 600 kg but less than 3 000 kg, unladen, including the ROPS and tyres of the largest size recommended by the manufacturer.

0.3 Six normative references are listed in ISO 12003-2:2008. These references have been reviewed and accepted as part of the adoption of the ISO document in ASABE adoption number.

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

0.5 Product labelled to reference ISO 12003-2 shall be deemed compliant to ASABE/ISO 12003-2.

Text of ISO 12003-2:2008, Agricultural and forestry tractors — Roll-over protective structures on narrow-track wheeled tractors — Part 2: Rear-mounted ROPS, follows.

1 Scope

This part of ISO 12003 specifies procedures for both the static and dynamic testing of roll-over protective structures (ROPS) rear-mounted on narrow-track wheeled agricultural and forestry tractors. It defines the clearance zone and acceptance conditions for rigid or tiltable, rear, two-post roll bar, frame and cab ROPS, and is applicable to tractors so equipped having the following characteristics.

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— A mass greater than 600 kg but less than 3 000 kg, unladen, including the ROPS and tyres of the largest size recommended by the manufacturer.

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 630, Structural steels — Plates, wide flats, bars, sections and profiles

ISO 898-1:1999, Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs

ISO 898-2:1992, Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread

ISO 2408, Steel wire ropes for general purposes — Minimum requirements

ISO 5353, Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point

ASTM A370, Standard Test Methods and Definitions for Mechanical Testing of Steel Products

3 Terms and definitions

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

3.1
roll-over protective structure
ROPS
framework protecting drivers of wheeled agricultural and forestry tractors, which minimizes the likelihood of driver injury resulting from accidental overturning during normal field work

NOTE: The ROPS is characterized by the provision of space for a clearance zone, either inside the envelope of the structure or within a space bounded by a series of straight lines from the outer edges of the structure to any part of the tractor that might come into contact with the ground; it is capable of supporting the tractor in an overturned position.

3.2

rear-mounted ROPS

two-post, roll-bar-type, roll-over protective structure mounted on the tractor rearwards of the driving seat, or a frame or cab

NOTE: Compare with front-mounted ROPS described in ISO 12003-1.

3.3

tractor mass

mass of the unladen tractor in working order with tanks and radiator full, rear-mounted ROPS with cladding, and any track equipment or additional front-wheel drive components required for normal use

NOTE: The operator, optional ballast weights, additional wheel equipment, and special equipment and tools are not included.

3.4

reference mass

mass, not less than the tractor mass, selected by the manufacturer for calculation of the energy inputs to be used in the tests

3.5

horizontal loading test

application of a horizontal load to the rear, front and side of the roll-over protective structure

3.6

crushing test

application of a vertical static load through a beam placed laterally across the uppermost members of the rear-mounted ROPS

3.7

reference plane

vertical plane, generally longitudinal to the tractor and passing through the seat index point and the steering-wheel centre

NOTE: Normally this reference plane coincides with the longitudinal median plane of the tractor.

3.8

longitudinal median plane

longitudinal plane of symmetry

zero Y plane

vertical plane Y passing through the mid-points of AB, perpendicular to AB, where, for each wheel, the vertical plane passing through its axis cuts the mid-plane of the wheel following a straight line Δ which meets the supporting surface of the vehicle at one point, and where A and B are two points thus defined which correspond to two wheels, both of which are either steering or powered wheels, situated respectively at the two ends of the same real or imaginary axle.

See Figure 1.

NOTE 1: “Mid-plane of the wheel” designates the plane equidistant from the inner edges of the rim. In the case of dual wheels, the straight line Δ is, in this particular case, the intersection of the mid-plane of the dual wheels and the vertical plane passing through the axis of the axle pin.

NOTE 2: Adapted from ISO 612:1978[1], Clause 5.

3.9

impact test

application of a dynamic load produced by a block acting as a pendulum