ASABE/ISO 5700:2013 SEP2017
Tractors for agriculture and forestry — Roll-over protective structures — Static test method and acceptance conditions

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ASABE/ISO 5700:2013 SEP2017
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Tractors for agriculture and forestry — Roll-over protective structures — Static test method and acceptance conditions

This standard was reviewed and approved for adoption by the ASABE Machinery System Agricultural Machinery Common Tests subcommittee. The adoption of this standard was made possible by the signing of 2004 SAE-ASABE copyright agreements, which gave ASABE a royalty-free license to publish in whole or in part SAE standard document J2194. 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 5700:2013 SEP2017, Tractors for agriculture and forestry — Roll-over protective structures — Static test method and acceptance conditions, is an adoption without modification of the identically titled ISO standard ISO 5700:2013, Tractors for agriculture and forestry — Roll-over protective structures — Static test method and acceptance conditions and ISO 5700:2013/Maintenance Agency (MA) 23 July 2014.

0.2 ASABE/ISO 5700:2013 SEP2017 specifies a static test method and the acceptance conditions for roll-over protective structures (cab or frame) of wheeled or tracked tractors for agriculture and forestry.

It is applicable to tractors having at least two axles for wheels mounted with pneumatic tyres, or having tracks instead of wheels, with an unballasted tractor mass of not less than 600 kg and a minimum track width of the rear wheels greater than 1 150 mm. It is not applicable to tractors having a mass ratio (maximum permissible mass / reference mass) greater than 1,75.

0.3 Three normative references are listed in ISO 5700:2013. 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). The original content of ISO 5700 was based on SAE J2194. The 2004 SAE-ASABE MOU gives ASABE copyright and royalty-free publishing rights to SAE J2194 and international derivative standards.

0.5 Product labelled to reference ISO 5700 shall be deemed compliant to ASABE/ISO 5700.

Text of ISO 5700:2013, Tractors for agriculture and forestry — Roll-over protective structures — Static test method and acceptance conditions and ISO 5700:2013/Maintenance Agency (MA) 23 July 2014, follows.

1 Scope

This International Standard specifies a static test method and the acceptance conditions for roll-over protective structures (cab or frame) of wheeled or tracked tractors for agriculture and forestry.

It is applicable to tractors having at least two axles for wheels mounted with pneumatic tyres, or having tracks instead of wheels, with an unballasted tractor mass of not less than 600 kg and a minimum track width of the rear wheels greater than 1 150 mm. It is not applicable to tractors having a mass ratio (maximum permissible mass / reference mass) greater than 1,75.

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 630-1:2011, Structural steels — Part 1: General technical delivery conditions for hot-rolled products

ISO 5353:1995, 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 (safety cab or frame) protecting drivers of tractors for agricultural and forestry that avoids or limits risk to the driver resulting from accidental overturning during normal operation

Note 1 to entry:The ROPS is characterized by the provision of space for a clearance zone, as defined in 9.1, 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 flat ground and that is capable of supporting the tractor in that position if the tractor overturns.

3.2

unballasted tractor mass

mass of the tractor in working order with tanks and radiators full, roll-over protective structure with cladding, and any track equipment or additional front-wheel drive components required for normal use Note 1 to entry: Not included are the operator, optional ballast weights, additional wheel equipment, special equipment and loads.

3.3

reference mass

m_t

mass, not less than the unballasted mass, selected by the manufacturer for calculation of the energy inputs and crushing forces to be used in the tests

Note 1 to entry: The reference mass shall not be less than the unballasted mass and must be sufficient to ensure the mass ratio does not exceed 1,75.

3.4

maximum permissible mass

technically permissible mass

maximum allowable equipment mass and allowable payload specified by the manufacturer

Note 1 to entry: This mass corresponds to the sum of the technically maximum possible axle loads.

3.5

mass ratio

number calculated by taking the maximum permissible mass divided by reference mass

3.6

horizontal loading test

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

3.7

crushing test

application of a vertical load through a beam placed laterally across the uppermost members of the rollover protective structure

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, A and B being such that

— 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

— 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 to entry: The mid-plane of the dual wheels being equidistant from the inner edge of one wheel and the outer edge of the other, 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 to entry: Adapted from ISO 612:1978, Clause 5.

Note 3 to entry: The longitudinal median plane may also be applied to track-laying tractors.

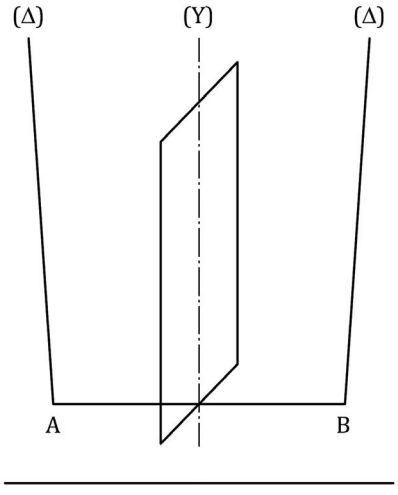

Figure 1 – Longitudinal median plane