

INTERNATIONAL STANDARD

ISO
4254-3

First edition
1992-02-15

**Tractors and machinery for agriculture and
forestry — Technical means for ensuring
safety —**

iTeh STANDARD PREVIEW
Part 3:
(Tractors
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ISO 4254-3:1992

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*Tracteurs et matériels agricoles et forestiers — Dispositifs techniques
permettant d'assurer la sécurité —*

Partie 3: Tracteurs

INTERNATIONAL

ISO



Reference number
ISO 4254-3:1992(E)

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.

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.

International Standard ISO 4254-3 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort of the operator*.

ISO 4254 consists of the following parts, under the general title *Tractors and machinery for agriculture and forestry — Technical means for ensuring safety*:

- Part 1: *General*
- Part 2: *Anhydrous ammonia applicators*
- Part 3: *Tractors*
- Part 4: *Forestry winches*
- Part 5: *Power-driven soil-working equipment*
- Part 6: *Equipment for crop protection*
- Part 7: *Combine harvesters, forage and cotton harvesters*
- Part 9: *Equipment for sowing, planting and distributing fertilizers*

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International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Tractors and machinery for agriculture and forestry — Technical means for ensuring safety —

Part 3: Tractors

1 Scope

This part of ISO 4254 provides guidelines regarding the prevention of accidents arising from the use of tractors and indicates appropriate parameters to be met when designing tractors.

It also specifies technical means of improving the degree of personal safety of operators and others involved in the course of normal running, maintenance and use of agricultural tractors. These are additional to the requirements of ISO 4254-1 to which reference should also be made.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 4254. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4254 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 730-1:1990, *Agricultural wheeled tractors — Rear-mounted three-point linkage — Part 1: Categories 1, 2 and 3.*

ISO 3600:1981, *Tractors and machinery for agriculture and forestry — Operator manuals and technical publications — Presentation.*

ISO 4252:1983, *Agricultural tractors — Access, exit and the operator's workplace — Dimensions.*

ISO 4254-1:1989, *Tractors and machinery for agriculture and forestry — Technical means for ensuring safety — Part 1: General.*

ISO 5353:1978, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point.*

ISO 8759-2:1985, *Agricultural wheeled tractors — Front-mounted linkage and power take-off — Part 2: Front linkage.*

3 Requirements

3.1 Three-point linkages

The hazards of coupling implements with three-point linkages can be reduced by the use of semi-automatic implement couplers (quick-coupling devices).

3.1.1 Three-point linkage at rear

3.1.1.1 Forward of a plane passing through the median plane of the pivot points of the lifting rods in a three-point coupling system, a minimum safety margin of 25 mm shall be maintained between the moving parts at each point of the lifting device's travel. This does not however apply for the extreme upper and lower range of travel $0,1n$ which are defined in a) below and illustrated in figure 1. A minimum clearance of 25 mm or a minimum angle of 30° shall be maintained between parts in shear where the angle can change (see figure 2).

a) For the total movement range, n , the lower position A of the lower hitch point is limited by the dimension in definition 3.2.14 and [14] in figure 2 of ISO 730-1:1990, while the upper pos-

ition B is limited by the maximum hydraulic travel. Travel n' corresponds to travel n reduced upwards and downwards by $0,1n$, and constitutes the vertical distance between A' and B'.

- b) Within the distance of travel n' , a minimum safety margin of 25 mm in relation to the adjacent parts shall be maintained around the profile of the lifting rods.

3.1.2 Three-point linkage at front

3.1.2.1 In any position of the power lift coupling system range of lift n' , a minimum safety margin shall be maintained. Where the angle can change, a minimum angle of 30° or a safety margin of 25 mm shall be maintained (see also figure 1).

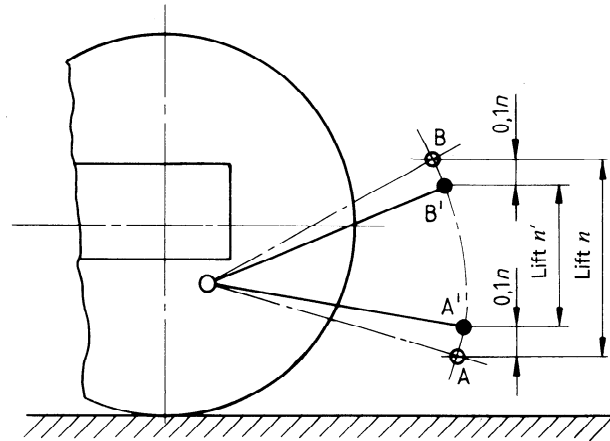


Figure 1 — Lift range
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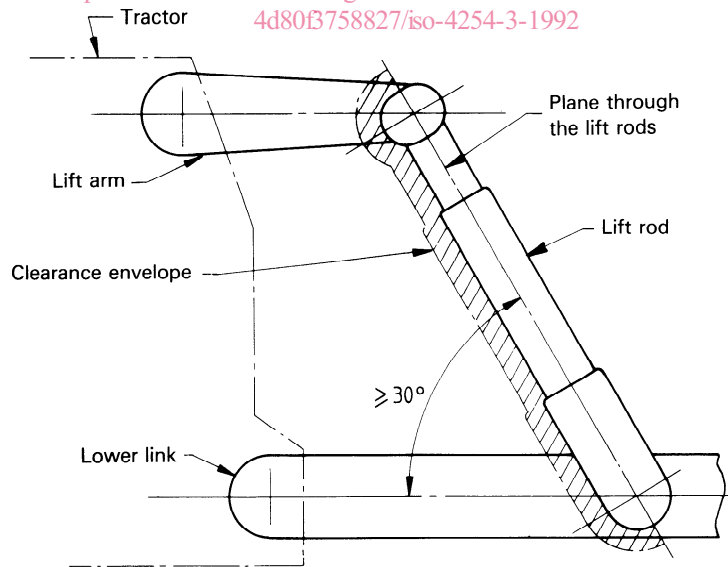


Figure 2 — Three-point linkage

3.1.2.2 For the total movement range, n , the lower position A of the lower hitch point is limited by the dimension in definition 3.2.14 in ISO 730-1:1990 which is defined as [14] in figure 3 and table 3 of ISO 8759-2:1985, while the upper position B is limited by the maximum hydraulic travel. Travel n' corresponds to travel n reduced upwards and downwards by $0,1n$, and constitutes the vertical distance between A' and B'.

3.1.2.3 If three-point linkage coupling devices are used which do not require the presence of an operator between the tractor and the implement carried (for example in the case of a semi-automatic implement coupler), the provisions of 3.1.2.1 do not apply within a radius of 250 mm around the lower link points of the tractor.

3.1.3 Controls

3.1.3.1 Main controls

The main controls and their linkage shall be arranged or protected in such a way that the operator cannot reach them if he is standing on the ground between the tractor and the mounted implement.

3.1.3.2 External controls

When additional external controls are fitted, they shall be arranged in such a way that the operator can actuate them from a safe position, for instance where the three-point hydraulic lift controls or the additional controls for the lifting mechanism are located outside the vertical planes formed by the internal walls of the mudguards.

In addition, the three-point hydraulic lifting mechanism shall be actuated by means of controls which

- either restrict the amount of movement to a maximum of 100 mm each time the control is actuated: the measurement points in this case are formed by the coupling points on the lower arms of the three-point coupling;
- or operate on the operator-presence and continual activation principle (dead man's control).

3.1.3.3 Main controls on narrow-track tractors

The controls on narrow-track tractors¹⁾ are arranged in front of the transverse vertical plane through the seat index point (SIP) as defined in ISO 5353.

3.1.3.4 Other arrangements

Other arrangements are permitted if the manufacturer provides evidence that they have an effect at least equivalent to the requirements set out in 3.1.3.1 to 3.1.3.3.

3.2 Operator's workplace

3.2.1 When seated, no shearing or pinching points are permitted within reach of the operator's hands (reach B in figure 3) or feet. For tractors designed for special applications the requirements in ISO 4254-1 may not apply. In these cases the requirements in 3.2.2 shall apply.

3.2.2 The reach of the operator is divided into spherical volumes A and B (shown as reaches A and B respectively in figure 3). The spherical centre-point of the volumes is located 60 mm in front and 580 mm above the seat index point (SIP) (see figure 3). Volume A is formed by a spherical radius of 550 mm, volume B is the volume between this radius and a spherical radius of 1 000 mm.

Within volume A, a minimum clearance of 120 mm between power and inertia-operated, and other adjacent parts shall be maintained. Within volume B, a minimum clearance of 25 mm shall be maintained. Within both volumes, a minimum angle of 30° shall be maintained where parts shear against each other.

In the case of narrow-track tractors¹⁾, these requirements do not apply to any points behind a plane which is located at an angle of 45° to the rear and which runs transverse to the travel direction through a point located 230 mm behind the SIP (see figure 4).

Warning decals shall indicate hazards, if any.

1) A narrow-track tractor is an agricultural tractor with a smallest adjustable track gauge equal to or less than 1 150 mm.

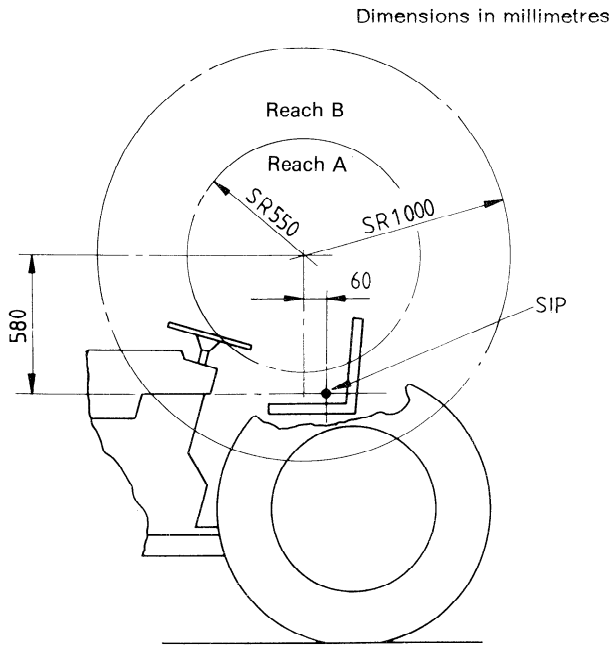


Figure 3 — Operator's reach

3.3 Access to operator's seat and optional passenger's seat²⁾

3.3.1 Access to the operator's seat shall meet the requirements of ISO 4252 and shall not be restricted.

Access should minimize the probability of the operator being inadvertently restrained; i.e. catching or holding of the person or clothes should be avoided.

If any parts protrude from the standing area (e.g. clutch pedal), provisions shall be made to enable one foot to be placed either in front of, rearward or at the side of such parts.

These requirements also apply where an optional passenger seat is provided (see figure 5). In addition, where a passenger seat is fitted and where parts could constitute a danger to the feet, provision shall be made for protective devices within a hemispherical radius of 800 mm starting from the forward edge of the seat cushion and pointing downwards. Dangerous parts in reaches A and B shall be protected within a sphere centred 670 mm above the centre of the passenger seat front edge.

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Dimensions in millimetres

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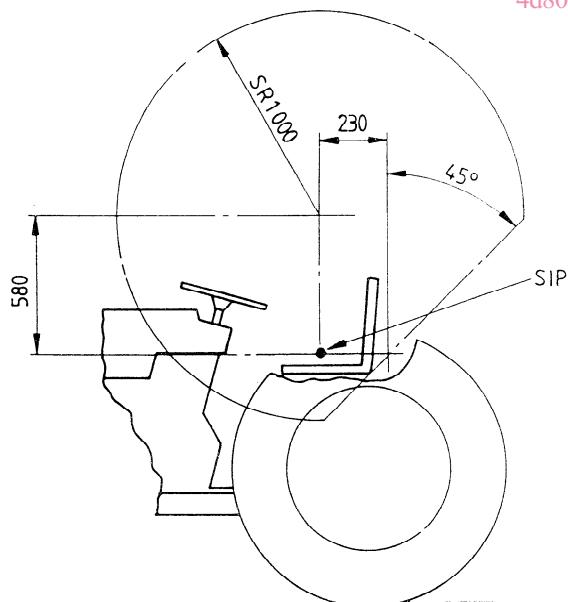


Figure 4 — Limitation to operator's reach volumes for narrow-track tractors

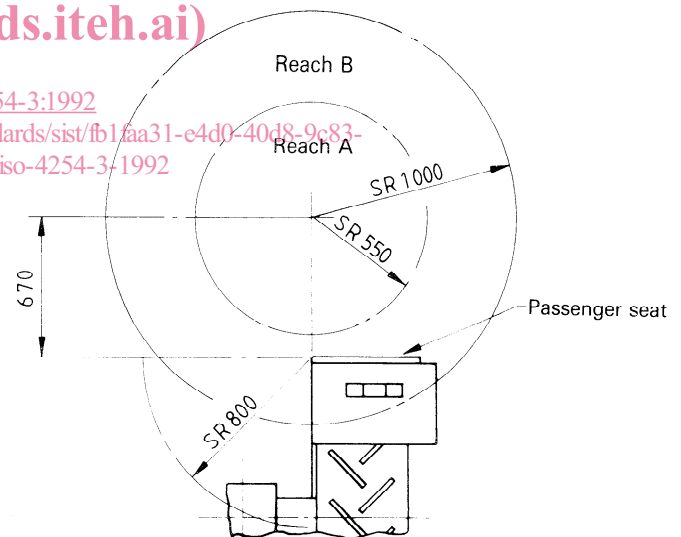


Figure 5 — Part of tractor end view showing reach volumes in relation to passenger seat

3.3.2 For narrow-track tractors¹⁾, the exhaust system, whether vertical or horizontal, shall be positioned so that its hot parts cannot be touched by the driver whilst gaining access to the tractor seat or sitting at the controls.

2) An optional passenger seat may not be acceptable in some conditions due to legal requirements.

Alternatively, any system hot parts within reach of access or the driving seat shall be shielded to protect the operator.

The exhaust outlet shall be positioned so that exhaust fumes pass above or behind the driver.

4 Access for servicing and fluid level checks

Appropriate access steps and handholds shall be provided for routine servicing and fluid level checks.

5 Operator's manual

The operator's manual shall meet the requirements of ISO 3600; it shall also include mention of the safety aspects of the tractor together with information on any special requirements to ensure its safe operation.

The operator's manual should also cover the fitting and use of additional accessories and/or optional extras and their routine maintenance.

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UDC 631.372-78

Descriptors: agricultural machinery, forest equipment, agricultural tractors, accident prevention, operator protection, safety devices, specifications, safety requirements.

Price based on 5 pages
