INTERNATIONAL STANDARD

ISO
17900

First edition
2002-05-15

Agricultural trailers — Balanced and semi-mounted trailers — Determination of payload, vertical static load and axle load

Remorques agricoles — Remorques à avant-train et semi-remorques — Détermination de la charge utile, de la charge statique verticale et de la charge par essieu

Reference number
ISO 17900:2002(E)

© ISO 2002

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 17900:2002
https://standards.iteh.ai/catalog/standards/sist/aff4b89e-2ca2-4bcb-b0a9-
fc6a751e2743/iso-17900-2002

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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 17900 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 17900:2002
https://standards.iteh.ai/catalog/standards/sist/aff4b89e-2ca2-4bcb-b0a9-
fc6a751e2743/iso-17900-2002

Agricultural trailers — Balanced and semi-mounted trailers — Determination of payload, vertical static load and axle load

1 Scope

This International Standard specifies a method for determining the payloads, vertical static drawbar loads and axle loads of agricultural semi-mounted and balanced trailers by means of weighing the empty trailer and then calculating the requirements.

2 Terms and definitions

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

2.1
semi-mounted trailer
towed vehicle with one axle or axle group of landwheels and a drawbar towing device (drawbar) that cannot move relative to the vehicle, allowing the transmission of vertical forces from the towed vehicle through the drawbar to the towing vehicle

NOTE 1   Some slight vertical movement may occur at a rigid drawbar (e.g. due to suspension movements).

NOTE 2   A hydraulically adjustable articulated drawbar is considered to be a rigid drawbar.

2.2
balanced trailer
towed vehicle with at least two landwheel axles at least one of which is steerable, and a drawbar towing device that allows vertical movement so that vertical forces cannot be transferred to the towing vehicle

2.3
axle load
m_a
that part of the mass of the trailer and any payload carried by a particular ground wheel axle of the trailer or, in the case of multiple axles, the combined axle load

NOTE   The maximum permissible axle load is specified by the manufacturer.

2.4
vertical static load
m_s
vertical load resulting from the loads produced by the mass of a semi-mounted trailer exerted at the centre of the drawbar coupling point under static conditions

NOTE   The maximum permissible vertical static load is specified by the manufacturer.

2.5
maximum mass
m_{max}
technically maximum possible trailer mass and allowable payload specified by the manufacturer

NOTE   This mass corresponds to the sum of the technically maximum possible axle loads and, in the case of a semi-mounted trailer, the vertical static load.

2.6

empty mass

m_{empty}

sum of the axle loads and, in the case of a semi-mounted trailer, the vertical static load, with the trailer empty but ready for operation

2.7

payload

m_p

difference between maximum mass, m_{max}, and empty mass, m_{empty}:

$$m_p = m_{max} - m_{empty} \tag{1}$$

2.8

support load

m_b

vertical load acting through the centre of the rigid drawbar support at the ground surface resulting from the mass of the trailer, with the trailer load platform in the horizontal and static position

NOTE   For drawbar jacks, see ISO 12140.

2.9

semi-mounted trailer wheel space

s_s

horizontal distance between centre of the coupling point and the landwheel axle centre or, in the case of multiple axles, the point at which the combined axle loads act

NOTE   See Figures 1 and 2.

2.10

balanced trailer wheel space

s_b

horizontal distance between the landwheel front- and rear-axle centres or, in the case of multiple axles, the point at which the combined axle loads act

NOTE   See Figure 3.

2.11

supporting distance

d_s

for a semi-mounted trailer, distance between the vertical centre line of the support device at the ground surface and the landwheel axle centre or, in the case of multiple axles, the point at which the combined axle loads act

2.12

load platform length

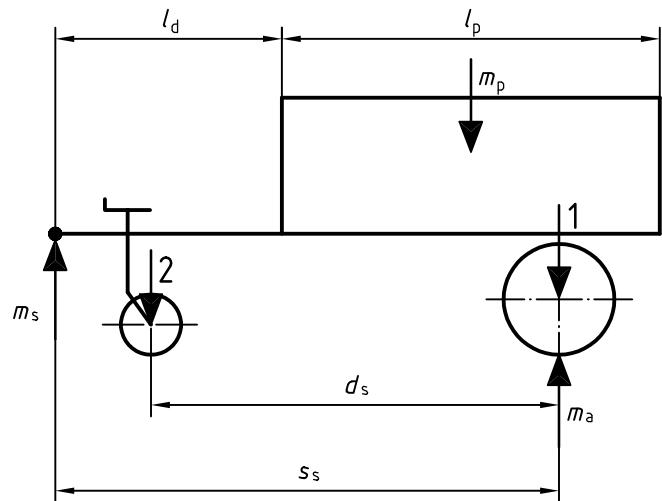l_p

inner span of the load platform in the operating direction of the vehicle
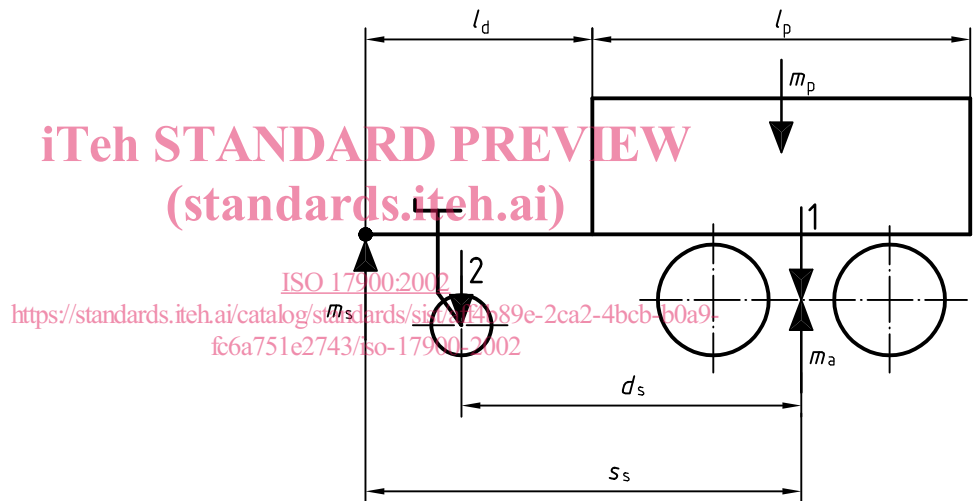
2.13

drawbar length

l_d

horizontal distance from the centre of the coupling point to the inside front edge of the load platform of a semi-mounted trailer

Key

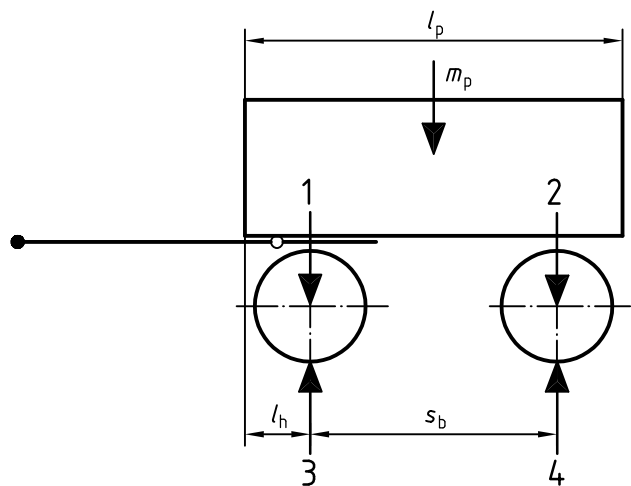1 $m_{a,\,empty}$

2     $m_{b,\,empty}$

Figure 1 — Semi-mounted trailer

Key

1     $m_{a,\,empty}$

2     $m_{b,\,empty}$

Figure 2 — Semi-mounted trailer with multiple axle

Key

1     $m_{a,\,front,\,empty}$

2     $m_{a,\,rear,\,empty}$

3     $m_{a,\,front}$

4     $m_{a,\,rear}$

Figure 3 — Balanced trailer

3 Determination of masses, loads and dimensions

3.1 General

For all measurements, the trailer shall be adjusted so that the load platform is horizontal to within $\pm\,2^{\circ}$.

All weightings, load measurements and measurements of dimensions shall be determined with an accuracy of $\pm\,5\,\%$.

3.2 Empty mass, m_{empty}

The trailer empty mass shall be determined and recorded using a suitably sized and accurate weighbridge, or using load pad scales, or using both.

3.3 Empty loads

3.3.1 Empty axle load, $m_{\text{a, empty}}$

This axle load shall be determined by measuring and summing the individual wheel loads of an empty trailer using load pad scales.

iTeh STANDARD PREVIEW

3.3.2 Empty support load, $m_{\text{b, empty}}$

(standards.iteh.ai)

This support load shall be measured for empty semi-mounted trailers using load pad scales.

3.4 Dimensions

The following dimensions (see Figures 1 to 3), in metres, shall be measured and recorded:

— wheel space s_{s} or s_{b};

— load platform length l_{p};

— supporting distance d_{s} (only for semi-mounted trailers);

— drawbar length l_{d} (only for semi-mounted trailers);

— auxiliary dimension l_{h}, (only for balanced trailers, see Figure 3).

3.5 Vertical static load for empty semi-mounted trailer

The vertical static load for an empty semi-mounted trailer shall be calculated using the formula:

$$m_{\text{s, empty}} = \frac{m_{\text{b, empty}} \times d_{\text{s}}}{s_{\text{s}}} \tag{2}$$

where

$m_{\text{b, empty}}$ is the empty trailer support load, in kilograms;

$s_{\text{s}}, d_{\text{s}}$ are the dimensions, in metres.

3.6 Maximum mass and payload

The maximum mass of the load platform (i.e. payload m_p) shall be determined and is taken to act at $l_p/2$.

NOTE It is assumed that the mass on the load platform is evenly distributed and, in the case of a balanced trailer, that the landwheel axles are arranged symetrically about the span of the load platform.

3.7 Vertical static and axle loads for trailer laden to maximum mass

3.7.1 The vertical static load of a semi-mounted trailer laden to its maximum mass, $m_{s,\,laden}$, shall be calculated using the formula:

$$m_{s,\,laden} = \frac{m_{b,\,empty} \times d_s}{s_s} + m_p \left(1 - \frac{2l_d + l_p}{2s_s} \right) \tag{3}$$

where

$m_{b,\,empty}$ is the empty trailer support load, in kilograms;

m_p is the payload, in kilograms;

s_s, d_s, l_p, l_d are the dimensions, in metres.

iTeh STANDARD PREVIEW

3.7.2 The axle load of a semi-mounted trailer laden to its maximum mass, $m_{a,\,laden}$, shall be calculated using the formula:

(standards.iteh.ai)

$$m_{a,\,laden} = m_{a,\,empty} + m_p \left(\frac{2l_d + l_p}{2s_s} \right) \tag{4}$$

where

$m_{a,\,empty}$ is the empty trailer axle load, determined in accordance with 3.3.1, in kilograms;

m_p is the payload, in kilograms;

s_s, l_p, l_d are the dimensions, in metres.

3.7.3 The front-axle load of a balanced trailer laden to its maximum mass, $m_{a,\,front,\,laden}$, shall be calculated using the formula:

$$m_{a,\,front,\,laden} = m_{a,\,front,\,empty} + m_p \left[\frac{2\left(s_b + l_h\right) - l_p}{2s_b} \right] \tag{5}$$

where

$m_{a,\,front,\,empty}$ is the front, empty axle load, determined in accordance with 3.3.1, in kilograms;

m_p is the payload, in kilograms;

s_b, l_p are the dimensions, in metres;

l_h is the auxiliary dimension.