INTERNATIONAL STANDARD

ISO 7133

Second edition
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Earth-moving machinery — Tractor-scrapers — Terminology and commercial specifications

Engins de terrassement — Décapeuses — Terminologie et spécifications commerciales

Reference number
ISO 7133:1994(E)

Contents

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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 7133 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Sub-Committee SC 2, *Safety requirements and human factors*.

This second edition cancels and replaces the first edition (ISO 7133:1985), note 1 of figure 12, the corresponding definitions in the annex and subclauses 5.3.2, 5.3.3 and 7.1 of which have been technically revised.

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Earth-moving machinery — Tractor-scrapers — Terminology and commercial specifications

1 Scope

This International Standard establishes terminology and the content of commercial literature specifications for self-propelled tractor-scrapers and their equipment.

This International Standard applies to tractor-scrapers as defined in ISO 6165.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 3450:1985, *Earth-moving machinery — Wheeled machines — Performance requirements and test procedures for braking systems.*

ISO 5010:1992, *Earth-moving machinery — Rubber-tyred machines — Steering requirements.*

ISO 6014:1986, *Earth-moving machinery — Determination of ground speed.*

ISO 6165:1987, *Earth-moving machinery — Basic types — Vocabulary.*

ISO 6484:1986, *Earth-moving machinery — Elevating scrapers — Volumetric ratings.*

ISO 6485:1980, *Earth-moving machinery — Tractor-scraper volumetric rating.*

ISO 6746-1:1987, *Earth-moving machinery — Definitions of dimensions and symbols — Part 1: Base machine.*

ISO 7457:1983, *Earth-moving machinery — Measurement of turning dimensions of wheeled machines.*

ISO 9249:1989, *Earth-moving machinery — Engine test code — Net power.*

3 Definitions

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

3.1 General

3.1.1 tractor-scraper: Self-propelled wheeled machine, having an open bowl with a cutting edge positioned between the axles, which cuts, loads, transports, discharges and spreads material through forward motion of the machine.

Loading through the forward motion of the machine may be assisted by a powered mechanism (elevator) fixed to the scraper bowl. [See ISO 6165.]

3.1.2 base machine: Tractor-scraper without equipment, as described by the manufacturer's specifications, but provided with the necessary mountings to secure the attachments.

3.1.3 equipment: Set of components mounted onto the base machine to fulfil the primary design function.

3.1.4 attachment: Optional assembly of components that can be mounted onto the base machine for a specific use.

3.1.5 component: Part or an assembly of parts of a base machine, equipment or an attachment.

3.2 Masses

3.2.1 operating mass: Mass of the base machine with empty bowl, equipment specified by the manufacturer, operator (75 kg), full fuel tank and full lubricating, hydraulic and cooling systems.

3.2.2 payload: Manufacturer's rated mass that can be carried in the scraper bowl.

3.2.3 loaded mass: Sum of the operating mass and the payload loaded in accordance with ISO 6485.

3.2.4 axle distribution: Percentage of machine mass or the actual mass of each axle, empty and loaded.

3.2.5 shipping mass: Mass of the base machine with empty bowl, without operator, with full lubricating, hydraulic and cooling systems, 10 % of fuel tank capacity and with or without equipment, cab, canopy, ROPS[1] or FOPS[2], as stated by the manufacturer.

3.2.6 cab, canopy, ROPS or FOPS mass: The mass of cab, canopy, ROPS or FOPS with all their components and mountings required to secure these to the base machine.

3.3 Modes of operation

3.3.1 push-pull or dual loading: Mode of operation which allows one tractor-scraper to assist in loading another tractor-scraper by pushing or pulling through engagement devices which usually include push plates, a hook and a bail.

3.4 Performance

3.4.1 net power: (See ISO 9249.)

3.4.2 maximum travel speeds: Maximum speeds that can be obtained on hard level surfaces in each of the forward and reverse gear ratios available, with scraper bowl empty. (See ISO 6014.)

3.4.3 rimpull: Force available between the tyre and the ground to propel the tractor-scraper.

3.4.4 rimpull with direct drive transmission: Rimpull calculated or measured at the rated engine speed and at maximum engine torque in each forward speed.

NOTE 1 The maximum pull may be limited by mass and traction conditions.

3.4.5 rimpull with powershift transmission, electric drive, or hydrostatic drive: Rimpull is given by the calculated or measured pull versus machine speed curves in each forward gear range.

NOTE 2 The maximum pull may be limited by mass and traction conditions.

3.5 Steering capability

3.5.1 turning radius: (See ISO 7457.)

3.5.2 machine clearance diameter: (See ISO 7457.)

3.6 Dimensions

3.6.1 height of scraper, $H15$: Distance on Z coordinate[3] between the ground reference plane (GRP)[3] and the highest point on the scraper, with apron closed and the bowl at its highest position. See figure 1.

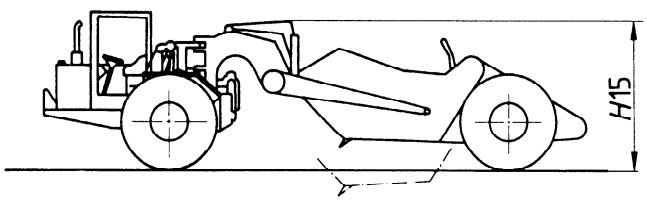


Figure 1 — Dimension $H15$

1) ROPS: Roll-over protective structure.

2) FOPS: Falling object protective structure.

3) The X, Y and Z coordinates and the GRP are defined in ISO 6746-1.

3.6.2 clearance under cutting edge in travel position, $H16$**:** Distance on Z coordinate between the GRP and the cutting edge with the bowl at the highest position. See figure 2.

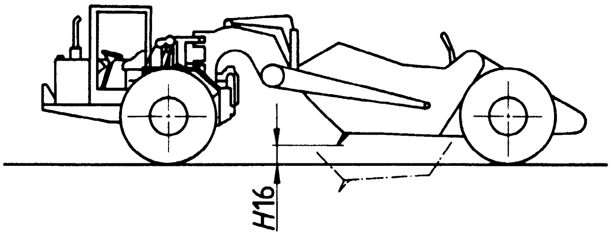


Figure 2 — Dimension $H16$

3.6.3 maximum cutting depth, $H17$**:** Distance on Z coordinate between the GRP and the cutting edge with the bowl at the lowest position below GRP. See figure 3.

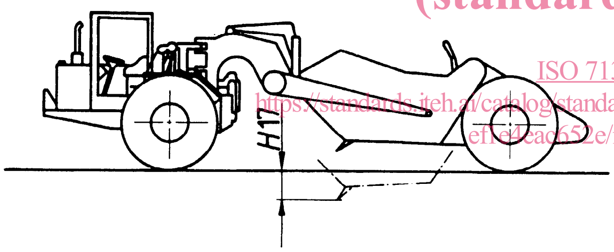


Figure 3 — Dimension $H17$

3.6.4 wheel base, $L8$**:** Distance on X coordinate[3)] between two X planes passing through the centres of the rear wheels of the tractor and the rear wheels of the scraper when the bowl is at its highest position. See figure 4.

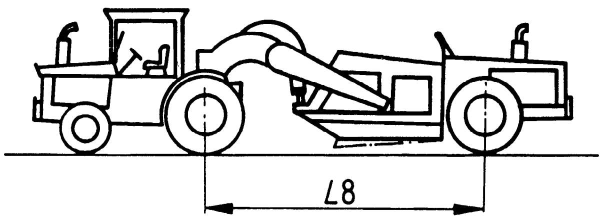


Figure 4 — Dimension $L8$

3.6.5 overall length of scraper, $L11$**:** Distance on X coordinate between two X planes passing through the foremost point of the tractor and the rearmost point of the scraper when the bowl is at its highest position. See figure 5.

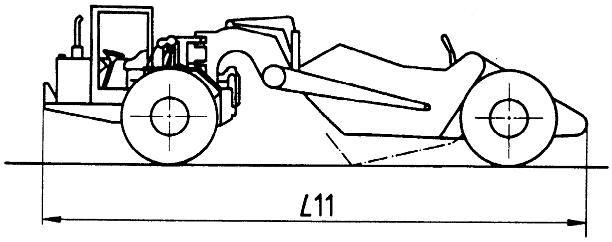


Figure 5 — Dimension $L11$

3.6.6 width of cut, $W6$**:** Distance on Y coordinate[3)] between two Y planes passing through the furthest points of the cutting edge or side bits of the bowl. See figure 6.

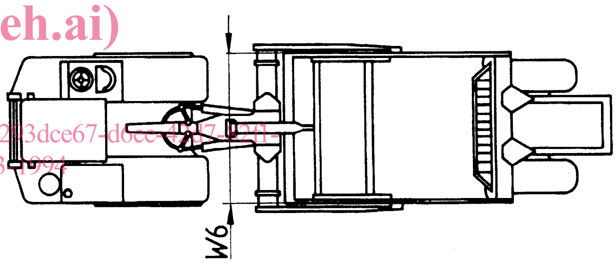


Figure 6 — Dimension $W6$

3.6.7 scraper width, $W7$**:** Distance on Y coordinate between two Y planes passing through the furthest points of the scraper. See figure 7.

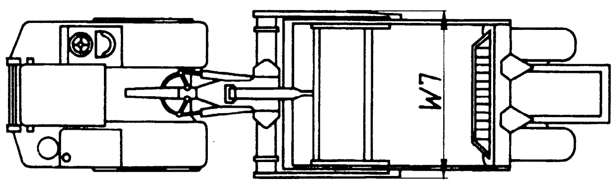


Figure 7 — Dimension $W7$

4 Base machine

4.1 Types of tractor-scrapers

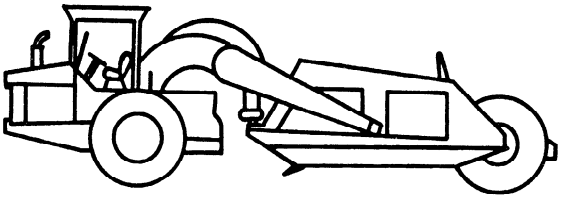
Tractor-scrapers are classified according to the following attributes.

4.1.1 Method of loading

The method of loading may be:

a) open bowl loading (see figure 8), or

b) elevated loading (see figure 9).



NOTE — Open bowl scrapers require the application of tractive effort to load material into the bowl. This tractive effort may be developed by the tractor-scraper itself, by another tractor-scraper temporarily or permanently connected, or by a pushing tractor.

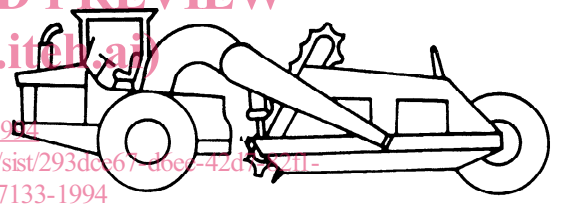
Figure 8 — Open bowl loading

4.1.2 Steering system

The steering system may be:

a) front wheel steer (see figure 10), or

b) articulated steer (see figure 11).



NOTE — Elevating scrapers have a powered mechanism fixed to the scraper bowl to assist in loading material.

Figure 9 — Elevated loading

4.1.3 Number of axles

The base machine may have:

a) two axles (see figure 12), or

b) three axles (see figure 13).

4.1.4 Number of engines

The base machine may have:

a) one engine (see figure 14), or

b) two engines (see figure 15).

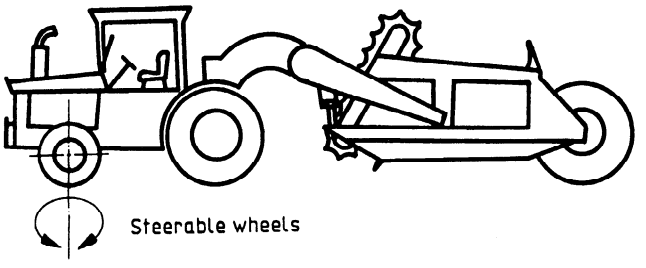


Figure 10 — Front wheel steer

4.1.5 Drive system

The drive system may be:

a) front wheel drive (see figure 16), or

b) all wheel drive (see figure 17), or

c) centre axle drive (see figure 18).

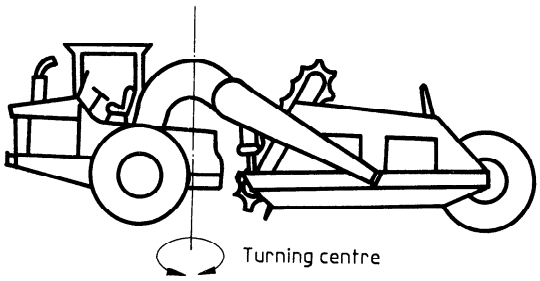


Figure 11 — Articulated steer

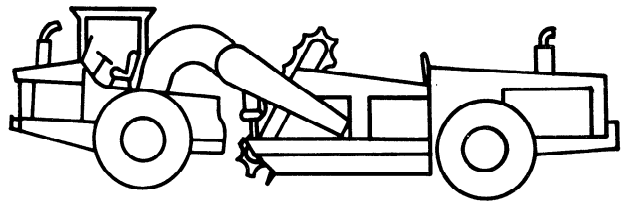


Figure 15 — Two engines

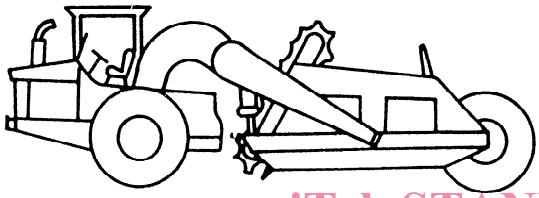


Figure 12 — Two axles

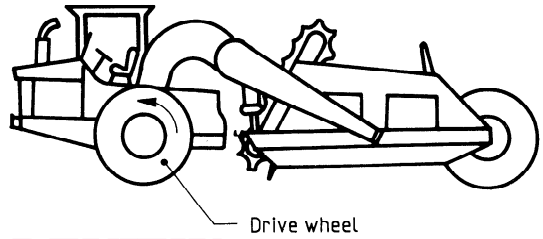


Figure 16 — Front wheel drive

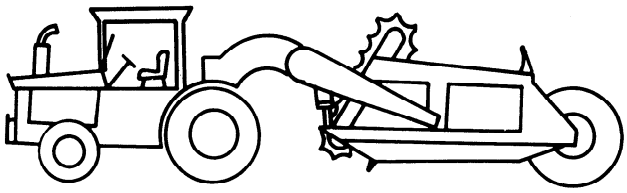


Figure 13 — Three axles

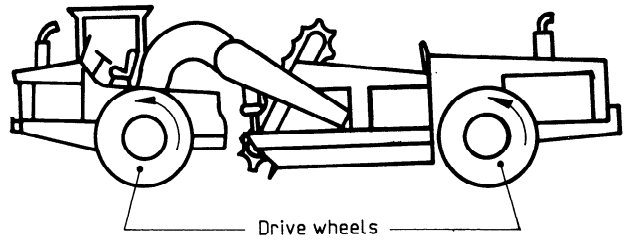


Figure 17 — All wheel drive

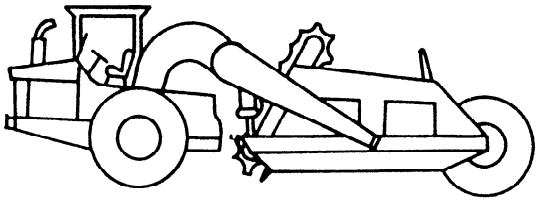


Figure 14 — One engine

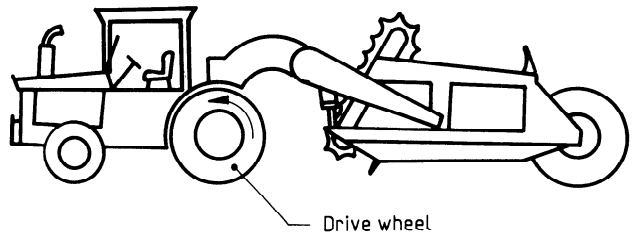


Figure 18 — Centre axle drive