
**Agricultural tractors — Test
procedures —
Part 13:
Vocabulary and specimen test report**

Tracteurs agricoles — Méthodes d'essai —

Partie 13: Vocabulaire et modèle de rapport d'essai
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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A list of all the parts in the ISO 789 series can be found on the ISO website.

Agricultural tractors — Test procedures —

Part 13: Vocabulary and specimen test report

1 Scope

This document gives terms and definitions for use in the other parts of ISO 789. [Annex A](#) provides a specimen test report for all parts of ISO 789.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 <https://standards.iteh.ai/catalog/standards/sist/e62350a2-529b-4877-9328-654d681bca8/iso-789-13-2018>

agricultural tractor

self-propelled agricultural vehicle having at least two axles and wheels, or endless tracks, particularly designed to pull agricultural trailers and pull, push, carry and operate implements used for agricultural work (including forestry work), which may be provided with a detachable loading platform

Note 1 to entry: The agricultural vehicle has a maximum design speed of not less than 6 km/h and may be equipped with one or more seats.

[SOURCE: ISO 12934:2013, 3.1]

3.2

wheelbase

distance at ground level between two vertical planes passing through the centres of the front wheels and the rear wheels with tractor and wheels in the same straight ahead position

Note 1 to entry: See [Figure 1](#).

3.3

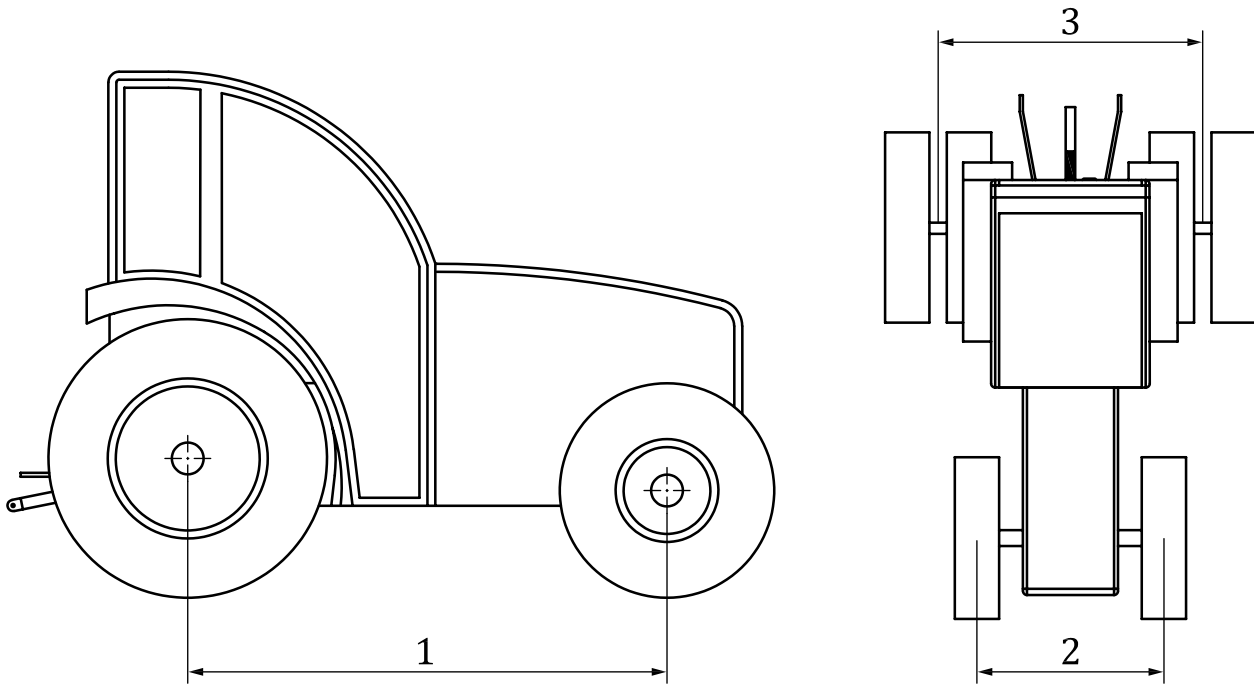
track

tread

distance at ground level between two vertical planes passing through the centreline of ground contact of the tyres parallel to the median longitudinal plane of the tractor with the wheels in the straight ahead position

Note 1 to entry: In the case of dual wheels, it is the distance at ground level between two planes passing through the centreline of the dual wheels. In the case of track-laying tractors, it is the distance between the two vertical planes passing through the centreline of ground contact of the tracks.

Note 2 to entry: See [Figure 1](#).



Key

- 1 wheelbase
- 2 track
- 3 track (dual wheels)

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Figure 1 — Track and wheelbase of wheeled tractor

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3.4 tractor mass

mass of a tractor as submitted for test

3.5 ballasted mass

mass of the tractor with ballasting devices and without the driver mass while the tractor is in running order with tanks, circuits and radiator full, and any track equipment or additional front wheel drive components required for a normal use included; and in the case of tractors with pneumatic tyres, sometimes with liquid ballast in the tyres

[SOURCE: OECD Code 2: February 2017, 2.12]

3.6 unballasted 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.

[SOURCE: ISO 5700:2013, 3.2]

3.7 rated engine speed

engine speed specified by the tractor manufacturer for continuous operation at full load

3.8 maximum engine speed

engine speed at which the throttle control is at the maximum setting

3.9**engine power**

power measured at the flywheel or the crankshaft

[SOURCE: OECD Code 2: February 2017, 2.2]

3.10**power take-off power**

power measured at any shaft (with the tractor stationary) designed by the tractor manufacturer to be used as a power take-off

3.11**axle power**

sum of the powers measured at all powered axles

3.12**power at the drawbar**

power available at the drawbar which can be sustained for at least 20 s, or the time needed to cover a distance of at least 20 m, whichever is longer

3.13**maximum drawbar pull**

mean maximum sustained pull the tractor can maintain at the drawbar over a given distance where the pull is being exerted horizontally and in the vertical plane containing the longitudinal axis of the tractor

[SOURCE: OECD Code 2: February 2017, 2:6]

3.14**maximum permissible torque** (standards.iteh.ai)

maximum torque specified by the manufacturer for the purpose of a test

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3.15**external hydraulic service**

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source of hydraulic power, derived from the hydraulic system of the *agricultural tractor* (3.1), available for use on an implement mounted on, coupled to or otherwise used in conjunction with it

[SOURCE: ISO 10448:1994, 3.1]

3.16**coupler pair**

pair of female hydraulic couplers compatible with male couplers as specified in ISO 5675, mounted on *agricultural tractors* (3.1) and connected to the hydraulic system to allow flow from one coupler to the other

[SOURCE: ISO 10448:1994, 3.2]

3.17**available differential pressure**

steady state difference of the hydraulic pressure between two male coupler parts on the implement side

[SOURCE: ISO 10448:1994, 3.3]

3.18**maximum pressure**

maximum steady state hydraulic pressure at either male coupler connected to a *coupler pair* (3.16)

[SOURCE: ISO 10448:1994, 3.4]

3.19

maximum loop return pressure

maximum steady hydraulic pressure at the male coupler returning flow to a hydraulic system that can reverse the flow through that coupler

[SOURCE: ISO 10448:1994, 3.5]

3.20

maximum sump return pressure with coupler

maximum steady state hydraulic pressure at the male coupler returning flow directly to the reservoir

[SOURCE: ISO 10448:1994, 3.6 (1)]

3.21

maximum sump return pressure without coupler

maximum steady state hydraulic pressure at an M22 × 1,5 or M27 × 2 thread size port in accordance with ISO 6149-1, ISO 6149-2 or ISO 6149-3, returning flow directly to the reservoir

[SOURCE: ISO 10448:1994, 3.6 (2)]

3.22

rated maximum hydraulic pressure

maximum pressure as specified by the tractor manufacturer for continuous use

3.23

maximum hydraulic power

hydraulic power calculation based on the measured flow and available coupler outlet pressure (the pressure near the coupler where oil is exiting from the tractor)

Note 1 to entry: The calculation does not take into account return pressure losses.

3.24

maximum useable hydraulic power

maximum useable continuous hydraulic power

hydraulic power calculation based on the measured flow and available differential pressure (the pressure near the coupler where oil is exiting from the tractor minus the pressure near the coupler where oil is re-entering the tractor)

Note 1 to entry: The calculation takes into account the return pressure losses and defines the useable hydraulic power available.

3.25

peak pressure

maximum instantaneous hydraulic pressure at either male coupler connected to a *coupler pair* (3.16)

[SOURCE: ISO 10448:1994, 3.7]

3.26

dynamic radius index

effective radius corresponding to the distance travelled by the tractor in one rotation of the driving wheels (i.e. this distance divided by 2π), when the tractor is driven without drawbar load at a speed of approximately 3,5 km/h

3.27

non-mechanical drive system

system which has a non-mechanical coupling between the engine and the power take-off

Note 1 to entry: A fluid or electrical power transmission system is considered to be non-mechanical. A cooling component may be included.

3.28**deviation from rated PTO speed**

rotational frequency per unit time (min^{-1}) of the PTO output shaft above or below the rated (standard) PTO rotational frequency of the system

3.29**safety element**

air cleaner element fitted downstream of a primary, barrier-type element for the purpose of providing the engine with protection against dust in the event of either any type of primary element failure, or dust being present during the removal of the primary element for servicing

3.30**steering control effort**

force applied to the steering control in order to steer the tractor

[SOURCE: ISO 10998:2008, 3.2.1]

3.31**turning radius**

radius of the circular path described by the centre of tyre contact with the surface of the test site of the wheel describing the largest circle

3.32**turning diameter**

diameter of the circular path described by the centre of tyre contact with the surface of the test site of the wheel describing the largest circle when the tractor is executing its sharpest practicable turn

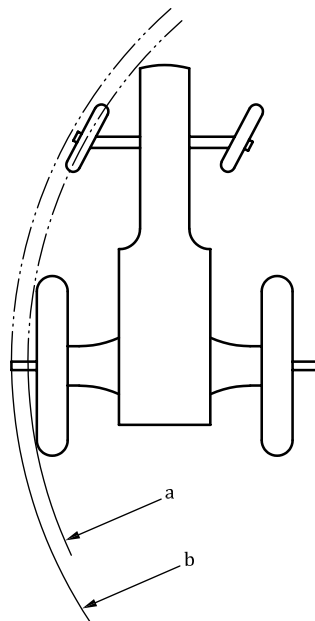
Note 1 to entry: See [Figure 2](#).

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3.33**clearance diameter**

diameter of the smallest circle which will enclose the outermost points of projection of the tractor and its equipment while executing its sharpest turn

Note 1 to entry: See [Figure 2](#).



Key

- a Minimum turning diameter.
- b Maximum clearance diameter.

Figure 2 — Turning diameter and clearance diameter
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3.34 Fuel consumption

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3.34.1

<https://standards.iteh.ai/catalog/standards/sist/e62350a2-529b-4877-9328-654d681bcaf8/iso-789-13-2018>

specific fuel consumption

mass of fuel consumed per unit of work

Note 1 to entry: When consumption is measured by mass, to obtain hourly consumption by volume and the work performed per unit volume of fuel, a conversion of units of mass to units of volume shall be made using the fuel density value at 15 °C. When consumption is measured by volume, the mass of fuel per unit of work shall be calculated using the density corresponding to the fuel temperature at which the measurement was made. This figure shall then be used to obtain hourly consumption by volume and the work performed per unit volume of fuel, using the density value at 15 °C for conversion from units of mass to units of volume

[SOURCE: OECD Code 2: February 2017, 2.7.2]

3.34.2

specific energy

work per unit volume of fuel consumed

[SOURCE: OECD Code 2: February 2017, 2.7.3]

3.35

specific reagent consumption

mass of reagent consumed per unit of work

[SOURCE: OECD Code 2: February 2017, 2.8.1.1]

3.36**diesel particulate filter**

DPF

system which traps particulate matter and either passively or actively converts the trapped particulate matter into carbon dioxide and ash

Note 1 to entry: The carbon dioxide is released to the atmosphere and the ash is stored within the DPF.

3.37**slip**

percentage difference of theoretical maximum possible distance travelled and the actual distance travelled

3.38 Reference planes**3.38.1 Vertical reference planes****3.38.1.1****transverse plane**

<for wheeled tractors> vertical plane containing the centreline of the rear axle

3.38.1.2**transverse plane**

<for track-laying tractors> vertical plane containing the centreline of the driving sprocket axle

3.38.1.3**longitudinal median plane**

median longitudinal plane
symmetric longitudinal plane

vertical plane Δ 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

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.

[SOURCE: ISO 5700:2013, 3.8]

3.38.2**horizontal reference plane**

ground level in which a hard contact is assumed

3.39 Coordinates of the centre of gravity**3.39.1****horizontal fore-and-aft coordinate**

$$\bar{x}$$

horizontal distance of the centre of gravity from the traverse reference plane

3.39.2

vertical coordinate

\bar{h}

vertical distance of the centre of gravity from the horizontal reference plane

3.39.3

lateral coordinate

\bar{y}

horizontal distance of the centre of gravity from the median longitudinal plane of the tractor

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Annex A (informative)

Specimen ISO 789 test report

A.1 General

Tractor manufacturer's name and address: _____

Location of tractor assembly: _____

Submitted for test by: _____

Selected for test by: _____

Location of running-in: _____

Duration of running-in: _____

Location of test: _____

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A.2 Specification of tractor

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A.2.1 Identification

Make and model: _____

Model(s) for other countries: _____

Type (2WD, 4 WD, rubber tracks, articulated 4 WD, articulated 4 WD with duals, etc.): _____

Serial No.: _____

Transmission type or gears × ranges: _____

Maximum designed grounds speed version: _____ km/h

A.2.2 Engine

Make / Model / Type: _____

Serial No.: _____

A.2.2.1 Cylinders

Number / disposition: _____
Bore / stroke: _____ mm/mm
Capacity: _____ cm³
Compression ratio: _____
Arrangement of valves: _____
Cylinder liners (wet or dry): _____

A.2.2.2 Supercharging

Make / Model / Type: _____
Pressure: _____ MPa

A.2.2.3 Fuel and injection system

Fuel system: _____
Make / Model / Type of fuel filter(s): _____
— Primary: _____
— Secondary: _____

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Capacity of fuel tank: <https://standards.iteh.ai/catalog/standards/sist/e62350a2-529b-4877-9328-654d681bcafa8/iso-789-13-2018> ^{ISO 789-13:2018} _____ dm³

Make / Model / Type of injection pump: _____
— Serial No.: _____
Manufacturer's production setting:
— Flow rate: _____ dm³/h
— Timing: _____

Make / Model / Type of injectors: _____
Injection pressure: _____ MPa
Make / Model / Type of carburettor: _____

A.2.2.4 Governor

Make / Model / Type: _____
Governed range of engine speed from _____ min⁻¹ to _____ min⁻¹
Rated engine speed: _____ min⁻¹

A.2.2.5 Air cleaner

Pre-cleaner:

— Make / Model / Type: _____

— Location of air intake: _____

Main cleaner:

— Make / Model / Type _____

Primary: _____

Secondary: _____

— Location of air intake: _____

Maintenance indicator: _____

A.2.2.6 Lubrication system

Type of feed pump: _____

Type of filter(s): _____

Number of filters: _____

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A.2.2.7 Cooling system

Type of coolant: <https://standards.iteh.ai/catalog/standards/sist/e62350a2-529b-4877-9328-654d681bca8/iso-789-13-2018> ISO 789-13:2018

Type of pump: _____

Specification of fan or blower:

— Number of fan blades: _____

— Fan diameter: _____ mm

Coolant capacity: _____ dm³

Type of temperature control: _____

Over-pressure system: _____ kPa

A.2.2.8 Starting system

Make / Model / Type: _____

Starter motor power rating: _____ kW

Cold starting aid: _____

Safety device: _____