
**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

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.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 2, *Common tests*.

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

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

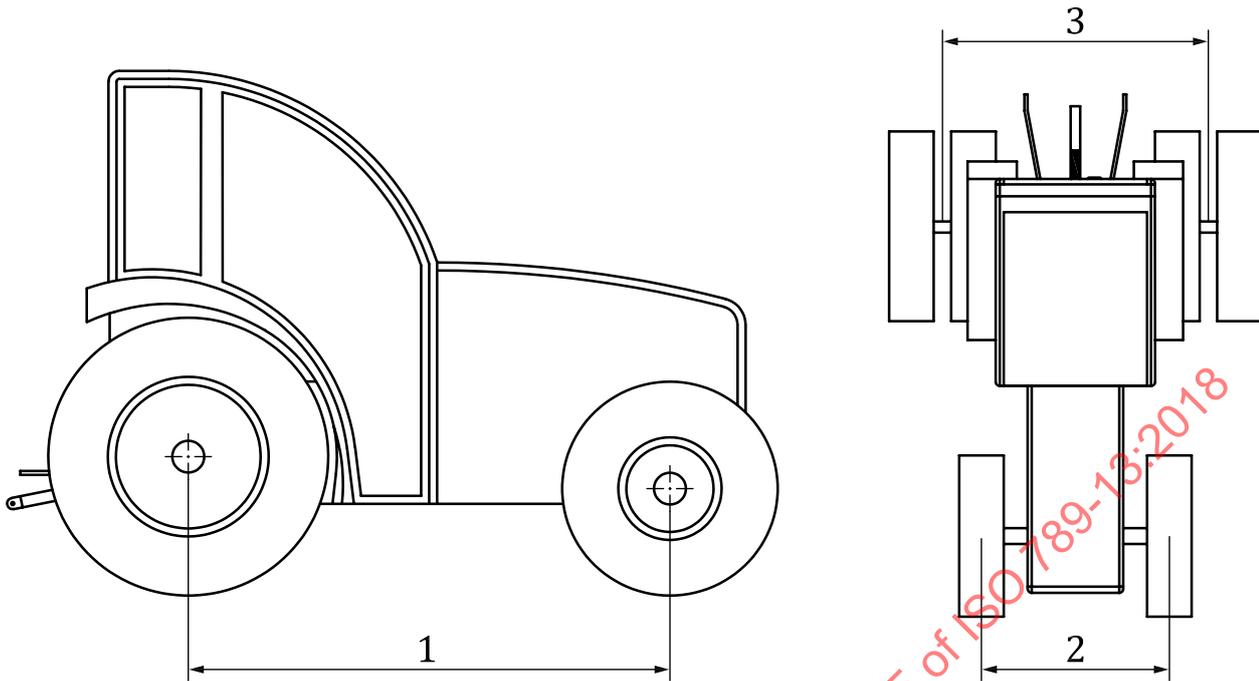
track

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)

Figure 1 — Track and wheelbase of wheeled tractor

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**

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

3.15**external hydraulic service**

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**

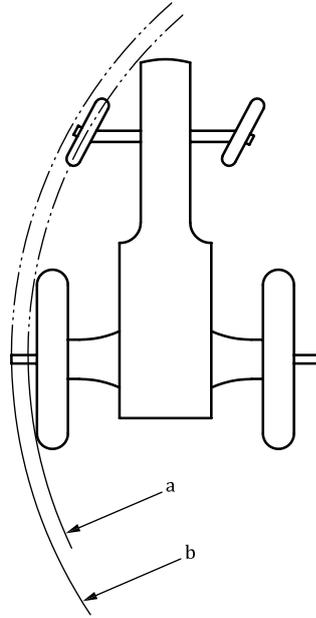
diameter of the circular path described by the centre of tyre contact with the surface of the test site of the wheel describing the largest circle when the tractor is executing its sharpest practicable turn

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

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

3.34 Fuel consumption

3.34.1

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 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

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: _____

A.2 Specification of tractor

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: _____
Capacity of fuel tank: _____ 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: _____

A.2.2.7 Cooling system

Type of coolant: _____

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: _____

A.2.2.9 Electrical system

Voltage: _____ V

Generator:

— Make / Model / Type: _____

— Power: _____ kW

Battery of accumulators:

— Number: _____

— Rating: _____ Ah at _____ hours

Over-pressure system: _____ kPa

A.2.2.10 Exhaust system

Make / Model / Type: _____

Location: _____

A.2.2.11 Reagent injection system (if applicable)

Make / Model / Type: _____

Location: _____

Specifications of the reagent used: _____

A.2.2.12 Diesel particulate filter (if equipped)

Make / Model / Type: _____

Maximum allowable turbine outlet pressure: _____

Change in power at fully loaded rated engine speed between a clean DPF _____ and one that has achieved the maximum allowable soot loading:

Special operational procedures required if the tractor is operated for long _____ periods of time at low load factors:

The average of the time between regenerations that occur during each of _____ the tests at the 3 load conditions in ISO 789-1:2018, 6.2.1; 6.4.1 c); and 6.4.1 d) shall be declared. Should this interval exceed 50 h, this shall be stated:

A.2.3 Transmission

A.2.3.1 Clutch

Make / Model / Type: _____

Number of plates: _____

Diameter of plates: _____ mm

Method of operation: _____

A.2.3.2 Gear box

Make / Model / Type: _____

Description: _____

Table A.1 — Gear box

	Forward	Reverse
Number of ranges/groups		
Number of gears		
Total of arrangements		

Available options: _____

A.2.3.3 Rear axle and final drives

Make / Model / Type: _____

Differential lock:

— Type: _____

— Method of engagement: _____

— Method of disengagement: _____

A.2.3.4 Front axle and final drives (if applicable)

Make / Model / Type: _____

Differential lock:

— Type: _____

— Method of engagement: _____

— Method of disengagement: _____

A.2.3.5 Total ratios and travelling speeds

Table A.2 — Total ratios and travelling speeds

Gear number	Group or range	Number of engine revolutions for one revolution of the driving wheels	Nominal travelling speed (*) at rated engine speed of _____ min ⁻¹ (r/min) km/h

(*) Calculated with a tyre dynamic radius index of _____ mm (pneumatic tyred tractors only).

Number of revolutions of front wheels for one revolution of rear-wheels (for 4WD tractors only): _____

A.2.4 Power take-off (if applicable)

A.2.4.1 Main power take-off

Type (independent, semi-independent or not independent): _____

Method of engagement (if necessary describe the type of clutch): _____

Number of shafts: _____

Method of changing power take-off: _____

A.2.4.1.1 Power take-off proportional to engine speed

Power take-off at 540 min⁻¹(r/min)

— Location: _____

— Diameter of power take-off shaft end: _____ mm

— Number of splines: _____

— In conformity/not in conformity with ISO 500-1, ISO 500-2, or ISO 500-3: _____

— Height above ground: _____ mm

— Distance from the median plane of the tractor: _____ mm

— Distance behind rear-wheel axis: _____ mm

— PTO speed at rated engine speed: _____ min⁻¹

— Engine speed at standard power take-off speed: _____ min⁻¹

— Ratio of rotation speeds (engine speed / PTO speed): _____

- Power restriction: _____ kW
- Maximum torque transmissible: _____ Nm
- Direction of rotation (viewed from behind the tractor): _____

Power take-off at 1 000 min⁻¹(r/min)

- Location: _____
- Diameter of power take-off shaft end: _____ mm
- Number of splines: _____
- In conformity/not in conformity with ISO 500-1, ISO 500-2, or ISO 500-3: _____
- Height above ground: _____ mm
- Distance from the median plane of the tractor: _____ mm
- Distance behind rear-wheel axis: _____ mm
- PTO speed at rated engine speed: _____ min⁻¹
- Engine speed at standard power take-off speed: _____ min⁻¹
- Ratio of rotation speeds (engine speed / PTO speed): _____
- Power restriction: _____ kW
- Maximum torque transmissible: _____ Nm
- Direction of rotation (viewed from behind the tractor): _____

Power take-off at 1 300 min⁻¹(r/min)

- Location: _____
- Diameter of power take-off shaft end: _____ mm
- Number of splines: _____
- In conformity/not in conformity with ISO 500-1, ISO 500-2, or ISO 500-3: _____
- Height above ground: _____ mm
- Distance from the median plane of the tractor: _____ mm
- Distance behind rear-wheel axis: _____ mm

- PTO speed at rated engine speed: _____ min⁻¹
- Engine speed at standard power take-off speed: _____ min⁻¹
- Ratio of rotation speeds (engine speed / PTO speed): _____
- Power restriction: _____ kW
- Maximum torque transmissible: _____ Nm
- Direction of rotation (viewed from behind the tractor): _____

A.2.4.2 Optional power-take off

Give the same description as for the main PTO: _____

A.2.5 Hydraulic power lift (if applicable)

Make / Model / Type: _____

Type of hydraulic system: _____

Type and number of cylinders (single or double acting): _____

Type of linkage lock for transport: _____

Relief valve pressure setting (tolerance): _____ MPa

Opening pressure of cylinder safety valve (if fitted): _____ MPa

Lift pump type: _____

Transmission between pump and engine: _____

Type and number of filters: _____

Site of oil reservoir: _____

Type, number, and location of tapping points: _____

Maximum volume of oil available to external cylinders: _____ dm³

A.2.6 Three point linkage

A.2.6.1 Rear three point linkage (if applicable)

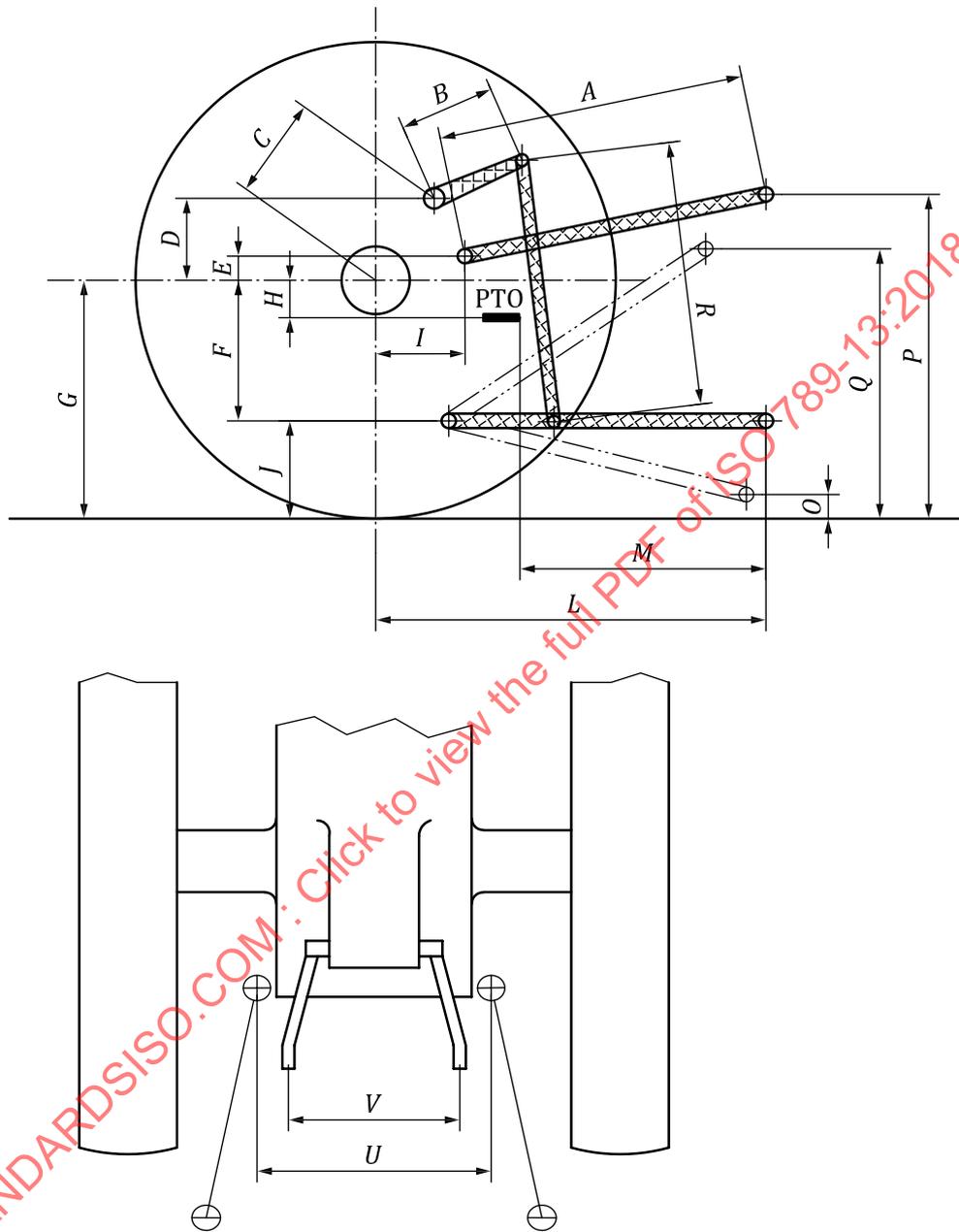


Figure A.1 — Rear three point hitch geometry

Table A.3 — Rear three point hitch dimensions

Figure A.1 variable	Dimension or range mm	Settings used in test(s) mm
<i>A</i>		
<i>B</i>		
<i>C</i>		
<i>D</i>		
<i>E</i>		
<i>F</i>		
<i>G</i>		
<i>H</i>		
<i>I</i>		
<i>J</i>		
<i>K</i>		
<i>L</i>		
<i>M</i>		
<i>N</i>		
<i>O</i>		
<i>P</i>		
<i>Q</i>		
<i>R</i>		
<i>U</i>		
<i>V</i>		

Category: _____

In conformity/not in conformity with categories 1N, 1, 2N, 2, 3N, 3, 4N and 4 of ISO 730:2009 and ISO 730:2009/Amd 1:2014: _____

Category adapter: _____

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A.2.6.2 Front three point linkage (if applicable)

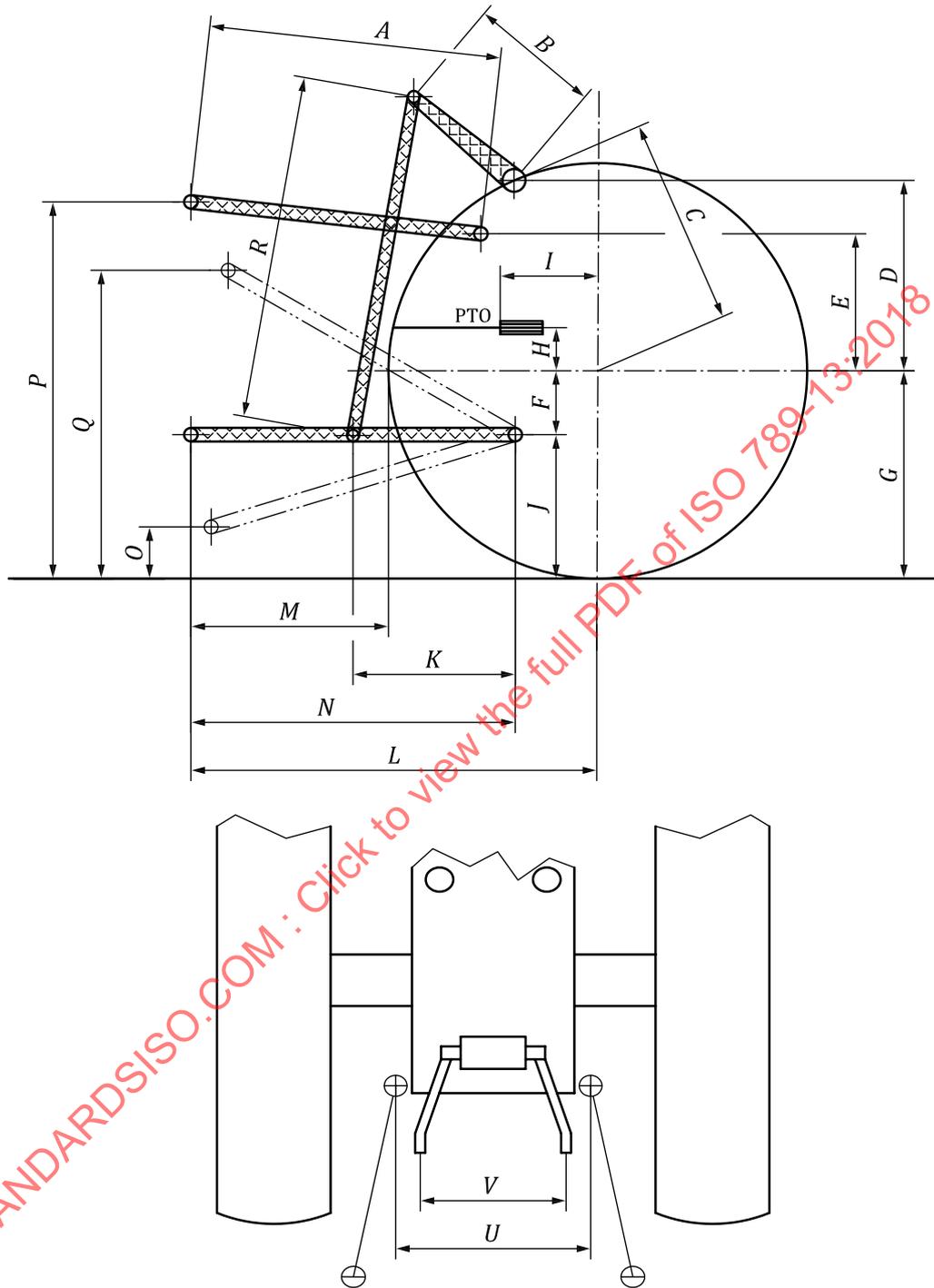


Figure A.2 — Front three point hitch geometry

Table A.4 — Front three point hitch dimensions

Figure A.2 variable	Dimension or range mm	Settings used in test(s) mm
<i>A</i>		
<i>B</i> (if present)		
<i>C</i>		
<i>D</i>		
<i>E</i>		
<i>F</i>		
<i>G</i>		
<i>H</i>		
<i>I</i> (if present)		
<i>J</i>		
<i>K</i>		
<i>L</i>		
<i>M</i>		
<i>N</i>		
<i>O</i>		
<i>P</i>		
<i>Q</i>		
<i>R</i> (if not an external cylinder)		
<i>U</i>		
<i>V</i>		

Category: _____

In conformity/not in conformity with categories 1N, 1, 2N, 2, 3N, 3, 4N and 4 of ISO 8759-1:—: _____

Category adapter: _____

A.2.7 Swinging drawbar (if applicable)

Type: _____

Height above ground:

— Minimum: _____ mm

— Maximum: _____ mm

Type of adjustment: _____

Distance of hitch point from rear wheel axis, horizontally: _____ mm

Distance of hitch point from power take-off shaft end:

— Horizontally _____ mm

- Vertically: _____ mm
- Lateral adjustment (centre of clevis):
- Left hand: _____ mm
- Right hand: _____ mm
- Distance of pivot point from rear wheel axis, horizontally: _____ mm
- Diameter of drawbar pinhole: _____ mm
- Maximum vertical permissible load: _____ kN

A.2.8 Trailer hitch (if applicable)

- Type: _____
- Hole diameter: _____ mm
- Height above ground: _____ mm
- Distance of hitch point from rear wheel axis, horizontally: _____ mm
- Distance of hitch point from power take-off shaft end:
- Horizontally _____ mm
- Vertically: _____ mm
- Maximum vertical permissible load: _____ kN

A.2.9 Holed drawbar (if applicable)

- Number of holes: _____
- Distance between holes: _____ mm
- Hole diameter: _____ mm
- Thickness / width of the drawbar: _____ mm/mm
- Height above ground:
- Minimum: _____ mm
- Maximum: _____ mm
- Distance of hitch point from power take-off shaft end (rear): _____ mm

A.2.10 Steering

Make / Model / Type: _____

Method of operation:

— Pump(s): _____

— Ram(s): _____

Working pressure: _____ MPa

A.2.11 Brakes

A.2.11.1 Service brake

Make / Model / Type: _____

Method of operation: _____

Trailer braking take-off (hydraulic or air brakes): _____

A.2.11.2 Parking brake

Type: _____

Method of operation: _____

A.2.12 Wheels (if applicable)

Number

— Front (driving / steering): _____

— Rear (driving / steering): _____

Wheelbase: _____ mm

Table A.5 — Track width adjustment

	Minimum mm	Maximum mm	Adjustment method
Front			
Rear			

A.2.13 Protective structure

Make / Model / Type: _____

Manufacturer's name and address: _____

Protective device:

— Cab / frame / rollguard / other: _____

- Tiltable / not tiltable: _____
- Approving organization: _____
- Approval number: _____
- Date of approval: _____
- No. of minor modification certificates, if any: _____

A.2.14 Seats

A.2.14.1 Driver's seat

Make / Model / Type: _____

Seat and steering wheel reversible (Yes or No): _____

Type of suspension: _____

Type of dampening: _____

Range of adjustment:

— Longitudinally: _____ mm

— Vertically _____ mm

Safety belt (Yes or No): _____

— Type: _____

A.2.14.2 Optional driver's seat(s)

Make / Model / Type: _____

Type of suspension: _____

Type of dampening: _____

Range of adjustment:

— Longitudinally: _____ mm

— Vertically _____ mm

A.2.14.3 Passenger seat

Location: _____

Capacity (number): _____

A.2.15 Lighting

Table A.6 — Lighting dimensions

	Height above ground of centre mm	Size mm	Distance from outside edge of lights to median plane of tractor mm
Headlights			
Sidelights			
Rearlights			
Reflectors			

A.3 Test conditions

A.3.1 Overall dimensions

Table A.7 — Tractor dimensions

	Length mm	Width		Height at top of:	
		Minimum mm	Maximum mm	Protective structure mm	Exhaust pipe mm
Ballasted					
Unballasted					

A.3.2 Ground clearance (unballasted tractor)

Clearance-limiting part: _____ mm

A.3.3 Tractor mass

Mass (with or without frame / rollguard / cab / other):

Table A.8 — Tractor masses

	Ballasted		Unballasted	
	With driver kg	Without driver kg	With driver kg	Without driver kg
Front				
Rear				
Total				

A.3.4 Ballast

Table A.9 — Ballast specifications

	Weights		Water kg
	Number	Total mass kg	
Front			
Rear			
Optional			

A.3.5 Track specifications (if applicable)

Track materials: _____

Track width and base: _____ mm

Dynamic radius (rolling radius): _____ mm

Track support system: _____

Treadbars:

- Number of treadbars per metre _____ mm
- Height: _____ mm
- Width: _____ mm
- Length: _____ mm

Other specifications: _____

A.3.6 Tyres and track specifications

Table A.10 — Tyres and track specifications

	Front	Rear
Tyres		
Dimensions		
Ply rating		
Type		
Maximum load (tyre manufacturer's) (kN)		
Maximum load (tractor manufacturer's) (kN)		
Inflation pressure (tyre manufacturer's) (kPa)		
Dynamic radius index (mm)		
Tracks		
Chosen track width (mm)		

A.3.7 Fuel

Trade name: _____

Octane (RON) No.: _____

Octane number or cetane number: _____

Density at 15 °C: _____ g/cm³

Type: _____

In conformity / not in conformity with national standards: _____

A.3.8 Oil and lubricants

A.3.8.1 Capacity and change interval

Table A.11 — Oil capacity and change interval

	Capacity dm ³	Oil change h	Filter change h
Engine			
Gear box			
Front axle			
Rear axle			
Final drive (front)			
Final drive (rear)			
Hydraulic system (*)			
Other (steering, ____)			

(*) State if common with gear box and rear axle.

A.3.8.2 Specifications (SAE, API, CCMC, ACEA, Mil.L, ISO)

Table A.12 — Oil specifications

	Recommended	Used during test
Engine oil		
Type		
Viscosity		
Classifications		
Transmission oil		
Type		
Viscosity		
Classifications		
Hydraulic fluid		
Type		
Viscosity		
Classifications		
Steering oil		

Table A.12 (continued)

	Recommended	Used during test
Type		
Viscosity		
Classifications		

A.3.8.3 Grease

Number of lubrication points _____

A.3.8.4 Reagent (if applicable)

Type: _____

In conformity / not in conformity with national standards: _____

If reagent includes urea:

— Percentage of urea to water: _____ %

A.4 Test results**A.4.1 Power tests for power take-off per ISO 789-1**

Date and location of test: _____

A.4.1.1 Equipment and conditions

Location of PTO (front / rear): _____

Type of dynamometer bench: _____

Mean relative humidity: _____ %

Mean atmospheric pressure: _____ kPa

Mean ambient temperature: _____ °C

Maximum engine air intake temperature _____ °C

Maximum coolant temperature: _____ °C

Maximum engine oil temperature: _____ °C

Maximum fuel temperature: _____ °C

A.4.1.2 Results

Table A.13 — PTO test data

Power	Speed			Fuel consumption			Specific energy	Reagent Consumption
	Engine	PTO	Fan	Hourly	Specific			
kW	r/min			kg/h	l/h	g/kWh	kJ/kg	l/h
6.2 Significant power points								
6.2.1 Power at rated engine speed								
6.2.2 Power at standard PTO speed								
6.2.3 Maximum power- One hour test								
6.3 Variable loads								
6.3.1 Rated engine speed								
6.3.1.1 85 % of the torque obtained in 6.2.1								
6.3.1.2 75 % of the torque obtained in 6.3.1.1								
6.3.1.3 50 % of the torque obtained in 6.3.1.1								
6.3.1.4 25 % of the torque obtained in 6.3.1.1								
6.3.1.5 Unloaded								
6.3.2 Standard PTO speed								
6.3.2.1 85 % of the torque obtained in 6.2.2								
6.3.2.2 75 % of the torque obtained in 6.3.2.1								
6.3.2.3 50 % of the torque obtained in 6.3.2.1								
6.3.2.4 25 % of the torque obtained in 6.3.2.1								
6.3.2.5 Unloaded								
6.4 Variable loads and varying engine speed								
6.4.1 Five additional points for calculating fuel consumption characteristics								
6.4.1 a) 80 % of power obtained in 6.2.1 with the throttle lever set fully open								
6.4.1 b) 80 % of power obtained in 6.2.1 with the throttle lever set to 90 % of rated engine speed								
6.4.1 c) 40 % of power obtained in 6.2.1 with the throttle lever set to 90 % of rated engine speed								
6.4.1 d) 60 % of power obtained in 6.2.1 with the throttle lever set to 60 % of rated engine speed								

Table A.13 (continued)

Power kW	Speed			Fuel consumption			Specific energy kJ/kg	Reagent Consumption l/h
	Engine	PTO	Fan	Hourly		Specific g/kWh		
				kg/h	l/h			
	r/min							
6.4.1 e) 40 % of power obtained in 6.2.1 with the throttle lever set to 60 % of rated engine speed								

A.4.2 Three-point linkage lifting capacity per ISO 789-2

Date and location of test: _____

A.4.2.1 Conditions

Hydraulic fluid temperature: _____ °C

Mean ambient temperature: _____ °C

A.4.2.2 Results

Table A.14 — Hydraulic lifting test data

	Height of lower hitch point above ground position in down position mm	Vertical movement mm	Maximum force exerted through full range kN	Pressure ¹⁾ kPa	Moment about rear axle kN·m	Tilt angle of mast over range of lift degrees
At lower hitch points						
On coupled frame						
1) 90 % minimum relief valve pressure setting						

Table A.15 — Corrected lift forces

Height of hitch points relative to horizontal lower links mm	Corrected lift force at hitch points kN	Corrected lift force at frame kN

Table A.15 (continued)

Height of hitch points relative to horizontal lower links mm	Corrected lift force at hitch points kN	Corrected lift force at frame kN

A.4.3 Turning and clearance diameters per ISO 789-3 (not applicable to zero turn radius tractors)

Date and location of test: _____

A.4.3.1 Conditions

Tyre inflation pressure:

— Front: _____ kPa

— Rear: _____ kPa

Front fenders (Yes / No): _____

Description of test surface: _____

A.4.3.2 Results

Table A.16 — Turning and clearance diameters

Track (tread) nom.	Minimum turning diameter (m)				Minimum clearance diameter (m)			
	with brakes		without brakes		with brakes		without brakes	
	left	right	left	right	left	right	left	right

Comments: _____

A.4.4 Measurement of exhaust smoke per ISO 789-4

Date and location of test: _____

A.4.4.1 Conditions

Make / Model / Type of opacimeter: _____

A.4.4.2 Results

Table A.17 — Emission levels

	Engine speed	Nominal flow rate, q	Measured absorption values
	min ⁻¹	l/s	min ⁻¹
1			
2			
3			
4			
5			
6			

Comments: _____

A.4.5 Partial power PTO - Non-mechanically transmitted power per ISO 789-5

Date and location of test: _____

Table A.18 — Partial power PTO results

Power kW	Engine speed min ⁻¹	PTO speed min ⁻¹	Fuel consumption ^a			Temperature			
			l/h	kg/kWh	kWh/l	PTO sys-tem ^b	Engine cooling medium °C	Wet bulb °C	Dry bulb °C
Test a rated PTO rotational frequency (540 or 1 000 min ⁻¹) - Maximum speed control lever setting - 1 h									
Test a rated PTO rotational frequency 1 000 min ⁻¹) - Minimum speed control lever setting - 1 h									
Varying load test - Minimum speed control lever setting - 2 h									

^a Relative density and temperature of fuel used should be noted, and be in accordance with the manufacturer's instructions.

^b Significant PTO system temperature to be identified and recorded.

Table A.19 — Observed rotational frequency variation

Load	Throttle setting	Engine rotational frequency variation (min ⁻¹)		PTO rotational frequency variation (min ⁻¹)	
		min.	max.	min.	max.
Full	Full				
Full	Minimum				
85 %	Minimum				
3/4 × 85 %	Minimum				
1/2 × 85 %	Minimum				
1/4 × 85 %	Minimum				

A.4.6 Centre of gravity per ISO 789-6

Date and location of test: _____

Describe the main tractor specifications influencing the position of the centre of gravity (for example, if provided with a cab, state the type:

Tyre inflation pressure:

— Front: _____ kPa
 — Rear: _____ kPa

Coordinates of centre of gravity:

— \bar{x} : _____ mm
 — \bar{h} : _____ mm
 — \bar{y} : _____ mm

A.4.7 Axle power determination per ISO 789-7

Date and location of test: _____

Table A.20 — Nominal travel speeds

Gear						
Rear wheels						
Tyre size						
Dynamic radius index						
Axle, r/ min ^a						
Nominal travel speed, km/h ^a						
Front wheels (if powered)						
Tyre size						
Dynamic radius index						
Axle, r/ min ^a						
Nominal travel speed, km/h ^a						
^a At rated engine speed						

Maximum temperatures:

— Coolant: _____ °C
 — Engine oil: _____ °C

- Fuel: _____ °C
- Engine air intake: _____ °C
- Transmission oil: _____ °C

Atmospheric conditions:

- Temperature: _____ °C
- Relative humidity: _____ %
- Pressure: _____ kPa

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A.4.8 Engine air cleaner per ISO 789-8

Date and location of test: _____

A.4.8.1 Test conditions

Test dust (fine / coarse): _____ Batch No.: _____

Test oil: _____

Barometric pressure:

— Before test: _____ kPa

— After test: _____ kPa

Temperature:

— Before test: _____ °C

— After test: _____ °C

Relative humidity:

— Before test: _____ %

— After test: _____ %

Applied method (direct weighing method / absolute filter method): _____

Rated air flow: _____ m³/minTest air flow (steady / variable): _____ at _____ m³/minScavenge air flow: _____ m³/min

Test terminal condition: _____

Dust concentration: _____ g/m³

Feed air pressure: _____ kPa

A.4.8.2 Results

Restriction (at test air flow): _____ kPa

Pressure drop (at test air flow): _____ kPa

Pressure loss (at test air flow): _____ kPa

Initial efficiency (after dust fed): _____ %

Full life efficiency: _____ %

Precleaner efficiency: _____ %

Capacity (at test terminal condition): _____ g

Dust cup served: _____ times

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Oil carry-over (Yes / No): _____ at single flow rate: _____ m³/min

Oil carry-over (increasing flow rates) at flow rate: _____ m³/min

Resistance to vibration:

- Amplitude of vibration: _____ mm
- Frequency of vibration: _____ Hz
- Location of failure: _____
- Mode of failure (if any): _____
- Torques applied to fixing: _____
- Initially: _____ Nm
- At end of test:: _____ Nm
- Number of cycles to failure/completed: _____

Resistance to moisture of dry air cleaner:

- Initial mass: _____ g
- Wet mass: _____ g
- Mass of retained moisture: _____ g
- Mass after drying: _____ g

A.4.9 Power tests for drawbar per ISO 789-9

Date and location of test: _____

Type of track: _____

Height of drawbar above ground: _____ mm

Tyre inflation pressure:

Tyre inflation pressure:

— Front: _____ kPa

— Rear: _____ kPa

Ballasted / Unballasted: _____