INTERNATIONAL STANDARD

ISO 3965

Second edition
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Agricultural wheeled tractors — Maximum speeds — Method of determination

Tracteurs agricoles à roues — Vitesses maximales — Méthode de détermination

Reference number
ISO 3965:1990(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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3965 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*.

This second edition cancels and replaces the first edition (ISO 3965:1977), of which it constitutes a minor revision, now incorporating a specimen test report.

Annex A forms an integral part of this International Standard.

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Agricultural wheeled tractors — Maximum speeds — Method of determination

1 Scope

This International Standard specifies a method for calculating the maximum design speed and a method for measuring the maximum travel speed of agricultural wheeled tractors.

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 789-1:1981, *Agricultural tractors — Test procedures — Part 1: Power tests.*

ISO 4251-1:1988, *Tyres and rims (existing series) for agricultural tractors and machines — Part 1: Tyre designation and dimensions.*

3 Maximum design speed calculation

Calculate the maximum design speed from parameters as specified by the manufacturer, i.e.

— the rated engine rotational frequency (rated engine speed) ("rated" is defined in ISO 789-1);

— the transmission gear ratio for the highest (fastest) forward gear;

— the dynamic radius index, calculated in accordance with ISO 4251-1, of the maximum size drive wheel tyres recommended by the tractor manufacturer for road use.

4 Maximum travel speed measurement

4.1 Test requirements

4.1.1 Tractor

4.1.1.1 The fuel specified in the operation manual shall be used.

4.1.1.2 The settings for the carburettor and ignition and/or the fuel injection pump, the engine power and the no-load engine rotational frequency shall be as specified by the manufacturer.

4.1.1.3 Front-wheel drive or any additional (power) driving axle shall only be engaged when recommended by the manufacturer for road use.

4.1.1.4 The tyres shall be of the same stated size as those used to calculate maximum design speed (clause 3). The tyres shall be new and inflated to the pressure indicated by the tractor manufacturer for road use.

4.1.1.5 The tractor shall be in working order, with full fuel tanks, radiators and with an operator, but without removable ballast weights, special equipment or loads.

4.1.2 Test roadway

4.1.2.1 The roadway shall be straight and allow the maximum speed to be maintained for a minimum test distance of 100 m.

4.1.2.2 The surface shall be dry, smooth concrete, or similar finish, swept clean.

4.1.2.3 The surface shall not have more than 1,5 % slope in the direction of travel and not more than 1,5 % slope at right-angles to the direction of travel.

4.1.2.4 The approaches to the test roadway shall be of sufficient length, smoothness and uniformity of slope to ensure a uniform travel speed of the tractor immediately prior to the test measurement.

4.1.3 Ambient conditions

The tests shall be made in dry, calm weather with a wind velocity not exceeding 5 m/s.

4.2 Test procedure

4.2.1 Immediately prior to the test, the tractor shall be run for a period sufficient to ensure that the engine, transmission oils and coolant are at normal working temperatures. These temperatures shall be maintained during the test.

4.2.2 Drive the tractor over the test roadway with the throttle fully open in the forward gear producing maximum tractor speed.

4.2.3 Measure the maximum travel speed over a distance of at least 100 m first in one direction on the test roadway and then in the opposite direction. The time interval for a point on the machine to traverse 100 m shall be recorded.

4.2.4 Determine the maximum travel speed as the mean of the results of the two successive test drives in opposite directions.

4.3 Test report

The test report shall be in accordance with the specimen test report presented in annex A.

Annex A
(normative)

Specimen test report — Maximum travel speed measurement

The test report (see 4.3) shall contain the following information:

a) reference to this International Standard;

b) type of tractor and drive type (two-wheel drive or four-wheel drive with the front-wheel drive engaged or disengaged);

c) make of tractor;

d) the number or identification of the tractor;

e) rated engine rotational frequencies (rated engine speeds), in revolutions per minute (r/min);

f) type of transmission;

g) mass of the tractor as tested, in kilograms;

h) tyre size:

— rear axle,

— front axle;

i) tyre pressure, in kilopascals, and rolling radius of tyres used in the test;

j) confirmation of the test track being dry;

k) type of test track, i.e. concrete, asphalt, etc.;

l) longitudinal gradient of test track: i.e. level or up to 1,5 % slope;

m) slope at right-angles of test track;

n) tractor gear at which test was conducted;

o) weather conditions, including wind velocity in metres per second and direction across the test roadway;

p) tractor speed measurements, in accordance with the table:

Test No.	Direction of travel (e.g. left to right, right to left)	Time interval t	Tractor speed[1] $v = \frac{3{,}6l}{t}$
		s	km/h
1		t_1	v_1
2		t_2	v_2
1) where l is the test length, in metres (100 m minimum, see 4.2.3).			

q) test speed, v of the tractor in kilometres per hour, determined according to the equation:

$$v = \frac{v_1 + v_2}{2}$$

The value of speed, v, shall be rounded to the second decimal digit for individual measurements and to the first decimal digit for the average value.

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