

Earth-moving machinery — Rubber-tyred machines — Steering requirements

ICS 53.100

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents



Document Sharing Hub

National foreword

This British standard is the UK implementation of EN 12643:1997+A1:2008. It supersedes BS EN 12643:1998 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted by Technical Committee B/513, Construction equipment and plant and site safety, to Subcommittee B/513/1, Earthmoving machinery (International).

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Board and comes into effect on 15 June 1998

© BSI 2009

ISBN 978 0 580 62377 6

Amendments/corrigenda issued since publication

Date	Text affected
31 July 2009	Implementation of CEN amendment A1:2008, and alignment of BSI and CEN publication dates

English Version

Earth-moving machinery - Rubber-tyred machines - Steering requirements (ISO 5010:1992 modified)

Engins de terrassement - Engins équipés de pneumatiques
- Systèmes de direction (ISO 5010:1992 modifié)

Erdbaumaschinen - Radfahrzeuge - Lenkvermögen (ISO
5010:1992 modifiziert)

This European Standard was approved by CEN on 21 April 1997 and includes Amendment 1 approved by CEN on 30 July 2008.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This document (EN 12643:1997+A1:2008) has been prepared by Technical Committee CEN/TC 151 "Construction equipment and building material machines - Safety", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2008-07-30.

This document supersedes EN 12643:1997.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

This European Standard has been prepared on the basis of ISO 5010:1992 elaborated by ISO/TC 127 "Earth-moving machinery" and contains additionally an alternative test procedure.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

Endorsement notice:

The text of the International Standard ISO 5010:1992 was approved by CEN as a European Standard with agreed common modifications as given below:

- Normative references are dated
- Clause "Alternative steering tests" and figure 3 have been added.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies steering system tests and performance criteria for evaluating the steering capability of rubber-tyred self-propelled earth-moving machines having a machine speed, determined in accordance with ISO 6014:1986, greater than 20 km/h.

It applies to tractors, loaders, backhoe loaders, excavators, dumpers, tractor-scrappers and graders equipped with either manual (unassisted) steering, power-assisted steering or fully powered steering as defined in ISO 6165:1997.

This European Standard excludes rollers, compactors and pipelayers.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this European Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this European 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.

EN ISO 3450:1996, *Earth-moving machinery – Braking systems of rubber-tyred machines – Systems and performance requirements and test procedures (ISO 3450:1996)*.

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

ISO 6165:1997, *Earth-moving machinery – Basic types – Vocabulary*.

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

3 Definitions

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

3.1

steering system

system including all machine elements between the operator and the ground-contacting wheels participating in steering the machine

3.1.1

manual steering system

system depending exclusively on the muscular power of the operator to effect normal steering of the machine

3.1.2

power-assisted steering system

system employing auxiliary power source(s) to supplement the muscular power of the operator to effect steering of the machine. Without steering auxiliary power source(s), the machine can be steered with muscle power only (see 6.2.1)

3.1.3

fully powered steering system

system in which steering is provided by steering power source(s). Without the power source(s), the machine cannot reasonably be steered with muscle power only (see 6.2.1)

3.1.4

emergency steering system

system used to steer the machine in the event of a failure of the normal steering power source(s) or engine stoppage

3.2 steering power source

3.2.1

normal steering power source

means for providing power to effect steering in either power-assisted or fully powered steering systems, for example, hydraulic pump, air compressor, electric generator

3.2.2

emergency steering power source

means for providing power to the emergency steering system, for example, hydraulic pump, air compressor, accumulator, battery

3.2.3

failure of normal steering power source

complete and instantaneous loss of a normal steering power source output. It is assumed that not more than one failure will occur at the same time

3.3

steering control element

manual control means by which the operator provides muscular power inputs to the steering systems to effect the desired steering of the machine, including the typical steering-wheel or any equivalent manual control means

3.4

steering effort

necessary force exerted by the operator on the steering control element in order to steer the machine

3.5

steering angle

total displacement angle between the front wheels and the rear wheels as they move about one or more vertical steering axes from their normal straight-ahead condition to a turned condition

NOTE 1 The steering angle for multiple axle machines is determined between the wheels at the farthest forward and the farthest rearward axle.

NOTE 2 Ackermann steering inherently has a greater steering angle on the side of the machine toward the inside of the turn as compared to the wheels on the outside of the turn. Therefore, where Ackermann steering is involved, the location of the steering angle measurement also needs to be specified.

A steering angle accomplished by a combination of geometries incorporating Ackermann steering is included, and also requires the location of steering angle measurement to be specified.

3.6

tyre circle

outer tyre clearance diameter determined in accordance with clause 9

3.7

working circuit pressure

that nominal pressure applied to the specific circuit by the pump(s)