BS EN ISO 3691-6:2015

Incorporating corrigenda March 2014 and June 2016

BSI Standards Publication

Industrial trucks — Safety requirements and verification

Part 6: Burden and personnel carriers (ISO 3691-6:2013)

bsi.

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 3691-6:2015

National foreword

This British Standard is the UK implementation of EN ISO 3691-6:2015, incorporating corrigenda March 2014 and June 2016. It is identical to ISO 3691-6:2013. It supersedes BS EN ISO 3691-6:2013 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MHE/7, Industrial trucks.

A list of organizations represented on this committee 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.

© The British Standards Institution 2016. Published by BSI Standards Limited 2016

ISBN 978 0 580 93558 9

ICS 53.060

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2013.

Amendments/corrigenda issued since publication

Date	Text affected
31 May 2014	Implementation of CEN corrigendum March 2014. Annex ZA inserted
31 March 2016	This corrigendum renumbers BS EN ISO 3691-6:2013 as BS EN ISO 3691-6:2015
30 September 2016	Implementation of CEN corrigendum June 2016. European foreword updated

Documents
Document Sharing Hub

Full document details: BS EN ISO 3691-6:2015

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 3691-6

October 2015

ICS 53.060

Incorporating corrigendum June 2016
Supersedes EN ISO 3691-6:2013

English Version

Industrial trucks - Safety requirements and verification - Part 6: Burden and personnel carriers (ISO 3691-6:2013)

Chariots de manutention - Exigences de sécurité et vérification - Partie 6: Transporteurs de charges et de personnel (ISO 3691-6:2013)

Flurförderzeuge - Sicherheitstechnische Anforderungen und Verifizierung - Teil 6: Lasten- und Personentransportfahrzeuge (ISO 3691-6:2013)

This European Standard was approved by CEN on 7 October 2015.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

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

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2015 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 3691-6:2015 E

Documents
Document Sharing Hub

Full document details: BS EN ISO 3691-6:2015

European foreword

The text of ISO 3691-6:2013 has been prepared by Technical Committee ISO/TC 110 "Industrial trucks" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 3691-6:2015 by Technical Committee CEN/TC 150 "Industrial Trucks - Safety" the secretariat of which is held by BSI.

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 April 2016, and conflicting national standards shall be withdrawn at the latest by April 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 3691-6:2013.

For the purposes of global relevance, the requirements of all clauses referring to ISO/TS 3691-7 have been transferred and published as European Standard EN 16307-6, *Industrial trucks — Safety requirements and verification — Part 6: Supplementary requirements for burden and personnel carriers.*

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.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 3691-6:2013 has been approved by CEN as EN ISO 3691-6:2015 without any modification.

Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard, except clause 6.2.5 and with the exclusion of all references to ISO/TS 3691-8 confers, within the limits of the scope of this standard, a presumption of conformity with the Essential Requirements of that Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

Documents
Document Sharing Hub

Full document details: BS EN ISO 3691-6:2015

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **2**

4 Safety requirements and/or protective measures **3**
- 4.1 General 3
- 4.2 Starting/moving 3
- 4.3 Brakes 4
- 4.4 Manual control actuators 4
- 4.5 Power systems and accessories 7
- 4.6 Operator and passenger positions 10
- 4.7 Stability 12
- 4.8 Protective devices 12
- 4.9 Visibility/lighting 13
- 4.10 Environmental conditions 14
- 4.11 Transport 15

5 Verification of safety requirements and/or protective measures **15**
- 5.1 General 15
- 5.2 Functional verification 15

6 Information for use **16**
- 6.1 General 16
- 6.2 Instruction handbook(s) 16
- 6.3 Marking 19

Annex A (informative) **List of significant hazards** **21**

Bibliography **26**

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub

Full document details: BS EN ISO 3691-6:2015

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. 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. 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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: http://www.iso.org/iso/home/standards_development/resources-for-technical-work/foreword.htm

The committee responsible for this document is ISO/TC 110, *Industrial trucks*, Subcommittee SC 2, *Safety of industrial trucks*.

This first edition of ISO 3691-6, together with ISO 3691-1, ISO 3691-2, ISO 3691-3, ISO 3691-4, ISO 3691-5, ISO/TS 3691-7 and ISO/TS 3691-8, cancels and replaces ISO 3691:1980, of which it constitutes a technical revision.

ISO 3691 consists of the following parts, under the general title *Industrial trucks — Safety requirements and verification*:

— *Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*

— *Part 2: Self-propelled variable-reach trucks*

— *Part 3: Additional requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads*

— *Part 4: Driverless industrial trucks and their systems*

— *Part 5: Pedestrian-propelled trucks*

— *Part 6: Burden and personnel carriers*

— *Part 7: Regional requirements for countries within the European Community* [Technical Specification]

— *Part 8: Regional requirements for countries outside the European Community* [Technical Specification]

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

Introduction

This document is a type-C standard as stated in ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

The ISO 3691 series of standards covers safety requirements and their verification for industrial trucks as defined in ISO 5053.

Structure

An important step forward in the work on the ISO 3691 series of standards was the agreement to issue a new structure of International Standards for industrial trucks having on one side basic standards for all kinds of trucks (see Foreword) and on the other side independent standards to cover the respective specific functions of industrial trucks, e.g. visibility, noise, vibration, electrical requirements, etc.

Assessment of hazards

The product needs to be designed in such a way that it is fit for its purpose or function and can be adjusted and maintained without putting persons at risk when used under the conditions foreseen by the manufacturer.

In order to properly design a product and to cover all specific safety requirements, the manufacturer will have to identify the hazards that apply to his product and carry out a risk assessment. The manufacturer will then need to design and construct the product taking this assessment into account.

The aim of this procedure is to eliminate the risk of accidents throughout the foreseeable lifetime of the machinery, including the phases of assembling and dismantling where risks of accidents could also arise from foreseeable abnormal situations.

In selecting the most appropriate methods, the manufacturer will need to apply the following principles, in the order given here:

a) eliminate or reduce risks as far as possible by design (inherently safe machinery design and construction);

b) take the necessary protective measures in relation to risks that cannot be eliminated by design;

c) inform users of any shortcoming of the protective measures adopted;

d) indicate whether any particular training is required;

e) specify any need to provide personal protection equipment;

f) refer to the appropriate user's document for proper operating instructions.

Industrial trucks need to be designed to prevent foreseeable misuse wherever possible, if such would engender risk. In other cases, the manufacturer's instructions will need to draw the user's attention to ways shown by experience in which the machinery ought not to be used.

This part of ISO 3691 does not repeat all the technical rules which are state-of-the-art and which are applicable to the material used to construct the industrial truck. Reference will also need to be made to ISO 12100.

© ISO 2013 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

Legislative situation/Vienna Agreement

From the very beginning, the task of the working group was to revise ISO 3691:1980 and establish worldwide basic standards to comply with the major legislative regulations in, for example, the EU, Japan, Australia and North America.

Every effort was made to develop a globally relevant International Standard. That goal was achieved with most of the issues. For several potential problem areas compromises were needed and will be needed in the future. Where divergent regional requirements remain, these are addressed by ISO/TS 3691-7 and ISO/TS 3691-8.

In order to ensure that the revised International Standard will be actively used in the ISO member countries, worldwide, procedures are necessary to replace the existing national standards and technical regulations by the revised International Standard. In the European Community, ISO and the European Committee for Standardization (CEN) agreed on technical co-operation under the Vienna Agreement, with the aim of replacing European Standards (EN) by International Standards. Other countries are asked to make similar agreements to ensure that their national standards and technical regulations are replaced by this International Standard.

Only by these actions will there be the guarantee that products in accordance with International Standards can be shipped worldwide freely without any technical barriers.

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

INTERNATIONAL STANDARD ISO 3691-6:2013(E)

Industrial trucks — Safety requirements and verification —

Part 6: Burden and personnel carriers

1 Scope

This part of ISO 3691 gives safety requirements and the means for their verification for self-propelled carriers designed for carrying burdens without lifting, as defined in ISO 5053, and/or personnel carriers, having three or more wheels, a maximum speed not exceeding 56 km/h and a load capacity not exceeding 5 000 kg (hereafter referred to as *carriers* or *trucks*).

This part of ISO 3691 is applicable to trucks equipped with a platform (which can be tilting) for the purpose of carrying materials or with a number of seats for the purpose of transporting passengers.

It is not applicable to

— vehicles intended primarily for earth-moving or over-the-road hauling,

— driverless trucks,

— golf cars,

— tractors with a drawbar pull up to and including 20 000 N equipped with a platform for the purpose of carrying materials.

This part of ISO 3691 deals with all significant hazards, hazardous situations or hazardous events, as listed in Annex A, relevant to the applicable machines when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

It does not establish requirements for hazards that can occur when using trucks on public roads or when operating in potentially explosive atmospheres.

Regional requirements, additional to the requirements given in this part of ISO 3691, are addressed in ISO/TS 3691-7 and ISO/TS 3691-8.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2867:2011, *Earth moving machinery — Access systems*

ISO 3287:1999, *Powered industrial trucks — Symbols for operator controls and other displays*

ISO 3411:2007, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 5010:2007, *Earth-moving machinery — Rubber-tyred machines — Steering requirements*

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

ISO 5053, *Powered industrial trucks — Terminology*

ISO 6292:2008, *Powered industrial trucks and tractors — Brake performance and component strength*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13564-1:2012, *Powered industrial trucks — Test methods for verification of visibility — Part 1: Sit-on and stand-on operator trucks and variable-reach trucks up to and including 10 t capacity*

ISO 13849-1:2006, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 15870:2000, *Powered industrial trucks — Safety signs and hazard pictorials — General principles*

ISO 20898:2008, *Industrial trucks — Electrical requirements*

ISO 21281:2005, *Construction and layout of pedals of self-propelled sit-down rider-controlled industrial trucks — Rules for the construction and layout of pedals*

ISO 24135-1:2006, *Industrial trucks — Specifications and test methods for operator restraint systems — Part 1: Lap-type seat belts*

ANSI/ITSDF B56.8:2006, *Safety Standard for Personnel and Burden Carriers*[1)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5053 and ISO 12100 and the following apply.

3.1
burden [personnel] carrier
mobile power-driven machine that is not self-loading, used for transporting material and/or personnel on indoor and outdoor improved surfaces, but not for use on public roads

3.2
operator
designated person, trained and authorized, who is responsible for the movement and operation of the carrier and, depending on the carrier type, can be transported by the carrier, or can be on foot accompanying the truck or can be remote from the truck (remote-controlled by cables, radio, etc.)

3.3
normal operating position
position in which the operator is able to control all functions for driving as defined by the manufacturer

3.4
load capacity
maximum load, including the operator and passengers

3.5
capacity
operator and number of passengers permitted by the manufacturer

1) American National Standards Institute/Industrial Truck Standards Development Foundation

© ISO 2013 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015

4 Safety requirements and/or protective measures

4.1 General

4.1.1 Overall requirements

Trucks shall comply with the safety requirements and/or protective measures of this clause. In addition, the truck shall be designed according to the principles of ISO 12100 for relevant but not significant hazards which are not dealt with by this document.

4.1.2 Normal climatic conditions

For truck operation, the following climatic conditions apply:

— average ambient temperature for continuous duty: +25 °C

— maximum ambient temperature, short term (up to 1 h): +40 °C

— lowest ambient temperature for trucks intended for use in normal indoor conditions: +5 °C

— lowest ambient temperature for trucks intended for use in normal outdoor conditions: −20 °C

— altitude: up to 2 000 m

4.1.3 Electrical requirements

Electrical systems and equipment shall be in accordance with ISO 20898, except where regional requirements apply. See ISO/TS 3691-7 and ISO/TS 3691-8.

4.1.4 Edges and angles

There shall be no sharp edges or angles posing a hazard in the area of the operator in the normal operating position or in the area of access and egress of operators or passengers and during normal operation and daily checks.

4.1.5 Stored energy components

Components which store energy and would cause a risk during removal or disassembly, e.g. hydraulic accumulator or spring applied brakes, shall be provided with a means of releasing the energy before removal or disassembly.

4.2 Starting/moving

4.2.1 Unauthorized starting

Carriers shall be provided with a device (e.g. a key, a code, a magnetic card) that prevents starting without that device.

4.2.2 Unintended movement

4.2.2.1 Parking brake

A parking brake shall be provided complying with 4.3.1.

4.2.2.2 Internal combustion engine-powered carriers

Internal combustion engine-powered carriers shall be fitted with a device that prevents the engine being started while the transmission is engaged.

© ISO 2013 – All rights reserved

AVA Documents Document Sharing Hub
Full document details: BS EN ISO 3691-6:2015