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Aircraft ground support equipment - Specific requirements - Part 15: Baggage and equipment tractors

Luftfahrt-Bodengeräte - Besondere Anforderungen - Teil 15: Gepäck- und Geräteschlepper

Matériel au sol pour aéronefs - Exigences particulières - Partie 15 : Tracteurs à bagages et matériel

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This European Standard was approved by CEN on 29 December 2019.

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European foreword

This document (EN 12312-15:2020) has been prepared by Technical Committee CEN/TC 274 “Aircraft ground support equipment”, 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of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

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

This document supersedes EN 12312-15:2006+A1:2009.

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 2006/42/EC on machinery.

For relationship with EU Directive 2006/42/EC on machinery, see informative Annex ZA, which is an integral part of this document.

EN 12312, *Aircraft ground support equipment – Specific requirements* consists of the following parts:

— *Part 1: Passenger stairs*;

— *Part 2: Catering vehicles*;

— *Part 3: Conveyor belt vehicles*;

— *Part 4: Passenger boarding bridges*;

— *Part 5: Aircraft fuelling equipment*;

— *Part 6: Deicers and deicing/anti-icing equipment*;

— *Part 7: Aircraft movement equipment*;

— *Part 8: Maintenance or service stairs and platforms*;

— *Part 9: Container/Pallet loaders*;

— *Part 10: Container/Pallet transfer transporters*;

— *Part 11: Container/Pallet dollies and loose load trailers*;

— *Part 12: Potable water service equipment*;

— *Part 13: Lavatory service equipment*;

— *Part 14: Disabled/incapacitated passenger boarding vehicles*;

— *Part 15: Baggage and equipment tractors* (the present document);

— *Part 16: Air start equipment*;

— *Part 17: Air conditioning equipment*;

— *Part 18: Nitrogen or Oxygen units*;

— *Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions*;

— *Part 20: Electrical ground power units*.

The main changes compared to the previous edition EN 12312-15:2006+A1:2009 are:

a) amendment A1:2009 was incorporated;

b) the Introduction was updated in relation to the deviation from recommended criteria;

c) the Scope was updated to cover reasonably foreseeable misuse;

d) Clause 2, *Normative references*, was updated;

e) new definitions for whole body vibration, SEAT factor, categories, restraint system, SIP (Seat Index Point) and OPC (operator presence control) were added;

f) *list of significant hazards* was updated to exclude hazards due to traffic and repair and was moved to informative Annex A;

g) subclause 5.1, *General requirements* was changed to include stability and strength calculations and site operational requirements;

h) subclause 5.2, *Driver's accommodation* was completely revised and restraint systems/seat belts were added;

i) in subclause 5.3, *Driver's cabin* clarification was given regarding the requirements for the intake of emissions;

j) subclause 5.4, *Seats* has been changed and contains now further requirements for seats and a table giving advice for the selection of seats;

k) subclause 5.5, *Controls, monitoring devices and displays* was changed and contains a more detailed clarification about the idle speed and the use of a deadman switch;

l) subclause 5.6, *Additional operating positions* was updated regarding controls and contains now provisions for an interlocking system;

m) sublause 5.7, *Chassis and body* was changed regarding fuel tank requirements and clarifications for the wheel position within the vehicle's contour;

n) subclauses 5.9, *Vibrations*, 5.10 *Stability* and 5.11 *Options* were added;

o) subclause 6.2, *Additional marking* was updated to include a tolerance for the mass of the battery and marking for the operator's seat;

p) subclause 6.3 was updated to include instructions for the lateral restraint system and a declaration of exhaust emission values and whole body vibrations;

q) Clause 7, *Verification* was updated and contains now a tilting platform test;

r) informative Annex A, *Examples of typical baggage and equipment tractors* was deleted and replaced by informative Annex A *List of significant hazards*;

s) normative Annex C, *Minimum space envelope for seated operator enclosure* was moved to Annex B and renamed *Seat operator enclosure*;

t) informative Annex D, *Examples of couplings*, was changed into informative Annex C, *Whole body vibration*;

u) a new informative Annex D, *Recommendations for restraint systems / access gate* was added;

v) informative Annex D, *Examples of couplings*, was reduced to one example and changes to new informative Annex E;

w) Annex ZA referring to the Machinery directive 98/37/EC was replaced by Annex ZA referring to the new Machinery directive 2006/42/EC;

x) the Bibliography was updated.

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

Introduction

This European Standard defines health and safety requirements for baggage and equipment tractors intended for towing equipment and baggage/cargo trailers on airports.

The minimum essential criteria are considered to be of primary importance in providing safe, serviceable, economical and practical baggage and equipment tractors. Deviations should occur only after careful consideration, extensive testing, risk assessment and service evaluation have shown alternative methods or conditions to be satisfactory. Such deviations are outside the scope of this standard and a manufacturer should be able to demonstrate an equivalent level of protection.

This European Standard is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

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 type-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. Deviations from requirements do not fall within the presumption of conformity given by the standard.

1 Scope

This document specifies the technical requirements to minimize the hazards listed in Clause 4 which can arise during the commissioning, the operation and the maintenance of baggage and equipment tractors when used as intended, including misuse reasonably foreseeable by the manufacturer, when carried out in accordance with the specifications given by the manufacturer or his authorized representative. It also takes into account some requirements recognized as essential by authorities, aircraft and ground support equipment (GSE) manufacturers as well as airlines and handling agencies.

This document applies to self-propelled baggage and equipment tractors with driver accommodation.

This document does not apply to pedestrian controlled equipment.

This document deals with vibrations which are considered as significant. Vibration measurements are dealt with in EN 1915-3.

No extra requirements on noise are provided other than those given in EN 1915-4.

NOTE EN 1915-4 provides the general GSE noise requirements.

This part of EN 12312 is not applicable to baggage and equipment tractors manufactured before the date of its publication.

This part of EN 12312 when used in conjunction with EN 1915-1, EN 1915-2, EN 1915-3 and EN 1915-4 provides the requirements for baggage and equipment tractors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1175-1:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 1: General requirements for battery powered trucks*

EN 1175-2:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 2: General requirements of internal combustion engine powered trucks*

EN 1175-3:1998+A1:2010, *Safety of industrial trucks — Electrical requirements — Part 3: Specific requirements for the electric power transmission systems of internal combustion engine powered trucks*

EN 1915-1:2013, *Aircraft ground support equipment — General requirements — Part 1: Basic safety requirements*

EN 1915-2:2001+A1:2009, *Aircraft ground support equipment — General requirements — Part 2: Stability and strength requirements, calculations and test methods*

EN 1915-3:2004+A1:2009, *Aircraft ground support equipment — General requirements — Part 3: Vibration measurement methods and reduction*

EN 1915-4:2004+A1:2009, *Aircraft ground support equipment — General requirements — Part 4: Noise measurement methods and reduction*

EN 13490:2001+A1:2008, *Mechanical vibration — Industrial trucks — Laboratory evaluation and specification of operator seat vibration*

EN ISO 2860:2008, *Earth-moving machinery — Minimum access dimensions (ISO 2860:1992)*

EN ISO 2867:2011, *Earth-moving machinery — Access systems (ISO 2867:2011)*

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

EN ISO 3691-1:2015, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks (ISO 3691-1:2011, including Cor 1:2013)*

EN ISO 10326-1:2016, *Mechanical vibration — Laboratory method for evaluating vehicle seat vibration - Part 1: Basic requirements (ISO 10326-1:2016, Corrected version 2017-02)*

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

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN 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 21281:2005)*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 1915-1:2013, EN 1915-3:2004+A1:2009 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
baggage and equipment tractor
industrial truck, travelling on the ground, intended for use on airports, fitted with coupling means and specially designed to draw trailers

3.2
maximum drawbar pull
maximum reached horizontal towing capacity at stall

Note 1 to entry: When establishing the maximum drawbar pull, an operator's mass of 80 kg is taken into account.

3.3
whole body vibration
vibration transmitted to the body as a whole through the buttocks of a seated operator

3.4
SEAT factor
Seat Effective Amplitude Transmissibility factor
ratio of the frequency-weighted root mean square (r.m.s) acceleration on the seat divided by the frequency-weighted r.m.s acceleration at the platform

Note 1 to entry: See EN 13490:2001+A1:2008.

3.5
Categories

3.5.1
category A
tractor with wheel (mean) diameter equal or below 800 mm and solid rubber or pneumatic tyres

3.5.2
category B
tractor with wheel (mean) diameter above 800 mm and rubber solid or pneumatic tyres

3.6
restraint system
restraint device, system, or enclosure intended to reduce the risk of entrapment of the operator's head and/or torso between the tractor and ground in the event of a tip-over

3.7
SIP
Seat Index Point
point on the central vertical plane of the seat as determined by ISO 5353

[SOURCE: EN ISO 3164:2013, 3.2]

Note 1 to entry: See EN ISO 3411:2007.

3.8
OPC
operator presence control
control device that automatically interrupts the power, e.g. to a drive or an engine, when the operator's actuating force is removed

4 List of significant hazards

The list of risks and hazards (given at Annex A) is based on EN ISO 12100:2010 and contains the hazards and hazardous situations as far as they are dealt with in this European standard, identified by risk assessment as significant for baggage and equipment tractors and which require action to eliminate or reduce the risk. Not covered are hazards due to the traffic and repair.

5 Safety requirements and/or measures

5.1 General requirements

5.1.1 Baggage and equipment tractors shall conform to the requirements of this standard and the relevant requirements of EN 1915-1:2013, EN 1915-2:2001+A1:2009, EN 1915-3:2004+A1:2009 and

EN 1915-4:2004+A1:2009 unless otherwise specified in this standard. The specific requirements of this European standard take precedence over those of the EN 1915 series.

Machinery shall comply with the safety requirements and/or measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100:2010 for relevant but not significant hazards which are not dealt with by this document.

5.1.2 Stability and strength calculations shall be carried out in accordance with EN 1915-2:2001+A1:2009.

5.1.3 The overall dimensions of baggage and equipment tractors shall be kept to a minimum, consistent with their function, taking into account site operational requirements.

The following information shall be determined by the manufacturer through consultation with the user:

a) overall dimensions;

b) speeds;

c) maximum drawbar pull;

d) drawbar interface heights;

e) maximum-braked train mass.

5.1.4 Internal combustion engine powered baggage and equipment tractors using liquefied petroleum gas (LPG) shall be in accordance with the requirements of EN ISO 3691-1:2015, 4.5.4.

5.2 Driver's accommodation

5.2.1 Baggage and equipment tractors shall be equipped with seated driver accommodation.

5.2.2 The operator's seat shall be so located that the operator has sufficient room while operating the baggage and equipment tractor so as to remain within the plan view outline of the tractor. The minimum dimensions given in Annex B shall be applied. The dimensions shall be of suitable and ergonomic shape to accommodate at least a 5th percentile to a 95th percentile of the population, as shown in EN ISO 3411:2007, Figures 1 to 3, within the plan view outline of the tractor. The seat shall not extend beyond the plan view outline of the tractor.

5.2.3 Provision shall be made for the storage of operating instructions in the vicinity of the driver's accommodation. This shall not obstruct the driver's usual field of operation and view nor constitute a dangerous obstacle in case of a frontal impact.

5.2.4 In addition to seat belts (see 5.4.5), lateral restraint systems shall be provided on each side exposed to a risk of tipping over. Such means shall not unduly restrict the operation of the tractor, e.g. the driver's access, egress, movement, and/or visibility (see Annex D for recommendations). The lateral restraint system shall:

a) be provided to reduce the risk of entrapment of the operator's head and/or torso between the tractor and the ground in the event of a tip-over. For this purpose it shall be designed so that the driver's shoulders are under the top level of the protection, whatever the adjustment of the seat;

b) be latched in the protective position;

c) prevent the whole body of the operator passing through the lateral opening;