DIN EN ISO 3691-1:2020-11 (E)

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 + AMD.1:2020)

Contents

Page

European foreword ... 5

European foreword to Amendment A1 ... 6

Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered ... 7

Foreword ... 12

Foreword to Amendment 1 ... 13

Introduction ... 14

1 Scope ... 16

2 Normative references ... 17

3 Terms and definitions ... 19

4 Safety requirements and/or protective measures ... 21
4.1 General ... 21
4.1.1 Overall requirements ... 21
4.1.2 Normal climatic conditions ... 21
4.1.3 Normal operating conditions ... 21
4.1.4 Electrical requirements ... 22
4.1.5 Edges or angles ... 22
4.1.6 Stored energy components ... 22
4.2 Starting/moving ... 22
4.2.1 Unauthorized starting ... 22
4.2.2 Unintended movement and inadvertent activation ... 22
4.2.3 Travel speed ... 23
4.3 Brakes ... 24
4.3.1 General ... 24
4.3.2 Failure of energy supply to service brake ... 24
4.3.3 Stand-on and pedestrian-controlled trucks ... 25
4.4 Manual control actuators ... 25
4.4.1 General ... 25
4.4.2 Travel and braking controls ... 25
4.4.3 Steering controls ... 27
4.4.4 Load-handling controls ... 28
4.4.5 Multi-function controls ... 29
4.4.6 Controls for automated functions ... 29
4.4.7 Marking ... 29
4.5 Power systems and accessories ... 29
4.5.1 Exhaust and cooling systems ... 29
4.5.2 Fuel tank ... 29
4.5.3 Access to engine and other compartments ... 29
4.5.4 Liquefied petroleum gas (LPG)-powered trucks ... 30
4.6 Systems for lifting and tilting ... 32
4.6.1 Lift chains ... 32

4.6.2 Mechanical lifting systems 33
4.6.3 Hydraulic lifting and tilting systems 33
4.6.4 Hydraulic systems 34
4.6.5 Load-handling and -stacking attachments 34
4.7 Operator positions 35
4.7.1 Dimensions 35
4.7.2 Operator access and egress 36
4.7.3 Platforms 37
4.7.4 Operator's seat 37
4.7.5 Protection from road wheels and objects thrown up by the wheels 38
4.7.6 Protection from burning 40
4.7.7 Protection against crushing, shearing and trapping 40
4.7.8 Operator restraint 40
4.7.9 Additional operator positions 41
4.8 Stability 41
4.8.1 General 41
4.8.2 Specific operating conditions 41
4.8.3 Levelling indicator for rough-terrain trucks 42
4.9 Protective devices 42
4.9.1 Overhead guard 42
4.9.2 Load backrest extension 42
4.9.3 Warning device 42
4.9.4 Wheels with split wheel rims for inflatable tyres 42
4.9.5 Traction battery compartment 43
4.9.6 Battery-restraint devices 43
4.9.7 Starter battery requirements 44
4.9.8 Handling of batteries 44
4.10 Visibility and lighting 44
4.10.1 Visibility 44
4.10.2 Lighting 44
4.11 Environmental conditions 44
4.11.1 Operator's cab 44
4.11.2 Noise emissions 45
4.11.3 Vibration 45
4.11.4 Electromagnetic compatibility (EMC) 45
4.11.5 Transport 45
4.12 Devices for towing 46

5 Verification of safety requirements and/or protective measures 46
5.1 General 46
5.2 Structural tests 46
5.3 Functional verification 47

6 Information for use 47
6.1 General 47
6.2 Instruction handbook 47
6.2.1 Truck/attachments 47
6.2.2 Operation of truck 47
6.2.3 Details for battery-powered trucks 49
6.2.4 Details for internal-combustion-engine powered trucks 49
6.2.5 Service and maintenance 49
6.2.6 Transportation, commissioning and storage 50
6.2.7 Truck modification 50
6.3 Marking 51

6.3.1 Information plates 51
6.3.2 Information plate for trucks operating in special conditions 52
6.3.3 Other information 52
6.3.4 Languages 53
6.3.5 Operator restraint 53
Annex A (normative) Determination of driving direction and rated capacity 54
A.1 Forward-driving direction 54
A.2 Rated capacity 54
A.2.1 Specification 54
A.2.2 Standard lift height, *H* 55
A.2.3 Standard load centre distance, *D* 56
A.3 Rated drawbar pull of tractors 56
Annex B (informative) List of significant hazards 57