



Product Service

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Report No.: 70.435.24.138.01-00 I of II

TEST REPORT	
EN ISO 3691-5:2015/A1:2020	
TUV SUD Test Report for Industrial trucks - Safety requirements and verification - Part 5: Pedestrian-propelled trucks	
Report No.:	70.435.24.138.01-00 I of II
Date of issue:	2024-09-27
Project handler:	Hanming Zhang
Testing laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
Address:	No. 1999 Duhui Road, Shanghai 201108, P. R. China
Testing location:	as above
Client:	Vietmachine Producing and Trading Co., Ltd.
Client number:	076538
Address:	Plot VII.1, Plot VIII.3, Thuan Thanh 3 Industrial Park, Thanh Khuong, Thuan Thanh, 16511 Bac Ninh, VIETNAM
Contact person:	Dinh Truong An
Standard:	This TUV SUD test report form is based on the following requirements: EN ISO 3691-5:2015/A1:2020
TRF number and revision:	EN ISO 3691-5:2015/A1:2020 Rev.00
TRF originated by:	TUV SUD Product Service, Mr. Hanming Zhang (<i>product specialist</i>)
Copyright blank test report:	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TUV SUD Product Service. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
General disclaimer:	This test report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.
Scheme:	☐ TUV Mark ☐ without certification ☒ UK legislation
Non-standard test method:	☐ GS Mark ☐ NRTL Mark ☒ EU-Directive
National deviations:	☒ No ☐ Yes, see details under Summary of testing
Number of pages (Report):	N/A
Number of pages (Attachments):	37
Compiled by:	Hanming Zhang (Printed Name and Signature)
Approved by:	Qiang Sun (Printed Name and Signature)

Test Report EN_ISO_3691-5:2015/A1:2020

Test sample:	Pallet carts (Pallet Truck)
Type of test object:	MACH
Trademark:	ICHIMENS
Model and/or type reference:	XTN 1.0T, XTN 1.2T, XTN 1.5T, XTN 1.7T, XTN 2.0T, XTN 2.5T
Rating(s):	Refer to CDF 70.435.24.138.01-00
Manufacturer:	Vietmachine Producing and Trading Co., Ltd.
Manufacturer number:	076538
Address:	Plot VII.1, Plot VIII.3, Thuan Thanh 3 Industrial Park, Thanh Khuong, Thuan Thanh, 16511 Bac Ninh, VIETNAM
Sub-contractors/ tests (clause):	N/A
Name:	N/A
Order description:	☒ Complete test according to TRF
	☐ Partial test according to manufacturer's specifications
	☐ Preliminary test
	☐ Spot check
	☐ Others:
Date of order:	2024-09-06
Date of receipt of test item:	2024-09-06
Date(s) of performance of test:	2024-09-11 to 2024-09-19
Test item particulars:	N/A
Purpose of the product (Description of intended use): Manufacturer's specification for intended use: The pallet truck is designed to be manually pushed, pulled and steered, on a smooth, level, hard surface, by a pedestrian operator using an articulated tilted.	
Characteristic data (not shown on the marking plate): Refer to CDF 70.435.24.138.01-00	
Attachments:	N/A

General remarks:

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a **comma** is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

Summary of testing:

The technical data & parameter of XTN 1.0T is same as XTN 1.2T only excluding the opening pressure of safety valve is different, which leads to different rated load, the actual product will be according to client's requirement. So the type testing is conducted with the model XTN 1.2T, rated load:1200kg. The technical data & parameter of XTN 1.5T is same as XTN 1.7T only excluding the opening pressure of safety valve is different, which leads to different rated load, the actual product will be according to client's requirement. So the type testing is conducted with the model XTN 1.7T, rated load:1700kg.

☐ deviation(s) found

☒ no deviations found

Additional information on Non-standard test method(s)

Sub clause: N/A

Page: N/A

Rational: N/A

If additional information is necessary, please provide

N/A

Copy of marking plate:

Refer to CDF 70.435.24.138.01-00

Picture of the product:

Refer to CDF 70.435.24.138.01-00

Name and address of factory (ies) *(only if certification is provided):*

Refer to CDF 70.435.24.138.01-00

Possible test case verdicts:

test case does not apply to the test object: N/A (not applicable / not included in the order)

test object does meet the requirement: P (Pass)

test object does not meet the requirement: F (Fail)

Possible suffixes to the verdicts:

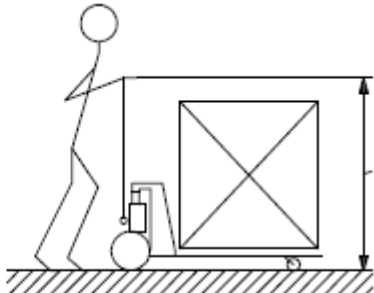
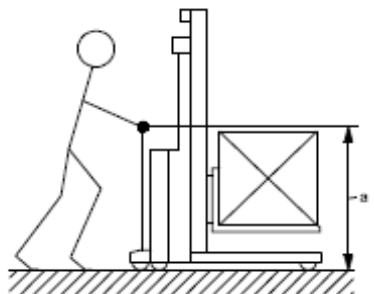
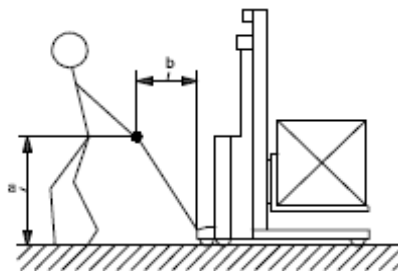
suffix for detailed information for the client: C (Comment)

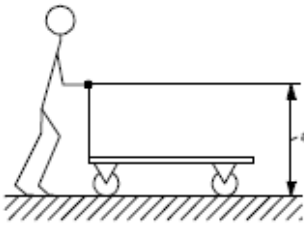
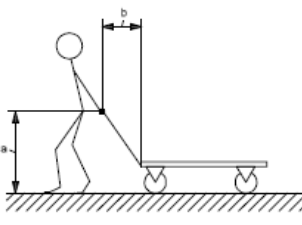
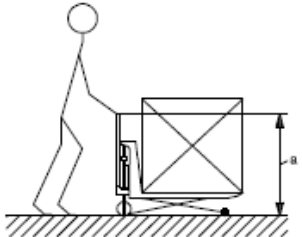
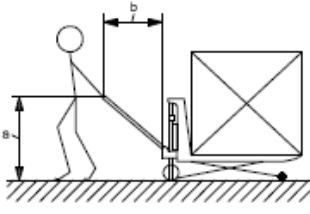
suffix for important information for factory M (Manufacturing)

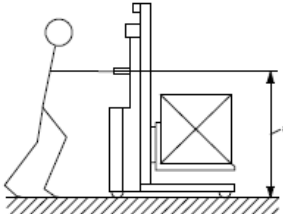
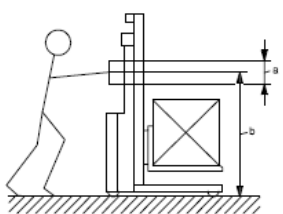
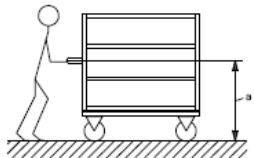
inspection:

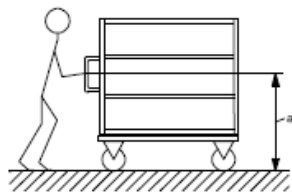
Clause	Requirement + Test	result – Remark	Verdict																														
1.	Scope		-																														
2.	Normative references		-																														
3.	Terms and definition		-																														
4.	Safety requirements and/or protective measures		-																														
4.1	General 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.	Informative.	-																														
4.2	Propelling, steering																																
4.2.1	Push/pull handles Push/pull handle(s), either vertical or horizontal, and/or a tiller shall be provided to allow the operator to push, pull and steer the truck and, where applicable, lift the load. The force shall be measured and be within the limits defined in Annex A.	<table><tr><td>Model</td><td>XTN 1.2T</td><td>XTN 1.7T</td></tr><tr><td>Starting</td><td>250N</td><td>290N</td></tr><tr><td>Rolling</td><td>140N</td><td>217N</td></tr><tr><td>Lifting</td><td>200N</td><td>364N</td></tr><tr><td>Steering</td><td>150N</td><td>217N</td></tr><tr><td>Model</td><td>XTN 2.0T</td><td>XTN 2.5T</td></tr><tr><td>Starting</td><td>367N</td><td>480N</td></tr><tr><td>Rolling</td><td>250N</td><td>450N</td></tr><tr><td>Lifting</td><td>318N</td><td>382N</td></tr><tr><td>Steering</td><td>423N</td><td>450N</td></tr></table> Although the steering force of model XTN 2.0T and XTN 2.5T over the requirements in Annex A, this can be accept here that the operation with overload force won't lead to any damage of the product and the operator's safety.	Model	XTN 1.2T	XTN 1.7T	Starting	250N	290N	Rolling	140N	217N	Lifting	200N	364N	Steering	150N	217N	Model	XTN 2.0T	XTN 2.5T	Starting	367N	480N	Rolling	250N	450N	Lifting	318N	382N	Steering	423N	450N	P-C
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4.2.2	Tiller The tiller shall be provided with a handle of the closed loop type or otherwise designed to ensure lateral protection of the operator's hands. The hand grips shall be of a cross-section enclosed within the space between two concentric circles of 25 mm inside diameter and 35 mm outside diameter and provide a minimum span of 120 mm for each hand. The height of the tiller handle (dimension a) shall conform to the dimensions shown in Figures 1 to 7. When pulling, the horizontal distance between the end of the tiller and the front of the wheel (dimension b in Figures 3, 5, and 7) shall be more than	The tiller fulfilled the requirements. The height of the tiller handle a=1210mm for all models which fulfill the specification. When pulling, a and b fulfill the specification. The tiller will automatically return to the upper rest position when released	P																														

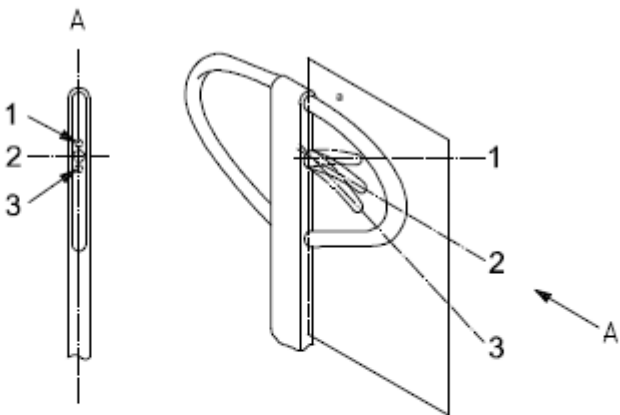
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Clause	Requirement + Test	result – Remark	Verdict
	500 mm, the handle axis being positioned within 700 mm to 1 000 mm height. The tiller shall automatically return to the upper rest position when released.		
	 a 1 100 mm to 1 300 mm. Figure 1 — Height of tiller handle  a 1 100 mm to 1 300 mm. Figure 2 — Tiller (pushing)  a 700 mm to 1 000 mm. b 500 mm minimum. Figure 3 — Tiller (pulling)		--

Clause	Requirement + Test	result – Remark	Verdict
	 a 1 100 mm to 1 300 mm. Figure 4 — Tiller (pushing)  a 700 mm to 1 000 mm. b 500 mm minimum. Figure 5 — Tiller (pulling)		--
	 a 1 100 mm to 1 300 mm. Figure 6 — Height of tiller handle  a 700 mm to 1 000 mm. b 500 mm minimum. Figure 7 — Position of tiller when pulling		--

Clause	Requirement + Test	result – Remark	Verdict
4.2.3	Push/pull bars The height from the ground to the centre of push/pull bar shall be 1 100 mm to 1 300 mm, see Figures 8 to 11. Vertical bars shall have a vertical length of at least 300 mm, see Figure 9. A minimum distance of 50 mm shall be provided between the lateral outside of the push/pull bars and the lateral plan view of the truck. The hand grips shall be of a cross-section that is enclosed within the space between two concentric circles of 25 mm inside diameter and 35 mm outside diameter.	Not applicable.	N/A
	 a 1 100 mm to 1 300 mm. Figure 8 — Horizontal push/pull handle  a 300 mm minimum. b 1 100 mm to 1 300 mm. Figure 9 — Vertical push/pull handle  a 1 100 mm to 1 300 mm. Figure 10 — Horizontal push/pull handle		--

Clause	Requirement + Test	result – Remark	Verdict
	 a 1 100 mm to 1 300 mm. Figure 11 — Vertical push/pull handle		
4.3	Load-handling controls		
4.3.1	General Lift and lower controls may be located on the tiller, when fitted, or may be by a separate device. Controls shall be designed to minimize the risk of unintended operation and shall return to neutral and stop movement when released.	Lift and lower controls are located on the tiller.	P
4.3.2	Control with a device located on the tiller If the lift and lower controls are on the tiller, they shall be located in such a way that the operator is able to activate the controls without releasing hold of the hand grip. The lift and neutral controls shall be maintained in the selected position. The lower control, when released, shall return to the neutral position and lowering movement of the forks or platform shall stop. The actuating force on selection devices shall not exceed 150 N. Where the movements of selection devices for lifting and lowering are located in a plane parallel to the tiller plane, the lift control shall be selected by pushing the selection devices towards the tiller articulation point, and the lower control by pulling the selection device in the opposite direction. See Figure 12.	The lift and lower controls are on the tiller and can be easy to activate the controls without releasing hold of the hand grip. The actuating force is less than 150N for all models. Movements of the selection devices fulfilled the specification	P

Clause	Requirement + Test	result – Remark	Verdict
	 Key 1 lower 2 neutral 3 raise a Tillerplane. Figure 12 — Example of selection control lever in plane of tiller		--
4.3.3	Control with a device not located on the tiller Lifting can be performed by a separate device, e.g. a hand pump lever, foot-operated lever or rotating handle. Lowering can be by a separate device, e.g. hand-operated lever, foot-operated lever or screw type valve, all of which return to neutral or closed position and stop movement when released.	Not applicable.	N/A
4.4	Lifting systems		
4.4.1	Chain system The truck or mast manufacturer shall have on record a certificate on chains from the chain manufacturer, showing the breaking load of chains. When the lifting mechanism includes a chain or chains, the truck manufacturer shall only use leaf or roller chains. The chain(s) shall provide a minimum safety factor, $K_1 \geq 5$, when the maximum capacity load is in the transporting position, assuming no friction in the mast structure. K_1 is given by Equation (1): $K_1 = (L_c \times n) / (R + w)$ (1)	Not applicable.	N/A

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Clause	Requirement + Test	result – Remark	Verdict
	where K_1 is the safety factor of the chain; L_c is the minimum breaking load for a new chain; n is the number of chains; R is the maximum load capacity of the truck; w is the dead weight of lifting mechanism supported by the chains. Pulley diameters shall be in accordance with the chain manufacturer's instructions.		
4.4.2	Wire rope system The truck manufacturer shall select wire ropes that will provide a minimum safety factor of $K_2 = 6$ when the rated capacity is in the transporting position, assuming no friction in the mast structure. K_2 is given by Equation (2): $K_2 = (L_r \times n) / (R + w)$ (2) where K_2 is the safety factor of the rope; L_r is the minimum breaking load for new wire rope; n is the number of wire ropes; R is the maximum rated capacity of the truck; w is the dead weight of lifting mechanism. The diameter of wire rope guide pulleys, measured from the bottom of the groove, shall be at least $22 \times$ the diameter of the wire rope. Splicing of wire ropes, except at the terminal ends, is not allowed. Where more than one wire rope is used, means shall be provided to limit uneven loading in the wire ropes, e.g. by adjustment.	Not applicable.	N/A
4.4.3	Hydraulic system		
4.4.3.1	Limitation of stroke On stacker trucks, the lift assembly shall be fitted with a positive means of preventing over-travelling. In addition, positive means (e.g. mechanical stops) shall be provided to prevent the fork carrier and moving elements of the	Not a stacker trucks	P

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Clause	Requirement + Test	result – Remark	Verdict																		
	mast structure from unintentionally disengaging from the upper end of the mast. On pallet and scissor-lift trucks, means shall be provided to limit the stroke of the lifting ram at stroke end.	The limit was provided at the stroke end.																			
4.4.3.2	Load supporting The descent of a load equal to the rated capacity caused by an internal leakage in the hydraulic system shall not exceed 25 mm during the first 10 min, under intended operation and with hydraulic fluid at the ambient temperature.	<table><tr><td>Model:</td><td>XTN 1.2T</td><td>XTN 1.7T</td></tr><tr><td>Load:</td><td>1200kg</td><td>1700kg</td></tr><tr><td>Descend:</td><td>0.5mm</td><td>1.2mm</td></tr><tr><td>Model:</td><td>XTN 2.0T</td><td>XTN 2.5T</td></tr><tr><td>Load:</td><td>2000kg</td><td>2500kg</td></tr><tr><td>Descend:</td><td>0.5mm</td><td>1.1mm</td></tr></table>	Model:	XTN 1.2T	XTN 1.7T	Load:	1200kg	1700kg	Descend:	0.5mm	1.2mm	Model:	XTN 2.0T	XTN 2.5T	Load:	2000kg	2500kg	Descend:	0.5mm	1.1mm	P
Model:	XTN 1.2T	XTN 1.7T																			
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Model:	XTN 2.0T	XTN 2.5T																			
Load:	2000kg	2500kg																			
Descend:	0.5mm	1.1mm																			
4.4.3.3	Pressure relief valves Except for manually operated lifting trucks, all powered hydraulic systems shall include a device that prevents the pressure in the system from exceeding a preset level, which shall be less than 115 % of the maximum working pressure under the intended operation. The device shall be so designed that it cannot work loose by itself and that a tool or key is required to alter the pressure setting. Manually operated lifting trucks shall be designed in such a way that can be equipped with a pressure-limiting device.	The max. working pressure were less than 115% of rated load.	P																		
4.4.3.4	Hydraulic circuit All hoses, pipes and connections subject to internal pressure shall be capable of withstanding, without bursting or permanent deformation, a pressure equal to at least three times the operating pressure of the respective hydraulic circuit. On trucks with powered lifting, the hydraulic system shall include a means for appropriate filtering (e.g. a filter or collecting magnet).	No hoses nor pipes connections. Truck with manual power lifting.	N/A																		
4.4.3.5	Lowering speed limitation On stacker trucks, a device shall be incorporated in the lift circuit –		P																		

Clause	Requirement + Test	result – Remark	Verdict
	excluding the hydraulic lift cylinder(s) - shall restrict the rate of descent of the lifting mechanism with its rated load to 0,6 m/s maximum. The device shall be fitted directly at the lifting cylinder(s) On pallet and scissor-lift trucks, the lowering device shall be designed to allow the operator to control the lowering speed, or the lowering speed shall automatically be limited to 0,2 m/s.	The lowering speed can be controlled by operator.	
4.4.3.6	Failure of energy supply of hydraulic circuit In the case of a fault or interruption of the supply of energy, the design of the hydraulic system shall be such that it does not allow any uncontrolled motion of equipment or attachment. Unintentional descent of the lifting system shall be avoided.	Tested with positive results. Non-return valve is integrated with product.	P
4.4.4	Fork arms and platforms — Stacker trucks only Disengagement of the fork arms from the fork carrier shall only be possible with intentional manual action.	Not stacker truck.	N/A
4.4.5	Fork carriers — Stacker trucks only		
4.4.5.1	Disengagement of the fork Fork carriers shall comply with ISO 2328.	Not stacker truck.	N/A
4.4.5.2	Fork arm removal slot Fork carriers shall comply with ISO 2328.	Not stacker truck.	N/A
4.4.5.3	Unintentional lateral displacement of fork arms Fork carriers shall comply with ISO 2328.	Not stacker truck.	N/A
4.4.6	Load-handling attachments — Stacker trucks only		
4.4.6.1	Disengagement of the attachments Disengagement of the attachments	Not stacker truck.	N/A

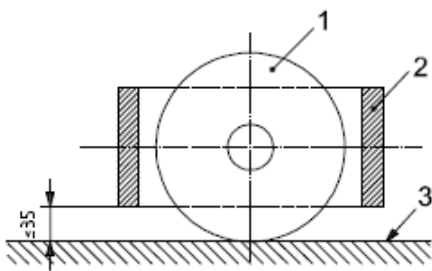
Test Report EN_ISO_3691-5:2015/A1:2020

Clause	Requirement + Test	result – Remark	Verdict
	(clamps, tilted fork carrier, fork extensions, etc.) shall only be possible with intentional manual action. Movements of the attachment and its parts shall be mechanically limited at the extreme positions.		
4.4.6.2	Clamping devices Clamping devices shall be so designed that the clamping pressure is automatically sustained for at least 10 min by means of non-return valves or any other effective system when the truck's control mechanisms are in the neutral position, or in the event of a malfunction in the power system of the attachment used for support of the load. Instructions in the event of a malfunction shall be given in accordance with 6.2.3 n).	Not stacker truck.	N/A
4.4.6.3	Separate attachment hydraulic system If an attachment has its own separate hydraulic system, this shall comply with the provisions of 4.4.3.4.	Not stacker truck.	N/A
4.4.6.4	Attachment hydraulic system connected to truck hydraulic system If an attachment has a hydraulic system that is connected to the truck hydraulic system, then the two systems shall be compatible and the combined system shall comply with the provisions of 4.4.3.4.	Not stacker truck.	N/A
4.5	Parking brake Stacker and platform trucks shall be provided with a parking brake that should be sufficient to hold the truck laden to its rated capacity on a gradient of 5 % with a hard, smooth surface. Pallet and scissor-lift trucks shall be designed in such a way that they can be equipped with a parking brake.	The parking brake can be equipped and mentioned in the user manual.	P
4.6	Stability		P

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Clause	Requirement + Test	result – Remark	Verdict
	In order to minimize the hazards of longitudinal and lateral tip-over during intended operation, the trucks shall comply with the requirements for the respective tests defined, for example, in ISO 22915-16 without permanent deformation.	Tested with positive results.	
4.7	Lateral stabilizers Scissor lifts shall be equipped with stabilizers that shall be automatically applied at between 350 mm and 450 mm lift height. They shall be able to maintain the truck at a standstill on level ground. If manoeuvring with an applied stabilizer is required, a device (e.g. roller) shall be provided with the stabilizer.	Not applicable.	N/A
4.8	Protection against crushing, shearing and entanglement points Parts that move relative to one another and are within reach of the operator in the normal operating position shall be adequately guarded. If residual hazards exist, these shall be identified in accordance with 6.2.3. The following minimum distances in accordance with ISO 13857, shall apply: - places where the operator's fingers can be trapped: 25 mm - places where the operator's hands or feet can be trapped: 50 mm - places where the operator's arms or legs can be trapped: 100 mm If hazards still exist, they shall be identified on the truck in accordance with 6.3.3.4. Protection against crushing, shearing and entanglement is subject to regional requirements, additional to the requirements of this part of ISO 3691. See ISO/TS 3691-7.	Fulfilled the requirements.	P
4.9	Edges and angles External parts of the truck which may impact parts of the body shall be free of	Fulfilled the requirements.	P

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Clause	Requirement + Test	result – Remark	Verdict
	sharp edges and angles that pose a hazard to the operator in the normal operating position.		
4.10	Protective devices		
4.10.1	Wheel guards Stacker and platform trucks fitted with push-pull handles and with wheels or castors that extend beyond the confines of the truck chassis shall be provided with guards as illustrated in Figure 13 to protect the operator's feet when in the normal operating position (see Figures 1 to 11). Figure 13 shows a typical wheel guard.	Not applicable	N/A
	Dimensions in millimetres  Key 1 wheel 2 deflector 3 ground (floor) Figure 13 — Example of wheel guard		--
4.10.2	Glass guards or screens If glass is used for guards or screens, it shall be toughened or laminated safety glass.	Not applicable	N/A
4.10.3	Stacker truck load backrest extension Stacker trucks with a lift height of 1 800 mm and higher shall be designed so that they can be equipped with a load backrest extension. For information for use, see 6.2.2 e) and 6.2.3 b).	Not applicable	N/A
4.10.4	Pallet handling Pallet truck fork arms shall be designed	Fulfilled the requirements.	P

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Clause	Requirement + Test	result – Remark	Verdict
	and manufactured to facilitate easy pallet entry and exit (e.g. use of rollers, skids, etc.).		
4.11	Additional requirements for trucks with battery-powered lifting		
4.11.1	Lifting Controls shall be chosen, designed and positioned so that - unintended activation is avoided, - they are clearly identified, - the movement of the control to activate the function corresponds to the intended effect, - they return to neutral when released. The lifting/lowering shall be stopped when releasing the control and shall hold the load in position.	Not applicable	N/A
4.11.2	Electrical systems and equipment All electrical systems and equipment shall comply with ISO 20898, except where regional requirements apply. See ISO/TS 3691-7. Batteries shall be firmly attached in a ventilated space. Batteries and/or battery locations shall be so designed and built, or covered, to minimize any hazard to the operator caused by battery acid or acid vapours. Live parts (not connected to the frame) and/or connectors shall be covered with insulating material. It shall be possible to disconnect batteries easily, e.g. by quick coupling or using an accessible isolator switch.	Not applicable	N/A
4.12	Lifting points Lifting points shall be provided if required.	Not applicable	N/A
5	Verification of safety requirements and/or protective measures		
5.1	General The manufacturer shall have verification that the requirements of this part of ISO 3691 have been incorporated into the design and manufacture of the truck. Either one or	Informative.	P

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Clause	Requirement + Test	result – Remark	Verdict
	a combination of the following shall achieve this: - design, e.g. verification of drawings and documents or calculation; - measurements, e.g. tests of travelling and lowering speed or lift and tilt leakage; - visual examination, e.g. no permanent deformation after tests, verification of the marking of the truck; - further tests.	Drawing provided.	
5.2	Functional verification Functional verification shall be carried out on the truck to verify that it is able to perform the tasks for which it was designed. The truck shall be inspected to make sure that the travelling, braking, steering, load-handling controls and combined functions, if any, are appropriately identified and operate correctly. The correct operation of any warning devices, safety devices and lighting shall also be checked.	Checked, OK	P
5.3	Design verification (type test) For design verification, see test forces in Annex A.	Checked, OK	P
6	Information for use		
6.1	General All identified hazards shall be addressed in the instruction handbook. There is no need for the workshop and parts handbooks intended for use by specialized personnel employed by the manufacturer or his authorized representative to be supplied with each truck, and these can be printed in the language of the country where the truck is to be used, as required by national law. In other cases, the instructions shall be in a language agreed between the truck supplier and purchaser.	All necessary information were provided on the digital user manual from customer.	P-C
6.2	Instruction handbooks		
6.2.1	General		

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Clause	Requirement + Test	result – Remark	Verdict
	Each truck and removable attachment shall be supplied to the user with an instruction handbook covering operating and regular servicing, printed in the language of the country where the truck is to be used, where this is required by national law. See also ISO 12100:2010, 6.4.5. The instruction handbook(s) shall include, if applicable, at least the information listed in 6.2.2 to 6.2.6. Instruction handbooks are subject to regional requirements, additional to the requirements of this part of ISO 3691. See ISO/TS 3691-7.	All necessary information were provided on the digital user manual from customer.	P-C
6.2.2	Concerning the truck/attachment a) name and address of the manufacturer or, where applicable, of the authorized representative; b) designation of type, e.g. stacker truck, pallet truck; c) description of the truck; d) attachments that are supplied with the truck and their assembly precautions; e) details of use of the removable load backrest extension; f) details for the installation of a fire extinguisher, if required by the application of the truck; g) description of the safety devices and warning labels.	All necessary information were provided on the digital user manual from customer.	P-C
6.2.3	Operation of the truck Recommendations on personal protective equipment to be used: a) intended uses of the truck and attachments; b) training requirements for the operator; c) function of operating controls and displays; d) daily checks before putting the truck into operation; e) de-energizing of stored energy components; f) instructions for safe handling by the operator, e.g. when changing attachments or moving fork arms;	All necessary information were provided on the digital user manual from customer.	P-C

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Clause	Requirement + Test	result – Remark	Verdict
	g) requirements of the ground/floor where the truck is to be used; h) instructions for handling loads, warning of the hazards due to the action of wind forces; i) instructions when operating on a gradient; j) instructions for towing the truck; k) instructions for parking the truck; l) warning of risks during the use of the truck and its attachments including crushing and shearing hazards; m) climatic conditions in which the truck is designed to operate; n) information or instructions on action to be taken in the event of malfunctions; o) the normal operating conditions and conditions defined by the manufacturer, i.e. those for which the truck has been designed and the manner in which the truck will be used; p) information about lighting of the working area; q) procedure for movement of inoperative trucks; r) instructions against operating the truck with guarding removed; s) lift height for travelling. t) information of instructions regarding modification of the truck, which can introduce hazards or risks not considered by manufacturers and can invalidate the existing truck risk assessments.		
6.2.4	Details for trucks with battery-powered lifting systems a) specification of approved batteries and on-board battery chargers; b) procedure for safe handling of batteries, including installation, removal and secure mounting on the truck; c) warning of risks of accumulation of hydrogen under covers; d) battery charging procedures and instructions.	Not applicable	N/A
6.2.5	Service and maintenance of the truck		

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Clause	Requirement + Test	result – Remark	Verdict
	a) training and qualifications for service and maintenance staff; b) safe procedure for the identification, detection and correction of faults; c) instructions for changing tyres or wheels; d) instructions for verifying that markings, e.g. decals, are in place and legible; e) instructions for de-energizing stored energy components; f) access for maintenance while working at height; g) servicing operations for which no specific skills are required; h) use of approved spare parts; i) drawings and diagrams necessary for truck service and maintenance; j) instructions for disposing of waste material (e.g. oils and battery); k) type and frequency of inspections and maintenance operations, paying particular attention to the replacement and durability of worn and serviceable parts, emissions, and to the user's logbook (e.g. filter, brakes, chains, hydraulic hoses); l) instructions about removing and re-attaching guarding.	All necessary information were provided on the digital user manual from customer.	P-C
6.2.6	Transportation, commissioning and storage a) mass and overall dimensions of the truck and dismantled parts for transport, commissioning and storage; b) procedures for transporting, including loading and unloading; c) procedure for truck reassembly and mounting of attachments; d) functional tests on completion of commissioning; e) procedure for movement of inoperative trucks; f) procedure for prolonged shutdown and storage of trucks.	All necessary information were provided on the digital user manual from customer.	P-C
6.2.7	Truck modification Truck modification outside Europe is subject to regional requirements. See ISO/TS 3691-8:2019.	Warning of unauthorized truck modification is not permitted existed in the user manual.	P-C

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Clause	Requirement + Test	result – Remark	Verdict
6.3	Marking		
6.3.1	Information plates Information plates are subject to regional requirements, additional to the requirements of this part of ISO 3691. See ISO/TS 3691-7.	All necessary information were provided on the digital label from customer.	P-C
6.3.1.1	Trucks Trucks shall be marked legibly and indelibly (e.g. weather-proof, profiled letters) with the following minimum details: a) name and address of the manufacturer or, where applicable, of his authorized representative; b) designation of series or type and compliance with requirements of this part of ISO 3691; c) serial number and the year of manufacture; d) non-laden mass of the truck in working order without removable attachments but with fork arms or integrated attachments (for battery-powered trucks, with and without battery); the mass may vary from the figure shown by up to $\pm 5\%$; e) the rated capacity information, which shall not be in view of the operator in the normal operating position; f) actual capacity at maximum lift height with load centre distance; where a secondary lift is fitted to a truck, the capacity at maximum lift shall be determined with the secondary mast fully elevated; g) actual capacities at other lift heights and load centre distances if applicable; h) actual capacity with each removable attachment fitted at the manufacturer's authorized lift height(s) and load centre(s); the actual capacities shall be easily readable by the operator in the normal operating position; i) on battery-powered trucks, the authorized maximum and minimum battery mass and the system voltage;	All necessary information were provided on the digital label from customer.	P-C

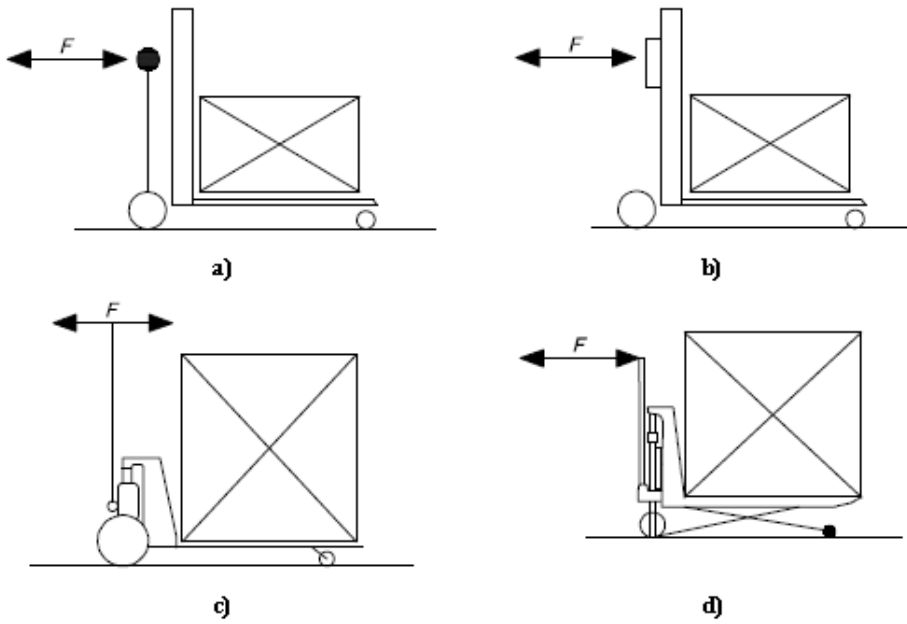
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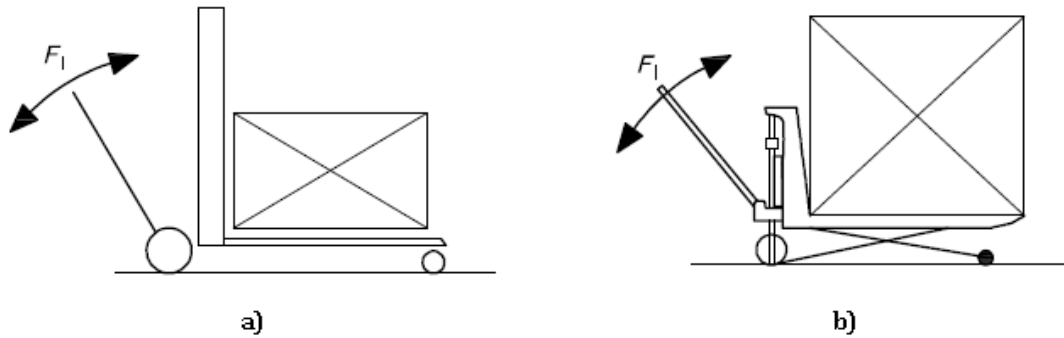
Clause	Requirement + Test	result – Remark	Verdict
	j) if fitted, the nominal power in kilowatts.		
6.3.1.2	Removable attachments Removable attachments shall be marked legibly and indelibly (e.g. weather-proof, profiled letters) with the following minimum details: a) name and address of the attachment manufacturer or, where applicable, his authorized representative; b) model or type; c) serial number and year of manufacture; d) mass of attachment, which may vary from the figure shown by up to $\pm 5\%$ or 200 kg, whichever is the lower; e) distance of the centre of gravity of the attachment from its mounting face on the truck; f) rated capacity; g) in the case of hydraulically or pneumatically operated attachments, the maximum operating pressure recommended by the attachment manufacturer; h) load centre if applicable; i) lost load centre; j) the instruction "The capacity of the truck and attachment combination shall be complied with."	Not applicable.	N/A
6.3.1.3	Marking of controls Controls shall be legibly and indelibly marked (e.g. weather-proof, profiled letters) with graphic symbols indicating the function(s) except where obvious, e.g. accelerator pedal. Each symbol shall be affixed to or in close proximity to the control to which it applies. Control symbols shall comply with ISO 3287 where available.	Controls were legibly and indelibly marked	P
6.3.2	Information plate for trucks operating in special conditions If a truck is designed to operate in special conditions, the manufacturer shall provide, where appropriate,	No special conditions.	N/A

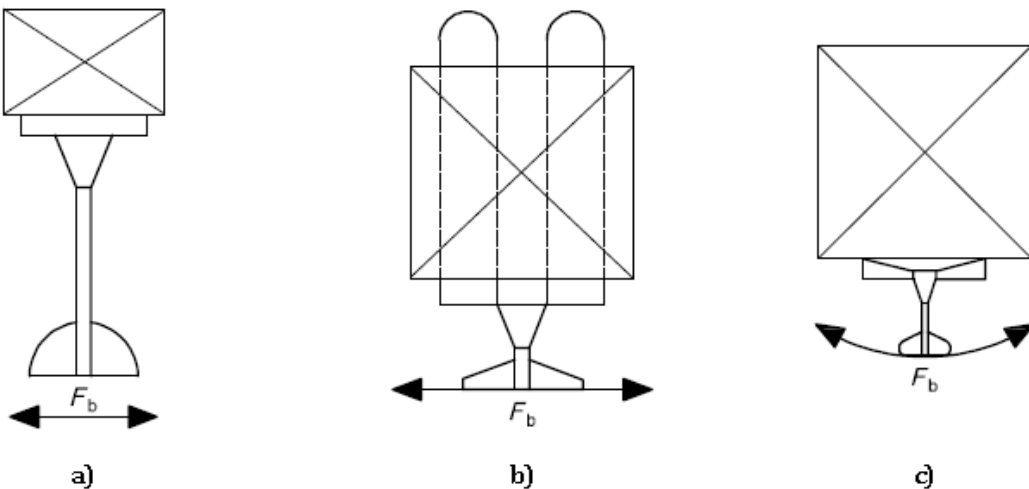
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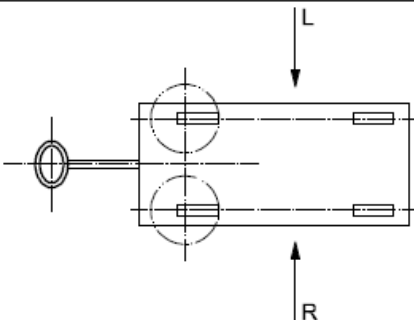
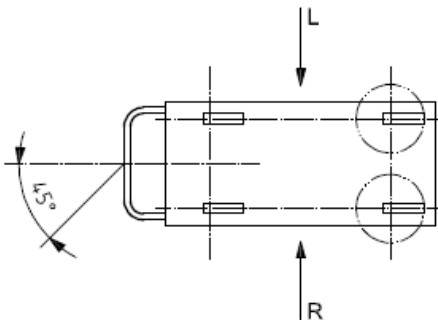
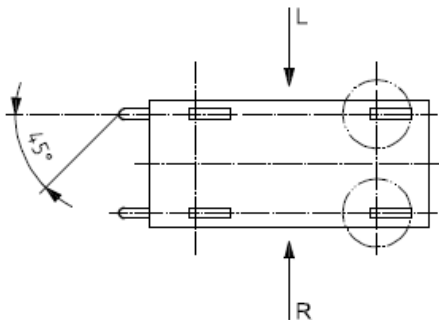
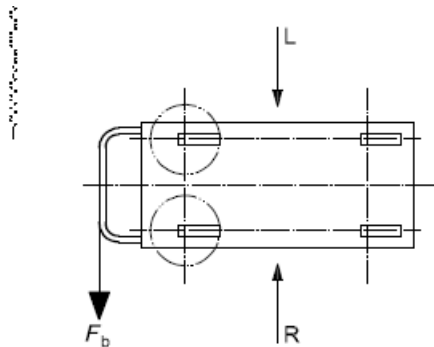
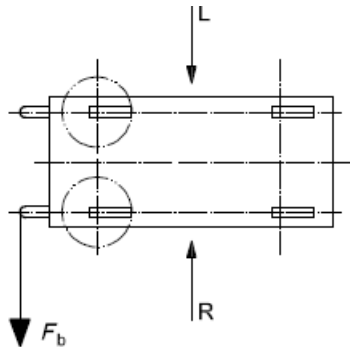
Clause	Requirement + Test	result – Remark	Verdict
	information in the instruction handbook, and an information plate on the truck identifying the special conditions of use including capacity if different from the actual capacities.		
6.3.3	Other information		
6.3.3.1	Marking for lifting or slinging of trucks Locations for slinging and lifting shall be clearly indicated on the truck or be declared in the instruction handbook.	No special conditions.	N/A
6.3.3.2	Pneumatic tyre inflation pressure The specified inflation pressures shall be clearly indicated on the truck.	No special conditions.	N/A
6.3.3.3	Filling points Filling points and hydraulic fluid shall be clearly indicated on the truck in accordance with ISO 3287.	Checked ok.	P
6.3.3.4	Warning signs Symbols giving warnings of residual hazards shall be affixed to the truck and attachments on or in close proximity to the hazard concerned. On stored energy devices, a warning label and the method for removing any stored energy shall be affixed to that component and noted in the service handbook. Warnings shall conform to ISO 15870.	Checked ok.	P
6.3.4	Languages If any of the information in 6.3.1 to 6.3.3 is in words, it shall be written in the language of the country where the truck is to be used, where this is required by the national laws of that country. In other cases the instruction shall be in a language agreed upon between the truck supplier and purchaser.	English version.	P
Annex A (normative)			

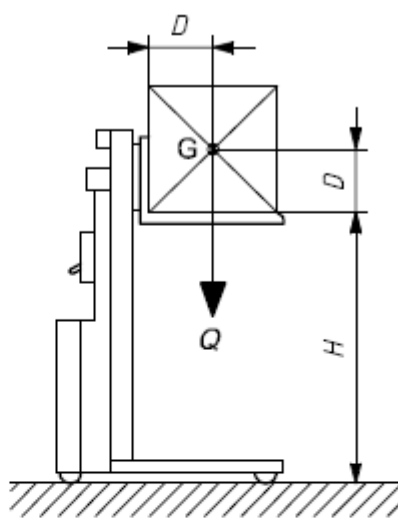
Clause	Requirement + Test	result – Remark	Verdict																																																													
Method for measurement of forces, F																																																																
A.1	Conditions for test The tests, chosen in accordance with 5.1, shall be carried out with a new truck on a smooth, dry, level, concrete floor in good condition. The tests shall be conducted at an ambient temperature of between 15 °C and 28 °C. The measuring instrument used shall indicate maximum values with ± 3 % accuracy. The efforts shall be measured in accordance with the methods described below for all the values of load indicated in Table A.1 which are less than or equal to the rated capacity. Table A.1 — Maximum design forces <table><tr><th rowspan="2">Test load kg</th><th colspan="2">Propelling</th><th colspan="3">Lifting (manual lifting only)</th><th rowspan="2">Steering N</th></tr><tr><th>Starting N</th><th>Rolling N</th><th>Hand-powered except pallet stacker N</th><th>Hand-powered pallet stacker N</th><th>Foot-powered N</th></tr><tr><td>250</td><td>150</td><td>75</td><td>100</td><td>200</td><td>300</td><td>150</td></tr><tr><td>500</td><td>200</td><td>100</td><td>150</td><td>200</td><td>300</td><td>200</td></tr><tr><td>750</td><td>250</td><td>150</td><td>200</td><td>200</td><td>300</td><td>250</td></tr><tr><td>1 000</td><td>300</td><td>200</td><td>250</td><td>200</td><td>300</td><td>300</td></tr><tr><td>1 500^a</td><td>400</td><td>300</td><td>350</td><td>N/A</td><td>N/A</td><td>300</td></tr><tr><td>2 000^a</td><td>500</td><td>400</td><td>400</td><td>N/A</td><td>N/A</td><td>300</td></tr><tr><td>2 300^a</td><td>500</td><td>450</td><td>400</td><td>N/A</td><td>N/A</td><td>300</td></tr></table> 1 500 kg, 2 000 kg and 2 300 kg applies only to pallet trucks. ^a The values in this table are maximum forces measured under conditions described above.			Test load kg	Propelling		Lifting (manual lifting only)			Steering N	Starting N	Rolling N	Hand-powered except pallet stacker N	Hand-powered pallet stacker N	Foot-powered N	250	150	75	100	200	300	150	500	200	100	150	200	300	200	750	250	150	200	200	300	250	1 000	300	200	250	200	300	300	1 500 ^a	400	300	350	N/A	N/A	300	2 000 ^a	500	400	400	N/A	N/A	300	2 300 ^a	500	450	400	N/A	N/A	300
Test load kg	Propelling		Lifting (manual lifting only)			Steering N																																																										
	Starting N	Rolling N	Hand-powered except pallet stacker N	Hand-powered pallet stacker N	Foot-powered N																																																											
250	150	75	100	200	300	150																																																										
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1 000	300	200	250	200	300	300																																																										
1 500 ^a	400	300	350	N/A	N/A	300																																																										
2 000 ^a	500	400	400	N/A	N/A	300																																																										
2 300 ^a	500	450	400	N/A	N/A	300																																																										
A.2	Measurement of starting force and rolling force																																																															
A.2.1	General With the truck in starting position and stationary, the wheels are positioned in the direction that they naturally take when moving the truck in the test direction. The force shall be applied horizontally along the truck’s axis on the tiller handle or bar. The tiller shall be maintained in vertical position along the truck’s axis (see Figure A.1). Two tests in both the forward and reverse directions shall be carried out and the average result recorded.																																																															

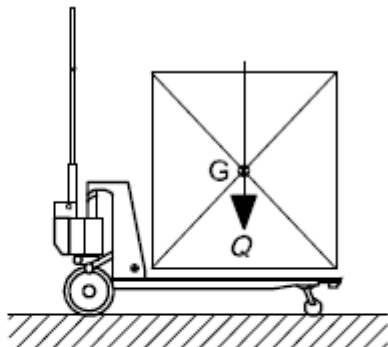
Clause	Requirement + Test	result – Remark	Verdict
	 Figure A.1 — Tiller in vertical position		
A.2.2	Starting force The maximum value necessary to start the truck shall be recorded.		
A.2.3	Rolling force The maximum value necessary to maintain the truck at a stabilized speed of 0,5 m/s (± 20 %) shall be recorded. The maximum starting force, $F_{d,max}$ or the maximum rolling force, $F_{r,max}$, is the average of the maximum values recorded in each direction of travel, forward, AV, and reverse, AR, during two successive tests. $F_{d,max} = \frac{F_{V,max} A_V 1 + F_{V,max} A_V 2 + F_{R,max} A_R 1 + F_{R,max} A_R 2}{4} \quad (A.1)$ $F_{r,max} = \frac{F_{V,max} A_V 1 + F_{V,max} A_V 2 + F_{R,max} A_R 1 + F_{R,max} A_R 2}{4} \quad (A.2)$		
A.3	Measurement of load lifting force		
A.3.1	Lifting using a tiller Engage fork arms into the pallet with its load and lift until they touch the underside of the pallet or, in the case of a platform, put the load on the platform in its lowered position. Actuate the tiller with full swing as many times as necessary to lift the load to its maximum height (see Figure A.2).		

Clause	Requirement + Test	result – Remark	Verdict
	 Figure A.2 — Actuating tiller to lift the load The maximum force value is measured perpendicularly to the tiller at each pumping cycle. The maximum lifting force, $F_{l,max}$, is the average of the maximum values measured for each pumping cycle: $F_{l,max} = \frac{\sum_{i=1}^n F_{l,max,i}}{n} \quad (A.3)$ where $F_{l,max,i}$ is the maximum lifting force for cycle i; n is the number of measurement cycles		
A.3.2	Lifting using a hand lever or a pedal The maximum force value is recorded during a lever or pedal cycle. The maximum lifting force, $F_{l,max}$, is the average of the maximum values recorded at each lever or pedal cycle during one complete lifting.		
A.3.3	Lifting using a rotating handle The maximum force value is recorded during each turn. The maximum lifting force, $F_{l,max}$, is the average of the maximum values recorded at each turn during one complete lifting.		
A.4	Measurement of the steering force		
A.4.1	Steering by means of a tiller With the truck stationary and lifted up to its travel position, measurement consists of recording the maximum force applied tangentially in the middle of the handle throughout the steering lock in one direction from the tiller's axial position (see Figure A.3).		

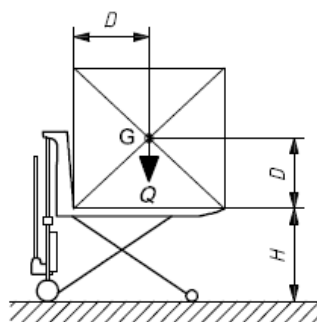
Clause	Requirement + Test	result – Remark	Verdict
	 Figure A.3 — Tangentially applied force During measurement, the lower surface of the tiller handle is maintained at a height of 950 mm above the ground. Two measurements are recorded in each direction of tiller steering. The maximum steering force, $F_{b,max}$, is the average of the four recorded measurements on the left hand side, L and on the right hand side, R. $F_{b,max} = \frac{F_{b,max}L1 + F_{b,max}L2 + F_{b,max}R1 + F_{b,max}R2}{4} \quad (A.4)$		
A.4.2	Steering by means of horizontal or vertical bars With the truck travelling at 1 km/h and lifted up to its travel position, measurement consists of recording the maximum force applied tangentially in the middle of the horizontal bar or between the vertical bars during 90° steering in one direction. Two measurements are recorded in each direction of bar steering. The maximum steering force, $F_{b,max}$, is the average of the four recorded measurements on the left hand side, L and on the right hand side, R.		

Clause	Requirement + Test	result – Remark	Verdict
	 a) Truck with tiller  b) Swivelling wheels placed on opposite side of bar or bow  c) Swivelling wheels placed on opposite side of bar or bow  d) Swivelling wheels placed on side of bar or bow  e) Swivelling wheels placed on side of bar or bow Figure A.4 — Position of the wheels and direction of the force at the beginning of measurement		
Annex B (normative) Rated capacity			
B.1	General		
B.1.1	Stacker trucks		
	The rated capacity is the load in kilograms given by the manufacturer, which the truck type is capable of transporting and/or lifting under the following specific conditions.		

Clause	Requirement + Test	result – Remark	Verdict
	The rated capacity is defined for a load uniformly distributed over the length and width of the fork arms or platform. It is equal to the load, Q_1, which the truck type is designed to carry and stack on fork arms or on a platform with a vertical mast, the maximum lift height of which is equal to the standard lift height, H (see Clause B.2), and with a standard load centre of gravity distance, D (see Clause B.3). The centre of gravity “G” shall be on the centre-line of the truck. Where a truck does not lift to the standard lift height, H, it is given a rated capacity at its maximum lift height.  Key D standard load centre of gravity distance G centre of gravity H standard lift height Q load Figure B.1 — Rated capacity of stacker trucks		
B.1.2	Pallet trucks The rated capacity is the load in kilograms given by the manufacturer, which the truck can raise and transport under intended operation. The rated capacity is defined for a load uniformly distributed over the length (see Figure B.2) and width of the fork arms, without going beyond the length. The centre of gravity shall be at the longitudinal axis of the truck.		

Clause	Requirement + Test	result – Remark	Verdict
	 Key G centre of gravity Q load Figure B.2 — Rated capacity of pallet trucks		
B.1.3	Scissor-lift pallet truck The rated capacity is the load in kilograms given by the manufacturer, which the truck can lift and transport under the following intended operation conditions: - the rated capacity is defined for a load uniformly distributed over the length and width of the fork arms or platform; - the centre of gravity is on the longitudinal axis of the truck, located at a distance measured horizontally from the face of the fork arm shank and vertically from the upper face of the fork arms; - the height, H, is the maximum lift height from the ground.		
B.2	Standard lift height This is the height, H, from the ground to the upper surface of the fork arm blades or load platform, as shown in Figures B.1 and B.3 and Table B.1		

Clause	Requirement + Test	result – Remark	Verdict
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**Key**

- D standard load centre of gravity distance
 G centre of gravity
 H standard lift height
 Q load

Figure B.3 — Rated capacity of scissors lift pallet truck**B.3****Standard load centre of gravity distance**

This is the distance, D , in millimetres from the centre of gravity “ G ” of the load measured horizontally to the front face of the fork arm shank and vertically to the upper surface of the fork arm blades, as shown in Figure B.3 and Table B.1.

Table B.1 — Load centre of gravity distance and lift height for rated capacity

Rated capacity Q kg	Standard lift height H m	Standard load centre of gravity distance D	
		Straddle stacker mm	Pallet stacker mm
$Q \leq 250$	1,5	250	—
$251 \leq Q \leq 500$	1,5	350/500	600
$501 \leq Q \leq 750$	2,0	500	600
$751 \leq Q \leq 1\,000$	2,5	500	600

NOTE This table does not apply to special applications.

Annex ZA**(informative)****Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC aimed to be covered**

This European Standard has been prepared under a Commission's standardization request “M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery” to provide on voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZA.1 – Correspondence between this European Standard and Annex I of Directive 2006/42/EC

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Clause	Requirement + Test	result – Remark	Verdict
The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes	
		<i>To cover all the relevant safety requirements for the products(s) in its scope, this standard (providing global requirements and references to regional requirements for a machine) has to be applied together with one of those standards as specified in the scope (providing European regional requirements for a machine).</i>	
1.1.2. Principles of safety integration	4.1		
1.1.3. Materials and products	4.4.3.4, 4.4.6.4, 4.10.2		
1.1.5. Design of machinery to facilitate its handling	4.10.4, 4.12, 6.3.3		
1.1.6. Ergonomics	4.2, 4.3.2		
1.1.7. Operating positions	4.10		
1.2.1. Safety and reliability of control systems	4.3, 4.4.3.5, 4.4.3.6		

Clause	Requirement + Test	result – Remark	Verdict
	The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
	1.2.2. Control devices	4.3	
	1.2.3. Starting	4.3	
	1.2.4.1. Normal stop	4.3	
	1.2.5. Selection of control or operating modes	4.3	
	1.2.6. Failure of the power supply	4.4.3.6	
	1.3.1. Risk of loss of stability	4.6	
	1.3.2. Risk of break-up during operation	4.4, 6.2.5	
	1.3.3. Risks due to falling or ejected objects	4.4.4, 4.4.5, 4.4.6.1, 4.4.6.2, 4.10.2, 4.10.3	
	1.3.4. Risks due to surfaces, edges or angles	4.9	
	1.3.6. Risks related to variations in operating conditions	6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6, 6.3.1.1, 6.3.1.2, 6.3.1.3, 6.3.2, 6.3.3, 6.3.4	
	1.3.7. Risks related to moving parts	6.1, 6.2.2	
	1.3.8. Choice of protection against risks arising from moving parts	4.1	
	1.3.8.1. Moving transmission parts		not covered
	1.3.8.2. Moving parts involved in the process	4.10.1	
	1.3.9. Risks of uncontrolled movements	4.4.3.2, 4.4.3.6	
	1.4.1. General requirements		not covered
	1.4.2. Special requirements for guards		not covered
	1.4.3. Special requirements for protective devices	4.4.3.3	
	1.5.1. Electricity supply		not covered

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Clause	Requirement + Test	result – Remark	Verdict
	The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
	1.5.2. Static electricity		not covered
	1.5.3. Energy supply other than electricity	4.4.3.3	
	1.5.4. Errors of fitting	6.2.6	
	1.5.6. Fire		not covered
	1.5.7. Explosion	6.2.4	
	1.5.10. Radiation		not covered
	1.5.11. External radiation		not covered
	1.5.13. Emissions of hazardous materials and substances	4.4.3.4, 4.4.6.3	
	1.5.16. Lightning	6.2.3	
	1.6.1. Machinery maintenance	6.2.5	
	1.6.2. Access to operating positions and servicing points	6.2.5	
	1.6.3. Isolation of energy sources	6.2.5, 6.3.3.4	
	1.6.4. Operator intervention	4.2, 4.3	
	1.7.1. Information and warnings on the machinery	6.1, 6.3.1.3, 6.3.3, 6.3.4	
	1.7.1.1. Information and information devices	6.3.1.1, 6.3.1.2, 6.3.1.3, 6.3.2, 6.3.3, 6.3.4	
	1.7.1.2. Warning devices	6.2.2, 6.2.3, 6.2.5	
	1.7.2. Warning of residual risks	6.1	
	1.7.3. Marking of machinery	6.3.1.1, 6.3.1.2, 6.3.1.3, 6.3.2	
	1.7.4. Instructions	6.3.1.1, 6.3.1.2, 6.3.1.3, 6.3.2, 6.3.3, 6.3.4	
	1.7.4.1. General principles for the drafting of instructions		not covered

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Clause	Requirement + Test	result – Remark	Verdict
The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes	
1.7.4.2. Contents of the instructions	6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6		
1.7.4.3. Sales literature		not covered	
2.2.1. General	4.2, 4.3		
3.2.1. Driving position	4.10.1		
3.3. Control systems	4.11.1		
3.3.1. Control devices	4.2		
3.3.3. Travelling function	4.5		
3.3.4. Movement of pedestrian-controlled machinery	4.10.1		
3.4.1. Uncontrolled movements	4.6		
3.5.1. Batteries		not covered	
3.5.2. Fire	6.2.2		
3.6.1. Signs, signals and warnings	6.3.1.3, 6.3.3		
3.6.2. Marking	6.3.1.1		
3.6.3.2. Multiple uses	6.2.2, 6.2.6, 6.3.1.1, 6.3.1.2, 6.3.1.3		
4.1.2.1. Risks due to lack of stability	4.6, 4.7, 4.12		
4.1.2.3. Mechanical strength	4.4, 5		
4.1.2.4. Pulleys, drums, wheels, ropes and chains	4.4.1, 4.4.2		
4.1.2.6. Control of movements	4.3, 4.4.3.1, 4.4.3.2, 4.4.3.5, 4.4.3.6, 4.4.6.2, 4.11.1		
4.1.2.7. Movements of loads during handling	4.10.3, 4.10.4		
4.1.3. Fitness for purpose	5		

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Clause	Requirement + Test	result – Remark	Verdict
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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
4.2.1. Control of movements	4.3, 4.11.1	
4.2.2. Loading control	4.4.3.3	
4.3.2. Lifting accessories	6.3.1.2	
4.4. Instructions	6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6	
4.4.2. Lifting machinery	6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.2.6	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

END