


Prüfbericht-Nr.: <i>Test report no.:</i>	CN25H1H5 001 Part I of II	Auftrags-Nr.: <i>Order no.:</i>	326109939	Seite 1 von 34 Page 1 of 34
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2349883	Auftragsdatum: <i>Order date:</i>	2025-05-19	
Auftraggeber: <i>Client:</i>	HAISHIDA EMERGENCY EQUIPMENT (ZHEJIANG) CO.,LTD. Xianren Village, Hetou Town, Linhai, 317034 Zhejiang, P.R. China			
Prüfgegenstand: <i>Test item:</i>	8X8 Amphibious All Terrain Vehicle			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	HSD-BV228			
Auftrags-Inhalt: <i>Order content:</i>	Type test			
Prüfgrundlage: <i>Test specification:</i>	EN 16990:2020 Light motorized vehicles for the transportation of persons and goods and related facilities and not subject to type-approval for on-road use - Side by Side Vehicles - Safety requirements and test methods			
Wareneingangsdatum: <i>Date of sample receipt:</i>	N/A			
Prüfmuster-Nr.: <i>Test sample no.:</i>	LHSDB1N25P0085			
Prüfzeitraum: <i>Testing period:</i>	2025-07-09 - 2025-07-09			
Ort der Prüfung: <i>Place of testing:</i>	As client			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	Qiao He/Trainee <i>Qiao He</i> Nick Yu <i>Nick Yu</i>	genehmigt von: <i>authorized by:</i>	Xinling Liu	
Datum: <i>Date:</i>	2025-08-03	Ausstellatum: <i>Issue date:</i>	2025-08-03	<i>Xinling Liu</i>
Stellung / Position:	Project Engineer	Stellung / Position:	Reviewer	
Sonstiges / Other:	This report is only valid in its full version: Part I of II and Part II of II.			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

Description of the machine

The presented machine is a gasoline engine powered All-Terrain Vehicle. It is a tyres-powered vehicle with a maximum speed of 60km/h on the ground. The speed can be adjusted according to customer requirements, but it must not exceed the maximum limit of 60km/h. There are 12V powered lighting and turning indicating circuits provided for the product.

Type	Engine				Dimension	
	Engine model	type	Rated power(kw/rpm)	Displacement(cc)	Dimension(mm)	Weight (kg)
HSD-BV228	SQR372	Three-cylinder, water-cooled, four-stroke	39 KW	800cc	3600*1760*1300	1060

Clause	Requirement	Remarks - Results	Verdict
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5	Safety requirements and/or protective measures	Considered	P
5.1	General Requirements	Considered	P
	Vehicles shall comply with the safety requirements and/or protective measures of Clause 5. In addition, the vehicle 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.	The vehicle designed according to the principles of EN ISO 12100:2010	P
	The operator and passengers, in the normal operating position, shall be protected from parts of the vehicle that represent a hazard.	All passengers are protected by frame of vehicle.	P
	Vehicles shall be provided with seat(s) and body restraints for each intended occupant position.	Considered	P
	Operator and passenger stations shall accommodate the 5th to 95th percentile male and shall be within the plan view outline of the vehicle.	Considered	P
	NOTE Reference to 5th to 95th percentile male National Aeronautics and Space Administration (NASA) Man-Systems Integration Standards, Volume I, Section 3, ANTHROPOMETRY AND BIOMECHANICS. http://msis.jsc.nasa.gov/sections/section03.htm	Considered	P
	The operator and passengers in the normal operating position shall be protected from particles directly thrown by the tyres and wheels of the vehicle.	All tyres are under the Splash guard	P
5.2	Mechanical hazards	Considered	P
5.2.1	Speed control pedal	Considered	P
5.2.1.1	Introduction	Considered	P
	The speed control pedal shall be the primary machine speed control and shall be located to the right of the other foot controls and be designed for right-foot operation. The direction of pedal travel shall be forward and/or downward to progressively increase vehicle's speed. When foot force is removed from the speed control pedal, the machine's speed shall decrease, except when the cruise control (if equipped) is engaged.	Fulfill the requirement	P
5.2.1.2	Cruise control	None	N/A
	A visual indication of the engagement of the cruise control system shall be provided to the operator from their normal driving position.	None	N/A

Clause	Requirement	Remarks - Results	Verdict
	Disengagement of the cruise control system, if fitted, shall occur on operation of the means/control which engaged it and automatically on operation of the service brakes.	None	N/A
	It shall not be possible to start the engine with the cruise control engaged.	Considered	P
5.2.2	Braking devices	Considered	P
5.2.2.1	General requirements	Considered	P
	All vehicles shall be equipped with service braking devices.	Considered	P
	The service braking system shall make it possible to control the movement of the vehicle and to halt it safely, speedily and effectively, whatever its speed and load, on any intended up or down gradient for which the vehicle is designed. It shall be possible to graduate this braking action. The operator shall be able to achieve this braking action from his driving seat without removing his hands from the steering control.	Service braking system provided.	P
	A secondary braking system shall be provided to enable application of the service brake control to halt the vehicle within a reasonable distance in the event of failure of the service braking system. It shall be possible to graduate this braking action. The operator shall be able to obtain this braking action from his driving seat while keeping at least one hand on the steering control device.	Parking brake provided	P
	For the purposes of these provisions it is assumed that not more than one failure of the service braking system can occur at one time.	Considered	P
	Certain parts such as the pedal and its bearing, the master cylinder and its piston(s) (hydraulic systems), the linkage between the pedal and the master cylinder or the linkage, the brake cylinders and their pistons, and the lever-and-cam assemblies of brakes, shall not be regarded as liable to breakage if they are amply dimensioned, are readily accessible for maintenance, and exhibit safety features at least equal to those prescribed for other essential components (such as the steering linkage) of the vehicle. Where the failure of any such part would make it impossible to brake the vehicle with a performance at least equal to that prescribed for the secondary braking system that part shall be made of metal or of a material with equivalent characteristics and shall not be subject to significant distortion in the normal operation of the braking systems.	The brake connecting rod is made of metal	P

Clause	Requirement	Remarks - Results	Verdict
	All SbSs shall have a parking brake or parking mechanism capable of holding the SbS stationary under the conditions prescribed in 5.2.2.4 without sustained action. The control shall be in a location accessible to the operator in his normal driving position.	Parking brake provided	P
5.2.2.2	Service brakes (performance requirements)	Considered	P
5.2.2.2.1	The Service brake performance shall be tested in accordance with the conditions contained in Annex B. The performance prescribed for braking systems shall be determined by measuring the stopping distance (5.2.2.2.2) in relation to the initial speed of the vehicle or by measuring the mean fully developed deceleration (MFDD) during the test. Only one result is required to demonstrate compliance.	Considered	P
	<p>The mean fully developed deceleration d_m shall be calculated as the deceleration averaged with respect to distance over the interval v_b to v_e according to the following formula:</p> <p>Where</p> <p>v_1 = initial vehicle speed is calculated as described in 5.2.2.2.3;</p> <p>v_b = vehicle speed at 0,8 v_1 in km/h;</p> <p>v_e = vehicle speed at 0,1 v_1 in km/h;</p> <p>s_b = distance travelled between v_1 and v_b in metres;</p> <p>s_e = distance travelled between v_1 and v_e in metres.</p> <p>All SbS vehicles shall be capable of achieving a mean fully developed deceleration d_m value greater than or equal to [5,0] m/s² (0,51 g).</p>	<p>According to the formula in 5.2.2.2.1, the deceleration is 5.87 m/s²</p>	P

Clause	Requirement	Remarks - Results	Verdict
5.2.2.2.2	<p>The stopping distance shall be the distance covered by the vehicle from the moment when the operator begins to actuate the control device of the braking system until the moment when the vehicle stops; the initial vehicle speed (v1) shall be the speed the moment when the operator begins to actuate the control device of the braking system; the initial speed shall not be less than 98 % of the maximum speed measured in B.1 for the test in question.</p> <p>An SbS capable of achieving a stopping distance (s (metres)) less than or equal to the resultant value obtained using the following formula is deemed to demonstrate compliance</p> $s \leq 0,15 v + v^2/130$ <p>Where</p> <p>v = initial test speed of the vehicle, in km/h as measured in B.1;</p> <p>s = stopping distance, in metres.</p>	<p>Result of stopping distance is 3100cm and smaller than 3670cm which calculated from the formula</p>	P
5.2.2.2.3	<p>The speed and distance shall be determined using instrumentation having an accuracy of $\pm 1\%$ at the prescribed speed for the test. The dm may be determined by other methods than the measurement of speed and distance; in this case, the accuracy of the dm shall be within $\pm 3\%$.</p>	<p>Considered</p>	P
5.2.2.3	<p>Service brake fade</p>	<p>Considered</p>	P
5.2.2.3.1	<p>MFDD test</p>	<p>Considered</p>	P
	<p>When tested in accordance with B.2.3.4, the hot performance of the test vehicle shall be measured following the twentieth brake application and shall not be less than 80 % of that prescribed in 5.2.2.2.1 (mfdd) and not less than 60 % of the figure recorded in the service brake performance requirements in 5.2.2.2.1 (MFDD) with the engine disconnected, unless the vehicle is equipped with a transmission which cannot be disengaged (e.g. Continuously Variable Transmission (CVT), semi-automatic transmission,).</p>	<p>After 20 consecutive brake applications, the MFDD measured on the 20th application was 5.1 m/s², which did not fall below 80% of the value specified in 5.2.2.2.1.</p>	P
5.2.2.3.2	<p>Stopping Distance test</p>	<p>Considered</p>	P

Clause	Requirement	Remarks - Results	Verdict
	When tested in accordance with B.2.3.4, the hot performance of the test vehicle shall be measured following the twentieth brake application and shall not be exceeded by more than 20 % of that prescribed in 5.2.2.2.2 (stopping distance) and shall not be exceeded by more than 40 % of the figure recorded in the service brake performance requirements in 5.2.2.2.2 (stopping distance) with the engine disconnected, unless the vehicle is equipped with a transmission which cannot be disengaged (e.g. Continuously Variable Transmission (CVT), semi-automatic transmission,).	After 20 times of brake test, the stopping distance is 4000cm which fulfill the requirement.	P
5.2.2.3.3	Service brake fade recovery	See below	P
	When tested in accordance with B.2.2 the test vehicle shall meet the requirements contained in 5.2.2.2.1 or 5.2.2.2.2.	Considered	P
5.2.2.4	Parking brakes	Considered	P
	When tested according to the procedure specified in Annex C, (parking brake/mechanism performance) the parking brake or parking mechanism shall be capable of holding the SbS stationary on the test surface to the limit of traction of the tyres on the braked wheels. After the vehicle has settled, leave the SbS for five minutes in both uphill and downhill directions. Vehicle motion shall not exceed 25mm during the 5 minute period when tested according to the procedure in C. The parking brake/mechanism control shall be designed so as to prevent unintentional release. (It is not permitted to hold the parking brake in the on/applied position using stored energy which can leak away; e.g. hydraulic or pneumatic although a compression spring is acceptable).	After the vehicle has settled, vehicle motion not exceed 25mm during the 5 minute	P
5.2.2.5	Alternative braking requirements	Considered	P
	As an alternative to complying with the requirements of 5.2.2.2, 5.2.2.3 and 5.2.2.4, a SbS should conform to the requirements of UNECE Regulation 78 Revision 1 (20th July 2007) specific to Category L5 vehicles. Additionally, a SbS which has a braking system that conforms to the technical requirements of Regulation EU 2015/68 (Regulation on Vehicle Braking Requirements) is deemed to comply with 5.2.2.2, 5.2.2.3 and 5.2.2.4.	Considered	P
5.2.3	Steering system	Considered	P
	SbSs shall be equipped with a steering system ensuring safe driving at any speed and braking capability of the SbS.	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	The steering system shall be designed and constructed in such a way as to reduce the force of sudden movements of the steering system caused by rough terrain and transmitted to the operator through the steering control.	The steering system has been tested and verified to ensure stable handling and control under various road conditions	P
	All steering controls shall be confined within the plan view outline of the vehicle and shall be designed so the vehicle will respond as follows when moving in a forward direction: movement of the steering control in a clockwise direction or movement to the right shall steer the vehicle to the operator's right. Movement of the steering control in an anti-clockwise direction or movement to the left shall steer the vehicle to the operator's left.	Fulfill the requirement	P
	The following requirements apply to all steering systems within the scope of this document:	Considered	P
	vehicle design shall prevent dangerous interferences to the steering system by any other component such as cables, wiring, etc.;	Considered	P
	the design shall allow the inspection of critical parts, welds, etc.;	Fulfill the requirement	P
	the steering system shall not lock under any circumstances while the vehicle is in motion;	Fulfill the requirement	P
	the steering system shall not foul other components.	Considered	P
5.2.4	Moving parts	Considered	P
	A fixed guard or part fulfilling the function of a fixed guard that needs to be removed for routine inspection, adjustment or maintenance as described in the instructions handbook, shall be attached with fixings that are retained in the guard, or vehicle when the guard is removed. Guards in accordance with EN ISO 14120:2015 or structural parts of the vehicle shall prevent access to the following dangerous moving parts:	Considered	P
	all moving parts which, while the SbS is stationary, are within hand reach of the operator when in his normal driving position or within the reach of bystanders or passengers;	Fulfill the requirement	P
	all moving parts which, while the SbS is travelling, are within hand reach of the operator when in his normal driving position and when using controls to be operated from that position or, where applicable, all parts within reach of a passenger.	Fulfill the requirement	P
	The area to be verified shall be bound by the following planes:	See below	P

Clause	Requirement	Remarks - Results	Verdict
	towards the front of the SbS: a vertical plane, perpendicular to the longitudinal median axis of the vehicle and passing through the centre of the front wheels;	Considered	P
	towards the rear of the SbS: a vertical plane, perpendicular to the longitudinal median axis of the vehicle and passing through the most rearward point of the most rearward seat;	Considered	P
	towards the left and right of the SbS: a vertical plane parallel to the longitudinal median axis of the vehicle and passing through the outermost left + right side of the vehicle.	Considered	P
	In this area, safety distances shall be in accordance with EN ISO 13857:2008.	Considered	P
	For reaching through guard openings, the safety distances shall be in accordance with Table 1 of this standard (below).	All safety distances comply with EN ISO 13857	P
5.2.5	Sharp edges	Considered	P
	All parts that may be contacted by the operator, passengers or bystanders shall have no sharp edges.	Fulfill the requirement	P
5.2.6	Safety Belts and their anchorages	See below	P
5.2.6.1	General	Considered	P
	Side by Side vehicles with a maximum design speed of $\leq 60\text{km/h}$ shall be fitted with a minimum of two lower anchorage points and a lap (2 point) belt. Those vehicles with a maximum design speed $> 60\text{km/h}$ shall be fitted with at least two lower and one upper anchorage points and a lap and diagonal belt (3 point). Safety Belt systems are required to be fitted to all seating positions on side by side vehicles.	3 point safety belt system provided in the front of vehicle and 2 point safety belt system provided to all 4 seating position in the back	P
5.2.6.2	Safety belt anchorage requirements	See below	P
	A SbS should be fitted with safety belt anchorages that comply with all relevant requirements of UNECE Regulation 14.07 (Sup.1).	Considered	P
	The following are acceptable alternatives:	None	N/A
	(a) compliance with all the relevant requirements of SAE J386 (201208) or	None	N/A
	(b) compliance with all the relevant requirements of SAE J2292 (200612 or JAN2016) or	None	N/A
	(c) for Type II, 3 point restraint system (anchorage points), compliance with all the relevant requirements of SAE J386 (201208) amended as described below:	None	N/A

Clause	Requirement	Remarks - Results	Verdict
	Replace the requirements of SAE J386, section 4.3, Seat Belt Assembly Installation, with the requirements of SAE Recommended Practice J383-JUN95, section 5.1, Pelvic Restraint Angle Guidelines, and section 6, Location of Upper Torso Restraint Anchorages;	None	N/A
	Replace the requirements of SAE J386, section 4.4 Performance Requirements, with the Type II 3-point restraint test requirements of SAE Recommended Practice J384-JUN94, and establish a new requirement for Type II 3-point restraints, when tested according to the requirements of SAE J384, that the anchorages, attachment hardware, and attachment bolts shall withstand a minimum 9000N force applied to the lap portion of the seat belt assembly simultaneously with a minimum 9000-N force applied to the shoulder portion of the seat belt assembly;	None	N/A
	Replace the requirements of SAE J386, section 5.5.4, Attachment Hardware, with the requirements of SAE Recommended Practice J141-JUN95 section 4.4, Attachment Hardware Strength.	None	N/A
	For vehicles ≤ 600 kg, the combination of requirements in 5.2.6.3–5.2.6.4 and Annex H are an alternative way to demonstrate compliance with the safety belts anchorage provisions for SbS's.	None	N/A
5.2.6.3	Alternative Safety belt anchorage requirements	Considered	P
5.2.6.3.1	Safety belt anchorages shall conform to the 7/16-20 UNF 2B thread size and tolerance specifications.	None	N/A
5.2.6.3.2	However, if the safety belts are fitted by the manufacturer of the SbS vehicle as standard equipment to specific seating positions, the safety belt anchorages for those seating positions may have characteristics different from those specified in 5.2.6.3.1.	None	N/A
5.2.6.3.3	Anchorage points complying with the specific provisions for the installation of special-type (e.g. harness-type) safety belts may have characteristics different from those specified in 5.2.6.3.1.	None	N/A
5.2.6.3.4	It shall be possible to remove a safety belt from the SbS vehicle without causing any damage to the safety belt anchorage point.	Considered	P
5.2.6.3.5	Where suspension seats are used, the seat belt assemblies shall be fastened to the movable portion of the seats to accommodate the ride motion of the occupants.	None	N/A
5.2.6.3.6	The safety belt anchorages may be incorporated within the chassis, bodywork, seat or any other structure of the vehicle.	The safety belt anchorages incorporated within the bodywork and seat	P

Clause	Requirement	Remarks - Results	Verdict
5.2.6.3.7	A single safety belt anchorage point may be used for attaching the safety belts for two adjacent seating positions.	None	N/A
5.2.6.3.8	The permitted locations of the effective safety belt anchorage points for all seating positions are indicated in Figure H.1.	The location of anchorage point comply with Figure H.1	P
5.2.6.3.9	Position of the lower effective safety belt anchorages	Considered	P
5.2.6.3.9.1	The α_1 and α_2 angles in Figure H.1 shall lie between 30° and 80° in all normal positions of use of the seat.	Considered	P
5.2.6.3.9.2	If seats are fitted with an adjustment system and the manufacturer's declared torso angle is less than 20°, the α_1 and α_2 angles referred to in the previous point may lie between 20° and 80° in all normal positions of use of the seat.	Considered	P
5.2.6.3.9.3	The distance between the two vertical planes parallel to the longitudinal median plane of the vehicle and passing through each of the two lower effective anchorages L1 and L2 in Figure H.1 of the same safety belt shall not be less than 350 mm. This may be reduced to 240 mm in the case of a centre-row seating position. The longitudinal median plane of the seating position shall pass points L1 and L2 at no less than 120 mm from those points.	Considered	P
5.2.6.3.10	Location of the upper effective safety belt anchorage	Considered	P
5.2.6.3.10.1	A single upper effective safety belt anchorage point shall comply with the following requirements.	Considered	P
5.2.6.3.10.2	The upper effective safety belt anchorage point shall lie below the plane FN that is perpendicular to the longitudinal median plane of the seating position and forms an angle of 65° with the torso reference line. For rear seats, this angle may be reduced to 60°. The plane FN may therefore not be perfectly horizontal and shall intersect the torso reference line at a point D so that:		P
	$DR = 315 + 1,8S$ However, if S does not exceed 200 mm: $DR = 675$ mm. S = the distance from the effective upper safety belt anchorage point to the longitudinal median plane of the seat (see Figure H.1)	Considered	P

Clause	Requirement	Remarks - Results	Verdict
5.2.6.3.10.3	The upper effective safety belt anchorage point shall also lie behind plane FK perpendicular to the longitudinal median plane of the seat and intersect the torso reference line at an angle of 120° at a point B so that: $BR = 260 + S$.	Considered	P
	If S is not less than 280 mm, the vehicle manufacturer may opt to use: $BR = 260 + 0,8 S$.	Considered	P
5.2.6.3.10.4	The value S shall not be less than 140 mm.	Considered	P
5.2.6.3.10.5	The upper effective safety belt anchorage point shall also be located behind a vertical plane that is perpendicular to the longitudinal median plane of the vehicle and passes through the R-point.	Considered	P
5.2.6.3.10.6	The upper effective safety belt anchorage point shall also be located above the horizontal plane passing through the point C.	Considered	P
	Point C is located 450 mm vertically above the R-point.	Considered	P
	However, if distance S is 280 mm or more and if the vehicle manufacturer did not opt to use the alternative formula for BR in point 5.2.6.3.10.3 the vertical distance of 500 mm between point C and the R-point shall apply.	Considered	P
5.2.6.3.10.7	More than one actual upper safety belt anchorage point may be fitted, provided that all resulting effective safety belt anchorage points meet the requirements of points 5.2.6.3.10.1 to 5.2.6.3.10.6.	Considered	P
5.2.6.3.10.8	If the height of the upper safety belt anchorage point is manually adjustable without the use of any tools, all selectable upper safety belt anchorage point positions and the resulting effective safety belt anchorage points shall comply with the requirements of points 5.2.6.3.10.1 to 5.2.6.3.10.6. In this case, the permitted area as defined above may be enlarged by shifting it 80 mm upwards and downwards in the vertical direction; however, the permitted area remains bounded by the horizontal plane passing through point C. (See Figure H.1).	The height of the upper safety belt anchorage point position is unadjustable.	P
5.2.6.3.11	Strength of safety belt anchorages	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	Each safety belt anchorage point shall be capable of withstanding the appropriate tests provided for in points H.3.1 to H.3.5. Permanent deformation, including partial rupture of an anchorage or the surrounding area, does not constitute failure if the required force is sustained for the specified time. During the test, the minimum distances for the lower effective safety belt anchorage points set out in point 5.2.6.3.9.3 and the minimum height of the upper effective safety belt anchorage points set out in point 5.2.6.3.10.3 shall be maintained.	Considered	P
	Displacement systems fitted to seats shall be capable of being manually activated once the tractive force is no longer applied.	Fulfill the requirement	P
5.2.6.4	Anchorage points intended for special-type (e.g. harness-type) safety belts	3 point safety belt used	N/A
	Any additional upper effective safety belt anchorage point shall lie on the opposite side of the first upper effective anchorage point in relation to the longitudinal median plane of the seating position. In addition:	None	N/A
	both upper safety belt effective anchorage points shall be located above the horizontal plane passing through the point C (See Figure H.1);	None	N/A
	both upper safety belt effective anchorage points shall be located behind the transverse plane passing through the torso reference line;	None	N/A
	where there is a single actual safety belt anchorage point (i.e. both ends of the safety belt are to be attached to a single anchorage point), this shall be located within the area common to two dihedrals bounded by vertical lines passing through the points J1 and J2, and for each point forming an angle of 30° horizontally between two vertical planes which are in turn related to the two vertical longitudinal planes intersecting both J1 and J2 and forming an outward angle of 10° and an inward angle of 20° with those longitudinal planes. (See Figure H.1);	None	N/A

Clause	Requirement	Remarks - Results	Verdict
	<p>where there are two separate actual safety belt anchorage points, these shall be located within each of the respective areas formed by dihedrals bounded by vertical lines passing through the points J1 and J2, and for each point forming an angle of 30° horizontally between two vertical planes which are in turn related to the two vertical longitudinal planes intersecting both J1 and J2 and forming an outward angle of 10° and an inward angle of 20° with those longitudinal planes. (See Figure H.1). In addition, the two anchorage points shall be so located that they are no more than 50 mm apart in any direction when one of the points is mirrored in relation to the vertical longitudinal plane passing through the R-point of the seating position in question.</p>	None	N/A
5.2.6.5	Safety belt installation	Considered	P
5.2.6.5.1	<p>A SbS should be fitted with safety belts that comply with, and that are installed as per, all relevant requirements of UNECE Regulation 16.06 as prescribed for vehicle category N1.</p>	Considered	P
	<p>An alternative equivalence is by compliance with all the relevant requirements of SAE J386 (201208) or SAE J2292 (200612 or JAN2016).</p>	The safety belt comply with UNECE Regulation 16.06	P
	<p>For Type II 3 point seat belt assemblies compliance with all the relevant requirements of SAE J386 (201208) when amended as described below is also acceptable:</p>	None	N/A
	<p>Replace the requirements of SAE J386, section 5.1.6 Breaking Strength (of the complete seat belt assembly) with the requirements of SAE Recommended Practice J141-JUN95, section 7, Requirements for Assembly Performance; subsection 7.2, Type II Seat Belt Assembly;</p>	None	N/A
	<p>Replace the requirements of SAE J386, section 5.2.6 Strength (webbing), with the requirements of SAE Recommended Practice J141-JUN95, section 6, Requirements for Webbing; subsection 6.1.b, Type II Seat Belt Assembly;</p>	None	N/A
	<p>Replace the requirements of SAE J386, sections 5.4.3.1.a and 5.4.3.1.d of section 5.4.3, Emergency Locking Retractors (ELR), with the requirement that manufacturers shall determine the appropriate locking point based on the vehicle's intended use;</p>	None	N/A

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Clause	Requirement	Remarks - Results	Verdict
	Replace requirements of SAE J386, section 5.1.7, Marking (Labelling), with a requirement that each seat belt assembly or the individual sections of an assembly shall be permanently and legibly labelled with the year of manufacture, model or style number, and name or trademark of the seat belt manufacturer or importer.	None	N/A
	In addition to the requirements of SAE J2292 or SAE J386, vehicles shall be equipped with Emergency Locking Retractors (ELR). Seat belts shall also include a tilt locking function at an angle determined by the manufacturer.	None	N/A
	As the requirements prescribed in UNECE regulation No 16.06 (Sup. 1), SAE J386 and SAE J2292 are not interchangeable safety belt assemblies should comply solely with the requirements of any one of the above for the whole assembly.	None	N/A
5.2.6.5.2	Any reference in UNECE regulation No 16.06 (Sup. 1) to UNECE regulation No 14.07 (Sup. 1) should be understood as a reference to 5.2.6.1 to 5.2.6.3.11 and H.2 to H.3.6 where appropriate.	Considered	P
5.2.7	Roll Over Protective Structures (ROPS)	See below	P
5.2.7.1	Roll Over Protective Structures shall be provided with the SbS.	Roll Over Protective Structures provided	P
5.2.7.2	ROPS fitted to a SbS with an MRO > 600 kg shall meet the requirements of OECD test codes 3, 4, 6, 7 as appropriate (Edition 2015 – July 2014, or a later published version), or ISO 3463:2006, ISO 5700:2013, ISO 12003-1:2008, ISO 12003-2:2008 depending on vehicle/ROPS type.	The SbS have meet the requirements of OECD	P
5.2.7.3	As an alternative to 5.2.7.2 and 5.2.7.4 a SbS may meet the requirements of ISO 3471:2008 using the test criteria specified in Table 1 item 1 – “Crawler earth-moving machine: dozer, loader, pipe-layer and trencher type”, or OSHA 1928.53 (July 1 2010).	See 5.2.7.2	N/A
5.2.7.4	A SbS with an MRO of > 300 kg to ≤ 600 kg shall comply with the requirements of ISO 21299:2009 or the requirements of OECD test codes 6, 7 (Edition 2015 – July 2014) or a later published version, or ISO 3463:2006, ISO 5700:2013, ISO 12003-1:2008, ISO 12003-2:2008 depending on vehicle/ROPS type. As an alternative it shall comply with the requirements applying to roll over protective structures for Category L7e-B2 vehicles contained in Annex XI of Commission Delegated Regulation (EU) No 3/2014 (24 October 2013) respectively depending on applicability.	See 5.2.7.2	N/A
5.2.8	Fuel and hydraulic systems	Considered	P

Clause	Requirement	Remarks - Results	Verdict
5.2.8.1	Pipes, fittings and hoses	Considered	P
	Pipes, fittings and hoses shall be installed in such a manner that they are protected against leakage, mechanical and/or thermal damage.	Considered	P
	This shall be achieved as appropriate by: the selection of appropriate materials; preventing abrasion; providing suitable fixings; other means which offer protection against damage. Visual inspection of fittings and hoses shall be possible, except for those located inside frames.	Whether the pipe is routed inside or outside the frame, it must meet the requirement of withstanding 2 times the test pressure and 4 times the burst pressure.	P
5.2.8.2	Fuel system Fuel tanks shall withstand an internal pressure of 30 kPa (0,3 bar) without permanent deformation or leakage. Where the fuel is supplied to the engine by gravity, the SbS shall be equipped with a manual fuel shut-off control to avoid the fuel continuing to flow once the engine has been switched off, unless the design of the fuel system is fulfilling the same objective.	Considered manual fuel shut-off control provided	P
5.2.9	Operator's seat	Considered	P
	The SbS shall be fitted with a seat correctly positioned to allow the operator to steer the SbS safely in all conditions of use foreseeable by the manufacturer.	Considered	P
5.2.10	Passenger seat and handhold(s)	Considered	P
	The design of the seat together with the handhold(s) shall enable the passenger to maintain a stable position during travelling.	Fulfill the requirement	P
	A handhold shall be provided for each designated seating position. Where the steering control is a wheel it shall be considered a handhold for the operator. A handhold shall be placed in such a manner that when grasping the handhold, the occupant's hands shall be within occupant compartment.	Fulfill the requirement	P
	These handholds shall be designed in such a way that each is able to withstand, without failure, a vertical force, in both an upward and downward direction, of 500 N applied statically to the centre of the surface of the handhold at a maximum pressure of 0,5 MPa. Handholds shall be designed to allow the passengers to ingress and egress without interference from the handholds.	Fulfill the requirement	P
5.2.11	Suspension	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	The SbS shall be fitted with a suspension system suitable for the vehicle to perform its intended function and, providing appropriate operator and passenger protection against vibration and shock.	Considered	P
5.2.12	Drive Train controls	Considered	P
5.2.12.1	Transmission Controls	Considered	P
	Transmission controls shall be located so as to be easily operable by the operator. Controls for selecting gears, forward direction, neutral position, reverse direction and for overall transmission ranges shall be identified by a diagram/pictogram showing the different positions of the control devices. The diagram shall be within the sight of the operator when seated and close to the relevant control. The markings shall be durable.	Considered	P
5.2.12.2	Controls and indicators other than the drivetrain controls	Considered	P
	The main controls of the SbS (e.g. steering control, handles, pedals, switches) shall be designed and arranged so that: a) they are easily accessible; b) their functions are clearly identified and explained in the instructions handbook (see 7.3 instructions handbook); c) the direction of movement to activate the controls and indicators corresponds to the intended effect or common practice, unless otherwise required by application; d) when a control is designed and constructed to carry out several functions, e.g. a dashboard key or a handle, the activated function shall be clearly identified.	Considered	P
5.2.13	Electric starter interlock	Considered	P
	An interlock shall be provided to prevent the SbS engine from being started by electric cranking, or the electric motor from being energised, unless the clutch is disengaged, or the transmission is in neutral or park position.	The SbS can only be started when the transmission is in the neutral or park position	P
	The electric starter interlock shall conform to well-trying principles and applies well-trying components. A "well-trying component" for a safety-related application is a component which has been either a) widely used in the past with successful results in similar applications, or b) made and verified using principles which demonstrate its suitability and reliability for safety related applications. Newly developed components and safety principles may be considered as equivalent to "well-trying" if they fulfil the conditions of b). NOTE For further information, see EN ISO 13849-1.	The SbS engine start is interlocked and allowed only when the transmission is in the neutral or park position	P

Clause	Requirement	Remarks - Results	Verdict
5.2.14	Reversing indicator and warning	Considered	P
	All SbS with a reverse function shall be fitted with a reversing indicator readily visible to the operator when the operator is seated on the SbS. The indicator shall be activated whenever the engine is running, or the motor is energised, and the transmission is in reverse.	Considered	P
	In addition, if the visibility from the operator's station to the rear by direct or indirect view cannot be achieved in accordance with ISO 5006:2017 when using the test criteria specified in Table 1 – Rigid Frame Dumper m< 10 tonne, or ISO 5721:2014 parts 1 and 2, the vehicle shall be equipped with an acoustic and/or visual warning signal activated automatically when the reversing command is given. The reverse warning alarm shall be maintained whilst driving in reverse is possible.	Both the acoustic and visual warning signal activated automatically when the reversing command is given	P
	If visual warning is fitted it should meet the technical requirements of UNECE Regulation 86 in relation to reversing lamps. If an audible warning is fitted it shall meet the relevant requirements of ISO 9533:2010 with respect to reverse Warning Alarms?	Considered	P
	The reverse visual warning and/or reverse warning alarm shall conform to well-trying principles and applies well-trying components. A "well-trying component" for a safety-related application is a component which has been either a) widely used in the past with successful results in similar applications, or b) made and verified using principles which demonstrate its suitability and reliability for safety related applications. Newly developed components and safety principles may be considered as equivalent to "well-trying" if they fulfil the conditions of b). NOTE For further information, see EN ISO 13849-1.	Considered	P
5.2.15	Access systems to the operator's station, passenger accommodation and maintenance points	Considered	P
	All surfaces providing access to the vehicle shall remain slip-resistant for the normal life of the vehicle taking into account the possible presence of wet conditions, mud, snow, etc.	slip-resistant plate provided for access to the vehicle	P
5.2.16	Foot controls	Considered	P
	All surfaces of foot controls of the vehicle shall remain slip-resistant for the normal life of the vehicle taking into account the possible presence of wet conditions, mud, snow, etc.	slip-resistant provided on foot control	P
5.2.17	Lighting Equipment (headlamps, tail lamps and stop lamps)	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	All SbS shall have at least two headlamps projecting a white light to the front of the SbS and at least one tail lamp projecting a red light to the rear. All SbS shall be equipped with a stop lamp or combination tail-stop lamp, and such stop lamp(s) shall be operated by the actuation of any service brake control.	Provided	P
	Each headlamp shall give the following illumination values when projected on a vertical screen at 25 m distance: at a point 1,7 degrees below the horizontal plane through the lamp and in the vehicle longitudinal plane: minimum 3 lux; and at a point 0,5 degrees above horizontal plane through the lamp and in the vehicle longitudinal plane: maximum 4 lux. In case of switchable main beam and passing beam, these requirements may be fulfilled separately.	At a point 1,7 degrees below the horizontal plane through the lamp and in the vehicle longitudinal plane: 6 lux At a point 0,5 degrees above horizontal plane through the lamp and in the vehicle longitudinal plane: 2 lux	P
	NOTE Headlamps complying with ECE R 98, 112, 113 or SAE J 1623 normally fulfil these requirements.	Considered	P
5.2.18	Tilt Table Stability Tests (Lateral and Longitudinal)	Considered	P
5.2.18.1	General	Considered	P
	Vehicles which comply with the provisions stated in the stability tests are in general stable when properly operated in accordance with specific safety rules and practices established to meet actual operating terrain and conditions. However, improper operation or lack of maintenance may contribute to a condition of instability and defeat the purpose of the standard. Some conditions which could affect stability are failure of the operator to follow safety practices, surface conditions, grade, speed, loading braking, turning, improper loads, towing, attachments, dynamic forces, and the judgement exercised by the vehicle operator.	Considered	P
5.2.18.2	Tilt Table Lateral Stability Tests Performance Requirement	All tests are applied and pass	P
	Acceptance of the tilt table lateral stability tests as set out in D.1.4 shall require that at least one of the supporting tyres on the uphill side does not lift off the platform surface when the vehicle is tested in each direction for each configuration. Lift off and test failure shall have occurred when all supporting tyres on the uphill side no longer visually remain in contact with the surface.	Considered	P
	It is recommended that the vehicle is restrained during the test in such a way that the method used shall prevent rollover but shall not interfere or restrict the test in any way.	Considered	P
5.2.18.3	Tilt Table Longitudinal Stability Tests Performance Requirement	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	Acceptance of the tilt table longitudinal stability test as set out in D.2.1 and D.2.2 shall require that at least one of the supporting tyres on the uphill side does not lift off the platform surface when tested in each direction. Lift off and test failure shall have occurred when both supporting tyres on the uphill side no longer visually remain in contact with the surface.	Considered	P
5.2.19	Tyres	Considered	P
5.2.19.1	General	Considered	P
	The tyres and the wheels fitted as original equipment shall be selected by the vehicle manufacturers taking into account the conditions of use foreseeable for the type of vehicle.	Considered	P
	The size designation and type of tyres suitable for the vehicle shall be specified in the instructions handbook.	Related information is stated in user manual.	P
	The tyres shall comply with the following requirements:	See below	P
	the maximum load carrying capacity at the manufacturer's recommended pressure and maximum design speed of the vehicle of every tyre with which the vehicle is fitted, shall be at least equal to the maximum permissible axle mass of the vehicle divided by the number of tyres equipping that axle;	Related information is stated in user manual.	P
	every tyre with which the vehicle is fitted shall have a speed capability equal to or higher than the maximum design speed of the vehicle (inclusive of the variability due to series production);	Related information is stated in user manual.	P
	the space in which the wheel revolves shall be such as to allow unrestricted movement when the largest permissible tyre size is used within the suspension, steering, chassis and wheel guard constraints provided by the vehicle manufacturer.	Fulfill the requirement	P
5.2.19.2	Markings for Pneumatic tyres	Considered	P
	A SbS shall be equipped with tyres carrying the following markings/information on at least one sidewall unless the tread pattern is unidirectional which then requires markings/information on both sidewalls:	Considered	P
	a) markings: at least one tyre sidewall shall have the following information: 1) the manufacturer's name or brand name; 2) the date code of manufacture; 3) the tyre size designation; 4) the load/speed index;	Fulfill the requirement	P
	b) the information required by 5.2.19.2 (1) and (2) shall be in letters or numerals no less than 2 mm in height and permanently moulded into tyre sidewall.	Fulfill the requirement	P
5.2.19.3	Pressure for Pneumatic tyres	Considered	P
	It shall be possible to check the pressure in the tyres in an easy manner.	Considered	P
5.2.20	Maximum design speed	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	The maximum design speed is the resultant figure achieved when the vehicle is tested in accordance with the test procedure given in B.1.3.	Related information is stated in user manual.	P
5.2.21	Engine stop switch	See below	P
5.2.21.1	General	Considered	P
	All SbSs shall have a means to stop the engine which is operable by hand and can be reached by the operator when seated in the driving position.	Checked, OK	P
5.2.21.2	Operation	Considered	P
	The means to stop the engine shall not require the operator to hold it in the off position to stop the engine.	Considered	P
5.2.22	Manual clutch control	None	N/A
	All SbSs equipped with a manual clutch shall have a clutch pedal, which is located to the left side of the brake pedal.	None	N/A
5.2.23	Unauthorised use	Considered	P
	All SbSs shall have a means to deter unauthorised persons from using the vehicle. A key-operated switch to start or allow the starting of the engine/energising of the motor, or equivalent system shall be provided for all SbSs.	A key-operated switch provided	P
5.2.24	Acoustic/audible warning	Considered	P
	All SbS's shall have an acoustic/audible device activated by the operator from their seated position to warn other road users, pedestrians or animals of its position. The device should meet the relevant requirements of UNECE Regulation 28 as amended by supplement 4.	Considered	P
5.3	Electrical Hazards – General	Considered	P
5.3.1	Grounding	Considered	P
	Wiring system assemblies may be grounded to the SbS chassis provided the electrical system is 24 volts nominal or less.	Considered	P
	Operators and passengers shall be protected against electrostatic shock.	Considered	P
5.3.2	Capacity and over-current protective devices	See below	P
	The electrical system shall have an adequate capacity for the safe operation of all installed electrical equipment whether or not used simultaneously.	Checked, ok	P
	Electrical equipment shall be protected against over-current (e.g. fuse, circuit breaker, or fusible link). This does not apply to short duration loads with high current draw (e.g. starter, winch ...).	Checked, ok	P
5.3.3	Routing and Installation	Considered	P
	Live parts (not connected to the frame) and/or connectors shall be covered with insulation material or installed in a protected location to prevent direct contact.	Direct contact with live parts are not possible access without the use of a tool.	P

Clause	Requirement	Remarks - Results	Verdict
	Electrical components and conductors shall be installed to avoid damage from exposure to environmental and operational conditions (e.g. vibrations ...) and to avoid the risk of fire or electrical shock. Electrical conductors passing through frames or bulkheads shall be protected against abrasion.	Considered	P
	Wiring system assemblies shall be protected against vibration and shall be routed within the SbS in such a manner as to provide the clearance necessary to avoid breakdown of the wiring insulation due to heat from heat generating components. The wiring system assemblies shall also be protected from obstacles or projections that the vehicle may encounter during normal operation.	All wires inside the SbS are properly tied.	P
	Electrical cables shall be protected if located in a position of potentially abrasive contact with metal surfaces, or lubricants or fuel. The SbS wiring assembly shall, where possible, be grouped together, and shall be supported and located so that no portion is in contact, except for electrical connections, with the fuel system, fuel lines, exhaust system or moving parts.	Considered	P
	Electrical cables shall be supported and located so that no portion is in contact, except for electrical connections, with the carburettor, fuel lines, exhaust system or moving parts. Any edges of metal parts or components with the potential to contact the electrical cables or wiring shall be rounded or shielded to prevent possible abrasion or cutting damage to the cables or wiring.	Considered	P
5.3.4	Electrical Energy Storage Systems	Considered	P
5.3.4.1	Batteries	Considered	P
5.3.4.1.1	General	Considered	P
	The batteries shall be easily disconnected by an isolator switch or with the aid of a readily available tool if necessary; e.g. spanner	isolator switch provided	P
5.3.4.1.2	Displacement and Spilling	Considered	P
	The batteries shall be firmly attached. In the event that the vehicle overturns the battery shall be constrained so as to avoid the battery being displaced.	Considered	P
	The finish of internal surfaces of battery containers shall be resistant to the chemical effects of the electrolyte. Provision shall be made to prevent electrolyte from being ejected onto the occupants during normal operation, tip over or overturn situations.	Spill tray provided	P
	NOTE This may be achieved by means of the use of sealed batteries.	Considered	P
5.3.4.1.3	Fire and Explosion	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	Ventilation openings shall be provided in the battery compartment or cover so that dangerous accumulations of gases do not occur when the equipment is used in accordance with manufacturer's instructions.	Considered	P
	Sparking components shall not be located where explosive gas/air mixtures can be present. Battery connectors shall be accepted as non-sparking components provided they are not used as an emergency switching-off device.	Considered	P
5.3.4.1.4	Access and Maintenance	Considered	P
	The battery location shall be easily accessible. However, access to batteries or battery packs with a voltage exceeding 48volts shall require the use of a tool.	Battery pack with a voltage 24V provided	P
	Batteries shall be covered sufficiently to prevent unintentional contact with live parts.	Considered	P
	Provisions shall be made to disconnect the battery/batteries to facilitate maintenance and replacement.	A switch provided outside the battery pack enclosure to allow disconnection of the battery in case of emergency or maintenance.	P
	The correct connection of batteries shall be achieved by marking; e.g. symbols, signs or colours. The instructions manual shall contain instructions for correct connection of batteries.	Related information is stated in user manual.	P
5.3.4.2	Capacitors	Considered	P
	Provision shall be made to isolate and/or discharge stored energy for maintenance.	A switch provided outside the battery pack enclosure to allow disconnection of the battery in case of emergency or maintenance.	P
5.3.5	Protection against accidental by-passing of the starter security	Considered	P
	The electrical connections of the solenoid and the starter relay shall be protected to prevent any accidental connection and prevent any deliberate attempt at connection which may bypass or over-ride the starter interlock system.	Considered	P
5.4	Hot surfaces	See below	P
5.4.1	General	See below	P
5.4.1.1	Description of normal vehicle operation in relation to hot surfaces Normal operation of the vehicles covered by this clause includes: - occupants getting in, out and riding in the vehicle; - driving the vehicle (start, accelerate, run, decelerate, brake and stop).	The surface beside the accelerator when the occupant riding in the vehicle	P
5.4.1.2	Identification of hazardous zones	Considered	P
	The identified possible hazardous zones for the vehicles covered by this European Standard with respect to extreme temperatures are the following:	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	the exhaust system;	Covered by Heat-protection wire mesh	P
	exposed parts of the engine;	None	N/A
	all controls, steering control;	No extreme temperature on this part	N/A
	the seat and pedals;	No extreme temperature on this part	N/A
	disc brakes;	It is enclosed inside the vehicle and not accessible to the user.	P
	exposed parts of the cooling system/radiator.	It is enclosed inside the vehicle and not accessible to the user.	P
5.4.2	Temperature limits for touchable surfaces	Considered	P
5.4.2.1	General	Considered	P
	All surfaces that are identified by the test method described in Annex E as potentially excessively hot surfaces shall have a surface temperature ≤ 43 °C, or a skin temperature ≤ 43 °C when measured within the personal protective equipment specified by the manufacturer to be worn.	Considered	P
5.4.2.2	Specific requirements	Considered	P
5.4.2.2.1	Seat, steering components and pedals	Considered	P
	The seat, steering components, pedals and handholds are parts that are considered in continuous contact with the occupants. Means shall be provided to ensure that their surface temperature remains below 43 °C when subjected to heat generated by the SbS.	Fullfill the requirement	P
5.4.2.2.2	Brakes	Considered	P
	Due to the operational requirements of (disc) brakes, the variability of their working temperatures depending on the type of use, and the fact that they are distant from the normal driving and passenger positions, no temperature limit is defined for these parts. However, the instructions handbook shall contain a warning of the possible danger of burns if the brakes are touched after a prolonged use of the vehicle.	Related information is stated in user manual.	P
5.5	Noise control	See below	P
5.5.1	Noise control at source by design	Considered	P
	When designing the vehicle, the available information and technical measures to control at source the noise from vehicle parts, tools, hydraulic, pneumatic and extraction equipment, shall be taken into account, see for example EN ISO 11688-1:2009.	Considered	P
	Examples of noise control measures are:	Considered	P
	a) reduction of vibration through static and dynamic balancing of rotating parts;	Considered	P
	b) reduction of vibration within the vehicle by reducing both the mass of moving parts and their acceleration;	Considered	P

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Clause	Requirement	Remarks - Results	Verdict
	c) reduction of impactive over-clearance of rotational bearings by application of positive pre-loading;	Considered	P
	d) proper choice and design of energy transfer components to eliminate bouncing;	Considered	P
	e) proper choice and design of transmission components (gears, pulleys, belts, bearings etc.);	Considered	P
	f) proper design of vehicle structures taking into account vibration damping and avoidance of structural resonance;	Considered	P
	g) proper design of vehicle components and systems installation taking into account rough terrain and ground clearance for exposed parts (intake system components, exhaust systems etc);	Considered	P
	h) special care shall be taken in the design of the intake and exhaust system and the selection of the silencer.	Considered	P
	The above list is not exhaustive. Other noise control measures with the same or better efficiency may be used by a manufacturer.	Considered	P
	NOTE EN ISO 11688-2 provides useful information on noise generation mechanisms in machinery.	Considered	P
5.5.2	Noise control by protective measures	Considered	P
	Examples of noise control measures are:	Considered	P
	a) noise enclosures, screens fitted to the vehicle, silencers;	Considered	P
	b) sound deadening of pneumatic discharges, vibration damping of hydraulic circuits.	Considered	P
5.5.3	Noise reduction by information	Considered	P
	Appropriate information shall be given (see also 7.3) reflecting the results of tests as described in Annex F.	Considered	P
5.6	Vibration hazards	Considered	P
	Hand-transmitted and whole-body vibration emission by the SbS shall be minimized as far as possible by design of the vehicle following the principles defined in the CR 1030-1 and in the CEN/TR 15172-1.	Considered	P
	NOTE Vibrations caused by travelling of the SbS depend mainly on the terrain, the way of using the SbS, and on the mechanical suspension (see 5.2.11 (suspension) and 7.3 (accompanying documents)).	Considered	P
	Among the important aspects to be considered during design are the balancing of the moving parts of the engine and the isolation between the engine and the SbS frame throughout the permitted engine range including idling.	Considered	P
	The efficiency of the design measures regarding vibration emitted by the vehicle may be assessed by comparing the vibration emission values of the vehicle when tested in accordance with Annex G with those of other vehicles of the same type and of similar size and power (see also 7.3.i).	Considered	P
5.7	Material/substance hazards	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	No part or system shall contain materials endangering persons' safety or health. The exhaust system shall be gastight over its full length.	Fulfill the requirement	P
	The exhaust system shall be positioned such that it directs exhaust gas away from the operator and any passengers.	Fulfill the requirement	P
	The exhaust tailpipe shall be positioned in such a way that the exhaust gases cannot penetrate inside the cab.	Fulfill the requirement	P
5.8	Storage provisions	Considered	P
	All SbSs shall be equipped with a means of carrying the instructions handbook that provides protection from destructive elements while allowing reasonable access.	Fulfill the requirement	P
5.9	Ergonomics	Considered	P
	Design and construction of SbSs shall be consistent with the ergonomic principles described in EN 614-1:2006+A1:2009 and in EN ISO 12100:2010, 6.2.8	Considered	P
	Account shall be taken of the characteristics of the user group and a statement on the age recommendation for the particular SbS model in question, which shall not be less than 14 years, together with any corresponding pictogram (see example in Annex K). This statement shall be repeated on the front cover of the instructions handbook.	Considered	P
	NOTE National legislation on usage may impose age restrictions.	Considered	P
	Some specific aspects of ergonomics are dealt with in other clauses of this standard (controls and indicators, operator position, noise and vibration emissions...).	Considered	P
5.10	Errors of fitting	Considered	P
	Design and construction of SbSs shall eliminate or reduce so far as possible the risks due to errors made when fitting or refitting parts or connecting or reconnecting conductors or conduits. Particular attention shall be paid to this hazard for SbSs the final assembly of which takes place after the vehicle has left the manufacturer's premises.	Considered	P
	If these risks cannot be sufficiently reduced by design, the parts, conductors or conduits shall be identified by marking and appropriate information shall be included in the assembly instructions.	Related information is stated in user manual.	P
5.11	Additional Requirements for Electric-Powered Vehicles	The power is provided by a gasoline engine.	P
5.11.1	Grounding	Considered	P
	Wiring system assemblies > 24 volts shall not be grounded to the vehicle chassis.	Considered	P
5.11.2	Electrical Heat-generating	None	N/A

Clause	Requirement	Remarks - Results	Verdict
	Electrical heat-generating components shall be mounted and contained within the vehicle in such a manner as to prevent injury to occupants and damage to other vehicle components.	None	N/A
5.11.3	Heat test acceptance	Considered	P
	When the SbS is tested in accordance with I.1 and I.2 there shall be no signs of fire and all electrical components shall remain contained within the test vehicle.	Considered	P
	Any heat transfer through the test vehicle shall not produce an external surface temperature accessible to persons outside or on the vehicle in excess of 60 °C on metal surfaces and 85 °C on non-metal surfaces.	Considered	P
	Adequate design measures shall be taken to achieve compliance with the specified temperature limits.	Considered	P
5.11.4	Movement Modes (Safety Requirements)	Considered	P
5.11.4.1	Power-On and Motion Initiation	Considered	P
	It shall be indicated to the operator, that the propulsion system of the vehicle is in the energised mode making driving possible.	Considered	P
	However, this provision does not apply when an internal combustion engine is providing directly or indirectly the vehicle's propulsion power.	Considered	P
	When leaving the vehicle the operator shall be informed by a signal (e.g. optical or audible signal) if the vehicle is still in the active driving possible mode.	Considered	P
	On level ground, the vehicle shall start from rest only when the control(s) for speed are activated. Where no neutral position of the direction control is provided the vehicle shall not move unless the speed control device is actuated.	Considered	P
5.11.4.2	Reverse Operation	Considered	P
	It shall be possible for the operator to readily identify the status of the drive direction control. If driving backwards is achieved by reversing the rotational direction of the electric motor, this shall occur only when the vehicle is stationary or moving slowly.	Considered	P
5.11.4.3	Power Reduction Modes	Considered	P
	If the vehicle limits its performance the operator shall be informed by a signal.	Considered	P
5.11.5	Charging Requirements	Considered	P
	On-board chargers shall be designed, constructed and equipped in such a way that all foreseeable hazards of an electrical nature are prevented, according to EN 60335-2-29:2004+A2:2010.	Considered	P
	Vehicle movement by its own propulsion system shall be impossible whenever the vehicle is physically connected to a live electric power supply (e.g. mains). The battery charging system shall prevent overcharging when "end of charge" conditions are reached.	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	In the case of motor vehicles which are intended to be connected to a grounded external electric power supply through the conductive connection shall be provided with a device to enable the galvanic connection of the electrical chassis to be grounded to earth. The device shall enable connection to the grounded earth before exterior voltage is applied to the vehicle and retain the connection until after the exterior voltage is removed from the vehicle.	Considered	P
5.11.6	High Voltage Requirements	None	N/A
5.11.6.1	General	None	N/A
	This section only applies to "Electric powered vehicles" with a nominal voltage greater or equal to 60 V DC or 30 V AC.	None	N/A
5.11.6.2	Protection against direct contact	None	N/A
	Access to live parts shall be prevented. If this is achieved by the use of enclosures or guards, it shall not be possible to access or have direct contact with live parts without the enclosure/guarding being dismantled or removed with the use of tools.	None	N/A
	Where there is a risk of direct contact with the battery or with live parts of the high voltage electrical equipment that are exposed after removal of barriers or enclosures, the symbol in Figure K.1 shall be used.	None	N/A
	The outer covering of high voltage cables and wires not within enclosures or behind barriers shall be orange in colour.	None	N/A
5.11.6.3	Protection against indirect contact	None	N/A
	For protection against electrical shock which could arise from indirect contact, the exposed conductive parts, such as the conductive barrier and enclosure, shall be securely galvanically connected to the electrical chassis with electrical wire or ground cable, or by welding, or by connection using bolts, etc. so that no dangerous electrical potentials are produced.	None	N/A
	The resistance between all exposed conductive parts and the electrical chassis shall be lower than 0,1 Ω when there is current flow of at least 0,2 amperes.	None	N/A
	This requirement is satisfied if the galvanic connection has been established by welding.	None	N/A
5.11.6.4	Access and Maintenance	None	N/A
	Persons shall be protected against direct contact with the live parts of the high voltage electrical circuits. The protection measures against direct contact shall be provided by either one or both of the following:	None	N/A
	1) basic insulation of the live parts;	None	N/A
	2) barriers/enclosures, preventing access to the live parts. The barriers/enclosures may be electrically conductive or non-conductive.	None	N/A

Clause	Requirement	Remarks - Results	Verdict
	A power disconnection device shall be provided that requires manual action to break the connection. The disconnection shall be physically verifiable and have a means to prevent unintended reconnection.	None	N/A
6	Verification of the safety requirements and/or protective measures	Considered	P
6.1	Verification methods This clause contains the methods of verification of the conformity with the requirements of Clause 5. The criteria for acceptance are contained in Clause 5 or are specified in this clause.	Considered	P
6.2	Verification of final assembly	Considered	P
	Each vehicle shall be accompanied by a document having sufficient detail to provide an adequate record of pre-delivery checks carried out before supplying the vehicle to the purchaser. Information that may be relevant is given in Annex J (pre-delivery certificate form). In case the delivery to the final user is not made by the manufacturer himself, the manufacturer should ensure that the pre-delivery checks are carried out. Vehicles that are shipped by the manufacturer partly assembled shall be accompanied with final assembly instructions (see 7.3 g) that include details of the final pre-delivery or pre-use check.	The final assembly instructions contain in the user manual	P
7	Information for use	Considered	P
7.1	General	Considered	P
	Information for the use of the SbS shall be provided in accordance with EN ISO 12100:2010, 6.4.5 and, where relevant, the specific requirements of this clause.	Refer to Part II of report	P
7.2	Signs (pictograms), written warnings	Considered	P
	The user shall be informed about the residual risks of the vehicle with appropriate signs (pictograms) and, if necessary written warnings permanently marked on the vehicle so that they remain legible for the life of the vehicle. Signs and written warnings shall inform clearly and without ambiguity, preferably with use of pictograms. Pictograms shall comply with the principles of the EN 61310-1:2008. Signs and written warnings concerning ways in which the vehicle shall not be used that experience has shown might occur shall be supplied.	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	<p>In particular, the following warnings shall be marked on the vehicle by either text or pictograms. Annex K provides examples of pictograms:</p> <ul style="list-style-type: none"> - not for use on public roads (shall be visible to the operator when seated in the driving position) - read instructions hand-book (shall be visible to the operator when seated in the driving position) - for SbS with liquid cooling; never open when hot - tyre pressure - for SbS equipped with a towing device for maximum vertical and horizontal loads <p>The signs and warnings shall be reproduced and explained in the instructions handbook.</p>	<p>Considered</p>	<p>P</p>
7.3	<p>Accompanying documents (in particular the instructions handbook)</p>	<p>Instruction handbook provided in the vehicle</p>	<p>P</p>
	<p>All SbSs shall be accompanied by an instructions handbook with contents in accordance with EN ISO 12100:2010, 6.4.5.</p>	<p>Fulfill the requirement</p>	<p>P</p>
	<p>The content of the instructions handbook shall be consistent with all warnings on the vehicle for; e.g. safety, noise and vibrations.</p>	<p>Fulfill the requirement</p>	<p>P</p>
	<p>Advertising and promotional material shall be consistent with the information in the instructions handbook. Each instructions handbook shall contain, where applicable, at least the following:</p>	<p>Considered</p>	<p>P</p>
	<p>a) information on the manufacturer; The business name and full address of the manufacturer and, where applicable, his authorized representative;</p>	<p>Related information is stated in user manual.</p>	<p>P</p>
	<p>b) information concerning the SbS models; A list of the particular SbS model types and any variants covered by the handbook;</p>	<p>Related information is stated in user manual.</p>	<p>P</p>
	<p>c) information concerning the vehicle: a general description of the vehicle; a description of the conditions of use foreseeable by the manufacturer for the type of vehicle the designation of the vehicle as marked on the vehicle itself, except for the serial number; a description or drawing of the location of the vehicle serial number; the drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the vehicle and for checking its correct functioning; including: the location of the controls, instruments and equipment and the pre-start checks; all information for the front and the rear tyres to allow the operator or owner to select correct replacement tyres, with regards to dimensions, load capacity and speed (refer to Annex L);</p>	<p>Related information is stated in user manual.</p>	<p>P</p>

Clause	Requirement	Remarks - Results	Verdict
	d) legal information; A copy of the mandatory documents stating the conformity of the vehicle with applicable legislation 4);	Considered	P
	e) safety information:	Considered	P
	1) an introductory safety message emphasizing: i) the importance of reading and understanding the manual prior to operation; ii) the importance of following the safety rules contained in the handbook, familiarisation of the particular vehicle and, where necessary, for safe operation the recommendation to access further training; iii) a warning that the weight and location of implements and loads carried on the vehicle will affect its stability.	Related information is stated in user manual.	P
	2) a notice emphasizing: i) that an SbS is not a “toy”; ii) the importance of giving correct information for the minimum age of operators relevant to the particular vehicle. In any case the minimum age shall not be lower than 14 years; iii) the importance of passengers understanding and following the instructions and warnings contained in the manual;	Related information is stated in user manual.	P
	3) descriptions or drawings of the location of warning signs(pictograms) and written warnings on the SbS and a statement emphasizing the importance of understanding and following the warnings, and the importance of keeping these on the SbS;	Related information is stated in user manual.	P
	4) an instruction on how to obtain replacement warning signs and written warnings in the event any of these become damaged;	Related information is stated in user manual.	P
	5) a pre-operating inspection procedure and a statement emphasizing the importance of this procedure;	Related information is stated in user manual.	P
	6) information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted;	Related information is stated in user manual.	P
	f) information on the use:	Related information is stated in user manual.	P
	1) instructions for the putting into service and use of the vehicle including a form to enable the pre-delivery checks (see also below under 7.3 g);	Related information is stated in user manual.	P
	2) instructions for the training of operator where necessary;	Related information is stated in user manual.	P
	3) instructions on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided;	Related information is stated in user manual.	P
	4) instructions with a view to ensuring that transport, handling and storage may be made safely, giving the mass of the vehicle;	Related information is stated in user manual.	P

Clause	Requirement	Remarks - Results	Verdict
	5) operating method to be followed in the event of a breakdown or recovery;	Related information is stated in user manual.	P
	6) the description of the adjustment and maintenance operations that should be carried out by the operator and the preventive maintenance measures that should be observed;	Related information is stated in user manual.	P
	7) instructions designed to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations;	Related information is stated in user manual.	P
	8) instructions on the tyres an example of such a text can be found in Annex K;	Considered	P
	9) the specifications of the spare parts to be used, when these affect the health or safety of operator;	Considered	P
	10) guidance on driving on rough terrain, especially on sloping ground;	Related information is stated in user manual.	P
	11) guidance on driving with loads and/or towing;	Considered	P
	g) information on assembly and pre-delivery checks:	Related information is stated in user manual.	P
	1) a copy of a pre-delivery certificate form containing at least the points listed in Annex J;	Considered	P
	2) a recommendation that the purchaser obtains verification from the dealer that the vehicle has been checked in accordance with the pre-delivery document given in Annex J;	Considered	P
	3) for SbSs supplied partly disassembled to facilitate transportation prior to putting into service, the vehicle shall be accompanied by instructions (including drawings and diagrams) sufficient to allow correct assembly. The necessary tools, the essential special competences to achieve this assembly and the adjustments and verifications to be made shall be described. The assembly instructions 5) should make reference to the pre-delivery certificate (see Annex J) and explain the necessity to perform a pre-delivery check;	Related information is stated in user manual.	P
	h) information on noise:	Considered	P
	The instruction handbook and the technical sales literature describing a side by side shall:	Considered	P
	1) give the declared noise emission values of the side by side in accordance with the noise test code specified in Annex F. Annex F gives an example of a noise emission declaration	the result of 77.8dB from the test	P
	2) refer to the noise test code specified in Annex F to this standard upon which the determination of the noise emission values of the side by side is based and state which basic noise measurement standards have been used	Considered	P
	3) give an explanation that these measurements are for stationary vehicles and, that the noise emission values when the vehicle is operating/travelling during foreseeable normal use are not significantly different from those obtained using Annex F of this standard	Considered	P

Clause	Requirement	Remarks - Results	Verdict
	4) instructions regarding exposure to noise, selection and use of hearing protection, including recommendations for limiting the duration of operation, if appropriate.	Considered	P
	i) information on vibrations:	Considered	P
	The instruction handbook, the technical documentation and the sales literature describing the performance characteristics of a side by side shall:	Considered	P
	Provide information concerning:	Considered	P
	2) refer to the vibration test code specified in Annex G to this standard upon which the determination of the vibration values of the side by side is based and state which basic vibration measurement standards have been used	Considered	P
	3) give an explanation that these measurements are for stationary vehicles and, that the vibration values when the vehicle is operating/travelling during foreseeable normal use are not significantly different from those obtained using Annex G of this standard.	Considered	P
7.4	Marking	Considered	P
	Every SbS shall be marked legibly and indelibly throughout their expected life with at least the following information:	Considered	P
	a) business name and address of the manufacturer and, where applicable, his authorized representative;	Related information is stated in user manual.	P
	b) mandatory marking 6);	Considered	P
	c) designation of the vehicle;	Related information is stated in user manual.	P
	d) designation of series or type;	Related information is stated in user manual.	P
	e) serial number, if any;	Related information is stated in user manual.	P
	f) the year of construction (year in which the manufacturing process is completed);	Related information is stated on the label	P
	g) rating information including:	Related information is stated on the label	P
	1) rated power expressed in kilowatts (kW);	Related information is stated on the label	P
	2) mass of the most usual configuration, in kilograms (kg);	Related information is stated on the label	P
	3) and where appropriate:	Considered	P
	i) maximum drawbar pull provided for at the coupling hook, in Newton (N);	Considered	P
	ii) maximum vertical load provided for on the coupling hook, in Newton (N).	None	N/A
	The horizontal and vertical loads on the coupling hook may additionally be expressed in kilograms (kg).	None	N/A
	On battery-electric vehicles, the nameplate shall also show:	Considered	P
	h) vehicle mass without battery (batteries);	Related information is stated in user manual.	P

Clause	Requirement	Remarks - Results	Verdict
	i) the maximum service mass of battery (s) and tray to be used;	Related information is stated on the label	P
	j) nominal voltage for which the vehicle is designed. For recommended voltages, see ISO 1044:1993.	Considered	P
	For batteries in a lift-out tray the maximum combined mass of the batteries and tray shall be legibly identified on the battery tray near the lifting means with the information shown as appropriate 'Service mass xxx kg'.	Considered	P
Annex A (informative)	Examples of Side by Side Vehicles (SbSs)	Informative.	-
Annex B (normative)	Service braking system and service brake performance	Informative.	-
Annex C (normative)	Parking Brake/Mechanism Performance	Informative.	-
Annex D (normative)	Test conditions stability	Informative.	-
Annex E (normative)	Determination of hot surfaces	Informative.	-
Annex F (normative)	Noise test code	Informative.	-
Annex G (normative)	Vibration test method	Informative.	-
Annex H (normative)	Test methods applying to safety belt anchorages and safety belts	Informative.	-
Annex I (normative)	Heat Generating Components – Heat Test for Electric Powered Vehicles	Informative.	-
Annex J (informative)	Pre-delivery form	Informative.	-
Annex K (informative)	Warnings and Pictograms	Informative.	-
Annex L (informative)	Instructions for tyres to be included in the instructions handbook	Informative.	-
Annex M (normative)	List of hazards	Informative.	-
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC aimed to be covered	Informative.	-

End of Test Report

Measurement Equipment List

Service Start Date 09.07.2025
 Service End Date 09.07.2025

Deliverable/Report Number CN25H1H5 001
 AMEL ID P01953842AA


Client HAISHIDA EMERGENCY EQUIPMENT
 Product 8X8 Amphibious Terrain Vehicle
 Comment

Page 1 of 1

Equip.	Description	Model	Manufacturer	Last Date DD.MM.YYYY	Due Date DD.MM.YYYY
9074028	XL3 Analyzer	XL3	NTI	15.04.2025	15.04.2026
9023922	Lumeter	TES-1330A	TES	18.04.2025	18.04.2026
9076091	Steel Tape Measure	5m* 25mm	Deli	12.03.2025	12.03.2026
9074032	Temperature Rise Tester	GL840M	GRAPHTEC	16.04.2025	16.04.2026
9078146	StopWatch	PS-1003A	ZhuiRi	07.05.2025	07.05.2026

* No entry for devices that are not subject to regular calibration or require initial verification/calibration only.

where required, Signature: Nick Yu

Prüfbericht-Nr.: <i>Test report no.:</i>	CN25H1H5 001 Part II of II	Auftrags-Nr.: <i>Order no.:</i>	326109939	Seite 1 von 18 Page 1 of 18
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2349883	Auftragsdatum: <i>Order date:</i>	2025-05-19	
Auftraggeber: <i>Client:</i>	HAISHIDA EMERGENCY EQUIPMENT (ZHEJIANG) CO.,LTD. Xianren Village, Hetou Town, Linhai, 317034 Zhejiang, P.R. China			
Prüfgegenstand: <i>Test item:</i>	8X8 Amphibious All Terrain Vehicle			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	HSD-BV228			
Auftrags-Inhalt: <i>Order content:</i>	Type test			
Prüfgrundlage: <i>Test specification:</i>	EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction			
Wareneingangsdatum: <i>Date of sample receipt:</i>	N/A			
Prüfmuster-Nr.: <i>Test sample no.:</i>	LHSDB1N25P0085			
Prüfzeitraum: <i>Testing period:</i>	2025-07-09 - 2025-07-09			
Ort der Prüfung: <i>Place of testing:</i>	As client			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	Qiao He/Trainee <i>Qiao He</i> Nick Yu <i>Nick Yu</i>	genehmigt von: <i>authorized by:</i>	Xinling Liu <i>Xinling Liu</i>	
Datum: <i>Date:</i>	2025-08-03	Ausstellatum: <i>Issue date:</i>	2025-08-03	
Stellung / Position:	Project Engineer	Stellung / Position:	Reviewer	
Sonstiges / Other:	This report is only valid in its full version: Part I of II and Part II of II.			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
4.	Strategy for risk assessment and risk reduction		P
	To implement risk assessment and risk reduction the designer shall take the following actions, in the order given (see Figure 1)	Considered	P
	Risk assessment is a series of logical steps to enable, in a systematic way, the analysis and evaluation of the risks associated with machinery.	Considered	P
	Risk assessment is followed, whenever necessary, by risk reduction. Iteration of this process can be necessary to eliminate hazards as far as practicable and to adequately reduce risks by the implementation of protective measures.	Considered	P
	It is assumed that, when present on machinery, a hazard will sooner or later lead to harm if no protective measure or measures have been implemented.	Considered	P
	Protective measures are the combination of the measures implemented by the designer and the user in accordance with Figure 2. Measures which can be incorporated at the design stage are preferable to those implemented by the user and usually prove more effective.	Considered	P
	The objective to be met is the greatest practicable risk reduction, taking into account the four below factors. The strategy defined in this clause is represented by the flowchart in Figure 1. The process itself is iterative and several successive applications can be necessary to reduce the risk, making the best use of available technology.	Considered	P
5	Risk assessment	See below	P
5.1	General	See below	P
	Risk assessment comprises (see Figure 1)	Considered	P
	- risk analysis	It is included in the analysis that the determination of the limits of the machinery, hazard identification and risk estimation.	P
	- risk evaluation (see 5.6).	Considered	P
5.2	Information for risk assessment	See below	P
	The information for risk assessment should include the following.	Provided in the rating label and user manual.	P
	a) Related to machinery description	Considered in the risk assessment	P
	b) Related to regulations, standards and other applicable documents	Considered	P
	c) Related to experience of use	Considered	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
	d) Relevant ergonomic principles.	Considered	P
5.3	Determination of limits of machinery	See below	P
5.3.1	General	See below	P
	Risk assessment begins with the determination of the limits of the machinery, taking into account all the phases of the machinery life. This means that the characteristics and performances of the machine or a series of machines in an integrated process, and the related people, environment and products, should be identified in terms of the limits of machinery as given in 5.3.2 to 5.3.5.	Considered and see below	P
5.3.2	Use limits	Related information indicated in the manual	P
5.3.3	Space limits	Related information indicated in the manual	P
5.3.4	Time limits	Related information mentioned in the manual.	P
5.3.5	Other limits	Related information mentioned in the manual as temperature, humidity etc.	P
5.4	Hazard identification	See below	P
	After determination of the limits of the machinery, the essential step in any risk assessment of the machinery is the systematic identification of reasonably foreseeable hazards (permanent hazards and those which can appear unexpectedly), hazardous situations and/or hazardous events during all phases of the machine life cycle	Stated in the manual	P
	Only when hazards have been identified can steps be taken to eliminate them or to reduce risks. To accomplish this hazard identification, it is necessary to identify the operations to be performed by the machinery and the tasks to be performed by persons who interact with it	Considered	P
	The designer shall identify hazards taking into account the following.	Considered and detail as below	P
	a) Human interaction during the whole life cycle of the machine	All reasonably foreseeable hazards, hazardous situations or hazardous events associated are identified.	P
	b) Possible states of the machine.	Stated in the manual	P
	c) Unintended behaviour of the operator or reasonably foreseeable misuse of the machine	Stated in the manual	P
5.5	Risk estimation	See below.	P
5.5.1	General	See below.	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
	After hazard identification, risk estimation shall be carried out for each hazardous situation by determining the elements of risk given in 5.5.2. When determining these elements, it is necessary to take into account the aspects given in 5.5.3.	Considered	P
	If standardized (or other suitable) measurement methods exist for an emission, they should be used, in conjunction with existing machinery or prototypes, to determine emission values and comparative emission data.	The evaluation according to EN 16990:2020 performed	P
	Hazards other than emissions that are described by measurable parameters can be dealt with in a similar manner.	Considered	P
5.5.2	Elements of risk	All elements of risk is considered	P
5.5.2.1	General	See below	P
	The risk associated with a particular hazardous situation depends on the following elements:	See below	P
	a) the severity of harm;	Considered	P
	b) the probability of occurrence of that harm	Considered	P
5.5.2.2	Severity of harm	See below	P
	The severity can be estimated by taking into account the following:	See below	P
	a) the severity of injuries or damage to health	Slight	P
	b) the extent of harm	Several persons	P
	When carrying out a risk assessment, the risk from the most likely severity of the harm that is likely to occur from each identified hazard shall be considered, but the highest foreseeable severity shall also be taken into account, even if the probability of such an occurrence is not high.	Considered.	P
5.5.2.3	Probability of occurrence of harm	See below	P
5.5.2.3.1	Exposure of persons to the hazard	See below	P
	The exposure of a person to the hazard influences the probability of the occurrence of harm.	Considered	P
5.5.2.3.2	Occurrence of a hazardous event	See below	P
	The occurrence of a hazardous event influences the probability of occurrence of harm.	Considered	P
5.5.2.3.3	Possibility of avoiding or limiting harm	See below	P
	The possibility of avoiding or limiting harm influences the probability of occurrence of harm. Factors to be taken into account when estimating the possibility of avoiding or limiting harm	Considered	P
5.5.3	Aspects to be considered during risk estimation	See below	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
5.5.3.1	Persons exposed	See below	P
	Risk estimation shall take into account all persons (operators and others) for whom exposure to the hazard is reasonably foreseeable.	Mentioned in the manual.	P
5.5.3.2	Type, frequency and duration of exposure	See below	P
	The estimation of the exposure to the hazard under consideration (including long-term damage to health) requires analysis of, and shall account for, all modes of operation of the machinery and methods of working. In particular, the analysis shall account for the needs for access during loading/unloading, setting, teaching, process changeover or correction, cleaning, fault-finding and maintenance.	Considered	P
	The risk estimation shall also take into account tasks, for which it is necessary to suspend protective measures.	Considered	P
5.5.3.3	Relationship between exposure and effects	See below	P
	The relationship between an exposure to a hazard and its effects shall be taken into account for each hazardous situation considered. The effects of accumulated exposure and combinations of hazards shall also be considered. When considering these effects, risk estimation shall, as far as practicable, be based on appropriate recognized data	Considered	P
5.5.3.4	Human factors	See below	P
	Human factors can affect risk and shall be taken into account in the risk estimation	Considered	P
	Training, experience and ability can affect risk; nevertheless, none of these factors shall be used as a substitute for hazard elimination, risk reduction by inherently safe design measure or safeguarding, wherever these protective measures can be practicably implemented.	Appropriate information provided in the user manual	P
5.5.3.5	Suitability of protective measures	Related information is stated in user manual.	P
	Risk estimation shall take into account the suitability of protective measures and shall	See below	P
	a) identify the circumstances which can result in harm,	Considered	P
	b) whenever appropriate, be carried out using quantitative methods to compare alternative protective measures and	Considered	P
	c) provide information that can assist with the selection of appropriate protective measures.	Considered	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
	When estimating risk, those components and systems identified as immediately increasing the risk in case of failure need special attention.	Considered	P
	When protective measures include work organization, correct behavior, attention, application of personal protective equipment (PPE), skill or training, the relatively low reliability of such measures compared with proven technical protective measures shall be taken into account in the risk estimation.	Related information is stated in user manual.	P
5.5.3.6	Possibility of defeating or circumventing protective measures	Considered	P
	For the continued safe operation of a machine, it is important that the protective measures allow its easy use and do not hinder its intended use. Otherwise, there is a possibility that protective measures might be bypassed in order for maximum utility of the machine to be achieved.	Easy use is allowed as designation. The intended use cannot be hindered as designation.	P
	Risk estimation shall take account of the possibility of defeating or circumventing protective measures. It shall also take account of the incentive to defeat or circumvent protective measures	The protective measures cannot be defeated.	P
	Whether or not a protective measure can be defeated depends on both the type of protective measure, such as an adjustable guard or programmable trip device, and its design details.	No such construction	N/A
	Protective measures that use programmable electronic systems introduce additional possibilities of defeat or circumvention if access to safety-related software is not appropriately restricted by design and monitoring methods. Risk estimation shall identify where safety-related functions are not separated from other machine functions and shall determine the extent to which access is possible. This is particularly important when remote access for diagnostic or process correction purposes is required.	No such measures used.	N/A
5.5.3.7	Ability to maintain protective measures	See below	P
	Risk estimation shall consider whether the protective measures can be maintained in the condition necessary to provide the required level of protection.	Considered	P
5.5.3.8	Information for use	See below	P
	Risk estimation shall take into account the information for use, as available. See also 6.4.	Mentioned in the user manual.	P
5.6	Risk evaluation	See below	P
5.6.1	General	See below	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
	After risk estimation has been completed, risk evaluation shall be carried out to determine if risk reduction is required. If risk reduction is required, then appropriate protective measures shall be selected and applied.	Considered	P
	Achieving the objectives of risk reduction and a favorable outcome of risk comparison applied when practicable gives confidence that risk has been adequately reduced.	Considered	P
5.6.2	Adequate risk reduction	See below	P
	Application of the three-step method described in 6.1 is essential in achieving adequate risk reduction.	Three-step method used for risk reduction.	P
5.6.3	Comparison of risks	See below	P
	As part of the process of risk evaluation, the risks associated with the machinery or parts of machinery can be compared with those of similar machinery or parts of machinery	Considered	P
	The use of this comparison method does not eliminate the need to follow the risk assessment process as described in this International Standard for the specific conditions of use. For example, when a band saw used for cutting meat is compared with a band saw used for cutting wood, the risks associated with the different material shall be assessed.	Considered	P
6	Risk reduction	See below	P
6.1	General	See below	P
	The objective of risk reduction can be achieved by the elimination of hazards, or by separately or simultaneously reducing each of the two elements that determine the associated risk:	Considered	P
	- severity of harm from the hazard under consideration; - probability of occurrence of that harm.	Considered	P
	All protective measures intended for reaching this objective shall be applied in the following sequence, referred to as the three-step method (see also Figures 1 and 2).	Three-step protective measures considered.	P
	Step 1: Inherently safe design measures	Considered	P
	Step 2: Safeguarding and/or complementary protective measures	Considered	P
	Step 3: Information for use	Considered	P
6.2	Inherently safe design measures	See below	P
6.2.1	General	See below	P
	Inherently safe design measures are the first and most important step in the risk reduction process.	Considered	P

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Clause	Requirement	Result - Remark	Verdict
	Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features for the machine itself and/or interaction between the exposed persons and the machine.	Considered	P
6.2.2	Consideration of geometrical factors and physical aspects	See below	P
6.2.2.1	Geometrical factors	See below	P
	Such factors include the following.	Considered	P
	a) The form of machinery is designed to maximize direct visibility of the working areas and hazard zones from the control position - reducing blind spots. so as to take into account the characteristics of human vision, particularly when safe operation requires permanent direct control by the operator. The design of the machine shall be such that, from the main control position, the operator is able to ensure that there are no exposed persons in the danger zones.	Considered	P
	b) The form and the relative location of the mechanical components parts	Considered	P
	c) Avoiding sharp edges and corners, protruding parts	Considered	P
	d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).	Considered	P
6.2.2.2	Physical aspects	See below	P
	Such aspects include the following:	See below	P
	a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;	Considered	P
	b) limiting the mass and/or velocity of the movable elements, and hence their kinetic energy;	Considered	P
	c) limiting the emissions by acting on the characteristics of the source using measures for reducing 1) noise emission at source 2) the emission of vibration at source, 3) the emission of hazardous substances, and 4) radiation emissions, including	Considered	P
6.2.3	Taking into account general technical knowledge of machine design	See below	P
	This general technical knowledge can be derived from technical specifications for design (standards, design codes, calculation rules, etc.), which should be used to cover	Considered and the evaluation as EN 16990:2020 performed.	P

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Clause	Requirement	Result - Remark	Verdict
	a) mechanical stresses	As above	P
	b) materials and their properties	As above	P
	c) emission values	As above	P
	When the reliability of particular components or assemblies is critical for safety (for example, ropes, chains, lifting accessories for lifting loads or persons), stress limits shall be multiplied by appropriate working coefficients.	As above	P
6.2.4	Choice of appropriate technology	See below	P
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain applications such as the following:	Considered	P
	a) on machines intended for use in explosive atmospheres	Not used in such atmospheres.	N/A
	b) for particular products to be processed	No for processing particular products	N/A
	c) the use of alternative equipment to avoid high noise levels	Considered	P
6.2.5	Applying principle of positive mechanical action	See below	P
	Positive mechanical action is achieved when a moving mechanical component inevitably moves another component along with it, either by direct contact or via rigid elements.	Considered	P
6.2.6	Provisions for stability	See below	P
	Machines shall be designed so that they have sufficient stability to allow them to be used safely in their specified conditions of use.	Considered	P
	Stability shall be considered in all phases of the life cycle of the machine, including handling, travelling, installation, use, dismantling, disabling and scrapping.	Considered	P
6.2.7	Provisions for maintainability	See below	P
	When designing a machine, the following maintainability factors shall be taken into account to enable maintenance of the machine:	Considered	P
	- accessibility - ease of handling, taking into account human capabilities; - limitation of the number of special tools and equipment.	Considered	P
6.2.8	Observing ergonomic principles	See below	P

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Clause	Requirement	Result - Remark	Verdict
	Ergonomic principles shall be taken into account in designing machinery so as to reduce the mental or physical stress of, and strain on, the operator. These principles shall be considered when allocating functions to operator and machine (degree of automation) in the basic design.	Considered	P
	Account shall be taken of body sizes likely to be found in the intended user population, strengths and postures, movement amplitudes, frequency of cyclic actions (see ISO 10075 and ISO 10075-2).	Considered	P
	All elements of the operator-machine interface, such as controls, signalling or data display elements, shall be designed to be easily understood so that clear and unambiguous interaction between the operator and the machine is possible. See EN 614-1, EN 13861 and IEC 61310-1.	Considered	P
6.2.9	Electrical hazards	The machine is gasoline engine powered.	P
6.2.10	Pneumatic and hydraulic hazards	Considered	P
6.2.11	Applying inherently safe design measures to control systems	See below	P
6.2.11.1	General	See below	P
	The design measures of the control system shall be chosen so that their safety-related performance provides a sufficient amount of risk reduction (see ISO 13849-1 or IEC 62061).	Considered	P
	The correct design of machine control systems can avoid unforeseen and potentially hazardous machine behaviour.	Considered	P
6.2.11.2	Starting of an internal power source/switching on an external power supply	See below	P
	The starting of an internal power source or switching-on of an external power supply shall not result in a hazardous situation.	The machine comply with EN 16990:2020.	P
6.2.11.3	Starting/stopping of a mechanism	The machine comply with EN 16990:2020.	P
6.2.11.4	Restart after power interruption	The machine comply with EN 16990:2020.	P
6.2.11.5	Interruption of power supply	See below	P
	Machinery shall be designed to prevent hazardous situations resulting from interruption or excessive fluctuation of the power supply.	The machine is complied with EN 16990:2020.	P
6.2.11.6	Use of automatic monitoring	None	N/A

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Clause	Requirement	Result - Remark	Verdict
	Automatic monitoring is intended to ensure that a safety function or functions implemented by a protective measure do not fail to be performed	As above	N/A
	Automatic monitoring either detects a fault immediately or carries out periodic checks so that a fault is detected before the next demand upon the safety function.	As above	N/A
6.2.11.7	Safety functions implemented by programmable electronic control systems	No such programmable electronic control system for safety functions	N/A
6.2.11.7.1	General	As above	N/A
6.2.11.7.2	Hardware aspects	As above	N/A
6.2.11.7.3	Software aspects	As above	N/A
6.2.11.8	Principles relating to manual control	See below	P
	These are as follows.	See below	P
	a) Manual control devices shall be designed and located according to the relevant ergonomic principles	Considered	P
	b) A stop control device shall be placed near each start control device.	Considered	P
	c) Manual controls shall be located out of reach of the danger zones	Considered	P
	d) Whenever possible, control devices and control positions shall be located so that the operator is able to observe the working area or hazard zone	Considered	P
	e) the control circuit shall be so arranged that only one control is effective at a given times.	Considered	P
	f) Control actuators shall be designed or guarded so that their effect, where a risk is involved, cannot occur without intentional operation	Considered	P
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be implemented to ensure the presence of the operator at the control position	The machine functions safe operation depends on the certified protection devices.	P
	h) For cableless control, an automatic stop shall be performed	As above	N/A
6.2.11.9	Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance	Considered	P
6.2.11.10	Selection of control and operating modes	See below	P

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Clause	Requirement	Result - Remark	Verdict
	If machinery has been designed and built to allow for its use in several control or operating modes requiring different protective measures and/or work procedures (for example, to allow for adjustment, setting, maintenance, inspection), it shall be fitted with a mode selector which can be locked in each position. Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.	Considered	P
	The selector may be replaced by another selection means which restricts the use of certain functions of the machinery to certain categories of operators (for example, access codes for certain numerically controlled functions).	Considered	P
6.2.11.11	Applying measures to achieve electromagnetic compatibility (EMC)	Not applicable	N/A
	For guidance on electromagnetic compatibility, see IEC 60204-1 and IEC 61000-6.	As above	N/A
6.2.11.12	Provision of diagnostic systems to aid fault-finding	No diagnostic system provided	N/A
	Diagnostic systems to aid fault-finding should be included in the control system so that there is no need to disable any protective measure.	No diagnostic system provided	N/A
6.2.12	Minimizing probability of failure of safety functions	See below	P
6.2.12.1	General	See below	P
	Safety of machinery is not only dependent on the reliability of the control systems but also on the reliability of all parts of the machine.	Considered	P
6.2.12.2	Use of reliable components	See below	P
6.2.12.3	Use of "oriented failure mode" components	No such component	N/A
	"Oriented failure mode" components or systems are those in which the predominant failure mode is known in advance and which can be used so that the effect of such a failure on the machine function can be predicted.	As above	N/A
	NOTE In some cases, it will be necessary to take additional measures to limit the negative effects of such a failure.	As above	N/A
	The use of such components should always be considered, particularly in cases where redundancy (see 6.2.12.4) is not employed.	As above	N/A
6.2.12.4	Duplication (or redundancy) of components or subsystems	Considered	P
6.2.13	Limiting exposure to hazards through reliability of equipment	Certified critical components used	P

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Clause	Requirement	Result - Remark	Verdict
6.2.14	Limiting exposure to hazards through mechanization or automation of loading (feeding)/ unloading (removal) operations	No such mechanization	N/A
6.2.15	Limiting exposure to hazards through location of setting and maintenance points outside danger zones	Considered	P
6.3	Safeguarding and complementary protective measures	The machine is complied with EN 16990:2020.	P
6.3.1	General	See below	P
	Guards and protective devices shall be used to protect persons whenever an inherently safe design measure does not reasonably make it possible either to remove hazards or to sufficiently reduce risks.	Considered	P
6.3.2	Selection and implementation of guards and protective devices	See below	P
6.3.2.1	General	See below	P
	The exact choice of a safeguard for a particular machine shall be made on the basis of the risk assessment for that machine.	Considered	P
	A combination of safeguards can sometimes be required.	Considered	P
	Consideration shall be given to the enclosure of control positions or intervention zones to provide combined protection against several hazards	Considered	P
6.3.2.2	Where access to the hazard zone is not required during normal operation	Considered	P
6.3.2.3	Where access to the hazard zone is required during normal operation of the machinery, safeguards should be selected from the following:	No need to access to the hazard zone during normal operation.	N/A
	a) interlocking guards with or without guard locking	As above	N/A
	b) sensitive protective equipment	As above	N/A
	c) adjustable guards;	As above	N/A
	d) self-closing guards	As above	N/A
	e) two-hand control devices	As above	N/A
	f) interlocking guards with a start function	As above	N/A
6.3.2.4	Where access to the hazard zone is required for machine setting, teaching, process changeover, fault-finding, cleaning or maintenance	Considered	P
6.3.2.5	Selection and implementation of sensitive protective equipment	Considered	P
6.3.2.5.1	Selection	See below	P

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Clause	Requirement	Result - Remark	Verdict
	Due to the great diversity of the technologies on which their detection function is based, all types of sensitive protective equipment are far from being equally suitable for safety applications. The following provisions are intended to provide the designer with criteria for selecting, for each application, the most suitable device(s).	Considered	P
6.3.2.5.2	Implementation	See below	P
	Consideration should be given to	Considered	P
	a) the size, characteristics and positioning of the detection zone	Considered	P
	b) the reaction of the device to fault conditions	Considered	P
	c) the possibility of circumvention, and	Considered	P
	d) detection capability and its variation over the course of time	Considered	P
	Sensitive protective equipment shall be integrated in the operative part and associated with the control system of the machine	Considered	P
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation	No such cycle initiation	N/A
	In this exceptional application, the starting of the machine cycle is initiated by the withdrawal of a person or of the detected part of a person from the sensing field of the sensitive protective equipment, without any additional start command, hence deviating from the general requirement given in the second point of the dashed list in 6.3.2.5.2, above. After switching on the power supply, or when the machine has been stopped by the tripping function of the sensitive protective equipment, the machine cycle shall be initiated only by voluntary actuation of a start control.		N/A
6.3.2.6	Protective measures for stability	See below	P
	If stability cannot be achieved by inherently safe design measures such as weight distribution (see 6.2.6), it shall be maintained by the use of protective measures	Considered	P
6.3.2.7	Other protective devices	See below	P
	When a machine requires continuous control by the operator (for example, mobile machines, cranes) and an error of the operator can generate a hazardous situation, this machine shall be equipped with the necessary devices to enable the operation to remain within specified limits	Considered	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
6.3.3	Requirements for design of guards and protective devices	See below	P
6.3.3.1	General requirements	All guards are well fixed and have enough strength.	P
	Guards and protective devices shall be designed to be suitable for the intended use, taking into account mechanical and other hazards involved. Guards and protective devices shall be compatible with the working environment of the machine and designed so that they cannot be easily defeated. They shall provide the minimum possible interference with activities during operation and other phases of machine life, in order to reduce any incentive to defeat them.	Guards are fixed reliable.	P
	NOTE For additional information, see ISO 14120, ISO 13849-1, ISO 13851, ISO 14119, ISO 13856, IEC 61496 and IEC 62061.	Considered	P
	Guards and protective devices shall	See below	P
	a) be of robust construction,	Considered	P
	b) not give rise to any additional hazard,	Considered	P
	c) not be easy to bypass or render non-operational,	Considered	P
	d) be located at an adequate distance from the danger zone (see ISO 13855 and ISO 13857),	Considered	P
	e) cause minimum obstruction to the view of the production process, and	Considered	P
	f) enable essential work to be carried out for the installation and/or replacement of tools and for maintenance by allowing access only to the area where the work has to be carried out — if possible, without the guard having to be removed or protective device having to be disabled.	Considered	P
	For openings in the guards, see ISO 13857.	Considered	P
6.3.3.2	Requirements for guards	Considered	P
6.3.3.3	Technical characteristics of protective devices	See below	P
	Protective devices shall be selected or designed and connected to the control system such that correct implementation of their safety function(s) is ensured.	Certified protection devices used	P
6.3.3.4	Provisions for alternative types of safeguards	No such alternative type of safeguard provided	N/A

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Clause	Requirement	Result - Remark	Verdict
	Provisions should be made to facilitate the fitting of alternative types of safeguards on machinery where it is known that it will be necessary to change the safeguards because of the range of work to be carried out.	As above	N/A
6.3.4	Safeguarding to reduce emissions	No safeguarding provided to reduce emissions	N/A
6.3.4.1	General	As above	N/A
	If the measures for the reduction of emissions at source specified in 6.2.2.2 are not adequate, the machine shall be provided with additional protective measures (see 6.3.4.2 to 6.3.4.5).	As above	N/A
6.3.4.2	Noise	As above	N/A
	Additional protective measures against noise	As above	N/A
6.3.4.3	Vibration	As above	N/A
	Additional protective measures against vibration	As above	N/A
6.3.4.4	Hazardous substances	As above	N/A
	Additional protective measures against hazardous substances See ISO 14123-1.	As above	N/A
6.3.4.5	Radiation	As above	N/A
	Additional protective measures against radiation	As above	N/A
6.3.5	Complementary protective measures	See below	P
6.3.5.1	General	See below	P
	Protective measures which are neither inherently safe design measures, nor safeguarding (implementation of guards and/or protective devices), nor information for use, could have to be implemented as required by the intended use and the reasonably foreseeable misuse of the machine.	Considered	P
6.3.5.2	Components and elements to achieve emergency stop function	No such function	N/A
6.3.5.3	Measures for the escape and rescue of trapped persons	Considered	P

EN ISO 12100:2010			
Clause	Requirement	Result - Remark	Verdict
	Measures for the escape and rescue of trapped persons may consist, among others, of <ul style="list-style-type: none"> - escape routes and shelters in installations generating operator-trapping hazards, - arrangements for moving some elements by hand, after an emergency stop, - arrangements for reversing the movement of some elements, - anchorage points for descender devices, - means of communication to enable trapped operators to call for help. 	None	N/A
6.3.5.4	Measures for isolation and energy dissipation	See below	P
	Machines shall be equipped with the technical means to achieve isolation from power supply(ies) and dissipation of stored energy	Considered	P
6.3.5.5	Provisions for easy and safe handling of machines and their heavy component parts	See below	P
	Machines and their component parts which cannot be moved or transported by hand shall be provided or be capable of being provided with suitable attachment devices for transport by means of lifting gear.	Considered	P
6.3.5.6	Measures for safe access to machinery	See below	P
	Machinery shall be so designed as to enable operation and all routine tasks relating to setting and/or maintenance to be carried out as far as possible by a person remaining at ground level.	All operation, maintenance and setting can be done by a person remaining at ground level.	P
6.4	Information for use	See below	P
6.4.1	General requirements	See below	P
6.4.1.1	Drafting information for use is an integral part of the design of a machine	Considered	P
6.4.1.2	Information shall be provided to the user about the intended use of the machine, taking into account, notably, all its operating modes.	Relevant information provided in user manual	P
	The information shall contain all directions required to ensure safe and correct use of the machine. With this in view, it shall inform and warn the user about residual risk.	Relevant information provided in user manual	P

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Clause	Requirement	Result - Remark	Verdict
6.4.1.3	Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use of the machine (setting, teaching/programming or process changeover, operation, cleaning, fault-finding and maintenance) and, if necessary, dismantling, disabling and scrapping.	Relevant information provided in user manual	P
6.4.2	Location and nature of information for use	See below	P
6.4.3	Signals and warning devices	See below	P
	Visual signals, such as flashing lights and audible signals such as sirens may be used to warn of an impending hazardous event such as machine start-up or over speed. Such signals may also be used to warn the operator before the triggering of automatic protective measures	Indicator is provided.	P
	The warning devices shall be designed and located such that checking is easy. The information for use shall prescribe regular checking of warning devices.	The checking can be done easily.	P
	The attention of designers is drawn to the possibility of "sensorial saturation", which can result from too many visual and/or acoustic signals and which can also lead to defeating the warning devices. NOTE Consultation of the user on this subject is often necessary.	Considered.	P
6.4.4	Markings, signs (pictograms) and written warnings	See below	P
	Machinery shall bear all markings which are necessary	Considered	P
6.4.5	Accompanying documents (in particular - instruction handbook)	All documents are integrated to user manual	N/A
7	Documentation of risk assessment and risk reduction	See below	P
	The documentation shall demonstrate the procedure that has been followed and the results that have been achieved. This includes, when relevant, documentation of	Considered	P
	Standards or other specifications used to select protective measures referred to in f) above should be referenced. NOTE No requirement is given in this International Standard to deliver the risk assessment documentation together with the machine. See ISO/TR 14121-2 for information on documentation.	Considered	P