



AUSA Center s.L.U.

RISK ASSESSMENT

December 22nd,
2022

MACHINE

TYPE: Dumper

MODELS: D 601 / D1001

NA = Not applicable

Hazards according to EN 1050 (hazards mentioned on EN 414 are included)

Criteria

Comments

Clause	Type	Hazard	situation	exposed persons	prevent	protect	inform	Comments	
1	Mechanical	explosion	pressure vessels	all	NA			there are not vessels under high pressure	
1.1	crushing	falling objects	operator seat	operator		FOPS cabin		FOPS cabin is not standard equipment. It is an option applicable on demand, if the normal operation of the machine includes this risk - EN 474-1 clause 5.3.4	
			operator seat	operator		roll over protective structure (ROPS)	horn, warning plate	EN 474-1 clauses 5.9 and 7.1	
		unexpected fall of heavy parts	unexpected movement of the machine maintenance under engine cover	maintenance people	braking system		operator instructions		EN 474-1 clause 5.3.3
			maintenance under lifted bucket	maintenance people	safety prop		operator instructions		operator restraint - EN 474-1 clause 5.4.1.4
1.2	shearing hazard	moving parts	rotating parts into engine compartment	operator		guards preventing access to moving parts	warnings and operator instructions	EN 474-1 clause 5.3.1.2, 5.14.3, 7.1 and 7.2	
			articulated chassis	operator when access	minimum distances for access			EN 474-1 clause 5.2.1	
			articulated chassis	maintenance people	frame lock	audible warning device	warning plate	EN 474-1 clause 5.14.5 and EN 474-6 clause 5.2.2	
1.3	cutting	sharp edges, corners or angles	operator's station	operator	operator's station design of the access areas for maintenance			EN 474-1 clauses 5.3.2.2	
			maintenance operations environment	maintenance people	general design	operator visibility	warning plate	EN 474-1 clauses 5.3.2.2 and 5.14.6	
1.4	catch	turning parts	pulleys, fans, on engine compartment	maintenance people		guards preventing access to moving parts	warning plate	EN 474-1 clause 5.14	
			vehicle wheels	pedestrian		guards locked	maintenance instructions	EN 474-1 clause 7.2	
				pedestrian		guards and fenders	warning plate	EN 474-1 clauses 5.14.4, 5.22.4 and 7.1	

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1.5	person caught or trapped	impossibility of coming out because trapped body	option closed cabin operator seat access to broken parts access to inner parts (engine)	operator operator maintenance people pedestrian	dimensions for access minimum dimensions for access guards	emergency exit	warning plate	EN 474-1 clause 5-3-2-5 EN 474-1 clause 5-3-1-1 EN 474-1 clause 5.22.1 and 5.22.4 EN 1474-1 clauses 55.14.4 and 7.1
1.6	impact	tyre exploding ejection of objects and debris crash	working area working area - ejection from the wheels unattended movements during the transport of the machine	pedestrians all all	mudguards and fenders	provision of retrieval, tie-down and lifting points	tyre inflation instructions operator instructions	EN 474-1 clauses 5.10 and 7.2 EN 474-1 clause 5.14.7 EN 474-1 clauses 5.15 and 7.2
1.7	high pressure fluid ejection			all	hydraulic circuit design	guards		EN 474-1 clause 5.18
2	electrical							
2.1	direct contact with live parts	electrical live parts	battery connectors	maintenance people	insulation covers			EN 474-1 clause 5.17.5
2.2	not direct contact with live parts		circuits overloaded	all	over current protective devices (fuses etc.)			EN 474-1 clause 5.17
2.3	ejection of gas, etc.	ejection of battery acid	machine roll-over	operator	location and fastening points of the battery			EN 474-1 clause 5.17.5
		battery acid vapours	operator seat	operator	location of the battery			EN 474-1 clause 5.17.5
2.4	external factors	electromagnetic emissions	electrical equipment conforming EMC regulations	all	EMC test			EN 474-1 clause 5.16
		electromagnetic emissions	electrical equipment conforming EMC regulations	all	EMC test			EN 474-1 clause 5.16
3	thermal hazards							
3.1	burns and scalds	direct contact with hot parts	tanks containing hot fluids (hydraulic tank) exhaust gas release	operator maintenance people pedestrian pedestrian	tanks not in the vicinity of the operator exhaust system design		operator and maintenance instructions, warning plates warning plates warning plates	EN 474-1 clause 5.3 EN 474-1 clauses 5.14.2, 7.1 and 7.2 EN 474-1 clause 7.1 EN 474-1 clause 7.1
3.2	strong external climatic conditions		operator site	operator		options closed cab, heating and air conditioning		EN 474-1 clause 5.3.2
4	noise							
4.1	noise level	hear loss noise nuisances	operator seat environment	operator pedestrian	maximum noise emission	information noise level at the operator ear	warning plate for ear protectors noise level information on operator instructions noise level information on operator instructions	EN 474-1 clause 5.13 and 7.1, EN 474-6 clause 5.5.2 EN 474-1 clause 5.13 and 7.2, EN 474-6 clause 5.5.2 European Directive 2000/14*2005/88 and EN 474-1 clauses 5.13, 7.1 and 7.2, EN 474-6 clause 5.5.1 European Directive 2000/14*2005/88 and EN 474-1 clauses 5.9, 5.13, 7.1 and 7.2, EN 474-6 clause 5.5.1
4.2		difficulties for general communication and global stress	environment	pedestrian	noise level on the environment	audible warning device test	noise level information on operator instructions	EN 474-1 clauses 5.9, 5.13, 7.1 and 7.2, EN 474-6 clause 5.5.1
5	vibration							
5.1	vibration	skeleton diseases	operator seat	operator	operator seat design		vibration level information on operator instructions	EN 474-1 clause 5.4.1.3 and 7.2, EN 474-6 clause 4.4.3.2

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Clause	Type	Hazard	situation	exposed persons	prevent	protect	inform	
6	radiation							NA
7	hazards generated by substances							
7.1		gas inhalation inhalation of harmful fluids loss of harmful material	exhaust gas release environment closed cabin tank filling filling and draining of cases	operator all operator operator maintenance people	operator's station design engine exhaust emissions heating and ventilation system location of tank cups location of filling and draining cups		operator instructions maintenance instructions	EN 474-1 clause 5.3.1.3 European Directive 1997/68*2004/26, Stage IIIA EN 474-1 clause 5.3.2.7 EN 474-1 clause 5.19.2 EN 474-1 clause 7.2
7.2		fire and explosion	fuel and hydraulic tanks electrical systems option closed cabin general	all all operator all	design fire resistance materials	design of electrical circuit place for fire extinguisher	operator instructions	EN 474-1 clause 5.19 and 7.2 EN 474-1 5.17 EN 474-1 clause 5.20.1 EN 474-1 clause 5.20.2
8	ergonomic negligence							
8.1		unhealthy postures or excessive effort	operator's station	operator maintenance people	operator environment design operator seat operator compartment design closed cabin (option) controls design filling points	 access for maintenance purpose	 operators manual maintenance instructions	EN 474-1 clause 5.3 EN 474-1 clause 5.4 EN 474-1 clause 5.3 EN 474-1 clause 5.3 EN 474-1 clauses 5.5.1, 5.54 and 7.2 EN 474-1 clause 5.22.2 and 7.2
8.2		inadequate ergonomics climate comfort	operator's station	operator	operator environment design controls design visibility option of closed cab	seat adjustments heating / air conditioning / ventilation	operators manual operators manual	EN 474-1 clauses 5.3 and 5.4 EN 474-1 clauses 5.5.1, 5.54 and 7.2 EN 474-1 clause 5.8.1 and ISO 5006 EN 474-1 clause 5.3.2
8.3		neglecting use or safety personal equipment		operator maintenance people	safety belt		manuals and safety signs manuals and safety signs	EN 474-1 clauses 5.4.1.4, 7.1 and 7.2 EN 474-1 clauses 7.1 and 7.2
8.4		inadequate lighting in working area	working area presence of the machine	operator pedestrians	optional lightning operator's field of view	reflectors, rotating beacon, rear mirror - option of lighting	operators manual operators manual	EN 474-1 clause 5.8.2 and 7.2 EN 474-1 clause 5.8.1, 5.8.2 and 7.2
8.5	mental overload and underload stress	confusion in manoeuvring	operator's station	operator		ergonomic design		EN 474-1 clauses 5.3, 5.4 and 5.5
8.6	human error, human	unexpected movement uncontrolled movements unauthorised starting	working area working area working area	pedestrian all all	starting systems starting device	controls design and lay-out	manuals and safety signs safety signs	EN 474-1 clause 5.5.2 EN 474-1 clauses 5.5.1, 5.5.3 and 5.5.6 EN 474-1 clauses 5.5.2 and 7.1
8.7	inadequate design of controls	unexpected movements	operator's station	all		controls design and lay-out	operator's manual	EN 474-1 clauses 5.5 and 7.2
8.8	inadequate design of display units	errors		operator		display design and lay-out	operator's manual	EN 474-1 clauses 5.5.8 and 7.2
8.9	neglecting principles of safety integration	inadequate ergonomics	whole machine	all		design according to harmonised Standards design		EN 474-1 clause 52, 5.3, 5.4 and 5.5
8.10	inadequate guards and protection	inadequate ergonomics				design according to harmonised Standards		EN 474-1 clause 5.14.4 and EN ISO 3457

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8.11	inadequate operator's position	inadequate ergonomics	operator's station	operator		design of operator's station		EN 474-1 clause 5.3
8.12	inadequate access to maintenance	inadequate ergonomics				access design		EN 474-1 clause 5.22
9	combination of hazards	general disorders	whole machine	all	electrical circuits			EN 474-1 clause 5.17
10	functional disorders							
10.1		failure control system	machine	all	hydraulics general design		operator manual	EN 474-1 clause 5.5
10.2		failure of the power supply	movement of the machine	all		braking system emergency steering system		EN 474-1 clause 5.7 EN 474-1 clause 5.6
	loss of stability	roll-over	machine	operator		ROPS structure		EN 474-1 clause 5.3.3
10.3	electrical disturbs	electromagnetic emissions	electrical equipment conforming EMC regulations	all	EMC test			EN 474-1 clause 5.16
11	absence of safety devices							
11.1		absence of guards	unforeseeable	all	guards securely placed			EN 474-1 clause 5.14.4
11.2		loss of care on starting system	unforeseeable	all	starting / moving safety systems			EN 474-1 clause 5.5.2
11.3		general emergency	unforeseeable	operator		emergency exit on closed cabin		EN 474-1 clause 5.3.2.5
12	failure of the power supply	failure of the power supply	movement of the machine	all all		braking system emergency steering system		EN 474-1 clause 5.7 EN 474-1 clause 5.6
15	errors of fitting		transport and maintenance	maintenance people	design for maintenance and transport		manuals	EN 474-1 clause 7.2
17	falling or ejected objects or fluids ejection of fluids ejection of objects	hoses and pipes break down parts broken down	operator site general maintenance vicinity of pipes and hoses rotating parts	operator maintenance people pedestrian maintenance people pedestrian	absence of pipes in the operators compartment hydraulic circuit design hydraulic circuit design access to rotating parts blocked	hoses / pipes fastening system guards on rotating parts	operator's manuals safety signs safety signs	EN 474-1 clause 5.3 EN 474-1 clause 5.18.1 and 7.2 EN 474-1 clause 5.18.1 and 7.1 EN 474-1 clause 5.14 and 7.1 EN 474-1 clause 5.14 and 7.1
19	fall of persons	slip, trip and fall	operator site	operator		operator access	operator manual	
ADDITIONAL HAZARDS DUE TO THE MOBILITY (hazards not described yet)								
20								
20.1	ergonomics	unhealthy postures	operator site	operator	ergonomic access			EN 474-1 clause 5.2
20.2	travelling function	movement when starting the engine	working area	pedestrian	controls in neutral when starting			EN 474-1 clause 5.5.2
20.3		running over	front and rear of the machine	pedestrian	braking system	forward and rearward visibility - rear mirror - wipers and washers	horn / rotating beacon / back-up alarm	EN 474-1 clause 5.7, 5.8 and 5.9
24	Additional hazards due to working underground							NA

COMMENTS:

These machines are designed and produced according to the requirements of the European Standards EN 474-1 and 474-6. The conformity to these Standards mean presumption to conform the safety requirements of the European Machinery Directive 2006/42/EC. For this reason, the solutions given on the risk assessment are based on these Standards.