



AUSA Center s.L.U.

RISK ASSESSMENT

August 12th,
2023

MACHINE

TYPE: Dumper

MODELS: D 350 AHG /D450 AHG

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		
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	pedestrian			horn, warning plate	EN 474-1 clauses 5.9 and 7.1	
		roll over	operator seat	operator			roll over protective structure	operator instructions	EN 474-1 clause 5.3.3
			unexpected movement of the machine	maintenance people	braking system			maintenance instructions	operator restraint - EN 474-1 clause 5.4.1.4
			unexpected fall of heavy parts	maintenance people	safety prop			maintenance instructions	EN 474-1 clauses 5.7 and 7.2
machine or assemblies falling down	when lifting with a crane for transport	all	access to engine		lifting points	operator instructions	EN 474-1 clauses 5.14.4.2 and 7.2		
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
		moving parts on maintenance operation	pedestrian	controls of the operator					operator visibility
				maintenance people			maintenance instructions	EN 474-1 clause 5.8	
1.3	cutting	sharp edges, corners or angles	operator's station	operator	operator's station design			EN 474-1 clauses 5.3.2.2	
			maintenance operations	maintenance people	design of the access areas for maintenance			EN 474-1 clauses 5.3.2.2 and 5.14.6	
			environment	pedestrian	general design		warning plate	EN 474-1 clauses 5.14.6 and 7.1	
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	
				pedestrian			maintenance instructions	EN 474-1 clause 7.2	
			vehicle wheels	pedestrian			guards locked	warning plate	EN 474-1 clauses 5.14.4, 5.22.4 and 7.1
						guards and fenders		EN 474-1 clause 5.14.7	

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1.5	person caught or trapped	impossibility of coming out because trapped body	option closed cabin	operator			emergency exit	EN 474-1 clause 5.3-2.5
			operator seat	operator	dimensions for access			EN 474-1 clause 5.3-1-1
			access to broken parts	maintenance people	minimum dimensions for access			EN 474-1 clause 5.22.1 and 5.22.4
			access to inner parts (engine)	pedestrian	guards		warning plate	EN 1474-1 clauses 55.14.4 and 7.1
1.6	impact	tyre exploding	working area	pedestrians			tyre inflation instructions	EN 474-1 clauses 5.10 and 7.2
			working area - ejection from the wheels unattended movements during the transport of the machine	all	mudguards and fenders			EN 474-1 clause 5.14.7
		crash	all		provision of retrieval, tie-down and lifting points	operator instructions	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		
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		
3	thermal hazards							
3.1	burns and scalds	direct contact with hot parts	tanks containing hot fluids (hydraulic tank)	operator	tanks not in the vicinity of the operator			EN 474-1 clause 5.3
				maintenance people			operator and maintenance instructions, warning plates	EN 474-1 clauses 5.14.2, 7.1 and 7.2
			exhaust gas release	pedestrian	exhaust system design		warning plates	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	operator seat	operator		information noise level at the operator ear	warning plate for ear protectors	EN 474-1 clause 5.13 and 7.1, EN 474-6 clause 5.5.2
		noise nuisances	environment	pedestrian	maximum noise emission		noise level information on operator instructions	EN 474-1 clause 5.13 and 7.2, EN 474-6 clause 5.5.2
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	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
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		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		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		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		EN 474-1 clause 5.7
	loss of stability	roll-over	machine	operator		emergency steering system		EN 474-1 clause 5.6
						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		braking system		EN 474-1 clause 5.7
				all		emergency steering system		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	hoses and pipes break down	operator site	operator	absence of pipes in the operators compartment			EN 474-1 clause 5.3
			general maintenance vicinity of pipes and hoses	maintenance people	hydraulic circuit design		operator's manuals	EN 474-1 clause 5.18.1 and 7.2
	ejection of objects	parts broken down	rotating parts	pedestrian maintenance people	hydraulic circuit design	hoses / pipes fastening guards on rotating parts	safety signs	EN 474-1 clause 5.18.1 and 7.1
				pedestrian	access to rotating parts blocked		safety signs	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.