

DIN EN 1501-5:2012-02 (E)

Refuse collection vehicles - General requirements and safety requirements - Part 5: Lifting devices for refuse collection vehicles

Contents		Page
Foreword		6
Introduction		7
1	Scope	8
2	Normative references	8
3	Terms and definitions	11
4	List of significant hazards	17
5	Safety requirements and/or protective measures	21
5.1	General	21
5.2	Requirements for lifting the designated waste containers	24
5.3	Specific requirements for waste container lifting devices mounted on rear loaded RCVs	29
5.4	Specific requirements for waste container lifting devices mounted on side and front loaded RCVs	31
5.5	Hydraulic system	32
5.6	Pneumatic system	32
5.7	Electrical powered system	32
5.8	Operating symbols	32
5.9	Control systems	35
5.10	Visual control	36
5.11	Electrical components	37
5.12	Working light(s)	38
5.13	Electromagnetic compatibility (EMC)	38
5.14	Noise	38
5.15	Maintenance	38
5.16	Lifting points	39
5.17	Signals and warning devices	39
6	Verification	39
7	Information for use	39
7.1	Signals and warning devices	39
7.2	Operation manual	39
7.3	Maintenance	41
7.4	Data sheet	41
7.5	Marking	41
Annex A (normative)	Functional spaces, dimensions and connections	43
Annex B (informative)	Types of special containers and their pick-up systems	75
Annex C (normative)	Requirements for pin connections and data sheets	81
Annex ZA (informative)	Relationship between this Standard and the Essential Requirements of EU Directive 2006/42/EC	86
Bibliography		87

Figures Page		
Figure A.1-1 -- Rear mounted waste container lifting device	43	
Figure A.1-2 -- Side mounted waste container lifting device	44	
Figure A.1-3 -- Front mounted waste container lifting device	45	
Figure A.1-4 -- Rear loaded RCV with winch and skip container	46	
Figure A.1-5 -- RCV with loader crane and top lifted and bottom emptied container	47	
Figure A.1 -- Types of RCVs, working stations, functional and visible spaces	47	
Figure A.2-1 -- Standard comb and guide system for waste containers according to EN 840-1 to -3 .	48	
Figure A.2-2 -- Standard comb and guide system for waste containers according to EN 840-1 to -3, when identification systems according to EN 14803 are used	49	
Figure A.2-3 -- Standard wide comb and guide system for containers according to EN 840-4	50	
Figure A.2-4 -- Standard comb and guide system for containers according to EN 840-4, when identification systems according to EN 14803 are used	51	
Figure A.2-5a -- Locking system for EN 840 forms A and B	52	
Figure A.2-5b -- Locking system for EN 840 form C	52	
Figure A.2-5 -- Locking system for comb pick-up system	52	
Figure A.2 -- Standard combs and guide systems	53	
Figure A.3-1 -- Pushing pad for containers according to EN 840-1, EN 840-2 and EN 840-3	54	
Figure A.3-2 -- Pushing pad for containers according to EN 840-4	55	
Figure A.3 -- Pushing pads for comb pick-up system	55	
Figure A.4-1 -- Trunnion pick-up system for containers according to EN 840-2 and EN 840-3	56	
Figure A.4-2 -- Trunnion pick-up system for containers according to EN 840-4	57	
Figure A.4-3 -- Trunnion pick-up system for container according to EN 12574-1 with dome lid	58	
Figure A.4-4 -- Double trunnion lifting system for containers according to EN 12574-1	59	
Figure A.4 -- Trunnion pick-up system	59	
Figure A.5.1a -- All views of single version	60	
Figure A.5.1b -- Rear view of double version	60	
Figure A.5-1 -- Diamond pick-up system	60	
Figure A.5-2 -- Diamond pick-up system locking device	61	
Figure A.5 -- Diamond pick-up system	61	
Figure A.6 -- BG pick-up system for containers according to EN 840-4	62	
Figure A.7-1 -- Pocket pick-up system and lid opener	63	
Figure A.7-2 -- Pocket pick-up system and lid opener for EN 12574-1 pocket containers (Type 3)	64	

Figure A.7 -- Pocket pick-up systems	64
Figure A.8 -- Limit of the functional space of the interchangeable waste container lifting device in rear loaded RCV's tailgate for lifting EN 840-1, EN 840-2, EN 840-3 or diamond containers	65
Figure A.9 -- Entrance protection in automatic mode	66
Figure A.10-1 -- Opening of single-chamber rear loaded RCV for interchangeable waste container lifting device	67
Figure A.10-2 -- Opening of multi-chamber rear loaded RCV for interchangeable waste container lifting device	68
Figure A.10 -- Openings of rear loaded RCVs for interchangeable waste container lifting device	68
Figure A.11-1 -- Mounting frame of interchangeable waste container lifting device for single-chamber rear loaded RCV	69
Figure A.11-2 -- Mounting frames of interchangeable waste container lifting devices for multi-chamber rear loaded RCV	70
Figure A.11 -- Mounting frame of interchangeable waste container lifting devices for rear loaded RCV	70
Figure A.12 -- Positions of hydraulic and electric connectors for interchangeable waste container lifting device	71
Figure A.13-1 -- 16-pole floating plug (location 2 on Figure A.12)	72
Figure A.13-2 -- 16-pole socket (location 2 on Figure A.12)	73
Figure A.13 -- Electric 16-pole connectors for interchangeable waste container lifting device	73
Figure A.14 -- Pin connections between interchangeable waste container lifting device and RCV -- Emergency and CleAN OPEN loops	74
Figure B.1-1 -- Paladin container	75
Figure B.1-2 -- Diamond containers	76
Figure B.1 -- Non European standardized containers	76
Figure B.2 -- Example of catch for skip container lifted by a winch or a two chains skip pick-up system	77
Figure B.3-1 -- Two chains skip container pick-up system	78
Figure B.3-2 -- Four chains skip container pick-up system	78
Figure B.3 -- Chains skip container pick-up system	78
Figure B.4-1 -- Detail tooth 4.1 (universal teeth) see also Figures A.2-1 to -4	79
Figure B.4-2 -- Detail tooth 4.2 (specific teeth for container EN 840-2 and -3) see also Figures A.2-1 to -4	79
Figure B.4-3 -- Perspective with rounded borders and corners	79
Figure B.4 -- Profiles of comb teeth	79

Figure B.5-1 -- Warning label: Do not reach into moving parts	80
Figure B.5-2 -- Warning label: Do not stand under any moving part	80
Figure B.5 -- Safety labels	80
Figure B.6 -- Warning sign: Falling container or object	80
Tables Page Table 1 -- List of significant hazards	18
Table 2 -- Graphical symbols	33
Table Figure A.2	53
Table Figure A.3-1	54
Table Figure A.3-2	55
Table Figure A.4-1	56
Table Figure A.4-2	57
Table Figure A.4-3	58
Table Figure A.4-4	59
Table Figure A.5-1	60
Table Figure A.5-2	61
Table Figure A.6	62
Table Figure A.7-1	63
Table Figure A.7-2	64
Table Figure A.8	65
Table Figure A.10-1	67
Table Figure A.10-2	68
Table Figure A.11-1	69
Table Figure A.11-2	70
Table Figure B.1-1	75
Table Figure B.2	77
Table Figure B.4	79
Tables C.1 -- Pin connection for the connectors defined in A.13	81
Table C.1 a -- List of signals from RCV: 16-pin socket (fixed on RCV)	81
Table C.1 b -- List of signals from waste container lifting device: 16-pin plug (with cable from lifting device)	82
Table C.1 c -- List of signals from waste container lifting device: 16-pin socket (fixed on lifting device)	83

Table C.1 d -- List of signals from RCV: 16-pin plug (with cable from RCV)84

Table C.2 -- Signal processing chronogram footstep(s). Pins 13,16, 3 and 4 of Tables C.1c and C.1d.85

Table C.3 -- Data sheet: Lifting device data85