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## Lifts (Schindler) - BLOCK A (11704106)

[Contents](#)

**Schindler**  
Admin

Benwell House  
Green Street  
Sunbury-on-Thames  
Middlesex  
TW16 6QT

nimodfulfilment.gb@schindler.com  
01932 758100



**winvic**  
**DOING IT RIGHT.**





## Contents

[Scope of Works](#)

[Certificates/Warranties/Guarantees](#)

[Cleaning and Maintenance Regimes](#)

[Data Sheets](#)



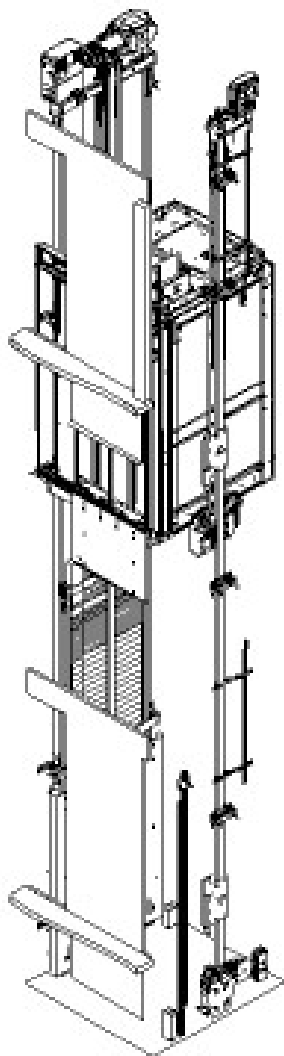




## Scope of Works







**ES1**  
Owner's manual  
J 50900020\_02





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This is the released English version.

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# Table of contents

<b>1 Introduction.....</b>	<b>13</b>
1.1 About this document .....	13
1.1.1 Document structure.....	13
1.1.2 Typographic convention.....	13
1.1.3 Units .....	14
1.1.4 Symbols.....	14
1.1.5 Storage of this document .....	15
1.1.6 Replacement of this document .....	15
1.1.7 Definitions .....	15
1.2 Target user of this document.....	15
1.3 About this elevator .....	16
1.3.1 About this elevator .....	16
1.3.2 Intended purpose .....	16
1.3.3 Identification of elevator.....	16
<b>2 Safety .....</b>	<b>19</b>
2.1 Definitions of safety information elements .....	19
2.1.1 Safety notes .....	19
2.1.2 Safety warnings and signal words .....	19
2.1.3 Safety warnings .....	20
2.1.4 Product safety labels / safety signs .....	20
2.2 Safety components and equipment .....	20
2.2.1 Safety component types .....	20
2.2.2 Safety related components .....	22
2.2.3 Personal protective equipment .....	23
2.3 Duties of owner .....	23
2.3.1 General duties .....	23
2.3.2 Periodic checks by owner .....	24
2.4 Duties of the rescue service.....	24
2.5 Duties of the maintenance organization .....	25
2.6 Generic safety warnings .....	26
2.7 Safety environment.....	28
2.7.1 Working places .....	28
<b>3 Elevator overview .....</b>	<b>31</b>
3.1 Overview.....	31
3.2 Operating range .....	32
3.2.1 Technical operating range.....	32
3.2.2 Environmental operating range .....	33
<b>4 Function and operation .....</b>	<b>35</b>
4.1 Main component functions.....	35
4.1.1 User interface display (HMI).....	35
4.1.2 Control cabinet .....	41
4.1.3 Power transmission.....	41
4.1.4 Safety components .....	41
4.1.5 Safety circuit.....	41
4.1.6 Standard control functions .....	41
4.1.7 Optional control functions .....	42
4.2 Normal operations .....	49
4.2.1 Safety instruction during operation .....	49
4.2.2 Behavior of passengers .....	49
4.2.3 Positioning of goods .....	50
4.2.4 Car operating panel (COP) .....	51
4.2.5 Landing operating panel (LOP) .....	52
4.2.6 Light curtain on car entrance .....	53
4.3 Special operations .....	53
4.3.1 Taking of elevator out of service for a long time.....	53
4.3.2 Putting of elevator back into service.....	53
4.3.3 Release after activation of safety parking service.....	53
4.3.4 Remote alarm emergency rescue.....	54
4.3.5 ETMA (Embedded telemonitoring alarm) .....	54
4.3.6 Third party call center configuration .....	59
4.3.7 Evacuation instruction with PEBO .....	61
4.3.8 Evacuation instruction MMR with MBR .....	62
4.3.9 Overview of TSD21 short pit and headroom .....	63
4.3.10 Firefighter.....	69



4.4	Seismic .....	77
<b>5</b>	<b>Maintenance .....</b>	<b>79</b>
5.1	Safety instruction for maintenance .....	79
5.2	Inspection tools .....	80
5.3	Cleaning .....	80
5.3.1	Safety .....	80
5.3.2	Cleaning agents .....	80
5.3.3	Parts to be cleaned .....	82
5.4	Machine DR FMB 130 .....	82
5.4.1	Overview of machine .....	82
5.4.2	Maintenance plan for machine .....	83
5.4.3	Checking of cleanness .....	83
5.4.4	Checking for unusual noise .....	83
5.4.5	Make sure that the damping pads are in place and intact .....	83
5.4.6	Make sure the machine is properly fasten and levelled .....	84
5.4.7	Checking of fan .....	85
5.4.8	Checking of central bearing .....	85
5.4.9	Checking of stop switch JHM .....	86
5.5	Brake for machine DR FMB 130 .....	86
5.5.1	Maintenance plan for machine brake .....	86
5.5.2	Checking of identification marking .....	86
5.5.3	Visually check the brake .....	86
5.5.4	Checking of correct seating of the O-Rings .....	86
5.5.5	Checking of brake air gap .....	87
5.5.6	Air gap range for brakes Leroy Somer .....	87
5.5.7	Checking of Manual Brake Release MBR .....	89
5.5.8	Brake test .....	90
5.6	Machine DR PMB 125/135 .....	90
5.6.1	Overview of machine .....	90
5.6.2	Maintenance plan for machine .....	91
5.6.3	Checking of cleanness .....	91
5.6.4	Checking for unusual noise .....	91
5.6.5	Make sure that the damping pads are in place and intact .....	91
5.6.6	Make sure the machine is properly fasten and levelled .....	92
5.6.7	Checking of fan .....	93
5.6.8	Checking of central bearing .....	94
5.6.9	Checking of stop switch JHM .....	94
5.7	Brake for machine DR PMB 125/135 .....	94
5.7.1	Maintenance plan for machine brake .....	94
5.7.2	Checking of identification marking .....	94
5.7.3	Visually check the brake .....	95
5.7.4	Checking of correct seating of the O-Rings .....	95
5.7.5	Checking of brake air gap .....	95
5.7.6	Air gap range for brakes Kendrion .....	95
5.7.7	Air gap range for brakes Leroy Somer .....	96
5.7.8	Brake test .....	98
5.8	Frequency converter DR VAB 11/22/33/44/88 .....	98
5.8.1	Overview .....	98
5.8.2	Maintenance plan .....	98
5.8.3	Check of fan .....	98
5.8.4	Cleaning .....	99
5.8.5	Replacement .....	99
5.9	Frequency converter DR VAF 013/023/043 .....	99
5.9.1	Overview .....	99
5.9.2	Maintenance plan .....	99
5.9.3	Cleaning of fans and air ducts .....	100
5.9.4	Function check of fan .....	101
5.9.5	Replacement .....	101
5.10	Elevator control CO SC 1 .....	102
5.10.1	Overview .....	102
5.10.2	Maintenance plan .....	109
5.10.3	Check of RCBO functionality .....	110
5.10.4	Visual inspection of cabinet .....	110
5.10.5	Check of evacuation .....	110
5.10.6	Replacement of battery after end of life – control cabinet .....	110
5.10.7	Replacement of battery after end of life – AESD .....	110
5.10.8	Error code .....	111



5.11	Fixtures FI GS	132
5.11.1	Overview	132
5.11.2	Maintenance plan	132
5.11.3	External visual checks, function checks and cleaning	132
5.11.4	Opening of COP	133
5.11.5	Opening of accessible COP (COPH)	134
5.11.6	Opening of LOP and LIP	134
5.11.7	Internal visual checks, function checks and cleaning	135
5.11.8	Replacement of buttons	136
5.12	AC GTW 04 (CUBE)	137
5.12.1	Overview of AC GTW 04	137
5.12.2	Maintenance plan for AC GTW 04	137
5.12.3	CUBE HMI	137
5.12.4	Replacing of CUBE Power	141
5.13	Intercom AC TMA 1 (ETMA PSTN)	143
5.13.1	Overview	143
5.13.2	Maintenance plan	143
5.13.3	Triggering of test alarm call	144
5.14	Hoistway information AC GSI	144
5.14.1	Overview of hoistway information components	144
5.14.2	Overview of optional components for hoistway information	145
5.14.3	Maintenance plan for AC GSI hoistway information	145
5.14.4	Cleaning of hoistway information components	145
5.14.5	Cleaning of mechanical KNE	145
5.14.6	Cleaning of KSE	146
5.14.7	Cleaning of mechanical KSERE	146
5.14.8	Checking of identification marking	146
5.14.9	Check of connections for all hoistway information components	146
5.14.10	Check of connections for mechanical KNE	146
5.14.11	Check of connections to switch KSE	146
5.14.12	Check of connections for mechanical KSERE	146
5.14.13	Check of magnetic band and AC GSI main sensor	147
5.14.14	Check of switch KNE	148
5.14.15	Check of switch KSE and KSE magnet	148
5.14.16	Check of switch KSERE	148
5.14.17	Check of switch KSSSI	149
5.14.18	Check of magnetic band tensioning	149
5.14.19	Check of AC GSI main sensor	149
5.14.20	Check of LED status of AC GSI 2/3/4/5 main sensor	150
5.14.21	Overview of LED indicator on AC GSI main sensor	151
5.14.22	Reset of AC GSI main sensor	152
5.15	Load measurement system AC LMF	152
5.15.1	Overview	152
5.15.2	Maintenance plan	152
5.15.3	Check of LMS fixation and operation	153
5.16	Light curtain	153
5.16.1	Overview	153
5.16.2	Maintenance plan	153
5.16.3	Check of light curtain operation and fixation	153
5.17	Suspension and traction media STM	154
5.17.1	Overview of suspension and traction media	154
5.17.2	Maintenance plan for suspension and traction media	154
5.17.3	Visual checks	155
5.17.4	Checking of cleanness	155
5.17.5	Checking of STM lifetime limit	156
5.17.6	Checking of STM condition	158
5.17.7	Checking of end connectors and anti-twist device	161
5.17.8	Checking of STM tension	162
5.17.9	Replacement of STM	162
5.18	Guide rail system MM GRS	163
5.18.1	Maintenance plan	163
5.18.2	Safety	163
5.18.3	Check and cleaning of fixation	163
5.18.4	Check and cleaning of oil collectors	163
5.19	Oil buffer SA OLE	164
5.19.1	Maintenance plan of buffer	164
5.19.2	Cleaning of buffer	164



5.19.3	Checking of identification marking .....	164
5.19.4	Check of buffer and buffer support condition .....	164
5.19.5	Check of buffer positioning .....	164
5.19.6	Check of buffer fixation .....	164
5.19.7	Check of buffer vertical movement .....	164
5.19.8	Check of buffer oil level .....	165
5.19.9	Check of buffer height .....	165
5.19.10	Check of buffer safety contact switch .....	166
5.19.11	Functional test .....	166
5.19.12	Replacement of buffer .....	166
5.20	Elastomer buffer SA AC and SA PS .....	167
5.20.1	Maintenance plan of buffer .....	167
5.20.2	Cleaning of buffer .....	167
5.20.3	Checking of identification marking .....	167
5.20.4	Check of buffer and buffer support condition .....	167
5.20.5	Check of buffer damage, deformation or skin loss .....	167
5.20.6	Check of buffer positioning .....	167
5.20.7	Check of buffer fixation .....	167
5.20.8	Check of buffer integrity .....	168
5.20.9	Functional test .....	168
5.20.10	Replacement of buffer .....	168
5.21	Spring buffer SA BS-EM .....	169
5.21.1	Maintenance plan of buffer .....	169
5.21.2	Cleaning of buffer .....	169
5.21.3	Check of buffer and buffer support condition .....	169
5.21.4	Check of buffer positioning .....	169
5.21.5	Check of buffer fixation .....	169
5.21.6	Functional test .....	169
5.21.7	Replacement of buffer .....	169
5.22	Overspeed governor system SA GBP 201 .....	170
5.22.1	Overview .....	170
5.22.2	Maintenance plan for overspeed governor .....	170
5.22.3	Checking of cleanness .....	171
5.22.4	Checking of identification marking .....	171
5.22.5	Checking of condition of factory seal .....	171
5.22.6	Checking of condition of overspeed governor .....	171
5.22.7	Checking of condition of governor rope .....	171
5.22.8	Checking of condition of rope coupling .....	172
5.22.9	Checking of static fixation of overspeed governor .....	172
5.22.10	Checking of fixation of safety switch on overspeed governor .....	172
5.22.11	Checking of fixation of slack rope switch on tension device .....	172
5.22.12	Check for fixation of tension device .....	173
5.22.13	Checking of operation of slack rope switch .....	173
5.22.14	Checking of condition of pulley on overspeed governor .....	173
5.22.15	Check for condition of pendulum .....	174
5.22.16	Checking of operation of overspeed safety switch .....	175
5.22.17	Testing procedure .....	175
5.22.18	Spare parts .....	177
5.23	Car door DO SEC .....	178
5.23.1	Overview of car door .....	178
5.23.2	Maintenance plan for car door .....	178
5.23.3	Checking of cleanness .....	179
5.23.4	Checking for damage and corrosion .....	179
5.23.5	Checking of condition of guide shoe .....	179
5.23.6	Checking of condition of door drive belt .....	180
5.23.7	Checking of condition of synchronization rope .....	181
5.23.8	Checking of vertical parallelism of door panel .....	181
5.23.9	Checking of alignment of door panel .....	182
5.23.10	Checking of door panel clearance .....	182
5.23.11	Checking of door opening in locked condition .....	183
5.23.12	Checking of door panel performance .....	184
5.24	Car door lock for DO SEC .....	184
5.24.1	Maintenance plan for car door lock .....	184
5.24.2	Checking of identification marking .....	184
5.24.3	Checking of condition of lock roller and counter roller .....	184
5.24.4	Checking of clutch cam position .....	185
5.24.5	Checking of clutch alignment .....	186



5.24.6	Checking of clutch plate position .....	187
5.24.7	Checking of latch position .....	188
5.24.8	Checking of alignment of switches and contact bridges .....	188
5.25	Car door DO VAR 15 .....	189
5.25.1	Overview of car door .....	189
5.25.2	Maintenance plan for car door .....	190
5.25.3	Checking of cleanness .....	191
5.25.4	Checking for damage and corrosion .....	191
5.25.5	Checking of condition of guide shoe .....	191
5.25.6	Checking of condition of synchronization rope .....	192
5.25.7	Checking of condition of door drive belt .....	192
5.25.8	Checking of vertical parallelism of door panel .....	194
5.25.9	Checking of alignment of door panel .....	195
5.25.10	Checking of door panel clearance .....	196
5.25.11	Checking of door opening in locked condition .....	196
5.25.12	Checking of door panel movement condition .....	197
5.25.13	Checking of door panel performance .....	198
5.26	Car door lock for DO VAR 15 .....	198
5.26.1	Maintenance plan for car door lock .....	198
5.26.2	Checking of identification marking .....	198
5.26.3	Checking of condition of rollers and sliders .....	198
5.26.4	Checking of mechanical car door lock in closed position .....	199
5.26.5	Checking of clearance of mechanical car door lock in closed position .....	200
5.26.6	Checking of position of clutch release roller .....	201
5.26.7	Checking of latch position .....	202
5.26.8	Checking of alignment of switches and contact bridges .....	203
5.27	Landing door DO FEC-EU .....	206
5.27.1	Overview of landing door .....	206
5.27.2	Maintenance plan for landing door .....	206
5.27.3	Checking of cleanness .....	207
5.27.4	Checking for damage and corrosion .....	207
5.27.5	Checking of condition of guide shoe .....	207
5.27.6	Checking of condition of synchronization rope .....	208
5.27.7	Checking of vertical parallelism of door panel .....	208
5.27.8	Checking of alignment of door panel .....	209
5.27.9	Checking of door panel clearance .....	209
5.27.10	Checking of door opening in locked condition .....	210
5.27.11	Checking of operation of door closing spring .....	211
5.27.12	Checking of release device of door lock .....	213
5.27.13	Checking of emergency release .....	213
5.27.14	Checking of switch KNET for damage .....	213
5.27.15	Checking of door panel performance .....	214
5.28	Landing door lock for DO FEC-EU .....	214
5.28.1	Maintenance plan for landing door lock .....	214
5.28.2	Checking of identification marking .....	214
5.28.3	Checking of condition of lock roller and counter roller .....	214
5.28.4	Checking of latch position .....	215
5.28.5	Checking of lock roller position .....	216
5.28.6	Checking of alignment of switches and contact bridges .....	217
5.29	Landing door DO NST .....	219
5.29.1	Overview of landing door .....	219
5.29.2	Maintenance plan for landing door .....	220
5.29.3	Checking of cleanness .....	220
5.29.4	Checking for damage and corrosion .....	220
5.29.5	Checking of condition of guide shoe .....	221
5.29.6	Checking of condition of synchronization rope .....	221
5.29.7	Checking of vertical parallelism of door panel .....	222
5.29.8	Checking of alignment of door panel .....	223
5.29.9	Checking of door panel clearance .....	223
5.29.10	Checking of door opening in locked condition .....	224
5.29.11	Checking of operation of door closing spring .....	225
5.29.12	Checking of release device of door lock .....	226
5.29.13	Checking of emergency release .....	227
5.29.14	Checking of LDU module .....	227
5.29.15	Checking of door panel performance .....	228
5.30	Landing door lock for DO NST .....	229
5.30.1	Maintenance plan for landing door lock .....	229



5.30.2	Checking of identification marking .....	229
5.30.3	Checking of condition of lock roller and counter roller .....	229
5.30.4	Checking of operation of counter rollers .....	229
5.30.5	Checking of latch position .....	230
5.30.6	Checking of lock roller position .....	231
5.30.7	Checking of alignment of switches and contact bridges .....	231
5.31	Landing door DO SEC.....	232
5.31.1	Overview of landing door .....	232
5.31.2	Maintenance plan for landing door .....	233
5.31.3	Checking of cleanness.....	233
5.31.4	Checking for damage and corrosion .....	233
5.31.5	Checking of condition of guide shoe.....	234
5.31.6	Checking of condition of synchronization rope .....	234
5.31.7	Checking of vertical parallelism of door panel .....	234
5.31.8	Checking of alignment of door panel .....	235
5.31.9	Checking of door panel clearance.....	235
5.31.10	Checking of door opening in locked condition .....	236
5.31.11	Checking of emergency release.....	236
5.31.12	Checking of operation of door closing spring.....	236
5.31.13	Checking of door panel performance.....	237
5.32	Landing door lock for DO SEC .....	237
5.32.1	Maintenance plan for landing door lock .....	237
5.32.2	Checking of identification marking .....	237
5.32.3	Checking of condition of lock roller and counter roller .....	237
5.32.4	Checking of latch position .....	238
5.32.5	Checking of alignment of switches and contact bridges .....	239
5.33	Landing door DO VL 15 .....	240
5.33.1	Overview of landing door .....	240
5.33.2	Maintenance plan for landing door .....	240
5.33.3	Checking of cleanness.....	241
5.33.4	Checking for damage and corrosion .....	241
5.33.5	Checking of condition of guide shoe.....	241
5.33.6	Checking of condition of synchronization rope .....	242
5.33.7	Checking of vertical parallelism of door panel .....	242
5.33.8	Checking of alignment of door panel .....	243
5.33.9	Checking of door panel clearance.....	243
5.33.10	Checking of door opening in locked condition .....	244
5.33.11	Checking of operation of door closing spring.....	245
5.33.12	Checking of release device of door lock .....	247
5.33.13	Checking of emergency release .....	248
5.33.14	Checking of door panel performance.....	249
5.34	Landing door lock for DO VL 15 .....	249
5.34.1	Maintenance plan for landing door lock .....	249
5.34.2	Checking of identification marking .....	249
5.34.3	Checking of condition of lock roller and counter roller .....	249
5.34.4	Checking of latch position .....	250
5.34.5	Checking of lock roller position .....	252
5.34.6	Checking of alignment of switches and contact bridges .....	253
5.35	Landing door DO WCM .....	255
5.35.1	Overview of landing door .....	255
5.35.2	Maintenance plan for landing door .....	255
5.35.3	Checking of cleanness.....	256
5.35.4	Checking for damage and corrosion .....	256
5.35.5	Checking of condition of guide shoe.....	256
5.35.6	Checking of condition of synchronization rope .....	257
5.35.7	Checking of vertical parallelism of door panel .....	257
5.35.8	Checking of alignment of door panel .....	258
5.35.9	Checking of door panel clearance.....	258
5.35.10	Checking of door opening in locked condition .....	259
5.35.11	Checking of operation of door closing device .....	260
5.35.12	Checking of release device of door lock .....	261
5.35.13	Checking of emergency release .....	263
5.35.14	Checking of door panel performance.....	264
5.36	Landing door lock for DO WCM.....	264
5.36.1	Maintenance plan for landing door lock .....	264
5.36.2	Checking of identification marking .....	264
5.36.3	Checking of condition of lock roller and counter roller .....	264



5.36.4	Checking of latch position .....	265
5.36.5	Checking of lock roller position .....	266
5.36.6	Checking of alignment of switches and contact bridges .....	267
5.37	Landing door DO WIA-AP .....	269
5.37.1	Overview of landing door .....	269
5.37.2	Maintenance plan for landing door .....	269
5.37.3	Checking of cleanness .....	270
5.37.4	Checking for damage and corrosion .....	270
5.37.5	Checking of condition of guide shoe .....	270
5.37.6	Checking of condition of synchronization rope .....	271
5.37.7	Checking of vertical parallelism of door panel .....	271
5.37.8	Checking of alignment of door panel .....	272
5.37.9	Checking of door panel clearance .....	272
5.37.10	Checking of door opening in locked condition .....	273
5.37.11	Checking of operation of door closing spring .....	274
5.37.12	Checking of release device of door lock .....	276
5.37.13	Checking of emergency release .....	277
5.37.14	Checking of switch KNET for damage .....	277
5.37.15	Checking of door panel performance .....	278
5.38	Landing door lock for DO WIA-AP .....	278
5.38.1	Maintenance plan for landing door lock .....	278
5.38.2	Checking of identification marking .....	278
5.38.3	Checking of condition of lock roller and counter roller .....	278
5.38.4	Checking of latch position .....	279
5.38.5	Checking of lock roller position .....	280
5.38.6	Checking of alignment of switches and contact bridges .....	281
5.39	Landing door DO WIC-AP .....	283
5.39.1	Overview of landing door .....	283
5.39.2	Maintenance plan for landing door .....	283
5.39.3	Checking of cleanness .....	284
5.39.4	Checking for damage and corrosion .....	284
5.39.5	Checking of condition of guide shoe .....	284
5.39.6	Checking of condition of synchronization rope .....	285
5.39.7	Checking of vertical parallelism of door panel .....	285
5.39.8	Checking of alignment of door panel .....	286
5.39.9	Checking of door panel clearance .....	286
5.39.10	Checking of door opening in locked condition .....	287
5.39.11	Checking of operation of door closing spring .....	288
5.39.12	Checking of release device of door lock .....	289
5.39.13	Checking of emergency release .....	290
5.39.14	Checking of door panel performance .....	291
5.40	Landing door lock for DO WIC-AP .....	291
5.40.1	Maintenance plan for landing door .....	291
5.40.2	Checking of identification marking .....	291
5.40.3	Checking of condition of lock roller and counter roller .....	291
5.40.4	Checking of latch position .....	292
5.40.5	Checking of lock roller position .....	293
5.40.6	Checking of alignment of switches and contact bridges .....	294
5.41	Landing door DO WIV-EU .....	296
5.41.1	Overview of landing door .....	296
5.41.2	Maintenance plan for landing door .....	296
5.41.3	Checking of cleanness .....	297
5.41.4	Checking for damage and corrosion .....	297
5.41.5	Checking of condition of guide shoe .....	297
5.41.6	Checking of condition of synchronization rope .....	298
5.41.7	Checking of vertical parallelism of door panel .....	298
5.41.8	Checking of alignment of door panel .....	299
5.41.9	Checking of door panel clearance .....	299
5.41.10	Checking of door opening in locked condition .....	300
5.41.11	Checking of operation of door closing spring .....	301
5.41.12	Checking of release device of door lock .....	302
5.41.13	Checking of emergency release .....	303
5.41.14	Checking of switch KNET for damage .....	303
5.41.15	Checking of door panel performance .....	304
5.42	Landing door lock for DO WIV-EU .....	304
5.42.1	Maintenance plan for landing door lock .....	304
5.42.2	Checking of identification marking .....	304



5.42.3	Checking of condition of lock roller and counter roller .....	304
5.42.4	Checking of latch position .....	305
5.42.5	Checking of lock roller position .....	306
5.42.6	Checking of alignment of switches and contact bridges .....	307
5.43	Landing door DO WIV-LA .....	309
5.43.1	Overview of landing door .....	309
5.43.2	Maintenance plan for landing door .....	309
5.43.3	Checking of cleanness .....	310
5.43.4	Checking for damage and corrosion .....	310
5.43.5	Checking of condition of guide shoe .....	310
5.43.6	Checking of condition of synchronization rope .....	311
5.43.7	Checking of vertical parallelism of door panel .....	311
5.43.8	Checking of alignment of door panel .....	312
5.43.9	Checking of door panel clearance .....	312
5.43.10	Checking of door opening in locked condition .....	313
5.43.11	Checking of operation of door closing spring .....	314
5.43.12	Checking of release device of door lock .....	316
5.43.13	Checking of emergency release .....	317
5.43.14	Checking of door panel performance .....	317
5.44	Landing door lock for DO WIV-LA .....	318
5.44.1	Maintenance plan for landing door lock .....	318
5.44.2	Checking of identification marking .....	318
5.44.3	Checking of condition of lock roller and counter roller .....	318
5.44.4	Checking of latch position .....	319
5.44.5	Checking of lock roller position .....	320
5.44.6	Checking of alignment of switches and contact bridges .....	321
5.45	Car CA PK 44 .....	323
5.45.1	Overview .....	323
5.45.2	Maintenance plan .....	323
5.45.3	Checks inside car .....	324
5.45.4	Checks on car roof .....	324
5.45.5	Checks on car bottom .....	324
5.45.6	Check of guide shoe .....	324
5.45.7	Function check of safety gear .....	324
5.45.8	Check of seismic retaining plate (if available) .....	324
5.45.9	Replacement of damaged parts .....	325
5.45.10	Replacement of car lamps .....	325
5.46	Safety gear SA GED 10/20/30 .....	330
5.46.1	Overview .....	330
5.46.2	Maintenance plan for safety gear .....	330
5.46.3	Cleaning of safety gear .....	331
5.46.4	Check for guide rail condition .....	331
5.46.5	Checking of identification marking .....	332
5.46.6	Check of spring assembly seal .....	332
5.46.7	Check of spring assembly .....	332
5.46.8	Check of safety contact switch .....	332
5.46.9	Check for static fixation .....	332
5.46.10	Check for movement of safety gear .....	332
5.46.11	Check for running clearance .....	333
5.46.12	Alignment of safety gear .....	333
5.46.13	Check for fixation and clearance of eccentric disk .....	334
5.46.14	Check for fixation of governor lever and rope coupling .....	334
5.46.15	Check for function of retaining spring .....	334
5.46.16	Check for function of actuating mechanism .....	334
5.46.17	Check for actuation of safety contact switch .....	334
5.46.18	Check for actuation of governor lever and eccentric disk .....	334
5.46.19	Testing procedure .....	335
5.46.20	Reset procedure .....	335
5.46.21	Spare parts .....	335
5.47	Sliding guide shoe MM GSL B029D .....	335
5.47.1	Overview of MM GSL B029D sliding guide shoe .....	335
5.47.2	Maintenance plan .....	335
5.47.3	Clearance check between guide shoe lining and guide rail .....	336
5.47.4	Clearance check between stop buffer and base frame .....	337
5.47.5	Check and cleaning of guide shoe .....	337
5.47.6	Check of wear of guide shoe lining .....	338
5.47.7	Check of guide shoe lubricator .....	338



5.47.8	Block and center of car/counterweight.....	338
5.47.9	Replacing of guide shoe lining.....	339
5.48	Sliding guide shoe MM GSL I7 and MM GSL I13 .....	340
5.48.1	Overview of I7 and I13 sliding guide shoes .....	340
5.48.2	Maintenance plan.....	340
5.48.3	Clearance check .....	340
5.48.4	Check and cleaning of guide shoe .....	341
5.48.5	General check of guide shoe .....	341
5.48.6	Check of guide shoe lubricator .....	341
5.48.7	Block and center of car/counterweight.....	341
5.48.8	Replacing of guide shoe .....	341
5.49	Sliding guide shoe MM GSL I/L10 and MM GSL I/L14.....	342
5.49.1	Overview I/L10 and I/L14 sliding guide shoes .....	342
5.49.2	Maintenance plan.....	342
5.49.3	Clearance check .....	342
5.49.4	Check and cleaning of guide shoe .....	343
5.49.5	General check of guide shoe .....	343
5.49.6	Check of guide shoe lubricator .....	343
5.49.7	Block and center of car/counterweight.....	343
5.49.8	Replacing of guide shoe lining.....	343
5.50	Lubricator for sliding guide shoe MM GSL.....	344
5.50.1	Overview of lubricator .....	344
5.50.2	Maintenance plan.....	344
5.50.3	Check of lubricator .....	345
5.50.4	Adjustment of oil flow.....	345
5.51	Modular counterweight CW GGM 43 .....	346
5.51.1	Overview .....	346
5.51.2	Maintenance plan.....	346
5.51.3	Check of component condition .....	347
5.51.4	Check of pulley for STM.....	347
5.51.5	Check of pulley for rope .....	348
5.51.6	Check of guide shoes and lubricator .....	348
5.51.7	Check of safety gear.....	348
5.51.8	Adjustment of HGUR.....	349
5.52	Counterweight CW GG 41 .....	350
5.52.1	Overview .....	350
5.52.2	Maintenance plan.....	350
5.52.3	Check of component condition .....	351
5.52.4	Check of pulleys for STM .....	351
5.52.5	Check of guide shoes and lubricator .....	351
5.52.6	Check of safety gear.....	351
5.52.7	Check of buffer and buffer impact plate .....	351
5.53	Safety gear SA RF 0002.....	352
5.53.1	Overview .....	352
5.53.2	Maintenance plan for safety gear.....	352
5.53.3	Cleaning of safety gear .....	352
5.53.4	Check for guide rail condition .....	353
5.53.5	Checking of identification marking .....	353
5.53.6	Check for roller and braking surface condition .....	354
5.53.7	Check of safety contact switch .....	354
5.53.8	Check for static fixation.....	354
5.53.9	Check for running clearances .....	354
5.53.10	Alignment of safety gear .....	355
5.53.11	Check for movement of roller .....	355
5.53.12	Check for actuation of safety contact switch.....	355
5.53.13	Testing procedure.....	355
5.53.14	Reset procedure.....	355
<b>6</b>	<b>Modification, dismantling and discarding.....</b>	<b>357</b>
6.1	Safety instruction for modification, dismantling and discarding.....	357
6.2	Modification.....	357
6.2.1	Registration after modification .....	357
6.2.2	Updating of documentation and maintenance activities after modification .....	358
6.3	Dismantling .....	358
6.4	Discarding.....	358
6.4.1	Discarding of lubricants, oils and other dangerous material .....	358
6.4.2	Discarding of spare parts, components and subsystems .....	358
6.4.3	Discarding after replacement of the installation.....	358







# 1 Introduction

## 1.1 About this document

This document gives technical and legal information for the owner of the elevator installation, for building technicians, for cleaning personnel and for third party maintenance companies.

### 1.1.1 Document structure

The document has 6 main chapters plus appendix that contain all related information for maintaining, operating and modifying the elevator.

No.	Chapter name	Content
1	Introduction	<ul style="list-style-type: none"><li>– How to read this document</li><li>– Owner documentation deliverables</li><li>– Your elevator installation</li></ul>
2	Safety	<ul style="list-style-type: none"><li>– Safety during operation and maintenance</li><li>– Duties of the owner</li></ul>
3	Overview	<ul style="list-style-type: none"><li>– Elevator components</li><li>– Options</li><li>– User interface</li></ul>
4	Operation	<ul style="list-style-type: none"><li>– How to operate the elevator system and its components</li><li>– Special operations and options</li></ul>
5	Maintenance	<ul style="list-style-type: none"><li>– Cleaning</li><li>– Maintenance plan</li><li>– Maintenance tasks</li><li>– Error codes</li></ul>
6	Modification, dismantling and disposal	<ul style="list-style-type: none"><li>– Modification or modernization of the elevator</li><li>– Dismantling of the elevator after end of life</li><li>– Disposal of parts, materials and substances</li></ul>
A	Terms used	<ul style="list-style-type: none"><li>– Explanation of elevator abbreviations</li></ul>

### 1.1.2 Typographic convention

#### Action steps

The black triangle shows a step. A dash shows a substep.

Example:

- Clean these parts of the door.
  - Door panels
  - Door header

#### Hints

The hint symbol shows tips and tricks.

Example:



On center doors, the polyurethane buffer is at the center of the door track.






### 1.1.3 Units

The standard units of measurement in this manual are:







- Length: millimeters (mm) or meters (m)
- Mass: kilograms (kg)
- Time: seconds (s)
- Speed: meters per second (m/s)
- Acceleration: meters per second squared (m/s<sup>2</sup>)
- Voltage: Volt (V)
- Frequency: Hertz (Hz)

### 1.1.4 Symbols







#### Shape code

Shape	Name	Description	Shape	Name	Description
	Circle	Prohibition or mandatory action		Square	Information, including instructions
	Triangle	Warning	-	-	-

#### Color code

Shape	Color	Description	Shape	Color	Description
	Red	Prohibition or fire equipment		Green	Safe conditions
	Blue	Action		Black	Instructions not related to safety which are not covered by other colors
	Yellow	Caution, risk of danger		White	

#### How to read a sign

Sign	Type	Description	Sign	Type	Description
	Warning	Dangerous condition related to lubrication		Prohibition (mainly related to safety)	Do not lubricate
	Safe condition	Location of the emergency lubricator		Mandatory action (mainly related to safety)	Must lubricate
	Action	Lubricate something		Indication	Lubricator to be placed in a list of item as a spare list or for indicating the component in an overview drawing



### 1.1.5 Storage of this document

- Keep this document in a safe location.
- Make sure that all target users of this document always have free access to their related content.

### 1.1.6 Replacement of this document

- Record the number of this document in a different location.
- If this document cannot be found or is damaged, contact the installer. Refer to customer information document.

### 1.1.7 Definitions

You will find the technical and legal terms that follow in this document. Here is a definition of what they mean in the context of this document:

Term	Definition
<b>Competent person</b>	A person who is sufficiently trained, has the knowledge, the practical experience, and the instructions to safely do the necessary tasks for maintaining or inspecting the elevator, or for evacuating passengers.
<b>Authorized person</b>	A person who has access to restricted areas (for example machine room, pulleys, hoistway pit) for maintenance, inspection or rescue operations. This access was given by the natural or legal person who has the responsibility for the operation and use of the elevator.
<b>Trained person</b>	Persons with approval by the owner of the installation, who have been trained by the maintenance company to do specified tasks given to them.
<b>Installation</b>	An installation has one or more elevators, which includes the car, the hoistway and machine room areas, and the entrances to them.
<b>Installer</b>	A natural or legal person who has the responsibility for the design, manufacture, installation, commissioning and placing on the market of elevators.
<b>Notified body</b>	An independent body with elevator experience, professional integrity and technical competence, approved by the EC-Member-States.
<b>Preventive maintenance</b>	All tasks necessary to make sure that the elevator operates safely and correctly.
<b>Repair</b>	Replacement or repair of defective and/or worn components.
<b>Safety component</b>	Components that are specified as safety components in the local regulations.
<b>Emergency</b>	A situation in which passengers are trapped in the car.
<b>Fault</b>	A condition of operation in which safe operation of the elevator for its intended purpose is at a limit or not possible.
<b>Handover of the installation</b>	The point in time at which the installer makes the elevator available to the user for the first time.
<b>Maintenance company</b>	A company or part of a company where competent maintenance person(s) carry out maintenance operations on behalf of the owner of the installation.
<b>Manufacturer</b>	Natural or legal person who takes responsibility for the design, manufacture and placing on the market either of safety components for lifts or of machinery (escalator, passenger conveyor, service lift and accessible goods only lift)

## 1.2 Target user of this document

Target user	Definition of reader	Target chapters	
<b>Owner</b>	The natural or legal person who has the power of disposing of the installation. This person is responsible for operation, the intended use and the maintenance of the installation.	1	Introduction
		2	Safety
		2.3	Duties of the owner
		3	Elevator overview
		4	Operations
		6	Modification, dismantling and discarding
		A	Terms used
<b>Cleaning personnel</b>	A person who is authorized to do surface cleaning of non-restricted areas.	1	Introduction
		2	Safety



Target user	Definition of reader	Target chapters	
		5.3	Cleaning
<b>Building technician</b>	A person who is authorized by the owner of the installation to monitor the operation of the elevator and to do technical servicing in the building. The building technician did not receive elevator-specified training and is thus not authorized to do elevator maintenance or repair.	1	Introduction
		2	Safety
		3	Elevator overview
<b>Maintenance company technician</b>	A company authorized by the owner of the installation that employs competent persons who do maintenance of the installation.	1	Introduction
		2	Safety
		3	Elevator overview
		4	Maintenance

### 1.3 About this elevator

#### 1.3.1 About this elevator

##### 1.3.1.1 Intended use – passenger, firefighter

This elevator system is designed for the transport of passengers and firefighters.

##### 1.3.2 Intended purpose


The intended purpose of the elevator system includes not only the typical target building use but also the typical environmental conditions for which elevator systems are developed. The functioning of the elevator must be ensured within this purpose.

For example: For elevators in airports or train stations, changes in emergency situation strategy might require the change of the fire recall floor. In an home for elderly, changes in door timers might be necessary. In a hotel, changes of access codes might be necessary. Hence, adequate maintenance contains such parameter settings.

##### 1.3.3 Identification of elevator

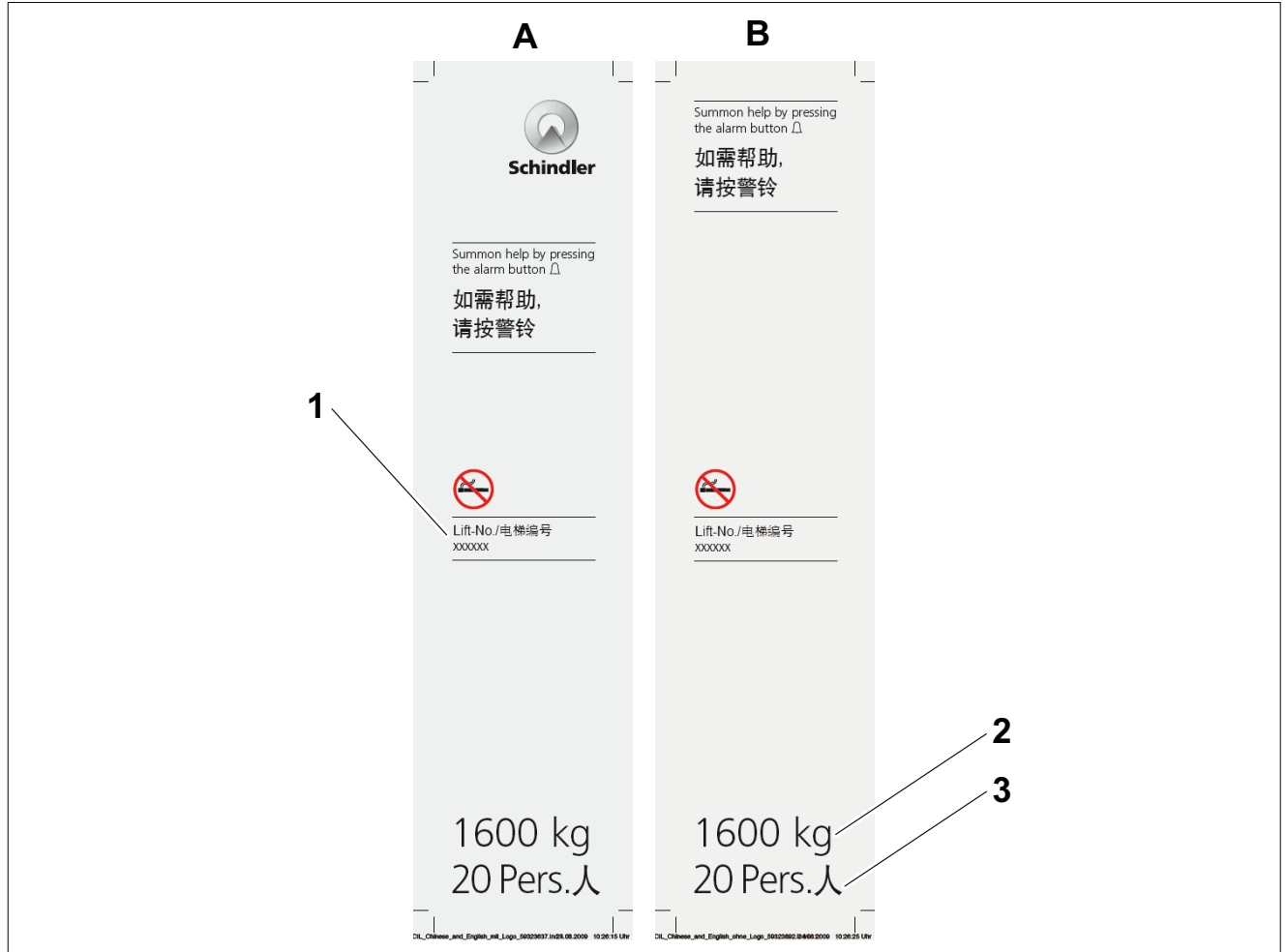
The identification plate of your elevator is on the COP and contain the information specific to:

- Commissioning number of the elevator
- Maximum allowed people in the car
- Maximum capacity of the elevator

 The layout can change depending on the elevator system, the car interior design and the car operating panel installed.



## AP type



**A** Default label

**1** Commission number

**3** Maximum allowed people

**B** Optional label

**2** Maximum capacity





The identification plate can change depending on the elevator type and the local regulations. It contains important information about the elevator installation, like the year of activation, commission number, weight indication, number of persons and so on.



## 2 Safety

### 2.1 Definitions of safety information elements

#### 2.1.1 Safety notes

Safety notes are information elements about safety, which are distributed throughout this document. They give information about the safe operation and maintenance of the product.

Safety note	Target chapters	
The correct use of the product	4	Operations
The application range of the product	1	Introduction
The personal protective equipment	2	Safety
The target user for the different types of information	1	Introduction
Possible hazard	2	Safety
	4	Operations
	5	Maintenance
	6	Modification, dismantling and discarding
Precautions for special groups of persons and/or target users	1	Introduction
	2	Safety
Description of the personnel who is permitted to use or do specified tasks and the necessary skills.	1	Introduction

#### 2.1.2 Safety warnings and signal words

Safety warnings in this document are given in the context in which a dangerous situation can occur. They show possible dangerous situations and consequences, if not prevented.

Safety warnings in the document are divided into:

- **Generic safety warnings:** Safety warnings that are collected in a section of the document devoted primarily to safety information and are applicable for the full system and all the condition.
- **Section safety warnings:** Safety warnings that apply to full sections, subsections, or multiple paragraphs or procedures in a document. These messages apply to larger units of information than embedded safety warnings and are shown at the top of the section to which they apply.
- **Embedded safety warnings:** Safety warnings that apply to a specified part of a section, a paragraph, a special procedure or part of a procedure, a special sentence, etc. in a document. These messages apply to smaller units of information than do section safety warnings and are integrated within procedures or other text.

Signal words are used to call attention to a safety warning and designates a degree or level of hazard seriousness.

Signal words in this document are:

**DANGER:** The safety warning with the signal word DANGER is used to identify a hazardous situation which, if not prevented, will cause death or serious injury.

**WARNING:** The safety warning with the signal word WARNING is used to identify a hazardous situation which, if not prevented, can cause death or serious injury.

**CAUTION:** The safety warning with the signal word CAUTION - in combination with the safety alert symbol - is used to identify a hazardous situation which, if not prevented, can cause minor or moderate injury.

**NOTICE:** The safety warning with the signal word NOTICE is used to address procedures that can cause property damage but not injury.



### 2.1.3 Safety warnings

You will find these types of safety warnings in this document.

#### **DANGER**

##### **Title of safety warning**

Description of the dangerous situation. The safety warning with the signal word DANGER is used to identify a hazardous situation which, if not avoided, will cause death or serious injury.  
How to avoid the dangerous situation.

#### **WARNING**

##### **Title of safety warning**

Description of the dangerous situation. The safety warning with the signal word WARNING is used to identify a hazardous situation which, if not avoided, can cause death or serious injury.  
How to avoid the dangerous situation.

#### **CAUTION**

##### **Title of safety warning**

Description of the dangerous situation. The safety warning with the signal word CAUTION, in combination with the safety alert symbol, is used to identify a hazardous situation which, if not avoided, can cause minor or moderate injury.  
How to avoid dangerous situation.

#### **NOTICE**

##### **Title of safety warning**

Description of the dangerous situation. The safety warning with the signal word NOTICE is used to address a procedure that can cause property damage but not injury.  
How to avoid the dangerous situation.

### 2.1.4 Product safety labels / safety signs

A warning label attached to the elevator system warns the user about risks related to the use of the item and can include restrictions by the manufacturer on specified operations.

Safety labels refer also to signal words for the level of hazard.

## 2.2 Safety components and equipment

### 2.2.1 Safety component types

#### **DANGER**

##### **Replacement of safety components**

Parts which have been copied, modified, or subsequently reworked, can put the safe operation of the installation at risk or can cause dangerous operating conditions.

If the safety components are replaced, only spare parts from the OEMs, with a related declaration of conformity, can be used.

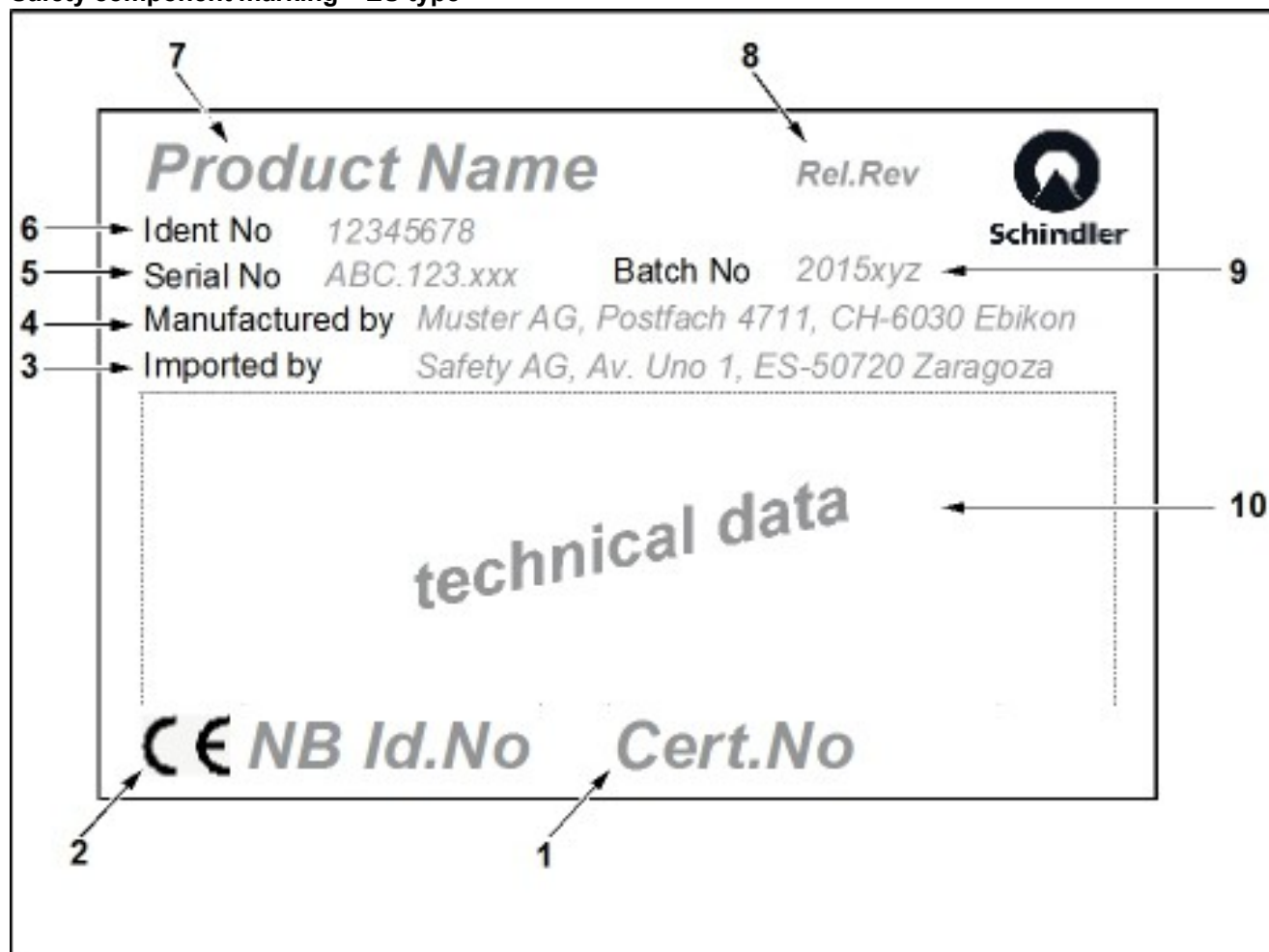
As given in the local regulations, the safety components in the elevator system are:

- Landing door locking device
- Buffers
- Overspeed governor
- Machine brake
- Safety gear
- Safety circuit containing electronic components and programmable electronic system.



Safety components come with a certificate. For these certificates refer to the certificate list supplied with the owner documentation.



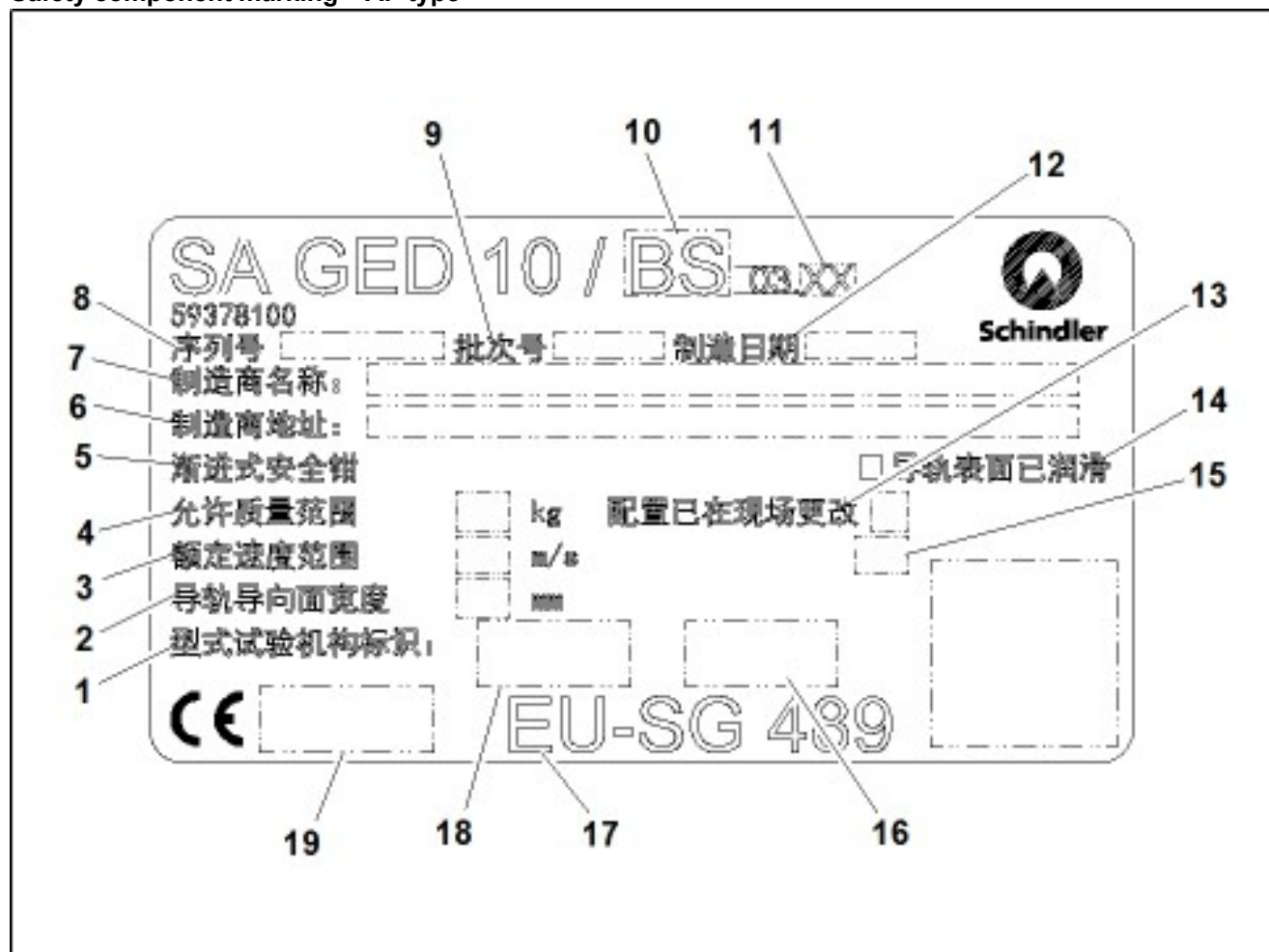


- |                               |  |
|-------------------------------|--|
| <b>1</b> Certification number | <b>2</b> CE conformity certification number and identification number of the notified body |
| <b>3</b> Importer             | <b>4</b> Manufacturer  |
| <b>5</b> Serial number        | <b>6</b> Identification number   |
| <b>7</b> Product name         | <b>8</b> Release and revision  |
| <b>9</b> Schindler logo       | <b>10</b> Batch number   |
| <b>11</b> Technical data      |  |



Not all safety components have a label, the marking can be done differently.





- |    |  |    |   |
|----|--|----|---|
| 1  | Type examination organization  | 2  | BFK   |
| 3  | Range of VKN   | 4  | Range of GKU  |
| 5  | Progressive safety gear  | 6  | Manufacturer address  |
| 7  | Manufactured by  | 8  | Serial no.  |
| 9  | Batch no.  | 10 | Type of GED BS, AS or AR  |
| 11 | Revision no. according to current SAP value  | 12 | Manufacturing date  |
| 13 | SCIF   | 14 | Oiled   |
| 15 | Disc spring supplier   | 16 | Identification number of China Type Examination certification               |
| 17 | EC Type examination  | 18 | Abbreviation of China Type Examination notified bodies (NETEC, SISE or ETC) |
| 19 | Identification number of the notified body involved in the quality assurance process |    |   |

**i** Not all safety components have a label, the marking can be done differently.

## 2.2.2 Safety related components

As given in the manufacturer safety policy, the safety related components in the Elevator System are:

- Gear drive with brake mechanism
- Guide rail
- Car door locking device.



**i** Safety related components could come with a certificate. For these certificates refer to the certificate list supplied with the owner documentation.



### 2.2.3 Personal protective equipment

All persons must know and obey the local safety regulations.

All persons must wear the applicable personal protective equipment when accessing the elevator system or doing maintenance work on the elevator.

	Wear protective clothing		Wear eye protection
	Wear head protection		Wear ear protection
	Wear safety shoes		Wear a full body harness
	Wear protective gloves		Wear a mask

## 2.3 Duties of owner

### 2.3.1 General duties

- The owner of the installation is responsible for ensuring that the installation is used as intended (transport of passengers).
- The owner must keep the installation in a safe operating condition. To fulfil this, the owner shall use a maintenance organization complying with the requirements of the standard.

**i** The owner of the installation should use a maintenance organization with adequate and proper insurance coverage provided by an insurance company.

- The owner must take care of any national regulations and other requirements, where relevant, and their implications on maintenance.
- Planned maintenance must be carried out by a maintenance organization, at the latest when the installation is put into service or if the installation is to remain unused for a long period of time before first being put into service.

**i** The owner should have the same maintenance organization in the case of several installations having common hoistway pit/spaces and/or machine room.

- The owner of a passenger/goods passenger elevator must keep the two-way means of communication efficient and linked to a 24 h rescue service for the whole of the time that the installation can be used.
- The owner must put the passenger/goods passenger elevator out of service when the two-way means of communication is out of order.
- The owner must put the installation out of service in case of dangerous situations.
- The owner of the installation must inform the maintenance organization:
  1. Immediately about any perceived abnormal operation of the installation or abnormal change in its direct environment.
  2. Immediately after putting the installation out of service in case of a dangerous situation.
  3. After any rescue intervention by their authorized and competent person(s).
  4. Before any modification related to the installation and/or its environment or use.

#### Hint:

The owner of the installation should obtain from the company carrying out the relevant modification the maintenance instructions for the maintenance organization.


5. Before any authorized third party inspection or works other than maintenance works are carried out on the installation.
  6. Before taking the installation out of service for a prolonged period of time.
  7. Before putting the installation back into service after a prolonged period of non-operating time.
- The owner of the installation must take into consideration the consequences of the risk assessment carried out by the maintenance organization.
  - The owner of the installation must make sure that the risk assessment for maintenance is carried out:
    1. If the maintenance organization is replaced.
    2. If the use of the building and/or the installation changes.
    3. After a major modification of the installation or of the building.
    4. If it is the case, after an accident involving the installation.
  - The building owner must make sure, through a risk assessment, that:



1. Their premises are safe and free from risk to health as far as it is practicable. This includes access to the premises and installation equipment, and articles or substances used according to the regulation for the use of work equipment at the workplace.
2. The persons using the premises are informed about any remaining risks.
3. Any step to be done because of this risk assessment is carried out.

Regarding the access ways to areas restricted to maintenance persons, the need for the owner of the installation to inform the maintenance organization, in particular about:

1. The access ways to be used and fire evacuating procedures from the building.
2. The place where the keys of the restricted areas can be found.
3. If necessary, the persons who shall accompany the maintenance persons to the installation.
4. If necessary, personal protective equipment to be used in the access ways, and, possibly, where this equipment can be found.

 The information must be made available also on site to the maintenance organization.


- The owner of the installation must make sure that the name and the telephone number of the maintenance organization are always available to the user of the installation, permanently affixed and clearly in view.
- The owner of the installation must make sure that the keys of the machine and pulley room doors (trap doors) and of the inspection and emergency doors (trap doors) are permanently available in the building and are used only by persons with an approval to get access.
- The owner must put the passenger/goods passenger elevator out of service when the two-way means of communication is out of service.
- The owner of the installation must keep the access to working areas and working rooms safe and free for the maintenance persons and to tell the maintenance organization about hazards or change in the workplace and/or the access ways (lighting, blockage, ground conditions, etc.).
- In addition to those checks and tests which the owner of the installation entrusts to the maintenance organization, the owner must travel at an interval, in their own interests, along the hoistway to find changes in the quality of the ride or damage to the equipment.

### 2.3.2 Periodic checks by owner

The owner must regularly travel along the hoistway to find changes in the quality of the ride or damage to the equipment.

Typical items to be examined to make sure that they are in position, undamaged and operate correctly are:

- Landing doors tracks and sills
- Stopping accuracy
- Correct functioning of indicators
- Landing push buttons
- Car push buttons
- Two-way means of communication in the car which makes permanent contact with a rescue service possible
- Usual car lighting
- Door reversing device
- Safety signs / pictograms
- Door open controls

 For goods only and service elevators, the checks to be done are the same, when necessary.

## 2.4 Duties of the rescue service

The owner of the installation must tell the rescue service about these tasks:

- Periodic checks
- Address originating the alarm, with the location of the elevator.
- Building organization with necessary availability of the rescue service, for example in each 24 h period.
- Description of means to get access to the trapped user(s).
- Special risks related to the entry of the building and getting access to the installation.
- The need to make sure that equipment is compatible.
- The need to make sure that the alarm(s) are fully and correctly received and identified before the acknowledgment is sent to the alarm equipment.
- The general instructions information of the installer taking also into account the requirements of this standard.
- The need to establish at all time 2-way communication to establish contact with trapped users with the ability to speak regularly with them and to tell them about the status of the rescue operation.
- Speak about the limits in time of the emergency power supply to the alarm system.



## 2.5 Duties of the maintenance organization

The information relating to the tasks of the maintenance organization must include the following:

- The need to carry out the work of maintenance in conformity with the maintenance instructions and based on systematic maintenance checks.
- After these checks, the maintenance organization shall decide in conformity with the maintenance instructions what is required to be done.
- The need to update the initial maintenance instructions if the installation changes its intended operation and/or the environmental conditions existing on the completion of the installation.
- The need for the maintenance organization to make sure that a risk assessment for all working areas and for all maintenance operations has been done, taking into account the installer's maintenance instructions and all information supplied by the owner of the installation.
- The need for the maintenance organization to tell the owner of the installation about work to be done because of a risk assessment, especially for the access and/or the environment related to the building/installation.
- The need to follow a maintenance plan so that preventive maintenance is applicable for the installation and maintenance time is as short as reasonably practicable, without decreasing the safety of persons, in order to keep the non-operational time of the installation at a minimum.
- The need to adapt the plan for maintenance so as to take account of predictable failures, for example those due to misuse, mishandling, deterioration, etc.
- The need to have maintenance operations done by competent maintenance persons (see 3.3) and given the necessary tools and equipment.
- The need to keep the competency of maintenance persons.
- The need to do the maintenance at an interval.
- To select the frequency of maintenance interventions, this non-exhaustive list must be considered:
  1. Number of trips per year, operating time and non operating periods of time.
  2. Age and condition of the installation.
  3. Location and type of building in which the installation is installed, and the needs of the users and/or the type of goods transported.
  4. Local environment where the installation is installed, and the external environmental elements, for example, weather conditions (rain, heat, cold, etc.) or vandalism.
- The need to have a 24 h, all year call-out service for rescue of persons.
- The need to keep records of the result of each intervention because of a failure of the installation. These records must include the type of failures in order to find all repetitions. They must be available to the owner of the installation on request.
- The need to put out of service the installation if the maintenance organization knows of a dangerous situation, found during maintenance, for which there is not immediately a solution, and to tell the owner of the installation of the need to keep it out of service until repaired.
- The need to be organized to supply the necessary spare parts for all types of repair.
- The possible need for attendance of a competent maintenance person(s), given reasonable notice, for all inspections done by an approved third party or for building maintenance works to be done in the areas restricted for the maintenance organization.
- The need to tell in due time the owner of the installation about necessary progressive upgrading of the installation.
- The need to organize rescue operations, even with subcontractor(s), and to make provision for circumstances such as fire, panic, and so on.



**⚠ DANGER****Working in heights of more than 2 meters**

Falling from a height of more than 2 meters can cause serious injury or death.  
Use fall protection attached to a safe anchor point.

**⚠ DANGER****Hazardous voltage**

Contact with live parts will result in electric shock.  
Switch off the main switch and de-energize the installation completely before starting to work on the installation.

**⚠ DANGER****Rotating machinery**

Rotating parts can crush limbs.  
– Keep clear of rotating parts.  
– Do not wear loose clothing.  
– Tie long hair back or tuck it under a cap.

**⚠ DANGER****Replacement of safety components**

Parts which have been copied, modified, or subsequently reworked, can put the safe operation of the installation at risk or can cause dangerous operating conditions.  
If the safety components are replaced, only spare parts from the OEMs, with a related declaration of conformity, can be used.

**⚠ WARNING****Access to machine room and hoistway**

Not approved access to the machine room or the hoistway can cause serious injury.  
– Access doors to the machine room and hoistway for maintenance must be kept locked at all times.  
– It must be possible to open the doors from inside without a key.  
– A ladder must be available to permit safe access to the hoistway pit.  
– Access routes to the machine room and hoistway must be easy and safe to pass through at all times.  
– If one or more of the access routes are blocked, the installation must be taken out of service.  
– For emergencies, and to carry out maintenance operations, safe access to the building and to the installation must be guaranteed at all times.

**⚠ WARNING****Accidental falling of objects**

Objects falling on persons or material can cause material damage or serious injury.  
– Make sure that nobody is working on higher or lower levels before entering the hoistway.  
– Illuminate the working area within the hoistway with appropriate lighting.  
– Avoid sudden movement which can provoke objects to fall while working in the hoistway.  
– During work, always store tools or small objects in appropriate places such as intended pockets or boxes.

**⚠ WARNING****Insufficient lighting**

Insufficient lighting can cause serious injury.  
– Adequate lighting of the machine room, hoistway and access routes must be guaranteed at all times.  
– The lighting of the control cabinet for MRL has to be installed.

**⚠ WARNING****Contamination of brake with lubricants**

Lubricants on the brake drum or linings affect the braking action.  
Clear away any contamination on all functional parts of the brake.

**⚠ WARNING****Removed protective covers**

Removing protective covers can lead to accidental contact with hazardous parts.  
– It is forbidden to remove protective covers unless instructed otherwise.  
– Proceed with great care when protective covers are removed.



## ⚠ WARNING

### **Non-approved consumables**

The use of cleaning material or lubricants not approved by the installer affects the safe elevator operation. It is forbidden to use non-approved consumables

## ⚠ WARNING

### **Non-original spare parts**

Parts supplied by third parties are not approved by the installer. The installation of non-original spare parts can have a negative effect on the safe elevator operation and the ride comfort.

- It is not permitted to install non-original spare parts.
- Contact the installer to order original spare parts.

## ⚠ CAUTION

### **Periodic inspection**

Inspection must be carried out according to the national regulations.

If there are no special regulations, the owner of the installation must make sure that periodic inspections must be carried out by a competent person according to the instructions given by the installer.

## ⚠ CAUTION

### **Information to maintenance company about irregular performance**

Report immediately anything irregular in the installation— (for example, leveling, noise, vibration, defective car lighting, start with a sudden movement, and so on) — to the maintenance company.

The owner of the installation must also tell the maintenance company of any changes that are scheduled in the area of the installation, and whenever an emergency has occurred.

## ⚠ CAUTION

### **Notification to the installer**

According to the product liability laws, the installer must also keep track of its installations even after commissioning and handover.

Therefore, damage to the installation or possible dangerous conditions must also be reported to the installer by the owner of the installation.

## ⚠ CAUTION

### **Access to restricted areas**

If there are no special regulations, the owner of the installation must make sure that periodic inspections must be done by a competent person according to the instructions from the installer.

Doors giving access to the machine room and hoistway for maintenance must be kept locked at all times. It must be possible to open the doors from the inside without a key.

## NOTICE

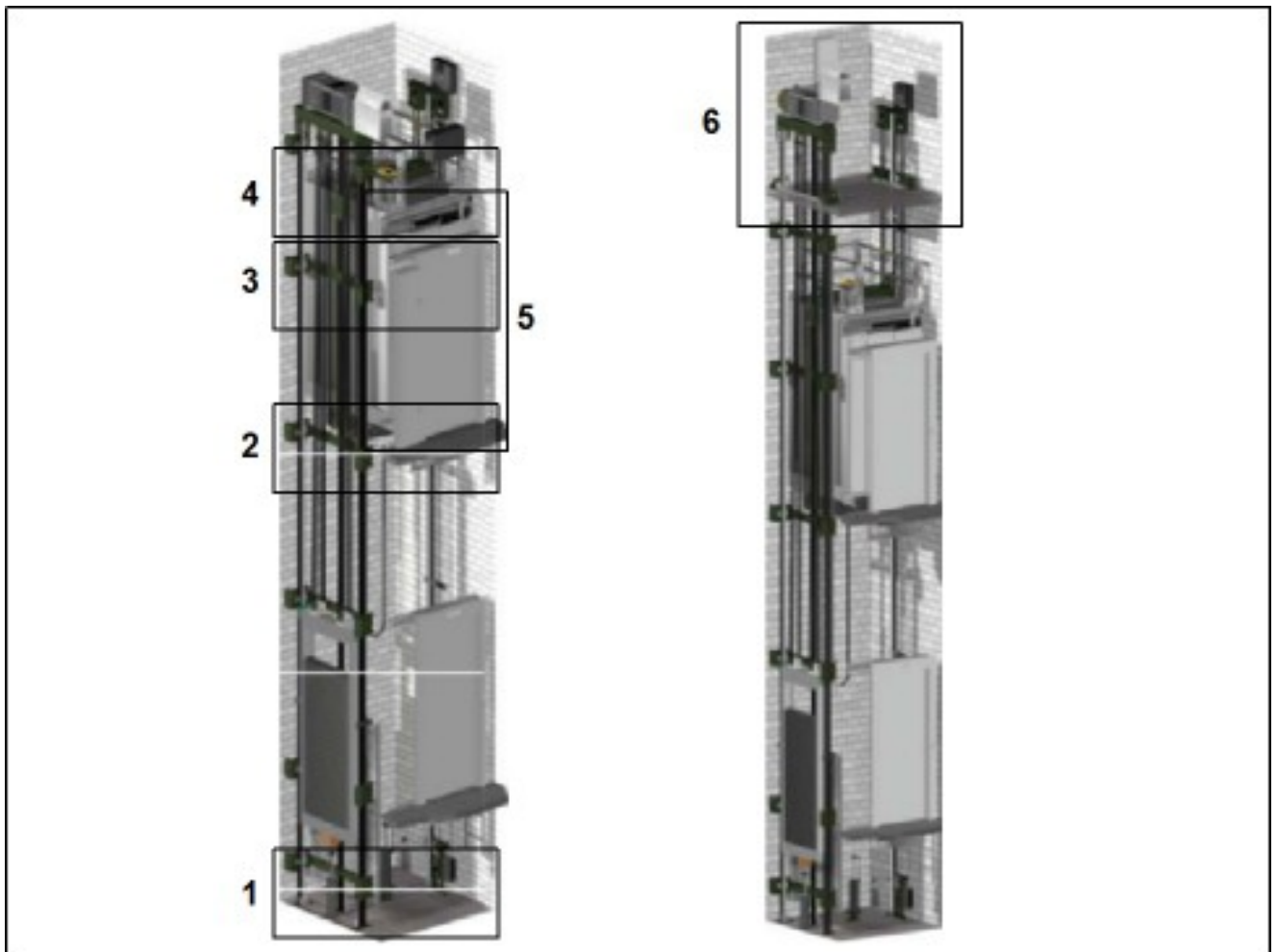
### **Temperature and ventilation**

Too high or too low temperature can cause damage to components.

- The owner of the installation must make sure that the temperature in the machine room and in the hoistway is maintained between + 5 °C and + 40 °C.
- The machine room and the hoistway must be adequately ventilated.
- The machine room and the hoistway cannot be used for ventilating spaces which are not associated with the installation.



2.7 Safety environment  
2.7.1 Working places



Pos. No.	Location	Components to access	Target group		
			Cleaning personnel	Building technician	Maintenance technician
1	Pit	Pit set			X
		Guide rails			X
		Traveling cable			X
		Counterweight bottom			X
2	Car bottom	Traction media fixation			X
		Guide shoes			X
		Load measuring device			X
3	Car interior	COP	X	X	X
		Car decoration	X	X	
		Door sill	X		X
4	Car roof	Car roof			X
		Hoistway head			X
		Counterweight bottom and top			X
		Traction media			X
		Hoistway			X
		Door drive			X
		Hoistway information			X
		Overspeed governor rope			X
5	Landings	LOP, LIP	X	X	X



Pos. No.	Location	Components to access	Target group		
			Cleaning personnel	Building technician	Maintenance technician
6	Hoistway head	Door sill	X		X
		Car roof			X
		Landing door	X	X	X
		Control cabinet		X	X
		Frequency converter			X
		Machine			X
		Overspeed governor			X
		Traction media fixpoints			X

## ⚠ CAUTION

### Access to restricted areas

If there are no special regulations, the owner of the installation must make sure that periodic inspections must be done by a competent person according to the instructions from the installer.

Doors giving access to the machine room and hoistway for maintenance must be kept locked at all times. It must be possible to open the doors from the inside without a key.

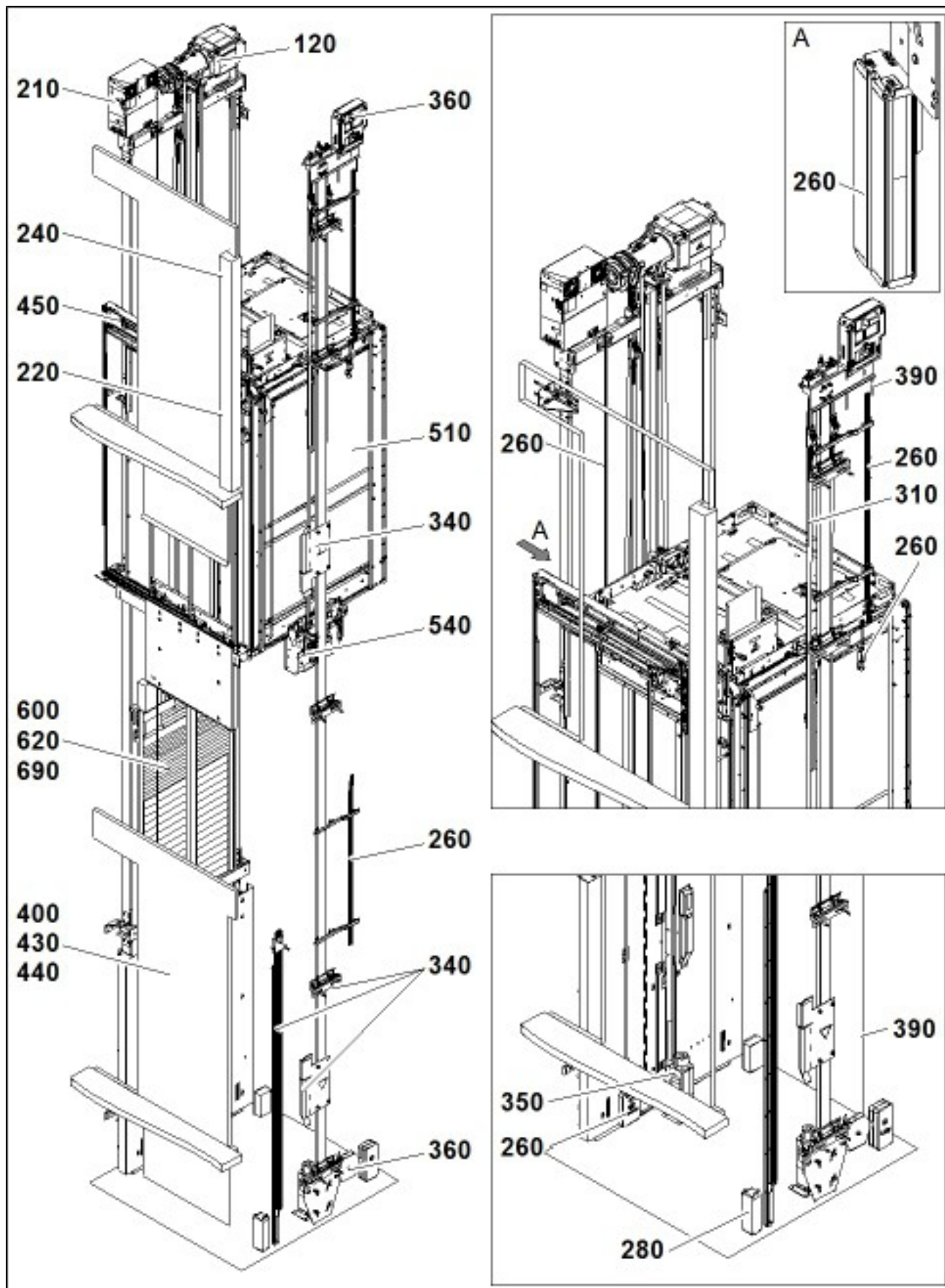






# 3 Elevator overview

## 3.1 Overview





Product code	Description
120	Gearless machine
210	Electrical drive
220	Control
240	User interface
	Fixture
	Sensor system
	Main sensor of hoistway information system
260	Magnetic band of hoistway information system
	Tension device of hoistway information system
	Switch and curve of hoistway end inspection contact
280	Electrical installation material
	Light curtain
310	Transmission - Traction
	Guide rail system
	Drive support
340	Guide rail
	Brackets
	Buffer of temporary safety device
	Pit ladder
350	Buffer
360	Overspeed governor system
	Tension device
390	Governor rope
400	Door
430	Car door and sill
440	Landing door
450	Door drive
510	Car body
	Car sling
540	Safety gear at car
	Guide shoe
600	Counterweight
620	Counterweight frame
	Actuating mechanism at counterweight
690	Counterweight safety gear

## 3.2 Operating range

### 3.2.1 Technical operating range



The table shows the technical operating range of the elevator system for all possible configurations.

For the specific technical data of the installed elevator, refer to the OM customer information document delivered with the Owner's documentation.

Characteristic	Value / range / description
Location of machine	MRL
Position of CWT	Lateral
ZZ	2 or 4
KG (%)	50
GQ (kg)	225 ... 1150 / 1179
VKN (m/s)	0.63 ... 1.75
HQG (m)	30 if VKN < 1.0 m/s
	45 if (VKN = 1.0 m/s and GQ ≤ 408 kg) or HSK_Type = LH



Characteristic	Value / range / description
	60 if (Elevator_Standard $\neq$ IS_14665:2001 and VKN = 1.0 m/s and 409 kg $\leq$ GQ $\leq$ 680 kg) or HSK_Type = RH
	57 if Elevator_Standard = IS_14665:2001 and VKN = 1.0 m/s and 409 kg $\leq$ GQ $\leq$ 680 kg
	66 if VKN > 1.0 m/s and 409 kg $\leq$ GQ $\leq$ 680 kg
	75 if VKN > 1.0 m/s and 600 kg $\leq$ GQ $\leq$ 1179 kg
ZKH_max (1/h)	If VAF013_480 then 180 else 240
BK (mm)	660 ... 1600
TK (mm)	860 ... 2100
HK (mm)	2139 ... 2500 2039 if EU and HSK_Type = LH
BT (mm)	600 ... 1100
HT (mm)	2000 ... 2300
Supply_Power_Net_Type	TN-C
	TN-S
	TT
UN (V)	3 x 208V (Uo/U=120/208)
	3 x 220V (Uo/U=127/220)
	3 x 380V (Uo/U=220/380)
	3 x 400V (Uo/U=230/400)
	3 x 415V (Uo/U=240/415)
	3 x 440V (Uo/U=254/440)
	3 x 460V (Uo/U=265/460)
	3 x 480V (Uo/U=277/480)
UN_Tol_Range (%)	+ 10 / - 15 w/starting current
UN_Phase_Asymmetry_Range (%)	$\pm$ 5
UNL (V)	110
	115
	120
	127
	220
	230
	240
UNL_Tol_Range (%)	+ 10 / - 15
FN (Hz)	50/60
UN_Phase_Asymmetry_Range (%)	$\pm$ 5

### 3.2.2 Environmental operating range

Characteristic	Unit	Value / range / description
Ambient condition	–	Dry and dust free
Humidity_Range	–	60/85
T_Operation_Range	–	+5/+40, no iced condition
HAM	m	$\leq$ 2000
		> 2000 to 4000 w/ derating
Soft_Stop Plus (Soft Stop option)	–	<ul style="list-style-type: none"> <li>– No (standard)</li> <li>– Yes (optional) if Country_Inst = IN and VKN <math>\geq</math> 1.5 m/s and DD = DO_VAR_15 and AES_Opt = Yes (AESD)</li> </ul>



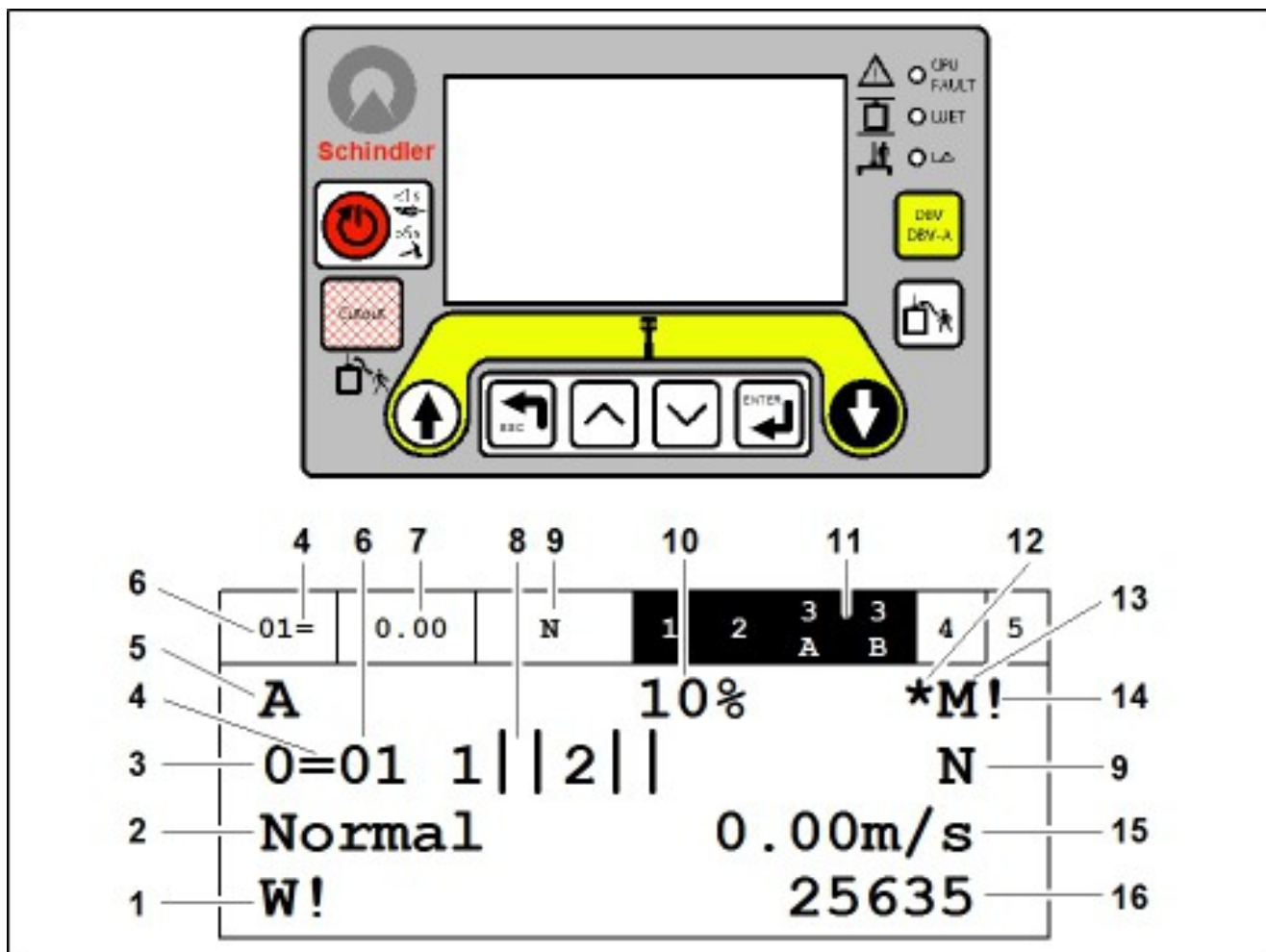




## 4 Function and operation

### 4.1 Main component functions

#### 4.1.1 User interface display (HMI)










Position number	Status	Symbol / abbreviation	Description
1	Traction media		
	Blinking	W !	The traction media monitoring reached the warning limit
	Blinking	E !	The traction media monitoring reached the blocking limit
	Blinking	C !	The traction media monitoring detected a wrong data and time setting (RTC)
2	Travel control		
	When in error condition		The display changes between error code and status
		IniPara	The control initializes the motor control parameters
		Precomm	A learning trip is necessary for the control
		Install	Control is in installation trip status
		Learn	Control does a learning trip
		Synch	Control does a synchronization trip
		Insp	Control is in inspection trip mode
		Recall	Control is in recall trip mode
		Relevel	Control does a releveing trip
		BlkTemp	Control is temporarily blocked by an error
		BlkPerm	Control is permanently blocked by a fatal error
		Control	Control does a trip that is started by DFM-D/U
		T1Open	Safety circuit is open at T1



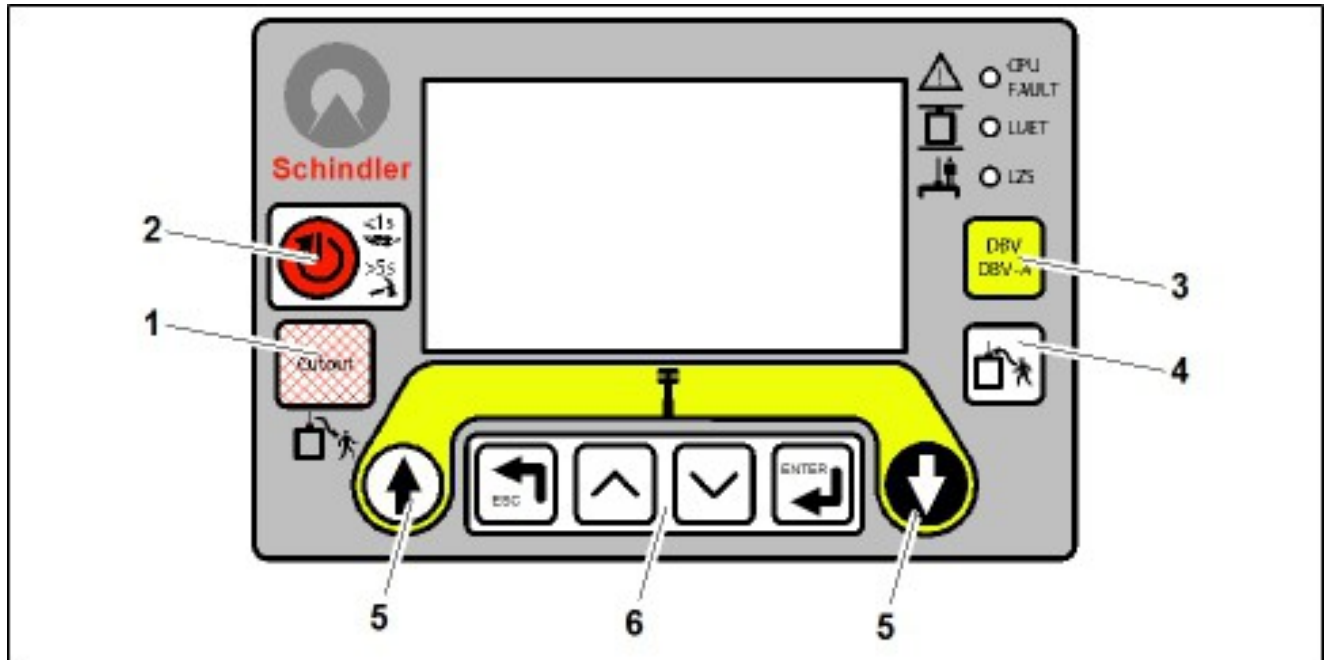
Position number	Status	Symbol / abbreviation	Description
		T2Open	Safety circuit is open at T2
		T3AOpen	Safety circuit is open at T3A
		T3BOpen	Safety circuit is open at T3B
		T4T5Opn	Safety circuit is open at T4 and/or T5
		JHM On	Control stopped by JHM
		JHC On	Control stopped by JHC
		JHC1 On	Control stopped by JHC1
		SwthCon	Switch consistency. The control detected the two inputs that read the status of the JRH switch (N_JRH and JRHCHK) in an inconsistent state (either both 0 or 1). The elevator is prevented to run in normal operation
		FC_NRdy	Frequency control not ready for travel
		DoorByp	Landing door bypass active
		BypNMan	Landing door bypass switch (JUEKTS) is ON, but none of the inspection switches (JHR or JREC) are ON. Trips in normal operation are not possible
		KTHMH	Hoisting motor overtemperature
		VFOvTmp	Frequency converter overtemperature
		Lift24V	Lack of 24 VDC supply
		SB Fault	Control stopped by a failure on the brake contactor
		LMSnRdy	Load measuring system is not ready
		Correct	Elevator is doing a correction trip
		PEBOFit	A fault has occurred on the PEBO device
		Creep	A control completes a trip with the speed IG
		BatFit	A fault occurred on the emergency supply battery
		Ovrload	Elevator is in overload
		AccTBlk	Elevator blockage after an acceptance test
		RdyBVR	Prepared for speed governor reset. Control finds the situation that occurs when you connect the GPB_RESET plug (safety circuit closed, but logic state of KBF input open) and will only let the inspection and recall travel occur to go until the governor and reset it manually
		BMini	The brake emergency stop monitor waits for start
		BMErr	The brake emergency stop monitor starts operation
		PeboBat	Manual evacuation battery exhausted
3	Drive	0	Drive is at a standstill
		+	Drive increases
		=	Drive moves at constant speed
		-	Drive decreases
		F	Drive is not available
		?	Unknown drive status
4	Car	=	Car is at a standstill in the door zone
		#	Car is at a standstill out of the door zone
		↑	Car moves up
		↓	Car moves down
		?	Unknown car status
5	Elevator designation within a group		
6	Current group selector value (1 ... n)		
7	Traveling speed		
8	Door	1/2	Door side



Position number	Status	Symbol / abbreviation	Description
			Door open
			Door closes
			Door opens
			Door closed
			Door locked
			Door stopped or unavailable
			Status unknown
<b>9</b>	Active control service		
<b>10</b>	LMS	CAL	Calibration is necessary for LMS
		CALF	Floor dependent zero calibration is necessary for LMS
		UNV	LMS is not available
		DIS	LMS is not in operation
		xx%	Car load in % of the rated load
<b>11</b>	Safety circuit status: The black background shows that the safety circuit is closed until here		
<b>12</b>	Service visit		Blinking* when the service visit is in operation
<b>13</b>	Master		M = this elevator is group master, blank if not
<b>14</b>	Node tree		
	Blinking	"%"	Node SW download is in progress
	ON	"?"	Node freeze is necessary
	Blinking	"?"	Executing node freeze
	Blinking	"!"	Freeze is unsuccessful
	ON	"!"	Missing or new nodes found after freeze
	Blank		Freeze done and no changes on node tree
<b>15</b>	Traveling speed		
	When in error condition:		The display changes between error code and status
<b>16</b>	Normal operation	Different modes are available. IMOF (information installation travel)	
		Counter for traction media monitoring.	
	Power failure	Distance between the car and the closest floor during power failure	
		Positive indication means that the car is above a floor.	






#### 4.1.1.1 HMI button description



No.	ID	Description	Symbol
1	TSD RESET	Lockable TSD reset button for SPH elevators	
2	RESET	Control reset button: – SW reset < 1 s – HW reset > 5 s (HW reset clears temporary SW flags)	
3	DBV	Overspeed test – DBV = trigger – DBV-A = reset	
4	INSPPRE	Automatic car positioning - top-of-car inspection	
5	DRH-U	Car direction in ESE mode RECALL panel — DRH-U	
	DRH-D	Car direction in ESE mode RECALL panel — DRH-D	
6	ESC	HMI escape button – navigation	



No.	ID	Description	Symbol
	UP	HMI up button – navigation	
	DOWN	HMI down button – navigation	
	OK	HMI OK button – navigation	

#### 4.1.1.2 Login and logout

For full access to all menu items, a login with entry of a password is necessary.

The behavior of the login/logout menu item in the HMI top menu is as follows:

- When not logged in, the menu item is **Login**.
- After correct login, the menu item changes to **Logout**.
- After logout, the menu item changes to **Login** and the display changes to the status elevator display.
- If the HMI is idle for 30 minutes without a user interaction, the HMI does an automatic logout.
- ▶ To login, follow these steps:
  - Select **login** from the top-level menu.
  - Enter the 4 digit password (letters only) upon 'Password=' prompt.
    - ↳ Status display: **Log-in success** or **Log-in failed**.
- ▶ To logout, follow these steps:
  - Select **logout** from the top-level menu.
  - Confirm logout (OK? prompt).
    - ↳ Status display: **Success** (for 2 seconds after correct logout).

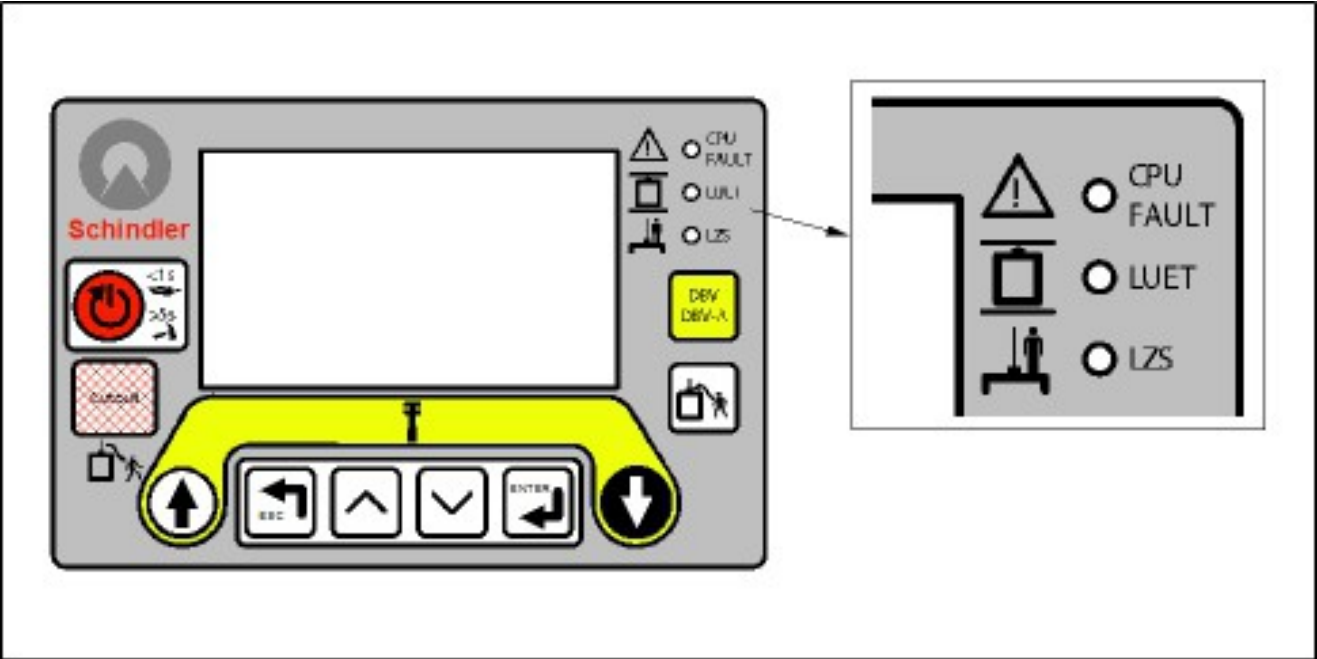
#### 4.1.1.3 Manual checking of trip counter ZQF

- ▶ Login to HMI.
- ▶ Read trip counter from **menu statistics → car trips**.



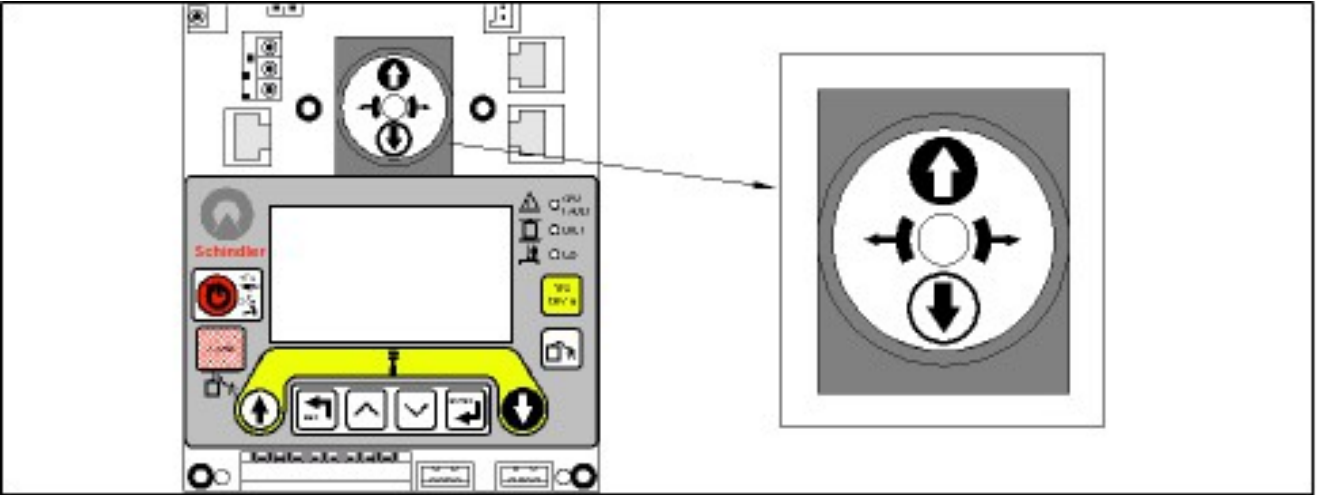
4.1.1.4 LED description on main board

LED on HMI: CPU Fault, LUET and LZS



LED	Status	Description
CPU Fault	ON	Main CPU (SCCORE) stuck in bootloader
	OFF	Main CPU can boot
LUET	ON	Car is in door zone
	OFF	Car is out of door zone
LZS	ON	TSD was/is activated and reset is necessary
	OFF	TSD not in operation

LED on SCMAIN: LED in DEM/DRH-E button



LED	Status	Description
RH/EM	Blinking	Manual evacuation (PEBO) starts
	Fast blinking	Manual evacuation (PEBO) is in overtemperature
	ON	Recall is in operation



#### 4.1.2 Control cabinet

The control cabinet at the closing-side door jamb of the top floor contains the elevator control, the emergency device, and the rescue instructions. As an alternative location, the control cabinet is integrated in the landing door jamb or in the cabinet remote from the landing door.

#### 4.1.3 Power transmission

Monitored by the elevator control, the motor operates the traction sheave, which transmits the force to the car by the suspension media and counterweight.

#### 4.1.4 Safety components

The overspeed governor monitors the speed of the car and triggers the safety gear if the car travels at too much speed.

The safety gear on the car stops the car if it moves down at too much speed. The safety gear is triggered by the overspeed governor.

If available (see characteristics), the safety gear on the counterweight stops the counterweight if it travels down at too much speed. The brake on the motor stops the car if one or more of the safety switches activate. The brake holds the car while stopped.

The buffers stop the car or the counterweight if there is overtravel into the hoistway pit.

The door interlock prevents the landing doors from opening during travel and when the car is outside the mechanical unlocking zone. The car door is a protection of the car entrance during travel and when the car is not in the door opening zone.

The hoistway information system as part of the hoistway information, serves as door opening zone detection respectively to bypass the door bridging circuit, when the elevator approaches a floor.

The slowdown monitoring device monitors the terminal speed at the terminal landing. This is used with a reduced buffer stroke to make sure that the car does not hit the buffer at too high a speed.

The safety system – protected area is a mechanical system to ensure a protected area to do maintenance.

#### 4.1.5 Safety circuit

The safety circuit monitors all electrical safety elements.

#### 4.1.6 Standard control functions



Available control functions are built-in and cannot be changed by the customer.

##### Pick-up control

The control registers only one call from the car, which is only in direct travel. Floor calls are registered and served in the sequence of registry, once the car is free.

##### One directional collective control

The control registers calls from the landings and calls from the car at all times. While the car moves down, it serves the calls in their natural sequence. The floor calls are only served in the down direction (up direction for the basement).

##### Collective selective control

The control registers calls from the landings and calls from the car at all times. While the car moves down or up, it serves car calls in their natural sequence and floor calls of the same direction.

##### Destination control

The passengers enter the destination floor on a terminal on the floor. An algorithm calculates which elevator will serve the call.

##### Group control

The group control puts two or more elevators together into a single control system. This optimizes the distribution of the floor calls between the elevators.

##### Overload control

The overload control prevents travel with an overloaded car. The car stays at the landing with the door open. A sound and optical signal catches the passenger's attention.



### **Full load control (only for collective)**

When the car is full, it will only serve car calls. Floor calls are ignored or given to the other elevator, if it is a duplex elevator.

#### **4.1.7 Optional control functions**



Not all functions are available in each combination. Depending on the specific elevator configuration, it is possible that some functions are not available as standard. Some functions are only available with a standard control while others are only available with a destination control.



Available control functions are built-in and cannot be changed by the customer.

##### **4.1.7.1 Signalization**

#### **Position indicator car (ASC1 optional)**

The car position indicator is a visual indicator in the car that shows the current position of the car.

#### **Position indicator landing (ASE optional)**

The landing position indicator is a visual indicator on the landing that shows the current position of the car.

#### **Arrival gong (GA1/2 optional)**

**GA1:** The arrival gong on the landing generates a tone or melody to tell waiting passengers that the floor call at their floor is about to be served. A double tone can indicate the next direction of travel of the car.

**GA2:** The arrival gong in the car generates a tone or melody to tell passengers that their car is arriving at a landing to serve a floor call. A double tone can indicate the direction of travel of the car.

#### **Out of service indicator (LAB optional)**

The "Out-of-service" indicator is illuminated on landings on which the car is not available to serve floor calls.

#### **Travel direction indicator in car (LR optional)**

The direction of travel indicator shows passengers in the car the direction in which the car is currently traveling (usually on the car position indicator).

#### **Hall lanterns (LW optional)**

Hall lanterns for KS elevators use illuminated up and down arrows to show the direction in which the car will then travel. If no calls have been registered, the two arrows are illuminated.

#### **Voice signalization in car (VS optional)**

To give verbal signaling of the elevator state as for example for blind passengers.

##### **4.1.7.2 Capacity**

#### **Door open button (DT-O standard)**

The door open button is a passenger operated in-car facility that over-rides the automatic door closing system. When the car is staying at floor level, pushing the door open button opens the doors immediately. If the door is closing, it is immediately stopped and reversed until fully open. The function of the door open button can be suppressed by other options, especially the access control, security options, and firefighter's controls.

#### **Door close button (DT-S standard)**

The door close button is a passenger operated in-car facility that lets automatic car doors to be closed before the dwell time has elapsed, so it decreases journey time. In normal operation pushing the door close button closes the fully open door immediately. If the door is opening, the door close button is ignored. The function of the door close button can be influenced by other active options.

#### **Full load control (LV standard)**

When the car is full it serves only car calls and ignores floor calls. If the elevator is part of a group, the full load control allocates floor calls to the other elevators in the group.



### **Automatic return to main floor (RL optional)**

If an elevator does not receive a call in an adjustable period, and the minimum load measuring KL-M or the car empty contact KCL is not activated, the car automatically goes back to the recall floor. The trip to the recall floor can be stopped by a floor call or a car call. In elevator groups, only one car goes back to the main floor.

### **Door pre-opening (UET standard)**

The door pre-opening function saves passenger and system time by starting the door opening cycle immediately before the car comes to a stop at a landing. The command to open the doors is given when the car goes into the door zone at the destination floor and its speed is less than 0.8 m/s.

### **Distribution of free cars (VCF standard)**

During periods with low traffic, free cars with no calls registered are distributed in the building to pre-defined floors or zones. The main floor is usually given priority. Extended floor-dependent door open times can be specified for cars parked and waiting to make a trip. This is sometimes useful in commercial buildings where the occupants wish to have a car waiting with open doors for their customers. The zones, priorities, and door open times can be changed in the field.

## **4.1.7.3 Comfort**

### **Car light switch (manual/automatic) (JLC optional): Without light switch in car:**

The car lighting is automatically set to OFF, after an adjustable time frame is over (minimum 1 min., maximum 40 min.) during which the car stays empty on a landing and no calls are registered.

### **Car light switch (manual/automatic) (JLC optional): With light switch in car:**

When the light switch in the car (manual/automatic) is in the ON position, the car lighting is permanently on. If the light switch is in the OFF position, after an adjustable time frame is over (minimum 1 min., maximum 40 min.) during which the car stays empty on a landing and no calls are registered.

### **Adaptive door timing (calls) (TOZD optional)**

For the adaptive door timing to set the journey time lost at landings to a minimum by changing the door open dwell time refer to the type of call registered. A car call requires the shortest dwell time for the passenger transfer, a floor call is given slightly longer, and if the two car and floor calls are registered, an additional time element is added.

### **Selective door timing (floors) (TOZS optional)**

If individual landings have a requirement for door open times, longer or shorter than the standard settings for the building, these can be adjusted using the service interface tools.

### **Door reversing device (TR1/2/3 standard)**

If an obstacle is found in the doorway, the elevator door stops closing and reopens. After a predefined time or some closing tries, the door stays open until a passenger enters a floor call or car call or pushes the door open/close button.

### **Car fan (OFF/ON/AUTO) (VEC optional)**

There is a switch in the car to specify the functionality of the car fan (off, on or automatic operation).

## **4.1.7.4 Alarm and communication**

### **Remote alarm (FA optional)**

If a passenger pushes the alarm button in the car, the elevator starts, after alarm validation, an alarm. A call center receives the alarm. The validation of the alarm prevents alarm misuse. The call center operator identifies the location of the elevator, acknowledges the alarm, sets up a two-way voice communication with the trapped passenger(s) and if necessary, calls up a technician to go on site and rescue the trapped passengers. The call center operator can always make a back call to the car. The location of a call center can be anywhere, locally in the building or remotely in a regional or national call center.

### **Remote monitoring (FUE optional)**

Remote telemonitoring gives 24-hour peace of mind to the elevator ownership. A telephone data link to the communications center makes permanent supervision of the elevator's drive and control systems possible.



Telemonitoring gives operators periodically operating data and can save time and cost by identifying possible problems before they occur.

#### **Building management interface (GLT optional)**

The building management interface gives external information of the status of the elevator through dry contacts. The interface also lets external operation of emergency power controls by the building management (supervisory panel interface).

#### **Intercom system (GSP optional)**

The intercom system lets the passengers in the car to speak with persons outside the car. These persons are typically at the security desk, in the lobby, in the machine room or at the firefighter recall landing.

#### **Building monitoring interface (GUE optional)**

The building monitoring interface supplies external information of the status of the elevator through dry contacts (supervisory panel interface).

#### **LobbyVision (ICC optional)**

LobbyVision™ supplies a building management with centralized information and control of elevators, escalators and many other buildings systems through a PC-based interface. Old and new generation elevator systems are supported. At the same time, an on-screen supervision of each installation on the building network is possible. The detailed status of individual groups can be shown in a graphical format. On-screen menus give access to many standard or optional facilities, such as VIP service, elevator switching and emergency services. In emergency situations, action screens show step-by-step procedures to be followed. LobbyVision™ also collects and shows statistical operating data on a display.

#### **Passenger alarm (PA standard)**

To alert the rescue services if there are trapped persons in, below or on top of the car. If a passenger in the car starts the 'alarm' button, the alarm horn sounds while the button is pushed. If a technician below or on top of the car pushes the 'elevator personnel alarm' button, the alarm horn sounds while the button is pushed.

#### **Central alarm with/without reset contact (ZA optional)**

A function to tell the rescue services if there are trapped persons in, below or on top of the car. It visually shows the passengers in the car that the alarm has been acknowledged.

### **4.1.7.5 Special transports**

#### **Service for disabled passengers (BF optional)**

The elevators have special buttons and audible and visible signalization devices for disabled passengers. After the button 'floor call for disabled' or 'wheelchair' on the landing is pushed, the assigned elevator enables the special functions for disabled passengers as additional audible and visible signalization, extended door open time, and so on.

#### **Car preference service (CW optional)**

It lets one car in a group to be called with "car preference" floor call. Typical this service is necessary when only one car in the group serves a specified floor. The dedicated elevator manages these calls according to the active control policy. A push button/key is used to enter car preference calls. This must be clearly identified to prevent being mistaken for a normal landing call button/key. If, for example, only one selectable car serves floor 10, the car preference push button could be marked "To floor 10".

#### **VIP service (KA/KS) (DF1/2 optional)**

The allocation of an elevator for one direct trip from a specified landing.

**DF1:** The VIP service allocates a pre-defined elevator for one direct trip from a specified landing. The VIP service is started by the exclusive user on a specified landing or by a building attendant. The pre-defined elevator is removed from the normal group service, finishes serving all pending car calls and then it is sent directly to the specified landing. The exclusive user can then enter one car call and travel directly to this floor.

**DF2:** The VIP service allocates an empty car for one direct trip from a specified landing. The VIP service is started by the exclusive user on a specified landing or by a building attendant. The selected elevator is removed from the normal group service, finishes serving all pending car calls and then it is sent directly to the specified landing. The exclusive user can then enter one car call and travel directly to this floor.



### **VIP service (M10) (DF5/6 optional)**

The allocation of a car for one direct trip from a specified landing.

**DF5:** The VIP service for M10 lets an individual to get priority use of a car by entering a special code at one landing terminal, then by selecting a destination floor. One specified car in the group is nominated for this service, which will complete its existing allocations before serving the VIP call.

**DF6:** The VIP service for M10 lets an individual to get priority use of a car by entering a special code at one landing terminal, then by selecting a destination floor. When the service is started, the elevator control looks for an empty car to allocate. If no empty car is available, it selects the car with the smallest number of car calls registered. This car will complete its existing allocations before serving the VIP call.

### **Attendant service (KS) (LI optional)**

Attendant service lets an operator in the car to control manually some of the car functions. Floor calls are assigned to cars and car calls are registered in the usual manner. The attendant must start the closing of the doors using the start button. He can also bypass floor calls or change the car's direction of travel. If a floor call is registered while the car is at rest, a buzzer alerts him.

### **Attendant service (M10) (LI-M10 optional)**

When the attendant operation M10 is started, the elevator serves pending destinations, travels to the activation landing and becomes available for attendant operation. The attendant operator enters the car, opens the hidden terminal and waits for passenger destination calls. He controls the door closing, the start of a trip and can cancel or enter new destination calls.

### **Priority travel service (PF optional)**

Priority travel service allows one direct journey to one floor. A key switch on the car operating panel bypasses registered floor calls and cancels existing car calls. At the end of the journey, the car automatically reverts to usual service. On a simplex installation registered floor calls are temporarily ignored. In a group, floor calls are given to other elevators. Registered car calls are canceled, and the doors stay open until a car call is entered or a pre-defined time-out has elapsed. The pre-defined time-out can be adjusted in the field. After a car call was entered, the door closes and the car travels directly to the required floor. The car then goes back to normal operation.

### **Independent service without parking (RV1 optional)**

A function to use the elevator for special purposes, for example transporting goods. The car is removed from normal operation and answers to car calls only. Floor call are no longer given to the elevator.

### **Independent service with parking (RV2 optional)**

A function to use the elevator for special purposes requiring enduring access of the car, for example for cleaning. The car is removed from the normal operation and answers to car calls only. Floor call are no longer given to the elevator. The door open mode can be customized. While parking is in operation, the car is blocked at floor level with open doors and does not accept car calls.

### **Subgroup control (UG optional)**

A function to divide an elevator group for different traffic demands. The subgroup control lets an elevator group to be divided into two smaller groups that answer to floor calls from special floor call risers. One subgroup is usually reserved for specialized traffic while the other stays in general use. For each subgroup, the related floor call riser (s) and elevators can be freely assigned. Each subgroup serves only floor calls from its assigned riser(s). The assignment of floor calls is based on the same control algorithm as in normal operation. More than one subgroup can be in operation at the same time.

## **4.1.7.6 Emergency**

### **Earthquake operation (EB optional)**

If the "seismic switch" of the building is started, all elevators of the group stop at the next possible landing. If the "contact counterweight derailment" (if present) gets on, only the affected elevator stops at the next possible landing. The affected elevator(s) are blocked continuously and open the doors for a pre-configured time.



This function is possibly different depending on the country codes.



### Building sway (GSU2 optional)

A function to prevent damage of elevator equipment in the hoistway caused by swinging ropes and traveling cables caused by building sway caused by very bad weather conditions (high winds/storms).

A building sway detection device gives maximum three different sway levels (low, medium and high) which are processed by the elevator control. Automatic building sway detection can be based on wind speed and direction gauges, accelerometers or devices putting together multiple sensors. The device can be manually started with a key switch.

If building sway is found, the elevator control answers as follows:

- low sway: optional speed reduction and optional restriction of serviced floors in endangered hoistway zones
- medium sway: optional further speed reduction and optional extension of the prohibited hoistway zones
- high sway: passengers are evacuated and then the elevator is parked.

The restriction for serving of calls applies to all elevators in the group.

### Emergency service (NF1/2 NF5/6 optional)

A function to reserve an elevator for emergency transports. If the emergency service is put in operation, the selected elevator is recalled to a specified floor. At the recall floor, the car is parked with opened door and the elevator is prepared to execute only car and destination calls.

These variants of this function exist:

- **NF1:** Collective control, predefined elevator
- **NF2:** Collective control, best elevator of group
- **NF5:** Destination controls (M10) predefined elevator
- **NF6:** Destination controls (M10) best elevator of group

It is put in operation through the "key switch emergency call" at the recall landing or the M10 code "emergency call" is made active on the recall landing.

### Emergency light on car panel (NLC1 optional)

Car lighting in case of power failure.

If the power supply to the lighting circuit is interrupted, a small light element in the car operating panel is turned on to give minimal lighting in the car. This is driven from a battery capable of supplying the load for a minimum of one hour.

### Emergency power evacuation (NS1/11 optional)

**NS1:** After a main power supply failure, an emergency power generator provided by the building owner supplies the elevators in the group. Elevators cause a blockage between floors are evacuated in turn to the next landing.

**NS11:** After a main power supply failure, an emergency power generator given by the building owner supplies the elevators in the group. All elevators are evacuated in turn to the predefined recall floor.

### Emergency power evacuation (NS2/21 optional)

After the evacuation in emergency power (phase one NS1 or NS11) is done, one or more elevators are released for usual mode (public use).

NS2 and NS21 are designations for the two functions 'evacuation' and 'operation' put together in emergency power. The difference between them is the evacuation phase only. NS2 includes the evacuation type NS1 and NS21 includes the evacuation type NS11.

### Monitoring of machine room temperature (TMX optional)

This is a function to prevent trapping of passengers in the car or damage of the elevator equipment because of overheating. If the elevator finds overtemperature of its components, it completes its current travel, cancels remaining and new car calls and recalls its car to the designated recall landing. Floor calls and destination calls are given to other available elevators or canceled, if no elevator is available.

At the designated recall landing, the elevator(s) opens the door, closes it after the usual door open hold time and parks with closed doors until the temperature of its components is below overtemperature level.

#### 4.1.7.7 Fire services



There are many different fire services available. In almost all countries there are regulations regarding the behavior of elevators if there is a fire. The functioning of the elevators if there is a fire is divided into two basic categories (these services are only a very rough explanation).

**Category type 1: Fire recall control** if there is a fire, elevators with option type 1 evacuate to a predefined recall floor and are then blocked at this floor.



**Category type 2/3/4: Fire service emergency travel - fire service elevator** If there is a fire, elevators with option type 2/3/4 evacuate to a predefined recall floor and are then available for a fire service emergency travel. The fire service emergency travel makes it possible for the fire service to use the elevator for firefighting or for evacuating persons.

#### **Fire emergency recall type 1 (BR1 xx optional)**

Elevator controls which operate with the fire emergency recall type 1 are referred to as firefighter's control BR1. Firefighter's control BR1 evacuates the elevators to a predefined recall floor and cause there a blockage with the doors closed or open.

The firefighter's control can be started manually with a switch or remotely with a fire alarm system. In some countries the regulations also stipulate that the restoration of usual service must take place with a reset switch.

The individual country-specific differences in the firefighter's control BR1 are in the descriptions of the related options.

#### **Fire emergency recall type 2 (BR2 xx optional)**

Elevator controls which operate with the fire emergency recall type 2 are referred to as firefighter's control BR2. Firefighter's control BR2 has a phase 1 during which it operates in the same manner as type 1. But after the elevator evacuates, it is not blocked but has a phase 2 which releases it for fire service emergency travel.

The special feature of the firefighter's control BR2 is that individual elevators of a group can be moved to fire service emergency travel status, while the remaining elevators in the group continue in normal operation. The fire service emergency travel switch can be found on a control panel in the building security office or directly adjacent to the landing operating panel on the related recall floor.

The individual country-specific differences in the firefighter's control BR2 are in the descriptions of the related options.

#### **Fire emergency recall type 3 (BR3 xx optional)**

Elevator controls which operate with the fire emergency recall type 3 are referred to as firefighter's control BR3. Firefighter's control BR3 has a phase 1 during which it operates in the same manner as type 1. But after the elevator evacuates, it is not blocked but has a phase 2 which releases it for fire service emergency travel.

The special feature of firefighter's control BR3 is that all the elevators of a group evacuate to the fire recall floor. Then they are blocked, but the elevator with the option BR3 can be released for fire service emergency travel. The fire service emergency travel switch is found on the car operating panel. Because of this, after the evacuation phase, the elevator must cause a blockage with its doors open, or else a means must be given for opening the doors (DE call, etc.).

The individual country-specific differences in firefighter's control BR3 are in the descriptions of the related options.

#### **Fire emergency recall type 4 (BR4 xx optional)**

Elevator controls which operate with the fire emergency recall type 4 are referred to as firefighter's control BR4. Firefighter's control BR4 has a phase 1 during which it operates in the same manner as type 1. But after the elevator evacuates, it is not blocked but has a phase 2 which releases it for fire service emergency travel.

The special feature of the firefighter's control BR4 is that all the elevators of a group evacuate to the fire recall floor. Then they are blocked, but the elevator with the option BR4 can be released for a fire service emergency travel. The fire service emergency travel switch can be found on a control panel in the building security office or directly adjacent to the landing operating panel on the related recall floor. The individual country-specific differences in the firefighter's control BR4 are in the descriptions of the related options.

### **4.1.7.8 Security**

#### **Anti-burglar operation (ES optional)**

The anti-burglar service is a crime protection facility that gives security personnel control over the elevator. If a burglar or vandal is known to be in the elevator, a special key switch or the LobbyVision function locks the car and sends it to a pre-defined floor where it stops. The doors can only be opened with a special command from the security staff at the landing.

The anti-burglar control is started by security personnel with a key switch or through LobbyVision.

#### **Card reader interface (elevator) (ZBC2 optional)**

This option is an interface of the car call access control for 3rd party card reader supplier or the building management. The parallel interface is in the machine room and 2 twisted pairs in the traveling cable are reserved to connect the 3rd party card reader in the car with the access control unit in the machine room. After



the card reader function gets on, all car calls of the concerned elevator will be locked. To release the elevator for car calls, each floor separately needs an active signal given from the 3rd party security system through the parallel interface in the machine room.

#### **Card reader interface (group) (ZBC3 optional)**

This option is an interface of the car call access control for suppliers of 3rd party card reader or the building management. The parallel interface is in the machine room and 2 twisted pairs in the traveling cable are reserved to connect the 3rd party card reader in the car with the access control unit in the machine room. After the card reader function gets on, the system-defined car calls in the full group can be locked.

The calls are released for operation when the related signal is received through the parallel interface.

### **4.1.7.9 Safety**

#### **Trip time monitoring (FZK standard)**

If the drive of an elevator is in operation significantly longer than the expected maximum trip time, then it is likely that the car is stalled. The trip time-out facility finds this delay and protects the drive by shutting it down.

#### **Overload protection (LX standard)**

The overload protection prevents an overloaded car from starting a trip. An overload signal and an optional audible warning will be operated to tell the passengers, and the automatic doors will stay open.

If the car is overloaded before the doors have fully closed, automatic doors will reopen and stay open. Manually operated doors stay unlocked. An overload signal in the car is illuminated (optionally flashing) and as an option, a buzzer can be started.

If the overload gets on after the doors have fully closed (for example because of the acceleration of the elevator the signal is ignored).

### **4.1.7.10 Misuse**

#### **Anti-nuisance operation (AN1/2/3 standard)**

It prevents not necessary trips caused by unserviceable or incorrect registered car calls.

**AN1:** Car call canceling in empty car ("minimum load"): If no passengers are in the car, the minimal load control function cancels all remaining car calls after serving one more call.

**AN2:** Car call canceling with loaded or empty car: ("comparison number of passengers and calls ") If the number of registered car calls is higher than the number of passengers in the car, the anti-nuisance function cancels all surplus car calls. A safety margin of one or more calls can be given.

**AN3:** Car call canceling after stop of empty call: ("door protection"). If a car stops on a car call and nobody leaves the car, it can be assumed that the car is empty and all remaining car calls will be canceled after serving one more call.

#### **Door nudging (FT standard)**

If an obstacle is found in the doorway, the elevator door stops closing and reopens. When the final door open time is reached, the elevator disables the reopening devices and starts the door closing (nudging) with an audible signaling and with reduced speed.

### **4.1.7.11 Miscellaneous**

#### **Car call cancellation (CCC optional)**

This is to cancel a registered car call.

If a passenger pushes two times the 'car call' button of an already registered car call, the elevator cancels this car call.

#### **Out-of-service elevator (JAB optional)**

The out-of-service switch is used to take an elevator out of service. Currently registered car calls are served before the car goes back to a specified recall floor, where it is blocked after the doors have opened and closed.

With M10, the feature can be started and stopped with a key switch or optionally with a code registered on the landing terminal.



## Out-of-service group (JABG optional)

The out-of-service switch is used to take a group of elevators out of service. Currently registered car calls are served before the elevators go back to a specified recall floor, where they are blocked after the doors have opened and closed.

With M10, the feature can be started and stopped with a key switch or optionally with a code registered on the landing terminal.

## 4.2 Normal operations

### 4.2.1 Safety instruction during operation

#### ⚠ CAUTION

##### Information to maintenance company about irregular performance

Report immediately anything irregular in the installation— (for example, leveling, noise, vibration, defective car lighting, start with a sudden movement, and so on) — to the maintenance company.

The owner of the installation must also tell the maintenance company of any changes that are scheduled in the area of the installation, and whenever an emergency has occurred.

#### ⚠ DANGER

##### Fire, smoke, water in building

If there is a fire because of power failure or other fire damage, the car can stop in a position where it is not possible for passengers to get out of the car, so that danger or burns and/or suffocation can occur.

If there is a fire, smoke, water, and so on in the building, it is not permitted to use the elevator.

#### ⚠ CAUTION

##### Rescuing of trapped passengers

When rescuing trapped passengers, obey the procedure shown in the machine room or elevator control panel.

- If the instruction notice in the machine room is missing, immediately tell the maintenance company, so that they can rescue the passenger and replace the missing instruction notice.

- In case of an emergency, where there is no response from the car, it must be assured that the person in the car pressing the alarm button has impaired speech or hearing. This requires immediate intervention by a competent person.

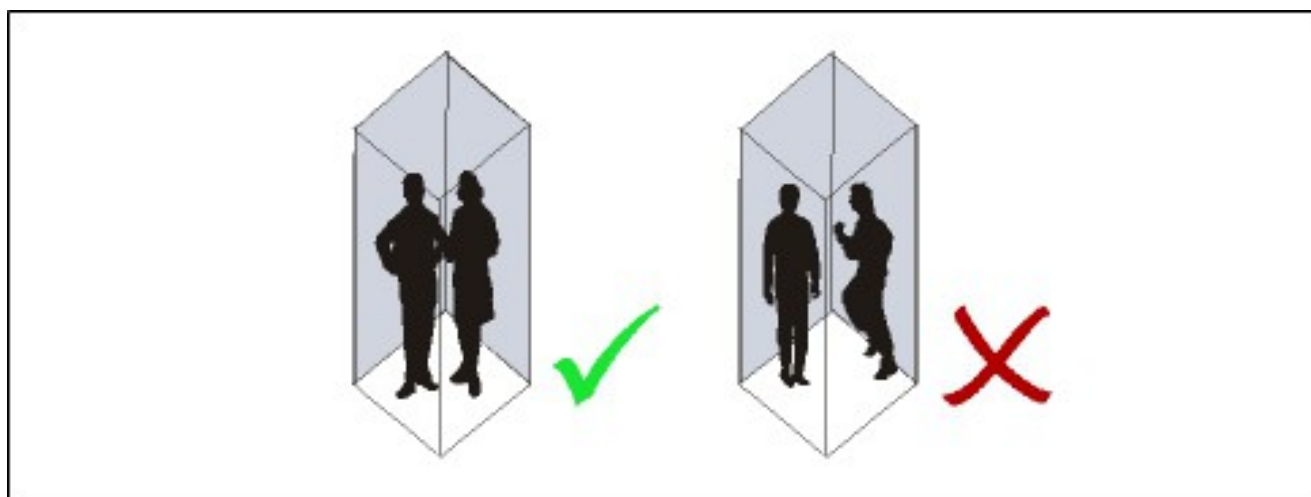
#### NOTICE

##### Handing over of emergency keys

The installer must hand over the emergency unlocking keys for the landing doors and control cabinet to the owner of the installation.

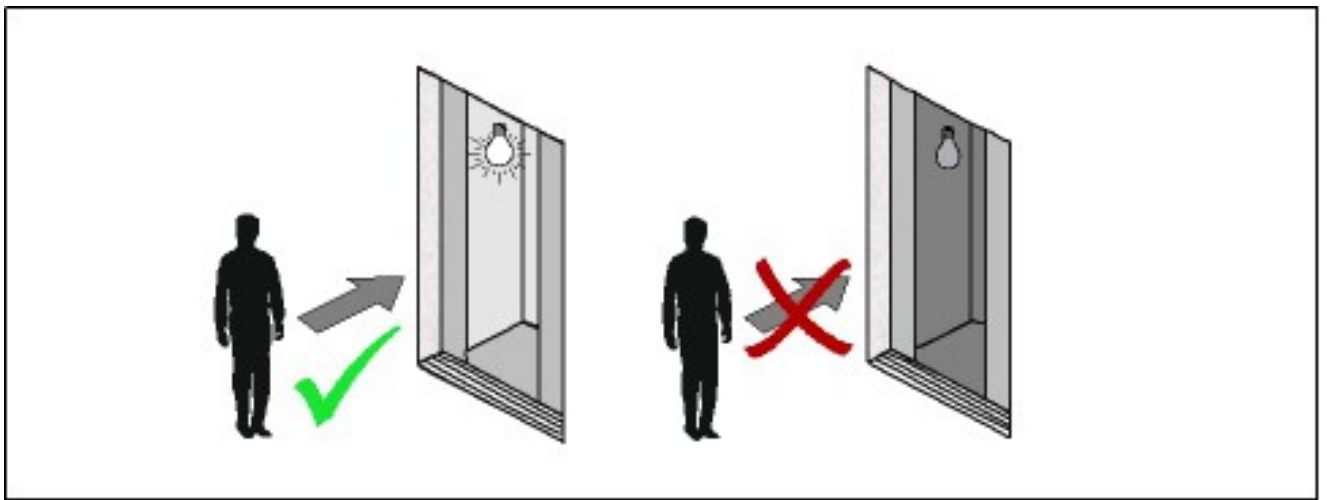
Together with the handover, there must be written instructions on how to use the key with the necessary precautions to be taken to prevent possible accidents caused from unlocking or access to the cabinet.

### 4.2.2 Behavior of passengers

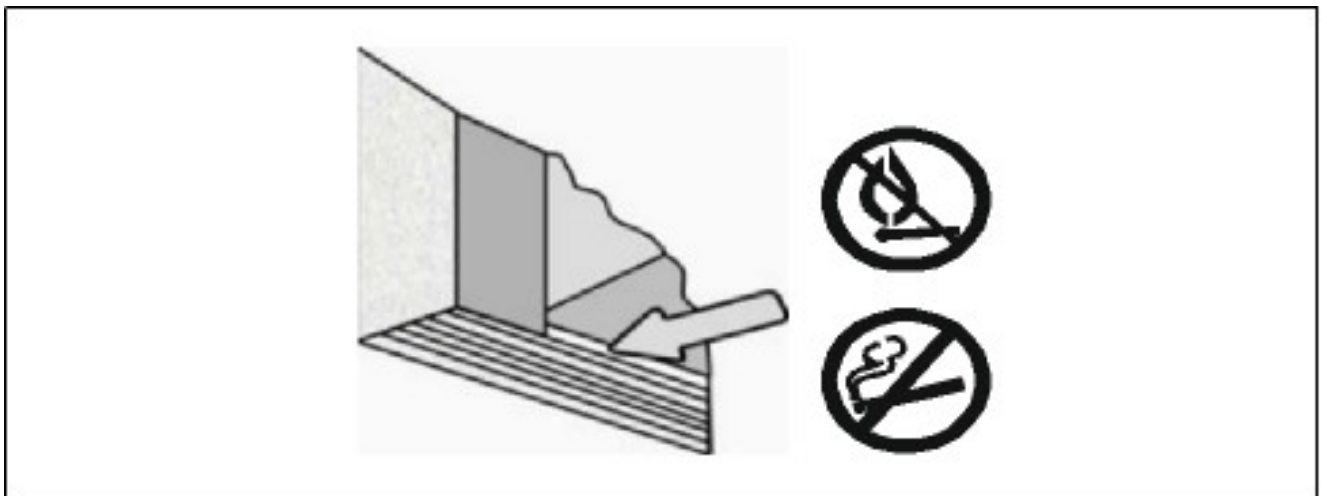


- Passengers must stand still while the car is moving. To jump or rock is not permitted. The instructions in the car must be obeyed.



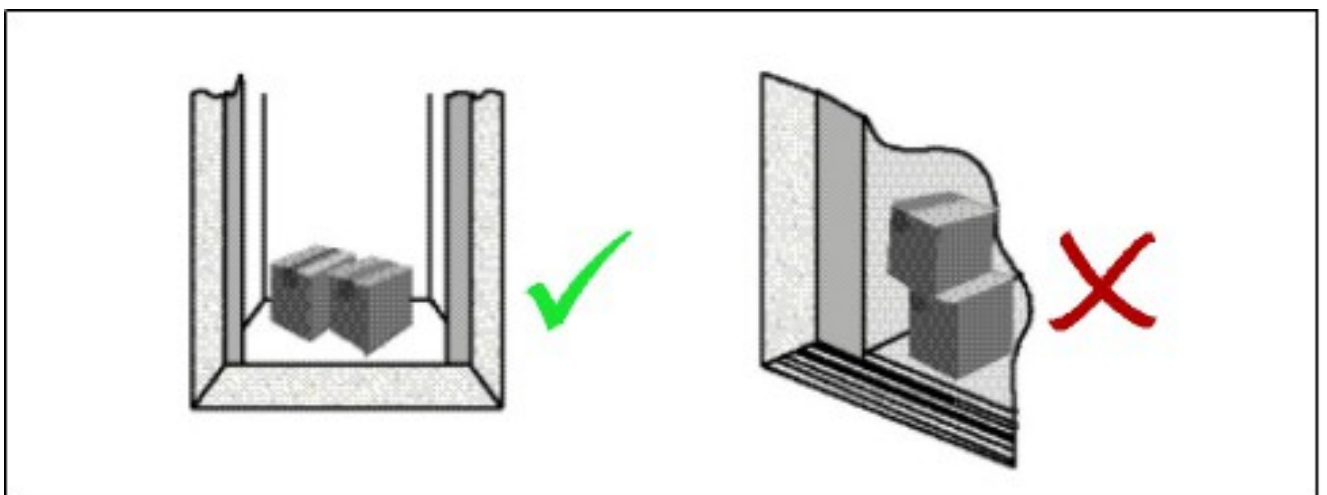


- The operation of the elevator is only permitted when the car lighting is on.



- To discard objects, especially burning matches or cigarettes, through the space between the door and the landing door sill into the hoistway pit is not permitted. This can cause a fire and dangerous smoke.
- Persons who cannot use the controls in the car are only permitted to use the elevator if accompanied by a person who can help.

#### 4.2.3 Positioning of goods

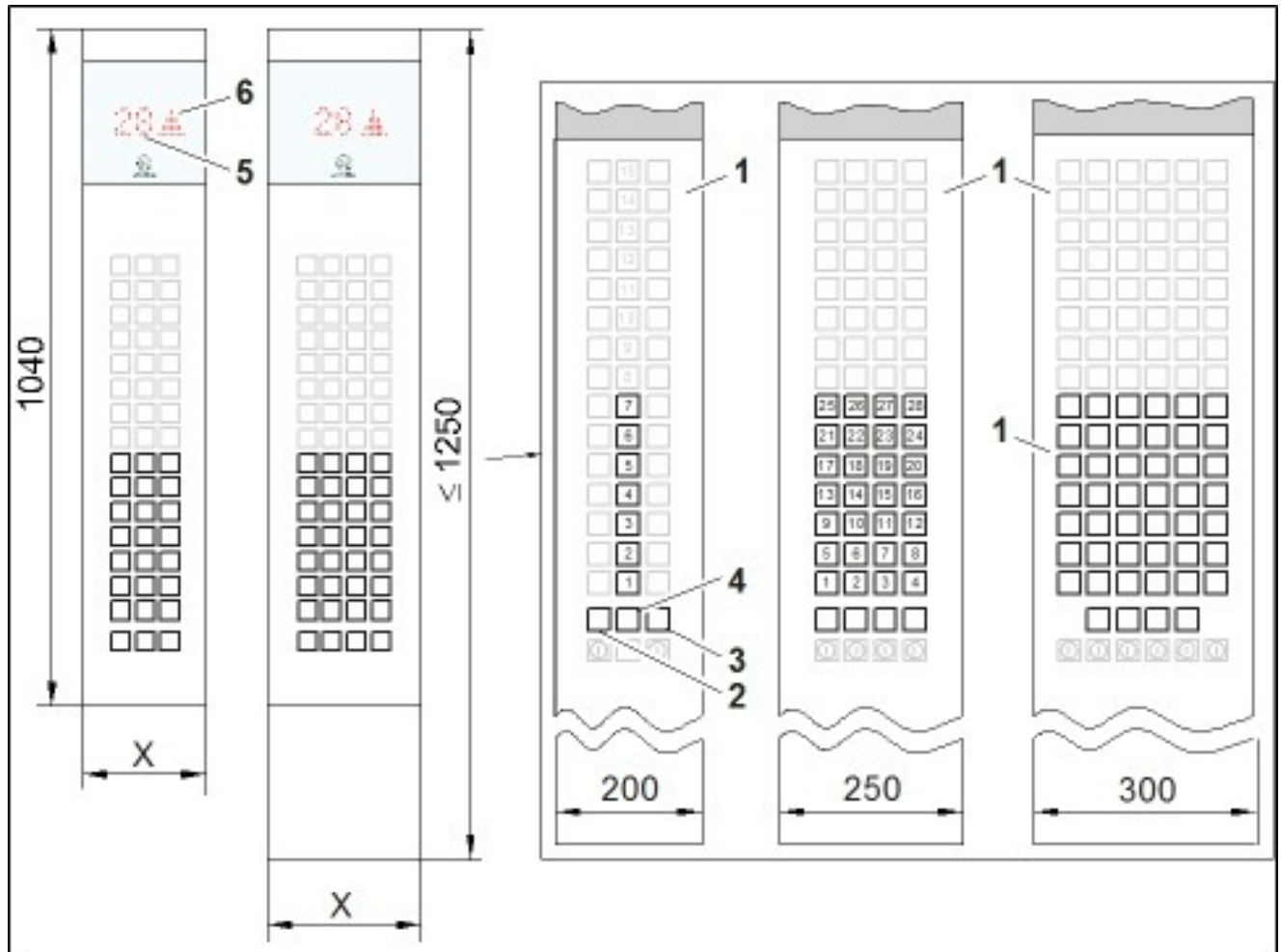


- The transport of goods is only allowed with service elevators and there, only within the defined loading limitations.
- Goods must be placed so that their weight is evenly distributed across the entire floor area of the car.
- The use of fork lift trucks or electric hand trolleys to load the elevator are not allowed.



#### 4.2.4 Car operating panel (COP)

**i** In the picture, a generic layout of the control elements in the car is shown. The layout can change depending on the configuration of the elevator, the interior design of the control element and the installed features.



- |   |                    |   |   |
|---|--------------------|---|---|
| 1 | Command keyboard   | 2 | Open door button                        |
| 3 | Close door button  | 4 | Alarm button                            |
| 5 | Position indicator | 6 | Pre announcing arrow / direction arrows |

Car operating panels are touch sensitive or with mechanical buttons. Main commands and indicator are:

- Travel command keyboard. It is used to select the destination floor. As soon as the push button is pushed and accepted, it will illuminate.
- The door open button is used to hold the door open or to open again a closing door.
- The door close button is used to close the door immediately. It permits immediate closing when the door is open and no person or object is between the doors.
- The alarm button, when touched, makes a permanent two-way voice communication with a rescue service possible.

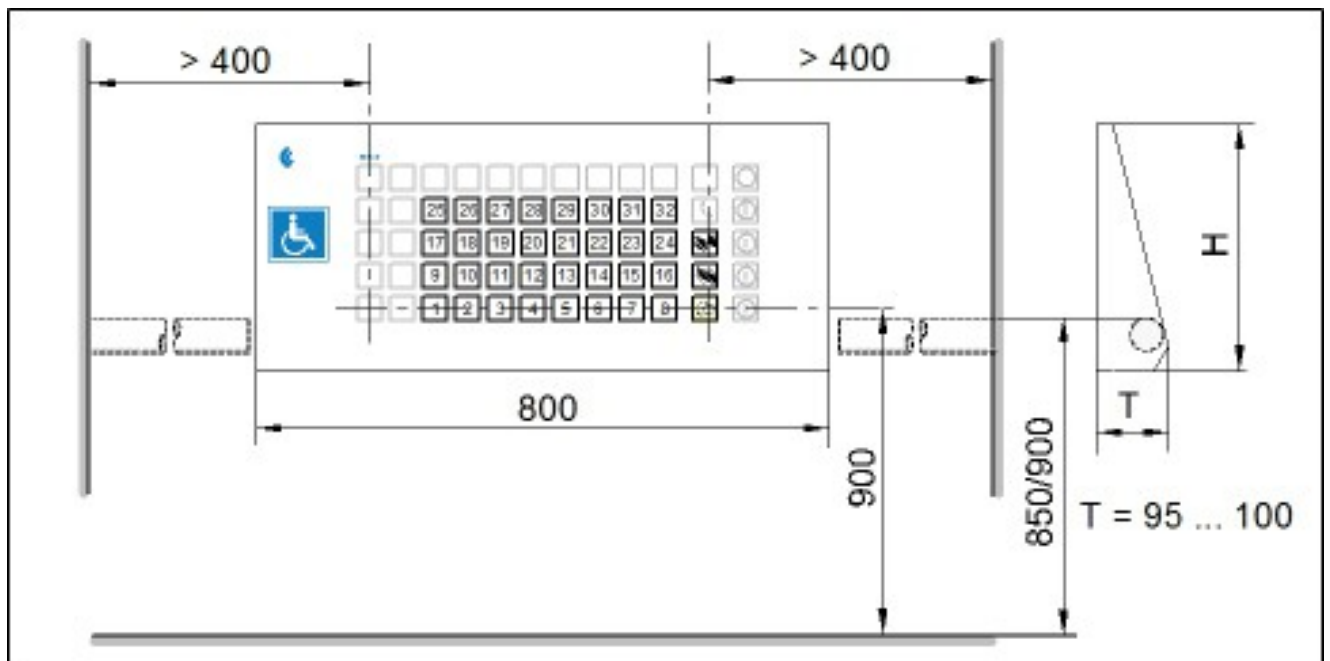
Position indicator. It shows the position of the car.

- Further travel indicator. Show for collective and selective controls further car travel up or down (direction arrows show for pick-up control the direction the car is traveling).
- Overload indicator. When the function is started, there is a beep, a flashing OL indication is shown on the main display and an overload pictogram is shown.
- Main floor with accessibility code, the main floor is designated with a green frame.
- Recall floor with firefighter code, the recall floor is labeled.

Additional feature and indicators can be placed in the control element panel in the car:

- Key switches for diverse control options, installed into a key module on the COP.
- Mechanical COP with push button.
- Out of service indicator.
- Configurable COP (mechanical or sensitive) with n-push buttons. (Push buttons only for served floors).



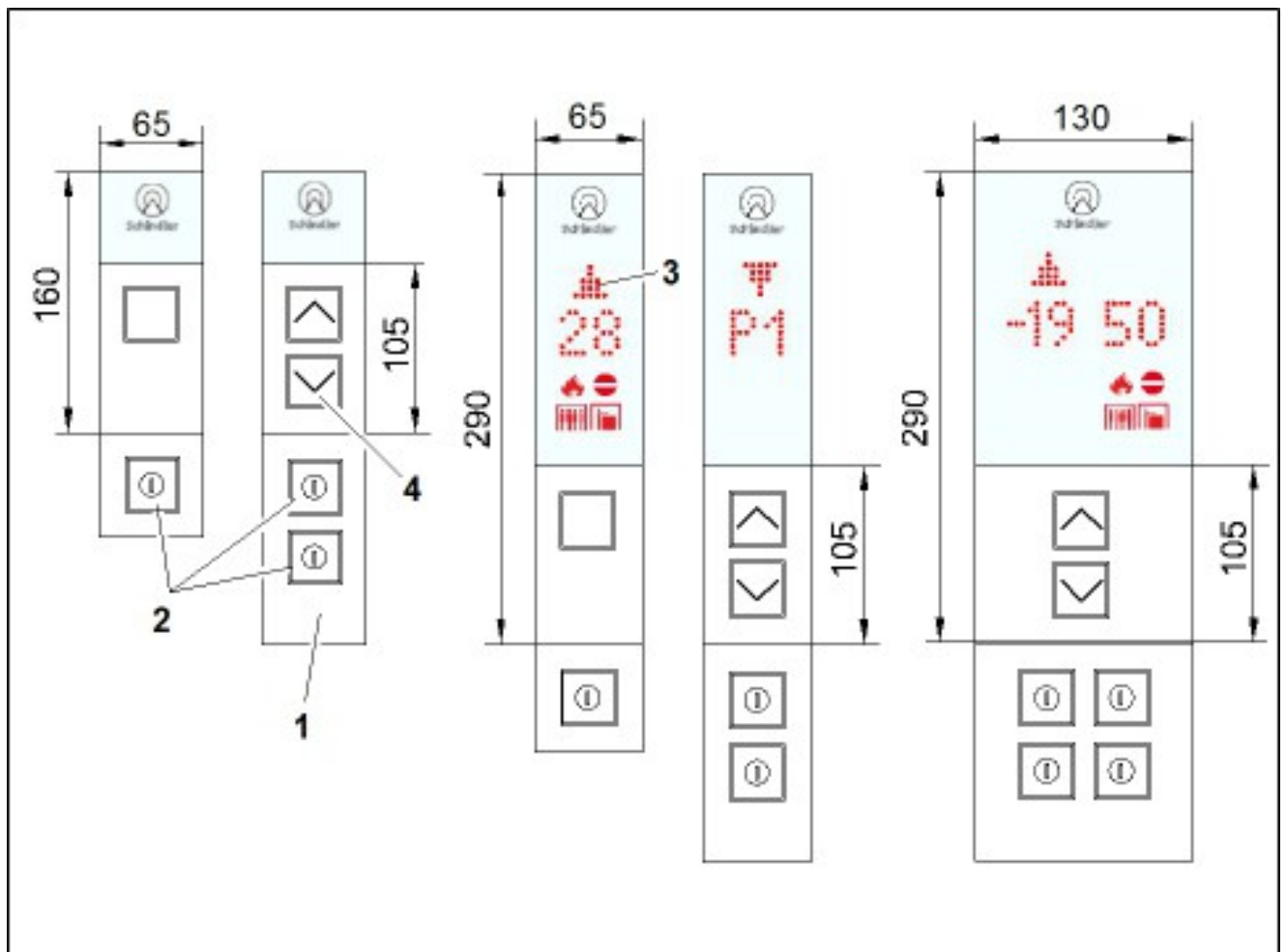


Optional feature for persons with disability:

- Braille on landing call button
- Additional car operating panel.

#### 4.2.5 Landing operating panel (LOP)

**i** In the picture, a generic layout of the control elements of the landing is shown. The layout can change depending on the configuration of the elevator, the interior design of the control element and the installed features.





- |   |   |
|---|---|
| <b>1</b> Landing operating panel<br><b>3</b> Position indicator | <b>2</b> Key switch<br><b>4</b> Further travel indicator / direction arrows |
|---|---|

The hall call button is used to call the car.

After entering a call, the hall call button lights up as an acknowledgment. If this does not happen, the elevator is not available.

The LOP may include up and down buttons for collective selective control (optionally at main floor for collective control).

Optionally, the hall call buttons can be controlled with a key (detached) or additional functions.

#### 4.2.6 Light curtain on car entrance

It senses persons, animals or objects on the area between the doors. It stops doors from closing and reopens them immediately.

### 4.3 Special operations

#### 4.3.1 Taking of elevator out of service for a long time


In some cases it is necessary to take the elevator out of service for a period of time. If this is necessary, contact the installer to assess the requirements and correctly shut down and protect the equipment.

#### 4.3.2 Putting of elevator back into service

After a long period of shut down, or an accident, the elevator must be correctly inspected before going back into service. Contact the installer to assess the requirements and return the elevator to service.

#### 4.3.3 Release after activation of safety parking service

This instruction gives the procedure necessary to put the elevator back to usual service when safety parking was started. With activation of safety parking the software logs the message **1653 Safety Parking Request**. The procedure can only be done from the user interface in the control cabinet/enclosure.

 This blocking of the elevator cannot be removed by resetting the CPU or with a fatal reset action on recall panel.

► Make sure that these conditions are met before you do the procedure below:

- Make sure that the recall and the inspection switches JRH, JREC and JRESG are set to OFF.
- Safety circuit is closed.
- No load in the car.
- Elevator system can do the brake capability test.

Step	Procedure	Display on HMI
1	Select <b>ClrSafetyPark</b> item in the Command menu.	<b>Commands → &gt; ClrSafetyPark</b>
2	The user interface shows a request for the fitter to examine the brakes: push <b>enter</b> to continue when the brake was examined.	Check Brakes! Ok?
3	Confirm that the brake is safe by selecting <b>YES</b> and <b>enter</b> .	Is Brake Safe? NO
		Is Brake Safe? YES
		Is Brake Safe? YES Ok?
4	To start the brake capability test, the user interface tells you to confirm: Push <b>enter</b> to start the test.	BrakeCapaTest Ok?
5	If the test is successful the blocking after safety parking is removed and the car is released for operation.  The blocking will stay on if the test fails and the machine room buzzer makes a sound again.	BrakeCapaTest Done



#### 4.3.4 Remote alarm emergency rescue

If the car stops, and it is not possible to get out of the car in the usual way, there is little risk for users in the car. The car is secured against uncontrolled movements. Airflow slits let air into the car. If there is a power supply failure, emergency light will immediately illuminate the inner car.

The car has a 2-way voice communication system, which can be used in an emergency to set up the communication with a rescue service.

The alarm button in the car must only be pushed in an emergency. When the alarm button is pushed, the alarm is forwarded automatically. After a short time, the person on duty at the responsible service center replies. The person gives instructions to the passenger, and organizes whatever step is necessary.

#### 4.3.5 ETMA (Embedded telemonitoring alarm)

##### Standard alarm call

	Rescue service	Handling form →to	Remote alarm device
Make connection		← ring	The TA device dials the rescue alarm number
	The rescue service responds to the incoming call		
Check of installation ID	Ask the installation ID with	#10#→	
		#12xxxxxxxxxxx#	Send installation ID (x=0 to 999999999999)
Check of unit ID	Ask the unit ID with	#13#→	
		← #15abcd#	Send the unit ID (a=1 to 8)
Speak	Open the voice channel with	#21# →	Starts microphone and speaker
		← #00# <sup>1)</sup>	Send ok
	Speak with car		
	Close the voice channel with	#20# →	Stops microphone and speaker
Set lamp switch to off		← #00# <sup>1)</sup>	Sends ok
	Set lamp switch to off in car with	#28# →	Stops lamps
Acknowledge alarm	Acknowledge the alarm with	#22# →	Call algorithm satisfied
		← #00# <sup>1)</sup>	Sends ok
Close connection	Send the hang up signal	#24# →	
	The rescue service hangs up	← #00# <sup>1)</sup>	Sends ok TA device disconnects the phone line

<sup>1)</sup> If the alarm device responds with #99# then the TA device did not get the DTMF commands right. Try again to send the command



## Back call from rescue service

	Rescue service	Handling form →to	Remote alarm device
Make connection	Dial the telephone number of the TA device	ring →	
		← beep	The TA device responds to the call
Check of installation ID	Ask the installation ID with	#10#→	
		#12xxxxxxxxxxx#	Send installation ID (x=0 to 999999999999)
Switch unit ID <sup>1)</sup>	Select TA module with (x=1 to 8)	#16#→	
		← beep	Switches the unit
Check of unit ID	Ask the unit ID with	#13# →	
		← #15abcd#	Sends unit ID (a=1 to 8)
Speak	Open the voice channel with	#21# →	Starts microphone and speaker
		← #00# <sup>2)</sup>	Send ok
	Speak with car		
	Close the voice channel with	#20# →	Stops microphone and speaker
		← #00# <sup>2)</sup>	Sends ok
Close connection	Send the hang up signal	#24# →	
	The rescue service hangs up	← #00# <sup>2)</sup>	Sends ok TA device disconnects the phone line

<sup>1)</sup> Optional, it is only necessary, when a connection is necessary to other units than the master unit.

<sup>2)</sup> If the alarm device responds with #99# then the TA device did not get the DTMF commands right. Try again to send the command.

## Watchdog

The TA device sets the limit for a call to maximum 3 minutes. Then the connection will be stopped.

The command below starts the timer for the next 3 minutes without stopping the communication.

It can be used with each connection independent of alarm -back- or configuration call.

	Rescue service	Handling form →to	Remote alarm device
Watchdog	Start the watchdog with	#23# →	The TA device starts the timer for the next 3 minutes
		← #00# <sup>2)</sup>	Sends ok

<sup>2)</sup> If the alarm device responds with #99# then the TA device did not get the DTMF commands right. Try again to send the command.



## Configuration call

The procedure that follows gives the change of the necessary alarm device parameters. Use the telephone codes as given.

**i** If the configuration of the alarm device is not permitted and it responds with #99#, a reset of the alarm device is necessary. Because during the operation, the password was changed by the rescue service.

	Rescue service	Handling form →to	Remote alarm device
Make connection	Dial the telephone number of the TA device	ring →	
		← beep	The TA device responds to the call
Check of installation ID	Ask the installation ID with	#10#→	
		#12xxxxxxxxxxx#	Send installation ID (x=0 to 999999999999)
Switch unit ID <sup>1)</sup>	Select TA module with (x=1 to 8)	#16#→	
		← beep	Switches the unit
Check of unit ID	Ask the unit ID with	#13# →	
		← #15abcd#	Sends unit ID (a=1 to 8)
Login	Login with	#350000# →	
		← #00# <sup>2)</sup>	Sends ok
Change installation ID	Set installation ID with (x=0 to 999999999999)	#11xxxxxxxxxxx# →	Sets installation ID
		← #00# <sup>2)</sup>	Sends ok
Change the CC number	Set prefix with (x=0..8 digits)	#40xxxxxxxxx# →	Sets prefix phone number
		← #00# <sup>2)</sup>	Sends ok
	Sets alarm number 1 with (x=0..24 digits)	#41xxxxxxxxxxx# →	Sets phone number 1
		← #00# <sup>2)</sup>	Sends ok
	Sets alarm number 2 with (x=0..24 digits)	#42xxxxxxxxxxx# →	Sets phone number 2
		← #00# <sup>2)</sup>	Sends ok
	Sets alarm number 3 with (x=0..24 digits)	#43xxxxxxxxxxx# →	Sets phone number 3
		← #00# <sup>2)</sup>	Sends ok
	Sets alarm number 4 with (x=0..24 digits)	#44xxxxxxxxxxx# →	Sets phone number 4
		← #00# <sup>2)</sup>	Sends ok



	Rescue service	Handling form →to	Remote alarm device
	Set alarm test line with (x=0..24 digits)	#71xxxxxxxxxxx# →	Set phone number test line
		← #00# <sup>2)</sup>	Sends ok
	Set monitoring number with (x=0..24 digits)	#83xxxxxxxxxxx# →	Sets monitoring number (also used for power fail notification)
		← #00# <sup>2)</sup>	Sends ok
Close connection	Send the hang up signal	#24# →	
		← #00# <sup>2)</sup>	Sends ok TA device disconnects the phone line

<sup>1)</sup> Optional, it is only necessary, when a connection is necessary to other units than the master unit.

<sup>2)</sup> If the configuration of the alarm device is not permitted and it responds with #99#, and one more try is unsatisfactory, a reset of the alarm device is necessary. Because during the operation, the password was changed by the rescue service

#### Automatic periodic call procedure

	Rescue service	Handling form →to	Remote alarm device
Make connection		← ring	The TA device dials the rescue alarm number
	The rescue service responds the incoming call		
Verify installation ID	Ask the installation ID with	#10#→	
		#12xxxxxxxxxxx#	Send installation ID (x=0 to 999999999999)
Verify unit ID	Ask the unit ID with	#13# →	
		← #14abcd#	Sends unit ID (a=1 to 8) (b=1 : test call)
Set line test timer	Set line test timer (x = 0 to 99999 minutes)	#74xxxxx# →	Set line test timer
		← #00# <sup>2)</sup>	Sends ok
Close connection	Send the hang up signal	#24# →	
	The rescue service hangs up	← #00# <sup>2)</sup>	Sends ok TA device disconnects the phone line

<sup>2)</sup> If the alarm device responds with #99# then the TA device did not get the DTMF commands right. Try again to send the command.



## Power fail notification

The procedure that follows gives a power fail notification. Reception of the call, steps to be made for acknowledgement of the call as requested by local regulation. Use the telephone codes as given.

	Rescue service	Handling form →to	Remote alarm device
Make connection		← ring	The TA device dials the rescue alarm number
	The rescue service responds the incoming call		
Check of installation ID	Ask the installation ID with	#10#→	
		#12xxxxxxxxxxx#	Send installation ID (x=0 to 999999999999)
Check of unit ID and status of battery	Ask the unit ID with	#13# →	
		← #14abcd#	Send unit ID (a=1 to 8) Sends notify c = 0: all power ok c = 1: mains power nok c = 2: ind/batt nok c = 3: all power nok c = 4: battery low in power fail c = 5: battery defect
Close connection	Send the hang up signal	#24# →	
	The rescue service hangs up	← #00# <sup>1)</sup>	Sends ok TA device disconnects the phone line

<sup>1)</sup> If the alarm device responds with #99# then the TA device did not get the DTMF commands right. Try again to send the command.



### 4.3.6 Third party call center configuration

This information is for the third party to reconfigure the CUBE.

Minimum SIM requirement:

- Industrial grade for high temperature
- Size 2FF
- Follow these steps to configure the CUBE in the OEM mode:
  - Switch OFF the CUBE.
  - Put in a new SIM card
  - Switch ON the CUBE.
  - Send the SMS configuration to the CUBE.
  - The CUBE is configured for the OEM mode.
  - When the OEM mode is started, the LED CIL4 on the CUBE will flash slowly.

#### 4.3.6.1 Configuration with SMS

With a simple SMS, the third party can configure:

- Installation ID
- Battery status report
- SMS number for notification

The configuration message must follow these rules to make sure that the configuration is correct:

- Start with oem-config
- Complete with #
- It contains all the necessary parameters
- It contains only key-value pairs, with one key-value pair per line and divided by a colon
- It contains at least the last 10 digits of the CUBE serial number
- It is not longer than 160 characters (maximum SMS length)
- It contains only ASCII characters

#### SMS configuration content for notification (CUBE only)

Oem-config	SMS of string declaration as a configuration for third party
sn:	Header of the serial number
2345678901	Serial number of the target CUBE
instid:	Header of the installation ID
12345678901	Installation ID (maximum 12 characters long)
snum1:	Header of the first SMS number
+4179123456	First SMS number
snum2:	Header of the second SMS number
+4179123457	Second SMS number (can be empty)
snum3:	Header of the third SMS number
+4179123458	Third SMS number (can be empty)
snum4:	Header of the fourth SMS number
+4179123459	Fourth SMS number (can be empty)
lnum:	Header of the battery monitoring number
+4141123459	Battery monitoring number
lbt:	Header of the battery monitoring timer
4320	Battery monitoring timer in minutes (3 days = 4320 min)
#	Declares the end of the SMS



All headers and line endings must be written in the SMS.

Example to an SMS configuration content:

```
oem-config
sn: 2102113374P0B4000046
instid: HK-Tower 12
snum1: +445678900
snum2: +445678901
snum3: +445678902
```



snum4: +445678903

#

If the submitted serial number matches the one stored in the device, CUBE will send back this confirmation SMS:

oem-config: success

# // this string confirms the successful configuration

If the submitted serial number does not match the one stored in the device, CUBE will send back this rejection SMS:

oem-config: failed

reason: [reason]

# // this string informs about the unsuccessful configuration

It is possible that the CUBE ignores the incoming SMS and does not send any message back. Then, the configuration was not correct. To prevent not necessary costs by sending SMS automatically, CUBE does not respond to every SMS.

### Notification

The CUBE will send an SMS to tell if:

- The battery is defective
- The battery is OK.

This is the content of the SMS sent to the number(s) given before:

oem-notify	String declaration as a notification SMS
instid: 123456789012	// example of a number for the SV_ID (maximum 12 characters long)
Message: Battery defect	// example of a notification message
#	

#### 4.3.6.2 Recovering from third party configuration

When the CUBE configuration with a third party is done, it is not possible to go back to the factory state. If so, contact the installer.

The CUBE will stay in OEM mode.

#### 4.3.6.3 Configuration of FXS

- If a 3<sup>rd</sup> party telealarm (other than ETMA-PSTN) is connected to the CUBE, send an SMS message to adjust the FXS interface if necessary.

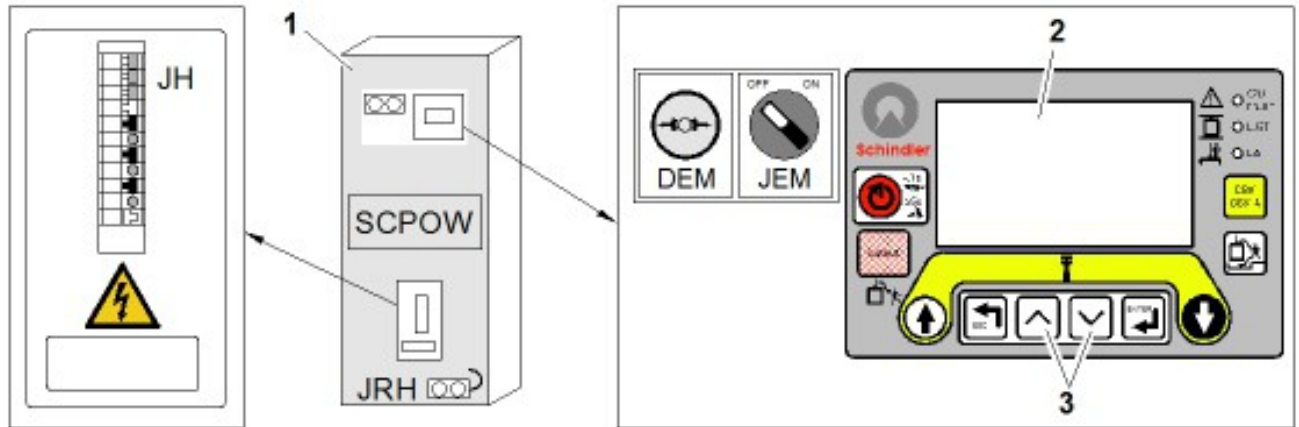
Example SMS for Switzerland:

fxs-config  
country: CH  
#

- For more information, contact the installer.



### 4.3.7 Evacuation instruction with PEBO



- 1 Control cabinet
- 2 Display
- 3 UP and DOWN buttons

- i** – Only trained and authorized personnel are allowed to execute an evacuation.
- Manual operation of the elevator is only permitted in emergency situations according to the instruction below.
- It is not allowed to bridge the safety circuit.

- ▶ Set the main switch JH to OFF in the control cabinet (AS).
- ▶ Make sure that the location of the car is as shown on the display.

#### 4.3.7.1 Evacuation with car on floor

- ▶ If the LUET LED is ON, evacuate the passengers, refer to the paragraph "Evacuation of passengers from car".

#### 4.3.7.2 Moving of car with recall control

- ▶ If the LUET LED is OFF, calm the passengers, tell them to stay back and that the car will move.

- i** Make sure that all hoistway doors are locked.
  - Turn the switch JRH to INSP.
  - Set the main switch JH to ON.
  - Use the recall control to move the car to the next available landing floor until the LUET LED comes on.
  - Set the main switch to OFF and evacuate the passengers, refer to paragraph "Evacuation of passengers from car."

#### 4.3.7.3 Moving of car with PEBO

If it is not possible to move the car with the recall control, then move the car with PEBO:

- ▶ Calm the passengers, tell them to stay back and that the car will move.
- ▶ Make sure that the main switch JH is set to OFF.
- ▶ Push the buttons UP and DOWN at the same time and monitor the LR-U, LUET and LR-D LEDs.
- ▶ If the LR-U, LUET and LR-D LEDs are OFF, close and lock the control cabinet and tell the emergency service.
- ▶ If the LR-U, LUET and LR-D LEDs comes on:
  - Turn on the manual evacuation switch JEM.
  - While you monitor the display, push and release the button DEM at 3 second intervals so that the car moves in the up or down direction, depending on the car load.
- i** During the evacuation procedure, the display and the LED LR-D show the movement direction of the car. If the car does not move, see "Evacuation instruction balanced".
  - When the LED LUET comes on, the car got to a landing floor.
  - Turn off the switch JEM and evacuate the passengers, refer to paragraph "Evacuation of passengers from car".

#### 4.3.7.4 Evacuation of passengers from car

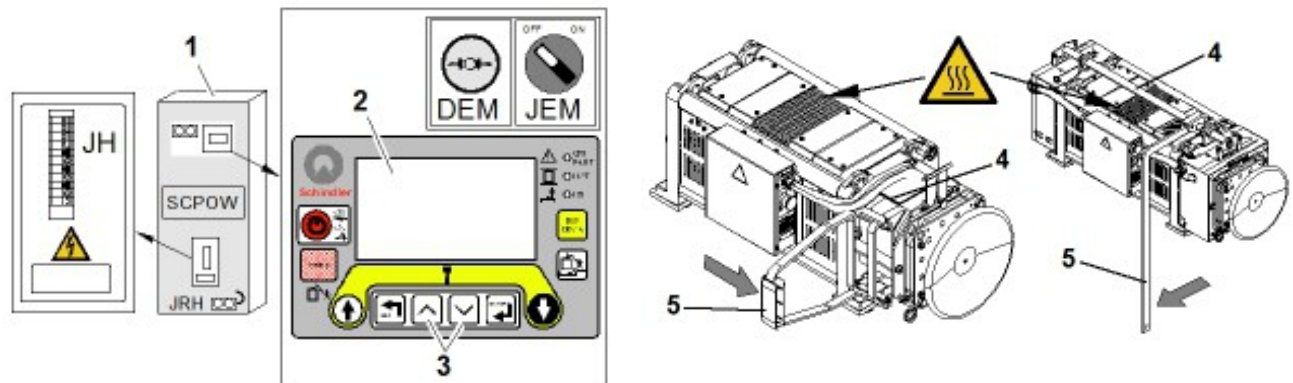
- ▶ Close and lock the control cabinet (AS).
- ▶ Go to the floor shown on the display.
- ▶ Use the triangular key to open the hoistway door and evacuate the passengers.
- ▶ Close the hoistway door.
- ▶ Make sure that the hoistway door is locked.
- ▶ If installed, remove the balanced evacuation kit (BEK), refer to "Evacuation instruction balanced".



- ▶ Tell the repair service.
- ▶ Open the control cabinet to make sure that the main switch JH is set to OFF.
- ▶ Close the lock the control cabinet.

#### 4.3.8 Evacuation instruction MMR with MBR

**i** The drive in the graphic below is an example. Components may differ depending on actual scenario.



- |   |                     |   |  |
|---|---------------------|---|--|
| 1 | Control cabinet     | 2 | Display                                      |
| 3 | UP and DOWN buttons | 4 | Actuating lever FML/PML, brake notch FMR/PMR |
| 5 | Brake release lever |   |  |

- i**
- Only trained and authorized personnel are allowed to execute an evacuation.
  - Manual operation of the elevator is only permitted in emergency situations according to the instruction below.
  - It is not allowed to bridge the safety circuit.

##### 4.3.8.1 Car on floor

- ▶ If the LUET LED is ON, calm the passengers, refer to paragraph “Evacuation of passengers from car”.

##### 4.3.8.2 Moving car with recall control

- ▶ If the LUET LED is OFF, calm the passengers, tell them to stay back and that the car will move.
- ▶ Make sure that all hoistway doors are locked.
- ▶ Turn the switch JRH to INSP.
- ▶ Set the main switch JH to ON.
- ▶ Use the recall control to move the car to the next available landing floor until the LUET LED comes on.
- ▶ Set the main switch JH to OFF
- ▶ Evacuate the passengers, refer to paragraph “Evacuation of passengers from car”.
- ▶ Set the main switch JH to OFF and evacuate the passengers, refer to paragraph “evacuation of passengers from car”.

##### 4.3.8.3 Moving of car with manual brake release

If moving the car is not possible with the recall control, then open the brake to move the car manually.

- ▶ Calm the passengers, tell them to stay back and that the car will move.
- ▶ Make sure that the main switch JH is set to OFF.
- ▶ Push the buttons UP and DOWN at the same time.
- ▶ Monitor the LR-U, LUET and LR-D LEDs.
- ▶ If LR-U, LUET and LR-D LEDs are OFF.
- ▶ Close the control cabinet.
- ▶ Close and lock the machine room door.
- ▶ Tell the emergency service.
- ▶ If LR-U, LUET and LR-D LEDs comes on:
  - Carefully put the brake release lever into the actuating lever (FML/PML) or the brake notches (FMR/PMR) in the position shown.
  - While you monitor the display, move the brake release lever in the direction of the arrow to open the brake.

**i** If the car moves too fast you hear a signal, then pull the manual brake release lever and close the machine brake to stop immediately.

- ▶ Put the brake release lever into the machine.



- Pull the manual brake release lever.
- Keep the machine brake open for a very short time.
- Open and close the machine brake to monitor and control the speed of the traction sheave.
- Do the procedure until the car gets to the next door zone.
- Remove the brake release lever.

**i** During the evacuation procedure, the display and the LR-D and LR-U LEDs show the movement direction of the car. If the car is not moving, see "Evacuation instruction balanced".

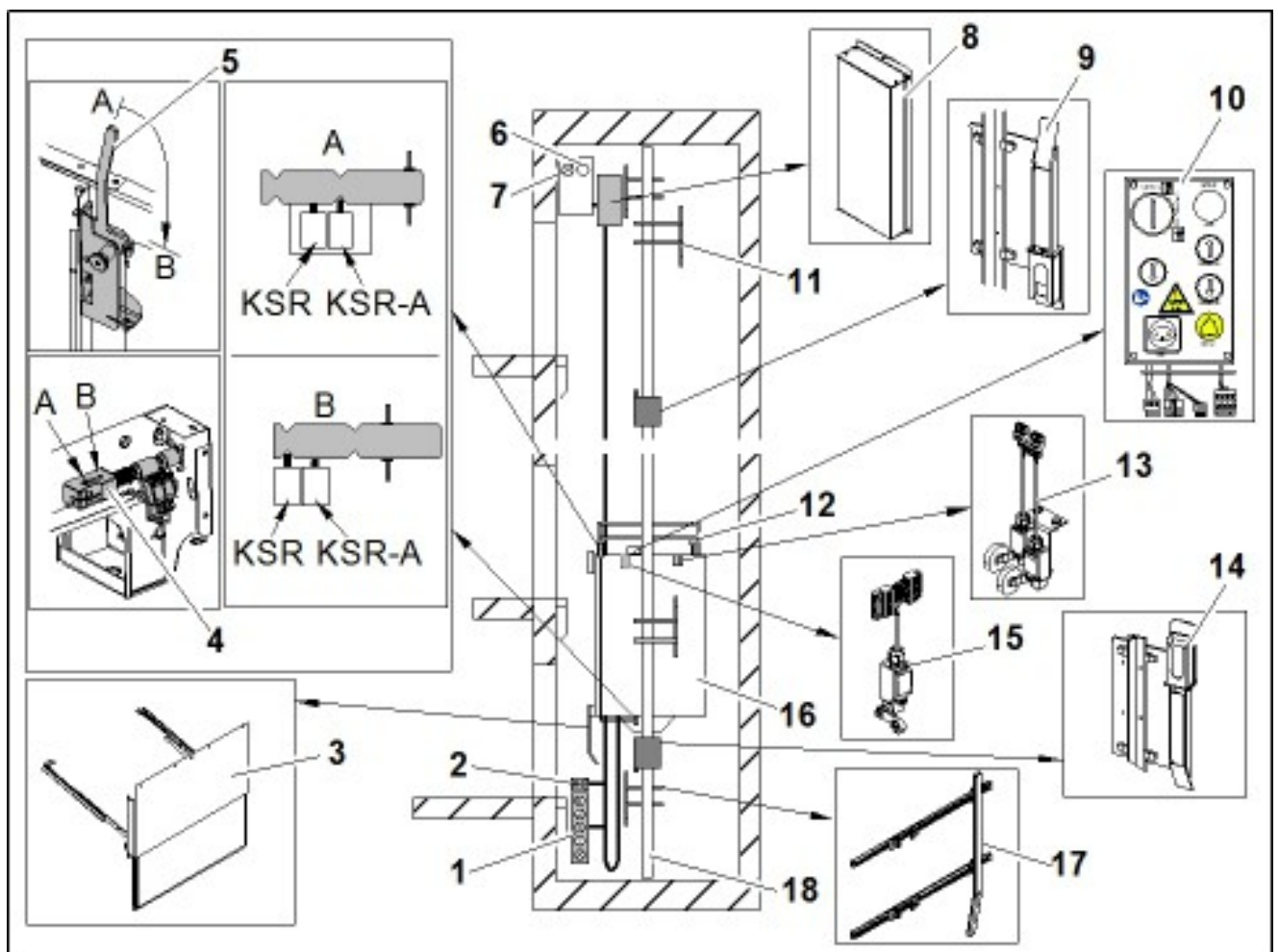
- Move the car until the LUET LED comes on.
- When the LUET LED comes on, the car got to a landing floor.
- Push back the brake release lever to its start position, then put the lever back to the storage place.
- Close the control cabinet.
- Close and lock the machine room door.
- Evacuate the passengers, refer to paragraph "Evacuation of passengers from car".

#### 4.3.8.4 Evacuation of passengers from car

- Close and lock the control cabinet (AS).
- Go to the floor shown on the display.
- Use the triangular key to open the hoistway door and evacuate the passengers.
- Close the hoistway door.
- Make sure that the hoistway door is locked.
- If installed, remove the balanced evacuation kit (BEK), refer to "Evacuation instruction balanced".
- Tell the repair service.
- Open the control cabinet to make sure that the main switch JH is set to OFF.
- Close the lock the control cabinet.

#### 4.3.9 Overview of TSD21 short pit and headroom

**i** The graphic represents the version with short headroom and short pit. The system can change depending on the elevator configuration.



**A** Activate TSD21 lever  
**1** Inspection control panel

**B** Deactivate TSD21 lever  
**2** Lamp



<b>3</b>	Retractable apron	<b>4</b>	Movable bolts
<b>5</b>	TSD21 lever	<b>6</b>	DRZS button
<b>7</b>	LZS light	<b>8</b>	Safety system
<b>9</b>	Buffer stops-U	<b>10</b>	REC panel
<b>11</b>	Cam	<b>12</b>	KFB switch
<b>13</b>	Limit switch (KSERE-U/D)	<b>14</b>	Buffer stops-D
<b>15</b>	KNE switch	<b>16</b>	Car
<b>17</b>	KNE curve	<b>18</b>	Guide rail

The TSD21 system consists of:

- A monitoring of the manual opening of any door, giving access to the car roof and/or the pit.
- A control system managing the travel of the car and the resetting of the system.
- Movable bolts located below the car and operated by a lever on the car roof where the lever position also acts as indicator of the bolt position.
- Buffer stops mounted on the guide rails.
- Limit switches operated immediately before the bolts hit the buffer stops.
- A reset button which can be locked with a padlock.
- In case of reduced bottom clearances, lamps in the pit indicate the active and passive position of the movable bolts.
- In case of reduced bottom clearances, a retractable apron.

#### 4.3.9.1 Hoistway access and exit procedures TSD21

For correct use of the TSD21 system, always lock the DRZS with a padlock and follow the additional steps given in table for hoistway access and exit procedure.

##### Hoistway access overview

	<b>Car roof access</b>	<b>Pit access</b>
<b>Short headroom and normal pit</b>	Activate TSD21 lever and extract balustrade (if any)	Same as without TSD21
<b>Short pit and normal headroom</b>	Same as without TSD21	On the car roof, activate TSD21 lever On the car roof, cycle top-of-car inspection
<b>Short headroom and short pit</b>	Activate TSD21 lever and extract balustrade (if any)	On car roof, activate TSD21 lever and extract balustrade (if any) On car roof, cycle top-of-car inspection

##### Hoistway exit overview

	<b>Car roof exit</b>	<b>Pit exit</b>
<b>Short headroom and normal pit</b>	Deactivate TSD21 lever and retract balustrade (if any) Reset safety device	Same as without TSD21
<b>Short pit and normal headroom</b>	Same as without TSD21	On the car roof, deactivate TSD21 lever Reset safety device
<b>Short headroom and short pit</b>	Deactivate TSD21 lever and retract balustrade (if any) Reset safety device	On the car roof, deactivate TSD21 lever and retract balustrade (if any) Reset safety device

In case of pit inspection operation, the reset of the safety system also resets the pit inspection.



- Before access to the car roof or the pit, the stopping device must always be activated.
- The activation of the TSD21 lever and the extraction of the balustrade (if any), does not automatically activate top-of-car inspection operation.

#### 4.3.9.2 Activation of the system

Any landing door or other opening point giving access to an area where the safety space is reduced. Landing door is fitted with a safety contact (KNET) at the emergency unlocking triangular key mechanism. When the



emergency unlocking is operated, a safety system will be activated, thus disable the normal operation as well as the manual electrical brake lifting (PEBO) operation. By opening the safety chain and the PEBO activation path, the machine brake is powerless / closed and the system is in a safe state.

#### **Inspection operation with the system:**

The upper and/or lower end of the hoistway is equipped with buffer stops and the car is equipped with movable bolts which need to be extended in order to temporarily grant the needed safety space in the pit/headroom. To move the car in inspection mode, the movable bolts need to be extended.

#### **Reset of the system:**

The reset of the safety system is only possible by pressing the reset button which is located in the control cabinet.

The reset button on the controller (DRZS) is lockable by means of a padlock and it indicates if the system is active or not by an integrated lamp (LZS).

#### **Status indication:**

The triggered status of the system is indicated in the control cabinet.

When on top of the car, the position of the lever on the car roof indicate the position of the movable bolts.

When in the pit, the position of the bolts is indicated by LSR/LSR-A.

### **4.3.9.3 Components and Functionalities**

#### **Access door monitoring**

Any landing door or other opening point giving access to an area where the safety space is reduced. Landing door is fitted with a safety contact (KNET) at the emergency unlocking triangular key mechanism.

When the landing door is opened manually by the use of the triangular key, this contact opens before the landing door is unlocked.

<b>Reduced clearances</b>	<b>Landing doors monitored</b>
Short headroom	All landing doors allowing access to the car roof
Short pit	All landing doors having a distance less than 2.5 m from the pit floor
Shot pit and headroom	All landing doors

#### **Safety system**

When one of the contacts KNET opens, the safety circuit is triggered:

- Opens the safety chain of the elevator.
- Opens the circuit for the activation of the manual electrical brake opening.
- Disables normal operation.
- A lamp LZS is activated indicating the triggered status of the system.
- If present, a red lamp LSR-A is located in the pit in case of reduced bottom clearances is activated, indicating the inactive position of the movable bolts.

The safety system can only be reactivated if all monitoring contacts KNET are closed and the relay RFRZS is energized. The relay RFRZS can only be energized under the following conditions:

- The reset button DRZS is pressed and activates the relay RRZS.
- The relay RRZS disconnects the safety chain from the elevator control and switches a part of the safety chain to the relay RFRZS.

When all landing doors are closed and locked (KTS/KV):

- The stopping devices in the pit (JHSG) and on the car roof (JHC) are not activated, exits in the car roof are closed (KNA).
- The extendable balustrade (if present) is fully retracted (KBC-A).
- The TSD21 system is in the retracted position (KSR-A).
- The relay RFRZS is energized and resets the monitoring circuit.

Any safety contact connected in this section of the safety chain need to be closed. The car door contact(s) (KTC) is not monitored during the reset because the car door can be open.

The second safety circuit is composed of the relays RSR, RSR1 and RKSR. This circuit is connected to the safety contact KSR which monitors the extended position of the movable bolts. The switch is opened when the movable bolts are not in the fully extended position. When this circuit is activated the circuit to activated:

- The circuit to activate the manual electrical brake opening, opened by the relays RZS, RZS1 and RKZS is closed again.



- The green lamp LSR located in the pit in case of reduced bottom clearances is activated, indicating the active position of the movable bolts.

The circuit operates on the emergency power supply of the elevator control, which means the monitoring is also active when the main power supply is off.

When the main power supply is switched off for a time exceeding the buffer capacity of the battery, the system is triggered and needs a manual reset to bring the elevator back to normal operation.

### Movable bolts

The car is fitted with 2 manually movable bolts installed on the lower yoke structure. The bolts are forced to be extracted by a pressure spring (one per bolt).

A lever installed at the border of the car roof is connected to the first bolt by a cable and the first bolt is connected to the second bolt by another cable. The second bolt is monitored by 2 safety contacts KSR and KSR-A.

The lever is secured in the “normal” position (bolts retracted) by a pin. If this pin is extracted, the lever changes automatically into the “active” position (bolts extended).

### Switch status in relation to bolt position

	<b>KSR-A</b>	<b>KSR</b>	<b>Elevator operation</b>
Bolts extended (active)	Forced open	Closed	Only inspection operation possible
Bolts retracted (passive)	Closed	Forced open	Normal operation
Bolts in intermediate position	Forced open	Forced open	No operation

The open KSR-A switch, disables normal operation mode and emergency electrical operation in the safety chain of the elevator.

The closed KSR switch, enables the inspection operation in the safety chain of the elevator and activates a safety circuit which enables the manual electrical brake lifting (PEBO) and also the optical indication in the pit.

The bolts limit the movement of the car to the buffer stops fitted in the hoistway. The contacts KSR and KSR-A are safety contacts.

### Buffer stops

Buffer stops are mounted on the guide rails in the upper and/or lower part of the hoistway. The stops limit the movement of the car in the up and/or down direction when the movable bolts are extended.

The inspection speed is limited to 0.3 m/s. It is not possible to change this speed to a higher value.

If the movable bolts for any reason are extended when the car is already passed the installed buffers, a cam pushes the movable bolts back and the car can pass the buffer in the opposite direction without damages.

### Limit switches for inspection operation

Inspection operation is limited by additional limit switches in the up-direction and/or down-direction (KSERE-U and/or KSERE-D). The limit switches are safety switches. The switches are located on the car roof and connected to the inspection operation panels on car roof and in pit.

The additional limit switches ensure that the electric safety chain is allowed to close only when the up or down button is pressed to move the elevator away from the buffer.

### Reset button

The button to reset the control system DRZS is located in the control cabinet. The reset button is lockable by means of a padlock. An optical signal LZS indicates that the system is triggered.

### Position information of the movable bolts

When on top of the car, the lever to move the movable bolts is the visible information on the car roof about the position of the movable bolts.

When in the pit, two visible indications are provided in the pit.


- A red lamp LSR-A is activated as soon as the safety system is triggered.
- A green lamp LSR is activated by the KSR switch if the movable bolts are in the extended position.

### Access to the car roof and start the inspection


- Open the landing door giving access to the car roof.



- ▶ Press the top-of-car stop button (JHC).
- ▶ Enter the car roof.
- ▶ Activate the TSD21 lever.
- ▶ Extract/unfold the balustrade, if any.

 Even if only pit inspection is needed, top-of-car inspection mode must be activated first.

- ▶ To activate the top-of-car inspection mode:
  - Activate the top-of-car inspection mode (JREC).
  - Release the top-of-car stop switch (JHC) after the top-of-car inspection mode is activated.
- ▶ To activate the pit inspection mode:
  - Press the top-of-car stop button (JHC).
  - Deactivate the top-of-car inspection mode (JREC).
  - Exit the car roof.
  - Release the top-of-car stop switch (JHC).
  - Close the landing door giving access to the car roof.
  - Open landing door giving access to the pit.
  - Press the pit stop button (JHSG1).
  - Enter the pit.
  - Activate the switch JRESG in the pit to activate inspection mode.
  - Release the pit stop button (JHSG1) after the pit inspection mode is activated.


 – Once the TSD21 lever has engaged, the top-of-car inspection mode must be activated at least once before activating the pit inspection mode.

– The system will not allow the elevator to move if pit inspection mode (JRESG) is activated after the lever has engaged and before the top-of-car inspection mode (JREC) has activated and released.

### Leave the pit or the car roof and reset the safety system

The safety system can only be reset using the DRSZ button located in the control cabinet. The top-of-car inspection mode can be used to travel back to the top floor.

- ▶ To leave the pit:
  - Press the pit stop button (JHSG1).
  - Deactivate the pit inspection mode (JRESG).
  - Exit the pit.
  - Release the pit stop switch (JHSG1) after exit from the pit.
  - Close the landing door giving access to the pit.
  - Enter the car roof. Refer to section "Access to the car roof and start the inspection".
- ▶ To leave the car roof:
  - Press the top-of-car stop button (JHC).
  - Deactivate the top-of-car inspection mode (JREC).
  - Retract/fold the balustrade, if any.
  - Deactivate the TSD21 lever.
  - Exit the car roof.
  - Release the top-of-car stop switch (JHC) after exit from the car roof.
  - Close the landing door giving access to the car roof.
- ▶ Once it is ensured that no person or object remains in the pit or car roof, reset the safety system.

 The conditions for successful reset are:

- TSD21 lever released
- Balustrade retracted
- All stopping devices are released
- The landing doors are closed and locked.

↳ If these conditions are satisfied, press the TSD21 reset button (DRZS), will reset the safety system and the TSD21 activation light (LZS) will turn off. The elevator will then perform a synch trip before returning to normal mode.

### Inspection operation

Once the lever is activated and balustrade is extracted (if any), the car will move in top-of-car inspection mode by activating switch JREC or in pit inspection mode by activating switch JRESG.

If a person needs to go from the pit to the car roof or vice-versa, it is necessary to prevent the movement of the car with the stop switch before the inspection switch is deactivated until the person is out of the hoistway. This avoids the risk which could arise, if a second person moves the car from the other inspection panel while the first person has deactivated the inspection mode but not exit from the hoistway.

The first inspection operation allowed by the elevator controller is the inspection operation on the car roof.



## Emergency electrical operation

Emergency electrical operation is only possible, if the control system is not triggered or if the movable bolts are in the fully extended position and the balustrade is extracted (if any).

## Manual electrical brake opening

The electrical lifting of the brake is only possible if the control system is not triggered or if the movable bolts are in the fully extended position.

## Telescopic apron

Telescopic apron is used, extended under normal operation, retracted when the car is reaching its lowest position and if following condition are fulfilled:

- Normal operation is impeded by electric safety devices, if the apron is not in the extended position (KSC).
- The electric safety device is connected in the part of the electric safety chain, which is bypassed in emergency electrical operation. In case the apron touches the pit-floor, before the final limit switch in down direction is operated by the car, an additional switch is installed (KUESC).
- The additional switch bypasses the electric safety device on the apron and allows the apron to retract.
- The bypass-switch is forced to open when the car is 1 m away from the lowest landing.

## Car roof balustrade

In case of the need of a car roof balustrade and a fixed balustrade is not possible, an extend-able balustrade is installed.

This balustrade is equipped with safety switches:

- KBC-A for the fully retracted position.
- KBC for the fully extended position.

As an alternative, the switches KBC and KBC-A can be combined in a single KFB switch.

A safety contact, for emergency electrical operation is not installed, because the contact KBC-A / KFB and the safety system does not allow emergency electrical operation, if the balustrade is not fully retracted.

## KNET

- ▶ Open one door giving access to a reduced safety space using the triangular key.
- ▶ Close the door.
- ▶ Make sure that the TSD21 system is activated (LZS is on).
- ▶ Press the DRZS to reset the TSD21 system and make sure that the LZS is off.

## TSD21 systems equipped with an acoustic feedback

At each landing door giving access to a reduced safety space, do the following:

- ▶ Turn the triangular key until the acoustic feedback is activated.
- ▶ Make sure that the door does not open.
- ▶ Turn the triangular key until the door opened.
- ▶ Release the triangular key.
  - ↳ The acoustic feedback stops.
- ▶ Close the door.



#### 4.3.10 Firefighter

##### 4.3.10.1 Overview

A firefighter elevator, compared to a regular elevator, is made to operate as long as possible when there is a fire in parts of the building.

The elevator can be used as a passenger elevator when there is no fire.

Electrical devices on landings, other than at the fire service access level, are made to operate correctly in an ambient temperature range of 0 °C ... 65 °C or made non-operational.

##### 4.3.10.2 Maintenance plan

Interval (months)	Description
<b>Weekly</b>	Checking of fire recall operation
<b>1</b>	Checking of secondary power supply
<b>12</b>	Checking of function
<b>1</b>	Checking of building
<b>–</b>	Checks and tests required as per local regulations

##### 4.3.10.3 Related standards and guidelines

These codes state the changes to the basic elevator configuration. Other codes can apply for different countries or zones.

Code	Title
<b>Europe</b>	
EN81-72:2015	Firefighter lifts
EN81-73:2016	Behavior of lifts in the event of fire
VKF 23-15	Brandschutzrichtlinie für Beförderungsanlagen der Vereinigung Kantonalen Feuerversicherungen
GOST R 34305-2017	Firefighters lifts
<b>China</b>	
GB/T 26465–2011	Safety rules for the construction and installation of firefighter's lifts
TSG T7002-2011+A1:2013 +A2:2017	Regulation for Lift Supervisory Inspection and Periodical Inspection - Firefighter Lifts
GB 50116-2013	Code of design of automatic fire alarm system
GB/T 24479-2009	Code for fire protection design of buildings
<b>Singapore</b>	
SS550:2009+A1:2013+A2:2017+A3:2017	Code of Practice for Installation, operation and maintenance of electric passenger and goods lifts
<b>Hong Kong</b>	
EMSD CoP 2012 incl DC01:2013 and DC02:2015	Code of Practice on the Design and Construction of Lifts and Escalators
BD CoP FS 2011 (Rev. 2012)	Code of Practice for Fire Safety in Buildings 2011
<b>India</b>	
IS 14665 (Part 2:2000 /Section 1 / Amendment 1)	Electric traction lifts Part 1:2000, Part 2:2000, Part 3:2000, Part 4:2001, Part 5:1999 incl. Amendments
<b>Malaysia</b>	
MS 1183:1990 Part 5	Code of practice for fire precautions in the design and construction of buildings Part 5 : Firefighting stairways and lifts
MS 1183:1990 Part 8	Specification for fire precautions in the design and construction of buildings Part 8 : Code of practice for means of escape for disable people
<b>Indonesia</b>	
26/PRT/M/2008	Fire Protection System for building, fire code Indonesia



Code	Title
SNI 03-6573:2001 (Fire lift part)	Codes for the Design of Vertical Transportation Systems in Buildings (Elevators)

#### 4.3.10.4 Components and functionalities

The codes apply to these components:

- Control
- COP / LOP / LIP
- Intercom
- SALSIS
- Buffer / pit set
- Overspeed governor system
- Car door
- Landing door
- Car body / car front
- Pit maintenance platform / pit access door



For information refer to the system related chapters or the maintenance information of each component.

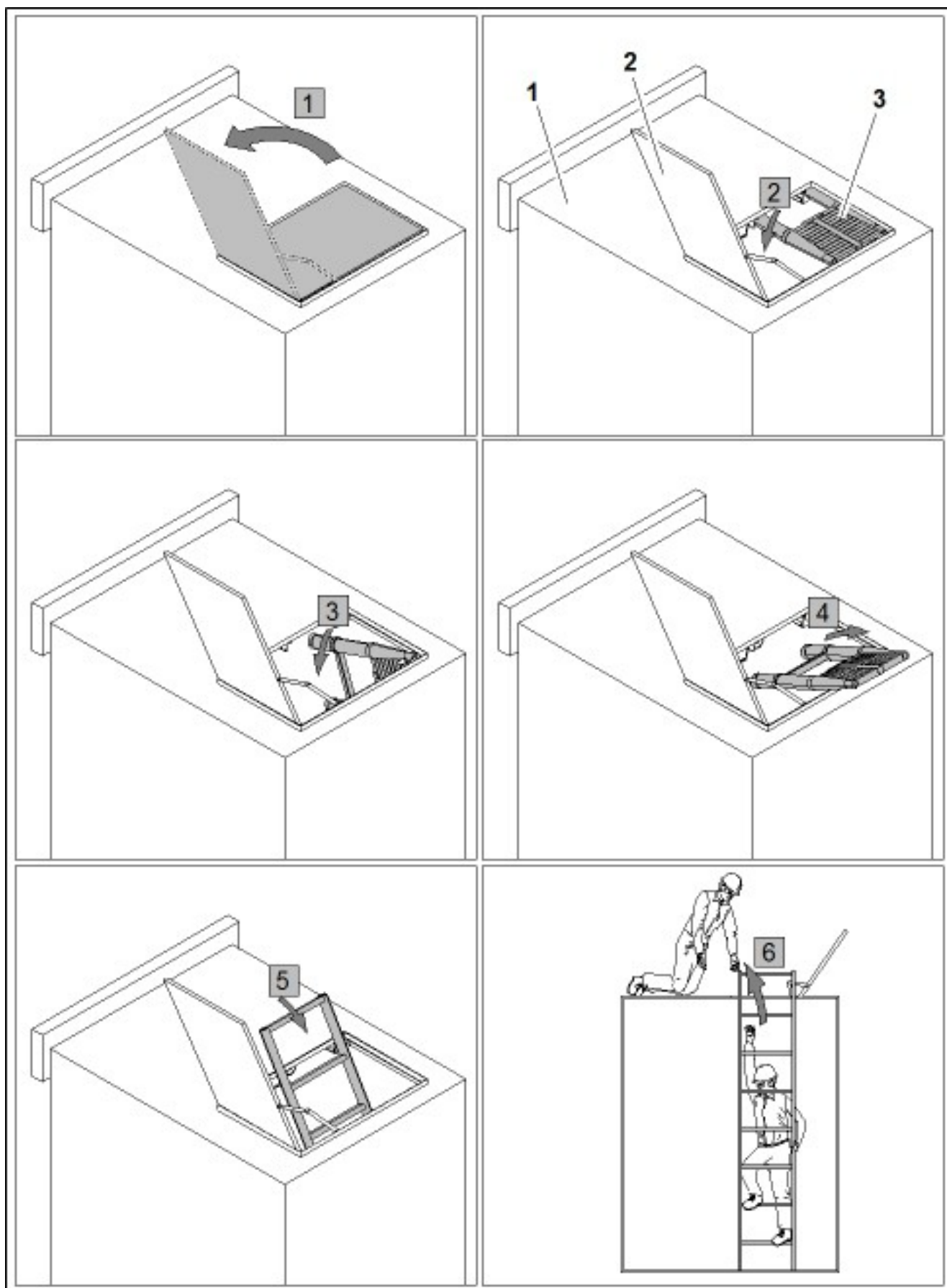
#### 4.3.10.5 Rescue procedure from outer side of car

### **⚠ WARNING**

#### **Collapsing of car roof**

If you put too much weight of the car roof, it can collapse.  
Do not put more than 200 kg of weight on the car roof.





- 1 Car roof
- 3 Telescopic ladder

- 2 Emergency trap door

► Go onto the car roof from the nearest landing door with a firefighter ladder or, if this is not possible, rappel from the hoistway.



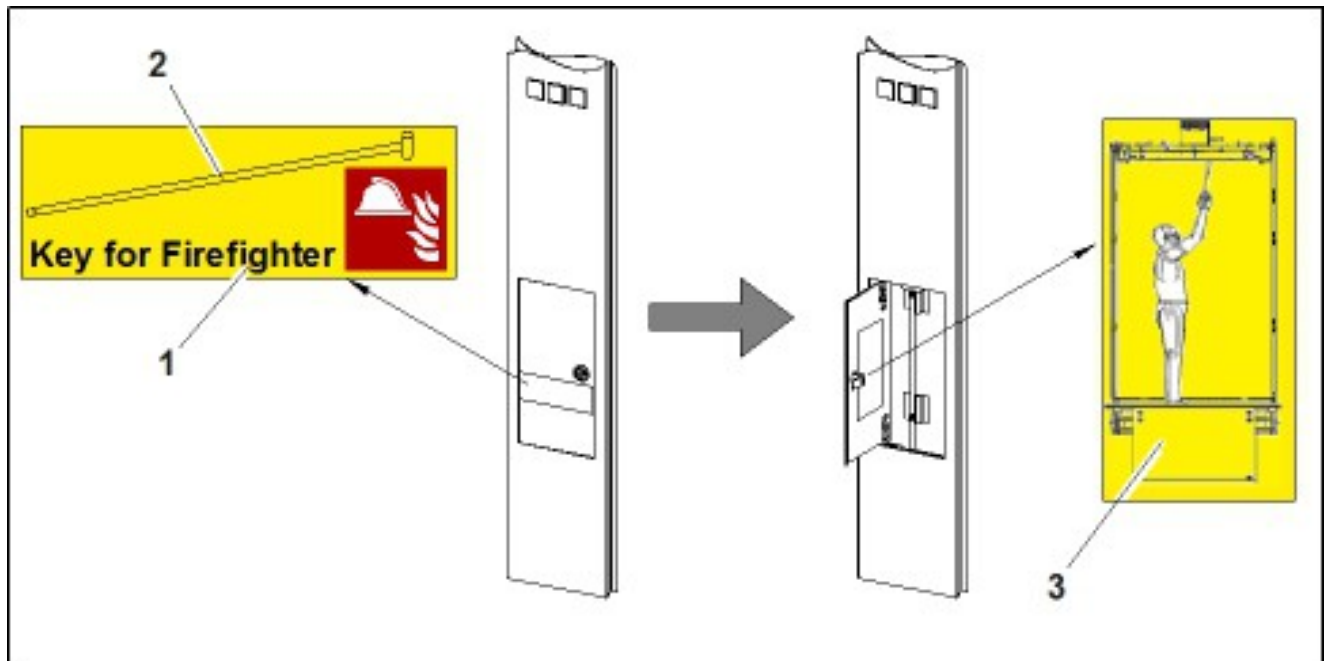
- ▶ From the car roof, use the interlock lever to open the emergency trap door.
- ▶ From the car roof, pull the emergency rope to open the ceiling panels.
- ▶ Release the telescopic ladder with the rope.
- ▶ Swivel the telescopic ladder out of its holder sheet.
- ▶ Pull out the ladder from the bearing pin.
- ▶ Set the telescopic ladder so that the person can go onto the car roof.
- ▶ Let a maximum of 2 persons to go onto the car roof at one time.
- ▶ If the firefighter ladder is not on the car roof, move the telescopic ladder to the car roof.
- ▶ Put the telescopic ladder in direction of the nearest landing door.
- ▶ Rescue the person through the landing door.
- ▶ If there is more than one person to rescue, do the rescue steps again.

#### 4.3.10.6 Self-rescue procedure from inner side of car

### ⚠ WARNING

#### Collapsing of car roof

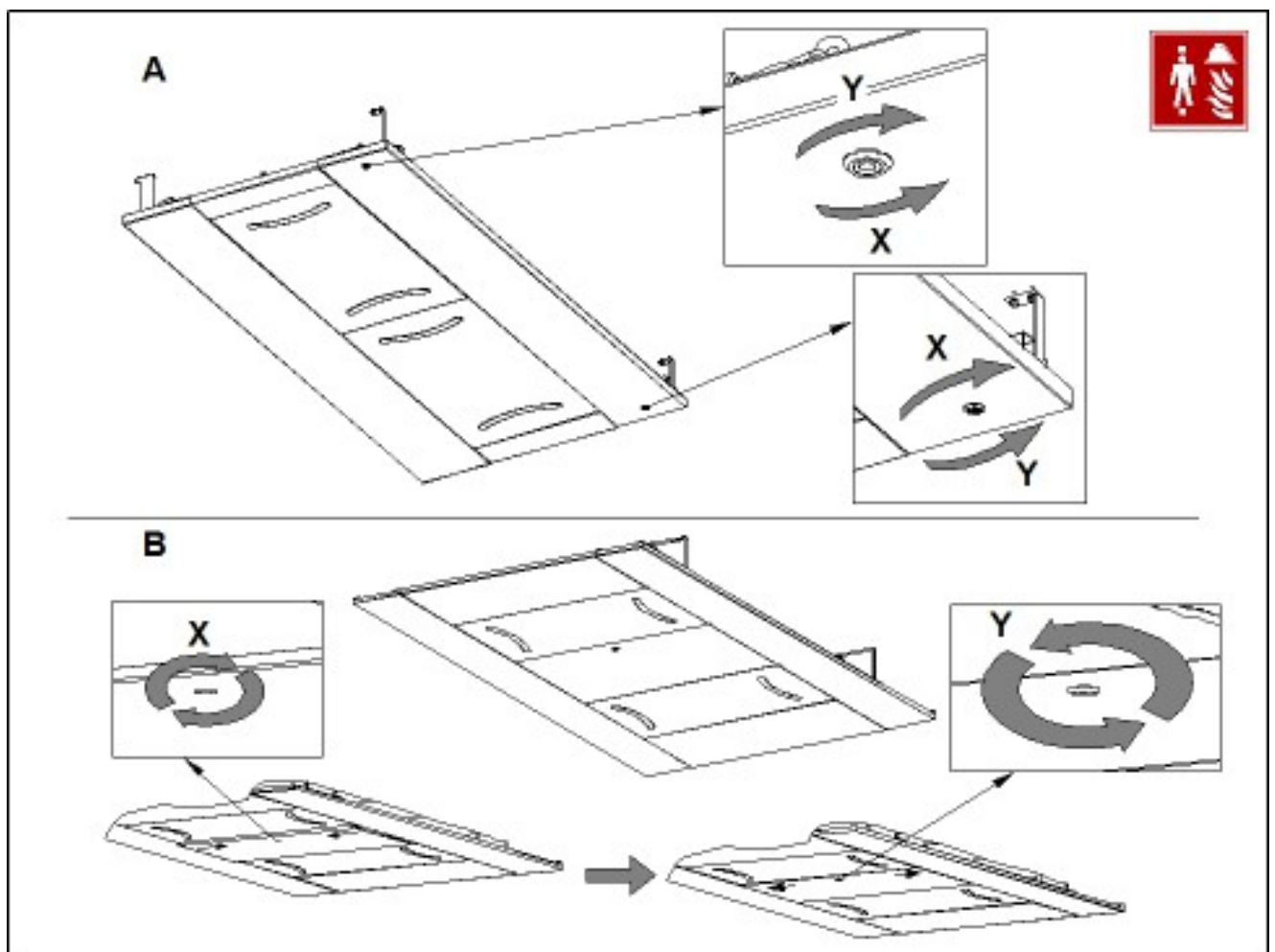
If you put too much weight of the car roof, it can collapse.  
Do not put more than 200 kg of weight on the car roof.



- 1 Horizontal sticker
- 3 Vertical sticker

- 2 Triangular key in car operating panel box





**A** Firefighter ceiling for car width < 1300 mm

**X** Open

**B** Firefighter ceiling for car width ≥ 1300 mm

**Y** Close

- From the inner side of the car, use the triangular key to open the ceiling panels.
- Release the telescopic ladder with the rope.
- Swivel the internal ladder out of the ladder holder sheet.
- Pull out the ladder from the bearing pin.
- Open the emergency trap door with the triangular key.
- Set the telescopic ladder so that the person can go onto the car roof.
- Let maximum 2 persons go onto the car roof at one time.
- Move the telescopic ladder from the inner side of the car to the car roof in direction of the closest landing door.
- Rescue the person through the landing door.
- If there is more than one person to rescue, do the rescue steps again.

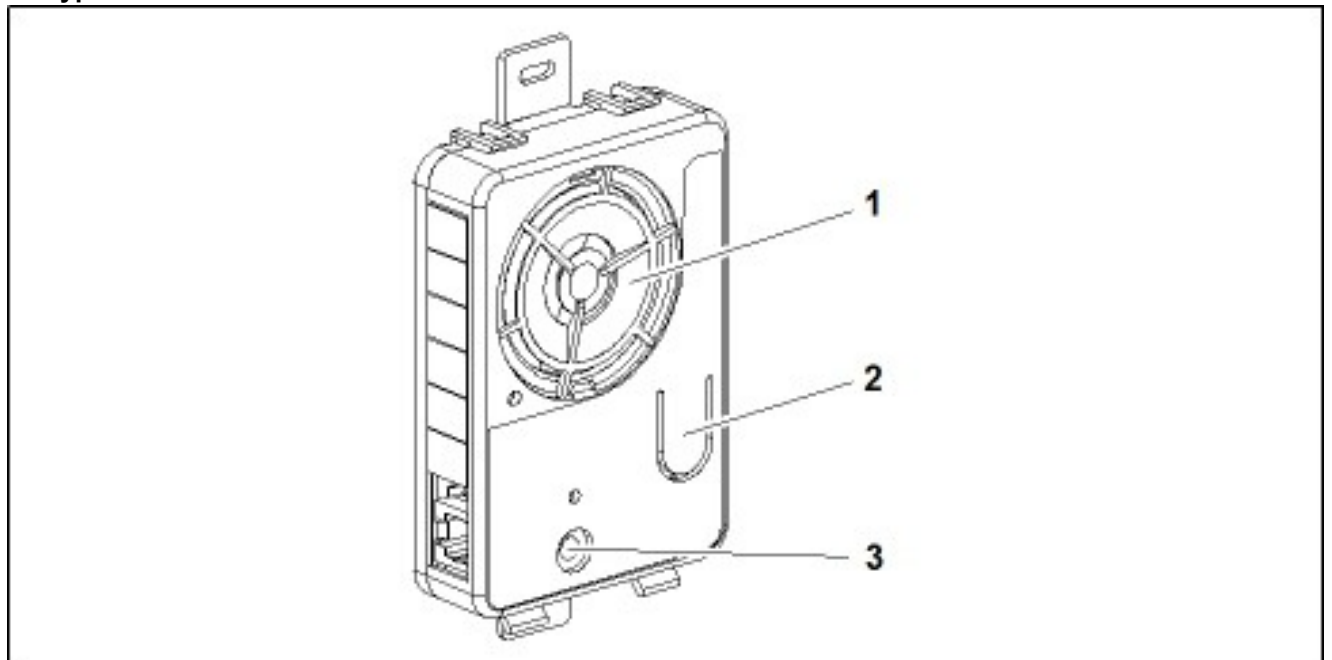
### Intercom

The Triphonie devices are:

- On the car or below the car (optional)
- In the pit (for AP only)



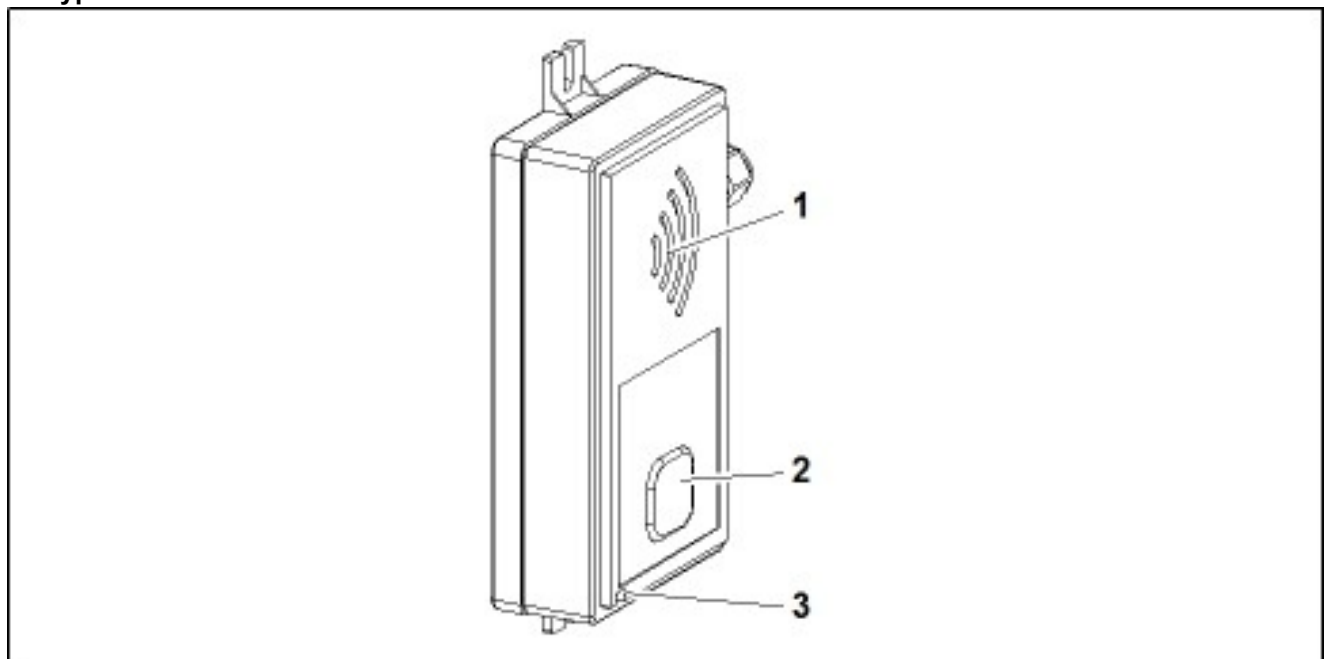
## EU type



- 1 Loudspeaker
- 3 Microphone

- 2 Emergency call button

## AP type



- 1 Loudspeaker
- 3 Microphone

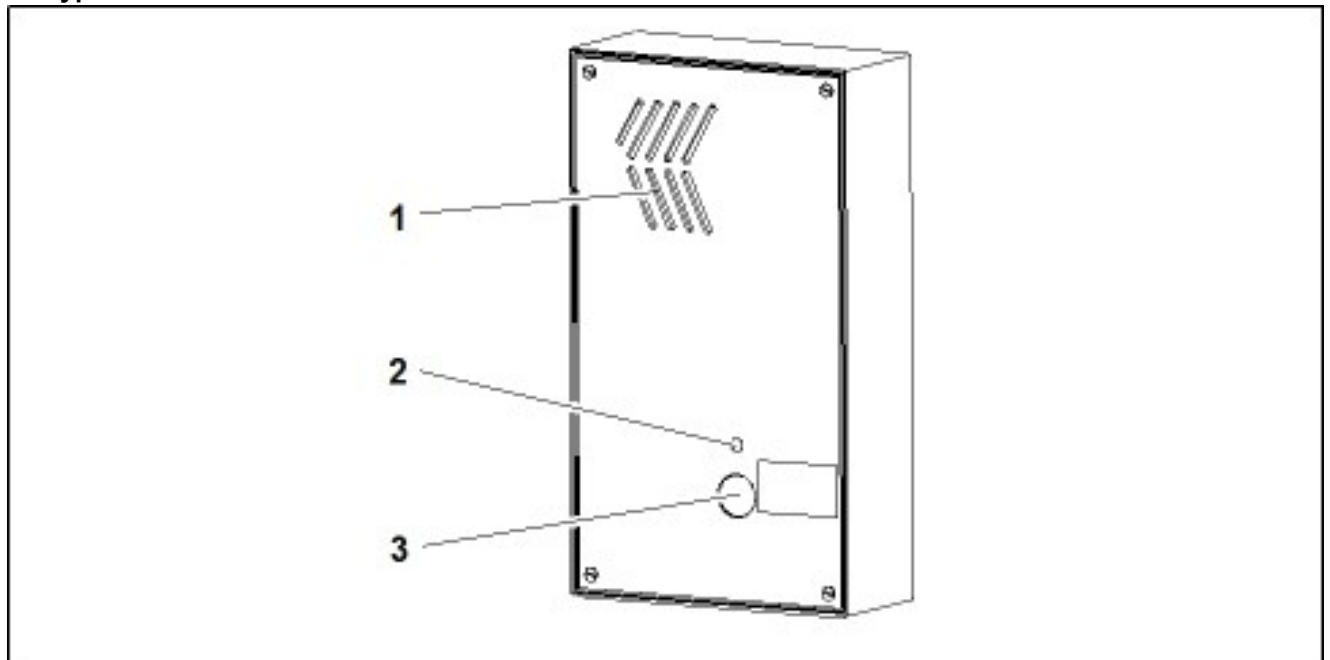
- 2 Emergency call button

## MR firefighter intercom

The MR firefighter intercom box is in the machine room. It is for a two-way communication between a firefighter in the machine room and the firefighter in the car.



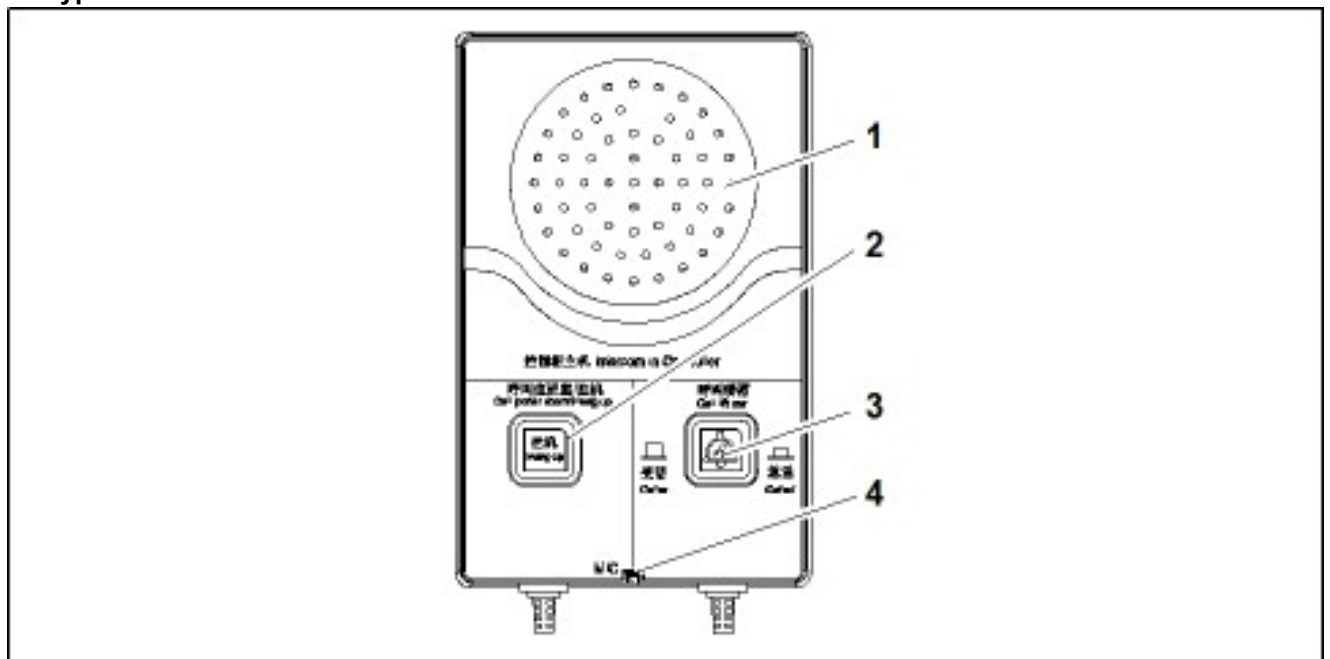
## EU type



- 1 Loudspeaker
- 3 Microphone activation button

- 2 Microphone

## AP type



- 1 Loudspeaker
- 3 Call car

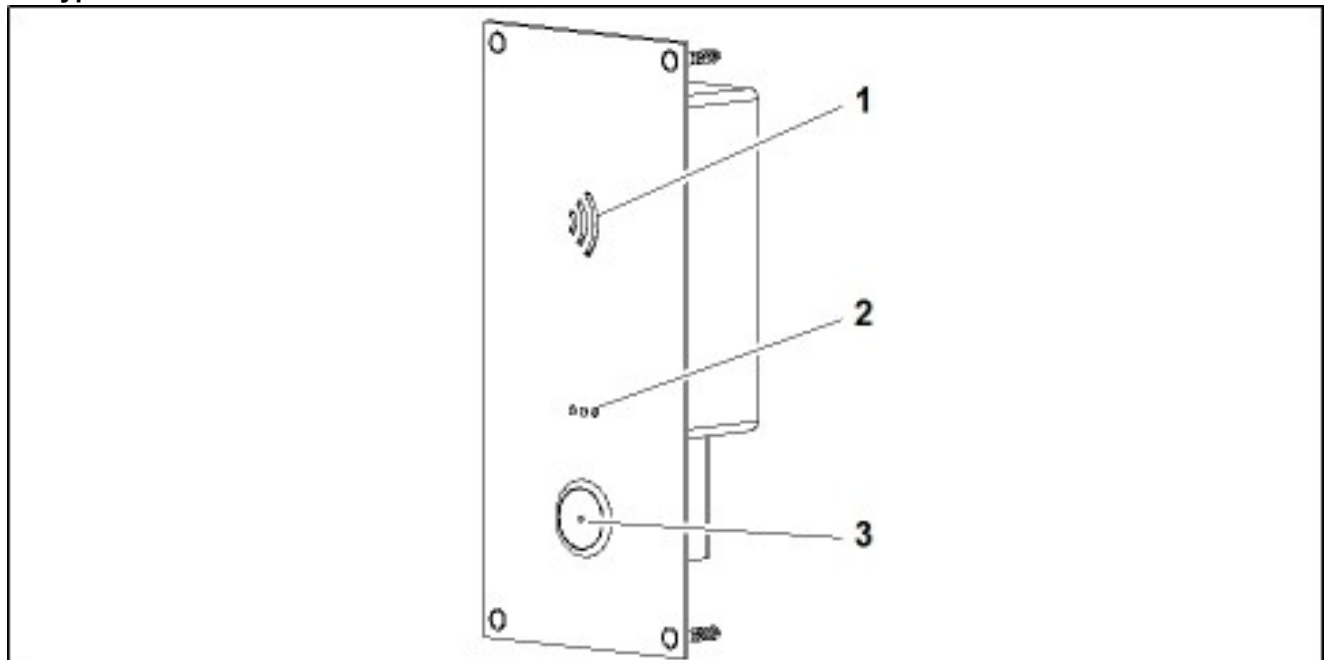
- 2 Call port room / Hang-up
- 4 Microphone

## Firefighter elevator switch

The firefighter elevator switch is on the firefighter access level. The switch is set < 2 m horizontally away from the firefighter elevator at a height of 1.4 ... 2.0 m above floor level.



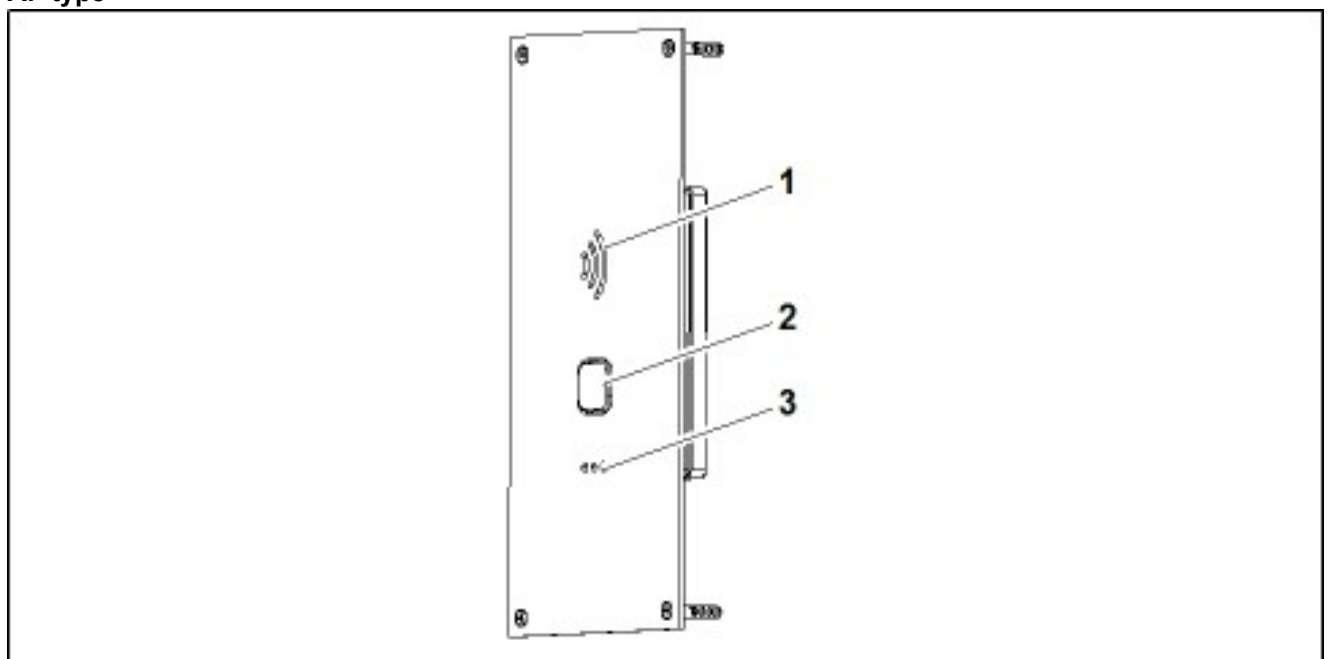
## EU type



- 1 Loudspeaker
- 3 Activation button

- 2 Microphone


## AP type



- 1 Loudspeaker
- 3 Microphone

- 2 Call car

## Firefighter access floor

Symbol	Description
	<p>The access floor for the firefighter service is marked with this symbol.</p> <ul style="list-style-type: none"> <li>– Inside the car: 20 x 20 mm</li> <li>– On the access floor: 100 x 100 mm</li> </ul>

### 4.3.10.7 Checking of fire recall operation

- After the operation of the firefighter elevator switch, make sure that:



- The elevator travels to the fire service access level.
  - The elevator parks with its doors open.
  - The elevator does not operate after floor calls.
- If a BMS or a fire detection system is installed, make sure that the elevator follows the instruction from each of these systems.

#### 4.3.10.8 Checking of secondary power supply

- Simulate the failure of the primary power supply to do a check of the changeover to and the operation of the secondary supply.
- ↳ If the secondary supply is from a generator, it must energize the elevator(s) for minimum one hour.

#### 4.3.10.9 Checking of function

- A full test of the firefighter elevator operation is usually annually arranged by the person responsible with the elevator maintenance contractor. To do a check of the full firefighting facilities which includes the communication systems, do a check of:
- The firefighters' elevator switch.
  - The BMS detection system.
- ↳ This check is to make sure that:
- The elevator can travel to each required landing.
  - When the elevator arrives at the landing, it opens its doors only when instructed.
  - The elevator stays at the landing with its doors open.

#### 4.3.10.10 Checking of building

- Do a check of building related issues including:
- measures to prevent water entry into the elevator hoistway.
  - measures to address water entry into the elevator hoistway.
  - the operation of all pumps used to control the level of water in the elevator pit.

#### 4.3.10.11 Duties of maintenance company

- Tell the person responsible if it is necessary to change components or parts of the elevator to make sure that the availability and reliability of the elevator in case of fire is guaranteed.
- Tell the person responsible of changes in standards related to elevators in service, especially to elevators for operation in case of fire.

### 4.4 Seismic

Depending on the configuration of the elevator, the seismic package will include different components.

Description	Seismic elevator category		
	1	2	3
Machine beam design	X	X	X
AESD	–	X	X
Emergency power	–	X	X
Snag point guarding	X	X	X
Guide rail pins	X	X	X
Buffer protection	X	X	X
Rope retainer	X	X	X
Car retaining devices	X	X	X
Counterweight retaining devices	X	X	X
Steel fillers	X	X	X
Seismic detection system	–	–	X
Visual indicator	–	–	X

For additional information about the seismic package, refer to the chapter operation and the maintenance where the component is installed.







**⚠ DANGER****Hazardous voltage**

Contact with live parts will result in electric shock.

Switch off the main switch and de-energize the installation completely before starting to work on the installation.

**⚠ DANGER****Rotating machinery**

Rotating parts can crush limbs.

- Keep clear of rotating parts.
- Do not wear loose clothing.
- Tie long hair back or tuck it under a cap.

**⚠ WARNING****Contamination of brake with lubricants**

Lubricants on the brake drum or linings affect the braking action.

Clear away any contamination on all functional parts of the brake.

**⚠ WARNING****Removed protective covers**

Removing protective covers can lead to accidental contact with hazardous parts.

- It is forbidden to remove protective covers unless instructed otherwise.
- Proceed with great care when protective covers are removed.

**⚠ WARNING****Non-approved consumables**

The use of cleaning material or lubricants not approved by the installer affects the safe elevator operation. It is forbidden to use non-approved consumables.

**⚠ WARNING****Non-original spare parts**

Parts supplied by third parties are not approved by the installer. The installation of non-original spare parts can have a negative effect on the safe elevator operation and the ride comfort.

- It is not permitted to install non-original spare parts.
- Contact the installer to order original spare parts.


**⚠ WARNING****Collapsing of car roof**

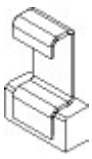
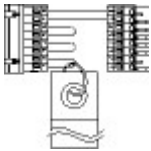

If you put too much weight of the car roof, it can collapse.

Do not put more than 200 kg of weight on the car roof.



## 5.2 Inspection tools

 The inspection tool can be different depending on the country.

Tool	Description	ID number
	Belt calibration tool	59351709
	Acceptance test plug kit	57816205
	Triangular emergency key	59313531: HT ≥ 2000 mm 59352070: 2000 mm ≥ HT > 2300 mm 59356303: 2300 mm ≥ HT > 2500 mm 59356304: 2500 mm ≤ HT < 2700 mm

## 5.3 Cleaning

### 5.3.1 Safety

#### ⚠ CAUTION

##### Turn off light

Danger of electric shock.

Turn off the light when cleaning the lights.

#### NOTICE

##### Damage to material surfaces

The use of incorrect cleaning solvents or cleaning techniques can cause damage to material surfaces. Obey these rules when cleaning:

- Do not use cleaning agents containing strong solvents or abrasives
- Always try mechanical cleaning with soapy water before using solvents
- When cleaning several different materials always proceed by taking into account the method of cleaning the most sensitive material
- Clean materials with a structured surface only in the direction of the surface finish.

#### NOTICE

##### Damage by water

Water that runs into the car, the hoistway or the pit can cause material damage.

Make sure that no water runs into the hoistway, the pit or the car.

### 5.3.2 Cleaning agents

Material		Agent	Method
Stainless steel	General	Commercially available stainless steel cleaner Example: isopropyl alcohol or ketone	



Material		Agent	Method
	<b>Polished</b>	<ul style="list-style-type: none"> <li>– Preparatory stainless steel polish</li> <li>– Commercially available stainless steel cleaner Example: isopropyl alcohol or ketone</li> </ul>	<ul style="list-style-type: none"> <li>– Clean carefully</li> <li>– Buff with a clean, white cotton cloth to a highly polished finish</li> </ul>
	<b>Patterned/etched</b>	<ul style="list-style-type: none"> <li>– Warm, soapy water</li> <li>– Cool, clean water</li> <li>– <b>No detergent</b></li> </ul>	<ul style="list-style-type: none"> <li>– Clean off surface finish with a dampened cloth using warm, soapy water (not a detergent)</li> <li>– Rinse off using a clean dampened cloth and cool, clean water</li> <li>– Let dry and then buff with a clean, dry, white cotton cloth</li> </ul>
	<b>Colored</b>	<ul style="list-style-type: none"> <li>– Warm, soapy water</li> <li>– <b>No detergent</b></li> </ul>	<ul style="list-style-type: none"> <li>– Clean very carefully</li> <li>– Clean off surface finish with a dampened cloth using warm, soapy water (not a detergent)</li> <li>– Rinse off using a clean dampened cloth and cool, clean water</li> <li>– Let dry and then buff with a clean, dry, white cotton cloth.</li> </ul>
<b>Aluminum</b>		Liquid cleaning and degreasing agents	<ul style="list-style-type: none"> <li>– Apply with a soft cotton cloth or sponge</li> <li>– Polish and rub dry</li> </ul>
<b>Copper, brass, bronze</b>		Liquid chrome and brass cleaning agents	<ul style="list-style-type: none"> <li>– Apply sparingly with a soft cotton cloth</li> <li>– Polish and rub dry</li> </ul>
<b>Wood and veneer</b>		Liquid cleaning and degreasing agent	<ul style="list-style-type: none"> <li>– Apply with a soft cotton cloth or sponge</li> <li>– Polish and rub dry</li> </ul>
<b>Glass and mirror</b>		Commercially available glass cleaning liquid	<ul style="list-style-type: none"> <li>– Apply sparingly with a soft cotton cloth</li> <li>– Polish and rub dry</li> </ul>
<b>Synthetic resin panels</b>		Commercially available plastic cleaner (solvent containing alcohol or hydrocarbons)	<ul style="list-style-type: none"> <li>– Clean with a soft cotton cloth</li> <li>– Apply cleaning agents sparingly</li> <li>– Clean, polish, wipe dry</li> </ul>
<b>Painted finishes</b>		Mild, liquid degreasing agents based on alcohol or hydrocarbons	<ul style="list-style-type: none"> <li>– Test the reaction on an unobtrusive spot before using on a large surface</li> <li>– Clean, with a moist, soft cotton cloth</li> </ul>
<b>Plastic laminates</b>		Commercially available plastic cleaner	<ul style="list-style-type: none"> <li>– Test the reaction on an unobtrusive spot before using on a large surface</li> <li>– Clean with a moist, soft cotton cloth</li> </ul>
<b>Carpet</b>		Commercially available carpet cleaning products or solvents based on hydrocarbons or alcohol	<ul style="list-style-type: none"> <li>– Vacuum clean</li> <li>– Shampoo</li> <li>– Rub with a moist sponge</li> <li>– Wipe stubborn marks clean with a cloth soaked in solvent</li> <li>– Dry well</li> </ul>
<b>Synthetic/rubberized floor cover</b>		Liquid cleaning and degreasing agents or alcohol such as propyl alcohol	<ul style="list-style-type: none"> <li>– Wipe with a moist floor cloth</li> </ul>
<b>Stone and tiles</b>		Soapy water	



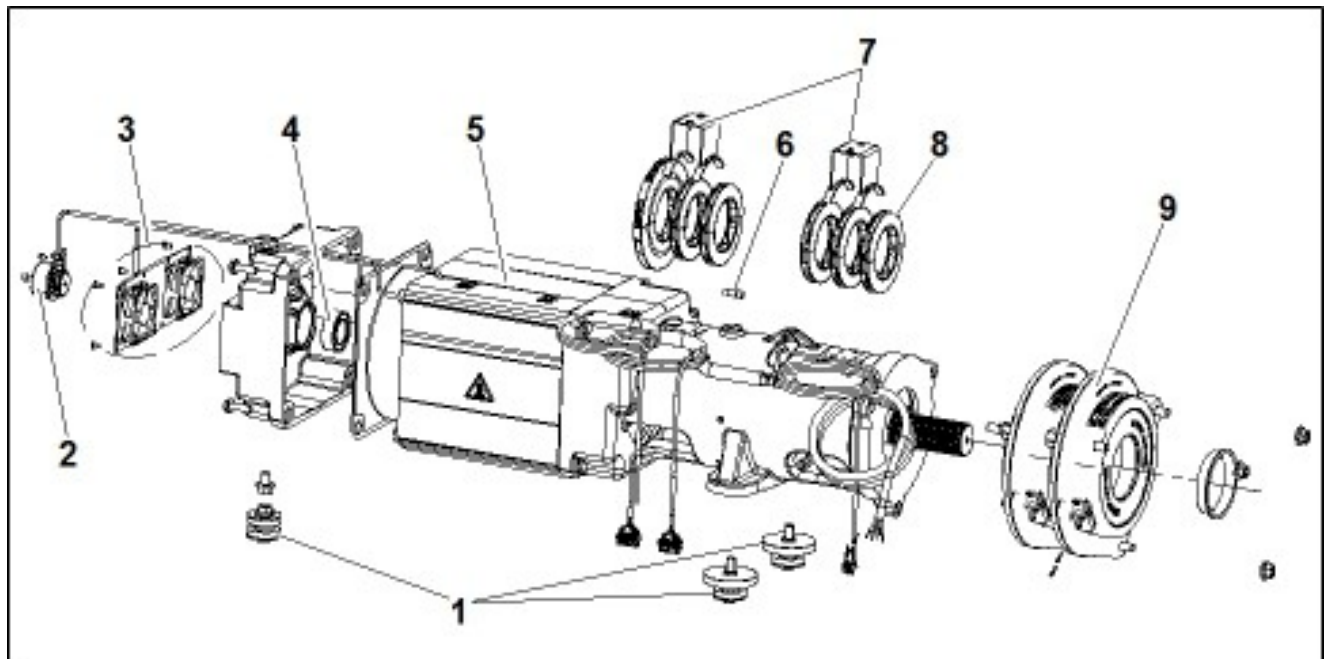
Material	Agent	Method
<b>Door sills and tread plates</b>	<ul style="list-style-type: none"> <li>– Warm, soapy water</li> <li>– No detergent</li> </ul>	<ul style="list-style-type: none"> <li>– Clean door sills and door grooves with a vacuum cleaner</li> <li>– Loosen solidified dirt with slow-vaporizing solvents such as kerosene</li> <li>– Brush out the dirt</li> <li>– If necessary scratch out the solidified dirt</li> </ul>
<b>Lighting</b>	<ul style="list-style-type: none"> <li>– Warm, soapy water</li> <li>– Not detergent</li> </ul>	<ul style="list-style-type: none"> <li>– Switch off the light</li> <li>– Clean off surface using a dampened cloth and warm, soapy water</li> <li>– Rinse with a clean, dampened cloth and cool, clean water</li> </ul>

### 5.3.3 Parts to be cleaned

- Clean these parts of the car inside and on each landing:
  - Car walls
  - Car ceiling
  - Lighting
  - Door frames
  - Push buttons
  - Indicator plates
- Clean the car and landing door sills:
  - Clean door sills and door grooves with a vacuum cleaner.
  - Loosen solidified dirt with slow-vaporizing solvents such as kerosene.
  - Brush out the dirt.
  - If necessary, scratch out the solidified dirt.

## 5.4 Machine DR FMB 130

### 5.4.1 Overview of machine



- |   |                       |   |                             |
|---|-----------------------|---|-----------------------------|
| 1 | Damper kit            | 2 | Encoder + cable + connector |
| 3 | Fan assembly          | 4 | Rear bearing kit            |
| 5 | Motor                 | 6 | Spirit level                |
| 7 | Anti-Seismic Retainer | 8 | Belt retainer               |
| 9 | Brake                 |   |                             |



## 5.4.2 Maintenance plan for machine

Interval (months)	Description
12	Checking for cleanness
12	Checking for unusual noise
12	Checking of the damping pads
12	Make sure the machine is properly fasten and levelled
12	Checking of fan
12	Checking of central bearing
12	Checking of machine brake
12	Checking of stop switch JHM

### 5.4.3 Checking of cleanness

- ▶ Check all bolts to ensure the machine is firmly fixed on the machine support.
- ▶ Make sure that the fan protection is clean.
  - ↳ If not clean the brake drum.
- ▶ Make sure that the traction sheave is clean.
  - ↳ If not clean the traction sheave.

### NOTICE

Make sure that there is no grease or oil contamination on the traction sheave and on the traction media. If dirt with oil or grease is visible, investigate to find the leakage.

### 5.4.4 Checking for unusual noise

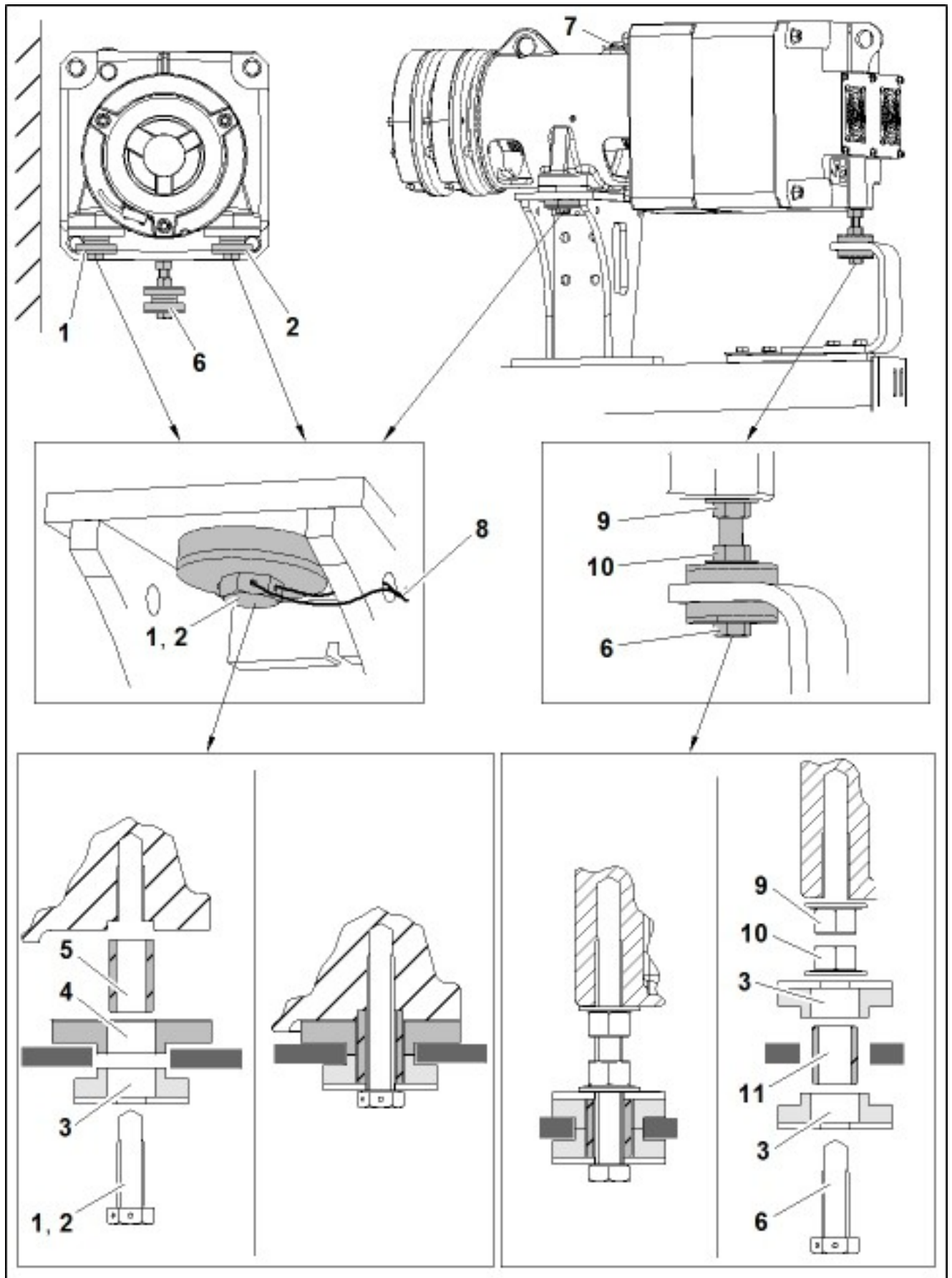
- ▶ Make sure that all fixation of the machine for example, fixation bolts, cable fixation, etc. are fixed properly.
- ▶ Make sure that all guards and covers are fixed properly.
- ▶ Make sure that no abnormal noise of the machine during the normal elevator operation. If any abnormal or disturbing noise is heard:
  - Find out the source and solve it if the noise can be solved on site.
  - Find out the source and report the issue if the noise cannot be solved at the moment.

### 5.4.5 Make sure that the damping pads are in place and intact

- ▶ If the damping pads are cracked, replace them.



#### 5.4.6 Make sure the machine is properly fasten and levelled



- 1 M12x60 bolt on wall side
- 3 Small diameter damping pad with washer
- 5 Guiding tube (long)

- 2 M12x60 bolt on car side
- 4 Large diameter damping pad with washer
- 6 M12x100 bolt on fan end



- |    |                        |    |                     |
|----|------------------------|----|---------------------|
| 7  | Spirit level           | 8  | Safety wire         |
| 9  | M12 locking flange nut | 10 | M12 bolt flange nut |
| 11 | Guiding tube (short)   |    |                     |

- Use the spirit level on top of the machine to make sure that the machine is level.

## NOTICE

A correct alignment of the machine is important to ensure the correct behavior of the STM.

- Check the M12 locking flange bolt is tight.
- Check the M12 bolt flange nut is tight.
- Check the safety wire is in place.
- Check the machine is levelled.
- If necessary, level the machine as follows:
  - Loosen the M12 locking flange nut.
  - Loosen the M12 bolt flange nut.
  - Adjust the M12x100 bolt at the fan end until the machine is level.
  - Tighten the M12 locking flange nut.
  - Tighten the M12 bolt flange nut.

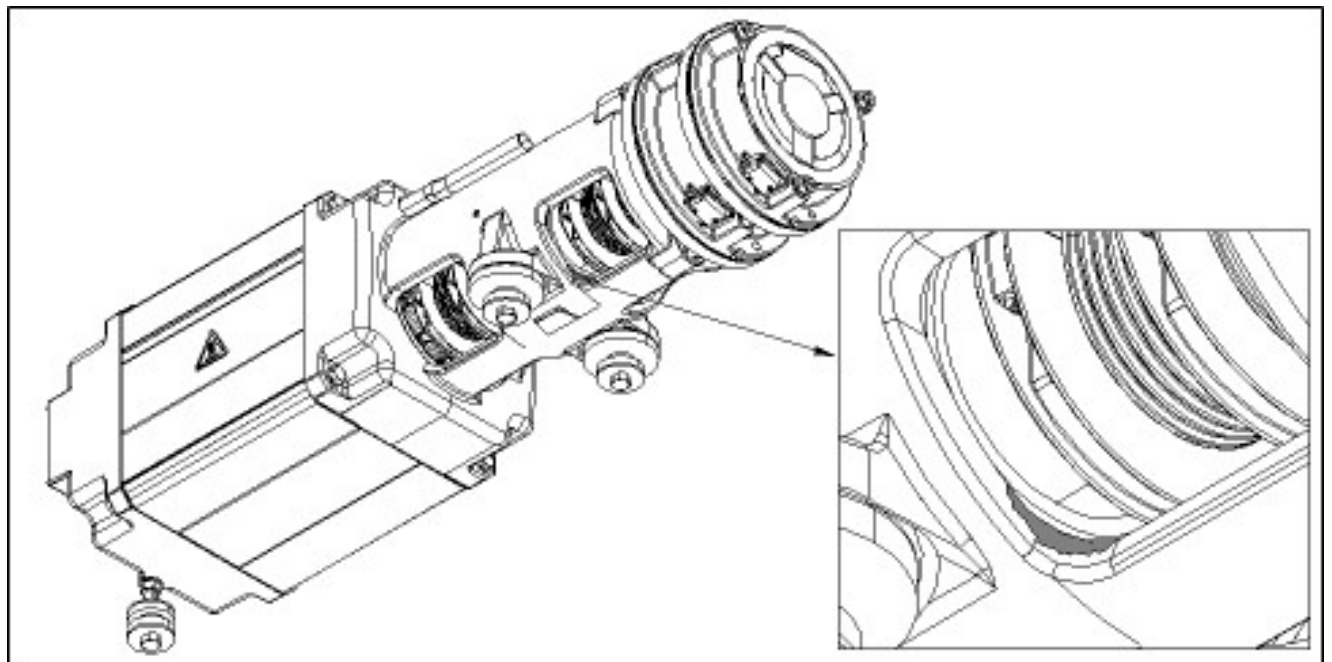


The use of impact wrenches must be avoided for this operation.

### 5.4.7 Checking of fan

- Check the function of fans:
  - Turn on the fans.
  - Use a sheet of paper to test air movement.
  - Put your hand in front of the fan to feel the air movement.
  - Make sure that all fans work properly.
  - Make sure that the fan extracts the air from the motor.
  - If 1 or more fans are faulty, replace the fan unit.

### 5.4.8 Checking of central bearing



- Make sure that the central bearing area is clean and free of leaking grease and oil.
- If oil or grease are present:
  - Carefully wipe off any traces of leaking grease with a clean dry cloth.
  - When cleaning, be careful not to contaminate the traction sheave with grease.




#### 5.4.9 Checking of stop switch JHM

- ▶ Tag and disconnect electrical wiring from the rear of emergency stop switch JHM.
- ▶ Remove the yellow lock tab which is on the side of the switch. Turn lever on switch to unlock and remove switch from behind the control panel.
  - Obey orientation of push button before removing to aid in assembly.
- ▶ Remove push button from panel by removing lock nut and gasket.
- ▶ Examine emergency stop switch for corrosion and obvious damage. Inspection of electrical connectors for damage and indication of short.
- ▶ Push switch shaft to examine the correct operation. Push the switch and reset smoothly.
- ▶ Examine electrical wiring for cuts, crimps, bare wire, or other damage. Make sure connectors are safely attached.


### 5.5 Brake for machine DR FMB 130

#### 5.5.1 Maintenance plan for machine brake

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Visually check the brake
12	Checking of correct seating of the O-Rings
12	Checking of brake air gap
12	Checking of Manual Brake Release MBR
12	Brake test

#### 5.5.2 Checking of identification marking

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### 5.5.3 Visually check the brake

### WARNING


#### Braking action impaired by contamination of brake disk

Contamination of the brake disks with oil or grease decreases the braking torque quickly, which can cause a drift of the car. Not sufficient braking action in general, or a drift of the car with open door(s) can cause damage to the installation, dangerous injury or death.

If the traction sheave shows signs of oil/grease, bearing sealing plus tissue sealing can be damaged. Contact the installer.

- ▶ Make sure that the brake drum is clean.
  - ↳ If not clean the brake drum.
- ▶ Check for unusual brake noise.
  - ↳ If unusual brake noise occurs, replace the O-rings.
- ▶ Make sure that the sealing lacquer is still on the brake screws.
  - ↳ If not put the elevator out of service and contact the installer.

#### 5.5.4 Checking of correct seating of the O-Rings

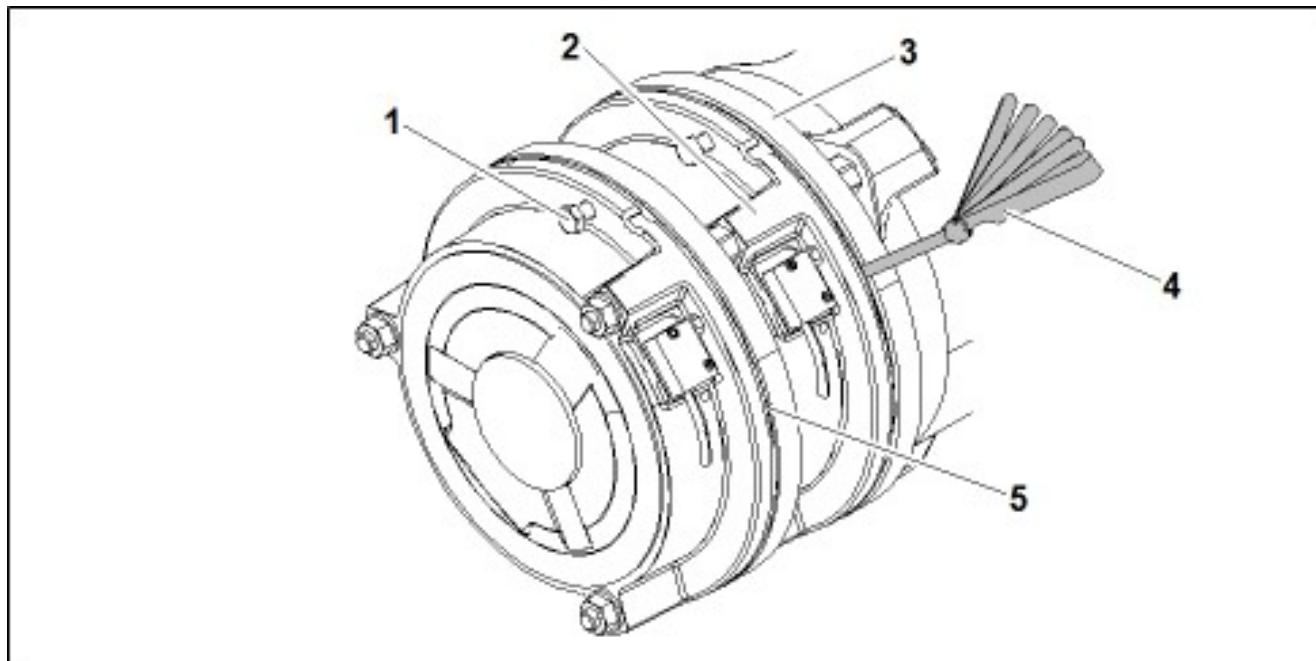
- ▶ Check O-ring for tears, breaks, deformation or hardening.
  -  If the O-ring is incorrectly assembled, oil leakage or damage will occur.
- ▶ Make sure that the O-ring is not twisted, and that it is installed correctly.



### 5.5.5 Checking of brake air gap

- ▶ Clean the feeler gauge before using it in order to avoid pollution of the air gap.
- ▶ Air gap must be checked at 3 or more locations regularly distributed around the brake, for example, in vicinity of the stud bolts.
- ▶ Start with the lowest gauge (usually 0.30 mm) and insert the feeler gauge at least 20 mm inside the brake. Do not remove the O-ring.
- ▶ Do a visual check on which side of the O-ring the feeler gauge must be inserted.
- ▶ Repeat the process by increasing the gauge by 0.10 mm and insert it at the same location where the smaller gauge was inserted.
- ▶ Make sure that the O-ring is placed back correctly after extracting the feeler gauge.
- ▶ Make sure that the permissible air gap is according to the values in the table for each brake.

### 5.5.6 Air gap range for brakes Leroy Somer

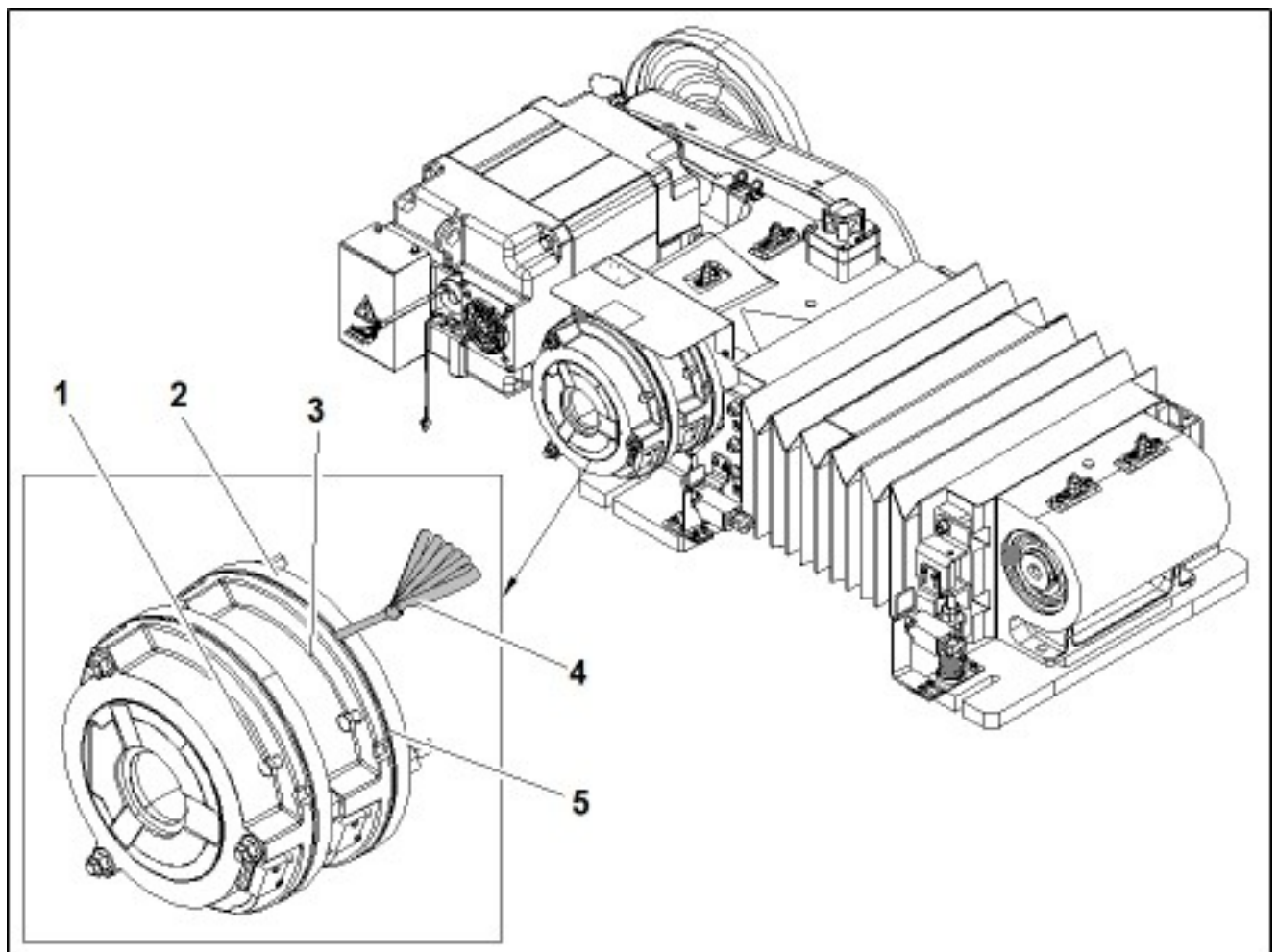


- 1 Adjusting screw  
3 Brake yoke  
5 O-ring

- 2 Brake armature  
4 Feeler gauge

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCD90	59601930	2 x 65 Nm	≥ 0.65
FCD90	59601931	2 x 80 Nm	≥ 0.65
FCD90	59602079	2 x 88 Nm	≥ 0.65
FCD90	59609631	2 x 105 Nm	≥ 0.65
FCD90	59607477	2 x 150 Nm	≥ 0.65
FCD90	59607478	2 x 165 Nm	≥ 0.65
FCD90	59609632	2 x 105 Nm	≥ 0.65
FCD90	59609633	2 x 150 Nm	≥ 0.65
FCD90	59609634	2 x 165 Nm	≥ 0.65
FCD90	59609689	2 x 105 Nm	≥ 0.65
FCD90	59609690	2 x 150 Nm	≥ 0.65
FCD90	59601932	2 x 165 Nm	≥ 0.65
FCD90	59610401	2 x 68 Nm	≥ 0.50
FCD90	59610402	2 x 80 Nm	≥ 0.50
FCD90	59610403	2 x 100 Nm	≥ 0.50



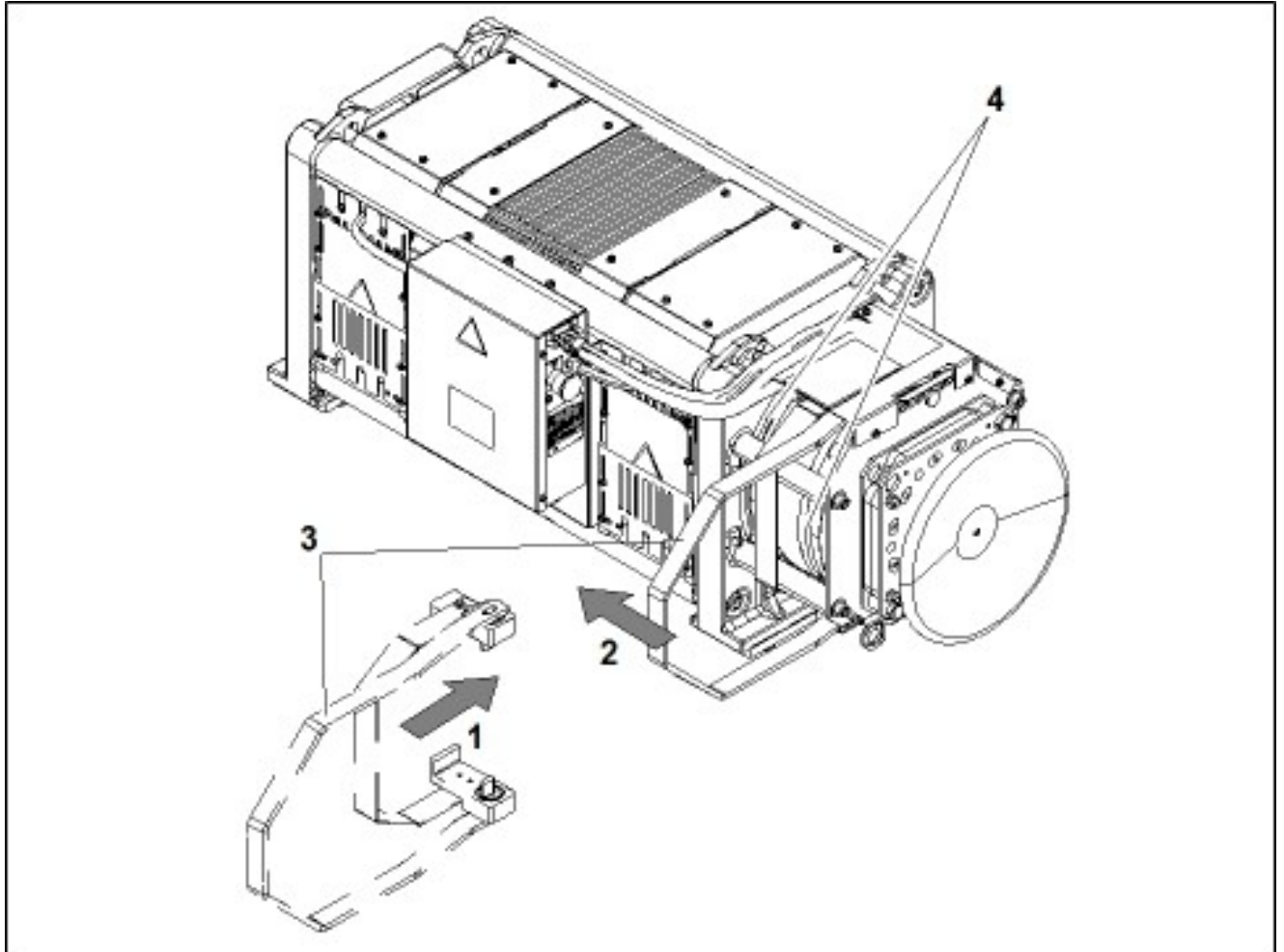


- |   |                     |   |              |
|---|---------------------|---|--------------|
| 1 | KB adjusting screw  | 2 | Brake yoke   |
| 3 | Brake coil armature | 4 | Feeler gauge |
| 5 | O-ring              |   |              |

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCRD112	59610601	2 x 100 Nm	≥ 0.60
FCRD112	59610602	2 x 125 Nm	≥ 0.60
FCRD112	59610603	2 x 160 Nm	≥ 0.60
FCRD112	59610604	2 x 200 Nm	≥ 0.60
FCRD112	59610605	2 x 220 Nm	≥ 0.60
FCRD112	59610612	2 x 100 Nm	≥ 0.60
FCRD112	59610613	2 x 125 Nm	≥ 0.60
FCRD112	59610614	2 x 160 Nm	≥ 0.60
FCRD112	59610615	2 x 200 Nm	≥ 0.60
FCRD112	59610616	2 x 220 Nm	≥ 0.60
FCRD132	—	—	≥ 0.55



### 5.5.7 Checking of Manual Brake Release MBR



- |   |  |   |   |
|---|--|---|---|
| 1 | Insertion position of manual brake release | 2 | Pulling direction of manual brake release |
| 3 | Manual brake release                       | 4 | Brake notch                               |

- Put the manual brake release into the brake notches in the direction of the white arrow.
- Move the manual brake release in the direction of the black arrow to open the brake.
- Turn the handwheel and make sure that the shaft turns freely (two-man operation).
- Release the manual brake release.
- Disengage the hand winding device.
- Remove the spring cotters and the hand winding device.
- Close the sliding door.



### 5.5.8 Brake test

- ▶ Function brake test at inspection speed.
- ▶ Run the elevator at VKI and make sure that there is no abnormal noise while the brake is open and while closing.

#### 5.5.8.1 Dynamic full brake test upward

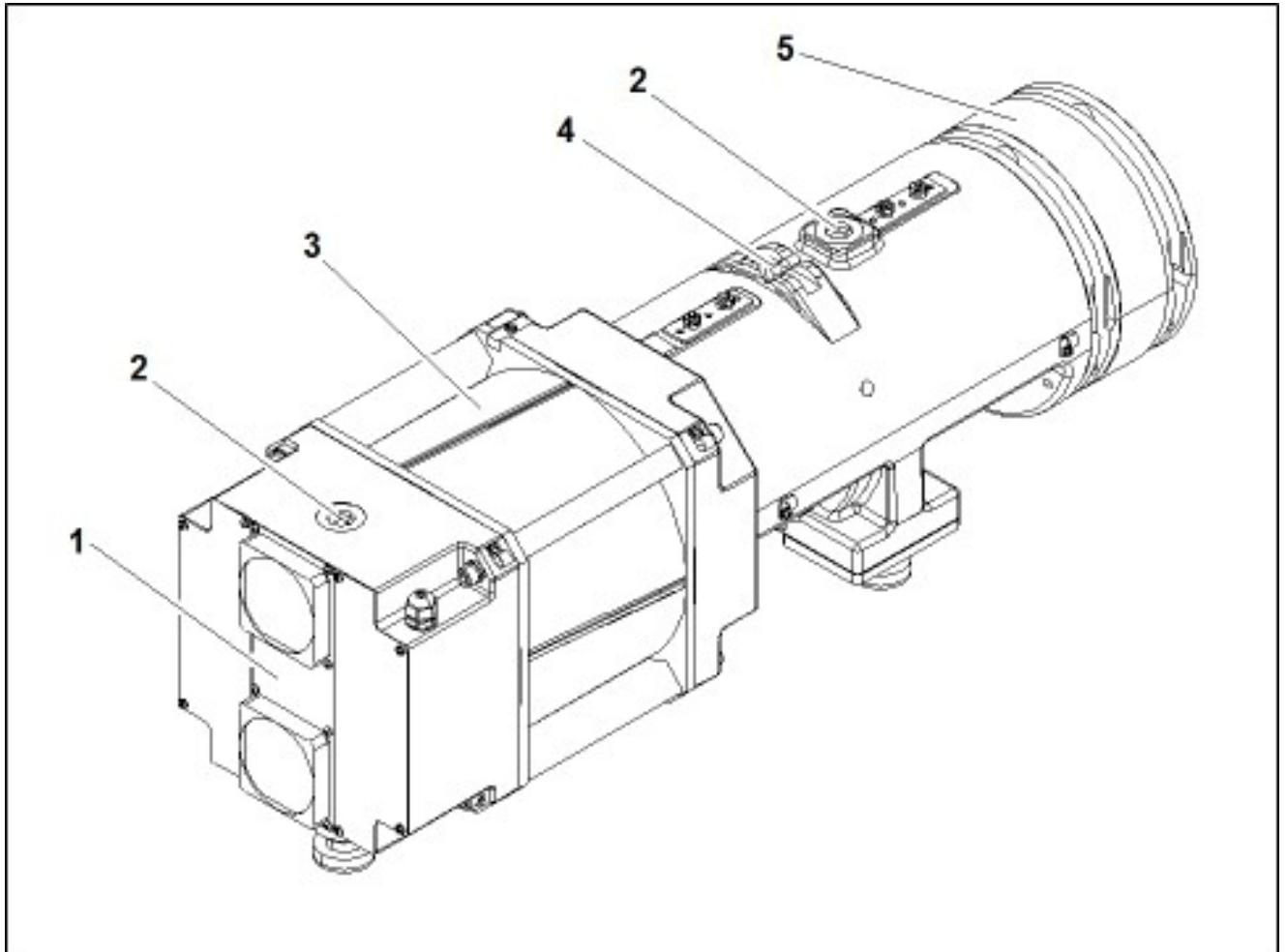
- ▶ To execute the dynamic brake test, contact the installer.

#### 5.5.8.2 Dynamic single brake test upward

- ▶ To execute the dynamic brake test, contact the installer.

## 5.6 Machine DR PMB 125/135

### 5.6.1 Overview of machine



1 Encoder (hidden)

3 Motor

5 Brake (system)

2 Thread for lifting provision (2x)

4 Spirit level



## 5.6.2 Maintenance plan for machine

Interval (months)	Description
12	Checking for cleanness
12	Checking for unusual noise
12	Checking of the damping pads
12	Make sure the machine is properly fasten and levelled
12	Checking of fan
12	Checking of central bearing
12	Checking of machine brake
12	Checking of stop switch JHM

### 5.6.3 Checking of cleanness

- ▶ Check all bolts to ensure the machine is firmly fixed on the machine support.
- ▶ Make sure that the fan protection is clean.
  - ↳ If not clean the brake drum.
- ▶ Make sure that the traction sheave is clean.
  - ↳ If not clean the traction sheave.

### NOTICE

Make sure that there is no grease or oil contamination on the traction sheave and on the traction media. If dirt with oil or grease is visible, investigate to find the leakage.

### 5.6.4 Checking for unusual noise

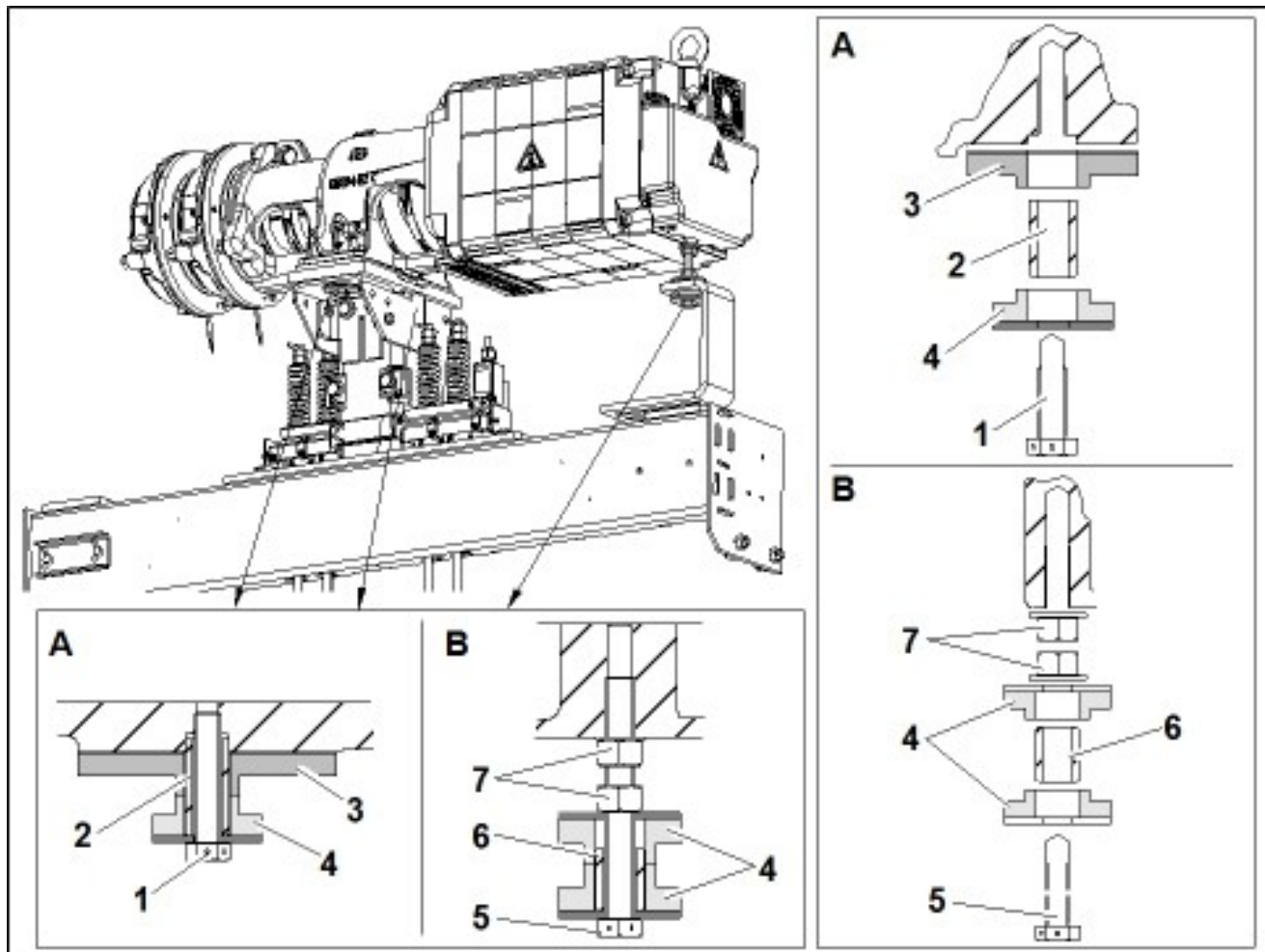
- ▶ Make sure that all fixation of the machine for example, fixation bolts, cable fixation, etc. are fixed properly.
- ▶ Make sure that all guards and covers are fixed properly.
- ▶ Make sure that no abnormal noise of the machine during the normal elevator operation. If any abnormal or disturbing noise is heard:
  - Find out the source and solve it if the noise can be solved on site.
  - Find out the source and report the issue if the noise cannot be solved at the moment.

### 5.6.5 Make sure that the damping pads are in place and intact

- ▶ If the damping pads are cracked, replace them.

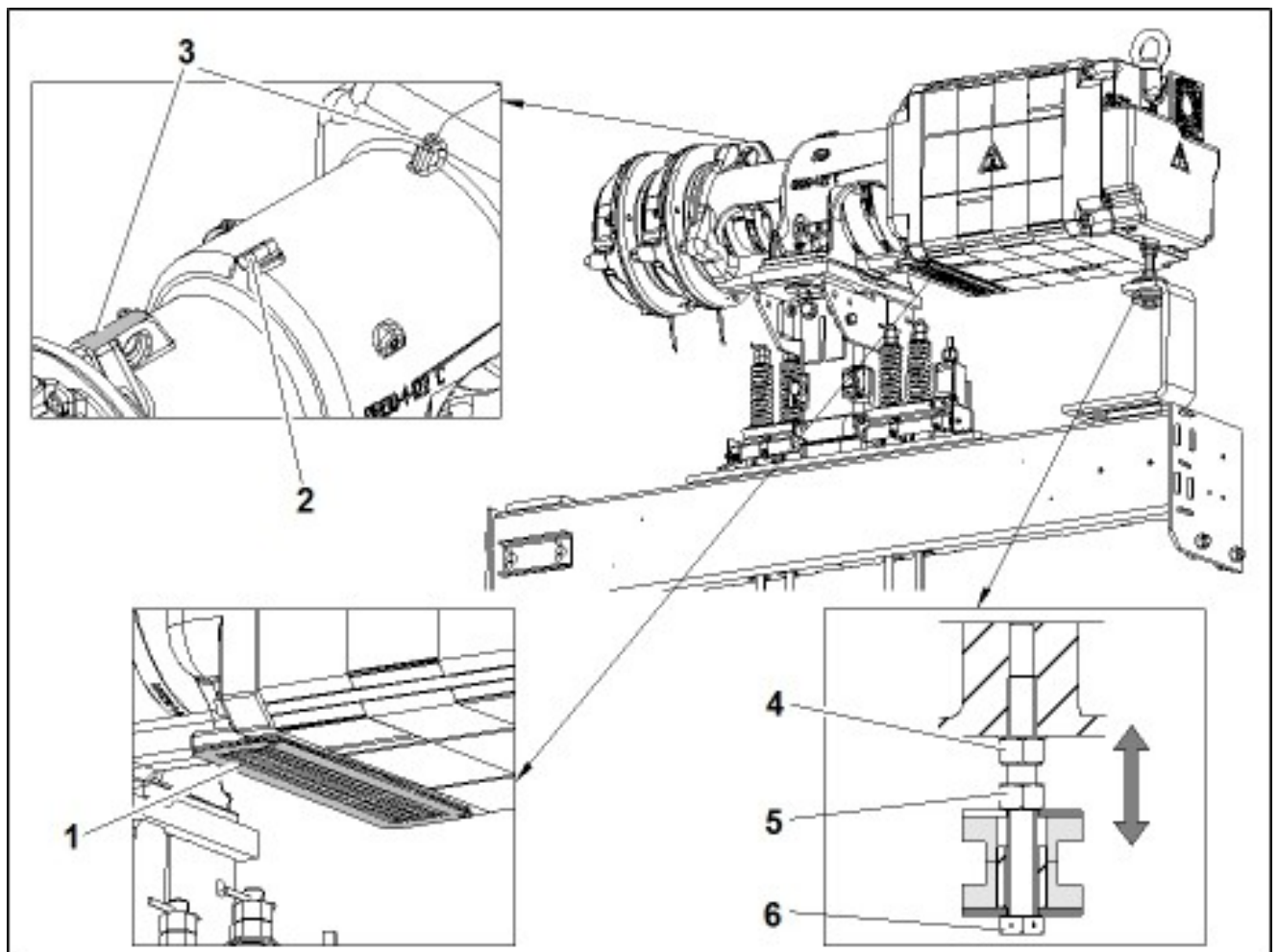


## 5.6.6 Make sure the machine is properly fasten and levelled



- |          |                                      |          |                    |
|----------|--------------------------------------|----------|--------------------|
| <b>A</b> | Central support                      | <b>B</b> | Rear support       |
| 1        | M12 hex head bolt with security hole | 2        | Central guide bush |
| 3        | Top damping pad                      | 4        | Damping pad        |
| 5        | M12-2SK hex head bush                | 6        | Rear guide bush    |
| 7        | M12 hex nut                          |          |                    |





- |   |                           |   |                            |
|---|---------------------------|---|----------------------------|
| 1 | Leveled surface at bottom | 2 | Spirit level               |
| 3 | Leveled surface at top    | 4 | M12 hex locking flange nut |
| 5 | M12 hex bolt flange nut   | 6 | M12 hex head bolt          |

- Use the spirit level on top of the machine to make sure that the machine is level.

## NOTICE

A correct alignment of the machine is important to ensure the correct behavior of the STM.

- Check the safety wire is in place.
- If necessary, level the machine as follows:
  - Loosen the M12 locking flange nut.
  - Loosen the M12 bolt flange nut.
  - Adjust the M12x100 bolt at the rear end until the machine is level.
  - Tighten the M12 locking flange nut.
  - Tighten the M12 bolt flange nut.

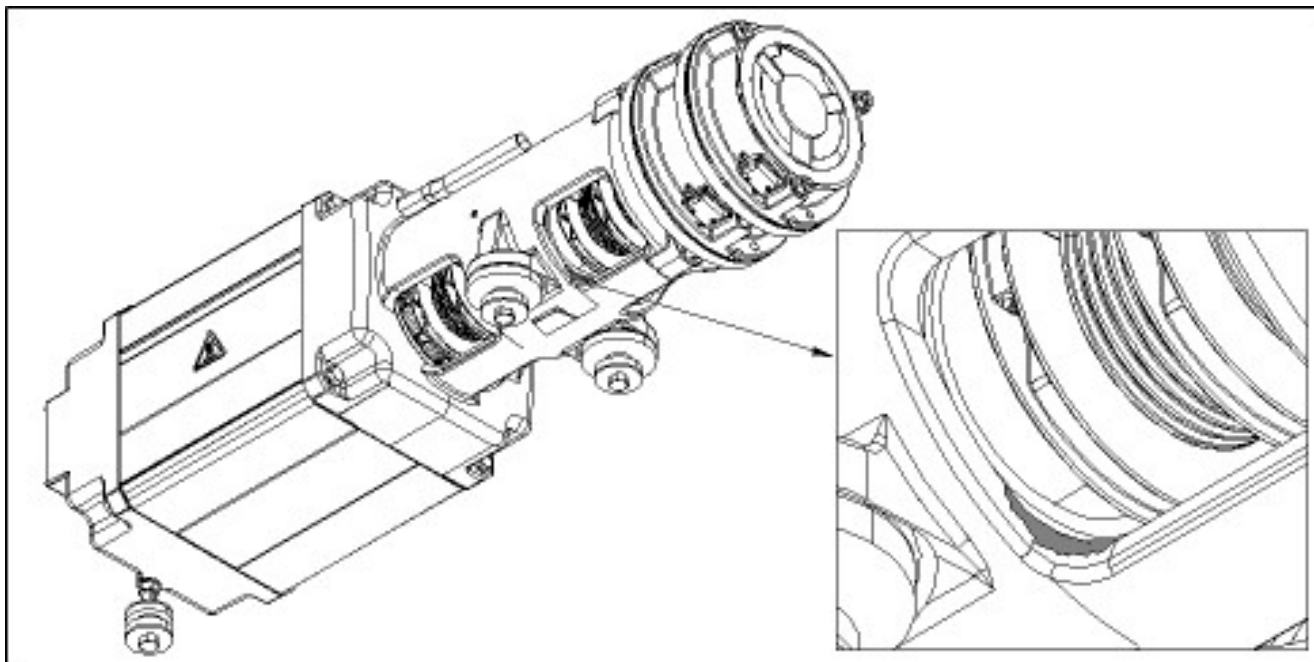
**i** The use of impact wrenches must be avoided for this operation.

### 5.6.7 Checking of fan

- Check the function of fans:
  - Turn on the fans.
  - Use a sheet of paper to test air movement.
  - Put your hand in front of the fan to feel the air movement.
  - Make sure that all fans work properly.
  - Make sure that the fan extracts the air from the motor.
  - If 1 or more fans are faulty, replace the fan unit.



### 5.6.8 Checking of central bearing




- ▶ Make sure that the central bearing area is clean and free of leaking grease and oil.
- ▶ If oil or grease are present:
  - Carefully wipe off any traces of leaking grease with a clean dry cloth.
  - When cleaning, be careful not to contaminate the traction sheave with grease.

### 5.6.9 Checking of stop switch JHM

- ▶ Tag and disconnect electrical wiring from the rear of emergency stop switch JHM.
- ▶ Remove the yellow lock tab which is on the side of the switch. Turn lever on switch to unlock and remove switch from behind the control panel.
  - Obey orientation of push button before removing to aid in assembly.
- ▶ Remove push button from panel by removing lock nut and gasket.
- ▶ Examine emergency stop switch for corrosion and obvious damage. Inspection of electrical connectors for damage and indication of short.
- ▶ Push switch shaft to examine the correct operation. Push the switch and reset smoothly.
- ▶ Examine electrical wiring for cuts, crimps, bare wire, or other damage. Make sure connectors are safely attached.


## 5.7 Brake for machine DR PMB 125/135

### 5.7.1 Maintenance plan for machine brake

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Visually check the brake
12	Checking of correct seating of the O-Rings
12	Checking of brake air gap
12	Brake test

### 5.7.2 Checking of identification marking

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.



### 5.7.3 Visually check the brake

## ⚠ WARNING

#### Braking action impaired by contamination of brake disk

Contamination of the brake disks with oil or grease decreases the braking torque quickly, which can cause a drift of the car. Not sufficient braking action in general, or a drift of the car with open door(s) can cause damage to the installation, dangerous injury or death.

If the traction sheave shows signs of oil/grease, bearing sealing plus tissue sealing can be damaged. Contact the installer.

- ▶ Make sure that the brake drum is clean.
  - ↳ If not clean the brake drum.
- ▶ Check for unusual brake noise.
  - ↳ If unusual brake noise occurs, replace the O-rings.
- ▶ Make sure that the sealing lacquer is still on the brake screws.
  - ↳ If not put the elevator out of service and contact the installer.

### 5.7.4 Checking of correct seating of the O-Rings

- ▶ Check O-ring for tears, breaks, deformation or hardening.



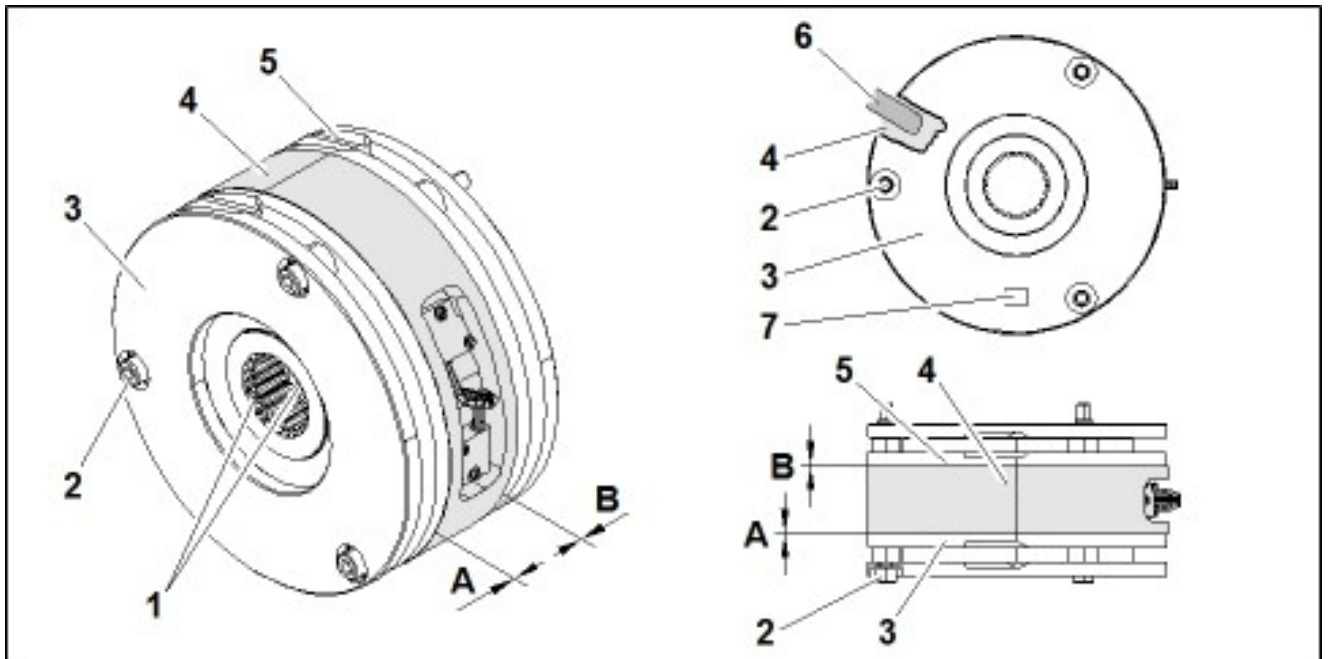
If the O-ring is incorrectly assembled, oil leakage or damage will occur.

- ▶ Make sure that the O-ring is not twisted, and that it is installed correctly.

### 5.7.5 Checking of brake air gap

- ▶ Clean the feeler gauge before using it in order to avoid pollution of the air gap.
- ▶ Air gap must be checked at 3 or more locations regularly distributed around the brake, for example, in vicinity of the stud bolts.
- ▶ Start with the lowest gauge (usually 0.30 mm) and insert the feeler gauge at least 20 mm inside the brake. Do not remove the O-ring.
- ▶ Do a visual check on which side of the O-ring the feeler gauge must be inserted.
- ▶ Repeat the process by increasing the gauge by 0.10 mm and insert it at the same location where the smaller gauge was inserted.
- ▶ Make sure that the O-ring is placed back correctly after extracting the feeler gauge.
- ▶ Make sure that the permissible air gap is according to the values in the table for each brake.

### 5.7.6 Air gap range for brakes Kendrion



**A, B** Air gap

**2** M10 x 130 bolt and washer (3x)

**4** Brake magnet coil

**6** Feeler gauge

**1** O-ring (2x)

**3** MGB

**5** MGB1

**7** Air gap level

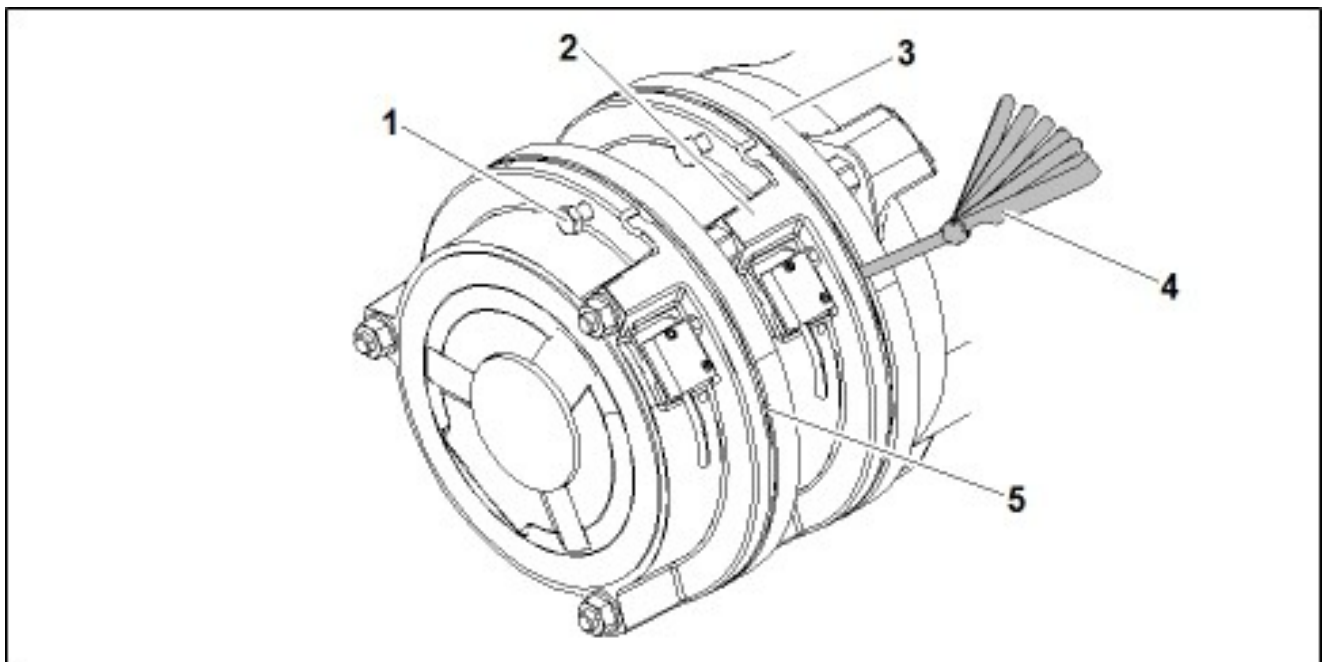


Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
78 11029B05	59609830	2 x 125 Nm	≥ 0.80
78 11029B05	59609831	2 x 155 Nm	≥ 0.80
78 11029B05	59609832	2 x 195 Nm	≥ 0.80
78 11029B05	59609833	2 x 250 Nm	≥ 0.80

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
78 11033B05	59609834	2 x 300 Nm	≥ 0.75
78 11033B05	59609835	2 x 380 Nm	≥ 0.75
78 11033B05	59609836	2 x 475 Nm	≥ 0.75

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
78 11040B05	59609837	2 x 475 Nm	≥ 0.80
78 11040B05	59609838	2 x 560 Nm	≥ 0.80
78 11040B05	59609839	2 x 700 Nm	≥ 0.80

#### 5.7.7 Air gap range for brakes Leroy Somer

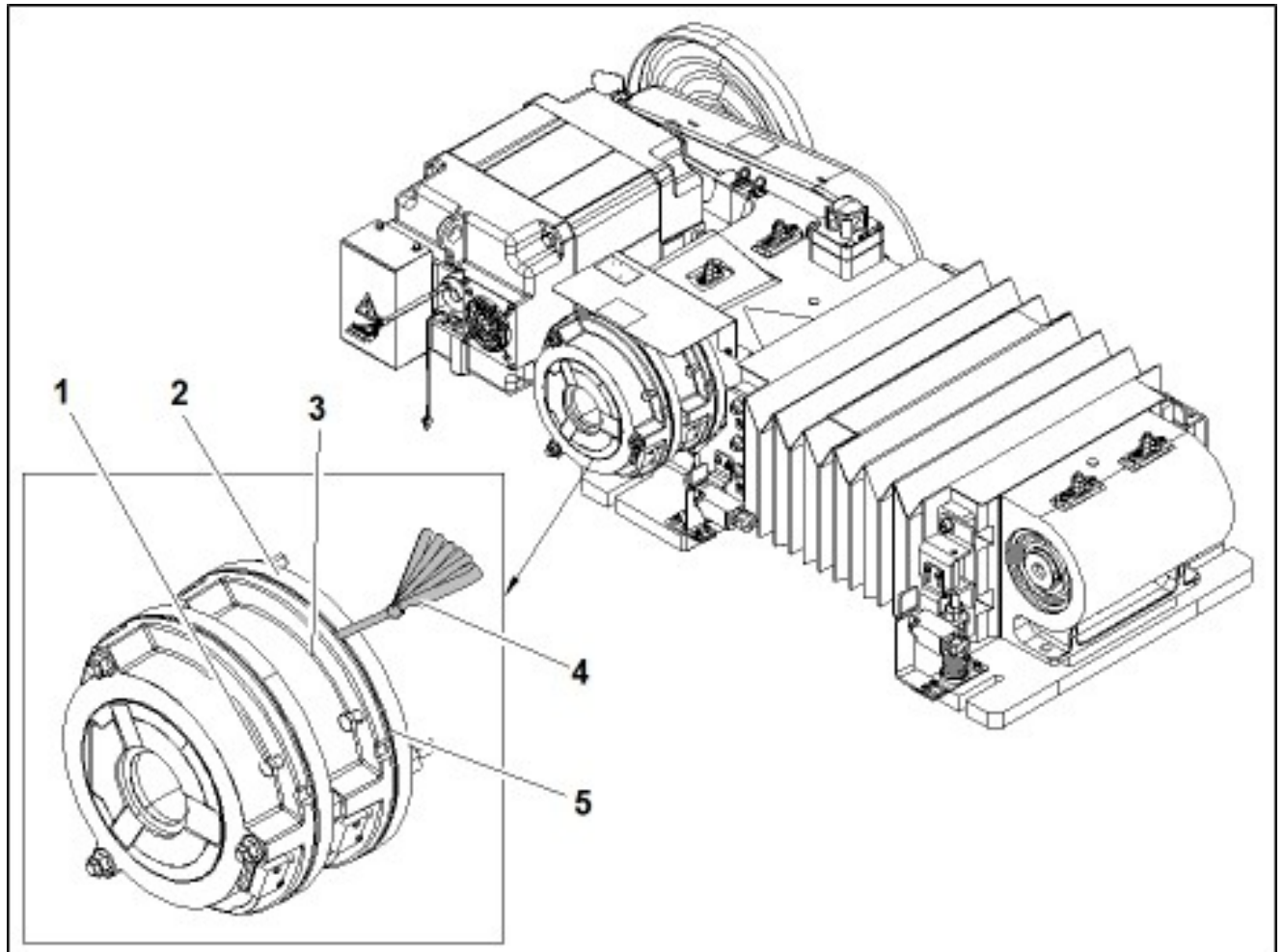


- |   |                 |   |                |
|---|-----------------|---|----------------|
| 1 | Adjusting screw | 2 | Brake armature |
| 3 | Brake yoke      | 4 | Feeler gauge   |
| 5 | O-ring          |   |                |

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCRD90	59601930	2 x 65 Nm	≥ 0.65
FCRD90	59601931	2 x 80 Nm	≥ 0.65
FCRD90	59602079	2 x 88 Nm	≥ 0.65
FCRD90	59609631	2 x 105 Nm	≥ 0.65
FCRD90	59607477	2 x 150 Nm	≥ 0.65



Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCRD90	59607478	2 x 165 Nm	≥ 0.65
FCRD90	59609632	2 x 105 Nm	≥ 0.65
FCRD90	59609633	2 x 150 Nm	≥ 0.65
FCRD90	59609634	2 x 165 Nm	≥ 0.65
FCRD90	59609689	2 x 105 Nm	≥ 0.65
FCRD90	59609690	2 x 150 Nm	≥ 0.65
FCRD90	59601932	2 x 165 Nm	≥ 0.65
FCRD90	59610401	2 x 68 Nm	≥ 0.50
FCRD90	59610402	2 x 80 Nm	≥ 0.50
FCRD90	59610403	2 x 100 Nm	≥ 0.50



- |   |                     |   |              |
|---|---------------------|---|--------------|
| 1 | KB adjusting screw  | 2 | Brake yoke   |
| 3 | Brake coil armature | 4 | Feeler gauge |
| 5 | O-ring              |   |              |

Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCRD112	59610601	2 x 100 Nm	≥ 0.60
FCRD112	59610602	2 x 125 Nm	≥ 0.60
FCRD112	59610603	2 x 160 Nm	≥ 0.60
FCRD112	59610604	2 x 200 Nm	≥ 0.60
FCRD112	59610605	2 x 220 Nm	≥ 0.60
FCRD112	59610612	2 x 100 Nm	≥ 0.60



Type	ID	TBMZ	Air Gap Shutdown and replace immediately (mm)
FCRD112	59610613	2 x 125 Nm	≥ 0.60
FCRD112	59610614	2 x 160 Nm	≥ 0.60
FCRD112	59610615	2 x 200 Nm	≥ 0.60
FCRD112	59610616	2 x 220 Nm	≥ 0.60
FCRD132	—	—	≥ 0.55

### 5.7.8 Brake test

- Function brake test at inspection speed.
- Run the elevator at VKI and make sure that there is no abnormal noise while the brake is open and while closing.

#### 5.7.8.1 Dynamic full brake test upward

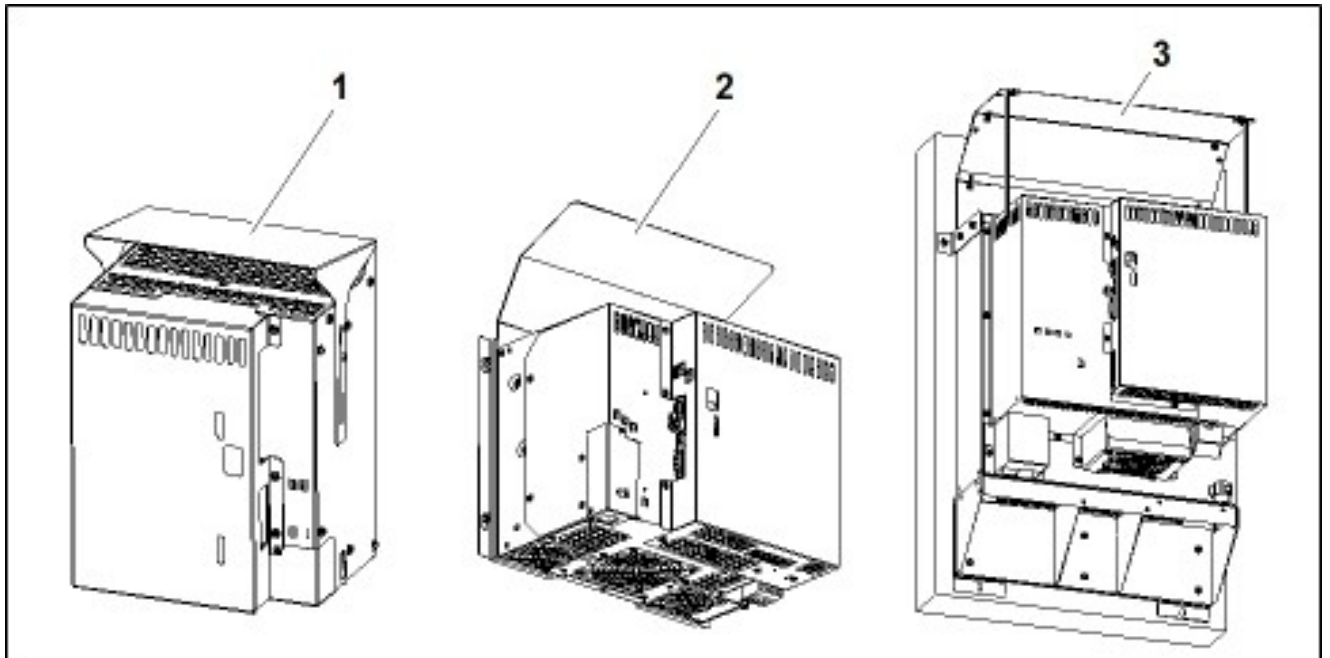
- To execute the dynamic brake test, contact the installer.

#### 5.7.8.2 Dynamic single brake test upward

- To execute the dynamic brake test, contact the installer.

## 5.8 Frequency converter DR VAB 11/22/33/44/88

### 5.8.1 Overview



1 DR VAB 011

2 DR VAB 022 / DR VAB 033

3 DR VAB 044

### 5.8.2 Maintenance plan

**i** The component is made for a lifetime of 5.5 million trips and 10 years. After that period, it is recommended to replace the component.

Interval (months)	Description
12	Check of fan

### 5.8.3 Check of fan

- To turn on the fan, refer to the control. All ACVF and motor fans, if connected, must operate.
- If one of the fans does not operate, replace the full frequency converter. .



- 5.8.4
- Cleaning
- Clean the cabinet if necessary.

► Make sure to clean the ventilation grids.

- 5.8.5
- Replacement
- Contact the installer for spare parts and for information on how to replace the component.

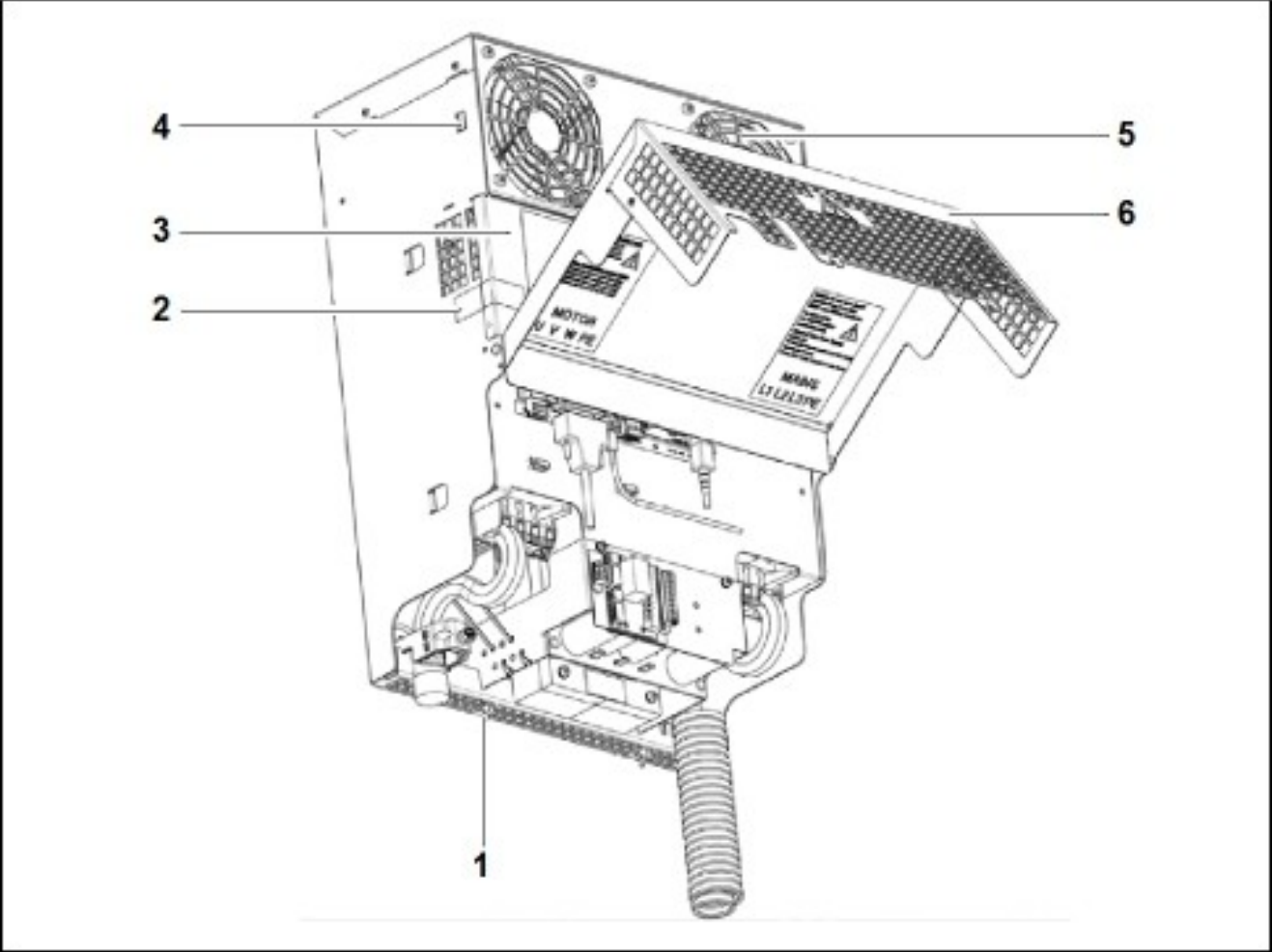
► Record the replacement in the service book.

5.9

Frequency converter DR VAF 013/023/043

5.9.1

Overview



- 1

Wing screw / panel fastener
- 2

Cover sealing
- 3

Cover of PCBAICBR
- 4

Catch
- 5

Fan assembly
- 6

Connector cover

5.9.2

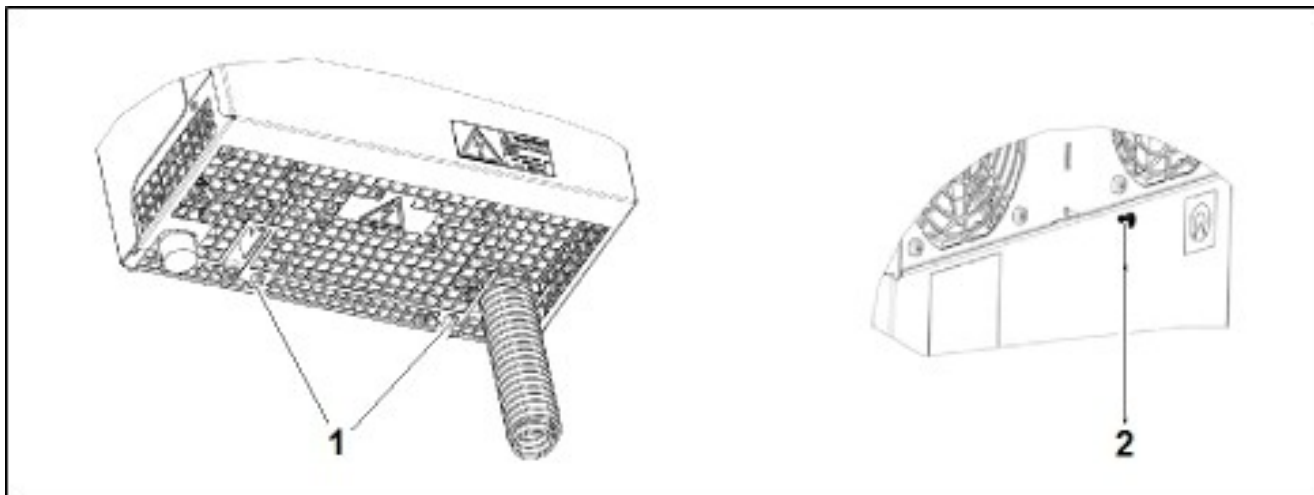
Maintenance plan

Interval (months)	Description
12	Check of fans and air ducts, clean if necessary
12	Function check of fan unit



### 5.9.3 Cleaning of fans and air ducts

#### 5.9.3.1 Removal of connector cover



1 Wing screw / panel fastener

2 Nylon rivet

### **⚠ DANGER**

#### **Hazardous voltage**

Contact with live parts will result in electric shock.

Switch off the main switch and de-energize the installation completely before starting to work on the installation.

### **NOTICE**

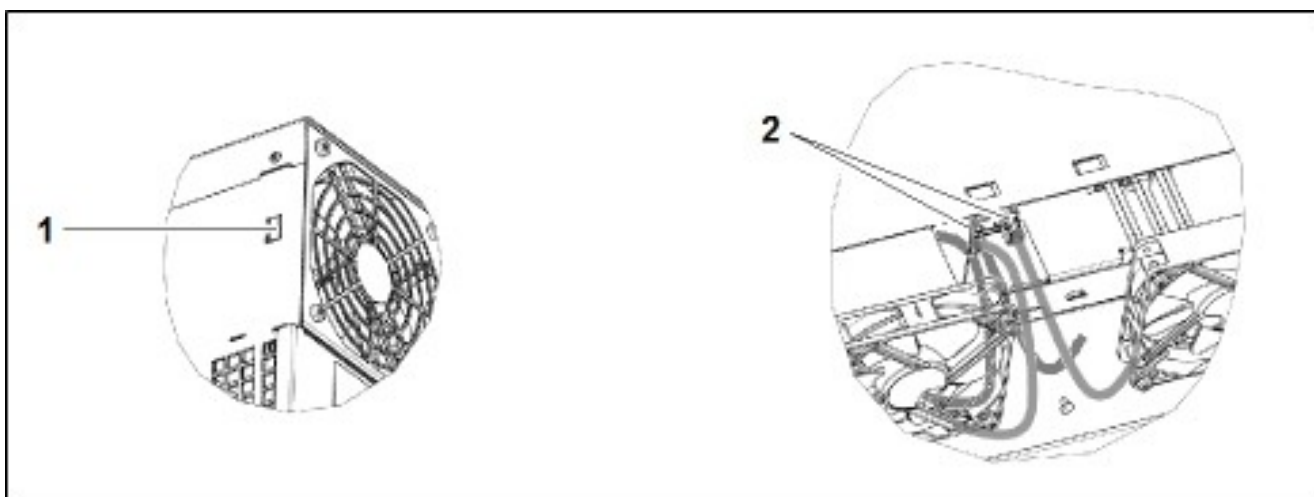
#### **Void warranty and safety certificate**

The warranty and safety certificate of the frequency converter is void if the cover sealing is broken.

Do not open the cover of the PCBA ICBR.

- ▶ Set the main switch JH to off.
- ▶ Wait for a minimum of 5 minutes until the capacitors are fully discharged.
- ▶ Carefully loosen the two wing screws.
- ▶ Open the connector cover.

#### 5.9.3.2 Removal of fan assembly



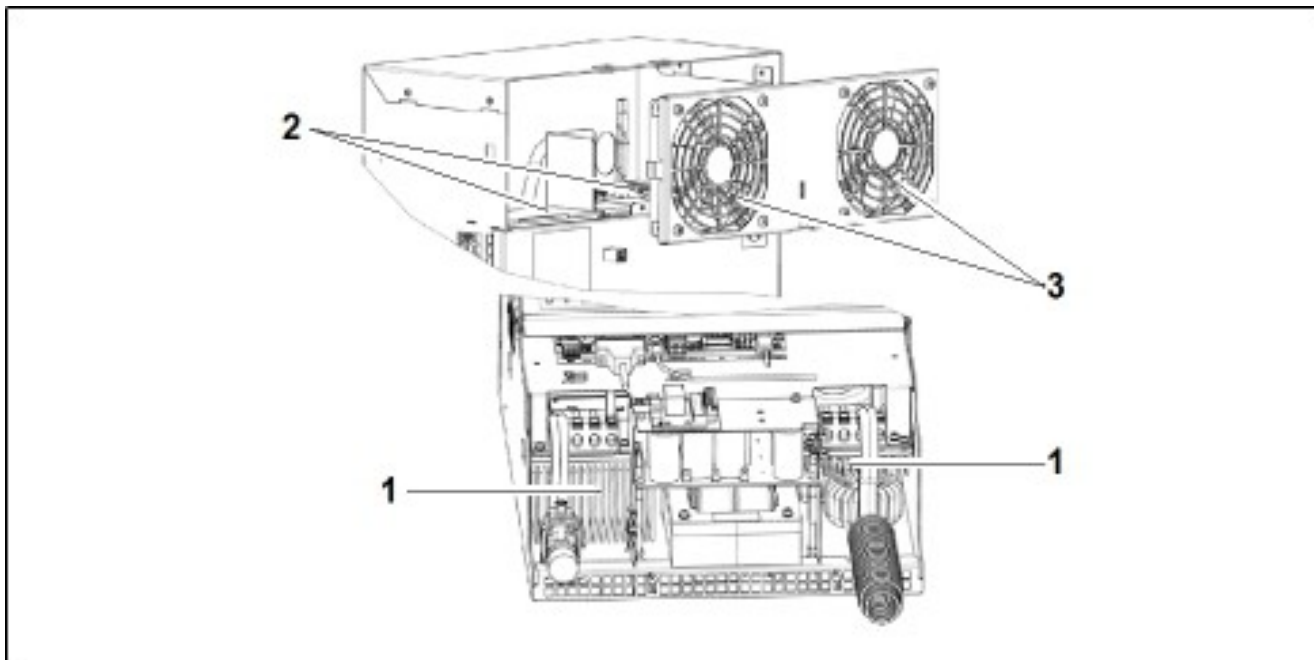
1 Catch

2 Fan power cable

- ▶ Remove the nylon rivet from the fan assembly.
- ▶ Push in the catches on each side of the release the fan assembly.
- ▶ Disconnect the fan power cables from the frequency converter.
- ▶ Remove the fan assembly.



### 5.9.3.3 Cleaning



1 Air duct behind power module

2 Air duct behind fan assembly

3 Fan assembly

- ▶ Use a vacuum cleaner with a plastic nozzle to clean these parts:
  - The fan assembly
  - The air duct behind the fan assembly
  - The air ducts behind the power module.

### 5.9.3.4 Installation of fan assembly and connector cover

- ▶ Connect the fan power cables to the frequency converter.
- ▶ Install the fan assembly.
- ▶ Put in the nylon rivet.
- ▶ Close and lock the connector cover with the two panel fastener.
- ▶ Tighten the two wing screws.

### 5.9.4 Function check of fan

- ▶ Turn on the fans. For instruction, refer to the maintenance information of the control.
- ▶ Use a sheet of paper to do an air movement test.
- ▶ Put your hand in front of the fan to feel the air movement.
- ▶ Make sure that all fans operate correctly.
- ▶ Make sure that the fan removes the air from the motor.
- ▶ If a fan is defective, replace it.

**i** The fan is the only component which can be replaced. If one of the other components is defective, the whole frequency converter must be replaced.

### 5.9.5 Replacement

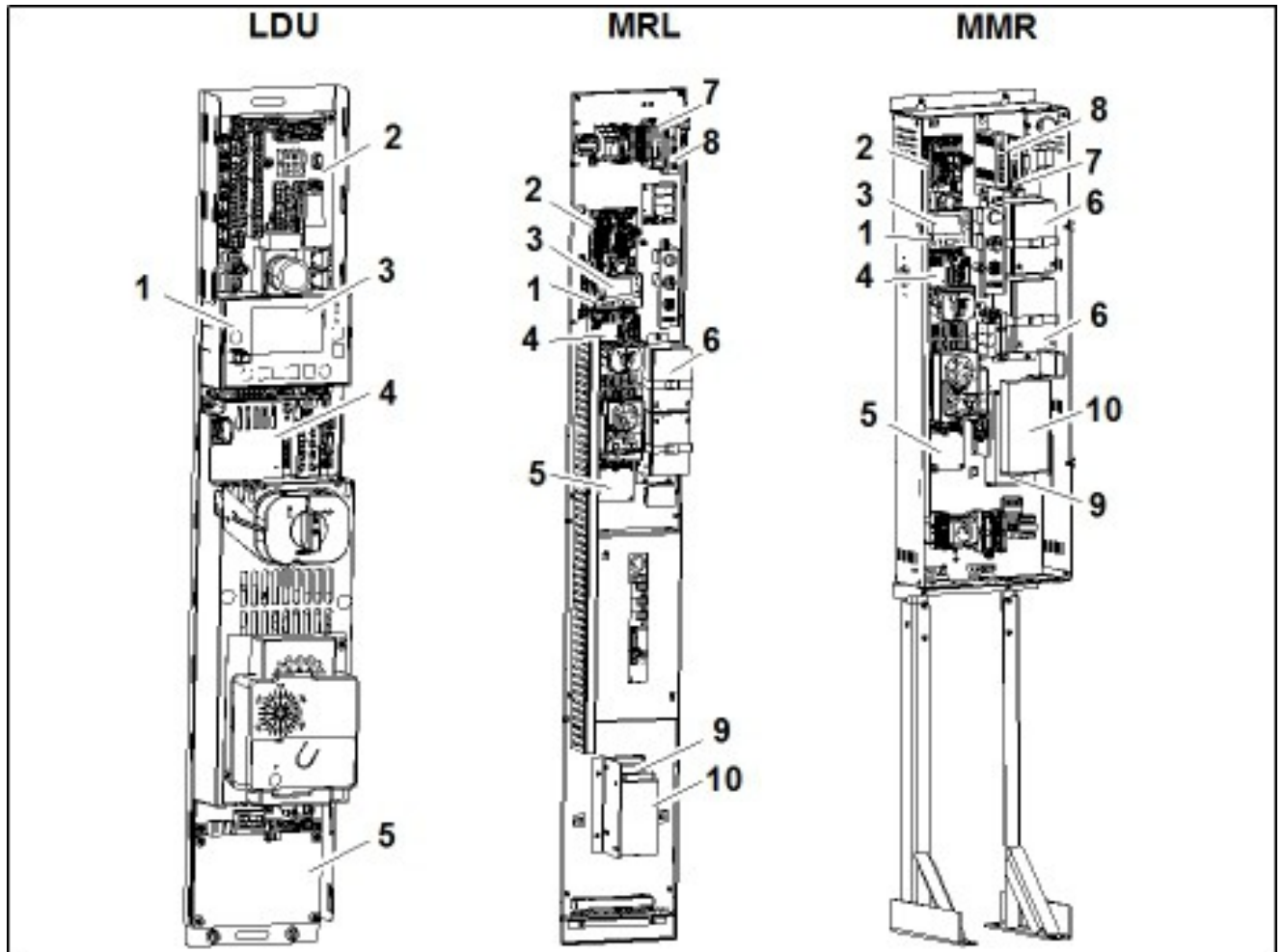
- ▶ Contact the installer for spare parts and for information on how to replace the component.
- ▶ Record the replacement in the service book.



## 5.10 Elevator control CO SC 1

### 5.10.1 Overview

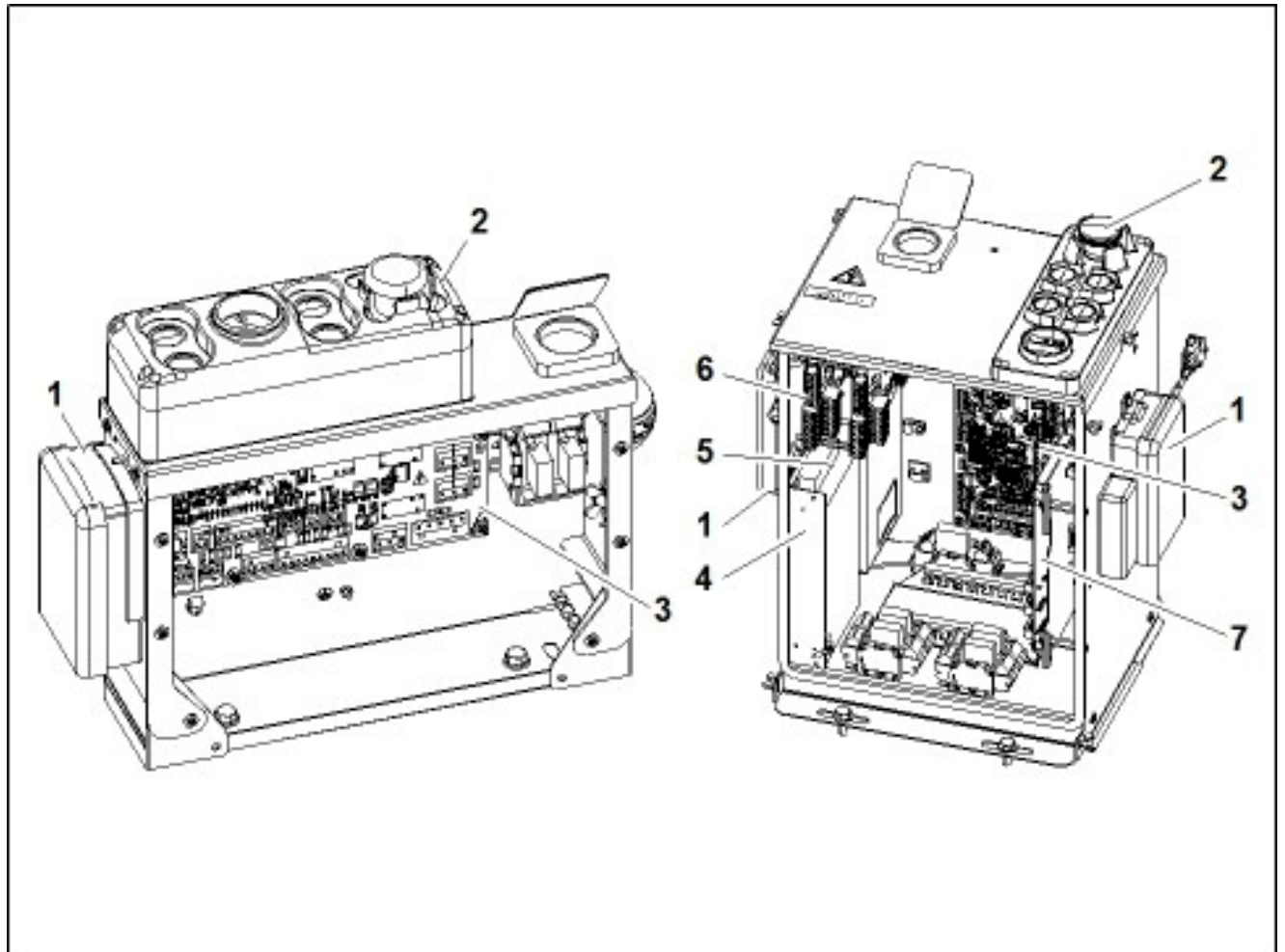
#### Control cabinet



- 1 SCCORE PCBA (below HMI)
- 3 HMI
- 5 SCAES (optional)
- 7 PTDB (PTG)
- 9 NGL

- 2 SCMAIN PCBA
- 4 SCPOWH / L PCBA
- 6 BATNSG
- 8 Network switch
- 10 NGO1 (optional, only for MRL and MMR)

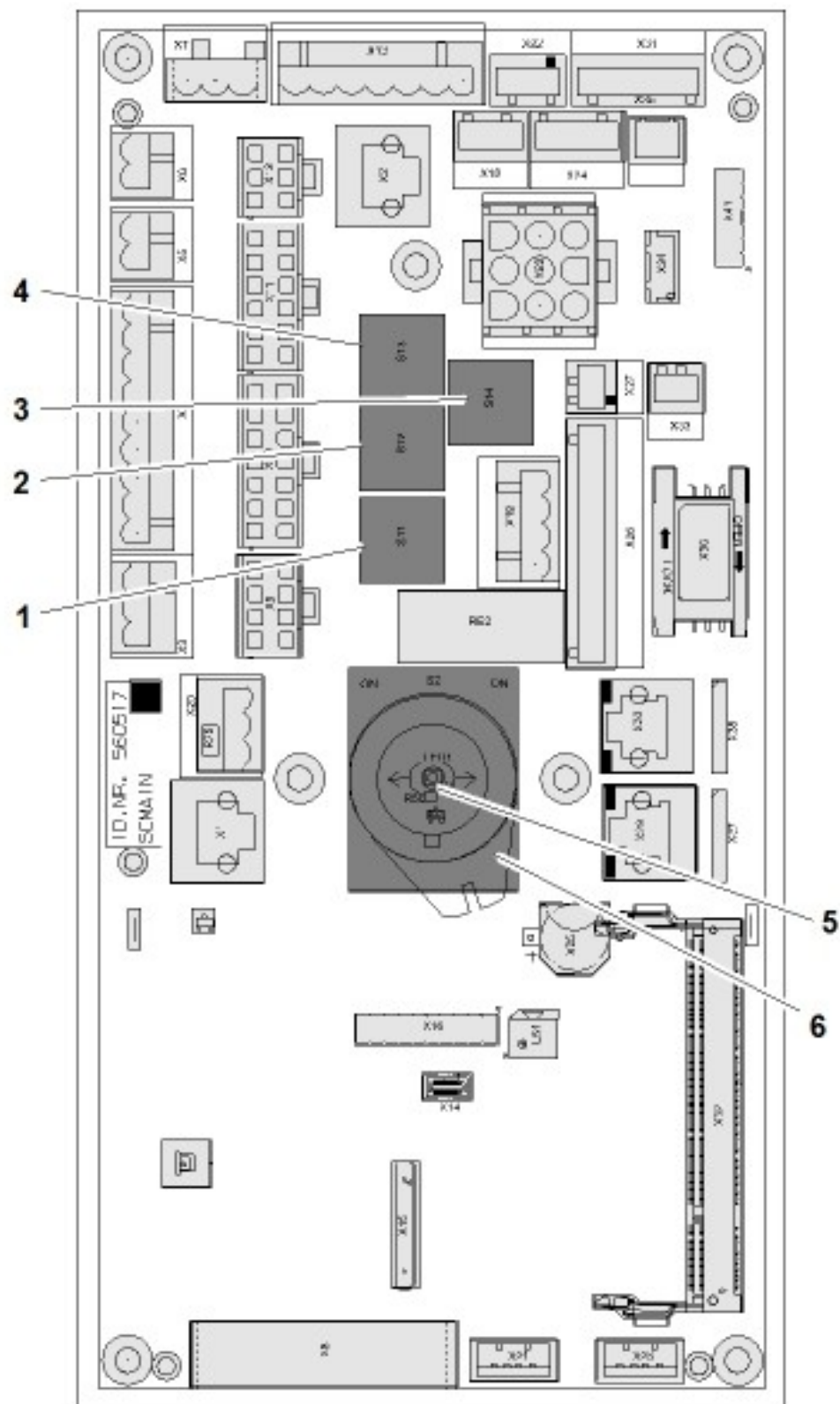




- 1 Intercom
- 3 SCCAR
- 5 VEC\_UPS

- 2 REC
- 4 NGC
- 6 CANGIO 3.Q (option, up to 2)







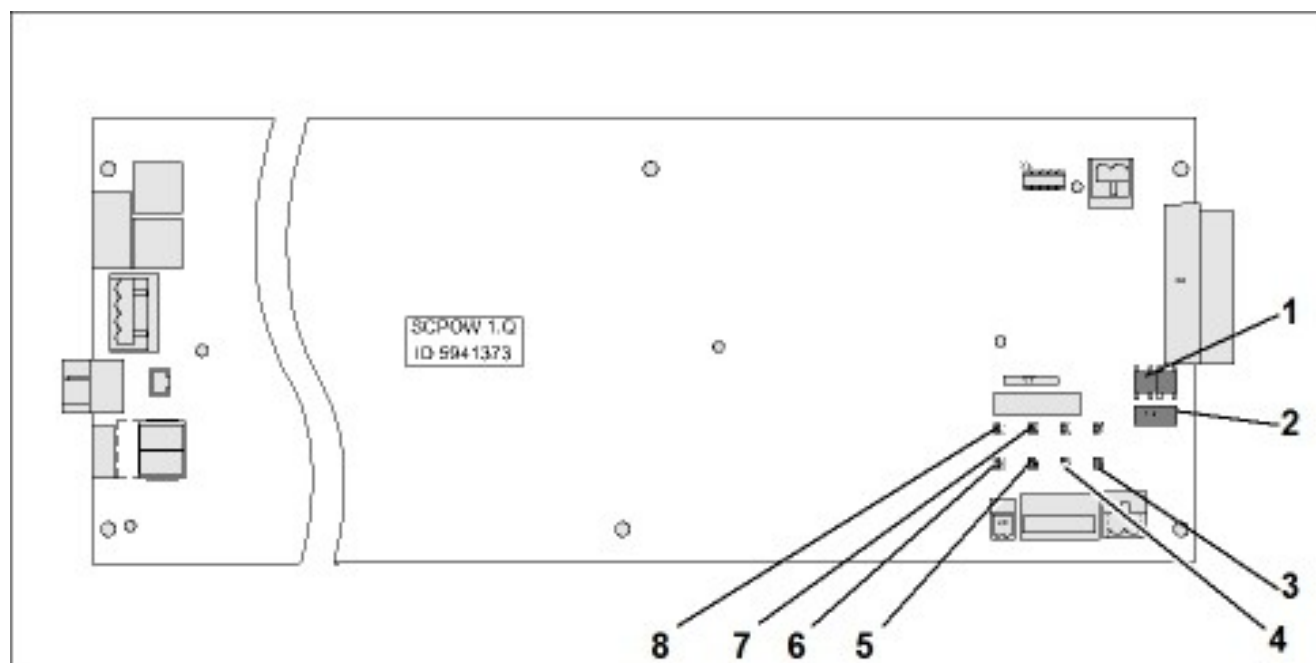
## LED

Position number	Component designator	Description
5	RH/EM	This LED is below the DRH-E / DEM button, it illuminates the button Blinking: Manual evacuation (PEBO) is on Fast blinking: Manual evacuation (PEBO) is in overtemperature Permanent ON: Recall is on

## Fuse / switch

Position number	Component designator	Description
1	SPH	Fuse for short pit and headroom safety device
2	HK	Fuse for traveling cable
3	LOP	Fuse for landing BIO bus
4	CANL	Fuse for landing CAN bus
6	DRH-E / DEM	Button for PEBO or recall operation

## SCPOWL



## LED

Position number	Component designator	Description
3	KB	Lit: The contact is open Not lit: The contact is closed
4	KB1	Lit: The contact is open Not lit: The contact is closed
5	KB2	Lit: The contact is open Not lit: The contact is closed
6	KB3	Lit: The contact is open Not lit: The contact is closed
7	BAT	Lit: Battery is > 50 % Blinking: Battery is between 10 % and 50 % Not lit: Battery is < 10 % or the battery is disconnected

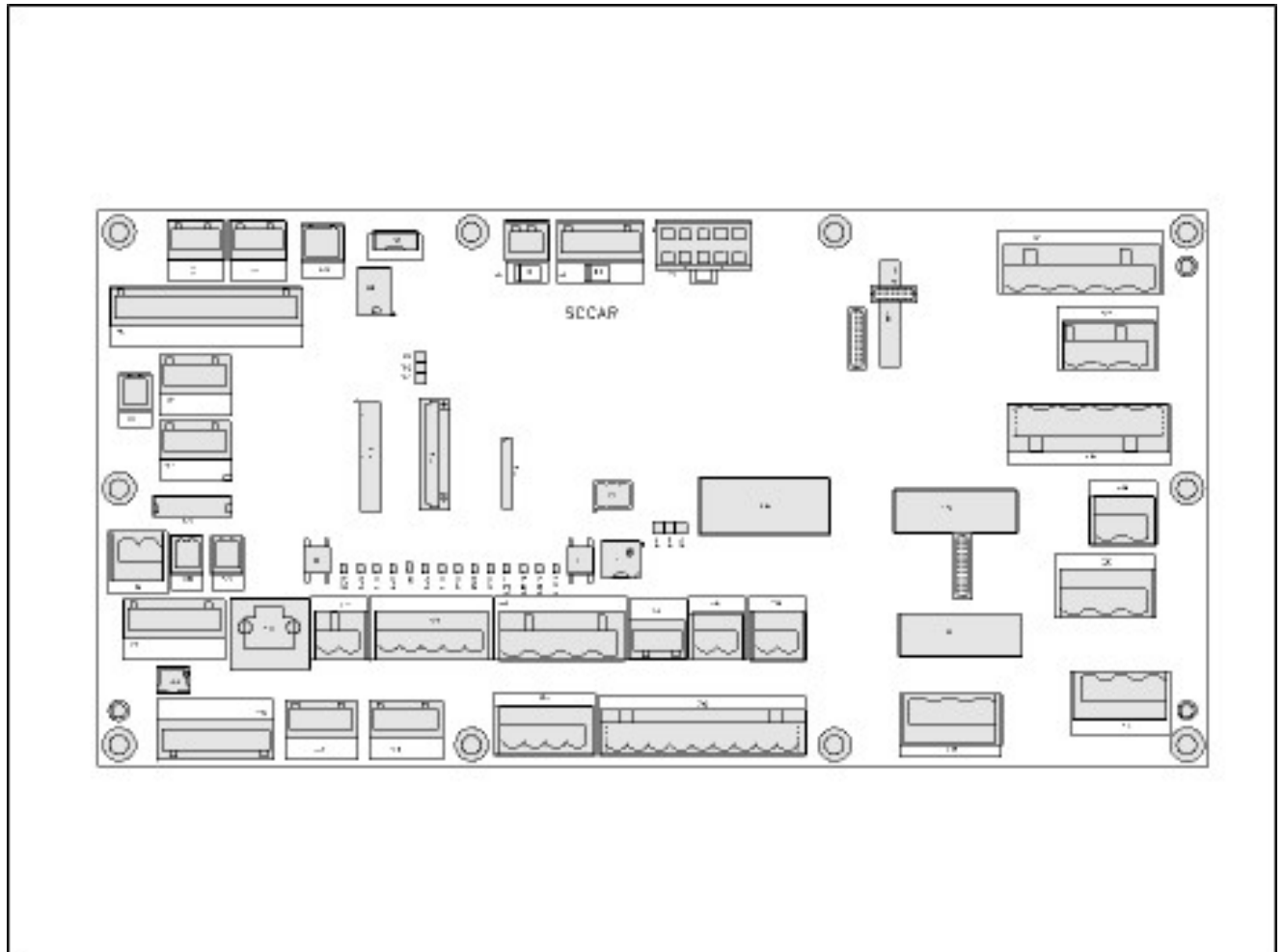


Position number	Component designator	Description
8	DWN	Lit: SW download in progress Not lit: No SW download active

#### Button / switch

Position number	Component designator	Description
1	BAT-RESET	Push after empty battery replacement
2	BRAKE-TYPE	VV: Closing fast during emergency stop VD: Closing slow during emergency stop

#### SCCAR



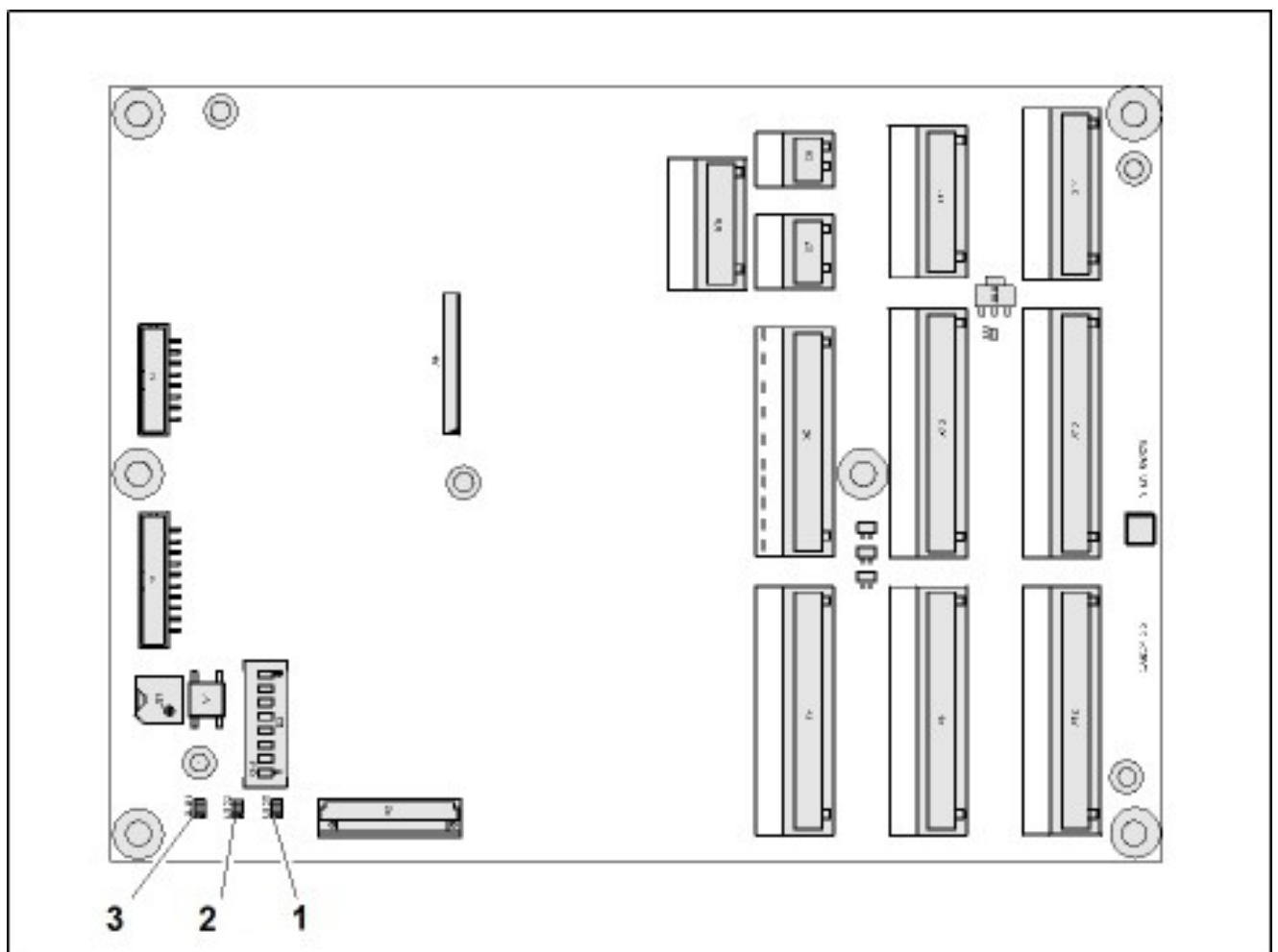
#### LED

Position number	Component designator	Description
n/a	PWR	Lit: Any board supply present (NGL and / or NSG) Not lit: Broad supply is not present (no NGL nor NSG)
n/a	NOK	Lit or blinking: HW error, CPU stuck in bootloader Not lit: No HW error, CPU was able to boot
n/a	DWLD	Blinking: SW download in process Not lit: SW download not in process
n/a	REC	Lit: Recall on
n/a	ISKT5	Lit: Complete safety chain is closed



Position number	Component designator	Description
n/a	CAN1 (lift CAN)	Blinking: CAN communication is on Not lit: No CAN communication
n/a	CAN1 (lift CAN)	Lit or blinking: CAN communication error Not lit: No CAN communication error
n/a	CAN2 (Car CAN)	Blinking: CAN communication is on Not lit: No CAN communication
n/a	CAN2 (Car CAN)	Lit or blinking: CAN communication error Not lit: No CAN communication error
n/a	COP	Lit: COP found
n/a	DOOR	Lit: First DOOR heartbeat found
n/a	2DOOR	Lit: Second DOOR heartbeat found
n/a	LMS1	Lit: LMS frequency signal found
n/a	LMS2	Lit: Second LMS frequency signal found

## CANCPPI



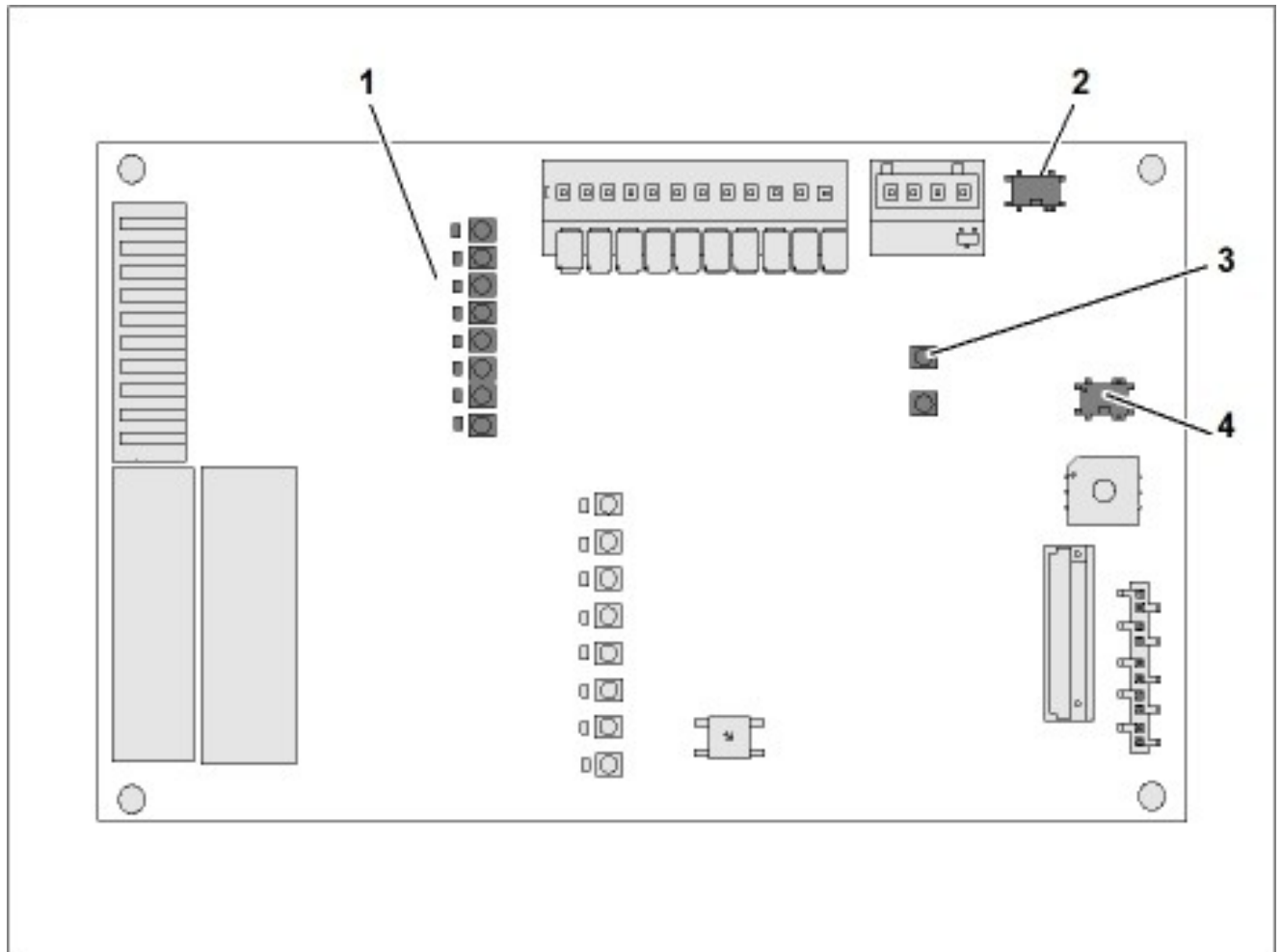
## LED

Position number	Component designator	Description
1	DWLD	Blinking: SW download in process Not lit: SW download not in process
2	WDOG	Blinking: Microcontroller in operation Static lit or not lit: Microcontroller not in operation (error)



Position number	Component designator	Description
3	SUPPLY	Lit: There is a board supply Not lit: There is no board supply

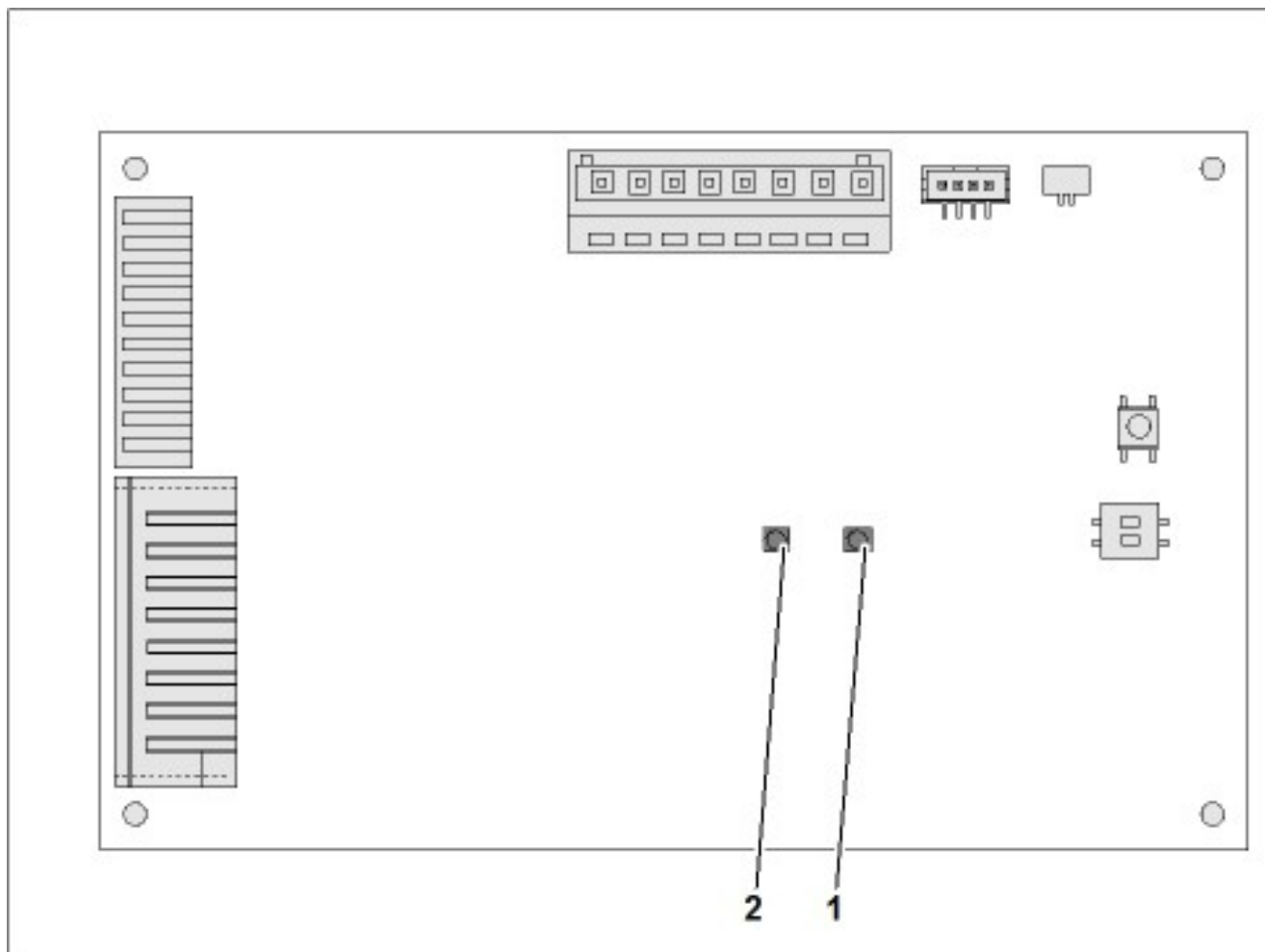
## CANGIO



## LED

Position number	Component designator	Description
1	I1 — I8	Lit: Contact at input is closed Not lit: Contact at input is open
4	O1 — O8	Lit: Output relay is on Not lit: Output relay is not in operation
2	P0	Lit: There is a DC supply Not lit: There is no DC supply
3	CAN	Blinking: CAN communication is on Lit or not lit: CAN communication is not in operation





## LED

Position number	Component designator	Description
1	WDOG	Blinking: Microcontroller in operation Lit or not lit: Microcontroller not in operation (error)
2	P0	Lit: There is a DC supply Not lit: There is no DC supply

## 5.10.2 Maintenance plan

Interval (months)	Description
12	Check of RCBO functionality
12	Check of error log, number of trips and LEDs on HMI
12	Visual inspection of cabinet
12	Check of manual and automatic evacuation
12	Check of all landing door connections to PE
60	Replacement of battery after end of life - control cabinet
60	Replacement of battery after end of life – AESD



### 5.10.3 Check of RCBO functionality

- ▶ Push the emergency button JHM to stop the elevator.
- ▶ Make sure that the main power switches SIS, SIBS and SIL trip.
  - ↳ If the switches do not release, replace the component.
- ▶ Set SIL, SIBS and SIS again.
- ▶ Release the elevator to usual operation.

### 5.10.4 Visual inspection of cabinet

- ▶ Make sure that the cabinet door closes perfectly, to prevent dust from going in.
- ▶ Replace all defective batteries. If the battery LED is not lit, there is a battery with low charge or a defective battery. If the situation continues for more than 1 hour, the battery is defective.
- ▶ For MMR installations, also examine the supply module found in a different cabinet on the MMR wall.

### 5.10.5 Check of evacuation

- ▶ Examine the manual evacuation:
  - Obey the manual (PEBO) evacuation instruction on the label in the cabinet.
- ▶ Examine the automatic evacuation:
  - Obey the automatic evacuation instruction in the embedded documentation.

### 5.10.6 Replacement of battery after end of life – control cabinet

- ▶ In the installation logbook, control the date of installation/replacement of the control cabinet batteries. If the batteries were used more than 60 months, replaced them:
  - Get access to the control cabinet.
  - Put the elevator out of usual service. Refer to the primary owner's manual for instruction.
  - Set JH to OFF.
  - Remove the battery plug on the power PCBA.
  - Disconnect the wires from the battery terminals.
  - Isolate the battery terminals.
  - Loosen the battery retaining strap.
  - Remove the batteries.
  - Install the new batteries.
  - Tighten the battery retaining strap.
  - Reconnect the wiring to the battery terminals.
  - Make sure that there is voltage on the terminals of the battery plug.
  - Make sure that the voltage has the correct polarity, refer to the installation wiring diagram.
  - Connect the battery plug.
  - Set JH to ON.

### 5.10.7 Replacement of battery after end of life – AESD

- ▶ In the installation logbook, control the date of installation/replacement of the control cabinet batteries. If the batteries were used more than 60 months, replaced them:
  - Put the elevator out of usual service. Refer to the primary owner's manual for instruction.
  - Get access to the AESD battery box.
  - Set JH to OFF.
  - Set FU1 and FU2 in the AESD to OFF.
  - Disconnect the wires from the battery terminals.
  - Isolate the battery terminals.
  - Remove the battery brackets.
  - Remove the batteries.
  - Install the new batteries.
  - Install again the battery brackets.
  - Reconnect the wiring to the battery terminals.
  - Set FU1 and FU2 to ON.
  - Set JH to ON.
  - Get off the car roof (if MRL).



## 5.10.8 Error code

Error ID	Error description	Error ID	Error description	Error ID	Error description
0	No event	651	Supply failure cc2	1577	Brake emergency stop data - virgin store detected
1	NormalStop	652	Input contactor failure cc2	1578	Brake emergency stop data - storage mismatch
2	ExceptionMC	653	Charge contactor failure cc2	1579	Brake emergency stop - new block limit calculated
3	NoKSE_STDSTL	654	DL overvolt trigg cc2	1580	Brake emergency stop - undefined data
4	InvldMovement	655	Current difference warn cc2	1581	Brake emergency stop data store recover success
5	SH_on_STDSTL	656	Current loop failure cc2	1582	Brake emergency stop data storage not recover
6	SB_on_STDSTL	657	Overtemperature cc2	1583	Brake emergency stop key entered - initialized
7	SH_Fault	658	External error cc2	1584	Brake emergency stop counter values entered
8	SB_Fault	659	Supply failure cc3	1585	Brake emergency stop - air gap value exceeded
9	KB_Fault	660	Input contactor failure cc3	1586	Brake emergency stop - air gap entered
10	FC_Fault	661	Charge contactor failure cc3	1587	Safety circuit overvoltage at relay
11	FC_Block	662	DL overvolt trigg cc3	1588	Safety circuit undervoltage output
12	DirectionErr	663	Current difference warn cc3	1589	Safety circuit overvoltage output
13	OverSpeed	664	Current loop failure cc3	1590	Safety circuit overcurrent
14	UnderSpeed	665	Overtemperature cc3	1591	Stop override relay 1
15	NoTargetLow	666	External error cc3	1592	SI hoistway image upload failed
16	NoTargetUp	667	Dummy 1	1593	Hoistway access guard fault
17	OverSpeedKSE	668	Dummy 2		SI communication OK
18	NoLowerKSE	669	Dummy 3	1595	SI communication dead
19	NoUpperKSE	700	Memory failure	1596	Overspeed KSE-U
20	PositionLost	701	SW warning	1597	Overspeed KSE-D
21	HigherPrio	702	Communication failure	1598	SI UET command lost
22	MaskErased	703	Overcurrent motor	1599	Traction loss



Error ID	Error description	Error ID	Error description	Error ID	Error description
23	JHC_Pressed	704	IG failure	1600	JREC switch fault
24	JHC1_Pressed	705	Speed difference	1601	JRECC switch fault
25	JHSG_Pressed	706	Speed ref missing	1602	JRH switch fault
26	JHR_Pressed	707	SGRW failure	1603	JACCEN switch fault
27	JHM_Pressed	708	SH failure	1604	JUEKTS switch fault
28	OverTempMotor	709	Safety circuit	1605	JUEKTC switch fault
29	TripBlocked	710	FCR not ready	1606	MBB current difference channel2
30	NewTripBlockd	711	Overcurrent inverter	1607	MBB open timeout current channel2
31	PrepNewDest	712	Power electronic failure	1608	MBB close timeout current channel2
32	PrepClearDest	713	Current difference	1609	SI configuration mismatch
33	RelvNewDest	714	Current not zero	1610	Improve flight time disabled
34	SH_Timeout	715	Current sum failure	1611	Improve flight time failed - safety circuit not closed
35	FC_Timeout	716	Overtemp HS trigger	1612	Improve flight time failed - overtravel
36	Timeout preparing	717	Overtemp HS limit	1613	Improve flight time failed - locking withdrawn
37	CarAtLevel	718	DCL overvoltage trigger	1614	Overspeed drive
38	TargetLost	719	DCL overvoltage	1615	Underspeed drive
39	NoDirRelv	720	DCL undervoltage	1616	Overspeed car
40	NoPHS_Learn	721	DCL unsymmetric voltage	1617	Underspeed car
41	ErrTachoFact	722	DCL charging time	1618	Speed reference limit exceeded
42	LowKSE_Low	723	DCL discharge time	1619	CLC blocked sensor detected
43	LowKSE_Hig	724	Power supply	1620	SI PHNRU wrongly IN fin
44	UpperKSE	725	Overtemp KTHBR	1621	SI PHNRU wrongly OUT fin
45	NoFloorTop	726	Overtemp MH	1622	SI PHNRD wrongly IN fin
46	ErrFloorTop	727	HW failure	1623	SI PHNRD wrongly OUT fin
47	ErrReleveling	728	Phase failure	1624	SI PHNRU tolerance
48	InvldTripType	729	Fan failure	1625	SI PHNRD tolerance
49	ErrFloorCTP	730	FCM failure	1626	SI PHNRU stuck
50	NoDistRelv	731	FCM overtemperature	1627	SI PHNRD stuck
51	ZeroParam	732	Overtemp line choke	1628	Car damping device permanent activated



Error ID	Error description	Error ID	Error description	Error ID	Error description
52	OverflowCTP	733	Mains current difference	1629	FC_Start_Failed
53	NoSTR_Com	734	Mains overcurrent	1630	FC_Preparation_Failed
54	PCT_Checksum	735	Mains phase interruption	1631	Extensive zero speed trip for inverter
55	NoMCR_Com	736	Mains voltage failure	1632	SI PHNR fault
56	CarNoStop	737	UEM detected	1633	SI maximum speed exceeded
57	MCR_NoStop	738	Inverter application error	1634	SI maximum teaching speed exceeded
58	SH_NoStop	739	Unknown MC-PVEC_message	1635	SI outside learned hoistway
59	SingleReset	740	Overspeed	1636	Sync trip aborted
60	DoubleReset	741	Tach loss	1641	SI validation failed
61	RSE1_Fault	742	Reverse tach	1642	MBB voltage difference channel 2
62	RSE2_Fault	743	not_a_number	1643	MBB mains undervoltage channel 1
63	RSE3_Fault	744	overflow	1644	MBB mains undervoltage channel 2
64	PHS_Fault	745	underflow	1645	MBB mains overvoltage channel 1
65	PHNR_D_Fault	746	divide by zero	1646	MBB mains overvoltage channel 2
66	NoGetAnswer	747	Motor overload	1647	MBB overcurrent brake channel 1
67	KUET_Fault	748	Motor field overcurrent	1648	MBB overcurrent brake channel 2
68	SGRB_Fault	749	Contacto fault	1649	MBB watchdog timed out
69	SBNH_Fault	750	1 minute full field	1650	MBB HW test failed channel 1
70	SW_Warning	751	Open armature circuit	1651	MBB hardware fault channel 2
71	SWerror	752	Safety circuit	1652	MBB HW test failed channel 2
72	Safety 110V	753	PAC fault	1653	Safety parking requested
73	Safety SPT	754	DCU CEMF fault	1654	Brake capability test passed
74	Safety KNE	755	PCU CEMF fault	1655	Brake capability test not passed
75	Safety RTS	756	PCU reset	1656	Brake capability test aborted
76	Safety end	757	Loop fault	1657	Motor temperature sensor misconfiguration
77	LM_PrintsErr	758	IST fault	1658	KNE active



Error ID	Error description	Error ID	Error description	Error ID	Error description
78	LM_NoCommiss	759	Power supply	1659	Safety parking config
79	Topt_Fault	760	Line synch	1660	Safety parking failed
80	OverTempMCR	761	Low line	1661	Safety parking released
81	TripV_Tacho	762	Field loss	1662	Maximum releve limit
82	NoSupply12V	763	DCU failure	1663	Brake capability test suspended
83	NoSupply24V	764	Bad thermistor	1664	Safety parking not permitted
84	DMS_Spoiled	765	High temperature	1665	Communication to car lost
85	LM_ComErr	766	Excessive ripple	1666	Communication to car dead
86	RUET_Fault	767	Blown fuse	1667	Communication to car ok
87	RTSC_Fault	768	Shorted doubler	1668	SH OFF run
88	TachoFault	769	Open SCR	1669	SH not ON start
89	TripTimeExp	770	Bad parameter	1670	SH not OFF stop
90	StopOverFault	771	Forcing fault	1671	KV bridged
91	SMPB_Fault	772	AV feedback reversed	1672	KV fault
92	REC / RH HW failure	773	Parameter too high	1673	RTTC fault
93	AccessSwitch	774	Parameter out of range	1674	RTTV fault
94	DoorLockFault	775	Parameter out of range	1675	Safety circuit test tap fault
95	ETSL_Overspeed	776	Bypass fault	1676	Brake test requested
96	ETSL_VaneError	777	Parameter out of range	1677	Safety circuit mismatch
97	ETSL_DeviceError	778	Parameter out of range	1678	Door safety contact bypass device plug input broken
98	COM_Busreconf	779	Parameter out of range	1679	Communication to brake module lost
99	RSK_Fault	780	Field supply fault	1680	BCM block
100	RFE_Fault	781	PCU software fault	1681	UET check delayed
101	RTRT_Fault	800	VD35 base	1682	No UET check
102	RKUET_Fault	809	wCommand unknown	1683	Inspection low speed limit exceeded
103	HighSpeedStop	812	Wrong motion direction	1684	RREC fault
104	CDOOR bypass	821	Door movement too fast	1685	Ascending car overspeed
105	SDOOR bypass	832	wKET-S2 failure	1686	Brake HW test failed channel 1
106	PHASE loss	833	eKET-S2 Short: contact bridged	1687	Brake HW test failed channel 2
107	Pit oil switch	834	wMotor over temperature	1688	SK states inconsistent
108	Over temperature oil	835	eAuto setup failed	1689	MCR speed feedback missing



Error ID	Error description	Error ID	Error description	Error ID	Error description
109	KSE failure	836	wCAN messages too fast	1690	MCR STO safety circuit state not Off
110	Motor overload	837	eLocked position failure	1691	SI internal Log2
111	No floor slowdown	838	eLocking jam	1692	Stopping time expired
112	Pressure switch	839	eUnlocking jam	1694	SI initialization failed
113	Thermistor failure	840	wNGT 24VDC over 5% limit	1695	KNET in non TSD21 system
114	Anti stall failure	841	wNGT 24VDC under 5% limit	1696	TSD21: forbidden car roof action
115	Duty cycle regulation	842	eNGT 24VDC over 10% limit	1697	TSD21: forbidden pit action
116	KLU fault	843	eNGT 24VDC under 10% limit	1698	TSD21: KNET not enabled
117	KLD fault	844	ePower door off	1699	Pit node lost
118	NodeAlive	849	eOver current	1700	Brake capability test info
119	Node dead	850	eOver voltage	1701	Drive block recovery no success
120	Door lock failure	851	eUnder voltage	1999	MAX_EVENTS_EXT
121	Switch fault	852	eDoor drive over temperature	2000	Commissioning phase success
122	KSE fail 2	855	eInternal software	2001	2001
123	EV error	856	eSoftware internal parameter	2002	2002
124	EV shutdown	857	eSensor position	2003	Timeout expired
125	EV event	858	eCAN overrun	2004	2004
126	Wrong hardware	863	eCAN bus off	2005	EEPROM cell spoiled
127	SI_Error	864	eCAN Rx queue overflow	2006	Device not OK
128	LOWER_KSE_LOW_S YNCH	865	eCAN Tx queue overflow	2007	Unknown commissioning command
130	EQ_Midpoint_Fault	867	ePosition following	2008	ADC no effect ADC
130	PCT_Drive_Para	868	eHall sensor	2013	Floor Mismatch
131	SI KNE active	869	eIndex processing	2015	Spoiled LMS type
132	SI ETSL active	870	eEncoder resolution	2017	CMMSS state not OK
133	Inverter para not accepted	874	eHall angle detection	2018	CMMSS parameter not OK
134	NTSD active	875	eSoftware position limit	2019	System not OK
135	DREC_DRH_button	876	ePosition sensor breach	2020	LON TX spoiled
136	Safety bypass	877	eSystem overloaded	2021	LON RX spoiled
137	JHCC_pressed	899	Unknown VD35_essage	2022	LON trouble
138	Brake not set	900	IOH error base	2023	LON PEND trouble
139	Unintended movement found	901	ConfigErr	2030	ADT range error
140	Unintended movement found	902	PIO error	2033	ADT EEPROM Id not OK
141	Safety T1	903	IO table overflow	2064	System unavailable



Error ID	Error description	Error ID	Error description	Error ID	Error description
142	Safety T2	904	IO_Missing	2065	Trip not ready
143	Safety T2A	905	COP configuration error	2066	No trip finish
144	Safety T2B	906	Duplicate_BMK	2100	SI - no error
145	Safety T3	910	COM_Busreconf	2101	SI - no tape available
146	Safety T3A	920	PCT IO section checksum	2102	SI - no magnetic zero
147	Safety T3B	921	PCT parameter section checksum	2103	SI - undefined codeword
148	Safety T4	922	VCOM request	2104	SI - undefined alternative codeword
149	Safety T5	923	VCOM provide	2105	SI - ATAN2 catch fail
150	Max Eevent Id TravelControl	924	Board configuration error	2106	SI - ATAN2 interpolation not available
151	LearnTrip	925	IO_reserve_925	2107	SI - Leaps during position initialization
152	CorrTrip	951	IO_Configuration_Error	2108	SI - Position extrapolated
153	SynchTrip	952	EEP_BurnProbl	2109	SI - Line 0 Swap
154	KS_MagnetPos	953	Deployment_Rule_Failure	2110	SI - line 1 swap
155	KSE_MagnetPos	954	Freeze table invalid entry	2111	SI - too many position extrapolations
156	LearnMesProbl	961	EEP_BurnPrbl	2112	SI - too many undefined codes
157	DeltaS_2BP	970	Timer error	2113	SI - too many invalid ADC sets
158	SF_Fault	971	IO_VCOM telegram mismatch	2114	SI - too many missing tape reports
159	NoBpReaction	1000	Bus error	2115	SI - tape gap too small
160	SK ErrorStart	1001	Address error	2116	SI - tape gap too big
161	CarNotAtLevel	1002	Illegal instruction	2117	SI - UART - no free message
162	CarOutOfFloor	1003	Zero divide	2118	SI - UART - other channel offline
163	TargetFailure	1004	CHK instruction	2119	SI - UART - query overflow
164	FC_ShortBrake	1005	TRAPV instruction	2120	SI - UART - too many NACK
165	FC_StopSpeed	1006	Privilege violation	2121	SI - UART - Too many timeouts
166	SW_BlockPerm	1007	TRACE	2122	SI - UART - RX message incomplete
167	LastBlockTime	1008	Uninitialized Int Vect	2123	SI - UART - cleanup incomplete messages
168	ShaftChecksum	1009	Spurious interrupt	2124	SI - UART - offline cleanup
169	Supply24V	1010	TRAP instruction	2125	SI - UART - buffer overflow



Error ID	Error description	Error ID	Error description	Error ID	Error description
170	FloorPrec	1011	User interrupt vector	2126	SI - UART - index overflow
171	InvDrivePCT	1012	Stuck IRQ	2127	SI - UART - invalid frame
172	InvDriveParam	1013	Task create	2128	SI - test token timeout
200	Door error base	1014	Queue create	2129	SI - WDT test timeout
201	ConfigErr	1015	Operating system RTEMS	2130	SI - buffer under voltage
202	DoorOperErr	1016	New config reset	2131	SI - buffer over voltage
203	ThermoDoorMot	1017	Event handler reset	2132	SI - main supply over voltage
204	DoorRevDevErr	1018	Appl. requested reset	2133	SI - test - relay supply fail
205	DoorContrErr	1019	Memory allocation failure	2134	SI - Test - 2V under voltage detection
206	DoorBoltErr	1020	Line1010 instruction emulation	2135	SI - Test - 2V over voltage detection
207	CloseSeqErr	1021	Line1111 instruction emulation	2136	SI - Test - 3V3 under voltage detection
208	DoorDevErr	1022	HW breakpoint	2137	SI - Test - 3V3 over voltage detection
209	DoorContac	1023	FP protocol violation	2138	SI - Test - 12V under voltage detection
210	Elevator guardian	1024	Format error	2139	SI - Test - 12V over voltage detection
211	COM_Busreconf	1025	Reserved interrupt	2140	SI - Test - 24V under voltage detection
212	Open sequence KOKB	1026	Autovector 1	2141	SI - test - 24V over voltage detection
213	DT-O continuous activation	1027	Autovector 2	2142	SI - RAM check initial fail
214	RPHT continuous activation	1028	Autovector 3	2143	SI - ROM check timeout
215	REP continuous activation	1029	Autovector 4	2144	SI - RAM check timeout
216	KTL continuous activation	1030	Autovector 5	2145	SI - supply switch timeout
217	KSKB continuous activation	1031	Autovector 6	2146	SI - supply switch recovery timeout
218	DT-S continuous activation	1032	Autovector 7	2147	SI - over voltage 3V3
219	RTS continuous activation	1033	FP reserved	2148	SI - under voltage 3V3
220	KOKB continuous activation	1034	FP Br Unord	2149	SI - over voltage 2V
221	Door inverter failure	1035	FP inexact result	2150	SI - under voltage 2V
222	Door drive inspection active	1036	FP div zero	2151	SI - over voltage system-supply



Error ID	Error description	Error ID	Error description	Error ID	Error description
223	Door locking jam	1037	FP underflow	2152	SI - under voltage system-supply
224	Door un-locking jam	1038	FP operand error	2153	SI - over voltage 24 V
225	RPHT no activation	1039	FP overflow	2154	SI - under voltage 24V
226	RPHT recovered	1040	FP signaling NAN	2155	SI - invalid memory item
227	Door node communication lost	1041	FP unimplemented DataType	2156	SI - memory mirror timeout
228	Door node dead	1042	MMU reserved	2157	SI - memory mirror timeout - device state
229	Missing request response	1043	MMU config error	2158	SI - memory mirror timeout - wanted device state
230	DT-O malfunction warning	1044	MMU illegal operation	2159	SI - memory mirror timeout - functional state
231	Door recovery no success	1045	MMU access level violation	2160	SI - memory mirror timeout - raw position
240	SW-Warning	1046	TPU interrupt	2161	SI - memory mirror timeout - output KNE
251	Door command timeout	1047	SCI interrupt	2162	SI - memory mirror timeout - output ETSL
252	Door unavailable	1048	SPI interrupt	2163	SI - memory mirror timeout - output UET
253	Door wrong response	1049	CPM interrupt	2164	SI - memory mirror timeout - button
254	Floor zone not available	1050	External H reset	2165	SI - memory mirror timeout - RINS
255	Floor weight not available	1051	PowerUpReset	2166	SI - memory mirror timeout - KTCC
256	Out of floor zone	1052	Watchdog reset	2167	SI - memory mirror timeout - 2KTCC
260	Reserve_Error_260	1053	DoubleBusFaultReset	2168	SI - memory mirror timeout - HINS
261	Door position recovery failure	1054	ClockLossReset	2169	SI - memory mirror timeout - ROM CRC
271	Door command failure	1055	External S-reset	2170	SI - memory mirror timeout - floorimage CRC
300	CTR_PAR_ACCESS	1056	BErr released write	2171	SI - memory mirror timeout - UET state
301	CTR_CALC	1057	BErr prefetch	2172	SI - memory mirror timeout - tape gap



Error ID	Error description	Error ID	Error description	Error ID	Error description
302	TRC_PAR_ACCESS	1058	BErr operand read	2173	SI - memory mirror timeout - wanted output ETSL
303	TRC_POS_ERR	1059	BErr operand write	2174	SI - memory mirror timeout - wanted output over
304	TRC_CALC	1060	BErr MoveMultiple	2175	SI - memory mirror timeout - wanted output UET
305	OS_CYCLE_OVERRUN	1061	BErr exception processing	2176	SI - memory mirror timeout - wanted output KNE
306	PAR_NOVRAM_MISSING	1062	Dead task	2177	SI - memory mirror timeout - inspection state
307	HW_PAR_ACCESS	1063	Group24vFail	2178	SI - memory mirror timeout - AC speed limit
308	HW_POSITION	1064	Lift24vFail	2179	SI - memory mirror timeout - floor tolerance
309	HW_POSREF	1065	12vPowerFail	2180	SI - memory mMirror timeout - battery sleep flag
310	HW_DRV_SERIOUS	1066	BatteryCharging	2181	SI - memory mirror timeout - standby sleep flag
311	DRIVE_OVER_TEMP	1067	BatteryLow50	2182	SI - memory mirror timeout - test state
312	HW_FLASH_READ	1068	BatteryLow25	2183	SI - floor image full
313	HW_FLASH_WRITE	1069	BatteryDeadOrMissing	2184	SI - floor side invalid
314	HW_WATCHDOG	1070	LiftIdSwitchInvalid	2185	SI - floor adjustment too huge
315	IAC_MOD_UPD_FAIL	1071	MissingEB	2186	SI - floor adjustment unknown floor
316	IAC_PAR_UPD_FAIL	1072	Saved registers	2187	SI - floor image erased
317	IAC_UNKNOWN_LEVEL	1073	ManualDoubleReset	2188	SI - UART - invalid message delivered
318	IAC_DOOR_TYPE_UNKNOWN	1074	Init NVRAM	2189	SI - Unknown special librarian item
319	IAC_CLUTCH_FAILURE	1075	Bad_SIMM Memory	2190	SI - IO - generic failure
320	ESTIMATED_CONSTRUCT_DATA	1076	CPLD_Programmed	2191	SI - IO dynamic active - ETSL
321	ESK_INTERNAL	1077	OS fault	2192	SI - IO dynamic active - over
322	ESK_PARAM_WRITE	1078	OS restriction failure	2193	SI - IO dynamic active - UET



Error ID	Error description	Error ID	Error description	Error ID	Error description
323	ESK_PARAM_READ	1079	Appl restriction failure	2194	SI - IO dynamic active - KNE
324	ESK_COMMUNICATION_ERR	1080	BKPT BGND	2195	SI - IO dynamic passive - ETSL
325	VLON_INTERNAL	1081	Page fault on instruction fetch	2196	SI - IO dynamic passive - over
326	VLON_TRANSMIT	1082	Page fault on operand read	2197	SI - IO dynamic passive - UET
327	VLON_RECEIVE	1083	Page fault on operand write	2198	SI - IO dynamic passive - KNE
328	EMERGENCY	1084	Bus error read protection	2199	SI - IO dynamic active drift - ETSL
329	NORMAL_RESET	1085	Bus error write protection	2200	SI - IO dynamic active drift - over
330	EST_LRACCU_OVERFL	1086	Bus tenure	2201	SI - IO dynamic active drift - UET
331	BLOCKED_OPENING_DIRECTION	1087	Date time first init	2202	SI - IO dynamic active drift - KNE
332	BLOCK_CLOSE_DIRECTION	1088	File operation interrupted	2203	SI - IO dynamic passive drift - ETSL
333	SLV70_OBSTACLE_DETECT	1089	Init FLASH (file system)	2204	SI - IO dynamic passive drift - over
334	SLV70_RESULT_RANGE	1090	ManualResetPress	2205	SI - IO dynamic passive drift - UET
335	IAC_CLUTCH_WARNING	1091	Shutdown timeout	2206	SI - IO dynamic passive drift - KNE
336	DRIVE_OVER_TEMP_WARNING	1092	SW update reset	2207	SI - IO static active - ETSL
337	HOLDING_FORCE_AT_CLOSED_POSITION	1093	RemoteInitiatedReset	2208	SI - IO static active - over
338	Reserve_8	1094	Configuration restore	2209	SI - IO static active - UET
339	Reserve_9	1095	ManualResetLongPress (hard reset)	2210	SI - IO static active - KNE
340	Reserve_10	1096	Cleared persistent application data and flags	2211	SI - IO static passive - ETSL
341	Reserve_11	1097	FLASH replacement needed (File System)	2212	SI - IO static passive - over
342	Reserve_12	1200	LON error base Id	2213	SI - IO static passive - UET
343	Reserve_13	1201	PowerUpReset	2214	SI - IO Static Passive - KNE
344	Reserve_14	1202	Exception68332	2215	SI - IO SSR test invert timeout - UET
345	Reserve_15	1203	ExtReset	2216	SI - IO SSR test reverse timeout - UET
399	Unknown VD70_Message	1204	DeadTask	2217	SI - IO SSR test invert timeout - KNE



Error ID	Error description	Error ID	Error description	Error ID	Error description
400	No_Error	1205	WdogReset	2218	SI - IO SSR test reverse timeout - KNE
401	VCOM node connected	1206	MysteryReset	2219	SI - IO SSR feedback - KNE
402	VCOM node disconnected	1207	NiInitFail	2220	SI - IO SSR feedback - UET
403	PowerUp	1208	NewNodeFound	2221	SI - timeout wakeup - battery
404	Start monitor expired	1209	Missing node	2222	SI - Timeout wakeup - standby
405	Permanent active call	1210	NiErrLogged	2223	SI - timeout device state
406	ExceptionMC	1211	NodeErrLogged	2224	SI - EEPROM - operation fail
407	COM bus stress	1212	SvcPinEvent	2225	SI - EEPROM - format wrong
408	PIOL_ConfErr	1213	NiReset	2226	SI - EEPROM - invalid floor image
409	COM_Bus Reconfiguration	1214	DupLocID	2227	SI - wrong hardware
410	PIO-Error	1215	NiErrCounter	2228	SI - invalid ratio - free-running
411	ARA-Service	1216	DiffCksGP_Konf	2229	SI - invalid ratio - millisecond
412	KTHM-Service	1217	DiffCksIO_Konf1	2230	SI - invalid ratio - main
413	TAB-Service	1218	TmoCksGP_Konf	2231	SI - invalid call count - free-running
414	SDU-Service	1219	TmoDatGP_Konf	2232	SI - invalid call count - Millisecond
415	SID alive	1220	TmoCksIO_Konf	2233	SI - invalid call count - main
416	SID dead	1221	TmoDatIO_Konf	2234	SI - invalid call Ssequence - free-running
417	Reserve_Error_417	1222	DnLdGP_Konf	2235	SI - invalid call sequence - millisecond
418	IO Subsys_checksum error	1223	DnLdIO_Konf	2236	SI - invalid call sequence - main
419	ParamGrp checksum error	1224	CksErrGP_Konf	2237	SI - invalid confirmation - adjustment
420	SCT/PCT-Checksum	1225	CksErrIO_Konf	2238	SI - invalid confirmation - battery handling
421	Invalid parameter value	1226	DoubleReset	2239	SI - invalid confirmation - ETSL
422	FLASH failure	1227	HWisLCTRL	2240	SI - invalid confirmation - ETSL2
423	PCT define	1228	NiNoInAppBuf	2241	SI - invalid confirmation - KNE



Error ID	Error description	Error ID	Error description	Error ID	Error description
424	Parameter missing	1229	NiNoInNetBuf	2242	SI - invalid confirmation - learning
425	SCT/PCT write error	1230	PmipNoOutQ	2243	SI - invalid confirmation - LUET
426	Wrong SBT data	1231	PmipIqOverflow	2244	SI - invalid confirmation - NTSD
427	Wrong SCT data	1232	SubsystemStart	2245	SI - invalid confirmation - overspeed
428	End monitor expired	1233	SybsystemDead	2246	SI - invalid confirmation - AC overspeed
429	Chip card general error	1234	VcomUpcall	2247	SI - invalid confirmation - standby handling
430	Chip card general warning	1235	KonfWipe	2248	SI - invalid confirmation - strange place
431	Chip card general event	1236	CadiReset	2249	SI - invalid confirmation - UET
432	Chip card expansion done	1237	VcomAllDied	2250	SI - invalid confirmation - UCM
433	Chip card not valid	1238	KonfTableFull	2251	SI - invalid confirmation - librarian
434	SCT expansion	1239	TelTrap	2252	SI - invalid confirmation - CPU check
435	Invalid SCT	1240	LonDistQFull	2253	SI - invalid confirmation - floor detection
436	Reserve_Error_436	1241	LonPupXON	2254	SI - invalid confirmation - functional state
437	Reserve_Error_437	1242	LonDownNACK	2255	SI - invalid confirmation - HMI
438	Reserve_Error_438	1243	FreezeFailed	2256	SI - invalid confirmation - IO abstract
439	Reserve_Error_439	1244	No response critical node	2257	SI - invalid confirmation - IO abstract pin
440	Invalid parameter access	1245	LON error debug	2258	SI - invalid confirmation - IO abstract direct
441	Invalid telegram data	1246	LonErr46	2259	SI - invalid confirmation - IO abstract NTST
442	Invalid telegram attribute	1247	LonErr47	2260	SI - invalid confirmation - IO abstract SAFE
443	Invalid telegram ID	1248	LonErr48	2261	SI - invalid confirmation - IO filter



Error ID	Error description	Error ID	Error description	Error ID	Error description
444	Invalid telegram group	1249	NodePowerFail	2262	SI - invalid confirmation - IO handler SI - invalid confirmation - IO handler
445	Invalid elevator number	1250	BIO2_ISR_Initialisation_Error	2263	SI - invalid confirmation - IO handler pin
446	Reserve_Error_446	1251	BIO2_ISR_Buffering_Error	2264	SI - invalid confirmation - parameter
447	Reserve_Error_447	1252	BIO2_ISR_Queueing_Error	2265	SI - invalid confirmation - position
448	Reserve_Error_448	1253	BIO2_ISR_Communication_Error	2266	SI - invalid confirmation - RAM check
449	PCT config error	1254	BIO2_ISR_Busmaster_Error	2267	SI - invalid confirmation - ROM check
450	Parameter configuration error	1255	BIO2_spare	2268	SI - invalid confirmation - runtime monitor
451	IO configuration error	1256	BIO2_Reserve_1256	2269	SI - invalid confirmation - stack check
452	SCT/PCT read error	1257	BIO2_Reserve_1257	2270	SI - invalid confirmation - state machine
453	Timer table overflow	1258	BIO2_Reserve_1258	2271	SI - invalid confirmation - token handler
454	Totals log overflow	1259	BIO2_Reserve_1259	2272	SI - invalid confirmation - translator
455	Unknown task id	1260	BIO2 queue failure	2273	SI - invalid confirmation - voltage supervision
456	CT download_successful	1261	BIO2 requestor failure	2274	SI - invalid confirmation - diagnostic
457	Reserve_Error_457	1262	BIO2 dispatcher failure	2275	SI - invalid confirmation - self monitor slow
458	Reserve_Error_458	1263	BIO2 missing node	2276	SI - invalid confirmation - self monitor fast
459	Reserve_Error_459	1264	BIO2 node alive again	2277	SI - invalid confirmation - UART postmaster
460	VCOM Init	1265	BIO2 No_Address_Left	2278	SI - invalid confirmation - CAN Tx
461	VCOM open	1266	BIO2 No_supported_Protocol	2279	SI - invalid confirmation - CAN Rx
462	VCOM close	1267	BIO2 multiple node on address	2280	SI - invalid confirmation - UART handler



Error ID	Error description	Error ID	Error description	Error ID	Error description
463	VCOM provide	1268	BIO2 multiple BIOGIO nodes	2281	SI - invalid confirmation - memory external
464	VCOM unprovide	1269	BIO2 nodes manually cleared	2282	SI - invalid confirmation - memory solid
465	VCOM request	1300	CAN error base Id	2283	SI - invalid confirmation - memory single
466	VCOM unrequest	1301	CAN missing node	2284	SI - invalid confirmation - memory mirror
467	VCOM send	1302	CAN node alive again	2285	SI - invalid confirmation - memory manager
468	VCOM pend	1303	CAN node SW download failed	2286	SI - invalid confirmation - FIT
469	VCOM get	1304	CAN	2287	SI - invalid confirmation - inspection handler
470	VCOM accept	1305	CAN duplicate node found	2288	SI - invalid confirmation - inspection overspeed
471	VCOM reply	1306	CAN dynamic node ID configuration error	2289	SI - invalid confirmation - test state handler
472	VCOM queue overflow	1307	CAN node configuration failed	2290	SI - invalid confirmation - IO abstract SSR
473	VCOM table full	1308	CAN GC controller error	2291	SI - invalid confirmation - acceleration
474	VCOM comms queue full	1309	CAN GC controller bus off	2292	SI - invalid confirmation - kalman
475	Too much bus reconfiguration	1310	CAN GC controller bus warning	2293	SI - invalid confirmation - kinematic supervision
476	Elevator operation interrupted	1311	CAN peripheral controller bus off	2294	SI - invalid confirmation - undefined task
477	Elevator operation resumed	1312	CAN LSS no node Id left	2295	SI - CAN - BusOff
478	OVERLAY failure	1313	UnexpectedNodeStateChange	2296	SI - CAN - warning limit reached
479	Reserve_Error_479	1401	SW_Event	2297	SI - CAN - passive error send
480	No modem	1402	SW_Warning	2298	SI - CAN - passive error receive
481	Modem present	1403	SW_Error	2299	SI - floordetection - front NACK
482	Modem calling	1404	VarOutOfRange	2300	SI - floordetection - rear NACK



Error ID	Error description	Error ID	Error description	Error ID	Error description
483	Modem answering	1405	JHC_Pressed	2301	SI - floordetection - front response compare
484	Modem online	1406	JHM_Pressed	2302	SI - floordetection - rear response compare
485	Modem error	1407	JHSG_Pressed	2303	SI - floordetection - no space to publish front (B)
486	Modem line busy	1408	Supply24V_OFF	2304	SI - floordetection - no space to publish rear (B)
487	Modem no dialtone	1409	DriveLocked	2305	SI - floordetection - no pace to publish front (A)
488	Modem no carrier	1410	UnknownFloor	2306	SI - floordetection - no space to publish rear (A)
489	Modem delayed	1411	SF_Fault	2307	SI - floordetection - use default flag attributes
490	Table_Overflow	1412	SF1_Fault	2308	SI - floordetection - not all flag points
491	User level 3 disabled	1413	KB_Fault	2309	SI - inspection signal - HINS-RINS mismatch
492	User level 3 reenabled	1414	ShaftChecksum	2310	SI - test state handshake failed
493	Low building sway active	1415	StartFailed	2311	SI - ACC sensor - read timeout
494	Medium building sway active	1416	TargetFailure	2312	SI - ACC sensor - No noise
495	High building sway active	1417	CarNotAtLevel	2313	SI - ACC sensor - no active connection
496	Building sway deactivated	1418	CarOutOfFloor	2314	SI - ACC sensor - offset out of range
497	Ins IO missing	1419	KSE_Int_Fail	2315	SI - emergency state
498	Group 24VDC Fail	1420	KS_MagnetPos	2316	SI - UCM detection
499	Lift 24VDC Fail	1421	KSE_MagnetPos	2317	SI - emergency state boot
500	12VDC power fail	1422	KS_Bounce	2500	Drive ext error base Id
501	Control battery charging	1423	KSE_Bounce	2501	Brake SB contact stuck at inactive position



Error ID	Error description	Error ID	Error description	Error ID	Error description
502	Control battery charge low	1424	SynchFailed	2502	Brake SB1 contact stuck at inactive position
503	Control battery charge very low	1425	IO_NotPresent	2503	Brake SB contact stuck at active position
504	Control battery dead / missing	1426	VF_Notstop	2504	Brake SB1 contact stuck at active position
505	Control battery charge time expired	1427	DeltaS_2BP	2505	Brake finds AC frequency other than 50/60Hz
506	PEBO battery charge Low	1428	TEL_Request	2506	Brake opening aborted due to under-voltage
507	Building sway detection device error	1429	TEL_Provide	2507	AC input voltage out of range
508	WAD-service	1430	TEL_Reply	2508	Pre-opening aborted, safety circuit is open
509	Group master conflict	1431	TEL_Get	2509	Safety circuit mismatch
510	TM stress warning limit exceeded	1432	TEL_ReadQueue	2510	KSB/KSB1 error, contact inactive
511	TM stress maximum limit exceeded	1433	TEL_VCOMopen	2511	KSB/KSB1 error, contact active
512	TM aging warning limit exceeded	1434	Unknown_TEL	2512	No fast close on MGB (1)
513	TM aging maximum limit exceeded	1435	No_ANT_PCT (Not Used)	2513	MGB (1) Feedback error, FW diode stuck open
514	TM defect steel cord in coated traction media	1436	No_VF20_PCT	2514	MGB (1) Feedback error, MGB transistor stuck open
515	Flash write hoistway image	1437	OverTempMotor	2515	MGB (1) Ffeedback error, MGB or FW not closed
516	TM virgin store detected	1438	NoIncrement	2516	MGB (1) feedback error, MGB or FW not open
517	TM reference key mismatch	1439	InvldMovement	2517	Brake type selection mismatch
518	TM mismatch but same reference key	1440	OverSpeed	2518	Oversped DVB released during activation
519	TM undefined data	1441	OverSpeedKSE	2519	Oversped DVB released during reset
520	Chip card missing	1442	DirectionErr	2520	Control battery charge stopped, temp. out-of-range
521	TM aging clock warning	1443	DirNotAllowed	2521	Control battery charge stopped, Charg.Curve fail
522	TM aging clock error	1444	PosLost_Tacho	2522	Control battery wrong type found



Error ID	Error description	Error ID	Error description	Error ID	Error description
523	TMaging clock failure recovered	1445	PosLost_KS	2523	Control battery charge stage 1 time-out
524	PEBO device failure	1446	PosLost_KSE	2524	15V out-of-range
525	TMdata storage recovery successful	1447	FloorPrec	2525	MGB(1) feedback error, the two FW diodes inactive
526	TMdata storage recovery failed	1448	RSK_Fault	2526	MGB(1) overcurrent found
527	PEBO battery and device OK	1449	RSK1_Fault	2527	Heartbeat lost
528	SDU critical rope stretch	1450	TIF_WriteErr	2528	HW/SW is not compatible
529	SDU inadmissible rope stretch	1451	TIF_ReadErr	2529	Controller battery no test load current
530	Group 24VDC ok	1452	NoStartOK	2530	JEM knob is missing
531	Lift 24VDC ok	1453	SK ErrorStart	2531	Command sequence is not valid
532	12VDC power ok	1454	SK ErrorRun	2532	Control battery no config present
533	Control battery ok and charged	1455	SynchTrip	2533	Control battery config error
534	534	1456	LearnTrip	2534	AES interruption event
535	Group comm transmit (Tx) stress	1457	CorrTrip	2535	Booster DC voltage too low
536	Group comm receive (Rx) overflow	1458	Inv_VF20_PCT	2536	ISHE contact stuck
537	Group comm offline	1459	Inv_BMG_Param	2537	Booster temperature too high
538	TM installation data entered	1460	LastBlockTime	2538	IRM contact stuck
539	TM stress count entered	1461	LearnFailed	2539	IRI contact stuck
540	AEDS battery charge low	1462	LearnMesProbl	2549	Unknown nnPOW_Message
541	AEDS battery OK	1463	TEL_Send	4001	4001
542	VCOM ID conflict	1464	NoBpReaction	5000	No error
543	Overspeed governor rope tension LOW	1465	Jump_Tacho	5002	No physical data connection to control center
544	EAQ operation activated	1466	SK_Bridging	5003	Data line to control center busy
545	EAQ operation de-activated	1467	PosLost_IUET	5004	No logical data connection to control center
546	Traction media 1 broken	1468	Supply24VOn	5005	Max data connection attempts to control center
547	Traction media 2 broken	1469	VF20_Blocked	5006	Max data connection time to control center exceed



Error ID	Error description	Error ID	Error description	Error ID	Error description
548	Traction media 3 broken	1470	Safety110V	5007	Data communication device dead
549	Traction media 4 broken	1471	SafetySPT	5008	Data communication device alive
550	Traction media 5 broken	1472	SafetyKNE	5009	Data communication device faulty
551	Traction media 6 broken	1473	SafetyRTS	5011	Data communication device intrusion detection
552	Traction media 7 broken	1474	SafetyEnd	5012	Data communication device in use
553	Traction media 8 broken	1475	SW_BlockPerm	8000	Alarm error base
554	Traction media 9 broken	1476	DataDestroyed	8009	Alarm device is off hook
555	Traction media 10 broken	1477	VF_StartError	8010	Alarm device is on hook
556	Building sway manual override	1478	VF_ShortBrake	8011	Car alarm test enabled
557	KEF input of AES device broken	1479	VF_StopSpeed	8012	Car alarm test started
558	OEM policy disabled	1500	Travel control ext error base Id	8013	Car alarm test end
559	OEM policy status undefined	1501	Invalid car position	8014	Car alarm test disabled
560	OEM order data mismatch for OEM never enable	1502	Position jump	8017	Main switch JH off
561	Invalid TMM configuration	1503	SI_Sensor_Defect	8018	Mains power (UN) failed
562	Parameter length different	1504	Safety T6	8019	Car emergency light defect
563	Parameter type different	1505	Invalid floor position during trip	8020	Car emergency light ok
564	OEM policy status disabled	1506	Invalid floor position in standstill	8021	Hoistway/top-of-car temperature is ok
565	OEM policy status enabled not active	1507	KB ON standstill	8022	Hoistway/top-of-car temperature out of range
566	OEM policy status enabled active	1508	KB not ON start	8025	Electrical indicators COP failed
567	OEM policy status never enable	1509	KB OFF run	8026	Electrical indicators LOP failed
568	HW change	1510	KB not OFF stop	8028	Automatic self test trip triggered
569	Config backup	1511	Broken traction media	8030	EC cabinet temperature ok
570	CPU discovery timed out	1512	SI communication lost	8031	EC cabinet temperature out of range



Error ID	Error description	Error ID	Error description	Error ID	Error description
571	SI standby wake-up failed	1513	SI UET device fault	8032	Main switch JH on
572	Date/time set or adjusted	1514	SI floor device fault	8033	Mains power (UN) ok
573	TM retainer failure	1515	SI internal log	8034	Car alarm test failed
574	Car lighting low warning	1516	No target lower KSE slowdown	8035	Car alarm test ok
575	Car lighting broken	1517	No target upper KSE slowdown	8036	Electrical indicators COP ok
576	Car lighting OK	1518	JNH active	8037	Electrical indicators LOP ok
577	Car lighting calibration missing	1519	Bypass plug conflict	8038	Daily test not performed
578	Car lighting calibration failed	1520	Door bypass recall	8039	Hoistway/top-of-car temperature sensor broken/missing
579	Global timeout of recovery/unavailable status	1521	SI teach-in mode	8040	Top-of-car emergency light defect
580	Emergency car lighting calibration missing	1522	SI ETSL device fault	8041	Top-of-car emergency light ok
581	Emergency car lighting calibration failed	1523	SI KNE device fault	8043	Car alarm test deactivated
599	LC_MAX_Errors_LC	1524	CAN Sync send	9000	Out-of-Service
600	Attempt to start not allowed	1525	CAN controller	9001	Passenger travel operation
601	Attempt to restart not allowed	1526	ZSB fault	9002	Independent operation
602	Overtemperature	1527	KTS bridged	9003	Fire recall operation
603	SW warning	1528	KTC bridged	9004	Firefighter operation
604	DL overvolt trigg	1529	RCAM fault	9005	Emergency power operation
605	DL overvolt	1530	RTC fault	9006	Earthquake operation
606	DC link undervoltage	1531	RTS fault	9007	Emergency operation
607	Control hardware command wrong	1532	KTS fault	9009	Water In pit operation
608	Charging DC link failure	1533	KTC fault	9010	Passenger attendant operation
609	Discharging DC link failure	1534	Door state fault	9011	Passenger travel operation without load monitoring
610	Current loop not OK	1535	KTS/KTC bridged	9012	Passenger release travel operation
611	Deactivate current loop failure	1536	Invalid SI lash	9014	Building emergency power recall operation



Error ID	Error description	Error ID	Error description	Error ID	Error description
612	Input contactor failure	1537	SI commission number not matching	9015	Priority travel operation
613	Charge contactor failure	1538	SI mismatch of number of stops	9016	Hospital emergency travel
614	Current difference warning	1539	CLC zero load calibration frequency failed	9017	Building sway operation
615	SW IG warning	1540	CLC reference load calibration frequency failed	9018	Building emergency power operation
616	Over current warning	1541	CLC continuous adjustment not successful	9021	Occupant evacuation operation
617	Over speed warning	1542	CLC no signal from sensor	9022	Sabbath operation
618	Start direction wrong	1543	CLC invalid signal from sensor	9029	Move around service
619	Speed reference warning	1544	UET bridged	9039	Overload service
620	Time control motor exceeded	1545	SB ON standstill	9044	Out-of-Service from remote
621	Receive UART failure	1546	SB not ON start	9045	Out-of-Service due to TMM failure
622	Message source failure	1547	SB OFF run	9046	Technical Out-of-Service due to critical IO
623	Message length failure	1548	SB not OFF stop	9050	Service technician visit
624	Receive state wrong	1549	RB ON standstill	9051	Installation travel operation
625	Transmit state wrong	1550	RB not ON start	9052	Configuration operation
626	EPROM checksum failure	1551	RB OFF run	9053	Machine room inspection
627	RAM failure	1552	RB not OFF stop	9054	Top-of-car inspection operation
628	Board battery failure	1553	Load measuring functions disabled	9055	In-Car inspection operation
629	RAM checksum failure	1554	Load measuring functions enabled	9056	Hoistway access operation
630	Watchdog failure	1555	MBB open timeout current	9057	Test travel operation
631	Transmit failure	1556	MBB close timeout current	9059	Learning travel operation
632	Open safety circuit	1557	MBB IGBT3 fault	9060	Inspection preparation travel
633	HW IG warning	1558	MBB hardware fault	9065	Hoistway pit inspection operation
634	Exception vector	1559	MBB current difference	9066	Hoistway pit emergency recall operation
635	Contactor time exceeded	1560	MBB mains not Off	9070	Elevator unavailable

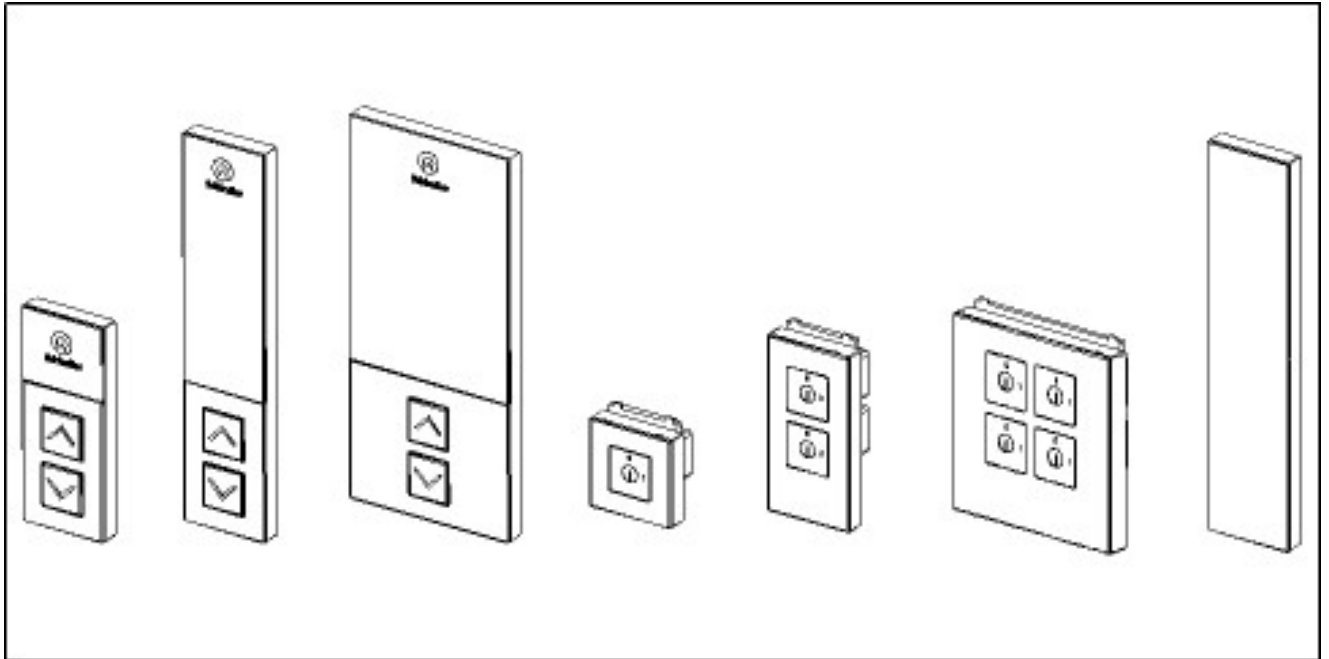


Error ID	Error description	Error ID	Error description	Error ID	Error description
636	Driver print power failure	1561	MBB IGBT1 fault	9071	Elevator temperature recovery
637	Over-temperature brake resistor	1562	MBB voltage difference	9072	Car position recovery
638	FCR no start	1563	Landing door opened not permitted	9077	Safety parking operation
639	FCR no stop	1564	LUET off at floor	9080	Stop switch pressed
640	FCR interrupt	1565	UET circuit failed	9088	Static safety circuit open
641	External error	1566	KTS/KTC fault	9091	Elevator CPU startup
642	PCC failure	1567	INSP cmd to ACUM failure	9095	Mains power off
643	Supply failure cc1	1568	KNE KPG bypass activated	9098	Elevator temporary breakdown
644	Input contactor failure cc1	1570	Car damping device activation failure	9099	Elevator permanent breakdown
645	Charge contactor failure cc1	1571	Car damping device deactivation failure	9200	Service change
646	DL overvolt trigg cc1	1572	CLC continuous adjustment exceeded	9201	Maintenance message cleared
647	Current difference warn cc1	1573	SI verification trip failed	9202	Service tool connected
648	Current loop failure cc1	1574	Safety circuit bridged	9203	Assisted acceptance test executed
649	Overtemperature cc1	1575	Brake emergency stop warning limit exceeded	9204	Diagnostic snapshot taken
650	External error cc1	1576	Brake emergency stop blocking limit exceeded		



## 5.11 Fixtures FI GS

### 5.11.1 Overview



### 5.11.2 Maintenance plan

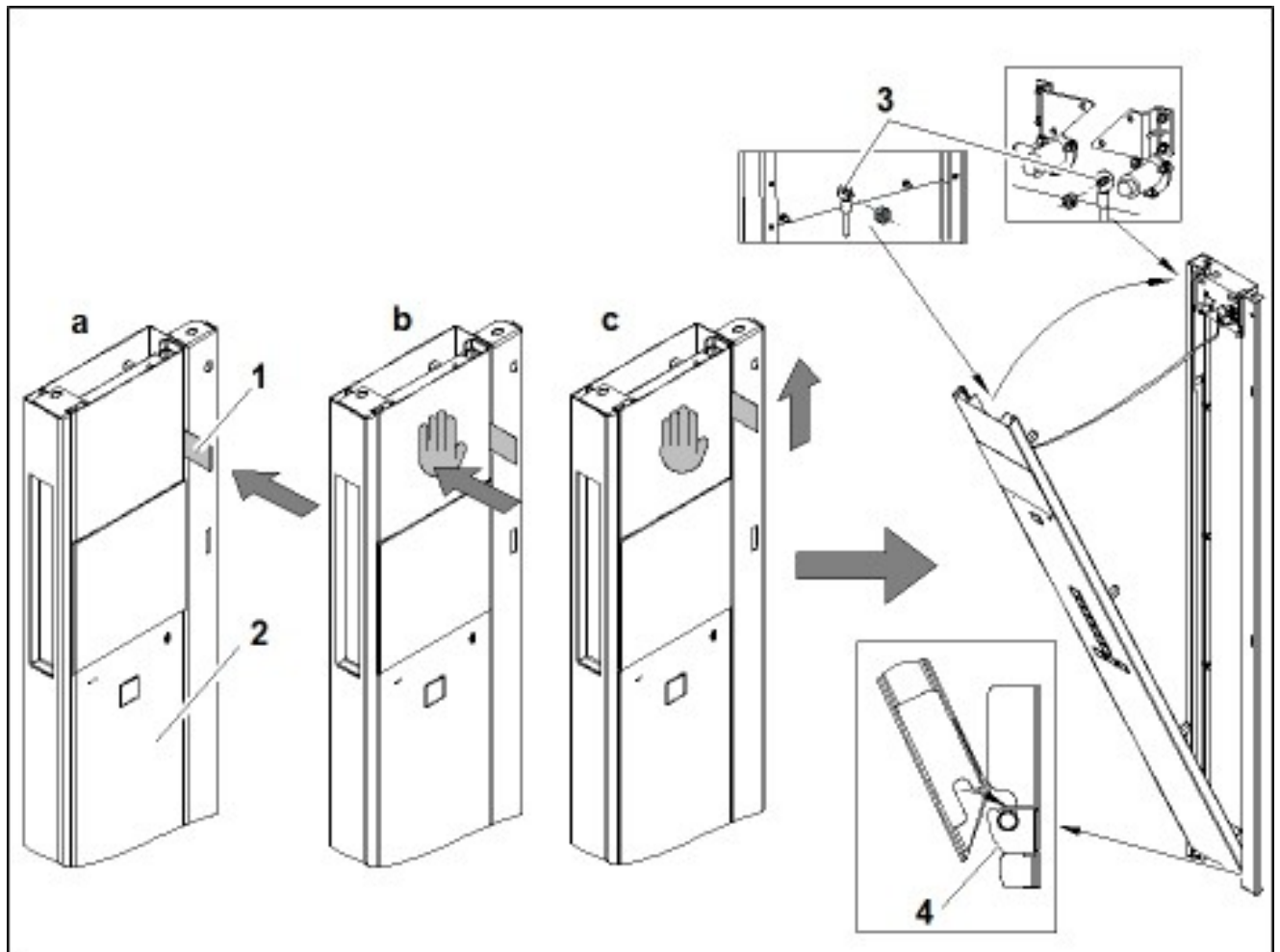
Interval (months)	Description
12	External visual checks, function checks and cleaning
12	Internal visual checks, function checks and cleaning

### 5.11.3 External visual checks, function checks and cleaning

- Examine the overall condition of all fixtures.
- Make sure that all fixtures are tight.
- Examine the condition and function of the push buttons and indicators. If necessary, replace.
- Make sure that the fixtures are clean and use a dry cloth or brush if necessary.



#### 5.11.4 Opening of COP

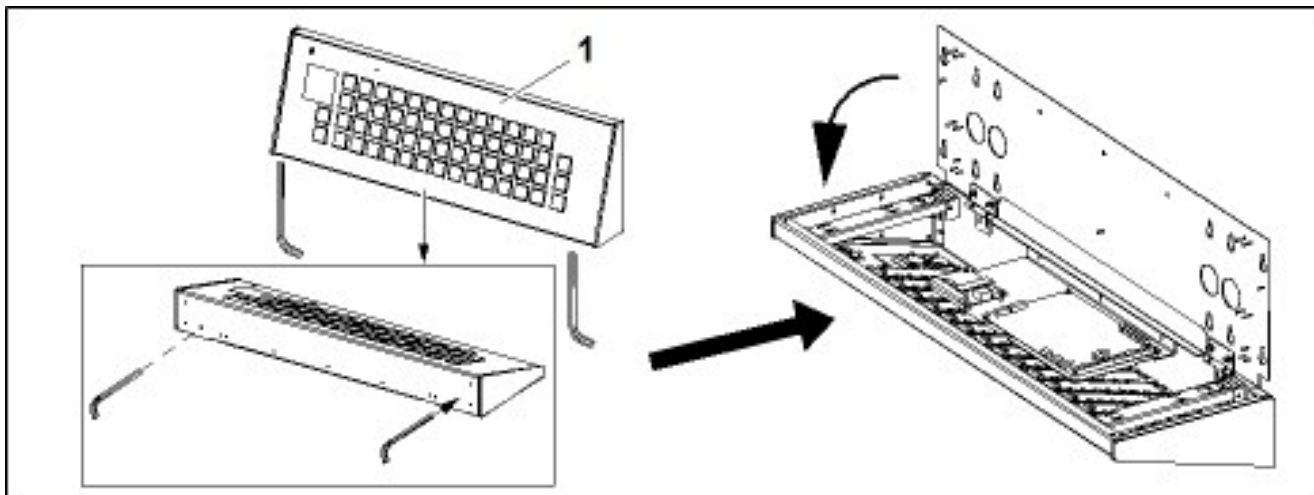


- |   |                                  |   |                        |
|---|----------------------------------|---|------------------------|
| 1 | Plastic card                     | 2 | COP                    |
| 3 | COP holding card fixation points | 4 | COP bottom hinge point |

- Get a plastic card, like an identification card, and put it into the clearance between the COP and the car wall on the right side.
- Push the COP with a little force, move the card up and feel that the card engages the release mechanism.
- Move the card up to unlock the mechanism.
- The COP is spring-loaded and opens 3 ... 5 mm when the mechanism is unlocked. The COP is held with magnetic strips. To open the COP, pull at the top edge.
- After the COP is unlocked, make sure that the two ends of the fixation points of the holding cord are correctly connected.
- Make sure that the two ends of the fixation points of the holding cord and the cord is not damaged.
- Lower the COP on the bottom hinge point.



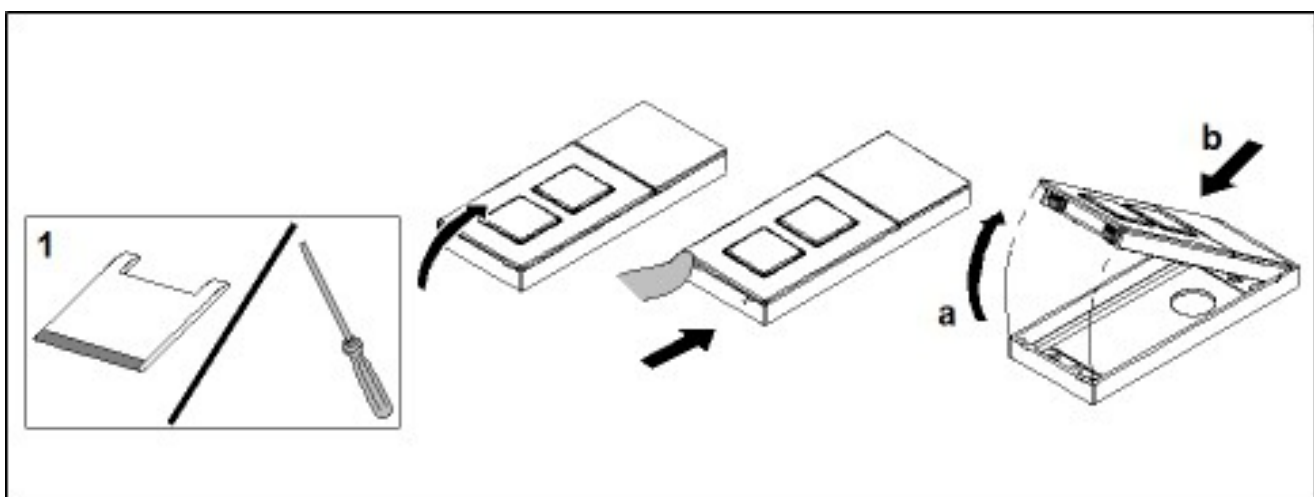
### 5.11.5 Opening of accessible COP (COPH)



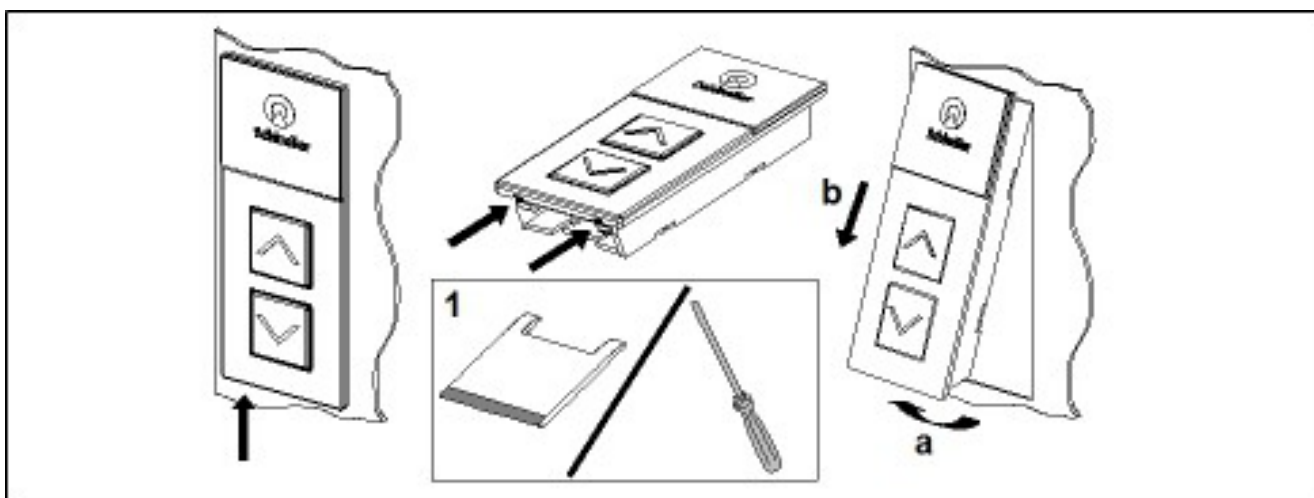
#### 1 COPH

- Put the 3 mm hex key into the screw hole on the bottom left of the COPH and turn counterclockwise to loosen the hex screw.
- Obey the same procedure for the hex screw on the right side of the COPH.
- When the hex screws are loose, lift the COPH a small distance to lower the COPH on the bottom hinge point.

### 5.11.6 Opening of LOP and LIP

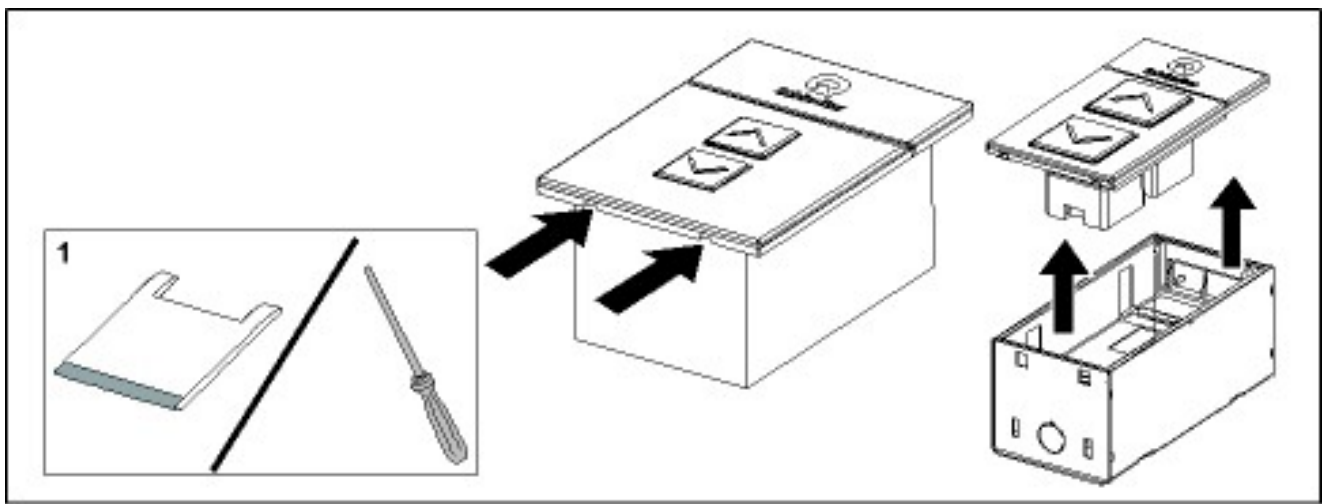


#### 1 LOP/LIP release tool or terminal screwdriver



#### 1 LOP/LIP release tool or terminal screwdriver

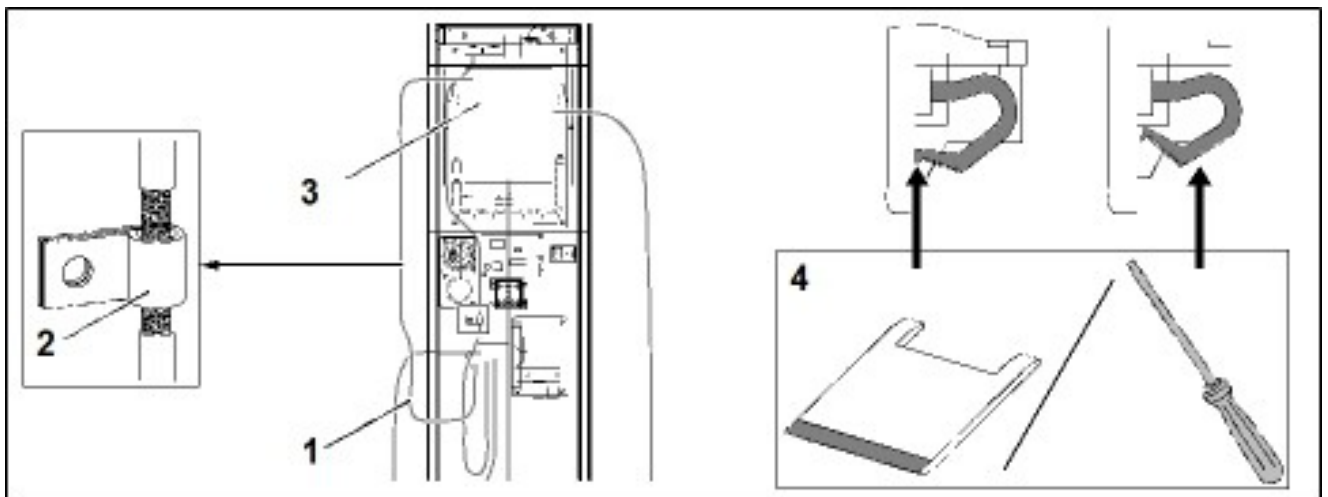




1 LOP/LIP release tool or terminal screwdriver

- ▶ Select the method of LOP or LIP removal based on the diagrams.
- ▶ Always open the LIPs and LOPs with a small screwdriver or the LIP/LOP release tool.

#### 5.11.7 Internal visual checks, function checks and cleaning



1 Shielded COP wiring

2 Shielding clip and wire

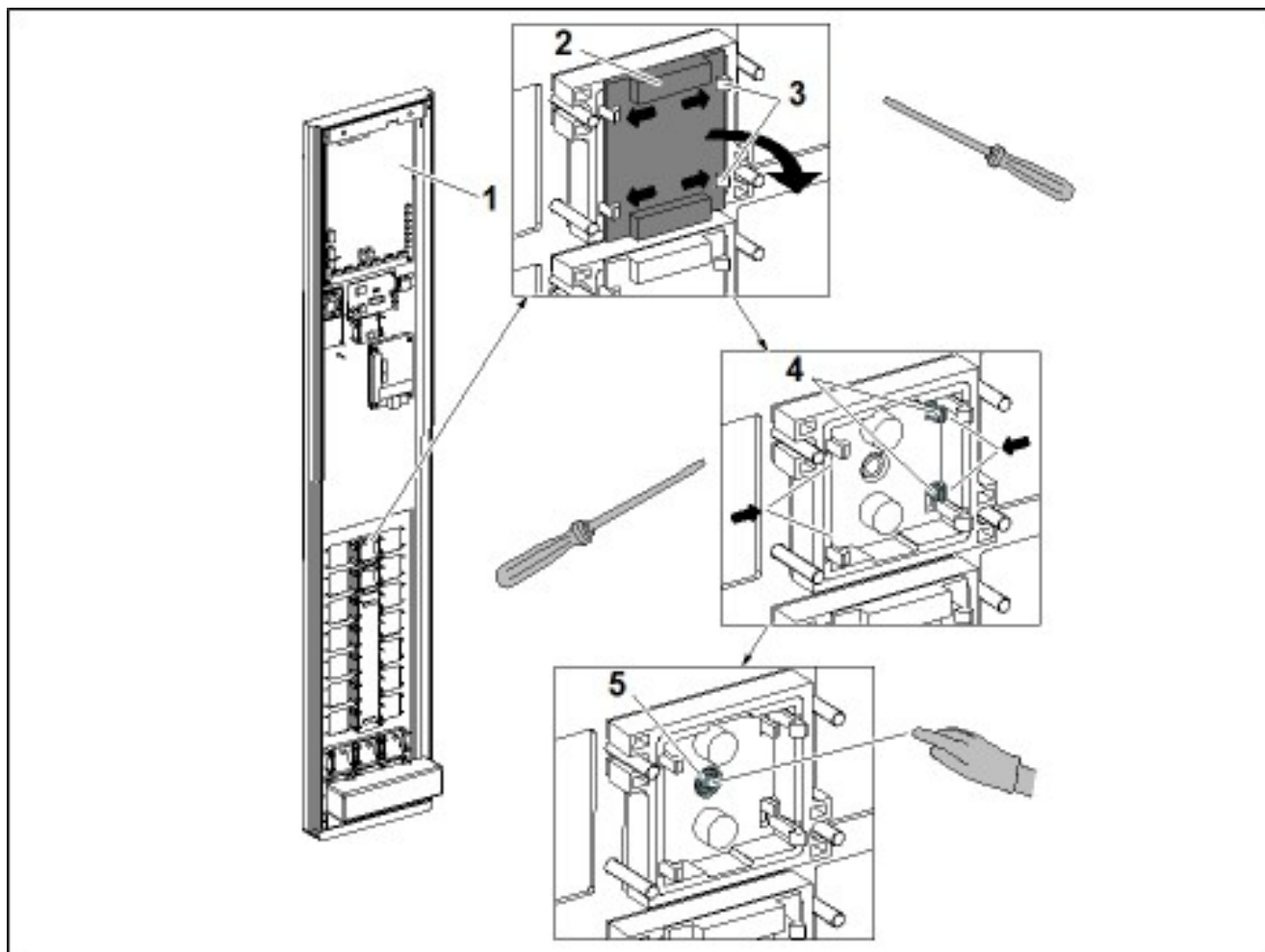
3 COP main PCBA

4 LOP/LIP release tool or terminal screwdriver

- ▶ Clean dust and debris with a dry cloth or brush.
- ▶ Examine the condition of the wiring and connections, make sure that there is no damage. If necessary, replace.
- ▶ Examine the connection of all shielding clips.
- ▶ Make sure that the wire and clip are tight and in good condition.
- ▶ Make sure that the COP main PCBA has no corrosion or green discoloration.
  - ↳ This can be an indication of water or moisture damage.
- ▶ Make sure that the release clips are in good condition. If one is broken, replace the clips.
- ▶ Always examine the wiring for damage or cut. If you find one, replace the wire.
- ▶ Remove the backing cover from the unit.
- ▶ Make sure that there is no corrosion on the PCBA and no damage on the plug connection.



### 5.11.8 Replacement of buttons



- |   |                       |   |                  |
|---|-----------------------|---|------------------|
| 1 | Car COP               | 2 | Push button PCBA |
| 3 | PCBA clips            | 4 | Button clips     |
| 5 | Push button faceplate |   |                  |

- Open the COP or LOP.
  - On some LOPs it is necessary to remove the large PCBAs to get access to the button element.
- Disconnect the wiring to the push button PCBA.
- Use a small screwdriver in the direction shown to open the PCBA clips.
- Remove the PCBA push button.
- Open the button clips in the direction shown.
- Remove the push button faceplate.
- Replace the push button faceplate.
- Replace the push button PCBA.
- Reconnect the wiring.
- Install other removed components and close the LOP or COP.
- Do a function check of the new component.

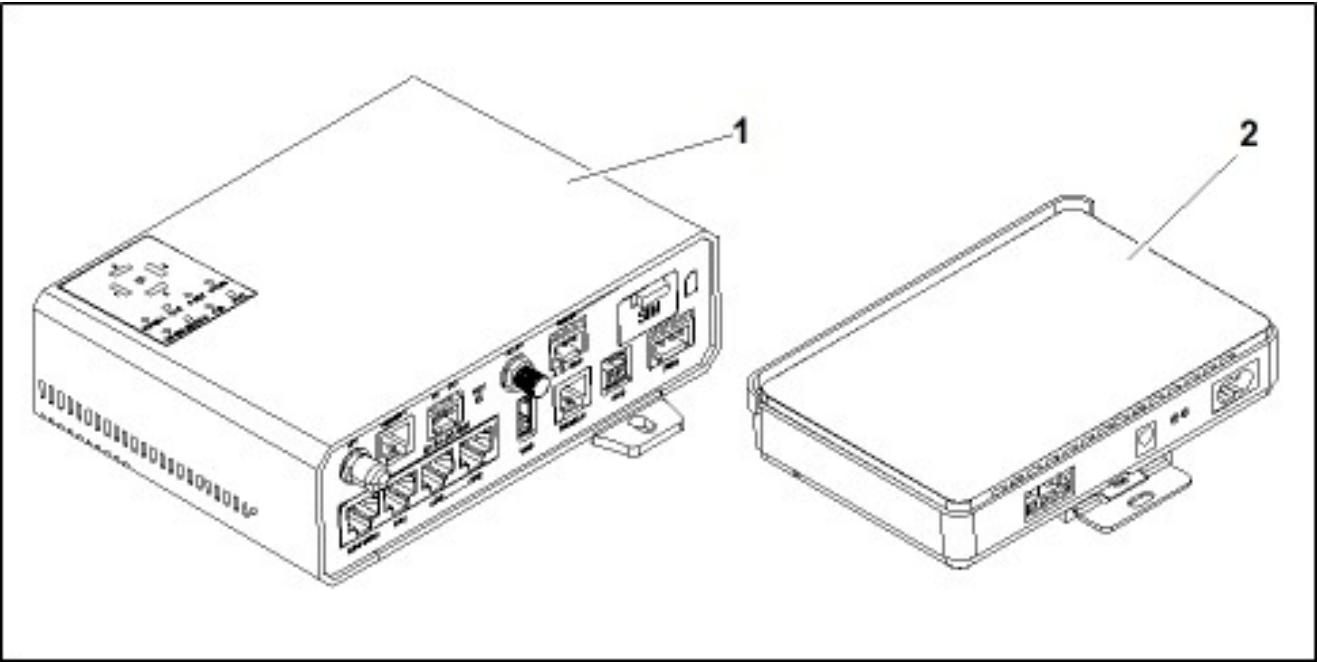


5.12 AC GTW 04 (CUBE)

5.12.1 Overview of AC GTW 04

The overview shows the CUBE (AC GTW 04) in combination with the CUBE Power. The power supply to the CUBE Power is supplied from the main power supply. The CUBE Power consists of the power supply, charger, backup battery and monitoring circuit.

**i** The version of CUBE might be different and the CUBE Power might be unavailable for some geographic locations or type of equipment.



1 CUBE Plus

2 CUBE Power

5.12.2 Maintenance plan for AC GTW 04

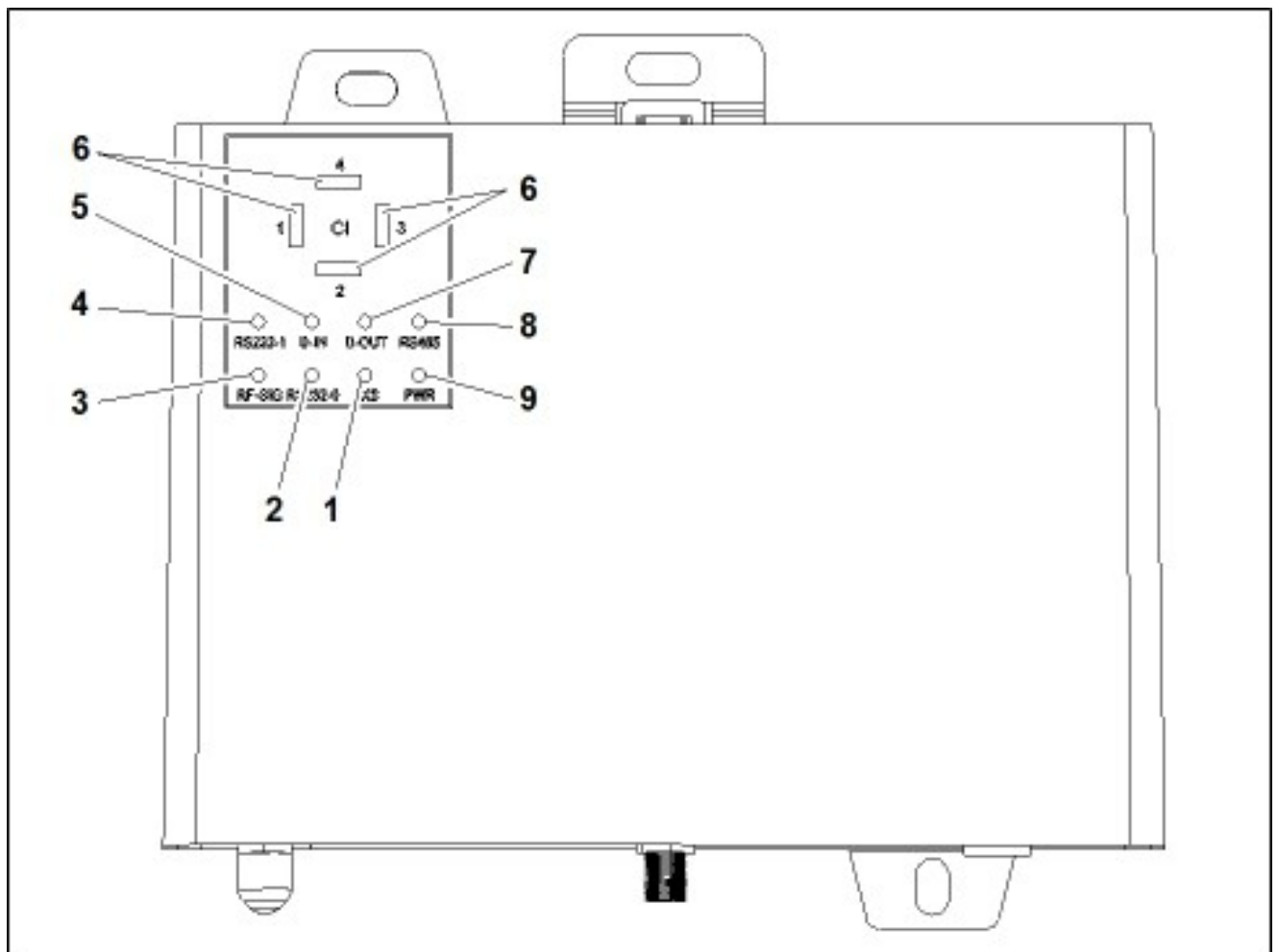
Interval (months)	Description
60	Replacing of complete CUBE Power

5.12.3 CUBE HMI

5.12.3.1 Description of LEDs

**i** Depending on the geographical Location, LED allocation might be different.





- |   |                               |   |                                  |
|---|-------------------------------|---|----------------------------------|
| 1 | FXS (phone line status)       | 2 | RS232 – 0 (RS232 status)         |
| 3 | RF-SIG (mobile signal status) | 4 | RS232-1 (RS232-1 status)         |
| 5 | D-IN (digital input status)   | 6 | CI 1/2/3/4 (connectivity status) |
| 7 | D-OUT (digital output status) | 8 | RS485 (RS485 status)             |
| 9 | PWR (power supply status)     |   |                                  |

#### 5.12.3.2 PWR LED – Power supply and the boot status

PWR LED status	LED color	Status
OFF	None	Device is OFF
1 s ON / 1 s OFF	Green	Device is booting the operating system - Kernel/VRP loading
ON	Green	Operating from main power supply and OS started successfully
0.1 s ON / 5 s OFF	Green	Operating from Cube Power battery

#### 5.12.3.3 FXS LED – FXS line status

FXS LED status	LED color	Status
OFF	None	FXS line not available / line on-hook
0.5 s ON / 0.5 s OFF	Yellow	Line is off-hook (active)
0.1 s ON / 0.1 s OFF	Yellow	Ringing signal (incoming voice call)

#### 5.12.3.4 RF-SIG – Radio frequency signal quality and strength status

RF-SIG status	LED color	Status
0.1 s ON / 0.1 s OFF	Blue	SIM card related troubles



RF-SIG status	LED color	Status
0.5 s ON / 0.5 s OFF	Blue	Insufficient RF signal (weak)
0.25 s ON / 0.25 s OFF	Blue	Too low signal (low)
1 s ON / 1 s OFF	Blue	Sufficient RF signal (normal)
OFF	None	Unregistered / Network registration lost (default value)
ON	Blue	Good RF signal (good)


#### 5.12.3.5 D-IN LED – Digital input status

D-IN status	LED color	Status
OFF	None	Digital input is OFF
ON	Green	Digital input is ON

#### 5.12.3.6 D-OUT LED – Digital output status

D-OUT status	LED color	Status
OFF	None	Digital output is OFF
ON	Green	Digital output is ON

#### 5.12.3.7 ETH0 to ETH3 LEDs – Ethernet connected ports status

 Depending on the version, the ETH LED's might be placed at the lower side of the device.

ETH LED status	LED color	Status
OFF	None	Ethernet not connected or connected device is powered off
ON	Green	Ethernet connected

#### 5.12.3.8 CI1 to CI4 LEDs – Connectivity configuration status

Status	Description	CI 1 LED status	CI 2 LED status	CI 3 LED status	CI 4 LED status
N1	No configuration available, device not ready	OFF	OFF	OFF	OFF
N2	No configuration available, device ready	Flashing	OFF	OFF	OFF
N3	Configuration received / available	ON	OFF	OFF	OFF
N4	Building up Internet connection	ON	Flashing	OFF	OFF
N5	Internet connection established, NTP time synchronized	ON	ON	OFF	OFF
N6	Connecting to the OpenVPN server	ON	ON	Flashing	OFF
N7	Connection to OpenVPN server established successfully	ON	ON	ON	OFF
N8	Connecting to RMP	ON	ON	ON	Flashing



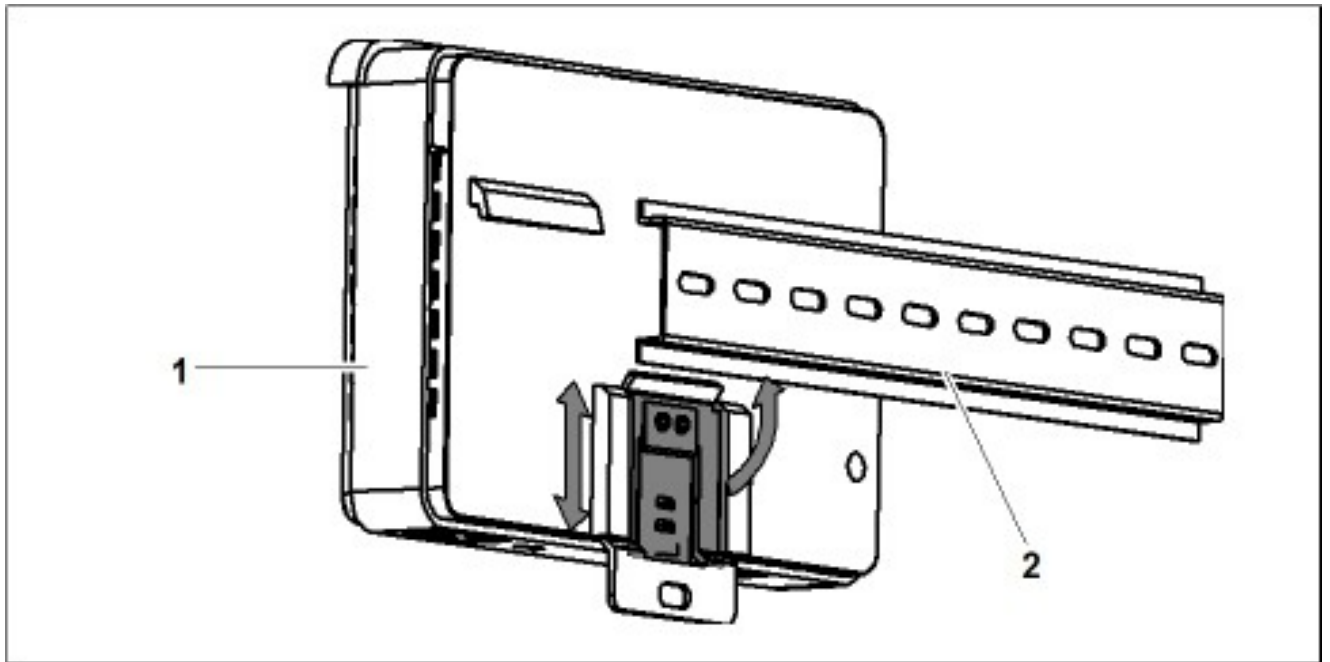
Status	Description	CI 1 LED status	CI 2 LED status	CI 3 LED status	CI 4 LED status
N9	Connection to RMP was successful	ON	ON	ON	ON
–	Bluetooth Low Energy (BLE) ON	Flashing	Flashing	Flashing	ON
–	<p>The CI LED's will return to their previous "Connectivity" state after the following specified time:</p> <ul style="list-style-type: none"> <li>– BLE: When enabled, BLE function automatically switched off after 60 minutes</li> <li>– Button operation not recognized: - this status remains for 2 seconds.</li> </ul>	Return to previous "Connectivity" state	Return to previous "Connectivity" state	Return to previous "Connectivity" state	Return to previous "Connectivity" state
OEM	OEM mode active	OFF	OFF	OFF	Flashing

#### 5.12.3.9 CI1 to CI4 LEDs – Exception status

Status	Description	CI1 LED status	CI2 LED status	CI3 LED status	CI4 LED status
E1	Temporary lost internet connection	ON	Flashing	Flashing	OFF
E2	Open VPN connection lost, internet connection available	ON	ON	Flashing	Flashing



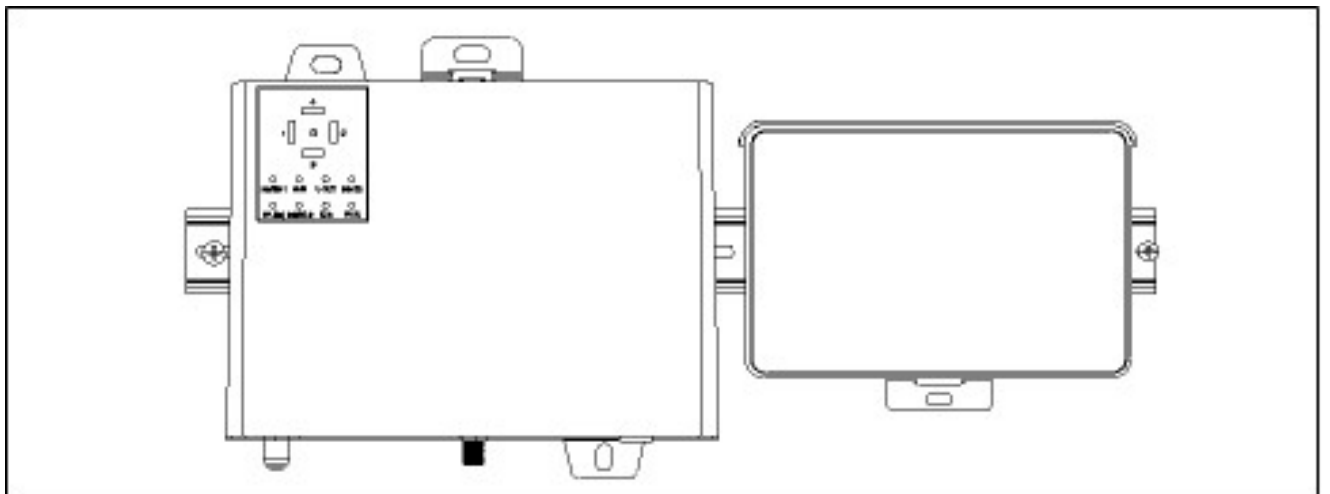
#### 5.12.4 Replacing of CUBE Power



1 CUBE Power

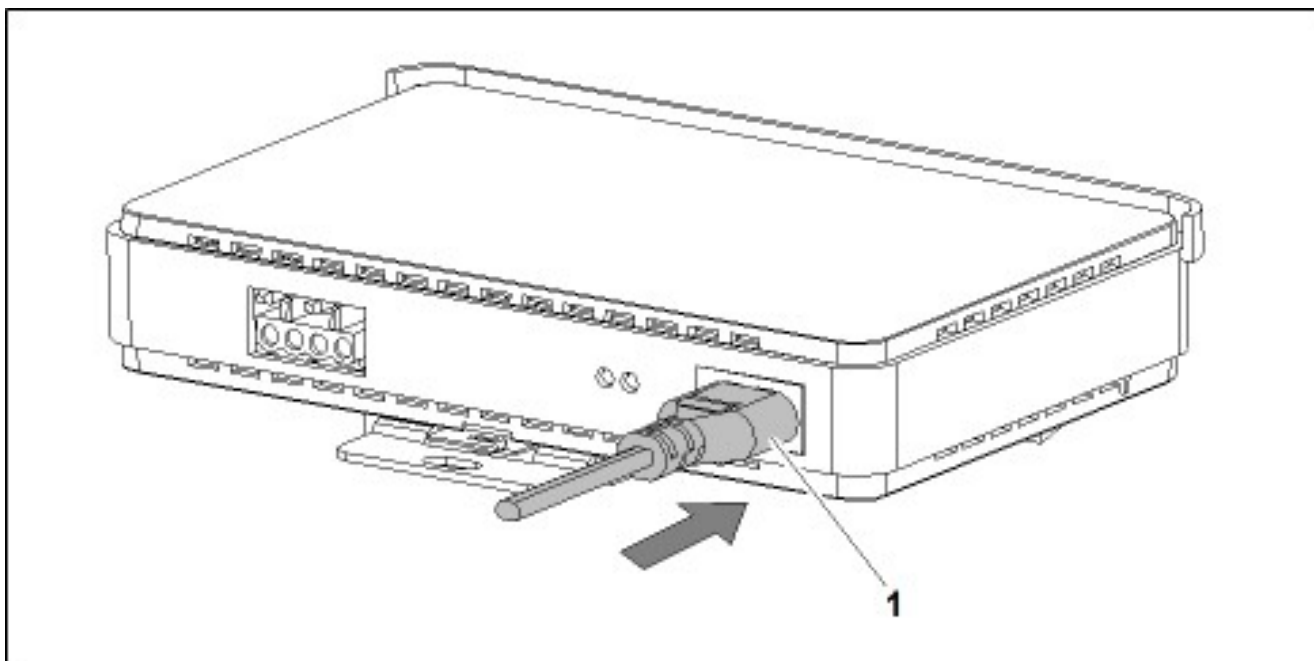
2 DIN rail

► Pull and push the latch to install the CUBE Power on the DIN rail.



► Install the CUBE Power on the right hand-side of the DIN rail.

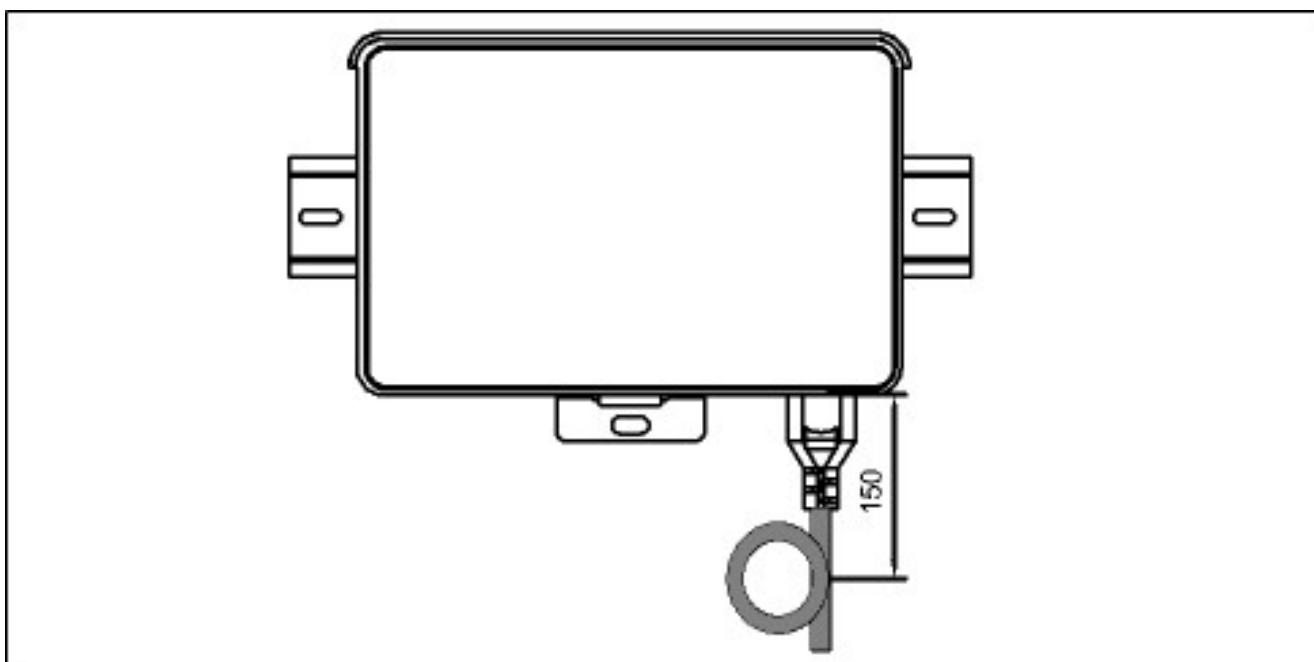




1 Power supply cable plug

- Connect the power supply cable to the 240 V power socket of the CUBE Power.

**i** Marked input: 100 ... 240 V; 50/60 Hz, 0.8 A.



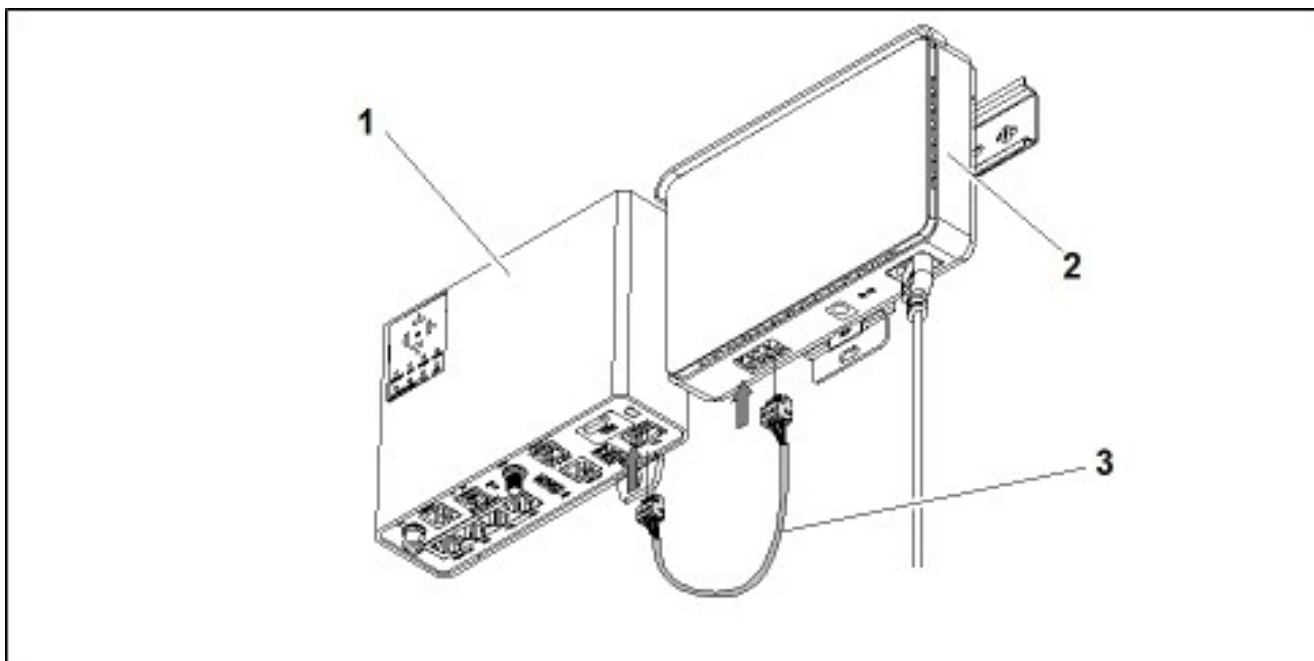
- Attach the power supply cable with a loop to the wall to release tension.

**i** Put the cable tie at 150 mm from the CUBE Power.

- Connect the power supply cable to the main power supply in the control cabinet. Keep the same connections as before.

**i** – Follow local codes to do the wiring of the power supply cable.  
 – Do not disconnect the plug of the power supply cable when it is energized.



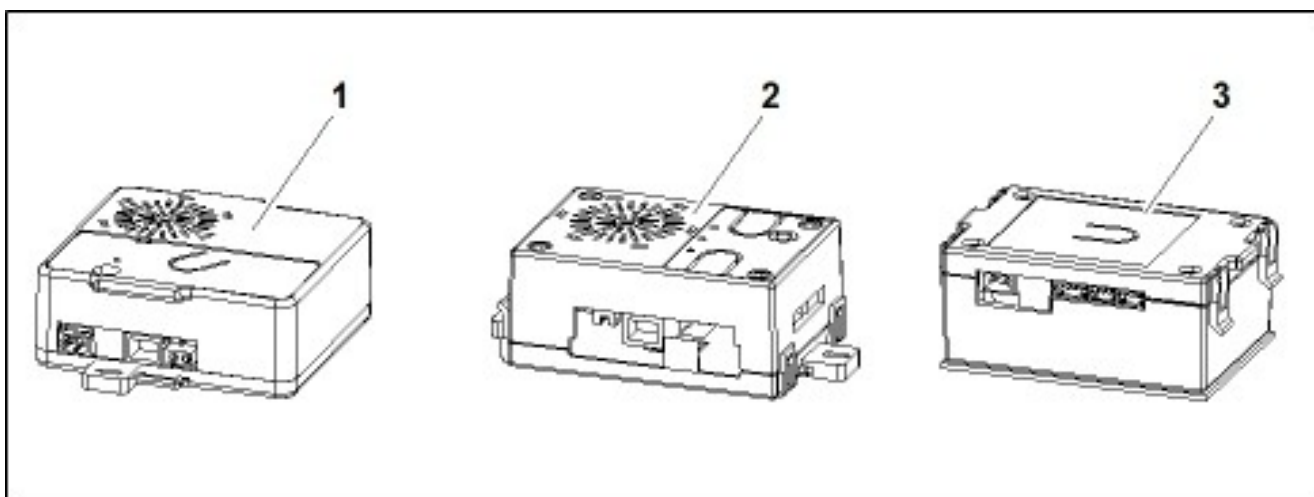


- 1 CUBE Plus  
2 CUBE Power  
3 Cable (Connects CUBE Power to CUBE Plus)

► Connect the cable from the CUBE Power to the CUBE Plus.

## 5.13 Intercom AC TMA 1 (ETMA PSTN)

### 5.13.1 Overview



- 1 ETMA MR PSTN 1  
2 ETMA TRI  
3 ETMA CAR

### 5.13.2 Maintenance plan

Interval (months)	Description
12	Triggering of test alarm call



### 5.13.3 Triggering of test alarm call

**i** In case of capacitive COP:

- ▶ Push the alarm button (DAKI) five times in 10 seconds or less. This preparatory step identifies the alarm call to TACC as "test alarm call from a technician".
- ▶ After the beep-beep sound, push the alarm button (DAKI) for more than 30 seconds to trigger the actual test alarm call.

**i** For all other COP:

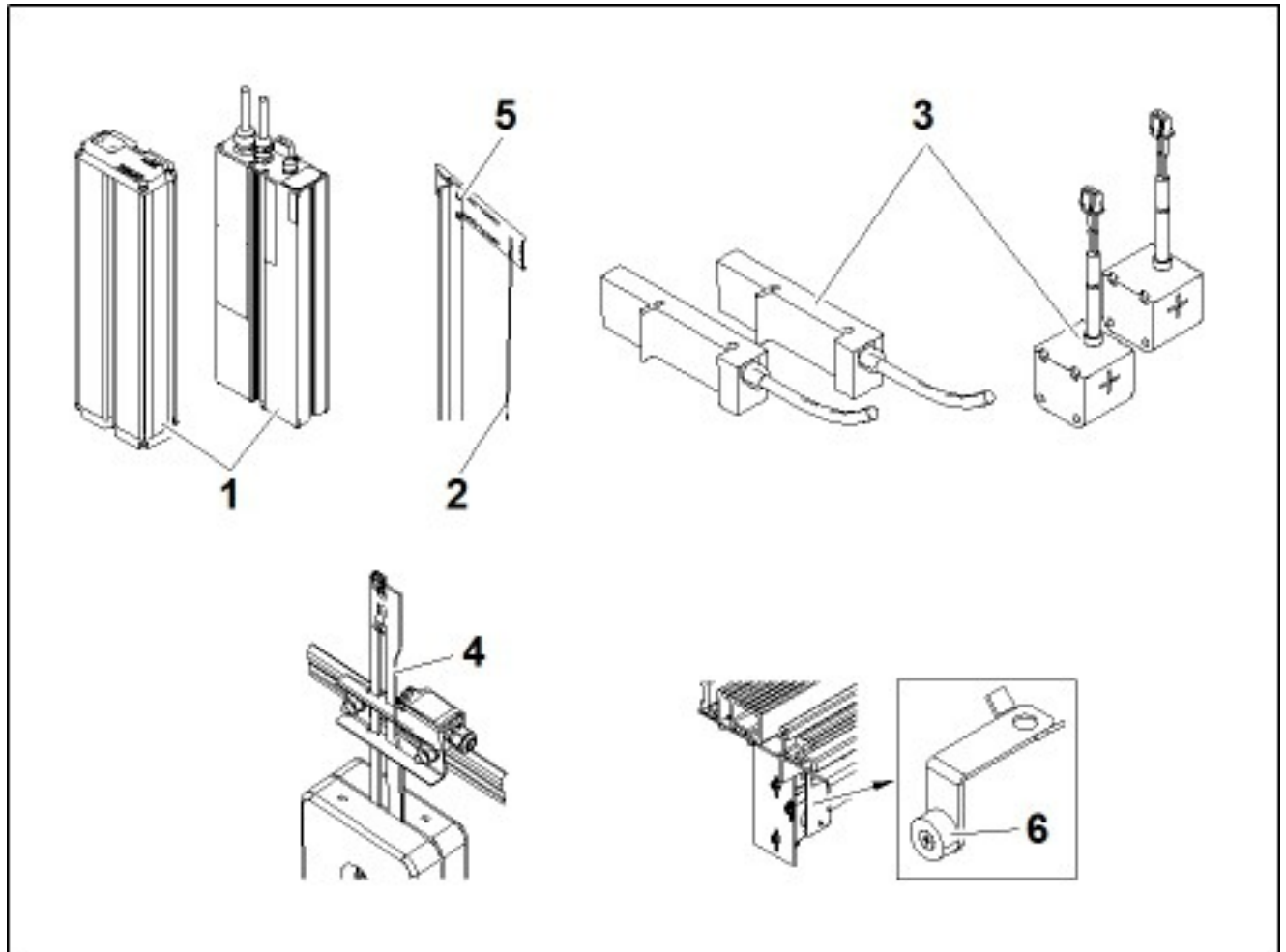
- ▶ Disable alarm filtering if necessary.
- ▶ Release a usual alarm call.

## 5.14 Hoistway information AC GSI

### 5.14.1 Overview of hoistway information components

The hoistway information AC GSI is an absolute car positioning system.

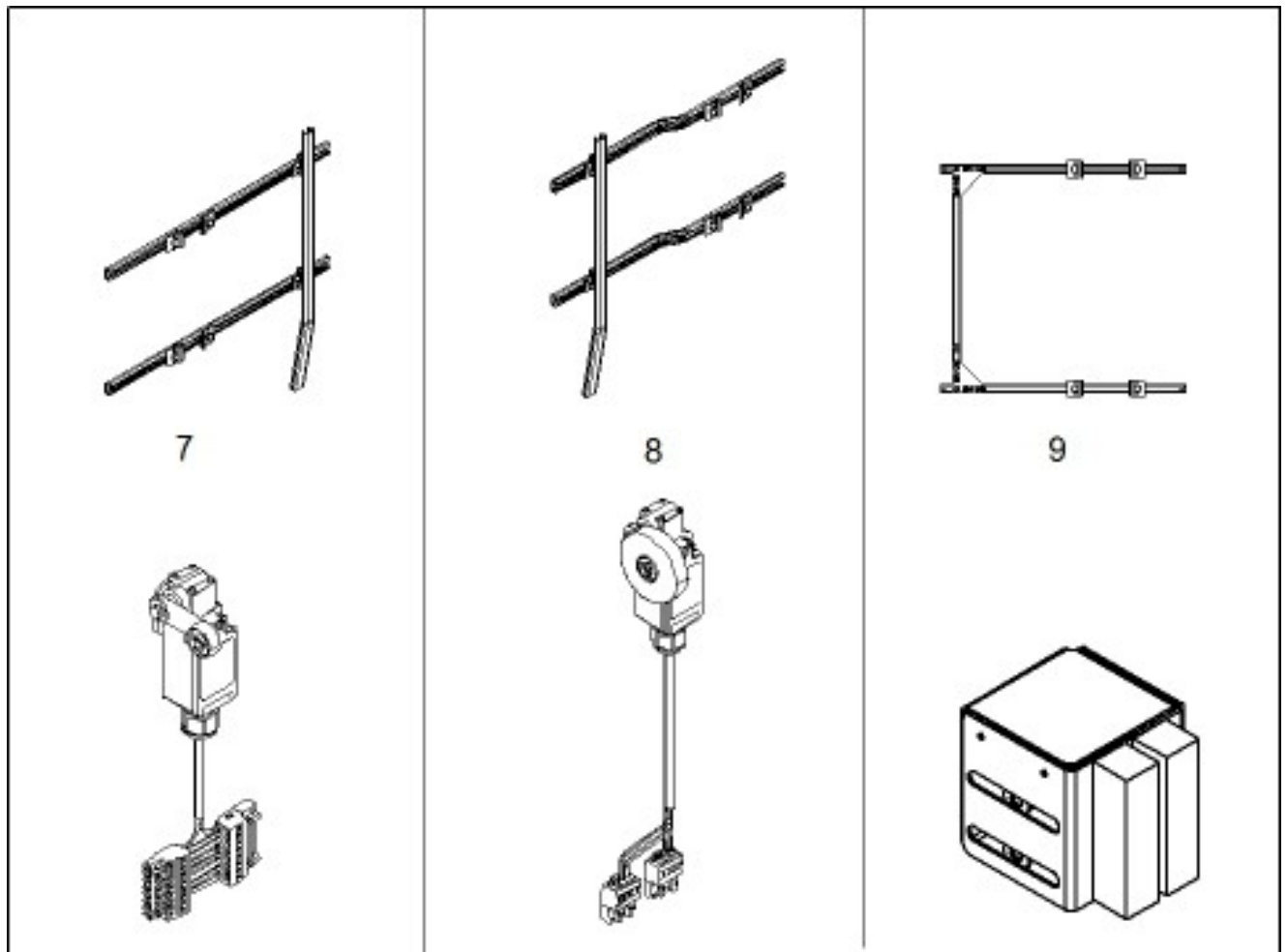
Standard components for AC GSI hoistway information:



- |   |                            |   |                          |
|---|----------------------------|---|--------------------------|
| 1 | Main sensor                | 2 | Magnetic band            |
| 3 | Floor sensor               | 4 | Magnetic band tensioning |
| 5 | Magnetic band top fixation | 6 | Landing magnet           |



### 5.14.2 Overview of optional components for hoistway information



7 Switch KNE  
9 Switch KSE

8 Switch KSERE

### 5.14.3 Maintenance plan for AC GSI hoistway information

**i** This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Check of identification marking
12	Check of magnetic band
12	Check of switch KNE
12	Check of switch KSE and KSE magnet
12	Check of switch KSERE (short head and short pit system, only)
12	Check and adjust of magnetic band tensioning
12	Check of AC GSI main sensor
60	Check of switch KSSSI
240	Replacement of AC GSI x main sensor

### 5.14.4 Cleaning of hoistway information components

- Clean subsystems and components when appropriate and necessary to guarantee a reliable.
- Remove any steel particles from the magnetic band with a dry rag.
- Make sure that no dust exists on the roller of switch KSSSI.
- Make sure that no dust exists on floor magnet.

### 5.14.5 Cleaning of mechanical KNE

- Make sure that no dust exists on the roller of switch KNE.




#### **5.14.6 Cleaning of KSE**

- ▶ Make sure that no dust exists on switch KSE and KSE magnet.

#### **5.14.7 Cleaning of mechanical KSERE**

- ▶ Make sure that no dust exists on the roller of switch KSERE.

#### **5.14.8 Checking of identification marking**

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### **5.14.9 Check of connections for all hoistway information components**

- ▶ Make sure that all connections are tightly and correctly connected.
- ▶ Make sure that all fixations are tight and all adjustments appropriate.
- ▶ Make sure that the cable of the switch KSSSI is connected to the pit box.
- ▶ Make sure that the connector cable of AC GSI main sensor is connected to the connectors.
- ▶ Make sure that the AC GSI main sensor is correctly connected and powered.
- ▶ Make sure that the connector of AC GSI floor sensor is correctly connected to AC GSI main sensor.

#### **5.14.10 Check of connections for mechanical KNE**

- ▶ Make sure that the connector cable of switch KNE is connected to the connector.

#### **5.14.11 Check of connections to switch KSE**

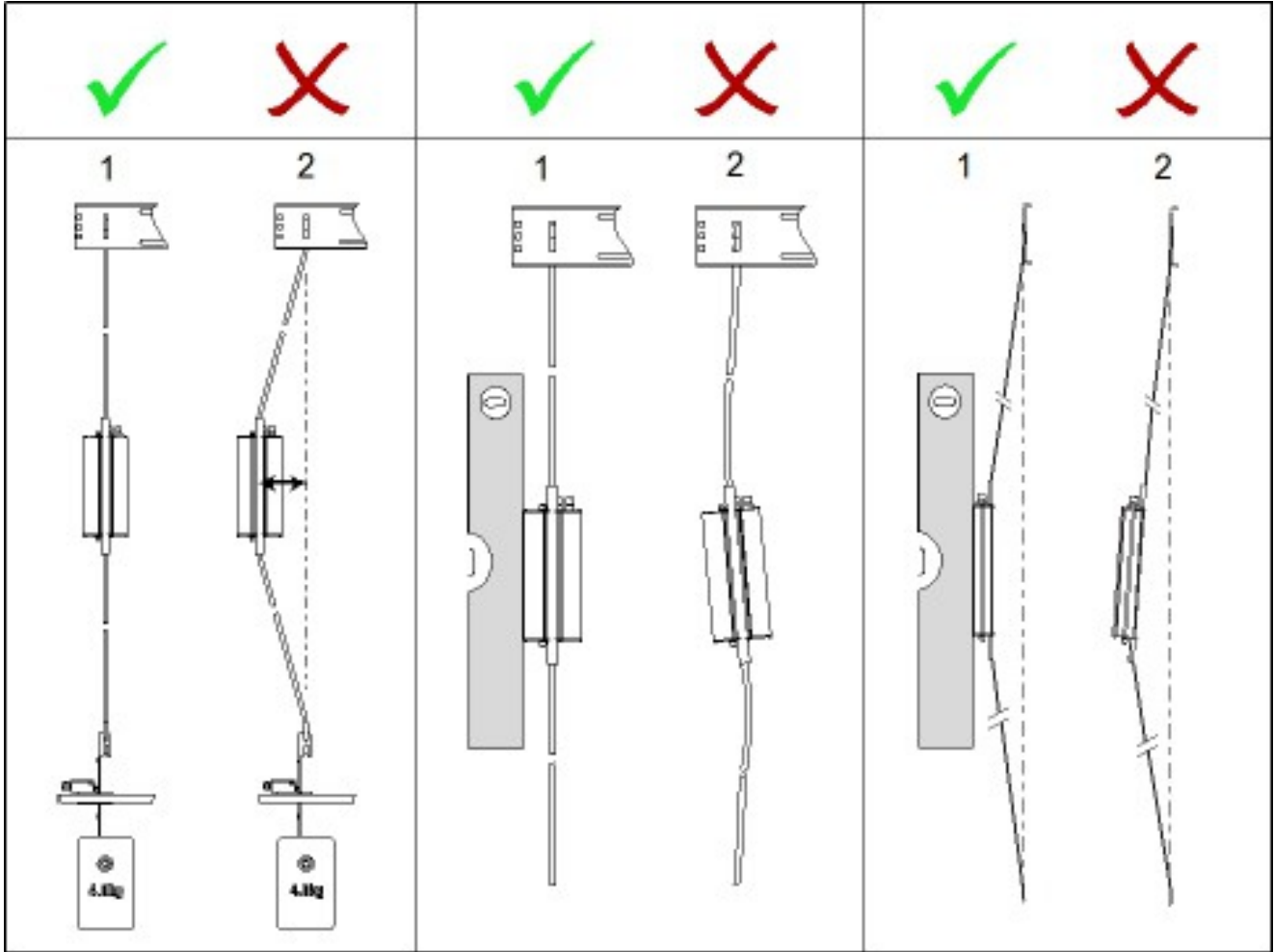
- ▶ Make sure that the cable of the switch KSE is connected to OKR (terminal box on car roof).

#### **5.14.12 Check of connections for mechanical KSERE**

- ▶ Make sure that the cable of the switch KSERE is connected to OKR (terminal box on car roof).



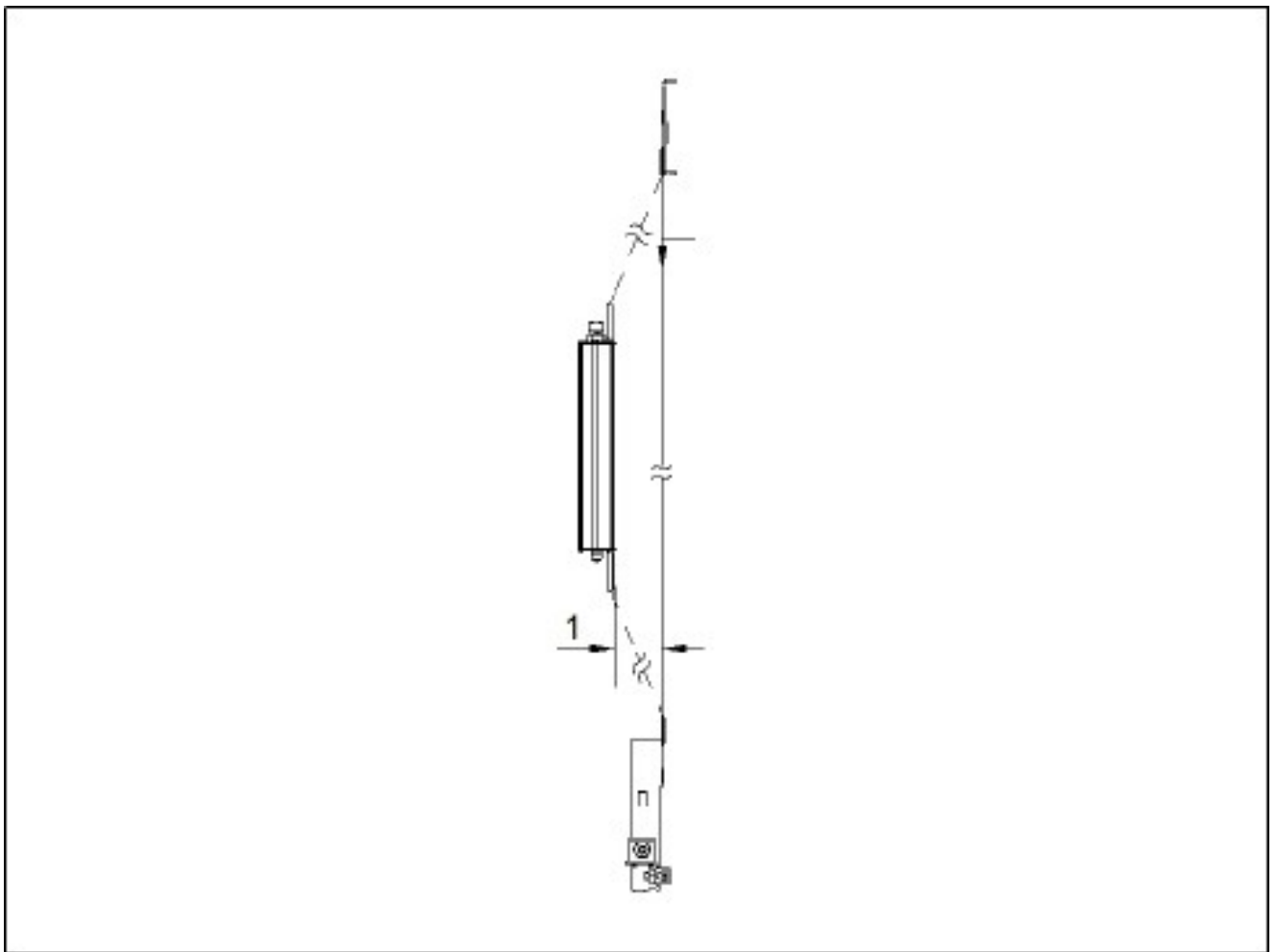
5.14.13 Check of magnetic band and AC GSI main sensor



1 Correct magnetic band layout

2 Lateral offset (forbidden)





Operating condition	Distance 1 (mm): Pre-tension offset (required)
$HQ \leq 60 \text{ m}$	20 ... 60
$60 \text{ m} < HQ \leq 100 \text{ m}$	30 ... 60
$100 \text{ m} < HQ \leq 250 \text{ m}$	40 ... 60

- ▶ Make sure that the magnetic band is correctly guided on the AC GSI main sensor.
- ▶ Make sure that the steel layer of the magnetic band is in contact with the slipway of the magnetic band guiding.
- ▶ Make sure that no lateral offset exists between magnetic band and relative fall line.
- ▶ Make sure that the magnetic band has the correct pretension offset relative to the fall line.

#### 5.14.14 Check of switch KNE

- ▶ Make sure that the contact is open along the normal traveling in the hoistway.
- ▶ Make sure that the roller of the switch is centered in the KNE curve (both upper and lower).
- ▶ Make sure that the switch engages along the KNE curve within the proper travel distance.
- ▶ Make sure that the switch KNE is adjusted relative to the KNE curve.
- ▶ Make sure that the roller of the KNE switch is centered with the KNE curve (KNE-U, KNE-D).
- ▶ Make sure that the switch KNE works. If the KNE switch does not work replace it.
- ▶ If the engagement of the switch does not happen along the curve in the foreseen position adjust the leverage.

#### 5.14.15 Check of switch KSE and KSE magnet

- ▶ Make sure that the switch KSE is adjusted relative to the KSE magnet.
- ▶ Make sure that the switch KSE works. If the switch KSE does not work replace it.
- ▶ Make sure that the KSE magnet is not damaged. If the KSE magnet is damaged replace it.

#### 5.14.16 Check of switch KSERE

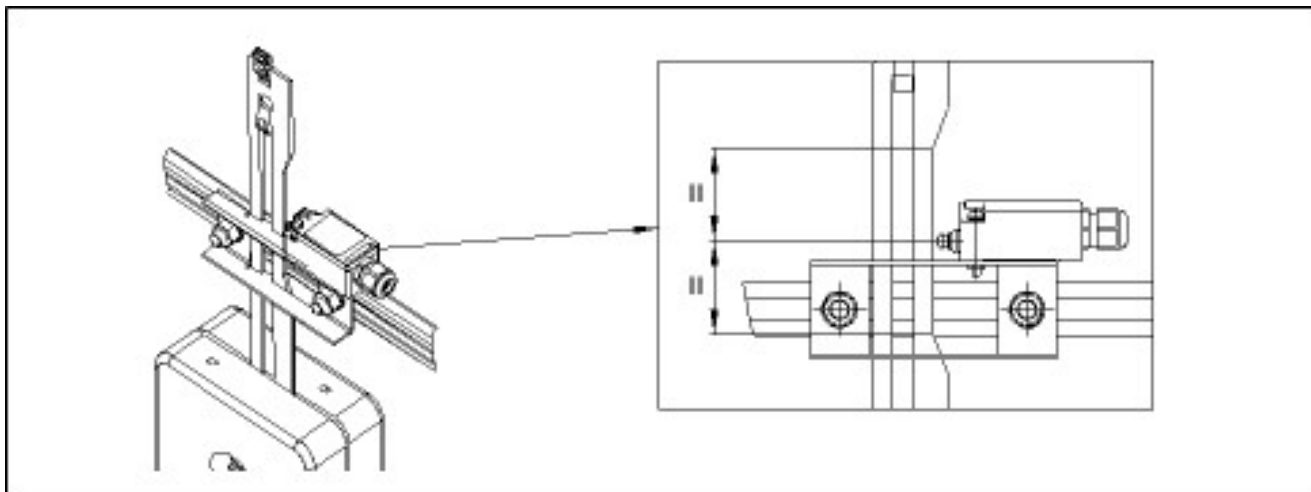
- ▶ Make sure that the contact is open along the normal traveling in the hoistway.
- ▶ Make sure that the roller of the switch is centered in the KSERE curve (both upper and lower).
- ▶ Make sure that the switch engages along the KSERE curve within the proper travel distance.
- ▶ Make sure that the switch KSERE works. If the switch KSERE does not work replace it.
- ▶ If the engagement of the switch does not happen along the curve in the foreseen position adjust the leverage.



#### 5.14.17 Check of switch KSSSI

- ▶ Make sure that the switch is centered to the curve.
- ▶ Make sure that the switch KSSSI works. If the switch KSSSI does not work replace it.

#### 5.14.18 Check of magnetic band tensioning



- ▶ Make sure that no lateral offset exists between magnetic band and relative fall line. If necessary, adjust magnetic band.

#### 5.14.19 Check of AC GSI main sensor

- ▶ Make sure that the AC GSI main sensor is not damaged. If damaged, replace the AC GSI main sensor.

### ⚠ WARNING

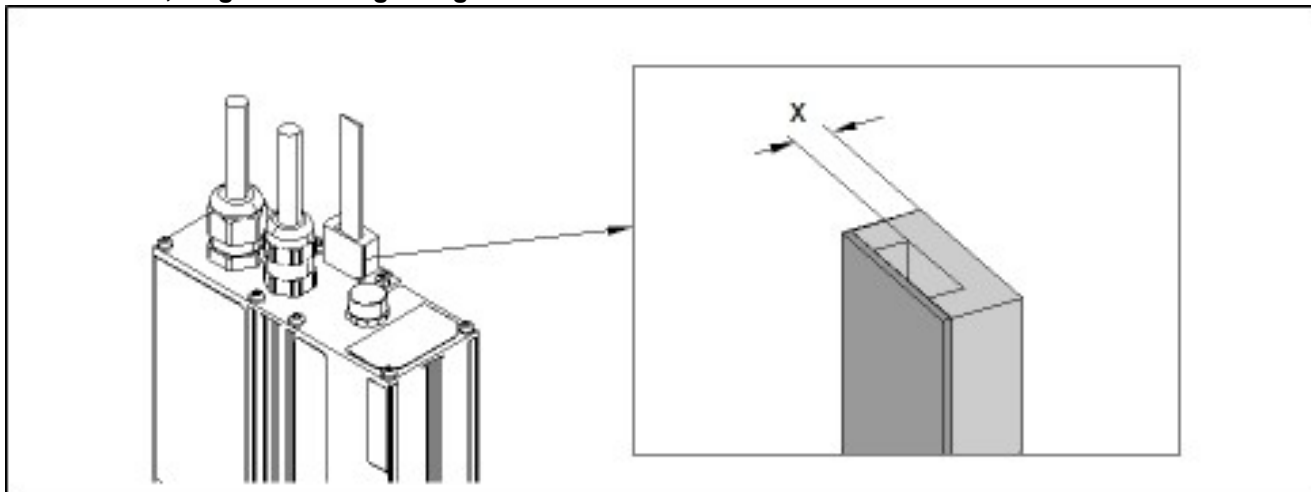
#### **Protective function ETSL for installations with reduced buffer stroke**

Operating an installation with reduced buffer stroke without the protective function ETSL could result in damage to the installation or in serious injury or death.

Make sure that the installed AC GSI main sensor features the protective function ETSL if required.

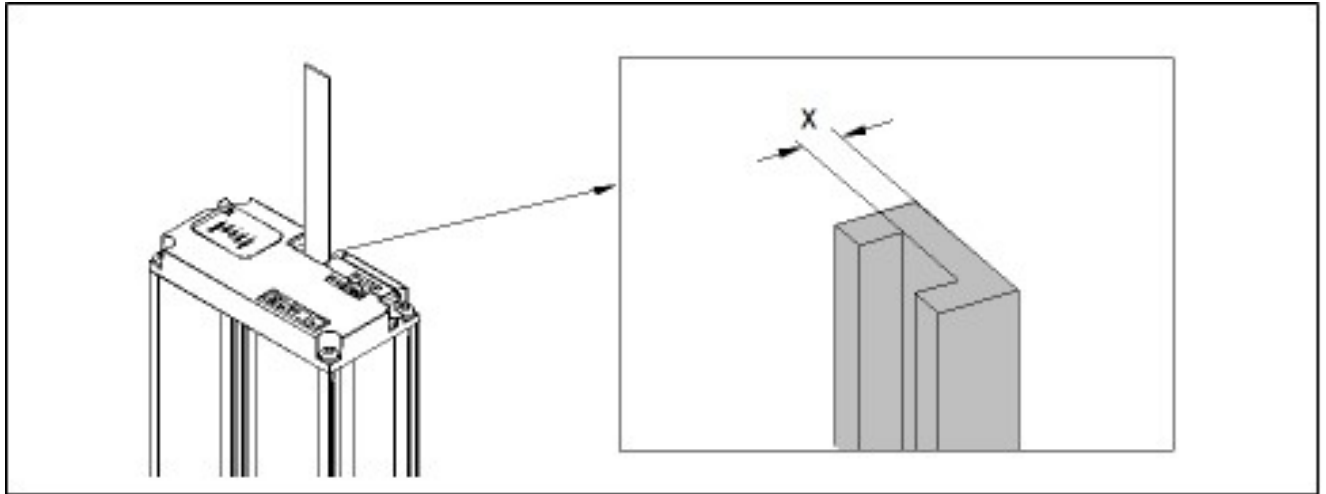
- ▶ Make sure that the AC GSI main sensor works properly.
- ▶ Make sure that the AC GSI main sensor is vertically aligned in both directions, verify with a spirit level.

#### AC GSI 3 & 4, magnetic band guiding

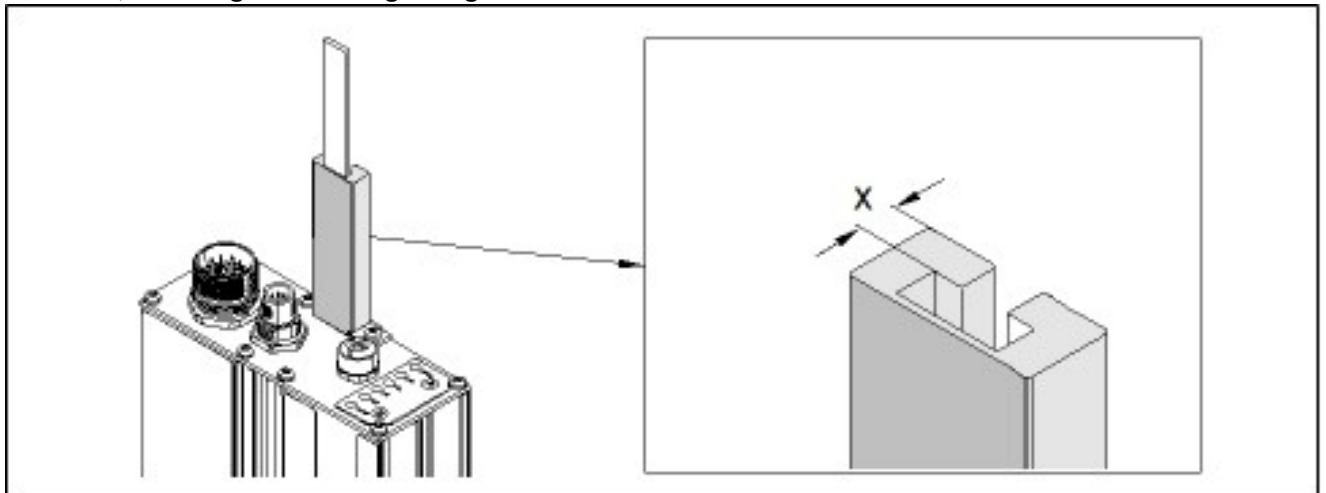




#### AC GSI 10x/20x, magnetic band guiding



#### AC GSI 5, new magnetic band guiding



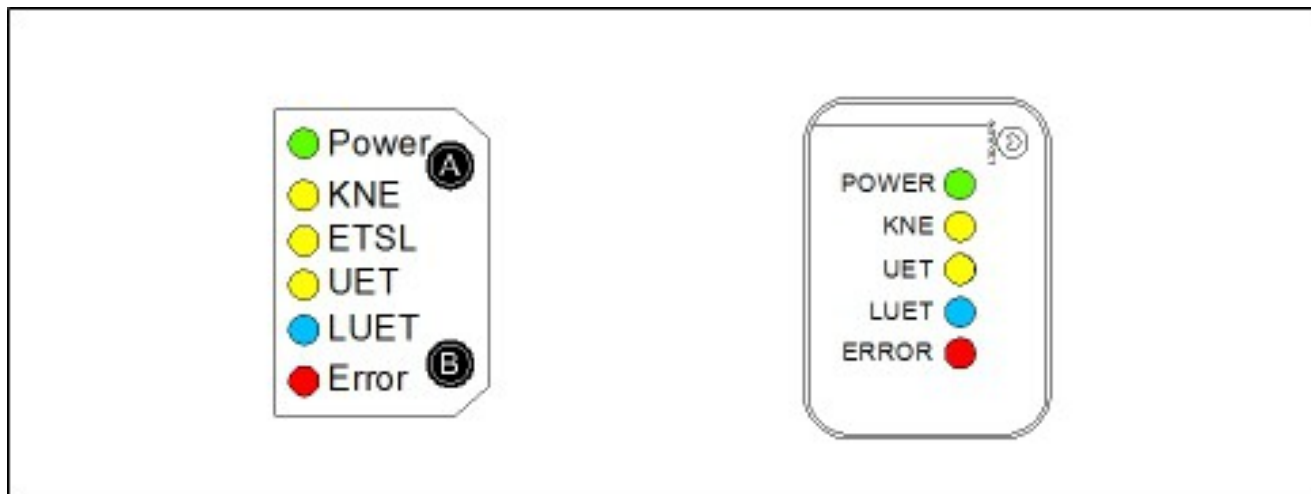
- Make sure that the material from the magnetic band guiding on the AC GSI main sensor is correct.
- If the thickness of the material on the top side of the duct base is  $X = \leq 2 \text{ mm}$ , replace the magnetic band.

#### 5.14.20 Check of LED status of AC GSI 2/3/4/5 main sensor

- Do a check of the LED status on the AC GSI main sensor. If the status is in emergency state, reset the AC GSI main sensor.



#### 5.14.21 Overview of LED indicator on AC GSI main sensor







Type of LED	Type of color	Description and function
<b>Power</b>	green	LED is ON when AC GSI is energized.
<b>KNE</b>	yellow	LED is ON when a KNE safety contact is open in normal mode. LED flashes long-ON/short-OFF when AC GSI is in pre-commissioning mode. LED flashes short-ON/long-OFF when AC GSI is in learning mode.
<b>ETSL</b>	yellow	LED is ON when a ETSL safety contact is open.
<b>UET</b>	yellow	LED lit when the UET safety contacts are closed (door over bridging active).
<b>LUET</b>	blue	LED is ON when the car is 120 mm or less away from a floor (= car inside door zone).
<b>Error</b>	red	LED is ON when the AC GSI has an internal failure and is in emergency mode.
<b>A, B</b>	–	Pushing the buttons <b>A</b> and <b>B</b> at the same time for minimum 2 seconds starts the learning mode. Pushing button <b>A</b> or <b>B</b> shortly stops the learning mode and depending on the learning result, sets the AC GSI into normal mode.

#### Overview of LED status on AC GSI main sensor

LED Code	Status	Description
	Device not powered	Shows that AC GSI is not energized (no main power supply and no battery power applied)
	Pre-commissioning state	Shows that AC GSI is in pre-commissioning mode. LED KNE has a flashing pattern of 90% ON and 10% OFF. LED LUET can be ON or OFF.
	Learn trip state	Shows that AC GSI is in learning mode. LED KNE has a flashing pattern of 10% ON and 90% OFF. LED LUET can be ON or OFF.
	Normal state and LUET condition	If ON, LED LUET shows that the car is inside a door zone. If OFF, LED LUET shows that the car is outside of any door zone. In learning mode, only learned floors are shown. LED LUET can be ON or OFF.
	Normal state and UET activated	Shows that the car is inside a door unlocking zone, where the door contacts are bridged. Normal mode condition.



LED Code	Status	Description
	Overtravel condition	Shows that an overtravel condition has occurred in normal mode. LED LUET can be ON or OFF. LED LUET can be ON or OFF.
	Overspeed condition	Shows that an overspeed condition caused the ETSL safety contacts to open. LED LUET can be ON or OFF. The ETSL contacts close automatically 10 seconds after the car comes to a standstill. Overspeed condition: - In normal mode, the car approaches the top or bottom floor at a speed higher than the ETSL speed curve permits. - In learning mode, the car travels faster than 1 m/s.
	Power failure in normal state	AC GSI operates in normal mode on battery power. LED LUET can be ON or OFF.
	Emergency state	AC GSI main sensor is in emergency state after having detected an internal error. All safety contacts are open. An internal fault has occurred and AC GSI operates in emergency mode. LED LUET can be ON or OFF. All safety contacts are open.

#### 5.14.22 Reset of AC GSI main sensor

Reset the AC GSI main sensor after error LED is ON, follow the below procedure:

- ▶ Shut the power of AC GSI main sensor off (including battery) for example, by unplugging from OKR (terminal box on car roof) or by disconnecting traveling cable connector.
- ▶ Power on the AC GSI main sensor.
- ▶ If the error persists, replace the AC GSI main sensor.

### ⚠ WARNING

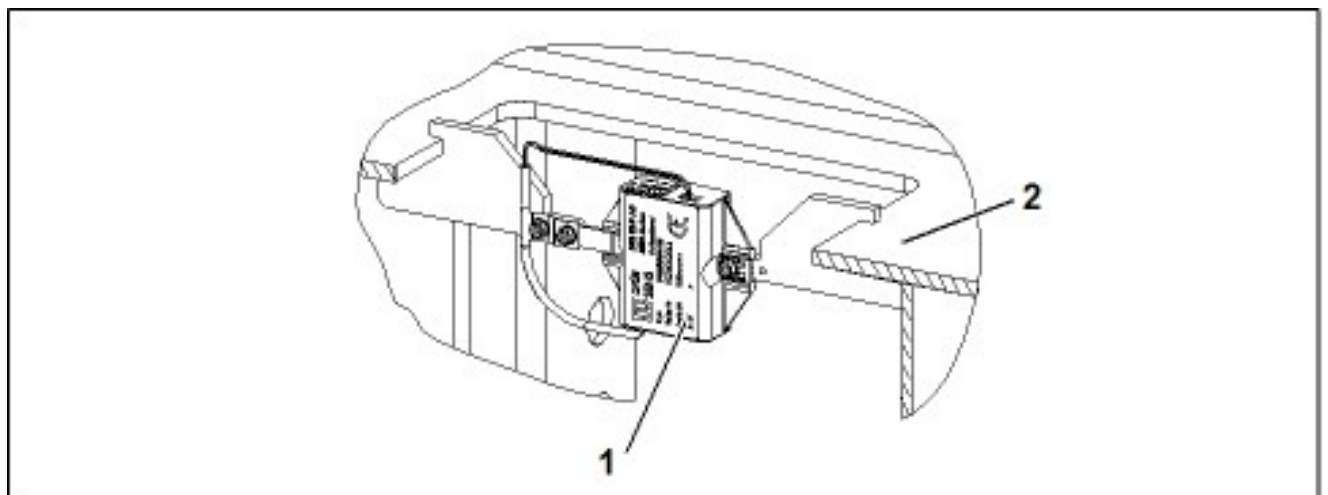
#### Protective function ETSL for installations with reduced buffer stroke

Operating an installation with reduced buffer stroke without the protective function ETSL could result in damage to the installation or in serious injury or death.

Make sure that the installed AC GSI main sensor features the protective function ETSL if required.

## 5.15 Load measurement system AC LMF

### 5.15.1 Overview



1 LMS

2 Lower yoke

### 5.15.2 Maintenance plan

Interval (months)	Description
12	Check of LMS fixation and operation

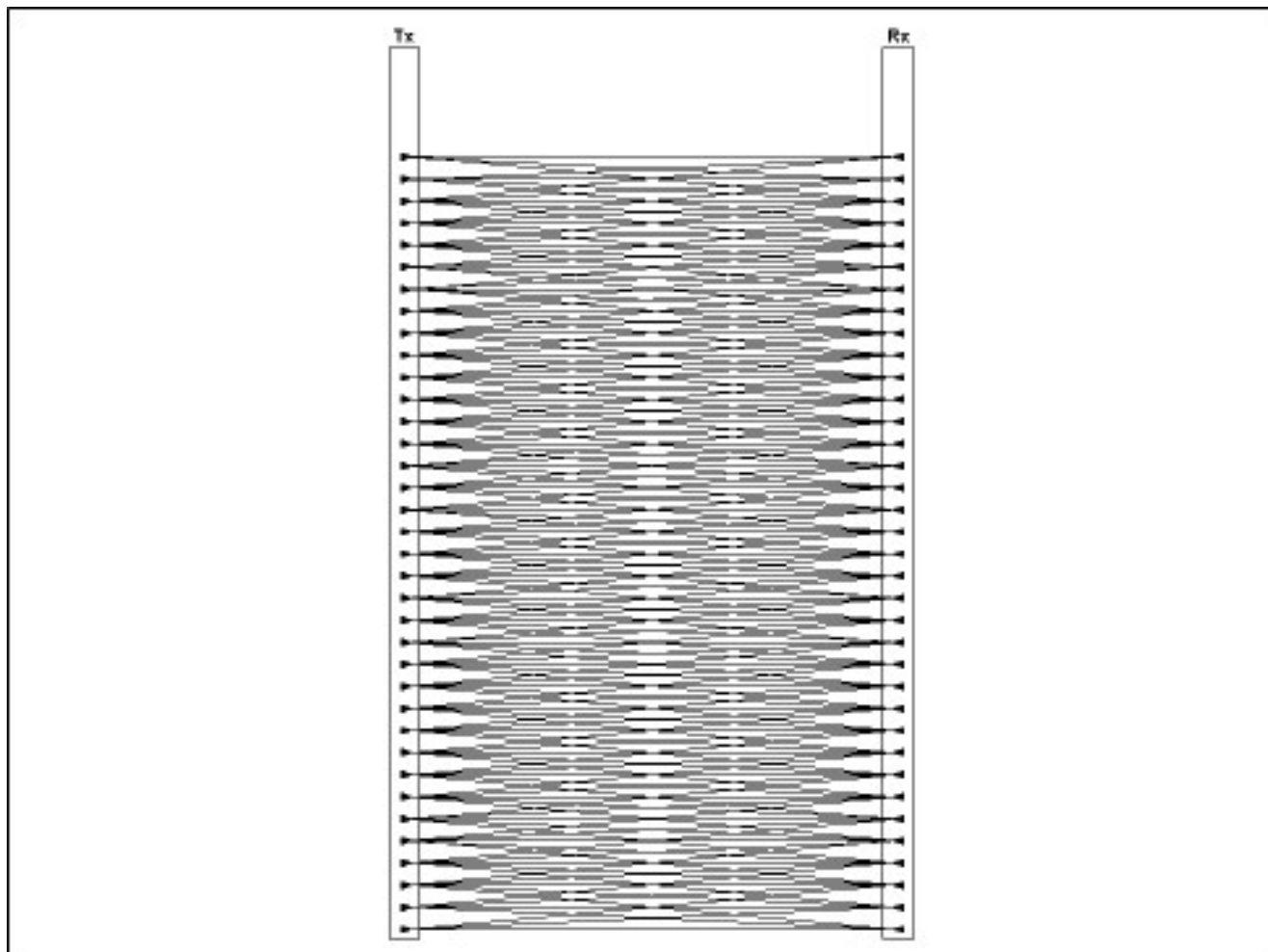


### 5.15.3 Check of LMS fixation and operation

- ▶ Make sure that the LMS is tightly attached.
- ▶ Use the control to make sure that the LMS operates correctly.

## 5.16 Light curtain

### 5.16.1 Overview



### 5.16.2 Maintenance plan

Interval (months)	Description
12	Check of light curtain operation and fixation

### 5.16.3 Check of light curtain operation and fixation

#### ⚠ CAUTION

##### Damage to light curtain sensors

The plastic of the light curtain sensors is sensitive to scratches and too much water.

- Do not use solvents, cleaners or abrasive cloths to clean the sensor units.
- Do not scratch the surface of the sensors.
- Do not use large quantities of water or high-pressure cleaners.

- ▶ Do a test of the reopening along the full door length. Refer to local regulation.
  - The door must open if an object of  $\geq 50$  mm is in the doorway between 25 mm and 1600 mm above the door sill.
  - Do three tests at different heights along the door length.
  - Make sure that the orange diagnostic LED on the receiver unit is on when the light curtain holds the door open.
- ▶ Make sure that the sensor unit is tightly installed on the door panel or door jamb.
- ▶ Carefully clean the front surface of the sensor units with a dry or moist cloth.

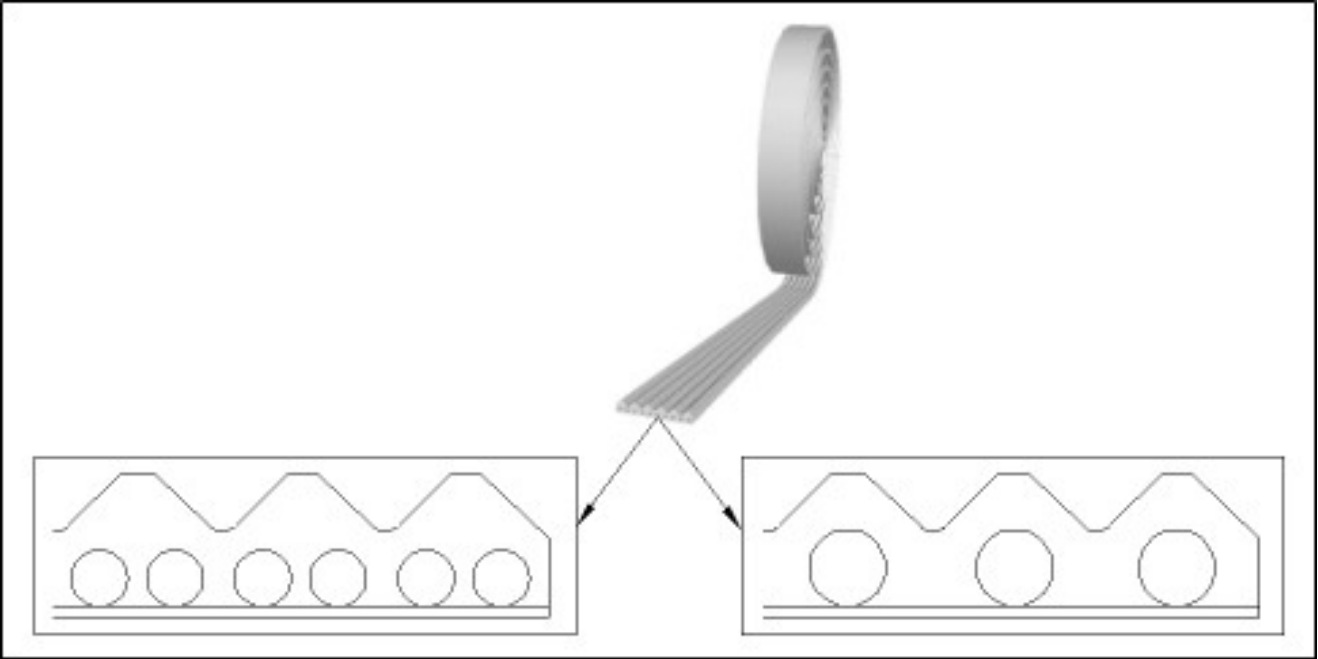


5.17

Suspension and traction media STM

5.17.1

Overview of suspension and traction media



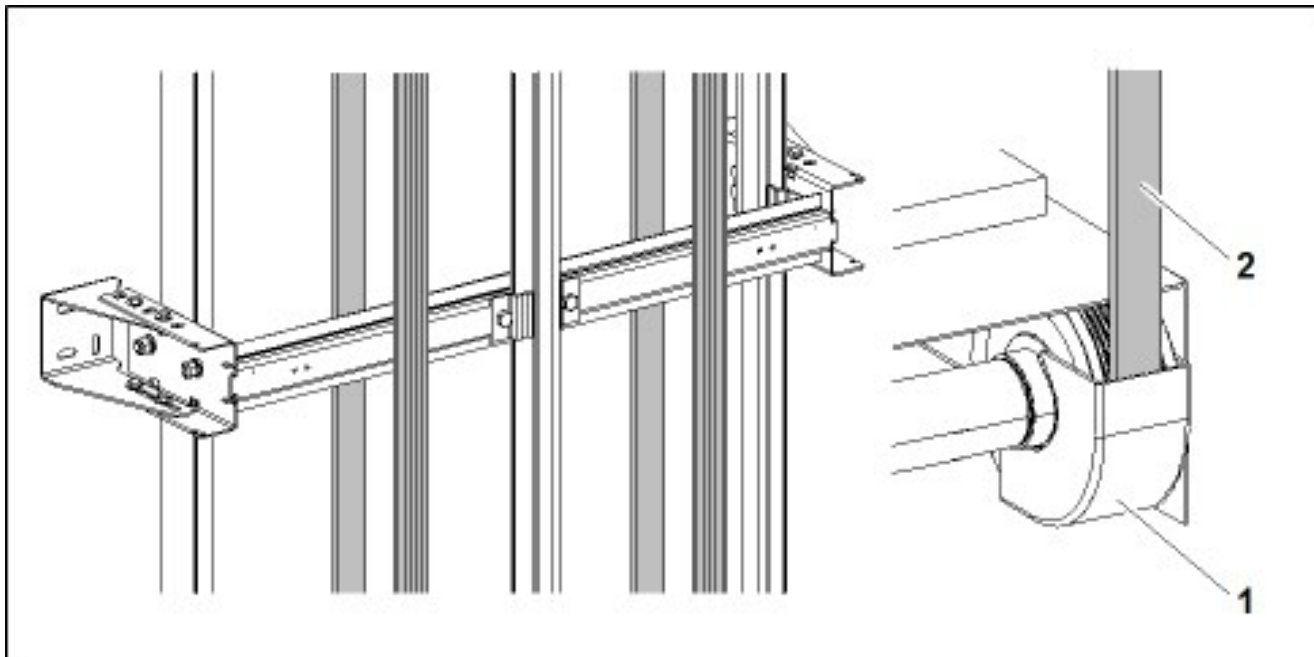
5.17.2

Maintenance plan for suspension and traction media

Interval (months)		Description
< 100000 trips/year	≥ 100000 trips/year	
12	6	Visual checks
12	6	Checking of cleanness
12	6	Checking of STM lifetime limit
12	6	Checking of STM condition
12	6	Checking of safety switch KSS alignment and contact bridge
12	6	Checking of end connectors and anti-twist device
12	6	Checking of STM tension



### 5.17.3 Visual checks



1 STM retainer underneath car

2 STM

- ▶ Make sure that the STM are straight in the grooves of the car pulley, counterweight pulley and machine pulleys.
- ▶ Make sure that there is no unusual noise from the STM.
- ▶ Make sure that all STM retainers are in position.
- ▶ Make sure that the STM do not touch hoistway material or the car.

### 5.17.4 Checking of cleanness

#### **⚠ WARNING**

##### **Damage to STM**

Oil, solvents, white spirit or acetone will damage the STM. Damaged STM can lead to serious injury or death. Only use water to clean the STM.

- ▶ Examine the STM for oil, solvent or dirt.
  - If the STM are dirty, clean them with a dry or moist cloth.

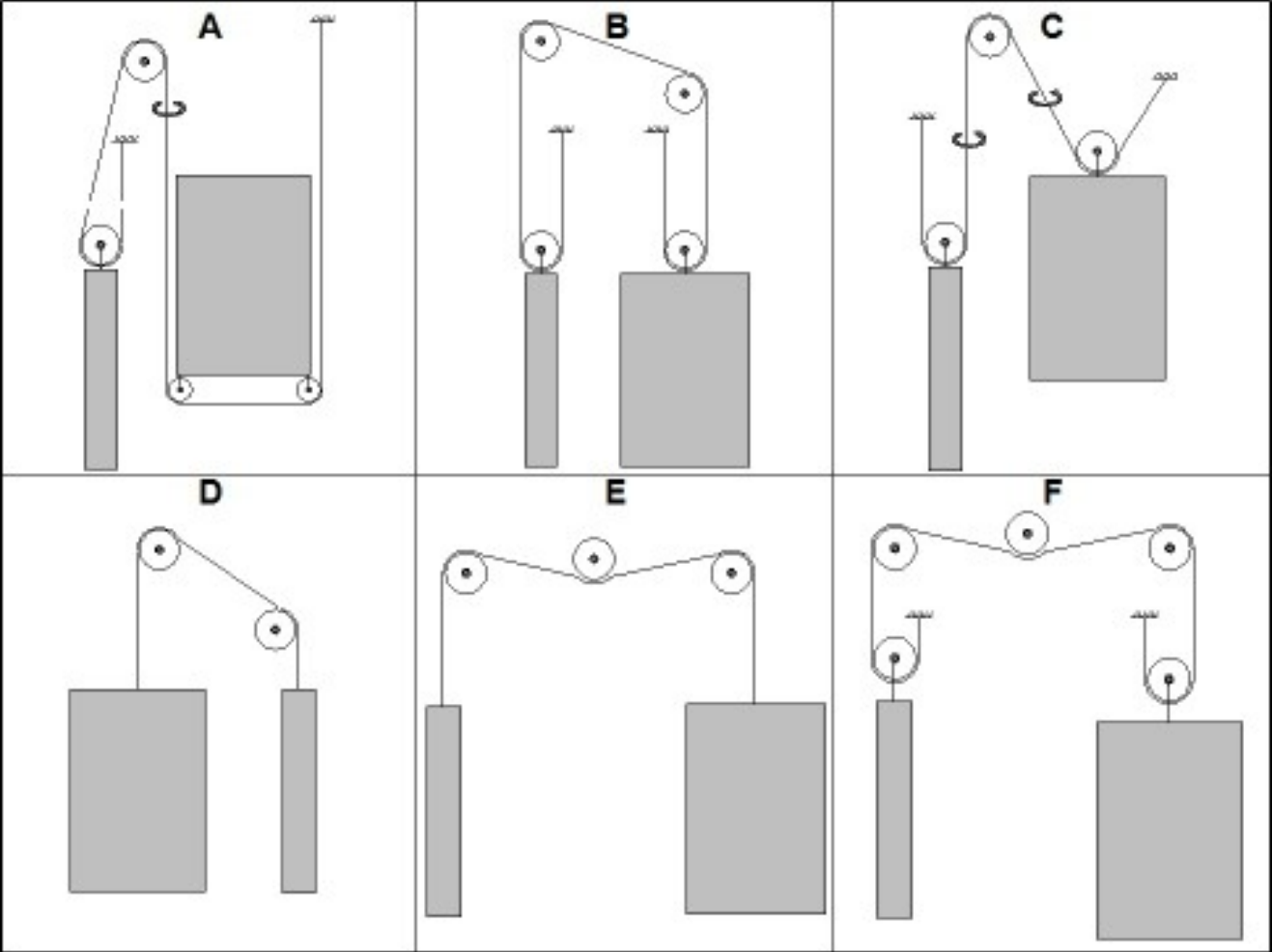


5.17.5 Checking of STM lifetime limit

STM lifetime limits

Pulley / traction sheave diameter (mm)	Maximum number of trips			
	3 SB	2 SB	1 SB / 2 RB	2 SB / 2 RB
72	1000000	n/a	n/a	n/a
87 ... 150	3000000	4500000	1000000	900000

STM layouts

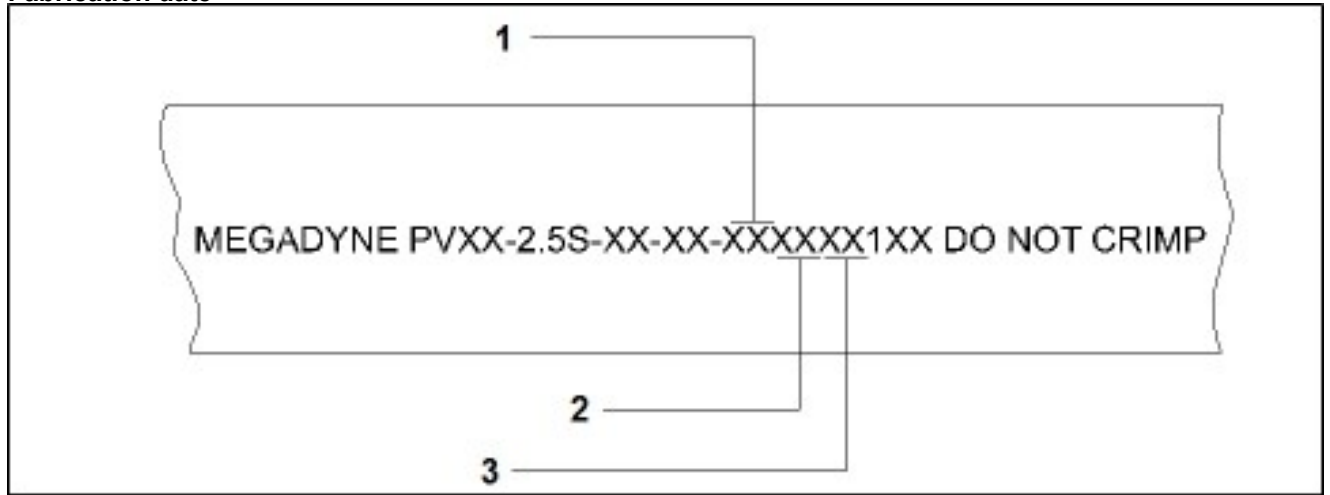


- A 3 SB
- C 2 SB
- E 1 SB + 2 RB

- B 3 SB
- D 2 SB
- F 2 SB + 2 RB



## Fabrication date



1 Day: Monday ... Sunday = 1 ... 7

2 Week: 1 ... 52

3 Year: 04 ... 99

### 5.17.5.1 Checking of STM lifetime on elevator with no STMM

- ▶ Do a check of the STMs condition.
- ▶ Read the number of trips from the trip counter.
- ▶ Calculate the number of trips between the latest replacement of STMs and the inspection date. Use the data from the service book and the trip counter.
- ▶ When the STMs are at or after their end of life, put the elevator out of service immediately.
- ▶ If the end of life of STMs will occur before the next inspection, make sure that the STMs are replaced before their end of life.
- ▶ Record this data in the service book:
  - The name of the maintenance technician
  - The inspection date
  - The total number of trips read from the trip counter
  - The results of the visual inspection.

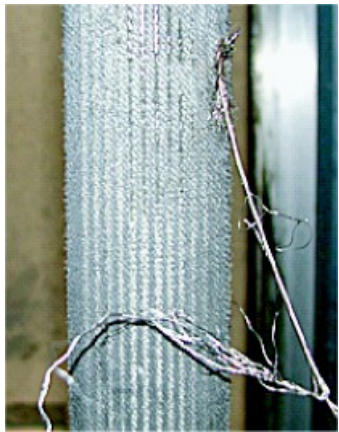
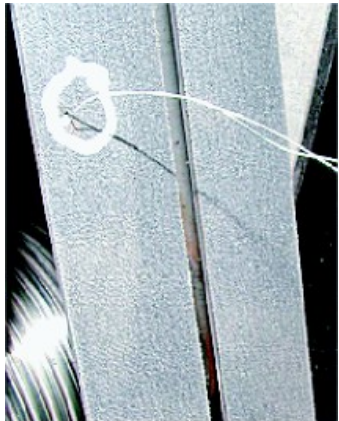
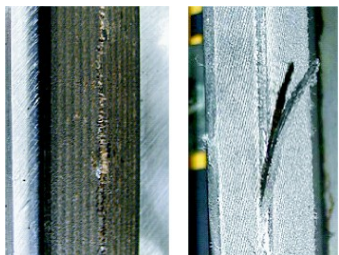
### 5.17.5.2 Checking of STM lifetime on elevator with STMM

- ▶ Do a check of the STMs condition.
- ▶ If the STMM shows a warning, do one of these steps:
  - If a level 1 warning is shown: Make sure that all STMs are replaced in less than 6 months.
  - If a level 2 warning is shown: The elevator was stopped automatically. Make sure that the elevator stays out of service until all STMs are replaced.
- ▶ If the STMM does not show a warning, and the inspection of the STMs condition is satisfactory: Read the extrapolated replacement date from the elevator control.
- ▶ Make sure that the STMs are replaced before their end of life.
- ▶ Record this data in the service book:
  - The name of the maintenance technician
  - The inspection date
  - The warning level status
  - The total number of trips read from the trip counter
  - The extrapolated replacement date from the elevator control
  - The results of the visual inspection.


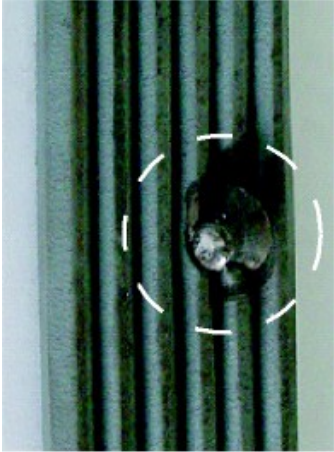
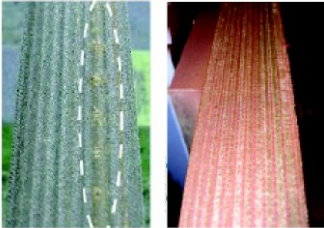
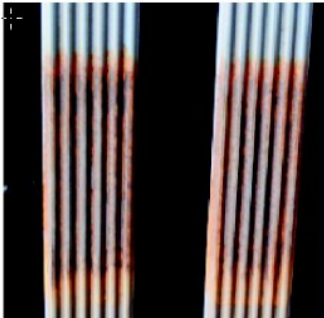


#### 5.17.6 Checking of STM condition

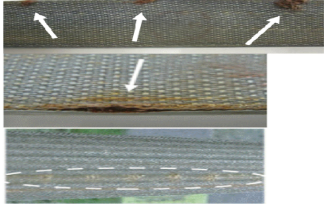




- Do a visual inspection of the STMs. If one of this type of damage is found, replace all the STMs.

Type of damage	Description
<p>Cord break</p> 	Always tell the maintenance company
<p>Wire break</p> 	Always tell the maintenance company, if wires are protruding the coating
<p>Coat damage – longitudinal cracks</p> 	Always tell the maintenance company



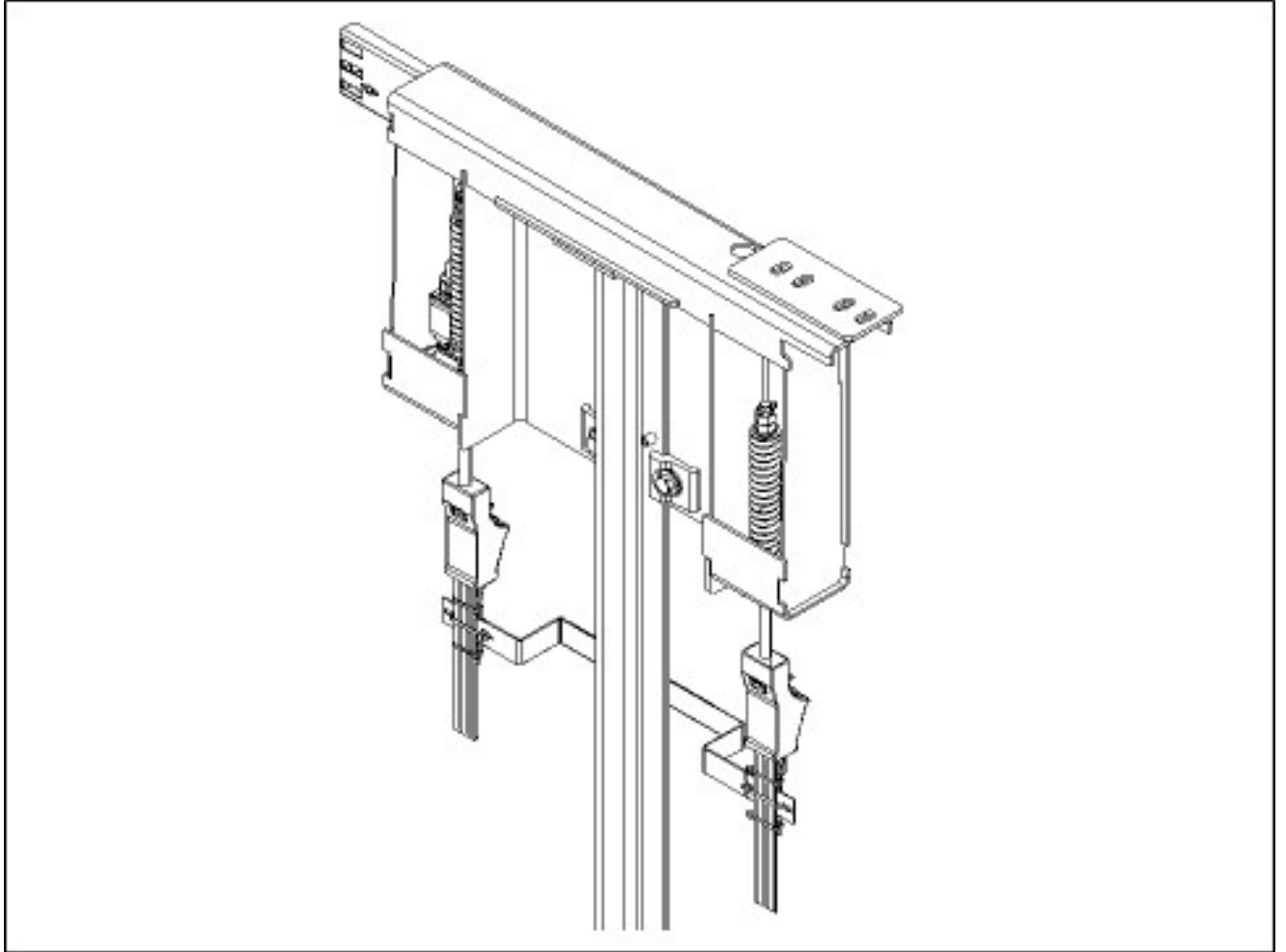
Type of damage	Description
<p>Coat damage – transversal cracks</p> 	<p>Always tell the maintenance company, if cracks are exposing cord</p>
<p>Coat damage – STM piercing, by foreign object as for example a lost screw</p> 	<p>Always tell the maintenance company</p>
<p>STM fretting corrosion on backside</p> 	<p>Always tell the maintenance company</p>
<p>Corrosion on Poly-V-Profile</p> 	<p>Clean STM with dry cloth if possible. No reason for replacement</p>



Type of damage	Description
STM corrosion/rust on backside 	Always tell the maintenance company
Damage of STM edge, outermost cord visible 	Always tell the maintenance company
Worn or damaged profile affecting the STM guidance 	Always tell the maintenance company
Undulation of STM 	Always tell the maintenance company, if amplitude of the wave is more than 2 mm
STM exposed to fire (no picture)	Always tell the maintenance company
Damage of STM backside 	Always tell the maintenance company, if cord is visible



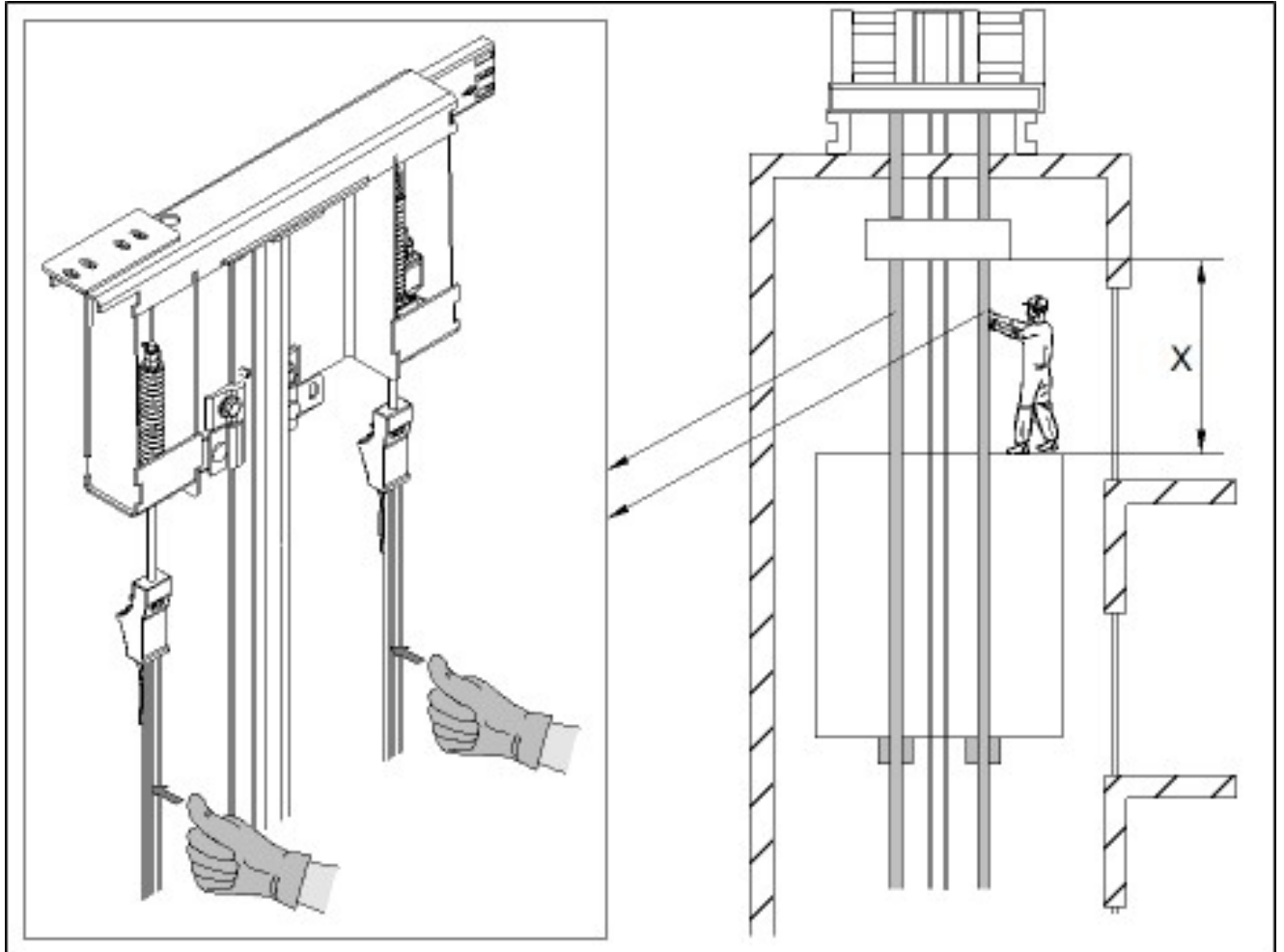
#### 5.17.7 Checking of end connectors and anti-twist device



- Make sure that the lock nuts at the car ends and counterweight ends are in position and tight.
- Make sure that the cotter pins and anti-twist plates are in position.



### 5.17.8 Checking of STM tension



- ▶ Move the car to approximately 2 m below the car fix point.
- ▶ Push your thumb against the first STM and feel the tension.
- ▶ Push your thumb against the other STM and compare the tension.
- ▶ If there is a clear difference in tension, loosen the lock nut and adjust the tension of each STM.
- ▶ Move the car two times from the hoistway top to the bottom.
- ▶ Do a check of the STM tension.
  - ↳ If the tension is not equal, adjust the tension again.
- ▶ When the tension of all STM is equal, tighten the lock nuts.

### 5.17.9 Replacement of STM

- ▶ Contact the installer for spare parts and for information on how to replace the component.
- ▶ Record the replacement in the service book.



## 5.18 Guide rail system MM GRS

### 5.18.1 Maintenance plan

Interval (months)	Description
12	Check and cleaning of fixation
12	Check and cleaning of oil collectors

### 5.18.2 Safety

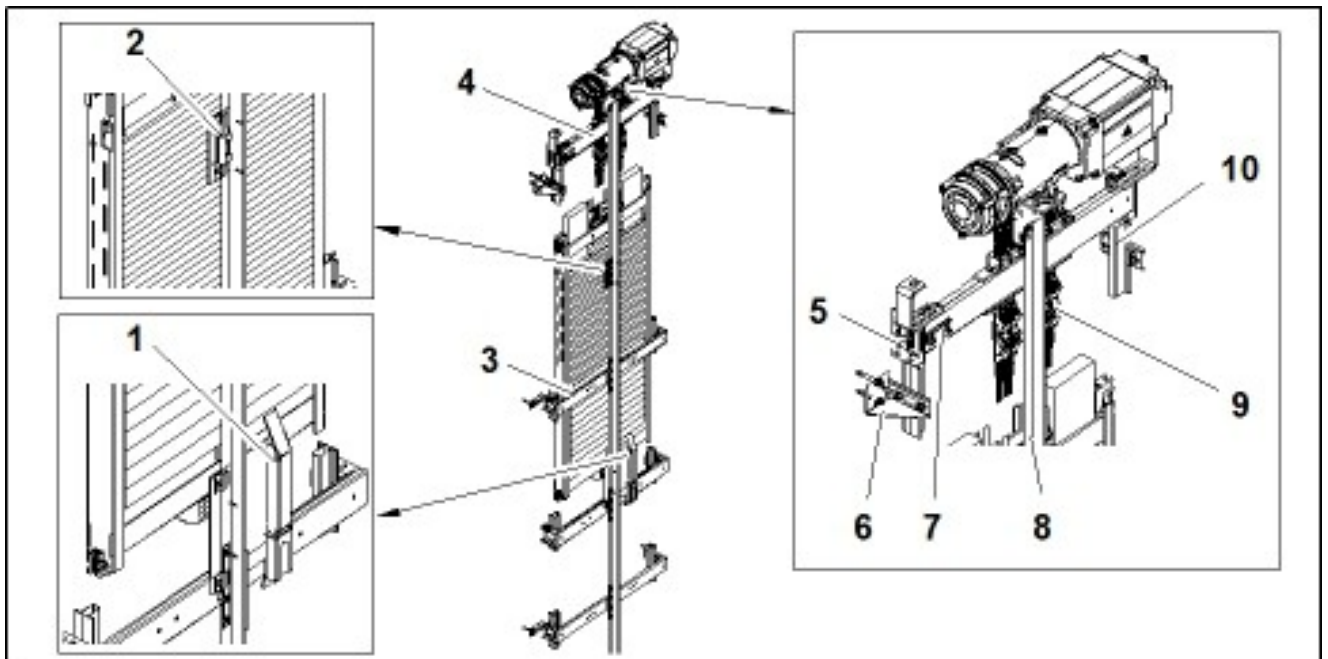
#### ⚠ CAUTION

##### Contamination of STM with oil

The contamination of STM with oil can cause slippage on the traction shaft, which can cause damage to the installation or injury.

- Prevent contamination of the STM when filling the lubricators, for example, use an oil can with an applicable spout.
- Clean up spilled oil.

### 5.18.3 Check and cleaning of fixation



- |   |                                     |    |                          |
|---|-------------------------------------|----|--------------------------|
| 1 | TSD21 buffer stop (optional)        | 2  | CBD (optional)           |
| 3 | Omega bracket                       | 4  | Machine support          |
| 5 | Outside plate of machine support    | 6  | L bracket                |
| 7 | Traveling cable fixation            | 8  | Car guide rail           |
| 9 | STM end connection on counterweight | 10 | Counterweight guide rail |

► Make sure that these components are tight:

- All guide rail brackets
- All fishplates
- The two overspeed governors
- The machine support
- The two counterweight protection screens.

► Make sure the safety wire on each machine fastening bolt is in position.

► For machine room less, make sure that the frequency converter is safely attached to the hoistway wall.

► For mini machine room, make sure that the damper top cover is safely attached to the main beam of the building.

### 5.18.4 Check and cleaning of oil collectors

- Remove the oil from the oil collectors on the car and the counterweight guide rails.



## 5.19 Oil buffer SA OLE

### 5.19.1 Maintenance plan of buffer



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Cleaning of buffer
12	Check of identification marking
12	Check of buffer and buffer support condition
12	Check of buffer positioning
12	Check of buffer fixation
12	Check of buffer oil level
12	Functional test
60	Check of buffer vertical movement
60	Check of buffer height
60	Check of buffer safety contact switch

### 5.19.2 Cleaning of buffer

#### WARNING

##### **Personnel injury or death**

A leaking oil buffer decreases the buffer performance, which can cause serious injury or death.  
Replace a leaking oil buffer.

- Clean the buffer casing and the plunger.
- Lubricate the plunger lightly with oil.

### 5.19.3 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- Make sure that the identification marking is present and readable.
- If the identification marking is missing or not readable replace the component.

### 5.19.4 Check of buffer and buffer support condition

- Make sure that the buffer and the buffer support if present are not damaged.

### 5.19.5 Check of buffer positioning

- Make sure that the buffer and buffer support are aligned vertically in the hoistway.
- Make sure that the buffer is aligned to the car/counterweight buffer plate.

### 5.19.6 Check of buffer fixation

- Make sure that the mounting bolts are attached correctly. If necessary, tighten.

### 5.19.7 Check of buffer vertical movement

- Make sure that the buffer plunger is not blocked and free to move either by hand or, if available, by pit recall control.



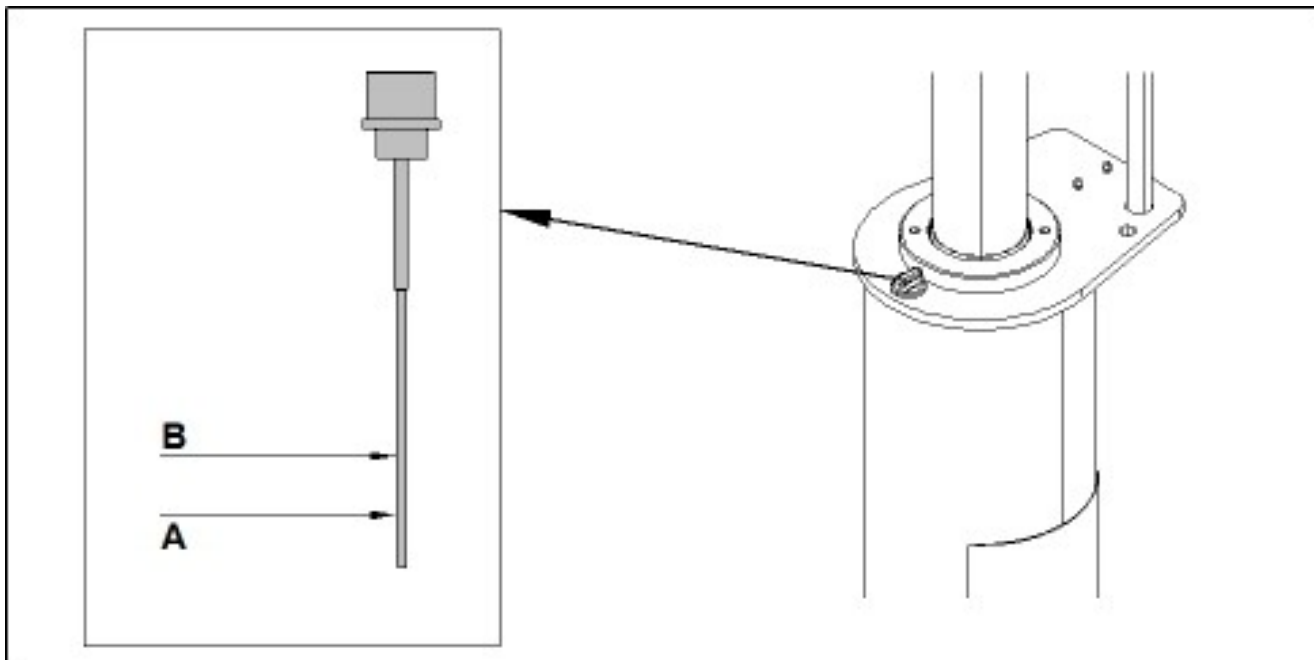
#### 5.19.8 Check of buffer oil level

### NOTICE

#### Buffer oil spillage

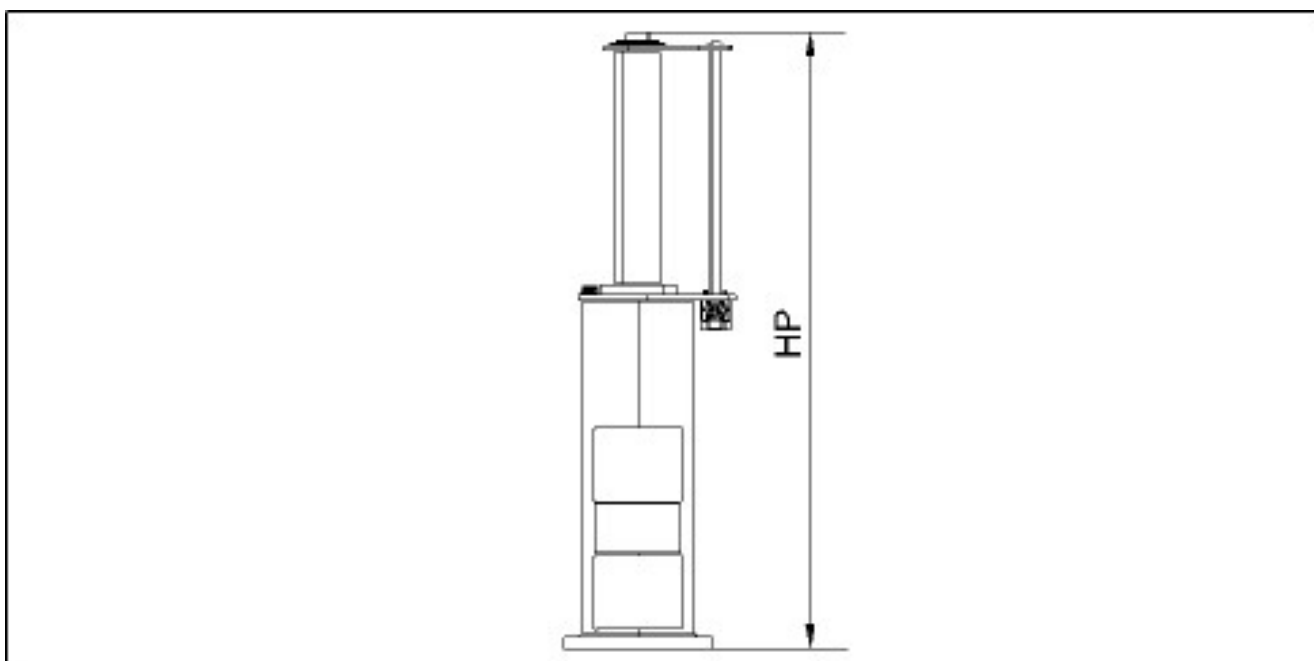
If too much oil is filled into the buffer, unwanted oil will be spilled from the buffer.

Check oil level with the oil level indicator, make sure that the maximum oil level must not be exceeded.



- ▶ Use the oil level indicator to check the oil level.
  - Remove the oil level indicator.
  - If the buffer has a breather screw, remove the breather screw.
  - Make sure that the oil level is correct on oil level indicator.The minimum oil level (A) is marked on the oil level indicator.
- ▶ If necessary, refill with HLP 68/ISO 6743/4 L-HM68/68A oil up to the maximum level.
- The maximum oil level (B) is marked on the oil level indicator.

#### 5.19.9 Check of buffer height



Type	HP (mm)
LSB10.A	221 ±2




Type	HP (mm)
LSB16.B	483 +3/-2
LSB18.B	575 +3/-2
LSB20.B	767 +4/-5
LSB25.B	1158 ±4
MLB13.1	404 ±4
MLB16.1	526 ±4
MLB18.1	628 ±4
MLB20.1	776 ±4
MLB25.1	1158 ±4
MLB32.1	1725 +4/-5
MLB35.3	2104 ±5
MLB40.3	2689 ±5
SEB16.2	537 +4/-5
SEB18.2	640 +4/-5
SEB20.2	774 +4/-5
SEB25.2	1123 +4/-5
LB16.003	613 ±5
LB18.001	719 ±5
LB20.001	835 ±5
LB23.001	1034 ±5
LB25.003	1207 ±5
LB32.002	1702 ±5
LB35.001	2104 ±5
LB40.001	2689 ±5
LB50.001	4208 +8/-9
LB55.001	5031 +8/-9
LB60.001	6173 +8/-9

- ▶ Make sure that the HP dimension is correct when the buffer is fully extended, refer to the table.
- ▶ If the HP dimension is not in the permitted range shown in the table, replace the buffer.

#### 5.19.10 Check of buffer safety contact switch


- ▶ From the control, activate the recall function ESE.
- ▶ Press slowly the car toward the buffer.
- ▶ Verify in the SMLCD screen the safety circuit opens in correspondence of the buffer's switch.

#### 5.19.11 Functional test

 Refer to local regulation for functional test requirements and their frequency.

- ▶ From the control activate the recall function ESE.
- ▶ Place slowly the car on the buffer.
- ▶ Hoist the car.
- ▶ Repeat the tasks described in the maintenance plan and check the buffer and buffer support.
  - Check of buffer support condition.
  - Check of buffer positioning, height and fixation.
  - Check of buffer movement.
  - Check of buffer safety contact switch.

#### 5.19.12 Replacement of buffer

 Contact the installer for spare parts and for information on how to replace the component.

- ▶ Perform the functional test.
- ▶ Record the replacement in the service book.



## 5.20 Elastomer buffer SA AC and SA PS

### 5.20.1 Maintenance plan of buffer



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Cleaning of buffer
12	Check of identification marking
12	Check of buffer and buffer support condition
12	Check of buffer damage, deformation or skin loss
12	Check of buffer positioning
12	Check of buffer fixation
12	Check of buffer integrity
12	Functional test

### 5.20.2 Cleaning of buffer

#### WARNING

##### **Damage to the buffer**

Acids, solvents and alkalis may damage the buffer.  
Use only approved products.

- Clean the buffer of dust and dirt with water only.

### 5.20.3 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- Make sure that the identification marking is present and readable.
- If the identification marking is missing or not readable replace the component.

### 5.20.4 Check of buffer and buffer support condition

- Make sure that the buffer and the buffer support if present are not damaged.

### 5.20.5 Check of buffer damage, deformation or skin loss

- Check the physical condition of the outer surface of the buffer.
  - The cracks in the molded skin in a length of  $\geq 40$  mm and a depth  $\geq 3$  mm are not allowed.
  - The material outbreaks or detachment of the molded skin  $\geq 20 \times 20$  mm are not allowed.
  - If the buffer is deformed and the height is  $\geq 5$  mm shorter than the nominal height, replace the buffer

### 5.20.6 Check of buffer positioning



If more than one buffer is installed, make sure that the height difference between any two buffers is  $\leq 5$  mm.

- Make sure that the buffer and buffer support are aligned vertically in the hoistway.
- Make sure that the buffer is aligned to the car/counterweight buffer plate.

### 5.20.7 Check of buffer fixation

- Make sure that the mounting bolts are fastened correctly. If necessary, retighten.
- Make sure that the buffer bonding to the base plate is intact.



## 5.20.8 Check of buffer integrity

### ⚠ WARNING

#### Contamination of elastomer buffers

The performance of buffers made from Diepocell BM deteriorates if contaminated with aqueous liquids, which in the event of a buffer travel may result in damage to the installation or injury to elevator passengers.

- If the buffers are contaminated with aqueous liquids, for example after flooding of the pit with water, replace the buffers.
- If the buffer material is brittle after a scratch test, replace the buffers. The buffer bonding to the base plate is weakened.

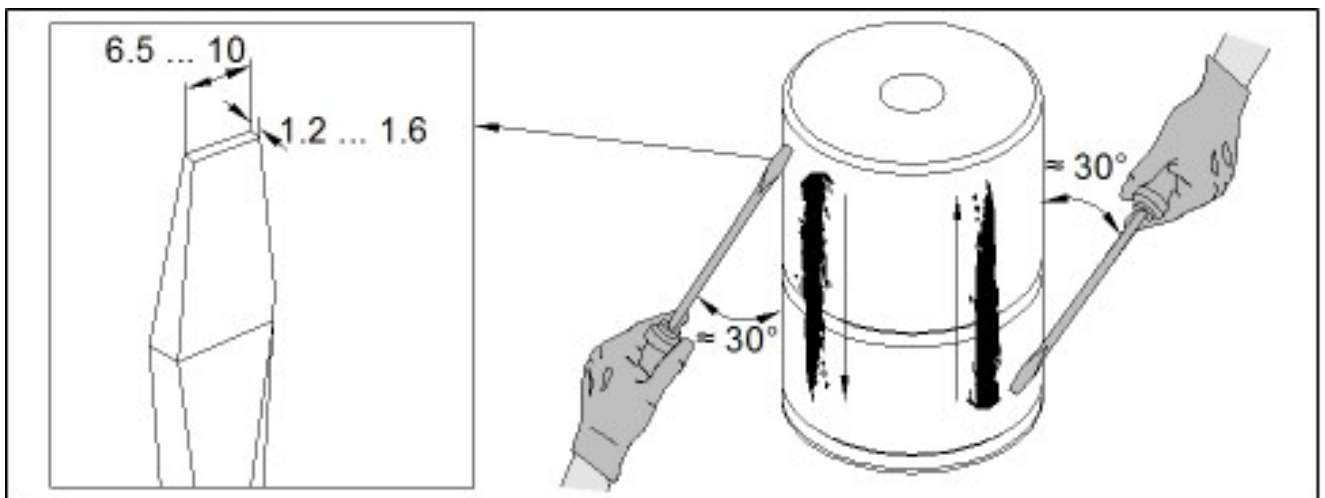
### ⚠ WARNING

#### Parallel elastomer buffers with different age

Parallel elastomer buffers of different age adversely affect the buffer performance, which in the event of a buffer travel may result in damage to the installation or in injury to elevator passengers.

Replace always all buffers in a set of parallel elastomer buffers with an identical product at the same time.

- ▶ Make sure that the buffer is visible for any contamination or deterioration due to contact with liquids such as detergent, oil, etc.
- ▶ If necessary, replace the buffers.



- ▶ Prepare a slotted-head screwdriver of following size:
  - Thickness = 1.2 ... 1.6 mm
  - Width = 6.5 ... 10 mm.
- ▶ With the screwdriver, manually apply pressure on the buffer surface as shown in the graphic. Scratch from top to bottom or from bottom to top 5 times depending on the fixation of the buffer.
- ▶ If a clear scratching mark is visible on the buffer due to the material deterioration, replace the buffers.

## 5.20.9 Functional test

**i** Refer to local regulation for functional test requirements and their frequency.

- ▶ From the control activate the recall function ESE.
- ▶ Place the car slowly on the buffer.
- ▶ Hoist the car.
- ▶ Repeat the tasks described in the maintenance plan and check the buffer and buffer support.
  - Check of buffer support condition.
  - Check of buffer positioning, integrity and fixation.

## 5.20.10 Replacement of buffer

**i** Contact the installer for spare parts and for information on how to replace the component.

- ▶ Perform the functional test.
- ▶ Record the replacement in the service book.



## 5.21 Spring buffer SA BS-EM

### 5.21.1 Maintenance plan of buffer

Interval (months)	Description
12	Cleaning of buffer
12	Check of buffer and buffer support condition
12	Check of buffer positioning
12	Check of buffer fixation
12	Functional test


#### 5.21.2 Cleaning of buffer

- Clean the buffer of dust and dirt with water only.

#### 5.21.3 Check of buffer and buffer support condition

- Make sure that the buffer and the buffer support if present are not damaged.


#### 5.21.4 Check of buffer positioning

-  If more than one buffer is installed, make sure that the height difference between any two buffers is  $\leq 5$  mm.
- Make sure that the buffer and buffer support are aligned vertically in the hoistway.
- Make sure that the buffer is aligned to the car/counterweight buffer plate.


#### 5.21.5 Check of buffer fixation

- Make sure that the mounting bolts are fastened correctly. If necessary, retighten.
- Make sure that the buffer bonding to the base plate is intact.

#### 5.21.6 Functional test

-  Refer to local regulation for functional test requirements and their frequency.
- From the control activate the recall function ESE.
- Place the car slowly on the buffer.
- Hoist the car.
- Repeat the tasks described in the maintenance plan and check the buffer and buffer support.
  - Check of buffer support condition.
  - Check of buffer positioning, integrity and fixation.


#### 5.21.7 Replacement of buffer

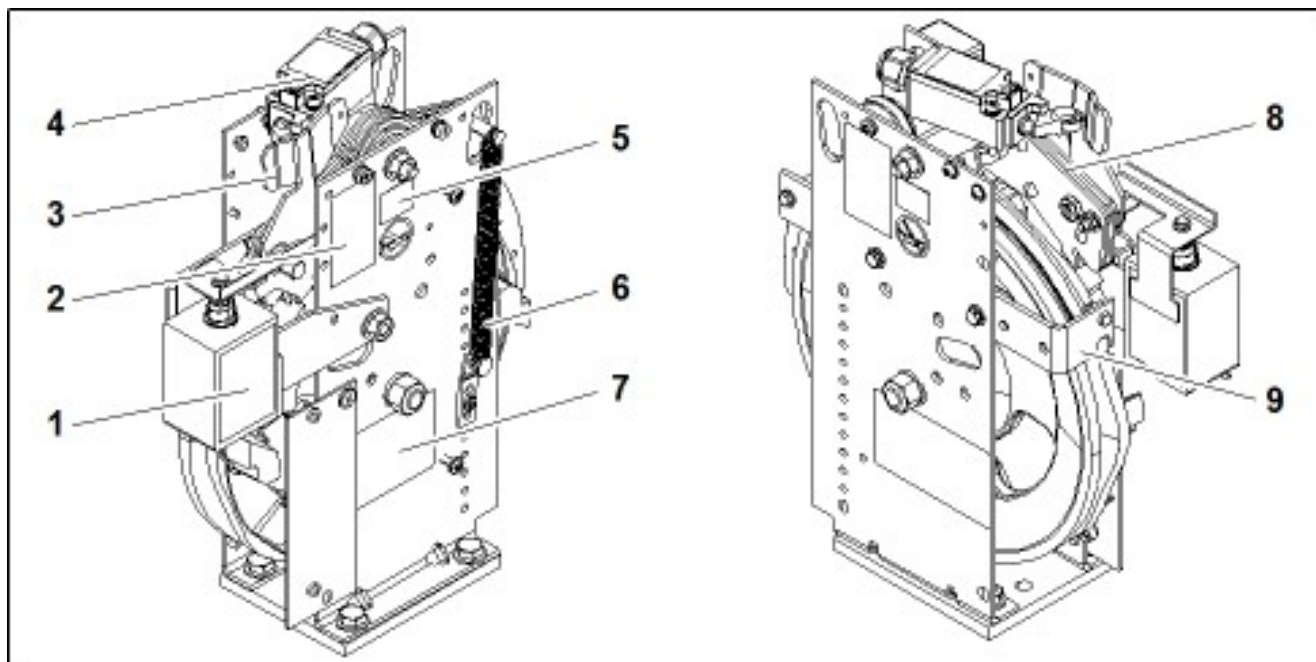
-  Contact the installer for spare parts and for information on how to replace the component.
- Perform the functional test.
- Record the replacement in the service book.



## 5.22 Overspeed governor system SA GBP 201


### 5.22.1 Overview

 Cover removed from the graphic for more clarity of components.



- |   |                                    |   |   |
|---|------------------------------------|---|---|
| 1 | Electric remote control (optional) | 2 | Arrow sticker                                     |
| 3 | Pre-contact plate                  | 4 | Safety switch on overspeed governor               |
| 5 | Operation label                    | 6 | Retaining spring                                  |
| 7 | Type label                         | 8 | Pendulum for tripping speed of overspeed governor |
| 9 | Rope retainer (optional)           |   |   |

### 5.22.2 Maintenance plan for overspeed governor

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	General check of overspeed governor
12	Check governor rope and coupling
12	Check tension device and slack rope switch
12	Check safety switch on overspeed governor
60	Test of friction force of the rope at speed governor FC and engagement of safety gear
60 <sup>1)</sup>	Test of tripping speed
-	Checks and tests required as per local regulations

1) Functional test must be performed by a qualified elevator technician.



### 5.22.3 Checking of cleanness

## ⚠ WARNING

#### Lubrication of overspeed governor system

Lubrication of the overspeed governor or overspeed governor rope impairs the functioning of the safety gear system.

Do not lubricate the overspeed governor and overspeed governor rope.

**i** Do not use cleaning agents containing strong solvents or abrasives.

- ▶ Do a check of the overspeed governor for dirt and oil.
  - Make sure that there is no dirt and oil on the pulley groove.
  - If necessary, clean the overspeed governor from dirt and oil.
- ▶ Clean the rope tension device.

### 5.22.4 Checking of identification marking

**i** This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

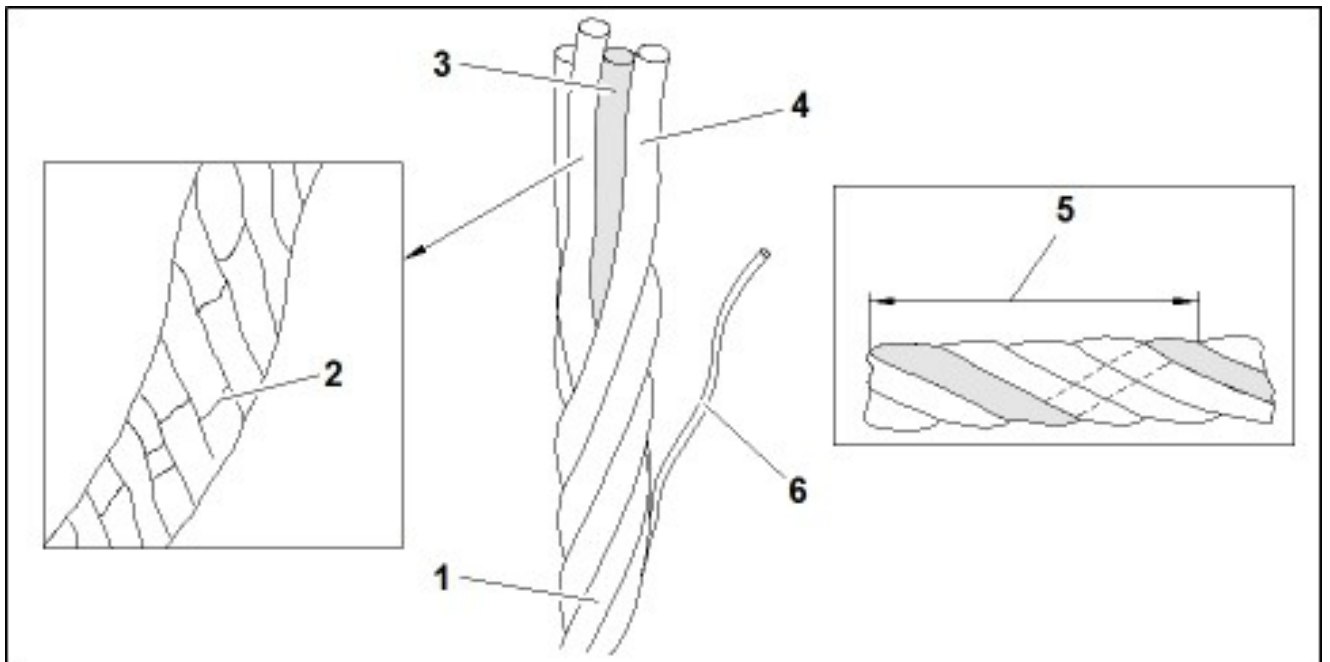
### 5.22.5 Checking of condition of factory seal

- ▶ Make sure that the factory seal is in place and has not been tampered or broken.
- ▶ If the factory seal is damaged, replace the overspeed governor. Contact the installer and make a note in the service book.

### 5.22.6 Checking of condition of overspeed governor

- ▶ Make sure that the overspeed governor is free from damage or deformation.

### 5.22.7 Checking of condition of governor rope



- |   |                 |   |                         |
|---|-----------------|---|-------------------------|
| 1 | Steel wire rope | 2 | Breaks in strand of lay |
| 3 | Rope core       | 4 | Strand                  |
| 5 | One lay of rope | 6 | Wire out of lay         |

**i** The original governor rope diameter is mentioned on the identification marking.

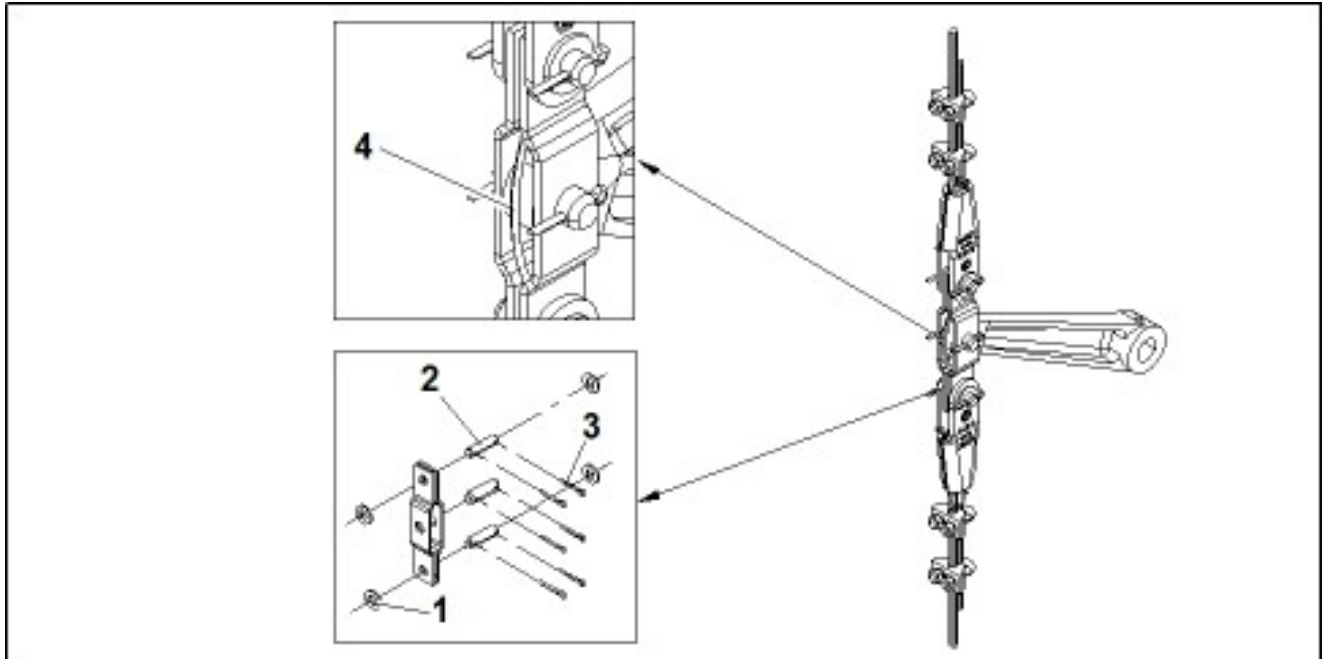
**i** If the governor rope does not run freely, check the guides for correct positioning.



**i** If any of the below conditions are failed, replace the governor rope.

- ▶ Do a check for the condition of the governor rope, at the inspection speed VKI from the car roof.
  - Make sure that the governor rope runs freely during operation.
  - Make sure that there is no more than 6 wires broken in one lay of rope.
  - Make sure that there is no more than 3 wires broken in one strand of one lay of rope.
  - If there is visible red dust or rust, the governor rope is damaged or disfigured.
  - Make sure that the governor rope is not contaminated with oil or grease.
  - Make sure that the diameter of the rope has not reduced more than manufacturers recommended limit (5 ... 10%).

#### 5.22.8 Checking of condition of rope coupling



- |   |            |   |             |
|---|------------|---|-------------|
| 1 | Washer     | 2 | Clevis pin  |
| 3 | Cotter pin | 4 | Spring wire |

- ▶ Examine the condition of the rope coupling and sub-components for damage, deformation and fixation:
  - Washers
  - Clevis pins
  - Cotter pins
  - Spring wire.

#### 5.22.9 Checking of static fixation of overspeed governor

- ▶ Do a check for static fixation of the overspeed governor.

#### 5.22.10 Checking of fixation of safety switch on overspeed governor

- ▶ Do a check for fixation of the contact switch.

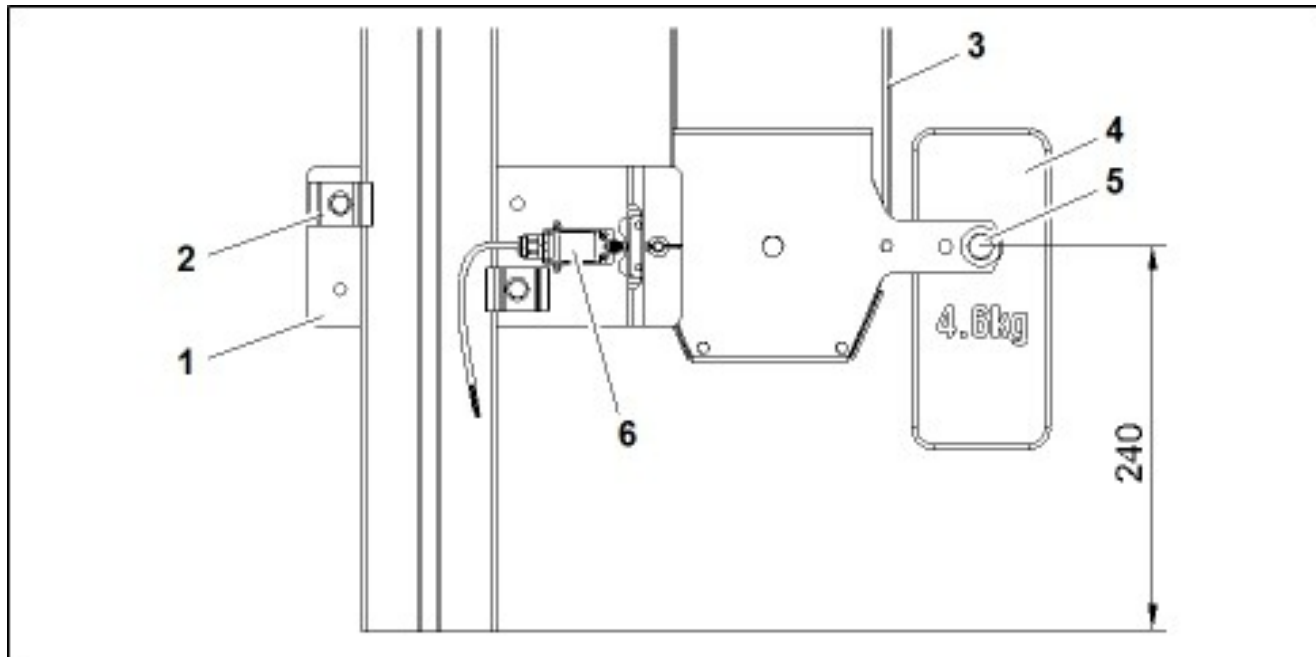
#### 5.22.11 Checking of fixation of slack rope switch on tension device

**i** The slack rope switches must not be bypassed with the recall control.

- ▶ Do a check for fixation of the slack rope switch.



### 5.22.12 Check for fixation of tension device



- |   |                               |   |                   |
|---|-------------------------------|---|-------------------|
| 1 | Mounting support              | 2 | Guide clip        |
| 3 | Governor rope                 | 4 | Tension weight    |
| 5 | Tension weight fastening bolt | 6 | Slack rope switch |

**i** The mass of the tension device weight may be different from shown.

- ▶ Examine the fixation of the tension device.
  - Check the tightness of the guide clips, tension weight fastening bolts and mounting support.
  - Make sure that the tension device has not moved down the guide rail from its initial position.
  - Check for elongation of the governor rope. The tension arm must be in the horizontal position.
  - Make sure that the correct mounting position of the tension weight is  $\geq 240$  mm from the floor.
    - ↳ If necessary, align the tension device and decrease the rope length.

### 5.22.13 Checking of operation of slack rope switch

- ▶ Manually activate the slack rope switch.
- ▶ Exit the hoistway.
- ▶ Switch on the emergency stop switch.
- ▶ Close the landing doors.
- ▶ Enter a floor call and observe the movement of the car:
  - Make sure that there is no movement of the car.
  - If there is a movement of the car, find the fault and rectify.

### 5.22.14 Checking of condition of pulley on overspeed governor

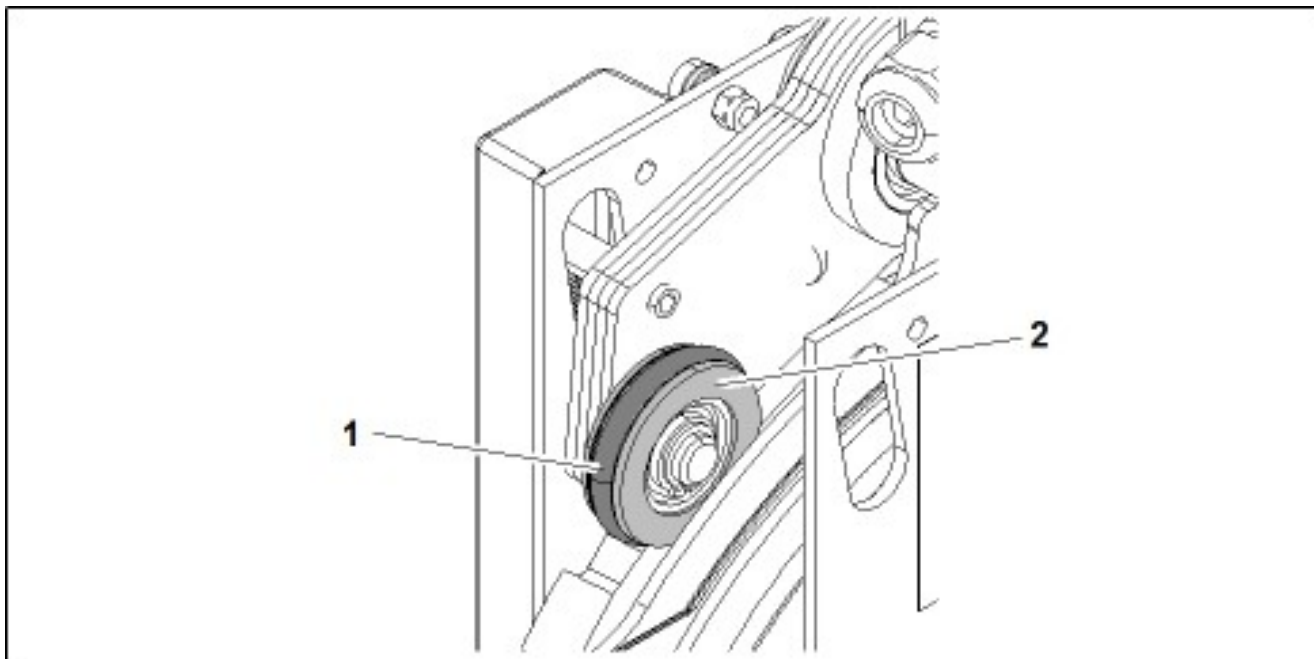
**i** If any of the below steps are failed, replace the overspeed governor. Contact the installer and make a note in the service book.

- ▶ Examine the pulley groove for wear or damage.
- ▶ Examine the groove for metal filings.
  - i** Lateral movement of governor pulley is  $> 3$  mm or excessive noise indicates a worn bearing.
- ▶ Examine the governor pulley for lateral movement or grinding noises during operation.
  - i** The pulley must not have any axial movement, it indicates a worn bearing.
- ▶ Examine the governor pulley for axial movement.



### 5.22.15 Check for condition of pendulum

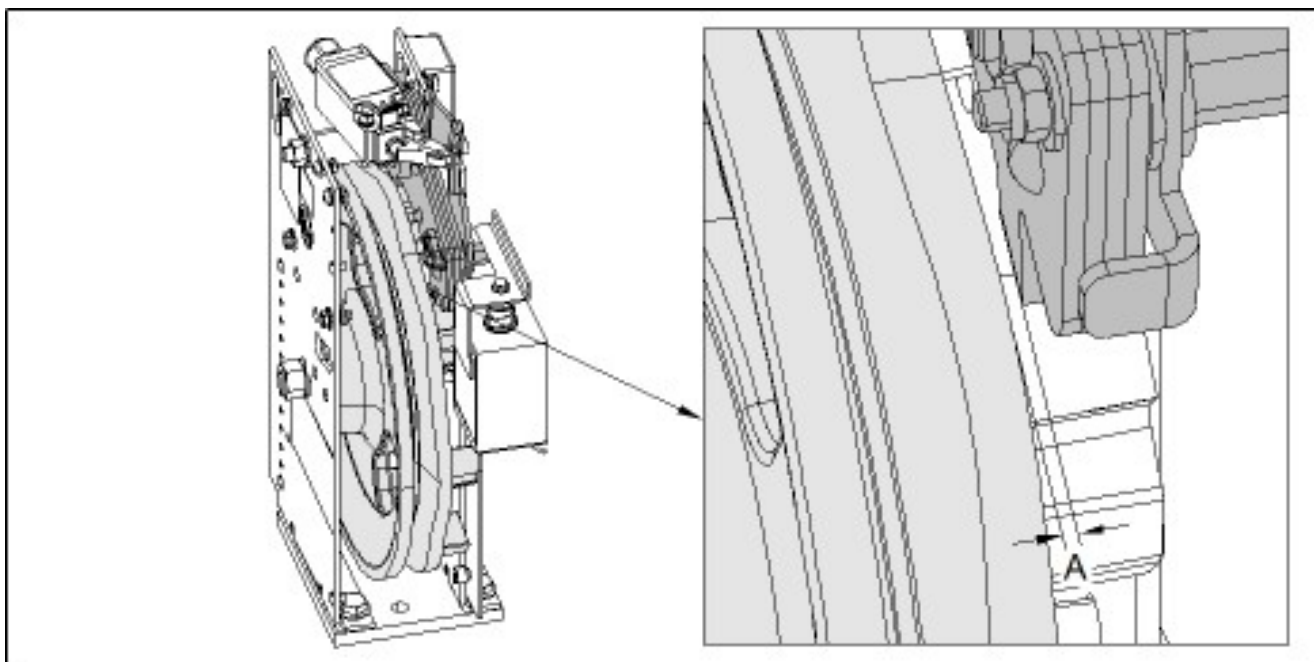
- Make sure that the pendulum arm is free from wear.



1 O-ring

2 Friction roller

- Make sure that the friction roller O-ring is free from damage.
  - ↳ If damaged, replace the O-ring.



- Examine the bearing for wear by measuring the gap A between the pendulum and pulley.
  - ↳ If  $A \leq 1 \text{ mm}$ , replace the overspeed governor. Contact the installer and make a note in the service book.
- Check the lateral movement or grinding noises during operation.
  - ↳ If lateral movement or a grinding noise is present, replace the overspeed governor. Contact the installer and make a note in the service book.



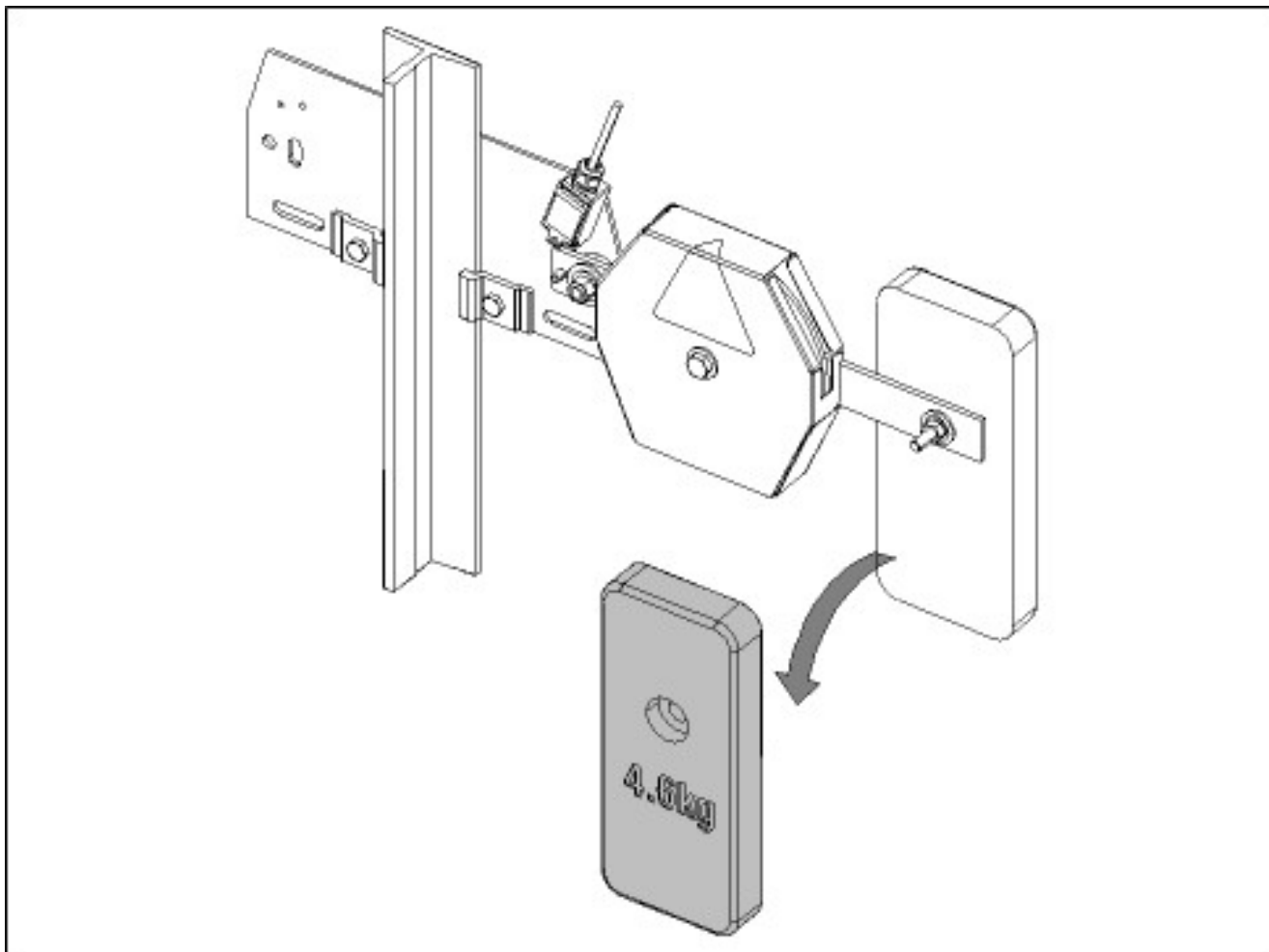
#### 5.22.16 Checking of operation of overspeed safety switch

- ▶ Do a check for the movability of moving parts.
- ▶ Activate the overspeed governor safety switch.
- ▶ Make sure that the overspeed governor safety switch actuates correctly.
- ▶ Make sure that the car is not able to move in inspection mode.
- ▶ If successful, reset the overspeed governor safety switch.

#### 5.22.17 Testing procedure

##### 5.22.17.1 Mechanical tripping test

- i** The friction force of the rope overspeed governor FC must be checked also following the replacement of the governor rope.



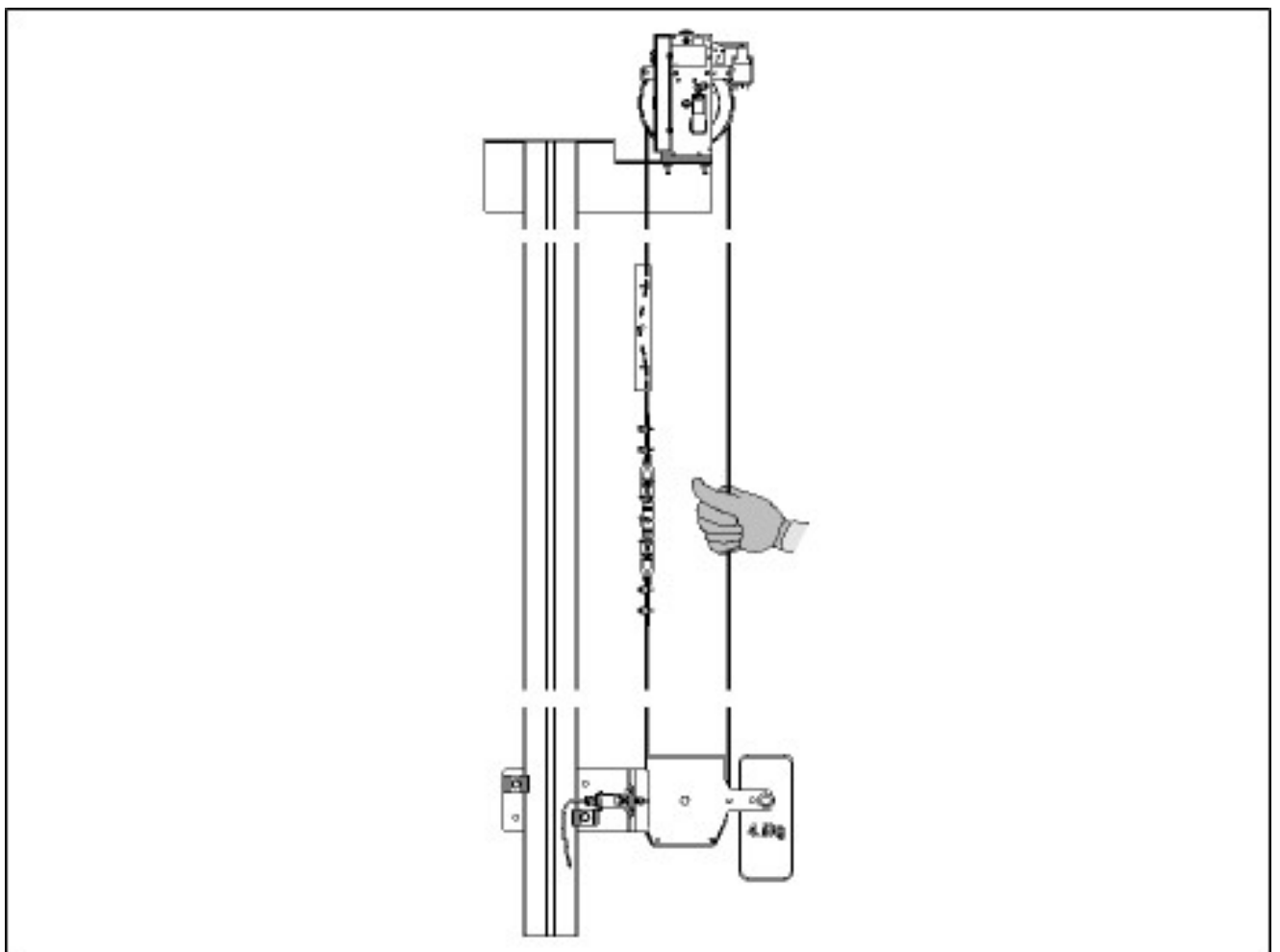
- i** The mass of the tension device weight may be different from shown.
- ▶ Make sure that the car is empty.
  - i** Make sure that the landing door is accessible without moving the car, as the car is not movable after the test.
  - ▶ Position the car\CWT 1 m above the lowest floor with recall control.
  - ▶ Remove one weight block from tension device (approximately 1/2 of the friction force of the rope at return pulley FCU) and tighten one weight block with the screw and nut again.
  - ▶ Move the car\CWT downwards approximately 10 cm at low speed with recall control.
    - Block the governor pulley by engaging the pendulum manually or with ERC and let the car travel more.
  - ▶ If the safety gear is engaged and the car\CWT has stopped, the test is successful.



- If the safety gear is not engaged and the car\CWT is travelling:
  - Make sure that the actuating mechanism and safety gear mechanism moves freely.
  - Make sure that there is correct weight on the tension device.
  - Make sure that the governor rope is not lubricated.
  - Make sure that the overspeed governor is aligned correctly.
  - Repeat the test.
- ↳ If necessary, replace the overspeed governor or the overspeed governor rope.
- Move the car\CWT upwards until the overspeed governor and safety gear is disengaged.
- Reset the safety switch on the overspeed governor and the actuating mechanism of safety gear.
- Install and tighten the removed weight block on the tension device with screw and nut.

#### 5.22.17.2 Tripping speed test

Rated speed VKN (m/s)	Allowable tolerance of tripping speed VCA for field check	Type of safety gear
<b>VKN ≤ 0.63</b>	$VCA_{\text{measured}} \leq 1.00 \text{ m/s}$	Captive roller safety gear Progressive safety gear
<b>0.63 &lt; VKN ≤ 1.00</b>	$VCA_{\text{measured}} \leq 1.50 \text{ m/s}$	Progressive safety gear
<b>VKN &gt; 1.00</b>	$VCA_{\text{measured}} \leq 1.25 \times VKN + 0.25/VKN$	Progressive safety gear



- Do a check of the marking speed on the identification marking and make sure that the correct overspeed governor is installed.
- Make sure that the overspeed governor and tension device are installed correctly.
- Position the car so that the governor lever on the actuation mechanism of the safety gear is easily accessible.
- Make sure that the landing door is accessible without moving the car. After the test movement of car is not possible.



If the governor lever is not accessible in the pit, the technician must do the procedure on the car roof.



- ▶ Make sure that the car is positioned correctly depending on the conditions given below:
  - The car is checked and the governor lever on the actuation mechanism of the safety gear is on top of the car:  
Position the car so that the car roof can be accessed from the top floor.
  - The car is checked and the governor lever on the actuation mechanism of the safety gear is below the car:  
Position the car so that the governor lever can be accessed from the hoistway pit.
  - The CWT is checked from the car roof:  
Position the car so that the governor lever can be accessed from the car roof.
  - The CWT is checked from the hoistway pit:  
Position the car so that the governor lever can be accessed from the hoistway pit. Add the weights that are supplied above the rope coupling.
- ▶ Lift the governor lever and fasten it to keep the governor lever in position. Make sure that the safety gear remains engaged.
- ▶ Release the rope coupling from the governor lever.
- ▶ Add an additional weight above the rope coupling.
  - Select the weight allowing a gradual acceleration of the governor rope.
  - Insert weights starting from 1 ... 3 kg above the rope coupling. Do not use other weights than the ones supplied.
- ▶ If the check is performed from the hoistway pit, pull the rope coupling with the additional weight as follows:
  - For rated speed  $\leq 1.75$  m/s: approximately 3 m.
  - For rated speed  $> 1.75$  m/s: approximately 10 m.
- ▶ Hold the tachometer against the governor rope.
- ▶ Release the governor rope. Allow the governor rope with additional weight to accelerate downward until the overspeed governor trips.
- ▶ Use the free hand to catch the side of governor rope that moves upward.
- ▶ Write down the indicated value and reset the tachometer.
- ▶ Repeat the procedure of governor rope with additional weights two more times and calculate the average of all three measurements.
- ▶ Compare the average value with the allowable tolerance of tripping speed VCA in the table.
- ▶ Remove the additional weight. Connect the rope coupling, release the governor lever and if necessary reset the safety switch on the safety gear.
- ▶ Reset the overspeed governor.

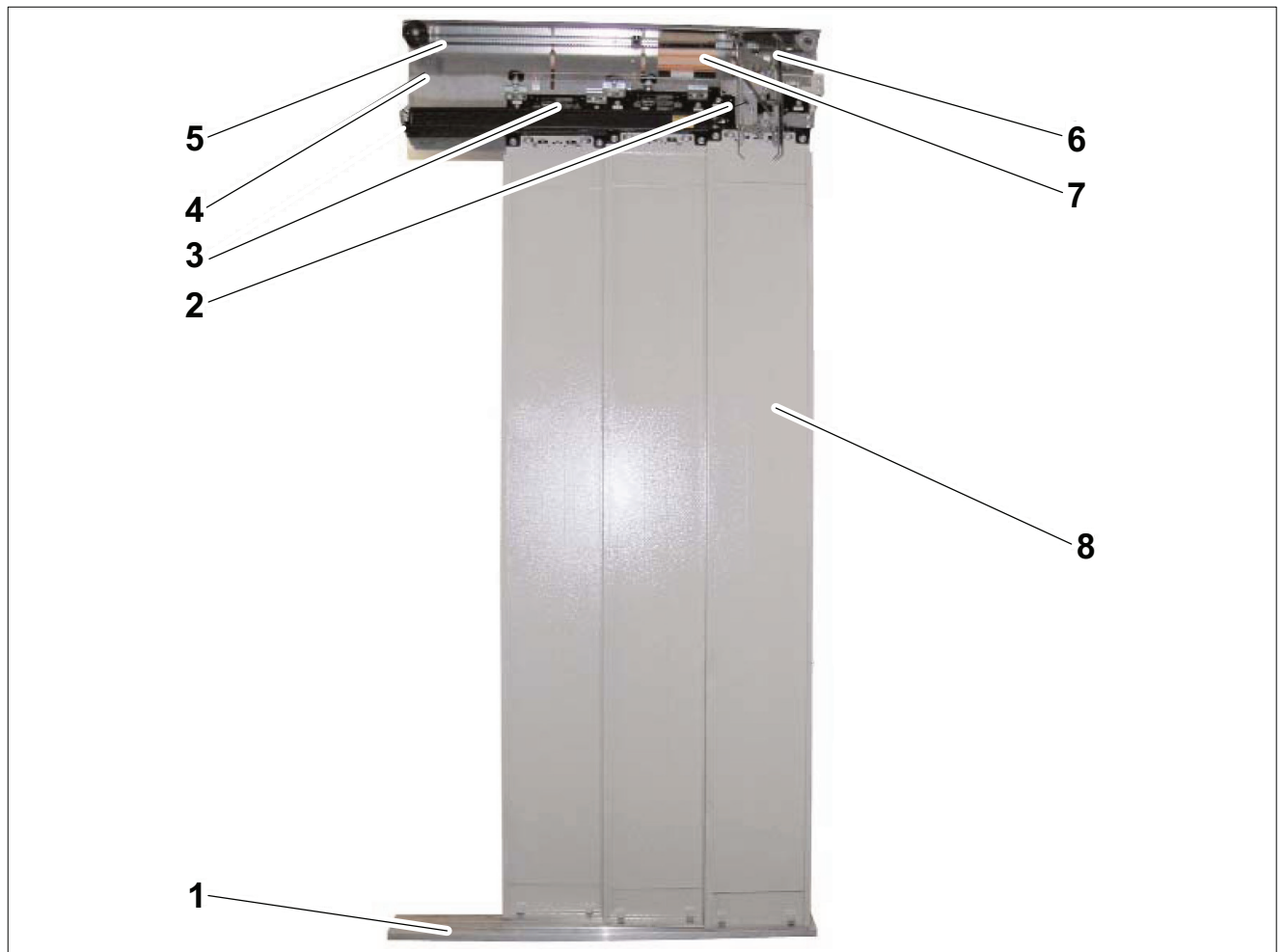
#### 5.22.18 Spare parts



For more information regarding spare parts, contact the installer.



**5.23 Car door DO SEC**  
**5.23.1 Overview of car door**



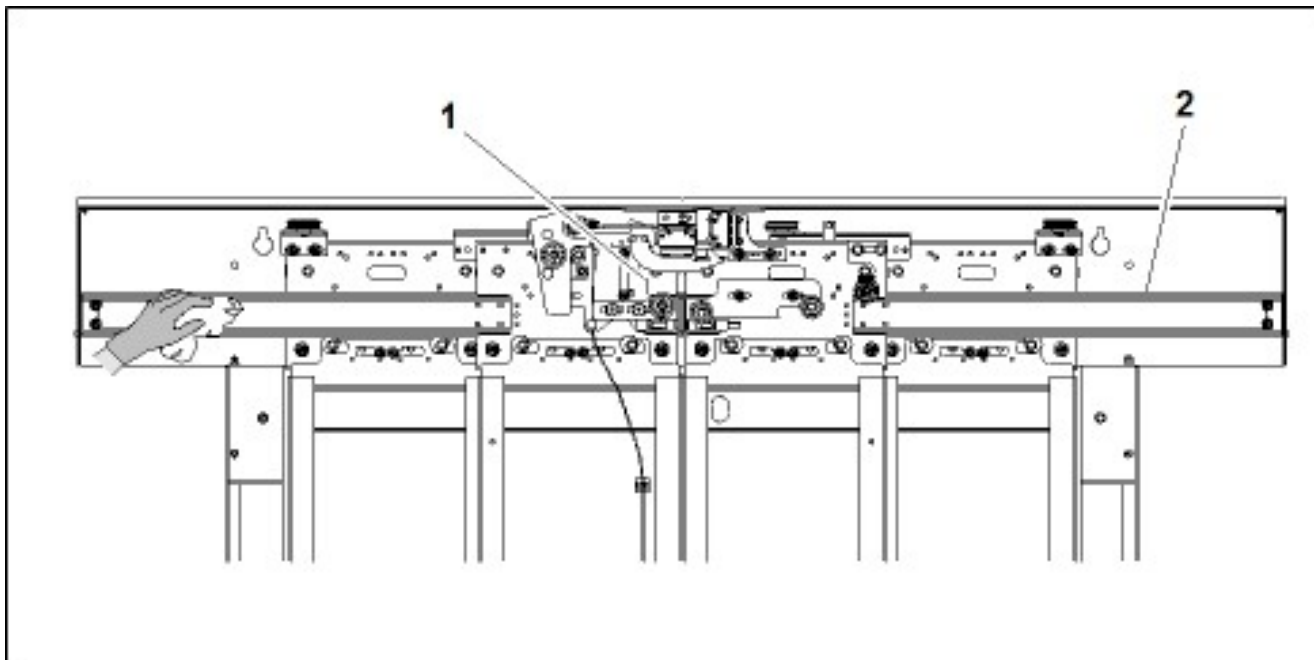
- |          |                 |          |               |
|----------|-----------------|----------|---------------|
| <b>1</b> | Door sill       | <b>2</b> | Car door lock |
| <b>3</b> | Carrier roller  | <b>4</b> | Transom       |
| <b>5</b> | Drive belt      | <b>6</b> | Clutch        |
| <b>7</b> | Drive mechanism | <b>8</b> | Door panel    |

**5.23.2 Maintenance plan for car door**

Interval (months)	Description
<b>12</b>	Checking of cleanness
<b>12</b>	Checking for damage and corrosion
<b>12</b>	Checking of condition of guide shoe
<b>12</b>	Checking of condition of door drive belt
<b>12</b>	Checking of condition of synchronization rope
<b>12</b>	Checking of vertical parallelism of door panel
<b>12</b>	Checking of alignment of door panel
<b>12</b>	Checking of door panel clearance
<b>12</b>	Checking of door opening in locked condition
<b>12</b>	Checking of car door lock DO SEC
<b>12</b>	Checking of door panel performance



### 5.23.3 Checking of cleanness



1 Door mechanism

2 Rail



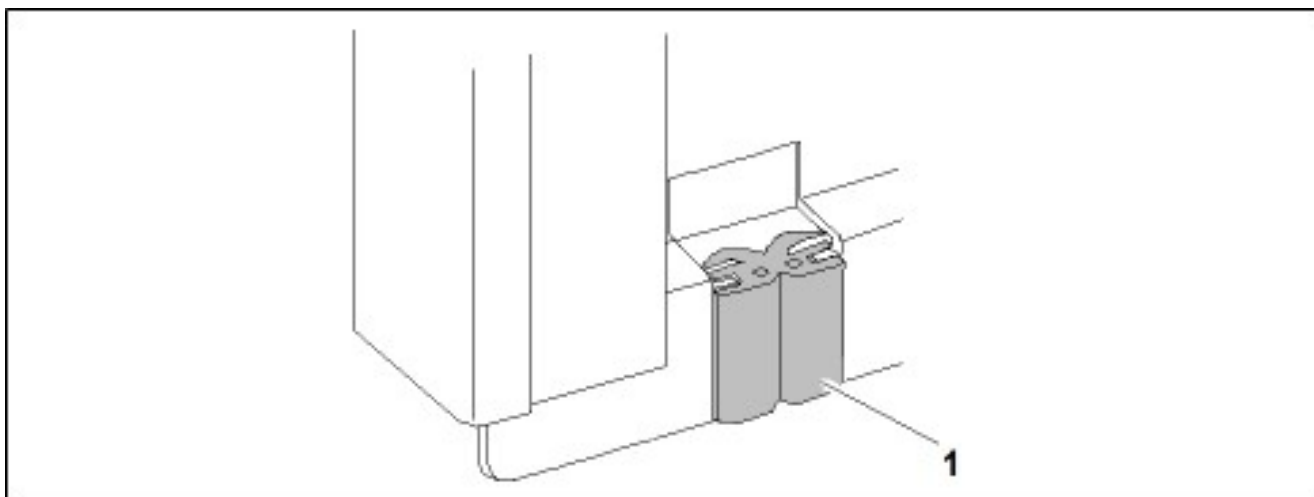
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- ▶ Make sure that the door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.23.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.23.5 Checking of condition of guide shoe

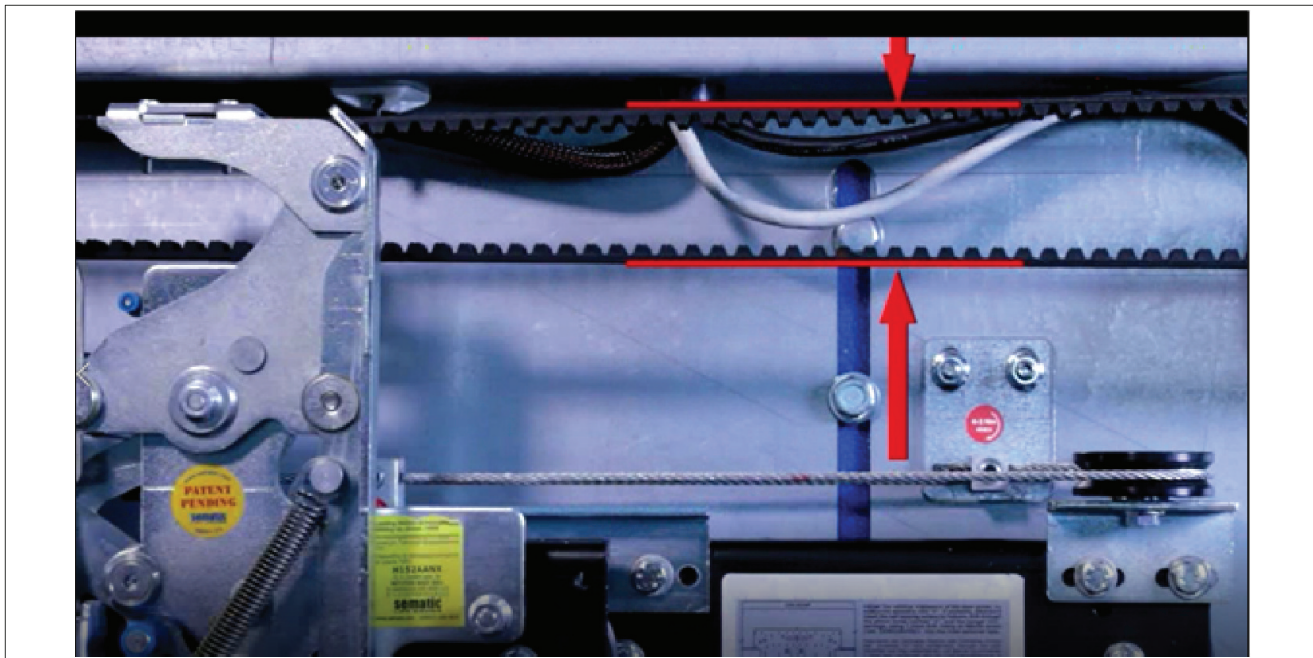


1 Guide shoe

- ▶ Push the door panel towards the opening side.
- ▶ Make sure that the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and guide shoe is  $> 1\text{ mm}$ , replace the guide shoe.

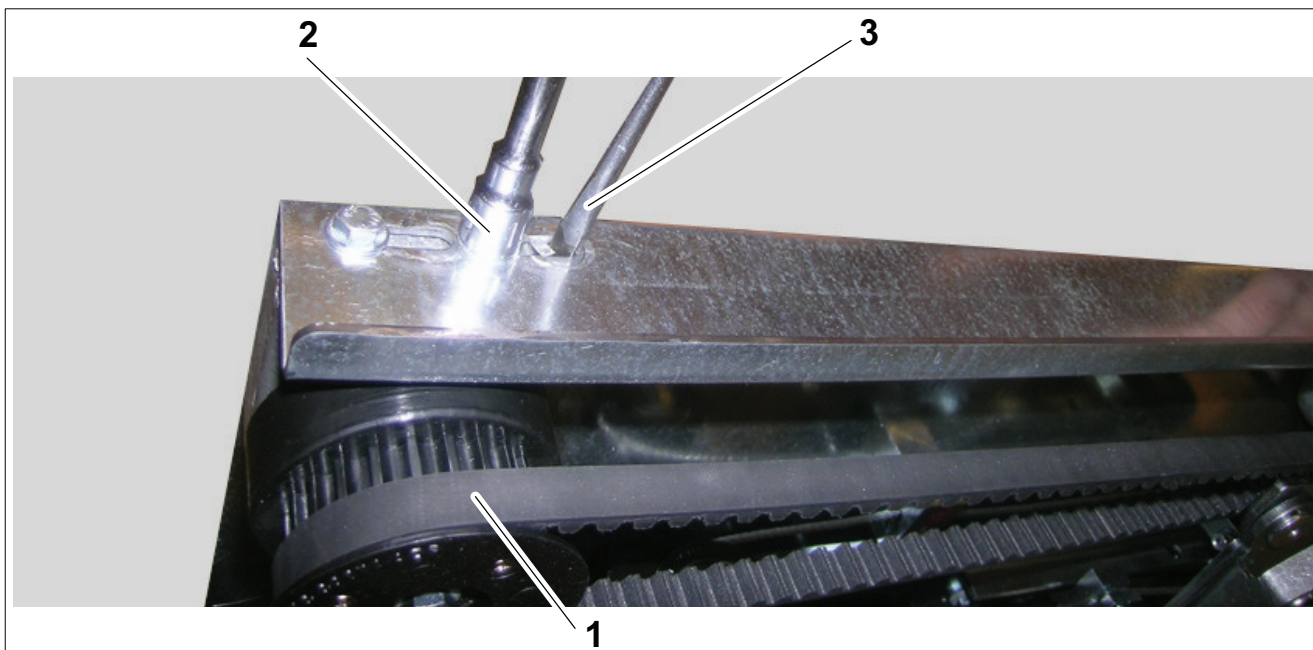


### 5.23.6 Checking of condition of door drive belt



- ▶ Make sure that there is no missing or damaged teeth on the door drive belt.
- ▶ Make sure that the door drive belt is not frayed.
- ▶ Make sure that the door drive belt is not damaged.
- ▶ Make sure that the tension on the door drive belt is correct according to the label on the door drive transom.
  - If the tension on the door drive belt is not correct, adjust the tension on the door drive belt.

#### 5.23.6.1 Adjustment of tension of door drive belt



- 1 Belt tensioner
- 3 Screwdriver

- 2 Screw

**i** Do not remove the screw completely, loosen the screw to allow the belt tensioner movement only.

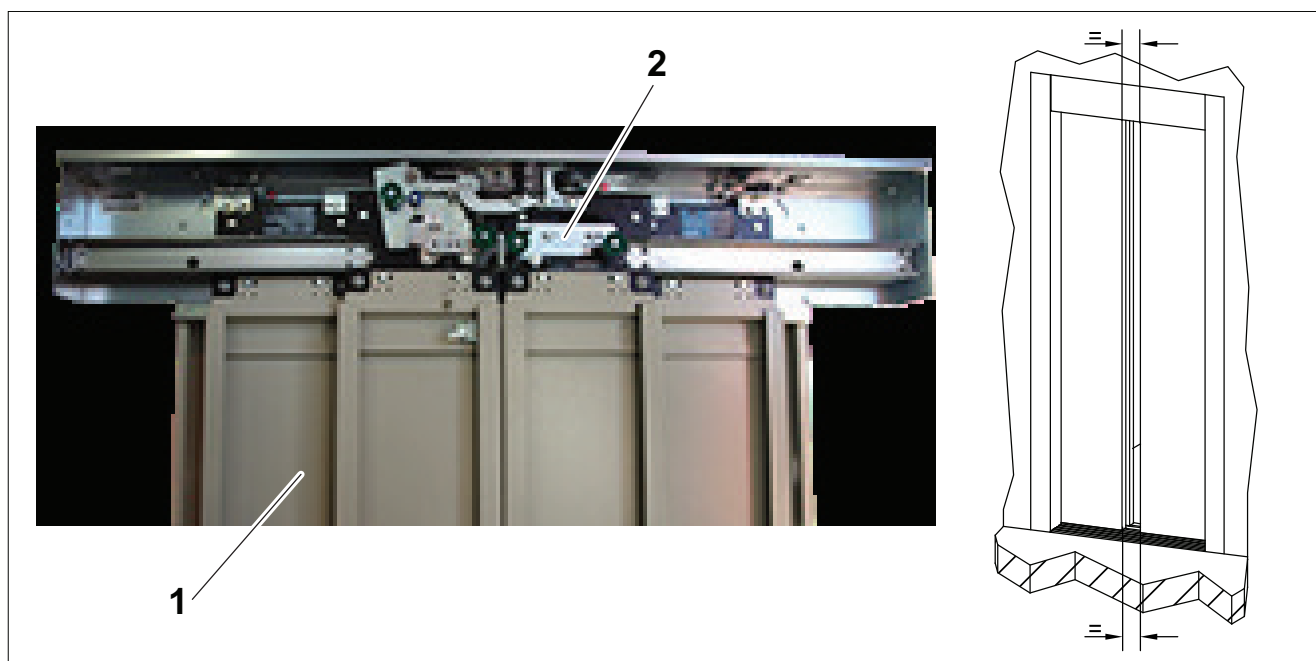
- ▶ Loosen the screw to release belt tensioner.
- ▶ Use a screwdriver in the cut out to push the belt tension support bracket away from the door drive to increase the belt tension.
- ▶ Tighten the screw and remove the screwdriver



### 5.23.7 Checking of condition of synchronization rope

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ make sure that the cable clamps are tight.
- ▶ Make sure that the compressed spring length is correct.

### 5.23.8 Checking of vertical parallelism of door panel



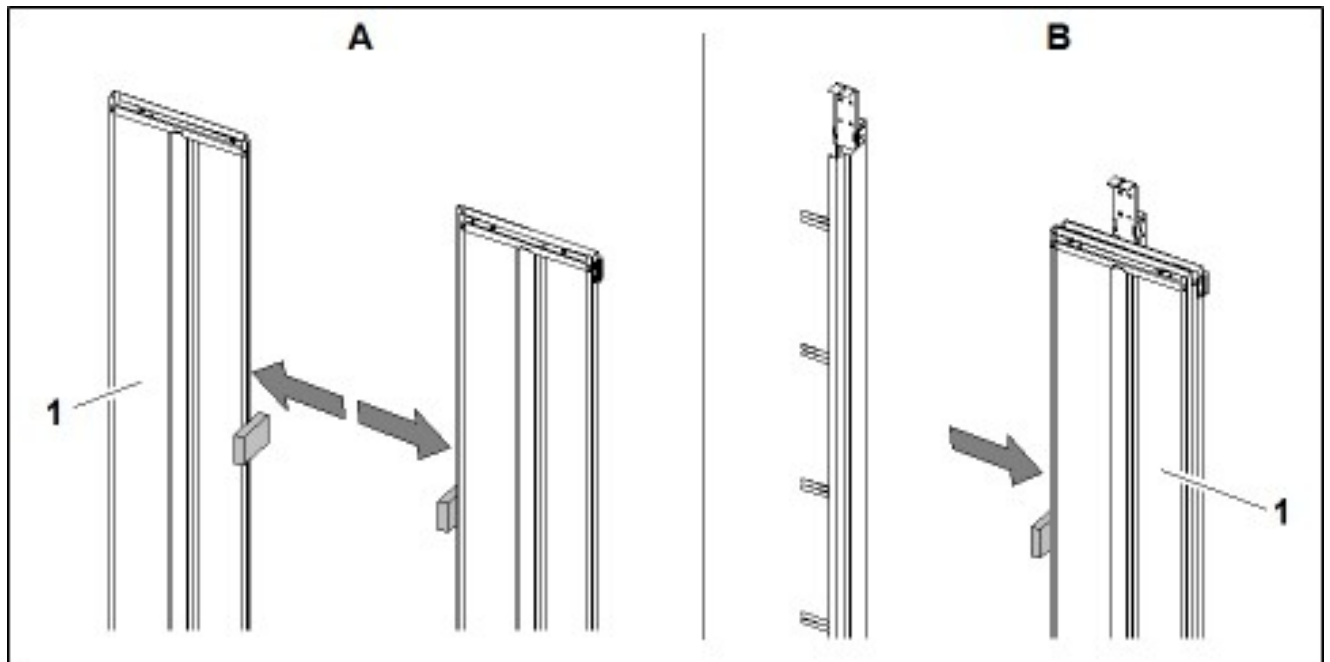
1 Door panel

2 Door mechanism

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.



### 5.23.9 Checking of alignment of door panel



**A** Center door

**B** Telescopic door

**1** Door panel

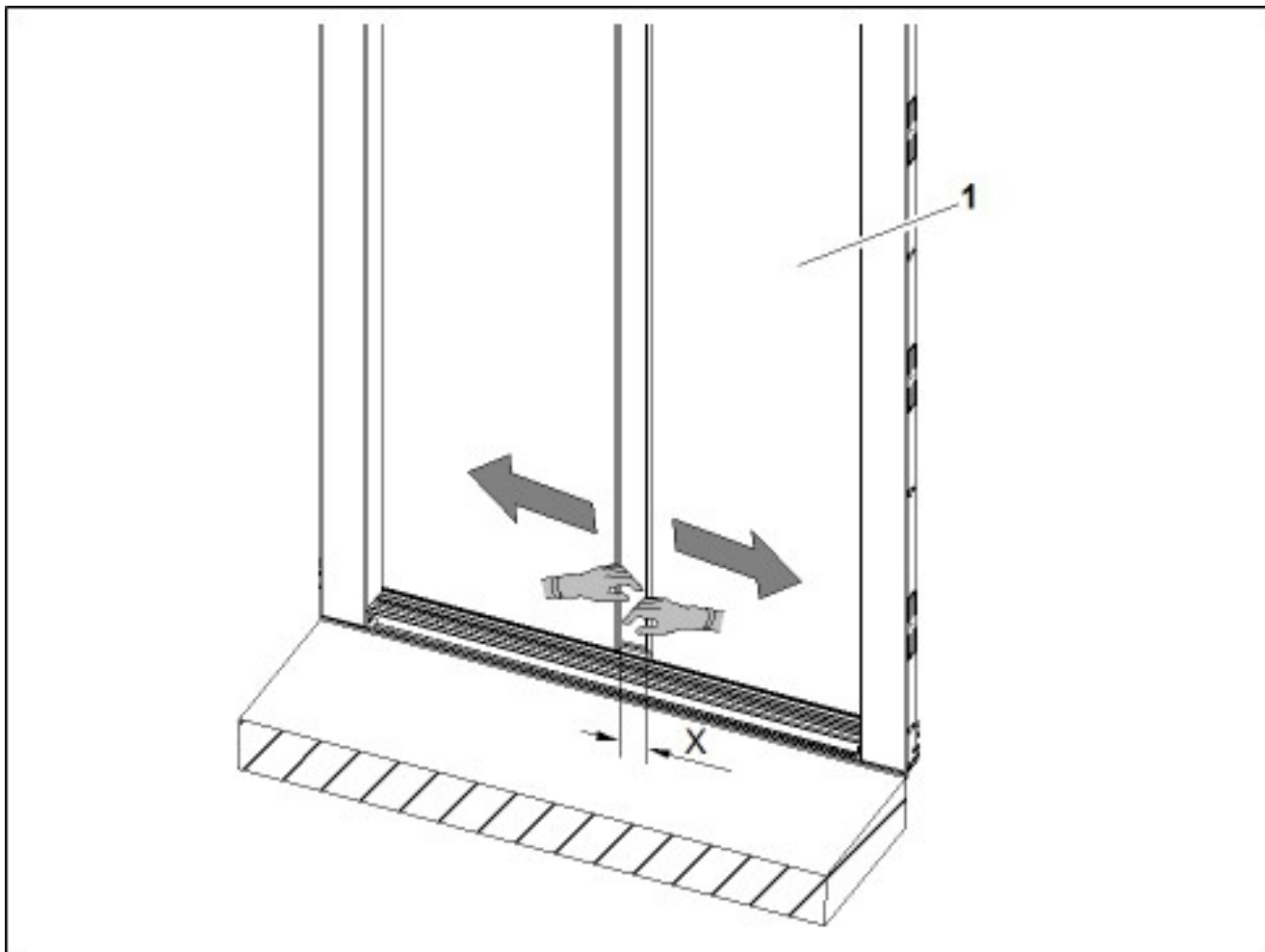
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

### 5.23.10 Checking of door panel clearance

- ▶ Make sure that the clearance is  $\leq 10$  mm between:
  - Door panels and door sill.
  - Door panels and car fronts.
- ↳ If required, adjust the door panels.



#### 5.23.11 Checking of door opening in locked condition



##### 1 Door panel

**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.23.12 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

## 5.24 Car door lock for DO SEC

### 5.24.1 Maintenance plan for car door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of clutch cam position
12	Checking of clutch alignment
12	Checking of clutch plate position
12	Checking of latch position
12	Checking of alignment of switches and contact bridges

### 5.24.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

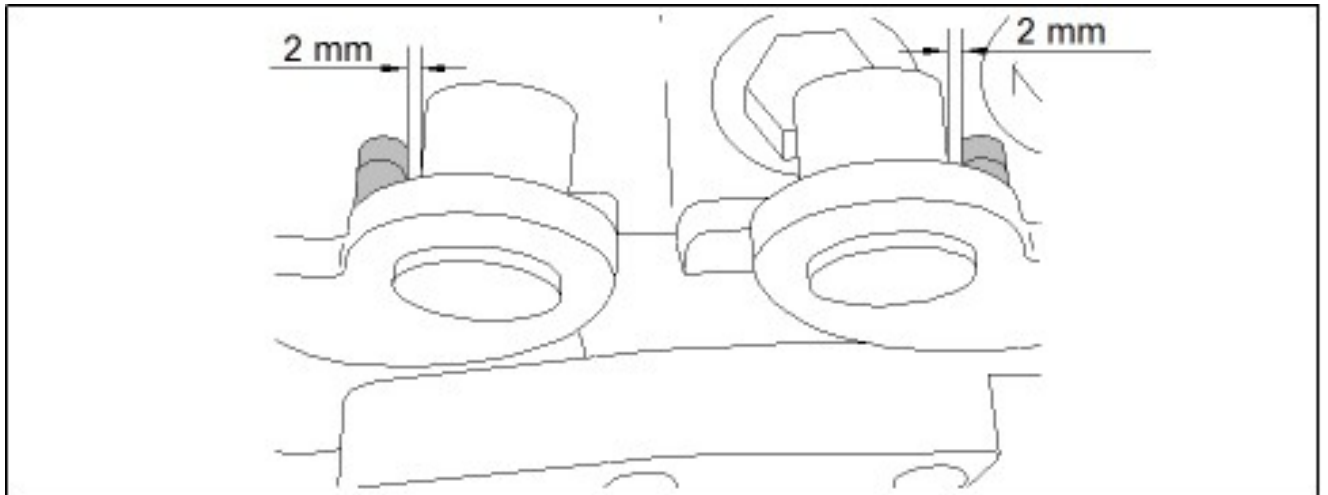
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.24.3 Checking of condition of lock roller and counter roller

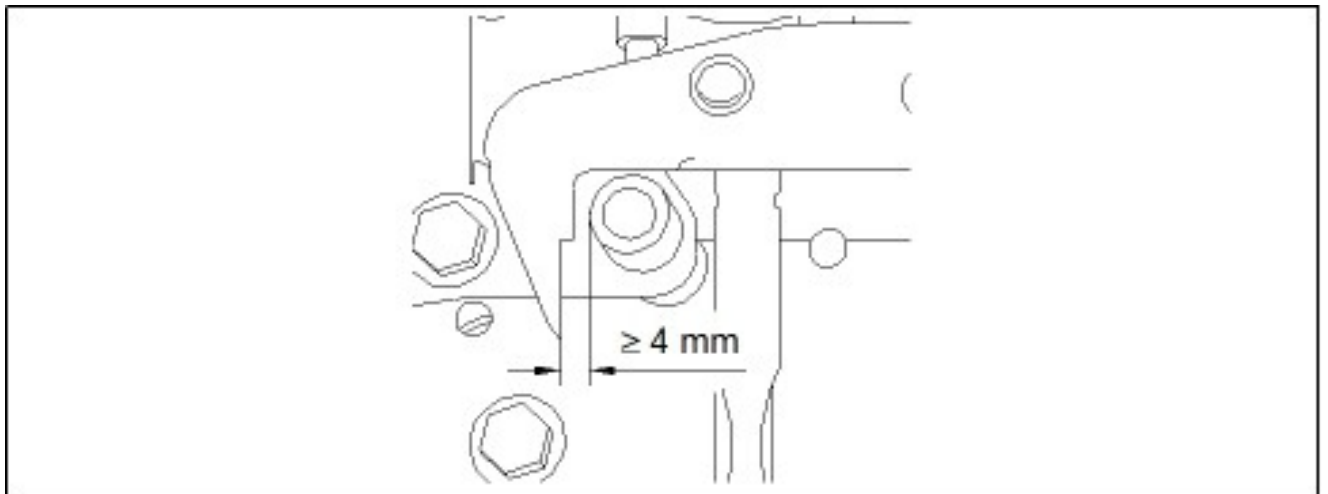
- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.24.4 Checking of clutch cam position



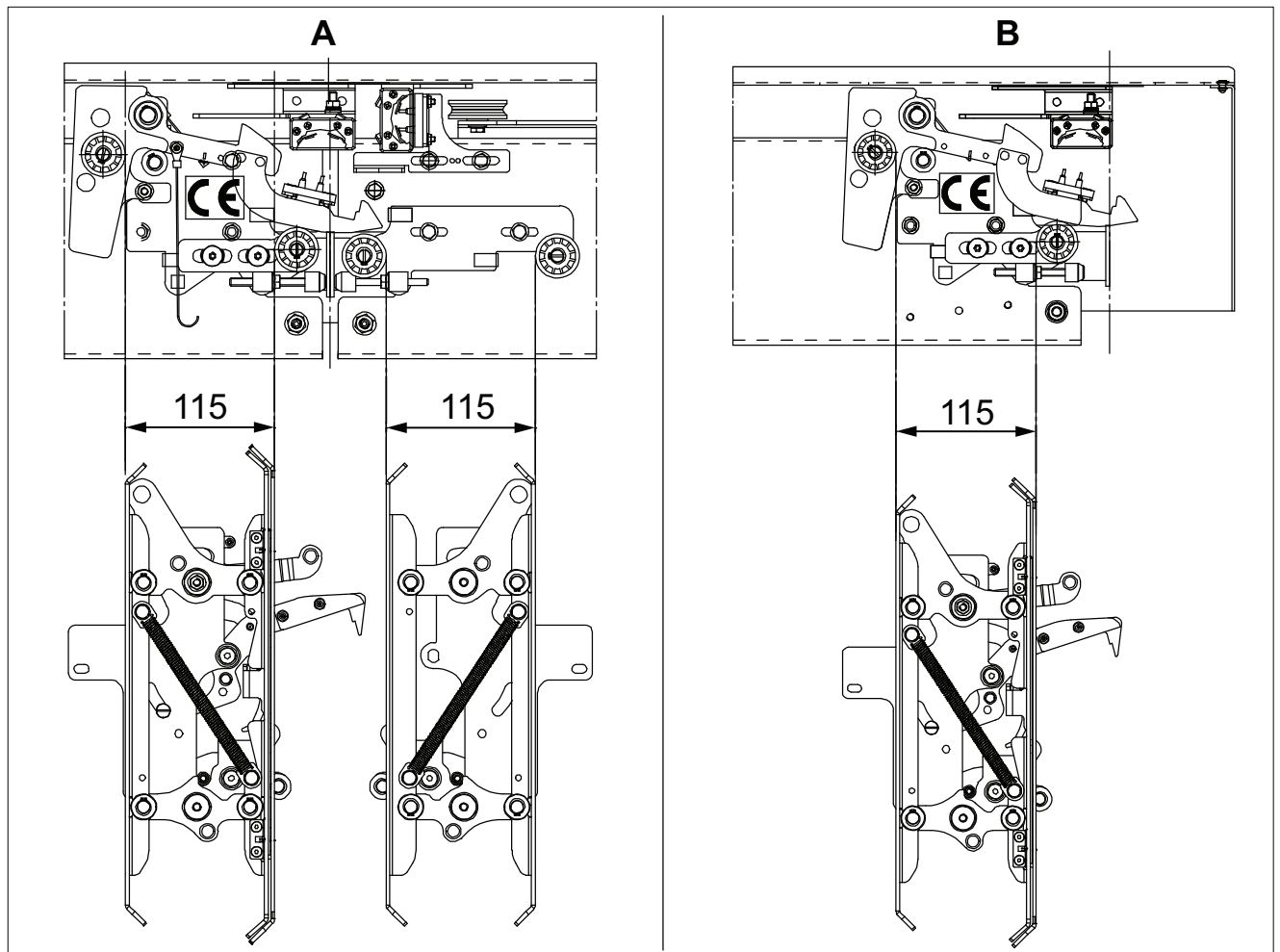
- Do a check of the clearance between the roller and the curve when the clutch is closed and locked position.
  - Make sure that the clearance is 2 mm.
  - ↳ If necessary, adjust the position of the clutch.



- Do a check of the clearance in the lock latch and the lock hook. Use an allen key with wrench size of 4 mm.
  - Make sure that the clearance is  $\geq 4$  mm
  - ↳ If necessary, adjust the lock latch and lock hook



### 5.24.5 Checking of clutch alignment

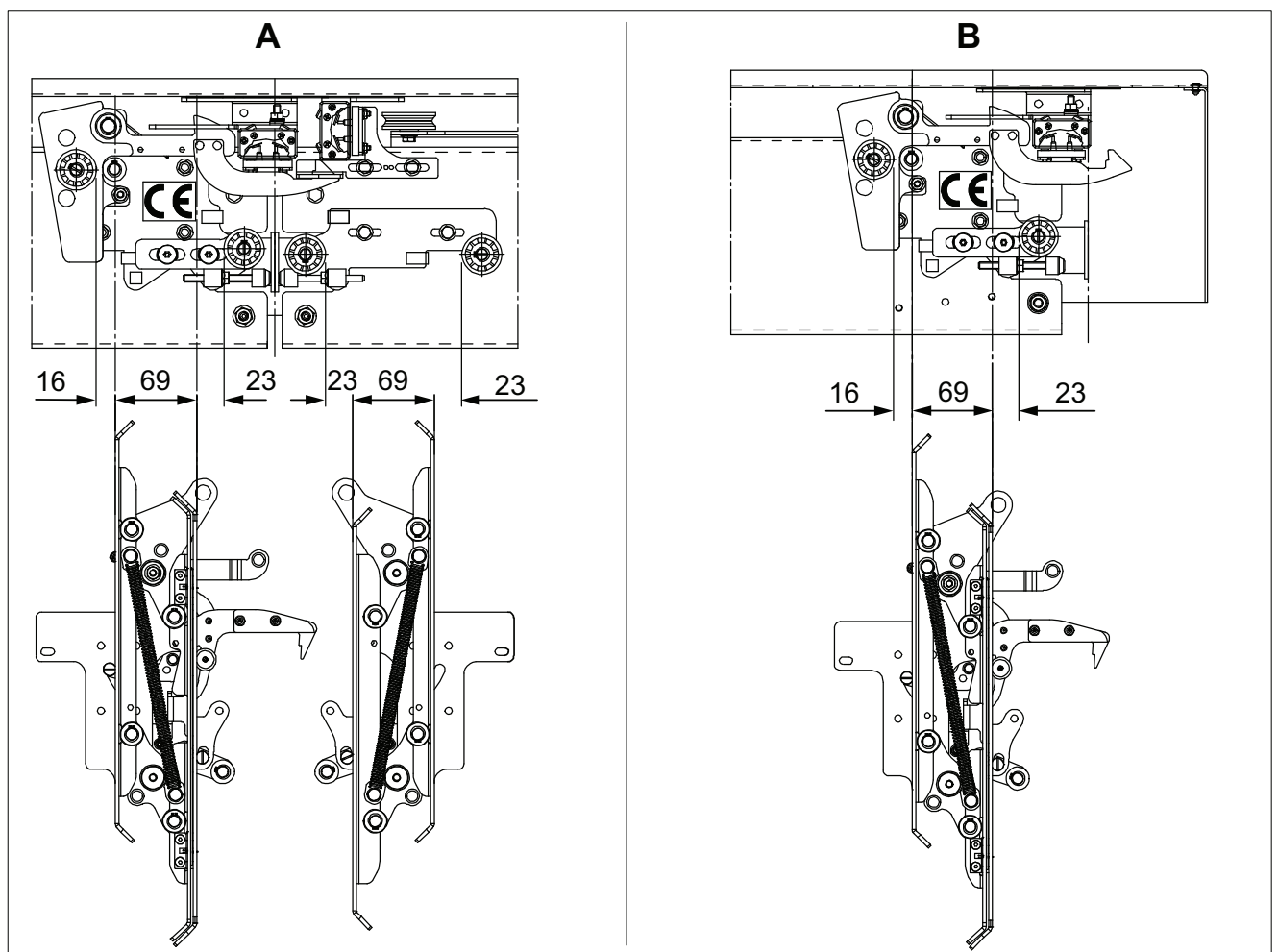


**A** Center door (C2)

**B** Telescopic door (T2)

- Measure the clearance between the closed clutch forks and the landing door mechanism rollers.
  - ↳ If the clearance and measurements are not correct, replace the clutch.



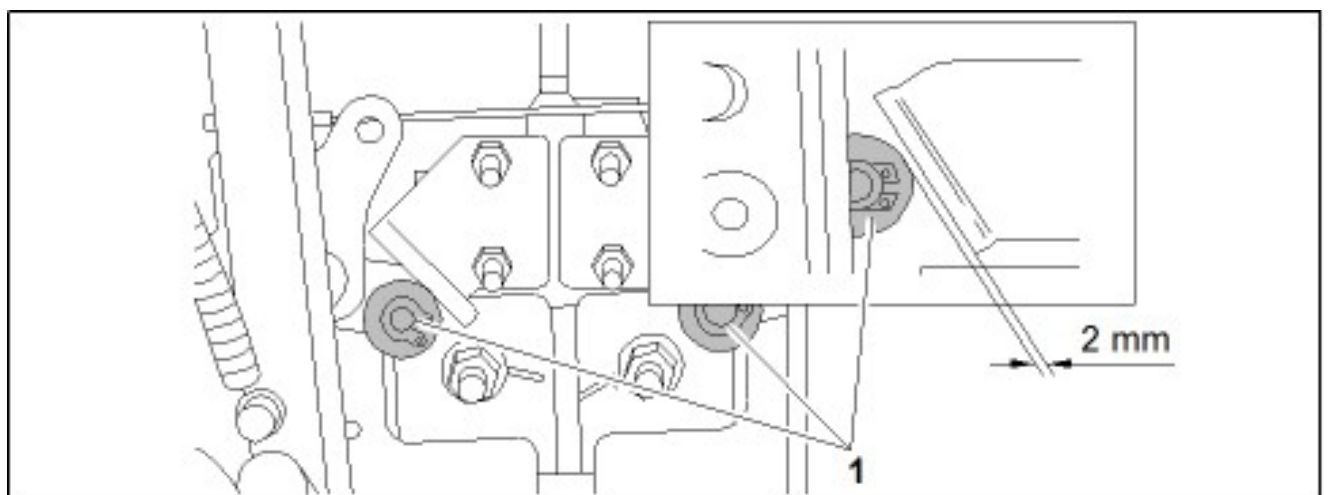


**A** Center door (C2)

**B** Telescopic door (T2)

- Measure the clearance between the open clutch forks and the landing door mechanism rollers.
- ↳ If the clearance and measurements are not correct, replace the clutch.

#### 5.24.6 Checking of clutch plate position



**1** Roller

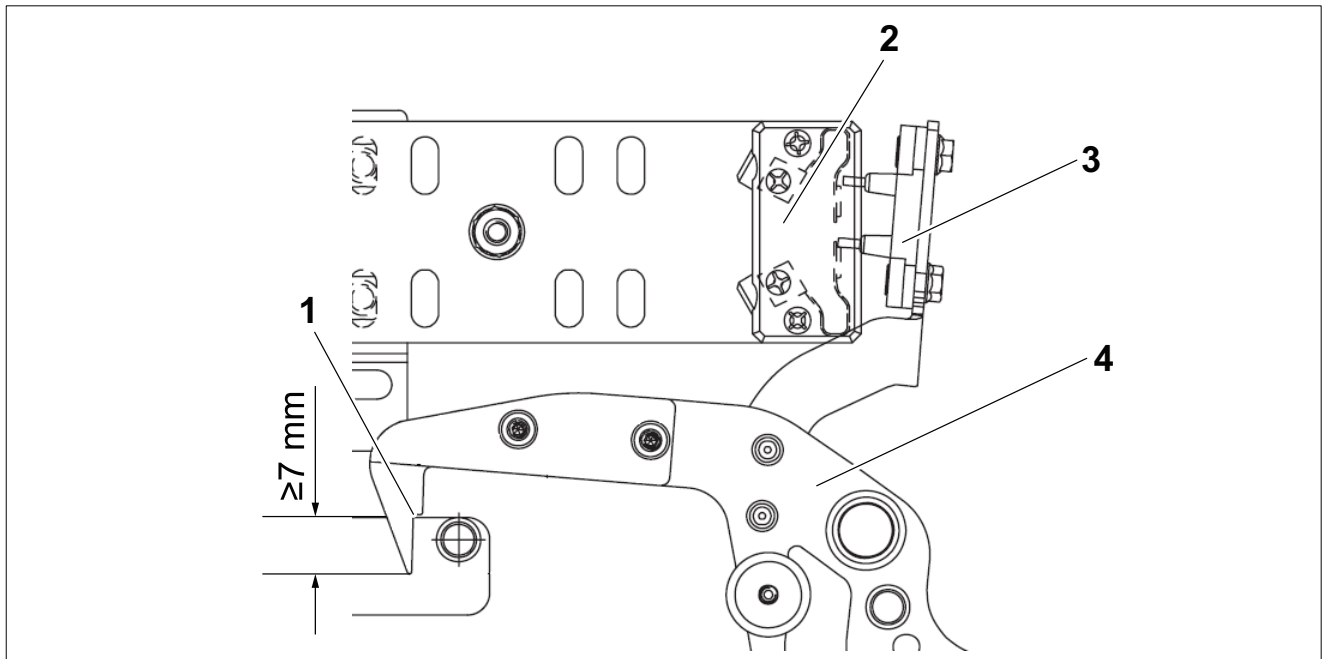
**i** Make sure that both rollers touch the clutch plate at same time.

- Make sure that the clutch is closed correctly.



- Push the rollers down manually.
- Do check of the clearance between the clutch plate and the unlocking roller.
  - Make sure that the clearance is 2 mm.
  - ↳ If required, adjust the clearance between the clutch plate and the unlocking roller.

#### 5.24.7 Checking of latch position



- 1 7 mm marked line  
3 Contact bridge

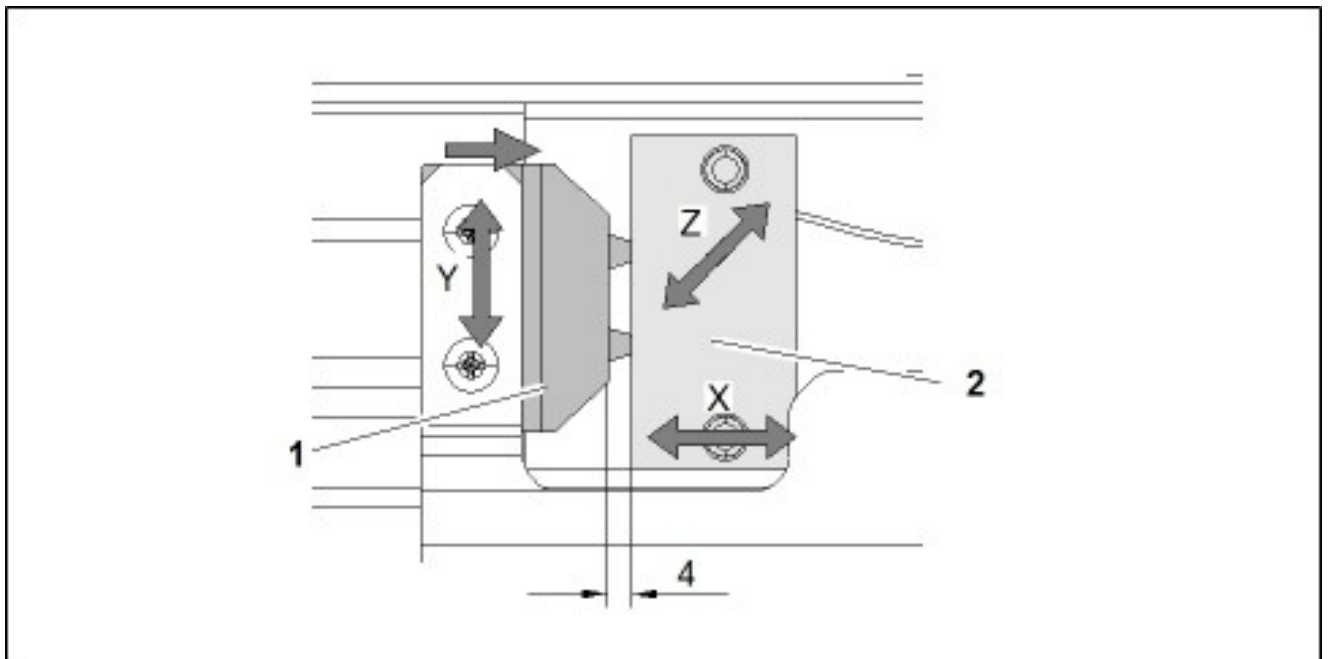
- 2 Switch KTC  
4 Latch

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTC makes contact.

#### 5.24.8 Checking of alignment of switches and contact bridges

##### 5.24.8.1 Checking of alignment of car door switch KTC and contact bridge



- 1 Contact bridge

- 2 Switch KTC

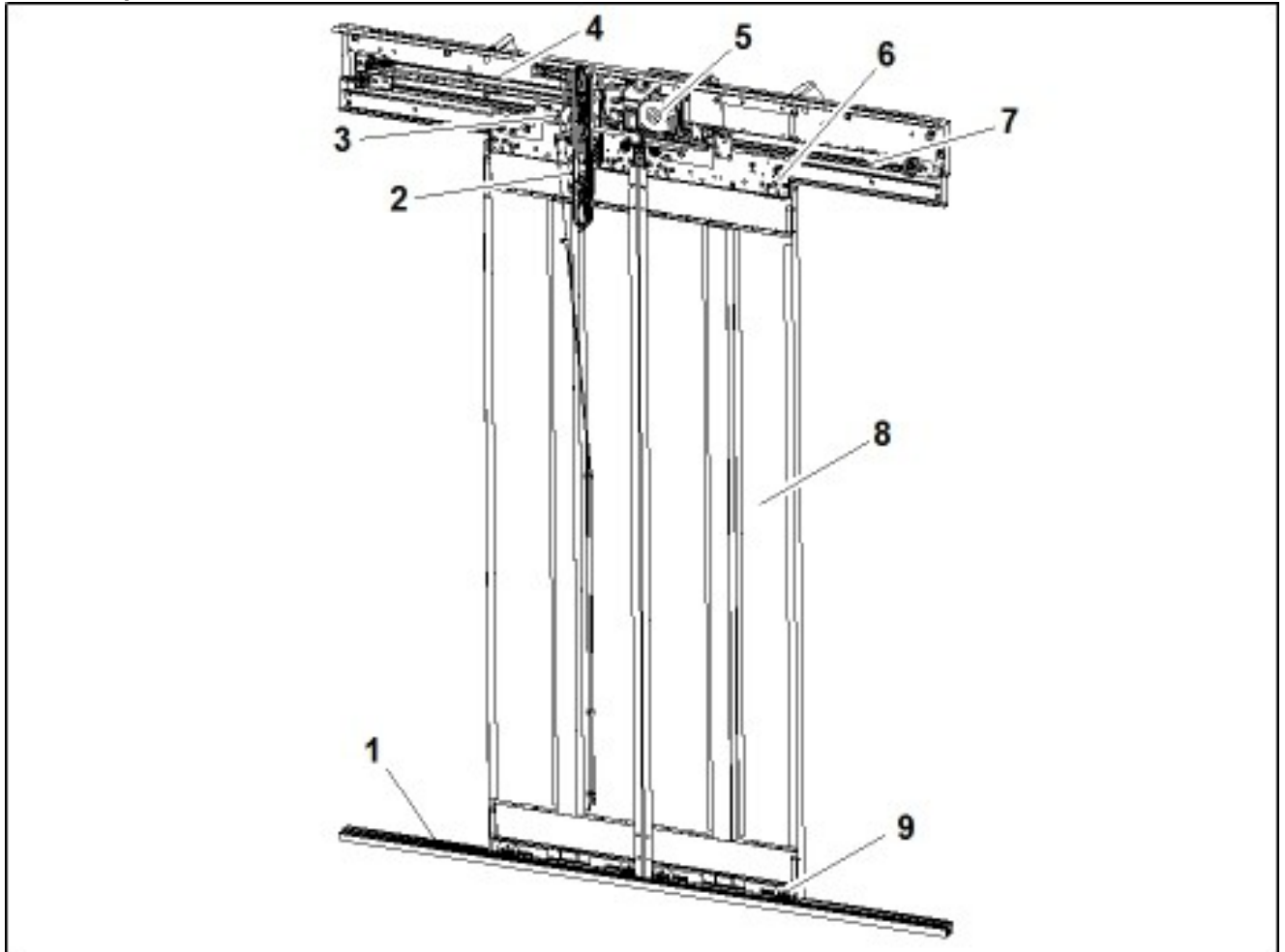


- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KTC position.
  - X-position: Distance of the contact bridge to the switch KTC is 4 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the switch KTC.
  - Z-position: Contact bridge fit centered to the housing holes of the switch KTC.
- ↳ If required, adjust the switch KTC.

## 5.25 Car door DO VAR 15

### 5.25.1 Overview of car door

#### Main component

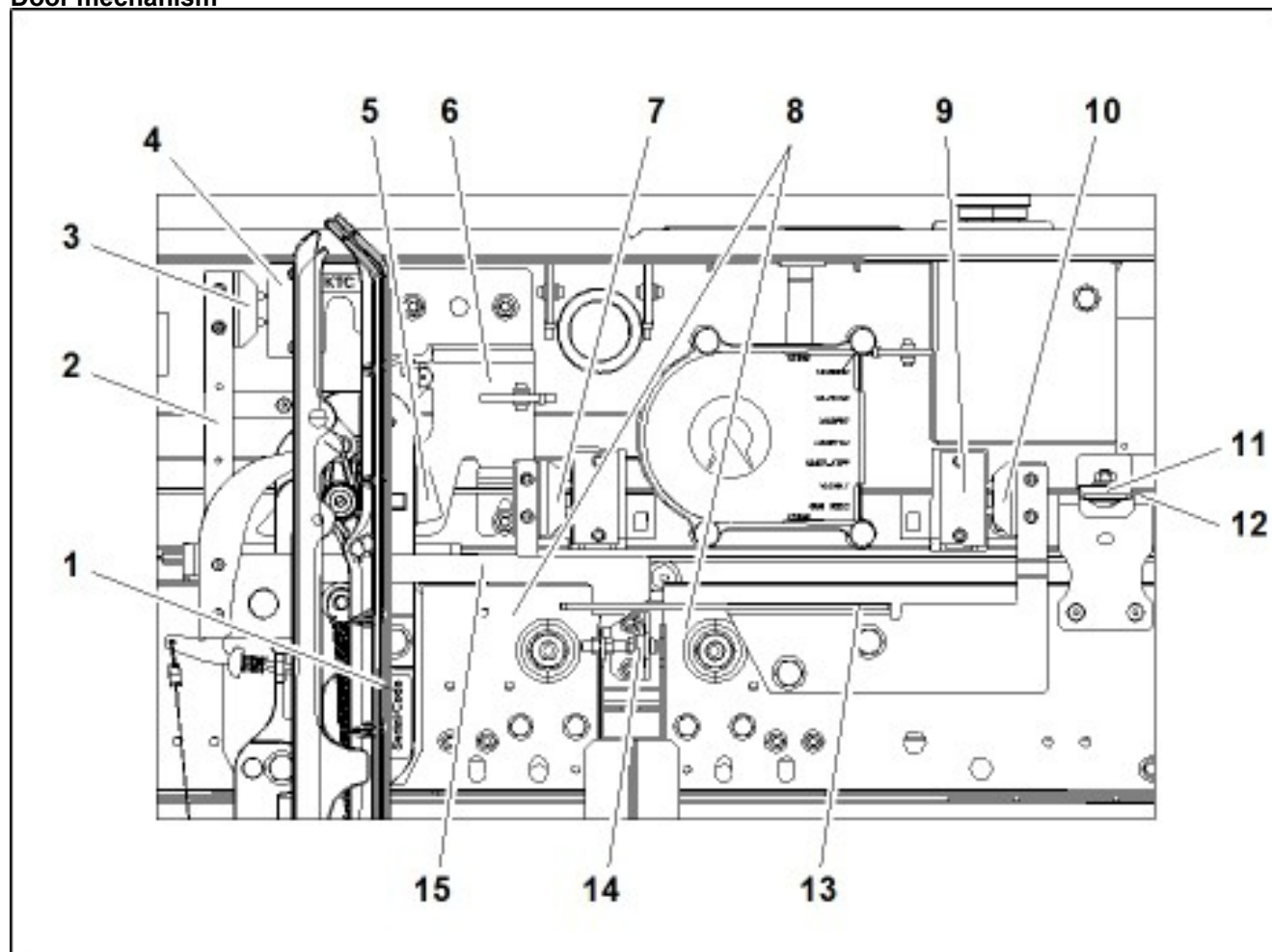


- 1 Sill
- 3 Clutch cam
- 5 Door drive
- 7 Rails
- 9 Guide shoe

- 2 Clutch
- 4 Drive belt
- 6 Rollers
- 8 Door panels



## Door mechanism



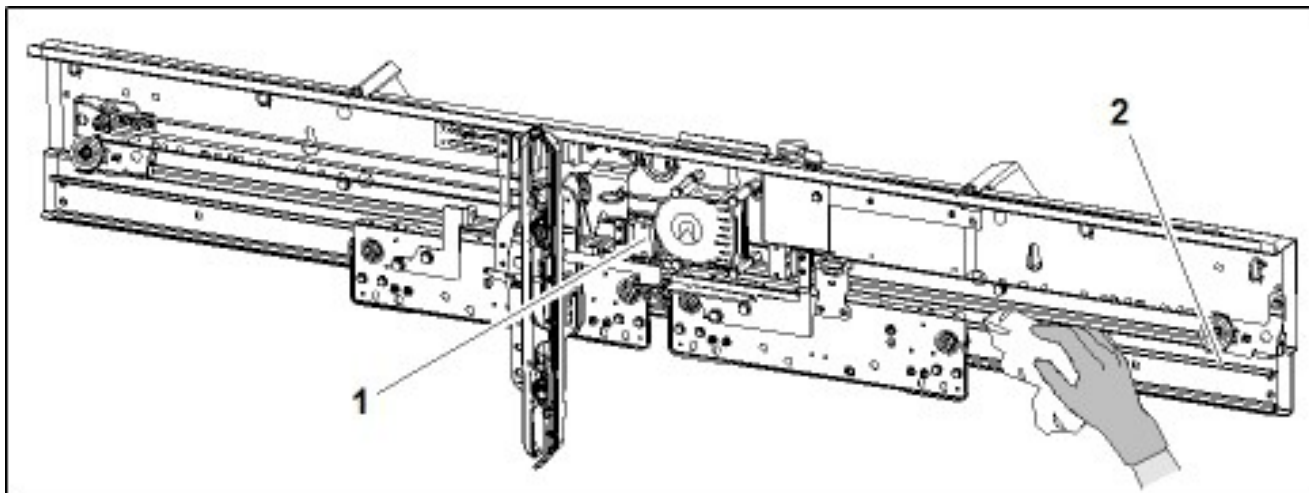
- |    |  |    |                                      |
|----|--|----|--------------------------------------|
| 1  | Clutch                                   | 2  | Contact arm of car door switch KTC   |
| 3  | Contact bridge of car door switch KTC    | 4  | Car door switch KTC                  |
| 5  | Clutch release lever                     | 6  | Clutch cam plate                     |
| 7  | Contact bridge of car door switch KET-S2 | 8  | Carriers                             |
| 9  | Car door switch KTC2                     | 10 | Contact bridge of safety switch KTC2 |
| 11 | Synchronization rope clamp               | 12 | Synchronization rope                 |
| 13 | Support of contact bridge                | 14 | Stopper buffer                       |
| 15 | Latch                                    |    |                                      |

### 5.25.2 Maintenance plan for car door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of condition of door drive belt
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of door panel movement condition
12	Checking of car door lock DO VAR 15
12	Checking of door panel performance



### 5.25.3 Checking of cleanness



1 Door drive

2 Rail



- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

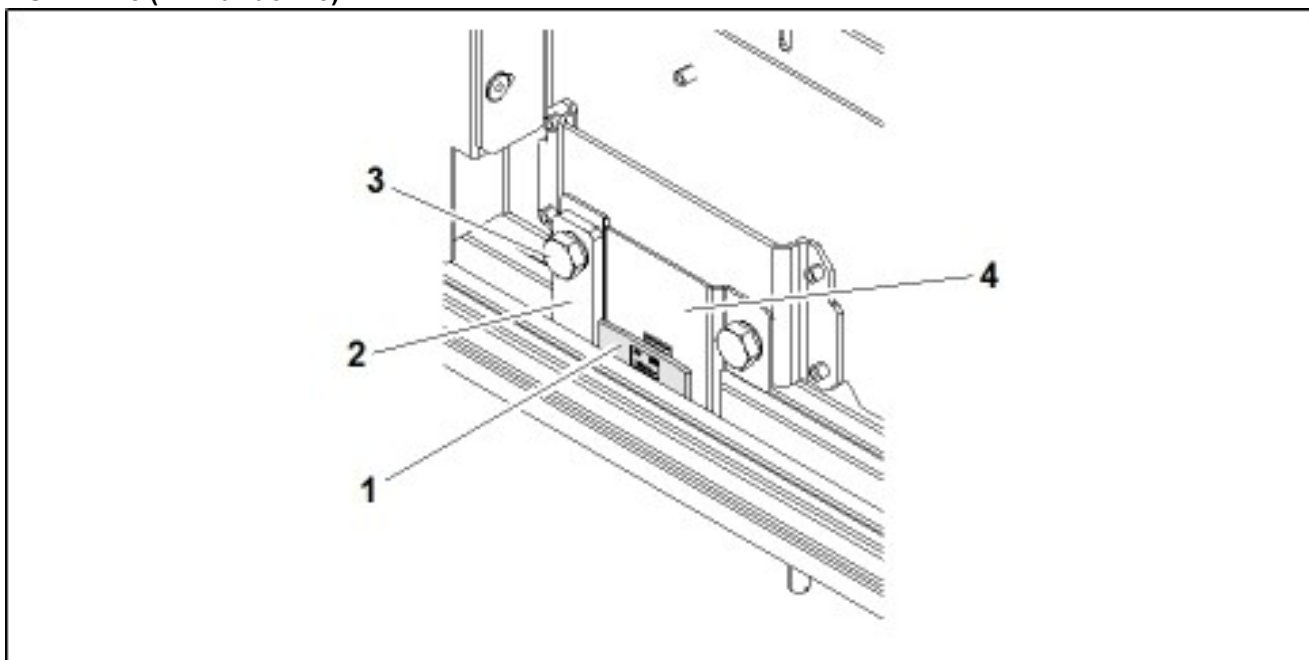
- ▶ Make sure that the door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.25.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.25.5 Checking of condition of guide shoe

DO VAR 15 (CD Varidor 15)



1 Guide shoe

2 Bottom retainer

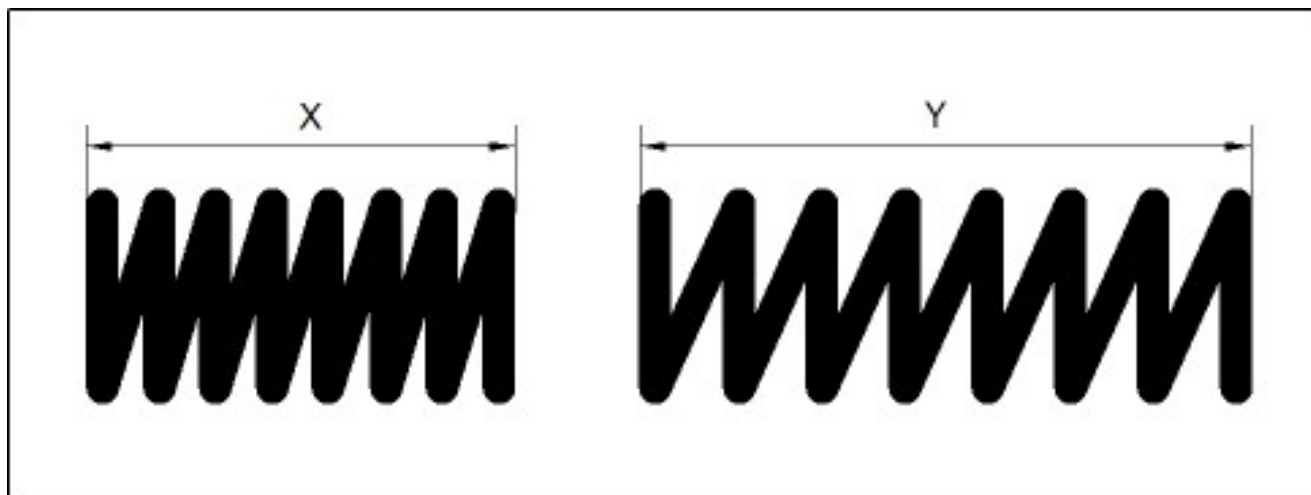
3 Hex head screw

4 Guide shoe bracket

- ▶ Push the door panels towards the opening side.
- ▶ Make sure that the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and guide shoe is  $> 1$  mm, replace the guide shoe.



#### 5.25.6 Checking of condition of synchronization rope

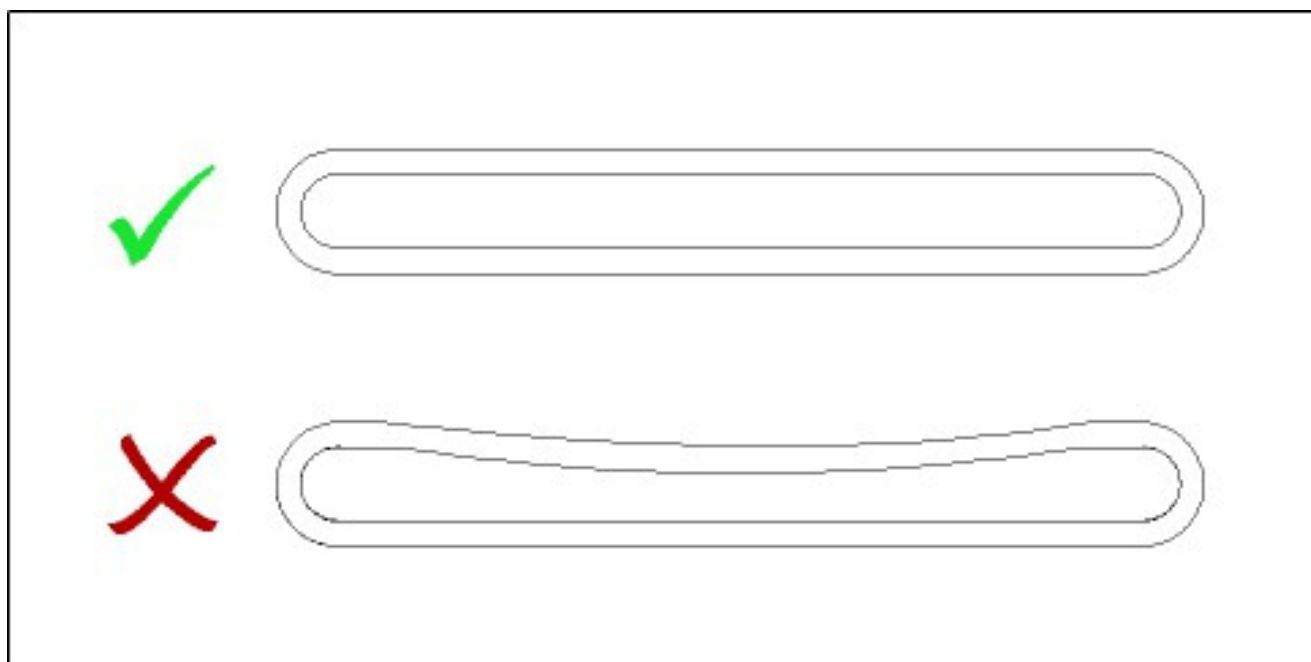


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 19 \text{ mm}$ .

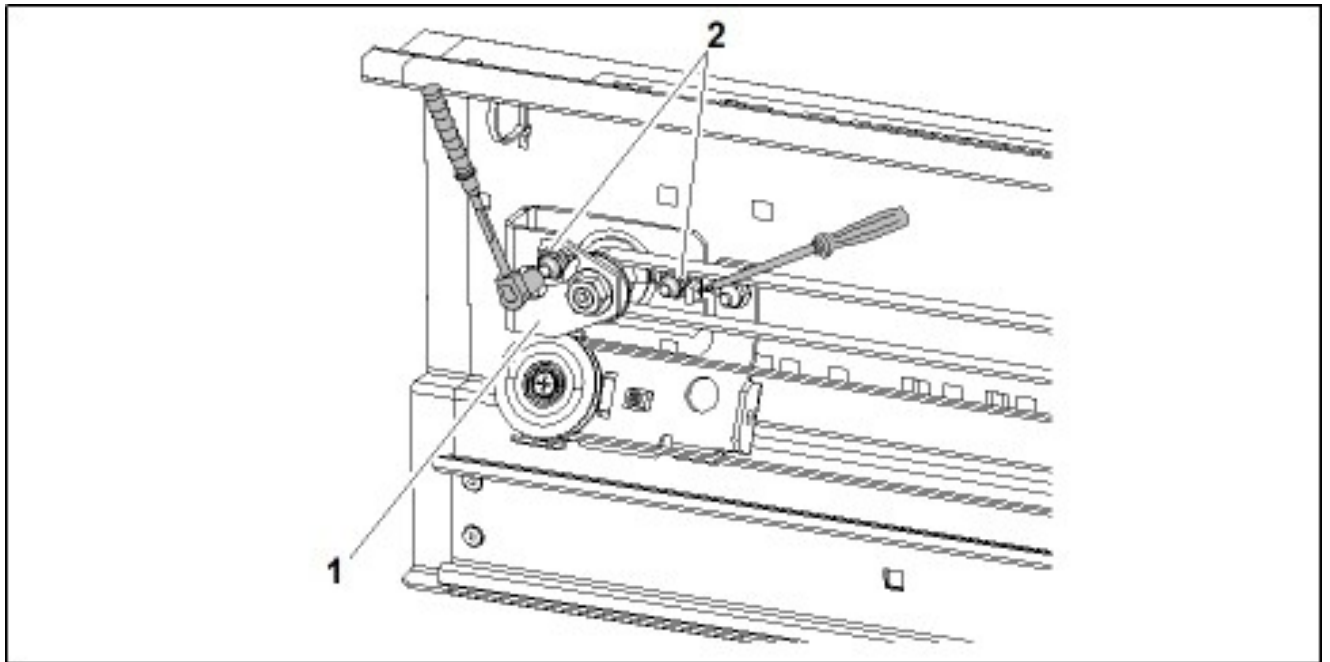
#### 5.25.7 Checking of condition of door drive belt



- ▶ Make sure that there is no missing or damaged teeth on the door drive belt.
- ▶ Make sure that the door drive belt is not frayed.
- ▶ Make sure that the door drive belt is not damaged.
- ▶ Make sure that the tension on the door drive belt is correct according to the label on the door drive transom.
  - If the tension on the door drive belt is not correct, adjust the tension on the door drive belt.



#### 5.25.7.1 Adjustment of tension of door drive belt



1 Belt tensioner

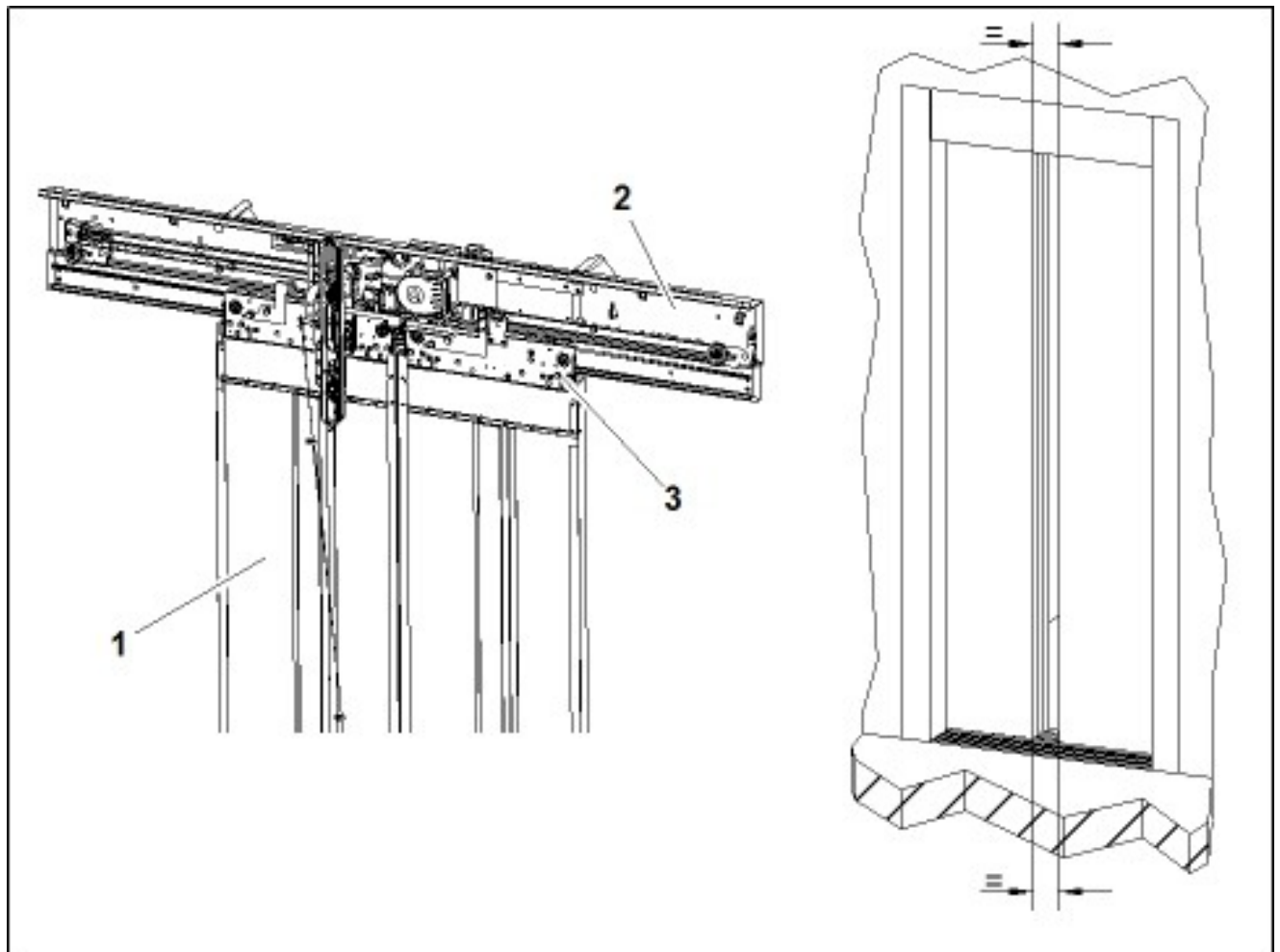
2 Hex nut

**i** Do not remove the hex nuts completely, loosen the hex nuts to allow the belt tension support bracket movement only.

- ▶ Loosen the hex nuts to release belt tensioner.
- ▶ Use a screwdriver in the cut out to push the belt tension support bracket away from the door drive to increase the belt tension.
- ▶ Tighten one of the hex nut and remove the screwdriver.
- ▶ Tighten the second hex nut.



### 5.25.8 Checking of vertical parallelism of door panel



1 Door panel

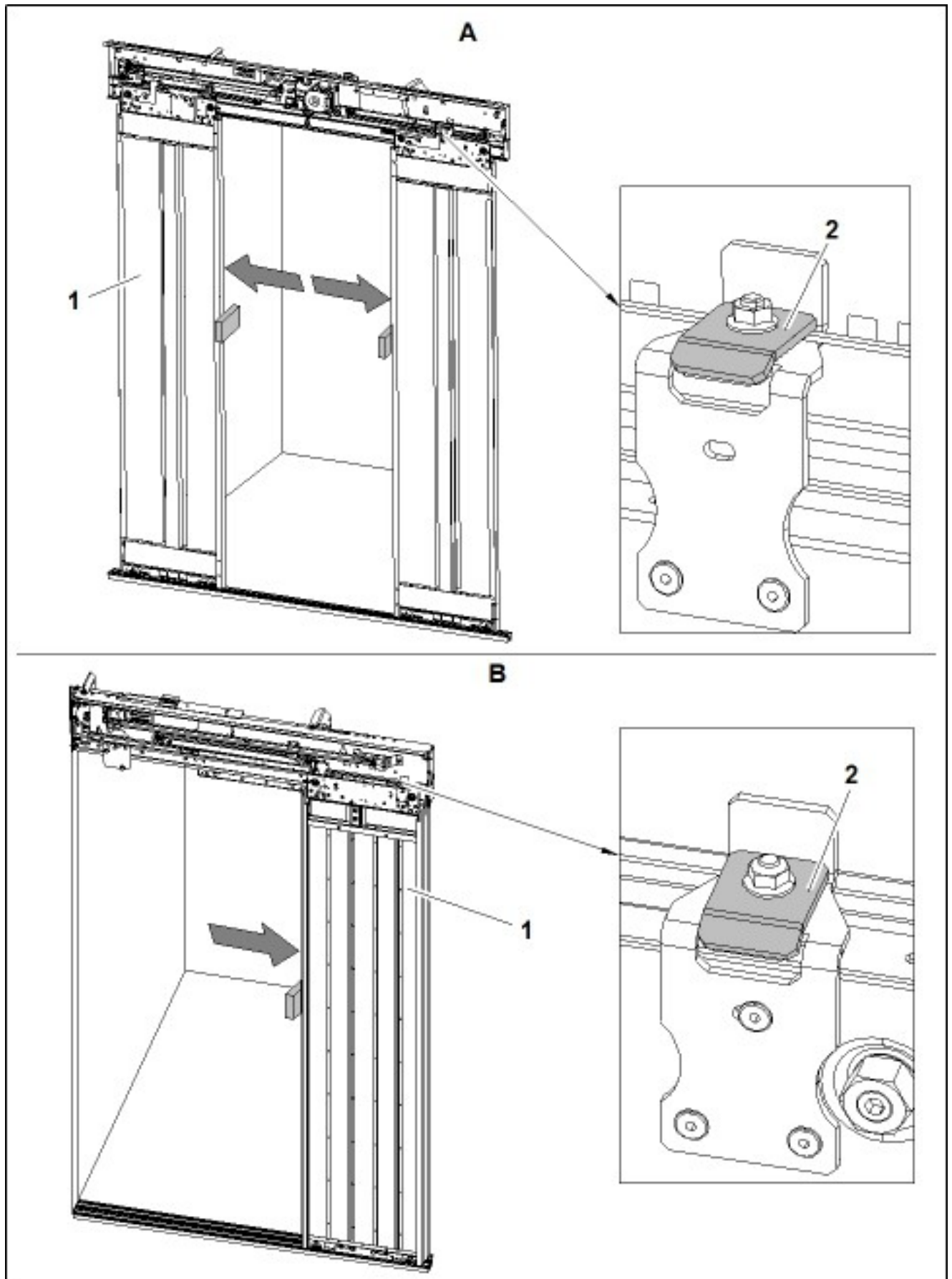
2 Door mechanism

3 Bolt

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.



### 5.25.9 Checking of alignment of door panel



**A** Center door  
**1** Door panel

**B** Telescopic door  
**2** Synchronization rope clamp

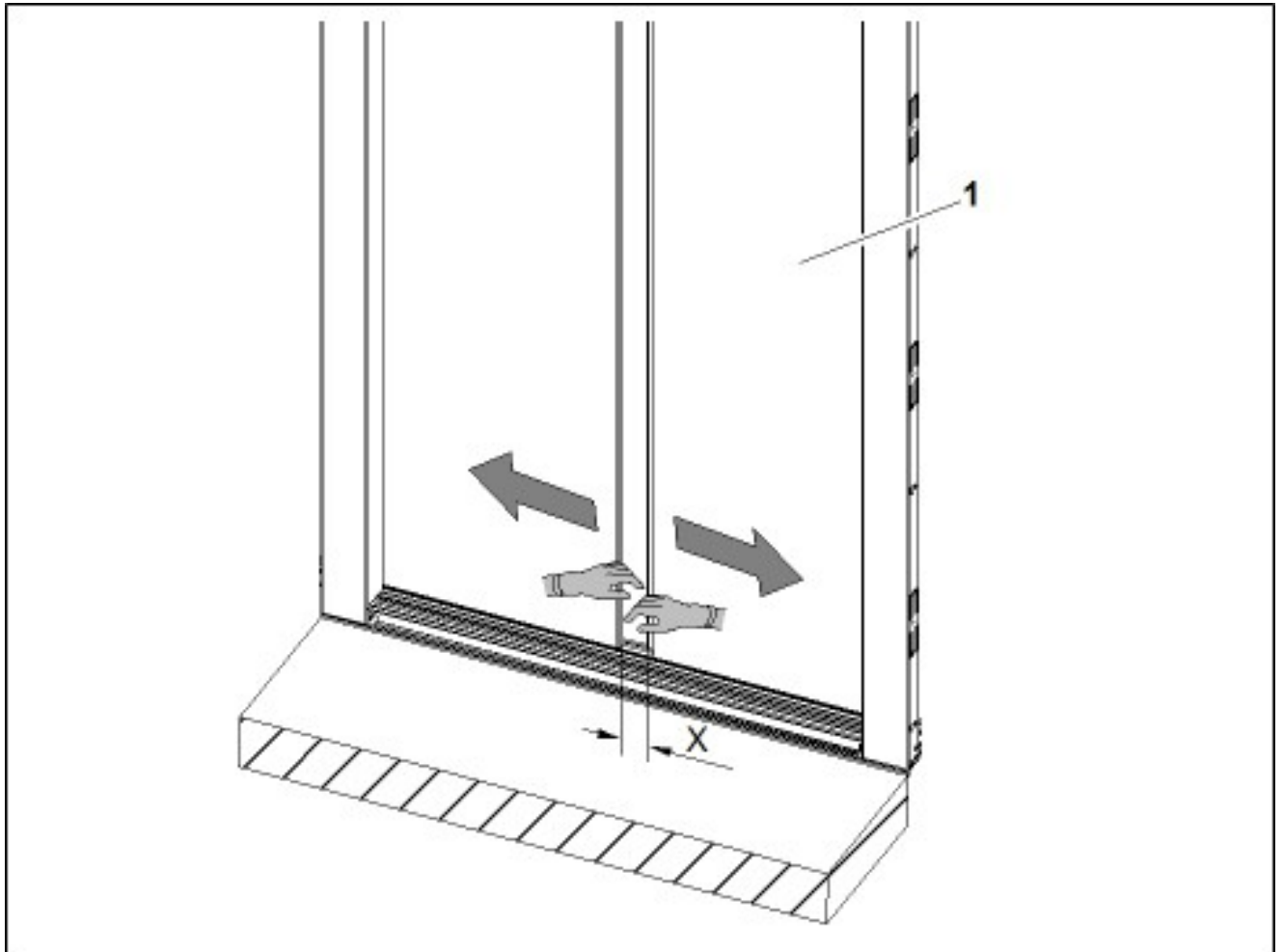


- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.

#### 5.25.10 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.

#### 5.25.11 Checking of door opening in locked condition



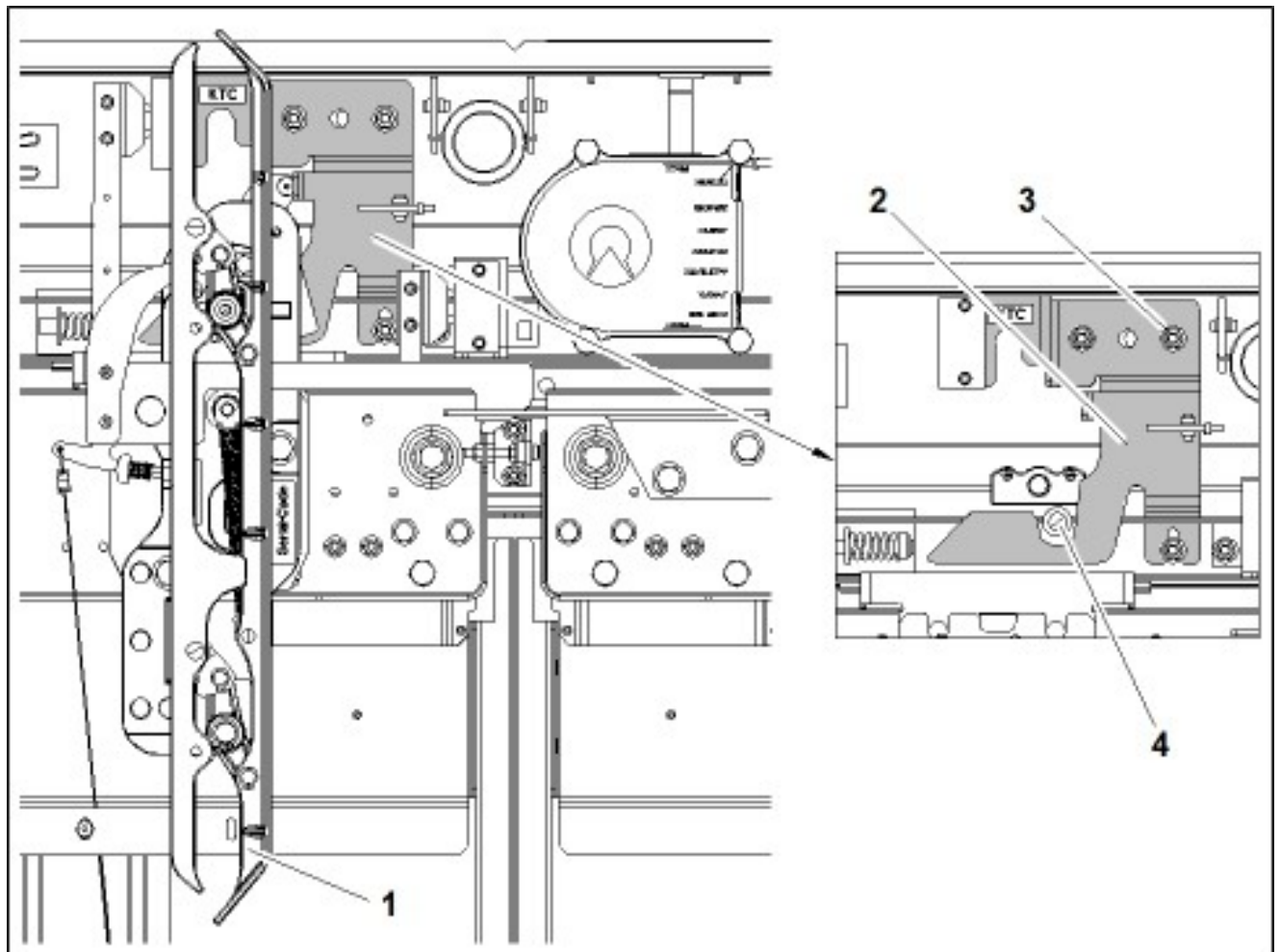
##### 1 Door panel

**i** Use no more than 150 N to manually move the door panels.

- ▶ Make sure that the door panel is closed and the door is locked.
- ▶ Open the door panels manually from the bottom as far as possible.
- ▶ Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- ▶ If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.25.12 Checking of door panel movement condition



- 1 Primary clutch
- 3 Fastening nuts

- 2 Clutch cam plate
- 4 Retainer

**i** Make sure that all the adjustments for the primary clutch are complete.

- ▶ Press the clutches by hand then pull the clutches in the direction of opening until the retainer touches the hook of the clutch cam plate.
- ▶ Make sure that the door panels move at the same time.
  - ↳ If necessary, adjust the position of the clutch.



### 5.25.13 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

## 5.26 Car door lock for DO VAR 15

### 5.26.1 Maintenance plan for car door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of rollers and sliders
12	Checking of mechanical car door lock in closed position
12	Checking of clearance of mechanical car door lock in closed position
12	Checking of position of clutch release roller
12	Checking of latch position
12	Checking of alignment of switches and contact bridges

### 5.26.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

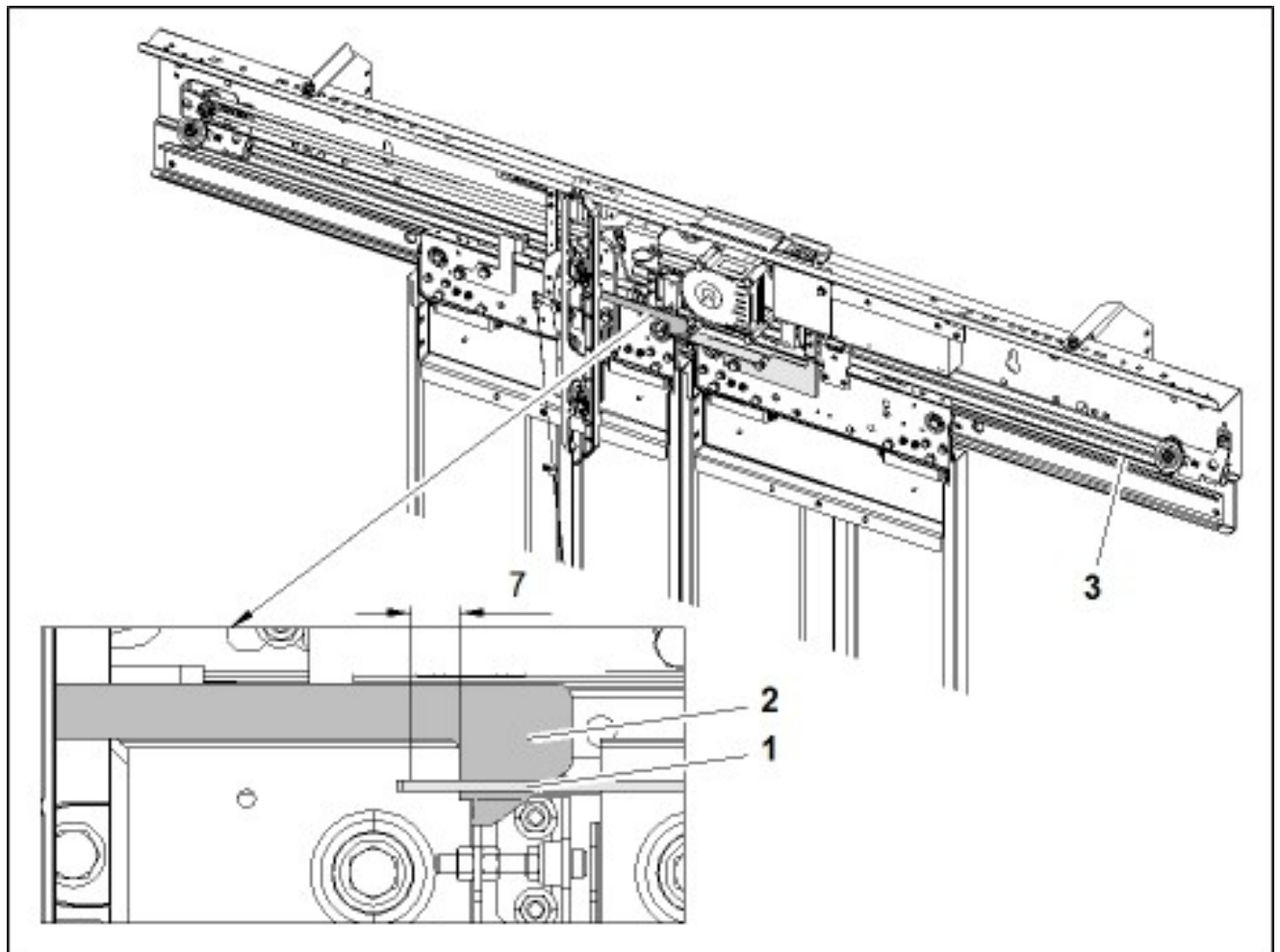
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.26.3 Checking of condition of rollers and sliders

- ▶ Make sure that the main rollers, counter rollers or sliders and the retaining washers are not damaged.



#### 5.26.4 Checking of mechanical car door lock in closed position



- 1 Support of contact bridge
- 3 Rail

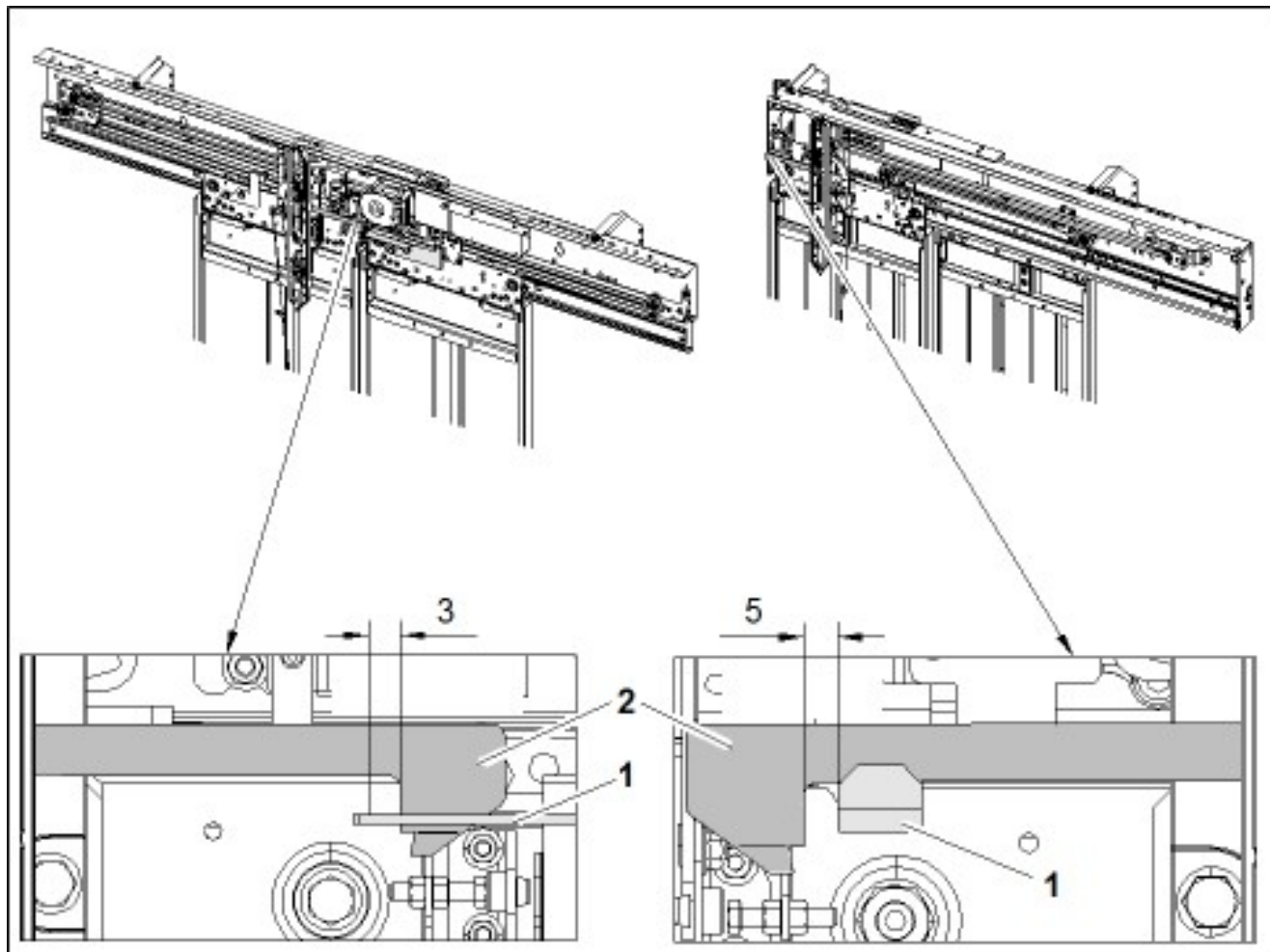
- 2 Latch

**i** The process to check the position of latch arm is same for center doors and telescopic doors.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch arm is in horizontal position. Do a visual check with the rail.
- Make sure that the clearance between the latch arm and the support of contact bridge is 7 mm.



#### 5.26.5 Checking of clearance of mechanical car door lock in closed position



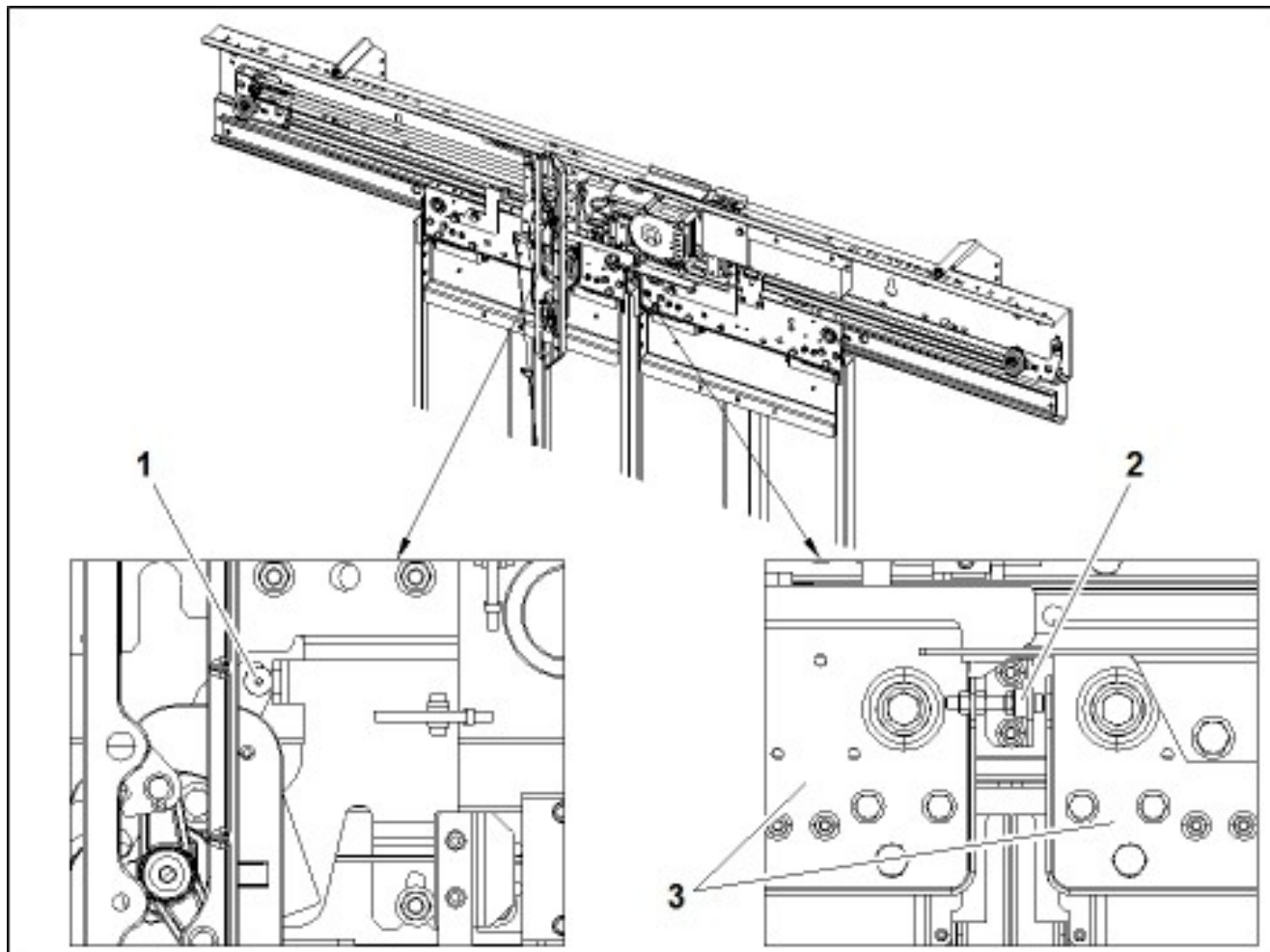
1 Support of contact bridge

2 Latch

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the lock latch arm is in the normal position, touching the support of contact bridge.
- Open the doors manually in the closed condition by opening the clutch a little bit by hand.
- If center doors, make sure that the clearance between the latch and the support of contact bridge is minimum 3 mm.
- If telescopic doors, make sure that the clearance between the latch and the support of contact bridge is minimum 5 mm.



### 5.26.6 Checking of position of clutch release roller



1 Clutch release lever

2 Stopper buffer

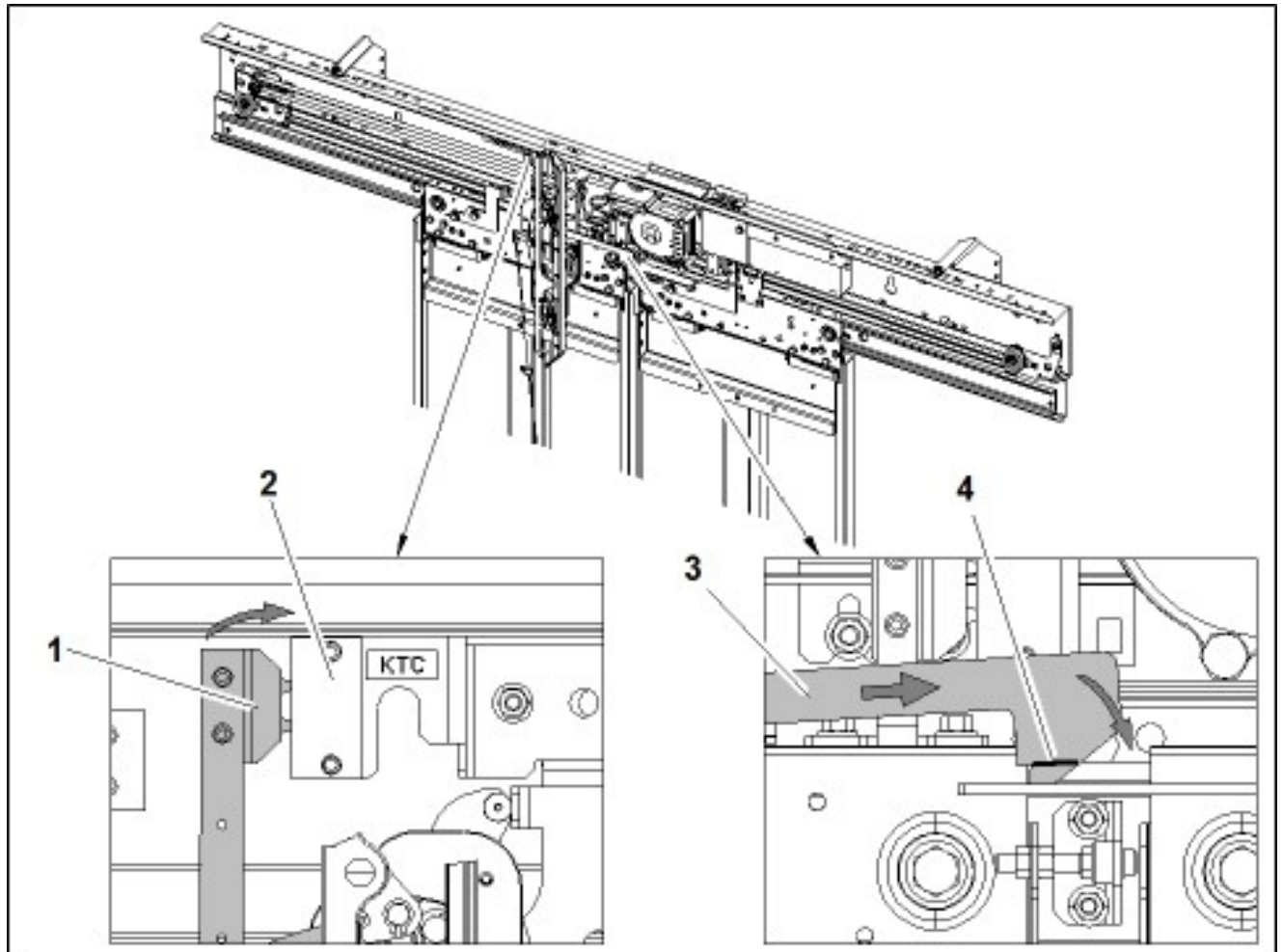
3 Carrier

**i** Make sure that the pulley bolts are not removed completely. Loosen the pulley bolts to allow the tensioner movement only.

- Move the carriers 20 mm in the open direction.
- Move the carriers in the close direction until there is 10 mm distance to the stopper buffer.
- Make sure that the clutch release roller touches the clutch release lever.
  - ↳ If necessary, adjust the clutch release roller.



### 5.26.7 Checking of latch position



1 Contact bridge

2 Switch KTC

3 Latch

4 7 mm marker

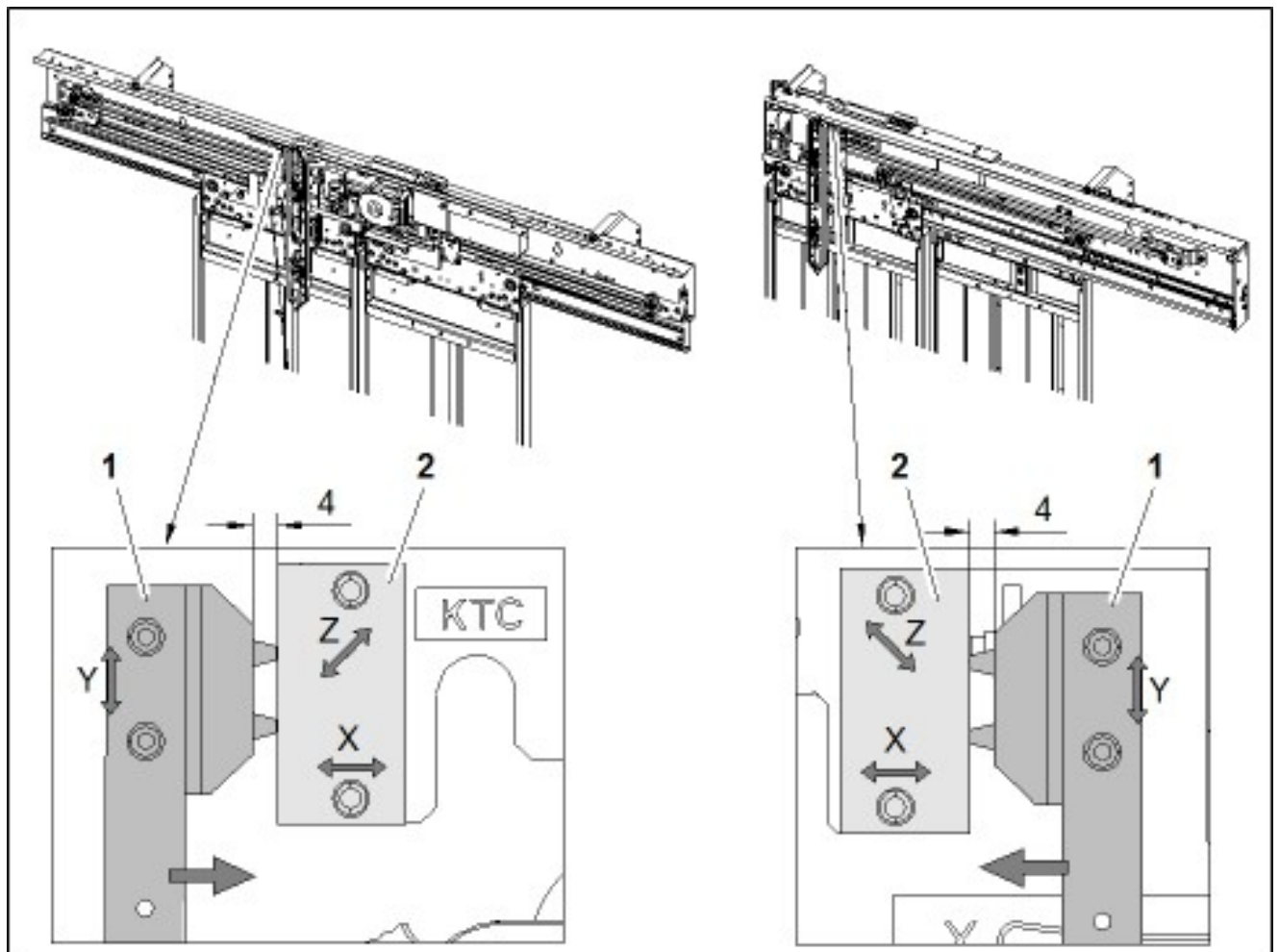
**i** The marked line on the car door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTC makes contact.



## 5.26.8 Checking of alignment of switches and contact bridges

### 5.26.8.1 Checking of alignment of car door switch KTC and contact bridge



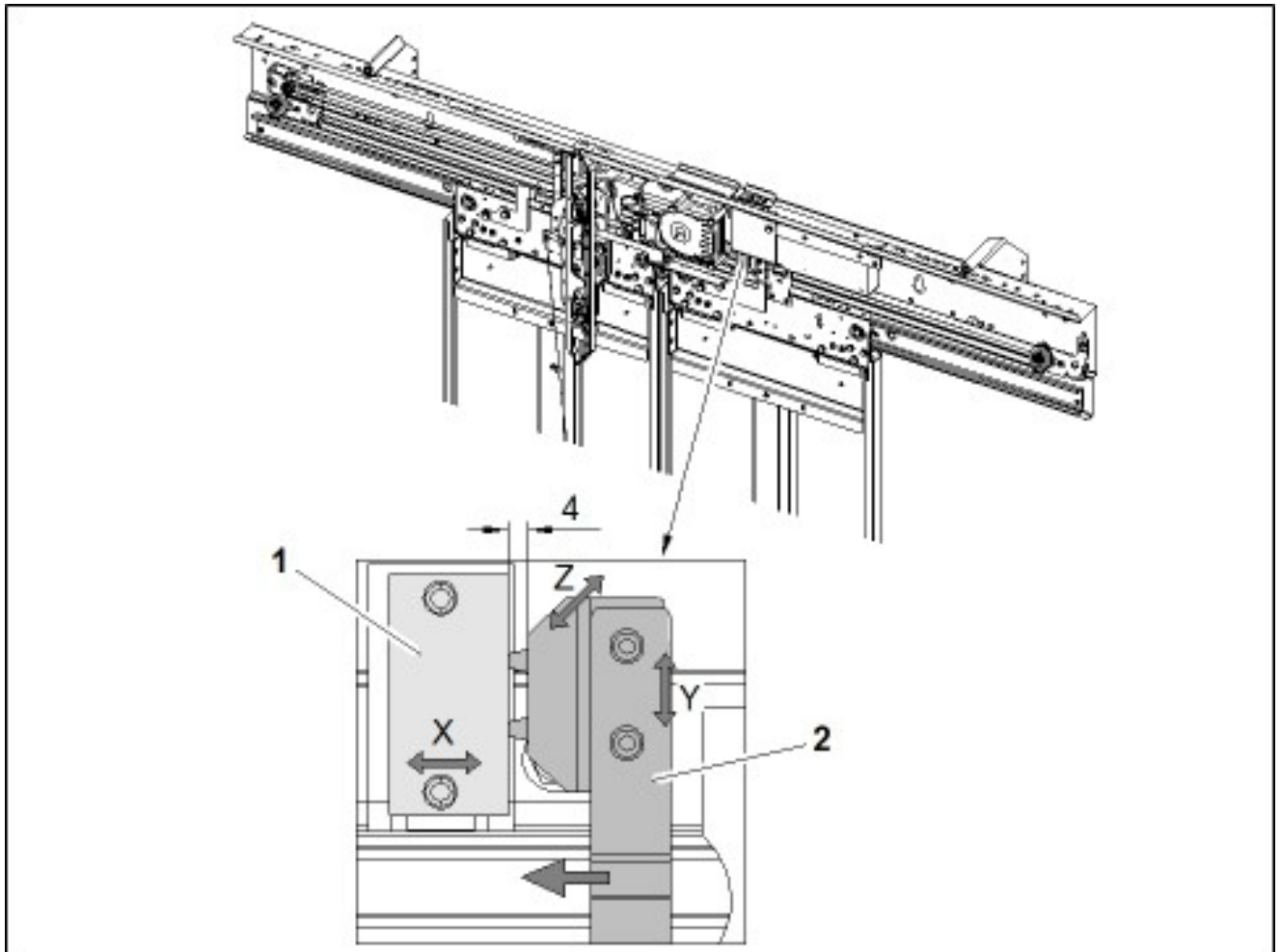
1 Contact bridge

2 Switch KTC

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KTC position.
  - X-position: Distance of the contact bridge to the switch KTC is 4 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the switch KTC.
  - Z-position: Contact bridge fit centered to the housing holes of the switch KTC.
- ↳ If required, adjust the switch KTC.



#### 5.26.8.2 Checking of alignment of safety switch KTC2 and contact bridge



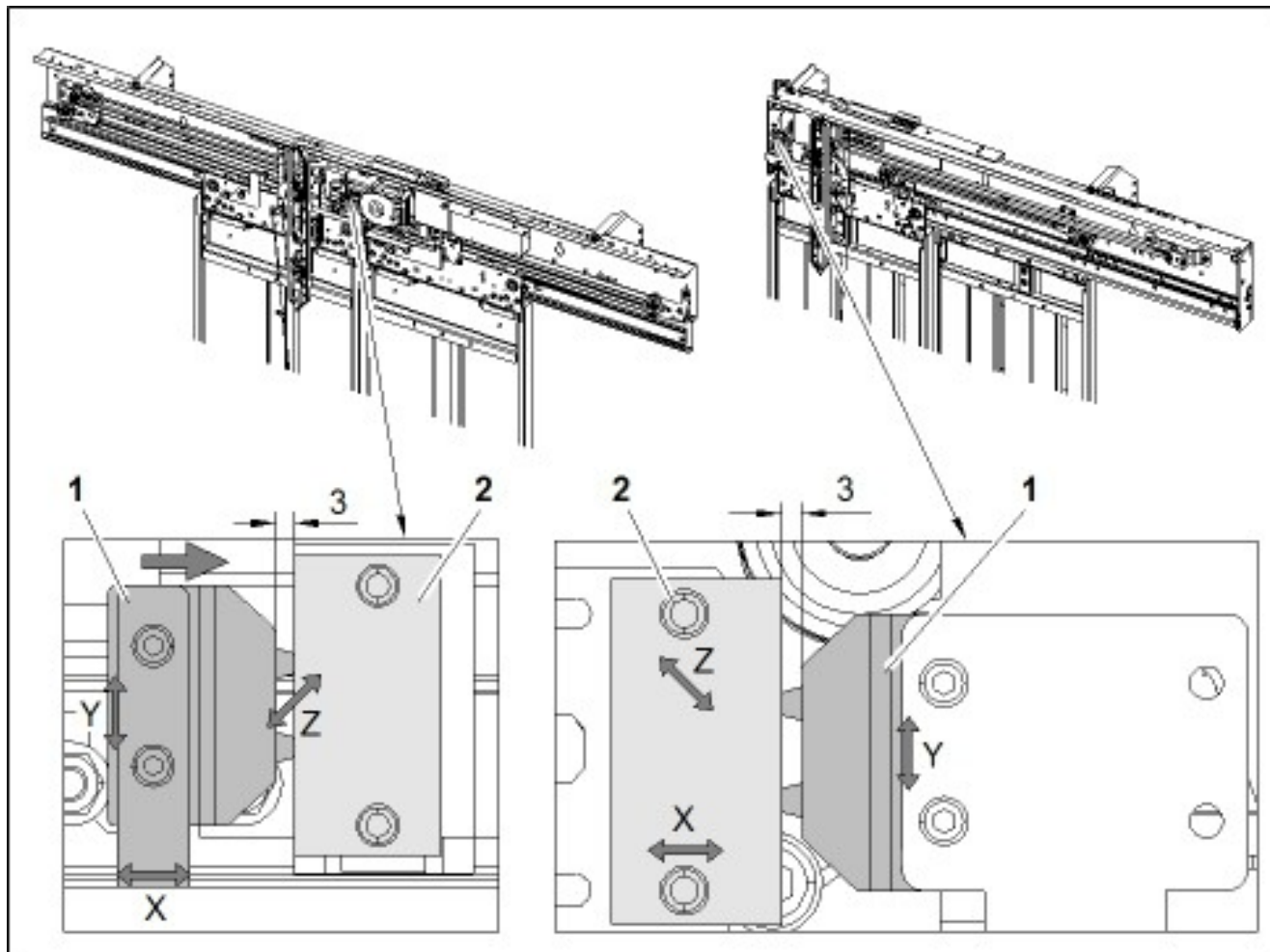
1 Safety switch KTC2

2 Contact bridge

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KTC2 position.
  - X-position: Distance of the contact bridge to the safety switch KTC2 is 4 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTC2.
  - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTC2.
- ↳ If required, adjust the safety switch KTC2.



### 5.26.8.3 Checking of alignment of car door switch KET-S2 and contact bridge



1 Contact bridge

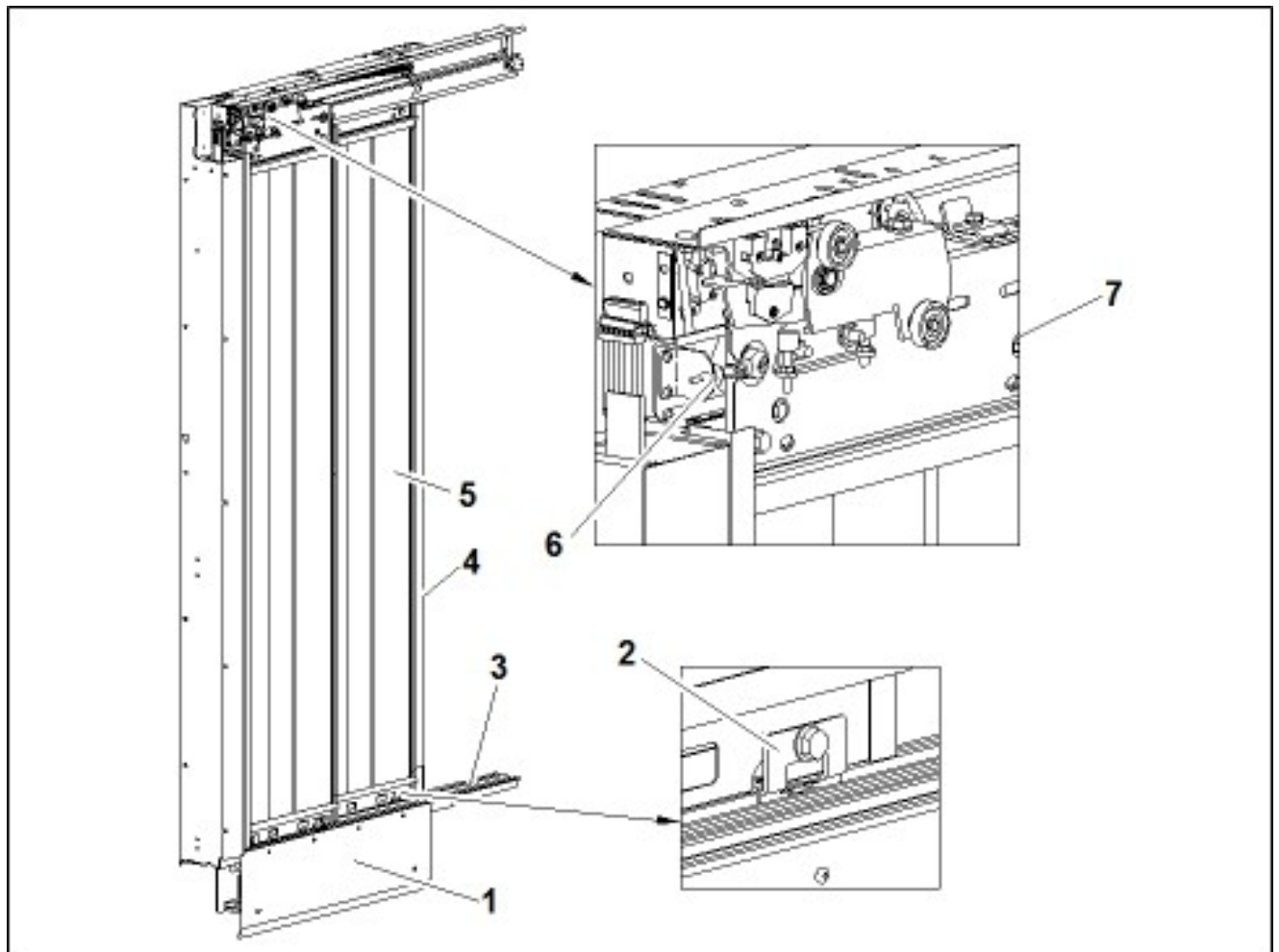
2 Switch KET-S2

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KET-S2 position.
  - X-position: Distance of the contact bridge to the switch KET-S2 is 3 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the switch KET-S2.
  - Z-position: Contact bridge fit centered to the housing holes of the switch KET-S2.
- ↳ If required, adjust the switch KET-S2.



## 5.27 Landing door DO FEC-EU

### 5.27.1 Overview of landing door



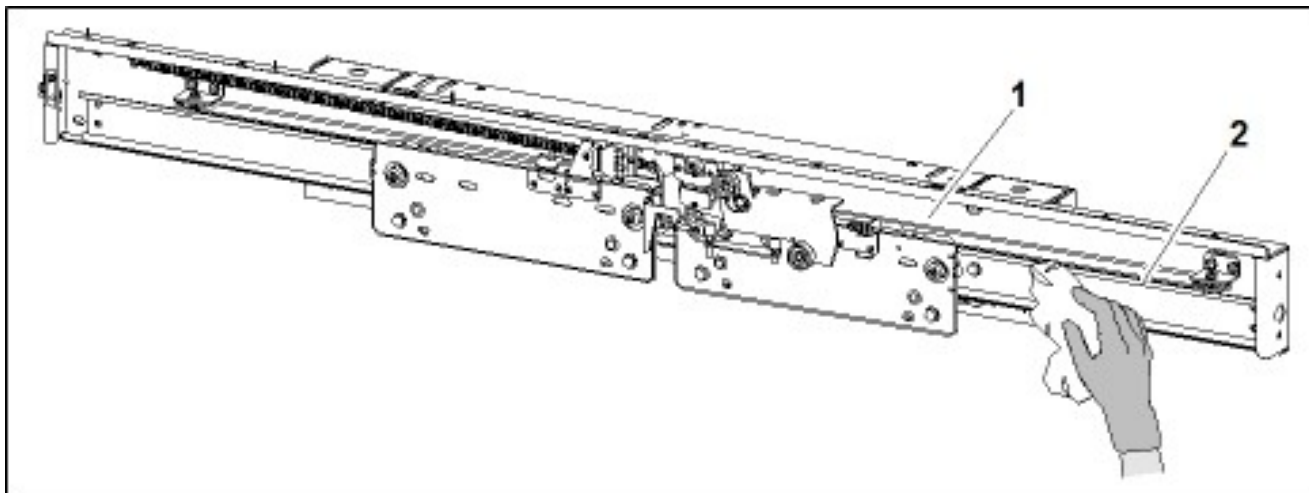
- |   |                |   |                             |
|---|----------------|---|-----------------------------|
| 1 | Toe guard      | 2 | Guide shoe                  |
| 3 | Sill           | 4 | Door frame                  |
| 5 | Door panel     | 6 | Release device of door lock |
| 7 | Door mechanism |   |                             |

### 5.27.2 Maintenance plan for landing door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking for door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of switch KNET for damage
12	Checking of landing door lock DO FEC-EU
12	Checking of door panel performance



### 5.27.3 Checking of cleanness



1 Door mechanism

2 Rail



- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

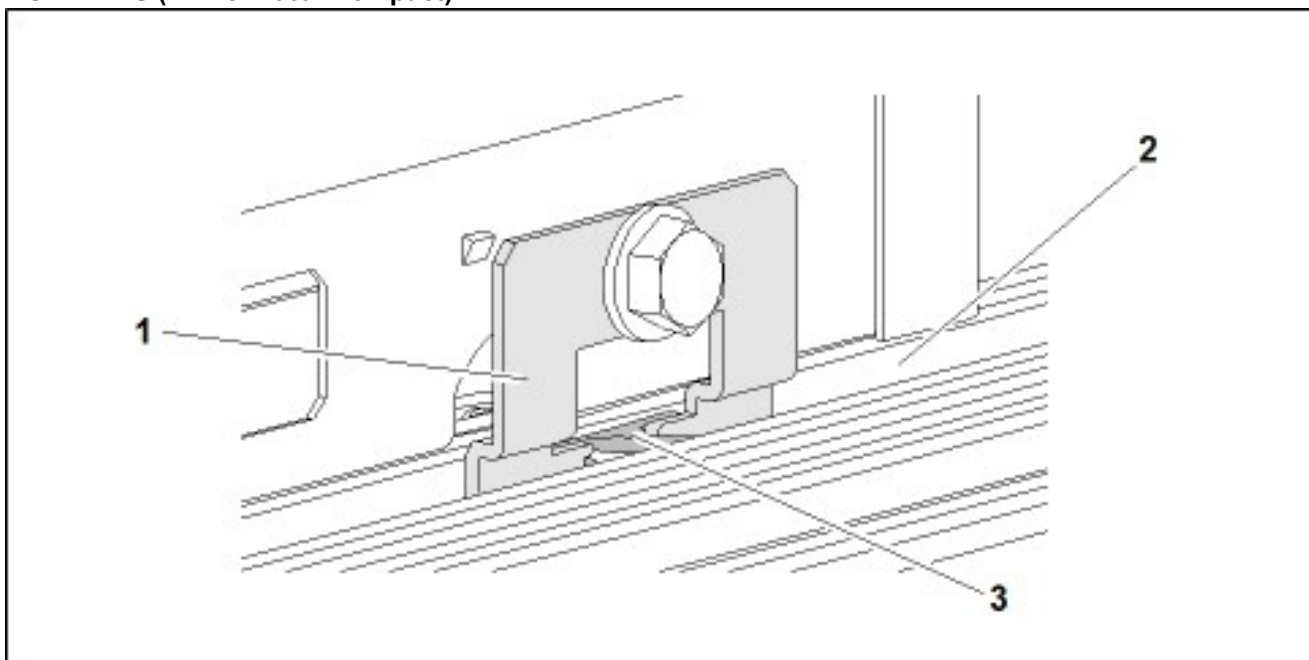
- ▶ Make sure that the door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.27.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.27.5 Checking of condition of guide shoe

#### DO FEC-EU (LD Fermator Compact)



1 Guide shoe bracket

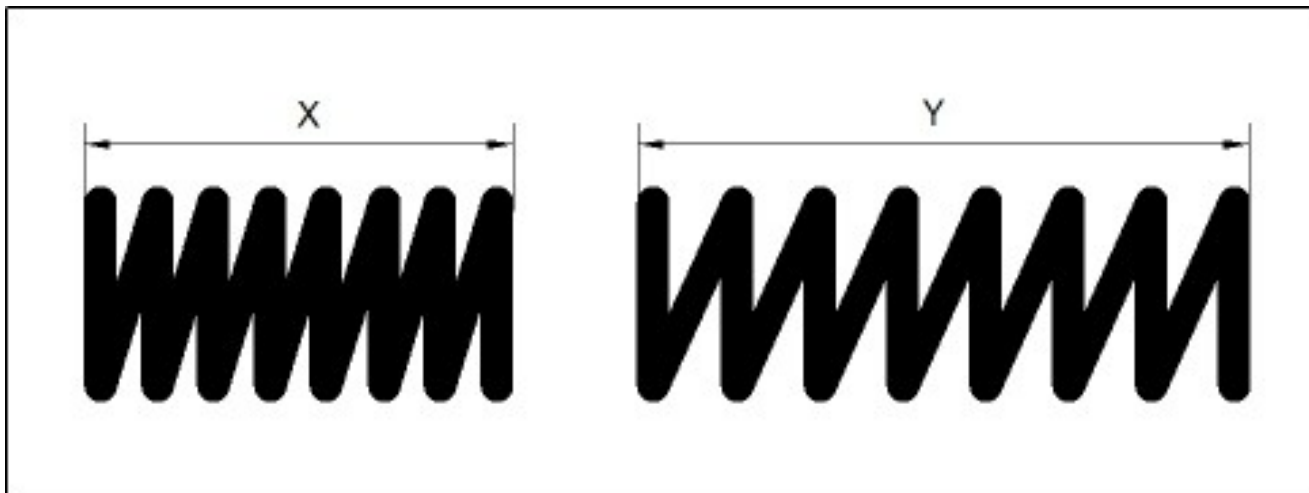
2 Sill profile

3 Guide shoe

- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 1$  mm, replace the guide shoe.



#### 5.27.6 Checking of condition of synchronization rope

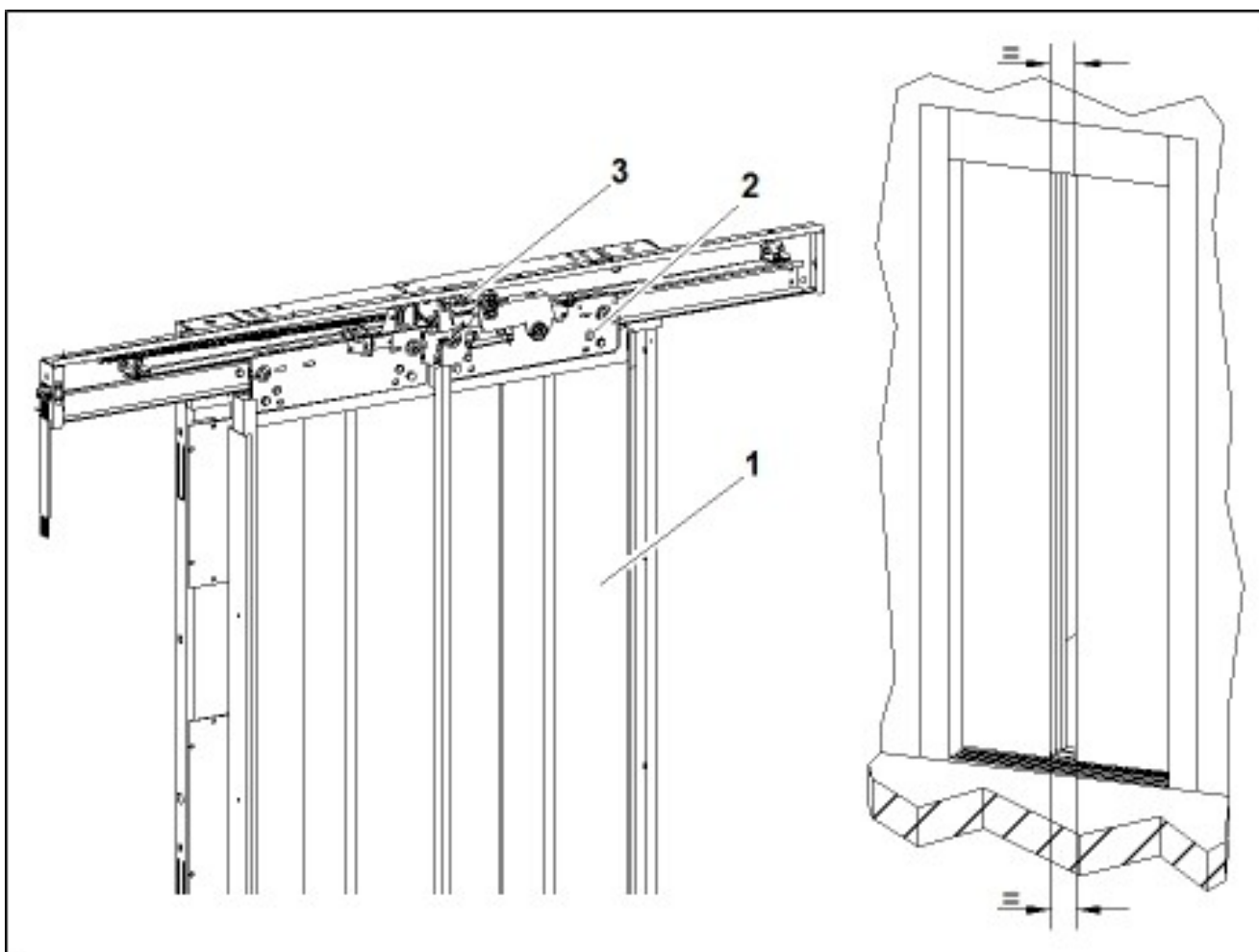


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 21 \text{ mm}$ .

#### 5.27.7 Checking of vertical parallelism of door panel



**1** Door panel

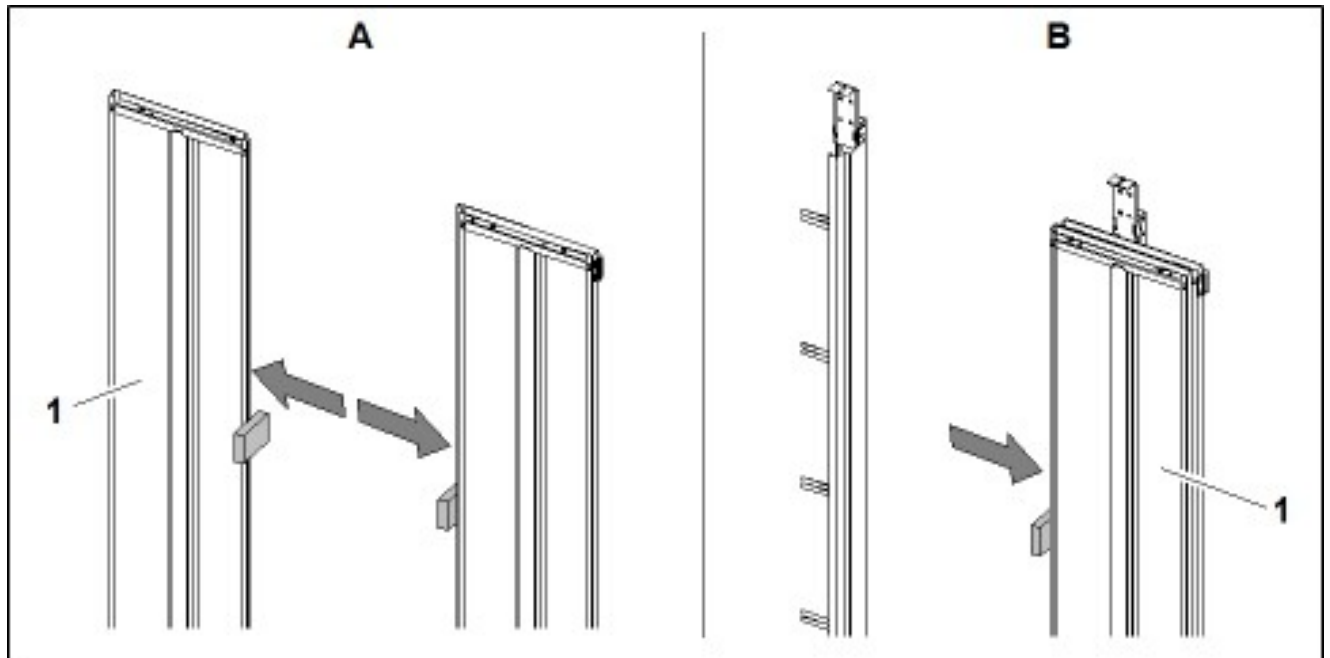
**2** Bolt

**3** Door mechanism



- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.27.8 Checking of alignment of door panel



**A** Center door

**B** Telescopic door

**1** Door panel

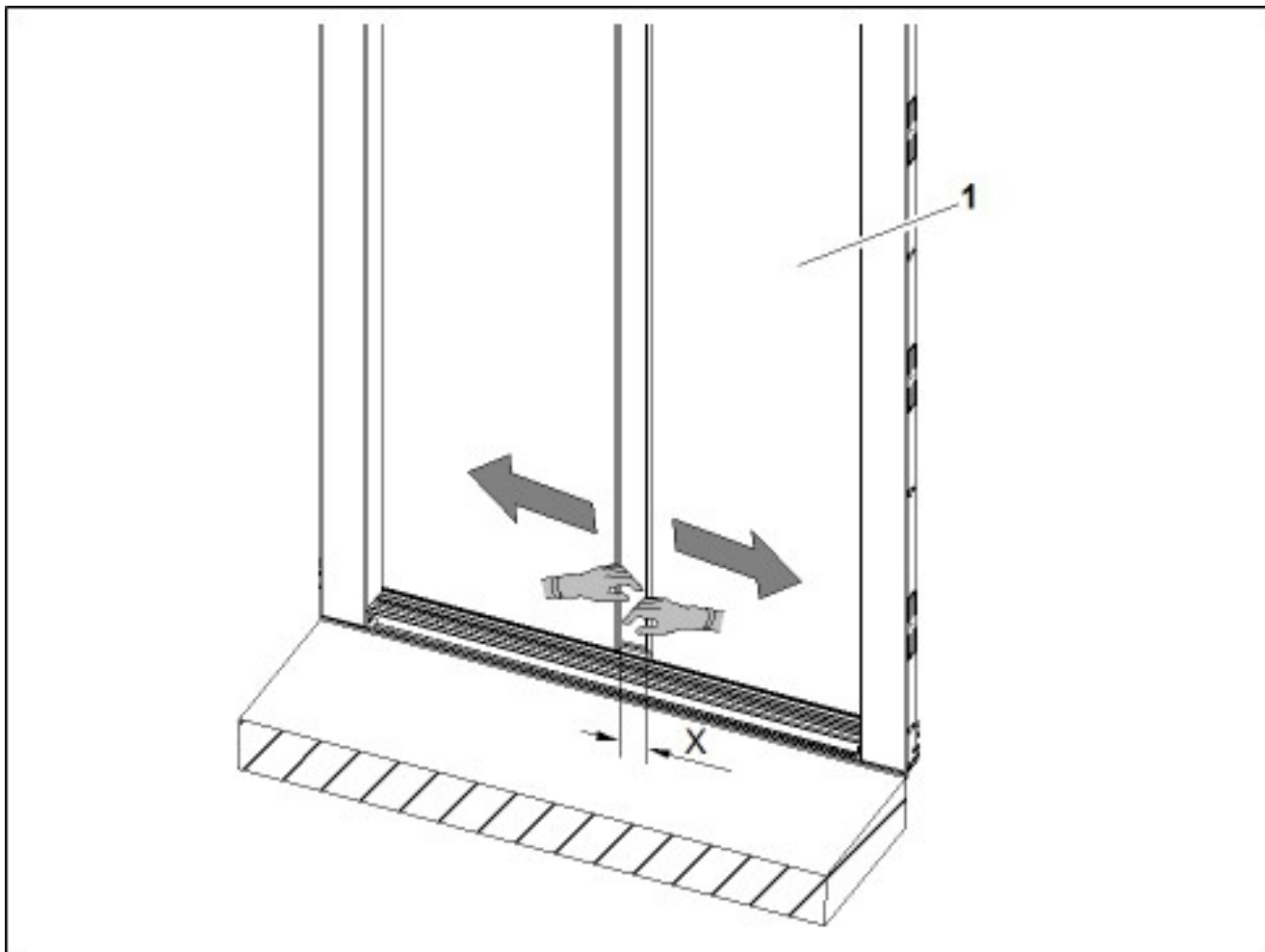
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

#### 5.27.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.27.10 Checking of door opening in locked condition



##### 1 Door panel

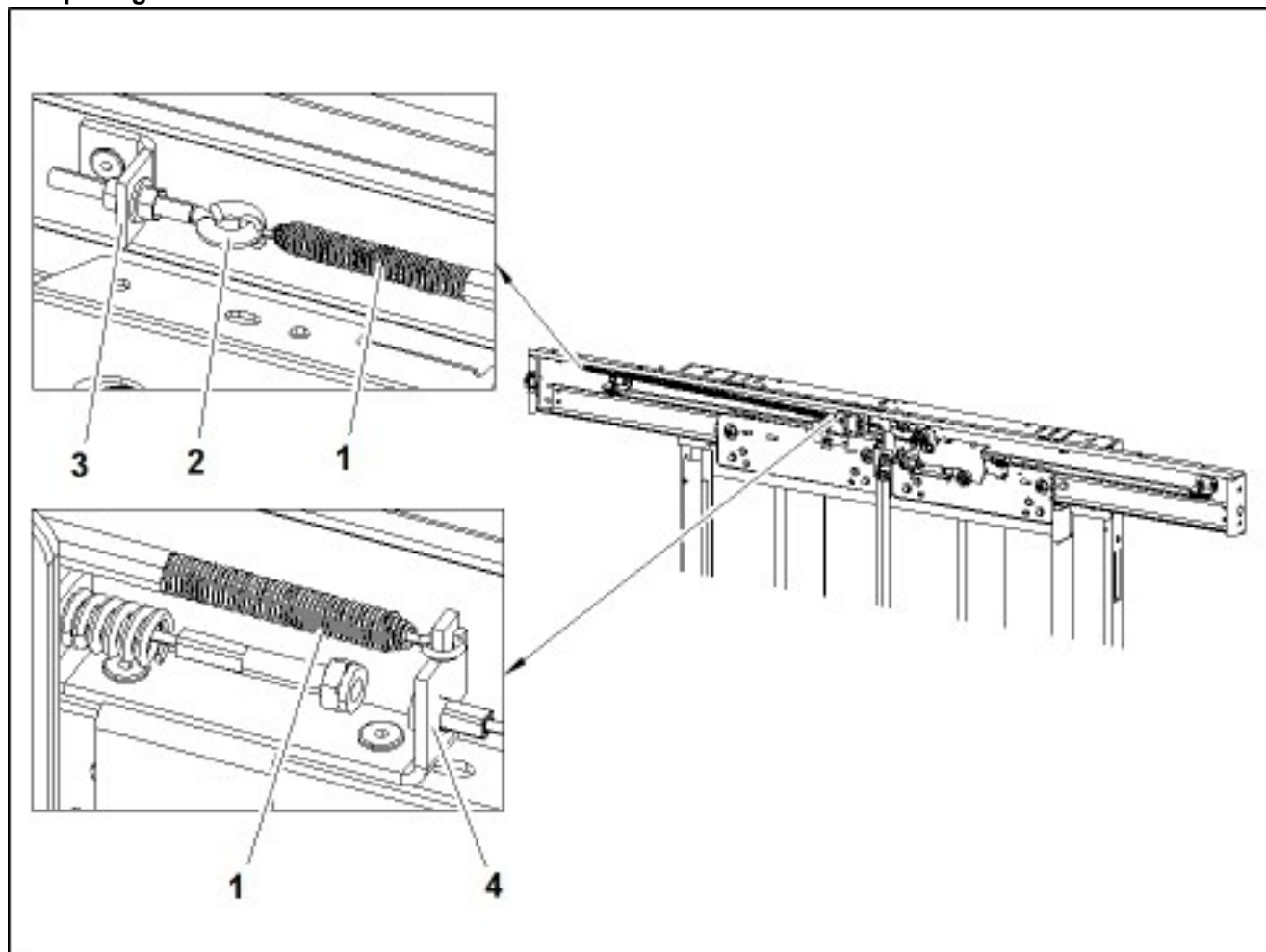
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.27.11 Checking of operation of door closing spring

#### C2 opening

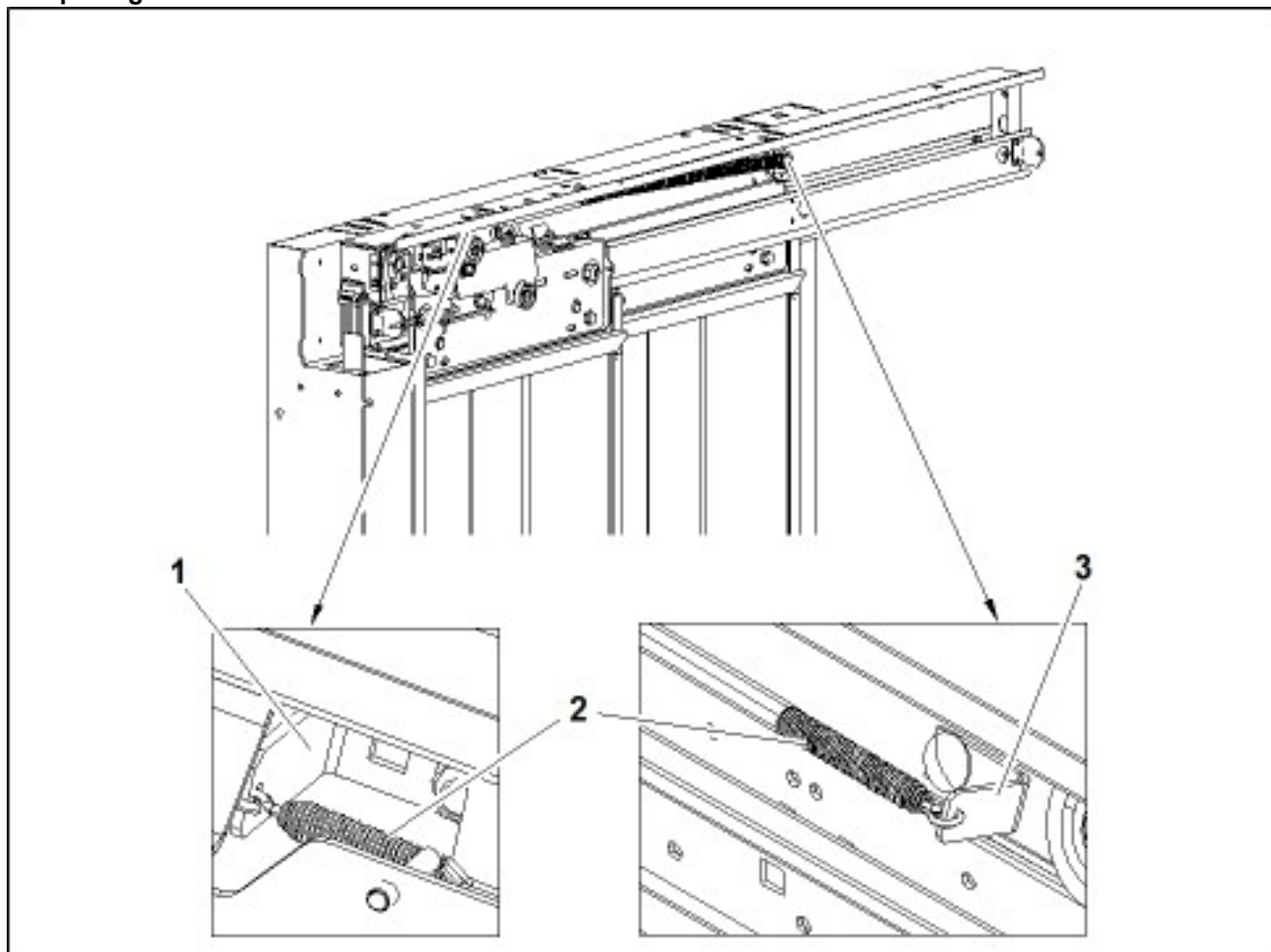


- 1 Door closing spring
- 3 Tension element holder

- 2 Tension element
- 4 Spring holder



## T2 opening



- 1 Tension element holder  
3 Spring holder

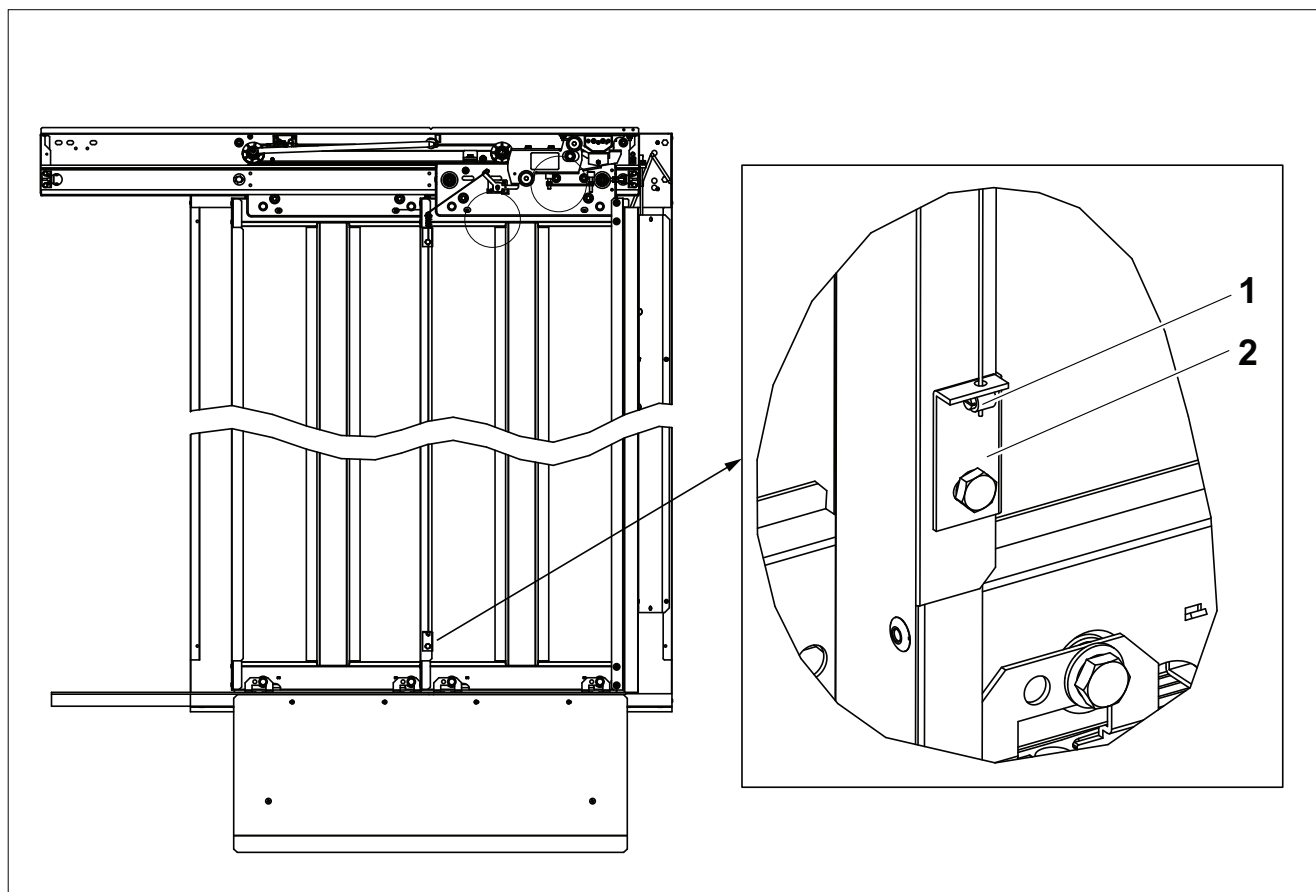
- 2 Door closing spring

- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring-holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.27.12 Checking of release device of door lock

**i** Do a check on the release device on the lowest landing door only.



1 Steel rope

2 Rope plate

- ▶ Pull the steel rope and make sure that the door lock opens.
- ▶ Make sure that the release device does not touch the door lock.
- ▶ Make sure that the steel rope is not damaged.

### 5.27.13 Checking of emergency release

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

### 5.27.14 Checking of switch KNET for damage

**i** The switch KNET is optional and only mandatory when the Temporary Safety Device (TSD) is installed.

- ▶ Make sure that the switch KNET has no damage.
  - ↳ If the switch KNET is damaged, replace it.



### 5.27.15 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

## 5.28 Landing door lock for DO FEC-EU

### 5.28.1 Maintenance plan for landing door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of landing door switches and contact bridges

#### 5.28.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

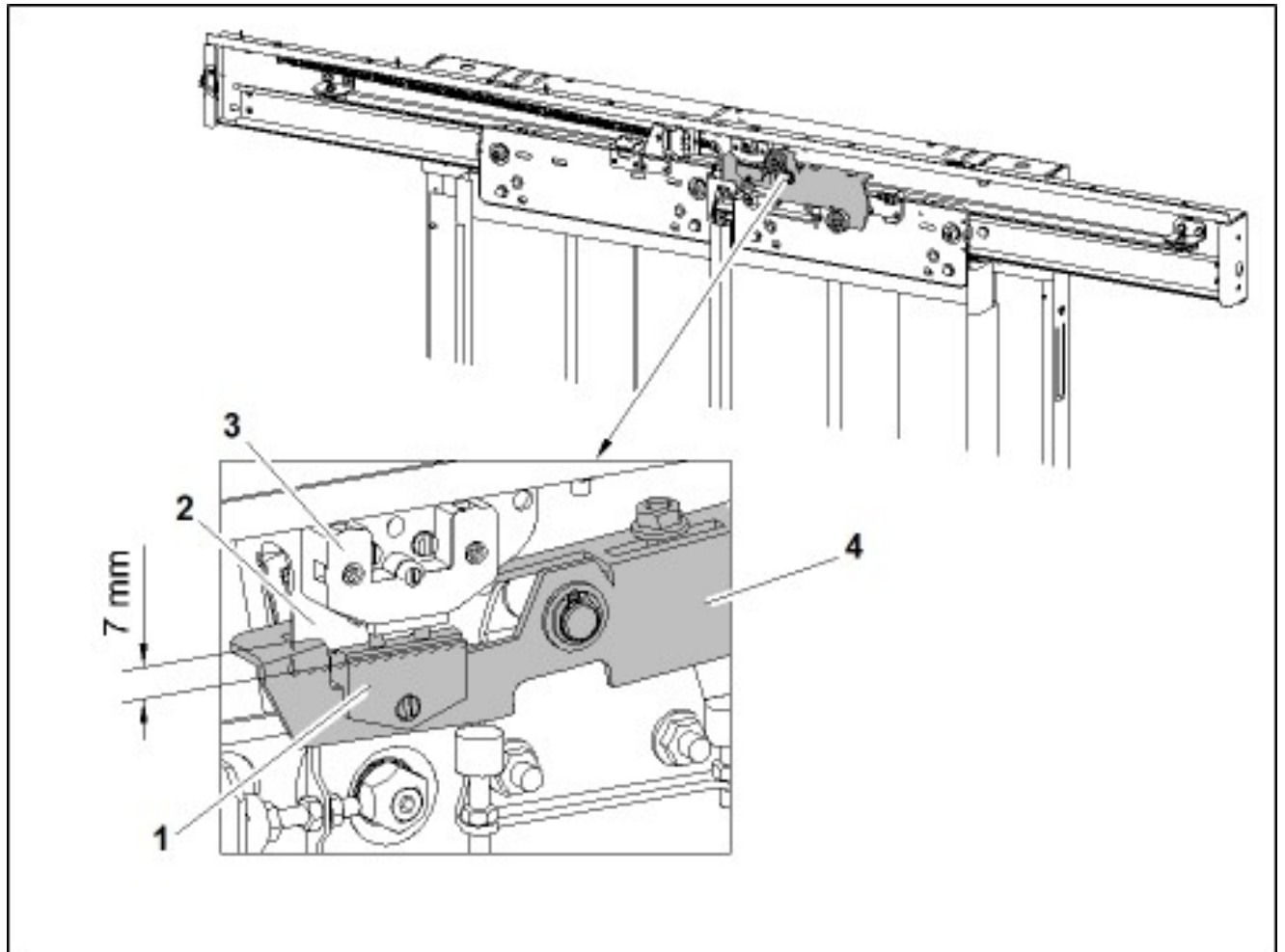
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### 5.28.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.28.4 Checking of latch position



1 Contact bridge

2 KTS support

3 Switch KTS

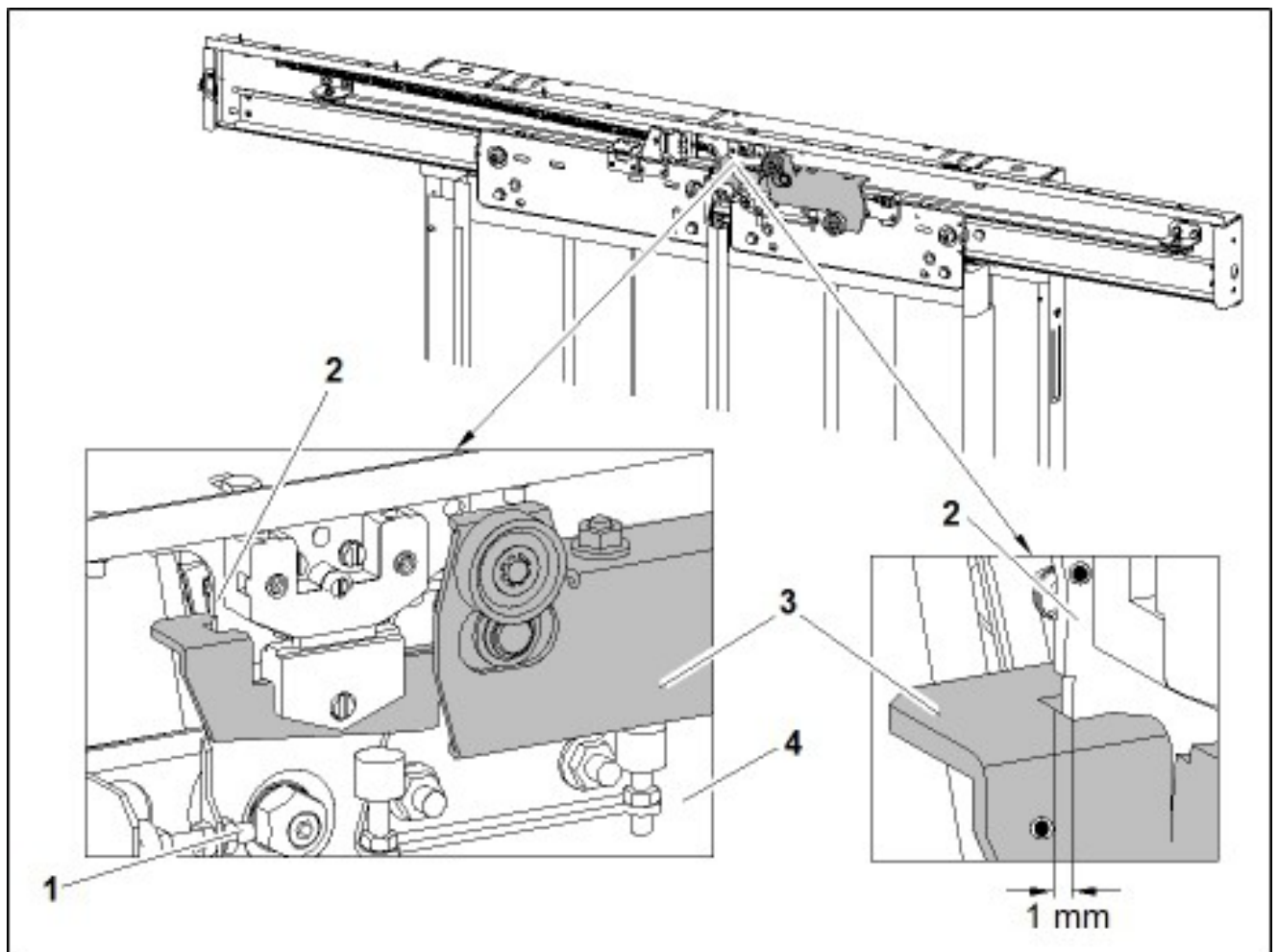
4 Latch



The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.





1 Closed stopper rubber

2 KTS support

3 Latch

4 Carrier

- Make sure that the clearance between the KTS support and the latch is 1 mm.
- Make sure that the clearance does not break the function of the switch KTS.

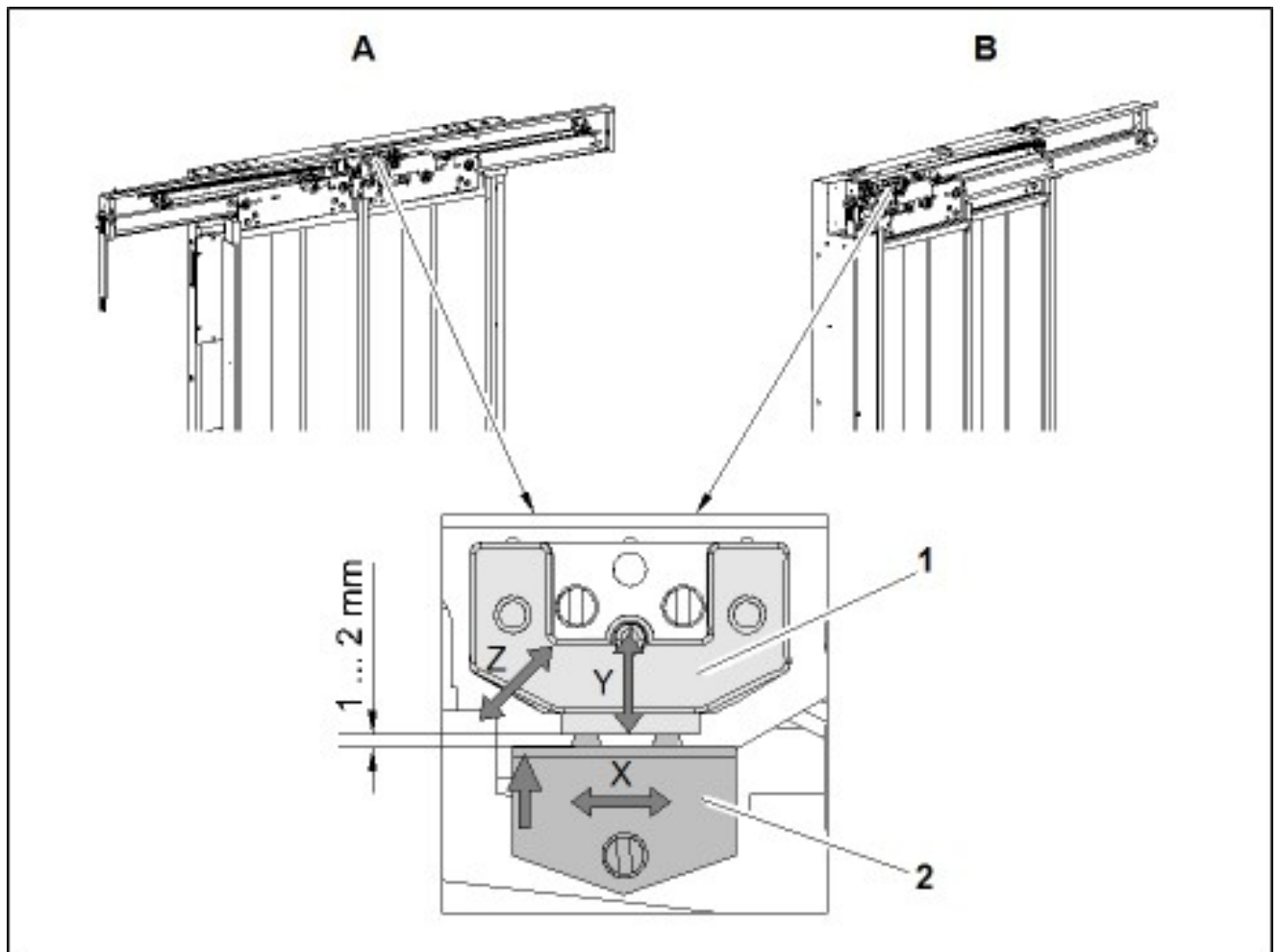
#### 5.28.5 Checking of lock roller position

- Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.
  - ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.



## 5.28.6 Checking of alignment of switches and contact bridges

### 5.28.6.1 Checking of alignment of landing door switch KTS and contact bridge



**A** Center door

**B** Telescopic door

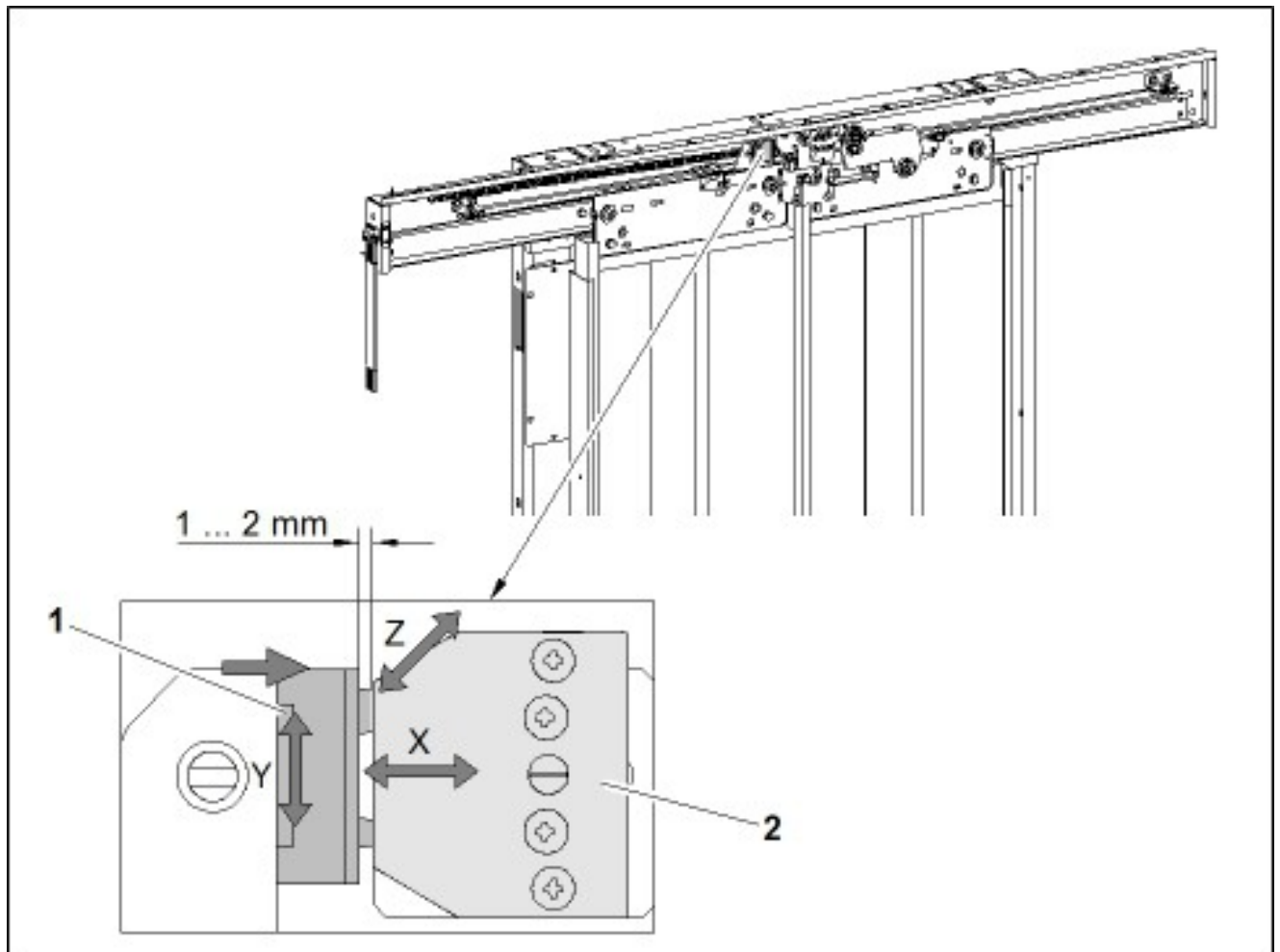
**1** Switch KTS

**2** Contact bridge

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS position.
    - X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
    - Y-Position: Distance of the contact bridge to the switch KTS is 1 ... 2 mm.
    - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
- ↳ If required, adjust the switch KTS.



#### 5.28.6.2 Checking of alignment of safety switch KTS1 and contact bridge



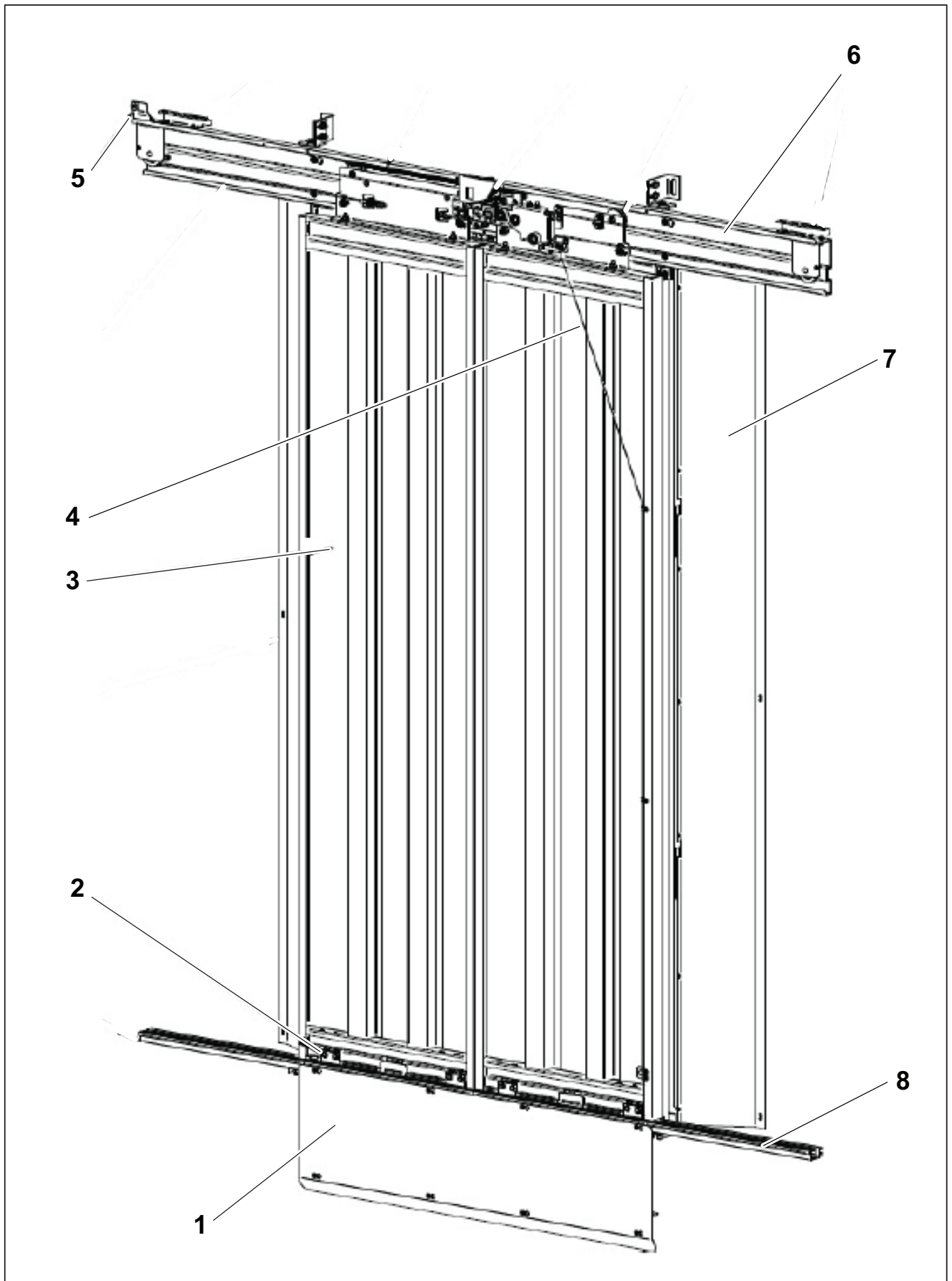
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 1 ... 2 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the switch safety switch KTS1.



5.29 Landing door DO NST  
5.29.1 Overview of landing door



- 1 Toe guard
- 3 Door panel

- 2 Guide shoe
- 4 Release device of door lock



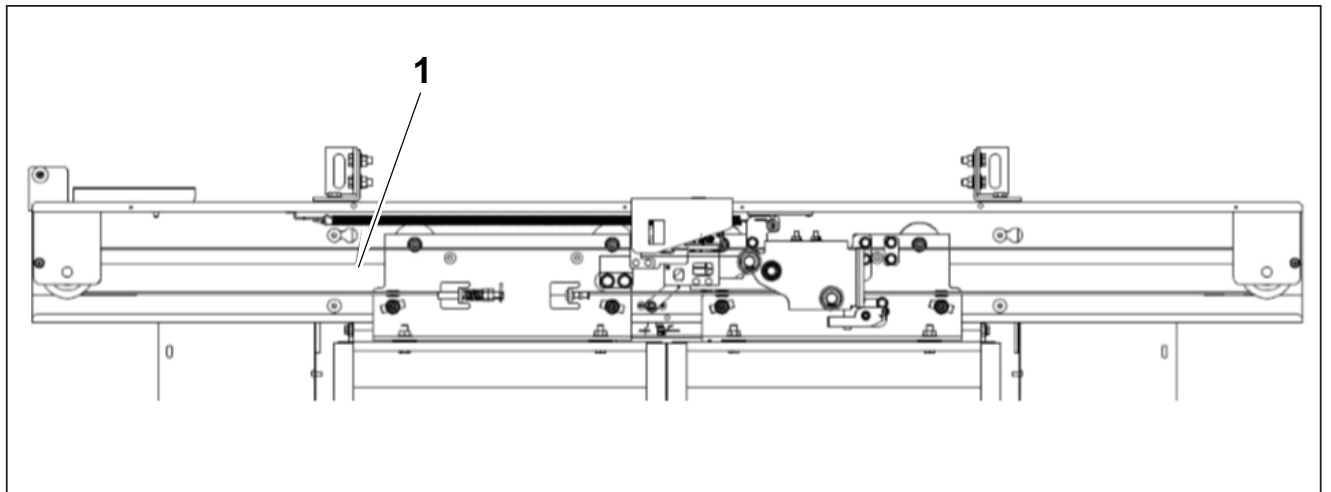
- 5 Door magnet of hoistway information  
 – only for control MX and SC
- 7 Door frame

- 6 Door mechanism
- 8 Sill


### 5.29.2 Maintenance plan for landing door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing device
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of LDU module
12	Checking of landing door lock DO NST
12	Checking of door panel performance

### 5.29.3 Checking of cleanness



#### 1 Rail

-  – Do not use cleaning agents containing strong solvents or abrasives.
  - Do not oil or lubricate the rails.
  - Use a cloth to clean the sill profile and the door panels.
- Make sure that the door mechanism and the rail are clear of dirt and rust.
  - Make sure that the door panels and the door sill profile are clean and clear of dirt.

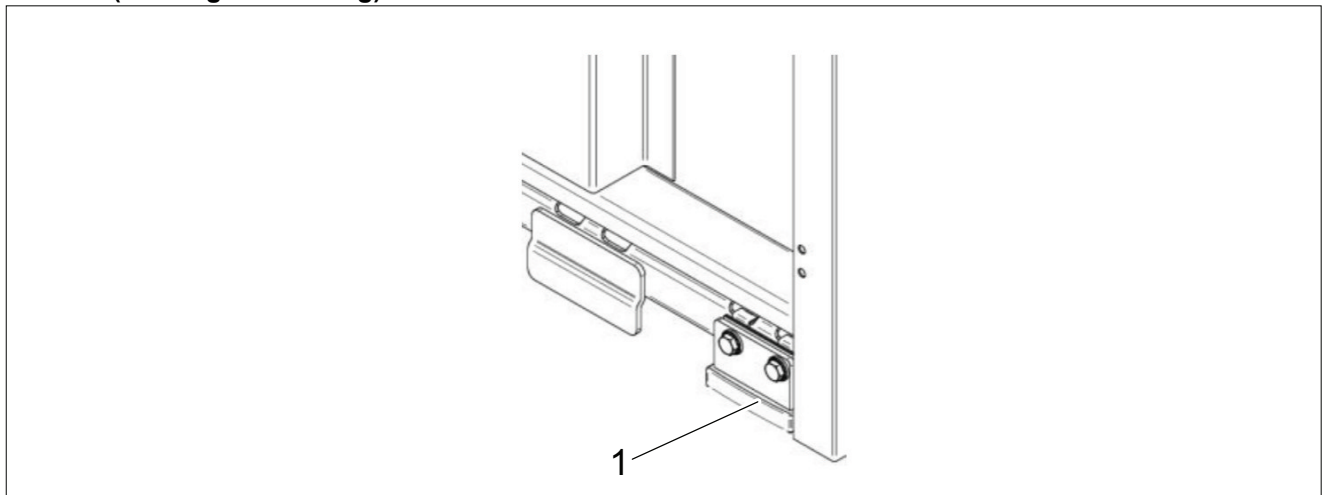
### 5.29.4 Checking for damage and corrosion

- Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.



### 5.29.5 Checking of condition of guide shoe

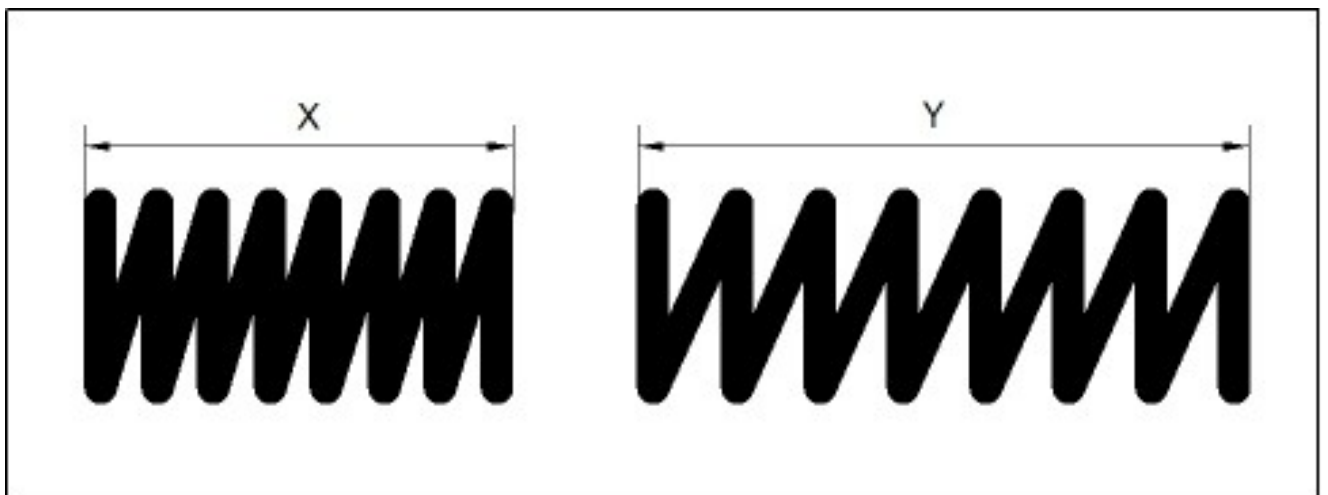
DO NST (LD Ningho Shenling)



1 Guide shoe

- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 2 \text{ mm}$ , replace the guide shoe.

### 5.29.6 Checking of condition of synchronization rope



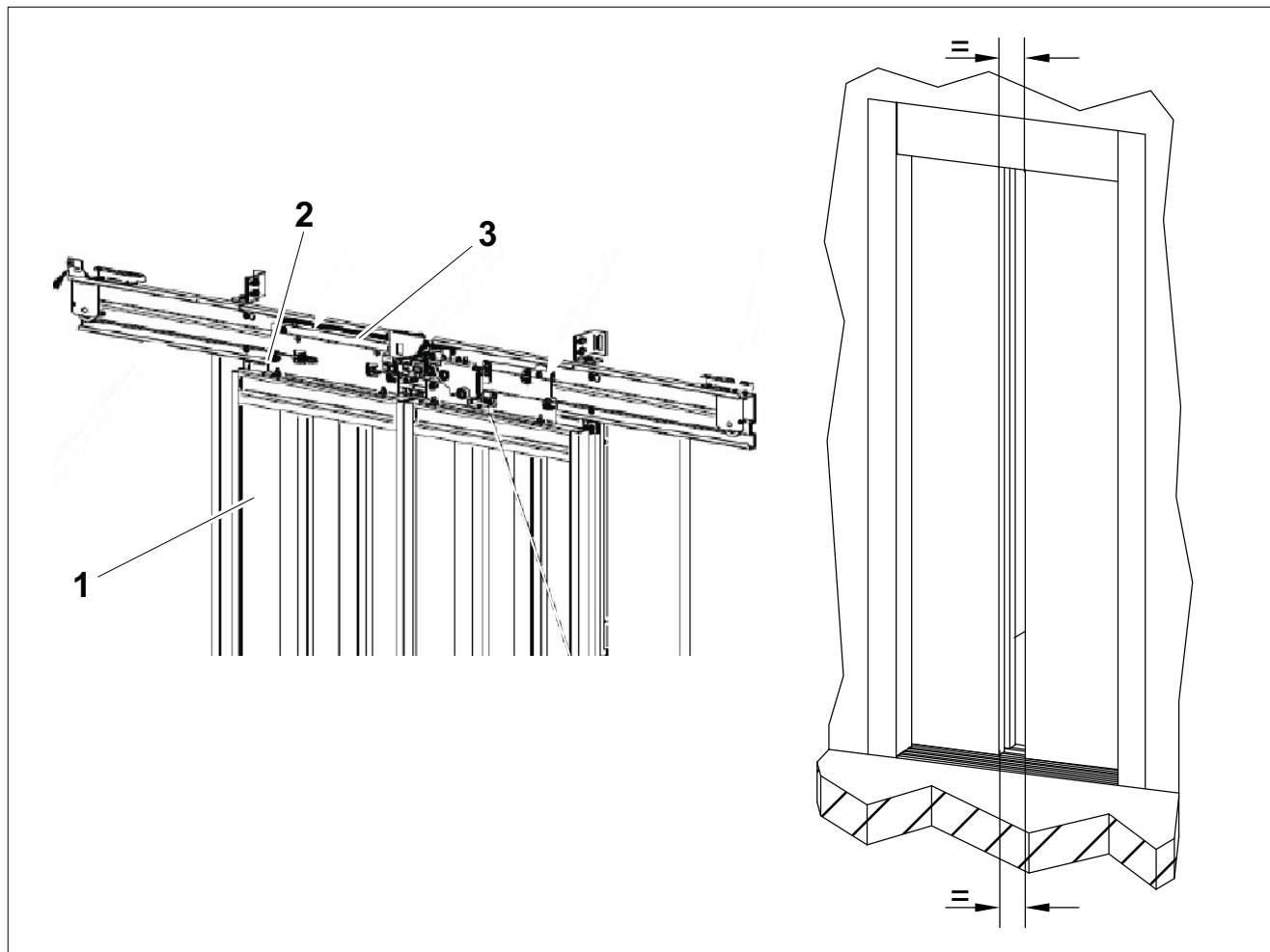
X Compression spring length

Y Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the cable clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 20 \pm 1 \text{ mm}$ .



### 5.29.7 Checking of vertical parallelism of door panel

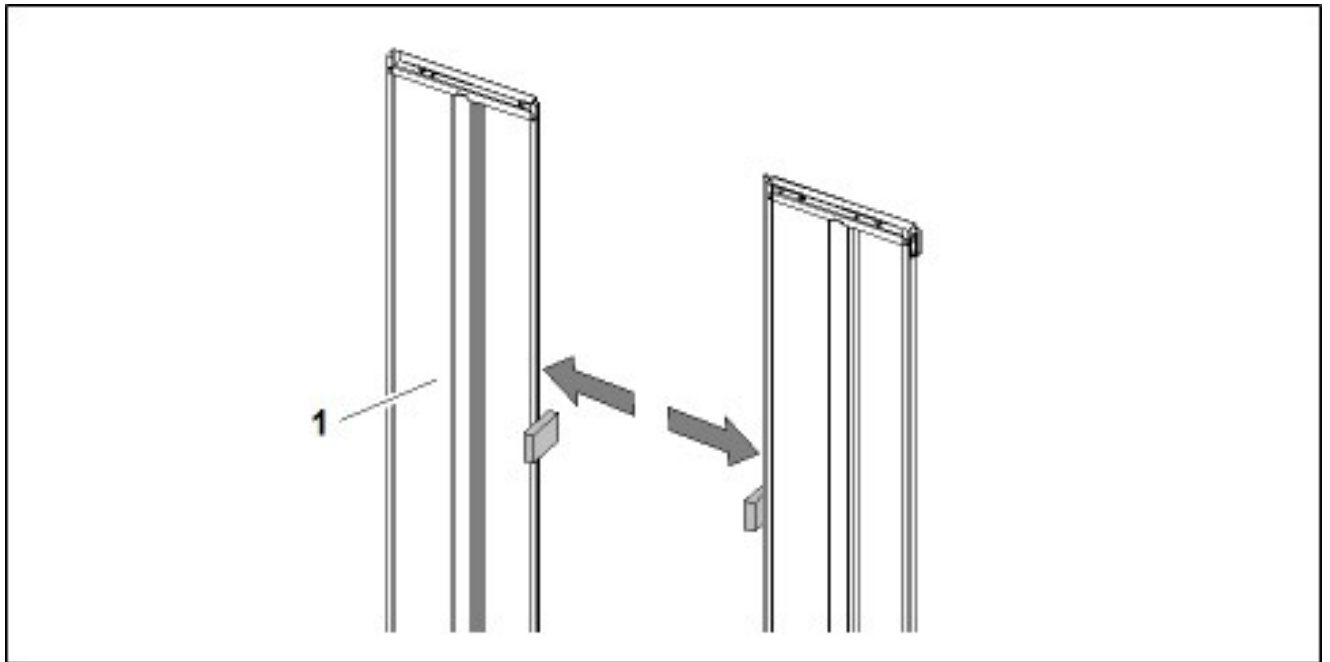


- |   |                |   |      |
|---|----------------|---|------|
| 1 | Door panel     | 2 | Bolt |
| 3 | Door mechanism |   |      |

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.



### 5.29.8 Checking of alignment of door panel



#### 1 Door panel

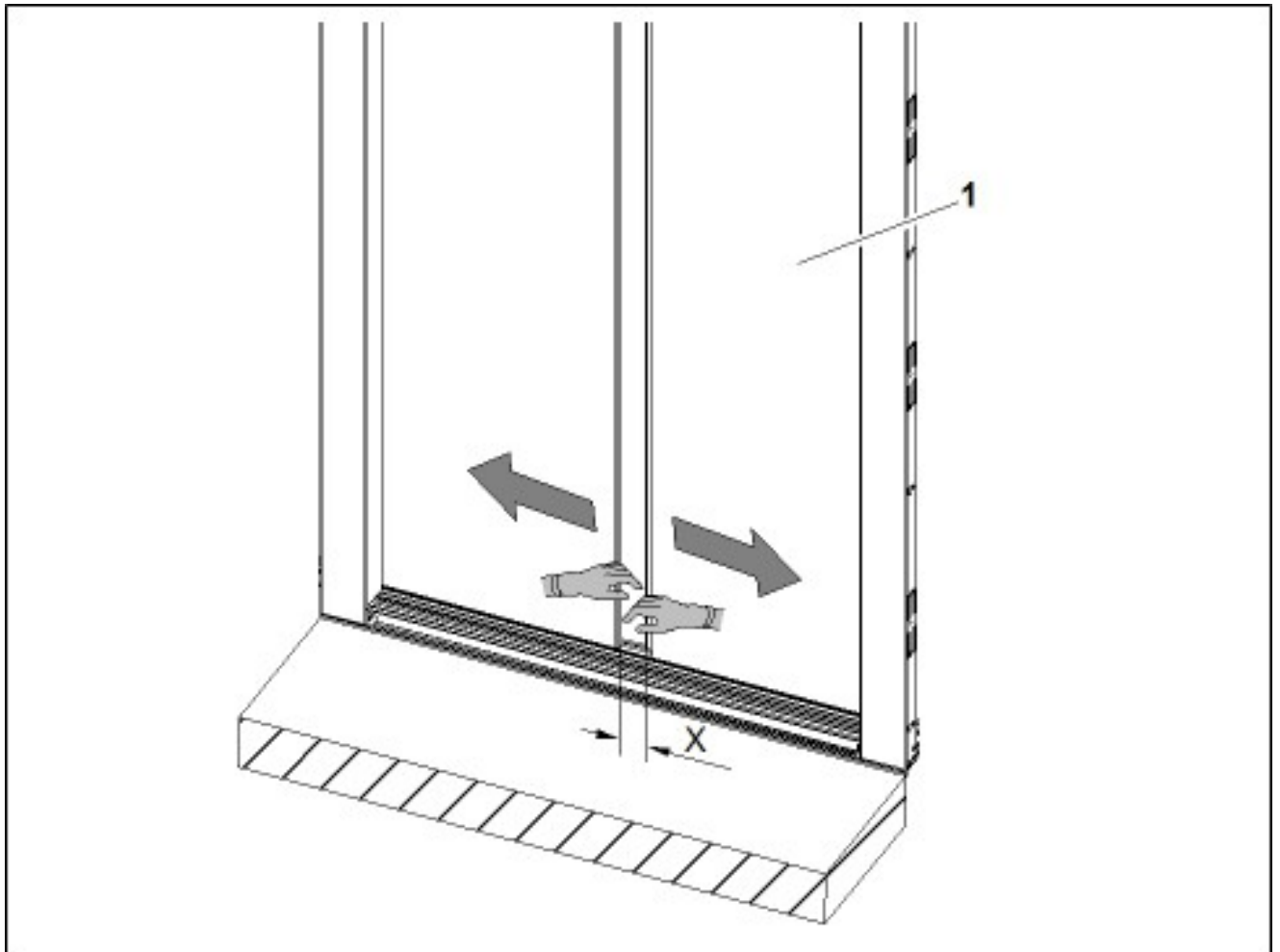
- Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

### 5.29.9 Checking of door panel clearance

- Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.29.10 Checking of door opening in locked condition



##### 1 Door panel

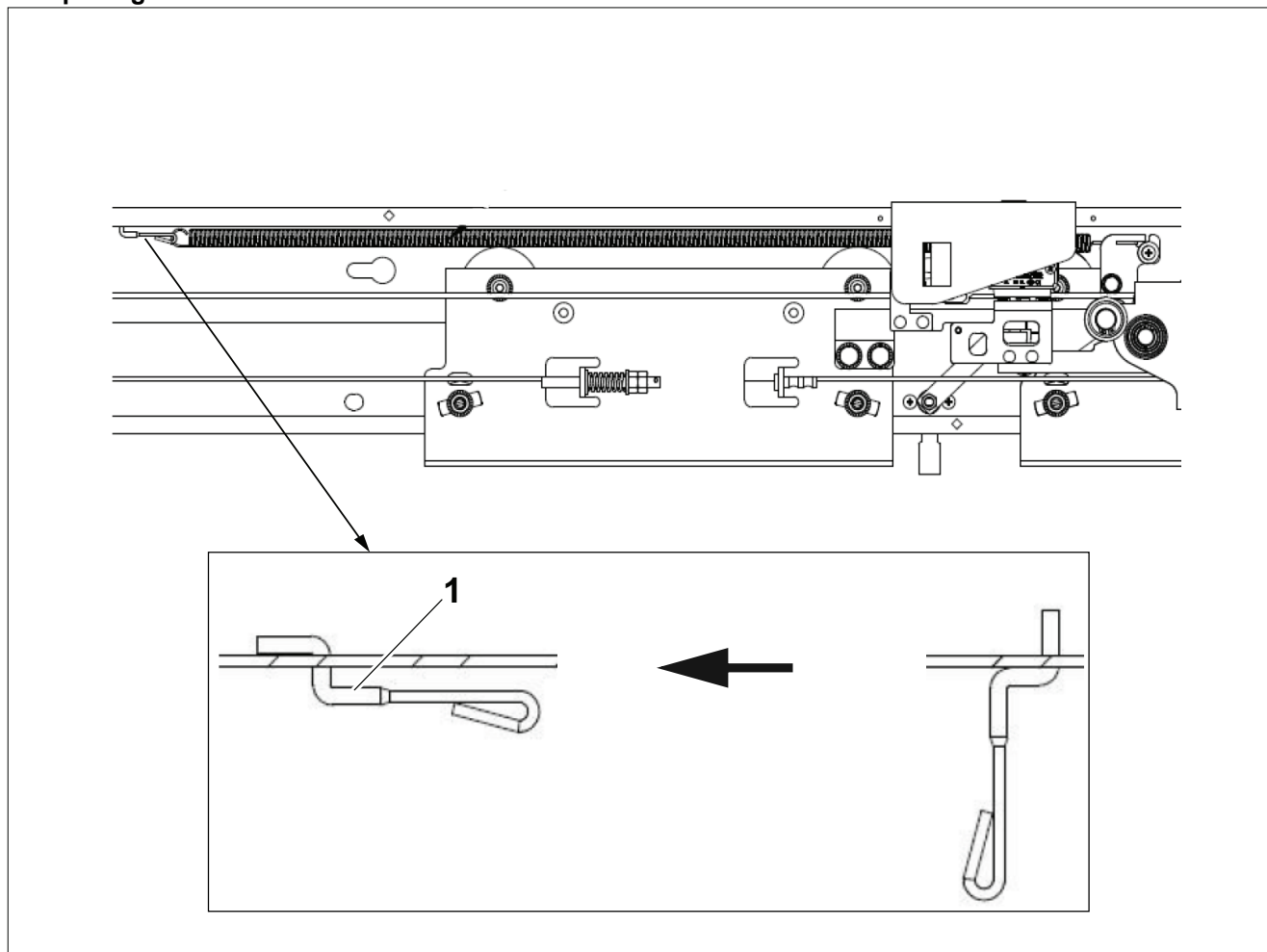
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 45$  mm.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



## 5.29.11 Checking of operation of door closing spring

### C2 opening



#### 1 Pin

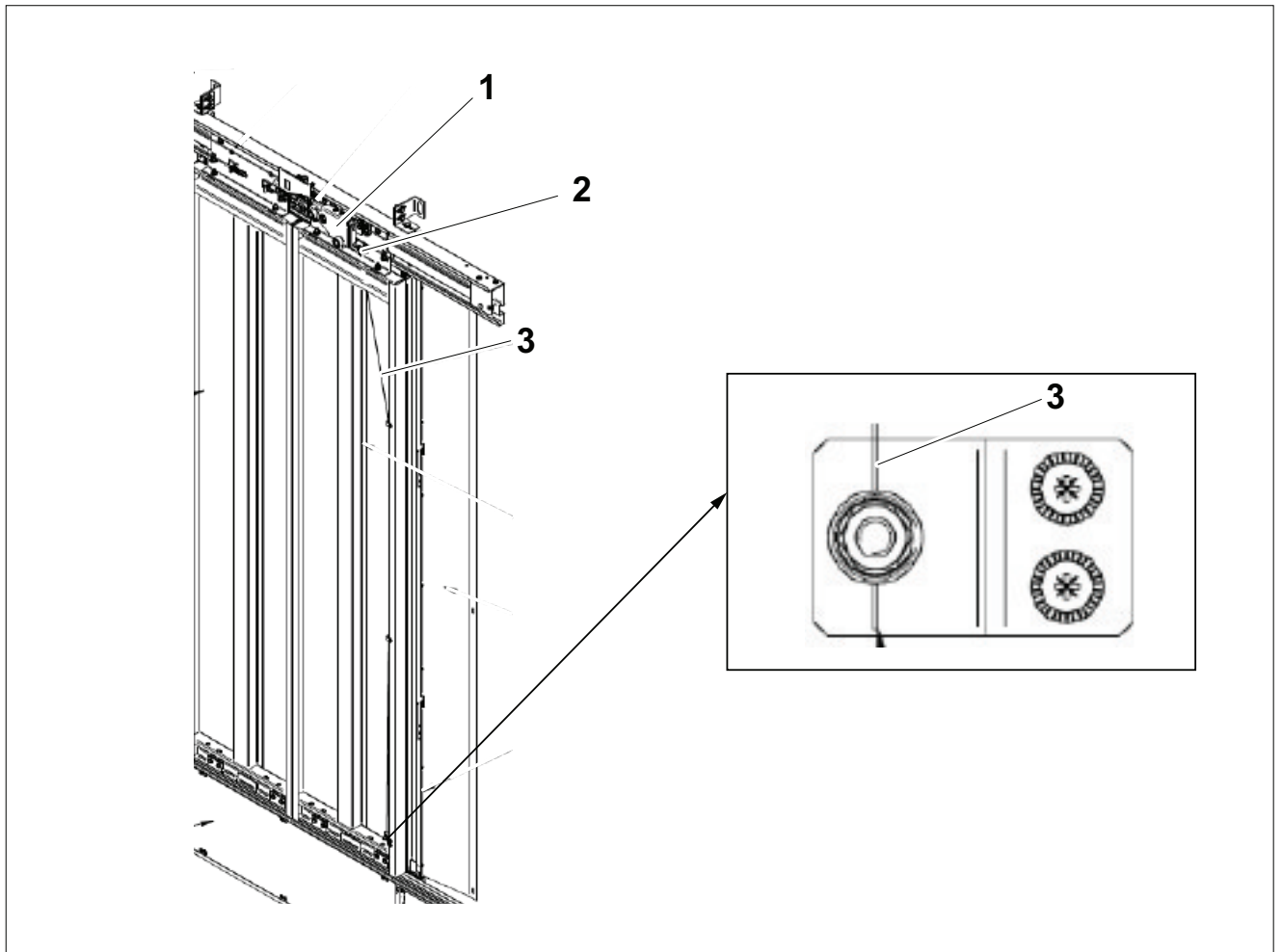
- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring-holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.29.12 Checking of release device of door lock



Do a check on the release device on the lowest landing door only.



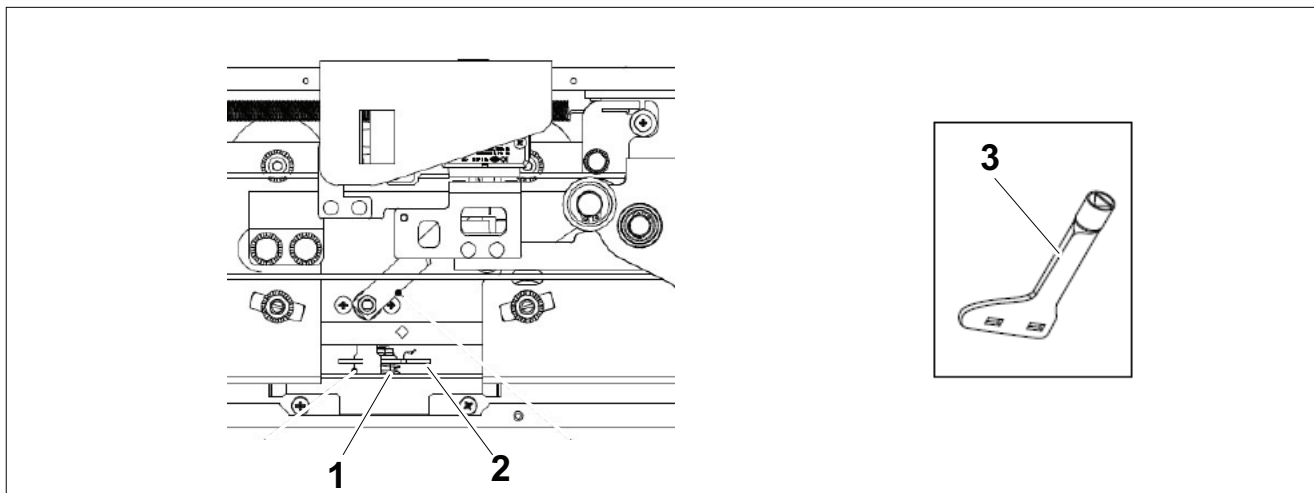
1 Release device  
3 Steel rope

2 Door lock

- Pull the steel rope and make sure that the door lock opens.
- Make sure that the release device does not touch the door lock.
- Make sure that the steel rope is not damaged.



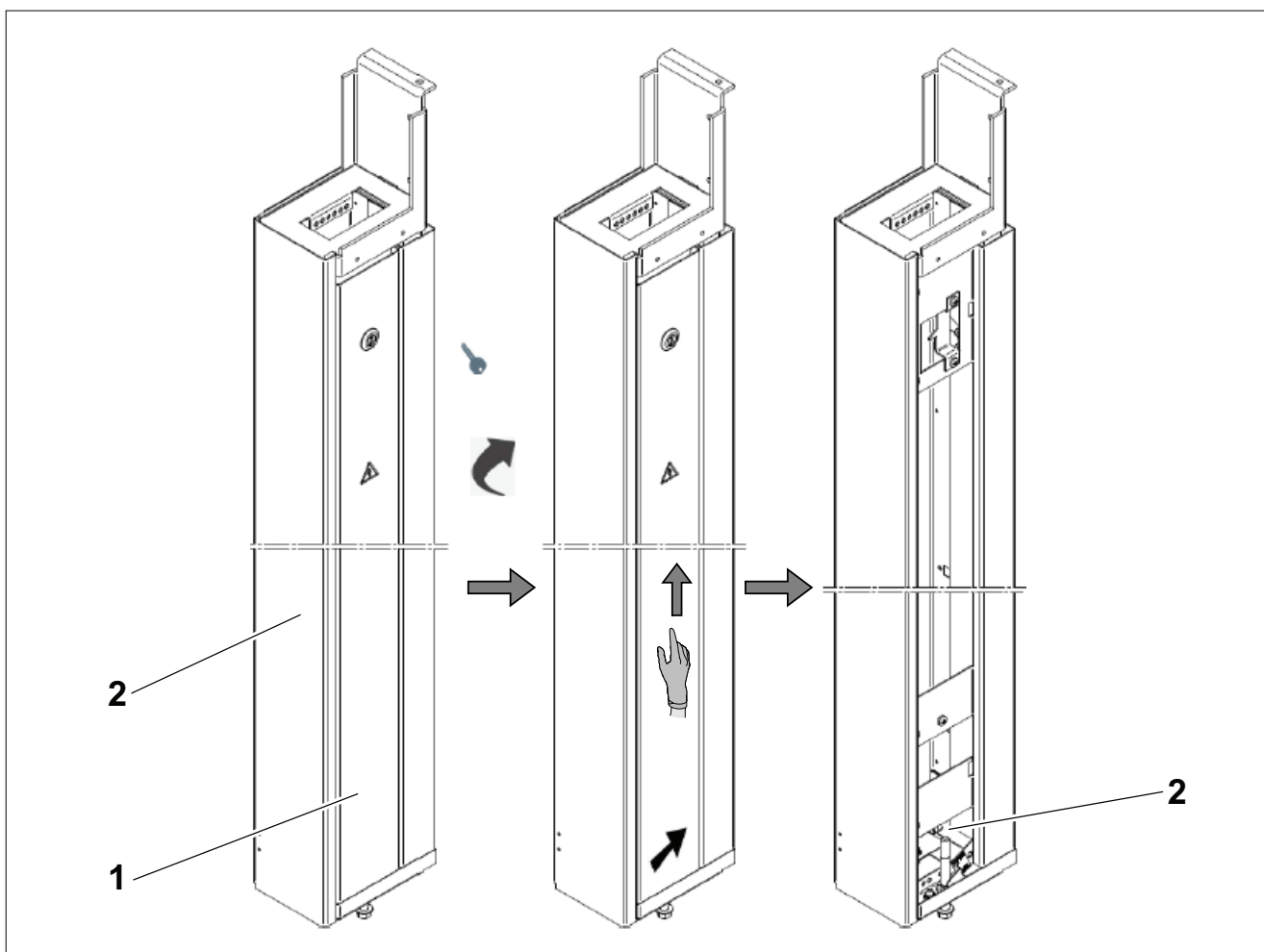
### 5.29.13 Checking of emergency release



- 1 Torsion spring  
2 Emergency release arm  
3 Emergency release key

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

### 5.29.14 Checking of LDU module







The keys are kept by maintenance personnel.

- ▶ Turn the key clockwise to unlock the LDU lock.
- ▶ Make sure that the LDU cover will open automatically on bottom.
- ▶ Push the LDU cover upwards.
- ▶ Install the LDU cover back into the LDU module.
- ▶ Make sure that the LDU cover is correctly locked to the LDU module.

### 5.29.15 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.



## 5.30 Landing door lock for DO NST

### 5.30.1 Maintenance plan for landing door lock

**i** This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of operation of counter rollers
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridges

### 5.30.2 Checking of identification marking

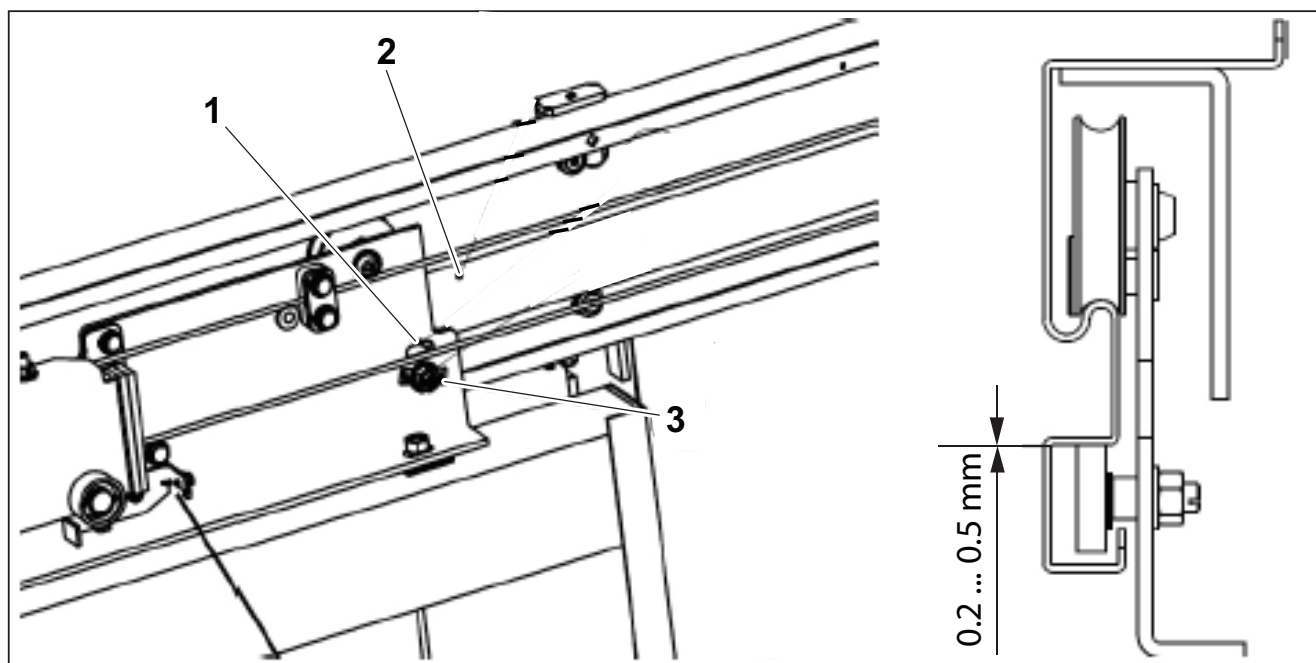
**i** This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- Make sure that the identification marking is present and readable.
- If the identification marking is missing or not readable replace the component.

### 5.30.3 Checking of condition of lock roller and counter roller

- Make sure that the lock rollers, counter rollers and retaining washers are not damaged.

### 5.30.4 Checking of operation of counter rollers



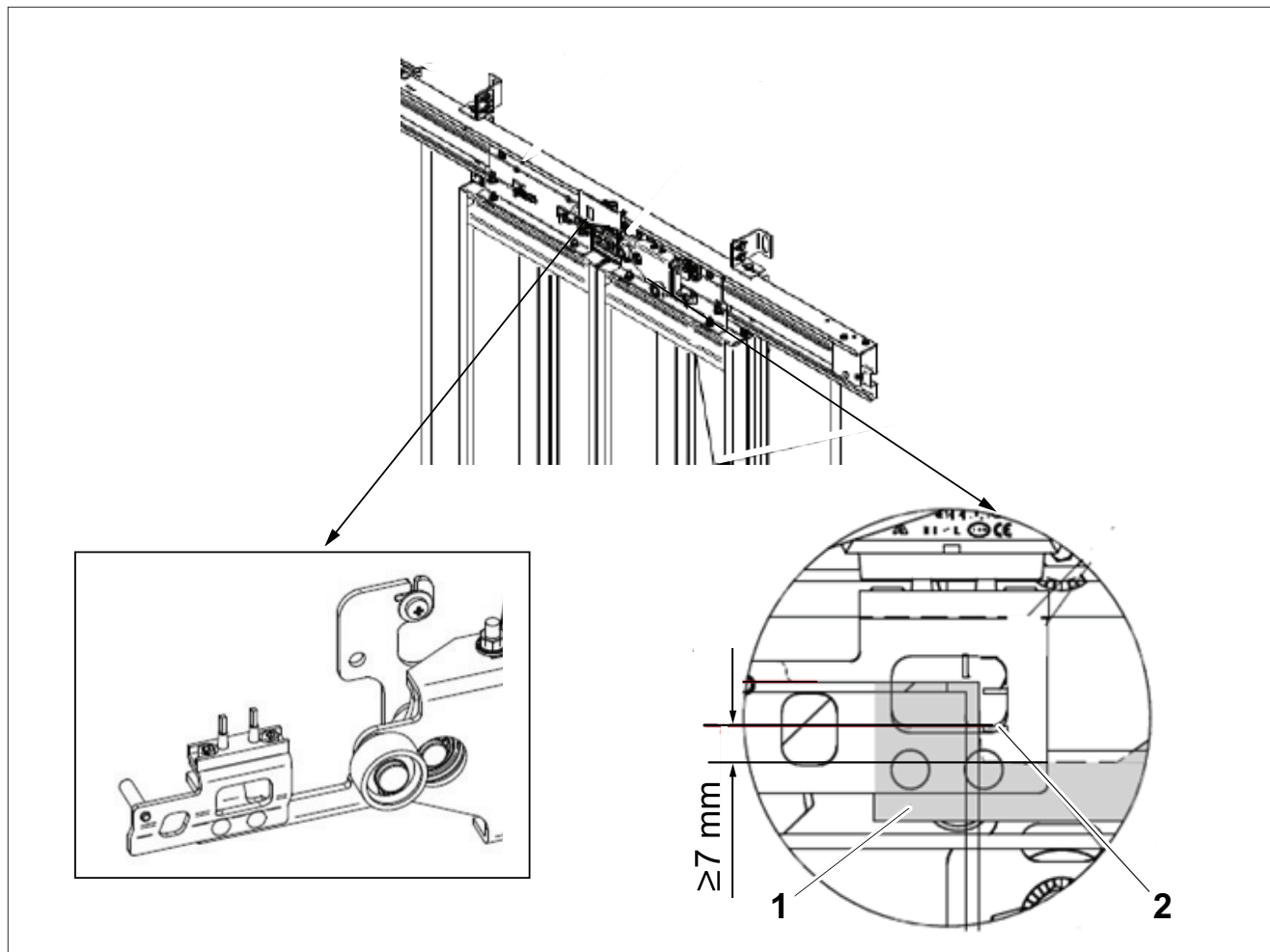
- 1 Observing window  
3 Counter rollers

- 2 Guide rail

- Make sure that the counter rollers can rotate freely.
- Make sure that the clearance between the counter rollers and the guide rail is 0.2 ... 0.5 mm.
  - ↳ If necessary, adjust the counter rollers.



### 5.30.5 Checking of latch position



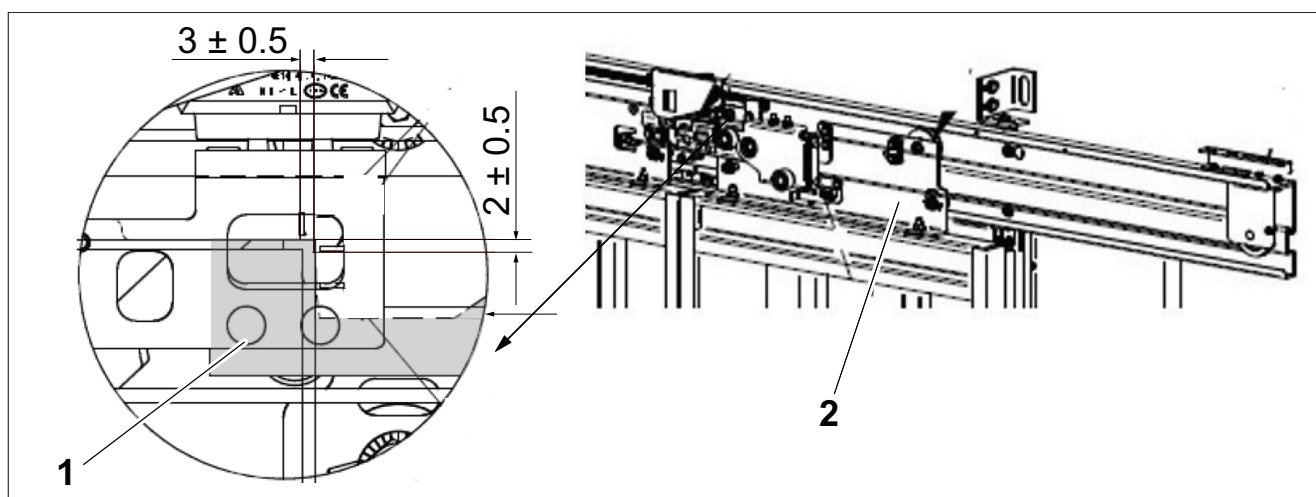
1 Latch

2 7 mm marked line



The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.



1 Latch

2 Carrier

- Make sure that the door panels are closed and the carriers touch the stopper buffers.



- Make sure that the clearance between the KTS support and the latch is vertical  $2 \pm 0.5$  mm and lateral  $3 \pm 0.5$  mm.
  - ↳ If required, adjust the carrier to achieve the correct clearance.
- Move the carrier to achieve the required adjustment.
- Tighten the fixation bolt and fixation screw.
- Make sure that the clearance does not break the function of the switch KTS.

### 5.30.6 Checking of lock roller position

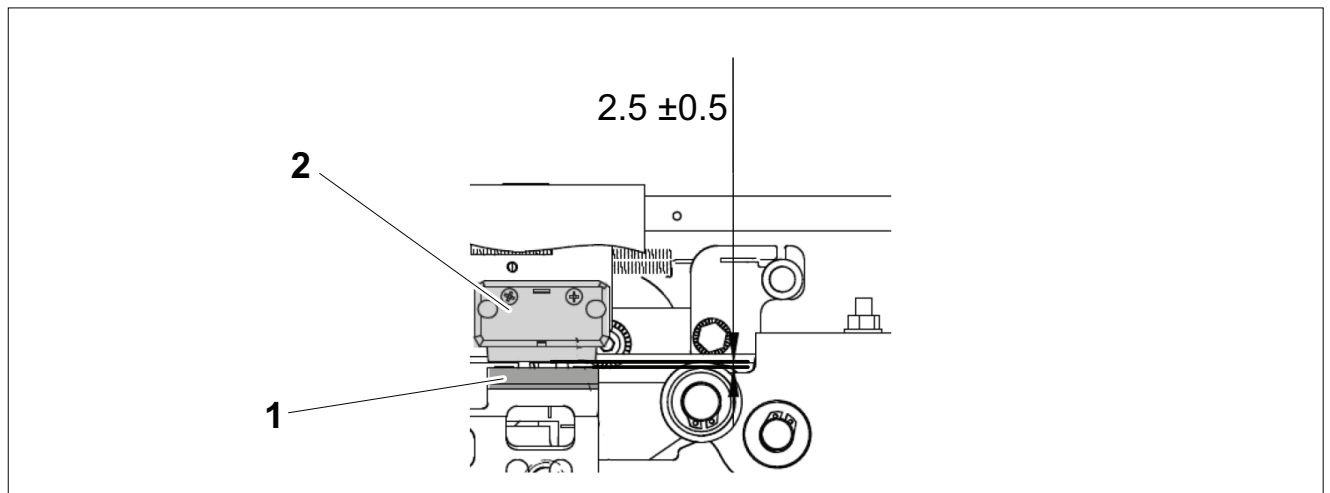
DO VAR 15 C2	A	B
Clutch phase II	15	39
CDL phase II	15	47

DO VAR 35 C2	A	B
Clutch phase I (long)	14	42
CDL phase I (long)	14	48
Clutch phase II (long)	15	39
CDL phase II (long)	15	47

- Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.
  - ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.

### 5.30.7 Checking of alignment of switches and contact bridges

#### 5.30.7.1 Checking of alignment of landing door switch KTS and contact bridge



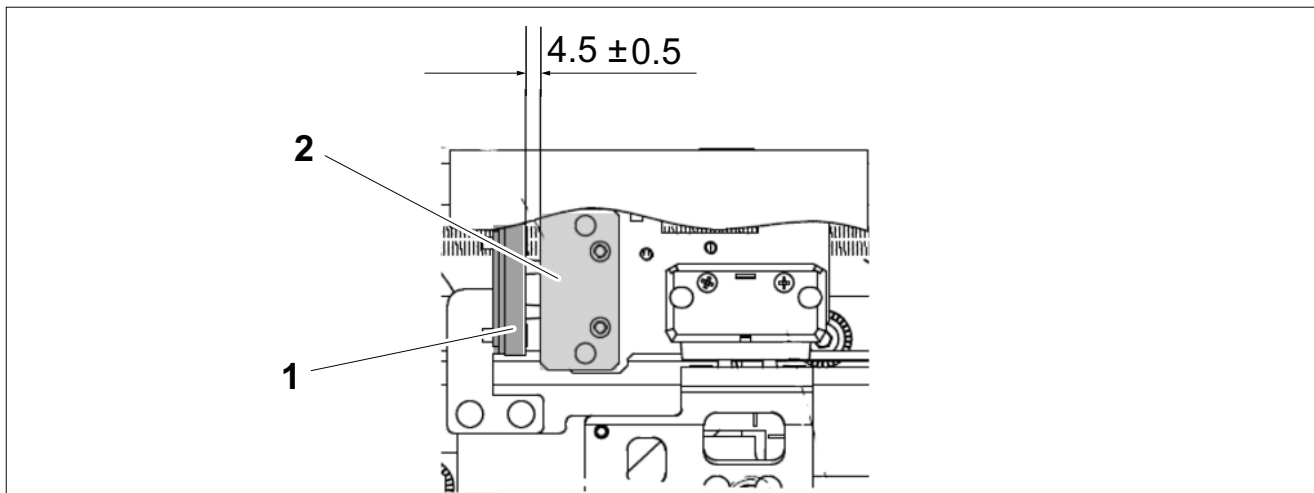
1 Switch KTS

2 Contact bridge

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KTS position.
  - X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
  - Y-Position: Distance of the contact bridge to the switch KTS is  $2 \pm 0.5$  mm.
  - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
    - ↳ If required, adjust the switch KTS.



### 5.30.7.2 Checking of alignment of safety switch KTS1 and contact bridge



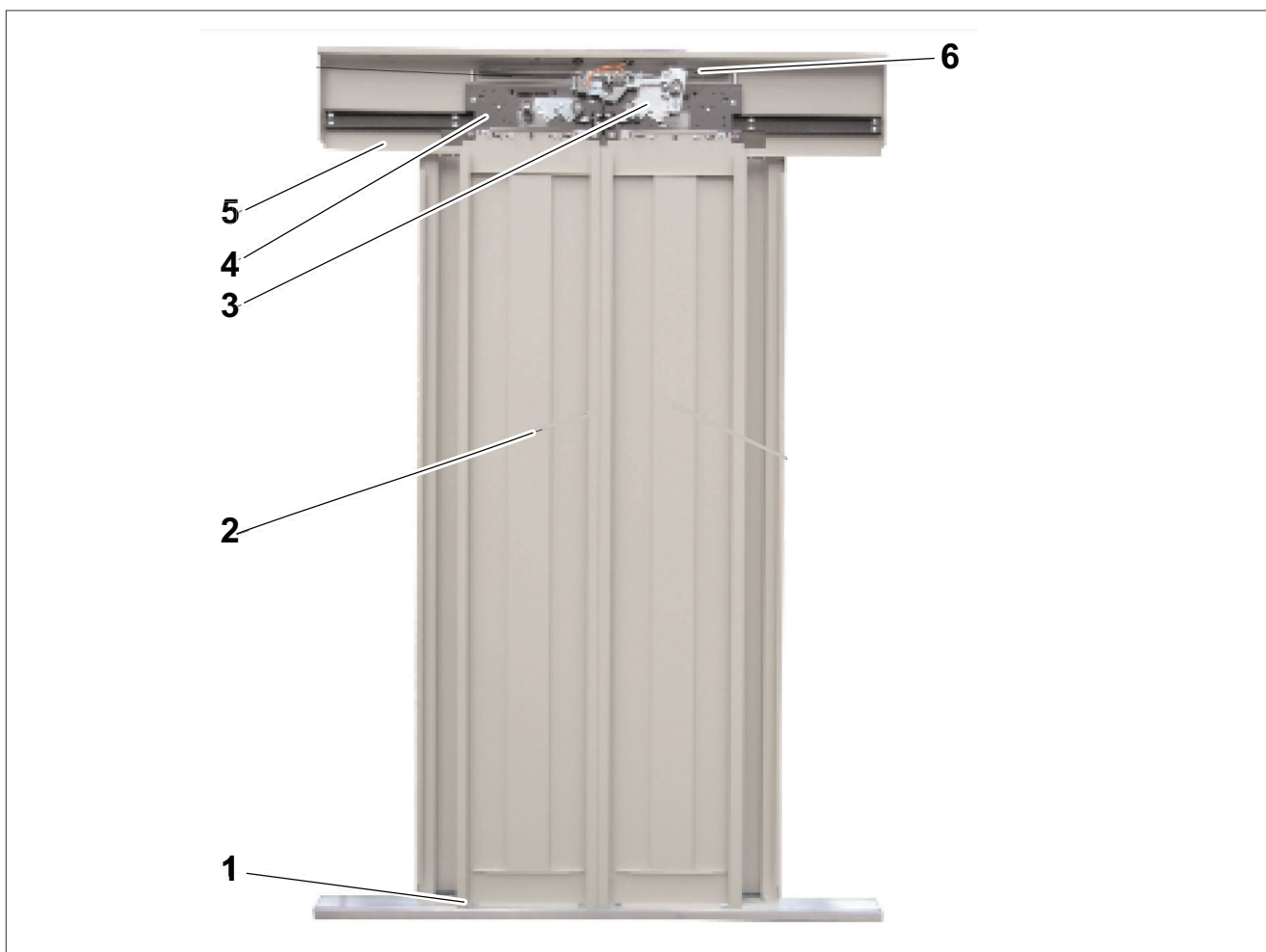
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is  $4.5 \pm 0.5$  mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.

## 5.31 Landing door DO SEC

### 5.31.1 Overview of landing door



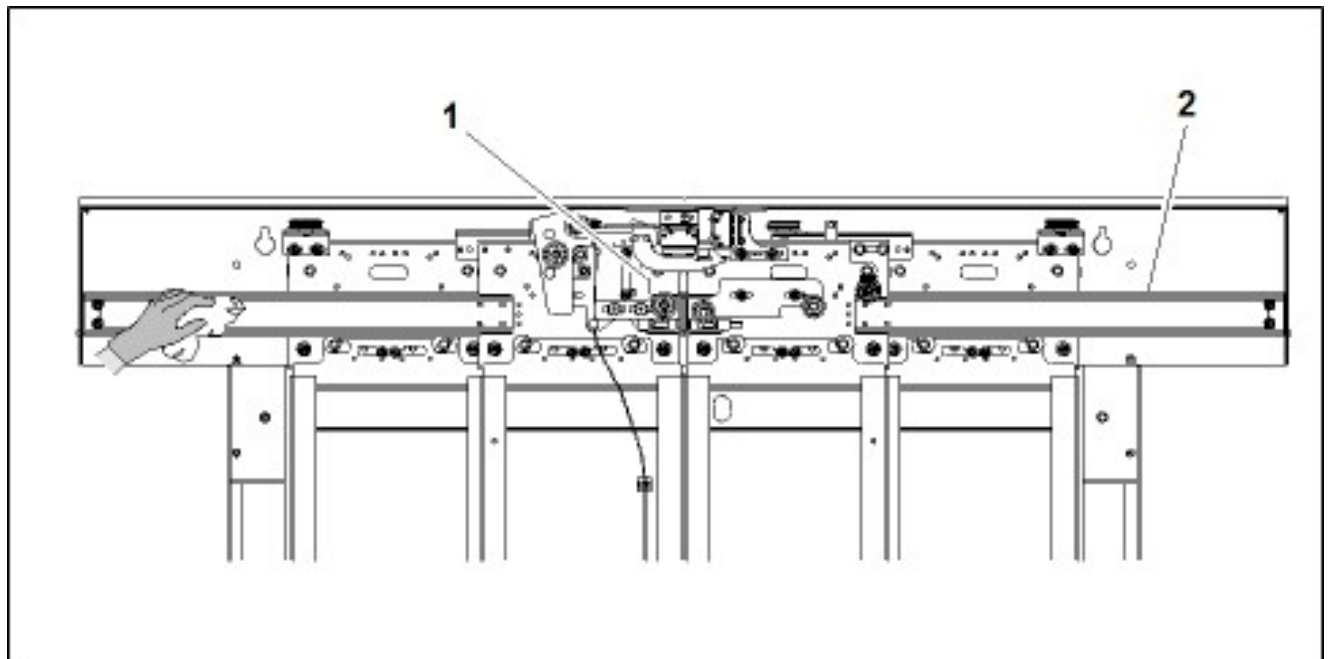


- |   |                   |   |                       |
|---|-------------------|---|-----------------------|
| 1 | Door sill         | 2 | Door panel            |
| 3 | Landing door lock | 4 | Carrier               |
| 5 | Transom           | 6 | Synchronization cable |

### 5.31.2 Maintenance plan for landing door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of emergency release
12	Checking of operation of door closing spring
12	Checking of landing door lock DO SEC
12	Checking of door panel performance

### 5.31.3 Checking of cleanness



- |   |                |   |      |
|---|----------------|---|------|
| 1 | Door mechanism | 2 | Rail |
|---|----------------|---|------|

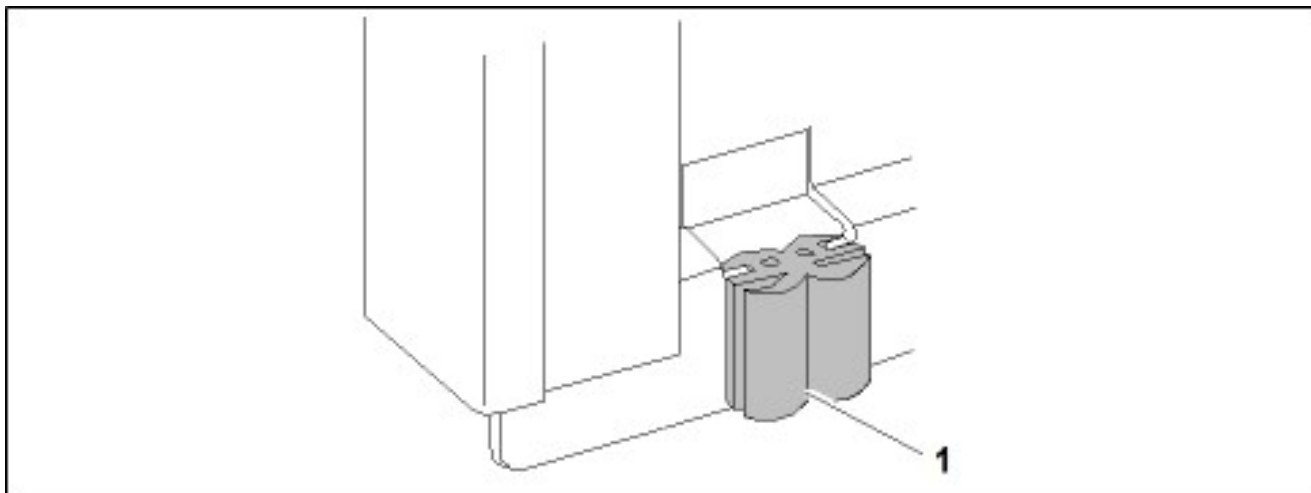
- i** – Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.
- Make sure that the door mechanism and the rail are clear of dirt and rust.
- Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.31.4 Checking for damage and corrosion

- Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.



### 5.31.5 Checking of condition of guide shoe



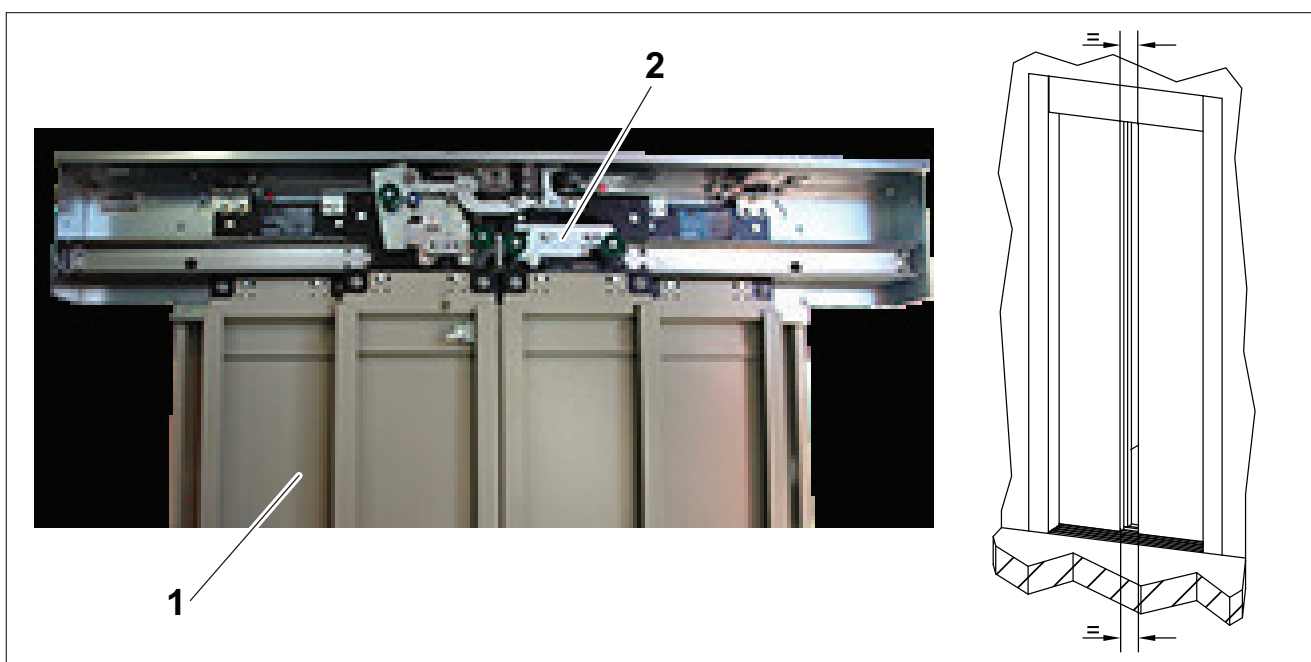
1 Guide shoe

- ▶ Push the door panel towards the opening side.
- ▶ Make sure that the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and guide shoe is  $> 1$  mm, replace the guide shoe.

### 5.31.6 Checking of condition of synchronization rope

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ make sure that the cable clamps are tight.
- ▶ Make sure that the compressed spring length is correct.

### 5.31.7 Checking of vertical parallelism of door panel



1 Door panel

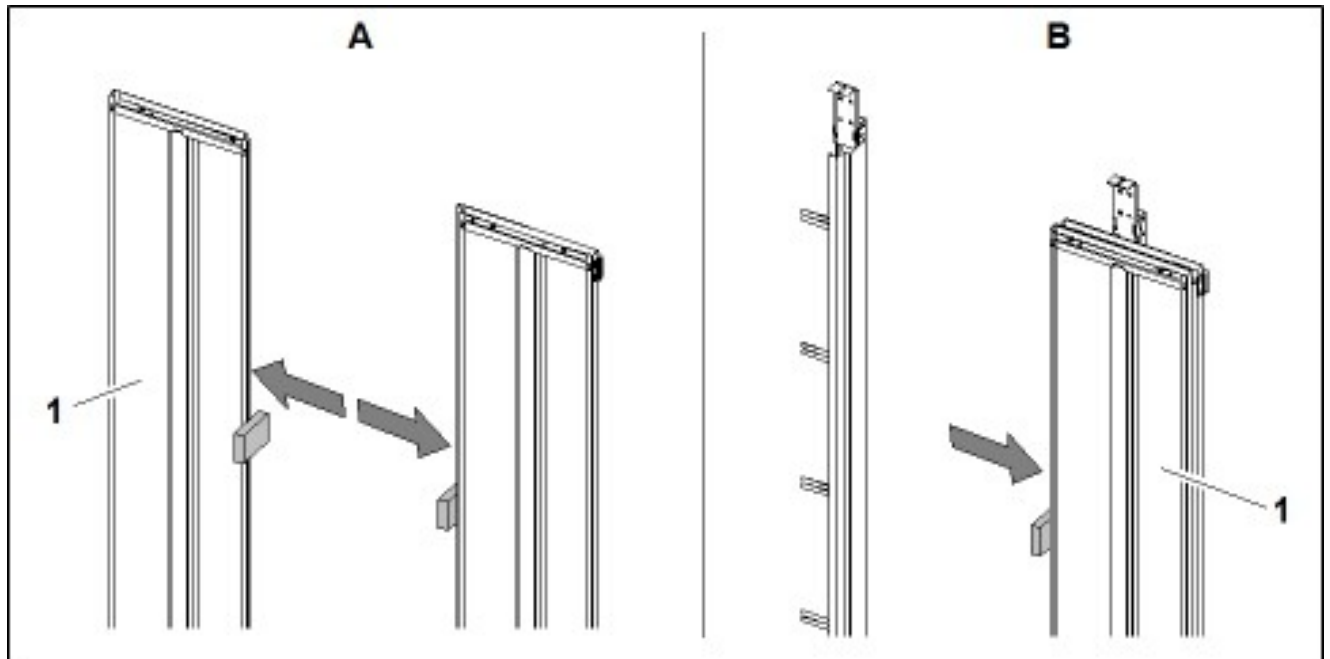
2 Door mechanism

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.



- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.31.8 Checking of alignment of door panel



**A** Center door

**B** Telescopic door

**1** Door panel

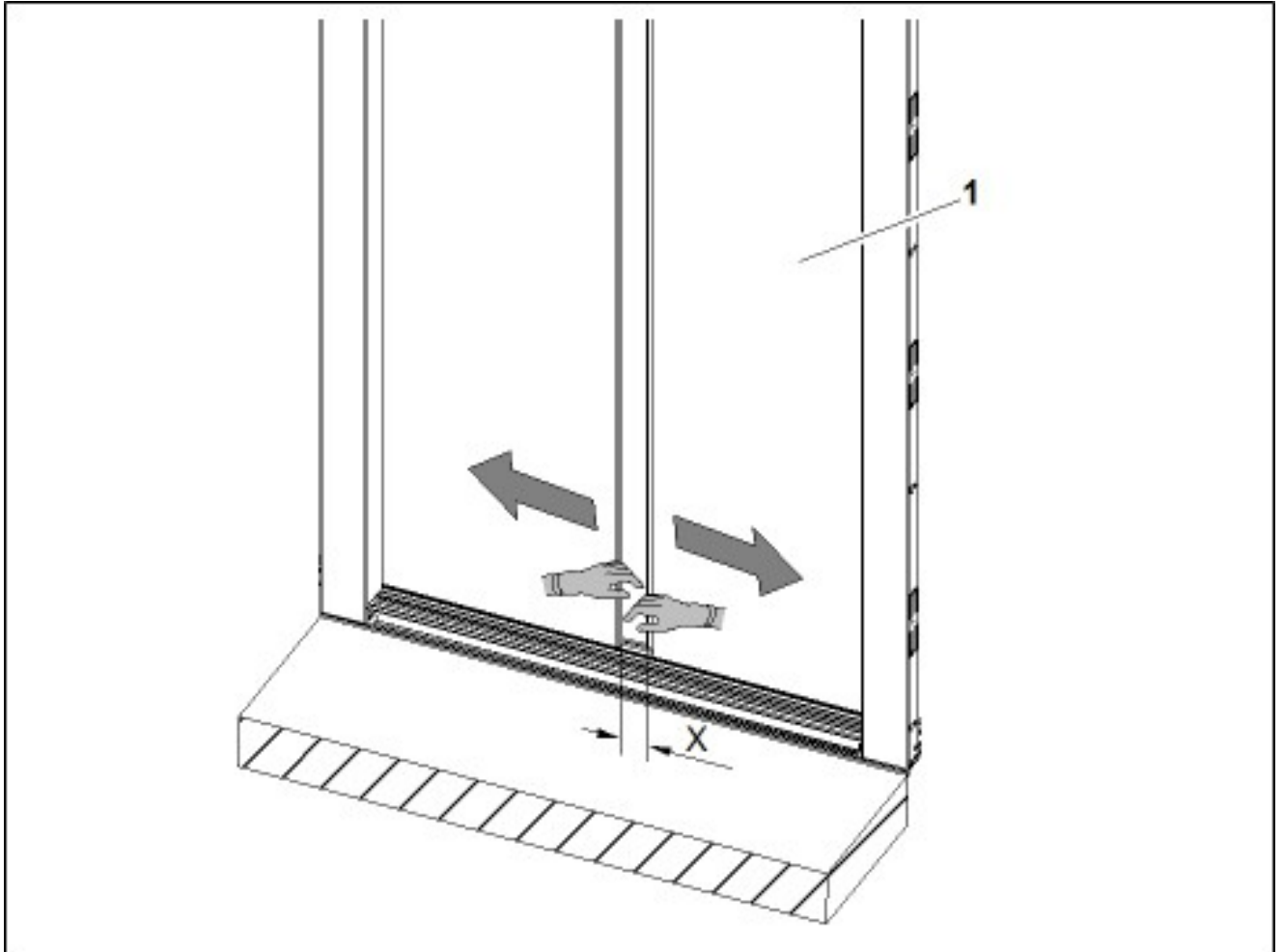
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

#### 5.31.9 Checking of door panel clearance

- ▶ Make sure that the clearance is  $\leq 10$  mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.31.10 Checking of door opening in locked condition



##### 1 Door panel



Use no more than 150 N to manually move the door panels.

- ▶ Make sure that the door panel is closed and the door is locked.
- ▶ Open the door panels manually from the bottom as far as possible.
- ▶ Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- ▶ If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.

#### 5.31.11 Checking of emergency release

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

#### 5.31.12 Checking of operation of door closing spring

- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring-holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.31.13 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

## 5.32 Landing door lock for DO SEC

### 5.32.1 Maintenance plan for landing door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of alignment of switches and contact bridges

### 5.32.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

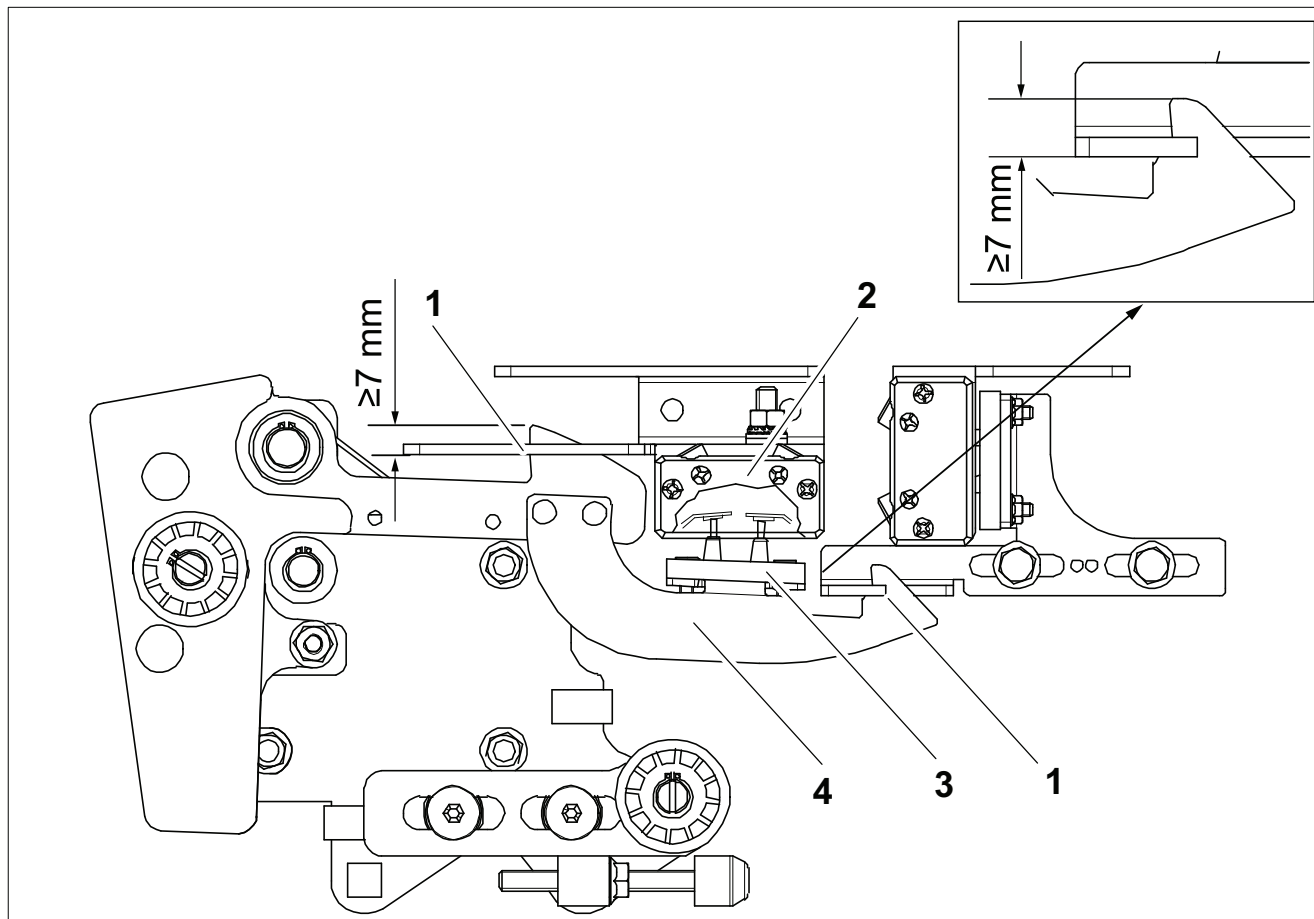
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.32.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.32.4 Checking of latch position



- 1 7 mm marked line
- 3 Contact bridge

- 2 Switch KTS
- 4 Latch

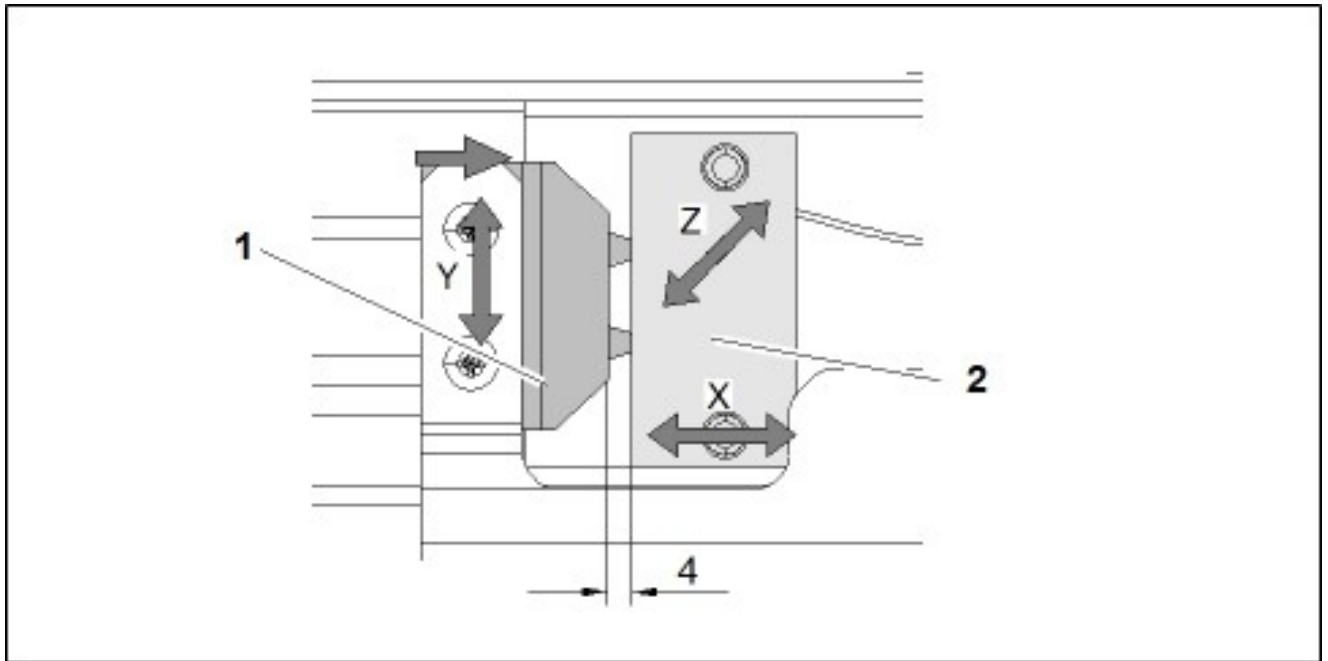
**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.



### 5.32.5 Checking of alignment of switches and contact bridges

#### 5.32.5.1 Checking of alignment of landing door switch KTS and contact bridge



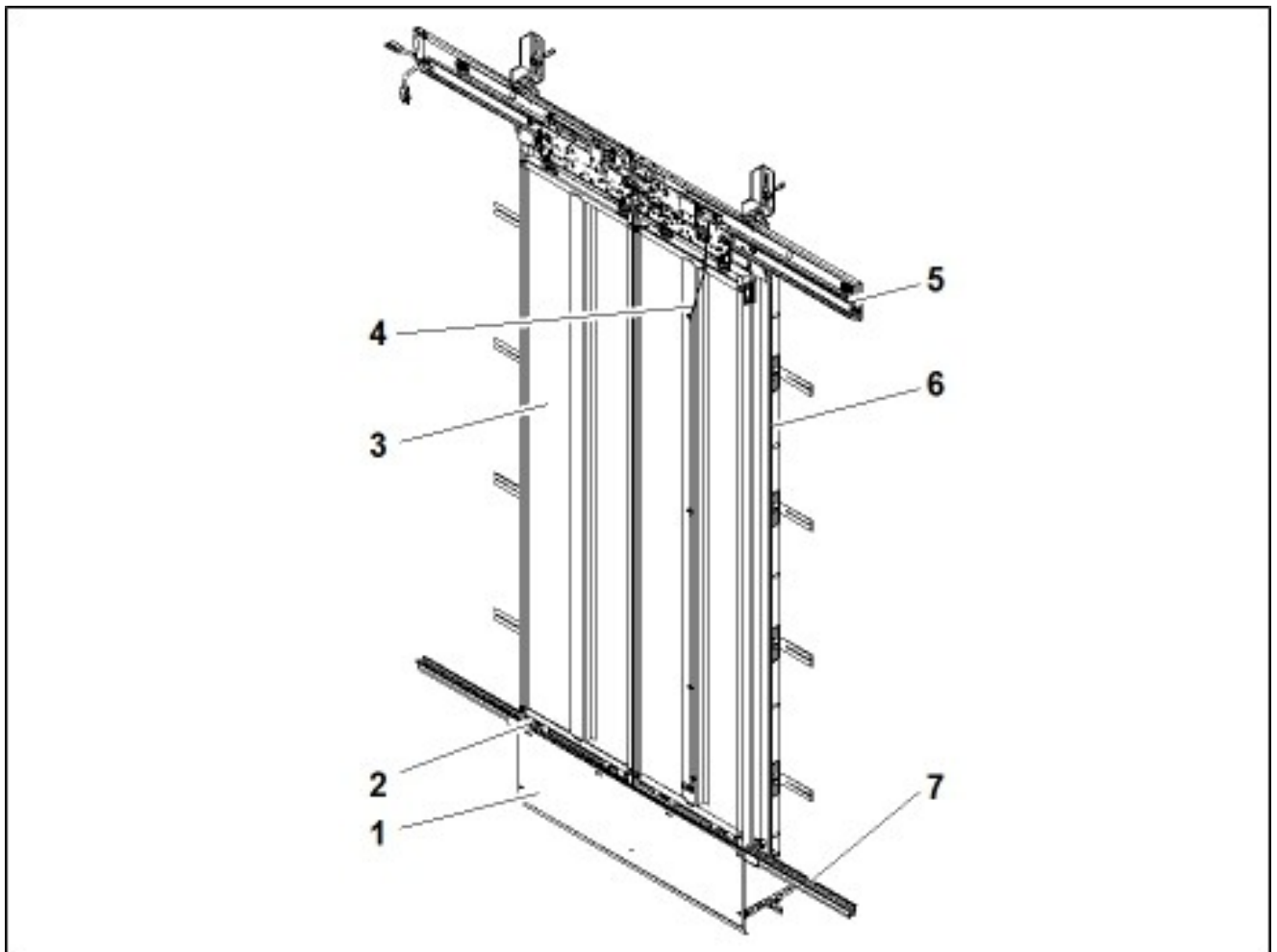
1 Contact bridge

2 Switch KTS

- ▶ Make sure that the door panels are closed and the carriers touch the stopper buffers.
- ▶ Do a check of the KTS position.
  - X-position: Distance of the contact bridge to the switch KTS is 4 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the switch KTS.
  - Z-position: Contact bridge fit centered to the housing holes of the switch KTS.
- ↳ If required, adjust the switch KTS.



**5.33 Landing door DO VL 15**  
**5.33.1 Overview of landing door**



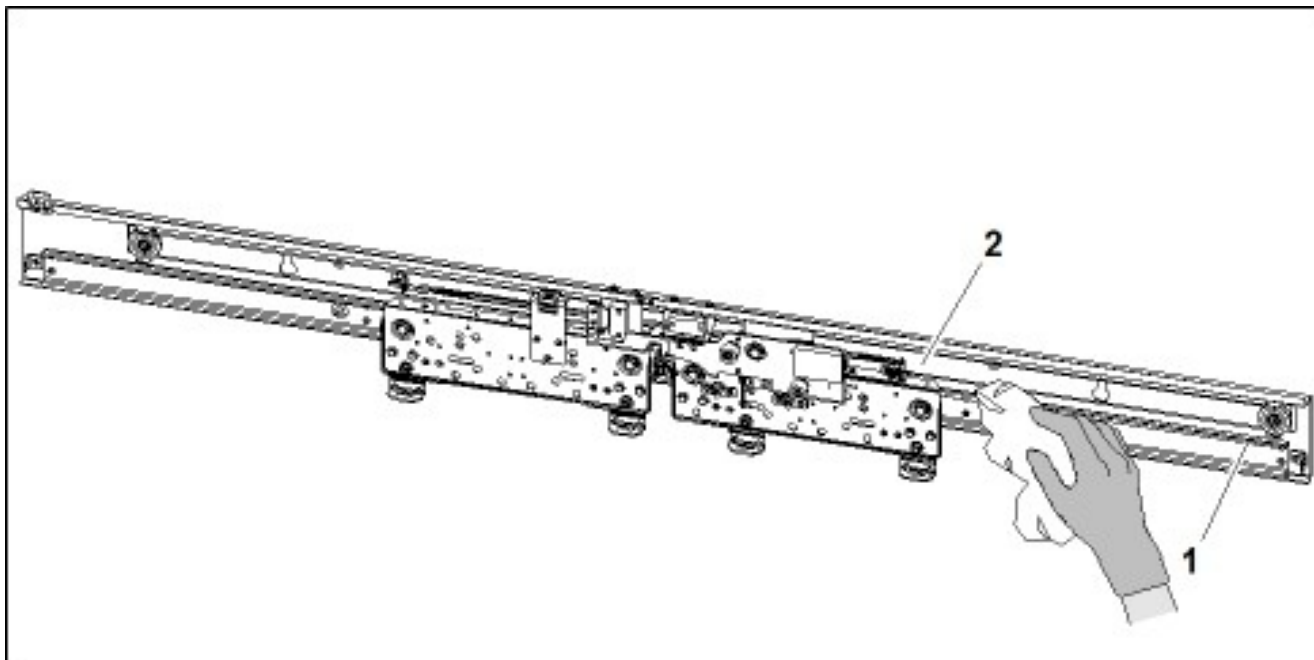
- |   |                |   |                             |
|---|----------------|---|-----------------------------|
| 1 | Toe guard      | 2 | Guide shoe                  |
| 3 | Door panel     | 4 | Release device of door lock |
| 5 | Door mechanism | 6 | Door frame                  |
| 7 | Sill           |   |                             |

**5.33.2 Maintenance plan for landing door**

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of landing door lock DO VL 15
12	Checking of door panel performance



### 5.33.3 Checking of cleanness



1 Rail

2 Door mechanism



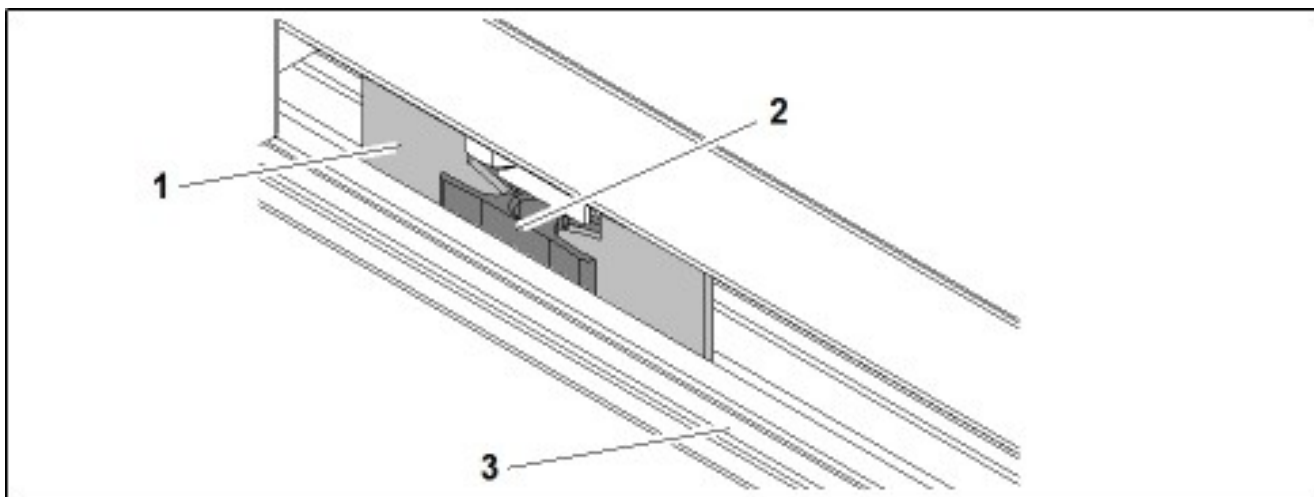
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- Make sure that the door mechanism and the rail are clear of dirt and rust.
- Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.33.4 Checking for damage and corrosion

- Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.33.5 Checking of condition of guide shoe



1 Guide shoe bracket

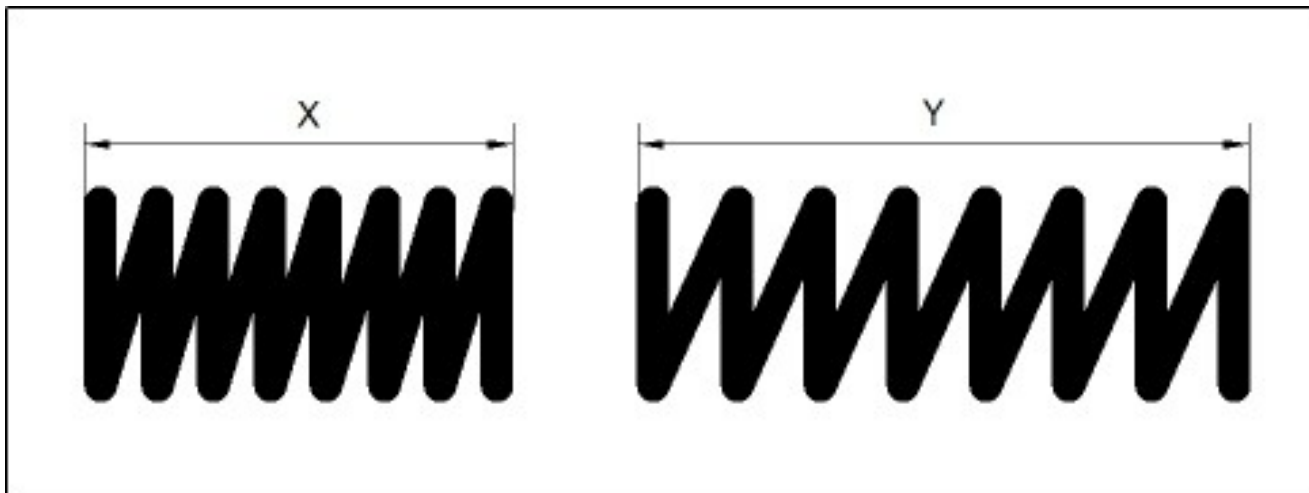
2 Guide shoe

3 Sill profile

- Push the door panels towards the opening side.
- Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 1$  mm, replace the guide shoe.



### 5.33.6 Checking of condition of synchronization rope

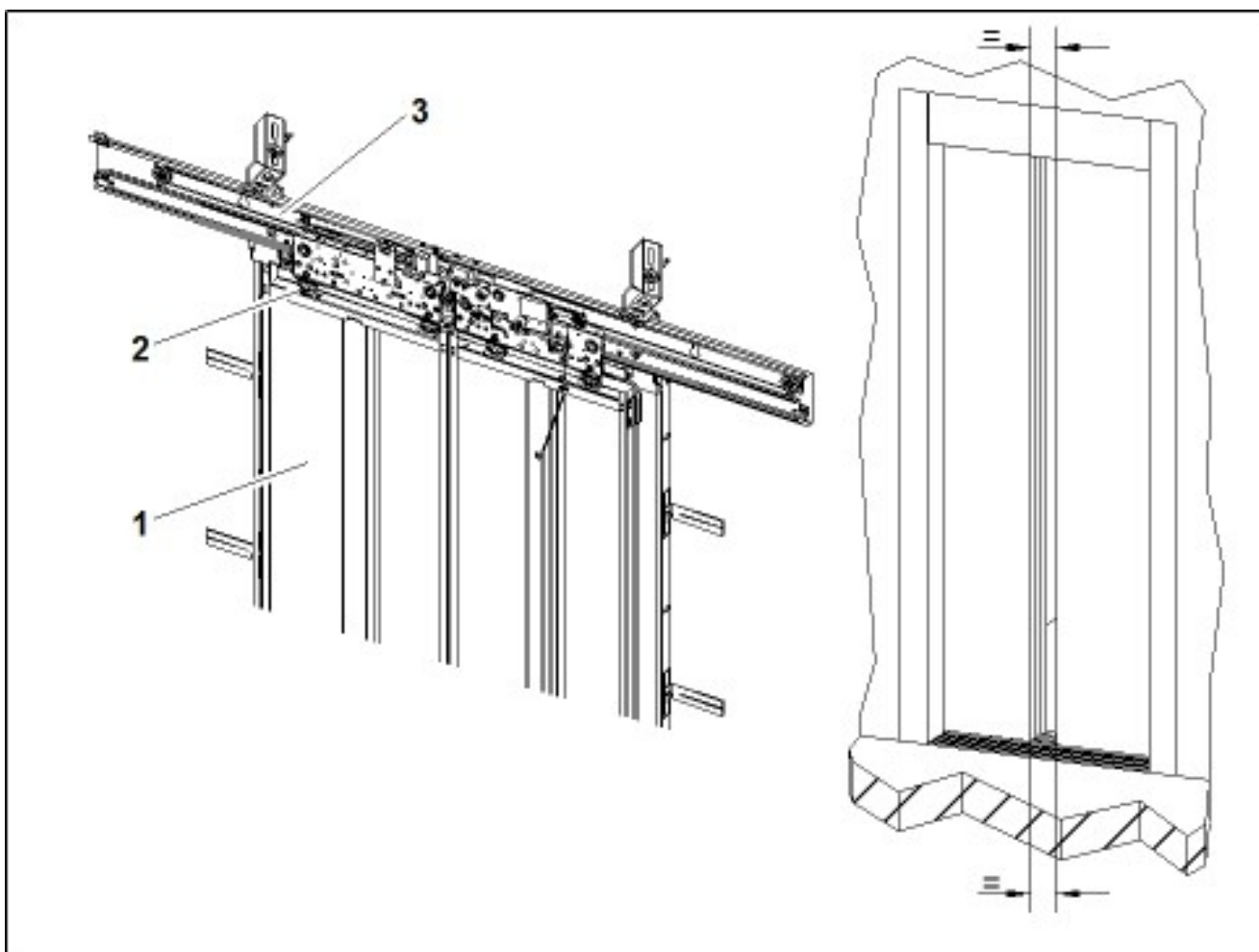


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 10 \text{ mm}$ .

### 5.33.7 Checking of vertical parallelism of door panel



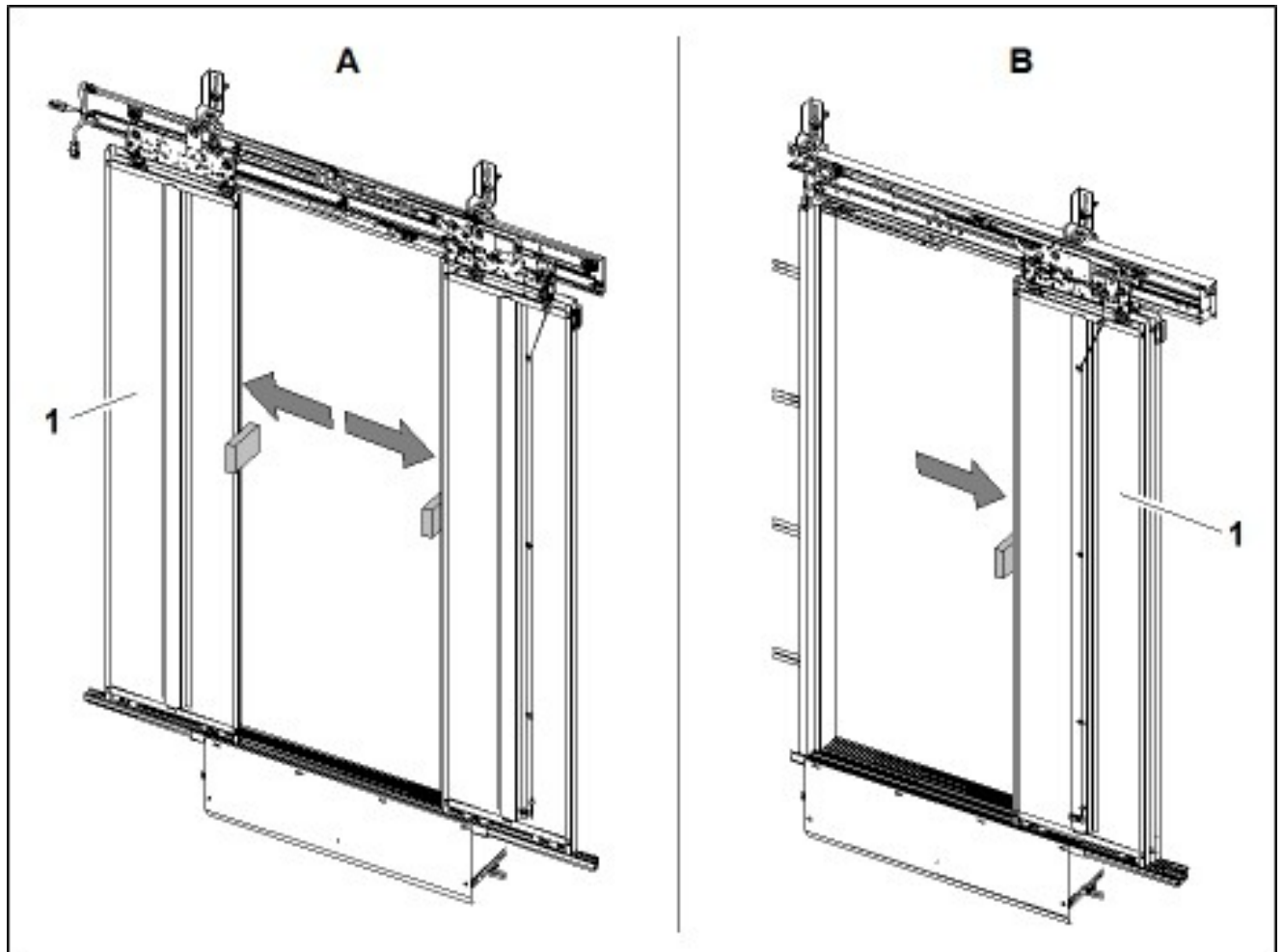
**1** Door panel  
**3** Door mechanism

**2** Bolt



- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.33.8 Checking of alignment of door panel



**A** Center door

**B** Telescopic door

**1** Door panel

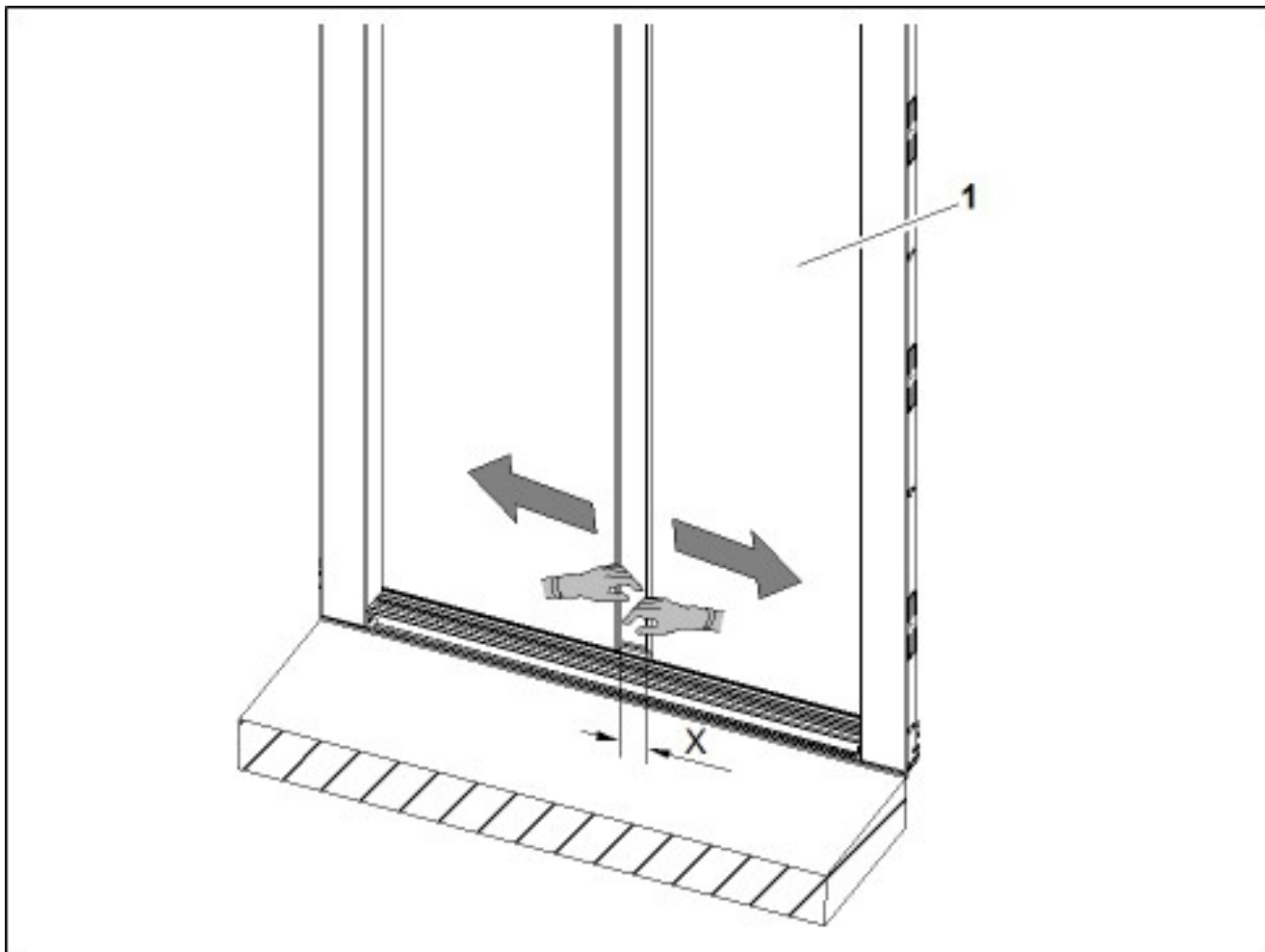
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.

#### 5.33.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



### 5.33.10 Checking of door opening in locked condition



#### 1 Door panel

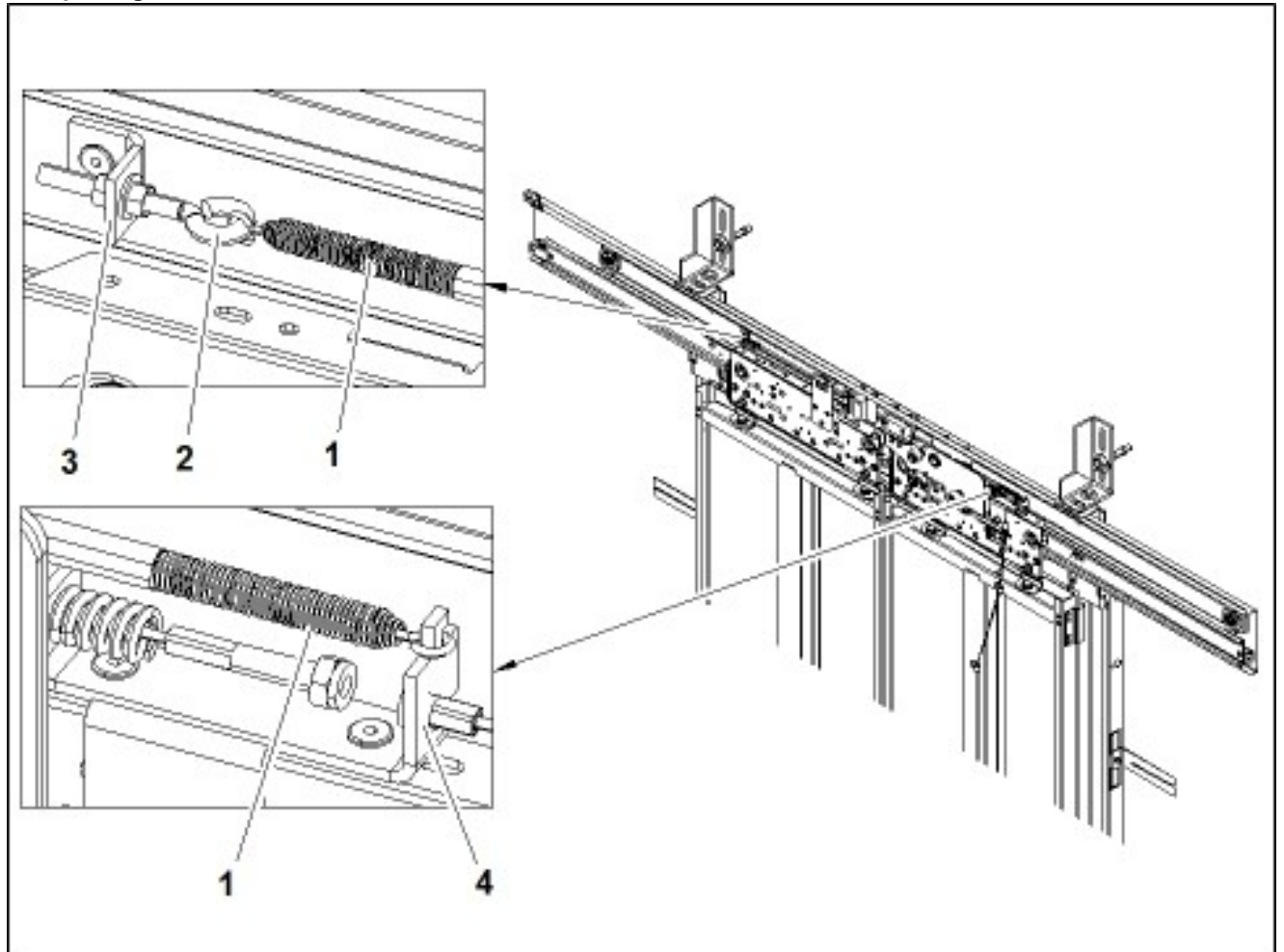
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.33.11 Checking of operation of door closing spring

#### C2 opening

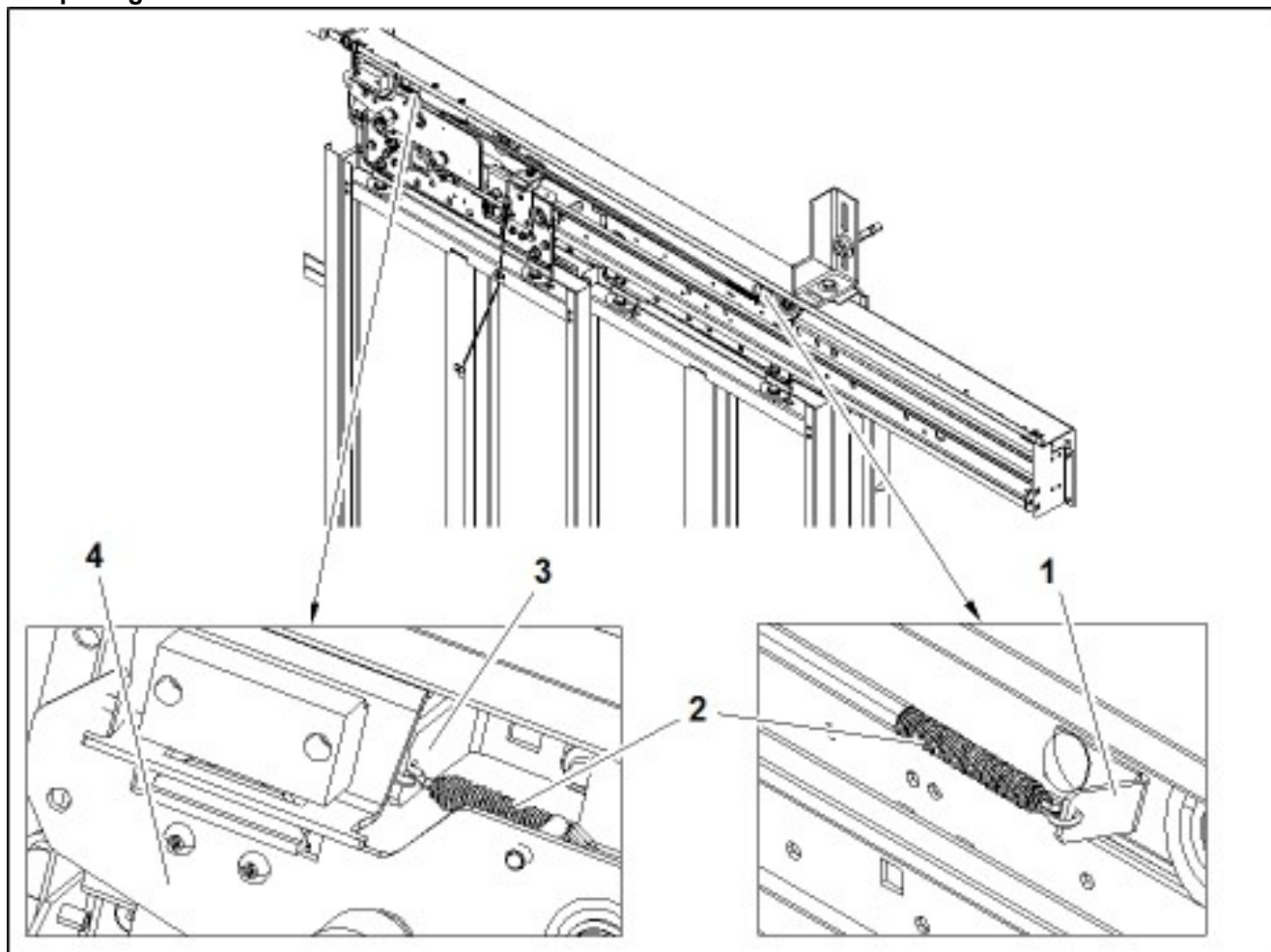


- 1 Door closing spring
- 3 Tension element holder

- 2 Tension element
- 4 Spring holder



## T2 opening



- |   |                        |   |                     |
|---|------------------------|---|---------------------|
| 1 | Spring holder          | 2 | Door closing spring |
| 3 | Tension element holder | 4 | Latch               |

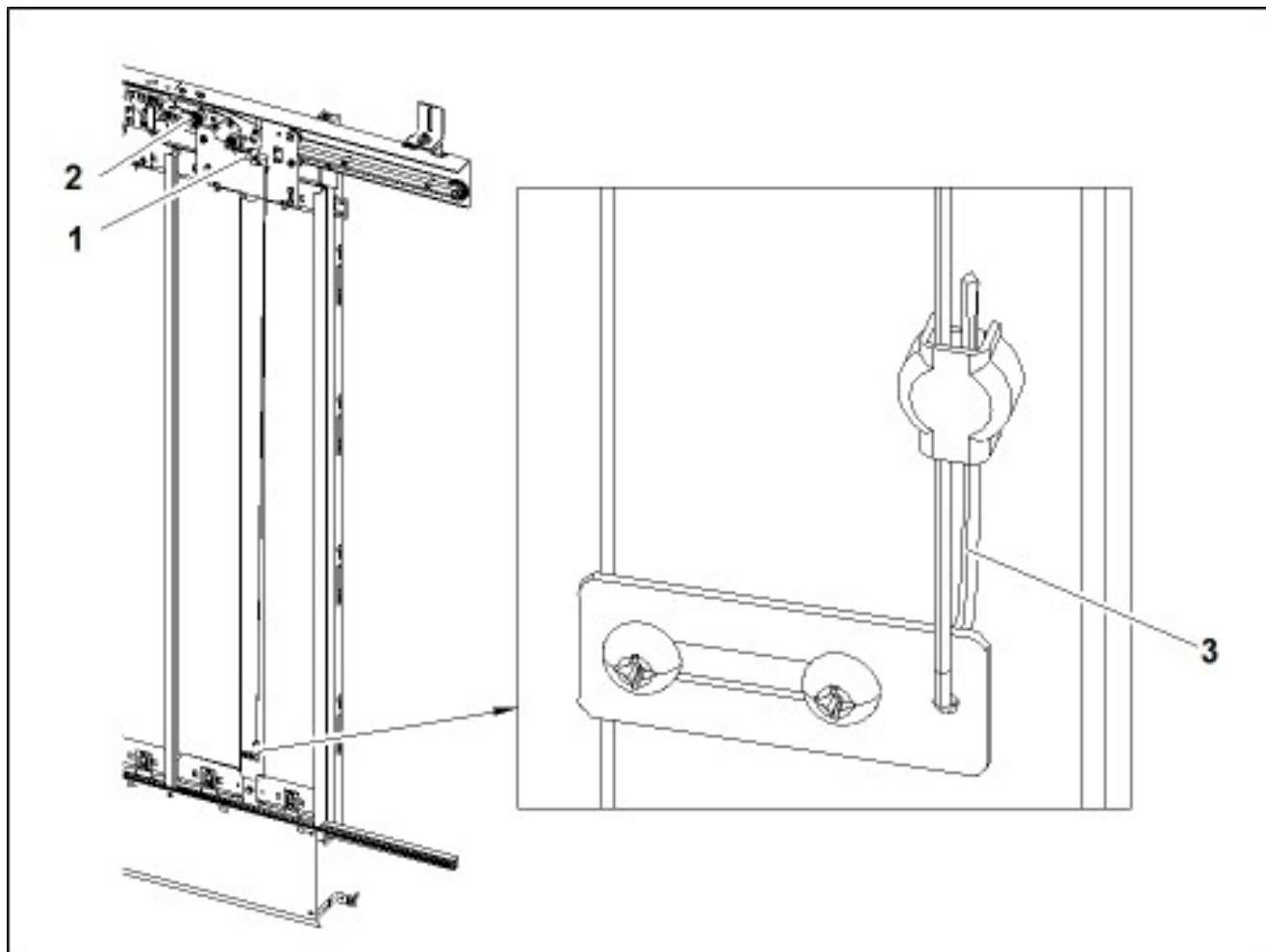
- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring-holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.33.12 Checking of release device of door lock



Do a check on the release device on the lowest landing door only.



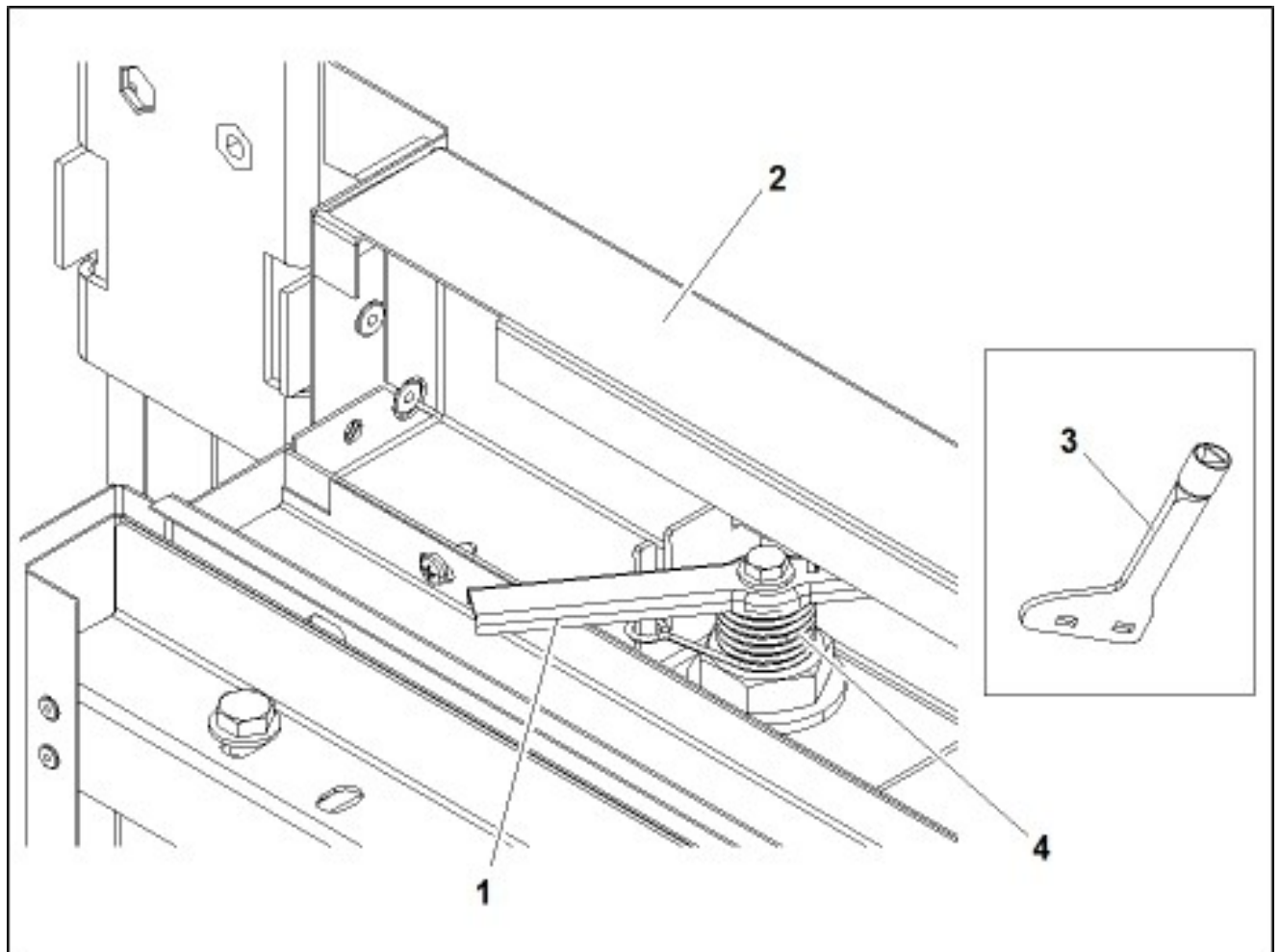
1 Release device  
3 Steel rope

2 Door lock

- ▶ Pull the steel rope and make sure that the door lock opens.
- ▶ Make sure that the release device does not touch the door lock.
- ▶ Make sure that the steel rope is not damaged.



### 5.33.13 Checking of emergency release




1 Emergency release arm  
3 Emergency release key

2 Door frame header  
4 Torsion spring


- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.




### 5.33.14 Checking of door panel performance

 Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.

 Make sure that the movement of the door is done in normal or HMI operation mode.


- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.

 Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.


## 5.34 Landing door lock for DO VL 15

### 5.34.1 Maintenance plan for landing door lock

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridges

### 5.34.2 Checking of identification marking

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

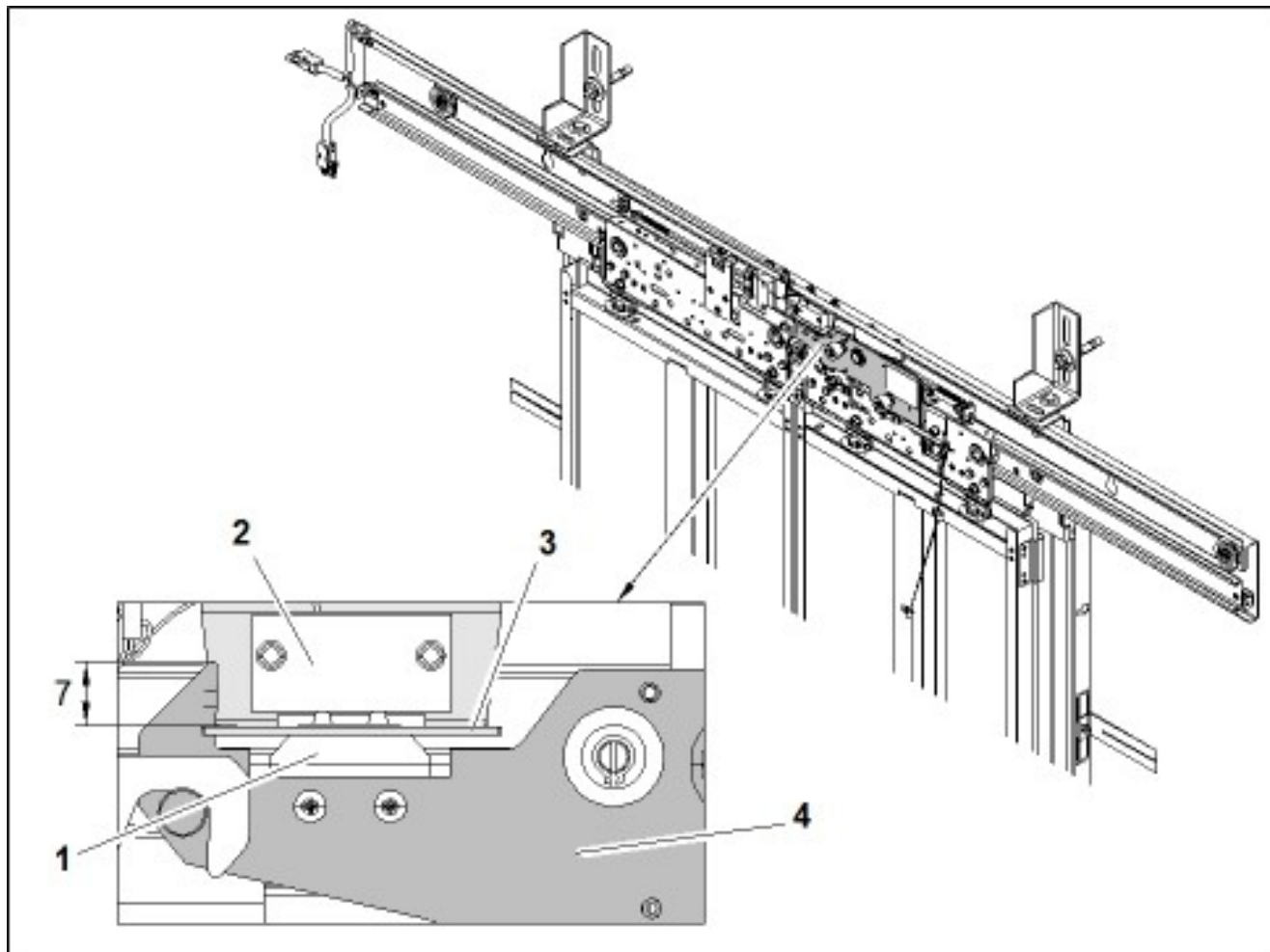
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.34.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.34.4 Checking of latch position



1 Contact bridge

2 Switch KTS

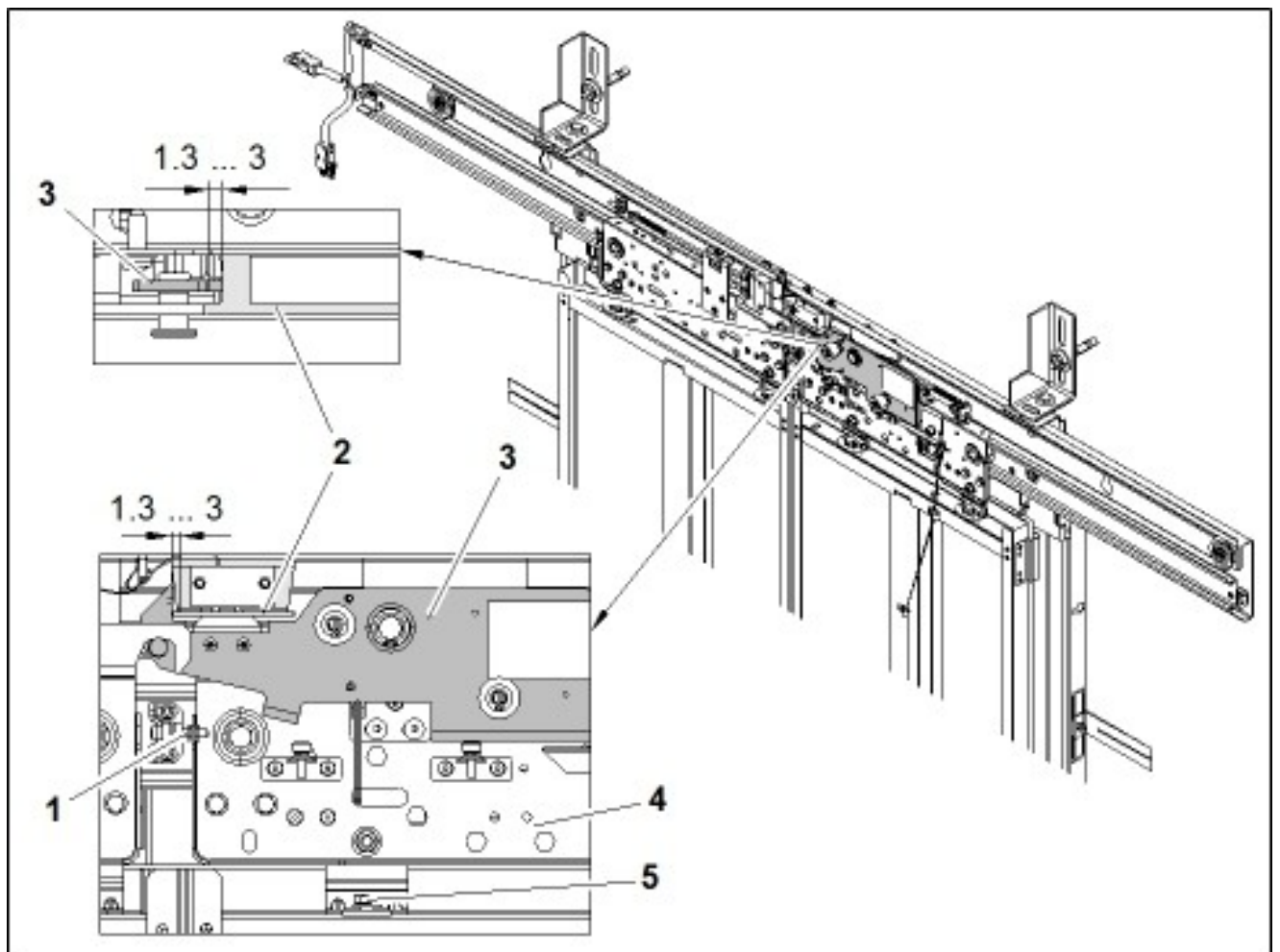
3 KTS support

4 Latch

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.



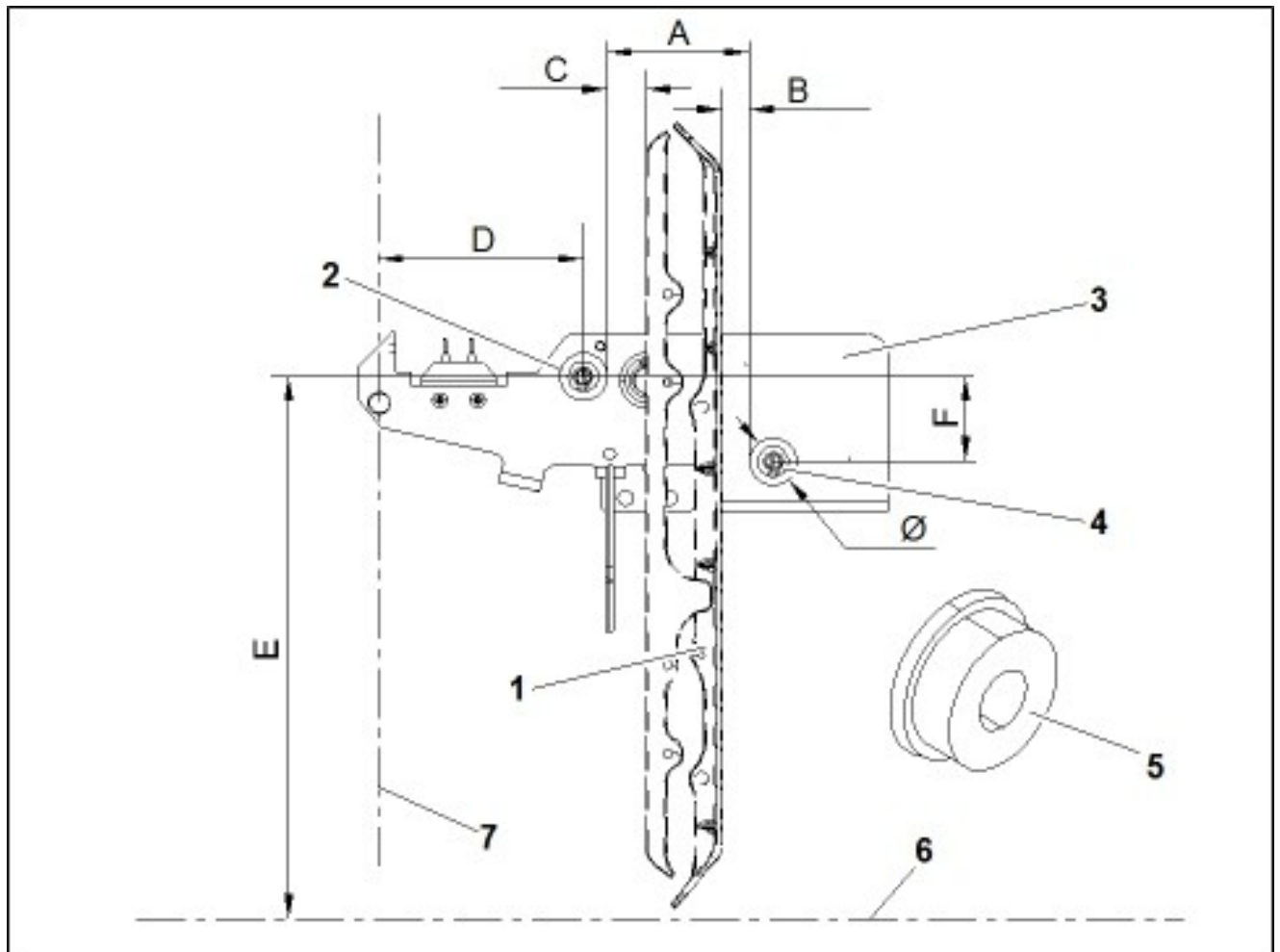


- |   |                       |   |             |
|---|-----------------------|---|-------------|
| 1 | Closed stopper rubber | 2 | KTS support |
| 3 | Latch                 | 4 | Carrier     |
| 5 | Fixation bolt (M8)    |   |             |

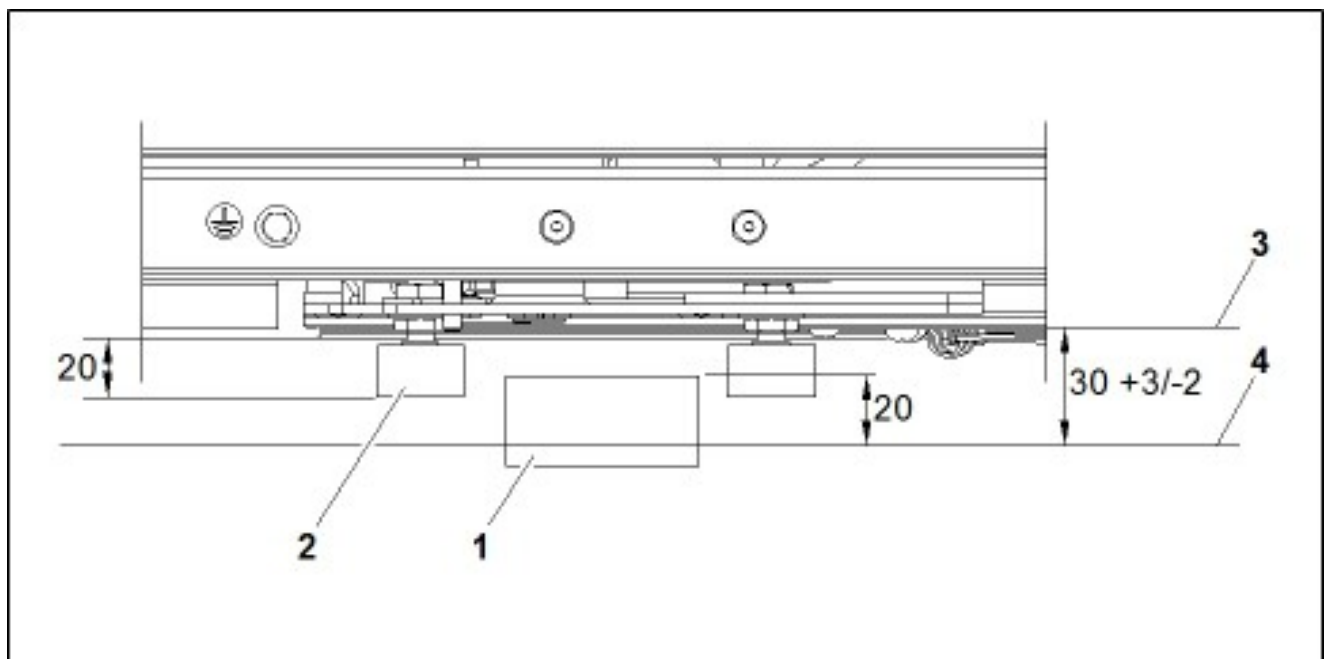
- Make sure that the clearance between the KTS support and the latch is 1.3 ... 3 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



### 5.34.5 Checking of lock roller position



- |   |   |   |                          |
|---|---|---|--------------------------|
| 1 | Clutch                                    | 2 | M8 thread pin and M8 nut |
| 3 | Hook plate                                | 4 | Lock roller (dia. 25 mm) |
| 5 | Landing doors roller template             | 6 | Sill line                |
| 7 | Center line (C2) / side closing line (T2) |   |                          |





- 1 Clutch  
3 Landing door sill line

- 2 Lock roller  
4 Car sill line

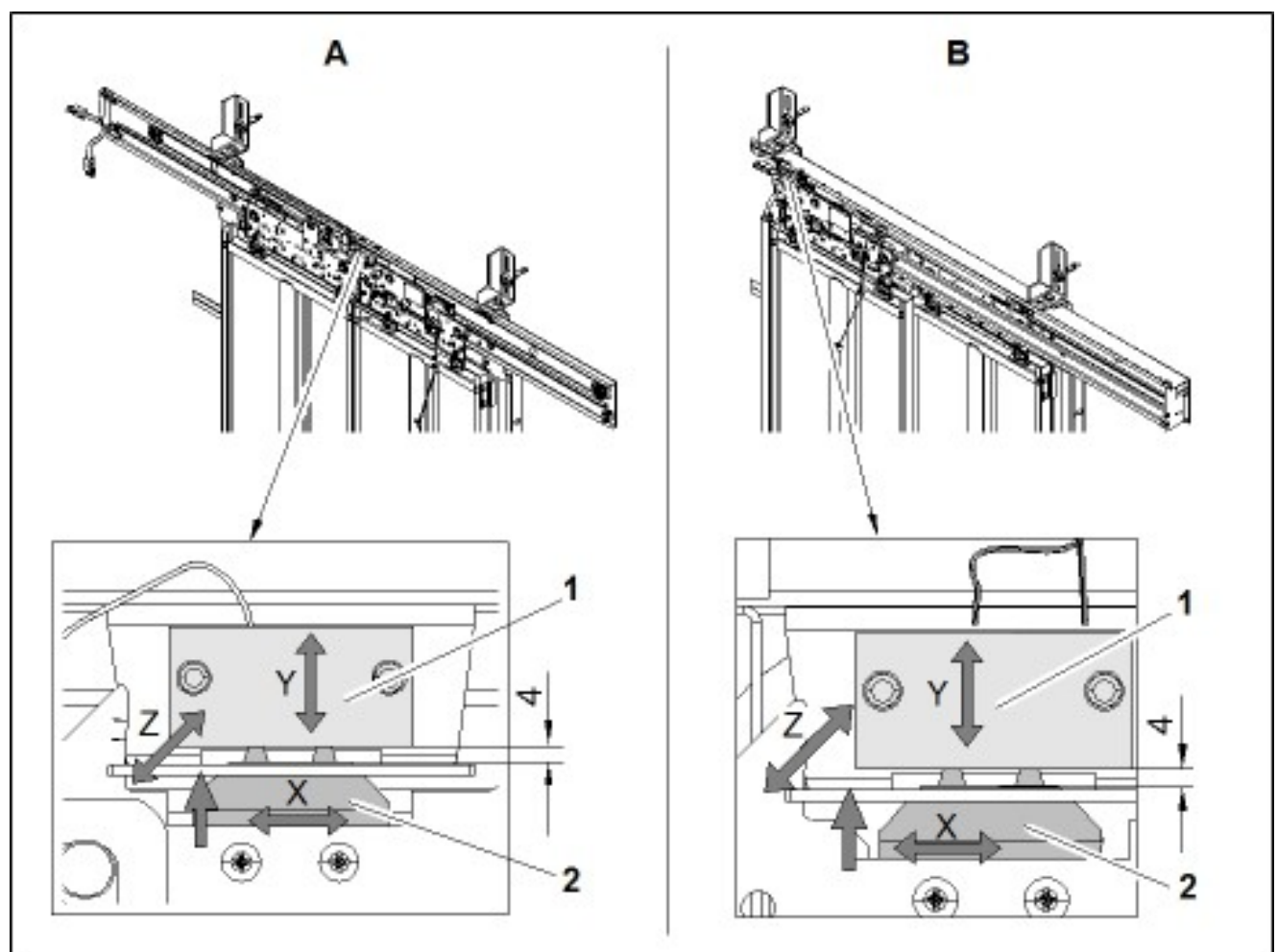
Type of locking device	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Ø (mm)
VAR 15 C2 w CDL	75	9	19	106	HT + 163	45	25
VAR 15 C2 w/o CDL	75	17	19	106	HT + 163	45	25
VAR 35 C2 w CDL	75	9	19	106	HT + 163	45	25
VAR 35 C2 w/o CDL	75	17	19	106	HT + 163	45	25
VAR 15 T2L/T2R w CDL	80	11	22	86	HT + 143	25	25
VAR 15 T2L/T2R w/o CDL	80	19	22	86	HT + 143	25	25
VAR 35 T2L/T2R w CDL	78	9	22	86	HT + 143	34.5	25
VAR 35 T2L/T2R w/o CDL	78	17	22	86	HT + 143	34.5	25

► Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.

↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.

### 5.34.6 Checking of alignment of switches and contact bridges

#### 5.34.6.1 Checking of alignment of landing door switch KTS and contact bridge



- A** Center door  
**1** Switch KTS

- B** Telescopic door  
**2** Contact bridge

► Make sure that the door panels are closed and the carriers touch the stopper buffers.

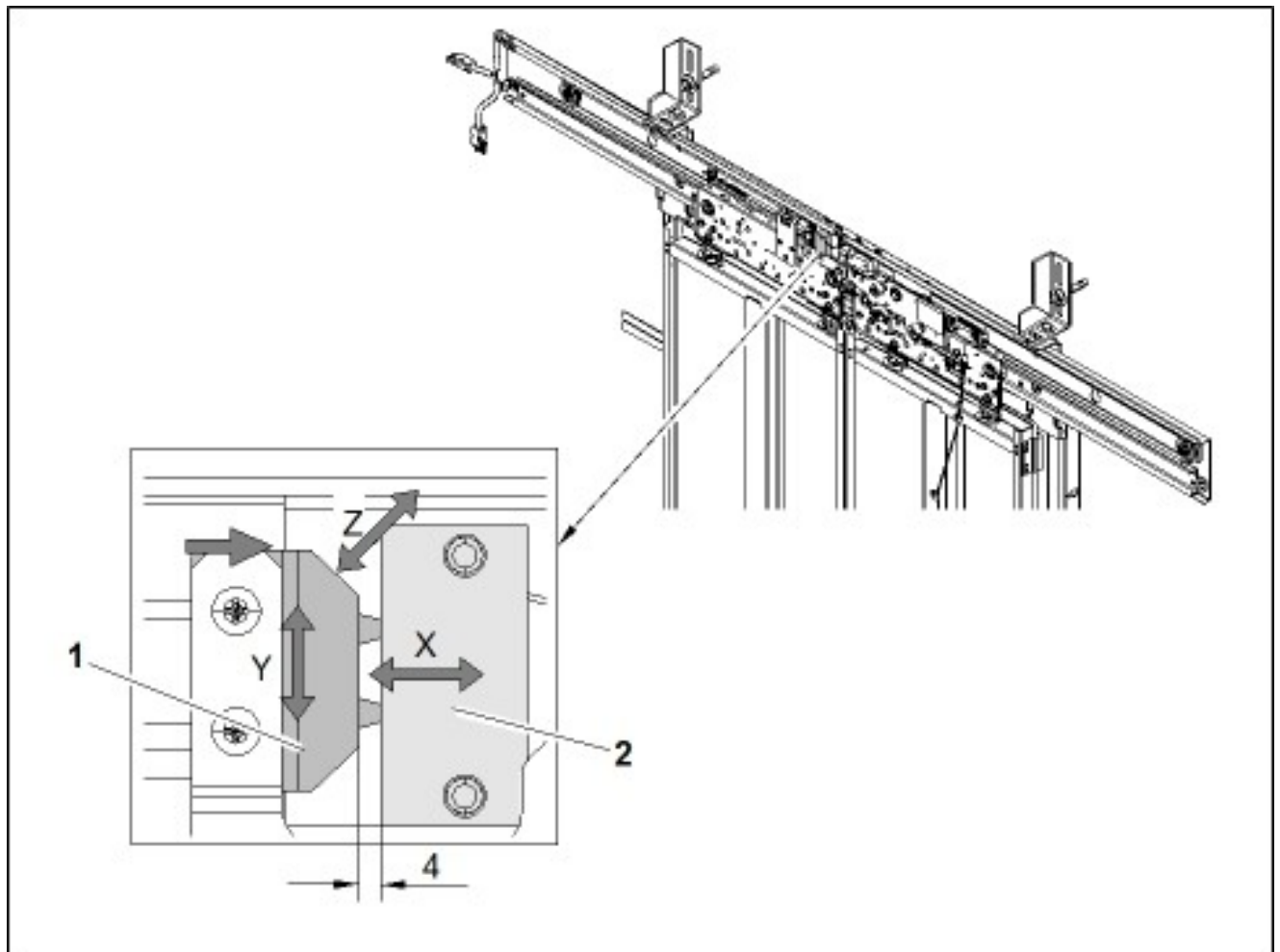
► Do a check of the KTS position.

- X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
- Y-Position: Distance of the contact bridge to the switch KTS is 4 mm.
- Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.

↳ If required, adjust the switch KTS.



#### 5.34.6.2 Checking of alignment of safety switch KTS1 and contact bridge



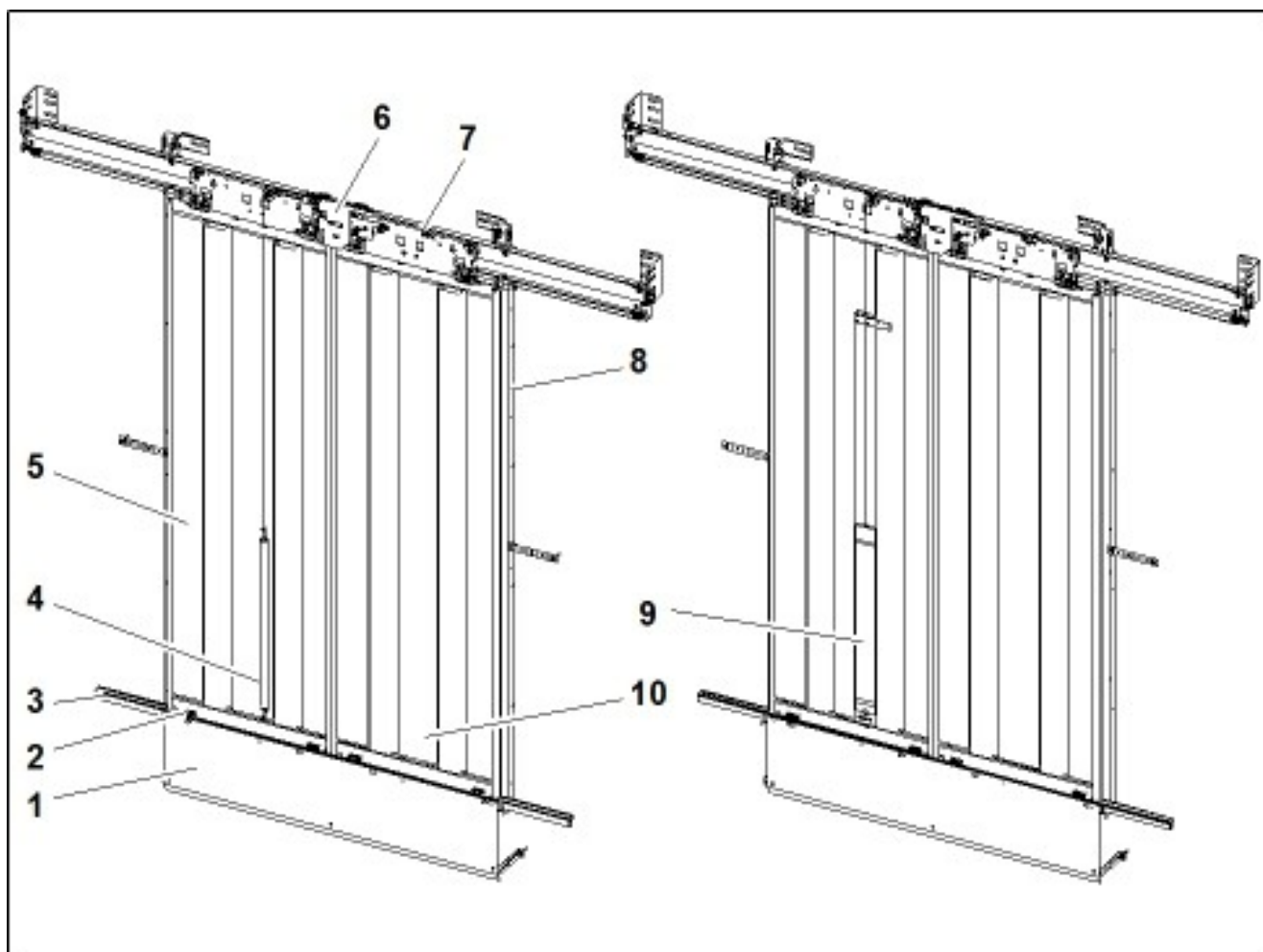
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 4 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



**5.35 Landing door DO WCM**  
**5.35.1 Overview of landing door**



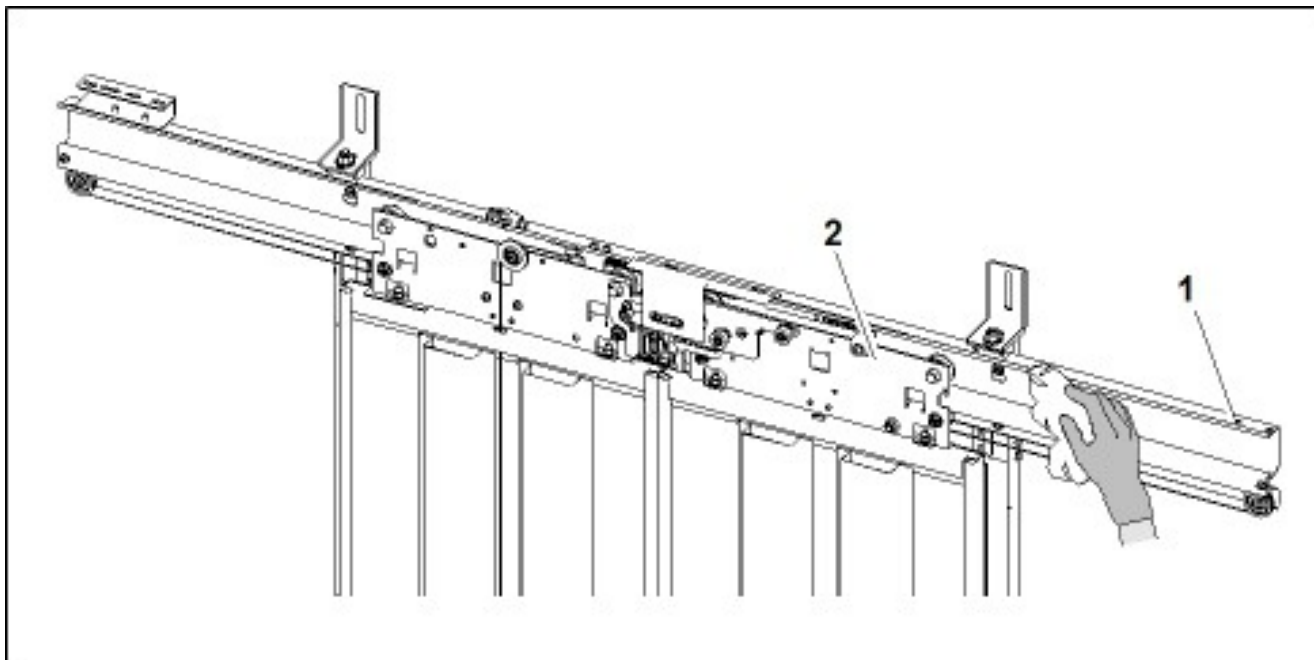
- |   |   |    |                                 |
|---|---|----|---------------------------------|
| 1 | Toe guard                               | 2  | Guide shoe                      |
| 3 | Door sill                               | 4  | Door closing spring (BT ≥ 1000) |
| 5 | Door panel                              | 6  | Door mechanism                  |
| 7 | Door closing spring (BT = 800 or 900)   | 8  | Door frame                      |
| 9 | Door closing weight (BT = 800 ... 1400) | 10 | Release device of door lock     |

**5.35.2 Maintenance plan for landing door**

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing device
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of landing door lock DO WCM
12	Checking of door panel performance



### 5.35.3 Checking of cleanness



1 Rail

2 Door mechanism



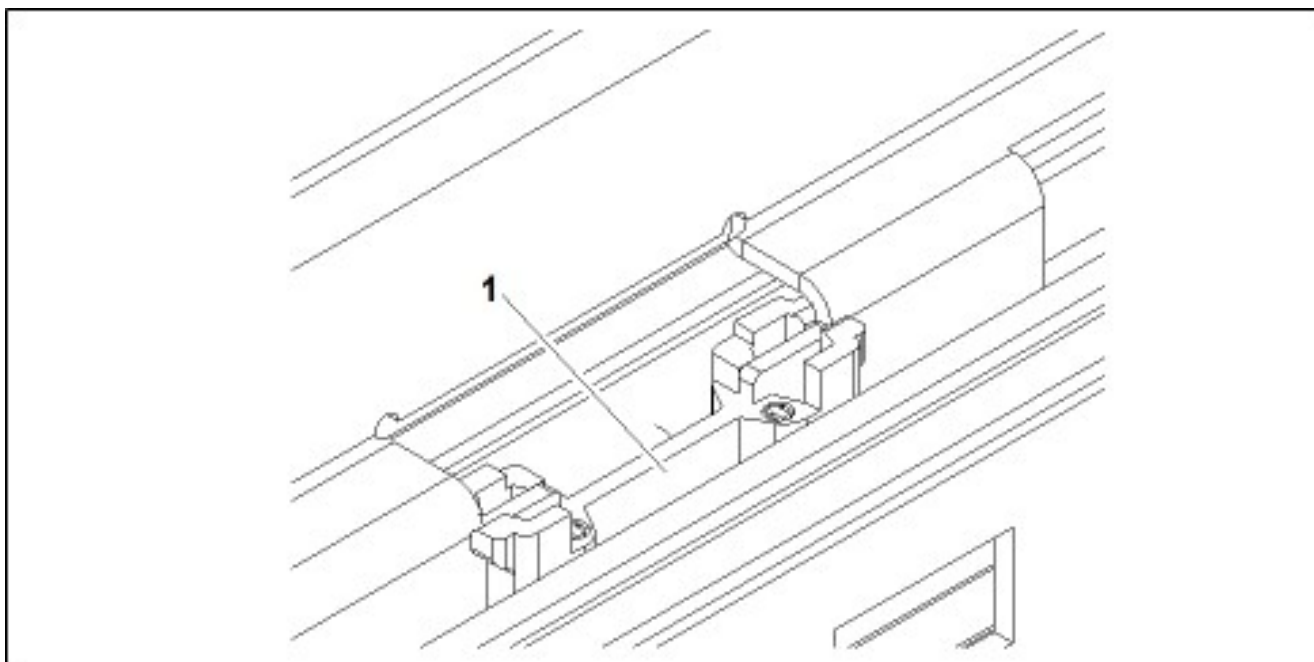
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- Make sure that the complete door mechanism and the rail are clear of dirt and rust.
- Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.35.4 Checking for damage and corrosion

- Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.35.5 Checking of condition of guide shoe

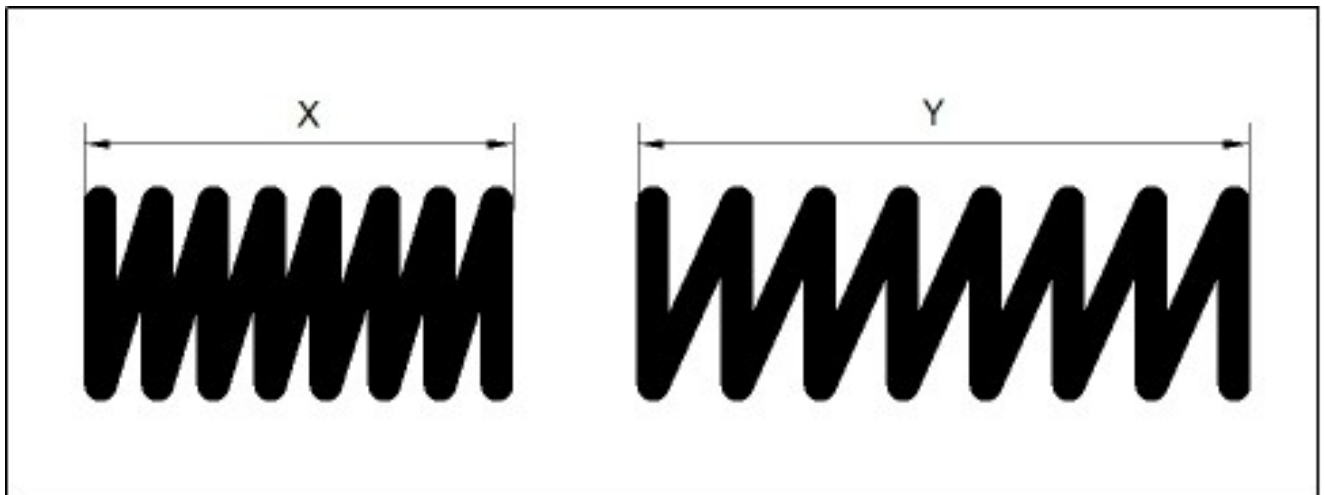


1 Guide shoe



- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 3\text{ mm}$ , replace the guide shoe.

#### 5.35.6 Checking of condition of synchronization rope

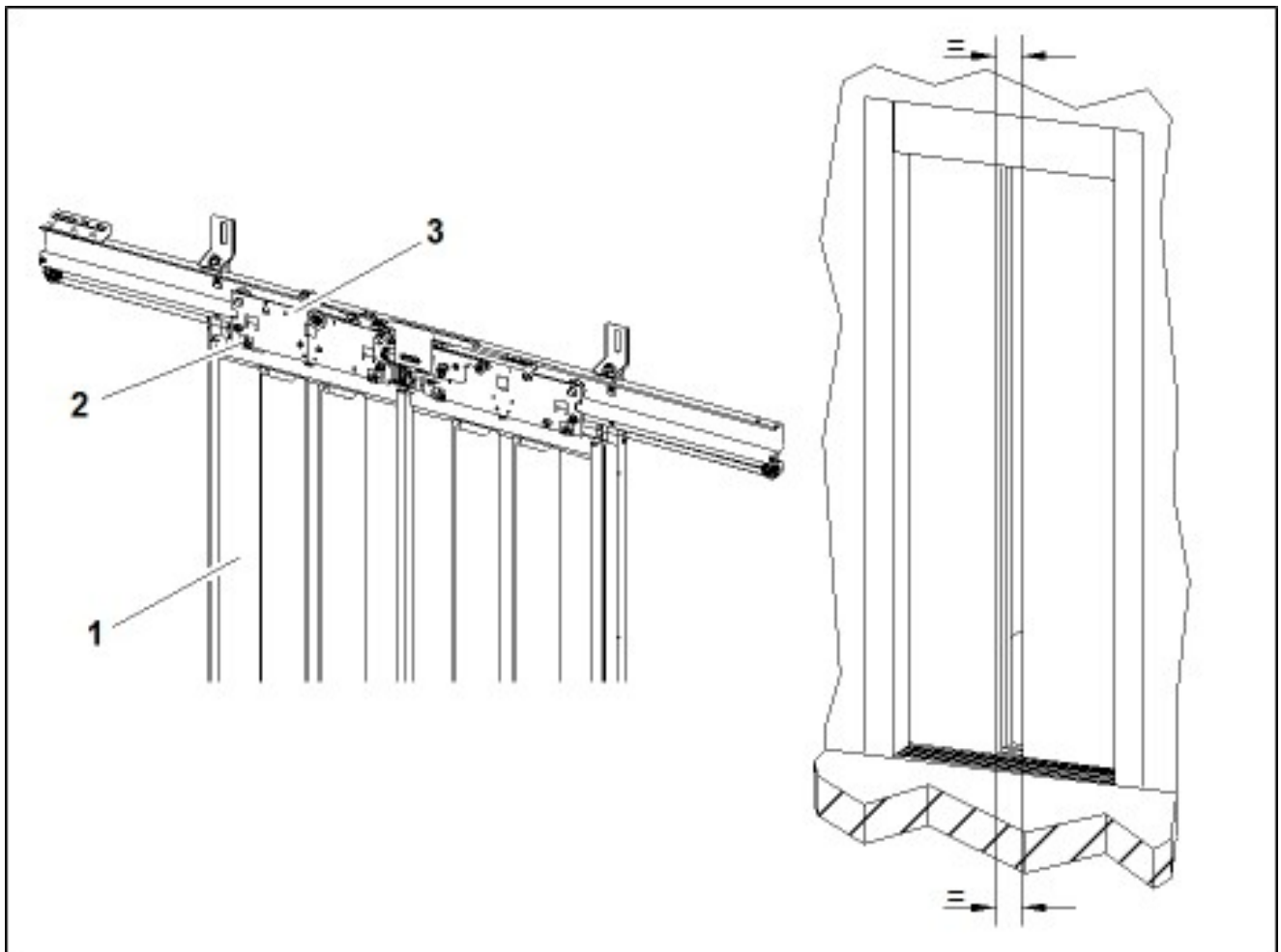


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compression spring length  $X = 16 \dots 19\text{ mm}$ .

#### 5.35.7 Checking of vertical parallelism of door panel

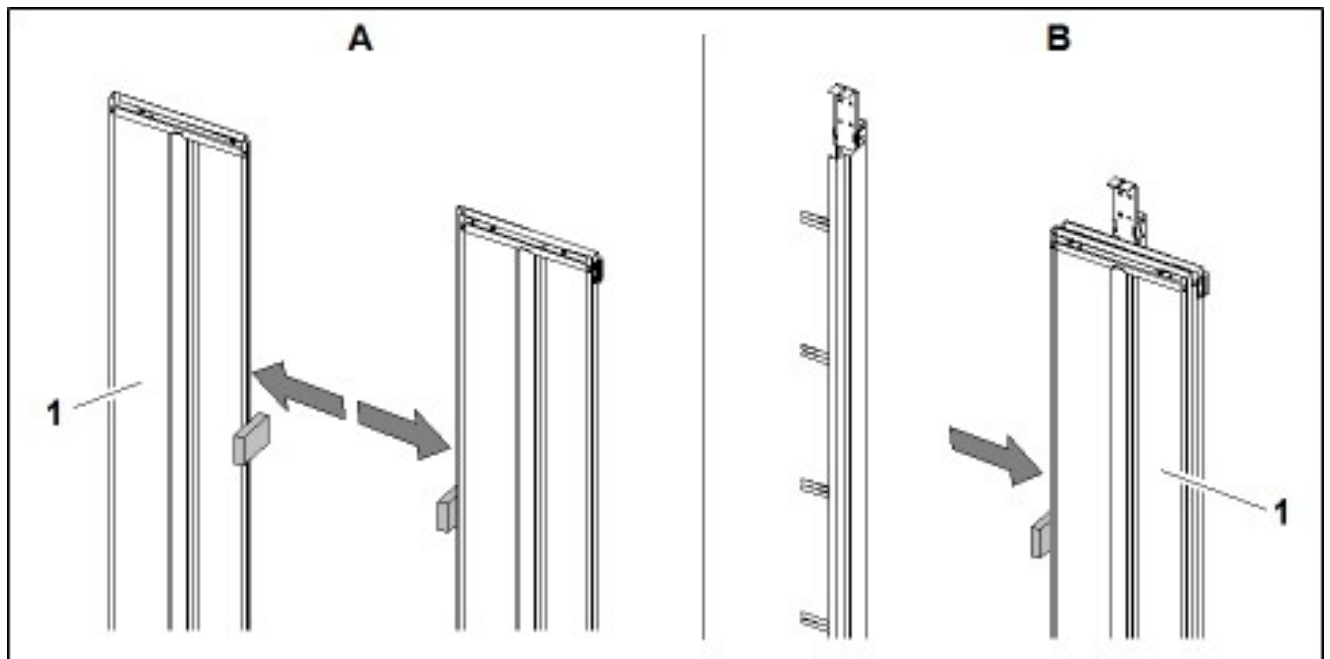




- |          |                |          |      |
|----------|----------------|----------|------|
| <b>1</b> | Door panel     | <b>2</b> | Bolt |
| <b>3</b> | Door mechanism |          |      |

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

### 5.35.8 Checking of alignment of door panel



- |          |             |          |                 |
|----------|-------------|----------|-----------------|
| <b>A</b> | Center door | <b>B</b> | Telescopic door |
| <b>1</b> | Door panel  |          |                 |

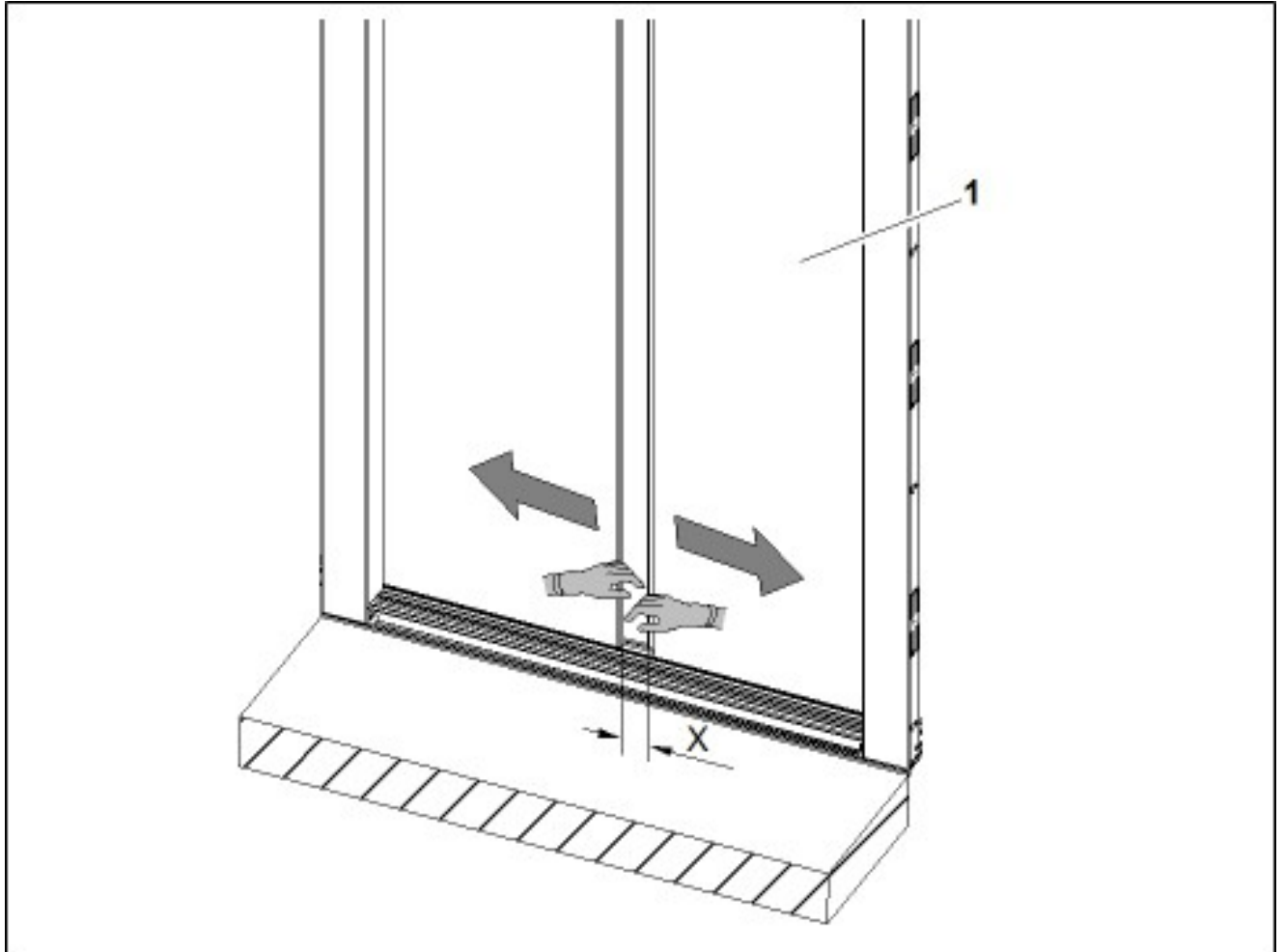
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

### 5.35.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.35.10 Checking of door opening in locked condition



##### 1 Door panel

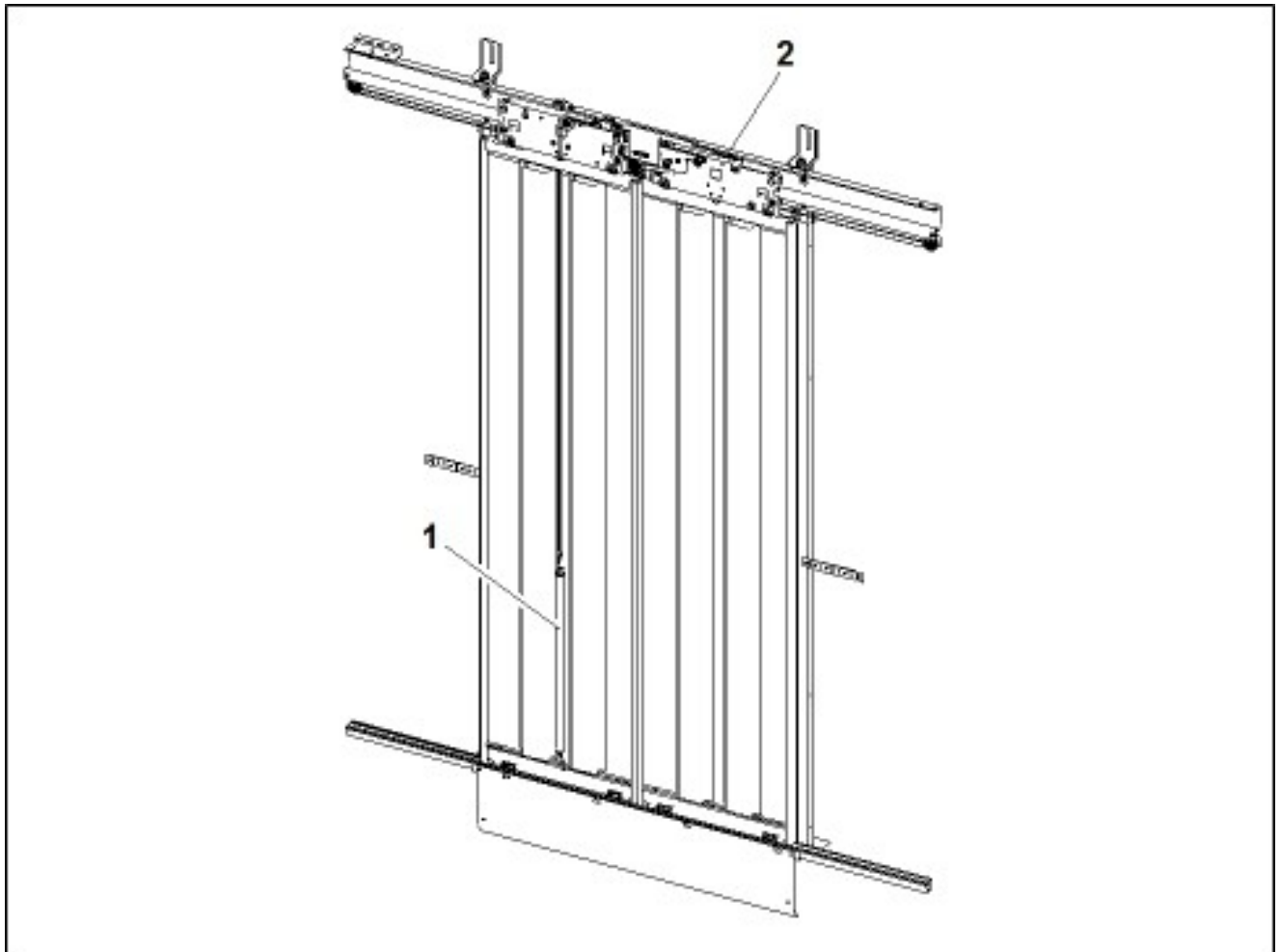
**i** Use no more than 150 N to manually move the door panels.

- ▶ Make sure that the door panel is closed and the door is locked.
- ▶ Open the door panels manually from the bottom as far as possible.
- ▶ Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- ▶ If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.35.11 Checking of operation of door closing device

#### 5.35.11.1 Checking of operation of door closing spring



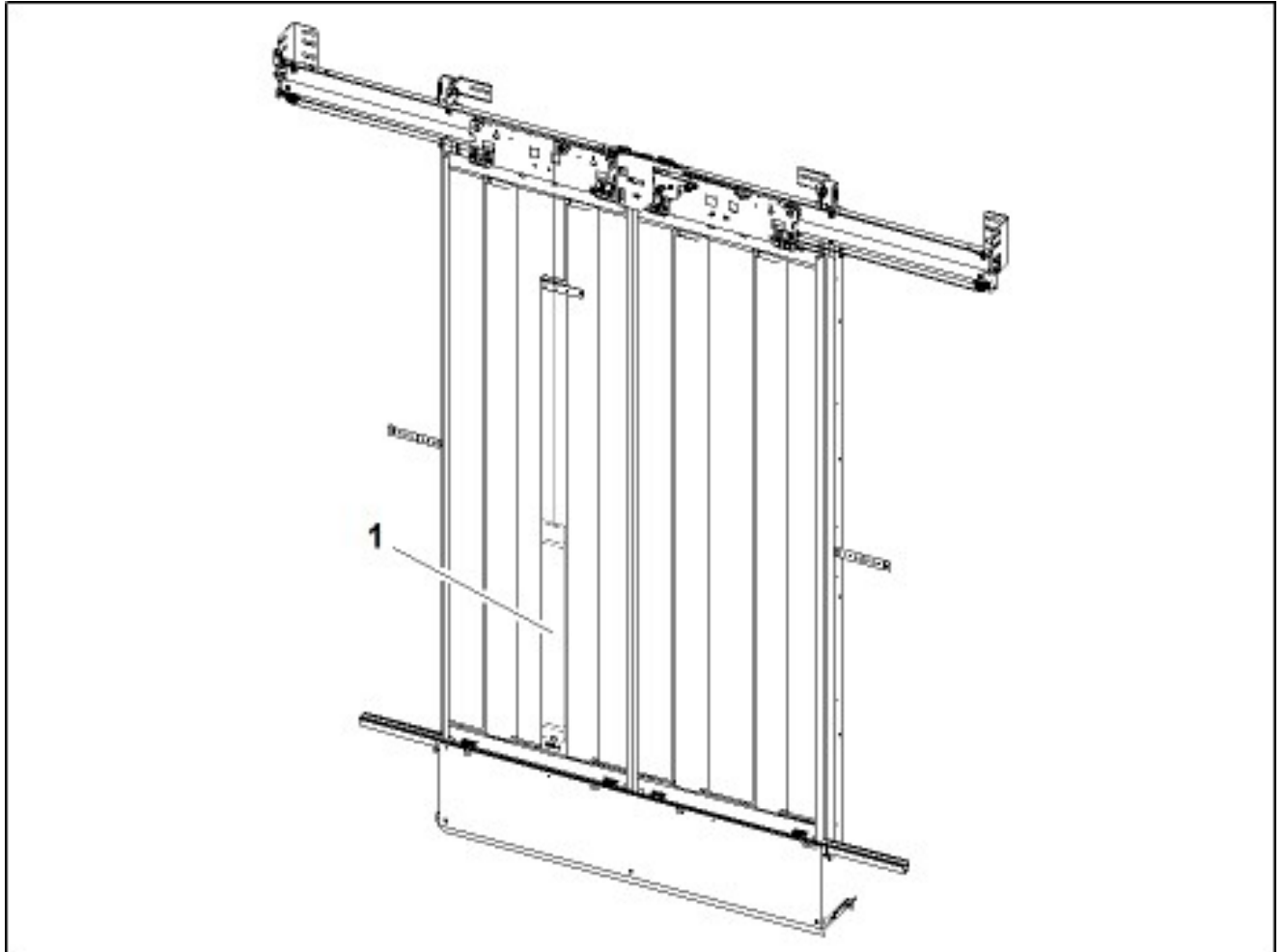
**1** Door closing spring (BT ≥ 1000)

**2** Door closing spring (BT = 800 or 900)

- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



#### 5.35.11.2 Checking of operation of door closing weight



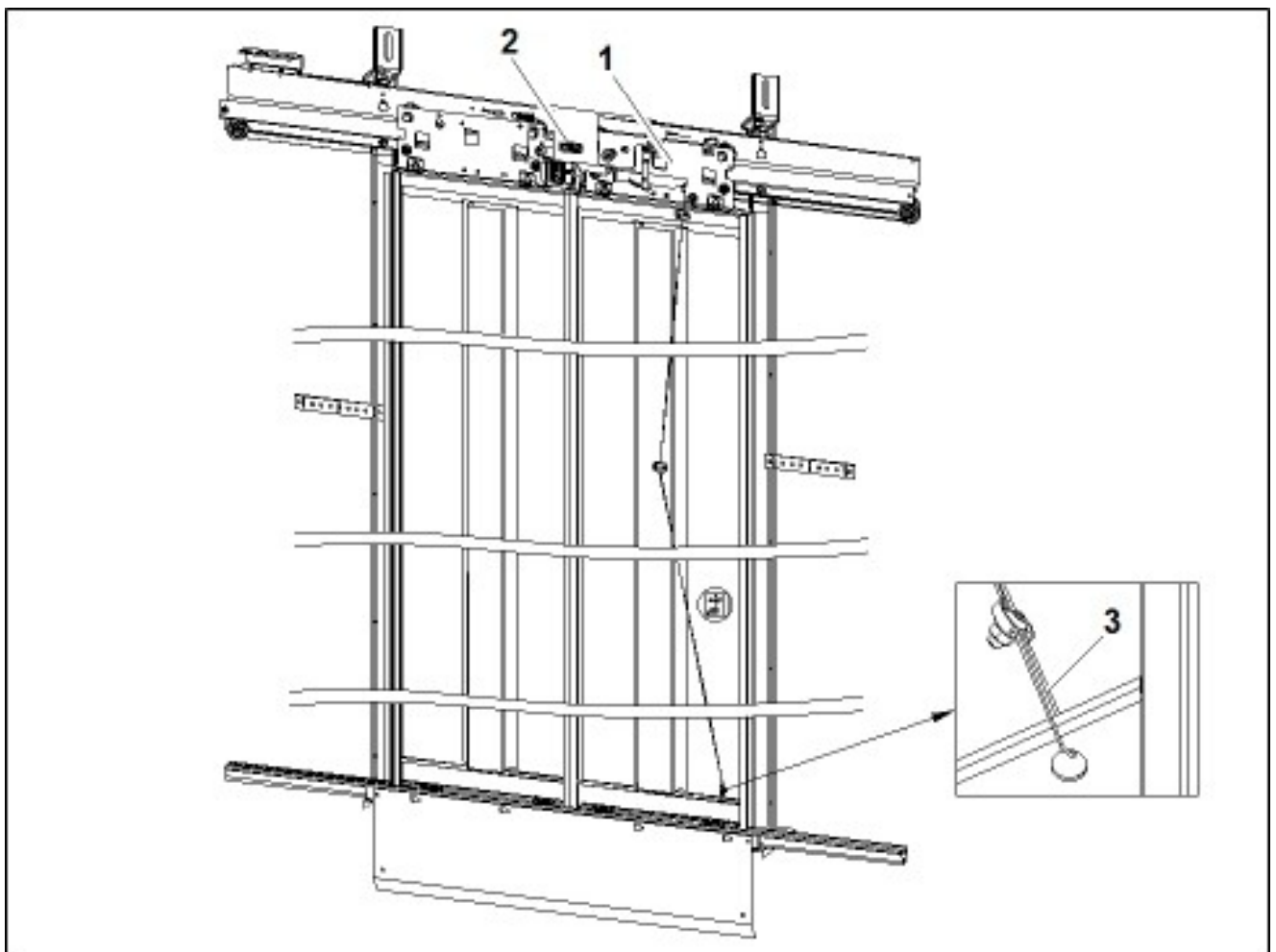
1 Door closing weight (BT = 800 ... 1400)

- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels will close automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.

#### 5.35.12 Checking of release device of door lock

 Do a check of the release device on the lowest landing door only.





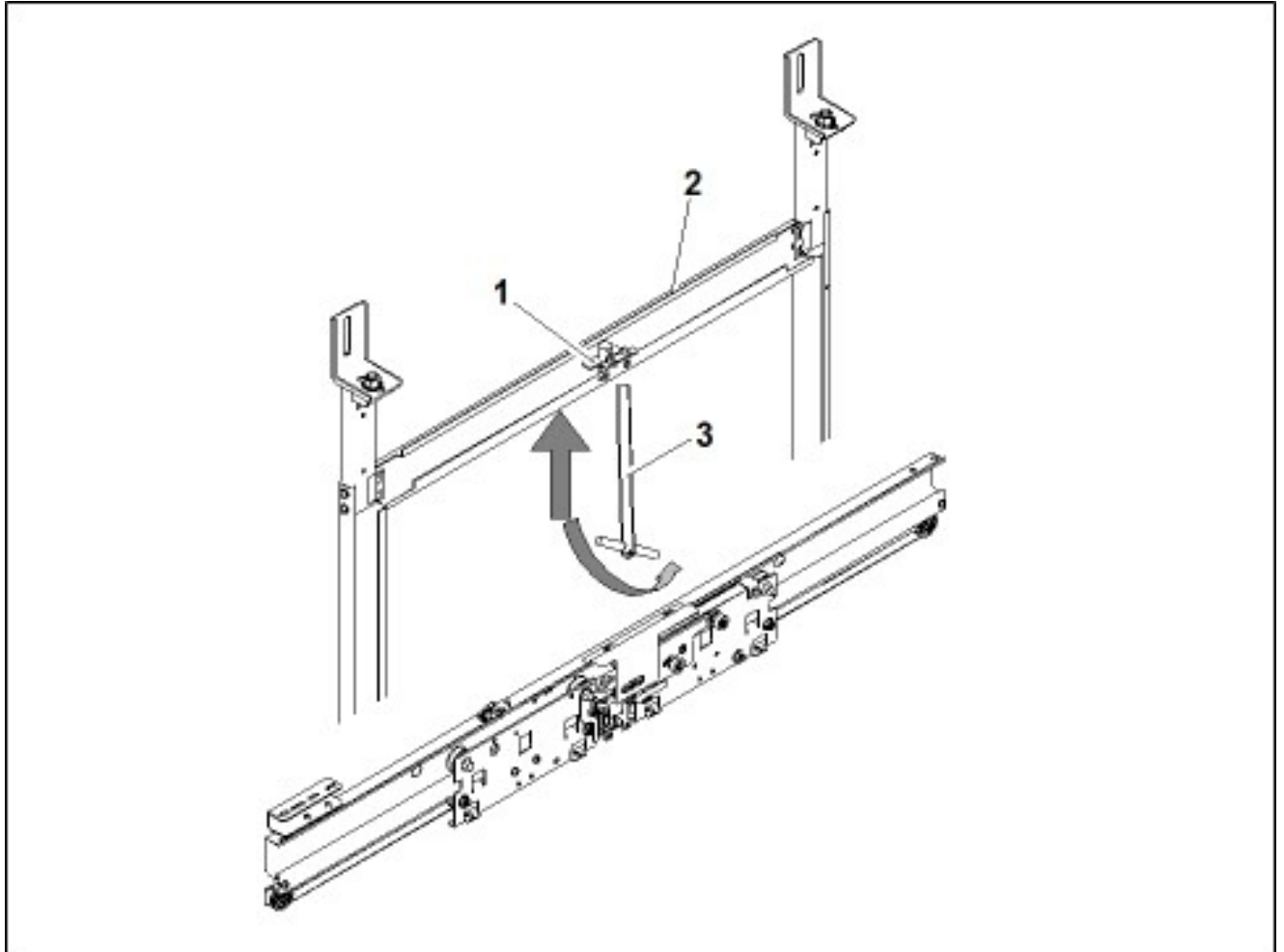
1 Release device  
3 Steel rope

2 Door lock

- ▶ Pull the steel rope and make sure that the door lock opens.
- ▶ Make sure that the release device does not touch the door lock.
- ▶ Make sure that the steel rope is not damaged.



### 5.35.13 Checking of emergency release



- 1 Emergency release arm
- 3 Emergency release key

- 2 Door frame header

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.



#### 5.35.14 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

### 5.36 Landing door lock for DO WCM

#### 5.36.1 Maintenance plan for landing door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Check of alignment of switches and contact bridges

#### 5.36.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

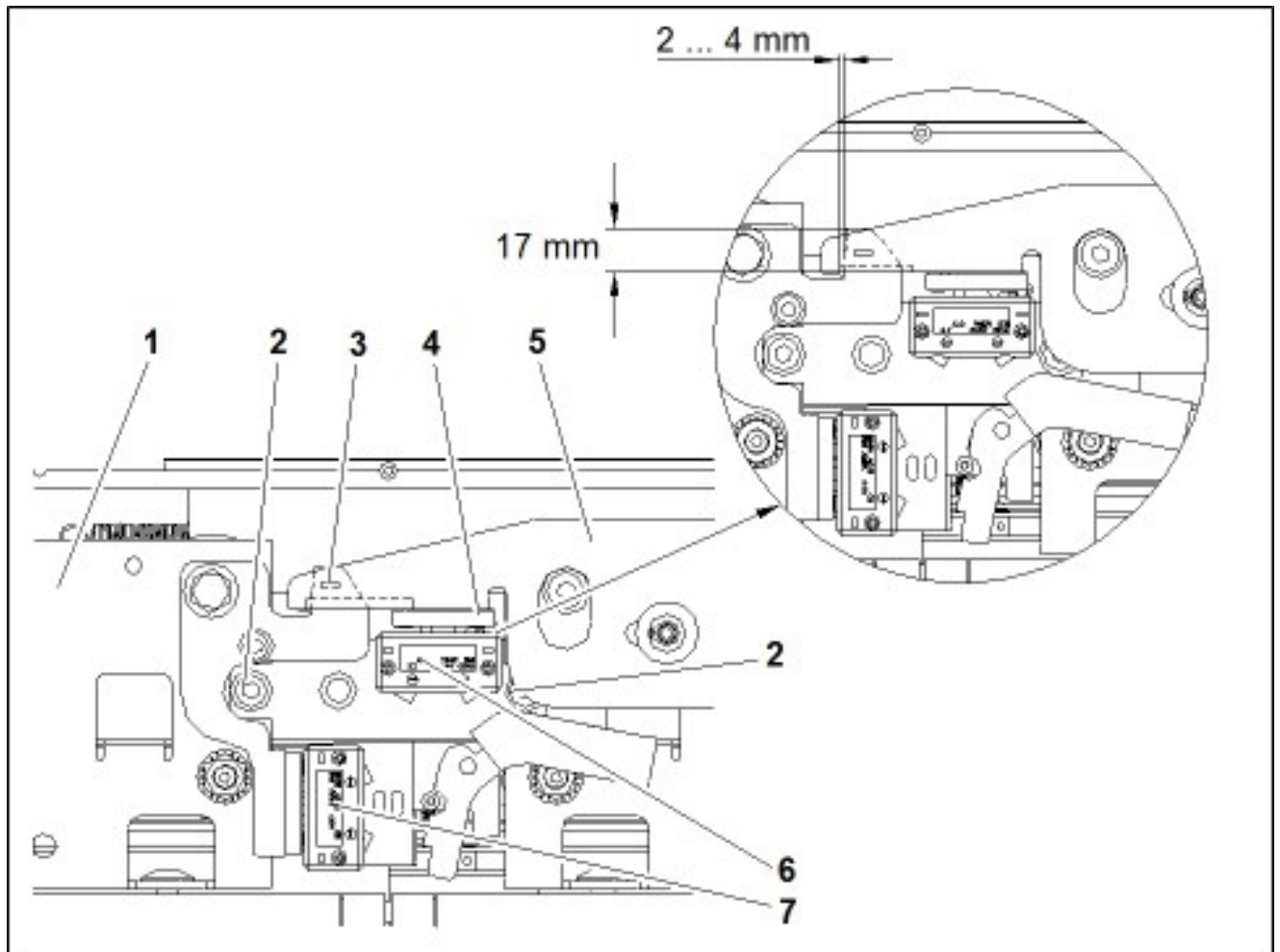
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### 5.36.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.36.4 Checking of latch position



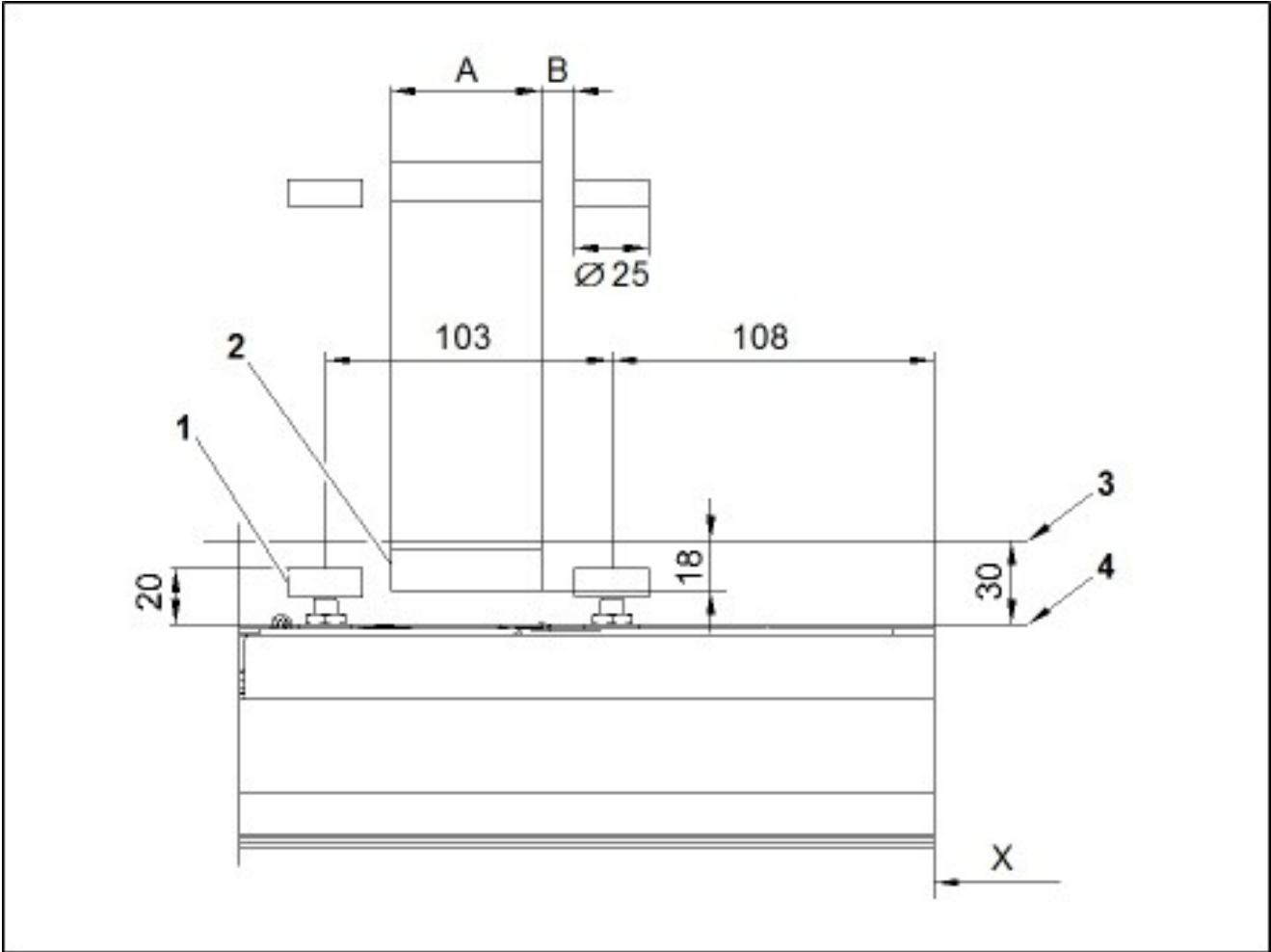
- |   |                  |   |                |
|---|------------------|---|----------------|
| 1 | Carrier          | 2 | Stopper buffer |
| 3 | 7 mm marked line | 4 | Contact bridge |
| 5 | Latch            | 6 | Switch KTS     |
| 7 | Switch KTS1      |   |                |

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.
- Make sure that the clearance between the latch and the KTS support is 2 ... 4 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



5.36.5 Checking of lock roller position



- X

Closing center line
- 1

Lock roller
- 2

Clutch
- 3

Car door sill projection
- 4

Landing door sill projection

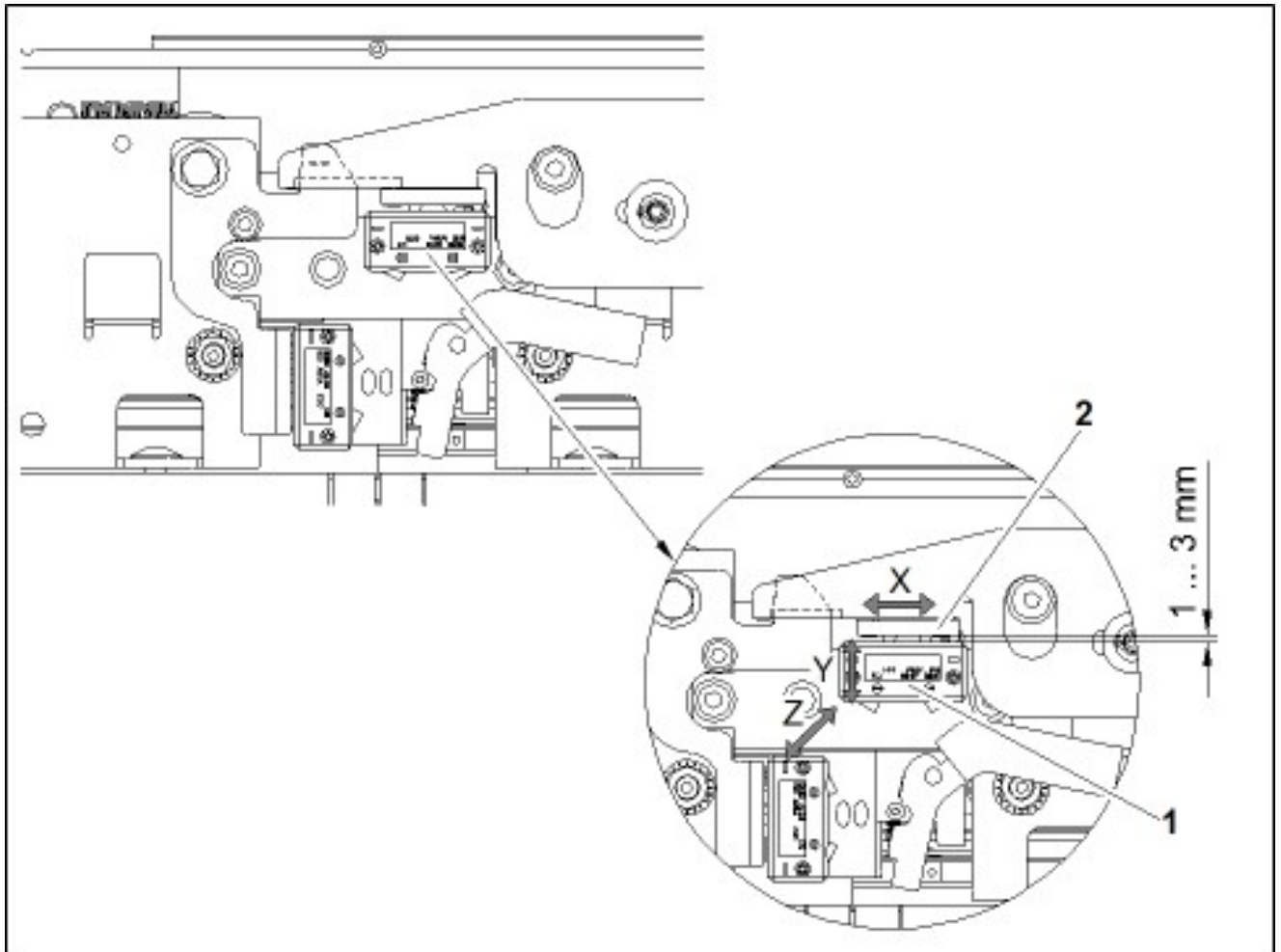
DO V15 C2 / DO V35 C2	A	B
Clutch phase II	39	15.5
CDL phase II	47	

- Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.
- ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.



## 5.36.6 Checking of alignment of switches and contact bridges

### 5.36.6.1 Checking of alignment of landing door switch KTS and contact bridge



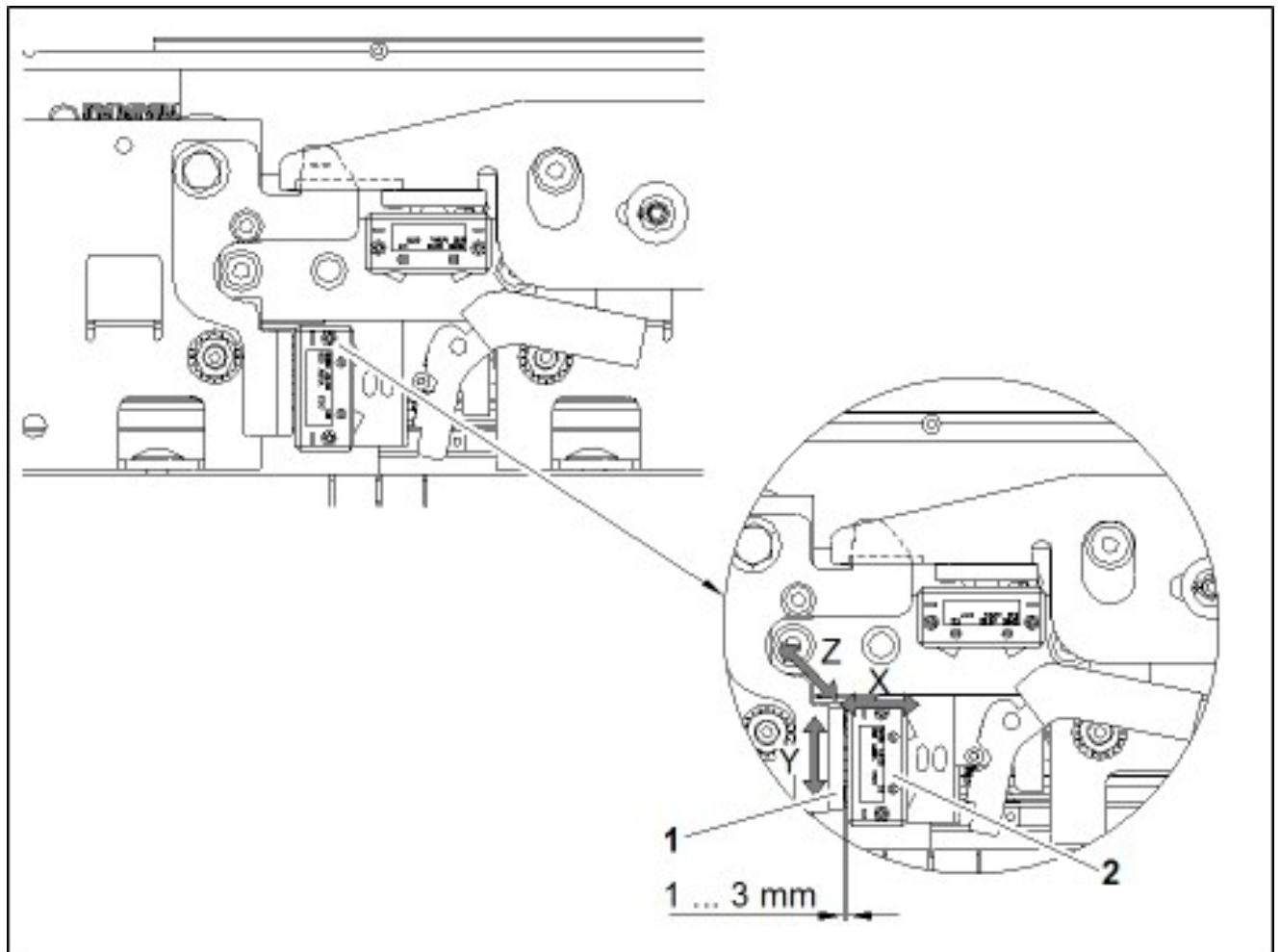
1 Switch KTS

2 Contact bridge

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Do a check of the KTS position.
  - X-Position: Contact bridge fit centered to the housing holes of switch KTS.
  - Y-Position: Distance of the contact bridge to the switch KTS is 1 ... 3 mm.
  - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
    - ↳ If required, adjust the switch KTS.



### 5.36.6.2 Checking of alignment of safety switch KTS1 and contact bridge



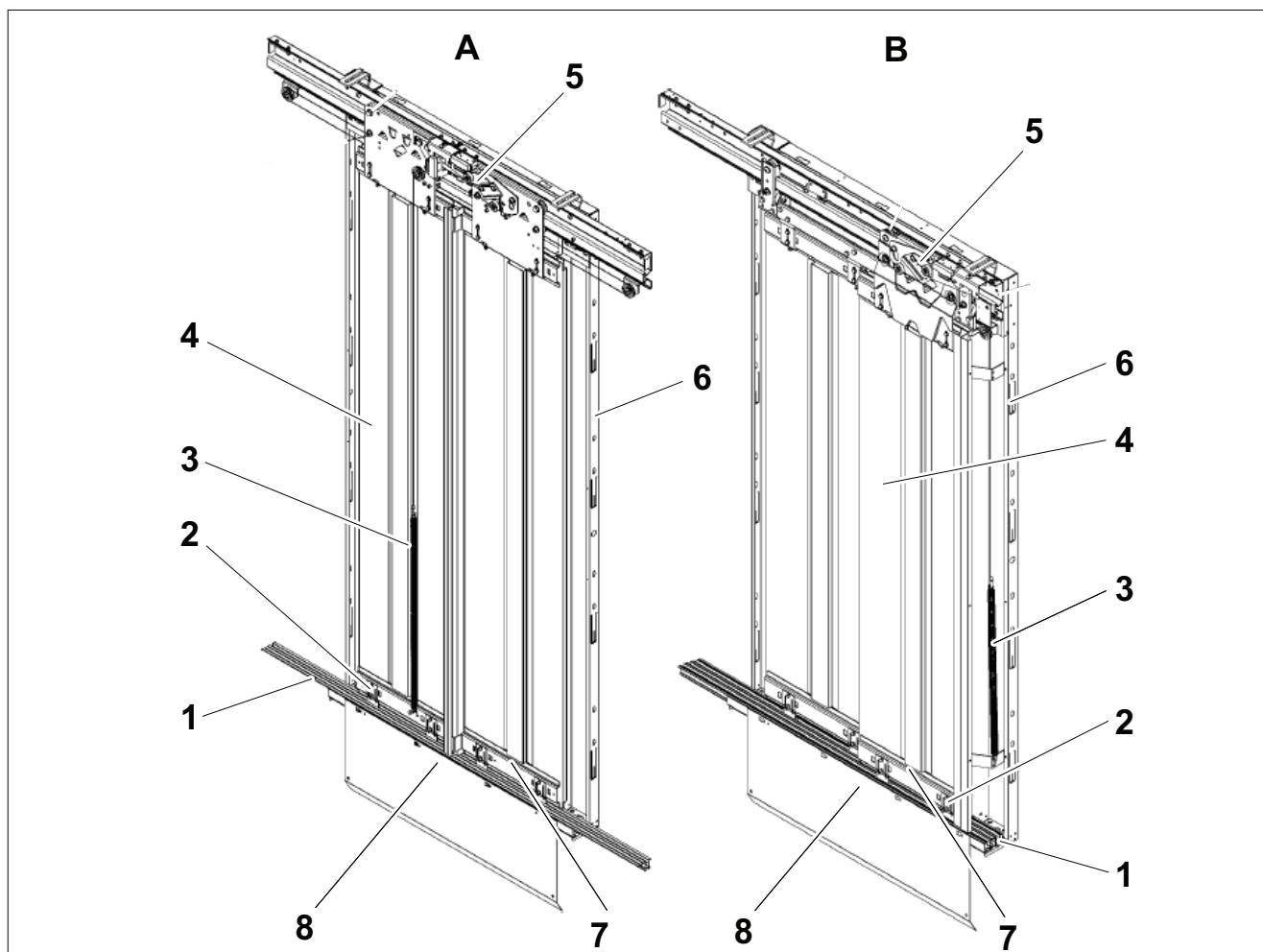
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 1 ... 3 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



**5.37 Landing door DO WIA-AP**  
**5.37.1 Overview of landing door**



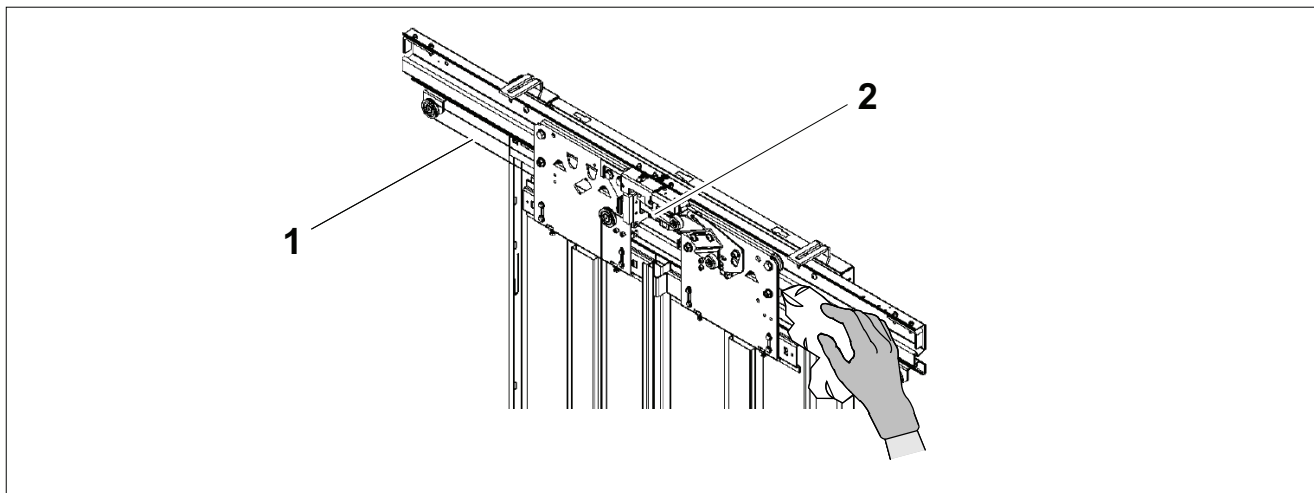
- |          |                             |          |                 |
|----------|-----------------------------|----------|-----------------|
| <b>A</b> | Central door                | <b>B</b> | Telescopic door |
| <b>1</b> | Door sill                   | <b>2</b> | Guide shoe      |
| <b>3</b> | Door closing spring         | <b>4</b> | Door panel      |
| <b>5</b> | Door mechanism              | <b>6</b> | Door frame      |
| <b>7</b> | Release device of door lock | <b>8</b> | Toe guard       |

**5.37.2 Maintenance plan for landing door**

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of switch KNET for damage
12	Checking of landing door lock DO WIA-AP
12	Checking of door panel performance



### 5.37.3 Checking of cleanness



1 Rail

2 Door mechanism



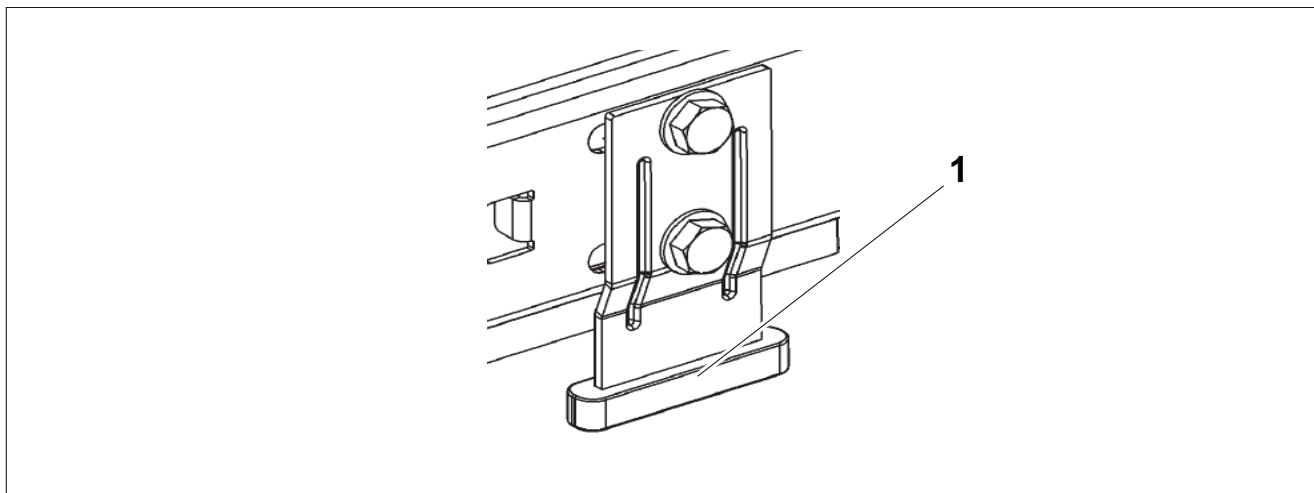
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- ▶ Make sure that the complete door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.37.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.37.5 Checking of condition of guide shoe

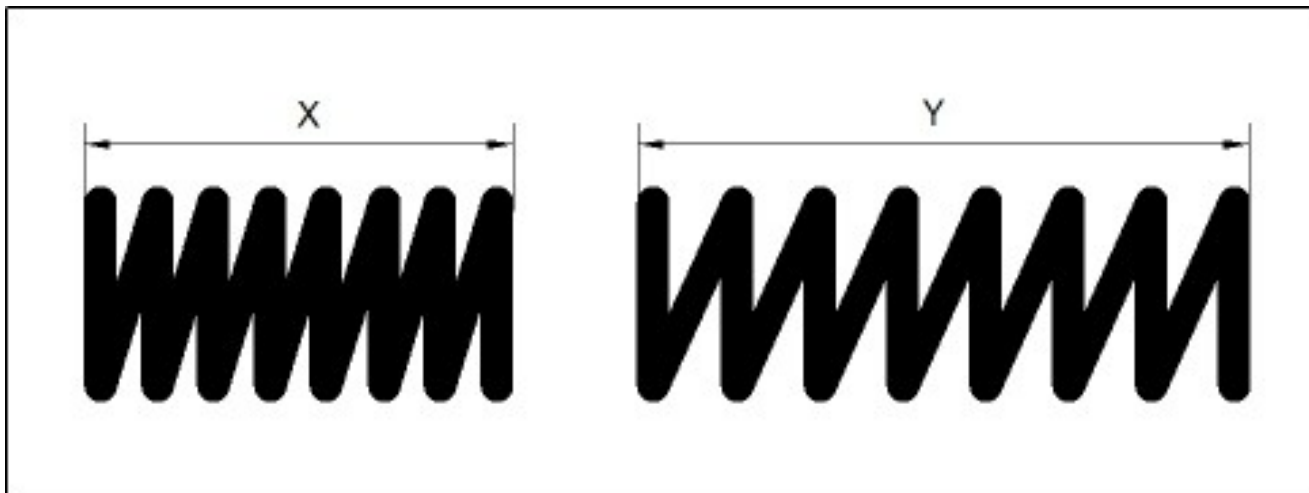


1 Guide shoe

- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 3$  mm, replace the guide shoe.



### 5.37.6 Checking of condition of synchronization rope

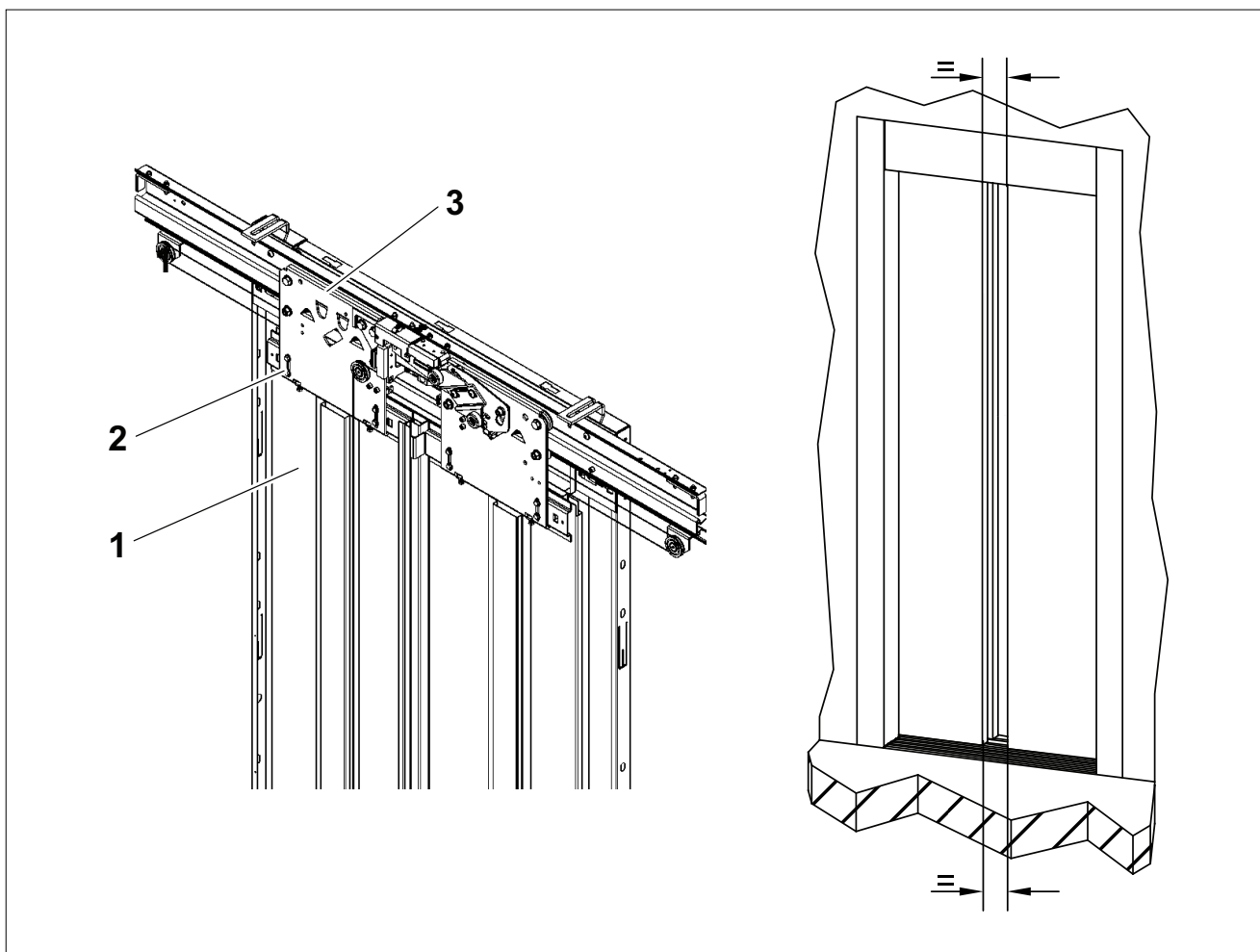


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the tension of the synchronization rope is correct.
- ▶ Make sure that the compressed spring length  $X = 10 \text{ mm}$ .

### 5.37.7 Checking of vertical parallelism of door panel



**1** Door panel

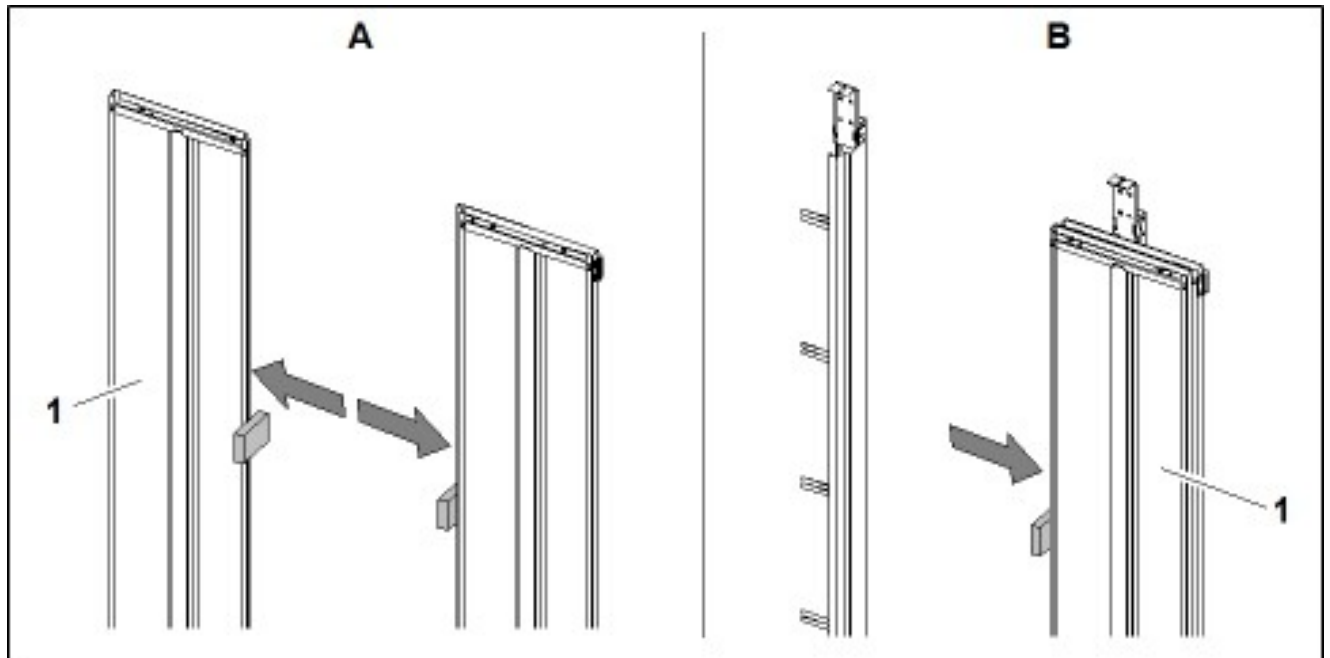
**2** Bolt

**3** Door mechanism



- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels:
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.37.8 Checking of alignment of door panel



**A** Center door  
**1** Door panel

**B** Telescopic door

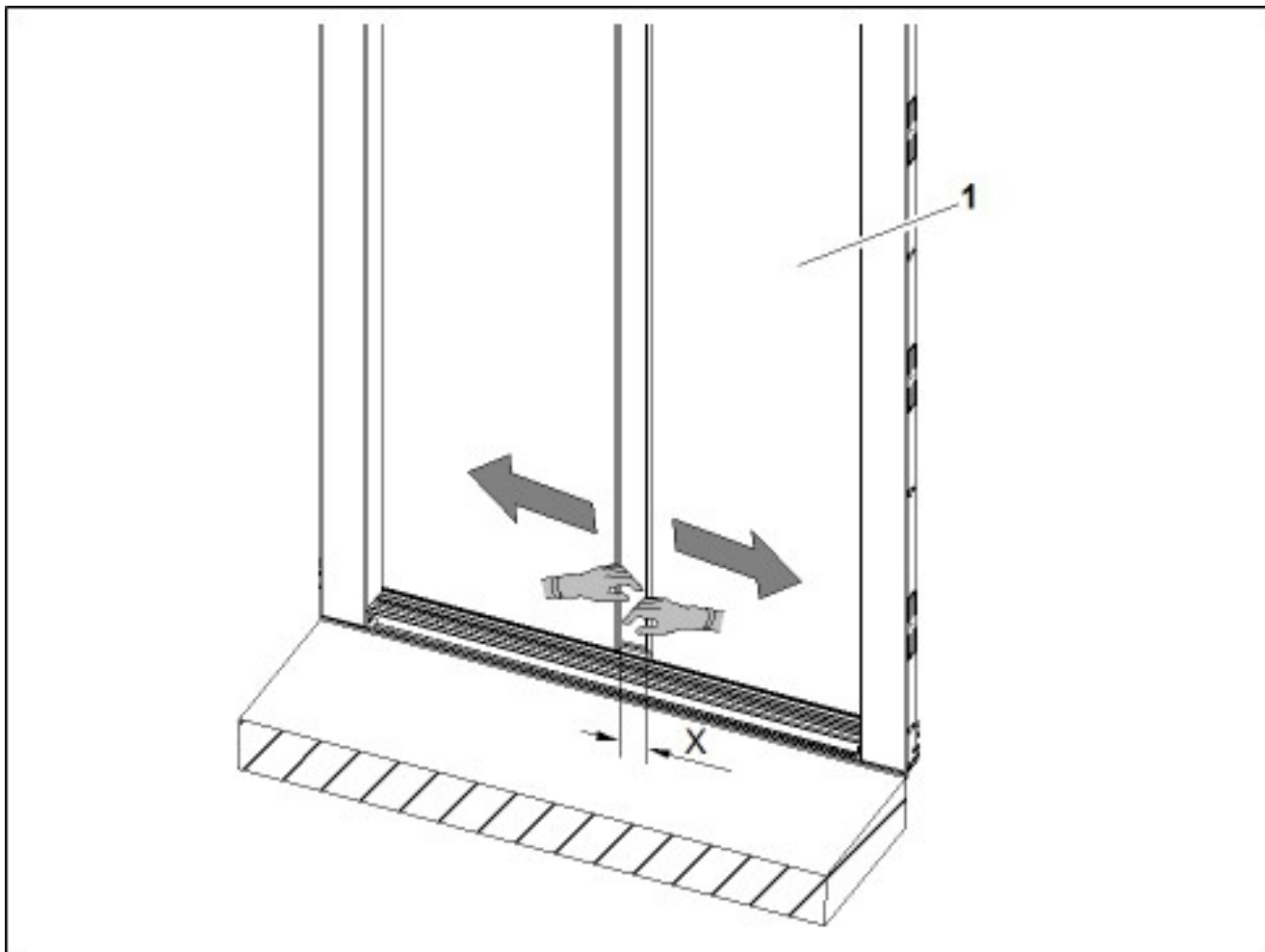
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the lock washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

#### 5.37.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.37.10 Checking of door opening in locked condition



##### 1 Door panel

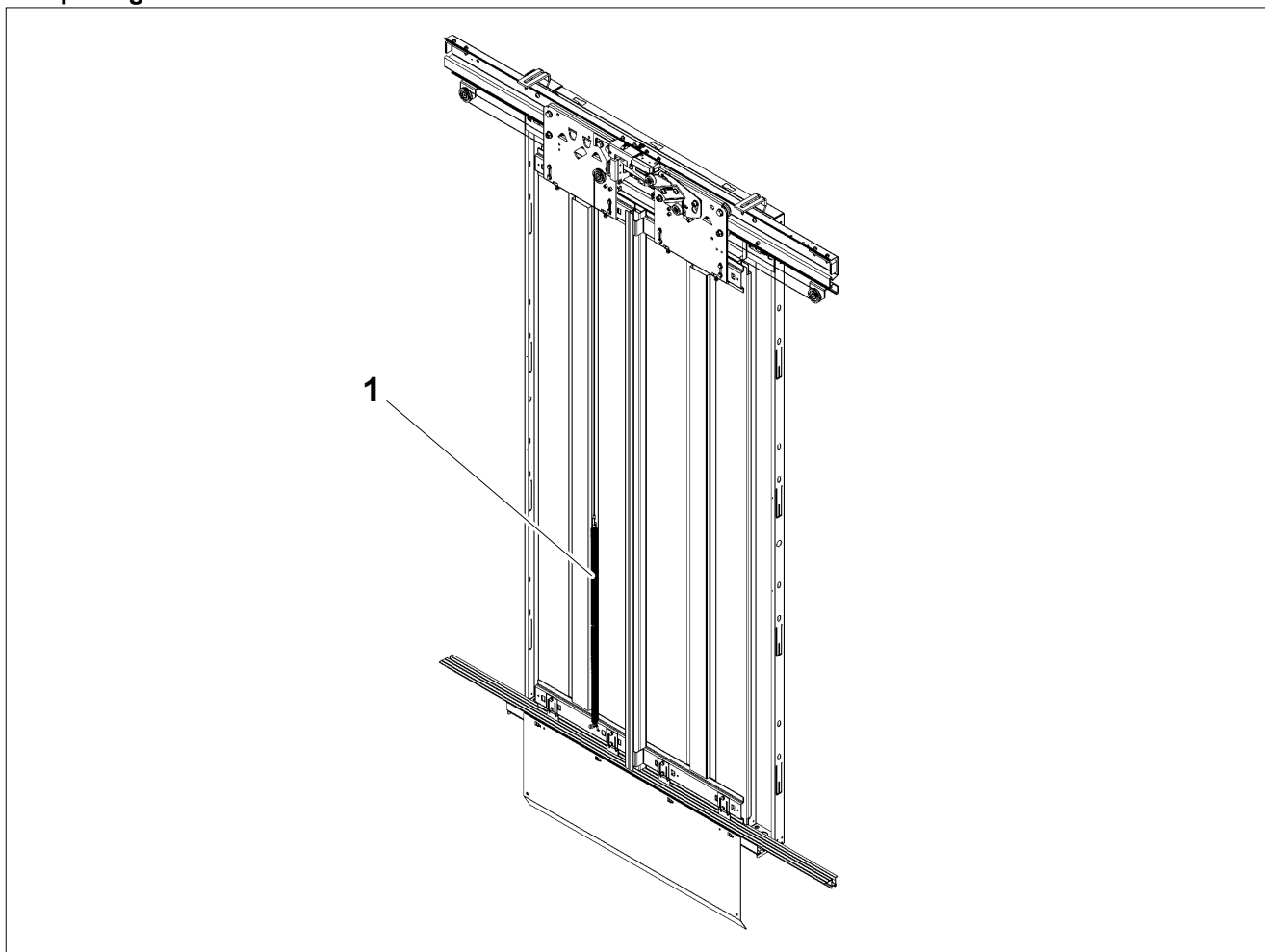
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.37.11 Checking of operation of door closing spring

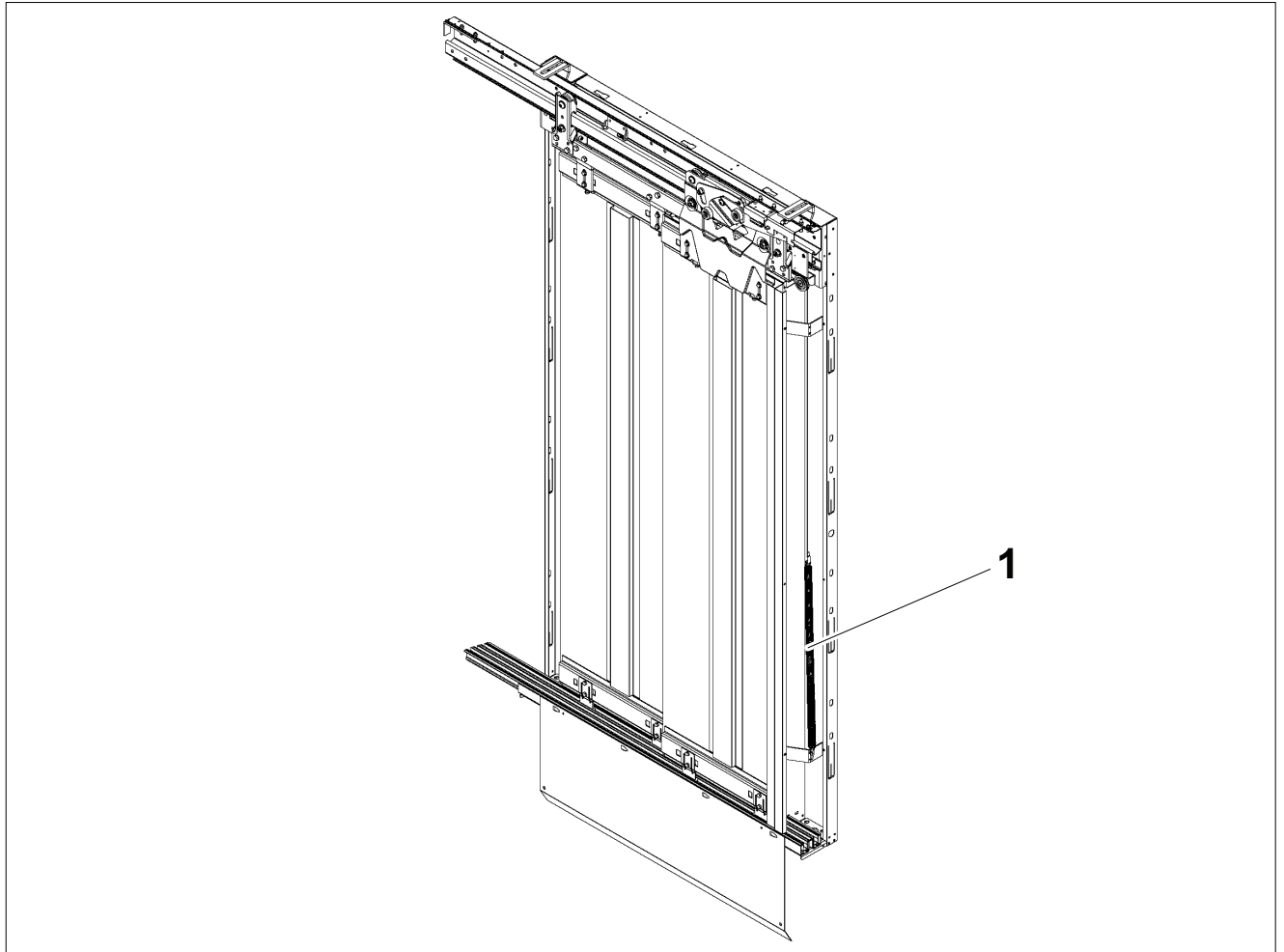
#### C2 opening



**1** Door closing spring



## T2 opening



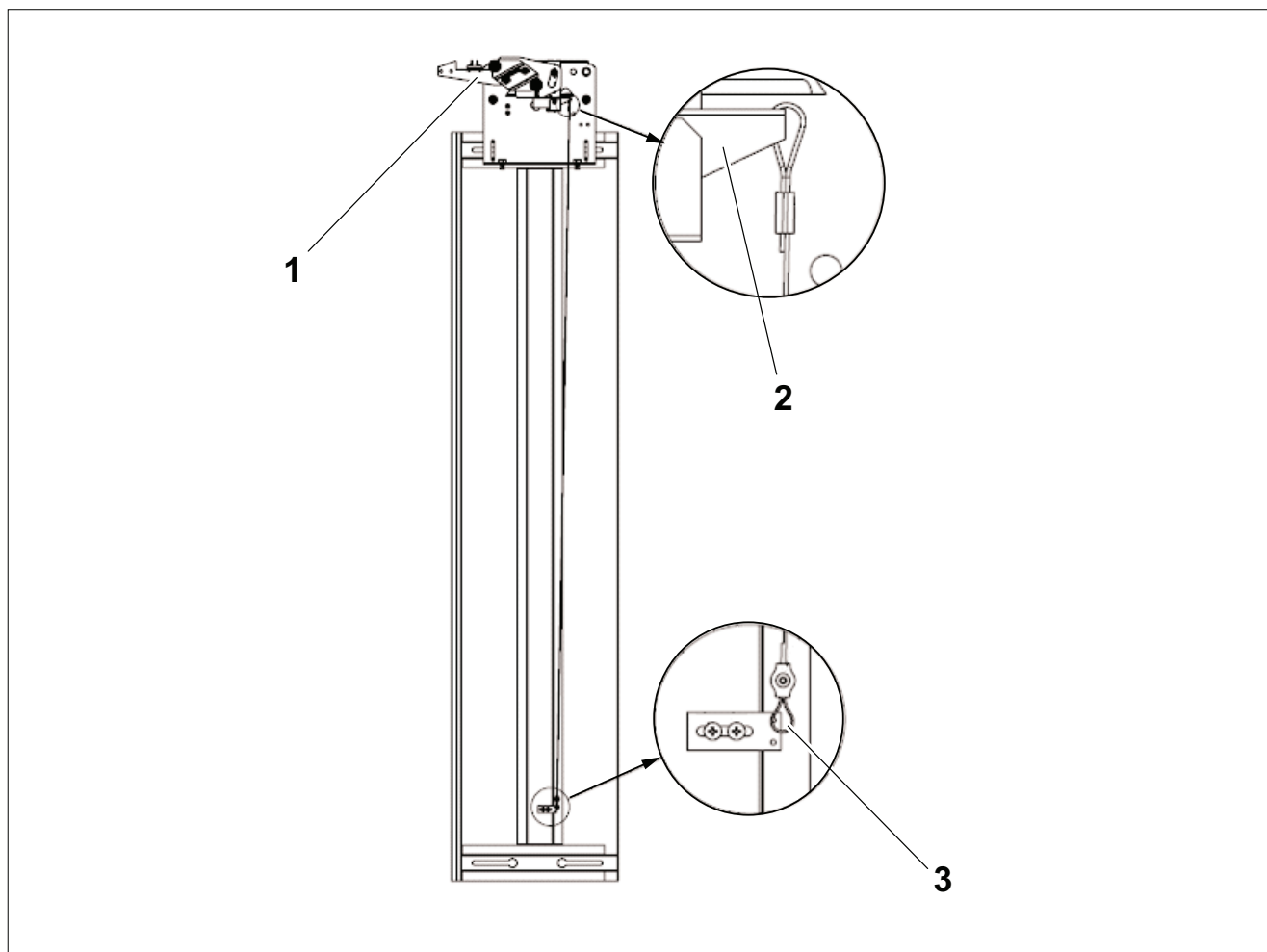
### 1 Door closing spring

- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.37.12 Checking of release device of door lock

**i** Do a check of the release device on the lowest landing door only.



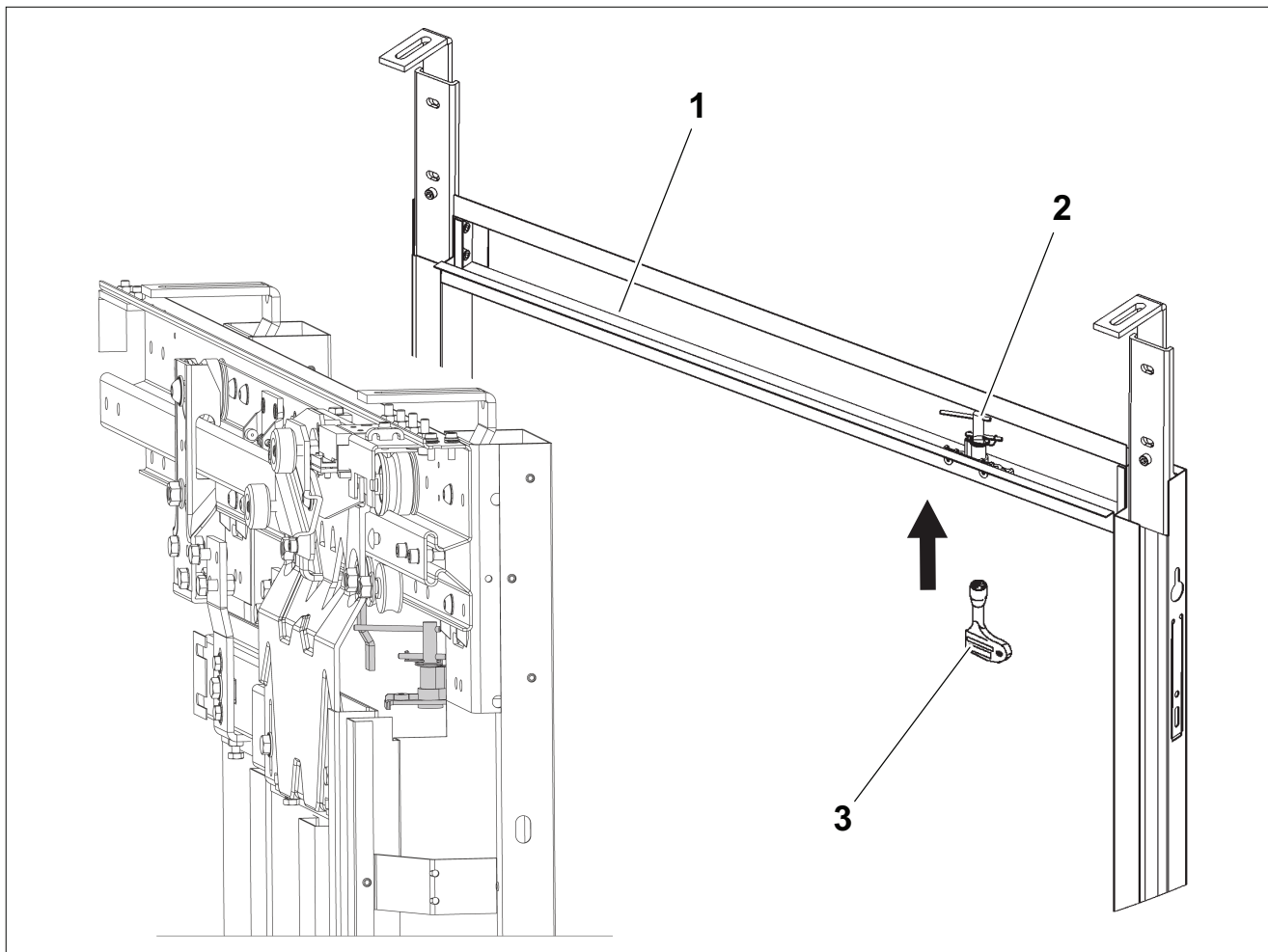
1 Door lock  
3 Steel rope

2 Release device

- Pull the steel rope and make sure that the door lock opens.
- Make sure that the release device does not touch the door lock.
- Make sure that the steel rope is not damaged.



### 5.37.13 Checking of emergency release



- 1 Door frame header
- 3 Emergency release key

- 2 Emergency release arm

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

### 5.37.14 Checking of switch KNET for damage

**i** The switch KNET is optional and only mandatory when the Temporary Safety Device (TSD) is installed.

- ▶ Make sure that the switch KNET has no damage.
  - ↳ If the switch KNET is damaged, replace it.



### 5.37.15 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

## 5.38 Landing door lock for DO WIA-AP

### 5.38.1 Maintenance plan for landing door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridges

### 5.38.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

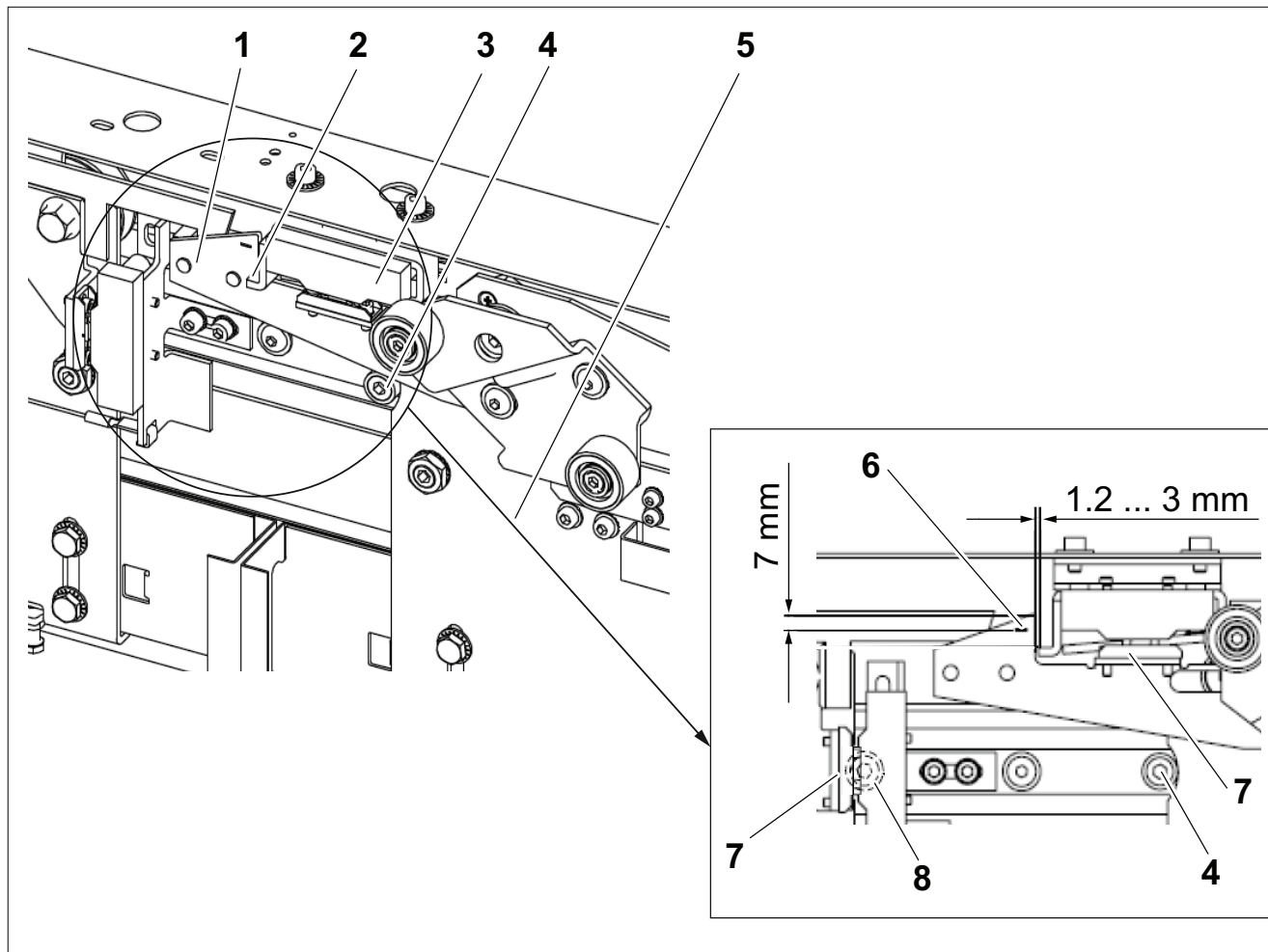
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.38.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.38.4 Checking of latch position



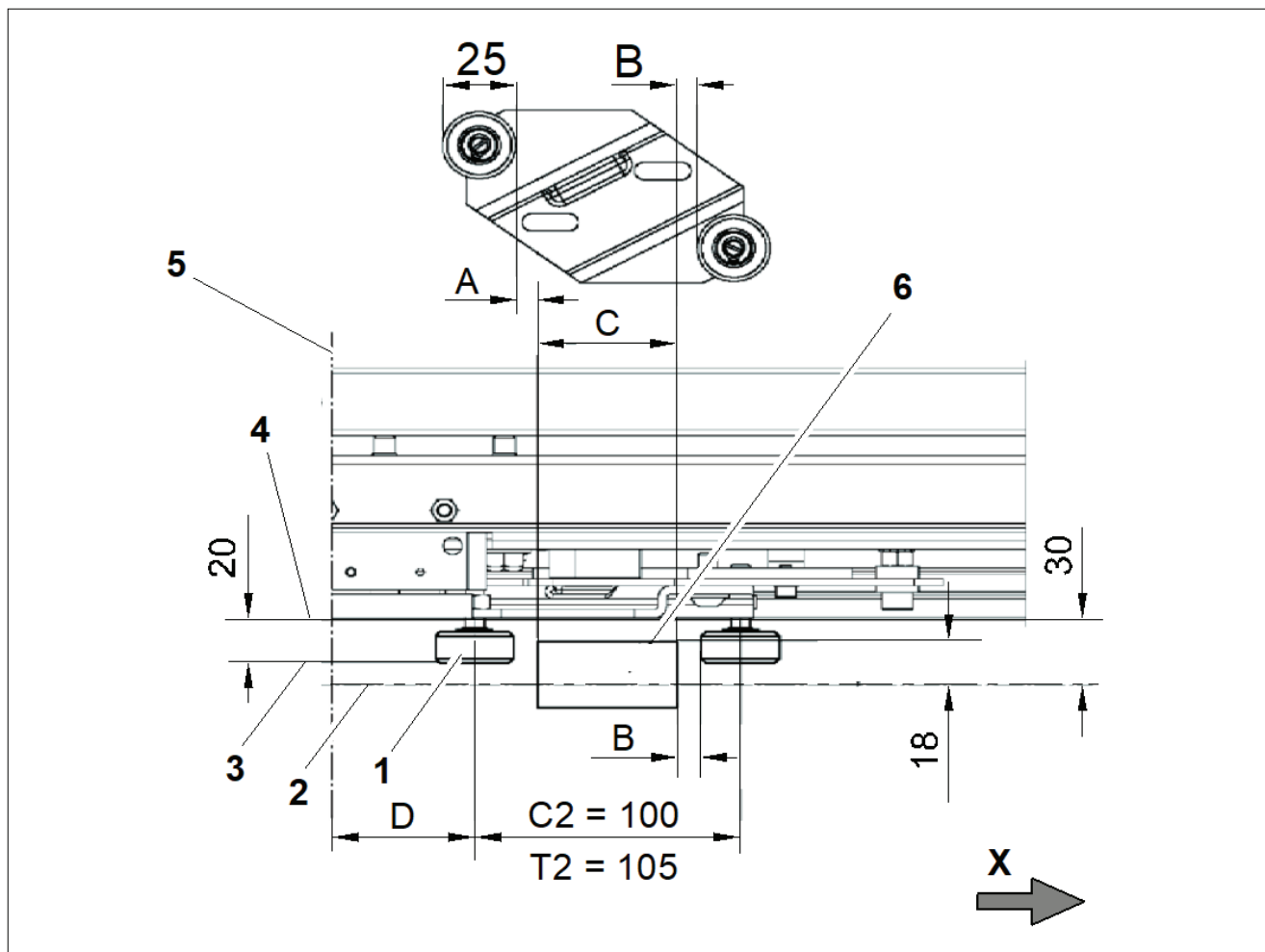
- |   |                |   |                  |
|---|----------------|---|------------------|
| 1 | Latch          | 2 | KTS support      |
| 3 | Switch KTS     | 4 | Stopper buffer   |
| 5 | Door carrier   | 6 | 7 mm marked line |
| 7 | Contact bridge | 8 | Switch KTS1      |

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.
- Make sure that the clearance between the latch and the KTS support is 1.2 ... 3 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



### 5.38.5 Checking of lock roller position



- |          |                              |          |   |
|----------|------------------------------|----------|---|
| <b>X</b> | Opening direction            | <b>1</b> | Lock roller                               |
| <b>2</b> | Car door sill projection     | <b>3</b> | Lock roller support parallel to sill line |
| <b>4</b> | Landing door sill projection | <b>5</b> | Center line or side closing               |
| <b>6</b> | Clutch                       |          |   |

DO VAR 35 C2	A	C
Clutch phase I	16	42
CDL phase I	16	48
Clutch phase II	17	39
CDL phase II	17	47

DO VAR 35 T2	A	C
Clutch phase I	21	42
CDL phase I	21	48
Clutch phase II	22	39
CDL phase II	22	47

DO VAR 15 C2	A	C
Clutch phase I	16	42
CDL phase I	16	48
Clutch phase II	17	39
CDL phase II	17	47



<b>DO VAR 15 T2</b>	<b>A</b>	<b>C</b>
Clutch phase I	21	42
CDL phase I	21	48
Clutch phase II	22	39
CDL phase II	22	47

<b>DO VAR 30 AP C2/T2</b>	<b>B</b>	<b>C</b>
Clutch	8.5	58.5

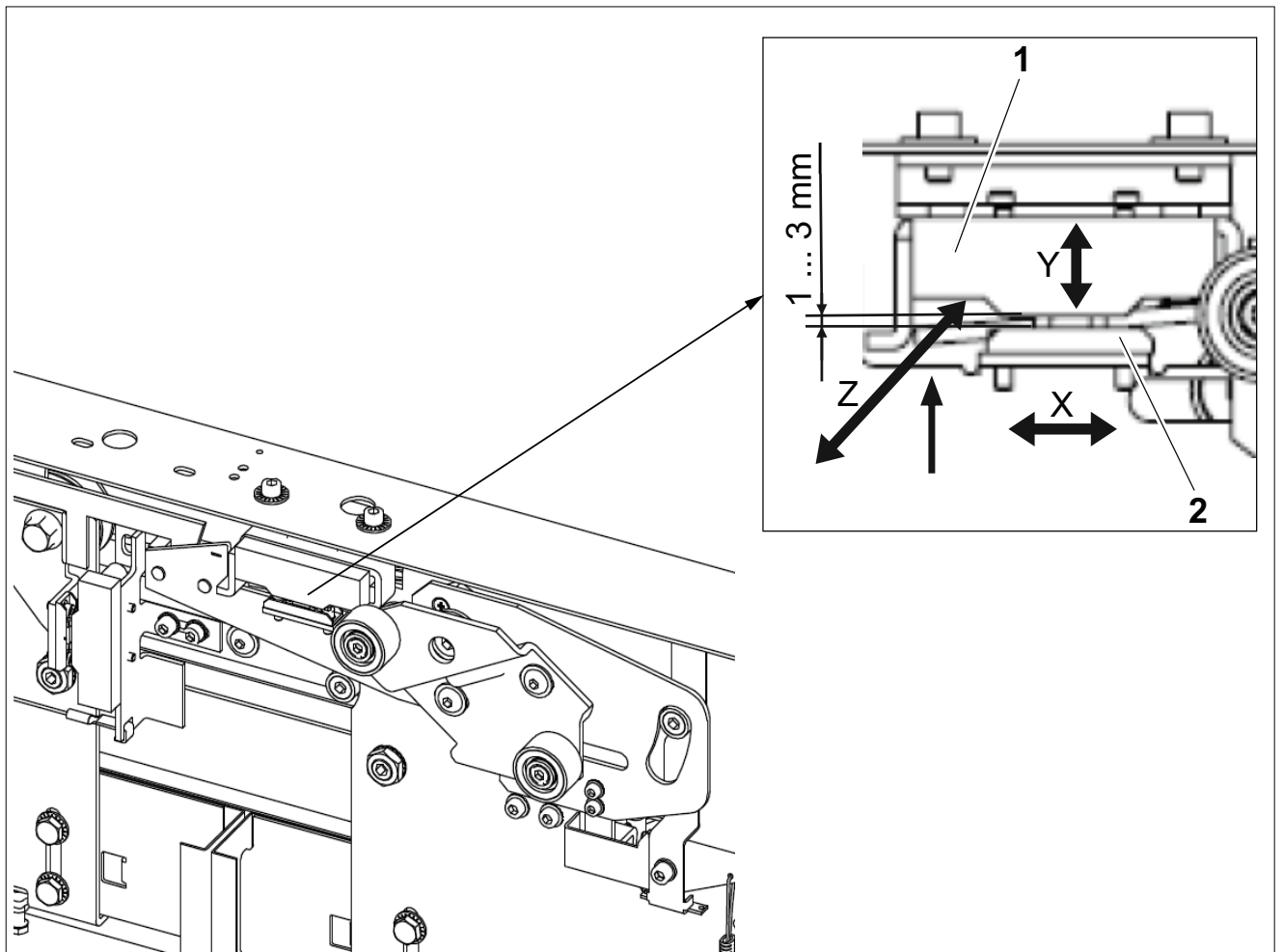
<b>FEC C2/T2</b>	<b>B</b>	<b>C</b>
Clutch/CDL	10	48

<b>Landing door</b>	<b>D</b>
T2	86
C2	106

- Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide run by.
  - ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.

### 5.38.6 Checking of alignment of switches and contact bridges

#### 5.38.6.1 Checking of alignment of landing door switch KTS and contact bridge



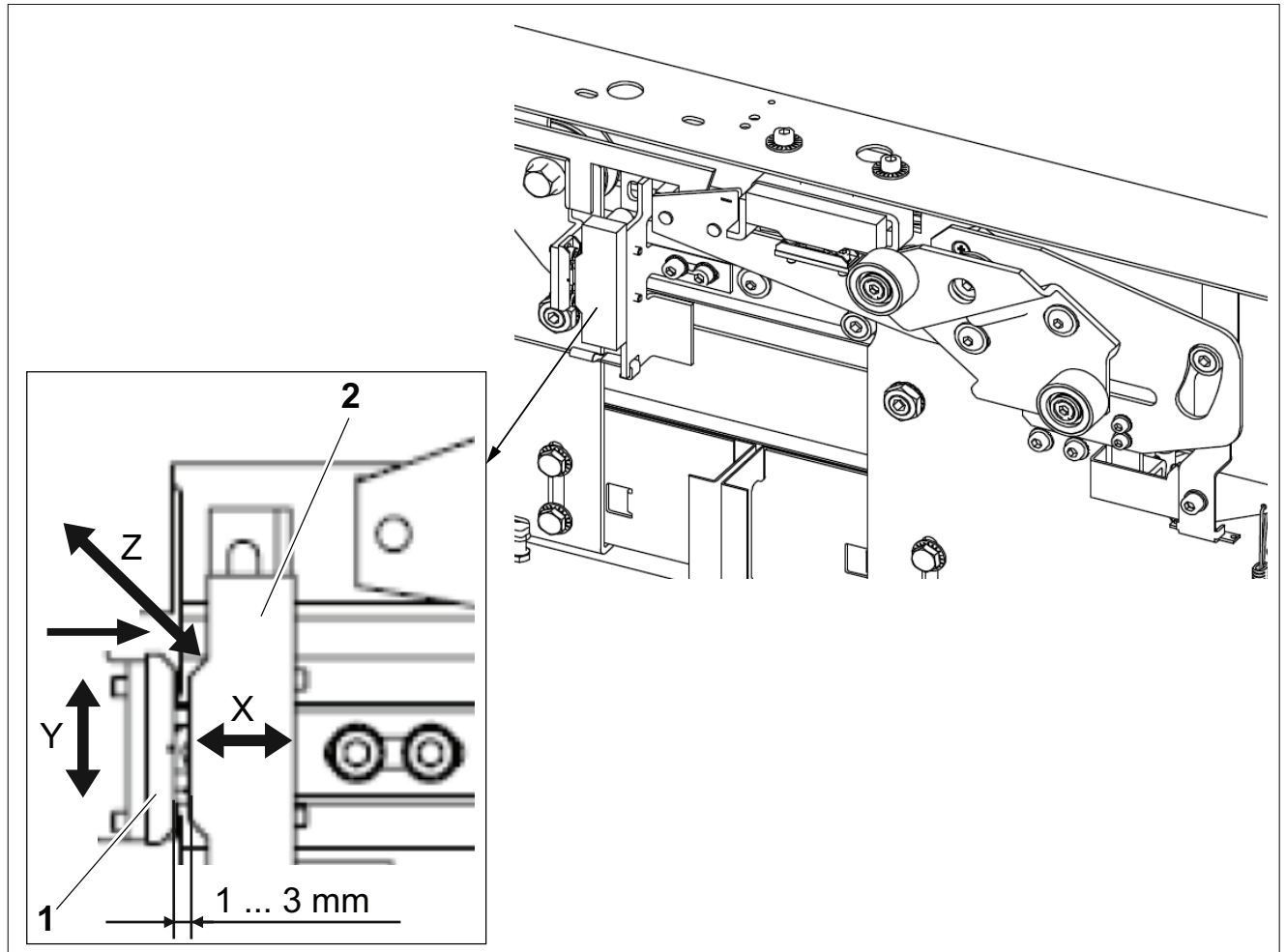
1 Switch KTS

2 Contact bridge



- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
- Do a check of the KTS position.
  - X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
  - Y-Position: Distance of the contact bridge to the switch KTS is 1 ... 3 mm.
  - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
- ↳ If required, adjust the switch KTS.

#### 5.38.6.2 Checking of alignment of safety switch KTS1 and contact bridge



1 Contact bridge

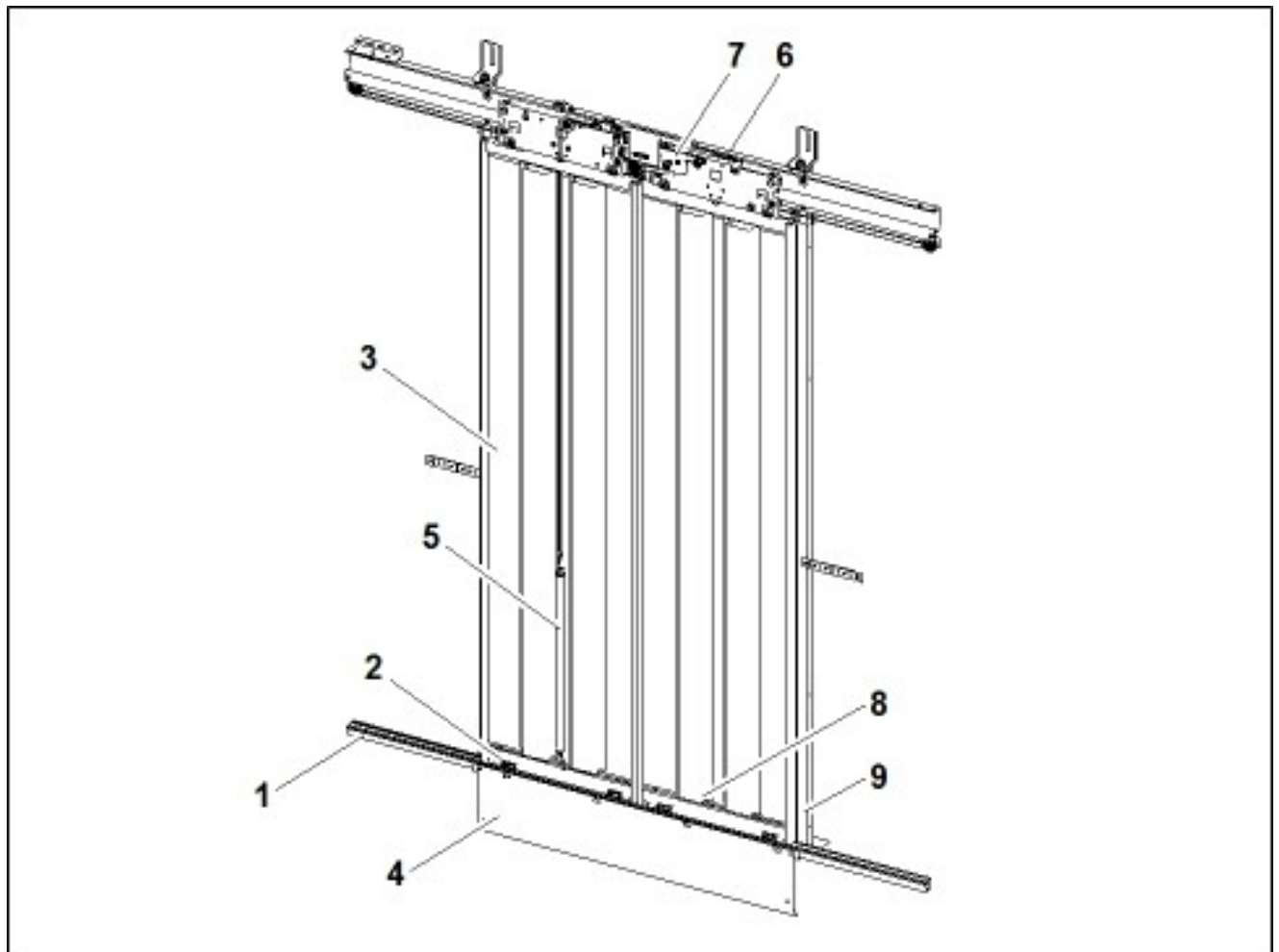
2 Safety switch KTS1

- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
- Do a check of the KTS1 position.
  - X-position: Distance of the contact bridge to the safety switch KTS1 is 1 ... 3 mm.
  - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
  - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



## 5.39 Landing door DO WIC-AP

### 5.39.1 Overview of landing door



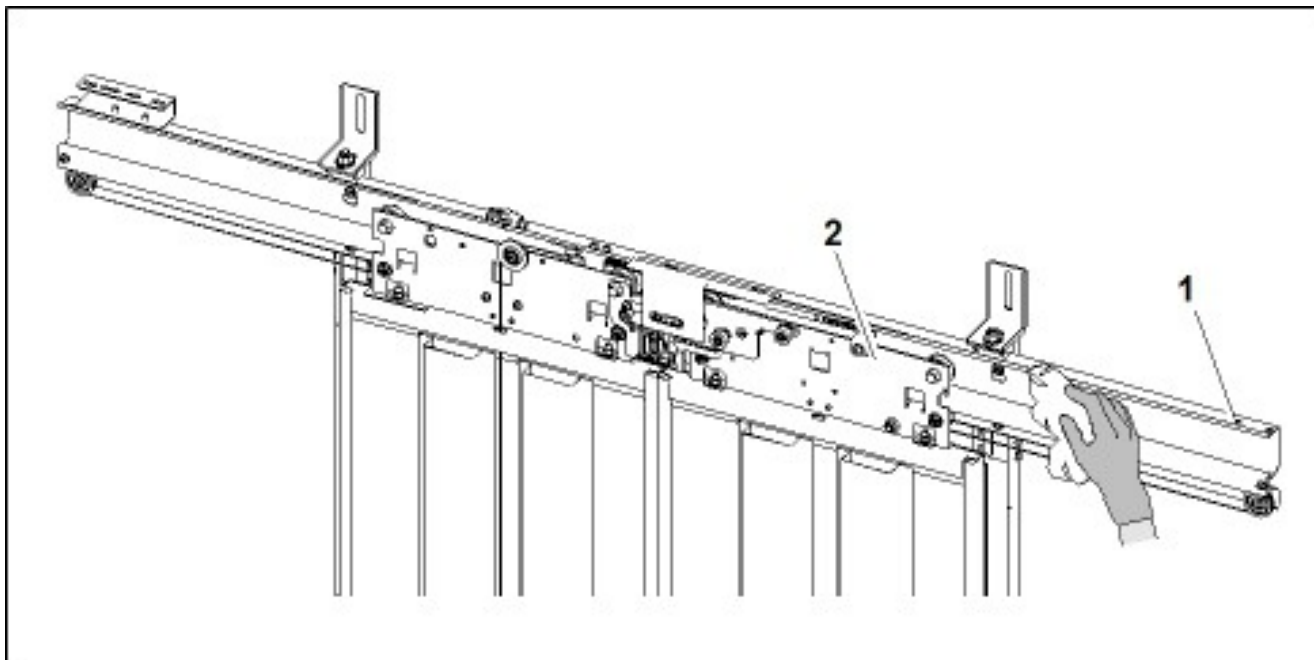
- |   |                                 |   |                                       |
|---|---------------------------------|---|---------------------------------------|
| 1 | Door sill                       | 2 | Guide shoe                            |
| 3 | Door panel                      | 4 | Toe guard                             |
| 5 | Door closing spring (BT = 1000) | 6 | Door closing spring (BT = 800 or 900) |
| 7 | Door mechanism                  | 8 | Release device of door lock           |
| 9 | Door frame                      |   |                                       |

### 5.39.2 Maintenance plan for landing door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of landing door lock DO WIC-AP
12	Checking of door panel performance



### 5.39.3 Checking of cleanness



1 Rail

2 Door mechanism



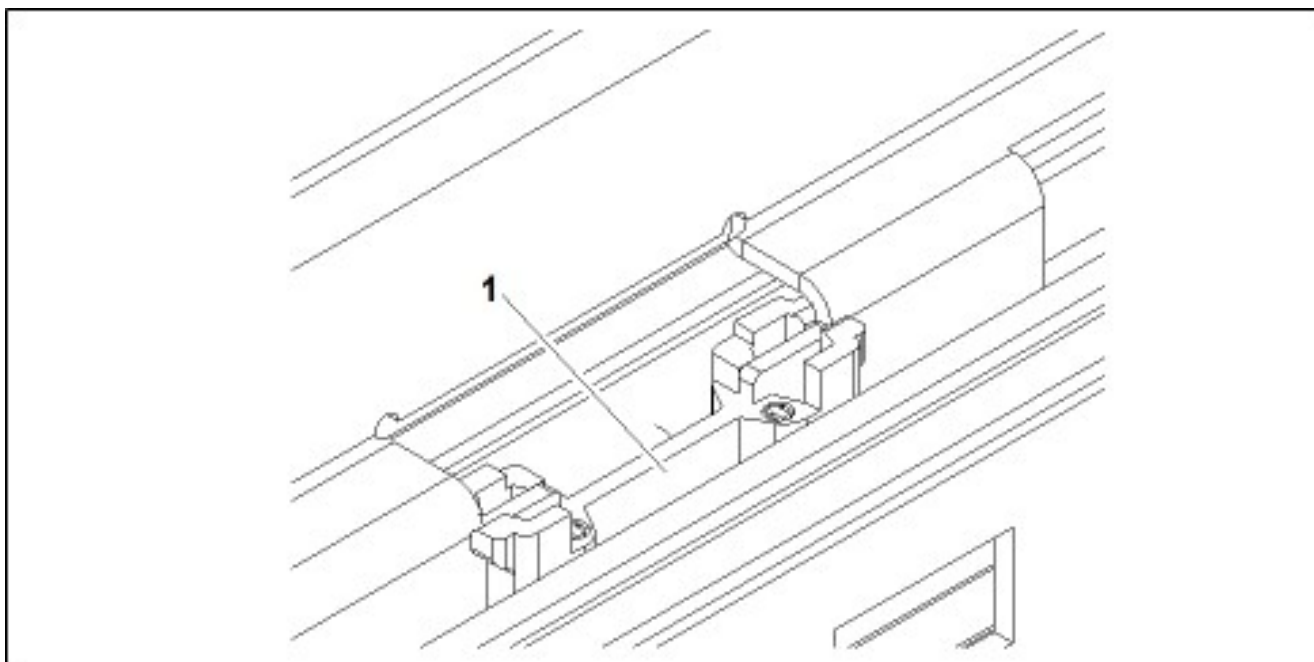
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- ▶ Make sure that the complete door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.39.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.39.5 Checking of condition of guide shoe

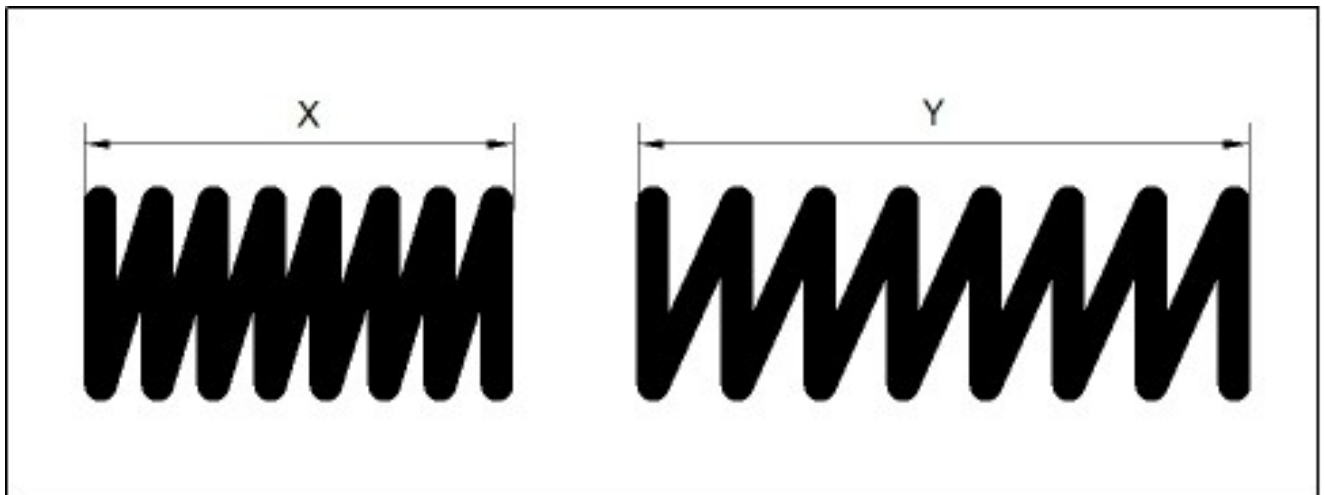


1 Guide shoe



- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 3\text{ mm}$ , replace the guide shoe.

#### 5.39.6 Checking of condition of synchronization rope

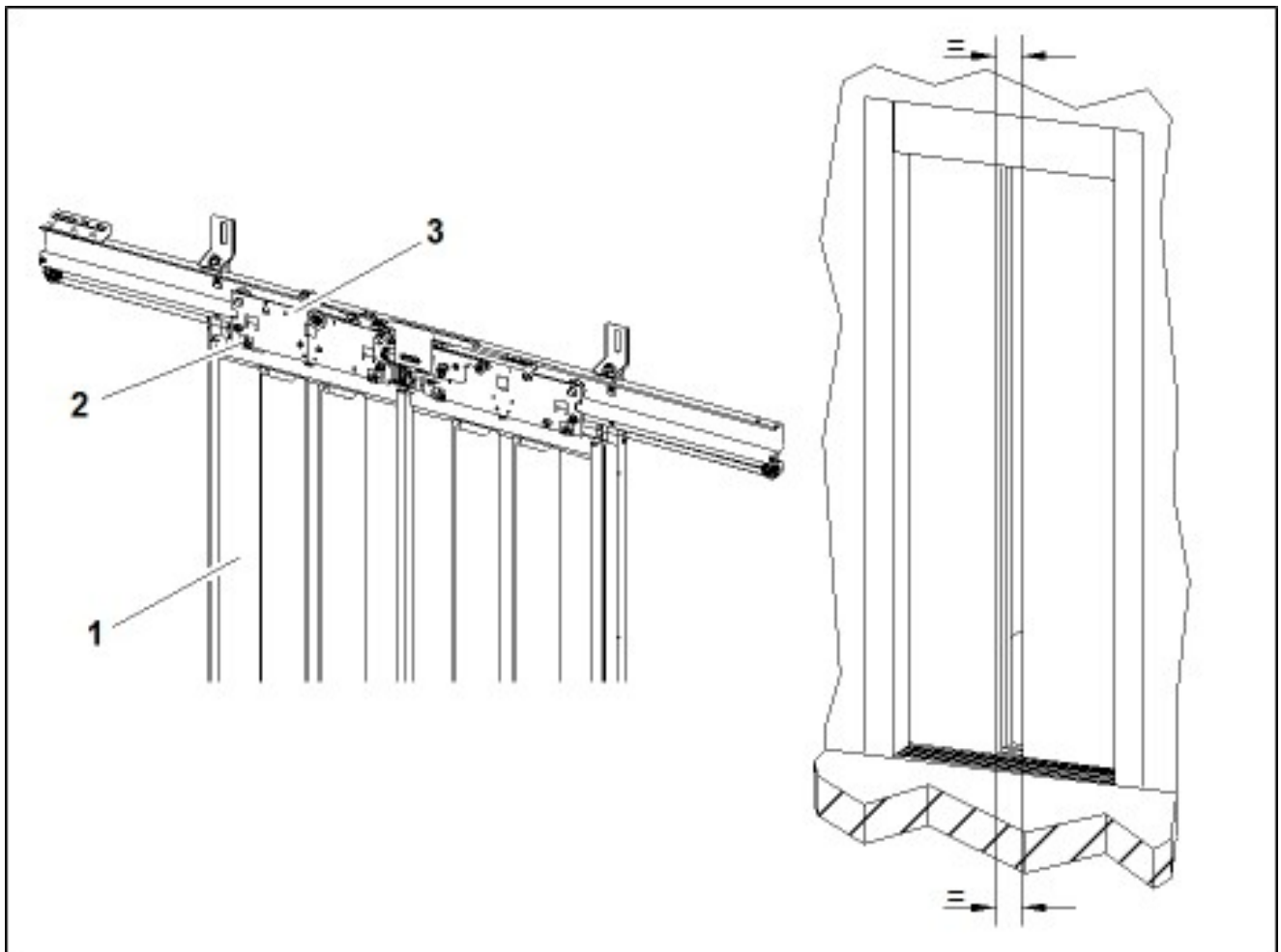


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 10\text{ mm}$ .

#### 5.39.7 Checking of vertical parallelism of door panel

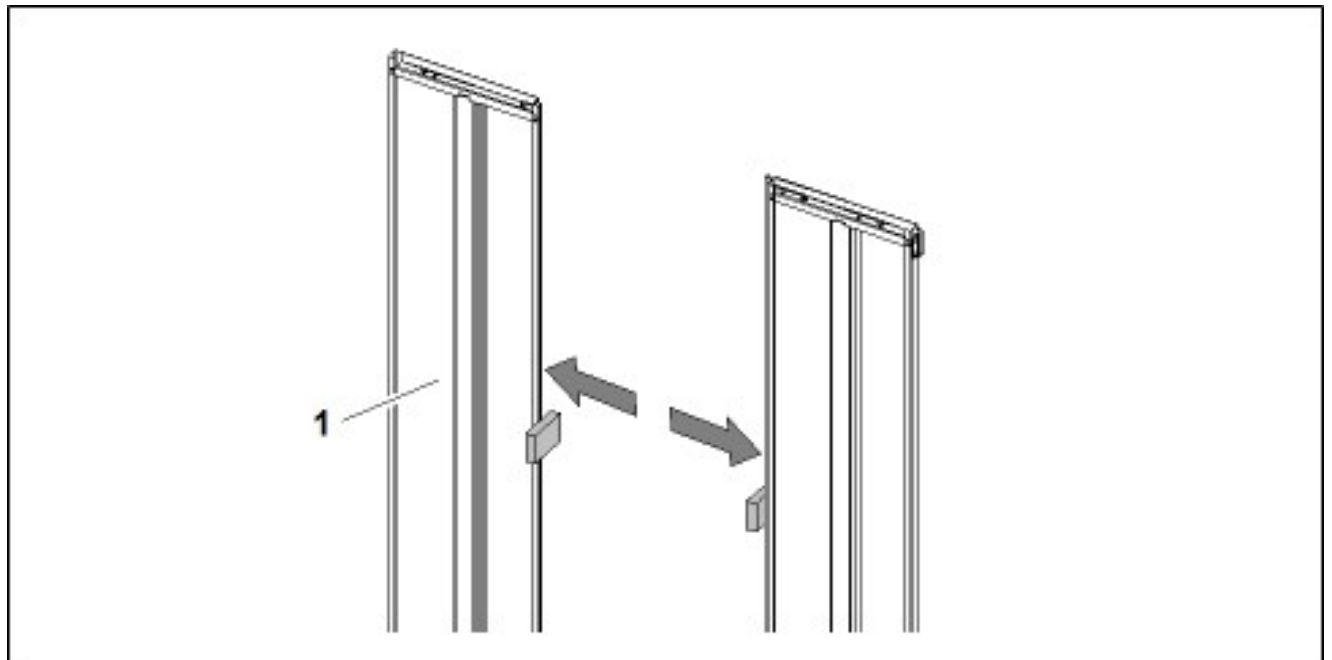




- 1 Door panel
- 2 Bolt
- 3 Door mechanism

- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

### 5.39.8 Checking of alignment of door panel



- 1 Door panel

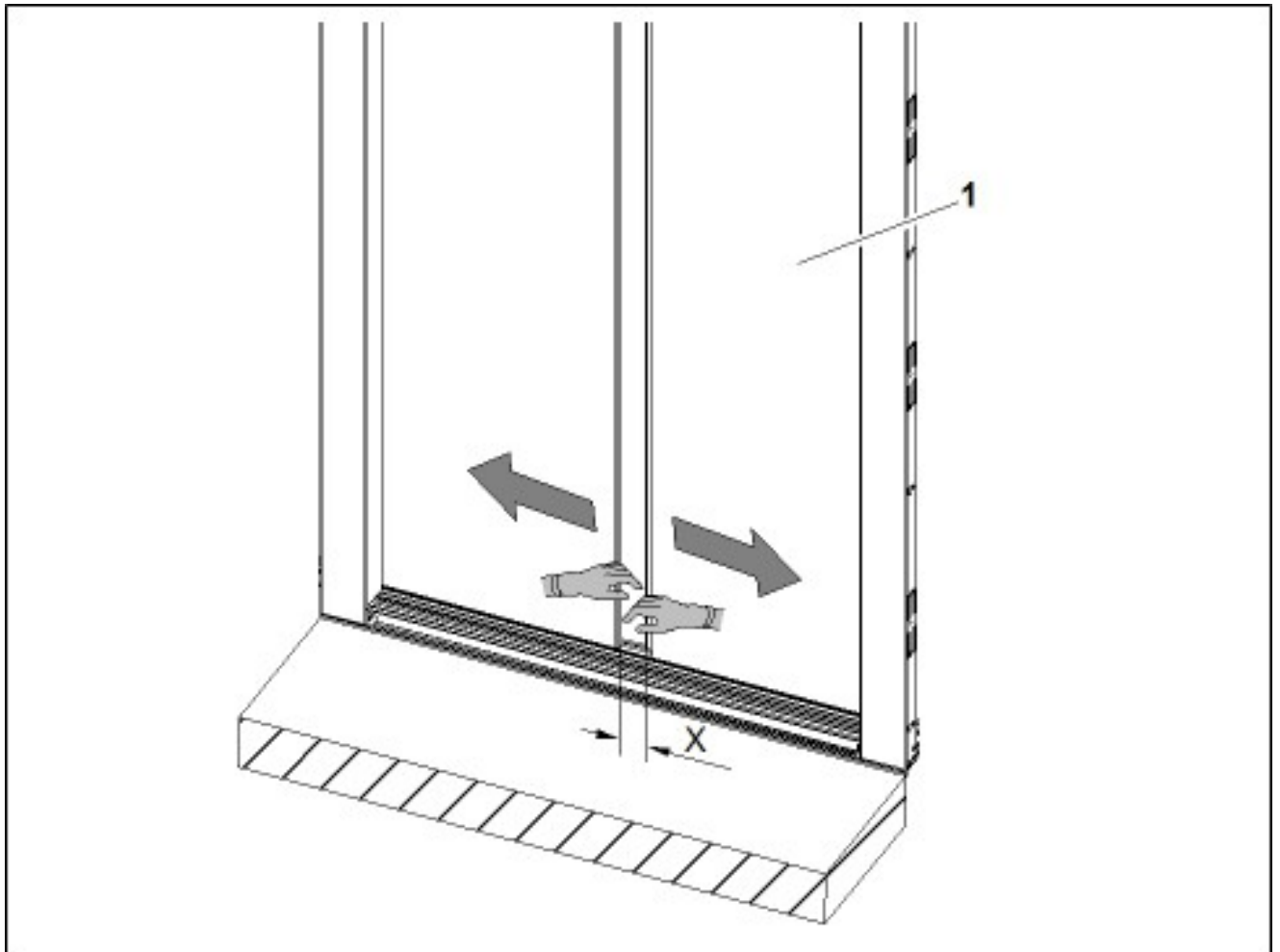
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

### 5.39.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.39.10 Checking of door opening in locked condition



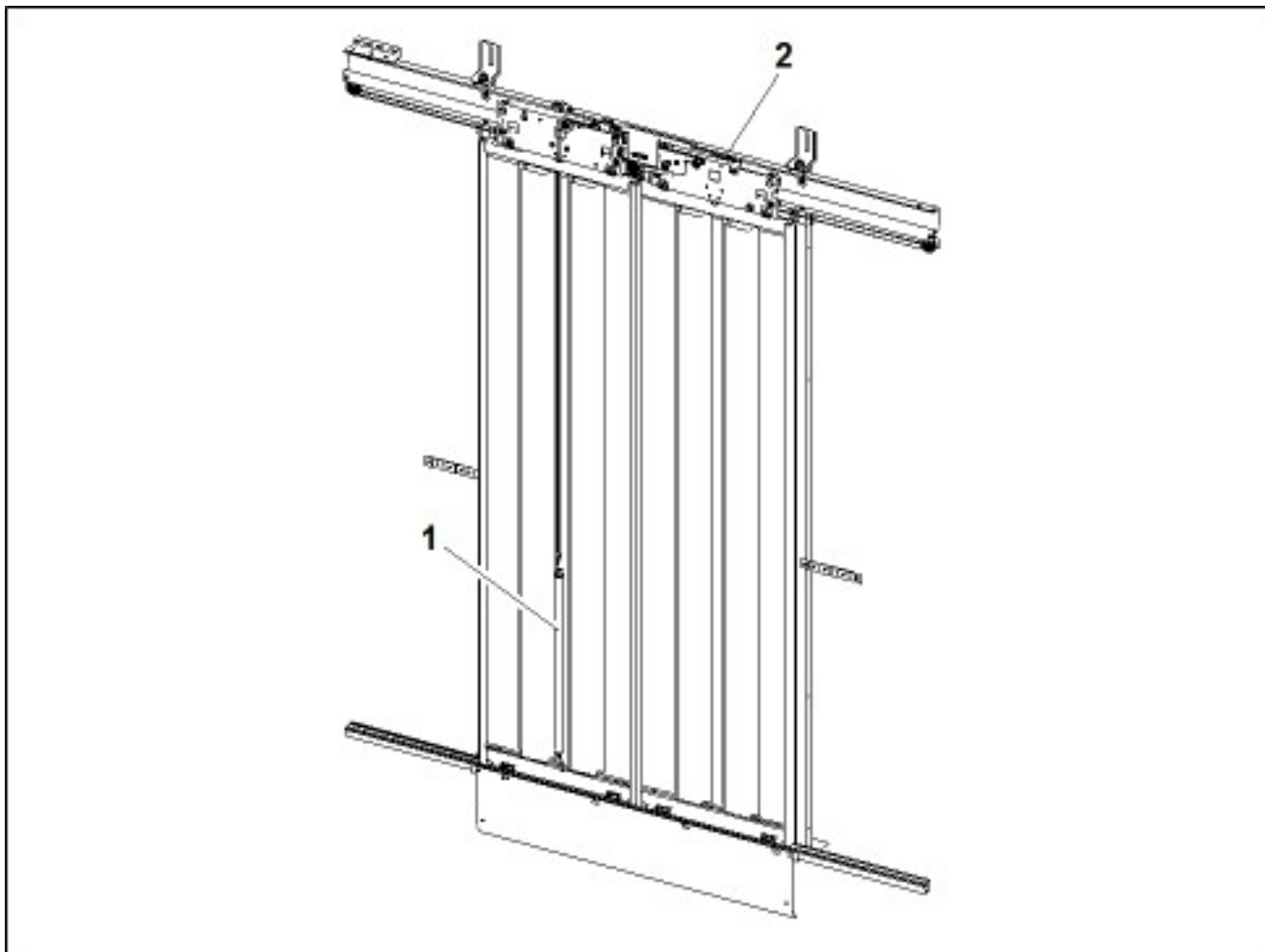
##### 1 Door panel

**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 45$  mm.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



### 5.39.11 Checking of operation of door closing spring



1 Door closing spring (BT = 1000)

2 Door closing spring (BT= 800 or 900)

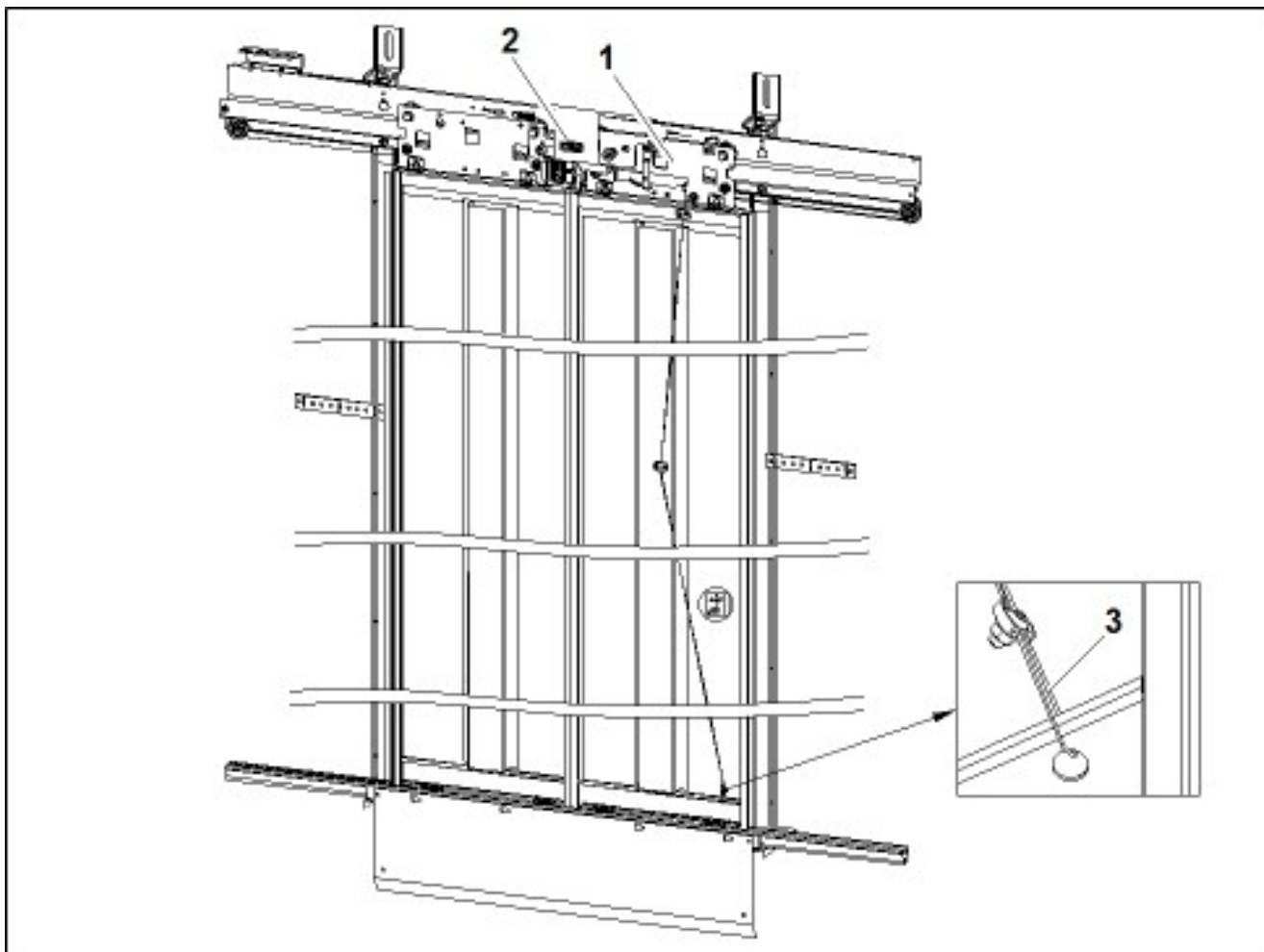
- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than 1 spring holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



### 5.39.12 Checking of release device of door lock



Do a check of the release device on the lowest landing door only.



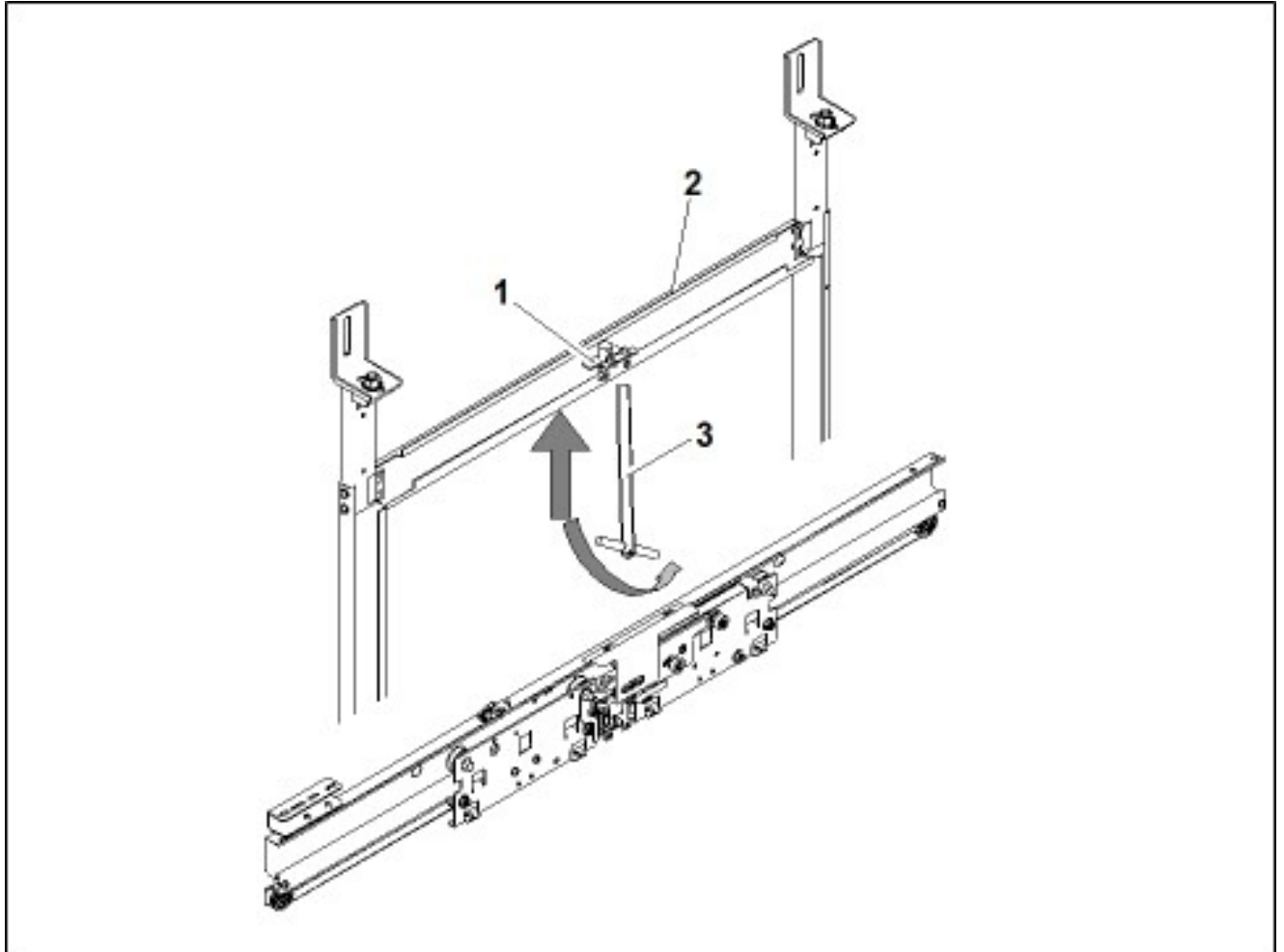
1 Release device  
3 Steel rope

2 Door lock

- Pull the steel rope and make sure that the door lock opens.
- Make sure that the release device does not touch the door lock.
- Make sure that the steel rope is not damaged.



### 5.39.13 Checking of emergency release




- 1 Emergency release arm
- 3 Emergency release key

- 2 Door frame header


- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.




### 5.39.14 Checking of door panel performance

 Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.

 Make sure that the movement of the door is done in normal or HMI operation mode.


- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.

 Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.


## 5.40 Landing door lock for DO WIC-AP

### 5.40.1 Maintenance plan for landing door

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridges

### 5.40.2 Checking of identification marking

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

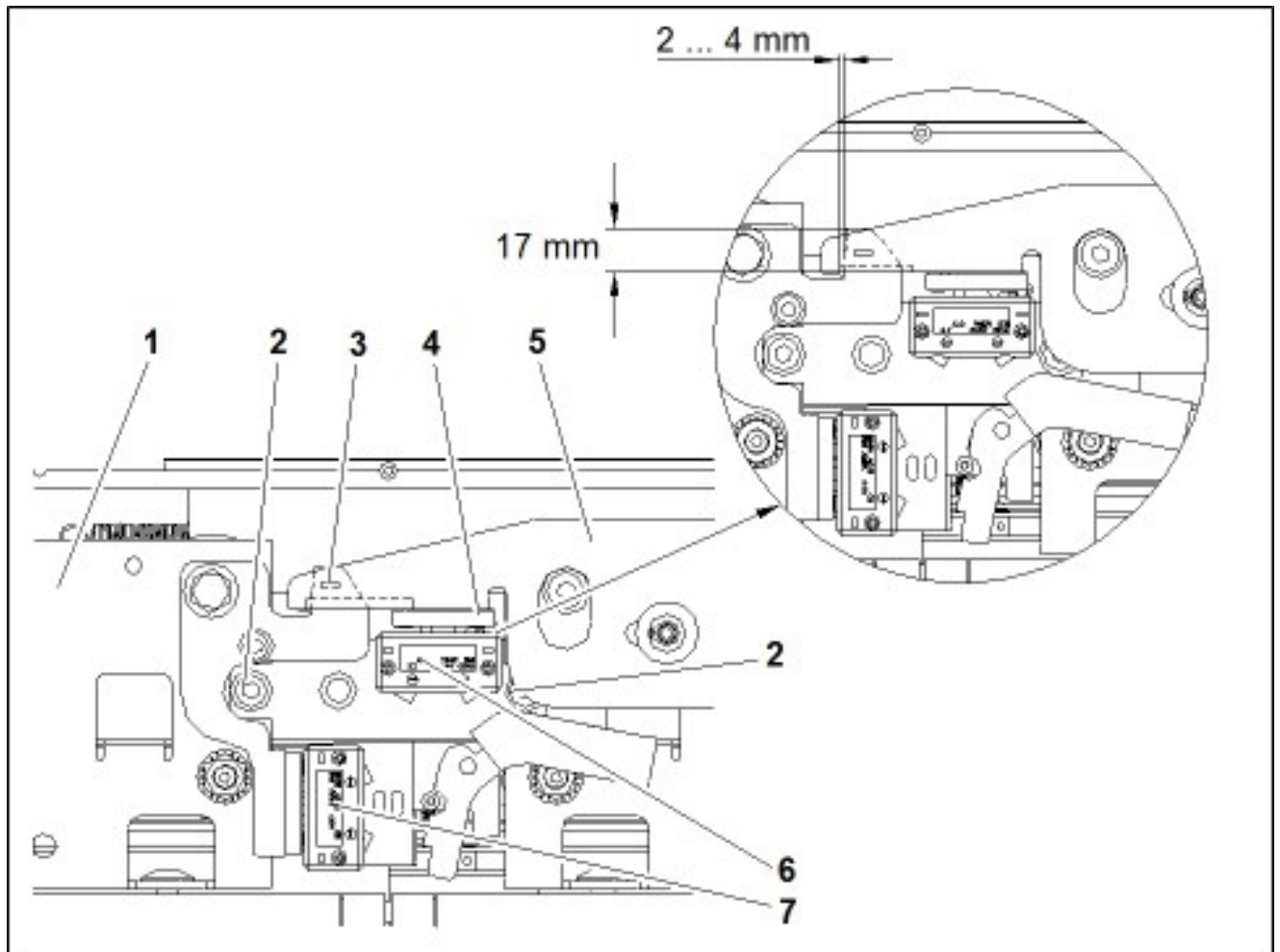
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

### 5.40.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.40.4 Checking of latch position



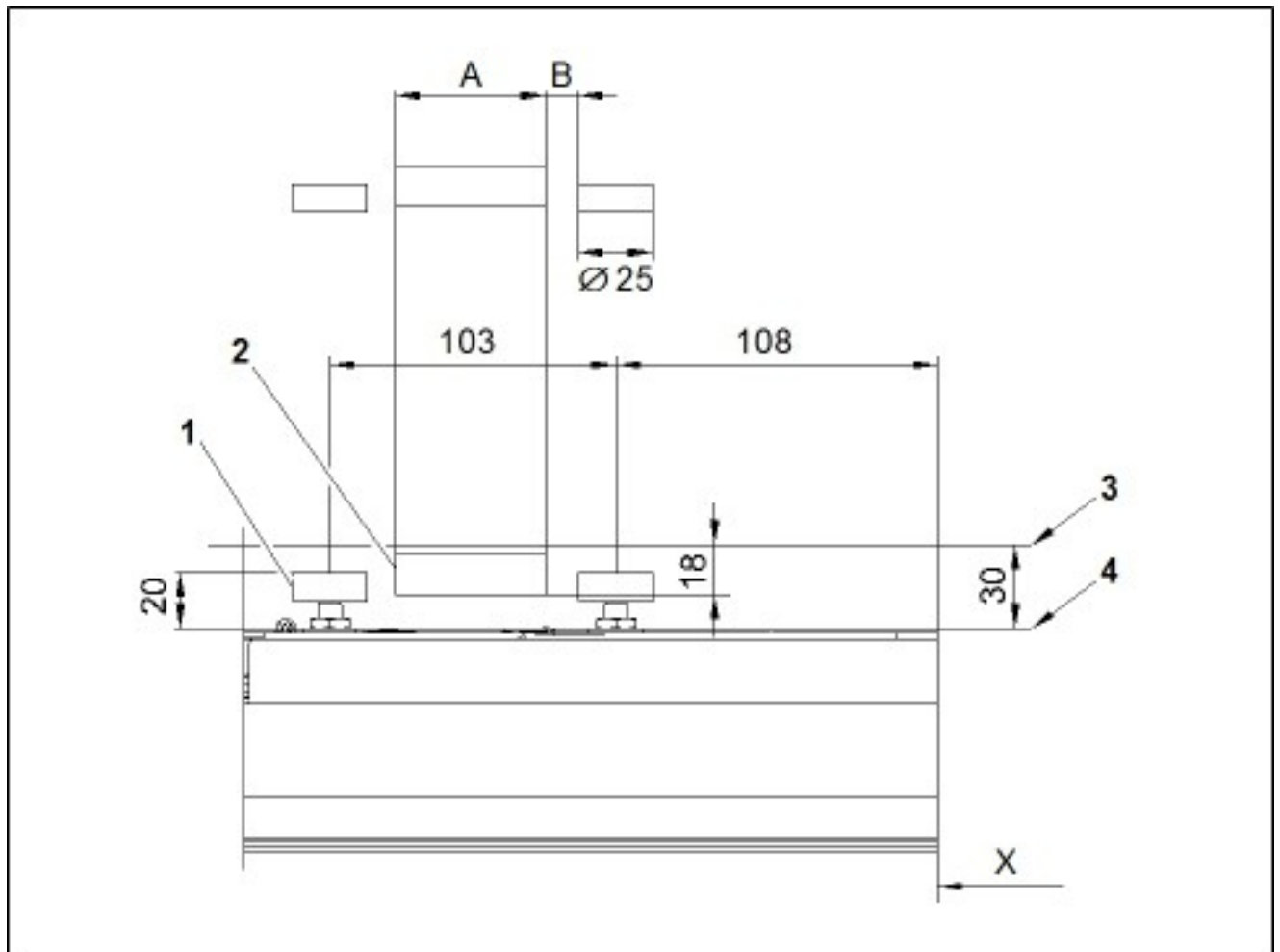
- |   |                  |   |                |
|---|------------------|---|----------------|
| 1 | Carrier          | 2 | Stopper buffer |
| 3 | 7 mm marked line | 4 | Contact bridge |
| 5 | Latch            | 6 | Switch KTS     |
| 7 | Switch KTS1      |   |                |

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.
- Make sure that the clearance between the latch and the KTS support is 2 ... 4 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



#### 5.40.5 Checking of lock roller position



- X** Closing center line  
**2** Clutch  
**4** Landing door sill projection

- 1** Lock roller  
**3** Car door sill projection

DO V15 C2	A	B
Clutch phase II	39	15.5
CDL phase II	47	

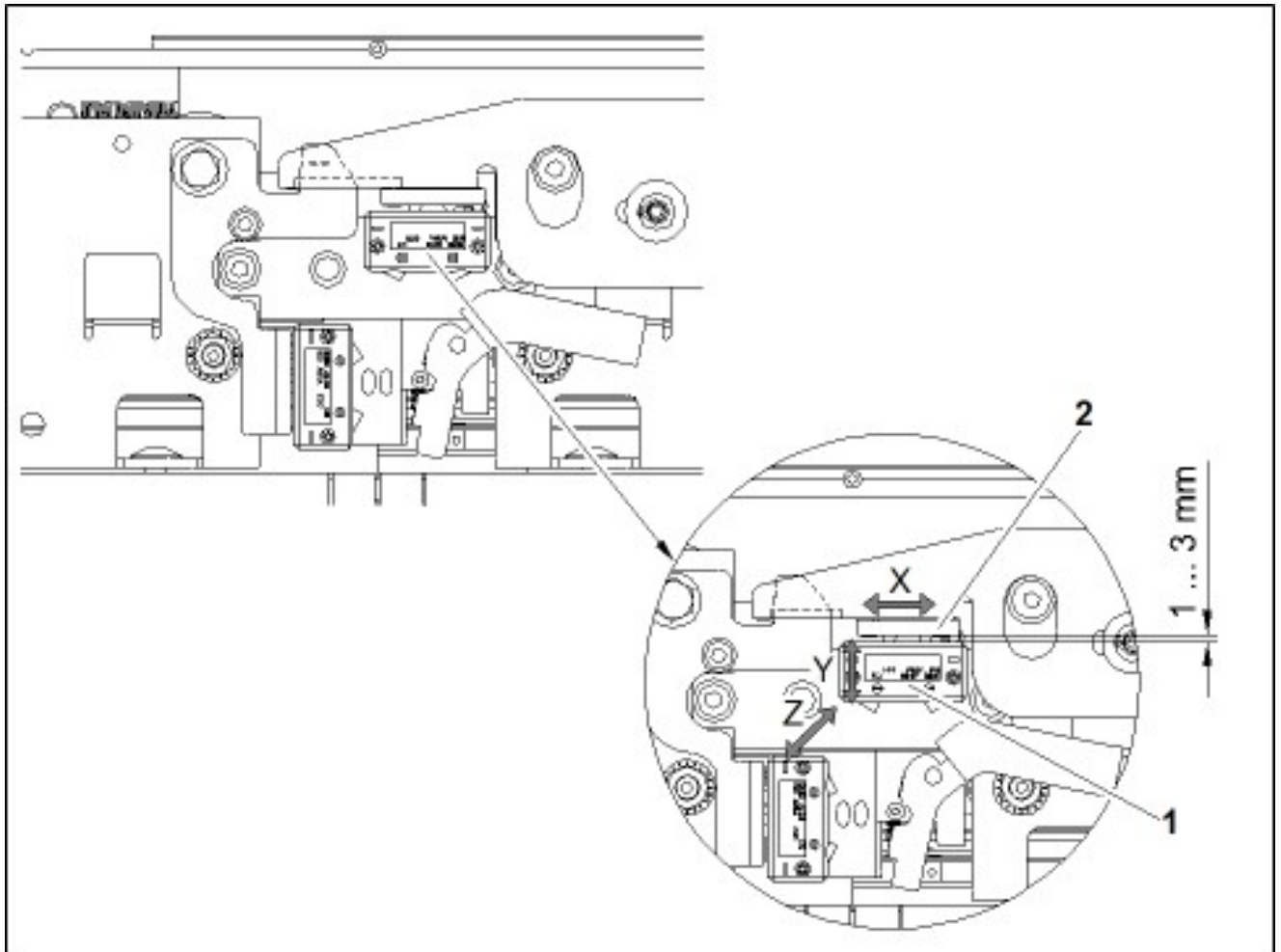
DO V35 C2	A	B
Clutch phase I (LONG)	42	14.5
CDL phase I (LONG)	48	
Clutch phase II (LONG)	39	15.5
CDL phase II (LONG)	47	

- Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.
  - ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.



## 5.40.6 Checking of alignment of switches and contact bridges

### 5.40.6.1 Checking of alignment of landing door switch KTS and contact bridge



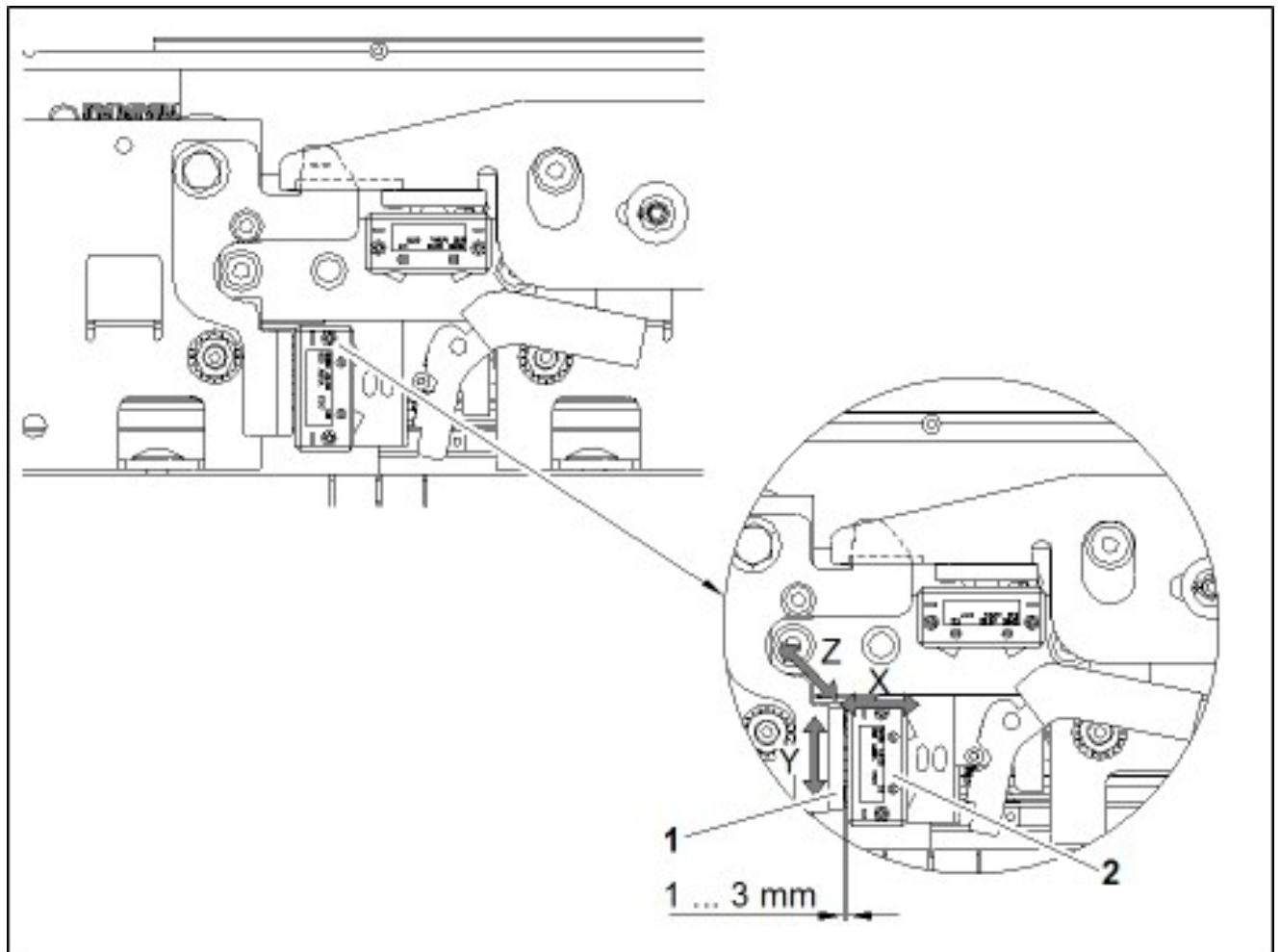
1 Switch KTS

2 Contact bridge

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS position.
    - X-Position: Contact bridge fit centered to the housing holes of switch KTS.
    - Y-Position: Distance of the contact bridge to the switch KTS is 1 ... 3 mm.
    - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
- ↳ If required, adjust the switch KTS.



#### 5.40.6.2 Checking of alignment of safety switch KTS1 and contact bridge



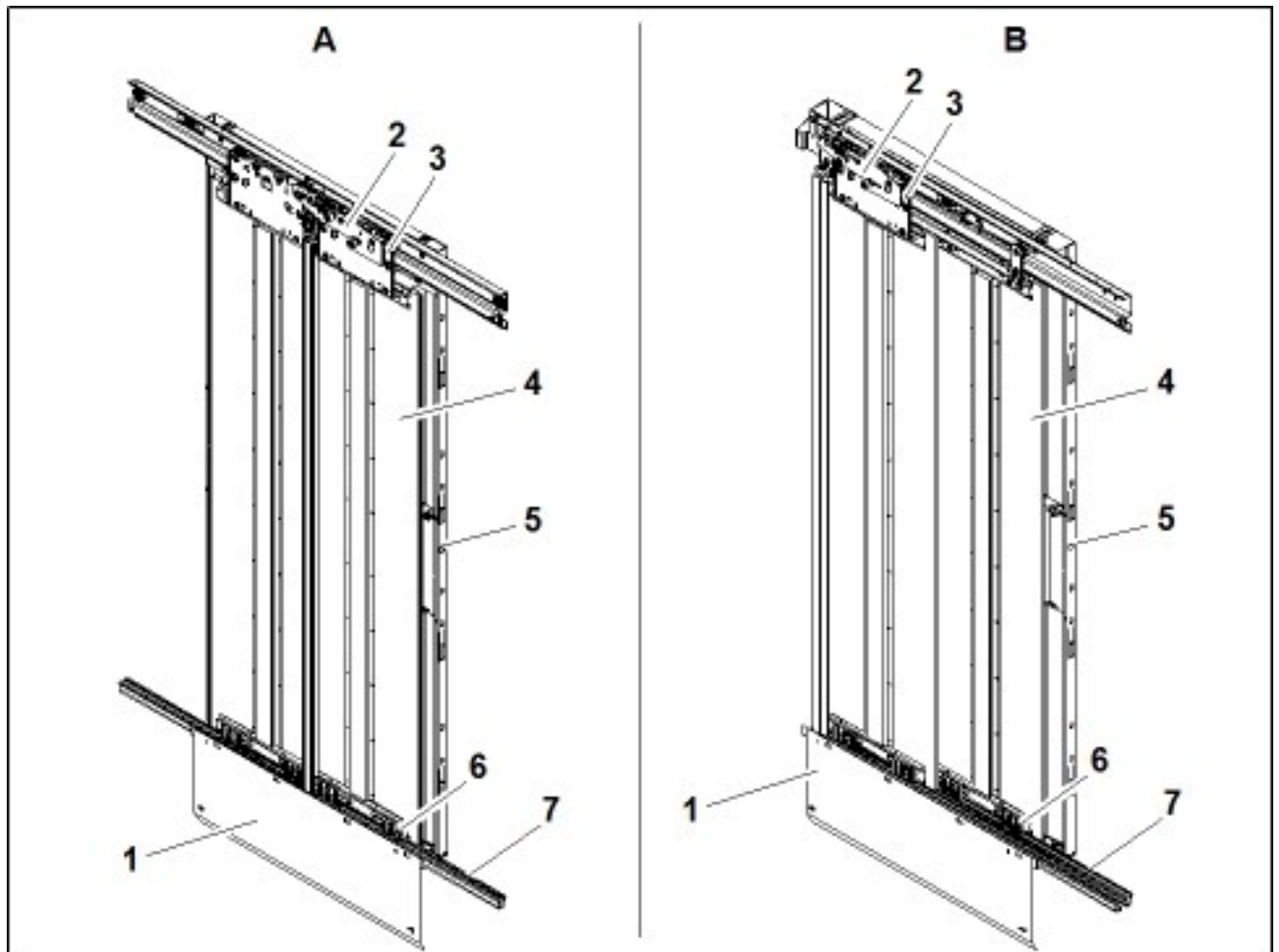
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 1 ... 3 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



**5.41 Landing door DO WIV-EU**  
**5.41.1 Overview of landing door**



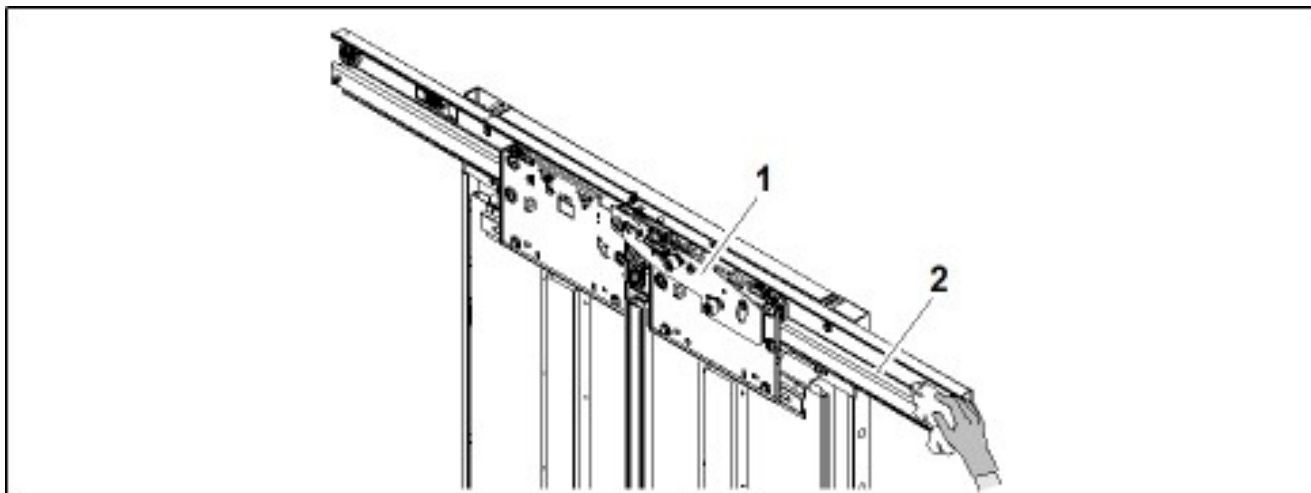
- |          |                     |          |                 |
|----------|---------------------|----------|-----------------|
| <b>A</b> | Centre door         | <b>B</b> | Telescopic door |
| <b>1</b> | Toe guard           | <b>2</b> | Door mechanism  |
| <b>3</b> | Door closing spring | <b>4</b> | Door panel      |
| <b>5</b> | Door frame          | <b>6</b> | Guide shoe      |
| <b>7</b> | Door sill           |          |                 |

**5.41.2 Maintenance plan for landing door**

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of switch KNET for damage
12	Checking of landing door lock DO WIV-EU
12	Checking of door panel performance



### 5.41.3 Checking of cleanness



1 Door mechanism

2 Rail



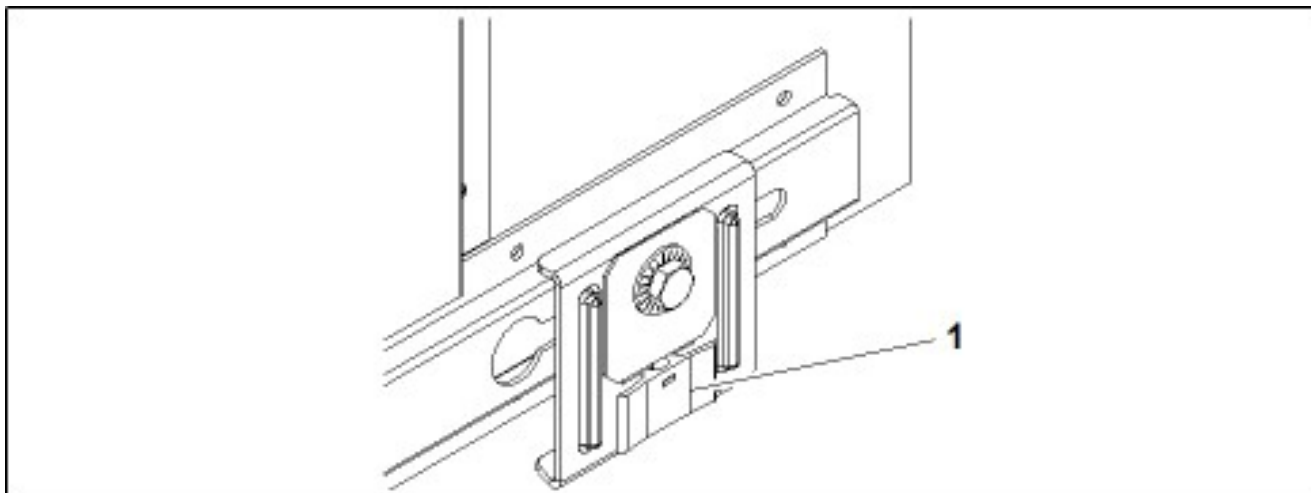
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- ▶ Make sure that the door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.41.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.41.5 Checking of condition of guide shoe

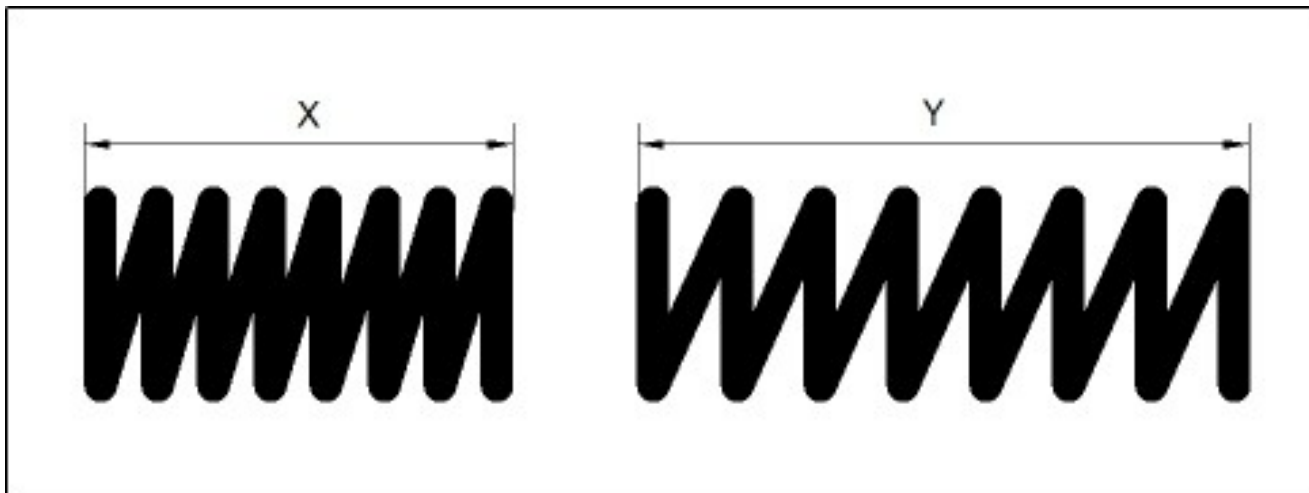


1 Guide shoe

- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 3$  mm, replace the guide shoe.



#### 5.41.6 Checking of condition of synchronization rope

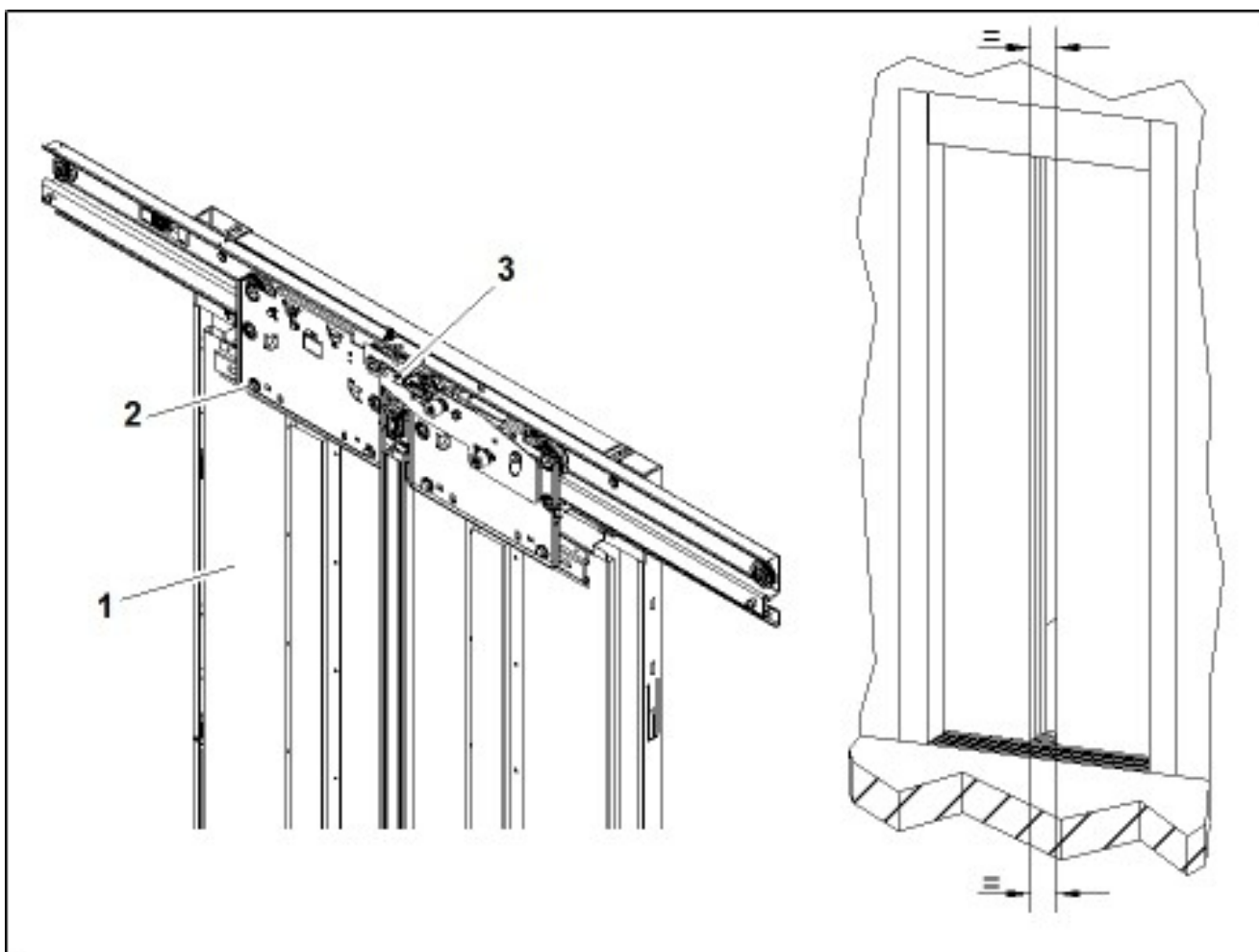


**X** Compressed spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 21$  mm.

#### 5.41.7 Checking of vertical parallelism of door panel



**1** Door panel

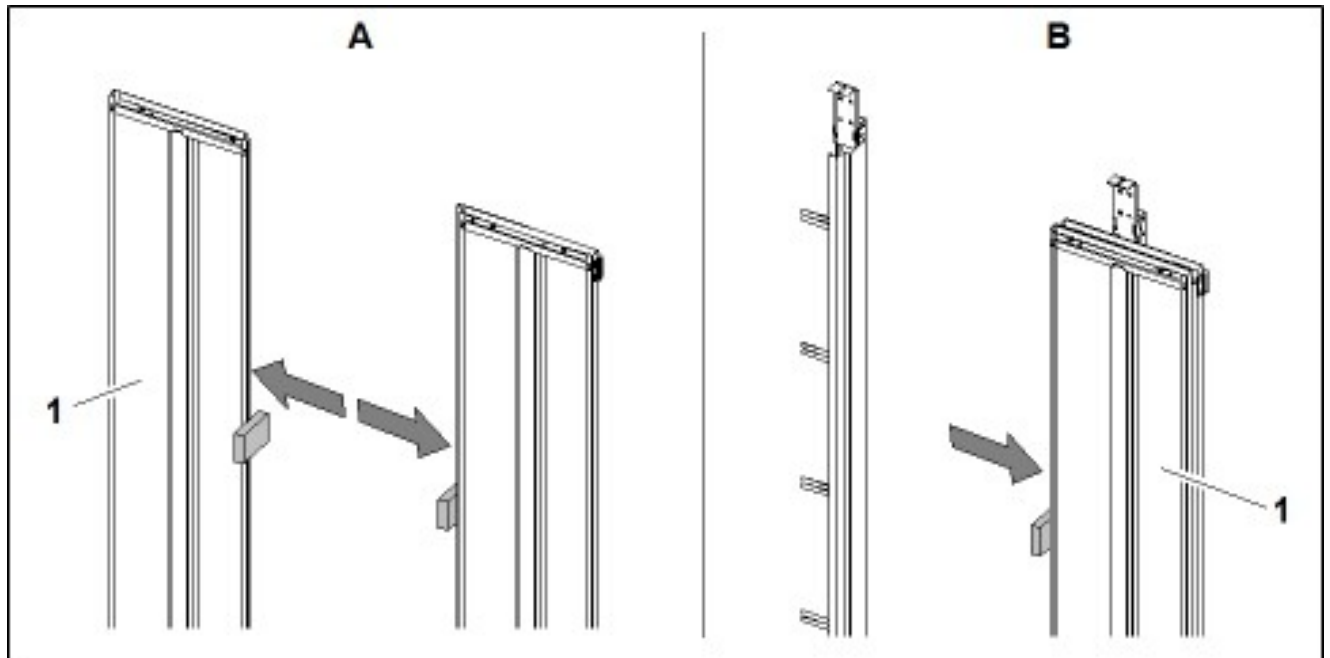
**2** Bolt

**3** Door mechanism



- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels:
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.41.8 Checking of alignment of door panel



**A** Center door

**B** Telescopic door

**1** Door panel

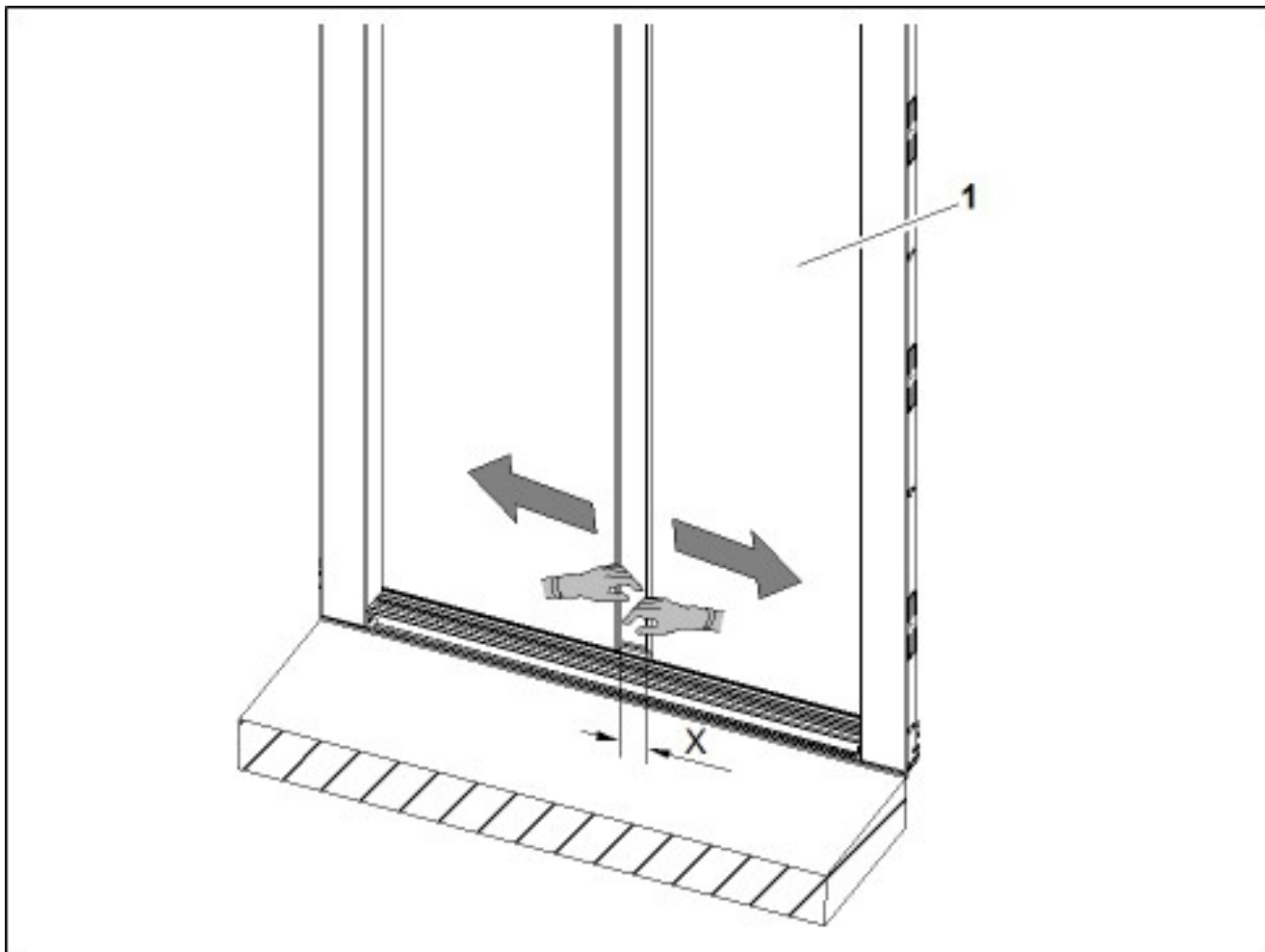
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

#### 5.41.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.41.10 Checking of door opening in locked condition



##### 1 Door panel

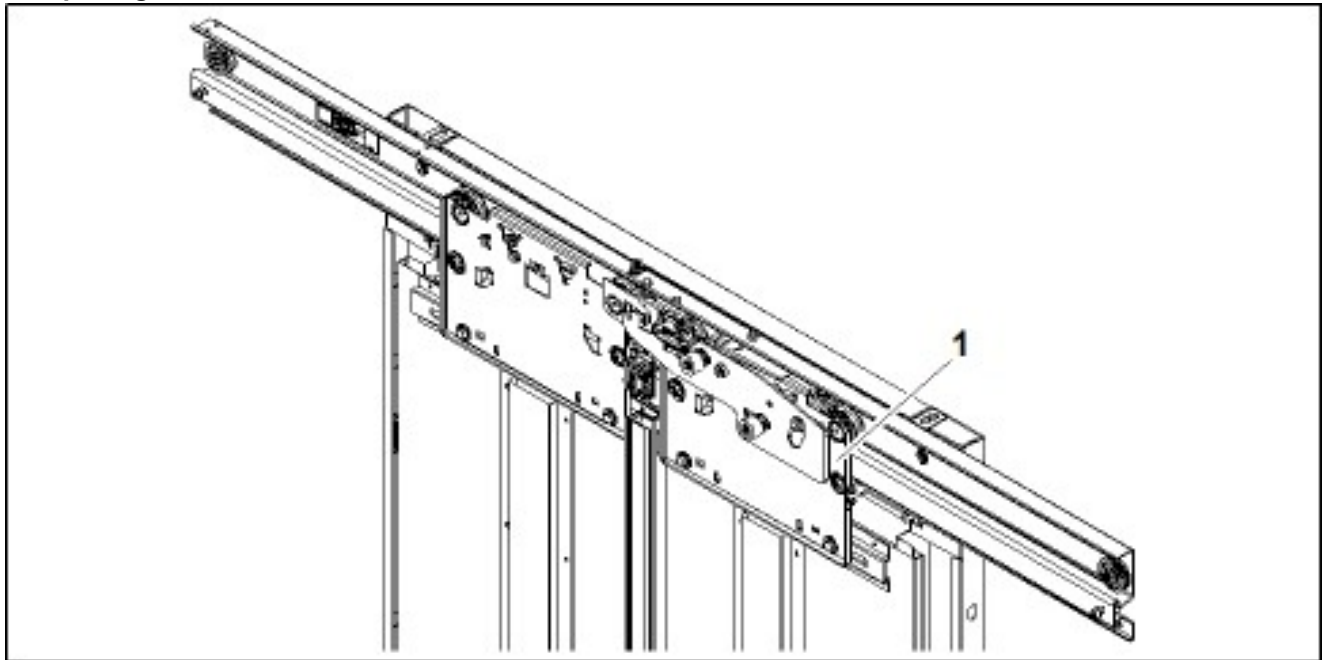
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



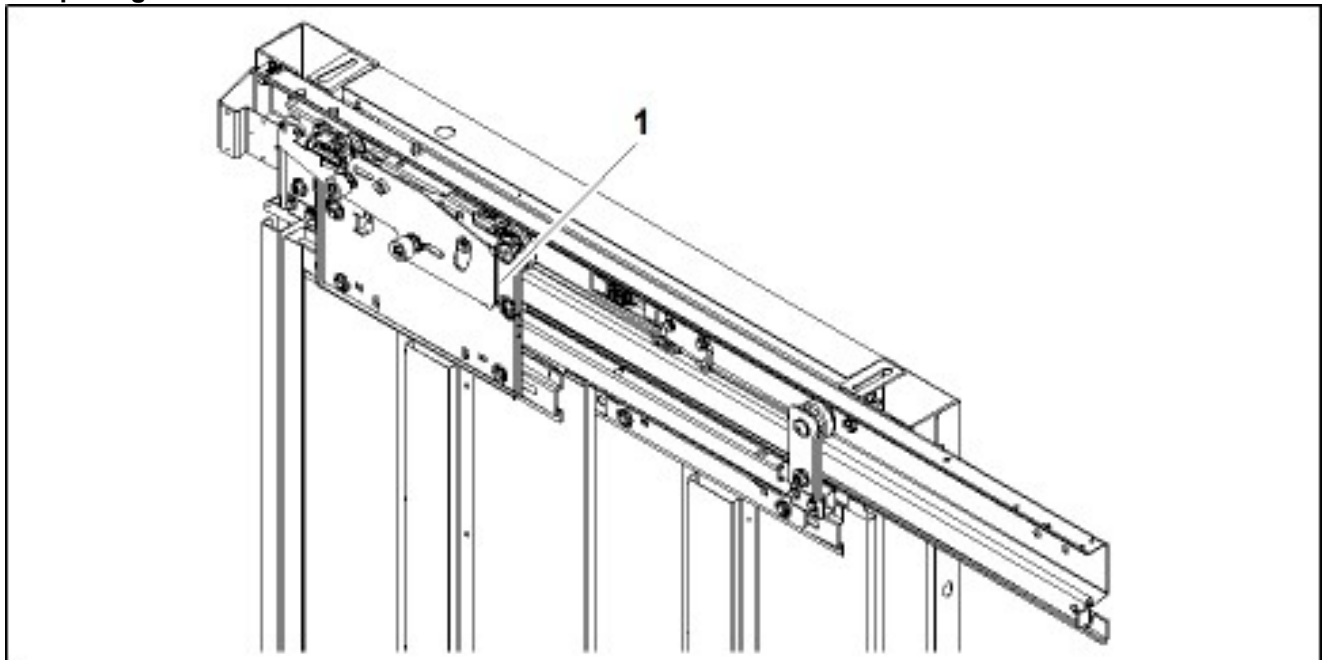
#### 5.41.11 Checking of operation of door closing spring

##### C2 opening



1 Door closing spring

##### T2 opening



1 Door closing spring

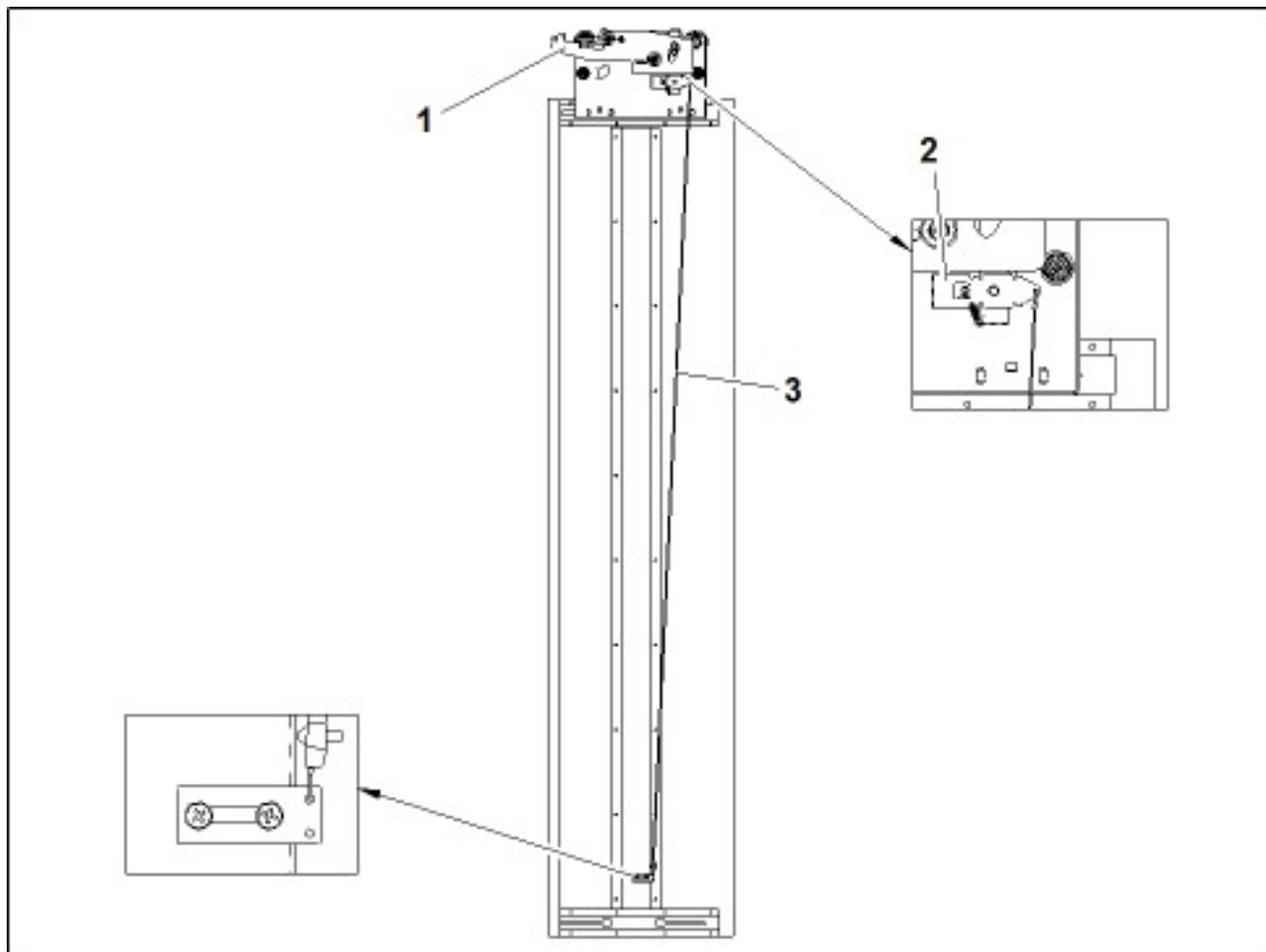
- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



#### 5.41.12 Checking of release device of door lock



Do a check of the release device on the lowest landing door only.



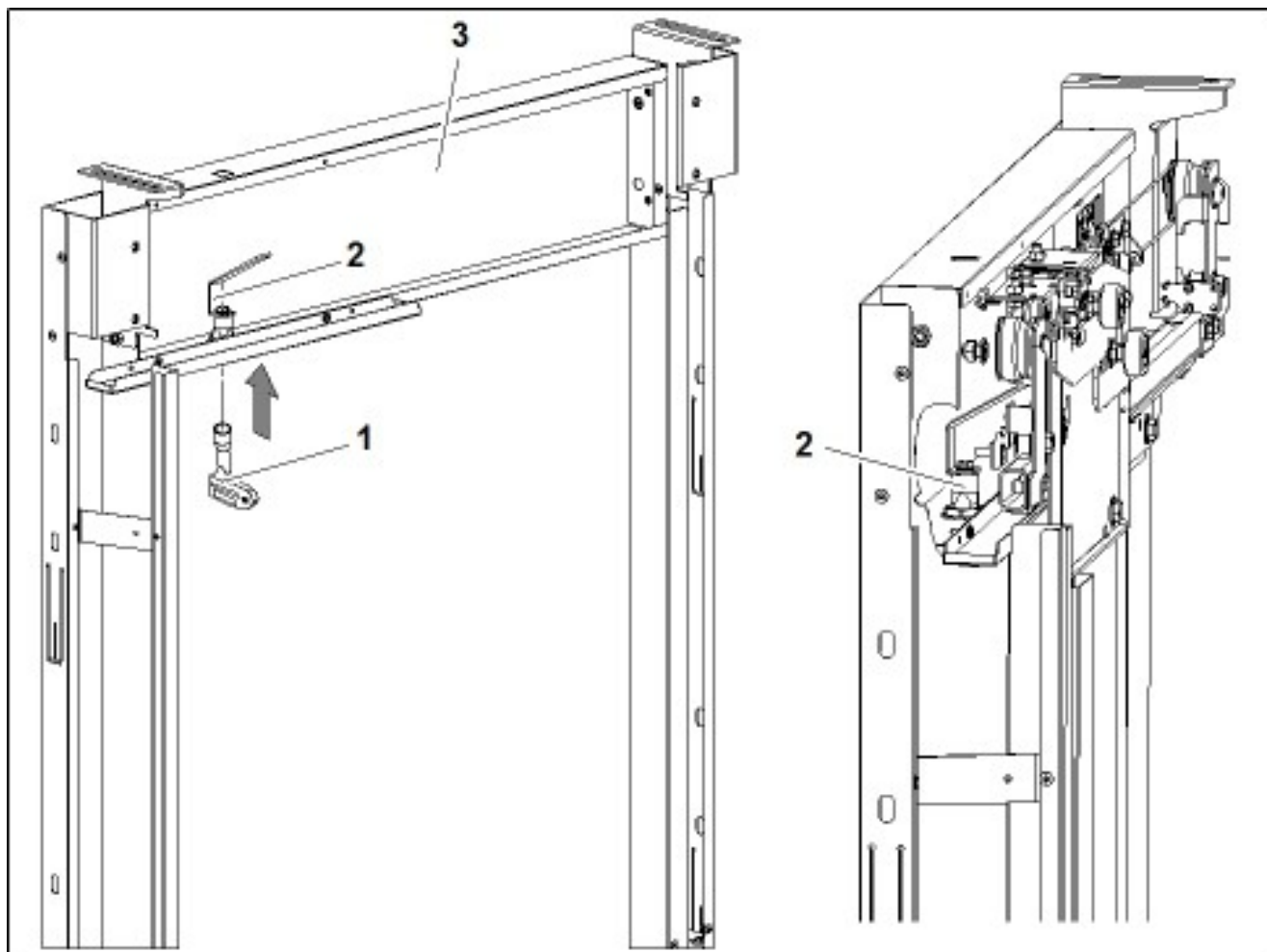
1 Door lock  
3 Steel rope

2 Release device

- Pull the steel rope and make sure that the door lock opens.
- Make sure that the release device does not touch the door lock.
- Make sure that the steel rope is not damaged.



#### 5.41.13 Checking of emergency release



1 Emergency release key

2 Emergency release arm

3 Door frame header

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release arm 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

#### 5.41.14 Checking of switch KNET for damage



The switch KNET is optional and only mandatory when the Temporary Safety Device (TSD) is installed.

- ▶ Make sure that the switch KNET has no damage.
  - ↳ If the switch KNET is damaged, replace it.



#### 5.41.15 Checking of door panel performance



Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.



Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.



Make sure that the movement of the door is done in normal mode.

- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.
- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
    - ↳ If necessary, adjust the door panels and carrier stops.

#### 5.42 Landing door lock for DO WIV-EU

##### 5.42.1 Maintenance plan for landing door lock



This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Check of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridge

##### 5.42.2 Checking of identification marking



This is a safety component. The identification marking is mandatory for identifying and tracking the component.

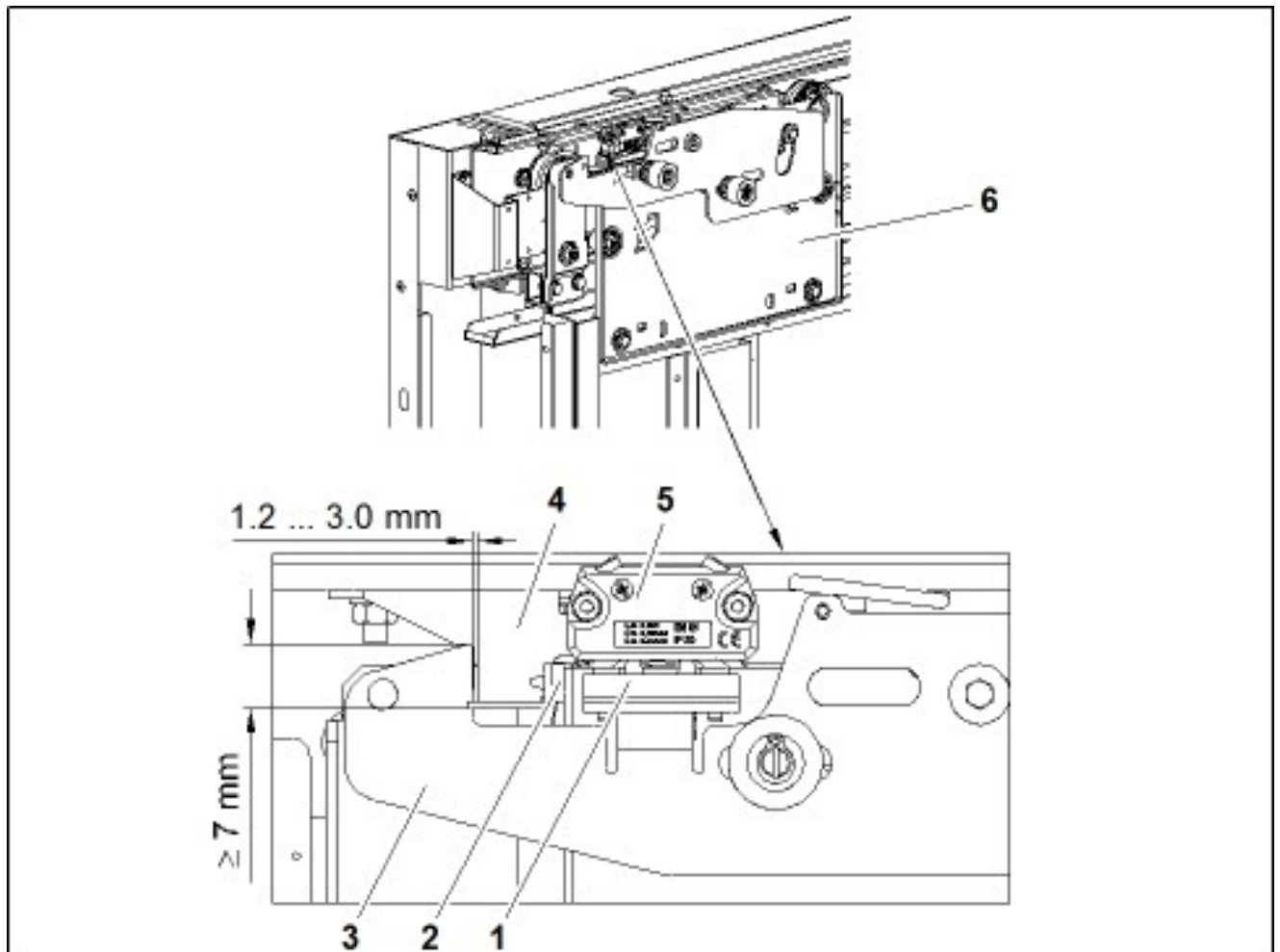
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

##### 5.42.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.42.4 Checking of latch position



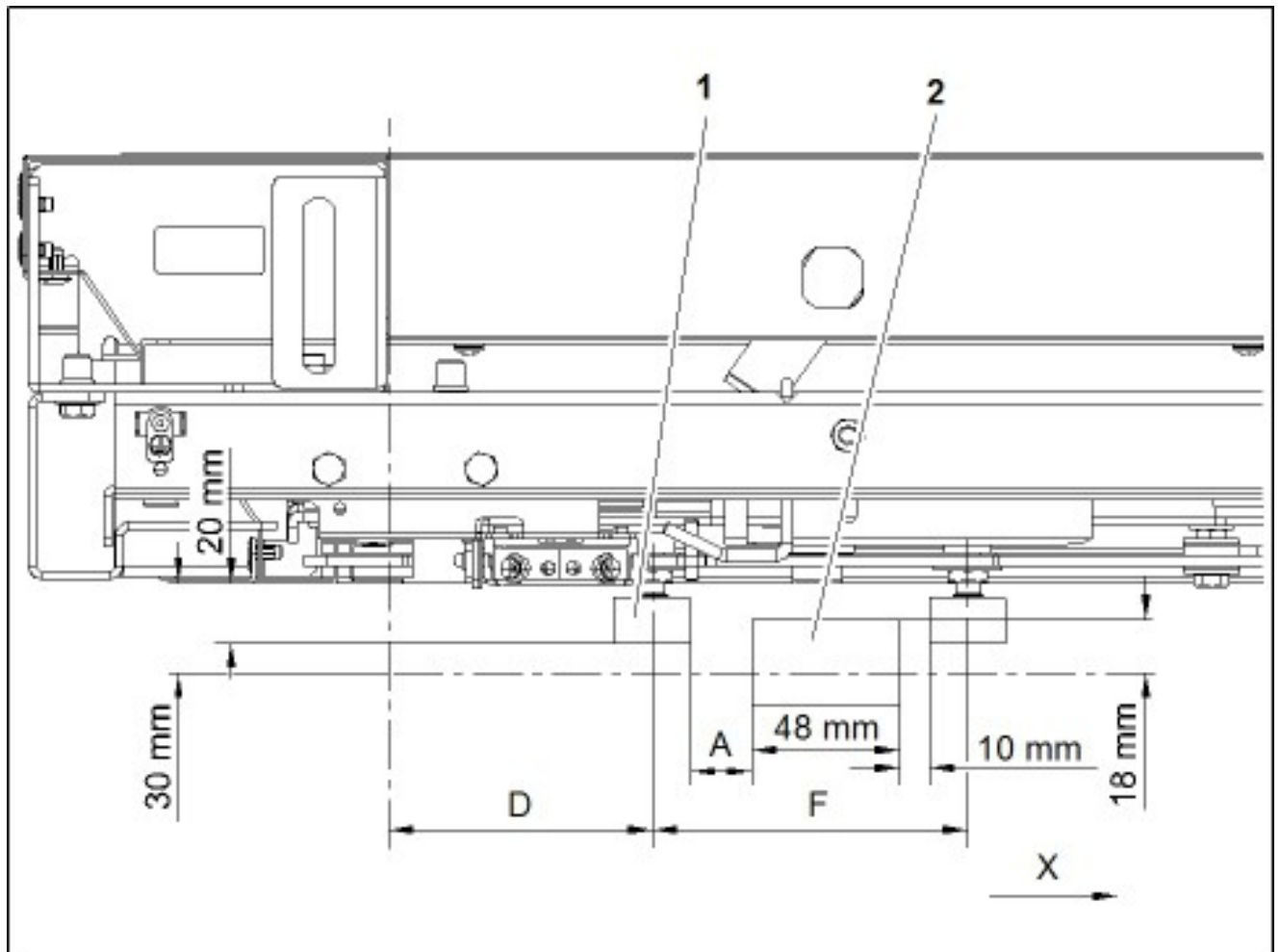
- |   |                |   |                |
|---|----------------|---|----------------|
| 1 | Contact bridge | 2 | Stopper buffer |
| 3 | Latch          | 4 | KTS support    |
| 5 | Switch KTS     | 6 | Carrier        |

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.
- Make sure that the clearance between the latch and the KTS support is 1.2 ... 3 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



### 5.42.5 Checking of lock roller position



**X** Opening direction

**1** Lock roller

**2** Clutch

Door type	Dimension (mm)			
	A	B	E	F
C2	17.5	106	45	100.5
T2	22.5	86	25	105.5

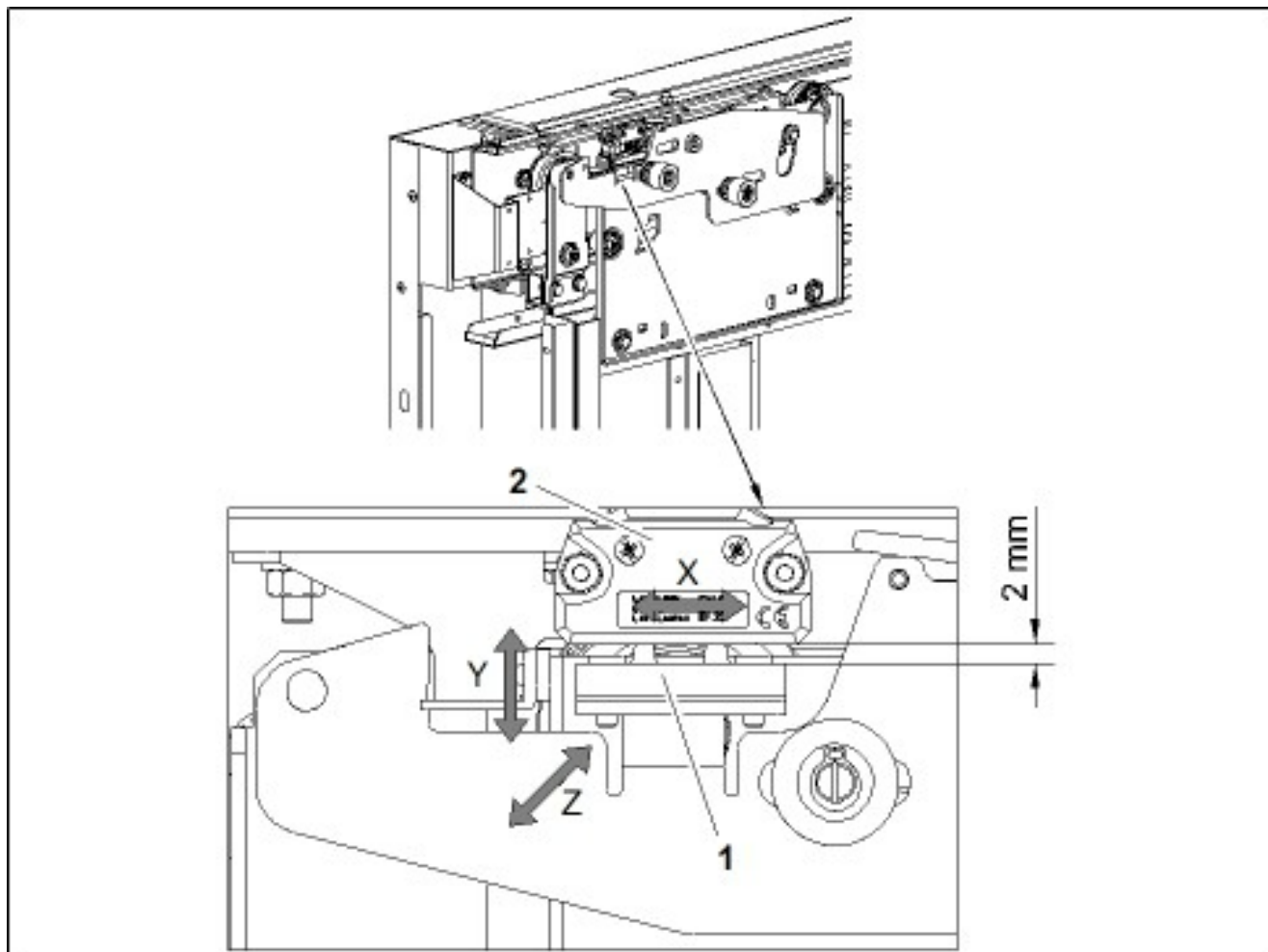
► Make sure that there is a sufficient clearance between the lock rollers and the car door sill to provide for run by.

↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.



## 5.42.6 Checking of alignment of switches and contact bridges

### 5.42.6.1 Checking of alignment of landing door switch KTS and contact bridge



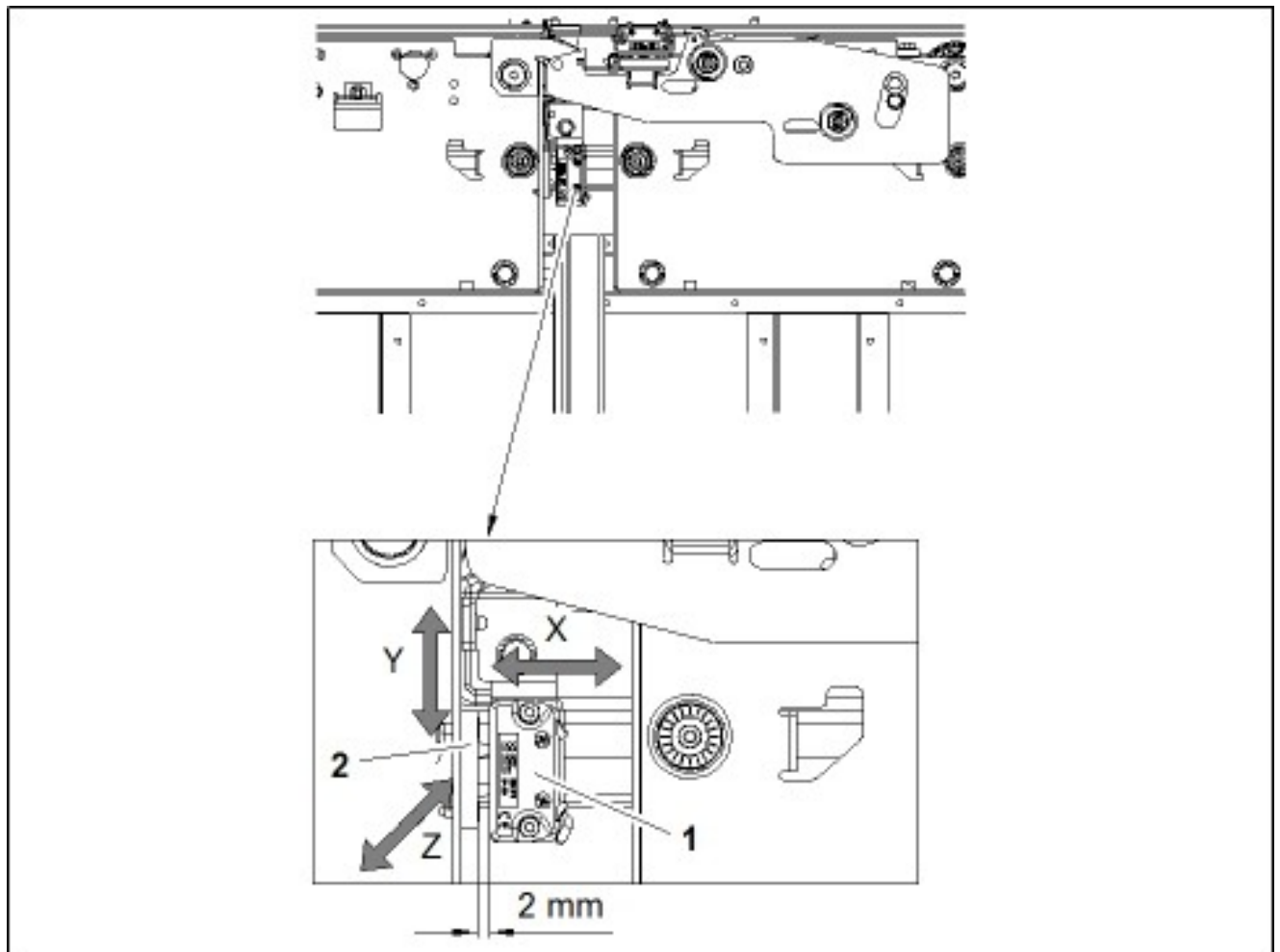
1 Contact bridge

2 Switch KTS

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS position.
    - X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
    - Y-Position: Distance of the contact bridge to the switch KTS is 2 mm.
    - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
- ↳ If required, adjust the switch KTS.



#### 5.42.6.2 Checking of alignment of safety switch KTS1 and contact bridge



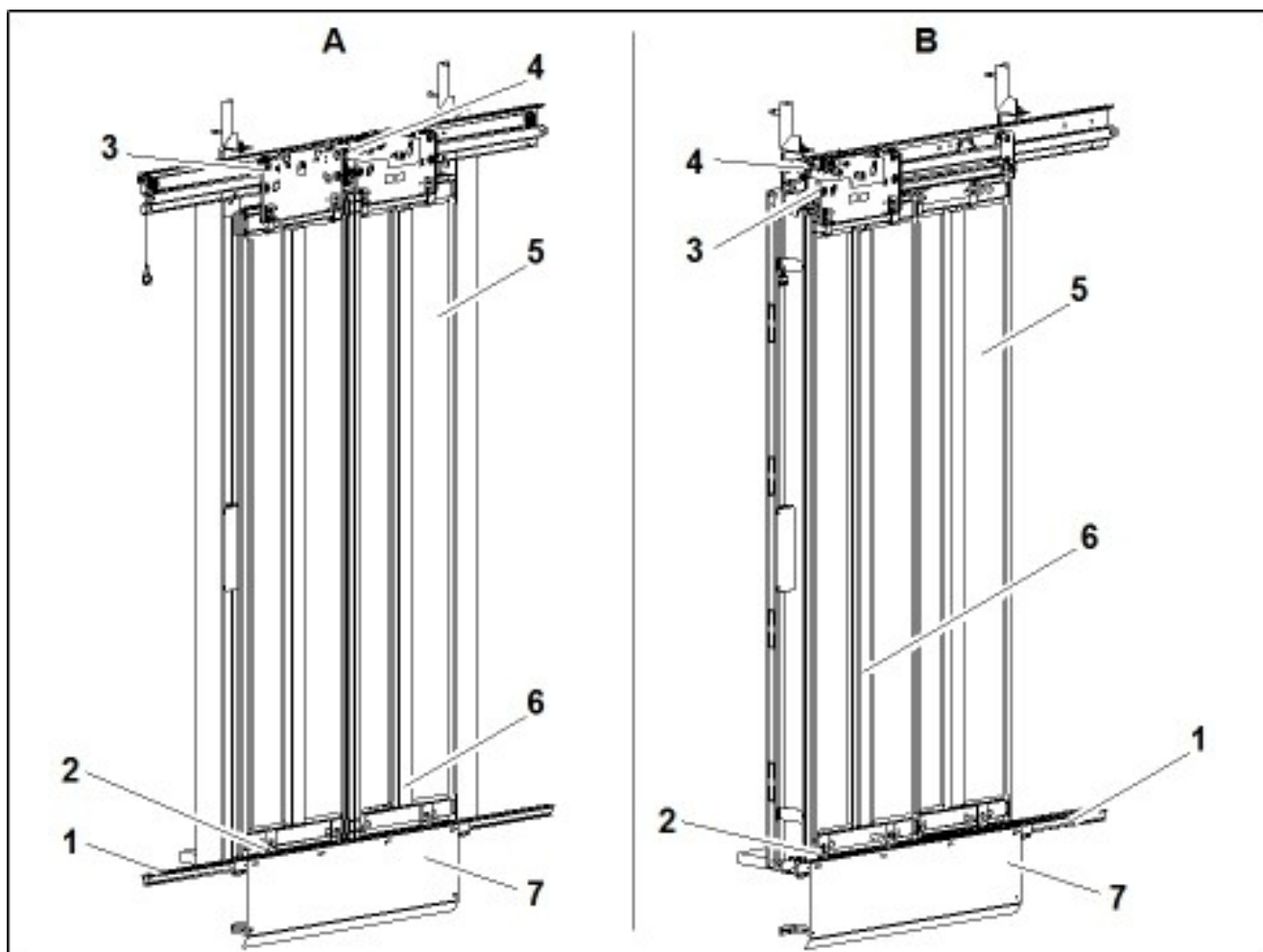
1 Contact bridge

2 Safety switch KTS1

- Make sure that the door panels are closed and the carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 2 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



5.43 Landing door DO WIV-LA  
5.43.1 Overview of landing door



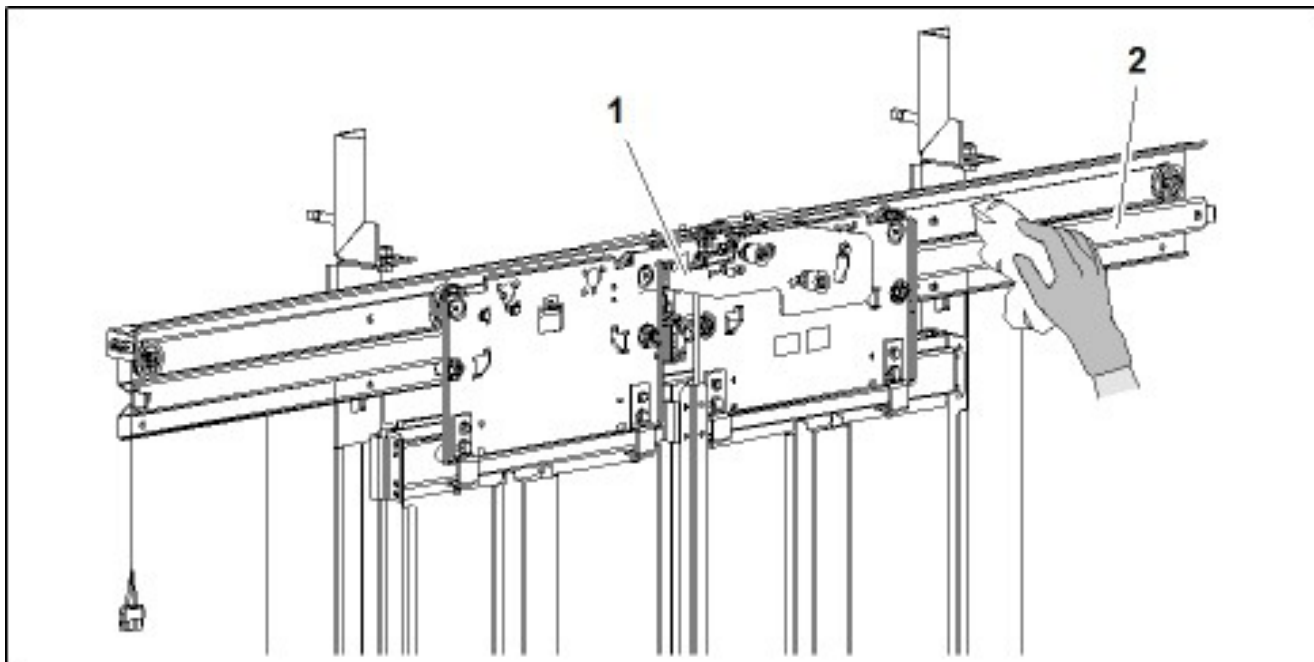
- |          |                     |          |                             |
|----------|---------------------|----------|-----------------------------|
| <b>A</b> | Center door         | <b>B</b> | Telescopic door             |
| <b>1</b> | Door sill           | <b>2</b> | Guide shoe                  |
| <b>3</b> | Door closing spring | <b>4</b> | Door mechanism              |
| <b>5</b> | Door panel          | <b>6</b> | Release device of door lock |
| <b>7</b> | Toe guard           |          |                             |

5.43.2 Maintenance plan for landing door

Interval (months)	Description
12	Checking of cleanness
12	Checking for damage and corrosion
12	Checking of condition of guide shoe
12	Checking of condition of synchronization rope
12	Checking of vertical parallelism of door panel
12	Checking of alignment of door panel
12	Checking of door panel clearance
12	Checking of door opening in locked condition
12	Checking of operation of door closing spring
12	Checking of release device of door lock
12	Checking of emergency release
12	Checking of landing door lock DO WIV-LA
12	Checking of door panel performance



### 5.43.3 Checking of cleanness



1 Door mechanism

2 Rail



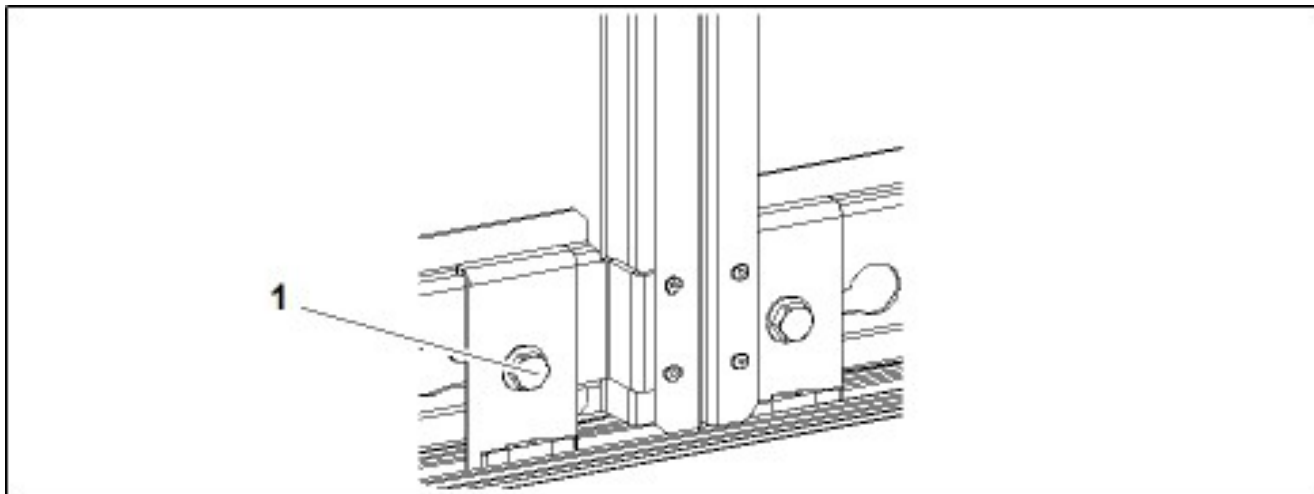
- Do not use cleaning agents containing strong solvents or abrasives.
- Do not oil or lubricate the rails.
- Use a cloth to clean the sill profile and the door panels.

- ▶ Make sure that the door mechanism and the rail are clear of dirt and rust.
- ▶ Make sure that the door panels and the door sill profile are clean and clear of dirt.

### 5.43.4 Checking for damage and corrosion

- ▶ Make sure that the door mechanism, the door panels and the door sills are not damaged and no corrosion exists.

### 5.43.5 Checking of condition of guide shoe

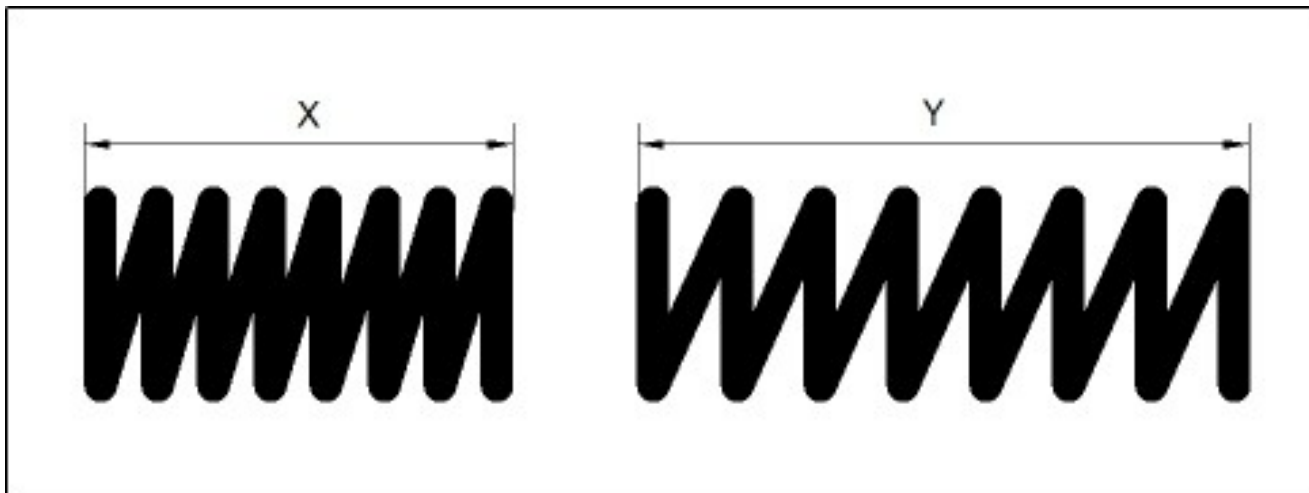


1 Guide shoe

- ▶ Push the door panels towards the opening side.
- ▶ Make sure the door panels move smoothly and are guided in the door sill.
  - If the gap between the sill wall and the guide shoe is  $> 3$  mm, replace the guide shoe.



#### 5.43.6 Checking of condition of synchronization rope

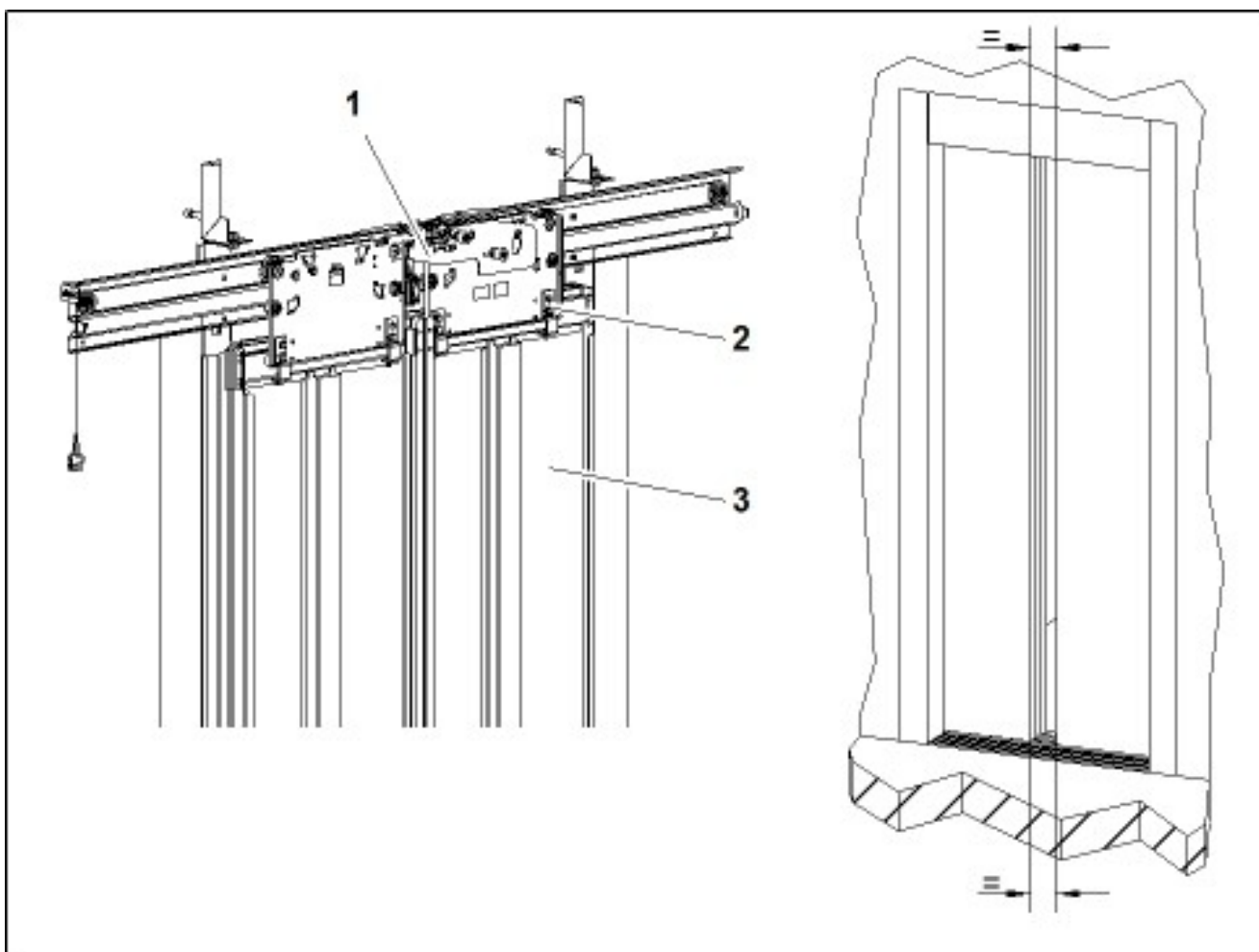


**X** Compression spring length

**Y** Free spring length

- ▶ Make sure that the synchronization rope is not damaged.
- ▶ Make sure that the synchronization rope is not frayed.
- ▶ Make sure that no rust exists on the synchronization rope.
- ▶ Make sure that the rope clamps are tight.
- ▶ Make sure that the compressed spring length  $X = 20 \text{ mm}$ .

#### 5.43.7 Checking of vertical parallelism of door panel



**1** Door mechanism

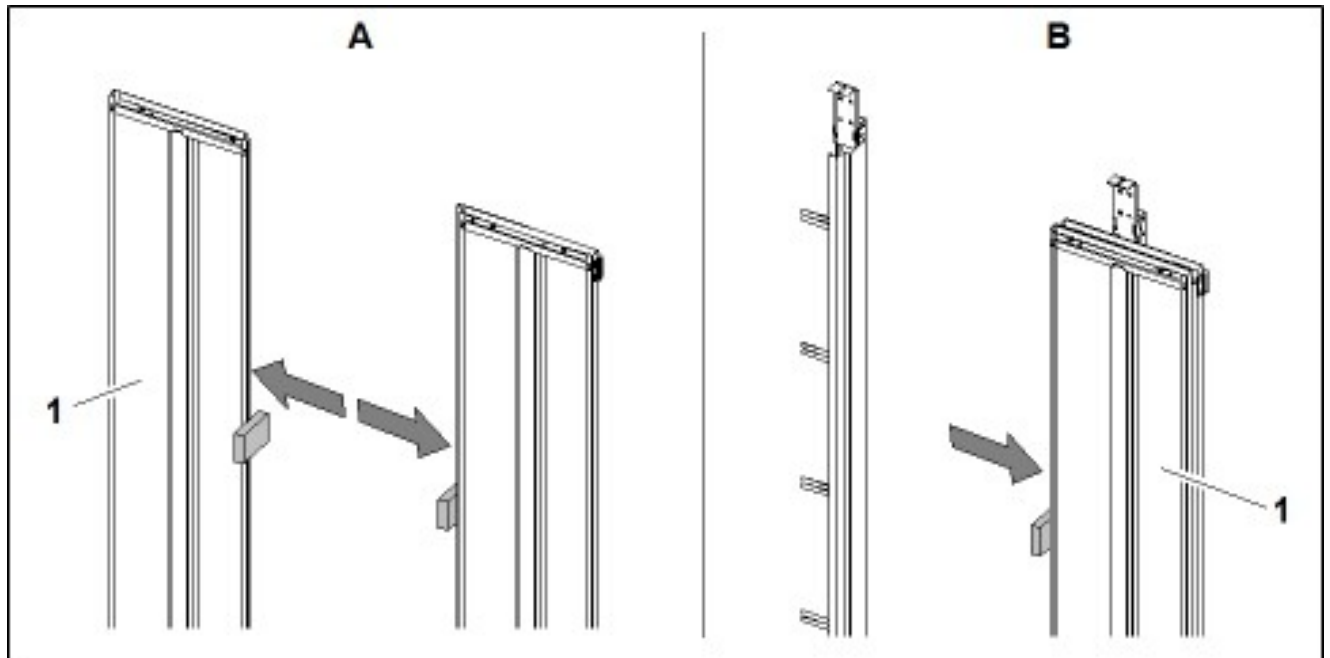
**2** Bolt

**3** Door panel



- ▶ Make sure that the closing edge of the door panels are vertical and parallel to each other.
- ▶ Close the door panels.
- ▶ If center doors, make sure that the gap between the closing edges of the door panels is 1 ... 6 mm.
- ▶ If telescopic doors closes right or left, make sure that the gap between the closing edges of the door panel and the door frame is 1 ... 6 mm.
- ▶ If necessary, adjust the gap and align the door panels.
  - Loosen the bolts.
  - Align the door panels.
  - Tighten the bolts.

#### 5.43.8 Checking of alignment of door panel



**A** Center door  
**1** Door panel

**B** Telescopic door

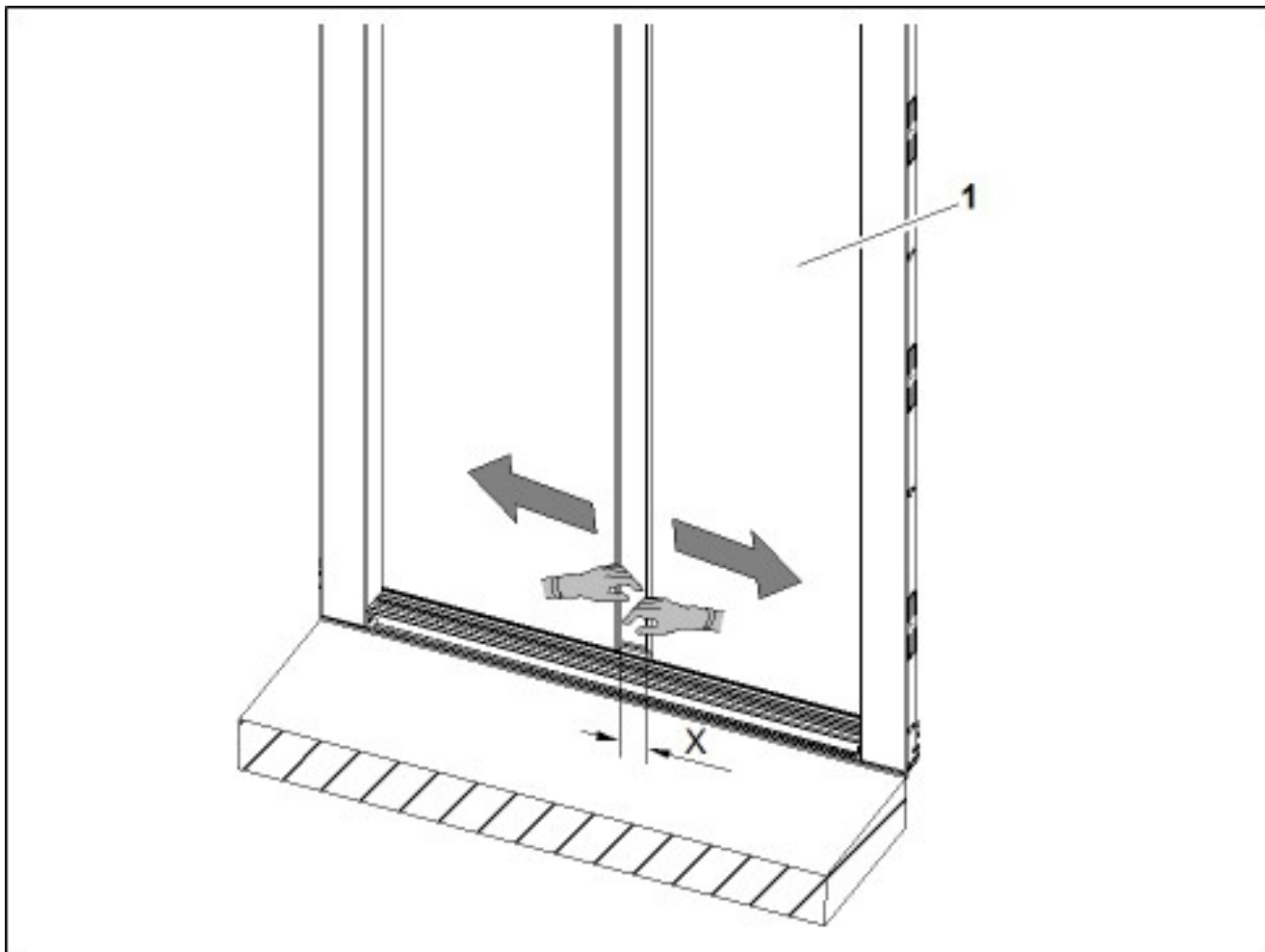
- ▶ Make sure that the door panels are open. Use a suitable tool to make sure that the door panels are aligned with the front wall or door jamb.
- ▶ If the door panels are not aligned:
  - Loosen the synchronization rope clamp to release the door panel from the synchronization rope.
  - Make sure that the washers are not damaged.
  - Align the door panels and tighten the synchronization rope clamp.
  - If necessary, adjust the rear or the front shim package.

#### 5.43.9 Checking of door panel clearance

- ▶ Make sure that the clearance is 3 ... 5 mm between:
  - Door panels and door sill.
  - Door panels and frame.
- ↳ If required, adjust the door panels.



#### 5.43.10 Checking of door opening in locked condition



##### 1 Door panel

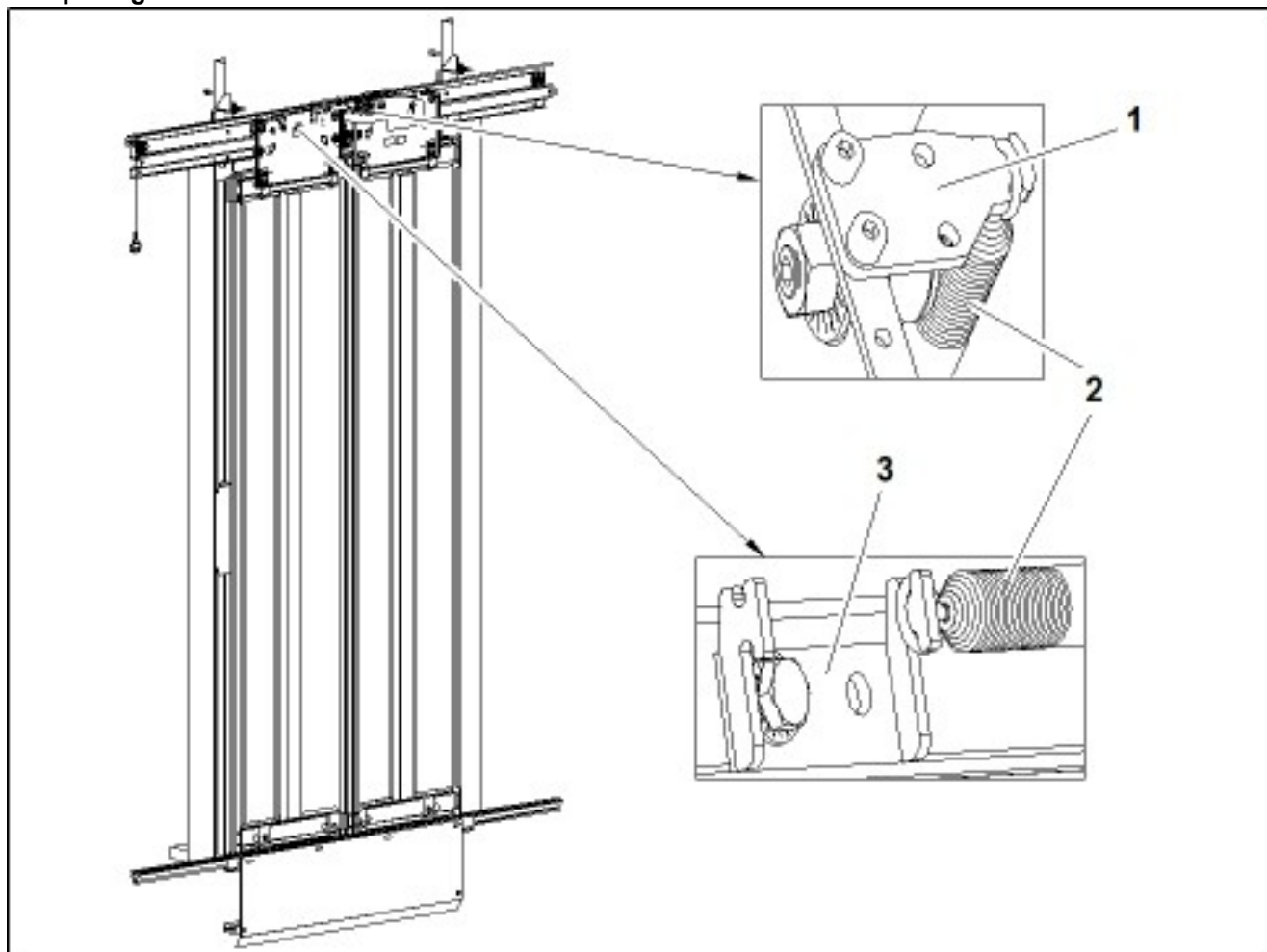
**i** Use no more than 150 N to manually move the door panels.

- Make sure that the door panel is closed and the door is locked.
- Open the door panels manually from the bottom as far as possible.
- Make sure that the clearance  $X \leq 30$  mm for telescopic doors and  $X \leq 45$  mm for center doors.
- If the clearance is more than the tolerance value, adjust the door panels and do a check for condition of counter rollers.



#### 5.43.11 Checking of operation of door closing spring

C2 opening

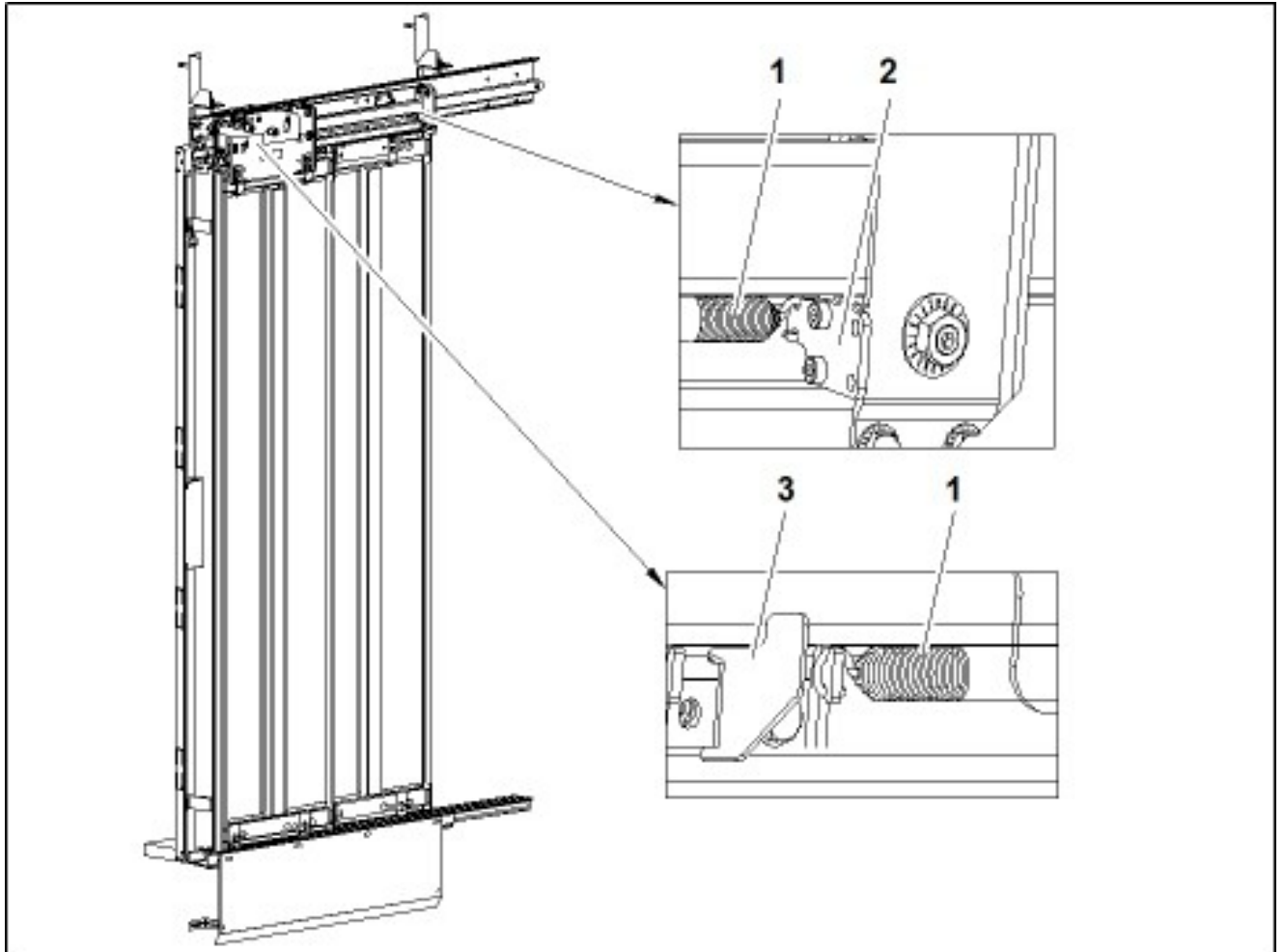


- 1 Spring holder
- 3 Fix spring holder

- 2 Door closing spring



## T2 opening



- 1 Door closing spring
- 3 Fix spring holder

- 2 Spring holder

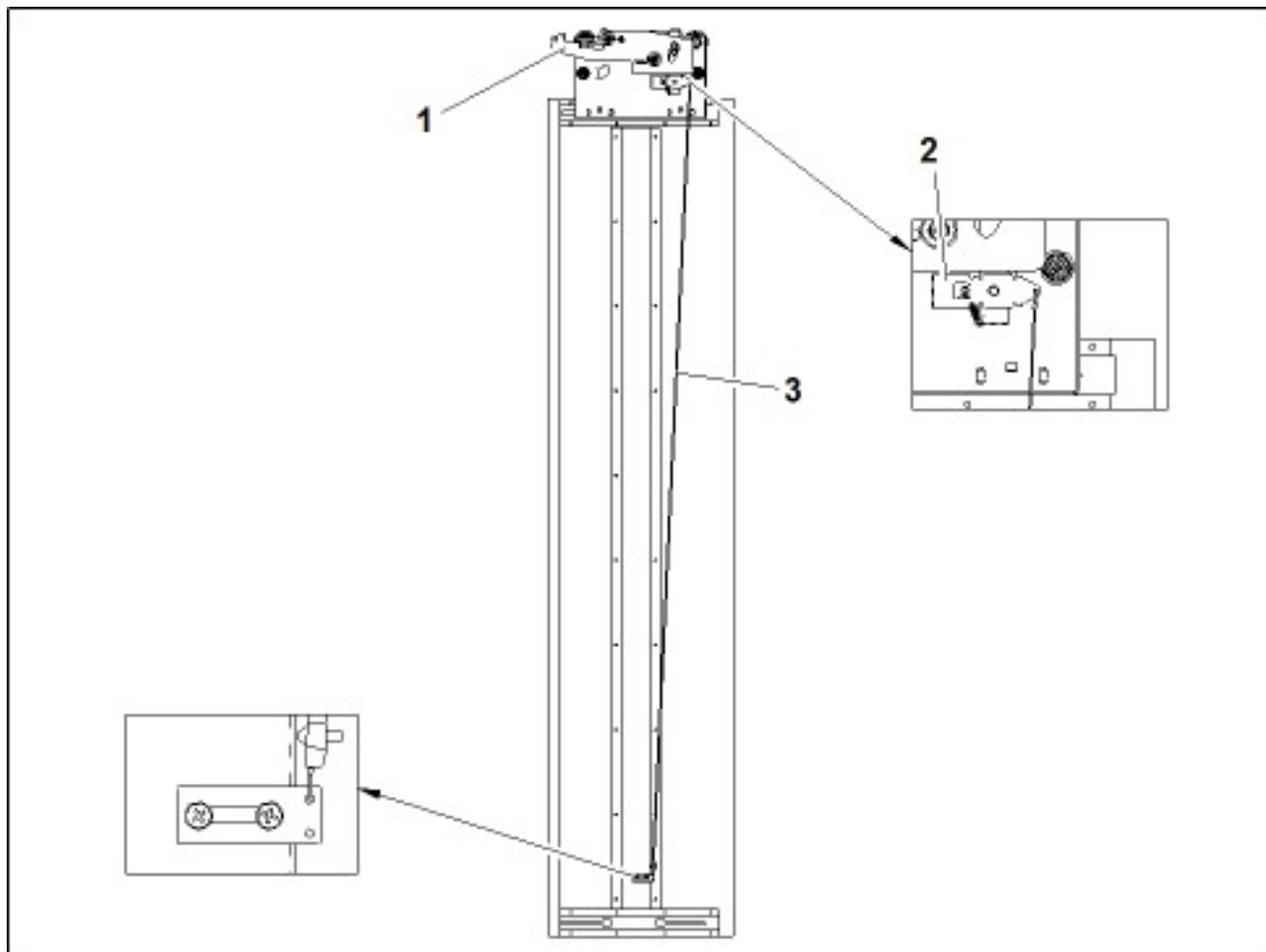
- ▶ Make sure that the door closing spring has no corrosion.
- ▶ Make sure that there is no noise from the door spring during opening and closing of doors.
  - ↳ If necessary, clean the door spring.
- ▶ Make sure that the door closing spring is in the correct position.
- ▶ Make sure that all landing doors operate correctly.
- ▶ Make sure that all door panels are closed automatically from multiple opening positions.
- ▶ Make sure that the door lock is engaged correctly.
- ▶ If there is more than one spring holder location, stretch the door closing spring to the next one.
- ▶ If the doors do not operate or the door lock does not engage correctly, replace the door closing spring.



#### 5.43.12 Checking of release device of door lock



Do a check of the release device on the lowest landing door only.



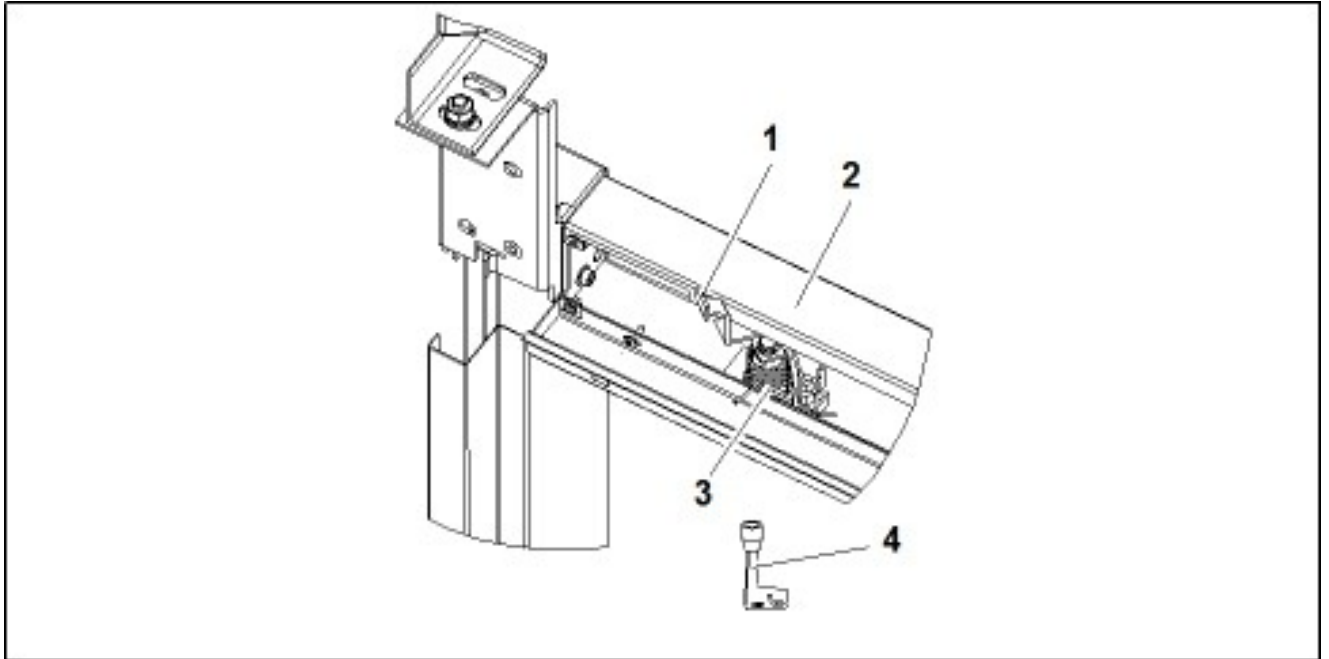
- 1 Door lock
- 3 Steel rope

- 2 Release device

- Pull the steel rope and make sure that the door lock opens.
- Make sure that the release device does not touch the door lock.
- Make sure that the steel rope is not damaged.



#### 5.43.13 Checking of emergency release



- |   |                       |   |                       |
|---|-----------------------|---|-----------------------|
| 1 | Emergency release arm | 2 | Door frame header     |
| 3 | Torsion spring        | 4 | Emergency release key |

- ▶ Fit the emergency release key to the emergency release.
- ▶ Turn the emergency release key and make sure that the emergency release arm releases the door lock.
- ▶ Make sure that the torsion spring has no corrosion.
- ▶ After removing the emergency release key, make sure that the emergency release arm returns back to the original position.
- ▶ Turn the emergency release 10 times by using the emergency release key.
- ▶ Make sure that the emergency release moves freely.

#### 5.43.14 Checking of door panel performance

**i** Make sure that the movement of the door is done manually.

- ▶ Make sure that no clash conditions occur on the door frame or car door.
  - If required, adjust the door panel or door frame.
- ▶ Make sure that the guide shoes run smoothly in the sill. If the operation of door is not smooth:
  - Remove the guide shoes and do a check for the horizontal bending of the door panel.
  - If necessary, replace the guide shoe.

**i** Make sure that the movement of the door is done in normal or HMI operation mode.

- ▶ Make sure that the main rollers run smoothly and there is no excessive noise (such as rattling) with moving resistance.
- ▶ If there is excessive noise or uneven movement do the following:
  - Light rattling: Do a check of the condition of main roller. The rattling noise is acceptable if the noise disappears with the movement of the door more often.
  - Heavy rattling: Do a check of the condition of main roller.
    - ↳ If necessary, replace the main roller.
  - Uneven movement: Make sure that the counter roller is adjusted correctly.
    - ↳ If necessary, replace the counter roller.

**i** Make sure that the movement of the door is done in normal mode.


- ▶ Do a check of overall performance of the door.
  - Do a check of the ride quality of the door.
  - Make sure that there is no rattling, scratching on the door.
  - Make sure that the door does not stop during locking / unlocking state.
  - Make sure that there is no noise while closing of hoistway or car door lock.



- ▶ Do a check for noise from the guide shoe.
  - ↳ If there is considerable noise, adjust or replace the components.
- ▶ Do a check for complete closing of the landing door and the car door.
  - Make sure that there is no visible gap between the door panels.
  - If the doors are completely closed, make sure that there is no light visible from hoistway.
  - ↳ If necessary, adjust the door panels and carrier stops.


## 5.44 Landing door lock for DO WIV-LA

### 5.44.1 Maintenance plan for landing door lock

 This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Checking of identification marking
12	Checking of condition of lock roller and counter roller
12	Checking of latch position
12	Checking of lock roller position
12	Checking of alignment of switches and contact bridges

#### 5.44.2 Checking of identification marking

 This is a safety component. The identification marking is mandatory for identifying and tracking the component.

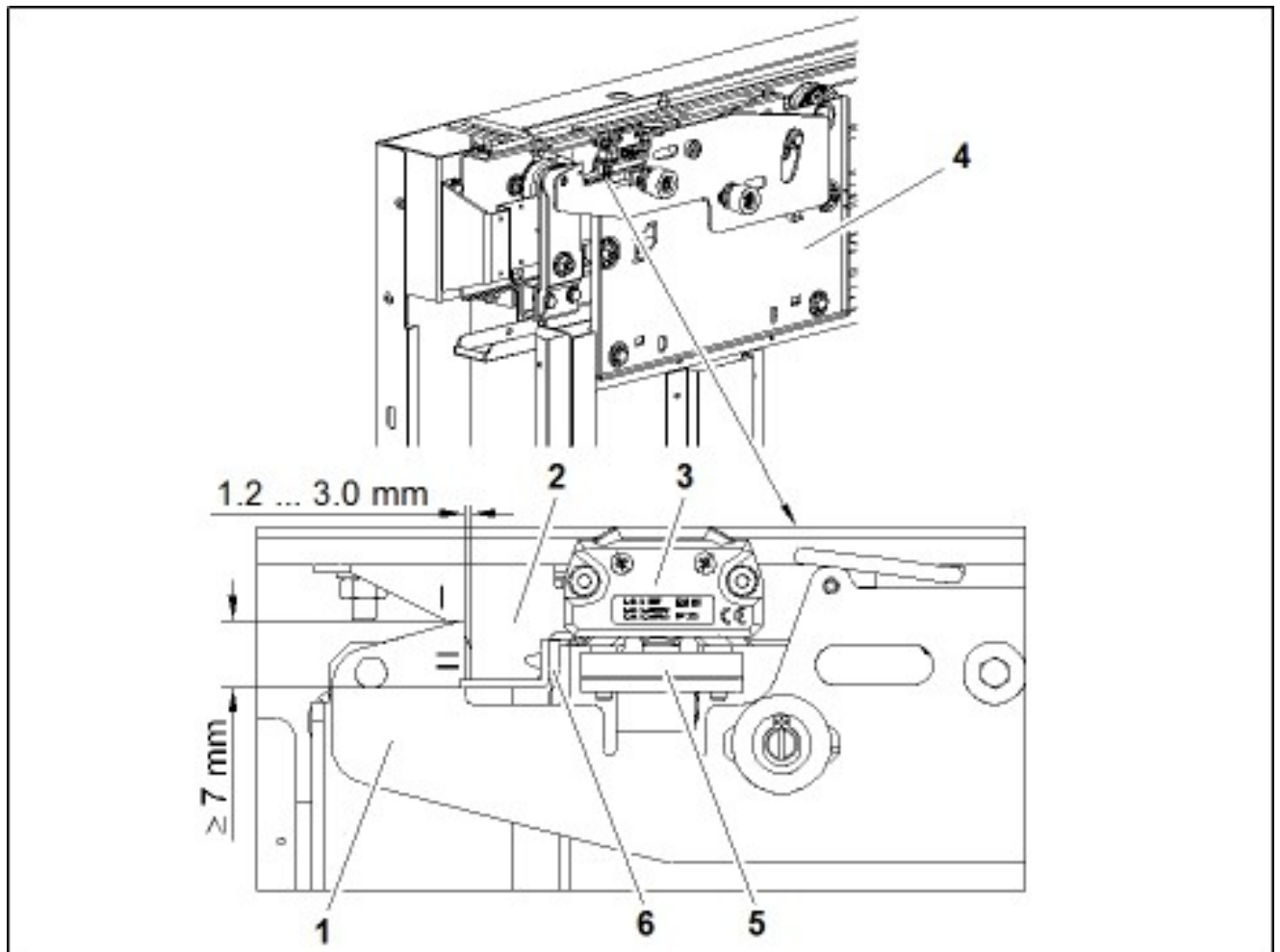
- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### 5.44.3 Checking of condition of lock roller and counter roller

- ▶ Make sure that the lock rollers, counter rollers and retaining washers are not damaged.



#### 5.44.4 Checking of latch position



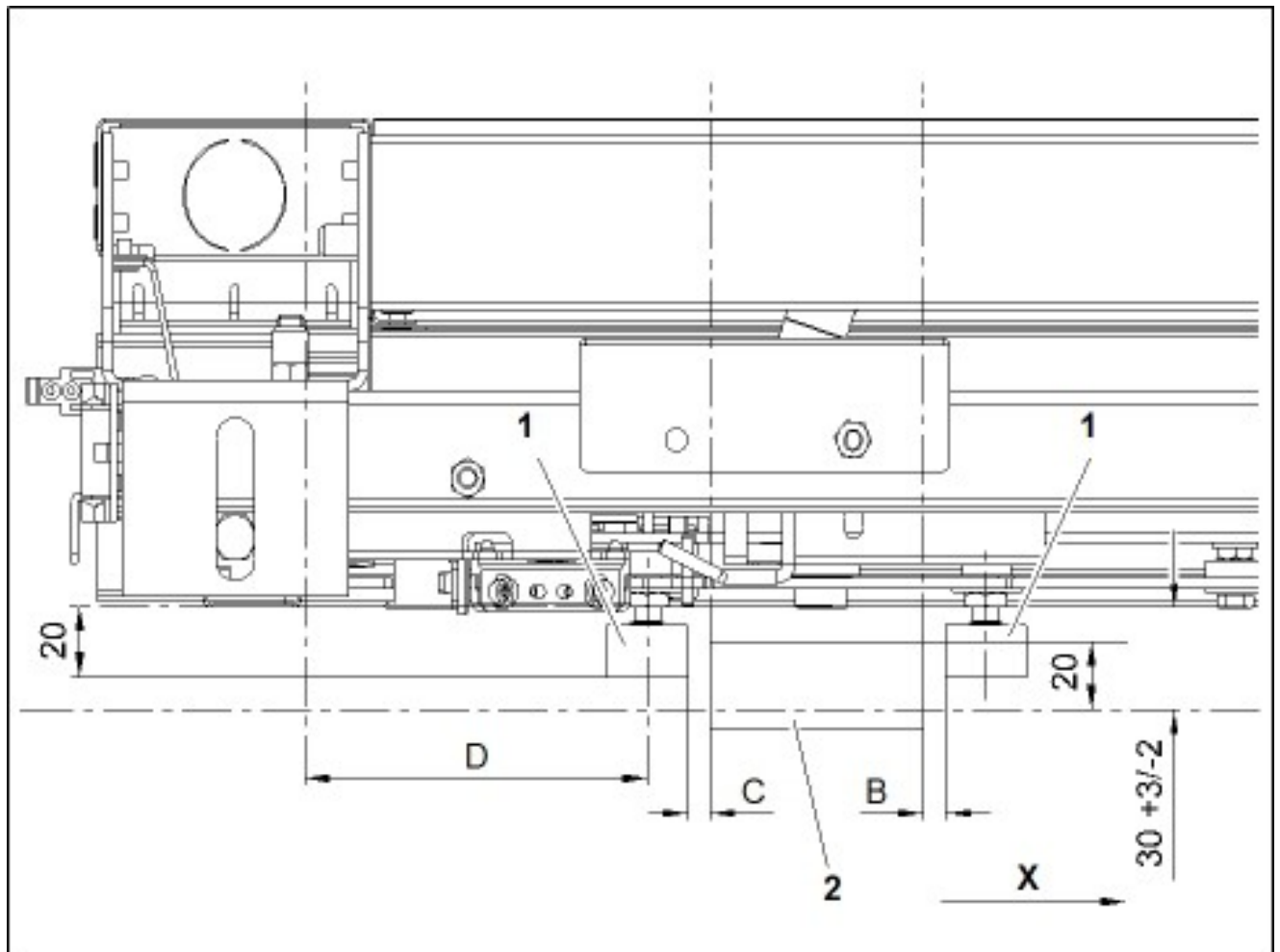
- |   |                |   |                |
|---|----------------|---|----------------|
| 1 | Latch          | 2 | KTS support    |
| 3 | Switch KTS     | 4 | Door carrier   |
| 5 | Contact bridge | 6 | Stopper buffer |

**i** The marked line on the door lock identifies when the latch is engaged 7 mm.

- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
- Make sure that the latch engages minimum 7 mm before the switch KTS makes contact.
- Make sure that the clearance between the latch and the KTS support is 1.2 ... 3 mm.
- Make sure that the clearance does not brake the function of the switch KTS.



#### 5.44.5 Checking of lock roller position



**X** Opening direction

**1** Lock roller

**2** Clutch

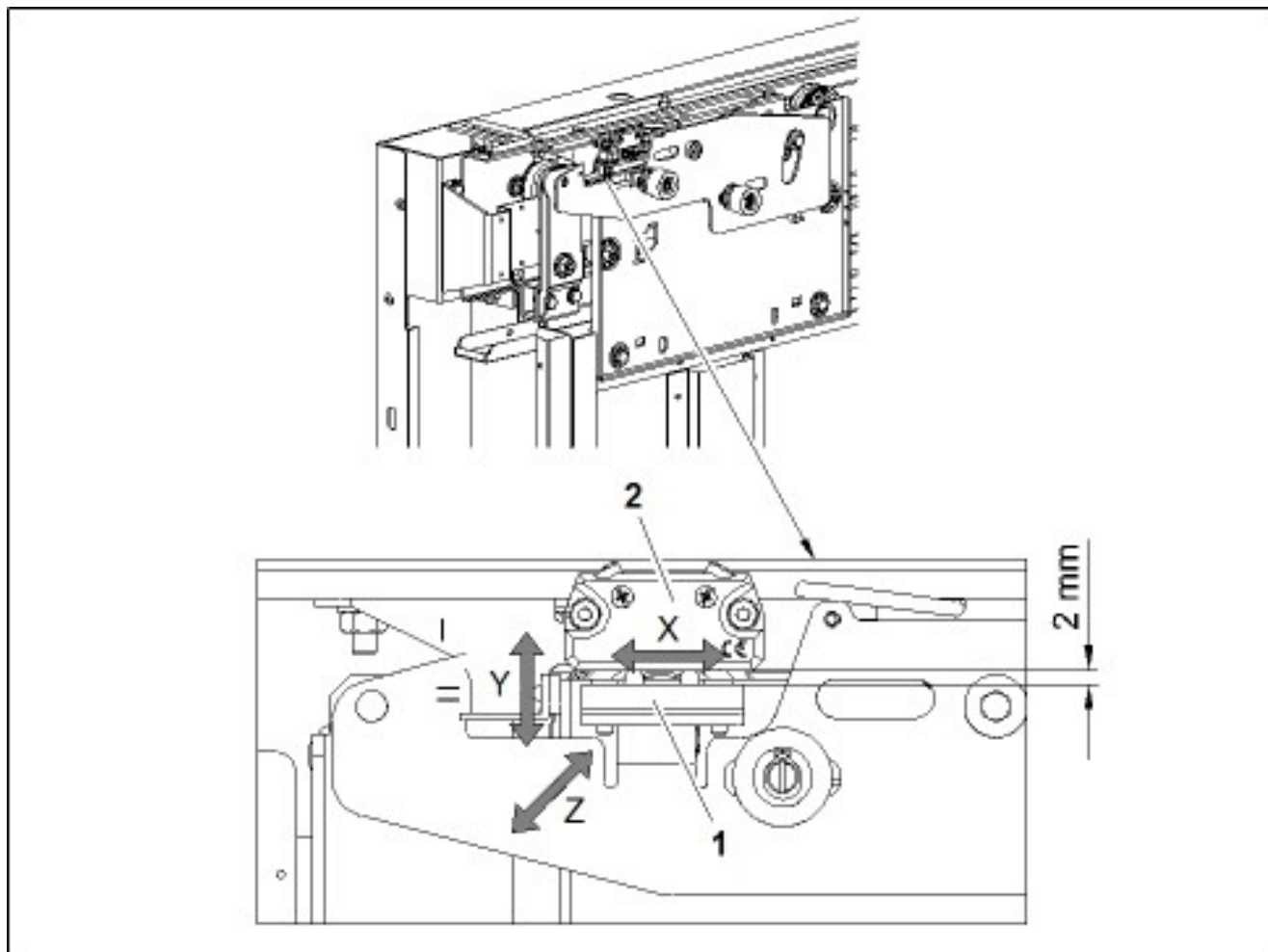
System Type	Opening Type	Clutch Option	B (mm)	C (mm)	D (mm)
<b>VAR 15</b>	C2	Without CDL	10	17.5	-
	T2			22.5	-
	C2	With CDL	10	17.5	-
	T2			22.5	-
<b>VAR 35</b>	C2	Without CDL	18	16	106
	T2		17		86
	C2	With CDL	12	22	106
	T2		11		86

- Make sure that there is a sufficient clearance between the lock rollers and the car sill to provide for run by.
  - ↳ If required, adjust the lock rollers and the clutch to achieve the correct clearances.



## 5.44.6 Checking of alignment of switches and contact bridges

### 5.44.6.1 Checking of alignment of landing door switch KTS and contact bridge



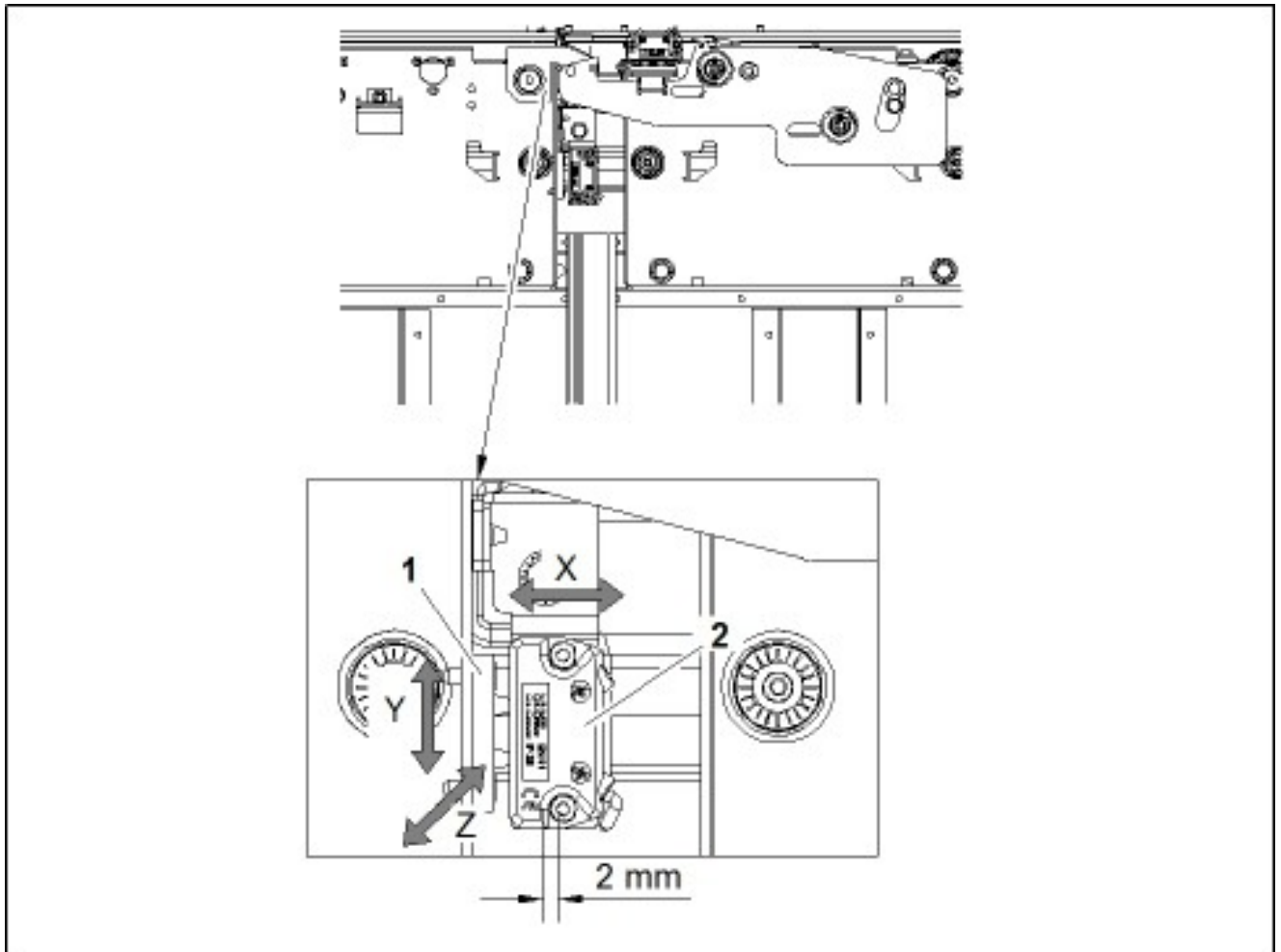
1 Contact bridge

2 Switch KTS

- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
- Do a check of the KTS position.
  - X-Position: Contact bridge fit centered to the housing holes of the switch KTS.
  - Y-Position: Distance of the contact bridge to the switch KTS is 2 mm.
  - Z-Position: Contact bridge fit centered to the housing holes of the switch KTS.
    - ↳ If required, adjust the switch KTS.



#### 5.44.6.2 Checking of alignment of safety switch KTS1 and contact bridge



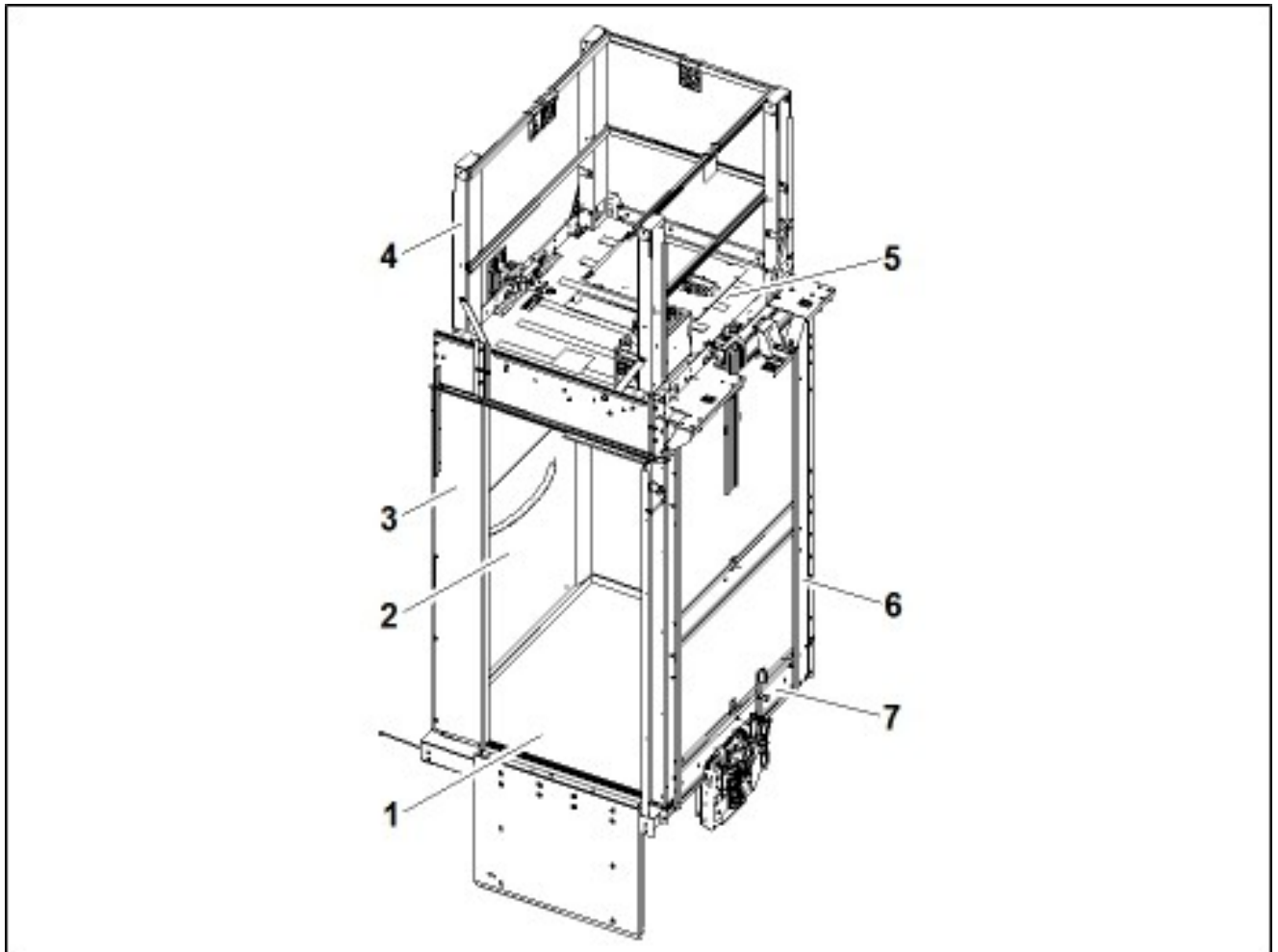
1 Safety switch KTS1

2 Contact bridge

- Make sure that the door panels are closed and the door carriers touch the stopper buffers.
  - Do a check of the KTS1 position.
    - X-position: Distance of the contact bridge to the safety switch KTS1 is 2 mm.
    - Y-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
    - Z-position: Contact bridge fit centered to the housing holes of the safety switch KTS1.
- ↳ If required, adjust the safety switch KTS1.



5.45 Car CA PK 44  
5.45.1 Overview



- |   |                 |   |                    |
|---|-----------------|---|--------------------|
| 1 | Floor cover     | 2 | Car walls          |
| 3 | Car front walls | 4 | Car balustrade     |
| 5 | Car roof        | 6 | Structural upright |
| 7 | Floor structure |   |                    |

5.45.2 Maintenance plan

Car inside

Interval (months)	Description
12	Visual checks

Car roof

Interval (months)	Description
12	Check of upper guide shoes, clearances and lubricators
12	Check of attachment of car roof components
12	Function check of OKR
12	Function check of DA-U switch and intercom
12	Check of KNE switch
12	Check of emergency exit opening
12	Check of seismic retainer plate (optional)

Car bottom

Interval (months)	Description
12	Check of lower guide shoes and clearance



Interval (months)	Description
12	Check of attachment of car bottom components
12	Check of pulleys and bearings (bottom suspension cars)
12	Check of load measuring system

#### 5.45.3 Checks inside car

- ▶ Do a visual check of these components on the inner car:
  - Car decoration
  - Car floor
  - Car ceiling
  - Car lighting
  - Handrail
- ▶ If necessary replace the damaged components.
- ▶ Call the call center to make sure that the microphone and the speakers operate correctly.

#### 5.45.4 Checks on car roof

- ▶ Make sure that these components on the car roof are safely attached:
  - Door drive
  - Balustrade
  - OKR
  - Car fan
  - Car sling
  - Guide shoes
  - Emergency light
- ▶ Do a check of the OKR operation. For instruction, refer to the maintenance information of the control.
- ▶ Make sure that the OKR closes tightly to prevent dust from getting into it.
- ▶ Push the DA-U switch to make sure that the intercom operates correctly.
- ▶ Make sure that the roof damping between the car roof and the car wall is correctly tightened.
- ▶ Do a check of the KNA operation.
- ▶ Do a check of the car fan operation.
- ▶ Make sure that the emergency exit opens correctly.

#### 5.45.5 Checks on car bottom

- ▶ Make sure that these components on the car bottom are safely attached:
  - Guide shoes
  - Connections to car walls, car front and car uprights
  - Compensation chain
  - Buffer plate
  - Balance sheet (if available)
  - Apron
  - Traveling cable
  - Car platform isolation
- ▶ Make sure that the LMS is correctly attached and operates correctly.
- ▶ Make sure that the STM move correctly over the pulleys.
- ▶ Make sure that the anti-jumping covers are correctly attached to the pulleys.

#### 5.45.6 Check of guide shoe

- ▶ Do a check of the guide shoe linings and clearances. For instruction, refer to the maintenance information of the guide shoes.
- ▶ Do a check of the guide shoe lubricators. For instruction, refer to the maintenance information of the guide shoes.

#### 5.45.7 Function check of safety gear

- ▶ Do a check of the safety gear operation. For instruction, refer to the maintenance information of the safety gears.

#### 5.45.8 Check of seismic retaining plate (if available)

- ▶ Examine the seismic retainer plates. For details, refer to the seismic maintenance information.



## 5.45.9 Replacement of damaged parts

### **⚠ DANGER**

#### **Hazardous voltage**

Contact with live parts will result in electric shock.

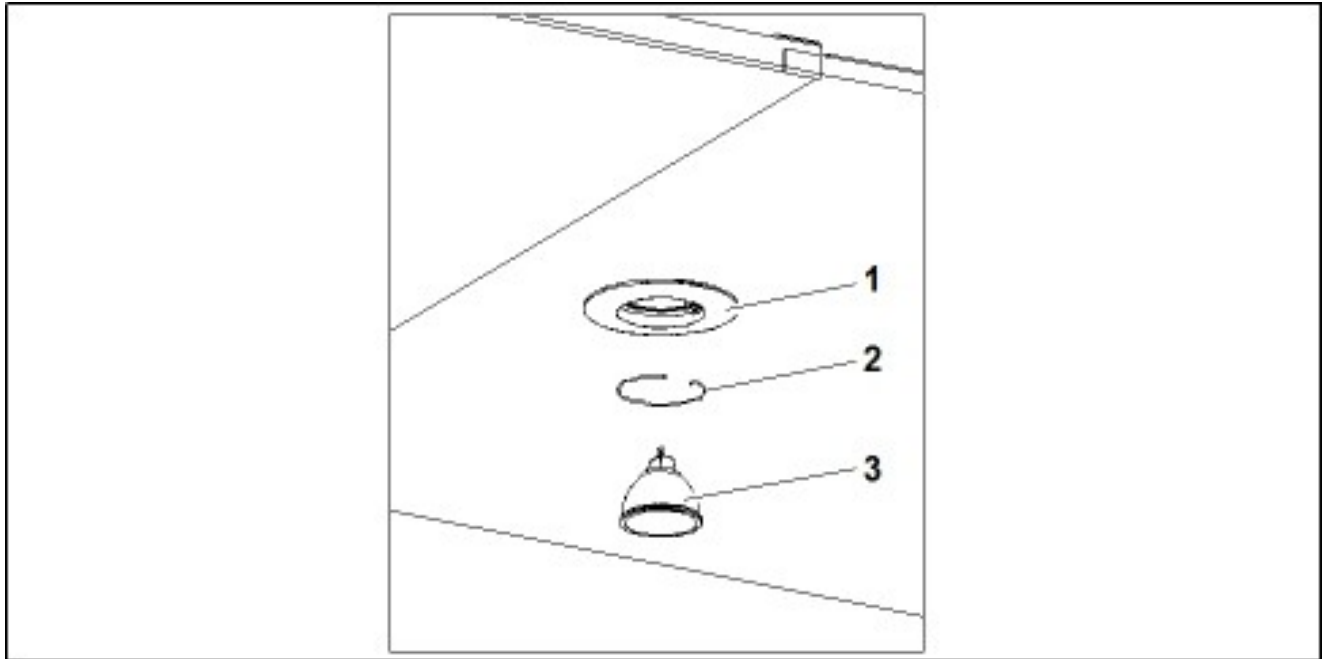
Switch off the main switch and de-energize the installation completely before starting to work on the installation.

**i** The car lighting is not on the main switch. To replace the car lamps, the switch SIL has to be set to off.

- Examine the inner and outer car for wear and damage. If necessary, replace worn or damaged parts. Contact the installer about spare parts and information on how to replace the component.

## 5.45.10 Replacement of car lamps

### 5.45.10.1 Replacement of LED spots



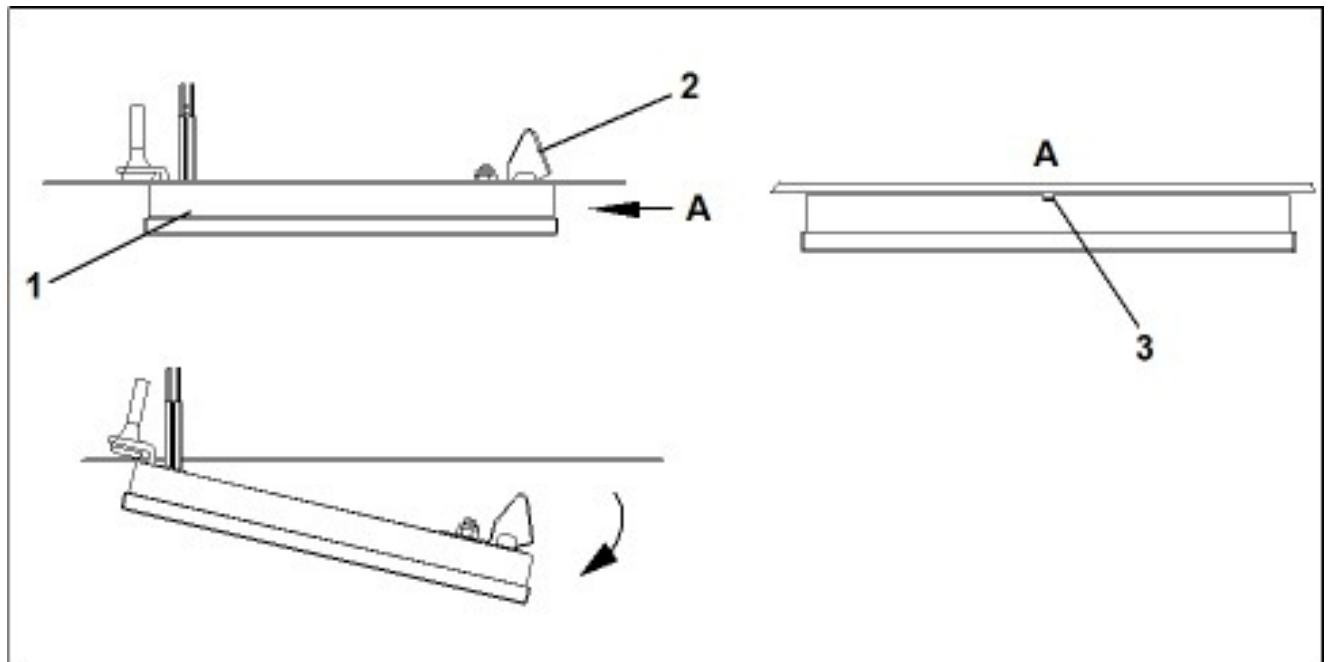
- 1 Lamp holder
- 3 LED spot

- 2 Spring

- Set the switch SIL to off.
- Push the two ends of the spring against each other to release the LED spot from the lamp holder.
- Replace the LED spot with a new one.
- Set the switch SIL to on.



#### 5.45.10.2 Replacement of LED square spot



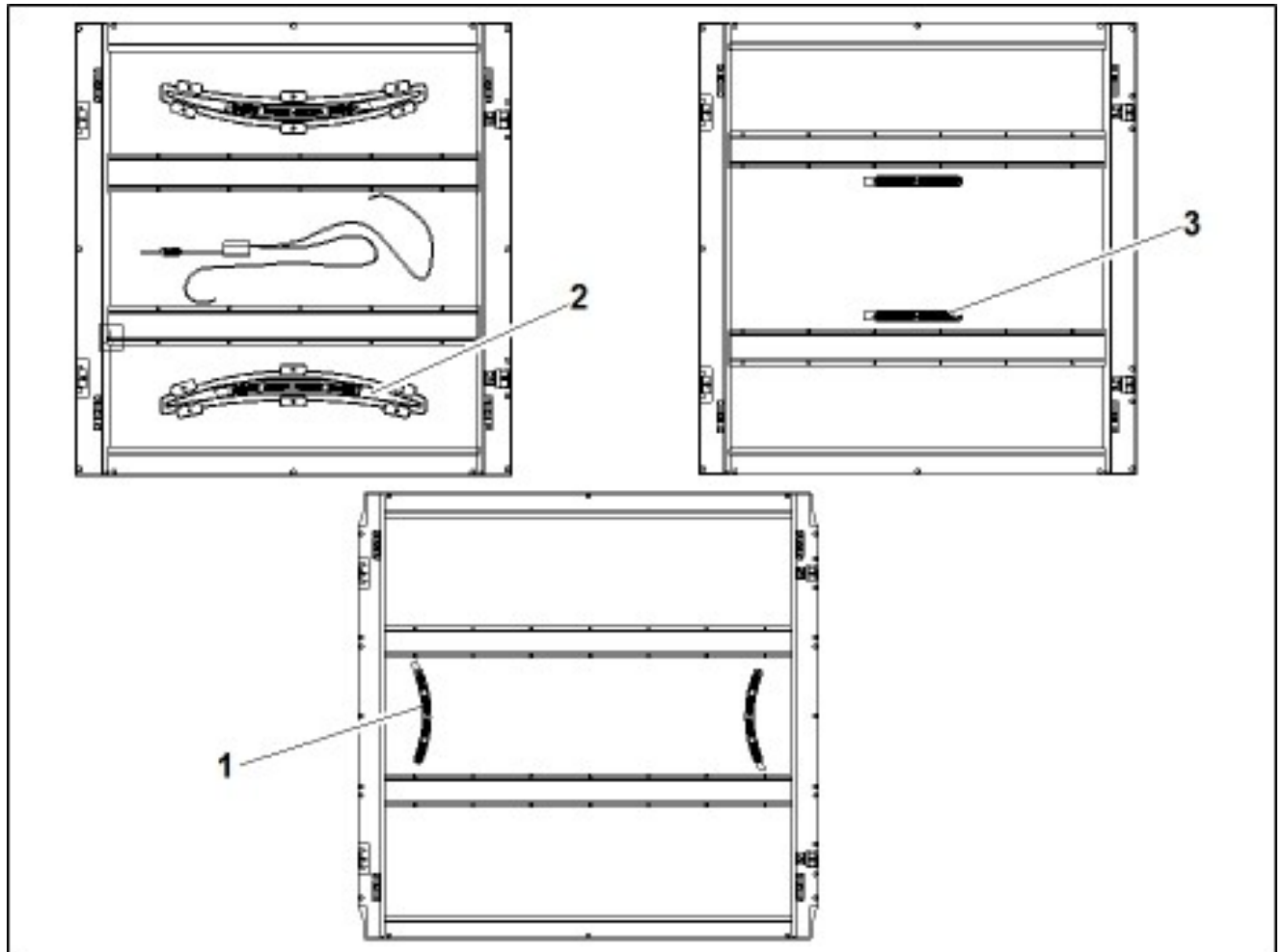
- 1 LED square spot
- 3 Cutout

- 2 Spring
- A Side of cutout

- Set the switch SIL to off.
- Release the LED square spot from the ceiling.
- Put the tip of a thin screwdriver into the cutout of the LED square spot.
- Use the screwdriver to push the spring from the cutout.
- Push the spring while you pull the LED square spot out of the car ceiling.
- Set the switch SIL to on.



### 5.45.10.3 Replacement of curved and line LED lamps

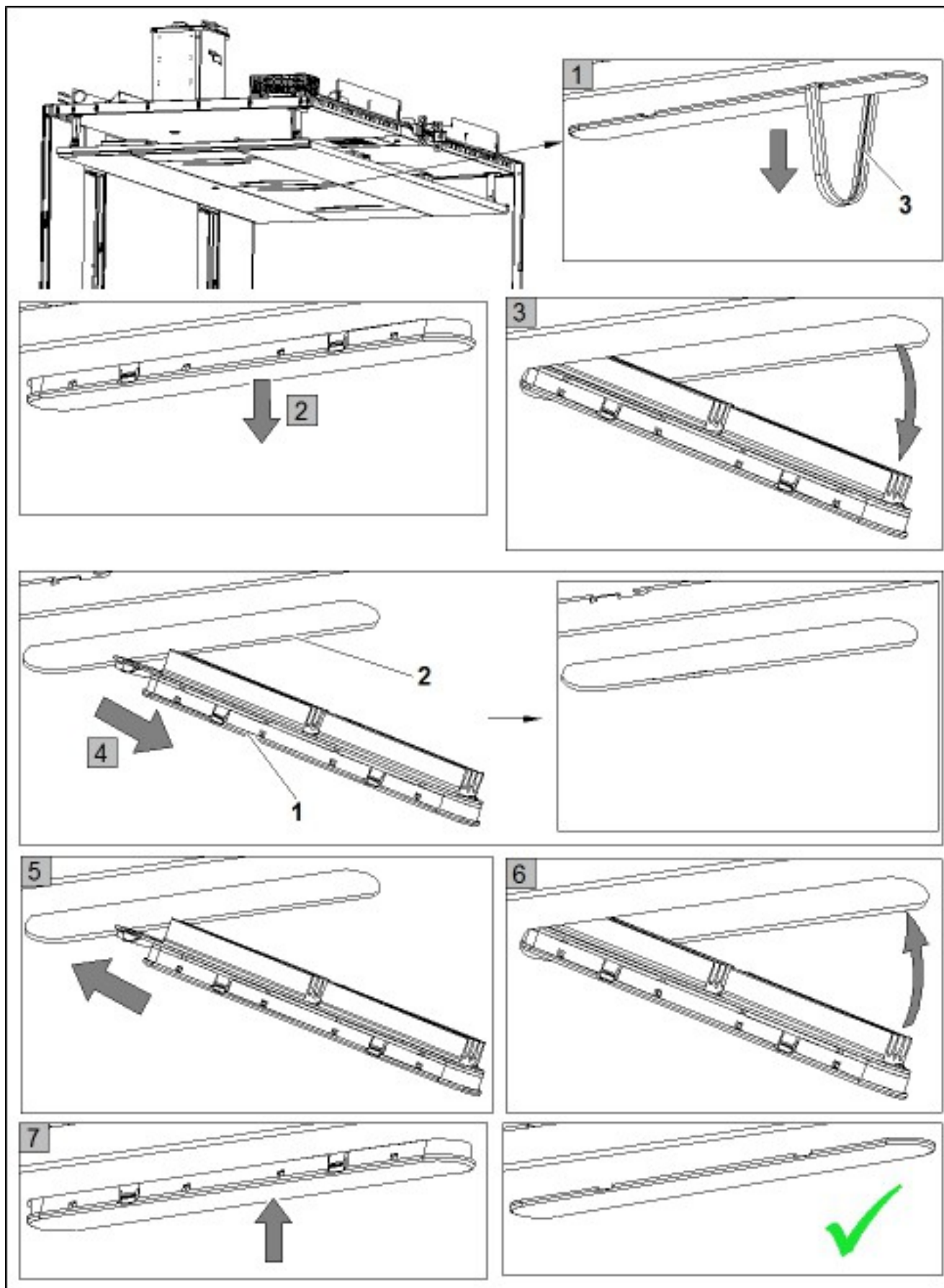


- 1 Bracket LED lamp
- 2 Curved type LED lamp
- 3 Line type LED lamp

- ▶ Set the switch SIL to off.
- ▶ Turn down the full ceiling.
- ▶ If the standard COP is installed, use carton or some equivalent material to put a cover on the top edges of the COP.
  - ↳ This protection prevents the surface of the COP from scratches while you do work on the ceiling.
- ▶ If the full height COP is installed, remove the COP.
- ▶ Remove the M8 x 20 hex screws from the car roof.
- ▶ If there are corners, remove the corners from the wall panel.
- ▶ In the car, push up and move the ceiling away from the wall to unlock the ceiling bracket from the ceiling hook on the OKR side.
- ▶ Turn the ceiling at a different ceiling point.
- ▶ Disconnect all the cables to the drive. If necessary, disconnect the cable from the drive to the OKR.
- ▶ Remove the bracket, the curve or the line LED lamp.
- ▶ Replace the bracket, the curve or the line LED lamp.
- ▶ Reconnect all the cables.
- ▶ Turn the ceiling again to attach it on the ceiling hook.
- ▶ Install the M8 x 20 hex screws (4 Nos) on the car roof.
- ▶ If the standard COP is installed, remove the carton or the equivalent material from the top edges of the COP.
- ▶ If the full height COP is installed, install the COP.
- ▶ If there are corners, install the corners on the wall panel.
- ▶ Set the switch SIL to on.



#### 5.45.10.4 Alternate replacement method of bracket, curve and line LED lamps



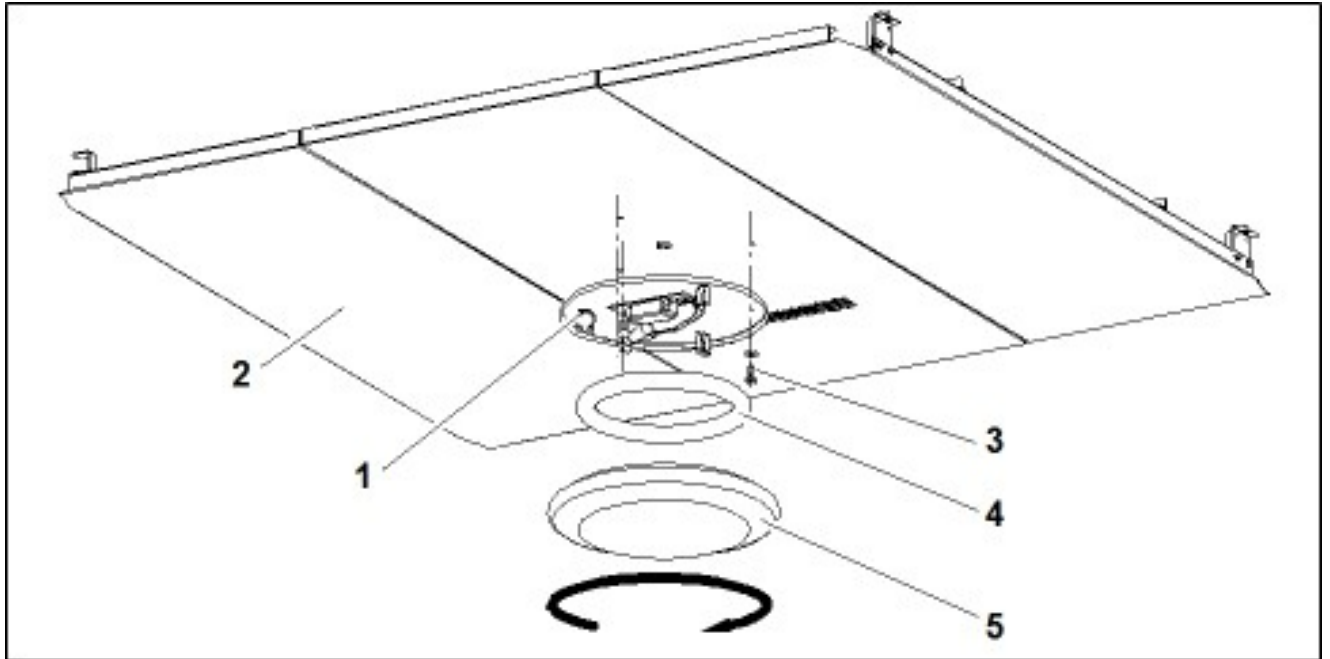
- 1 LED lamp
- 3 Release clip

- 2 Ceiling



- Use a special release tool to disassemble the bracket, the curve and the line LED lamp. If applicable, replace the bracket, the curve and the line LED lamp.

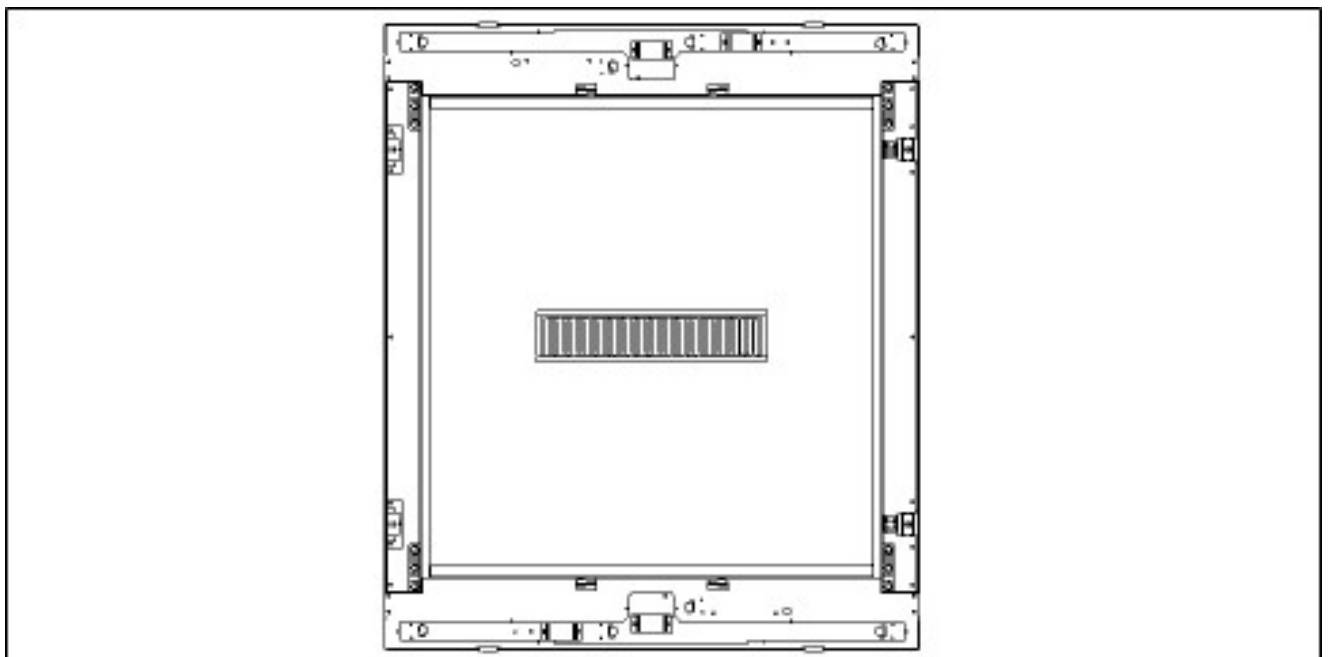
#### 5.45.10.5 Replacement of ring lamp



- |   |                        |   |           |
|---|------------------------|---|-----------|
| 1 | Lamp socket            | 2 | Car roof  |
| 3 | M8 bolt and RIP washer | 4 | Ring lamp |
| 5 | Lamp cover             |   |           |

- Set the switch SIL to off.
- Turn the lamp cover.
- Release the lamp cover from the lamp socket.
- Remove the lamp cover carefully.
- Remove the ring lamp.
- Replace the ring lamp with a new one.
- Put the lamp cover onto the lamp socket.
- Turn the lamp cover to install it.
- Set the switch SIL to on.

#### 5.45.10.6 Replacement of fluorescent tube from half-moon type ceiling

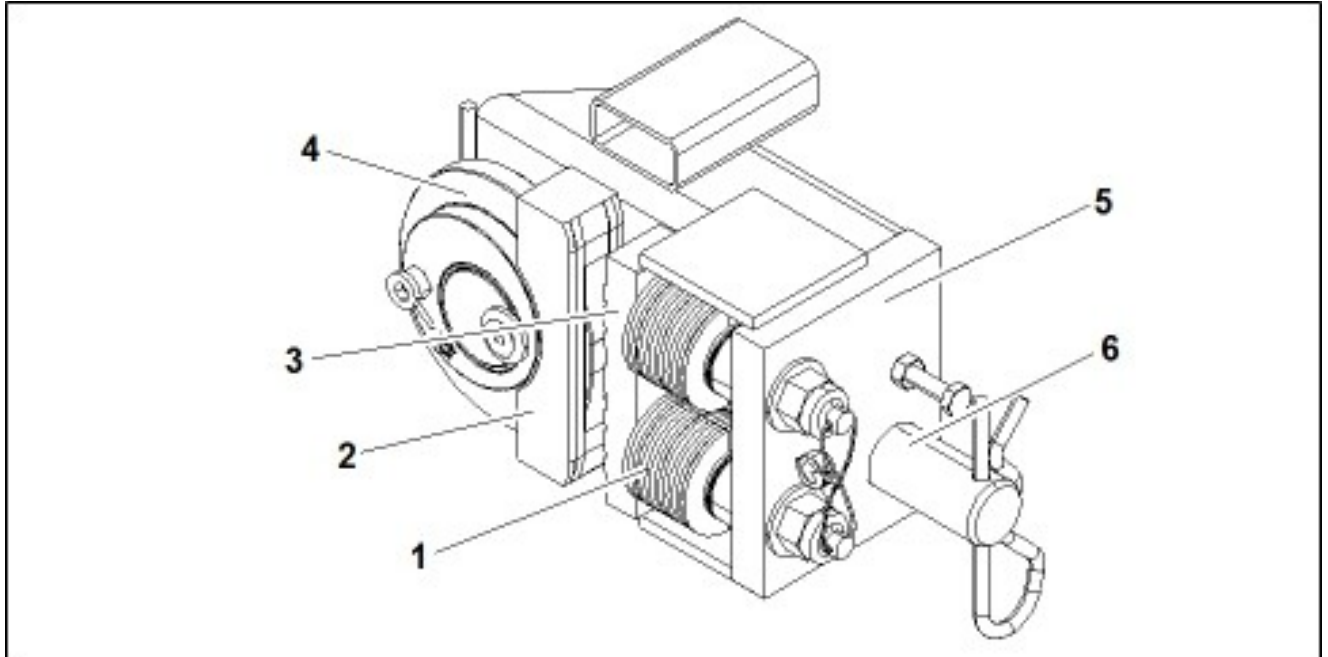




- Push against the lamp cover on the car wall side until:
  - The lamp cover tabs lose their catch and
  - The lamp cover opens.
- Remove the lamp cover and the defective fluorescent tube.
- Put a new fluorescent tube in position.
- Install the lamp cover as follows:
  - First put the two mount noses (on the curved side of the lamp cover) into the designated slots on the roof structure.
  - Turn the cover.
  - Push it up until the two lamp cover tabs catch on the supporting edge.

## 5.46 Safety gear SA GED 10/20/30

### 5.46.1 Overview



- |   |                     |   |                 |
|---|---------------------|---|-----------------|
| 1 | Disk spring         | 2 | Brake shoe      |
| 3 | Brake plate         | 4 | Eccentric disk  |
| 5 | Safety gear housing | 6 | Supporting bolt |

### 5.46.2 Maintenance plan for safety gear

**i** This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Cleaning of safety gear
12	Check for guide rail condition
12	Checking of identification marking
12	Check of spring assembly seal
12	Check of spring assembly
12	Check of safety contact switch
12	Check for static fixation
12	Check for movement of safety gear
12	Check for running clearance
12	Check for fixation and clearance of eccentric disk
12	Check for fixation of governor lever and rope coupling
12	Check for function of retaining spring
12	Check for function of actuating mechanism
12	Check for actuation of safety contact switch



Interval (months)	Description
12	Check for actuation of governor lever and eccentric disk
-	Actuation test of the safety gear as per local regulation

#### 5.46.3 Cleaning of safety gear

**i** Do not use cleaning agents containing strong solvents or abrasives.

**i** The guide rail condition must be checked after every safety gear engagement.

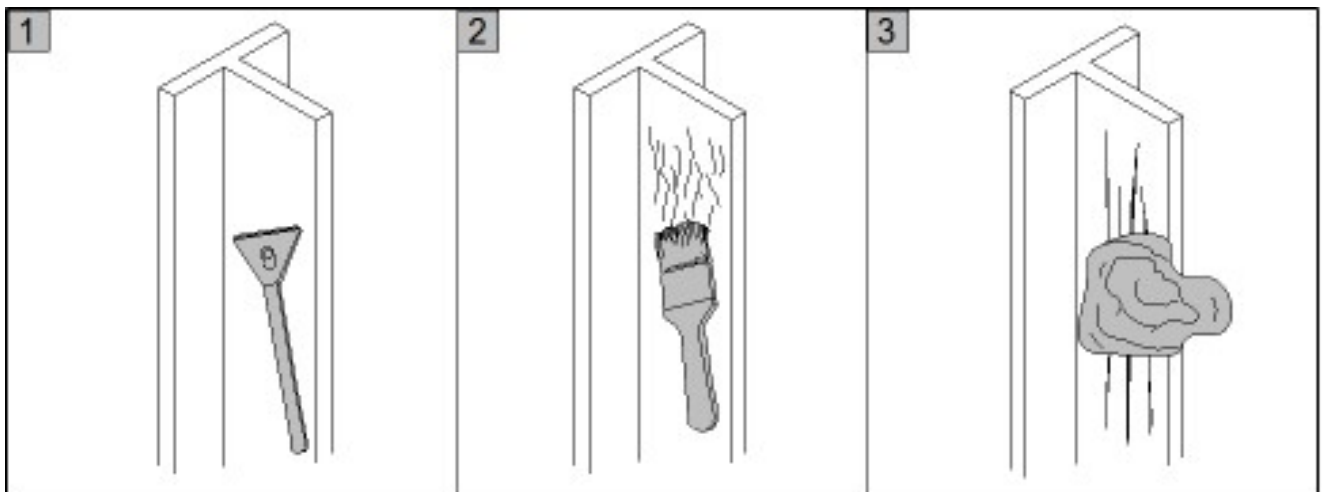
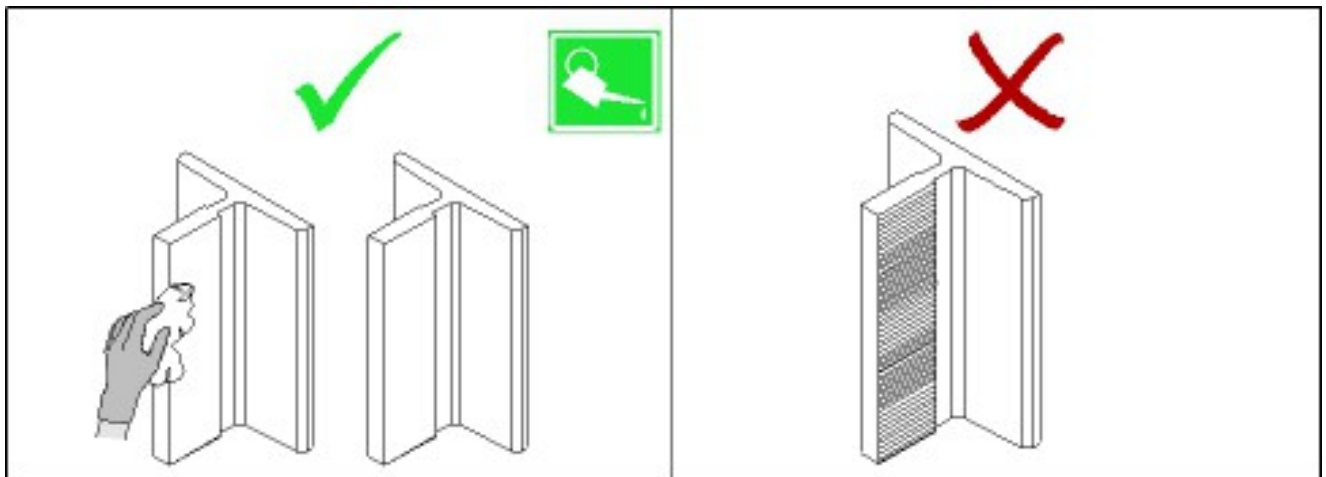
- Do a check of the safety gear for dirt, rust and damage.
  - Make sure that there is no dirt or rust on the safety gear.
  - Make sure that there is no grease except in required areas.
  - Make sure that there is no damage to the safety gear.
- ↳ If necessary, clean the safety gear from rust, grease and dirt.

#### 5.46.4 Check for guide rail condition

### ⚠ WARNING

#### Crushing

Contaminated guide rail surfaces affect the action of the safety gears.  
Clean the guide rail surfaces from rust, dirt and any protective coating.



**i** For HLP 68 type oils, refer to E 41314514 - Oil ISO Grade 68, List of Qualified Products (LQP).

- Examine the cleanliness of the guide rail surface with a clean cloth. If necessary, clean the guide rails.
- If necessary, remove the dirt buildup with a scraper. Make sure that the guide rail surface is not damaged while scrapping.
- Apply an approved cleaning solvent to the guide rail surface with a brush.



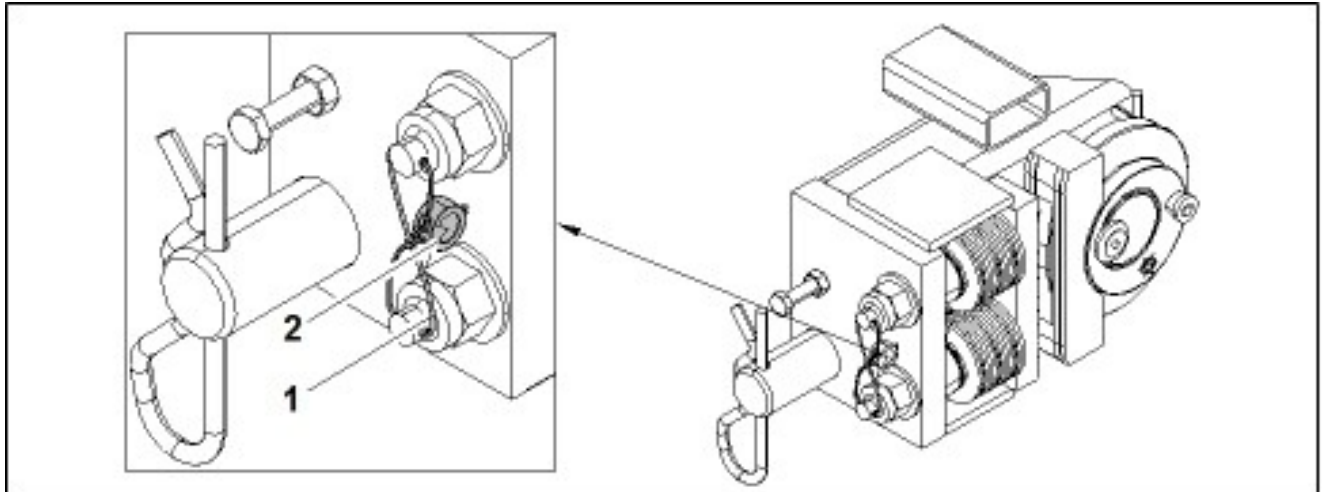
- ▶ Clean the guide rail surfaces with a cleaning cloth/srubb sponge soaked in the cleaning solvent.
- ▶ Wait for 1 ... 2 min to allow the cleaning solvent to dissolve with rust and dirt.
- ▶ Remove all remaining cleaning solvent with a clean and dry cleaning cloth.
- ▶ Make sure that the guide rail surface is clean with a white cloth.
  - ↳ The cloth must be completely free from visible dirt. If not, clean the guide rails again.
- ▶ Make sure that all guide shoe rollers are free from rust and dirt.
- ▶ Lightly oil the guide rail surfaces with HLP 68 oil with a cleaning cloth to prevent guide rail corrosion.

#### 5.46.5 Checking of identification marking

**i** This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.

#### 5.46.6 Check of spring assembly seal



1 Sealing wire

2 Lead plumb bolt

- ▶ Make sure that the wire seal is complete and free from damage.
- ▶ If the wire seal is broken, stop the inspection and put the elevator out of service. Contact the installer for further instructions.

#### 5.46.7 Check of spring assembly

- ▶ Make sure that the spring assembly is complete and free from damage.
- ▶ If the spring assembly is damaged or any spring is missing, replace the safety gear.

#### 5.46.8 Check of safety contact switch

- ▶ Make sure that the safety contact switch is present, correctly installed and free from damage.
  - ↳ If necessary, clean the safety contact switch fully.
  - ↳ If damaged, replace the safety contact switch.

#### 5.46.9 Check for static fixation

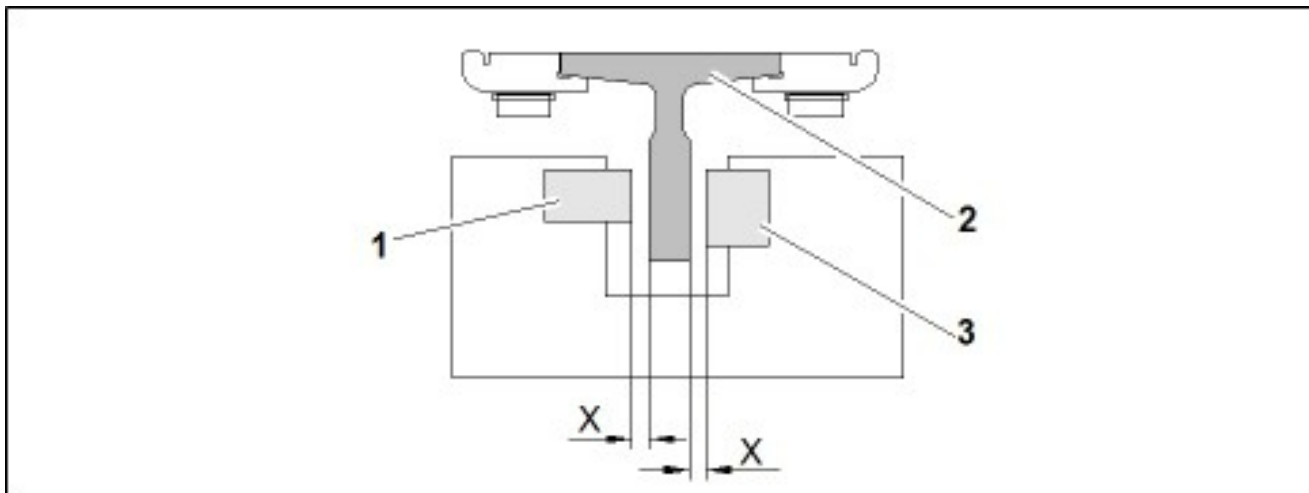
- ▶ Make sure that the safety gear is correctly assembled and all screws are correctly tightened.
- ▶ Make sure that all parts are correctly connected.
- ▶ If necessary, refer to the installation instructions to make sure that the static fixation is correct.

#### 5.46.10 Check for movement of safety gear

- ▶ Make sure that the movement of safety gear is correct.
  - Push the safety gear downward and sideward and do a check of the horizontal and vertical mobility of the safety gear.



#### 5.46.11 Check for running clearance

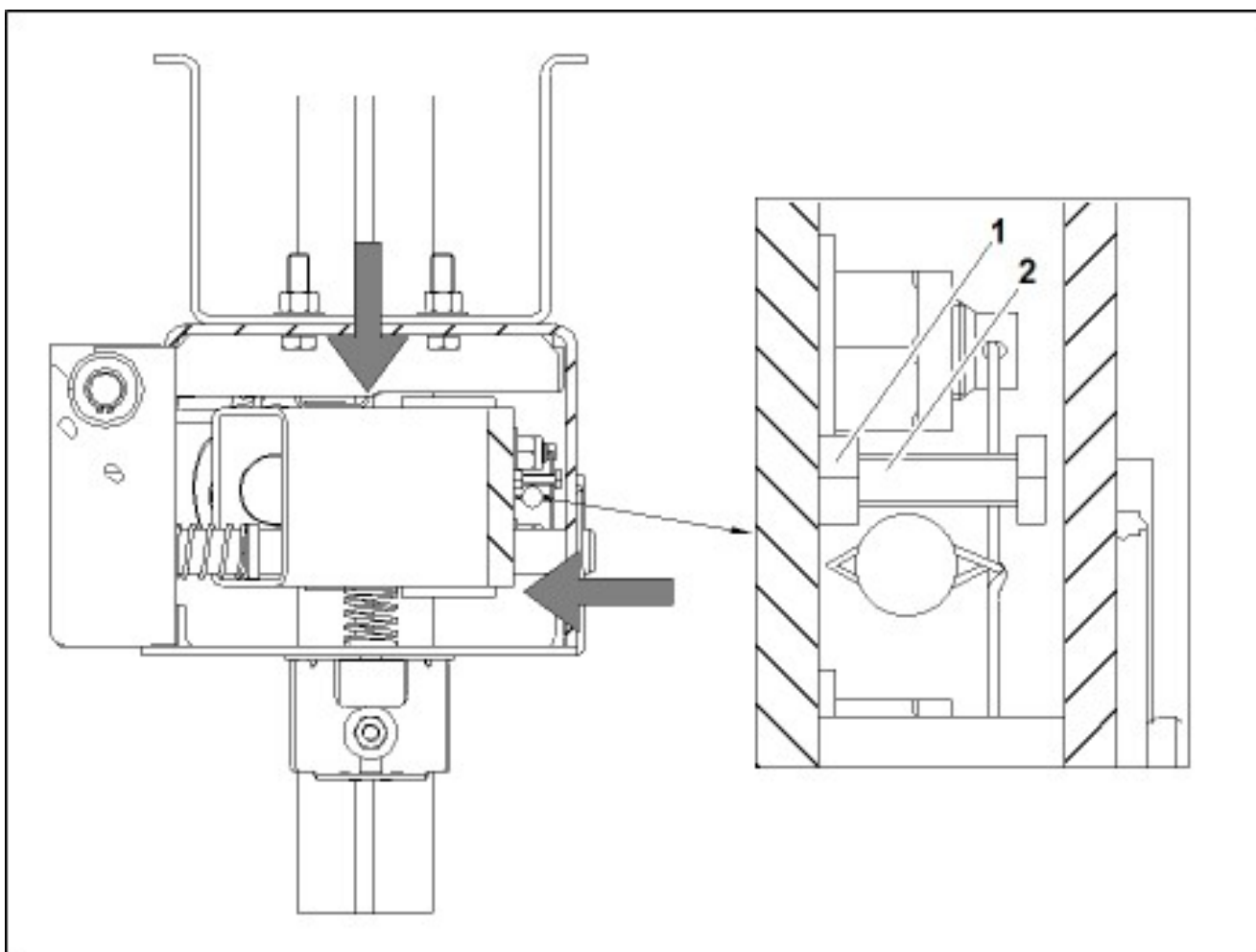


- 1 Brake shoe in eccentric disk  
3 Brake plate

2 Guide rail

- Make sure that the running clearance X is 2 mm between:
- the brake shoe and the guide rail
  - the brake plate and the guide rail.

#### 5.46.12 Alignment of safety gear



1 Adjustment bolt locking nut

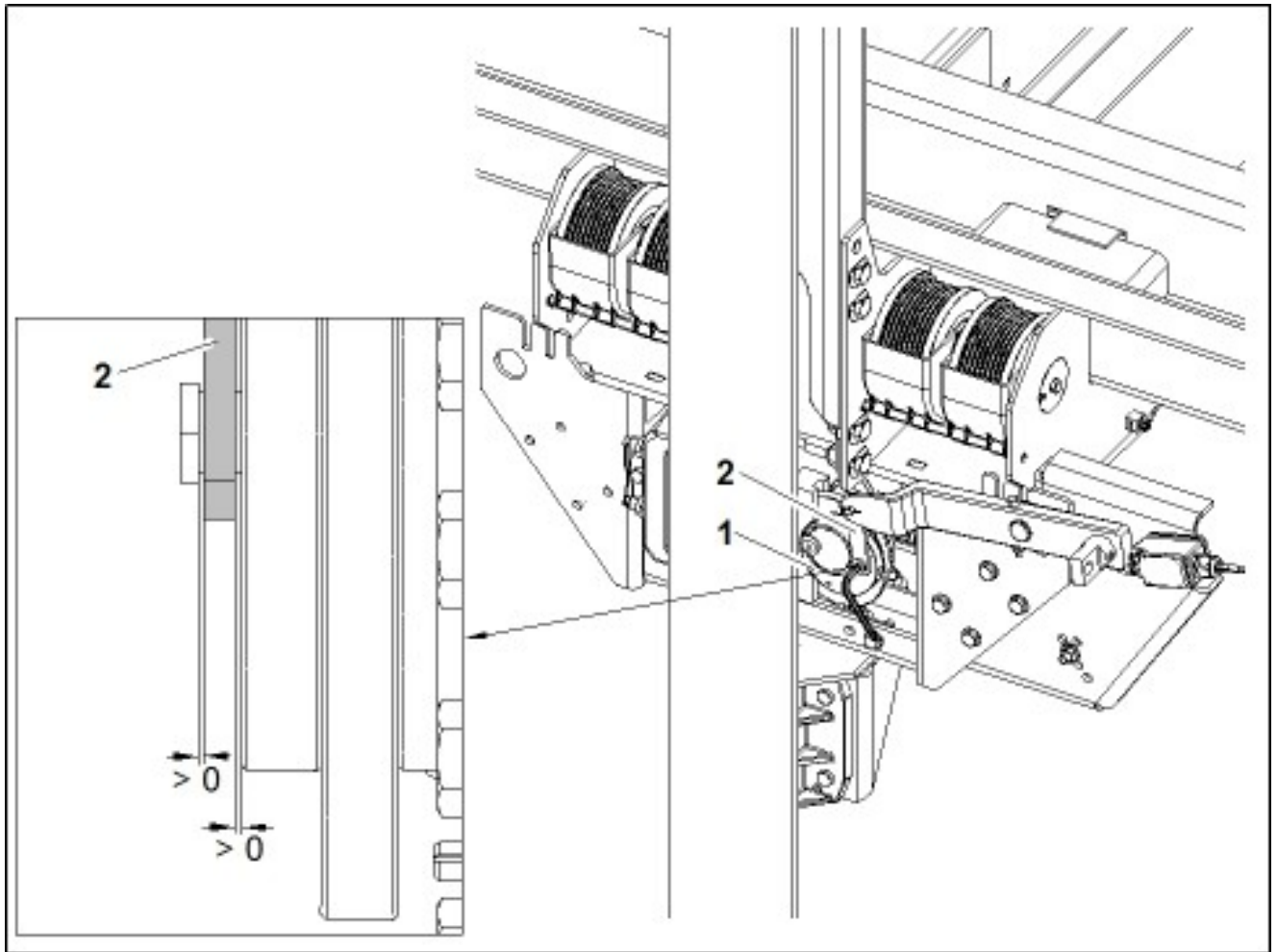
2 Adjustment bolt

- If the running clearances are not equal:
- Loosen the adjustment bolt locking nut.



- Depending on the safety adjustment, screw in or out the adjustment bolt until the brake plate and brake shoe have an equal distance 2 mm from the guide rail.
- Tighten the adjustment bolt locking nut.

#### 5.46.13 Check for fixation and clearance of eccentric disk



1 Eccentric disk

2 Connecting lever

- Do a check of the fastening of the eccentric disk.
  - Make sure that the connecting lever does not touch the eccentric disk.

#### 5.46.14 Check for fixation of governor lever and rope coupling

- Make sure that the governor lever is securely fastened to the rope coupling.

#### 5.46.15 Check for function of retaining spring

- Make sure that the reset unit can hold the governor lever in the resting position.

#### 5.46.16 Check for function of actuating mechanism

- Move the actuating mechanism manually.
- Make sure that the mechanism moves freely and actuates the safety contact switch.

#### 5.46.17 Check for actuation of safety contact switch

- Make sure that the safety contact switch actuates correctly by manually pressing the switch.
  - ↳ If necessary, replace the safety contact switch.

#### 5.46.18 Check for actuation of governor lever and eccentric disk

- Check the movement of the governor lever.
  - Make sure that the eccentric disk is in contact with the guide rail.



## 5.46.19 Testing procedure

### 5.46.19.1 Actuation test of safety gear


- ▶ Pull the governor rope.
- ▶ Monitor the following conditions:
  - The eccentric disk touch the guide rail.
  - The safety contact switch activates.
  - The brake plate, brake shoes and eccentric disk engage simultaneously.
- ▶ Reset the safety gear.
- ▶ Do the required checks after an activation.
  - ↳ If failed, correct any issues and test again.

## 5.46.20 Reset procedure

### 5.46.20.1 Reset of safety gear after activation

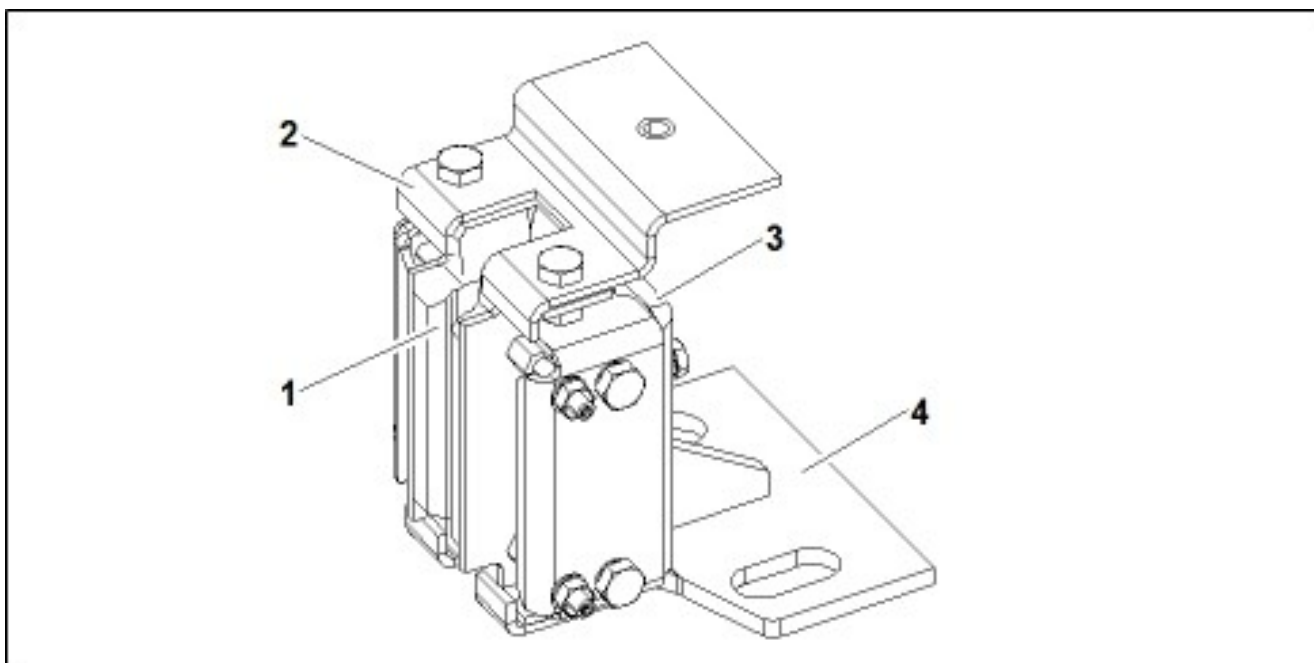
- ▶ Move the car or CWT upwards, either:
  - Manually, by means of releasing the machine brake and moving the hand wheel of the machine.
  - Automatically, moving it with the main power of the machine.
- ▶ The safety gear will be automatically disengaged.

## 5.46.21 Spare parts

 For more information regarding spare parts, contact the installer.

## 5.47 Sliding guide shoe MM GSL B029D

### 5.47.1 Overview of MM GSL B029D sliding guide shoe



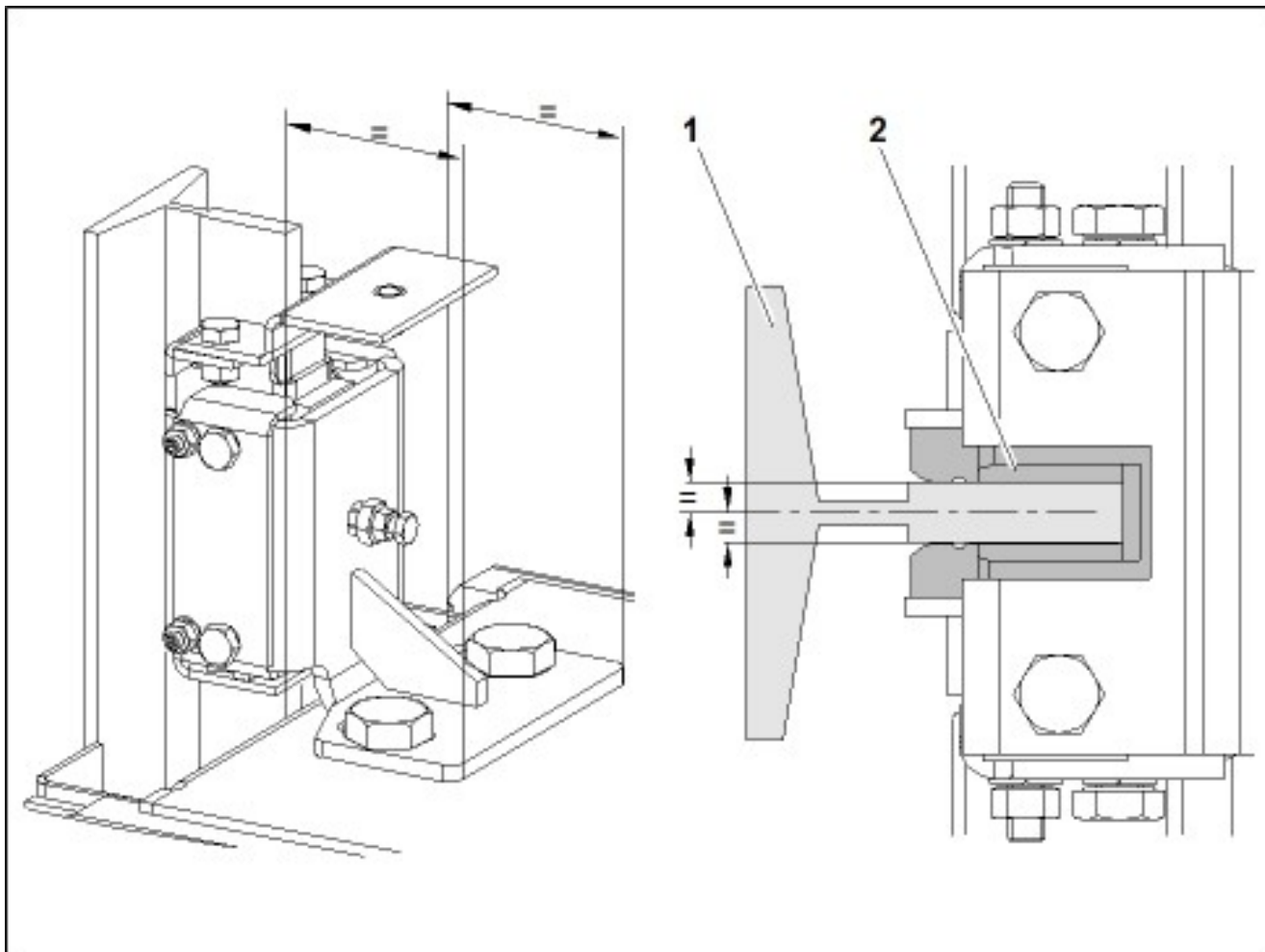
- |   |                    |   |                       |
|---|--------------------|---|-----------------------|
| 1 | Guide shoe lining  | 2 | Guide plate           |
| 3 | Guide shoe housing | 4 | Guide shoe base frame |

### 5.47.2 Maintenance plan

Interval (months)	Description
12	Check of clearance between guide rail and guide shoe lining
12	Cleaning of guide shoes
12	General check of guide shoes
12	Check of guide shoe lubricator



### 5.47.3 Clearance check between guide shoe lining and guide rail



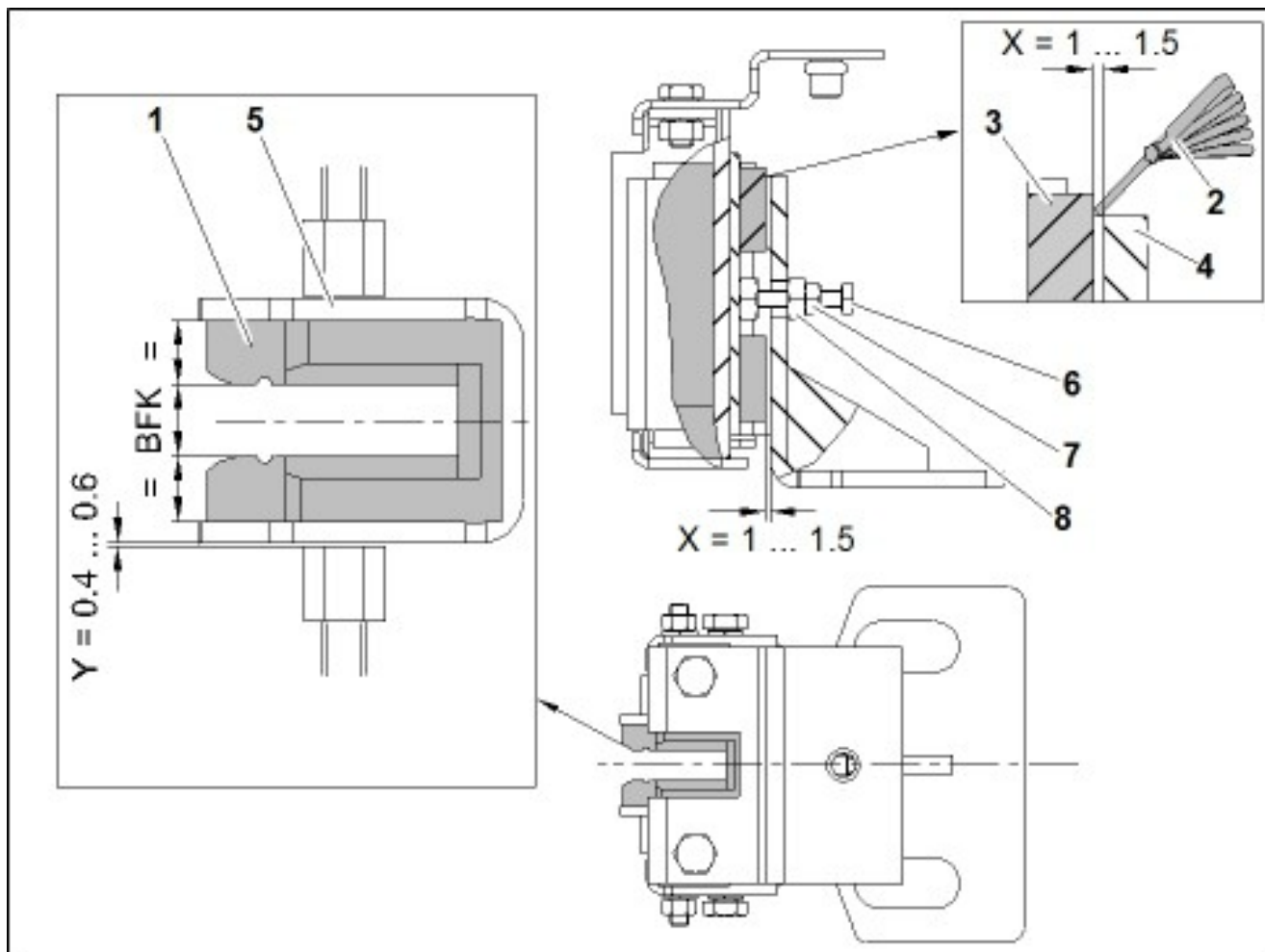
1 Guide rail

2 Guide shoe lining

- ▶ Remove the lubricator.
- ▶ Make sure that the guide shoes are aligned.
- ▶ Make sure that the guide shoes are centered in the guide rails.
- ▶ Do a check if there is a space between the lining and the head of the guide rail. If yes, remove the guide shoe.
- ▶ Adjust the clearance to remove the space.
  - For instruction, refer to chapter Clearance check between stop buffer and base frame.
  - If the space cannot be removed, replace the complete set of guide shoes.
- ▶ Install the removed guide shoe.
- ▶ Install the lubricator.



#### 5.47.4 Clearance check between stop buffer and base frame



- |   |                   |   |                  |
|---|-------------------|---|------------------|
| 1 | Guide shoe lining | 2 | Feeler gauge     |
| 3 | Stop buffer       | 4 | Base frame       |
| 5 | Lining support    | 6 | Fixation bolt    |
| 7 | M6 lock nut       | 8 | M6 adjusting nut |

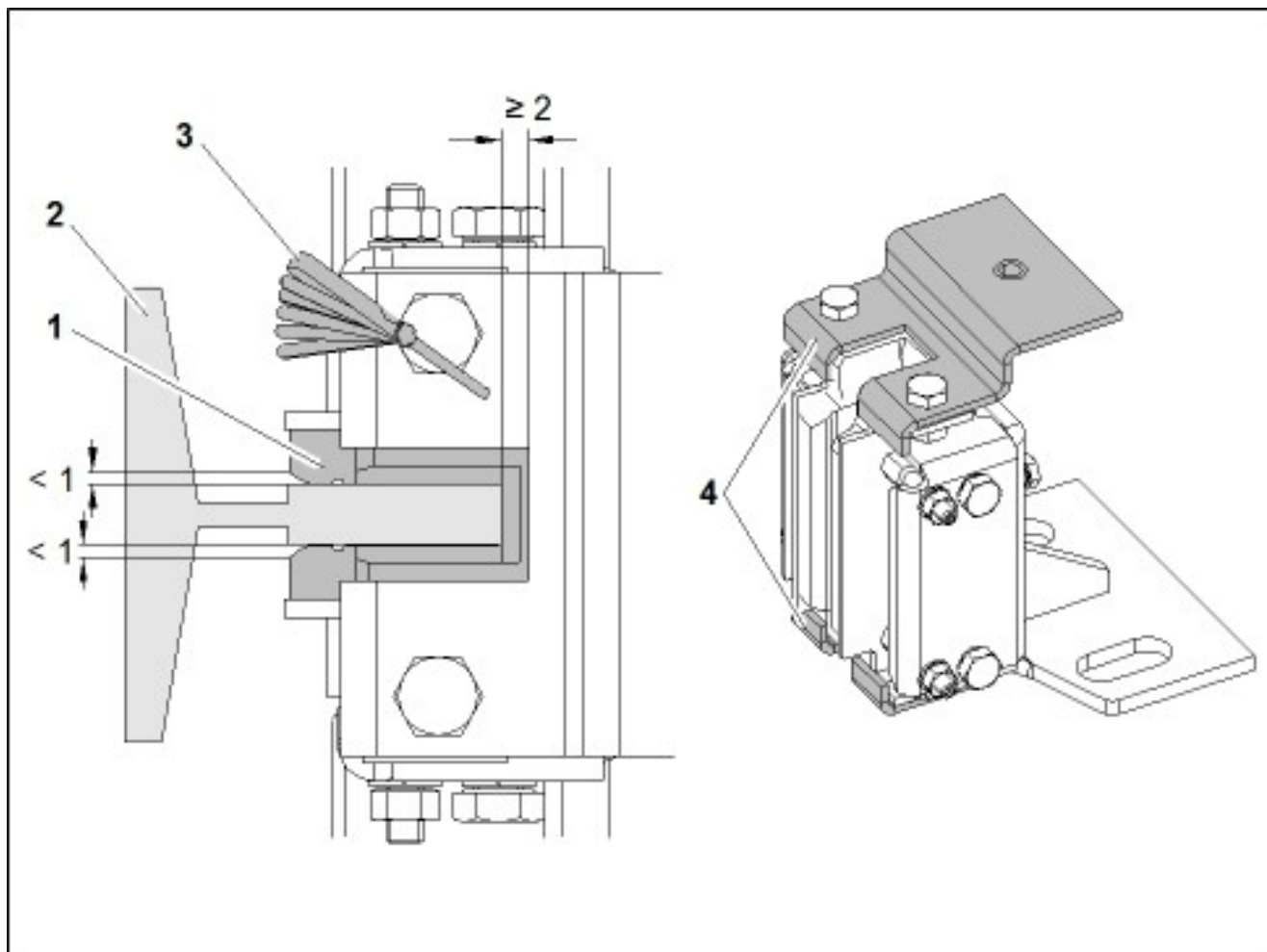
- Remove the lubricator.
- Make sure that the clearance X between the stop buffer and the base frame is 1 ... 1.5 mm. If the clearance is not in this range, remove the guide shoe and adjust it.
- Use the adjusting nut to adjust the clearance.
- If the clearance X is no longer possible, replace the complete set of guide shoes.
- Make sure that the clearance Y between the lining support and the stop buffer is 0.4 ... 0.6 mm. If it is outside this range, adjust it.
- Install the removed guide shoe or, if necessary install a complete new set of guide shoes.
- Install the lubricator.

#### 5.47.5 Check and cleaning of guide shoe

- Make sure that on the guide shoe housing there is no dust or lubricant.



#### 5.47.6 Check of wear of guide shoe lining



- |   |                   |   |             |
|---|-------------------|---|-------------|
| 1 | Guide shoe lining | 2 | Guide rail  |
| 3 | Feeler gauge      | 4 | Guide plate |

- ▶ Remove the lubricator.
- ▶ Make sure that the guide shoes are aligned and centered in the guide rails.
- ▶ Measure the distance between the front face of the guide rail and the guide shoe lining.
  - Make sure that there is no more than 2 mm. If the clearance is more than 2 mm, replace the guide shoe lining.
- ▶ Measure the distance between each lateral face of the guide rail and the guide shoe.
  - Make sure that there is no more than 1 mm on each side. If the clearance is more than 1 mm, replace the guide shoe lining.
- ▶ Install the lubricator.

#### 5.47.7 Check of guide shoe lubricator

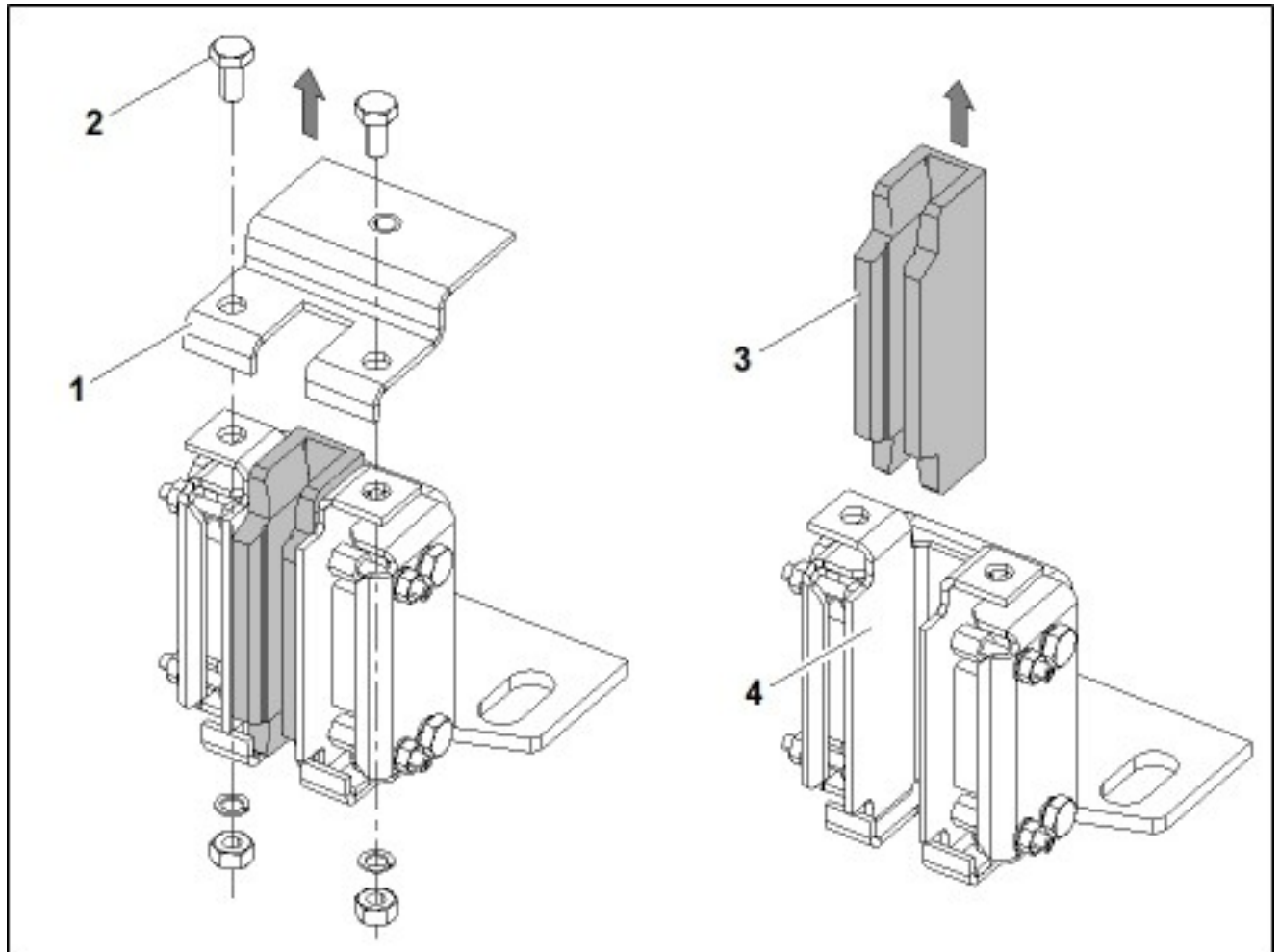
- ▶ Do a check of the guide shoe lubricator. For instruction, refer to the maintenance information of the lubricator.

#### 5.47.8 Block and center of car/counterweight

- ▶ Get two large wooden wedges (or equivalent items) to make sure that the car sling/counterweight frame (when in position) does not move. Put them between the car sling/counterweight frame and the guide rail.
- ▶ Make sure that the distance between the car sling/counterweight frame and the guide rail is equal on the two sides.
- ▶ Make sure that the wooden wedges are tight and the car sling/counterweight frame does not move laterally when the guide shoes are removed.



#### 5.47.9 Replacing of guide shoe lining



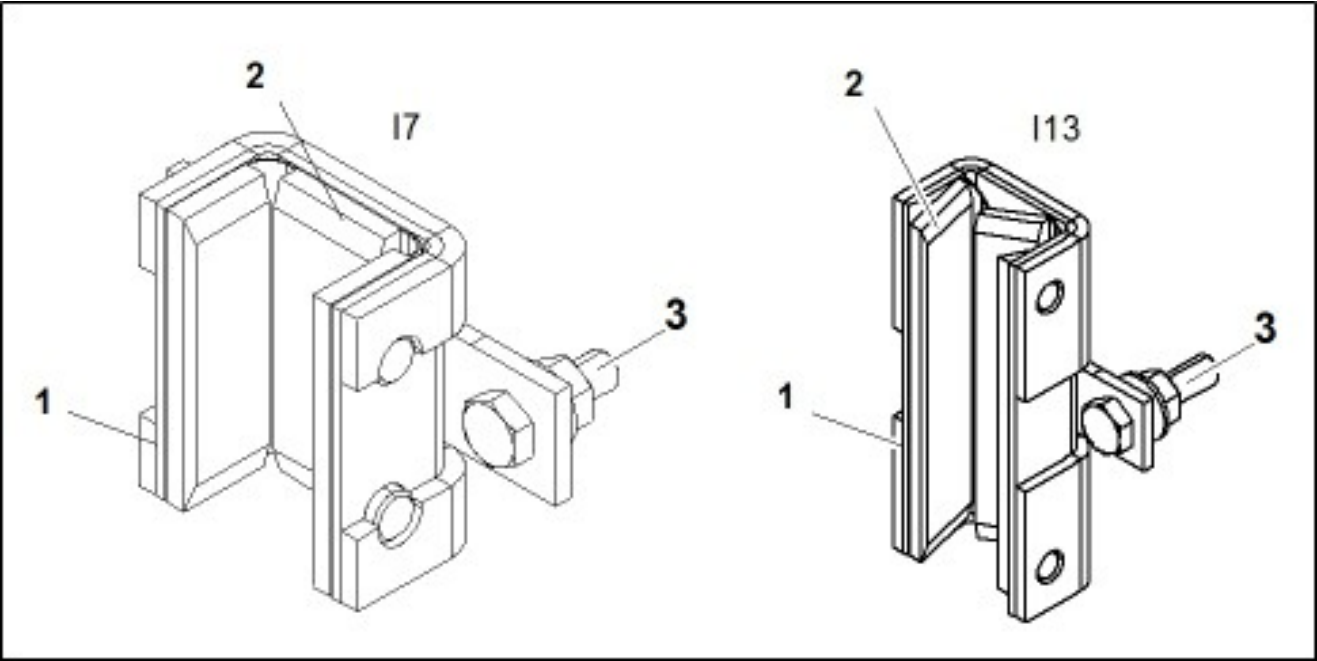
- |   |                    |   |                |
|---|--------------------|---|----------------|
| 1 | Lubricator support | 2 | Fixation bolt  |
| 3 | Guide shoe lining  | 4 | Lining support |

- Remove the oil lubricator.
- Remove the lubricator support.
- Remove the guide shoe lining.
- Put the new lining in the support.
- Install the lubricator support.
- Install the oil lubricator.



5.48 Sliding guide shoe MM GSL I7 and MM GSL I13

5.48.1 Overview of I7 and I13 sliding guide shoes

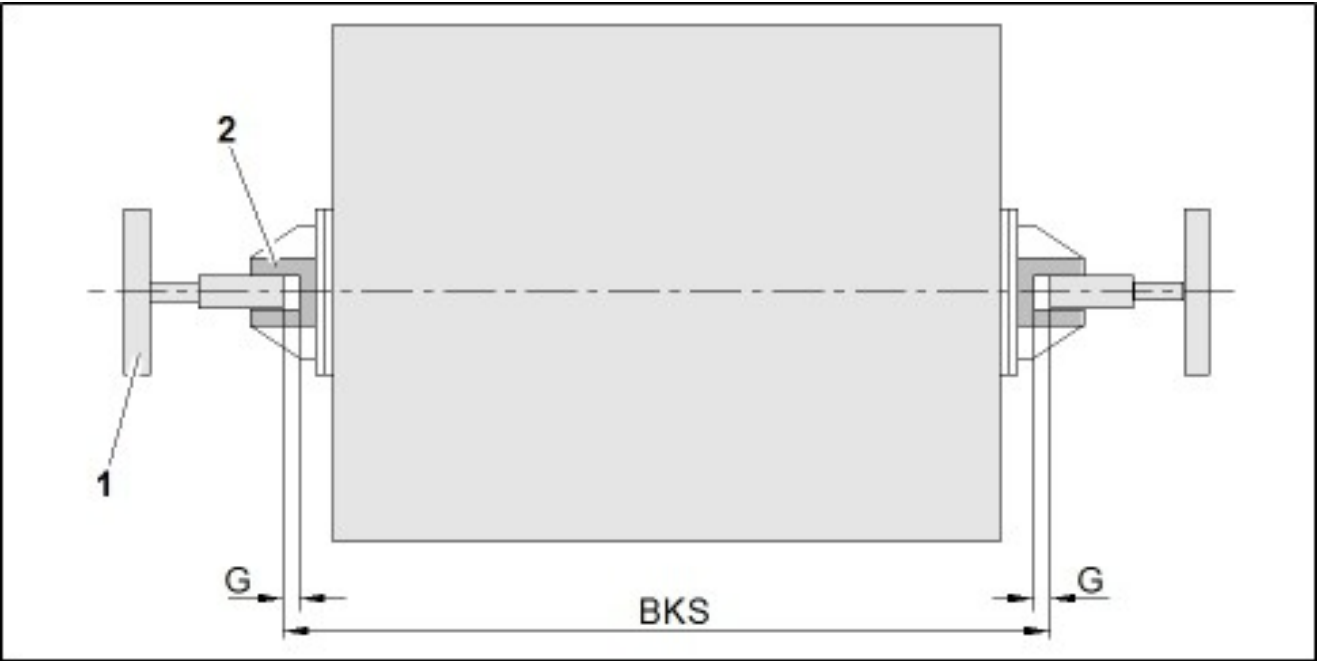


- 1 I guide shoe housing
- 2 I guide shoe lining
- 3 I guide shoe fixation

5.48.2 Maintenance plan

Interval (months)	Description
12	Check of clearance between guide rail and guide shoe lining
12	Cleaning of guide shoes
12	General check of guide shoes
12	Check of guide shoe lubricator

5.48.3 Clearance check



- 1 Guide rail
- 2 Guide shoe lining



- ▶ Remove the lubricators.
- ▶ Make sure that the guide shoes are aligned and centered in the guide rails.
- ▶ Make sure that the clearance G between the guide rail and the guide shoe lining is within the permitted range:

Guide shoe	Clearance
I7	0.3 ... 3 mm
I13	0.5 ... 1.5 mm
I/L 10	0.25 ... 1.25 mm
I/L 14	0.25 ... 1.25 mm
T15 – T22	0.25 ... 1.25 mm

- ▶ If the clearance is out of this range, adjust it. Replace the guide shoe lining if this clearance is no longer possible.
- ▶ Install the lubricator.

#### 5.48.4 Check and cleaning of guide shoe

- ▶ Make sure that on the guide shoe housing there is no dust or lubricant.

#### 5.48.5 General check of guide shoe

- ▶ Examine the top and bottom of the guide shoe lining for wear. There must be no more than 0.5 ... 1.5 mm equal clearance between the guide rail side face and the guide shoe lining. Use a feeler gauge to make sure this is accurate.
- ▶ If the slideway lining is  $\leq 0.4$  mm, replace the sliding guide.

#### 5.48.6 Check of guide shoe lubricator

- ▶ Do a check of the guide shoe lubricator.
  - For instruction, refer to the maintenance information of the lubricator.

#### 5.48.7 Block and center of car/counterweight

- ▶ Get two large wooden wedges (or equivalent items) to make sure that the car sling/counterweight frame (when in position) does not move. Put them between the car sling/counterweight frame and the guide rail.
- ▶ Make sure that the distance between the car sling/counterweight frame and the guide rail is equal on the two sides.
- ▶ Make sure that the wooden wedges are tight and the car sling/counterweight frame does not move laterally when the guide shoes are removed.

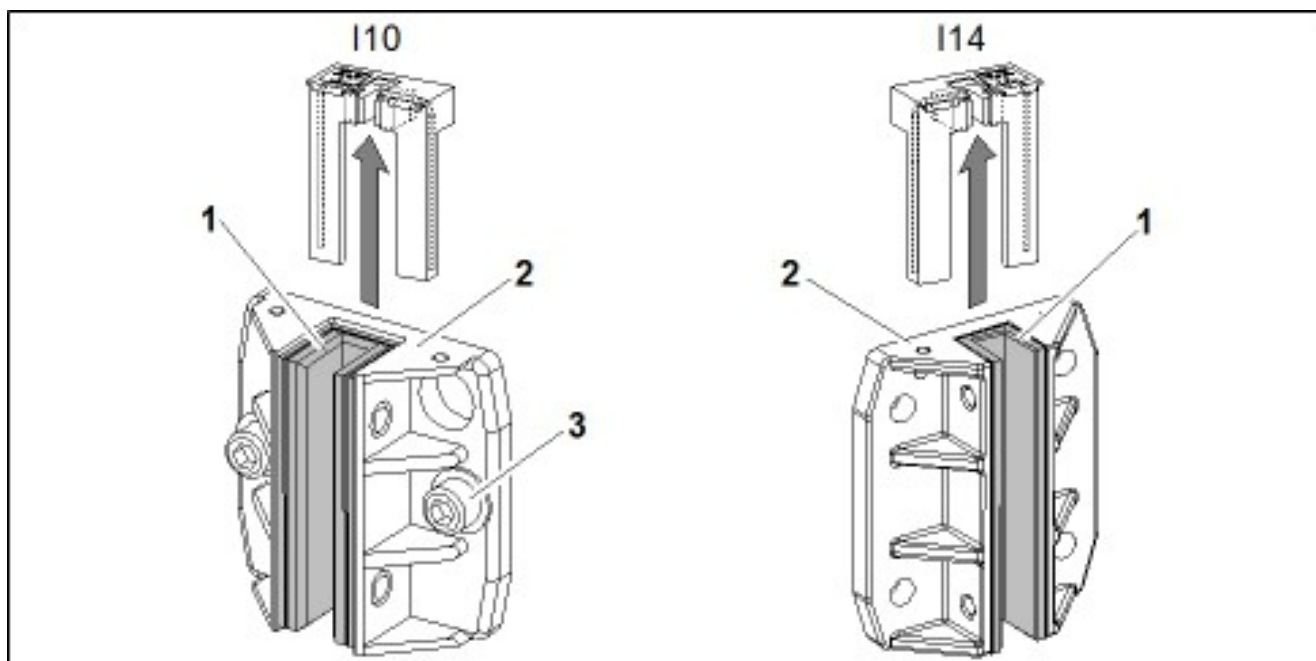
#### 5.48.8 Replacing of guide shoe

- ▶ Make sure that the car or counterweight cannot move and replace as follows:
  - Remove the oil lubricator from the top of the guide shoe housing.
  - Loosen the lock to remove the sliding guide shoe.
  - Pull the guide out of the slot.
  - Install the new sliding guide. It is not necessary to realign the car.
  - Tighten the guide shoe fixation screws.
  - Install the oil lubricator.
  - Remove the blockage.



## 5.49 Sliding guide shoe MM GSL I/L10 and MM GSL I/L14

### 5.49.1 Overview I/L10 and I/L14 sliding guide shoes



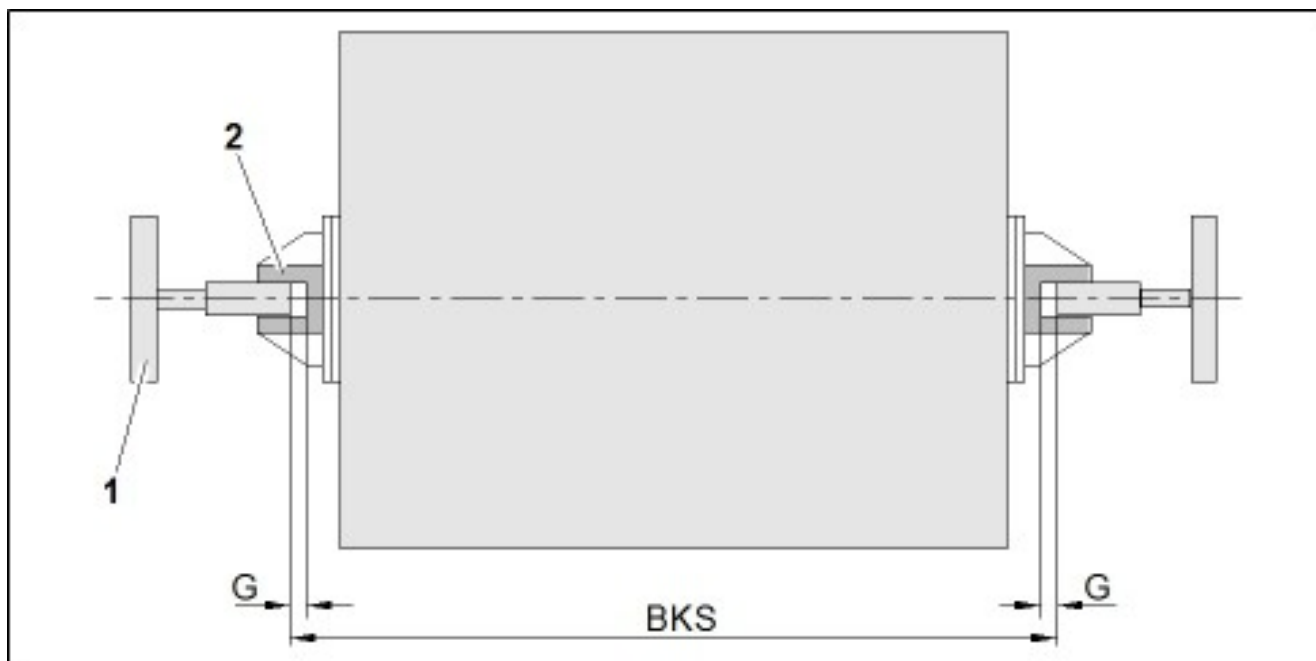
- 1 I guide shoe lining
- 3 I guide shoe fixation

- 2 I guide shoe housing

### 5.49.2 Maintenance plan

Interval (months)	Description
12	Check of clearance between guide rail and guide shoe lining
12	Cleaning of guide shoes
12	General check of guide shoes
12	Check of guide shoe lubricator

### 5.49.3 Clearance check



- 1 Guide rail

- 2 Guide shoe lining



- ▶ Remove the lubricators.
- ▶ Make sure that the guide shoes are aligned and centered in the guide rails.
- ▶ Make sure that the clearance G between the guide rail and the guide shoe lining is within the permitted range:

Guide shoe	Clearance
I7	0.3 ... 3 mm
I13	0.5 ... 1.5 mm
I/L 10	0.25 ... 1.25 mm
I/L 14	0.25 ... 1.25 mm
T15 – T22	0.25 ... 1.25 mm

- ▶ If the clearance is out of this range, adjust it. Replace the guide shoe lining if this clearance is no longer possible.
- ▶ Install the lubricator.

#### 5.49.4 Check and cleaning of guide shoe

- ▶ Make sure that on the guide shoe housing there is no dust or lubricant.

#### 5.49.5 General check of guide shoe

- ▶ Examine the top and bottom of the guide shoe lining for wear. There must be no more than 0.5 ... 1 mm equal clearance between the guide rail side face and the guide shoe lining. Use a feeler gauge to make sure this is accurate.
- ▶ Make sure that the distance between the front face of the guide rail and the guide shoe lining is no more than 1 mm.
  - If the distance is more than 1 mm, adjust the unit. If there is too much wear, replace the guide shoe lining.
- ▶ Examine the condition of the guide shoe lining for too much wear, damage, brittleness or cracking. If necessary, replace the guide shoe lining.

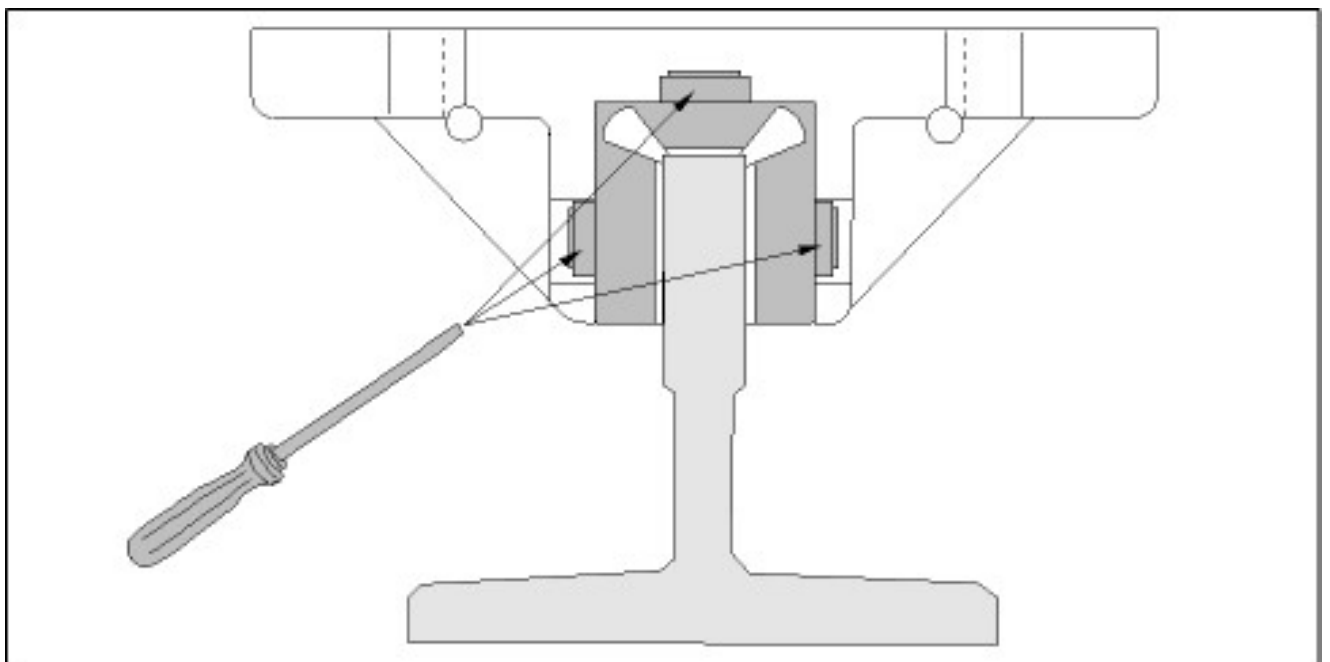
#### 5.49.6 Check of guide shoe lubricator

- ▶ Do a check of the guide shoe lubricator.
  - For instruction, refer to the maintenance information of the lubricator.

#### 5.49.7 Block and center of car/counterweight

- ▶ Get two large wooden wedges (or equivalent items) to make sure that the car sling/counterweight frame (when in position) does not move. Put them between the car sling/counterweight frame and the guide rail.
- ▶ Make sure that the distance between the car sling/counterweight frame and the guide rail is equal on the two sides.
- ▶ Make sure that the wooden wedges are tight and the car sling/counterweight frame does not move laterally when the guide shoes are removed.

#### 5.49.8 Replacing of guide shoe lining

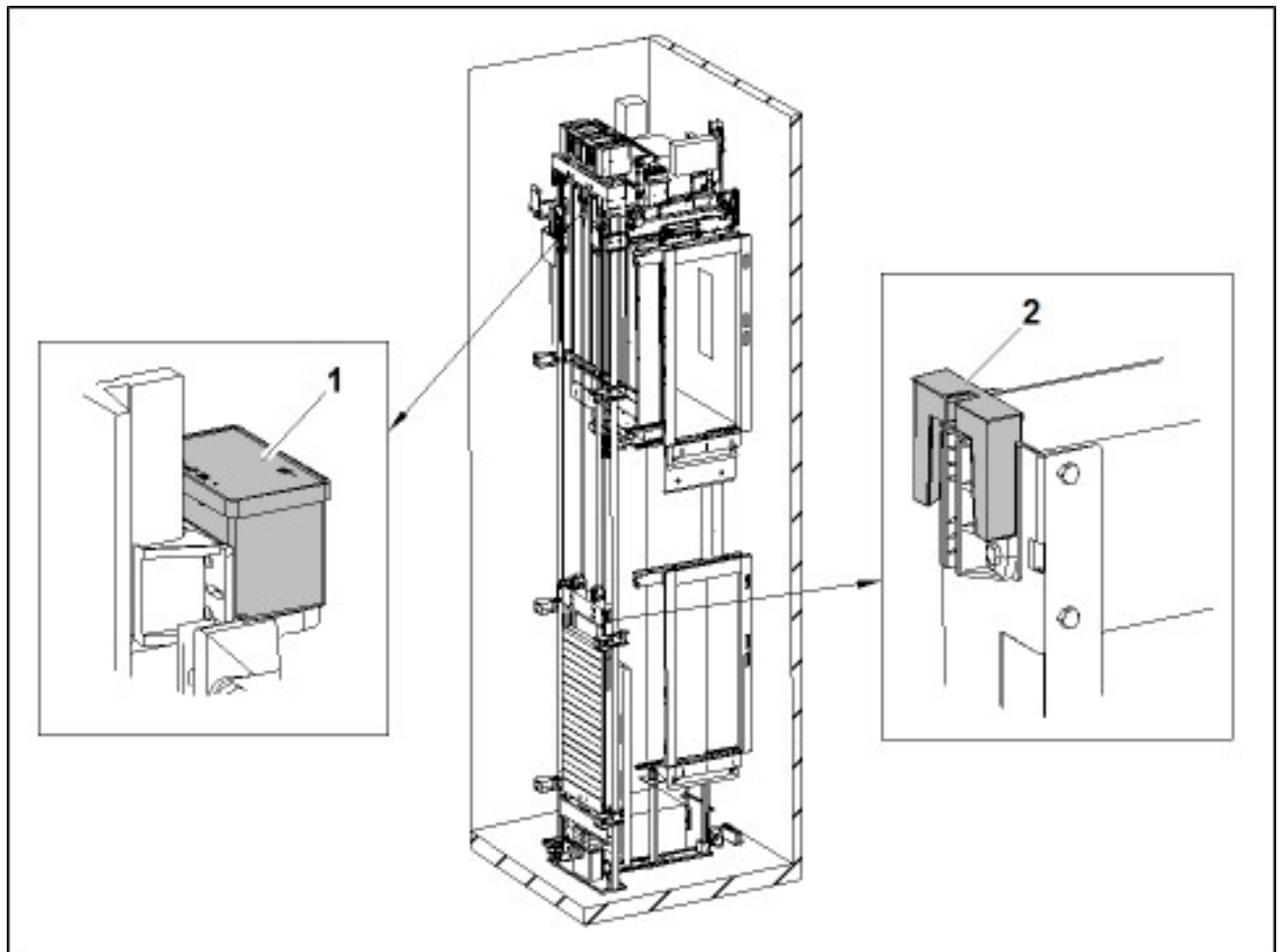




- Make sure that the car or counterweight cannot move and replace as follows:
- Remove the oil lubricator from the top of the guide shoe housing.
  - Loosen the guide shoe fixation screws of the guide shoe housing.
  - Remove all shims.
  - Make sure that the shims do not fall in the hoistway.
  - Keep the shims in a safe area.
  - Remove the guide shoe fixation screws.
  - Move the housing with the shoe lining off the car or counterweight frame.
  - Push the guide shoe holding tabs in with a screw driver to remove the guide shoe lining.
  - Install the new guide shoe lining. Make sure that the holding tabs are seated correctly in the guide shoe housing.
  - Move the housing with the guide shoe back into position and install the guide shoe fastening bolt. Install all shims that were removed.
  - Tighten the guide shoe fixation screws. Install the oil lubricator to the top of the guide shoe housing. Remove the blockage.

## 5.50 Lubricator for sliding guide shoe MM GSL

### 5.50.1 Overview of lubricator



1 Oil lubricator for car

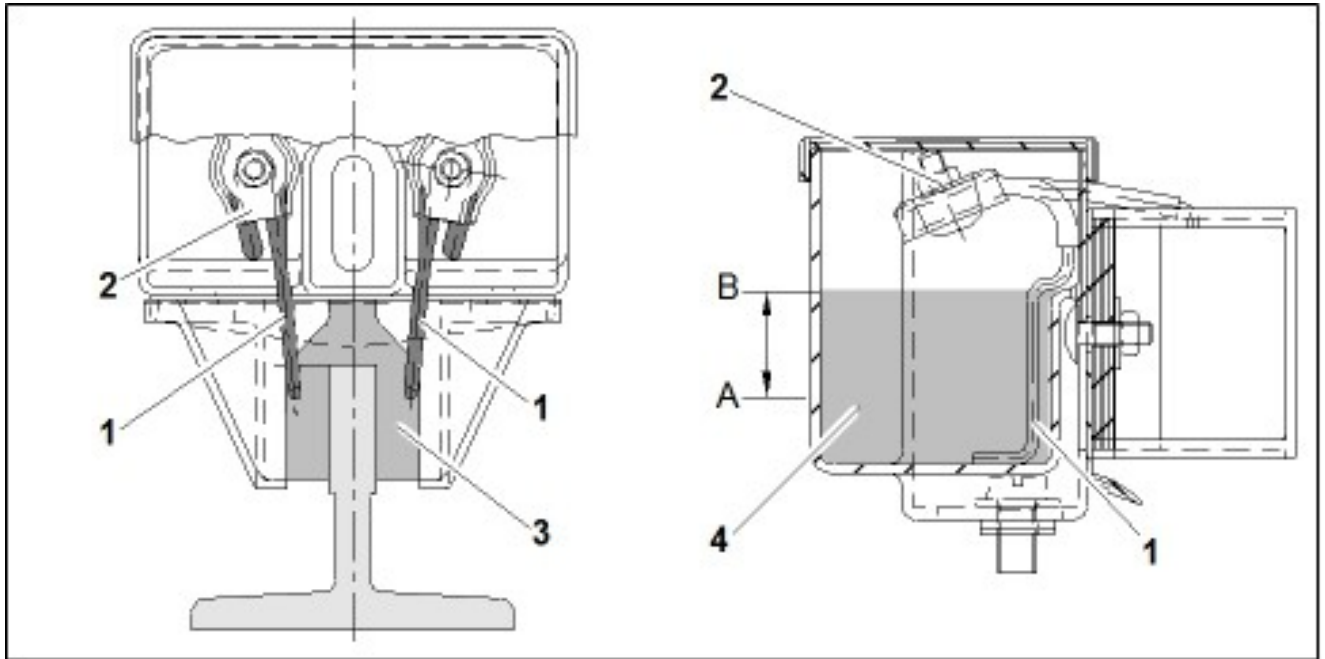
2 Oil lubricator for counterweight

### 5.50.2 Maintenance plan

Interval (months)	Description
12	Visual check of lubricator
12	Check of oil level in lubricator



### 5.50.3 Check of lubricator



**A** Minimum oil level

**1** Oil pot wick

**3** Guide rail pad

**B** Maximum oil level

**2** Wick clip

**4** Oil

**i** Depending on the thickness of the guide rail, the lubricator might look different.

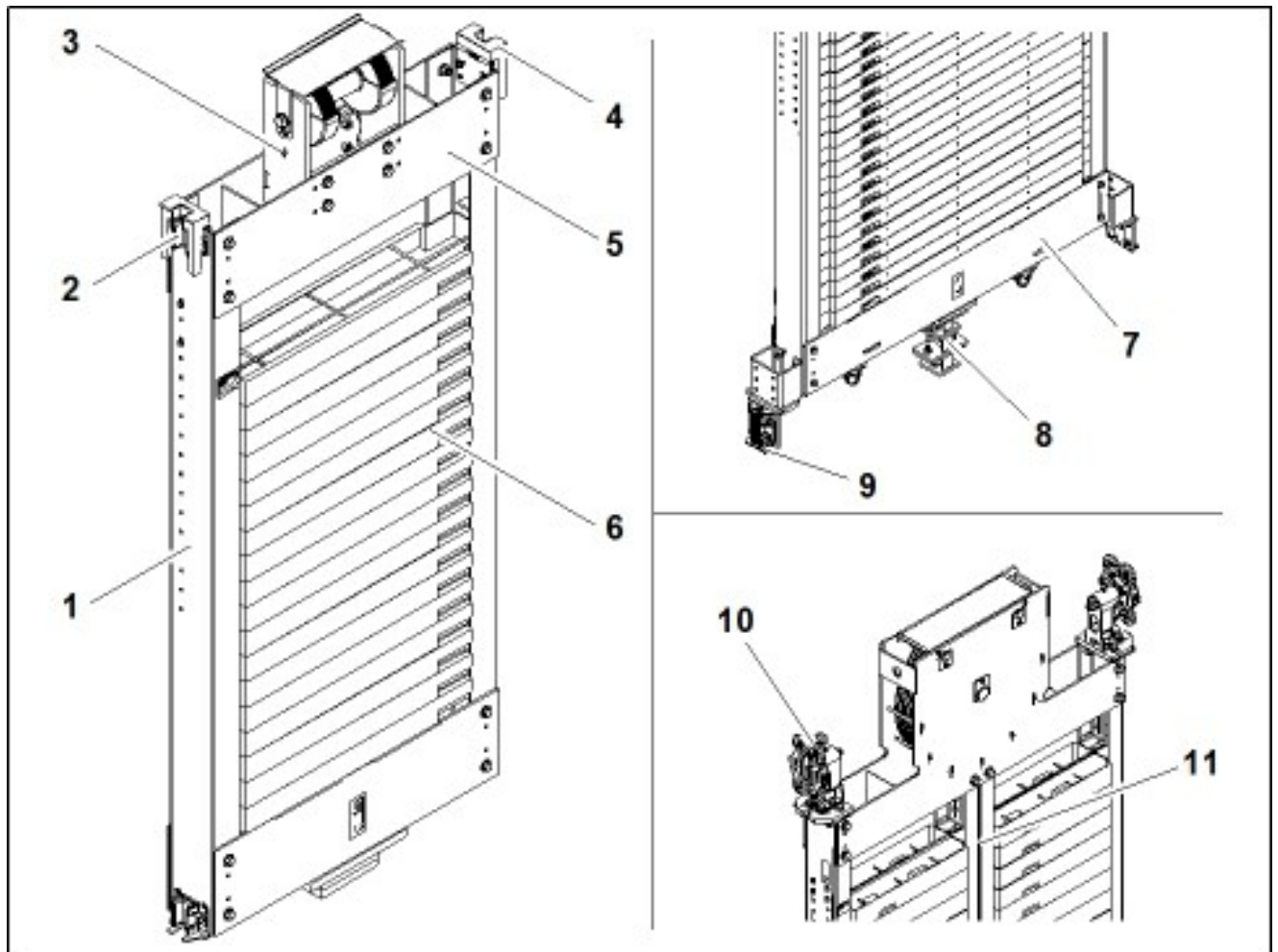
- ▶ Examine the lubricator for any damages and for oil leaks.
- ▶ Examine the oil level in the lubricator cup and if necessary, fill it. The end of the oil wick must be submerged in oil.
  - Use only oil type HLP68 or HH150 as lubrication oil.
  - Replace the lid of the oil lubricator and clean up spilled oil.

### 5.50.4 Adjustment of oil flow

- ▶ Make sure that the lubrication pads are moist with oil. Make sure that there is an oil layer on the guide rail.
  - If there is not sufficient oil, loosen the screw clamping of the wick clips.
  - If there is too much oil, tighten the screw clamping the wick clips.



**5.51 Modular counterweight CW GGM 43**  
**5.51.1 Overview**



- |           |                                |           |                              |
|-----------|--------------------------------|-----------|------------------------------|
| <b>1</b>  | Upright                        | <b>2</b>  | Sliding guide shoe           |
| <b>3</b>  | Pulley box                     | <b>4</b>  | Oil lubricator               |
| <b>5</b>  | Upper yoke                     | <b>6</b>  | Filler block                 |
| <b>7</b>  | Lower yoke                     | <b>8</b>  | Buffer impact plate coupling |
| <b>9</b>  | Retaining device               | <b>10</b> | Roller guide shoe            |
|           | – Only for seismic application |           |                              |
| <b>11</b> | Middle upright                 |           |                              |

**5.51.2 Maintenance plan**

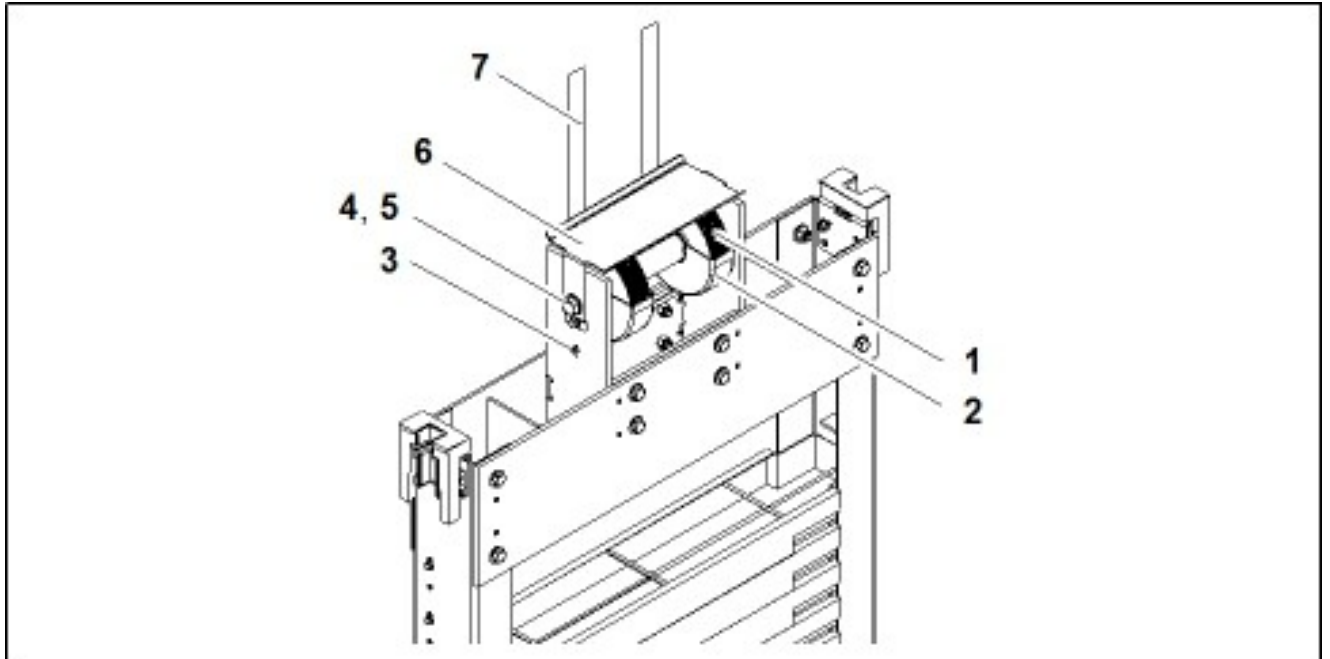
Interval (months)	Description
<b>12</b>	Check of component condition
<b>12</b>	Check of pulleys for STM
<b>12</b>	Check of pulley for rope
<b>12</b>	Check of compensating chain assembly (if applicable)
<b>12</b>	Check of guide shoes and lubricator
<b>12</b>	Check of safety gear
<b>6</b>	Adjustment of HGUR



### 5.51.3 Check of component condition

- ▶ Visually examine the general condition of the pulley box for STM or rope.
- ▶ Listen for any vibrations, sudden movement or noise during travel.
- ▶ Make sure that all screw connections of the suspension pulley are tightened.
- ▶ Make sure that the retaining clips for the filler weights are in position and tight.
- ▶ Visually examine the condition of the counterweight.
  - Make sure that there are no loose counterweight fixation bolts on the uprights and all components of the counterweight.

### 5.51.4 Check of pulley for STM

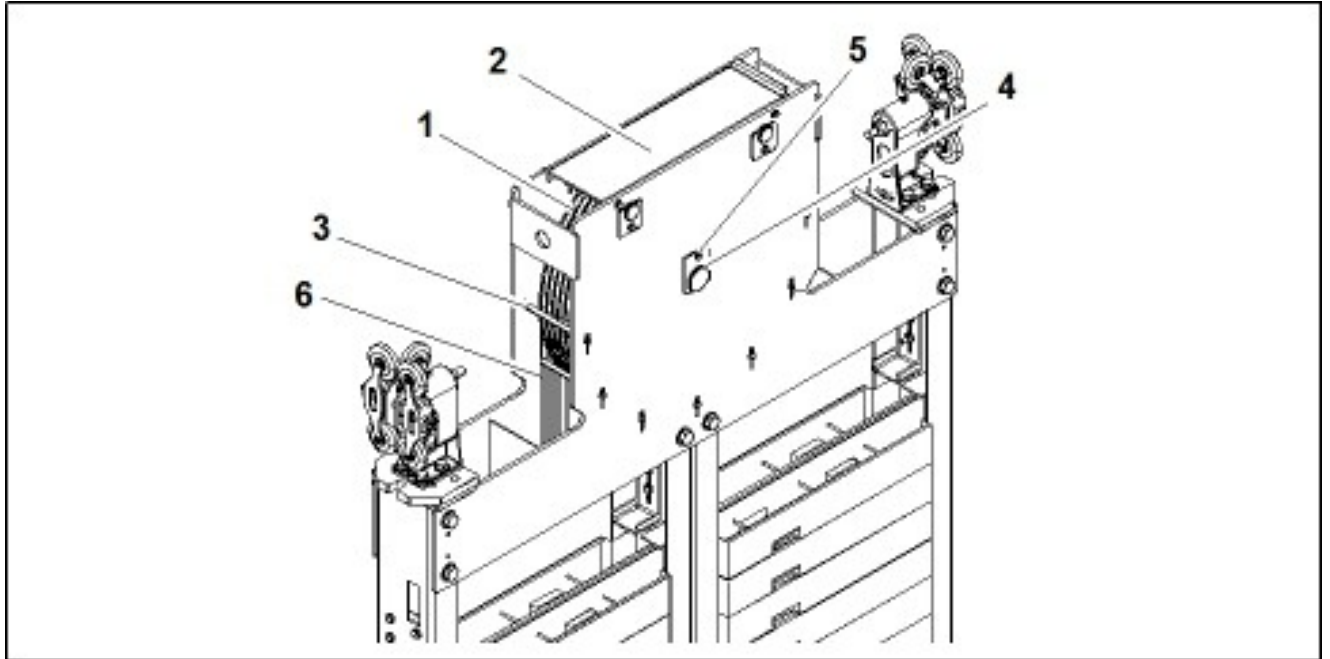


- |   |                      |   |                        |
|---|----------------------|---|------------------------|
| 1 | Counterweight pulley | 2 | Retainer               |
| 3 | Anti-rebound rod     | 4 | Pulleys fastening bolt |
| 5 | Pulley protection    | 6 | STM                    |

- ▶ Make sure that the pulleys, retainers and pulley protection are clean.
- ▶ Make sure that the STMs run correctly over the pulleys.
- ▶ Make sure that retainer is securely mounted.
  - Make sure that the retainer does not touch the STMs.
- ▶ Make sure that the pulley protection is securely mounted.
- ▶ Make sure that the pulley fastening bolts are tightened.
- ▶ Make sure that the two anti-rebound rods are securely mounted.



#### 5.51.5 Check of pulley for rope



- |   |                  |   |                       |
|---|------------------|---|-----------------------|
| 1 | Pulley for rope  | 2 | Protection cover      |
| 3 | Anti-rebound rod | 4 | Pulley fastening bolt |
| 5 | Rope             |   |                       |

- ▶ Make sure that the rope pulleys and protection cover are clean.
- ▶ Make sure that the ropes operate correctly over the pulleys.
- ▶ Make sure that the protection cover is securely mounted.
  - Make sure that the protection cover does not touch the ropes.
- ▶ Make sure that the pulley fastening bolts are tightened.
- ▶ Make sure that the anti-rebound rods are securely mounted.

#### 5.51.6 Check of guide shoes and lubricator

- ▶ Examine the clearance between the guide shoe and the guide rail.
- ▶ Examine the condition of the lubricator.



For more information refer to the maintenance information of the guide shoe.

#### 5.51.7 Check of safety gear

- ▶ Examine the clearance between the safety gear and the guide rail.

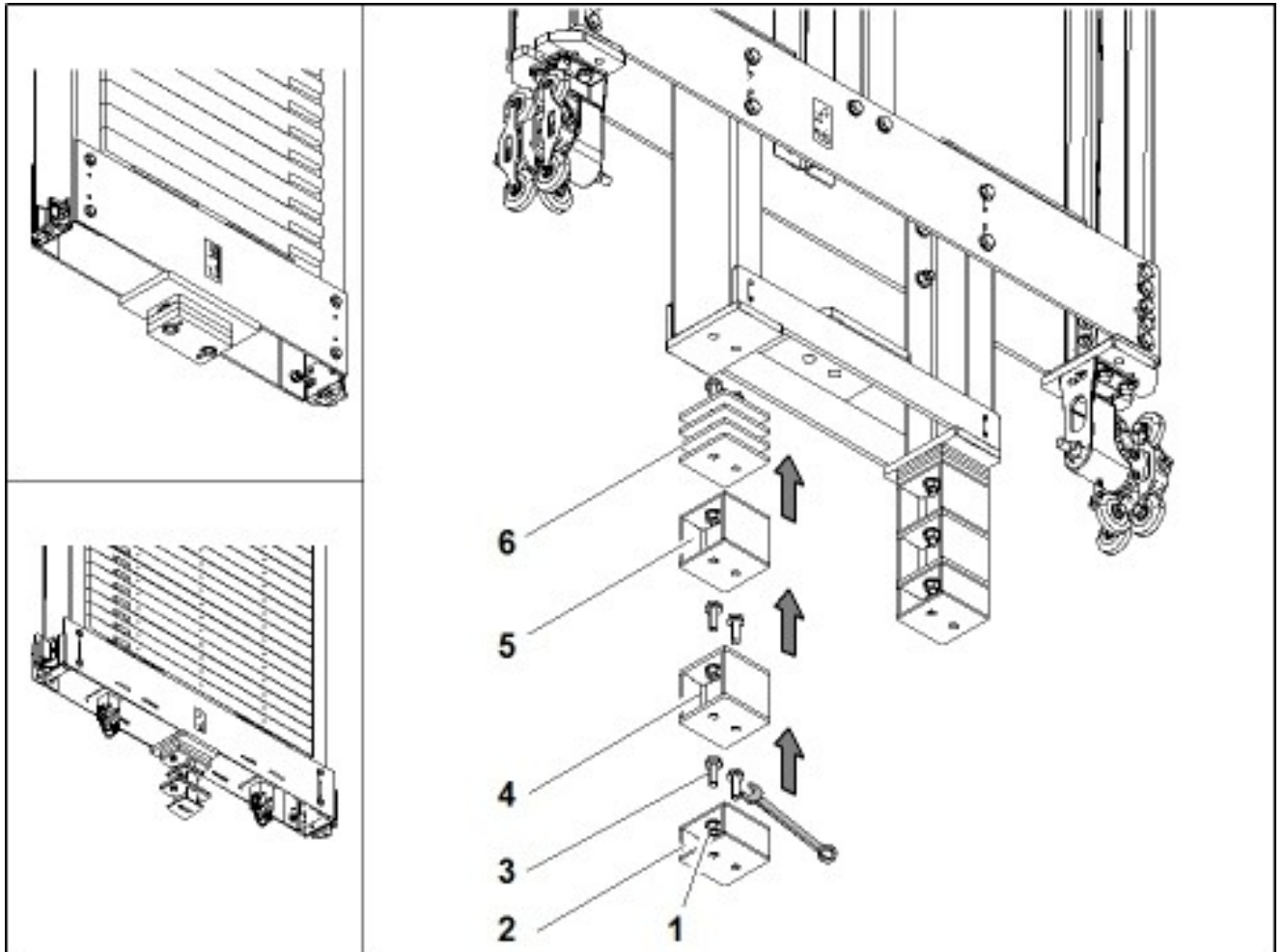


For more information refer to the maintenance information of the safety gear.



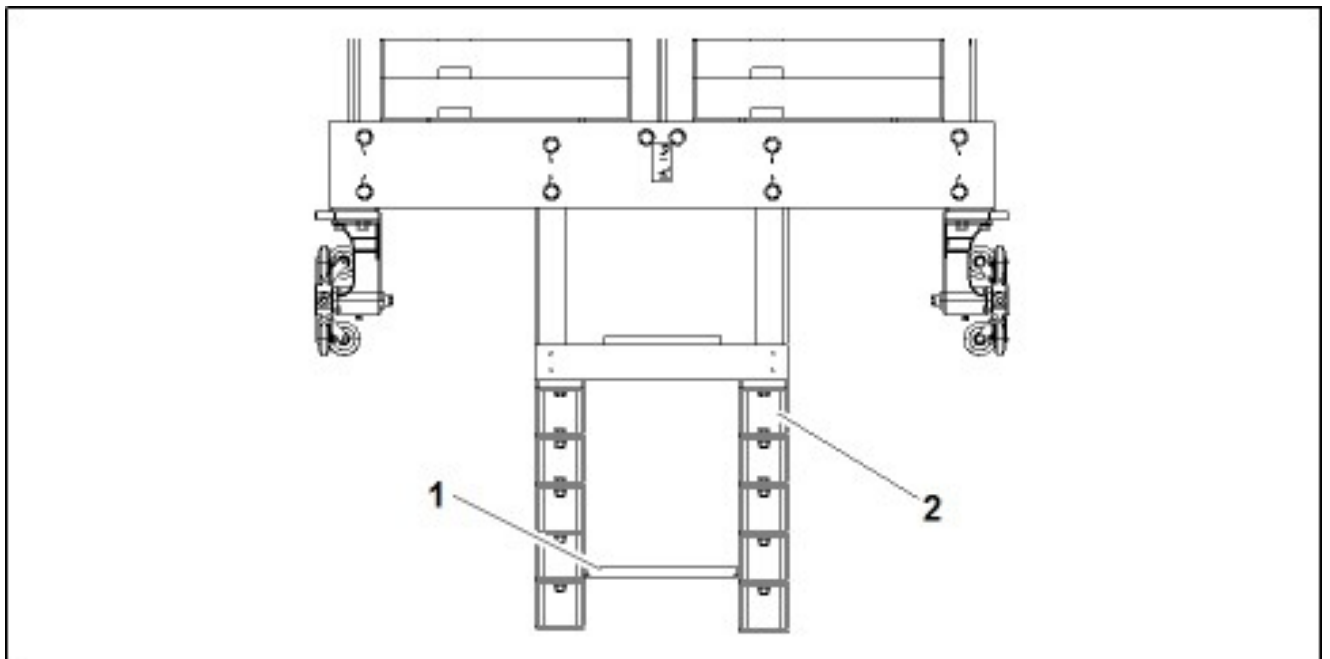
### 5.51.8 Adjustment of HGUR

**i** The stabilizer is required for 4 or more buffer blocks per side.



- 1 Hex nut with washer
- 3 Screw
- 5 Buffer block 1

- 2 Buffer block 3
- 4 Buffer block 2



- 1 Stabilizer

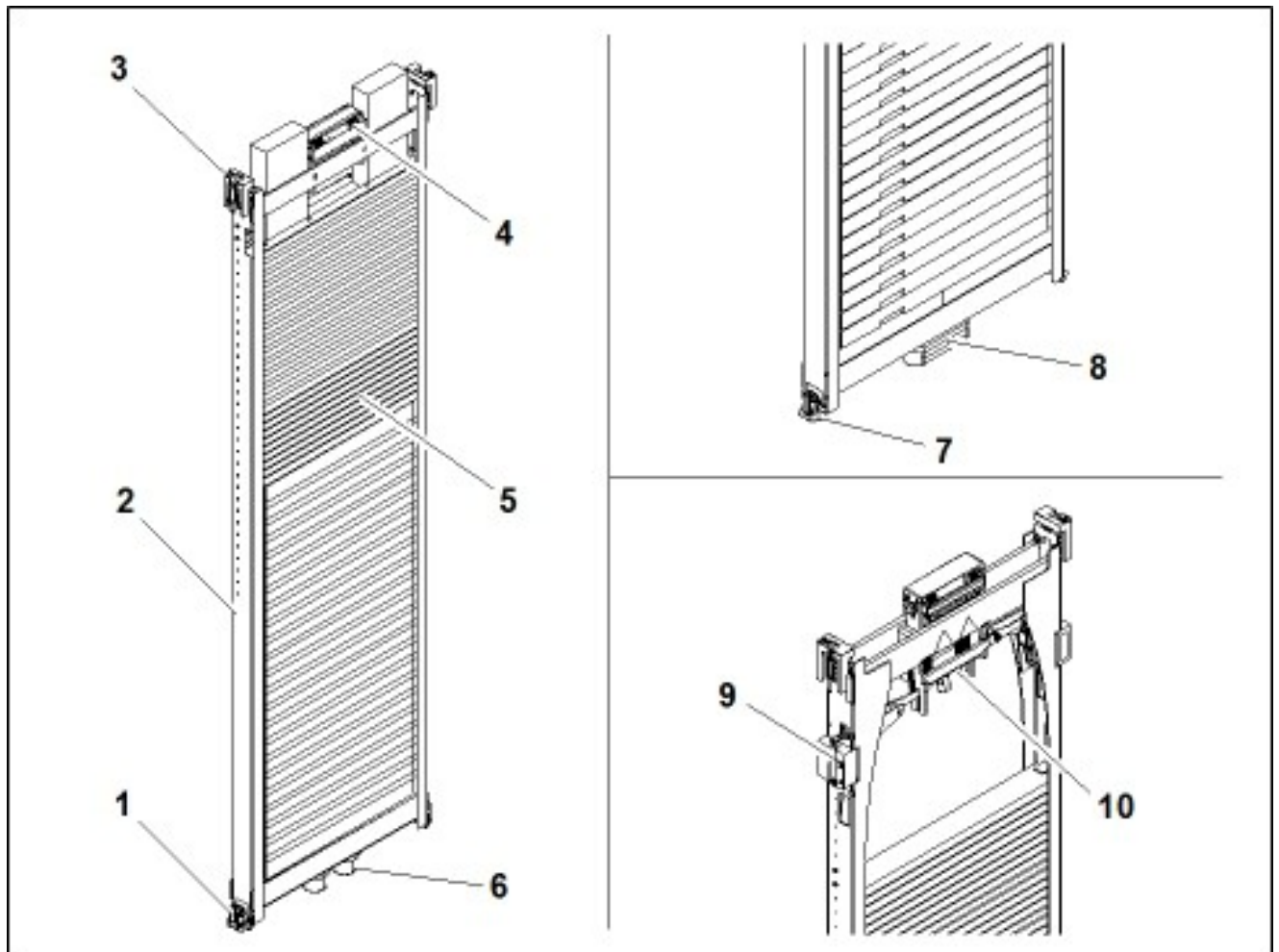
- 2 Buffer block



- Make sure that the counterweight is at the lowest position.
- Make sure that the vertical distance between the buffer blocks and the counterweight buffer is correct.
- If necessary, remove buffer block(s), but must be properly preserved for subsequent maintenance.
- If the vertical distance is still too short, correct the compensation rope length.
  - Before measuring the correct distance, reinstall the originally configured buffer blocks and stabilizer.

## 5.52 Counterweight CW GG 41

### 5.52.1 Overview



- |   |                                |    |                     |
|---|--------------------------------|----|---------------------|
| 1 | Guide shoe with bolt           | 2  | Counterweight frame |
| 3 | Oil lubricator                 | 4  | Flange pulley       |
| 5 | Filler block                   | 6  | Buffer              |
| 7 | Retaining device               | 8  | Buffer impact plate |
|   | – Only for seismic application |    |                     |
| 9 | Safety gear                    | 10 | Actuating mechanism |

### 5.52.2 Maintenance plan

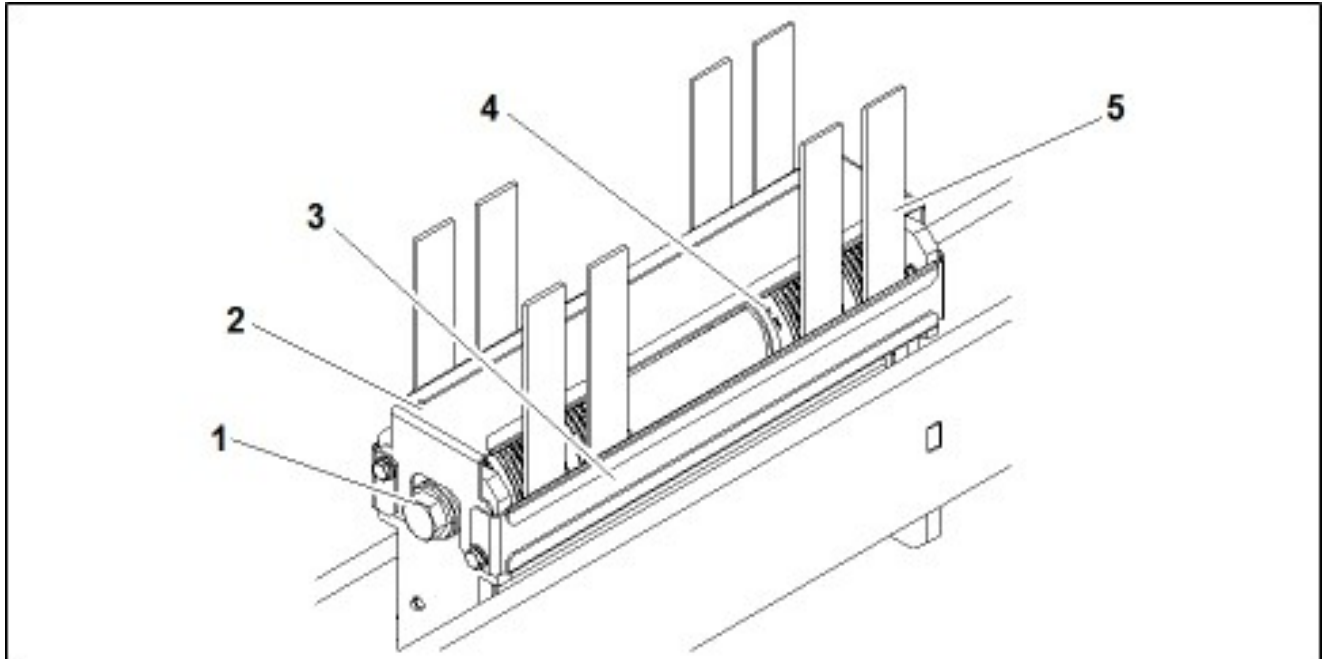
Interval (months)	Description
12	Check of component condition
12	Check of pulleys for STM
12	Check of compensating chain assembly (if applicable)
12	Check of guide shoes and lubricator
12	Check of safety gear
12	Check of buffer and buffer impact plate



### 5.52.3 Check of component condition

- ▶ Visually examine the general condition of the pulley box for STM.
- ▶ Listen for any vibrations, sudden movement or noise during travel.
- ▶ Make sure that all screw connections of the suspension pulley are tightened.
- ▶ Make sure that the retaining clips for the filler weights are in position and tight.
- ▶ Visually examine the condition of the counterweight.
  - Make sure that there are no loose counterweight fixation bolts on the uprights and all components of the counterweight.

### 5.52.4 Check of pulleys for STM



- |   |                       |   |                   |
|---|-----------------------|---|-------------------|
| 1 | Pulley fastening bolt | 2 | Pulley protection |
| 3 | Retainer              | 4 | Flanged pulley    |
| 5 | STM                   |   |                   |

- ▶ Make sure that the pulleys, retainers and pulley protection are clean.
- ▶ Make sure that the STMs run correctly over the pulleys.
- ▶ Make sure that the retainer and the pulley protection are securely mounted.
  - Make sure that the retainer does not touch the STMs.
- ▶ Make sure that the pulley fastening bolts are tightened.

### 5.52.5 Check of guide shoes and lubricator

- ▶ Examine the clearance between the guide shoe and the guide rail.
- ▶ Examine the condition of the lubricator.



For more information refer to the maintenance information of the guide shoe.

### 5.52.6 Check of safety gear

- ▶ Examine the clearance between the safety gear and the guide rail.



For more information refer to the maintenance information of the safety gear.

### 5.52.7 Check of buffer and buffer impact plate

- ▶ If the rubber buffers are installed on the bottom of the counterweight frame, make sure that there is no damage on the buffer.



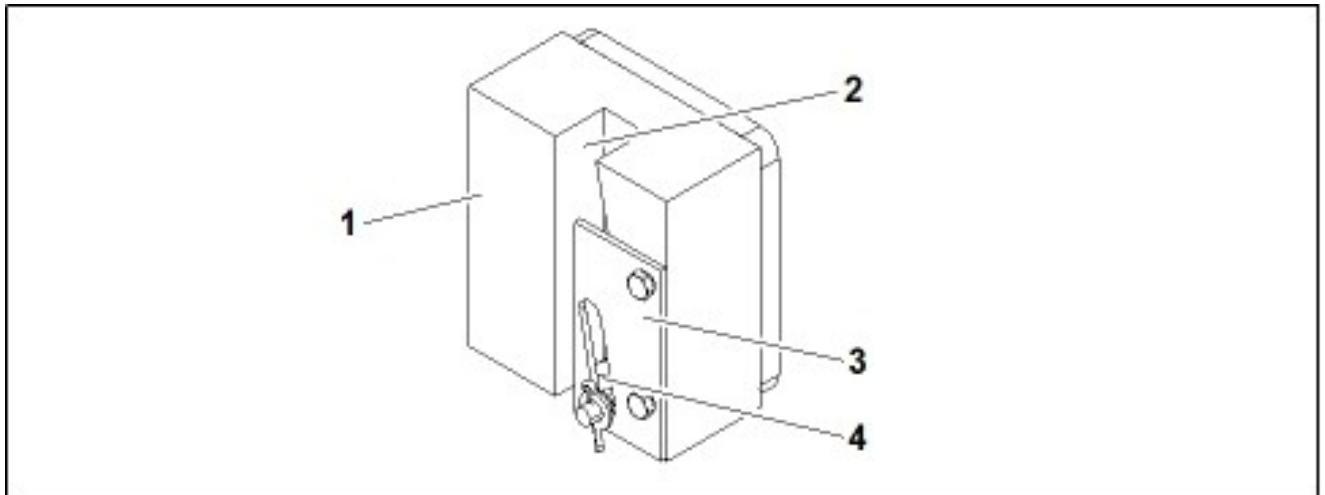
For more information refer to the maintenance information of the buffer.

- ▶ If the buffer impact plate is installed on the bottom of the counterweight frame, make sure that there is no damage on the buffer impact plate.



## 5.53 Safety gear SA RF 0002

### 5.53.1 Overview



1 Safety gear base

2 Braking surface

3 Plate

4 Braking roller

### 5.53.2 Maintenance plan for safety gear

**i** This is a safety component. Type certificate number and manufacturer are part of the customer information document.

Interval (months)	Description
12	Cleaning of safety gear
12	Check for guide rail condition
12	Checking of identification marking
12	Check for roller and braking surface condition
12	Check of safety contact switch
12	Check for static fixation
12	Check for running clearances
12	Check for movement of roller
-	Actuation test of the safety gear as per local regulation

### 5.53.3 Cleaning of safety gear

**i** Do not use cleaning agents containing strong solvents or abrasives.

**i** The guide rail condition must be checked after every safety gear engagement.

- Do a check of the safety gear for dirt, rust and damage.
  - Make sure that there is no dirt or rust on the safety gear.
  - Make sure that there is no grease except in required areas.
  - Make sure that there is no damage to the safety gear.
- ↳ If necessary, clean the safety gear from rust, grease and dirt.

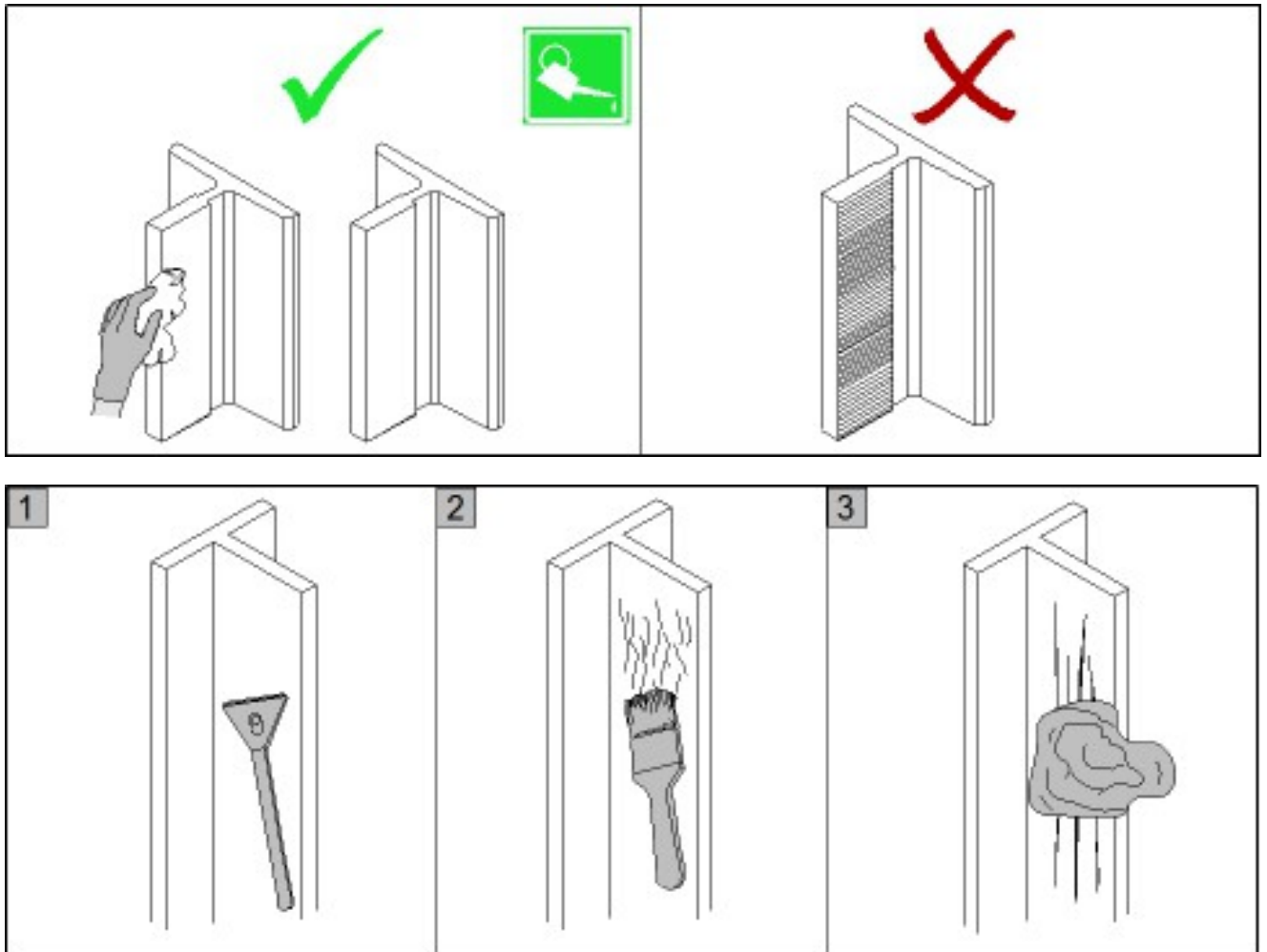


#### 5.53.4 Check for guide rail condition

### ⚠ WARNING

#### Crushing

Contaminated guide rail surfaces affect the action of the safety gears.  
Clean the guide rail surfaces from rust, dirt and any protective coating.



**i** For HLP 68 type oils, refer to E 41314514 - Oil ISO Grade 68, List of Qualified Products (LQP).

- ▶ Examine the cleanliness of the guide rail surface with a clean cloth. If necessary, clean the guide rails.
- ▶ If necessary, remove the dirt buildup with a scraper. Make sure that the guide rail surface is not damaged while scrapping.
- ▶ Apply an approved cleaning solvent to the guide rail surface with a brush.
- ▶ Clean the guide rail surfaces with a cleaning cloth/srclub sponge soaked in the cleaning solvent.
- ▶ Wait for 1 ... 2 min to allow the cleaning solvent to dissolve with rust and dirt.
- ▶ Remove all remaining cleaning solvent with a clean and dry cleaning cloth.
- ▶ Make sure that the guide rail surface is clean with a white cloth.
  - ↳ The cloth must be completely free from visible dirt. If not, clean the guide rails again.
- ▶ Make sure that all guide shoe rollers are free from rust and dirt.
- ▶ Lightly oil the guide rail surfaces with HLP 68 oil with a cleaning cloth to prevent guide rail corrosion.

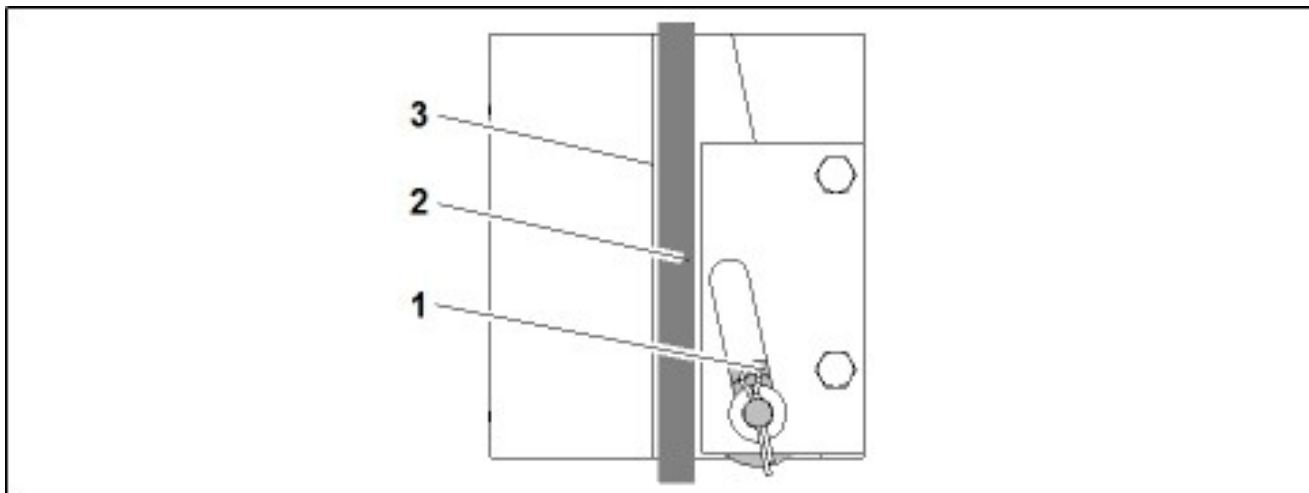
#### 5.53.5 Checking of identification marking

**i** This is a safety component. The identification marking is mandatory for identifying and tracking the component.

- ▶ Make sure that the identification marking is present and readable.
- ▶ If the identification marking is missing or not readable replace the component.



#### 5.53.6 Check for roller and braking surface condition



- |   |                 |   |            |
|---|-----------------|---|------------|
| 1 | Roller          | 2 | Guide rail |
| 3 | Braking surface |   |            |

- Do a check of the roller and braking surfaces for cleanliness, excessive wear, deformations and movement of roller.
  - ↳ If required, clean the roller and lower area of braking cage.

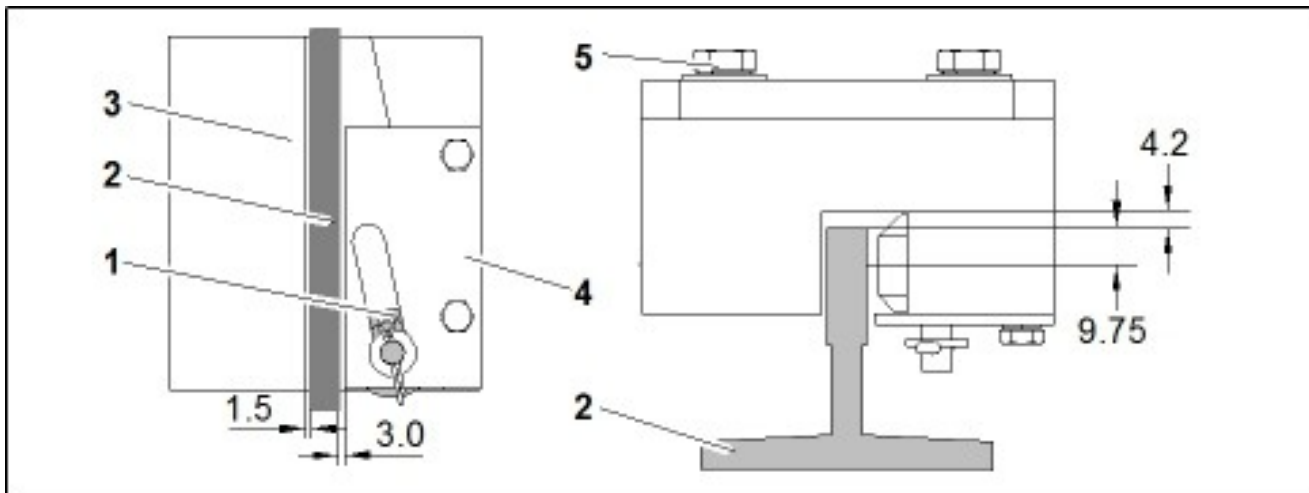
#### 5.53.7 Check of safety contact switch

- Make sure that the safety contact switch is present, correctly installed and free from damage.
  - ↳ If necessary, clean the safety contact switch fully.
  - ↳ If damaged, replace the safety contact switch.

#### 5.53.8 Check for static fixation

- Make sure that the safety gear is correctly assembled and all screws are correctly tightened.
- Make sure that all parts are correctly connected.
- If necessary, refer to the installation instructions to make sure that the static fixation is correct.

#### 5.53.9 Check for running clearances



- |   |                  |   |            |
|---|------------------|---|------------|
| 1 | Braking roller   | 2 | Guide rail |
| 3 | Safety gear base | 4 | Plate      |
| 5 | Fastening screws |   |            |

- Do a check for free running clearance between:
  - Guide rail and braking surface of the casing.
  - Guide rail and roller guide.
  - Guide rail head and safety gear.



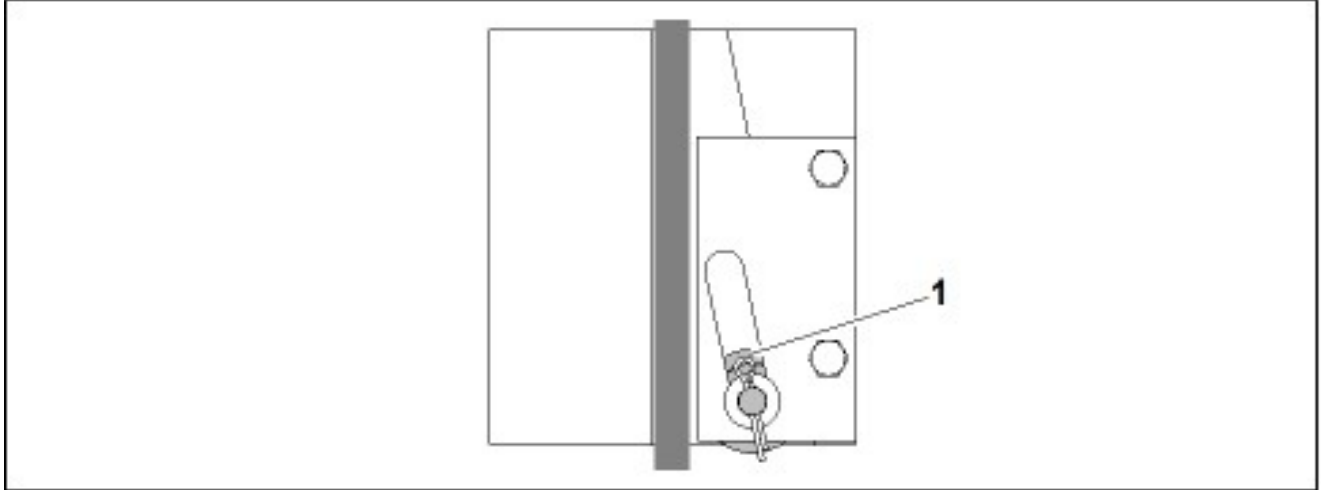
- ↳ If required, adjust the safety gear.

#### 5.53.10 Alignment of safety gear

**i** The alignment of the safety gear must be done only if necessary.

- ▶ Loosen the fastening screws.
- ▶ Adjust the clearances on both sides of the guide rail.
- ▶ Tighten the fastening screws to 86 Nm.

#### 5.53.11 Check for movement of roller



1 Roller

- ▶ Make sure that the roller moves freely.
- ▶ Do a check of bolts and if required, tighten the bolts.

#### 5.53.12 Check for actuation of safety contact switch

- ▶ Make sure that the safety contact switch actuates correctly by manually pressing the switch.
  - ↳ If necessary, replace the safety contact switch.

#### 5.53.13 Testing procedure

##### 5.53.13.1 Actuation test of safety gear

- ▶ Pull the governor rope.
- ▶ Monitor the following conditions:
  - The eccentric disk touch the guide rail.
  - The safety contact switch activates.
  - The brake plate, brake shoes and eccentric disk engage simultaneously.
- ▶ Reset the safety gear.
- ▶ Do the required checks after an activation.
  - ↳ If failed, correct any issues and test again.

#### 5.53.14 Reset procedure

##### 5.53.14.1 Reset of safety gear after activation

- ▶ Move the car or CWT upwards, either:
  - Manually, by means of releasing the machine brake and moving the hand wheel of the machine.
  - Automatically, moving it with the main power of the machine.
- ▶ The safety gear will be automatically disengaged.







## 6 Modification, dismantling and discarding

### 6.1 Safety instruction for modification, dismantling and discarding

#### DANGER

##### **Replacement of safety components**

Parts which have been copied, modified, or subsequently reworked, can put the safe operation of the installation at risk or can cause dangerous operating conditions.

If the safety components are replaced, only spare parts from the OEMs, with a related declaration of conformity, can be used.

#### NOTICE

##### **Incorrect material disposal**

Lubricants and motor/ hydraulic oils belong to the classes of hazardous materials which can cause water pollution.

- The maintenance company must remove used lubricants and/or oils correctly.
- The materials must be discarded in accordance with local legal requirements.

### 6.2 Modification

"If a lift that has been put into service is subject to important changes, and the new risk assessment indicates that the nature of the hazard has changed or the level of risk has increased, the person carrying out the modification has to check the compliance of the modified product with the applicable essential requirements of the local regulation and the person has to fulfil the same requirements as an original manufacturer."

#### 6.2.1 Registration after modification

Tests after important modification or critical incidents must be recorded in the logbook and a copy of the inspection report must be attached.

In particular, the following are considered as important modifications:

Change of the:

- rated speed
- rated load
- mass of the car
- travel

Change or replacement of the:

- type of locking device
- control system
- guide rail or the type of guide rails
- type of door
- machine or traction sheave
- overspeed governor
- ascending car overspeed protection means
- buffers
- safety gear
- unintended car movement protection
- mechanical device for preventing movement of the car
- mechanical device for stopping the car
- platform
- mechanical device for blocking the car or movable stops
- devices for emergency and tests operations.



### 6.2.2 Updating of documentation and maintenance activities after modification

After a modification that changes the functions of the installation, the installation documentation must be updated. For example, if the control system is changed, the schematic wiring diagrams must be updated. It is the obligation of the installer to update maintenance activities after any modification.

## 6.3 Dismantling

### DANGER

#### Dismantling

The dismantling of components or the elevator system is a complex procedure which, if not done correctly, can cause dangerous operating conditions.

For dismantling, only use trained and authorized persons, who know how to deal with special waste and local regulations.

- 
- Contact the installer for information on dismantling of components or the elevator system.
  - Follow local regulations.

## 6.4 Discarding

### 6.4.1 Discarding of lubricants, oils and other dangerous material

The maintenance company must take back lubricants, oils and other materials which pollute the environment, and discard in conformity with local regulations. If the owner of the installation takes responsibility for discarding, he must follow local requirements, and also the instructions of the maintenance company.

### 6.4.2 Discarding of spare parts, components and subsystems

The owner of the installation must discard parts, components and subsystems, which are replaced during repair and modification.

### 6.4.3 Discarding after replacement of the installation

When an installation is fully replaced, it is between the owner of the installation and the installer to discard the used installation.



## A Terms used

+ AS	Control cabinet	BFK	Width of the guide rail head
BK	Clear width of car	BT	Clear width of landing door
COP	Car operating panel	CWT	Counterweight
ETMA	Embedded telemonitoring and alarming	GKU	Parameter — masses acting upon car safety gear
GQ	Rated load of car	HF	Vertical distance between guide rail brackets
HK	Parameter — car height	HMI	Human Machine Interface
HQ	Travel height	HQG	Parameter — maximum travel height
HQK	Parameter — minimum travel height	HT	Height of landing door, clear
KG	Balancing of load	KZU	Reeving factor (whole number)
LIP	Indicator panel on landing	LMS	Load measuring system
LOP	Landing operating panel	OEM	Original Equipment Manufacturer
MR	Machine room	MRL	Machine room less
PSTN	Public Switched Telephone Network	SIM	Subscriber Identity Module
TK	Clear depth of car	TSD	Temporary Safety Device
VKN	Rated speed of car	ZAG	No. of elevators in one group
ZE	Parameter — number of stops	ZKE	Number of car entrances
ZKH	Number of starts per hour	ZZ	Parameter — number of suspension ropes

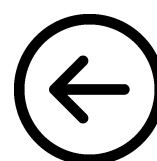








## Certificates/Warranties/Guarantees





**Schindler**

# Handover Acceptance Certificate

**Installer**

Name	Schindler Ltd
Address	400 Dashwood Lang Road, Bourne Business Park, Addlestone Surrey KT15 2HJ

**Installation**

Name	Bletchley Park View, Block A
Address	Bletchley Park, Bletchley MK2 2EN

**Client**

Name	Winvic Construction Limited
Address	Brampton House

The Installer hereby declares that the following product may be put into service:

Product	Schindler
Type	Electric Traction Lift (MRL Gearless)
Control	Scalable ES1
Travel (m)	26.400
No. of stops	10
Speed (m/s)	1.60
Load (kg)	1000
Capacity (no. of persons)	13
NI Contract No.	11704106
SM Number	11704106
Year of Installation	2024
PCM Type / No. of visits	12 Months / 4 Visits
Application	For the transport of passengers according to the instruction manual
Cube Connected	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If no, state why):

It is a condition precedent to the lift being put into service and to the signed acceptance, that the Declaration of Conformity has been signed.

**For and on behalf of the Installer** - I, the undersigned, hand over the above product:

Date	25/7/24		
Signatory / Signature	Name	Function	Signature
	Ian Koczalski	New Installation Manager	

**For and on behalf of the Client** - I / We the undersigned have accepted the above product in good working order and condition, and understand that the Guarantee Period commences from this date:

Date	25/7/24		
Signatory / Signature	Name	Function	Signature
	C. Pearson	Project Manager	



**Schindler**

# UK Declaration of Conformity for Lifts

**Installer**

Name

Schindler Ltd

Address

400 Dashwood Lang Road, Bourne Business Park, Addlestone, Surrey KT15 2HJ

The Installer hereby declares that the following Lift:

Product Name	Schindler 1000 / 3000	Identification Number	59102752
Technical Platform	ES1 Rel.2		
Commission No.	11704106		
Address of installed Lift	Bletchley Park View, Block A, Bletchley MK2 2EN		
Year of Installation	2024		

Is in conformity with the following Regulations:

2016 No.1093 /  
2019 No. 696

The Lifts Regulations 2016 amended by The Product Safety and Metrology (EU Exit) Regulations 2019

By application of the following standards:

<input checked="" type="checkbox"/>	EN 81-20:2020	Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts
<input checked="" type="checkbox"/>	EN 81-50:2020	Safety rules for the construction and installation of lifts — Examinations and tests — Part 50: Design rules, calculations, examinations and tests of lift components
<input type="checkbox"/>	EN 81-21:2022	Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 21: New passenger and goods passenger lifts in existing building
<input type="checkbox"/>	EN 81-22:2021	Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 22: Electric lifts with inclined path
<input checked="" type="checkbox"/>	EN 81-28:2022	Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 28: Remote alarm on passenger and goods passenger lifts
<input checked="" type="checkbox"/>	EN 81-58:2022 Class: <u>E120</u>	Safety rules for the construction and installation of lifts — Examination and tests — Part 58: Landing doors fire resistance test <i>NOTE: The lift landing entrances have a fire resistance test certificate/report in accordance with EN 81-58. Other building standards (outside the lift installer responsibility under the Lifts Regulations) are applicable to the fire resistance of the lift well walls, and the interfacing of the lift landing entrances (including any fire stopping).</i>
<input checked="" type="checkbox"/>	EN 81-70:2021 + A1:2022	Safety rules for the construction and installations of lifts — Particular applications for passenger and goods passenger lifts — Part 70: Accessibility to lifts for persons including persons with disability
<input type="checkbox"/>	EN 81-71.2005 + A1:2006 EN 81-71:2022 Category: <input type="checkbox"/> 1, <input type="checkbox"/> 2	Safety rules for the construction and installation of lifts — Particular applications to passenger lifts and goods passenger lifts — Part 71: Vandal resistant lifts
<input checked="" type="checkbox"/>	EN 81-72:2020	Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 72: Firefighters lifts
<input type="checkbox"/>	EN 81-73:2020	Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 73: Behavior of lifts in the event of fire
<input type="checkbox"/>	EN 81-77:2022 Category: <input type="checkbox"/> 1, <input type="checkbox"/> 2, <input type="checkbox"/> 3	Safety rules for the construction and installations of lifts — Particular applications for passenger and goods passenger lifts — Part 77: Lifts subject to seismic conditions





Schindler

# UK Declaration of Conformity for Lifts

As proven by the following Conformity Assessment:

## Type Examination

Name of Approved / Notified Body	LIFTINSTITUUT BV
Address	Buikslotermeerplein 381, 1025 XE Amsterdam, The Netherlands
Identification Number:	0400
Type Examination Certificate Number:	NL 19-400-1002-004-92

## Final Inspection

Name of Approved / Notified Body	N/A
Address	
Identification Number:	

## Product / Production Quality Assurance

Name of Approved / Notified Body	N/A
Address	
Identification Number:	

Or:

Or:

## Full Quality Assurance

Name of Approved Body	Bureau Veritas UK Limited
Address	2nd Floor Atlantic House, Atlas Business Park, Simonsway, Manchester M22 5PR
Identification Number:	0041

## Design Examination

Name of Approved Body	
Address	
Identification Number:	

Or:

## Unit Verification

Name of Approved Body	N/A
Address	
Identification Number:	

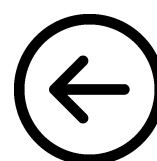
## On behalf of the Installer:

Place / Date	Block A Bletchley Park 25/7/24		
Signatories / Signatures	Name	Function	Signature
	Ian Koczalski	New Installation Manager	
		SAIS INSPECTOR	





## **Cleaning and Maintenance Regimes**







## Lift Services Cleaning and Maintenance Regimes

This maintenance schedule for **P22012 Bletchley View, Milton Keynes** is to be followed from **9th September 2024** year on year to ensure all plant and equipment is kept within warranty. Please keep a log of these inspections so that records can be checked should an issue arise.

Code; ✓ Blue – Recommended ✓ Red – To Maintain Warranty

Item	Daily	Weekly	Monthly	3 Months	6 Months	9 Months	Annually	2 Yearly	5 Yearly	Certificates	Regime
Lift Maintenance Contract							✓			Handover Certificate DOC	The Client must legally have a maintenance package running on the lift to ensure building Insurance and Lift Compliance are valid.
Owner Maintenance											<p>In addition to those examinations and tests which the owner of the installation entrusts to the maintenance organization, the owner needs to carry out the following checks periodically:</p> <ul style="list-style-type: none"> <li>• correct functioning of landing doors and landing door tracks</li> <li>• stopping accuracy</li> <li>• correct functioning of indicators</li> <li>• landing push buttons</li> <li>• car push buttons</li> <li>• two-way means of communication in the car which provide permanent contact with a rescue service</li> <li>• normal car light</li> <li>• door reversal devices</li> <li>• safety signs / pictograms</li> </ul>



Item	Daily	Weekly	Monthly	3 Months	6 Months	9 Months	Annually	2 Yearly	5 Yearly	Certificates	Regime
Cleaning	✓									N/A	The areas to be cleaned are the inside of the car, the landing doors and door frames, push-buttons and indicator plates and the car and landing door sills.





**Data Sheets**

**N/A**

