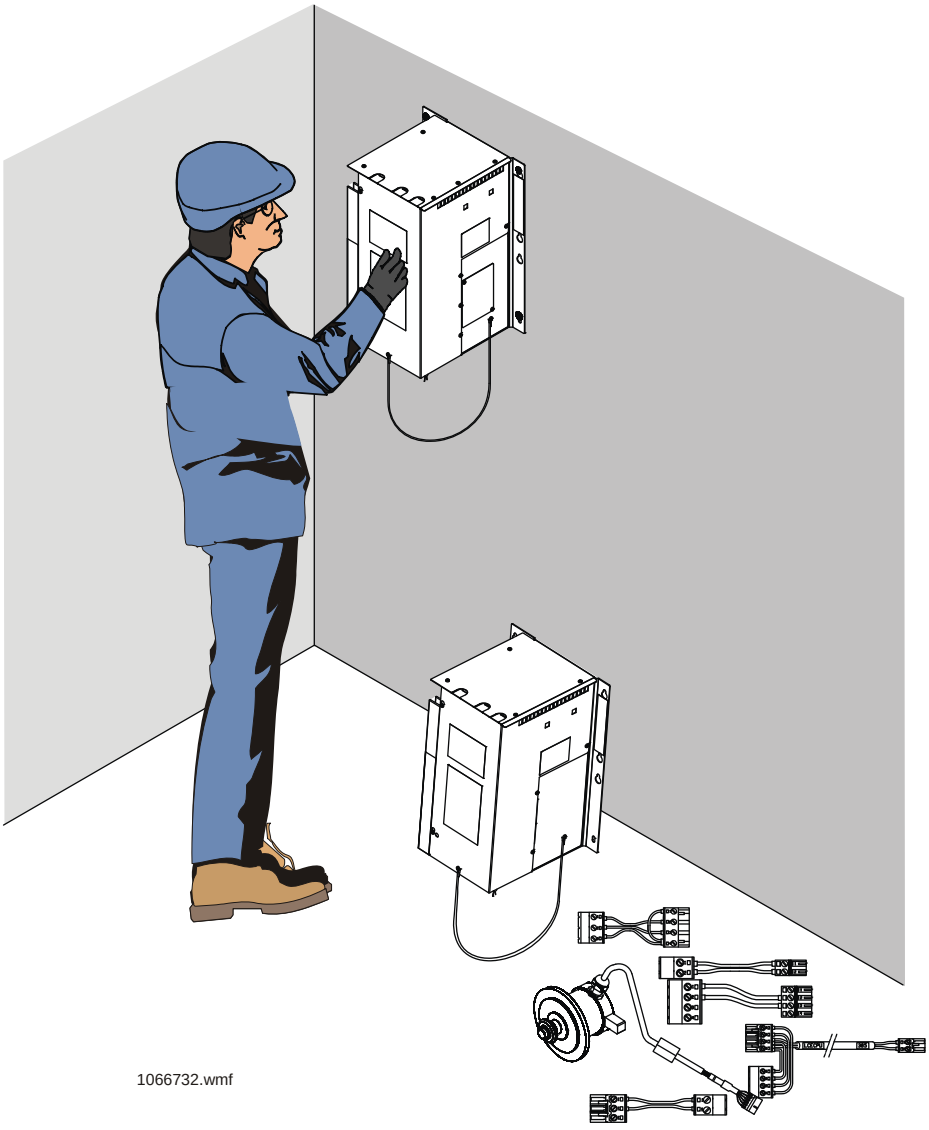
REPLACEMENT INSTRUCTION FOR V3F16L DRIVE MODULE WITH KDL16L DRIVE MODULE

This document is intended to be used by people who are familiar with elevator maintenance and installation and have received proper training on methods and safety as specified by KONE.



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AS-11.65.037
(A) 2009-10-16

CONTENTS

1 INTRODUCTION

This instruction describes replacement methods for V3F16L drive module (KM769900G01/G05) with KDL16L drive module (KM953503Gxx) by using replacement kit KM953503R1xx. The replacement kit contains all necessary adapters for electrification interface.

The following tasks are described in the document:

- Checking content of the spare part kit
- Recording parameters from V3F16L drive module
- Checking LCE software version
- Machinery operations
- Removing V3F16L drive module
- Installing KDL16L drive module
- Cabling by using adapters
- Setting drive parameters and checking encoder rotation
- Doing commissioning
- Finalizing drive module replacement

The replacement tasks with KDL16L drive module require special training and technical expertise. The environment where the tasks are executed requires special attention to guarantee safety on the work. If the machine is equipped with tachometer, the tachometer will be replaced with encoder simultaneously when replacing the drive module.

1.1 Related documents

The following documents are required to complete the corrective actions:

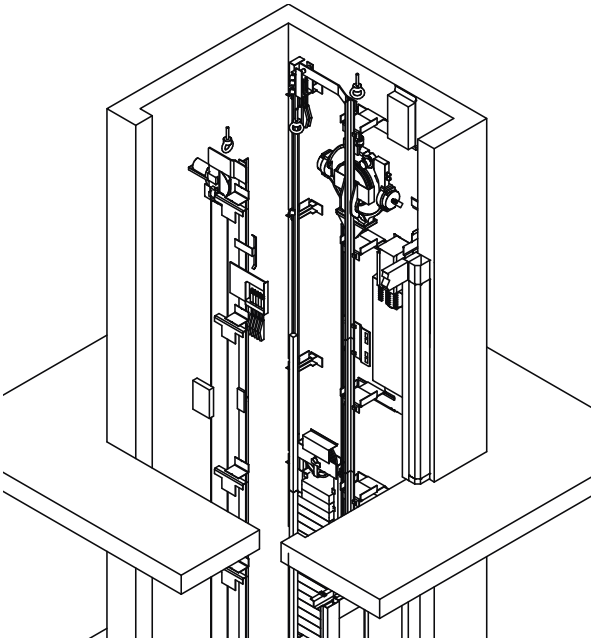
- AM-01.03.002 Take 5 - Electrical safety when working on elevators, escalators and autowalks
- AR-11.65.034 Spare parts manual for KDL16 drive module
- AS-01.01.004 Take care, end user safety focal points in elevator maintenance
- AS-01.05.001 Instruction manual for counterweight lifting device
- AS-12.02.001 Instruction for handling electrostatic-discharge-sensitive-devices on site
- 972483D01 KDL16 parameter table
- 972484D01 KDL16 parameter guide
- 972485D01 Diagnostic codes for KDL16

1.2 Abbreviations

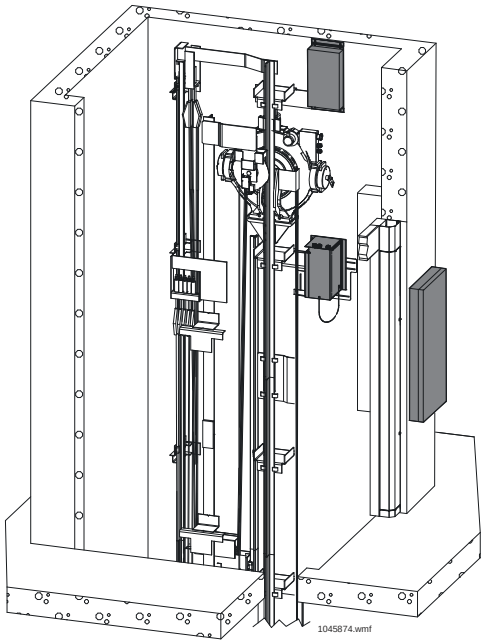
CWT = Counterweight	MAP = Maintenance Access Panel
DOM = Door Open Monitoring	MR = Machine room elevator
ESD = Electrostatic discharge	MRL = Machineroomless elevator
LCE = Lift Controller Electrification	PCB = Printed Circuit Board
LPT = Low Pit and Top safety devices	RDF = Recall Drive Feature
LWD = Load Weighing Device	SEP = Shaft Electrification Panel

1.3 Scope of the document

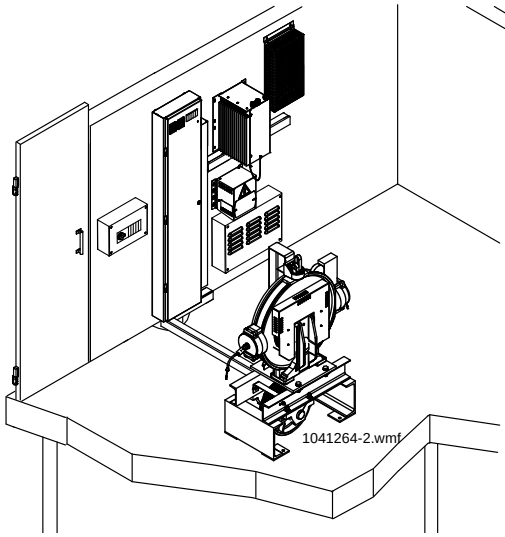
The KDL16L drive module can be installed to the KONE MonoSpace® type and KONE ReGenerate™ MX type elevators. The drive module is located in the shaft (KONE MonoSpace® type elevators) or in the machine room (KONE ReGenerate™ MX type elevators).



KONE MonoSpace®



KONE EcoSpace®



KONE ReGenerate™ MX

1.4 Before going to the site

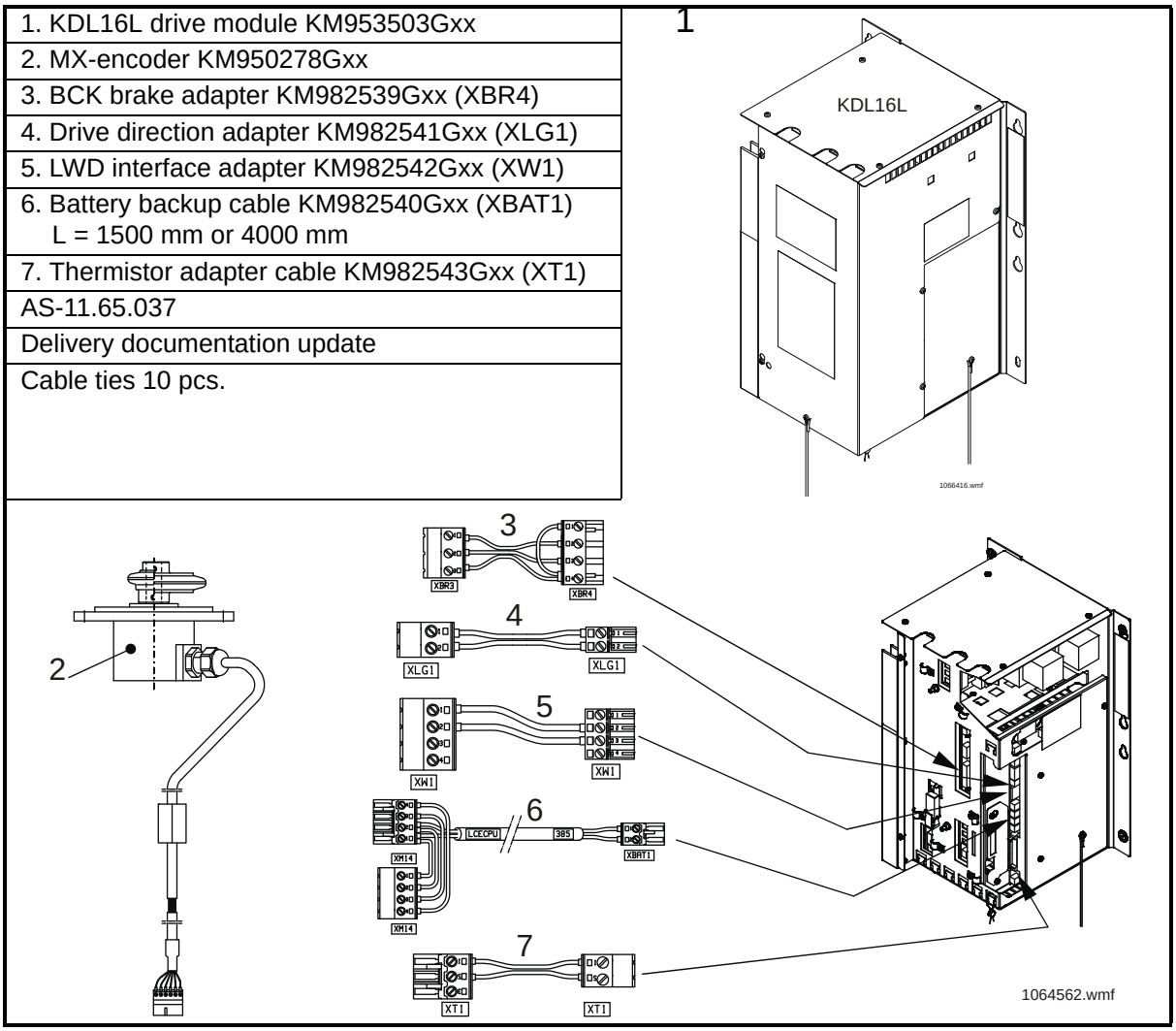
Site survey must have been done before starting the work. Bring the site survey on the site. Check the site conditions have not changed after doing the site survey.

Check that the replacement kit is complete (see the list in section 1.5). Check case by case, if you need special tools, such as counterweight lifting tool or computer and software material.

1.5 KDL16L replacement kit KM953503Rxxx

The KDL16L drive module weighs approximately 13,5 kg and the replacement kit approximately 15 kg.

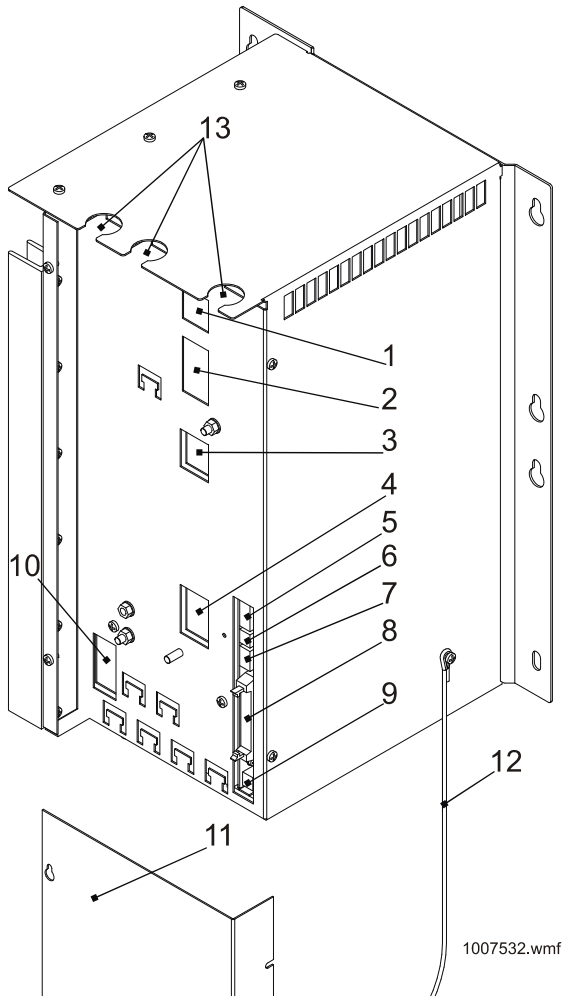
1. KDL16L drive module KM953503Gxx
2. MX-encoder KM950278Gxx
3. BCK brake adapter KM982539Gxx (XBR4)
4. Drive direction adapter KM982541Gxx (XLG1)
5. LWD interface adapter KM982542Gxx (XW1)
6. Battery backup cable KM982540Gxx (XBAT1) L = 1500 mm or 4000 mm
7. Thermistor adapter cable KM982543Gxx (XT1)
AS-11.65.037
Delivery documentation update
Cable ties 10 pcs.



NOTE! **Documents are for reference. Correct documents should be updated according to elevator.**

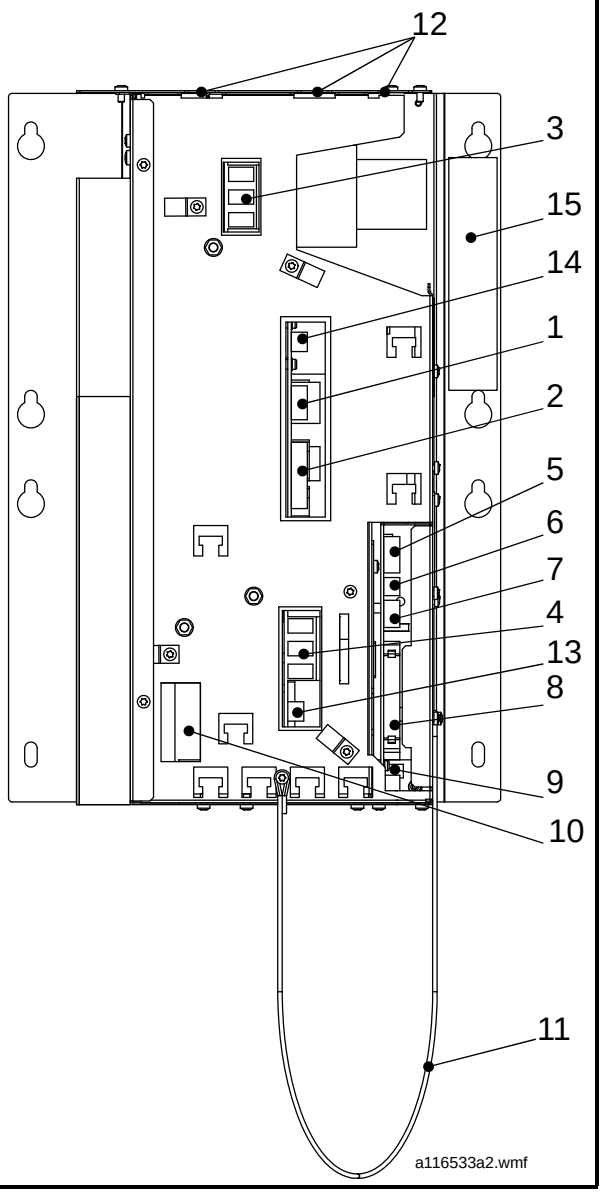
1.6 V3F16L rev. 1.x drive module

1. Brake cable connector, XBR3
2. LCE cable connector, XS3
3. Motor cable connector, U-V-W
4. Supply cable connector, T1-T2-T3
5. Cable connector for LWD and motor current signals, XW1
6. MAP tachometer connector, XLG1
7. Tachometer cable connector, XG1
8. LCECPU cable connector, XL1
9. Motor thermistor connector, XT1
10. Braking resistor cable connector, XBRE2
11. Cover plate
12. Holding wire for cover plate
13. Slots for cable bushings

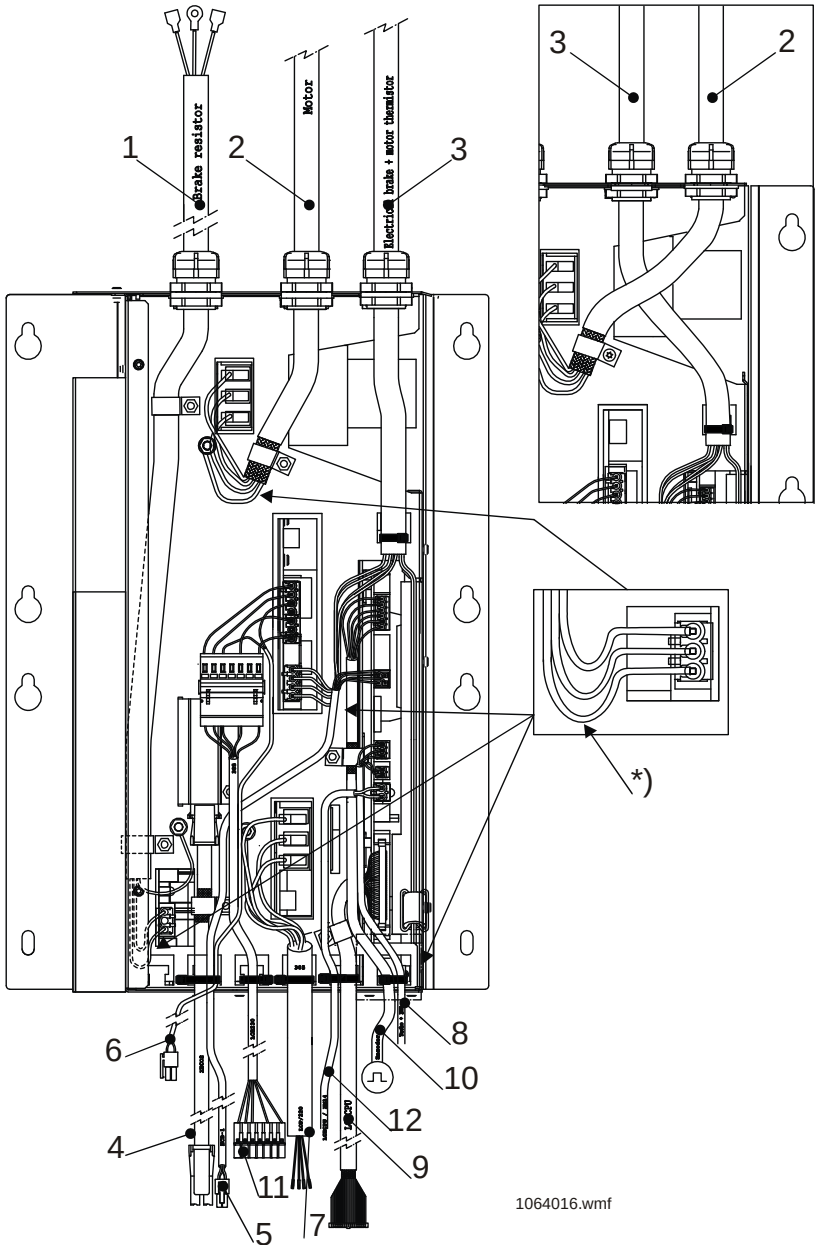


1.7 V3F16L rev. 2.x drive module

1. Brake cable connector, XBR3
2. LCE cable connector, XS3
3. Motor cable connector, U-V-W
4. Supply cable connector, T1-T2-T3
5. LWD motor current cable connector, XW1
6. MAP tachometer connector, XLG1
7. Tachometer cable connector, XG1
8. LCECPU cable connector, XL1
9. Motor thermistor connector, XT1
10. Braking resistor cable connector, XBRE2
11. Holding wire for cover plate
12. Slots for cable bushings
13. Battery tool connector, XG3
14. Not used, XBR4
15. Drive module label



1.8 Connections of KDL16L drive module

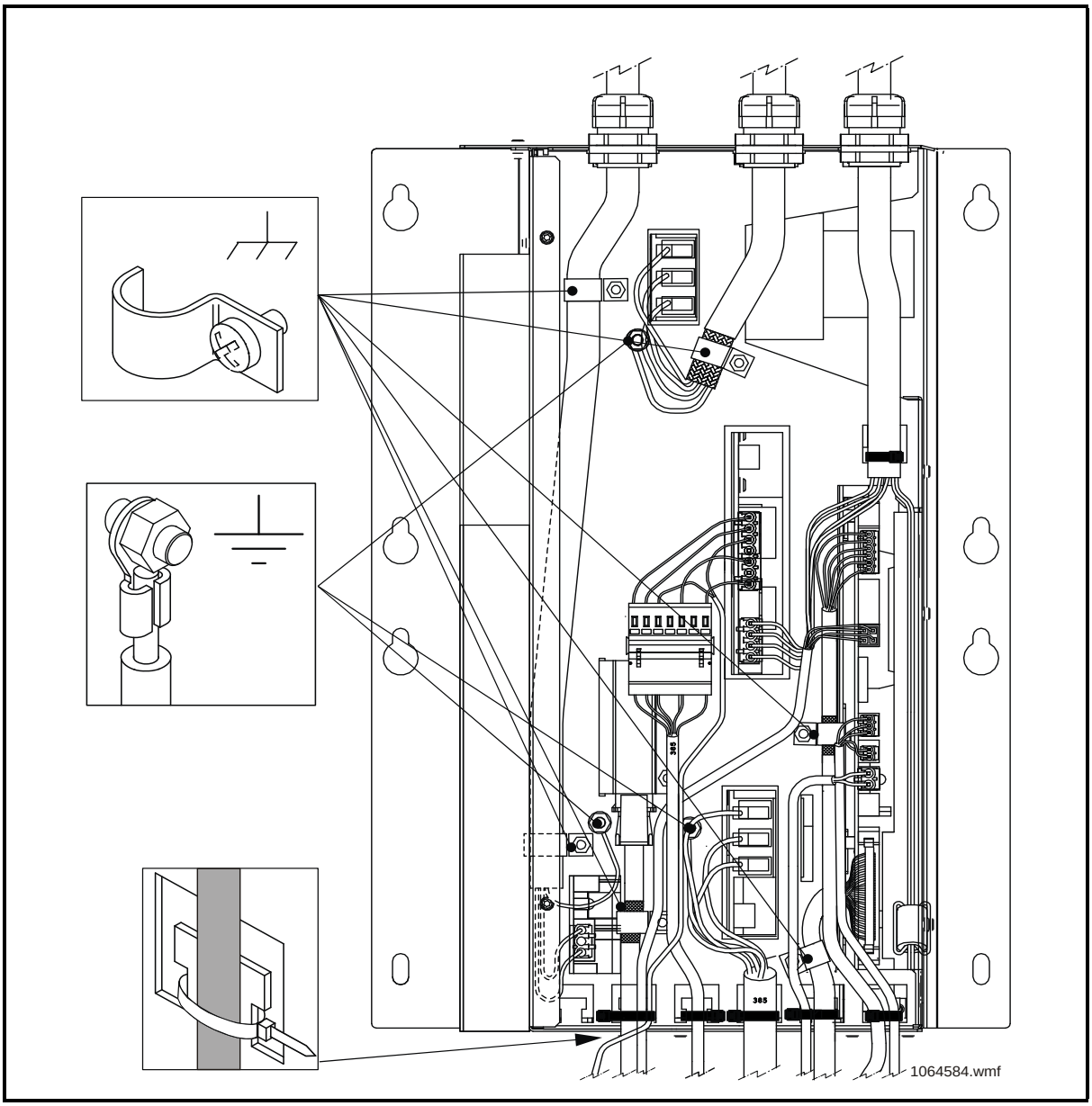


1. Braking resistor (XBRE2)
2. Motor (U, V, W)
3. Brake (XBR4) / Thermistor (XT1)
4. DC-link (XECO2), if ECB is applicable
5. Control (XECO1), if ECB is applicable
6. Start permit linking (XS3A), if ECB is applicable
7. Terminal for power supply (T1-T3)
8. Load weighing device (XW1) / Speed feedback (XLG1)
9. LCECPU (XL1)
10. Encoder (XMEN5)
11. Brake supply (XS3)
12. Battery back-up (12V) (XBAT1)

*) Loop the wires at the connectors. This is to avoid gravity water entering to the connectors.

NOTE! Cabling order of motor cable (2) and brake / thermistor cable (3) may be swapped if cables are not long enough.

1.9 Earthing of KDL16L drive module



2 ENVIRONMENTAL ISSUES

Hazardous waste material must be taken care of according to the local requirements and KONE Environment Strategy.

3 SAFETY

3.1 General safety precautions

Safety precautions	Note
Follow your national lift codes and other safety related regulations.	In case of conflict between the Code and the present instructions, rely on your national code.
Follow your local hot work procedures.	
The local safety codes and rules must be obeyed at all times.	Refer to your local procedures for the type of entrance protection required. **Use barriers and warning signs to inform and protect the building users**.
Follow the safe working methods.	
Follow this instruction. Do not skip any step, otherwise there may be a potentially dangerous situation which you have not considered.	Warning signs highlight possible hazards. 
ENSURE THAT ELECTRICAL EQUIPMENT AND CONDUCTORS ARE SAFELY DE-ENERGISED BEFORE WORKING ON THEM. A locking off system for main electric supply isolator or other system (for example fuse removal, locking and tagging system, etc. when applicable) must be agreed with person responsible for the building electrification.	Do not connect or disconnect any connectors when the power is ON. 
Personal safety equipment must be available and used as required.	Refer to the list of Personal safety items on the next chapter.
IF RISK OF INJURY FROM A FALL Adequate fall prevention system must be in place.	
If the safety harness is used incorrectly you may still sustain severe injury or death during a fall or uncontrolled movement of the elevator. If you have attached the harness to a guide rail bracket or other fixed point in the lift well, you must ensure that there can be no unwanted movement of the car or counterweight.	
Handle and dispose of waste materials in accordance with the regulations applicable to your country/state.	
Ensure that your work does not cause a hazard to others.	In particular keep access ways and fire exits clear. Refer to AS-01.01.004 Take Care End user safety in elevator maintenance.
Keep the entrance and emergency exits clear. Prevent unintentional access to working area with additional fences.	

3.2 Personal safety

Gloves, safety shoes, helmets, goggles, dust masks, hearing protection and harnesses are provided for your personal protection. USE THEM AS REQUIRED.

Safety item	Figure
Fall prevention equipment.	
Dust mask, suitable for working with mineral wool insulation in landing doors	
First aid kit	
Safety goggles	
Safety gloves	
Rubber gloves for cleaning rails	
Hearing protection	
Hard hats	
Work clothes / overalls	
Safety shoes with ankle protection	

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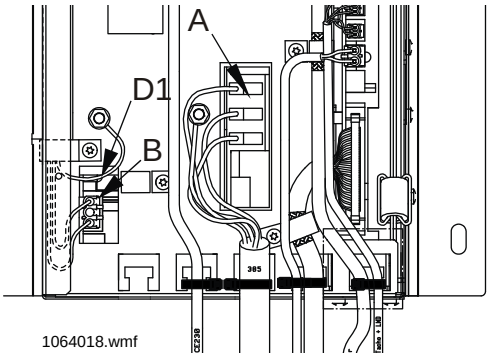
3.3 Maintenance method safety

Note the following safety items when working with KDL16L drive module:

- General KONE safety regulations must be followed during the work. All normal safety measures required in elevator maintenance must be implemented. Local safety regulations must also be followed.
- Refer to AM-01.03.002 Take 5 - Electrical safety when working on elevators, escalators and autowalks. The Take 5 safety initiative is designed for installation, servicing, maintenance and modernisation work done on the elevators.
- Personal safety equipment must be used as required.
- Safety must be ensured with additional fences or guarding, depending on the site conditions.
- Do not work on the different levels in the elevator shaft at the same time.
- Ensure that the working site do not cause a danger to the outsiders! It is strongly recommended to use additional fences or guarding to prevent dangerous situations. For example the outsiders enter the working zone or some parts or tools cause risks of tripping on the landing.
- Ensure, that proper lighting is arranged at the work area.
- Cover of the drive module must be kept closed always when not working with the module, even if the main power has been switched OFF.
- Power must be turned OFF 5 min. before removing the protection shields.
- Prevent the reconnection of the possible emergency power supplies etc.
- Check that the drive module is de-energized before starting any work. There must be no voltage (AC or DC) in the drive module. Check the operation of the multimeter before and after the test.
- Each replacement case must be separately assessed for the risks due to site conditions. Replacement cases must not limit site conditions.
- Use only tested and calibrated measuring devices.

3.4 Safe de-energizing method

- Check that the DANGER led (D1) is lit.
- Switch OFF the main switch (220) in the MAP.
- Lock and tag the main switch (220).
- Wait for 5 minutes.
- Check that the link voltage led (D1) is NOT lit.
- Check that there is no voltage (AC) in power supply terminals (A) T1-T2, T1-T3, T2-T3.
- Check that there is no voltage (DC) in the intermediate circuit from braking resistor terminal XBRE2 (B). Measure from connector XBRE2 (B), between terminals 1 to ground and 3 to ground.



WARNING

If the DANGER led (D1) does not illuminate, when the main power is ON, do not open the drive module. Switch OFF the main switch (220). Lock and tag. Wait for 5 minutes. Remove the drive module with special caution!

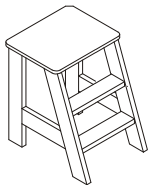
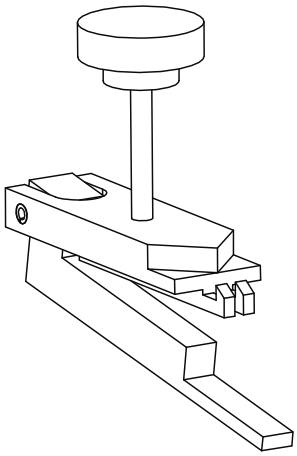
Inverter drives usually remain energized for about 5 minutes after the power has been disconnected.
DO NOT work on the drive, hoisting motor or braking resistors until you have verified that this energy has been discharged.

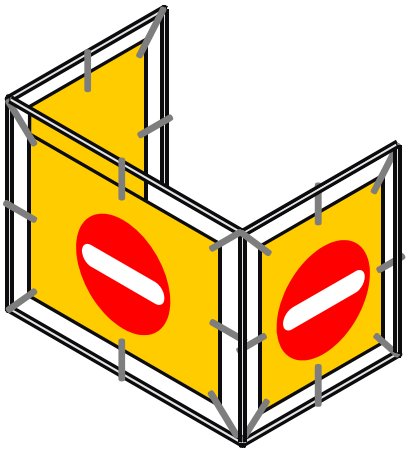
Test equipment must be set to the 1000 VDC range. The test equipment must be checked before and after the test to ensure that it functions correctly.

3.5 Basic rules preventing ESD hazards

1 Disconnect all power supplies.
2 Earth yourself before touching components.
3 Do not unpack the spare parts before installation.
4 Do not touch the components on the board unnecessarily.
5 Hold the PCB from its edges.
6 The old component must be handled in the same way as the new one.
7 Do not wear combinations of clothing that can create static charges.

4 TOOLS

Part number	Tool	Illustration/Note
	Normal hand tool set	
	RS232 port Correct LCE software	If LCE software version is older than 5.1.0 (Real time display not available)
	Counterweight lifting device	
	Torx screwdriver	TX10
	Test weights	For LWD setup, according to rated load, only KONE ReGenerate™ elevators
	Multimeter	Fluke 179 (or equivalent) with insulated test probes (min. L = 100 mm) specified to 1000 VDC voltage  1057588.jpg
KM265173	Work stool	Height approximately 750 mm  1007089.wmf
KM871952	Door blocking tool	 1052235.wmf

Part number	Tool	Illustration/Note
	Safety barriers	
KM857505	ESD protection kit	

5 PREPARATIONS FOR DRIVE MODULE REPLACEMENT

5.1 Recording parameters from the V3F16L drive module

Write following drive parameters down to the site survey list before switching OFF the power from the drive module.

You need this information later on when commissioning new drive module.

Reference list for parameter numbers of the replaced drive module	V3F16	KDL16	Value
Machine parameters	6_1	6_60	
Nominal speed of the elevator (determines also acceleration and jerk)	6_2	6_3	
Elevator load	6_3	6_4	
Roping	6_4	6_7	
Acceleration (manually changeable, determines also jerk)	6_20	6_2	

NOTE! It is recommended to check load weighing device operation. Purpose of this step is to verify operation of the load weight device before continuing drive module replacement.

5.2 Checking LCE software version

The LCE software must be updated, if the LCE version is older than 5.1.0 (18.01.2002).

Stand-by mode and brake test features require LCE version 6.7.18 or newer.

Step	Action	Illustration/Note
1	Check the existing LCE software version on user interface in the MAP.	
	Action	**Display**
	Push MENU button until number 4 shows on the MENU display. Verify selection by pushing ACCEPT button.	4 _ _ __
	Push Arrow buttons until number 10 shows on the MENU display. Verify selection by pushing ACCEPT button.	4 _10 _ __
	The display shows drawing number and version of the LCE software.	For example 813140 6.0.4
2	If the software version is old, update the old software according to APPENDIX A.	

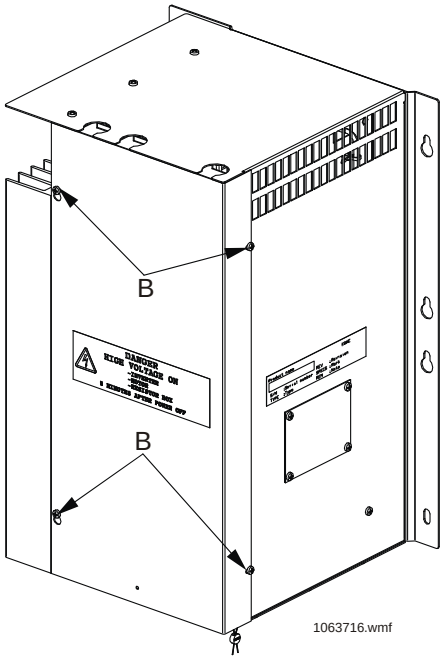
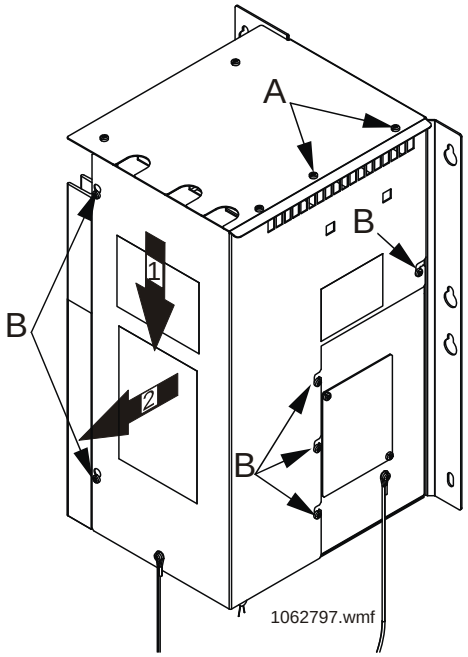
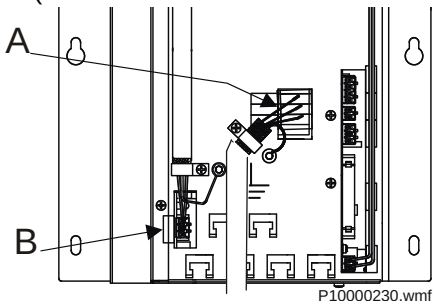
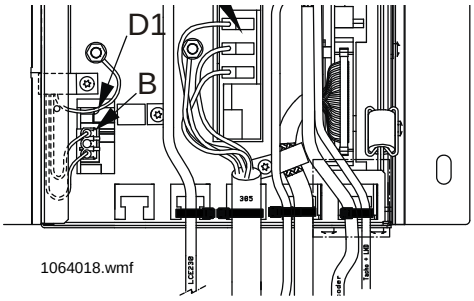
6 MACHINERY OPERATIONS

6.1 Safety measures

With MRL elevators the car roof is used as a working platform. Therefore the special safety procedures and working methods are mandatory.

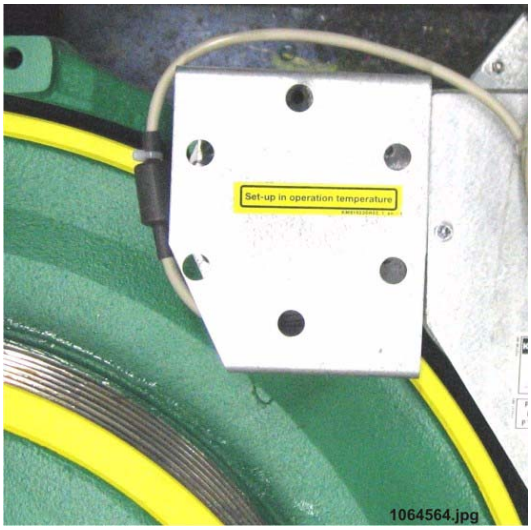
The following safety measures must be carried out before the actual work.

Step	Action	Illustration/Note
1	Drive the car to the topmost floor.	
2	Take the elevator out of use.	Ensure the car and car roof are empty.
3	Put safety barriers around the work place if needed.	
4	Open the MAP. Switch ON the RDF.	Only with MRL elevators.
5	Move the car on RDF to a suitable working level with access to topmost landing, machine and drive module.	Only with MRL elevators.
6	Engage the blocking device.	Only with MRL elevators.
7	**If the elevator could not be moved on RDF** to a suitable working level: • Switch OFF the main switch (220). • Lock and tag them. • Move the empty car upwards opening the brake or downwards using the counterweight lifting tool. • Close the MAP.	Only with MRL elevators. **Empty car upwards:** Open the machine brake. Move the car upwards in small steps. **Empty car downwards:** Use CWT lifting device, refer to operation instruction AS-01.05.001.
8	Disconnect and prevent reconnection of the possible emergency power supplies.	
9	Switch OFF the main switch (220). Lock and tag.	
10	Wait for 5 minutes.	

Step	Action	Illustration/Note
11	Open the V3F16L drive covers. **1.X:** Loosen fixing screws (B) (4 pcs.). Remove the cover of the drive module. 	**2.X:** Remove fixing screws (A) (2 pcs.). Loosen fixing screws (B) (6 pcs.). Remove the cover of the drive module. 
12	Switch ON the main switch (220).	
13	Check that the DANGER led (D1) is lit. **1.X:** (D1 led is located above connector B). 	**WARNING!** If the DANGER led (D1) does not illuminate, continue with special caution! **2.X:** 
14	Switch OFF the main switch (220).	
15	Wait for 5 minutes.	
16	Check that the DANGER led (D1) is NOT lit.	
17	Lock and tag the main switch (220).	
18	Close the MAP.	

Step	Action	Illustration/Note
19	Open the landing door. Keep the landing door open by using door blocking device.	Only MRL elevators

6.2 Replacing tachometer with encoder for MX machines

Step	Action	Illustration/Note
1	Open the tachometer fixing screws (4 pcs.). Remove installation cover, if applicable. It is not needed in encoder assembly.	Do not remove the tachometer cable, because encoder cable will be mounted on it.
	 1064563.jpg	 1064564.jpg
2	Fit the encoder carefully to the machine. Install the fixing screws (4 pcs.).	 1064565.jpg
3	Route the encoder cable to the drive module. Fix the encoder cable to the tachometer cable by using cable ties.	**NOTICE: Do not shorten the encoder cable.**

7 REMOVAL OF V3F16L DRIVE MODULE

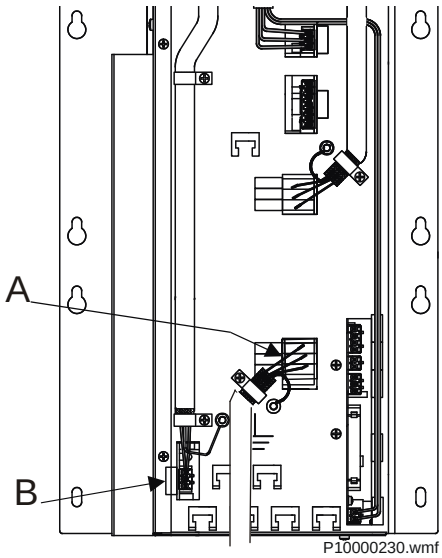
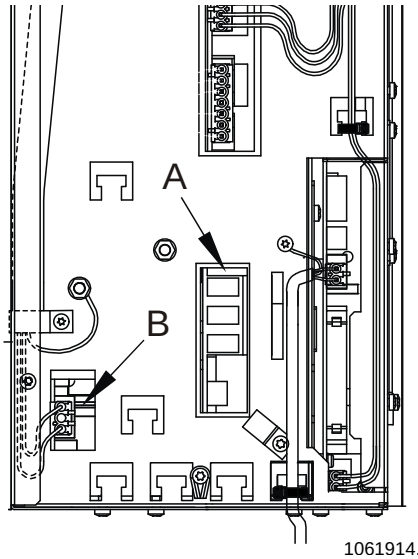
7.1 Tools

Following tools are recommended to be used when replacing the drive module:

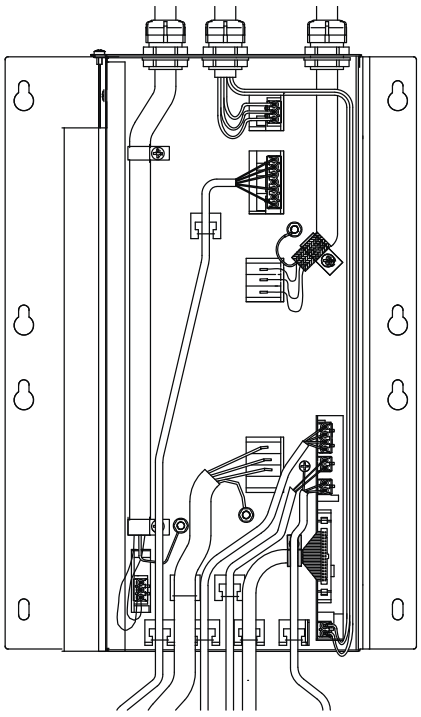
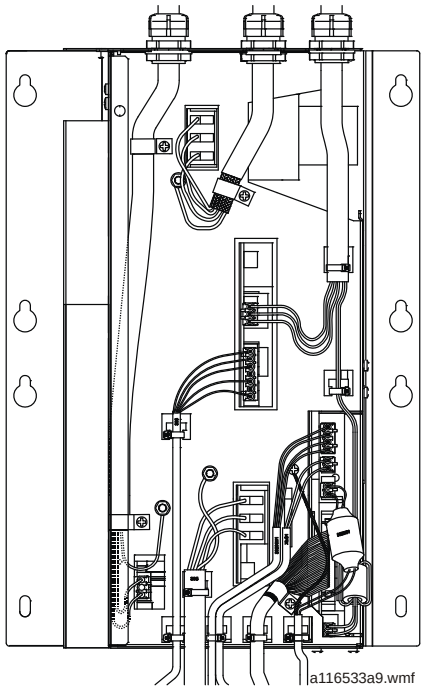
- Door blocking tool KM871952
- Safety barriers
- Work stool
- Multimeter

7.2 Safety measures

With MRL elevators the car roof is used as a working platform. Therefore the special safety procedures and working methods are mandatory.

Step	Action	Illustration/Note
1	Ensure that AC voltage is not fed to the drive module. Measure AC voltage from power supply terminals (A) T1-T2, T1-T3, T2-T3.	
2	Ensure that DC voltage is not fed to the drive module. Measure DC voltage from connector (B) (XBRE2), between terminals 1 to ground and 3 to ground. 1.X:  P10000230.wmf	**WARNING!**Check that the DANGER led (D1) is not lit (located above the XBRE2 connector (B)). 2.X:  1061914.wmf

7.3 Removing V3F16L drive module

Step	Action	Illustration/Note
1	Disconnect wires of the power supply cable from terminals.	Mark the wires, if the old markings are missing or unclear.
2	Disconnect wires of the motor cable from terminals.	Mark the wires, if the old markings are missing or unclear. Secure the lead-in nut from dropping down the shaft.
3	Disconnect all the other cable connectors from the drive module.	
4	Loosen fixing screws (4 pcs.). Remove the drive module and lower it down to landing floor.	The drive module has eight fixing points for different fixings to guide rail but only four of them are used.
5	Place the cables so, that they do not hinder the installation procedure.	Wrap the motor cables together. Wrap the control cables together.
	1.X: 	2.X:  a116533a9.wmf

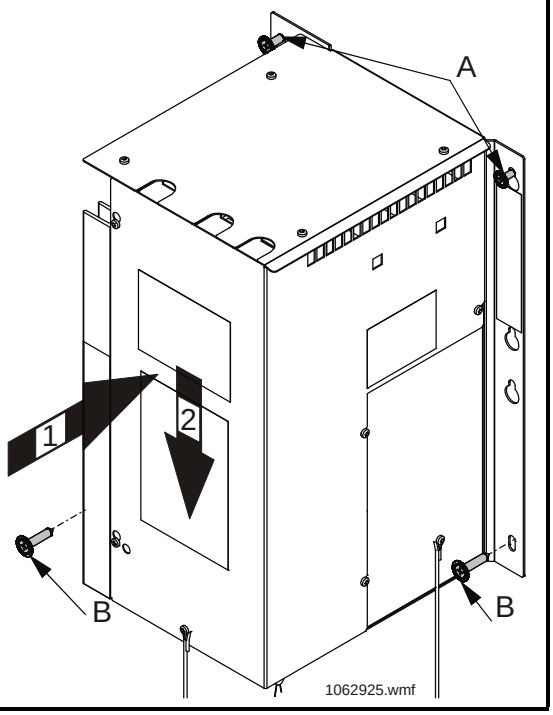
8 INSTALLATION OF KDL16L DRIVE MODULE

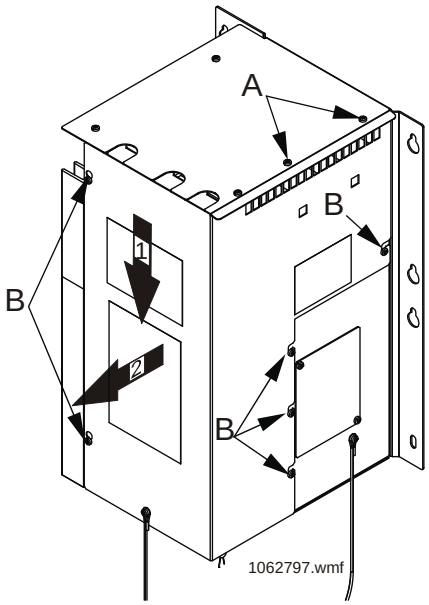
8.1 Tools

Following tools are recommended to be used when replacing the drive module:

- Door blocking tool KM871952
- Safety barriers
- Work stool
- Multimeter
- Torx screwdriver TX10

8.2 Installing new drive module

Step	Action	Illustration/Note
1	Check the drive module fixings on the shaft wall, if the new drive module fits to the old fixings.	Only MRL elevators
2	Attach rail fixings on the shaft wall, if new fixings are needed.	
3	Lift the new drive module into the place.	
4	Tighten the fixing screws (A). Insert and tighten fixing screws (B). NOTE! Check fixing points of the old drive module. The drive module has eight fixing points for different fixings to guide rail but only four of them are used.	

Step	Action	Illustration/Note
5	Loosen fixing screws (5 pcs.). Slide the cover of the drive module downwards and remove it.	
6	Connect all the cables, which do not require adapters. Connect the earthings. Secure the cables by using cable ties.	Check the cable markings. See section 1.8. Especially check connections of the motor cable terminals and power supply terminals. Do not place wires too deep into the connector.
7	Connect rest of the wires to the drive module by using adapters. Connect the earthings. Secure the cables by using cable ties.	See the adapter connections in section 1.5. The battery back-up cable is connected to the drive module in this phase. The cable will be connected to SEP later on. Secure the cable until it is connected.
8	Install the cover to the drive module. Tighten fixing screws (5 pcs.).	Be careful not to damage the cables. Reconnect the emergency power supplies (if applicable).

8.3 Getting the car off the blocking device (MRL elevators)

Step	Action	Illustration/Note
1	Remove all the tools from the car roof.	
2	Disengage the blocking device.	
3	Leave the car roof. Close the landing door.	

9 PARAMETER SETTINGS

9.1 Setting drive parameters

All the steps in the following table must always be carried out in following order.

Step	Action	Illustration/Note
1	Check that **Document identification (6_0)** parameter matches the ID on parameter list 972483D01.	
Set the elevator dependent parameters:		
2	Parameter lock (6_95) parameter to 0.	
3	Default parameters (6_98) parameter to 1.	Wait at least for 10 seconds.
4	**Motor type (6_60)** parameter Refer to section 5.1. See also table below.	Setting **Motor type (6_60)** parameter turns parameters **6_4, 6_6, 6_7, 6_10, 6_11, 6_25, 6_30, 6_61, 6_64, 6_65, 6_67, 6_80..84, 6_86, 6_87** value to default settings for that type of motor.
5	**Acceleration (6_2)** parameter	Refer to section 5.1.
6	**Nominal speed (6_3) parameter**	
7	**Elevator load (6_4) parameter**	
8	**Roping (6_7)** parameter	
9	**Save (6_99)** parameter to 1.	Value is returned automatically to 0.
10	Switch the power OFF. Wait at least for 15 seconds.	This actions ensures that parameters are stored correctly.
11	Switch the power ON.	Ensure that the RDF is switched ON.
12	Check that the **Motor type (6_60)** parameter is set to the correct value.	

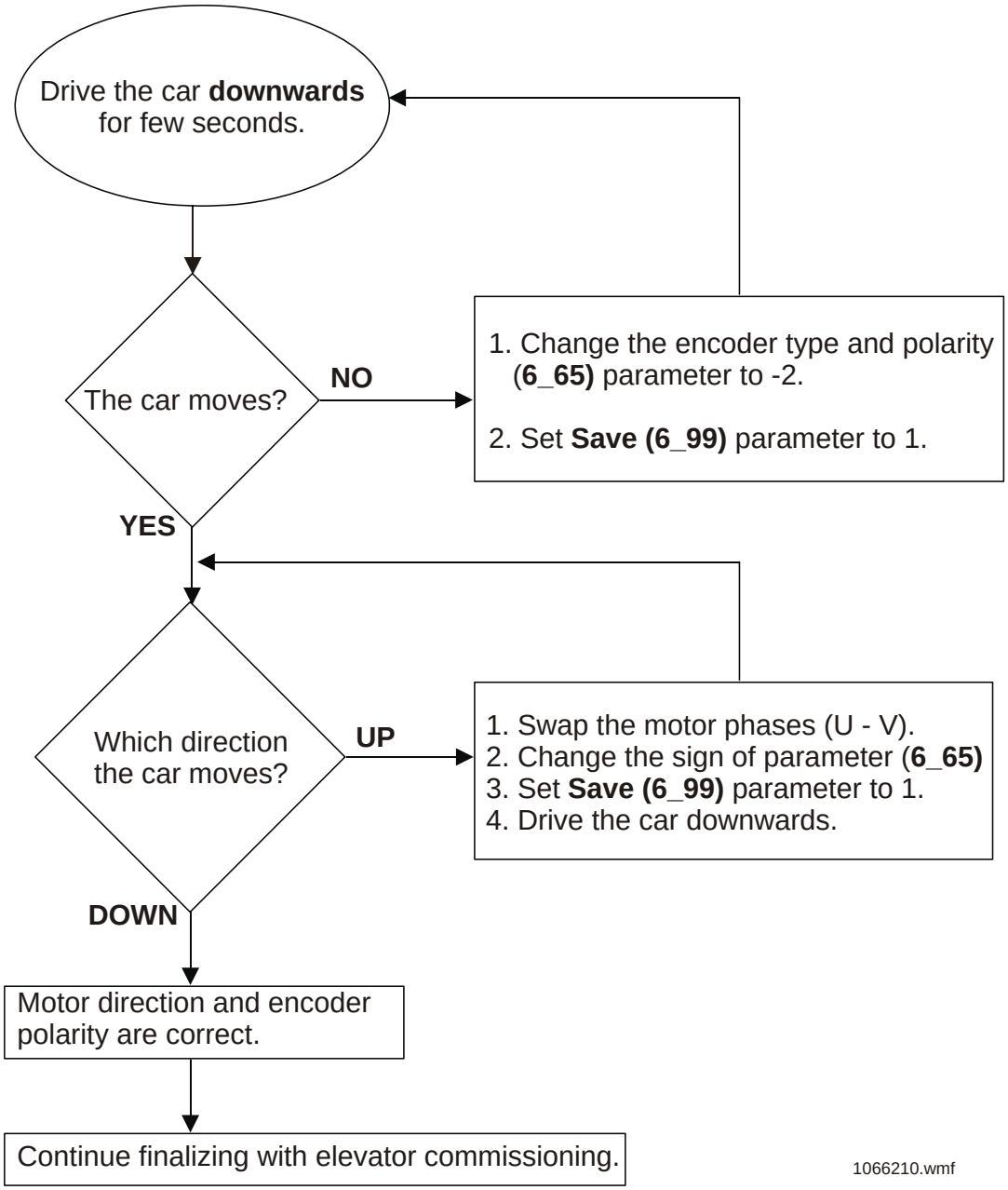
Value	Type	6_6	6_64	6_80	6_81	6_82	6_83	6_84	6_86	6_87
KONE MonoSpace® elevators:										
5.20	MX05/10	340	14452	208	9.0	13.1	112.3	2.8	3.50	8.8
5.22	MX05/16	340	14452	210	14.0	21.0	179.8	4.5	1.45	5.6
6.20	MX06/05, MX06/10	400	17067	208	11.2	12.7	96.0	3.7	2.47	6.8
6.21	MX06/16	400	17067	226	16.5	20.4	153.0	5.9	1.17	5.0
10.20	MX10/05, MX10/10	480	19819	217	16.5	13.3	79.6	5.7	1.55	4.9
KONE ReGenerate™ elevators:										
6.20	MX06/05, MX06/10	400	17067	208	11.2	12.7	96.0	3.7	2.47	6.8
6.21	MX06/16	400	17067	226	16.5	20.4	153.0	5.9	1.17	5.0
10.20	MX10/05, MX10/10	480	19819	217	16.5	13.3	79.6	5.7	1.55	4.9
10.28	MX10/08	480	19819	139	12.9	6.6	39.8	2.9	2.00	3.1

9.2 Checking the motor direction and encoder polarity

WARNING

No one is allowed to be on the car roof when driving the car with RDF.

NOTE! Check movement directly from the car, do not look from the speed leds of LOP-CP.



10 FINALIZING DRIVE MODULE REPLACEMENT

If machine room elevator start the finalizing from section 10.2.

If KONE MonoSpace® type elevator start the finalizing from section 10.1. If the elevator is equipped with DOM or LPT safety devices, and the landing door has been opened with emergency release key, the system must reset before the elevator can drive on normal.

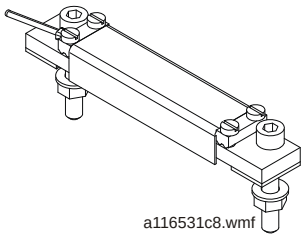
10.1 Safety measures (KONE MonoSpace® type elevators)

Step	Action	Illustration/Note
1	Switch the elevator on inspection.	Follow the safety practises according to elevator specific MBM-2 manual.
2	Push down the stop button on inspection drive unit.	Reset the LPT / DOM, if applicable, by switching reset key switch.
3	Switch OFF the RDF.	
4	Go to the car roof.	
5	Drive the car downwards on inspection. Position the car with access to the SEP.	

10.2 Finalizing the replacement

Step	Action	Illustration/Note
1	Connect the battery back-up cable to the LCECPU (XM14) in SEP/ReCab panel (MRL elevators) or in control cabinet (MR elevators).	
2	Drive the car back to the topmost landing level on inspection. Reset the LPT / DOM, if applicable.	Only MRL elevator.

11 COMMISSIONING FOR RATED SPEED FOR MRL ELEVATORS

Type of load weighing device	**Illustration/Note**
LWM:	 a116531c8.wmf

11.1 Selecting LWD setup type

Step	Action	Illustration/Note
1	Set **LWD setup (6_74)** parameter to -2.	
2	Set **Save (6_99)** parameter to 1.	Value is returned automatically to 0.
3	Leave **Menu 6**. Verify LWD value from **LWD adjustment parameter (5_1)**.	With empty car the parameter value should be 0. If the load weighing device is not working correctly, make adjustment according to APPENDIX B.

11.2 Elevator shaft setup

NOTE! Relevelling is not possible if LWD setup is not done.

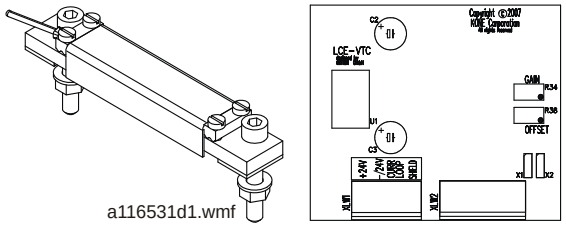
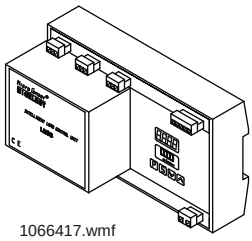
Step	Action	Illustration/Note
1	Ensure that the RDF is switched ON.	
2	Drive the car just below the bottom floor.	
3	Check that leds 61:U, 77:N and 77:S are lit.	**Led 61:N must not be lit.** LCE leds 30 and/ or B30 must be lit.
4	Activate the setup mode from the controller. Set **Shaft setup (5_2)** parameter to 1.	
5	Switch elevator to normal mode.	Elevator starts the setup drive upwards.
6	Watch floor numbers on LOP-CB.	Elevator is ready for the normal drive when the car stops at the topmost floor. The car relevels and the LOP-CB shows the number of the topmost floor.
7	If the drive code 118 and related subcode is displayed after setup, refer to KDL16 diagnostic codes, 972485D01.	

11.3 Finalizing the commissioning (MRL elevators)

Step	Action	Illustration/Note
1	Remove all the tools and waste material from the work site.	
2	Clean the site.	
3	Return the elevator to normal. Perform a test run for the elevator.	If the load weighing device is not working correctly, make adjustment according to APPENDIX B.
4	Return the elevator to service.	

12 COMMISSIONING FOR RATED SPEED FOR MR ELEVATORS

Select the correct procedure (sections) for adjusting the load weighing device according to the load weighing device type.

Type of load weighing device	**Illustration/Note**
LWM + LCEVTC:	 a116531d1.wmf
WR (Micelect):	 1066417.wmf

12.1 Selecting LWD setup type

Step	Action	Illustration/Note
1	Set **LWD setup (6_74)** parameter to -2 (fixed scaling).	This must be done before programming load weighing device.
2	Set **Save (6_99)** parameter to 1.	
3	Leave **Menu 6**. Verify LWD value from **LWD adjustment parameter (5_1)**.	With empty car the parameter value should be 0. If the load weighing device is not working correctly, make adjustment according to APPENDIX C. (LWM + LCEVTC) or APPENDIX D. (WR, Micelect).

12.2 Elevator shaft setup

Step	Action	Illustration/Note
1	Ensure that the elevator is in RDF mode.	
2	Drive the car just below the bottom floor.	
3	Check that the leds 61:U, 77:N and 77:S are lit.	**Led 61:N must not be lit.** LCE leds 30 and/ or B30 must be lit.
4	Activate the setup mode from the controller. Set **Shaft setup (5_2)** parameter to 1.	
5	Switch elevator to normal mode.	Elevator starts the setup drive upwards.
6	Watch floor numbers on LCECPU.	Elevator is ready for the normal drive when the car stops at the topmost floor, car relevels and the LCECPU shows the number of the topmost floor.
7	If the drive code 118 and related subcode is displayed after setup, refer to KDL16 diagnostic codes, 972485D01.	

12.3 Finalizing the commissioning (MR elevators)

Step	Action	Illustration/Note
1	Remove all the tools and waste material from the work site.	
2	Clean the site.	
3	Return the elevator to normal. Perform a test run for the elevator.	If the load weighing device is not working correctly, make adjustment according to APPENDIX C. (LWM + LCEVTC) or APPENDIX D. (WR, Micelect).
4	Return the elevator to service.	

APPENDIX A.UPDATE OF LCE SOFTWARE

This section describes methods for updating LCE software to comply with KDL16L drive module.

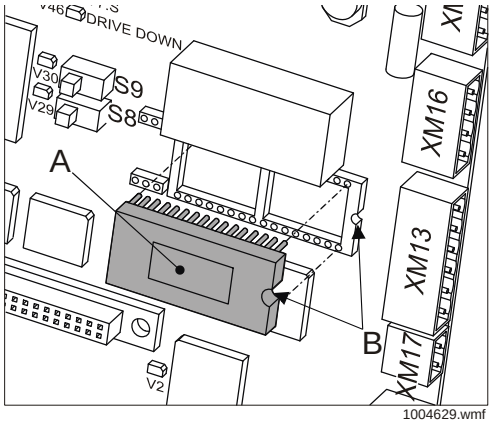
A.1 Preparations

The LCE software must be updated, if the LCE version is older than 5.1.0 (18.01.2002).

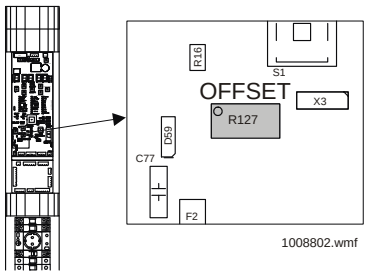
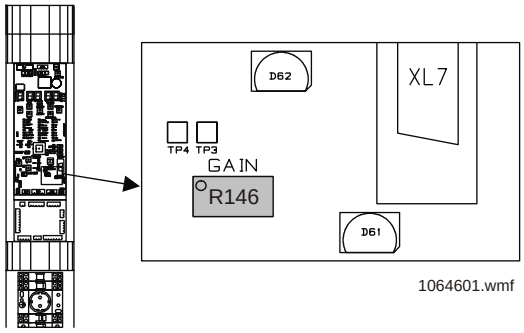
Stand-by mode and brake test features require LCE version 6.7.18 or newer.

Step	Action	Illustration/Note
1	Open the MAP.	
2	Use LCE User Interface on LOPCB board to scroll and register into a paper all the set parameters of the elevator.	This procedure is necessary, when updating software (parameters are reset). The memory of this board contains the information of the elevator. The spare board is normally set for the factory test machine.
3	Follow the instruction for working with electrical discharge sensitive devices (ESD sensitive devices)	
4	On the car roof open the cover of the SEP.	

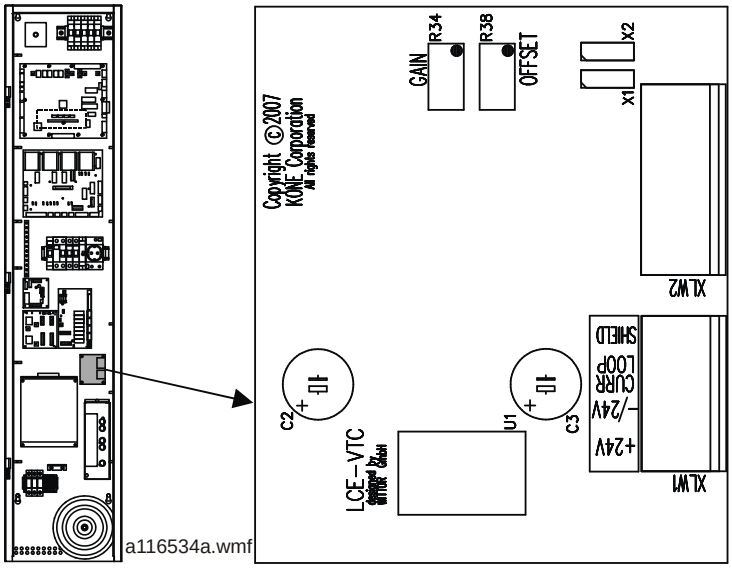
A.2 Updating LCE software (EPROM)

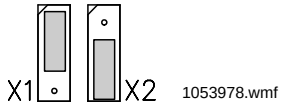
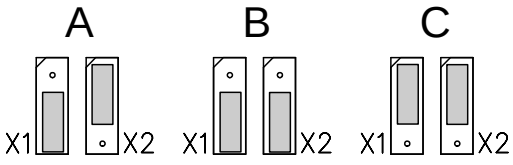
Step	Action	Illustration/Note
1	Remove the old EPROM (A) from the board. 	 1004629.wmf
2	Attach the new EPROM (A) to the board. Be careful! • Avoid twisting the connection pins of the EPROM. • Place the notches (B) in EPROM and socket against each other.	
3	Ensure that the elevator is on the RDF.	
4	Switch ON the power.	
5	Check the parameters and modify the values according to the old settings.	
6	Return the elevator to normal.	

APPENDIX B.ADJUSTING LOAD WEIGHING DEVICE (LWM)

Step	Action	Illustration/Note
1	Set **LWD setup (6_74)** parameter to -2.	
2	Set **Save (6_99)** parameter to 1.	Value is returned automatically to 0.
3	Adjust the load weighing device OFFSET setting to 0%.	
	Action	**Display**
	Push MENU button until there is number 5 on the MENU display.	5 _ _ __
	Push ACCEPT button.	5 _1 _ __
	Push ACCEPT button.	L _ _ (xx where xx is load %)
	Turn the OFFSET potentiometer on LOP-CB board until there is number 0 on the screen.	L _ _ 0
4	Drive the car to a suitable height at the top of the elevator shaft and lock it with blocking device.	
5	Open the brake and wait until the load display is steady. Close the brake and open again for a few seconds to ensure that all the tension is released.	
6	Set the GAIN of the load weighing device with the LOP-CB in the MAP.	
	Action	**Display**
	Push MENU button until there is number 5 on the MENU display.	5 _ _ __
	Push ACCEPT button.	5 _1 _ __
	Push ACCEPT button.	L _ _ xx (where xx is load %)
	Adjust the potentiometer GAIN until there is 50% on the MENU display. Check the value from the site survey form.	L _ _ 50
7	Check the setting by releasing the brake again. Close the brake.	If the reading is not stabilized, readjust the load weighing device.

APPENDIX C.ADJUSTING OFFSET POTENTIOMETER (LCEVTC)



Step	Action	Illustration/Note
1	Set jumper X1 and X2 positions on the LCEVTC board.	 1053978.wmf
2	Use MENU button to navigate to menu **LWD adjustment (5_1)** parameter and press ACCEPT button.	LCECPU displays load in elevator in percentage of full load.
3	Adjust the OFFSET potentiometer on the LCEVTC board so that the LCECPU shows 0.	Turning potentiometer clockwise increases the value.
	If the value of 0 cannot be reached, re-set the jumper positions: • If the value in first adjustment is less than 0 use jumper setting A. If the value is still less than 0 use jumper setting B. • If the value in first adjustment is more than 0 use jumper setting C.	 1053979.wmf
4	Place 50 % of the rated load in the car.	
5	Adjust the GAIN potentiometer on the LCEVTC board so that the LCECPU shows 50.	
6	Remove the weights from the car.	

APPENDIX D.PROGRAMMING AND ADJUSTING LOAD WEIGHING DEVICE (WR, MICELECT)

D.1 Programming procedure

Step	Action	Illustration/Note
1	Check that the control unit display is lit.	Energy saving control turns display OFF after 5 minutes. By pressing any of the buttons turns the display ON.
2	Ensure that the elevator is in RDF mode.	
3	Program the load weighing device. Press the P button for 3 sec. to begin the programming. (Refer to the following programming procedure.)	Press P to accept setting you have chosen. Press the arrow (up and down) buttons to change the value of the setting.

NOTE! Before starting the procedure (Zero Calibration), the car should be positioned in the shaft at a point when it is lightest. The weight of the car is affected by the weight of the roping system (1:1 or 2:1 roping, compensation chain) and the travelling cable. For example, the car is usually the lightest: at the bottom floor, in 1:1 and 2:1 roping with compensation chain; or at the topmost floor, in 2:1 roping without compensation chain.

The LWD display must always show a positive value when the car is at any point of the shaft. The negative value marking should never appear in the display (dot on the bottom right). After setup, run the car up and down the shaft to check the weight.

Check the LWD software version.

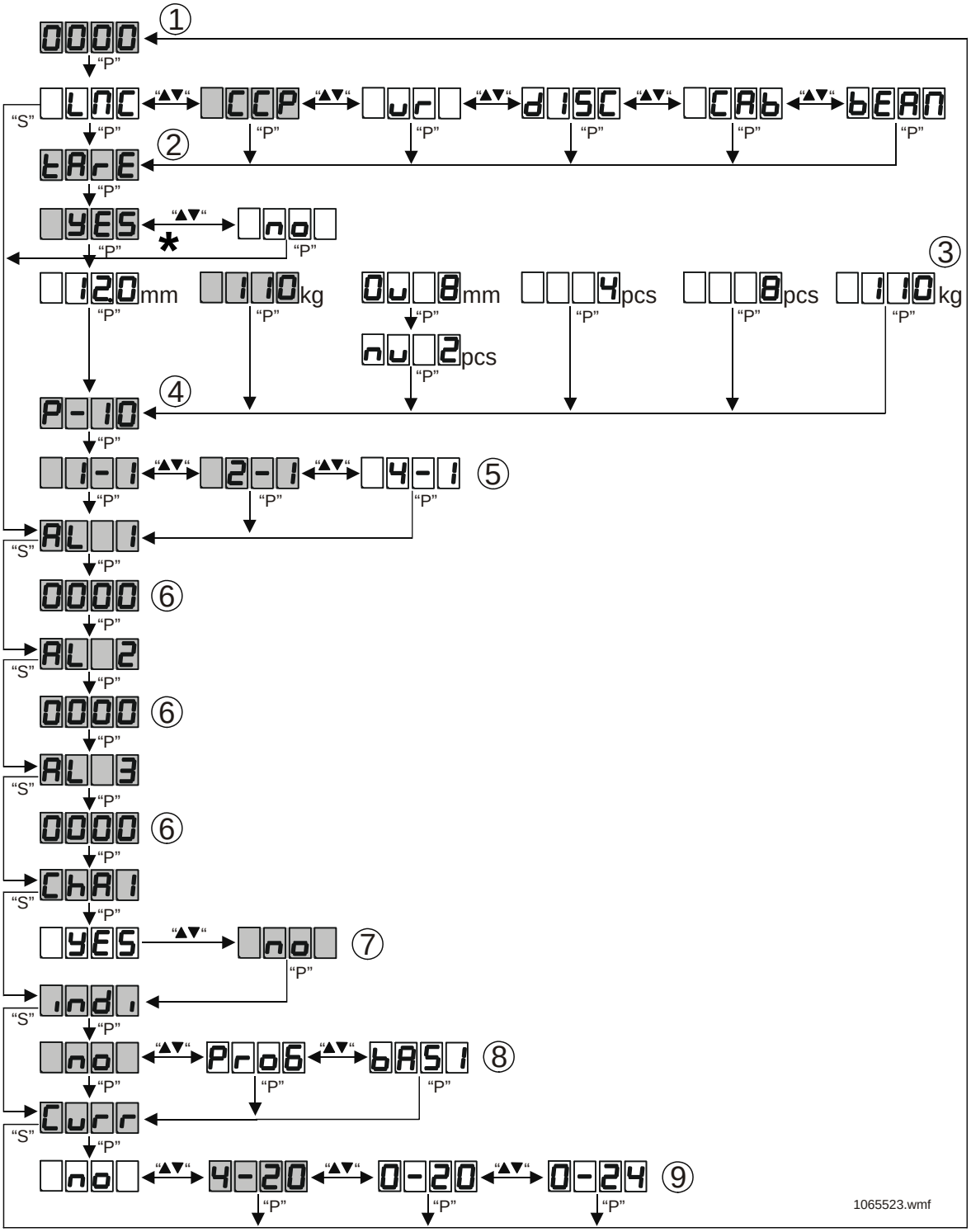
- If the software version is P-LM3D-025 or newer, continue on D.1.1.
- If the software version is P-LM3D-022, or older, or not marked, continue on D.1.2.

D.1.1 LWD mode (P-LM3D-025 or newer)

①	**Sensor selection** • Display shows “0000” • Press P. • Select “CCP” (well known weight). • Press P.
②	**Zero calibration (“TARE”), with lightest car position (see above):** • Display shows “TARE”. • Press P button. • Make zero setting with empty car by selecting “YES”. • Press P. (The display blinks and beeps for 5 seconds.)

③	**Sensor configuration:** • **Add 100% of the rated load to the car**. • Set the elevator rated load (kg) by pressing the arrow buttons (the same load as above). • Press P.
④	**Number of passengers:** • Set the maximum number of persons in the car using arrow buttons. • Press P.
⑤	**Roping ratio:** • Select roping 2:1 using arrow buttons. • Press P.
⑥	**Alarm values:** • Display shows “AL 1” . • Press P • Set the rated load of the elevator using arrow buttons. • Press P. • Display shows “AL 2”. • Press P. • Set the rated load of the elevator using arrow buttons. • Press P. • Display shows “AL 3”. • Press P. • Set 120% of the rated load of the elevator using arrow buttons. • Press P.
⑦	**Compensation chain weight (“CHAI”):** • Display shows “CHAI”. • Press P. • Select “NO” using arrow buttons. • Press P.
⑧	**Car indicator (“INDI”):** • Display shows “INDI” • Press P. • Select “NO” using arrow buttons. • Press P.
⑨	**Analogical output (“CURR”):** • Display shows “CURR” • Press P. • Select “4-20” using arrow buttons. • Press P.

Rated load of the elevator is displayed.

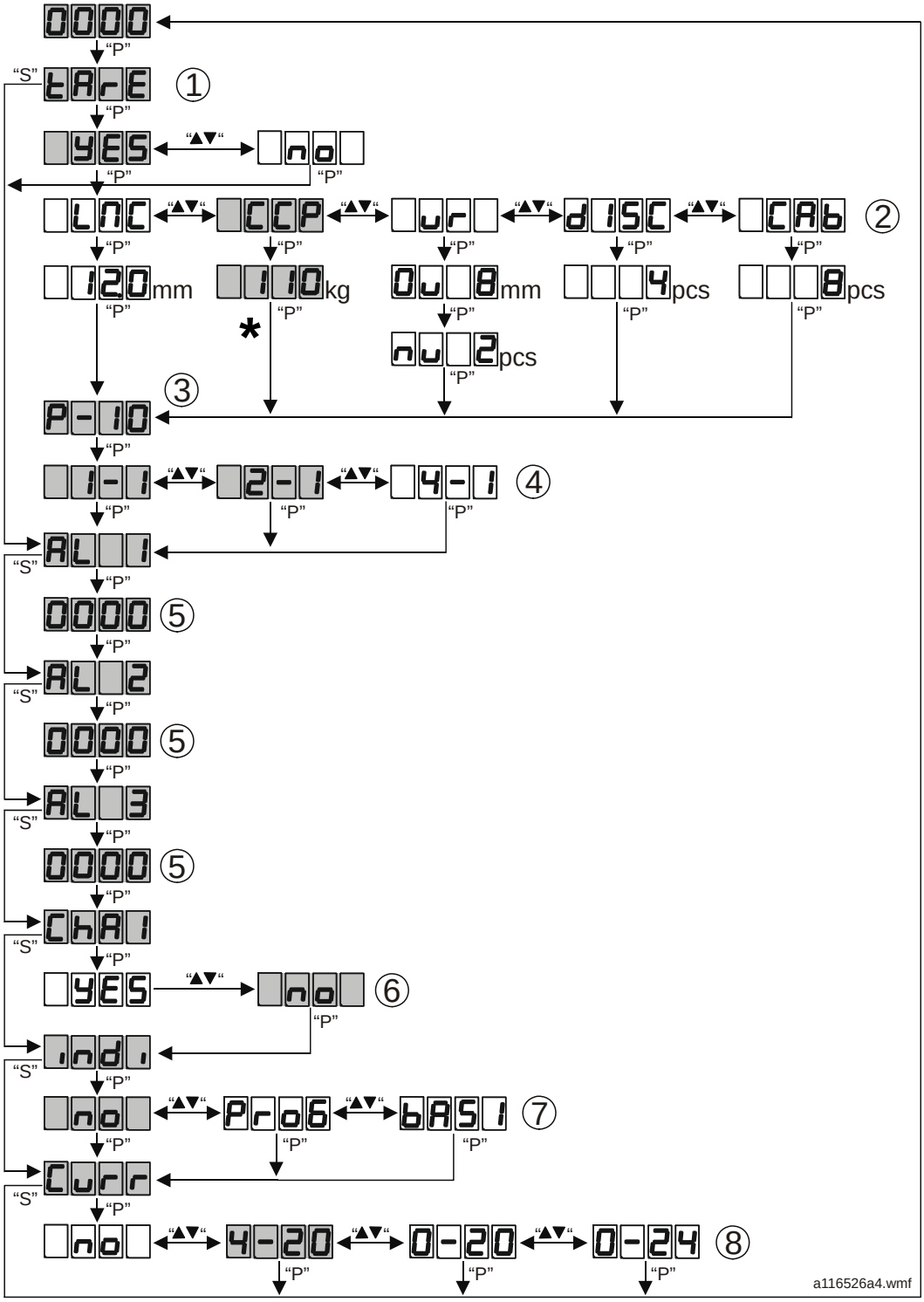


*** NOTE!** Add 100% of the rated load to the car before setting the load and pressing P.

D.1.2 LWD mode (P-LM3D-022, or older, or not marked)

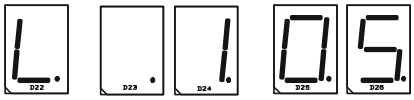
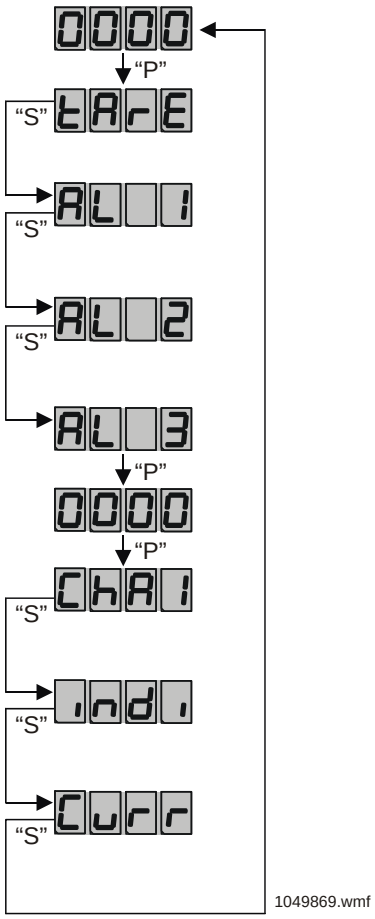
①	**Zero calibration ("TARE"):** • Display shows "TARE". • Press P button. • Make zero setting with empty car by selecting "YES". • Press P. (The display blinks and beeps for 5 sec.)
②	**Sensor configuration:** • Select "CCP" (well known weight). • Press P. • Add 100% of the rated load to the car. • Set the elevator rated load (kg) by pressing the arrow buttons (the same load as above). • Press P.
③	**Number of passengers:** • Set the maximum number of persons in the car using arrow buttons. • Press P.
④	**Roping ratio:** • Select roping 1:1 or 2:1 using arrow buttons. • Press P.
⑤	**Alarm values:** • Display shows "AL 1" . • Press P • Set the rated load of the elevator using arrow buttons. • Press P. • Display shows "AL 2". • Press P. • Set the rated load of the elevator using arrow buttons. • Press P. • Display shows "AL 3". • Press P. • Set 120% of the rated load of the elevator using arrow buttons. • Press P.
⑥	**Compensation chain weight ("CHAI"):** • Display shows "CHAI". • Press P. • Select "NO" using arrow buttons. • Press P.
⑦	**Car indicator ("INDI"):** • Display shows "INDI" • Press P. • Select "NO" using arrow buttons. • Press P.
⑧	**Analogical output ("CURR"):** • Display shows "CURR" • Press P. • Select "4-20" using arrow buttons. • Press P.

Rated load of the elevator is displayed.



* NOTE! Add 100% of the rated load to the car before setting the load and pressing P.

D.2 Adjusting load weighing device

Step	Action	Illustration/Note
1	**In the control panel:** • Push MENU button until number 5 shows on the MENU display. • Push ACCEPT button. • Push ACCEPT button. NOTE! Normally the value is more than 100 %, for example 134 %. It should be between 103 % and 109 %.	**5** __ __ **5 _1** __ **L _x xx** (where xxx is load %)
2	**In the LWD control unit:** • Adjust the value of AL3-parameter until the control panel (5_1) displays 103-109 %.  1049868.wmf NOTE! Increasing the AL3 value in the LWD control unit is reducing 5_1 value in the control panel.	 1049869.wmf

13 APPROVALS AND VERSION HISTORY

Compiled by:	Information Product Author	Janne Kaskimies
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Issue	Date	Description of Change	Ref CR	Approved by
-	2009-04-29	First issue		S. Valliovuo
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