Baumaschinen GmbH

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Multi-Dumper MCE400

User manual and spare parts list

ATTENTION - BEFORE TIPPING:

(Only for versions with electric lifting cylinder)

1. Pull the left black lever
2. Then push the black button (up / down) on the left

Authorized reseller:

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CE Certificat

EG – Konformitätserklärung

Hiermit erklären wir,

PowerPac Baumaschinen GmbH
Niederhöchstädter Str. 71-73
D-61476 Kronberg

dass das Produkt:

Name: Multi-Dumper MCE400

Built: from 2012
Serial number: from 5688010213

folgenden einschlägigen Bestimmungen entspricht:

Maschinenrichtlinie 2006/42/EG
NiederspRL 2014/35/EU
EMV-Richtlinie 2014/30EU

Angewendete harmonisierte europäische Normen

DIN EN 292, 294, 349, 418, 60204

Angewendete nationale Normen und technische Spezifikationen

VBG

Kronberg, 01.01.2021

Christian Urbschat
Geschäftsführer

Dokumentationsbevollmächtigter der PowerPac Baumaschinen GmbH:
Christian Urbschat – Niederhöchstädter Str. 71-73 – 61476 Kronberg

Introduction

- Read and follow all instructions. Not following the instructions may result in serious injury or damage to property.
- The warnings and hazards in this guide cannot capture all situations and conditions that may arise. Use common sense and caution when using the device. Always be environmentally conscious and pay attention to safe and responsible use of the device.
- Do not allow anybody to operate or start-up the device until they have read this manual and have a thorough understanding of how it works.
- Do not make any changes to this product. Unauthorized modifications may affect the function and/or safety of the product and affect the life of the product. This product is designed for specific applications.
- Use the right tool for all jobs. DO NOT attempt to use small equipment to perform jobs that require large tools. There are specific applications this device was designed for. The product is safe and does a great job when used for the capacities for which it was designed. DO NOT use the device for purposes for which it is not intended.

Labelling

The machine is marked with a special label that says:

- CE marking in accordance with the provisions of Directive 98/37 / EC, Annex II, Part A
- year of production
- Name and address of the manufacturer and legal representative in Europe
- Type of Machine: serial number or register number
- Technical data regarding the machine

For all kind of request and question make reference to PowerPac Baumaschinen GmbH!

	Be careful when using the machine.
	Read the instruction manual carefully before use.
	**DO NOT OVERLOAD! Max. 400 kg load**

Safe work area

- Check the working area before each use. Keep the working area clean, dry, free of clutter and well-lit. Unclear, wet or dark working areas can lead to injuries. Using the product in confined work areas can create a dangerous proximity to cutting and rotating parts.
- Do not use the product if there is a risk of fire or explosion, e.g. in the presence of flammable liquids, gases or dust. The product can generate sparks which can ignite flammable liquids, gases or dusts.
- Do not allow the product to come into contact with electrical power sources. The device is not isolated and the contact causes an electric shock.
- Keep children and bystanders away from the work area while you are operating the device. Do not let children work with the product.
- Pay attention to all power lines, circuits, water pipes and other mechanical hazards in your work area. Some of these hazards may be out of your sight and may result in personal injury and/or property damage in the event of contact.

Personal safety

- Always be vigilant when operating the device, pay attention to what you are doing and use your common sense. Do not use the device if you are tired or under the influence of drugs, alcohol or medication. A moment of carelessness during operation can lead to serious injuries.
- Wear appropriate clothing. Do not wear loose clothing, hanging items or jewelry. Keep hair, clothes and gloves away from movable parts. Loose garments, jewelry or long hair can get caught in moving parts. Vents on the tool often cover moving parts and should be avoided.
- If necessary, wear the appropriate protective clothing. Safety glasses that are ANSI Z87.1 compliant with side protection or use a face mask if necessary. Use a dust mask in dusty working conditions. In addition, non-slip safety shoes, safety helmets, gloves, hearing protection and if necessary, dust collection systems should be used. This applies to all people in the workspace.
- Don't overestimate yourself. Always make sure you are safe and balanced.
- Remove screwdrivers or wrenches before turning on the device or connection to a power supply. A screwdriver or wrench that hangs on a rotating part of the tool can cause injury.
- Remove screwdrivers, wrenches and other tools before switching on the device or connecting it to the power supply. A screwdriver or wrench etc. that comes into contact with a rotating part of the machine can cause injuries.

Use and care

- Do not overload the product. Products are safer and perform better when used for their intended purpose. Plan your work and use the right product for each task.
- Check the device for damaged parts before each use. Carefully check that the product is functioning properly and is fulfilling its intended function. Damaged or worn components must be replaced immediately. Never operate the device with a damaged or loose part.
- Never operate the machine with a defective key switch. Machines that cannot be switched off with the key switch are dangerous and must be repaired before use.
- Before working on the machine, switch off the machine using the key switch. When working on electrical components of the machine, always disconnect the batteries, otherwise there is a risk of a short circuit. Such preventive safety measures reduce the risk of the device starting up accidentally and prevent serious personal injury and damage to property.
- Store the product when not in use. Store in a dry, safe place out of reach of children. Check the machine and attachments before storage and before re-use to ensure that it is in excellent working condition.
- Use only attachments that are recommended by the manufacturer for use with your product. Attachments suitable for a product may cause injury when used with another machine.
- Ensure that the protective devices are present and functional. Never operate the device without a protective device.
- Do not let the machine run unattended.

IMPORTANED:
If possible, the batteries should be recharged after each use and every 2-3 weeks when not in use.

Special precautions during operation

- Do not allow anyone to stand on or / on any part of the machine, including the tray / buildup.
- Only operate the machine if you hold onto both handles.
- Pay attention to where you are going. Always keep an eye on your surroundings.
- Avoid sudden maneuvers, especially on uneven and slippery ground.
- Only lift the tray / buildup when the machine is leveled.
- If you leave the device unattended, always lower the tray / buildup. Always switch off the machine when you leave it.
- Drive more slowly before turning. Tight turns can lead to losing control of the machine.
- Switch off the machine using the key switch before making any settings on the machine.
- Disconnect the batteries before working on the electrical system.
- Do not operate the machine on or near embankments. Look for ditches, holes, etc., and watch out for traffic near roads.
- Only work in daylight or in good artificial lighting.
- The device must not be operated under the influence of alcoholic beverages or medication.
- Take special care when loading and unloading the device onto a trailer or truck.
- Do not touch any devices or accessories that can get hot during operation. Allow the device to cool down before performing maintenance work or adjusting settings.
- Do not let children play on or near the device.
- Do not place any bulky objects in the tray that could impair the view from the driving position.

Operating on slopes

- Do not operate on slopes above 22° (40%). If the slope is more than 5°, only go up and down (not crosswise).
- Always position the heavy end of the machine up hill. The weight distribution changes depending on the use. When the tray / buildup is empty, the center of gravity of the machine is relatively central. The front of the machine is heavier when the tray / buildup is loaded. If you are unsure, call and ask us. The same rules apply to loading and unloading equipment onto a trailer or truck.
- Avoid twists on gradients. If a turn is unavoidable, turn slowly and position the heavier end at the top slope.
- Avoid working near ditches or embankments, the machine could tilt if a wheel travels over the edge of a slope or ditch.
- Avoid working on wet or slippery surfaces. Despite the good tires, the machine can slip.
- Remove obstacles such as stones, tree trunks, etc. from the workspace. Pay attention to grooves or bumps, as uneven terrain can lead to the machine tipping over. Obstacles can be hidden in high grass.
- Always drive slowly on slopes. When driving or parking on slopes, always lower the tray / buildup and wedge the wheels to prevent unintended slipping/rolling of the machine.
- If the machine is unstable, jump out of the way. Never attempt to stabilize the machine by placing your foot on the ground.

Maintenance

- Switch off the machine before any maintenance, repair or adjustment.
- Check all visible bolts, nuts and screws regularly.
- Safety devices must never be tampered with. Check the safety device before each use.
- Keep the machine free of grass, leaves or other dirt. Clean oil or fuel contaminants. Allow the machine to cool before storage.
- Never keep the machine near an open flame, e.g. near a water heater or furnace.
- Stop and check the device if you're driving it against something or hear strange noises from the machine. If necessary, repair the machine before restarting.
- Only use original spare parts to ensure that the original standards are met.

Maintain the product by following a diligent program of repair and maintenance according to the recommended procedures below. It is recommended to check the general condition of the machine before using it. The following table is based on a normal operating plan.

Operating hours	Maintenance point
Every 25 hours	1. Check all screw connections and joints and grease them. 2. Regular greasing of the grease nipples on the pendulum axle, as well as the steering wheels, facilitates operation and ensures a long service life. Any common all-purpose grease is suitable for this application. 3. Check the air pressure of the tires (front max. 1.9 bar; rear max. 2.0 bar).
Every 50 hours	1. Make sure that all functions are working properly. 2. Check all electrical components for their correct function. 3. Oil the bowden cable of the tipping mechanism after either 50 operating hours or after moisture penetration, depending on which situation occurs sooner.

Bushings and joints

- Bushings are subject to wear and tear and must be checked regularly. The bushings must be replaced at the first sign of wear, otherwise costly consequential damage can occur.
- Lubricate all joints, grease nipples and moving parts of the machine at regular intervals. This contributes to a longer life of all joints and bearings. (Pendulum axle joint, wheel axles steering wheels, rotating axle steering wheels)

Cleaning and long-term storage

Lower the tray / buildup and switch off the machine using the key switch. Remove dirt from the outer parts of the entire machine, especially the motor, the area of the batteries and the control box.

- **IMPORTANT:** The machine can be washed with mild detergent and water. Do not clean the machine with a high-pressure cleaner. Avoid using water, especially near electrical components.
- Check all screws, nuts and bolts and tighten them if necessary. Repair or replace damaged or defective parts.
- Store the machine in a clean, dry garage or storage room. Turn off the machine using the key switch and disconnect the batteries.

DANGER! There is a risk of a short circuit! Secure the contacts of the cables / batteries with suitable insulation!

- **The batteries must always be stored dry, protected from frost and out of the reach of potential sources of fire.**
- **The batteries must not get into the hands of children.**

Commissioning

The MCE400 is operational in the delivery state (see First use).
Remove the packaging film and check the machine for transport damage.
Avoid driving against edges, steps or ledges at maximum speed.
The steering wheels (Fig.: 1, Fig.: 2) are locked on delivery and must be unlocked before use.

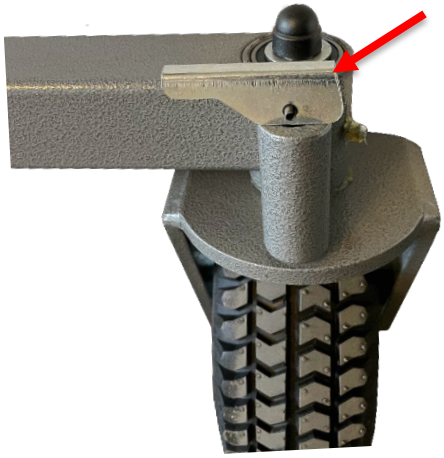


Fig.: 1 – Steering wheels locked

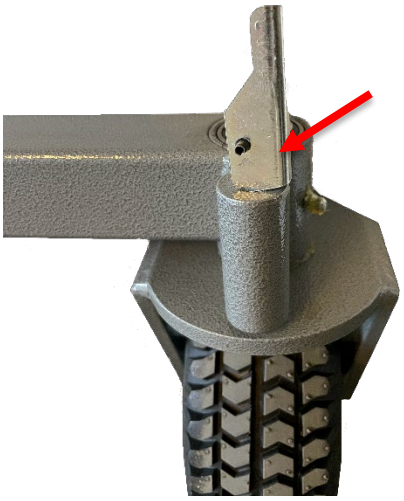


Fig.: 2 – Steering wheels unlocked

DANGER! The release of the mechanical brake, see "Parking brake (Fig.: 8) "on the engine leads to a travel lock!

Releasing the brake and moving the MCE400 in the event of a drive failure may only be carried out when it is unloaded! In any case, pay attention to the own weight of the MCE400 when working on a slope! Driving is not possible in this state, but there is a risk of the Multi-Dumper MCE400 rolling away by itself. An empty battery leads to the motor being switched off. Therefore, the batteries must be charged according to the topic "Operating hours counter / battery display" as soon as the battery display shows "charge battery".

Handlebar adjustment

The angle of the handlebar (the handles) of the MCE400 can be variated and thus precisely adjusted to the respective body size or application.

1. Loosen the six Allen screws. Do not remove them completely! (Fig.: 3)

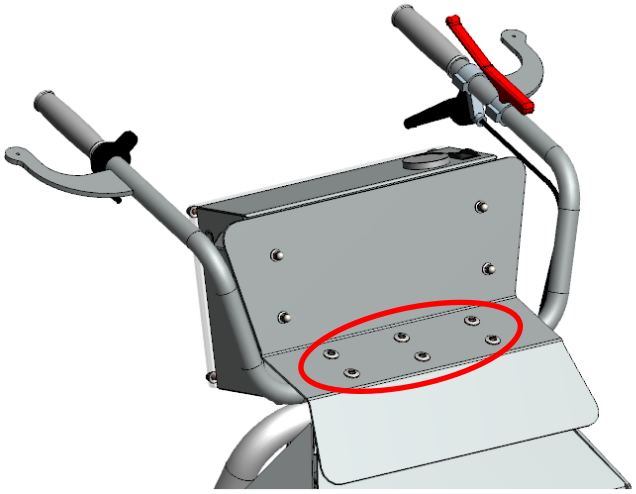


Fig.: 3 – Allen screws, handlebar adjustment

2. As soon as it is released, slide the handlebar either to the right or left until the angle can be freely adjusted. The anti-twist protection is ensured by a toothed ring. You can change the angle of the handlebar in predefined steps and adjust the handlebar perfectly to your height. In any case, the handlebar must be pushed back into its starting position so that the ring gear (the anti-twist device) can grip.

Before any use

Read this manual.
Before each start-up, the following must be checked:

- Charge level of the battery, recharge if necessary
- Remove any dirt from the machine
- Care must be taken to ensure that the work area is free of other persons and children
- Remove obstacles from the work area. Know and mark the location of the utility lines on site.
- Check all parts, screws, brackets and equipment of the machine for correct seating, functionality and condition.
- A check of the machine, its attachments and the functional test is necessary before each use.

Charging

IMPORTANT:
If possible, the batteries should be recharged after each use and when not in use every 2-3 weeks.

The MCE400 is supplied with maintenance-free lead batteries. These deliver a total voltage of 24V (series connection) and have a capacity of 80-110Ah. Furthermore, the MCE400 is delivered with a charger integrated in the control box, so that the charging process is limited to plugging the main plug into the socket (100V-240V 50/60Hz AC voltage).

Before you connect the machine to the main plug, switch it off using the key switch and make sure that the machine is secured against unintentional sliding / rolling. In addition, make sure that the protruding cable does not create a "trip hazard" that could cause injuries to third parties.
Make sure that the device is connected to a properly earthed socket.

First use
The batteries are delivered with storage voltage.
DANGER! Although this voltage is sufficient for operation, the machine should still be fully charged before commissioning! This usually takes 12 to a maximum of 15 hours.

Charging after each use
The batteries must be FULLY CHARGED after each use. This is essential to achieve a long service life.

Storage
When storing the batteries, ensure that they are kept in a dry, warm, and clean environment. The storage temperature should be between 1 ° C and a maximum of 40 ° C. We recommend storing the batteries only when they are fully charged and, if necessary, recharge them.

Hour meter / battery indicator

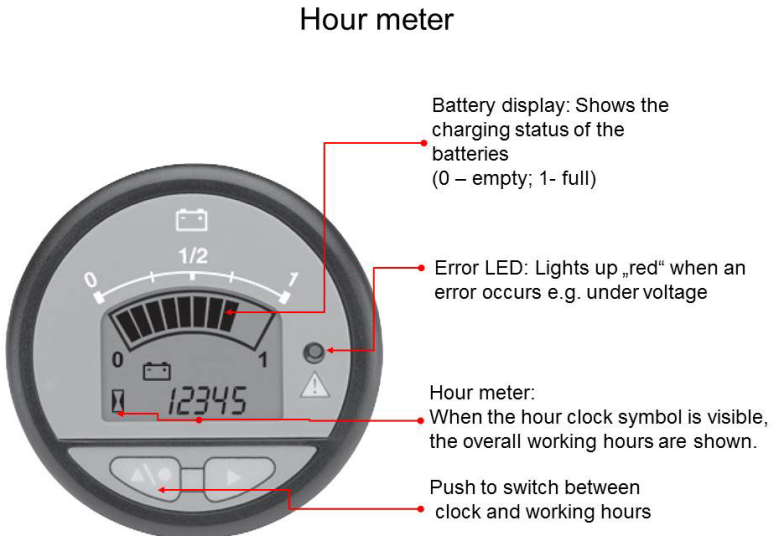


Fig.: 4 – Operating hour meter labeling

A capacity display and an error LED are integrated in the operating hour meter (Fig.: 4). The remaining battery capacity and any errors are displayed here. After each use or immediately if the charge indicator shows empty or the error LED lights up red, the batteries must be charged with the integrated charger. Please note that the indicator has a yellow backlite. This backlite will also illuminate the Error LED field. This is not an error sign! Only if the LED is in red there is an error and problem.

If the batteries are not charged after the error LED and the charge indicator light up, the MCE400 will be switched off shortly afterwards. This avoids deep discharge of the batteries.
This increases the service life of the batteries and you always have a ready-to-use MCE400.

- The batteries used have no "memory effect", so you can always connect the machine to a socket for recharging without worries.
- The batteries are seriously damaged if they are deeply discharged. The charging time increases and the range / capacity decreases extremely.
- When the batteries are charged, explosive gas mixtures are produced.
- The batteries may only be charged outdoors or in well-ventilated rooms. Open flames or smoking while charging is prohibited.
- If the battery is discharged thus the controller switches off the MCE400, it can only be pushed manually after releasing the parking brake (Fig.: 9).

DANGER! The lead batteries used are maintenance-free except for charging.
In any case, it must be avoided that the batteries are completely discharged.
The MCE400 is switched off to protect against total discharge. The batteries must therefore be charged immediately as soon as the right LED of the operating hour meter lights up.

Charger

The progress of the charging process is indicated by an LED on the right side of the control box (white cover, Fig.: 5):

○	**yellow**	Active charging
○	**green**	Batteries fully charged
○	**blinking green**	Error while charging

Fig.: 5 – LED indicator charger

Error while charging means that there is no connection from the charger to the battery. The cause can be a defective fuse or a defective charger. Overcharging the batteries is not possible! As soon as the batteries are fully charged, the charger automatically switches to trickle charging.

DANGER! The MCE400 is ready for operation even during the charging process. It is therefore important to ensure that the charger plug is no longer plugged into the socket when the MCE400 is put into operation.

The charging time depends on the discharge status of the batteries. However, a battery set that is not over-discharged should be charged within a maximum of 15 hours.
A charging time of more than 15 hours indicates a defective charger or defective or used batteries.

The manufacturer states that the guaranteed service life of the battery is 300 complete charging cycles (1 cycle = 1 x loading, 1 x unloading).
Recommendation: To increase the service life of the batteries, the machine should be charged after each use! A deep discharge must always be avoided.

The integrated charger has a build in fuse. The fuse is situated inside the control box on the right side of the charger under a small cap.

Attention! The change of the fuse should be only mad by a trained professional!

Cleaning the machine

IMPORTANT: If the engine is operated with too much dirt, grass or other debris covered, it can lead to overheating, a corresponding loss of performance and long-term damage.

1. Park the machine on a level surface, lower the tray / buildup and switch off the machine using the key switch.
2. Check the battery holder for dirt and remove it.

DANGER! There is a risk of electric shock and short circuit!

3. Dirt can accumulate in the engine area. Before each use, clean the dirt with a brush or a blower.

IMPORTANT: It is better to blow out dirt than to wash it out. When water is used, keep it away from the electrical equipment.

IMPORTANT: Do not use a high-pressure cleaner. High-pressure cleaning can damage the electrical system.

Inspection before take-off

It is very important to visually inspect the machine before commissioning. This inspection should include:

- Check all stickers and warning signs for damage.
- Check the battery level and charge if necessary
- Check the machine for damage or loose fasteners.
- Carry out daily visual checks.
- Make sure that the control levers automatically return to their neutral position!
- Check all parts, screws, brackets and equipment of the machine for correct seating, functionality and condition.

Characteristics

Description of the machine

The Multi-Dumper MCE400 is built, designed, manufactured, tested and sold by PowerPac Baumaschinen GmbH.

It leaves the factory with the intention of transporting heavy loads through rough terrain without any problems. By operating the appropriate levers and switches, the speed of the machine can be continuously regulated and switched between forward and reverse travel. Depending on the equipment variant, the tray or buildup is supported pneumatically or tipped electrically via a switch.

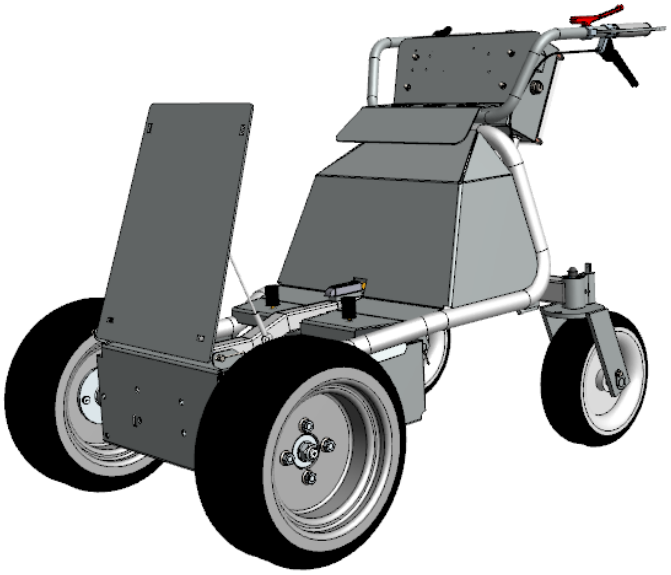


Fig.: 6 – MCE400 ISO view without buildup (drawing may differ slightly from the original)

The main features of this machine are: simplicity, robustness, reliability.

The small size and the special construction of the frame allow it to be used in any terrain and guarantee safety, stability and reliability over time. A quick check in the morning guarantees you a loyal and safe work colleague for the whole day. The control levers are positioned so that you have a good view in every position and the operator always has full control of the machine.

Technical characteristics and drawing

Technical data Multi-Dumper MCE400

Drive	Electric / Batteries
Nominal voltage	24V
Power	1000W
Climb performance	max. 40% (22°)
Revolutions	2200 RPM
Operating data	
Weight	130 kg
Max. load	400 kg
Max. weight (loaded)	530 kg
Tray volume (standard)	110 Liter (standard)
Tipping device	Mechanically / pneumatically assisted
Travel time	8 – 10 h
Speed	0 – 6,0 km/h stepless forward 0 – 3,0 km/h stepless backwards
Standard equipment 2 batteries à 12V / 80-110Ah Integrated charger Agricultural tires 16x6.50-8 Gearbox with differential compensation Swing axle	
Optional accessories • Electric lifting cylinder for even easier tipping • Differential lock • 85cm sweeper incl. 60l collection container. or 105cm adjustable sweeper • 85cm snow plow with rubber scraper • Snow chains • Box body with removable side walls (900 x 790 x 260mm) • Multi-Cleaner MCS 520ltr. • Light goods tray 450ltr. (1160 x 850 x 565mm) • Water tank 200ltr. • Feed pan • Trailer seat with sprung seat and foot brake • Trailer with platform to set up	

Due to the properties of the rubber tires, the machine can be used at temperatures between -10 ° C and + 40 ° C.

Technical drawing / Dimensions Multi-Dumper MCE400

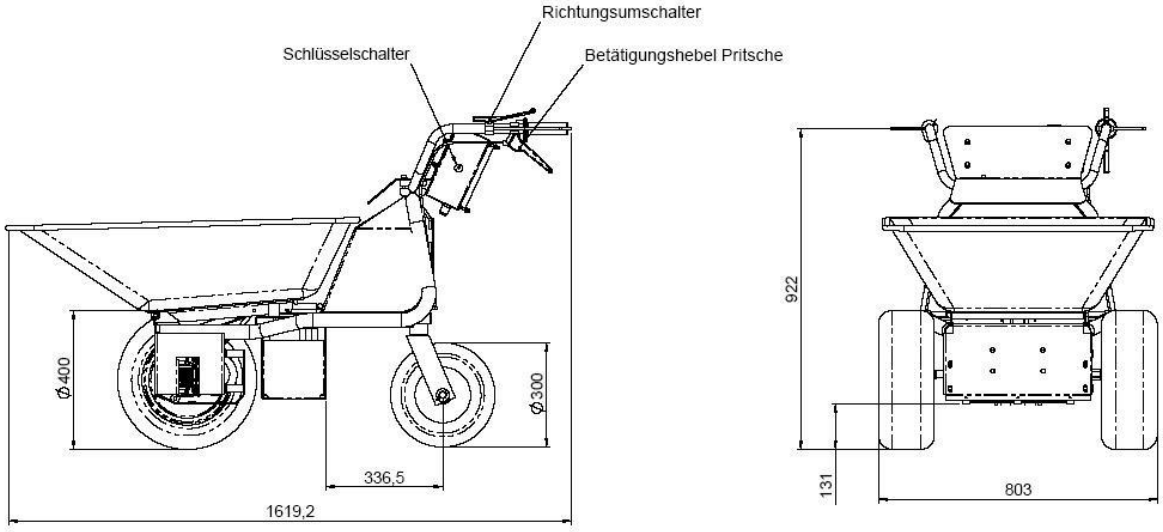


Fig.: 7 – Technical drawing Multi-Dumper MCE400 / dimensions MCE400

Operation

Before the use of the machine, it is necessary to attentively read this manual learning the formalities and the procedures to operate the machine safely.

- The control levers should only be operated with both hands on the handlebars.
- Do not operate the machine on public roads.

Fig.: 8 – Operation: key switch, thumb throttle, etc.

Turn on the machine

Check that the thumb lever (Pos. 13) for controlling the speed of the motor is in its neutral position. Only then switch on the machine using the key switch (Pos. 20). After actuating the key switch - depending on the state of charge of the battery - the light bar of the battery indicator (Pos. 19) lights up. Make sure that the machine is fully charged or not fully discharged. If necessary, charge the machine before use.

Driving

Pressing the thumb lever (Pos. 13) sets the Multi-Dumper MCE400 in motion. The speed of the MCE400 can be adjusted variable with the thumb lever. The direction of travel (forwards or backwards) is determined by the lever (Pos. 15) on the left side of the handlebar. If the lever is not actuated while the thumb lever is actuated, the machine moves forward; if the lever is actuated simultaneously with the thumb lever, the machine moves backwards. For safety reasons, reversing is only possible at low speed.

When driving, the operator has to hold both hands on the handles and guide the MCE400, while between the two bars he dictates the direction of travel of the MCE400 by pressing left or right on foot.

Brake

Always move the thumb lever gently and slowly. Jerky inputs on the thumb lever ensure a weakened jerky reaction of the machine. The recuperation (braking effect) of the machine is designed to be able to apply full braking in an emergency with a full load. Always brake carefully and test the brakes on a flat stretch of road before using the vehicle with a load, in order to get a feel for how hard the machine brakes when operated appropriately. See also “Operating on slopes”.

DANGER! Never transport unsecured cargo! Transporting unsecured cargo can lead to serious injuries and property damage!

Parking brake (Fig.: 9)

Normal operation
The Multi-Dumper MCE400 is equipped with an electromagnetic parking brake (parking brake) which is integrated in the motor.
This brake is automatically released as soon as the thumb lever is operated.
When the thumb lever is in the rest position again, the brake is automatically applied.
This makes it impossible for the MCE400 to roll away.

Manual pushing / failure of the drivetrain
In order to be able to move the MCE400 if the drivetrain fails, it is possible to unlock the electromagnetic brake.
For this purpose, you can find a release lever on the left side of the motor.

A lever positioned in the direction of travel means the brake is unlocked, a lever pointing to the handlebar means the brake is locked.
While driving, braking takes place via the recuperation (generator brake) of the engine. If the MCE400 is too fast, you only need to turn the thumb lever back a little (see "Brake").

When the thumb lever is released, it automatically returns to the basic position, the MCE400 brakes and stops, the electromagnetic stand brake engages.
In the event of danger, the MCE400 comes to an immediate standstill by releasing the thumb lever.

Turn off the machine
The MCE400 is switched off by turning the key switch in the off position.
The magnetic brake prevents the MCE400 from moving when it is switched off.

The drive control is switched off with the key switch.
The batteries must always be disconnected before any work on electrical components.
Otherwise, there is a risk of electric shock and / or short circuit!

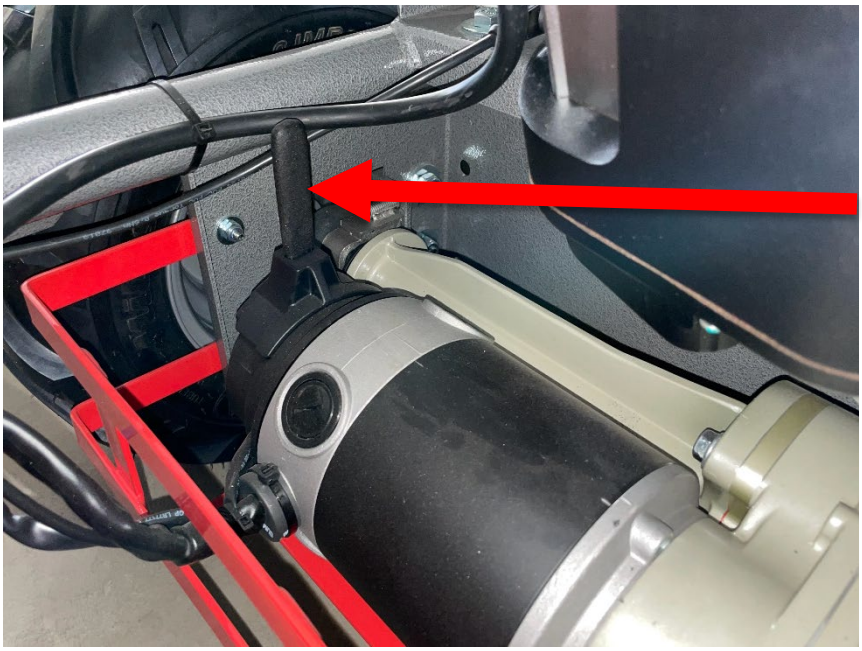


Fig.: 9 – Parking brake release lever

DANGER! Unlocking the mechanical brake will result in a stop of the electric power drive!

Releasing the brake and moving the MCE400 in the event of a drivetrain failure may only take place when it is unloaded! In any case, pay attention to the own weight of the MCE400 when working on a slope!

Loading
When loading, make sure that the MCE400 is standing securely and that the goods to be transported are securely anchored.
Distribute the goods to be transported evenly in the tray / buildup.
Do not overload the MCE400. The maximum load is 400 kg.

Tipping the tray / the buildup

Standard equipment *Fig.: 10*

The MCE400 is equipped with a spring lock and a gas pressure spring as standard. The spring lock prevents the tray / buildup from tipping over unintentionally. The gas pressure spring supports the operator in tipping the tray / buildup when it is loaded.

By actuating the spring lock release lever (Pos.14) on the lower left side of the handlebar, the locking mechanism (spring lock) of the tipping mechanism is released.

Pouring out the goods from the tray can be supported by slightly lifting the tray by hand. The independent tipping depends on the center of gravity of the transported goods.

DANGER! If the MCE400 is unloaded and you operate the tipping lever, depending on the equipment, the buildup will be jerked up by the gas pressure spring. Hold the tray / buildup firmly so that it is slowly pushed into its end position.

Fig.: 10 – Release lever spring lock (tray / buildup)

Machines with an electric lifting cylinder (optional accessory)

Machines that have a built-in electric lifting cylinder for tipping the tray / buildup, are operated in a similar way to the machines with standard equipment. The main difference to tip the tray / buildup is to firstly actuate the spring lock release lever (Pos.14) and then pressing the equivalent button for tipping up or down (A).

Tipping the tray / buildup (Fig.: 11)

1. Pull on spring lock release lever (Pos.:14)
2. Push button (A) in the ↑ direction to lift the tray / buildup

DANGER! Always keep in mind that the center of gravity of the machine changes when you tip the tray / buildup when it is loaded! Tipping the tray / buildup must take place on a leveled ground and the machine must not be overloaded!

DANGER! Make sure that you always pull the spring lock release lever (Pos.14) before pressing the UP / DOWN button! If you actuate the lifting cylinder while the tray / buildup is locked, permanent damage to the machine can occur! In addition, there may be a risk of injury!

Lower the tray / buildup

1. Push button (A) in the ↓ direction to lower the tray / buildup
2. When lowering the tray / buildup, make sure that you hear a decent "click" of the spring lock. If this is not the case, safe operation is not possible because the tray / buildup is not properly locked.

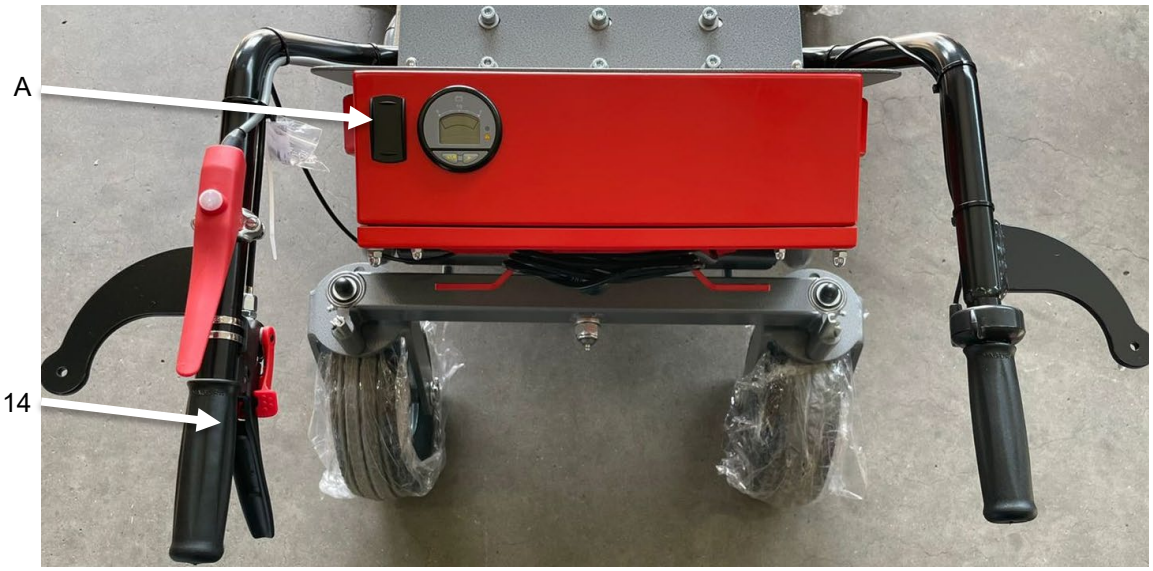


Fig.: 11 – Operation with electric lifting cylinder

Attachment broom (accessory)

The attachment broom is mounted on the front of the frame of the MCE400 using an adapter and provided with an extra plug. The attachment of the broom is limited to a mechanical and electrical coupling of the broom and the MCE400. The broom is switched on or off via a button which is installed in the control box of the broom.

Controller

Status-LEDs

The Curtis series 1226 controller has a red and a yellow status LED. The following table describes which status of the controller the LEDs describe.

Status	Red LED	Yellow LED
OK	OFF	The flashing cycle is 1.5 seconds. The LED flashes for 500 msec, followed by a delay of 1 sec.
Downloading Firmware	ON	ON
Out of order	ON	OFF
Error	Flashes the first digit of the fault code.	Flashes the second digit of the fault code. For details, see the following section.
Invalid Software	Flashes fast	OFF

Display Fault Codes

Fault codes consist of two digits, with the digits delimited by a comma. For example, the Parameter Change fault's code is 5,2.
The red status LED shows the fault code's first digit and the yellow LED shows the second digit. The fault LEDs' flash cycle operates as follows:

- The red LED is on for 250ms, followed by a 250ms delay.
- The yellow LED is on for 250ms, followed by a 250ms delay.
- A 2s delay occurs, then the cycle is repeated until the fault is cleared.

If there are multiple active faults, the controller flashes each fault code using the sequence described above. After fault codes for all active faults have been flashed, an additional 2s follows the last fault code.
Fig.: 12 shows how the status LEDs flash when for example both, the 3,4 and 5,2, faults are active. Each block in the diagram represents 500ms.

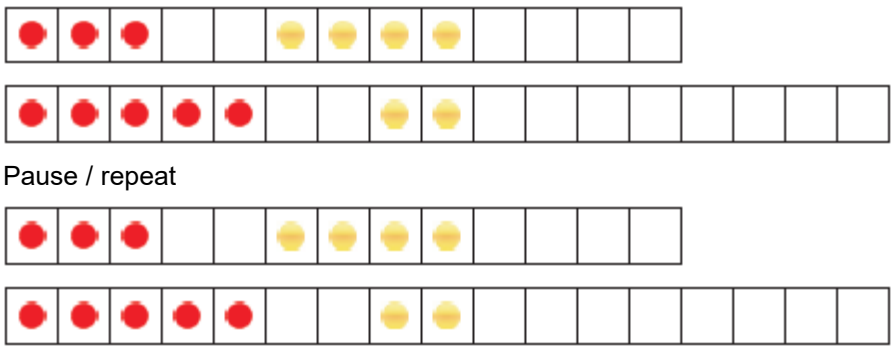


Fig.: 12 – Blink codes

Fault-Codes

If the controller detects an error, the controller continues to work with restrictions or stops operation depending on the error. Depending on how serious the error is, the drive current will be reduced (machine moves very slowly) or the controller will shut off completely.
The following table describes the error codes and how to correct them.
Note: The Error / Error Action column contains both the error name and the action (s) of the controller when the error is detected.

Error-Code	Fault und Fault-Action	Possible Causes	Set and Clear Conditions
1,2	Controller Overcurrent Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• External short of phase M1 or M2 motor connections. • The controller is defective.	The phase current exceeds the current limit. ➢ Check the connections, then cycle the keyswitch.
1,3	Current Sensor Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	The controller is defective.	The controller's current sensors have invalid offset readings. ➢ Cycle the keyswitch.
1,4	Precharge Failed Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• An external load on the capacitor bank (Brake+ connection terminal or B+ connection terminal for the external contactor model) prevents the capacitor bank from charging. • The controller is defective	The precharge failed to charge the capacitor bank. ➢ Cycle the keyswitch.
1,5	Controller Severe Under temperature Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	The controller is operating in an extremely cold environment.	The heatsink temperature is below –40°C. ➢ Raise the heatsink temperature to above -40°C, then cycle the keyswitch.
1,6	Controller Severe Over temperature Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	The controller is operating in an extremely hot environment.	The heatsink temperature is above 85°C. ➢ Decrease the heatsink temperature to below 85°C, then cycle the keyswitch.

1,7	Severe B+ Undervoltage Current limit decreases to 0	• A system other than the controller is draining the battery. • The battery resistance is too high. • The battery is disconnected. • The B+ fuse is blown. • The main contactor did not close. • Undervoltage parameters are incorrectly configured.	The voltage is below the Severe Undervoltage threshold. ➢ Address the possible causes, then cycle the keyswitch.
1,9	Severe B+ Overvoltage Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• The user overvoltage parameter is incorrectly configured. • The battery resistance is too high for the regen current. • The battery disconnected during regen braking.	The voltage is above the Severe Overvoltage threshold. ➢ Address the possible causes, then cycle the keyswitch.
2,3	Controller Overtemperature Cutback Reduced drive torque Reduced regen braking torque	• The controller is operating in an extremely hot environment. • There is excessive load on the vehicle. • The controller is incorrectly mounted, which is preventing the controller from cooling.	The controller's heatsink temperature exceeded 75°C. ➢ Address the possible causes, then cycle the keyswitch.
2,4	Undervoltage Cutback Reduced drive torque	• The batteries need recharging. • The undervoltage parameters are incorrectly configured. • A system other than the controller is draining the battery. • The battery resistance is too high. • The battery is disconnected. • The B+ fuse is blown. • The main contactor did not close.	The capacitor bank voltage dropped below the Undervoltage threshold. ➢ Address the possible causes, then cycle the keyswitch.

2,5	Overvoltage Cutback Reduced brake torque	• The regen braking current elevated the battery voltage. • The User Overvoltage parameter is incorrectly configured. • The battery resistance is too high for the regen current. • The battery disconnected during regen braking. • Note: The controller generates this fault only during regen braking.	The controller's capacitor bank voltage exceeded the Overvoltage threshold. ➢ Address the possible causes, then cycle the keyswitch.
2,10	Main Driver Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• The main driver is open or shorted. • The controller's or contactor coil's connector pins are dirty. • Bad connector crimps or faulty wiring.	The Main Contactor driver is either open or shorted. ➢ Repair the wiring and connections, then cycle the keyswitch.
3,1	EM-brake Driver Shutdown EM-Brake Shutdown Throttle	• The driver is open or shorted. • The controller's or EM brake coil's connector pins are dirty. • Bad connector crimps or faulty wiring.	The electromagnetic brake driver is either open or shorted. ➢ Repair the wiring and connections, then cycle the keyswitch.
3,4	AUX 1 Driver Shut down the assigned driver	• The driver is open or shorted. • The controller's or contactor coil's connector pins are dirty. • Bad connector crimps or faulty wiring.	The driver for the Aux 1 contactor is either open or shorted. ➢ Repair the wiring and connections, then cycle the keyswitch.
3,5	AUX 2 Driver Shut down the assigned driver	• The driver is open or shorted. • The controller's or contactor coil's connector pins are dirty. • Bad connector crimps or faulty wiring.	The driver for the Aux 2 contactor is either open or shorted. ➢ Repair the wiring and connections, then cycle the keyswitch.
3,6	Encoder Fault Shutdown EM-Brake Shutdown Throttle Shutdown Motor	• Motor encoder failure. • Bad connector crimps or faulty wiring.	The controller detected a motor encoder failure. ➢ Repair the wiring and connections, then cycle the keyswitch.

3,7	Motor Open Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• The motor phase is open. • Bad crimps or faulty wiring.	The controller detected that the motor phase is open. ➢ Make sure the motor is connected to the M1 and M2 connectors, then cycle the keyswitch.
3,8	Main Contactor Welded Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• The main contactor tips are short circuited. • Motor phase M1 or M2 is disconnected or open. • An alternate voltage path, such as an external circuit to B+, is providing current to the capacitor bank (B+ connection terminal).	Prior to the main contactor closing, the capacitor bank voltage (B+ connection terminal) was loaded via the motor for a short time, but the voltage did not discharge. ➢ Address the possible causes, then cycle the keyswitch.
3,9	Main Contactor Did Not Close Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	• The main contactor tips are oxidized, burnt, or not making good contact. • An external load on the capacitor bank (B+ connection terminal) is preventing the capacitor bank from charging. • Blown B+ fuse. • The Pull-In Voltage and Holding Voltage parameters are incorrectly configured. • The main contactor opened even though the controller commanded the contactor to close. • The wiring to the contactor's coil was removed. • The coil is defective.	The capacitor bank voltage (B+ connection terminal) did not charge to B+ when the main contactor was commanded to be closed. ➢ Contact costumer support
3,10	Throttle Input ShutdownThrottle	• The throttle's input voltage is outside the voltage range of the throttle's analog input. • The Analog 1 Type parameter is incorrectly configured.	The throttle input voltage is outside the range defined by the analog input's Low and High parameters. ➢ Contact costumer support

4,3	NV Memory Failure Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle Shutdown Interlock Shutdown Driver1 Shutdown Driver2 Shutdown Driver3	• Failure to read or write to nonvolatile (NV) memory. • Internal controller fault.	Contact costumer support
4,4	HPD/Sequencing Fault Shutdown Throttle	• The keyswitch, interlock, direction, and throttle switches were not applied in the correct order. • Faulty wiring, crimps, or switches for the keyswitch, interlock, direction switches, or throttle. • Moisture in the keyswitch, interlock, direction switches, or throttle.	The controller detected that the keyswitch, interlock, direction, and throttle switches were not cycled in the correct order after an HPD action. ➢ Cycle the switches in the correct order. ➢ If that doesn't clear the fault, check the wiring and for moisture, then cycle the switches in the correct order.
4,9	BB Wiring Fault Shutdown Throttle Shutdown EM-Brake Shutdown Main Contactor	Bad crimps or faulty wiring for the emergency reverse normally open switch.	The wire connecting Driver 2 and the emergency reverse normally open switch is broken. ➢ Fix the wiring, then cycle the keyswitch.
4,10	Emergency braking Shutdown thumb throttle Electromagnetic brake shutdown	The inputs for throttle and forwards and backwards were not returned to the neutral state after an emergency braking.	The operator attempted to drive after an emergency reverse without first clearing the throttle, direction, and interlock inputs. ➢ If the EMR Dir Interlock parameter's value is On, clear the interlock, throttle, and direction inputs. Otherwise, clear the throttle and direction inputs.
5,2	Parameter Change Fault Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	A parameter was changed but the keyswitch was not cycled.	A parameter that requires the keyswitch to be cycled has changed. ➢ Cycle the keyswitch.

5,3	EMR Switch Redundancy Shutdown Interlock Shutdown EM-Brake	• Either or both Emergency Reverse input switches are inoperative, resulting in an invalid state. • There is dirt or moisture in the switches.	The emergency reverse NO and NC switches are in an invalid state. ➢ Address the possible causes, then cycle the keyswitch.
5,8	Stall Detected Shutdown EM-Brake Shutdown Throttle Shutdown Motor	The motor has stalled.	The controller did not detect motor movement. ➢ Cycle the keyswitch. If the fault is still active, call costumer support.
7,7	Supervision Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle Shutdown Interlock Shutdown Driver1 Shutdown Driver2 Shutdown Driver3	The controller failed.	Internal controller failure. ➢ Cycle the keyswitch.
8,8	Internal Hardware Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	An internal controller fault occurred.	The controller detected an internal fault. ➢ Cycle the keyswitch.
8,10	Parameter Out of Range Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle	A parameter is set to an invalid value.	The controller detects an invalid parameter value. ➢ Contact costumer support
9,4	Emer Rev Timeout Shutdown Throttle Shutdown EM-Brake	• Emergency braking has ended because the action exceeded the emergency braking time limit. • The emergency brake lever is caught in the on position.	An emergency reverse operation stopped when it reached the specified time limit. ➢ Turn off the emergency reverse switch.

9,5	Parameter Mismatch Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle Shutdown Vehicle	Two or more parameters are set to conflicting values.	The controller detects conflicting parameter values. ➢ Contact costumer support
9,9	Driver 1 Shutdown Driver 1	• The coil is open or shorted. • Dirty connector pins for the controller or the contactor coil. • Bad connector crimps or faulty wiring. • Driver overcurrent	The driver is open or shorted. ➢ Address the possible causes, then cycle the keyswitch.
9,10	Driver 2 Shutdown Driver 2		
10,3	Driver Assignment Shutdown Driver	A driver output is being used for two or more functions.	A driver assignment conflict is detected. ➢ Resolve the driver conflict, then cycle the keyswitch.
11,4	EMR SRO Shutdown Throttle	The emergency reverse switch was on when the keyswitch was powered on.	The operator turned the keyswitch on while the emergency reverse switch was on. ➢ Turn off the emergency reverse switch, then cycle the keyswitch.
11,8	SW FAULT Shutdown Motor Shutdown Main Contactor Shutdown EM-Brake Shutdown Throttle Shutdown Interlock Shutdown Driver1 Shutdown Driver2 Shutdown Driver3 Shutdown Driver4 Shutdown Driver5	Defective controller.	The controller did not power up correctly. ➢ Cycle the keyswitch.
11,11	Motor Short Shutdown Motor Shutdown EM-Brake Shutdown Main Contactor	M1 and M2 are shorted	The controller detects M1 and M2 are shorted when the interlock is turned on. ➢ Fix the connections to M1 and M2, then cycle the keyswitch.

Lifting the machine

Ignoring the following instructions could result in severe damage, accident, or death. Never lift the Multi-Dumper MCE400 unsecured or with unsuitable tools. Always use suitable means of transport, belts and tools. The straps must be long enough and have a tensile load of at least 2t. Use suitable machinery that can support the weight of the Multi-Dumper. Never lift the machine with people or children on board. Only attach the straps to the lashing points provided. If you are not sure, contact us and ask.

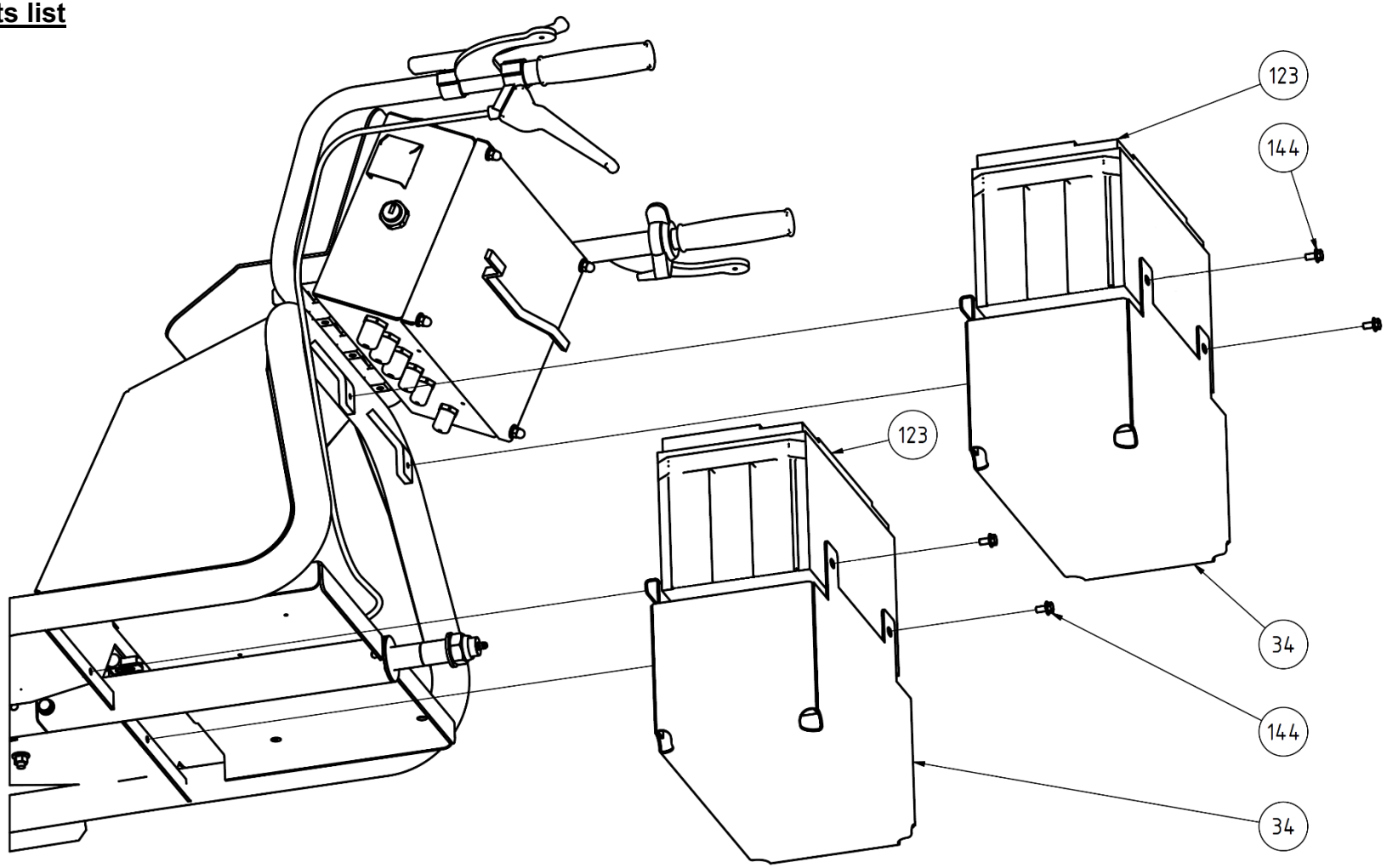
Problems, probable causes, troubleshooting

Problem	***Probable causes***	***Troubleshooting***
The machine does not move	1. Batteries are discharged 2. Controller defective 3. Defective thumb lever 4. Machine was not switched on 5. Parking brake opened	1. Charge batteries 2. Contact customer service 3. Exchange thumb lever 4. The machine must be switched on, on the left side of the control box using the key switch. 5. See Parking brake (Fig.: 9)
The machine can no longer be switched on	1. Check the contacts on the batteries and in the control box 2. Batteries empty 3. Defective thumb lever	1. Clean contacts and retighten them if necessary 2. Charge batteries 3. Exchange thumb lever
Loud abnormal noises	1. Defective bearings 2. Defective gearbox 3. Machine may be too dirty	1. Contact customer service 2. Contact customer service 3. Clean the machine
The machine does not react to any operation	Control defective	Contact customer service
The machine only travels in one direction	1. Reverse switch defective 2. Controller defective	1. Exchange reverse switch 2. Contact customer service
Batteries cannot be charged (The voltage of the batteries should be > 24V when fully charged (measured individually > 12V))	1. Defective charger 2. Defective batterie/s	1. Exchange charger 2. Exchange batterie/s

If your problem is not described, please contact our technical support.
DANGER! PowerPac Baumaschinen GmbH rejects any liability if the machine has not been maintained as described in this manual and / or has not been repaired with original spare parts.

Spare parts list

Batteries



[The views are only meant for illustration: parts and machines can deviate.]

Pos.	Qty.	Description	ID code	Note
34	2	Battery box	MCEK8100037	
123	2	Battery	MCEK8013005	
144	4	Hex bolt	MCEW1500017	
R	1	Frame with swing axle MCE	MCE156	

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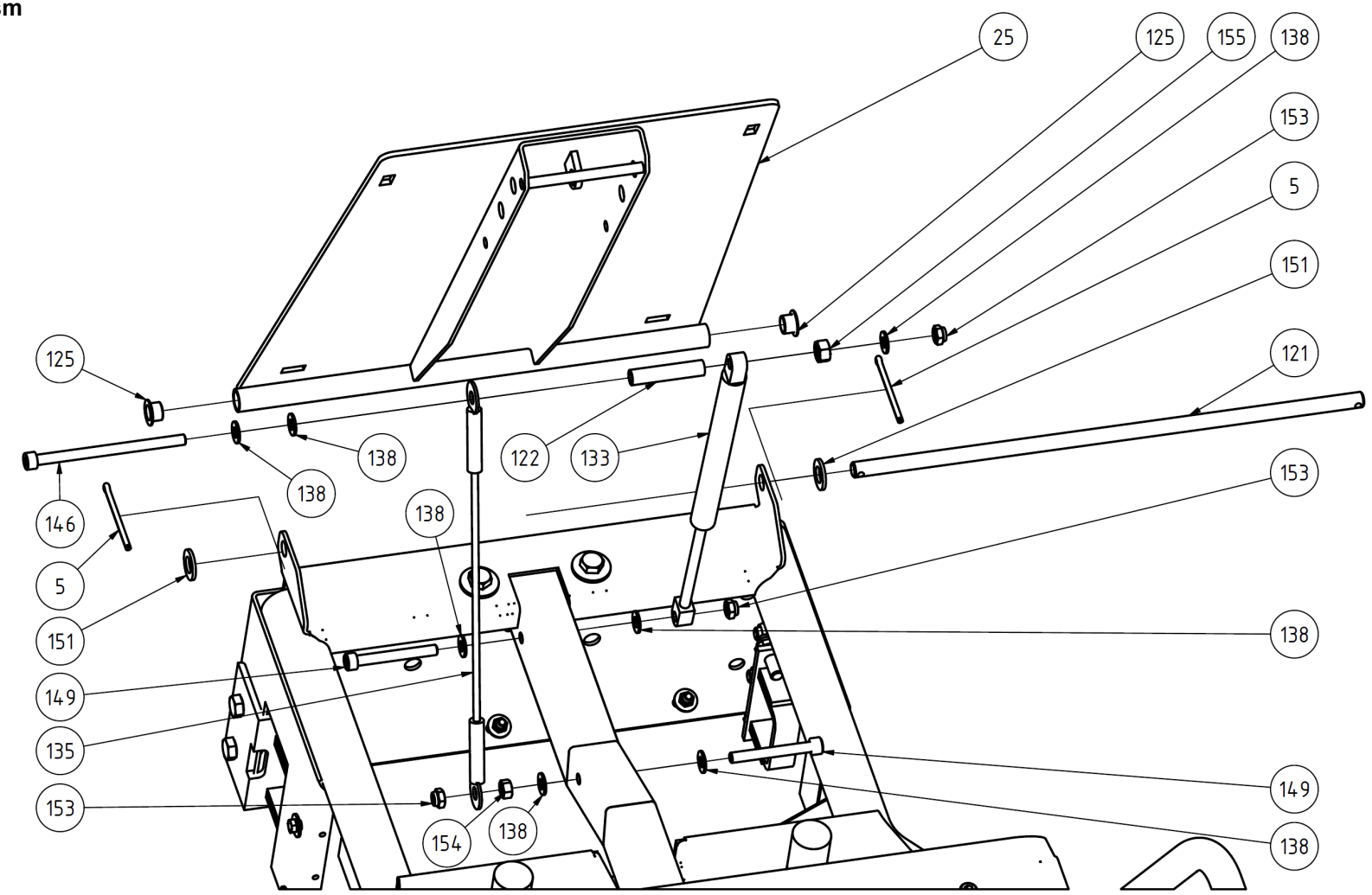
Tilt mechanism



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Pos.	Qty.	Description	ID code	Note
5	2	Safety split pin	MCEW1500844	
25	1	Base plate	MCEF8100032	
121	1	Axis tilt mechanism	MCEK8100045	
122	1	Spacer sleeve	MCEK8100046	
125	2	Rifle	MCEW2100191	
133	1	Gas spring	MCEW1200027	
135	1	Safety rope	MCEW1900100	
138	7	Washer	MCEW1500116	
146	1	Allen screw	MCEW1500838	
149	2	Allen screw	MCEW1500604	
151	2	Washer	MCEW1500825	
153	3	Hexagon nut, self-locking	MCEW1500152	
154	1	Hexagon nut	MCEW1500213	
155	1	Hexagon nut	MCEW1500120	

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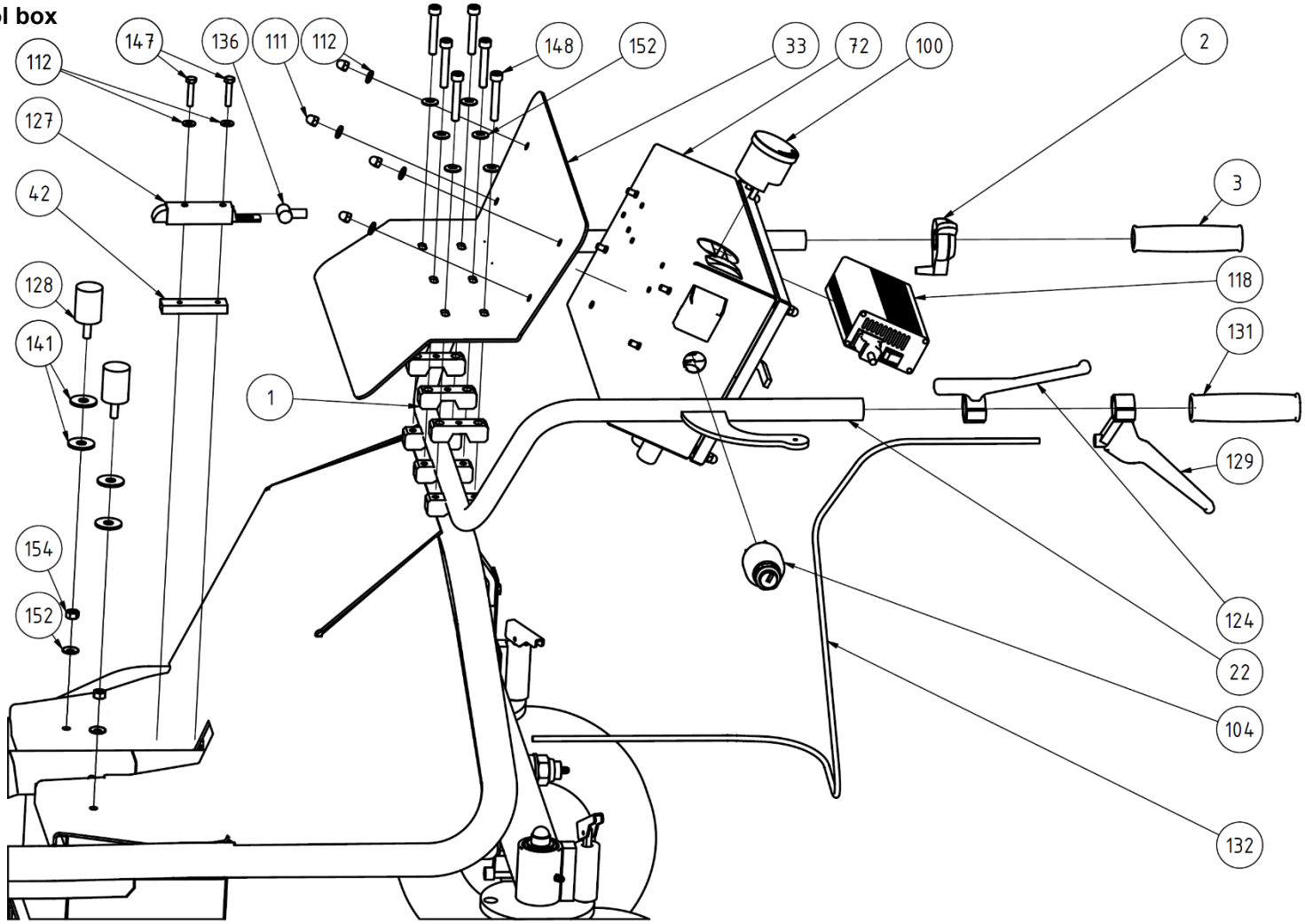
Handlebar / control box



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Pos.	Qty.	Description	ID code	Note
1	3	Handlebar clamping jaws	MCEK8100019	
2	1	Thumb throttle	MCEW1200028	
3	1	Rubber grip on the right	MCEW1700084	
22	1	Steering handle	MCE492945	
33	1	Splash guard	MCEK8100018	
42	1	Base wedge spring latch only with electrical "fast" lifting cylinder		
72	1	Control box	MCEF8100010	
100	1	Battery indicator / hour counter	MCEW0700017	
104	1	Ignition switch	MCEW0800048	
111	4	Cap nut	MCEW1500748	
112	6	Washer with locking teeth	MCEW1500833	
118	1	Charger	MCEK8013011	
124	1	Dead man's lever reverse gear	MCEW1200025	
124a	1	Cable for dead man's lever reverse gear	MCEF8019041	
127	1	Spring latch	MCEK8012010	
128	2	Rubber buffers	MCEK8012016	
129	1	Release lever tilt mechanism	MCEW1200024	
131	1	Rubber grip on the left	MCEW1700167	
132	1	Bowden cable tilt mechanism	MCEK8012014	
136	1	Bowden cable screw nipple	MCE23-041	
141	4	Washer	MCEW1500144	
147	2	Hex bolt	MCEW1500967	
148	6	Allen screw	MCEW1500829	
152	2	Washer	MCEW1500833	
154	2	Hexagon nut, self-locking	MCEW1500213	

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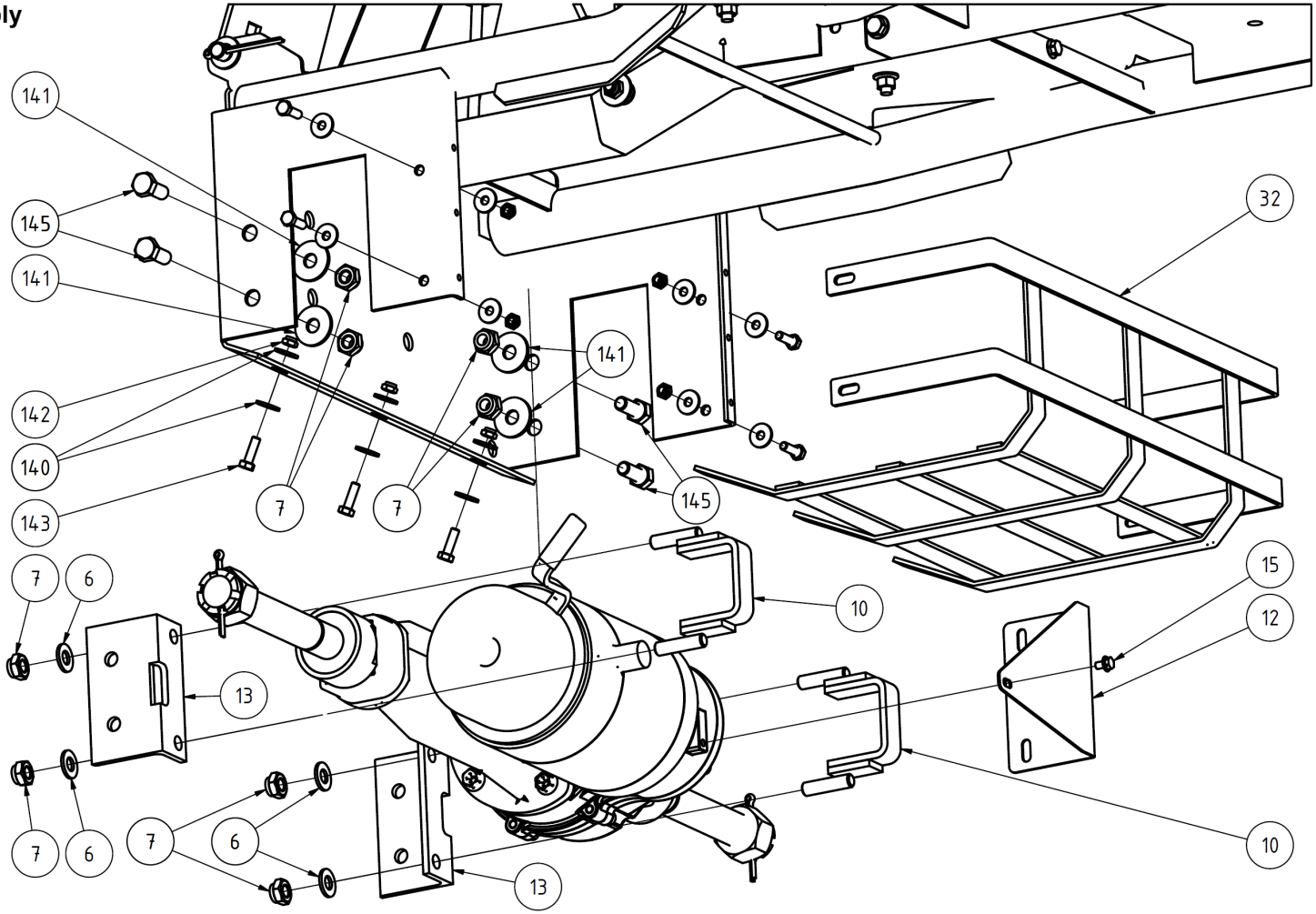
Transaxle assembly



Alle explodierten, nicht gekennzeichneten Schrauben, Muttern und Unterlegscheiben entsprechen den Pos.Nr.: 143, 142, 140

[The views are only meant for illustration: parts and machines can deviate.]

Pos.	Qty.	Description	ID code	Note
6	4	Washer		
7	8	Hexagon nut, self-locking		
10	2	U-bracket, stud bolt	MCEF8100025	
12	1	Torque arm, transaxle	MCEK8100022	
13.1	1	Mounting bracket right, transaxle	MCEK8100049	
13.2	1	Mounting bracket left, transaxle	MCEK8100047	
15	1	Hexagon screw with collar		
32	1	Protective body transaxle	MCEF8100026	
140	14	Washer	MCEW1500180	
141	4	Washer	MCEW1500144	
142	7	Hexagon nut, self-locking	MCEW1500339	
143	7	Hex bolt	MCEW1500419	
145	4	Hex bolt		

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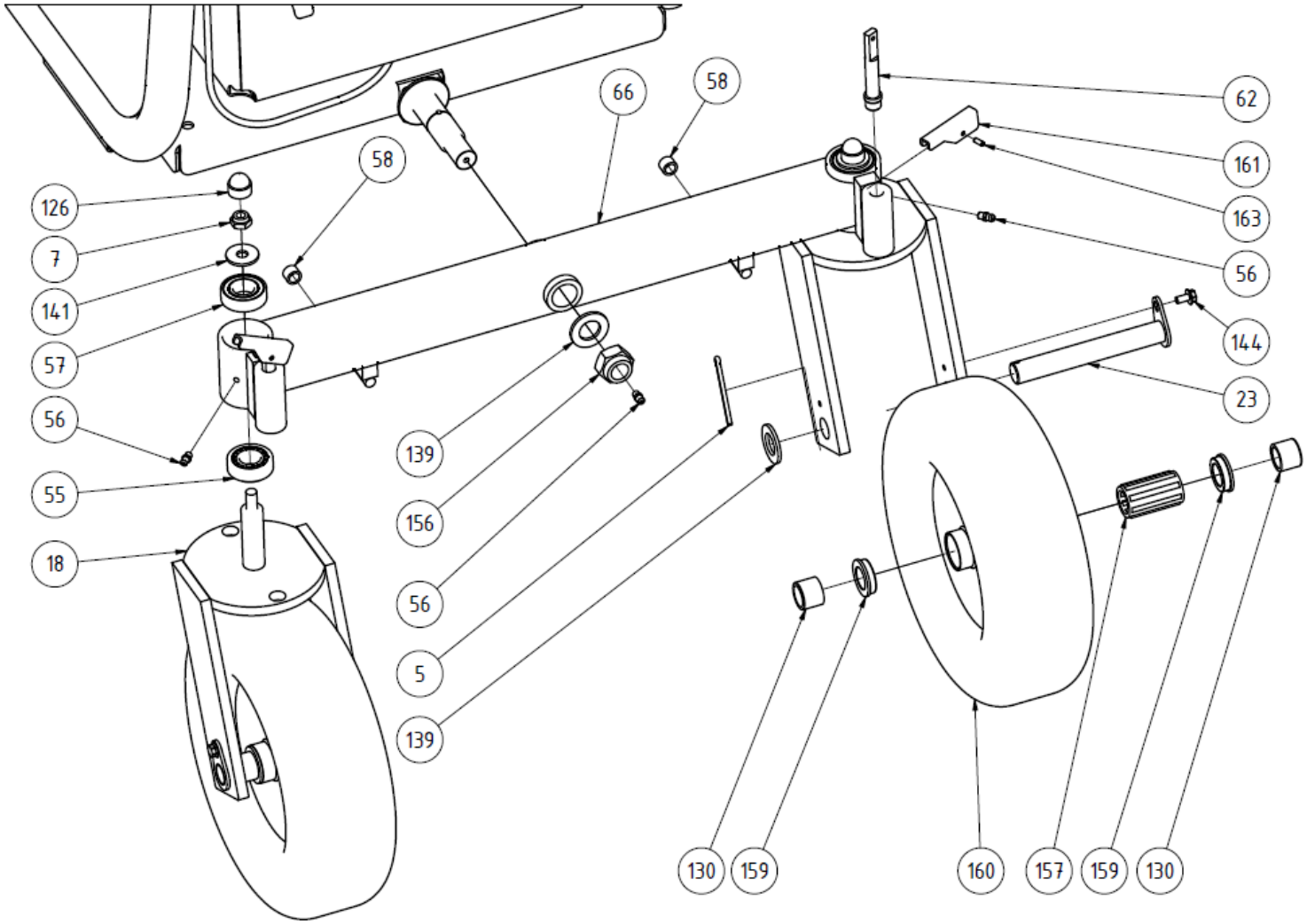
Swing axle



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Pos.	Qty.	Description	ID code	Note
5	2	Safety split pin	MCEW1500844	
7	2	Hexagon nut, self-locking		
18	2	U-bracket star wheel	MCEFP801203100	
23	2	Axis star wheel	MCEK8012306	
55	2	Tapered roller bearings	MCEK8012304	
56	5	Grease nipple		
57	2	Deep groove ball bearings	MCEW2100033	
58	2	PVC hose, transparent	MCEW1400010	
62	2	Locking bolt star wheel (only with pendulum axle)	MCE139	
66	1	Pendulum axle (welded construction)	MCE139	
126	2	protective cap	MCEW1500086	
130	4	Bearing bush without collar	MCEW2100192	
139	3	Washer	MCEW1500826	
141	2	Washer	MCEW1500144	
144	2	Hexagon screw with collar	MCEW1500017	
156	1	Hexagon nut, self-locking	MCEW1500478	
157	2	Roller bearings	MCEW2100181	
159	4	Bearing bush with collar for star wheel	MCEW2100182	
160	2	Star wheel cpl. (with item 157, 2x 159)	MCEW2100195	
160a	2	Hose for tail wheel	MCE1-1662	
161	2	Locking lever (only with pendulum axle)	MCE139	
163	2	Dowel pin (only with pendulum axle)	MCE139	

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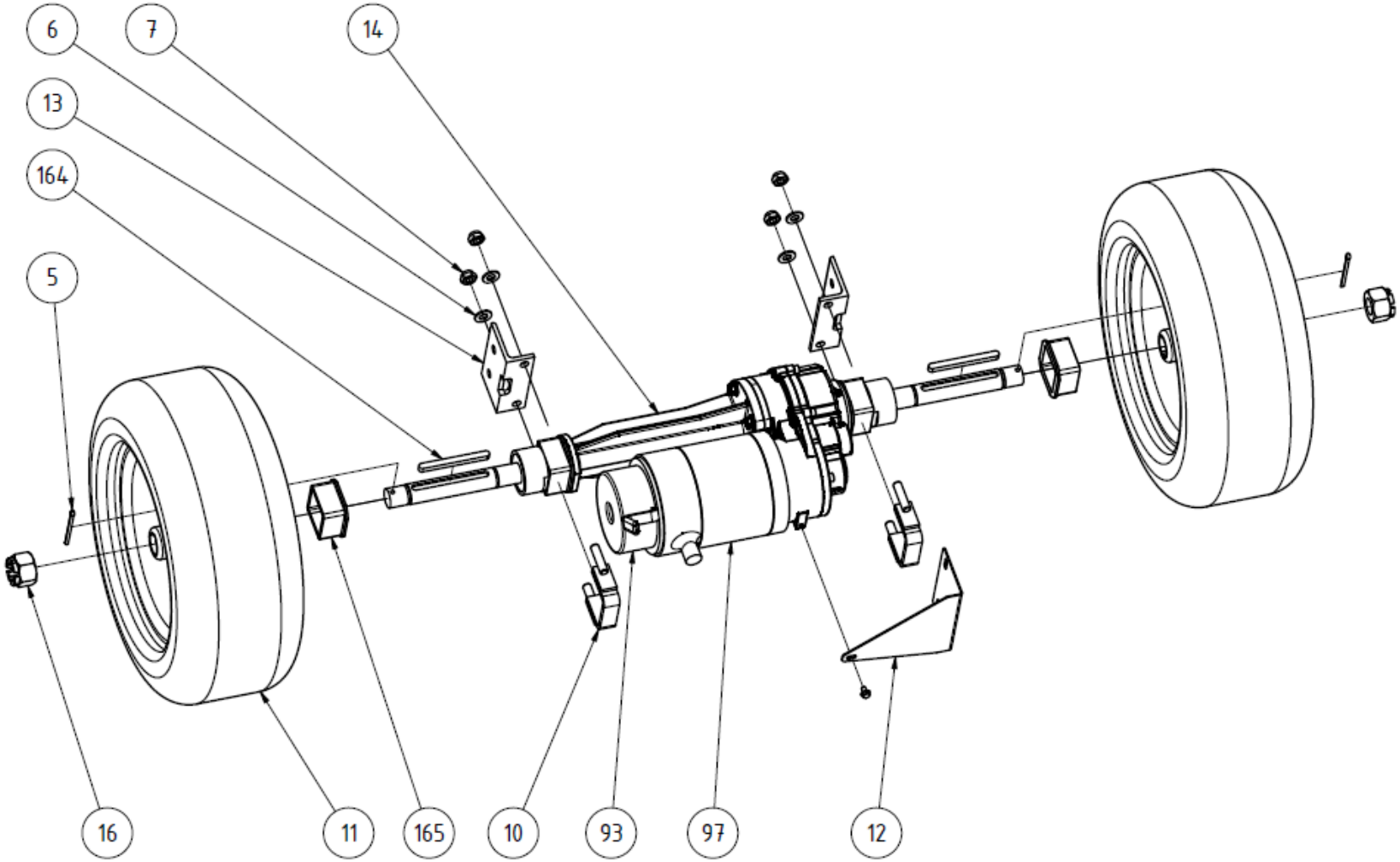
Transaxle



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Pos.	Qty.	Description	ID code	Note
5	2	Safety split pin	MCEW1500844	
6	4	Washer		
7	4	Hexagon nut, self-locking		
10	2	U-bracket, stud bolt	MCEF8100025	
11.1	1	Front wheel cpl. right	MCEW2100193	
11.2	1	Front wheel cpl. left	MCEW2100194	
11a	2	Tube for front wheel	MCE1-106	
11b	2	Tire cover for front wheel	MCE1-412	
12	1	Torque arm, transaxle	MCEK8100022	
13	2	Mounting bracket, transaxle	See trans axle assembly	
14	1	Transaxle gearbox	MCEK8012005C	
16	2	Castle nut	MCEW1501006	
93	1	EM brake	MCEW2000010	
97	1	Electric motor	MCEK8012005E	
164	2	Adjusting spring	MCEW1501274	
165	2	Axle damper	MCEK8012021	
	2	Circlip gear axis	MCE596815	

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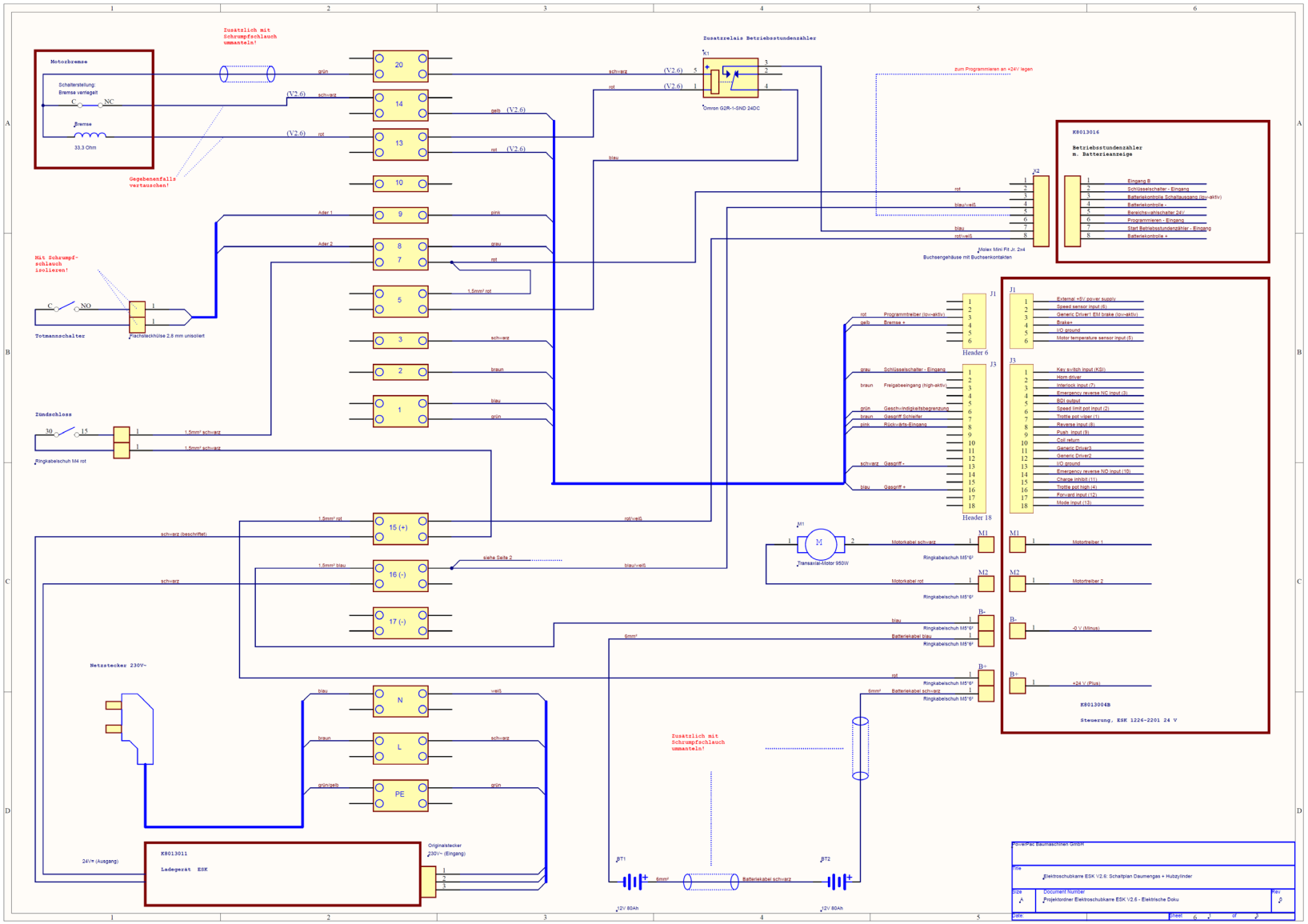
Circuit diagram



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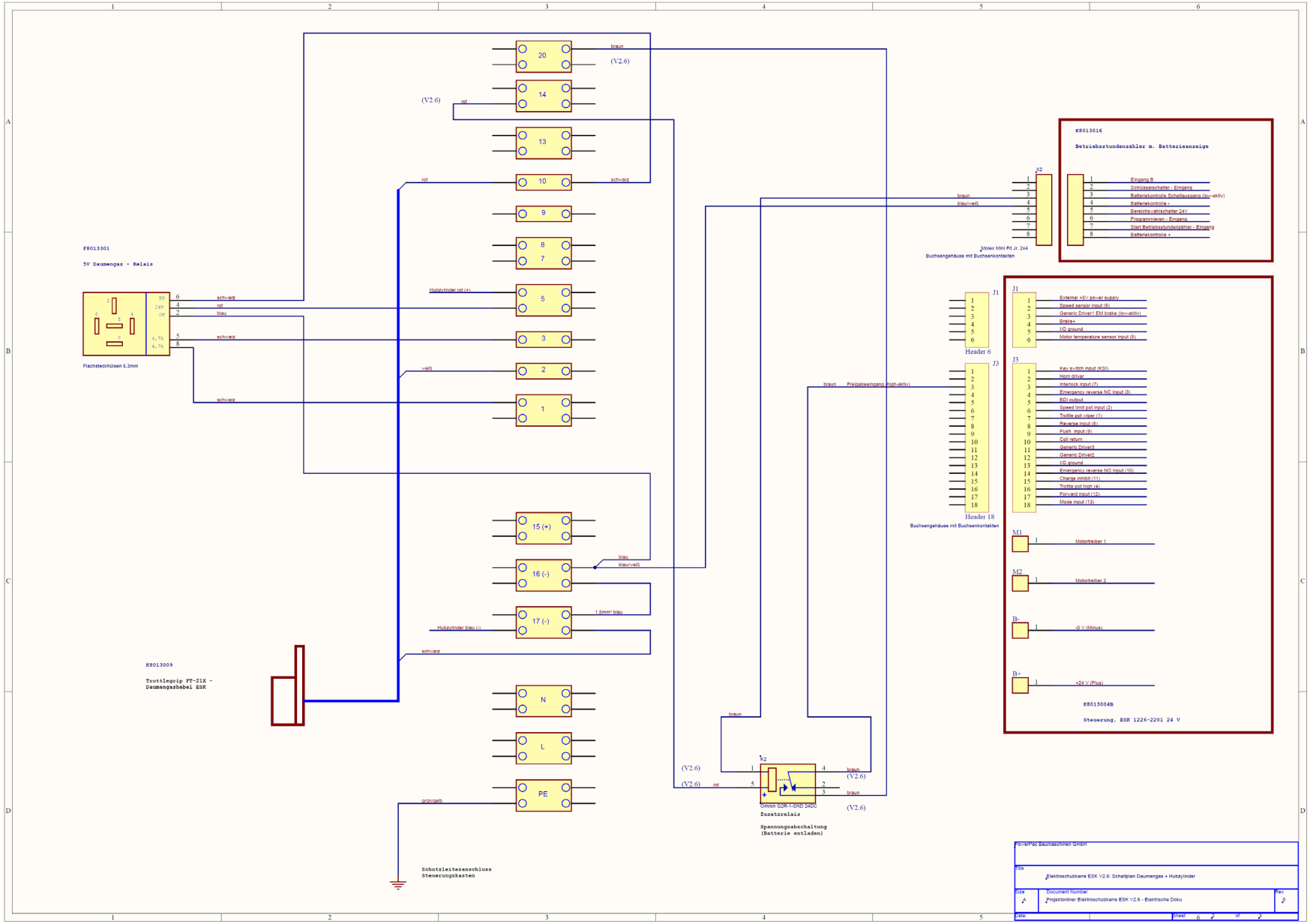

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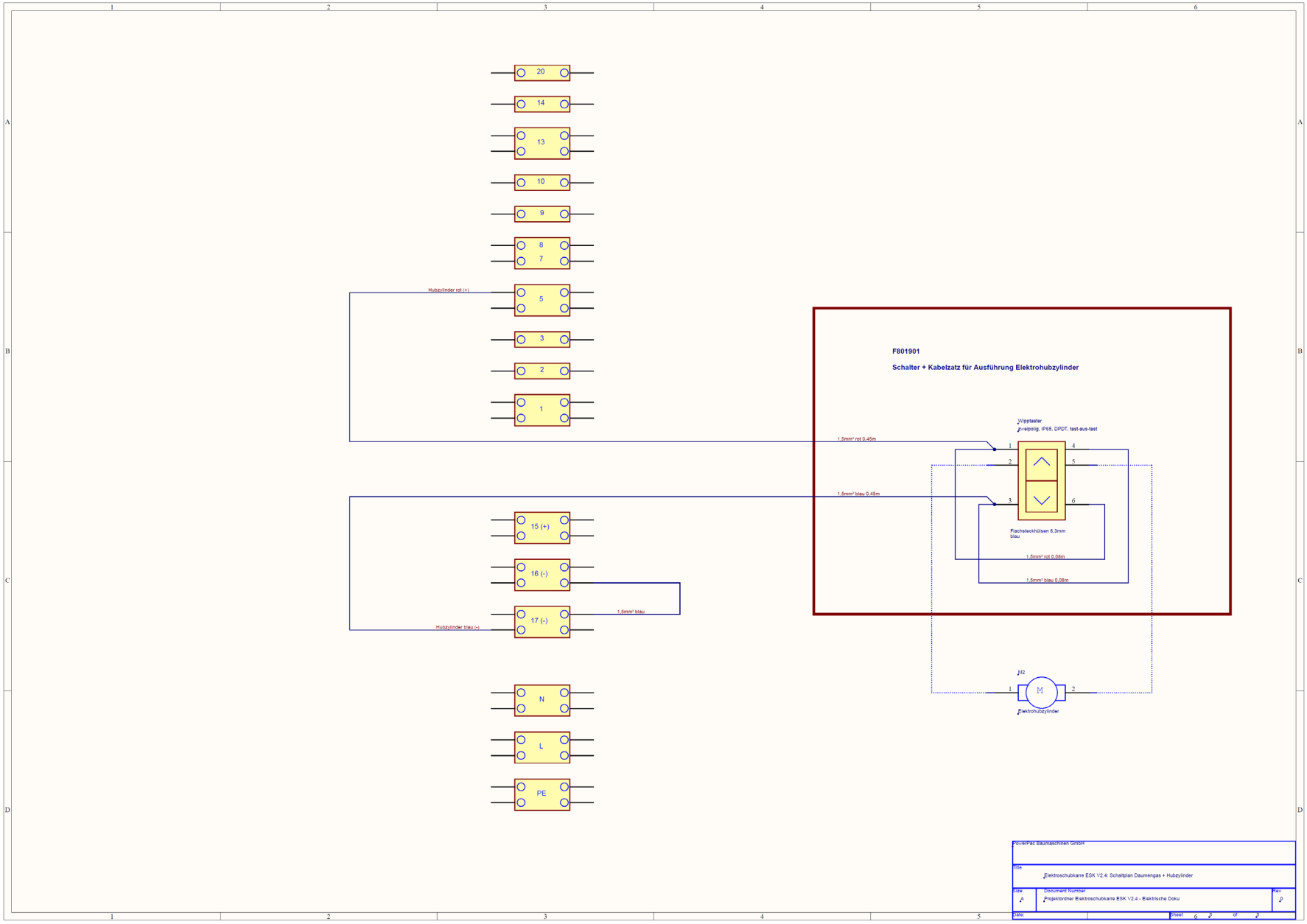

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