

## Modul E-Drive

- DE Montage- und Betriebsanleitung
- EN Installation and operating instructions
- FR Instructions de montage et d'utilisation
- IT Istruzioni per il montaggio e l'uso
- ES Instrucciones de montaje y funcionamiento



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# 1 Explanation of symbols



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## **WARNING!**

Means that death, serious physical injury or significant material damage can occur if the relevant safety instructions are not followed.

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## **ATTENTION!**

Means that slight physical injury or material damage can occur if the relevant safety instructions are not followed.

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## **IMPORTANT!**

Note on the obligation to read the documentation!  
Failure to comply with these instructions can result in incorrect conduct by the personnel.

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## **ADVICE!**

Contains additional important information.

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## 2 Foreword

This landing gear is a product that is at the state of the art with regard to the safety afforded to operating personnel. Nevertheless, the landing gear(s) can pose a danger if it is used by insufficiently trained personnel, used incorrectly or not in accordance with the intended use. Reference is made to potential dangers in chapter 4 "Safety" and by safety instructions throughout the documentation. This documentation is intended to ensure safe and correct work on and with the landing gear. It contains safety instructions that must be complied with!

The E-Drive module is type-approved according to ECE E1 10R-043838. Modifications of any kind will render both the warranty and the design approval void and therefore also cancel the vehicle's operating licence.

Everyone who works on and with the landing gear must have this documentation available during their work, and must comply with the information and instructions that are relevant to them.

The documentation must always be complete and fully legible.

JOST-Werke Deutschland GmbH is not liable for technical or printing errors in this documentation, and neither is it liable for damage attributable directly or indirectly to the delivery, performance or utilisation of this documentation.



### ADVICE!

Technical modifications reserved. The latest information can be found at [www.jost-world.com](http://www.jost-world.com)

## 2.1 Identification

The landing gear is clearly identified by the content of its type plate.



### ATTENTION!

Make sure that the type plate is not damaged, it must be renewed if necessary.



E-Drive/002

### Manufacturer

JOST-Werke Deutschland GmbH  
Siemensstr. 2, 63263 Neu-Isenburg  
Tel: +49 6102 295-0  
Fax: +49 6102 295-298  
[www.jost-world.com](http://www.jost-world.com)

## 2 Foreword

### 2.2 Liability

The information in this documentation describes the properties of the product without however guaranteeing these properties.

No liability will be accepted for damage attributable to:

- ▶ Use of the landing gear not in accordance with the intended use.
- ▶ Failure to comply with the documentation.
- ▶ Independent modifications to the landing gear or the electric drive.
- ▶ Incorrect working on and with the landing gear or the electric drive.
- ▶ Operation of the landing gear if safety devices are defective or if safety and protective devices are not attached correctly or are not functioning.
- ▶ Defective monitoring of landing gear components subject to wear.
- ▶ Incorrectly performed repairs.
- ▶ Independent, incorrect modification of operating parameters.
- ▶ Catastrophes, effects of foreign bodies and force majeure.

### 3 Intended use

The Modul E-Drive landing gear is intended for installation on semi-trailers. It is used for supporting semi-trailers which are not hitched up.

The electric drive is only used for extending and retracting the landing gear – not for moving loads. The load is only allowed to be lifted and lowered using the air suspension of the vehicle or by manual operation of the landing gear in the low gear. Up or unhitching is normally undertaken using the air suspension to adjust the hitching height of the tractor vehicle to the laden or unladen trailer. The landing gear can be used on laden and unladen trailers. Loading is only allowed on correctly and securely parked trailers in compliance with the corresponding safety regulations. Any other usage requires the written approval of JOST.

Usage not in accordance with the intended use can represent a danger to persons and a danger of damage to the landing gear.

The Modul E-Drive is suitable for connection to a 24 V electrical power supply with negative vehicle earth. The Modul E-Drive is not intended for uninterrupted, continuous operation. Uninterrupted operation is limited to 15 minutes. After that, it is necessary to wait for at least 30 minutes.

The landing gear is not an independently functional piece of equipment. It is designed for mounting on a trailer. Re-evaluation of the entire system with regard to safety is necessary following installation. It must not be used until it has been established that the trailer on which the landing gear has been mounted complies with the national regulations for road traffic. The landing gear is only allowed to be put into operation in conjunction with the documentation of the tractor vehicle and trailer as well as of the landing gear.

Furthermore, no liability and warranty claims will be accepted in the event of failure to comply with the intended use. The landing gear is only allowed to be operated under the application conditions prescribed in this documentation.

#### 3.1 Target group and preliminary knowledge

This documentation is intended for the installation, operating and maintenance personnel of the landing gear.

The installation, operating and maintenance personnel must be appointed by the owner.

The following precondition apply:

- ▶ Basic technical knowledge
- ▶ At least 18 years of age
- ▶ Reading and understanding of this operation, installation and servicing manual
- ▶ In order to obtain the knowledge required for operating this landing gear, it is necessary for the following measures to be carried out by the owner:
  - Product training
  - Safety instruction



#### **WARNING!**

Installation and repairs are only allowed to be carried out by technical specialists with product-specific training.

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## 3 Intended use

### 3.2 Content and purpose of this documentation

This documentation contains the relevant information for installation, operation, maintenance and disposal of the landing gear. It is intended to enable people to work on and with the landing gear safely.

Complying with the instructions provided in this document will make it possible to avoid dangers and prevent damage to the landing gear.

### 3.3 Application limits

The application limits for the landing gear are as follows:

- ▶ Operating temperature range -20 °C to +85 °C. When in its rest position, the system can be exposed to a temperature of 95 °C for maximum 2 hours (e.g. during repainting).
- ▶ Max. static test load depending on the winch type is up to 25 t per support, the information on the type plates of the particular landing gears applies.
- ▶ Lifting load max. 12 t per support (lifting a load is only permitted in low gear)
- ▶ Horizontal set-up location on consolidated ground (place suitable underlay boards underneath if necessary), in compliance with any relevant national regulations concerning maximum floor loading.

### 3.4 Principle

The landing gear is a state-of-the-art product in accordance with the applicable safety and occupational health regulations. Nevertheless, the following dangers can arise if it is used incorrectly or misused:

- ▶ Danger of serious or fatal injury to the user or third parties.
- ▶ Danger of damage to the landing gear and other property of the owner.
- ▶ Danger to efficient use of the landing gear.

## 4 Safety

This documentation is structured according to the valid EU regulations and contains safety instructions.

The owner of the landing gear is responsible for the operating personnel receiving the required safety-relevant information, and also for them reading the documentation.

Individuals are personally responsible for complying with the safety instructions.

This chapter contains a general introduction to the safety instructions that are used. Furthermore, it contains important information on preventing accidents.

### 4.1 Residual danger/general safety instructions

Despite the greatest of care having been taken during the design and construction of the landing gear in accordance with all safety relevant circumstances, it is nevertheless possible for residual dangers to arise that have been evaluated by means of a risk assessment.



#### **WARNING!**

- ▶ Beware of the danger of crushing when working with the components of the landing gear, some of which are heavy.
  - ▶ Beware of the danger of crushing when inserting the connection shaft into the holes of the trailer. It is essential to obtain assistance from a second person during this activity so that the connection shaft can be inserted into the opposite hole without misalignment.
  - ▶ During installation work on the electric drive, also beware of the crushing hazard between the shaft and electric drive.
  - ▶ If the landing gear is assembled without being mounted on a trailer (e.g. for maintenance activities), it is essential to secure it against falling over.
  - ▶ Be aware of the danger of crushing on the pin and fork when installing the hand crank of the freewheel kit.
  - ▶ Be aware of the danger of crushing when swivelling up and engaging the crank in the square profile.
  - ▶ Be aware of the danger of crushing between the inner tube and landing gear foot when installing the landing gear foot.
  - ▶ Be aware of the danger of crushing when installing the bracing. Screw on the bracing components gradually. Loose screw connections cause shearing edges and thus represent a danger of crushing.
  - ▶ Be aware of the danger of snagging between the gear wheels during maintenance activities.
-



### WARNING!

- ▶ The trailer on which the landing gear is being installed or removed must be secured by a tractor vehicle or by load lifting equipment of adequate size. The tractor vehicle or the load lifting equipment (e.g. haul crane) must be braked and secured to prevent it from being taken into operation. In addition, a chock must be positioned on both sides of the vehicle tyre during installation and maintenance work.
- ▶ The landing gear is only allowed to be operated when the vehicle is secured (braked).
- ▶ Make sure that no different types of landing gear are fitted.
- ▶ During installation, both sides must be completely retracted or extended before they are linked together using the connection shaft. A different lift distance represents a danger of the trailer tipping over.
- ▶ Be aware of the danger of crushing between the ground and landing gear foot when extending the landing gear.
- ▶ Be aware of the danger of crushing between the landing gear foot and landing gear when retracting the landing gear.
- ▶ Keep an eye on both sides during this activity so that third parties are not endangered either.
- ▶ Be aware of the danger of crushing in the area of the extended rolling area with the A/S foot.



### WARNING!

- ▶ Trailers must always be parked on consolidated level ground. If the ground is soft, suitable underlay boards must be inserted between the landing gear foot and ground.
- ▶ If a stacking truck is driven on an unhitched trailer and the tipping point is exceeded (projecting cargo bed beyond the landing gear), there is a danger of the trailer tipping over. It is essential for the trailer manufacturer to refer to this danger in its documentation and conduct a re-evaluation.
- ▶ Before and during each hitching-up procedure, make sure that no one is in the danger area.
- ▶ Beware of the danger of crushing between the two fifth wheel coupling plates of the tractor vehicle and trailer when lowering the trailer.
- ▶ The crank must be relieved of load at the end of each working procedure by slowly turning it in the opposite direction, and then securing it in the holding fixture provided. It is prohibited for the trailer to be moved if the crank is not secured.
- ▶ Every time the landing gear is operated, make sure that no one is in the danger area. Stop the movement immediately if anyone approaches the danger area.



### ATTENTION!

- ▶ Beware of the danger of impact with the trailer during assembly, installation and maintenance work.
  - ▶ The screw connections between the landing gear and the semi-trailer must be tightened to a torque of 190 +10 Nm. All bolts for the electric drive with 50 + 5 Nm. M16 bolts with strength class 8.8 and locking nuts with strength class 8 are to be used for securing the landing gear. Before each use of the landing gear, check all screw connections are firmly secured.
  - ▶ Make sure that no different types of landing gear are fitted.
  - ▶ The crank must be secured in the holding fixture provided after each working procedure. It is prohibited for the trailer to be moved if the crank is not secured. The crank holding fixture can also be mounted on the vehicle by the customer.
  - ▶ Each time before the hitched-up trailer is transported, make certain that the landing gear has been retracted fully on both sides.
  - ▶ Before each hitching up procedure, make sure that the height of the tractor vehicle matches the height of the trailer, and make any necessary adjustments using the air suspension.
- 

## 4.2 Safety instructions for the owner

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### WARNING!

- ▶ Make sure that the instructions attached to the landing gear on delivery remain clearly legible! Missing and damaged warning signs must be renewed immediately!
  - ▶ Installation and repairs are only allowed to be carried out by specialist personnel!
  - ▶ Subsequent mounting of additional devices from third-party manufacturers is prohibited, as are modifications to protective devices without consultation with JOST or the manufacturer of the additional device in question!
- 



### ATTENTION!

Exclusively use genuine spare parts! Otherwise, warranty regulations might be violated and product liability risks incurred!

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### IMPORTANT!

Make sure that anyone who works on the landing gear for the first time has read and understood this documentation. In particular, point out the requirement to observe the safety instructions in this documentation and on the landing gear. Keep the documentation in the area of the landing gear and pass on the documentation to new personnel. Make sure that no one without specialist knowledge works on the landing gear.

### 4.3 Safety instructions for the operating personnel



### WARNING!

This landing gear is exclusively allowed to be operated by appropriately qualified personnel! These personnel must be familiar with all safety instructions and the corresponding measures contained in this documentation and on the landing gear with regard to operation, maintenance and cleaning!

### 4.4 Personal protective equipment

The landing gear is configured so that people who work with the landing gear will not require any protective equipment beyond the necessary standard equipment. Wear safety shoes and protective gloves during installation and maintenance work.



### ATTENTION!

- ▶ Wearing safety shoes is a requirement during installation and maintenance of the landing gear!
- ▶ Wearing protective gloves is a requirement during installation and maintenance of the landing gear!



### ADVICE!

People who carry out cleaning and maintenance work must comply with the prescribed measures for the corresponding cleaning agents (e.g. gloves for use with cleaning agents, protection against spray)!

## 4 Safety

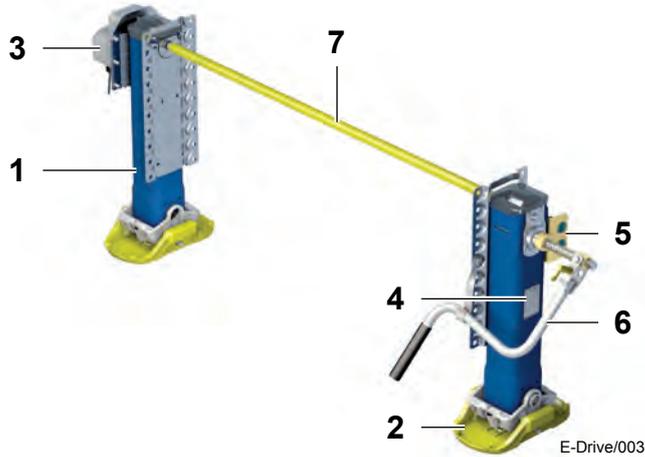
### 4.5 General safety regulations and obligations

In general, the following safety regulations and obligations apply when working with the landing gear:

- ▶ The landing gear is only allowed to be operated if in fault-free and clean condition.
- ▶ It is prohibited for any protective and safety devices to be removed, modified, defeated or bypassed.
- ▶ It is prohibited for the landing gear to be converted or modified without written approval by the supplier.
- ▶ Malfunctions or damage must be reported to the owner immediately. This must be corrected immediately.
- ▶ Only genuine spare parts are allowed to be used during repairs.
- ▶ The safety instructions and operating instructions in the documentation for the components used must be taken into account in any event.
- ▶ All protective and safety devices must be checked regularly by the owner and maintained.
- ▶ Only instructed, trained or qualified people are allowed to work with and on the landing gear.
- ▶ Operation of the landing gear is subject to national employee protection regulations as well as national health and safety and accident prevention regulations.
- ▶ In addition, comply with the regulations in BGI 599 "Safe hitching of vehicles".

## 5 Structure

### 5.1 Scope of delivery



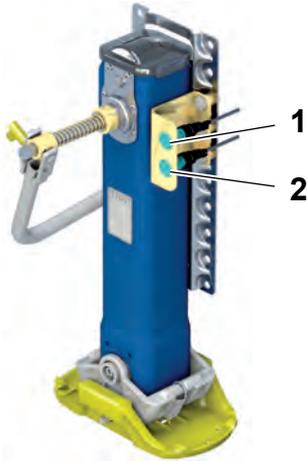
- 1 Landing gear
- 2 Landing gear feet
- 3 Electric drive
- 4 Type plate (also on the drive)
- 5 Control elements with standard console or universal bracket
- 6 Crank with crank holding fixture (must be ordered separately)
- 7 Connection shaft (must be ordered separately)

## 5 Structure

1	Landing gear	The landing gear is used for supporting semi-trailers and single-axle trailers when they are not hitched up. For hitching up or unhitching, the height of the laden or unladen trailer is adjusted using the crank to match the hitching height of the tractor vehicle (unless this is done by means of the air suspension of the tractor vehicle).
2	Landing gear feet	The landing gear feet are in moving mountings and are used for compensating for slight unevenness in the ground.
3	Electric drive	The electric landing gear drive allows the landing gear to be retracted and extended without load.
4	Type plate	All the manufacturer's information can be read off the type plate. The type plate must be undamaged. There is one on the drive and another on the landing gear itself.
5	Control elements	The control elements are used for moving the landing gear up and down using the electric landing gear drive. The control elements are mounted using either a standard console or universal bracket. The standard console is used for mounting the control elements (5) and can be bolted onto the landing gear (1). The universal bracket can be used as an alternative for mounting the control elements (5) if the standard console is not used.
6	Crank with crank holding fixture (must be ordered separately)	The crank is used for manual height adjustment of the landing gear in low gear (turning clockwise lifts the vehicle - turning anticlockwise lowers the vehicle) or as emergency actuation in high gear if the electric drive has failed. The crank holding fixture secures the crank in a safe position. The crank must be secured in the holding fixture each time after it has been used. Each time before the vehicle is transported, make certain that the crank is secured in this holding fixture.
7	Connection shaft (must be ordered separately)	The connection shaft is used for connecting the two landing gears together.

## 5 Structure

### 5.2 Control elements



E-Drive/004

The control elements consist of two buttons that are mounted in the standard console or a universal bracket. The landing gear can be operated both in momentary-contact operation and in automatic mode. Pressing the top button (1) causes the landing gear to be retracted, and pressing the bottom button (2) extends it.



#### ADVICE!

Momentary-contact operation: the landing gear only moves when the buttons are pressed. Movement stops immediately when the button is released. Movement of the landing gear stops automatically when contact is made with the ground, or when it is fully retracted.

Automatic mode: the landing gear moves until it makes contact with the ground or is fully retracted, and then the movement stops automatically. During movement, the landing gear can be stopped at any time by pressing any button.

When the limit position is reached, the motor is briefly run opposite to the previous movement direction so as to avoid wind-up in the landing gear.



#### ATTENTION!

Note that the landing gear is not allowed to be used for lifting trailers in conjunction with the electric drive. The landing gear stops when it encounters resistance from the ground, the height can then be compensated manually using the crank in order to achieve the correct support position.

## 5 Structure

### 5.3 Electric landing gear drive unit

The electric landing gear drive is supplied as a fully preassembled unit. The cables are wound up on delivery and are attached to the landing gear drive.



#### **WARNING!**

- ▶ Avoid damaging the housing and cables of the electric landing gear when installing the landing gear.
  - ▶ The cables to the control elements are not allowed to be shortened!
-



### WARNING!

- ▶ Installation is exclusively to be undertaken by personnel who are authorised to do so. During installation, make sure that both supports touch the ground at the same time when the landing gear is lowered. Having different loads on the supports leads to damage. Follow the specifications (e.g. installation directive) supplied by the semi-trailer manufacturer and the installation instructions.
- ▶ The manufacturer will not accept any warranty claims if installation is carried out incorrectly.
- ▶ The electrical connection (terminal 15 or 30) must be made via a fuse on the tractor unit or semi-trailer.
- ▶ The electrical connection (terminal 31) must be at an earth post provided by the manufacturer of the semi-trailer.

### Material required

- ▶ 28 x M16 hexagon screws (8.8)
- ▶ The length of the bolts must be selected according to the vehicle frame (if the standard console with the control elements is to be bolted onto the landing gear, these bolts must be selected 20 mm longer than the screw connection without standard console)
- ▶ 28 x self-locking hexagon nuts M16 (8)
- ▶ 28 x washers
- ▶ Any additional fastening material required when using the universal bracket for the control elements
- ▶ Installation material such as cable ties, cable clamps, protective tubes, etc.



### ADVICE!

Take the following into account when installing the electrical cables:

- ▶ The electrical cables must not be secured to brake cables.
- ▶ The electrical cables must be routed at an adequate distance from heat sources and moving parts of the semi-trailer. If necessary the cables must be fitted with a heat protection corrugated tube or a chafing guard.
- ▶ The electrical cables must be routed so that they have no kinks and cannot chafe.
- ▶ The electrical cables are to be secured using cable ties (for example to the semi-trailer's wiring harness).

Please note the following before carrying out any work to the electrical system:

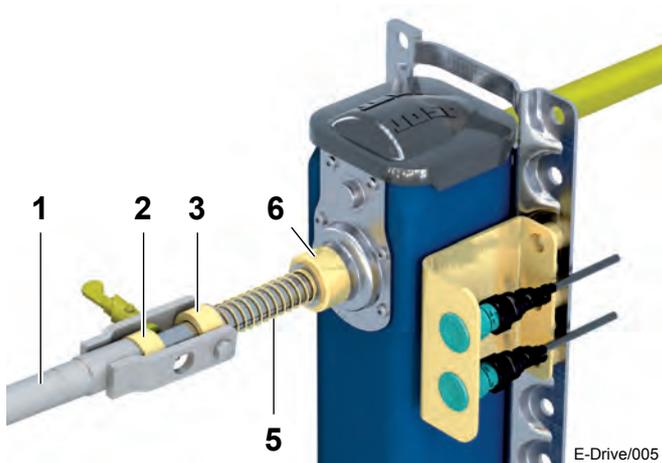
- ▶ Disconnect the semi-trailer from the electrical power supply of the semi-trailer tractor.
- ▶ Disconnect the negative terminal of the vehicle battery (if there is one on the semi-trailer).
- ▶ When working on the semi-trailer tractor, read out the error memory of the semi-trailer tractor before disconnecting the negative terminal from the vehicle battery.

### Installation of the Modul E-Drive landing gear (with previous removal of the existing landing gears)

- ▶ Raise the landing gear using the crank (remove the load).
- ▶ Remove the left and right landing gear.
- ▶ Install the Modul E-Drive landing gear and tighten it to the prescribed tightening torque. Make sure that the landing gears are extended or retracted by the same amount.
- ▶ When mounting the right landing gear, bolt on the standard console with the landing gear according to the available space (left/right). Note that the bolts for this are 20 mm longer than when installing without standard console. Alternatively, the control elements can be mounted in the supplied universal bracket and positioned at any point (note the cable length).

## 6 Installation

### Installation of the crank

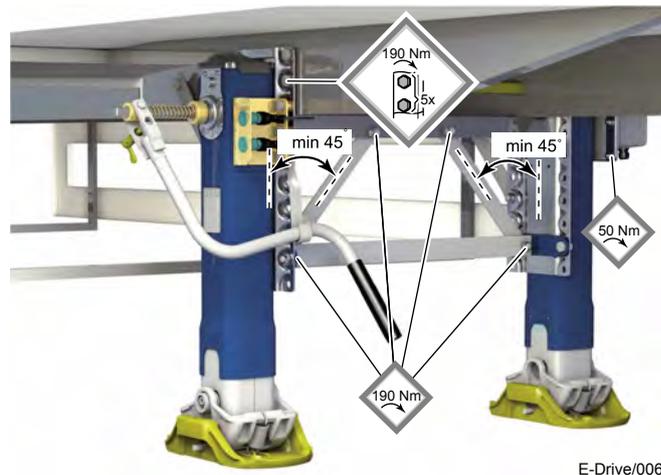


- ▶ Install the special crank (1) on the right landing gear.
- ▶ To do this, remove the cable tie (not illustrated - used for transport protection). Note that the spring (5) is under tension due to the cable tie.
- ▶ Push the guide ring (3) that is on the crank onto the crank drive (6).
- ▶ Then push the adjusting ring (2) onto the crank drive and secure it in the hole provided using a clamping sleeve.
- ▶ Then, with the crank inserted, check that it is certain the crank drive is pressed to the high gear position by the spring.



### ADVICE!

Tighten all screw connections to a tightening torque of  $190 + 10$  Nm.



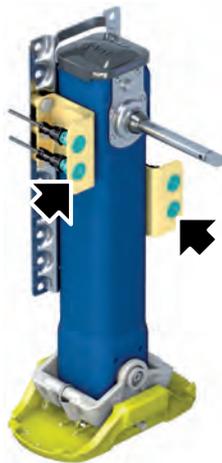
### WARNING!

- ▶ If there are bracings on the landing gear, these must be installed in the same way or attached according to the illustration on initial installation.
- ▶ Beware of the danger of crushing when working with the components to be installed!

## 6 Installation

### Installation of the console for the control elements

This standard console can be individually attached to the holes in the bolt-on plate, and bolted onto the landing gear. Another attachment bracket is supplied in case no optimum mounting position can be found. The control elements should be attached in the vicinity of the landing gear in any event so that the operator can observe the area around the landing gear during the movement.



E-Drive/007

- ▶ Screw the standard console onto the landing gear using at least two bolts, according to the available space (left/right). Alternatively, you can install the universal bracket at another suitable point in the vicinity of the landing gear (screw on with at least 2 x M8).



E-Drive/008

- ▶ If it is not possible to secure using the supplied elements, a suitable bracket must be made to suit the situation on the actual vehicle.

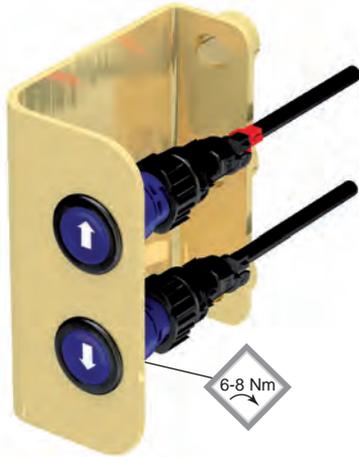


#### ADVICE!

The specifications (e.g. installation directive) of the vehicle manufacturer must be complied with when mounting the universal attachment plate.

## 6 Installation

### Installation and electrical connection of the control elements



E-Drive/009

- ▶ Insert the control elements into the opening in the console. Make sure that the printed arrows are aligned correctly.
- ▶ Secure the control elements with the union nut, and make sure that the tightening torque is correct (6 to 8 Nm).
- ▶ Route the two connection cables of the drive at a suitable point on the semi-trailer to the control elements, and secure them with cable ties at regular intervals. Make sure that the routing does not expose the cables to any chafing.
- ▶ Connect the plug connector with the coloured marking to the cable on the control element, with the arrow pointing upwards (travel direction: landing gear upwards) and secure it by turning the bayonet lock clockwise.
- ▶ Connect the plug connector without the coloured marking to the cable on the control element, with the arrow pointing downwards (travel direction: landing gear downwards) and secure it by turning the bayonet lock clockwise.



#### **WARNING!**

The cables to the control elements are not allowed to be shortened!

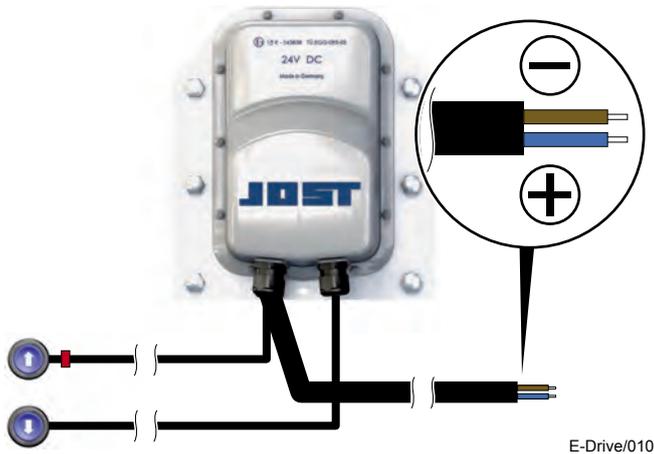


#### **ADVICE!**

Make sure that the bayonet connectors are correctly locked so as to avoid malfunctions during operation.

## 6 Installation

### Electrical connection of the supply line



- ▶ Disconnect the electrical connection of the semi-trailer during installation so as to avoid damage to the electrical system.
- ▶ Route the 7 m long connection cable along a suitable point on the vehicle frame (e.g. along the vehicle wiring harness) to the selected voltage pick-off point, and secure it at regular intervals with cable ties. Route the cable to avoid any chafing.
- ▶ Shorten the connection cable to the required length if required before connecting it to the electrical power supply.
- ▶ Connect the brown wire to earth terminal 31.
- ▶ Connect the blue wire to +24 V terminal 30 or terminal 15.



### WARNING!

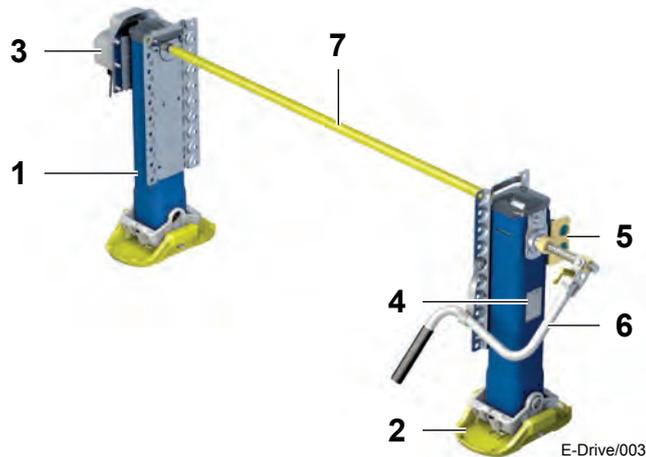
If it is not possible to exclude the possibility of the E-Drive module being operated in public areas, an emergency off switch must be incorporated into the +24 V connection cable: The emergency off switch must be provided in a sealed housing, comply with ADR regulations if necessary. The emergency off switch must be installed on the opposite side from the control elements in the vicinity of the landing gear. The emergency off switch is not supplied.



### ADVICE!

- ▶ Follow the specifications (e.g. installation directive) of the vehicle manufacturer when connecting the supply line to terminal 15 or 30 and terminal 31. A corresponding connection must be provided on the tractor vehicle and must be fused with at least 15 A (preferably with a circuit breaker). This can take the form of a separate socket or a suitably fused standard socket. Follow the specifications (e.g. installation directive) of the semi-trailer tractor and vehicle manufacturer when doing this.
  - ▶ Vehicles that are used in ADR conditions must comply with the relevant statutory regulations.
  - ▶ If it is installed on a semi-trailer for hazardous substances in classes FL, AT and OX pursuant to ADR, the technical features required for ADR vehicles of the named classes must be retained.
  - ▶ The Modul E-Drive must be supplied in full through the battery isolation switch and thus does not meet the "permanently supplied circuits" technical features under ADR regulations.
  - ▶ Make sure that a minimum cross section of 2.5 mm<sup>2</sup> is provided if using an adapter in the general electrical power supply.
-

## 7 Operation



- 1 Landing gear
- 2 Landing gear feet
- 3 Electric drive
- 4 Type plate (also on the drive)
- 5 Control elements
- 6 Crank with crank holding fixture
- 7 Connection shaft

### 7.1 Checks before initial start-up

Carry out the following activities before taking the Modul E-Drive landing gear into operation:

- ▶ Check the attachment and correct tightening torque of the bolts for the landing gear.
- ▶ Check that the crank has been installed correctly and is functioning (freewheel).
- ▶ Check that the crank of the landing gear is not connected and that it is in the parked position, so that it will not be spun around when the electric landing gear drive is running.
- ▶ Check the attachment of the electrical cables.
- ▶ Check that the electrical cables are routed without kinks and so that they cannot chafe.
- ▶ Check that the electrical cables are an adequate distance away from hot components.
- ▶ Check that the supply line has been connected correctly.
- ▶ Check that there is adequate fusing for the 24 V electrical power supply on the semi-trailer tractor side (at least 15 A).



#### ADVICE!

All semi-trailer tractors that are intended for use with the semi-trailer fitted with the Modul E-Drive must provide adequate fusing at the selected voltage pick-off point.

### 7.2 Checks during initial start-up

During initial start-up, it is necessary to check that the E-Drive landing gear module is functioning correctly, as follows.

The semi-trailer must be hitched up to a semi-trailer tractor in order for the following steps to be checked.

- ▶ Start automatic running of the landing gear as described in chapter 7.3.
- ▶ Check the STOP function by pressing the button with the symbol for the downwards travel direction (block arrow pointing down).
- ▶ The motor must stop immediately.
- ▶ Start the automatic run of the landing gear for this position again according to the Operation chapter.
- ▶ Check the STOP function by pressing the button with the symbol for the upwards travel direction (block arrow pointing up).
- ▶ Start the automatic run of the landing gear again according to the Operation chapter, and allow the landing gear to move downwards until it makes contact with the ground.
- ▶ When ground contact is achieved, the electric landing gear drive must switch off automatically (when the limit position is reached, the motor is briefly run opposite to the previous travel direction).

- ▶ The control unit must switch off completely after a further 10 seconds - the display lights on the control element are off.
- ▶ Repeat the steps for retracting the landing gear.
- ▶ If an additional emergency off switch has been installed, its correct function must also be checked.

If any of the functions does not operate as described, the landing gear is not allowed to be taken into operation. The fault must be corrected before start-up.

### 7.3 Operation of the landing gear

The following chapter explains operation of the Modul E-Drive landing gear in more detail.



#### ADVICE!

It is not possible to move loads using the electric drive. It is only used for extending the landing gears down to the ground and for retracting it again. Height differences must be compensated using the air suspension of the vehicle or by means of the crank in low gear.



#### WARNING!

Before the electric drive is taken into operation, it is necessary to ensure that there is no driving connection between the crank and the connection shaft, i.e. the crank is folded down and must be inserted in the parked position.

- ▶ There is a danger of accident if the crank has a driving connection to the landing gear and is spun round due to the rotating movement of the electric landing gear drive!
- ▶ Before extending or retracting the landing gear, the driver must ensure that there is nobody in the danger area.
- ▶ Before unhitching, look and check that the landing gear has reached the ground.

Electrical movement can be carried out either in automatic mode or in momentary-contact mode.

#### Electrical movement of the landing gear in automatic mode

- ▶ Activate the system by pressing both control elements simultaneously for two seconds. Both control elements flash at the same time when the control unit is activated.
- ▶ Select the travel direction by pressing a control element for the required travel direction (press the button for about 1 second until the motor starts, see Fig. E-Drive/009, page 63).
- ▶ The landing gears are moved in both directions (retracting/extending) in automatic mode with self-holding until the maximum permitted motor current is exceeded. This is generally the case whenever the landing gear makes contact with the ground or is fully retracted.
- ▶ When the limit position is reached, the motor is briefly run opposite to the previous movement direction so as to avoid wind-up in the landing gear.
- ▶ Running of the motor can be stopped immediately by pressing any button.
- ▶ After the motor stops running, it can be started again in either direction within ten seconds. Otherwise, the system will have to be reactivated again as described previously by pressing the control elements simultaneously.

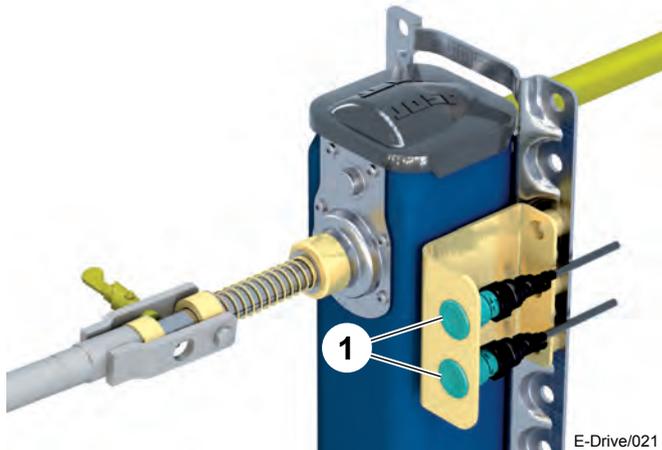


#### WARNING!

Before the working procedure, make sure that there is no one in the danger area. The operator is only allowed to move away from the visible area when the supports have made contact with the ground.

## 7 Operation

### Electrical movement of the landing gear in momentary-contact mode



- ▶ Activate the system by pressing both control elements (1) simultaneously for two seconds. Both control elements flash at the same time when the control unit is activated.
- ▶ Select the travel direction by pressing a control element in the required travel direction, and hold the control element pressed until the required landing gear position has been reached (min. 3 seconds).
- ▶ The motor stops as soon as the button (1) is released or when the maximum permitted motor current is exceeded.

The control unit switches itself off automatically after ten seconds when the travel procedure has finished in automatic or momentary-contact mode.



#### ADVICE!

- ▶ If no travel direction selection is detected by the control unit within ten seconds of it being activated, the electric drive switches itself off automatically.
- ▶ If the permitted motor current of the electric drive is exceeded and the landing gear has not yet reached the required position then the system must be restarted or the landing gear moved to the required position manually using the crank. This situation can arise if:
  - ▶ The outside temperature is too low so that the available current is inadequate.
  - ▶ The landing gear cannot move freely due to wear or damage.

## 7 Operation

### 7.4 Optional changeover to 20 A

By default, the electric landing gear is preset to a maximum motor current of 15 A.

However, it is possible to operate the system with a higher motor current in 20 A mode. 20 A mode is only allowed to be activated if the feeder cable from the semi-trailer tractor to the semi-trailer is fused with at least 20 A, and the cables are designed for operation at 20 A. Information about this can be obtained from the manufacturer of your semi-trailer tractor or semi-trailer. Proceed as follows to do this:

- ▶ Activate the system by pressing both control elements simultaneously for five seconds. Both control elements flash alternately if the control unit has been activated in 20 A mode.
- ▶ From this point on, proceed as described in the previous section for automatic or momentary-contact mode.

If exclusively semi-trailer tractors with feeder cable fusing of at least 20 A are used, the control can be set to operate in 20 A mode permanently by making a setting on the electronic circuit board.



#### ADVICE!

This work is exclusively allowed to be carried out by specialist personnel, otherwise there is a danger of damage to the electronic circuit board, e.g. by electrostatic discharge.

Proceed as follows to do this:

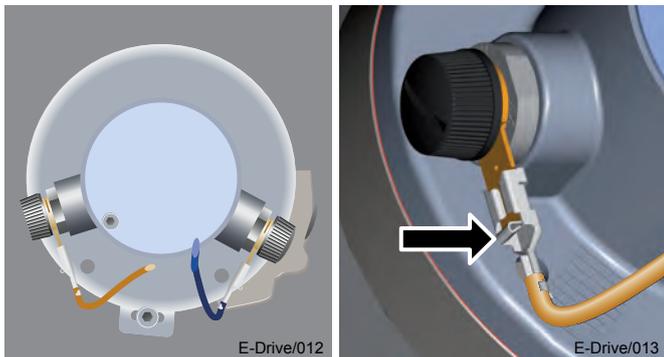
- ▶ Disconnect the motor from the electrical power supply.



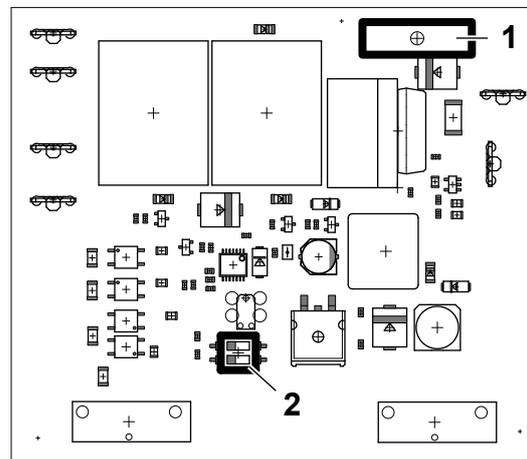
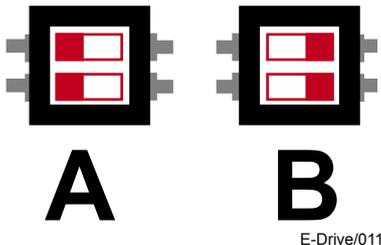
E-Drive/014

- ▶ Unscrew the motor housing bolts (10 x T20).

## 7 Operation



- ▶ Lift the housing cover carefully by about 10 cm and disconnect the connection cables from the motor (bear in mind the locking mechanism on the ribbon cable connector) - brown/blue cable.



E-Drive/015

- ▶ Move the DIP switch (figure no. 2 - (position A = 15 A mode; position B = 20 A mode)) to 20 A.
- ▶ Assembly is carried out correspondingly in reverse order. Make sure that the motor connections cables are connected correctly. Make sure that the seal on the housing has not slipped (secure the seal with a flexible adhesive if required) and retighten the bolts evenly to 2.7 to 3.3 Nm.

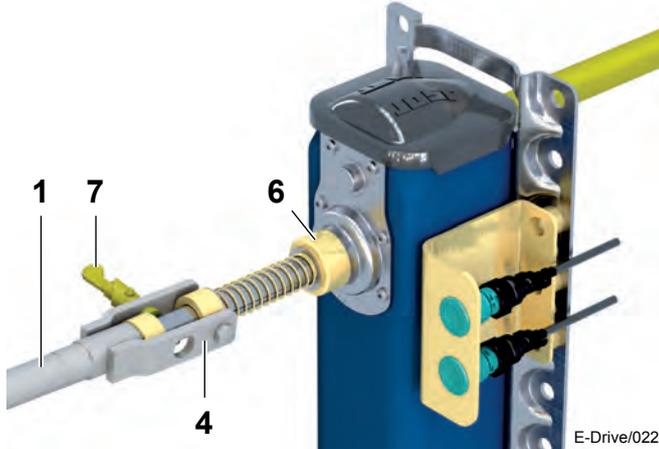
## 7 Operation

### 7.5 Manual movement of the landing gear



#### ADVICE!

It is not possible to move loads using the electric drive. It is only used for extending the landing gears down to the ground and for retracting it again. Height differences must be compensated using the air suspension of the vehicle or by means of the crank in low gear.



The crank drive (6) is always in high gear.

Proceed as follows to operate the crank manually:

- ▶ Release the crank (1) from the holding fixture and move the joint of the crank (4) up
- ▶ Push the crank (1) onto the square profile of the crank drive (6).
- ▶ Operate the snap-on lock (7) to secure the crank (1) on the square profile.
- ▶ To change over to low gear, press the crank (1) in the direction of the crank drive (6) and keep it pressed with constant pressure, because the crank drive (6) does not engage in low gear.



#### WARNING!

- ▶ Be aware of the danger of crushing when swivelling up and engaging the crank!
- ▶ The crank must be relieved of load at the end of each working procedure by slowly turning it in the opposite direction, and then securing it in the holding fixture provided. It is prohibited for the trailer to be moved if the crank is not secured.
- ▶ It is essential to secure the crank back in the holding fixture after the working procedure has finished.

## 8 Maintenance work

Various maintenance activities are essential for ensuring that the landing gear will operate correctly over a long period.

The maintenance work comprises the following:

- ▶ Cleaning
- ▶ Maintenance



### ATTENTION!

Only use genuine parts in consultation with JOST. Otherwise, liability and warranty claims could be invalidated.



### WARNING!

Neglecting maintenance work has a significant effect on the correct function and safety. It is possible that liability and warrant claims might be invalidated.

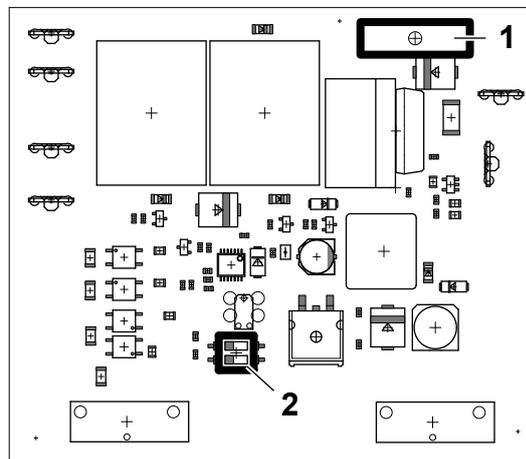
The maintenance work is described in the following chapters.

### 8.1 Checking and renewing fuses



### ADVICE!

This work is exclusively allowed to be carried out by trained specialist personnel, otherwise it is possible for damage to be caused to the electronic circuit board, e.g. by electrostatic discharge.



E-Drive/015

- ▶ Remove the housing cover as described in chapter "7.4 Optional changeover to 20 A".
- ▶ Check the fuse (no. 1) and renew it if necessary.
- ▶ When doing this, note that it is exclusively permitted for blade fuses according to ISO 8820-3 to be used.
- ▶ Assembly is carried out as described in chapter "7.4 Optional changeover to 20 A".

## 8 Maintenance work

### 8.2 Cleaning

The landing gear is cleaned along with the vehicle. No special cleaning is required.



#### **ATTENTION!**

Make sure that no high-pressure jet is directly sprayed onto electrical components or into the gear unit openings. Keep a minimum distance of 50 cm.

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### 8.3 Maintenance

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#### **WARNING!**

- ▶ Maintenance work is exclusively allowed to be carried out by authorised, trained personnel. These persons must also have read and understood this documentation.
  - ▶ Be aware of electrical hazards during maintenance work.
- 

All maintenance activities and the intervals between them are listed in the table below.

## 8 Maintenance work

<b>Servicing</b>	<b>Interval</b>	<b>Activity</b>
Visual inspection of the landing gear	Every day (before use)	Check the landing gear for corrosion, cracks, deformation and if screw connections have come loose. Damaged landing gears must immediately be taken out of operation and repaired or renewed.
Lubrication of the spindle and spindle nut	After three years, and then every year thereafter	Grease the spindle and spindle nut via the grease hole on the landing gear (see chapter 8.3.1).
Check the spindle and spindle nut for wear	Annually	Make sure that the entire stroke can be covered (e.g. by lifting with air suspension or checking over a pit). Move the spindle over the entire stroke with the crank in high gear. Renew the spindle as well as the inner leg if movement is difficult.
Visual inspection of the inside of the landing gear	Annually	When constantly used in climates encouraging corrosion, the inside of the landing gear must be visually inspected for corrosion.

## 8 Maintenance work

### 8.3.1 Lubrication

The spindle must be lubricated for the first time after three years, and then every year thereafter.

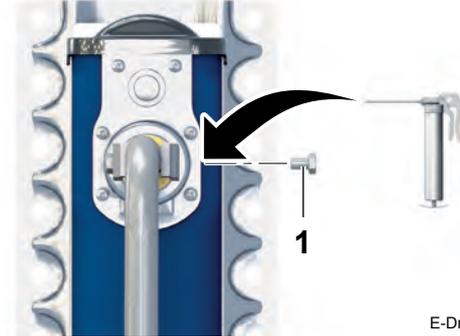
The gear unit only if required, e.g. if used continuously in climates encouraging corrosion (depending on visual inspection).



#### ADVICE!

- ▶ We recommend JOST special grease SKE 005670000 for lubricating the gear unit (2 cartridges of 400 ml; fill quantity 60 g per landing gear). Use of other greases can lead to restricted availability at low temperatures.
- ▶ Use high-performance EP grease with a lithium saponified base and good adhesion/corrosion protection properties for lubricating the spindle and spindle nut. Comply with the temperature range appropriate for the application in question.

#### Procedure for lubricating the spindle



- ▶ Extend the landing gear completely.
- ▶ Remove the sealing plug (1) from the lubricating hole.
- ▶ Fill the grease trough in the spindle nut with approx. 200 g EP grease.
- ▶ Screw in the spindle as far as the stop, then out and back in again.
- ▶ Reinsert the sealing plug (1) afterwards. However, it is recommended for the sealing plug to be replaced by a special grease nipple (JOST genuine part JS E0084000).

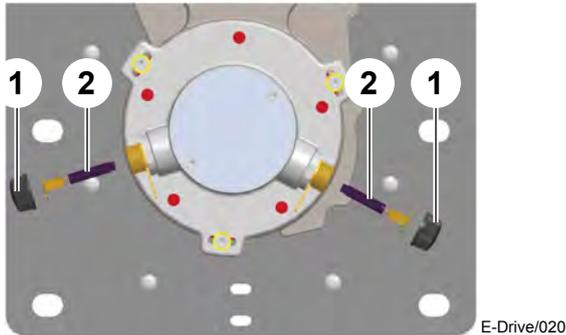


#### ATTENTION!

Using a different grease nipple can lead to damage to the landing gear.

## 8 Maintenance work

### 8.4 Cleaning and replacement of the carbon brushes



- ▶ Remove the housing cover as described in chapter "7.4 Optional changeover to 20 A".
- ▶ Unscrew the black plastic caps (1).
- ▶ Pull out the two carbon brushes (2) carefully.
- ▶ Blow out the carbon brush holders with compressed air so as to remove the carbon dust.
- ▶ Insert the new carbon brushes (2) carefully into both holders and tighten the plastic caps (1) to 1 Nm.
- ▶ Assembly is carried out as described in chapter "7.4 Optional changeover to 20 A".

## 9 Malfunction

The following chapter describes in more detail how to respond to malfunctions.

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### **WARNING!**

- ▶ Malfunctions and inadvertent alterations in the landing gear must be rectified without delay.
  - ▶ It is prohibited or the landing gear to be operated if it is not functioning correctly.
  - ▶ Repair work is only allowed to be carried out by specialists. Do not work in any way which impairs safety when handling the landing gear.
  - ▶ A function guarantee can only be provided if genuine parts are used.
- 

The table below lists malfunctions that we are aware of, what causes them and the possibility for rectification:

## 9 Malfunction

Malfunction	Cause	Remedy
Significant power loss.	Landing gears damaged/worn. Carbon brushes worn.	Repair or replace the landing gears. Renew carbon brushes.
Landing gears do not extend or retract electrically.	Electric drive is defective. There is a mechanical problem on the landing gears. Activation of the electric drive is faulty. Extremely low outdoor temperatures. The load has not been removed from the landing gears before attempting to move it electrically. Electrical power supply from the tractor vehicle is not sufficient.	Replace, move the landing gear manually with the crank. Repair or renew the landing gear. Check cables and connectors for damage and correct seating. Check the plug connection to the tractor vehicle. Check the fuse on the tractor vehicle. Check the fuse in the electric drive (see chapter 8.1). Move the landing gear manually with the crank. Remove the load from the landing gear using the air suspension and try again. Check the battery charge status of the semi-trailer tractor vehicle, and charge the battery if necessary.
Winches do not retract or extend, and the button LEDs flash quickly.	Electronics defective.	Renew the electric landing gear drive.
Manual operation does not function.	There is a mechanical problem on the landing gears. The electric drive unit has a mechanical defect and is therefore blocked.	Repair or renew the landing gear. Unscrew the connection bolts between the motor and screw-on plate and pull off the motor. Renew the defective drive.

# 10 Disposal

## 10.1 Principle

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### ADVICE!

Dispose of the parts of the landing gear in an environmentally friendly way, following sorting into material types, when it is time to take the unit out of service permanently.

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Prior to disposal, check if the materials and landing gear parts can be reused. Send as many of them as possible for reuse.

When doing so, comply with the information from the manufacturer and the corresponding regulations and legislation.

## 10.2 Procedure

### Landing gear and electric drive

The mounted parts are valuable raw materials that can be recycled. They can be split into plastics, rubber and metallic materials. Plastics and rubber are identified according to VDA recommendation 260. Before disposal, parts may need to be cleaned of any residual oil or grease.

When disposing of electronic components such as circuit boards, cables and electric motor, comply with the waste regulations of the country in question. Further information about this is available from your local disposal office.

### Lubricant

The particular manufacturer of the lubricant will supply the disposal instructions for the lubricants used.

- ▶ Dispose of used lubricants as special waste, disposal key no. 120 112 EAK
- ▶ PCB content: free of PCB
- ▶ Halogen content: free of halogen

# 11 Appendix

## 11.1 Technical data

Electrical power supply:  
24 V with negative vehicle earth

Fusing:  
At least 15 A (circuit breaker is recommended)

Travel speed at room temperature and 24 V:  
7.7 mm/s +/-15%

Tested acc. to:  
Electric drive: IP5K4  
Control element: IP6K9K

## 11.2 Dimensions

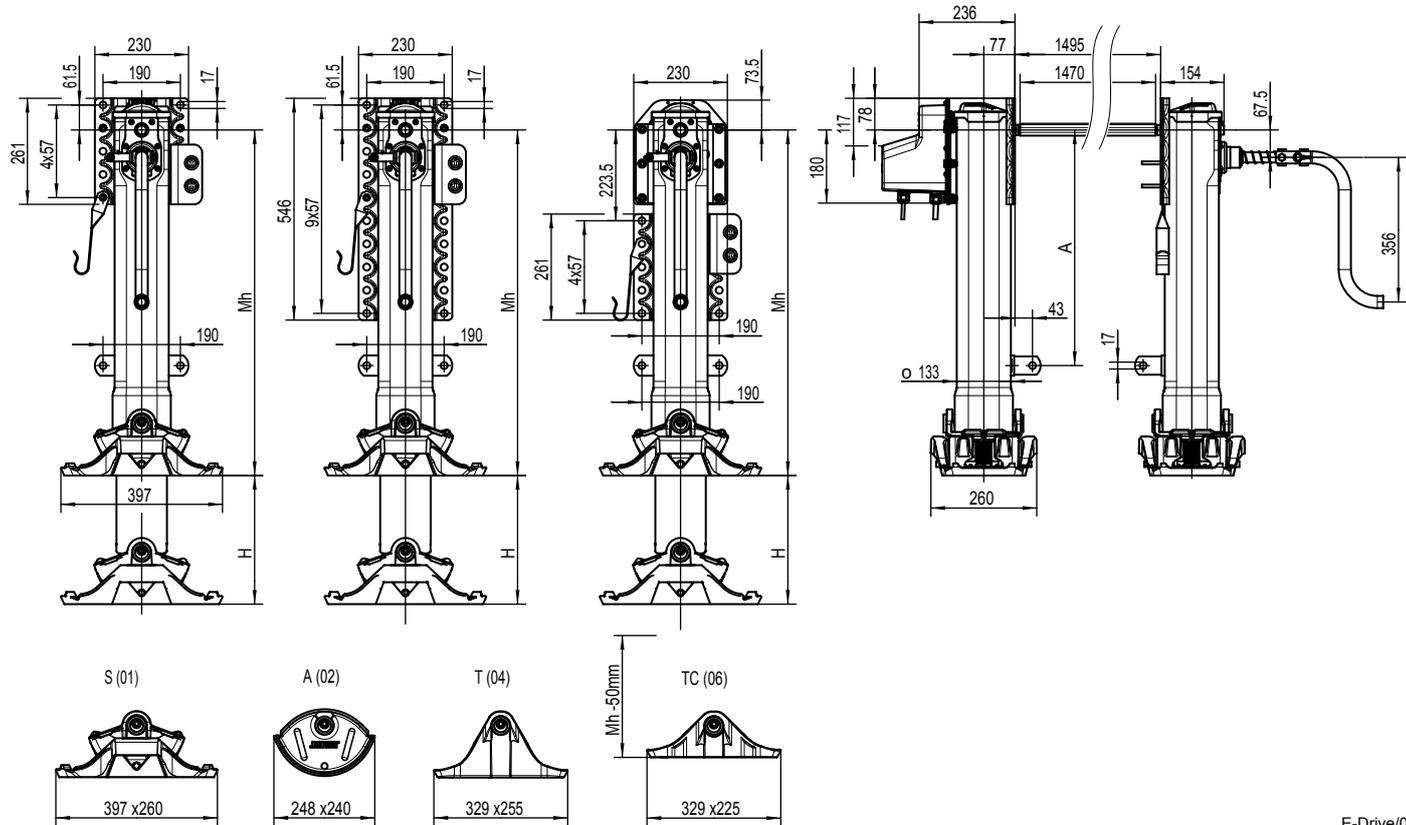
Order number	Mh	H	A
Module B010X-0Y0000ED	900	560	630
Module B020X-0Y0000ED	850	520	580
Module B030X-0Y0000ED	800	470	530
Module B040X-0Y0000ED	750	430	480
Module B050X-0Y0000ED	700	400	430
Module B060X-0Y0000ED	650	350	380

X = 1	Top plate	Y = 1	S-foot
X = 2	Bottom plate	Y = 2	A-foot
X = 3	Dual plate	Y = 4	T-foot
		Y = 6	TC-foot

Load data (per set)	
Lifting load*	24 t
Static test load	50 t
Lift per turn of crank handle, low gear*	0.9 mm
High gear*	15 mm
Crank force with 16 t lifting load	210 N

\* with manual actuation

# 11 Appendix



E-Drive/017

Member of **JOST**-World

JOST, Germany, Tel. +49 6102 295-0, [tkd-technik@jost-world.com](mailto:tkd-technik@jost-world.com), [www.jost-world.com](http://www.jost-world.com)

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