Operator Manual

Screw Compressor

M50

No.: 9_9435 24 USE

Manufacturer:

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Original instructions
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KAESER KOMPRESSOREN

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1 Regarding this Document

1.1 Using this document

The operating manual is a component of the product. It describes the machine as it was at the time of first delivery after manufacture.

- ➢ Keep the operating manual in a safe place throughout the life of the machine.
- ➢ Supply any successive owner or user with this operating manual.
- ➢ Please insert any amendment or revision of the operating manual sent to you.
- ➢ Enter details from the machine nameplate and individual items of equipment in the table in chapter 2.

1.2 Further Documents

Further documents included with this operating manual are:

- Certificate of acceptance / operating instructions for the pressure vessel
- Manufacturer's declaration / declaration of conformity in accordance with applicable directives
- Engine documentation (compressors driven by internal combustion engine)

Missing documents can be requested from KAESER.

- ➢ Make sure all documents are complete and observe the instructions contained in them.
- ➢ Make sure you provide the data from the nameplate when ordering documents.

1.3 Copyright

1.4 Symbols and labels

- ➢ Please note the symbols and labels used in this document.

1.4.1 Warnings

Warning notices indicate dangers that may result in injury when disregarded.

Warning notices indicate three levels of danger identified by the corresponding signal word:

Signal term	Meaning	Consequences of ignoring the warning
DANGER	Warns of an imminent danger	Will result in death or severe injury
WARNING	Warns of a potentially imminent danger	May result in death or severe injury
CAUTION	Warns of a potentially dangerous situation	May result in a moderate physical injury

Tab. 1 Danger levels and their definitions (personal injury)

Warning notices preceding a chapter apply to the entire chapter, including all sub-sections.
For example,

⚠ DANGER

These show the kind of danger and its source.
The possible consequences of ignoring a warning are shown here.
If you ignore the warning notice, the "DANGER" signal word indicates a lethal or severe injury will occur.

➢ *The measures required to protect yourself from danger are shown here.*

Warning notes referring to a sub-section or the subsequent action are integrated into the procedure and numbered as an action.

For example,

1. **⚠ WARNING** *These show the kind of danger and its source.*
   The possible consequences of ignoring a warning are shown here.
   If you ignore the warning notice, the "WARNING" signal word indicates that death or severe injury may occur.
   ➢ *The measures required to protect yourself from danger are shown here.*
2. Always read and comply with warning instructions.

1.4.2 Potential damage warnings

Unlike the warnings shown above, damage warnings do not indicate a potential personal injury.

Warning notices for damages are identified by their signal term.

Signal term	Meaning	Consequences of ignoring the warning
NOTE	Warns of a potentially dangerous situation	Damage to property is possible

Tab. 2 Danger levels and their definition (damage to property)

For example,

NOTICE

These show the kind of danger and its source.
Potential effects when ignoring the warning are indicated here.

➢ *The protective measures against the damages are shown here.*

➢ Carefully read and fully comply with warnings against damages.

1.4.3 Other alerts and their symbols

This symbol indicates particular important information.

Material Here you will find details on special tools, operating materials or spare parts.

Precondition Here you will find conditional requirements necessary to carry out the task.
The conditions relevant to safety shown here will help you to avoid dangerous situations.

➢ This symbol is placed by lists of actions comprising one stage of a task.
1. For instructions with several steps ...
2. ... the sequence of actions is numbered.

Result — Shows the expected conclusion of the previous action.

Option da — ➢ Information relating to one option only is marked with an option code (e.g., "option da" means that this section is only valid for machines with the air treatment components "aftercooler and cyclone moisture separator"). Option codes used in this service manual are explained in chapter 2.2.

Information referring to potential problems are identified by a question mark.

The cause is named in the help text ...

➢ ... and a remedy given.

This symbol refers to important information or measures concerning environmental protection.

Further information — Further topics are introduced here.

2 Technical Data

2.1 Nameplate

The machine's nameplate provides the model designation and important technical information.
The nameplate is located on the outside of the machine (see illustration in chapter 13.1).

➢ Enter the nameplate data here as a reference:

Feature	Value
Vehicle Identification No.	
Permissible total weight	
Permissible coupling load	
Permissible axle load	
Portable compressor	
Part no.	
Serial no.	
Year of manufacture	
Total weight	
Lifting point load capacity	
Rated engine power	
Engine speed	
Maximum working pressure	

Tab. 3 Nameplate

2.2 Options

A list of the options fitted to your machine helps to relate the information in this service manual.
A list of the options fitted is given as code letters on the right side of the options label.

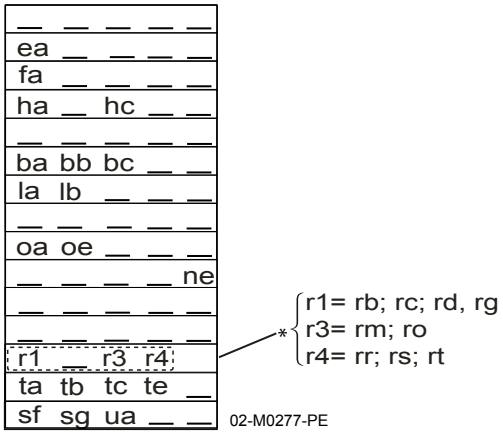
The nameplate can be found:

- on the outside of the machine,
- on the front of the machine (see chapter 13.1)

The following table lists all possible options.
Only the codes for those options fitted appear on the nameplate.

M50 Material No. Serial number

Options fitted



* r1 - r5 = place holders for chassis options

Tab. 4 Options label

➢ Take note of the fitted options from the options label and enter them here for reference.

2.2.1 Option ea, ec Tool lubricator

Option	Option code	Available?
Tool lubricator (with option fa)	ea	
Tool lubricator (with option fc)	ec	

Tab. 5 Tool lubricator option

2.2.2 Option fa, fc Compressed air distributor

Option	Option code	Available?
Non-separated compressed air distribution line	fa	
Separated compressed air distribution lines, down-stream of the option	fc	

Tab. 6 Compressed air distributor option

2.2.3 Option ba Low temperature equipment

Option	Option code	Available?
Low temperature equipment	ba	
Engine coolant pre-heating	bb	

Option	Option code	Available?
Defroster	bc	

Tab. 7 Low temperature equipment options

2.2.4 Option la, lb Equipment for fire hazard areas

Option	Option code	Available?
Spark arrestor	la	
Spark arrestor and engine air intake shut-off valve (automatic)	lb	

Tab. 8 Optional equipment for fire hazard areas

2.2.5 Option ne Fuel de-watering filter

Option	Option code	Equipped?
Fuel de-watering filter	ne	

Tab. 9 Option ne: Fuel de-watering filter

2.2.6 Option oa Battery isolating switch

Option	Option code	Available?
Battery isolating switch	oa	

Tab. 10 Battery isolating switch option

2.2.7 Option rb/rm/rr, rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs, rd/ro/rr, rd/rn/rr Chassis

Chassis are defined by the combination of several option designations as follows:
Model/Height adjustment/Service brake

Example: *rb/rm/rs* means
EU chassis with height-adjustable towbar and overrun brake

Chassis

Chassis	Option code	Available?
Model (rb, rc, rd):		
EU chassis	rb	
GB chassis	rc	
GB chassis	rg	
US chassis	rd	
EU = Europe, GB = Great Britain, US = United States of America		

Chassis	Option code	Available?
Height adjustment options (rm, rn, ro):		
Height-adjustable towbar	rm	
Adjustable coupling height	rn	
Fixed height towbar	ro	
Anti-twist protection towbar (rp):		
Adapter, mounted rotatable	rp	
Service brake (rr, rs):		
Without service brake	rr	
With overrun brake	rs	
EU = Europe, GB = Great Britain, US = United States of America		

Tab. 11 Chassis options

2.2.8 Option tb, tc, te Lighting

Option	Option code	Available?
Reflective warning triangle	tb	
EG 12 V	tc	
USA 12 V (DOT conformity)	te	

Tab. 12 Lighting options

2.2.9 Option oe Sealed floor pan

Option	Option code	Available?
Sealed floor pan	oe	

Tab. 13 Sealed floor pan option

2.2.10 Option ua Hose reels

Option	Option code	Available?
Hose reels	ua	

Tab. 14 Hose reel option

2.2.11 Option sf Anti-theft device

Option	Option code	Available?
Anti-theft device	sf	

Tab. 15 Anti-theft device option

2.3 Machine (without options)

2.3.1 Sound pressure level

Sound pressure levels comply with the American EPA Standard.
Measurement distance: 23 ft

	M50
Guaranteed sound pressure level [dB(A)]	76

Tab. 16 Sound pressure level

2.3.2 Tightening torques for screws

Recommended values for screws of property class 8.8

Thread	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20
Torque [lbf-in]	26.6	52.2	88.5	216.8	424.8	743.5	1177	1823	2611	3673

Tab. 17 Tightening torques for screws (property class 8.8, coefficient of friction μ = 0.12)

2.3.2.1 Torque cover fixing screws oil separator tank

Recommended values for screws corresponding to the strength category:

Screws	Strength category	Thread	Torque [lbf in]
Hex-head screw	8.8	M10	407

Tab. 18 Torque cover fixing screws oil separator tank

2.3.2.2 Torques for lifting eye

Recommended values for screws corresponding to the strength category:

Screws	Strength category	Thread	Torque [lbf in]
Hex-head screw	8.8	M12	708
Stud	8.8	M12	708

Tab. 19 Torques for lifting eye screws

2.3.3 Ambient conditions

Installation	Limit value
Maximum altitude amsl* [ft]	3000
Minimum ambient temperature [°F]	14
Maximum ambient temperature [°F]	113
Maximum ambient temperature** [°F]	122
* Higher altitudes are permissible only after consultation with the manufacturer.	
** Machines with increased fan capacity can be operated in ambient temperatures up to 122°F.	

Tab. 20 Ambient conditions

2.3.4 Additional specifications

For specifications, according to the machine's operating license, such as:

- dimensions,
- track width,
- footprint,

can be found in the dimensioned drawings in Chapter 13.3.

The dimensional drawings also show the position of the following inlets and outlets:

- Cooling air inlet
- Cooling air outlet
- Compressed air outlet
- Exhaust

2.4 Chassis

2.4.1 Option rb/rm/rr, rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs, rd/ro/rr, rd/rn/rr Weight of machines approved for towing on public roads

Actual weight of individual machines is dependent on equipment fitted (see machine nameplate).

➢ Enter the actual overall weight* from the nameplate into the table for reference.

Option	rb/rm/rr	rb/rm/rs	rc/ro/rr	rg/rp/rr	rc/ro/rs	rd/ro/rr	rd/rn/rr
Chassis type	EU chassis	EU chassis	GB chassis	GB chassis	GB chassis	US chassis	US chassis
Height-adjustable towbar	x	x	–	–	–	–	–
Fixed height towbar	–	–	x	x	x	x	x
Adapter, mounted rotatable	–	–	–	x	–	–	–
Adjustable coupling height	–	–	–	–	–	–	x
Parking brake	–	x	x	x	x	–	–
Overrun brake	–	x	–	–	x	–	–
Actual total weight [lb]*							
Permissible axle load [lb]	1650	1870	1650	1650	1870	1650	1650

x = fitted, – = not fitted
EU = Europe, GB = Great Britain, US = United States of America

Tab. 21 Weight of the machine

2.4.2 Tires

The tire's dimensions are shown on the side wall, see also Fig. 1.

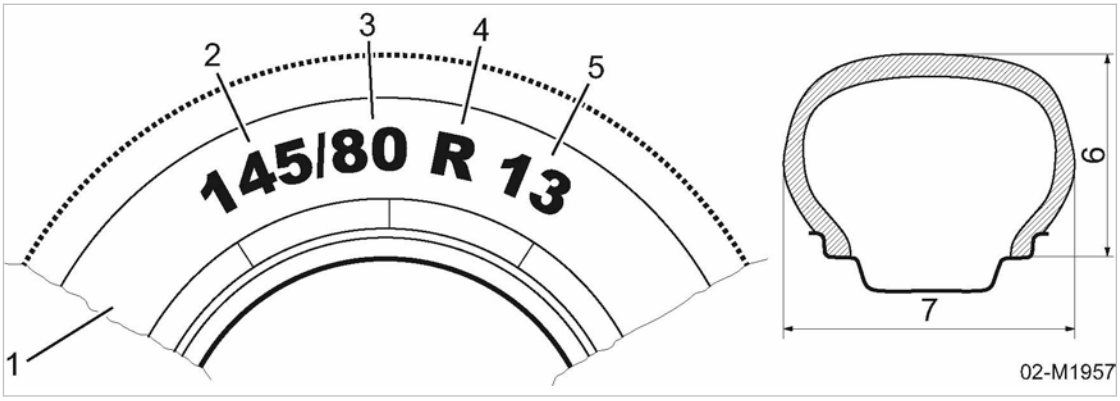


Fig. 1 Example for tire information on the side wall

1 Section, tire side wall
2 Tire width [in]
3 Ratio cross-section height to cross-section width [%]
4 Radial design
5 Rim diameter [in]
6 Cross-section height
7 Cross-section width

Use the following table for detailed information regarding the tires of your machine:

Characteristic/marking	Value	
Market	Europe	USA
Unit of pressure	bar	psi
Tire size	145/80 R 13	145/80 R 13
Minimum and recommended tire pressure	3.0	43.5
Wheel bolts	M 12 x 1.5	M 12 x 1.5

Tab. 22 Technical data – tires and wheel bolts

2.4.3 Wheel nut/bolt tightening torque

Fixing medium	Thread	Wrench size	Torque [lbf in]
Wheel bolt	M 12 x 1.5	19	800

Tab. 23 Wheel nut/bolt tightening torque

2.4.4 Towbar tightening torque

Components	Thread	Strength category	Torque [lbf in]
Ball coupling	M12	8.8	765
Towing eye	M12	8.8	765
Towbar	M12	8.8	765
	M16	8.8	1860

Tab. 24 Towbar tightening torque

2.5 Compressor

2.5.1 Working pressure and FAD

Maximum working gauge pressure [psig]	100	–	–	–
SIGMA airend	191	–	–	–
Free air delivery [cfm]	180	–	–	–
FAD as per ISO 1217:2009. Annex D				

Tab. 25 Working pressure and FAD

2.5.2 Compressed air outlet

Outlet valve ["]	Number
G 3/4	2
G 1	1

Tab. 26 Compressed air distributor

2.5.3 Air quality at the compressed air outlets

The compressed air outlets at the air distributor are labelled with the identifiers of compressed air quality.

Interrelation between compressed air treatment and compressed air quality:

Air Treatment		Compressed air quality	
Option designation	Components	Characteristics	Abbreviation
ea / ec	Tool lubricator	Lubricated	E

Tab. 27 Interrelation between compressed air treatment and compressed air quality

2.5.4 Safety relief valve

Maximum working pressure: See machine nameplate

Maximum working pressure [psig]	100	–	–	–
Relief valve activating pressure* [psig]	140	–	–	–
*The safety relief valve is fitted onto the oil separator tank.				

Tab. 28 Relief valve activating pressure

2.5.5 Temperature

A combination valve automatically regulates the compressor temperature depending on the ambient temperature.

Temperatures	Values	
Airend compressed air outlet [°F]	194	140

Temperatures	Values	
Ambient [°F]	50	77

Tab. 29 Airend discharge temperature

Machine temperatures	Values
Recommended airend discharge temperature for switching to load [°F]	86
Typical airend discharge temperature during operation [°F]	167 – 212
Maximum airend discharge temperature (automatic safety shut-down) [°F]	239

Tab. 30 Machine temperatures

2.5.6 Cooling oil recommendation

A sticker showing the type of oil used is located near the oil separator tank filler.

Information on ordering cooling oil is found in chapter 11.

Characteristic	SIGMA FLUID	
Oil grade	S–460	MOL
Classification	Silicone-free, synthetic oil	Mineral oil
Application	Standard oil for all applications except in connection with foodstuffs. Particularly suitable for machines with a high duty cycle.	Standard oil for all applications except in connection with foodstuffs. Particularly suitable for machines with a low duty cycle.
Approval	—	—
Viscosity at 104 °F	45 mm^2/s (D 445; ASTM test)	44 mm^2/s (DIN 51562–1)
Viscosity at 212 °F	7.2 mm^2/s (D 445; ASTM test)	6.8 mm^2/s (DIN 51562–1)
Flash point	460 °F (D 92; ASTM test)	428 °F (ISO 2592)
Density at 59 °F	864 kg/m^3 (ISO 12185)	–
Pour point	-50.8 °F (D 97; ASTM test)	-27.4 °F (ISO 3016)
Demulsibility at 29 °F	40/40/0/10 min (D 1401; ASTM test)	–

Tab. 31 Cooling oil recommendation

2.5.7 Cooling oil charge

Cooling oil	Fluid volume [qt]
Machine	9.5

Tab. 32 Cooling oil charge

2.6 Engine

2.6.1 Engine data

Feature	Specification
Make/Model	Kubota V1505–T
Engine control	Mechanical
Fuel injection	Mechanical
Rated engine power [hp]	44.3
Speed at LOAD mode [rpm]	3000
speed at IDLE mode [rpm]	2200
Type of fuel	Diesel *
Fuel consumption under LOAD mode [gal/h]	2.4
Oil consumption related to fuel consumption [%]	approx. 0.2
* Use only diesel fuel to EN 590 or ASTM D975. Consult the engine manufacturer on the use of other fuels if necessary.	

Tab. 33 Engine data

2.6.2 Oil recommendation

The engine oil must meet the following classification:

- ACEA, class E4, E7
- API, class CF, CI-4

The engine is filled initially with engine oil of viscosity class SAE 10W–40 .

Ambient temperature [°F]	Viscosity class
−22 86	SAE 0W–30 SAE 5W–30
−22 104	SAE 0W–40 SAE 5W–40
−4 86	SAE 1 W–30
−4 104	SAE 10W–40
5 104	SAE 15W–40
23 104	SAE 20W–50

Tab. 34 Engine oil recommendation

2.6.3 Fuel recommendation

The diesel fuel must meet the requirements of EN 590 and ASTM D975 respectively.

According to these standards a specific portion of bio-diesel is permitted in the fuel.

Depending on the country of origin, bio-diesel can be produced from different plant materials and thus have different properties.

Affected by temperature, atmospheric oxygen, and time, these bio-diesel components in the fuel may decompose in the fuel and thus cause damages within the fuel system.

The use of other fuels as well as the mixing with additives is only permitted after consultation with the engine manufacturer.

The engine service manual gives further information on fuel use.

2.6.4 Engine coolant recommendation

The engine coolant must meet the requirements of specification ASTM D4985.

Do not use a common coolant and/or antifreeze that meets only the requirements of ASTM D3306. Such coolants are intended only for light use in vehicles and could shorten the useful life of the engine.

The engine service manual gives further information on coolant application.

2.6.5 Fluid volumes

Description	Fluid volume [gal]
Engine oil	2.1
Fuel	21.1
Coolant	1.9

Tab. 35 Fluid volumes

2.6.6 Batteries

Feature	Value
Voltage [V]	12
Capacity [Ah]	60
PTC testing current [A] (according to EN 50342)	480

Tab. 36 Batteries

Further information Depending on machine equipment, a higher capacity battery may be required. See chapter 2.7.2.

2.7 Options

2.7.1 Option ea, ec
Tool lubricator

Name	Temperature range [°F]	Fluid volume [gal]
Special road breaker lubricant	−13 – 122	0.7

Tab. 37 Road breaker lubricant recommendation

2.7.2 Option ba
Low temperature equipment

2.7.2.1 Ambient conditions

Positioning	Limit value
Maximum elevation amsl* [ft]	3000
Minimum ambient temperature [°F]	−13
Maximum ambient temperature [°F]	122
*Higher altitudes are permissible only after consultation with the manufacturer.	

Tab. 38 Ambient conditions, low temperature equipment

2.7.2.2 Option bb
Coolant pre-heater

Coolant pre-heater	Value
Voltage [V]	230
Power [W]	600

Tab. 39 Coolant pre-heater

2.7.2.3 Option bc
Compressed air line frost protection

Anti-freeze	Fluid volume [qt]
Wabcothyl	0.32

Tab. 40 Recommended anti-freeze

3 Safety and Responsibility

3.1 Basic instructions

The machine is manufactured to the latest engineering standards and acknowledged safety regulations. Nevertheless, dangers can arise through its operation:

- danger to life and limb of the operator or third parties,
- Impairments to the machine and other material assets.

⚠ Disregard of warning or safety instructions can cause serious injuries!

➢ Use this machine only if it is in a technically perfect condition and only for the purpose for which it is intended; observe all safety measures and the instructions in the service manual!

➢ Immediately rectify (have rectified) any faults that could be detrimental to safety!

3.2 Specified use

The machine is intended solely for generating compressed air for industrial use. Any other use is considered incorrect. The manufacturer is not liable for any damages that may result from incorrect use. The user alone is liable for any risks incurred.

➢ Keep to the specifications listed in this service manual.

➢ Operate the machine only within its performance limits and under the permitted ambient conditions.

➢ Do not use compressed air for breathing purposes unless it is specifically treated.

➢ Do not use compressed air for any application that will bring it into direct contact with food products unless it is specifically treated.

3.3 Incorrect Use

Improper usage can cause damage to property and/or (severe) injuries.

➢ Only use the machine as intended.

➢ Never direct compressed air at persons or animals.

➢ Do not use untreated compressed air for breathing purposes.

➢ Do not allow the machine to take in toxic, acidic, flammable, or explosive gases or vapors.

➢ Do not operate the machine in areas in which specific requirements with regard to explosion protection are in effect.

3.4 User's Responsibilities

3.4.1 Observe statutory and universally accepted regulations

➢ Observe relevant statutory and accepted regulations during operation, transporting and maintenance of the machine.

3.4.2 Determining personnel

Suitable personnel are experts who, by virtue of their training, knowledge, and experience as well as their knowledge of relevant regulations can assess the work to be done and recognize the possible dangers involved.

Authorized operators possess the following qualifications:

- are of legal age,
- are familiar with and adhere to the safety instructions and sections of the service manual relevant to operation,
- have received adequate training and authorization to operate vehicles and electrical and compressed air devices.

Authorized maintenance personnel possess the following qualifications:

- are of legal age,
- have read, are familiar with and adhere to the safety instructions and sections of the service manual applicable to maintenance,
- are completely familiar with the safety concepts and regulations of motor vehicle, electrical and compressed air engineering,
- are able to recognize the possible dangers of motor vehicle, electrical and compressed air devices and take appropriate measures to safeguard persons and property,
- have received adequate training in and authorization for the safe installation and maintenance of this machine.

Authorized transport personnel possess the following qualifications:

- are of legal age,
- are familiar with and adhere to the safety instructions and sections of the service manual relevant to transporting,
- are trained and authorized in safe vehicle transporting,
- are familiar with the safety regulations relating to handling motor vehicles and transport goods,
- are able to recognize the possible dangers of motor vehicles and take appropriate measures to safeguard persons and property.

➢ Ensure that personnel entrusted with operation, maintenance and transporting are qualified and authorized to carry out their tasks.

3.4.3 Adherence to inspection schedules and accident prevention regulations

The machine may be subject to local inspection schedules.

➢ Ensure that local inspection schedules are adhered to.

3.4.4 Attachment of a "Hazardous goods" label

The special regulation 363 "Transport of machines and equipment with liquid fluids" of the European regulations for the hazardous goods transport (ADR) has taken effect.

This regulation requires that machines filled with more than 0.26 gallons petrol or 1.32 gallons diesel (in the fuel tank) during transport must be identified with hazardous goods labels on the machine's exterior.

Number of labels per machine:

- *Fuel tank content 16 - 119 gallons*
  - ➢ Attach one label to the exterior.
- *Fuel tank content 120 gallons - 396 gallons*
  - ➢ Attach one label on every exterior side.

The operator of the machine but also the authorised users and transport personnel are responsible for compliance with this requirement. Please instruct your employees accordingly.

A violation of this regulation will be punished with a fine and the further machine transport will be forbidden.

➢ Have a "Hazardous goods" label attached.

Further information Chapter 3.7 “Safety signs” indicates the suggested position(s) for the hazardous goods label(s).

3.5 Dangers

Basic instructions

The following describes the various forms of danger that can occur during machine operation.

Basic safety instructions are found in this service manual at the beginning of each chapter in the section entitled 'Safety'.

Warning instructions are found before a potentially dangerous task.

3.5.1 Safely dealing with sources of danger

The following describes the various forms of danger that can occur during machine operation.

Exhaust fumes

Exhaust gases from combustion engines contain carbon monoxide, a color- and odor- less but highly toxic gas. The inhalation of minute quantities can be lethal.
Furthermore, diesel exhaust contains soot particles, some of which are noxious.

➢ Do not inhale exhaust fumes.

➢ Park the machine in such a manner that the exhaust cannot blow towards the operators.

➢ Never use the machine in enclosed spaces, only in the open.

Fire and explosion

Spontaneous ignition and combustion of fuel can result in serious injury or death.

➢ Do not allow open flames or sparks at the place of use.

➢ Do not smoke while refueling.

➢ Never refuel the machine when it is running.

➢ Do not allow fuel to overflow.

➢ Wipe up spilled fuel immediately.

➢ Provide a fire extinguisher in the immediate vicinity.

➢ For operation in combustible environment, fit the machine with an exhaust silencer (Option la).

Hot coolant

The cooling system of a liquid-cooled engine at running temperature is under high pressure. Coolant can spray out when the filler cap is opened causing severe burns.

- ➢ Let the machine cool down before opening the cooling system.
- ➢ Unscrew the filler cap carefully by a quarter to half a turn at first. Remove the filler cap only when pressure has escaped completely.

Electricity

Touching voltage-carrying components can result in electric shocks, burns, or death.

- ➢ Allow only qualified and authorized electricians or trained personnel under the supervision of a qualified and authorized electrician to carry out work on electrical equipment according to electrical engineering regulations.
- ➢ Check regularly that all electrical connections are tight and in proper condition.
- ➢ Switch off any external power sources.
  For example, the connections to the electrical engine cooling water pre-heater.

Forces of compression

Compressed air is contained energy. Uncontrolled release of this energy can cause serious injury or death. The following information concerns work on components that could be under pressure.

- ➢ Wait until the compressor has automatically vented. (Check the pressure gauge: it must read 0 psig!)
- ➢ Then open an outlet valve carefully to ensure that the line between the minimum pressure / check valve and the compressed air outlet is vented.
- ➢ Do not carry out welding, heat treatment, or mechanical modifications to pressurized components (e.g. pipes and vessels) as this influences the component's resistance to pressure. The safety of the machine is then no longer ensured.

Compressed air quality

The composition of the compressed air must be suitable for the actual application in order to preclude health and life-threatening dangers.

- ➢ Use appropriate systems for air treatment before using the compressed air from this machine as breathing air (fresh air reinforcement) and/or for the processing of food products.
- ➢ Use food-grade cooling oil whenever compressed air is to come into contact with food products.

Spring forces

Springs under tension or compression store energy. Uncontrolled release of this energy can cause serious injury or death.
Minimum pressure / check valves, safety relief valves, and inlet valves are powerfully spring-loaded.

- ➢ Do not open or dismantle any valves.

Rotating components

Touching the fan wheel, the coupling, or the belt drive while the machine is switched on can result in serious injury.

- ➢ Do not open the access doors or panels while the machine is running.

- ➢ Switch off and lock out the machine and check that no voltage is present before opening the access doors or canopy.
- ➢ Wear close-fitting clothes and a hair net if necessary.
- ➢ Ensure that all covers and safety guards are in place and secured before restarting.

Temperature

The operation of the combustion engine and the compression generate high temperatures. Touching hot components may cause injuries.

- ➢ Avoid contact with hot components.
  These include, for example, engine, compressor airend, oil and compressed air lines, coolers, and oil separator tank. Any objects in or near the flow of exhaust gas or discharged cooling air will become very hot.
- ➢ Wear protective clothing.
- ➢ Wear protective gloves when connecting or disconnecting compressed air hoses.
- ➢ Allow the machine to cool down before commencing any maintenance work.
- ➢ If welding is carried out on or near the machine, take adequate measures to prevent sparks or heat from igniting oil vapors or parts of the machine.

Noise

The enclosure absorbs the machine noise to a tolerable level. This function will be effective only if the bodywork is closed.

- ➢ Operate the machine only with closed bodywork and intact sound insulation.
- ➢ Wear hearing protection if necessary.
  The blowing-off of the safety relief valve can be particularly loud.
- ➢ Never generate compressed air without air consumers being connected.

Operating fluids/materials

The used operating fluids and materials can cause adverse health effects. Suitable safety measures must be taken in order to prevent injuries.

- ➢ Strictly forbid fire, open flame, and smoking.
- ➢ Follow safety regulations when dealing with fuel, lubricants, antifreeze, and chemical substances.
- ➢ Avoid contact with skin and eyes.
- ➢ Do not inhale fumes or vapors from fuel or oil.
- ➢ Do not eat or drink while handling fuel, cooling and lubricating fluids, or antifreeze.
- ➢ Keep suitable fire extinguishing agents ready for use.
- ➢ Use only KAESER approved operating materials.

Unsuitable spare parts

Unsuitable spare parts compromise the safety of the machine.

- ➢ Use only spare parts approved by the manufacturer for use in this machine.
- ➢ Use only genuine KAESER replacement parts on pressure bearing parts.

Conversion or modification of the machine

Modifications, additions to, or conversions of the machine can result in unpredictable hazards.

- ➢ Do not convert or modify the machine!
- ➢ Do not install any non-approved additional components.
- ➢ Do not make any changes to the machine that will increase its weight beyond the permissible limit and/or endanger its safe use or transportation.
- ➢ Obtain written approval by the manufacturer prior to any technical modification or expansion of the machine or controller.

3.5.2 Safe machine operation

The following is information supporting you in the safe handling of the machine during individual product life phases.

Personal protective equipment

When working on the machine you may be exposed to dangers that can result in accidents with severe adverse health effects.

- ➢ Wear protective clothing as necessary.

Suitable protective clothing (examples):

- Safety workwear
- Protective gloves
- Safety boots
- Eye protection
- Ear protection

3.5.2.1 Transporting

The weight and size of the machine require safety measures during its transport to prevent accidents.

- ➢ Allow transportation only by personnel trained in safely dealing with motor vehicles and the transporting of goods.
- ➢ Ensure that no persons are on the machine when transporting.

Transporting as trailer

Non-compliance with the basic rules for safe trailer operation may cause severe accidents during machine transport.

- ➢ The maximum permissible load for the towing vehicle coupling and the maximum coupling load given for the machine must not be exceeded.
- ➢ Avoid causing a shift in the center of gravity by an excessive or incorrectly distributed load.
- ➢ Do not tow in a manner that will impose excessive stress on the machine or chassis.
- ➢ Adjust towing speed to accommodate ground conditions. This applies particularly to unpaved roads and when taking curves.
- ➢ The towbar must be parallel with the ground otherwise towing instability can develop, resulting in damage to the machine and/or towing vehicle.
- ➢ Before moving the machine, make sure any security devices (e.g. anti-theft chain) are released.

Transporting as trailer on public roads

- ➢ Do not tow machines without illumination and signaling equipment on public roads.
- ➢ Ensure all running gear, including chassis, wheels, brakes, signalling and lighting, is in safe condition.
- ➢ The local laws and regulations regarding the use of public roads must be observed.

Transporting with a crane

Non-compliance with the safety regulations for load suspension and hoisting equipment may cause severe accidents during lifting and moving the machine with cranes.

- ➢ Do not enter the danger zone while the machine is being lifted.
- ➢ Never lift and move the machine over people or occupied buildings.
- ➢ Avoid extreme weight shifting caused by additional loads or additions (tilting).
- ➢ Do not exceed the lifting capacity on the machine's lifting point (lifting eye).
- ➢ Only the designated lifting point should be used to attach lifting gear and under no circumstances are handles, towbar or other components to be used.
- ➢ Use only hooks and shackles that comply with local safety regulations.
- ➢ Do not attach cables, chains or ropes directly to the machine's lifting eye.
- ➢ Do not manipulate the crane suspension system, in particular the holding points of the crane lifting eye.
- ➢ If screwed crane fixings had to be removed, please use only new self-locking nuts when installing.
- ➢ Avoid jerking when lifting, as this may damage components.
- ➢ Loads must be slowly lifted and carefully set down.
- ➢ Never allow the load to hang from the crane longer than necessary.

The following are forbidden:

- Air transport of the machine by slinging beneath a helicopter.
- Dropping by parachute.

3.5.2.2 Positioning

A suitable installation location for the machine prevents accidents and faults.

- ➢ Do not position the machine directly against a wall. A build up of heat from the exhaust can damage the machine.
- ➢ Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.
- ➢ Do not operate in areas in which specific requirements regarding explosion protection are in force.
- ➢ Ensure adequate ventilation.
- ➢ Place the machine in such a manner that the working conditions in its environment are not impaired.
- ➢ Comply with limit values for ambient temperature and humidity.
- ➢ The intake air must not contain any damaging contaminants,

Damaging contaminants are for instance:

- Exhaust gases from internal combustion engines,

- Flammable, explosive, or chemically instable gases and vapors.
- Acid or base forming substances such as ammonia, chlorine, or hydrogen sulfide.

➢ Do not position the machine in warm cooling outlet air from other machines.
➢ Keep suitable fire extinguishing agents ready for use.
➢ Chock the wheels to prevent unwanted movement.
➢ Do not place additional loads on the machine (e.g. excavator bucket as anti-theft measure).

3.5.2.3 Commissioning, operation and maintenance

During commissioning, operation and maintenance you may be exposed to dangers resulting from electricity, pressure, and temperature. Careless actions can cause accidents with severe adverse effects for your health.

➢ Allow maintenance work to be carried out only by authorized personnel.
➢ Wear close-fitting, flame-resistant clothing. Wear protective clothing as necessary.
➢ Switch off the machine and lock out the supply disconnecting device.
➢ Wait until the compressor has automatically vented (check: The pressure gauge must read 0 psig!)
➢ Then open the outlet valve carefully to ensure that the line between the minimum pressure / check valve and the compressed air outlet is vented.
➢ Allow the machine to cool down.
➢ Do not open the bodywork while the machine is switched on.
➢ Do not open or dismantle any valves.
➢ Use only spare parts approved by KAESER for use in this machine.
➢ Carry out regular inspections:

- for visible damage and leakage,
- of safety devices,
- of the EMERGENCY STOP push button,
- of parts needing monitoring.

➢ Pay particular attention to cleanliness during all maintenance and repair work. Cover components and openings with clean cloths, paper or tape to keep them clean.
➢ Do not leave any loose components, tools, or cleaning rags on or in the machine.
➢ Components removed from the machine can still be dangerous.
Do not attempt to open or destroy any components taken from the machine.
➢ Use only suitable compressed air hoses.

Compressed air hoses must meet the following requirements:

- that are of the right type and size for the highest permissible machine working pressure,
- that are not damaged, worn or of reduced quality,
- that have hose couplings and connections of the right type and size.

➢ Make sure compressed air hoses are depressurized before disconnecting from the machine.
➢ Secure the open end of an air hose before applying air pressure. An unsecured hose may whiplash and cause injury.
➢ At working pressures >100 psig, compressed air hoses should be secured by a cable to their respective outlet valves.

3.5.2.4 Parking the compressor

Improper parking and use of the parked machine endangers personnel and material.

- ➢ Select an even surface for parking.
- ➢ Use a coupled towing vehicle to move the machine into position.
- ➢ Place chocks under the wheels.
- ➢ Pull on the parking brake.
- ➢ Loosen the lighting and signaling system.
- ➢ Detach the breakaway cable / safety chain.
- ➢ Lower the prop stand / wind down the jockey wheel.
- ➢ Uncouple the compressor.
- ➢ Ensure that the machine is properly separated from the towing vehicle.
- ➢ Remove the towing vehicle from the machine.
- ➢ Nobody must enter the parked machine or, in particular, its chassis.
- ➢ Nobody must sit on the parked machine or, in particular, its towing mechanism.

3.5.2.5 Decommissioning, storage, disposal

Improper handling of old operating fluids and components represent a danger for the environment.

- ➢ Drain out fluids and dispose of according to environmental regulations.
  These include, for example, fuel, engine oil, compressor cooling oil, and engine coolant.
- ➢ Dispose of the machine in accordance with local environmental regulations.

3.5.3 Organizational Measures

- ➢ Designate personnel and their responsibilities.
- ➢ Give clear instructions on reporting faults and damage to the machine.
- ➢ Give instructions on fire reporting and fire-fighting measures.

3.5.4 Danger areas

The table gives information on areas dangerous to personnel.

Only authorized personnel may enter these areas.

Task	Danger area	Authorized personnel
Transport	Within a 10 ft radius of the machine.	Operating personnel to prepare for transport. No personnel during transport.
	Beneath the lifted machine.	No personnel!
Commissioning	Within the machine. Within a 3 ft radius of the machine.	Maintenance personnel
Operation	Within a 3 ft radius of the machine.	Operating personnel
Maintenance	Within the machine. Within a 3 ft radius of the machine.	Maintenance personnel

Tab. 41 Danger areas

3.6 Safety devices

Safety devices ensure safe working with the machine.

- ➢ Do not change, bypass or disable safety devices.
- ➢ Regularly check safety devices for their correct function.
- ➢ Do not remove or obliterate labels and notices.
- ➢ Ensure that labels and notices are clearly legible.

Further information — More information on safety devices is contained in chapter 4.6.

3.7 Safety signs

The diagram shows the locations of safety signs on the machine. The table lists the various safety signs used and their meanings.

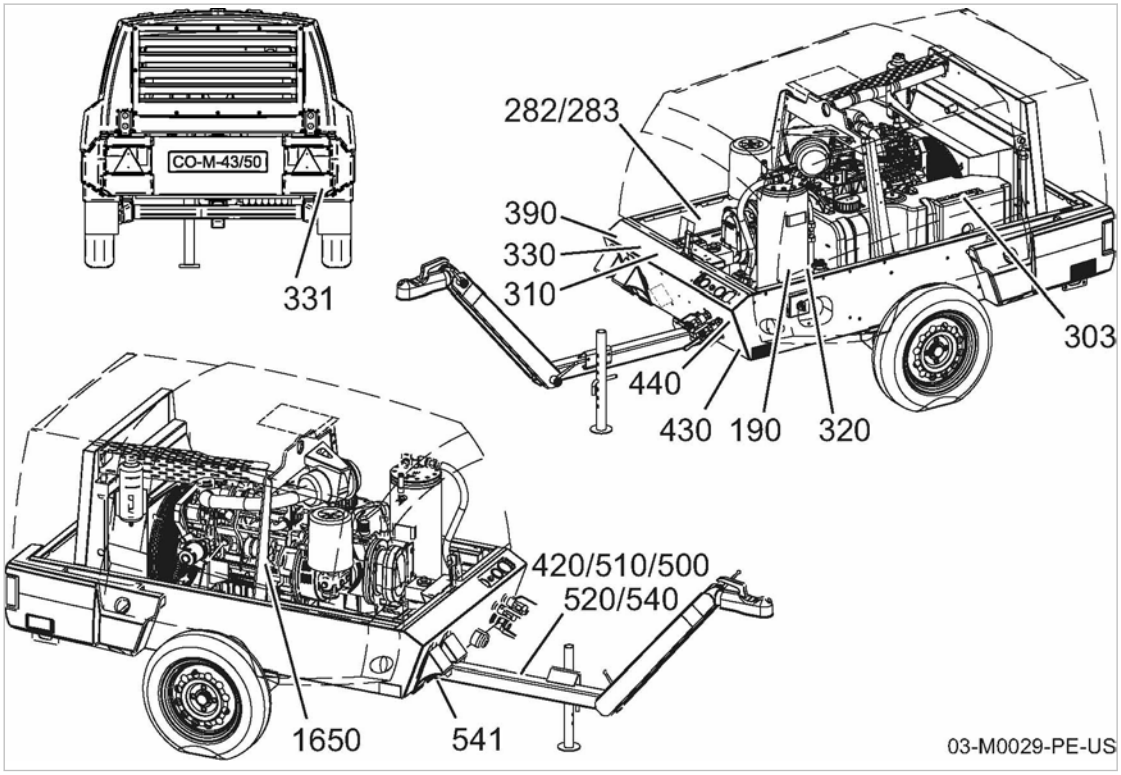


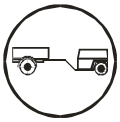
Fig. 2 Location of safety signs

Position	Symbol	Meaning
190*		Wrong cooling oil level. Risk of machine defects or rising oil consumption (oil content for pure air). ➢ Check cooling-oil level. ➢ Run the machine only with proper cooling-oil level.

*Location within the machine
**Only towable machines
***Only machines equipped with Option ga, gb

Position	Symbol	Meaning
282		Explosive hydrogen gas. Severe injury or death could result from exploding gas. ➢ Keep flames, sparks, and other sources of ignition away.
283		Battery contains acid. Severe injury results from contact with battery acid. ➢ Do not allow battery acid to contact eyes, skin, clothing, or painted surfaces. ➢ Do not attempt to jump-start if battery fluid is frozen. ➢ Bring temperature of battery up to at least 60°F before attempting to jump-start - it may explode!
303		Fire or explosion caused by refueling. Severe injury or death result from inflaming fuel. ➢ Use diesel fuel only. ➢ NEVER attempt to refuel the compressor while it is operating. ➢ Always replace fuel filter cap after refueling. ➢ Always wipe up fuel spills which may occur inside the compressor enclosure and allow the machine to ventilate.
310 311		Injury or damage from open machine. ➢ Operate the machine only when closed. ➢ Transport the machine only when closed.
320*		Loud noise and oil mist when the safety relief valve opens. Ear damage and burns can result. ➢ Wear ear protection and protective clothing. ➢ Close all maintenance doors and cover panels. ➢ Work carefully.
330 331		Hot surface can cause burns. ➢ Let the machine cool down. ➢ Work carefully. ➢ Wear protective clothing and gloves.
390		Rotating fan blades and v-belt drive. Severe injury could result from touching the fan blades and v-belt drive while it is rotating. ➢ Never switch the machine on without a guard in place over the fan blade. ➢ Isolate completely from the power supply (all conductors) and ensure the supply cannot be switched on again (lock off).
420		Injury or damage can result because tongue weight on this equipment may be heavy. ➢ Do not lift towbar by hand if weight is more than you can safely handle. ➢ See safety section of service manual.

*Location within the machine
**Only towable machines
***Only machines equipped with Option ga, gb

Position	Symbol	Meaning
430		Connect air hoses only in full compliance with OSHA standard 29 CFR 1926,302 (bX7). The required safety devices should be tested in accordance with their manufacturer's recommendations to verify that they reduce pressure in case of hose failure and will not nuisance trip with the hose and tool combinations in use.
440		Compressed air quality. Injury and/or contamination can result from breathing compressed air. Contamination of food can result from using untreated compressed air for food processing. ➢ Never breathe untreated compressed air! ➢ Air from this compressor must meet OSHA 29 CFR1910.134 and FDA 21 CFR178.3570 standards, if used for breathing or food processing. Use proper compressed air treatment. ➢ Food grade coolant must be used for food processing.
450		Loud noise and compressed air blast! Damage to hearing and injury if ball valve is opened without a compressed air hose being connected. ➢ Connect a suitable compressed air hose. ➢ Open the ball valve.
500**		Towbar load and ground clearance. Danger of fishtailing, incorrect towing vehicle load, damage to the machine caused by rollover or contact with the ground. ➢ Always line up the towbar so that the machine is level with the ground.
510**		Malfunction due to lack of maintenance. Accidents and machine damage possible. ➢ Maintain the chassis regularly. ➢ Follow instructions in the service manual.
520		Always use safety chains! Chains hold trailer if connection fails. ➢ Cross chains underneath coupling. ➢ Allow slack for trailer to run. ➢ Attach chain hooks securely to tow vehicle frame.
540		Machine without breaks. Serious injury or death may result from uncontrolled movement when the unit is not safeguarded by chocks. ➢ Always use chocks before uncoupling and generally when the unit is not in motion. ➢ Do not move unit manually.

*Location within the machine
**Only towable machines
***Only machines equipped with Option ga, gb

Position	Symbol	Meaning
541		Missing chock. Serious injury or death may result from uncontrolled movement when the unit is not safeguarded by chocks. ➢ Always fix chock for proper storage. ➢ Always replace missing chock immediately.
600*		Pressure and spring force! Risk of fatal injury caused by loosening, opening, or dismantling valves or other components that are under pressure or heavy spring loading. ➢ Do not open or dismantle valves. ➢ Contact an authorized KAESER service representative in the event of a fault.
1650*		Machine damage if switched while the engine is running! ➢ Use the «Battery isolating switch» only with the engine stopped. ➢ Do not use the «Battery isolating switch» as a main or emergency switch.

*Location within the machine
**Only towable machines
***Only machines equipped with Option ga, gb

Tab. 42 Safety signs

3.8 Emergency situations

3.8.1 Correct fire fighting

Suitable measures

Calm and prudent action can safe lives in the event of a fire.

- ➢ Keep calm.
- ➢ Give the alarm.
- ➢ Shut down the machine from the instrument panel if possible.
- ➢ Warn and move endangered personnel to safety.
- ➢ Help incapacitated persons.
- ➢ Close the doors.
- ➢ When trained accordingly: Attempt to extinguish the fire.

Extinguishing substances

- ➢ Suitable extinguishing media:
  Foam
  Carbon dioxide
  Sand or soil
- ➢ Unsuitable extinguishing media:
  Strong jet of water

3.8.2 Injury from handling operating fluids/materials

The following operating fluids/materials are in the machine:

- Fuel
- Lubricating oils
- Compressor cooling oil
- Engine coolant
- Battery electrolyte
- Tool lubricant (Option ea)
- Antifreeze (Option ba)

Eye contact

Fuel, oil, and other fluids/materials can cause irritation.

➢ Rinse open eyes thoroughly for a few minutes under running water.

➢ Seek medical advice for persistent irritation.

Skin contact

Fuel, oil, and other fluids/materials may irritate after prolonged contact.

➢ Wash thoroughly with skin cleaner, then with soap and water.

➢ Contaminated clothing should be intensively cleaned before reuse.

Inhalation

Fuel and oil vapors impair breathing.

➢ Clear the respirator tract from fuel or oil vapor.

➢ Seek medical help if difficulty with respiration continues.

Ingestion

➢ Wash out the mouth immediately.

➢ Do not induce vomiting.

➢ Seek medical aid.

3.9 Warranty

This operator manual contains no independent warranty commitment. Our general terms and conditions of business apply with regard to warranty.

A condition of our warranty is that the machine is used for the purpose for which it is intended under the conditions specified.
Due to the multitude applications for which the machine is suitable the obligation lies with the user to determine its suitability for his specific application.

In addition, we accept no warranty obligation for:

- the use of unsuitable parts or operating materials,
- unauthorized modifications,

- incorrect maintenance,
- incorrect repair.

Correct maintenance and repair includes the use of original spare parts and operating materials.

➢ Obtain confirmation from KAESER that your specific operating conditions are suitable.

3.10 Environmental protection

The operation of this machine may cause dangers for the environment.

➢ Do not allow operating materials to escape into the environment or into the sewage system.

➢ Store and dispose of operating materials and replaced parts in accordance with local environmental protection regulations.

➢ Observe relevant regulations.
This applies particularly to parts contaminated with fuel, oil, coolants and acids.

4 Design and Function

4.1 Bodywork

Bodywork is understood to be the exterior of the machine mounted on the chassis.

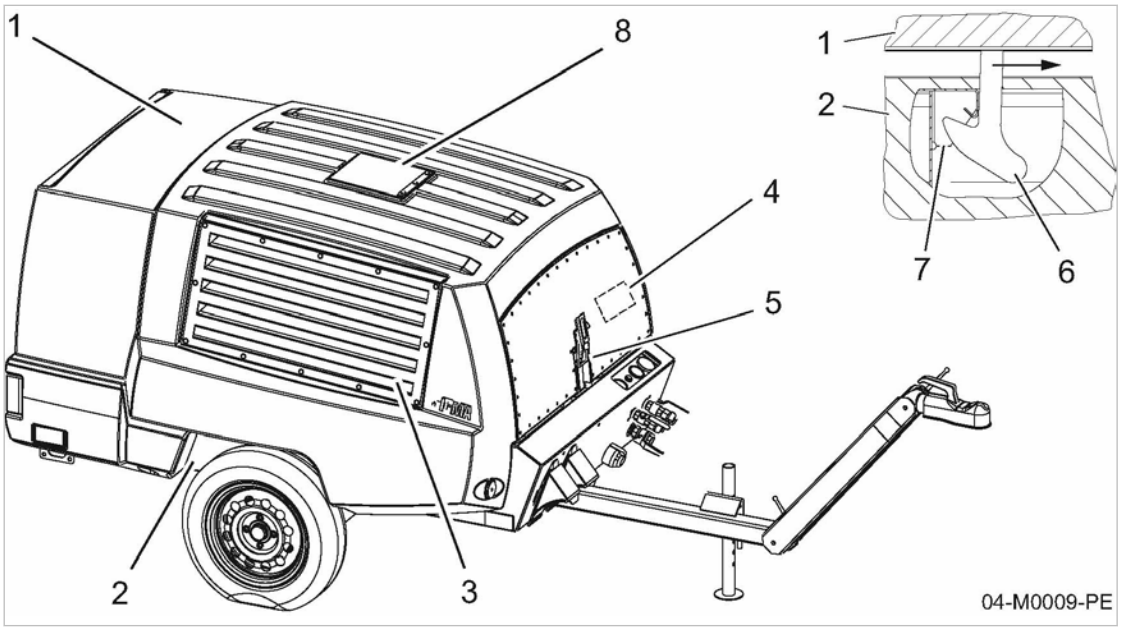


Fig. 3 Bodywork

1	Canopy	5	Snap fastener
2	Lower body	6	Canopy safety catch
3	Cooling air inlet	7	Lock
4	Recessed grip for the canopy	8	Cover for lifting eye

The bodywork has several functions when it is closed:

- Weather protection
- Sound insulation
- Guarding against touching
- Cooling air flow

Safe and reliable operation is only ensured when the bodywork is closed.

The canopy 1 can be opened when the snap fastener 5 and the canopy safety latch 6 are released.
The safety latch is inside the canopy on the right side, next to the handle.
The safety latch can be seen when the snap fastener is released.
If the safety latch is unlocked (pressed in the direction of the arrow), the canopy opens independently.
Two gas-filled springs maintain the opened position of the canopy. For closing the canopy, a recessed grip is incorporated within the canopy 1.

The bodywork is not suitable for the following uses:

- Walking on, standing, or sitting on.
- As a resting place or storage for any kind of load.

4.2 Component identification

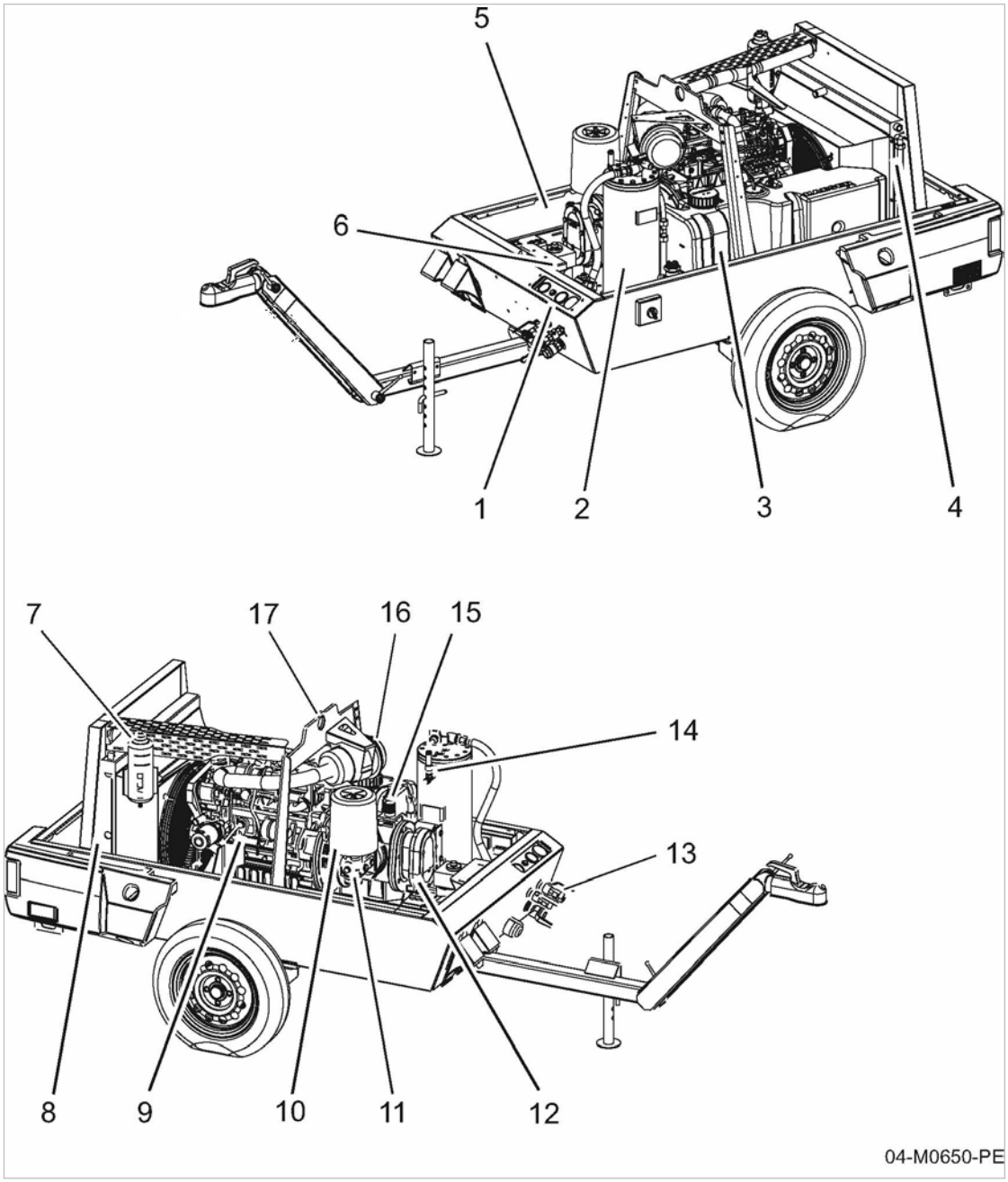


Fig. 4 Side view (canopy removed)

1. Instrument panel
2. Oil separator tank
3. Fuel tank
4. Oil cooler
5. Battery
6. Canopy safety catch lock
7. Coolant expansion tank
8. Water cooler
9. Drive engine
10. Compressor air filter
11. Inlet valve
12. Airend
13. Compressed air outlet valve
14. Safety relief valve
15. Thermostatic valve
16. Engine air filter
17. Lifting eye

4.3 Machine function

Machine function (with options)

Further information Pipe and instrument diagram (P&I diagram), see chapter 13.2.

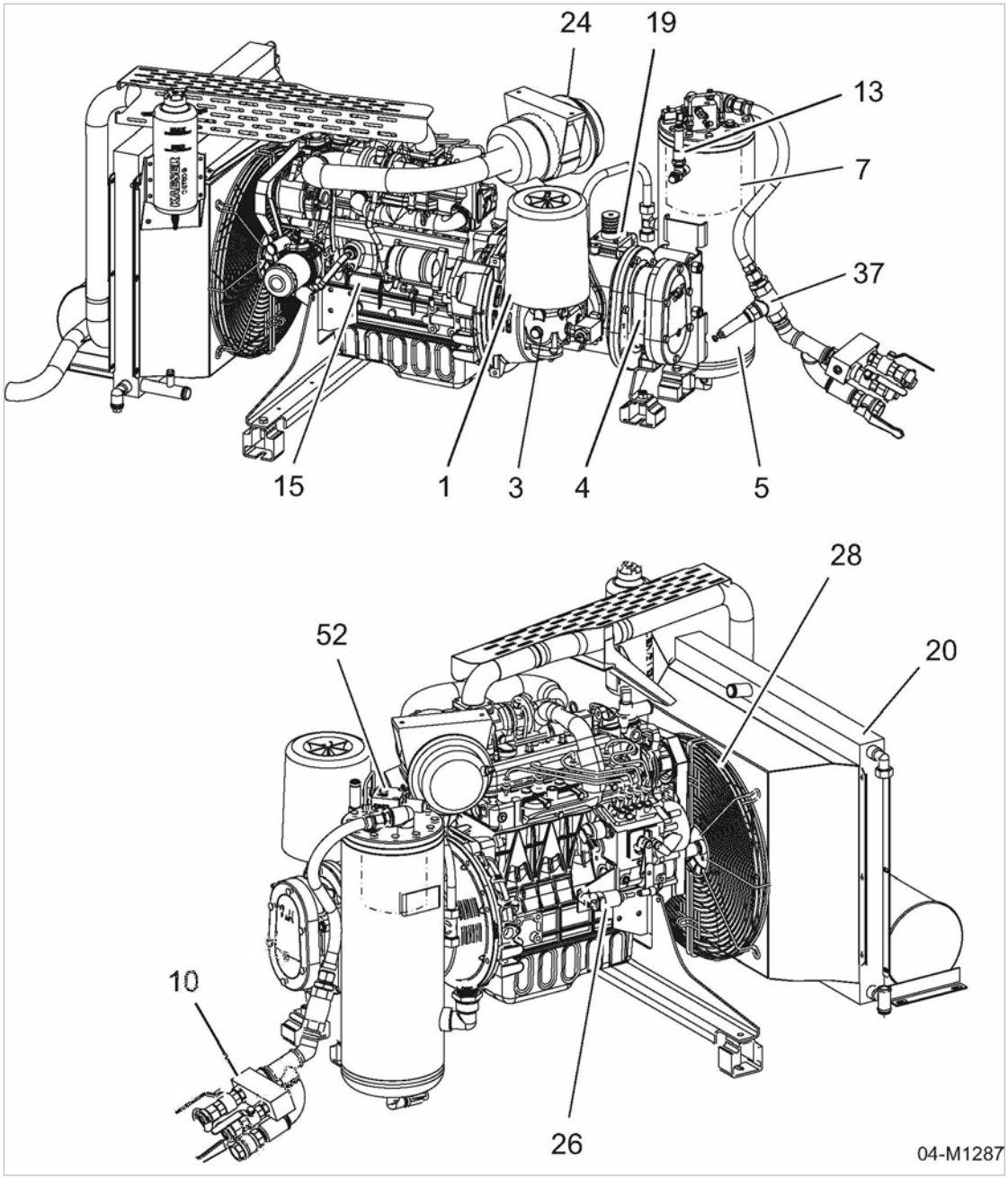


Fig. 5 Machine function

[1]	Compressor air filter	[19]	Thermostatic valve (oil temperature control)
[3]	Inlet valve	[20]	Oil cooler
[4]	Airend	[24]	Engine air filter
[5]	Oil separator tank	[26]	Engine speed control cylinder
[7]	Oil separator cartridge	[28]	Fan
[10]	Air distributor	[37]	Minimum pressure/check valve
[13]	Safety relief valve	[52]	Control valve
[15]	Engine		

Ambient air is cleaned as it is drawn in through the filter [1].

The air is then compressed in the airend [4].

The airend is driven by an internal combustion engine.

Cooling oil is injected into the airend. It lubricates moving parts and forms a seal between the rotors themselves and between them and the airend casing. This direct cooling in the compression chamber ensures a very low airend discharge temperature.

Cooling oil recovered from the compressed air in the oil separator tank [5] gives up its heat in the oil cooler [20]. The oil then flows through the oil filter [21] and back to the point of injection. Air pressure within the machine keeps the oil circulating. A separate pump is not necessary. A thermostatic valve [19] automatically maintains optimum cooling oil temperature.

Compressed air, freed of cooling oil in the oil separator tank [5], flows through the minimum pressure / check valve [37] into the air distributor [10]. The minimum pressure/check valve ensures sufficient internal pressure to maintain cooling oil circulation.

The cooling fan [28] ensures optimum cooling of all components within the enclosure.

4.4 Operating modes and control mode

Further information Pipe and instrument diagram (P&I diagram), see chapter 13.2.

4.4.1 Operating modes

The machine operates in the following modes:

- LOAD
  - The inlet valve is open.
  - The engine runs at maximum speed.
  - The airend delivers compressed air.
- MODULATING
  - With the help of a control valve (the proportional controller) the degree of opening of the inlet valve is continuously varied in response to the air demand.
  - The load and fuel consumption of the engine rises and falls with the air demand.
  - The airend delivers compressed air.
- IDLE
  - The inlet valve is closed.
  - The control valve opens, allowing pressure in the oil separator tank to be applied to the inlet valve.
  - Compressed air then flows in a closed circuit through the airend, the oil separator tank and the control valve.
  - The pressure in the oil separator tank remains constant.
  - The engine runs at minimum speed.
- STANDSTILL (shut down)
  - The inlet valve closes.
  - The venting valve opens to depressurize the machine.
  - The engine stops.

4.4.2 MODULATING control

The control system regulates the volume of air generated to match the actual demand. The machine keeps the working pressure constant by varying the volume of compressed air delivered, thereby matching the air demand.

With the help of a mechanical control valve (the proportional controller), the opening and closing of the inlet valve is continuously varied in relation to the actual air demand. The airend provides compressed air for connected consumers.

This continuous delivery regulation minimizes fuel consumption of the engine. The load and fuel consumption of the engine rises and falls with the air demand.

The control valve [52] is mounted on the oil separator tank cover.
In compact design comprising the following components:

- Proportional controller [23]
- Venting valve [27]
- Combined control valve [62]

4.5 Setting full load operation

Upon starting, the machine initially runs in IDLE mode.
The load valve is not activated.
The unloaded motor run-up protects the machine from unnecessary wear. The motor must run up in unloaded state until an airend discharge temperature of 86°F has been attained.
The airend discharge temperature is shown by the temperature gauge switch. During this run-up phase, the machine is **not** ready to discharge compressed air.

In order to activate the LOAD mode after the warm-up phase, press «Full load ON».
The load valve is activated.
The machine is **ready** for discharging compressed air.
Upon actuation of the «Full load ON» button, the integrated *control indicator* of the «Full load ON» button will light up.

Further information

Start the machine, wait for the motor warm-up to be finished and press «Full load ON» to ensure the maximum compressed air discharge, see also chapter 8.2.

4.6 Safety devices

4.6.1 Monitoring functions with shutdown

The following functions are monitored automatically.

- Engine oil pressure
- Coolant temperature
- Airend discharge temperature
- Engine alternator

The fuel stop device is activated when an alarm occurs. The engine comes to a stop and the venting valve releases pressure from the machine.

4.6.2 Further safety devices

The following safety devices are provided and may not be modified in any way.

- Pressure relief valve:
  This valve protects the system from excessive pressure. It is factory set.
- Enclosures and covers over moving parts and electrical connections:
  These protect against accidental contact.

4.7 Options

The options available for your machine are described below.

4.7.1 Option ea
Tool lubricator

Compressed air containing lubricating oil is needed for the lubrication of certain air tools. The tool lubricator introduces a fine oil mist into the compressed air for this purpose.

A metering valve on the lubricator regulates the amount of oil in the compressed air:

- minimal oil to lubricate the tools and prevent corrosion,
- more oil for cleaning and to prevent wear in the tools.

The oil flow can be stopped by a shut-off valve.

The oil flow adjusts automatically to changes in air demand (one or more tools/air consumers on line).

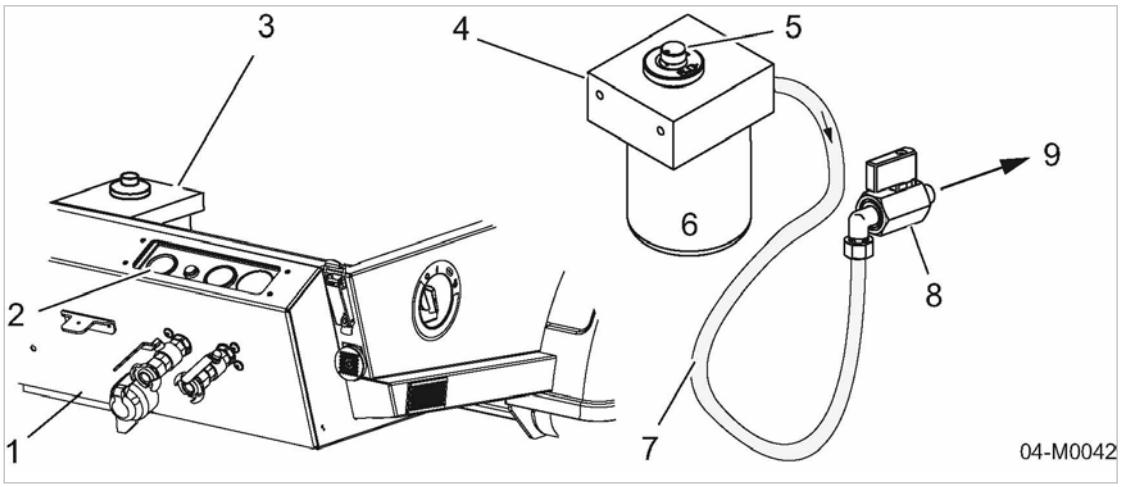


Fig. 6 Tool lubricator

[1]	Bodywork	[6]	Oil tank
[2]	Instrument panel	[7]	Air line
[3]	Location of the tool lubricator	[8]	Shut-off valve (opened)
[4]	Tool lubricator	[9]	Air pipe
[5]	Metering knob		

Please note for air tools not to be lubricated:

NOTICE

Lubrication with tool oil!
Air tools not intended for lubrication can be damaged.

➢ *Blow any residual oil out of the line before connecting such an air tool.*

4.7.2 Option ba
Low temperature equipment options

The machine is fitted with low-temperature equipment for the operation in extremely low temperatures to -13°F.

- The engine coolant can be pre-heated to improve starting under cold conditions.
- Wetting valves and control lines with anti-freeze prevent the freezing of the control and regulating devices.
- The electrical system starts the engine without problem at ambient temperatures to 14°F.

4.7.2.1 Option bb
Coolant pre-heating

The engine coolant can be pre-heated to improve starting under cold conditions.
The power supply to the coolant pre-heater takes place via a separate network connector. A flexible power cable (supplied) connects the machine's power plug to the user's power socket.
The coolant pre-heater works according to the principle of self-circulation.

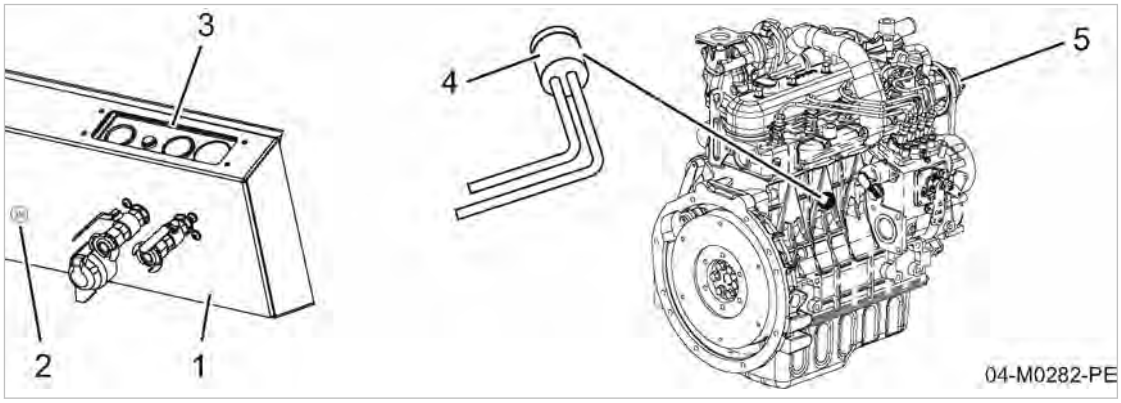


Fig. 7 Coolant pre-heating

1 Bodywork
2 Connection for the coolant pre-heater
3 Instrument panel
4 Coolant pre-heating
5 Drive engine

The ideal coolant pre-heating period is 2-3 hours before the machine is started. A pre-heating period of more than 3 hours is not necessary, as the maximum effect has already been achieved within this period (thermal balance).

Continuous operation of maximum 6 hours must be followed by a rest of approximately 3 hours.

4.7.2.2 Option bc
Frost protection

Control air is mixed with an alcohol-based antifreeze to prevent control and regulating devices from freezing. This considerably lowers the freezing point of any moisture in the air.

At ambient temperatures to -13°F, wetting the valves and control lines with anti-freeze prevents a freezing of the control and regulating devices of a shut-down machine.

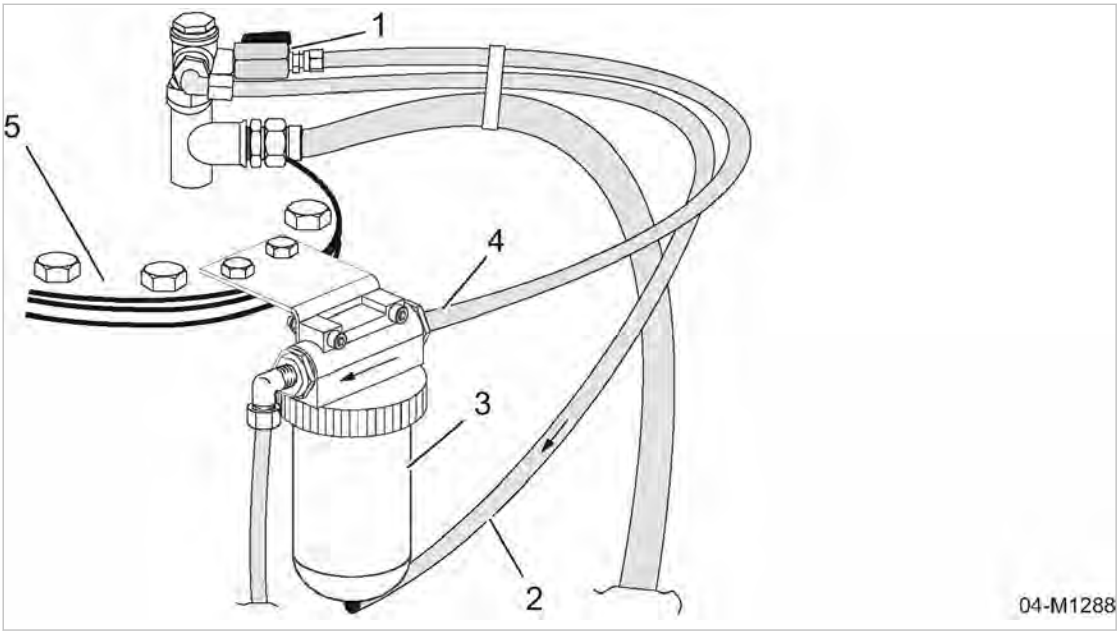


Fig. 8 Frost protection

[1] Shut-off valve
[2] Control line (frost protection)
[3] Frost protector
[4] Control line (bypass line)
[5] Oil separator tank cover

Frost protection

The frost protector comes into action when the machine is stopped in ambient temperatures below 32°F. The compressed air carries anti-freeze to coat control air lines and valves. This prevents freezing of the control and regulating components of a shut-down machine.

The heat of the machine prevents individual control components freezing up during operation.

Summer operation

At ambient temperatures above 32°F it is no longer necessary to inject the control lines in the machine with anti-freeze before shutting it down.

Further information See chapter 7.4.2 for frost protector operation.

4.7.3 Option Ia, Ib Options for operating in fire hazard areas

4.7.3.1 Option Ia Spark arrestor

A spark arrestor on the exhaust silencer is required when operating a diesel engine in a fire hazard area and in forestry and agricultural applications. In such applications, a spark may ignite flammable materials.

The spark arrestor prevents the exhaust silencer from emitting any glowing fuel residue.

4.7.3.2 Option lb
Engine air intake shut-off valve

Any flammable gas drawn into the diesel engine's air intake alters and enriches the controlled fuel/air mixture fed to the engine. This causes a sudden and uncontrolled increase in engine speed that can lead to serious mechanical damage. Without appropriate preventive measures, the engine and compressor can be destroyed. Explosion or fire are also possible.

When flammable gas is drawn into the engine, shutting off the fuel supply will not stop the engine right away. Only by shutting off the air intake can the engine be brought to an immediate stop.

The self-closing valve shuts off the engine air intake as soon as flammable gas is drawn in. This brings the engine to an immediate stop.

4.7.4 Option ne
Fuel de-watering filter option

A combined water and particle filter element is installed to prevent such impurities in lower quality fuel reaching the pump.

4.7.5 Option oe
Sealed floor pan option

The machine is fitted with a sealed floor pan.

In the event of a leak, all liquids required for the machine's operation are caught in the floor pan. Service openings in the floor pan are closed with plugs. These openings must be tightly re-closed after performing any cleaning work.

4.7.6 Option oa
Battery isolating switch

The «battery isolating switch» disconnects the battery completely from the machine's electrical system (fire protection, battery discharge protection).

NOTICE

Danger of short circuit!
Damage to the machine electrical components is possible.

- ➢ *Use the «battery isolating switch» only when the machine is shut down.*
- ➢ *Do not use the «battery isolating switch» as a main or emergency switch.*

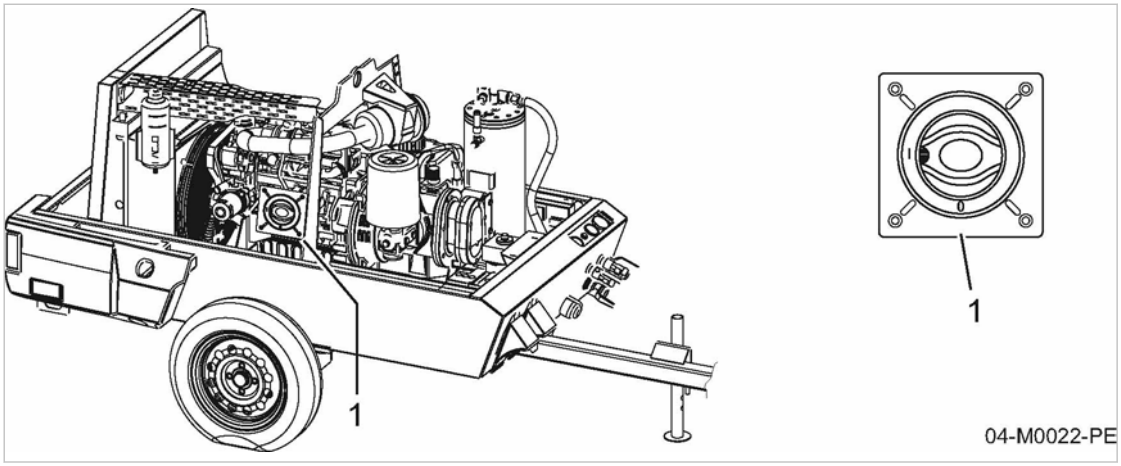


Fig. 9 Battery isolating switch

[1] «Battery isolating switch»

4.7.7 Option ua
Hose reel option

The machine is provided with an extension hose to allow connection and operation of remote air tools. A hose reel is provided for safe storage of this hose.

4.7.8 Option sf
Anti-theft device option

The machine is fitted with a safety chain as theft protection.
The supplied safety chain is stored in a container at the front of the machine.

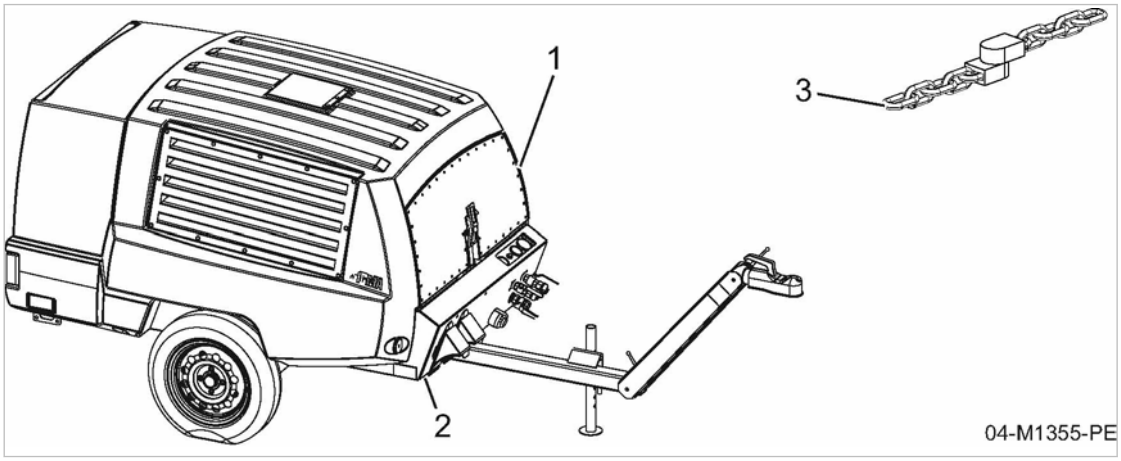


Fig. 10 Container for safety chain

[1] Machine
[2] Container for the safety chain
[3] Safety chain

4.7.9 Transportation options

4.7.9.1 Option rb/rm/rr, rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs, rd/ro/rr, rd/rn/rr Chassis options for road-worthy machines

Option rg/rp/rr Anti-twist protection, towbar

Chassis with the *rg/rp/rr* option are fitted with a rotatable mounted adapter for seating the towing eye or ball coupling. If the trailer is towed over rugged ground, this adapter will offset opposing forces caused by different lateral slope angles of towing vehicle and trailer.
This effectively prevents damages to the chassis geometry of the trailer.

Option rs Overrun brake

The chassis with option *rs* is equipped with an overrun brake. If the towing vehicle brakes during the towing event, the trailer presses the overrun device together to a point where the trailer is actively braked. The stopping distance is significantly less than for a trailer without overrun brake.

Function:

- The overrun device activates the relay lever.
- The relay lever pulls the brake actuating rod with the brake cable.
- The brake joint lock is twisted and spreads the brake shoes in the drum brake.
- The trailer brakes.

Options and their characteristics

Option	Name	Characteristics
rb/rm/rr	EU chassis	■ Single-axle ■ Axle rubber-sprung ■ Prop stand ■ Height-adjustable towbar ■ Safety chains*
rb/rm/rs	EU chassis	■ Single-axle ■ Axle rubber-sprung ■ Automatic jockey wheel ■ Height-adjustable towbar ■ Overrun brake ■ Parking brake ■ Breakaway cable
rc/ro/rr	GB chassis	■ Single-axle ■ Axle rubber-sprung ■ Jockey wheel ■ Fixed height towbar ■ Parking brake ■ Breakaway cable

EU = Europe, GB = Great Britain, US = United States of America
* = country-specific accessories

Option	Name	Characteristics
rg/rp/rr	GB chassis	■ Single-axle ■ Axle rubber-sprung ■ Jockey wheel ■ Fixed height towbar ■ Adapter, mounted rotatable ■ Parking brake ■ Breakaway cable
rc/ro/rs	GB chassis	■ Single-axle ■ Axle rubber-sprung ■ Jockey wheel ■ Fixed height towbar ■ Overrun brake ■ Parking brake ■ Breakaway cable
rd/ro/rr	US chassis	■ Single-axle ■ Axle rubber-sprung ■ Prop stand ■ Fixed height towbar ■ Without parking brake
rd/rn/rr	US chassis	■ Single-axle ■ Axle rubber-sprung ■ Prop stand ■ Adjustable coupling height ■ Without parking brake

EU = Europe, GB = Great Britain, US = United States of America
* = country-specific accessories

Tab. 43 Chassis - overview

Further information For adjusting the chassis, see chapter 6.5.
For dimensional drawings of road-worthy machines, see chapter 13.3.

5 Installation and Operating Conditions

5.1 Ensuring safety

The conditions in which the machine is installed and operated effect the safety of personnel and surroundings.

Warning instructions are located before a potentially dangerous task.

⚠ Disregard of warning instructions can cause serious injuries!

Complying with safety warnings

Disregard of safety warnings can cause unforeseeable dangers!

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ If welding is carried out on or near the machine, take adequate measures to prevent sparks or heat from igniting fuel or oil vapors or parts of the machine.
- ➢ Do not store any flammable materials in the vicinity of the machine.
- ➢ The machine is not explosion-proof!
  Do not operate in areas in which specific requirements with regard to explosion protection are applied.
- ➢ Keep suitable fire extinguishing agents on hand and ready for use.
- ➢ Ensure that required ambient conditions are maintained.

Required ambient conditions may be:

- A specific ambient temperature range
- Air composition at the installation site:
  - clean with no damaging contaminants (e.g., dust, fibers, fine sand)
  - free of explosive or chemically-unstable gases or vapors
  - free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.

5.2 Installation conditions

Precondition The floor must be level, firm and capable of bearing the weight of the machine.

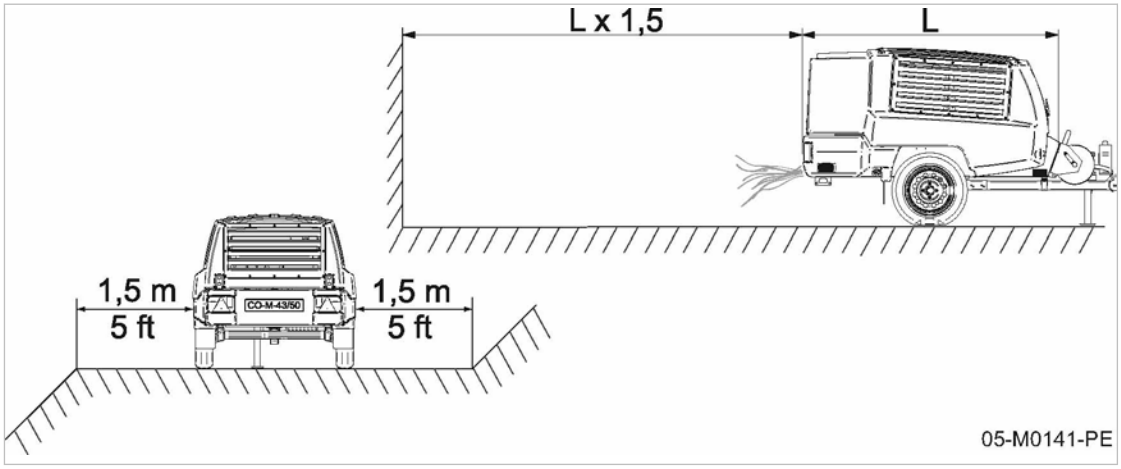


Fig. 11 Minimum distance from excavations/slopes and walls

1. Keep sufficient distance (at least 5 ft) from the edges of excavations and slopes.
2. Ensure that the machine is as level as possible.

The machine can be temporarily operated on a slope of not more than 15° .

3. Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.
4. **NOTICE** *Danger of burning from build up of heat and hot exhaust.*
   Insufficient distance from a wall may well cause heat build-up that could damage the machine.
   - ➢ *Do not position the machine directly against a wall.*
   - ➢ *Ensure always sufficient ventilation space around the machine.*
5. Position the machine as far as possible from any wall.
6. Ensure there is enough free space all round and above the machine.
7. Keep air inlet and outlet openings free of obstructions so that the cooling air can flow freely through the machine.
8. Place the machine in such a manner that
   - wind does not blow into the cooling air outlet.
   - exhaust gases and heated cooling air can not be drawn into the compressor.
9. **NOTICE** *Ambient temperature too low!*
   Frozen condensate and highly viscous engine or compressor cooling oil can cause damage when starting the machine.
   - ➢ *Use winter grade engine oil.*
   - ➢ *Use low viscosity compressor cooling oil.*
   - ➢ *Allow the machine to warm up in IDLE (low speed), see chapter 8.2.2.*
10. At ambient temperatures below 32 °F, follow instructions in chapter 7.4.

6 Installation

6.1 Ensuring safety

Follow the instructions below for safe installation.
Warning instructions are located before a potentially dangerous task.

⚠ Disregard of warning instructions can cause serious injuries!

Complying with safety warnings

Disregard of safety warnings can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 “Safety and Responsibility”.
- ➢ Installation work may only be carried out by authorized personnel.

Further information
Details of authorized personnel are found in chapter 3.4.2.
Details of dangers and their avoidance are found in chapter 3.5.

6.2 Reporting Transport Damage

1. Check the machine for visible and hidden transport damage.
2. Inform the carrier and the manufacturer in writing of any damage found.

6.3 Fitting the towbar

For space reasons, the machine is mounted on a transport frame when delivered.

- Shifted adapter [7] of the height-adjustable towing device.
- Disassembled adapter [7] of the height-adjustable towing device.
- Shifted fixed-height towing device.
- Disassembled fixed-height towing device.

Prior to removal of the transport frame, you must loosen the transport securing means and install and/or adjust the towing device.

Material
Protective gloves
Wrench
Hard rubber hammer

Precondition
The machine is standing firm and level.
The machine is switched off.

⚠ CAUTION
Pinch hazard!
Severe pinching injury to fingers is possible.
- ➢ *Always wear protective gloves.*
- ➢ *Work with caution.*

1. Loosen the transport safety means.
2. Remove the securing strap and the foam from the towing device.

6.3.1 Fitting the height-adjustable towbar

Option rb/rm/rr, rb/rm/rs

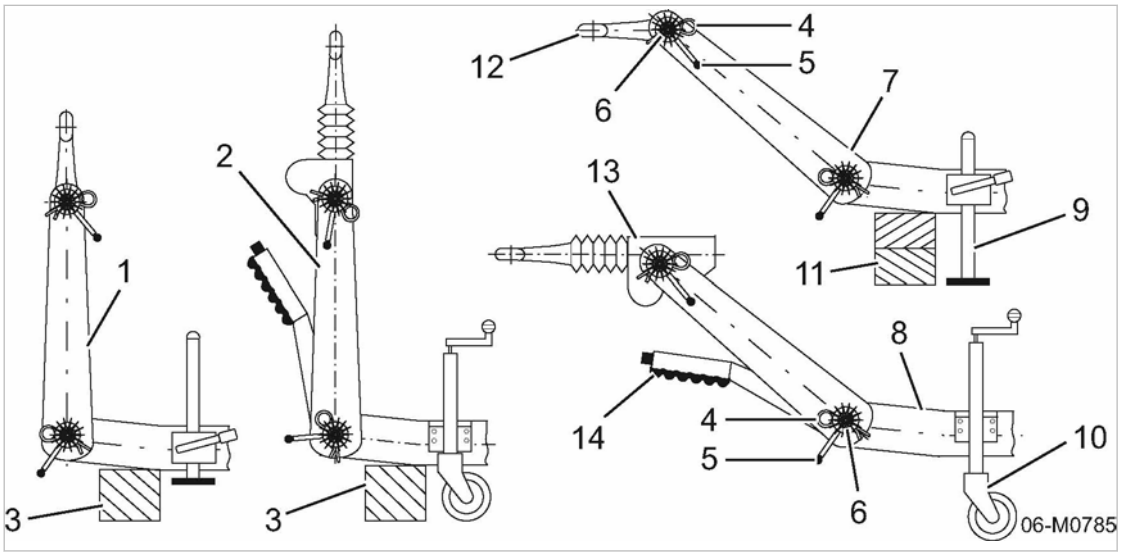


Fig. 12 Fitting the height-adjustable towbar

1	Delivery state, towing device rb/rm/rr	8	Towbar tube
2	Delivery state, towing device rb/rm/rs	9	Prop stand
3	Transport frame	10	Jockey wheel
4	Split pin	11	Support
5	Locking lever	12	Towing eye
6	Joint	13	Overrun braking mechanism
7	Towbar adapter	14	Parking brake

Option rb/rm/rr	Option rb/rm/rs
1. Use a suitable base to jack up the towing device until the machine is in horizontal position. 2. Throw the clamping lever to loosen the support's clamp. 3. Push the support downward. 4. Throw the clamping lever to secure the support's clamp. 5. Draw out both split pins. 6. Loosen the lower locking lever. 7. Adjust the adapter. 8. Tighten the lower locking lever. Make sure the teeth in the adjustment joint mesh together. 9. Loosen the upper locking lever. 10. Bring the towing eye into the horizontal position. 11. Tighten the upper locking lever. Make sure the teeth in the adjustment joint mesh together. 12. Secure both locking levers with a tap of a hammer. 13. Insert both split pins.	1. Crank the jockey wheel downward until the machine is standing horizontally. 2. Draw out both split pins. 3. Loosen the lower locking lever. 4. Adjust the adapter. 5. Tighten the lower locking lever. Make sure the teeth in the adjustment joint mesh together. 6. Loosen the upper locking lever. 7. Bring the overrun braking mechanism into the horizontal position. 8. Tighten the upper locking lever. Make sure the teeth in the adjustment joint mesh together. 9. Secure both locking levers with a tap of a hammer. 10. Insert both split pins.

Result Towing device is pre-assembled.

Further information Adjusting the towbar to the height of the towing device of the towing vehicle, see chapter 6.5.

6.3.2 Fitting the fixed height towbar

Option rc/ro/rr, rg/rp/rr, rc/ro/rs

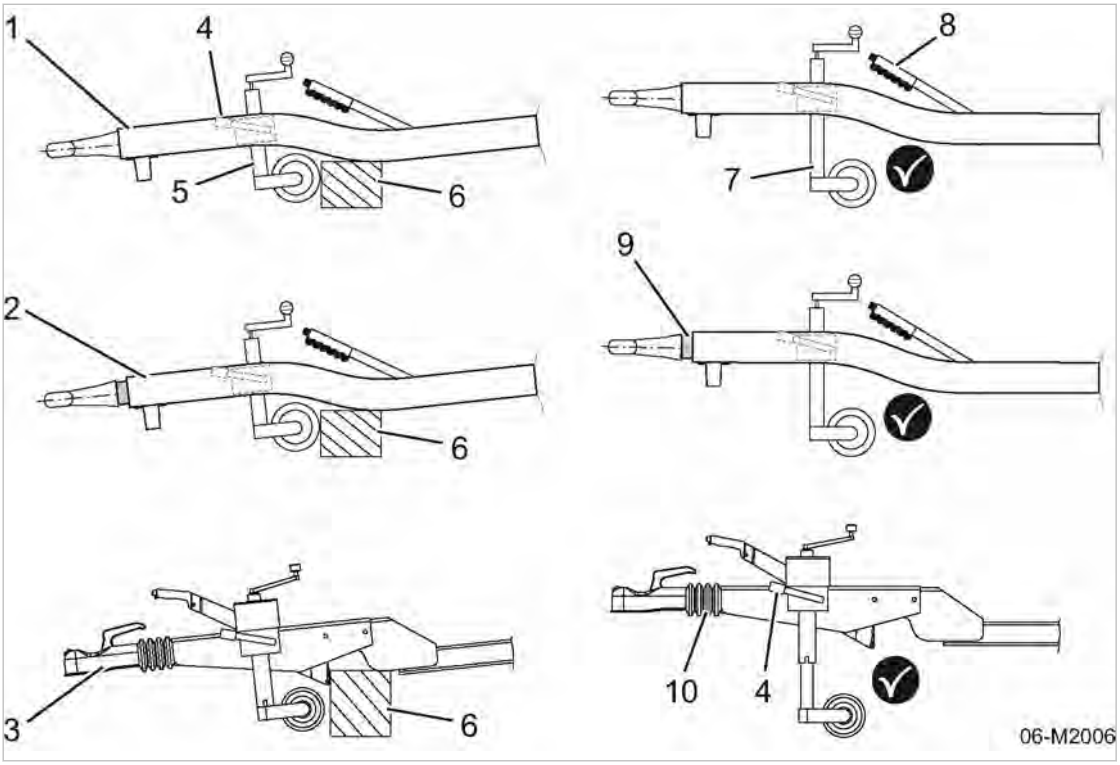


Fig. 13 Fitting the fixed height towbar

1	Delivery state, towing device rd/ro/rr	6	Transport frame
2	Delivery state, towing device rg/rp/rr	7	Jockey wheel cranked down
3	Delivery state, towing device rc/ro/rs	8	Parking brake
4	Clamping lever	9	Adapter, mounted rotatable
5	Jockey wheel	10	Overrun braking mechanism

Option rc/ro/rr, rg/rp/rr, rc/ro/rs

1. Check whether the clamping levers are properly tightened.
2. Crank down the jockey wheel.
3. Check whether the machine is in horizontal position.
4. If necessary, crank the jockey wheel further down.

Result Towing device is pre-assembled.

6.3.3 Fitting the fixed height towbar

Option rd/ro/rr, rd/rn/rr

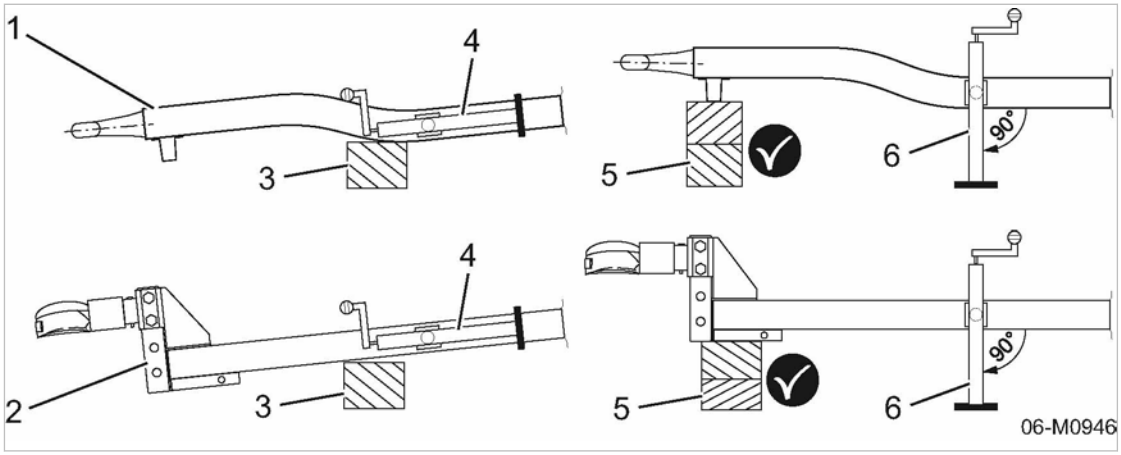


Fig. 14 Fitting the fixed height towbar

1	Delivery state, towbar option rd/ro/rr	4	Delivery state, support
2	Delivery state, towbar option rd/rn/rr	5	Suitable base
3	Transport frame	6	Support (turned)

1. Use a suitable base to jack up the towing device.
2. Remove the support's safety cotter pin.
3. Turn the support by 90° clockwise.
4. Insert the safety cotter pin.
   The support is secured.
5. Lower the support.

6.4 Installing and adjusting the brake rod

Overview:

- Screwing the brake rod into the swivel head
- Installing the brake rod (Options rb/rm/rs , rc/ro/rs)
- Installing the brake rod (Options rc/ro/rr , rg/rp/rr)

➢ Comply with all instructions.

Further information The required tightening torques for the screw connections are provided in the annex, Installation drawings, chapter 13.8.

6.4.1 Installing the con-rod

The con-rod of the brake rod must be screwed into the pivot mount and secured against loosening. Depending on the chassis option, the pivot mount is positioned as follows:

Chassis option	Pivot mount position
rb/rm/rs	Lower relay lever below the height adjustment pieces
rc/ro/rs	Below the overrun mechanism
rc/ro/rr	Parking brake relay lever

Chassis option	Pivot mount position
rg/rp/rr	Parking brake relay lever

Tab. 44 Pivot mount position

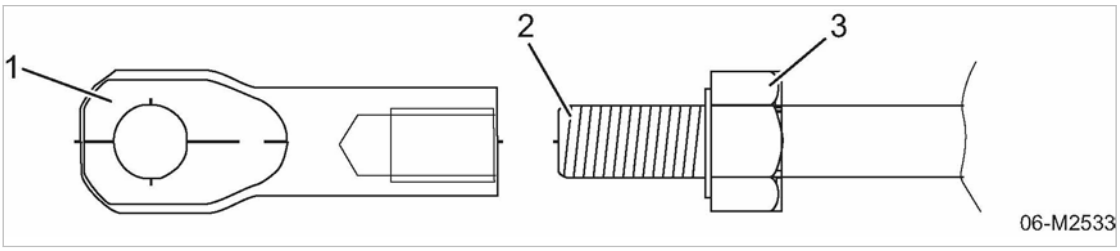


Fig. 15 Screw in the con-rod.

1 Pivot mount
2 Con-rod
3 Nut

Option rb/rm/rs , rc/ro/rs	Option rc/ro/rr , rg/rp/rr
1. Fully release the parking brake. 2. Fully extend the draw pipe of the overrun mechanism. 3. Screw the con-rod for at least 0.6 in. into the pivot mount of the overrun mechanism. 4. Secure the con-rod with the lock nut.	1. Fully release the parking brake. 2. Screw the con-rod for at least 0.6 in. into the pivot mount of the parking brake. 3. Secure the con-rod with the lock nut.

6.4.2 Option rb/rm/rs , rc/ro/rs Installing the brake rod

Aligning the equalizer at right angles of the brake rod

The axle end is a mechanism to accept and fixate the exterior sleeve of the Bowden cables. The axle end is positioned beneath the axle.

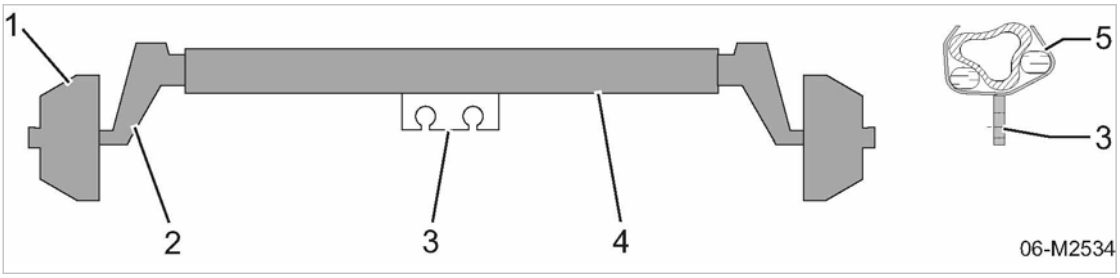


Fig. 16 Axle end position

1 Wheel hub
2 Rocker arm
3 Axle end
4 Axle
5 Axle (cross section)

Option rb/rm/rs , rc/ro/rs

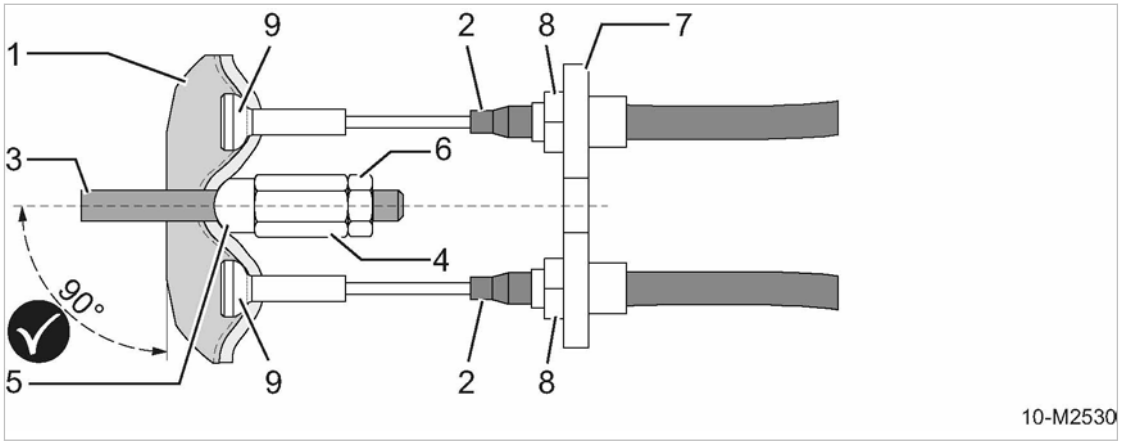


Fig. 17 M10 brake rod

1	Equalizer	6	Nut
2	Bowden cable	7	Axle end
3	Towbar	8	Nut
4	Connecting sleeve	9	Bowden cable fitting
5	Spacer		

1. Insert both Bowden cables 2 in the axle end.
2. Use nuts 8 to fasten both Bowden cables.
3. Thread both Bowden cable fittings 9 into the equalizer.
4. Push the towbar into the equalizer.
5. Place the spacer.
   The curve points in the direction of the equalizer.
6. Screw the connecting sleeve onto the towbar.

Adjusting the brake rod

1. Manually tighten the connecting sleeve.
2. Check whether the equalizer is aligned at right angles to the brake rod.
3. Forcefully pull and release the hand brake three times.
4. Turn the wheel in forward direction and simultaneously tighten the connecting sleeve up to a clearly experienced braking resistance.
   You must be able to manually turn the wheel in forward driving direction.

You are unable to manually turn the wheel in forward driving direction.

➢ Repeat the process.

Securing the screw joint against loosening

Precondition The equalizer is aligned at right angles to the brake rod.
You are able to manually turn the wheel in forward driving direction.

1. Screw the nut 6 onto the towbar.
2. Secure the connecting sleeve 4 with the lock nut 6.

6.4.3 Option rc/ro/rr , rg/rp/rr Installing the brake rod

Aligning the equalizer at right angles to the brake rod

The axle end is a mechanism to accept and fixate the exterior sleeve of the Bowden cables. The axle end is positioned beneath the axle.

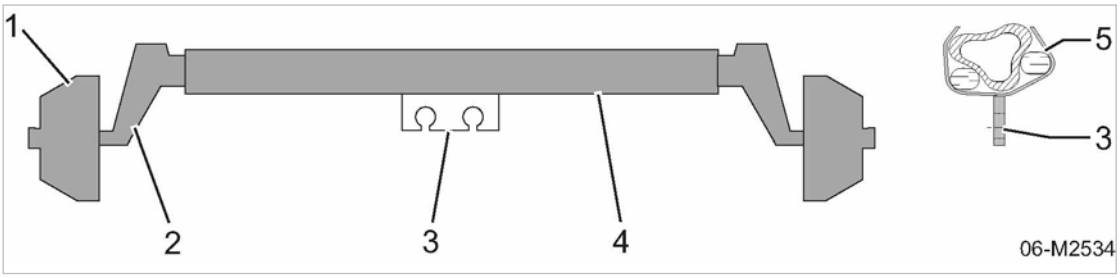


Fig. 18 Axle end position

1. Wheel hub
2. Rocker arm
3. Axle end
4. Axle
5. Axle (cross section)

Option rc/ro/rr , rg/rp/rr

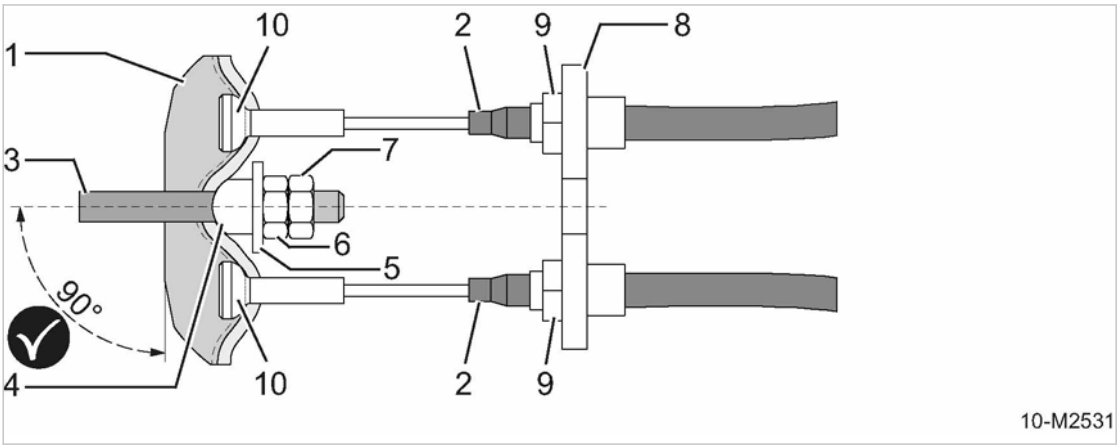


Fig. 19 M8 brake rod

1. Equalizer
2. Bowden cable
3. Con-rod
4. Spacer
5. Washer
6. Nut
7. Nut
8. Axle abutment
9. Nut
10. Bowden cable fitting

1. Insert Bowden cables 2 in the equalizer 8.
2. Use nuts 9 to fasten the Bowden cables.
3. Thread both Bowden cable fittings 10 into the equalizer.
4. Push the towbar into the equalizer.
5. Place the spacer.
   The curve points in the direction of the equalizer.
6. Place the washer.
7. Screw the nut 6 onto the con-rod.

Adjusting the brake rod

1. Manually tighten the nut [6].
2. Check whether the equalizer is aligned at right angles to the brake rod.
3. Forcefully pull and release the hand brake three times.
4. Turn the wheel in forward direction and simultaneously tighten the nut up to a clearly experienced braking resistance.

   You must be able to manually turn the wheel in forward driving direction.

? You are unable to manually turn the wheel in forward driving direction.

➢ Repeat the process.

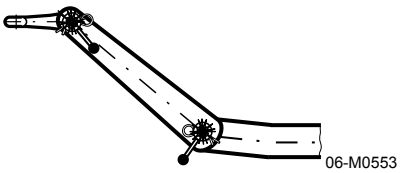
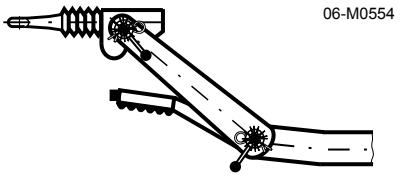
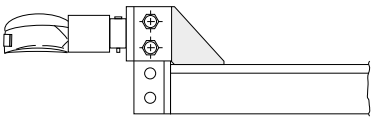
Securing the screw joint against loosening

Precondition The equalizer is aligned at right angles to the brake rod.

You are able to manually turn the wheel in forward driving direction.

1. Screw the nut [7] onto the towbar.
2. Secure the nut [6] with the [7] lock nut.

6.5 Adjusting the chassis

Height-adjustable towbar		
Option	Type	Representation
rb/rm/rr	Unbraked	 06-M0553
rb/rm/rs	Braked	06-M0554 
rd/rn/rr	■ Unbraked ■ Coupling height incrementally selectable due to variable screw fitting	 06-M1421

Tab. 45 Height-adjustable towbar

Material Pliers

Hard rubber hammer

Precondition The machine is shut down.

The machine is disconnected from the towing vehicle and safely parked.

⚠ CAUTION

Danger of pinching!
Severe injury to fingers is possible if they become trapped in the adjusting mechanism.

➢ *Always wear protective gloves.*

➢ *Work carefully.*

➢ Comply with the safety instructions in chapter 3.5.

6.5.1 Option rb/rm/rr
Adjusting the towbar height

The purpose of height adjustment is to bring the towing eye, or coupling, to the correct height for the towing vehicle.

At the correct height, the towing eye or coupling should be parallel to the ground.

Height adjustment is by two serrated joints.

- Serrated joint 1: Adjustable position of the center piece relative to the chassis.
  - Maximum adjustment upwards: 50°
  - Maximum adjustment downwards: 10°
- Serrated joint 2: Adjustable position of the towing eye or ball coupling to the center piece.

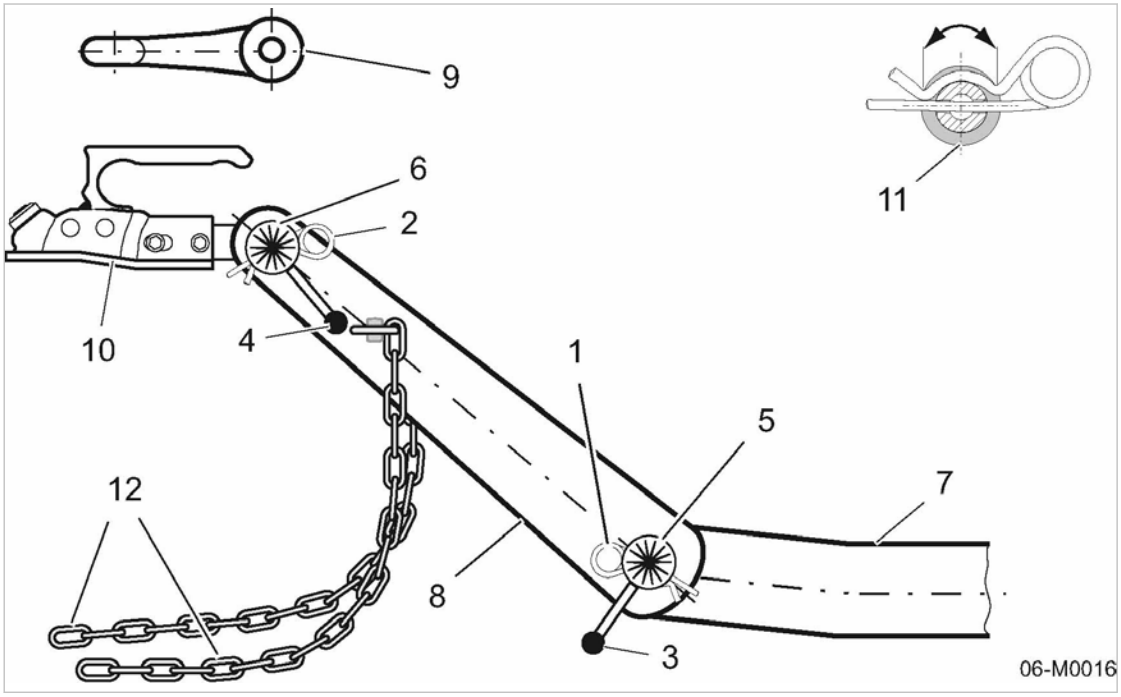


Fig. 20 Towbar height adjustment (rb/rm/rr)

[1,2] Split pin
[3,4] Locking lever
[5] Serrated joint 1
[6] Serrated joint 2
[7] Towbar tube
[8] Towbar adapter
[9] Ball coupling
[10] Towing eye
[11] Split pin securing principle

1. Draw out the split pin [1].

2. Undo the locking lever [3] until the serrated joint [5] is disengaged.
3. Make the angle adjustment to the serrated joint [5].
4. Tighten the locking lever [3] making sure the serrations engage.
5. Draw out the split pin [2].
6. Undo the locking lever [4] until the serrated joint [6] is disengaged.
7. Adjust the angle of the serrated joint [6] to bring the towing eye or coupling parallel to the ground at the height of the towing vehicle hitch.
8. Tighten the locking lever [4] making sure the serrations engage.
9. Check that the tow bar is adjusted to the correct height.

   Check if:
   - the towing eye [10] or coupling is at the right height and parallel to the ground,
   - the serrated joints [5] and [6] are fully engaged,
   - The locking levers [3] and [4] are tightened.
10. Make sure the locking levers [3] and [4] are tight by striking with a hard rubber hammer.
11. Insert the split pins [1] and [2].
12. Check the correct position of the split pin.

The split pin must be fully inserted so that it is trapped by its bow over the axis of the locking lever (see 20.).

Check locking position [11].
- Split pin [1] properly inserted.
- Split pin [2] properly inserted.

13. Tighten the locking lever again after 30 miles on the road.

The serrations in the adjustment joint will not disengage. The serrations are corroded together.

➢ Free the serrations by jerking the towbar horizontally and vertically.

6.5.2 Option rb/rm/rs Adjusting the towbar height

The purpose of height adjustment is to bring the towing eye, or coupling, to the correct height for the towing vehicle.

At the correct height, the towing eye or coupling should be parallel to the ground.

Height adjustment is by two serrated joints.

- Serrated joint 1: Adjustable position of the center piece relative to the chassis.
  - Maximum adjustment upwards: 50°
  - Maximum adjustment downwards: 10°
- Serrated joint 2: Adjustable position of the towing eye or ball coupling to the center piece.

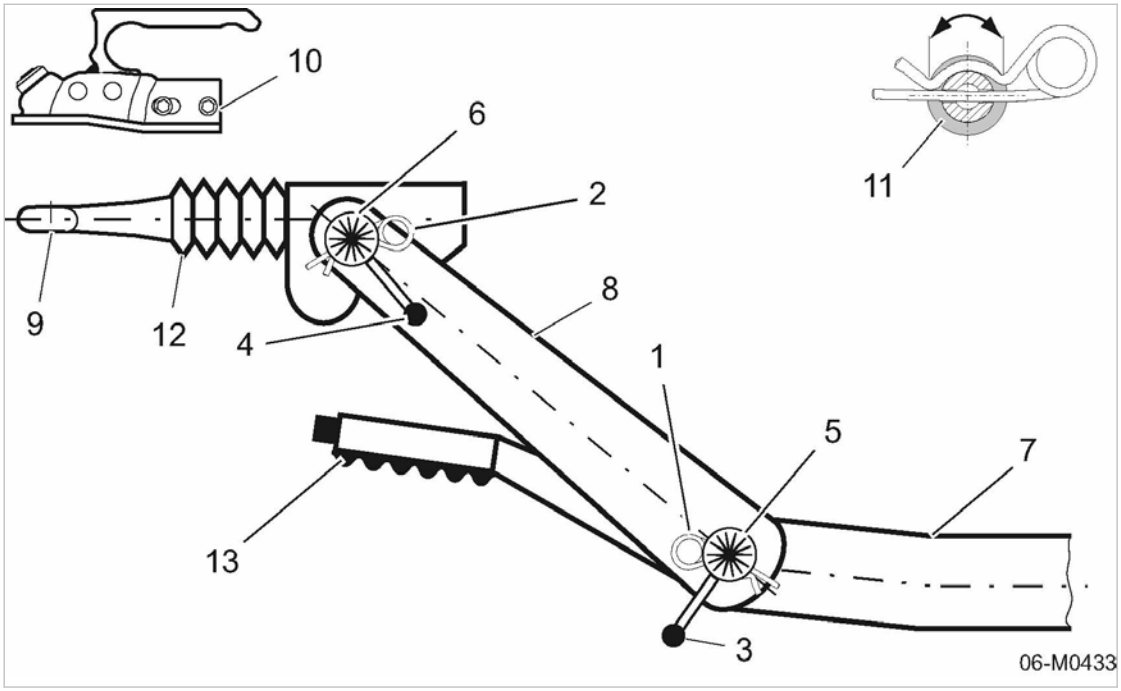


Fig. 21 Towbar height adjustment (rb/rm/rs)

[1,2] Split pin
[3,4] Locking lever
[5] Serrated joint 1
[6] Serrated joint 2
[7] Towbar tube
[8] Towbar adapter
[9] Towing eye
[10] Ball coupling
[11] Split pin securing principle
[12] Overrun damper
[13] Parking brake

1. Draw out the split pin [1].
2. Undo the locking lever [3] until the serrated joint [5] is disengaged.
3. Make the angle adjustment to the serrated joint [5].
4. Tighten the locking lever [3] making sure the serrations engage.
5. Draw out the split pin [2].
6. Undo the locking lever [4] until the serrated joint [6] is disengaged.
7. Adjust the angle of the serrated joint [6] to bring the towing eye or coupling parallel to the ground at the height of the towing vehicle hitch.
8. Tighten the locking lever [4] making sure the serrations engage.
9. Check that the tow bar is adjusted to the correct height.

   Check if:

   - the towing eye [9] or coupling is at the right height and parallel to the ground,
   - the serrated joints [5] and [6] are fully engaged,
   - The locking levers [3] and [4] are tightened.
10. Make sure the locking levers [3] and [4] are tight by striking with a hard rubber hammer.
11. Insert the split pins [1] and [2].

12. Check the correct position of the split pin.

The split pin must be fully inserted so that it is trapped by its bow over the axis of the locking lever (see 21).

Check locking position [11].

- Split pin [1] properly inserted.
- Split pin [2] properly inserted.

13. Tighten the locking lever again after 30 miles.

The serrations in the adjustment joint will not disengage. The serrations are corroded together.

➢ Free the serrations by jerking the towbar horizontally and vertically.

6.5.3 Option rd/rn/rr
Adjusting the coupling height

The purpose of height adjustment is to bring the towing eye, or coupling, to the correct height for the towing vehicle.
At the correct height, the towing eye or coupling should be parallel to the ground.

There are three height levels.

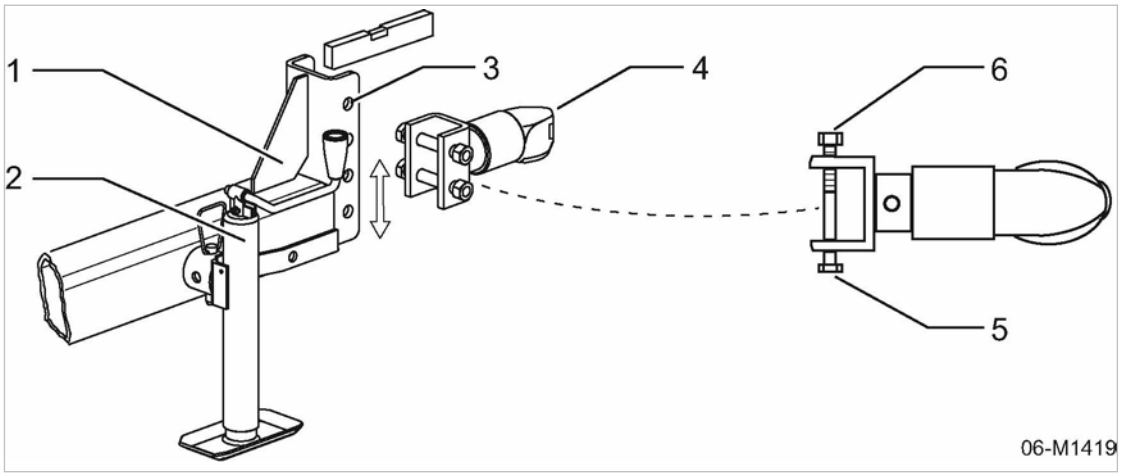


Fig. 22 Coupling height adjustment 1

[1] Towbar
[2] Prop stand
[3] Fixing holes
[4] Ball coupling
[5] Hex-head bolt
[6] Hexagon nut

1. Position the compressor near the towing vehicle hitch and secure with chocks under the wheels.
2. Adjust the prop to bring the towbar horizontal.
3. Unscrew the nuts and withdraw the bolts.
4. Adjust the vertical position of the towing coupling/eye to match the height of the towing vehicle coupling. Line up the fixing holes in the coupling/eye with those in the towbar.

5. ⚠ WARNING *Danger of the compressor breaking away from the towing vehicle.*
   An accident can occur if the coupling/eye is not securely fixed to the towbar when the compressor is being towed.
   - ➢ *The coupling must always be secured to the towbar with both fixing bolts and nuts.*
   - ➢ *The nuts must be fully tightened.*
6. Insert the fixing bolts and tighten the nuts.
7. Tighten the nuts.

6.5.4 Replacing the ball coupling with a towing eye

The towbar can be fitted with various towing eyes or ball couplings.

Material
Protective gloves
New self-locking nuts
Wrench
Hammer
Mounting pin

Precondition
The machine is switched off.
The machine is disconnected from the towing vehicle and safely parked.

> ⚠ WARNING
> *Reuse of self-locking nuts*
> *The protection against loosening no longer exists.*
> ➢ *Use only new, self-locking nuts for the assembly.*

➢ Determine which towing device is fitted to the machine.

6.5.4.1 Option rb/rm/rr
Replacing the ball coupling with a towing eye

The following alternative tasks must be carried out to change the towing eye or the ball coupling.

Option rb/rm/rr

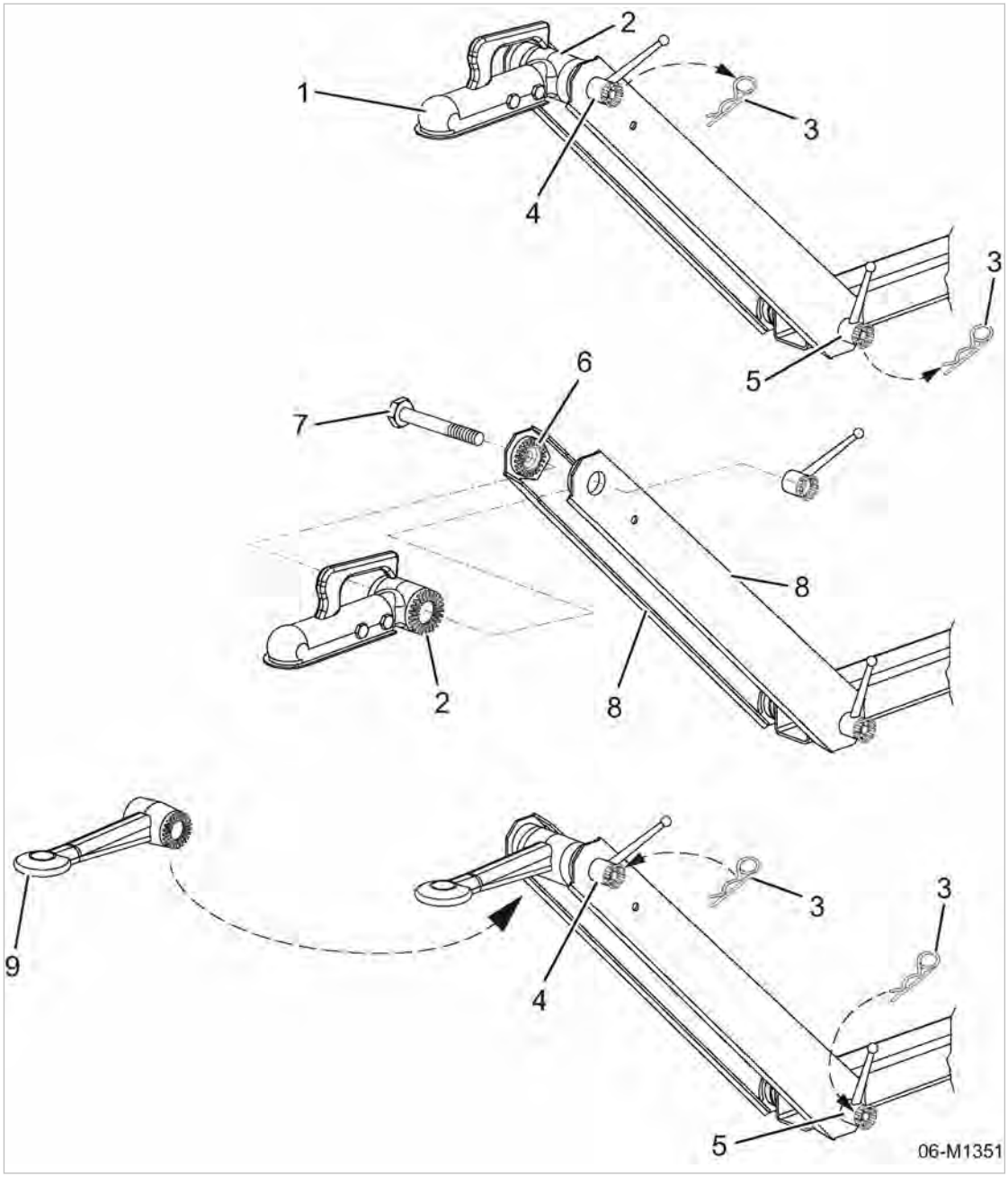


Fig. 23 Replacing the ball coupling with a towing eye

1 Ball coupling
2 Adapter for ball coupling
3 Split pin
4 Locking lever
5 Locking lever
6 Serrated joint
7 Hex-head bolt
8 Side part
9 Towing eye

Removing the ball coupling	Removing the towing eye
1. Remove both split pins [3]. 2. Loosen and remove the locking lever [4]. 3. Loosen the locking lever [5] 1-2 turns. 4. Shake the side parts. 5. Check if the serrated joints have sufficient movement. 6. Secure the ball coupling [1] and withdraw the hex-head bolt [7] from the side part [8] . 7. Remove the ball coupling with adapter [2].	1. Remove both split pins. 2. Loosen and remove the locking lever [4]. 3. Loosen the locking lever [5] 1-2 turns. 4. Shake the side parts. 5. Check if the serrated joints have sufficient movement. 6. Secure the towing eye [9] and withdraw the hex-head bolt [7] from the side parts. 7. Remove the towing eye.
Fitting the ball coupling	**Fitting the towing eye**
1. Use screw connection to fixate the ball coupling and the adapter. 2. Use new, self-locking nuts. 3. Tighten the screw connections of ball coupling and adapter with the specified torque (see chapter 2.4.4). 4. Position the adapter [2] of the ball coupling between the two serrated joints of the side parts. 5. Pass the hex-head bolt fully through the side parts. 6. Screw the locking lever [4] onto the thread of the bolt. 7. Check if: ■ The serrated joints correctly engage with each other. ■ The ball coupling is set horizontally. 8. Tighten the locking lever [5]. 9. Tighten the locking lever [4]. 10. Check if: ■ Both side parts are correctly seated. ■ The ball coupling is correctly seated. 11. Insert both split pins.	1. Position the towing eye between the two serrated joints of the side parts. 2. Pass the hex-head bolt fully through the side parts. 3. Screw the locking lever [4] onto the thread of the bolt. 4. Check if: ■ The serrated joints correctly engage with each other. ■ The towing eye is set horizontally. 5. Tighten the locking lever [5]. 6. Tighten the locking lever [4]. 7. Check if: ■ Both side parts are correctly seated. ■ The towing eye is correctly tightened. 8. Insert both split pins.

6.5.4.2 Option rb/rm/rs, rc/ro/rs
Replacing the ball coupling with a towing eye in towing systems with overrun brake

The rear fastening screw [6] also has the function of a shock absorber retaining screw. Because the shock absorber extends independently during de-installation, you must thread the fastening eye of the shock absorber. Use a mounting pin (thin metal rod with ø 0.3–0.4 in.) to facilitate the installation. In order to be able to remove the ball coupling or the towing eye and the spacers from the towbar when the shock absorber's eye is threaded, the length of the mounting pin must be smaller than the diameter of the towbar, see also illustration 25.

The following alternative tasks must be carried out to change the towing eye or the ball coupling.

Option rb/rm/rs

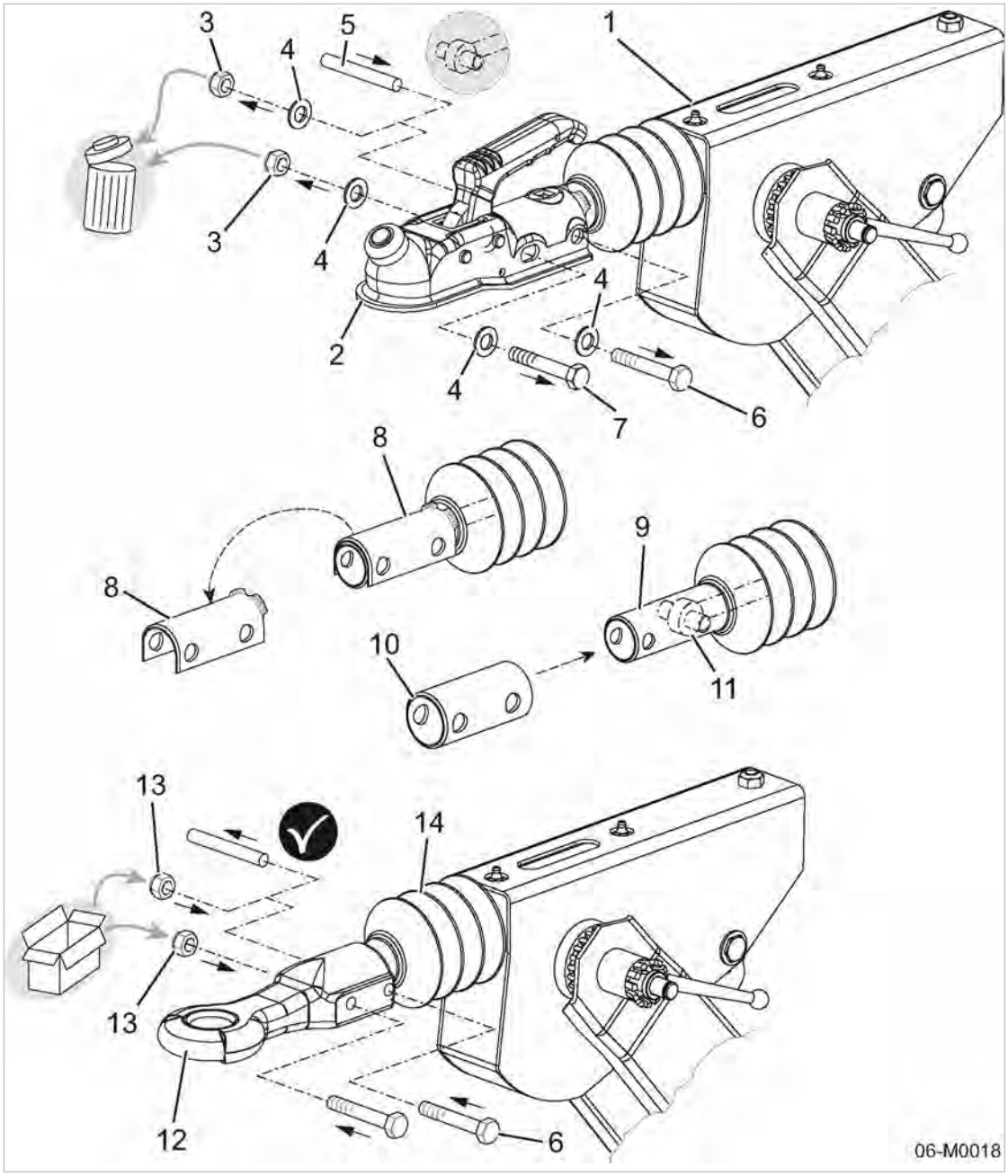


Fig. 24 Replacing the ball coupling (towing device with overrun brake)

1	Top part, towing device	8	Distance bow for ball coupling
2	Ball coupling	9	Towbar tube
3	Self-locking nut	10	Distance bushing for towing eye
4	Washer	11	Fastening eye of the shock absorber
5	Mounting pin	12	Towing eye
6	Retaining screw, shock absorber	13	New self-locking nut
7	Fastening screw	14	Protective sleeve

Using the proper distance elements for the towbar

Depending on the use of either ball coupling or towing eye, different distance elements must be installed to equalize the size difference between towbar and towing adapter.

Towing adapter	Model (example)	Distance element
Ball coupling	AK160–B	Distance bow
Towing eye	D40–F	Distance bushing

Tab. 46 Distance elements

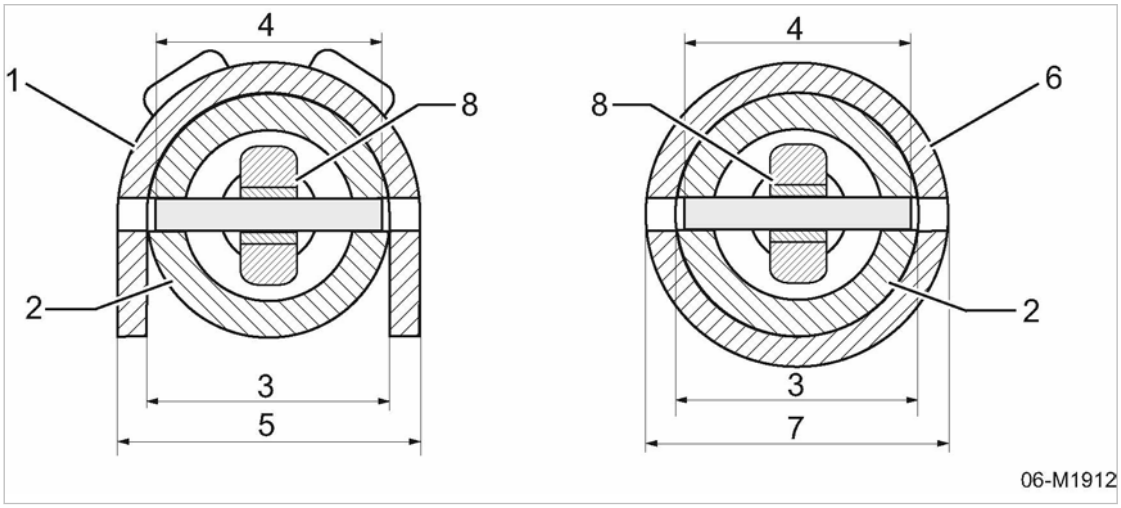


Fig. 25 Distance elements, towing adapter

1 Distance bow
2 Towbar tube
3 Diameter, towbar tube
4 Maximum length, mounting pin
5 External dimension, distance bow
6 Distance bushing
7 External dimension, distance bushing
8 Eye, shock absorber

➢ Determine which type of towing adapter is fitted with which accessories.

Removing the ball coupling	Removing the towing eye
1. Push back the protective sleeve, if necessary.	1. Push back the protective sleeve, if necessary.
2. Remove the self-locking nuts of both screw connections.	2. Remove the self-locking nuts of both screw connections.
3. Remove the washers.	3. Remove the washers.
4. Immediately dispose of the used self-locking nuts.	4. Immediately dispose of the used self-locking nuts.
5. If required, shorten the mounting pin to the required maximum length.	5. If required, shorten the mounting pin to the required maximum length.
6. Pull the screw from the bore.	6. Pull the screw from the bore.
7. Use the mounting pin to knock out the retaining screw for the shock absorber.	7. Use the mounting pin to knock out the retaining screw for the shock absorber.
8. Do not remove the mounting pin in order to retain the centring of the shock absorber in the towbar tube.	8. Do not remove the mounting pin in order to retain the centring of the shock absorber in the towbar tube.
9. Remove the ball coupling from the towbar.	9. Remove the towing eye from the towbar.
10. Remove the distance bow from the towbar.	10. Remove the distance bushing from the towbar.

Fitting the ball coupling	Fitting the towing eye
Use the distance bow to equalize the size difference between the towbar and the ball coupling.	Use the distance bushing to equalize the size difference between the towbar and the towing eye.
1. Place the distance bow onto the towbar.	1. Push the distance bushing onto the towbar tube.
2. Place the distance bow in such a manner that the bores of the bow and the towbar tube are aligned.	2. Place the distance bushing in such a manner that the bores of the bushing and the towbar tube are aligned.
3. Push the ball coupling onto the towbar tube.	3. Push the ball coupling onto the towbar tube.
4. Adjust the ball coupling until the bores of towbar tube and ball coupling are aligned.	4. Adjust the towing eye until the bores of towbar tube and towing eye are aligned.
5. Use the retaining screw for the shock absorber to knock out the mounting pin.	5. Use the retaining screw for the shock absorber to knock out the mounting pin.
6. Push the fastening screw through the frontal bore.	6. Push the fastening screw through the frontal bore.
7. Place the washers.	7. Place the washers.
8. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).	8. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).
9. Place the protective sleeve.	9. Place the protective sleeve.

Checking the overrun braking mechanism

➢ Push the towbar tube in and out by hand.

If resistance is felt, the shock absorber is properly hung.

If you don't feel a resistance:
The fastening eye of the shock absorber is not hung correctly.
➢ Repeat the assembly steps.

6.5.4.3 Option rc/ro/rr
Replacing the ball coupling with a towing eye

The following alternative tasks must be carried out to change the towing eye or the ball coupling.

Option rc/ro/rr

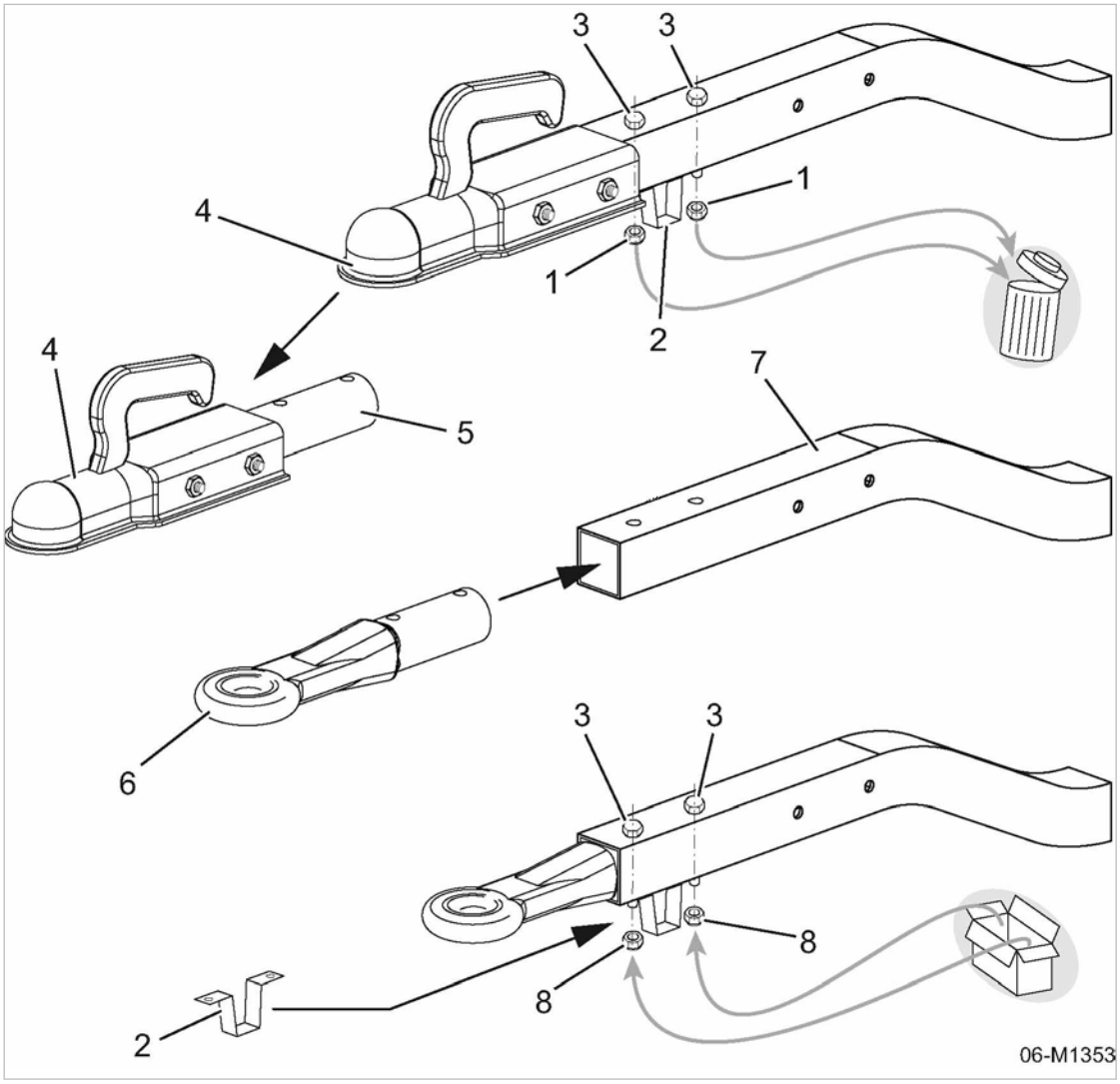


Fig. 26 Replacing the ball coupling with a towing eye

[1]	Self-locking nut	[5]	Adapter
[2]	Prop stand	[6]	Towing eye
[3]	Screw (vertical screw connection)	[7]	Towbar tube
[4]	Ball coupling	[8]	Self-locking nut

Removing the ball coupling	Removing the towing eye
1. Unscrew and remove the nuts [1] of the vertical screw connections. 2. Immediately dispose of the used self-locking nuts. 3. Remove the prop stand [2] . 4. Remove the screws [3]. 5. Pull the ball coupling [4] with adapter [5] from the towbar tube [7].	1. Unscrew and remove the nuts of the vertical screw connections. 2. Immediately dispose of the used self-locking nuts. 3. Remove the prop stand. 4. Remove the bolts. 5. Pull the towing eye [6] from the towbar tube.
Fitting the ball coupling	**Fitting the towing eye**
1. Push the ball coupling with the adapter into the towbar tube. 2. Position the adaptor so that the bolts can be freely inserted. 3. Insert the screws through the vertical fixing holes. 4. Position and hold the prop stand. 5. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).	1. Fit the new towing eye in the towbar. 2. Position the towing eye so that the bolts can be freely inserted. 3. Insert the screws through the vertical fixing holes. 4. Position and hold the prop stand. 5. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).

6.5.4.4 Option rg/rp/rr
Replacing the towing eye with a ball coupling

The following alternative tasks must be carried out to change the towing eye or ball coupling.

Option rg/rp/rr

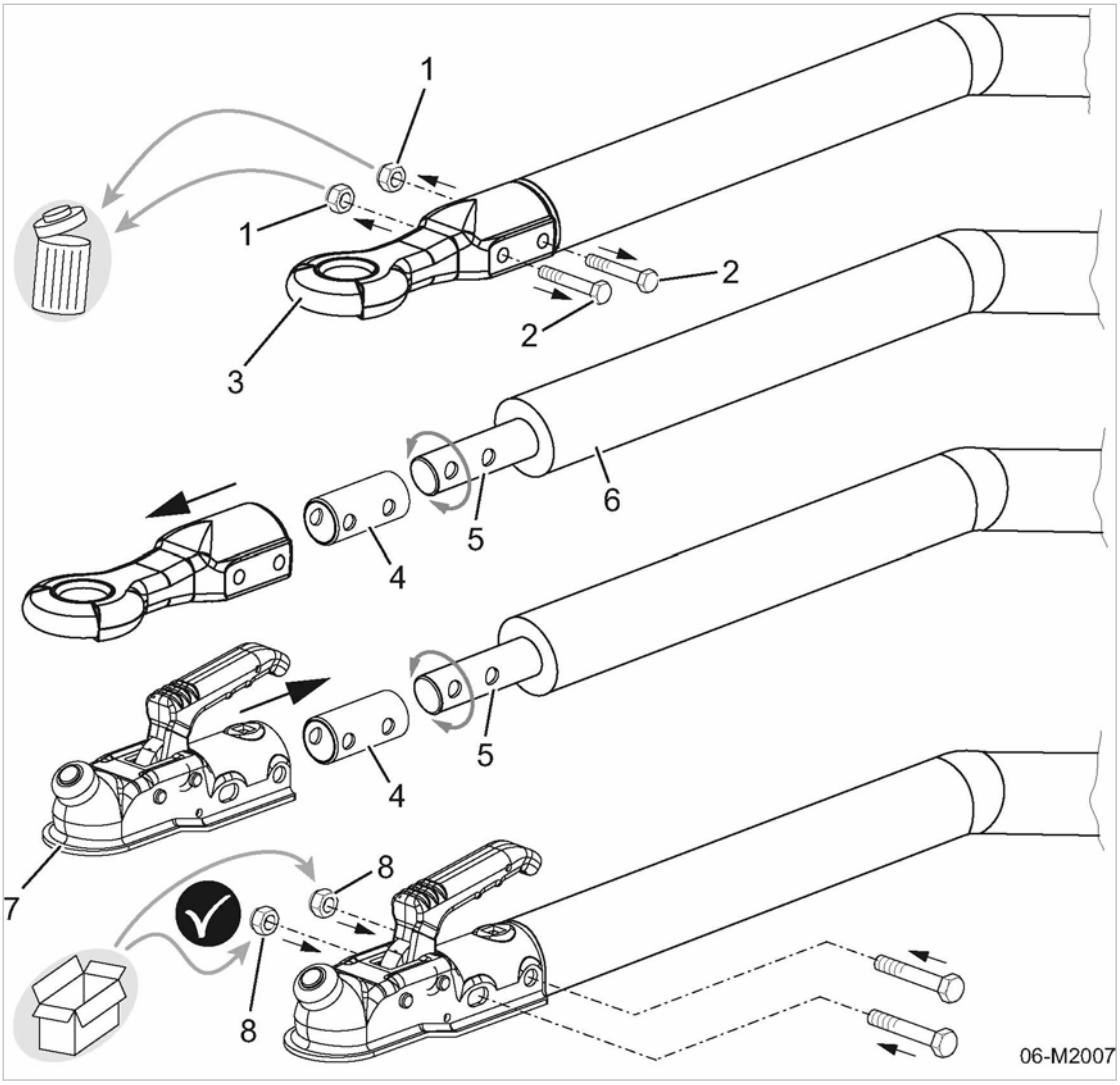


Fig. 27 Replacing the towing eye with a ball coupling

1 Self-locking nut
2 Screw
3 Towing eye
4 Distance bush for towing eye
5 Towbar (mounted rotatable)
6 Towbar tube
7 Ball coupling
8 New self-locking nut

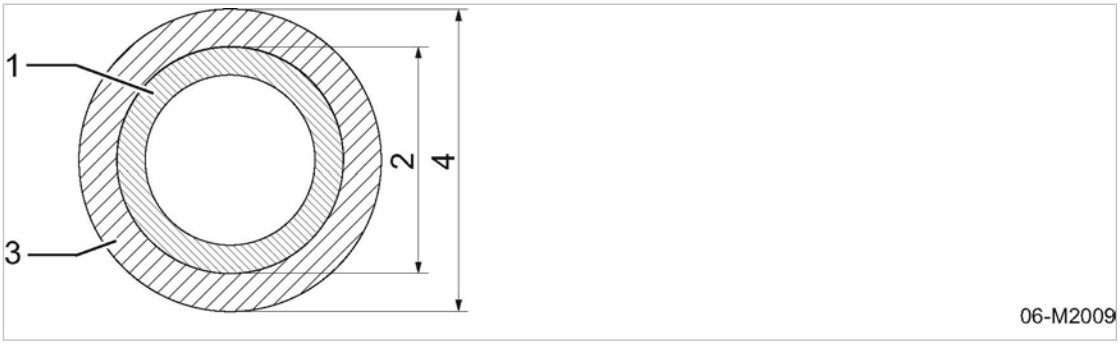


Fig. 28 Distance elements

[1] Towbar
[2] External dimension, towbar
[3] Distance bush
[4] External dimension, distance bush

Depending on the use of either ball coupling or towing eye, different distance elements must be installed to equalize the size difference between towbar and towing adapter:

➢ Check the necessity

Removing the towing eye	Removing the ball coupling
1. Unscrew and remove the nuts [1] of the screw connections. 2. Immediately dispose of the used self-locking nuts. 3. Remove the screws [2]. 4. Remove the towing eye. 5. Pull off the distance bush.	1. Unscrew and remove the nuts of the screw connections. 2. Immediately dispose of the used self-locking nuts. 3. Remove the bolts. 4. Remove the ball coupling [7]. 5. If necessary, pull off the distance bush from the towbar.
Fitting the towing eye	**Fitting the ball coupling**
1. Slide the distance bush over the towbar. 2. Position the distance bush so that the bolts can be freely inserted. 3. Push the towing eye onto the distance bush. 4. Position the towing eye so that the bolts can be freely inserted. 5. Push the screws through the corresponding fixing holes. 6. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).	1. If necessary, slide the distance bush over the towbar. 2. Position the distance bush so that the bolts can be freely inserted. 3. Push the ball coupling onto the distance bush. 4. Position the ball coupling so that the bolts can be freely inserted. 5. Push the screws through the corresponding fixing holes. 6. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).

6.5.4.5 Option rd/ro/rr
Replacing the ball coupling by a towing eye on the US towbar

The following alternative tasks must be carried out to change the towing eye or the ball coupling.

Option rd/ro/rr

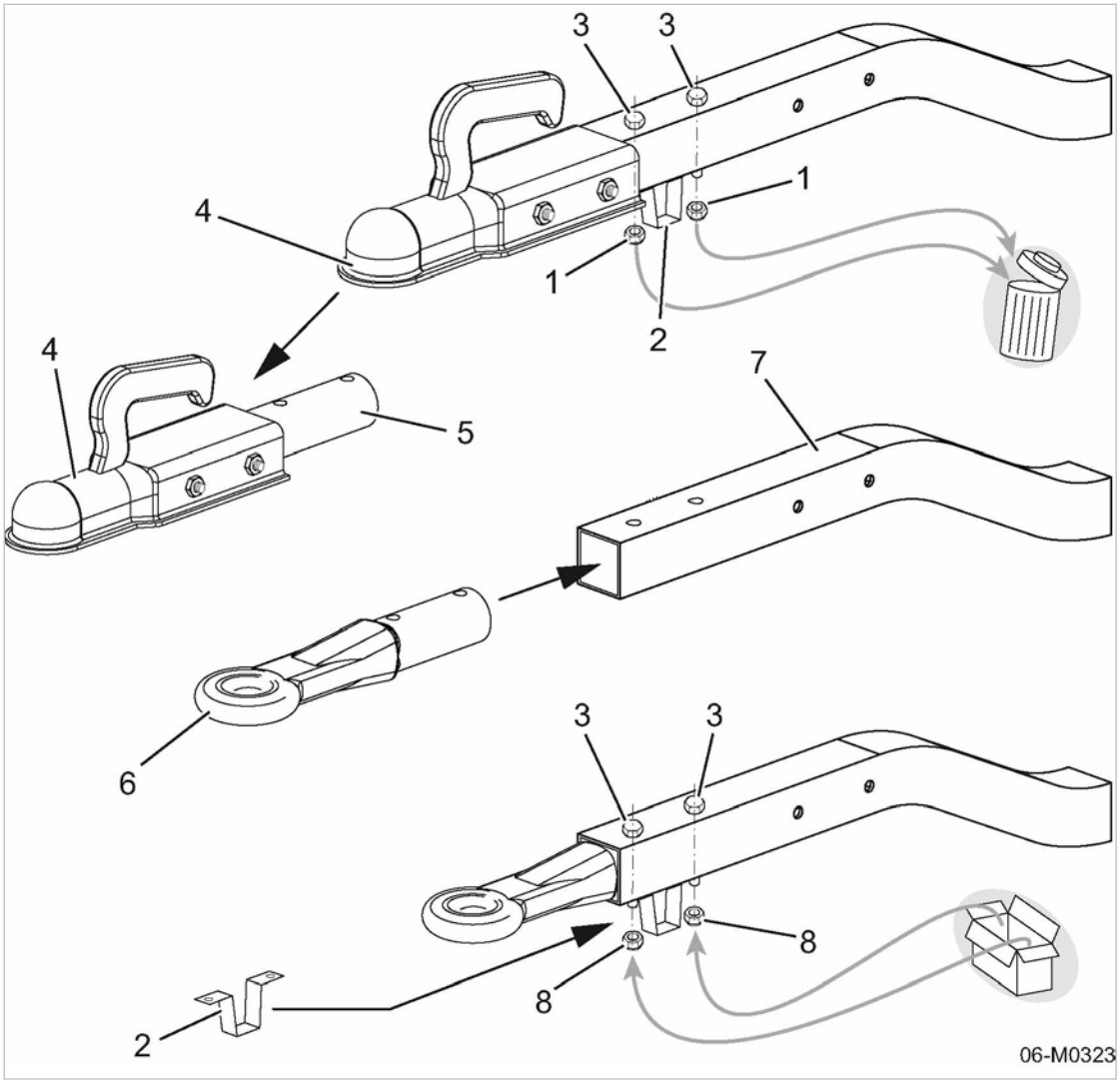


Fig. 29 Replacing the ball coupling with a towing eye

[1] Self-locking nut
[2] Supporting yoke
[3] Screw (vertical screw connection)
[4] Ball coupling
[5] Adapter
[6] Towing eye
[7] Towbar tube
[8] New self-locking nut

Removing the ball coupling	Removing the towing eye
1. Unscrew and remove the nuts [1] of the vertical screw connections.	1. Unscrew and remove the nuts of the vertical screw connections.
2. Immediately dispose of the used self-locking nuts.	2. Immediately dispose of the used self-locking nuts.
3. Remove the supporting yoke [2] .	3. Remove the supporting yoke.
4. Remove the screws [3].	4. Remove the bolts.
5. Pull the ball coupling [4] with adapter [5] from the towbar tube [7].	5. Pull the towing eye [6] from the towbar tube.

Fitting the ball coupling	Fitting the towing eye
1. Push the ball coupling with the adapter into the tow bar tube. 2. Position the adaptor so that the bolts can be freely inserted. 3. Insert the screws through the vertical fixing holes. 4. Position and hold the supporting yoke. 5. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).	1. Fit the new towing eye in the towbar. 2. Position the towing eye so that the bolts can be freely inserted. 3. Insert the screws through the vertical fixing holes. 4. Position and hold the supporting yoke. 5. Thread new self-locking nuts on both screws and tighten with torque wrench (see chapter 2.4.4).

6.5.4.6 Option rd/rn/rr
Replacing the ball coupling/towing eye (US chassis)

The towbar can be fitted with various towing eyes or couplings.

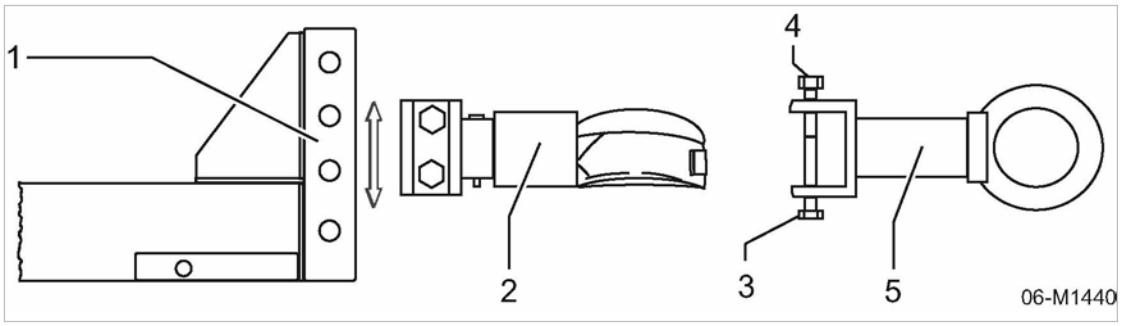


Fig. 30 Changing from towing eye to ball coupling

1 Towbar
2 Ball coupling
3 Hex-head screw
4 Hexagon nut
5 Towing eye

1. Unscrew the nuts and withdraw the bolts.
2. Remove the coupling or towing eye from the towbar.
3. Place the new coupling or towing eye on/in the towbar and line up the fixing holes on towing eye/coupling and towbar.
4. **⚠ WARNING** *Danger of the compressor breaking away from the towing vehicle.*
   An accident can occur if the coupling/eye is not securely fixed to the towbar when the compressor is being towed.
   - ➢ *The coupling must always be secured to the towbar with both fixing bolts and nuts.*
   - ➢ *The nuts must be fully tightened.*
5. Insert the fixing bolts and tighten the nuts.
6. Tighten the nuts.

7 Initial Start-up

7.1 Ensuring safety

Follow the instructions below for safe commissioning of the machine.
Warning instructions are located before a potentially dangerous task.

Disregard of warning instructions can cause serious injuries!

Complying with safety warnings

Disregard of safety warnings can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 “Safety and Responsibility”.
- ➢ Commissioning work may only be carried out by authorized personnel!
- ➢ Make sure that no one is working on the machine.
- ➢ Ensure that all service doors and panels are locked.

Further information

Details of authorized personnel are found in chapter 3.4.2.
Details of dangers and their avoidance are found in chapter 3.5.

7.2 Before initial start-up (or recommissioning)

Incorrect or improper commissioning can cause injury to persons and damage to the machine.

7.2.1 Instructions to be observed before commissioning or recommissioning

The initial start-up of every machine takes place at the factory. Every machine is also given a trial run and passes a careful check.

- ➢ Commissioning may only be carried out by authorized installation and service personnel who have been trained on this machine.
- ➢ Remove all packing materials on and in the machine.
- ➢ Observe the machine during the first few hours of operation to ensure that it is operating correctly.

7.2.2 Special measures for recommissioning after storage

➢ Carry out the following before every start-up after long period of storage:

Storage period longer than:	Remedy
5 months	➢ Remove the desiccant from the openings in the air intake filters of the engine and compressor. ➢ Check the air and oil filters. ➢ Drain the preserving oil from the separator tank. ➢ Fill with cooling oil. ➢ Drain the preserving oil from the engine. ➢ Fill with engine oil. ➢ Check the engine coolant ➢ Check the battery charge. ➢ Re-connect the battery (batteries). ➢ Check all fuel lines, engine oil lines and compressor cooling oil lines for leaks, loose connections, wear and damage. ➢ Clean the bodywork with a grease and dirt dissolving agent. ➢ Check the tire pressures.
36 months	➢ Have the overall technical condition checked by an authorized KAESER service representative.

Tab. 47 Measures for recommissioning the compressor after a long period of storage

7.3 Checking installation and operating conditions

➢ Check and confirm all the items in the checklist before starting the machine.

Task	See chapter	Confirmed?
➢ Are the operators completely familiar with safety regulations?	–	
➢ Have all the positioning conditions been fulfilled?	5	
➢ Is there sufficient cooling oil in the separator tank?	10.4.1	
➢ Is there sufficient oil in the engine?	10.3.4	
➢ Is the maintenance indicator on the air intake filters (engine and compressor) OK?	10.3.2, 10.4.7	
➢ Is there sufficient coolant in the coolant expansion tank?	10.3.1	
➢ Is there sufficient fuel in the fuel tank?	–	
➢ Is there sufficient tool oil in the tool lubricator? (Option ea, ec)	10.8.1	
➢ Is there enough antifreeze in the frost protector? (Option ba)	10.8.2	
➢ Are the access doors closed and all body panels in place?	–	
➢ Are the tire pressures OK?	–	

Tab. 48 Installation conditions checklist

7.4 Low-temperature operation (winter)

The machine's electrical equipment is designed for starting at ambient temperatures as low as 14°F.

➢ In temperatures below 32°F, use the following operating materials/components:
- Winter-grade engine oil,
- Low viscosity cooling oil for the compressor
- Winter-grade diesel fuel
- Stronger battery

Use air hoses that are as short as possible under extremely cold conditions.

Allow the engine to warm up

1. **NOTICE** *Problems with pneumatic control at low temperatures.*
   Damage to the machine may be caused by ice particles in the pneumatic control and feedback systems.
   ➢ *Let the machine warm up in IDLE to ensure trouble-free regulation.*
2. Allow the machine to warm up in idle with open air outlet valves until an airend discharge temperature of 86°F is reached. The airend discharge temperature is shown at the remote thermometer contact on the instrument panel.

7.4.1 Starting assistance

If the machine's starter battery is discharged, it can be started with the battery of another vehicle or engine-driven machine.

Material Jumper cables

Precondition The machine is disconnected from the towing vehicle and safely parked.

⚠ WARNING
Fire and explosion hazard.
High currents caused by short-circuited battery. A shorted battery can catch fire or explode. Battery casing may crack and allow acidic fluid to spray out.
➢ *Observe the instructions provided with the battery jumper cables.*
➢ *Do not connect the battery jumper cables to the negative pole of the discharged battery or to the bodywork of the machine.*
➢ *Work with caution.*

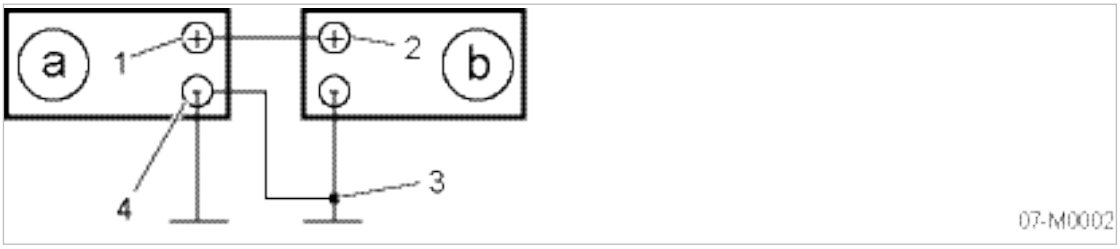


Fig. 31 Jumper cable connection diagram

[a] Assisting vehicle battery (external donor battery)
[b] Engine battery (receiving battery)
[1] Positive (+) terminal starting assistance
[2] Positive (+) terminal of the machine battery
[3] Bare metal point on the engine block (ground)
[4] Negative (-) terminal of assisting vehicle battery

Complying with safety warnings

1. **⚠ WARNING** *Fault in starting aid process!*
   - ➢ *Connect batteries of the same voltage only.*
   - ➢ *Ensure that machine and assisting vehicle do not touch.*
   - ➢ *Switch off all consumers prior to connecting and disconnecting the batteries.*
   - ➢ *Only use battery jumper cables of sufficient diameter and with insulated terminal clamps.*
   - ➢ *Observe the instructions provided with the battery jumper cables.*
   - ➢ *Keep jumper cables away from rotating parts.*
   - ➢ *Avoid short-circuits due to incorrect poling and/or bridging with tools.*
   - ➢ *Do not bend over the battery when attaching jumper cables.*
   - ➢ *Do not attempt to start the machine if its battery is frozen. Allow the battery to thaw first.*
   - ➢ *Do not try to start the machine with a boost charger.*
2. Comply with the safety instruction shown when using starting aids and starter batteries.

Preparations

1. Park the assisting vehicle in close distance to the engine, without their bodywork touching each other.
2. Stop the engine of the assisting vehicle.
3. Open the accesses to the batteries (remove maintenance panels/bonnet and pole caps).
4. Switch off all power consumers.

Connecting the battery jumper cables

1. Connect the positive terminals [2] and [1].
2. **⚠ DANGER** *Explosion hazard!*
   A spark may ignite an explosive gas mixture.
   - ➢ *Do not, under any circumstances, connect the negative pole of the assisting machine to the negative pole of the battery in the machine to be started.*
     This can cause sparks when connecting and disconnecting.
   - ➢ *Work with caution.*
3. Connect the minus pole of the assisting battery [4] to a bare metal point on the compressor engine [3] to be started as far away from the battery as possible.

Starting the engine

1. Start the engine of the assisting vehicle and run at high speed.
2. Start the compressor engine.

Upon a successful start, run both engines run for approximately 10–15 minutes.
This is important, in particular for fully discharged batteries. They will pick up little current only in the beginning and have a high internal resistance. Any voltage peaks occurring in the engine generator in this state can be attenuated only by the battery of the assisting vehicle. The engine electronics in particular, of the machine is sensitive to high voltages and could be damaged easily.

Disconnecting the battery jumper cables

1. Stop the engine of the assisting vehicle.
2. Disconnect the jumper cables in the reverse order, first negative (-) then positive (+).
3. Place the pole caps.
4. Close the maintenance panels and/or bonnet.

A stop of the compressor engine as soon as the cables are disconnected could indicate major damage to the alternator or battery to be repaired by a specialized workshop.

7.4.2 Option ba
Starting up low-temperature equipment

➢ Determine which low temperature equipment is fitted to the machine.

Option bb Operating the coolant pre-heater

The engine coolant can be pre-heated to improve starting under cold conditions.
The connection for the power supply [2] is located on the rear of the machine (see illustration).

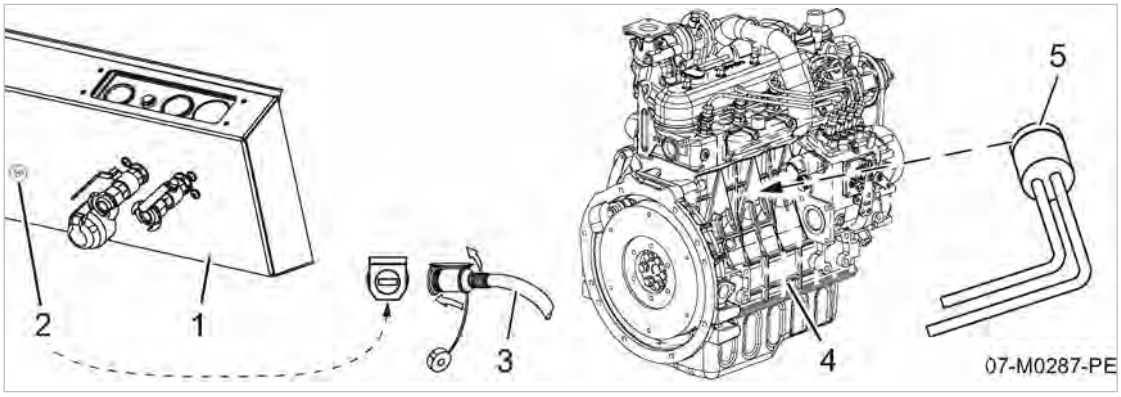


Fig. 32 Coolant pre-heating

[1] Bodywork
[2] Connection for the coolant pre-heater
[3] Power cable
[4] Engine block
[5] Coolant pre-heating

1. **⚠ DANGER** *Danger of fatal injury from electric shock!*
   Serious injury or death can result from a short-circuit in the electric coolant pre-heater.
   - ➢ *The power cable for the coolant pre-heater may only be plugged into an electrical socket fitted with a protective ground.*
   - ➢ *Have the coolant pre-heating and associated wiring checked according to the maintenance schedule.*
2. Connect the coolant pre-heater to the user's power socket with the power cable supplied.

Option bc Operating the frost protector

➢ Use the checklist when initially starting the frost protector.

To be checked	See chapter	Confirmed?
Check the level of antifreeze in the frost protector.	10.8.2	
Close the shut-off valve.	8.4	

Tab. 49 Operating the frost protector

8 Operation

8.1 Ensuring safety

Follow the instructions below for safe operation.
Warning instructions are located before a potentially dangerous task.

⚠ Disregard of warning instructions can cause serious injuries!

Complying with safety warnings

Disregard of safety warnings can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 “Safety and Responsibility”.
- ➢ Make sure that no one is working on the machine.
- ➢ Ensure that all service doors and panels are closed and secured.

Preventing accidental contact

Intensely heated, rotating, or electrically-live components can cause severe injuries.

- ➢ Ensure that all doors, canopy and panels are closed.
- ➢ Do not carry out any checks or settings while the machine is running.
- ➢ Shut down the machine before opening any doors/canopy.

When working on live components

Touching voltage-carrying components can result in electric shocks, burns or death.

- ➢ Work on electrical equipment may only be carried out by authorized electricians.

Safe working with compressed air tools and hoses

Open pressurized compressed air hoses move erratically and can cause serious injury to people.

- ➢ Pressurize compressed air hoses only after the tool has been connected.
- ➢ Do not pressurize open compressed air hoses.
- ➢ Detach compressed air hoses only after the hose has been purged of compressed air.
- ➢ At working pressures >100 psig, compressed air hoses should be secured by a cable to their respective outlet valves.

Condensate formation in compressed air hoses

Use the shortest possible compressed air hoses to minimize the temperature difference between the machine's compressed air outlet and the air tool. The hose length represents a cooling section. With increasing cooling, the compressed air gives off moisture capable of damaging the air tool.

- ➢ Use short compressed air hoses.

Condensate formation in compressed air receivers

Compressed air stored in a containers will cool down. The compressed air precipitates moisture that collects at the container's bottom. Corrosion may damage the container.

➢ Regularly drain the condensate.

Further information Details of authorized personnel are found in chapter 3.4.2.

Details of dangers and their avoidance are found in chapter 3.5.

8.2 Starting and stopping

Pictograms on the instrument panel illustrate the starting and stopping procedures, see also item [1] in the following illustration.

Precondition No personnel are working on the machine.

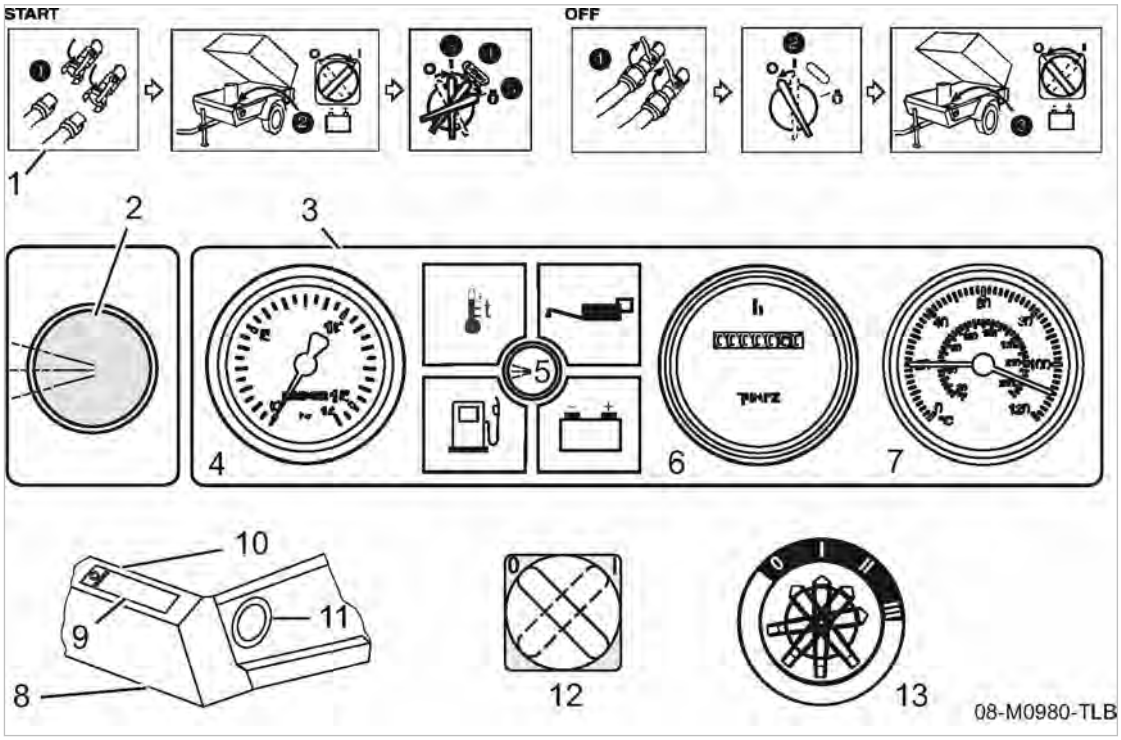


Fig. 33 Starting instruments

[1] Starting and stopping pictogram
[2] «Full load ON» push-button
[3] Instrument panel
[4] Compressed air outlet pressure gauge
[5] Alternator indicator, group alarm lamp
[6] Operating hours counter
[7] Temperature gauge switch
[8] Bodywork
[9] Location of the instrument panel
[10] Location of the «Controller ON» switch (within the machine)
[11] Location of the «Starter switch» on the machine
[12] «Control ON» switch
[13] «Starter switch»:
[0] STOP / OFF
[I] ON
[II] Preheating
[III] Start

8.2.1 Starting

1. **⚠ CAUTION** *Serious damage to engine from cold starting sprays.*
   Cold-start assists, such as ether or other sprays, can cause severe engine damage.
   - ➢ *Do not use cold start sprays.*
2. **⚠ CAUTION** *Destruction of the starter!*
   Improper operation could destroy the starter.
   - ➢ *As long as the engine is running, do not actuate the starter switch.*
   - ➢ *Do not turn and hold the starter switch for longer than 30 seconds.*
   - ➢ *Wait for a few minutes after each attempt to start the engine.*
   - ➢ *The starter switch must be returned to the neutral position before each start attempt (re-start protection).*
3. Turn the «Controller On» [12] switch to “I”.
4. Turn the «starter switch» [13] to “I”.
   The *charging indicator lamp* [5] must light.
5. Turn the «starter switch» to “II” and hold (max. 5-10 seconds).
   The engine's glow plugs are energized and the engine pre-heated.
6. Turn the «starter switch» to "III" and release it as soon as the engine starts.
   The *charging indicator lamp* [5] extinguishes as soon as the engine is running.
   A fault has occurred if the *charging indicator lamp* does not extinguish, see chapter 9.2.
   The engine will automatically be set to IDLE mode.
   The machine is not yet ready for delivering compressed air.

The electric fuel pump starts when the starter switch is in the "II" position. This vents the fuel line before each start.
Maximum preheating time should be 5-10 seconds.

8.2.2 Allowing the machine to run up to operating temperature

To avoid unnecessary wear, the engine should be run in IDLE until the airend discharge temperature reaches 86°F.
The airend discharge temperature is shown at the remote thermometer contact on the instrument panel.
Pushing the «Full load ON» button sets the machine to LOAD.
«Full load ON» push-button [2] see figure 33.
If the machine is set to LOAD, the integrated *load mode indicator lamp* is lit.

Precondition
The airend discharge temperature of 86°F has been reached.
The engine runs at constant speed.
The compressed air outlet valves are closed.

- ➢ Press the «Full load On »button.
  The load valve is activated.
  The integrated *full load indicating lamp* lights up.
  The engine accelerates to maximum speed.
  The machine is ready for compressed air delivery.

8.2.3 Shutting down

1. **⚠ CAUTION** *Thermal overload of the turbocharger!*
   Abrupt stopping of the engine under load can cause a fault or damage to the turbocharger.
   ➢ *Run the engine 2 to 3 minutes in idle before shutting down to allow the turbocharger to cool.*
2. Close all «compressed air outlet valves» on the air distributor.
   The engine runs in IDLE and the turbo charger can cool down.
3. After approx. 2 to 3 minutes, switch the «Starter switch» [13] to “0”.
4. Turn the «Control ON» switch [12] to “0”.

Close and lock the canopy.

8.3 Option ea
Operating the tool lubricator

Precondition The machine is shut down.
Tool lubricator filled with lubricant.

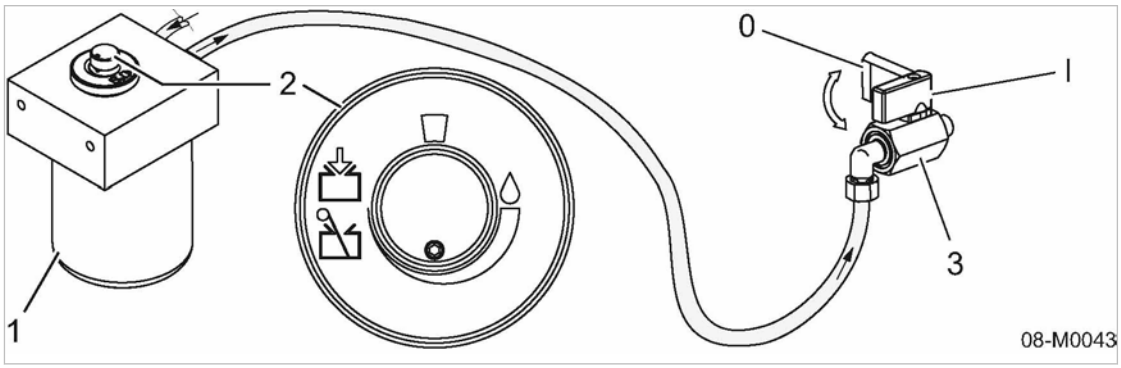


Fig. 34 Setting the tool lubricator

[1] Tool lubricator
[2] Metering knob
[3] Shut-off valve
I – open
0 – closed

➢ Open the canopy.

Adding lubricating oil

1. Open the shut-off valve [4].
2. Close the canopy.

Setting the oil flow

The amount of oil the compressed air should contain depends on the application and must be determined by the user. It depends on the nature of the air consumers and the supply hoses.

The metering valve controls the flow of oil into the air.

- Turning clockwise: reduces the oil flow.
- Turning counter-clockwise: increases the oil flow.

1. Set the required oil flow.
2. Close the canopy.

Further information Fill the tool lubricator with lubricant (see chapter 10.8.1).

Shutting off lubricating oil

1. Close the shut-off valve 4.
2. Close the canopy.

8.4 Option ba
Using the low-temperature equipment

➢ Determine which low temperature equipment is fitted to the machine.

8.4.1 Option bb
Coolant pre-heating

➢ Start the coolant pre-heating as described in chapter 7.4.2.

8.4.2 Option bc
Using the frost protector

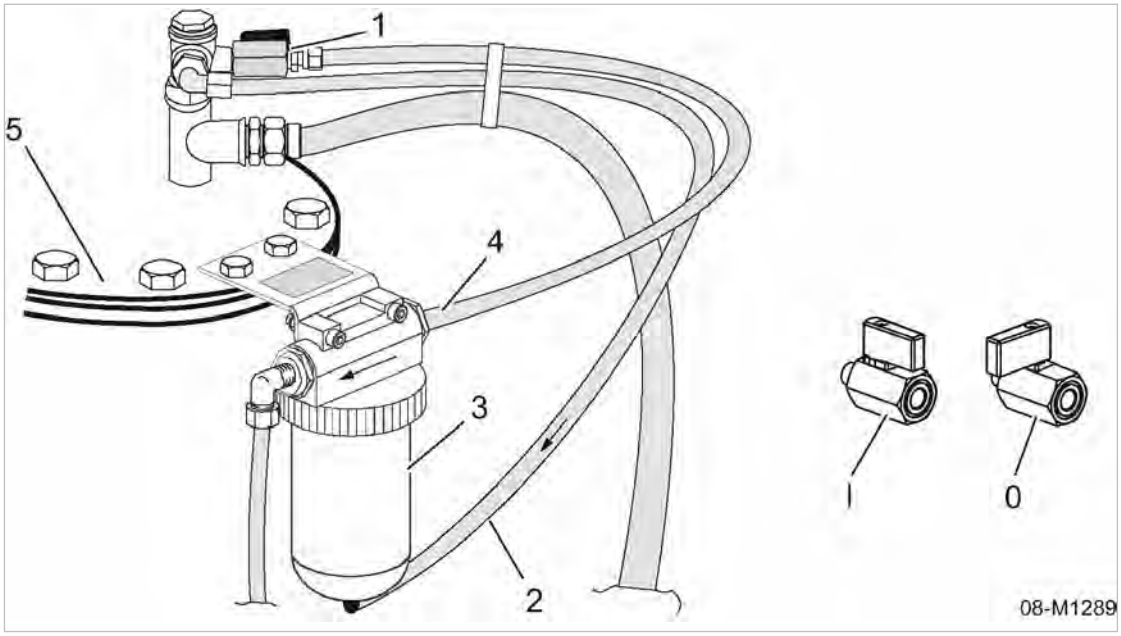


Fig. 35 Using the frost protector

[1] Shut-off valve
I – open
0 – closed
[2] Control line (frost protection)
[3] Frost protector
[4] Control line (bypass line)
[5] Oil separator tank cover

Operating the machine with frost protector (winter operation)

Operation at temperatures below 32°F (winter operation).

Subsequently to the daily operation of the machine, the compressed air conduits and valves must be moistened with antifreeze.
For this purpose, the defroster must be activated for a short time.
Antifreeze is added to the compressed air.

Precondition Frost protector filled with antifreeze

The machine is switched off.

1. Open the canopy.
2. Close the shut-off valve [1] of the bypass line [4] (position 0).
3. Close the canopy.
4. Start the machine.
5. Let the machine run for a short time.
6. Switch off the machine.
7. Open the canopy.
8. Open the shut-off valve [1] of the bypass line [4] (position I).

Result Conduits and valves are sufficiently moistened.

The machine is ready for winter operation.

The container for the anti-freeze agent is empty.

➢ Activate the defroster only for a short time, after daily use.

Activate the defroster only for a short time as described above. The antifreeze agent will be used up quickly and unnecessarily if the defroster runs continuously.

Further information See chapter 10.8.2 for filling the frost protector with antifreeze.

Using with the frost protector switched off

Operating at temperatures above 32°F (summer operation).

Precondition The machine is switched off.

1. Open the canopy.
2. Open the shut-off valve [1] on the bypass line [4] and keep it permanently open (position I).
3. Close the canopy.

8.5 Option oa
Operating the battery isolating switch

NOTICE

Danger of short circuit!
Damage to the machine electrical system is possible.

➢ *Use the «Battery isolating switch» only when the machine is switched off.*

➢ *Do not use the «Battery isolating switch» as a main or emergency switch.*

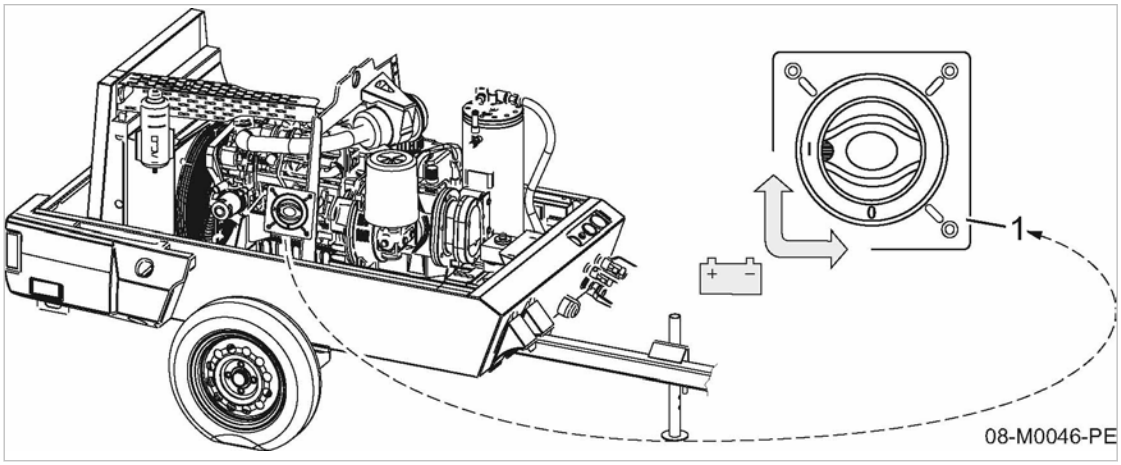


Fig. 36 Battery isolating switch

[1] «Battery isolating switch»
I – on
0 – off

➢ Raise the cover.

Starting the machine

1. Activate the «Battery isolating switch».
   The battery is now connected to the machine's electrical system. The machine can now be started.
2. Close the canopy.

Shutting down the machine:

1. Switch the «Battery isolating switch» to the 'off' position.
   The battery is disconnected from the machine's electrical system.
2. Close the canopy.

8.6 Option ua
Using the hose reel

The hose reel is positioned at the front of the machine, to the right side of the towbar.

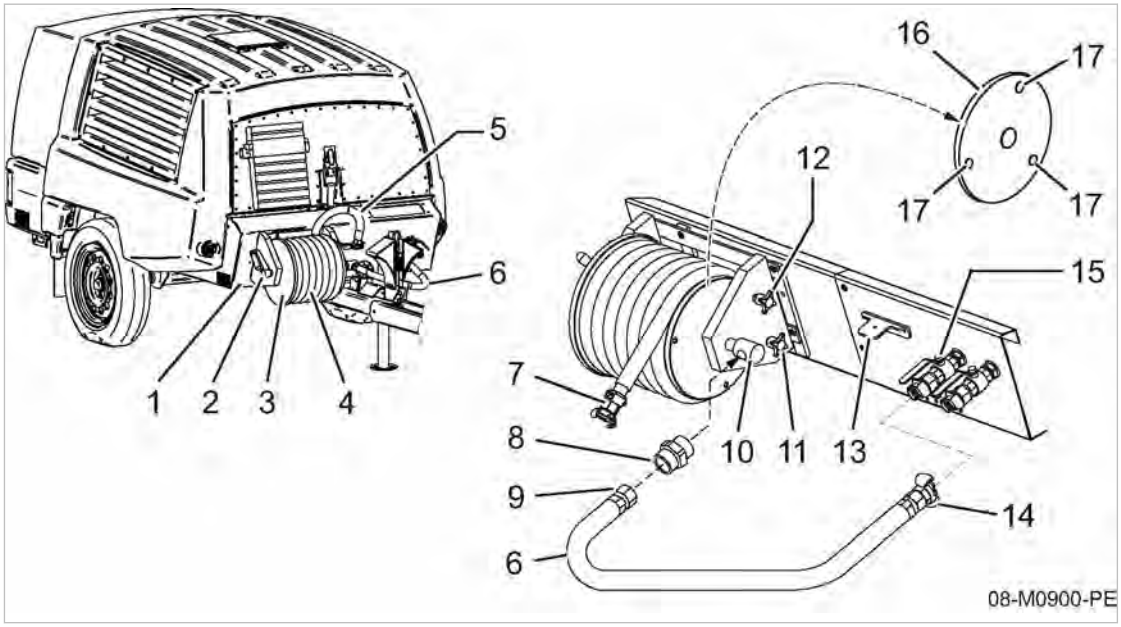


Fig. 37 Hose reel

[1] Front side, machine
[2] Winding handle (fold out)
[3] Hose reel
[4] Compressed air extension hose
[5] Hose end in safety position
[6] Connecting hose
[7] Claw coupling
[8] Adapter
[9] Union nut
[10] Connecting bore
[11] Clamping screw
[12] Transport securing bolt
[13] Bracket
[14] Claw coupling
[15] Compressed air outlet valve
[16] Side wall with safety bores
[17] Securing holes

8.6.1 Operating the machine with an extension air hose

A connecting hose [6] supplies the extension hose with compressed air.

Precondition The connecting hose is installed.
The compressed air outlet valve is closed.

1. Pull the hose coupling [7] of the bracket [13].
2. Loosen the transport securing bolt [12].
3. Loosen the clamping screw [11].
4. Unfold the crank [2].
5. Reel out the required length of the extension hose [4].
6. Tighten the clamping screw [11].
   The reel is locked against unwanted reeling in or out.
7. Fold the crank [2].
8. Connect the air tool.
9. Activate the machine
10. Hold the air consumer at its handle.
11. Open the compressed air outlet valve for the compressed air extension hose [15].

8.6.2 Operating the machine without an extension air hose

1. Close the shut-off valve for the compressed air extension hose.
2. Disconnect the air consumer.
3. Unfold the crank.
4. Coil the hose evenly and tightly.
5. Tighten the clamping knob.
   The reel is locked against unwanted reeling in or out.
6. Fold the crank.

8.6.3 Securing the hose reel for transport

1. Check that the compressed air extension hose is firmly and evenly reeled in.
2. Reel again, if necessary.
3. Tighten the clamping knob.
4. Engage the securing screw fully.
5. Plug the hose coupling onto the bracket.

8.7 Cleaning the machine after operation

Material High-pressure cleaner

Precondition The machine is switched off.
The machine has cooled down.
The machine is fully vented, the pressure gauge reads 0 psig.
All compressed air consumers are disconnected and the air outlet valves are open.

Maintain the following minimum distances to the object to be cleaned in order to prevent damages to the machine when cleaning with the high-pressure cleaner.

- Circular section jets: approximately 2.3 ft

- Fan jets: approximately 1 ft
- Dirt blasters: approximately 1 ft

Keep the water jet in permanent motion during the cleaning process. You prevent thus damage.

Cleaning with dry-ice jets is strictly forbidden as it could cause unforeseeable damages.

1. **NOTICE** *Machine damage caused by strong water jet!*
   Direct water jets can damage or even destroy sensitive components.
   - ➢ *Do **not** directly focus a strong water jet towards sensitive components.*
   - ➢ *Work carefully.*
2. Carefully clean the machine with the high-pressure cleaner.

Water has accumulated in the sealed floor pan.

- ➢ Drain the water.

Catch the liquid and dispose in accordance with applicable environmental regulations.

Further information See chapter 10.8.5 for information to the draining of liquids within the machine.

9 Fault Recognition and Rectification

9.1 Basic instructions

The following tables are intended to assist in fault finding and rectification.

1. Do not attempt fault rectification measures other than those given in this manual!
2. In all other cases:
   Have the fault rectified by an authorized KAESER service representative.

Further information

Observe the instructions in chapter 3 "Safety and Responsibility" and prevailing local safety regulations when rectifying faults and malfunctions.
Comply with local applicable safety provisions!

9.2 Engine faults and alarms

Further information

The engine service manual provides further information.

9.2.1 Engine refuses to start or comes to a stop

Possible cause	Remedy	Where can I get help?		
		Specialized workshop	KAESER Service	Engine service manual
Defective starter.	Have changed.	X	–	–
The fuel cut-off device has not opened.	Check the coil and electrics and have changed if necessary.	X	–	–
Fuel tank empty.	Fill up the fuel tank.	–	–	–
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line (see chapter 10.3.3).	–	–	X
Fuel filter clogged.	Clean or replace, see chapter 10.3.3.	–	–	X
Fuel line broken.	Have changed.	X	X	–
Defective control fuse or relay.	Have repaired or replaced if necessary.	X	X	–
Airend discharge temperature too high.	Have adjusted.	–	X	–
Defective temperature gauge switch giving no enable signal	Have repaired or replaced if necessary.	–	X	–
Starter switch defective.	Have repaired or replaced if necessary.	–	X	–
Electrical connections and/or cables loose or broken	Tighten the connection or have the cable replaced.	X	X	–
Defective battery or low charge.	Maintain battery, see chapter 10.3.7.	–	–	–

Possible cause	Remedy	Where can I get help?		
		Specialized workshop	KAESER Service	Engine service manual
Defective alternator.	Have repaired or replaced if necessary.	X	X	–
Defective alternator regulator.	Have repaired or replaced if necessary.	X	X	–
Oil pressure switch indicating insufficient oil pressure.	Check engine oil level, see chapter 10.3.4.	–	–	X
	Have the engine repaired or exchanged.	X	X	–

Tab. 50 Alarm: Engine refuses to start or comes to a stop.

9.2.2 Engine does not reach full speed

Possible cause	Remedy	Where can I get help?		
		Specialized workshop	KAESER Service	Engine service manual
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line (see chapter 10.3.3).	–	–	X
Fuel filter clogged.	Clean or replace, see chapter 10.3.3.	–	–	X
Fuel line broken.	Have changed.	X	X	–
Speed adjustment cylinder maladjusted or defective.	Have repaired or replaced if necessary.	X	X	–

Tab. 51 Alarm: Engine does not reach full speed.

9.2.3 Indicator lamp remains on

Possible cause	Remedy	Where can I get help?		
		Specialized workshop	KAESER Service	Engine service manual
Electrical connections and/or cables loose or broken	Tighten the connection or have the cable replaced.	X	X	–
Defective alternator.	Have repaired or replaced if necessary.	X	X	–
Defective alternator regulator.	Have repaired or replaced if necessary.	X	X	–

Possible cause	Remedy	Where can I get help?		
		Special-ized work-shop	KAESER Service	Engine service manual
Engine oil pressure too low.	Check engine oil level, see chapter 10.3.4.	–	–	X
	Check the engine and have re-paired if necessary.	X	X	–

Tab. 52 Indicator lamp remains on

9.3 Compressor faults and alarms

9.3.1 Working pressure too high

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Serv ice
Proportional controller misadjus-ted or defective.	Have repaired or replaced if necessary.	–	X
Inlet valve not closing.	Check the controller, the control air line and the inlet valve and replace if necessary.	–	X
Pressure gauge indicating false pressure.	Have repaired or replaced if necessary.	–	X
Venting valve does not blow off.	Check the connections and function and have repaired or replaced as necessary.	–	X

Tab. 53 Alarm: Working pressure too high

9.3.2 Working pressure too low

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Serv ice
Proportional controller maladjus-ted or defective.	Have repaired or replaced if necessary.	–	X
Inlet valve not opening or only opening partially.	Have repaired or replaced if necessary.	–	X
Pressure gauge indicating false pressure.	Have repaired or replaced if necessary.	–	X
Safety relief valve misadjusted and/or leaking.	Have repaired or replaced if necessary.	–	X
Venting valve does not close.	Check the connections and function and have repaired or replaced as necessary.	–	X

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
The engine runs at maximum speed (LOAD).	See chapter 9.2.	X	X
Engine air filter and/or compressor air filter clogged.	Clean or replace, see chapters 10.3.2 and 10.4.7.	–	–
Oil separator cartridge heavily clogged.	Replace, see chapter 10.4.6.	–	–

Tab. 54 Alarm: Working pressure too low

9.3.3 Safety relief valve blowing off

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Oil separator cartridge heavily clogged.	Change, see chapter 10.4.6.	–	–
Inlet valve not closing.	Check the controller, the control air line and the inlet valve and replace if necessary.	–	X
Safety relief valve misadjusted and/or leaking.	Adjust or have replaced if necessary.	–	X

Tab. 55 Alarm: Safety relief valve blowing off

9.3.4 Machine overheating

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Defective cooling fan.	Have the blades or the complete fan wheel replaced.	–	X
Oil cooler clogged.	Clean surface, see chapter 10.5.	–	–
Defective working element in the combination valve.	Have repaired or replaced if necessary.	–	X
Working pressure too high (proportional controller maladjusted).	Reset to the permissible value or have replaced.	–	X
Oil separator cartridge heavily clogged.	Measure the pressure differential and change the cartridge if greater than 14.5 psig. See chapter 10.4.6 for changing.	–	X
Compressor oil filter clogged.	Change, see chapter 10.4.4.	–	–
Compressor cooling oil level too low.	Top off, see chapter 10.4.2.	–	–

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Oil pipes leaking.	Seal leaks or have pipes changed.	X	X
Engine cooling system or cooling fan defective.	Have repaired or replaced if necessary.	X	X
Ambient temperature too high.	See installation conditions in chapter 5.2.	–	–

Tab. 56 Alarm: Machine overheating

9.3.5 Too much oil residue in the compressed air

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Oil separator cartridge scavenge line clogged.	Clean the oil separator cartridge dirt trap or replace the strainer and nozzle if necessary. See chapter 10.4.5.	–	X
Fractured oil separator cartridge.	See chapter 10.4.6 for changing.	–	–
Oil level in the oil separator tank too high.	Reduce to maximum level, see chapters 10.4.1 and 10.4.3.	–	–

Tab. 57 Alarm: "Too much oil residue in the compressed air"

9.3.6 Oil flows from the compressor air filter after shutdown

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Defective non-return function of the inlet valve.	Repair or have replaced if necessary.	–	X

Tab. 58 Alarm: Oil flows from the compressor air filter after shutdown

10 Maintenance

10.1 Ensuring safety

Follow the instructions below for safe machine maintenance.

Warning instructions are located before a potentially dangerous task.

⚠ Disregard of warning instructions can cause serious injuries!

Complying with safety warnings

Disregard of safety warnings can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 “Safety and Responsibility”.
- ➢ Maintenance work may only be carried out by authorized personnel.
- ➢ Use one of the safety signs below to advise others that the machine is currently being serviced:

Sign	Meaning
	Don't activate the machine.
	Warning: The machine is being serviced.

Tab. 59 Advise others that the machine is being serviced.

- ➢ Before switching on, make sure that:

- ■ nobody is working on the machine,
- ■ all protective guards and cover panels are attached,
- ■ all doors, canopy, and panels are closed,
- ■ all tools have been removed from the machine.

- ➢ Do not carry out any checks or maintenance while the machine is running!

When working on the pressure system

Compressed air is contained energy. Uncontrolled release of this energy can cause serious injury or death. The following safety concerns relate to any work on components that could be under pressure.

- ➢ Disconnect any air consumers or tools.
- ➢ Depressurize all pressurized components and enclosures.

- ■ Wait until the compressor has automatically vented.
- ■ Open the compressed air outlet valve carefully.
- ■ Check: the pressure gauge reads 0 psig!

- ➢ Do not open or dismantle any valves.

When working on the drive system

Touching rotating, very hot or electrically-live components can result in serious injury.

- ➢ Shut down the machine before opening any doors/canopy.
- ➢ Disconnect the negative terminals on the batteries.
- ➢ Ensure that the machine is cooled down.

Further information Details of authorized personnel are found in chapter 3.4.2.
Details of dangers and their avoidance are found in chapter 3.5.

10.2 Maintenance schedules

10.2.1 Logging maintenance work

The maintenance intervals given are recommended for KAESER original components with average operating conditions.

- ➢ In adverse conditions, perform maintenance work at shorter intervals.

Adverse conditions are, e.g.:

- high temperatures
- a lot of dust
- frequent use

- ➢ Adjust the maintenance intervals with regard to local installation and operating conditions.

- ➢ Logging all maintenance work.
  This enables the frequency of individual maintenance tasks and deviations from our recommendations to be determined.

Further information A list is given in chapter 10.9.

10.2.2 Maintenance tasks after commissioning

The table below lists maintenance tasks required after initial start-up.

- ➢ Carry out maintenance tasks according to the following schedule.

Component: Task	After the first 50 h	After the first half year (250 hours)	See chapter	Note
Engine:				
Change oil.	X		10.3.4	Engine SM
Change the oil filter.	X			Engine SM
Check the fuel lines and clamps.	X			Engine SM

h = operating hours; Engine SM = engine manufacturer's service manual

Component: Task	After the first 50 h	After the first half year (250 hours)	See chapter	Note
Wheels/chassis:				
Tighten the wheel nuts.	X			
Have brake system inspected and adjusted, if necessary.		X		
h = operating hours; Engine SM = engine manufacturer's service manual				

Tab. 60 Maintenance tasks after commissioning

10.2.3 Regular maintenance tasks

The following table lists the various maintenance intervals.

Maintenance interval	Short description
Daily	–
Every 250 h, at least annually.	A250
Every 500 h, at least annually.	A500
Every 1000 h, at least annually.	A1000
Every 1500 h, at least annually.	A1500
Every 2000 h, at least every 2 years.	A2000
Every 3000 h	A3000
Every 36000 h, at least every 6 years.	A36000

Tab. 61 Maintenance intervals and regular maintenance tasks

The table below lists regular maintenance tasks.

➢ Carry out maintenance tasks punctually taking ambient and operating conditions into consideration.

10.2.3.1 Machine maintenance schedule

➢ Carry out maintenance tasks according to the following schedule.

Component: Task	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Engine:										
Check inlet air filter maintenance indicator.	X								10.3.2	
Check engine oil level.	X								10.3.4	Engine SM
Engine SM = engine manufacturer's service manual; SW = specialized workshop.										

Component: Task	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Clean the engine air filter.		X							10.3.2	
Change the engine oil.		X							10.3.4	
Replace the engine oil filter.		X							10.3.5	Engine SM
Check/adjust the drive belt tension.			X						10.3.6	Engine SM
Change the engine air filter.				X					10.3.2	
Have the engine mounts checked.				X						SW
Have the valve clearance adjusted.				X						SW Engine SM
Replace the drive belt.							X		10.3.6	SW Engine SM
Check the engine coolant level.	X								10.3.1	Engine SM
Clean the cooler.		X							10.5	
Check coolant hoses and clamps.			X							
Check anti-freeze concentration.			X						10.3.1	Engine SM
Change the coolant.				X					10.3.1	Engine SM
Fill up the fuel tank.	X									
Clean/change the main fuel filter.			X						10.3.3	Engine SM
Clean the tank fuel strainer.			X							
Clean the fuel tank.			X							
Check fuel lines and hose clamping bands, have replaced if necessary.				X						SW
Change the fuel pre-filter.				X					10.3.3	Engine SM
Change the main fuel filter.				X					10.3.3	Engine SM
Check the fuel return line for leakage and firm fixing.			X							
Have the fuel injectors checked.							X			SW
Engine SM = engine manufacturer's service manual; SW = specialized workshop.										

Component: Task	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Have the fuel injector pump checked.							X			SW
Check the battery electrolyte level and connections.			X						10.3.7	
Compressor:										
Check inlet air filter maintenance indicator.	X								10.4.7	
Check the cooling oil level.	X								10.4.1	
Clean the compressor air filter.		X							10.4.7	
Clean the oil cooler.		X							10.5	
Have the safety relief valve(s) checked.			X						10.4.8	
Check/clean the oil separator tank dirt trap.			X						10.4.5	
Change the compressor air filter.				X					10.4.7	
Change the cooling oil.				X					10.4.3	
Change the compressor oil filter.				X					10.4.4	
Change the separator cartridge in the oil separator tank.						X			10.4.6	
Wheels/chassis/bodywork:										
Check the tire pressures.		X								
Check wheel bolts and nut for tightness.		X								
Carry out chassis maintenance.			X						10.7	
Grease the coupling head, joints, towbar, and the rotatable adapter.			X						10.7.2	
Brake maintenance.			X						10.7.3	
Check wear on the brake linings.			X						10.7.3.2	
Have the wheel brakes adjusted.			X							SW
Check all screw connections, hinges, locks, catches, handles and snap fasteners for wear and secure fixing.		X								
Carry out rubber sealing strip maintenance.			X						10.6	
Engine SM = engine manufacturer's service manual; SW = specialized workshop.										

Component: Task	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Have lifting eye and fixings checked.			X							SW
Other maintenance tasks:										
Check all accessible screw fittings, pipes and clamps for wear and tightness.			X							
Check hoses for proper seating, leaks and wear.			X							
Have hose lines replaced.								X		SW
Check that all electrical connections are tight.			X							
Engine SM = engine manufacturer's service manual; SW = specialized workshop.										

Tab. 62 Regular machine maintenance tasks

10.2.3.2 Maintenance schedule for options

➢ Carry out maintenance tasks according to the following schedule.

Option: Task	Daily	A250	A500	A1000	A2000	See chapter	Note
Option ea – tool lubricator:							
Check the oil level in the tool lubricator.	X					10.8.1	
Option bb – engine coolant pre-heater:							
Have the coolant pre-heating and associated wiring checked.			X				SW
Option bc – frost protector:							
Winter operation Check the level of anti-freeze in the frost protector.	X					10.8.2	
Option la – spark arrestor:							
Spark arrestor cleaning.		X				10.8.3	
Blow out the spark arrestor with compressed air.			X				
Option lb - engine air intake shut-off valve:							
Clean/check the engine air intake shut-off valve.		X				10.8.4	
SW = specialized workshop; KS = contact an authorized KAESER service representative							

Option: Task	Daily	A250	A500	A1000	A2000	See chapter	Note
Option ne - fuel water trap:							
Draining contamination.	X					10.3.3.3	
Change fuel water trap insert.			X			10.3.3.3	
Option oe – sealed floor pan:							
Checking the machine interior for liquid accumulations.						10.8.5	
SW = specialized workshop; KS = contact an authorized KAESER service representative							

Tab. 63 Maintenance schedule for options

10.3 Engine maintenance

➢ Perform maintenance tasks according to the schedule in chapter 10.2.3.1.

10.3.1 Water cooler maintenance

Material
Coolant
Coolant tester
Receptacle
Funnel
Cleaning cloth

Precondition
The machine is shut down,
the machine is standing level,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
all compressed air consumers are disconnected and the air outlet valves are open.

⚠ WARNING

Danger of scalding by hot coolant!
Serious injuries can be caused by hot coolant.

➢ *Let the machine cool down before opening the cooling system.*

⚠ CAUTION

There is danger of injury from coolant containing antifreeze!

➢ *Avoid eye and skin contact with coolant. If the eyes are affected, rinse immediately with running water.*

➢ *Wear protective glasses and gloves.*

NOTICE

Insufficient coolant can damage the engine.
Insufficient coolant will cause the engine to overheat. Overheating can cause serious damage to the engine.

➢ *Check the coolant level daily.*

➢ *Top off the coolant as necessary.*

➢ Open the canopy.

10.3.1.1 Checking coolant level

Check the coolant level of the engine daily before starting.

The level is checked on the coolant expansion tank:

- The tank is semi-transparent so the coolant level can be seen from outside.
- The level should be between the *minimum and maximum markings* with the engine cooled down.

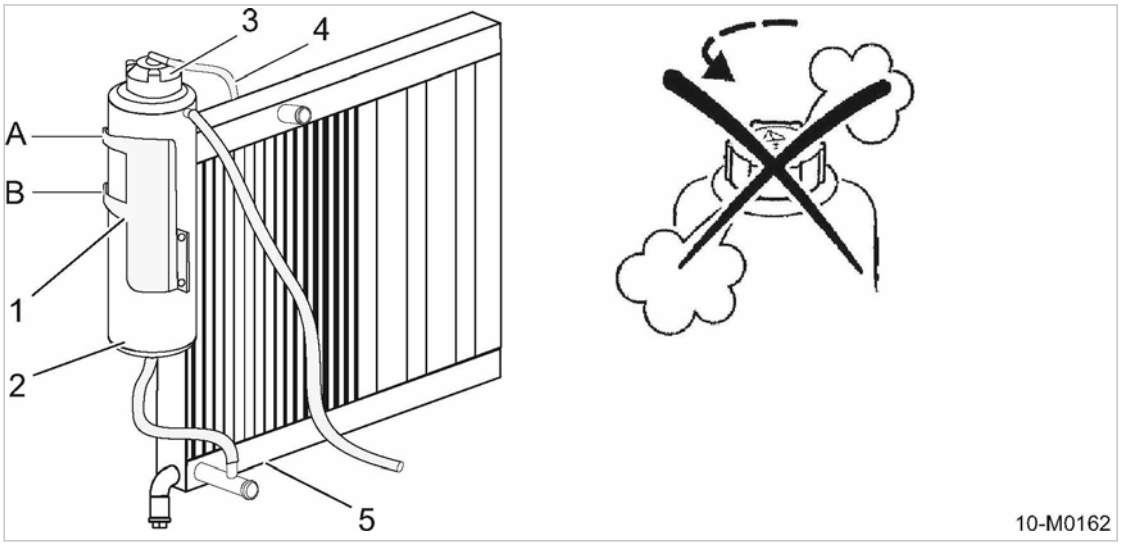


Fig. 38 Checking coolant level

1	Coolant level indicator	3	Filler port with cap
A	*Maximum markings* (FULL)	4	Overflow
B	*Minimum-markings* (LOW)	5	Water cooler
2	Coolant expansion tank		

1. Check the level of coolant in the expansion tank.
   Top up when the coolant level falls below the *minimum marking* B.
2. Close the canopy.

Determine and rectify the cause of coolant loss.

10.3.1.2 Checking the coolant

The coolant should be checked according to the maintenance schedule to ensure quality and operational life.

Coolant quality can be determined by the following parameters:

- Visual check
- Antifreeze concentration measurement

➢ Unscrew and remove the expansion tank filler cap [3].

Visual check

The coolant should be checked for its color and any particles or sediments floating in it.

➢ Take a coolant sample and have analyzed.
The coolant should be changed if it is discolored or has floating particles.

Antifreeze concentration measurement

An instrument (e.g. refractometer) is used to check antifreeze concentration.

Maximum frost protection is ensured with an antifreeze concentration of 55% by volume, as frost protection and heat transfer properties deteriorate beyond this point. Higher concentration also leads to higher operating temperature.

1. **NOTICE** *The engine can be damaged if the antifreeze concentration is insufficient.*
   Corrosion
   Damage to the cooling system.
   Engine casing fracture
   - ➢ *Check coolant.*
   - ➢ *Protect the coolant against frost.*
   - ➢ *Top off as necessary.*
2. Use the coolant tester as instructed by the manufacturer to test the coolant.
   Change the coolant when the concentration of antifreeze is too low.

Finish off the work steps

1. Screw on the filler cap.
2. Close the canopy.

10.3.1.3 Mixing the coolant

Do not use water without coolant additive. Water alone is corrosive at engine operating temperature. Water alone does not offer sufficient protection from boiling or freezing.

The coolant is a mixture of clean, fresh water and antifreeze with corrosion inhibitor.

For reasons of corrosion protection and the need to raise the boiling point, the coolant must remain in the cooling system throughout the year.
The maximum permissible coolant life is 2 years.

➢ Follow coolant recommendations in chapter 2.6.4.

Preparing the coolant

Precondition Coolant must meet the specification of ASTM D4985.

➢ The coolant should be mixed in the proportions given by the manufacturer.

KAESER coolant mixture table

Antifreeze	Water	Frost protection to [°F]
1 part	2 parts	−0.4
1 part	1.5 parts	−13
1 part	1 part	−35

Tab. 64 KAESER coolant mixture table

The concentration of antifreeze should not be less than 33% for ensured corrosion protection.

10.3.1.4 Filling and topping off the coolant

The proportion of antifreeze in the coolant should not fall below 33% to ensure frost and corrosion protection and prevent the build up of deposits in the cooling circuit. Topping up with water alone dilutes the antifreeze concentration and is forbidden.

Make sure that there is sufficient room for the coolant to expand when hot without overflowing.

Precondition The negative cable to the battery is disconnected.

1. Remove the expansion tank filler cap.
2. Mix a quantity of coolant according to the table and top up to the mark.
   Top off until the coolant level is just below the *maximum mark* Ⓐ.
3. Screw on the filler cap.
4. Reconnect the negative battery terminal.
5. Close the canopy.
6. Start the engine and allow to IDLE for about 1 minute.
7. Stop the engine.
8. Open the canopy.
9. Check the coolant level.
   Top off if the coolant level in the expansion tank has fallen.
10. Carry out a visual check for leaks.
11. Close the canopy.

10.3.1.5 Draining the coolant

Precondition The machine is cooled down.
The negative cable to the battery is disconnected.

Draining the coolant

The entire cooling agent of the motor can be drained by opening the screw plug at the water cooler.

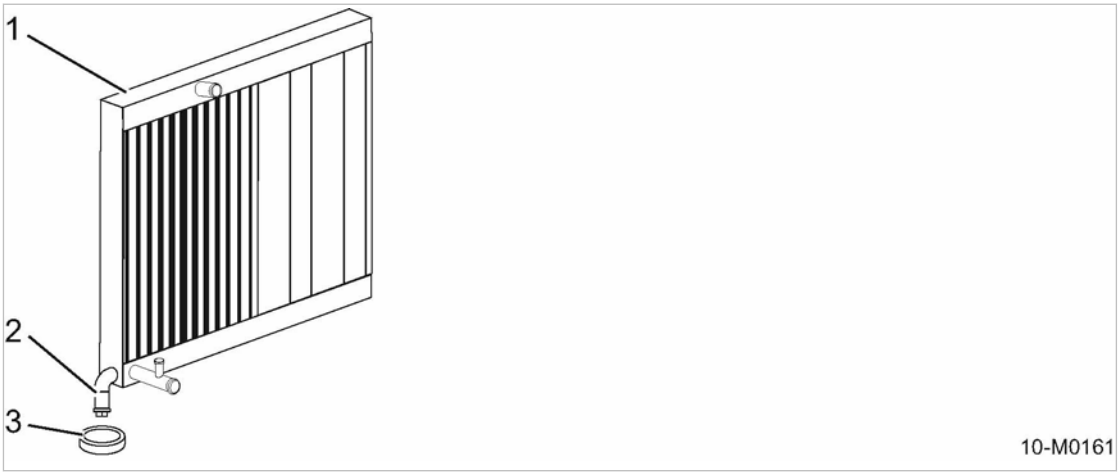


Fig. 39 Draining the coolant from the radiator

[1] Water cooler
[2] Screw plug
[3] Bung (Option oe)

1. Unscrew and remove the expansion tank filler cap.
2. In Option oe (sealed floor pan), the bung must be removed from the floor panel.
3. Position a receptacle beneath the water cooler drain point (accessible through a hole in the floor panel).
4. Remove the plug [2].
   Cooling agent is drained.
5. Insert the plug with sealing ring and tighten.
6. In Option oe (sealed floor pan), you must also close the opening in the floor panel, using the bung.
7. Screw on the filler cap.
8. Close the canopy.

➢ Dispose of used coolant in accordance with environmental protection regulations.

Further information The operating manual supplied by the engine manufacturer provides further information on coolant change and cleaning the cooling system.

10.3.2 Engine air filter maintenance

Clean the filter according to the maintenance schedule or if the maintenance indicator shows this to be necessary.

Renew the air filter element after one year at the latest or after it has been cleaned 3 times.

- Using the engine without an air filter element is not permitted!
- Do not use an air filter element with damaged folds or gasket.
- The use of an unsuitable air filter can permit dirt to ingress the engine and cause premature wear and damage.

Material
Compressed air for blowing out
Spare parts (as required)
Cleaning cloth

Precondition
The machine is shut down,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
all compressed air consumers are disconnected and the air outlet valves are open.

NOTICE

Damaged filter element.
Wear in the engine from intake of contaminated air.

- ➢ *Do not try to clean the filter element by striking or knocking it.*
- ➢ *Do not wash the filter element.*

Checking contamination of the air filter

Air filter maintenance is necessary when the yellow piston inside the maintenance indicator reaches the red zone.

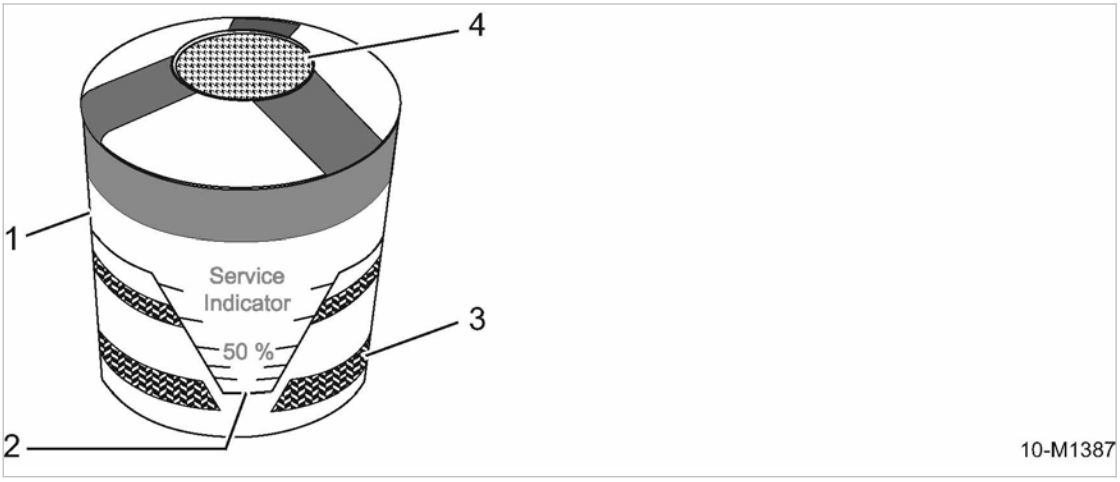


Fig. 40 Maintenance indicator

1 Maintenance indicator
2 Indicator piston
3 Red zone indicator scale
4 Reset knob for the maintenance indicator

- ➢ Check the air filter maintenance indicator.
  If the yellow piston reaches the red zone, clean or replace the filter element.

Cleaning the air filter

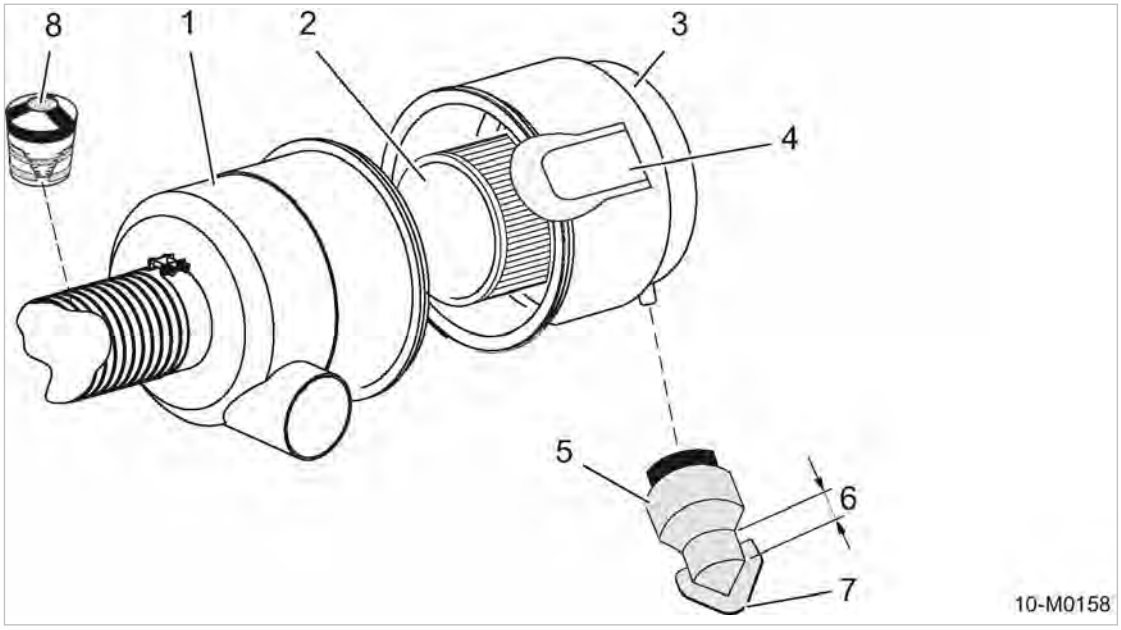


Fig. 41 Engine air filter maintenance

1. Filter housing
2. Filter element
3. Filter cap
4. Spring retaining flap
5. Dust evacuating valve
6. Valve part
7. Drain slit
8. Maintenance indicator

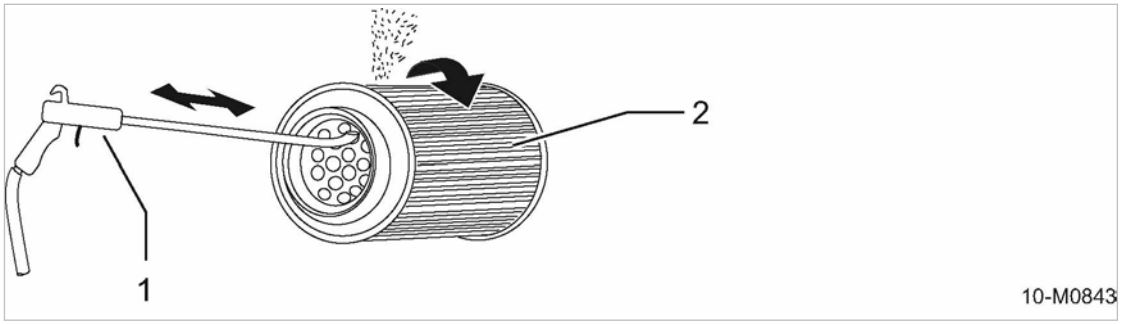


Fig. 42 Cleaning the filter element

1. Compressed air gun with blast pipe bent to 90° at the end
2. Filter element

1. Press both spring flaps together, lift the filter cap and remove the filter element.
2. Carefully clean the inside of the housing, the cover and sealing faces with a damp cloth.
3. Cleaning the filter element:
   - Use dry compressed air (≤ 72 psig!) at an angle to blow dust from the filter element from inside to outside until no further dust develops.
   - The blast pipe must be long enough to reach the bottom of the element.
   - The tip of the blast pipe should not be allowed to touch the element.
   - Clean sealing faces.
4. Inspect the element carefully for any damage.
   Replace any damaged filter element.

5. To empty the dust evacuator valve:
   - Pinch the valve part above the drain slit (drain slit opens).
   - Remove any dust clumps.
   - Clean the slit.
6. Insert the cleaned or new filter element into the filter housing. Make sure it is properly in place and sealed by its gasket.
7. Place the filter cap on the housing and press home.
8. Press on the cap until the spring retaining flaps snap home.

Resetting the maintenance indicator

➢ Press the reset knob on the maintenance indicator a number of times.

The yellow piston within the indicator is reset and the maintenance indicator is ready for use again.

➢ Close the canopy.

Dispose of old parts and contaminated materials according to environmental regulations.

10.3.3 Fuel system maintenance

Overview:

- Bleeding the fuel system
- Fuel system maintenance
  - Changing the fuel prefilter element
  - Replacing the filter cartridge of the main fuel filter
  - Starting the machine and performing a trial run
- Maintenance of the fuel system with water trap

Venting of the standard fuel system is the same as venting of the fuel system with optional water separator.

Material
Spare parts
Oil receptacle
Cleaning cloths

Precondition
The machine is switched off.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The negative cable to the battery is disconnected.

⚠ DANGER

Danger of fire from spontaneous ignition of fuel!
Serious injury or death could result from the ignition and combustion of fuel.

- ➢ *Allow no open flames or sparks at the place of use.*
- ➢ *Stop the engine.*
- ➢ *Wipe up escaped fuel.*
- ➢ *Keep fuel away from hot machine parts.*
- ➢ *Ensure that the maximum ambient temperature is not exceeded at the place of use.*

➢ Comply with all instructions.

10.3.3.1 Bleeding the fuel system

The electric fuel pump is used to bleed the system. The negative battery terminal must be connected for the pump to operate and bleeding to be carried out.
When the starter switch is turned to the "II" position, the pump starts and bleeds the fuel system. The engine is not started!

Air can find its way into the fuel system under certain conditions or maintenance tasks:

- Fuel tank empty.
- Replacing the filter element/cartridge of:
  - Fuel pre-filter
  - Main fuel filter
- Replacing the fuel pump
- Work on the fuel lines

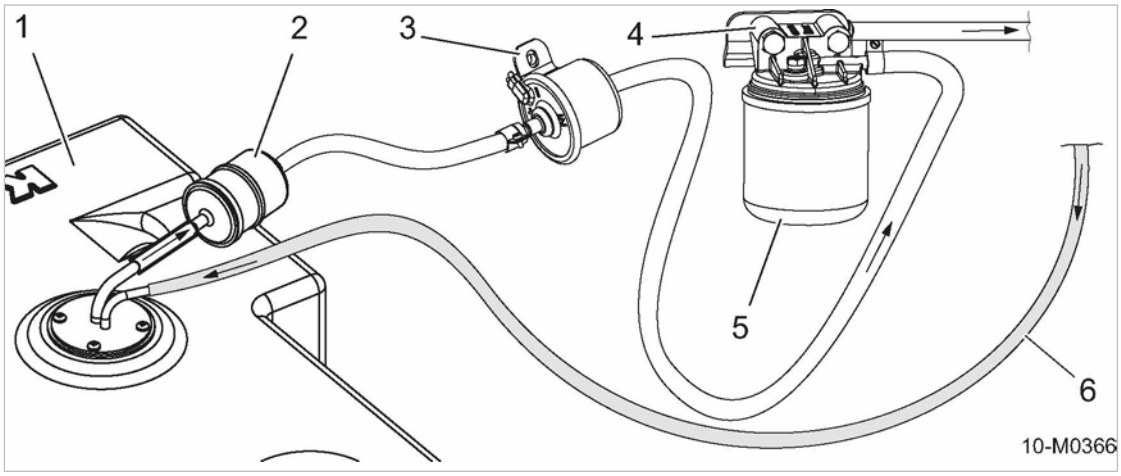


Fig. 43 Bleeding the fuel system

1	Fuel tank	4	Upper part, main fuel filter
2	Fuel prefilter	5	Filter cartridge, main fuel filter
3	Electric fuel pump	6	Fuel return line

1. Reconnect the negative battery terminal.
2. Turn the «starter switch» to the "II" position.
   The fuel system is bled.

3. Turn the «starter switch» to the “0” position.
   The venting process is completed.
4. Disconnect the negative terminal on the battery.

10.3.3.2 Filter maintenance

Changing the fuel prefilter element

The filter element should be changed according to the maintenance schedule.

Precondition The negative cable to the battery is disconnected!

Fig. 44 Fuel pre-filter maintenance

[1] Fuel line
[2] Hose clamp
[3] Fuel pre-filter

1. Place the fuel receptacle under the prefilter.
2. Loosen the hose clamp on the filter cap.
3. Pull off the fuel line.
4. Catch fuel in the receptacle.
5. Remove the prefilter cap.
6. Withdraw the filter element.
7. Insert the new element.
8. Replace the filter cap.
9. Connect the fuel line.
10. Tighten the hose clamp.
11. Bleed the system as described previously.

Catch any escaping fuel.
Dispose of escaped fuel, contaminated fuel and working materials and components contaminated with fuel according to environmental regulations.

Replacing the filter cartridge of the main fuel filter

The filter cartridge of the main fuel filter should be changed according to the maintenance schedule.

Use a filter wrench to loosen the cartridge if necessary.

Precondition The negative cable to the battery is disconnected!

1. Place a receptacle under the filter cartridge [5].

2. Unscrew and remove the cartridge [5].
3. Take a new filter cartridge.
4. Smear fuel on the gasket.
5. Spin on the new oil filter by hand until the gasket is firmly seated.
6. Bleed the system as described previously.

Catch any escaping fuel.
Dispose of escaped fuel, contaminated fuel and working materials and components contaminated with fuel according to environmental regulations.

Starting the machine and performing a test run

1. Start the machine and allow it to idle for at least 1 minute.
2. Visually check the fuel system for leaks.
3. Shut down the machine.
4. Tighten all fittings.

10.3.3.3 Option ne
Fuel filter with water trap maintenance

Material: Wrench
Receptacle
Cleaning cloth

Precondition: The machine is shut down,
the machine is standing level,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
the negative cable to the battery is disconnected.

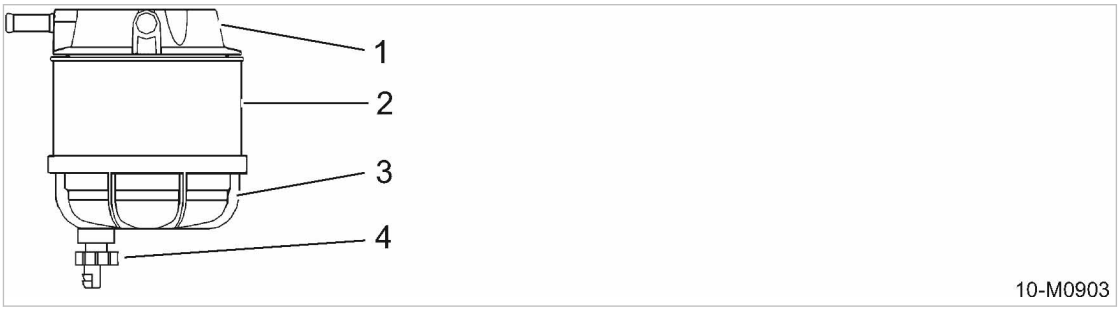


Fig. 45 Fuel de-watering filter

[1] Filter head
[2] Fuel water trap insert
[3] Transparent separator tank
[4] Screw plug

Checking the water trap

The water trap container [3] is semi-transparent for the fuel level to be seen from the outside.

- Water, being denser than diesel fuel, sinks to the bottom of the water trap.
- The presence of water can be verified because it's a different color than the fuel.

A check should be made daily as to whether water and dirt has accumulated.

1. Raise the canopy.
2. Check the fuel in the water trap.
   The water trap should be emptied when dirty.
3. Close the canopy.

Emptying the water trap

1. Place a receptacle under the drain plug [4] of the water trap.
2. Unscrew the drain plug and allow water and dirt to drain out into the receptacle.
3. Catch the liquid mixture in the receptacle.
4. Tighten the drain plug [4].
5. Reconnect the negative battery terminal.
6. Close the canopy.

Dispose of fuel and any materials contaminated with it in accordance with environmental protection regulations.

Bleeding the fuel system

Precondition Negative cable to the battery connected.

➢ Bleed the fuel system, see bleeding process window, chapter 10.3.3.

Starting the machine and performing a test run

1. Start the machine and allow it to idle for at least 1 minute.
2. Visually check the fuel system for leaks.
3. Shut down the machine.
4. Tighten all fittings.

10.3.4 Changing the engine oil

The engine oil should be changed

- according to the maintenance schedule,
- according to the degree of contamination of the intake air,
- at least once a year.

Check the operating manual of the engine manufacturer for information on oil changes in very dusty environments.

Material
New engine oil, see chapter 2.6.5 for engine oil filling quantity.
Receptacle
Wrench
Cleaning cloth

Precondition
The machine is shut down,
the machine is standing level,
the machine is fully vented, the pressure gauge reads 0 psig,
engine at operating temperature,
all compressed air consumers are disconnected and the air outlet valves are open,
the negative cable to the battery is disconnected.

⚠ CAUTION

Danger of burns from hot components and escaping engine oil!

➢ *Wear long-sleeved clothing and protective gloves.*

Draining the engine oil

In order to drain the engine oil, unscrew the screw plug in the oil pan. For this purpose, a drainage outlet is provided in the floor pan.

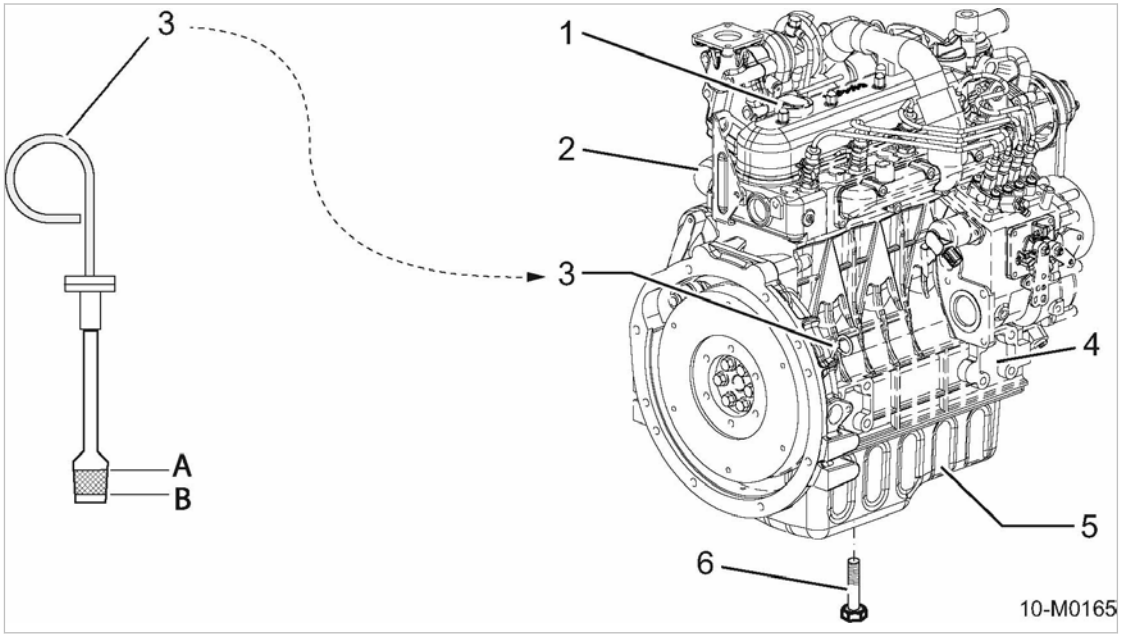


Fig. 46 Draining the engine oil

[1] Filler cap
[2] Oil filter
[3] Oil dipstick
[4] Engine block
[5] Engine oil sump
[6] Screw plug

1. Raise the canopy.
2. Remove the oil filler cover.
3. Place the oil receptacle below the drain hole in the floor pan.
4. Unscrew the drain plug and allow the engine oil to drain into the receptacle.
5. Clean the screw plug and screw in with a new gasket.

6. Replace the plug in the filler port.
7. Close the canopy.

Dispose of old oil and oil-soaked working materials according to environmental protection regulations.

Filling with engine oil

Precondition Screw plug with the sealing ring screwed into the oil pan.
Filler plug tightened.

1. Pour in the specified volume of fresh oil into the oil filler.
2. Screw on the filler cap.

Checking the engine oil level

It takes a few minutes for oil to reach the sump.
Wait 5 minutes then use the dip stick to check the oil level.
The level must be between marks A and B.

1. Pull out the dip stick, wipe it clean and reinsert it.
2. Pull out the dipstick once more and read off the oil level.
3. Top up if the level is too low.
4. Reconnect the negative battery terminal.

Starting the machine and performing a trial run

Precondition Battery connected

1. Start the machine and allow it to idle for at least 5 minutes.
2. Check the engine oil level.
   Top off as necessary.
3. Carry out a visual check for leaks.
4. Shut down the machine.

10.3.4.1 Option oe
Draining the engine oil by a shutoff valve

The engine oil should be changed:

- according to the maintenance schedule,
- according to the degree of contamination of the intake air,
- at least once a year.

Material
New engine oil, see chapter 2.6.5 for engine oil filling quantity.
Receptacle
Hose coupling
Cleaning cloth
Funnel

Precondition
The machine is shut down,
the machine is standing level,
the machine is fully vented, the pressure gauge reads 0 psig,
engine at operating temperature,
all compressed air consumers are disconnected and the air outlet valves are open,
The negative cable to the battery is disconnected.

⚠ CAUTION

Danger of burns from hot components and escaping engine oil!

➢ *Wear long-sleeved clothing and protective gloves.*

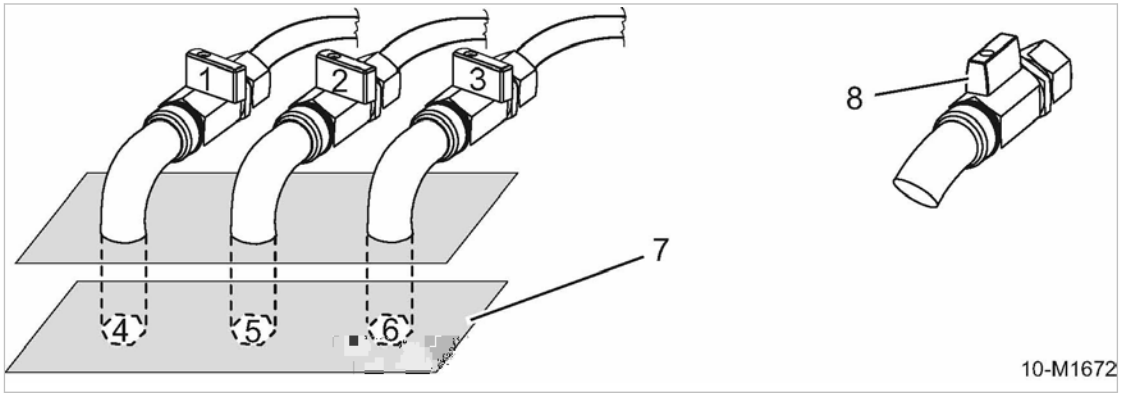


Fig. 47 Engine sump drain valve

[2] Engine sump shut-off valve
[5] Engine oil sump plug
[7] Lower bodywork
[8] Valve open position

Draining the engine oil

1. Remove the oil filler cap.
2. Position the receptacle.
3. Unscrew and remove the engine oil sump plug [5].
4. Open the engine oil sump plug valve [2].
   Engine oil flows into the receptacle.

10.3.5 Changing the engine oil filter

Material
Spares
Common tools
Cleaning cloth
Receptacle

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 psig.
The engine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

⚠ CAUTION

Danger of burns from hot components and escaping engine oil!

➢ *Wear long-sleeved clothing and protective gloves.*

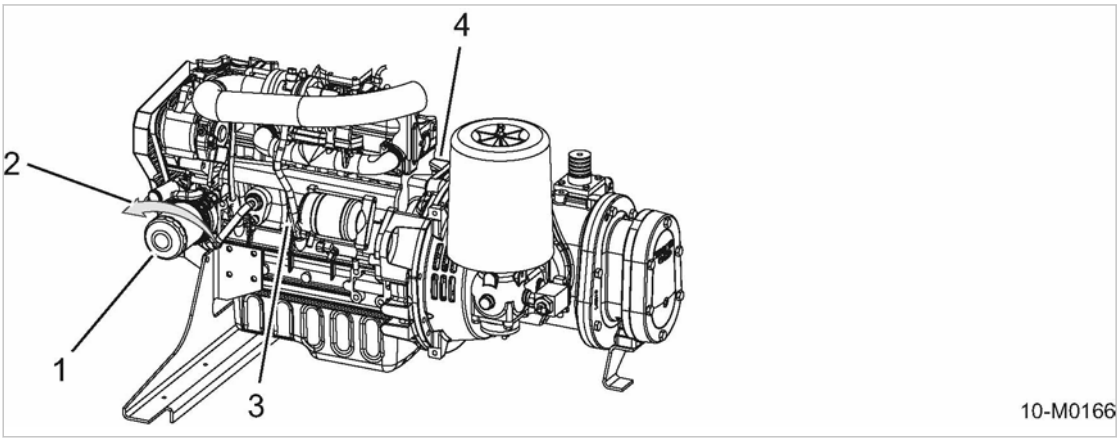


Fig. 48 Changing the engine oil filter

[1] Engine oil filter
[2] Direction of rotation to unscrew the filter
[3] Engine
[4] Oil dipstick

1. Open the canopy.
2. Prepare a receptacle.
3. Note the direction of rotation [2] to unscrew the filter.
4. Unscrew the filter [1]. Catch any escaping oil.
5. Carefully clean sealing surfaces using lint-free cloth.
6. Lightly oil the new filter's gasket.
7. Turn the oil filter clockwise by hand to tighten.
8. Check the engine oil level.
   Low oil level: Replenish engine oil.
9. Close the canopy.

Further information
The engine service manual gives further information on oil filter changing.

Dispose of old oil filters, old oil and materials contaminated with oil according to environmental protection regulations.

10.3.6 Drive belt maintenance

The life of the drive belts is influenced by belt tension.

- Slack belts can slip and become damaged and may result in engine overheating.
- Over-tight belts stretch and wear quicker. Over-tight belts also place unnecessary stress on bearings and shorten their life.

Material V-belt tension measuring device

Spares

Precondition The machine is shut down.

The machine is fully vented, the pressure gauge reads 0 psig.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

Negative cable to the batteries disconnected.

⚠ WARNING

Beware of rotating pulleys and moving belts.
There is danger of serious injury from pinching.

➢ *Never check the drive belts unless the engine is at standstill.*

➢ *Never run the machine without a belt guard.*

➢ Open the cover.

10.3.6.1 Visual inspection

Precondition Belt guard is removed

1. Check the belts thoroughly for cracks, fraying or stretching.
   When damaged or worn: Replace the drive belt immediately.
2. Replace the belt guard.
3. Reconnect the negative battery terminal.
4. Close the cover.

10.3.6.2 Checking belt tension

Check belt tension when the belts are warm, not hot, to avoid length variations through temperature.

The engine manufacturer recommends a tension measuring device for belts. See the engine service manual.

The belt tension may also be checked by hand if no tension measuring device is available.

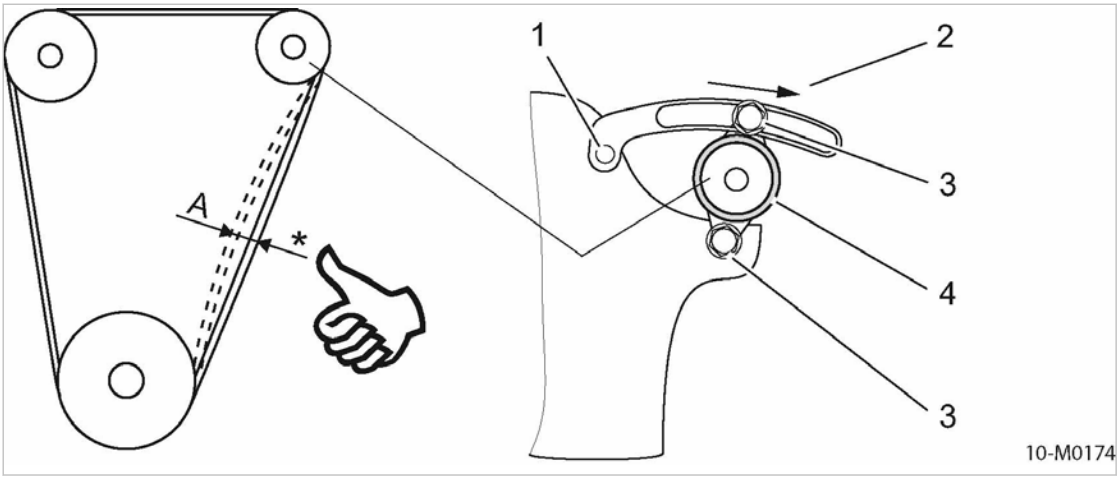


Fig. 49 Belt tension checking by hand

[A] Permissible deflection of the belt
[*] Approximate pressure exerted: 22 lb
Permissible movement: 7 – 9 inches
[1] Engine block mounting
[2] Direction of arrow
[3] Engine alternator screw
[4] Engine alternator

Checking and resetting belt tension with tension measuring device:	Checking and resetting belt tension manually:
1. Remove the belt guard.	1. Remove the belt guard.
2. Check belt tension with the tension measuring device.	2. Using your thumbs, push the belt between the belt pulleys (see illustration 49).
3. Tensioning a loose belt: ■ Loosen both securing screws [3] on the engine alternator [4]. ■ Using a suitable lever, pull the engine alternator [2] in the direction of the arrow until the correct belt tension is achieved. ■ Retighten both securing screws [3].	3. Tensioning a loose belt: ■ Loosen both securing screws [3] on the engine alternator [4]. ■ Using a suitable lever, pull the engine alternator [2] in the direction of the arrow until the correct belt tension is achieved. ■ Retighten both securing screws [3].
4. Replace the belt guard.	4. Replace the belt guard.
5. Reconnect the negative battery terminal.	5. Reconnect the negative battery terminal.

Changing the belt

1. Loosen both screws [3] at the engine generator [4].
2. Press the engine generator in opposite direction of the arrow.
   The drive belt is free of tension.
3. Pull the drive belt.
4. Check the pulleys for dirt and wear.
   - Dirty pulley: Clean pulley.
   - Worn pulley: Change the pulley.
5. Manually route the new drive belt over the pulleys without using force.
6. Using a suitable lever, pull the engine alternator [2] in the direction of the arrow until the correct belt tension is achieved.
7. Retighten both securing screws [3].

A belt that has been replaced may not be used again.
Check the belt tension after running for approximately 15 minutes.

Old belts should be disposed of in accordance with the latest environmental regulations.

Putting in operation:

1. Replace the belt guard.
2. Reconnect the negative battery terminal.
3. Close the cover.

Further information — For replacement and tensioning of the drive belts, see also the engine manufacturer's service manual.

10.3.7 Battery maintenance

➢ Check the charging system if the battery discharges without a reason.

10.3.7.1 Safety

⚠ WARNING

Danger of acid burns from escaping electrolyte!

- ➢ *Wear appropriate protective clothing including acid-proof rubber gloves.*
- ➢ *Always wear eye and face protection.*
- ➢ *Do not tip the battery. Electrolyte may run out of the vent holes.*
- ➢ *Work with caution.*

When working on the battery comply with the following safety signs:

A warning label with safety signs is attached to the battery.

10-M0167

Fig. 50 Safety signs - warning stickers on the battery.

➢ Take heed of any safety signs on the battery warning labels.
The individual safety signs have the following meaning:
- [1] – Fire, sparks, open flame and smoking are forbidden!
- [2] – Eye and face protection must be worn. Danger of acid burns!
- [3] – Keep children well away from batteries and electrolyte.
- [4] – Wear protective gloves, batteries are filled with caustic electrolyte!
- [5] – Observe the battery manufacturer's instructions!
- [6] – Follow safety rules, explosion hazard!

Further instructions on working with batteries:

➢ Do not remove battery terminal covers unnecessarily.
➢ Do not lay tools on the battery. This can lead to short circuits, overheating, and battery bursting.
➢ Take particular care when the battery has been in service for a long time or has just been charged as highly explosive gas is emitted!
Ensure adequate ventilation!

10.3.7.2 Battery checking and care

Even “maintenance-free” batteries need a degree of care to maintain their maximum operational life.

The outside of the battery and the terminals should be cleaned regularly with a soft cloth. This avoids current leaks and minimizes the discharge rate.

Material
Terminal grease
Distilled water
Cleaning cloth
Protective gloves
Eye protection

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine is cooled down.

➢ Open the canopy.
1. Clean the casing and terminals. Do not use a wire brush!
2. Lightly grease the terminals to prevent corrosion.
3. Check that the batteries and cable connections are properly seated and tighten if necessary.

Check the battery electrolyte level

The fluid is generally sufficient for the life of the battery. Nevertheless, the fluid level should be checked annually. The level should be up to the mark, 0.4 inches above the plates.

Replace the battery immediately if the casing leaks.

1. **NOTICE** *Battery destruction!*
   Topping off with pure acid will increase the electrolyte concentration and can destroy the battery.
   ➢ *Top off only with distilled water.*
2. Check the electrolyte level.

If the level does not reach the mark -
➢ Top off with distilled water.

➢ Close the canopy.

Winter operation

Batteries are particularly stressed in winter. Only a fraction of the normal starting energy is available at low temperatures.

1. **NOTICE** *Danger of batteries freezing!*
   Discharged batteries are subject to frost damage and can freeze at 14°F.
   ➢ *Check battery charge with a specific gravity tester.*
   ➢ *Recharge the battery.*
   ➢ *Clean the battery terminals and wipe with grease.*
2. Check the battery charge weekly.
   Recharge as necessary.
3. If the machine is to be unused for a number of weeks, remove the battery and store in a frost-proof room.

In extreme cases, the use of heavy-duty cold-start batteries and/or additional batteries is recommended.

10.3.7.3 Battery removal and installation

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine is cooled down.

1. **⚠ WARNING** *There is danger of batteries bursting!*
   If a battery short circuits it will overheat and can burst.
   ➢ *Never short circuit a battery (e.g. with a hand tool).*
   ➢ *Wear protective gloves and eye protection.*
2. **NOTICE** *Excessive voltage produced by the alternator.*
   Voltage peaks can destroy the alternator regulator and diodes.
   ➢ *The battery serves as a buffer and must not be disconnected while the engine is running.*
   ➢ *Carry out work on batteries only with the machine shut down.*
3. Open the canopy.
4. Disconnect the negative cable first, then the positive cable.
5. Unscrew the battery fixing clamp.
6. Replace in the reverse order.
7. Make sure the battery is properly secured.
8. Close the canopy.

Battery replacement

If the battery is to be replaced, the new battery should have the same capacity, current rating and shape as the original battery.

➢ Always replace a battery with one of the same type.

Old batteries are hazardous waste and must be disposed of correctly in accordance with local environment protection regulations.

10.3.8 Checking the fastening of the fuel tank

The machine is equipped with a fuel tank or tanks. These are fastened with lashing strips and ratchets.

Precondition The machine is shut down.

The machine is standing level.

The machine is fully vented, the pressure gauge reads 0 psig.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

NOTICE

The lashing strip of the fuel tank is overly tightened.
The plastic tank can be damaged by excessive tightening of the lashing strips.
The fuel tank may burst and spill.

➢ *Do not overtighten the lashing strips.*

➢ *Slightly hand-tighten the lashing strips.*

Carry out visual check

1. Check the lashing strips for tears and fraying in the fabric, and for damages to the ratchet.
   Change any damaged lashing strip immediately.
2. Check whether the lashing strips are tight with the tank and that the ratchet is closed.
   If the lashing strips sits loose, or the ratchet is not closed properly, tighten the fastening.

Tightening the fastening of the fuel tank

The lashing strips are tensioned via the integrated ratchet.

The lashing strips must fit closely around the fuel tank. The tensioning force of the strips must not exceed 10 daN (approx. 25 lbf), slightly hand-tighten only.

➢ Hand-tighten the lashing strip with the integrated ratchet and push the ratchet to the strip.

10.4 Compressor Maintenance

➢ Perform maintenance tasks according to the schedule in chapter 10.2.3.1.

10.4.1 Checking cooling oil level

The oil level is checked at the oil separator tank filling port. Oil should be visible in the port when the filler plug is removed.

Material
Wrench
Cleaning cloth

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
All compressed air consumers are disconnected and the air outlet valves are open.

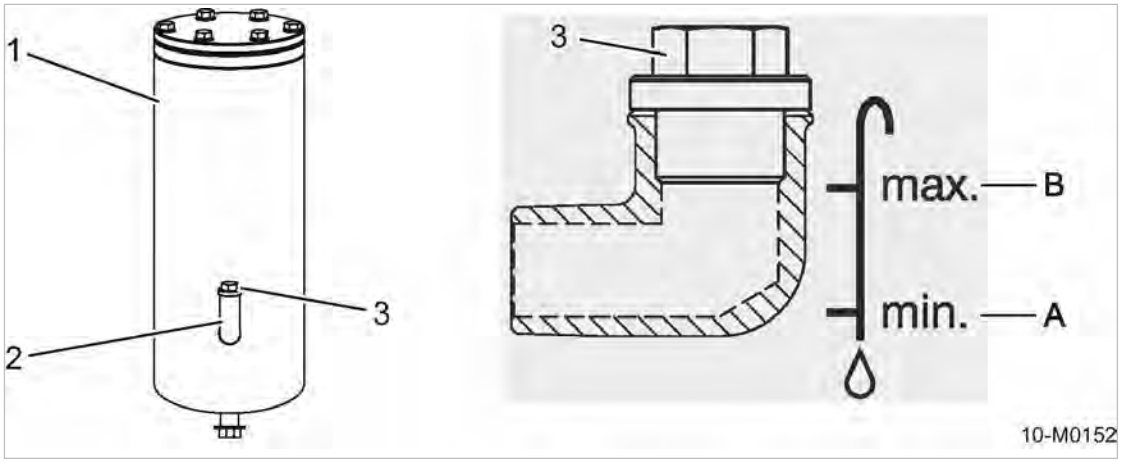


Fig. 51 Checking cooling oil level

[1] Oil separator tank
[2] Oil filler port
[3] Filler plug
[A] Mark for minimum oil level
[B] Mark for maximum oil level

1. Open the canopy.
2. Slowly unscrew and withdraw the plug from the oil filler port.
3. Check the cooling oil level.
   Top up if no oil is visible.
4. Replace the plug in the filler port.
5. Close the canopy.

10.4.2 Filling or topping off the cooling oil

Material
Cooling oil
Funnel
Cleaning cloth
Wrench

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The negative cable to the battery is disconnected.

Filling with cooling oil

A sticker on the oil separator tank specifies the type of oil used.

1. **NOTICE** *The machine could be damaged by unsuitable oil.*
   - ➢ *Never mix different types of oil.*
   - ➢ *Never top off with a different type of oil than that already used in the machine.*
2. Open the canopy.
3. Slowly unscrew and withdraw the plug from the oil filler port.
4. Top off the cooling oil to the maximum level (B) with the help of a funnel.
5. Check the oil level.
6. Check the filler plug gasket for damage.
   Change a damaged gasket.
7. Replace the plug in the filler port.
8. Reconnect the negative battery terminal.
9. Close the canopy.

Starting the machine and performing a test run:

1. Start the machine and run in IDLE until the operating temperature is reached.
2. Close the outlet valves.
3. Shut down the machine.
4. Wait until the machine has automatically vented.
   Pressure gauge reads 0 psig!
5. Open the outlet valves.
6. Open the canopy.
7. Check the oil level after about 5 minutes.
   Top up if necessary.
8. Carry out a visual check for leaks.
9. Close the canopy.

10.4.3 Changing the cooling oil

Drain the oil completely from the following components:

- Airend
- Oil separator tank
- Oil cooler
- Oil pipes

➢ Always change the oil filter when changing the oil.

Material
See chapter 2.5.7 for oil filling volume.
Receptacle
Funnel
Cleaning cloth

Precondition
The machine is shut down,
the machine is standing level,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is at operating temperature,
all compressed air consumers are disconnected and the air outlet valves are open,
the negative cable to the battery is disconnected.

⚠ CAUTION
Risk of burns from hot components and escaping oil!
➢ *Wear long-sleeved clothing and protective gloves.*

➢ Open the canopy.

10.4.3.1 Draining the cooling oil

The oil separator tank and oil cooler drain plugs are accessible from below through openings in the floor pan.

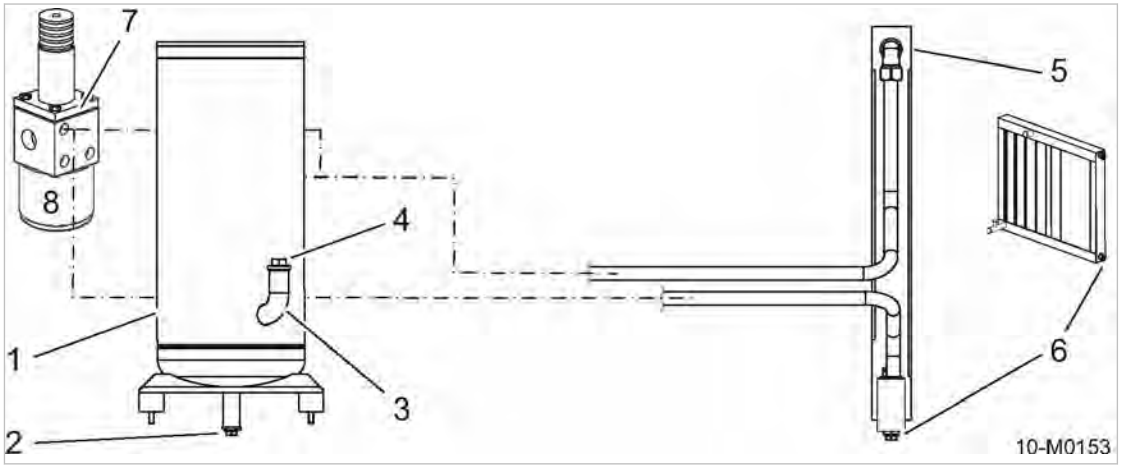


Fig. 52 Draining the compressor cooling oil

[1]	Oil separator tank	[5]	Oil cooler
[2]	Oil separator tank plug	[6]	Oil cooler plug
[3]	Oil filler port	[7]	Combination valve
[4]	Screw plug	[8]	Oil filter

1. Unscrew the filler plug in the oil separator tank.
2. Position a receptacle beneath the oil cooler plug (accessible through a hole in the floor panel).
3. Unscrew the drain plug and allow the cooling oil to drain into the receptacle.
4. Fit a new gasket on the plug and screw it back into the oil separator tank.
5. Position a receptacle beneath the oil cooler plug (accessible through a hole in the floor panel).
6. Unscrew the drain plug and allow the cooling oil to drain into the receptacle.
7. Fit a new gasket on the plug and screw it back into the oil cooler.

Perform final work steps

1. Replace the plug in the oil separator tank filling port.
2. Close the canopy.

Dispose of used oil and oil-contaminated working materials according to environmental protection regulations.

Further information: See chapter 10.4.2 for oil filling.

Option oe: Draining cooling oil via the shut-off valve

Material:
Fresh cooling oil
Receptacle
New gasket for the filler caps
Funnel
Cleaning cloth

Precondition:
Machine shut down
The machine is standing level.
The machine is at operating temperature.
The machine is fully vented, the pressure gauge reads 0 psig.
All compressed air consumers are disconnected and the air outlet valves are open.
The negative cable to the battery is disconnected.

⚠ CAUTION

Risk of burns from hot components and escaping oil!

➢ *Wear long-sleeved clothing and gloves.*

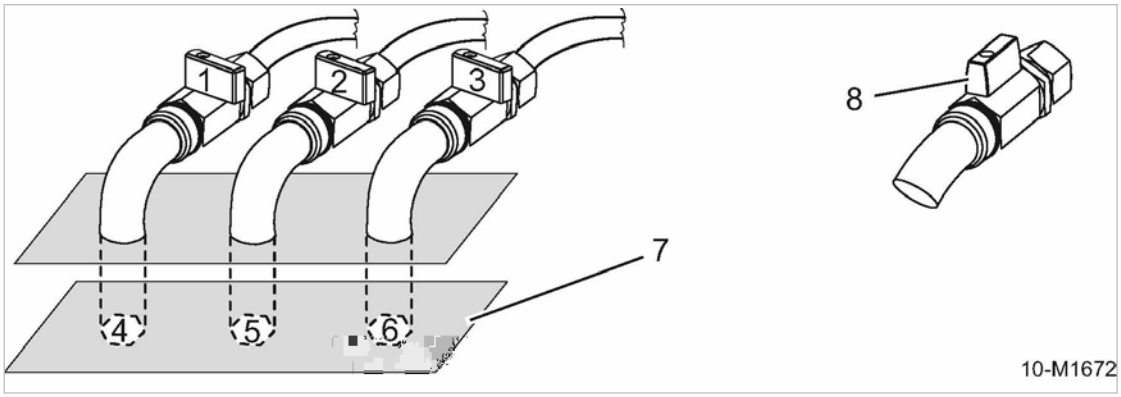


Fig. 53 Oil drain valves oil cooler and oil separator tank

[1]	Oil cooler shut-off valve (closed)	[5]	Engine oil sump plug
[2]	Engine sump shut-off valve (closed)	[6]	Oil separator tank plug
[3]	Separator tank shut-off valve (closed)	[7]	Lower bodywork
[4]	Oil cooler plug	[8]	Valve open position

1. Unscrew the oil filler cap.
2. Position the receptacle.
3. Unscrew and remove the oil cooler drain plug [4] and oil separator tank drain plug [6].
4. Open the shut-off valves [1] and [3] and drain the oil.

10.4.4 Replacing the compressor oil filter

Material
Spare parts
Tool
Receptacle
Cleaning cloth

Precondition
The machine is shut down,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
all compressed air consumers are disconnected and the air outlet valves are open,
negative cable to the batteries disconnected.

⚠ CAUTION

Risk of burns from hot components and escaping oil!

➢ *Wear long-sleeved clothing and protective gloves.*

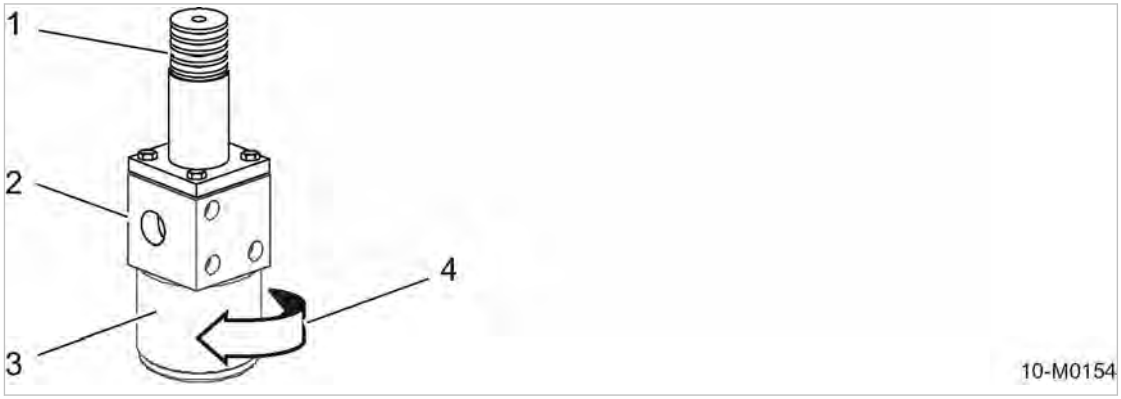


Fig. 54 Changing the compressor oil filter

[1] Ambient temperature acquisition
[2] Combination valve
[3] Oil filter
[4] Direction of rotation to unscrew the oil filter.

Changing the compressor oil filter

1. Open the canopy.
2. Prepare a receptacle.
3. Loosen the filter by turning counter-clockwise and catch any escaping oil.
4. Carefully clean sealing surfaces using lint-free cloth.
5. Lightly oil the new filter's gasket.
6. Turn the oil filter clockwise by hand to tighten.
7. Check the oil level in the oil separator tank.
   Top off if necessary.
8. Reconnect the negative battery terminal.
9. Close the canopy.

Dispose of old cooling oil and any materials or parts contaminated with oil according to environmental protection regulations.

Starting the machine and performing a test run

1. Start the machine and run in IDLE until the operating temperature is reached.
2. Close the outlet valves.
3. Shut down the machine.
4. Wait until the machine has automatically vented.
   Pressure gauge should read 0 psig!
5. Open the outlet valves.
6. Open the canopy.
7. Check the oil level after about 5 minutes.
   Cooling oil level too low: Top off cooling oil again.
8. Carry out a visual check for leaks.
9. Close the canopy.

10.4.5 Oil separator tank dirt trap maintenance

Material
Cleaning cloths
Wrench
Small screwdriver
Maintenance kit, control valve
Petroleum ether or spirit

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
Negative cable to the batteries disconnected.

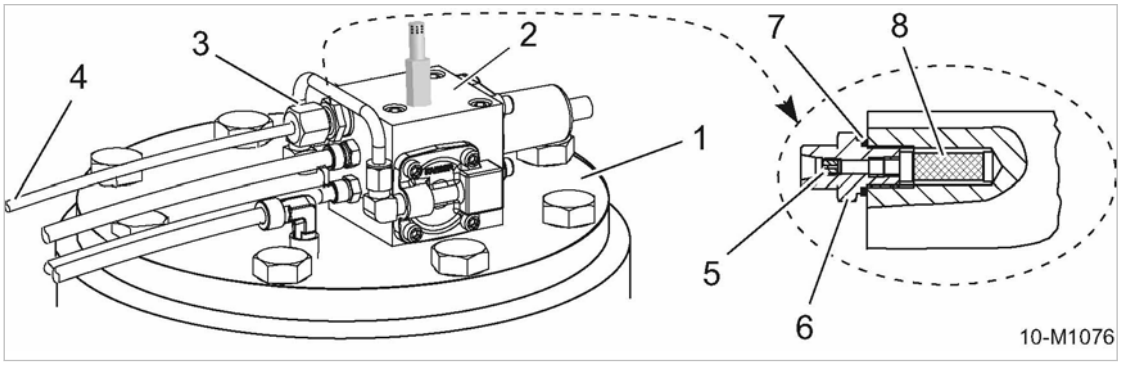


Fig. 55 Oil separator tank dirt trap maintenance

[1]	Oil separator tank cover	[5]	Nozzle
[2]	Control valve	[6]	Screw-in connector
[3]	Union nut	[7]	Sealing ring
[4]	Oil return line	[8]	Strainer

1. Open the canopy.
2. Undo the union nut [3] and bend the oil return line [4] to one side.
3. Unscrew the screw-in connector [6].
4. Unscrew the strainer [8] from the screw-in connector.

5. Use a screw driver to unscrew the nozzle [5] from the screw-in connector.
6. Clean the screw-in connector, strainer and sealing ring [7] with cleaning solvent or spirit.
7. Check the nozzle, strainer and sealing ring for function and wear.
   Replace components if they are heavily worn.
8. Fit the nozzle and strainer to the screw-in connector.
9. Screw in the connector making sure the sealing ring seats properly.
10. Refit the union nut of the oil scavenge line.

Returning the machine to operational readiness

1. Reconnect the negative cable to the battery.
2. Close the canopy.

Dispose of old parts and contaminated materials according to environmental regulations.

10.4.6 Changing the oil separator cartridge

The oil separator cartridge cannot be cleaned.
The life of the oil separator cartridge is influenced by:

- contamination in the air drawn into the compressor.
- and adherence to the changing intervals for:
  - Cooling oil
  - Oil filter
  - Air filter

Material: Spare parts
Cleaning cloths

Precondition: The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The negative cable to the battery is disconnected.

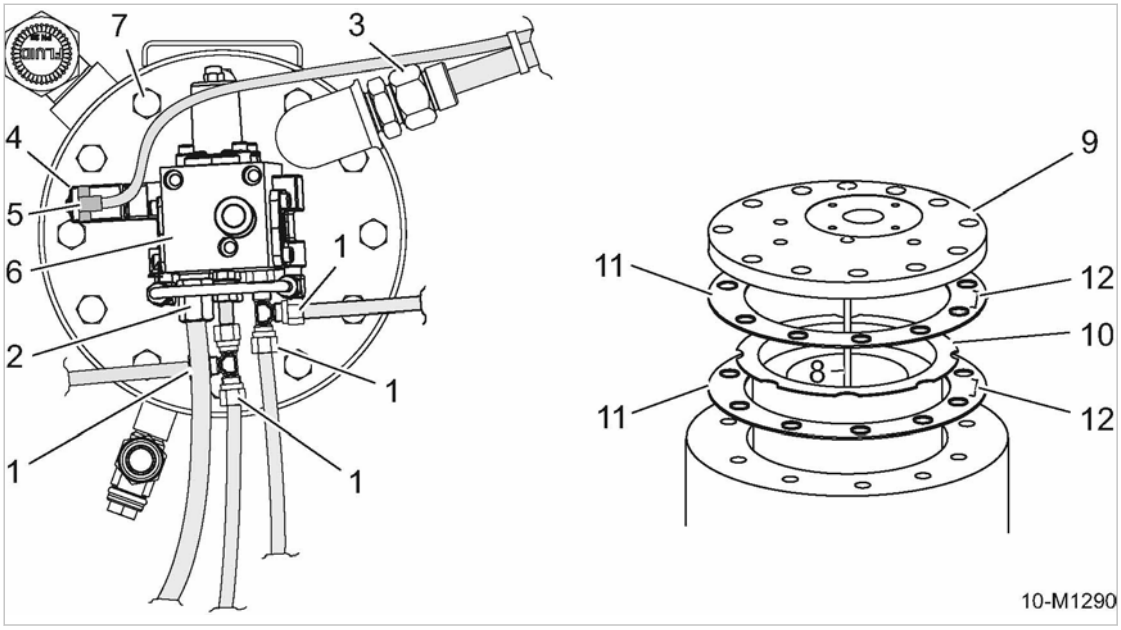


Fig. 56 Changing the oil separator cartridge

[1]	Control air line union nut	[7]	Fixing screw
[2]	Oil scavenge pipe union nut	[8]	Oil scavenge pipe
[3]	Compressed air hose union nut	[9]	Cover
[4]	Solenoid valve	[10]	Oil separator cartridge
[5]	Solenoid valve plug	[11]	Gasket
[6]	Control valve	[12]	Metal clip

Changing the oil separator cartridge

The dirt trap must be cleaned/changed when the oil separator cartridge is changed. Maintain dirt trap, (see chapter 10.4.5).

1. Undo the union nuts at [1], [2] and [3]
2. Remove the control line, oil scavenge line and compressed air hose.
3. Pull out the plug [5] with the connecting cable of the solenoid valve [4].
4. Remove the fixing screws [7] from the cover [9] of the oil separator tank, carefully lift the cover and place it to the side.
5. Remove the old oil separator cartridge [10] and the gaskets [11].
6. Clean all sealing surfaces, taking care that no foreign bodies (dirt particles) fall into the oil separator tank.

Do not remove the metal clips from the gasket!
The individual parts of the oil separator cartridge are electrically interconnected. The gaskets [11] have metal clips [12] to make contact with the oil separator tank and the machine frame.

7. Insert the new oil separator cartridge with gaskets and screw down the cover.
8. Replace and tighten all fittings.
9. Plug the connecting cable back into the solenoid valve.
10. Check the oil level in the oil separator tank.
    Cooling oil level too low: Top off the cooling oil.
11. Reconnect the battery negative terminal.

Dispose of the old separator cartridge and gaskets, along with any working materials contaminated with cooling oil, in accordance with environmental protection regulations.

Option ba **Changing the oil separator cartridge**

Changing the oil separator cartridge with the frost protector option is carried out as described above.
In addition, the frost protector must be emptied and its fittings undone.
Be careful of the frost protector control lines when removing the separator tank cover.

1. Empty the lower part of the frost protector. See chapter 10.8.2 on frost protector maintenance.
2. Remove the screws fixing the frost protector to the cover.
3. Lift the cover carefully and remove the frost protector control lines if necessary.

Starting the machine and performing a test run

1. Start the machine and run in idle until the operating temperature has been reached.
2. Close the outlet valves.
3. Shut down the machine.
4. Wait until the machine has automatically vented.
   Pressure gauge reads 0 psig!
5. Open the outlet valves.
6. Check the oil level after about 5 minutes.
   Top off if necessary.
7. Carry out a visual check for leaks.

10.4.7 Compressor air filter maintenance

Compressor air filter maintenance

- The filter element must cleaned at the latest when the corresponding maintenance indicator responds.
- As stipulated in the maintenance table, replace the filter element after one year.

- Using the machine without an air filter element is not permitted!
- Do not use filter elements with damaged surface or seals.
- The use of an unsuitable air filter can permit dirt to ingress the pressure system and cause premature wear and damage to the machine.

Material Spare parts
Cleaning cloth

Precondition The machine is shut down,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
all compressed air consumers are disconnected and the air outlet valves are open.

NOTICE
Dirty air filter element
Loss of machine performance
➢ *Replace the filter element.*

➢ Open the canopy.

Checking contamination of the air filter

Air filter maintenance is necessary when the yellow piston inside the maintenance indicator reaches the red zone.

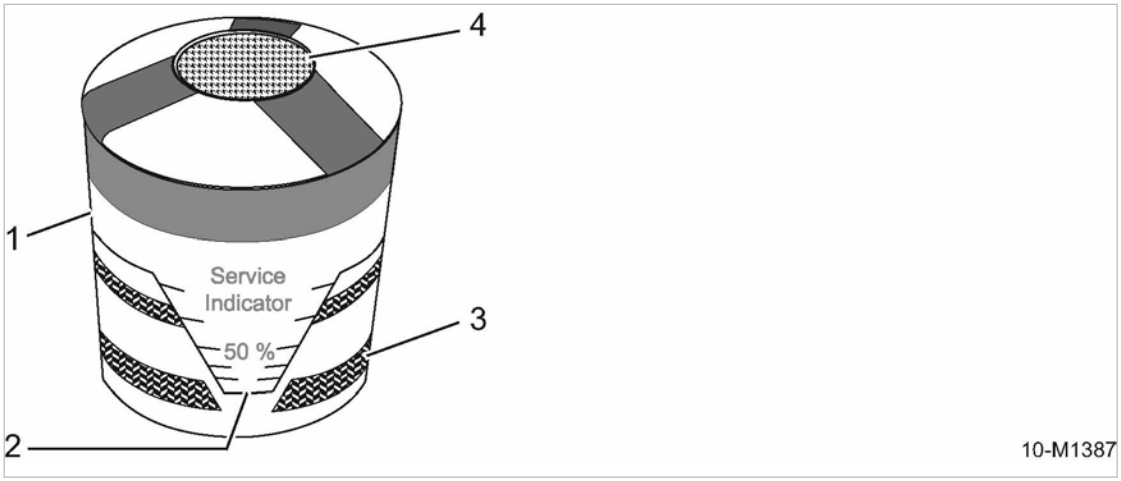


Fig. 57 Maintenance indicator

[1]	Maintenance indicator	[3]	Red zone indicator scale
[2]	Indicator piston	[4]	Reset knob for the maintenance indicator

➢ Check the air filter maintenance indicator.
If the yellow piston reaches the red zone, clean the filter element.

Cleaning the filter element

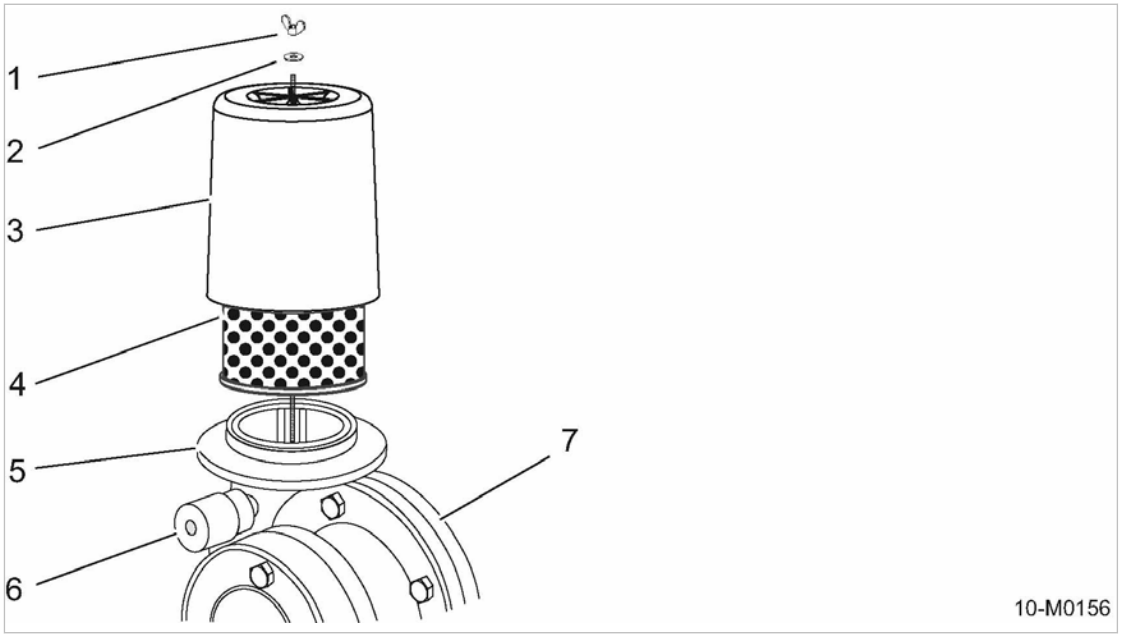


Fig. 58 Compressor air filter maintenance

1 Wing nut
2 Washer
3 Filter cap
4 Filter element
5 Inlet valve
6 Maintenance indicator
7 Airend

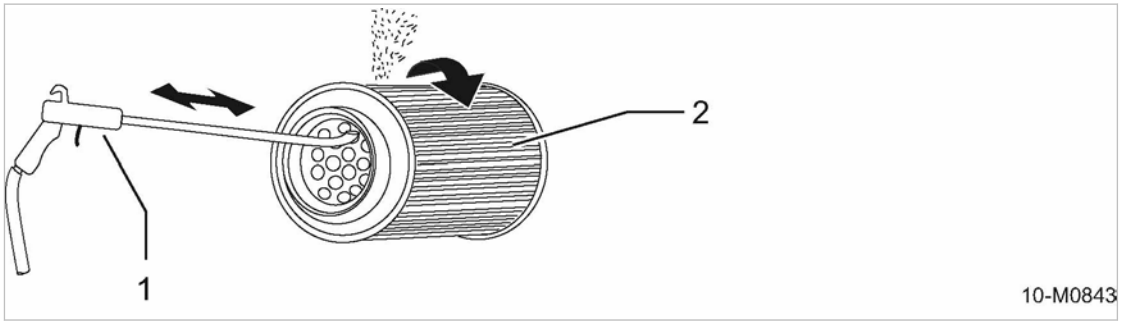


Fig. 59 Cleaning the filter element

1 Compressed air gun with blast pipe bent to 90° at the end
2 Filter element

1. Remove the wing nut and washer.
2. Remove the cover.
3. Remove the filter element.
4. Clean the filter housing and all sealing faces carefully with a damp cloth.
5. Cleaning the filter element:
   - Use dry compressed air (≤ 73 psig!) at an angle to blow dust from the filter element from inside to outside until no further dust develops.
   - The blast pipe must be long enough to reach the bottom of the element.
   - The tip of the blast pipe should not be allowed to touch the element.
   - Clean sealing faces

6. Inspect the element carefully for any damage.
   Damaged filter element: Replace filter element.
7. Insert the cleaned or new filter element into the filter housing. Make sure it is properly in place and sealed by its gaskets.
8. Replace the cover.
9. Secure the cover with washer and wing nut.
10. Check the correct attachment of the filter cover.

Resetting the maintenance indicator

➢ Press the reset knob on the maintenance indicator a number of times.
The yellow piston within the indicator is reset and the maintenance indicator is ready for use again.

➢ Close the canopy.

Dispose of old parts and contaminated materials according to environmental regulations.

10.4.8 Checking safety relief valves

➢ Have safety relief valves checked by KAESER Service in accordance with the maintenance schedule.

10.5 Cleaning the cooler/radiator

The frequency of cleaning is mainly dependent on local operating conditions.
Severe clogging of the cooler/radiator causes overheating and machine damage.
Check cooler/radiator regularly for clogging.
Avoid creating dust eddies. Wear breathing protection if necessary.
Do not clean the coolers/radiators with a sharp instrument as they may be damaged.
A severely contaminated cooler/radiator should be cleaned or replaced by an authorized KAESER service representative.

Material
Compressed air
Breathing mask (if necessary)
Water or steam jet blaster
Object as support
Screwdriver

Precondition
The machine is placed over a washing station equipped with an oil separator,
the machine is shut down,
the machine is cooled down,
the machine is fully vented, the pressure gauge reads 0 psig,
all compressed air consumers are disconnected and the air outlet valves are open,
the negative cable to the battery is disconnected.

NOTICE

Damage to the machine can be caused by water or steam jets.
Direct water or steam jets can damage or destroy electrical components and indicating instruments.

- ➢ *Cover up electrical components such as the control cabinet, alternator, starter, and instruments.*
- ➢ *Do **not** direct water or steam jets at sensitive components such as alternator, starter, or indicating instruments.*
- ➢ *Deploy the extension pole of the pressure washer at a distance of at least 20 inches and an approximately 90° angle to the cooler/radiator surface.*

➢ Raise the cover.

10.5.1 Securing the machine against tipping

In order to clean both coolers, you must open the cover to its maximum opening angle. For this purpose, you must remove the two gas struts at the cover. Due to the maximum opening angle of the cover when the gas struts are removed, the center of the machine's gravity is changed. Prior to the removal of the gas struts, support the horizontally-placed machine beneath its rear.

⚠ WARNING

Machine rear tips to the floor!
Serious injury is possible as well as damage to the machine.

- ➢ *Support the machine accordingly.*

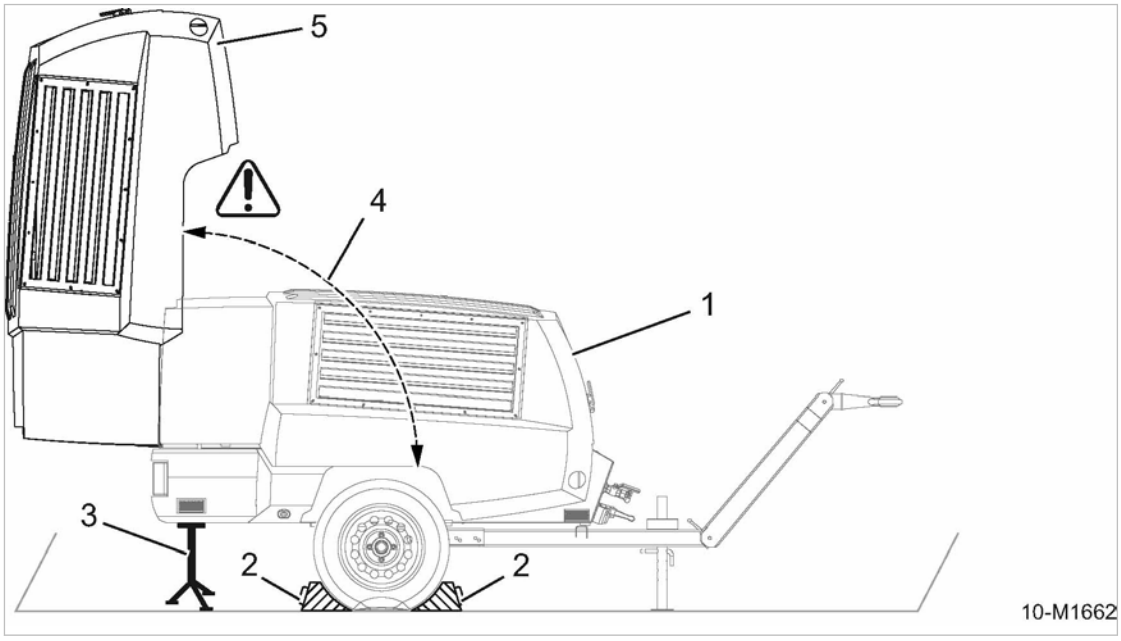


Fig. 60 Supporting the machine

1. Machine (cover closed)
2. Chock
3. Axle stand
4. Maximum opening angle (gas struts removed)
5. Cover open

1. Provide suitable chocks or squared timber.

2. Secure the wheels with chocks.
3. If available, engage the machine's parking brake.
4. Place chocks or squared timbers beneath the machine's rear.

Result Machine is supported.

10.5.2 Cleaning the compressor cooler and engine radiator

Connecting elements, positions	Ball head	Ball cup with clip	Ball cup
Cover interior	X	–	–
Gas strut cylinder	–	X	–
Body interior	X		
Gas strut piston	–	–	X

Tab. 65 Connecting elements

Unhinging the gas struts of the cover

Precondition Machine is supported, see Fig. 60.
Cover is opened.
Use a suitable object or a second person to support the cover.

1. Push a suitable screwdriver below the clip of the ball cup of the gas strut cylinder.
2. Slightly angle and hold the screwdriver.
   The clip opens.
3. Pull the ball cup off the ball head.
4. Proceed in the same manner with the second gas strut.
   Both gas struts are unhinged.
5. Fully open the cover.

Result The coolers are now accessible from the outside.

Cooler cleaning

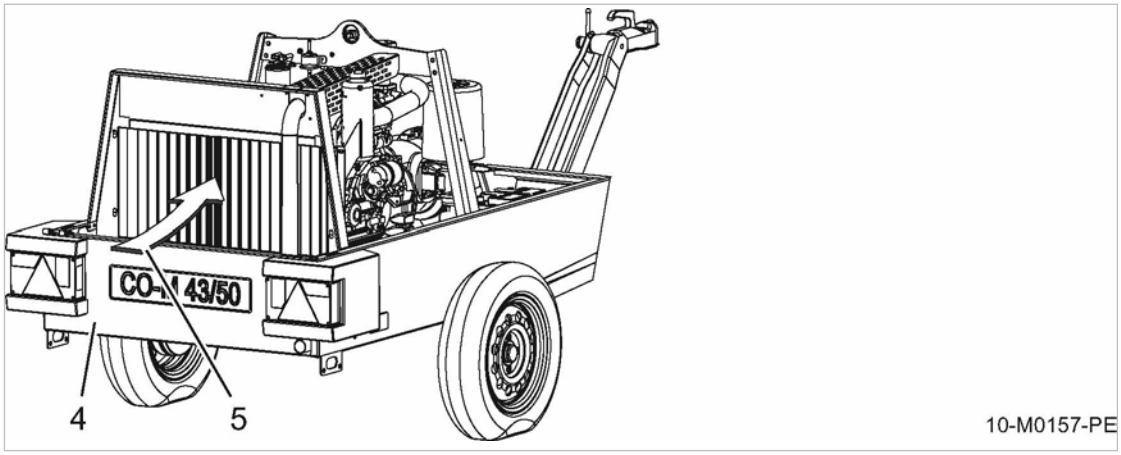


Fig. 61 Cleaning the compressor cooler and engine radiator

[1] Machine rear view, cover removed
[2] Direction of impacting water or steam jet (from outside to inside).

1. Seal off the air intakes of the engine and compressor air filters before starting cleaning.
2. Clean the cooling fins with compressed air, water or steam jet in the opposite direction to the cooling air flow (from inside to outside).
3. Remove the protective coverings from the air filters.

Hinging the gas struts of the cover

In order to ensure optimum lubrication and thus maximum life of the gas struts, the piston rod must always be aligned towards the ground.

1. Move the cover downward until the mounting position has been reached.
2. Support the cover.
3. Push the ball cup with the clip of the gas strut cylinder onto the ball head of the cover until it latches audibly.
4. Proceed in the same manner with the second gas strut.

   Both gas struts are hinged.
5. Remove the supporting object.

Starting the machine and performing a test run

1. Reconnect the battery.
2. Close the cover.
3. Start the machine and run up to operating temperature so that excess water is evaporated.

Check the cooler for leaks

1. Open the cover.
2. Visually check for leaks: does oil or cooling water escape?

Is a cooler leaking?

➢ Have the defective cooler repaired or replaced immediately by an authorized KAESER service representative.

➢ Close the cover.

Clean the cooler blades only in a washing area equipped with an oil separator.

10.6 Maintenance of rubber sealing strips

The rubber sealing strips between the lower body and the canopy serve both as a soundproofing measure and to prevent ingress of rain water.

Care of the rubber sealing strips is especially necessary in winter to prevent the strips from sticking and tearing when the canopy is opened.

Material: Cleaning cloth

Silicone or Vaseline

Precondition: The machine is shut down.

The machine is fully vented, the pressure gauge reads 0 psig.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

1. Open the canopy.
2. Clean the rubber sealing strips with a lint-free cloth and check for cracks, holes and other damage.

   Change a damaged gasket.
3. Grease the rubber strips.
4. Close the canopy.

10.7 Chassis maintenance

➢ Perform maintenance tasks according to the schedule in chapter 10.2.3.1.

10.7.1 Wheel checks

Check the wheels for tightness, visible damage and tire pressures:

- after the first 30 miles
- after every wheel change
- at least every six months

Material: Torque wrench

tire pressure gauge

Precondition: Machine shut down and secured against restarting.

1. Check/adjust for wheel fixing torques.
2. Check the tires and wheels for any defect.

   Replace any damaged or worn tires.

3. Check the tire treads for sufficient depth.

According to local roadworthy regulations, at least 63 mil in most countries.

Profile depth too low: change tires.

4. Check the tire pressures.

Result tire pressure too low: pump tires.

Further information See chapter 2.4.3 for wheel fixing torques.

See chapter 2.4.2 for tire pressures.
A sticker is found on each wheel arch giving the recommended tire pressure.

10.7.2 Towbar maintenance

Clean and lubricate all sliding and rotating bearings as necessary but at least every 6 months.

Material Lithium-enriched multi-purpose grease

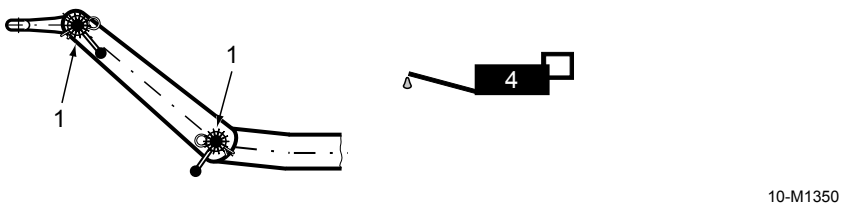
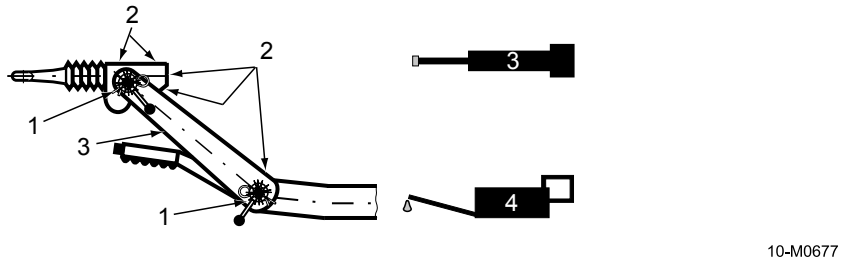
Acid-free oil

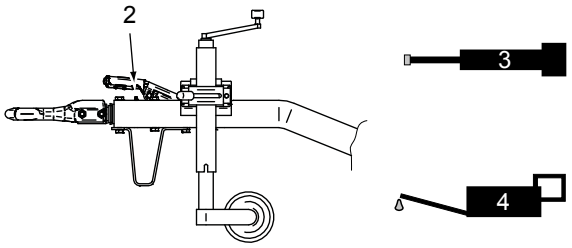
Cleaning cloths

Precondition The machine is switched off.

The machine is disconnected from the towing vehicle and safely parked.

10.7.2.1 Checking the towbar

Lubricating points	
Option	Representation
rb/rm/rr	
rb/rm/rs	

Lubricating points	
Option	Representation
rg/rp/rr	

Tab. 66 Lubricating points of the towbar

1. Check the towbar for correct function and movement.
2. Clean all teeth [1] , sliding and bearing components of the height adjustment and lubricate with acid-free oil [4].
3. Use a grease gun [2] on all fittings [3] until grease flows from the bearing points.

Option rb/rm/rr, rb/rm/rs **Checking the height setting of the towbar**

➢ Check the towbar height adjustment function.

The locking teeth on the towbar height adjustment joint are corroded and jammed and the towbar height cannot be adjusted.

➢ If necessary, free the teeth by jerking the towbar horizontally and vertically.

➢ Clean the toothed coupling and smear with water-repellent grease.

Further information See chapter 6.5 for towbar height adjustment.

Option rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs **Maintaining the parking brake**

➢ Lightly lubricate the pins and adjustment joints.

10.7.2.2 Overrun braking mechanism maintenance

Greasing the overrun mechanism:

➢ Pump fresh grease into the nipple until old grease is squeezed out.

Further information See table 66 for the lubricating points (option rb/rm/rs).

Checking the shock absorber:

1. Loosen the transfer cable [3] one side.
2. Press in the shock absorber against its damping force.
   Have the shock absorber replaced by a specialist workshop if:
   - There is little resistance to pushing in,
   - Air has entered the device,
   - There is little resistance to pulling out the shock absorber.
   - Oil leaks out.

10.7.2.3 Towing system with rotatable adapter maintenance

Grease the bearing

➢ Pump fresh grease into the fitting until fresh grease is squeezed out.

Further information See table 66 for lubricating points (Option rg/rp/rr).

10.7.2.4 Ball coupling maintenance

Option rb/rm/rr, rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs

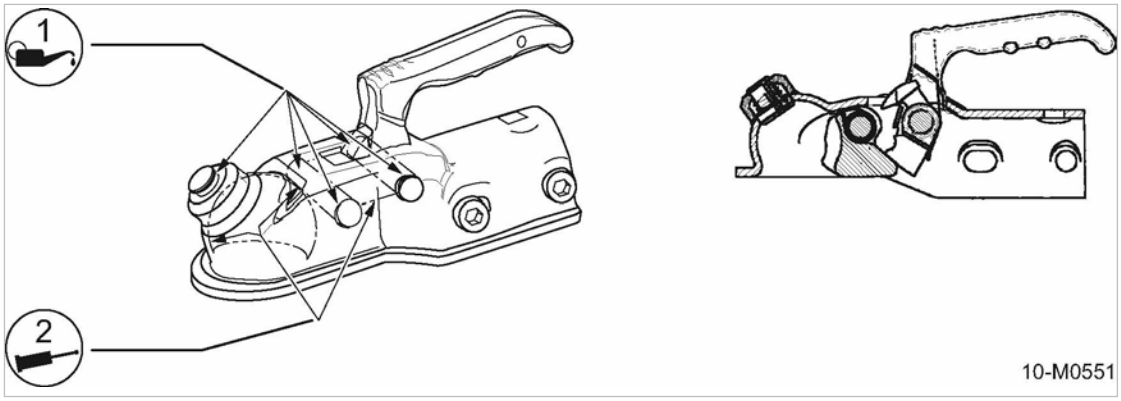


Fig. 62 Ball coupling (EU/GB versions)
[1] Lubricating points
[2] Greasing points

1. Check the ball coupling for correct function and movement.
2. Clean the ball coupling. Grease or oil the ball cup, joints and bearings.

10.7.2.5 Ball coupling maintenance

Option rd/ro/rr

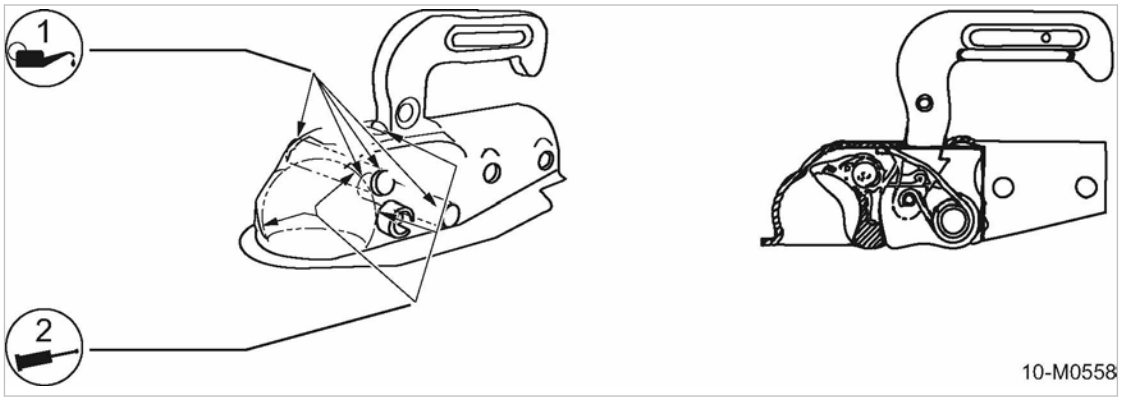


Fig. 63 Ball coupling (US chassis)
[1] Lubricating points
[2] Greasing points

Option rd/rn/rr

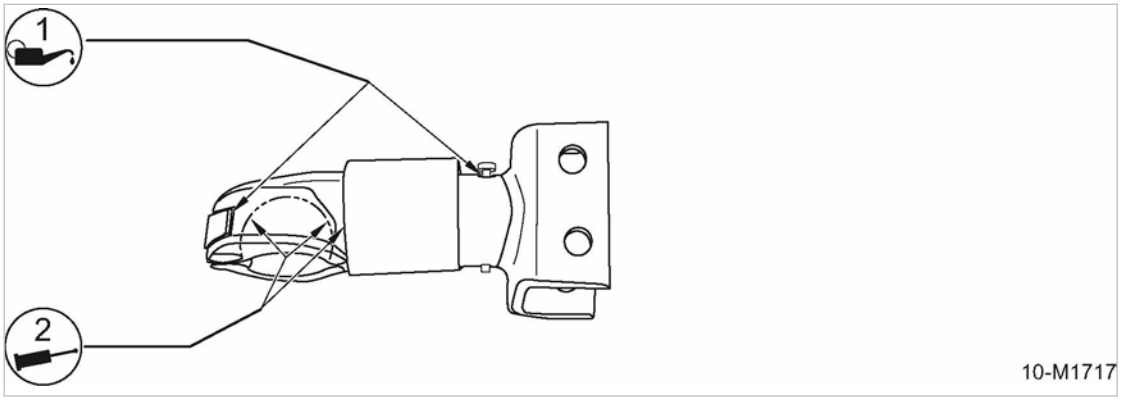


Fig. 64 Ball coupling (US chassis)

1. Check the ball coupling for correct function and movement.
2. Clean the ball coupling. Grease or oil the ball cup, joints, and bearings.

10.7.3 Brake system maintenance

The brake adjusting procedure ensures even wear on the brake linings by adjusting the brake shoes.

The following points must be observed:

- Carry out the adjustment procedure on all wheel brakes, one after the other.
- During adjustment, turn the wheel in the 'forward' direction only.

Material
Screwdriver
Wrench
Inspection lamp or torch
Lithium-enriched multi-purpose grease
Acid-free oil
Cleaning cloths

Precondition
The machine is switched off.
Set the «Controller ON» switch to the "0" position.

1. Jack up the machine and lower it onto supports.
2. Release the parking brake.
3. Fully extend the towbar tube of the overrun mechanism.

Result
The brake cables are not tensioned.

10.7.3.1 Option rb/rm/rs , rc/ro/rs Checking brake system settings

1. Pull up the parking brake to first notch.
2. Turn the wheels in the forward direction.
3. Check that there is the same braking resistance on both wheels.

Brake resistance not even:

➢ adjust brake system.

10.7.3.2 Option rb/rm/rs , rc/ro/rs Checking wheel brake lining wear

Use a torch to check the brake linings.

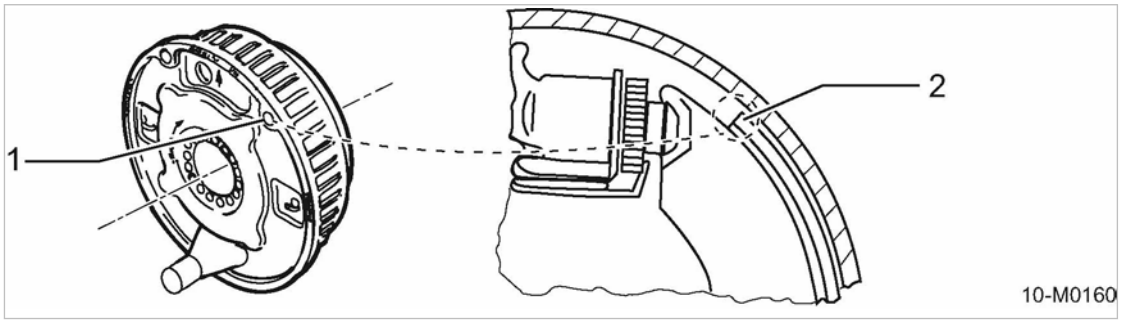


Fig. 65 Checking the brake lining thickness

[1] Inspection hole
[2] Brake linings

1. Remove the plug from the inspection hole.
2. Check the brake lining thickness.

The brake lining thickness is less than 0.08 in.

➢ Have the brake shoes replaced in a specialist workshop.

3. Replace the plug in the inspection hole.

10.7.3.3 Option rb/rm/rs , rc/ro/rs Brake system adjustment

There is an arrow pressed into the brake back plate near the adjustment hole.

- Turn in the direction of the arrow: Adjust the brake.
- Turn against the direction of the arrow: Loosen the brake.

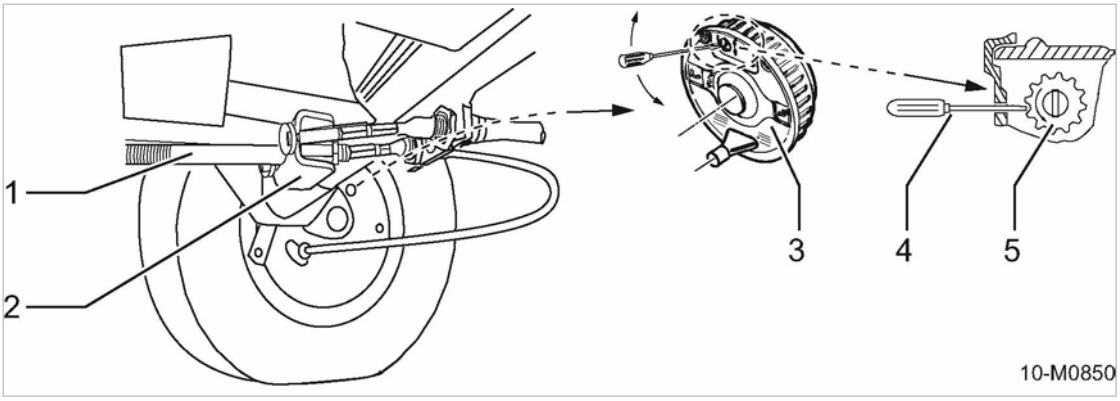


Fig. 66 Brake system adjustment

[1] Brake rod
[2] Equalizer
[3] Brake support
[4] Screwdriver as adjusting tool
[5] Adjusting wheel

1. Remove the plug from the inspection hole.
2. Use a screwdriver to turn the adjusting wheel [5] until the wheels no longer turn in the forward direction.
3. Apply the parking brake a number of times to center the brake linings.
4. Use the screwdriver to turn the adjusting wheel back (3 to 5 notches) until there is no more braking resistance to the wheels turning forward.
5. Pull on the parking brake.
6. Check the position of the equalizer [2] on the brake rod [1].

   If the equalizer is perpendicular to the brake rod, the brake clearance is the same on each wheel.

   If the equalizer is oblique to the brake rod, adjust the brake rod.
7. Pull the parking brake lightly and compare the braking force on the wheels.

   If the braking force on the wheels is not equal, re-adjust brake system.
8. Replace the plug in the inspection hole.

A light rubbing sound when the wheels turn is permissible if it does not affect free turning.

10.7.3.4 Servicing and adjusting the brake rod

Option rb/rm/rs , rc/ro/rs **Servicing the brake rod**

Option rb/rm/rs , rc/ro/rs

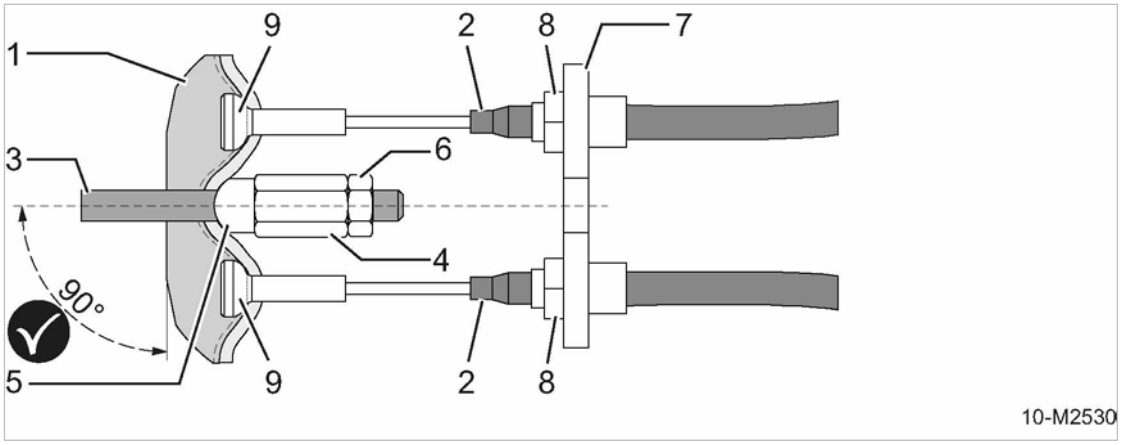


Fig. 67 M10 brake rod

[1]	Equalizer	[6]	Nut
[2]	Bowden cable	[7]	Axle end
[3]	Towbar	[8]	Nut
[4]	Connecting sleeve	[9]	Bowden cable fitting
[5]	Spacer		

1. Remove the nut [6] from the towbar.
2. Remove the connecting sleeve [4] from the towbar.
3. Remove the spacer from the towbar.
4. Clean and grease the towbar threads.
5. Check the towbar, equalizer and Bowden cables for damage.
6. Lubricate the pivot mount of the towbar.
7. Place the spacer.
   The curve points in the direction of the equalizer.
8. Screw the connecting sleeve onto the towbar.
9. Manually tighten the connecting sleeve.

Option rb/rm/rs , rc/ro/rs **Adjusting the brake rod**

Precondition The brake rod is serviced.
The connecting elements are installed.
The connecting sleeve is manually tightened.

1. Forcefully pull and release the hand brake three times.
2. Turn the wheel in forward direction and simultaneously tighten the connecting sleeve up to a clearly experienced braking resistance.
   You must be able to manually turn the wheel in forward driving direction.

? You are unable to manually turn the wheel in forward driving direction.
➢ Repeat the process.

Securing the screw joint against loosening

➢ Secure the connecting sleeve [4] with the lock nut [6].

Further information: If towbar, equalizer or Bowden cables require replacement, note the instructions for initial installation in chapter 6.4.

10.7.3.5 Servicing and adjusting the brake rod

Option rc/ro/rr , rg/rp/rr **Servicing the brake rod**

Option rc/ro/rr , rg/rp/rr

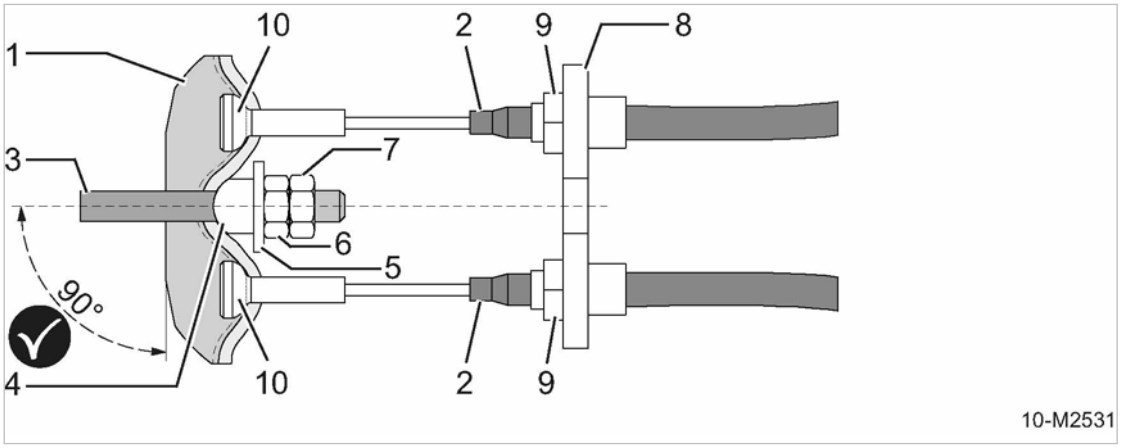


Fig. 68 M8 brake rod

[1]	Equalizer	[6]	Nut
[2]	Bowden cable	[7]	Nut
[3]	Con-rod	[8]	Axle end
[4]	Spacer	[9]	Nut
[5]	Washer	[10]	Bowden cable fitting

1. Remove the nut [7] from the con-rod.
2. Remove the nut [6] from the con-rod.
3. Remove the washer from the con-rod.
4. Remove the spacer from the con-rod.
5. Clean and grease the con-rod threads.
6. Check the con-rod, equalizer and Bowden cables for damage.
7. Lubricate the pivot mount of the con-rod.
8. Place the spacer.
   The curve points in the direction of the equalizer.
9. Place the washer.
10. Screw the nut [6] onto the con-rod.
11. Manually tighten the nut [6].

Option rc/ro/rr , rg/rp/rr **Adjusting the brake rod**

Precondition: The brake rod is serviced.
The connecting elements are installed.
The nut [6] is manually tightened.

1. Forcefully pull and release the hand brake three times.
2. Turn the wheel in forward direction and simultaneously tighten the nut [6] up to a clearly experienced braking resistance.

   You must be able to manually turn the wheel in forward driving direction.

You are unable to manually turn the wheel in forward driving direction.

➢ Repeat the process.

Securing the screw joint against loosening

➢ Secure the nut [6] with the [7] lock nut.

Further information: If towbar, equalizer or Bowden cables require replacement, note the instructions for initial installation in chapter 6.4.

10.8 Maintenance for Optional Items

➢ Perform maintenance tasks according to the schedule in chapter 10.2.3.2.

10.8.1 Option ea
Tool lubricator maintenance

Material: Tool oil (special lubricant for road breakers)
Funnel
Cleaning cloth

Precondition: The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

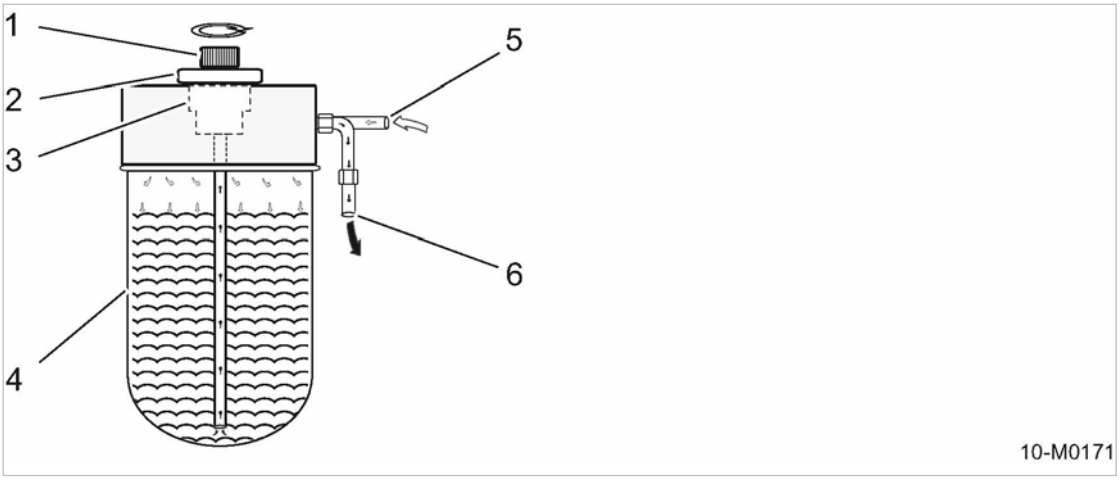


Fig. 69 Tool lubricator maintenance

[1] Metering knob
[2] Filler plug with dipstick and integrated riser tube
[3] Tool lubricator upper part with oil filling port
[4] Oil tank
[5] Compressed air inlet
[6] Tool oil outlet

➢ Open the canopy.

Checking the tool lubricator oil level

Check the oil level daily.
A dip stick is attached to the underside of the oil filler plug with which to measure the oil level.
The oil level should be in the upper third of the dipstick.

1. Slowly unscrew and withdraw the oil filler plug.
2. Wipe off the dipstick with a lint-free cloth or rag and screw the plug fully in again.
3. Unscrew and withdraw the plug once more and read off the oil level on the dipstick.
   Oil level at the upper third of the dip stick: OK.
   Top up if the oil does not reach this level.
4. Close the canopy.

Filling and topping up with tool lubricator oil

1. Slowly unscrew and withdraw the oil filler plug.
2. Use a funnel to pour in the oil to the maximum level (0.4 - 0.6 inches below the top of the tank).
3. Check the oil level.
4. Check the filler plug O-ring for external damage.
   Change a damaged O-ring.
5. Insert the plug in the filler port.
6. Close the canopy.

Further information See chapter 2.7.1 for suitable oil grade and volume.

10.8.2 Option bc
Frost protector maintenance

At temperatures below 41°F the level of antifreeze in the protector must be checked daily before starting the compressor. Fill the bowl of the frost protector to a maximum of $^{3}/_{4}$!

Material: Antifreeze (Wabcothyl) - see chapter 2.7.2 for the filling volume.
Cleaning cloth

Precondition: The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

⚠ DANGER

Spontaneous ignition of anti-freeze! Risk of fire and explosion caused by spontaneous ignition can cause severe injury.

➢ *Never top off antifreeze unless the machine is stopped and cooled down.*

⚠ WARNING

Compressed air!
The frost protector is pressurized during operation. Serious injury can result from loosening or opening components under pressure.

➢ *Depressurize the frost protector.*

Option bc

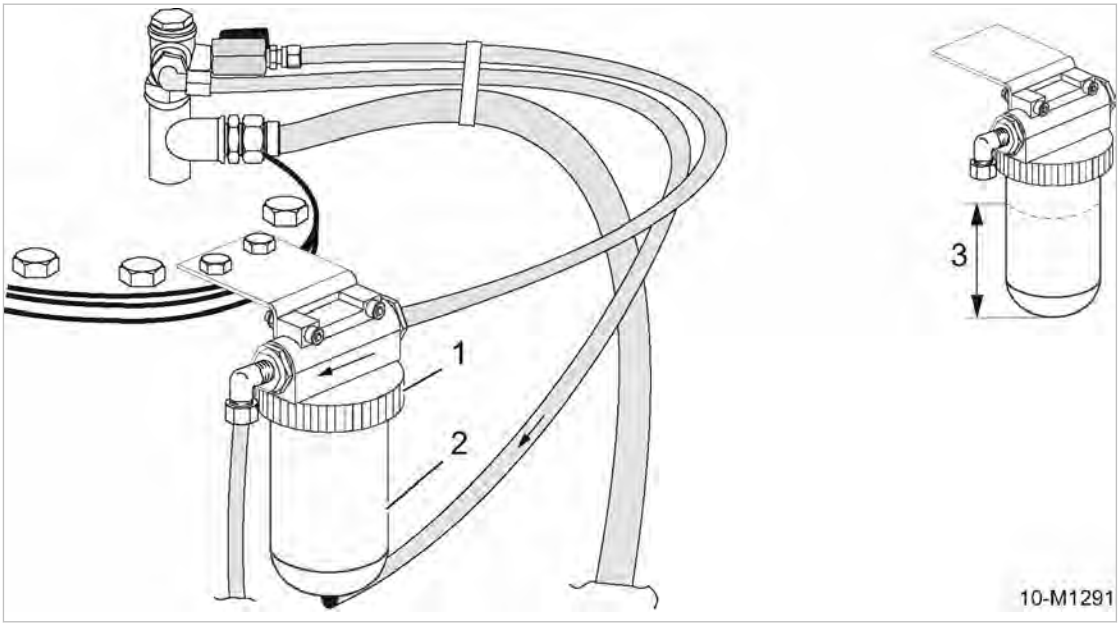


Fig. 70 Filling the frost protector

[1] Frost protector clamp ring
[2] Frost protector bowl
[3] Maximum fill level

1. Unscrew the ring clamp [1] and remove the bowl [2].

2. Fill the bowl ¾ full with anti-freeze.(3).
3. Screw the bowl carefully back into place.

10.8.3 Option Option Ia Spark arrester cleaning

The spark arrester must be cleaned of any soot residue every two months to prevent the emission of glowing particles from the exhaust silencer.

Material
Suitable rubber hose
Soot receptacle
Cleaning cloth
Protective gloves
Eye protection

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 psig.
The machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

⚠ DANGER

Danger of suffocation from toxic exhaust fumes.
Exhaust fumes from internal combustion engines contain carbon monoxide, which is odourless and deadly.

- ➢ *Use the machine only outdoors!*
- ➢ *Do not inhale exhaust fumes.*

⚠ CAUTION

Danger of burns from hot components and sparks.

- ➢ *Wear long-sleeved clothing and gloves.*
- ➢ *Wear eye protection.*

Cleaning the spark arrestor

In machines with sealed floor pan, the service openings are closed with plugs. In order to access the port of the soot drain, you must remove the appropriate plug.

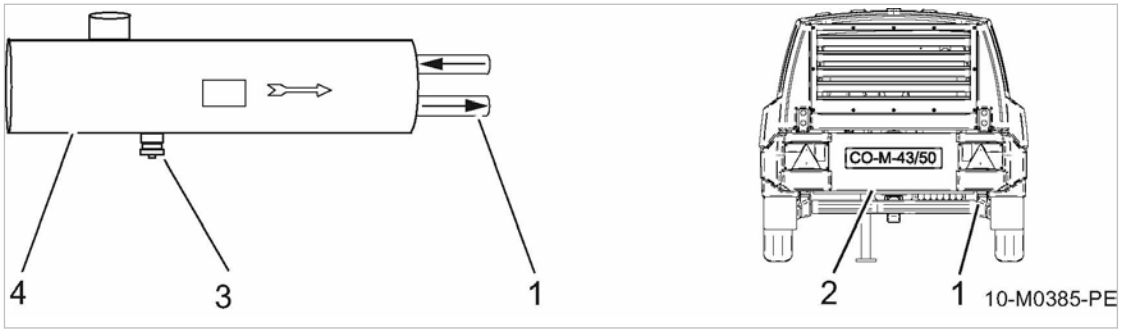


Fig. 71 Spark arrester cleaning

[1] Exhaust silencer end pipe
[2] Opening in floor panel to access drain port
[3] Soot drain port with plug
[4] Exhaust silencer with integrated spark arrester

1. If availabe, remove th plugs.
2. Unscrew the soot drain plug.
3. Push one end of the hose over the drain port and place the other end in the receptacle.
4. Start the compressor engine
5. In order to increase the pressure in the exhaust system, partially cover the exhaust discharge pipe with a fireproof object.
   Soot will drain through the hose into the receptacle.
6. Shut down the engine.
7. Remove the hose and replace the plug.

It is recommended to blow out the spark arrester with compressed air once a year.

Dispose of soot according to environment protection regulations.

10.8.4 Option Ib
Engine air intake shut-off valve maintenance

Material
Compressed air for blowing out
Petroleum ether or spirit
Cleaning cloth

Precondition
The machine is shut down,
the machine is fully vented, the pressure gauge reads 0 psig,
the machine is cooled down,
all compressed air consumers are disconnected and the air outlet valves are open.

NOTICE

Engine air intake shut-off valve
The engine air intake shut-off valve does not close when flammable gas is drawn into the engine:
The machine does not shut down? Destruction of the engine and explosion and/or fire are possible!

- ➢ *Do not move the valve adjusting screw.*
- ➢ *Have the valve set by a specialist workshop or KAESER Service.*

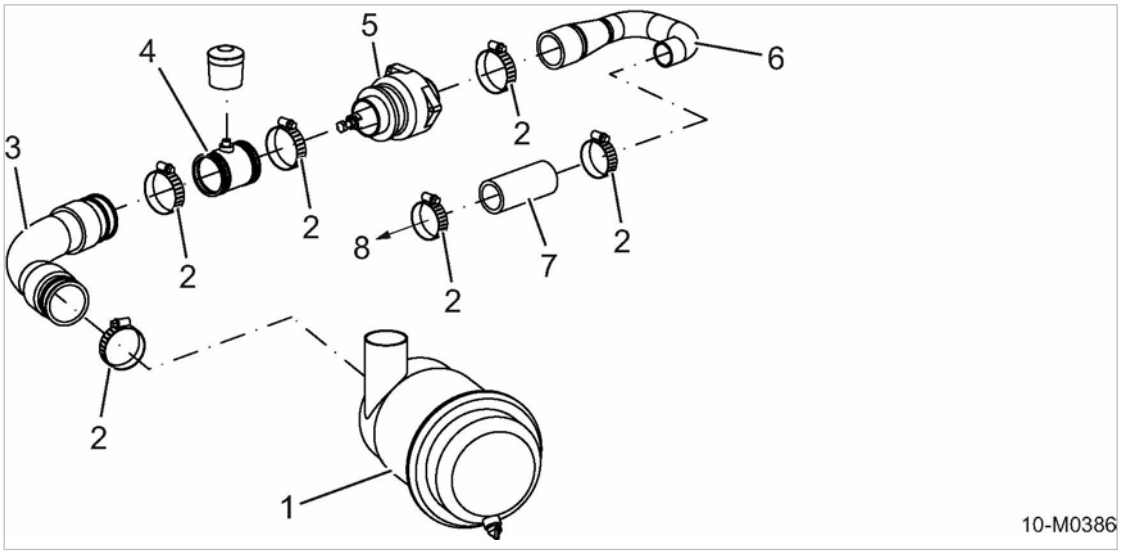


Fig. 72 Engine air intake shut-off valve maintenance

[1]	Air filter	[5]	Engine air intake shut-off valve
[2]	Hose clamp	[6]	Air intake hose (engine side)
[3]	Air intake hose (filter side)	[7]	Hose
[4]	Hose with maintenance indicator	[8]	Arrow direction motor inlet port

- ➢ Open the canopy.

Engine air intake shut-off valve cleaning

1. **NOTICE** *The engine air intake shut-off valve does not close fully.*
   The machine does not shut down? Damage to the engine and explosion and/or fire are possible!
   - ➢ *Do not grease the valve, as this may cause a build up of dust and valve sticking.*
2. Loosen the hose clamp on the filter side of the valve.
3. Turn the air intake hose to one side.
4. Loosen the hose clamp on the motor side of the valve.
5. Remove the valve from the flexible hose.
6. Check if the interior of the shut-off valve is clean.
   Blow out any dirt with compressed air.

If necessary, clean the valve with petroleum ether or spirit and allow to dry.
Refer to a specialized workshop or KAESER Service if dirt cannot be removed.

Check the engine air intake shut-off valve for correct function and movement

1. Check the valve for signs of excessive wear.
2. Check that the valve plate closes fully and easily.

Result Have the engine air intake shut-off valve changed if it is heavily worn or malfunctions in any way.

1. Slide the valve onto the flexible hose.
2. Tighten the hose clamp on the motor side.
3. Reposition the air intake hose on the filter side and tighten the hose clamp.
4. Close the canopy.
5. Start the machine and switch to LOAD.

   If the engine stops on switching to LOAD, have the valve adjusted by a specialist workshop or KAESER Service.

10.8.5 Option oe
Draining liquid accumulation within the machine

The so-called "closed floor pan" contributes to the protection of the environment by preventing a contamination of the soil in the event of leaking operating fluids.
Liquid accumulations within the machine's body can also cause corrosion or electrical faults. Liquid accumulations must be removed as quickly as possible in order to avoid potential machine faults.
For draining the liquid, maintenance openings have been added to the floor panel of the machine which are closed with bungs.

Material Receptacle

Cleaning cloth

Precondition The machine is shut down.

The machine is standing level.

The machine is secured against moving.

The machine is fully vented, the pressure gauge reads 0 psig.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

1. Place a receptacle underneath the maintenance opening(s).
2. Unscrew and remove the bung(s) from the maintenance openings.

   The liquid will drain.
3. Clean the bungs and maintenance openings.
4. Close all maintenance openings with bungs.

   The machine body is sealed.
5. Using the cleaning cloth, remove any dirt within the machine.

Dispose of collected liquid and contaminated working materials according to environmental protection regulations.

10.9 Documenting maintenance and service work

Machine model/part number:

➢ Enter maintenance and service work carried out in this list.

Date	Maintenance task carried out	Operating hours	Signature

Tab. 67 Maintenance log

11 Spares, Operating Materials, Service

11.1 Note the nameplate

The nameplate contains all information to identify your machine. This information is essential to us in order to provide you with optimal service.

➢ Please give the information from the nameplate with every inquiry and order for spares.

11.2 Ordering consumable parts and operating fluids/materials

KAESER consumable parts and operating materials are original KAESER products. They are specifically selected for use in our machines and ensure trouble-free operation.

Unsuitable or poor quality consumable parts and operating fluids/materials may damage the machine or impair its proper function.

Personal injury may result from machine damage.

⚠ WARNING

There is risk of personal injury or damage to the machine resulting from the use of unsuitable spares or operating fluids/materials.

➢ *Use only original KAESER parts and operating fluids/materials.*

➢ *Do not use alternative consumable parts and operating fluids and materials.*

Compressor

Name	Quantity	Number
Air filter element	1	1260
Oil filter	1	1210
Oil separator cartridge set	1	1450
Cooling oil	1	1600

Tab. 68 Compressor spare parts

KUBOTA engine parts

Name	Quantity	Number
Air filter element	1	1280
Fuel prefilter insert	1	1915
Main fuel filter cartridge	1	1920
Oil filter cartridge	1	1905
Oil drain plug sealing ring	1	4496
Injector nozzle	1	4475
Injector sealing ring	1	4476
V-belt	1	4470
Engine oil	1	1925

Tab. 69 Engine spare parts

11.3 KAESER AIR SERVICE

KAESER AIR SERVICE offers:

- Authorized service technicians with KAESER factory training.
- Increased operational reliability ensured by preventive maintenance.
- Energy savings achieved by avoidance of pressure losses.
- The security of genuine KAESER spare parts.
- Increased legal certainty as all regulations are kept to.

➢ Why not sign a KAESER AIR SERVICE maintenance agreement.
The advantages:
Lower costs and higher compressed air availability.

11.4 Service Addresses

Addresses of KAESER representatives are given at the end of this manual.

11.5 Replacement parts for service and repair

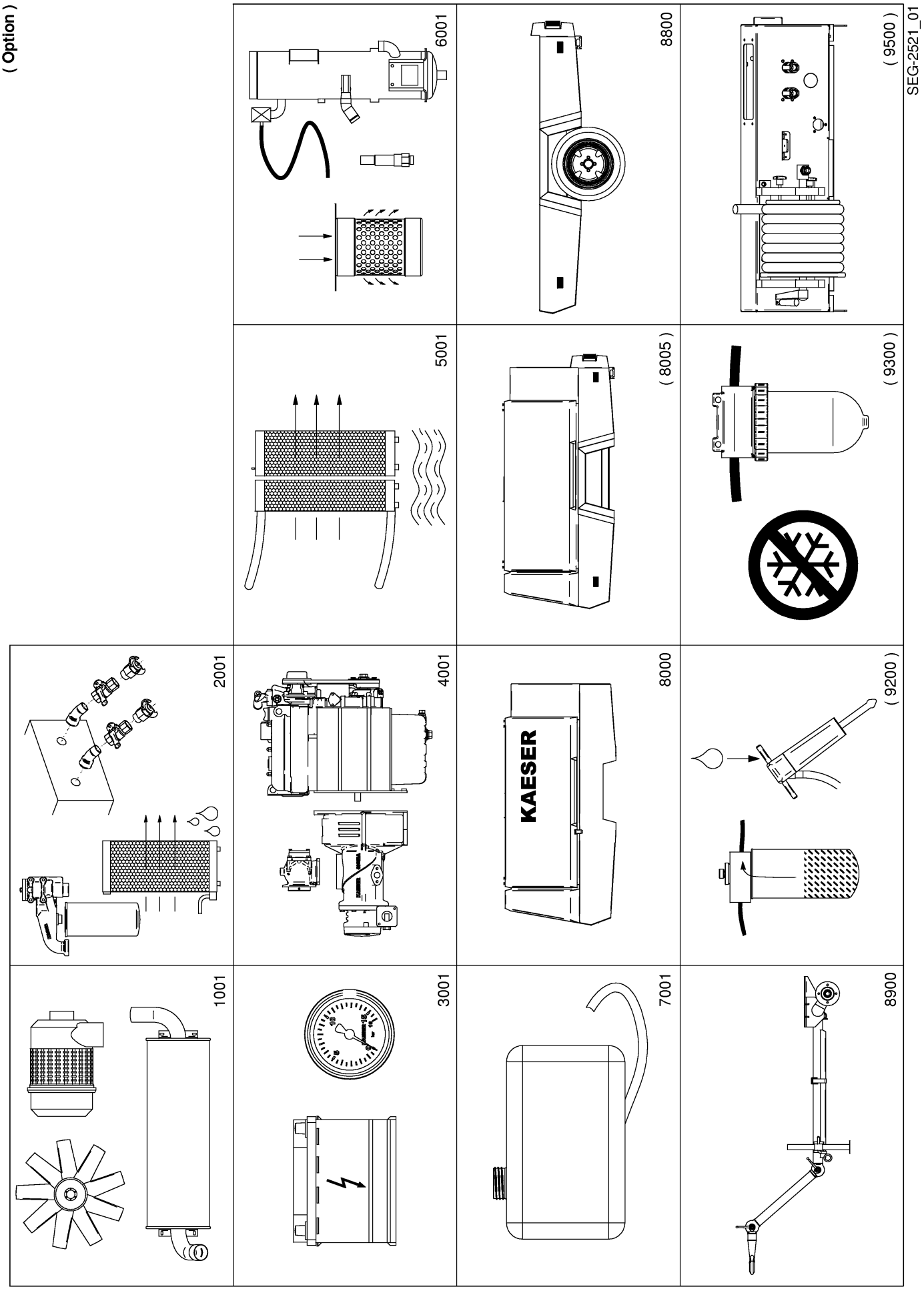
With the help of this parts list you can plan your material requirement according to operating conditions and order the spare parts needed.

⚠ WARNING

Personal injury or machine damage can result from working incorrectly on the machine! Incorrect inspection, service or repair can damage the machine or severely impair its function. Personal injury may result from damage.

➢ *Make sure that any service or repair tasks not described in this manual are carried out by an authorized KAESER service representative.*

(Option)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(9500)
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(8005)
(9300)
2001
4001
8000
KAESER
(9200)
1001
3001
7001
8900

1001 Ansaugluft/Kühlluft/Abgas / Inlet air/Cooling air/Exhaust

Service-Kit (Option)

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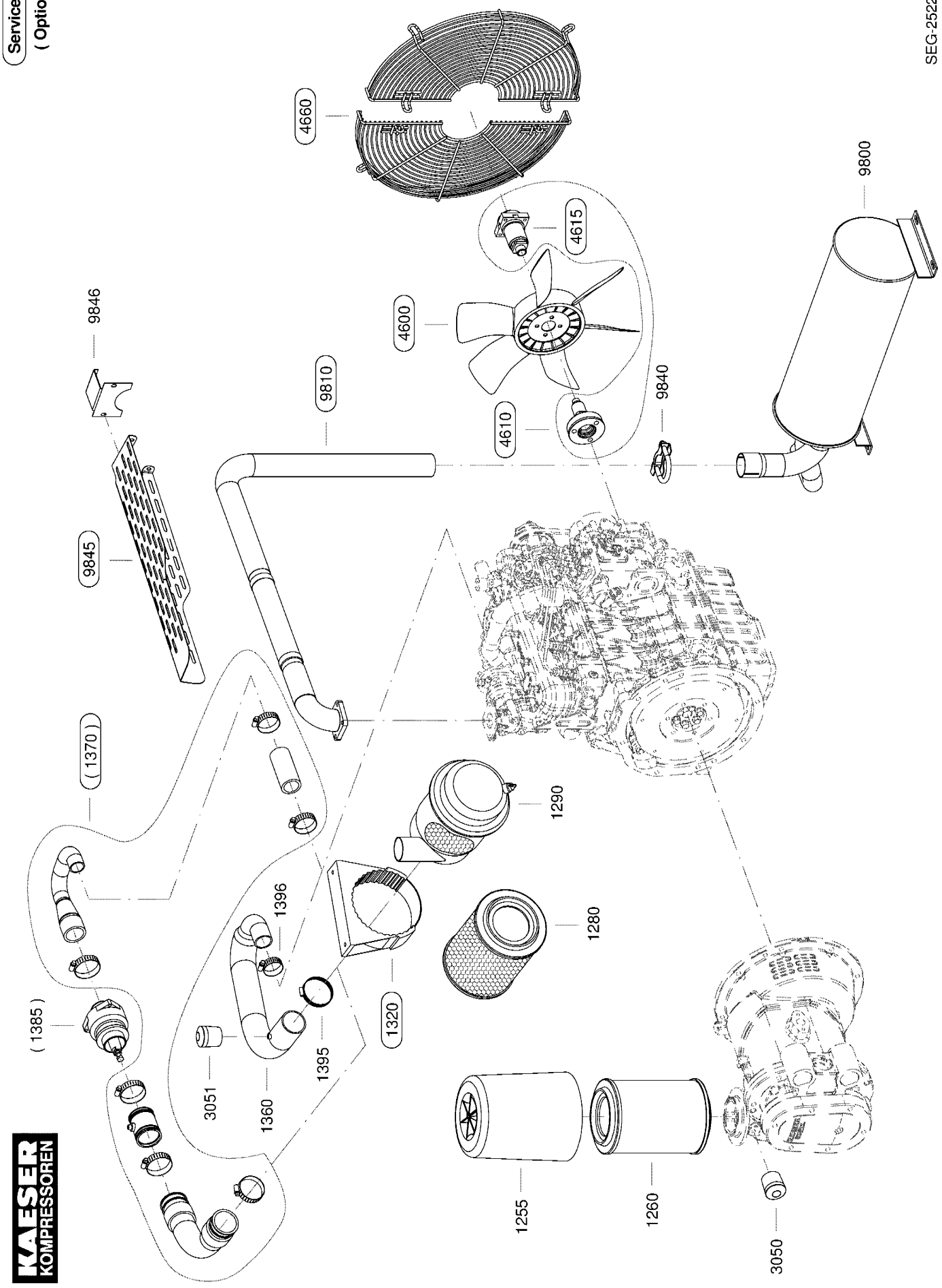
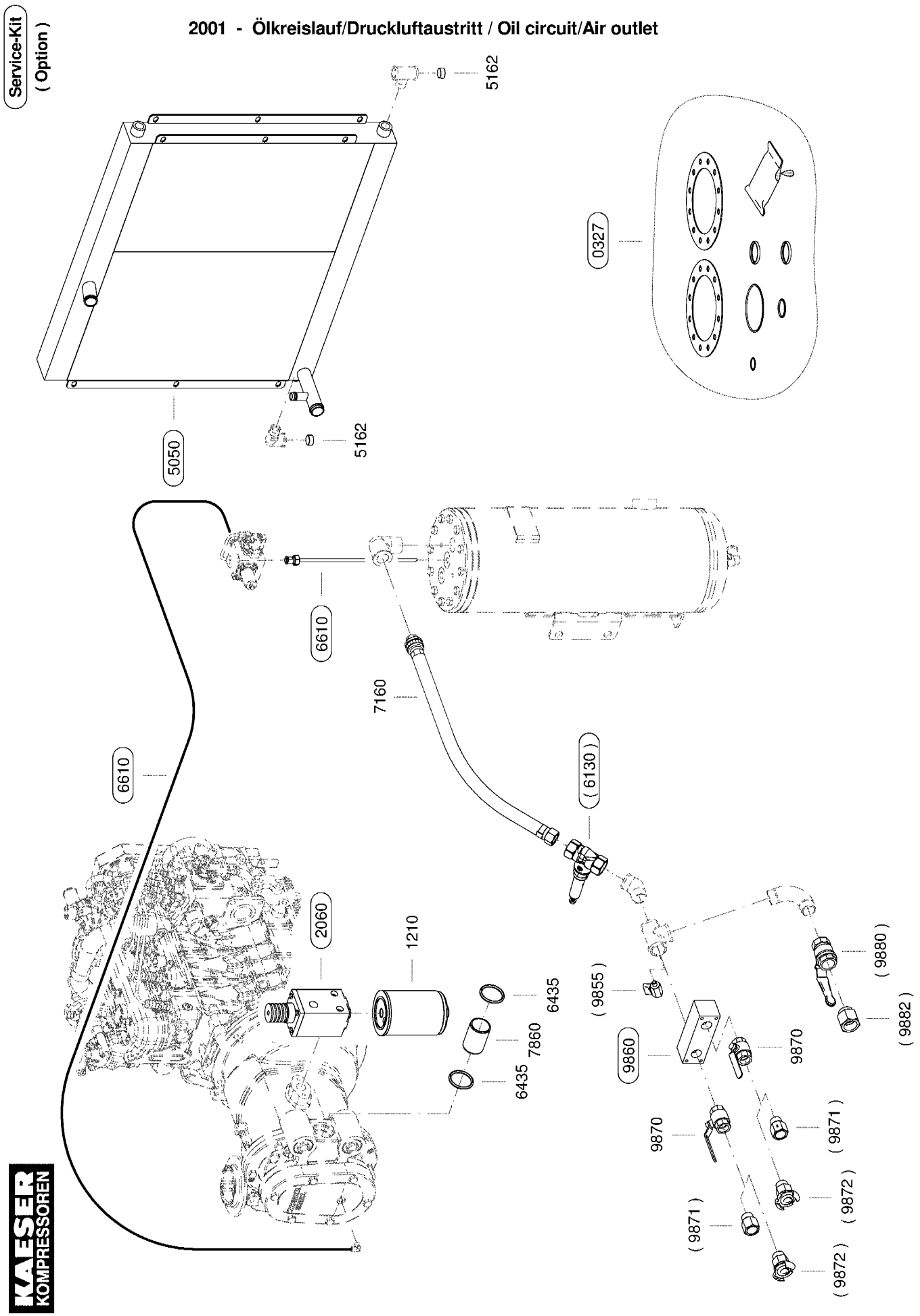


2001 - Ölkreislauf/Druckluftaustritt / Oil circuit/Air outlet



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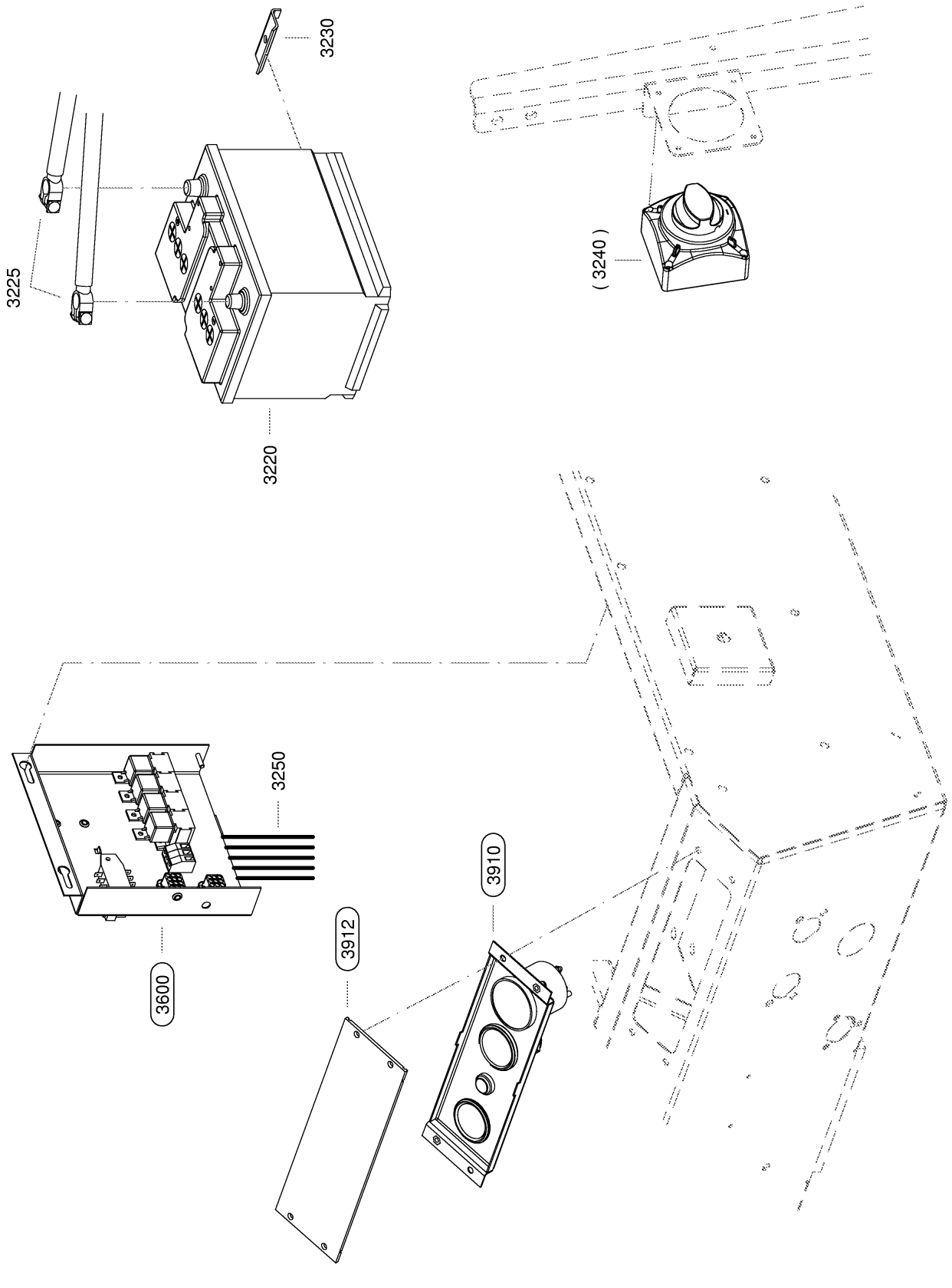
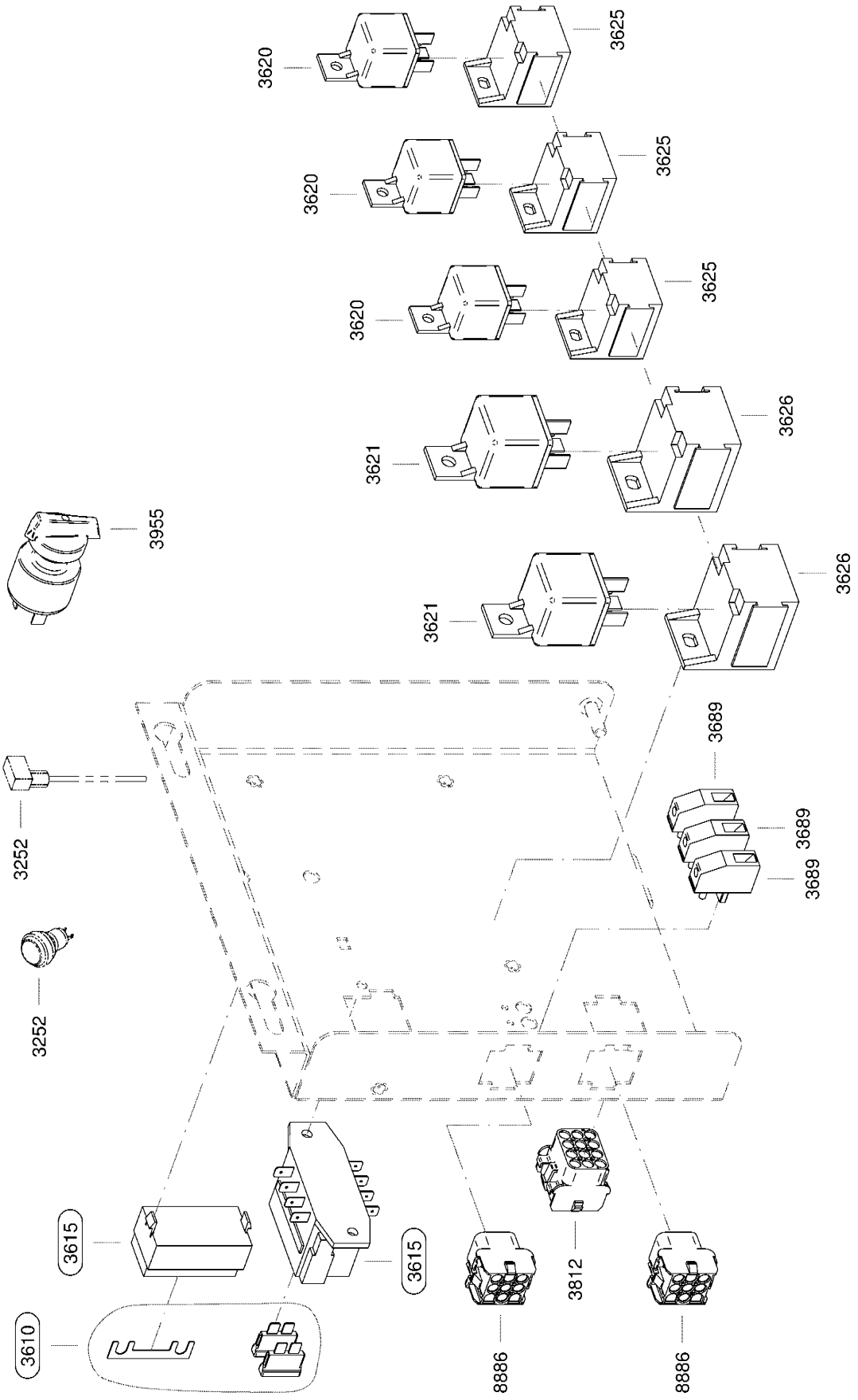


Service-Kit (Option)

3600 Schaltschrank / Control cabinet

SEG-6324_01



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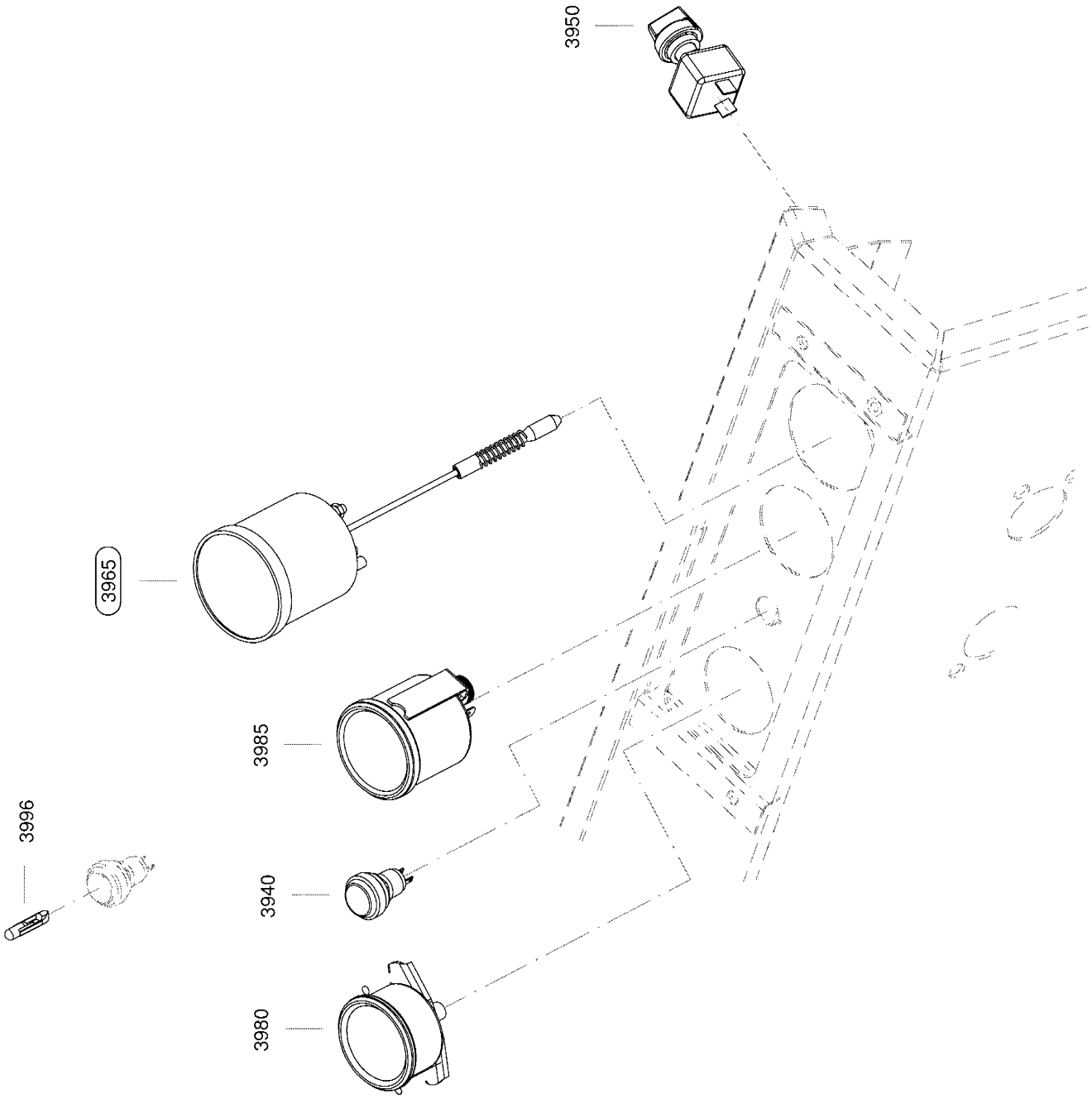

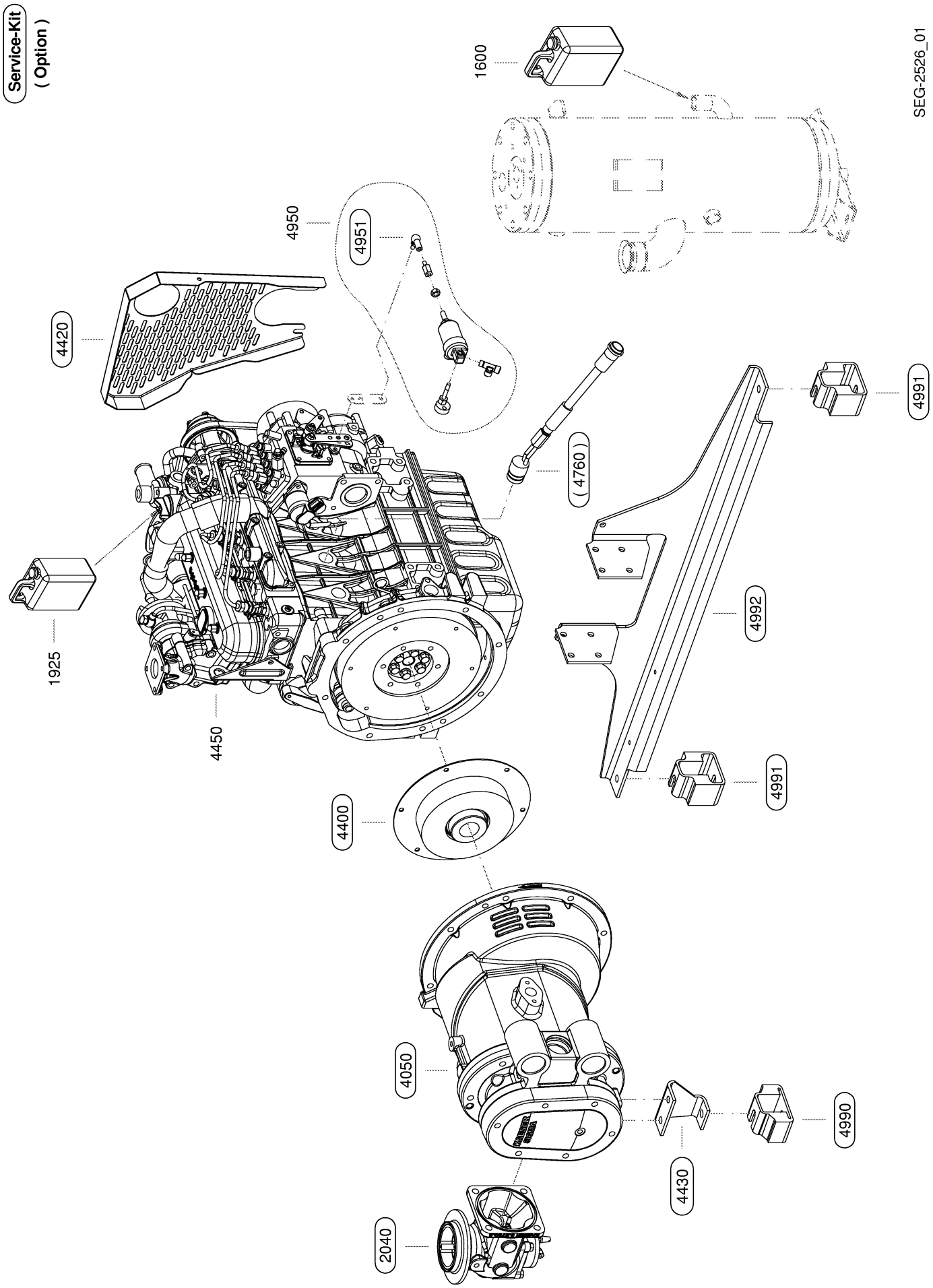
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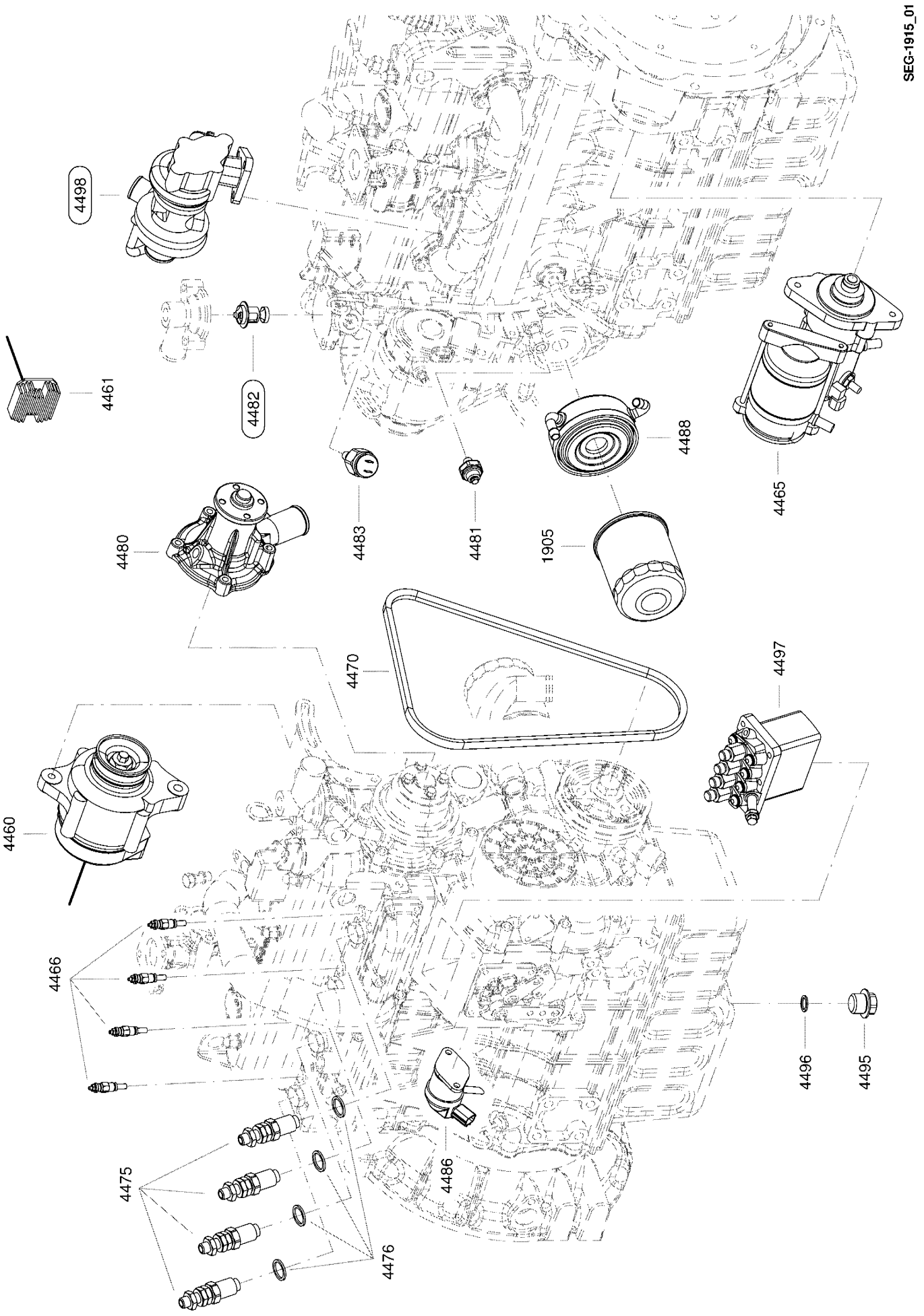
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Service-Kit

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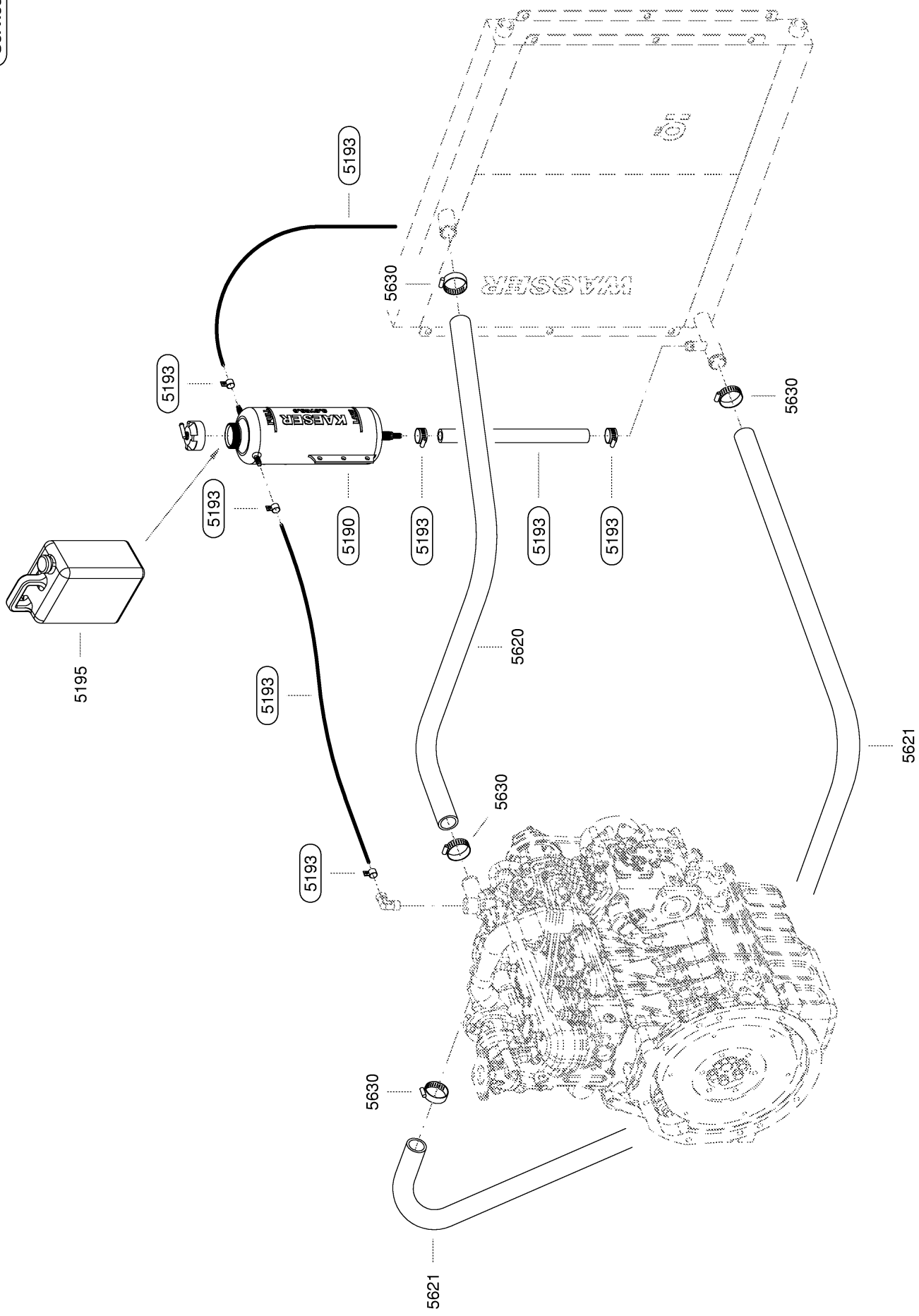

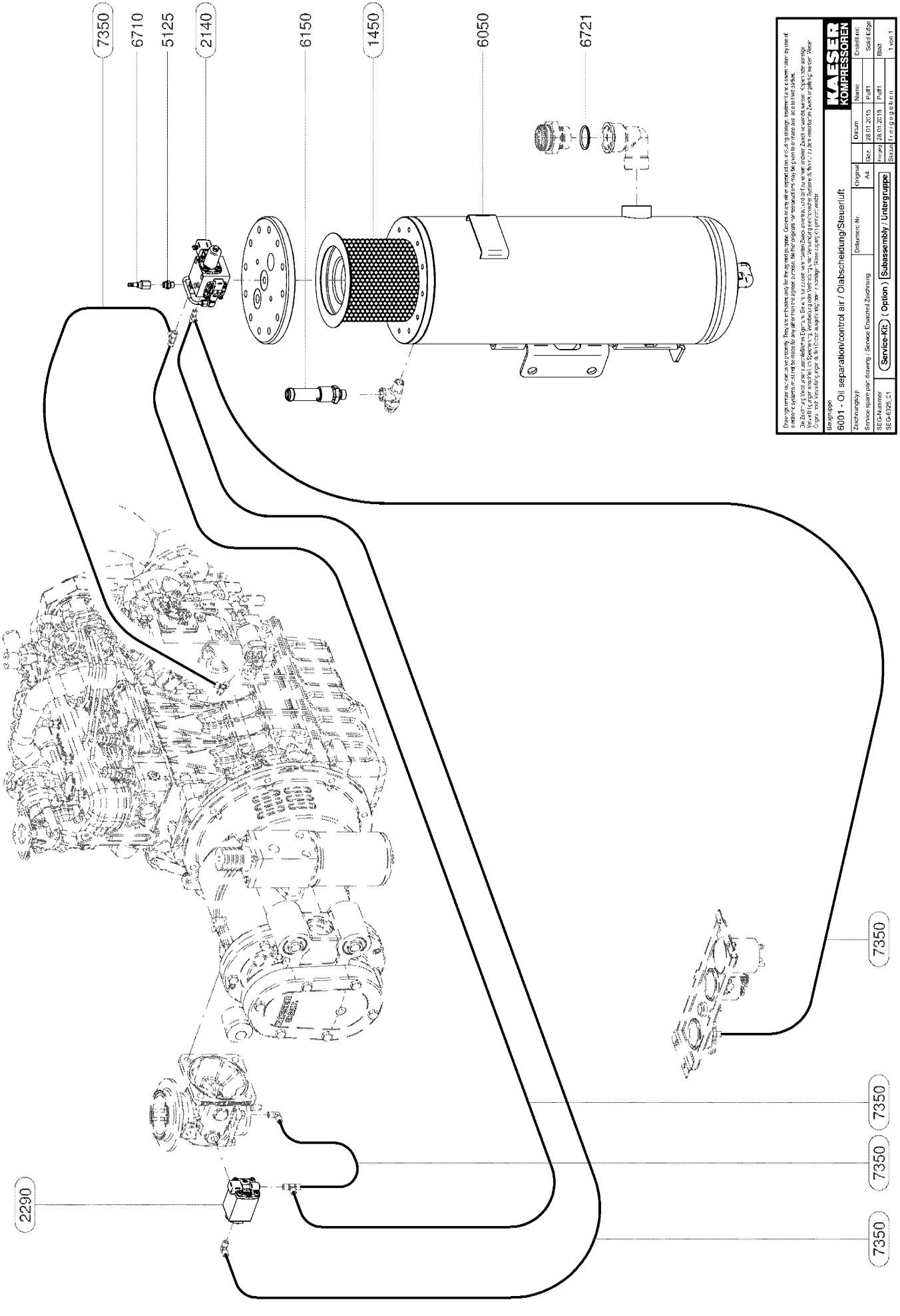
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KAESER KOMPRESSOREN
6001 - Oil separation/control air / Ölabscheidung/Steuerluft
Service spare part drawing / Service Ersatzteil Zeichnung
Service-Kit
(Option)
Subassembly / Untergruppe

Service-Kit

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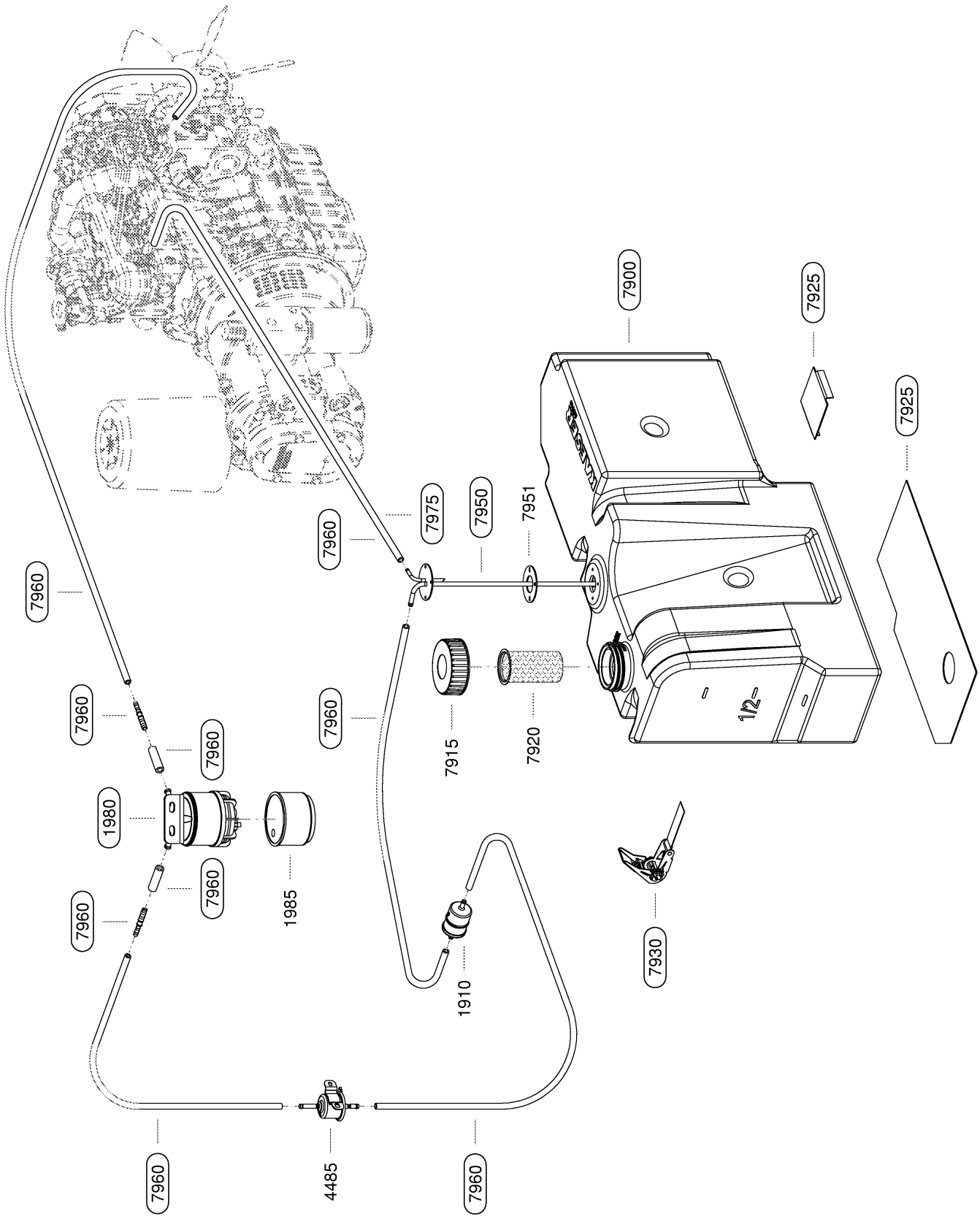

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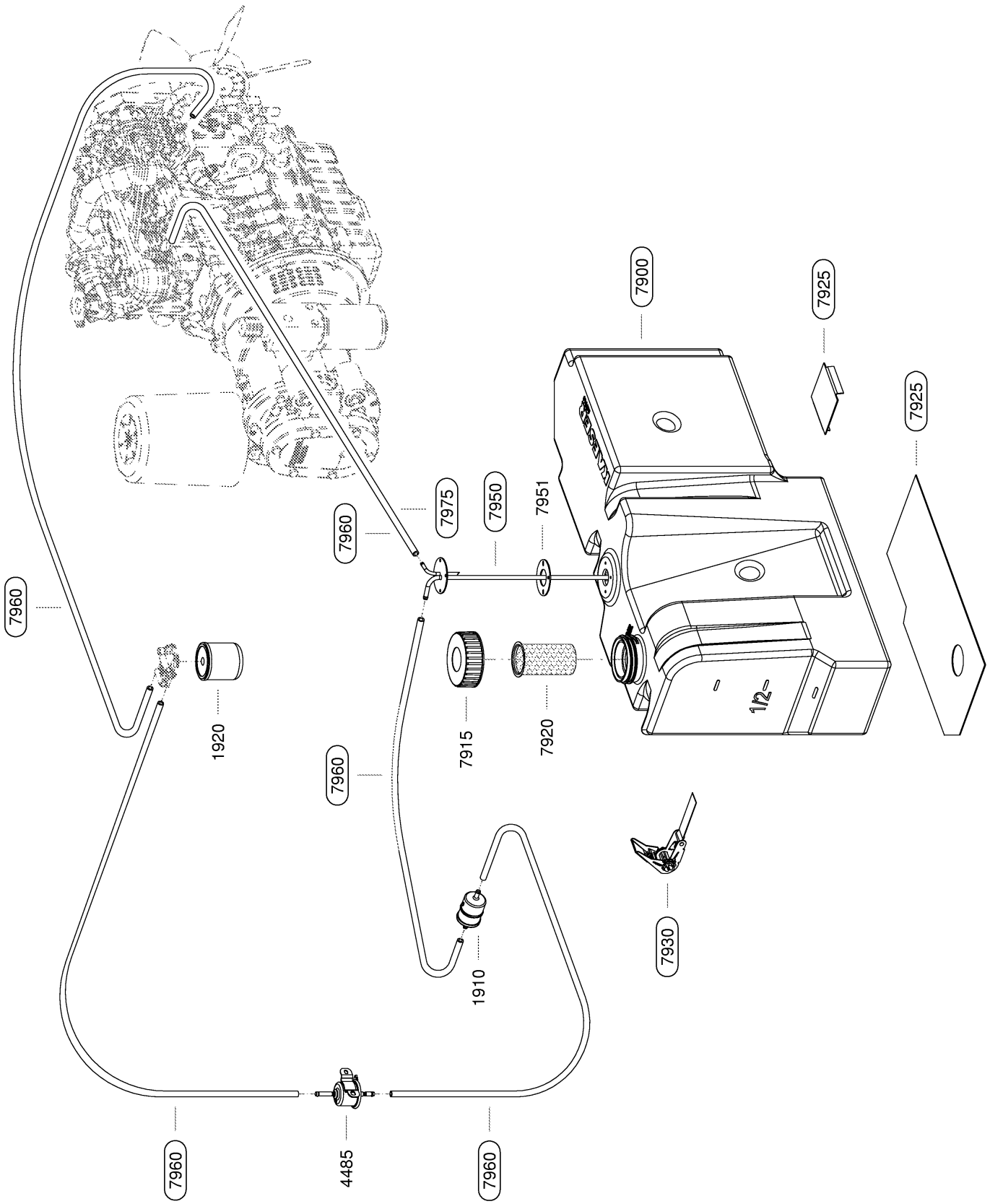

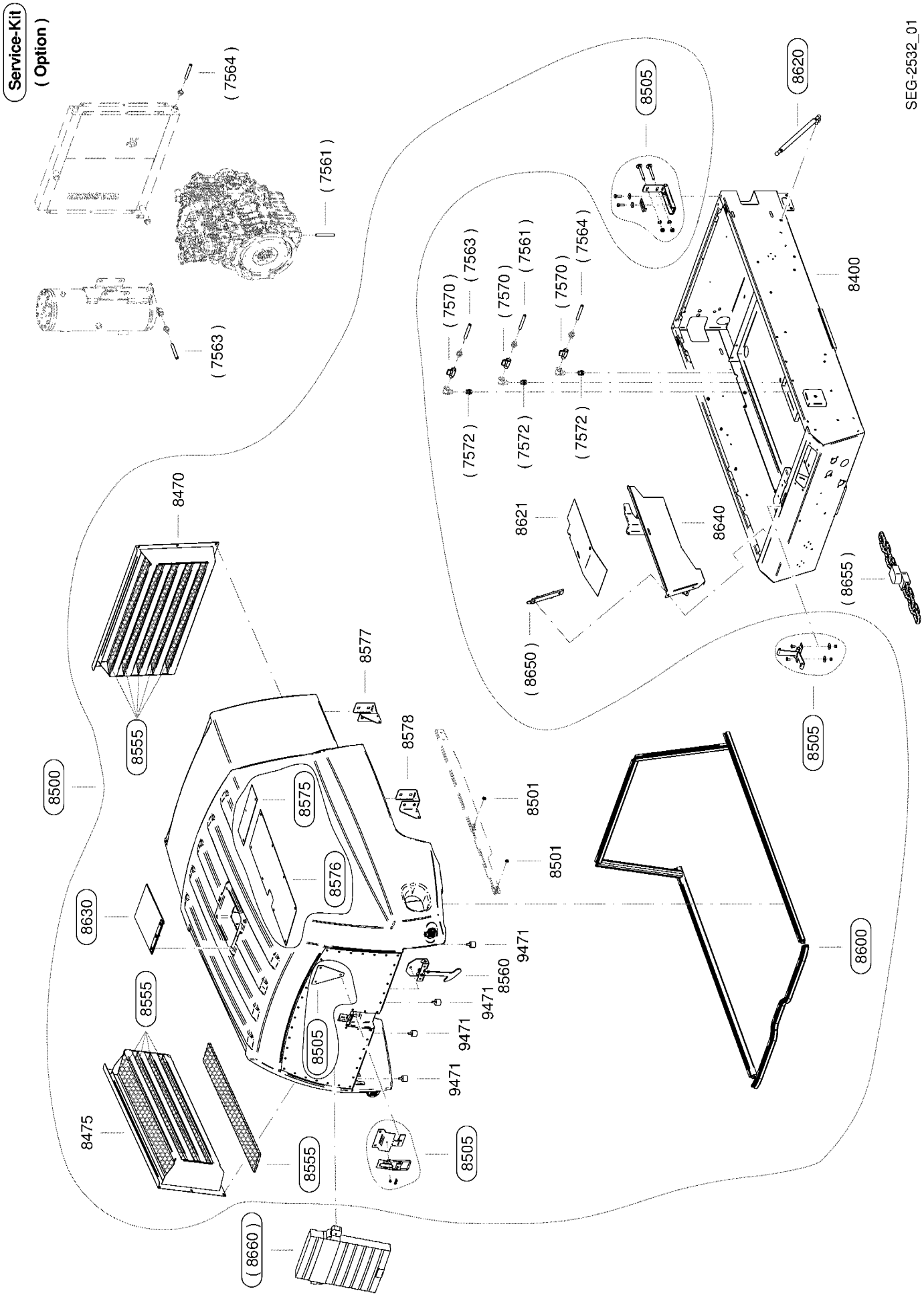
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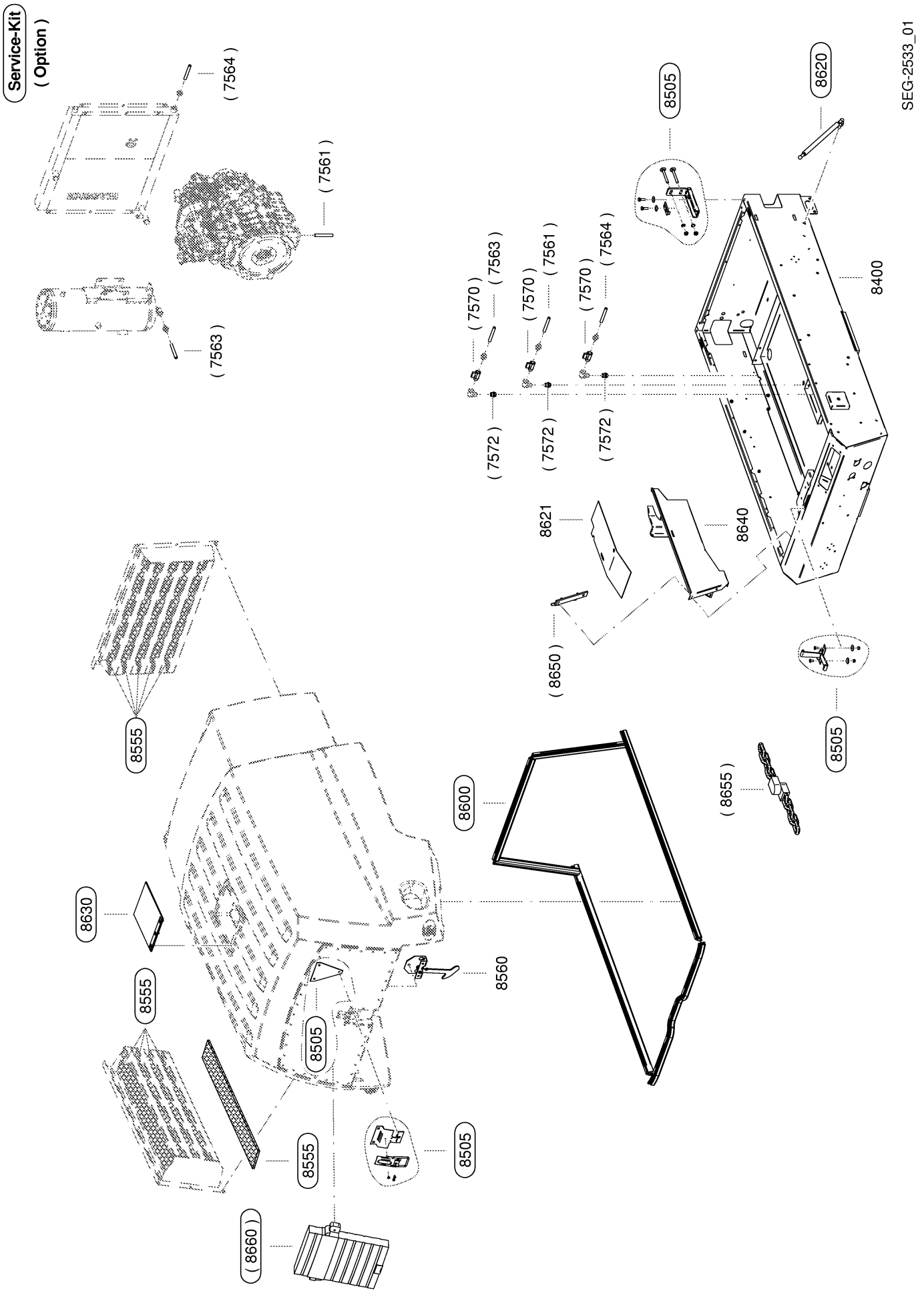
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Service-Kit

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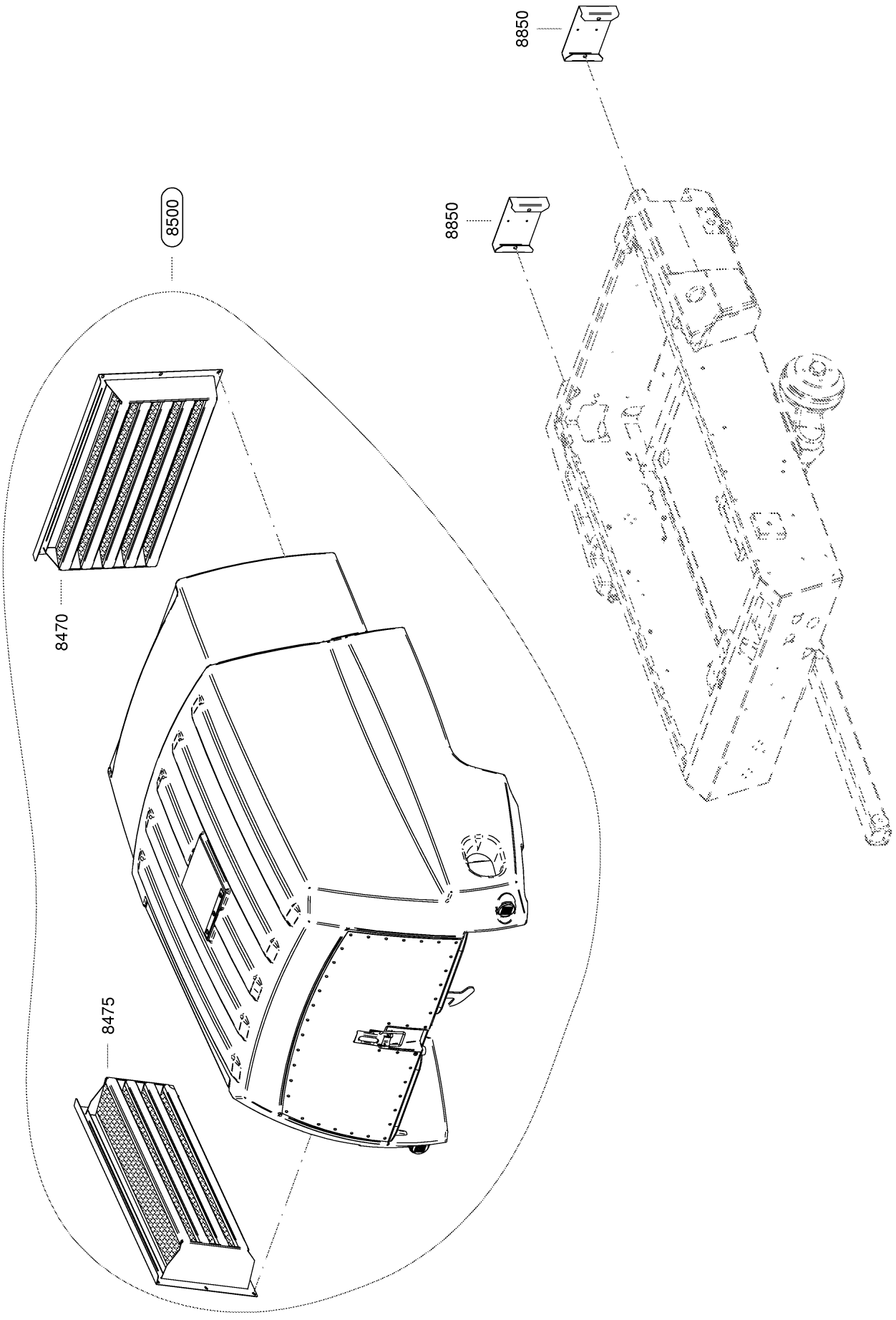

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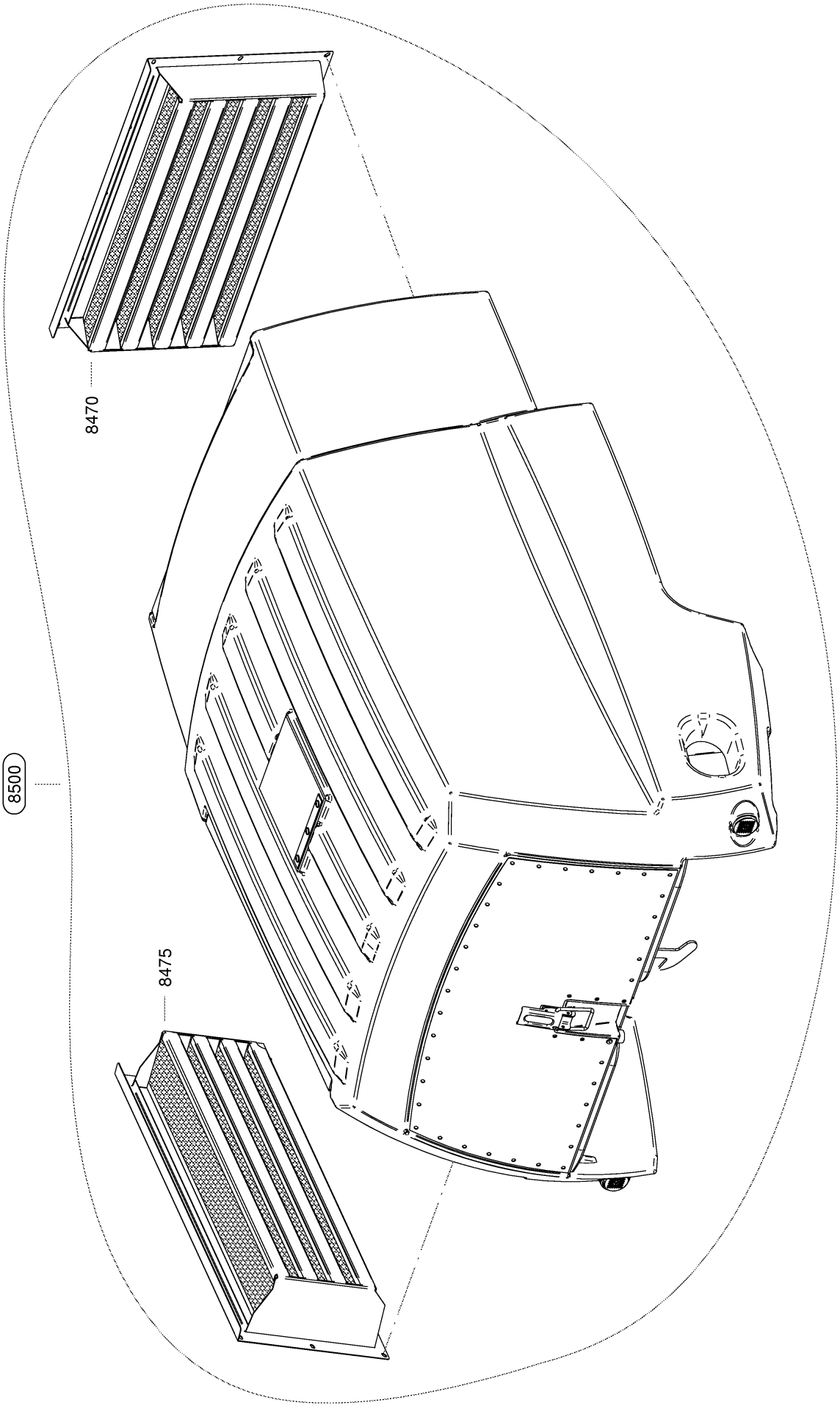

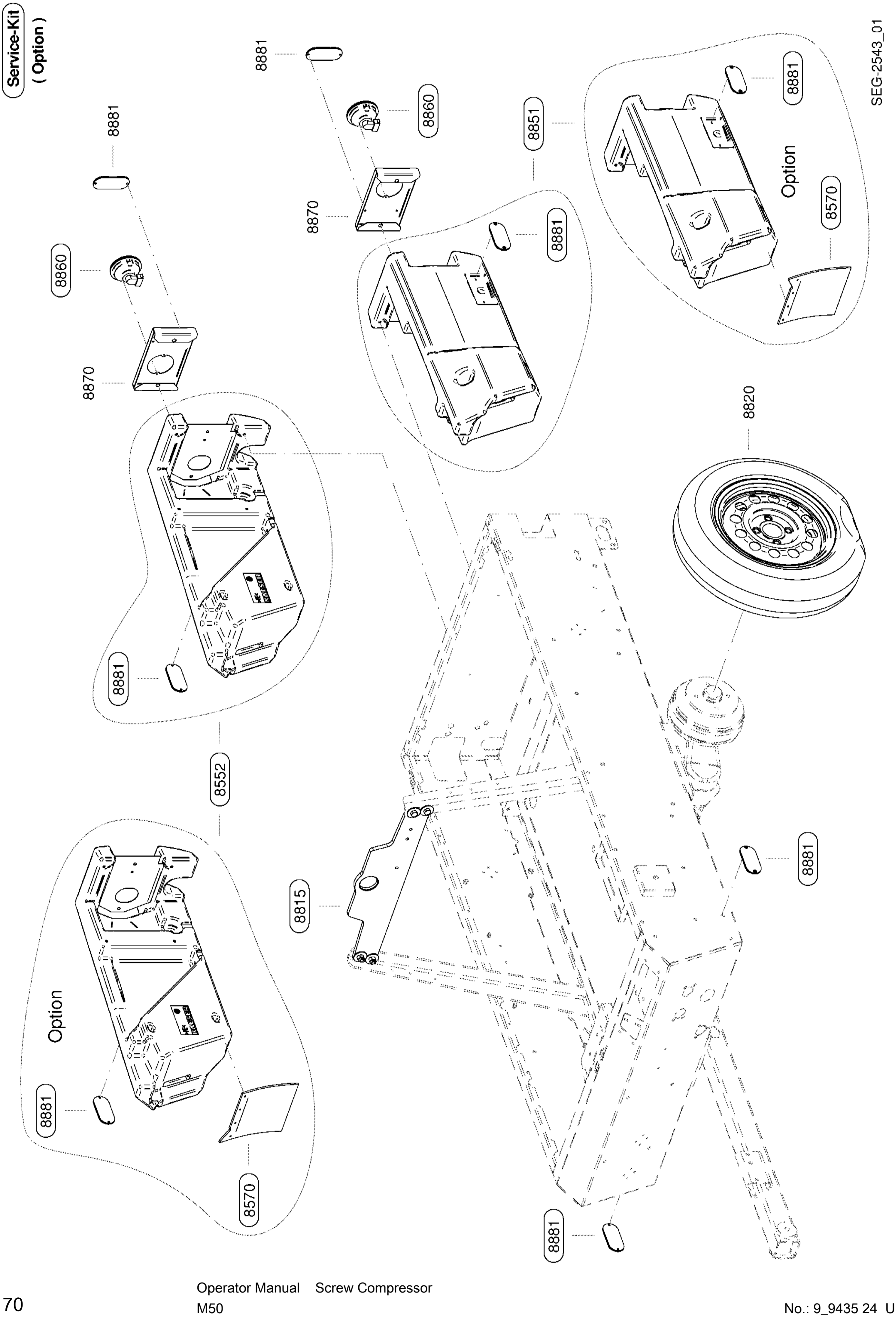
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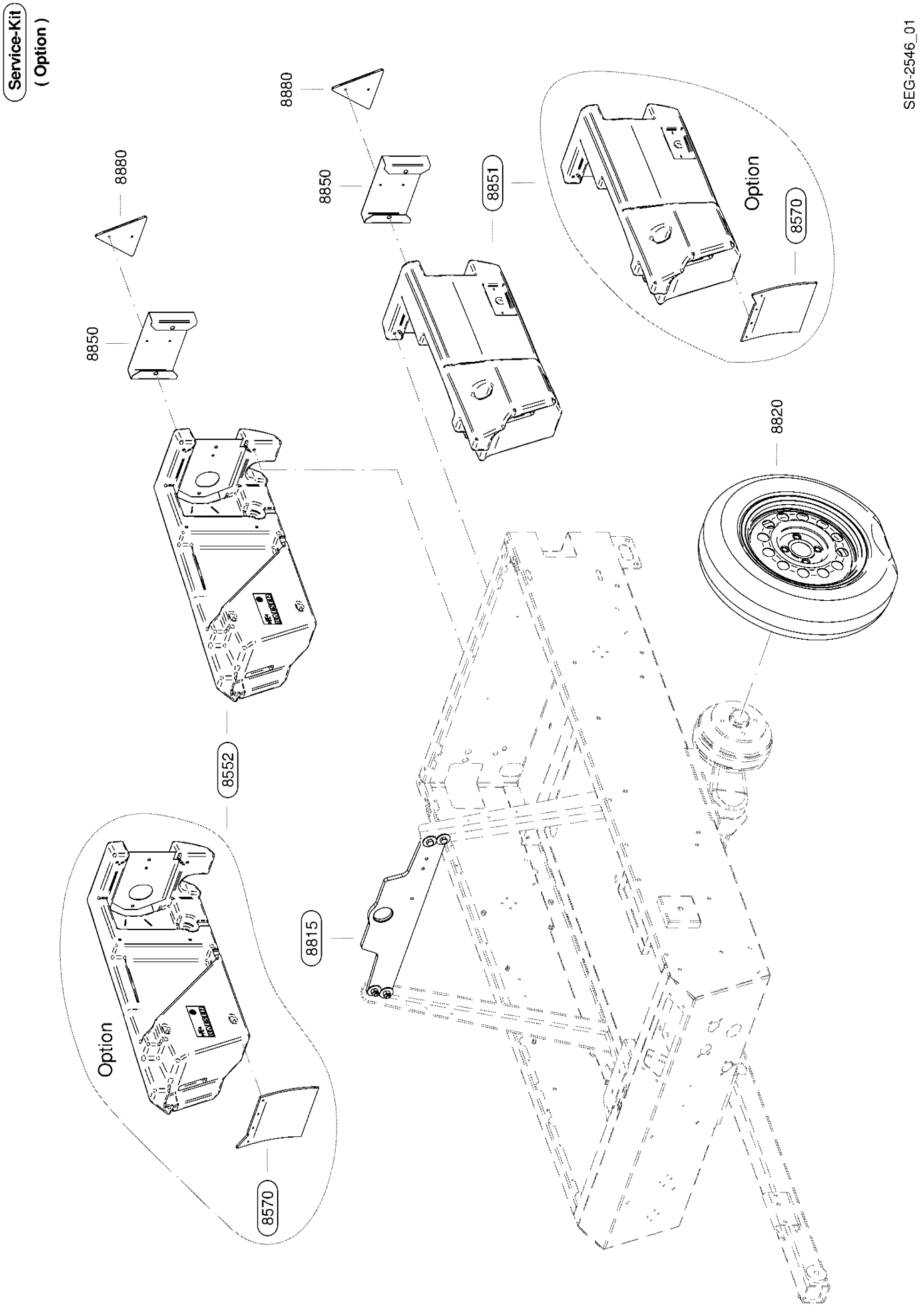
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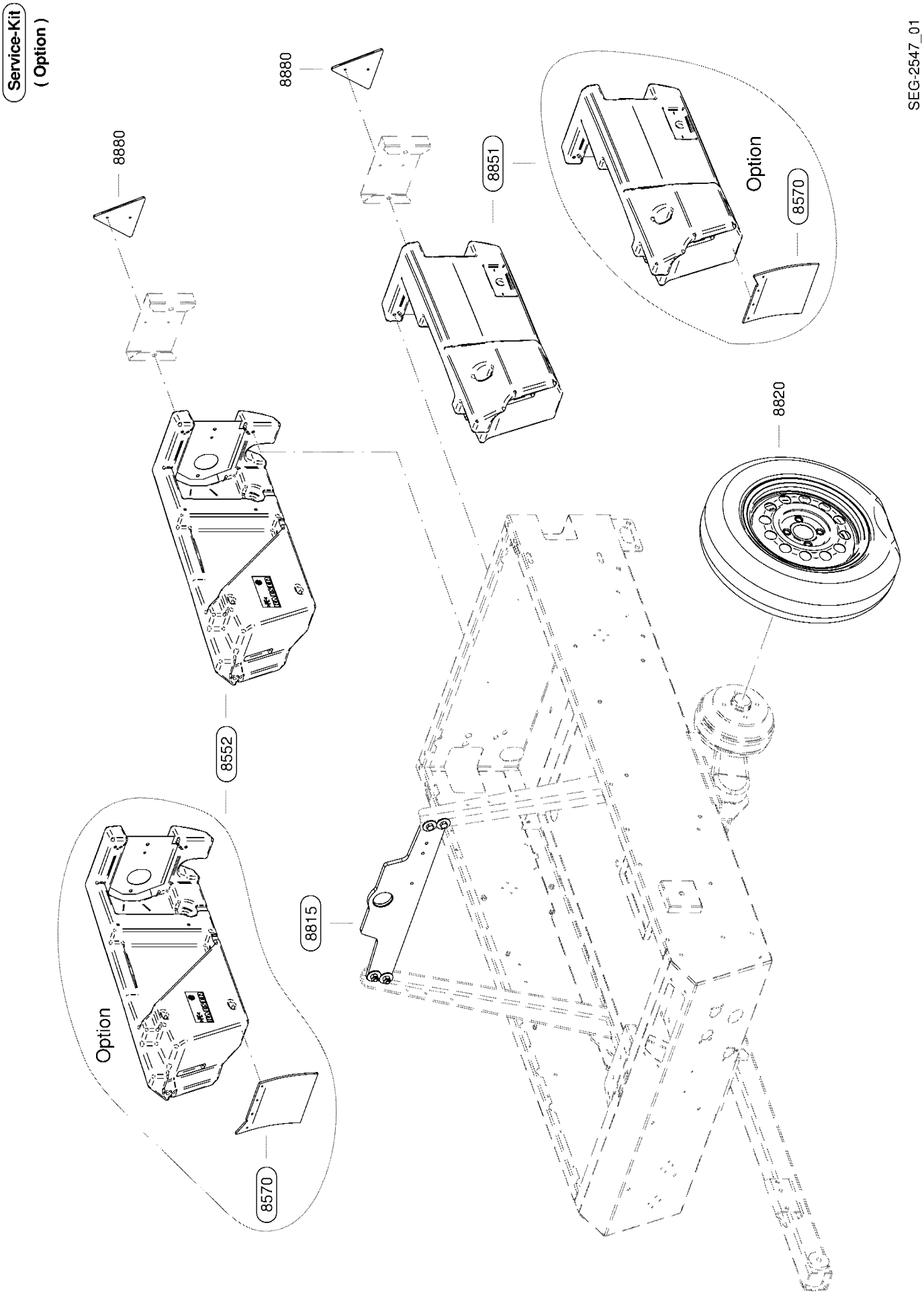
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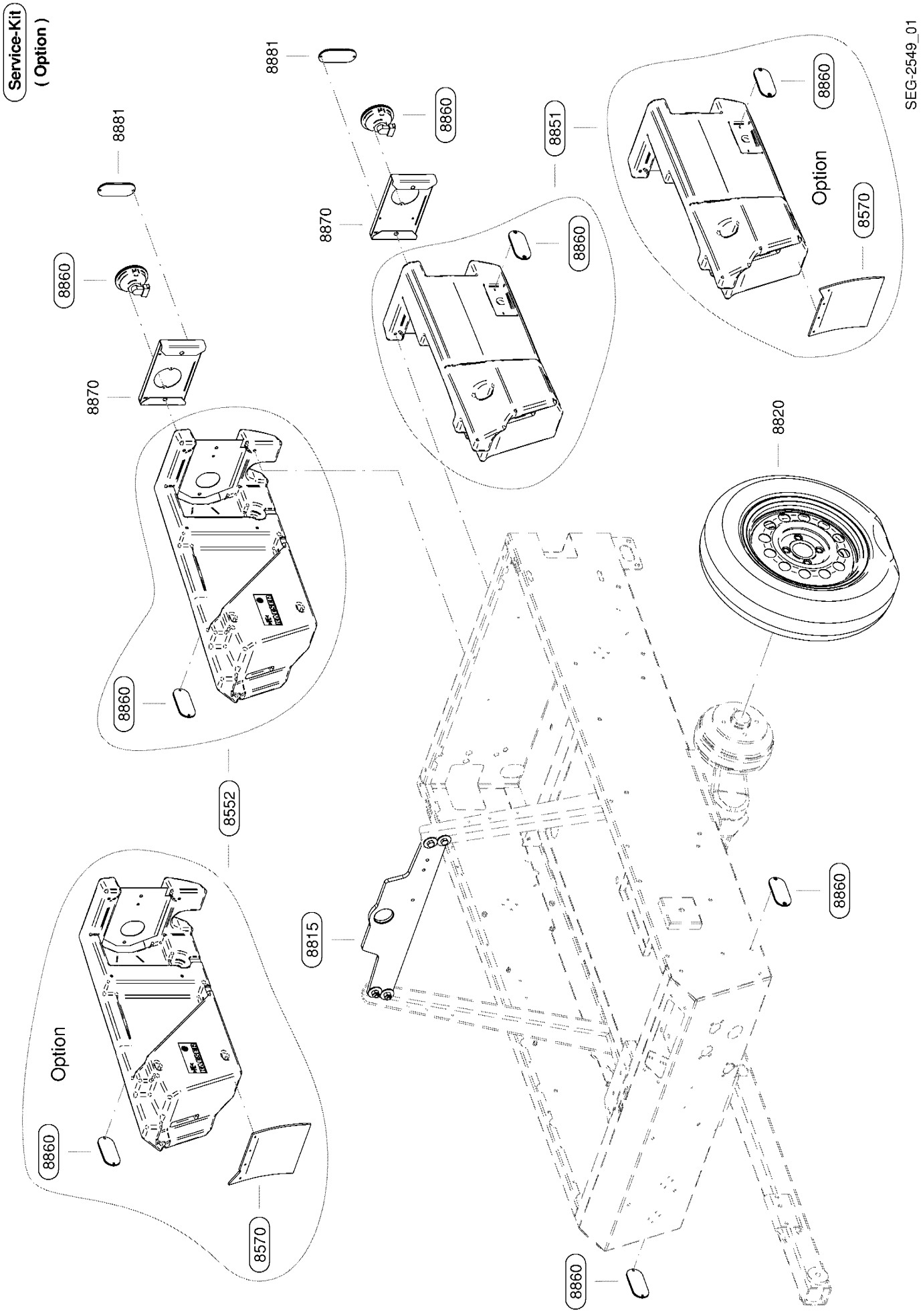
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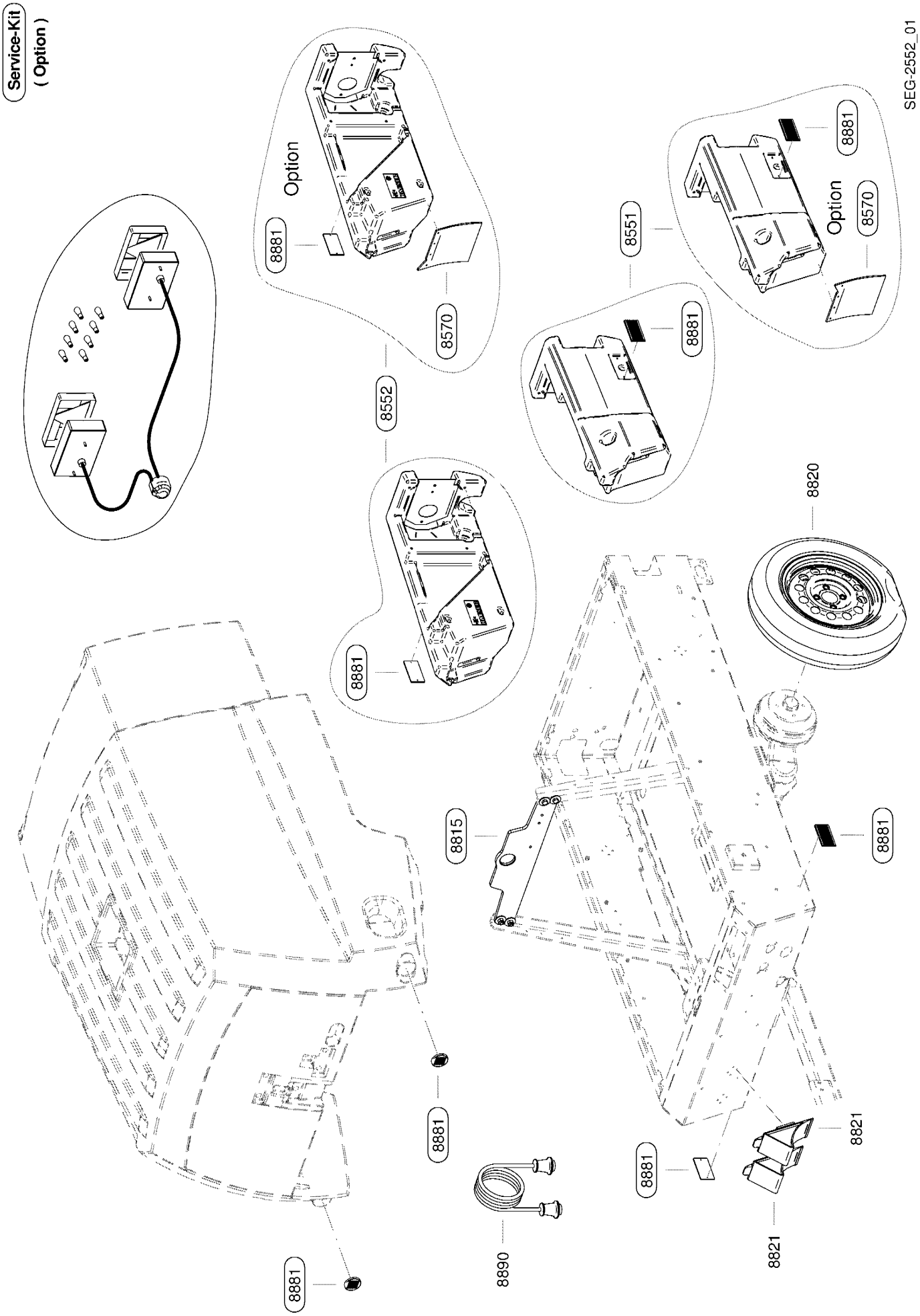
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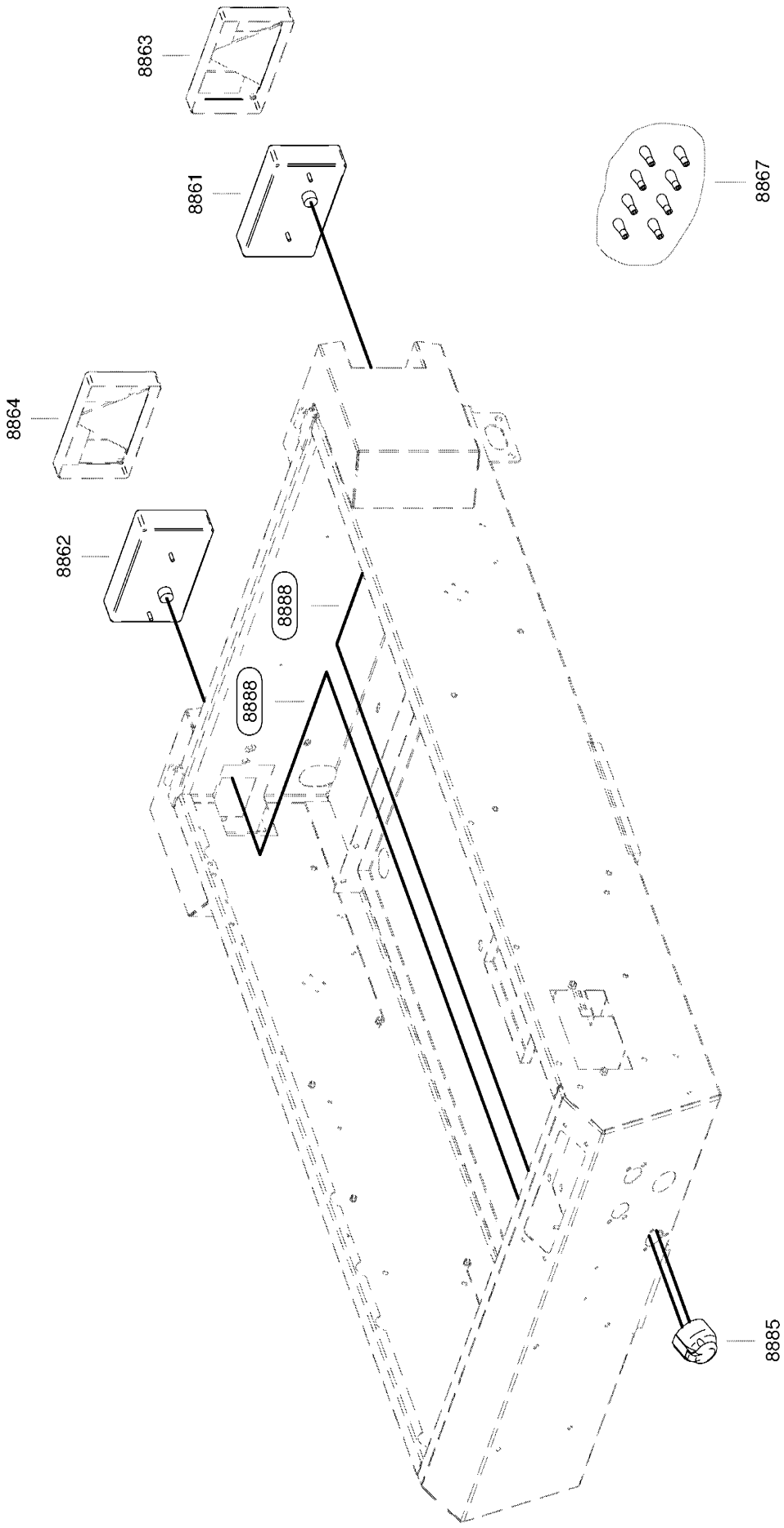

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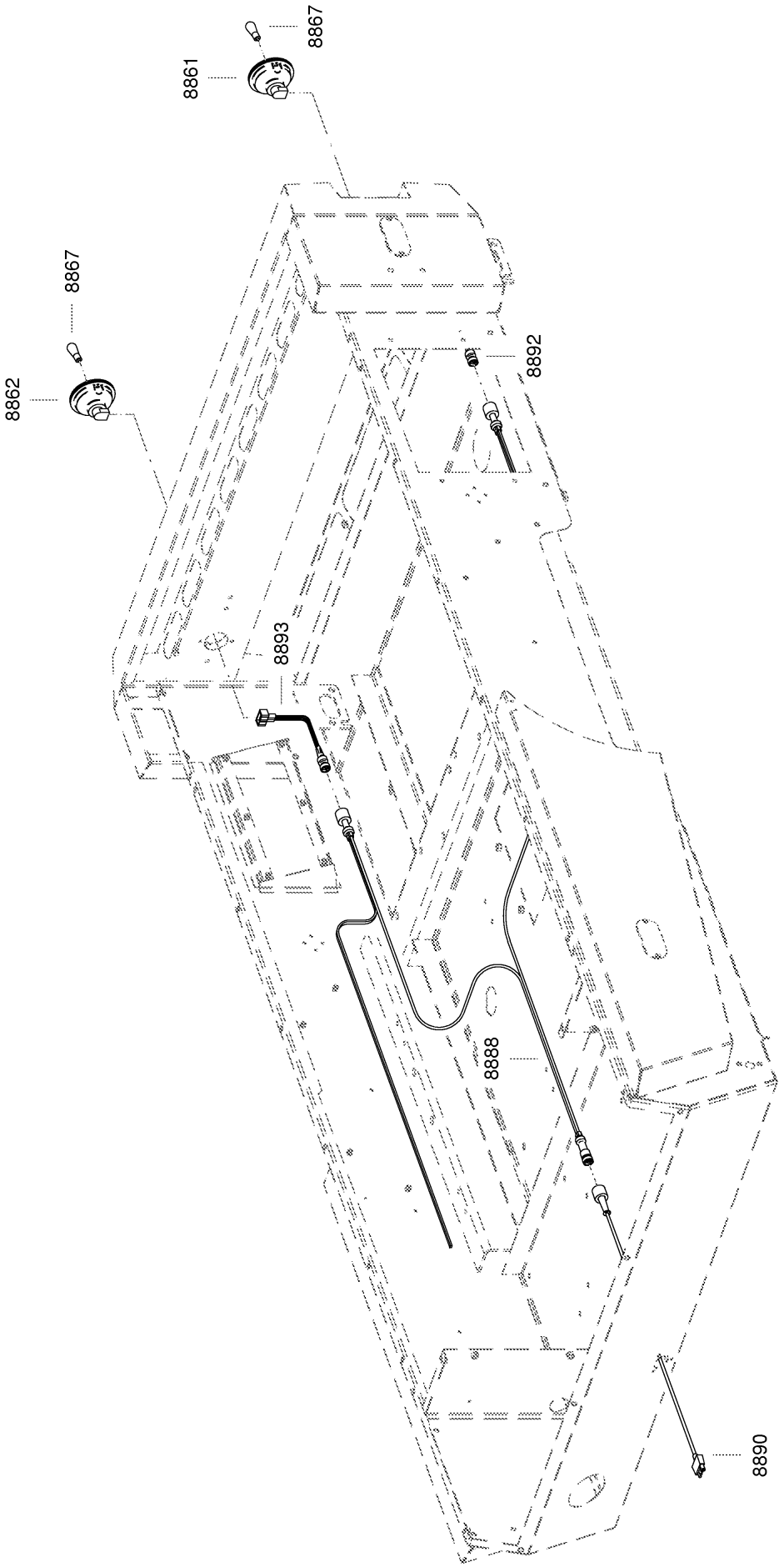

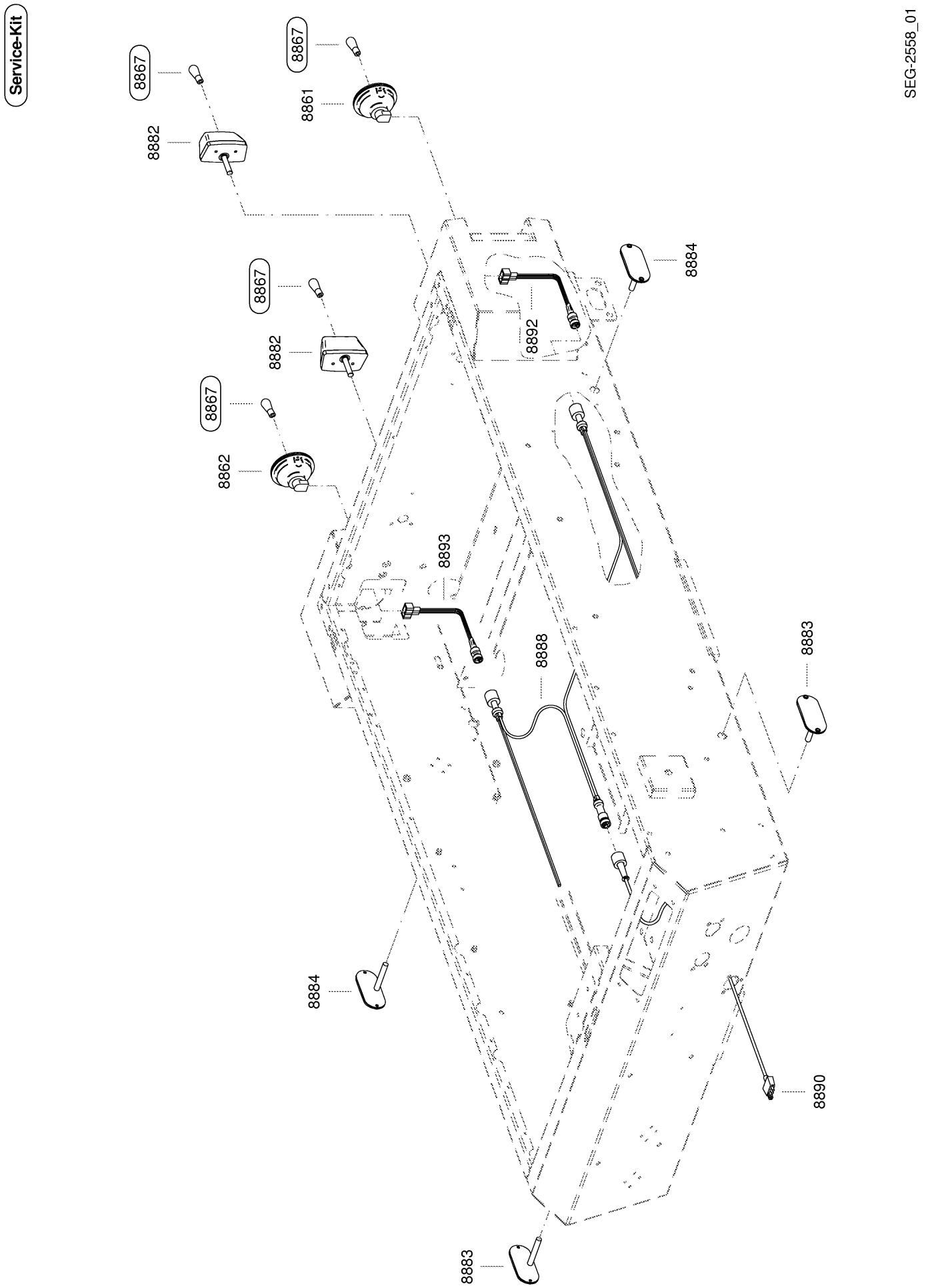
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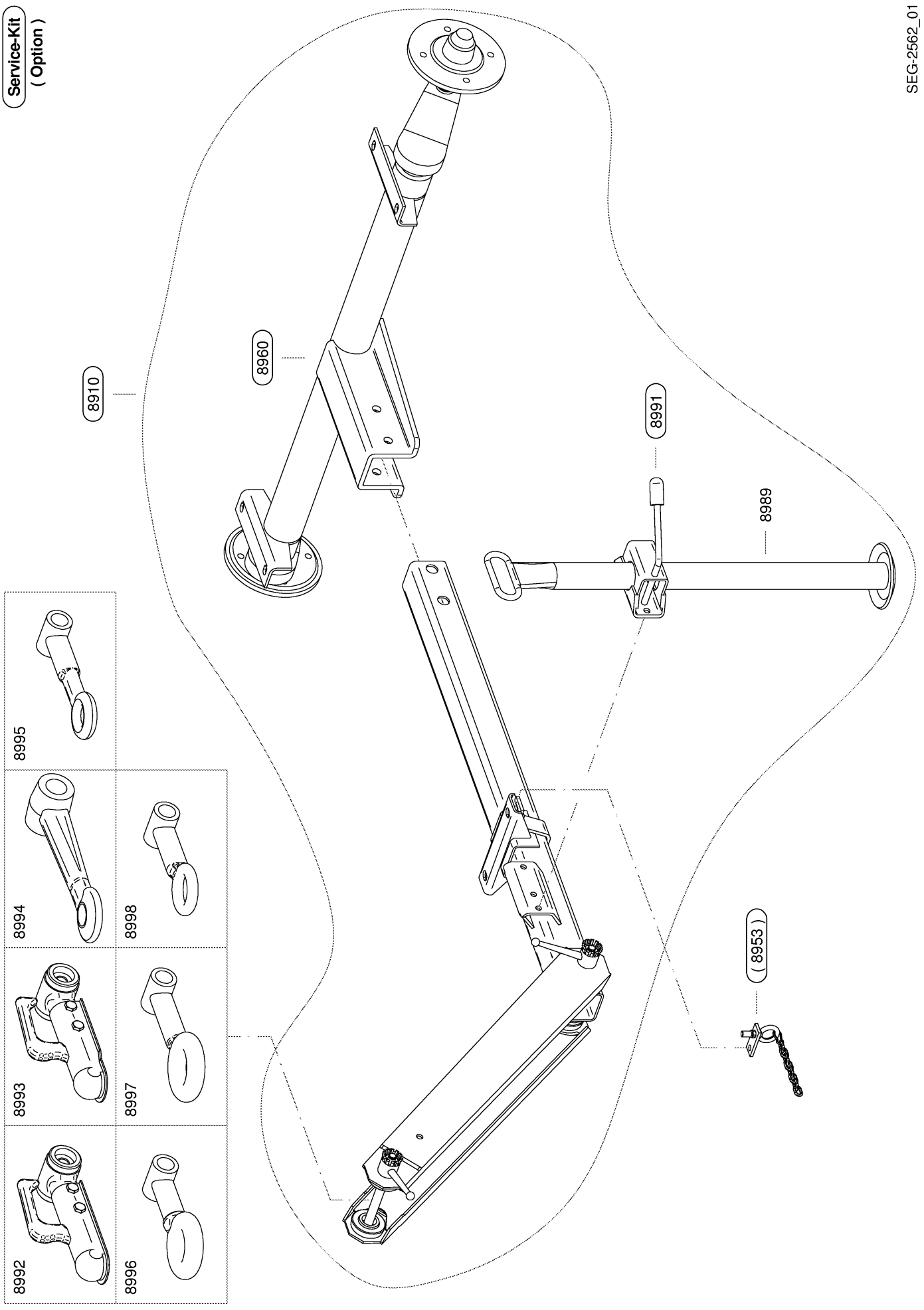
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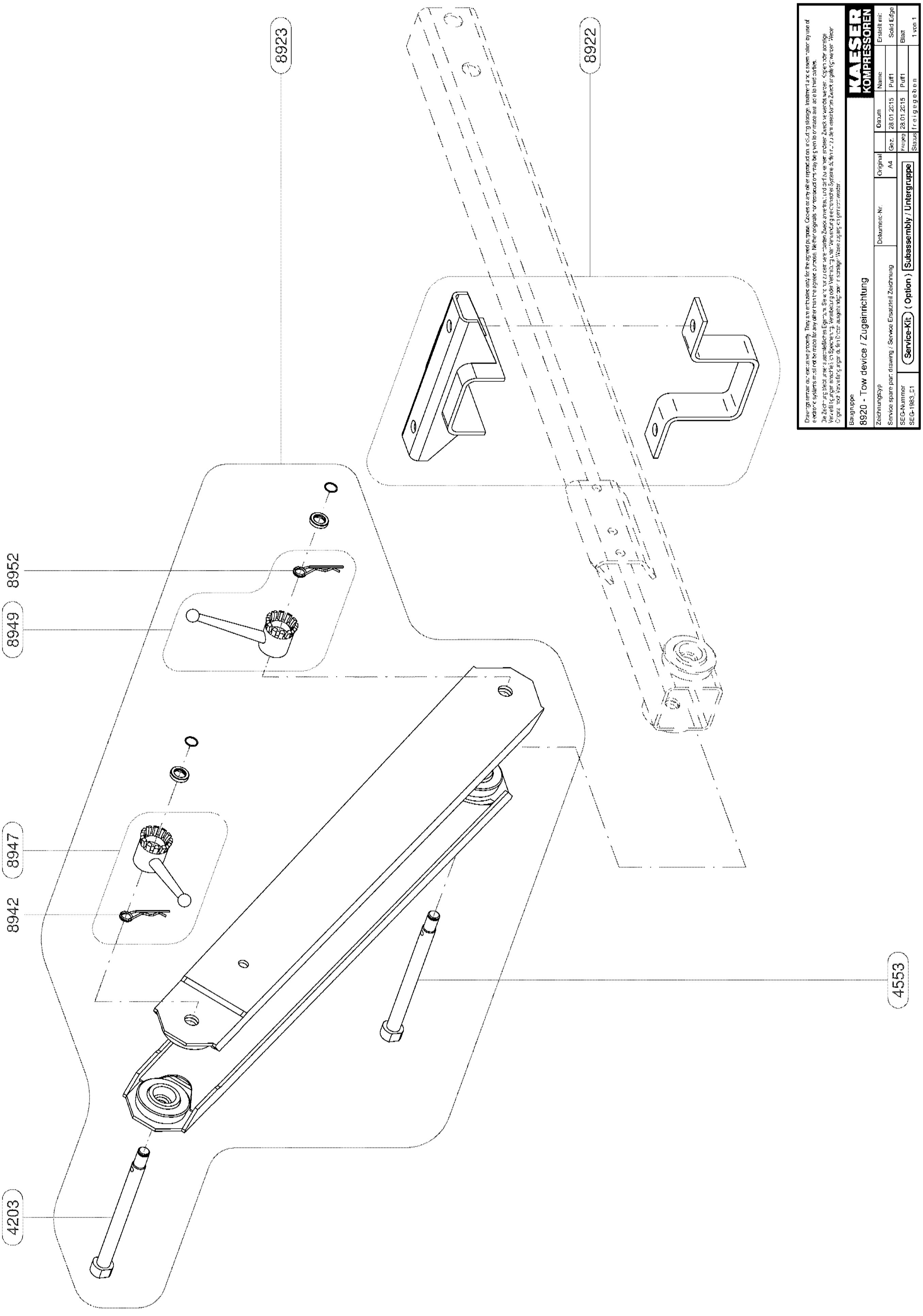
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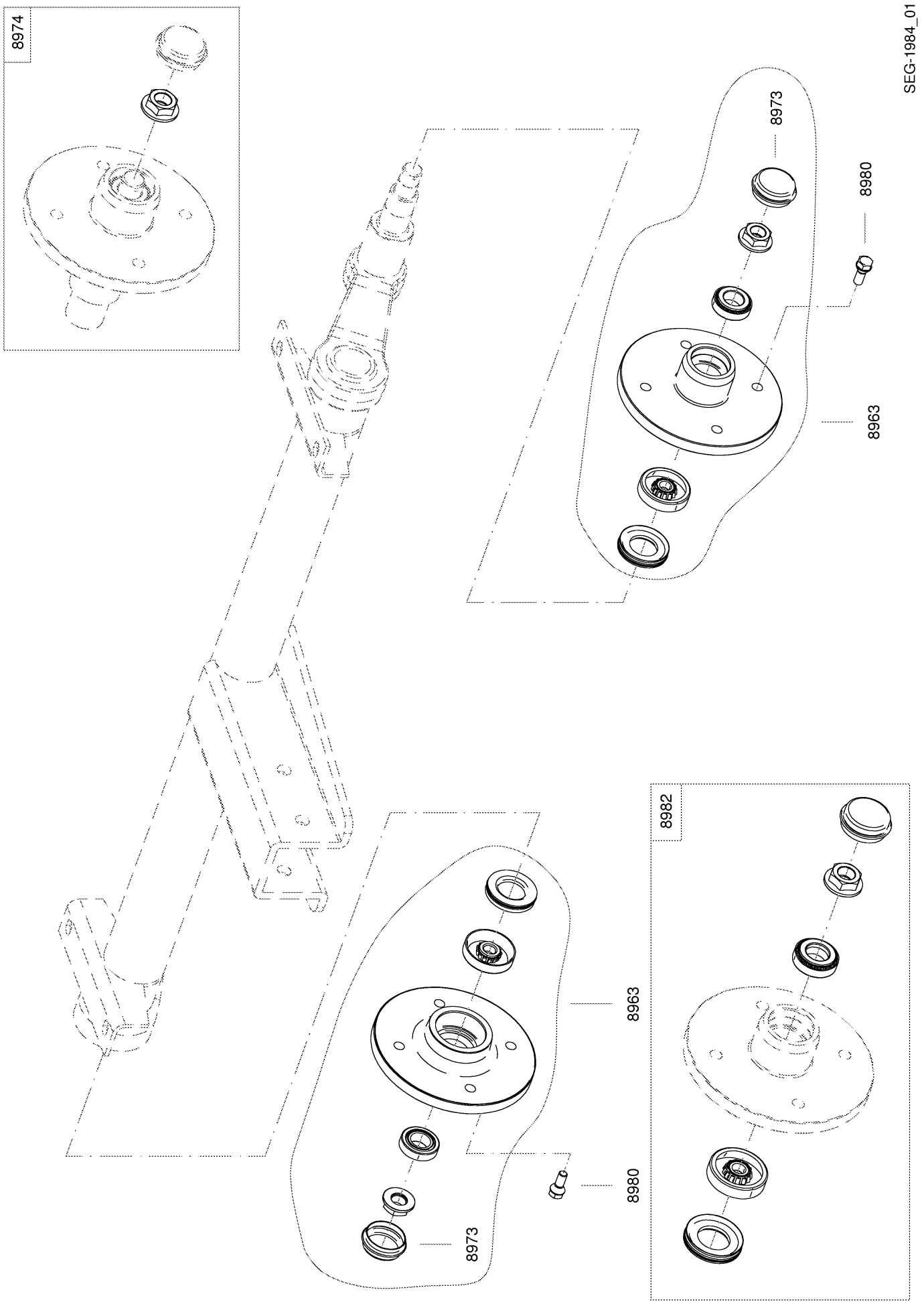
8920 - Tow device / Zugeinrichtung
Service-Kit
(Option)
Subassembly / Untergruppe
KAESER KOMPRESSOREN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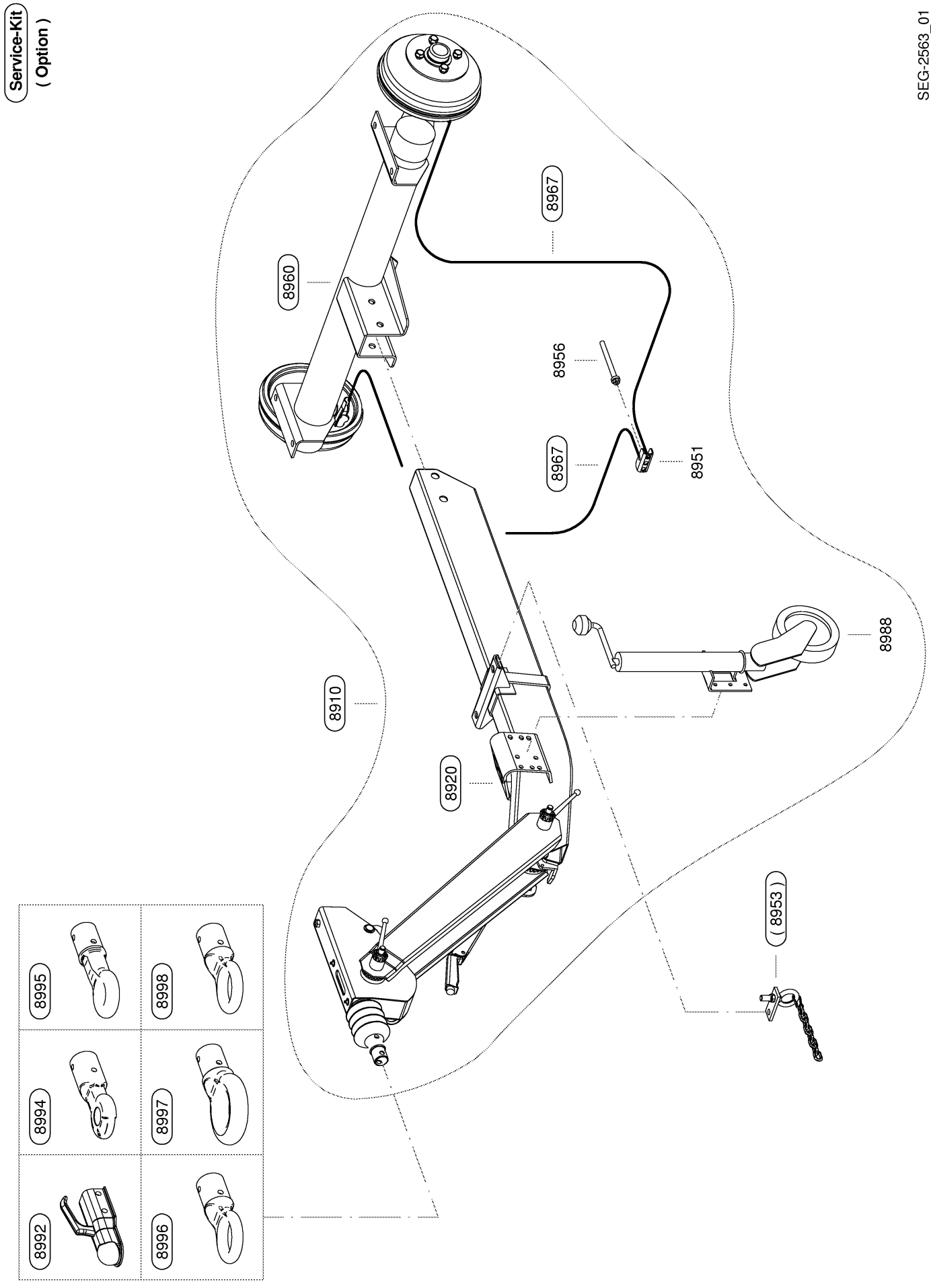
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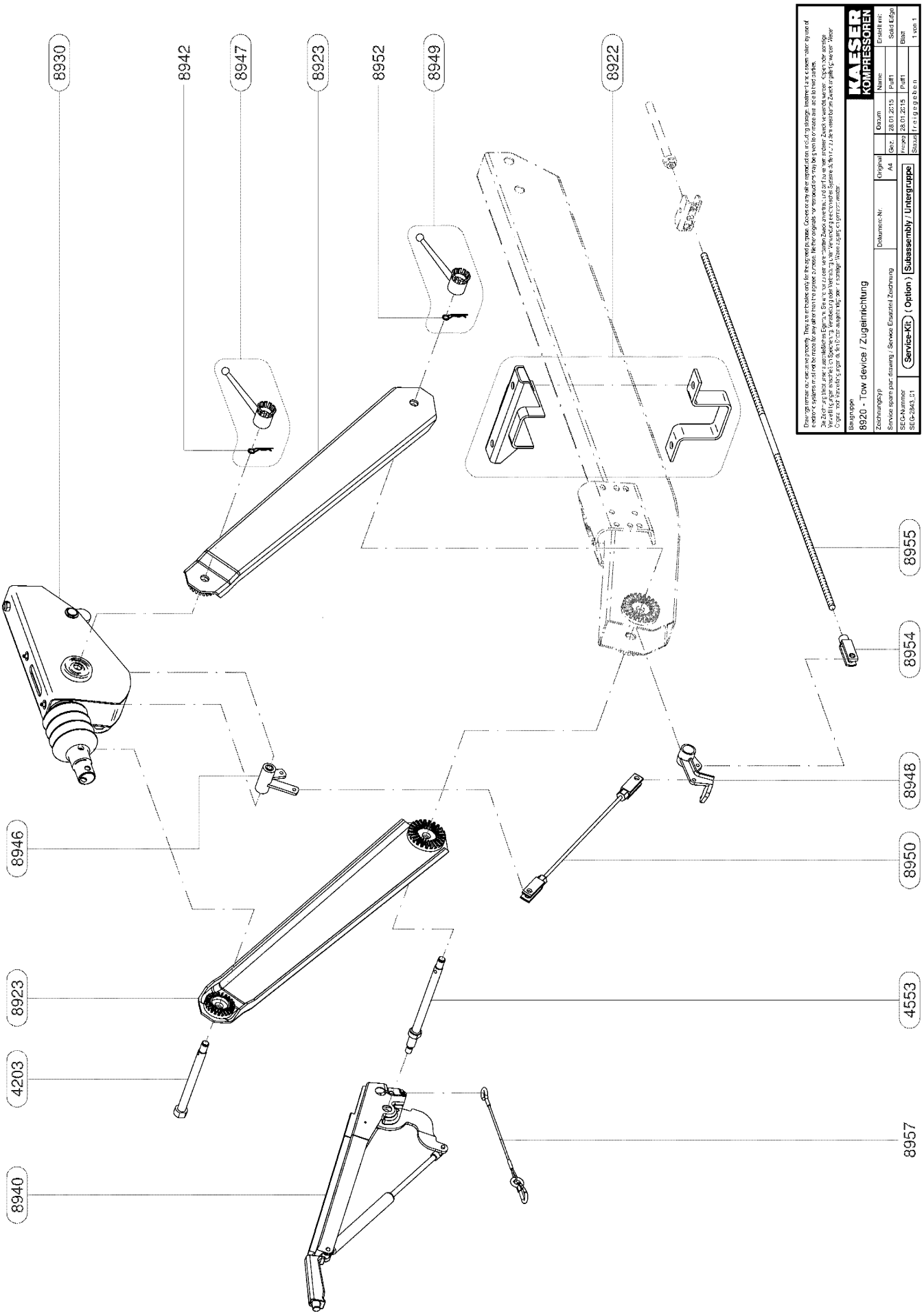
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KAESER KOMPRESSOREN
Baugruppe
8920 - Tow device / Zugeinrichtung
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
SEG-Nummer
SEG-2843.01
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Subassembly / Untergruppe
Dokument-Nr.
Original
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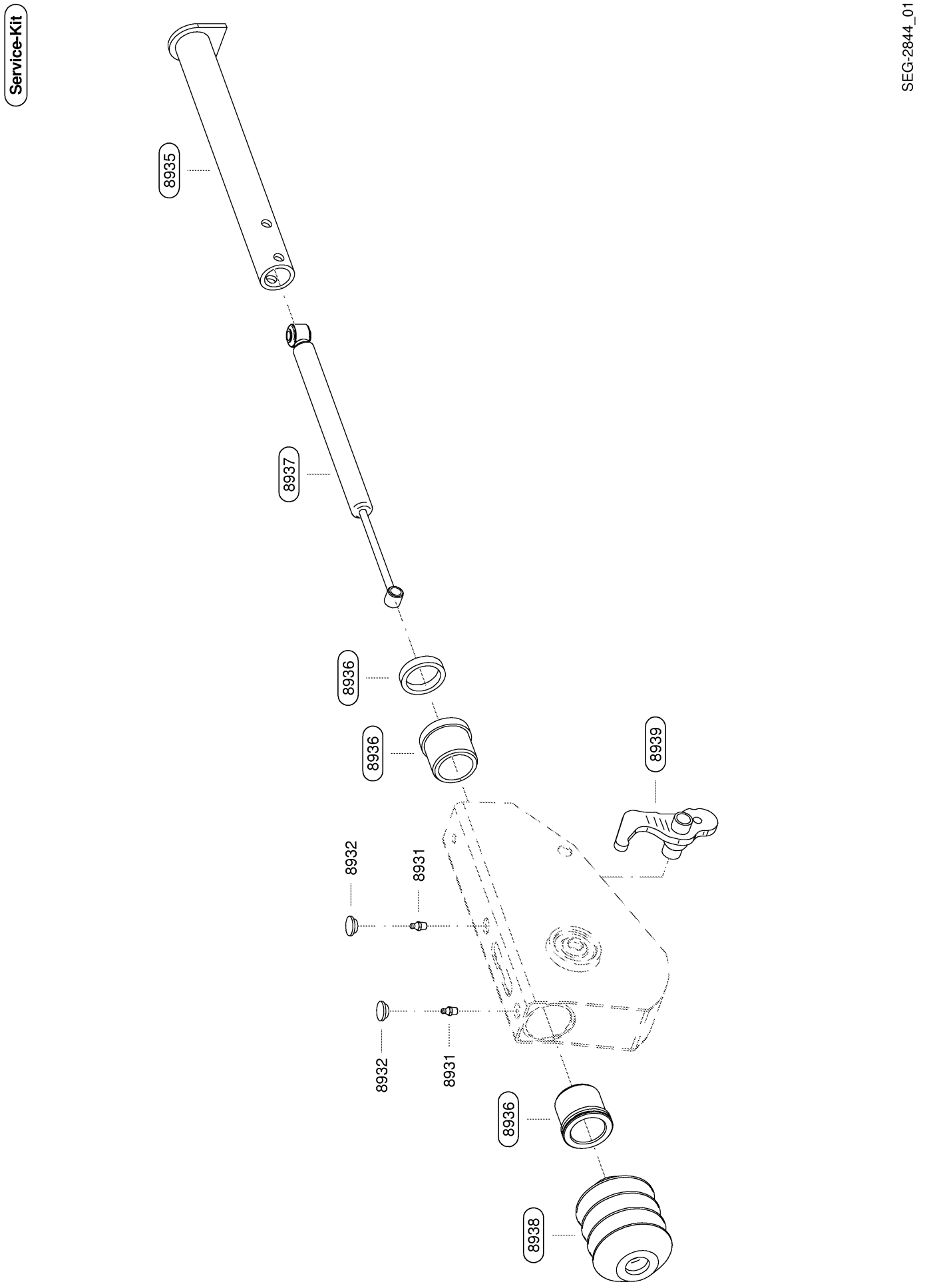
Name
Erstellt mit:
Solid Edge
Blatt
1 von 1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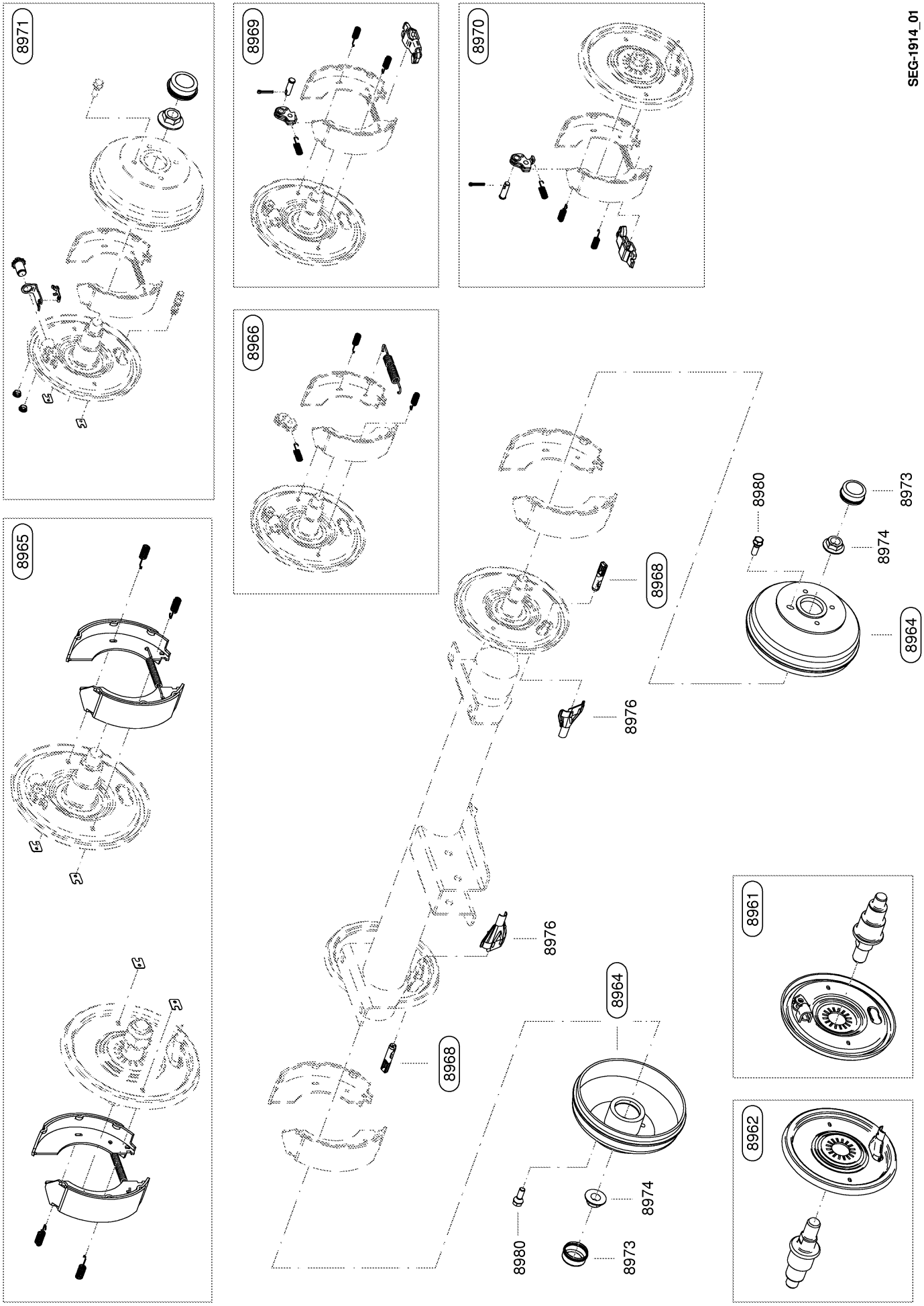
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Service-Kit
(Option)

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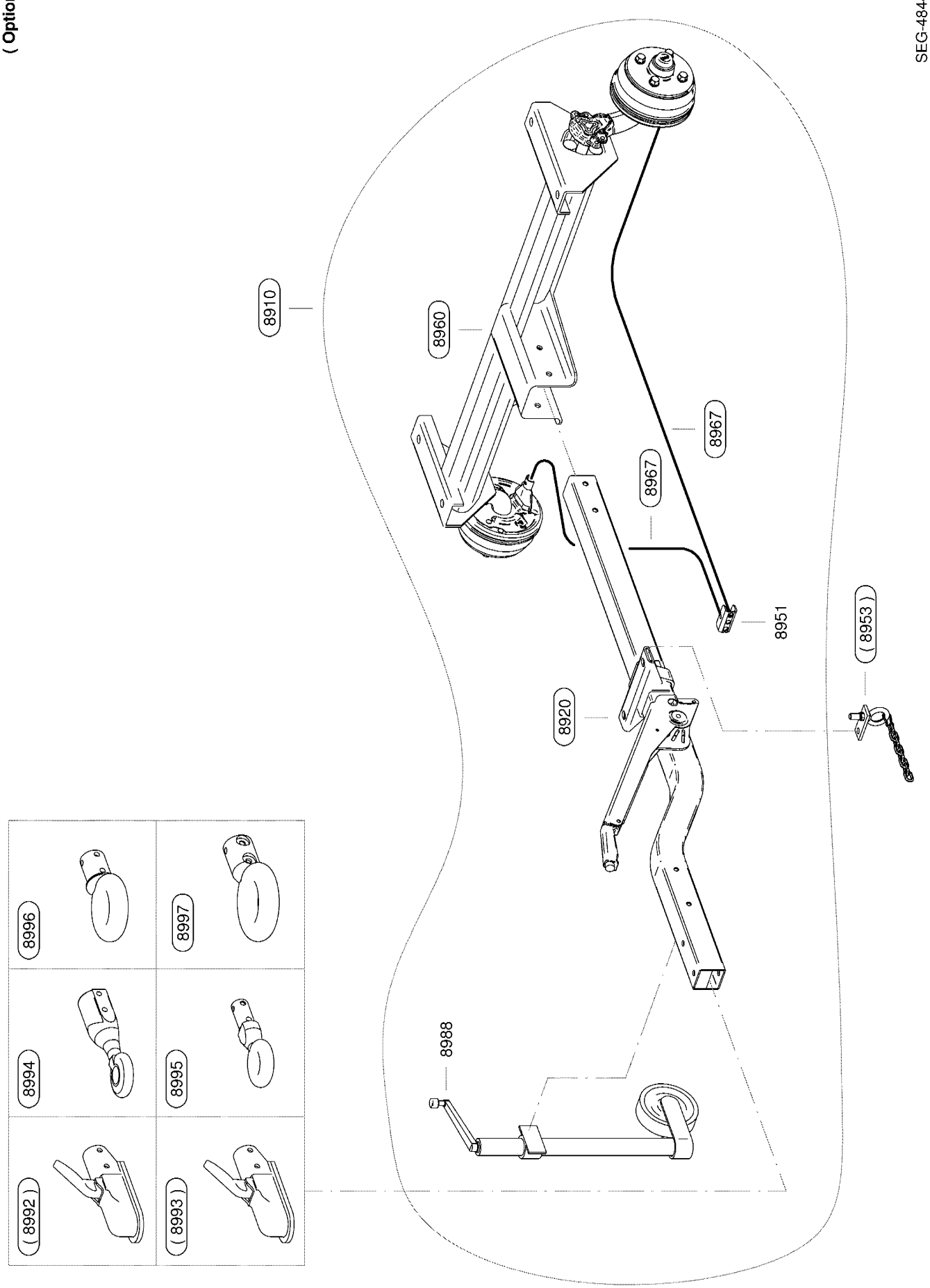
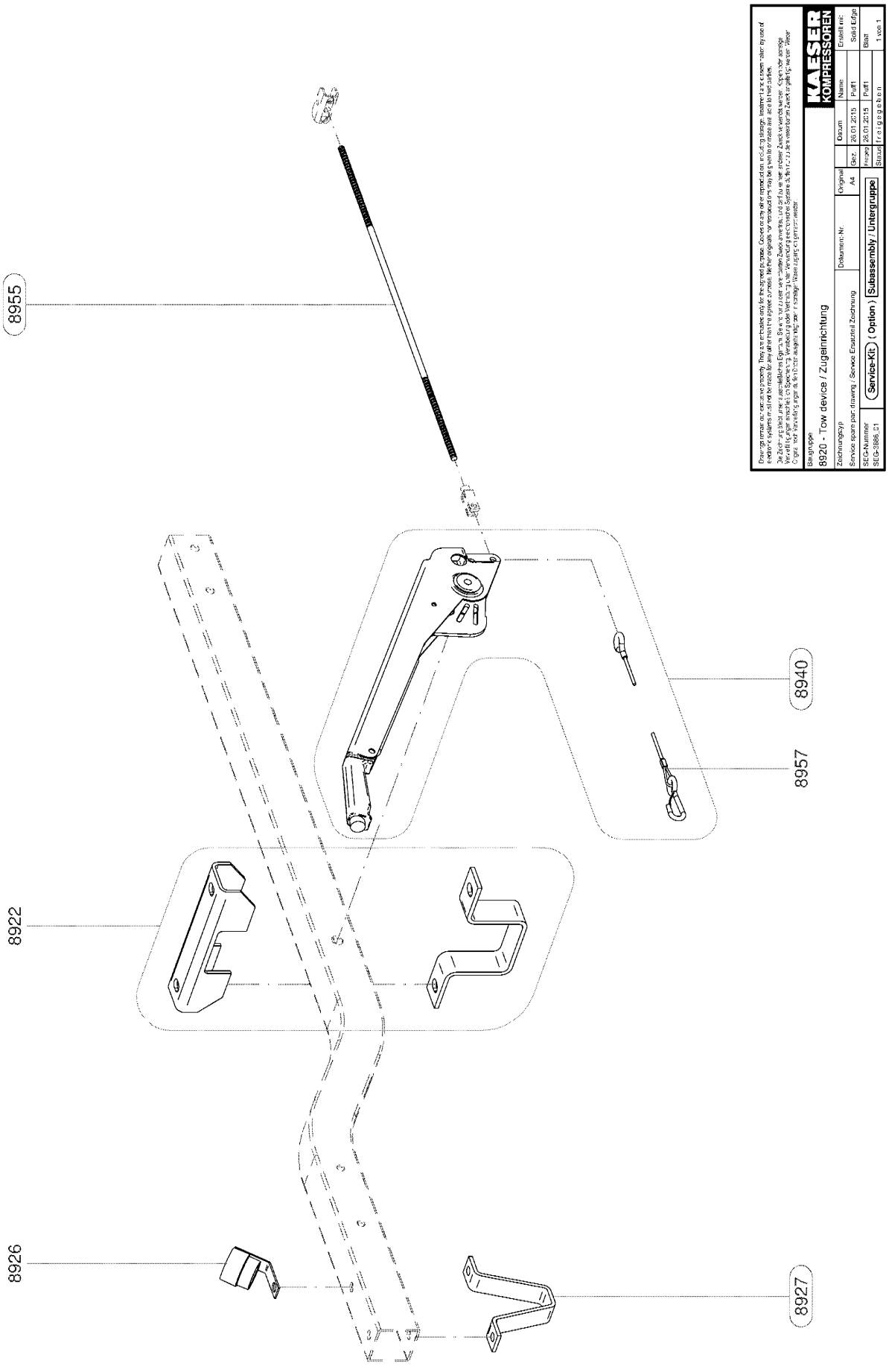
SEG-4844_01

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KAESER KOMPRESSOREN
Baugruppe
8920 - Tow device / Zugeinrichtung
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
SEG-Nummer
SEG-3866.01
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Original
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Name:
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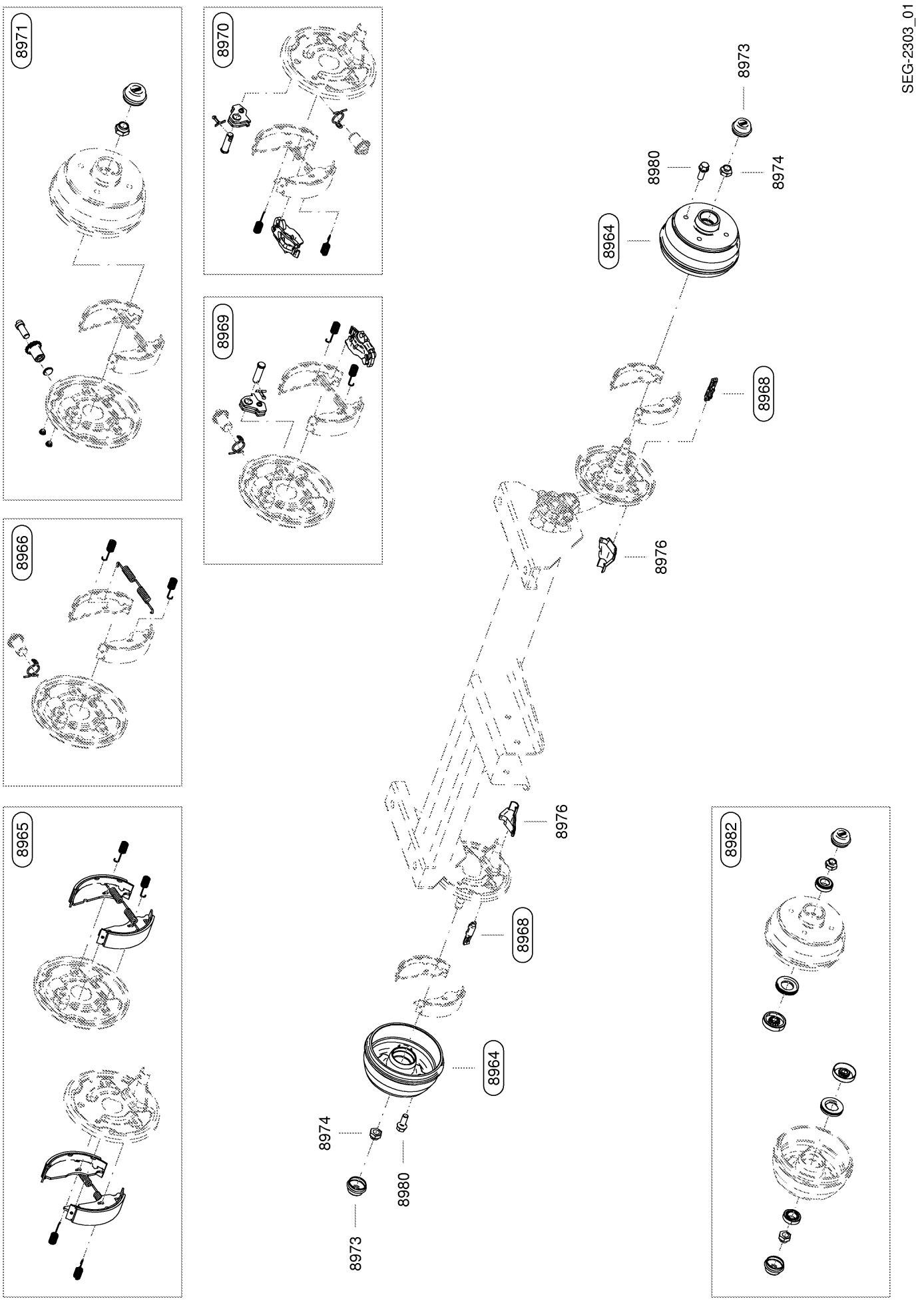
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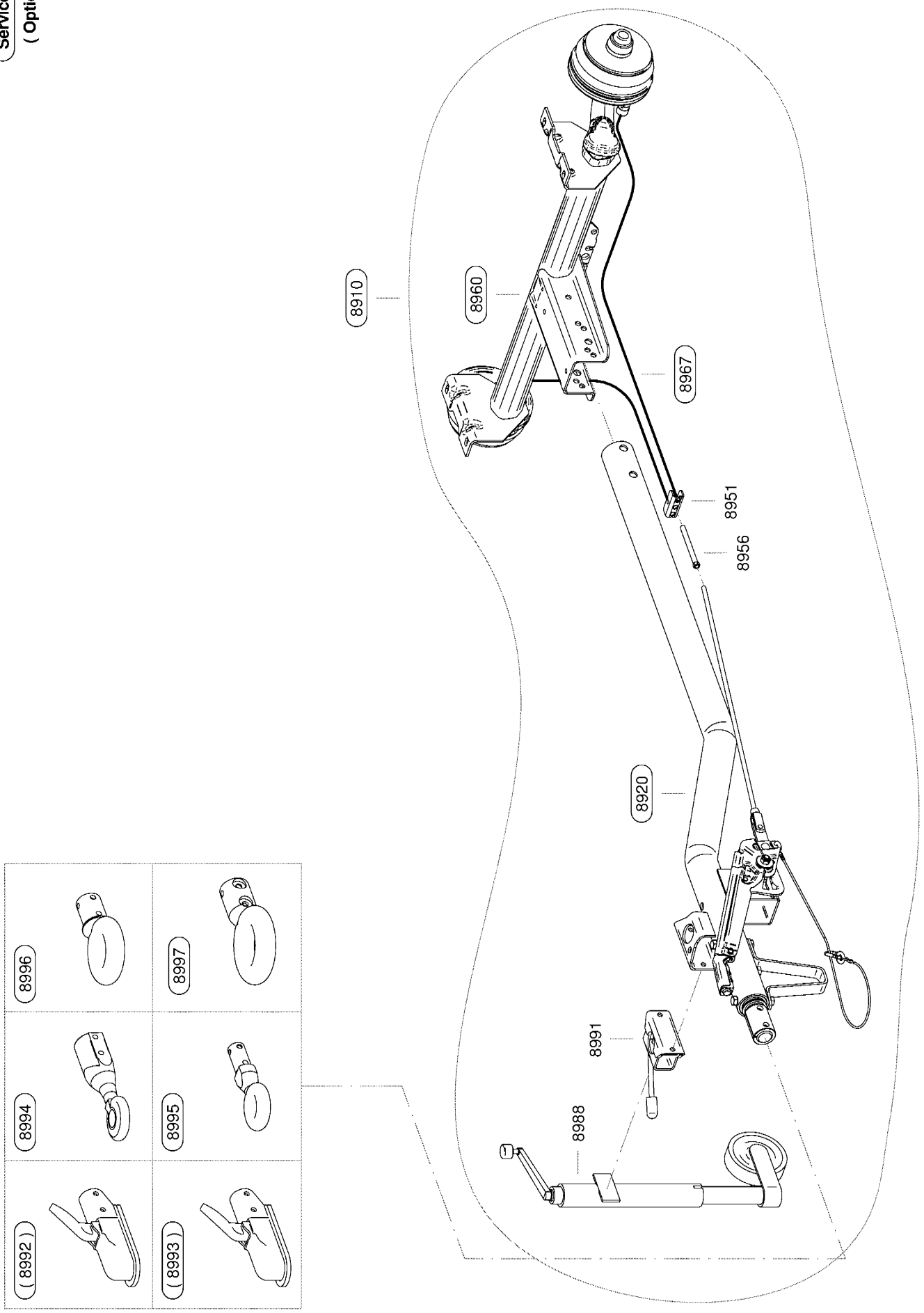
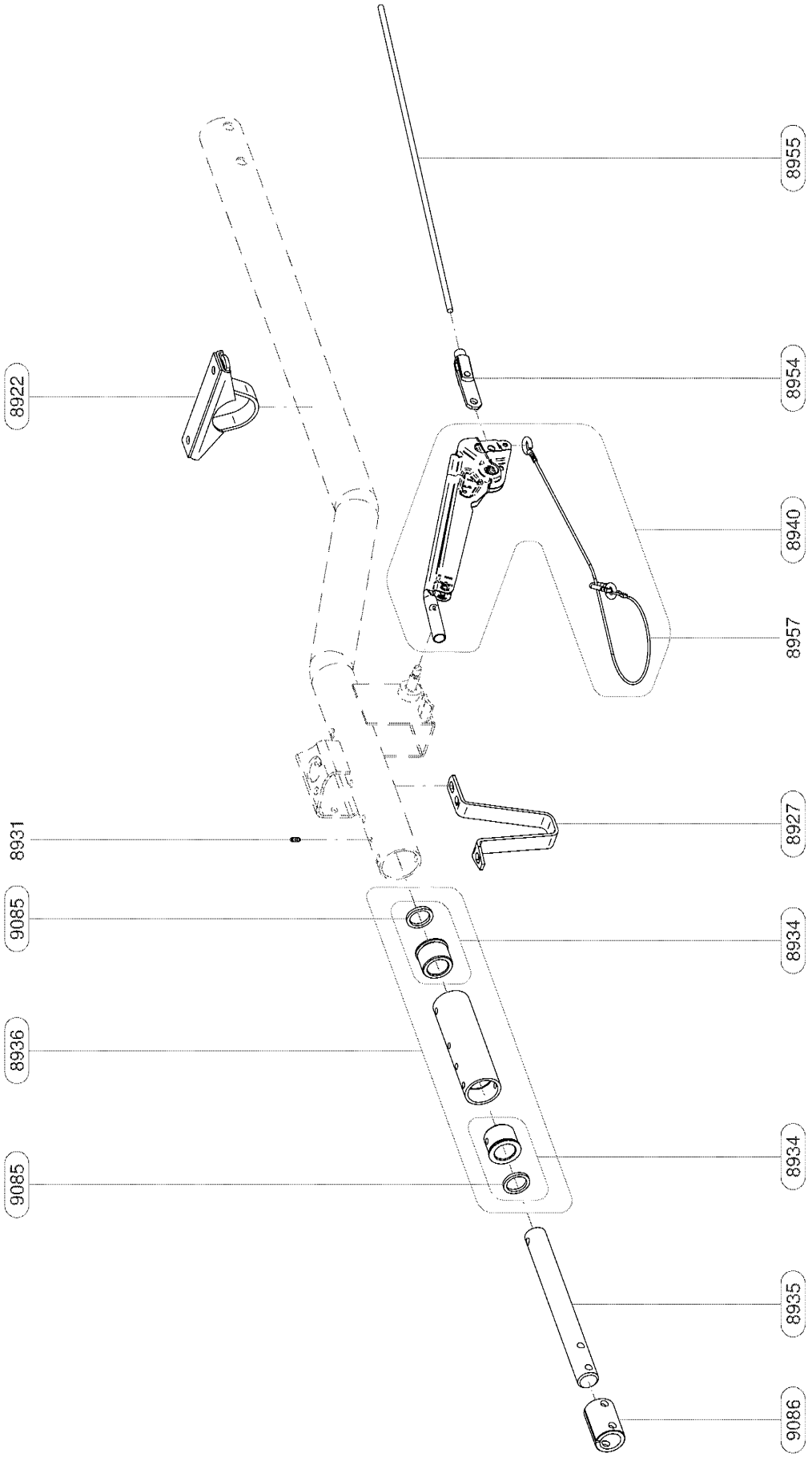
Service-Kit (Option)

8900 Fahrwerk komplett / Chassis complete

SEG-5171_01

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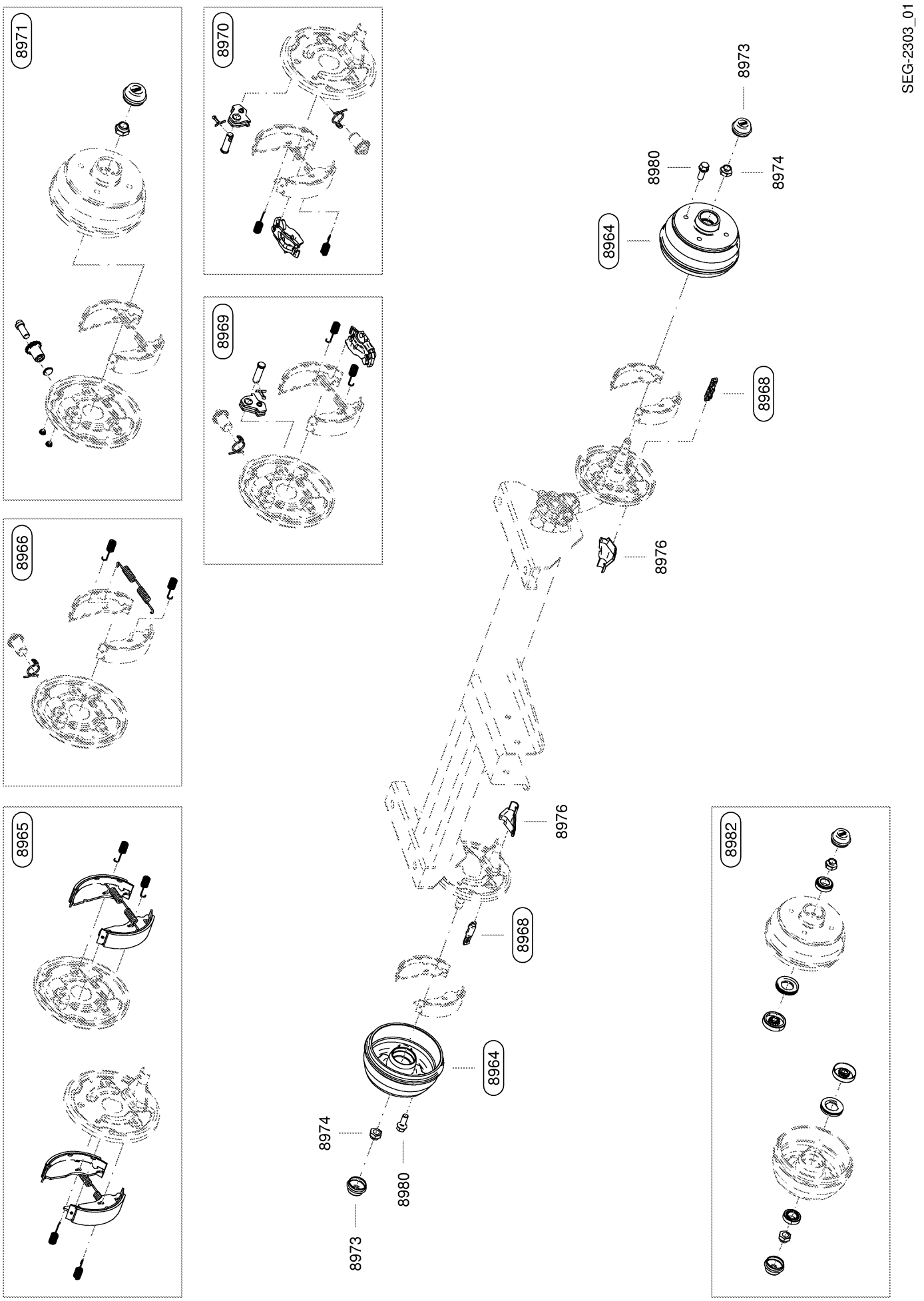
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Service-Kit (Option)

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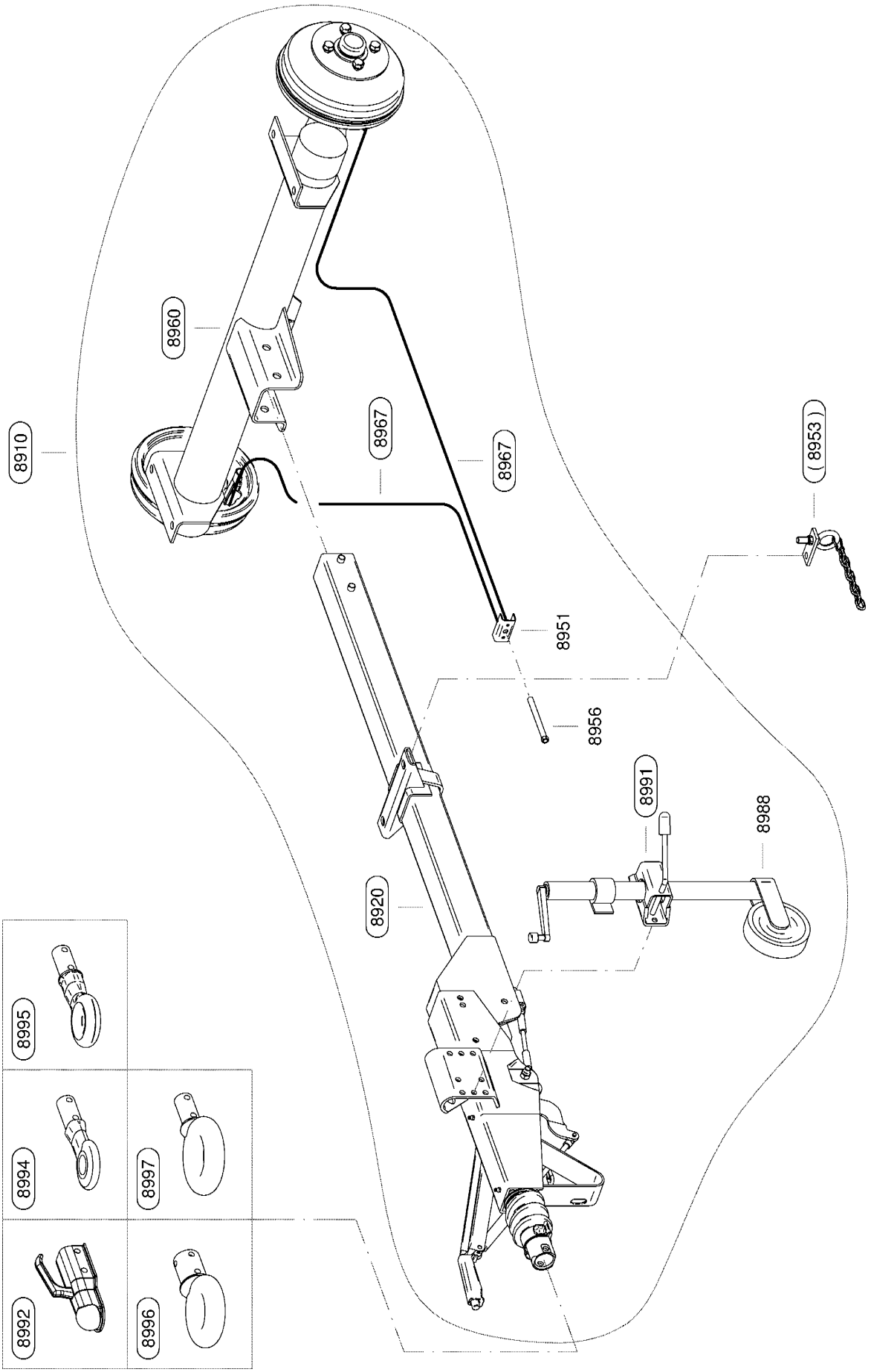

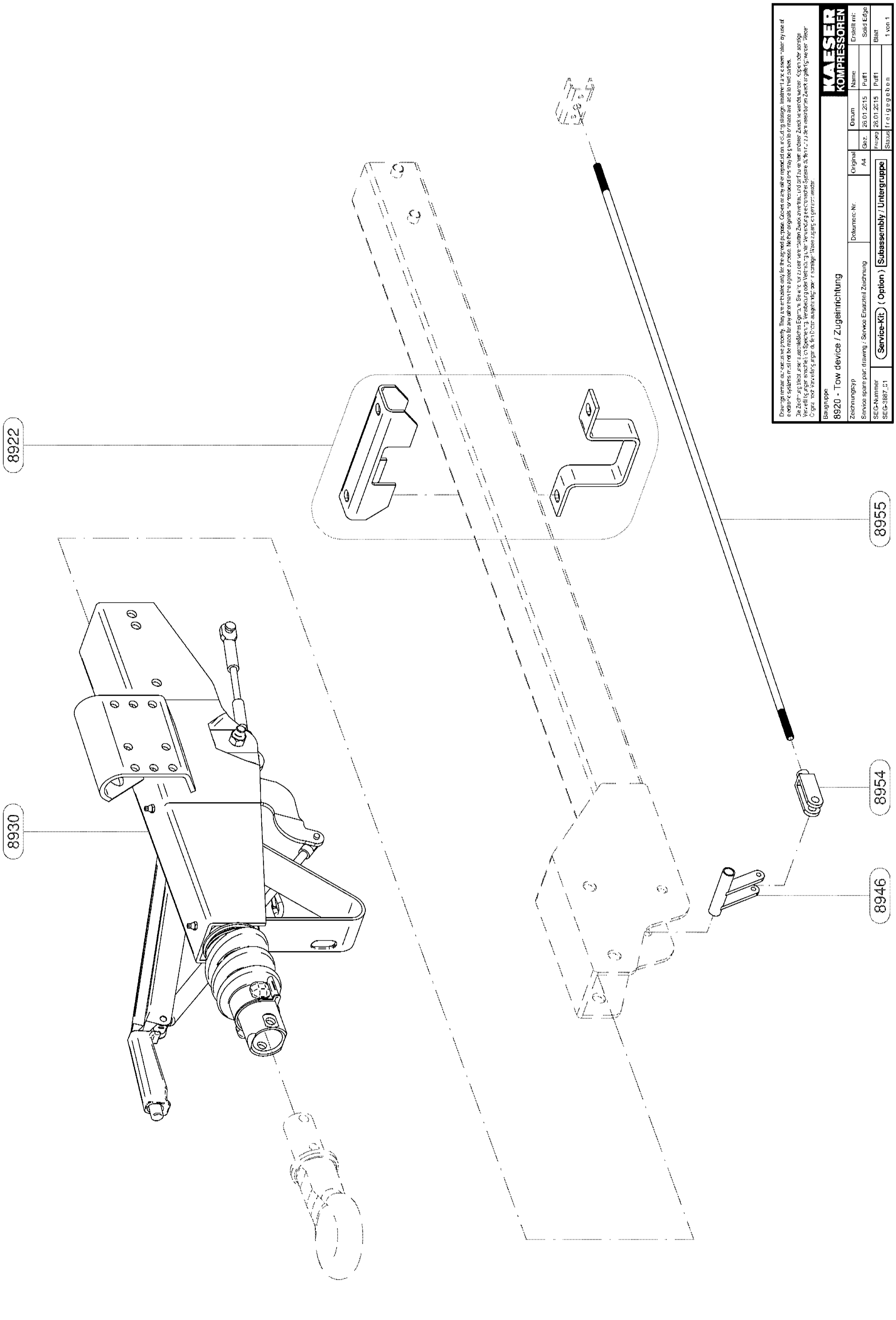
8920 - Tow device / Zugeinrichtung
Service spare part drawing / Service Ersatzteil Zeichnung
Service-Kit
(Option)
Subassembly / Untergruppe
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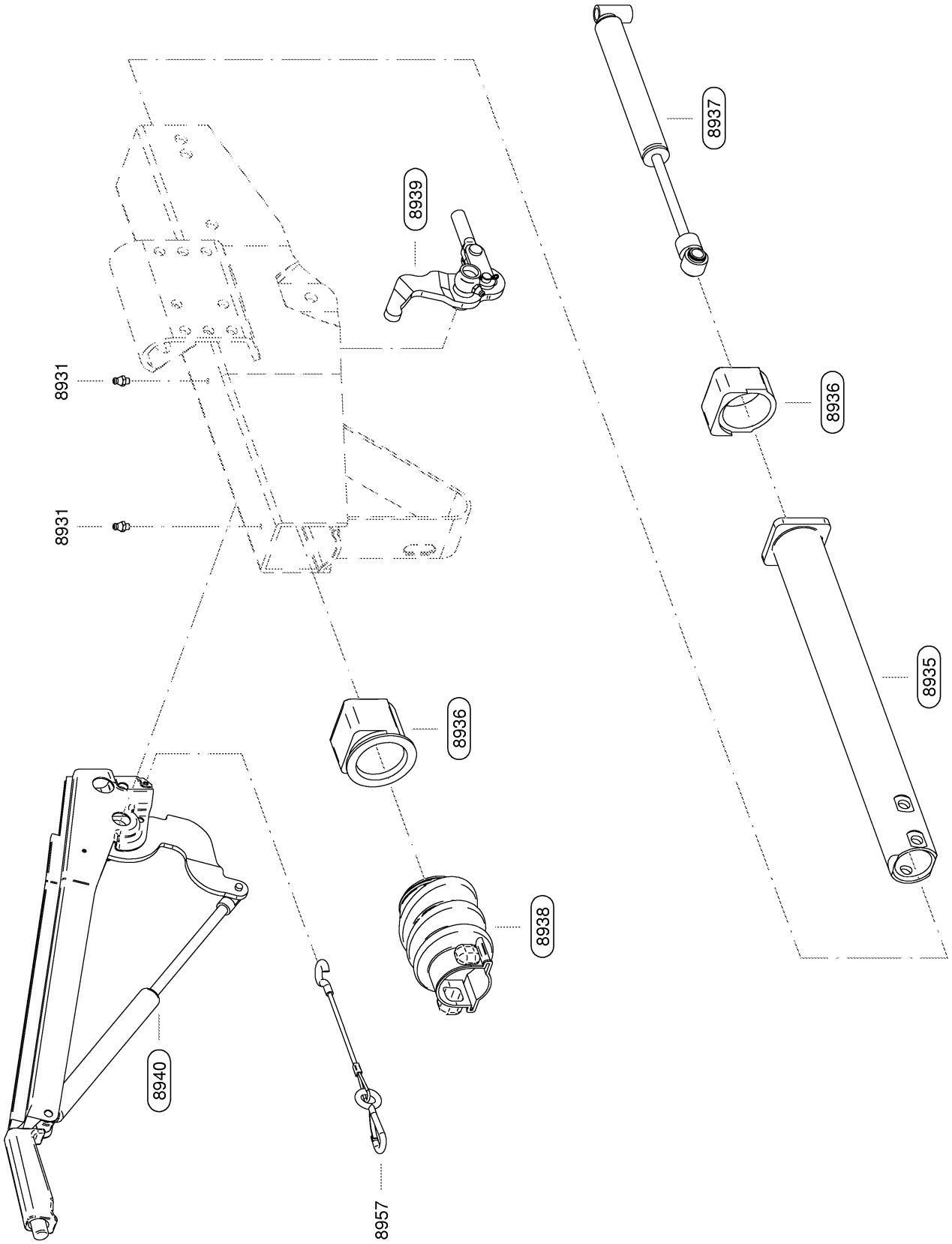
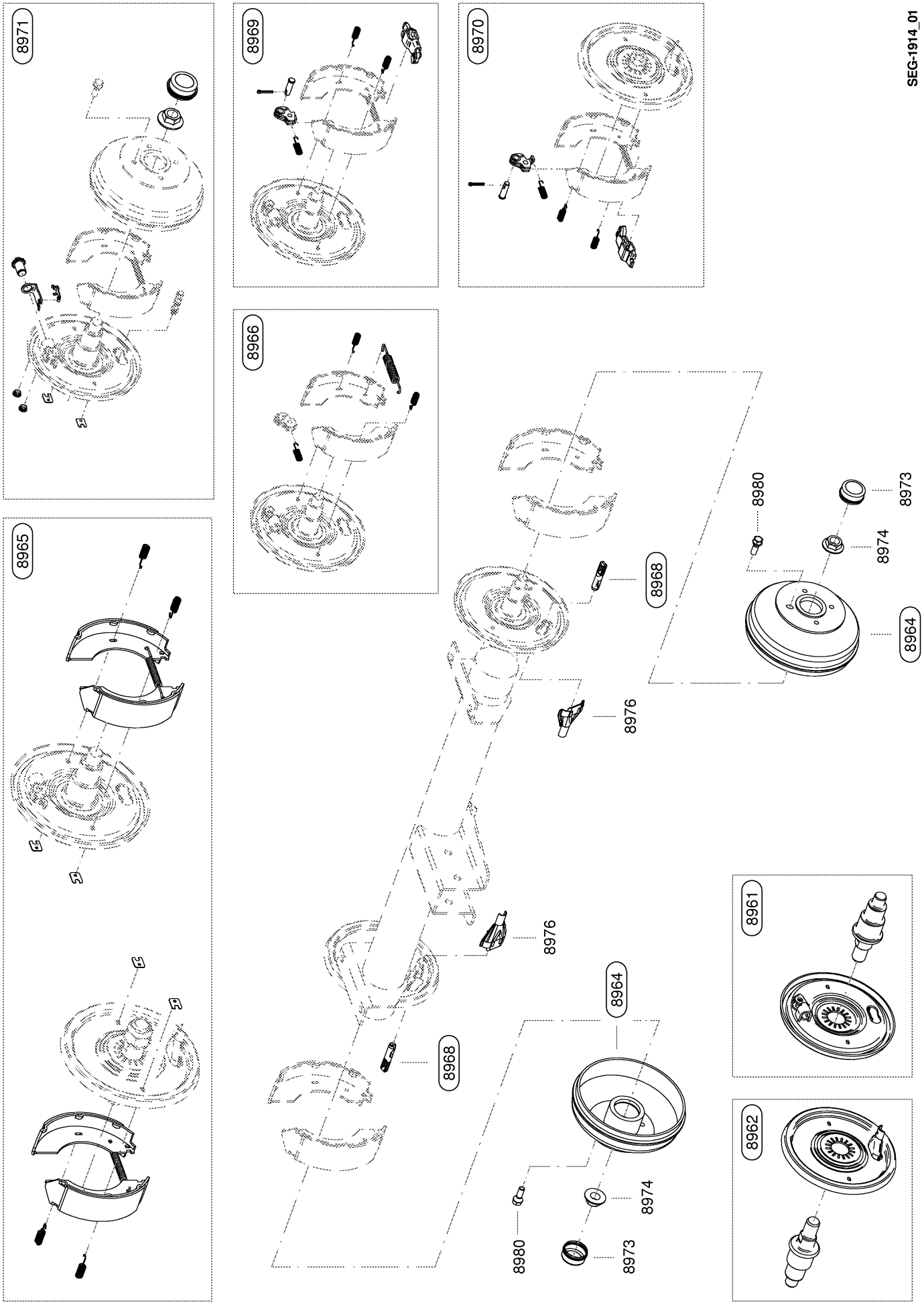
8930
8955
8954
8946

Service-Kit

SEG-2447_01

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SEG-1914_01
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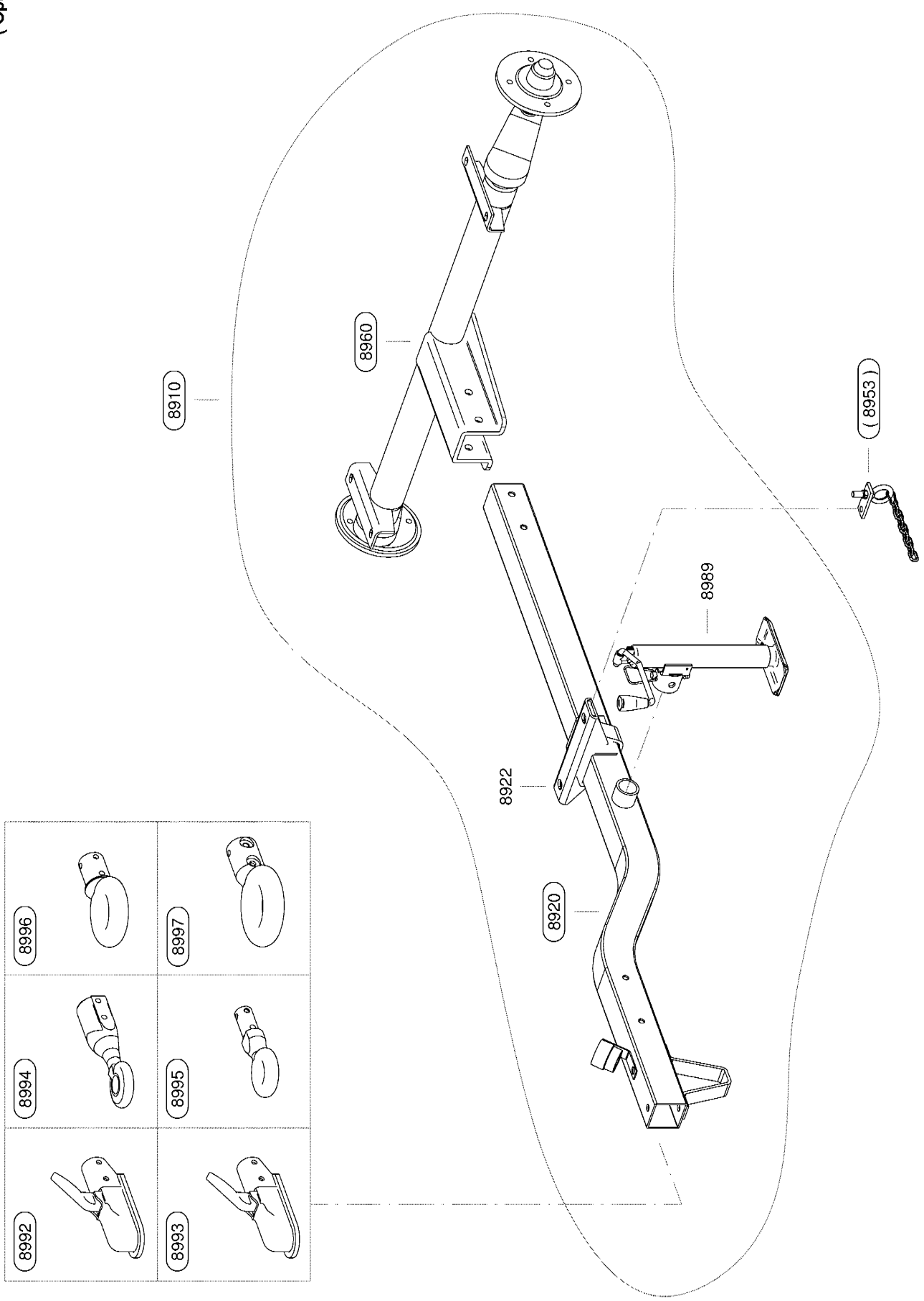
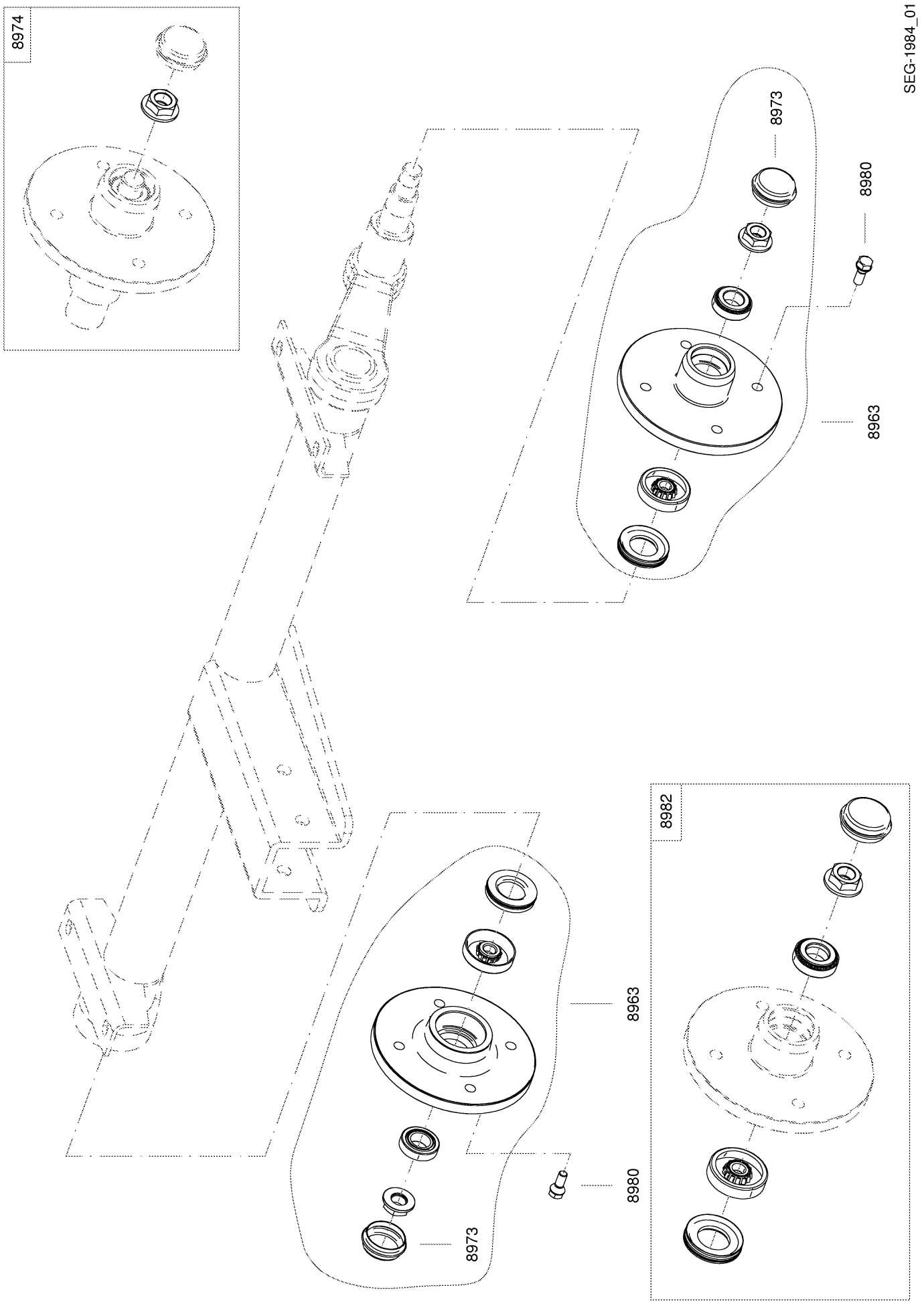
Service-Kit (Option)

8900 Fahrwerk komplett / Chassis complete

SEG-4841_01




SEG-1984_01
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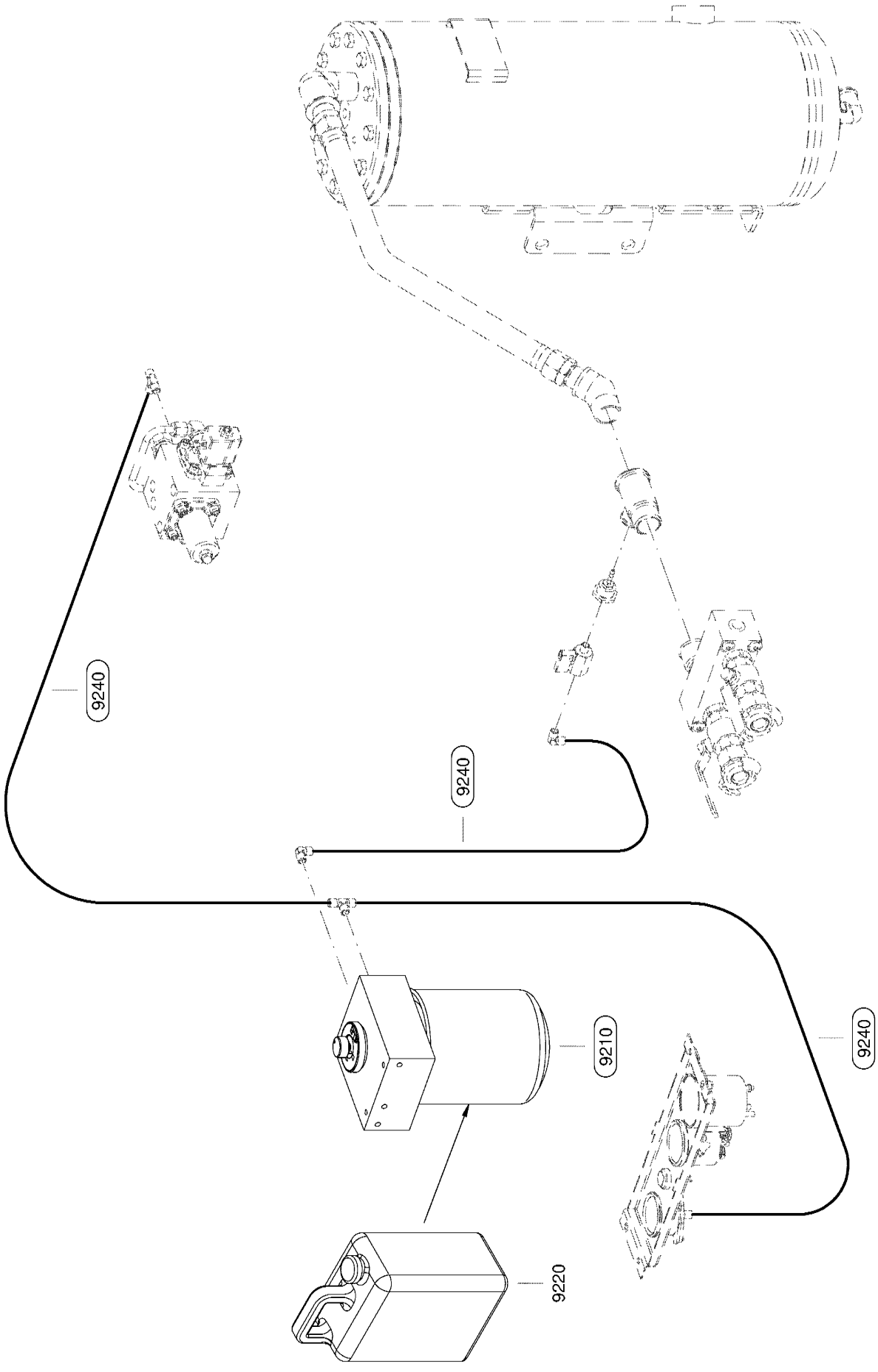
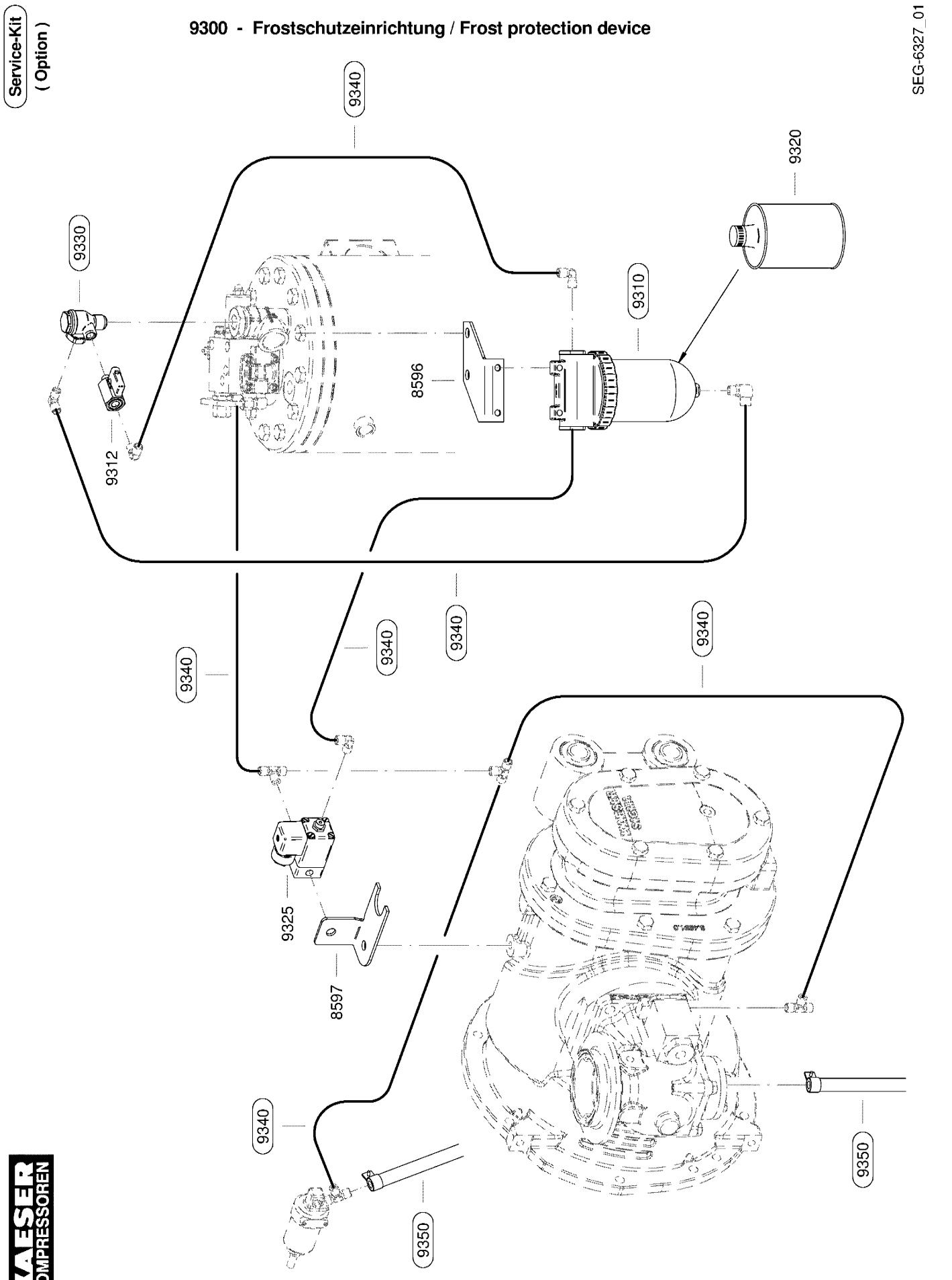
Service-Kit (Option)

9200 - Werkzeugschmierung / Tool lubrication

SEG-6326_01

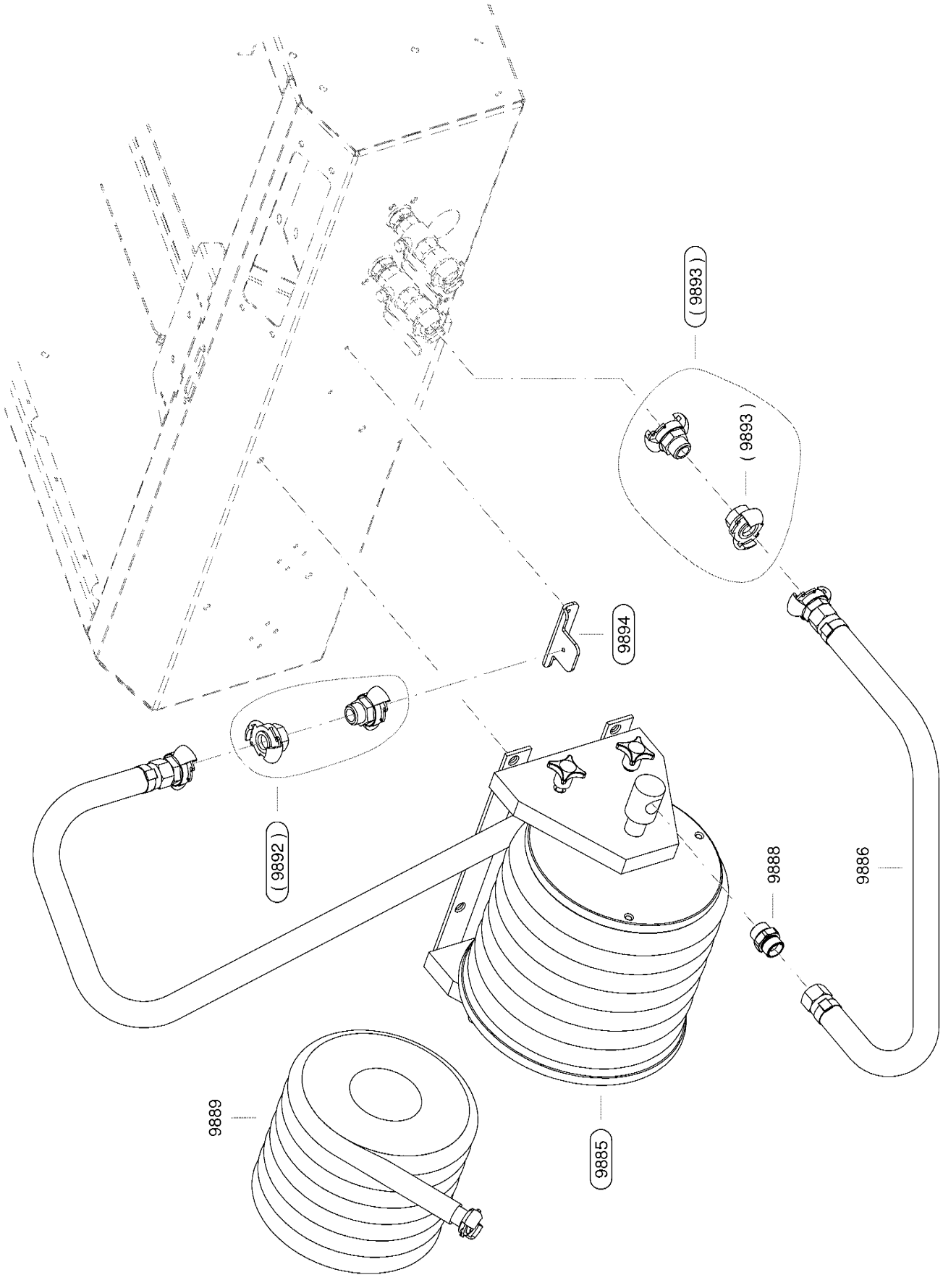


9300 - Frostschutzeinrichtung / Frost protection device



Service-Kit

SEG-2566_02



12 Decommissioning, Storage and Transport

12.1 De-commissioning

De-commissioning is necessary, for example, under the following circumstances:

- The machine is temporarily not needed
- The machine will not be needed for a considerable time.
- The machine is to be scrapped.

Precondition The machine is shut down.
Machine dry and cool.

1. Carry out the following de-commissioning procedures.
2. Place a notice on the instrument panel describing the de-commissioning procedures carried out.

12.1.1 Temporary de-commissioning

Decommissioning for about 4 months.

Material Plastic sheeting
Moisture-resistant adhesive tape

1. Disconnect the battery (the minus terminal first and then the plus terminal).
2. Close off the following openings with plastic foil and moisture-resistant adhesive tape.
   - Engine air inlet
   - Compressor air inlet
   - Exhaust silencer
3. Attach the following notice on the instrument panel showing the decommissioning measures taken.

Attention!

1. The machine is temporarily decommissioned.

2. The following machine openings have been covered:

- Engine air inlet
- Compressor air inlet
- Exhaust silencer

3. Recommission according to service manual.

Date / signature

Tab. 70 "Temporarily decommissioned" information notice

Decommissioning of the compressor for several weeks during severe frost

1. **NOTICE** *Danger of batteries freezing!*
   Discharged batteries are subject to frost damage and can freeze at 14 °F.
   ➢ *Store batteries in a frost-free place.*
   ➢ *Store batteries preferably fully charged.*

2. Remove the battery (batteries) and store in a frost-free room.
3. Make sure batteries are fully charged.

12.1.2 Long-term decommissioning and storage

Decommissioning the machine for 5 months or longer.

Material
Receptacle
Preserving oil
Preservative
Desiccant
Plastic sheeting
Moisture-resistant adhesive tape

➢ The following measures must be taken for long-term decommissioning and storage:

Long-term decommissioning and storage tasks	See chapter	Complied?
➢ Check engine coolant.	10.3.1	
➢ Drain the engine oil.	10.3.4	
➢ Drain the oil from the oil separator tank and the oil cooler.	10.4.3	
➢ Fill the separator tank and engine with preserving oil.	10.4.2 10.3.4	
➢ Run the machine for about 10 minutes to coat all parts with a protective oil film.	–	
➢ Disconnect the battery, the negative terminal first and then the positive terminal, and store in a frost-free room.	–	
➢ Check the battery fluid level.	10.6	
➢ Check the battery charge monthly and recharge if necessary to prevent the battery fluid freezing.	–	
➢ Clean the battery terminals and coat with acid-resistant grease.	–	
➢ Close the compressed air outlet valves.	–	
➢ Use plastic sheeting and moisture-resistant adhesive tape to seal off the following openings: ■ Engine air inlet ■ Compressor air inlet ■ Exhaust silencer	–	
➢ Clean the bodywork and treat with preservative.	–	
➢ Hang a notice on the instrument panel informing of the decommissioning measurements taken.	–	

Tab. 71 "Long-term decommissioning and storage" checklist

➢ Hang the following notice on the instrument panel informing of the decommissioning measures taken.

Attention!

1. The machine is decommissioned.
2. It is filled with preserving oil.
3. For recommissioning:

- Take measures for recommissioning the compressor after a long period of storage.
- Recommission according to the service manual.

Date / signature

Tab. 72 “Long-term decommissioning and storage” information notice

➢ Store in a dry place with consistent temperature.

12.2 Transport

Precondition Machine switched off and locked off.
The machine is fully vented, the pressure gauge reads 0 psig.
Machine is cooled down.
All compressed air consumers are disconnected.
All connecting lines and hoses disconnected and removed.
Any loose or movable parts that may fall when transporting are removed or secured.

12.2.1 Safety

Allow transportation only by personnel trained in safely dealing with motor vehicles and the transporting of goods.

1. **⚠ WARNING** *There is danger of being run over or crushed by an overturning vehicle. Death or serious injury can result from being crushed or run-over by a machine under tow.*
   ➢ *Riding on the machine while it is under tow is strictly forbidden.*
2. Make sure the danger area is clear of personnel.

12.2.2 Towing the compressor on the road

Machines with appropriate chassis versions and running gear are approved for towing on public roads. The machine is designed for a maximum towing speed of 100 km/h. National and local regulations must be observed when towing the machine on public highways.

1. **⚠ WARNING** *Risk of accident when towing the unilluminated machine on public roads. Death or severe injury possible due to accidents with unilluminated trailer.*
   ➢ *Do not tow machines without illumination on public roads.*
2. Observe the safety instructions in chapter 3.5.2 "Safe machine operation".

12.2.2.1 Preparing for transport

Stowing payload:

Do not exceed the permissible loading (overall mass, coupling load, axle load).
Observe national traffic laws. If additional loading is not permitted, the load must be transported in the towing vehicle.

1. Check that loading the machine with tools or accessories during transport is permissible.
2. Place additional loads only in the spaces provided (if available) and secure carefully.

Additional precautions for a very dirty machine:

The machine can become very dirty after prolonged use on a construction site. A machine in such condition is not suitable for towing on public roads.

1. Clean the machine, in particular around the chassis and the lighting and signalling equipment.
2. Check the function of wheels, brakes, lights and signalling equipment.
   If defects are found: Correct any defects before towing.

Additional precautions for conditions of snow and ice:

Considerable snow or ice may build up on the machine under low temperature conditions.

1. ⚠ CAUTION *Accident hazard due to snow or ice falling off the machine.*
   Snow or ice falling from the towed machine can endanger following vehicles.
   Problems with driving dynamics and damage to the machine could occur.
   The maximum permissible axle load could be exceeded.
   ➢ *Do not transport the machine if it is covered by snow or ice.*
2. Remove any snow or ice before towing.

Perform the following tasks prior to transporting the machine:

1. Make sure the towing hitch is compatible with the ball or eye coupling on the towed machine.
2. Check that the machine is shut down and secured against accidental restarting.
3. Detach all connecting lines and hoses.
4. Make sure there are no unsecured tools lying on or in the machine.
5. Close and lock the canopy.
6. Check whether the hazardous goods label is attached to the machine, see chapter 3.4.4.
7. If necessary, renew the "Hazardous goods" label.

Option rb/rm/rr, rb/rm/rs **Adjust the towing bar to suit the height of the towing vehicle hitch.**

When the machine is coupled up, the towing bar must be parallel with the ground.

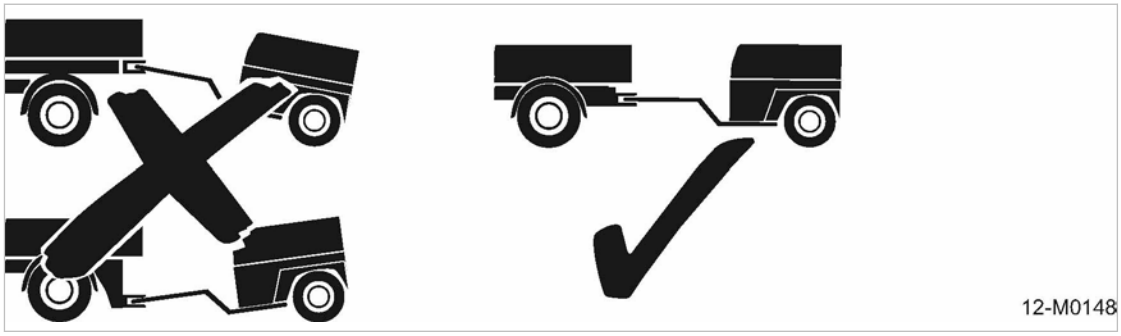


Fig. 73 Transport position

1. **⚠ WARNING** *Danger from problematic driving dynamics!*
   The permissible loading range may be exceeded or undercut.
   Personal injury may result from towing.
   Damage to the machine and/or towing vehicle is possible.
   - ➢ *Do not couple up the machine at an angle to the towing vehicle.*
   - ➢ *Ensure that the towing bar is horizontal when coupled to the towing vehicle.*
2. Adjust the towing bar height to suit the height of the hitch on the towing vehicle.

Further information See chapter 6.5 for towing bar height adjustment.

12.2.2.2 Coupling-up

Option rb/rm/rr, rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs

Coupling machine with ball coupling (EC version):

To hitch up the machine, lower the open coupling onto the ball of the towing vehicle so that it clicks into place. The coupling is fully locked when the green locking indicator protrudes and is visible from the side.

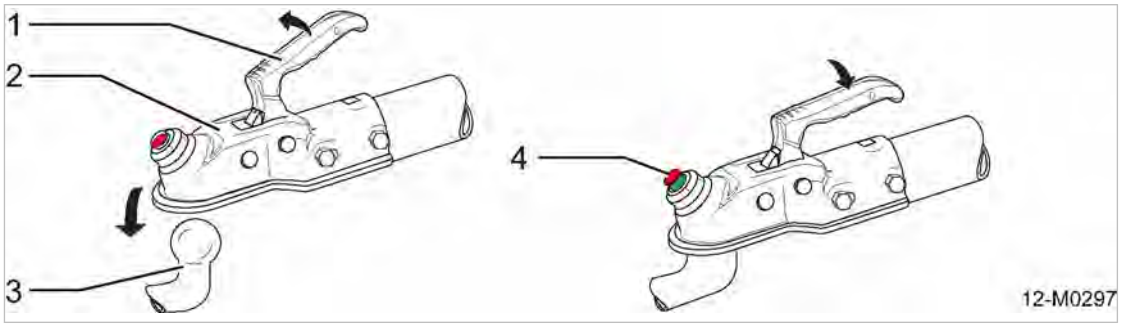


Fig. 74 Ball coupling (ALKO-EU)

[1]	Coupling handle	[3]	Towing vehicle ball hitch
[2]	Ball coupling	[4]	Locking indicator (protruding)

1. **NOTICE** *There is considerable danger of injury caused by trapped fingers.*
   They can be trapped in the spring-loaded closing mechanism.
   - ➢ *Never place your fingers inside an open ball coupling.*
   - ➢ *Always wear protective gloves.*
2. Pull up the coupling handle.
   The coupling opens.

3. **⚠ WARNING** *Risk of accident due to unhitching of the ball coupling during transport.*
   If the coupling is not fully closed the compressor can become uncoupled from the towing vehicle and cause an accident.
   ➢ *Check correct coupling.*
4. Place the open coupling over the towing vehicle ball hitch.
   The weight on the coupling will cause it to audibly close. The coupling locks automatically. Closing and locking is automatic.
5. Push the handle down to be certain of locking.
   The coupling is fully locked when the handle is fully down and can be pushed no further.
6. Check correct coupling.
   - Check that the coupling handle cannot be pushed further down.
   - Check that the locking indicator is protruding and visible.

?

The locking indicator is not visible.
➢ Lift the handle and uncouple.
➢ Set the coupling back on the towing vehicle ball hitch and push down.

Checking the ball coupling wear indicator (EU version):

The ball coupling is equipped with a wear indicator.

The wear indicator shows:
- Wear on the ball hitch.
- Wear on the coupling.

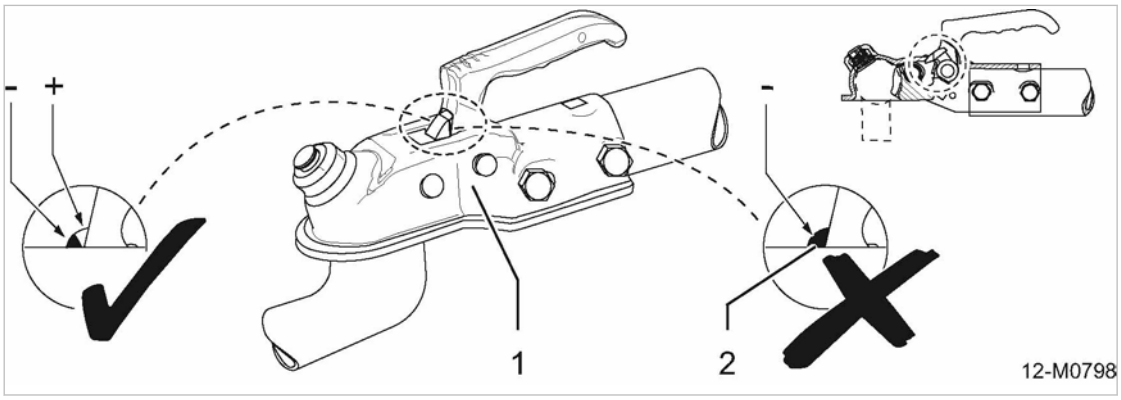


Fig. 75 Wear alert, ball coupling (ALKO-EU)

1	Ball coupling	+	Green zone (OK)
2	Wear indicator	−	Red zone (wear tolerance exceeded)

1. **⚠ WARNING** *Danger of accident from worn coupling!*
   The machine may detach from the towing vehicle.
   ➢ *Do not tow the machine.*
   ➢ *Have the ball coupling and ball hitch checked.*
   ➢ *Replace worn parts.*
2. Couple-up the machine and tow slowly and carefully for about 500 m.
   The action of towing sets the coupling mechanism to maximum closure and gives a true reading on the wear indicator.

3. Interpret the wear indicator as follows:

Wear indicator	Meaning
Green zone showing	■ Coupling in new condition. ■ Towing vehicle ball hitch wear within acceptable limits. ➢ No action necessary.
Red zone showing	■ Ball hitch wear at acceptable limit, ball coupling unworn. ■ Ball hitch in new condition; ball coupling showing increased wear. ■ Both ball and coupling showing increased wear. ■ Ball coupling damaged. ➢ Ball hitch and coupling ball must be inspected by a specialised workshop. ➢ Replace worn parts.

Tab. 73 Ball coupling wear indicator

Option rd/ro/rr **Coupling machine with ball coupling (US version):**

To couple up the compressor, lower the open coupling onto the ball hitch of the towing vehicle so that it clicks into place.

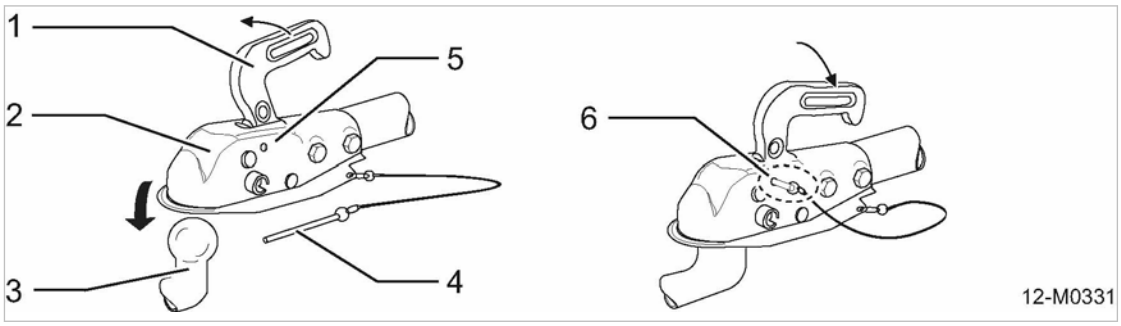


Fig. 76 Ball coupling (ALKO-US)

[1] Coupling handle
[2] Ball coupling
[3] Towing vehicle ball hitch
[4] Safety pin
[5] Fixing hole for the security pin
[6] Ball coupling properly secured

1. **NOTICE** *There is considerable danger of injury caused by trapped fingers. They can be trapped in the spring-loaded closing mechanism.*
   - ➢ *Never place your fingers inside an open ball coupling.*
   - ➢ *Always wear protective gloves.*
2. Check if the security pin is removed from the coupling and draw it out if not.
3. Pull up the coupling handle.
   The coupling opens.
4. **⚠ WARNING** *Risk of accident due to unhitching of the ball coupling during transport. If the coupling is not fully closed the compressor can become uncoupled from the towing vehicle and cause an accident.*
   - ➢ *Check correct coupling.*
   - ➢ *Check correct location of the security pin.*

5. Place the open coupling over the towing vehicle ball hitch.
   The weight on the coupling will cause it to audibly close. The coupling locks automatically. Closing and locking is automatic.
6. Push the handle down to be certain of locking.
   The coupling is fully locked when the handle is fully down and can be pushed no further.
7. Insert the security pin in the ball coupling fixing opening.

Option rd/rn/rr **Coupling machine with ball coupling (US version):**

Avoid manual movement of the machine for coupling the machine to the towing vehicle.
For the connection, lower the support of the towing device until the ball coupling is positioned higher than the towing device of the towing vehicle. Move the towing vehicle to towing position and park. Raise the support until the **open** ball coupling is seated on the ball hitch of the hitching device of the towing vehicle and latches.

Precondition The machine is secured with wheel chocks.
The ball coupling of the towing device is positioned above the hitching device of the towing vehicle.

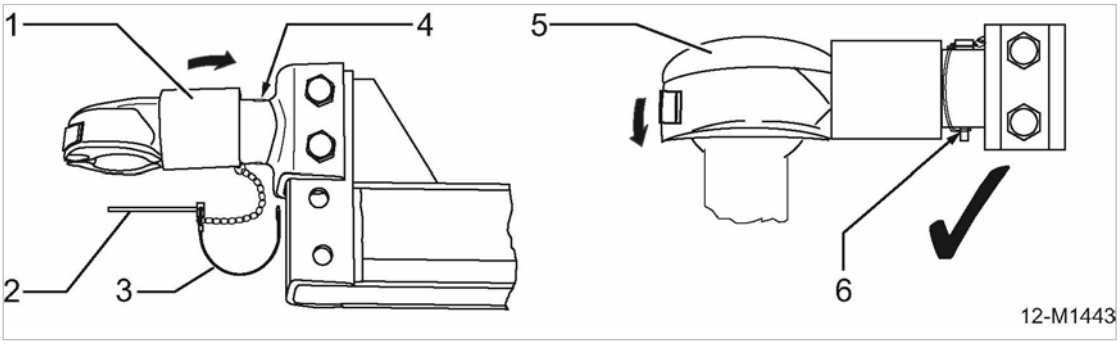


Fig. 77 Latching the ball coupling

[1] Spreader sleeve
[2] Safety pin
[3] Clip
[4] Fixing hole for the security pin
[5] Coupling head
[6] Ball coupling properly secured

1. **⚠ CAUTION** *There is considerable danger of injury caused by trapped fingers. They can be trapped in the spring-loaded closing mechanism.*
   - ➢ *Never place your fingers inside an open ball coupling.*
   - ➢ *Always wear protective gloves.*
2. **⚠ WARNING** *The ball coupling is not locked correctly. If the machine is not correctly coupled and locked it may break away from the towing vehicle and cause an accident.*
   - ➢ *Check the correct position of the ball coupling.*
3. Release the clip [3].
4. Swivel clip to the side.
5. Withdraw the safety pin [2].
6. Raise the support and simultaneously pull the spreader sleeve [1] to the stop and hold.
7. Release the spreader sleeve when positioning the ball coupling on the hitching device.
   Spreader sleeve springs back to original position.
8. Insert the safety pin.
9. Secure the safety pin with the clip.

Result Ball coupling is locked and secured.

12.2.2.3 Ensure transport readiness of the coupled machine.

Option rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs

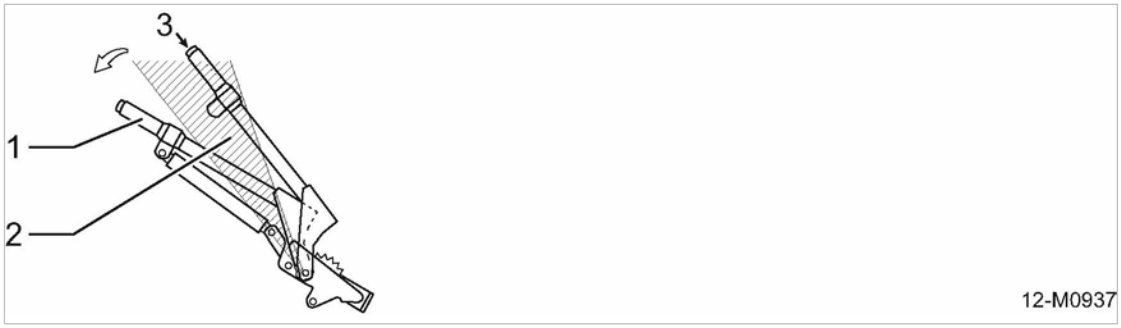


Fig. 78 Release the parking brake with gas spring assistance

1. Parking brake lever
2. Marking: “Dead point zone”
3. Brake lever release button

Option rb/rm/rr, rb/rm/rs Preparing the machine with adjustable chassis for transport:

Option rb/rm/rs

Fig. 79 Automatic jockey wheel in transport position

1. Check that the tow bar is adjusted to the correct height. (see also chapter 6.5)
   Check if:
   - The teeth in the tow bar height adjusting joints are fully engaged.
   - The locking levers are tightened
   - The security pin is fully inserted.
2. Push the support upward or crank the automatic jockey wheel to the op (end stop).
   The relieved automatic jockey wheel of the coupled machine swivels into transport position, see illustration 79.
3. Check that the wheels are securely fitted and the tyres are in good condition.
4. Check the tyre pressures.
5. Connect the cable for the lighting and indicator systems and carry out a function check.
6. Release the parking brake:
   (see Fig. 78).
   - Pull the brake lever a little further on and press the release button.
   - Hold the release button in and push the lever down past the dead point zone.

7. Install the safety chains and/or contact breaking cable at the towing vehicle, see illustration 81 and 83.
8. Remove the chocks.

Option rc/ro/rr, rg/rp/rr, rc/ro/rs

Prepare the machine with fixed chassis for transport:

1. Wind the jockey wheel to its uppermost position.
2. Check that the wheels are securely fitted and the tyres are in good condition.
3. Check the tyre pressures.
4. Connect the cable for the lighting and indicator systems and carry out a function check.
5. Release the parking brake:
   (see Fig. 78).
   - Pull the brake lever a little further on and press the release button.
   - Hold the release button in and push the lever down past the dead point zone.
6. Install the contact breaking cable at the towing vehicle, see illustration 83.
7. Remove the chocks.

Option rd/ro/rr

Prepare the machine with fixed chassis (without parking brake) for transport:

Option rd/ro/rr, rd/rn/rr

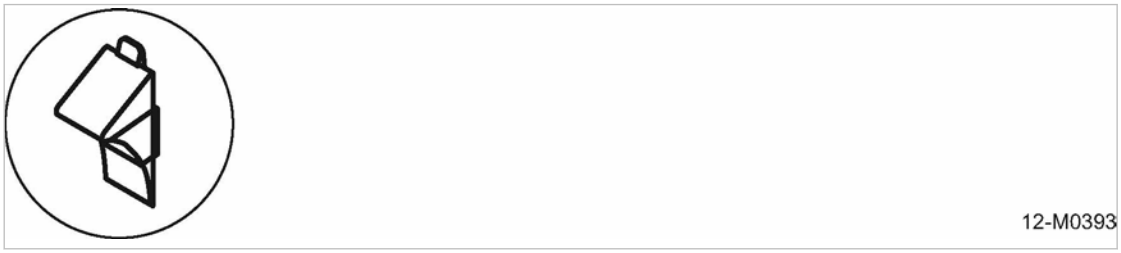


Fig. 80 Safety signs: Secure the chocks

1. **⚠ WARNING** *Missing chocks*
   Serious injury or death can result from an unsecured machine rolling away.
   - ➢ *Secure the chocks in the transport securing device before transporting the machine.*
   - ➢ *Replace missing chocks immediately.*
2. Raise the support to its uppermost position (end stop).
3. Check that the wheels are securely fitted and the tyres are in good condition.
4. Check the tyre pressures.
5. Attach the lighting and indicator systems and carry out a function check.
6. Remove the chocks and secure them in the transport securing device.

Replacement chocks can be purchased from KAESER representatives. A list is given at the end of this manual. The part number of the chock is 5.1325.0.

Option rb/rm/rr

Additional breakaway prevention

The tow bar may be provided with two safety chains as additional protection against breakaway from the towing vehicle (country-specific optional equipment).
It is essential that both safety chains be attached to the towing vehicle before towing.

Option rb/rm/rr

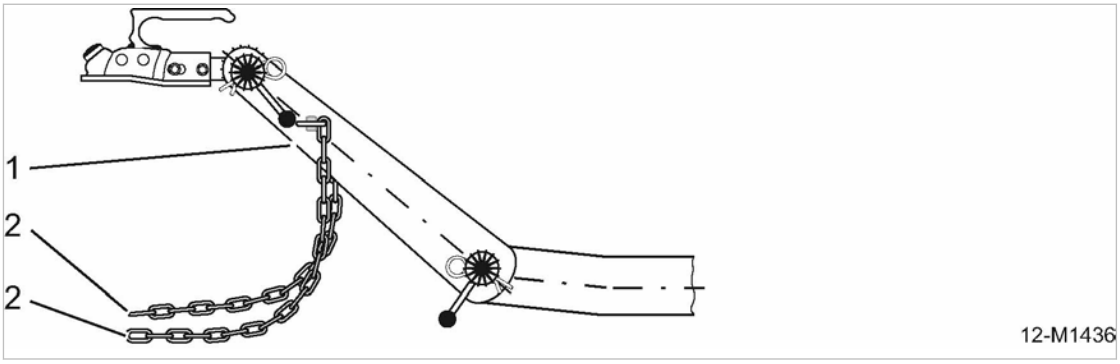


Fig. 81 Installing the safety chains

[1] Height adjustable tow bar
[2] Safety chains

1. Check if the tow bar is provided with safety chains.
2. If available, pick up the ends of the chains and cross the chains.
3. Loop the ends over the hooks provided on the towing vehicle.
4. If no special hooks are provided, secure the chains to the ball hitch.

Option rd/rn/rr **Additional breakaway prevention**

The towbar may be provided with two safety chains as additional protection against breakaway from the towing vehicle (see 82).

If these are provided, it is essential that they be attached to the towing vehicle before towing.

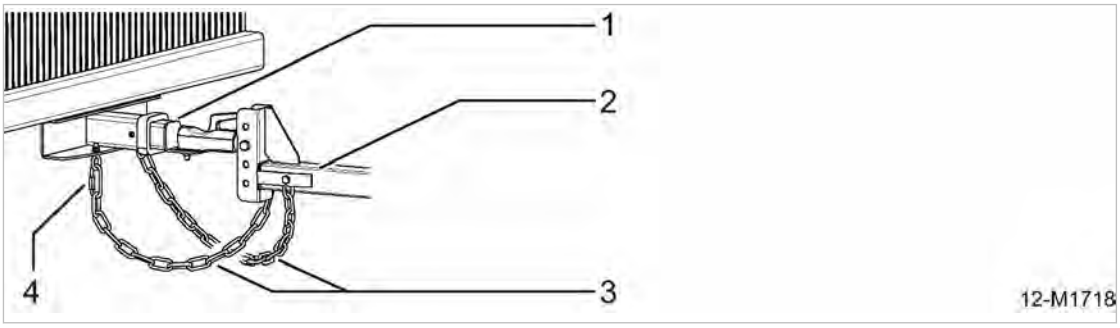


Fig. 82 Installing the safety chains

[1] Hitching device of the towing vehicle
[2] Tow bar
[3] Safety chains
[4] Mounting on the towing vehicle

1. Pick up the ends of the chains and cross the chains.
2. Loop the ends over the hooks provided on the towing vehicle.
3. If no special hooks are provided, secure the chains to the ball hitch.

Option rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs **Ensuring emergency braking in the case of breakaway from the towing vehicle:**

If the compressor breaks away from the towing vehicle, the cable tightens and pulls on the emergency brake (parking brake).

It is essential that the breakaway cable is threaded through its guides for correct emergency braking.

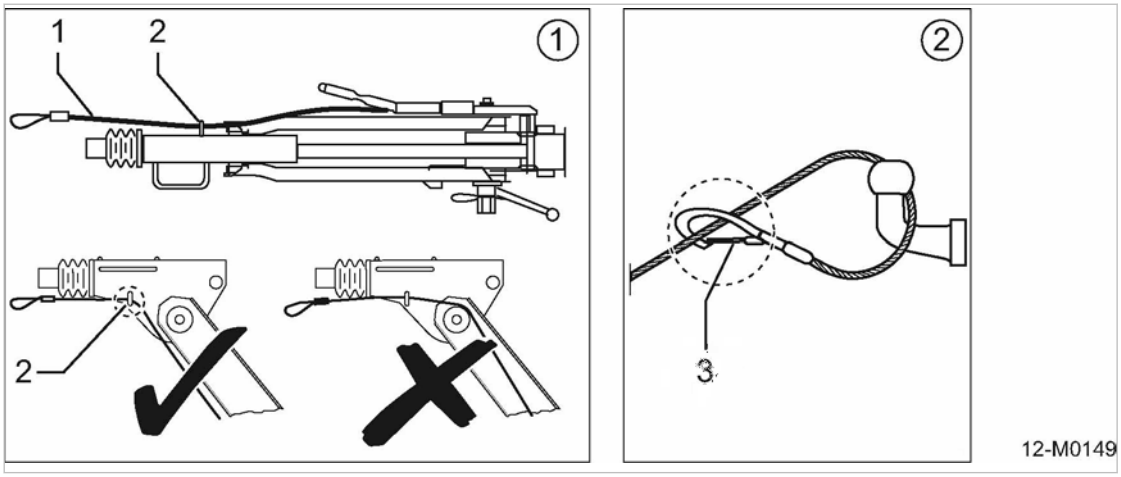


Fig. 83 Breakaway cable attachment

[1] Breakaway cable
[2] Breakaway cable guide (eye)
[3] Connection (spring clip)

1. **NOTICE** *Unintentional brake application.*
   If the breakaway cable is too short it can apply the brakes when rounding a curve. This imposes high wear on the braking system.
   ➢ *Make sure the breakaway cable is long enough.*
2. Thread the breakaway cable through the guide welded on the side of the towing bar.
3. Loop the end of the cable round the towing vehicle hitch and secure with the spring clip.

12.2.3 Parking the machine

Towing devices with parking brake

The parking brake is not a running brake and is used only to lock the wheels when the machine is positioned. The gas spring automatically increases parking brake force if the machine rolls backwards or when parked on a slope.

Option rb/rm/rs, rc/ro/rr, rg/rp/rr, rc/ro/rs

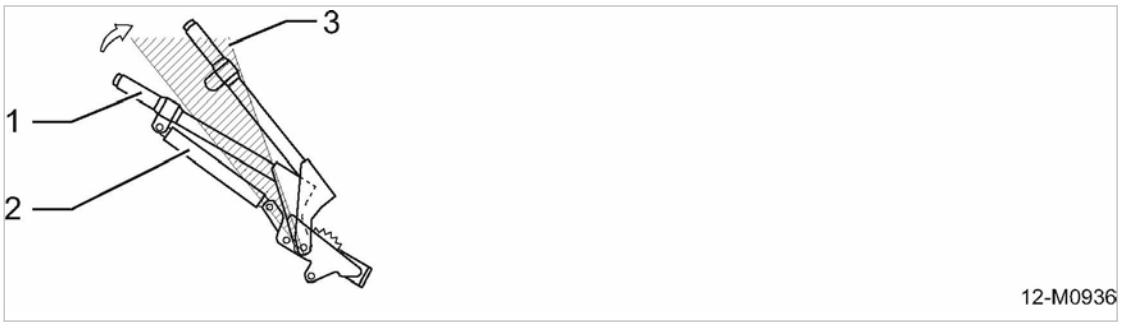


Fig. 84 Actuating the parking brake with gas spring assistance

[1] Parking brake lever
[2] Gas spring
[3] Dead point zone

➢ Always engage the parking brake when parking the machine.

12.2.3.1 Option rb/rm/rr
Parking a machine with a height adjustable chassis

When parking on a slope, securely chock the machine before uncoupling.

⚠ WARNING

Machine without parking brake.
Serious injury or death can result from an unsecured machine rolling away.

- ➢ *Securely chock the machine before uncoupling.*
- ➢ *As a general rule, the machine should always be blocked with chocks when it is not being moved.*

1. Use a coupled towing vehicle to move the machine into position.
2. Place chocks under the wheels.
3. Loosen the lighting and signalling system.
4. Throw the clamping lever to loosen the support.
5. Manually lower the support.
6. Throw the clamping lever to re-secure the support.
   The support must be secured.
7. Pull up and lift the coupling release lever.
8. Position the towing mechanism laterally next to the towing device of the towing vehicle.
9. Remove the machine from the towing vehicle.

12.2.3.2 Option rb/rm/rs
Parking a machine with a height adjustable chassis and automatic jockey wheel

In a parked machine which is separated from the towing vehicle, the machine's bearing load affects the automatic jockey wheel.

For this reason, the jockey wheel of a separated machine must be wound down until the cam [2] no longer touches the bead [1]. The automatic folding of the wheel suspension is thus blocked (see figure 85/A).

When the jockey wheel of a separated machine is wound up further, the bead pushes against the cam of the retaining pin (see figure 85/B). The retaining pin [3] unlocks the wheel suspension [4] which will abruptly fold (see figure 85/C).

⚠ WARNING

A folding wheel suspension during winding up causes the towing device to suddenly crash onto the ground,
potentially causing severe injuries to legs and/or feet.

- ➢ *Wind the automatic jockey wheel only up when the machine is coupled to a towing vehicle.*
- ➢ *Wind the automatic jockey wheel up only as far as the bead does not touch the cam.*
- ➢ *Do not place your feet beneath the towing device.*

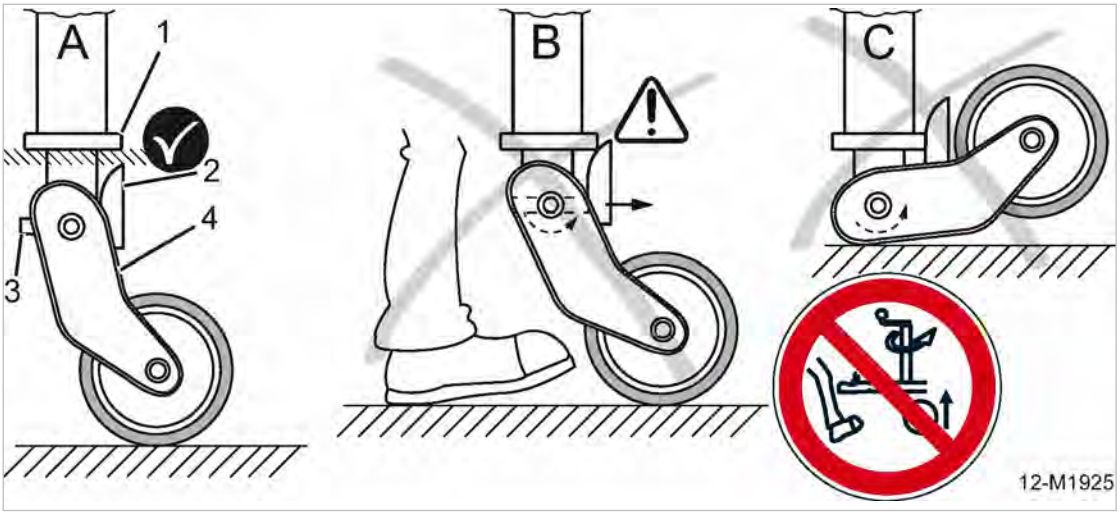


Fig. 85 Warning "Risk of injury due to falling towing device"

[1] Bead
[2] Cam
[3] Retaining pin
[4] Wheel suspension

1. Use a coupled towing vehicle to move the machine into position.
2. Place chocks under the wheels.
3. Loosen the lighting and signalling system.
4. Pull on the parking brake past the dead point zone (see figure 84).
   The gas spring holds the brake under tension.
5. Detach the breakaway cable.
6. Lower the jockey wheel.
7. Pull the coupling handle up and lower the jockey wheel further.
   The ball coupling must be released from the towing device of the towing vehicle.
8. Check whether the ball coupling is positioned higher than the towing device of the towing vehicle.
9. If necessary, lower the jockey wheel further.
10. Slowly remove the towing vehicle from the machine.

12.2.3.3 Option rc/ro/rr, rg/rp/rr, rc/ro/rs
Parking a machine with fixed height chassis (with parking brake)

When parking on a slope, securely chock the machine before uncoupling.

1. Use a coupled towing vehicle to move the machine into position.
2. Place chocks under the wheels.
3. Remove the lighting and signalling system.
4. Pull on the parking brake past the dead point zone (see figure 84).
   The gas spring holds the brake under tension.
5. Detach the breakaway cable.
6. Lower the jockey wheel.
7. Pull the coupling handle up and lower the jockey wheel further.
   The ball coupling must be released from the towing device of the towing vehicle.
8. Check whether the ball coupling is positioned higher than the towing device of the towing vehicle.

9. If necessary, lower the jockey wheel further.
10. Slowly remove the towing vehicle from the machine.

12.2.3.4 Option rd/ro/rr
Parking a machine with fixed height chassis (without parking brake)

When parking on a slope, securely chock the machine before uncoupling.

⚠ WARNING

Machine without parking brake.
Serious injury or death can result from an unsecured machine rolling away.

- ➢ *Securely chock the machine before uncoupling.*
- ➢ *As a general rule, the machine should always be blocked with chocks when it is not being moved.*
- ➢ *The machine should not be maneuvered by hand.*

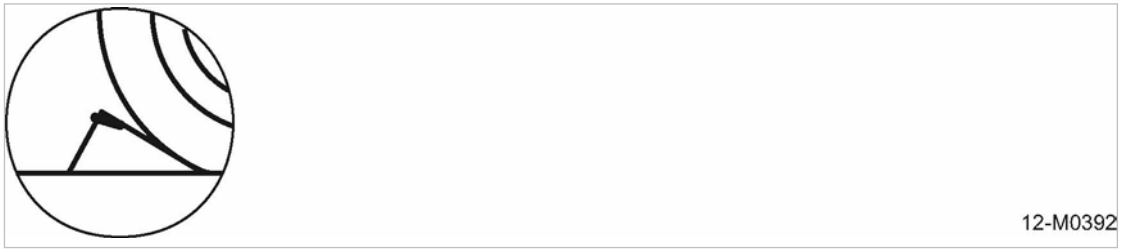


Fig. 86 Safety signs: Secure with chocks

1. Use a coupled towing vehicle to move the machine into position.
2. Place chocks under the wheels.
3. Remove the lighting and signalling system.
4. Lower the support.
5. Withdraw the security pin from the ball coupling.
6. Pull the coupling handle up and lower the support further.
   The ball coupling must be released from the towing device of the towing vehicle.
7. Insert the security pin in the ball coupling fixing opening.
8. Check whether the ball coupling is positioned higher than the towing device of the towing vehicle.
9. If necessary, lower the jockey wheel further.
10. Slowly remove the towing vehicle from the machine.

12.2.3.5 Option rd/rn/rr
Parking a machine with fixed height chassis and height-adjustable ball coupling (without parking brake)

When parking on a slope, securely chock the machine before uncoupling.

⚠ WARNING

Machine without parking brake.
Serious injury or death can result from an unsecured machine rolling away.

- ➢ *Securely chock the machine before uncoupling.*
- ➢ *As a general rule, the machine should always be blocked with chocks when it is not being moved.*
- ➢ *The machine should not be maneuvered by hand.*

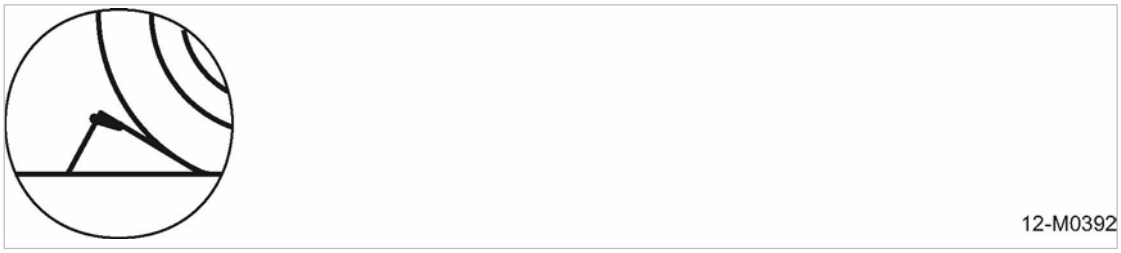


Fig. 87 Safety signs: Secure with chocks

1. Use a coupled towing vehicle to move the machine into position.
2. Place chocks under the wheels.
3. Remove the lighting and signalling system.
4. Lower the support.
5. Release the clip.
6. Swivel clip to the side.
7. Withdraw the security pin from the ball coupling.
8. Pull back the spreader sleeve to its end stop and hold there and simultaneously lower the support further.

   The ball coupling must be released from the towing device of the towing vehicle.
9. Release the spreader sleeve.

   Spreader sleeve springs back to original position.
10. Insert the security pin in the ball coupling fixing opening.
11. Secure the clip.
12. Check whether the ball coupling is positioned higher than the towing device of the towing vehicle.
13. If necessary, lower the jockey wheel further.
14. Slowly remove the towing vehicle from the machine.

12.2.3.6 Option sf
Using the optional anti-theft device

The machine is fitted with a safety chain as theft protection.
The supplied safety chain is stored in a container at the front inside the machine.

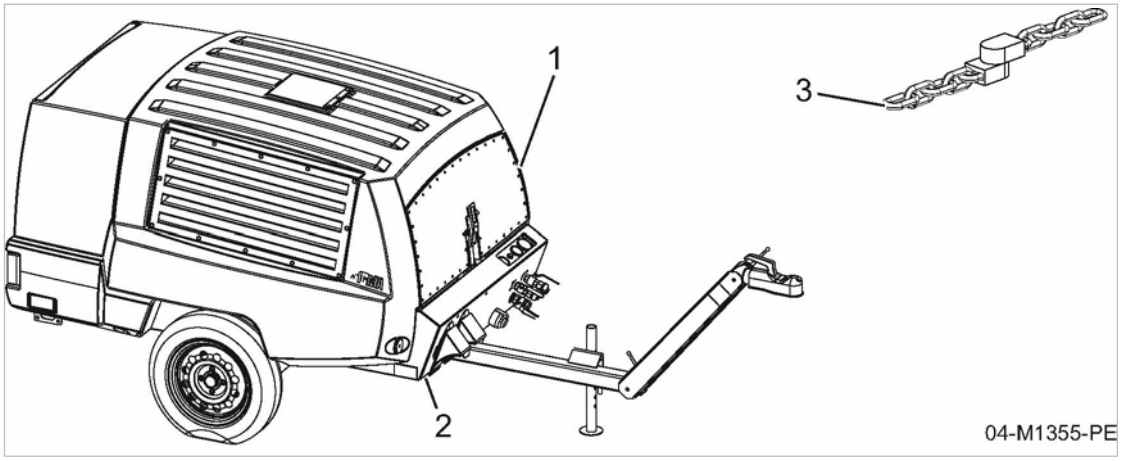


Fig. 88 Optional anti-theft device

[1] Machine
[2] Location of the container for the safety chain
[3] Safety chain

1. From below, insert your hand into the opening in the floor panel.
2. Press the rubber cover upward.
3. Take the safety chain and pull it out.
4. Wrap the safety chain around a suitable object.
5. Secure the safety chain with the lock.

Result The machine is protected against theft.

12.2.4 Transporting with a crane

Additional precautions for conditions of snow and ice

Considerable snow or ice may build up on the machine under low temperature conditions.
This may adversely effect the machine's center of gravity.
It is possible that the permissible loading on the crane or lifting eye is exceeded.

➢ Perform the following tasks in snow and ice conditions:
- Remove any snow and ice from the machine before lifting by a crane.
- Make sure the lifting eye cover plate is freely accessible and can be opened.

Perform the following tasks prior to moving the machine by crane

A lifting eye is provided for transporting with a crane. The lifting eye is located beneath a lift-up cover in the center of the canopy.

Precondition The canopy is closed and locked

1. Open the lifting eye cover.
2. Position the crane hook vertically over the lifting eye.
3. Engage the hook in the eye.
4. Lift the machine carefully.

Take care when setting down the machine

1. **NOTICE** *Incorrect setting down can damage the machine.*
   Machine components, particularly the chassis, can be damaged by incorrectly setting down.
   - ➢ *Set the machine down carefully.*
   - ➢ *Do not set down unevenly.*
2. Set the machine down slowly and carefully.

12.2.5 Transporting as a load

The medium of transport determines the type of packing and securing.
Packing and securing methods must be such that, assuming proper handling, the goods arrive in perfect condition at the destination.

Other measures must be taken for the transport of machines by sea or air. Please contact KAESER Service for more information.

Material Chocks

Restraints or timber balks

Straps

Load securing devices

- National directives and regulations for securing loads should be followed.
- Load securing is taken to mean that by full braking or sudden turning the load will not slide, fall, roll or cause unnecessary noise. Accepted technical regulations should be observed.
- Responsibility for properly secured loads falls on the driver, the vehicle keeper, and the carrier.

Use chocks, restrainers or timber balks for securing the load.
If necessary, use straps across the chassis and the tow bar.

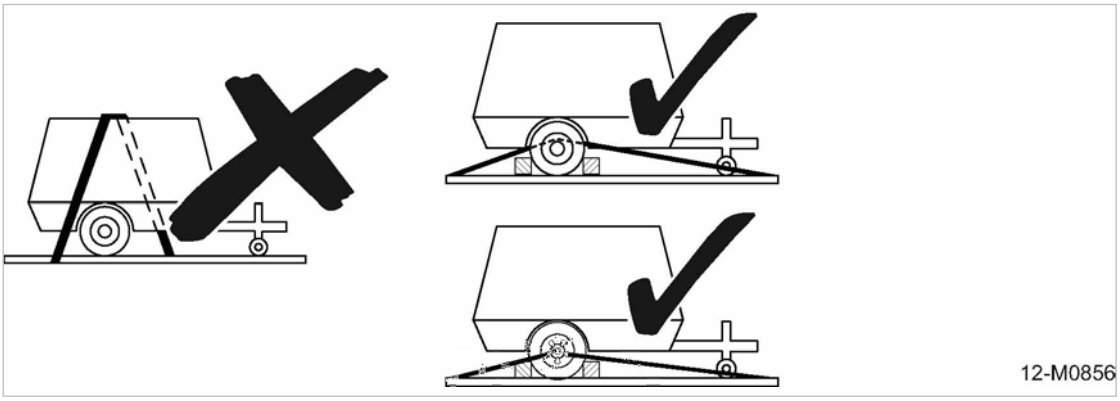


Fig. 89 Load secured by strapping

1. **NOTICE** *Straps can damage the bodywork!*
   Movement during transportation can damage the bodywork.
   - ➢ *Do not use straps over the bodywork.*
   - ➢ *Use straps only over the chassis.*

2. Always observe accident and safety regulations when transporting.
3. The loads must be secured against rolling, tipping, slipping and falling.

Contact KAESER Service with any questions regarding transporting or load securing.

KAESER accepts no liability and provides no guarantee for damage arising from incorrect transport or insufficient or incorrect load securing provisions.

For hire, rental and trade fair plant, any transport safety devices used for the delivery must also be used for the return transport.

Before shipment as air freight

The machine is designated as dangerous goods for air freight purposes; any disregard can result in a heavy fine.

1. **⚠ WARNING** *Danger of fire or explosion from operating fluids/materials!*
   The machine incorporates an internal combustion engine.
   ➢ *Any dangerous fluids/materials contained within the machine must be removed before transport.*
2. All hazardous materials must be removed.
   These include:
   - Residues of fuel or fuel vapors
   - Lubricating and cooling oils in the engine and compressor unit
   - Electrolyte charges in rechargeable batteries.
   - Residual quantities of tool lubricating oil in the tool lubricator (option ea, ec)
   - Residual quantities of antifreeze in the frost protector (Option ba)

12.3 Storage

Moisture can lead to corrosion, particularly in the engine, airend and oil separator tank.

Frozen moisture can damage components, valve diaphragms and gaskets.

The following measures also apply to machines not yet commissioned.

Please consult with KAESER if you have questions to the appropriate storage and commissioning.

NOTICE

Moisture and frost can damage the machine!

➢ *Prevent ingress of moisture and formation of condensation.*

➢ *Maintain a storage temperature of >32 °F.*

➢ Store the machine in a dry place, free from frost if possible.

12.4 Disposal

When disposing of a machine, drain out all liquids and remove old filters.

Precondition The machine is decommissioned.

1. Completely drain the fuel from the machine.

2. Completely drain the cooling oil and engine oil from the machine.
3. Remove used filters and the oil separator cartridge.
4. Drain the coolant from water-cooled engines and systems.
5. The battery has been removed.
6. Hand the machine over to an authorized disposal expert.

- ➢ Operating materials and components contaminated with fuel, cooling oil or engine oil must be disposed of in accordance with local environmental protection regulations.
- ➢ Old batteries are hazardous waste and must be disposed of correctly in accordance with local environmental protection regulations

13 Annex

13.1 Identification

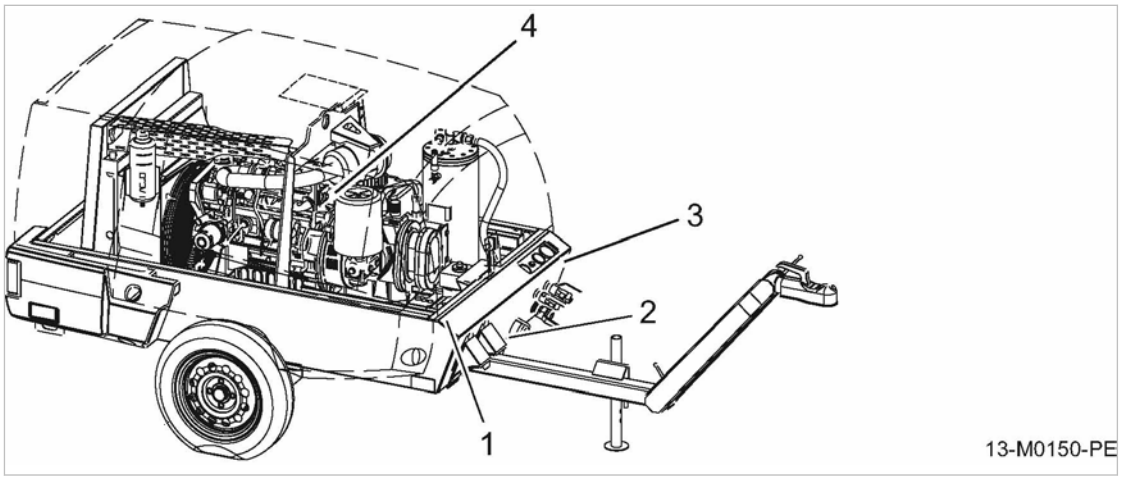
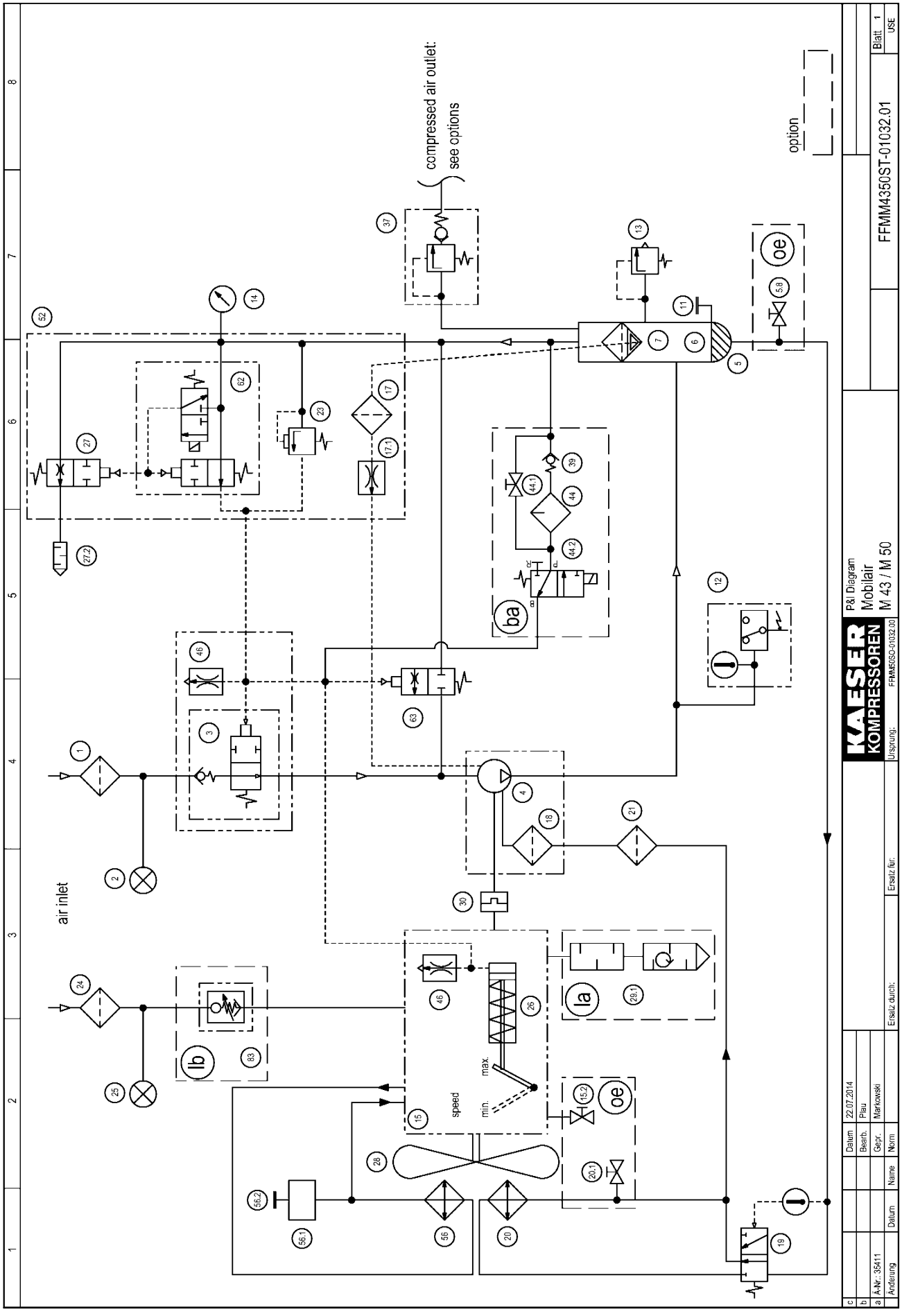


Fig. 90 Identification

[1] VIN* (stamped into the bodywork)
*Vehicle Identification Number
[2] Options label
[3] Machine nameplate with serial number
[4] Engine nameplate with serial number

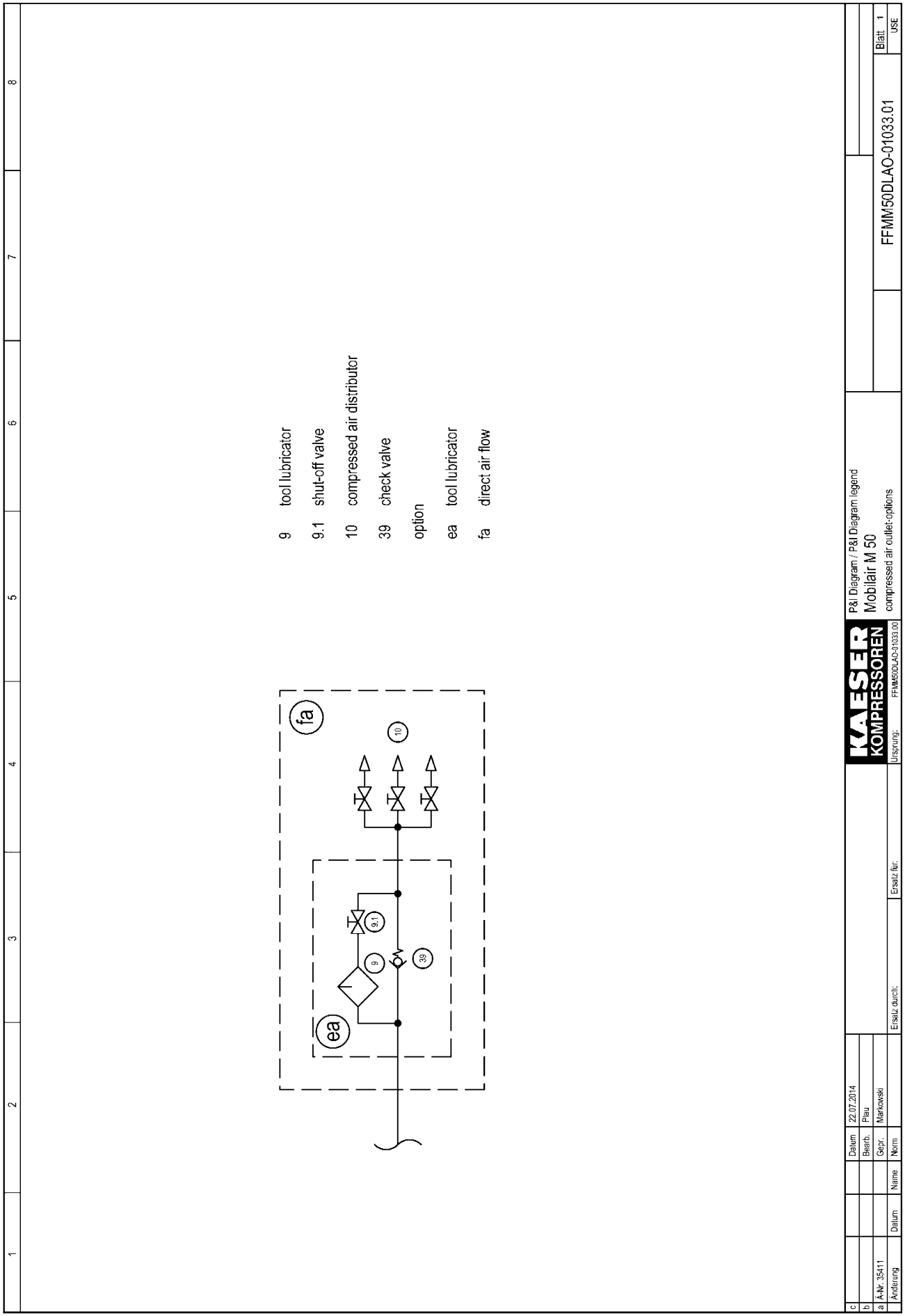
13.2 Pipeline and instrument flow diagram (P+I diagram)


compressed air outlet:
see options
option
air inlet
speed
max.
min.
P&I Diagram
Mobilair
M 43 / M 50
FFMM4350ST-01032.01
KAESER KOMPRESSOREN
Ursprung:
Ersatz für:
Ersatz durch:
Datum
Bearb.
Gepr.
Norm
Name
22.07.2014
Plau
Markowski
Änderung
A-Nr.: 35411
Blatt 1
USE

1	2	3	4	5	6	7	8

1	compressor - air filter
2	filter maintenance indicator, compressor -air filter
3	inlet valve
4	airend
5	oil separator tank
5.8	shut-off valve - oil drain
6	oil reserve
7	oil separator cartridge
11	oil filler port with screw plug
12	temperature gauge switch + indication
13	safety relief valve
14	pressure gauge - control panel
15	diesel engine
15.2	shut-off valve - oil drain
16	oil return line
17	dirt trap
17.1	nozzle
18	strainer
19	combination valve - oil temperature controller
20	oil cooler
20.1	shut-off valve - oil drain
21	oil filter
23	proportional controller
24	motor - air filter
25	filter maintenance indicator, motor - air filter
26	engine speed adjusting piston
27	venting valve
27.2	silencer
28	fan
29.1	exhaust silencer with integrated spark arrestor
30	drive coupling
37	minimum pressure check valve
39	check valve
44	defroster
44.1	shut-off valve
44.2	solenoid valve
46	nozzle (secondary end proportional controller)
52	control valve
56	water cooler
56.1	cooling water expansion tank
56.2	water filler with plug
62	combined control valve
63	control valve (air circulation valve)
83	engine air intake shut-off valve (automatic shutdown)
option	
ba	low temperature equipment
la	spark arrestors
lb	engine air intake shut-off valve (automatic shutdown)
oe	enclosed floor pan

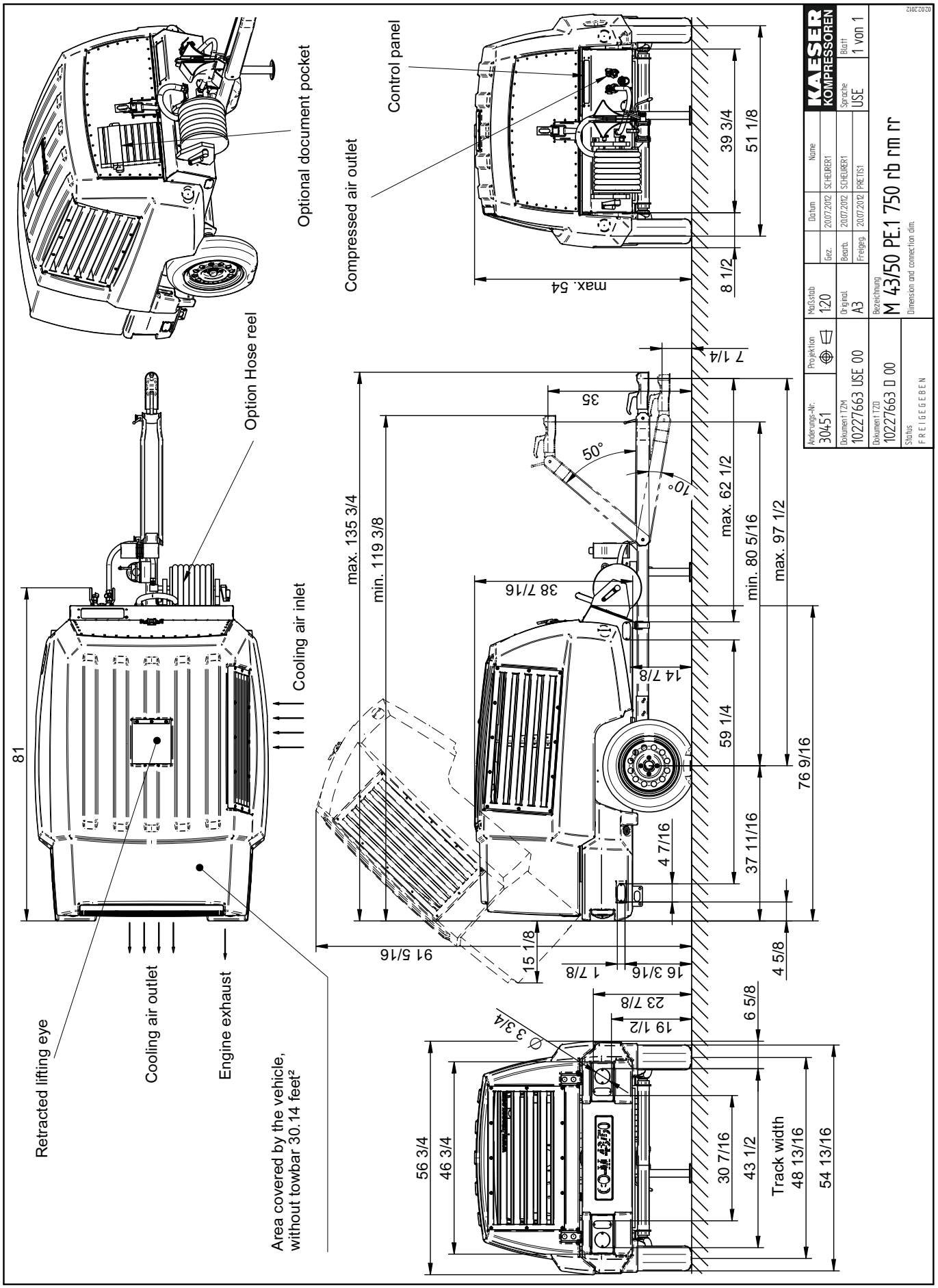
c				Datum	22.07.2014		KAESER KOMPRESSOREN	P&I Diagram legend	
b				Bearb.	Plau			Mobilair	
a				Gepr.	Markowski			M 43 / M 50	
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: FFMM50SO-01032.00	FFMM4350ST-01032.01	Blatt 2
										USE


9 tool lubricator
9.1 shut-off valve
10 compressed air distributor
39 check valve
option
ea tool lubricator
fa direct air flow
fa
ea
10
9.1
9
39
P&I Diagram / P&I Diagram legend
Mobilair M 50
compressed air outlet-options
FFMM50DLAO-01033.01
Blatt 1
USE
Datum 22.07.2014
Bearb. Plau
Gepr. Markowski
Norm
Name
Datum
Änderung
a A-Nr. 35411
Ersatz durch:
Ersatz für:
Ursprung: FFMM50DLAO-01033.00

13.3 Dimensional drawing

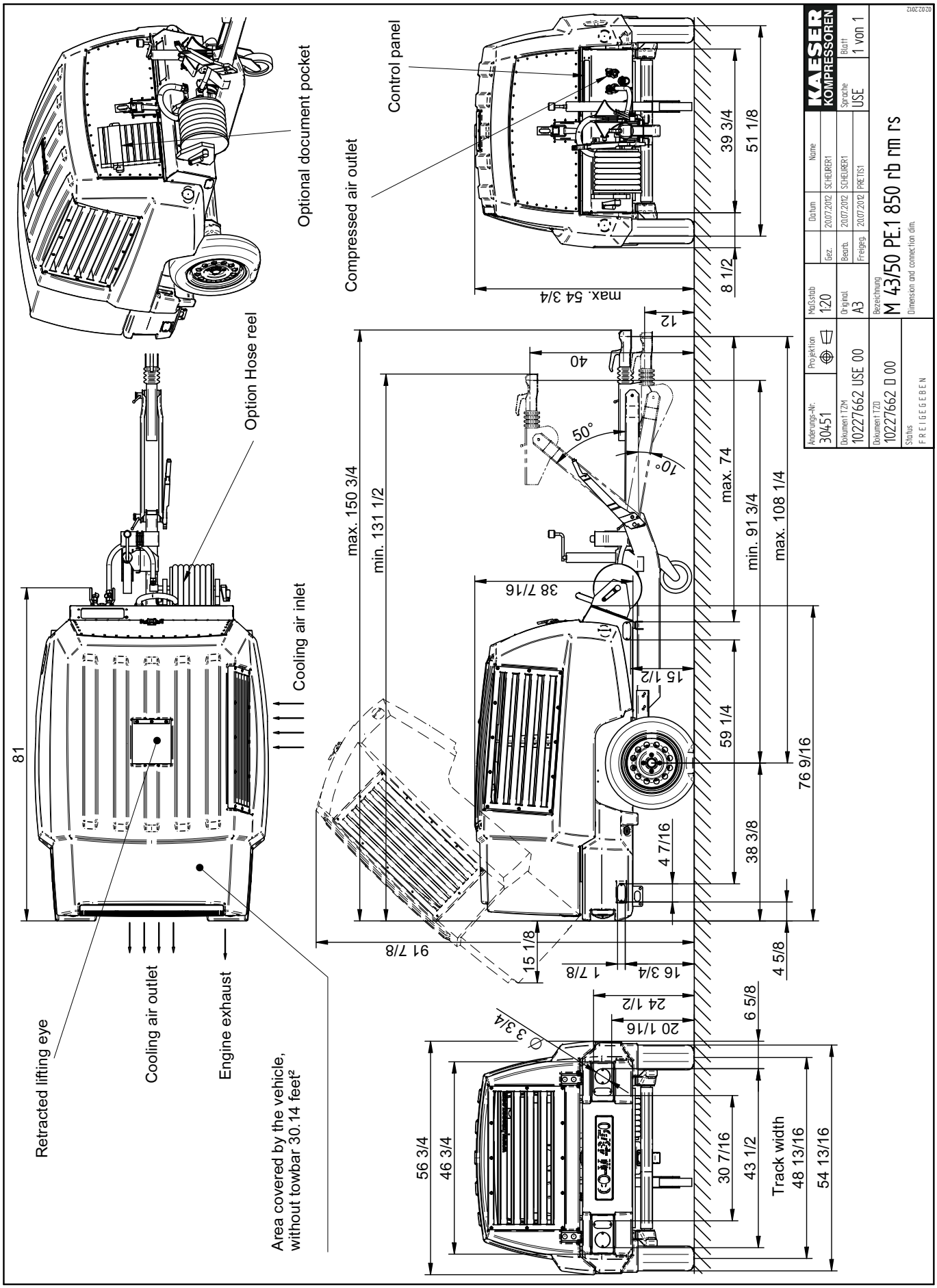
13.3.1 Option rb/rm/rr Dimensional drawing, chassis options

- Option rb - Chassis EU version
- Option rm - Chassis with height-adjustable towbar
- Option rr - Chassis without service brake



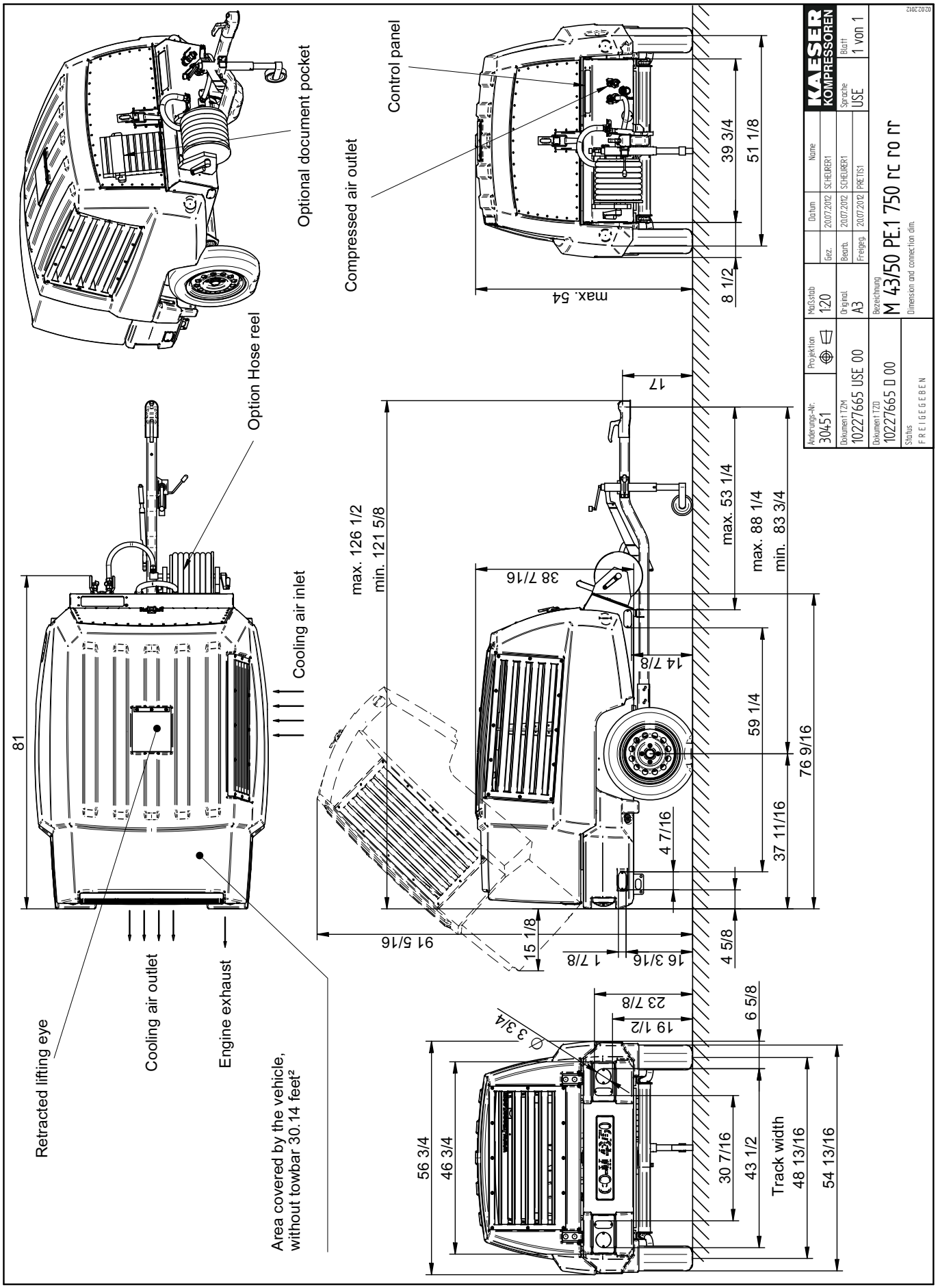
13.3.2 Option rb/rm/rs
Dimensional drawing, chassis options

- Option rb - Chassis EU version
- Option rm - Chassis with height-adjustable towbar
- Option rs - Chassis with overrun brake



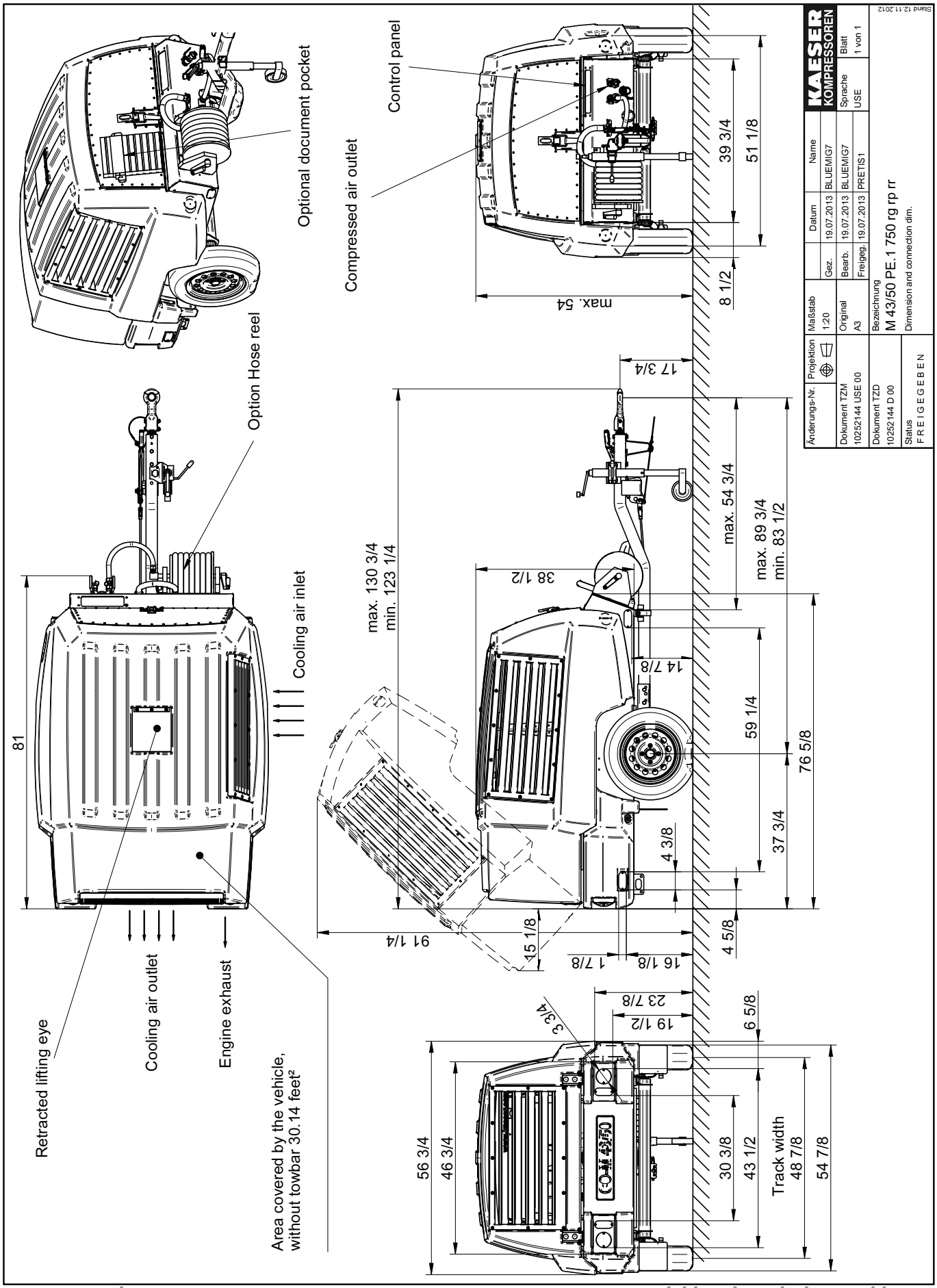
13.3.3 Option rc/ro/rr
Dimensional drawing, chassis options

- Option rc - Chassis GB version
- Option ro - Chassis with fixed height towbar
- Option rr - Chassis without service brake



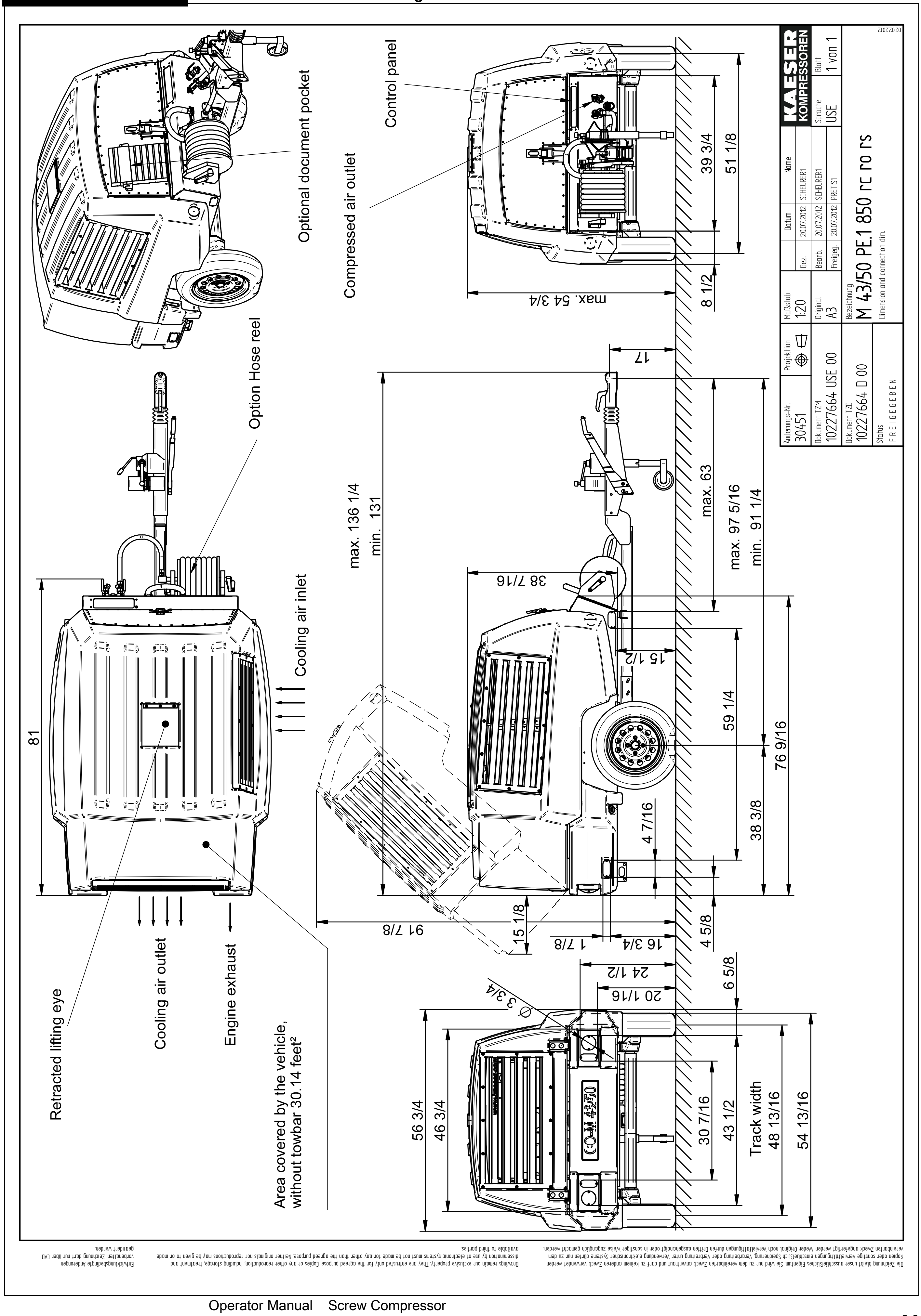
13.3.4 Option rg/rp/rr
Dimensional drawing – chassis options

- Option rg - Chassis, GB version
- Option rp - Chassis with adapter, mounted rotatable
- Option rr - Chassis without service brake



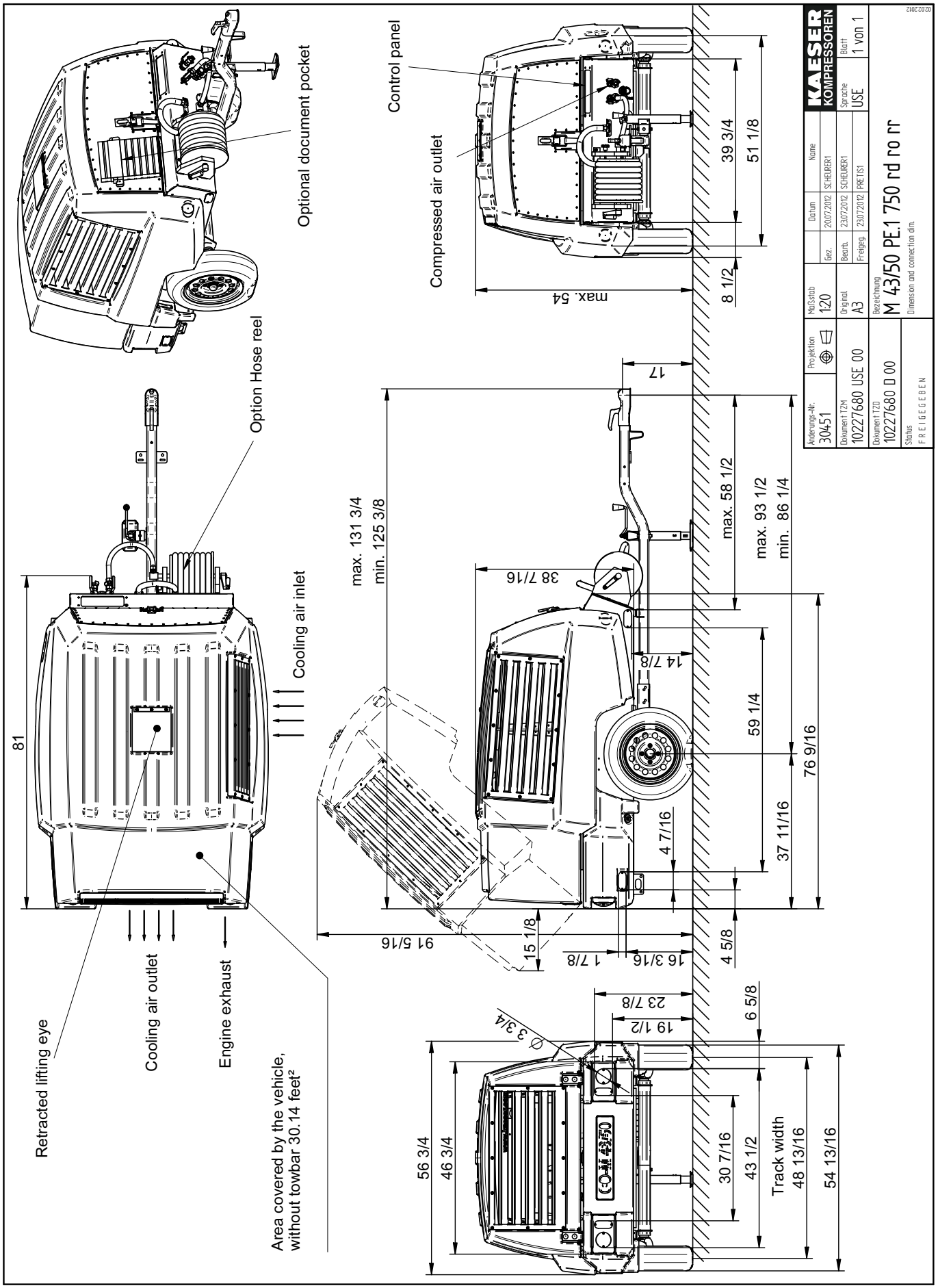
13.3.5 Option rc/ro/rs
Dimensional drawing, chassis options

- Option rc - Chassis GB version
- Option ro - Chassis with fixed height towbar
- Option rs - Chassis with overrun brake


Control panel
Optional document pocket
Compressed air outlet
Option Hose reel
Cooling air inlet
Retracted lifting eye
Cooling air outlet
Engine exhaust
Area covered by the vehicle, without towbar 30.14 feet²
Track width
max. 136 1/4
min. 131
max. 54 3/4
39 3/4
51 1/8
8 1/2
17
max. 63
max. 97 5/16
min. 91 1/4
38 7/16
15 1/2
59 1/4
76 9/16
38 3/8
4 7/16
81
91 7/8
15 1/8
1 7/8
16 3/4
4 5/8
24 1/2
6 5/8
20 1/16
⌀ 3/4
56 3/4
46 3/4
30 7/16
43 1/2
48 13/16
54 13/16
M 43/50 PE.1 850 rc ro rs
Dimension and connection dim.

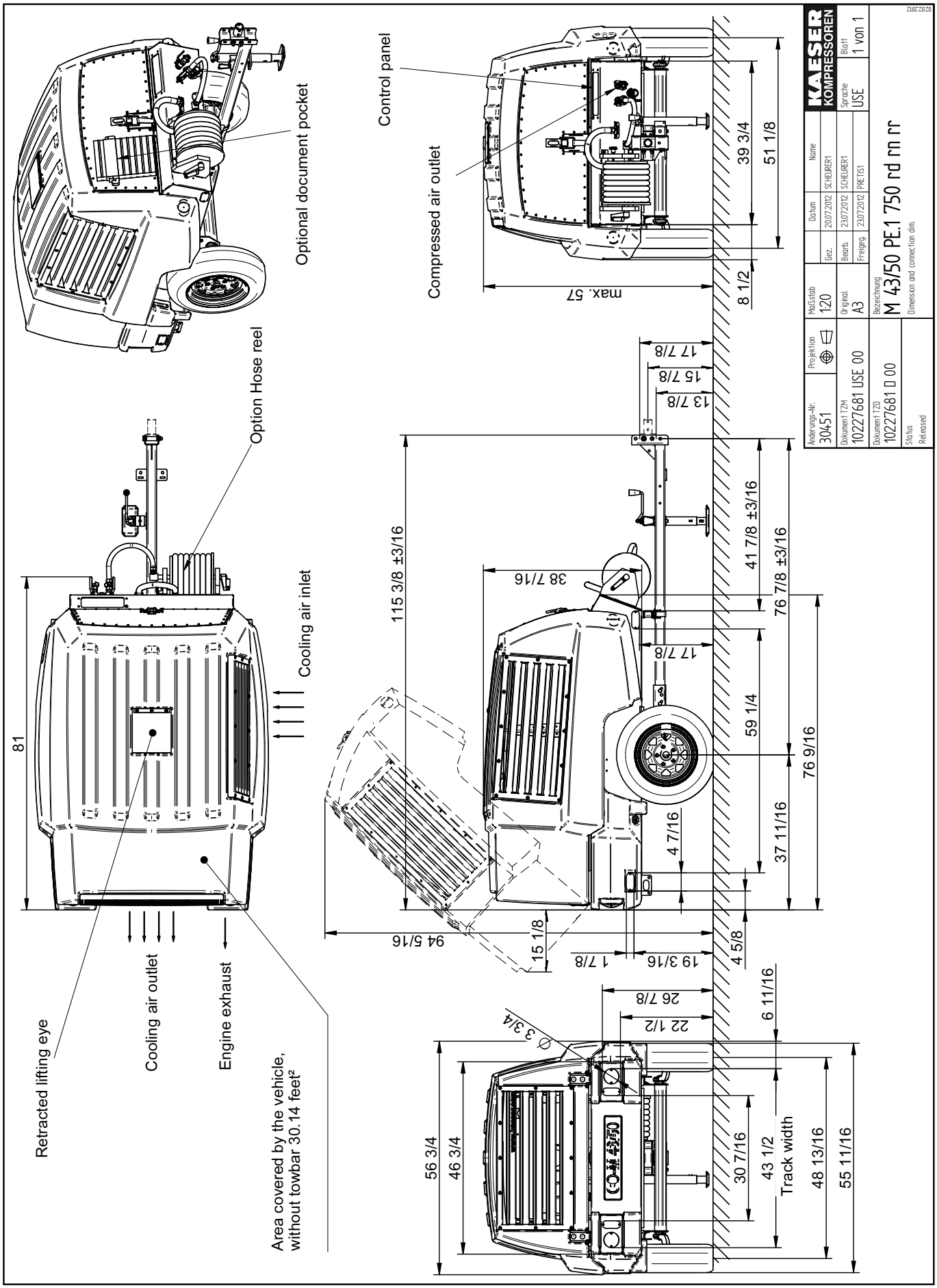
13.3.6 Option rd/ro/rr
Dimensional drawing, chassis options

- Option rd - Chassis USA version
- Option ro - Chassis with fixed height towbar
- Option rr - Chassis without service brake



13.3.7 Option rd/rn/rr
Dimensional drawing, chassis options

- Option rd - Chassis USA version
- Option rn - Chassis with height-adjustable towbar
- Option rr - Chassis without service brake



13.4 Electrical Diagram

1	2	3	4	5	6	7	8

Electrical diagrams

MOBILAIR M43/M50

KUBOTA - Motor

Manufacturer: KAESER KOMPRESSOREN SE
Postfach 2143
96410 Coburg

c				Datum	18.09.2014 E		KAESER KOMPRESSOREN	Cover page	=
b				Bearbeiter	Sitter			MOBILAIR M43/M50	+
a				Geprüft	Weid				
A	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa03009_00	DFA4350-03009.01 page 1 / 1 Bl.

Lfd. Nr. No.	Benennung Name		Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page			DFA4350-03009.01	1	
2	List of contents			ZFA4350-03009.01	1	
3	Block diagram			UFA4350-03009.01	1	
4	Block diagram	Cross-reference		UFA4350-03009.01	2	
5	Circuit diagram	Cable set Battery		SFA4350.BK-03009.01	1	=BK
6	Circuit diagram	Compressor - unit		SFA4350.IKM-03009.01	1	=IKM
7	Circuit diagram	Control cabinet		SFA4350.SK-03009.01	1	=SK
8	Circuit diagram	Control panel		SFA4350.BT-03009.01	1	=BT
9	Equipment parts list	components		GFA4350-03009.01	1	

c				Datum	18.09.2014	KAESER KOMPRESSOREN	List of contents		=
b				Bearbeiter	Sitter		MOBILAIR M43/M50		+
a				Geprüft	Weid			ZFA4350-03009.01	page 1
B	Änderung	Datum	Name	Norm	Ersatz durch:	Ersatz für:	Ursprung:		1 Bl.

general instructions

Control voltage 12VDC
All non-designated conductors H07V-K 1,5 mm² black

potentials:

15	switched plus + (unit ON)
19	Preheat with glowplug
30	+ terminal (Battery)
31	- terminal (Battery), earth
50	Starter-Control

components unit

-G1	Battery
-G2	Alternator
-M1	Starter-Motor
-M9	fuel pump
-B25	Oil pressure switch Motor
-B70	Cooling water-Thermostat
-E10	Glowplug
-K5	Fuel shut-off valve
-K7	Valve Full load operation, Venting
-T2	Regulator Alternator
-X11	Plug connection, Alternator
-X21	Plug connection, Cable set Motor

components Control cabinet

-F1	Control fuse
-F30	Fuse Starter
-F32	Fuse Glowplug
-K30	Starter - Relay
-K31	glow relay
-K32	Relay fuel pump
-K34	Relay Full load operation
-K40	Relay Safety chain
-S11	Ignition switch

0 = STOP
1 = ON
2 = Preheat with glowplug
3 = START

-X21,-X22	Plug connection, Control panel
-X23	Terminals: Terminal strip, Control panel

components Control panel

-B40	Distance temperature gauge Compressor airend
-P1	Charging control lamp
-P10	Hour meter
-S10	switch "Control ON"
-S12/-H12	Illuminated pushbutton Full load operation
-X22	Plug connection, Control panel

model-dependent components

-Q11	Battery isolating switch (option oa)
-K19	Valve defroster (option ba)

c				Datum	18.09.2014		KAESER KOMPRESSOREN	Block diagram	=
b				Bearbeiter	Sitter			general instructions	+
a				Geprüft	Weid				
C	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa03009_00	UFA4350-03009.01	page 1 / 2 Bl.

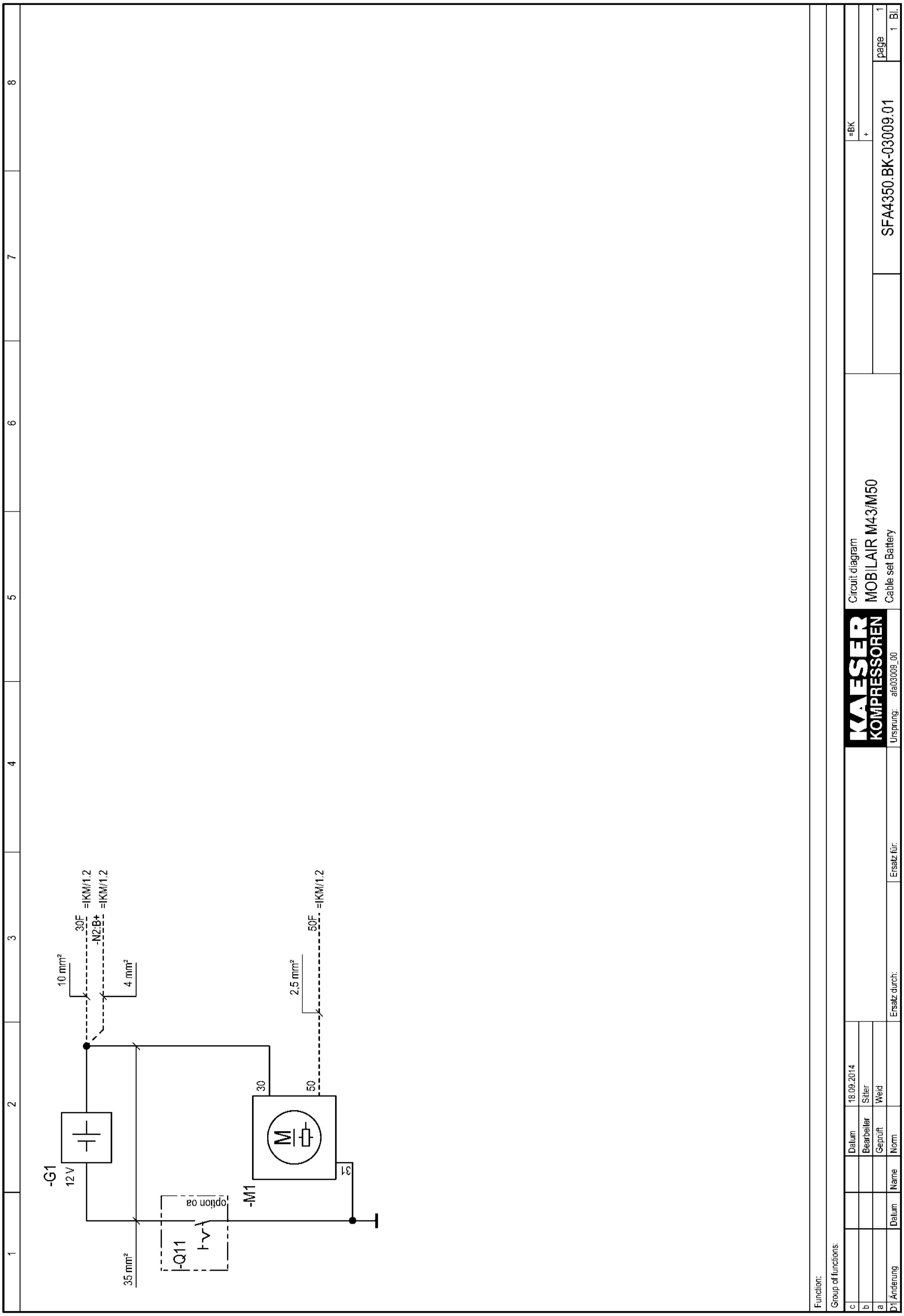
1	2	3	4	5	6	7	8

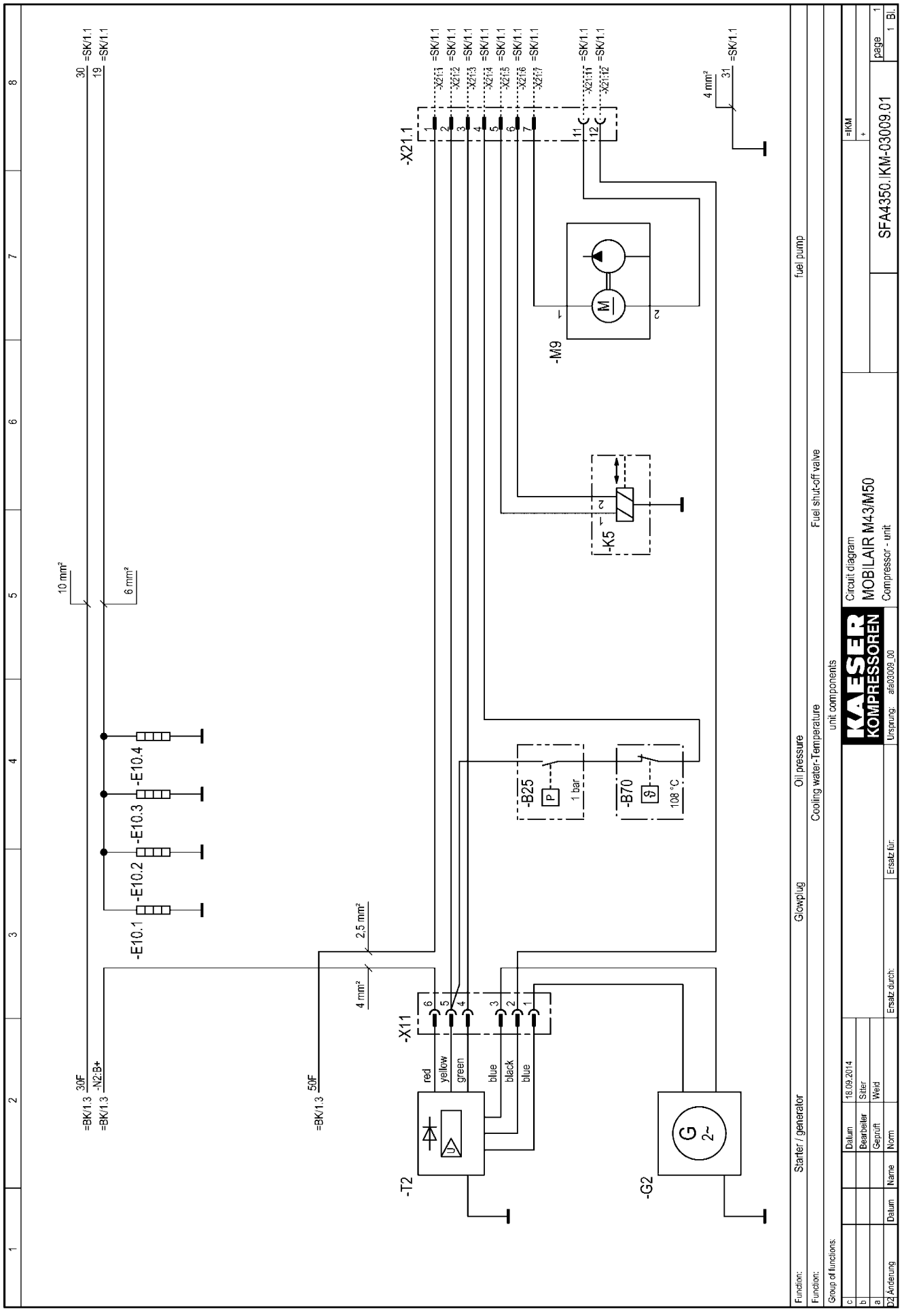
general instructions

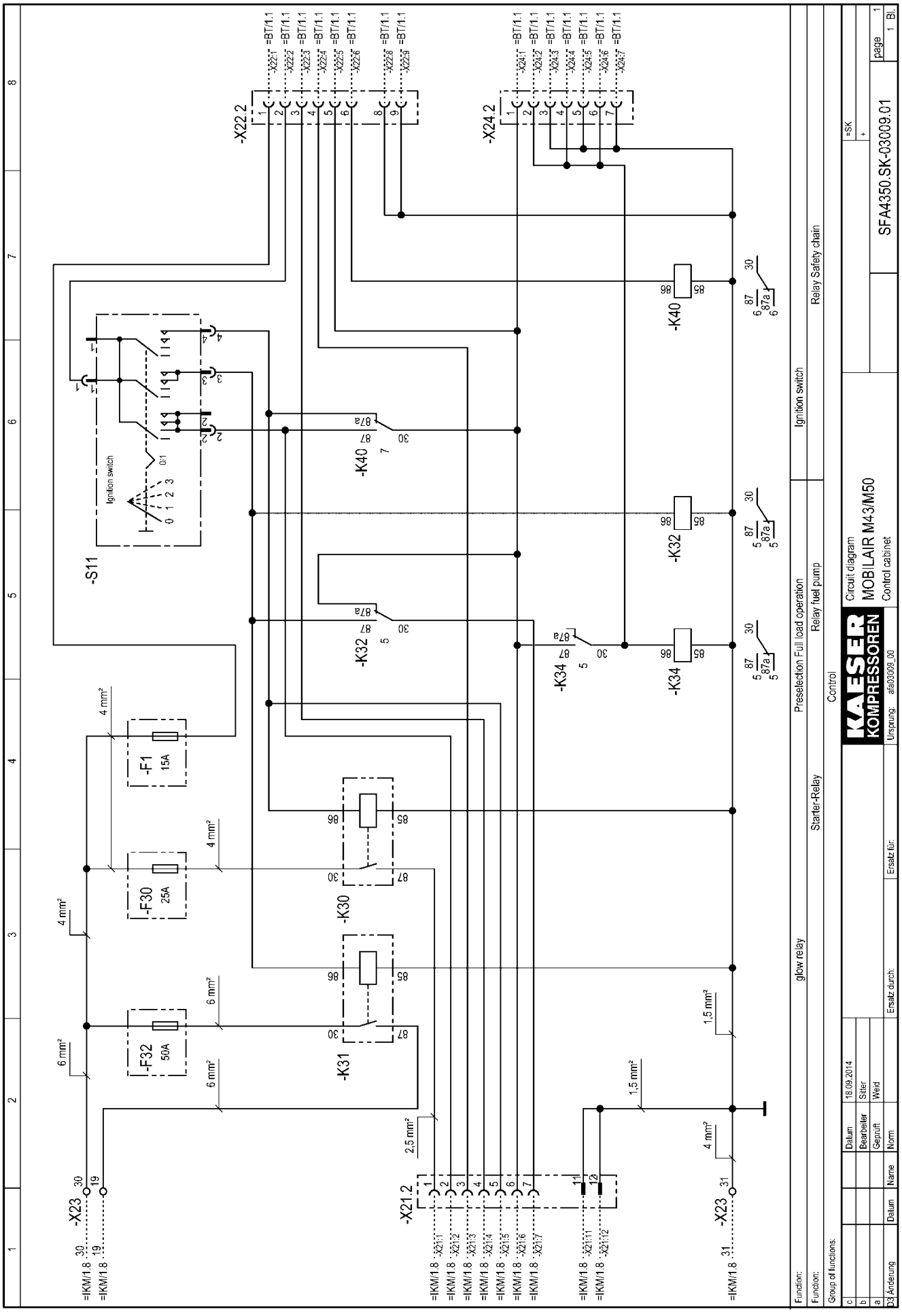
This document includes a common electrical diagram, consisting of documents:

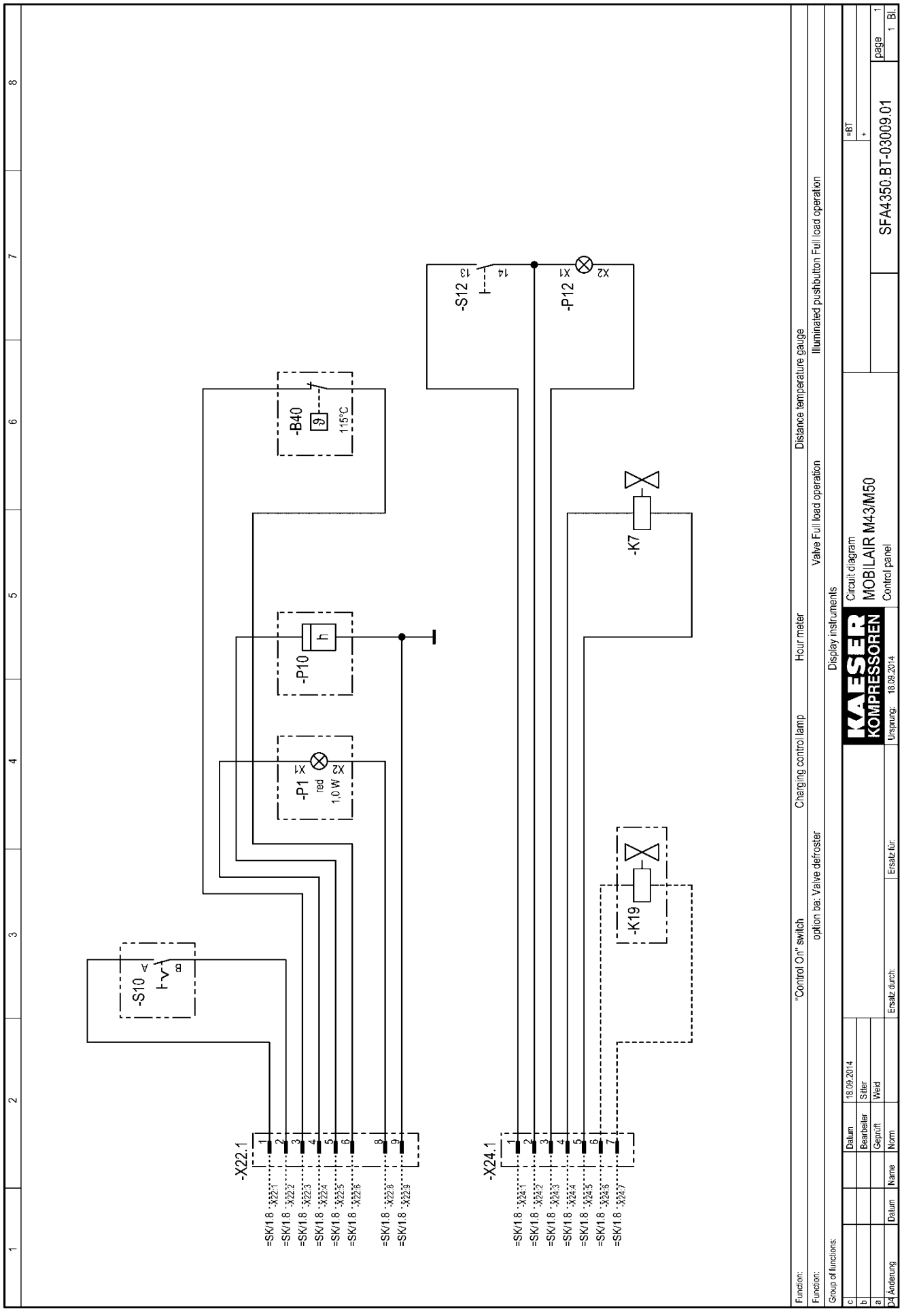
module	Electrical diagrams	Cross-reference
Cable set: connection Battery	SFA4350.BK-03009.01	BK
Cable set: connection Motor	SFA4350.IKM-03009.01	IKM
cabling Control cabinet	SFA4350.SK-03009.01	SK
cabling Control panel	SFA4350.BT-03009.01	BT

c				Datum	18.09.2014		KAESER KOMPRESSOREN	Block diagram	=
b				Bearbeiter	Sitter			general instructions	+
a				Geprüft	Weid			Cross-reference	
C	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa03009_00	UFA4350-03009.01	page 2 / 2 Bl.


-G1
12 V
-M1
M
-Q11
option oa
35 mm²
10 mm²
4 mm²
2,5 mm²
30F =IKM/1.2
-N2:B+ =IKM/1.2
50F =IKM/1.2
30
50
31
Function:
Group of functions:
Circuit diagram
MOBILAIR M43/M50
Cable set Battery
KAESER KOMPRESSOREN
Ursprung: afa03009_00
Datum 18.09.2014
Bearbeiter Siter
Geprüft Weid
Norm
Ersatz durch:
Ersatz für:
Änderung Datum Name
=BK
+
SFA4350.BK-03009.01
page 1
1 Bl.


-X21.1
-M9
-K5
-B25
1 bar
-B70
108 °C
-X11
-T2
-G2
-E10.1
-E10.2
-E10.3
-E10.4
10 mm²
6 mm²
2,5 mm²
4 mm²
30F
50F
Starter / generator
Glowplug
Oil pressure
fuel pump
Cooling water-Temperature
Fuel shut-off valve
unit components
Circuit diagram
MOBILAIR M43/M50
Compressor - unit
SFA4350.IKM-03009.01
page 1
Bl. 1


-X22.2
-X24.2
-S11
Ignition switch
-K40
-K32
-K34
-K30
-K31
-F1 15A
-F30 25A
-F32 50A
-X21.2
-X23
Preselection Full load operation
Ignition switch
glow relay
Starter-Relay
Relay fuel pump
Relay Safety chain
Control
Function:
Group of functions:
KAESER KOMPRESSOREN
MOBILAIR M43/M50
Circuit diagram
Control cabinet
SFA4350.SK-03009.01
page 1
Ersatz durch:
Ersatz für:
Ursprung: afa03009_00
Datum 18.09.2014
Bearbeiter Sitter
Geprüft Weid
Norm


-S10
-P1
-P10
-B40
-S12
-P12
-K7
-K19
-X22.1
-X24.1
"Control On" switch
Charging control lamp
Hour meter
Distance temperature gauge
option ba: Valve defroster
Valve Full load operation
Illuminated pushbutton Full load operation
Display instruments
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M43/M50
Control panel
SFA4350.BT-03009.01
page 1

1	2	3	4	5	6	7	8

A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.: Hersteller / Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer				D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 / Identifying symbol of device	F Stromlaufplan Planabschnitt / Circuit diagram sheet No.; section No.	G Einbauort / Location	Concerns only the manufacturer Wst.-Nr. H Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	components Control cabinet												
1	Ignition switch	47.14.08		7.2097.00020	KEYA		-S11						
1	Control voltage ON/OFF switch	26 00 00	12/24 V 15/7,5 A	8.7045.0	MERIT		-S10						
2	KFZ-Relay	22 200 111	12 V, 1S, 70 A	8.6544.00030	WEHRLE		-K30,-K31						
3	KFZ-Relay	20 201 100	12 V, 1W, 20/30 A	8.6544.0	WEHRLE		-K40,-K34,-K32						
2	Relay socket	10 700 007		7.3411.00010	WEHRLE		-K30,-K31						
3	Relay socket	10 485 008		7.3411.0	WEHRLE		-K40,-K34,-K32						
1	Fuse socket 1-pole			7.6410.00010	L&K		-F32						
1	Fuse		50 A	7.6411.0	L&K		-F32						
1	Fuse socket 4-pole			7.6407.00010	L&K		-F1,-F30						
1	UNIVAL-Fuse		15 A	7.6411.00060	L&K		-F1						
1	UNIVAL-Fuse		25 A	7.6411.00070	L&K		-F30						
	components Control panel												
1	Indicator light red		12 V/red	7.9027.10200	SCHLEGEL		-P1						
1	Lamp	W2x4,6-12 V	12 V/1,0 W	8.7030.0	SCHLEGEL		-P1						
1	Hour meter			8.6569.0	BAUSER		-P10						
1	Distance temperature gauge	0-120°C/115°C	1 W	8.7915.00020	WIEGAND		-B40						
	model-dependent components												
	option oa:												
1	Battery isolating switch	DC 24V	500 A, 2500 A 10s	7.5788.00030	HELLA		-Q11						
	components Full load operation												
1	Illuminated pushbutton green	RKTME+T20FGN+BSRXU		7.9027.10010	SCHLEGEL		-S12/-P12						
1	Switching element	BTL5	2 W	7.9027.10030	SCHLEGEL		-S12/-P12						
1	Lamp	T5,5K-12	12 V/1,2 W	7.9027.10060	SCHLEGEL		-S12/-P12						

Bei Nachbestellung von Geräten und Maschinen sind alle in den stark umrandeten aufzuführen. Die Daten in den Spalten D bis G sind zusätzlich unter Nennung anzugeben, soweit sie die Beantwortung technischer Rückfragen erleichtern, die Angabe der Serialnummer erforderlich, falls diese auf dem Typenschild des

In Zweifelsfällen gilt die deutsche Fassung.

Spalten B und C angegebenen Daten dieser Gerätestücklisten-Nummer Für Ersatzteilbestellung ist zusätzlich Erzeugnisses genannt ist.

When reordering the equipment, all data enclosed by the heavy lines of columns addition, the data in columns D to G should be given together with the No. of they ar helpful in answering technical enquiries. When ordering spare parts. product if stated on the rating plate.

The German version applies in cases of doubt.

B and C should be stated. In this list of equipment, insofar as also quote the serial No. of the

*) Versandanschrift - Kennzeichen

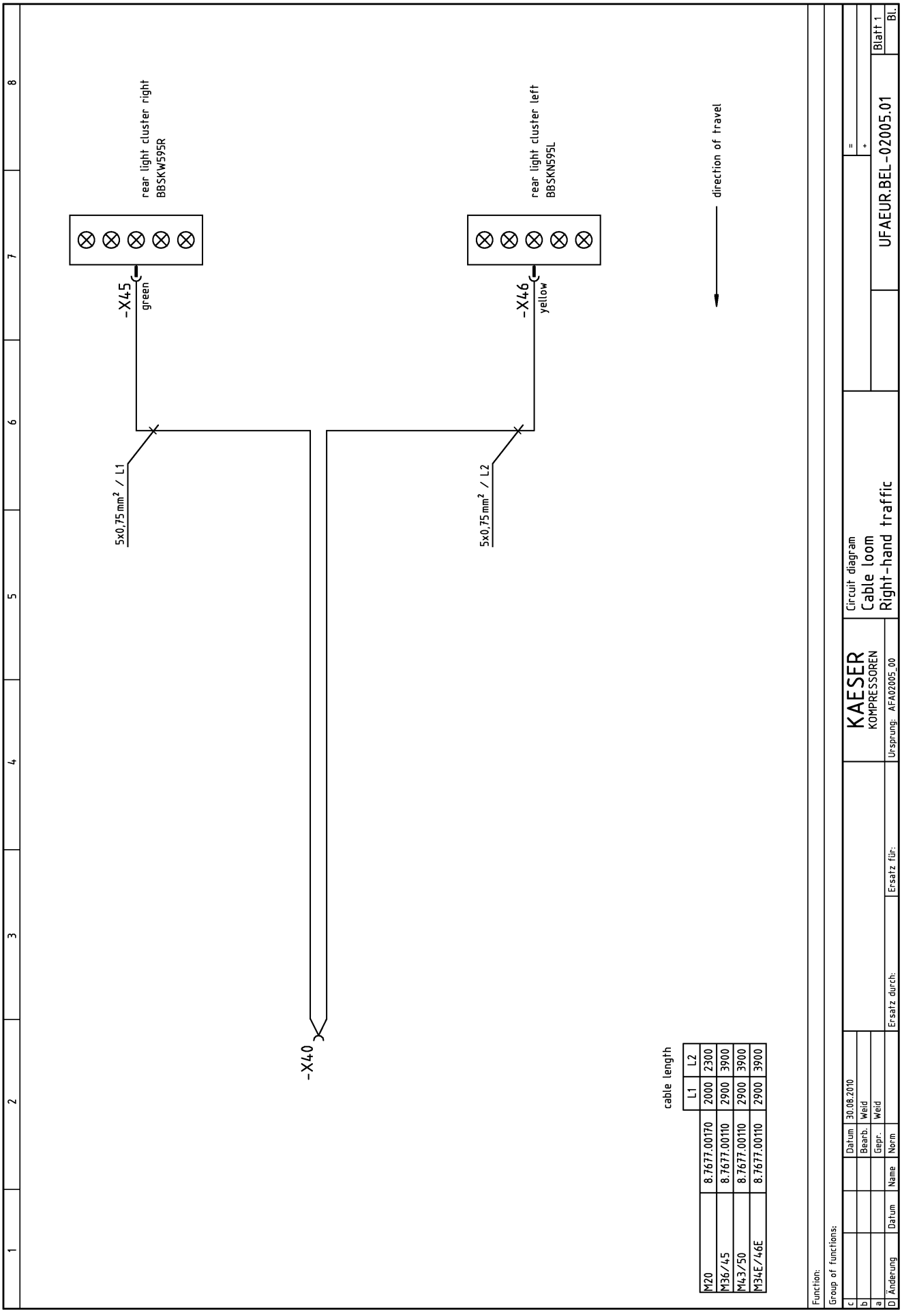
c				Datum	18.09.2014	KAESER KOMPRESSOREN	Equipment parts list			=	
b				Bearbeiter	Sitter		MOBILAIR M43/M50			+	
a				Geprüft	Weid		components				
F	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa03009_00		GFA4350-03009.01	page 1 / 1 Bl.

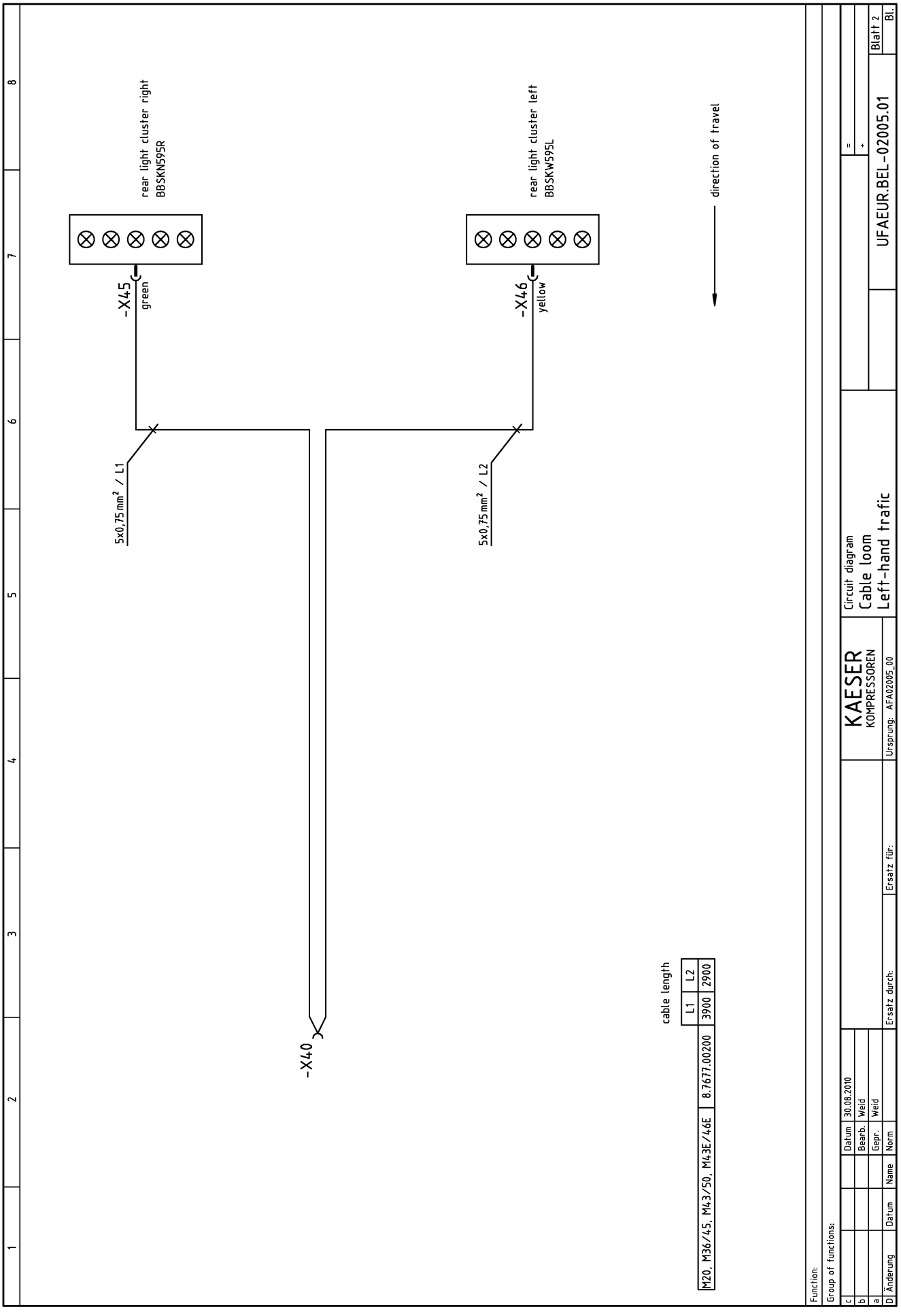
13.5 Option tc
Lighting and signaling system connection

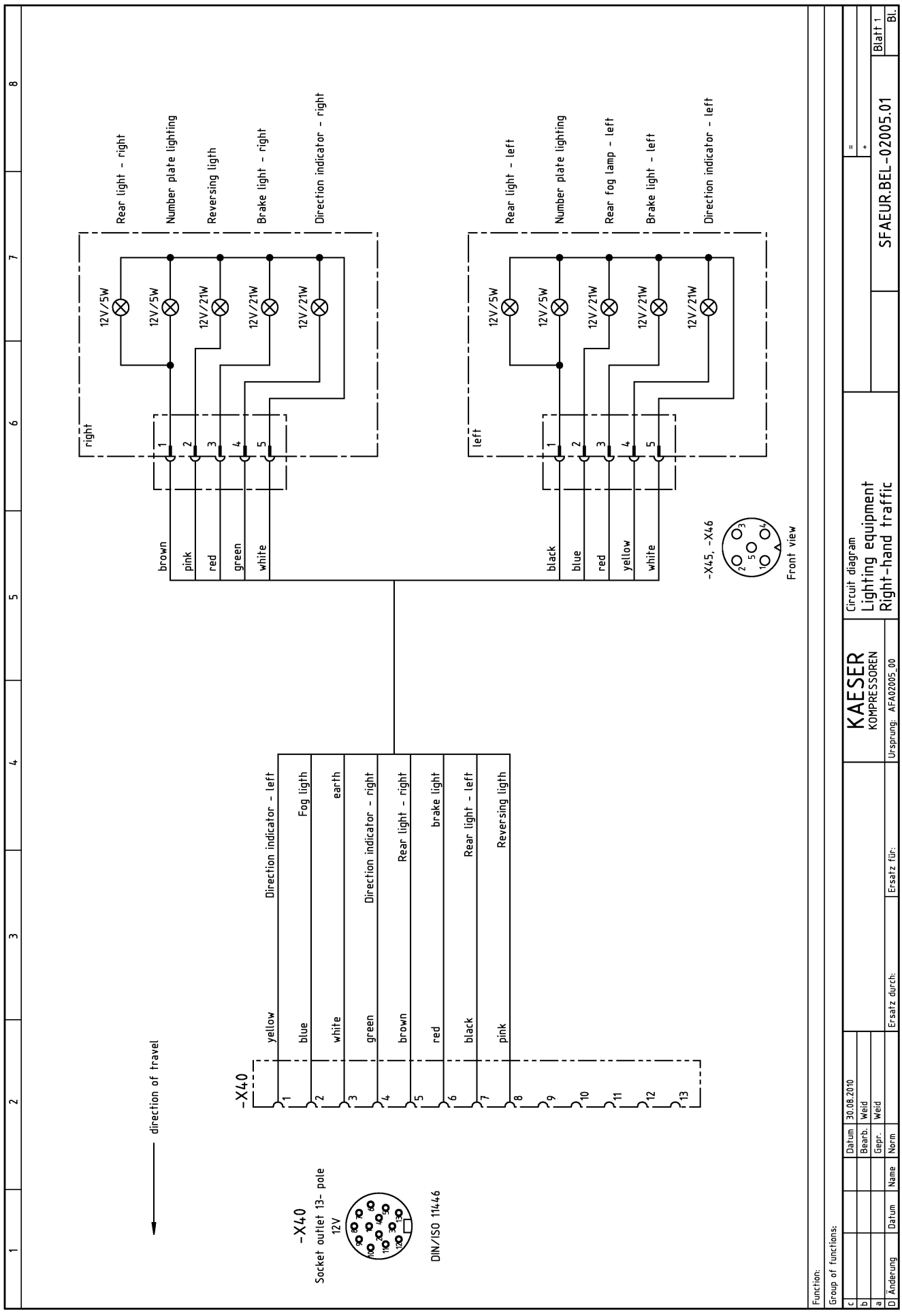
Electrical diagrams
MOBILAIR
Lighting equipment
connection 12V/13-pole

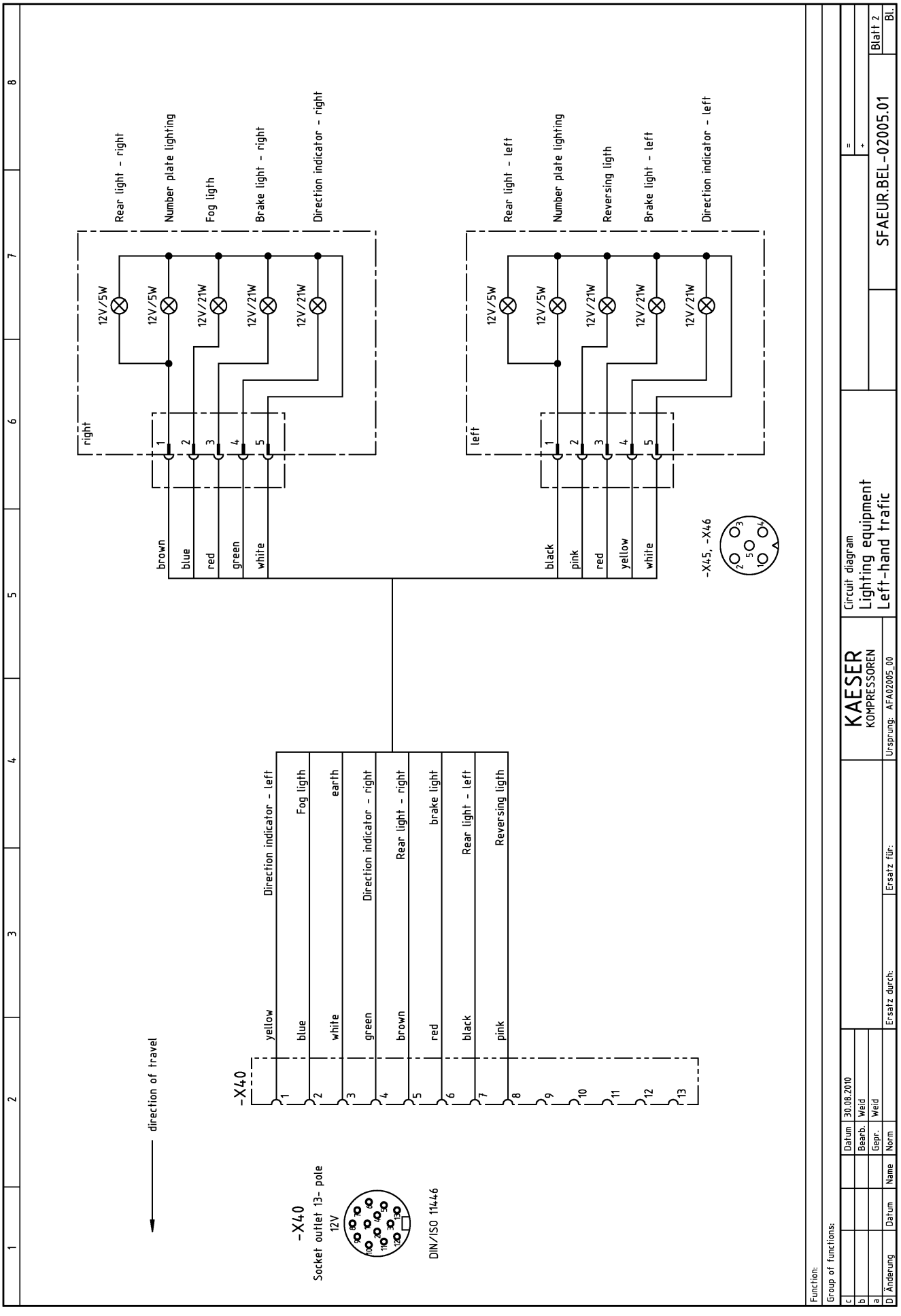
Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	30.08.2010 E		KAESER KOMPRESSOREN	Cover page MOBILAIR Lighting equipment	=
b				Bearb.	Weid				+
a				Gepr.	Weid				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AFA02005_00		DFAEUR.BEL-02005.01 Blatt 1 Bl.


rear light cluster right
BBSKW595R
rear light cluster left
BBSKN595L
direction of travel
-X45
green
-X46
yellow
5x0,75 mm² / L1
5x0,75 mm² / L2
-X40
cable length
M20 8.7677.00170 L1 2000 L2 2300
M36/45 8.7677.00110 2900 3900
M43/50 8.7677.00110 2900 3900
M34E/46E 8.7677.00110 2900 3900
KAESER KOMPRESSOREN
Circuit diagram
Cable loom
Right-hand traffic
UFAEUR.BEL-02005.01
Blatt 1
Ursprung: AFA02005_00
Ersatz durch:
Ersatz für:
Datum 30.08.2010
Bearb. Weid
Gepr. Weid
Name
Norm
Function:
Group of functions:


rear light cluster right
BBSKN595R
rear light cluster left
BBSKW595L
direction of travel
-X45
green
-X46
yellow
5x0,75 mm² / L1
5x0,75 mm² / L2
-X40
cable length
L1 3900
L2 2900
M20, M36/45, M43/50, M43E/46E 8.7677.00200
KAESER KOMPRESSOREN
Circuit diagram
Cable loom
Left-hand trafic
UFAEUR.BEL-02005.01
Blatt 2
Ursprung: AFA02005_00
Datum 30.08.2010
Bearb. Weid
Gepr. Weid
Name
Norm
Ersatz durch:
Ersatz für:
Function:
Group of functions:


Rear light - right
Number plate lighting
Reversing ligth
Brake light - right
Direction indicator - right
12V/5W
12V/5W
12V/21W
12V/21W
12V/21W
right
1
2
3
4
5
brown
pink
red
green
white
Rear light - left
Number plate lighting
Rear fog lamp - left
Brake light - left
Direction indicator - left
12V/5W
12V/5W
12V/21W
12V/21W
12V/21W
left
1
2
3
4
5
black
blue
red
yellow
white
-X45, -X46
Front view
direction of travel
-X40
Direction indicator - left
Fog ligth
earth
Direction indicator - right
Rear light - right
brake light
Rear light - left
Reversing ligth
yellow
blue
white
green
brown
red
black
pink
1
2
3
4
5
6
7
8
9
10
11
12
13
-X40
Socket outlet 13- pole
12V
DIN/ISO 11446
KAESER KOMPRESSOREN
Circuit diagram
Lighting equipment
Right-hand traffic
SFAEUR.BEL-02005.01
Blatt 1
Bl.
Datum 30.08.2010
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: AFA02005_00
Function:
Group of functions:

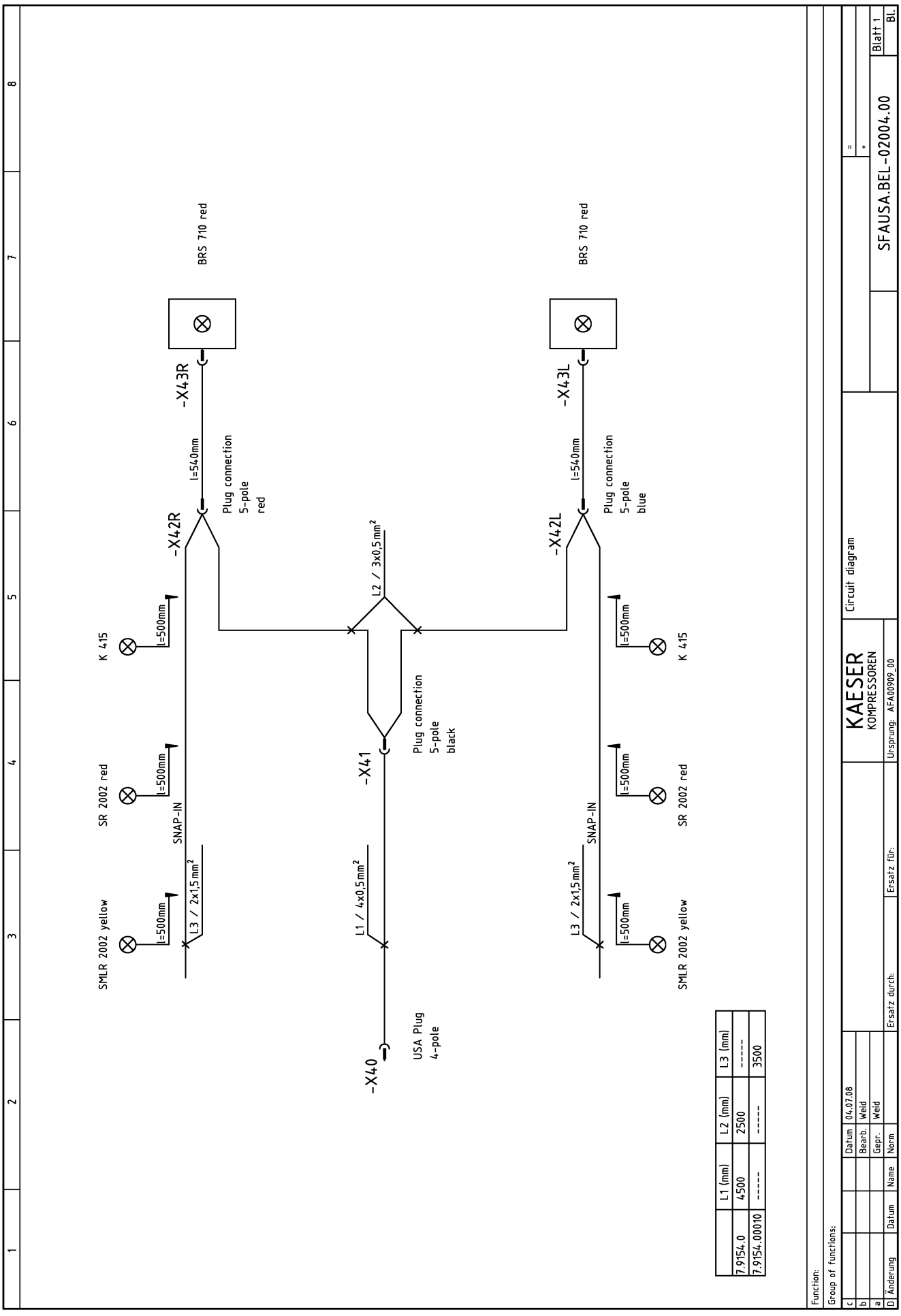

right
Rear light - right
Number plate lighting
Fog ligth
Brake light - right
Direction indicator - right
12V/5W
12V/5W
12V/21W
12V/21W
12V/21W
brown
blue
red
green
white
left
Rear light - left
Number plate lighting
Reversing ligth
Brake light - left
Direction indicator - left
12V/5W
12V/5W
12V/21W
12V/21W
12V/21W
black
pink
red
yellow
white
-X45, -X46
direction of travel
-X40
Direction indicator - left
Fog ligth
earth
Direction indicator - right
Rear light - right
brake light
Rear light - left
Reversing ligth
yellow
blue
white
green
brown
red
black
pink
-X40
Socket outlet 13- pole
12V
DIN/ISO 11446
KAESER KOMPRESSOREN
Circuit diagram
Lighting equipment
Left-hand trafic
SFAEUR.BEL-02005.01
Blatt 2
Bl.
Function:
Group of functions:
Datum 30.08.2010
Bearb. Weid
Gepr. Weid
Name
Norm
Ersatz durch:
Ersatz für:
Ursprung: AFA02005_00
Änderung
Datum

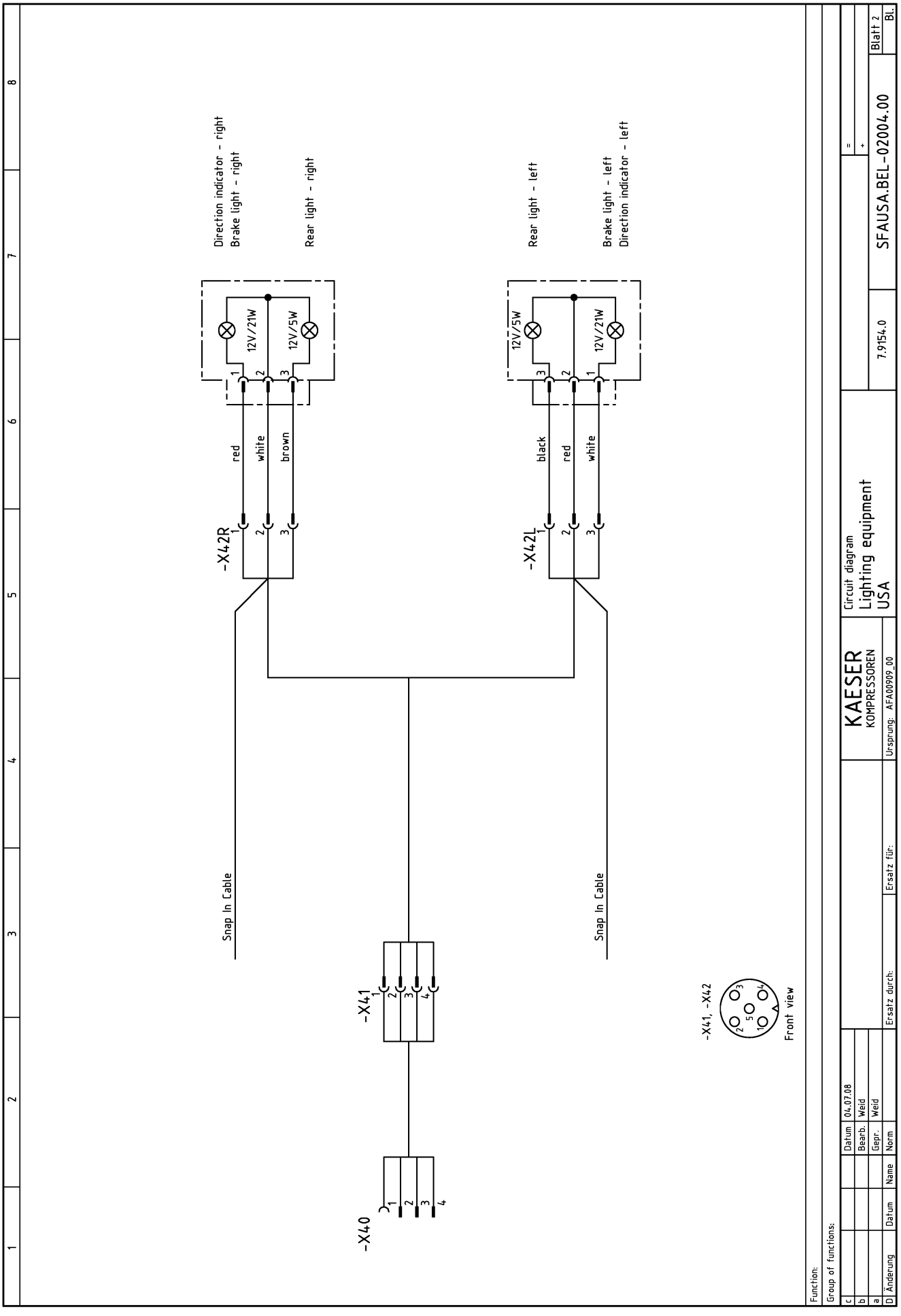
13.6 Option te
Lighting and signaling system connection

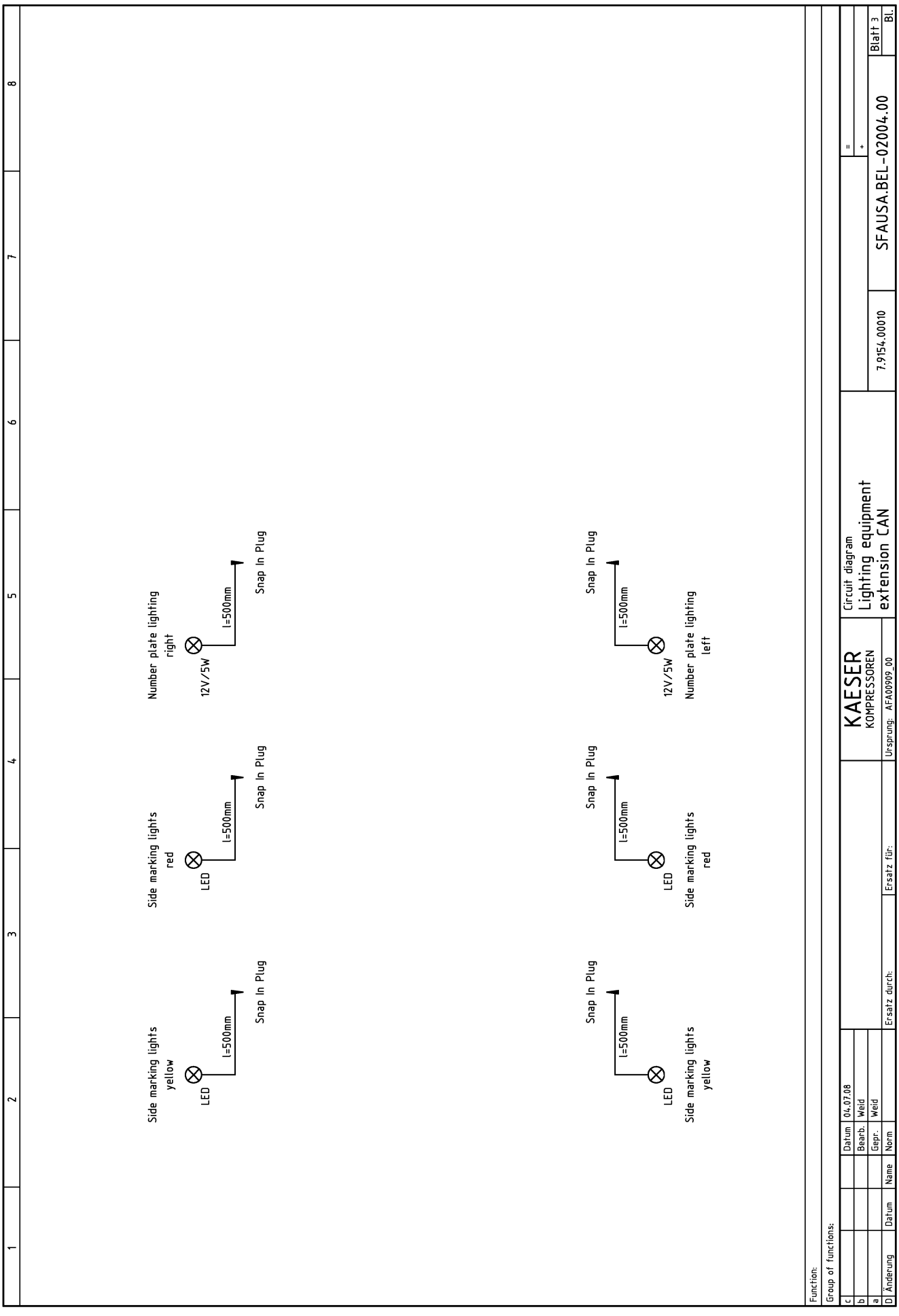
Electrical diagrams
MOBILAIR
Lighting equipment
for USA / CAN

Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

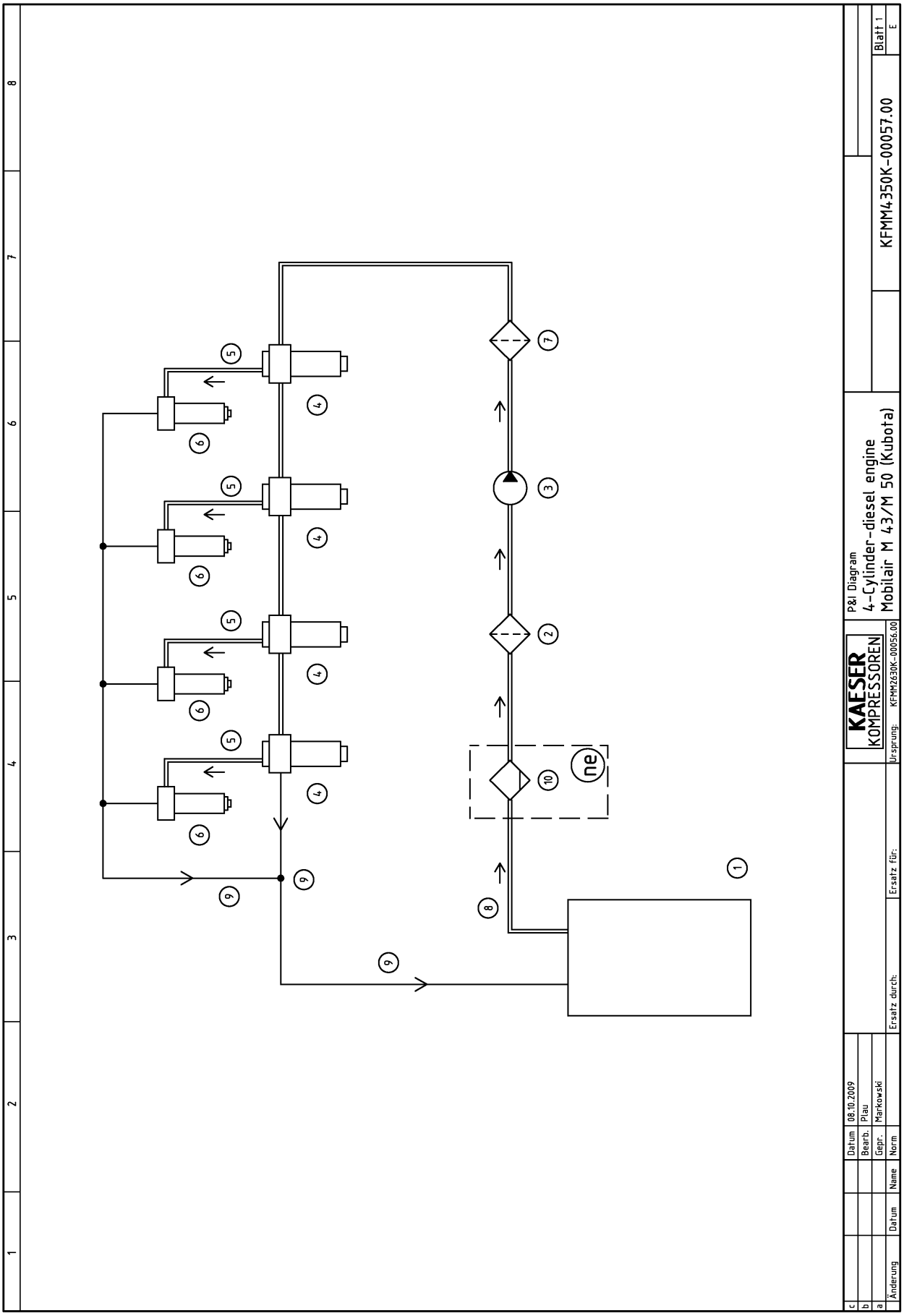
c				Datum	04.07.08 E		KAESER KOMPRESSOREN	Cover page MOBILAIR Lighting equipment	=
b				Bearb.	Weid				+
a				Gepr.	Weid				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AFA00909_00	DFAUSA.BEL-02004.00	Blatt 1 Bl.


BRS 710 red
-X43R
l=540mm
Plug connection
5-pole
red
-X42R
K 415
l=500mm
SR 2002 red
SNAP-IN
SMLR 2002 yellow
L3 / 2x1,5mm²
L2 / 3x0,5mm²
-X41
Plug connection
5-pole
black
L1 / 4x0,5mm²
-X40
USA Plug
4-pole
BRS 710 red
-X43L
l=540mm
Plug connection
5-pole
blue
-X42L
K 415
SR 2002 red
SNAP-IN
SMLR 2002 yellow
L3 / 2x1,5mm²
l=500mm
L1 (mm) L2 (mm) L3 (mm)
7.9154.0 4500 2500 -----
7.9154.00010 ----- ----- 3500
KAESER KOMPRESSOREN
Circuit diagram
SFAUSA.BEL-02004.00
Blatt 1
Bl.
Function:
Group of functions:
Datum 04.07.08
Bearb. Weid
Gepr. Weid
Ersatz durch:
Ersatz für:
Ursprung: AFA00909_00
Änderung Datum Name
Norm


Direction indicator - right
Brake light - right
Rear light - right
Rear light - left
Brake light - left
Direction indicator - left
12V/21W
12V/5W
12V/5W
12V/21W
red
white
brown
black
red
white
-X42R
-X42L
Snap In Cable
Snap In Cable
-X41
-X40
-X41, -X42
Front view
Function:
Group of functions:
KAESER KOMPRESSOREN
Circuit diagram
Lighting equipment
USA
7.9154.0
SFAUSA.BEL-02004.00
Blatt 2
Bl.
Datum 04.07.08
Bearb. Weid
Gepr. Weid
Norm
Ersatz durch:
Ersatz für:
Ursprung: AFA00909_00
Änderung
Name
Datum


Side marking lights
yellow
LED
l=500mm
Snap In Plug
Side marking lights
red
LED
l=500mm
Snap In Plug
Number plate lighting
right
12V/5W
l=500mm
Snap In Plug
Snap In Plug
l=500mm
LED
Side marking lights
yellow
Snap In Plug
l=500mm
LED
Side marking lights
red
Snap In Plug
l=500mm
12V/5W
Number plate lighting
left
Function:
Group of functions:
Datum 04.07.08
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: AFA00909_00
KAESER KOMPRESSOREN
Circuit diagram
Lighting equipment extension CAN
7.9154.00010
SFAUSA.BEL-02004.00
Blatt 3
Bl.

13.7 Fuel circulation diagram


P&I Diagram
4-Cylinder-diesel engine
Mobilair M 43/M 50 (Kubota)
KFMM4350K-00057.00
KAESER KOMPRESSOREN
Ursprung: KFMM2630K-00056.00
Ersatz für:
Ersatz durch:
Datum 08.10.2009
Bearb. Plau
Gepr. Markowski
Norm
Name
Datum
Änderung
Blatt 1
ne

1	Fuel tank	7	Fuel filter
2	Fuel prefilter	8	Fuel supply line
3	Fuel feed pump	9	Fuel return line
4	Injection pump	10	Water separator
5	Injection pipe	Option	
6	Injection nozzle	ne	Water separator

c				Datum	08.10.2009		
b				Bearb.	Plau		
a				Gepr.	Markowski		
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:

KAESER KOMPRESSOREN

Ursprung: KFMM2630K-00056.00

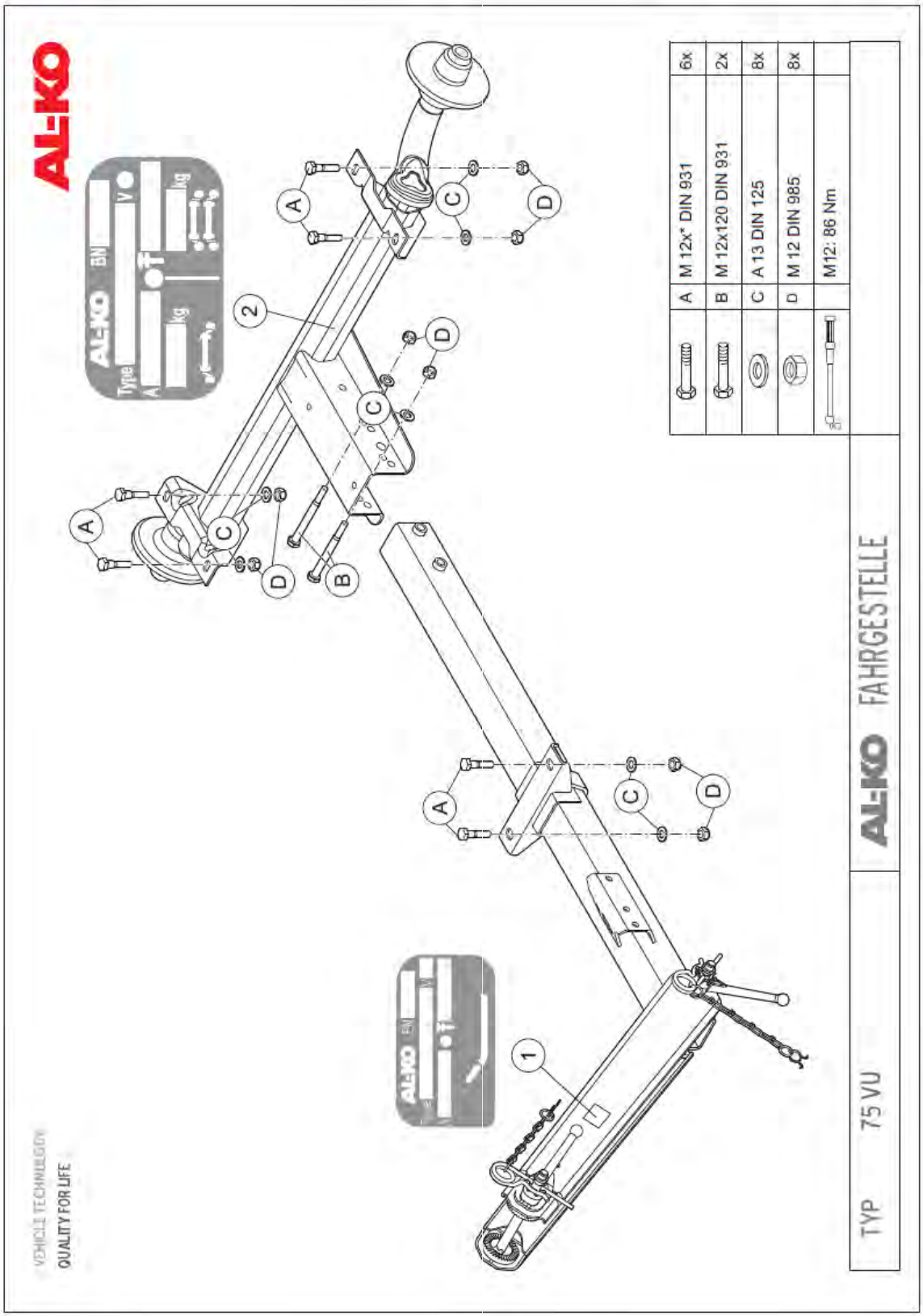
P&I Diagram legend
4-Cylinder-diesel engine
Mobilair M 43/M 50 (Kubota)

KFMM4350K-00057.00

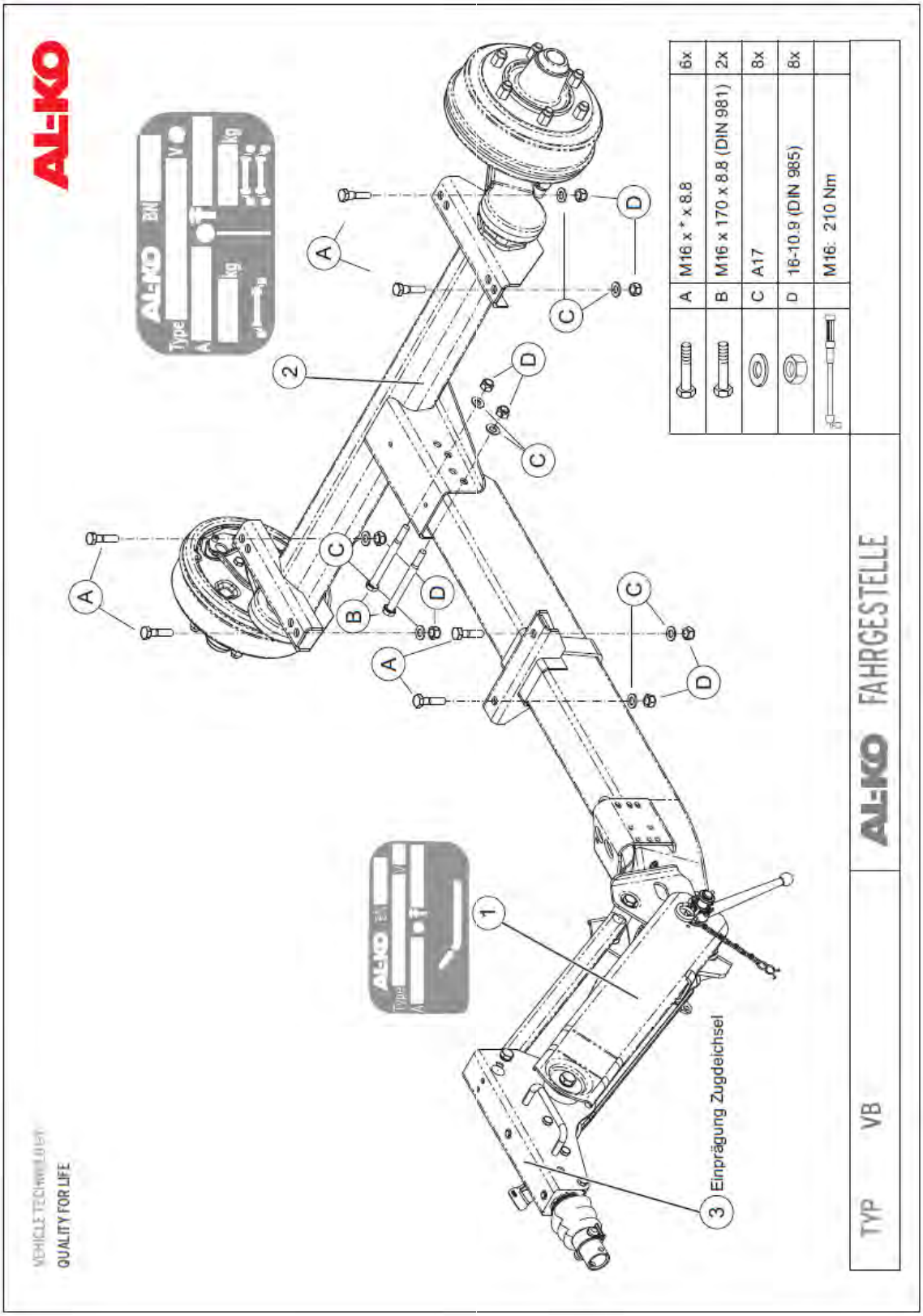
Blatt 2
E

13.8 Assambly diagrams chassis

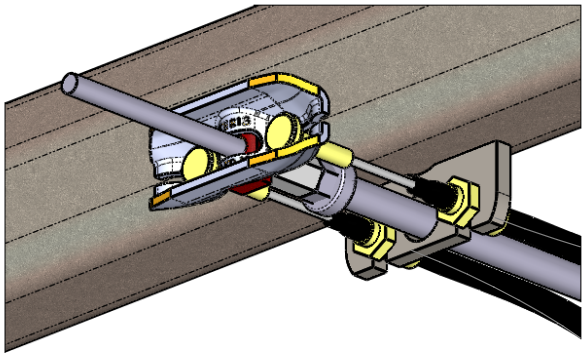
EU chassis option rb/rm/rr

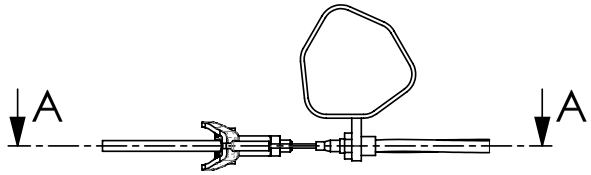

AL-KO
VEHICLE TECHNOLOGY
QUALITY FOR LIFE
TYP 75 VU
AL-KO FAHRGESTELLE
A M 12x* DIN 931 6x
B M 12x120 DIN 931 2x
C A 13 DIN 125 8x
D M 12 DIN 985 8x
M12: 86 Nm
1
2
A
B
C
D

EU chassis option rb/rm/rs

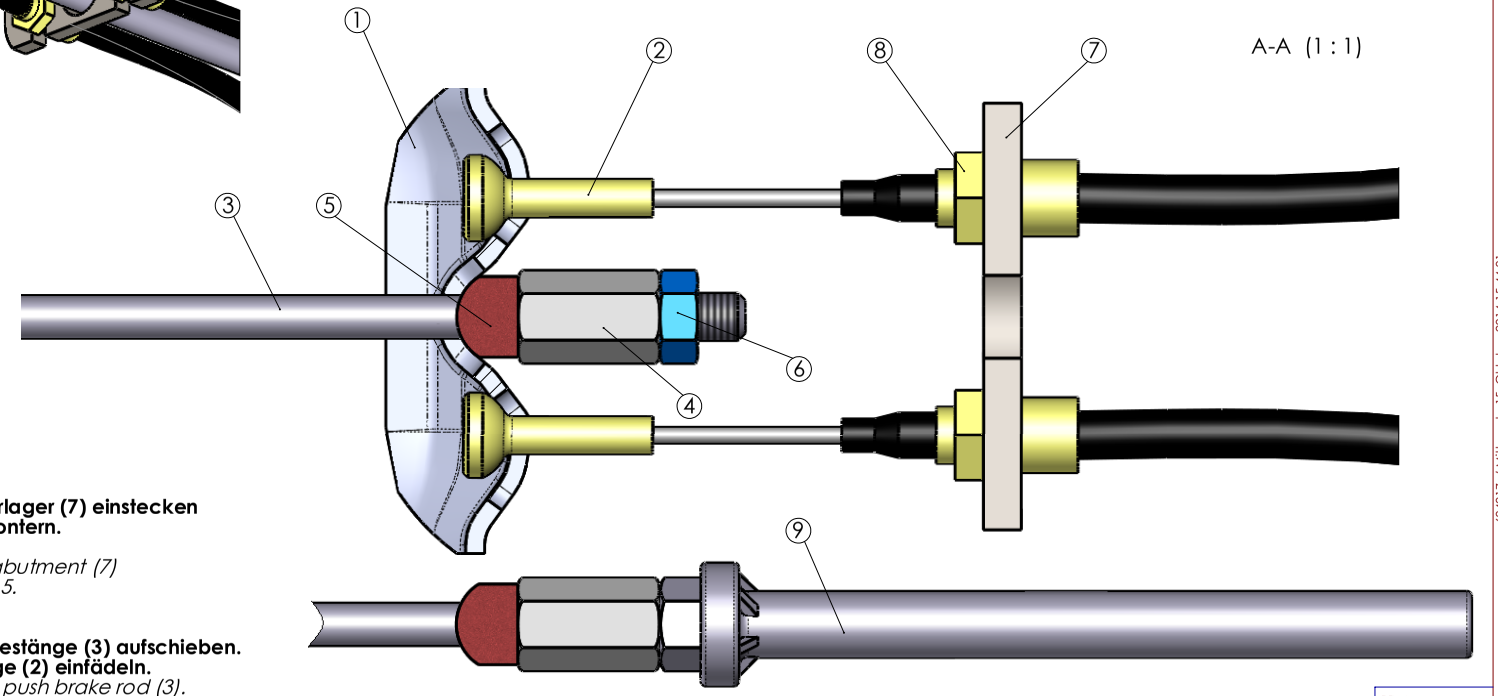

AL-KO
TYP VB
AL-KO FAHRGESTELLE
A M16 x * x 8.8 6x
B M16 x 170 x 8.8 (DIN 981) 2x
C A17 8x
D 16-10.9 (DIN 985) 8x
M16: 210 Nm
1
2
3 Einprägung Zugdeichsel
QUALITY FOR LIFE

Brake rod adjustment M10





A-A (1 : 1)



1. Bowdenzüge (2) am Achswiderlager (7) einstecken und mit Skt.-Mutter M12x1,5 (8) kontern. Anziehdrehmoment 40-45 Nm.
1. Insert bowden cables (2) into abutment (7) and counter with hex. nut M12x1,5. torque to 40-45 Nm.

2. Ausgleichsprofil (1) auf Bremsgestänge (3) aufschieben. Ausgleichsprofil (1) in Bowdenzüge (2) einfädeln.
2. Put the balance bar (1) on the push brake rod (3). Arrange the balance bar (1) into the bowden cables (2) .

3. Distanzstück (5) auf Bremsgestänge (3) schieben. (Rundung zum Ausgleichsprofil)
3. Fit the distance plate on to the push brake rod. (with the curve to the balance bar)

4. Langmutter M10 (4) aufschrauben und anziehen bis kein Spiel mehr vorhanden ist. Mit Skt.-Mutter M10 (6) kontern. Anziehdrehmoment 20-25Nm
4. Srew the long nut M10 (4) and fix it until no tolerance is available. Counter with hex. nut M10 (6) torque to 20-25Nm.

5. Gestängehalter (9) wahlweise
5. Brake rod rear (9) optional

PDM-Status:

Vers.	RevS	Änderungstext

Oberfläche nach EN ISO 1302	Zul. Abweichung nach DIN ISO 2768 m	Werkstoff	Norm	Halbzeug	Norm	Materialnr.
		-	-	-	-	-

Vers.	RevS	Änd.-Nr.	Datum	Name	Gewicht	KG	Bearb. Name: MUSKIETORZ	Datum: 10.10.2014

Projekt: -

Benennung
MONTPLAN AUSGLEICHSPR R13 EA1636G-2361
-

ALOIS KOBER GMBH
D-89359 Kötz

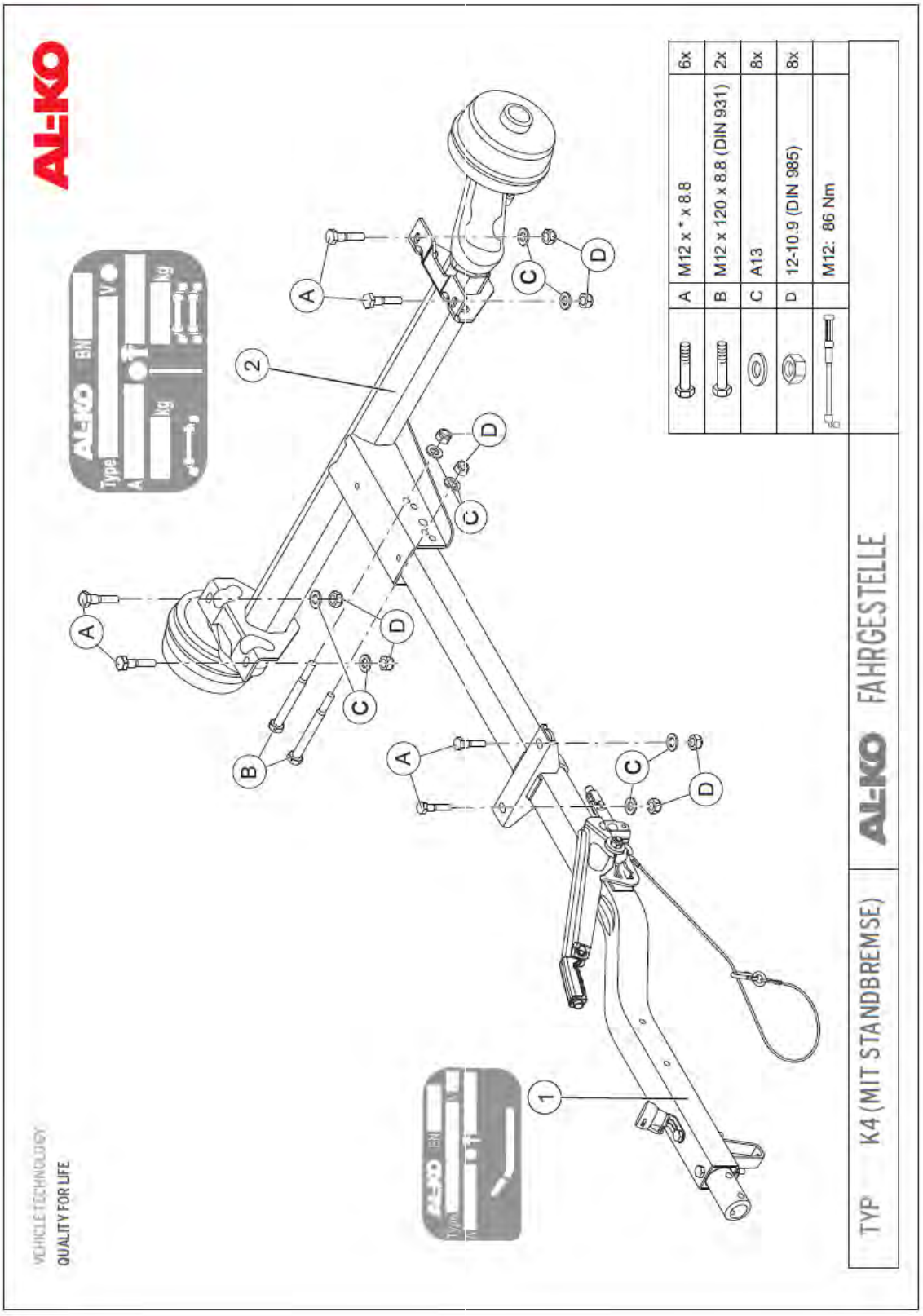
Materialnr. **694917**
Klass.-Nr. 904050
Maßstab 1:4 | Bl.-Nr. 1 | Bl.-Anz. 1 | Format A3

Urspr. | Ers. f. | Ers. d.

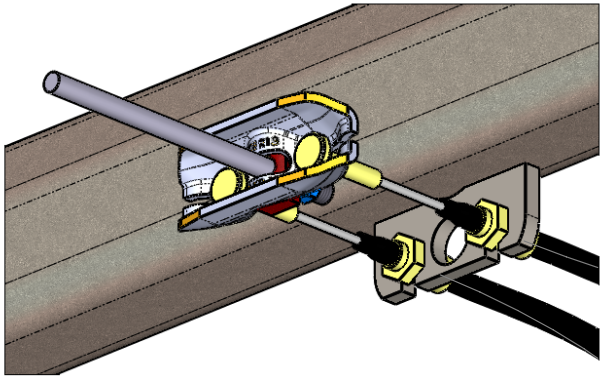
694917 / Mittwoch, 15. Oktober 2014 15:44:01

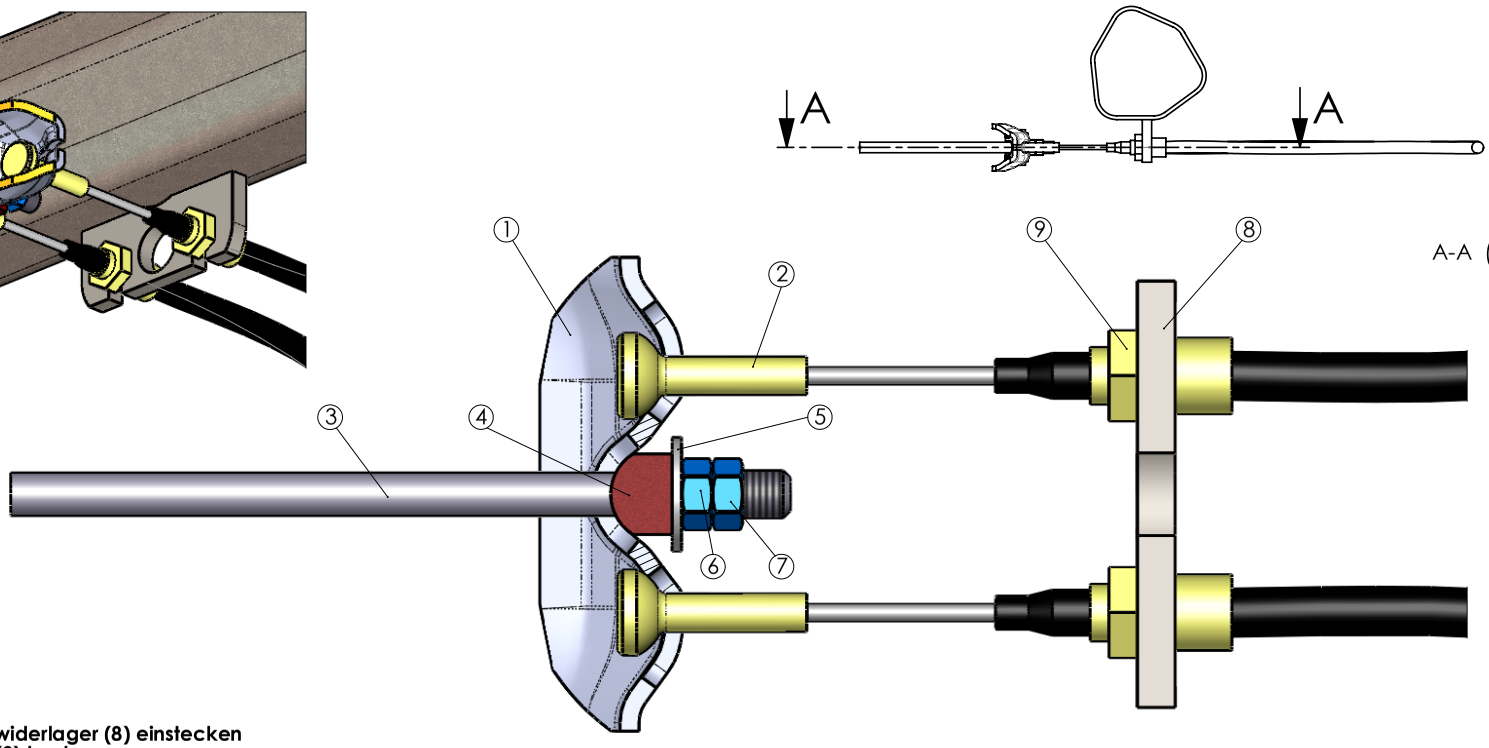
Vorlage Vers. 4.3.1 / 14.07.2005

GB chassis option rc/ro/rr


AL-KO
TYP K4 (MIT STANDBREMSE)
AL-KO FAHRGESTELLE
A M12 x * x 8.8 6x
B M12 x 120 x 8.8 (DIN 931) 2x
C A13 8x
D 12-10.9 (DIN 985) 8x
M12: 86 Nm
VEHICLE TECHNOLOGY
QUALITY FOR LIFE

M8 brake rod





1. Bowdenzüge (2) am Achswiderlager (8) einstecken und mit Skt.-Mutter M12x1,5 (9) kontern. Anziehdrehmoment 40-45 Nm.
1. Insert bowden cables (2) into abutment (8) and counter with hex. nut M12x1,5 (9). torque to 40-45 Nm.

2. Ausgleichsprofil (1) auf Bremsgestänge (3) aufschieben. Ausgleichsprofil (1) in Bowdenzüge (2) einfädeln.
2. Put the balance bar (1) on the push brake rod (3). Arrange the balance bar (1) into the bowden cables (2) .

3. Distanzstück (4) auf Bremsgestänge (3) schieben. (Rundung zum Ausgleichsprofil)
3. Fit the distance plate (4) on to the push brake rod (3). (with the curve to the balance bar)

4. Scheibe (5) aufstecken und Skt.-Mutter M8 (6) aufschrauben und anziehen bis kein Spiel mehr vorhanden ist. Mit Skt.-Mutter M8(7) kontern. Anziehdrehmoment 15-20Nm
4. Mount the washer (5) and screw the hex. nut M8 (6) until free of clearence Counter with hex. nut M8 (7) torque to 15-20Nm.

PDM-Status:

Vers.	RevS	Änderungstext

Oberfläche nach EN ISO 1302	Zul. Abweichung nach DIN ISO 2768 m	Werkstoff	Norm	Halbzeug	Norm	Materialnr.
		-	-	-	-	-

Vers.	RevS	Änd.-Nr.	Datum	Name	Gewicht	KG	Bearb. Name: MUSKIETORZ	Datum: 10.10.2014

Projekt: -

Benennung
MONTPLAN AUSGLEICHSPR R13 EA-STANDBREM
-

ALOIS KOBER GMBH
D-89359 Kötz

Materialnr.	Klass.-Nr.
694953	904050

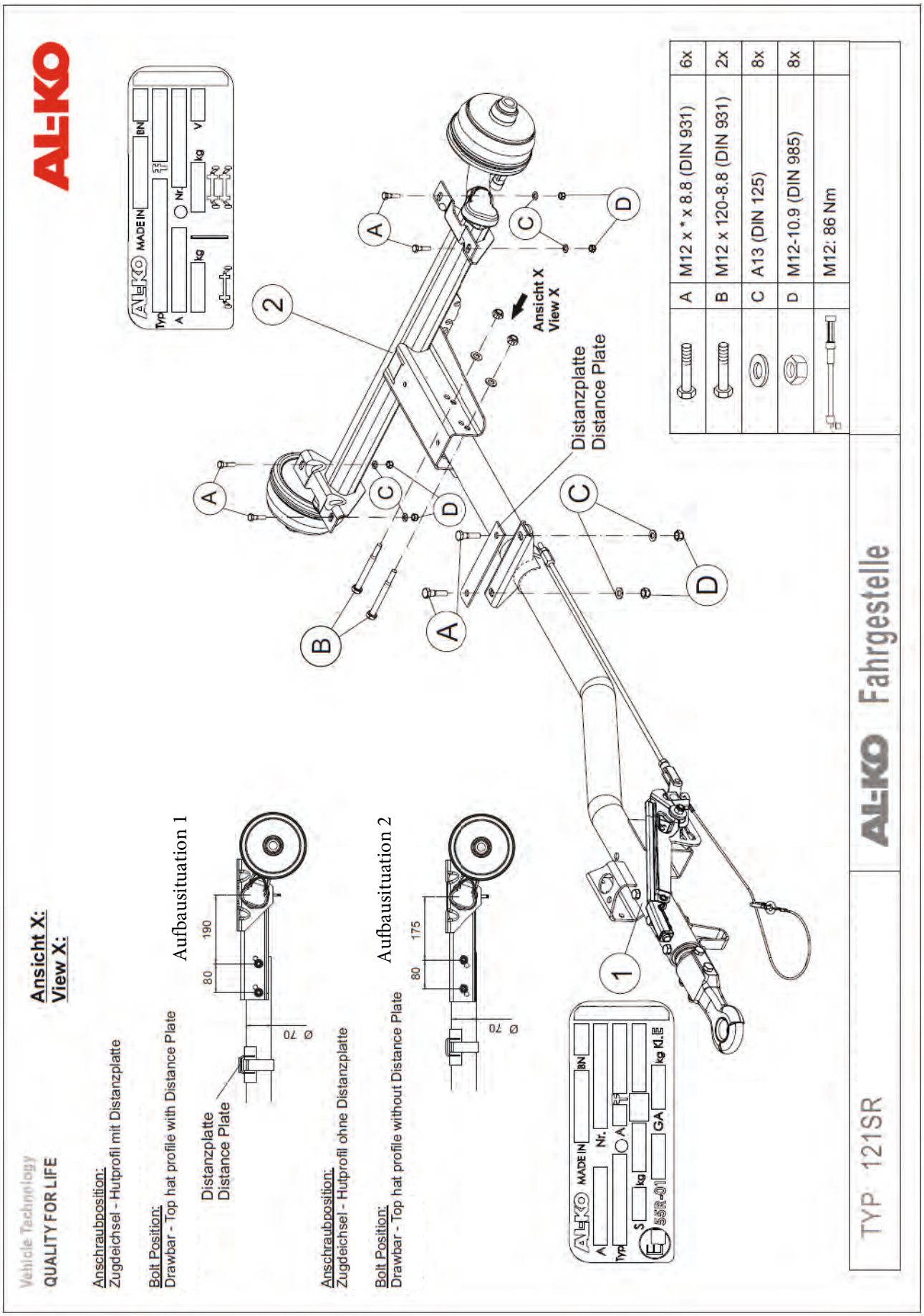
Maßstab	Bl.-Nr.	Bl.-Anz.	Format
1:5	1	1	A3

Urspr. | Ers. f. | Ers. d.

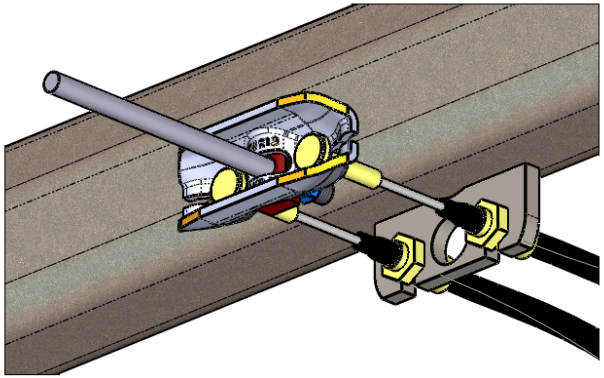
694953 / Mittwoch, 29. Oktober 2014 13:28:03

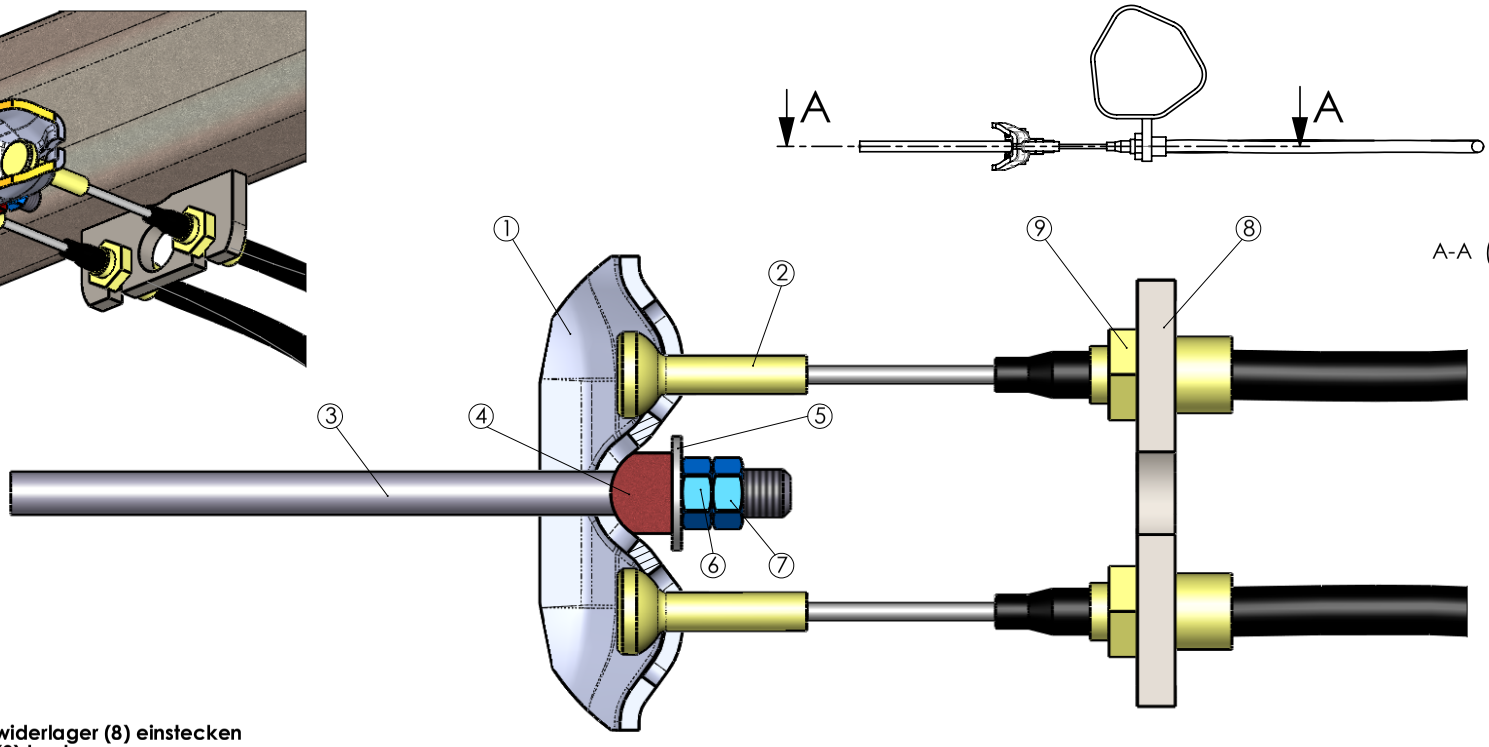
Vorlage Vers. 4.3.1 / 14.07.2005

GB chassis option rg/rp/rr


AL-KO
Vehicle Technology
QUALITY FOR LIFE
Ansicht X:
View X:
Anschraubposition:
Zugdeichsel - Hutprofil mit Distanzplatte
Bolt Position:
Drawbar - Top hat profile with Distance Plate
Aufbausituation 1
Distanzplatte
Distance Plate
Anschraubposition:
Zugdeichsel - Hutprofil ohne Distanzplatte
Bolt Position:
Drawbar - Top hat profile without Distance Plate
Aufbausituation 2
Ansicht X
View X
Distanzplatte
Distance Plate
A M12 x * x 8.8 (DIN 931) 6x
B M12 x 120-8.8 (DIN 931) 2x
C A13 (DIN 125) 8x
D M12-10.9 (DIN 985) 8x
M12: 86 Nm
TYP 121SR
AL-KO Fahrgestelle

Brake rod M8





1. Bowdenzüge (2) am Achswiderlager (8) einstecken und mit Skt.-Mutter M12x1,5 (9) kontern. Anziehdrehmoment 40-45 Nm.
1. Insert bowden cables (2) into abutment (8) and counter with hex. nut M12x1,5 (9). torque to 40-45 Nm.

2. Ausgleichsprofil (1) auf Bremsgestänge (3) aufschieben. Ausgleichsprofil (1) in Bowdenzüge (2) einfädeln.
2. Put the balance bar (1) on the push brake rod (3). Arrange the balance bar (1) into the bowden cables (2) .

3. Distanzstück (4) auf Bremsgestänge (3) schieben. (Rundung zum Ausgleichsprofil)
3. Fit the distance plate (4) on to the push brake rod (3). (with the curve to the balance bar)

4. Scheibe (5) aufstecken und Skt.-Mutter M8 (6) aufschrauben und anziehen bis kein Spiel mehr vorhanden ist. Mit Skt.-Mutter M8(7) kontern. Anziehdrehmoment 15-20Nm
4. Mount the washer (5) and screw the hex. nut M8 (6) until free of clearence Counter with hex. nut M8 (7) torque to 15-20Nm.

PDM-Status:

Vers.	RevS	Änderungstext

Oberfläche nach EN ISO 1302	Zul. Abweichung nach DIN ISO 2768 m	Werkstoff	Norm	Halbzeug	Norm	Materialnr.
		-	-	-	-	-

Vers.	RevS	Änd.-Nr.	Datum	Name	Gewicht	KG	Bearb. Name: MUSKIETORZ	Datum: 10.10.2014

Projekt: -

Benennung
MONTPLAN AUSGLEICHSPR R13 EA-STANDBREM
-

ALOIS KOBER GMBH
D-89359 Kötz

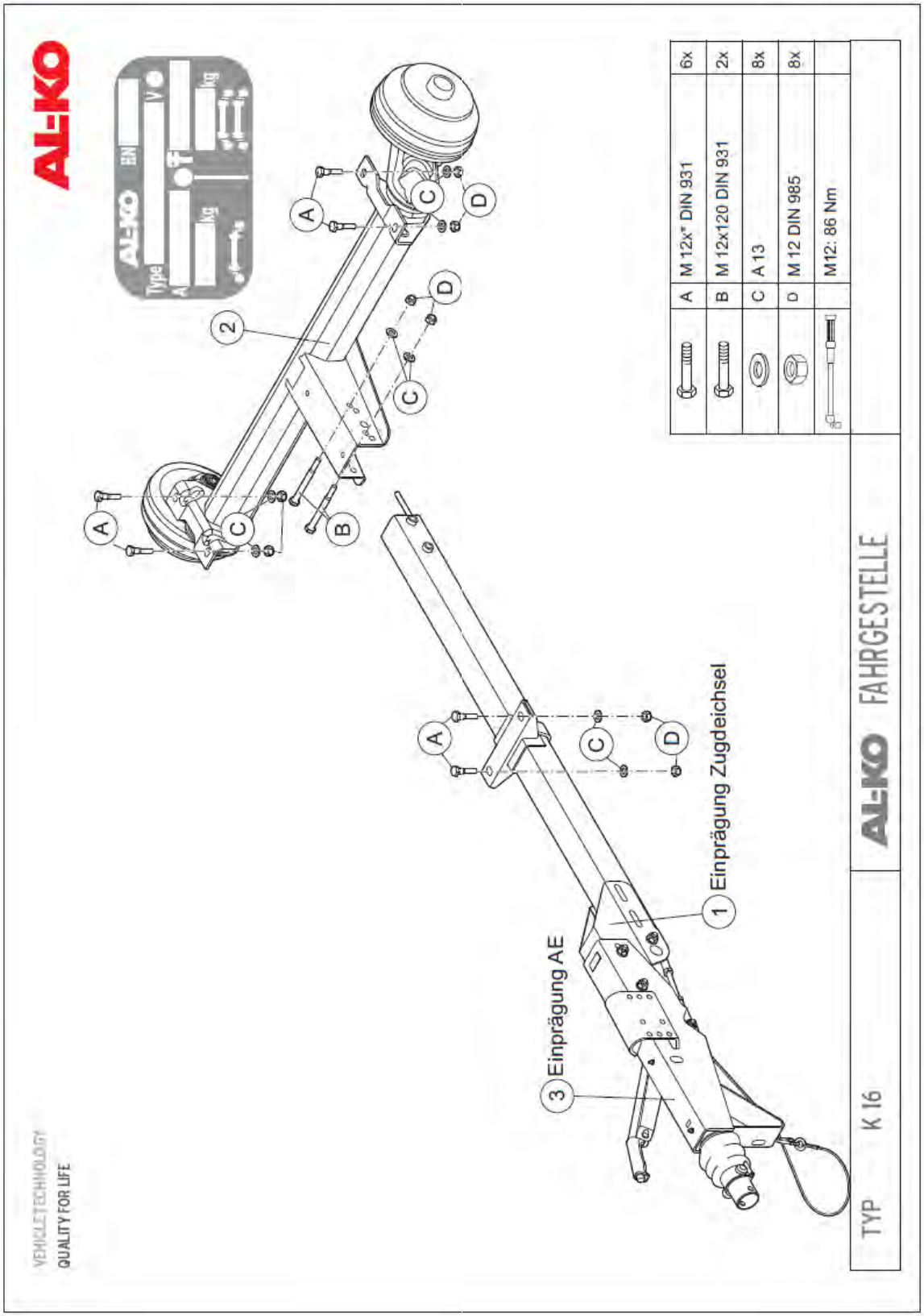
Materialnr. **694953**
Klass.-Nr. 904050
Maßstab 1:5 | Bl.-Nr. 1 | Bl.-Anz. 1 | Format A3

Urspr. | Ers. f. | Ers. d.

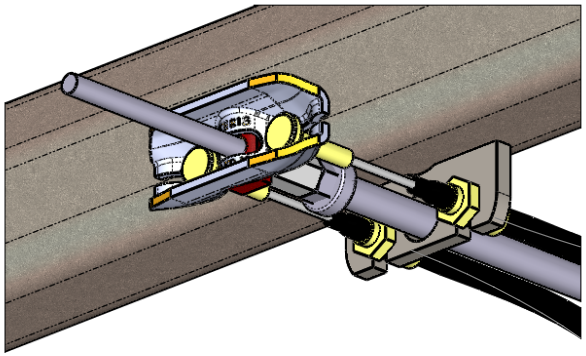
Vorlage Vers. 4.3.1 / 14.07.2005

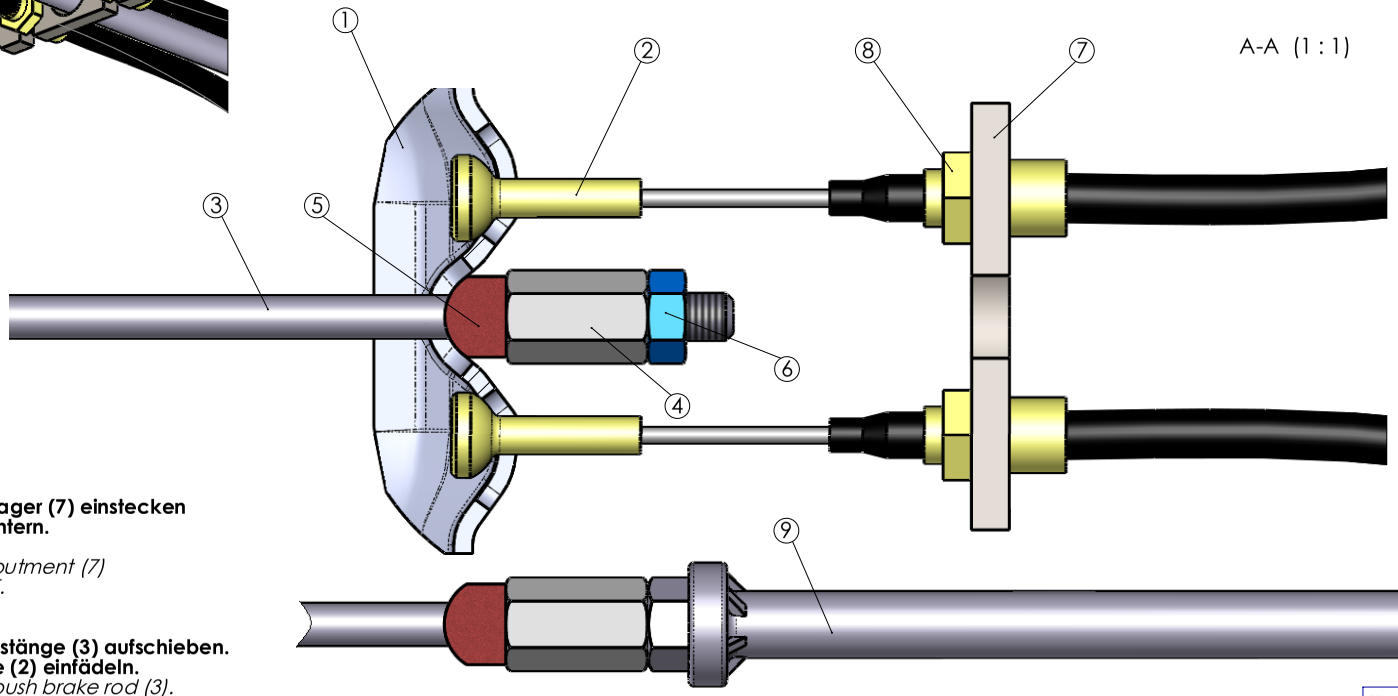
694953 / Mittwoch, 29. Oktober 2014 13:28:03

GB chassis option rc/ro/rs


AL-KO
A M 12x* DIN 931 6x
B M 12x120 DIN 931 2x
C A 13 8x
D M 12 DIN 985 8x
M12: 86 Nm
TYP K 16
AL-KO FAHRGESTELLE
1 Einprägung Zugdeichsel
2
3 Einprägung AE
VEHICLE TECHNOLOGY
QUALITY FOR LIFE

M10 brake rod





1. Bowdenzüge (2) am Achswiderlager (7) einstecken und mit Skt.-Mutter M12x1,5 (8) kontern. Anziehdrehmoment 40-45 Nm.
1. Insert bowden cables (2) into abutment (7) and counter with hex. nut M12x1,5. torque to 40-45 Nm.

2. Ausgleichsprofil (1) auf Bremsgestänge (3) aufschieben. Ausgleichsprofil (1) in Bowdenzüge (2) einfädeln.
2. Put the balance bar (1) on the push brake rod (3). Arrange the balance bar (1) into the bowden cables (2) .

3. Distanzstück (5) auf Bremsgestänge (3) schieben. (Rundung zum Ausgleichsprofil)
3. Fit the distance plate on to the push brake rod. (with the curve to the balance bar)

4. Langmutter M10 (4) aufschrauben und anziehen bis kein Spiel mehr vorhanden ist. Mit Skt.-Mutter M10 (6) kontern. Anziehdrehmoment 20-25Nm
4. Srew the long nut M10 (4) and fix it until no tolerance is available. Counter with hex. nut M10 (6) torque to 20-25Nm.

5. Gestängehalter (9) wahlweise
5. Brake rod rear (9) optional

PDM-Status:

Vers.	RevS	Änderungstext

Oberfläche nach EN ISO 1302	Zul. Abweichung nach DIN ISO 2768 m	Werkstoff	Norm	Halbzeug	Norm	Materialnr.
		-	-	-	-	-

Vers.	RevS	Änd.-Nr.	Datum	Name	Gewicht	KG	Bearb. Name: MUSKIETORZ	Datum: 10.10.2014
								Projekt: -

Benennung
MONTPLAN AUSGLEICHSPR R13 EA1636G-2361
-

ALOIS KOBER GMBH
D-89359 Kötz

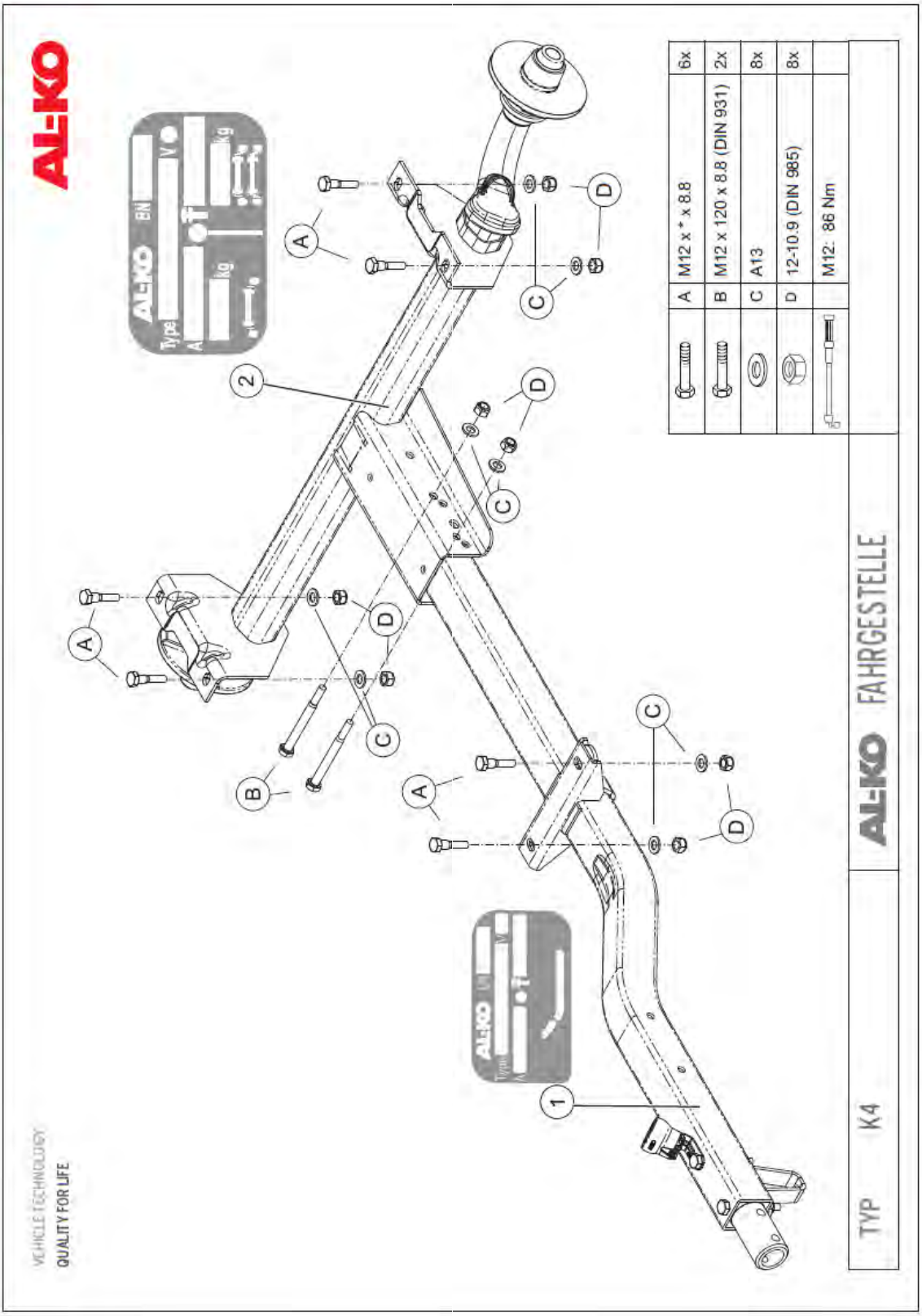
Materialnr. **694917**
Klass.-Nr. 904050
Maßstab 1:4 | Bl.-Nr. 1 | Bl.-Anz. 1 | Format A3

Urspr. | Ers. f. | Ers. d.

Vorlage Vers. 4.3.1 / 14.07.2005

694917 / Mittwoch, 15. Oktober 2014 15:44:01

US chassis option rd/ro/rr


AL-KO
A M12 x * x 8.8 6x
B M12 x 120 x 8.8 (DIN 931) 2x
C A13 8x
D 12-10.9 (DIN 985) 8x
M12: 86 Nm
TYP K4
AL-KO FAHRGESTELLE
VEHICLE TECHNOLOGY
QUALITY FOR LIFE