

SERVICE MANUAL

Screw Compressor

M57

No.: 9_5897 03 USE

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1 Regarding this Document

1.1 Using the Document

The service manual is part of the machine.

- Keep the service manual in a safe place throughout the life of the machine.
- Pass the manual on to the next owner/user of the machine.
- Ensure that all amendments received are entered in the manual.
- Enter details from the machine nameplate and individual items of equipment in the table in chapter 2.

1.2 Further documents

Included with this service manual are additional documents intended to assist in the safe operation of the machine:

- 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 give the data from the nameplate when ordering documents.

1.3 Copyright

This service manual is copyright protected. Queries regarding use or duplication of the documentation should be referred to KAESER. Correct use of information will be fully supported.

1.4 Symbols and labels

1.4.1 Warnings

Warning notices indicate three levels of danger signified by the signal word.

- DANGER
- WARNING
- CAUTION



DANGER

The type and source of the imminent danger is shown here!

The possible consequences of ignoring a warning are shown here.

The signal word "DANGER" indicates that death or severe injury can result from ignoring the warning.

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

- Always read and comply with warning instructions.

Signal term	Meaning	Consequences of non-compliance
DANGER	Warns of an imminent threat of danger	Will result in death or severe injury
WARNING	Warns of possible danger	May result in death or severe injury
CAUTION	Warns of a potentially dangerous situation	May result in moderate physical injury or damage to objects

Tab. 1 Danger levels and their definition

1.4.2 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.
Here conditions relevant to safety are named that will help you to avoid dangerous situations.

Option ec ➤ This symbol denotes operating instructions consisting of only a single operating step. Operating instructions with several steps are numbered in the sequence of the operating steps. Information relating to a single option is labelled with a symbol (e.g., "Option ec" means that this section applies only to machines with integrated "tool lubricator"). 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 shown in the help text ...
➤ ... and a remedy given.



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

Further information Further subjects are introduced here.

2 Technical Data

2.1 Nameplate

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

► Enter the data from the nameplate here as a reference.

Characteristic	Value
Vehicle identity no.	
Permissible total weight	
Permissible axle load	
Permissible coupling load	
Compressor model	
Material number	
serial number	
Year of manufacture	
Total weight	
Lifting point load capacity	
Rated engine power	
Engine speed	
Maximum working pressure	

Tab. 2 Nameplate

2.2 List of options

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

The label is to be found

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



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

- Take a list of fitted options from the combined coupling load / options label.

M57	MATNo	SERNo
Here is given the specified coupling load.		Options fitted
		__ __ __ __ __
		__ __ ec __ __
		__ __ __ __ fe
		__ __ __ __ __
		__ __ __ __ __
		ba bb __ __
		la lb __ __
		__ __ __ __ __
		oa __ __ __ __
		__ __ __ __ __
		__ __ __ __ ne
		__ __ __ __ sh
		sa __ sc sd __
		ta tb tc __ te
		sf sg ua pa __

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Tab. 3 Combined label for coupling load and options fitted

**2.2.1 Option ec
Tool lubricator**

- Enter the fitted option as reference.

Option	Option code	Exists?
Tool lubricator	ec	

Tab. 4 Tool lubricator

**2.2.2 Option fe
Compressed air distributor**

- Enter the fitted option as reference.

Option	Option code	Exists?
Additional air takeoff point	fe	

Tab. 5 Compressed air distributor

**2.2.3 Option ba, bb
Low temperature equipment**

- Enter the fitted option as reference.

Option	Option code	Exists?
Low temperature equipment	ba	
Low temperature equipment + engine coolant pre-heating	bb	

Tab. 6 Low temperature equipment

**2.2.4 Option la, lb
Equipment for fire hazard areas**

➤ Enter the fitted option as reference.

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

Tab. 7 Equipment for fire hazard areas

**2.2.5 Option oa
Battery isolating switch**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Battery isolating switch	oa	

Tab. 8 Battery isolating switch

**2.2.6 Option ne
Fuel de-watering filter**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Fuel de-watering filter	ne	

Tab. 9 Fuel de-watering filter

**2.2.7 Option sa, sc, sd, sh
Chassis**

➤ Enter the fitted option as a reference.

Option	Permissible axle load [lbs]	Option code	Exists?
Height adjustable towbar	2976	sa	
Fixed height towbar	2976	sd	
Height-adjustable towbar, without parking brake	2976	sh	
Stationary	–	sc	

Tab. 10 Chassis

**2.2.8 Option ta, tb, tc, te
Lighting**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
None (stationary)	ta	
Reflective warning triangle	tb	
EG - 12 V	tc	
USA 12 V (DOT conformity)	te	

Tab. 11 Lighting

**2.2.9 Option ua
Hose reel**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Hose reel	ua	

Tab. 12 Hose reel

**2.2.10 Option sf
Anti-theft device**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Anti-theft device	sf	

Tab. 13 Anti-theft device

**2.2.11 Option sg
Pedestrian protection**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Pedestrian protection	sg	

Tab. 14 Pedestrian protection

**2.2.12 Option pa
Instrument panel cover**

➤ Enter the fitted option as reference.

Option	Option code	Exists?
Instrument panel cover	pa	

Tab. 15 Instrument panel cover

2.3 Machine (without options)
2.3.1 Sound emission
2.3.1.1 Sound emission

Model	M57
Guaranteed sound power level* [dB(A)]	98

* To Directive 2000/14/EC

Tab. 16 Guaranteed sound power level

Model	M57
Emission sound pressure level* [dB(A)] According to EN ISO 11203: 1995 number 6.2.3.d.	80.5

Measurement distance: d = 1 m
 Logarithmic surface ratio: Q2 = 17.3dB(A)
 * Calculated from the guaranteed sound power level (2000/14/EC Directive, Sound Emission Standard ISO 3744)

Tab. 17 Emission sound pressure level

2.3.1.2 Sound pressure level

Model	M57
Sound pressure level* [dB(A)]	76

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

Tab. 18 Guaranteed sound pressure level

2.3.2 Torques

Recommended values for hexagonal bolts of strength category 8.8

Hex-head screws							
Thread	M6	M8	M10	M12	M14	M16	M18
Torque [lbf in]	85	204	407	708	1124	1726	2478

Tab. 19 Torques for hex-head screws

2.3.3 Ambient conditions

Installation	Limit value
Maximum altitude AMSL* [ft.]	3280
Minimum ambient temperature [°F]	14
Maximum ambient temperature [°F]	122

* Higher altitudes are permissible only after consultation with the manufacturer.

Tab. 20 Ambient conditions

2.3.4 Additional specifications

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

- dimensions,
- track width,
- footprint,

see the dimensional drawings in chapter 13.3.



The dimensional drawing also shows the position of the following inlets and outlets:

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

2.4 Chassis
2.4.1 Weights


Maximum weights are shown. Actual weights of individual machines are dependent on equipment fitted (see machine nameplate).

Feature	Chassis			Stationary
	with	with	without	
Overrun brake	with	with	without	–
Height adjustment	with	without	with	–
Actual total weight [lb]*				
Permissible axle load [lb]	2976	2976	2976	–

* Enter here for reference, the actual total weight taken from the nameplate.

Tab. 21 Machine weights

2.4.2 Tires

Characteristic/markings	Value	
	Europe	USA
Market	Europe	USA
Tire size	185 R 14C	205/75D14

Characteristic/markings	Value	
	Europe	USA
Market	Europe	USA
Maximum and recommended tire pressure [psi]	65	51
Wheel bolts	M 12 x 1.5	½" x 2" (fine)

Tab. 22 Tires

2.4.3 Wheel nut/bolt tightening torque

Market	Wheel bolt thread	Wrench size	Torque [lbf in]
Europe	M 12 x 1.5	SW 17	797
USA	½" x 2" (fine)	13/16"	885

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	682
	M12	10.9	1018
	M14	10.9	1106
Towing eye	M12	10.9	1018
	M14	10.9	1593
Locking lever	M20	–	2213
	M28	–	3540
	M36	–	5753

Tab. 24 Towbar tightening torque

2.5 Compressor

2.5.1 Working pressure and FAD

Maximum working pressure [psig]	100
SIGMA airend	265
Free air delivery [cfm]	198

Tab. 25 Working pressure and FAD

2.5.2 Compressed air outlet

Outlet valve ["]	Quantity l*
G 3/4 or NPT 3/4	2

* Quantity depending on country variant

Outlet valve ["]	Quantity l*
G 1 or NPT 1	1

* Quantity depending on country variant

Tab. 26 Compressed air distributor

2.5.3 Pressure relief valve

Further information Maximum working pressure: see nameplate

Maximum working pressure [psig]	Relief valve activating pressure [psig]
100	131

Tab. 27 Pressure relief valve opening pressure

2.5.4 Temperature

Temperature at the airend discharge port	
Ambient temperature [°F]	Combination valve (thermostatic) with ambient temperature acquisition [°F]
50	194
77	140

Tab. 28 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. 29 Machine temperatures

2.5.5 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

Characteristic	SIGMA FLUID	
Oil grade	S-460	MOL
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. 30 Cooling oil recommendation

2.5.6 Cooling oil charge

Fluid volume	Value
Total charge [gal]	3.9

Tab. 31 Cooling oil charge

2.6 Engine

2.6.1 Engine specification

Characteristic	Specified
Make/Model	Kubota V 2403 M-iDi
Rated power [HP]	48.3
Speed under full load [rpm]	2600
Idling speed [rpm]	1800
Type of fuel	Diesel *
Fuel consumption under full load [gal/h]	2.67
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.

Tab. 32 Engine specification

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
68 122	SAE 40
32 68	SAE 20W
5 32	SAE 10W
14 122	SAE 15W-40
-4 86	SAE 5W-30
-4 122	SAE 10W-40

Tab. 33 Engine oil recommendation

2.6.3 Engine coolant recommendation

Engine coolant must meet the requirements of specification ASTM D4985.



Do not use a common coolant / 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.

2.6.4 Fluid volumes

Description	Fluid volume [gal]
Engine oil	2.5
Fuel	27.7
Engine coolant	2.5

Tab. 34 Engine fluid volumes

2.6.5 Battery

Feature	Value
Voltage [V]	12
Capacity [Ah]	80
PTC testing current [A] (according to EN 50342)	640

Tab. 35 Battery

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

2.7 Options
**2.7.1 Option ec
Tool lubricator**

Name	Temperature range [°F]	Fluid volume [gal]
Special road breaker lubricant	-13 122	0.66

Tab. 36 Road breaker lubricant recommendation

**2.7.2 Option ba
Low temperature equipment**
2.7.2.1 Ambient conditions

Positioning	Limit value
Maximum altitude AMSL* [ft]	3280
Minimum ambient temperature [°F]	-13
Maximum ambient temperature [°F]	1220

* Higher altitudes are permissible only after consultation with the manufacturer.

Tab. 37 Ambient conditions

2.7.2.2 Compressed air line frost protection

Antifreeze	Fluid volume [gal]
Wabcothyl	0.08

Tab. 38 Recommended antifreeze

2.7.2.3 Battery

Feature	Value
Voltage [V]	12
Capacity [Ah]	100
PTC testing current [A] (according to EN 50342)	850

Tab. 39 Battery

**2.7.2.4 Option bb
Coolant pre-heating**

Coolant pre-heater	Value
Model	DEFA 102
Voltage [V]	230
Power [W]	550

Tab. 40 Coolant pre-heater

3 Safety and Responsibility

3.1 Basic Information

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.



DANGER

Disregarding these instructions can result in serious injury.

- Read the service manual carefully and take note of the contents for safe machine operation.

- 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 therefrom. 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 for any application that will bring it into direct contact with food products unless it is specifically treated.

3.3 Improper Use

- Never direct compressed air at persons or animals.
- Do not use untreated compressed air for breathing purposes.
- Do not allow the machine to breathe 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 force.

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 Defining 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 conversant 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 conversant with and adhere to the safety instructions and sections of the service manual applicable to installation and maintenance,
- are fully conversant 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 conversant 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 conversant 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.



DANGER

There is danger of fatal injury caused by contact with live components.

- Only qualified electricians may work on the installation, maintenance and repair of the machine's electrical assemblies. This includes work on current-carrying components.
- 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.

3.5 Dangers

Basic Information

Information concerning the various forms of danger that can arise during machine operation are found here.

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

Information is found here concerning how to counter the various forms of danger that can arise during machine operation.

Exhaust fumes

Exhaust fumes from combustion engines contain carbon monoxide; this gas is odorless and can cause death.

Furthermore, diesel exhaust contains soot particles, some of which are noxious.

- Use the machine only outdoors!
- Do not inhale exhaust fumes.
- Direct the exhaust fumes to the open air with a pipe of at least 100 mm dia.

Fire and explosion

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

- Allow no open flames or sparks at the place of use.
- Do not smoke while refuelling.
- Never refuel the machine when it is running.
- Do not allow fuel to overflow.
- Wipe up spilled fuel immediately.
- Keep fuel away from hot machine parts.
- Never top up antifreeze (option ba) unless the machine is stopped and cooled down.
- Make sure that the ambient temperature at the machine's place of use is within permissible limits.

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.

Forces of compression

Escaping compressed air can cause serious injury. The following information concerns work on components that could be under pressure.

- Wait until the machine has automatically vented (check that the pressure gauge indicates 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 no longer ensured.

Spring force

Sudden release of spring force can cause serious injury.

Minimum pressure / check valves, pressure relief valves and inlet valves are powerfully spring-loaded.

- Do not open or dismantle any valves.

Compressed air quality

Compressed air from oil-injected compressors may not be used for breathing or processing food products without suitable treatment.

- Never directly inhale compressed air.
- 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 compatible cooling oil whenever compressed air is to come into contact with food products.

Rotating components

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

- Operate the machine only with closed safety guards, access doors and panels.
- Shut down the machine before opening a door or canopy.
- Wear close-fitting clothes and a hair net if necessary.
- Fit all safety devices and panels before starting the engine.

Electricity

- 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 order.

Temperature

- Avoid contact with hot components. These include, for example, engine, compressor air end, 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 long-sleeved garments (not synthetics such as polyester) and protective gloves.
- 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 fuel or oil vapors or parts of the machine.

Noise

- Operate the machine only with intact soundproofing.
- Wear hearing protection if necessary. The pressure relief valve blowing off, for example, can be particularly loud.

Operating fluids/materials

- 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 aerosols from fuel or oil.
- Do not eat or drink while handling fuel, cooling and lubricating fluids or antifreeze.
- Have suitable fire extinguishing materials to hand and make known the location and use of fire extinguishers.
- Use only KAESER approved operating materials.

Unsuitable spare parts

- Use only spare parts approved by the manufacturer for use in this machine. Unsuitable spare parts compromise the safety of the machine.
- Use only genuine KAESER pressure components.

Conversion or modification of the machine

- Do not permit conversion or modification of the machine as this can compromise function and safe operation.
 - Do not fit 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.



Any such changes invalidate the approval to use the machine or tow it on the road.

3.5.2 Safe machine operation

Information on conduct that will help in handling the machine safely is given here.

**WARNING**

Danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- Operate the machine only with closed doors/canopy.
- Carry out maintenance and checks only with the machine shut down.

Transport

- Shut down and fully disconnect the machine before transporting it.
- 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.

- If the machine is towed 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.
- Follow the ground rules for safe towing:
 - 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 such a way as to 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.
- When the machine is lifted by a crane, the safety regulations relating to the crane and lifting slings must be observed.
 - Do not enter the danger zone while the machine is being lifted.
 - Never lift the machine over people or occupied buildings.
 - Secondary or attached loads may not:
 - cause excessive loading on the machine's lifting point (lifting eye),
 - adversely influence the machine's center of gravity so that it hangs out of square.
 - 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 lifting slings that are suitable for the loads to which they will be subjected.
 - 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.
 - Never tamper with the machine's lifting eye or its fixing.
 - 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:
 - transporting by slinging beneath a helicopter,
 - dropping by parachute.

Positioning

- Do not position the machine directly against a wall. A build up of heat from the exhaust can damage the machine.
- Do not operate in areas in which specific requirements regarding explosion protection are in force.
- Ensure adequate ventilation.

- Ensure that required ambient conditions are maintained with regard to:
 - Ambient temperature
 - Clean inlet air with no damaging contaminants
 - Inlet air free of explosive or chemically unstable gases or vapors
 - Inlet air free of exhaust gases from internal combustion engines
 - Inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.
- Do not position the machine in warm cooling outlet air from other machines.
- Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.
- Chock the wheels to prevent unwanted movement.
- Do not place additional loads on the machine (e.g. excavator bucket as anti-theft measure).

Operation

- Use the machine only when all safety devices, emergency stop facilities and sound damping measures are in place and fully functioning.
- Before starting the machine, make sure that this will not place anyone in danger.
- Keep the access doors closed and panels in place for safety, quiet running and to ensure correct cooling air flow.
- Stop and secure against restarting if any malfunctions occur. Have any malfunctions corrected immediately.
- Carry out regular inspections:
 - for visible damage and leakage,
 - of safety devices,
 - of components needing to be monitored.
- Never operate machines without an air filter when drawing in air from the surroundings.
- Outlet valves must be closed when no consumers are connected.
- Use only suitable compressed air hoses:
 - 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 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 whip and cause injury.
- At working pressures >101.5 psig, compressed air hoses should be secured by a cable to their respective outlet valves.

Maintenance

- Before commencing any work on the machine, make sure it is shut down, cooled down, pressure-free and locked off against unwanted starting.
- Wear close-fitting, flame-resistant clothing. Wear protective clothing as necessary.
- Do not leave any loose components, tools or cleaning rags on or in the machine.
- Adhere to the planned intervals for maintenance and exchange of wear parts.
- Pressure lines must be fitted correctly. Test run and check for leaks.

- Components removed from the machine may still be a source of danger. Do not open or destroy components removed from the machine as some, inlet valves, for instance, are powerfully spring-loaded.
- Never remove or change sound damping materials. Ensure that sound damping material is not damaged or dirty. Replace as necessary.

Decommissioning, storage, disposal

- Drain out fluids and dispose of according to environmental regulations. These include, for example, fuel, engine oil and 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.	Maintenance personnel
	Within a 3 ft radius of the machine.	

Tab. 41 Danger areas

3.6 Safety Devices

Safety devices ensure safe working with the machine.

- Do not change, bypass or disable safety devices.
- Check safety devices for correct function regularly.
- 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, section 4.5.

3.7 Safety signs

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

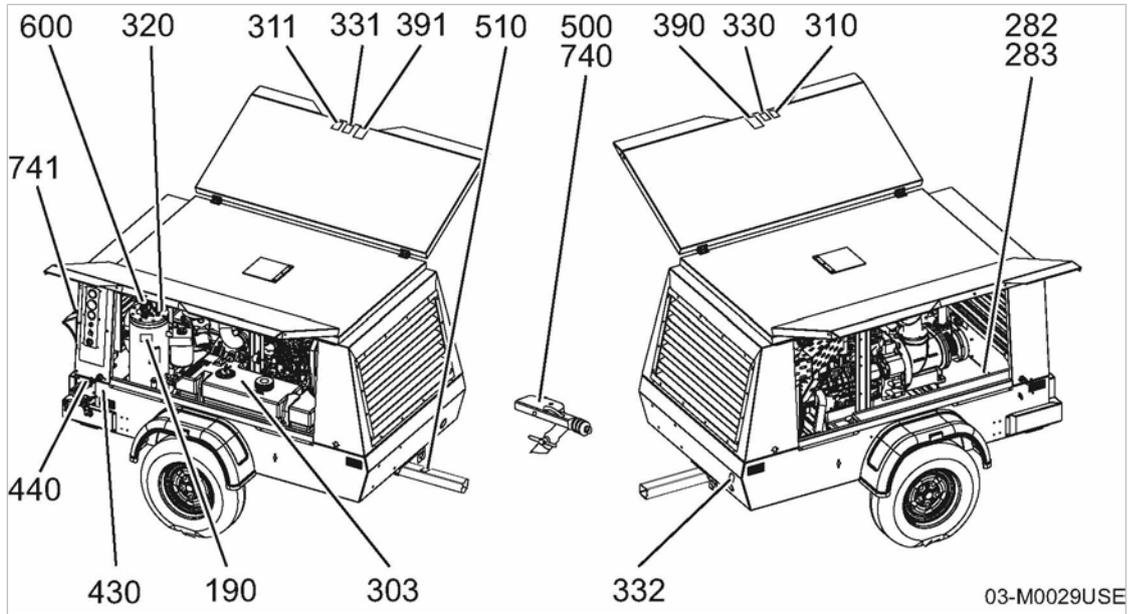


Fig. 1 Location of safety signs

Item	Sign	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.
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 result 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.

* Location within the machine

** Only towable machines

Item	Sign	Meaning
310		Injury or damage from open machine.
311		<ul style="list-style-type: none"> ➤ Operate the machine only when closed. ➤ Transport the machine only when closed.
320*		<p>Loud noise and oil mist when the safety relief valve opens. Ear damage and burns can result.</p> <ul style="list-style-type: none"> ➤ Wear ear protection and protective cloths. ➤ Close all maintenance doors and cover panels. ➤ Work carefully.
330		Hot surface can cause burns.
331		<ul style="list-style-type: none"> ➤ Let the machine cool down.
332		<ul style="list-style-type: none"> ➤ Work carefully. ➤ Wear protective cloths and gloves.
390*		Rotating fan blades and V-belt drive.
391*		<p>Severe injury could result from touching the fan blades and v-belt drive while it is rotating.</p> <ul style="list-style-type: none"> ➤ Never switch the machine on without 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**		<p>Injury or damage can result because tongue weight on this equipment may be heavy.</p> <ul style="list-style-type: none"> ➤ Do not lift drawbar by hand if weight is more than you can safely handle. ➤ See safety section of service manual.
430		<p>Connect air hoses only in full compliance with OSHA standard 29 CFR 1926,302 (bX7).</p> <p>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.</p>
440		<p>Compressed air quality.</p> <p>Injury and/or contamination can result from breathing compressed air. Contamination of food can result from using untreated compressed air for food processing.</p> <ul style="list-style-type: none"> ➤ 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.
500**		<p>Drawbar load and ground clearance.</p> <p>Danger of fishtailing, incorrect towing vehicle load, damage to the machine caused by rollover or contact with the ground.</p> <ul style="list-style-type: none"> ➤ Always line up the drawbar so that the machine is level with the ground.

* Location within the machine

** Only towable machines

Item	Sign	Meaning
510**		Malfunction due to lack of maintenance. Accidents and machine damage possible. ➤ Maintain the chassis regularly. ➤ Follow instructions in the service manual.
740**		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.
741**		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. Serious injury or death can result from loosening or opening component that is under pressure and heavily spring loaded. ➤ Never open (dismantle) valve. ➤ Contact authorized KAESER distributor.

* Location within the machine

** Only towable machines

Tab. 42 Safety signs

3.8 In emergency

3.8.1 Correct fire fighting

Suitable extinguishing agents:

- Foam
- Carbon dioxide
- Sand or dirt

Unsuitable extinguishing agents:

- Strong jet of water

1. Keep calm.
2. Give the alarm.
3. Shut down the machine from the instrument panel if possible.
4. To ensure safety:
 - warn persons in danger,
 - help incapacitated persons,
 - leave the danger area as fast as possible.
5. Try to extinguish the fire if you have the skill to do so.

3.8.2 Contact with operating fluids/materials

The following operating fluids/materials are in the machine:

- Fuel
- Lubricating oil
- Compressor cooling oil
- Engine coolant
- Battery electrolyte
- Tool lubricant (option e)
- Antifreeze (option ba)



If necessary, request a copy of the safety data sheet for KAESER SIGMA FLUID cooling oil.

- Eye contact:
Rinse eyes thoroughly with lukewarm water and seek medical assistance.
- Skin contact:
Wash off immediately.

3.9 Warranty

This service 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

- Store and dispose of operating materials and replaced parts in accordance with local environmental protection regulations.
- Observe relevant national regulations.



This applies particularly to parts contaminated with fuel, oil, coolants and acids.



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

4 Design and Function

4.1 Bodywork

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

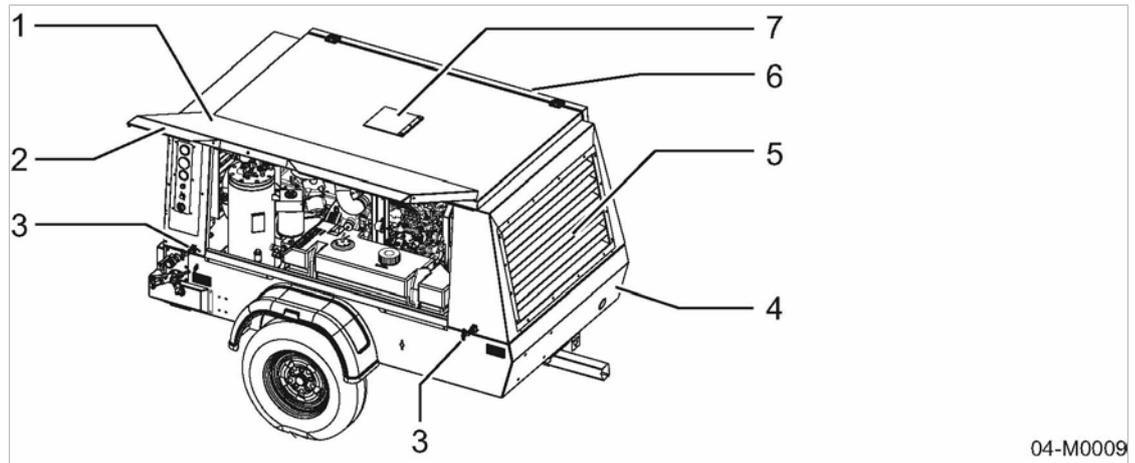


Fig. 2 Bodywork

- | | | | |
|---|----------------------|---|-----------------------|
| ① | Right-hand wing door | ⑤ | Sound damping louver |
| ② | Handle | ⑥ | Left-hand wing door |
| ③ | Snap fastener | ⑦ | Cover for lifting eye |
| ④ | Lower body | | |

The bodywork has several functions when it is closed:

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

The bodywork is not suitable for the following uses:

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

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

The gull doors are provided with handles for opening. Release the doors by the snap fasteners.

The doors are held open by gas struts.

4.2 Component identification

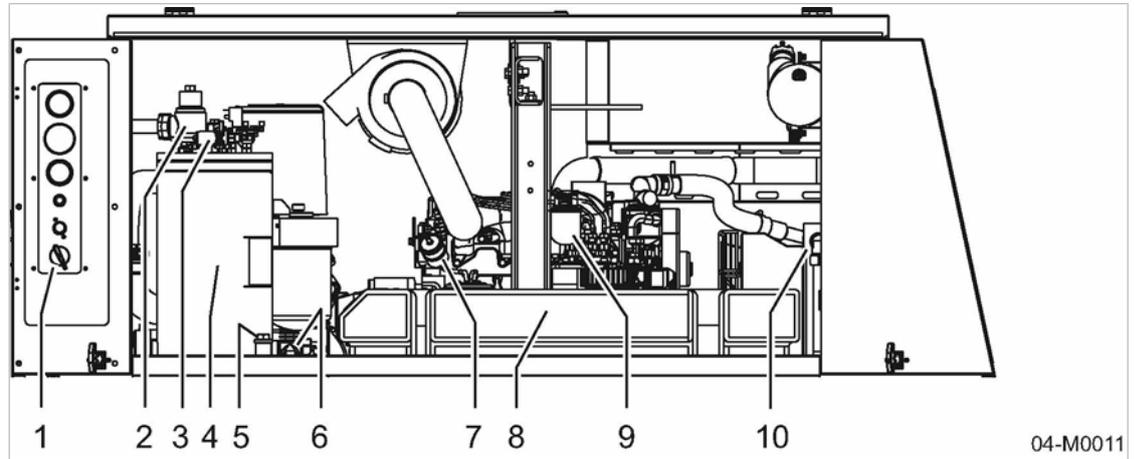


Fig. 3 Right-hand door opened

- | | |
|--------------------------------|----------------------|
| ① Instrument panel | ⑥ Combination valve |
| ② Minimum pressure/check valve | ⑦ Fuel prefilter |
| ③ Proportional controller | ⑧ Fuel tank |
| ④ Oil separator tank | ⑨ Fuel fine filter * |
| ⑤ Oil filler port with plug | ⑩ Oil cooler |

* According to country variant with integrated water separator.

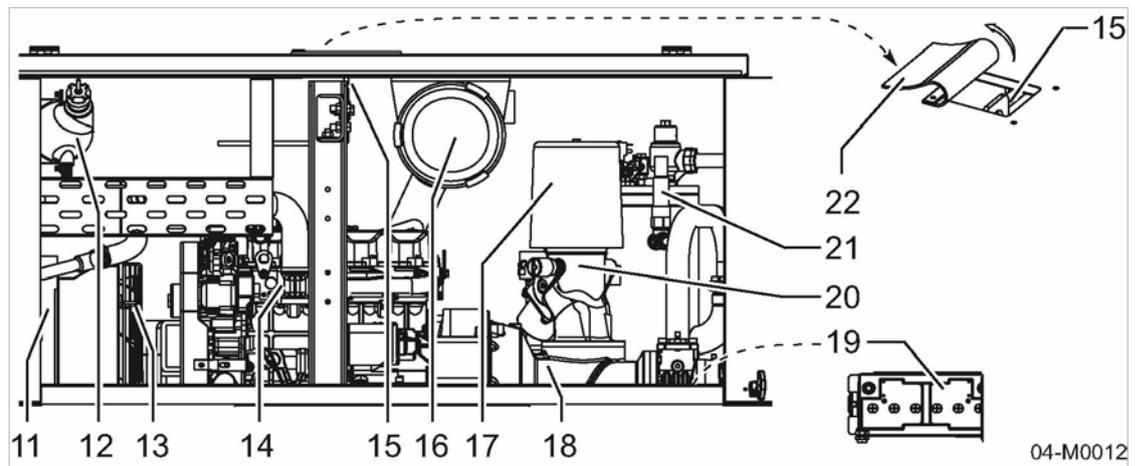


Fig. 4 Left-hand door opened

- | | |
|---------------------------|--------------------------|
| ①① Radiator | ①⑦ Compressor air filter |
| ①② Coolant expansion tank | ①⑧ Airend |
| ①③ Fan | ①⑨ Battery |
| ①④ Engine | ①⑩ Inlet valve |
| ①⑤ Lifting eye | ①⑪ Pressure relief valve |
| ①⑥ Engine air filter | ①⑫ Lifting eye cover |

4.3 Machine function

Machine function (without options)

Item numbers correspond to the pipe and instrument flow diagram in chapter 13.2.

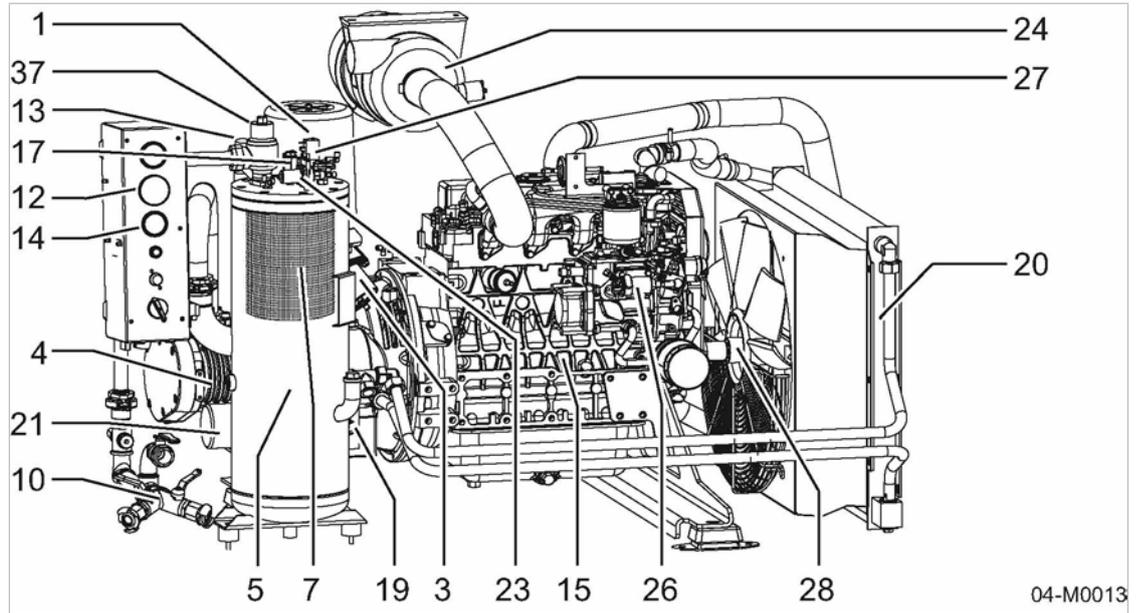


Fig. 5 Basic design

- | | |
|--|---|
| ① Compressor air filter | ①7 Dirt trap |
| ③ Inlet valve | ①9 Combination valve (oil temperature thermostat) |
| ④ Airend | ②0 Oil cooler |
| ⑤ Oil separator tank | ②1 Oil filter |
| ⑦ Oil separator cartridge | ②3 Proportional controller |
| ⑩ Compressed air distributor | ②4 Engine air filter |
| ⑫ Temperature gauge switch | ②6 Engine speed control cylinder |
| ⑬ Pressure relief valve | ②7 Venting valve |
| ⑭ Pressure gauge (on the instrument panel) | ②8 Fan |
| ⑮ Engine | ③7 Minimum pressure/check valve |

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. Pressure within the machine keeps the oil circulating. A separate pump is not necessary. A fully automatic combination valve ①9 registers the ambient temperature and regulates the compressor temperature accordingly.

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 that there is always a minimum internal air pressure sufficient to maintain cooling oil circulation in the machine.

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

4.4 Operating modes and control modes

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

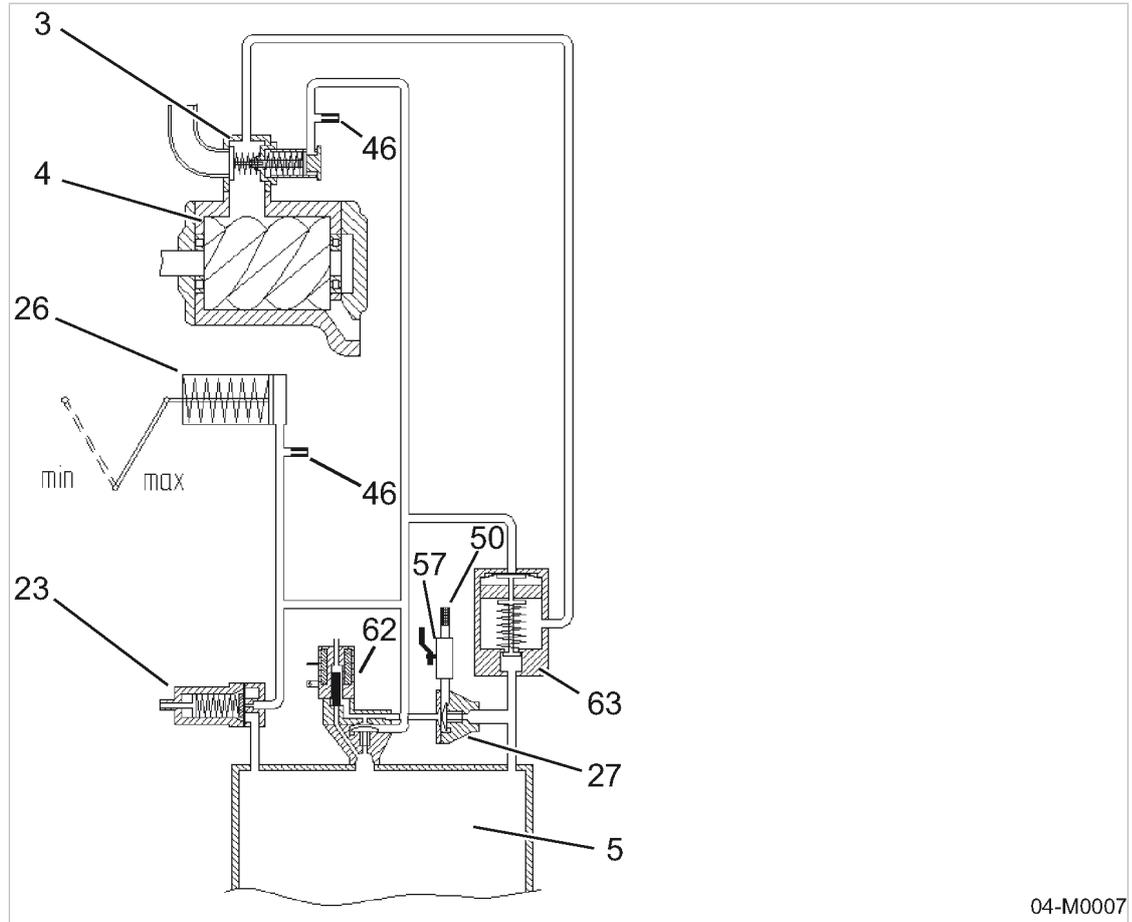


Fig. 6 Stepless regulation of FAD

- | | | | |
|----|-------------------------------|----|-----------------------------|
| ③ | Inlet valve | ④⑥ | Nozzle |
| ④ | Air end | ⑤⑦ | Silencer |
| ⑤ | Oil separator tank | ⑥② | Venting line shut-off valve |
| ②③ | Proportional controller | ⑥③ | Combined control valve |
| ②⑥ | Engine speed control cylinder | | Directional control valve |
| ②⑦ | Venting valve | | |

4.5 Safety devices

4.5.1 Monitoring functions with shutdown

The following functions are monitored automatically.

- Engine oil pressure
- Coolant temperature
- Air end 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.

4.5.2 Further safety devices

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

- Pressure relief valves
Pressure relief valves protect the system against unacceptable pressure rise. They are factory set.
- Enclosures and covers over moving parts and electrical connections:
These protect against accidental contact.

4.6 Option ec 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:

- minimum 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/consumers on line).

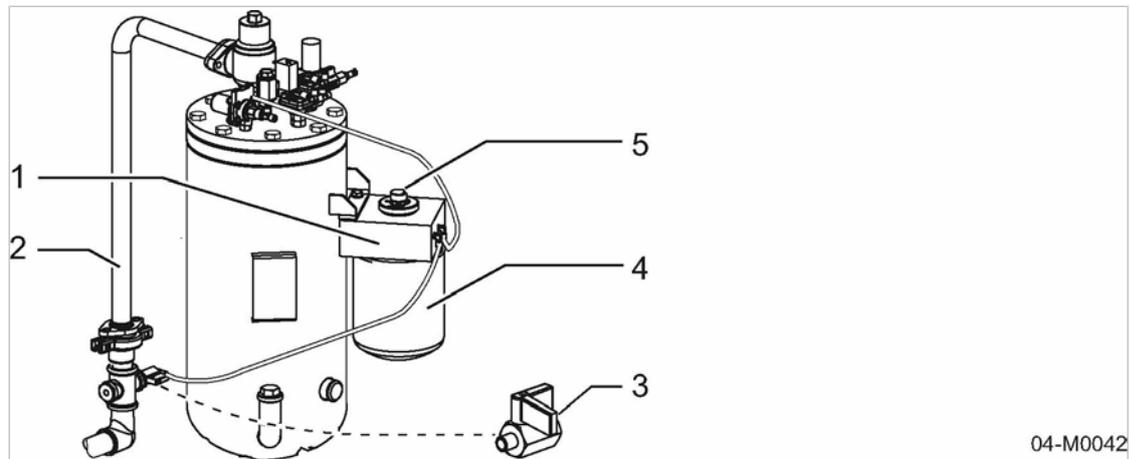


Fig. 7 Tool lubricator

- | | |
|-------------------|-----------------|
| ① Tool lubricator | ④ Oil tank |
| ② Air line | ⑤ Metering knob |
| ③ Shut-off valve | |

Option fc Points to be observed with separate compressed air lines



WARNING

Lubrication with tool oil.
Air tools that must not be lubricated can be damaged.

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

4.7 Option ba, bb Low temperature equipment option

Special equipment is provided for operation in extremely low temperatures.

This equipment guaranties trouble-free operation in ambient temperatures from -13 °F +122 °F. The electrical system starts the engine without problem at ambient temperatures down to -4 °F.

4.7.1 Option ba Frost protection

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

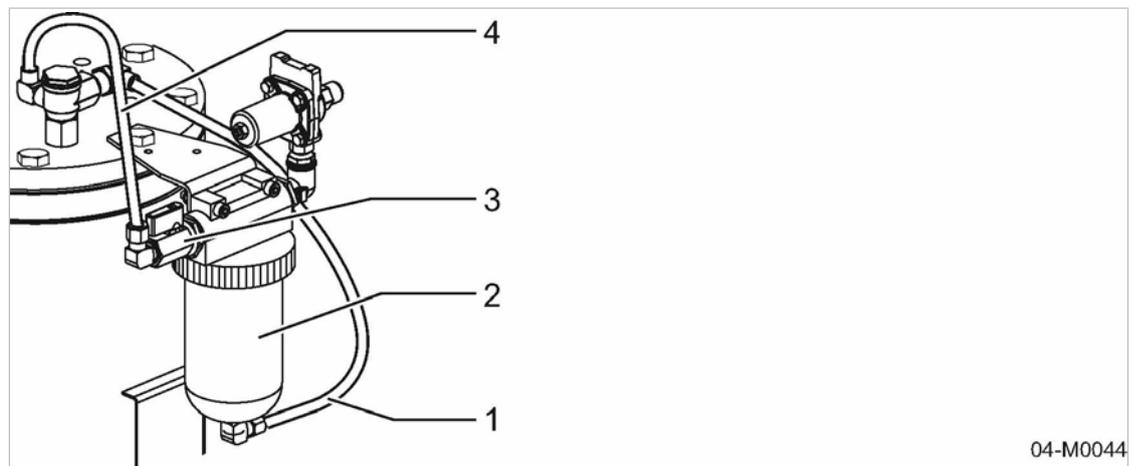


Fig. 8 Frost protector

- | | |
|-----------------------------------|------------------------------|
| ① Control line (frost protection) | ③ Ball valve |
| ② Frost protector | ④ Control line (bypass line) |

Operating at low temperatures

At ambient temperatures below 32 °F, run the machine with the frost protector switched on before shutting down. The compressed air carries antifreeze to coat and protect control air lines and valves. This prevents freezing up of control and regulating components.

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

Summer operation

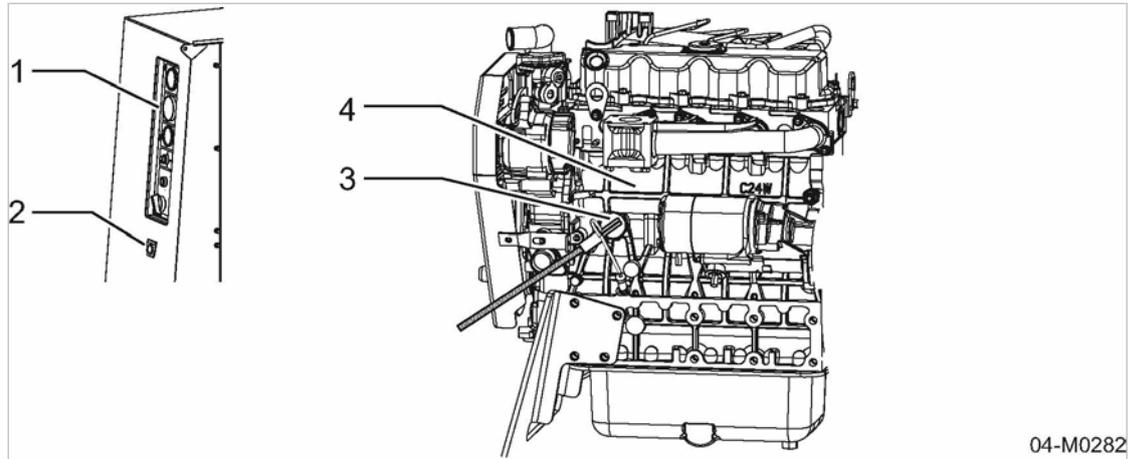
At outside temperatures above 32 °F it is no longer necessary to inject the control lines in the machine with antifreeze before shutting it down.

4.7.2 Option bb Coolant pre-heating

The engine coolant can be pre-heated to improve starting under cold conditions.

A separate mains power connection provides power to the coolant pre-heater. A flexible power cable joins the machine's power plug to the user's power socket.

The coolant pre-heater works according to the principle of self-circulation.



04-M0282

Fig. 9 Coolant pre-heating

- | | |
|---|-----------------------|
| ① Instrument panel | ③ Coolant pre-heating |
| ② Connection for the coolant pre-heater | ④ Engine block |

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).

4.8 Option oa Optional battery isolating switch

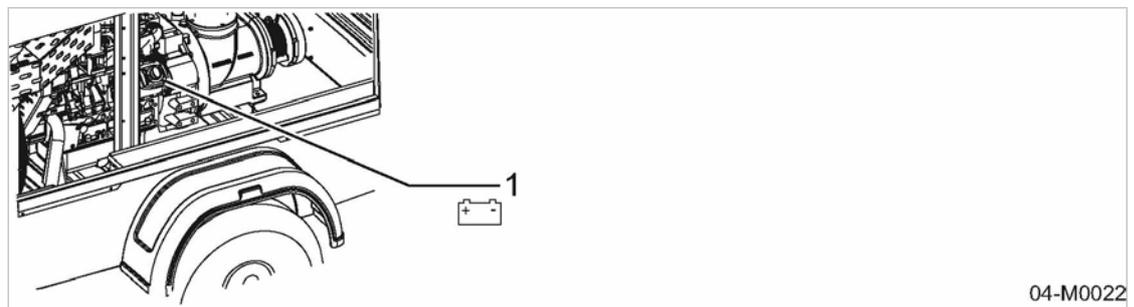
The «battery isolating switch» disconnects the battery completely from the machine's electrical system (fire protection, battery discharge protection).



CAUTION

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

- Use the «battery isolating switch» only when the machine is at standstill.
- Do not use the «battery isolating switch» as a main or emergency switch.



04-M0022

Fig. 10 Battery isolating switch

- ① «Battery isolating switch»

4.9 Option la, lb **Options for operating in fire hazard areas**

4.9.1 Option la **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 emitting any glowing fuel residue.

4.9.2 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 (Chalwyn valve) shuts off the engine air intake as soon as flammable gas is drawn in. This brings the engine to an immediate stop.

4.10 Option ne **Fuel de-watering filter option**

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

4.11 Option sa, sc, sd, sh **Transportation option**

4.11.1 Option sa **Chassis**

The chassis has the following features:

- Single-axle
- Rubber-sprung axle
- Height-adjustable towbar
- Overrun brake

4.11.2 Option sd **Chassis**

The chassis has the following features:

- Single-axle
- Rubber-sprung axle

- Fixed height towbar
- Overrun brake

4.11.3 Option sh Chassis

The chassis has the following features:

- Single-axle
- Rubber-sprung axle
- Height-adjustable towbar
- Without overrun brake
- without parking brake

4.11.4 Option sc Stationary frame

The frame has the following features:

- Skids
- Use as stationary machine
- Mounted on truck/trailer platform

4.12 Option sf Optional anti-theft device

The machine is fitted with a security chain as theft protection.

4.13 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.

4.14 Option sg Pedestrian protection option

The machine is provided with pedestrian protection that functions both as a deflector and against pedestrians being run-over.

4.15 Option pa Instrument panel cover option

To prevent unauthorized use and as protection during transport the machine is fitted with an instrument panel cover.

5 Installation and Operating Conditions

5.1 Safety

- 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.
- The machine is not explosion-proof!
Do not operate in areas in which specific requirements regarding explosion protection are in force.
- Ensure that required ambient conditions are maintained with regard to:
 - ambient temperature,
 - clean inlet air with no damaging contaminants,
 - inlet air free of explosive or chemically unstable gases or vapors,
 - inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.
- Keep suitable fire extinguishing agents ready for use.

5.2 Positioning conditions

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

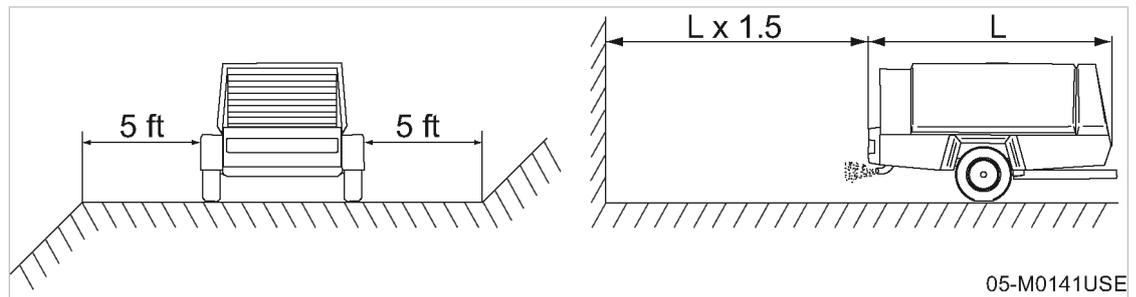


Fig. 11 Minimum distance from excavations/slopes and walls

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.



CAUTION

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.

4. Position the machine as far as possible from any wall.
5. Ensure there is enough free space around and above the machine.

6. Keep air inlet and outlet openings free of obstructions so that the cooling air can flow freely through the machine.
7. Do not allow wind to blow into the cooling air outlet.
8. Do not allow exhaust gases and heated cooling air to be drawn into the compressor.
9. Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.

**CAUTION**

Ambient temperature too low.

Frozen condensate and highly viscous engine or compressor oil can cause damage when starting the machine.

- Use winter grade engine oil.
- Use low viscosity compressor oil.
- Allow the machine to warm up in IDLE (low speed), see chapter 8.2.4.

10. At ambient temperatures below 32 °F, follow instructions in chapter 7.5.

6 Installation

6.1 Safety

Follow the instructions below for safe installation.

Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter "Safety and Responsibility".
2. Installation work may only be carried out by authorized personnel.

Further information Information on authorized personnel are found in chapter 3.4.2.
Information on 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 Option sa Fitting the towbar

If the machine is shipped on a transport frame, it is necessary to dismantle the towbar to save space. The overrun braking mechanism with center piece is fixed to the wooden frame next to the towbar. The locking lever is packed in the machine. The towbar must be re-assembled before removing the transport frame.

Material Protective gloves
Wrench
Hard rubber hammer

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



CAUTION

Danger of pinching!

Severe injury to fingers is possible if they become trapped in the adjusting mechanism.

- Wear safety gloves.
- Work with caution.

Option sa

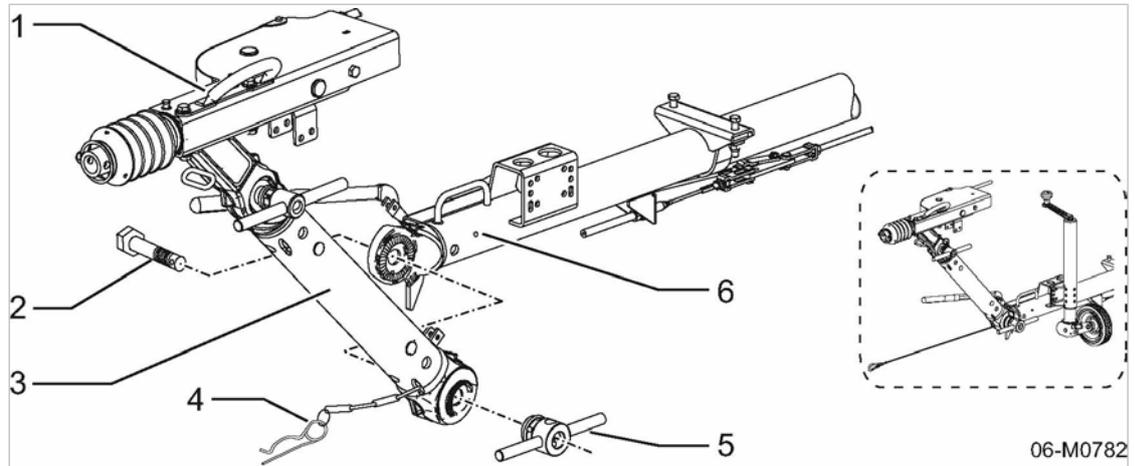


Fig. 12 Fitting the towbar

- | | | | |
|---|---------------------------|---|---------------|
| ① | Overrun braking mechanism | ④ | Split pin |
| ② | Fixing bolt | ⑤ | Locking lever |
| ③ | Towbar center-piece | ⑥ | Towbar |

1. Remove all transport securing devices from the towbar and centre piece.
2. Take the locking lever out of the machine, remove the packing and unscrew the securing bolt.
3. Locate the teeth of the center piece in those of the towbar and insert the securing bolt from the back. Drive in with light hammer blows if necessary.
4. Make sure the teeth engage and screw on the locking lever.
5. Tighten the locking lever. Make sure the teeth in the adjustment joint mesh together.
6. Fully tighten the lever with a few hammer blows and insert the split pin.

6.4 Adjusting the chassis

Material Pliers
Hard rubber hammer

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

**6.4.1 Option sa
Adjusting the towbar height**

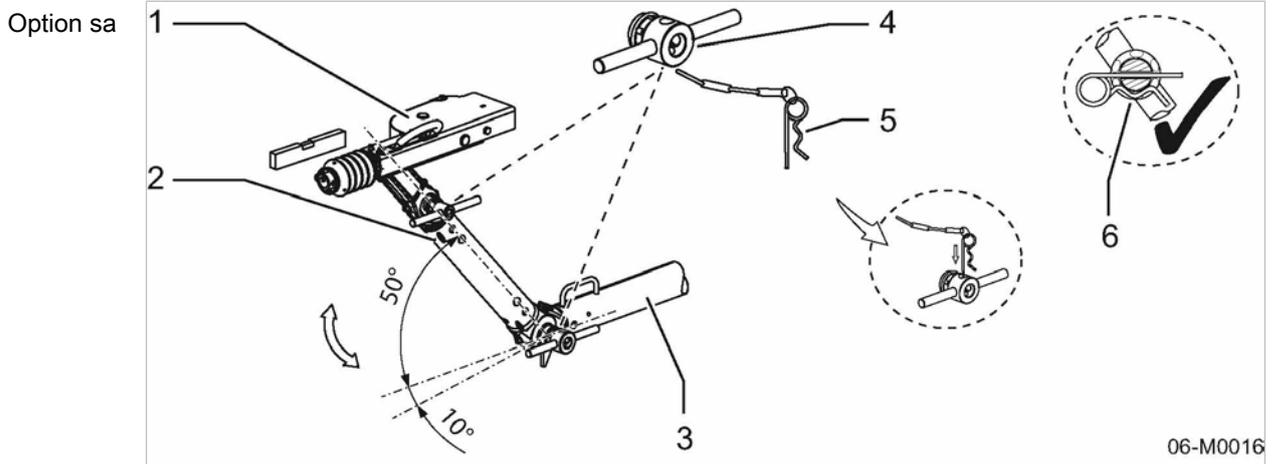


Fig. 13 Towbar height adjustment

- | | | | |
|---|---------------------------|---|--|
| ① | Overrun braking mechanism | ④ | Locking lever |
| ② | Towbar center-piece | ⑤ | Securing pin |
| ③ | Towbar | ⑥ | Split pin (securing pin) properly inserted |



CAUTION

Danger of pinching!

Severe injury to fingers is possible if they become trapped in the adjusting mechanism.

- Wear safety gloves.
- Work with caution.

1. Pull out the split pin and loosen the locking lever until the teeth in the height adjustment joints are no longer engaged.
2. The fixed part of the towbar must be parallel to the ground when the compressor is coupled to the towing vehicle.
The center-piece can be moved up to 49° upwards and 10° downwards for height adjustment.
3. Tighten the locking lever again and secure by striking with a hard rubber hammer.
4. Insert the split pin.
5. Check if:
 - The teeth in the tow bar height adjusting joints are fully engaged,
 - the locking levers are tightened,
 - The split pins are correctly inserted to secure the locking lever (see item 6 in fig. 13).
6. Tighten the locking lever again after 31 miles.



The serrations joint will not disengage. The serrations are corroded together.

- Free the teeth by jerking the towbar horizontally and vertically.

6.4.2 Option sh
Adjusting the coupling height

The height of the towing coupling can be adjusted, to a degree, to suit the towing vehicle coupling height.

There are three height levels.

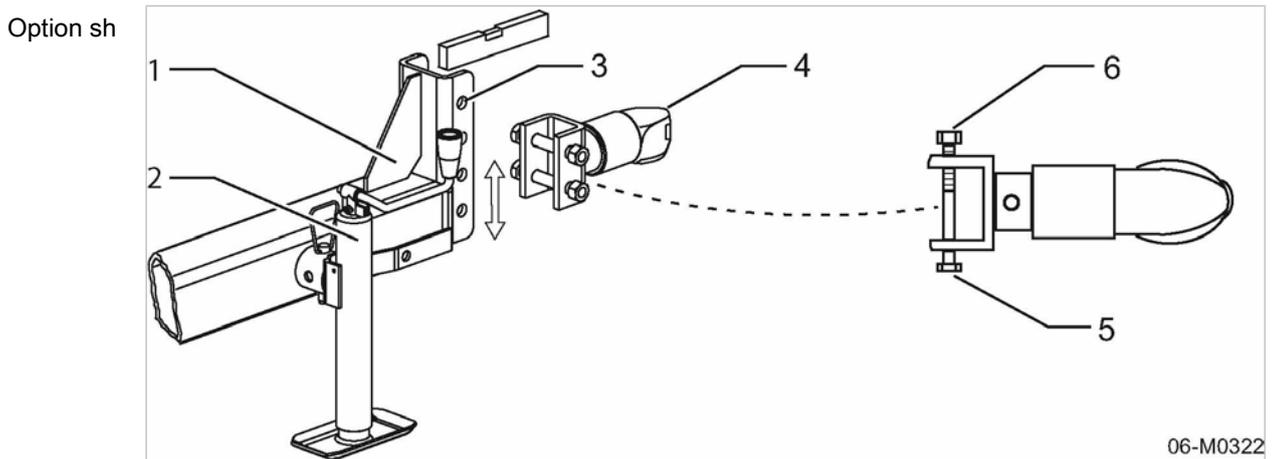


Fig. 14 Adjusting the coupling height

- | | |
|----------------|-----------------|
| ① Towbar | ④ Ball hitch |
| ② Prop stand | ⑤ Hex-head bolt |
| ③ Fixing holes | 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.



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.

6.4.3 Changing the ball hitch/towing eye

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



CAUTION

Danger of pinching!
Severe pinching injury to fingers is possible.

- Wear safety gloves.
- Work with caution.

**6.4.3.1 Option sa, sd
Changing the ball hitch/towing eye (European chassis)**

Option sa, sd

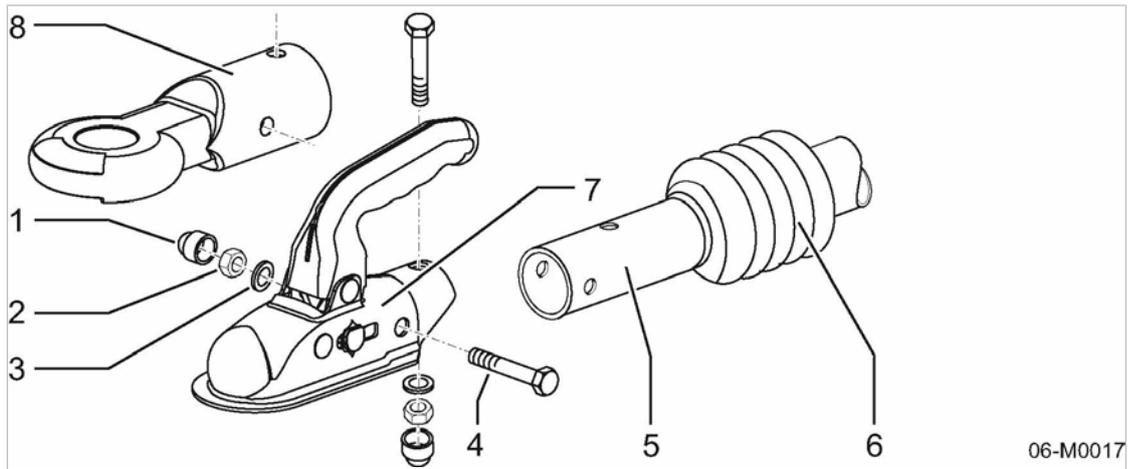


Fig. 15 Changing the towing eye

- | | |
|------------------|---------------------|
| ① Protective cap | ⑤ Towbar tube |
| ② Hexagon nut | ⑥ Protective sleeve |
| ③ Washer | ⑦ Ball hitch |
| ④ Hex-head bolt | ⑧ Towing eye |

1. Push back the protective sleeve ⑥.
2. Remove the protective caps ①, unscrew the nuts ②, remove the washers ③ and withdraw the bolts ④.
3. Remove the ball hitch ⑦ or eye ⑧ from the towbar tube ⑤.
4. Push the new towing eye ⑧ or ball hitch ⑦ in/on the towbar tube ⑤.
5. Adjust the position of the components till the holes in the coupling/eye line up with those in the towbar tube.
6. Insert the securing bolts ④, fit the washers ③ and nuts ② and tighten.
7. Replace the protective caps ① and slide the protective sleeve ⑥ forward.

**6.4.3.2 Option sh
Changing the towing coupling/ball coupling (USA chassis)**

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

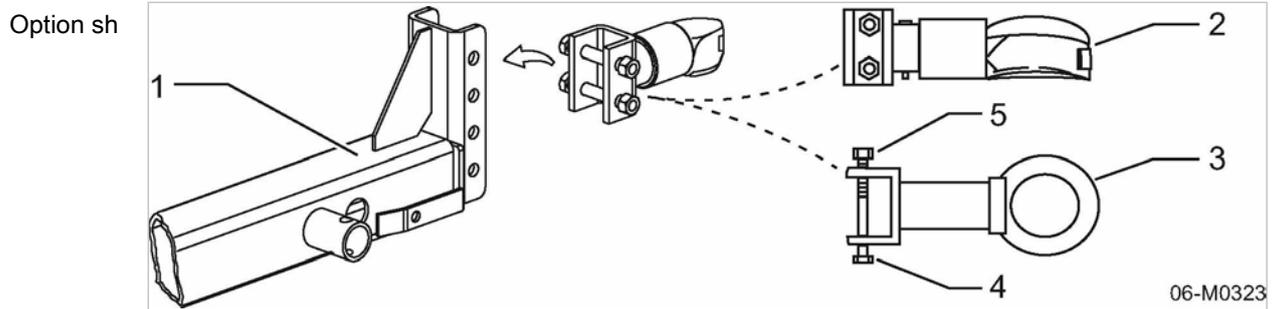


Fig. 16 Changing the towing eye

- | | |
|--------------|-----------------|
| ① Towbar | ④ Hex-head bolt |
| ② Ball hitch | ⑤ Hexagon nut |
| ③ Towing eye | |

1. Unscrew the nuts and withdraw the bolts.
2. Remove the unwanted ball coupling or eye from the towbar.
3. Place the new ball coupling or towing eye on/in the towbar and line up the fixing holes.



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.

4. Insert the fixing bolts and tighten the nuts.
5. Tighten the nuts.

7 Initial Start-up

7.1 Safety

Here you will find instructions for safe commissioning of the machine.
Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter "Safety and Responsibility".
2. Commissioning work may only be carried out by authorized operating and maintenance personnel.

Further information Information on authorized personnel are found in chapter 3.4.2.
Information on dangers and their avoidance are found in chapter 3.5.

7.2 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.

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

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

7.3 Checking installation and operating conditions

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

Function	See chapter	Confirmed?
➤ Are the operators fully 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?	–	

7 Initial Start-up

7.4 After storing the machine for a long period

Function	See chapter	Confirmed?
➤ Are the tire pressures OK?	–	

Tab. 43 Installation conditions checklist

7.4 After storing the machine for a long period

- Carry out the following before every re-commissioning after a long period of storage.

Storage period longer than	Action
5 months	<ul style="list-style-type: none"> ➤ 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 compressor oil. ➤ Drain the preserving oil from the engine. ➤ Fill up with engine oil. ➤ Check the engine coolant ➤ Check the battery charge state. ➤ Re-connect the battery. ➤ Check all fuel lines, engine oil lines and compressor oil lines for leaks, loose connections, wear and damage. ➤ Clean the bodywork with a grease and dirt cleansing agent. ➤ Check the tire pressures.
36 months	<ul style="list-style-type: none"> ➤ Have the overall technical condition checked by an authorized KAESER Service Technician.

Tab. 44 Measures for re-commissioning the compressor after a long period of storage

7.5 Low-temperature operation (winter)

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

- At temperatures below 32 °F use:
 - winter-grade engine oil
 - low viscosity compressor oil
 - Winter-grade diesel fuel
 - stronger battery



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

Machine operational state**CAUTION**

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.

➤ 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 by the temperature gauge switch on the instrument panel.

7.5.1 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.

**DANGER**

Fire and explosion hazard.

High currents can flow if the battery is short-circuited. A damaged 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.

➤ Follow the safety rules when dealing with batteries:

■ Connect batteries of the same voltage only.

■ The assisting vehicle and machine to be started must not touch.

■ Do not bend over the batteries when attaching jumper cables.

■ Only use battery jumper cables of sufficient cross-sectional area and with insulated terminal clamps.

■ Observe the instructions provided with the battery jumper cables.

■ Keep jumper cables away from rotating parts.

■ 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.

Connecting the battery jumper cables

1. Stop the engine of the assisting vehicle.

2. Switch off all power consumers.

3. Connect the positive pole of the discharged battery with the positive pole of the assisting battery.



DANGER

Explosion hazard.

A spark may ignite an explosive gas mixture.

- Do not, under any circumstances, connect the minus 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.

4. Connect the minus pole of the assisting battery to a bare metal point on the compressor engine 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.



Let the two engines run for approximately 3 minutes.

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 (+).



If the compressor engine stops as soon as the cables are disconnected, it can mean serious damage to the alternator or battery and it should be handed over to a specialized workshop.

**7.5.2 Option ba, bb
Starting up low-temperature equipment**

- Ascertain which low temperature equipment is fitted to the machine.

**7.5.2.1 Option ba
Operating the frost protector**

- Use the checklist when initially starting the frost protector.

Function	See chapter	Confirmed?
Check the level of antifreeze in the frost protector.	10.8.2	
Close the tap on the frost protector.	8.5	

Tab. 45 Low-temperature equipment checklist

**7.5.2.2 Option bb
Operating the coolant pre-heater**

The engine coolant can be pre-heated to improve starting under cold conditions.
The connection for the mains supply is located on the machine's instrument panel.

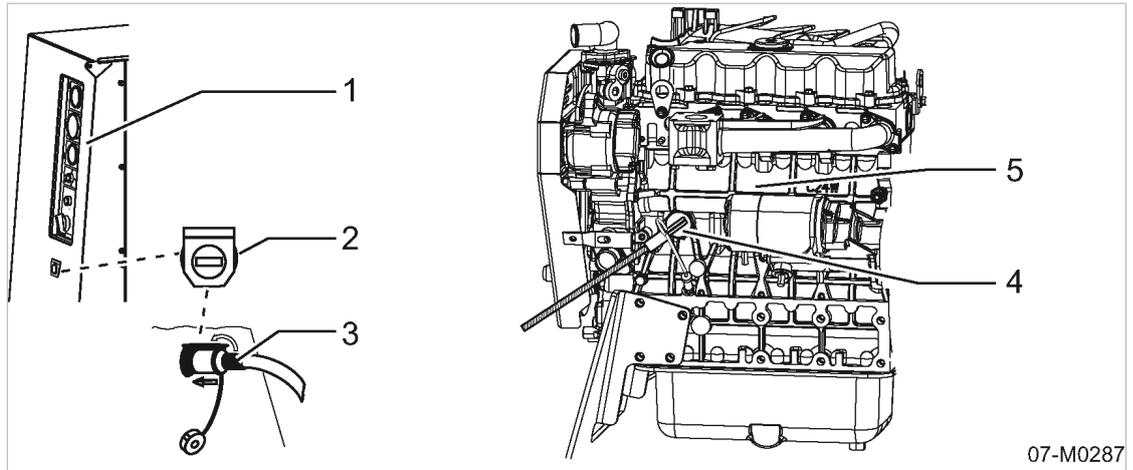


Fig. 17 Coolant pre-heater

- | | | | |
|---|---------------------------------------|---|--------------------|
| ① | Instrument panel | ④ | Coolant pre-heater |
| ② | Connection for the coolant pre-heater | ⑤ | Engine block |
| ③ | Power cable | | |

**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 earth.
- Connect the coolant pre-heater to the user's power socket with the power cable supplied.

8 Operation

8.1 Safety

Here are to be found instructions to ensure safe operation of the machine.
Warning instructions are located before a potentially dangerous task.

Basic safety instructions

**WARNING**

There is danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- Operate the machine only with closed doors/canopy.
- Shut down the machine before opening any doors/canopy.
- Do not carry out any checks or settings while the machine is running.

Follow the instructions in chapter 'Safety and Responsibility'.

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

Precondition No personnel are working on the machine.

**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.

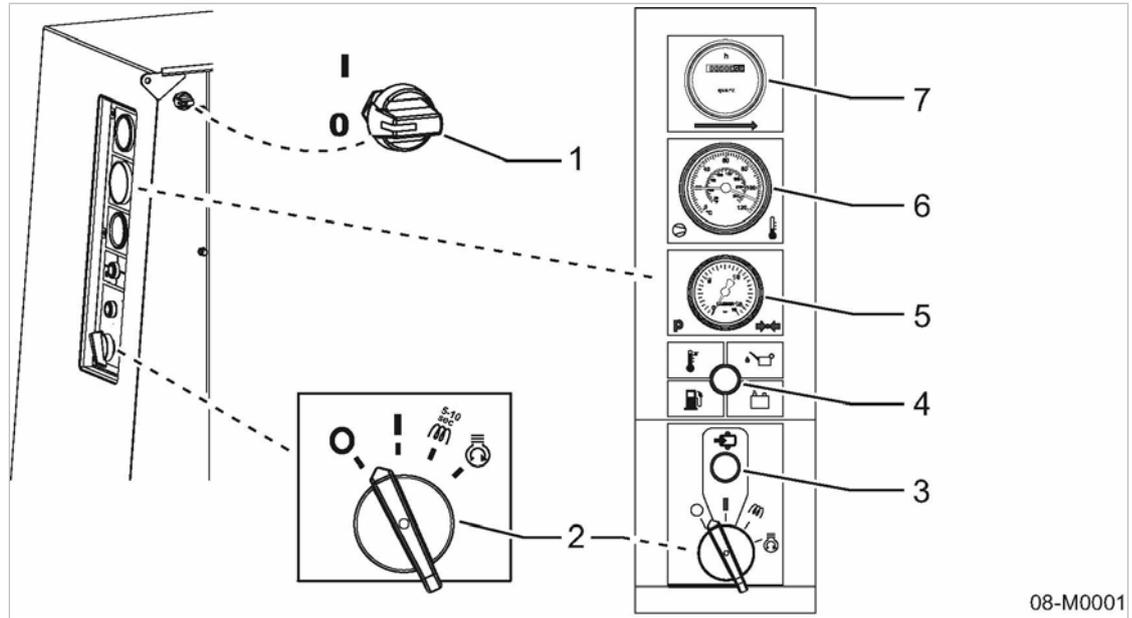


Fig. 18 Starting instruments

- | | |
|---|--|
| ① «Controller on» switch | ⑤ Compressed air outlet pressure gauge |
| ② «Starter switch» | ⑥ Temperature gauge switch |
| ○ – STOP/Aus | ⑦ Operating hours counter |
| ⊃ – On | |
| ⊃ – Pre-heat | |
| ⊃ – START | |
| ③ «LOAD» key with integrated indicator lamp | |
| ④ <i>Alternator indicator, group alarm lamp</i> | |

Notes concerning snow and ice

Considerable snow or ice may build up on the machine under low temperature conditions.
➤ Remove any snow and ice from the machine before operating.

8.2.1 Commissioning the machine

1. Open the right-hand access door.
2. Switch on the «Controller».
3. Close the access door.
4. Turn the «starter switch» to the "On" ⊃ position.
The *charging indicator lamp* must light.

8.2.2 Engine pre-heating

The preheating period should be between 5 and a maximum of 10 seconds depending on ambient temperature. Low ambient temperatures require a longer preheating period.



The electric fuel pump starts automatically during pre-heating. This vents the fuel line before each start.



CAUTION

Destruction of the glow plug
The glow plug could be destroyed if the preheating period is too long.

- Never allow the glow plugs to glow for longer than 10 seconds.
- Turn the «starter switch» to the "Pre-heat"  position and hold for 8 to 10 seconds.
The engine's glow plugs are energised and the engine pre-heated.

8.2.3 Starting the machine



CAUTION

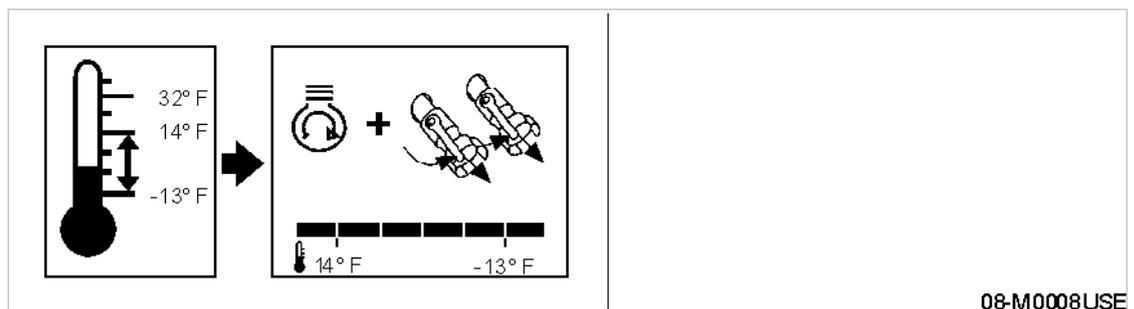
Destruction of the starter.
Improper operation could destroy the starter.

- The starter must not operate while the engine is running.
- Do not hold the start switch in the start position 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 (restart protection).
- Turn the «starter switch» to "START"  and release it as soon as the engine starts.
The *charging indicator lamp* extinguishes as soon as the engine is running.
If the *Back pressure* lamp lights, there is back pressure in the system and the start is prevented.
Only when the *back pressure* lamp extinguishes has pressure in the system fallen enough to allow the machine to be restarted.

8.2.4 Allow 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 by the temperature gauge switch on the instrument panel.

Option ba



08-M0008USE

Fig. 19 Label referring to the warm-up period when ambient temperatures are below 14 °F

- Allow the machine to warm up in IDLE (low speed).

8.2.5 Switching to LOAD

Precondition Airend discharge temperature must be at least +86 °F

**WARNING**

Compressed air can cause serious injuries.

- Never direct compressed air at persons or animals.
- No personnel may work on the machine.
- All bodywork must be secured in place.
- All access doors must be closed.

- Press the «Load on» button.

Result The *LOAD* indicator lights and the engine picks up to maximum speed.

8.2.6 Shutting down the machine

1. Turn the «starter switch» to the "STOP/Aus"  position.
The engine turns off.
2. Open the right-hand access door.
3. Switch off the «Controller».
4. Close the access door.



Secure both doors with locks as necessary.

**8.3 Option ua
Using the hose reel**

The machine is fitted with an additional compressed air extension hose.
A hose reel is provided for safe storage of this hose.

- Check which hose reel is fitted to your machine.

8.3.1 Using the hose reel (EC version)

The hose reel is on the front of the machine.

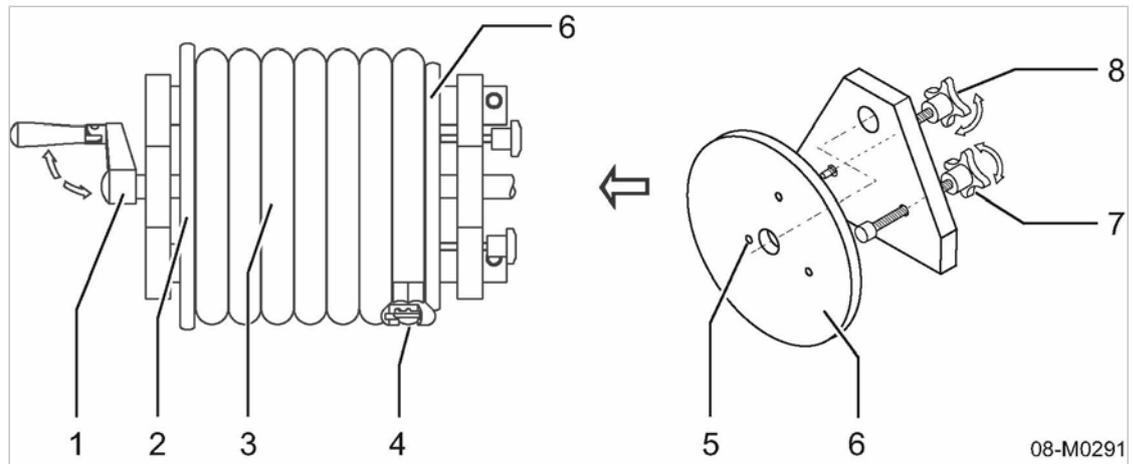


Fig. 20 Hose reel (EC design)

- | | | | |
|---|---------------------------|---|--------------------------|
| ① | Winding handle (fold out) | ⑤ | Securing hole |
| ② | Hose reel | ⑥ | Hose reel side plate |
| ③ | Hose | ⑦ | Clamping screw |
| ④ | Hose coupling | ⑧ | Transport securing screw |

8.3.1.1 Operating the machine with an extension air hose.

1. Loosen the transport securing pin ⑧ and the clamping screw ⑦.
2. Fold out the crank handle ① and reel out the required length of hose ③.
3. Tighten the clamping screw ⑦.
The reel is locked against unwanted reeling in or out.
4. Fold in the handle again ①.
5. Connect the air tool.
6. Put the machine into operation.
7. Open the compressed air shut-off valve.

8.3.1.2 Operating the machine without an extension air hose.

1. Close the compressed air shut-off valve.
2. Disconnect the air consumer.
3. Fold out the winding handle ① and reel in the hose ③ firmly and evenly.
4. Tighten the clamping screw ⑦.
The reel is locked against unwanted reeling in or out.
5. Fold in the handle again ①.

8.3.1.3 Securing the hose reel for transport

1. Check that the hose is firmly and evenly reeled in. Reel again, if necessary.
2. Locate the securing hole ⑤ in the reel's side plate ② until it is aligned with the securing screw ⑧.
3. Engage the securing screw fully.
4. Tighten the clamping screw ⑦.

8.3.2 Using the hose reel (USA version)

The hose reel is mounted on the towbar.

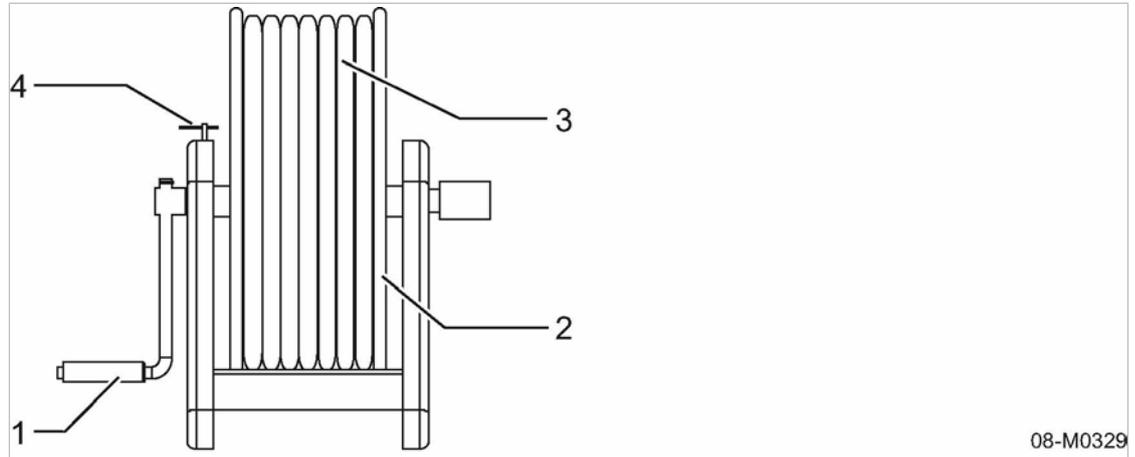


Fig. 21 Hose reel (EC design)

- | | |
|------------------|------------------|
| ① Winding handle | ③ Hose |
| ② Hose reel | ④ Clamping screw |

8.3.2.1 Operating the machine with an extension air hose.

1. Loosen the clamping screw ④.
2. Reel out the required length of hose ③.
3. Tighten the clamping screw ④.
The reel is locked against unwanted reeling in or out.
4. Connect the air tool.
5. Put the machine into operation.
6. Open the compressed air shut-off valve.

8.3.2.2 Operating the machine without an extension air hose.

1. Close the compressed air shut-off valve.
2. Disconnect the air consumer.
3. Loosen the clamping screw ④.
4. Use the winding handle ① to reel in the hose ③ firmly and evenly.
5. Tighten the clamping screw ④.
The reel is locked against unwanted reeling in or out.

8.3.2.3 Securing the hose reel for transport

1. Check that the hose is firmly and evenly reeled in. Reel again, if necessary.
2. Tighten the clamping screw ④.
The reel is locked against unwanted reeling in or out.

8.4 Option ec Operating the tool lubricator

Precondition The machine is switched off.

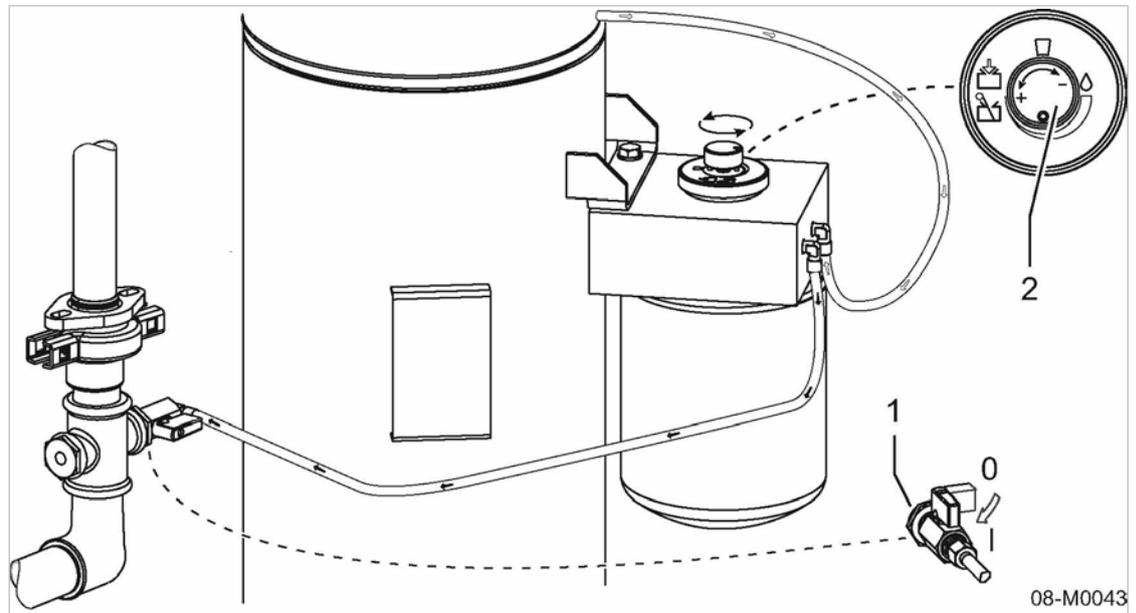


Fig. 22 Setting the tool lubricator

- ① Shut-off valve
1 – open
0 – closed
- ② Metering knob

➤ Open the right-hand access door.

Adding lubricating oil

1. Open the shut-off valve.
2. Close the access door.

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.

- Clockwise adjustment reduces the oil flow.
- Counter-clockwise adjustment increases the oil flow.

1. Set the required oil flow.
2. Close the access door.

Further information Fill the tool lubricator with suitable oil (see chapter 10.8.1)

Shutting off lubricating oil

1. Close the shut-off valve.
2. Close the access door.

**8.5 Option ba, bb
Using the low-temperature equipment**

➤ Heed the safety instructions in chapter 3.5.

**8.5.1 Option ba
Using with the frost protector switched on**

Precondition Frost protector filled with antifreeze

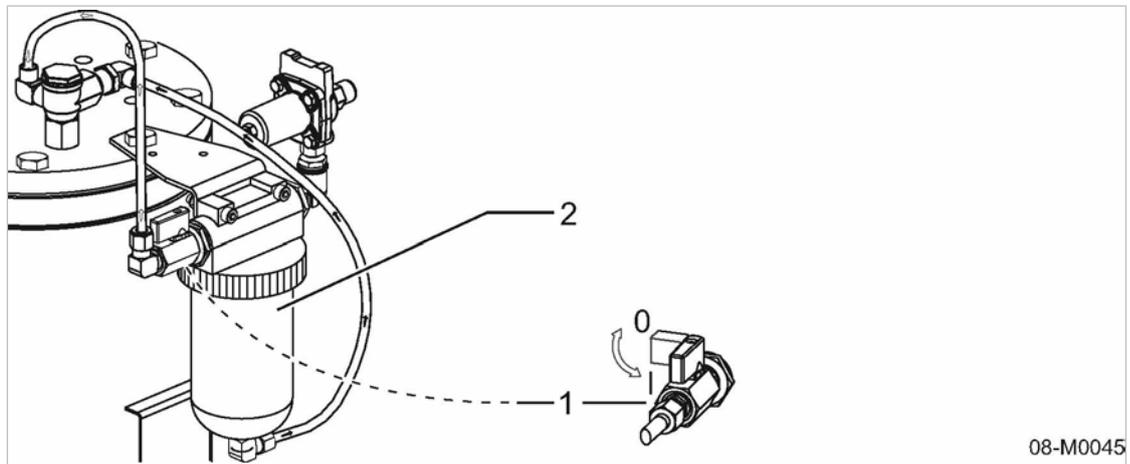


Fig. 23 Switching on the frost protector

- ① Shut-off valve
1 – open
0 – closed
- ② Frost protector tank

Using with the frost protector switched on

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

Precondition The machine is switched off.

1. Open the right-hand access door.
2. Keep the frost protector shut-off valve permanently closed (position 0).
3. Close the access door.

Result The machine is ready for winter operation.

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 right-hand access door.
2. Leave the frost protector shut-off valve open permanently (position I).
3. Close the access door.

8.5.2 Option bb Coolant pre-heating

- Start the coolant pre-heating as described in chapter 7.5.2.

8.6 Option oa Operating the battery isolating switch

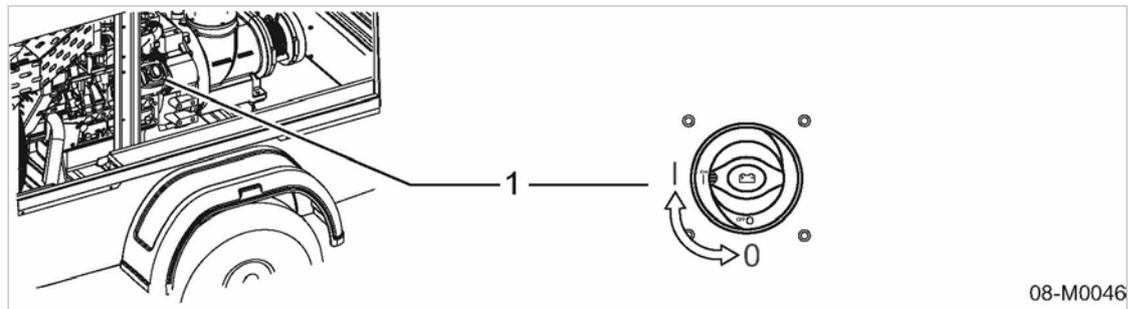


Fig. 24 Battery isolating switch

- ① «Battery isolating switch»
I – on
0 – off

Start the machine

1. Open the left-hand door.
2. Switch the «battery isolating switch» on.
The battery is now connected to the machine's electrical system. The machine can now be started.
3. Close the access door.

Shutting down the machine

1. Open the left-hand door.
2. Switch the «battery isolating switch» to the 'off' position
The battery is disconnected from the machine's electrical system.
3. Close the access door.

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. Inform KAESER Service if the fault cannot be removed by the action suggested.

Further information Observe the instructions in chapter "Safety" and prevailing local safety regulations when rectifying faults and malfunctions.

9.2 Engine faults and alarms

Further information See also the engine service manual.

9.2.1 Engine refuses to start or does not turn over

Possible cause	Remedy	Where can I get help?		
		Special-ized work-shop	KAESER Service	Engine service manual
Defective starter.	Have changed.	X	–	–
The fuel cut-off device has not opened.	Check the coil and electrical components and change 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	–	–
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	–	–
Defective battery or low charge.	Maintain battery, see chapter 10.6.	–	–	–
Defective alternator.	Have changed.	X	–	–
Defective alternator regulator.	Have changed.	X	–	–

Possible cause	Remedy	Where can I get help?		
		Specialized workshop	KAESER Service	Engine service manual
Oil pressure switch indicating insufficient oil pressure.	Check the engine oil level.	–	–	X
	Have the engine repaired or exchanged.	X	–	–

Tab. 46 Fault: 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	–	–
Speed adjustment cylinder maladjusted or defective.	Repair or have replaced if necessary.	X	X	–

Tab. 47 Fault: 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	–	–
Defective alternator.	Have replaced if necessary.	X	–	–
Defective alternator regulator.	Have replaced if necessary.	X	–	–
Engine oil pressure too low.	Check the engine oil level.	–	–	X
	Check the engine and have repaired if necessary.	X	–	–

Tab. 48 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 Service
Proportional controller maladjusted or defective.	Check the diaphragm and clean the nozzle or replace the proportional controller 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 giving false reading.	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. 49 Fault: working pressure too high

9.3.2 Working pressure too low

Possible cause	Remedy	Where can I get help?	
		Specialized workshop	KAESER Service
Proportional controller maladjusted or defective.	Check the diaphragm and clean the nozzle or replace the proportional controller if necessary.	–	X
Inlet valve not opening or only opening partially.	Repair or have replaced if necessary.	–	X
Pressure gauge giving false reading.	Have repaired or replaced if necessary.	–	X
Pressure relief valve maladjusted and/or leaking.	Have replaced if necessary.	–	X
Venting valve does not close.	Check the connections and function and have repaired or replaced as necessary.	–	X
Engine not running at full speed.	See chapter 9.2.	–	–
Engine air filter and/or compressor air filter clogged.	Clean or change, see chapters 10.3.2 and 10.4.7.	–	–
Oil separator cartridge heavily clogged.	Change, see chapter 10.4.6.	–	–

Tab. 50 Fault: working pressure too low

9.3.3 Pressure 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
Pressure relief valve maladjusted and/or leaking.	Adjust or have replaced if necessary.	–	X

Tab. 51 Fault: pressure relief valve blowing off

9.3.4 Machine overheating

Possible cause	Remedy	Where can I get help?	
		Specialised 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 psi. Change, see chapter 10.4.6.	–	X
Compressor oil filter clogged.	Change, see chapter 10.4.4.	–	–
Compressor oil level too low.	Top up (see chapter 10.4.2).	–	–
Oil pipes leaking.	Seal leaks or have pipes changed.	X	X
Engine cooling system or cooling fan defective.	Have repaired.	X	X
Ambient temperature too high.	See installation conditions in chapter 5.2.	–	–

Tab. 52 Fault: 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 strainer in the separator cartridge dirt trap (see chapter 10.4.5). Replace if necessary.	–	X
Fractured oil separator cartridge.	Change, see chapter 10.4.6.	–	–
Oil level in the oil separator tank too high.	Reduce to maximum level, see chapter 10.4.1 and chapter 10.4.3.	–	–

Tab. 53 Fault: 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. 54 Fault: oil flows from the compressor air filter after shutdown

10 Maintenance

10.1 Safety

Follow the instructions below to ensure safe machine maintenance.
Warning instructions are located before a potentially dangerous task.

Basic safety instructions



WARNING

Danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- Shut down the machine before opening any doors/canopy.
- Do not carry out any checks or maintenance while the machine is running.

1. Follow the instructions in chapter 'Safety and Responsibility'.
2. Maintenance work may only be carried out by authorized personnel.
3. Before restarting the machine, make sure that:
 - No personnel are working on the machine,
 - All protective devices and cover panels are in place and secured,
 - All tools have been removed from the machine.

The access doors are held up by gas struts.

- Check that the doors remain open.
Change any gas strut that is not able to hold the door open.

Working on pressure system

1. Disconnect all air consumers.
2. Wait until the machine is automatically vented (check that the pressure gauge indicates 0 psig).
3. Open outlet valves carefully to ensure that the line between the minimum pressure/check valve and the compressed air outlet is vented.
4. Do not open or dismantle any valves.

Working on the drive system

1. The negative cable to the battery is disconnected.
2. The machine has 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

The maintenance schedules provide an overview of the maintenance instructions for the machine.

- Read the relative section before undertaking maintenance.

10.2.1 Logging maintenance work



The maintenance intervals given are those recommended for average applications and operating conditions.
Maintenance schedules may be modified to take into account the application, the environment and the quality of maintenance.



WARNING

Wear and machine damage through unusual applications or operating conditions.

- Maintenance tasks must be carried out more frequently when operating conditions are unfavorable (e.g. dusty environment) or when the equipment is in constant use.
- Adjust the maintenance intervals with regard to local installation and operating conditions.
- Keep a log of all properly carried out maintenance and service work.
This enables the frequency of individual maintenance tasks and deviations from our recommendations to be determined.

Further information A prepared list is provided in chapter 10.9.

10.2.2 Maintenance tasks after commissioning

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

- Carry out maintenance tasks according to the following schedule.

Component Task	After the first 50 h	See chapter	Note
Engine			
Oil changing	X	10.3.6	Engine SM
Change the oil filter.	X	10.3.7	Engine SM
Check the fuel lines and clamps.	X		Engine SM
Compressor unit			
Change the oil filter.	X	10.4.4	
Chassis			
Retighten the wheel nuts/bolts.	X		

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

Tab. 55 Maintenance tasks after commissioning

10.2.3 Regular maintenance tasks

The following table lists the various maintenance intervals.

Maintenance interval	Short description
Daily	–

Maintenance interval	Short description
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 operating hours	A3000
Every 36000 h, at least every 6 years.	A36000

Tab. 56 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 Maintenance schedule

- Carry out maintenance tasks according to the following schedule.

Component Function	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
Clean the engine air filter		X							10.3.2	Engine SM
Change the engine oil		X							10.3.6	
Change the engine oil filter.		X							10.3.7	Engine SM
Check/adjust the drive belt tension.		X							10.3.8	Engine SM
Replace the drive belt.			X						10.3.8	SW Engine SM
Change engine air filter.				X					10.3.2	
Adjust the valve clearance.				X						SW Engine SM
Check the engine coolant level.	X								10.3.1	Engine SM

Engine SM = engine manufacturer's service manual; SW = specialized workshop.

Component Function	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Clean the cooler.		X							10.5	
Check antifreeze concentration.		X							10.3.1	Engine SM
Check radiator hose and hose clips, have replaced if necessary.		X								SW Engine SM
Change the coolant.				X					10.3.1	Engine SM
Fill up the fuel tank.	X									
Check fuel lines and hose clamping bands, have replaced if necessary.		X								SW
Have fuel lines and clamps replaced.						X				SW
Clean the fuel filter.		X							10.3.3	Engine SM
Change the fuel prefilter.			X						10.3.3	
Replace the fuel filter.			X						10.3.3	Engine SM
Clean the fuel tank.			X							
Clean the tank fuel strainer.			X							
Have the fuel injectors checked.					X					SW
Have the fuel injector pump checked.							X			SW
Check the battery electrolyte level and connections.			X						10.3.9	
Compressor unit										
Check inlet air filter maintenance indicator.	X								10.4.7	
Check 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 pressure relief valve(s) checked.			X						10.4.8	
Check/clean the oil separator tank dirt trap.			X						10.4.5	
Change engine air filter.				X					10.4.7	
Change the compressor cooling oil.				X					10.4.3	

Engine SM = engine manufacturer's service manual; SW = specialized workshop.

Component Function	Daily	A250	A500	A1000	A1500	A2000	A3000	A36000	See chapter	Note
Change the compressor oil filter.				X					10.4.4	
Change the separator cartridge in the oil separator tank.						X			10.4.6	
Chassis/bodywork										
Check the tire pressures.		X								
Check wheel fixings are tight.		X								
Carry out chassis maintenance.			X						10.7	
Grease the ball coupling, joints and towbar.			X						10.7.2	
Brake maintenance			X						10.7.3	
Check wear on the brake linings.			X						10.7.3.1	
Have the wheel brakes adjusted.			X							SW
Check all screw connections, hinges, locks, catches, handles and snap fasteners for wear and secure fixing.		X								
Grease the door hinges.			X							
Carry out rubber sealing strip maintenance.			X						10.6	
Have the lifting point checked.			X							SW
Other maintenance tasks										
Check all accessible fittings, pipes and clamps for wear and tightness.			X							
Check hoses for leaks and wear.			X							
Have hose lines replaced.							X			SW
Check that all electrical connec- tions are tight.			X							
Engine SM = engine manufacturer's service manual; SW = specialized workshop.										

Tab. 57 Regular maintenance tasks

10.2.3.2 Maintenance schedule for options

➤ Carry out maintenance tasks according to the following schedule.

Option Function	Daily	A250	A500	See chapter	Note
Option ec - tool lubricator					
Check the oil level in the tool lubricator.	X			10.8.1	
Option ba – frost protector					
Winter operation Check the level of antifreeze in the frost protector.	X			10.8.2	
Option la – spark arrestor					
Clean the spark arrestor.		X		10.8.3	
Blow out the spark arrestor with compressed air.			X		
Option lb - engine air intake shut-off valve					
Clean and check the engine air intake shut-off valve		X		10.8.4	
Fuel water trap (option ne)					
Check/empty the water trap.	X			10.3.3.3	
Changing the filter element.			X	10.3.3.3	

Tab. 58 Regular maintenance task options

10.3 Engine

➤ Carry out maintenance according to the schedule in chapter 10.2.3.1 .

10.3.1 Radiator maintenance

Material Coolant
Coolant tester
Receptacle
Wrench
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 has 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.

- Allow the machine to cool down before opening the coolant expansion tank cap.



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.



CAUTION

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 up the coolant as necessary.

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.

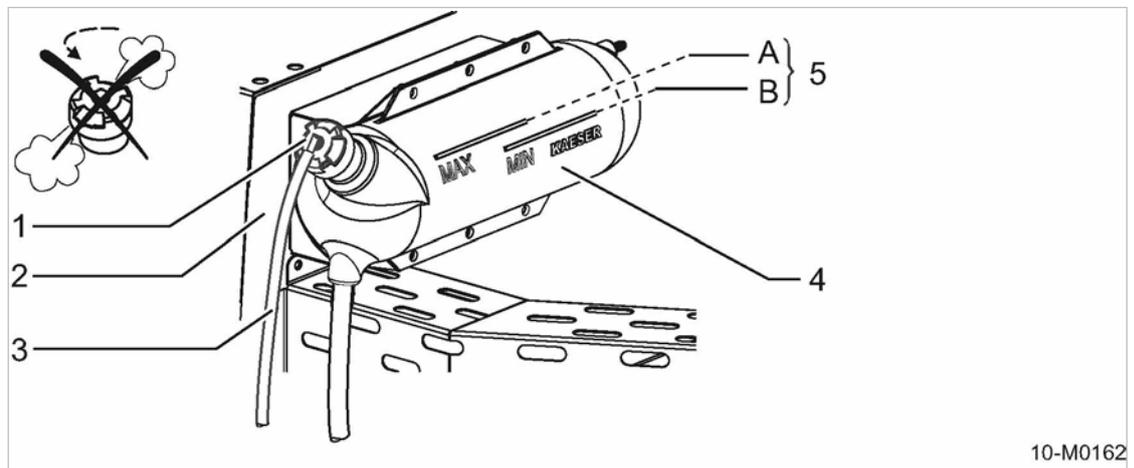


Fig. 25 Checking coolant level

- | | | | |
|---|---------------------------------------|---|---------------------|
| ① | Coolant expansion tank filler cap | ⑤ | Coolant level |
| ② | Radiator | Ⓐ | Maximum mark (FULL) |
| ③ | Overflow | Ⓑ | Minimum mark (LOW) |
| ④ | Coolant expansion tank (reserve tank) | | |

1. Open the right-hand access door.
2. Check the level of coolant in the expansion tank.
Top up when the coolant level falls below the minimum level Ⓑ.
3. Close the access door.



Find out and rectify the reason for coolant loss.

10.3.1.2 Checking the antifreeze concentration in the engine coolant

The coolant is a mixture of clean, fresh water and antifreeze/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. Maximum frost protection is ensured with an antifreeze concentration of 55% volume as frost protection and heat transfer properties deteriorate beyond this point. The maximum permissible service life of the coolant is 2 years.



CAUTION

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 up as necessary.

1. Open the left-hand door.
2. Remove the expansion tank filler cap.
3. Use the coolant tester as instructed by the manufacturer to test the coolant.
Change the coolant when the concentration of antifreeze is too low.
4. Screw on the filler cap.
5. Close the access door.

10.3.1.3 Mixing coolant

- Mix the concentration of antifreeze as shown in the table.

Description	Antifreeze concentration [% vol.]	Water percentage [% vol.]	Freezing point [°F]
Minimum required anti-freeze concentration	40	60	-13
Minimum required anti-freeze concentration for topping up	50	50	-35
Maximum permissible anti-freeze concentration	55	45	-49

Tab. 59 Coolant frost protection

10.3.1.4 Topping up the coolant



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

1. Open the left-hand door.
2. Remove the expansion tank filler cap.

3. Mix a quantity of coolant according to the table and top up to the mark.
Top up until the coolant level is just below the maximum mark **A**
4. Screw on the filler cap.
5. Start the engine and allow to idle for about 1 minute.
6. Stop the engine.
7. Check the coolant level.
Top up if the coolant level in the expansion tank has fallen.
8. Close the access door.

10.3.1.5 Changing the coolant

Precondition The negative cable to the battery is disconnected.

- Heed the safety instructions in chapter 3.5.

Draining the coolant

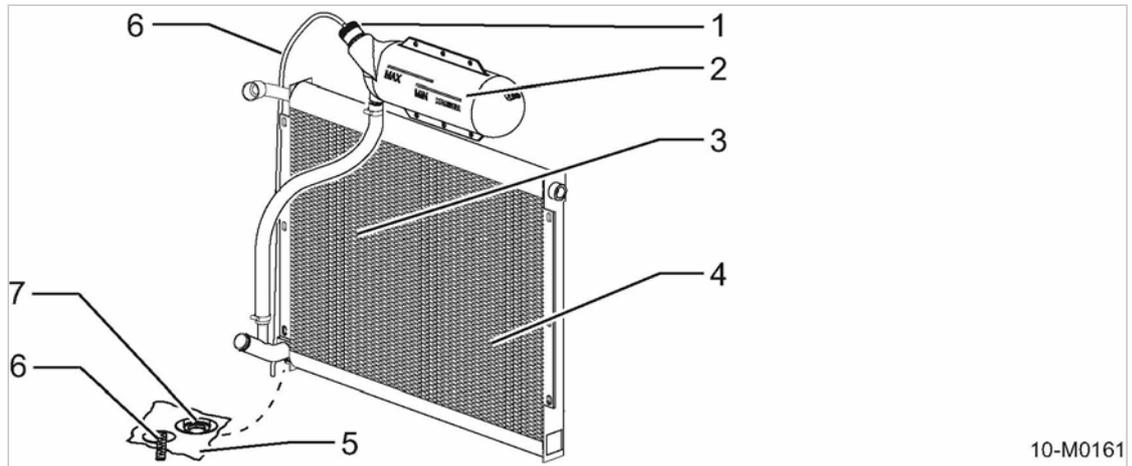


Fig. 26 Draining the coolant from the radiator

- | | |
|--------------------------|--------------------------|
| ① Filler cap | ⑤ Underside of floor pan |
| ② Coolant expansion tank | ⑥ Coolant expansion tank |
| ③ Radiator | ⑦ Radiator drain plug |
| ④ Oil cooler | |

1. Position the receptacle below the radiator draining point.
2. Unscrew the drain plug on the radiator and allow coolant to drain into the receptacle.
3. Replace the plug in the radiator.



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

Refilling with coolant

1. Mix the coolant as shown in the table.
2. Open the left-hand door.
3. Remove the expansion tank filler cap.
4. Pour coolant into the expansion tank until the level is just below the maximum **A**.

5. Screw on the filler cap.
6. Reconnect the battery.
7. Start the engine and allow to idle for 1-2 minutes.
8. Stop the engine.
9. Check the coolant level (see chapter 10.3.1.1).
Top up if the level has fallen.
10. Close the access door.



If the coolant has been changed, check the level of the new coolant frequently at first as it can fall due to the escape of air locks in the cooling circuit.

10.3.2 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 2 years or after it has been cleaned 5 times.



Using the engine without an air filter element is not permitted. Do not use an air filter element with damaged folds or gasket.

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



WARNING

Damaged air 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.

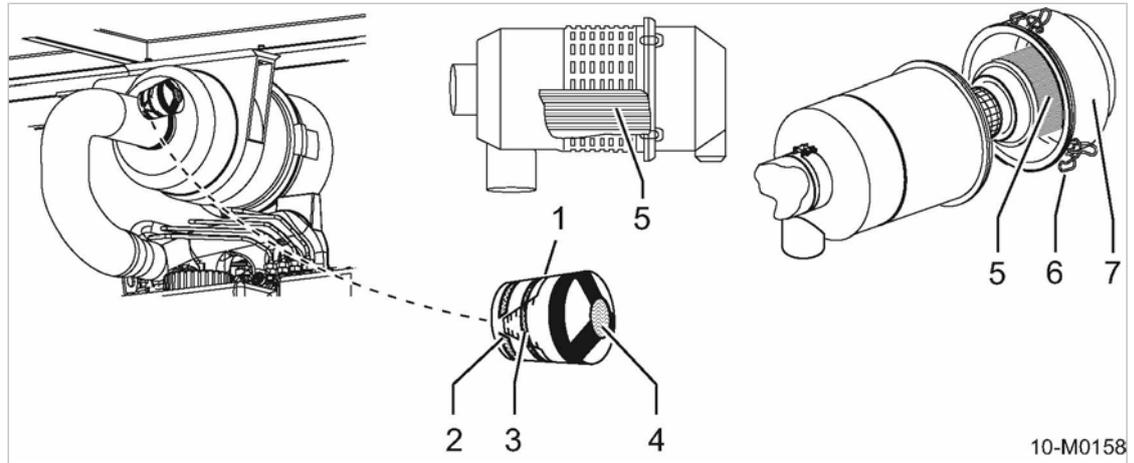


Fig. 27 Engine air filter maintenance

- | | |
|--|------------------|
| ① Maintenance indicator | ⑤ Filter element |
| ② Red zone indicator scale | ⑥ Retaining clip |
| ③ Indicator piston | ⑦ Filter cap |
| ④ Reset knob for the maintenance indicator | |

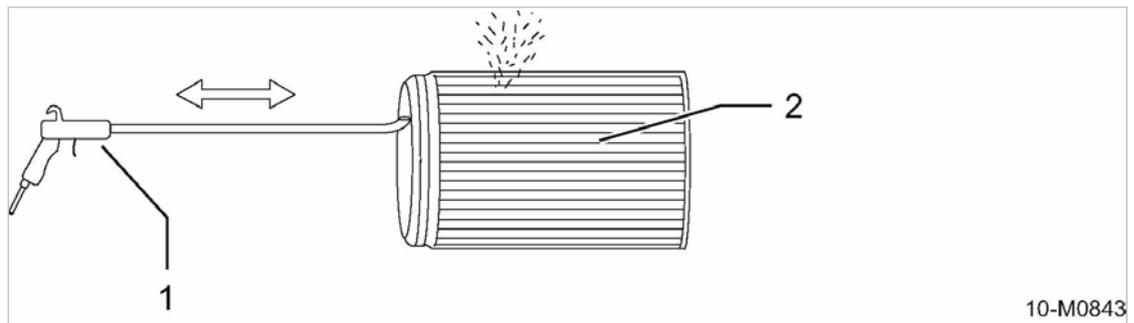


Fig. 28 Cleaning the filter element

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

1. Open the right-hand access door.
2. Check the air filter maintenance indicator.
If the yellow piston reaches the red zone, clean or renew the filter element.
3. Close the access door.

Cleaning the air filter:

1. Open both doors.
2. Release the retaining clip. Lift off the cap and extract the element.
3. Clean the inside of the housing, the cover and sealing faces carefully with a damp cloth.

4. Cleaning the filter element:
 - Use dry compressed air (≤ 72.5 psig) at an angle to blow dirt from the element from inside to outside.
 - The blast pipe must be long enough to reach right into the element.
 - The tip of the blast pipe should not be allowed to touch the element.
 - Clean sealing faces.
5. Inspect the element carefully for any damage.
Replace a damaged filter element.
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. Replace the cap and secure with the clip.

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 doors.



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

10.3.3 Fuel system maintenance

- Material
- Spares
 - 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 has cooled down.



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.

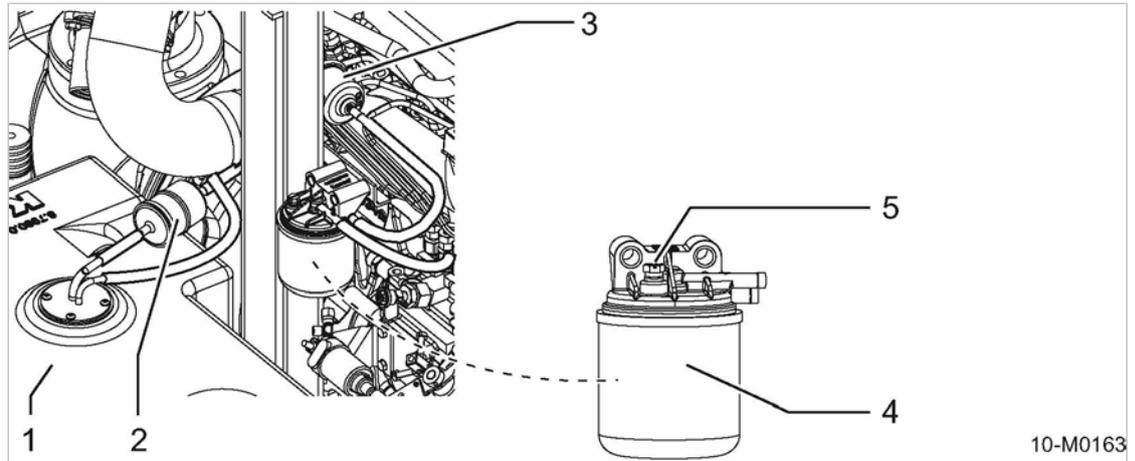


Fig. 29 Bleeding the fuel system

- | | |
|------------------|--------------------|
| ① Fuel tank | ④ Fuel fine filter |
| ② Fuel prefilter | ⑤ Bleed screw |
| ③ Fuel pump | |

➤ Open the right-hand access door.

10.3.3.1 Bleeding the fuel system

Air can enter the fuel system if the fuel tank is empty, after a fuel filter change or when carrying out work on the fuel lines.

Bleed the fuel system if the engine refuses to start despite the fact that the fuel tank is full.

1. Position the fuel receptacle beneath the fuel filter housing ④.
2. Loosen the filter bleed screw ⑤.
3. Close the access door.
4. Turn the «starter switch» to the "I" position I.
The fuel pump runs and air is bled out of the fuel system.
5. Turn the «starter switch» ● to the "STOP/off" position after 30 seconds.
6. Open the right-hand access door.
7. Tighten the bleed screw ④ again.
8. Remove the receptacle.
9. Close the access door.



Start the engine as soon as the fuel system has been bled and allow to run for at least 5 minutes in IDLE.

10. Open the right-hand access door.
11. Check the fuel prefilter for leaks.
If a leak is found, tighten the filter element and fittings.
12. Close the access door.



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

10.3.3.2 Fuel filter maintenance

Precondition The negative cable to the battery is disconnected.

Change the fuel prefilter:

1. Place a receptacle beneath the fuel prefilter.
2. Loosen the hose clamps and unscrew the fuel prefilter ② from between the fuel hoses. Catch any escaping fuel.
3. Install a new fuel prefilter between the hoses, taking care the flow is in the right direction, and secure using hose clamps.
4. Remove the receptacle.

Replace the fuel microfilter:

1. Place a receptacle beneath the fuel microfilter ④ housing.
2. Use a filter wrench to loosen then unscrew the microfilter cartridge. Catch fuel in the receptacle.
3. Carefully clean the filter holder sealing face using lint-free cloth.
4. Lightly coat the filter holder rubber gasket with fuel.
5. Lightly coat the new microfilter cartridge with fuel and screw on clockwise tight by hand.
6. Remove the receptacle.

Further information The engine service manual gives further information on changing the fuel microfilter.

Making operational

1. Re-connect the battery.
2. Close the access door.



The fuel system must be bled after the fuel filters have been changed.



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

Starting the machine and carrying out a trial run

1. Start the machine and allow it to idle for about 1 minute.
2. Shut down the machine.
3. Open the right-hand access door.
4. Visually check the fuel system for leaks.
5. Tighten all fittings.
6. Close the access door.

**10.3.3.3 Option ne
Maintenance of the fuel prefilter with water trap**

A combined water trap and filter element is used to clean the fuel.

Material Spares
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 has cooled down.

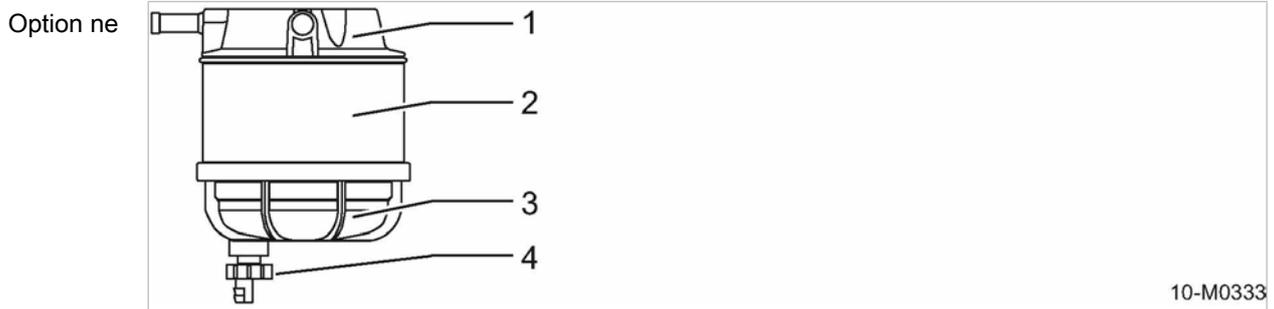


Fig. 30 Fuel filter with water trap

- | | |
|------------------|------------------|
| ① Filter head | ③ Separator tank |
| ② Filter element | ④ Drain plug |

➤ Open the right-hand access door.

Check the water trap:

The water trap is semi-transparent so the fuel level can be seen from outside.

- Water, being denser than diesel fuel, sinks to the bottom of the water trap.
- The presence of water can be verified by its different color to the fuel.

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

1. Check the fuel in the water trap.
The water trap should be emptied when dirty.
2. Close the access door.

Emptying the water trap

Precondition The negative cable to the battery is disconnected.

1. Place a receptacle under the drain plug ④.
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 again.
5. Reconnect the battery.
6. Close the access door.



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

Changing the filter element

The fuel filter element should be changed

- According to the maintenance schedule.
- If the engine cannot draw in enough fuel and loses power.

The interval between filter element changes is dependent on fuel quality and cleanliness. The fuel tank should be nearly empty when the filter element is changed.

Precondition The negative cable to the battery is disconnected.

1. Emptying the water trap.
2. Unscrew the filter element ② from the filter head ① anti-clockwise.
3. Unscrew the separator bowl ③ from the filter element and clean the bowl.
4. Check the separator bowl gasket ③ for damage and good seating.
Change the gasket if defective.
5. Smear some clean fuel on the gasket.
6. Screw the separator bowl ③ onto a new filter element ②.
7. Check the filter head gasket ① for damage and good seating.
Change the gasket if defective.
8. Smear some clean fuel on the gasket.
9. Check that the drain plug ④ under the separator bowl is tight.
Screw in the plug if it is loose.
10. Fill the filter element ② with clean fuel.
11. Screw the filter element ② carefully into the filter head ①.
12. Re-connect the battery.
13. Close the access door.



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

Starting the machine and carrying out a trial run

1. Start the machine and allow it to idle for about 1 minute.
2. Shut down the machine.
3. Open the right-hand access door.
4. Visually check the fuel system for leaks.
5. Tighten all fittings.
6. Close the access door.

10.3.4 Checking the engine oil level

The engine oil is indicated by a dipstick in the oil sump. The oil level should ideally be between the two marks on the dipstick. The oil level should not be allowed to fall below the «minimum level».

- Material 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 cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

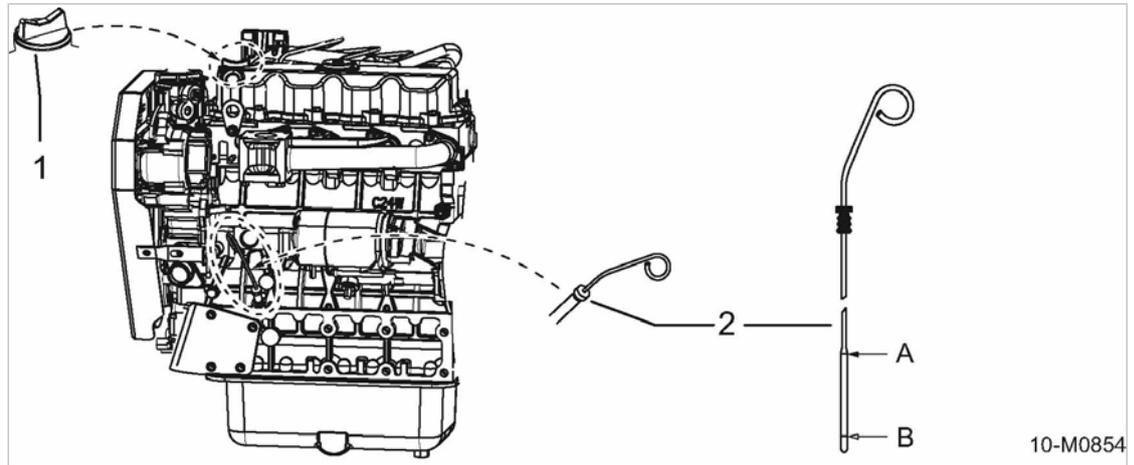


Fig. 31 Checking the engine oil level

- | | |
|-------------------------|--------------------------------|
| ① Engine oil filler cap | Ⓐ Mark for «maximum oil level» |
| ② Oil dipstick | Ⓑ Mark for «minimum oil level» |

1. Open the left-hand door.
2. Withdraw the dipstick, wipe with a lint-free cloth and replace fully.
3. Withdraw the dipstick once more and read off the oil level.
The level should be between the maximum and minimum markings.
Top up if the level has reached the «minimum level» mark.
4. Close the access door.

10.3.5 Engine oil filling and topping up

- Material Engine oil
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.
All compressed air consumers are disconnected and the air outlet valves are open.
The negative cable to the battery is disconnected.

Filling with engine oil



See chapter 2.6.4 for engine oil filling volume.
The oil dipstick is marked with the «maximum oil level».

1. Open the left-hand door.
2. Remove the filler cap and fill with fresh oil.
3. Wait 5 minutes then check the oil level.



It takes a few minutes for oil to reach the sump.

Top up if the level is too low.

4. Replace the filler cap.
5. Reconnect the battery negative terminal.
6. Close the access door.

Starting the machine and carrying out a trial run

1. Start the machine and allow it to idle for at least 5 minutes.
2. Shut down the machine.
3. Wait until the machine has automatically vented.
Pressure gauge reads 0 psig.
4. Open the left-hand door.
5. Check the oil level after about 5 minutes.
Top up if the level is too low.
6. Carry out a visual check for leaks.
7. Close the access door.

10.3.6 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.



See chapter 2.6.4 for engine oil filling volume.

Material	Engine oil 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 gloves.

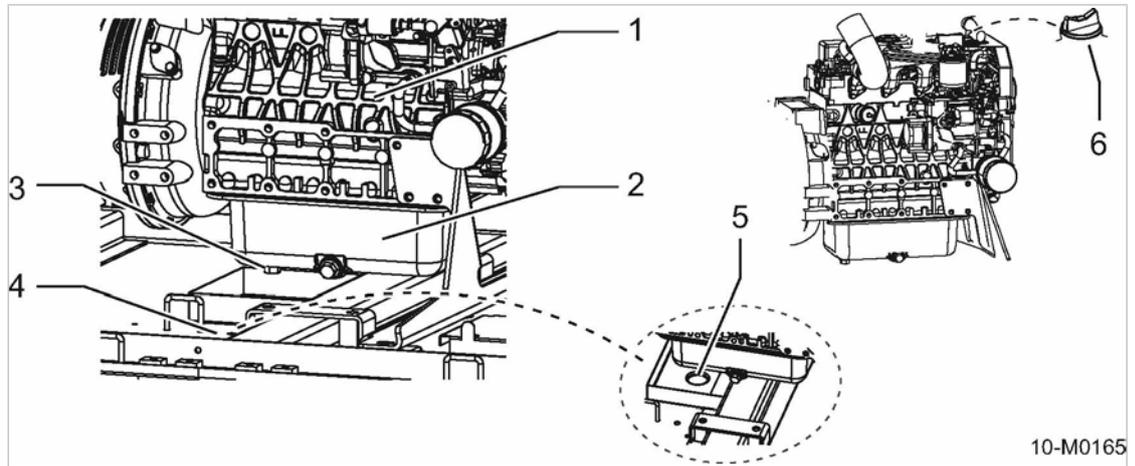


Fig. 32 Changing the engine oil

- | | |
|-------------------------|-------------------------------|
| ① Engine block | ④ Floor pan |
| ② Engine oil sump | ⑤ Drain hole in the floor pan |
| ③ Engine oil drain plug | ⑥ Engine oil filler cap |

Draining the engine oil

1. Open the right-hand access door.
2. Unscrew the engine oil filler cap.
3. Place the oil receptacle below the drain hole in the floor pan.
4. Unscrew the drain plug.
Engine oil flows into the receptacle.
5. Clean the drain plug and screw in with a new gasket.
6. Screw the engine oil filler cap back on.
7. Close the access door.



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

Further information See chapter 10.3.5 for oil filling.

The engine service manual gives instructions on oil changing.

10.3.7 Changing the oil filter

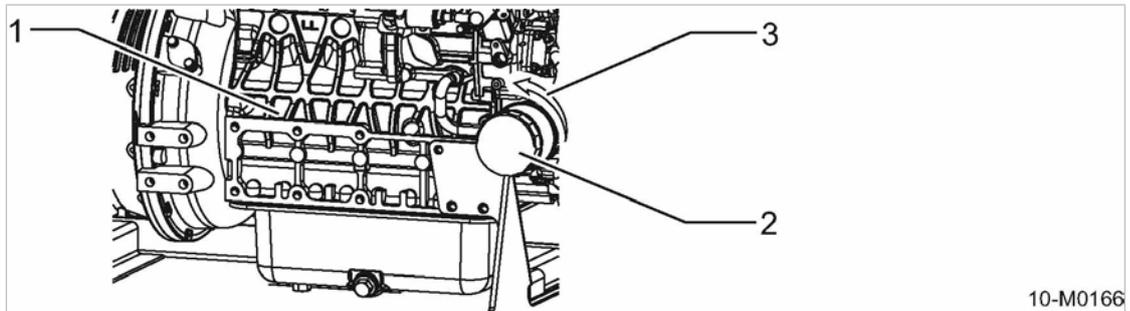
Material Spares
Filter wrench
Cleaning cloth
Receptacle

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



10-M0166

Fig. 33 Changing the oil filter

- ① Engine block
- ② Oil filter
- ③ Direction of rotation to unscrew the filter

1. Open the right-hand access door.
2. Position a capture tray beneath the oil filter.
3. Loosen the filter by turning counter-clockwise and catch any escaping engine 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 engine oil level.
Top up if the level is too low.
8. Reconnect the battery negative terminal.
9. Close the access door.

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.

10.3.8 Maintaining the drive belt

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

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

Material Wrench
suitable clamping lever (short, thin rod)
Spares

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.

**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 both doors.

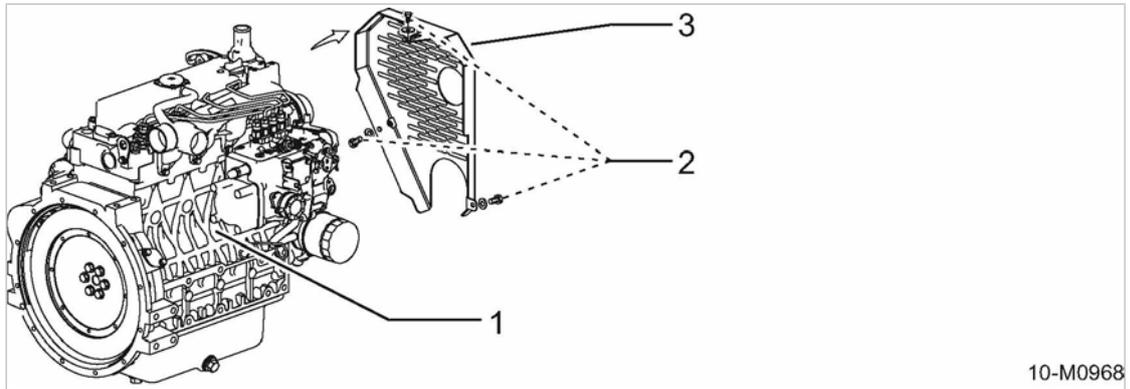
Remove the belt guard:

Fig. 34 Belt guard attachment

- ① Engine block
- ② Hex. head screws
- ③ Belt guard

- Unscrew the securing screws of the belt guard and remove the belt guard.

10.3.8.1 Visual check

Carry out a visual check for damage:

- Check the belts thoroughly for cracks, fraying or stretching.
Change the belt immediately if any damage or wear is found.

Check the belt seating:

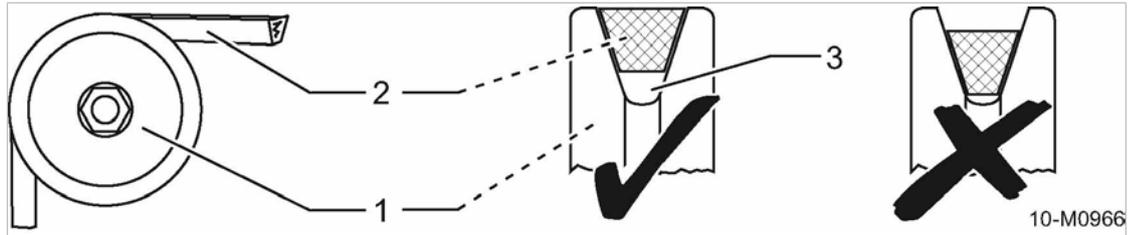


Fig. 35 Checking the drive belt seating

- ① Belt pulley
- ② Drive belt
- ③ Pulley guidance groove

- Check the drive belt seating.
If the belt sits too deep in the guidance groove: immediately change the drive belt.
- 1. Replace the belt guard.
- 2. Close the doors.

10.3.8.2 Checking belt tension

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

The belt tension can be checked by hand: To check the tension, press the belt inwards with the thumb at the mid-point between pulleys.

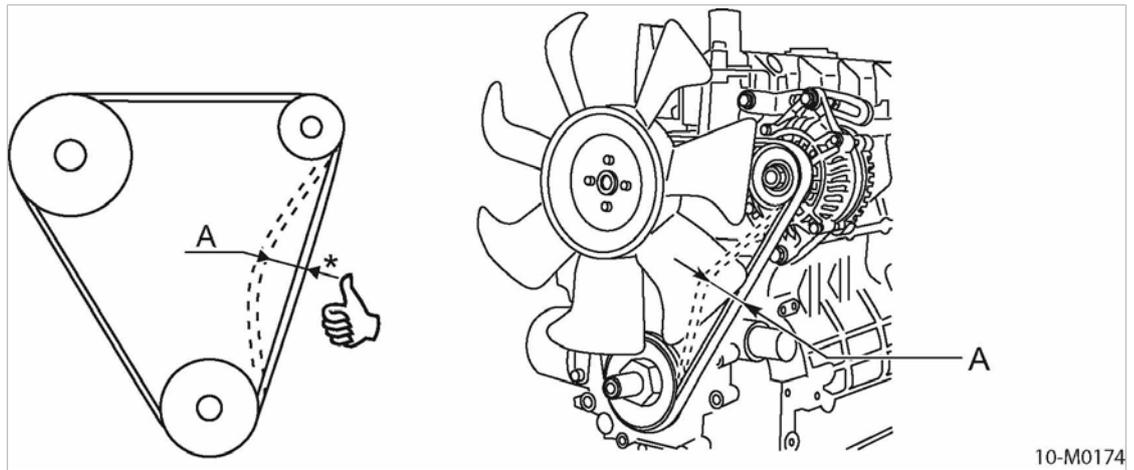


Fig. 36 Belt tension checking by hand

- Ⓐ Permissible deflection of the belt
- * Approximate pressure exerted: 22 kg
Permissible movement: 0.28 – 0.35 mm

1. Check belt tension by hand (see Fig. 36).
Belt tension too low: Tension
2. Replace the belt guard.
3. Reconnect the battery negative terminal.
4. Close the doors.

10.3.8.3 Changing/tensioning the drive belt

The drive belt is tensioned via the screw fastening of the alternator.

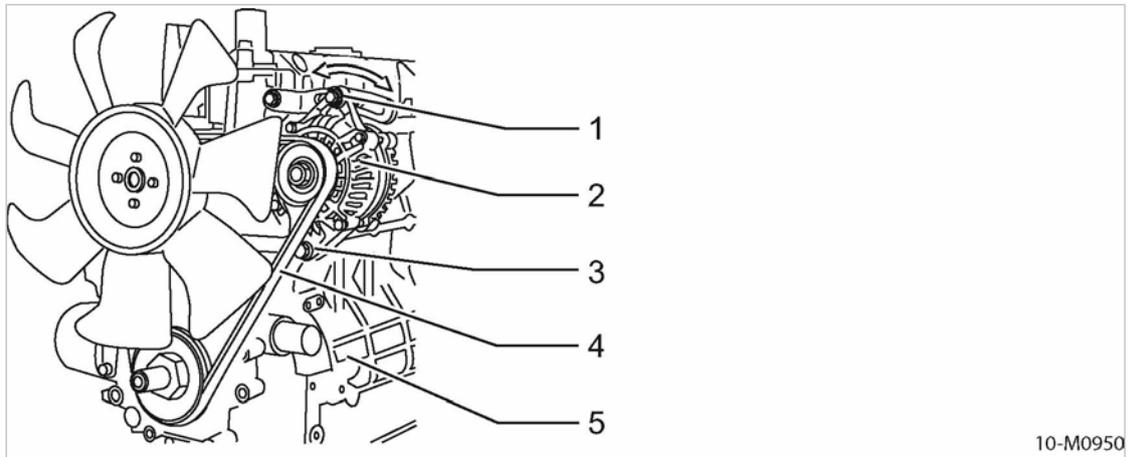


Fig. 37 Changing/tensioning the drive belt

- | | |
|------------------------------------|----------------|
| ① Hexagon screw (tensioning screw) | ④ Drive belt |
| ② Generator (alternator) | ⑤ Engine block |
| ③ Hexagon screw (securing screw) | |

Tension the drive belt:

1. Loosen the alternator securing screw and clamping screw.
2. Place a suitable lever between the alternator and engine block.
3. Gently push the alternator outwards using the lever until the drive belt is tensioned.
4. Retighten the securing screw and clamping screw.
5. Remove the lever.
6. Check the belt tension (see Fig. 36).
Belt tension too low: Tension again.

Changing the belts

1. Loosen the alternator securing screw and clamping nut until the drive belt can be taken off the pulleys.
2. Take off the belt.
3. Check the pulleys for dirt and wear.
Dirty pulley: Clean the pulley.
Worn pulley: have the pulley replaced.
4. Route the new drive belt over the pulleys without using force.
5. Tension the drive belt.



A belt that has been replaced may not be used again.
After running for two to three hours, check the belt tension again.



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

1. Replace the belt guard.
2. Secure the radiator hose.
3. Reconnect the battery negative terminal.
4. Close the doors.

Further information The operating manual of the engine manufacturer gives further information on removing, changing and tensioning drive belts.

10.3.9 Battery maintenance

- Check the charging system if the battery discharges without reason.

10.3.9.1 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.

Observe the following points when working on the battery.



10-M0167

Fig. 38 Safety signs - warning stickers on the battery.

- | | |
|--|---|
| <ul style="list-style-type: none"> ① Fire, sparks, open flame and smoking are forbidden. ② Wear eye and face protection. Danger of acid burn. ③ Keep children well away from batteries and electrolyte. | <ul style="list-style-type: none"> ④ Batteries are filled with caustic electrolyte. ⑤ Observe the battery manufacturer's instructions. ⑥ Explosion hazard! |
|--|---|

- Take heed of any safety signs on the battery warning labels.

Further instructions on working with batteries

1. Do not remove battery terminal covers unnecessarily.

2. Do not lay tools on the battery. These can lead to short circuiting, overheating and battery bursting.
3. 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.

10.3.9.2 Battery checking and care

Even so-called 'maintenance-free' batteries need a degree of care to obtain 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

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

1. Open the left-hand door.
2. Clean the casing and terminals.
3. Lightly grease the terminals to prevent corrosion.
4. Check that connections are tight and tighten if necessary.
5. Close the access door.

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 in. above the plates.



If a battery casing leaks fluid, the battery must be replaced immediately.



WARNING

Battery destruction!

Topping up with pure acid will increase the electrolyte concentration and can destroy the battery.

- Top up only with distilled water.

1. Open the left-hand door.
2. Check the electrolyte level



If the level does not reach the mark -

- top up with distilled water.

- Close the access door.

Winter operation

The battery is especially stressed during the winter. Only a fraction of the normal starting energy is available at low temperatures.

**CAUTION**

Danger of batteries freezing!

A discharged battery is endangered by frost and could freeze at a temperature of 14 °F.

- Check battery charge with a specific gravity tester.
- Recharge the battery
- Clean the battery terminals and wipe with grease.

1. Check the battery charge weekly.

Recharge as necessary.

2. 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 a heavy-duty cold-start battery and/or an additional booster battery is recommended.

10.3.9.3 Battery removal and installation

Material Wrench

Protective gloves

Precondition The machine is shut down.

The machine is standing level.

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

The machine has cooled down.

**WARNING**

There is danger of batteries bursting!

A short circuited battery heats up quickly and can burst.

Battery electrolyte will be sprayed out in such an event.

- Never short-circuit a battery (e.g. with a hand tool).
- Wear safety gloves.

**CAUTION**

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.

1. Open the left-hand door.
2. Disconnect the negative cable first, then the positive cable.
3. Unscrew the battery fixing clamp.
4. Lift the battery carefully out.
5. Close the access door.



Replace in the reverse order.

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.



The old battery is special waste and must be disposed of correctly in accordance with local environment protection regulations.

10.4 Compressor

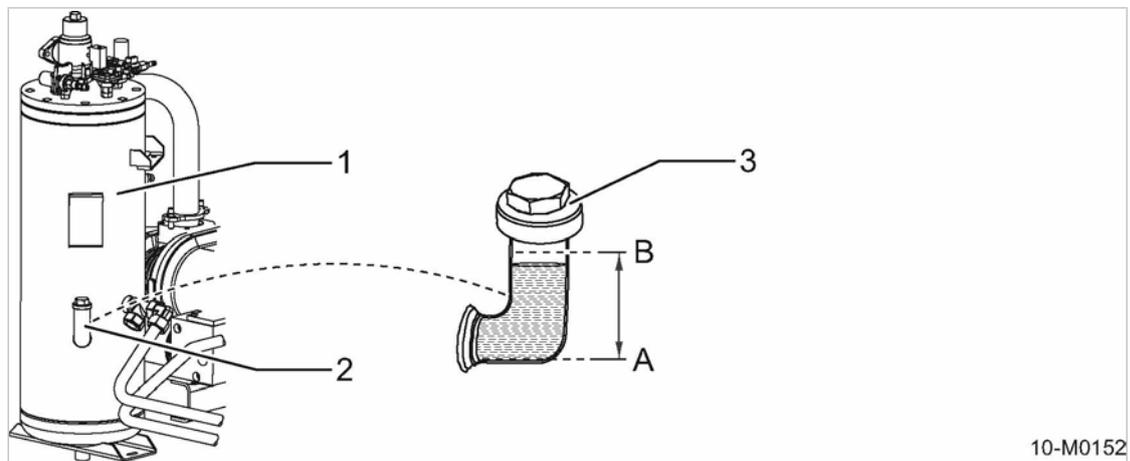
- Carry out maintenance according to the schedule in chapter 10.2.3.1.

10.4.1 Checking cooling oil level

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



10-M0152

Fig. 39 Checking cooling oil level

- | | |
|----------------------|-----------------|
| ① Oil separator tank | Ⓐ Minimum level |
| ② Oil filler | Ⓑ Maximum level |
| ③ Screw plug | |

1. Open the right-hand access door.
2. Slowly unscrew and withdraw the plug from the oil filler port.
3. Check that oil is visible.
Top up if no oil is visible.
4. Replace the filler plug.
5. Close the access door.

10.4.2 Cooling oil filling and topping up

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. 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.

Filling with cooling oil

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

**CAUTION**

The machine could be damaged by unsuitable oil.

- Never mix incompatible types of oil.
- Never top up with a different type of oil to that already used in the machine.

1. Open the right-hand access door.
2. Slowly unscrew and withdraw the plug from the oil filler port.
3. Top up the cooling oil to the maximum level  with the help of a funnel.
4. Check the oil level.
5. Check the filler plug gasket for damage.
Change a damaged gasket immediately.
6. Replace the plug in the filler port.
7. Reconnect the negative battery terminal.
8. Close the access door.

Starting the machine and carrying out a trial run

1. Start the machine and run in idle up to operating temperature.
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 right-hand access door.
7. Check the oil level after about 5 minutes.
Top up if necessary.
8. Carry out a visual check for leaks.
9. Close the access door.

10.4.3 Changing the cooling oil

Drain all cooling-oil from:

- Oil separator tank
- Oil cooler
- Oil pipes

Material Cooling oil
Receptacle
New gasket for the drain plug
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.
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

There is risk of burns from hot components and escaping oil.

- Wear long-sleeved clothing and gloves.

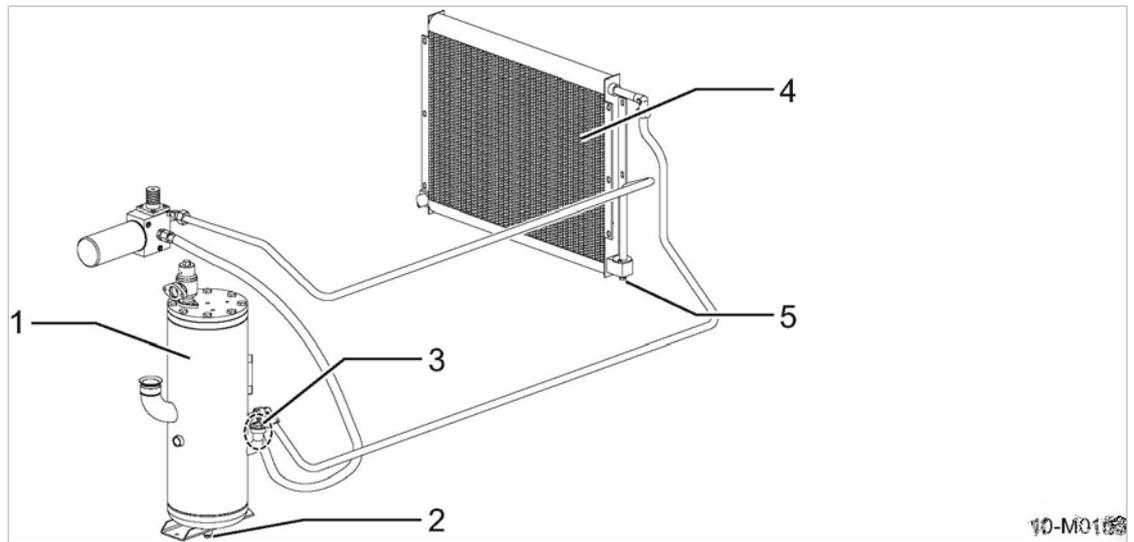


Fig. 40 Changing the cooling oil

- | | |
|---------------------------------|-------------------------|
| ① Oil separator tank | ④ Oil cooler |
| ② Oil separator tank drain plug | ⑤ Oil cooler drain plug |
| ③ Oil filler plug | |

- Heed the safety instructions in chapter 3.5.

10.4.3.1 Draining the cooling oil

- Open the right-hand access door.

Draining the oil from the separator tank

The oil separator tank is drained by a separate oil drain plug located on the underside of the tank (accessible from underneath through the access hole in the floor pan).

1. Remove the plug ③ from the oil separator tank filling port.
2. Position the receptacle below the separator tank drain plug ②.
3. Unscrew the drain plug ② and allow the cooling oil to drain into the receptacle.
4. Fit a new gasket on the drain plug and screw it back in again.

Draining the oil from the oil cooler:

Drain the oil cooler by unscrewing the separate drain plug located at the bottom of the oil collection box (accessible from underneath through the access hole in the floor panel).

1. Position the receptacle below the drain plug ⑤.
2. Unscrew the drain plug ⑤ and allow the cooling oil to drain into the receptacle.
3. Fit a new gasket on the drain plug and screw it back in again.

Finish off the work steps:

1. Replace the plug ③ in the oil separator tank filling port.
2. Close the access door.



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

Further information See chapter 10.4.2 for oil filling.

10.4.4 Changing the oil filter

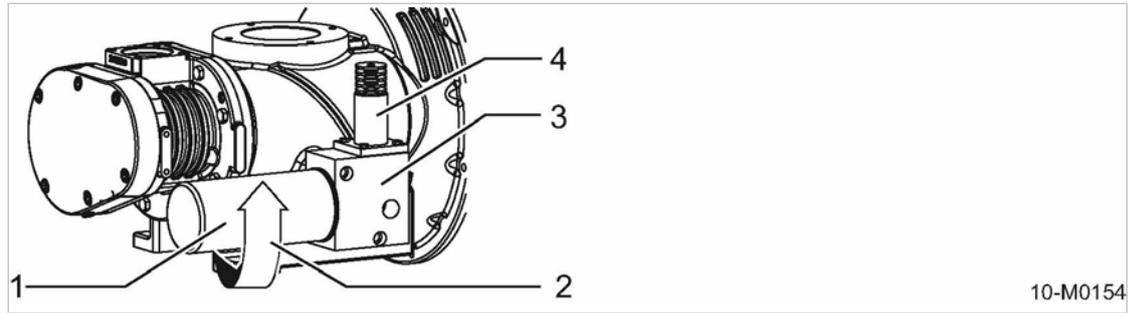
Material Spares
Filter wrench
Receptacle
Cleaning cloth

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.

**CAUTION**

There is risk of burns from hot components and escaping oil.

- Wear long-sleeved clothing and gloves.



10-M0154

Fig. 41 Changing the oil filter

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

Changing the oil filter

1. Prepare a receptacle.
2. Open the right-hand access door.
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 up if necessary.
8. Reconnect the negative battery terminal.
9. Close the access door.



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

Starting the machine and carrying out a trial run

1. Start the machine and run in idle up to operating temperature.
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 right-hand access door.
7. Check the oil level after about 5 minutes.
Top up if necessary.
8. Carry out a visual check for leaks.
9. Close the access door.

10.4.5 Oil separator tank dirt trap maintenance

- Material
- Cleaning cloth
 - Wrench
 - Small screwdriver
 - Dirt trap maintenance kit
 - Cleaning fluid or spirit

- 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.

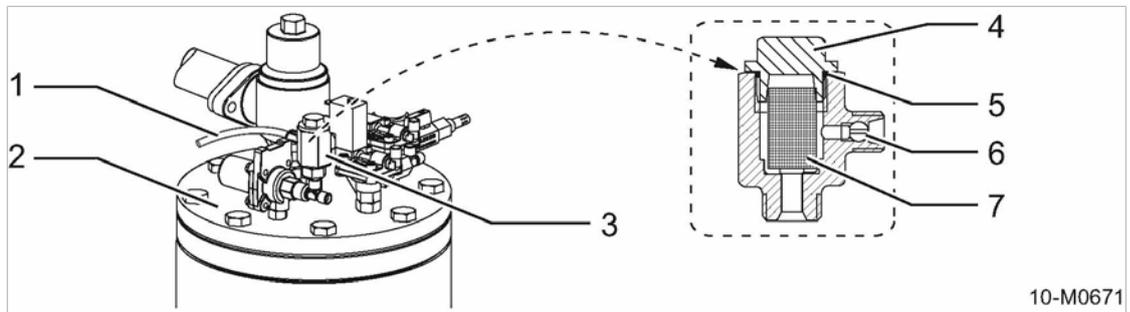


Fig. 42 Oil separator tank dirt trap maintenance

- | | |
|----------------------------|------------|
| ① Oil return line | ⑤ O-ring |
| ② Oil separator tank cover | ⑥ Nozzle |
| ③ Dirt trap | ⑦ Strainer |
| ④ Screw plug | |

- Open the right-hand access door.

Dirt trap maintenance:

1. Undo the union nut and bend the oil return line ① to one side.
2. Unscrew the plug ④.
3. Pull off the strainer ⑦.
4. Use a screwdriver to unscrew the nozzle ⑥ from the housing.
5. Clean the housing, nozzle and O-ring ⑤ with cleaning solvent or spirit.
6. Check the nozzle, strainer and O-ring for wear.
Change if heavily worn.
7. Refit the nozzle in the housing.
8. Place the strainer on the screw plug.
9. Screw in the plug making sure the O-ring seats properly.
10. Refit the oil scavenge line.

Making operational

1. Reconnect the battery negative terminal.
2. Close the access door.



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

Starting the machine and carrying out a trial run

1. Start the machine and run for approximately 5 minutes.
2. Shut down the machine.
3. Wait until the machine has automatically vented.
Pressure gauge reads 0 psig.
4. Open the outlet valves.
5. Open the right-hand access door.
6. Carry out a visual check for leaks.
7. Close the access door.

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 Spares

Cleaning cloth

Wrench

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.

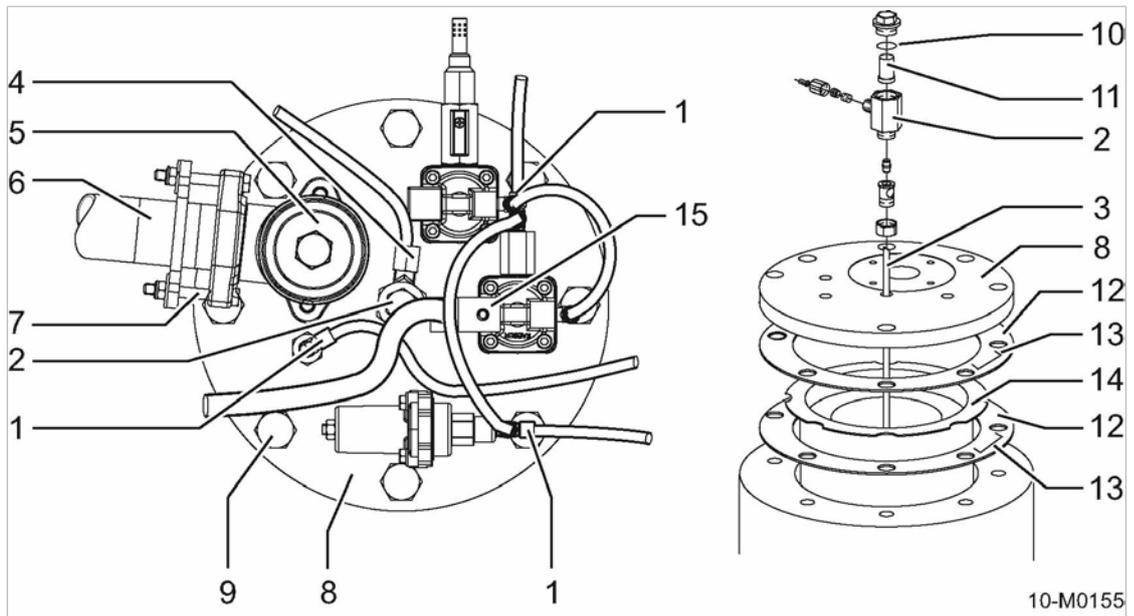


Fig. 43 Changing the oil separator cartridge

- | | |
|--------------------------------|---------------------------|
| ① Control air line union nut | ⑨ Fixing screw |
| ② Dirt trap | ⑩ O-ring |
| ③ Oil scavenge pipe | ⑪ Strainer |
| ④ Oil scavenge pipe union nut | ⑫ Gasket |
| ⑤ Minimum pressure/check valve | ⑬ Metal clip |
| ⑥ Air pipe | ⑭ Oil separator cartridge |
| ⑦ Pipe fitting | ⑮ Solenoid valve |
| ⑧ Cover | |

➤ Open the right-hand access door.

Changing the oil separator cartridge

1. Unscrew the union nuts ① and ④ and carefully put the parts to one side, then pull out the copper pipe ③ at item ②.
2. Pull out the plug to the solenoid valve ⑮ and withdraw the cable.
3. Unscrew the fitting ⑦ and turn the air pipe ⑥ to one side.
4. Remove the screws ⑨ securing the cover ⑧ to the tank.
5. Carefully lift the cover and put to one side.



Take care that the oil scavenge pipe ③ screwed to the underside of the cover is not bent in the process.

6. Take out the old cartridge ⑭ and gaskets ⑫.
7. Clean all sealing surfaces, taking care that no foreign bodies (dirt particles) fall into the oil separator tank.



Do not remove the metal clips!
The metal parts of the oil separator tank are electrically coupled. The gaskets ⑫ have metal clips ⑬ to make contact with the oil separator tank and the machine frame.

8. Insert the new oil separator cartridge with gaskets and screw down the cover.
9. Renew the strainer and sealing ring in the dirt trap.

10. Re-position the air pipe ⑥.
11. Replace and tighten all fittings.
12. Reconnect cables.
13. Check the oil level in the oil separator tank.
Top up if necessary.



Maintenance of the control valve dirt trap must be carried out whenever the oil separator cartridge is changed.

Further information Information on dirt trap maintenance is given in chapter 10.4.5.

Option ba Changing the oil separator cartridge

Option ba

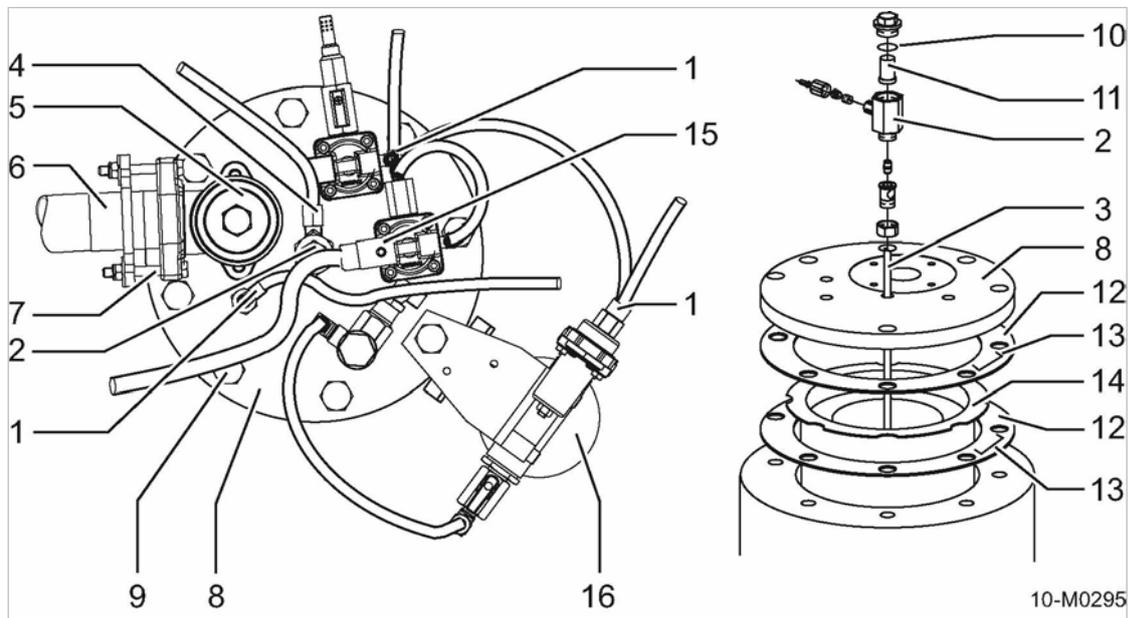


Fig. 44 Changing the oil separator cartridge (option ba)

- | | |
|--------------------------------|---------------------------|
| ① Control air line union nut | ⑨ Fixing screw |
| ② Dirt trap | ⑩ O-ring |
| ③ Oil scavenge pipe | ⑪ Strainer |
| ④ Oil scavenge pipe union nut | ⑫ Gasket |
| ⑤ Minimum pressure/check valve | ⑬ Metal clip |
| ⑥ Air pipe | ⑭ Oil separator cartridge |
| ⑦ Pipe fitting | ⑮ Solenoid valve |
| ⑧ Cover | ⑯ Frost protector |

1. Unscrew the union nuts ① and ④ and carefully put the parts to one side, then pull out the copper pipe ③ at item ②.
2. Pull out the plug to the solenoid valve ⑮ and withdraw the cable.
3. Unscrew the fitting ⑦ and turn the air pipe ⑥ to one side.
4. Loosen the frost protector clamp ring ⑯ and empty the bowl. See chapter 10.8.2 on frost protector maintenance.
5. Remove the screws ⑨ securing the cover ⑧ to the tank.

6. Carefully lift the cover and put to one side.



Take particular care with the following components:

- The frost protector (16) connected to the control line,
- The oil scavenge line (3) screwed to the underside of the cover.

7. Take out the old cartridge (14) and gaskets (12).

8. Clean all sealing surfaces, taking care that no foreign bodies (dirt particles) fall into the oil separator tank.



Do not remove the metal clips!

The metal parts of the oil separator tank are electrically coupled. The gaskets (12) have metal clips (13) to make contact with the oil separator tank and the machine frame.

9. Insert the new cartridge and gaskets.

10. Carefully replace the cover on the tank and the frost protector on the cover.

11. Screw down the cover.

12. Re-position the air pipe (5).

13. Replace and tighten all fittings.

14. Reconnect cables.

15. Check the oil level in the oil separator tank.

Top up if necessary.



Maintenance of the control valve dirt trap must be carried out whenever the oil separator cartridge is changed.

Further information Information on dirt trap maintenance is given in chapter 10.4.5.

Making operational

1. Reconnect the negative battery terminal.

2. Close the access door.



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

Starting the machine and carrying out a trial run

1. Start the machine and run in idle up to operating temperature.

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 right-hand access door.

7. Check the oil level after about 5 minutes.

Top up if necessary.

8. Carry out a visual check for leaks.

9. Close the access door.

10.4.7 Air filter maintenance

The air filter must be cleaned at the latest when the corresponding maintenance indicator demands. Replace the air filter after it has been cleaned 5 times according to the maintenance table.



Using the machine without an air filter element is not permitted. Do not use filter elements with damaged surface or seals.

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

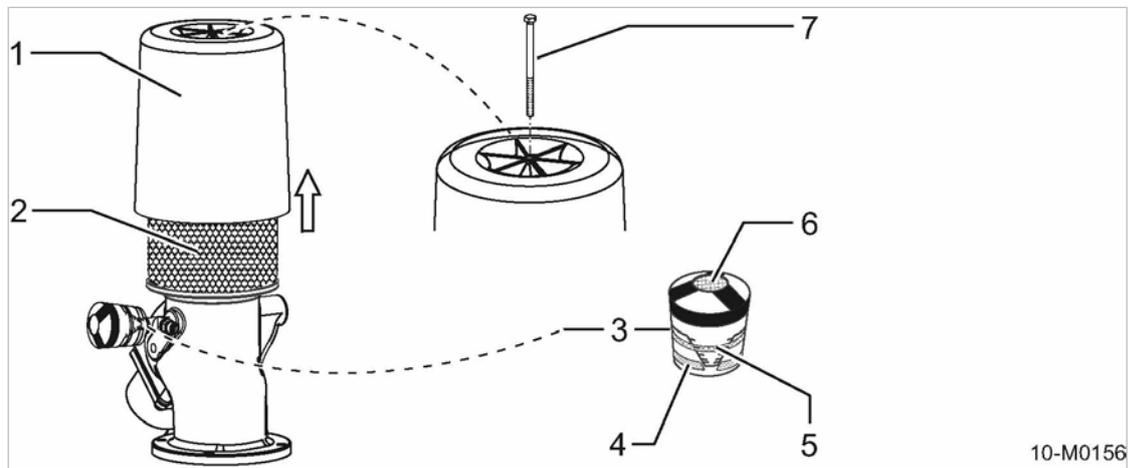
- Precondition
- The machine is shut down.
 - The machine is fully vented, the pressure gauge reads 0 psig.
 - The machine has cooled down.
 - All compressed air consumers are disconnected and the air outlet valves are open.



WARNING

Damaged air 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.



10-M0156

Fig. 45 Compressor air filter maintenance

- | | |
|---|---|
| <ul style="list-style-type: none"> ① Filter cap ② Air filter ③ Maintenance indicator ④ Red zone indicator scale | <ul style="list-style-type: none"> ⑤ Indicator piston ⑥ Reset knob for the maintenance indicator ⑦ Screw fitting |
|---|---|

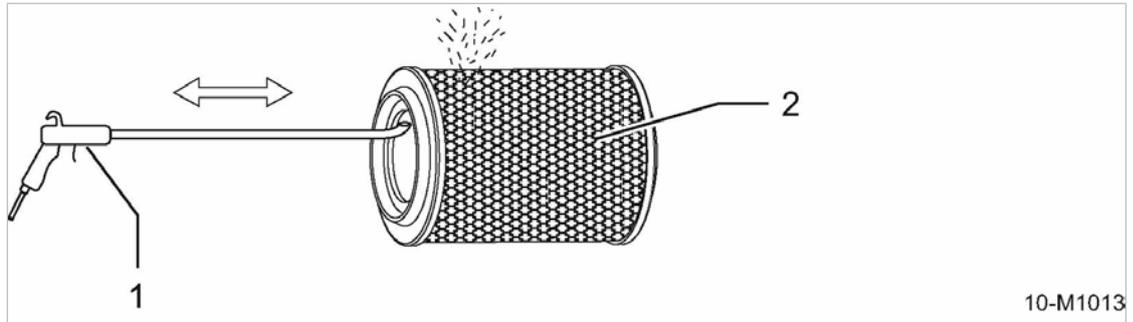


Fig. 46 Cleaning the filter element

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

➤ Open the left-hand door.

Check the degree of contamination of the filter element:

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

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

Cleaning the air filter:

1. Unscrew the hex-head screw in the filter cap.
2. Lift up the cap and remove the air filter element with a slight twisting action.
3. Clean the inside of the cap, the element holder and the sealing surfaces with a damp cloth.
4. Cleaning the filter element:
 - Use dry compressed air (≤ 72.5 psig) at an angle to blow dirt from the element from inside to outside.
 - The blast pipe must be long enough to reach right into the element.
 - The tip of the blast pipe should not be allowed to touch the element.
 - Clean sealing faces.
5. Inspect the element carefully for any damage.
Replace a damaged filter element.
6. Insert the new or cleaned air filter element in the holder. Make sure it is properly in place and sealed by its gasket.
7. Replace the cap and secure with the hex-head screw.

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 access door.



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 and radiator

The compressor oil cooler and engine coolant radiator are combined in a single cooler block. The frequency of cleaning is mainly dependent on local operating conditions. Heavy clogging of the cooler/radiator can cause oil overheating and overheating of the engine. Check the cooler/radiator regularly for clogging. Avoid creating dust eddies. Wear breathing protection if necessary. Do not clean the cooler/radiator with a sharp instrument, otherwise they could be damaged. A severely contaminated cooler/radiator should be cleaned by KAESER Service.

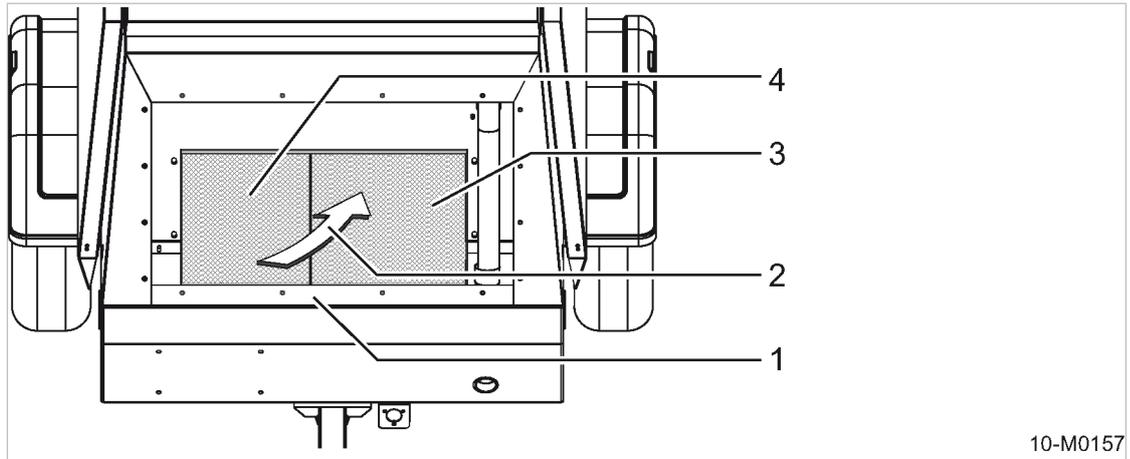
Material Compressed air
Water or steam jet blaster

Precondition Machine placed over a washing point equipped with an oil separator.
The machine is shut down.
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.
The negative cable to the battery is disconnected.

**CAUTION**

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 cubicle, alternator, starter and instruments.
- Do **not** direct water or steam jets at sensitive components such as alternator, starter or indicating instruments.



10-M0157

Fig. 47 Clean the cooler.

- | | | | |
|---|---|---|------------|
| ① | Front end of compressor, sound insulation (radiator grill) removed | ③ | Radiator |
| ② | Direction of impacting water or steam jet (from outside to inside). | ④ | Oil cooler |

1. Open both doors.
2. Seal off the air intakes of the engine and compressor air filters before starting cleaning.
3. Remove the sound damping louver in front of the coolers.
4. Clean the cooler with compressed air, water or steam jet in the opposite direction to the cooling air flow.
5. Replace the sound damping louver.
6. Remove the protective coverings again.
7. Reconnect the battery.
8. Close the doors.
9. Start the machine and run up to operating temperature so that excess water is evaporated.



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

10.6 Maintain rubber sealing strips

The rubber sealing strips between the body panels the access doors 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 access panels are 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 has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

1. Open all the doors.

2. Clean the rubber sealing strips with a lint-free cloth and check for cracks, holes and other damage.
Have damaged strips changed immediately.
3. Grease the rubber strips.
4. Close the doors.

10.7 Chassis

- Carry out maintenance according to the schedule in chapter 10.2.3.1.

10.7.1 Wheel checks

Check the wheels and tires after the first 31 miles and after every wheel change, but at least every six months for tightness, visible damage and tire pressures.

Material Torque wrench
Tire pressure gauge

Precondition Machine shut down and secured against restarting.

1. Check that the wheel fixings are tight.
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 1.6 mm in most countries).
4. Check tire pressures.

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.

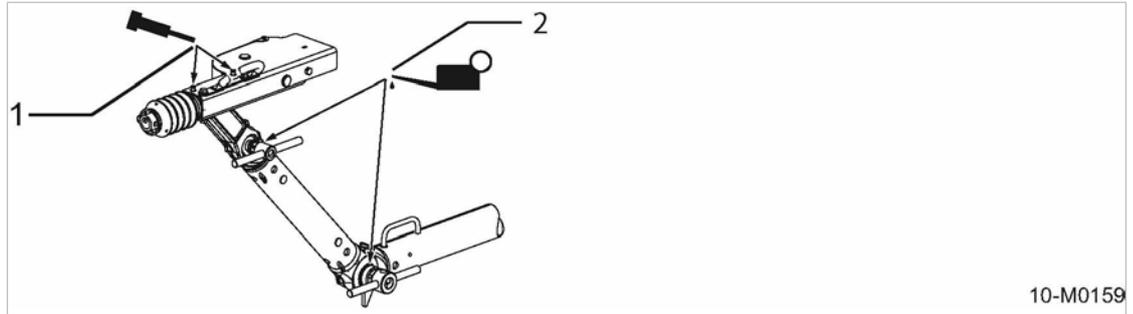
10.7.2 Towbar maintenance

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 cloth

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

Option sa

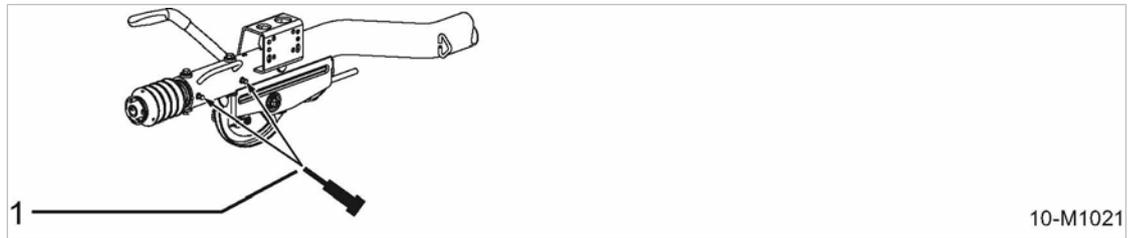


10-M0159

Fig. 48 Height adjustable towbar maintenance

- ① Overrun brake mechanism lubricating point
- ② Toothed coupling lubricating point

Option sd



10-M1021

Fig. 49 Fixed height towbar maintenance

- ① Overrun brake mechanism lubricating point

10.7.2.1 Check the towbar

1. Check the towbar for correct function and movement.
2. Clean and oil all sliding and rotating bearings.

Option sa Check 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 6.4.1 for towbar height adjustment.

10.7.2.2 Option sa, sd Maintaining the parking brake

- Lightly lubricate the pins and adjustment joints.

**10.7.2.3 Option sa, sd
Overrun device maintenance****Greasing the overrun mechanism:**

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

Further information Lubricating points of the height-adjustable tow mechanism (Option sa) see illustration 48.
Lubricating points of a tow mechanism non-adjustable in height (Option sd) see illustration 49.

Checking the shock absorber:

- Strongly press in the towbar against its damping force.
The towbar must return automatically when pressure is released.
Have the shock absorber replaced by a specialist workshop if:
 - Return of the towbar takes more than 30 seconds
 - There is little resistance to pushing in,
 - Air has entered the device,
 - There is little resistance to pulling out the shock absorber.

10.7.2.4 Ball coupling maintenance

Option sa, sd

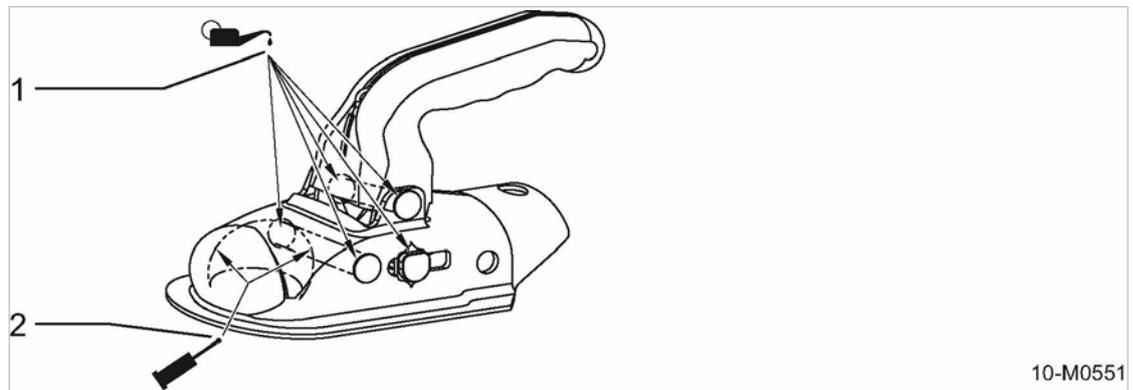


Fig. 50 Ball coupling maintenance

- ① Lubricating points
- ② Greasing points

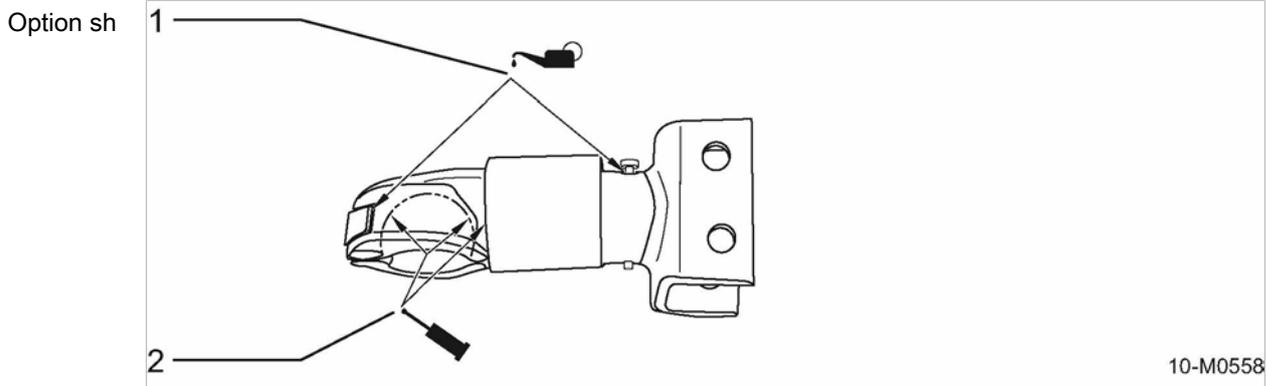


Fig. 51 Ball coupling maintenance (USA version)

- 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 socket, pins and moving parts.

10.7.3 Brake 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
Torch
Lithium enriched multi-purpose grease

Precondition The machine is switched off.

1. Jack up the machine and lower it onto supports.
2. Release the parking brake and pull out the overrun braking mechanism fully.
The brake cables are not tensioned.

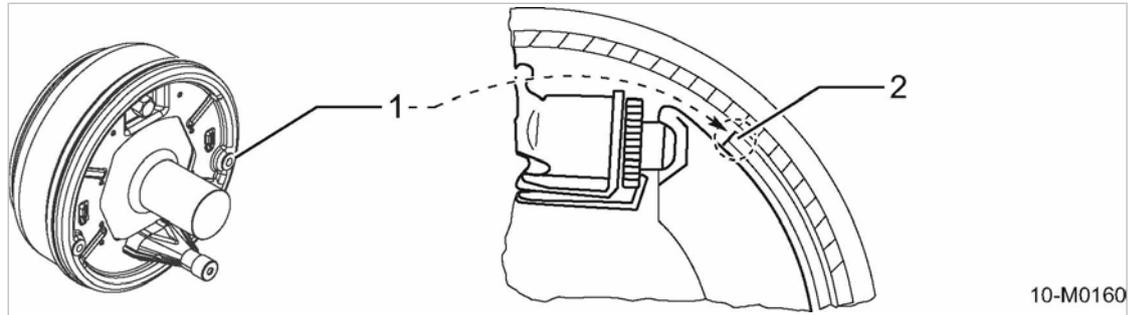
10.7.3.1 Checking wheel brake lining wear

Fig. 52 Checking the brake lining thickness

- ① Inspection hole
- ② Brake linings

1. Remove the plug from the inspection hole.
2. With the aid of a torch, check the brake lining thickness.
Have the brake linings replaced by a specialist workshop if they are less than 0.08 in thick.
3. Replace the plug in the inspection hole.

10.7.3.2 Checking brake system settings

1. Checking the free running of the wheels with released brake.
Adjust the brake if the wheels do not turn freely.
2. Slightly pull the parking brake lever.
3. Turn the wheels in the forward direction.
4. Check that there is the same braking resistance on both wheels.
Adjust the braking system if the resistance is not the same.
5. Release the parking brake.

10.7.3.3 Brake system adjustment

Carry out the adjustment procedure on all wheel brakes, one after the other.



Never adjust the brakes at the brake rods!

Precondition Wheel and brake drum taken down

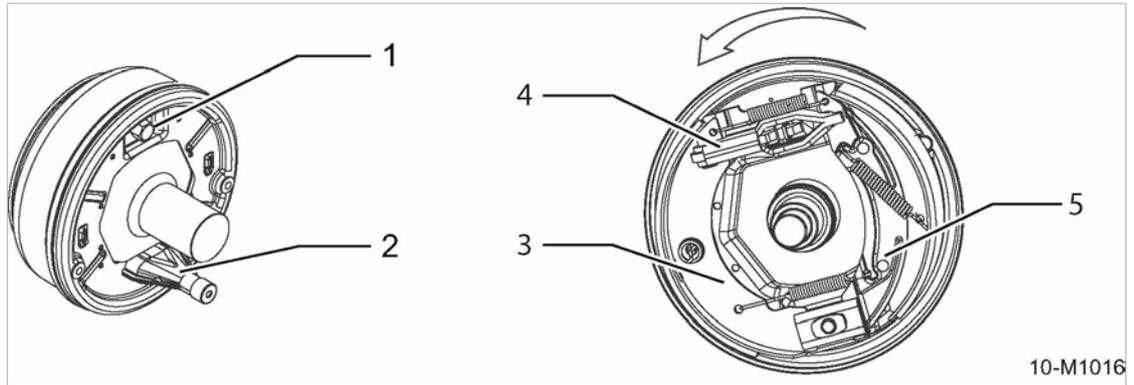


Fig. 53 Adjusting the wheel brake

- | | |
|---|--|
| <ul style="list-style-type: none"> ① Turn the adjusting screw ② Cable entry ③ Brake shoe | <ul style="list-style-type: none"> ④ Expander lock ⑤ Brake shoe, complete (brake shoe holder with brake pad) |
|---|--|

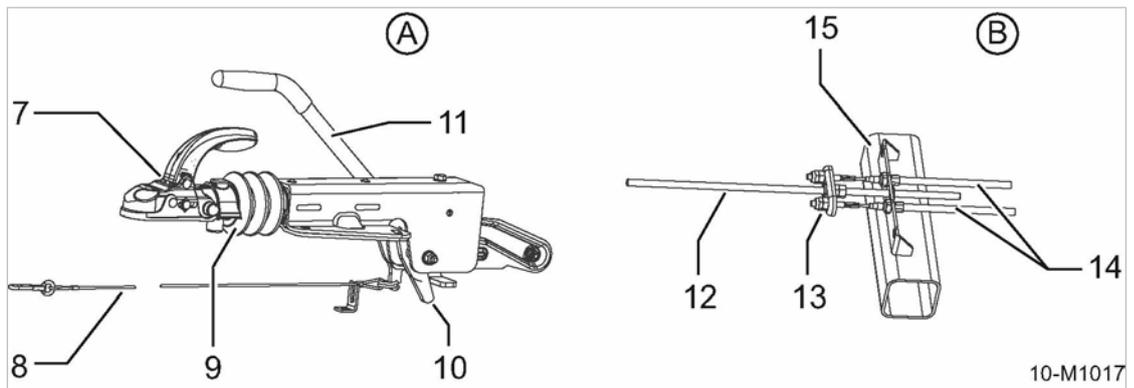


Fig. 54 Brake rod adjustment

- | | |
|---|--|
| <p>Ⓐ Overrun brake:</p> <ul style="list-style-type: none"> ⑦ Ball hitch ⑧ Brake cable ⑨ Tow bar tube ⑩ Relay lever ⑪ Hand brake lever, parking brake | <p>Ⓑ Transmission mechanism/brake equalization:</p> <ul style="list-style-type: none"> ⑫ Preset the brake rod ⑬ Equalizer ⑭ Actuating cable ⑮ Axle |
|---|--|

1. Check the smooth running of expander lock ④ and actuating cable ⑭.
When stiff, loosen brake rods ⑫ at the equalizer ⑬ (brake equalization).
2. Turn the adjusting screw ① outside on the brake anchor plate clockwise, until the wheel can be turned only with difficulty or not at all.
3. Loosen the adjustment screw clockwise (approximately ½ turn) until the wheel is running freely.



A light rubbing sound when the wheels turn is permissible if it does not affect free turning.
When the brake is adjusted accurately, the pedal travel is 0.16 – 0.24 in approximately.

Controlling the brake equalization:

1. Preset the brake rod ⑫ in its length (some play at the relay lever ⑩).
2. Center the brake shoes by repeatedly pulling the parking brake lever ⑪.

3. Check the position of the equalizer (13) on the brake rod (12).

The equalizer is in perpendicular position to the brake rods: identical play of the wheel brakes.
If the equalizer is oblique to the brake rods, correct the position of the equalizer.

Checking the parking brake:

- Pull parking brake lever strongly upwards and beyond the noticeable "dead point zone".
The brake is adjusted correctly, if resistance is felt approximately 0.4 – 0.6 in beyond the "dead point".



Adjust the brake if major deviations are noticed.

Brake rod adjustment:

1. To loosen the braking rod (12) undo the nut at the equalizer (13).
2. Grease the brake rod threads.
3. Adjust the rod so there is no play or tension.
Equalizer is perpendicular to the brake rods.
4. Tighten the nut.
5. Tighten all counter nuts.

Performing a test drive:

1. Reinstall brake drums and wheels.
2. Remove the jacks from the machine and couple it with the towing vehicle.
3. Test by applying the brake a number of times.
If necessary, re-adjust brakes.

**10.7.3.4 Option sa, sd
Greasing the brake rods**

Grease the brake rods when necessary (stiff movement) but at least annually.

Material Lithium enriched multi-purpose grease
Cleaning cloths

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

- Greasing the brake rods

10.8 Options

- Carry out maintenance according to the schedule in chapter 10.2.3.2.

10.8.1 Option ec
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 has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

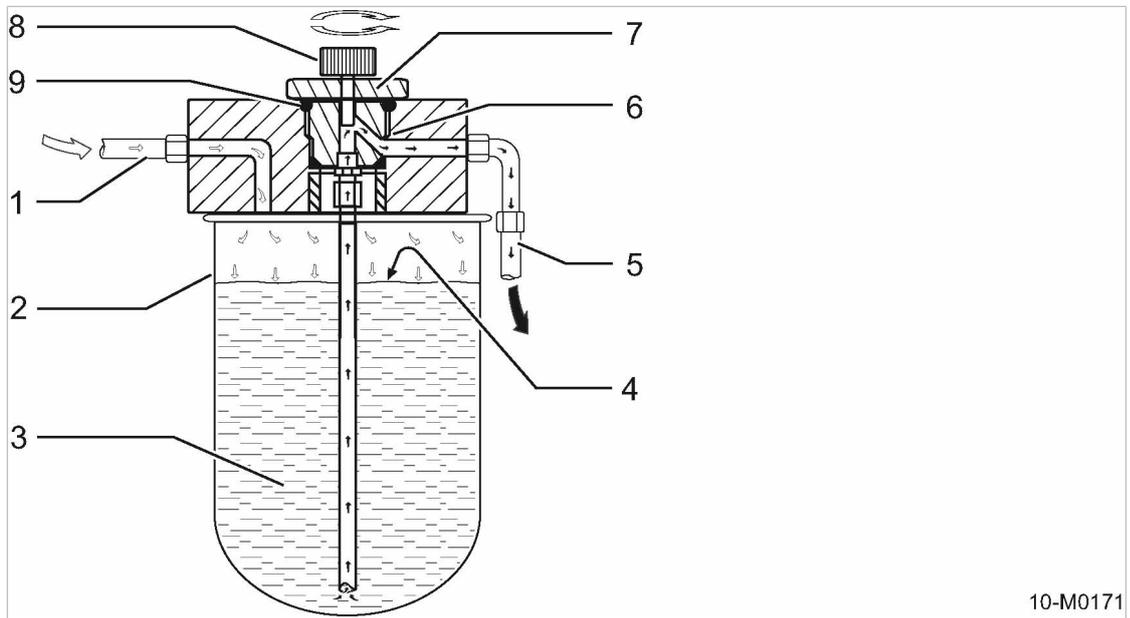


Fig. 55 Tool lubricator maintenance

- | | |
|------------------------|---|
| ① Compressed air inlet | ⑥ Tool lubricator upper part with oil filling port |
| ② Oil tank | ⑦ Filler plug with dipstick and integrated riser tube |
| ③ Oil volume | ⑧ Metering knob |
| ④ Oil surface | ⑨ O-ring |
| ⑤ Tool oil outlet | |

➤ Open the right-hand access door.

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 access door.

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 in below the top of the tank).
3. Check the oil level again.
4. Check the filler plug O-ring for damage.
Changing a damaged O-ring.
5. Replace the plug in the filler port.
6. Close the access door.

Further information See chapter 2.7.1 for suitable oil grade and volume.

**10.8.2 Option ba
Frost protector maintenance**

At temperatures under 41°F, the level of antifreeze in the protector must be checked daily before starting the compressor.

Material Antifreeze (Wabcothyl)
Cleaning cloth

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.

**DANGER**

Danger of fire or explosion caused by the spontaneous ignition of antifreeze.

- Never top up antifreeze unless the machine is stopped and cooled down.

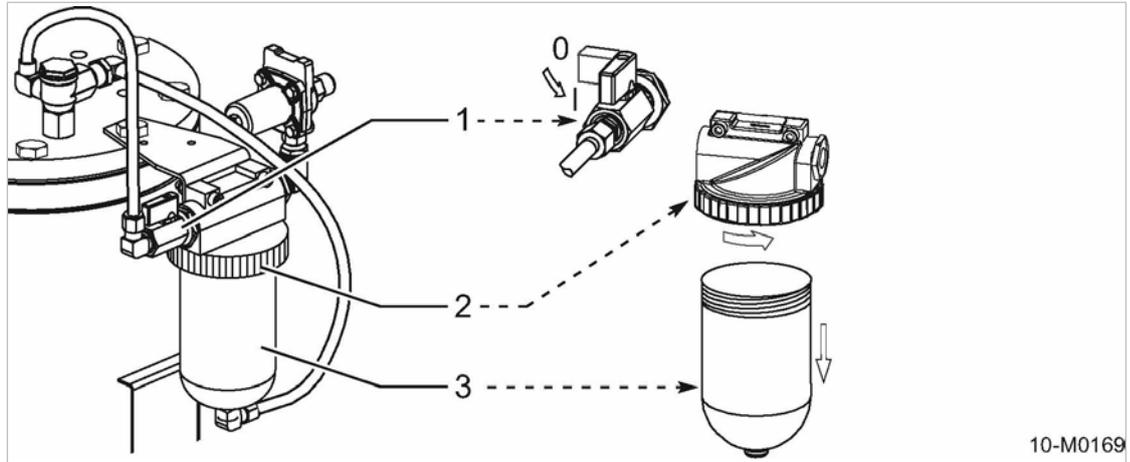
**WARNING**

Danger of injury from compressed air!

The frost protector is under pressure when operating; serious injury can result from loosening or opening components under pressure.

- Decompress the frost protector

Option ba



10-M0169

Fig. 56 Filling the frost protector

- ① Shut-off ball valve
I – open
0 – closed
- ② Bowl clamp ring
- ③ Frost protector bowl

1. Open the right-hand access door.
2. Open the shut-off valve (position I) and wait about 30 seconds until the frost protector is fully depressurized.
3. Unscrew the clamp ring and remove the bowl.
4. Fill the bowl $\frac{3}{4}$ full with antifreeze.
5. Screw the bowl carefully back into place.
6. Close the shut-off valve (pPosition 0).
7. Close the access door.

10.8.3 Option la Spark arrestor cleaning

The spark arrestor 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 has 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 odorless 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.

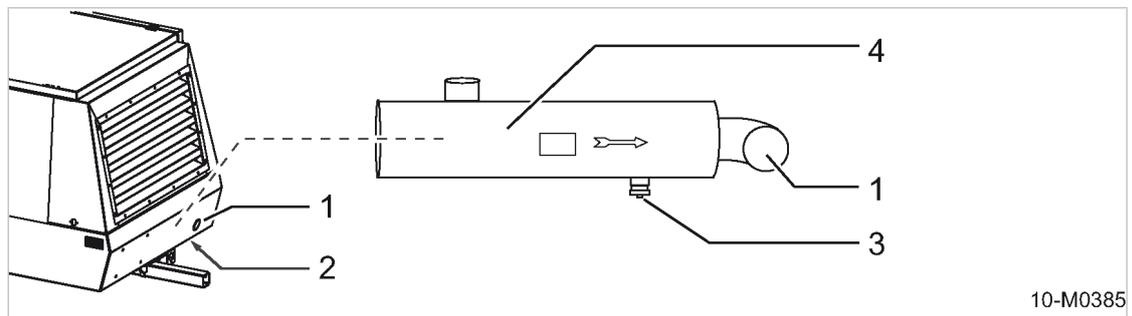


Fig. 57 Spark arrester cleaning

- | | |
|---|---|
| ① Exhaust silencer end pipe | ③ Soot drain port with plug |
| ② Opening in floor panel to access drain port | ④ Exhaust silencer with integrated spark arrester |

1. Unscrew the soot drain plug.
2. Push one end of the hose over the drain port and place the other end in the receptacle.
3. Start the compressor engine.
4. Partially cover the silencer end pipe to increase pressure in the exhaust system.

Result Soot will drain through the hose into the receptacle.

1. Shut down the engine.
2. 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 environmental protection regulations.

**10.8.4 Option 1b
Engine air intake shut-off valve maintenance**

Material Compressed air for blowing out
Cleaning fluid or spirit
Cleaning cloth
Screwdriver

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.



WARNING

If the engine air intake shut-off valve does not close when flammable gas is drawn into the engine: Destruction of the engine and explosion or fire are possible.

- Do not move the valve adjusting screw.
- Have the valve set by a specialist workshop or KAESER Service.

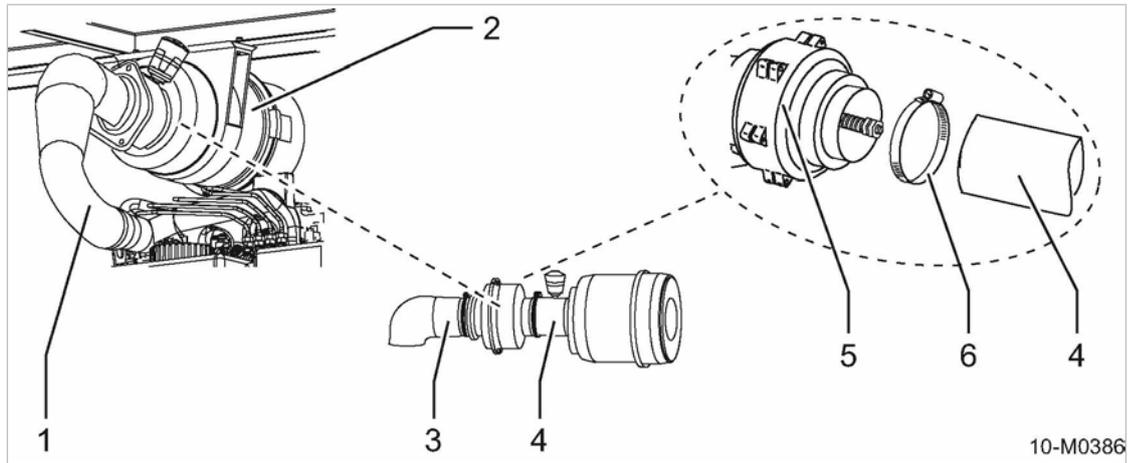


Fig. 58 Engine air intake shut-off valve maintenance

- | | |
|---------------------------------|------------------------------------|
| ① Engine air intake | ④ Air intake hose (filter side) |
| ② Engine air filter | ⑤ Engine air intake shut-off valve |
| ③ Air intake hose (engine side) | ⑥ Hose clamp |

- Open both doors.

Engine air intake shut-off valve cleaning



WARNING

The engine air intake shut-off valve does not function. Destruction of the engine and explosion or fire are possible.

- Do not grease the valve, as this may cause a build up of dust and valve sticking.

1. Loosen the hose clamp on the filter side of the valve and turn the air intake hose to one side.
2. Check if the interior of the shut-off valve is clean.
Blow out any dirt with compressed air.



If necessary, clean the valve with cleaning fluid 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 valve changed if it is heavily worn or malfunctions in any way.

1. Reposition the air intake hose and tighten the clamp.
2. Close the doors.
3. 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.

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 fluids/materials are all genuine KAESER parts. They are selected for use in KAESER machines.



WARNING

There is risk of personal injury or damage to the machine resulting from the use of unsuitable spare parts or operating materials.

Unsuitable or poor quality consumable parts and operating fluids/materials may damage the machine or impair its proper function.

In the event of damage, personal injury may result.

- Use only genuine KAESER parts and operating fluids/materials.
- Have an authorized KAESER Service Technician carry out regular maintenance.

Compressor

Name	Quantity	Number
Air filter element	1	1260
Oil filter	1	1210
Oil separator cartridge set	1	1450
Cooling oil	1	1600

Tab. 61 Compressor consumables

Kubota engine parts

Name	Quantity	Number
Air filter element	1	1280
Fuel prefilter	1	1910
Fuel filter cartridge	1	1920
Fuel filter element with water trap (option ne)	1	1980
Oil filter	1	1905
Oil drain plug sealing ring	1	4496
Injector nozzle	1	4475
Injector nozzle gasket	1	4476
V-belts	1	4470
Glow plug	1	4466

Name	Quantity	Number
Engine oil	1	1925

Tab. 62 Consumable engine 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 Spares for service and repair

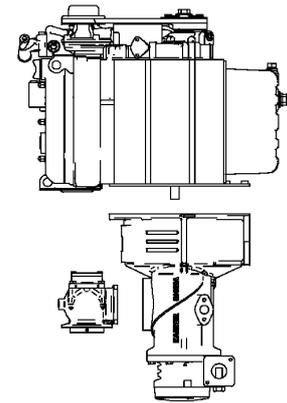
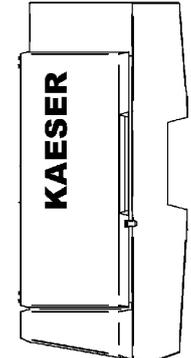
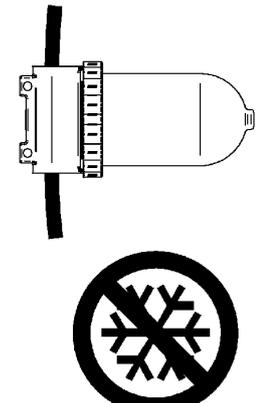
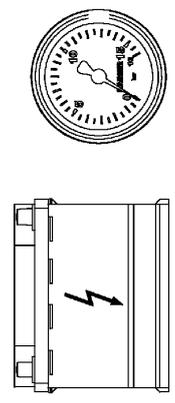
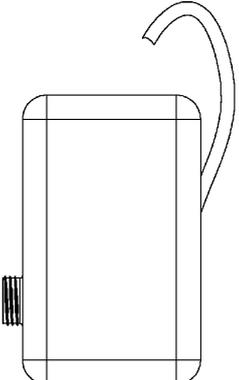
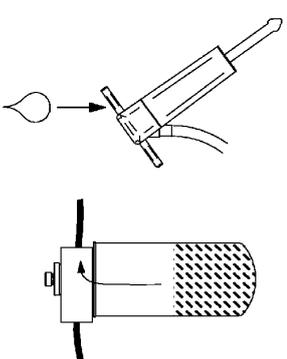
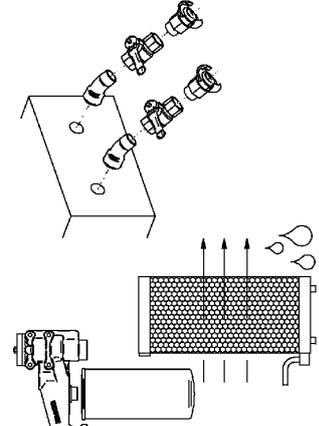
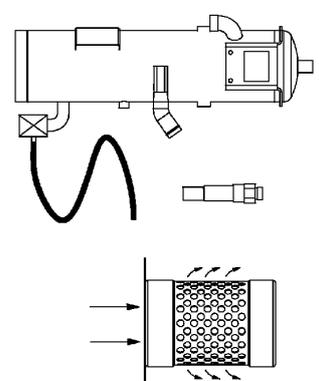
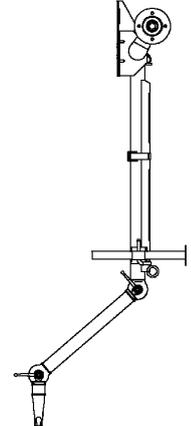
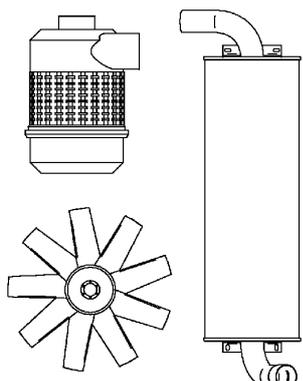
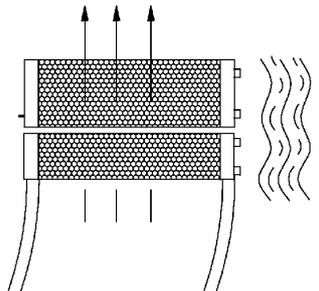
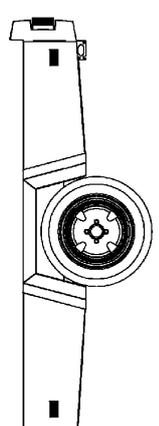
With the help of this parts list you can plan your material requirement according to operating conditions and order the spare parts you need.

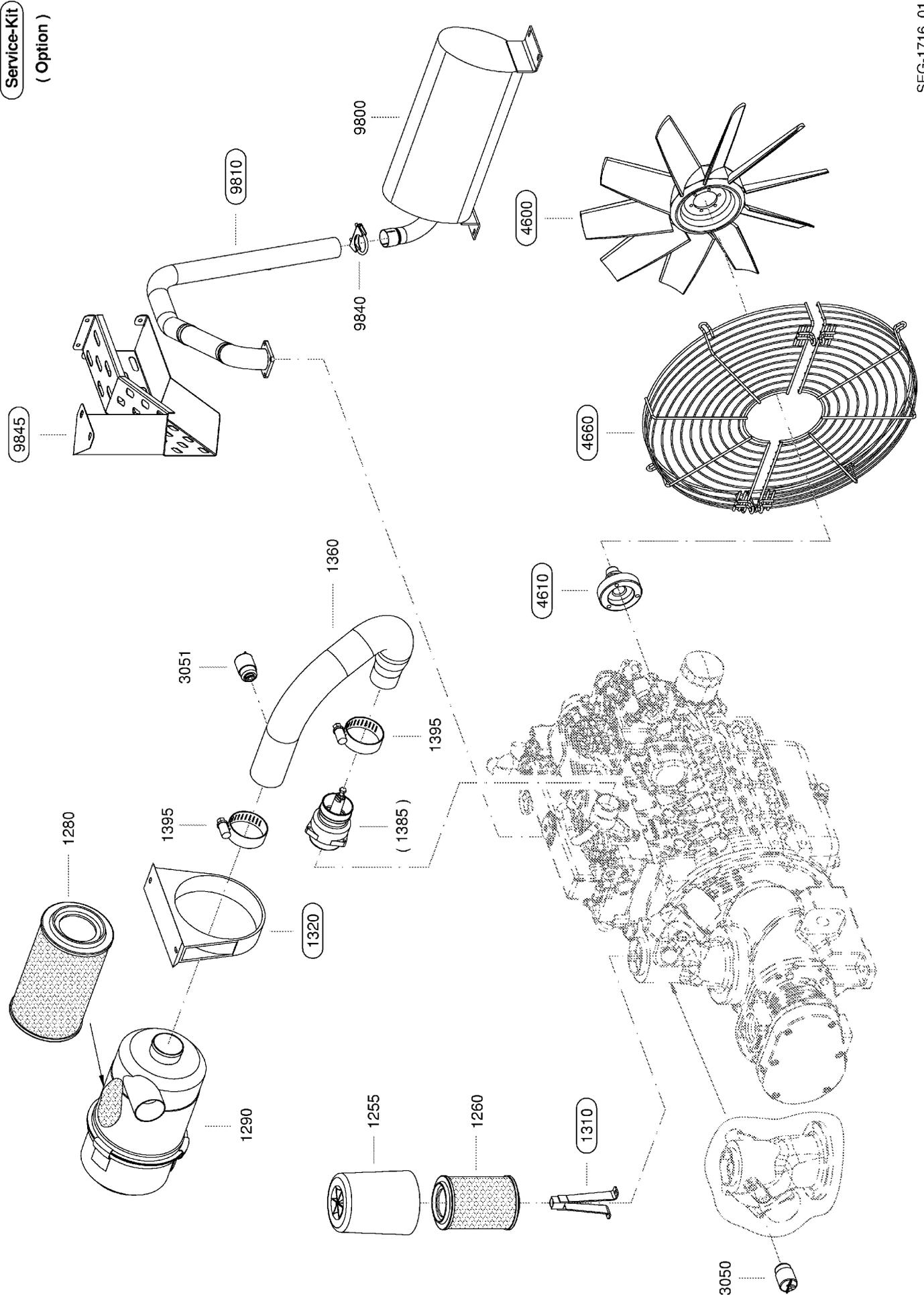


WARNING

Personal injury or machine damage due to incorrect working on the machine!
Incorrect inspection, service or repair can damage the machine or severely impair its function. Personal injury may result from machine damage.

- Inspections, preventive maintenance or repair tasks not described in this manual must not be carried out by unqualified personnel.
- Have further tasks, not described in this service manual, carried out by specialist workshops or KAESER Service.

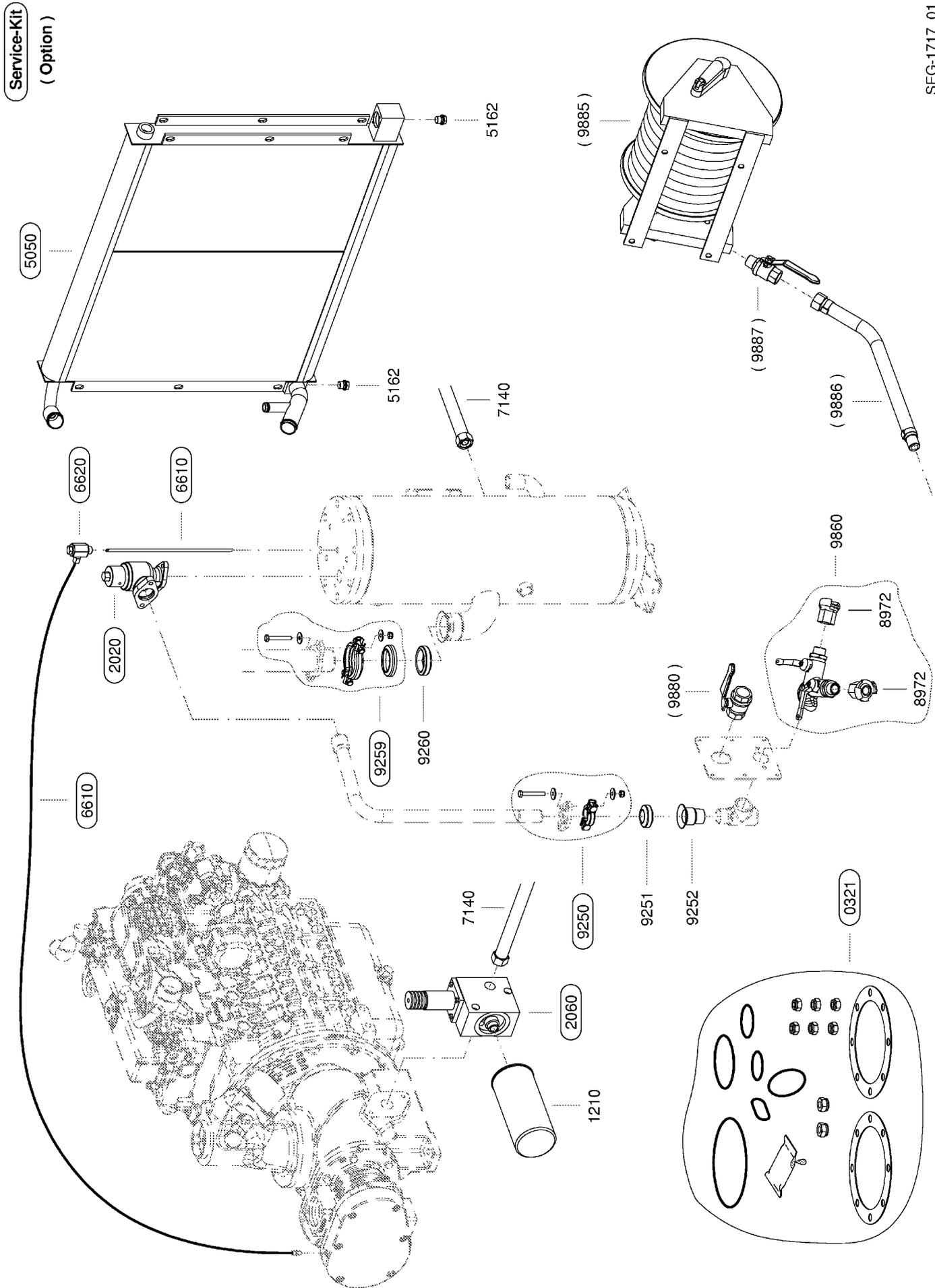
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	 <p>3001</p>	 <p>7001</p>	 <p>(9200)</p>
	 <p>2001</p>	 <p>6001</p>	 <p>8900</p>
	 <p>1001</p>	 <p>5001</p>	 <p>8800</p>



		Legend	KAESER
		Inlet air/Cooling air/Exhaust	SEL-1669_01E
Item	Description	Option	
1255	Compressor air filter housing		
1260	Compressor air filter element		
1280	Engine air filter element		
1290	Engine air filter, complete		
1310	Compressor air filter holder		
1320	Engine air filter holder		
1360	Engine air intake hose		
1385	Engine stop valve	X	
1395	Hose clamp		
3050	Air filter maint. indicator		
3051	Maintenance indicator for engine air filter		
4600	Engine fan		
4610	Fan coupling		
4660	Fan guard		
9800	Exhaust silencer		
9810	Engine exhaust pipe		
9840	Exhaust pipe clamp		
9845	Safety guard		

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



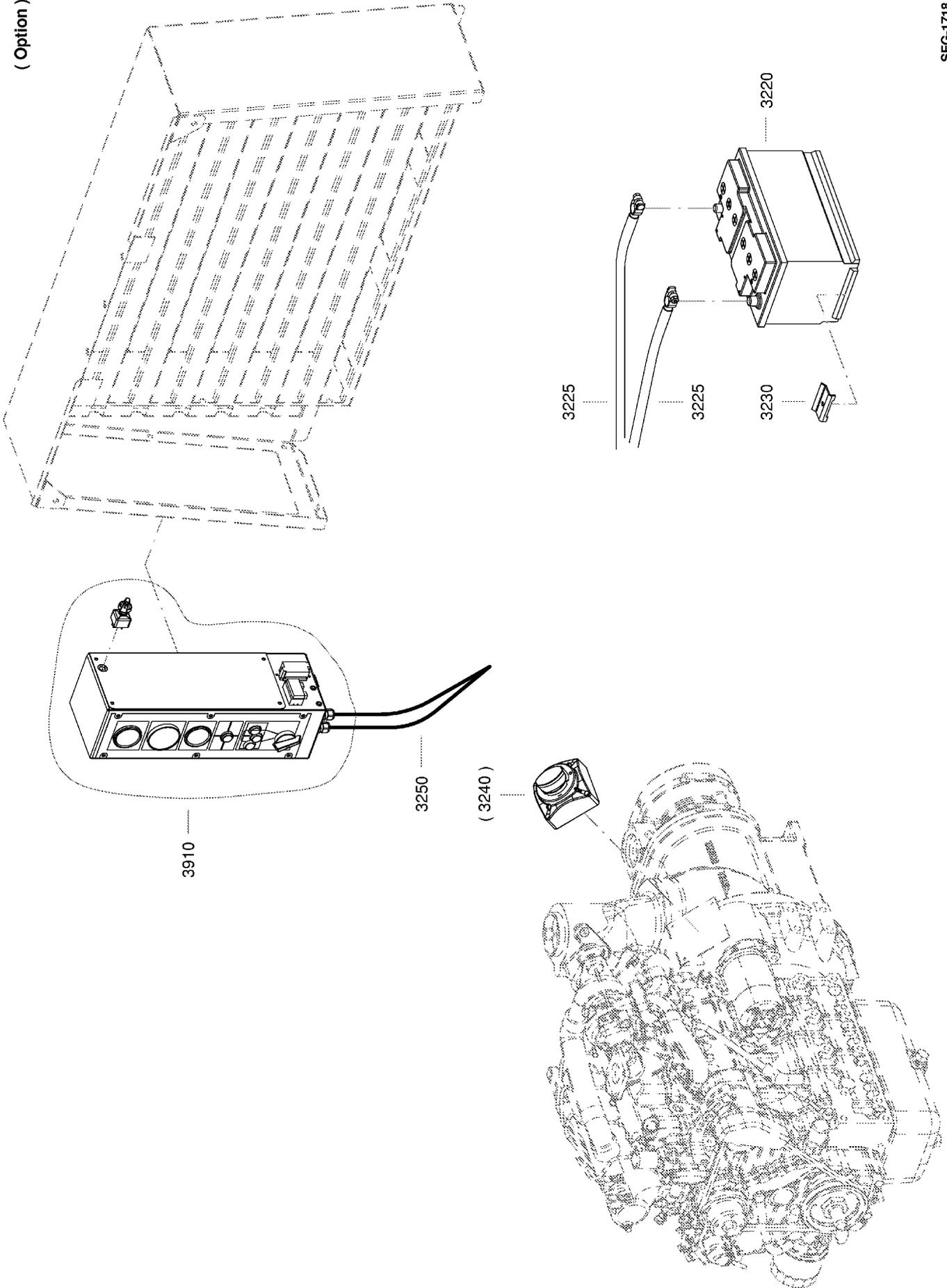
SEG-1717_01

		Legend	KAESER
		Oil circuit/Comprsd.air outlet	SEL-1671_01E
Item	Description	Option	
0321	Gasket set oil/air		
1210	Compressor oil filter element		
2020	Minimum pressure/check valve		
2022	Maintenance kit, MP/CV		
2024	Overhaul kit, MP/CV		
2060	Combination valve		
2062	Maintenance kit, combi. valve		
2064	Overhaul kit, combination valve		
5050	Cooler		
5162	Compressor oil cooler drain		
6610	Oil scavenge line		
6620	Dirt trap for oil scavenge tube		
9416	Dirt trap maintenance kit		
7140	Hose		
9250	Pipe clamp element		
9251	Pipe connection seal		
9252	Pipe adapter		
9259	Pipe clamp element		
9260	Pipe connection seal		
9860	Compressed air distributor		
9872	Claw coupling		
9880	Large outlet valve	X	
9885	Hose reel	X	
9886	Consumer feed lines	X	
9887	Hose reel ball valve	X	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

(Option)



Legend	KAESER
Electrics/Instruments	SEL-1673_01E

Item	Description	Option
3220	Battery	
3225	Battery cable	
3230	Battery bracket	
3240	Battery isolating switch	X
3250	Mains supply cable set	
3910	Instrument panel	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

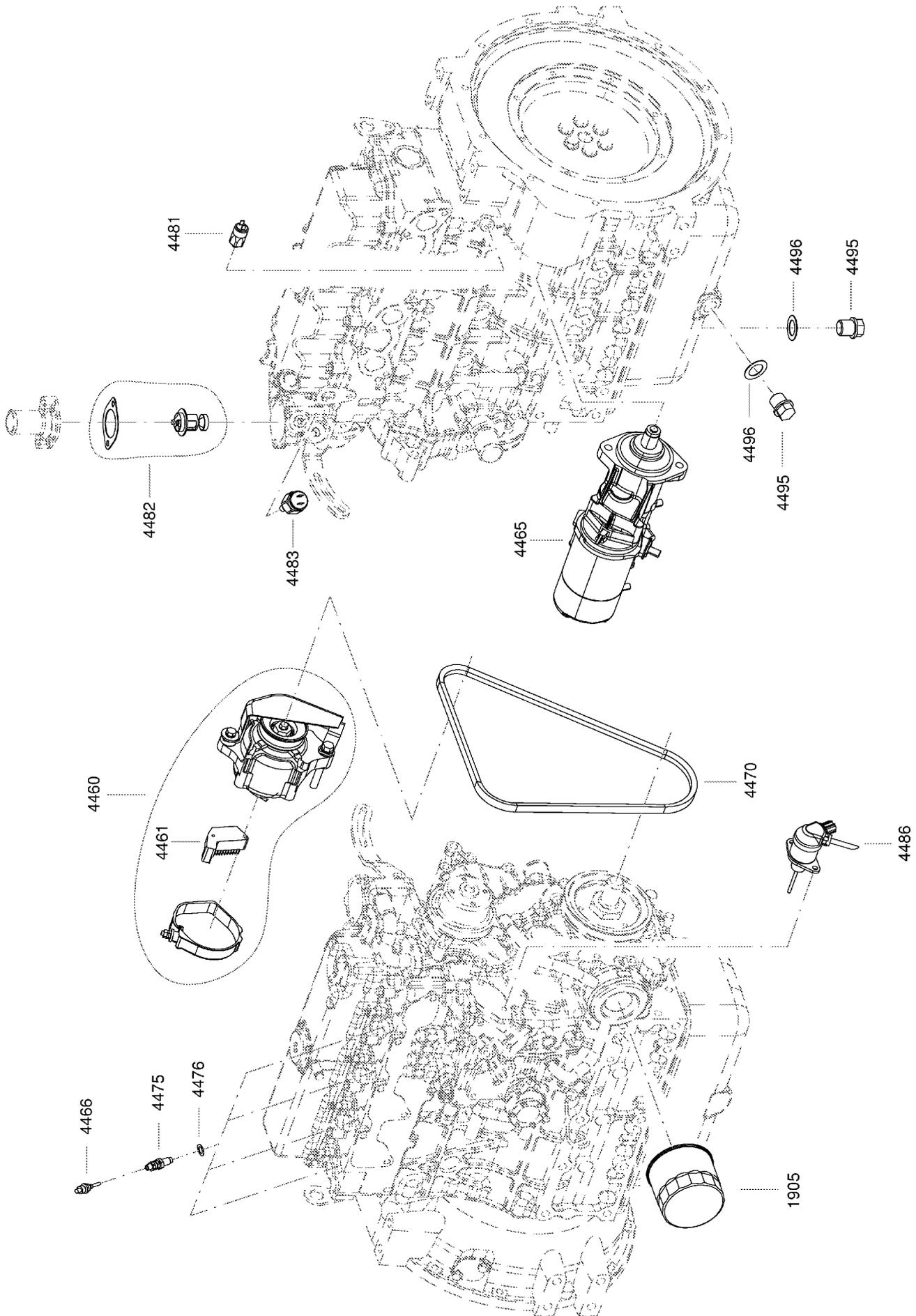
Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Legend	KAESER
Instrument panel	SEL-1701_01E

Item	Description	Option
3170	Starting relay	
3180	Shutdown relay	
3190	Power relay socket	
3610	Control fuse set	
3615	Fuse socket (set)	
3620	Control relay	
3621	Glow plug relay	
3625	Control relay socket	
3626	Socket for glow plug relay	
3940	Charging/fault indicator lamp	
3950	Main switch	
3955	Starter switch	
3960	Changeover switch full load mode	
3965	Temperature gauge	
3980	Pressure gauge, instrument panel	
3985	Operating hours counter	
3996	Instrument lamp set	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



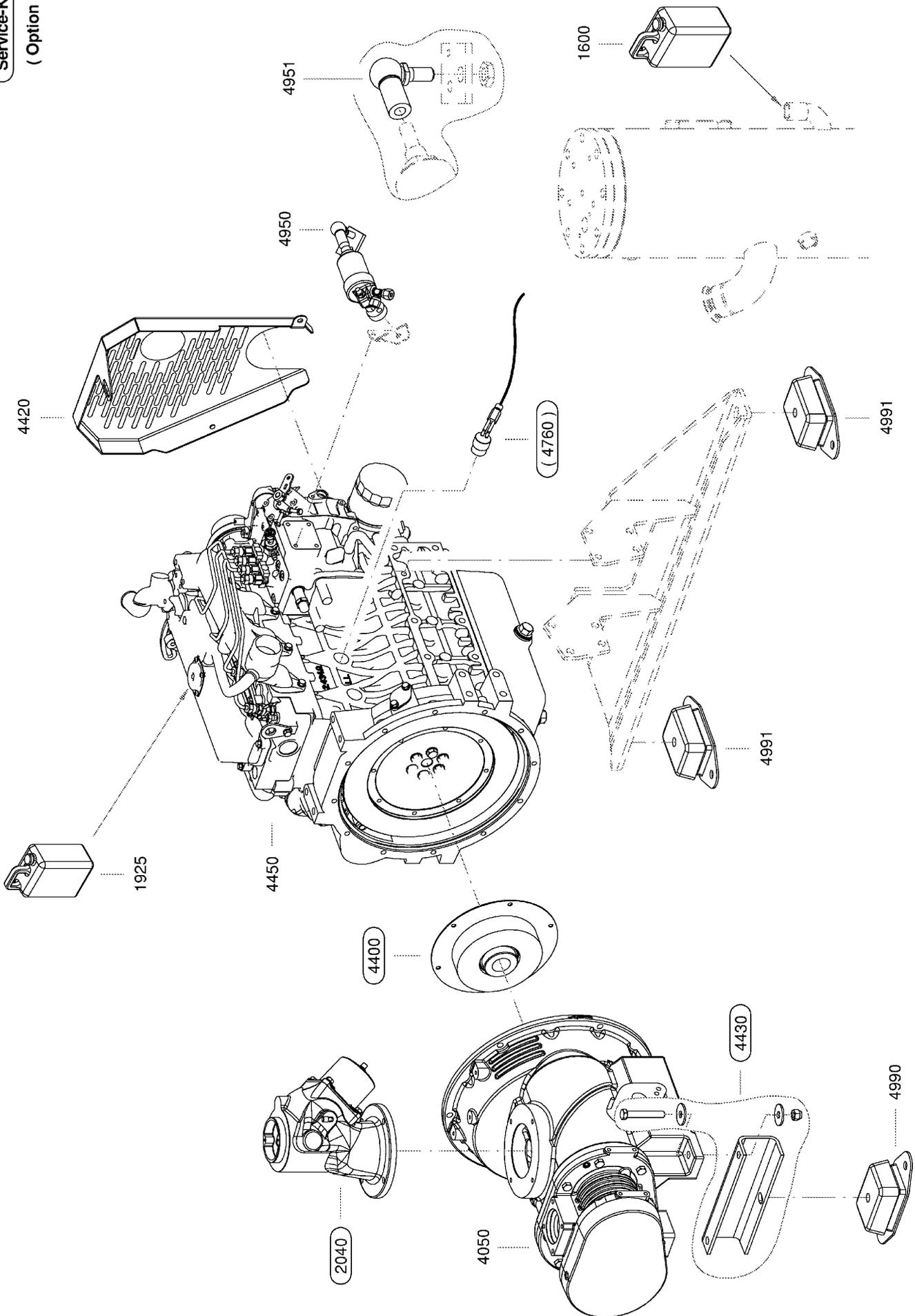
Legend	KAESER
Engine	SEL-1699_01E

Item	Description	Option
1905	Engine oil filter element	
4460	Alternator	
4461	Alternator regulator	
4465	Starter	
4466	Glow plug	
4470	Engine V-belt	
4475	Injector nozzle	
4476	Injector nozzle seal	
4481	Oil pressure switch	
4482	Coolant thermostat	
4483	Temperature switch	
4486	Fuel cut-off	
4495	Engine oil drain	
4496	Oil drain seal	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit
(Option)



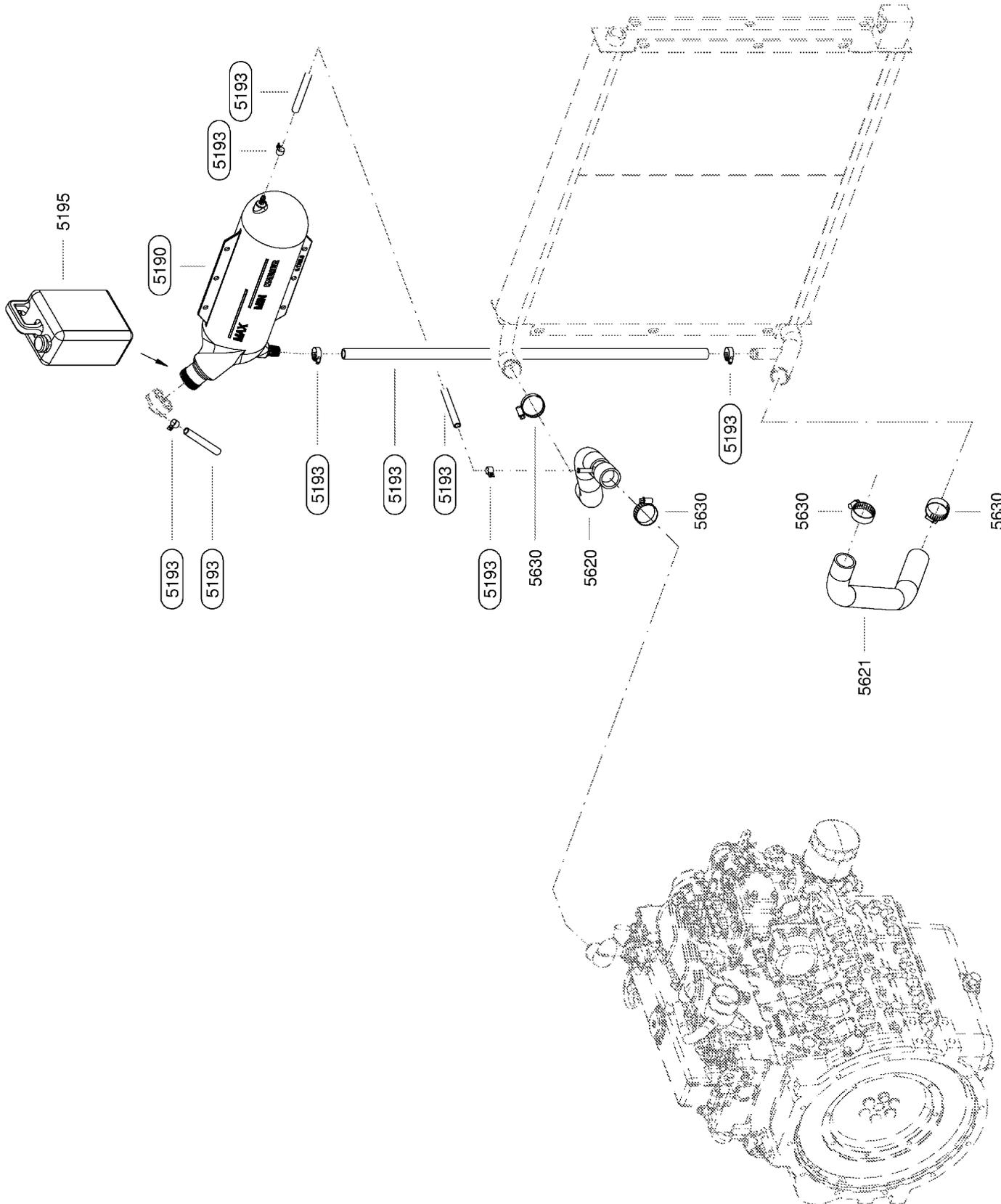
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		Legend	KAESER
		Airend/engine	SEL-1675_01E
Item	Description	Option	
1600	Sigma Fluid *)		
1925	Engine oil *		
2040	Inlet valve		
2042	Maintenance kit, inlet valve		
2044	Overhaul kit, inlet valve		
4050	SIGMA exchange airend		
4400	Drive coupling		
4420	Belt guard		
4430	Mounting bracket for airend base		
4450	Engine		
4760	Engine preheater		X
4950	Speed adjusting cylinder		
4951	Swivel joint		
4990	Compressor mountings		
4991	Engine mountings		

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

*) see cooling oil/engine oil recommendations



Legend	KAESER
Engine cooling	SEL-1677_01E

Item	Description	Option
5190	Expansion tank	
5193	Expansion tank pipes	
5195	Engine antifreeze *)	
5620	Coolant hose	
5621	Coolant hose	
5630	Hose clamp	

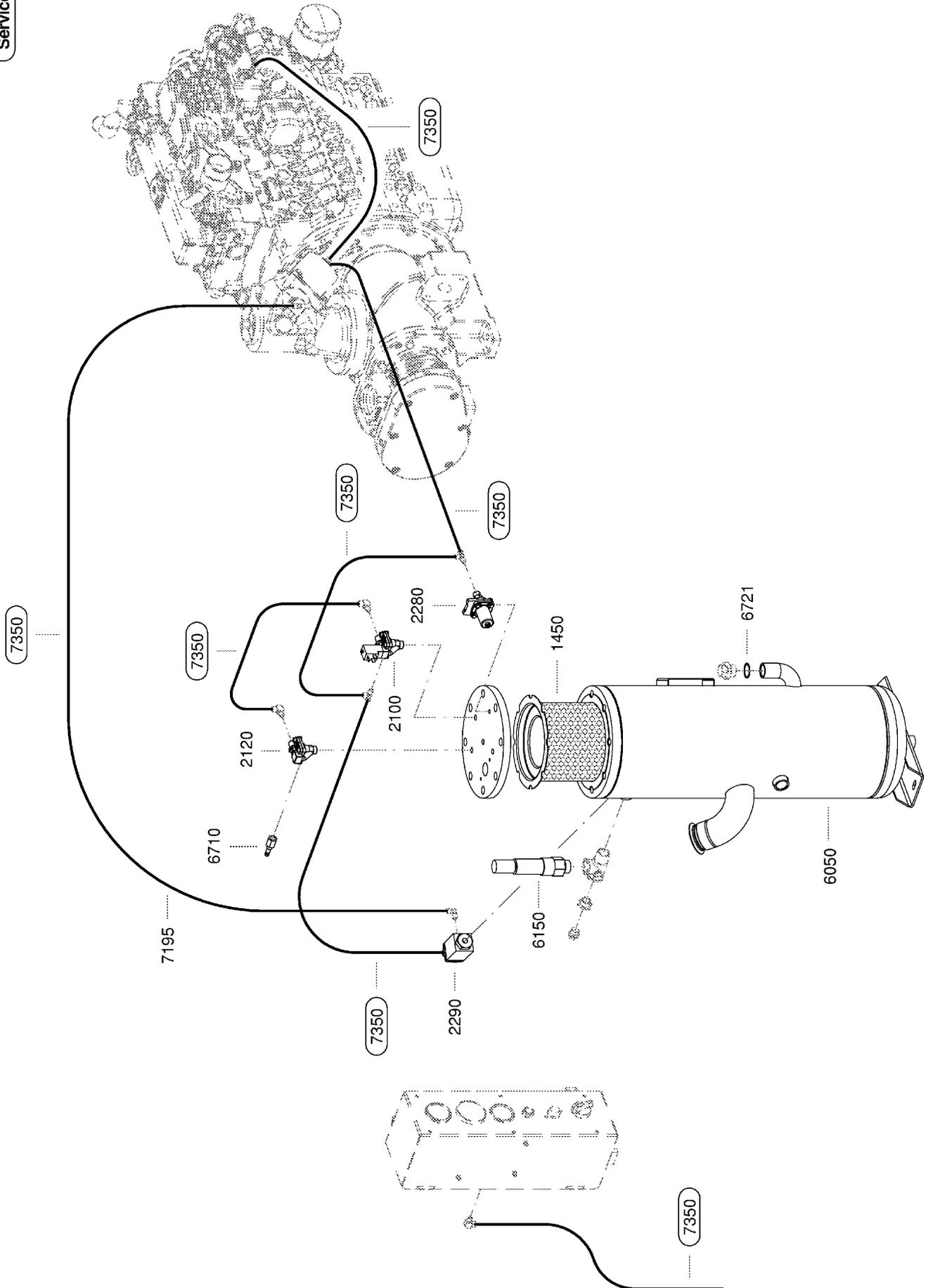
Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

*) see antifreeze recommendations

Service-Kit

SEG-1722_01

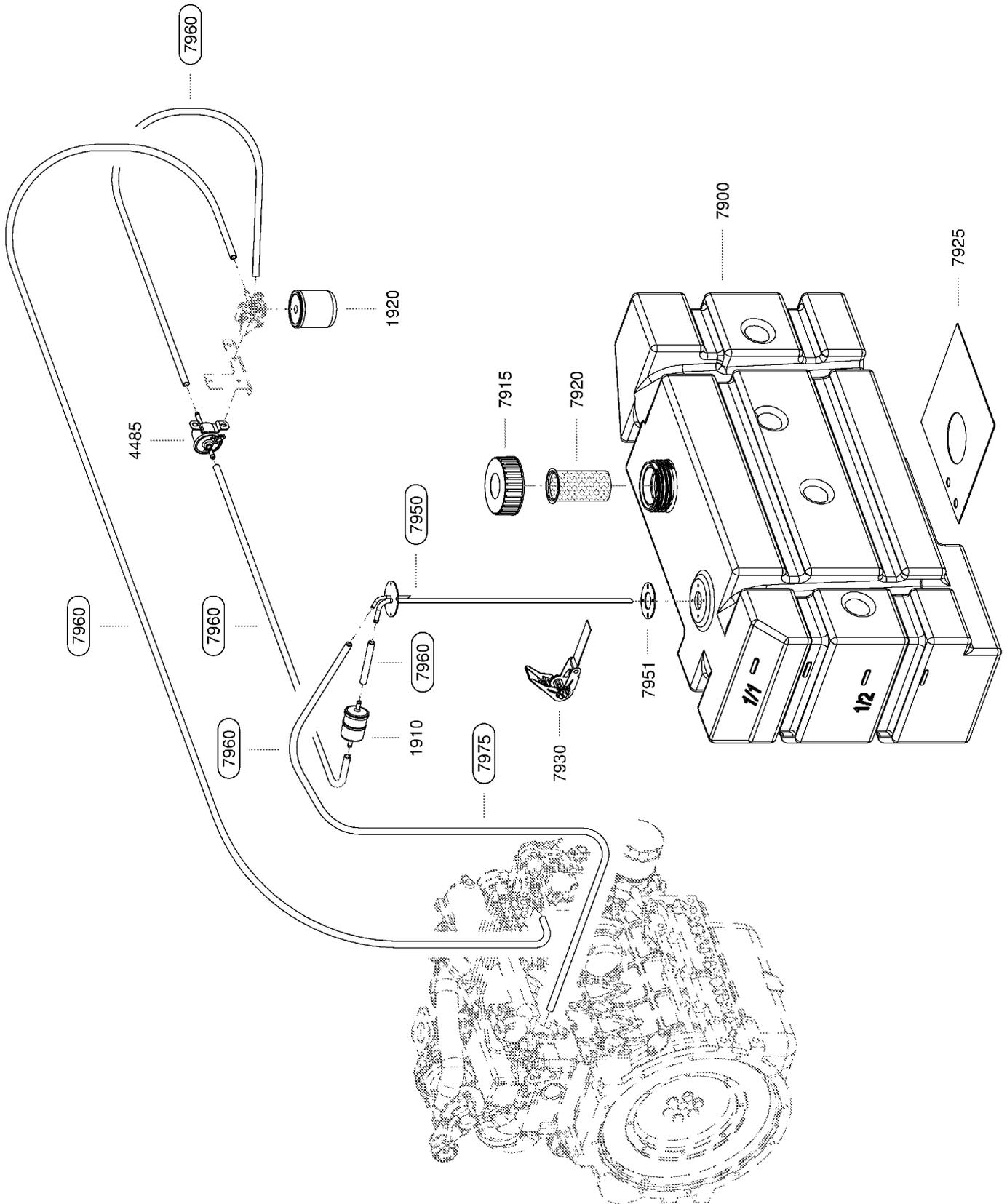


Legend	KAESER
Oil separation/control air	SEL-1679_01E

Item	Description	Option
1450	Oil separator cartridge	
2100	Venting and control valve	
2102	Maintenance kit, VC valve	
2104	Overhaul kit, VC valve	
2120	Venting valve	
2122	Maintenance kit, venting valve	
2280	Proportional controller	
2290	Directional control valve	
2292	Directional valve maint. kit	
6050	Oil separator tank	
6150	Pressure relief valve for oil separator tank	
6710	Venting silencer	
6721	Oil filler seal	
7195	Hose	
7350	Control line kit	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

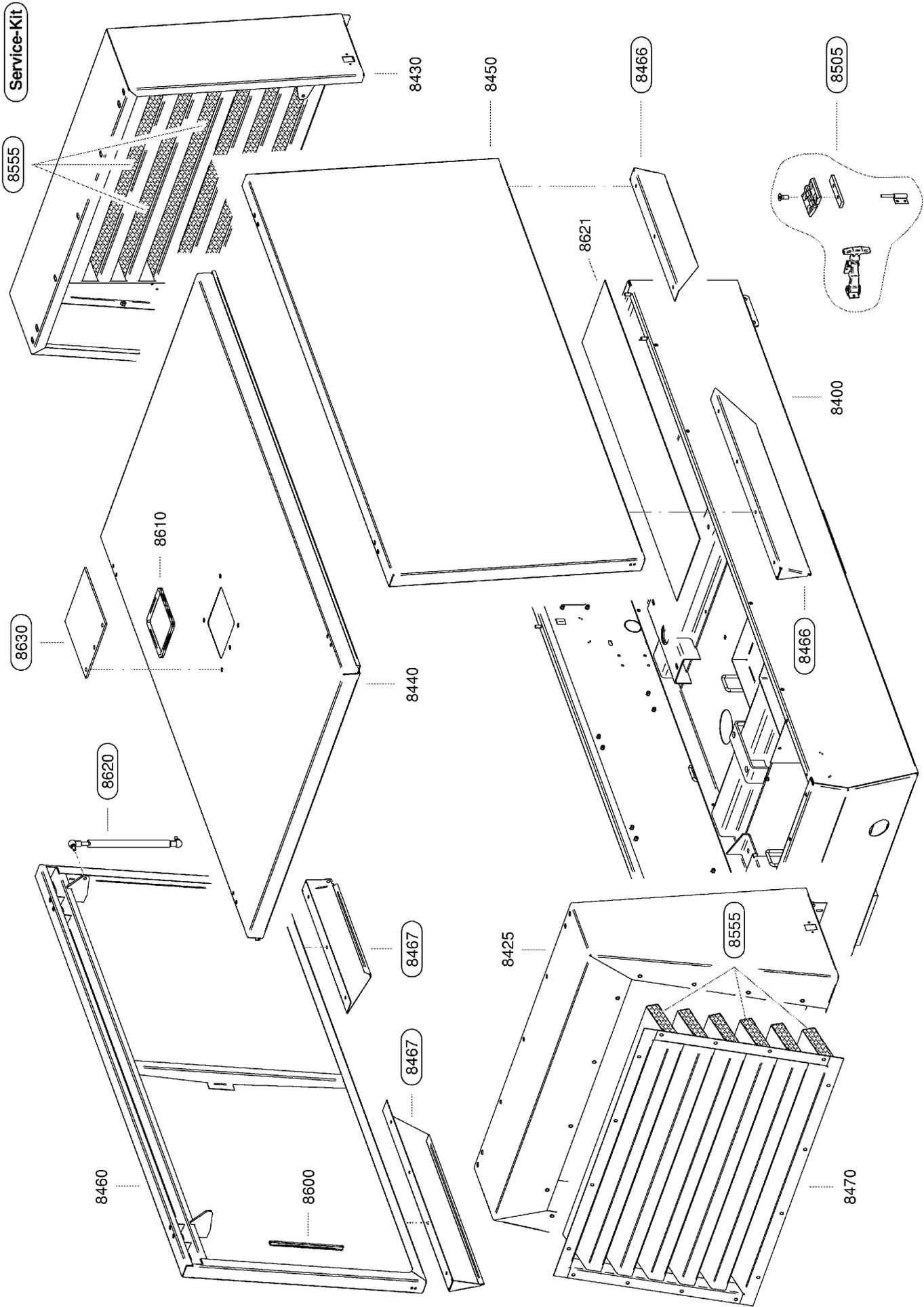


Legend	KAESER
Fuel supply	SEL-1681_01E

Item	Description	Option
1910	Fuel prefilter	
1920	Fuel fine filter element	
4485	Fuel pump	
7900	Fuel tank	
7915	Fuel tank cap	
7920	Fuel strainer	
7925	Tank support	
7930	Tank fixing	
7950	Fuel suction pipe	
7951	Connection gasket	
7960	Fuel lines	
7975	Fuel return line	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



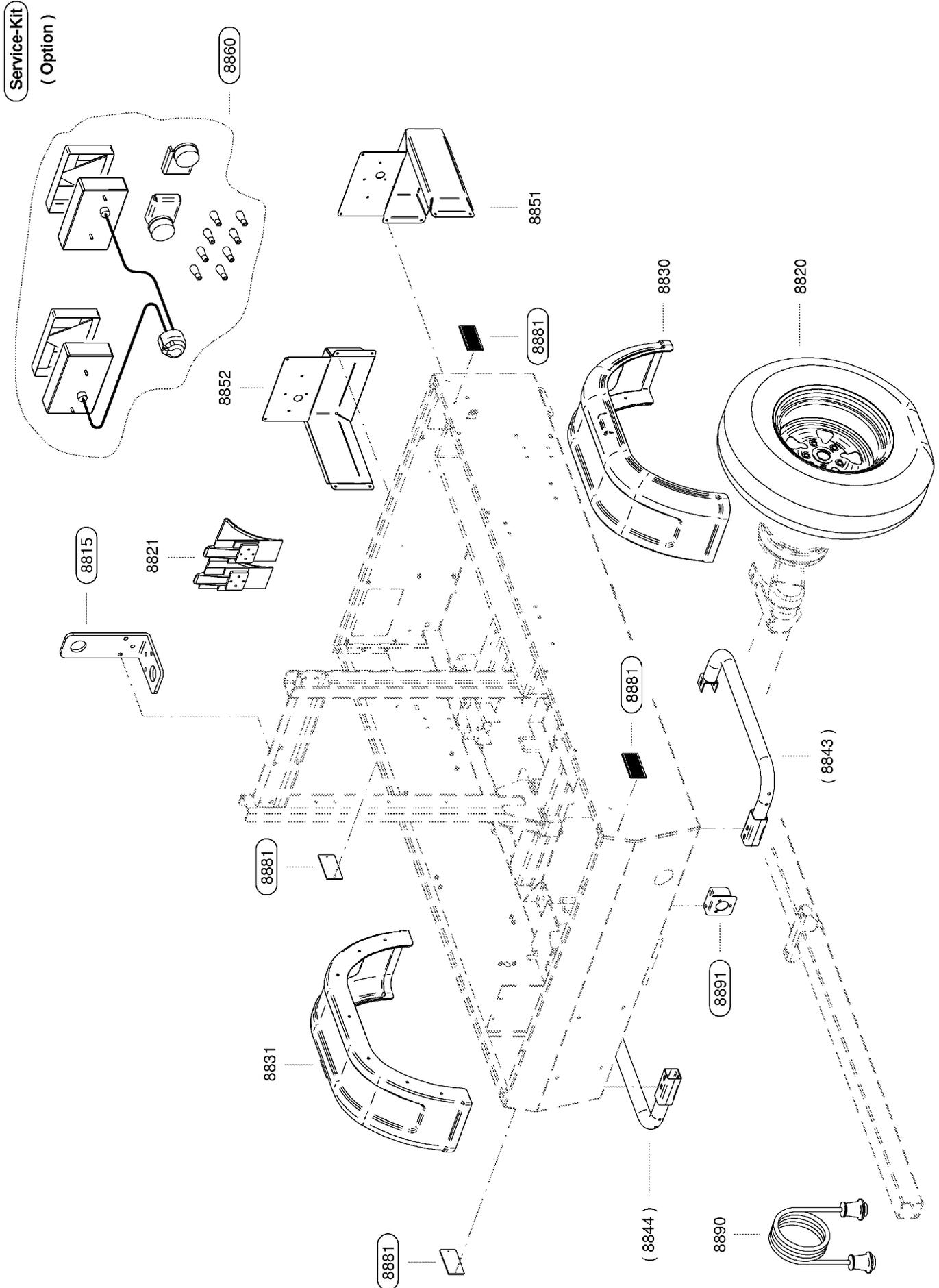
SEG-1848_01

Legend	KAESER
Bodywork	SEL-1683_01E

Item	Description	Option
8400	Lower bodywork	
8425	Canopy front	
8430	Canopy rear	
8440	Canopy, upper-centre	
8450	Left-hand wing door	
8460	Right-hand wing door	
8466	Left door handle	
8467	Right door handle	
8470	Exhaust air grill	
8505	Hinge/closure set	
8555	Sound damping louver kit	
8600	Sealing profile	
8610	Edge protecting strip	
8620	Gas strut	
8621	Rubber pad	
8630	Cover for lifting eye	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

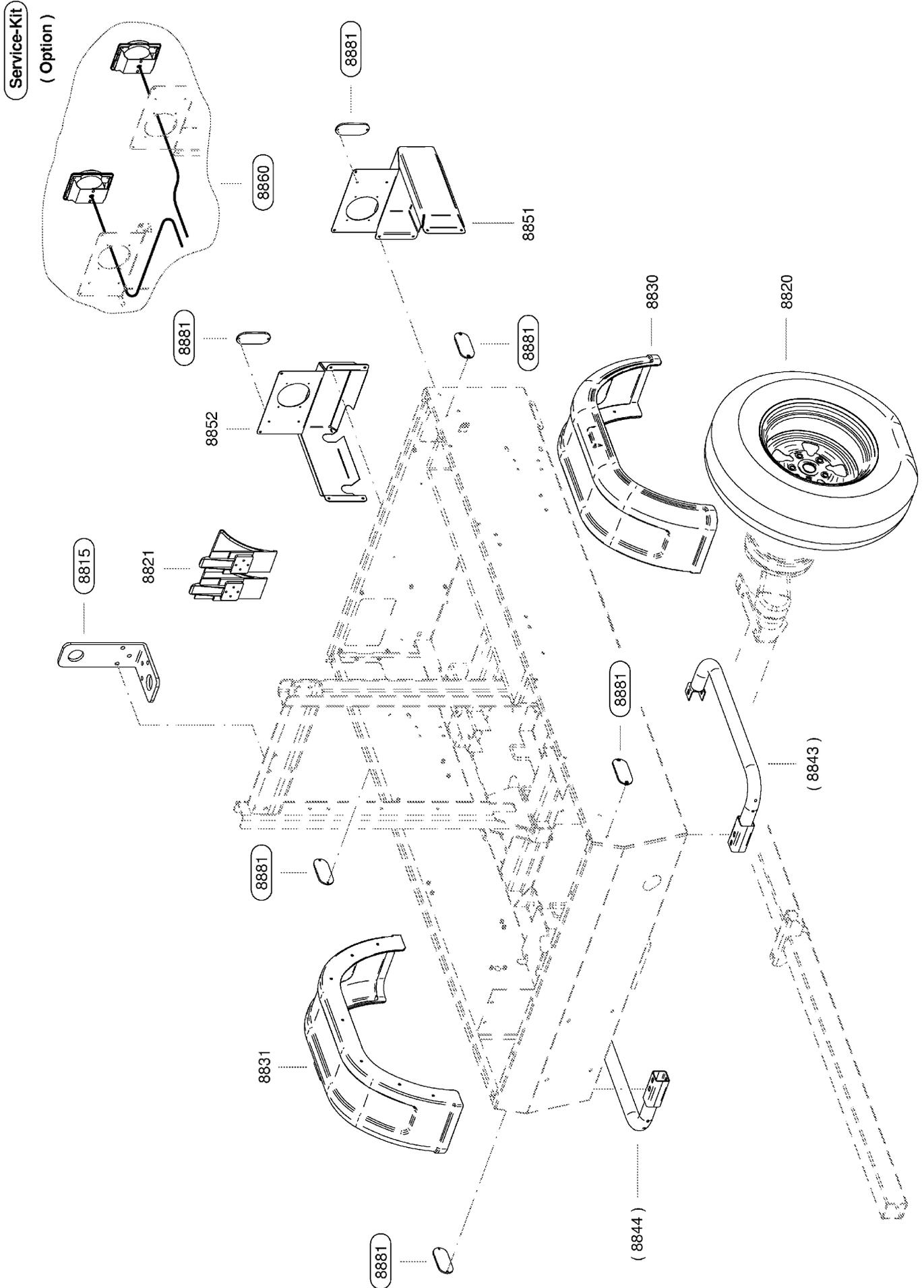


Legend	KAESER
Chassis	SEL-1685_01E

Item	Description	Option
8815	Lifting eye	
8820	Wheel	
8821	Chock	
8830	Left mudguard	
8831	Right mudguard	
8843	Pedestrian protection, left	X
8844	Pedestrian protection, right	X
8851	Left light cluster holder	
8852	Right light cluster holder	
8860	Lighting set	
8881	Reflectors (set)	
8890	Connector cable	
8891	Bracket for 12V male pin socket	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



Legend	KAESER
Chassis	SEL-1687_01E

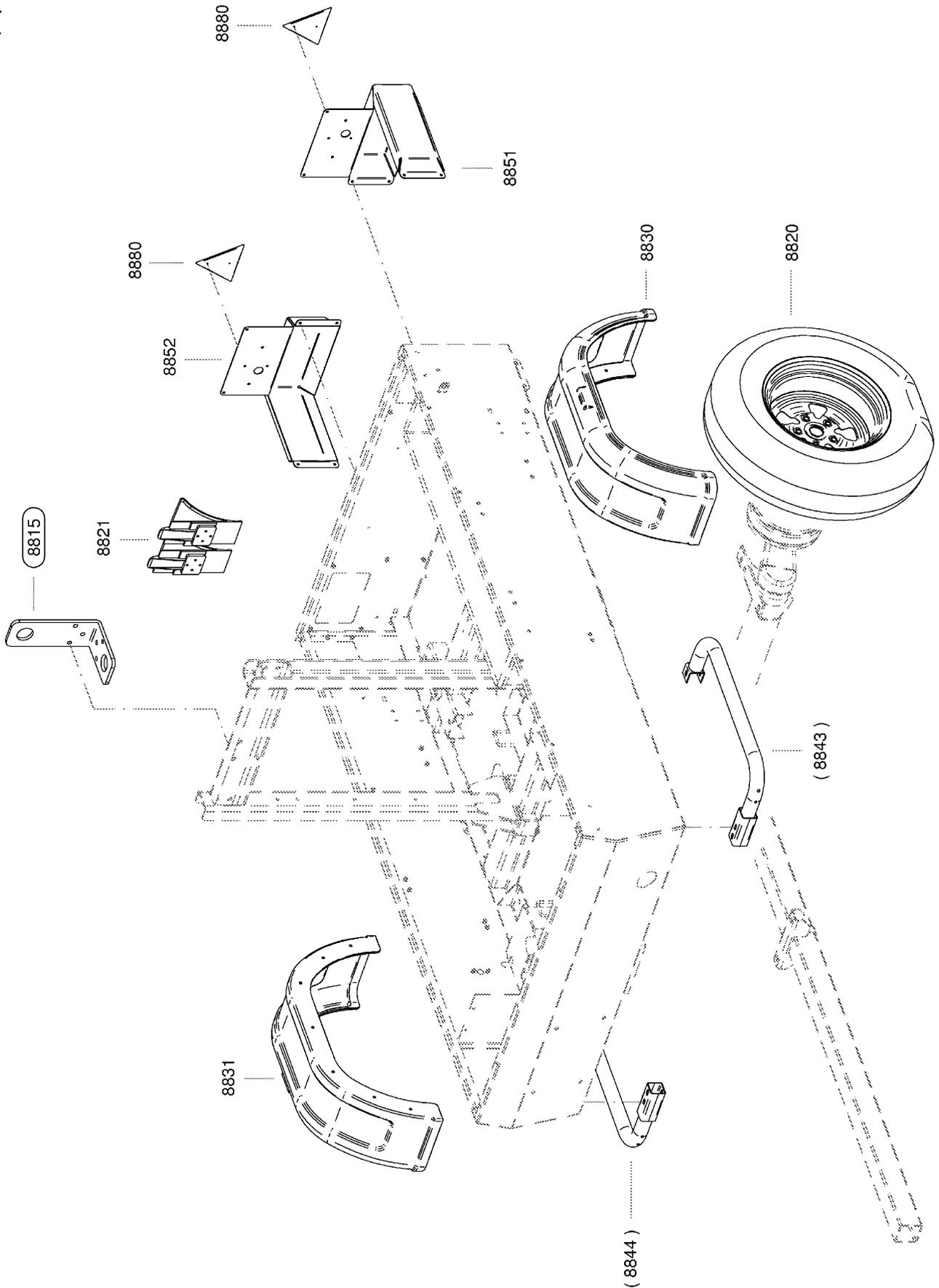
Item	Description	Option
8815	Lifting eye	
8820	Wheel	
8821	Chock	
8830	Left mudguard	
8831	Right mudguard	
8843	Pedestrian protection, left	X
8844	Pedestrian protection, right	X
8851	Left light cluster holder	
8852	Right light cluster holder	
8860	Lighting set	
8881	Reflectors (set)	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit
(Option)

SEG-1851_01



Legend	KAESER
Chassis	SEL-1689_01E

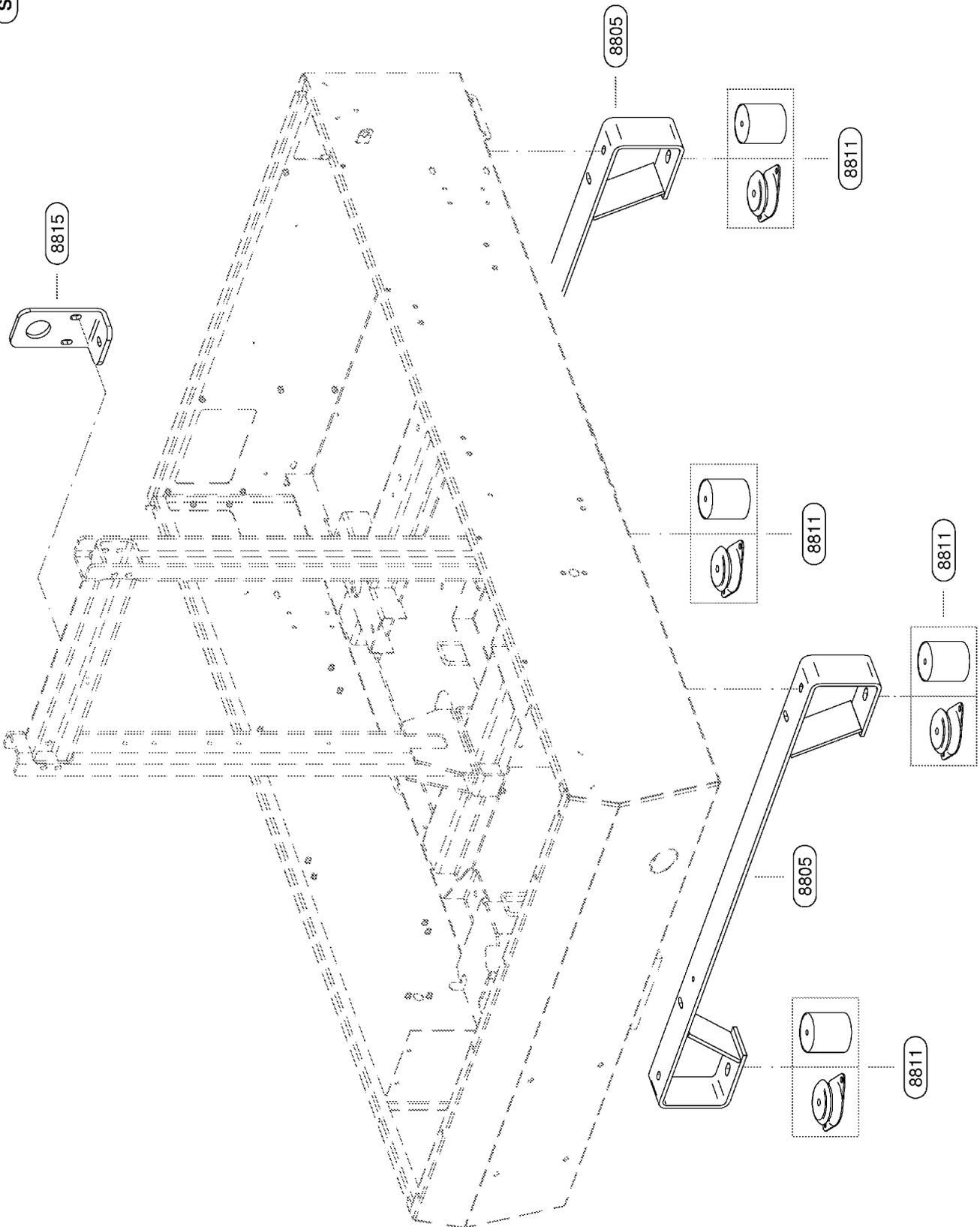
Item	Description	Option
8815	Lifting eye	
8820	Wheel	
8821	Chock	
8830	Left mudguard	
8831	Right mudguard	
8843	Pedestrian protection, left	X
8844	Pedestrian protection, right	X
8851	Left light cluster holder	
8852	Right light cluster holder	
8880	Reflector	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

SEG-1852_01



Legend	KAESER
Chassis (stationary base-frame versions)	SEL-1693_01E

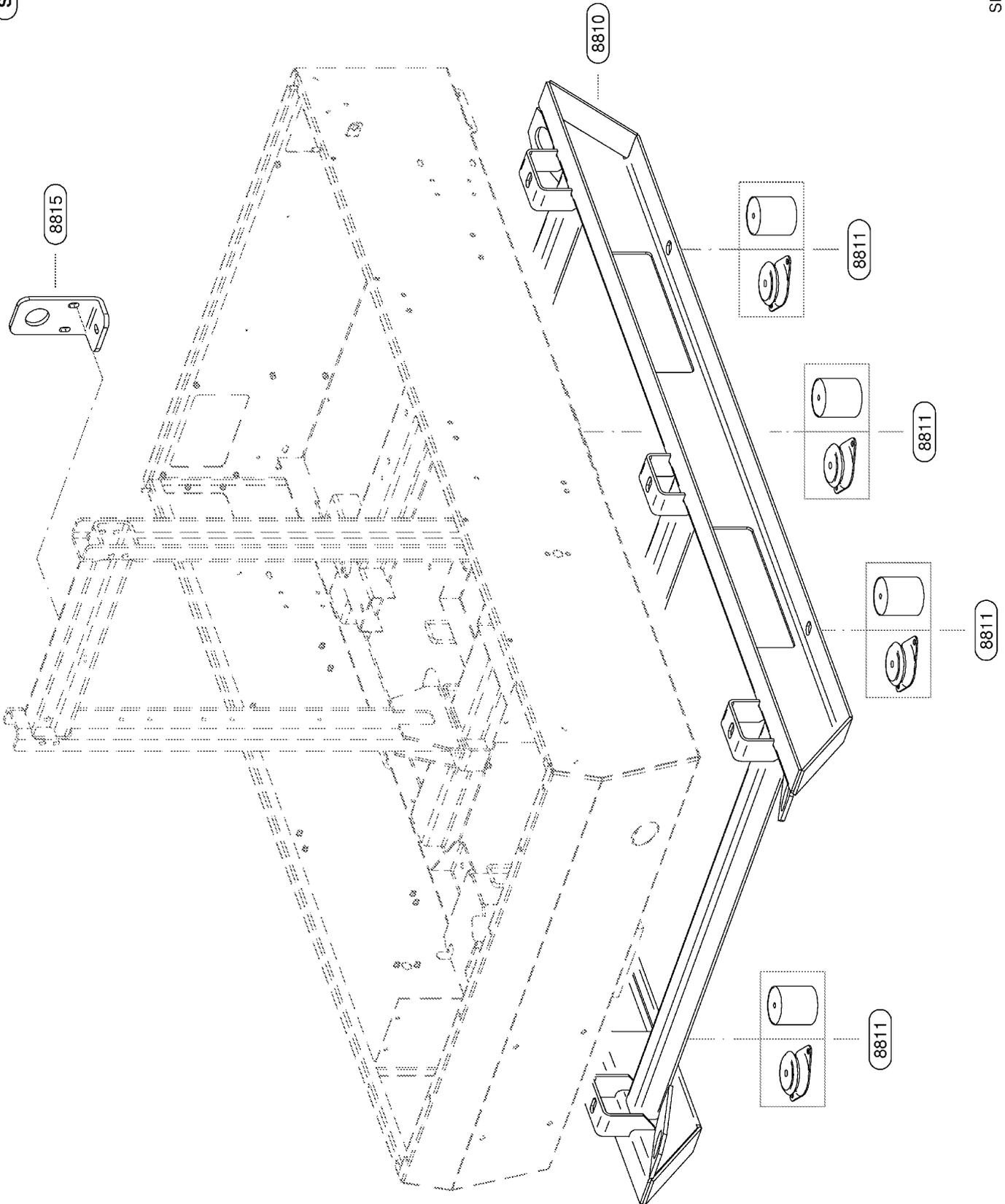
Item	Description	Option
8805	Chassis strut	
8811	Machine mounts for the skid	
8815	Lifting eye	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

SEG-1853_01



Legend	KAESER
Chassis (stationary skid versions)	SEL-1691_01E

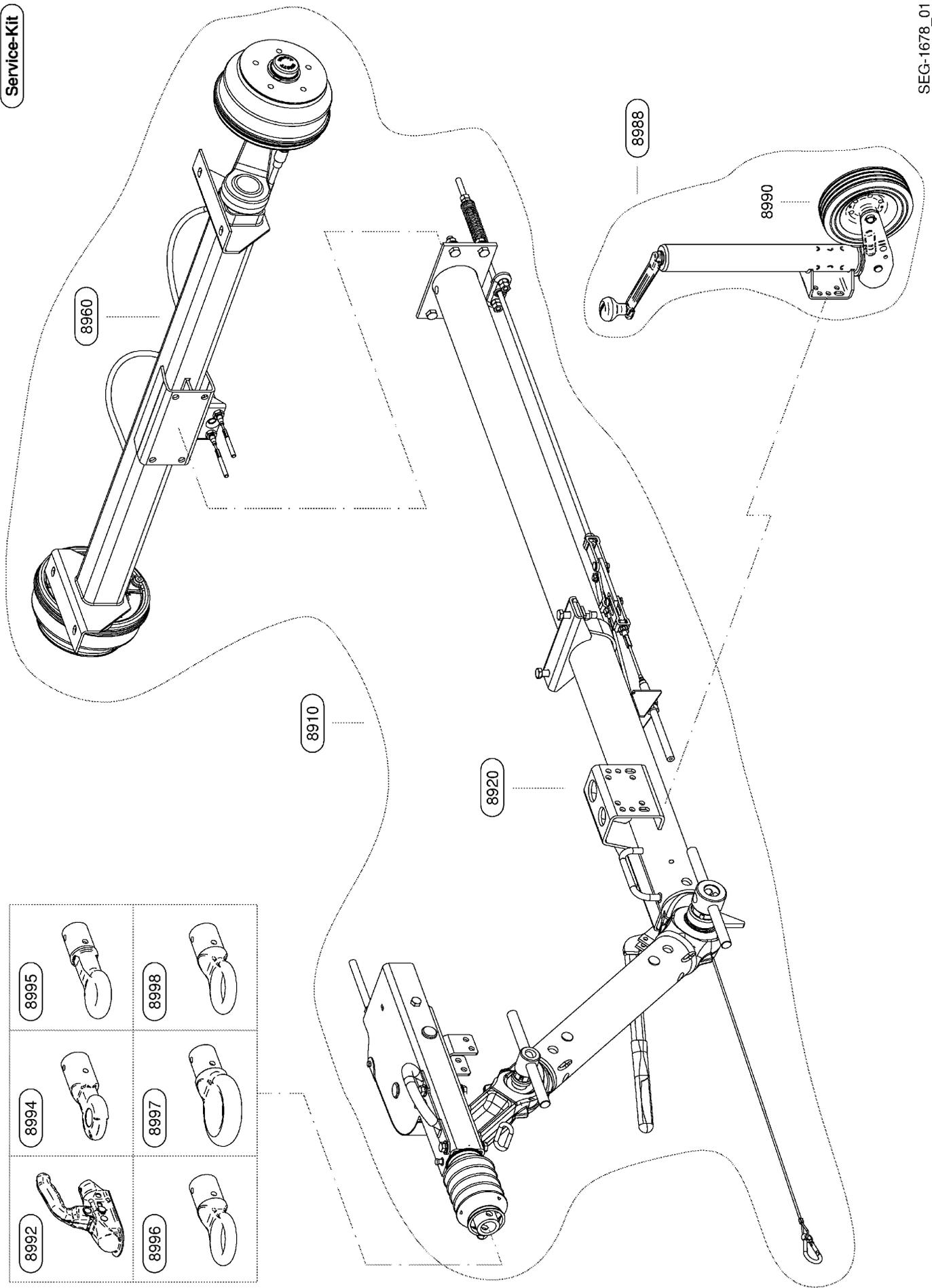
Item	Description	Option
8810	Skids	
8811	Machine mounts for the skid	
8815	Lifting eye	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

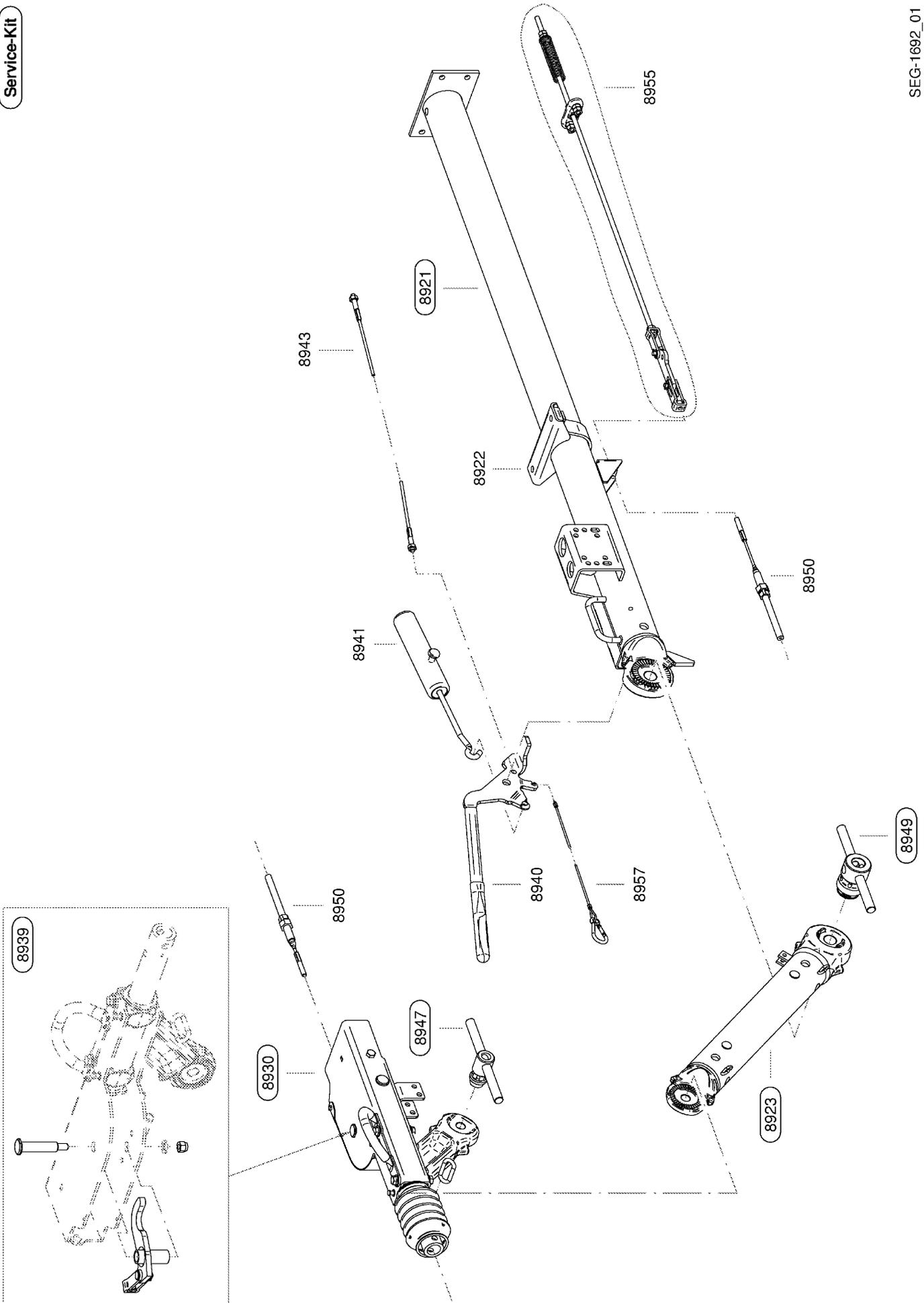
SEG-1678_01



		Legend	KAESER
		Chassis, cpl. EU	SEL-1617_01E
Item	Description	Option	
8910	Chassis, complete		
8920	Drawbar, complete		
8960	Complete axle		
8988	Jockey wheel, complete		
8990	Jockey wheel		
8992	Ball coupling for car, ø 50 (DIN)		
8994	Towing eye for HGV, ø 40 (DIN)		
8995	Towing eye for HGV, ø 45		
8996	Towing eye for HGV, ø 68 x 25		
8997	Towing eye for HGV, ø 76		
8998	Towing eye for HGV, ø 68 x 42		
<p>Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.</p> <p>Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.</p>			

Service-Kit

SEG-1692_01



Legend	KAESER
Drawbar, cpl. EU	SEL-1625_01E

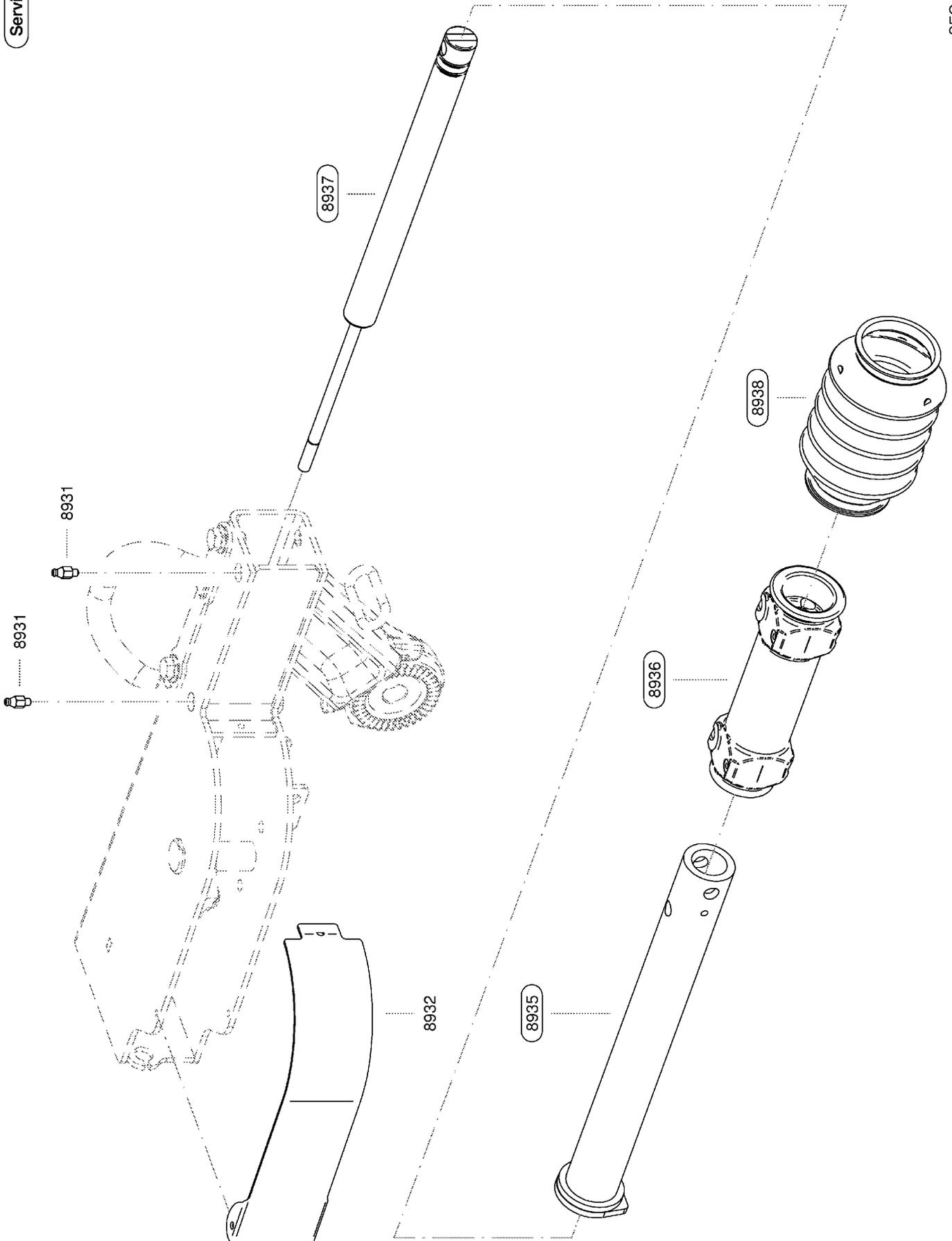
Item	Description	Option
8921	Towbar	
8922	Chassis mounting block	
8923	Height-adjustment bar	
8930	Overrun braking mechanism	
8939	Brake transmission lever	
8940	Parking brake lever	
8941	Parking brake gas spring	
8943	Parking brake cable	
8947	Locking toggle, upper	
8949	Locking toggle, lower	
8950	Brake transfer cable	
8955	Brake actuating rod	
8957	Breakaway cable	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

SEG-1680_01



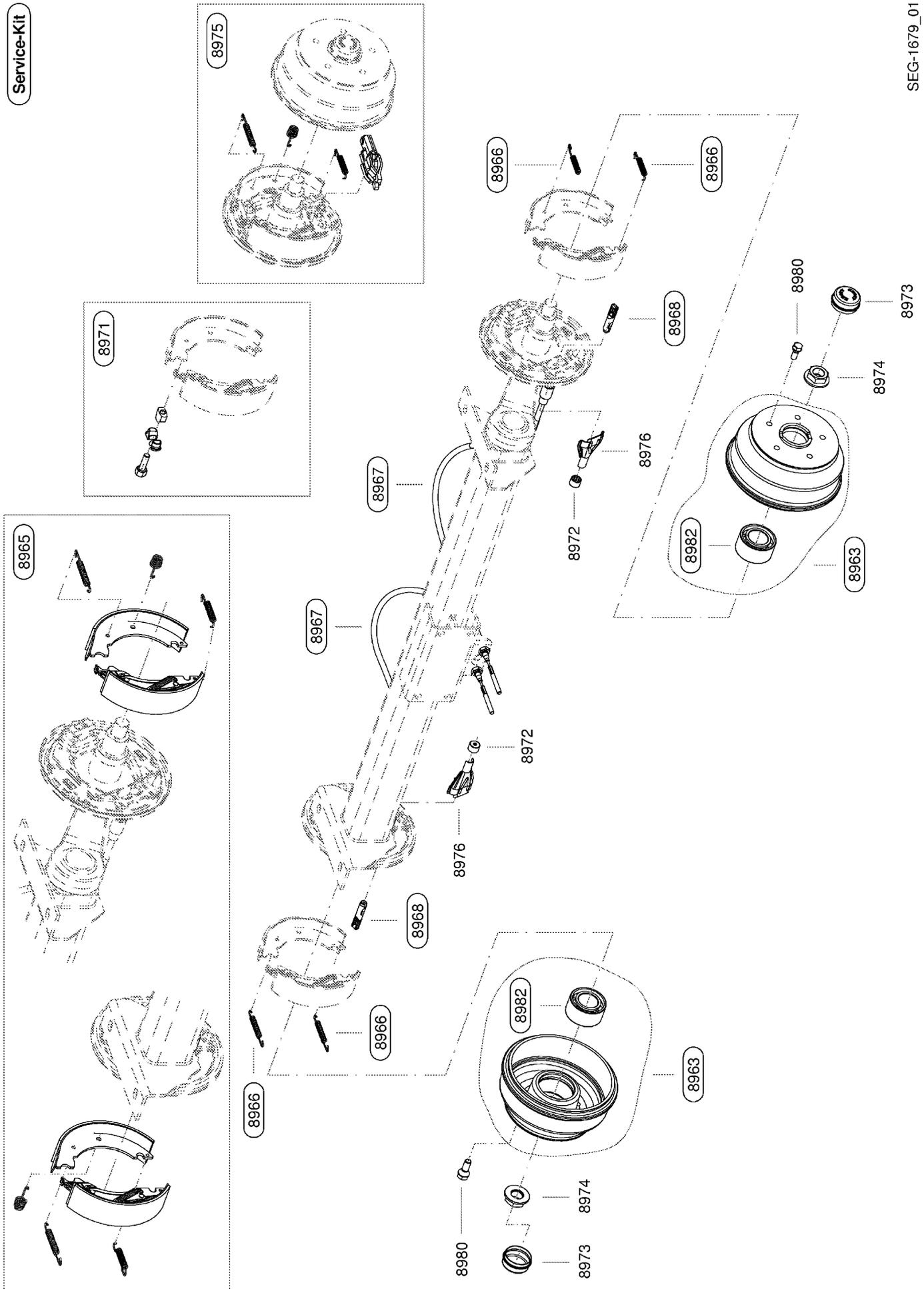
Legend	KAESER
Overrun braking mechanism	SEL-1613_01E

Item	Description	Option
8931	Grease nipple for overrun head	
8932	Overrun head cover	
8935	Towbar	
8936	Towbar guide bush	
8937	Towbar shock absorber	
8938	Towbar protective sleeve	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit



SEG-1679_01

Legend	KAESER
Axle, complete, braked	SEL-1615_01E

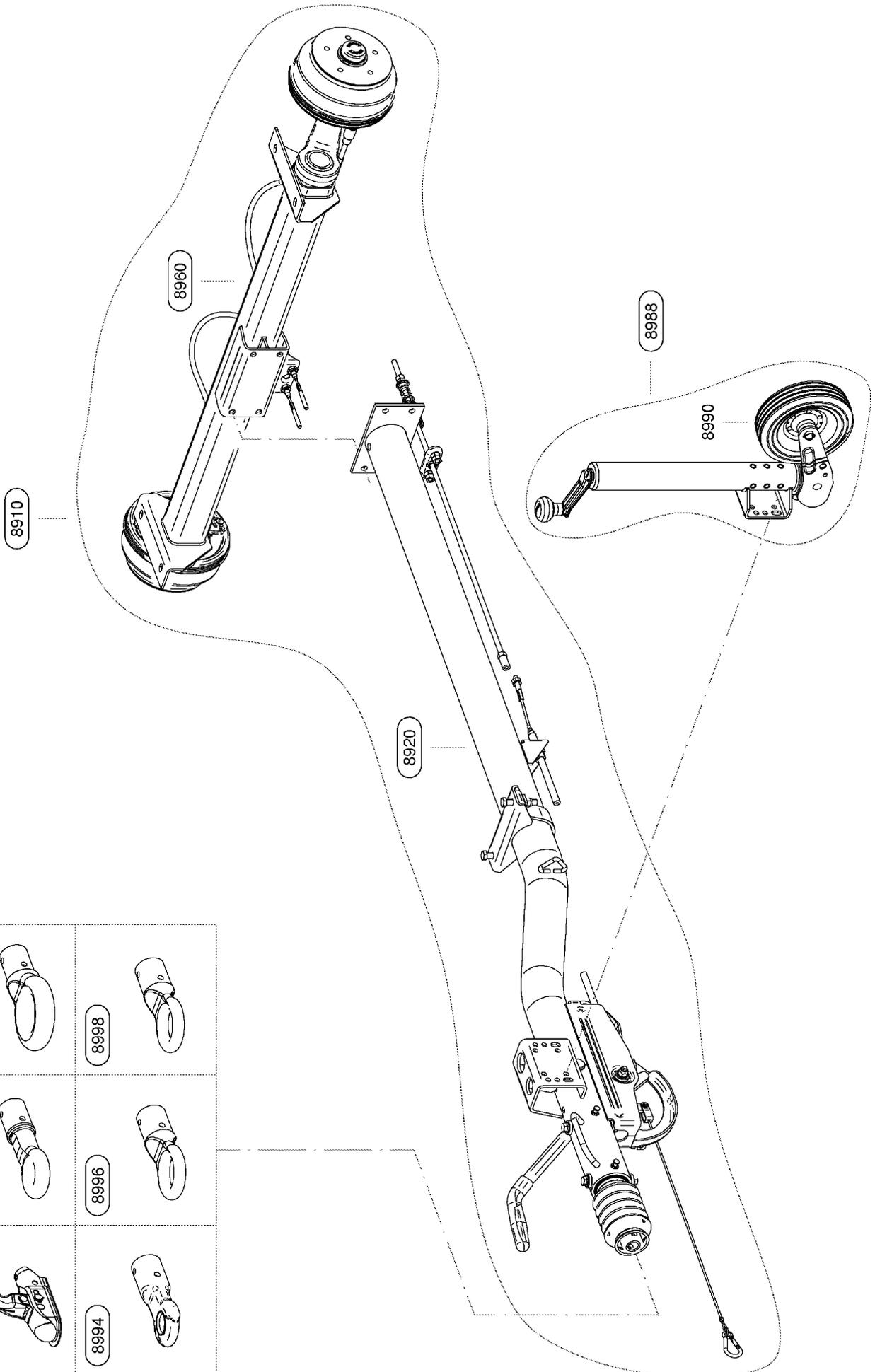
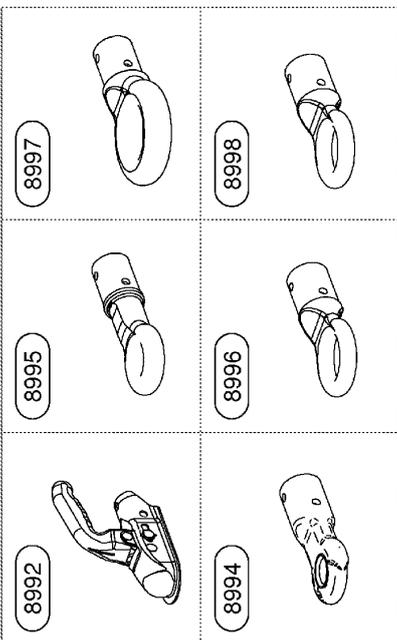
Item	Description	Option
8963	Wheel hub	
8965	Brake shoe set	
8966	Brake shoe spring set	
8967	Wheel brake cable	
8968	Brake cable hook-in pin	
8971	Brake adjusting set	
8972	Sealing cap for the brake backplate	
8973	Grease cap for the brake drum	
8974	Flanged locknut for the axle bearing	
8975	Brake actuating kit	
8976	Protective shell for brake cable	
8980	Wheel bolt	
8982	Wheel bearing set	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

SEG-1677_01

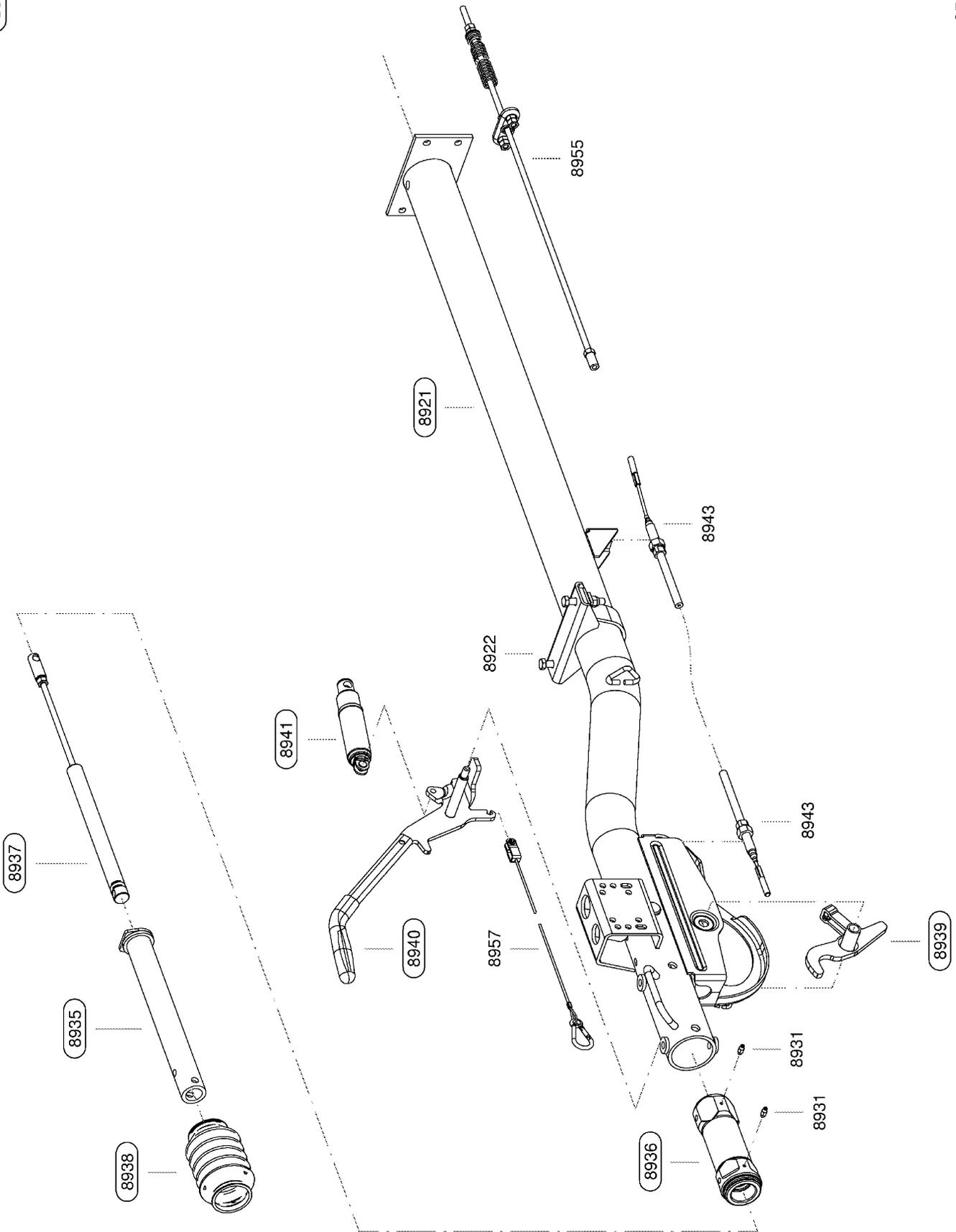


Legend	KAESER
GB chassis	SEL-1611_01E

Item	Description	Option
8910	Chassis, complete	
8920	Drawbar, complete	
8960	Complete axle	
8988	Jockey wheel, complete	
8990	Jockey wheel	
8992	Ball coupling for car, ø 50 (DIN)	
8994	Towing eye for HGV, ø 40 (DIN)	
8995	Towing eye for HGV, ø 45	
8996	Towing eye for HGV, ø 68 x 25	
8997	Towing eye for HGV, ø 76	
8998	Towing eye for HGV, ø 68 x 42	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



Legend	KAESER
Drawbar cpl. GB	SEL-1623_01E

Item	Description	Option
8921	Towbar	
8922	Chassis mounting block	
8931	Grease nipple for overrun head	
8935	Towbar	
8936	Towbar guide bush	
8937	Towbar shock absorber	
8938	Towbar protective sleeve	
8939	Brake transmission lever	
8940	Parking brake lever	
8941	Parking brake gas spring	
8943	Parking brake cable	
8955	Brake actuating rod	
8957	Breakaway cable	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

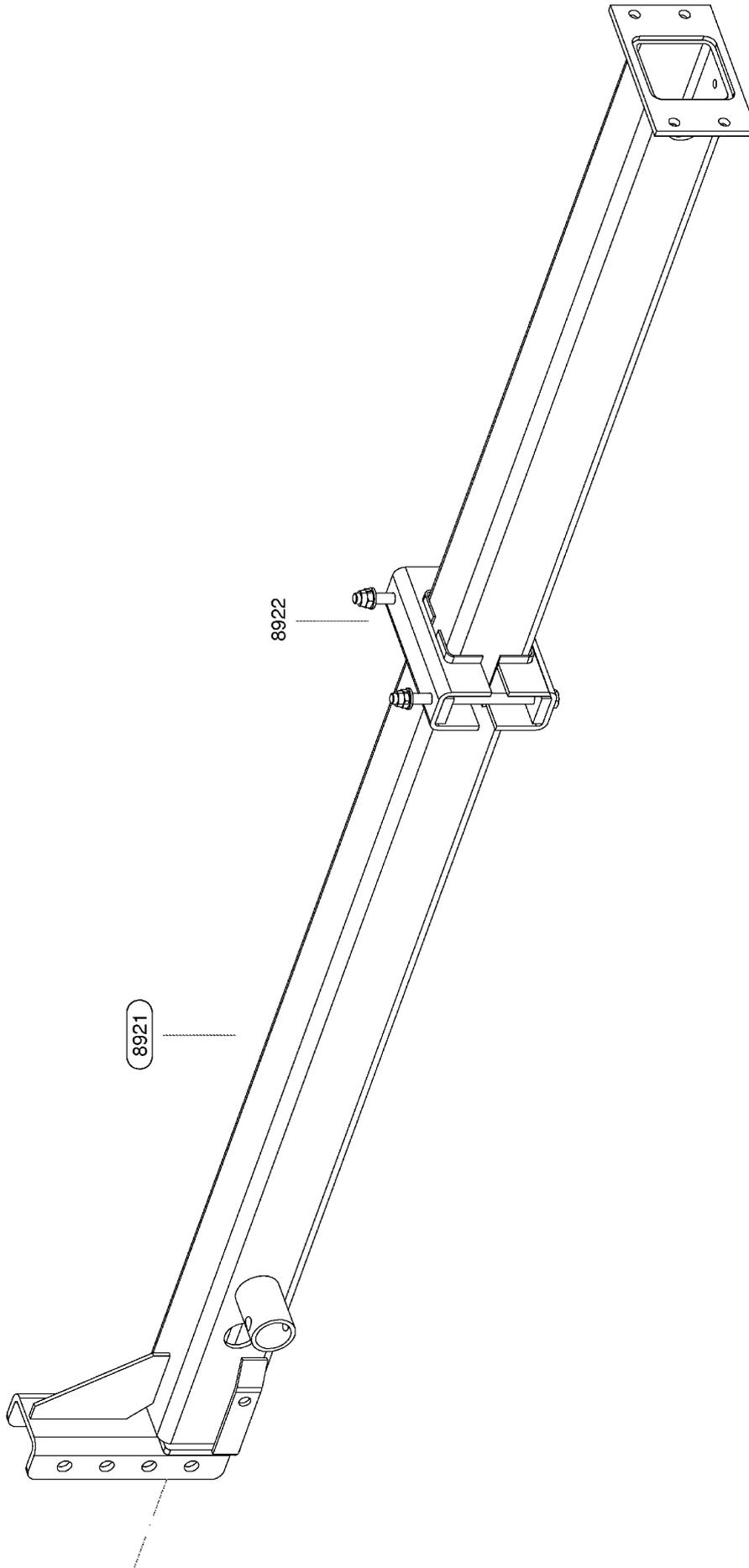
Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Legend	KAESER
Chassis	SEL-1607_01E

Item	Description	Option
8910	Chassis, complete	
8920	Drawbar, complete	
8960	Complete axle	
8989	Prop	
8993	Ball coupling for car, ø 2"	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.



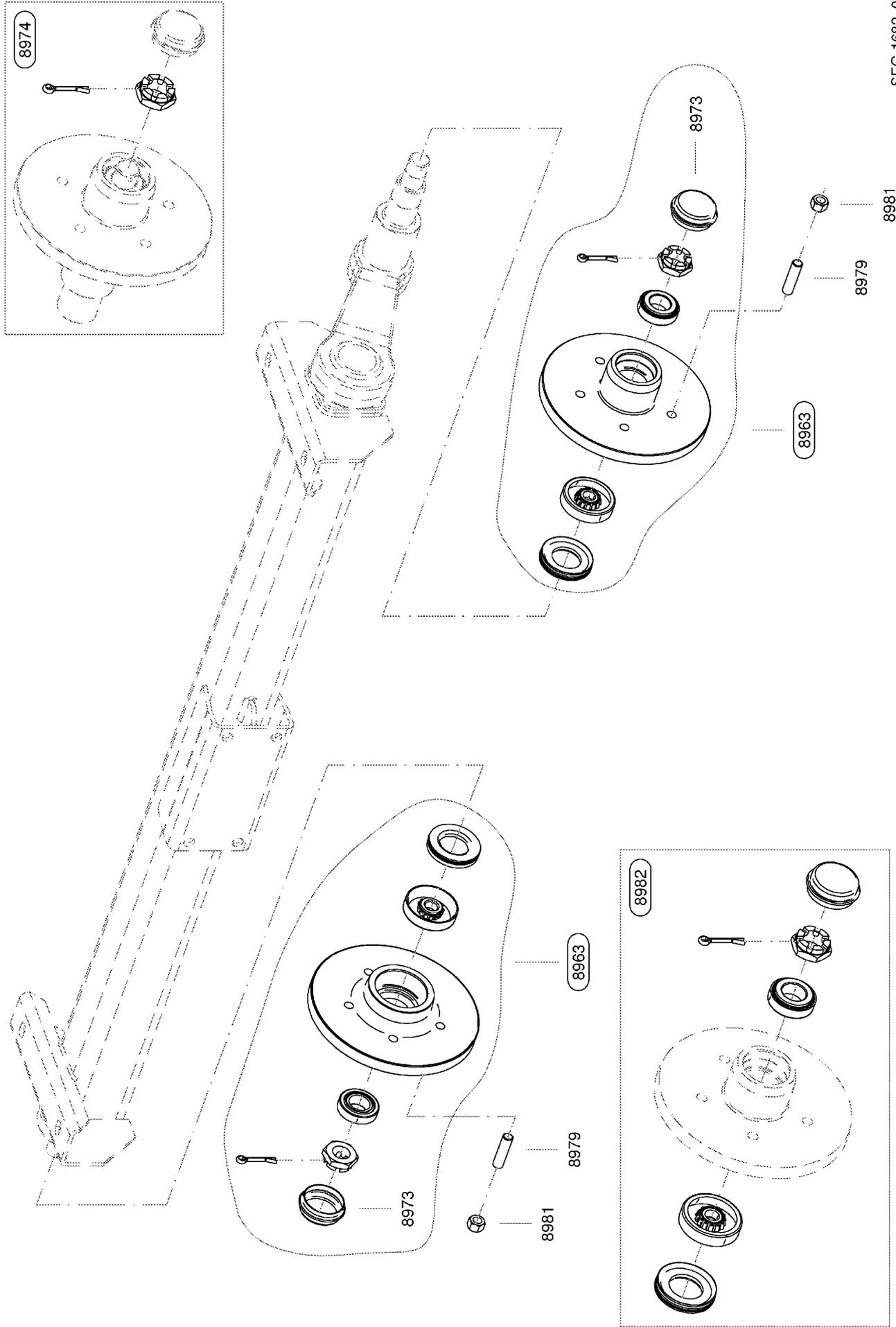
Legend	KAESER
Drawbar cpl. US	SEL-1619_01E

Item	Description	Option
8921	Towbar	
8922	Chassis mounting block	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit



SEG-1682_01

Legend	KAESER
Axle, complete, non-braked	SEL-1609_01E

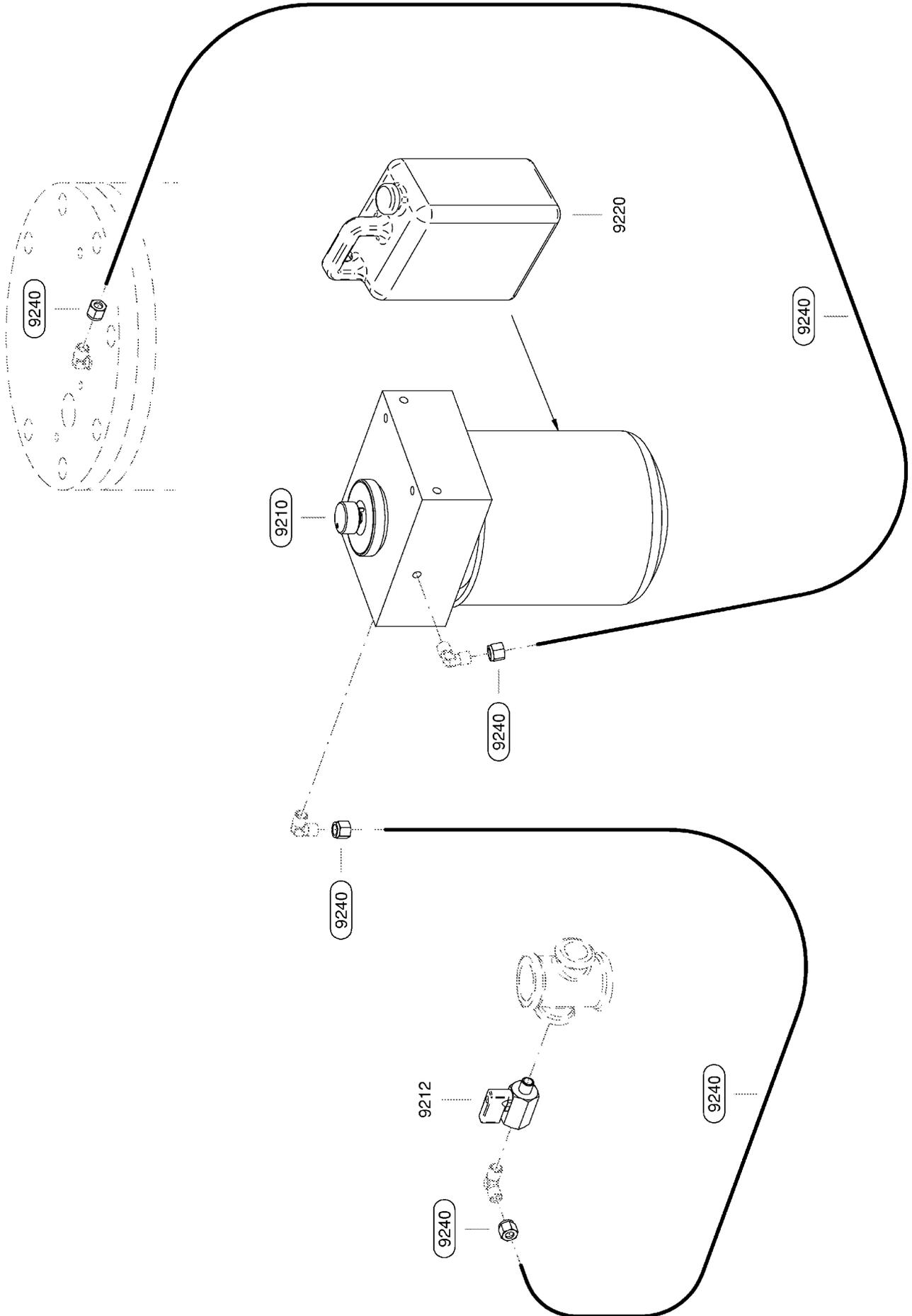
Item	Description	Option
8963	Wheel hub	
8973	Grease cap for the brake drum	
8974	Flanged locknut for the axle bearing	
8979	Wheelbolts	
8981	Wheel nut	
8982	Wheel bearing set	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

Service-Kit

SEG-1854_01



Legend	KAESER
Tool lubrication	SEL-1697_01E

Item	Description	Option
9210	Tool lubricator	
9212	Tool lubricator shut-off valve	
9220	Tool oil *)	
9240	Control line kit for tool lubricator	

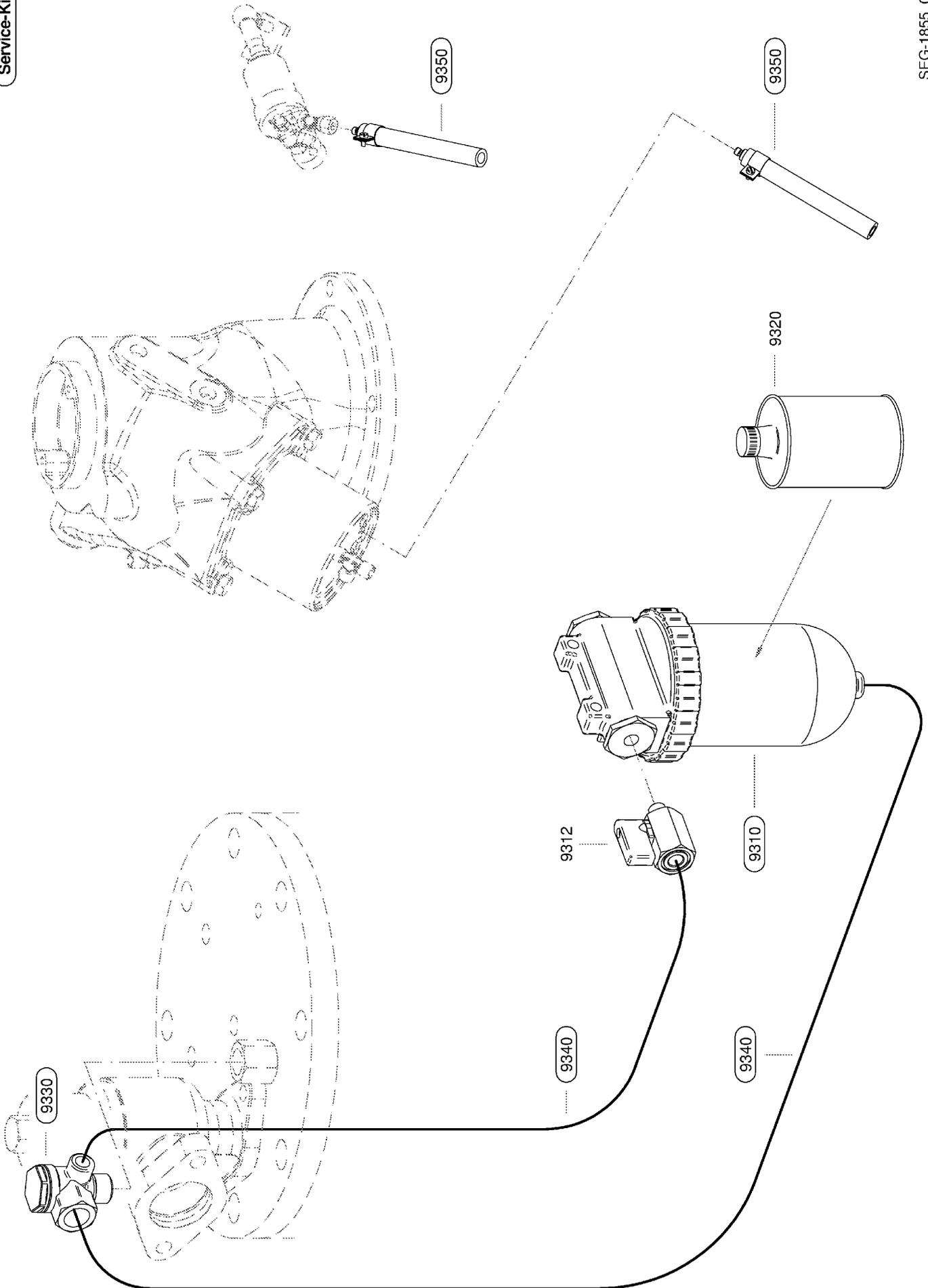
Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

*) see lubricating recommendations for road breakers

Service-Kit

SEG-1855_01



Legend	KAESER
Frost protection device	SEL-1695_01E

Item	Description	Option
9310	Frost protector	
9312	Shut-off valve	
9320	Frost protector antifreeze *)	
9330	Frost protector check valve	
2412	Check valve overhaul kit	
9340	Frost protector control lines	
9350	Antifreeze drain set	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual.

*) see antifreeze recommendations

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 decommissioning

Decommissioning for about 4 months.

Material Plastic foil

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
3. Hang the following notice on the instrument panel informing of the decommissioning measurements taken.

Attention!

1. The machine is temporarily decommissioned.
2. The following machine openings have been covered:

- Engine air inlet
- Compressor air inlet
- Exhaust

3. Recommission according to service manual.

Date / signature

Tab. 63 "Temporarily decommissioned" information notice

Decommissioning of the compressor for several weeks during severe frost



CAUTION

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.

1. Remove the battery (batteries) and store in a frost-free room.
2. Make sure batteries are fully charged.

12.1.2 Long-term decommissioning

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.

Long-term decommissioning tasks	See chapter	Confirmed?
➤ Check engine coolant.	10.3.1	
➤ Drain the engine oil.	10.3.6	
➤ 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 10.3.5	
➤ Run the machine for about 10 minutes to coat all parts with a protective oil film.	–	
➤ Disconnect the battery, the minus terminal first and then the plus 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 intake – Compressor air intake – Exhaust outlet	–	
➤ Clean the bodywork and treat with preservative.	–	
➤ Hang a notice on the instrument panel informing of the decommissioning measurements taken.	–	

Tab. 64 Long-term decommissioning checklist

- Hang the following notice on the instrument panel informing of the decommissioning measurements taken.

Attention!

1. The machine is decommissioned.
2. It is filled with preserving oil.
3. For recommissioning:
 - Take measures for recommissioning after a long period of storage.
 - Recommission according to service manual.

Date / signature

Tab. 65 Text for the long-term decommissioned information notice

- Store in a dry place with even temperature.

12.2 Transporting

Precondition Machine switched off and locked off.

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

The machine has cooled down.

All consumer hoses disconnected, all other lines and hoses disconnected and removed.

Any loose or movable parts that may fall when transporting, removed or secured.

Allow transportation only by personnel trained in safely dealing with motor vehicles and the transporting of goods.

**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.

- Make sure the danger area is clear.

12.2.1 Road transport of the machine as a trailer

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 62 mph. National and local regulations must be observed when towing the machine on public highways.

Payload:

Do not exceed the permissible loading (overall weight, coupling load, axle load).

Observe national traffic laws. If additional loading is not permitted, the load must go to 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 and secure carefully.

Additional requirements for a severely soiled 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. The machine, in particular in the area of the undercarriage, must be cleaned.
2. Check the function of wheels, brakes, lights and signalling equipment.
Functional defects must be repaired prior to transport.

Additional requirements during snowfall and freezing:

Considerable snow or ice may build up on the machine under low temperature conditions.

**CAUTION**

There is danger of accidents caused by 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.

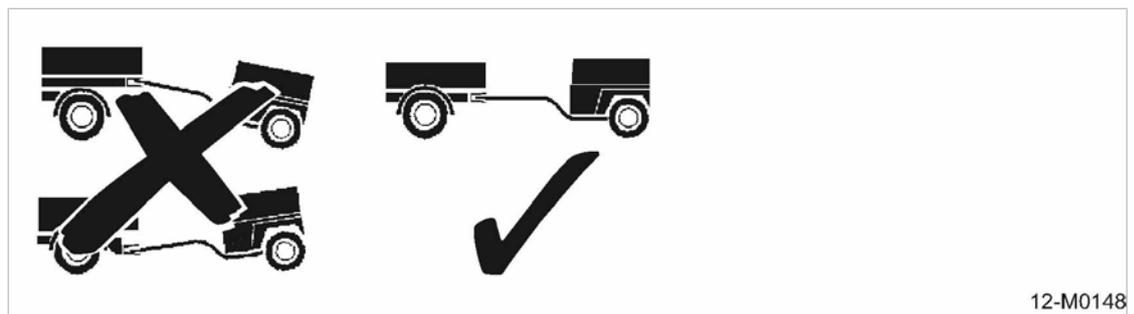
- Do not transport the machine burdened with snow and/or ice.
- Remove any snow or ice before towing.

Ensure and/or execute the following prior to towing the machine with a towing vehicle:

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 doors.

Option sa Adjusting the towbar to the towing mechanism of the towing vehicle:

When the machine is coupled up, the towbar must be parallel with the ground.



12-M0148

Fig. 59 Transport position

**WARNING**

Accident risk from problematic driving dynamics!
The permissible loading range may be exceeded or undercut.
Personal injury due to an accident during the transport is possible.
Damages to the machine and/or towing vehicle are possible.

- Do not hitch the machine in an oblique angle to the towing vehicle.
- Ensure that the towbar is horizontal when coupled to the towing vehicle.

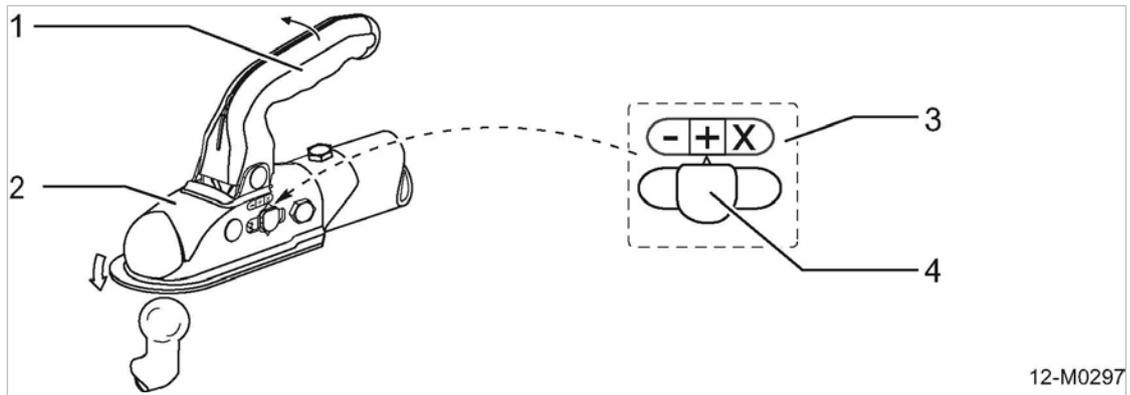
- Adjust the towbar height to suit the height of the hitch on the towing vehicle.

Further information See chapter 6.4.1 for towbar height adjustment.

Option sa, sd Hitching the machine:

To hitch up the machine, lower the open coupling onto the ball of the towing vehicle so that it clicks into place. The indicator of the safety control display will jump to the green zone of the marking identified with a "+", if the ball hitch has engaged correctly.

Option sa, sd



12-M0297

Fig. 60 Ball hitch (EU type)

- | | |
|----------------------------|--------------------------|
| ① Pull the coupling handle | ③ Safety control display |
| ② Ball hitch | ④ Indicator |



CAUTION

High risk of injury by trapped fingers!
They can be trapped in the spring-loaded closing mechanism.

- Do not insert fingers into the opened ball hitch.
- Wear safety gloves.

1. Pull up the coupling release lever ①.
The ball hitch opens and the indicator ④ of the safety control display ③ is in the red zone "X".



WARNING

Incorrectly coupled ball hitch!
If the machine is not correctly coupled and locked it may break away from the towing vehicle and cause an accident.

- The proper seating of the trailer coupling must be verified.

2. Place the open coupling ② over the towing vehicle ball hitch.
The bearing load forces the ball hitch to audibly latch. The coupling locks automatically.
3. Push the release lever ① down to be certain of locking.



The coupling is fully locked when the handle is fully down and can be pushed no further. The indicator of the safety control display is in the green zone "+".



The indicator of the safety control display is in the red zone ("X" or "-" position).

The ball hitch is closed incorrectly or not at all.

- Pull up the release lever ①, lift the coupling ② slightly and press it down on the ball hitch until it audibly locks into position.

Option sa, sd Checking the safety control display on the ball hitch:

The ball hitch is equipped with a safety control display.

The safety control display indicates:

- The wear limit of the coupling ball on the towing vehicle
- The wear limit of the ball hitch
- Open ball hitch.

Option sa, sd

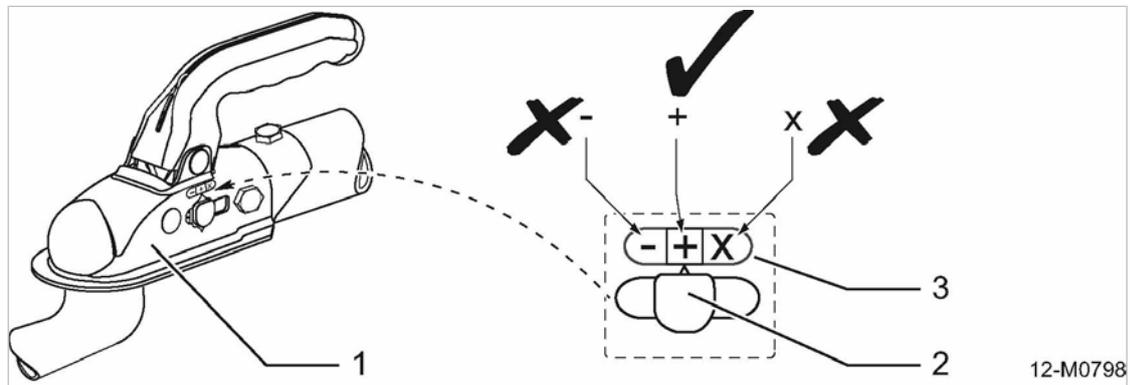


Fig. 61 Safety control display ball hitch

- | | | |
|--------------------------|---|--------------------------------|
| ① Ball hitch | + | green zone (ok) |
| ② Indicator | - | red zone (wear limit exceeded) |
| ③ Safety control display | X | red zone (ball hitch open) |



WARNING

Accident risk due to worn ball hitch!

The machine may separate from the towing vehicle.

- The machine must not be hitched and transported.
- Ball hitch and coupling ball must be inspected.
- Worn parts must be replaced.

1. Hitch the machine to the towing vehicle.
2. Read and interpret the safety control display as follows:

Safety control display	Meaning
Green zone (+) showing	<ul style="list-style-type: none"> ■ Ball hitch is in new condition. ■ Towing vehicle ball hitch wear within acceptable limits. <p>➤ No action required.</p>

Safety control display	Meaning
Red zone (-) showing	<ul style="list-style-type: none"> ■ 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 is damaged. <ul style="list-style-type: none"> ➤ Have the ball coupling and ball hitch checked by a specialist workshop. ➤ Worn parts must be replaced.
Red zone showing (X)	<ul style="list-style-type: none"> ■ Ball hitch not closed, coupling rests only loosely on the coupling ball. <ul style="list-style-type: none"> ➤ Reposition ball hitch on coupling ball until it audibly latches.

Tab. 66 Safety control display ball hitch

Option sh Hitching the machine:

To couple up the compressor, lower the open coupling onto the ball hitch of the towing vehicle so that it clicks into place.

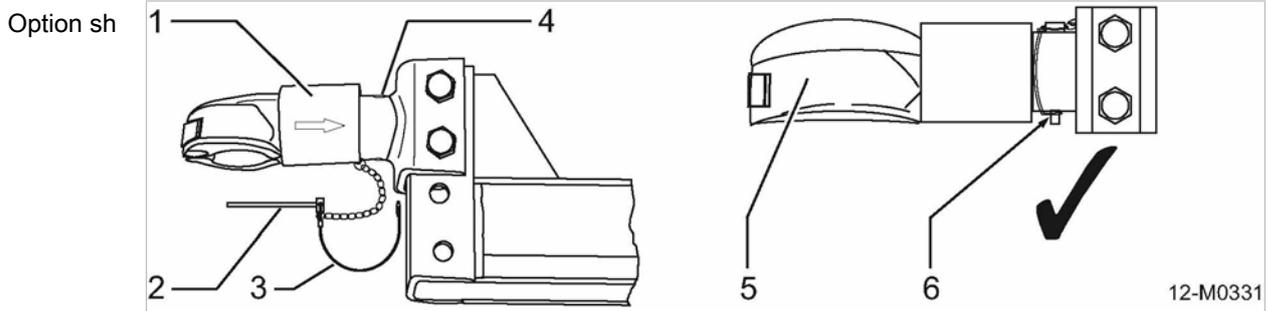


Fig. 62 Ball hitch (US type)

- | | |
|-----------------------|-----------------------------------|
| ① Spreader sleeve | ④ Mounting opening for safety pin |
| ② Plug the safety pin | ⑤ Coupling head |
| ③ Loosen cramp | ⑥ Ball hitch properly secured |



CAUTION

High risk of injury by trapped fingers!
They can be trapped in the spring-loaded closing mechanism.

- Do not insert fingers into the opened ball hitch.
- Wear safety gloves.



WARNING

Incorrectly coupled ball hitch!
If the machine is not correctly coupled and locked it may break away from the towing vehicle and cause an accident.

- The proper seating of the trailer coupling must be verified.

1. Release the clip ③, swivel to one side and pull out the safety pin ②.
2. Lower the ball coupling onto the ball hitch of the towing vehicle and pull back the spreader sleeve ① back to the end stop.
The ball coupling opens and the coupling head ⑤ encloses the ball hitch.
3. Lift the ball coupling off the ball hitch and carefully allow the spreader sleeve ① to snap back to its initial position.
4. Replace the safety pin ② in the fixing holes in the ball coupling and secure with the clip ③.

Option sa Carry out the following before starting to tow

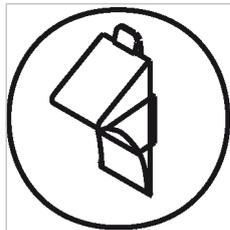
1. Check the height adjustment. See also chapter 6.4.1.
Check that:
 - The teeth in the tow bar height adjusting joints are fully engaged.
 - the immobilizing handles are properly tightened
 - The security pin is fully inserted.
2. Screw the jockey wheel upwards (to the stop).
3. Check that the wheels are securely fitted and the tires are in good condition.
4. Check tire pressures.
5. Connect the cable for the lighting and indicator systems and carry out a function check.
6. Loosen the parking brake and remove the chocks.

Option sd Carry out the following before starting to tow

1. Screw the jockey wheel upwards (to the stop).
2. Check that the wheels are securely fitted and the tires are in good condition.
3. Check tire pressures.
4. Connect the cable for the lighting and indicator systems and carry out a function check.
5. Loosen the parking brake and remove the chocks.

Option sh Carry out the following before starting to tow

Option sh



12-M0393

Fig. 63 Safety signs: secure chocks



WARNING

Missing chocks!

Serious injury or death can result from an unchocked machine rolling away.

- Secure the chocks in the transport securing device before transporting the machine.
- Immediately replace missing chocks.

1. Push the support up and fix in top position.
2. Attach safety chain on the towing vehicle.

3. Check that the wheels are securely fitted and the tires are in good condition.
4. Check tire 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.

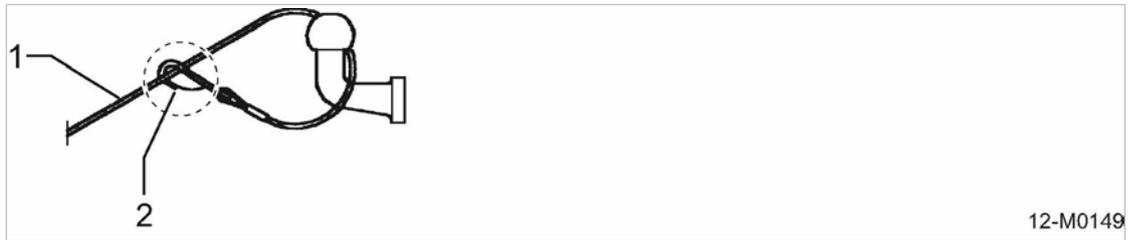


Replacement chocks can be obtained from KAESER. A list is given at the end of this manual. The part number of the chock is 5.1325.0.

Option sa, sd 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).

Option sa, sd



12-M0149

Fig. 64 Contact braking cable attachment

- ① Contact braking cable
- ② Connection (karabiner)



CAUTION

Inadvertent braking!

If the breakaway cable is too short it can apply the brakes when rounding a curve. This imposes high wear on the braking system.

- Use a contact braking cable of sufficient length.

- Loop the end of the cable round the towing vehicle hitch and secure with the karabiner.

12.2.2 Parking the compressor



CAUTION

Injury can occur if the towbar is unsupported and allowed to fall.

A falling towbar can cause injury, especially by crushing the feet.

If the jockey wheel is wound completely out, the spindle can disengage and allow the towbar to fall to the ground.

- Do not wind the jockey wheel completely out when the machine is uncoupled from the towing vehicle.

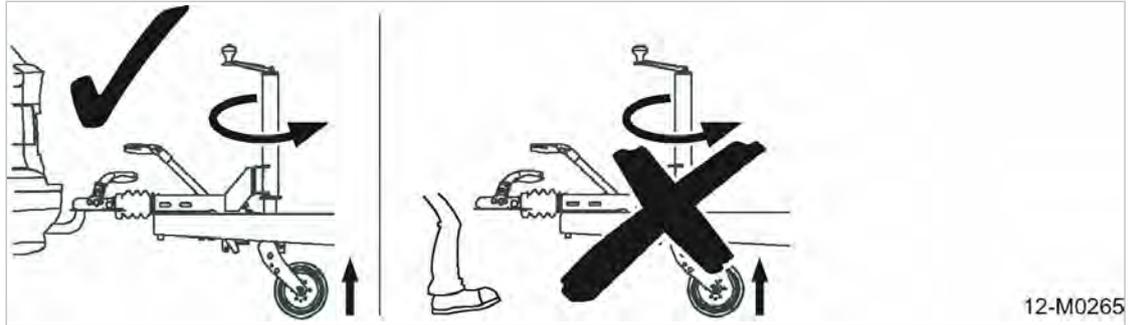


Fig. 65 Injury can occur if the towbar is unsupported and allowed to fall.

Option sa, sd Carry out the following when parking the compressor

When parking on a slope, securely chock the machine before uncoupling.

1. Disconnect the lighting and signalling cable.
2. Pull on the parking brake.
3. Detach the breakaway cable.
4. Wind down the jockey wheel.
5. Place chocks under the wheels.
6. Pull up the parking brake to the stop.
7. Uncouple the compressor from the towing vehicle:
 - Pull up the coupling handle.
 - Lift the coupling off the towing hitch ball.



The gas spring automatically increases parking brake force if the machine rolls backwards or when parked on a slope.

Option sh Carry out the following when parking the compressor

When parking on a slope, securely chock the machine before uncoupling.

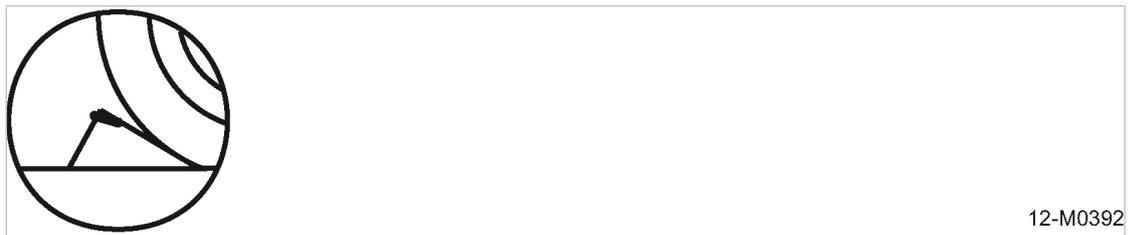


Fig. 66 Safety sign - secure the chocks



WARNING

Machine without parking brake.

Serious injury or death can result from an unchocked machine rolling away.

- Securely chock the machine before uncoupling.
- As a general rule, the machine should always be chocked when it is not being moved.
- The machine should not be manoeuvred by hand.

1. Lower and lock the prop stand.
2. Place chocks under the wheels.

3. Remove the safety chain from the towing vehicle.
4. Dismantle the lighting and signalling system.
5. Uncouple the compressor from the towing vehicle (see Fig 62).
 - Release the clip ②, swivel to one side and pull out the safety pin ①.
 - Pull back the spreader sleeve ④.
 - Lift the ball coupling off the towing vehicle ball hitch and carefully allow the spreader sleeve ④ to snap back to its original position.
 - Replace the safety pin ① in the fixing holes ③ in the ball coupling and secure with the clip ②.

12.2.3 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.

- Additional measures should be taken under conditions of snow or ice.
 - 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.

Carry out the following tasks before transporting the machine

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.

1. Close the rubber cover over the lifting eye on top of the enclosure.
2. Position the crane hook vertically over the lifting eye.
3. Hook the crane hook into the lifting eye.
4. Close and lock the access doors.
5. Lift the machine carefully.

Take care when setting down the machine



CAUTION

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.

- Set the machine down slowly and carefully.

12.2.4 Option sc Transporting with a forklift truck

- Precondition The machine is shut down.
All connecting lines and hoses disconnected and removed.



CAUTION

Damage to the machine by incorrect lifting with a fork truck.
The machine may fall or be damaged by the forks.

- Do not use a fork truck to lift towable machines.
- Only stationary machines with skids may be transported with a fork truck.
- Pick up the machine only from the side with the forks through the lifting lugs.

Option sc

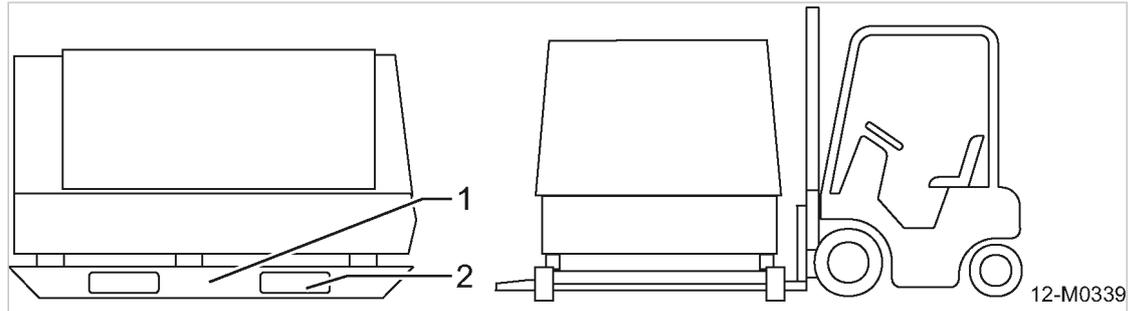


Fig. 67 Transport using a forklift truck

- ① Skids
- ② Lifting lugs

1. Close and lock the access doors or canopy.
2. Position the fork truck to the side of the machine with the forks lined up with the lifting lugs.
3. Drive the forks fully through the lifting lugs as far as possible.
The forks are fully under the machine.
4. Lift the machine carefully.

12.2.5 Transported as freight

The means of transporting will determine the type of packing and load securing. Packing and securing methods must be such that, assuming proper handling, the goods arrive in perfect condition at the destination.

Consult KAESER Service for advice concerning sea or air transport.

- Material
- Chocks
 - Drag shoes or squared timber
 - Guys (tension belts)

Freight securing:



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 bunks for securing the load.
If necessary, use straps across the chassis and the towbar.

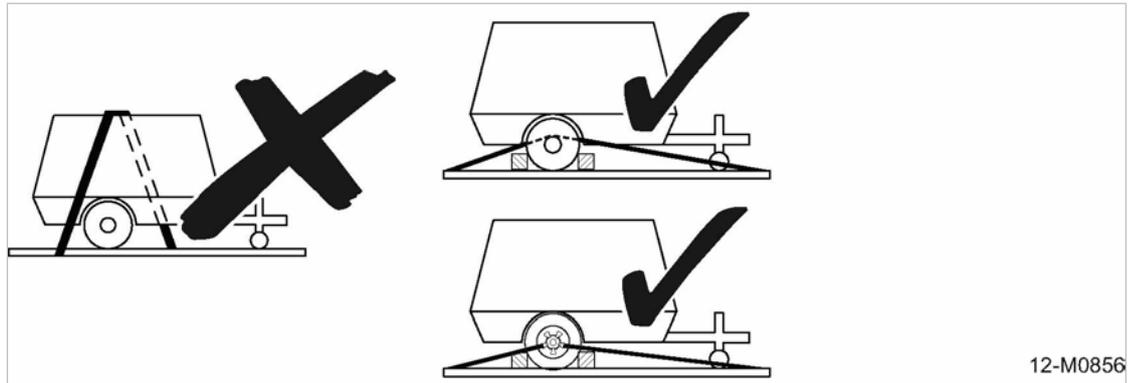


Fig. 68 Guys to secure the freight



CAUTION

Straps can damage the bodywork.
Movement during transportation can damage the bodywork.

- Do not use guys across vehicle body parts.
- Use guys only across running gear.

1. Always observe valid accident and safety regulations when transporting.
2. The loads must be secured against rolling, tipping, slipping and falling.



For more information about transportation and freight securing, please contact the KAESER Service.

Damages arising from improper transportation and/or insufficient or incorrect securing of the freight are explicitly excluded by KAESER from any liability and guarantee.

For rental, lease and trade fair systems, any transport securing means used for the delivery must be also used for the return shipment.

To be noted prior to shipment as airfreight:

The machine is designated as dangerous goods for air freight purposes; any disregard can result in a heavy fine.



DANGER

Danger of fire or explosion from operating fluids/materials.
The machine is equipped with a combustion engine.

- Any dangerous fluids/materials contained within the machine must be removed before transport.
- Remove all dangerous fluids/materials.
These include:
 - Residual quantities of fuel and fuel gases.
 - Lubricants in engine and compressor.
 - Electrolyte charges in rechargeable batteries.
 - Residual quantities of tool oil in the lubricator (Option 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.



Advice can be obtained from KAESER on storage and commissioning.



CAUTION

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. Hand the machine over to an authorized disposal expert.



- Parts contaminated with cooling oil or engine oil must be disposed of in accordance with local environment protection regulations.

13 Annex

13.1 Marking

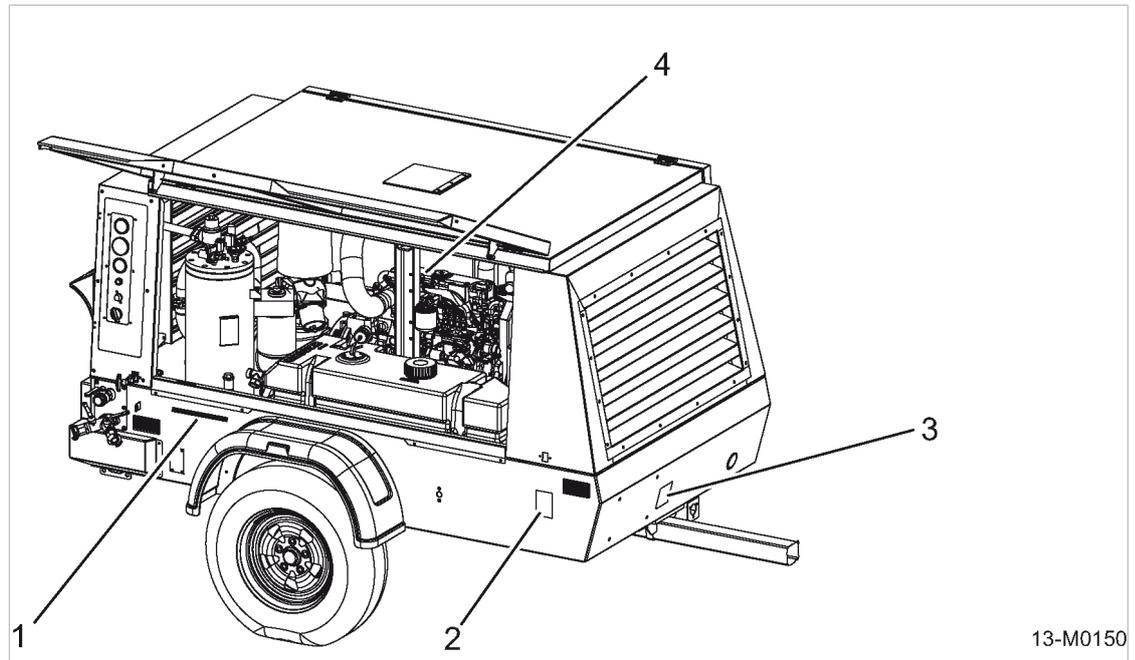
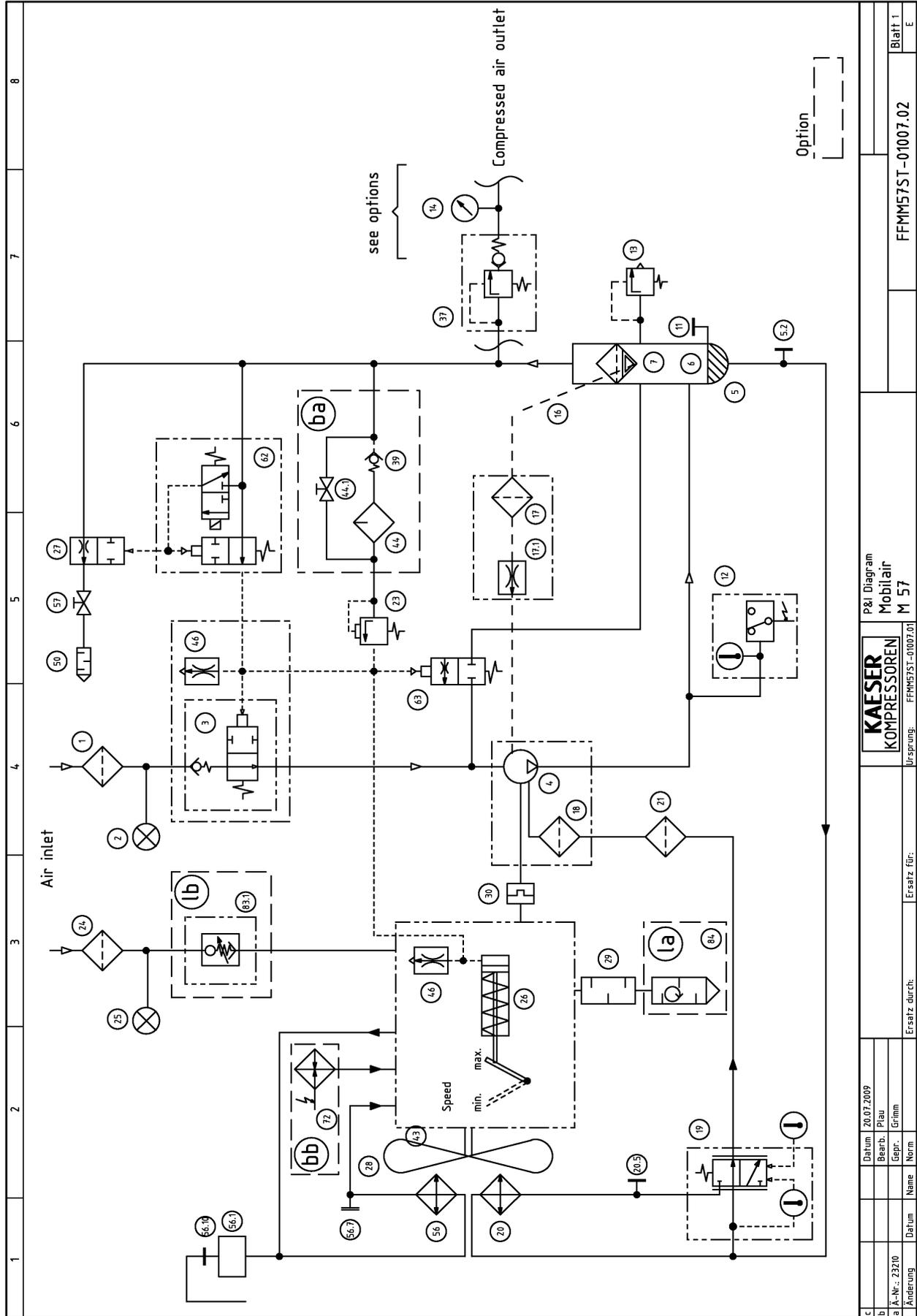


Fig. 69 Marking

- | | |
|--|---|
| ① VIN *) (stamped)
*Vehicle identity number | ③ Combined label for coupling loading and
built-in options |
| ② Machine nameplate with serial number | ④ Engine nameplate with serial number |

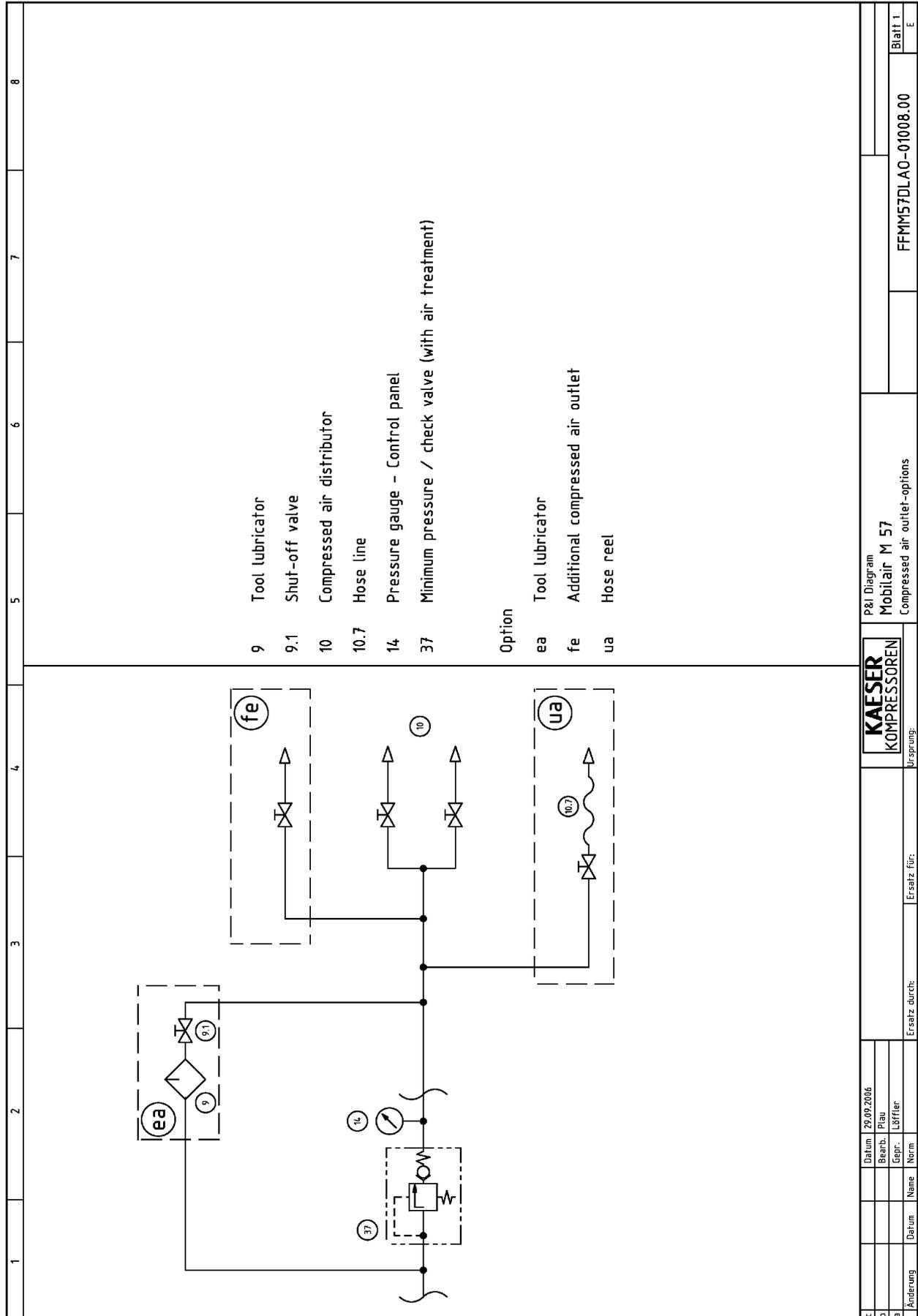
13.2 Pipeline and instrument flow diagram (P+I diagram)



Date: 20.07.2009		P&I Diagram		Blatt 1	
Prep.:	Plau:	Mobilair		E	
Drawn:	Grinn:	M 57		FFMM57ST-01007.02	
Origin:	FFMM57ST-01007.01	KAESER KOMPRESSOREN		FFMM57ST-01007.02	
Replacement by:	Ersatz für:	Ersatz durch:		Option	
Change:	Ä-Nr.: 232/0	Date:		Date:	
Name:	Name:	Name:		Name:	
Norm:	Norm:	Norm:		Norm:	

	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							
5.2	Screw plug							
6	Oil reserve							
7	Oil separator cartridge							
11	Oil filler with screw plug							
12	Temperature gauge switch + Indication							
13	Pressure relief valve							
14	Pressure gauge - Control panel							
15	Diesel engine							
16	Oil return line							
17	Dirt trap							
17.1	Nozzle							
18	Strainer							
19	Combination valve - Oil temperature controller							
20	Oil cooler							
20.5	Screw plug - 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							
28	Fan							
29	Exhaust silencer							
30	Coupling							
37	Minimum pressure / check valve (without air treatment)							
39	Check valve							
44	Defroster							
44.1	Shut-off valve							
46	Nozzle (Secondary end Proportional controller)							
50	Silencer							
56	Water cooler							
56.1	Cooling water expansion tank							
56.7	Screw plug - Water drain							
56.10	Water filling port with plug and pressure relief valve							
57	Shut-off valve - Venting line							
62	Combined control valve							
63	Control valve (Air circulation valve)							
72	Fail-safe heat exchanger							
83.1	Engine air intake shut-off valve (automatic shutoff)							
84	Spark arrestor							
	Option							
	ba	Low temperature equipment						
	bb	Cooling water pre-heating						
	la	Spark arrestor						
	lb	Engine air intake shut-off valve (automatic shutoff)						

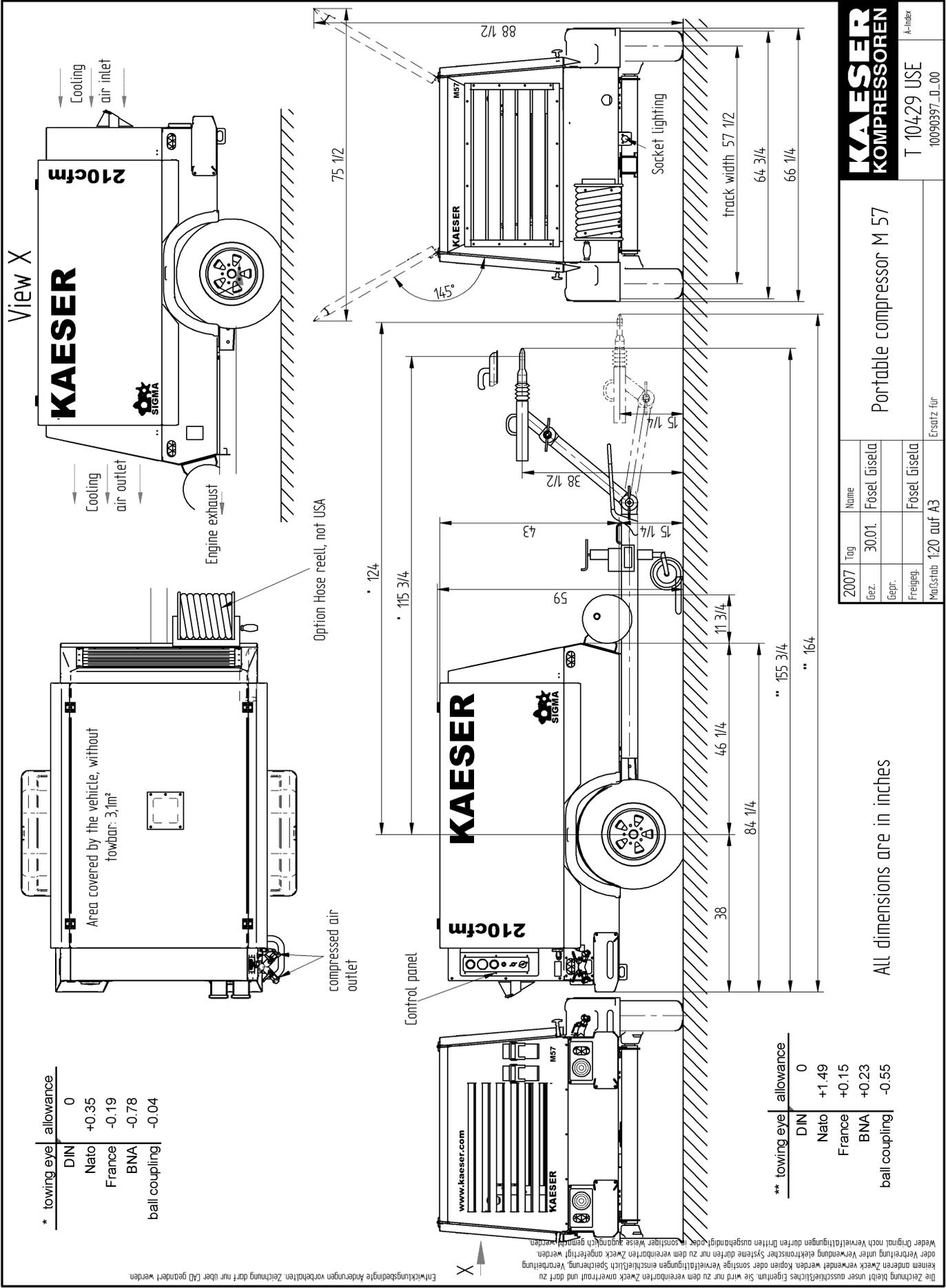
Kaeser Kompressoren		P&I Diagram Legend	
Mobilair		M 57	
Ursprung: FFMM57ST-0007.01		FFMM57ST-01007.02	
Ersatz durch:		Blatt 2	
Ersatz für:		E	



13.3 Dimensional drawings

13.3.1 Option sa

Dimensional drawing, chassis with height-adjustable tow bar



* towing eye allowance

DIN	0
Nato	+0.35
France	-0.19
BNA	-0.78
ball coupling	-0.04

** towing eye allowance

DIN	0
Nato	+1.49
France	+0.15
BNA	+0.23
ball coupling	-0.55

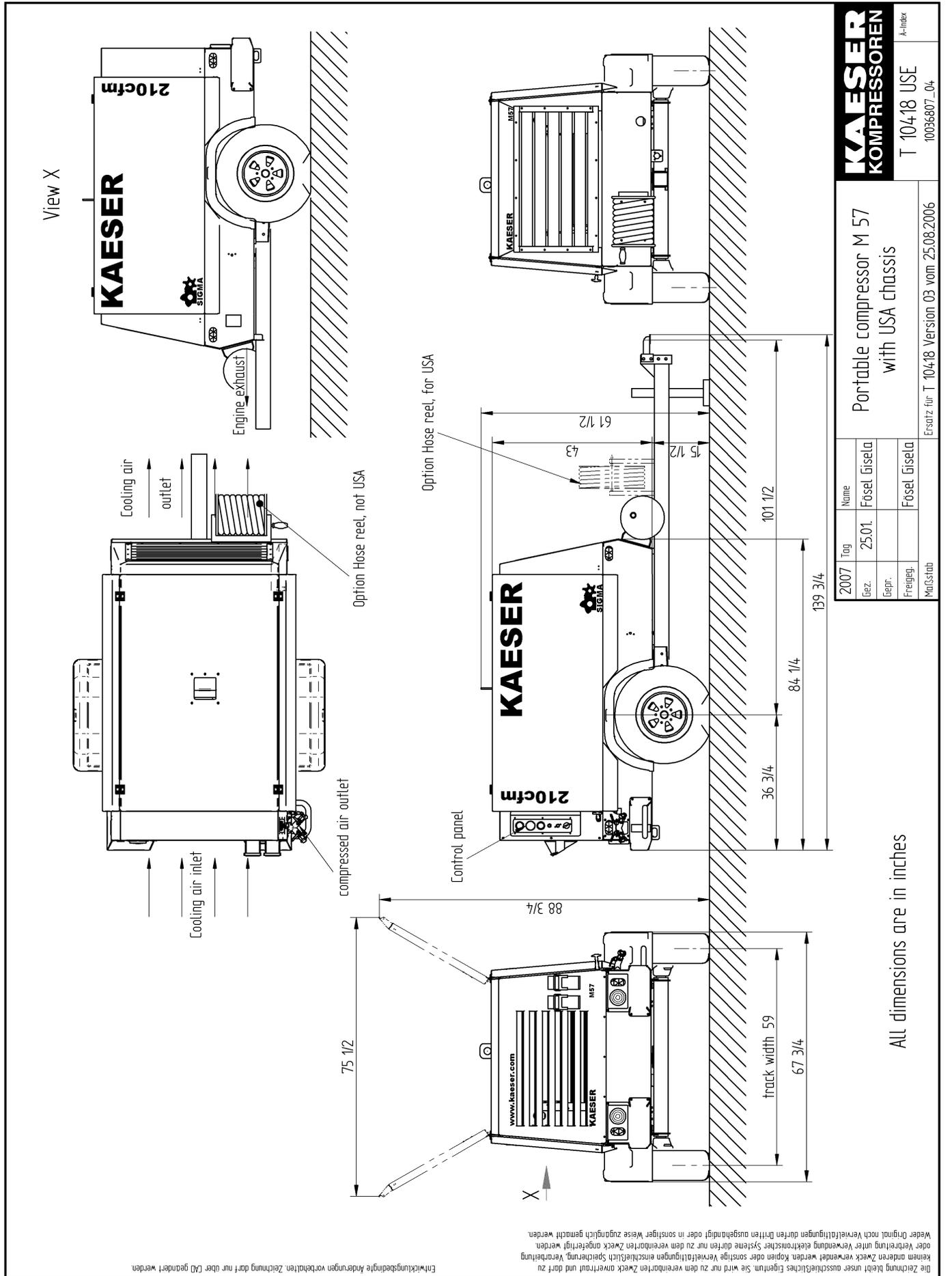
2007		Name	
Tag	30.01	Fösel Gaisela	
Bez.		Fösel Gaisela	
Gep.		Fösel Gaisela	
Freigez.		Maßstab 1:20 auf A3	
T 10429 USE		Ersatz für	
10090397_0_00		A-Index	

Portable compressor M 57

All dimensions are in inches

13.3.2 Option sd
Dimensional drawing, chassis with fixed height tow-bar

13.3.3 Option sh
Dimensional drawing, chassis without parking brake

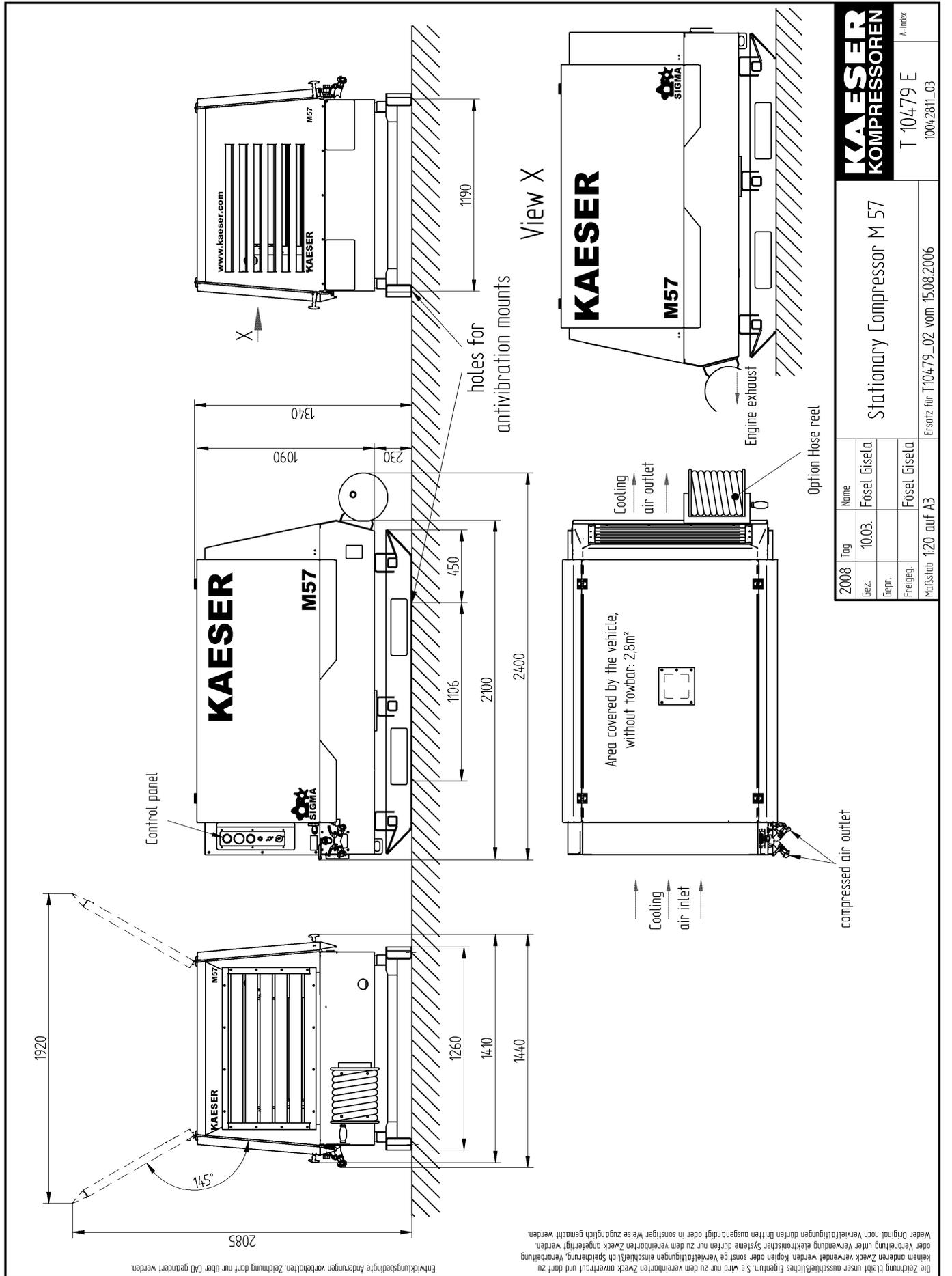


Entwicklungsbedingte Änderungen vorbehalten. Zeichnung darf nur über CAD geändert werden.

Die Zeichnung bleibt unser ausschließliches Eigentum. Sie wird nur zu dem vereinbarten Zweck anvertraut und darf zu keinem anderen Zweck verwendet werden. Kopien oder sonstige Verwertungen einschließlich Speicherung, Verarbeitung oder Verbreitung unter Verwendung elektronischer Systeme dürfen nur zu dem vereinbarten Zweck angefertigt werden. Weiter Original noch Verwertungen dürfen Dritten ausgedruckt oder in sonstiger Weise zugänglich gemacht werden.

All dimensions are in inches

13.3.4 Option sc
Dimensional drawing, stationary version



13.4 Wiring diagrams

13.4.1 Electrical Diagram

1	2	3	4	5	6	7	8	
<p>Electrical diagrams</p> <p>MOBILAIR</p> <p>M57, M52/M64/M70</p> <p>KUBOTA-Motor</p>								
<p>Manufacturer: Kaeser Kompressoren GmbH</p> <p>Postfach 2143</p> <p>96410 Coburg</p>								
<p>The drawings remain our exclusive property. They are entrusted only for the agreed purpose. Copies or any other reproductions, including storage, treatment and dissemination by use of electronic systems must not be made for any other than the agreed purpose. Neither originals nor reproductions must be forwarded or otherwise made accessible to third parties.</p>								
c	Datum	13.02.2009	E					Cover page
b	Bearb.	Weid						MOBILAIR M57, M52/64/70
a	Gepr.	Weid						=
A	Änderung	Datum	Name	Norm	Ersatz durch:			+
					Ersatz für:			DFA5764-01071.00
					Kaeser Kompressoren			Blatt 1
					Ursprung: AFA01070_01			BL

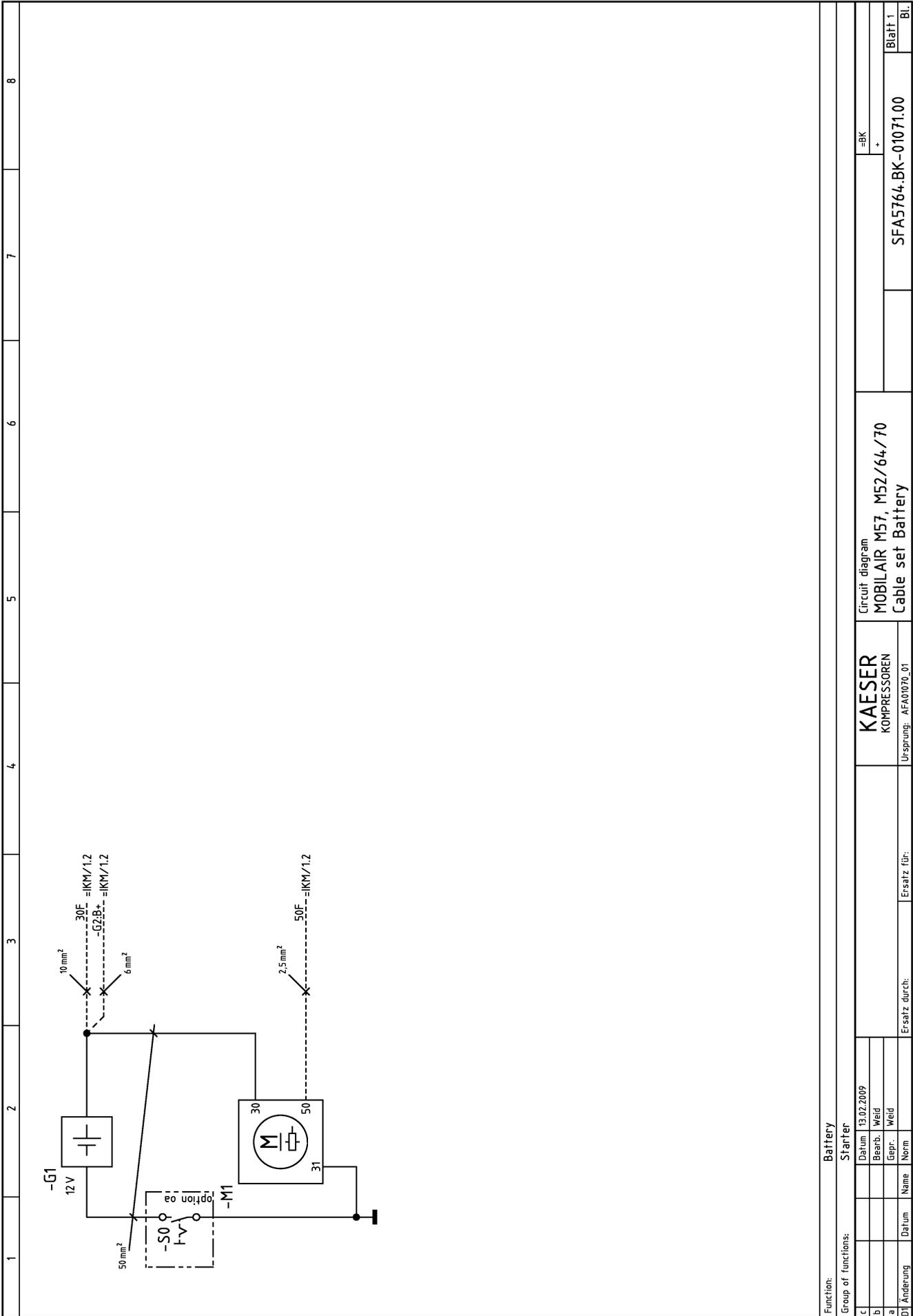
Lfd. Nr. No.	Benennung Name	Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page		DFA5764-01071.00	1	
2	List of contents		ZFA5764-01071.00	1	
3	Block diagram		UFA5764-01071.00	1	
4	Block diagram	Cross-reference	UFA5764-01071.00	2	
5	Circuit diagram	Cable set Battery	SFA5764.BK-01071.00	1	=BK
6	Circuit diagram	Compressor - unit	SFA5764.IKM-01071.00	1	=IKM
7	Circuit diagram	Control	SFA5764.BT-01071.00	1	=BT
8	Circuit diagram	Control	SFA5764.BT-01071.00	2	=BT
9	Circuit diagram	Cable set Control	SFA5764.IK1-01071.00	1	=IK1
10	Electrical equipment identification	Cable set generator	SFA5764.IK2-01071.00	1	=IK2
11	Circuit diagram	low temperature equipment	SFA5764.IK3-01071.00	1	=IK3
12	Equipment parts list		GFA5764-01071.00	1	

List of contents		MOBILAIR M57, M52/64/70		=	
KAESER		KOMPRESSOREN		+	
Ursprung: AFA01070_01				ZFA5764-01071.00	
Ersatz durch:		Ersatz für:		Blatt 1	
				Bl.	

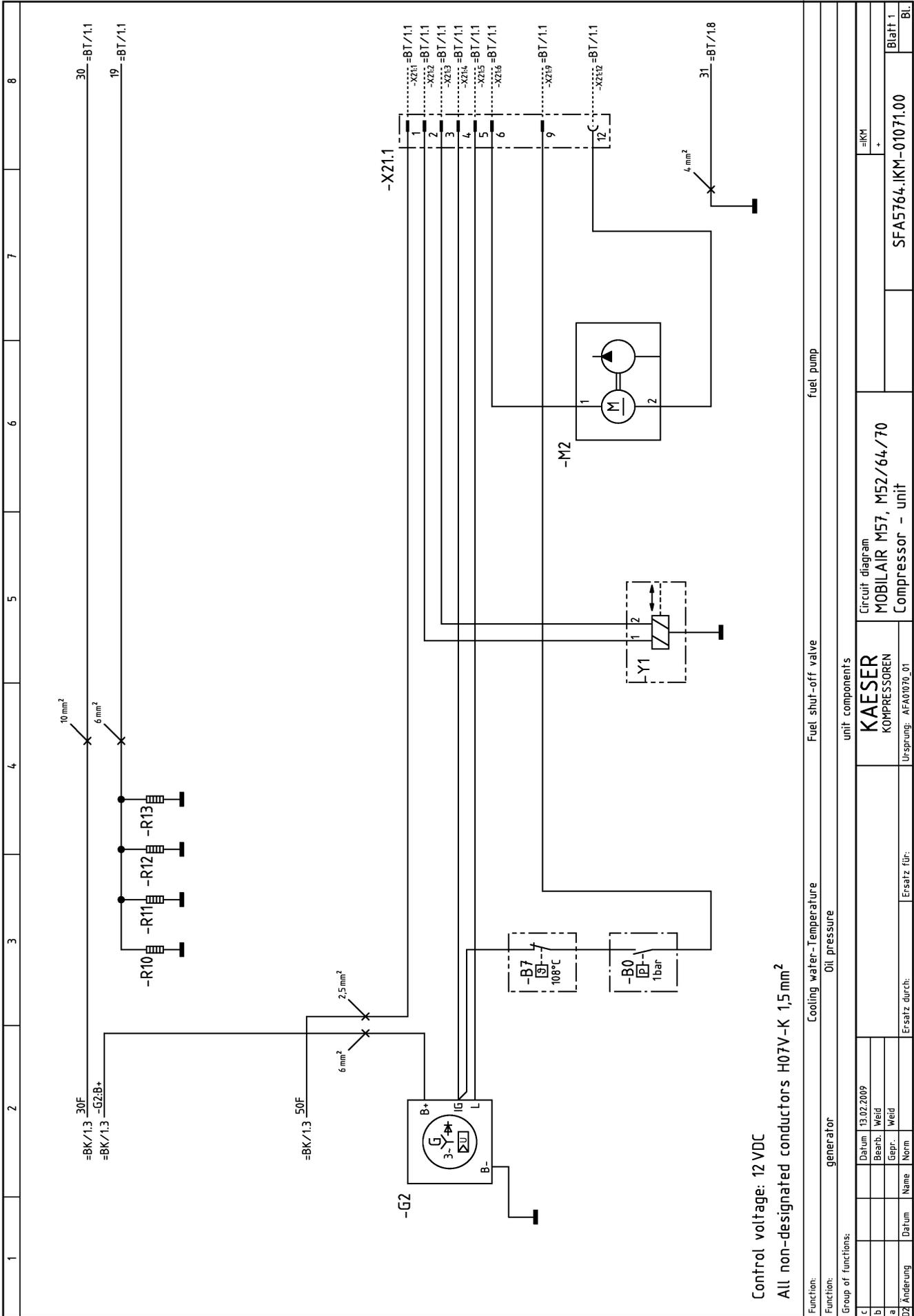
1	2	3	4	5	6	7	8
<p>general instructions Control voltage 12VDC All non-designated conductors H07V-K 1,5 mm² black</p> <p style="text-align: right;">potentials: 15 switched plus + (unit ON) 19 Preheat with glowplug 30 + terminal (Battery) 31 - terminal (Battery), earth 50 Starter-Control</p>							

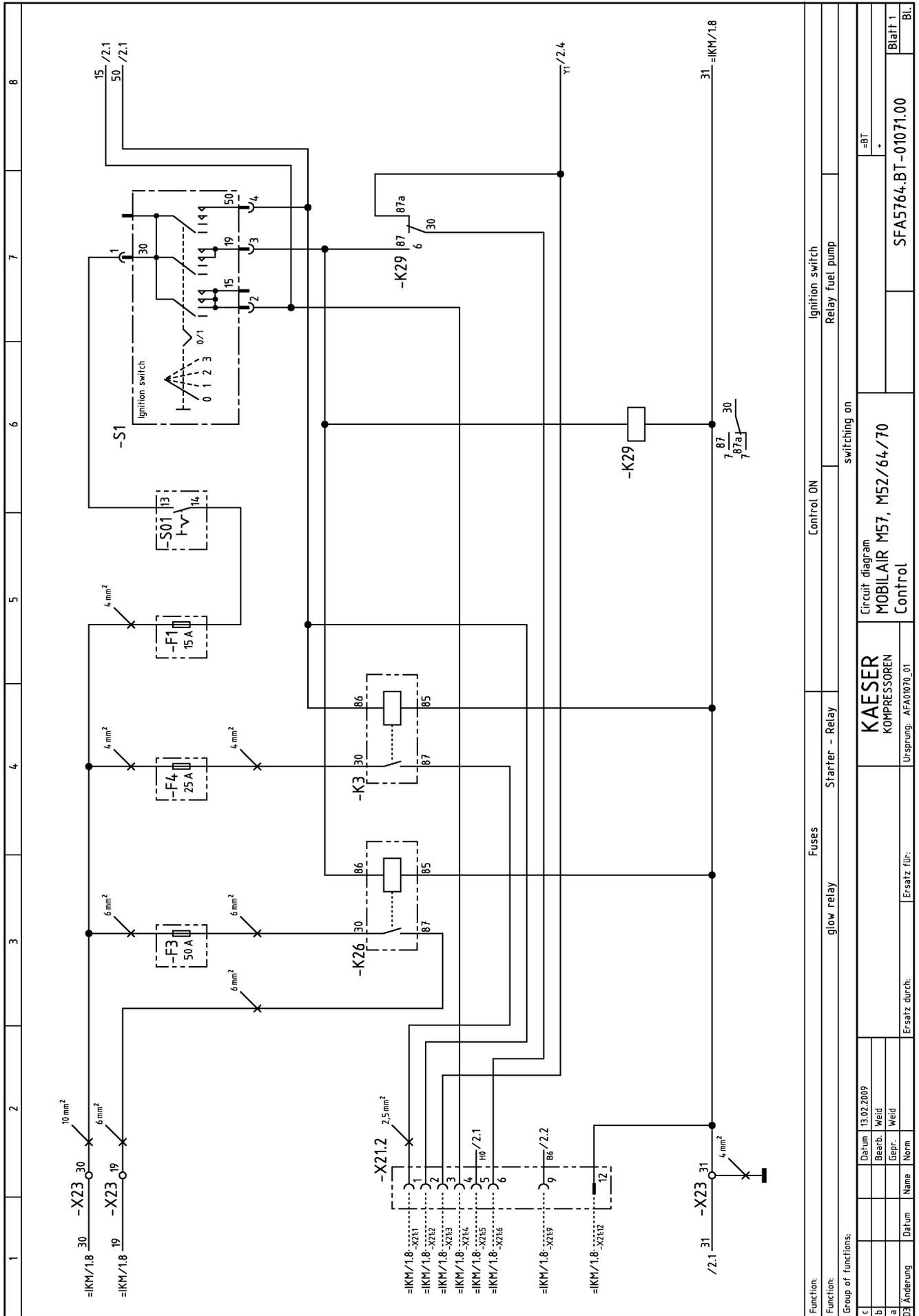
<p>components unit</p> <ul style="list-style-type: none"> -G1 Battery -M1 Starter-Motor -B0 Oil pressure switch Motor -B7 Cooling water-Thermostat -G2 Alternator -M2 fuel pump -R10 heating flange -Y1 Fuel shut-off valve -Y3 Valve Full load operation, Venting 							
<p>components Control panel</p> <ul style="list-style-type: none"> -B6 Distance temperature gauge Compressor aierend -F1 Control fuse -F3 Fuse Glowplug -F4 Fuse Starter -H0 Charging control lamp -H8 Indicator light Back pressure -K3 Starter - Relay -K4 Relay Safety chain -K9 Relay Full load operation -K26 glow relay -K29 Relay fuel pump -P8 Hour meter -S01 switch "Control ON" -S1 Ignition switch <p style="text-align: right;">0 = STOP 1 = ON 2 = Preheat with glowplug 3 = START</p>							
<p>model-dependent components</p> <ul style="list-style-type: none"> -S0 Battery isolating switch (option oa) -Y5 option generator: Valve FAD limitation -Y6 option generator: Valve for the motor speed full load control option: Valve defroster -X42 Plug connection, Generator control box 							
<ul style="list-style-type: none"> -S7/-H7 Illuminated pushbutton -X21,-X24, Preselection Full load operation -X25,-X27 Plug connection, Control panel -X23 Terminal strip, Control panel 							
<p style="text-align: right;">Block diagram general instructions</p>							
<p>KAESER KOMPRESSOREN Ursprung: AFA01070_01</p>							
<p style="text-align: right;">Ersatz durch: Ersatz für:</p>							
<p style="text-align: right;">Datum: 13.02.2009</p>							
<p style="text-align: right;">Bearb. Weid</p>							
<p style="text-align: right;">a Gepr. Weid</p>							
<p style="text-align: right;">c) Änderung Datum Name Norm</p>							
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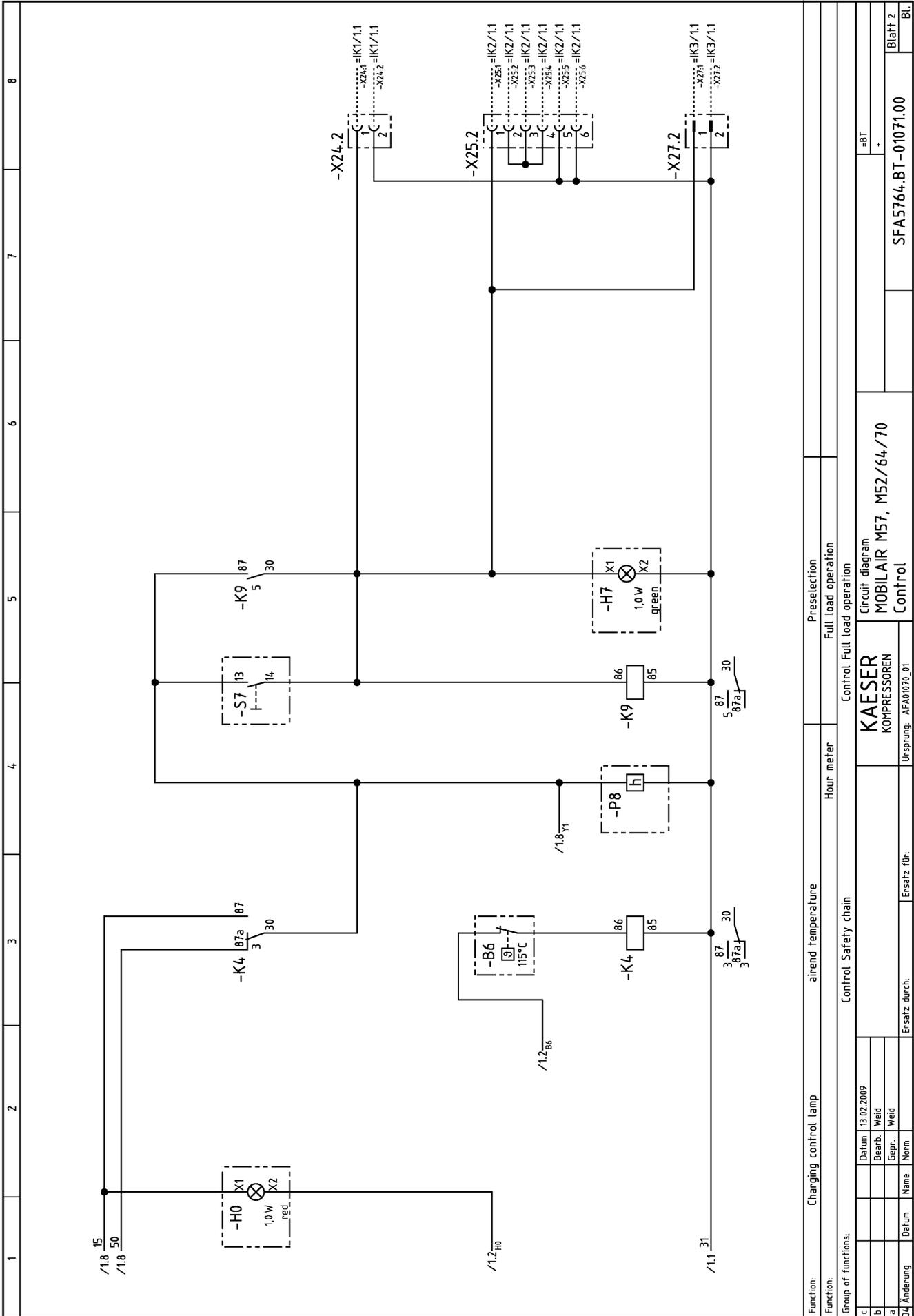
1	2	3	4	5	6	7	8
general instructions							
This document includes a common electrical diagram, consisting of documents:							
module	Electrical diagrams	Cross-reference					
Cable set: connection Battery	SFA5764.BK-01071.00	BK					
Cable set: connection Motor	SFA5764.IKM-01071.00	IKM					
cabling Control panel	SFA5764.BT-01071.00	BT					
cabling unit components 1	SFA5764.IK1-01071.00	IK1					
cabling unit components 2	SFA5764.IK2-01071.00	IK2					
cabling unit components 3	SFA5764.IK3-01071.00	IK3					
		Block diagram general instructions Cross-reference				UFA5764-01071.00 +	
		KAESER KOMPRESSOREN				Ursprung: AFA01070_01	
		Ersatz durch:		Ersatz für:			
		Datum: 13.02.2009		Name:			
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		Gepr. Weid					
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		c)					
		Änderung					
						Blatt 2 BL	



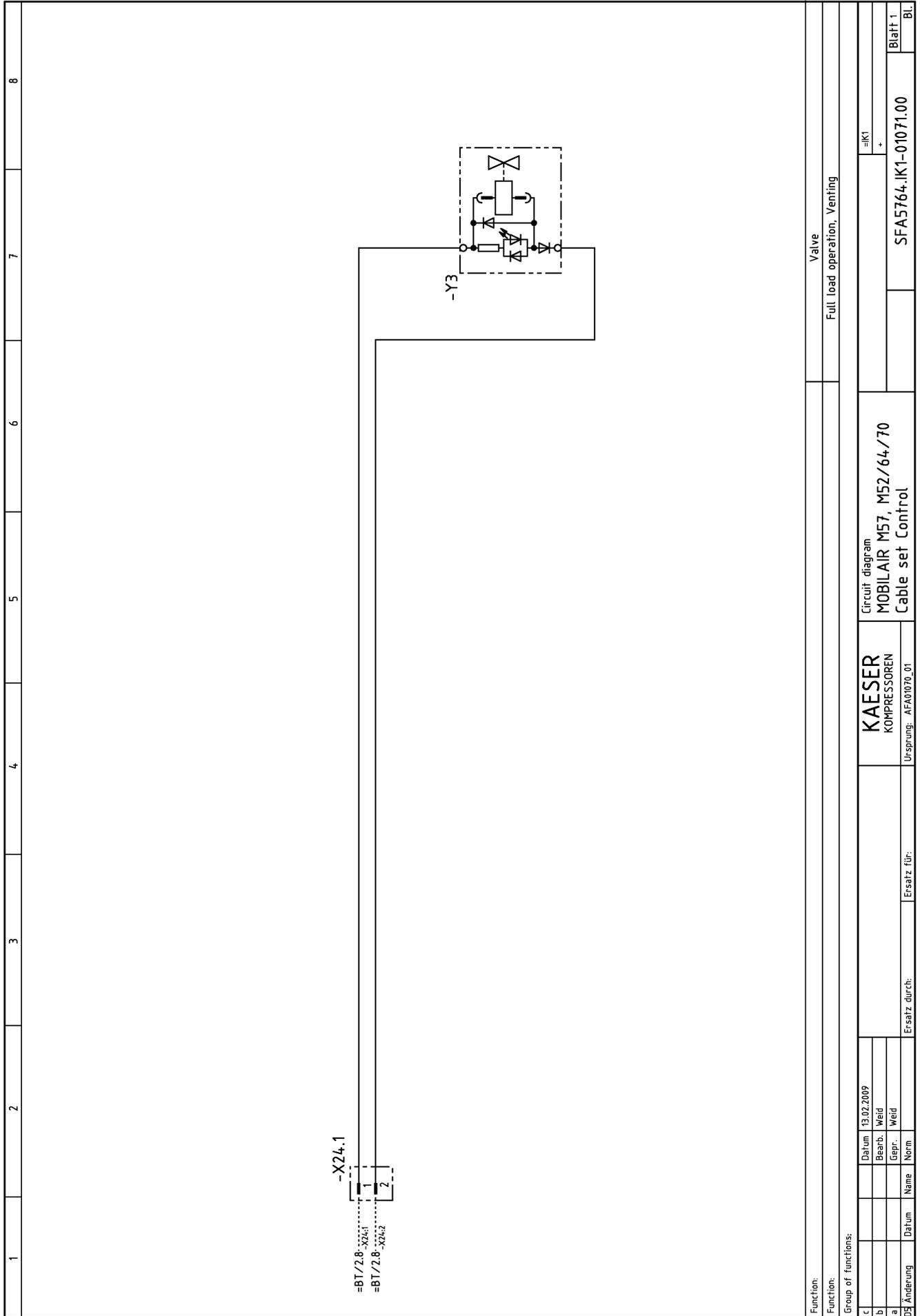
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Group of functions: Starter		Datum		Ursprung: AFA01070_01	
c		Datum	13.02.2009		
b		Bearb.	Weid		
a		Gepr.	Weid		
D1	Änderung	Datum	Norm		
Circuit diagram				SFA5764.BK-01071.00	
MOBILAIR M57, M52/64/70				Blatt 1	
Cable set Battery				BL	

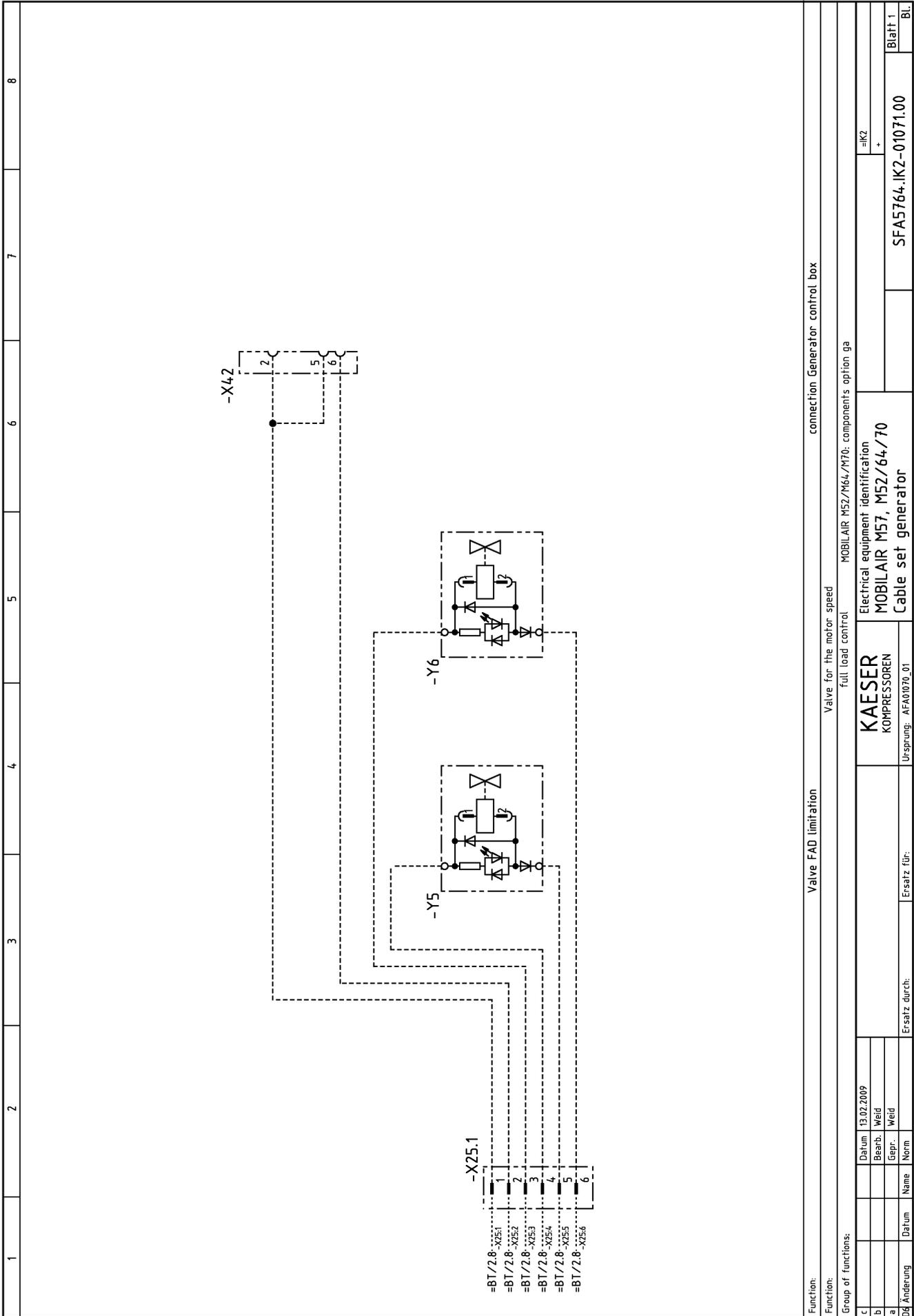




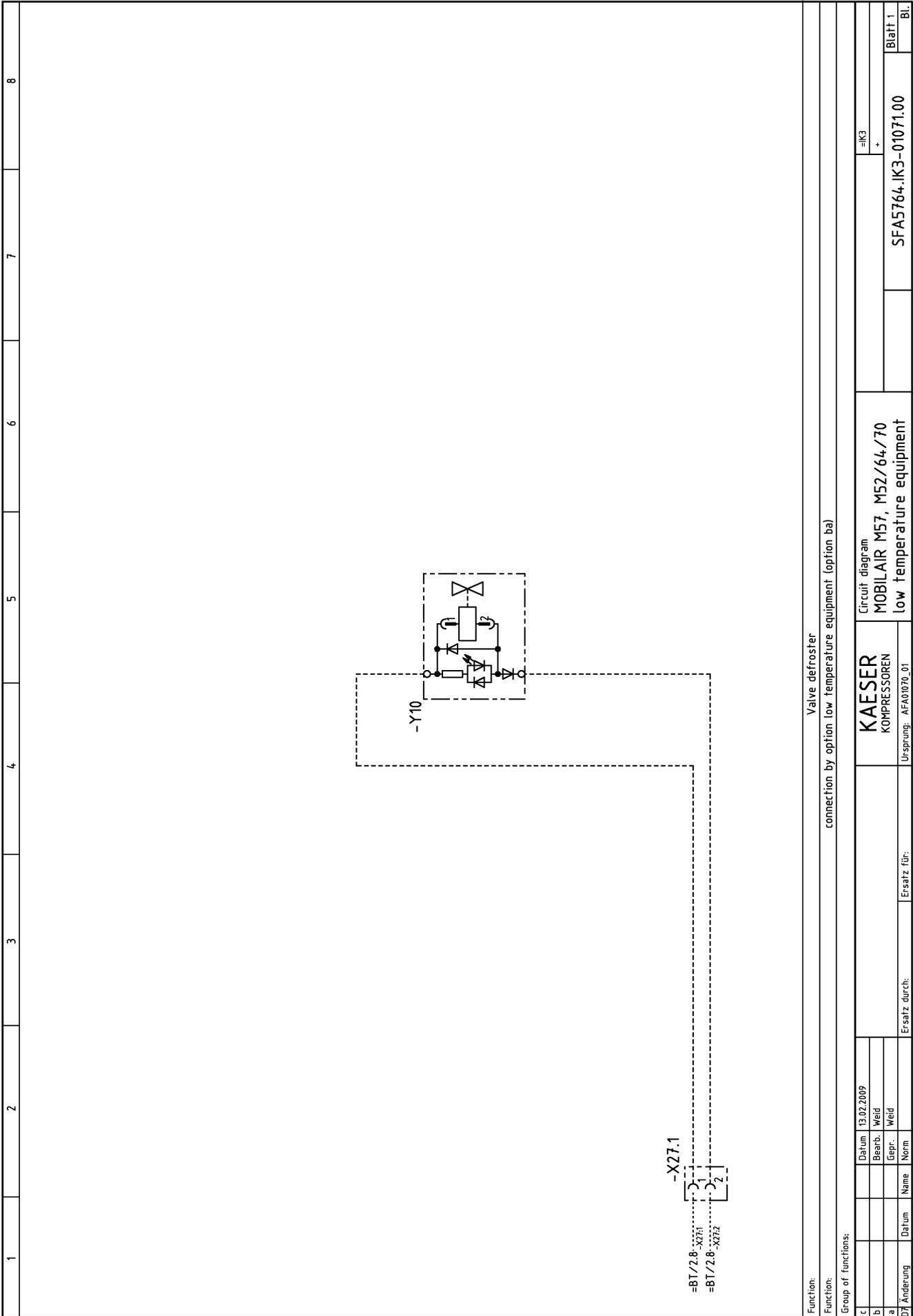


Function: Charging control lamp		air end temperature		Preselection	
Function:		Hour meter		Full load operation	
Group of functions:		Control Full load operation		Control Full load operation	
c	Datum	13.02.2009		-BT	
b	Bearb.	Weid		+	
a	Gepr.	Weid			
Da	Änderung	Datum	Name	Norm	
Ersatz durch:		Ersatz für:		Ursprung: AFA01070_01	
Control Safety chain		KOMPRESSOREN		MOBILAIR M57, M52/64/70	
Control Full load operation		KAESER		SFA5764.BT-01071.00	
Circuit diagram		MOBILAIR M57, M52/64/70		Blatt 2	
Control		Control		Bl.	





Function:		Valve FAD limitation		connection Generator control box	
Function:		Valve for the motor speed full load control		MOBILAIR M52/M64/M70: components option ga	
Group of functions:		KAESER KOMPRESSOREN		Electrical equipment identification	
c		Datum 13.02.2009		MOBILAIR M57, M52/64/70	
b		Bearb. Weid		Cable set generator	
a		Gepr. Weid		SFA5764.IK2-01071.00	
Da		Ersatz durch:		Blatt 1	
		Ersatz durch:		Bl.	

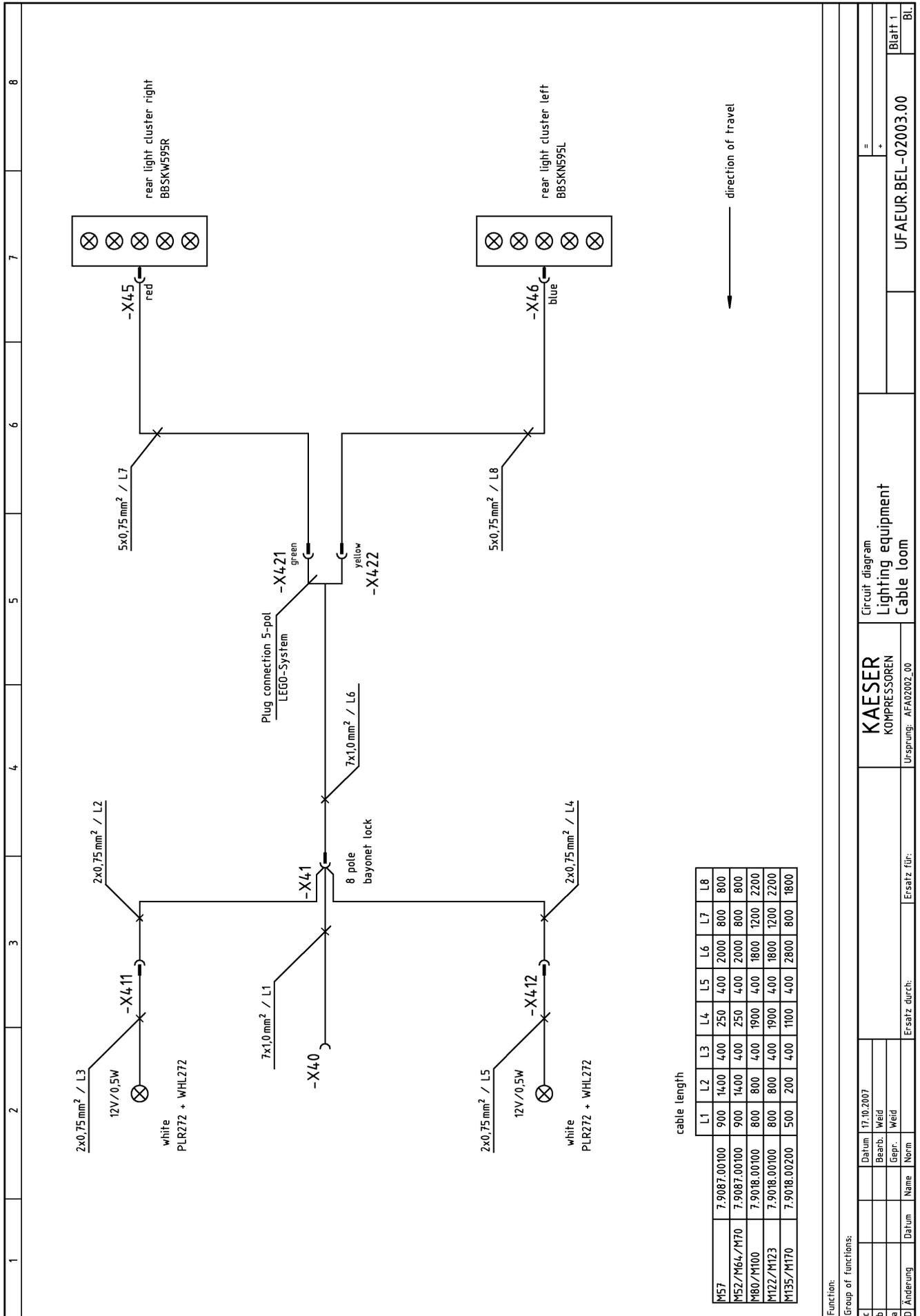


Function: Valve defroster
Function: connection by option low temperature equipment (option ba)

Group of functions:		Date: 13.02.2009	
c		Bearb.	Weid
b		Gepr.	Weid
a		Norm	
D7	Änderung	Datum	Name
		Ersatz durch:	
		Ersatz für:	
KAESER KOMPRESSOREN		Ursprung: AFA01070_01	
Circuit diagram MOBILAIR M57, M52/64/70 low temperature equipment		=IK3 +	
		SFA5764.IK3-01071.00	
		Blatt 1	
		BL	

13.4.2 Option tc
Lighting and signaling system connection

1	2	3	4	5	6	7	8	
<p>Electrical diagrams MOBILAIR Lighting equipment connection 12V / 13-pole</p>								
<p>Manufacturer: Kaeser Kompressoren GmbH Postfach 2143 96410 Coburg</p>								
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c	Datum	17.10.2007	E	Cover page				=
b	Bearb. / Weid			MOBILAIR				+
a	Gepr. / Weid			Lighting equipment				
D	Änderung	Datum	Name	Kaeser Kompressoren				Blatt 1
				Ursprung: AFA0202_00				Bl.
				Ersatz für:				DFAEUR.BEL-02003.00



Function:

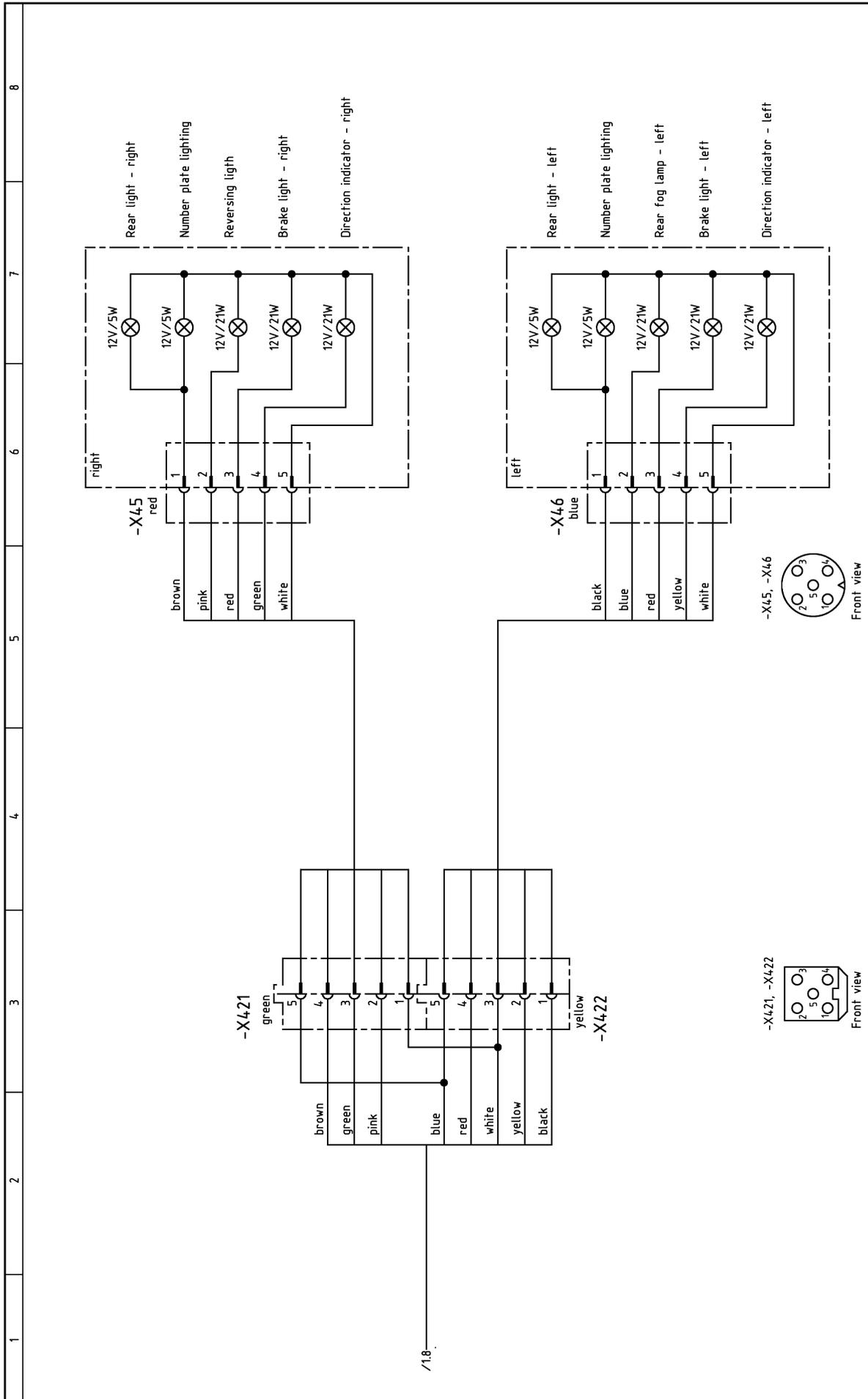
Group of functions:

c	Datum	17.10.2007
b	Bearb.	Weid
a	Gepr.	Weid
D	Änderung	Datum Name Norm

KAESER
KOMPRESSOREN
Ursprung: AFA02002_00

Circuit diagram
Lighting equipment
Cable loom

Ersatz durch: Ersatz für:
UFAEUR.BEL-02003.00
Blatt 1
BL

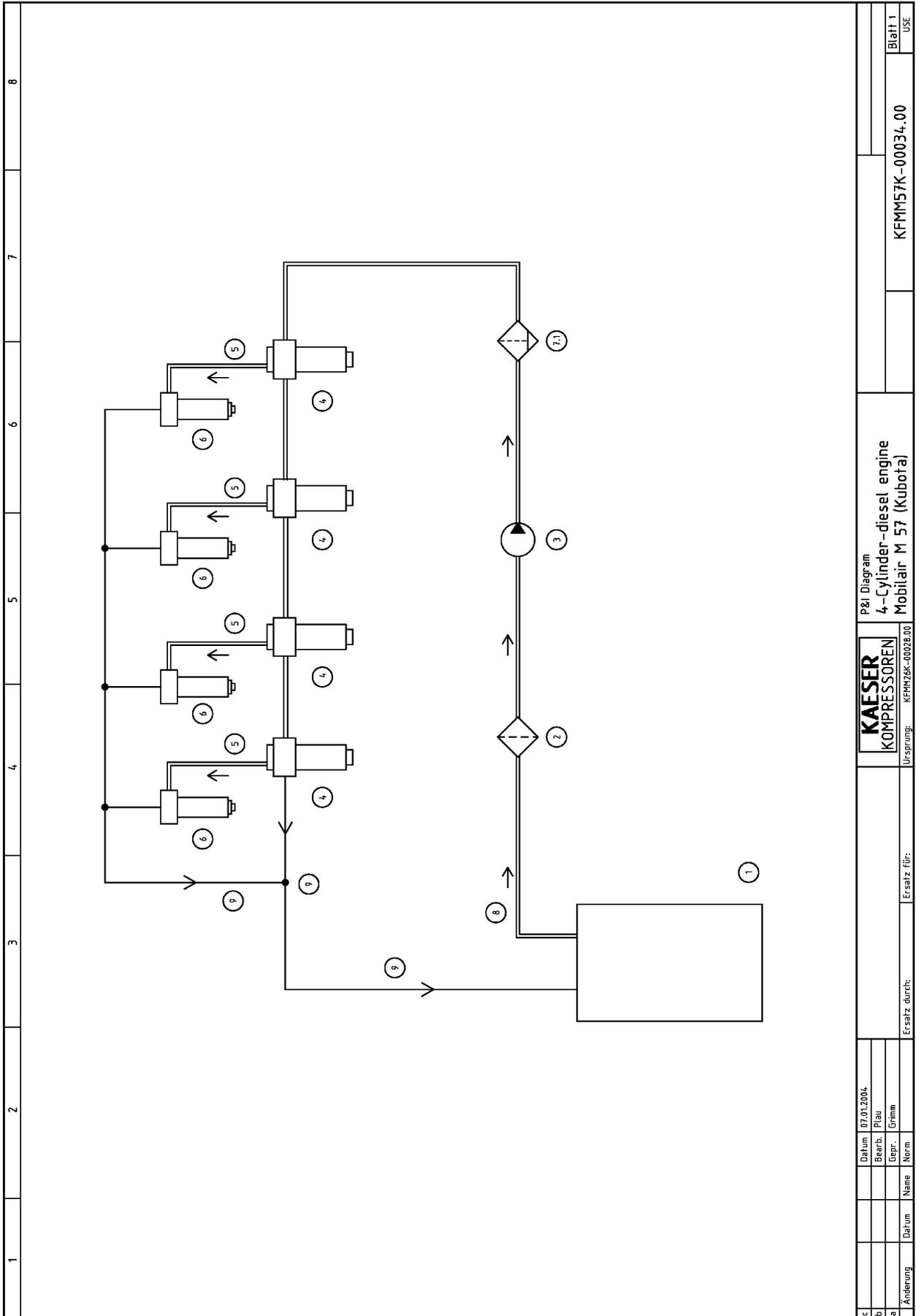


Function:		Group of functions:	
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b	Bearb.	Weid	
a	Gepr.	Weid	
d	Änderung	Datum	Name
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		Kaeser	
		KOMPRESSOREN	
		MOBILAIR	
		Lighting equipment	
		SFAEUR.BEL-02003.00	
		Blatt 2	
		BL	

13.4.3 Option te Lighting and signaling system connection

1	2	3	4	5	6	7	8
<div style="border: 1px solid black; padding: 20px; margin: 0 auto; width: 80%;"> <p style="font-size: 24px; margin: 0;">Wiring Diagram</p> <p style="font-size: 24px; margin: 0;">Mobilair</p> <p style="font-size: 24px; margin: 0;">US trailer light kit</p> </div>							
<p>manufacturer: Kaeser Kompressoren GmbH Postfach 2143 96410 Coburg</p>							
<p>The drawings remain our exclusive property. They are entrusted only for the agreed purpose. Copies or any other reproductions, including storage, treatment and dissemination by use of electronic systems must not be made for any other than the agreed purpose. Neither originals nor reproductions must be forwarded or otherwise made accessible to third parties.</p>							
		Datum		10.08.1999		USE	
c		Bearb.		Reup			
b		Gepr.		Schmidt			
a		Name					
D		Datum		Ersatz durch:		Ersatz für:	
						Kaeser Kompressoren	
						Ursprung:	
						cover page	
						Mobilair	
						US trailer light kit	
						8.6514.0	
						DFAUSA.BEL-00909.00	
						Blatt 1	
						Bl.	

13.5 Fuel circulation diagram



Änderung		Datum	Name	Ersatz durch:	Ersatz für:	Kaeser Kompressoren Ursprung: KFM26-0028.00		P&I Diagram 4-Cylinder-diesel engine Mobilair M 57 (Kubota)		KFMM57K-00034.00		Blatt 1	USE
c		Datum	07.01.2004										
b		Bearb.	Flau										
a		Genr.	Grimm										

