

OPERATING AND MAINTENANCE INSTRUCTIONS

Hydraulic unit Type BZGF4.2-silent



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Original operating and maintenance instructions

Hydraulic unit BZGF4.2-silent

Identification data	Device description	Hydraulic unit
	Type	BZGF 4.2-silent
	Serial number	
	Year of manufacture	2013
	ematec AG Ident. no.	504 9 176
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1 PREFACE

Operating instructions for hydraulic unit

These operating and maintenance instructions were written for the operator and maintenance personnel of the BZGF 4.2-silent hydraulic unit. They are an integral part of the product.

They contain:

- The safety instructions
- The operating instructions
- The inspection and maintenance instructions
- The replacement parts list.

Application

- These operating and maintenance instructions must be carefully read and applied before the first commissioning and later at regular intervals by the operators and maintenance personnel.
- These operating and maintenance instructions are part of the hydraulic unit. They accompany the machine and should always be kept handy for the operator and maintenance personnel.

Representations

Due to modifications or model improvements, the illustrations of the hydraulic unit may deviate from the hydraulic unit actually delivered or replacement and accessory parts.
The illustrations in these operating and maintenance instructions are not to scale.

Technical changes

The technical information, data and notes regarding operation, inspection and maintenance contained in these operating and maintenance instructions is up-to-date as of the time of printing. It is intended solely for informational purposes.
ematec AG reserves the right to make technical changes as part of further development.

Replacement parts

ematec AG will annul any and all obligations incurred by **ematec AG** and/or its dealers, such as guarantee commitments, service contracts etc. without prior notice in the event that replacement parts other than original **ematec AG** parts or parts purchased from **ematec AG** are used for maintenance or repair work.

Explanations/information

These operating instructions contain all necessary information for the operation, control and maintenance of the hydraulic unit. However, should you require any further explanations or information, the **ematec AG** Technical Documentation, Sales and Customer Service departments are available to you (contact information at www.ematec.com).

External documentation

In addition to these operating and maintenance instructions, the external operating instructions and external documentation listed in the appendix apply. In the event of differing information in the individual documents, the information in the **ematec** operating instructions applies.

Description

The BZGF4.2-silent hydraulic unit is hereafter called "hydraulic unit".

1.1 Terminology used

Terminology used	The following terms are used in these operating and maintenance instructions:
Manufacturer	The manufacturer of the hydraulic unit is the entity who plans and graphically specifies a hydraulic unit.
Operating company	The operating company refers to the entity operating and using the hydraulic unit in accordance with the regulations and permitting the unit to be operated by suitable, instructed personnel.
Operator/operating personnel	Operator/operating personnel refers to persons who have been commissioned by the operating company to operate the hydraulic unit.
Specialist staff	Specialist staff refers to persons charged with specific tasks by the operating company of the hydraulic unit, such as assembly/installation and set up, operation, service and maintenance and troubleshooting as well as disassembly.
Qualified electrician	A qualified electrician refers to a person who possesses knowledge and experience on electrical equipment as a result of technical training and, with knowledge of the applicable standards and regulations, is able to assess the work with which he is commissioned and can recognize and avert potential dangers.
Instructed person	Instructed person refers to a person who has been instructed and trained in the tasks commissioned to him and has been informed of the possible dangers associated with improper use of the equipment, as well as the required safety equipment, protective measures, applicable provisions, accident prevention regulations and operating conditions and who have proven their ability.
Expert	An expert is someone who has a thorough understanding of the hydraulic unit based on technical training and experience and is knowledgeable about the relevant national occupational safety regulations, accident prevention regulations, directives and generally accepted engineering principles and is able to assess that the hydraulic unit is safe to operate.

2 BASIC SAFETY INSTRUCTIONS

2.1 General safety information

Reading and comprehension rule

Every person who is charged with the commissioning, operation and with inspection and maintenance work of the hydraulic unit must first have read and understood

- the operating and maintenance instructions,
- the safety regulations,
- the safety instructions in the individual chapters and sections,
- the applicable documentation in connection with the hydraulic unit and the safety and warning signs attached to the hydraulic unit

Crane and diesel engine operating instructions

Observe the safety information and the operating and maintenance instructions of the crane manufacturer! Also that of the manufacturer of the diesel engine.

Faults, defects/irregularities in function



The hydraulic unit is to be immediately taken out of operation if defects or irregularities in function are discovered. In the event of shutdown, e.g.

- when defects are detected with respect to operating safety and operating reliability,
- in emergency situations,
- disruptions of operations and
- inspection and maintenance work,
- when damage is detected or
- after work is completed,

the operator/expert must carry out all prescribed safety measures.

Special local conditions/applications

Due to special local conditions or special applications, situations could exist or arise that were not known during the creation of the operating and maintenance instructions. In such cases, special measures must be initiated by the operating company to ensure safety.

Qualification/expert verification

The operating company of the hydraulic unit may only commission persons to independently handle or maintain the hydraulic unit who:

- have read and understood these operating and maintenance instructions,
- are at least 18 years of age,
- are physically and mentally fit,
- do not suffer from hearing or visual impairments,
- are able to read and write the language used to compile these operating and maintenance instructions,
- have been instructed in the handling or maintenance of the hydraulic unit and who have demonstrated their ability to the operating company (in addition to theoretical training, instruction also includes the opportunity to obtain knowledge pertaining to the recognition of defects which endanger the operational safety),
- can be expected to reliably fulfil any such tasks as commissioned to them.

All maintenance work, which is not explicitly permitted to be executed by the operator, may only be carried out by instructed or trained maintenance personnel.

Commissioning

The operating company must commission the operating and maintenance personnel with their individual tasks.

Disqualification of persons

Persons, who are under the influence of drugs, alcohol or medications affecting responsiveness, may not assemble, put into operation, operate, inspect, maintain, service or dismantle the hydraulic unit.

2.2 Intended and improper use

Intended use

The BZGF4.2-silent hydraulic unit has been built according to German and European standards and regulations according to the state-of-the-art. It is mounted on a platform handcart. It has a bar with drawbar eye, which allows the hydraulic unit to be pulled by hand or with a truck up to a max. of 6 km/h.

External consumers are supplied for a short time using this hydraulic unit, i.e. the unit is suitable e.g. for the crane emergency operation, hydraulic support or the supply of pin pulling cylinders. (Please see the crane operating instructions for the procedure for emergency crane operation, hydraulic support and pin pulling).

A diesel engine enables the self-sufficient operation of the BZGF4.2-silent hydraulic unit.

It is intended exclusively for commercial applications. Operation in potentially explosive atmospheres is prohibited.

Intended use also includes:

- observing all information in the operating and maintenance instructions,
- adherence with the inspection and maintenance intervals and work,
- observing the operating instructions of the crane to which the hydraulic unit is attached,
- observing the operating instructions of external devices such as the diesel engine.

Improper use

Applications other than those detailed above are prohibited. With improper use, dangers to life and limb or permanent damage to the hydraulic unit or other items can arise.

Improper use/erroneous operation includes among other things:

- Exceeding the maximum permitted loads
- Changes to the default values carried out by the manufacturer,
- Connection of consumers which do not meet the hydraulic/pneumatic/electrical characteristics.

2.3 Directives, laws, standards

National regulations

The operating and maintenance instructions should also incorporate information on existing national regulations for accident prevention.

Knowledge of safety regulations and safety guidelines

A basic prerequisite for safe handling and problem-free operation of the hydraulic unit is the knowledge of basic safety guidelines and safety regulations.



Regulations and accident prevention regulations and environmental protection



Wear gloves, hard hat and safety shoes when working with the hydraulic unit!

In addition to the operating instructions, generally applicable and national legal and other binding regulations for accident prevention and environmental protection as well as basic safety and health requirements are to be observed. Such requirements could also pertain to e.g. handling hazardous substances or providing/wearing personal protective equipment. These regulations as well as the generally applicable accident prevention regulations at the work site are to be observed for all work on the hydraulic unit! Nevertheless, dangers to life and limb can originate from the hydraulic unit if it is improperly operated, inspected, maintained or serviced by untrained or uninstructed personnel.

Crane regulations

Observe the applicable regulations for the crane!

Other regulations

Consult the diesel engine operating instructions if necessary

2.4 Symbols used

Icons

These are the icons used in these operating instructions, which warn of danger of fatal injury, danger of injury or property damage. All measures that are identified with these icons are to be followed!

Supplementary safety instructions

This sign points out safety-relevant information and the handling of information and gives generic information.



Danger warnings



DANGER

This icon denotes an immediate, imminent danger to the life and health of personnel.

Non-observance of this information will result in severe adverse health effects or death.



WARNING

This icon denotes an immediate, dangerous situation to the life and health of personnel.

Non-observance of this information can result in severe adverse health effects or death.



CAUTION

This icon denotes a possibly dangerous situation.

Non-observance of this information can result in minor injuries.

Warning of property damage



NOTE

This icon points out potential property damage.

Non-observance of this information can result in damage to the machine, the surrounding area or the environment.

Application tip**INFORMATION**

Application tips and especially useful information is provided under this icon.

They will help you to optimally utilize all functions on your machine.

**Warning of danger of burns****Command sign****Wear eye protection****Wear hearing protection****Wear gloves****Wear safety shoes****Wear helmet**

2.5 Technical condition of the system

Modifications, manipulations Changes, additions or modifications to the hydraulic unit which could impair the safety may not be carried out. If changes, additions or modifications are desired, **ematec AG** is to be consulted and permission is to be obtained.

Access to the system

- The area around the hydraulic unit must always be free of obstacles.
- Access to escape routes, emergency off switches and safety devices must always be free.
- The work area can change over the course of the work day. Look out for potential obstacles, bottlenecks and hazard areas.

Regular maintenance

Maintenance and inspections must be maintained. Only use proper tools for the hydraulic unit.

Connection values

The connection and setting values stated in chapter 3.1 must be observed.

Hydraulic hoses

ematec AG recommends replacing hydraulic hoses after 5 years at the latest. The storage time of hydraulic hoses should not exceed 2 years.

Replacement parts



Always use only original replacement parts and original accessories from **ematec AG**!

Sea transport

The hydraulic unit requires seaworthy packing for sea transport.

2.6 Obligations of the operating company

Handling dangers



The hydraulic unit has been built according to the state-of-the-art and recognized safety technical regulations. Nevertheless, dangers to life and limbs of the user or third persons, damage to the hydraulic unit or other items can arise during its use.

The hydraulic unit may only be used:

- for the intended use,
- when in perfectly safe working order.

Warranty and liability



Warranty claims and liability for personal and property damages are excluded if they can be traced to one or several of the following causes:

- improper use of the hydraulic unit,
- improper operation and maintenance of the hydraulic unit,
- operation of the hydraulic unit with defective safety equipment or improperly installed, overridden or non-functional safety and protective devices,
- non-observance of information in the operating and maintenance instructions regarding safety, operation and maintenance,
- unauthorized structural changes to the hydraulic unit or additions and modifications,
- insufficient monitoring of parts which are subject to wear,
- improper repairs,
- use of other than **ematec AG** replacement parts.

Duty of care



The operating company must make sure that

- the hydraulic unit is always operated only in flawless technical condition,
- all safety requirements and regulations are taken into account and
- the operating, inspection and maintenance conditions specified in the operating instructions are adhered to.

Before starting up the hydraulic unit, the operator must check that no persons reside in the work area or danger area of the hydraulic unit.

2.7 General working safety

Safety of the work area



- The area around the hydraulic unit must always be free of obstacles.
- No persons may reside in the danger area and work area of the hydraulic unit.
- Access to escape routes, emergency off switches and safety devices must always be free.
- The work area must be illuminated according to regulations.
- Only use proper tools for the hydraulic unit.
- The work area can change over the course of the work day. Look out for potential obstacles, bottlenecks and hazard areas!
- Familiarize yourself with the working environment. In particular, note where the
 - fire extinguisher
 - emergency off switch
 - emergency telephone are located.

Safety of the personnel



- Always wear safe work clothes, e.g. protective gloves, hard hat and safety shoes!
- Long hair that is not tied back and the wearing of rings, watches, scarves, etc. is prohibited. A risk of injury exists due to getting caught or pulled in.
- The employees must be informed where they can get first aid in the event of an accident or injury.

3 LAYOUT AND TECHNICAL DATA

3.1 Overview



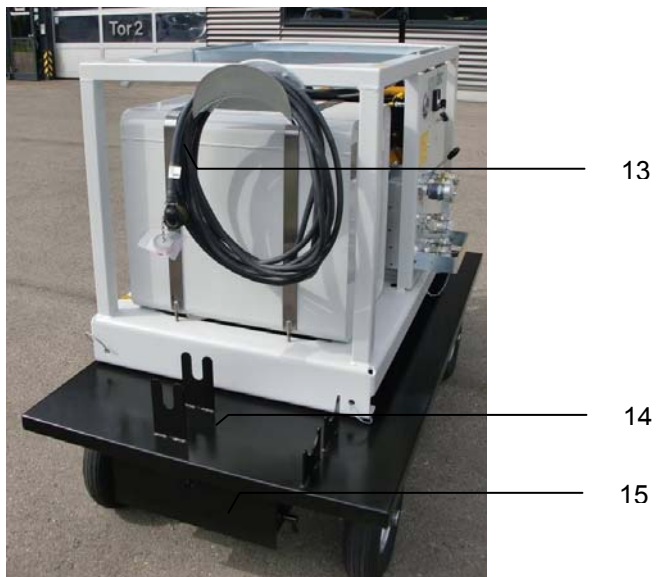
Legend

1. Tray for hydraulic hoses
2. Diesel fuel tank
3. Eyehooks, 4 pieces
4. Diesel engine ignition switch
5. Diesel engine
6. Control block
7. Locking pin
8. Hand cart



Legend

- 9. Hydraulic oil tank
- 10. Hydraulic pump
- 11. Starter battery
- 12. Bar with drawbar eye



- 13. Cable with Cannon plug, 54-pin
- 14. Tray for pin-pulling cylinder
- 15. Drawer with locking mechanism (covered)

3.2 Technical data

Hydraulic unit dimensions including hand cart	(Bar with drawbar eye folded up)		
	Length	mm	approx. 2253
	Width	mm	approx. 1056
	Height	mm	approx. 1594
	Weight without filling	kg	approx. 645
	Weight filled (hydr. oil, engine oil, diesel fuel)	kg	approx. 795
	Drawbar eye diameter	mm	32
Hydraulic unit	Length	mm	approx. 1595
	Width	mm	approx. 1036
	Height	mm	approx. 950
	Weight without hydraulic oil filling	kg	470
	Hydraulic oil tank fill quantity	l	160
	Hydraulic oil tank usable capacity	l	135
Hydraulic connections/pin pulling device/crawler support	Pressure connection	Size 3	16S
		Size 2	12L
	Return connection	Size 6	18L
		Size 2	12L
	Leakage oil connection	Size 3	15L
Hydraulic connections Crane function emergency operation	Pressure connection	Size 3	16S
	Return connection	Size 6	22L
	Leakage oil connection	Size 2	12L
Hydraulic parameters	Pressure cut-off	bar	230
	Pressure at DBV	bar	250
	Low pressure	bar	10 to 50
Hydraulic oil	Type	HLP according to DIN51524	
Electrical system	Installed load on the voltage doubler	30 A	
	Supply voltage	12 V	
	Operating voltage for cable	24 V	

Engine	Air-cooled 4-stroke diesel engine, USA design 1D81C VAR.X1		
	Preset rpm	min ⁻¹	2700
	Performance	kW	9
	Operating mode	S2 15min	
Diesel fuel tank	Fill quantity	l	10
Engine oil	Fill quantity	l	1.7
Voltage transformer	12V/24V; 10A; IP67		
Emission sound pressure level at the work station	L _{pA} measured:	dB(A)	87
Pump power	Type LA 10V0 28 DFLR	55 l/min at 2700 RPM	
Hand cart	Type	biaxial	
Dimensions	Length of loading area	mm	approx. 1892
	Width of loading area	mm	approx. 1056
	Height	mm	approx. 504
Wheels	Wheel diameter	mm	400
	Wheel width	mm	110
Tire pressure		bar	max. 6.2/90psi
Weight of hand cart	Weight	kg	approx. 175
	Load	kg	1000
Driving speed	max. permitted driving speed	km/h	6
Operating conditions	Operation	Outdoors Only permitted in a hall with sufficient ventilation	
Sea transport	Seaworthy packing	Climate foil	

4 TRANSPORTING THE HYDRAULIC UNIT

4.1 Safety information



DANGER

Suspended or falling loads can lead to serious injuries or death!

Never stand next to or under suspended loads!



- Attaching the hydraulic unit to the crane is only permitted by trained, authorized specialist staff.
- Make sure that no unauthorized persons operate the crane cylinder or the crane while working on the crane hook and the hydraulic unit!
- Make sure that no personnel is in the danger area!
- The hydraulic unit may only be hooked onto a suitable crane with sufficient load-bearing capacity and suitable loading equipment.
- Never work under and on the hydraulic unit as long as it is not safely put down!
- Moving the hydraulic unit over persons, with or without a load, is prohibited!
- Wear gloves, hearing protection, hard hat and safety shoes when working with and on the hydraulic system!

4.2 Transporting the hydraulic unit on a truck

Loading onto truck

Make sure that the hydraulic unit is turned off.

To load the hydraulic unit onto a truck, transport the hydraulic unit on a forklift or hook it onto a crane.

For transport using a crane, see description in chap. 8.1 and 8.2. For transport using a forklift, see description in chap. 8.1 and 8.3.

The hydraulic unit is connected with the hand cart platform using locking pins.

Make sure that the locking pins are engaged and secured using linch pins.

Rigging

Rig the hydraulic unit using tension belts and secure it with wedges for the transport of the hydraulic unit on a truck.

5 COMMISSIONING

5.1 Safety information for commissioning



The hydraulic unit may only be put into operation by trained, authorized specialist staff!



Danger of tipping

Park the hydraulic unit only on level and solid ground!

- If it is parked on an incline,
- it can tip and lead to bodily injuries or property damage
- the display on the oil inspection glass can become incorrect,
- the intake manifold can draw in air so that the pump runs dry,
- oil can escape at the ventilation filter



RISK OF BURNS!

Do not touch engine, pump, exhaust, oil and oil tank with bare hands! They can become very hot during operation.

Wear protective gloves!



Wear gloves, hearing protection and safety shoes when working with or on the hydraulic unit!



CAUTION

Do not mix hydraulic oils from different manufacturers or of different types with one another!

Plant-based hydraulic oils may not be used due to their unfavourable temperature resistance.



The drive speed with which the handcart and the assembled hydraulic unit can be moved may not exceed 6 km/h.

5.2 Applying the brakes

Applying the brakes



Swivel the bar (1) on the hand cart upwards to apply the brakes.

The installed pneumatic spring (2) keeps the bar up and the brake applied.



CAUTION

An uncontrolled upward movement of the bar can lead to injuries.

Swivel the bar upwards in a controlled manner by hand.

Releasing the brakes

When the bar is pushed down, the brake is automatically released and the hand cart can be moved.

5.3 Removing the hydraulic unit from the handcart and setting it down



INFORMATION

To operate the unit at locations which are not accessible with the hand cart, the unit can be removed from the hand cart with a crane or forklift.

Removing the hydraulic unit

- Make sure that
 - the unit is switched off,
 - all hoses are disconnected,
 - the handcart is standing on a solid foundation,
 - the handcart is braked.
- Pull out the lynch pins from all of the locking pins (2): See figure on the next page.
- Lift the unit with a 4-way suspension and a crane from the cart; use only the eyehooks (1) intended for this purpose - see figure on the next page.

Alternatively, you can also lift the unit from the cart using a suitable forklift.



WARNING

Place the hydraulic unit only on horizontal, level and solid ground.

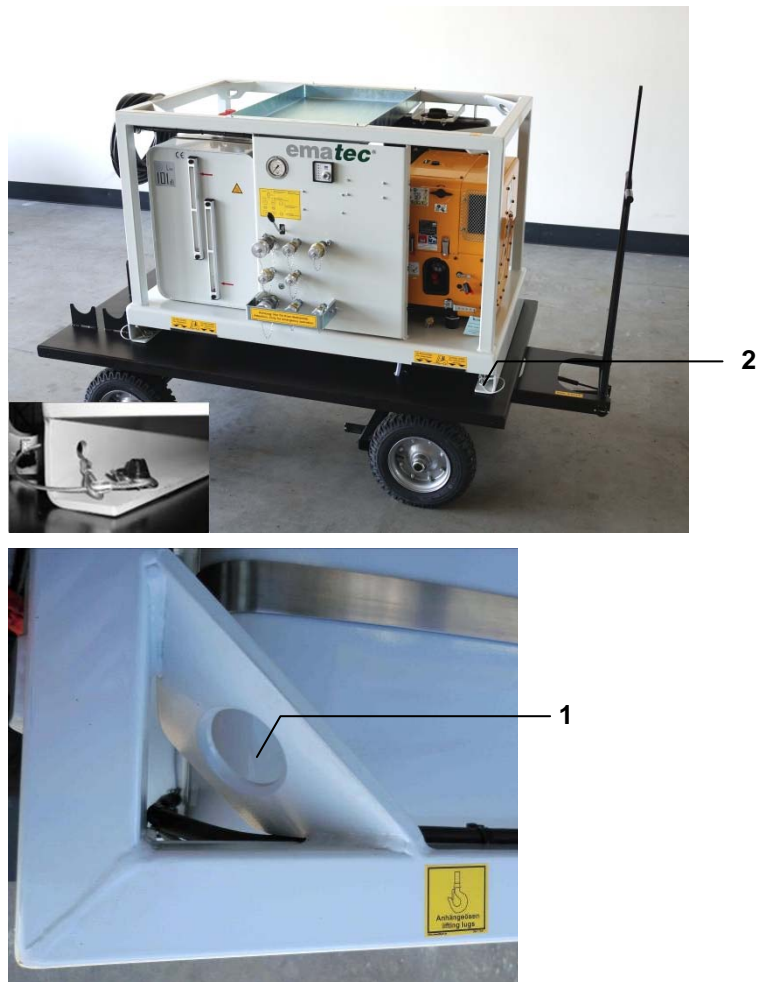
If the hydraulic unit is set down on an incline,

- it can tip and lead to bodily injuries or property damage,
- the display on the oil inspection glass can become incorrect,
- the intake manifold can draw in air so that the pump runs dry,
- oil can escape at the ventilation filter.



Operating the unit when it is hanging on the crane or on the forklift is not permitted, since the hydraulic unit can tip and/or the eyehooks can become damaged!

Follow the instructions for removing the hydraulic unit using a forklift in chapter 8.3.



Setting down the hydraulic unit

Place the hand cart securely on solid ground with the brake applied.
Carefully move the unit with the crane or forklift into the locking pins (2).
Lock the unit with all the linch pins.

5.4 Checks before start up

Exclusion of dangers to persons

Before starting up, make sure that no one can be endangered by the operation. If the operator notices the presence of persons who could be endangered through the operation, the operator must immediately discontinue the start up and may only pick it back up when the persons are outside of the danger area.

Checking for damage

Before each start up, the hydraulic unit is to be visually checked for damage and function. If damage is discovered or the function of the hydraulic unit or the safety equipment is impaired, operation is prohibited until the damage or defect has been remedied.

Service items

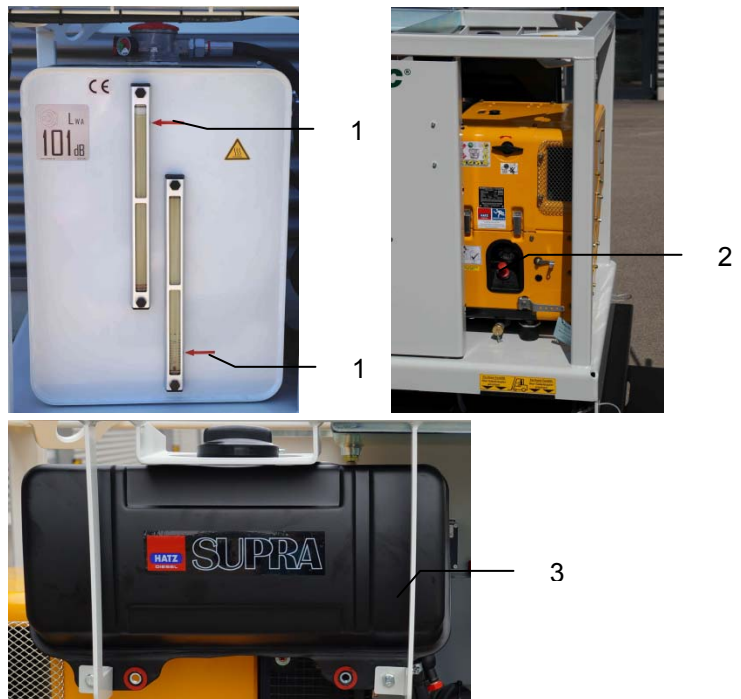
The hydraulic unit is normally delivered without fuel, engine oil and hydraulic oil.

For filling the fuel and for fuel specification, see external documentation for the engine.

For filling the engine oil and for engine oil specification, see external documentation for the engine.

For filling the hydraulic oil and hydraulic oil specification, see chapter 9.5.

When adding fuel and oil, and when checking the fuel and oil level, the hydraulic unit must be in horizontal position.



Inspection

Hydraulic unit:

The hydraulic oil tank must be filled up to the middle between the two marking arrows.

Engine oil level:

Engine oil up to the maximum marking on the dipstick (2).

Fuel level:

Fuel tank (3) must be at least half full.



Contamination:

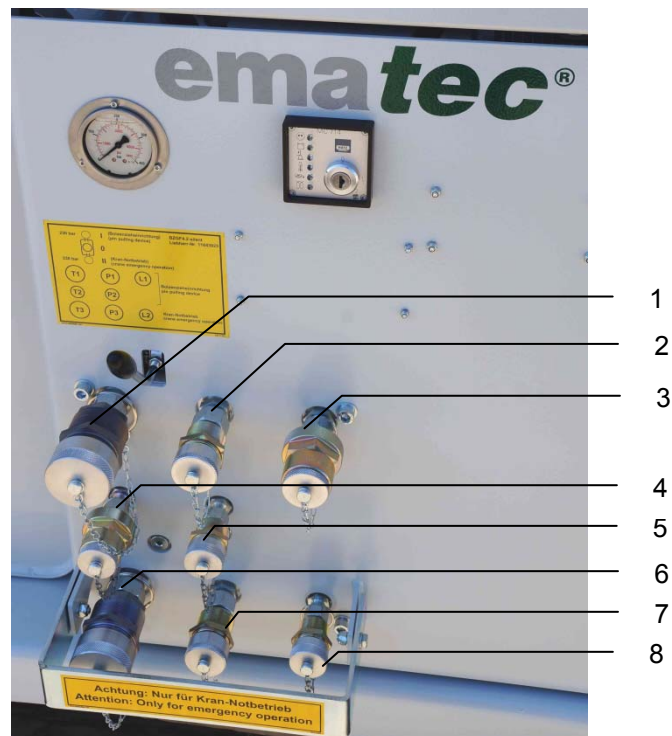
Replace the hydraulic oil and the filter at a degree of contamination of 2 bar / pointer in the red area (4). See chapter 9.5.

5.5 Coupling the hydraulic connections

INFORMATION

Tighten the hydraulic screw couplings all the way by hand and then release them again by $\frac{1}{4}$ turn.

Furnish non-coupled hydraulic couplings with protective caps or dummy couplings.



Pin pulling device connection points

1 Return line	T1	Size 6
2 Pressure line	P1	Size 3
3 Leakage oil line	L1	Size 3
4 Return line	T2	Size 2
5 Pressure line	P2	Size 2

Emergency crane operation connection points

6 Return line	T3	Size 6
7 Pressure line	P3	Size 3
8 Leakage oil line	L2	Size 2

Hydraulic connection

Establish the hydraulic connection between the hydraulic unit and the external consumer as follows:

- Connect return lines.
- Connect pressure lines.

6 STARTING AND OPERATING

6.1 General safety information for starting



DANGER

Never allow the engine to run in a closed or poorly ventilated area – danger of poisoning!
Before starting, make sure that no one is in the danger zone of the engine or the hydraulic unit.
Do not use any starting aid sprays!
The change over lever on the control block must be in position 0 before starting the engine.



WARNING

The exhaust gets hot during operation!
Do not touch!
Keep combustible, explosive or flammable materials away from the exhaust!



INFORMATION

The operation of the engine is described only briefly here.

More detailed information (e.g. starting the engine when cold) and additional clarification may be found in the operating instructions for the engine.



CAUTION

Do not remove the start key during operation!
Danger of equipment damage!



Perform cleaning, maintenance and servicing work only when the engine is turned off!
Refuel only when the engine is turned off!
Never refuel near open flames or sparks which could ignite, do not smoke!
Do not spill fuel!

Wear only close fitting work clothes when working on the running engine. Do not wear necklaces, bracelets and other things which can get caught on moving parts.

6.2 Electrical start

Turning on the power supply

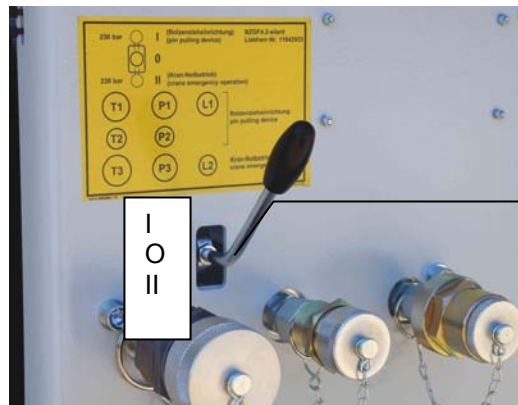
Turn on the power supply for the hydraulic unit (engine and voltage transformer) with the battery disconnecting switch. To do so, put the key into the switch and turn the key 90° clockwise.



Switch position
ON

Control block in zero position

Put change over lever (1) on the control block to position "zero".



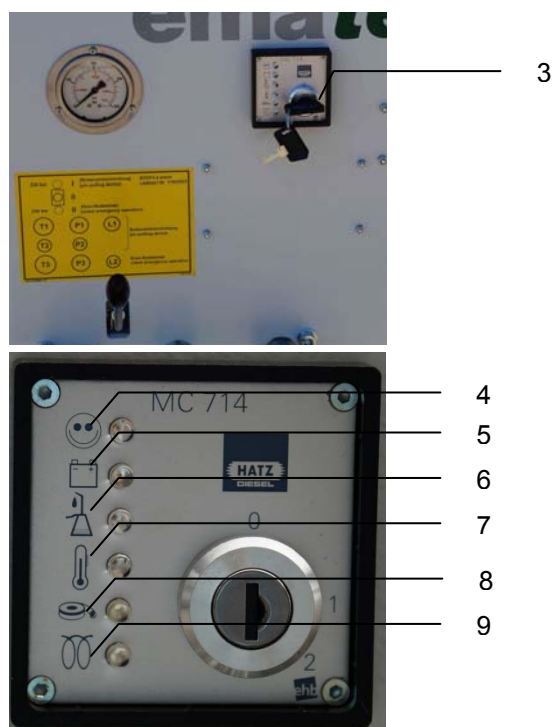
1

Set throttle control lever (2) on the engine to maximum setting.



2

Turning the ignition on



1. Put the start key (3) in the ignition switch and turn to position "1". The oil pressure display (6) and the temperature light (7) illuminate. The other 4 diodes blink.
2. When the pre-heating is finished, the blinking diodes go out and the upper 3 diodes (4, 5, 6) illuminate continuously.
3. Turn the start key (3) to position "2" and hold it in this position until the unit is running reliably.
4. Release the start key (3) as soon as the engine is running. The start key must automatically return to position "1" when released and stay in this position during operation. The charge indicator light (5) and the oil pressure display (6) must go out immediately after the engine starts. The green display light (4) illuminates permanently, indicating that the engine is in operation.
5. Shift the throttle control lever on the engine to the maximum setting in order to operate the hydraulic unit. This is necessary for a safe force transmission to the centrifugal clutch on the engine. No hydraulic function is possible in idle position.
6. The air filter maintenance light (8) only lights up during operation if the air filter needs to be cleaned or replaced.



Should any irregularities arise, switch off the engine immediately and locate and rectify the problem (see external engine documentation for faults, causes and remedies).



The engine temperature light (7) illuminates as soon as the cylinder head temperature is unacceptably high. Turn the engine off and rectify the fault (see external engine documentation for faults, causes and remedies).

**CAUTION**

Before each new start up, turn the start key (3) back to position "0". The restart interlock in the ignition switch prevents the starter from engaging while the engine is running and thereby being damaged.

**CAUTION**

Never restart the motor while it is still running or running down – danger of breaking gear teeth on the starter!

**INFORMATION**

When equipped with the starter protection module, the start key (3) must be returned to the "0" position for at least 8 seconds after a failed start or after the engine is switched off, in order to enable a new start.

6.3 Starting with a hand crank

A second person is necessary to start using a hand crank.

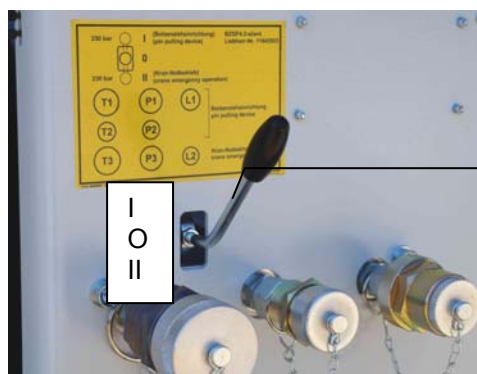
Turning on the power supply

Turn on the power supply for the hydraulic unit (engine and voltage transformer) with the battery disconnecting switch. To do so, put the key into the switch and turn the key 90° clockwise.



Switch position
ON

1. Put change over lever (1) on the control block to position "zero".



1

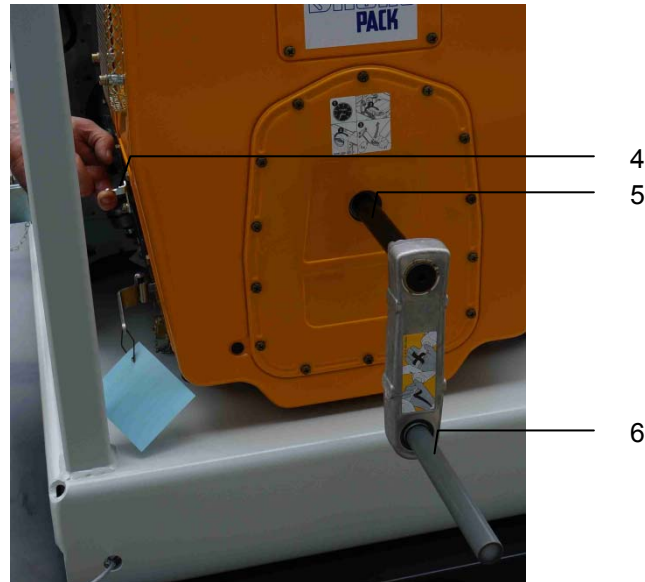
2. Set throttle control lever (3) on the engine to maximum setting.



2

3

3. Make sure that the stop lever (4) on the engine is held in the START operating position (second person), since the lever automatically returns to the zero position without electrical power supply and the engine then turns off.



4. Turn the decompression lever (2) on the engine to the stop (vertical). In this position, the automatic decompression latches audibly and the engine is ready to start.
5. In order to be able to plug the crank onto the engine, the steering guide with bar must be swivelled away.
6. Take the starting crank (6) out of the drawer and place it into the guide sleeve (5) on the engine.

INFORMATION

After latching the automatic decompression on the stop, five manual cranking turns are necessary until the engine can again compress and ignite.

Check the hand crank for good condition. Replace broken grip rod, worn starting pins, etc.!

Lightly grease the slide area between the starting crank and the guide sleeve.



WARNING

The frictional connection between the engine and starting crank must be ensured by anti-torsion holding of the grip rod and expeditious turning, and may under no circumstances be interrupted during the starting procedure.

7. Position yourself to the side of the engine and clasp the starting crank grip rod with both hands.
Turn slowly at first until the latch locks in place.
Then turn it forcefully with increasing speed.
When the decompression lever locks into place in position "0" (compression), the highest possible speed must be achieved.
8. As soon as the engine starts, pull the starting crank out of the guide sleeve and store it back in the drawer.



INFORMATION

If a kickback is encountered during the starting procedure due to too feeble turning, the connection from crankshaft to starting handle is released via the grip rod due to the short reverse twisting.

If, after a kickback, the engine starts in the wrong turning direction (smoke comes out of the air filter), let go of the starting crank immediately and switch off the engine.

Only repeat the starting procedure when the engine has come to a stop.

6.4 Selecting the operating mode



DANGER

Make sure that no dangerous situations can arise in the event of a fault on the hydraulic unit (e.g. sudden pressure drop).

- Secure the work area against authorized access!
- Inform colleagues at the site!
- Have a specialist staff look for and remedy the error!



CAUTION

Continuous operation in high pressure operating mode (230 bar) leads to overheating of the hydraulic oil and to damage to the hydraulic pump.

The maximum oil temperature may not exceed 65°C.

Pay attention to the temperature display on the hydraulic unit during operation!

If 65°C is exceeded, take the device out of service and wait until the oil is cooled off.



CAUTION

When operating the hydraulic unit, it is only permissible to operate the engine at its maximum rpm. To do so, the throttle control lever on the engine must be brought to the max. START position.

This is necessary for a safe force transmission to the centrifugal clutch on the engine.

Failure to do so can cause the centrifugal clutch to be damaged (excessive wear and overheating).



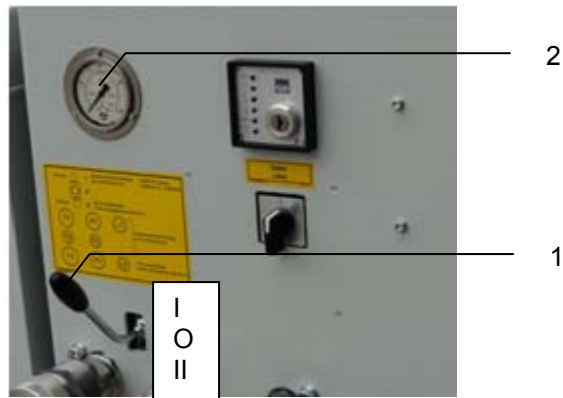
CAUTION

During operation, the hydraulic oil level must remain between both arrows on the inspection glass.

If the fill level is too low, refill hydraulic oil with the same type.

If the oil tank is too full:

- Wait until the hydraulic oil is cooled off.
- Unscrew cover on the filler neck of the hydraulic oil tank.
- Use a hand pump or an electric pump to suction off the excess hydraulic oil.
- Then screw the cover back on the hydraulic tank.

Selecting the operating mode

Using the change over lever (1) on the control block, set the hydraulic system to the desired operating mode:

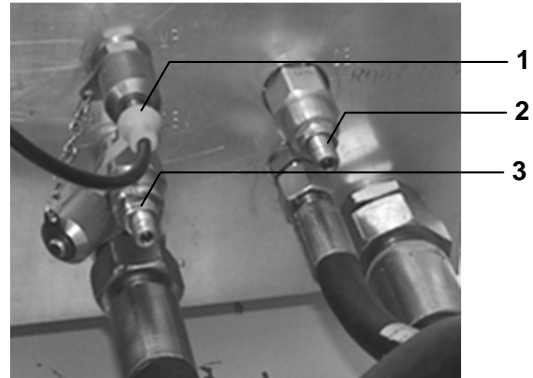
- Unpressurised circulation: Position "0" (spring centred)
- High pressure 230 bar: Position "I Pin pulling device" (without engagement, spring return position)
- High pressure 230 bar: Position "II Crane emergency operation" (engaged with lock)

**INFORMATION**

The pressure manometer (2) displays the hydraulic pressure in the hydraulic system.

**CAUTION**

The pressure limiting valves for low pressure and high pressure are set at the factory. Adjusting the pressure limiting valves can lead to overloading the system or the connected consumer or to malfunctions. Adjustments to the settings are only permitted after consulting with **ematec AG**.

**Pressure limiting valves
and measurement
connections**

- 1 Pressure manometer measurement connection
- 2 Pressure limiting valve, low pressure 30 bar
- 3 Pressure limiting valve, high pressure 230 bar

**WARNING**

After an interruption of the power supply, bring the control lever and switch on the front panel into zero position!

If pin pulling cylinders are connected to the hydraulic unit, bring the valve on the pin pulling cylinder into the middle position before restarting (A and B connected to the tank).

6.5 Connecting electric power suppliers



INFORMATION

Via an integrated voltage transformer, electrical consumers that are designed for a rated voltage of 24 V can be operated via a voltage source of 12 V.

The maximum installed load on the 54-pin Cannon plug is 120 W.

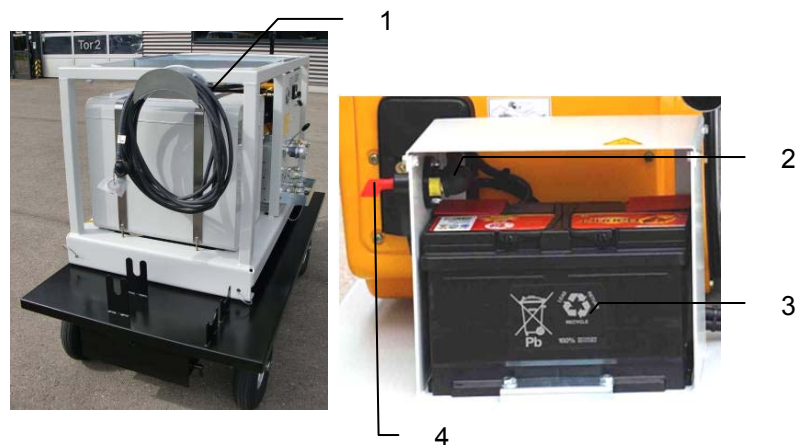


CAUTION

When current consumption is too high or upon overheating, the voltage transformer reduces the output voltage. The integrated melting fuse will trip in the event of an output short-circuit.

During a battery power sag, the voltage transformer switches off.

The maximum permissible input voltage is 16 V. Only operate the voltage transformer with a battery connected.



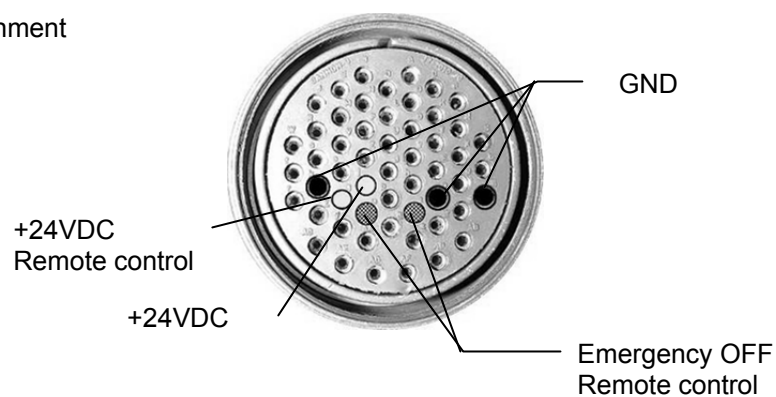
1 Connection cable with Cannon plug, 54-pin

2 Fuse 10 A

3 Battery 12 V, 70 Ah

4 Battery disconnecting switch

Plug assignment



7 SHUT DOWN

7.1 Safety information for shutting down



Shutting down may only be performed by authorized specialist staff!

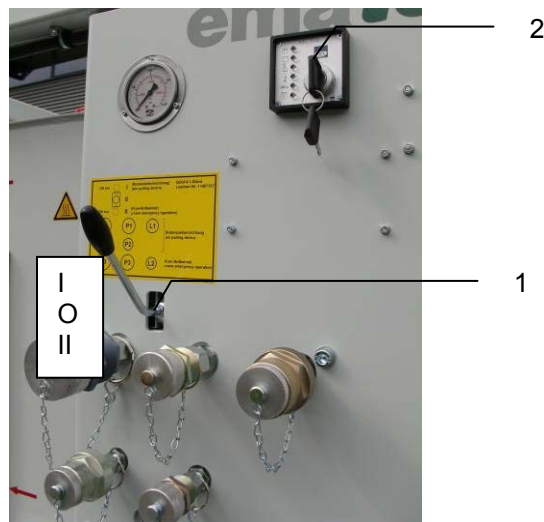
Never switch off the engine at the lever for decompression! During operating interruptions or after the completion of work, protect the crank and the start key from unauthorized access.

Switch off the unit's power supply with the battery disconnecting switch, since otherwise the voltage transformer discharges the battery.

7.2 Turning off

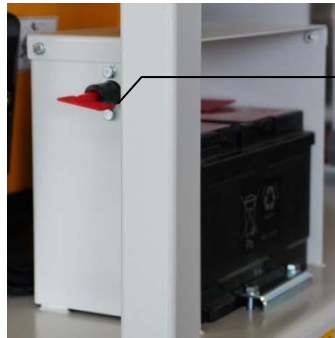
Turning off

Turn off the hydraulic unit as follows:



1. Bring change over lever (1) on the control block to position "zero".
2. Put start key (2) to position "zero" and pull it out. All indicator lights must go out.

3. Turn off power supply using the battery disconnecting switch. Turn the key (3) 90° counterclockwise and pull it out.



3
Switch position OFF

**Disconnecting
hydraulic connections**

Disconnect hydraulic connections between the hydraulic unit and the external unit:

- Disconnect pressure line
- Disconnect return line.

**Closing hydraulic
couplings**

Provide hydraulic couplings with protective caps or dummy couplings.

8 LOADING THE HYDRAULIC UNIT

8.1 Safety information for loading using a crane



DANGER

Suspended or falling loads can lead to serious injuries or death!

- Only use faultless and suitable suspension gear for crane loading!
- Only hook the hydraulic unit to a suitable crane with sufficient load-bearing capacity!
- Attaching the hydraulic unit to a crane is only permitted by trained, authorized specialist staff!
- Make sure that no unauthorized persons operate the crane cylinder or the crane while working on the crane hook and the hydraulic unit!
- Make sure that no persons are in the danger area!
- Never walk under suspended loads!
- Work on the hydraulic unit only when it is safely set down and secured against tipping!
- Wear gloves, hard hat, hearing protection and safety shoes when working with the hydraulic unit!

The own weight of the hydraulic unit with hydraulic oil filling is 795 kg.

Checking the eyehooks

Check the presence of the eyehooks on the hydraulic unit and check them for damage.



Check that the hydraulic unit is turned off and the main switch is secured against unintentional switching on.

Secure all moveable parts.

Disconnect all hydraulic lines.

When attaching to the crane, observe all information and safety regulations as well as the operating and maintenance instructions of the crane.

8.2 Procedure for loading using a crane



WARNING

Use suitable four-point suspension gear for loading!

Four lashing lugs (1) for fastening the four-point suspension gear are provided on the hydraulic unit.

Fasten the suspension gear only to the identified points!

The angle between the suspension gear lines may not exceed 60°! Otherwise, it can result in a deformation or overloading of the attachment points on the hydraulic unit or in an overloading of the suspension gear!

8.3 Loading the hydraulic unit using a forklift



The own weight of the hydraulic unit is 795 kg.

Use only an appropriate forklift, which is suitable for a load of more than 795 kg!



Loading and unloading using the forklift

Drive in the two forks of the forklift sideways between the frame (1) of the hydraulic unit and the support of the hand cart (2) in the area of the identified points.

Pay attention to the stickers (3)!

The hydraulic unit may only be lifted using the forklift when the forks are in the area marked underneath the two stickers.

Using the forks of the forklift, drive into the hydraulic unit far enough until it can be safely loaded.

**WARNING**

Danger of toppling, danger of falling down!

Lifting the hydraulic unit is prohibited when one or both of the forks are not in the area marked underneath the two stickers!

Lifting the hydraulic unit under the support of the hand cart is forbidden!

Setting down

Slowly drive to where the hydraulic unit is to be set down.

Slowly and carefully set it down on level and solid ground.

9 MAINTENANCE AND INSPECTION

9.1 Safety information for maintenance and inspection



- Perform maintenance and inspections only when the engine is turned off!
- Maintenance and inspections may only be performed by trained and authorized specialist staff!
- Observe the inspection and maintenance intervals!
- For inspection and maintenance of the engine, see external documentation for the engine!
- The exhaust gets very hot during operation! Keep explosives and easily combustible or flammable substances away from the exhaust!
- The operating company, or person charged by the operating company, must check in each individual case whether the specified work can be performed during operation without endangering persons due to the special local conditions.

Refuelling



Refuel only when the engine is turned off!

Do not spill fuel!

Never refuel near open flames or sparks which could ignite, do not smoke!

Pay attention to cleanliness when working on the hydraulic system and when refuelling.

Wear protective equipment!

Make sure that no oil/fuel reaches the ground or the drains.



RISK OF BURNS

Engine:

The engine is hot during operation.

This can lead to burns.

Wait until the engine is cooled off!

Wear protective gloves!

Hydraulic system:

The hydraulic system (hydraulic oil, pump, hoses etc.) can be hot during and after operation.

Wait until the oil is cooled off!

Wear protective gloves!

Avoid skin contact!



The maximum oil temperature may not exceed 65°C.

Pay attention to the temperature display on the hydraulic tank during operation.

If 65°C is exceeded, take the device out of service and wait until the oil is cooled off.

Do not look for leaks with bare hands!

A fine stream of liquid can penetrate the skin when under high pressure and cause serious injury. Always wear gloves!

Safety regulations for resources

When handling oils, greases and other chemical substances, observe the safety regulations that apply for the product!



CAUTION

Do not mix hydraulic oils from different manufacturers with one another!

Do not use plant-based hydraulic oils due to their unfavourable temperature resistance!

Tools

Only use calibrated and appropriate tools!
Use only tools insulated against voltage for the electrical system!



DANGER OF FIRE/DEVELOPMENT OF HARMFUL GASES

Avoid open flames, extreme heat impacts and sparks near cleaning substances and flammable or malleable parts and electrical systems!

NOTE

RISK OF DAMAGE

Do not clean hydraulic unit with a high pressure cleaner!

Environmentally friendly disposal

Ensure a safe and environmentally friendly disposal of operating and auxiliary materials as well as replaced parts. Observe the applicable disposal and environmental regulations!

9.2 Preparations before beginning maintenance and inspection

Turning off the power supply and pressure	<p>Disconnect the power supply to the hydraulic unit and make it pressureless before starting maintenance and inspection work.</p> <p>When work on live parts is necessary, call in a second person who can perform first aid in an emergency!</p>
Ruling out unintentional start ups	<p>Secure the hydraulic unit against an unintentional and unauthorized start up.</p> <p>Hang a warning sign "Do not turn on" clearly visible on the on-switch.</p>
Marking the danger area	<p>Block off the danger area with red-white safety chains or safety tape and mark with warning signs.</p>
Safely parking	<p>Check that the hydraulic unit is on safe and level ground.</p>
Cleaning	<p>At the start of the maintenance/repair, clean the hydraulic unit - and here in particular connections and screw fittings - of oil, fuel and dirt.</p> <p>Do not use any aggressive cleaning agents!</p> <p>Do not use a high pressure cleaner!</p> <p>Use lint-free cleaning cloths.</p>
Purchased components	<p>The operating and maintenance instructions of the respective manufacturer apply for all purchased components - see accompanying documentation!</p>
Exchange/replacement of components	<p>Use only original replacement parts when exchanging components!</p>
Approval	<p>The operating company approves the hydraulic unit after completion of all work.</p>

9.3 General maintenance and inspection table

Mechanical system	Activity	Time
Chap. 9.4	Check overall functional and operational safety	<ul style="list-style-type: none"> • Before start up • After repairs
Chap. 9.4	Check presence of stickers and tags	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.4	Cleaning	<ul style="list-style-type: none"> • As required
Chap. 9.4	Check presence of screws/nuts and tight seating	<ul style="list-style-type: none"> • After initial commissioning 4 x 120 hours, • Thereafter, every 500 hours
Chap. 9.4	Check mountings	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.4	Inspection of the welding seams and general visual inspections for cracks and damage.	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.4	Lubrication	<ul style="list-style-type: none"> • Weekly
Chap. 9.4	Lubricate spring bolt on tool drawer	<ul style="list-style-type: none"> • Quarterly
Chap. 9.4	Check air pressure in the tires	<ul style="list-style-type: none"> • As required
Chap. 9.4	Check rubber mounts of the engine	<ul style="list-style-type: none"> • Semi-annually
Chap. 9.4	Checking the parking brake	<ul style="list-style-type: none"> • Annually
Chap. 9.4	Checking the edge protection profile	<ul style="list-style-type: none"> • Before loading

Hydraulic system	Activity	Time
Chap. 9.5	Clean hydraulic system	<ul style="list-style-type: none"> • As required
Chap. 9.5	Check fill level of the hydraulic tank	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.5	Check hydraulic lines and hydraulic couplings for damage and leaks	<ul style="list-style-type: none"> • Quarterly
Chap. 9.5	Perform oil analysis.	<ul style="list-style-type: none"> • Since the frequency of operation can vary significantly, replace hydraulic oil and filter element as required
Chap. 9.5	Changing the ventilation filter	<ul style="list-style-type: none"> • Annually

Electrical system	Activity	Time
Chap. 9.6	Check electrical system	<ul style="list-style-type: none"> • Monthly
Chap. 9.6	Check battery charge state	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.6	Check of the electrical components for damage and loose contacts	<ul style="list-style-type: none"> • Before commencement of work
Chap. 9.6	Replace fuses	<ul style="list-style-type: none"> • As required

9.4 Maintenance and inspection of the mechanical system

Stickers and tags Check for completeness and legibility, replace if necessary.

Checking for cracks Check welding seams for cracks; general visual inspection for damage and cracks.

Cleaning The engine must be turned off and the hydraulic unit must be cooled off.
Do not use any cleaning substances that corrode the hydraulic unit parts or harm the environment.
Use an ordinary household cleaner and a rag.
Sweep away solids using a broom.

Inspection of mountings If screws and the associated elements are detached, loose or not present, operation is prohibited until the cause and the defect have been remedied and the hydraulic unit has been released again by a responsible party.

Observe the appropriate tightening torque for the screws!
Tighten screws as required!

Threads	Tightening torque [Nm]		
	8.8	10.9	12.9
M 4	2.8	4.1	4.8
M 5	5.5	8.1	9.5
M 6	9.6	14	16
M 8	23	34	40
M 10	46	67	79
M 12	79	115	135
M 14	125	185	220
M 16	195	290	340
M 18	280	400	470
M 20	395	560	660
M 22	540	760	890
M 24	680	970	1150
M 27	1000	1450	1700
M 30	1350	1950	2300

Recommended grease For roller bearings: Fuchs LUBRITECH, Lagermeister 300 PLUS

Spring bolt on the tool drawer

Check spring bolt (1) on the tool drawer and lubricate as required.



1

Air pressure of the tires

Add air as required.

Tire pressure: max. 6.2 bar/90 psi.

Rubber mounts of the engine

Check the four rubber mounts (2) of the engine for damage. Replace all four rubber mounts in the event of damage.



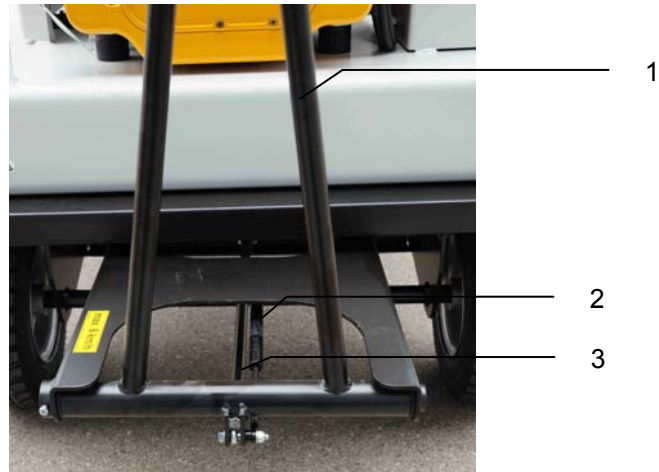
2

Checking the parking brake

Function test:

Pull or push the hand cart by hand.

Set bar (1) vertical - starting at an incline of approx. 30°, the bar is brought into and held in the vertical position independently through the pneumatic spring (2).



CAUTION

An uncontrolled upward movement of the bar can lead to injuries.

Swivel the bar upwards in a controlled manner by hand.

If the brake does not work:

- Check tire pressure and adjust if necessary.
- Check function of the pneumatic spring, replace if necessary.
- Adjusting the brake rod: Unscrew lock nut (4). Adjust brake rod (3) by turning until the bar is vertical (in the braked condition). Retighten counternut (4).

Checking the edge protection profile

The edge protection profiles on the intake openings for the fork tines are glued on. If they are worn, remove them and glue on new rubber lips.

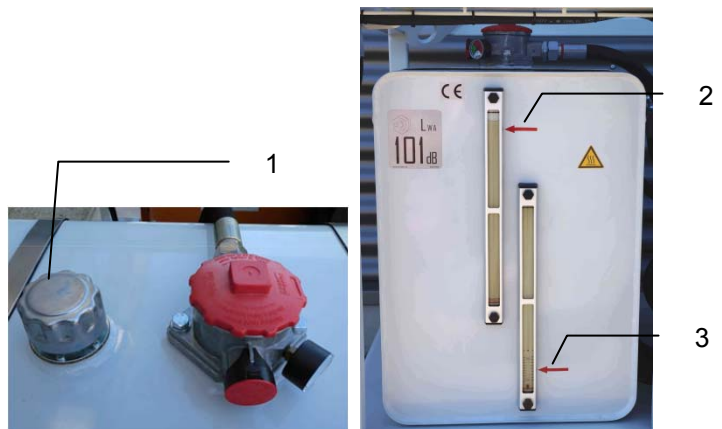
9.5 Maintenance and inspection of the hydraulic system

Initial filling of the hydraulic tank

The hydraulic unit is normally delivered without hydraulic oil.

Hydraulic oil type HLP according to DIN 51524 part 3 for filling. Use HERP pursuant to ISO 6743 part 4.

- Unscrew cover (1) on the filler neck of the hydraulic oil tank.
- Pour in hydraulic oil up to the middle between the two red arrows (2 and 3).
- Screw on cover again.



Refilling hydraulic oil

The hydraulic oil must be refilled at the latest when the hydraulic oil level has reached the bottom red arrow (3). Only the same kind of hydraulic oil may be used for refilling!

Procedure:

- Engine must be off.
- Unscrew cover (1) on the filler neck of the hydraulic oil tank.
- Pour in hydraulic oil.
- Screw on cover again.

Checking hydraulic oil level

After shutting down the hydraulic unit, wait approx. 3 minutes until the level adjustment in the hydraulic tank is achieved.

Check the fill level of the hydraulic oil tank via the level indicator. The hydraulic tank must be filled up to the middle between the red marking arrows.



CAUTION

If the oil tank is already too full when starting, a danger of running over exists if oil is delivered from the consumer hydraulic system into the tank.

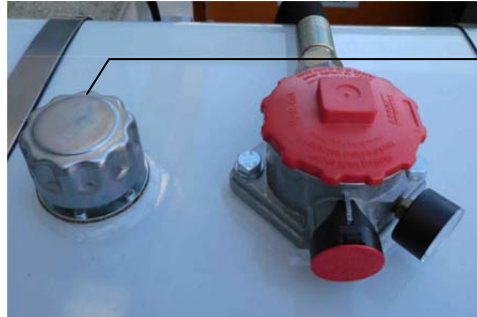
On the other hand, the danger of the pump running dry exists with too low of an oil level.

Make sure that hydraulic oil is refilled on time!

Procedure when the oil tank is too full

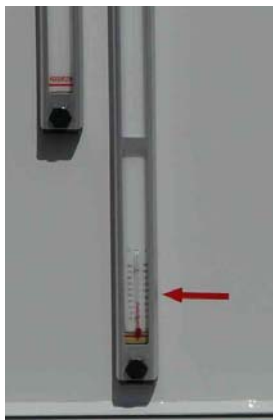
If the oil tank is too full:

- Turn off device.
- Wait until the hydraulic oil is cooled off.
- Unscrew cover on the filler neck of the hydraulic oil tank.
- Use a hand pump or an electric pump to suction off the excess hydraulic oil.
- Then screw the cover back on the hydraulic tank.



Checking the hydraulic oil temperature

Check the oil temperature on the oil inspection glass before start up and regularly during operation. It may not exceed 65°.



Checking lines and couplings

Check the condition and leak tightness of the hydraulic lines and hydraulic couplings.

Replace leaky hydraulic lines or couplings immediately. Check the coupling halves for soiling before every connection and clean if necessary.



ematec AG recommends having the hydraulic lines checked by a specialist after 5 years at the latest.

ematec AG explicitly points out that only original replacement parts and original accessories approved by **ematec AG** may be used.

Checking the return filter contamination indicator

Check the contamination indicator (1) on the return filter during operation. Have the hydraulic oil analysed and replace the filter at a degree of contamination of 2 bar or when the pointer of the display (1) is in the red area. Replace the hydraulic oil when the results of the analysis stipulates this.



1

Performing the oil analysis

It is recommended to regularly determine the condition of the oil using an oil analysis. If required, replace the hydraulic oil and the filter element.

Replacing the hydraulic oil filter

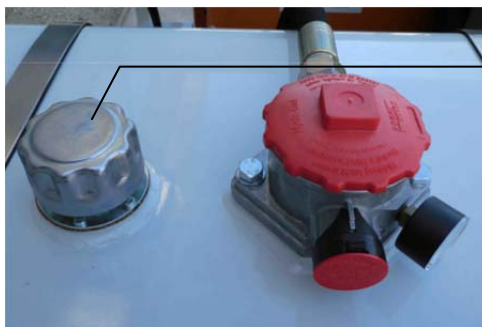
- Open the cover of the return filter (red).
- Pull filter together with the lower section of the housing upwards. This prevents dirt deposits in the housing from seeping back into the tank.
- Then disconnect the filter from the lower section of the housing.
- Clean the lower section of the housing and insert new filter element.
- Install both parts in the filter housing.
- Grease or lubricate the seal of the cover.
- Screw on cover, tightening torque 20 Nm.

If required, refill hydraulic oil, see page 60.



Changing the ventilation filter

Unscrew cover (1) on the filler neck of the hydraulic tank. The filter is installed in the cover. To change the ventilation filter, unscrew the filter from the cover, screw on the new filter, insert the unit again and screw on the cover to the filler neck of the hydraulic tank.



1

9.6 Maintenance and inspection of the electrical system

Authority All work on the electrical system may only be performed by a qualified electrician!

Semi-annual inspection Check all electrical components semi-annually for damage and loose contacts!

Fuses and bulbs Determine and remedy cause for the fuse or bulb burning out.



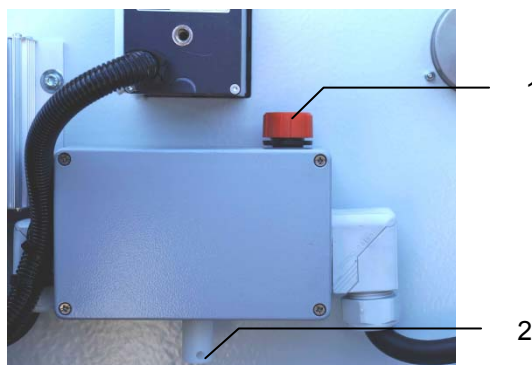
Replace only with replacement parts of the same type and same design!
Only use original fuses!
Never bypass electrical fuses!

Battery Do not mix up positive and negative terminals of the battery!
When installing the battery, first connect the positive lead and then the negative lead.

Cables and connections Rectify electrical system errors such as loose connections, frayed or broken cables or badly fastened clamps immediately!

Indicator lights Replace defective indicator lights immediately or exchange the components.

Venting, condensation discharge In order to prevent the formation of condensation in the switch box, the switch box is furnished with aeration and ventilation (1).
Check the condensation discharge screw (2) at the bottom quarterly. Clean the bores as required.



10 TROUBLESHOOTING

10.1 Safety information for troubleshooting



- Perform troubleshooting only when the engine is turned off!
- Troubleshooting may only be performed by trained and authorized specialist staff!
- For troubleshooting of the engine, see external documentation for the engine!
- Keep explosives and easily combustible substances from the engine since the exhaust gets very hot during operation!
- The operating company, or person charged by the operating company, must check in each individual case whether the specified work can be performed during operation without endangering persons due to the special local conditions.



RISK OF BURNS

Engine:

The engine is hot during operation.

This can lead to burns.

Wait until the engine is cooled off!

Wear protective gloves!

Hydraulic system:

The hydraulic system (hydraulic oil, pump, hoses etc.) can be hot during and after operation.

Wait until the oil is cooled off!

Wear protective gloves!

Avoid skin contact!



The maximum oil temperature may not exceed 65°C.

Pay attention to the temperature display on the hydraulic tank during operation.

If 65°C is exceeded, take the device out of service and wait until the oil is cooled off.

Do not look for leaks with bare hands!

A fine stream of liquid can penetrate the skin when under high pressure and cause serious injury.

Always wear gloves!

Safety regulations for resources

When handling oils, greases and other chemical substances, observe the safety regulations that apply for the product!

**CAUTION**

Do not mix hydraulic oils from different manufacturers with one another!

Do not use plant-based hydraulic oils due to their unfavourable temperature resistance!

Tools

Only use calibrated and appropriate tools!
Use only tools insulated against voltage for the electrical system!

**DANGER OF FIRE/
DEVELOPMENT OF HARMFUL GASES**

Avoid open flames, extreme heat impacts and sparks near cleaning substances and flammable or malleable parts and electrical systems!

Environmentally friendly disposal

Ensure a safe and environmentally friendly disposal of operating and auxiliary materials as well as replaced parts. Observe the applicable disposal and environmental regulations!

10.2 Preparation before beginning troubleshooting

Turning off the power supply and pressure	<p>Disconnect the power supply to the hydraulic unit and make it pressureless before starting maintenance and inspection work.</p> <p>When work on live parts is necessary, call in a second person who can perform first aid in an emergency!</p>
Ruling out unintentional start ups	<p>Secure the hydraulic unit against an unintentional and unauthorized start up.</p> <p>Hang a warning sign "Do not turn on" clearly visible on the on-switch.</p>
Marking the danger area	<p>Block off the danger area with red-white safety chains or safety tape and mark with warning signs.</p>
Safely parking	<p>Check that the hydraulic unit is on safe and level ground.</p>
Cleaning	<p>At the start of the maintenance/repair, clean the hydraulic unit - and here in particular connections and screw fittings - of oil, fuel and dirt.</p> <p>Do not use any aggressive cleaning agents!</p> <p>Do not use a high pressure cleaner!</p> <p>Use lint-free cleaning cloths.</p>
Purchased components	<p>The operating and maintenance instructions of the respective manufacturer apply for all purchased components - see accompanying documentation!</p>
Exchange/replacement of components	<p>Use only original replacement parts when exchanging components!</p>
Approval	<p>The operating company approves the hydraulic unit after completion of all work.</p>

10.3 Procedure during troubleshooting

Problem	Possible cause	Remedy
Engine does not run or runs badly	See engine manual	See engine manual
Plug for connecting external consumers does not work	<ul style="list-style-type: none"> Fuse in terminal box burnt out Fuse in voltage transformer burnt out 	Replace fuse
Engine shuts off during operation	<ul style="list-style-type: none"> Diesel tank is empty Error in the electrical system 	<ul style="list-style-type: none"> Refill diesel fuel Have a qualified electrician look for and remedy the error

Too little or no oil pressure	Hydraulic oil level too low	Refill hydraulic oil, check HD pump
	Too low engine rpm (idling)	Set rpm to maximum
	Leak in system	Check, replace defective parts
	Pump or valve defective	Replace, contact manufacturer

Too little or no volume flow	Hydraulic oil level too low	Refill hydraulic oil, check HD pump
	Too low engine rpm (idling)	Set rpm to maximum
	Contamination in hydraulic system	Clean, ensure free flow
	Restriction in hydraulic system	Remedy
	Hoses too long	Use shorter hoses
	Manual lever, valve not opened or not completely opened	All valves, open manual lever
	Pump or valve defective	Replace, contact manufacturer
	Quick couplings not correctly connected	Check, connect correctly

Loss of hydraulic oil	Leak in the hydraulic unit	Check, replace defective parts
	Hose couplings soiled or defective	Check, clean, replace defective parts
	Leak in the consumer	Check, replace defective parts
	Quick couplings not correctly connected	Check, connect correctly

Hydraulic oil too hot	Operating too long	Turn off, allow to cool
	High ambient temperature	Turn off, allow to cool
	Pump defective	Contact manufacturer

11 DISPOSAL



Observe the applicable safety and environmental regulations for the disposal of resources and machines!

12 REPLACEMENT PARTS LIST



INFORMATION

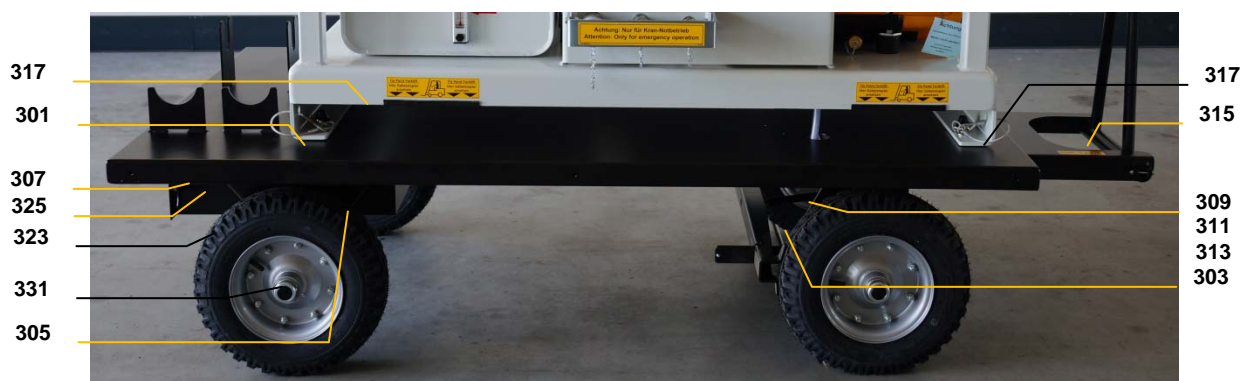
For the replacement parts list for the engine, see external documentation for the engine!

12.1 Hydraulic unit BZGF4.2-silent with handcart



Item	Quantity	Unit of quantity	Part no.	Description	Chapter
13	1	Pcs	5049444	Operating instructions	
301	1	Pcs	5049441	Hand cart complete	12.2
303	1	Pcs	5049406	Hydraulic unit BZGF4.2-silent	12.4

12.2 Hand cart complete



Item	Quantity	Unit of quantity	Part no.	Description	Chapter
301	1	ST	5040817	Support	
303	1	ST	5039630	Front axle complete	12.3
305	1	ST	5039638	Rear axle	
307	1	ST	5029677	Drawer	
309	1	ST	5039640	Washer	
311	1	ST	5039851	Washer	
313	1	ST	5039852	Washer	
315	1	ST	5039496	Sticker, "max. 6 km/h"	
317	2	ST	5041396	Rubber band (covered)	
321	1	ST	3009923	Sticker, data tag	
323	4	ST	3008885	Pneumatic wheel	
325	1	ST	3003215	Ball-bearing mounted rails (pair)	
331	4	ST	1002029	Adjusting ring	

12.3 Front axle complete



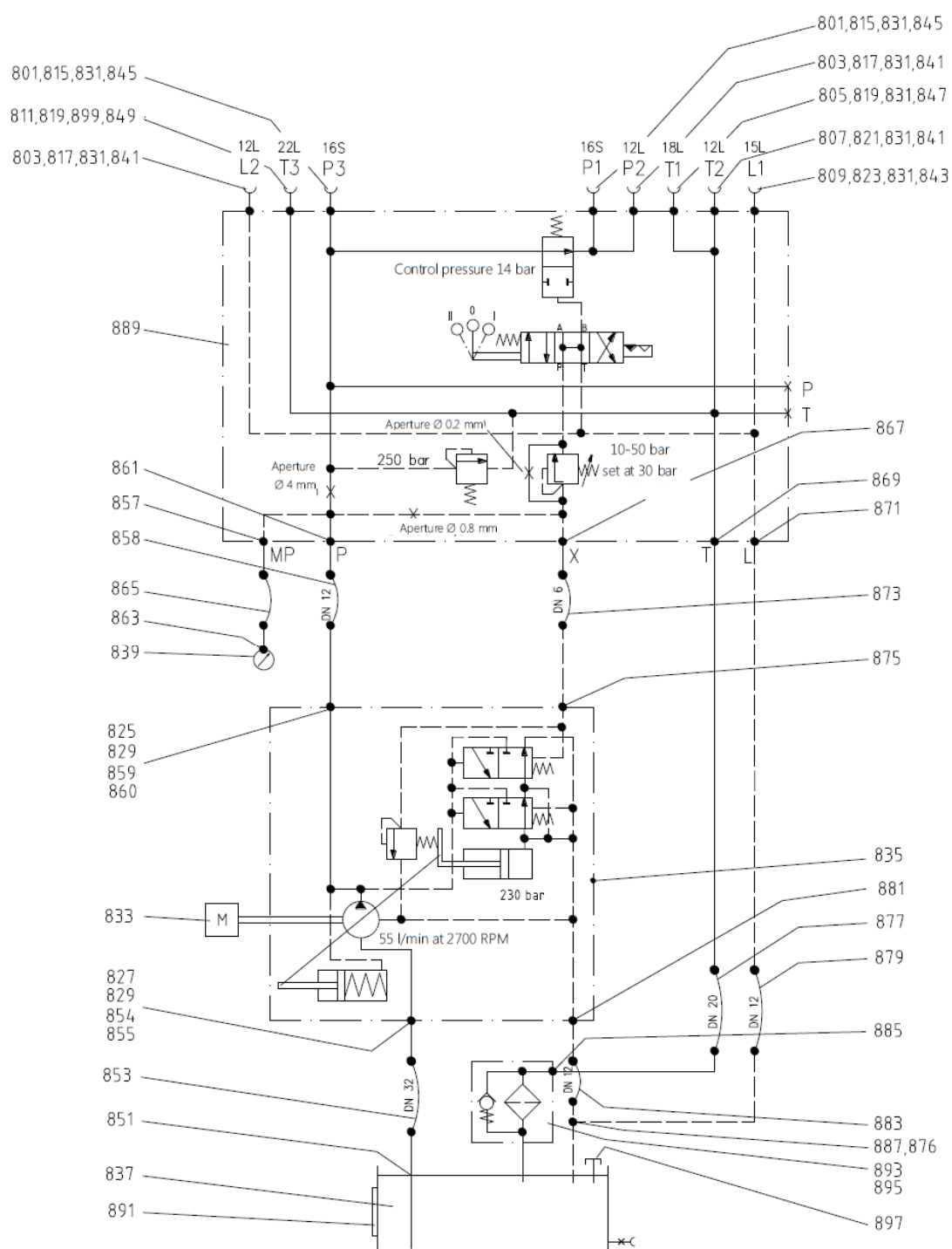
Item	Quantity	Unit of quantity	Part no.	Description
301	1	ST	5039632	Front axle
303	1	ST	5039634	Bar
305	1	ST	5039650	Brake
309	1	ST	5039666	Ring
311	1	ST	5039662	Rod
313	1	ST	5039800	Pipe
317	1	ST	3007449	Pneumatic spring
319	2	ST	3007442	Sliding bearing with collar
347	2	ST	3006399	Lamellar plug

12.4 Hydraulic unit BZGF4.2-silent



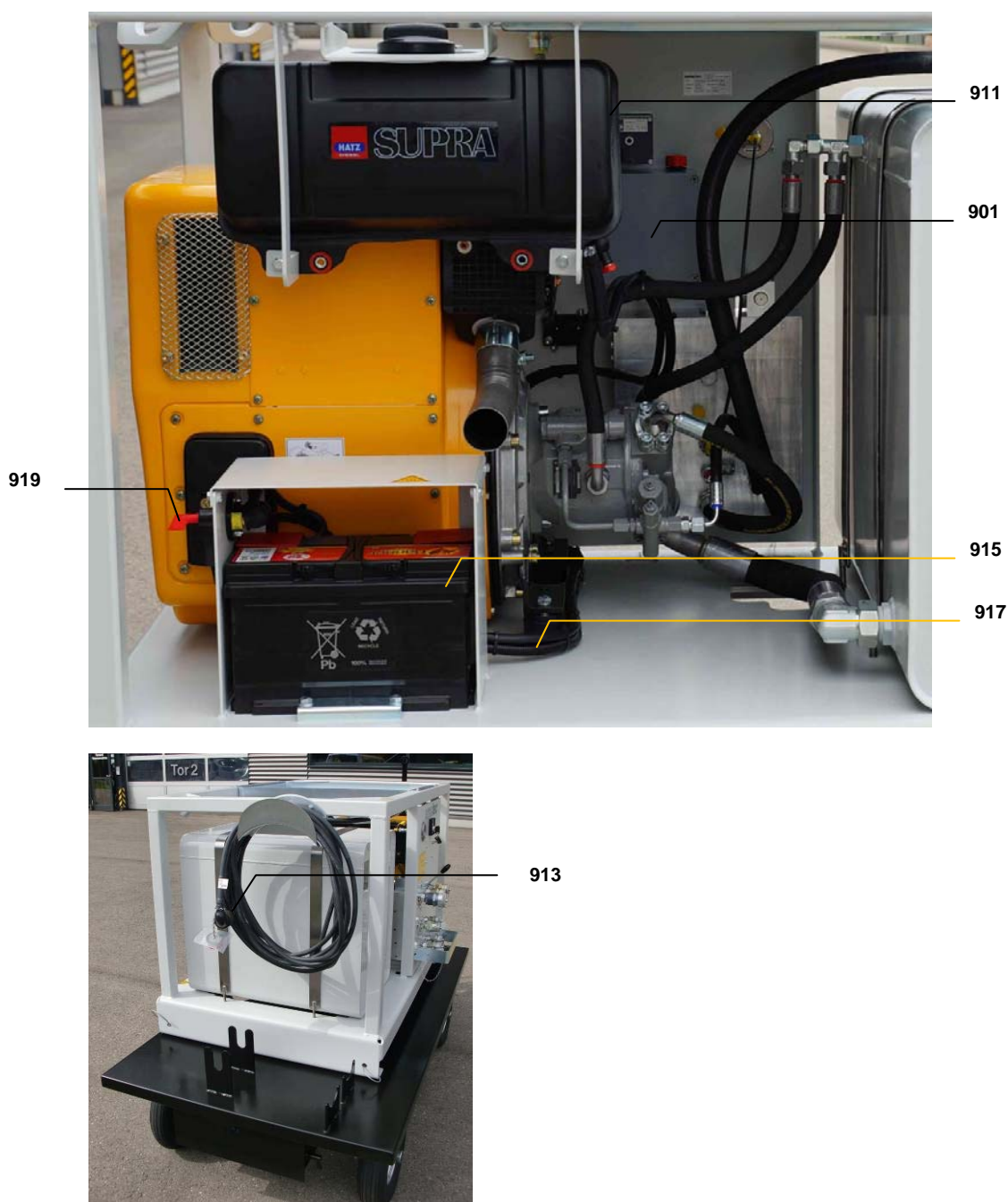
Item	Quantity	Unit of quantity	Part no.	Description	Chapter
301	1	ST	5040731	Hydraulic attachments	12.5
303	1	ST	5049394	Electrical attachments	12.6
305	1	ST	5029665	Hydraulic tank 160L complete	12.7
309	1	ST	5049389	Frame	
311	1	ST	5040654	Storage rack	
313	1	ST	5032436	Cover	
315	1	ST	5029674	Clamping claw	
317	1	ST	5029770	Bracket	
319	1	ST	5030270	Handle	
321	1	ST	5029955	Sticker, "Caution: only for emergency crane operation"	
323	1	ST	5049407	Sticker, "Control lever"	
327	1	ST	5036843	Sticker, "Noise level 101dB"	
329	2	ST	5040651	Rubber band (covered)	
331	1	ST	5049152	Exhaust pipe	
333	4	ST	5041341	Sticker, "Eyehooks"	
335	1	ST	5050070	Sticker, "Own weight 795kg"	
337	1	ST	5049147	Hose	
339	4	ST	5042508	Sticker, "Forklift..."	
351	1	ST	3010293	Engine 1D81C Var. XI	
353	1	ST	3003153	Adjusting pump	
355	1	ST	3004729	Sticker, "Warning hot surfaces"	
357	1	ST	3002508	Hose clamp D15/12	
359	1	ST	3003219	Hose bracket	
361	1	ST	3009923	Sticker, data tag	
363	1	ST	3001324	Sticker, "CE"	
365	1	ST	3008184	Pipe clamp D51.5	
367	0.78	M	3010376	Edge protection profile (4 pieces at 195 mm)	
371	4	ST	3007727	Linch pin	
373	4	ST	3003168	Safety rope	
375	4	ST	3002763	Key ring D35mm	
377	2	ST	3003305	Hose clamp D7-11mm	
379	2	ST	3006158	Hose clamp D13	
383	1	ST	1901856	Cylindrical hose socket G $\frac{3}{8}$ "	
391	1	ST	9000104	Sticker, "ematec"	

12.5 Hydraulic attachments



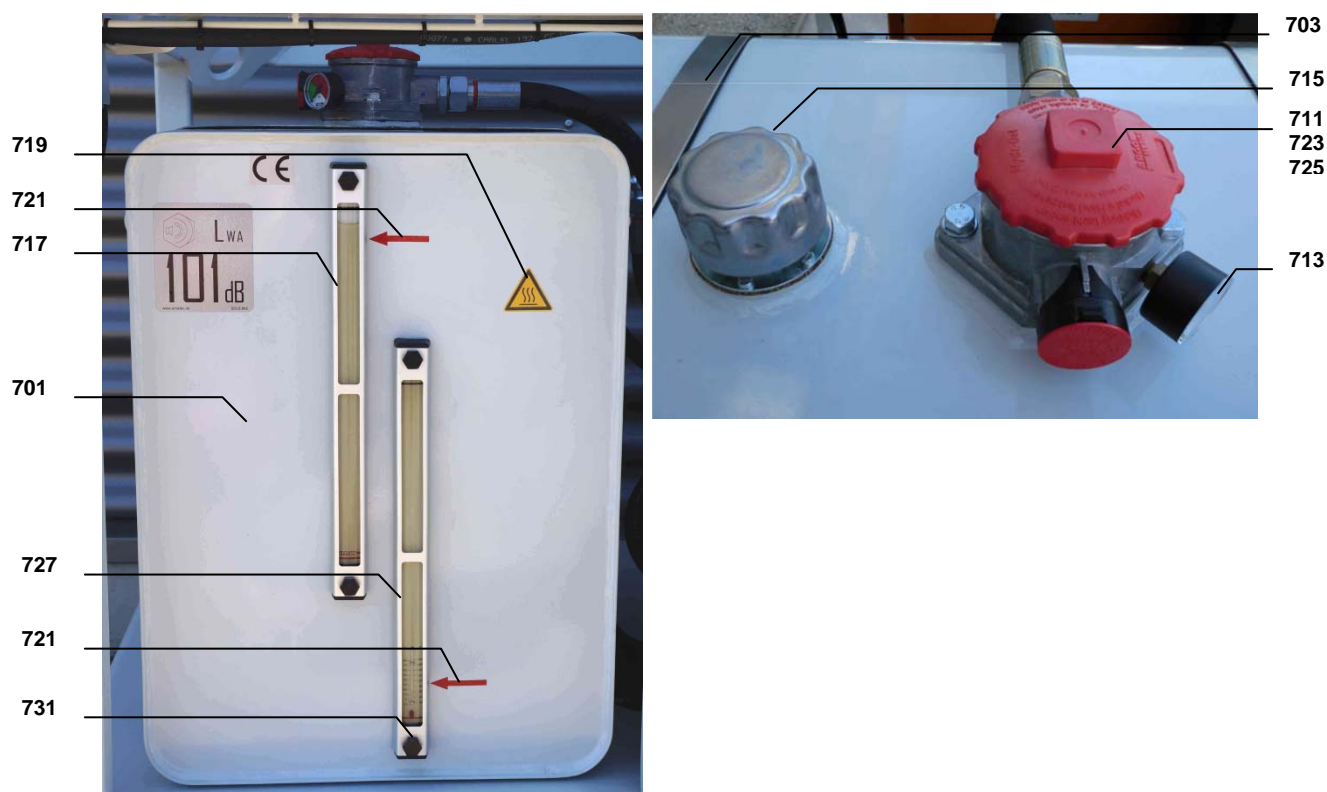
Item	Quantity	Unit of quantity	Part no.	Description
801	2	ST	1901839	Sleeve, size 3
803	2	ST	1901858	Sleeve, size 2
805	1	ST	1901836	Sleeve, size 6
807	1	ST	1901859	Plug, size 2
809	1	ST	1901860	Plug, size 3
811	1	ST	1901861	Sleeve, size 6
815	2	ST	1901845	Lock nut, size 3
817	2	ST	1901844	Lock nut, size 2
819	2	ST	1901846	Lock nut, size 6
821	1	ST	1901847	Screw plug, size 2
823	1	ST	1901848	Screw plug, size 3
825	4	ST	1000417	Cheese-head screw M10x30
827	4	ST	1000454	Cheese-head screw M10x35
829	8	ST	1000391	Schnorr washer 10
831	7	ST	3002763	Key ring D35mm
839	1	ST	1901873	Manometer
841	3	ST	1900315	Straight screw-in socket, EVGE 12PLR-ED 3/8"
843	1	ST	1900316	Straight screw-in socket, EVGE 15PLR-ED 1/2"
845	2	ST	1900324	Straight screw-in socket, EVGE 16PSR-ED 1/2"
847	1	ST	1900317	Straight screw-in socket, EVGE 18PLR-ED
849	1	ST	1900320	Straight screw-in socket, EVGE 22PLR-ED
851	1	ST	1900281	Adjustable angled connection fitting EVW 35PL
853	1	ST	3003285	Hydraulic hose DN 32 / 600
854	2	ST	3003284	SAE flange half 1 1/4
855	1	ST	7020047	Rectangular seal ring RDR 1 1/4
857	1	ST	1901800	Measurement connection
858	1	ST	3003286	Hydraulic hose DN 12 / 580
859	2	ST	3003283	SAE flange half 3/4
860	1	ST	7020046	Rectangular seal ring RDR 3/4
861	1	ST	1900196	Straight screwed coupling GE-16PSR 1/2"
863	1	ST	1901021	Manometer connection
865	1	ST	1901022	High pressure hose with screw coupling SMA 3-630
867	1	ST	1900188	Straight screwed coupling GE-08PSR 1/4"
869	1	ST	1900180	Straight screwed coupling GE-22PLR 3/4"
871	1	ST	1900928	Straight screwed coupling GE-15PLR 1/2"
873	1	ST	3003269	Hydraulic hose DN 6 / 450
875	1	ST	1900222	Straight screwed coupling GE-08PSM
876	1	ST	1900277	Adjustable angled connection fitting EVW 15PL
877	1	ST	3003271	Hydraulic hose DN 20 / 900
879	1	ST	3003270	Hydraulic hose DN 12 / 750
881	1	ST	1900217	Straight screwed coupling GE-15PLM M18x1.5
883	1	ST	3003272	Hydraulic hose DN 12 / 500
885	1	ST	1900968	Straight screwed coupling GE-22PLR 1"
887	1	ST	1900302	Adjustable L-connection fitting EVL 15PL
889	1	ST	5030151	Control block, complete (see 12.8)
899	1	ST	3006315	Key ring D50mm

12.6 Electrical attachments



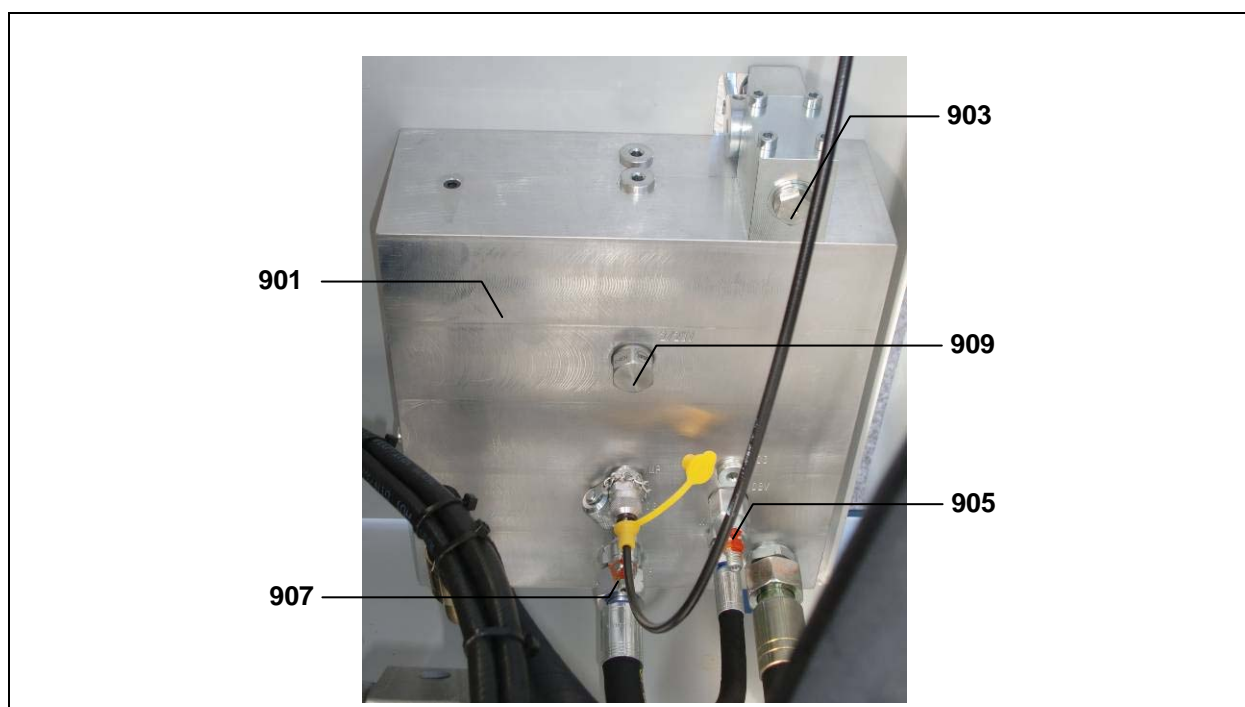
Item	Quantity	Unit of quantity	Part no.	Description
901	1	ST	5049396	Terminal box, complete
911	1	ST	3003165	Voltage transformer 12V / 24V, 5A, IP67 (covered)
913	1	ST	3003164	Cable with Cannon plug 54-pin, 15 m
915	1	ST	3003216	Battery 12 V, 72 Ah
917	1	ST	3010466	Cable set, complete, for battery connection
919	1	ST	3004188	Battery disconnecting switch 12 V

12.7 Hydraulic tank 160 l, complete



Item	Quantity	Unit of quantity	Part no.	Description
701	1	ST	5029623	Hydraulic tank 160 L
703	2	ST	5029625	Tension belt with rubber band
711	1	ST	3003187	Return filter with filter element 10µm
713	1	ST	3003190	Clogging indicator
715	1	ST	3002755	Ventilation filter 40µm, sieve 500µm
717	1	ST	3002757	Level indicator
719	2	ST	3004729	Sticker, "Warning hot surfaces"
721	2	ST	3004777	Sticker, "Red directional arrow"
723	-	ST	3003188	Filter element 10µm for return filter as replacement part
725	-	ST	3003189	Ventilation filter 7µm for return filter as replacement part
727	1	ST	3007007	Level indicator with thermometer
731	1	ST	1900940	Screw plug 1"

12.8 Control block complete



Item	Quantity	Unit of quantity	Part no.	Description
901	1	ST	5030149	Control block
903	1	ST	3003307	4/3-way valve, hand actuated
905	1	ST	3003318	Pressure limiting valve, 30 bar preset
907	1	ST	3003317	Pressure limiting valve, 70-420 bar
909	1	ST	3003316	2/2-way directional poppet valve
911 ¹⁾	1	ST	3003319	Nozzle G M 6 x 0.80
913 ¹⁾	1	ST	3003320	Nozzle G M 12 x 4.0
915 ¹⁾	2	ST	1901000	Screw plug 1/8"

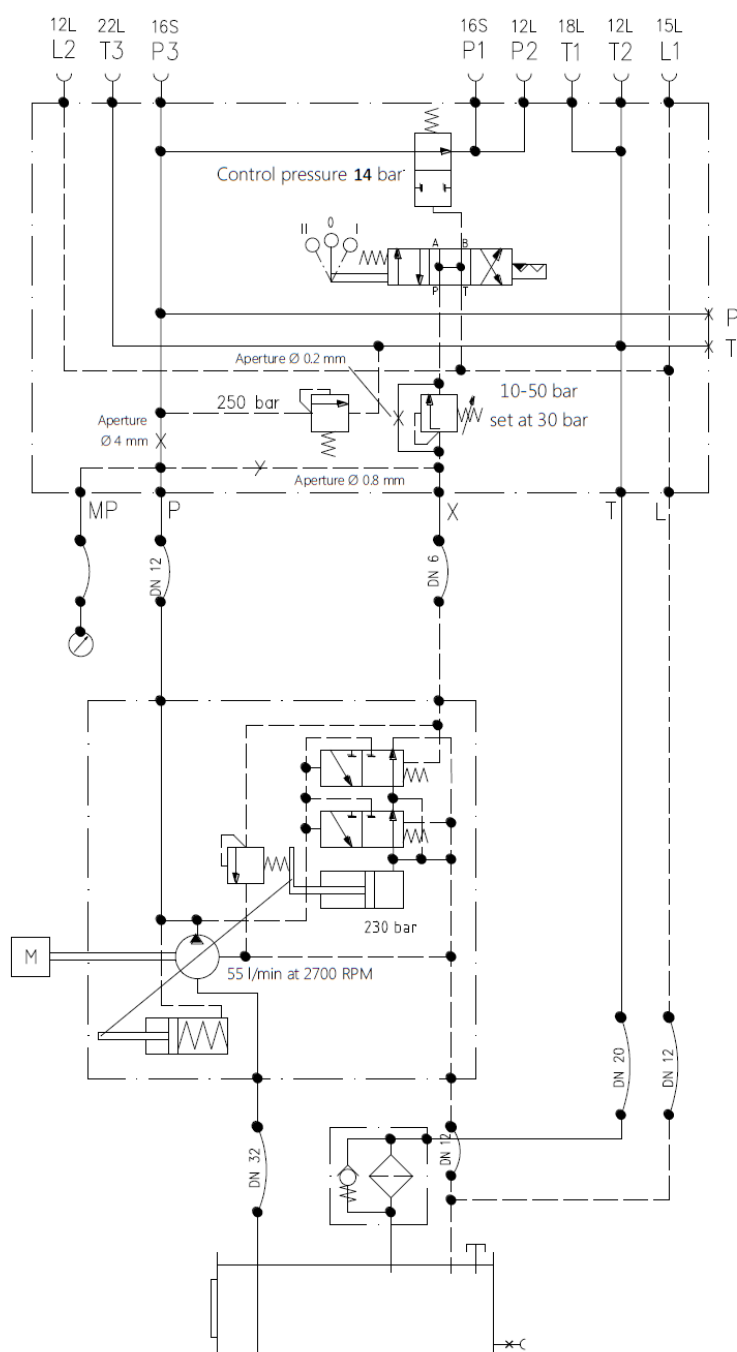
¹⁾ not shown

13 APPENDIX

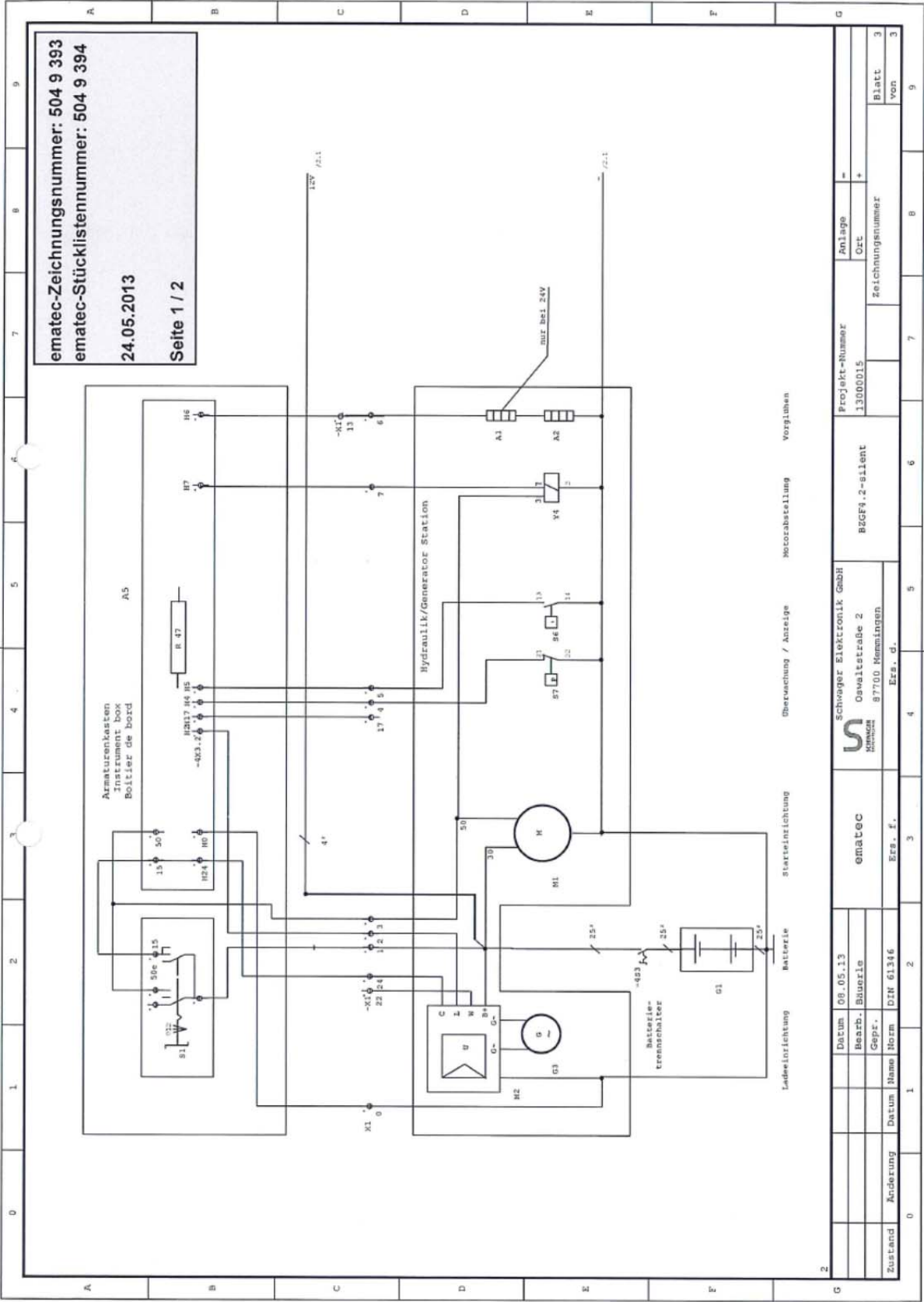
- **Hydraulic diagram**
- **Electrical diagram**
- **Declaration of conformity**
- **Separate technical documentation**
 - HATZ diesel engine operating instructions

Couplings for emergency
operation crane function

Couplings for pin pulling
device / crawler support



	Lever position	Function
0	Spring-centred	Start p = 10 - 50 bar, set at 30 bar
I	(P → A) without engagement, spring return position	P max pin pulling and emergency crane operation
II	(P → B) engaged with lock	P max emergency crane operation Pin pulling disabled





Declaration of conformity

Manufacturer and address **ematec AG**
Am Ziegelstadel 3

D-87766 Memmingerberg

**Documentation
representative**

Mr. Dietmar Bail

Product description

We hereby declare that the

Hydraulic unit type BZGF4.2-silent

Ident number

Ident no. 504 9 176

Serial number

**EC directives and
standards**

conforms to the regulations of the following European
directives:

EC machinery directive 2006/42/EC

EC outdoors directive 2000/14/EC

EMC directive 2004/108/EC

DIN EN ISO 3744

Noise emission

Sound/power level measured: 97 dB(A)

Sound/power level guaranteed: 101 dB(A)

Evaluation procedure Appendix VI

Notified body: TÜV SÜD Industrie Service GmbH

Westendstraße 199

80686 Munich

Notified body 0036

The following harmonised standards are applied:

EN ISO 12100

Place, date

Memmingerberg, 17.06.2013

Technical manager

Dipl.-Ing. (FH) [Engineering degree - Polytechnic] Dietmar
Bail