

Original Operating Instructions

TP EM I Vulcanizing Machine

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The TP EM I Vulcanizing Machine is CE-compliant in accordance with the applicable directives and regulations. The applicable standards and directives are outlined in the declaration of conformity.



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1 Introduction

1.1 General information

These Operating Instructions contain information and procedures regarding the safe operation and maintenance of the TP EM I Vulcanizing Machine.

To ensure your own safety and prevent injuries, carefully read and always observe the Operating Instructions and, in particular, the safety instructions.

The operator must supplement the Operating Instructions with existing national regulations, for example, about accident prevention and environmental protection.

The Operating Instructions are not a guide for carrying out extensive maintenance and repair work. Such work must be carried out by the manufacturer's customer care service.

The Operating Instructions must always be provided in the location where the machine is used.

Compliance with these Operating Instructions is essential to ensure trouble-free operation and in order for any warranty entitlements to be honored.

The procedures for carrying out repairs can be found in the separate REMA TIP TOP OTR 1-/2-Way Repair Instructions.

The work steps, safety instructions and descriptions provided in these Operating Instructions do not release the TP EM I operator and/or user from his/her general safety and due diligence obligations when handling technical equipment.

All information provided in these Operating Instructions refers exclusively to the use of original materials, accessories and spare parts from REMA TIP TOP.

Modifications for the purpose of further technical development remain reserved.

The use of high-quality repair materials and equipment is essential to achieving good repair results as is the state of the corresponding repair environment:

- Good lighting conditions
- Trained personnel
- Regular cleaning of workplace and equipment

2 Safety instructions

2.1 Notices and symbols

These Operating Instructions contain different symbols. The symbols used in these Operating Instructions are used to point out possible dangers or inform you of protective measures.

Warning symbols

The warning symbols are divided into the following categories: danger, warning, caution and attention.



Danger

This symbol indicates an **imminent danger**. Failure to take appropriate precautions will result in death or serious injury.



Warning

This symbol indicates a **potentially dangerous situation**. Failure to take appropriate precautions may result in death or serious injury.



Caution

This symbol indicates a **potentially dangerous situation**. Failure to take appropriate precautions may result in serious injury.



Attention

This symbol indicates a **potentially dangerous situation**. Failure to take appropriate precautions may result in material damage.

Always observe warning information, pay attention to the work steps described and exercise caution.

Special hazards

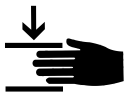
In the case of some potential hazards, the warning symbols are replaced with special pictograms. The division into the categories danger, warning, caution and remains reserved.



This pictogram warns against a hot surface.



This pictogram warns against electrical voltage.



This pictogram warns against being crushed.



This symbol refers to explanations intended to provide a better understanding of the machine and how to use it optimally.

2.2 General principles

- The machine is manufactured in accordance with the current state of science and technology and is approved in accordance with recognized safety regulations. Nevertheless, its use may endanger the life and limb of the user or third parties or have a detrimental effect on the machine and other property.
- Read the Operating Instructions and always observe the safety regulations and hazard warnings to ensure safe operation.
- Only use the machine for its intended purpose (see Section 3).
- Only use the machine if it is technically in perfect condition.
- Immediately repair or have somebody repair faults which could impair safety.
- The machine is integrated in the systems of other manufacturers. When working on these systems, also observe the instructions of the system manufacturer.

2.3 Organizational measures

Information for the operator

- Always keep these Operating Instructions within reach of where the machine is used and ensure that they are complete and legible.
- In addition to the Operating Instructions, any universally valid legal provisions or other mandatory regulations relating to accident protection and prevention must be complied with and observed.
The rules and regulations concern, for example:
 - Occupational safety
 - Accident prevention
 - Environmental protection
 - Handling of hazardous substances
 - Hygiene
 - First aid
- Supplement the Operating Instructions with information on in-house company regulations.
The rules concern, for example:
 - Labor organization
 - Work processes
 - Supervisory obligations
 - Reporting obligations
- Every person working with the machine must have read and understood the Operating Instructions and, in particular, the safety instructions, before carrying out any work.
- Check that personnel observes safety and hazard issues while working.
- Provide personal protective equipment – in so far as required – in accordance with regulations.
- All safety information and hazard warnings on the machine must be kept legible.
- No changes, additions or modifications may be made to the machine without the manufacturer's express written confirmation.
- Work for modifications or changes approved by the manufacturer must be carried out in compliance with safety requirements.
- Only use spare parts approved by the manufacturer. This is always guaranteed with original spare parts.
- Mandatory intervals and/or intervals listed in the Operating Instructions for regular tests/inspections must be observed.
- The location and operation of fire extinguishers must be made known.
- Persons under the influence of drugs, alcohol or medication that impair reactions are not allowed to work on the machine.
- Provide the appropriate workplace equipment for maintenance work.
- The Operating Instructions as well as any other documents on the machine must be given to the new owner when the machine is resold.
- The applicable regulations for the separation, recycling and proper and professional disposal of used parts must be observed when the machine is ultimately taken out of service at the end of its life.

Information for the operator

- Read the Operating Instructions and, in particular, any safety instructions before using the machine the first time.
- Refrain from any manner of work that endangers safety (e.g. incorrect operation).
- Observe all safety information and hazard warnings on the machine.
- National accident prevention regulations and universal safety instructions must be strictly observed.
- Personal protective equipment must be worn if required.
- Never disable safety functions.
- Immediately disconnect the machine from the power supply if safety-relevant changes occur to the operating behavior of the machine or the machine malfunctions, and notify the responsible person/authority of the malfunction.
- Observe all fire alarm requirements and firefighting procedures.
- All work carried out on the machine may only be done using suitable and tried-and-tested workshop equipment.
- Only move and/or operate the machine on flat, hard surfaces.
- Avoid rolling over supply cables. Risk of cable damage.
- Before starting up every time, check heating mats, heating plates and cables for damage. There is a risk of short-circuiting and risk of breakage.
- Immediately disconnect defective or damaged components from the machine and remove from the workplace, and then replace with original spare parts from REMA TIP TOP.
- Only have qualified experts carry out work on current-carrying and pressure-generating parts.
- Do not reach between heating plates, pressure plates and tyres while closing the pressure units. Risk of crushing.
- Never leave the machine unattended while in operation.
- Do not touch the heating plates and heating mat while the machine is in operation and cooling down. Risk of burns.
- Do not place any objects outside the designated storage area. Risk of fire.
- Protect the machine from getting wet; do not bend or open the heating mats. Risk of fire and short-circuiting.
- If necessary, seek assistance when making changes to the machine position and settings.
- Never use the machine for securing/holding tyres. Always use appropriate support aids/safety devices to prevent tyres from rolling away and/or falling over. If possible, use the REMA TIP TOP EM repair stand.
- Check the machine once a month for wear and/or defects caused by aging, for example, corrosion, deformation, etc. and replace with the corresponding parts as soon as possible.
- Only allow authorized persons access to the key for the control box.
- Only use accessories and attachments which are offered or approved by the machine manufacturer (REMA TIP TOP GmbH).
- Always remove any mineral oil-based tyre-fitting lubricants, tyre sealants, etc. from the inside of the tyre. Risk of spontaneous combustion due to heat.
- For all work on the machine, comply with any regulations concerning waste prevention, proper waste recycling and waste disposal.

- Workplace**
- The workplace in normal operation is located in the area around the machine.

2.4 Personnel selection and qualifications

- Only authorized personnel may work on the machine.
- The operator may only authorize persons to work on the machine who fulfill the following requirements:
 - The persons are physically and mentally fit.
 - The persons have demonstrated their ability to operate and carry out maintenance work on the machine, as based primarily on written operating instructions.
 - It is expected of these persons that they reliably carry out assigned tasks on a permanent basis.
- Clearly define personnel responsibilities for setting up, operating, maintaining and repairing the machine. Only technically trained and skilled persons may connect, service and repair the machine.
- Define responsibility! The operator must be allowed to refuse any third-party instructions that are detrimental to safety.
- Personnel who are trained, instructed or undergoing general training may only work on the equipment under the constant supervision of an experienced person.
- All work on the machine's electrical equipment may only be carried out by qualified electricians or by a person working under the direction and supervision of a qualified electrician according to electrical engineering regulations.

2.5 Safety instructions for specific operating phases

- Transport**
- Only use lift trucks and forklifts that are suitable for the machine's weight and dimensions.
 - Use suitable and appropriate devices for lifting.
 - Never stand under suspended loads.
- Assembly/disassembly**
- After receiving shipment, immediately inspect the package and the machine for transport damage. Immediately report any damage and defects to the transport company and supplier.
 - Assembly work should only be carried out by qualified persons (experts) in compliance with the safety instructions and local regulations.
 - Secure assembly area.
 - Only connect the machine to a power supply that is suitable for the machine's electrical load ratings. Please see Chapter 5 in this regard.
- Initial operation**
- Always check whether the voltages and frequencies indicated on the rating plates match those of the operator's network.

- Normal operation**
- Refrain from any manner of working which poses a risk to safety.
 - Only operate the machine if all the protective equipment and safety-related equipment is in place and fully functional.
 - Check the machine for any external signs of visible damage or defects once a day. Report any changes which have occurred (including changes in operating behavior) immediately to the responsible person/authority. If necessary, immediately disconnect the machine from the power supply and prevent it from being switched back on (warning label).
Immediately repair or have somebody repair damage or defects.
 - Ensure that there are no unauthorized persons in the work area.

- Maintenance**
- Adhere to the maintenance work and intervals stipulated in the Operating Instructions. Only qualified personnel may carry out such work.
 - Only carry out maintenance when the machine is turned off. Power to the appliance must always be switched off when working on the electrical equipment.
 - When protective equipment must be detached/disassembled for maintenance: Reattach/reassemble protective equipment immediately after work is completed.
 - When screw connections must be loosened for maintenance: Always retighten screw connections.
 - After cleaning, check all lines/cables for loose connections, wear and damage. Immediately fix any identified defects.
 - Properly dispose of cloths soaked in oil.
 - Dispose of operating materials and auxiliary material as well as replacement parts in an environmentally friendly manner.

- Storage**
- Avoid storing outside. Even if the machine is covered, it can be permanently affected by rain, cold, heat, wind, etc.

- Hazardous situations**
- Always immediately disconnect the machine from the power supply.
 - When disconnecting due to damage to the machine: Only operate the machine after the cause of the hazard has been eliminated.

2.6 Information about special dangers

- Electrical energy**
- All work on the machine's electrical equipment may only be carried out by qualified electricians or by a person working under the direction and supervision of a qualified electrician according to electrical engineering regulations.
 - Regularly check the machine's electrical equipment. Immediately repair or have somebody repair defects such as loose connections, damaged cables or worn-out earthing contacts.
 - Always keep the switch unit closed.
 - Only use tools that are insulated against voltage when working on the machine's electrical equipment.

- | | |
|--|---|
| Pneumatics | <ul style="list-style-type: none">• Check all lines/cables, hoses and screw connections regularly for leaks and any external signs of visible damage. Have damage repaired immediately.• Depressurize system sections and pressure lines to be opened before beginning repairs.• Properly route and install hydraulic lines. Check for leaks after installation. |
| Oils, greases and other chemical substances | <ul style="list-style-type: none">• Observe product-related safety regulations when handling oils, greases and other chemical substances. Refer to the manufacturer's safety data sheets for this information and wear the appropriate protective equipment.• Do not allow any auxiliary and operating materials to come into contact with skin or clothing. Wear personal protective equipment.• Immediately clean up any leaked operating materials using a suitable binding agent or a cloth. There is a risk of slipping.• Never allow any substances that pose a threat to the groundwater to get into the soil or enter the sewer system. Collect substances that pose a threat to groundwater.• Separately collect and properly return oils, greases and other chemical substances in accordance with the applicable national regulations. |
| Residual risks | <ul style="list-style-type: none">• Direct or indirect contact with live parts, in particular in the switch unit or at connections. Only a qualified electrician may work on the electrical equipment. Always keep the switch unit closed when the machine is in operation.• Danger posed by touching hot surfaces on the workpiece. Wear mandatory personal protective equipment.• Risk of falling posed by improperly installed cables. Properly install cables.• Risk of slipping posed by leaking operating material. Keep your workplace clean and immediately clean up leaks (or have leaks cleaned up).• Injury due to falling parts. Only use appropriate means to lift heavy parts. |

2.7 Safety labels



Warning against dangerous electrical voltage

Touching live parts can result in immediate death. Covers (e.g. hoods and doors) which are marked with this symbol may only be opened by qualified electricians after switching off the relevant operating voltage (input terminal voltage, operating voltage and external input terminal voltage).

3 Intended use

- Use** The TP EM I Vulcanizing Machine is only intended for the following work:
- Vulcanizing (curing) damaged areas filled with raw rubber on truck tyres, tractor tyres and in particular EM tyres (OTR)
 - Pressing multiply repair patches on the inside of the tyre of EM tyres

The TP EM I Vulcanizing Machine can be used for the following tyre sizes:

- Truck tyres from size 11.00 or comparative sizes
- Tractor tyres from size 11.2 or comparative sizes
- EM tyres from size 14.00-20 to size 33.25-35

As part of the intended use, you should read these Operating Instructions and comply with all information prescribed within the Operating Instructions, in particular the safety instructions.

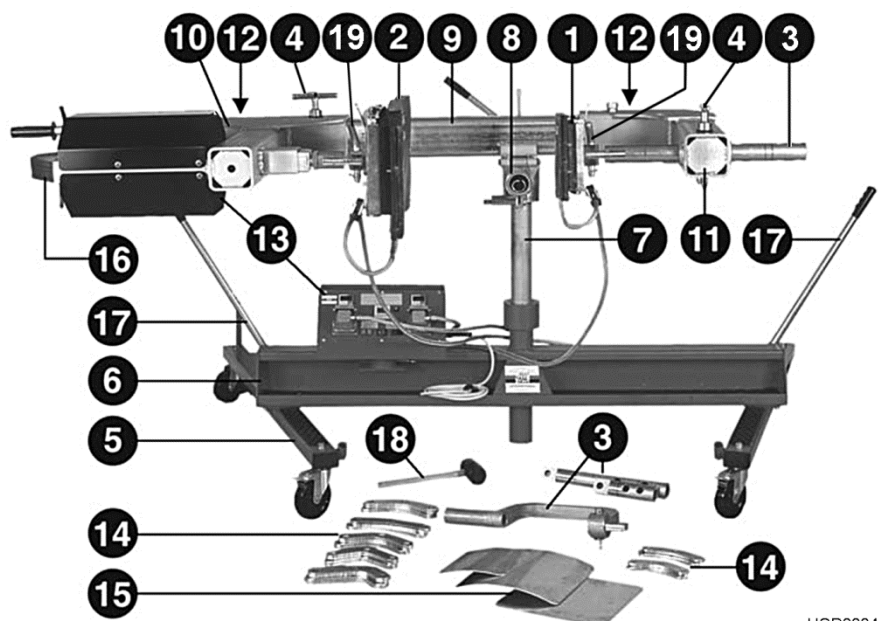
Any further usage or usage which goes beyond the defined scope of usage is considered as improper.

- Improper use** The application of veneers is considered improper use.
Use as a hose crimper is considered improper use.
Use as a gluing press is considered improper use.

- Exclusion of liability** Only the operator of the machine shall be held liable for all damages to persons and property arising from inappropriate use.

4 Brief description

4.1 Setup



HOR00046

Bild 1 TP EM I Vulcanizing Machine (complete package contents for the machine)

- 1 Inner heating plate
- 2 Outer heating plate
- 3 Heating plate holder for inner heating plate, 180 mm / 395 mm / 575 mm
(Accessory: truck tyre adapter)
- 4 Retaining bolt
- 5 Lower crossbar (chassis)
- 6 Center crossbar with tool tray
- 7 Hydraulic lifting/lowering device
- 8 Inclining/tilting mechanism
- 9 Longitudinal frame
- 10 Right frame section
- 11 Left frame section
- 12 Adjustment unit for right frame section
- 13 Pressure unit and control unit
- 14 Contour segments
- 15 Heating plates
- 16 Guard bracket
- 17 Operating lever
- 18 Rubber mallet
- 19 Retaining bolt

The TP EM I Vulcanizing Machine consists of the main structural components:

- Machine frame (Bild 1/9, 10 and 11)
- Pressure unit and control unit (Bild 1/13)
- Lifting/lowering device (Bild 1/7)
- Inclining/tilting mechanism (Bild 1/8)
- Heating plates (Bild 1/1 and 2)

4.1.1 Machine frame

The machine frame consists of the following components:

- Longitudinal frame (Bild 1/9)
- Left frame section (Bild 1/11)
- Right frame section (Bild 1/10)
- Retaining bolt (Bild 1/4)
- Adjustment unit for right frame section (Bild 1/12)

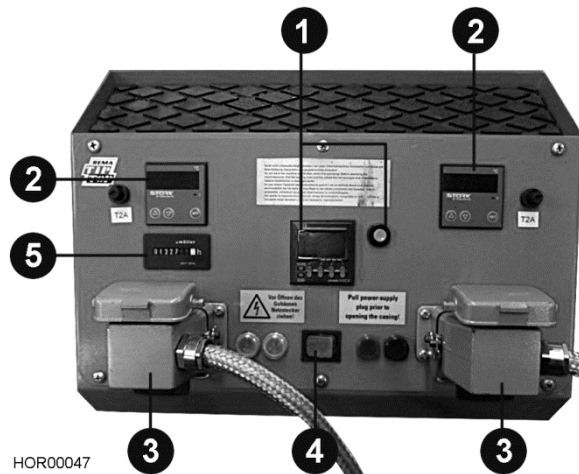
The longitudinal frame (Bild 1/9) consists of a rectangular tube and connects to the right and left frame section (Bild 1/10 and 11). The adjustment unit (Bild 1/12), retaining bolts (Bild 1/4) and holes can be used to adjust frame sections to the desired distance.

The right frame section (Bild 1/10) is used to attach the pneumatic pressure chamber of the pneumatic pressure unit (Bild 1/13). The outer heating plate (Bild 1/2) is attached next to the pressure unit with a retaining bolt (Bild 1/19).

The left frame section (Bild 1/11) is used to attach the inner heating plate (Bild 1/1). The inner heating plate is attached to the left frame section with a heating plate holder (Bild 1/3) and a retaining bolt (Bild 1/4 and 19).

The distance between the heating plates can be adjusted in order to adapt the heating plates to the tyres that are to be vulcanized.

4.1.2 Pressure unit and control unit



HOR00047

Bild 2 Control unit

- 1 Electronic timer and start button
- 2 Electronic temperature controller with fuse
- 3 Connection sockets for both heating plates
- 4 Illuminated on/off switch for the machine
- 5 Operating hour counter



HOR00048

Bild 3 Pressure unit

- 6 Hand lever valve
- 7 Guard bracket
- 8 Pressure relief safety valve (10 bar) (140 PSI)
- 9 Pressure gauge for operating pressure
- 10 Control valve for operating pressure (4–8 bar) (60–115 PSI)
- 11 Compressed air connection
- 12 Pneumatic pressure chamber (air bellows)

The purpose of the control unit, which consists of a metal housing, is to distribute the electrical current. An electronic timer equipped with a start button for operating the machine (vulcanization) (Bild 2/1), two connection sockets (Bild 2/3) for both heating plates, one illuminated on/off switch for the machine (Bild 2/4), two temperature controllers (Bild 2/2) and one operating hour counter (Bild 2/5) are built into the control unit.

The pressure unit primarily consists of the pneumatic pressure chamber (air bellows) (Bild 3/12), hand lever valve (Bild 3/6), control valve for the operating pressure (Bild 3/10), pressure gauge for operating pressure (Bild 3/9), compressed air connection (Bild 3/11), pressure relief safety valve (Bild 3/8) and guard bracket (Bild 3/7).

The pressure unit is used to generate the pneumatic operating pressure.



Further descriptions of the electronic timer, the temperature controller incl. ground-fault monitoring system (GF) and the operating hour counter can be found in Sections 4.1.5 to 4.1.7.

4.1.3 Lifting/lowering device, inclining/tilting mechanism, rotating device

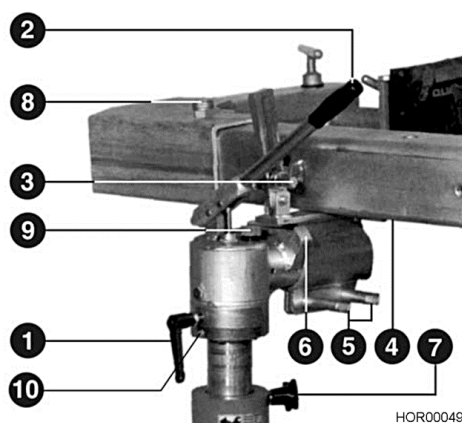


Bild 4 Lifting/lowering device, inclining/tilting mechanism, rotating device

- 1 Valve for hydraulic lifting/lowering device
- 2 Pump lever for hydraulic lifting/lowering device
- 3 Clamping screw for tilting mechanism
- 4 Pivot point for the tilting mechanism
- 5 Clamping screw for inclining mechanism
- 6 Inclining limit stopper
- 7 Clamping screw for lifting, lowering and rotating
- 8 Bracket for truck heating plate holder
- 9 Filling/bleed screw
- 10 Oil drain plug

The machine frame can be adjusted to the respective position requiring repair on the tyre by using a hydraulic lifting/lowering device as well as an inclining/tilting mechanism and a rotating device.

4.1.4 Heating plates

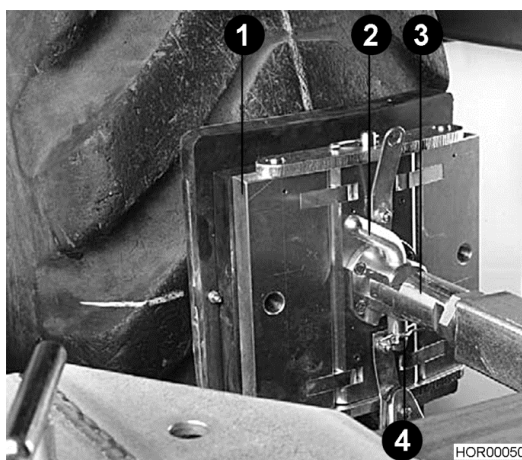


Bild 5 Heating plate

- 1 Outer heating plate (complete)
- 2 Retaining bolt

- 3 Heating plate holder
- 4 Locking pin

The heating plates (Bild 5/1) are attached to the pressure cylinder or frame section with a heating plate holder (Bild 5/3) and a retaining bolt (Bild 5/2) as well as with a locking pin (Bild 5/4). The heating plates are used to vulcanize (cure) repair patches on defective tyres.

4.1.5 Electronic timer

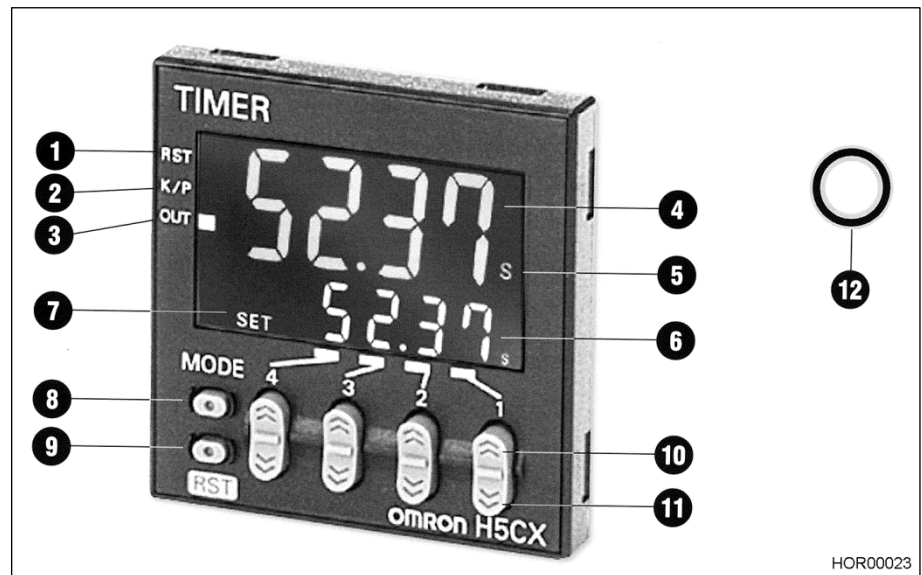


Bild 6 Electronic timer

- 1 Reset display (orange)
- 2 Button lock display (orange)
- 3 Control output display (orange)
- 4 ACTUAL value
- 5 Time unit display
- 6 TARGET value (green)
- 7 TARGET value 1, 2 display

Controls:

- 8 Mode/Menu button (switching of modes and settings)
- 9 Reset button (ACTUAL value and output are reset)
- 10 UP buttons 1 to 4
- 11 DOWN buttons 1 to 4
- 12 Start button for machine operation/vulcanization (to the right of the timer)

The TP EM I has an electronic timer with remaining time memory. The timer is used to set the TARGET value. After pressing the start button on the ACTUAL display, vulcanization (curing/heating time) counts down to the value 00.00. If there is a power failure or the machine is disconnected from the power supply during vulcanization, the remaining vulcanization (curing/heating) time is stored so that it automatically starts counting down the remaining time after restoration of the power supply.



To operate and set the timer, see Section 7.3.8.

4.1.6 Temperature controller and ground-fault monitoring system (GF)



Bild 7 Temperature controller

- 1 LED display field for TARGET value, ACTUAL temperature and fault signal
- 2 LED for switching state
- 3 SET button
- 4/5 ON/OFF button for TARGET value setting

The electrically powered heating system of the unit is controlled by two separate temperature controllers. In addition to the controller function, each controller is equipped with an internal temperature limiter unit which switches off the respective heating circuit when the preset limit value of 215°C/430°F is exceeded. The red LED display (Bild 7/2) shows the controller's current switching state.

Red LED ON = heating system ON, controller contact closed

Red LED OFF = heating system OFF, controller contact open

In addition to the temperature monitoring system, the machine has a built-in ground-fault monitoring system (GF) that also protects both heating circuits.

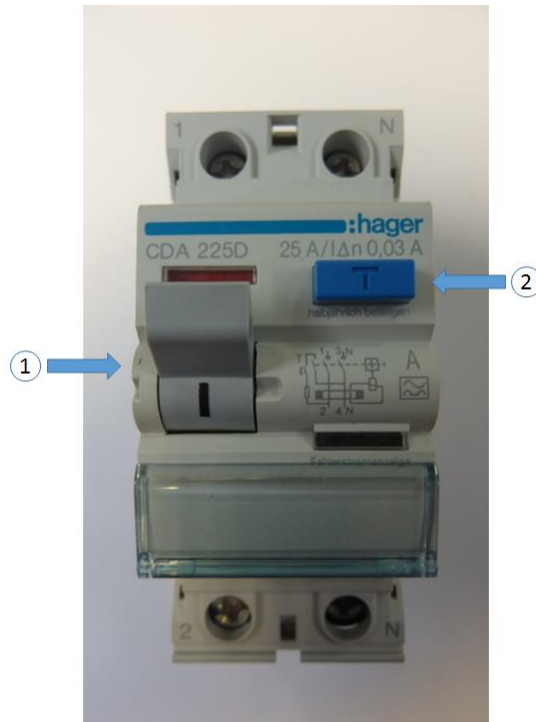


Bild 8 Ground-fault circuit interrupter (GFCI)

- 1 ON/OFF button
- 2 Test button "T"

4.1.7 Operating hour counter

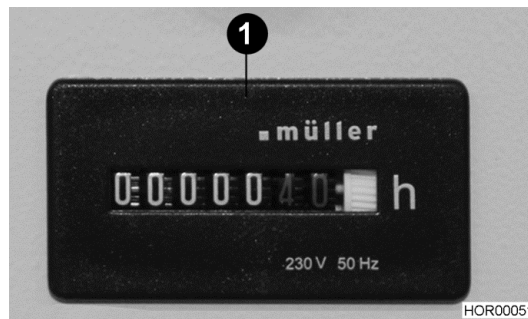


Bild 9 Operating hour counter

- 3 Operating hour counter

The machine has an operating hour counter (Bild 9/1) in the front panel of the control unit. The operating hours are recorded using an analog counter.

The operating hour counter makes it possible to properly observe the pre-determined service intervals for the installed electronic components.

4.2 Function

The TP EM I Vulcanizing Machine consists of a mobile lower part on which a three-part machine frame, which can swivel and be adjusted on all sides, is attached. The machine frame can be adjusted to the respective position requiring repair on the tyre by using a hydraulic lifting/lowering device. The two heating plates, which can be adapted to the different tyre contours, work with the hydraulic clamping unit to generate the necessary vulcanization parameters: pressure and temperature.

The tyre with attached repair patch or filled raw rubber is clamped between the two heating plates. The timer on the control unit is used to switch on both heating plates.

The heat and pressure of the heating plates vulcanize (cure) the repair patch onto the tyre. The timer automatically switches off the heating plates once the preselected curing/heating time expires. The vulcanizing machine can then be removed from the tyre after the mandatory cooling time.

4.2.1 Temperature controller function

The electronic temperature controller regulates and monitors the temperature of the respectively connected heating mat using two separate temperature sensors.

The target value setting specifies the temperature to be reached after the heat-up phase and to be maintained on average during vulcanization (curing time). Depending on the temperature, the controller turns the power supply to the heating mat either on or off (on/off principle). The second temperature sensor serves as the temperature limiter unit in combination with the limiter board which is integrated in the controller. If the heating mat's temperature at the sensor point goes above 215°C/430°F (e.g. breakdown of the temperature controller) while the machine is in operation, the limiter switches off the affected heating circuit (LED turns off). After checking the system components which triggered the machine to switch off (e.g. heating mat, heating mat cable, etc.) the safety shut-off can only be cancelled by briefly disconnecting the equipment from the power supply, cooling the heating plate down by more than 50°C/100°F, and pressing the start/stop button on the timer.

4.2.2 Function of the ground-fault monitoring system (GF)

In addition to the temperature monitoring system, the EM I has a built-in ground-fault monitoring system (GF) that also protects the heating circuits. The GFCI turns off the entire heating system in the case of a current flow of > 30 mA between the heating mat surface and heating conductor. After checking the heating mat as well as the supply cable for damage/wear, the system shutdown can be cancelled using the ground-fault monitoring system's on/off switch (Bild 8/1) which is located inside the control box (switch position "I").

The ground-fault circuit interrupter can be tested by pressing the test button "T" (Bild 8/2). The circuit interrupter works properly when the on/off switch (Bild 8/1) flips over to the "0" position.

4.3 Accessories

The following accessories are included in the package contents of the TP EM I Vulcanizing Machine:

- Operating lever (2 pcs)
- Contour segments, inner (3 pairs)
- Contour segments, outer (6 pairs)
- Heating plates (3 pcs)
- Heating plate holder for inner heating plate (3 pcs)
- Toolkit including:
 - Rubber mallet
 - SW 17 square wrench



Also see Bild 1 above.

The following accessories are not included in the package contents of the TP EM I Vulcanizing Machine:

- EM truck tyre adapter
- Heating element holder for truck tyre adapter
- Locking pin for truck tyre adapter



Also see the spare parts list in the Annex.

5 Technical data

5.1 General information

Designation..... TP EM I Vulcanizing Machine

5.2 Dimensions and weights

Max. dimensions in operation
(Length x width x height) approx. 2,550 x 2,110 x 1,770/1,370 mm
Max. tension of the pressure unit approx. 200 mm
Max. distance of tipping/tilting mechanism approx. 400 mm
Max. space between heating plate center and the machine's longitudinal
frame..... approx. 450 mm
Dimensions of inner heating plate approx. 220 x 220 mm
Dimensions of exterior heating plate approx. 350 x 350 mm
Machine weight.....approx. 270 kg
Package weightapprox. 50 kg

5.3 Performance

Operating temperatureapprox. 175°C/350°F
Pneumatic..... pressure system,
max. operating pressure 8 bar (115
PSI)
> 30000 N (ca. 3 t)
Operating pressure, adjustable4–8 bar (60–115 PSI)
Power consumption approx. 1 kW

5.4 Load ratings

Voltage.....230 V
Compressed air system.....10–12 bar (140–170 PSI)

5.5 Special features

Temperature control electronic, via digital temperature display
for each heating plate (two-circuit safety control
system)
Heating control electronic timer
with remaining time
memory, 0–99 h



Technical data modifications which serve the purpose of further technical development remain reserved.

6 Transport, storage, setup, disassembly

6.1 Transport

Package
Inspection upon delivery

The TP EM I Vulcanizing Machine is delivered in two wooden boxes. The wooden boxes have been specially treated and are also suitable for export. After receiving the package, immediately inspect the vulcanizing machine and accessories for shipping damage and ensure all pieces are there. Immediately report any damage, defects or missing parts to the transport company and supplier.

6.2 Storage

Only store the TP EM I Vulcanizing Machine in a dry place. There is no storage limitation.

6.3 Setup

6.3.1 Conditions for setup location

Only store the TP EM I Vulcanizing Machine on level, solid ground.

6.3.2 Assembly

- Take the machine out of the packaging, check for possible transport damage and put together according to the assembly instructions.
- Check load ratings.



There is no guarantee that the control unit will work when the input voltage is below 95 V or 210 V. Have a qualified electrician carry out the connection.



Observe the exact phase wiring when using the machine with 110 V power supply systems.

- Replace the transport screw with lifting/lowering device's bleed screw.

6.3.3 Connecting



Danger

Dangerous voltage

Touching live parts can result in serious injury or death.
Only have a qualified electrician install power outlets.



Caution

Risk of tripping

Lay out supply cables in such a way to prevent tripping.

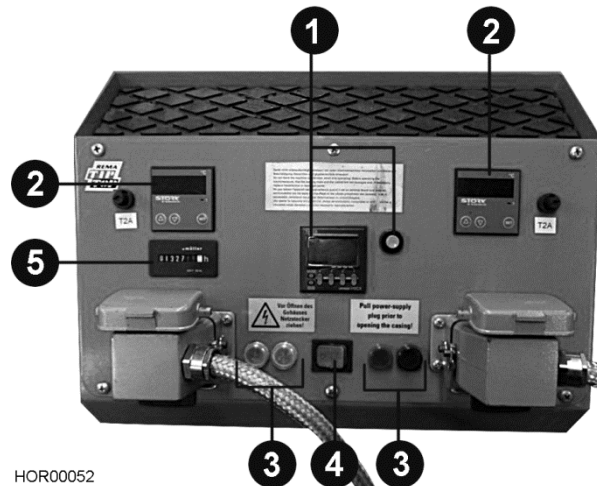
- Check the cable and plug for any damage.
- Insert the heating plate cables into the switch unit's sockets.

6.4 Disassembly

- Shut down the TP EM I Vulcanizing Machine and unplug all cables.
- If the TP EM I Vulcanizing Machine is no longer required for use, dispose of the TP EM I Vulcanizing Machine's parts in accordance with national regulations.

7 Initial operation, operating, decommissioning

7.1 Operating elements and display



HOR00052

Bild 10 Control unit

- 1 Electronic timer and start button
- 2 Electronic temperature controller with fuse
- 3 Indicator lights
- 4 Illuminated on/off switch for the machine
- 5 Operating hour counter



HOR00053

Bild 11 Pressure unit

- 6 Hand lever valve
- 7 Pressure gauge for operating pressure
- 8 Control valve for operating pressure (4–8 bar) (60–115 PSI)

The TP EM I Vulcanizing Unit is operated using the control unit and the pressure unit.

Electronic timer	The timer (Bild 10/1) is used to automatically turn the heating plates on/off after the preset time has elapsed.
Start button	The start button (Bild 10/1) is used to start operating the machine (vulcanizing process).
Temperature controller	Both temperature controllers (Bild 10/2) are used to control the electronically operated heating system of the heating plates.
On/Off machine switch	The machine switch (Bild 10/4) is used to turn the TP EM I machine on and off. The machine switch illuminates when in the "ON" position.

Indicator lights	The control unit's indicator lights (Bild 10/3) show the operating status of the machine.
Operating hour counter	The operating hour counter (Bild 10/5) shows how many hours the machine has been switched on during its life cycle.
Hand lever valve	The hand lever valve (Bild 11/6) is used to open or close the pneumatic pressure unit (clamping unit).
Control valve	The control valve (Bild 11/8) is used to set the operating pressure.
Pressure gauge	The pressure gauge (Bild 11/7) shows the current operating pressure.

7.2 Initial operation

After setting up and connecting the machine properly (see Section 6.3), carry out the following steps for the initial operation of the TP EM I Vulcanizing Machine:

- Connect the machine to the compressed air system and power supply.
- Check that all safety bolts are perfectly put in place.
- Set the control valve to approx. 8 bar (Bild 11/8).
- Use the hand lever valve to close the pressure unit (Bild 11/6).
- Turn the control valve (Bild 11/8) to slowly increase the operating pressure from 10 to 11 bar.



Pressure relief valve must activate at max. 11 bar (150 PSI). If the pressure relief valve is not activated at max. 11 bar (150 PSI), disconnect the machine from the power supply and compressed air system. Then have a REMA TIP TOP technician check the machine.

- Turn the control valve (Bild 11/8) to increase the operating pressure from 4 to 8 bar.
- Switch on the machine and heat up to operating temperature for at least 30 minutes under control. Make sure that the controller functions smoothly (recognizable on the indicator lights and temperature controller's temperature display (Bild 10/2)). If malfunctions occur: Disconnect the machine from the power supply, secure against being restarted and have it checked by a REMA TIP TOP technician.

The TP EM II Vulcanizing Machine is ready for use.

7.3 Operation

7.3.1 Vulcanization of damaged areas filled with raw rubber



HOR00054

Bild 12 Hooking the tyre into the repair stand

**Danger**

Danger due to overturning, falling or rolling large tyres

- Only use suitable and technically sound lifting equipment with sufficient carrying capacity.
- Never stand or work under suspended loads.
- Only place tyres and equipment on even surfaces.
- Observe accident prevent regulations.
- Observe the safety regulations of the auxiliary equipment used.

**Attention**

Make sure that the tyre is not damaged by lifting/holding devices.

- Use a crane or forklift to hook the tyre into the REMA TIP TOP EM repair stand (Item No. 517 3554).
- Lift the tyre until it can freely move and then turn the area to be repaired to the approx. the "3 o'clock position" (Bild 12).
- If no EM repair stand is available or its use is not possible due to the tyre dimensions: Use a crane or forklift to put the tyres in the required position and use several wooden wedges to secure them from tipping over or rolling away.

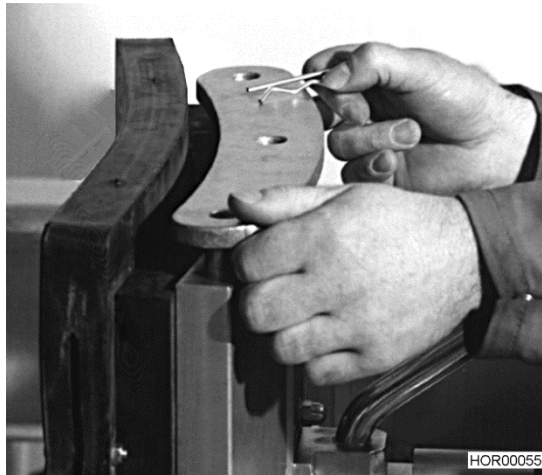


Bild 13 Replacing the heating plate contour segments



- Only operate the machine with completely assembled contour segments (2 per heating plate).
- Check locating bolts for wear and damage every time upon replacing each segment. Immediately replace defective parts.

- Remove the upper contour segment's retaining spring (Bild 13).
- Lift off contour segment and then repeat the process for the lower contour segment.



Bild 14 Replacing the heating plate contour segments

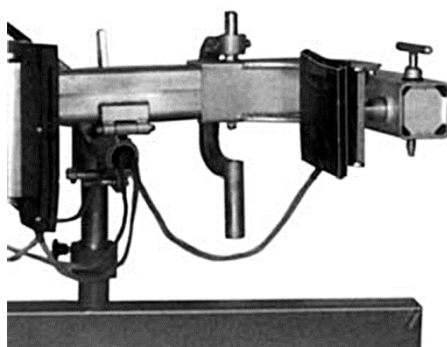
- Put the previously selected contour segments into place by adjusting the heating plate blades (use the operating lever for the outer heating plate) and press the retaining spring (Bild 14).



HOR00057

Bild 15 Positioning the right frame section

- Return the pneumatic pressure unit to its initial position by using the hand lever valve (open position).
- Remove the right frame section's retaining bolts and put them in the storage hole.
- Return the right frame section with the square socket wrench to the right until it stops (Bild 15).



HOR00058

Bild 16 Positioning the heating plate holder

- Remove the left heating plate holder's retaining bolt and push the heating plate holder towards the back (Bild 16).



This, however, is not necessary for a built-in truck tyre adapter (option).

- If necessary, replace the heating plate holder (see Section 7.3.3).



Bild 17 Positioning the machine

- Use the operating lever to move the tyre laterally and use the hydraulic lift/lowering device or the inclining/tilting mechanism to align the position of the two heating plates with the area to be repaired (Bild 17).



To operate the lifting/lowering device, the inclining/tilting mechanism and the rotating device, see Sections 7.3.4, 7.3.5, 7.3.6 and 7.3.7 respectively.



Bild 18 Positioning the left frame section



Danger

Danger of machine tipping over

Make sure that the machine is securely positioned before all position changes.

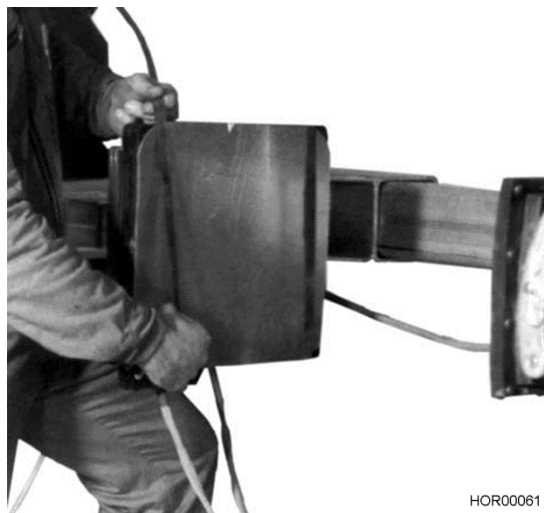
**Danger****Danger due to overturning, falling or rolling large tyres**

- Make sure that the tyre is securely positioned using the appropriate brackets/stands.
- During the clamping process, unplug the heating mat supply cable from the control unit.

- Move the chassis and rotate the upper part of the machine in such a manner as to guide the left frame section into the tyre (Bild 18).
- Move the heating plate holder with the inner heating plate as far as possible towards the inside of the tyre and lock into place using safety bolts (Bild 18).



Frame part must not rest on the tyre. If necessary, replace the heating plate holder (see Section 7.3.3).



HOR00061

Bild 19 Attaching the contour aluminum plate to the outer heating plate

- Hold the matching contour aluminum plate between the outer heating plate and the area to be repaired and attach to the heating plate (Bild 19) using two rubber rings (cut from used truck tyre tube).



For larger tyre punctures, also use the aluminum heating plates to prevent any uneven surfaces on the inside of the tyre.



To prevent thermal radiation, make sure the contour aluminum plate is not larger than the heating bag.

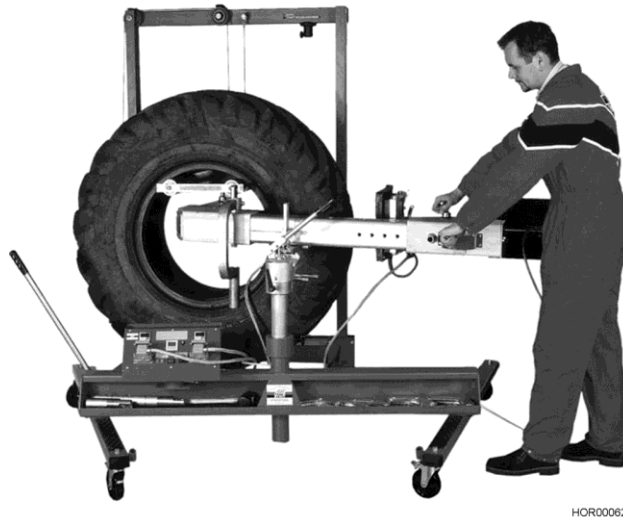


Bild 20 Positioning the right frame section

- Use the square socket wrench and frame adjuster to bring the right frame section as close as possible to the tyre and then use retaining bolts to lock it into place in the position closest to the tyre (Bild 20).

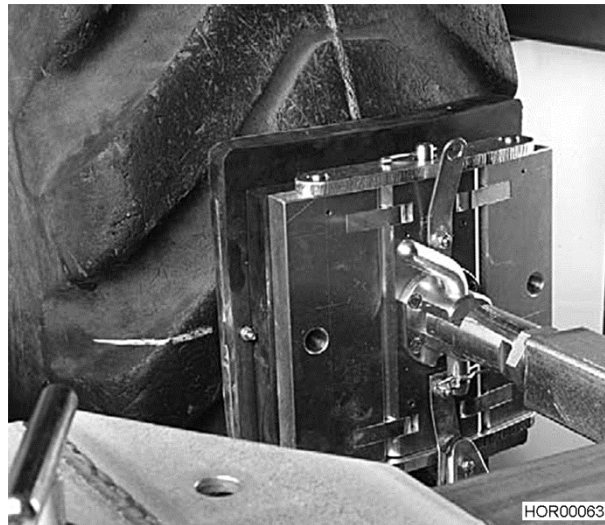
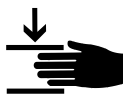


Bild 21 Positioning the inner and outer heating plates

- Use the guide lines provided on the tyre to center the inner and outer heating plates on the area to be repaired (Bild 21).
- If necessary, use the adjusting devices to adjust the position of the upper part of the machine (see Sections 7.3.4 to 7.3.7).



Bild 22 Operating the control unit/closing the pneumatic pressure unit



Caution

Risk of crushing

- Do not reach between the tyre and heating plate during the closing process.
- Check safety bolts.
- Make sure that the power supply corresponds to the load ratings on the rating plate.

- Connect control unit to power supply.
- Check that all retaining bolts are perfectly put in place.
- Adjust control valve for operating pressure (Bild 11/8) to required vulcanization pressure.
- Close the pneumatic pressure unit to its initial position by using the hand lever valve (Bild 11/6).



Throughout the vulcanization process, leave the hand lever valve (Bild 11/6) in the “pressure/automatic resetting device” position (Bild 22).

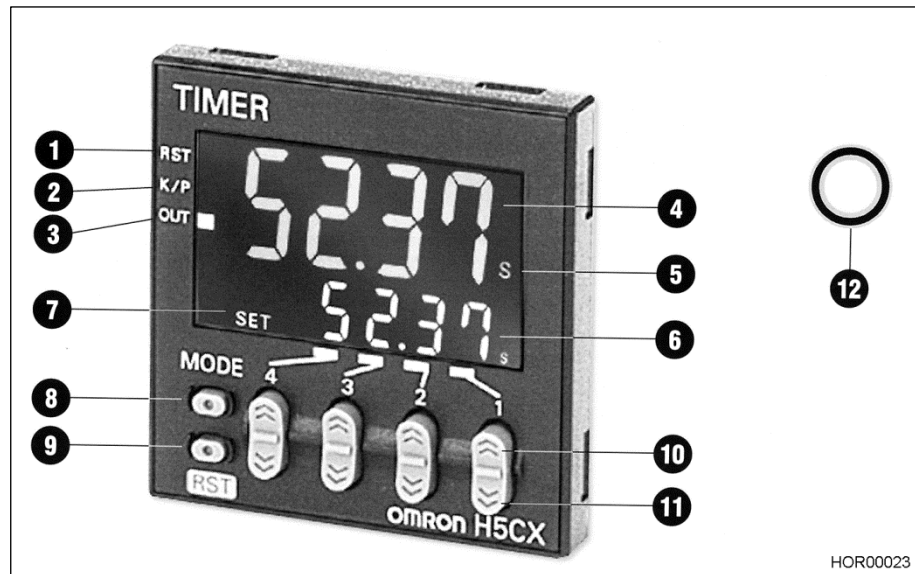


Bild 23 Setting the electronic timer



- Before using, ensure heating mats, cables and temperature controller(s) are working and not damaged.
- Immediately replace damaged parts.
- Never leave the machine unattended while in operation.

- Program the curing/heating time as the TARGET value in the timer. (see Section 7.3.8).
- Check the TARGET value setting and function of the temperature controller (see Section 7.3.9 and Section 4.2.1).
- Push the start button (Bild 23/12). Machine is in operation.



Bild 24 Release pneumatic pressure unit



The timer automatically switches off the machine after the preset curing/heating time has elapsed.

- Set the machine switch (Bild 10/4) to "0" (off).
- Disconnect machine from power supply.

- Use the hand lever valve (Bild 24) to release the pneumatic pressure unit and return to its original position.
- Detach the machine from the tyre, swing it out of the tyre and move to the appropriate place.
- Check that the repair area has been repaired properly.



Do not use water, etc. to expedite the cooling of the repair area.

7.3.2 Application of multiply repair patches



HOR00054

Bild 25 Hooking the tyre into the repair stand



Danger

Danger due to overturning, falling or rolling large tyres

- Only use suitable and technically sound lifting equipment with sufficient carrying capacity.
- Never stand or work under suspended loads.
- Only place tyres and equipment on even surfaces.
- Observe accident prevent regulations.
- Observe the safety regulations of the auxiliary equipment used.



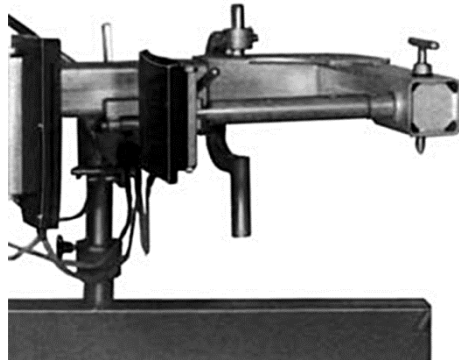
Attention

Make sure that the tyre is not damaged by lifting/holding devices.

- Use a crane or forklift to hook the tyre into the REMA TIP TOP EM repair stand (Item No. 517 3554).
- Lift the tyre until it can freely move and then turn the area to be repaired to the approx. the "3 o'clock position" (Bild 25).
- If no EM repair stand is available or its use is not possible due to the tyre dimensions: Use a crane or forklift to put the tyres in the required posi-

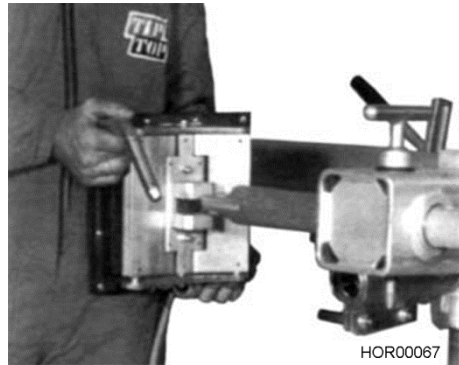
tion and use several wooden wedges to secure them from tipping over or rolling away.

7.3.3 Replacing the heating plate holder



HOR00066

Bild 26 Replacing the heating plate holder



HOR00067

Bild 27 Replacing the heating plate holder



Danger

Danger of falling parts

- Have a second person help you replace the heating plate or heating plate holder.
- Secure parts against falling.
- Wear safety shoes.



Attention

Do not bend the supply cable or subject it to any tension.



The machine is equipped with three different heating plate holders. Select heating plate holder based on the size of the tyre and the location of the damaged area (sidewall, tread or shoulder).

- Remove retaining spring.
- Remove the inner heating plate's retaining bolts and hold onto the heating plate at the same time. Then put the heating plate somewhere suitable (Bild 26 and Bild 27).
- Remove heating plate holder from its guide.
- Insert required holder in reverse order.
- Reattach the heating plate and insert the retaining spring.

7.3.4 Operate the lifting and lowering device

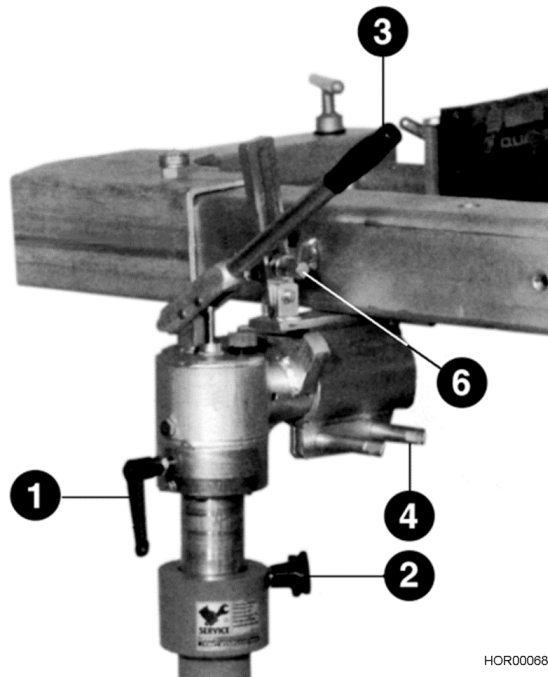


Bild 28 Lifting and lowering device

Lifting:

- Close valve (Bild 28/1).
- Open the clamping screw (Bild 28/2).
- Bring the upper part of the machine to the required working height with the pump lever (Bild 28/3).

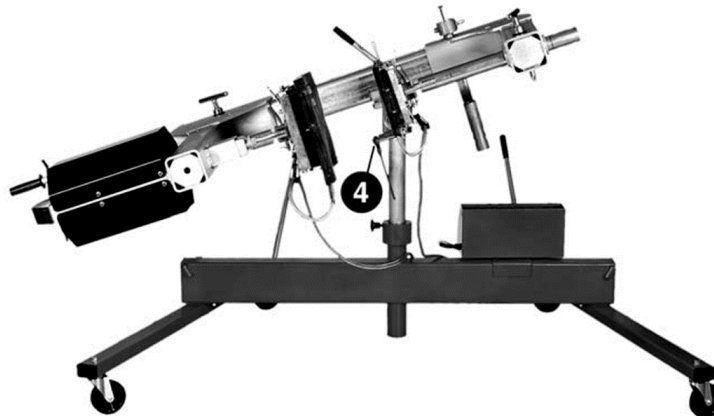
Lowering:

- Open the clamping screw (Bild 28/2).
- Slightly open the valve (Bild 28/1) (turn counterclockwise).
- Lower the upper part of the machine to the desired height and close the valve again.



Tighten the clamping screw (Bild 28/2) when the machine is moved outside the tyre.

7.3.5 Operating the inclining mechanism (for tread or shoulder repairs)



HOR00069

Bild 29 Inclining mechanism



Caution

Risk of crushing

- Do not reach between movable frame parts.
- Seek assistance when carrying out machine settings.



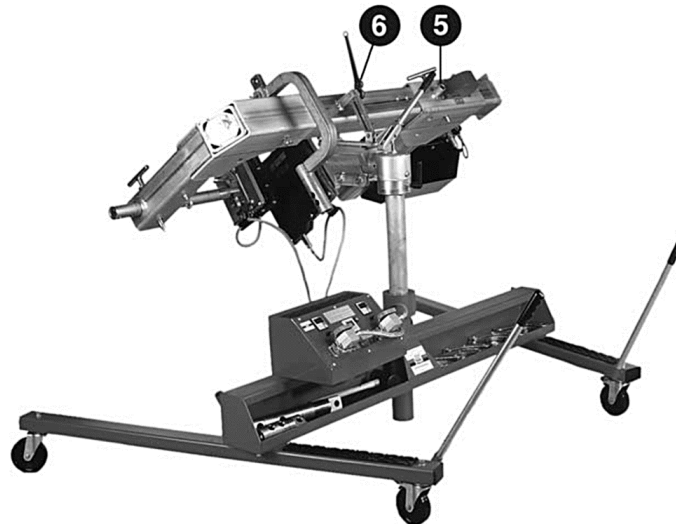
Attention

Risk of damage to the machine due to high torques

Seek assistance when carrying out machine settings.

- Use the square socket wrench to slightly open the clamping screw (Bild 28/4 or Bild 29/4).
- Insert operating lever at the longitudinal frame end.
- Tilt the upper part of the machine based on the area to be repaired.
- Close the clamping screw again.

7.3.6 Operating the tilting mechanism (for sidewall repairs)



HOR00070

Bild 30 Tilting mechanism



Danger

Danger of machine tipping over and falling parts

- Make sure that the machine is securely positioned before all position changes.
- Use retaining bolts to lock frame sections and heating plate holders into place to prevent them from falling out.



Caution

Risk of crushing

- Do not reach between movable frame parts.
- Seek assistance when carrying out machine settings.



Attention

Risk of damage to the machine due to high torques

Seek assistance when carrying out machine settings.

- Insert the control lever into one of the slots (Bild 30/5) provided on the front sides of the right frame section.
- Slowly open the conical clamping screw (Bild 28/6 or Bild 30/6) and move the upper part of the machine into the required position.
- Close the clamping screw (Bild 28/6 or Bild 30/6) and remove the operating lever.

To put the upper part of the machine back in the horizontal position:

- Insert operating lever into slot on right frame section.
- Press the control lever down and open the clamping screw (Bild 28/6 or Bild 30/6).
- Close the clamping screw again (Bild 28/6 or Bild 30/6).

7.3.7 Operating the rotating device

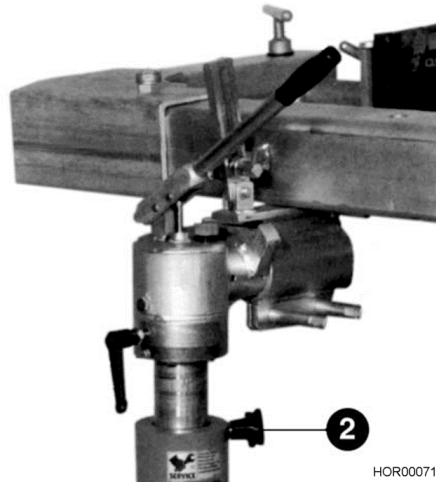


Bild 31 Rotating device



Danger of machine tipping over

- Make sure that the machine is securely positioned before all position changes.
- If necessary, seek assistance when carrying out machine settings.
- Only move frame parts individually. Do not loosen multiple clamping screws at once.



Risk of crushing

- Do not reach between movable frame parts.
- If necessary, seek assistance when carrying out machine settings.
- Only move frame parts individually. Do not loosen multiple clamping screws at once.

- Loosen clamping screw (Bild 31/2).
- Turn the upper part of the machine against the chassis and use the clamping screw to lock in the desired position.

7.3.8 Setting the electronic timer



Bild 32 Program the electronic timer (TARGET value setting)



Attention

The ACTUAL value display starts counting backwards once the machine is in operation (Bild 32/4).

The TARGET value setting (Bild 32/6) remains visible and unchanged.

If the reset button (Bild 32/9) or start button (Bild 32/12) is pressed again during vulcanization (curing time), the timer starts again from the beginning.



If there is a power failure or the machine is disconnected from the power supply during vulcanization (curing time), the remaining vulcanization time is stored so that it automatically starts counting down the remaining time after restoration of the power supply. If the disruption lasts more than 60 minutes, the remaining curing/heating time must be extended by half of the downtime, but must not be greater than the original curing/heating time.



The indicator light illuminates when the machine is in operation (Bild 32/3).



The last programmed TARGET value setting is displayed after connecting the machine to the power supply (Bild 32/6). The system is now ready for operation and can be programmed or started using this time.

■ Set the TARGET value as described in the following example.



The TARGET value of "11 hours and 30 minutes" (11.30) is used as the setting example.

Button (Bild 32)	Function	Result
Initial setting		00.00
10-4	Increasing the value of the first digit (example with the number 1)	<u>1</u> 0.00
10-3	Increasing the value of the second digit (example with the number 1)	1 <u>1</u> .00
10-2	Increasing the value of the third digit (example with the number 3)	11. <u>3</u> 0
10-1	Increasing the value of the fourth digit (example with the number 0)	11.3 <u>0</u>
11-4	Decreasing the value of the first digit	<u>0</u> 0.00
11-3	Decreasing the value of the second digit	0 <u>0</u> .00
11-2	Decreasing the value of the third digit	00. <u>0</u> 0
11-1	Decreasing the value of the fourth digit	00.0 <u>0</u>
9 or 12	The heating/vulcanization will start for the specified period of time.	The TARGET value is shown in the ACTUAL value display (Bild 32/4)

7.3.9 Setting the temperature controller

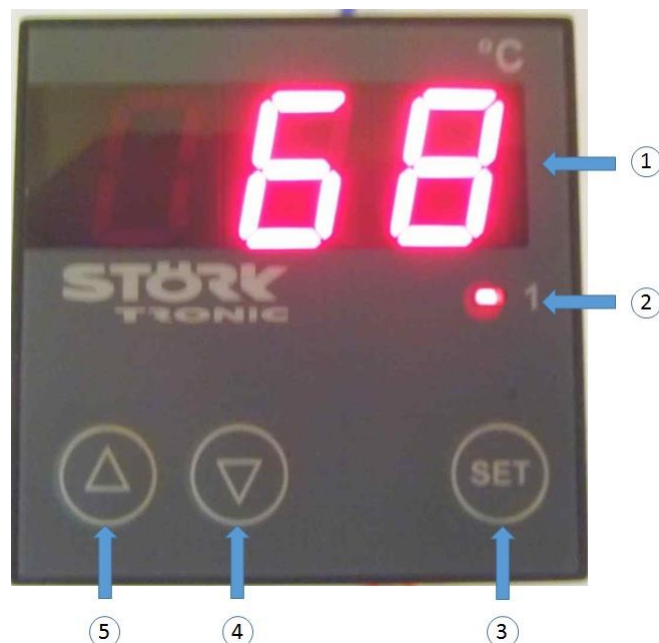


Bild 33 Temperature controller



Risk of electrical voltage

In the event of a GFCI-related system shutdown, disconnect the machine from the power supply before opening the switch contact (control unit).

Danger



Danger

Danger due to hot surface

- Immediately disconnect the machine from the power supply if the temperature limiter unit triggers a safety shutdown or there is an GFCI-related system shutdown again.
- Avoid contact with hot surfaces.



Attention

Immediately disconnect the machine from the power supply and inspect the machine components (e.g. heating mat incl. supply cable) for damage if the temperature limiter unit triggers a safety shutdown or there is an GFCI-related system shutdown again. Immediately replace damaged parts with original spare parts. Consult a REMA TIP TOP consultant and/or qualified electrician to inspect the machine and repair it.



Attention

There is no guarantee that the control unit will work when the input voltage/power voltage is under 210 V.



Use the buttons (Bild 33/3, 4 and 5) to set the TARGET value on the first operating level.



Connect the machine to the power supply to check and set the temperature values! After configuring the settings, always release the **UP/DOWN** button first then the **SET** button!

Button pressed	Result
None	The ACTUAL value is displayed
SET (3)	The preset TARGET value is displayed
SET (3) and ↓ (4)	The TARGET value is decreased
SET (3) and ↑ (5)	The TARGET value is increased

7.4 Switching on

Requirements

The following requirements must be fulfilled:

- The vulcanizing machine is properly set up and connected.
- The tyre and machine are properly prepared; the timer and the temperature controller are set (see Section 7.3.1 or 7.3.2).



Attention

Never leave the machine unattended while in operation.

- Press the start button (Bild 2/1). Machine is in operation.

7.5 Decommissioning

No special measures are required for taking the machine out of service (decommissioning). The TP EM I Vulcanizing Machine cannot be operated after unplugging the switching unit's supply cable.

8 Maintenance



Warning

- Only carry out maintenance measures that are described in these Operating Instructions.
- Maintenance measures that are not described must be carried out by the manufacturer's service technician or, after consultation with the manufacturer, by a qualified expert.
- Make certain that, during all cleaning, maintenance work and inspections, the machine is disconnected from the power and protected against being restarted again.



Attention

The machine operator is responsible for carrying out maintenance activities at the specified intervals (see Section 8.1).

8.1 Maintenance plan

The machine is extremely reliable due to its design and the processed materials and parts, meaning maintenance must only be carried out at longer intervals. For safety and warranty reasons, damaged machine components must be immediately replaced with original spare parts from REMA TIP TOP. Only qualified personnel may carry out work extending beyond the scope of maintenance. Used oil and soiled cloths must be disposed of properly.

The required maintenance work and maintenance intervals can be found in the TP EM I Vulcanizing Machine's service booklet.

8.2 Repairs

8.2.1 Replacing the heating mats

- Unplug the supply cable from control unit.
- Turn the heating plate 180° (cable outlet facing up).
- Remove the locking screws and heating mat.
- Dust the new heating mat with REMA TIP TOP asbestos-free talcum powder (Order No. 593 0649).
- Put the heating mat in the heating bag. Pay attention to the position of the cable connection block when you do this.
- Tighten the locking screws by hand.

8.2.2 Replacing the heating bags

- Detach the heating mat (see Section 8.2.1).
- Use a skiving knife to detach the heating bag in the area vulcanized to the pressure pad.
- Buff the back of the new heating bag within the marked area, coat it with Thermopress MTR Solution (Art. No. 516 9207), let dry for approx. 10 minutes and then apply one layer of Thermopress MTR Rubber (Art. No. 516 1250).
- Evenly buff the center of the pressure pad, coat with Thermopress MTR Solution, let dry for approx. 10 min. and then apply one layer of Thermopress MTR Rubber.
- Fit flat contour segments on both heating plates.



The heating bag must only be positioned on the pressure pad in the marked vertical direction; otherwise, it is not possible to adjust the heating plate to the corresponding tyre contour.

- Install the heating mats in the heating bag and then center the heating bag on the pressure pad.
- Press the two heating plates together (8 bar) and cure for 90 minutes.

8.2.3 Changing the hydraulic oil of the lifting/lowering device's hydraulic pump



Observe local disposal regulations for used oil!

Before you begin working, make sure to have suitable collection containers and binding agents ready for any eventual oil spills.

- Completely lower the upper part of the machine.
- Remove the bleed screw (Bild 4/9) from the filling hole.
- Put an appropriate collection container (approx. 1 liter) under the drain plug (Bild 4/10). Remove the drain plug and drain the oil. After having drained the oil completely, put the oil drain plug back in.
- Use a funnel to add new hydraulic oil (SAE 5-10) up to 2 cm below the filling hole.
- Bleeding the hydraulic system: Lift the upper part of the machine by approx. 30 cm, open the drain plug by approx. 1/3 revolution. As soon as you can see the oil, close the drain plug again.
- Check the oil level again and screw bleed screw back in.

9 Defect, possible cause and solution



Danger

Dangerous voltage

In the event of a machine malfunction which cannot be determined precisely, immediately disconnect the machine from the power supply, safeguard against being put into operation again and consult a specialist to diagnose and repair the malfunction.

Only qualified personnel may carry out corrective actions on electrical equipment when the vulcanizing machine is disconnected from the power supply.



Attention

For all the listed defects, a new heating system or repeat repair may be necessary after fixing the cause of the error. Reassess if it's worth repairing the tyre or if the tyre is capable of being repaired.

Defect	Possible cause	Solution
No display on the timer	Connection to power supply interrupted	Check connection to power supply
	Machine was not used for a longer period of time, thereby discharging the auxiliary battery	Connect the machine to the power supply and check the clock again after approx. 1 hour
No temperature display on the digital controllers	Machine switch set to 0 (off)	Set machine switch to I (on)
	Power supply interrupted	Restore power supply
	Defective temperature controller	Replace the temperature controller
	Defective glass tube fuse	Replace glass tube fuse
Heating plate does not heat up (enough)	Defective temperature controller	Replace the temperature controller
	Safety temperature limiter switched off system	Check heating mat and supply cable, replace if necessary (see Section 8.2.1)
	F1H/F1L or L error message is displayed	Unplug power plug and connect to other heating mat. If F1H/F1L error continues to be displayed, replace temperature controller.
	Defective timer	Replace the timer
	Target value for temperature controller set too low	Set target value to 175°C/350°F
	Defective heating mat	Replace heating mat (see Section 8.2.1)
	Damaged supply cable connection to the heating mat	Replace heating mat (see Section 8.2.1)

Defect	Possible cause	Solution
	Machine switch set to 0 (off)	Set machine switch to I (on)
	No curing/heating time set	Set curing/heating time
	START button on timer not pressed	Press START button
	Safety temperature limiter activated	Check heating mat and supply cable, replace if required
		Disconnect machine from power supply and restart
	Ground-fault monitoring system activated	Press rocker switch on ground-fault monitoring system
	Connection to power supply defective	Have a qualified electrician check the connection
Tears in the heating bag	Signs of wear	Replace heating bag
Heating mat damaged	Signs of wear	Replace heating mat, regularly dust with talcum powder
Operating pressure, adjustable 4–8 bar (60–115 PSI)	Operating pressure of compressed air supply too low	Increase operating pressure of compressed air supply
	Supply line cut off/damaged	Check supply line

Alarm function 1 of the temperature controller:

If the F1H symbol flashes on red LED display, there is a sensor break in the heating mat or connection cable.

In this case, the heating mat linked to the controller is then automatically switched off for safety reasons.

Important:

When this alarm is displayed, it indicates a defect in the electric system.

The following parts must be checked:

a) Heating mat cable:

Defective or destroyed because:

- plug connections to the control box are loose or not secured?
- it has been crushed or there is a sensor break?
- the cable has been pulled out of the heating mat outlet?

b) Heating mat:

Defective because:

- it has been crushed or there are scorched parts?
- of wear?

c) Electronic temperature controller:

Defective because:

- internal cable connections are loose?
- external effects, such as impact, etc.?

Alarm function 2 of the temperature controller:

If the F1L symbol or an L flashes on the red LED display, the heating mat's sensor has short-circuited.

Important:

When this alarm is displayed, it indicates a defect in the electric system. Disconnect the machine from the power supply and have a REMA TIP TOP technician determine the cause of the defect.

The controller will work again once the defect has been fixed. The alarm will then turn off and the actual value will be displayed. If the alarm lights up again, disconnect the machine from the power supply and have a REMA TIP TOP technician determine the cause of the defect.

Important information:

Customer changes to factory settings are not allowed as this may lead to hazardous changes in the functions.

10 Customer Service

Regular customer service is not required if the operator performs the prescribed inspection and maintenance work reliably.

Our Customer Service is available to answer any technical questions you may have about the machine and the use of its system technology.

You can contact our Customer Service at the following address:

REMA TIP TOP GmbH
Business Unit Automotive
Gruber Straße 63
85586 Poing
Telephone: 08121 707-333
08121 707-225
Fax: 08121 707-349
Email: tpotr.service@tiptop.de

11 Spare parts



Danger

Dangerous voltage

Only have qualified personnel carry out work on current-carrying parts.



Warning

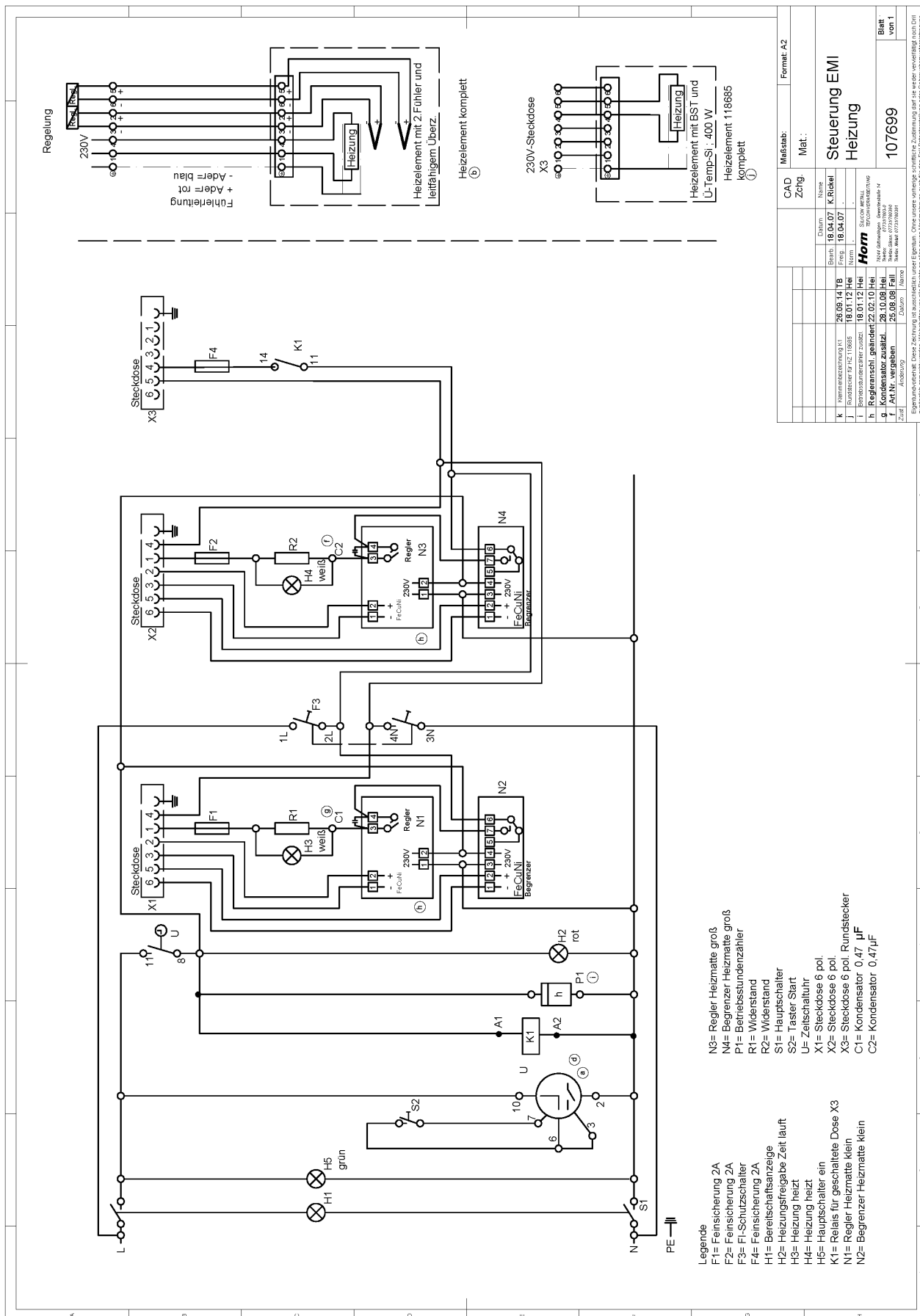
Only use original spare parts or spare parts which have been approved by the manufacturer.

Spare parts are listed in the spare parts list in the Annex of these Operating Instructions.

12 Annex

This Annex contains:

- Circuit diagram (electric)
- Declaration of conformity as well as the manufacturer's declaration
- Spare parts lists



CAD		Mailsab:		Format: A2	
Zugf.	Druck	Druck	Druck	Druck	Druck
18.04.07	18.04.07	18.04.07	18.04.07	18.04.07	18.04.07
Steuerung EMI Heizung					
Mat.:					
Blatt 107699					
von 1					

Declaration of conformity as well as the manufacturer's declaration


CE-Konformitätserklärung
EC Declaration of Conformity

Hersteller/Manufacturer: Horn GmbH
Anschrift/Address: Gewerbestrasse 14, D-78244 Gottmadingen

Dokumentationsbevollmächtigte(r): Markus Graf

Produktbezeichnung: Reifen Vulkanisiermaschine EM I
product designation: Tire vulcanizing machine EM I
Artikelnummer/Article no.: 106-145-0004
Article no.: 106-145-0004

Wir erklären hiermit im Sinne der EG-Richtlinien dass, das oben bezeichnete Produkt in Übereinstimmung mit folgenden Richtlinien entwickelt, konstruiert und gefertigt wurde.
 We thereby declare, in exclusive responsibility, that the aforementioned product was developed, designed and manufactured in harmony with the following directives

Richtlinie 2006/95/EG, (Niederspannungsrichtlinie Anhang 4)
 Richtlinie 2004/108/EG, (EMVG Anhang 2)
 Richtlinie 2006/42/EG, (Maschinen)
 Council Directive 2006/95/ECC (Low Voltage Annex 4)
 Council Directive 2004/108/ECC (Electromagnetic Compatibility Annex 2)
 Council Directive 2006/42/ECC (Machinery)

Wir bestätigen zusätzlich die Konformität des oben bezeichneten Produktes mit den Normen:
 We additionally confirm that the aforementioned product conforms with the following standards:

DIN EN 61140:03/2007	DIN VDE 0140-1
DIN EN 60335-1:11/2010	DIN VDE 0700-1
DIN EN 50106:05/2009	DIN VDE 0700-500
DIN EN 55014-1:02/2010	DIN VDE 0875-14-1
DIN EN 61000-6-3:09/2007	DIN VDE 0839-6-3
DIN EN 61000-3-2:03/2010	DIN VDE 0838-2
DIN EN 55014-2:06/2009	DIN VDE 0875-14-2
DIN EN ISO 12100-1:2003/A1:10/2009	
DIN EN ISO 12100-2:2003/A1:10/2009	
DIN EN ISO 14121-1:12/2007	
DIN EN ISO 13849-1:12/2008	
DIN EN ISO 13849-2:09/2008	

Horn GmbH
 Gottmadingen, 22.01.2015

 Geschäftsführer
 CEO

 Qualitätsmanagement
 Quality Management

Diese Erklärung ist keine Zusicherung im Sinne des Produkthaftungsgesetzes!
 This declaration is not an assurance for the purposes of the product liability law!

Die Sicherheitshinweise der Produktdokumentation sind zu beachten!
 The safety advice in the product's documentation must be followed!

Horn GmbH
 Gewerbestrasse 14 78244 Gottmadingen Fon +49 (77 31) 78 03 - 0 Fax +49 (77 31) 78 03 - 91 info@horngmbh.com www.horn-kettenschutz.de

Geschäftsführer
 Karl Emminger
 Ulrike Rühland

Registereintrag
 HRB 540 352
 Amtsgericht Freiburg
 USt-IdNr.: DE142761633

Bankverbindung:

Sparkasse Singen-Radolfzell
 BW - Bank Singen
 Volksbank Villingen
 Commerzbank Singen

IBAN: DE38 6925 0035 0003 0270 00
 IBAN: DE82 6005 0101 7485 5010 93
 IBAN: DE20 6949 0000 0000 7763 00
 IBAN: DE42 6928 0035 0843 8444 00

Swift-Bic: SOLADESINSG
 Swift-Bic: SOLADEST
 Swift-Bic: GENODE61VSI
 Swift-Bic: DRESDEFF692

Spare parts list for THERMOPRESS EM I Type 106-145-0004

Index: B replaces the Issue from: March

2001

Pos.	Item No.	Description
1	517 7732	Complete EM I control unit
1	517 5215 *	Heating mat Sz. I 190 x 190 mm, 230 V 350 W
2	517 6207 *	Heating bag Sz. I 230 x 230 mm
3	517 6214 *	Pressure pad Sz. I with fixing bracket 185 x 200 mm
4	517 5222 *	Heating mat Sz. II 265 x 265 mm, 230 V 450 W
5	517 5033 *	Heating bag Sz. II 330 x 330 mm
6	517 5057 *	Pressure pad Sz. II with fixing bracket 245 x 295 mm
7	557 8111	Adjustable pressure plate for heating plate 250 x 290 mm
8	557 8128	Adjustable pressure plate for heating plate 185 x 185 mm
9	557 8135	Retaining bolt for heating element
10	557 8159	Frame section – main cross-piece
11	557 8166	Left frame section
12	557 8173	Right frame section
13	557 8180 *	Hydraulic lever (extra list)
14	558 3508	Chassis center crossbar with electrical control box holder
15	558 3515	Chassis left crossbar 1500 mm
16	558 3522	Chassis right crossbar 1500 mm
17	557 8221 *	Castor Ø 125 with total locking device
18	557 8238 *	Castor Ø 125
19	558 3539	PE cap 80/50/5
20	557 8252	Operating lever 660 lg.
21	557 8269	Ø 25 handle
22	557 8276	Rubber pad for crossbar (2 pc.)
23	557 8283	Rubber pad for center crossbar
25	557 8300	Clamping unit (for tilting and swiveling device)
26	557 8317	Adjusting clip
27	557 8324	M12x67 mm square-head threaded bolt
28	557 8331	M14x112 mm square-head threaded bolt
29	557 8348	M14x132 mm square-head threaded bolt
30	557 8355	Ø 20 x 141 mm square-head threaded bolt with circlip
31	557 8362	Ø 12 x 38 mm square-head threaded bolt with circlip
32	557 8379	Retaining bolt
33	557 8386	Joint support with M8x20 mm hexagon socket screw
34	557 8393	Thrust washer
35	557 8403	Ø 40 x Ø 20.4 x 2.5 disc spring
36	557 8410	SW 17 square wrench
37	557 8427 *	Insert SW 17 for square wrench
38	557 8434	Safety pin
39	557 8441	Heating element holder, long – 595 mm
40	557 8458	Heating element holder, medium – 415 mm
41	557 8465	Heating element holder, short – 200 mm
45	557 1211	M12x30 mm star handle screw
46	557 8496 *	707570 slide bearing
47	557 8506	Rubber mallet
48	557 8513	Right stop plate main cross-piece
49	557 8520	Cover for adjusting wheel

Pos.	Item No.	Description
50	557 8537	M6x10 mm hexagon screw
51	557 8544	Fastening with bushing for adjusting wheel
52	557 8551	Adjusting wheel for mechanical fastening of the frame
53	558 6907	Upper housing cover for air bellows with bracket and hose guide
54	557 8575	Lower housing cover for air bellows
55	557 8582	M8x50 mm eye bolt
56	557 8599	Tensioning device for air bellows
57	557 8609	Thin nut M33x2 mm – Zn
58	557 8616	Joint connecting piece
59	557 8623 *	ø 50 x 6 x 380 mm tension spring
60	557 1479 *	620M air bellows
61	558 6914	Mounting plate for air bellows without bracket
62	557 8647	Rubber handle
63	557 1716	Mini 1/4" safety valve
64	557 8654	1/4" angle piece – inner/outer
65	558 6921	1/4" straight screw-in hose sleeve
67	557 1651	1/4" sound absorber
68	557 1644 *	3-way ball valve
69	557 8678	Throttle valve SCO - 344 - 1/4 - 04 - 1/4
70	557 8685	RI 3/8 x 1/4 reducer
71	558 6938 *	3/8" pressure reducing device with left > right flow direction
72	557 8692	3/8" plug-in nipple (inside)
73	557 8702	8.2/6 PVC fabric hose - blue - 0.6 m
74	557 8719	ø 12.7 mm U-seal
75	557 8726	3/8" check valve
76	557 3240	Pair of contour segments No. 1
77	557 3257	Pair of contour segments No. 2
78	557 3264	Pair of contour segments No. 3
79	557 3295	Pair of contour segments No. 6
80	557 3305	Pair of contour segments No. 7
81	557 3312	Pair of contour segments No. 8
82	557 3329	Pair of contour segments No. 9
83	557 3336	Pair of contour segments No. 10
84	557 3343	Pair of contour segments No. 11 (Asym.)
85	557 0999	Retaining screw M20 x 160 mm - Zn
86	557 8733	Hexagon screw DIN 931 - M8x20 mm - Zn
87	558 3553	Hexagon screw DIN 931 - M12x75 mm - Zn
88	557 8757	Hexagon screw DIN 933 - M10x20 mm - Zn
89	557 1132	Hexagon screw DIN 933 - M8x25 mm - Zn
90	557 8764	Countersunk screw DIN 7991 - M8x20 mm
91	557 8771	Countersunk screw DIN 7991 - M10x30 mm
92	557 1149	Nut DIN 934 - M8 - Zn
93	557 1077	Nut DIN 934 - M12 - Zn
94	557 8788	Lock nut DIN 985 - M10 - Zn
95	557 0047	Lock nut DIN 985 - M20 - Zn
100	557 0937	Washer DIN 125 - ø 10.5 - Zn
101	557 8829	Washer DIN 125 - ø 6.4 - Zn
102	557 1235	Washer DIN 125 - ø 13 - Zn

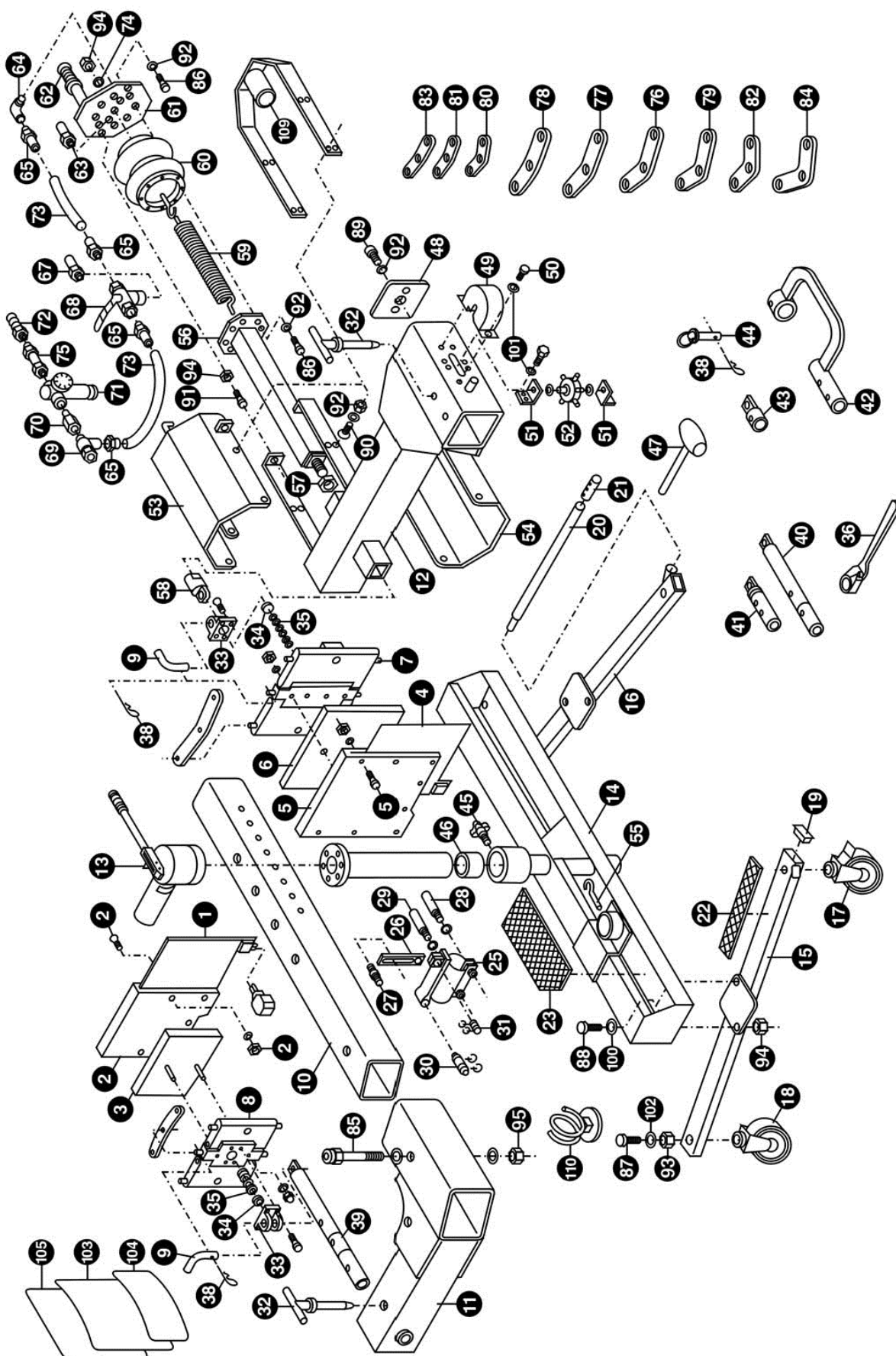
Pos.	Item No.	Description
103	557 8836 *	Aluminum heating plate, 300 x 300 x 2 mm, straight
104	557 8843 *	Aluminum heating plate, 200 x 200 x 2 mm, contoured
105	557 8850 *	Aluminum heating plate, 300 x 300 x 2 mm, contoured
106	557 8867	Adapter for heating plate holder, 200 mm
107	557 4359 *	Cable strain relief, for each heating plate
108	557 4366	Suspension device for inner heating plate
109	558 3560	Securing bracket for TP EM I
110	557 4373	Magnet holder

Accessories (not included in package contents)

Pos.	Item No.	Description
42	517 7725	EM truck tyre adapter
43	557 8472 *	Heating element holder for truck tyre adapter
44	557 8489 *	Locking pin for truck tyre adapter

The components marked with an asterisk *) are wear and tear parts for which no claims for defects shall be accepted within the scope permissible by law.

THERMOPRESS EM I



Spare parts list EM I Control Unit Type 135-115-0055

 Art. No. 517 7732
2001

Index: B replaces the Issue from: March

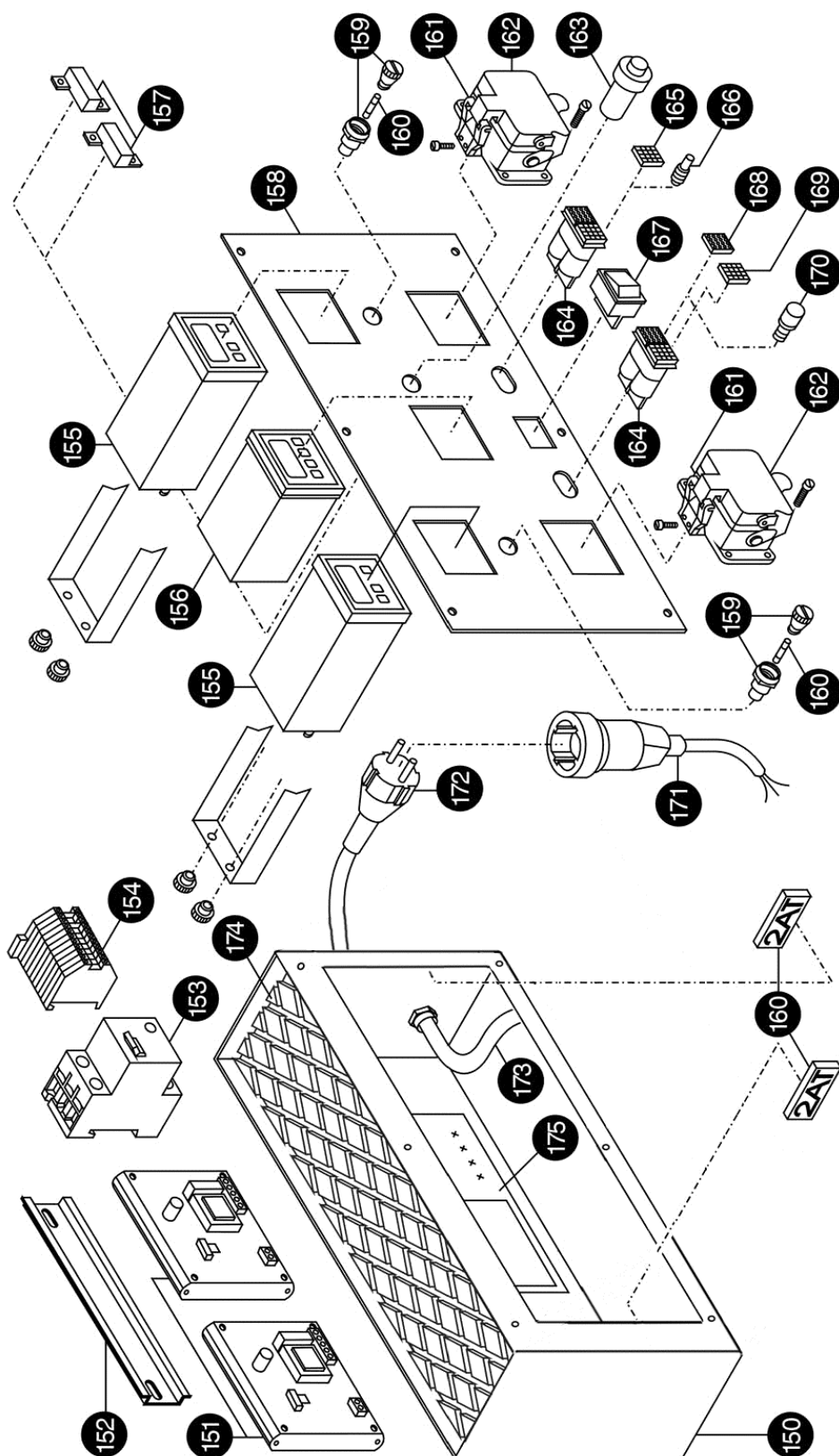
	Pos.	Item No.	Item Description
>	150	557 8874	Control box housing, no cover
>>	151	557 3783	Electric temperature limiter
>	152	557 3790	320 mm mounting rail
>>	153	557 3769	Ground-fault circuit interrupter (2 poles)
>	154	557 4153	Terminal block
>>	155	557 3972	Electrical temperature controller Fe.-Konst.
>>	156	557 4012	24-hour digital timer
>>	157	557 3941	RS 25 W resistance
>	158	557 8881	Case cover
>	159	557 3831	Fuse holder for glass-tube fuse
>	160	557 3855 *	Set of spare fuses 2 A (10 pc.)
>>	161	557 3800	6-pole connector
>>	162	557 3817	6-pole socket
>>	163	557 4029	Button for timer
>	164	517 2483	Indicator light housing without cover
>	165	517 2524	Transparent cover
>	166	517 1305 *	3.7 V special lamp
>>	167	557 8946	On/off switch, illuminated, red, 2 poles
>	168	517 2517	Green cover
>	169	517 2500	Red cover
>	170	517 2531 *	230 V glow lamp
>	171	517 7220	20 cm safety adapter cable
>>	172	557 3903	Supply cable with safety plug, 3 m
>	173	557 3910	Strain relief
>	174	557 3934	Rubber pad for control box
	175		Circuit diagram
>	176	557 8142	320 mm cable duct

> Only an authorized REMA TIP TOP service technician can carry out replacements.

>> Only have qualified personnel carry out work on current-carrying parts.

The components marked with an asterisk *) are wear and tear parts for which no claims for defects shall be accepted within the scope permissible by law.

Please note: Operating hour counter is not shown in illustration.



Spare parts list for hydraulic lever EM I

Item No 557 8180
2001

Index: B replaces the Issue from: March

Pos.	Item No.	Description
1	557 9134	Pump housing
2	557 9158	Cylinder tube
3	557 9172	Piston rod
4	557 9189 *	Guide head
5	557 9196	Pumping lever
6	557 9206	Lever arm
7	557 9213	Ø 22 rubber handle
8	557 9220 *	Drain valve lever (adjustable)
9	557 9237	Pump piston
10	557 9244 *	Valve spindle
11	557 9251	Straight pin DIN 9325 - 10 x 35
12	557 9268	Clamping sleeve 1481 - 10 x 50
13	557 9275	Clamping sleeve 1481 - 6 x 50
14	557 9282	Piston return spring Lo 95 x Da 13 x Ø 1.5
15	557 9299	RB 10 valve ball
16	557 9309	Spring for check valve
17	557 9316	RB 8 valve ball
18	557 9323	GN 542/ M 18 x 1.5 A2 bleed screw
19	557 9330	Screw plug DIN 7604 - M 18 x 1.5
20	557 9347	Hexagon screw DIN 931 - M 6 x 30
21	557 9354	Hexagon screw DIN 985 - M 6
22	557 9361	Copper ring Ø 12 x 16
23	557 9378	Screw plug DIN 7604 - M 12 x 1.5
24	557 9385 *	O-Ring 011 - 8307
25	557 9392	Thin nut DIN 936 - M 12
26	557 9402 *	O-Ring 207 - 8307
27	557 9419	Set screw DIN 914 - M 8 x 6
28	557 9426	Circlip DIN 7993 - B 60 x 3.2
29	557 9433 *	O-Ring 226 - 8307
30	557 9440 *	O-Ring 212 - 8307
31	557 9457	Filister head screw DIN 912 - M 10 x 25
32	557 9464	Copper ring Ø 6 x 10
33	557 9471	Hexagon screw DIN 933 - M 6 x 8
34	557 9488	Copper ring Ø 18 x 22
First machine version		
35	557 9495	Eyebolt DIN 444 - M 10 x 60
36	557 9505	Set screw DIN 914 - M 10 x 40
37	557 9512	Lock nut DIN 985 - M 10
38	557 9529	Copper ring Ø 10 x 14

The components marked with an asterisk *) are wear and tear parts for which no claims for defects shall be accepted within the scope permissible by law.

EM I hydraulic lift

