

Original Operating Instructions

TP EM II Vulcanizing Machine

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The TP EM II 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 II 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 Repair Instructions.

The work steps, safety instructions and descriptions provided in these Operating Instructions do not release the TP EM II 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

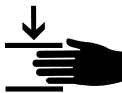
In the case of some potential hazards, the warning symbols are replaced with special pictograms. The division into the categories danger, warning, caution and remains reserved.



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.

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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Always check whether the voltages and frequencies indicated on the rating plates match those of the operator's network. |
| Normal operation | <ul style="list-style-type: none"> • 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 re-tighten 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.
- Hydraulics**
- Work on hydraulic systems may only be carried out by individuals with specialized knowledge and experience in hydraulics (experts).
 - Check all lines/cables, hoses and screw connections regularly for leaks and any external signs of visible damage. Have damage repaired immediately.
 - Replace hose lines within specified time intervals, even if no safety-relevant defects have been detected.
 - 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**
- 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

- Direct or indirect contact with live parts, especially 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 II Vulcanizing Machine is only intended for the following work:

- Vulcanizing (curing) damaged areas filled with raw rubber on tractor tyres and in particular EM tyres (OTR)
- Pressing multiply repair patches on the inside of the tyre of EM tyres

EM tyres up to size 45/65 or 65/45 and their comparative sizes can be worked with the Gigant Conversion Kit (Part No. 5175727).

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

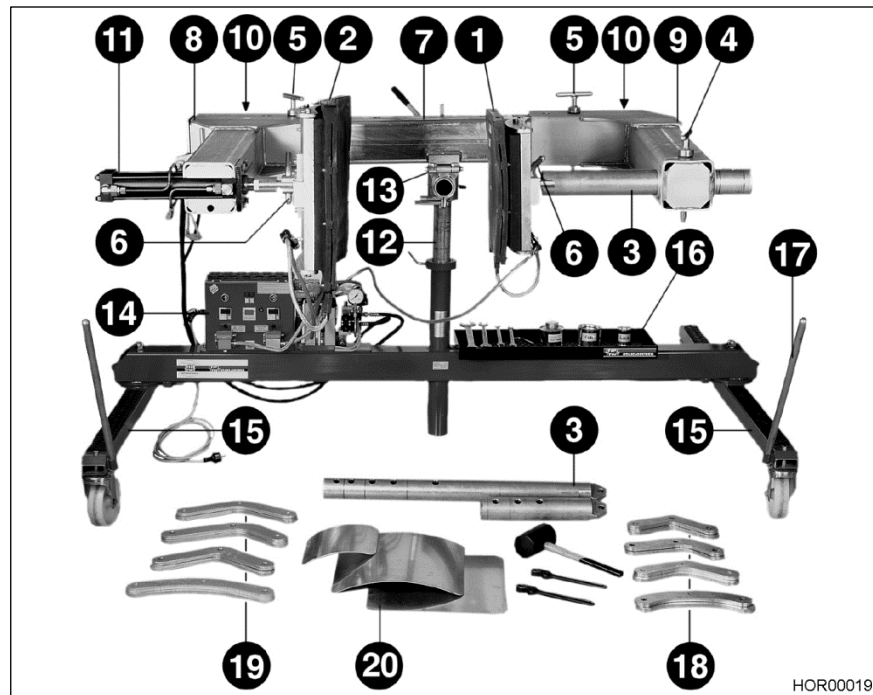


Bild 1 TP EM II Vulcanizing Machine (complete package contents for the machine)

- 1 Inner heating plate
- 2 Outer heating plate
- 3 Heating plate holder for inner heating plate (3 pc.), 50 x 224 mm / 450 mm / 695 mm
- 4 Retaining bolt for heating plate holder
- 5 Retaining bolt for frame section (2 pc.)
- 6 Retaining bolt for heating plate (2 pc.)
- 7 Frame section – main cross-piece
- 8 Left frame section
- 9 Right frame section
- 10 Adjustment unit for frame section with quick release wrench
- 11 Hydraulic pressure cylinder
- 12 Hydraulic lifting/lowering device
- 13 Inclining/tilting mechanism
- 14 Power generating unit/control unit
- 15 Lower crossbar (chassis)
- 16 Center crossbar with tool tray
- 17 Operating lever (2 pc)
- 18 Inner contour segments (4 pairs)
- 19 Outer contour segments (5 pairs)
- 20 Heating plates

TP EM II Vulcanizing Machine consists of the main structural components:

- Machine frame (Bild 1/7, 8 and 9)
- Power generating unit/control unit (Bild 1/14)
- Lifting/lowering device (Bild 1/12)
- Inclining/tilting mechanism (Bild 1/13)
- Heating plates (Bild 1/1 and 2)

4.1.1 Machine frame

The machine frame consists of the following components:

- Frame section – main cross-piece (Bild 1/7)
- Left frame section (Bild 1/8)
- Right frame section (Bild 1/9)
- Retaining bolt for frame section (Bild 1/5)
- Adjustment unit for frame section with quick release wrench (Bild 1/10)

The main cross-piece (Bild 1/7) consists of a rectangular tube and connects to the right and left frame section (Bild 1/8 and 9). The adjustment unit (Bild 1/10), retaining bolts (Bild 1/5) and holes can be used to adjust frame sections to the desired distance.

The left frame section (Bild 1/8) is used to attach a hydraulic pressure cylinder (Bild 1/11). The outer heating plate (Bild 1/2) is attached to the pressure cylinder with a retaining bolt (Bild 1/6).

The right frame section (Bild 1/9) is used to attach the inner heating plate (Bild 1/1). The inner heating plate is attached to the right frame section with a heating plate holder (Bild 1/3) and a retaining bolt (Bild 1/4 and 6).

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 Power generating unit/control unit

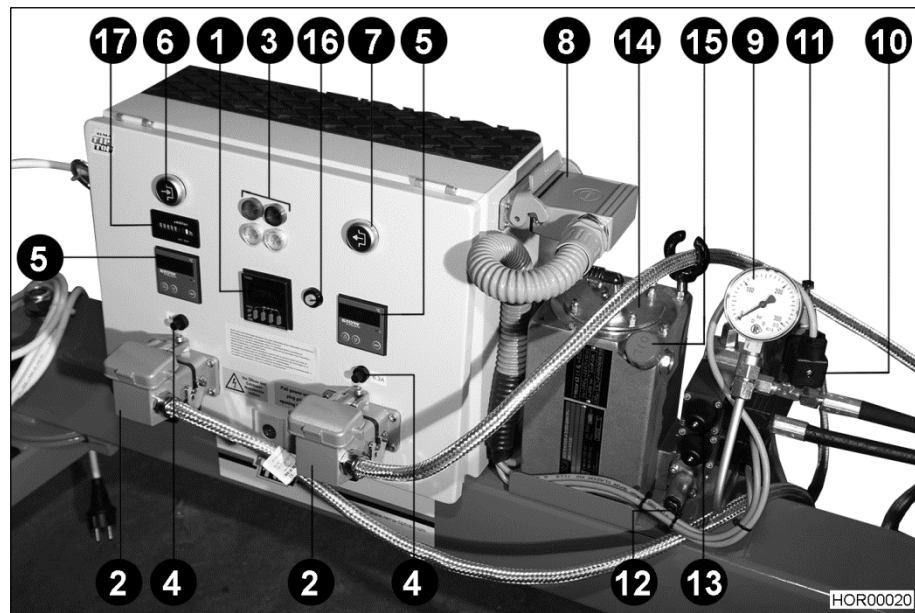


Bild 2 Power generating unit/control unit

- 1 Electronic timer
- 2 Connection sockets for both heating plates
Left = inner heating plate
Right = outer heating plate
- 3 Indicator lights
a) green = power indicator
b) red = heating system/timer in operation
c) white = heating system for inner heating plate ON
d) white = heating system for outer heating plate ON
- 4 Fuse holder (slow-blow fuse)
- 5 Temperature controller for inner/outer heating system
- 6 Push-button – Close clamping unit – CLOSE
- 7 Push-button – Open clamping unit – OPEN
- 8 Connection socket power-generating unit to control unit
- 9 Pressure gauge for operating pressure (max. 160 bar/2320 PSI)
- 10 Pressure control valve
- 11 Adjustment screw for pressure adjustment
- 12 Sealed pressure relief adjustment screw
- 13 Solenoid valves
- 14 Hydraulic oil tank/hydraulic pump
- 15 Bleed screw
- 16 Start button for machine operation/vulcanization
- 17 Operating hour counter

The purpose of the control unit, which consists of a metal housing, is to distribute the electrical current. An electronic timer (Bild 2/1), two connection sockets (Bild 2/2) for both heating plates, four indicator lights (Bild 2/3), two fuse holders (Bild 2/4), two temperature controllers (Bild 2/5), one operating hour counter (Bild 2/17), two push-buttons (Bild 2/6 and 7) for opening and closing the clamping unit as well as a start button (Bild 2/16) for operating the machine (vulcanization) are built into the control unit.

The energy block essentially consists of hydraulic oil tank and hydraulic pump (Bild 2/14), solenoid valves (Bild 2/13), pressure gauge (Bild 2/9), pressure control valve (Bild 2/10), screw for adjusting pressure (Bild 2/11), sealed pressure relief adjustment screw (Bild 2/12) and bleed screw (Bild 2/15).

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

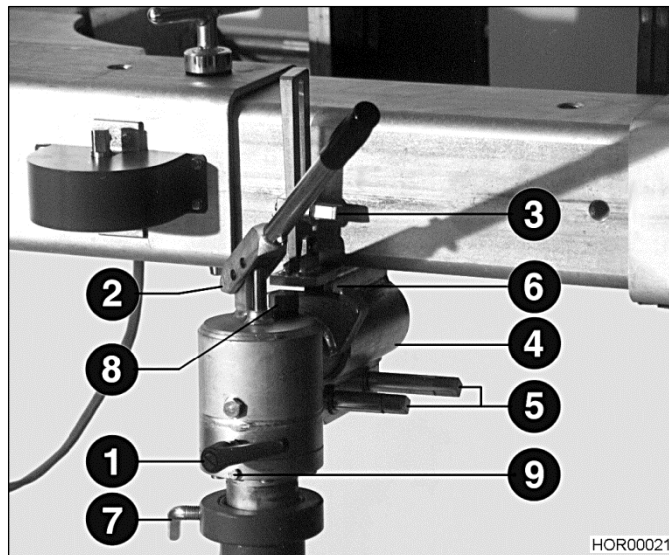


Bild 3 Lifting/lowering device, inclining/tilting mechanism, rotating device

- 1 Valve for hydraulic lifting/lowering device
- 2 Pumping lever
- 3 Clamping screw for tilting mechanism
- 4 Pivot point
- 5 Clamping screw for inclining mechanism
- 6 Inclining limit stopper
- 7 Clamping screw for lifting, lowering and rotating
- 8 Bleed screw
- 9 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

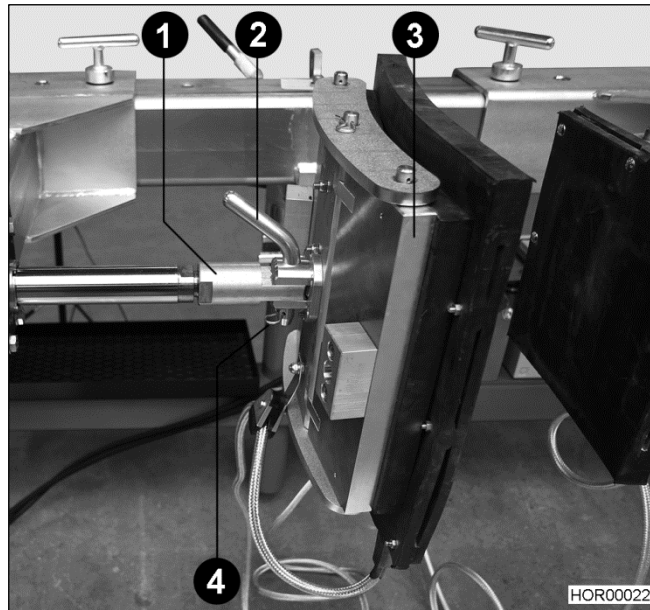


Bild 4 Heating plate

- 1 Heating plate holder
- 2 Retaining bolt
- 3 Outer heating plate (complete)
- 4 Locking pin

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

4.1.5 Electronic timer

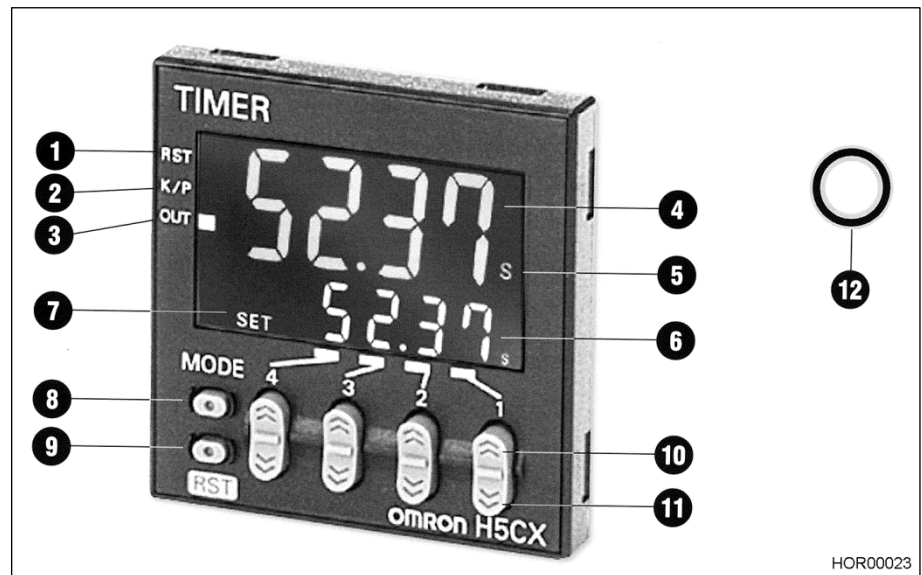


Bild 5 Electronic timer

- 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 II 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 6 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 6/2) 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.

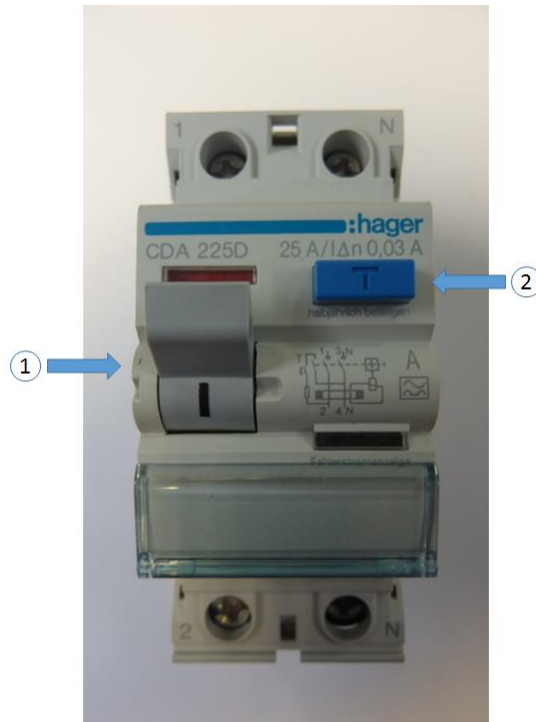


Bild 7 Ground-fault circuit interrupter (GFCI)

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

4.1.7 Operating hour counter



Bild 8 Operating hour counter

- 1 Operating hour counter

The machine has an operating hour counter (Bild 8/1) 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 II 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 II has a built-in ground-fault monitoring system (FI) 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 7/1) 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 7/2). The safety switch works properly when the on/off switch (Bild 7/1) flips over to the "0" position.

4.3 Accessories

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

- Operating lever (2 pcs)
- Contour segments, inner (4 pairs)
- Contour segments, outer (5 pairs)
- Heating plates (3 pcs)
- Heating plate holder for inner heating plate (3 pcs)
- Toolkit including:
 - SW 10-13 Fork wrench
 - SW 17-19 Fork wrench
 - SW 30-32 Fork wrench
 - 8 mm Allen wrench
 - Rubber mallet
 - Square socket wrench (2 pc.)



Also see Bild 1 above.

5 Technical data

5.1 General information

Designation..... TP EM II Vulcanizing Machine

5.2 Dimensions and weights

Shipping dimensions
(Length x width x height)approx. 2,070 x 1,070 x 800 mm
Max. dimensions in operation
(Length x width x height) approx. 2,600 x 2,500 x 1,770 mm
Max. tension of the pressure unit approx. 300 mm
Max. distance of tipping/tilting mechanism..... approx. 450 mm
Max. space between heating plate center and the machine's longitudinal
frame..... approx. 760 mm
Dimensions of inner heating plate Sz. 2..... approx. 330 x 330 mm
Dimensions of outer heating plate Sz. 3..... approx. 430 x 430 mm
Machine weight.....approx. 459 kg
Package weightapprox. 130 kg

5.3 Performance

Operating temperatureapprox. 175°C/350°F
Pressure system..... hydraulic with automatic resetting device,
max. operating pressure 160 bar (2320 PSI)

5.4 Load ratings

Voltage..... 230 V
Frequency..... 50 Hz
Rated output 2150 W

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 II 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 II 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 II 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 210 V or 110 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 the lifting and lowering device's and hydraulic pump'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 II Vulcanizing Machine and unplug all cables.
- If the TP EM II 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

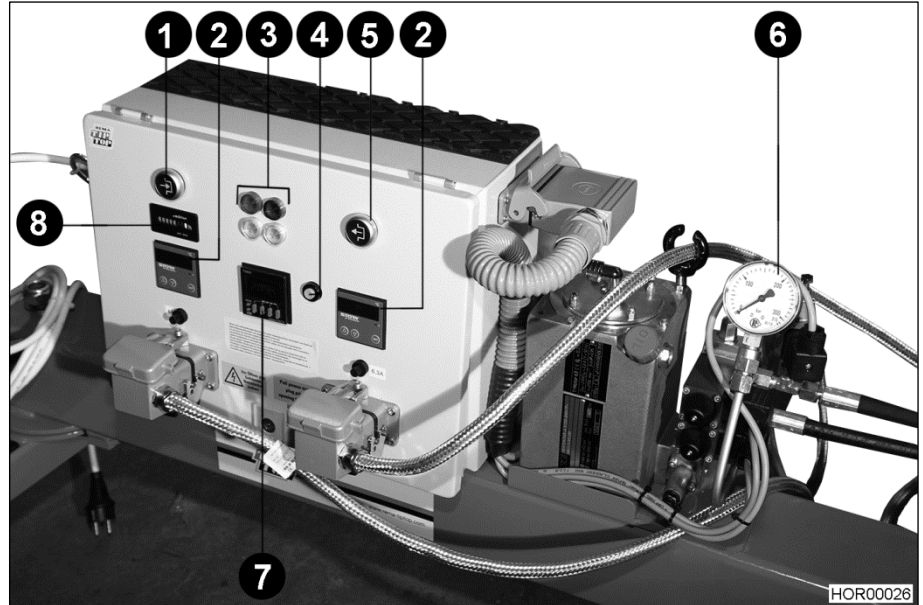


Bild 9 Control unit

- 2 Push-button – Close clamping unit – CLOSE
- 3 Temperature controller for inner/outer heating system
- 4 Indicator lights
 - a) green = power indicator
 - b) red = heating system/timer in operation
 - c) white = heating system (inner heating plate ON)
 - d) white = heating system (outer heating plate ON)
- 5 Start button for machine operation/vulcanization
- 6 Push-button – Open clamping unit – OPEN
- 7 Pressure gauge for operating pressure (max. 160 bar/2320 PSI)
- 8 Electronic timer
- 9 Operating hour counter

Electronic timer	The TP EM II Vulcanizing Machine is operated using the control unit. The timer (Bild 9/7) is used to automatically turn the heating plates on/off after the preset time has expired.
Temperature controller	Both temperature controllers (Bild 9/2) are used to control the electronically operated heating system of the heating plates.
Push-buttons	The push-buttons (Bild 9/1 and 5) are used to open or close the pressure unit.
Start button	The start button (Bild 9/4) is used to start operating the machine (vulcanizing process).

Indicator lights	The indicator lights (Bild 9/3) show the following statuses: green = power indicator red = heating system/timer in operation white = heating system of inner/outer heating plate in operation
Operating hour counter	The operating hour counter (Bild 9/8) shows how many hours the machine has been switched on during its life cycle.
Pressure gauge	The pressure gauge 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 II Vulcanizing Machine:

- Connect the machine to the power supply.
- Move the frame parts together and use the locking bolts to lock the frame parts/heating in place.
- Close the machine until the automatic operating pressure control switches off. Press the CLOSE button (Bild 9/1) to do this.
- 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 (Bild 9/3) and temperature controller's temperature display (Bild 9/2)). If malfunctions occur: Disconnect the machine from the power supply and have it checked by REMA TIP TOP technicians.

The TP EM II Vulcanizing Machine is ready for use.

7.3 Operation

7.3.1 Vulcanization of damaged areas filled with raw rubber



Bild 10 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.



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 10).
- 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 11 Replacing the heating plate contour segments



Attention

- 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 11).
- Lift off contour segment and then repeat the process for the lower contour segment.



Bild 12 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 12).



Bild 13 Positioning the frame sections

- Put the hydraulic pressure cylinder back in its the initial position by pressing the UP button (Bild 9/5).
- Remove both frame sections' safety bolts and use the adjustment unit/square socket wrench to put frame sections into the outer position (Bild 13).

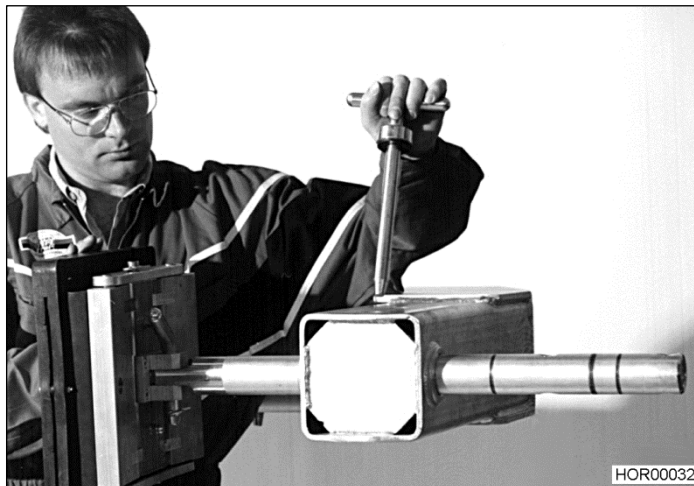


Bild 14 Positioning the heating plate holder

- Remove the heating plate holder's retaining bolt and push the heating plate holder towards the back (Bild 14).
- If necessary, replace the heating plate holder (see Section 7.3.3).

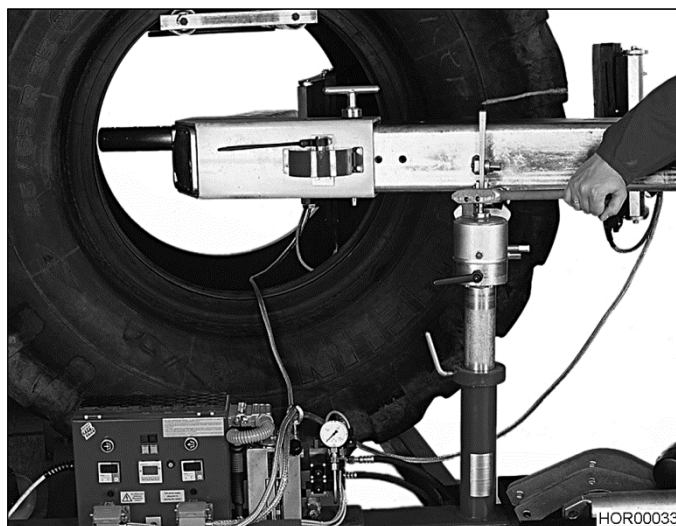


Bild 15 Positioning the machine

- 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 15).



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 16 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 16).
- 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 16).



Bild 17 Positioning the left frame section

- Use the lever to move the left frame section to the tyre until the inner heating plate rests against the area to be repaired and then lock into place using safety bolts.



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



Bild 18 Positioning the right frame section

- Use the frame adjuster to bring the right frame section as close as possible towards the tyre and then use the retaining bolt to lock it into place in the position closest to the tyre.
- Use the guide lines provided on the tyre to center the inner and outer heating plates on the area to be repaired.
- 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).

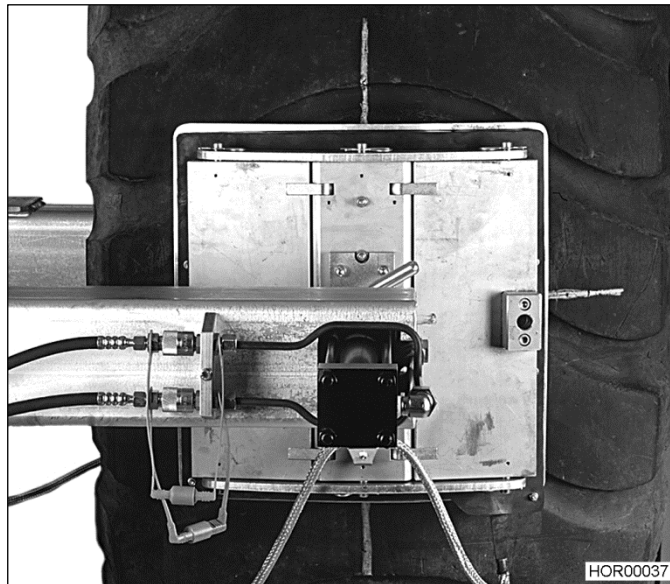


Bild 19 Attaching the contour aluminum plate to the outer heating plate

- Hold the matching contour aluminum plate between the outer heating plate and the area to be repaired and attach to the heating plate 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.

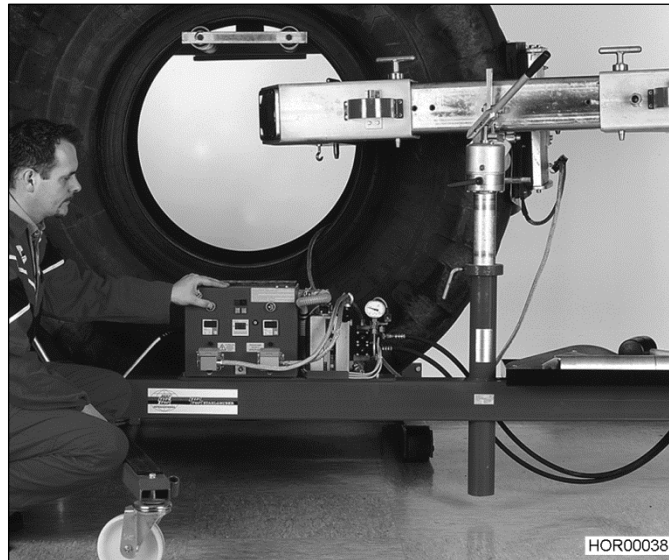
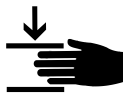


Bild 20 Operating the control unit/closing the hydraulic pressure unit



Caution

Risk of crushing

- Do not reach between the tyre and heating plate during the closing process.
- Do not go above or below target pressure.
- 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.
- Close the hydraulic pressure unit by pressing the CLOSE (Bild 9/1) button.



The machine automatically switches off after reaching the vulcanization pressure (160 bar/2320 PSI). Do not press the CLOSE (Bild 9/1) button again.

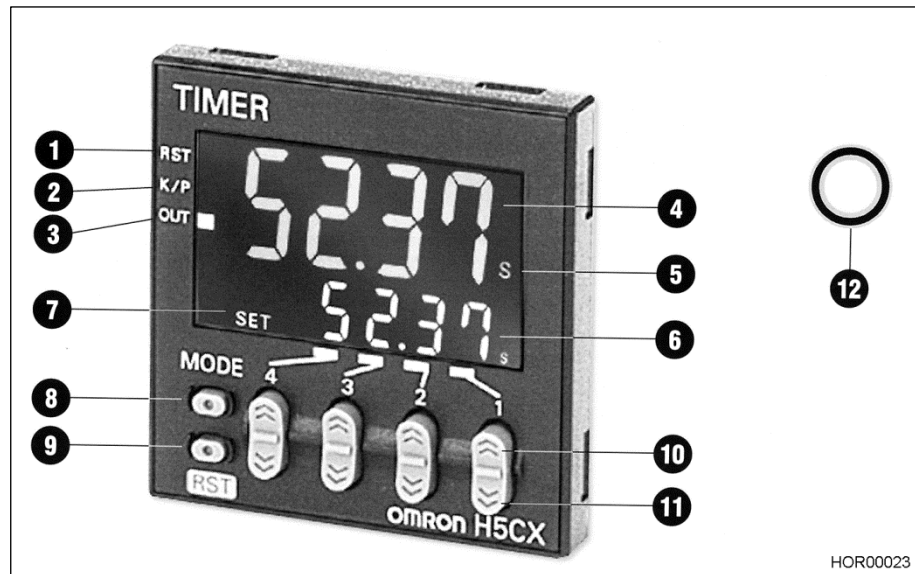


Bild 21 Setting the electronic timer



- 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.

- Reinspect heating plate position. If necessary, correct position by reopening the pressure unit.
- Reinspect heating mat connection cables or plug connections.
- 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 21/12). Machine is in operation.



Bild 22 Return the hydraulic pressure unit to its original position



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

- After 60 minutes of cooling down under pressure (residual temperature approx. 90°C/180°F), open the hydraulic pressure unit by pressing the UP button (Bild 22) and then return it to its original position.
- Remove machine from tyre.
- 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



Bild 23 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.



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 23).
- 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.

7.3.3 Replacing the heating plate holder



Danger

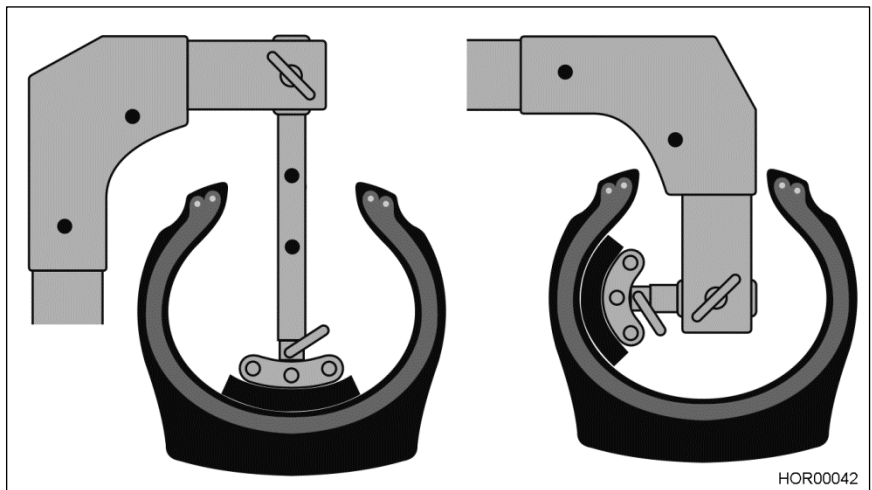
Danger of falling parts

- 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.



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Bild 24 Selecting the heating plate holder



The machine is equipped with 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) (Bild 24).

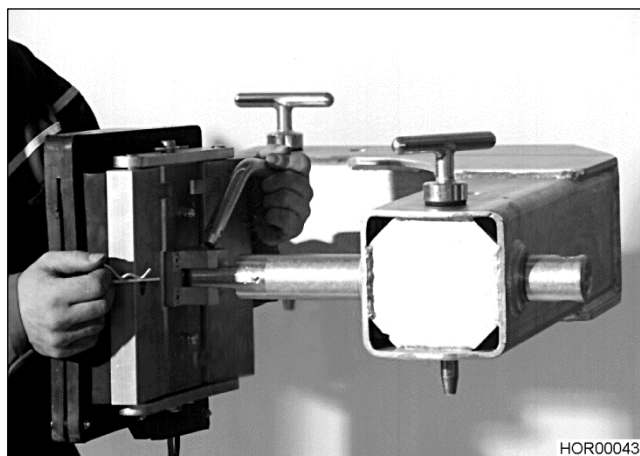


Bild 25 Replacing the heating plate holder

- Remove retaining spring.
- Remove the inner heating plate's retaining bolts and hold onto the heating plate at the same time. Then hang the heating plate onto the bracket on the frame section (Bild 25).
- Remove heating plate holder from its guide.
- Insert required holder in reverse order.
- Reattach the heating plate and insert the retaining spring.

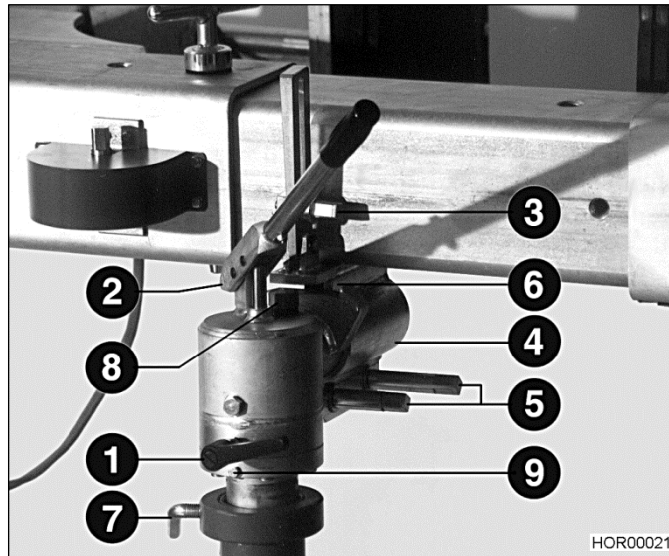
7.3.4 Operate the lifting and lowering device

Bild 26 Lifting and lowering device

Lifting:

- Close valve (Bild 26/1).
- Open the clamping screw (Bild 26/7).
- Bring the upper part of the machine to the required working height with the pumping lever (Bild 26/3).

Lowering:

- Open the clamping screw (Bild 26/7).
- Slightly open the valve (Bild 26/1) (turn counterclockwise).
- Lower the upper part of the machine to the desired height and close the valve again.



Tighten the clamping screw (Bild 26/7) when the machine is moved outside the tyre.

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

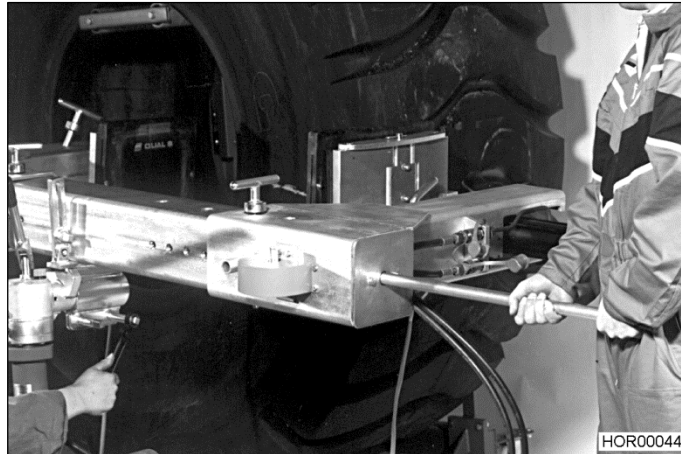
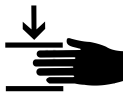


Bild 27 Inclining mechanism



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 26/5).
- 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.

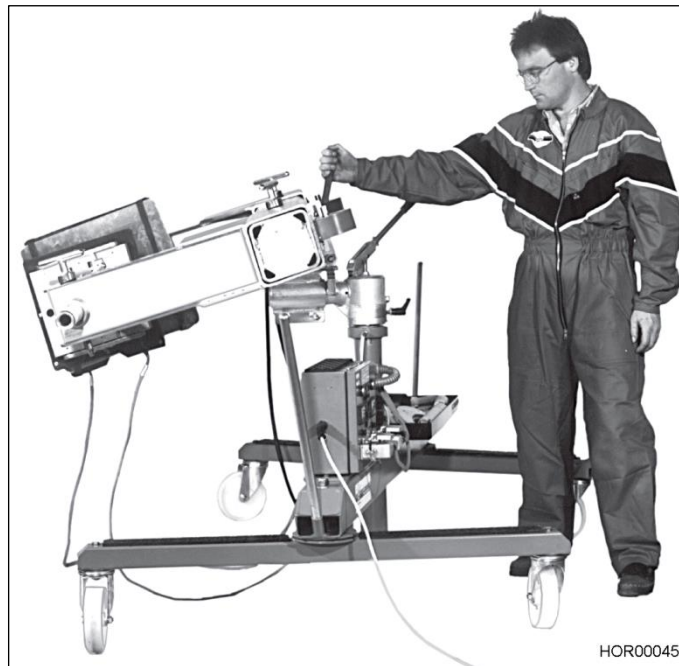
7.3.6 Operating the tilting mechanism (for sidewall repairs)

Bild 28 Tilting 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.

- Insert the control lever into one of the slots provided on the front sides of the right frame section.
- Slowly open the conical clamping screw (Bild 26/3) and move the upper part of the machine into the required position.
- Close the clamping screw (Bild 26/3) 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 26/3).
- Close the clamping screw again (Bild 26/3).

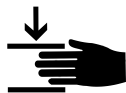
7.3.7 Operating the rotating device



Danger

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.



Caution

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 26/7).
- 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 29 Program the electronic timer (TARGET value setting)



Attention

The ACTUAL value display starts counting backwards once the machine is in operation (Bild 29/4).

The TARGET value setting (Bild 29/6) remains visible and unchanged.

If the reset button (Bild 29/9) or start button (Bild 29/12) 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 29/3).



The last programmed TARGET value setting is displayed after connecting the machine to the power supply (Bild 29/6). 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 29)	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 29/4)

7.3.9 Setting the temperature controller

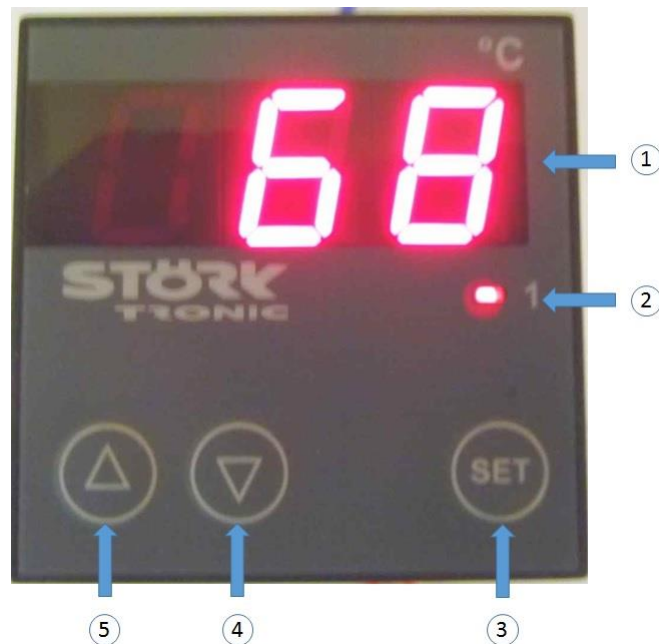


Bild 30 Temperature controller



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 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.



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.



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

Attention



Use the buttons (Bild 30/3, 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.

- Push the start button (Bild 2/16). Machine is in operation.

7.5 Decommissioning

No special measures are required for taking the machine out of service (decommissioning). The TP EM II 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 II 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 (60–80 bar) and cure for 90 minutes at the desired TARGET temperature setting.

8.2.3 Changing the hydraulic oil of the pressure unit hydraulic pump



Observe local disposal regulations for used oil!

- Press the UP button to retract the hydraulic cylinder's piston.
- Remove the bleed screw (Bild 2/15) from the filling hole.
- Put an appropriate collection container (approx. 2 liters) under the hydraulic pump. Open the oil drain plug on the rear of the pump (bottom) and drain oil into the container. After having drained the oil completely, put the oil drain plug back and tighten.
- Use a funnel to add new hydraulic oil (SAE 5-10) right up to the level of the bleed screw.
- Screw in the bleed screw.
- Press the UP/DOWN button once to extend/retract the hydraulic cylinder.
- Repeat the aforementioned process twice to completely remove the used oil from the hydraulic pump, cylinder and connecting lines.
- Fully extend/retract the hydraulic cylinder several times. When the cylinder retracted, make sure the oil level is at the level of the lower thread of the filling hole and screw in the bleed screw.

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



Observe local disposal regulations for used oil!

- Completely lower the upper part of the machine.
- Remove the bleed screw (Bild 3/8) from the filling hole.
- Hold an appropriate collection container (approx. 1 liter) under the drain plug (Bild 3/9). 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 (ca. 0.6 liters).
- 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. Plug power plug back in. 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
Automatic resetting device does not work or the pressure gauge is too low	Incorrect setting of pressure adjustment screw	Set target pressure of 160 bar
Hydraulic pump runs constantly	Oil pressure nozzle in the automatic resetting device dirty	Remove and clean oil pressure nozzle or replace complete pressure control unit
Automatic resetting device constantly resets	Oil loss	Check the entire hydraulic system for leaks and refill with oil
	Used, old oil	Change hydraulic oil

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 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

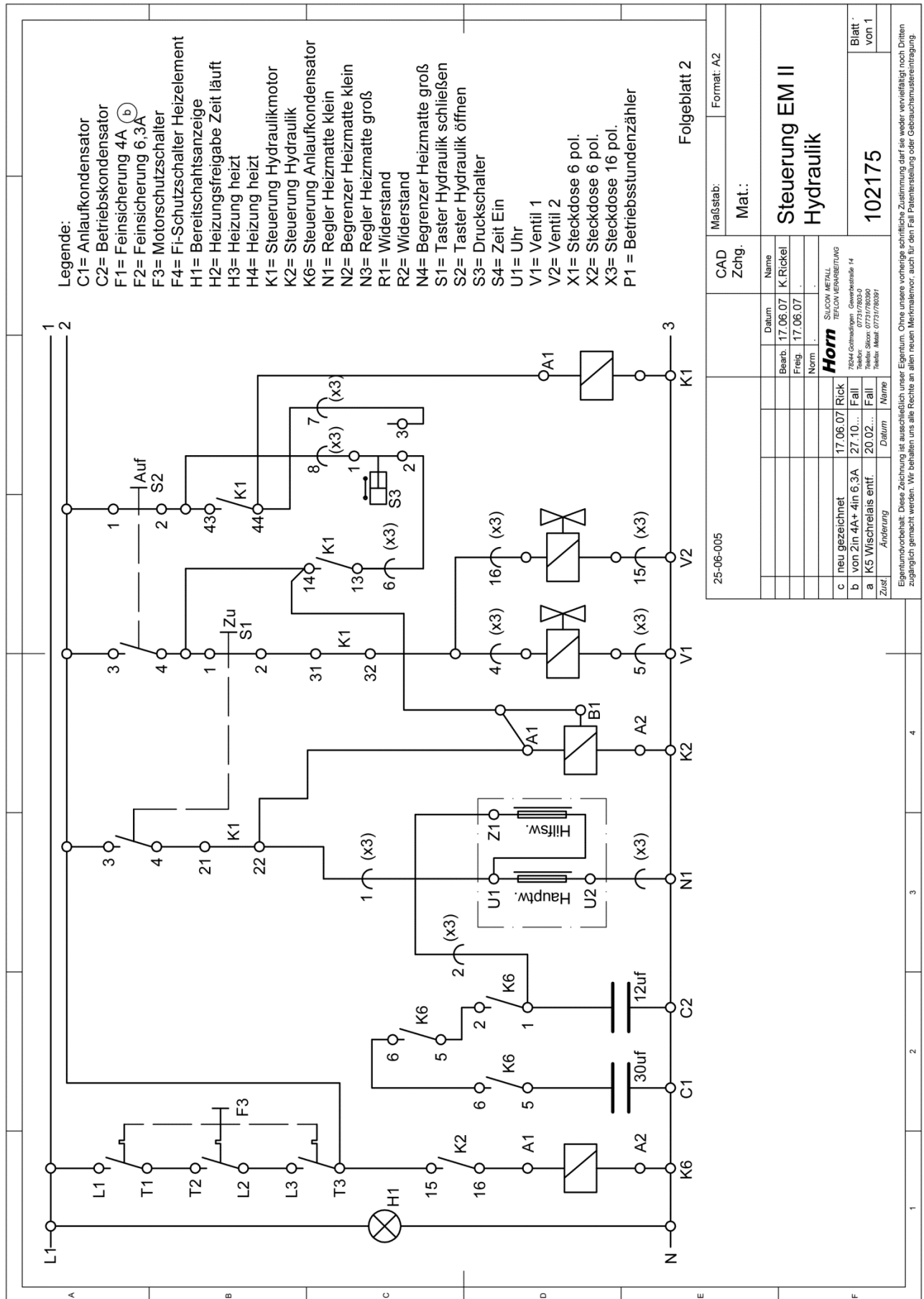
Only use original spare parts or spare parts which have been approved by the manufacturer.

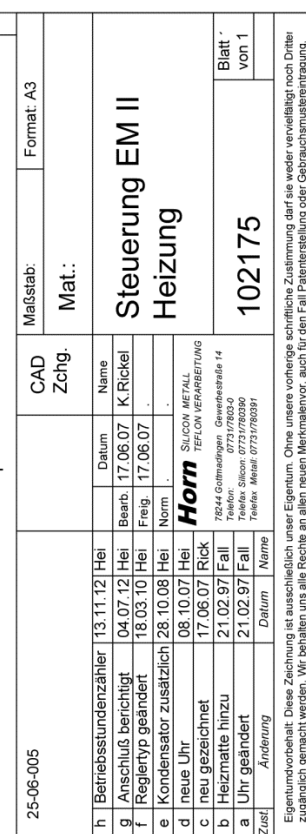
Spare parts are listed in the spare parts list in the Annex of these Operating Instructions.

12 Annex

This Annex contains:

- Circuit diagrams (hydraulics and electronics)
- Declaration of conformity as well as the manufacturer's declaration
- Spare parts lists





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 II
product designation: Tire vulcanizing machine EM II
Artikelnummer/Article no.: 106-155-0005-OE
Article no.: 106-155-0005-OE

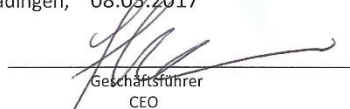
Wir erklären hiermit im Sinne der EG-Richtlinien dass, das oben bezeichnete Produkt in Übereinstimmung mit folgenden Richtlinien entwickelt, konstruiert und gefertigt wurde.
 We thereby declare, in exclusive responsibility, that the aforementioned product was developed, designed and manufactured in harmony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

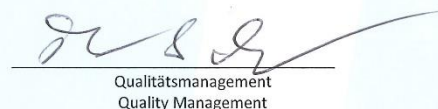
Richtlinie 2014/30/EU, (EMV)
 Richtlinie 2006/42/EG, (Maschinen)
 Council Directive 2014/30/ECC (Electromagnetic Compatibility)
 Council Directive 2006/42/ECC (Machinery)

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 61140:08/2014	DIN VDE 0140-1
DIN EN 60335-1:10/2012	DIN VDE 0700-1
DIN EN 50106:05/2009	DIN VDE 0700-500
DIN EN 55014-1:05/2012	DIN VDE 0875-14-1
DIN EN 61000-6-3:09/2011	DIN VDE 0839-6-3
DIN EN 61000-3-2:03/2015	DIN VDE 0838-2
DIN EN 55014-2:01/2016	DIN VDE 0875-14-2
DIN EN ISO 14121-1:12/2007	
DIN EN ISO 13849-1:12/2008	
DIN EN ISO 13849-2:02/2013	

Horn GmbH
 Gottmadingen, 08.03.2017


 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!

DIN ISO 9001 ZERTIFIZIERT



Horn GmbH
 Gewerbestrasse 14 78244 Gottmadingen Fon +49 (77 31) 78 03 - 0 Fax +49 (77 31) 78 03 - 90 info@horngmbh.com www.horngmbh.com

Geschäftsführer
 Dr. Felix Schneider
 Marcel Fahr
 Ulrike Hutsch

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

Bankverbindung:
 Sparkasse Hegau-Bodensee
 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: SOLADES1NG
 Swift-Bic: SOLADEST
 Swift-Bic: GENODE61VS1
 Swift-Bic: DRESDEFF692

Spare parts list for THERMOPRESS EM II Type No. 106-155-0005

Index: C replaces In-

dex: B

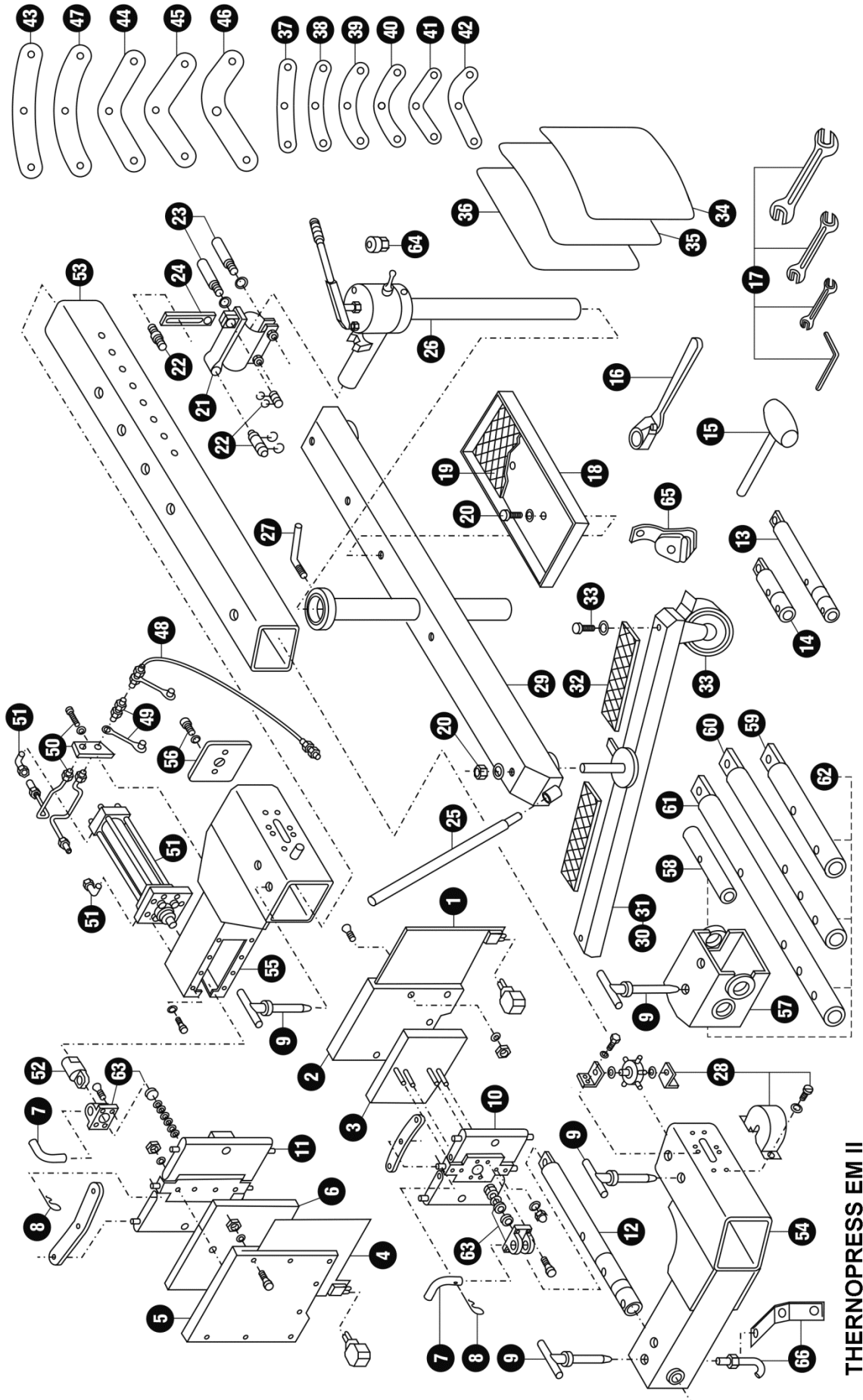
Pos.	Item No.	Description
1	517 5222 *	Heating mat 265 x 265 mm; 230 V, 450 W, Sz. II
2	517 5033 *	Heating bag 330 x 330 mm, Sz. II
3	517 5057 *	Pressure pad 245 x 295 mm, Sz. II
4	517 5239 *	Heating mat 365 x 365 mm 230 V, 800 W, Gr. III
5	517 5040 *	Heating bag 455 x 430 mm, Sz. III
6	517 5064 *	Pressure pad 345 x 395 mm, Sz. III
7	557 8135	Retaining bolt for heating plate
8	557 8434	Safety pin, 10 pc. set
9	558 0082	Retaining bolt
10	557 8111	Heating plate pressure plate Sz. II
11	557 3006	Heating plate pressure plate Sz. III
12	557 3013	Long heating plate holder 50 x 695 mm
13	557 3020	Medium heating plate holder 50 x 450 mm
14	557 3037	Short heating plate holder 50 x 224 mm
15	557 8506	Rubber mallet
16	557 8410	Square socket wrench
17	557 3044	Toolkit including: 3 fork wrenches: SW 10-13, SW 17-19 and SW 30-32 8 mm Allen wrench
18	557 3082	Tool tray
19	557 3099	Rubber for tool tray
20	557 4390	Set of screws, consisting of: 8 screws M8 x 10 mm, 4 hexagon nuts M20, (self-locking) ZN DIN 935
21	557 3116	Tilting mechanism
22	557 8355	Tilting mechanism accessories: Connecting bolt Ø 20 x 141 mm Connecting bolt Ø 12 x 38 mm Square-head threaded bolt M12 x 67 mm
23	557 8331	Set of threaded bolts: Square-head threaded bolt, short M14 x 112 mm, long M14 x 132 mm, 1 piece each.
24	557 3123	Guide for tilting mechanism
25	557 3130	Operating lever
26 not shown in illustration	557 3147 557 3154	Hydr. lifting and lowering device Seal kit for lifting and swiveling device (not shown)
27	557 3161	Locking lever
28	557 8551	Adjusting wheel set for mechanical frame adjustment, consisting of: Adjusting wheel, fastening with bushing for adjusting wheel, cover for adjusting wheel Screw M6 x 15 mm DIN 933 ZN and screw M6 x 10 mm
29	557 3178	Center crossbar chassis
30	557 3185	Left crossbar
31	557 4540	Right crossbar
32	557 3192	Rubber pads for crossbar (4 pc.)
33	557 3202	Castor (plastic) with screw and shim
34	557 3219 *	Contour plate 250 x 250 x 2 mm, contoured
35	557 3226 *	Contour plate 400 x 400 x 2 mm, straight
36	557 3233 *	Contour plate 400 x 400 x 2 contoured (for shoulder repairs, plate must be bent itself)
37	557 3295	Pair of contour segments No. 6 for heating plate Sz. II
38	557 3305	Pair of contour segments No. 7 for heating plate Sz. II
39	557 3312	Pair of contour segments No. 8 for heating plate Sz. II
40	557 3329	Pair of contour segments No. 9 for heating plate Sz. II
41	557 3336	Pair of contour segments No. 10 for heating plate Sz. II
42	557 3343	Pair of contour segments (asym.) No. 11 for heating plate Sz. II
43	557 3398	Pair of contour segments No. 14 for heating plate Sz. III
44	557 3408	Pair of contour segments No. 15 for heating plate Sz. III
45	557 3415	Pair of contour segments No. 16 for heating plate Sz. III
46	557 3422	Pair of contour segments (asym.) No. 17 for heating plate Sz. III
47	557 3439	Pair of contour segments No. 18 for heating plate Sz. III
48	557 3525	Hydraulic high-pressure hose
49	557 3532	Quick coupling for hydraulic hoses (complete)
not	557 3549	Gasket set for pos. 49

Pos.	Item No.	Description
shown in illustration		
50	557 3556	Upper and lower hydraulic hose with support block incl. fixing screw
51	557 3594	Hydraulic cylinder (complete)
not shown in illustration	557 3604	Gasket set for pos. 51
52	557 3611	Articulated joint for cylinder
53	557 3628	Frame main cross-piece
54	557 3635	Left frame section
55	557 3642	Right frame section
56	557 3659	Right stop plate main cross-piece incl. fixing screw M8 x 25 mm
57	557 3666	Frame attachment piece
58	557 3673	Retaining tube, 280 mm, Ø 50 mm
59	557 3697	Heating plate holder, short, 80 x 435 mm
60	558 0051	Heating plate holder, medium, 80 x 645 mm
61	557 3680	Heating plate holder, long, 80 x 1005 mm
62	517 5727	"Gigant" extension kit (optional)
63	557 8386	Joint support, thrust washer, disc spring (6 pc.), 40 x 20.4 x 2.5 mm
64	557 3381	Bleed screw for hydraulic lifting and lowering device
65	557 4359	Strain relief for heating plate cable
66	557 4366	Suspension device for inner heating plate
not shown in illustration	517 6032 *	Complete EM heating plate Sz. III, 430 x 430 mm, 230 V, 800 W (not shown in illustration)
not shown in illustration	517 6025 *	Complete EM heating plate Sz. II, 330 x 330 mm, 450 W (not shown in illustration)

Further EM II spare parts/retrofit parts (not shown in illustration)

Pos.	Item No.	Description
	517 6001 *	Complete EM heating plate, 200 x 200 mm, 230 V, 350 W, Sz. I
	517 5215 *	EM heating mat, 190 x 190 mm, Sz. I
	517 6207 *	EM heating bag, 230 x 230 mm, Sz. I
	517 6214 *	EM pressure pad, 185 x 200 mm, Sz. I
	517 6252 *	Complete EM heating plate, 530 x 530 mm, 230 V, 1100 W, Sz. IV
	517 5246 *	Heating mat, 450 x 450 mm, 230 V, Sz. IV
	517 6276 *	Heating bag, 530 x 530 mm, Sz. IV
	517 6283 *	Pressure pad, 495 x 495 mm, Sz. IV

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.



THERNOPRESS EM II

Spare parts list for THERMOPRESS EM II Type No. 51938

Item No 517 5679

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dex: B

+/-	Pos.	Item No.	Description
+	1	557 3707	Base plate for power-generating unit/control unit
+	2	557 3714	90 x 30 x 6 mm spacer plate for control box attachment
-	3	557 4153	Terminal block
-	4	557 3738	Power contactor (hydraulic motor)
-	5	557 3745	0–2.5 A motor protection switch
-	6	557 3752	Contact (control of hydraulic system)
-	7	557 3769	Ground-fault circuit interrupter (2 poles)
-	8	557 3776	Time lag relay (control of hydraulic system)
-	9	557 3783	Electric temperature limiter
-	10	557 3790	230 mm long mounting rail
-	11	557 3800	6-pole connector
-	12	557 3817	6-pole socket
-	13	557 3824	30 µF starting capacitor
+	14	557 3831	Fuse holder for glass-tube fuse
+	15	557 3848 *	Set of spare fuses 4 A (10 pc.)
+	16	557 3855 *	Set of spare fuses 2 A (10 pc.)
-	17	557 3862	12 µF operating capacitor
-	18	557 3879	Mounting clip for operating capacitor
-	19	557 3886	16-pole connector
-	20	557 3893	16-pole socket
-	21	557 3903 *	Supply cable with safety plug, 3 m
+	22	557 3910	Strain relief
+	23	557 3927	Control box housing, coated (empty)
+	24	558 6031 *	320 x 80 mm rubber pad for control box
-	25	557 3941	RS 25 W resistance
-	26	557 3958	Mounting plate for resistance
+	27	557 3965	Cylinder lock with key (triangular)
-	28	557 3972	Electronic temperature controller Fe-Konstantan
-	29	557 3989	Lock button
-	30	557 3996	Unlock button
-	31	557 4005	Contact block
+	32	517 2483	Double indicator light, green/red + covers
+			Double indicator light, transparent + covers
+	33	517 1305 *	Set: 230 V glow lamp, 3.7 V special lamp, four pc. each
-	34	557 4012	Digital time, 24 hours, from model 02/97 onwards
-	35	557 4029	Button for timer
+	36	557 4036	Elbow coupling for supply line to hydraulic pump
+	37	557 4043	HCW 14 K/0.61 230 V hydraulic pump
+	38	557 4050	Cable support
+	39	557 4067	Bleed screw for hydraulic pump
+	40	557 4074	VSM 18 x 1.5 WD sealing plug
+	41	557 4081	Pressure control unit
+	42	557 4098	ELVD 8L T coupling
+	43	557 4108	RSWV 8LR screw-in connection
+	44	557 4122	GEV 8LR WD screw-in connection (transition screw fitting connected to valve unit)
+	45	557 4115	Hydraulic pressure gauge
+	46	557 3721	MAV 8LR screw-in connection (transition screw fitting from Ermeto tube connected to valve unit)
+	47	557 4139	Ermeto tube (bent), no screw-in connection
+	48	557 4146	Solenoid valves (complete) with pressure relief valve A3/200-3WN1F-1-1-WG230
+	not shown in illustration	517 5679	230 V complete control unit
+	not shown in illustration	557 4160	End elbow
+	not shown in illustration	557 4177	255 mm long mounting rail
+	not shown in illustration	557 4184	90 mm cable duct
+	not shown in illustration	557 4191	250 mm cable duct

+/-	Pos.	Item No.	Description
+	shown in illustration not shown in illustration	557 4201	Base plate for control box, no electrical parts
+	not shown in illustration	557 4218	Control line for hydraulic motor, solenoid valves and pressure control unit mounted completely with sleeve housing
+	not shown in illustration	557 4225	Hydraulic hose with coupling plug and dustproof plug
+	not shown in illustration	557 4232	Hose clamp for control line
	not shown in illustration		Circuit diagram

+ only to be changed by an authorized electrician

- The electrician is liable for his/her work in accordance with regulations on machine safety and warranty regarding the functioning of the machine

The components marked with *) are wearing parts for which any claims for defects are excluded within the scope permissible by law.

THERMOPRESS EM II ENERGIEBLOCK

