OPERATING AND MAINTENANCE MANUAL

TYRE CHANGER
TOP AUTOMATIC 4.0

CE

Serial no.: _____

Manual version: UM TOP AUTOMATIC 4.0

FASEP 2000 Srl

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This manual is an integral part of the product and must always be available to the users of the product.

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1 – GENERAL INFORMATION

1.1 – LAYOUT OF THE MANUAL

This manual is an integral part of the official documentation of the tyre changer machine, (hereinafter referred to as the "machine"). It must be carefully stored and made available to users and servicemen.
The user and serviceman must carefully read the information in this manual in order to properly install and operate the machine.
FASEP (hereinafter referred to as the "Manufacturer") will not be held responsible for any damage caused during the operation of the machine due to the incorrect application of the safety concepts in this manual.

1.1.1 – Purpose and intended recipients

The purpose of this manual is to provide the information required to operate and service the machine.
Any work on the machine must be performed by a specially trained operator. Servicemen and operating personnel must read and understand the instructions in this manual.
The employer is responsible for training operators on risks due to injury and the regulations to prevent them which are in force in the country where the machine has been installed.
In the event of any doubts concerning the proper interpretation of these instructions, please contact the Manufacturer for any explanations necessary.
This manual is intended for the operator and the technicians appointed with servicing the machine.

1.1.2 - Storing

The User Manual must be stored close to the machine in a specific container and protected from liquids and anything else which may make it illegible.

1.1.3 – Symbols used within the manual

SYMBOL	MEANING
☞ **Warning**	This symbol is used in the safety messages in the following two cases: • to highlight important information for the servicemen and operating personnel; • to point out safety measures to be implemented to avoid damaging the machine.
	This symbol is used in the safety messages (rules) in the manual when potentially hazardous situations exist or it is probable for persons using the machine to be injured.

1.2 - MANUFACTURER

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1.3 – SERVICE CENTRES

The Manufacturer assembles the machine. Specialized FASEP personnel or an authorized FASEP Service Centre must be contacted for any servicing required on the machine.

1.4 - CERTIFICATION AND CE MARKING

The machine was manufactured in compliance with Directive 2006/42/EC and with the pertinent and applicable EU Community Directives at the time it was put on the market (Fig. 1).

DECLARATION OF CONFORMITY
(Encl. II A, Part I, Selection A- Machinery Directive 2006/42/EC)

Declares under the sole resposability of its legal representative that the machine:

Name: Tyre Changer
Model RASE.TOP.4028
Year:
Serial No:
Absorbed power: 3.5 kW
Weight: 780Kg

Conforms with the safety requirements set forth by:

- **Machinaru Directive 2006/42/EC**
- **Electromagnetic Compatibility Directive 2004/108/EC**

Name and Surname.....

Figure 1 – Facsimile of EC Declaration of Conformity

1.5 – WDK CERTIFICATION

The 'RASE.TOP 4028 tyre changer complies with the requirements of the German Rubber Association's (*Wirtschaftsverband der deutschen Kautschukindustrie*) WDK directive, 2016 edition (Test report K170853 dated 29 June 2017), with reference to the properties tested.

1.6 - WARRANTY

The warranty covers the machine for 24 months starting from the date the Manufacturer ships the machine to the customer.

2 – DESCRIPTION OF THE MACHINE

The tyre changer machine (the subject of this Operating and Maintenance Manual) allows a tyre to be changed on different types of wheels, in an easy and safe manner for the operator.
Its innovative tilting system of the self-centring unit (where the wheel is positioned) facilitates bead-breaking operations while decreasing the need for the operator to intervene on the tyre using manual tools.
The *"RASE.TOP 4028"* machine is completed by a PLC control system and by a dedicated electric panel.

2.1 - MAIN UNITS

The tyre changer consists of the following units (figure 2):

1. Machine frame.
2. Control panel.
3. Rear cabinet.
4. Electric panel compartment.
5. Self-centring unit.
6. Upper tool unit.
7. Lower tool.
8. Tecnoservice unit.
9. Lifter.
10. Pedals.

Figure 2 – Overall view of the machine

Depending on the tyre and related wheel rim, it is possible to select from three types of locking cones (Fig. 3):

Figure 3 – Locking cones

The average life (under normal operating conditions) of the tyre changer is estimated at 20 years. Once this period is over, the machine may undergo a complete overhaul/check by contacting the Manufacturer's Service Department.

2.1.1 - Machine frame

The machine framework consists of an extremely compact tubular monobloc which is easy to handle (Fig. 4).

Figure 4 – Machine frame

2.1.2 – Control panel

The operator controls the automatic pneumatic removal/fitting cycle using the touch screen unit that is incorporated into the control panel, which includes the selectors to activate machine tool movements in manual mode, the start and emergency buttons, and lifter selectors (Fig. 5):

1) Touch-screen unit.
2) UPPER TOOL UNIT RAISE/LOWER lever and LH/RH TRANSLATION LEVER FOR THE SELF-CENTRING UNIT.
3) TECNOSERVICE UNIT RAISE/LOWER lever.
4) Self-centring unit axis VERTICAL/TILTED positioning lever.
5) LOWER TOOL RAISE/LOWER lever.
6) WHEEL LOCK/UNLOCK selector switch.
7) MANUAL/AUTOMATIC mode selector.
8) UPPER TOOL SELECTOR.
9) LIFTER vertical translation selector.
10) LIFTER rotation selector.
11) EMERGENCY button.
12) START button.

Figure 5 – Control panel

2.1.3 – Rear cabinet and electric panel

The cabinet in the back of the machine (Fig. 6) holds the hydraulicontrol unit (a), the upper tool rotation unit (b) and the solenoid valve unit (c).

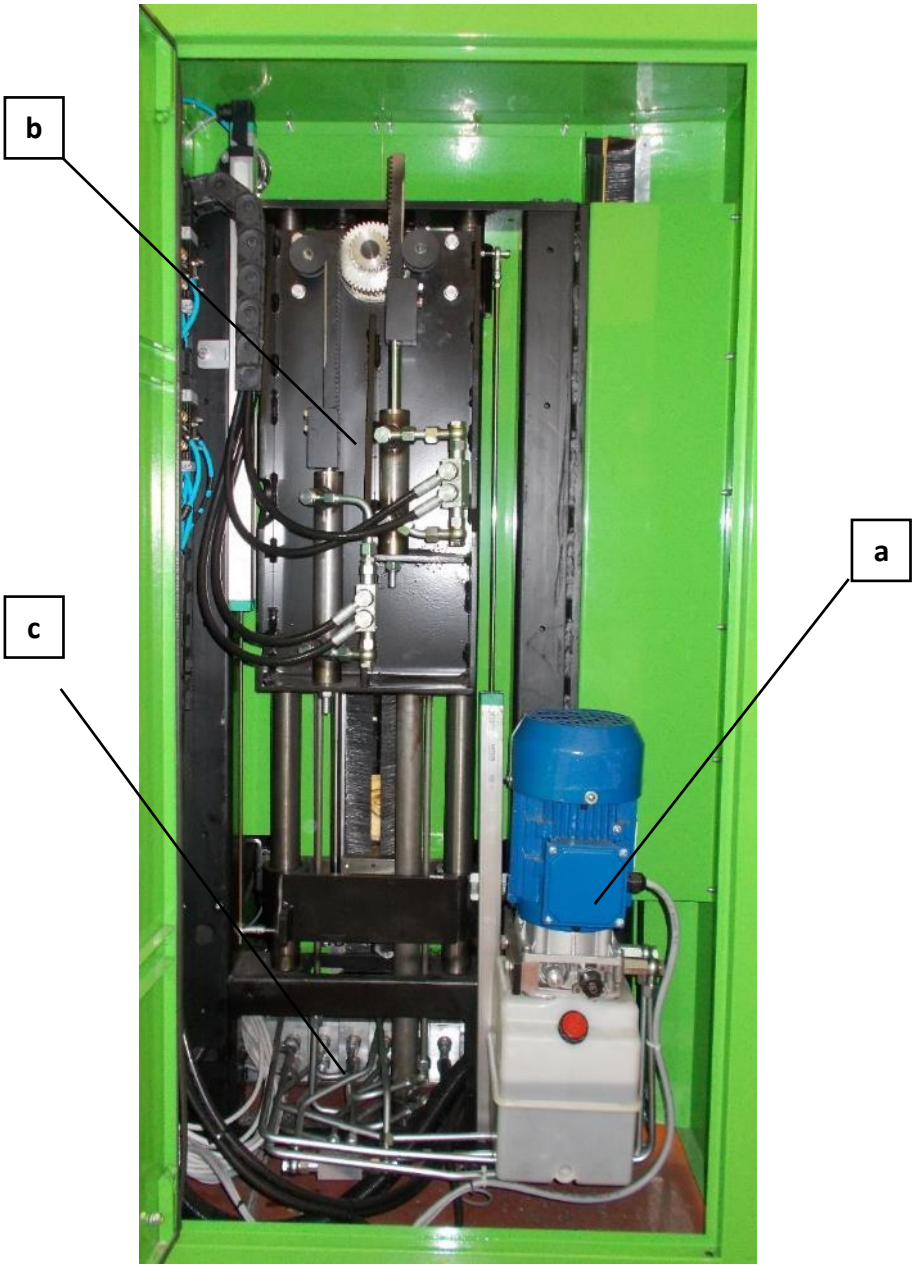

Figure 6 – Rear cabinet

2.1.4 – Electric panel compartment

The electric panel compartment (Fig. 7) holds the PLC (a), power supply unit (b), and inverters (c).

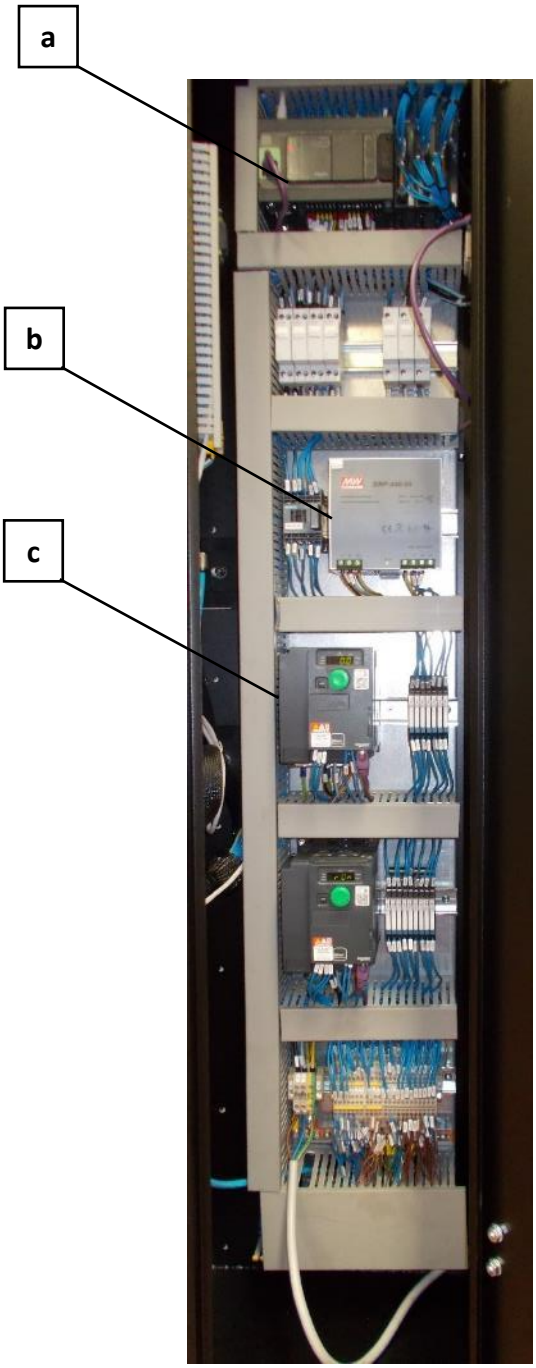

Figure 7 – Electric panel compartment

2.1.5 - Self-centring unit

In addition to translating in the direction parallel to the machine base, the self-centring unit (Fig. 8) may be tilted during the tyre extraction step in order to reduce the stress applied to the bead of the tyre during removal.

Figure 8 – Self-centring unit

2.1.6 - Upper tool unit

The upper tool unit is used by the operator to break and extract the upper bead of the tyre. The unit consists of three components (Fig. 9):

- Bead-breaker disc.
- Extraction tool.
- Fitting tool.

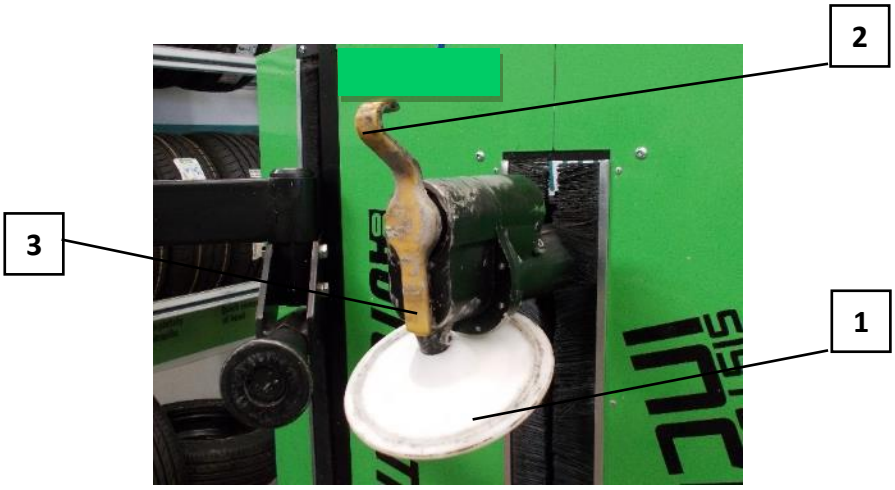

Figure 9 – Upper tool unit

2.1.7 - Lower tool unit

The lower tool is used by the operator to break the lower bead of the tyre (Fig. 10):

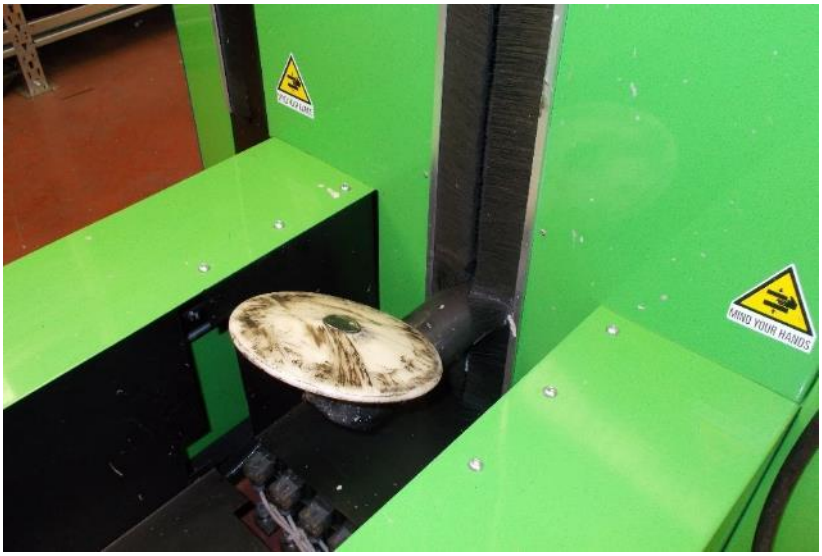

Figure 10 – Lower tool

2.1.8 - Tecnoservice unit

The Tecnoservice unit is used during the tyre fitting step. Three tools are used to set the tyre bead (Fig. 11):

1) Bead-press roller.
2) First bead-setting wedge.
3) Second bead-setting wedge.

Figure 11 – Tecnoservice unit

2.1.9 – Lifter

The lifter is pneumatically operated and used by the operator to load and unload the tyres for removal and fitting operations (Fig. 12).

Figure 12 – Lifter

2.1.10 – Pedals

The machine has four pedals (Fig. 13):

1)  - **Counter-clockwise rotation pedal:** pressing down on this pedal rotates the tyre counter-clockwise in relation to the operator's position.

2)  - **Clockwise rotation pedal:** pressing down on this pedal rotates the tyre clockwise in relation to the operator's position.

3) || - **Movement pause pedal:** when this pedal is pressed down during the automatic tyre removal cycle, the machine completes the removal cycle. Lifting the foot from the pedal during the automatic removal cycle stops the machine's moving parts.

4) AIR - **Tyre inflating pedal:** pressing down on this pedal activates the compressed air circuit for tyre inflation.

Figure 13 –Pedals

2.2 – CE PLATE

The identifying CE plate with serial number (Fig. 14) is located in the back of the machine, on the left-hand side, close to the main power switch (Fig. 15).

	**The data on the plate may not be altered for any reason.**

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CE

Type: SMONTAGOMME Type: TYRE CHANGER	Potenza assorbita / Absorbed power: 3.5 kW	Matricola / Serial number: XX
Alimentazione elettrica / Electrical supply: 230 V – 50/60 Hz	Modello / Model: RASE.TOP 2028	Alimentazione pneumatica / Pneumatic supply: 6 bar
Peso / Weight: 780 kg	Anno / Year: 201X	

Figure 14 – CE plate

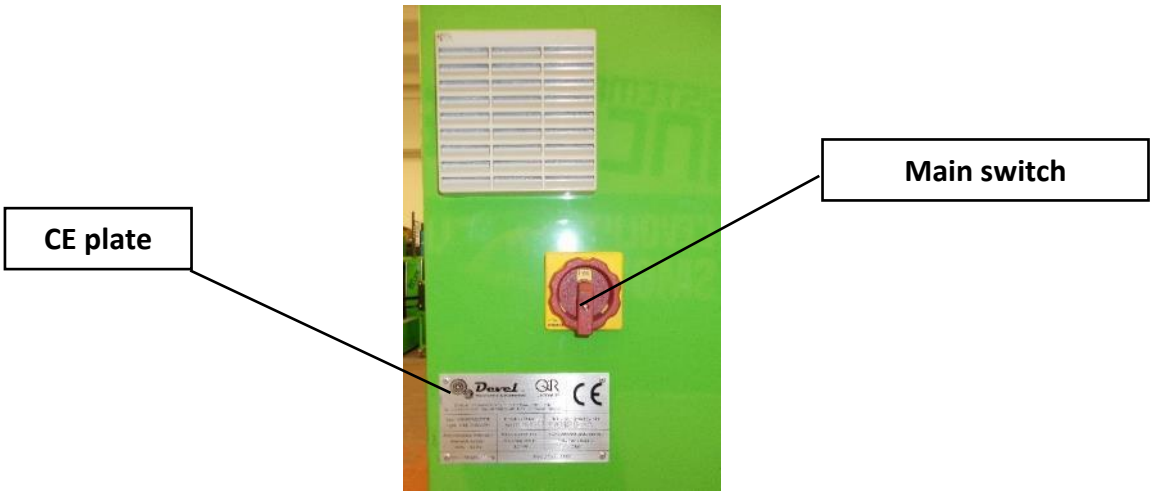

Figure 15 – CE plate location

2.3 - SPECIFICATIONS

Dimensions and weight:

LENGTH	1950 mm
WIDTH	1071 mm
HEIGHT	1620 mm
WEIGHT	780 kg

Dimensions of wheel:

RIM DIAMETER	from 13'' to 28''
MAX. TYRE DIAMETER	1143 mm (45'')
MAX. TYRE WIDTH	380 mm (15'')
TYPES OF TYRES	Conventional, low profile, run flat

Tilting translating self-centring system:

WHEEL LOCKING	Automatic
ROTATION SPEED	9 RPM

Power supply:

ELECTRICAL SUPPLY	230 V / 50-60 Hz, single-phase with PE
PNEUMATIC SUPPLY	6 bar
MAX ABSORBED POWER	3.5 kW

Hydraulic circuit:

LUBRICANT	Oil ENI OSO 46
TANK CAPACITY	9 kg
MAX. OPERATING PRESSURE	180 bar

3 – SAFETY

3.1 – GENERAL WARNINGS

The tyre changer was designed to be safe when used as intended (ref. par. 4.1), so long as it is run, operated and serviced by following the instructions in this Operating and Maintenance Manual.

Operators are obligated to carefully read the information in this manual, in particular concerning the appropriate safety precautions listed in this chapter.

Warning	The machine must not be tampered with; contrarily, no liability is accepted concerning its proper operation or any damage caused by the product itself.
Warning	Do not use the machine without first reading all instructions in this Operating and Maintenance Manual. Servicemen and operating personnel must be suitably trained and informed before beginning any work.

Moreover, operators are required to comply with the following warnings:

	Do not use the machine for any purposes other than its intended purpose (ref. par. 5.1).
	Keep the machine and the work area tidy, clean and free of any foreign objects.
	Periodically perform all the operations described in the specific section dedicated to maintenance.
	Contact DEVEL S.r.l. for any operations involving repairs, modifications and extraordinary maintenance.
	Check the direction of rotation of the electric motors when the machine is started up the first time or after any work on the electrical connections or on the power supply isolating device.
	Never open the compartments of the electrical equipment when the machine is connected to the power supply.
	Disconnect the power supply using the dedicated devices before cleaning or performing ordinary maintenance.

3.2 - DANGER ZONES

The tyre changing machine, except for the areas where residual risks are present (ref. par. 3.5), has no danger zones for the operator during the course of the work cycle.

3.3 - SAFETY GUARDS

All components of the tyre changer which may generate risks - such as motors and transmission components, electric panels, pipes and hydraulic and pneumatic components - are guarded inside the machine housing. In fact, the equipment includes fixed metal housings (bolted) protecting the movement and transmission components which do not require any intervention during regular operation (geared motors, hydraulic control unit).

3.4 - EMERGENCY BUTTON

The emergency button (category 0) is located on the control panel of the machine (Fig. 16 a).[1]

The main power switch is located in the back of the machine, on the left-hand side (Fig. 16 b).

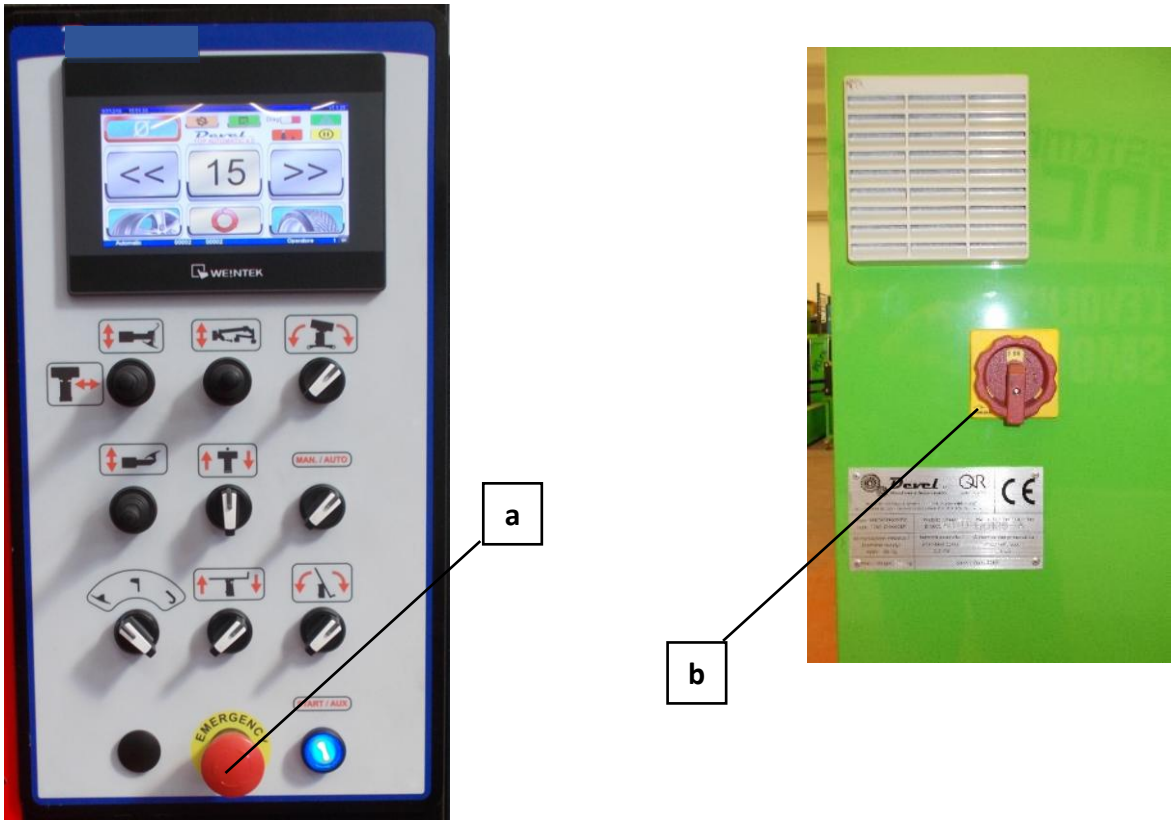

Figure 16 – Emergency button (a) and main power switch (b)

[1] "0" CATEGORY STOP: this stop is obtained by cutting power to the machine actuators (non-controlled stop).

3.5 - RESIDUAL RISKS

The machine was designed and built with the intent to eliminate all risks associated with its operation.
The residual risks are specified below:

a) Electrocution hazard: 
The cabinet containing the electric panel warns of an electrocution hazard (Fig. 17 a).
The electric panel parts are made with IP2X protection rating. Only qualified personnel may open the electric cabinet, and after having cut the power to the machine using the main power switch (ref. fig. 16 b).
The electrocution hazard may arise if unqualified personnel access the cabinet containing the electric panel and the machine is not disconnected from the power supply line.

b) Risk of upper limbs being crushed: 
The risk of upper limbs being crushed is indicated near the removal/fitting tools and the lifter (Fig. 17 b).
The risk of upper limbs being crushed can arise if the operator's upper limbs get too close to the contact zones between the bead breakers and tyre and to the zone between the lifter rollers and the protective housings of the machine body during the tyre removal/fitting operations.

Figure 17 – Position of pictograms showing residual risks

3.6 – PERSONAL PROTECTIVE EQUIPMENT

As a precaution, machine operators are recommended to wear the following personal protective equipment:

- **gloves that protect against the risk of cuts, abrasions**
- **safety footwear**
- **safety goggles**
- **protective clothing with tight cuffs**

3.7 – SAFE WORK PROCEDURES

Machine operators using the machine must monitor the danger zone, avoid starting the tyre removal/fitting operations if persons who are not involved in the work are within the danger zone or immediate vicinity.

	**If the operator needs to completely or partly disable certain safety devices for particular work involving servicing, inspecting or repairing the tyre changer or parts of it, he/she is responsible for immediately restoring the proper operation of the components themselves at the end of the work.**

3.7.1 – Safety rules for the operator

- Use the machine for the purposes and under the operating conditions specified in this Operating and Maintenance Manual.
- Perform the periodic maintenance checks indicated in this Operating and Maintenance Manual.
- Monitor all elements subject to possible wear and tear. This is particularly important for all moving mechanical components and for all cables and wiring, especially those with a high operating voltage or pipes containing pressurized fluids.
- Periodically check the operation of all active devices such as valves, emergency buttons, warning lights, control devices, isolating devices, etc.
- Always keep the electric panel closed;
- Clean and tidy up the work area at the end of a work cycle.

	**Protective housings may only be removed for maintenance requirements and must be repositioned before resuming operation of the system or its equipment.**

3.7.2 –Safety rules for the mechanical maintenance engineer

- Before performing any maintenance, make sure the equipment has been disconnected from all power supplies.
- Make sure no equipment or foreign bodies remain between the moving components of the machine after performing any maintenance or making any adjustments to prevent damaging the equipment and/or injuring personnel.
- Restore the safety and emergency devices on the machine when maintenance is complete.
- Always keep the area used for performing maintenance clean and dry, and more specifically eliminate any oil or grease spots.
- Do not use petrol or inflammable solvents such as detergent; always use non-hazardous commercial solvents.
- Do not use compressed air to clean components; if it is impossible to use other systems, protect yourself with goggles with side guards and limit the pressure to a maximum of 2 bar.

3.7.3 – Safety rules for the electrical maintenance engineer

- Ensure the electrical components have been disconnected from the supply line before doing any work on them.
- After any work on the electric panel or related wiring, close the safety guards properly before restoring the power and starting up the machine.

	**Only allow qualified personnel who has been properly trained and informed on the aforesaid activities to service the equipment (both mechanical and electrical).**

4 – HANDLING AND INSTALLATION

Carefully read this chapter before installing the machine.

	The machine installers must work carefully and ensure unexpected events do not occur, and must have the skills required to select the components for connecting to power supplies.
	This machine must be installed in a suitable area, while complying with the instructions set forth in this chapter.
	The machine is ready to be handled (completely assembled with all its components) with the assistance of a fork-lift truck equipped with hook (or other hoisting equipment). When required, directly contact the Manufacturer, who will provide all the information and support necessary to work in safe conditions.

	Any defects arising from installation not performed according to the rules of the trade release FASEP from any liability concerning subsequent malfunctioning and damage.
	Contact the Manufacturer if the machine requires handling and reinstalling in another location.

4.1 – PREPARATIONS THE CUSTOMER IS RESPONSIBLE FOR

The user is responsible for preparing:

- The installation premises, as prescribed by current local legislation regulating health and safety at the workplace;
- Supplying electrical energy, in compliance with the current regulations at the installation site;
- An efficient earthing system;
- An isolating switch with automatic protection against short circuits, earth faults and electrostatic discharges between the electric power supply line and the machine.

More specifically, the user must properly prepare the following at the installation premises:

- Lighting.
- Necessary space.
- Finishing work and floors.
- Suitable supply lines.

a) Lighting

The installation site for the machine must have sufficient natural and/or artificial lighting, in compliance with the current regulations in the country where the machine is installed.
In any case, lighting must be uniform, ensure good visibility of all areas on the machine, and must not create dangerous reflections with a stroboscopic effect.
Lighting must allow the control panels to be easily read and more specifically, the emergency button to be clearly identified.
We recommend a minimum lighting intensity of 300 lux.

b) Necessary space

Prepare the spaces in the machine installation area. Machine operability and easy execution of maintenance must be ensured (Fig. 18). In particular, pay careful attention when:

- Handling the Tecnoservice unit.
- Loading and unloading the wheel.
- Opening the electric panel and rear cabinet for servicing.

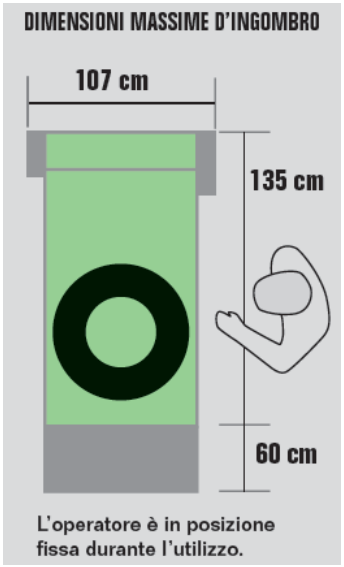

Figure 18 – Machine's dimensions

c) Finishing work and floors

No special finishing work is required for installation. Unless indicated otherwise, the floor must support a specific load of 2 kg/cm^2 and be of the industrial type, smooth and flat.

d) Power supply lines

The connection points on the machine to the power and pneumatic supply lines are located on the lower back part of the machine (Fig. 19). The power supply and pneumatic networks at the customer's premises are to have the following characteristics:

- Electrical energy: voltage = 230 V, frequency = 50/60 Hz, single phase power supply with overload conductor.
- Compressed air: dry, pressure between 6 to 9 bar.

Figure 19 – Connection points to power sources

The ambient conditions for proper use of the machine are indicated in Table 2:

Parameter	Values allowed
Operating temperature (ambient)	from -5° C to + 40 °C
Daily average temperature	< 40 °C
Storing temperature	from -10 °C to +50 °C
Relative humidity in the absence of condensation	from 30% to 95%

Table 2 – Ambient conditions for proper use of the machine

4.2 – HANDLING

The machine must be hoisted using a crane equipped with hook and a lift strap (minimum load = 2000 kg) (Fig. 20). The operator must perform the following operations to hoist the machine:

- Move the upper tool of the machine manually to its maximum height position.
- Secure the elastic strap to the lifting hook and surround the bottom of the upper tool rack shaft with the strap.
- Hoist the machine.

Figure 20 – Machine hoisting

☞⚠	Pay particular attention to the safety regulations below during machine hoisting operations: • Use hoisting means (fork-lift trucks or cranes) and harness accessories which are suitable for the mass and dimensions of the machine (ref. section 2.3). More specifically, ensure that the weight that can be hoisted is greater than the weight P of the machine (P = 780 kg). • The hoisting operation must be performed gradually and continuously (without pulling or jerking). • The entire area surrounding the machine is to be considered a danger zone. • Keep the load as low as possible for improved load stability and increased visibility during the movements. • We recommend the driver of the hoisting means be assisted by a second person if there are obstacles in the load handling zone.

4.3 – POSITIONING

When FASEP has not been appointed with installation, the user is responsible for the proper installation of the machine and must ensure that it complies with the relevant local provisions in force and the rules of the trade indicated by FASEP Unless indicated otherwise, the floor must support a specific load of 2 kg/cm^2 and be of the industrial type, smooth and flat.

Ensure the floor is flat and can support the weight of the machine before positioning the load. The weight of the machine is distributed on four adjustable legs (Fig. 21).

Figure 21 – Adjustable leg

	**It is important for the tyre changer to be properly levelled to prevent vibrations during operation.**

4.4 – PRELIMINARY OPERATIONS AT THE FIRST STARTUP

The customer is obligated to perform inspections to identify any non-conformities prior to installation.

Prior to commissioning:

- Check rating plate data of the electrical components and the corresponding supply available.
- Check for the presence of all ID plates (ref. par. 2.2) and danger signs (ref. par. 3.5).
- Check for the presence of the safety devices: emergency button (ref. par. 3.4).

When the machine is operating:

- At each startup: ensure the direction of operation of the control valves corresponds with the indication shown.
- It is prohibited to come into contact with moving components (self-centring system both when translating and tilted, bead-breaker unit) during machine operation.

Also:

- Ensure the tyre changer was not damaged during the assembly or installation step.
- Carefully check the integrity of electric panels, control panels, electric cables.
- Ensure all external energy sources are properly connected.

	**In any case, if equipment does not seem suitable for proper and safe operation, place it OUT OF ORDER until it is repaired or the damaged components have been replaced.**

4.5 – LONG PERIODS OF INACTIVITY

In the event of long periods of inactivity, do the following:

- Disconnect power sources;
- Prepare a clean storing area protected from the weather;
- Ambient conditions: temperature range -5 °C – +40 °C;
- Grease unpainted components;
- Protect the machine against knocks and stresses;
- Protect the machine and the electric equipment from humidity and significant variations in temperature;
- Ensure the machine does not come into contact with corrosive substances.

	**If the machine is uninstalled in order to be stored for a period of time, we recommend emptying the hydraulic control unit, or in any case replacing the oil before it is operated again.**

	**Repeat the initial checks for a first start-up to restore the machine after a long period of inactivity (ref. par. 5.3).**

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5 – OPERATING THE MACHINE

5.1 – INTENDED USE

The "RASE.TOP.4028" tyre changer is an automatic machine used to remove/fit tyres having the following characteristics (ref. table 2.3):

- type of tyre: conventional, low profile, run flat.
- rim diameter: 13" ÷ 27".
- max. tyre width: 380 mm (15").

The "RASE.TOP.4028" tyre changer and its components must never be used for purposes other than its intended use.
Complete compliance with the use, repair and maintenance conditions as specified by the Manufacturer are essential elements falling within the intended use.

	**The machine must ONLY be used by qualified personnel who have read the contents of this manual.**
	**Only use materials and products indicated by the Manufacturer to operate the machine (see section 6.3).**
	**Before beginning operation, ensure there are no tools or foreign objects on the work surface of the equipment.**
	**Do not operate the machine if it is not stable on the surface on which it is installed.**

5.2 – INAPPROPRIATE USE

	The tyre changer must **NOT** be used:

- For uses other than those indicated in section 5.1.
- In ambient conditions other than those indicated in section 4.1.
- For materials and with fluids other than those indicated for the intended use (wheels as per specifications and hydraulic oils).
- Never operate in a potentially explosive atmosphere.

5.3 – STARTING THE MACHINE

The customer is obligated to perform inspections to identify any non-conformities on the machine prior to starting it:

- Check rating plate data of the electrical components and the corresponding supply available.
- Check for the presence of all ID plates (ref. par. 2.2) and danger signs (ref. par. 3.5).
- Check operation of the safety devices: emergency button (ref. par. 3.4).

To start the machine, perform the following operations:

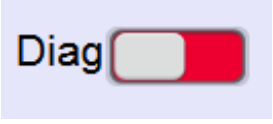
1. Turn the main power switch to ON (ref. fig. 16 a);
2. Wait a few seconds until the touch screen displays the screen that allows the operator to manage the work cycle;
3. Press START/AUX on the control panel (ref. fig. 5, no. 12).

The operator manages the work cycle using the touch screen and control panel and performing several manual operations. The controls on the touch screen are described in figure 22.

Reset: when the button is pressed, the self-centring unit moves to the 'ZERO' position (reference position) before the work cycle starts.

Configuration: press this button to access the reading of the machine's operation parameters (type of tyres changed, amount of power consumed, diagnostics, etc.).

Activity scheduling: press the button to access the daily calendar with scheduled tyre change appointments.



Diagnostics:

- LH button: rim geometry diagnostics not enabled.
- RH button: rim geometry diagnostics enabled.

Rim diagnostics alarm:

- green background: rim with no defects.
- red background: defective rim.

Valve position: indicator reminding the operator that the inflation valve must be positioned at 12 o'clock:

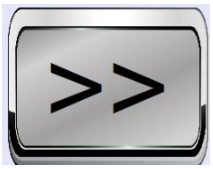
- red background: the operator did not rotate the self-centring unit to position the valve.
- green background: the operator rotated the self-centring unit to position the valve.

Pause: displays the status of the 'PAUSE' pedal:

- green background: the operator pressed the 'PAUSE' pedal during tyre removal.
- yellow background: the machine is waiting for the operator to press the 'PAUSE' pedal during tyre removal.

Decrease rim diameter: press the button to decrease the rim diameter.

View rim diameter: the icon displays the rim diameter setting (unit of measure: inches).



Increase rim diameter: press the button to increase the rim diameter.

Rim Touch: when the button is pressed, the upper bead breaker and the lower bead breaker move toward the tyre until touching against the rim's outer edge.

Repeat cycle: when the button is pressed, the machine uses the upper bead-breaker positions stored during the previous work cycle.

Tyre Touch: when the button is pressed, the operator uses levers 2 and 5 (ref. fig. 6) to manually bring the upper bead breaker and lower bead breaker to touch the respective beads of the tyre.

Figure 22 – Touch-screen for managing the work cycle

5.4 – OPERATING MODES

The "RASE.TOP.4028" tyre changer has two operating modes:

1. Automatic mode, with two variations:
    - 'Rim touch'.
    - 'Tyre touch'.
2. Manual mode.

5.4.1 – Automatic mode

The "RASE.TOP.4028" tyre changer can be operated in automatic mode in one of two ways:

a) 'Rim touch': the upper bead breaker and the lower bead breaker move toward the tyre until touching against the rim's outer edge.
b) 'Tyre touch': the operator uses levers 2 and 5 (ref. fig. 6) to bring the upper bead breaker and lower bead breaker to touch the respective beads of the tyre.

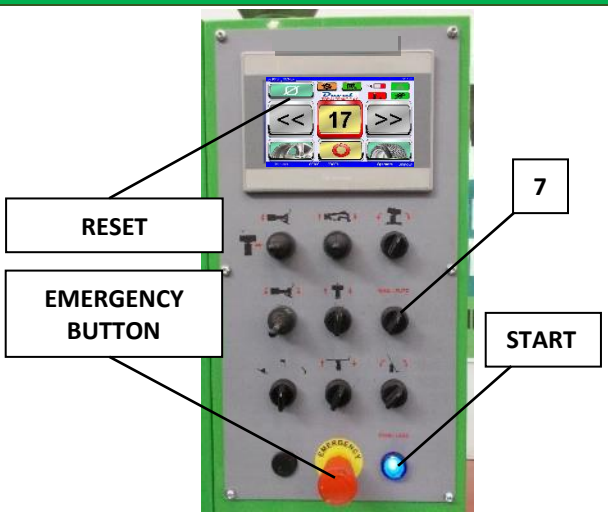
To choose option (a) or option (b), the operator has to press the appropriate button on the touch screen ('RIM TOUCH' or 'TYRE TOUCH', respectively).

A series of flashing frames around the touch screen buttons guide the automatic mode tyre removal procedure: the flashing icon lets the operator know the button has to be pressed to move on to the removal cycle.

When the upper and lower bead breakers come into contact with the edge of the rim [option (a)] or with the beads of the tyre [option (b)], the machine performs the tyre removal cycle automatically.

REMOVAL OPERATIONS

1



SWITCHING THE TYRE CHANGER ON:

- ✓ MOVE THE MAIN POWER SWITCH TO ‘ON’.
- ✓ MAKE SURE THE EMERGENCY BUTTON IS NOT PRESSED DOWN AND PRESS ‘START’ ON THE CONTROL PANEL (THIS WILL START THE PUMP AND SOLENOID VALVES OF THE HYDRAULIC CIRCUIT).
- ✓ POSITION SELECTOR 7 TO ‘AUTO’ (REF. FIG. 6).
- ✓ PRESS 'RESET' (REMOVAL TOOLS MOVE TO ZERO REFERENCE HEIGHT).

2

LOADING THE TYRE FOR REMOVAL:

- ✓ PLACE THE WHEEL ON THE SELF-CENTRING UNIT VIA THE LIFTER USING CONTROL PANEL SELECTORS 9 AND 10.

3

LOCKING THE WHEEL IN PLACE:

- ✓ PLACE THE WHEEL ON THE SELF-CENTRING UNIT AND THE LOCKING CONE INTO POSITION.

- ✓ PRESS DOWN ON THE TOP OF THE LOCKING CONE AND TURN SELECTOR 6 ON THE CONTROL PANEL TO THE RIGHT.
- ✓ ROTATE THE TYRE USING THE DEDICATED PEDALS UNTIL THE INFLATION VALVE IS ALIGNED WITH THE REMOVAL TOOL AT 12 O'CLOCK.

4

SETTING THE RIM DIAMETER:

- ✓ USE THE '<<' AND '>>' KEYS TO DECREASE AND INCREASE, RESPECTIVELY, THE DIAMETER OF THE WHEEL RIM. THE CHOSEN DIAMETER WILL DISPLAY IN THE MIDDLE BOX OF THE SCREEN.
- ✓ PRESS THE CENTRAL BUTTON INDICATING THE RIM DIAMETER TO CONFIRM THE CHOICE.

5

CHOOSING THE MACHINE'S OPERATING MODE:

- ✓ SELECT AUTOMATIC OPERATING MODE BY PRESSING THE RESPECTIVE BUTTON: 'RIM TOUCH' (LEFT BUTTON WITH RIM DESIGN: THE BEAD BREAKERS AUTOMATICALLY COME INTO CONTACT WITH THE RIM) OR 'TYRE TOUCH' (RIGHT BUTTON WITH TYRE DESIGN: THE OPERATOR BRINGS THE BEAD BREAKERS INTO CONTACT WITH THE TYRE USING CONTROL PANEL LEVERS 2 AND 5, REF. FIG. 6). THE OPERATOR HAS THE OPTION OF USING THE 'REPEAT CYCLE' FUNCTION (CENTRAL BUTTON WITH ARROW CIRCLE DESIGN) IF THE TYRE TO REMOVE AND THE TYRE REMOVED IN THE PREVIOUS WORK CYCLE SHARE IDENTICAL CHARACTERISTICS (DIAMETER, HEIGHT).

6

BREAKING THE TYRE BEAD:

- ✓ PRESS THE 'PAUSE' PEDAL (||): THE TYRE CHANGER AUTOMATICALLY BREAKS THE TYRE'S UPPER AND LOWER BEADS (DURING BEAD BREAKING, THE OPERATOR SHOULD ADEQUATELY GREASE BOTH THE UPPER AND LOWER BEADS OF THE TYRE).
- ✓ THE OPERATOR HAS TO KEEP THE 'PAUSE' (||) SAFETY PEDAL PRESSED DOWN UNTIL THE BEAD BREAKS AWAY FROM THE UPPER AND LOWER EDGES OF THE TYRE. RELEASING THE 'PAUSE' PEDAL STOPS THE MACHINE'S MOVING PARTS.

7

EXTRACTING THE TYRE:

- ✓ THE REMOVAL TOOL AUTOMATICALLY HOOKS ONTO THE TYRE'S UPPER BEAD AND EXTRACTS IT. DURING TYRE REMOVAL, THE OPERATOR HAS TO KEEP THE 'PAUSE' (||) SAFETY PEDAL PRESSED DOWN. RELEASING THE 'PAUSE' PEDAL STOPS THE MACHINE'S MOVING PARTS.
- ✓ WHEN THE UPPER BEAD HAS COMPLETELY BROKEN AWAY FROM THE TYRE, THE UPPER REMOVAL TOOL AUTOMATICALLY PULLS THE UPPER BEAD UPWARD. AT THE SAME TIME, THE LOWER BEAD BREAKER PULLS THE TYRE'S LOWER BEAD UPWARD.
- ✓ DURING THE UPWARD TRANSLATIONAL MOTION OF THE REMOVAL TOOL AND LOWER BEAD BREAKER, THE OPERATOR NEEDS TO GUIDE THE VERTICAL TRANSLATION OF THE TYRE WITH THE LEFT HAND TO EASE THE REMOVAL OF THE TYRE FROM THE RIM.
- ✓ AT THE END OF THE REMOVAL OPERATION, THE UPPER TOOL UNIT ROTATES AUTOMATICALLY SO THAT THE FITTING TOOL CAN GET INTO THE FITTING POSITION TO BEAD THE NEW TYRE.
- ✓ THE OPERATOR CAN USE THE 'REPEAT CYCLE' BUTTON WHENEVER THERE IS A NEED TO REMOVE FOUR TYRES HAVING THE SAME CHARACTERISTICS (DIAMETER, SIDEWALL HEIGHT, ETC.): THE OPERATOR CAN PERFORM THE BEAD BREAKING OPERATION OF THE

	FIRST TYRE WITH 'TYRE TOUCH' OR 'RIM TOUCH' AND USE 'REPEAT CYCLE' FOR THE SECOND, THIRD AND FOURTH TYRES.

FITTING OPERATIONS

1

GREASING THE NEW TYRE:

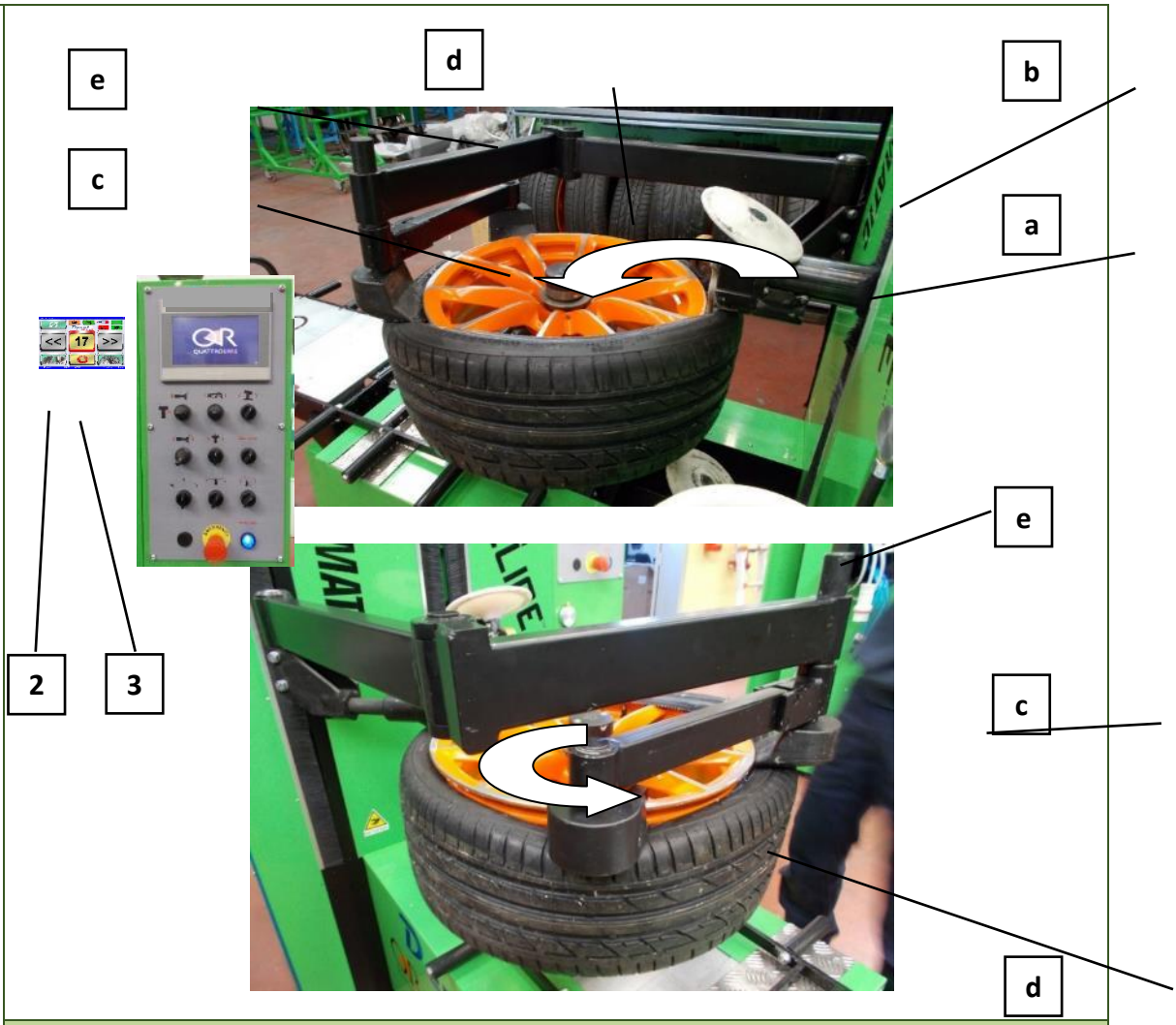
✓ GREASE THE NEW TYRE ADEQUATELY.

2

INSERTING THE TYRE:

✓ LOAD THE TYRE MANUALLY ONTO THE RIM.

3



BEADING THE TYRE:

- ✓ USE LEVER 3 ON THE CONTROL PANEL TO MOVE THE UPPER TOOL UNIT (a) DOWNWARD UNTIL THERE IS CONTACT BETWEEN THE UPPER TOOL UNIT AND THE TYRE'S UPPER BEAD.
- ✓ USE LEVER 2 ON THE CONTROL PANEL TO MOVE THE TECNOSERVICE UNIT (b) DOWNWARD AND MANUALLY POSITION THE FIRST BEAD PRESSER (c) AND THE SECOND BEAD PRESSER (d) CLOSE TO THE EDGE OF THE RIM.
- ✓ GUIDE THE BEADING OF THE TYRE BY HOLDING THE PIN (e) WITH THE LEFT HAND AND PRESSING ON THE ANTI-CLOCKWISE ROTATION PEDAL (REF. FIG. 13). USE LEVER 2 ON THE CONTROL PANEL TO MOVE THE TECNOSERVICE ARM AWAY FROM THE WHEEL WHEN THE BEADING OPERATION IS COMPLETED.

4

INFLATING THE TYRE:

- ✓ CONNECT THE AIR HOSE TO THE WHEEL'S AIR VALVE.
- ✓ PRESS ON THE 'AIR' PEDAL (REF. FIG. 13) UNTIL REACHING THE DESIRED PRESSURE. THE AIR PRESSURE CAN BE MONITORED VIA THE PRESSURE GAUGE LOCATED NEXT TO THE CONTROL PANEL.

5

RELEASING THE WHEEL:

- ✓ PLACE THE LEFT HAND ON THE LOCKING CONE.
- ✓ TURN SELECTOR 6 ON THE CONTROL PANEL TO THE LEFT AND GUIDE THE LOCKING CONE THROUGH ITS UPWARD RELEASE MOVEMENT WITH THE LEFT HAND.

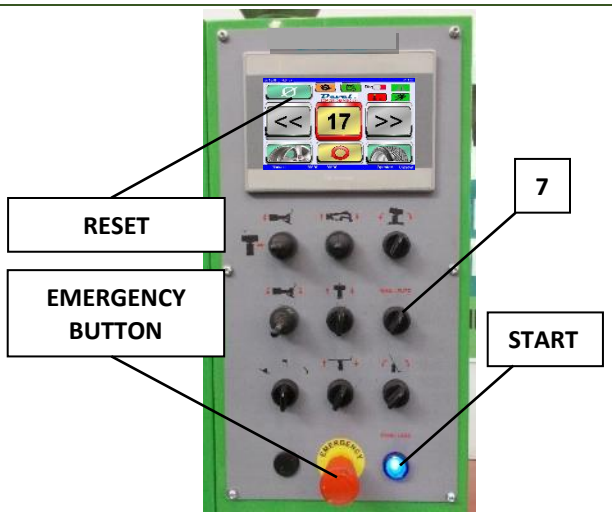
6

UNLOADING THE WHEEL:

- ✓ UNLOAD THE WHEEL VIA THE LIFTER USING CONTROL PANEL SELECTORS 9 AND 10.

5.4.2 – Manual mode

1



SWITCHING THE TYRE CHANGER ON:

- ✓ MOVE THE MAIN POWER SWITCH TO ‘ON’.
- ✓ MAKE SURE THE EMERGENCY BUTTON IS NOT PRESSED DOWN AND PRESS ‘START’ ON THE CONTROL PANEL (THIS WILL START THE PUMP AND SOLENOID VALVES OF THE HYDRAULIC CIRCUIT).
- ✓ MOVE SELECTOR 7 TO ‘MAN’ (REF. FIG. 6).
- ✓ PRESS 'RESET' (REMOVAL TOOLS MOVE TO ZERO REFERENCE HEIGHT).

2

LOADING THE TYRE FOR REMOVAL:

- ✓ PLACE THE WHEEL ON THE SELF-CENTRING UNIT VIA THE LIFTER USING CONTROL PANEL SELECTORS 9 AND 10.

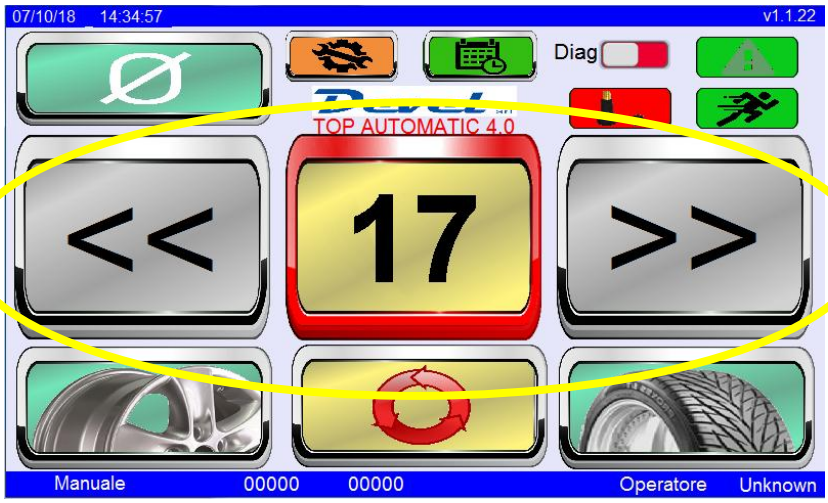
LOCKING THE WHEEL IN PLACE:

- ✓ PLACE THE WHEEL ON THE SELF-CENTRING UNIT AND THE LOCKING CONE INTO POSITION.

3

- ✓ PRESS DOWN ON THE TOP OF THE LOCKING CONE AND TURN SELECTOR 6 ON THE CONTROL PANEL TO THE RIGHT.
- ✓ ROTATE THE TYRE USING THE DEDICATED PEDALS UNTIL THE INFLATION VALVE IS ALIGNED WITH THE REMOVAL TOOL AT 12 O'CLOCK.

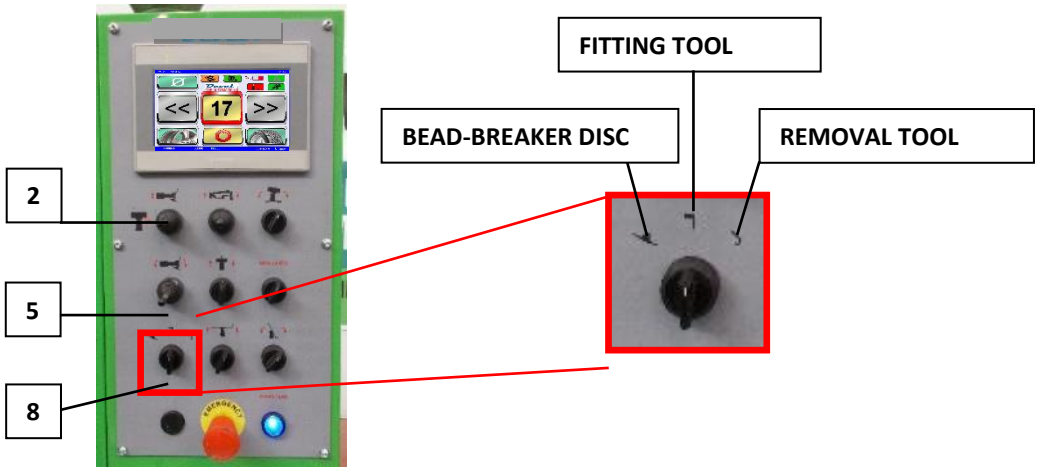
4



SETTING THE RIM DIAMETER:

- ✓ USE THE '<<' AND '>>' KEYS TO DECREASE AND INCREASE, RESPECTIVELY, THE DIAMETER OF THE WHEEL RIM. THE CHOSEN DIAMETER WILL DISPLAY IN THE MIDDLE BOX OF THE SCREEN.

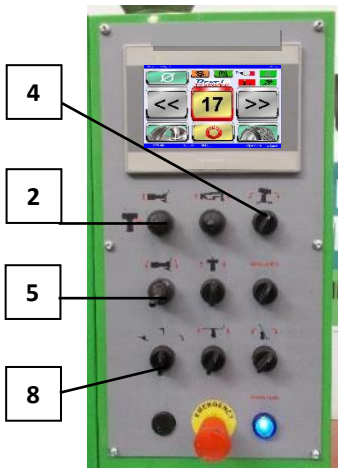
5



BREAKING THE TYRE BEAD:

- ✓ USING CONTROL PANEL SELECTOR 8, SELECT THE BEAD-BREAKER DISC WITHIN THE UPPER TOOL UNIT.
- ✓ BRING THE LOWER TOOL INTO CONTACT WITH THE LOWER BEAD OF THE TYRE BY USING LEVER 5 ON THE CONTROL PANEL.
- ✓ BRING THE UPPER BEAD BREAKER INTO CONTACT WITH THE UPPER BEAD OF THE TYRE BY USING LEVER 2 ON THE CONTROL PANEL.
- ✓ IDENTIFY THE APPROPRIATE POSITION OF THE LOWER BEAD BREAKER IN RELATION TO THE RIM'S LOWER EDGE AND COMPLETE THE BEAD-BREAKING OPERATION BY PRESSING ON THE CLOCKWISE ROTATION PEDAL.
- ✓ IDENTIFY THE APPROPRIATE POSITION OF THE UPPER BEAD BREAKER IN RELATION TO THE RIM'S UPPER EDGE AND COMPLETE THE BEAD-

	BREAKING OPERATION BY PRESSING ON THE CLOCKWISE ROTATION PEDAL. ✓ DURING THE BEAD-BREAKING OPERATION, THE OPERATOR SHOULD GREASE THE TYRE'S UPPER BEAD AND LOWER BEAD.



6

EXTRACTING THE TYRE:

- ✓ MOVE THE UPPER TOOL UNIT SLIGHTLY AWAY FROM THE TYRE WITH LEVER 2 OF THE CONTROL PANEL TO ENABLE SELECTION OF THE REMOVAL TOOL WITH SELECTOR 8.
- ✓ TILT THE WHEEL BY TURNING SELECTOR 4 TO THE RIGHT.
- ✓ BRING THE REMOVAL TOOL CLOSE TO THE TYRE USING LEVER 2.
- ✓ USE LEVER 2 TO INSERT THE REMOVAL TOOL UNDER THE RIM'S UPPER EDGE AND HOOK UP THE TYRE.
- ✓ EXTRACT THE TYRE'S UPPER BEAD WITH LEVER 2 AND KEEPING THE CLOCKWISE ROTATION PEDAL PRESSED DOWN.
- ✓ AID THE EXTRACTION OF THE TYRE'S LOWER BEAD BY RAISING THE LOWER TOOL UNIT WITH LEVER 5.
- ✓ DURING THE UPWARD TRANSLATIONAL MOTION OF THE REMOVAL TOOL AND LOWER BEAD BREAKER, THE OPERATOR NEEDS TO GUIDE THE VERTICAL TRANSLATION OF THE TYRE WITH THE LEFT HAND TO EASE THE REMOVAL OF THE TYRE FROM THE RIM.
- ✓ ONCE THE TYRE EXTRACTION OPERATION HAS BEEN COMPLETED, RE-POSITION THE RIM ORTHOGONAL TO THE PLANE OF THE REMOVAL TOOLS BY TURNING SELECTOR 4 TO THE LEFT.

FITTING OPERATIONS

1

GREASING THE NEW TYRE:

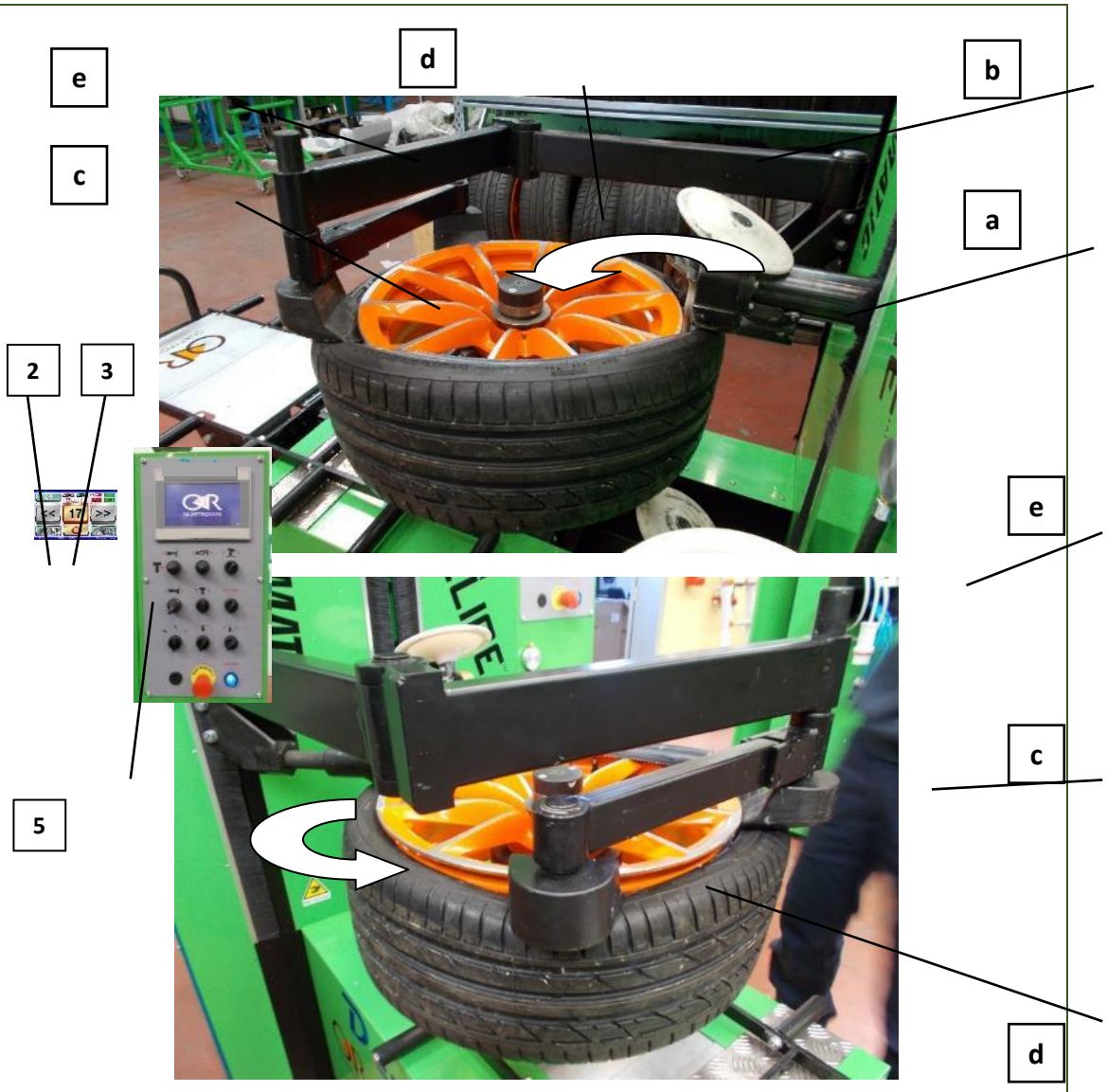
✓ GREASE THE NEW TYRE ADEQUATELY.

2

INSERTING THE TYRE:

✓ LOAD THE TYRE MANUALLY ONTO THE RIM.

3



BEADING THE TYRE:

- ✓ USE LEVER 2 TO MOVE THE UPPER TOOL UNIT (a) DOWNWARD UNTIL IT TOUCHES THE TYRE'S UPPER BEAD.
- ✓ USE LEVER 3 TO MOVE THE TECNOSERVICE UNIT (b) DOWNWARD AND MANUALLY POSITION THE FIRST BEAD PRESSER (c) AND THE SECOND BEAD PRESSER (d) CLOSE TO THE EDGE OF THE RIM.
- ✓ GUIDE THE BEADING OF THE TYRE BY HOLDING THE PIN (e) WITH THE LEFT HAND AND PRESSING ON THE ANTI-CLOCKWISE ROTATION PEDAL (REF. FIG. 13). ONCE THE BEADING OPERATION HAS BEEN COMPLETED, MOVE THE TECNOSERVICE ARM AWAY FROM THE WHEEL.

4

INFLATING THE TYRE:

- ✓ CONNECT THE AIR HOSE TO THE WHEEL'S AIR VALVE.
- ✓ PRESS ON THE 'AIR' PEDAL (REF. FIG. 13) UNTIL REACHING THE DESIRED PRESSURE. THE AIR PRESSURE CAN BE MONITORED VIA THE PRESSURE GAUGE LOCATED NEXT TO THE CONTROL PANEL.

5

RELEASING THE WHEEL:

- ✓ PLACE THE LEFT HAND ON THE LOCKING CONE.
- ✓ TURN SELECTOR 6 TO THE LEFT AND GUIDE THE LOCKING CONE THROUGH ITS UPWARD RELEASE MOVEMENT WITH THE LEFT HAND.

6

UNLOADING THE WHEEL:

- ✓ UNLOAD THE WHEEL VIA THE LIFTER USING CONTROL PANEL SELECTORS 9 AND 10.

5.5 – DIAGNOSTICS

5.5.1 – Finished work cycle reports

The touch screen panel lets the operator view a number of machine operation parameters and errors, if any. By pressing the 'Configuration' key on the touch screen (Fig. 23), the operator gains access to a window from which three operations are possible (Fig. 24):

- select the identity of the operator who is about to use the machine (press the relevant button from the six available).
- press 'Report'.
- press 'Started' to return to the main screen.

Figure 23 – 'Configuration' Key

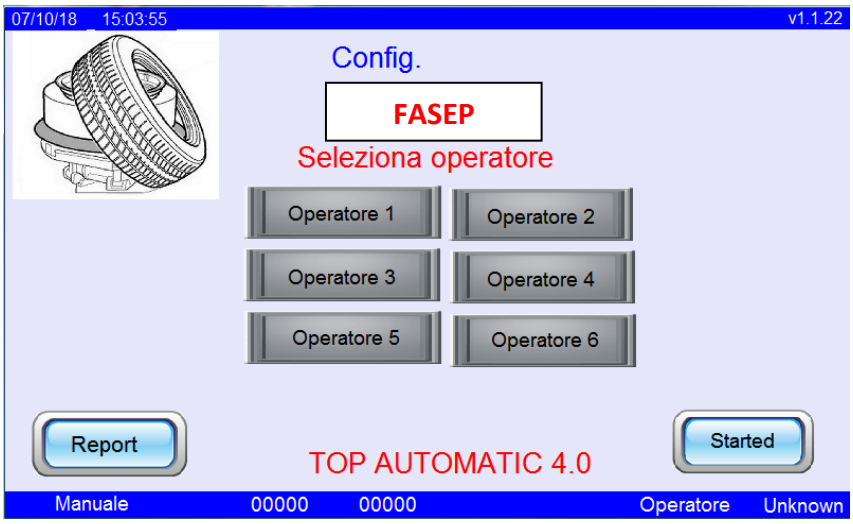


Figure 24 – 'Configuration' Window

The 'Report' key gives the operator access to a window with the following buttons (Fig. 25):

a) Reports.
b) Consumption and times.
c) Inverter diagnostics.
d) PLC.
e) Reset counters.

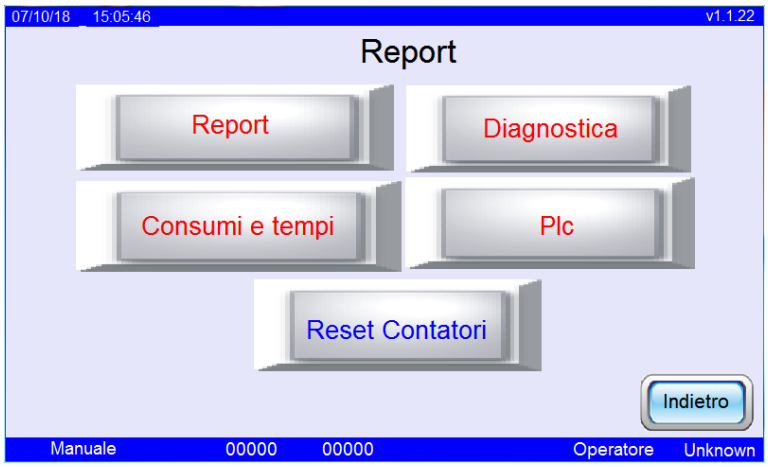


Figure 25 – 'Report' Window

a) 'Report' key

When the 'Report' key is pressed, the operator displays the summary of 'Tyres Completed' showing the tyres removed since the machine was installed (Fig. 26). The 'Tyres Completed' summary is broken down by wheel diameter and shows two counters: 'TOTAL' and 'STARTED'. The 'TOTAL' counter shows the number of removal cycles completed in automatic mode; the 'STARTED' counter, the overall number of removal cycles started in automatic mode.

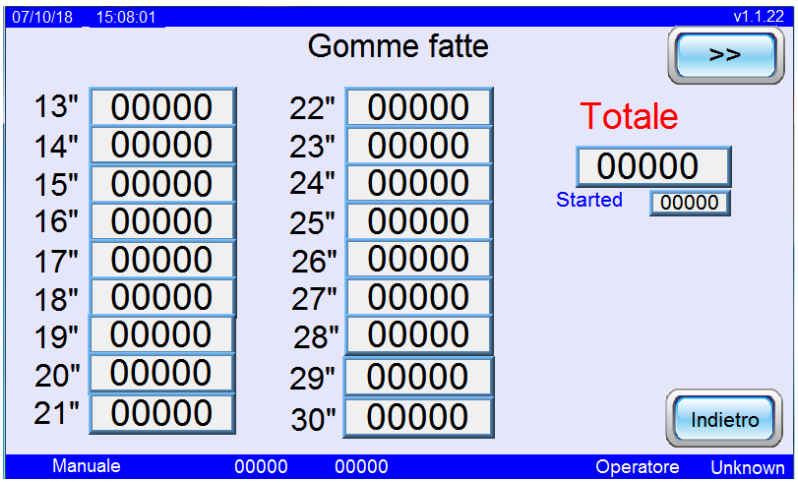


Figure 26 – 'Tyres Completed' Window

b) 'Consumption and Times' key

When the 'Consumption and Times' key is pressed, the operator displays the amount of power consumed and the machine activity time (Fig. 27).

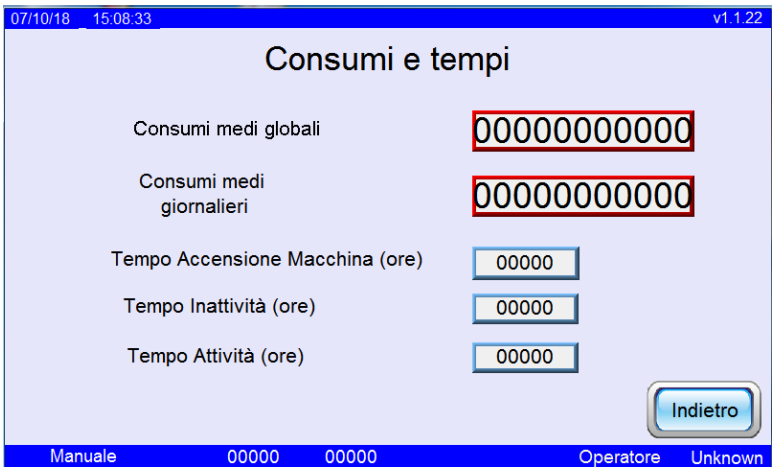


Figure 27 – 'Consumption and Times' Key

c) 'Inverter Diagnostics' key

When the 'Diagnostics' key is pressed, the operator displays any errors on the inverters that control the operation of the hydraulic circuit pump and self-centring unit spindle (Fig. 28).

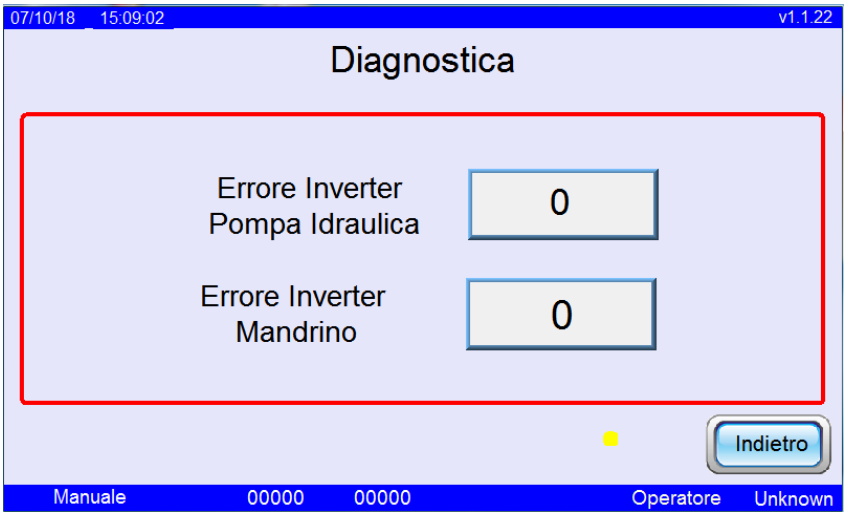


Figure 28 – 'Diagnostics' Window

d) 'PLC' key

When the 'PLC' key is pressed, the operator displays the software version installed on the machine's PLC unit (Fig. 29).

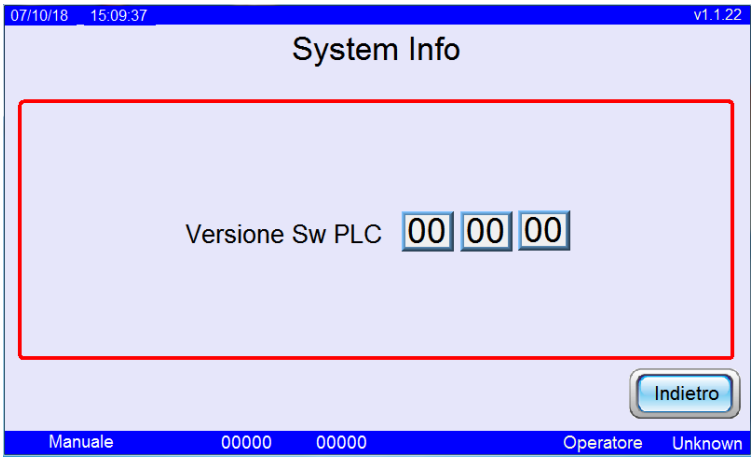


Figure 29 – 'System Info' Window

e) 'Reset counters' key

When the 'Reset Counters' key is pressed, the operator gains access to a window that allows resetting the 'tyres completed' and power consumed counters (Fig. 30).

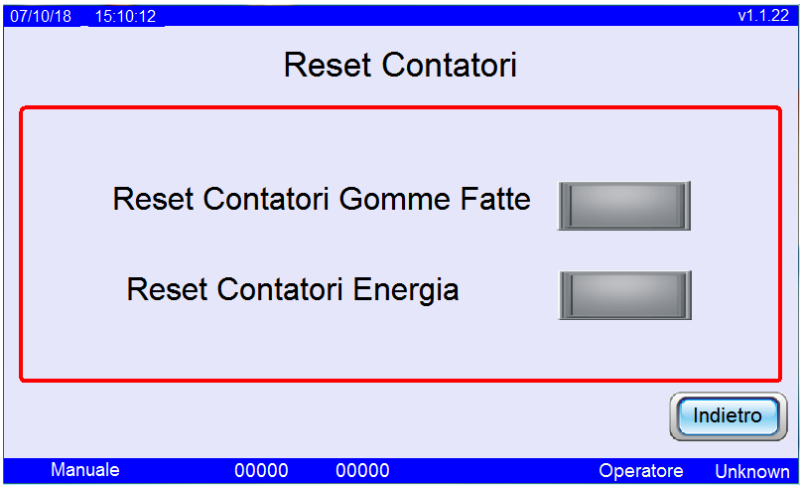


Figure 30 – 'Reset Counters' Window

5.5.2 – Rim geometry diagnostics

The tyre changer is able to detect rim geometry defects during bead breaking. More specifically, by enabling the 'DIAG' (Diagnostics) key on the touch screen panel, the upper and lower bead breakers detect rim geometry defects during a complete 360-degree rotation of the self-centring unit. Rim geometry defects are detected by the lower bead breaker ('Fault Z') and/or by the upper bead breaker ('Fault Y') (Fig. 31) against a reference 'Diagnostic Offset' value (in mm) chosen by the operator.

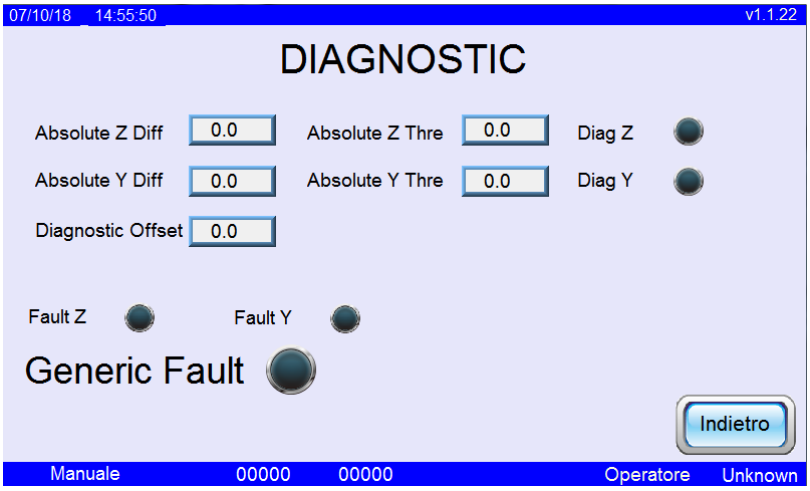


Figure 31 – 'Diagnostic' Window

5.6 – CONNECTION TO THE COMPANY'S COMPUTER NETWORK

The machine can be connected to the company's computer network using the Ethernet port on the back of the machine (Fig. 32).
Network connection makes it possible for users to monitor the operation of the machine from a remote location and for the manufacturer to provide remote assistance and/or remote maintenance.

Figure 32 – Ethernet port

To connect the machine to the company's computer network, follow the steps below:

1. Use the appropriate cable to connect the machine's Ethernet port to a PC with wired or wireless connection to the company network (Fig. 33).

Figure 33 – Machine connection to company network

2. Open an Internet browser (Internet Explorer, Mozilla, Safari, Google Chrome, etc.) and type the address IP-ADDRESS:8080/webvisu/htm (the machine's 'IP-ADDRESS' is set by the manufacturer): the PC connected to the machine displays the connection interface on the desktop (Fig. 34).

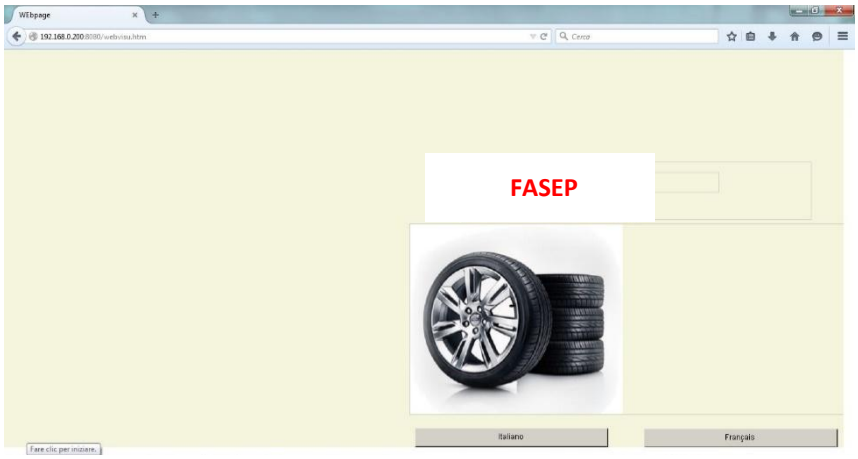


Figure 34 – Machine-company network connection interface

3. Choose the language to use when displaying machine parameters by clicking the relevant button; the control window with the machine's main parameters is displayed automatically (Fig. 35).

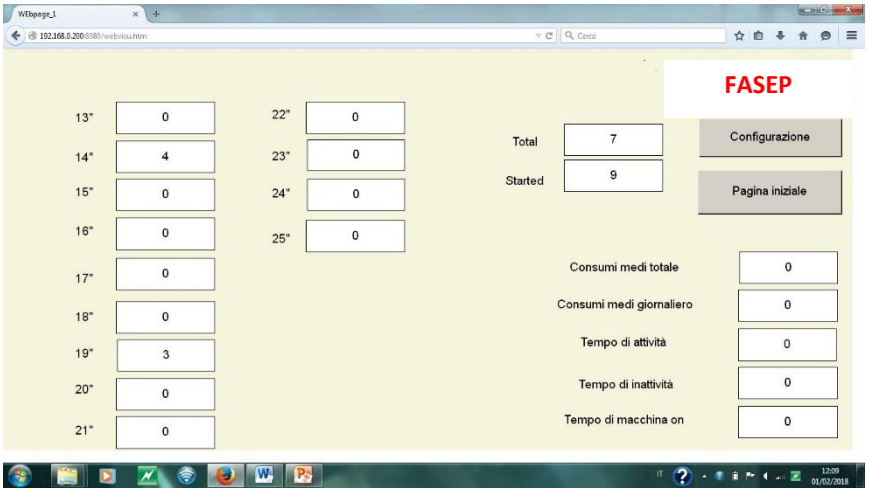


Figure 35 – Remote machine operation control window

4. For remote access to the machine's assistance/maintenance page, click the 'Configuration' button and type in the password provided by the Manufacturer (Fig. 36).

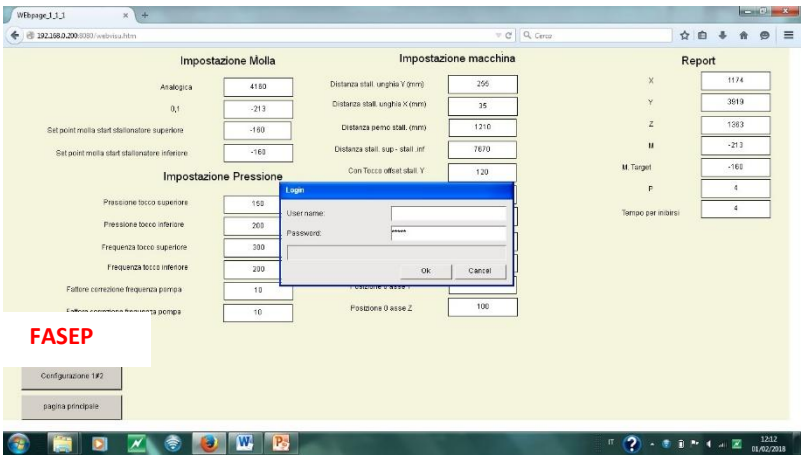


Figure 36 – Remote machine maintenance window

5.6.2 – Tasks and activities programming

The touch-screen monitor is provided with a key (Fig. 37) that can be used to access the 'Programmazione Attività' window where the customer can remotely enter the vehicle information on which the tyre's change has to be performed (Fig. 38). Once the tyre's change has been completed, the operator can press the key 'Fatto' so that the customer can remotely observe the state of performed.

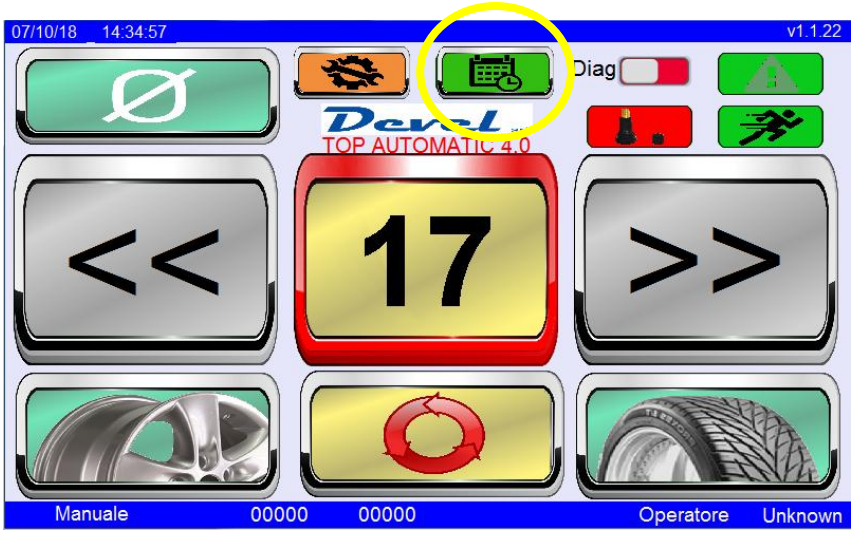


Figure 37 – 'Tasks and activities programming' key

Figure 38 – 'Tasks and activities programming' window

6 – MAINTENANCE

6.1 – SAFETY PRECAUTIONS

When performing maintenance or repairs, we recommend the following:

- Do not use inflammable products and materials.
- Pay careful attention not to leave lubricants or cleaning products in the area.
- Make sure all system components have come to a complete stop.
- When maintenance is complete, restore and properly secure all safety guards that have been removed and/or opened.

6.2 – DISCONNECTING AND PUTTING OUT OF SERVICE

	**Ensure the machine has been disconnected from all power supplies (electric and pneumatic) before performing any maintenance or repairs.**

6.3 – ORDINARY MAINTENANCE

Clean the machine regularly and perform periodic maintenance to ensure good operation and avoid risks or unscheduled stops.

Maintenance	Every month	Every six months	Every year
Check for wear on the bead-breaker and extraction tools.	X		
Grease the runner blocks of the Tecnoservice unit and lifter.		X	
Check the oil level of the control unit and always ensure it is between the minimum and maximum level (ENI OSO 46 oil).		X	
Clean the mobile mechanical parts (guide elements for lower and upper tool unit and sliding elements for self-centring unit) and spray them with oil.			X
Replace the oil in the control unit (ENI OSO 46 oil).			X

In general:

Daily:
- Check for any alarms or anomalies in the various components of the equipment.
- Ensure the emergency stop device operates properly.
- Ensure the work adjustment controls operate properly.

Weekly:
- Clean the pin on the self-centring unit and spray it with oil mist (Fig. 37).
- Check the integrity of the electric cables/pneumatic circuits.
- Check for any leaks or damage on pipes and fittings.

Every six months:
- Ensure plates/warning signs are legible.
- Ensure the operating labels of the control devices are legible.

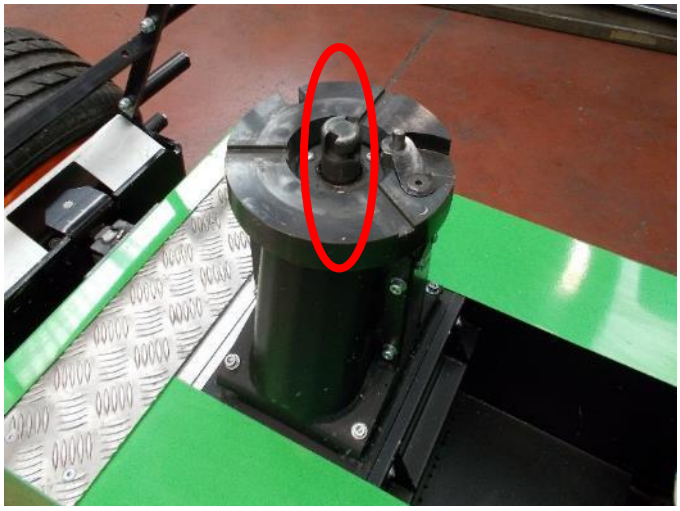


Figure 39 – Self-centring unit pin

6.4 – EXTRAORDINARY MAINTENANCE

Contact the Manufacturer immediately for any extraordinary maintenance required, so it can send specialized technicians to the machine premises.

	**Contact the Manufacturer before performing any maintenance not indicated in this manual or its attachments.**

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7 – TROUBLESHOOTING

Any troubleshooting performed to resolve problems must be performed by authorized and qualified personnel.

The table below lists certain anomalies and their solutions. Other possible operating anomalies are mainly of a technical nature and must be inspected and eliminated by qualified technicians.

Anomalies	Causes	Solution
The self-centring system does not rotate in either of the two directions.	1. The electric panel on the machine is not powered. 2. The electric panel on the machine is not on. 3. The voltage does not correspond with the value indicated.	1.-2. Ensure the electric panel on the machine is connected to the company network and that the isolating switch is turned to “ON”. 3. Check the mains voltage.
The bead breaker doesn’t have the force required to break the wheel bead.	1. Incorrect positioning of the bead-breaker tools. 2. Insufficient pressure in the hydraulic circuit. 3. The tyre is not completely deflated.	1. Use the dedicated control valves on the control board to position the bead-breaker tools at about 2 cm from the wheel rim. 2. Ensure there are no breaks or leaks in the hydraulic circuit. Check the oil level of the control unit. 3. Remove the valve element from the valve until the tyre is completely deflated.

Contact the Manufacturer directly for information concerning any breakdowns in the system or its components.

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8 – DISMANTLING AND DISASSEMBLY

	**Contact the Manufacturer directly for any information or instructions required to dismantle the machine so it can be moved or disposed of.**

The **first step** in the dismantling process involves emptying any fluids/lubricating products from the machine. Collect the oil in dedicated containers and dispose of it according to current regulations.

The **second step** involves removing all electric wires and pneumatic piping on the machine and collecting them to salvage any conductor metal.

The **third step** involves disassembling all remaining machine components and separating the pieces collected into similar materials such as steel/iron, aluminium, plastic materials, electric motors.

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9 – DISPOSAL AND DEMOLITION

If the machine is decommissioned, perform all operations described in the paragraph above "*Dismantling and Disassembly*" and ensure the warnings concerning their disposal are complied with. In Italy, the machine must be taken to a qualified disposal consortium, in compliance with WEEE provisions.

More specifically, non-ferrous components must be taken to an authorized company for disposal, while ferrous components may be sold for reuse.

In any case, inform the Manufacturer if the machine is decommissioned or transferred.

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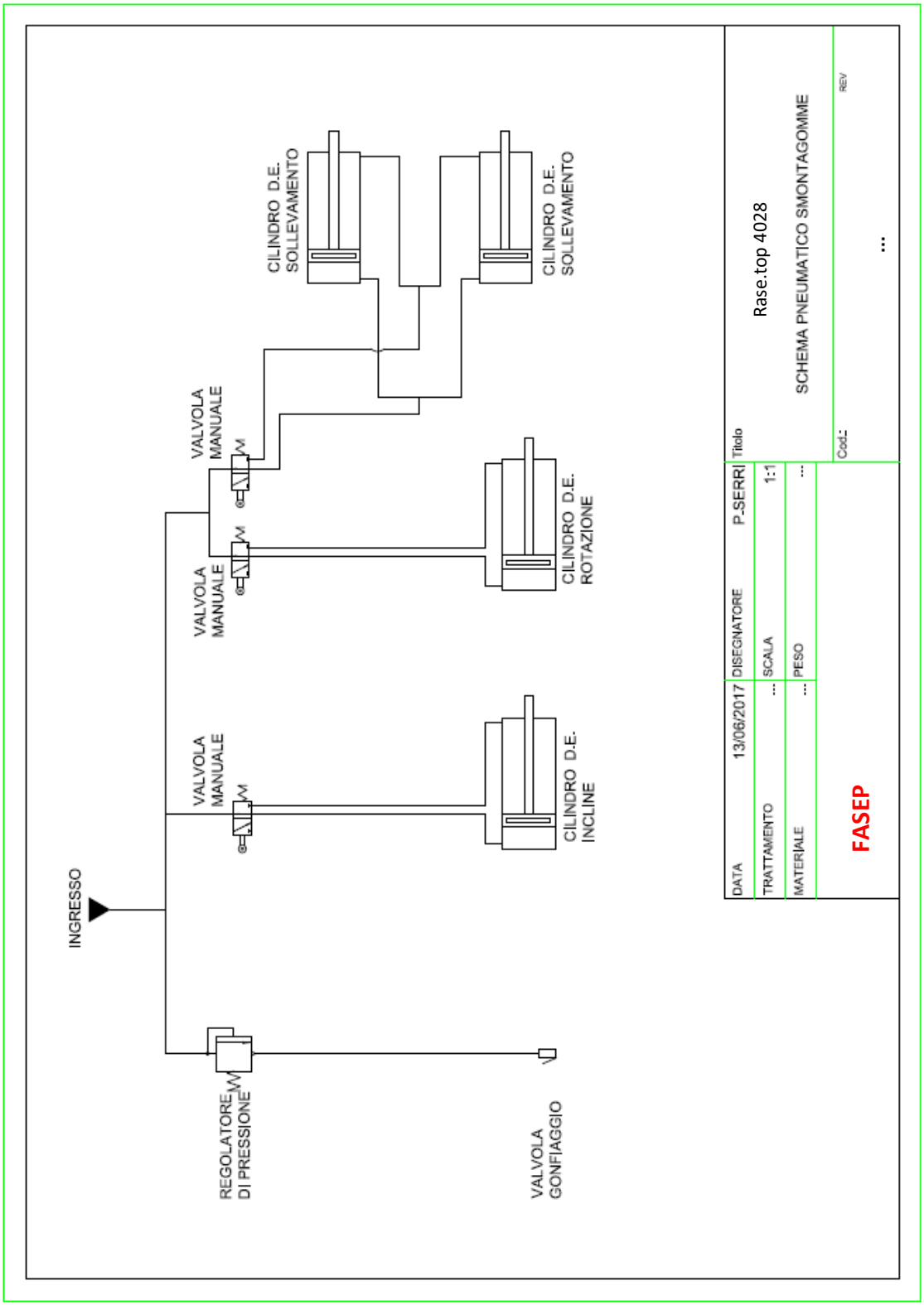
10 – ATTACHMENTS

1. Pneumatic diagram.
2. Hydraulic diagram.
3. Spare parts list.

10.1 – PNEUMATIC DIAGRAM



10.2 – HYDRAULIC DIAGRAM

10.3 – SPARE PARTS LIST