SMONTAGOMME

TYRE CHANGER

DESMONTADOR DE NEUMÁTICOS

REIFENMONTIERMASCHINE

DEMONTE PNEUS

M 424 - M 424 A

Cod. 4-117767C - 05/2019

Italiano	Manuale d'uso
English	*Operator's manual*
Français	Utilisation et entretien
Deutsch	*Betriebs und Wartungsanleitung*
Español	Uso y mantenimiento

www.hpa-faip.it
info@hpa-faip.it

ORIGINAL LANGUAGE

Thank you for choosing our tyre changer

HPA

Dear Customer
Thank you for purchasing HPA equipment.
This machine has been designed to provide years of safe and dependable service, as long as it is used and maintained in accordance with the instructions provided in this manual. Everyone who will use and/or perform maintenance on the equipment must read, understand and observe all the warnings and instructions provided in this manual, in addition to being properly trained.
This Owner's Manual should be considered an integral part of your equipment and should remain with the equipment. However, no information contained in this manual and no device installed on the equipment can replace suitable training, correct operation, careful evaluation of the situation and observing safe working procedures.
Always be sure that your equipment is in optimum working order. If any malfunctions or probable situations of danger are observed, immediately stop the machine and resolve the conditions before continuing.
For any question related to the correct equipment use or maintenance, contact your local official HPA dealer.
Sincerely,
HPA

USER INFORMATION

Owner Name_____
Owner Address_____
Model number_____
Serial number_____
Date of purchase_____
Date Installed _____
Service and Parts Representative_____
Telephone number_____
Sales manager_____
Telephone number_____

TRAINING CHECK

	Qualified	Rejected
Safety Precautions		
Warning and caution decals	☐	☐
High risk areas and other potential hazards	☐	☐
Safe Operating Procedures	☐	☐
Maintenance and Performance Checks		
Head assembly inspection	☐	☐
Adjustments and lubrication	☐	☐
Clamping		
Steel / alloy rims	☐	☐
Reverse rim wheels	☐	☐
Steel clamp internal/external locking	☐	☐
Bead Breaking		
Standard Wheels	☐	☐
Low profile wheels	☐	☐
Demounting procedure		
Standard wheels with plastic protectors for head and lever	☐	☐
Correct head position to prevent damage	☐	☐
Bead lubrication during demounting of low profile tyres	☐	☐
Reverse rim wheels	☐	☐
Mounting		
Standard Wheels	☐	☐
Mounting rigid low profile tyres	☐	☐
Reverse rim wheels	☐	☐
Bead lubrication to ensure correct mounting	☐	☐
Inflation		
Safety Precautions	☐	☐
Lubrication and removal of valve core	☐	☐
Tubeless tyres	☐	☐

UK

Individuals and Dates Trained

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UK

1. GETTING STARTED

1.1 INTRODUCTION

1.1.a. PURPOSE OF THE MANUAL

The purpose of this manual is to provide the instructions necessary for optimum operation, use and maintenance of your machine. If you sell this machine, please deliver this manual to the new owner. In addition, so we can contact our customers with any necessary safety information, please ask the new owner to complete and return to the Manufacturer the change of ownership form attached to the last page of this manual.
This manual assumes that the technicians are in possession of all the knowledge necessary for the identification and maintenance of rims and tyres. He/she must also have a thorough knowledge of the operation and safety features of all associated tools (such as the rack, lift, or floor jack) being utilized, and have the proper hand and power tools necessary to work in a safe manner. The first section contains detailed information about equipment The following sections contain detailed information about equipment, procedures, and maintenance. "Italics" are used to refer to specific parts of this manual that provide additional information or explanation. These references should be read for additional information to the instructions being presented. The owner of the equipment is solely responsible for enforcing safety procedures and arranging technical training. The equipment must only be used by qualified, specifically trained technicians. Maintaining records of personnel trained is solely the responsibility of the owner or management.
The equipment is designed and manufactured for mounting, demounting and inflating tyres for light vehicles (passenger cars, motorcycles, not intended for use for trucks) with a maximum external diameter of 43 inches and a maximum width of 14 inches.
Additional copies of this manual and the documentation enclosed with the machine may be requested to the constructor, specifying the machine type and serial number.
NOTICE: Design details are subject to change. Some illustrations may vary slightly in appearance from the machine you have."

1.2 FOR YOUR SAFETY

HAZARD DEFINITIONS
These symbols identify situations that could be harmful to the safety of personnel and/or cause damage to the equipment.

DANGER

DANGER: **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

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CAUTION!

WARNING: **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

WARNING

CAUTION: **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

CAUTION!

NOTICE: **Used without the safety alert symbol indicates potentially hazardous situation, which, if not avoided, may result in property damage.**

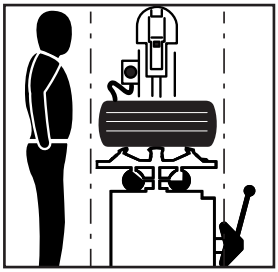
1.2.a. GENERAL WARNING AND INSTRUCTIONS

CAUTION!

Avoid Personal Injury. Carefully read, understand and follow the warnings and instructions given in this manual. This manual is an essential part of the product. Keep it with the machine in a safe place for future reference.

1. If the maintenance procedures described in this manual are not executed correctly, or if other instructions in the manual are not observed, accidents could occur. This manual makes continuous reference to the possibility that accidents can occur. Any accident could cause serious or fatal injuries to the operator or people nearby, or cause material damage.
2. Overinflated tyres can explode, producing hazardous flying debris that may result in an accident.
3. Tyres and rims that do not have the same diameter do not correspond. Never attempt to mount or inflate tyres and rims that do not correspond. For example, never mount a 16.5" tyre on a 16" rim, or vice versa. It is very dangerous. Tyres and rims that do not correspond could explode, causing accidents.
4. Never exceed the inflation pressure for the tyre indicated by the manufacturer on the side of the tyre itself. Carefully check that the air hose is well inserted in the valve

5. Never bring your head or other body parts close to a tyre during inflation or bead insertion operations. This machine is not a safety device against the possible explosion risk of tyres, air chambers or rims.
6. During inflation operations, remain at a safe distance from the tyre changer to ensure you are outside of the vertical cylindrical volume occupied by the wheel. Do not approach.



DANGER

A bursting tyre can cause projections of its parts in surrounding areas with a force sufficient to cause serious injury or death.

Do not mount a tyre if its dimensions (indicated on the side) do not correspond exactly with the rim dimensions (printed inside the rim) or if the rim or the tyre are defective or damaged.

Never exceed the pressure recommended by the tyre manufacturer.

The tyre changer is not a safety device and does not prevent tyres and rims from exploding. Keep all persons not working on the machine out of the working area.

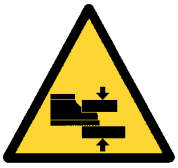
7. Crushing Hazard. Moving Parts Present. Contact with moving parts could result in an accident.

The machine may only be used by one operator at a time.

- Keep all bystanders clear of tire changer.
- Keep hands and fingers clear of rim edge during the demounting and mounting process.
- Keep hands and fingers clear of mount/demount head during operation.
- Keep hands and other body parts away from moving parts.
- Do not use tools other than those supplied with tyre changer.
- Use lubricant that is specific for tyres in order to prevent tyre seizure.
- Pay attention while handling the rim and tyre and while using the lever.

8. Electric Shock Hazard.

- Do not clean the electric parts with water or high pressure air jets.
- Do not operate machine with a damaged power cord.
- If an extension is necessary, use a cable with nominal features equal to or greater than those for the machine. Cables with nominal features that are lower to those of the machine could overheat and cause a fire.



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- Make sure that the cable is positioned so that no one will trip over it and it cannot be pulled.

9. Risk of Eye Injury. During the bead insertion and inflation phase, debris, dust and fluids could be projected into the air. Remove any debris present in the tread of the tyre and on the tyre surface. Wear protective goggles with OSHA, CE approval or other certified devices during all work phases.

10. Always inspect the machine carefully before using it. Missing, broken, or worn equipment (including warning stickers) must be repaired or replaced prior to operation.
11. Never leave nuts, bolts, tools or other materials on the machine. They could remain trapped in moving parts and cause malfunctions or be projected out of the machine.
12. NEVER install or inflate tires that are cut, damaged, rotten or worn. NEVER install a tire on a cracked, bent, rusted, worm, deformed or damaged rim.
13. If the tyre is damaged during the mounting phase, do not try to complete the mounting operation. Remove it and take it away from the service area, marking it as damaged.
14. Inflate the tyres slowly, in steps, while checking the pressure, the tyre, the rim and the bead. NEVER exceed the pressure limits indicated by the manufacturer.
15. The internal parts in this machine could create contacts or sparks if exposed to flammable vapours (petrol, paint thinner, solvents, etc.). Do not install the machine in a narrow area or below floor level.
16. Do not operate the machine while under the influence of alcohol, medicine or drugs. If you are taking prescription or non-prescription medicine, contact a physician to understand the side effects that the medicine could have on the ability to operate the machine safely.
17. Always use OSHA, EC approved and authorised personal protective equipment (PPE) or equipment with equivalent certification while operating the machine. Consult your supervisor for additional instructions.

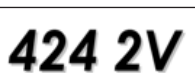
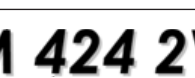
18. Remove jewellery, watches, loose clothing, ties and restrain long hair before using machine.
19. Wear protective, non-slip footwear while using the tyre changer.
20. Wear proper back support and employ proper lifting technique when placing, moving, lifting or removing wheels from the tire changer.

21. This machine may only be used, maintained or repaired by properly trained employees of your company. Repairs may only be performed by qualified personnel. The Manufacturer's technical personnel are the most qualified individuals. Employers must determine if an employee is qualified to carry out any machine repair safely if the operator has attempted to make the repair.
22. The operator must pay close attention to the warnings on the equipment labels before starting the machine.

23. The pneumatic actuators may still be pressurised when the compressed air supply is disconnected, whether this is due to a period of inactivity or maintenance of the machine or the workshop pneumatic system. Discharge the pneumatic system of the machine acting on the controls of the actuators themselves.

24. Use a lift if the weight of the wheel exceeds 10 kg with a lifting frequency exceeding 20 wheels/hour.

1.2.b. DECAL PLACEMENT

No.	Part Number	Drawing	Description
1	4-200132A		DECAL, LOGO HPA FRONT SIDE
3	4-137985		DECAL M 424A
	4-137986		DECAL M 424A 2V
	4-137987		DECAL M 424A 2V FS
	4-137988		DECAL M 424A FS
	4-117768		DECAL M 424
	4-117769		DECAL M 424 FS
	4-117776		DECAL M 424 2V FS
	4-117777		DECAL M 424 2V
4	446429		DECAL, WORKING PRESSURE

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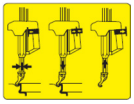
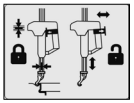
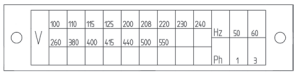
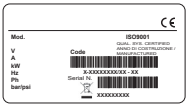
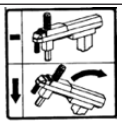
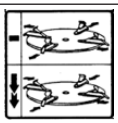
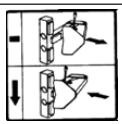
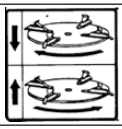
No.	Part Number	Drawing	Description
5	446442		DECAL, DANGER - PRESSURISED CONTAINER
6	4-113355		DECAL FILTER
7	446598		DECAL, DISCONNECT POWER SUPPLY
9	418135		LABEL, ROTATION DIRECTION
10	446433		DECAL, TURNTABLE HAZARD
11	446435		DECAL, HEAD HAZARD
12	446434		DECAL, RISK OF KNOCKING REAR COLUMN, DO NOT STAND BEHIND THE MACHINE
13	461931A		DECAL, INFLATION HAZARD
14	446437		CONTROL DATA PLATE (3 POSITIONS)
	4-136235		CONTROL DATA PLATE (2 POSITIONS)
15	435150		DECAL, INFLATION PEDAL (ONLY FS VERSIONS)

No.	Part Number	Drawing	Description
16	446388		DECAL, CORRECT FEEDING NETWORK
17	446431		DECAL, RISK OF CRUSHING HANDS/LEGS
18	446438		DECAL, COLUMN SPEED ADJUSTMENT
19	425211		DECAL, ELECTRIC HAZARD
2ì	446436		DECAL, INFLATION VALVE
21	-		DECAL, MODEL SERIAL NUMBER
22	470133		DECAL, TILTING COLUMN
	470134		DECAL, OPENING/CLOSING CHUCK
	470135		DECAL, BEAD BREAKER
	470136		DECAL, CHUCK ROTATION
23	35017099		DECAL, RISK OF KNOCKING FRONT COLUMN

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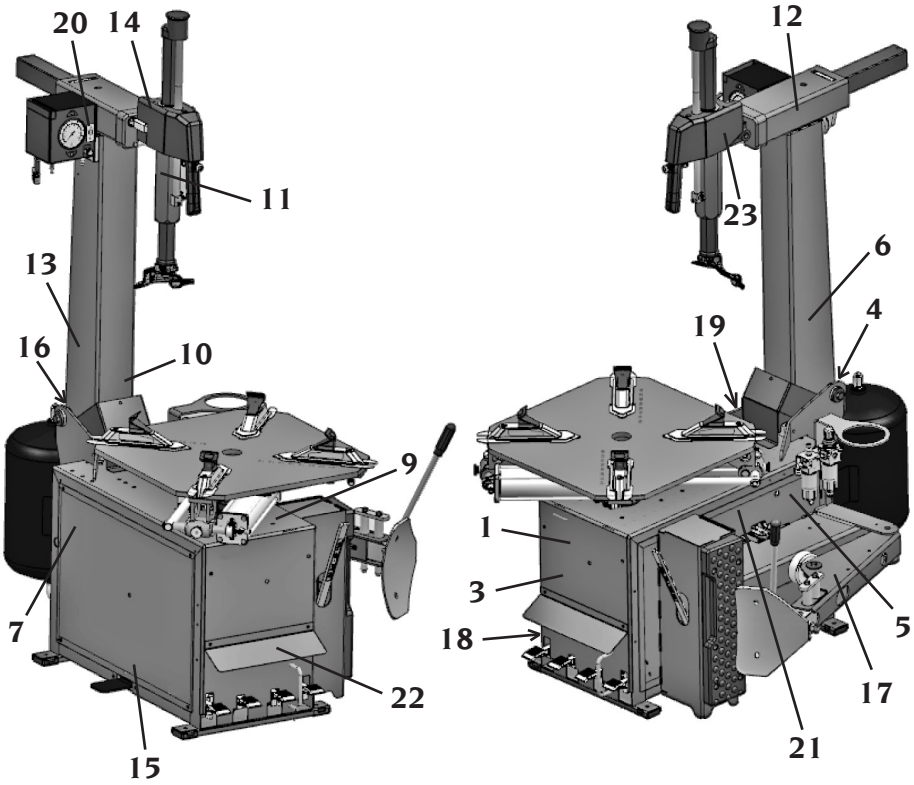

DANGER WARNING DECALS

part no. 446431. Bead breaker crushing hazard.

part n. 446442. Danger - pressurised container.

part no. 425211A. Risk of electrical shock.

part no. 461931A. Inflation hazard.

part no. 446433. Risk of hand crushing.

part no. 446434. Danger of column tilting.

part no. 446435. Risk of hand crushing.

part no. 35017099 Danger of front column tilting

part no. 425083. Earth ground terminal.

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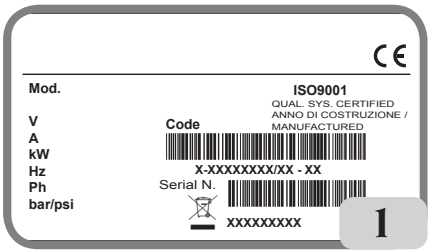
1.2.c. ELECTRICAL AND COMPRESSED AIR CONNECTIONS

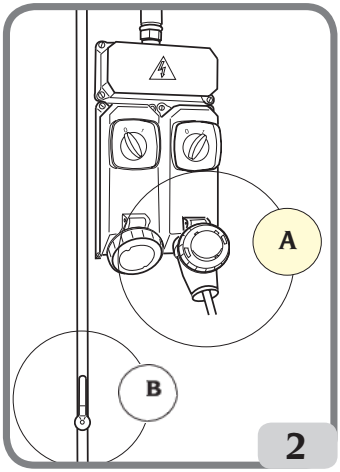
The electric hook-up used must be suitably sized:

- the electric power absorbed by the machine, indicated on its data plate (Fig. 1);
- the distance between the machine and the power supply hook-up point, so that voltage drops under full load do not exceed 4% (10% during start-up) compared with the rated voltage specified on the data plate



- The operator must:

- fit a plug that respects the current regulations onto the power supply cable;
- connect the machine to its own electrical connection - A, Fig. 2 - and fit a differential safety circuit-breaker with 30 mA residual current;
- install protection fuses on the power line that are suitably sized in accordance with the indications provided on the machine data plate (Fig. 1);
- connect the machine to an industrial socket; the machine must not be connected to domestic sockets.



CAUTION!

An effective grounding connection is essential for correct operation of the machine.

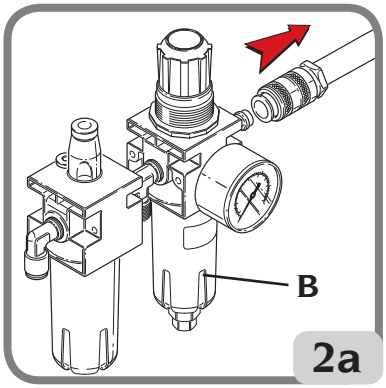
Make sure the available pressure and the rendered capacity of the pneumatic system are compatible with those required for correct machine operation - see the "Technical Data" section. For the machine to operate correctly, the compressed air supply must be capable of delivering air pressure within a range from 8 bar to 16 bar.

CAUTION!

For correct equipment operation, the air produced must be suitably treated (not above 5/4/4 according to ISO 8573-1).

Check that the lubricator cup (B, Fig. 2a contains lubricant; top up if necessary. Use oil SAE20.

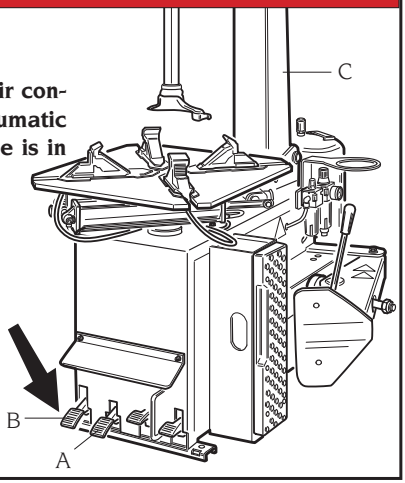
The compressed air supply delivery point in the workshop must be equipped with a compressed air supply shut-off valve located upstream of the regulator/filter assembly supplied with the machine (B Fig. 2a).



DANGER

Before making any electrical or compressed air connection and whenever the electrical or pneumatic power is restored, make sure that the machine is in the configuration described below:

- pedal A FULLY LOWERED (turntable E closed).
- pedal B FULLY LIFTED (column C not overturned).



1.2.d TECHNICAL DATA

- Turntable locking
- internal.....from 13" to 26"
- external.....from 10" to 24"
- Rim width.....from 3.5" to 14"
- Maximum tyre diameter.....1100 mm (43")
- Maximum wheel width.....360 mm (14")
- Max. bead breaker opening:.....380 mm
- Bead breaker force.....15000 N (pressure at 10 bar)
- Power supply voltage
- single-phase.....115-230±10% Volt 50/60Hz
- three-phase.....230-400±10% Volt 50/60Hz
- DV.....230±10% Volt 1ph 50/60Hz

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- Operating pressure.....8 - 10 bar
- Air consumption (FS version).....180 Nl/min (average) 764 Nl/min (max)
- Air consumption (NO FS version).....155 Nl/min (average) 520 Nl/min (max)
- Weight.....235 Kg (250 kg FS version)
- Sound level during working phase .....< 70 dB (A)

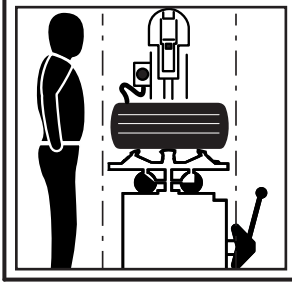
Model	Motor rating	kW	Rotation speed rpm	Torque Nm	Weight of electric/ electronic part kg
M 424A M 424A FS M 424 M 424 FS	400Volt/3ph 50Hz DV	0,9 - 1,5	6-12	900	11.5
	200/230Volt/3ph 50Hz DV	0,9 - 1,5	6-12	1200	11.5
	200/230Volt/3ph 60Hz DV	0,9 - 1,5	6-12	1200	11.5
	400Volt/3ph 50Hz	0.75	8.5	900	11.5
	200/230Volt/3ph 60Hz	0.75	8.5	1200	11.5
	200/230Volt/3ph 50Hz	0.75	8.5	1200	11.5
	200/230Volt/1ph 50Hz	0.75	8.5	800	11.5
	200/230Volt/1ph 60Hz	0.75	8.5	800	11.5
	115Volt/1ph 60Hz	0.75	8.5	800	11.5
	200/230Volt/1ph 50/60Hz DV	0.75	6-15	1200	10.2
	115Volt/1ph 60Hz DV	0.75	6-15	1200	10.2
	AIR MOTOR	/	6.5	800	/

The noise levels indicated correspond to emission levels and do not necessarily represent safe operating levels. Although there is a relationship between emission levels and exposure levels, this cannot be used reliably to establish whether or not further precautions are necessary. The factors which determine the level of exposure to which the operator is subject to include the duration of the exposure, the characteristics of the workplace, other sources of noise, etc. The permitted exposure levels may also vary according to the country. However, this information will enable machine users to make a more accurate assessment of hazards and risks.

1.2.e. AIR PRESSURE

The machine is equipped with an internal pressure limiting valve to minimize the risk of over inflating the tyre.

1. Never exceed these pressure limitations:
   - The supply circuit pressure (from the compressor) is **220 psi (16 bar)**.
   - The operating pressure (indicated on the regulator) is **150 psi (10 bar)**.
   - The tyre inflation pressure (displayed on the pressure gauge) must never exceed the pressure indicated by the manufacturer on the sidewall of the tyre itself.
2. Activate the air inflation jets only when inserting the bead.
3. Discharge the air pressure system fully before disconnecting the power supply or other pneumatic components. The air is stored in a tank for operating the inflation jets.
4. Activate the air inflation jets only if the rim is correctly clamped on the tyre changer (if required) and the tyre is completely mounted.



DANGER

- **EXPLOSION HAZARD**
- **Do not exceed the pressure recommended by the tyre manufacturer.**
- **Never mismatch tyre size and rim size.**
- **Pay careful attention to any damage to the tyre**
- **During inflation operations, assume a position which is outside of the vertical cylinder volume occupied by the wheel.**

1.3. ADDITIONAL RIM/TYRE INFORMATION

CAUTION

Wheels equipped with pressure sensors and special rims or tyres could require particular work procedures. Consult the service manuals from the manufacturer of the wheels and tyres.

1.4. INTENDED MACHINE USE

This machine must only be used to demount and mount vehicle tyres from/on the rims, using the provided tools. Any other use is considered inappropriate and may cause accidents.

1.5. PERSONNEL TRAINING

1. Employers are responsible for providing a training program for all employees who work on the wheels concerning the hazards deriving from maintenance and the safety procedures to be observed. Service and maintenance refers to mounting and demounting wheels and all the correlated activities, such as inflation, deflation, installation, removal and handling.
- Employers are required to make sure that operators do not work on the wheels unless they have received suitable training regarding the correct maintenance procedures for the type of wheel being serviced and the operative safety procedures.
- Information to be used for the training program includes, as a minimum, the information contained in this manual.

2. Employers are required to make sure that every employee demonstrates and maintains the ability to work on the wheels safely, including the performance of the following activities:

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- Demounting of tires (including deflation).
- Inspection and identification of the rim wheel components.
- Mounting of tires.
- Use of any restraining device, cage, barrier, or other installation.
- Handling of rim wheels.
- Inflation of the tire.
- Move away from the tyre changer while inflating the tyre and do not lean forward when inspecting the wheel during inflation.
- Wheel installation and removal.

3. Employers must evaluate the ability of their employees to carry out these tasks and work on the wheels in absolutely safety and must provide additional training as required to make sure that all employees maintain their skills.

1.6. PRELIMINARY CHECKS

Before starting to work, carefully check that all machine components, particularly rubber or plastic parts, are in place, in good condition and operate correctly. If damage or excessive wear is found during the inspection phase, replace or repair the component immediately regardless of the amount of damage or wear.
Walk around the machine to ensure that all components are in good condition and operational, and that there are no foreign objects or debris (rags, tools, etc…) in or around the machine which could affect its operation.
These checks must be carried out:

- Before starting the machine
- At regular time intervals
- After repairs

The machine may only be started after this pre-use check is successfully completed. Do not use the machine if it is out of service for fine-tuning, maintenance, lubrication, etc.

1.7. DURING USE

If strange or unusual noises are heard, if a component or system is not operating correctly or if you observe anything unusual, immediately stop using the machine.

- Identify the cause and take any necessary corrective action.
- Contact your supervisor if necessary.

Make sure that all other people are positioned at least 6 metres (20 feet) from the machine.
To stop the machine in an emergency:

- disconnect the power supply plug;
- interrupt the compressed air supply by disconnecting the supply pipe.

⚠ CAUTION

Disconnecting the compressed air supply may leave some actuators pressurised as indicated by the designated symbols on the machine.
Act on the controls to discharge the air in the actuators.

1.8. OPTIONAL ACCESSORIES

Contact the sales network to find out more about all the optional accessories which are suitable for this machine.

2. TRANSPORT, STORAGE AND HANDLING

Conditions for transporting the machine

The tyre changer must be transported in its original packaging and stowed in the position shown on the packaging itself.

- Packaging dimensions:
  - width ..... 800 mm
  - depth ..... 1140 mm
  - height ..... 970 mm
- Weight with packaging:
  - Standard version ..... 250 kg
  - FS version ..... 260 kg

Machine storage and shipping specifications

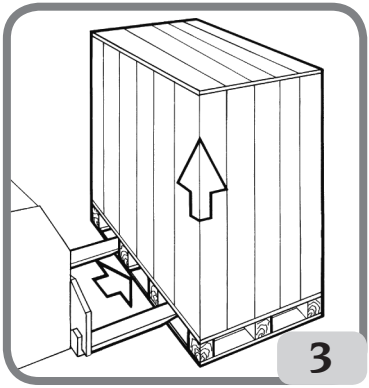
Temperature: -25° - +55°C.

CAUTION

Do not stack other goods on top of the packing or damage may result.

Handling

To move the packing, insert the tines of a fork-lift truck into the slots on the base of the packing itself (pallet) (Fig.3).
Before moving the machine, refer to the HOISTING/ HANDLING section.



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CAUTION

Keep the original packing in good conditions to be used if the equipment has to be shipped in the future.

UK

3. UNPACKING / ASSEMBLY

⚠ CAUTION

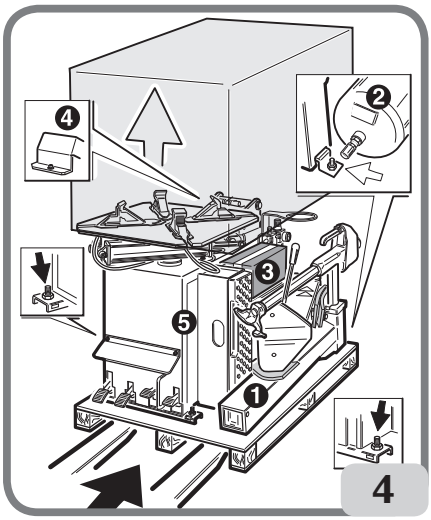
Pay careful attention when unpacking, assembling, handling and installing the machine as described below. Failure to observe these instructions could damage the machine and compromise operator safety.

CAUTION

Before removing the machine from the pallet, make sure the items shown below have been removed from the pallet.

Remove the upper part of the packing and make sure that the machine has not suffered damage in transit; identify the points at which the machine is anchored to the pallet.

- The machine comprises five main units (fig.1):
  1 tower
  2 air tank (FS version only)
  3 box with pressure gauge (FS version only)
  4 column guard
  5 body



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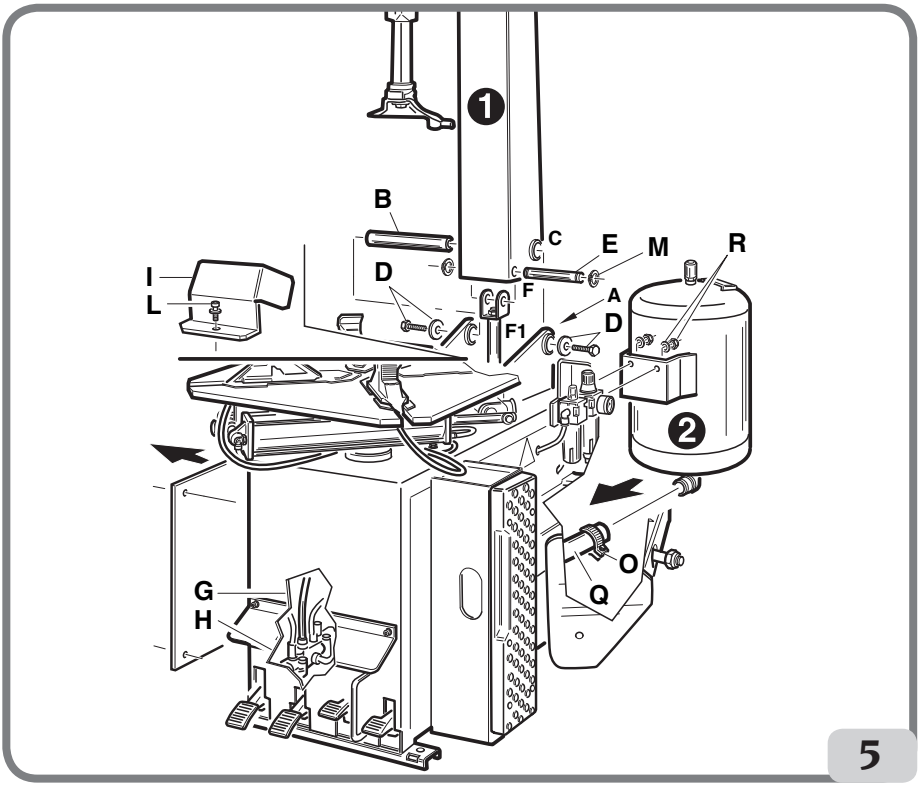
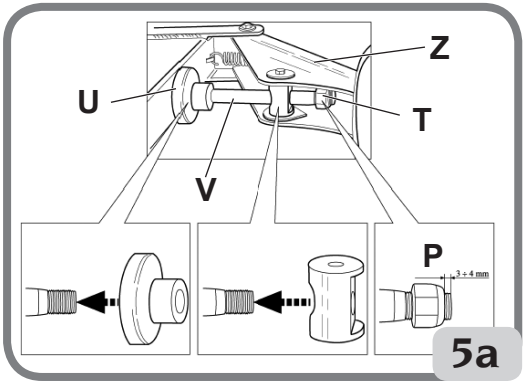
- After removing the tower 1, it is advisable to place it in a horizontal position to prevent it from falling and getting damaged.
- Remove the side cover.
- Insert the air hose G (fig. 5) into hole A behind the column tilting cylinder.
- Apply pin B (fig. 5) into hole C (fig. 5) and lock it using the screws and washers D (fig. 5).
- Insert pin E (fig. 5) into hole F (fig. 5) and into U-bolt F1 (fig. 5) on the tower tilt cylinder and lock with ring M (fig. 5).
- Connect pipe G (fig. 5) to the intermediate union connected to the column lifting valve H (fig. 5).
- Fit the hose connector of the tank 2 into hose Q (fig. 5), fasten the tank 2 to the machine with nuts and washers R (fig. 5), and tighten the clamp O (fig. 5) onto the hose Q (fig. 5) (FS version only).
- Open the bead breaker arm Z. (fig. 5a)
- Insert the spacer pad U on the bead breaker cylinder pin V (fig. 5a), re-close the bead breaker arm by making the bead breaker cylinder pin pass through the adjustable block.
- The T (fig. 5a) nut is to be screwed on to bead break cylinder pin V (fig. 5a) only when the machine is installed and hooked up to the compressed air line. Tighten the nut T



5

(fig. 5a) until P (fig. 5a) is 3-4mm.
- Assemble the column guard I (fig. 5) and lock it with the screws and washers L (fig. 5a).
- Mount the side cover.



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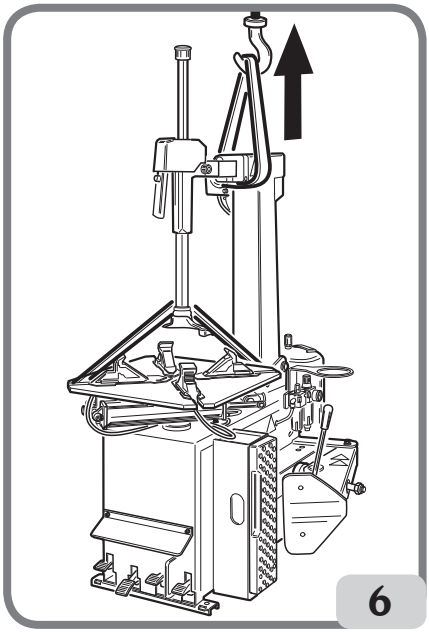
4. HOISTING/ HANDLING

In order to remove the machine from the pallet, hook it as shown in fig.6.
This hoisting point must be used whenever you need to change the installation position of the machine. Do not attempt to move the machine until it has been disconnected from the electricity and compressed air supply systems.



4.1 INSTALLATION AREA

⚠ WARNING

Install the machine in compliance with all the applicable safety standards, including, but not limited to, those issued by OSHA.

⚠ WARNING

IMPORTANT: for the correct and safe operation of the machine, the lighting level in the place of use should be at least 300 lux.

⚠ WARNING

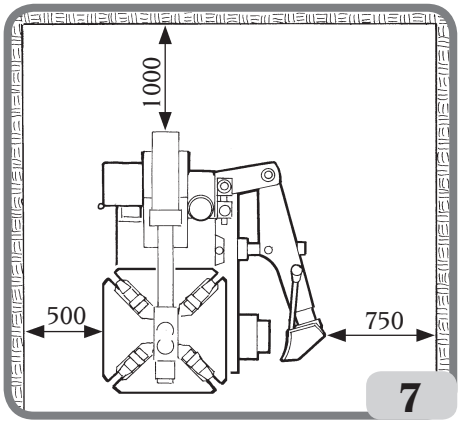
IMPORTANT: Do not install the machine outdoors. It is designed to be used in closed, covered areas.

⚠ DANGER

RISK OF EXPLOSION OR FIRE. Do not use the machine in areas that could be exposed to inflammable vapours (petrol, paint solvents, etc.).
Do not install the machine in a narrow area or below floor level

Install the tyre changer in the chosen work position, complying with the minimum clearances shown in **fig. 7**.

The support surface must have a load-bearing capacity of at least 1000 kg/m^2.



Work environment conditions

- Relative humidity 30% - 95% without condensation.
- Temperature range from 0°C to 50°C.

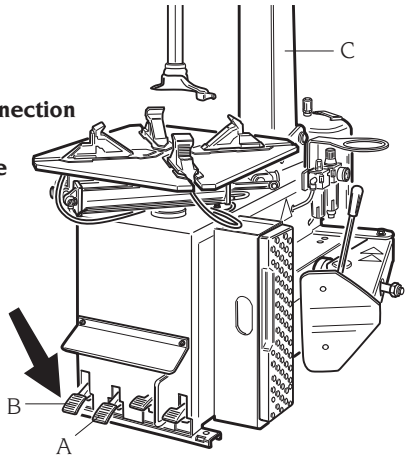
⚠ CAUTION

Whenever the machine is disconnected from the compressed air line for an extended period of time, check the configuration of the control pedals as shown below before restoring the compressed air supply.

⚠ DANGER

Before making any electrical or pneumatic connection and whenever the electrical or pneumatic power is restored, make sure that the machine is in the configuration described below:

- pedal A FULLY LOWERED (turntable E closed).
- pedal B FULLY LIFTED (column C not overturned).



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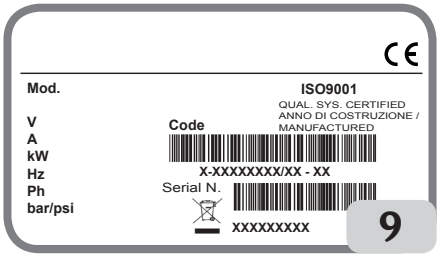
5. DESCRIPTION OF THE MACHINE

The machine is an electro-pneumatic tyre changer.
The machine is compatible with any type of drop-centre single-piece rims with the dimensions and weights indicated in the paragraph TECHNICAL DATA.
The sturdily constructed machine operates with the wheel in a vertical position for bead breaking and in a horizontal position for mounting and demounting tyres. All machine movements are controlled by the operator from the pedals.

Each machine has a data plate Fig. 9, with information about the machine and some technical data.

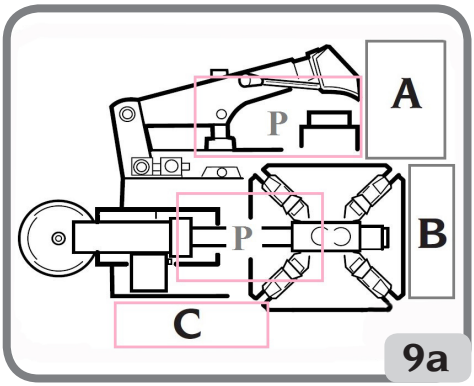


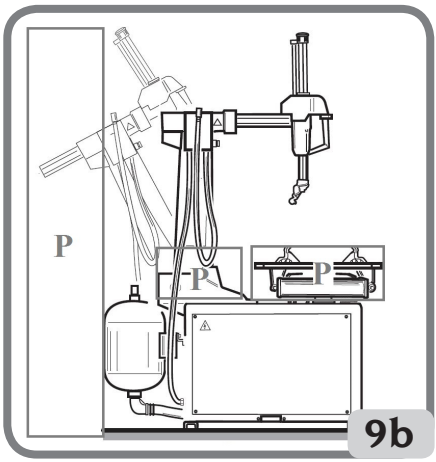
As well as the manufacturer's details, the plate indicates:
Mod. - Machine model;
V - power supply voltage in Volts;
A - Input voltage in Amperes;
kW - Absorbed power in kW;
Hz - Frequency in Hz;
Ph - Number of phases;
bar/psi - Operating pressure in bar and/or psi;
Serial N. - the machine serial number;
ISO 9001 - Certification of the company's Quality System;
EC - EC marking.

5.1. OPERATOR POSITION

Figure 9a and 9b shows the operator's working positions and the relative hazardous zones (P) at the different working stages:

A Bead breaking
B Tyre demounting and mounting
C Inflation area.





CAUTION

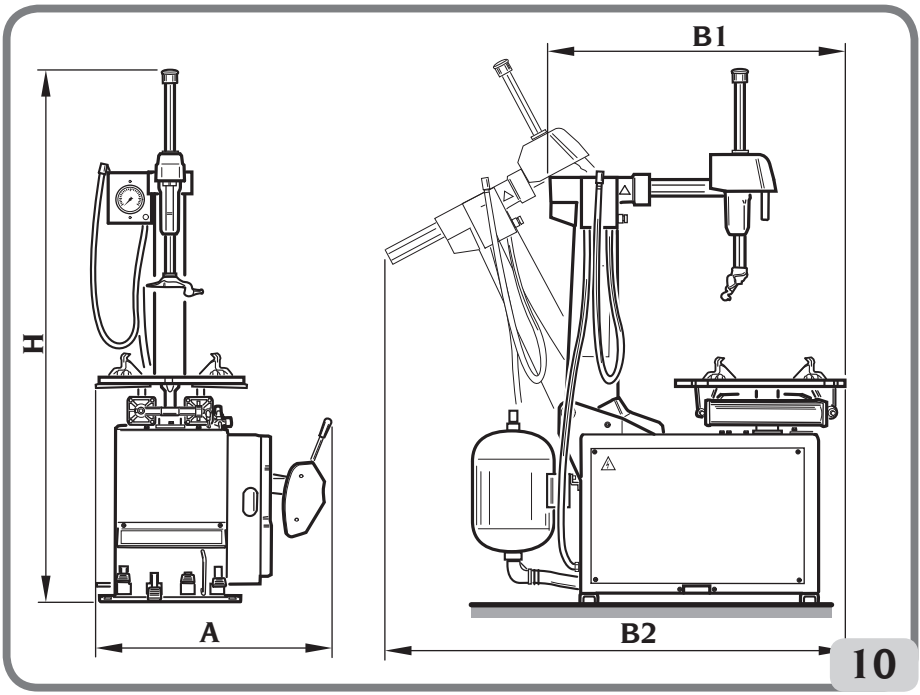
Before removing the machine from the pallet, make sure the items shown below have been removed from the pallet.

⚠ CAUTION

RISK OF CRUSH INJURY. Tilting the column and opening/closing the turntable clamp must be carried out from the working position B (fig.9a), keeping your hands away from any mobile parts of the machine.

6. OVERALL DIMENSIONS (mm)

Maximum length	A = 1100
Minimum width	B1 = 1050
Maximum width	B2 = 1700
Maximum height	H = 2030



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7. MAIN WORKING ELEMENTS OF THE MACHINE

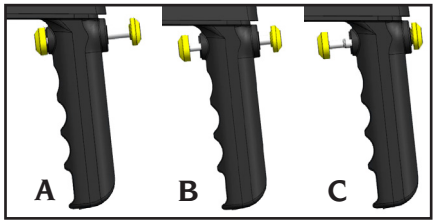
⚠ CAUTION

Get to know your machine: your familiarity with its exact operation is the best guarantee of safety and performance.
Learn the function and location of all commands.
Carefully check that all controls on the machine are working properly.
The machine must be installed properly, operated correctly and serviced regularly in order to prevent accidents and injuries.

Fig.11

1 **Clamping handle: with 3 positions (M 424A) and 2 positions (M 424)**

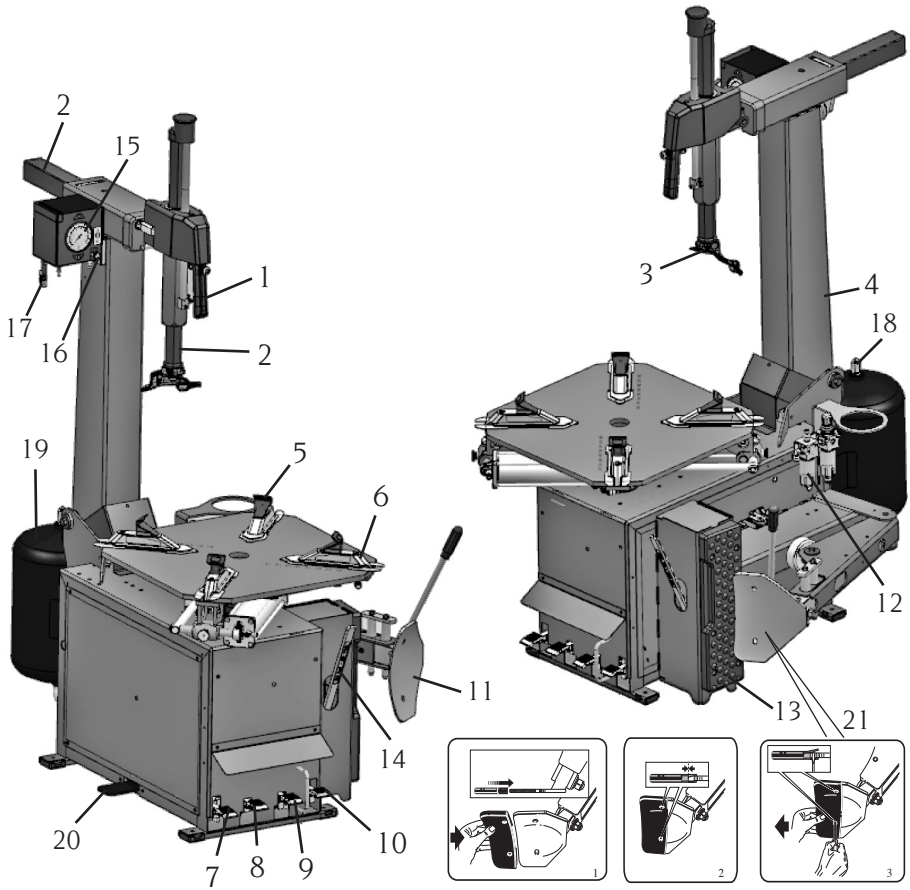
- **A** SU tool head - horizontal axis released
- **B** Central position button Tool Head DOWBN - horizontal axis released (only M 424A)
- **C** Horizontal axis and tool head clamping



2 Vertical and horizontal arm (to position the mounting/ demounting tool).
3 Mounting/ demounting tool (to mount and demount the tyre from the rim).
4 Tilting movable column.
5 Clamp gripper (secures the rim to the turntable).
6 Turntable (rotary platform supporting the wheel).
7 Movable column control pedal (4) (two-position pedal for tilting the column unit).
8 Clamp grippers (5) opening and closing control pedal (three-position pedal for opening/closing rim clamps).
9 Bead breaker control pedal (mono-stable pedal to operate the bead breaking shoe (11)
10 Turntable (6) rotation control pedal (three-position pedal):
- position 0: table stop (stationary)
- Pressed down (Unstable position) clockwise rotation.
- Lifted (Unstable position) anticlockwise rotation.

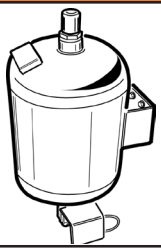
11 Bead breaker shoe (movable shoe to detach the bead from the rim).
12 Filter Regulator + Lubricator Unit (regulates pressure, filters, removes humidity of and lubricates the compressed air supply).
13 Rim rest.
14 Bead lifting lever (raises and positions the tyre bead on the mounting/demounting tool).
15 Pressure gauge (reads the wheel pressure), (FS version only).
16 Deflation button (button to remove the extra air inside the wheel), (FS version only).
17 Doyfe union (clips on to the tyre valve for inflation).
18 Safety relief valve (max. pressure 11 bar) (FS version only).

19 Air tank (FS version only).
20 Inflation pedal (FS version only).
21 Shoe guard (upon request)



⚠ CAUTION

EXPLOSION HAZARD
The operator and maintenance manual is provided together with the documentation of the accessory for information regarding technical characteristics, warnings, maintenance instructions and any other information relative to the air tank (optional).



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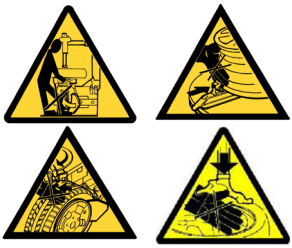
8. BASIC PROCEDURES - USE

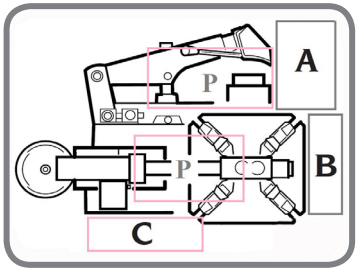
⚠ CAUTION

CRUSHING HAZARD:
Some parts of the machine, such as the demounting/ mounting head, the bead breaker, the turntable and the titling column move during operation and may constitute potential crushing hazards.



Keep hands and other parts of the body well away from moving parts of the machine.

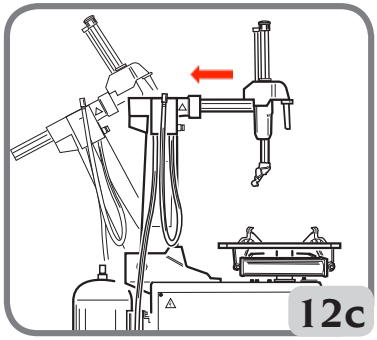
RISK OF IMPACT:
Tilting the manipulator arm can create the potential risk of impact with parts of the body.
The tilting operation must be performed in position B

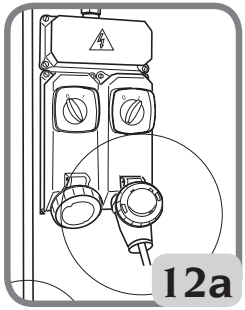


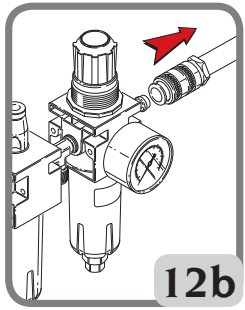
⚠ CAUTION

AVOID PHYSICAL INJURY
Before carrying out any maintenance on the machine:

1. Make sure that the machine is in a stable configuration with the horizontal axis fully retracted and the column in the working or stand-by position (Fig. 12c).







2. Disconnect the power cable (Fig. 12a).

3. Isolate the compressed air line disconnecting the closing valve (quick-release connector) (Fig. 12b)

CAUTION

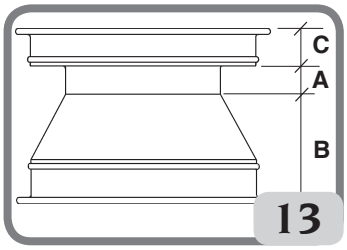
Use only original accessories and spare parts provided by the Manufacturer to prevent the risk of damage or uncontrolled movements of the machine.

8.1. PRELIMINARY CHECKS

Check that there is a pressure of at least 8 bar on the Filter Regulator pressure gauge. If the pressure is below the minimum level, some machine operations may be limited or insufficient.
After the correct pressure has been restored, the machine will function properly.
Check that the machine has been connected correctly to the mains electricity supply and the compressed air supply

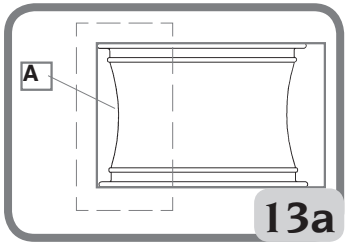
8.2. DECIDING FROM WHICH SIDE OF THE WHEEL THE TYRE MUST BE DEMOUNTED

See Fig.13. Identify the position of rim well A on the wheel. Find the largest width B and the smallest width C. The tyre must be mounted and demounted with the wheel on the turntable with the smallest width side C facing upwards.

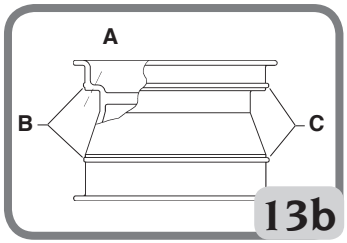


SPECIAL WHEELS

Alloy rim wheels: some alloy rim wheels have minimal rim wells A or no rim wells at all - **Fig. 13A**. These rims are not approved by DOT (Department of Transportation) standards. The DOT initials certify that tyres comply with the safety standards adopted by the United States and Canada (these wheels cannot be sold in these markets).



High performance wheels (asymmetric curvature) - Fig. 13B some European wheels have rims with a very pronounced curvature C, except in the area of the valve hole A where the curvature is less pronounced B. On these wheels the bead must first be broken in the area of the valve hole, on both the top and bottom sides.



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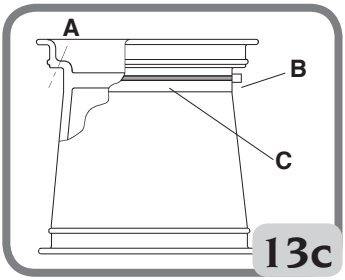
Wheels with pressure sensor - Fig.13C. To work correctly on these wheels and avoid damaging the sensor (which can be incorporated in the valve, secured to the belt, glued inside the tyre, etc.) suitable mounting/demounting procedures must be observed (refer to "Approved mounting/demounting procedure for runflat and UHP tyres").



CAUTION

The TPMS device (optional accessory) can be used to check the proper operation of the pressure sensor.

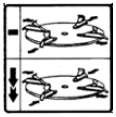
CAUTION

Remove the old weights from the rim before starting work operations.

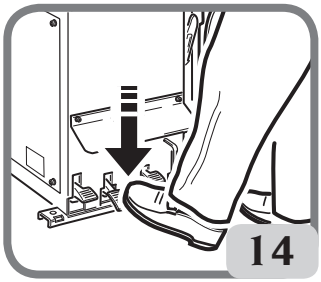
8.3. BEAD BREAKING

⚠ CAUTION

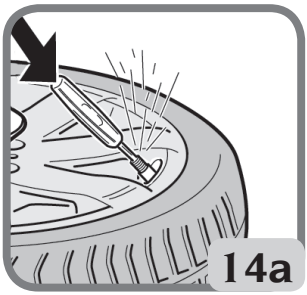
Before carrying out the bead breaking operation, close the turntable completely (clamping grippers towards the centre) (A. Fig.16) keeping your hands away from any moving parts.



- Press the pedal (Fig. 14) and bring it to the fully lowered configuration. In this configuration the clamps are fully closed.



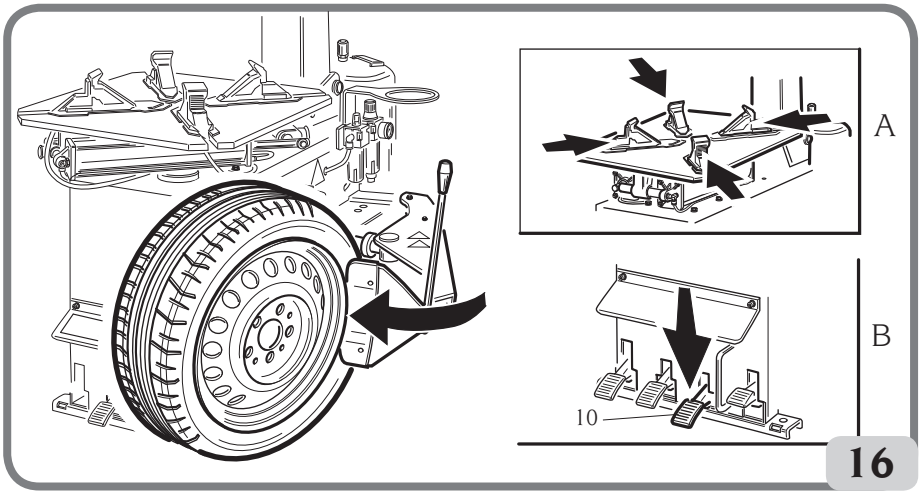
- Deflate the tyre completely, removing the valve core (Fig. 14a).

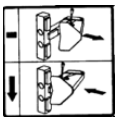


- Adjust the position of the shoe using the pin (1 fig. 15) based on the size of tyre.

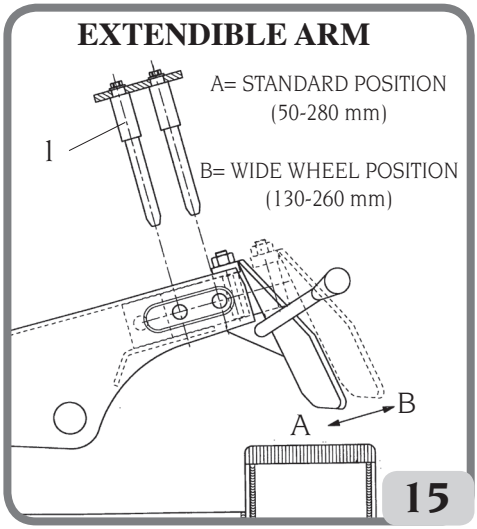
- Position the wheel as shown in fig.16 and move the bead breaking shoe near the rim edge.

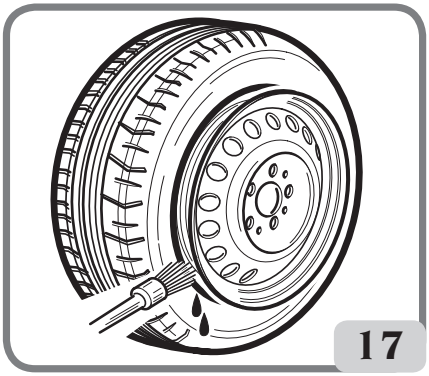
IMPORTANT: During the bead breaking operation, you are advised to keep the turntable closed (clamp gripper towards the centre) (A, fig.16).



- Press the pedal  (fig.16) to operate the bead breaker and detach the bead.
  Repeat this operation on the other side of the wheel.
  It may be necessary to break the bead at several points to free it completely.
  Releasing the pedal inverts the direction of movement of the bead breaking shoe.
  After detaching the beads, remove the old balancing weights.

- Thoroughly lubricate the sides of the tyre around the entire circumference of the lower and upper bead to facilitate demounting and avoid damaging the beads (fig.17).





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8.4. WHEEL CLAMPING

⚠ CAUTION

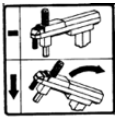
While moving the wheel clamping grippers, keep hands and other parts of the body well away from moving parts of the machine.

CAUTION

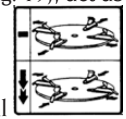
If the weight of the wheel exceeds 10 kg with a lifting frequency exceeding 20 wheels/hour, it is recommended that a lift is used (optional).

- Pull the release button (Fig.18a) to position the manipulator arms in the "resting" position (tool at the top and horizontal arm fully retracted) (A Fig. 18c).

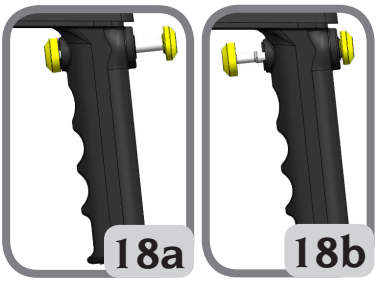
- Press the button (Fig. 18b) to lock the arms in the "resting" position.

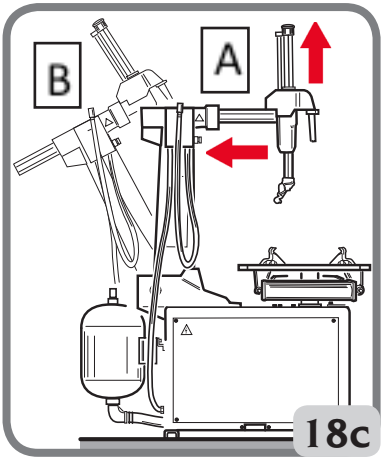


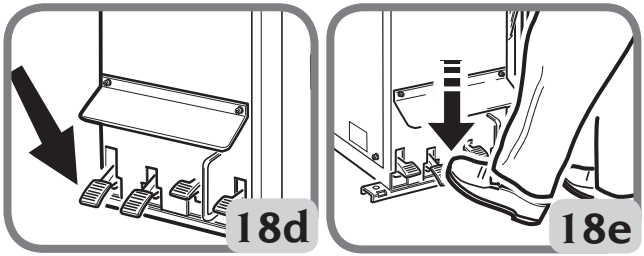
- Press the pedal (Fig.18d) to bring the column to the "resting" position (B Fig. 18c).
- If the range of the diameters (10"→20" or 14"→24") has to be set using the adjustment device below the turntable, ((1-2-3 Fig. 19), act as follows:



- Press the pedal and bring it to the fully raised configuration (Fig. 18e).
  In this configuration the clamps are fully open.
  - With the machine stationary, remove the locking pin by acting on the knob (A Fig.19) while ensuring that no control is pressed.
  - Rotate the adjustment device acting

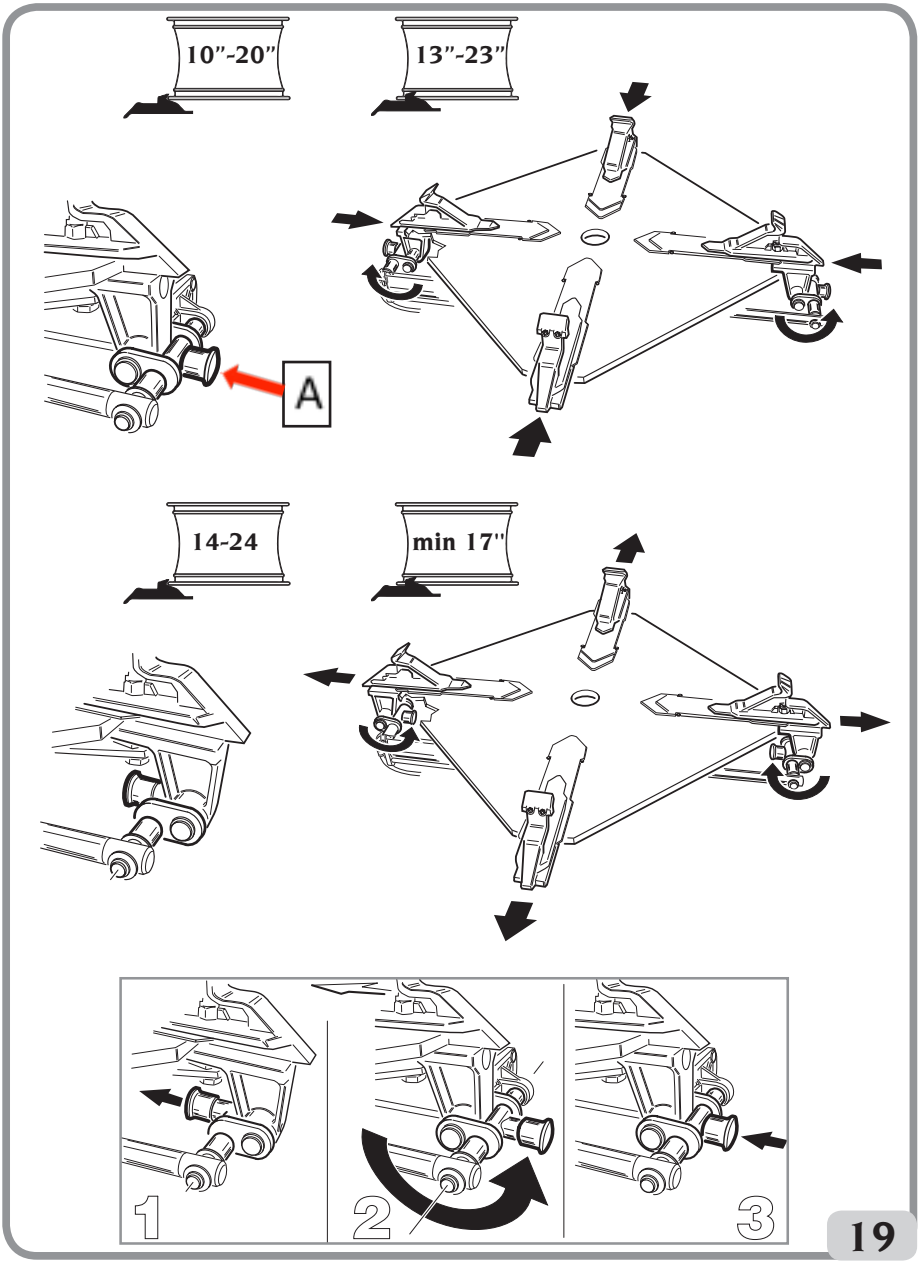






on the knob until it affixes in the new position (A Fig. 19).

- Check that the locking pin is firmly attached in its housing.

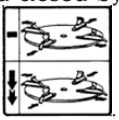


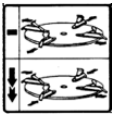
19

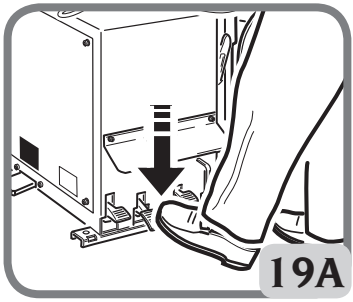
UK

CAUTION

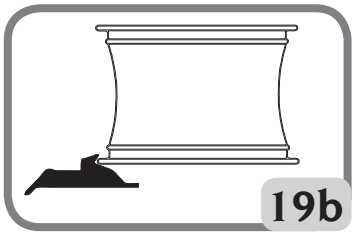
Setting the diameters (10"→20" or 14"→24") with an adjustment device is to be carried out with the turntable completely stationary and without acting on any controls.

- The turntable clamps are opened and closed by sequentially pressing the control pedal  .

- With the clamps fully closed, press the control pedal  slightly bringing it to the midway position (Fig. 19a).
In this configuration it is possible to control clamp opening with an operator present and then stop them in the required position.


19A

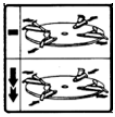
- If the rim blocks from the outside (Fig. 19b), pre-position the clamping grippers using the diameter references on the turntable plate and the red notch on the clamp (Fig. 19c).
For example, Rim 18", pre-position the clamps aligning them with the red notch with a value of 18".

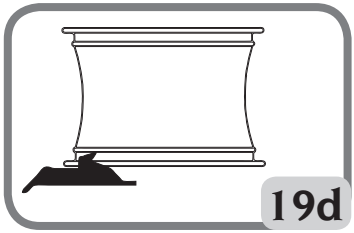

19b

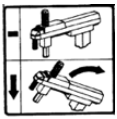
- If the rim blocks from the inside (Fig. 19d), the clamping grippers do not need to be pre-poisitioned. The shape of the grippers themselves bring the rim to be blocked into the correct position.

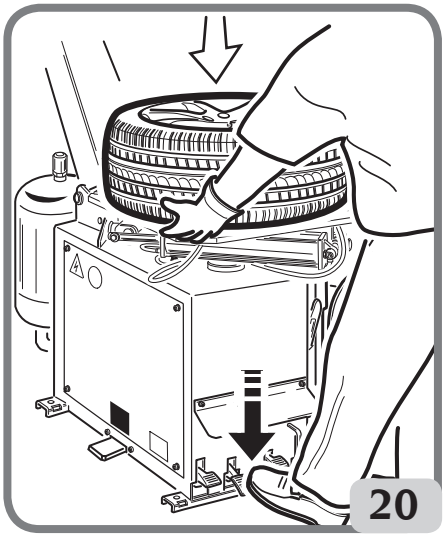

19c

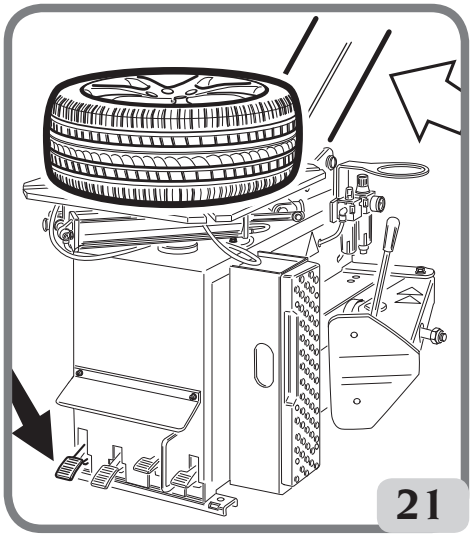
- Place the wheel (with the narrow shoulder of the rim facing upwards) on the turntable,

- Push it downwards slightly and actuate the control pedal  to lock the wheel in position (fig.20).


19d

- Press the pedal  to bring the column to the working position. (Fig.21).



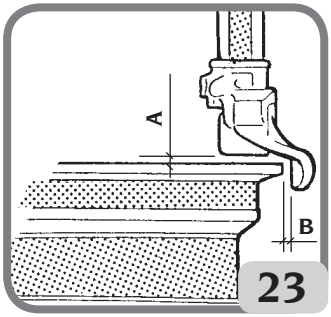


8.5. DEMOUNTING THE WHEEL

- Pull the button to simultaneously release the vertical arm and the horizontal arm (fig. 22a).

8.5.a POSITIONING THE WHEEL (for M 424A – M 424A FS)

- Press the button in the central position (Fig. 22b) to move the mounting/demounting head against the edge of the rim (fig.23).

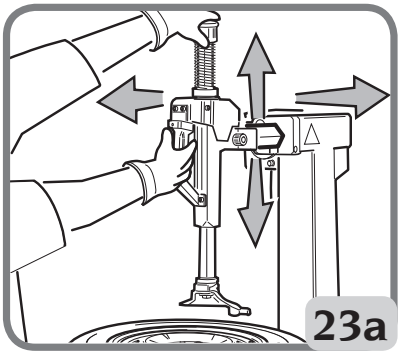


UK

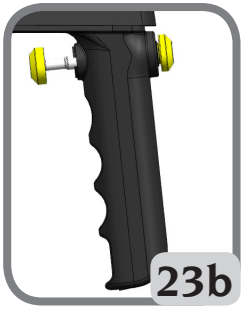
8.5.b POSITIONING THE WHEEL (for M 424 – M 424 FS)

- Move the mounting/demounting head against the edge of the rim (fig.23a).

- Press the button to lock the tool head in the working position (Fig. 23b).

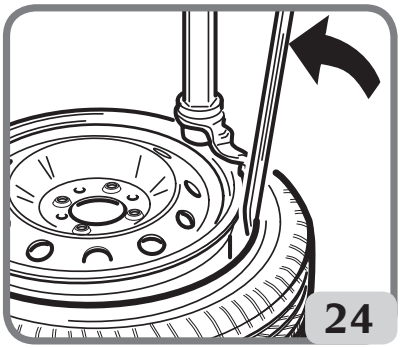


IMPORTANT: press the button to lock both the vertical and horizontal arms simultaneously while the mounting/demounting head moves slightly upwards away from the rim edge (fig. 23).
This space between the rim and the vertical slide will be maintained for as long as the handle is in the locking position. The operator can tilt the tower freely (eg. when demounting wheels of the same size) without repositioning the vertical slide.



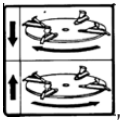
8.5.C DEMOUNTING THE WHEEL

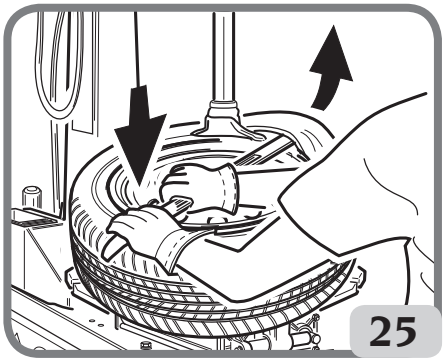
- Insert and position the bead lifting tool on the mounting vertical slide (fig.24).
When working with alloy wheels or wheels with delicate paintwork, it is recommended that the bead lifting tool is removed before proceeding with the demounting.



⚠ CAUTION

Grip the bead lifting tool firmly during use.

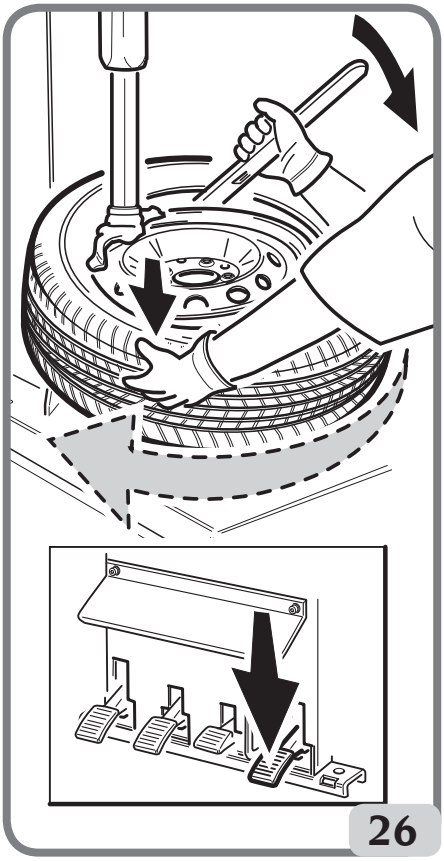
- Lift the upper bead above the rear part of the demounting head (fig.25) and push a part of the upper bead into the rim well by pushing downwards on the side wall of the tyre nearest the operator.
- Press the turntable drive pedal  , making the wheel turn clockwise. The upper

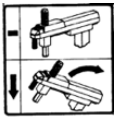


bead will be automatically guided up and over the rim edge (fig.26).

- Repeat the last three points to detach the lower bead.
- Tilt the column backwards.

NOTES: for tyres with an air chamber, after disassembling the upper bead, tilt the column backwards and remove the air chamber before continuing to disassemble the lower bead.
The rotation of the turntable can be stopped at any moment by releasing the drive pedal. For rotation in the opposite direction, just lift the pedal.



- lift the second bead manually onto the head then rotate the turntable plate in a clockwise direction until the tyre has been completely demounted from the rim.
- Press the pedal  to bring the column to the "resting" position.

CAUTION

For tyres with an inner tube, after having demounted the upper bead, tilt the column backwards and remove the inner tube before proceeding to demount the lower bead.
Turntable plate rotation can be interrupted at any moment by releasing the drive pedal.
For rotation in the opposite direction, simply lift the pedal.

UK

8.6. MOUNTING THE WHEEL

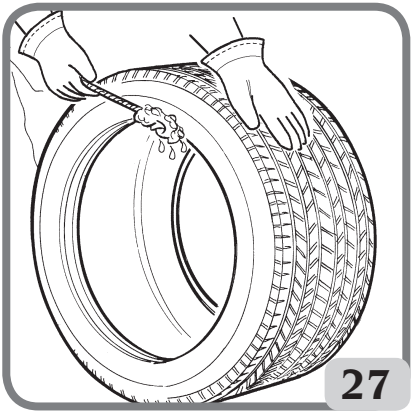
DANGER

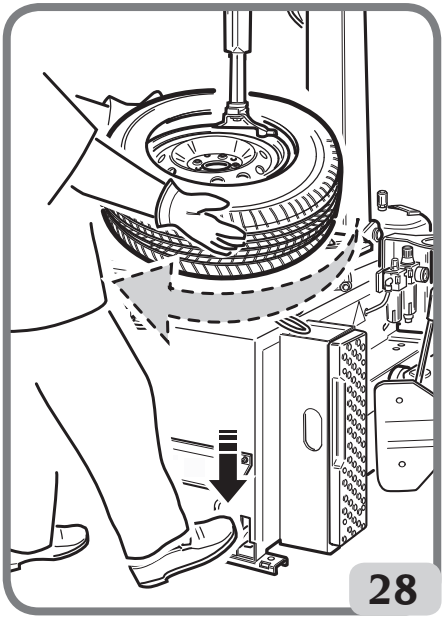
EXPLOSION HAZARD. Always check that the tyre/rim combination is correct in terms of compatibility (tubeless tyre on tubeless rim, tyre with inner tube on rim for inner tube) and geometric dimensions (keying diameter, transversal cross-section width, Off-set and shoulder profile) before mounting.
AVOID THE RISK OF SERIOUS PERSONAL INJURY OR EVEN FATAL INJURY.
Also check that the rims are not deformed, that their fastening holes have not become oval in shape, that there is no sign of deposits or rust and that there are no sharp burrs on the valve holes.
Check that the tyre is in a good condition and there is no sign of damage.

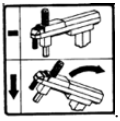
- Before you start with tyre mounting operations, lubricate the beads (fig.27).
  Lubricated beads require less force to mount/seat and are protected against torsional damage.

- Check that the tyre is in good condition with no sign of damage.

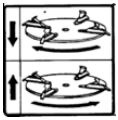
- Place the tyre over the rim and tilt the column to


27


28

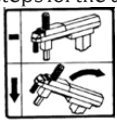


the working position . Position the bottom bead (fig.28) beneath the right hand side of the mount/demount head.
Press the turntable drive pedal to turn the



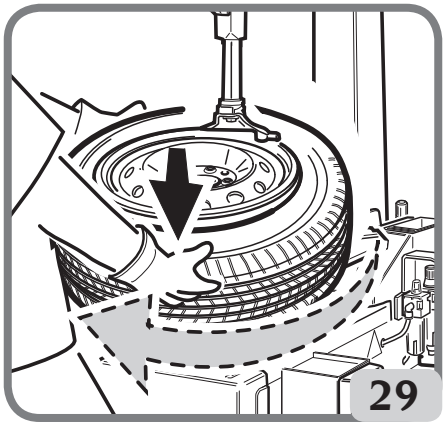
turntable in a clockwise direction and proceed with mounting. Use the drop centre by pressing the sidewall opposite the head to reduce tensional force on the bead as the wheel rotates (fig.28).

- Once you have mounted the bottom bead, repeat the same steps for the upper bead (fig.29).



- Press the pedal to bring the column to the "resting" position.

- Release the wheel and remove it from the tyre changer



Special tools

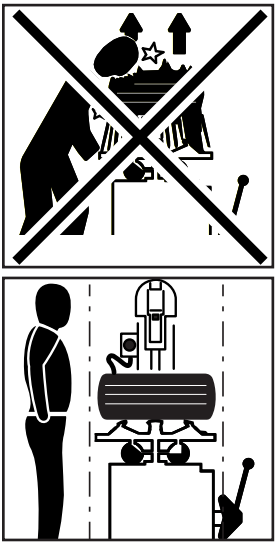
To make it easier to mount/demount low profile tyres, it is recommended that the ***bead presser gripper*** is used (optional accessory supplied on request).

8.7 APPROVED UHP AND RUN FLAT TYRE DEMOUNTING AND MOUNTING PROCEDURE

For a detailed description of the mounting/demounting procedure of the UHP and RUN FLAT tyres, please refer to the instructions in the manual prepared by WDK (German Tyre Industry Association).

8.8. INFLATING THE TYRES

8.8.A. SAFETY RULES



DANGER

- **EXPLOSION HAZARD**
- **Do not exceed the pressure recommended by the tyre manufacturer.**
- **Never mismatch tyre size and rim size.**
- **Pay careful attention to any damage to the tyre**
- **During inflation operations, assume a position which is outside of the vertical cylinder volume occupied by the wheel.**

UK

⚠ DANGER

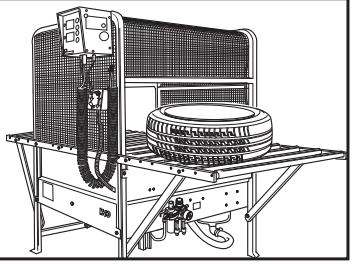
We do not recommend using inflation devices (e.g. gun) connected to compressed air sources other than the machine.

CAUTION

Always comply with the national safety regulations, which may be more restrictive with respect to this manual, following the principle that the more restrictive standard takes precedence over the less restrictive one.

⚠ DANGER

If the operating pressure of the tyre envisaged for a certain vehicle exceeds the value of the inflation limiting valve, it is recommended that the tyre/wheel assembly s placed in a suitable safety device.



⚠ CAUTION

Look carefully for any tyre damage. The following instructions must be read, understood and observed precisely.

1. Tyres that are excessively inflated could explode, causing the dispersion of debris in the air, which can cause accidents.

2. Tires and Rims that are not the same diameter are “mismatched”. Never attempt to mount or inflate any tire and rim that are mismatched. For example, never mount a 16” tire on a 16,5” rim (or vice versa). This is very dangerous. A mismatched tire and rim could explode, and resulting in an accident.

3. Never exceed the inflation pressure recommended by the tyre manufacturer.

Carefully check that the air hose is well inserted in the valve.

4. Never bring your head or other body parts close to a tyre during inflation or bead insertion operations.

This machine is not a safety device against the possible explosion risk of tyres, air chambers or rims.

5. Maintain a suitable distance from the tyre changer while inflating. Do not approach it.

⚠ CAUTION

Noise levels as high as 85db(A) may be reached during this operation. Therefore operators are advised to wear hearing protection devices. It is recommended that protective eye-wear is worn to prevent any injury resulting from contact with dust or any fragments inserted in the tyre

⚠ DANGER

A bursting tyre can cause projections of its parts in surrounding areas with a force sufficient to cause serious injury or death.

Do not mount a tyre if its dimensions (indicated on the side) do not correspond exactly with the rim dimensions (printed inside the rim) or if the rim or the tyre are defective or damaged.

Never exceed the pressure recommended by the tyre manufacturer.

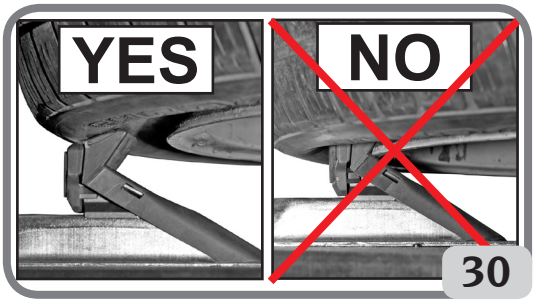
The tyre changer is not a safety device and does not prevent tyres and rims from exploding. Keep other people at a distance

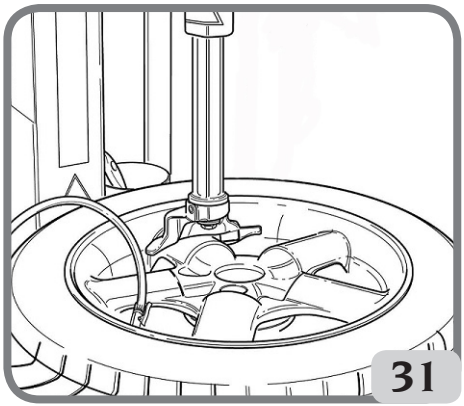
8.8.b. TYRE INFLATION

- Ensure the wheel is NOT clamped on the turntable by the clamps (Fig. 30).

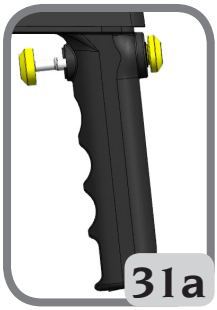
- Bring the horizontal arm to the centre of the wheel (fully extracted towards the operator)

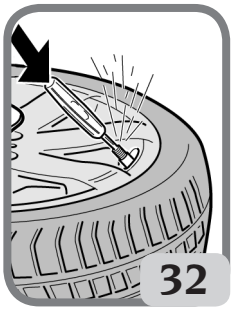
- Lower the vertical arm to touch the rim (fig. 31), then lock the arm in this position (fig. 31a).





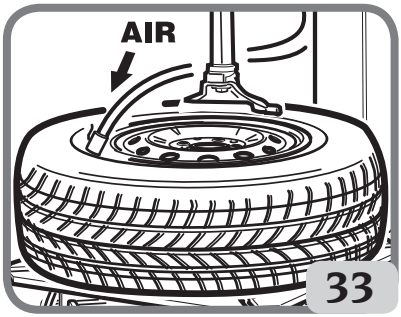
- Remove the valve core if it has not already been removed (Fig. 32).





UK

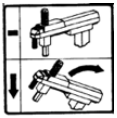
- Connect the Doyfe connector on the air hose to the valve stem (Fig. 33).



33

- Inflate the tyre with the designated gun or pressing the pedal in the intermediate position (Fig. 39), frequently checking that the pressure indicated NEVER exceeds the maximum pressure indicated by the tyre manufacturer.

- Disconnect the inflation hose from the valve stem.

- Press the pedal  to bring the column to the "resting" position.

- Remove the wheel from the tyre changer.

8.8.c. SPECIAL PROCEDURE (FS VERSION)

The FS version uses a powerful blast of air from nozzles near the clamping grippers to facilitate bead breaking and inflation with tubeless tyres.

⚠ CAUTION

Before starting with the operations described below, make sure there is no dirt, dust or other impurities near the inflation nozzles. It is recommended that protective glasses are worn.

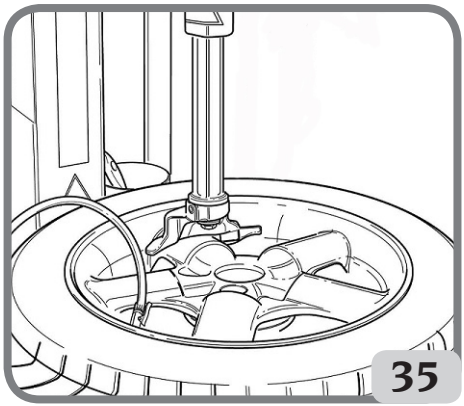
-Check that both the upper and lower beads and the rim bead seat have been suitably lubricated with approved paste for mounting.

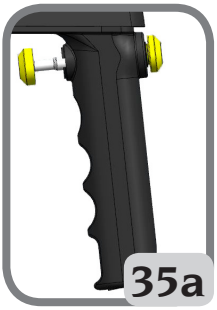
- Bring the horizontal arm to the centre of the wheel (fully extracted towards the operator)

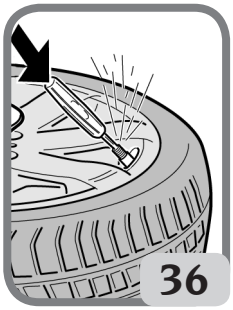
- Ensure that the wheel is clamped onto the turntable from the inner side (fig. 34).

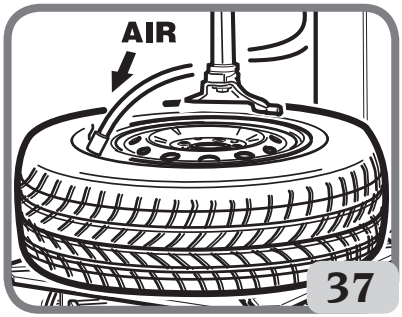
- Lower the vertical arm to touch the rim


34


35







(fig. 35), then lock the arm in this position (fig. 35a).

- Remove the valve core if it has not already been removed (Fig. 36).

- Connect the air hose Doyfe inflator connector to the valve stem (Fig. 37).

CAUTION

To increase the effectiveness of the air jets, manually lubricate and lift the lower bead before activating the nozzles.

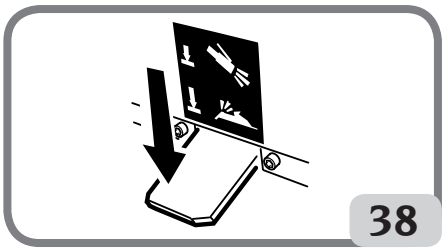
- Fully depress the inflation tyre briefly (fig. 38). The tyre expands, pushing the beads into the seating position.

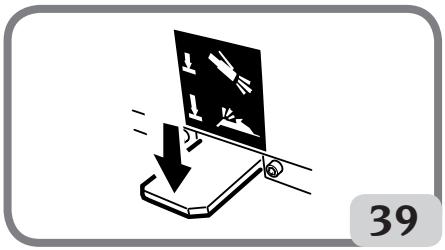
CAUTION

To improve the operation of the tubeless tyre inflation system the line pressure must be between 8 and 10 bar.

- Release the wheel from the grippers.

- Bring the inflation pedal to the intermediate position (fig. 39) to inflate the tyre. Check the pressure gauge frequently to ensure that the pressure NEVER exceeds the maximum pressure specified by the tyre manufacturer.





UK

⚠ CAUTION

Risk of explosion. During the bead insertion phase, do not exceed the maximum pressure indicated by the manufacturer.

⚠ CAUTION

Operate the inflation jets only for tyre bead insertion.

Discharge the air from the pneumatic system before disconnecting the power supply or other pneumatic components. The air is accumulated in the tank for operating the bead insertion jets.

⚠ CAUTION

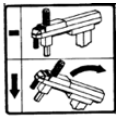
Activate the air jets only after having made sure that the rim is secured correctly.

⚠ CAUTION

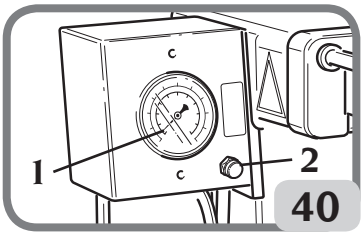
RISK OF EXPLOSION. Do not mount a tire and a rim that do not have the same diameter (for example, 16.5 inch tyre and 16 inch rim).

If the tyre is over-inflated, air may be released by pressing the brass manual deflation button located below the air pressure gauge (2 - Fig.40)

- Disconnect the inflation hose from the valve stem.

- Press the pedal  to bring the column to the "resting" position.

- Remove the wheel from the tyre changer.



9. TROUBLESHOOTING

⚠ CAUTION

The indications provided below and the "replacement parts" booklet do not authorise the user to act on the machine in the event of a malfunction. They serve to provide the technical support centre with accurate information so as to reduce intervention times. Any intervention on the machine or system must be carried out by qualified and enabled personnel.

Turntable will not turn

No mains power supply.

- ➥ Check the mains voltage is present.
- ➥ Check the state of the fuses.
- ➥ Check the state of the differential and/or circuit breaker.
- ➥ Check the connections of the cable in the plug.

The motor does not turn over:

- ➥ Check the micro-switches of the pedal unit (for inverter motors only)
- ➥ Check the motor rotation control of the pedal unit
- ➥ Replace the inverter board (for inverter motors only).
- ➥ Replace the motor.

The belt is broken.

- ➥ Replace the belt.

Gear unit blocked:

- ➥ Replace the gear unit

Turntable will not rotate in either direction

Faulty control.

- ➥ Replace the inverter.
- ➥ Check the micro-switches of the pedal unit (for inverter motors only)
- ➥ Replace the inverter board (for inverter motors only).

Gear unit clamped.

- ➥ Replace the gear unit.

Gear unit noisy. The turntable makes 1/3 of a spin and then stops

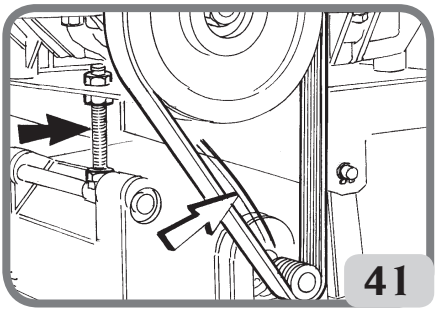
Gear unit seizing.

- ➥ Replace the gear unit.

The turntable blocks under strain but the motor turns over

Insufficient belt tension.

- ➥ Adjust belt tension (fig.41) or replace it.



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Turntable fails to clamp rims

Turntable does not clamp rim.

➥ Replace the turntable cylinder.

Clamp grippers are worn.

➥ Replace the clamp grippers.

The control pedal does not return to its position

Control spring broken.

➥ Replace the spring.

Bead breaker cylinder lacks force, fails to break beads and leaks air

Silencer plugged.

➥ Replace the silencer

Cylinder gaskets worn.

➥ Replace the gaskets.

➥ Replace the bead breaker cylinder.

After clamping, the tool head does not raise or raises too far from rim

Clamping plate not adjusted.

➥ Adjust the plate.

When the column tilts back, the arm and vertical slide slip to their limit stops

Defective clamping plate.

➥ Replace the plate.

Clamping plate not adjusted.

➥ Adjust the plate.

Clamping cylinders faulty or not working.

➥ Replace the cylinders or gaskets.

No supply to the clamping cylinders.

➥ Check that the compressed air circuit and controls are working correctly.

No air passes through the valve

➥ Replace valve.

Vertical slide ascends under strain

Defective clamping plate.

➥ Replace the plate.

Clamping plate not adjusted.

➥ Adjust the plate.

Column not tilted

Faulty tower tilt cylinder.

➥ Replace the column tilting cylinder.

No air supply to cylinder.

➥ Replace the cock.

Air is delivered from the valve.

➥ Replace the valve or column tilting cylinder.

The column tilts violently or too slowly

Incorrect outlet regulator setting.

➥ Adjust the outlet regulators.
Hare: speed increase.
Tortoise: speed reduction.

Tyre pressure gauge needle fails to return to 0

Pressure gauge faulty or damaged.

➥ Replace the pressure gauge.

The lubricator does not lubricate

No oil in lubricator.

➥ Top up lubricator with SAE20 non-detergent oil.

Lubricator broken.

➥ Replace the lubricator

10. MAINTENANCE

⚠ CAUTION

Any operation intended to modify the setting value of the relief valve or pressure limited is prohibited. The manufacturer declines all liability for damage resulting from tampering this these valve.

⚠ CAUTION

Before carrying out any adjustment or maintenance on the machine, disconnect the electrical and compressed air supplies and check that all moving parts are firmly immobilized.

UK

⚠ CAUTION

Do not remove or modify any part of the machine (these interventions may only be carried out by personnel of the technical support centres).

⚠ CAUTION

When disconnecting the machine from the compressed air supply, the pneumatic actuators may still be pressurised.

⚠ CAUTION

Before carrying out any scheduled maintenance operation or topping up with lubricant, disconnect the machine from the compressed air supply line.

CAUTION

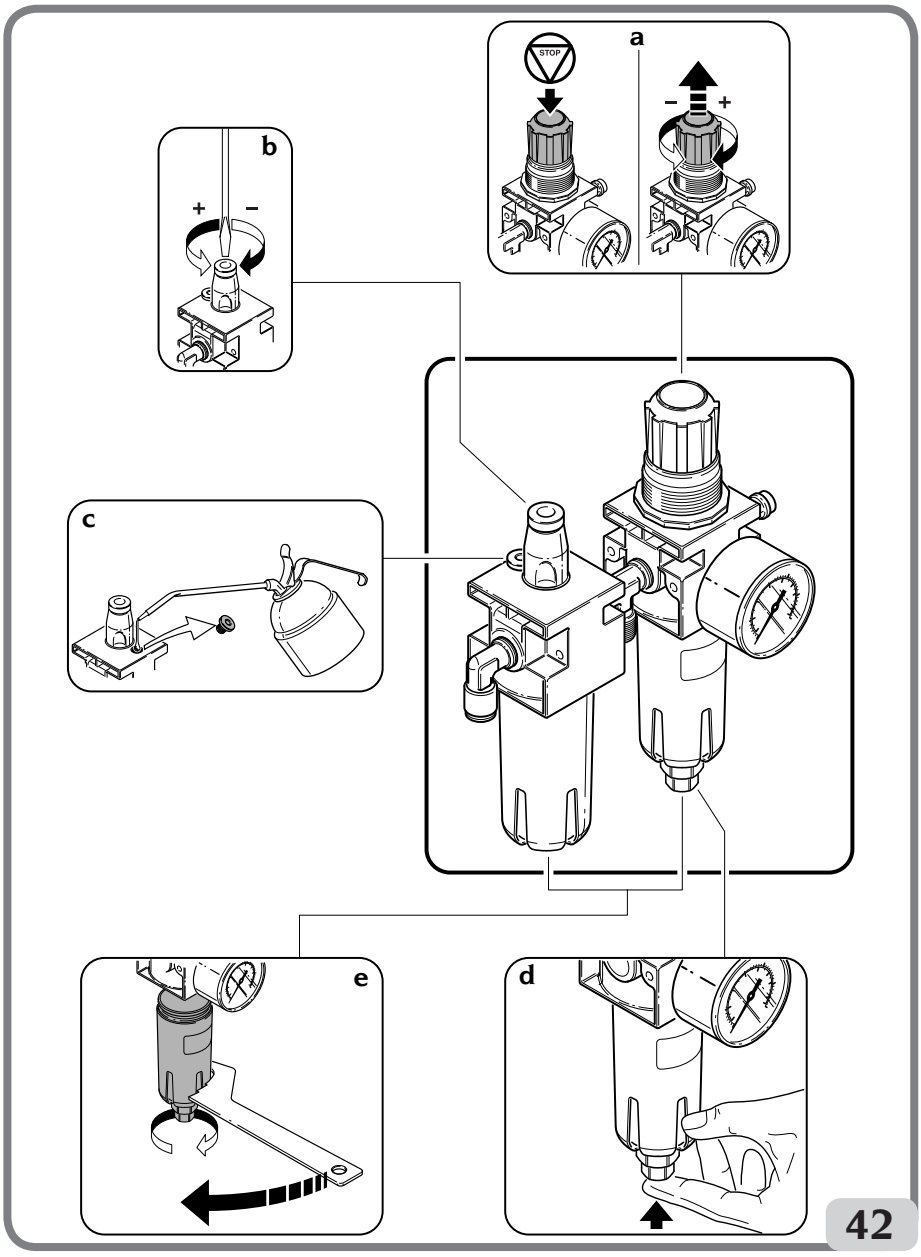
The manufacturer declines all responsibility for claims resulting from the use of non-original spare parts or accessories.

- Clean the machine regularly
- Keep all the guides (vertical axis, horizontal axis, clamping guides) clean and well lubricated
- The regulator filter unit plus lubricator (FRL)serves to filter the air, adjust the pressure and lubricate it.

The "FRL" unit supports a maximum input pressure of 16 bar and has an adjustment range of 0.5 to 10 bar. The setting may be modified by pulling the handle out and then turning. After adjusting, return the handle to the locked position by pushing down (fig.42a).
The lubricant flow-rate is adjusted by turning the screw on part "L", (fig.42b); normally this unit is precalibrated to a pressure of 10Bar, with SAE20 viscosity lubricant in order to make a drop of lubricant come out, which can be seen from the specific cover, every 4 times the bead breaker is operated.
Regularly check the level of the lubricant through the designated inspection window and top up as indicated in fig 42c. Only top up with 50cc of non-detergent oil SAE20.

The filter regulator "FR" has an automatic condensation drain system, therefore in conditions of normal use special maintenance is not required. The condensate may however be drained manually at any time (fig.42d). Normally the cups do not need to be removed, but check if this is necessary for maintenance operations after a long period of use. If a manual operation is not sufficient, use the specific key provided (fig.42e).
Clean with a dry cloth. Avoid contact with solvents.

NOTE: for the warning indications regarding oil, refer to the relevant chapter in the operator's manual of the machine.



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CAUTION

To keep the machine in optimum safety and operating conditions, the employer is required to ensure the following period checks are carried out by the authorised service network.

Periodic checks

a. periodic check of the inflation pressure gauge every 2 years
b. periodic check of the inflation pressure limiting valve every 2 years
c. periodic check of the compressed air supply regulating filter at the machine inlet every 2 years
d. periodic check of all machine controls every 2 years
e. periodic check of the maximum pressure safety valve fitted on the tanks every 2 years
f. check of some parts of the machine, such as: protective and safety devices, parts subject to wear, parts subject to pressurised fluid (tanks, connections, pipes, etc.), electrical connections, etc.

11. INFORMATION ABOUT SCRAPPING

If the machine is to be scrapped, remove all electrical, electronic, plastic and metal parts. Dispose of them separately, as provided for by local regulations in force.

12. ENVIRONMENTAL INFORMATION

The disposal procedure described below only applies to machines with the symbol of

the waste bin with a bar across it on their data plates.
This product may contain substances that can be hazardous to the environment and to human health if it is not disposed of properly.
We therefore provide you with the following information to prevent releases of these substances and to improve the use of natural resources.

This product may contain substances that can be hazardous to the environment and to human health if it is not disposed of properly.
We therefore provide you with the following information to prevent releases of these substances and to improve the use of natural resources.

Electrical and electronic equipment should never be disposed of in the usual municipal waste but must be separately collected for their proper treatment.
The crossed-out bin symbol, placed on the product and on this page, reminds the user that the product must be disposed of properly at the end of its life.
This prevents the inappropriate disposal of the substances which this product contains, or the improper use of some of them, from having hazardous consequences for the en-

vironment and human health. Furthermore, this helps to recover, recycle and reuse many of the materials contained in these products.

To this end, electrical and electronic manufacturers and distributors have set up proper collection and treatment systems for these products.
At the end of life your product contact your distributor to have information on the collection arrangements.

When buying this new product your distributor will also inform you of the possibility to return free of charge another end of life equipment as long as it is of equivalent type and has fulfilled the same functions as the supplied equipment.

Anyone disposing of the product otherwise than as described above will be liable to prosecution under the legislation of the country where the product is scrapped.

We also recommend you to adopt more measures for environment protection: recycling of the internal and external packaging of the product and proper disposal of used batteries (only if contained in the product).

With your help it is possible to reduce the amount of natural resources used to produce electrical and electronic equipment, to minimise the use of landfills for the disposal of the products and to improve the quality of life by preventing that potentially hazardous substances are released in the environment.

13. INFORMATION AND WARNINGS CONCERNING HYDRAULIC FLUID

Disposing of spent fluid

Do not dispose of used oil into sewage mains, storm drains, rivers or streams collect it and consign it to an authorised disposal company.

Fluid leaks or spills

Contain the spilt product from spreading using soil, sand or any other absorbent material. The contaminated zone must be degreased with solvent, taking care not to allow vapours to form or stagnate, and the residual material from the cleaning process must be disposed of as envisaged by law.

Precautions for the use of hydraulic fluid

- Avoid contact with the skin.
- Avoid the formation or spreading of oil mists in the atmosphere.
- The following fundamental health precautions must therefore be adopted:
  - protect yourself against splashes (suitable clothing, protective screens on machines)
  - wash yourself frequently with soap and water; do not use irritants or solvents which remove the skin's protective sebum coating
  - never dry your hands with dirty or oily rags

- change your clothes if wet with fluid, and always at the end of the working day
- never smoke or eat with oily hands

- Also adopt the following preventive and protective equipment:
  - gloves resistant to mineral oils, with fleecy lining
  - goggles, in case of splashes
  - aprons resistant to mineral oils
  - protective screens, in case of splashes

Mineral oil: first aid indications

- Swallowing: go to Casualty with the characteristics of the type of oil swallowed.
- Inhalation: in case of exposure to strong concentration of vapours or mists, take the affected person out into the open air and then to Casualty.
- Eyes: rinse with plenty of water and go to Casualty as soon as possible.
- Skin: wash with soap and water.

14. RECOMMENDED FIRE EXTINGUISHING MEASURES

For guidance on the most suitable type of extinguisher, refer to the table below:

Dry materials	
Water	**YES**
Foam	**YES**
Powder	**YES***
CO_2	**YES***
Flammable liquids	
Water	NO
Foam	**YES**
Dry chemical	**YES**
CO_2	**YES**
Electrical devices	
Water	NO
Foam	NO
Dry chemical	**YES**
CO_2	**YES**

YES* ***Use only if more appropriate extinguishers are not on hand or when the fire is small.***

⚠ CAUTION

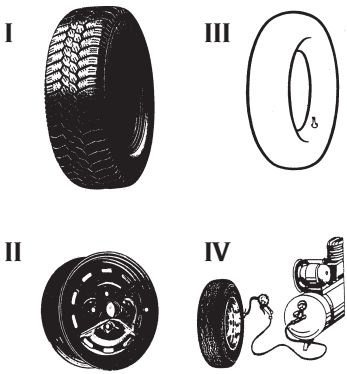
The indications given in this table are of a general nature and should be used as a general guide. All the applications of each type of extinguisher must be obtained from the relevant manufacturer.

15. GLOSSARY

Wheel and tyre assembly
Assembly consisting of:
Tyre
Wheel: rim and disc coupling
Inner tube (if present)
Pressurised air

I - *Tyre* The tyre is the main part of the complex that is in contact with the road and is therefore designed to support the internal air pressure and all other stress arising from use.

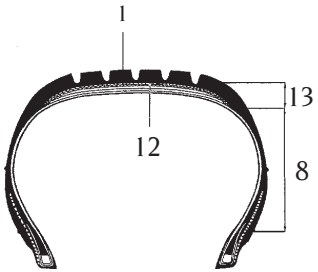
This cross section of the tyre illustrates the different parts making up the tyre itself.
The tyre must:
- withstand a load,
- ensure driving power,
- steer the vehicle,
- aid handling and braking,
- aid vehicle suspension.



1 - *Tread*. This is the part in contact with the ground when the tyre rolls. It comprises a rubber compound and a "pattern" suitable for ensuring good resistance to abrasion and good grip in dry and wet conditions, as well as quiet operating conditions.

2 - *Edge or bracing*. This is a metal fabric or textile insert, in the area of the outer bead part It protects the casing plys from rubbing against the rim.

3 - *Casing*. This is the resistant structure and comprises one or more layers of rubber plys. The way the plys comprising the casing are arranged give the structure its name. The following structures are possible:
Conventional: the plys are inclined and arranged so that the strands comprising a ply overlap with those of the adjacent ply. The tread, which is the part of the tyre in contact with the ground, is part of the sidewalls and so during rolling, sidewall flexure is transmitted to the tread.
Radial: the casing consists of one or more plys with the cords in a radial direction.
A radial casing in itself is quite unstable. To make it stable and prevent incorrect tread movement in the area of contact with the ground, the casing and the tread are reinforced with an annular structure, usually



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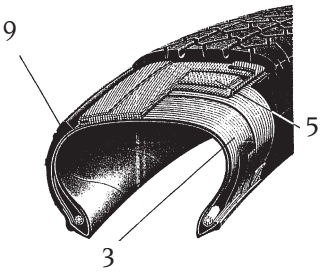
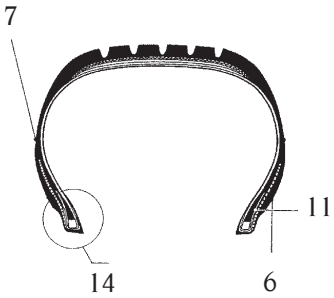
called a belt. The tread and sidewall work with different, independent rigidities, so during rolling, sidewall flexure is not transmitted to the tread.



4 - *Side ring*. This is a metal ring comprising several steel strands. The casing plys are secured to the side ring.

5 - *Belt*. This is a non-flexible circumferential structure comprising cross-plys at very low angles, positioned below the tread, to stabilise the casing in the footprint area.

6 - *Centring band*. This is a small marking which indicates the circumference of the top part of the bead and is used as a reference to check exact tyre centring on the rim after mounting.



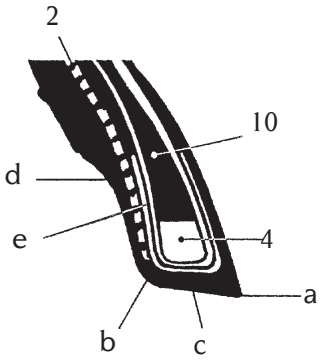
7 - *Protective band*. This is a circumferential marking in the area of the sidewall which is more exposed to accidental rubbing.

8 - *Sidewall*. This is the area between the shoulder and the centring band. It consists of a more or less thin layer of rubber, which protects the casing plys from lateral impact.

9 - *Liner*. This is a vulcanised, compound sheet, impermeable to air, inside tubeless tyres.

10 - *Filling*. This is a generally triangular rubber profile, above the side ring; it provides rigidity for the bead and gradually offsets the abrupt uneven thickness caused by the side ring.

11 - *Flap*. This is the part of the casing ply around the side ring and placed against the casing, to secure the ply and prevent it from slipping.

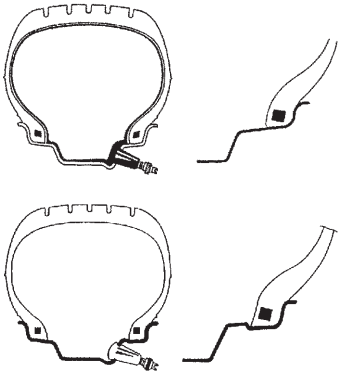


12 - *Foot*. This is the innermost layer of the tread in contact with the belt, or if the latter is not present (conventional tyres) with the last casing ply.

13 - *Shoulder*. This is the outer part of the tread, between the corner and start of the sidewall.

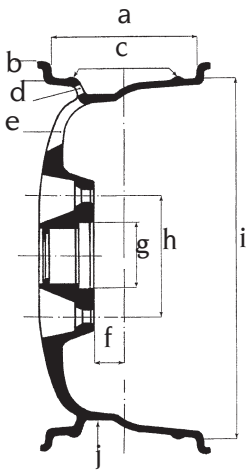
14 - *Bead*. This is the part joining the tyre to the rim. The bead point (a) is the inner corner. The spur (b)

is the outer part of the bead. The base (c) is the area resting against the rim. The groove (d) is the concave part against which the rim shoulder rests.



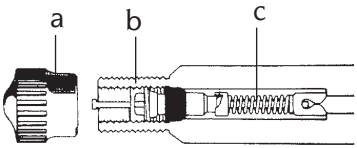
Tube type tyres. As a tyre has to contain pressurised air for a long period of time, an air chamber is used. The valve for adding air and maintaining, controlling and restoring air pressure is part of the chamber in this case.
Tubeless tyres. Tubeless tyres consist of a tyre with inner sidewall lined with a thin layer of special impermeable rubber, called ***liner***. This liner helps to maintain air pressure in the casing. This kind of tyre must be mounted on a specific rim, to which the valve is directly fixed.

II - *Rim* (*Wheel*). The wheel is the rigid metal part which connects the vehicle hub to the tyre, on a fixed but non-permanent basis.



***Rim profile*.** The rim profile is the form of the section in contact with the tyre. It comprises different geometric forms, which ensure: easy tyre mounting (bead insertion in the rim well); safe driving, in terms of the bead anchored in its seat.
The rim section shows its various parts: a) rim width – b) shoulder height – c) tubeless anchoring (HUMP) – d) valve hole – e) ventilation opening – f) off set – g) central hole diameter – h) attachment hole centre to centre i) keying diameter – j) rim well.

III - *Air chamber* (*tube type tyres*). The air chamber is a closed ring-like rubber structure with a valve, which contains pressurised air.



***Valve*.** The valve is a mechanical device to inflate/deflate the tyre and maintain air pressure inside the air chamber (or tyre in the case of tubeless tyres). It consists of three parts: the valve closing cap (a) (to protect the internal mechanism from dust and guarantee air tightness), an internal mechanism (b) and the base (c) (the outer lining).

Tubeless Inflator. Inflation system that makes the inflation of tubeless tyres easier.

Beading. Operation which takes place during inflation and ensures perfect centring between the bead and

the rim edge.

Bead pressing gripper. A tool intended for use when mounting the upper bead. It is positioned so that it engages the shoulder of the rim and maintains the upper tyre bead inside the well. It is generally used for mounting low profile tyres.

Air delivery regulator. Union allowing regulation of the air flow.

Bead breaking. Operation that allows the tyre bead to be detached from the rim edge.

16. GENERAL ELECTRIC LAYOUT DIAGRAMS

Fig. 43a-b-c-d

XS1	Power supply socket
X1	Power supply plug
QS1	Inverter
S2	Two speed inverter
M1	Single-phase motor
M3	Three-phase motor
R1	Resistor
C1	Capacitor
Fr	Fuse
AP1	Single / two-speed motor circuit board
SQ1	Two-speed micro-switch
SQ2	Micro-switch (clockwise rotation)
SQ3	Micro-switch (anticlockwise rotation)

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1-ph

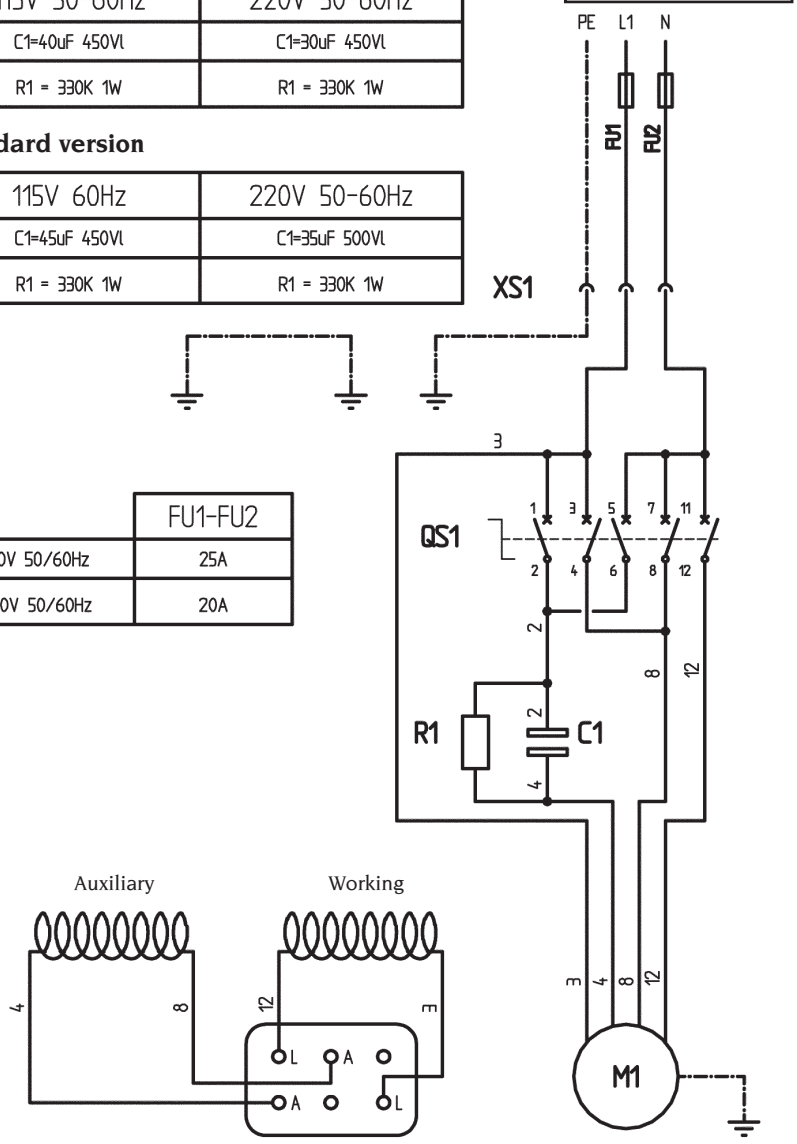
CSA version only

115V 50-60Hz	220V 50-60Hz
C1=40uF 450Vl	C1=30uF 450Vl
R1 = 330K 1W	R1 = 330K 1W

Standard version

115V 60Hz	220V 50-60Hz
C1=45uF 450Vl	C1=35uF 500Vl
R1 = 330K 1W	R1 = 330K 1W

	FU1-FU2
110V 50/60Hz	25A
220V 50/60Hz	20A

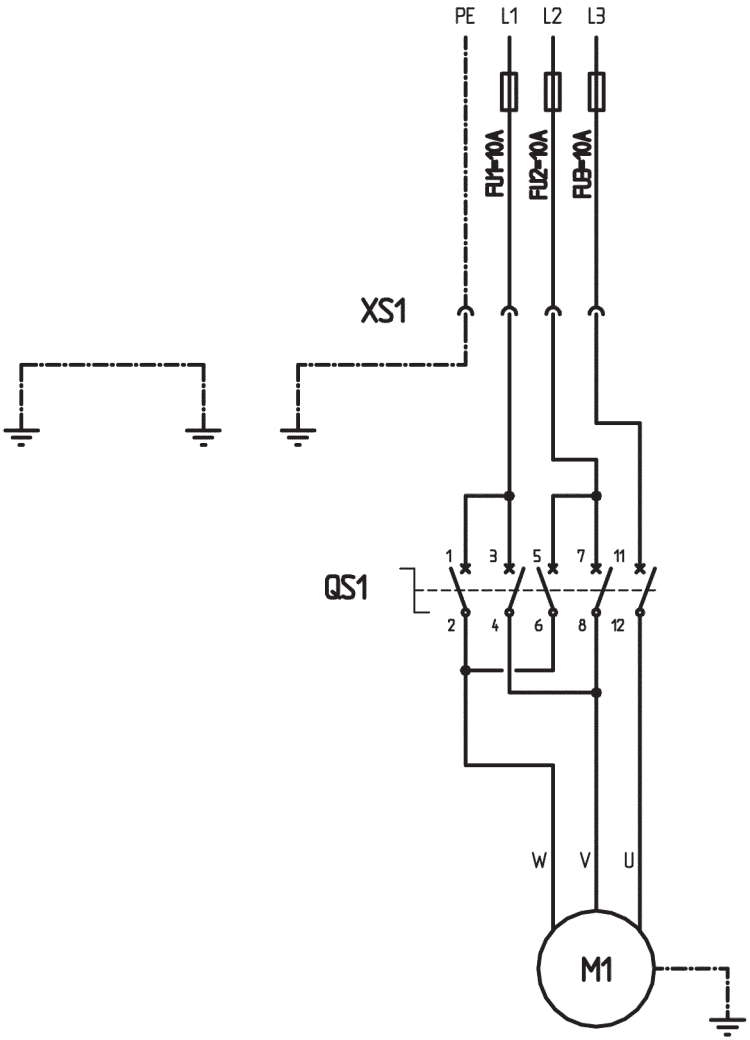


Terminal board wiring diagram

43a

3-ph

Diagram code 446694



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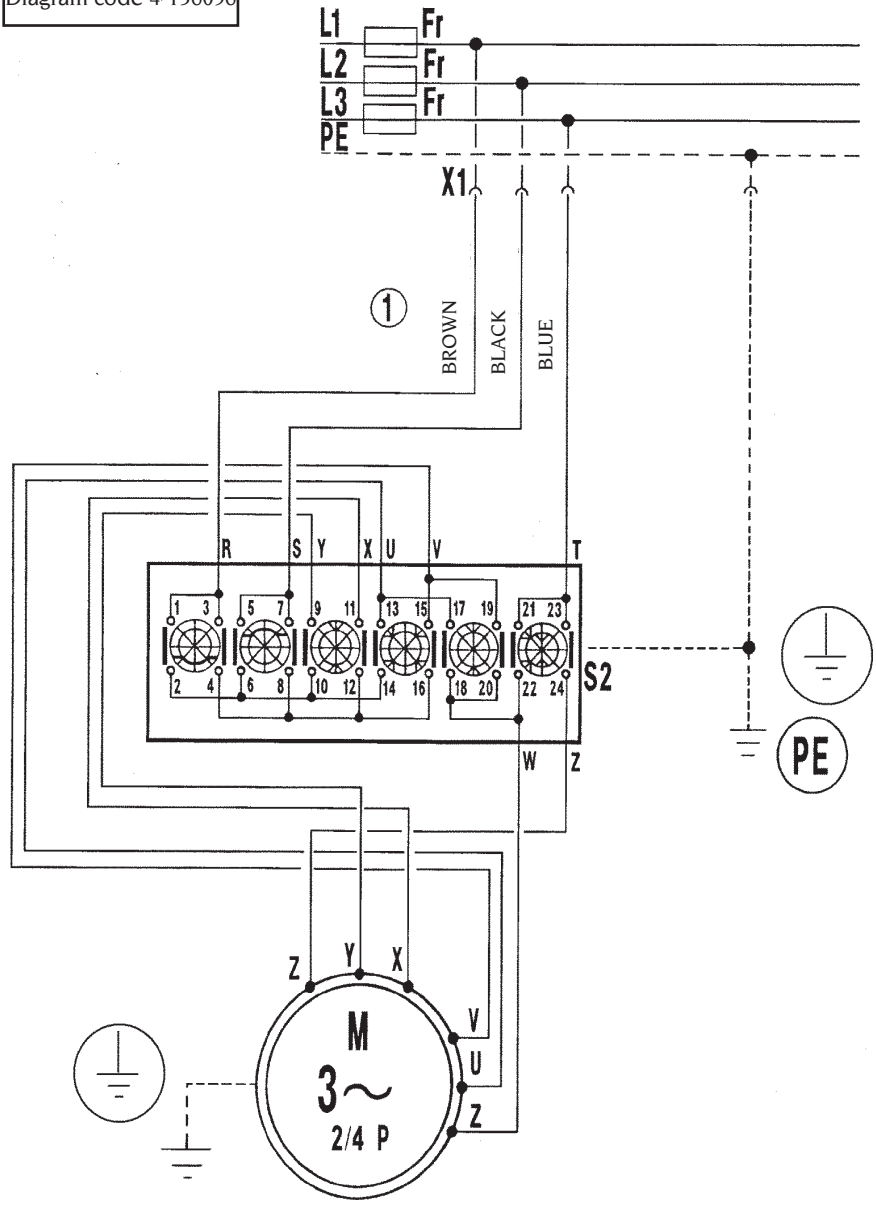
43b

DV - 3Ph

Diagram code 4-136056



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DV - 1Ph

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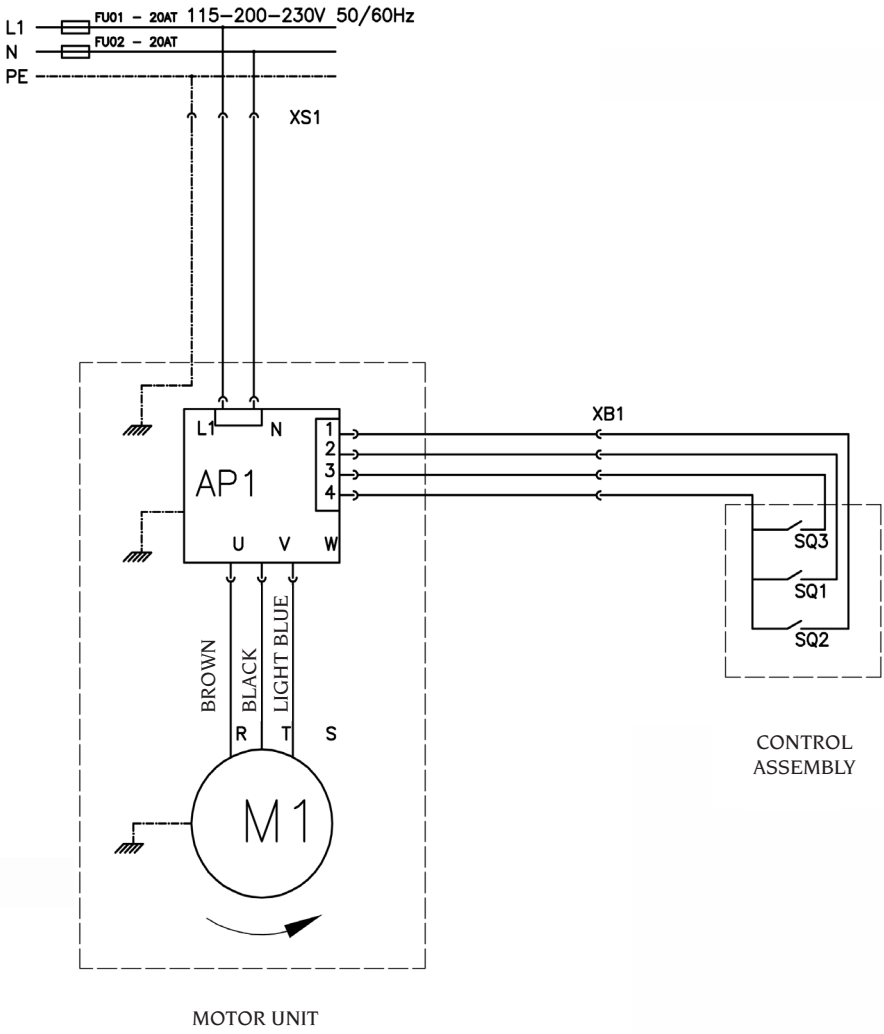

MOTOR UNIT

CONTROL ASSEMBLY

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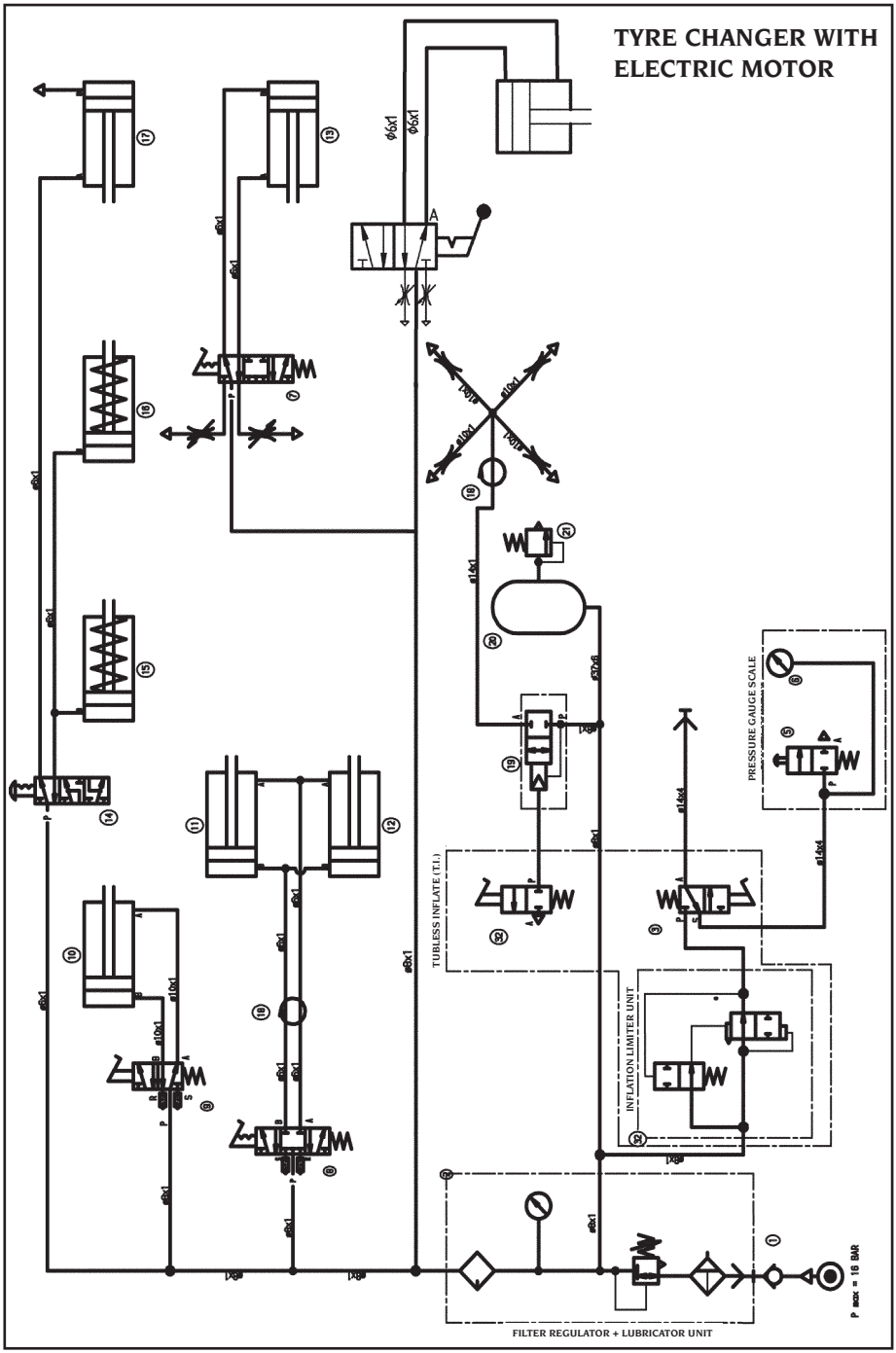
43d

17. PNEUMATIC SYSTEM DIAGRAM

1 Snap coupling
2 Filter regulator unit
3 Inflation pedal
4 Air pressure gun
5 Deflation push-button
6 Pressure Gauge
7 Column translation valve
8 Turntable valve
9 Bead breaker valve
10 Bead breaker cylinder
11 Right turntable cylinder
12 Left turntable cylinder
13 Column tilting cylinder
14 Clamping handle valve
15 Front clamping cylinder
16 Rear clamping cylinder
17 Column translation cylinder
18 Swivel connector
19 Delivery valve
20 Tank
21 Relief valve
22 Normal-racing cylinder Ø110
23 Rim rest cylinder Ø40
24 Loading unloading valve
25 Bead breaker ratchet cylinder Ø30
26 Pneumatic motor
27 Crushing safety valve
28 Selector valve
29 Console valve
30 Inflation unit valve
31 Air motor valve 5V - 3P
32 Inflation limiter unit
33 Automatic distributor for rapid discharge
34 Deflation valve
35 Doyfe union


TYRE CHANGER WITH
ELECTRIC MOTOR
TUBLESS INFLATE (T.I.)
INFLATION LIMITER UNIT
PRESSURE GAUGE SCALE
FILTER REGULATOR + LUBRICATOR UNIT
P max = 16 BAR

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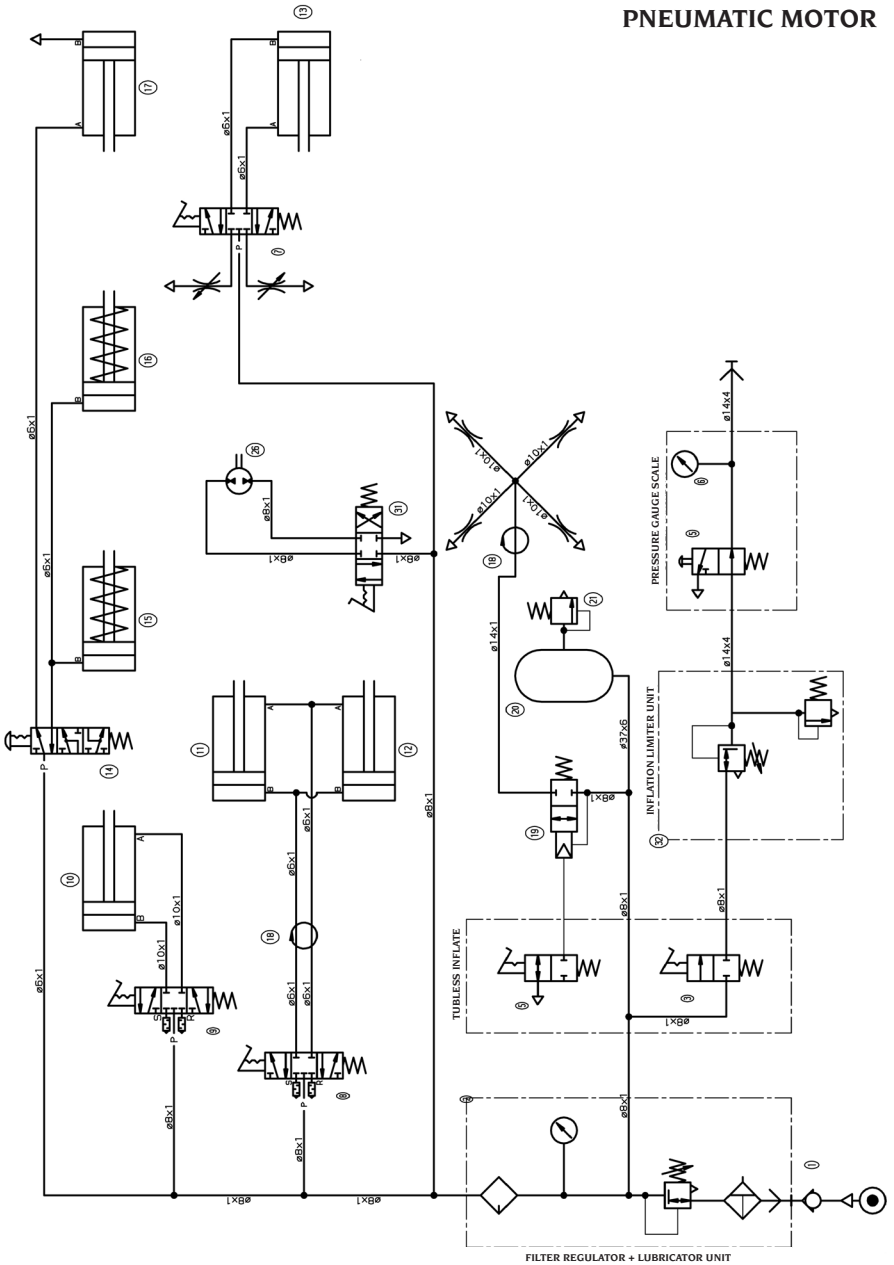
TYRE CHANGER WITH PNEUMATIC MOTOR



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