



**SMONTAGOMME**  
**TYRE CHANGER**  
**DESMONTADOR DE NEUMÁTICOS**  
**REIFENMONTIERMASCHINE**  
**DEMONTE PNEUS**

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# M 422 FS - M 422

Cod. 4-120972A dell'11/2017

Italiano  
*English*  
Français  
*Deutsch*  
Español

Manuale d'uso  
*Operator's manual*  
Utilisation et entretien  
*Betriebs und Wartungsanleitung*  
Uso y mantenimiento

[www.hpa-faip.it](http://www.hpa-faip.it)  
[info@hpa-faip.it](mailto:info@hpa-faip.it)

## TRANSLATION OF ORIGINAL INSTRUCTIONS (ITALIAN)

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The information contained herein may be subject to modifications without prior notice.

### Thank you for selecting our tyre changer

#### SIMPES FAIP

Dear Customer

Thank you for purchasing your SIMPES FAIP Tyre Changer.

Your Tyre Changer 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 tyre changer must read, understand and observe all the warnings and instructions provided in this manual, in addition to being properly trained.

This instruction manual must be considered an integral part of the tyre changer and kept together with it. However, no information contained in this manual and no device installed on the tyre changer can replace suitable training, correct operation and careful evaluation of procedures for working safely.

Always make sure that the tyre changer is in optimal operating conditions. If any malfunctions or probable situations of danger are observed, immediately stop the tyre changer and resolve the conditions before continuing.

For any question related to the correct tyre changer use or maintenance, contact your local official SIMPES FAIP dealer.

Yours sincerely,

**SIMPES FAIP**

#### USER INFORMATION

User Name \_\_\_\_\_

User Address \_\_\_\_\_

Model Number \_\_\_\_\_

Serial Number \_\_\_\_\_

Date of purchase \_\_\_\_\_

Date of installation \_\_\_\_\_

Support and spare parts manager \_\_\_\_\_

Phone number \_\_\_\_\_

Sales manager \_\_\_\_\_

Phone number \_\_\_\_\_

## TRAINING CHECK

	Qualified	Rejected
<b>Safety Precautions</b>		
Warning and caution labels	<input type="checkbox"/>	<input type="checkbox"/>
High risk areas and other potential hazards	<input type="checkbox"/>	<input type="checkbox"/>
Operative safety procedures	<input type="checkbox"/>	<input type="checkbox"/>
<b>Maintenance and Performance Checks</b>		
Mounting Head Inspection	<input type="checkbox"/>	<input type="checkbox"/>
Adjustment and Lubrication	<input type="checkbox"/>	<input type="checkbox"/>
Self-diagnostic procedures 9	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance instructions and messages	<input type="checkbox"/>	<input type="checkbox"/>
<b>Clamping</b>		
Steel / alloy wheels	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rim wheels	<input type="checkbox"/>	<input type="checkbox"/>
Cerchi ciechi 1	<input type="checkbox"/>	<input type="checkbox"/>
Internal/external clamping steel rims 2	<input type="checkbox"/>	<input type="checkbox"/>
<b>Bead breaking</b>		
Standard wheels	<input type="checkbox"/>	<input type="checkbox"/>
Low profile wheels	<input type="checkbox"/>	<input type="checkbox"/>
<b>Demounting</b>		
Bead lubrication when removing the low profile tyres	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rim wheels	<input type="checkbox"/>	<input type="checkbox"/>
Standard wheels with plastic protectors for head and lever 6	<input type="checkbox"/>	<input type="checkbox"/>
Mounting/Demounting head position and adjustment 5-6	<input type="checkbox"/>	<input type="checkbox"/>
<b>Mounting</b>		
Standard wheels	<input type="checkbox"/>	<input type="checkbox"/>
Mounting stiff, low profile tyres	<input type="checkbox"/>	<input type="checkbox"/>
Reverse rim wheels	<input type="checkbox"/>	<input type="checkbox"/>
Bead lubrication for correct mounting	<input type="checkbox"/>	<input type="checkbox"/>
WDK procedure	<input type="checkbox"/>	<input type="checkbox"/>
<b>Automatic procedures</b>		
Automatic size detection procedure 9	<input type="checkbox"/>	<input type="checkbox"/>
Using machine in automatic mode 9	<input type="checkbox"/>	<input type="checkbox"/>
Emergency procedures in automatic mode 9	<input type="checkbox"/>	<input type="checkbox"/>
<b>Accessories</b>		
Instructions for proper use of accessories	<input type="checkbox"/>	<input type="checkbox"/>
Instructions use Inflatron (optional)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Inflating</b>		
Safety measures	<input type="checkbox"/>	<input type="checkbox"/>
Lubrication and removal of the valve insert	<input type="checkbox"/>	<input type="checkbox"/>
Tubeless tyre inflation	<input type="checkbox"/>	<input type="checkbox"/>

### Individuals and Dates Trained

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# TABLE OF CONTENTS

1. GETTING STARTED .....	67
1.1 INTRODUCTION .....	67
1.1.A. PURPOSE OF THE MANUAL .....	67
1.2 FOR YOUR SAFETY .....	67
1.2.a. General Warning And Instructions.....	68
1.2.b. Decal Placement .....	71
1.2.c. Electrical And Pneumatic Connections.....	75
1.2.d. Technical Data.....	76
1.2.e. Air Pressures .....	77
1.3. SPECIAL RIM/TYRE CONSIDERATIONS .....	78
1.4. INTENDED USE OF THE MACHINE .....	78
1.5. EMPLOYEE TRAINING.....	78
1.6. PRE-USE CHECKS .....	79
1.7. DURING USE .....	79
2. TRANSPORT, STORAGE AND HANDLING .....	79
3. UNPACKING/ASSEMBLY .....	80
4. HOISTING/HANDLING.....	83
4.1 INSTALLATION CLEARANCES .....	83
5. M 422 DESCRIPTION .....	84
5.1 OPERATOR POSITION .....	85
5.2 OVERALL DIMENSIONS (MM).....	85
5.3 EQUIPMENT COMPONENTS .....	86
6. OPTIONAL ACCESSORIES.....	88
7. BASIC PROCEDURES - USE .....	88
7.1. PRELIMINARY CHECKS .....	89
7.2. DECIDING FROM WHICH SIDE OF THE WHEEL THE TYRE MUST BE DEMOUNTED .....	89
7.3. BEAD BREAKING .....	90
7.4. CLAMPING THE WHEEL.....	92
7.5. DEMOUNTING THE WHEEL .....	94
7.6. MOUNTING THE WHEEL .....	96
7.7. TYRE INFLATION .....	97
8. TROUBLESHOOTING .....	102
9. MAINTENANCE .....	105
10. INFORMATION ABOUT SCRAPPING .....	107
11. ENVIRONMENTAL INFORMATION .....	107



12. INFORMATION AND WARNINGS	
CONCERNING HYDRAULIC FLUID .....	108
13. FIREFIGHTING MEANS USABLE .....	109
14. GLOSSARY .....	109
15. GENERAL ELECTRIC LAYOUT DIAGRAMS .....	113
16. PNEUMATIC SYSTEM DIAGRAM .....	117

# 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 SIMPES FAIP the change of ownership form attached to the previous page of this manual. Alternatively, the new owner can send an email to [service@simpesfaip.com](mailto:service@simpesfaip.com).

This manual presumes that the technician has a thorough understanding of rim and tyre identification and service. 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 provides the basic information to safely operate the M 422 tyre changer family. 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 tyre changer is solely responsible for enforcing safety procedures and arranging technical training. The tyre changer is to be operated only by a qualified and trained technician. Maintaining records of personnel trained is solely the responsibility of the owner or management.

The M 422 tyre changer family is intended for mounting, demounting, and inflating tyres of lightweight vehicles (cars, not trucks or motorcycles) with maximum dimensions: see 1.2.d TECHNICAL DATA.

Copies of this manual and of the documents accompanying the machine may be obtained from SIMPES FAIP by specifying the type of machine and its 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 detrimental to your safety and/or cause equipment damage.

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



# WARNING



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



# CAUTION



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

# NOTICE

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

## 1.2.a. GENERAL WARNING AND INSTRUCTIONS

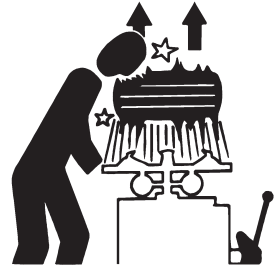


### WARNING

**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 use and maintenance procedures provided in this manual are not properly performed, or the other instructions in this manual are not followed, an accident could occur. Throughout this manual reference is made that “an accident” could occur. Any accident could cause you or a bystander to sustain severe personal injury or death, or result in property damage.
2. Overinflated tyres can explode, producing hazardous flying debris that may result in an accident.
3. Tyres and rims that are not the same diameter are “mismatched.” Never attempt to mount or inflate any tyre and rim that are mismatched. For example, never mount a 16.5” tyre on a 16” rim and vice versa. This is very dangerous. A mismatched tyre and rim could explode, resulting in an accident.
4. Never exceed the bead setting pressure provided by the tyre manufacturer, as stated

on the sidewall of the tyre.  
Carefully monitor the gauge on the air hose.



5. If tires being mounted require more than the tire manufacturer's maximum bead seating pressure and , the wheel should be removed from the tire changer, placed in an inflation cage, and inflated per manufacturer's instructions
6. The use of inflation devices (e.g. guns) connected to power sources outside of the machine is not permitted
7. Never place your head or any part of your body over a tyre during the inflation process or when attempting to seat beads. This machine is not intended to be a restraining device for exploding tyres, tubes or rims.
8. Always stand back from the tyre changer when inflating, never lean over.



## DANGER

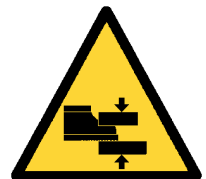
**An exploding tyre and rim may be propelled upward and outward with enough force to cause serious injury or death.**

**Never mount any tyre unless the tyre size (molded into the sidewall) matches the rim size (stamped into the rim) exactly or if the rim or tyre are defective.**

**Never exceed the tyre pressure recommended by the tyre manufacturer.**

**This tyre changer is not a safety device and will not restrain exploding tyres and rims. Keep the area clear of bystanders.**

9. Crushing Hazard. Moving Parts Present. Contact with moving parts could result in an accident.
  - Only one operator may work with the machine at a time.
  - Keep all bystanders clear of tyre 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, feet and other body parts away from moving parts.
  - Do not use tools other than those supplied with tyre changer.
  - Use proper tyre lubricate to prevent tyre binding.
  - Pay attention while moving tyre/rim or lever.
10. Electric Shock Hazard.
  - Never hose down or power wash electric tyre changers.
  - Do not operate the machine with a damaged power cord
  - If an extension cord is necessary, a cord with a current rating equal to or greater than that of the machine must be used. Cords rated for less current than the machine can overheat, resulting in a fire.
  - Care should be taken to arrange the cord so that it will not be tripped over or pulled.



11. Risk of Eye Injury. Flying debris, dirt and fluids may be discharged

during bead seating and the inflation process. Remove any debris from the tyre tread and wheel surfaces. Wear OSHA, CE or other approved safety glasses during mount and demount procedures.



12. Always inspect the machine carefully before using it. Missing, broken, or worn equipment (including warning stickers) must be repaired or replaced prior to operation.

13. Never leave nuts, bolts, tools or other equipment on the machine. They may become trapped between moving parts and cause a malfunction.



14. NEVER install or inflate tyres that are cut, damaged, rotten or worn. NEVER install a tyre on a cracked, bent, rusted, worn, deformed or damaged rim.

15. If a tyre becomes damaged during the mounting process, do not attempt to finish mounting. Remove from the service area and properly mark the tyre as damaged.

16. To inflate tyres, use short bursts while carefully monitoring the pressure, tyre, rim and bead. NEVER exceed the tyre manufacturer's pressure limits.

17. This equipment has internal arcing or sparking parts which should not be exposed to flammable vapours (gasoline, paint thinners, solvents, etc.). This machine should not be located in a recessed area or below floor level.

18. Never operate the machine if you are under the effects of alcohol, medications and/or drugs. If you are taking prescription or over the counter medication, you must consult a medical professional regarding any side effects of the medication that could hinder your ability to operate the machine safely.

19. Always use OSHA, CE or other approved and mandated Personal Protective Equipment (PPE) during use of the machine. See your supervisor for more instructions.



20. Remove jewellery, watches, loose clothing, ties and restrain long hair before using the machine.

21. Wear non-slip safety footwear when operating the tyre changer.

22. Wear proper back support and employ a proper lifting technique when placing, moving, lifting or removing wheels from the tyre changer.












23. This machine may only be used, maintained or repaired by properly trained employees of your company. Repairs should only be performed by qualified personnel. Your SIMPES FAIP service representative is the most qualified person. The employer is responsible for determining if an employee is qualified to safely make any repairs to the machine should repair be attempted by users.



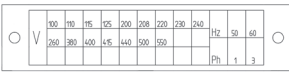
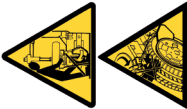









24. The user should understand all warning decals affixed to this equipment before operating.

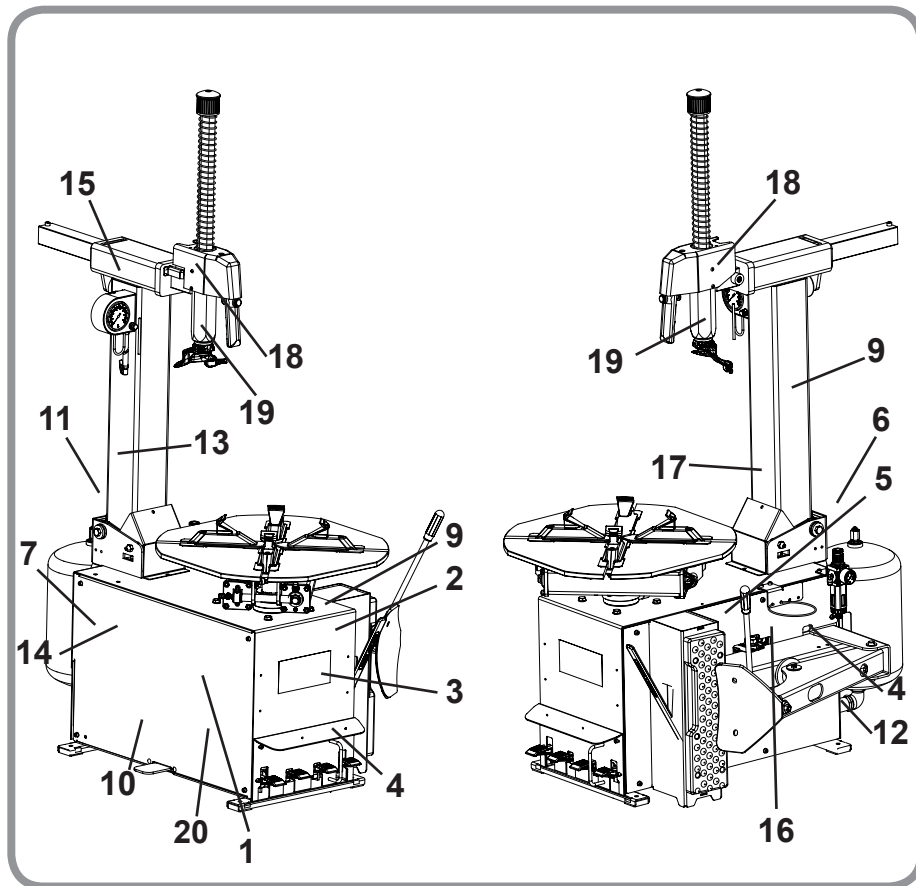
25. DO NOT lock the rim on the turntable during inflation.

### 1.2.b. DECAL PLACEMENT

N.	Numero del pezzo	Disegno	Descrizione
1	4-200132		DECAL, FRONTAL LOGO
3	4-120977		DECAL, M 422 FS
	4-121051		DECAL, M 422
4	470133		DECAL, TIPPING COLUMN
	470134		DECAL, OPEN-CLOSE SELFCENTRING
	470135		DECAL, START BEAD BREAKER
	470136		DECAL, SELFCENTRING ROTATION
5	446442		DECAL, WARNING UNDER PRESSURE
6	446429		DECAL, OPERATING PRESSURE
7	446598		DECAL, SWITCH OFF THE POWER
8	35017100		DECAL, DANGER OF CRUSHING

N.	Numero del pezzo	Disegno	Descrizione																																						
9	470250		DECAL, ROTATION																																						
10	435150		DECAL, INFLATION PEDAL (only TI version)																																						
11	446388	 <table border="1" data-bbox="365 408 654 480"> <tr> <td>100</td> <td>110</td> <td>115</td> <td>125</td> <td>135</td> <td>145</td> <td>155</td> <td>165</td> <td>175</td> <td>185</td> <td>195</td> <td>205</td> <td>215</td> <td>225</td> <td>235</td> <td>245</td> <td>Hz</td> <td>50</td> <td>60</td> </tr> <tr> <td>260</td> <td>280</td> <td>290</td> <td>300</td> <td>315</td> <td>330</td> <td>345</td> <td>360</td> <td>375</td> <td>390</td> <td>405</td> <td>420</td> <td>435</td> <td>450</td> <td>465</td> <td>480</td> <td>Ph</td> <td>1</td> <td>3</td> </tr> </table>	100	110	115	125	135	145	155	165	175	185	195	205	215	225	235	245	Hz	50	60	260	280	290	300	315	330	345	360	375	390	405	420	435	450	465	480	Ph	1	3	DECAL, CORRECT POWER SUPPLY
100	110	115	125	135	145	155	165	175	185	195	205	215	225	235	245	Hz	50	60																							
260	280	290	300	315	330	345	360	375	390	405	420	435	450	465	480	Ph	1	3																							
12	446431		DECAL, DANGER OF CRUSHING HANDS / FEET																																						
13	446430A		DECAL, DANGER OF INFLATION																																						
14	425211		DECAL, RISK OF ELECTRIC SHOCK																																						
15	446436		DECAL, VALVE INFLATION																																						
16		 <p>Mod. _____ ISO9001  V _____  A _____  AW _____  Hz _____  Ph _____  Serial N° _____  XXXXXXXXXX</p>	DECAL, SERIAL MODEL																																						
17	446433		DECAL, WARNING TURN-TABLE																																						
18	446434		DECAL, WARNING TIPPING COLUMN																																						
19	446435		DECAL, WARNING TOWER																																						

N.	Numero del pezzo	Disegno	Descrizione
20	446438		DECAL, REGULATION COLUMN SPEED





# DANGER WARNING DECALS



parte n. 35017100. DANGER OF CRUSHING.



parte n. 446431. DANGER OF CRUSHING HANDS / FEET.



parte n. 446442. WARNING UNDER PRESSURE.



parte n. 425211A. RISK OF ELECTRIC SHOCKa.



parte n. 446430A. DANGER OF INFLATION.



parte n. 425083. TERMINAL GROUND CONNECTION.

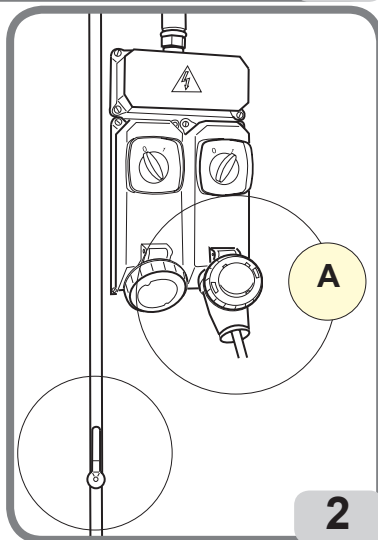
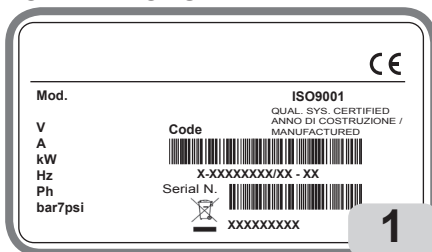
## 1.2.c. ELECTRICAL AND PNEUMATIC CONNECTIONS

The dimensions of the electric hook-up used must be suitably sized in relation to:

- 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 power plug on the power supply lead in compliance with the relevant safety standards;
- connect the machine to its own electrical connection - A, Fig. 2 - and fit a differential safety circuit-breaker with 30 mA residual current;
- fit fuses to protect the power supply line, rated as indicated on the general wiring diagram in this manual;
- connect the machine to an industrial socket; the machine must not be connected to domestic sockets.



### NOTICE

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

Make sure the available pressure and the rendered capacity of the compressed air system are compatible with those required for correct machine operation - see the "Technical Data" section. For correct machine operation, the compressed air supply line must provide a pressure range from no less than 8.5 bar to no more than 16 bar and guarantee an air flow rate greater than the average consumption of the machine, which is equal to 187 NI/min.

### NOTICE

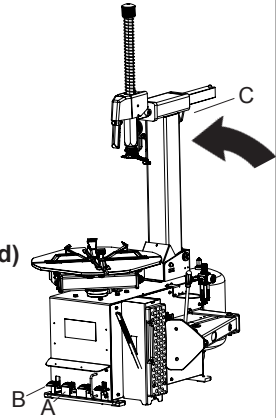
**For correct equipment operation, the air produced must be suitably treated (not above 5/4/4 according to ISO 8573-1)**



## DANGER

Before making the electrical and pneumatic hook-ups, make sure that the machine is configured as described below:

- pedal A in fully depressed position (turntable E closed)
- pedal B in fully up position (column C not tilted).



### 1.2.d TECHNICAL DATA

- Turntable clamping capacity
  - internal clamping..... from 10" to 22"
  - external clamping..... from 13" to 25"
- Rim width ..... from 3.5" to 12,5"
- Maximum tire diameter..... 1000 mm (39,5")
- Maximum tire width ..... 315 mm (12,5")
- Bead breaker aperture: .....from 45 mm to 300 mm
- Bead breaking force..... 15000 N (pressure 10 bar)
- Operating pressure ..... 8 - 10 bar
- Air operating flow..... 187 NI/min (minimum)
- Power supply voltage ..... see table below
- Weight ..... 214 Kg - 224 Kg (T.I.)
- Noise levels in operating conditions ..... < 70 dB (A)

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.

Model	Motor rating	kW	Rotation speed rpm	Torque Nm	Weight of electric/electronic part kg
M 422 FS	400Volt/3ph 50Hz	0,75	8,5	1200	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
M 422	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
	400Volt/3ph 50Hz DV	0.9/1,25	6-12	900	11,6
	AIR MOTOR	/	6,5	800	/

### 1.2.e. AIR PRESSURES

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




DANGER

- **EXPLOSION HAZARD**
- **Never exceed the tyre pressure recommended by the tyre manufacturer. Never mismatch tyre size and rim size.**
- **Avoid personal injury or death**

1. Never exceed these pressure limitations:

- Supply line pressure (from compressor) is 220 psi (15 bar).
- Operating pressure (gauge on regulator) is 145 psi (10 bar).

Bead setting pressure (gauge on hose) is the tyre manufacturer's maximum pressure as stated on the sidewall of the tyre

2. Activate air inflation jets only when sealing the bead.

3. Bleed air pressure system before disconnecting supply line or other pneumatic components. Air is stored in a reservoir for operation of inflation jets.

4. Only activate the air inflation jets if the rim securing device is locked in place and the tyre is properly clamped (when possible).

### 1.3. SPECIAL RIM/TYRE CONSIDERATIONS

#### **NOTICE**

Wheels equipped with low tyre pressure sensors or special tyre and rim designs may require special procedures. Consult wheels and tyre manufacturers' service manuals.

### 1.4. INTENDED USE OF THE MACHINE

This machine must be used only to remove and replace an automotive tyre on an automotive rim, using the tools with which it is equipped. Any other use is improper and can result in an accident.

The machine can not work on motorcycle wheels.

### 1.5. EMPLOYEE TRAINING

1. The employer is obligated to provide a programme to train all employees who service rim wheels in the hazards involved in servicing those rim wheels and the safety procedures to be followed. Service or servicing means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing and handling.

- The employer shall insure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in safe operating procedures.
- Information to be used in the training programme shall include, at a minimum, the applicable information contained in this manual.

2. The employer shall ensure that each employee demonstrates and maintains the ability to service rim wheels safely, including performance of the following tasks:

- Demounting tyres (including deflation).
- Inspecting and identifying rim wheel components.
- Mounting tyres.
- Using any restraining device, cage, barrier, or other installation.
- Handling rim wheels.
- Inflating the tyre.
- Understanding the necessity to stand back from the tyre changer during tyre inflation and during inspection of the rim wheel following inflation, never leaning over.
- Installing and removing rim wheels.

3. The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely, and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

### 1.6. PRE-USE CHECKS

Before beginning work, carefully check that all components of the machine, especially rubber or plastic parts, are in place, in good condition and working properly. If the inspection reveals any damage or excessive wear, no matter how slight, immediately replace or repair the component.

## 1.7. DURING USE

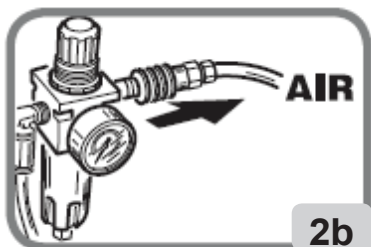
In the event you hear any strange noise or feel unusual vibration, if a component or system is not operating properly, or if there is anything unusual at all, stop using the machine immediately.

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

Never allow any bystander to be within 20 feet of the machine during operation.

To stop the machine in an emergency:

- disconnect the power supply plug;
- cut off the compressed air supply network by disconnecting the shut-off valve (snap coupling).



## 2. TRANSPORT, STORAGE AND HANDLING

### Conditions for transporting the machine

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

- Packing dimensions:

- width ..... 1120 mm
- depth ..... 1000 mm
- height ..... 970 mm

- Weight of carton packing: ..... 313 kg

### Machine storage and shipping specifications

Temperature: -25° - +55°C.

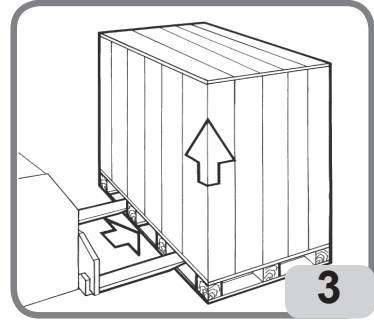
## NOTICE

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.



## NOTICE

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

## 3. UNPACKING/ASSEMBLY



## WARNING

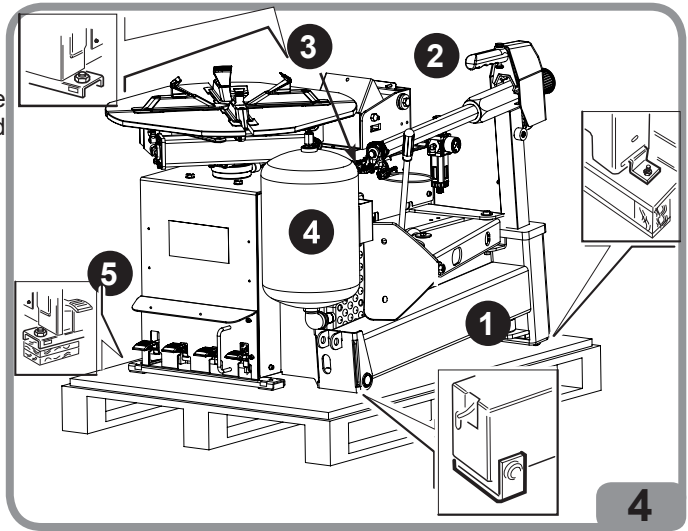
Take the utmost care when unpacking, assembling, hoisting and installing the machine as described below. Failure to observe these instructions can damage the machine and compromise the operator's safety.

## NOTICE

Before removing the machine from the pallet, make shure the items showed 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.4):

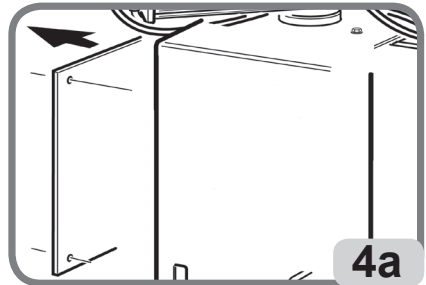
- 1 head
- 2 column guard
- 3 box with pressure gauge and standard equipment
- 4 air tank
- 5 body



- After removing the tower 1, it is advisable to place it in a horizontal position to prevent it from falling and getting damaged.

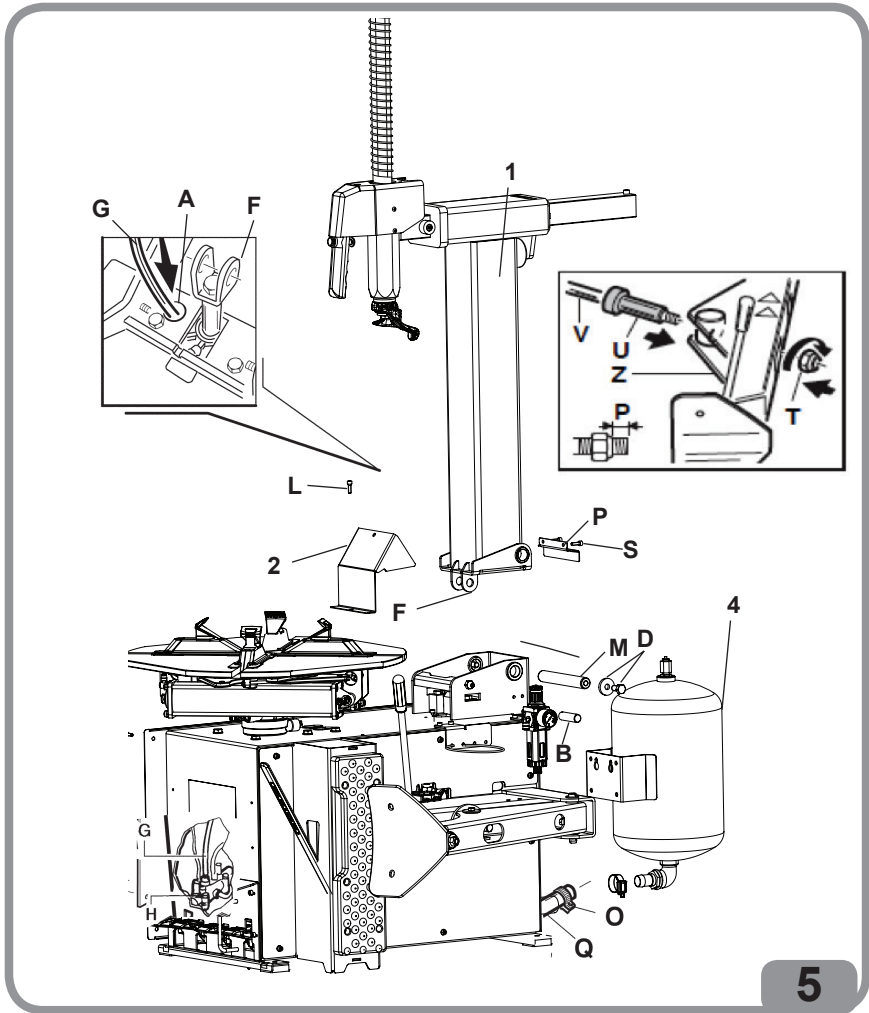
**Assemble the different parts of the machine:**

- Remove the side cover (Fig. 4a).
- Insert the air hose G fig.5 into hole A behind the tower tilt cylinder.



- Assemble the tower 1, insert pin B into hole C and lock with screw and washer D.
- Insert pin E into hole F and into U-bolt F1 on the tower tilt cylinder and lock with ring M.
- Connect hose G to the intermediate connection linked to the tower-lifting cock H.
- Fit the box with pressure gauge 3 on to the tower 1 and lock with screw and washer S.
- Fit the tower guard 2 and lock with screws and washers L.
- Insert the tank 4 outlet into hose Q. Fix the tank 4 to the machine with nuts and washers R and tighten clamp O on hose Q.
- Fit the side cover (Fig. 4a).



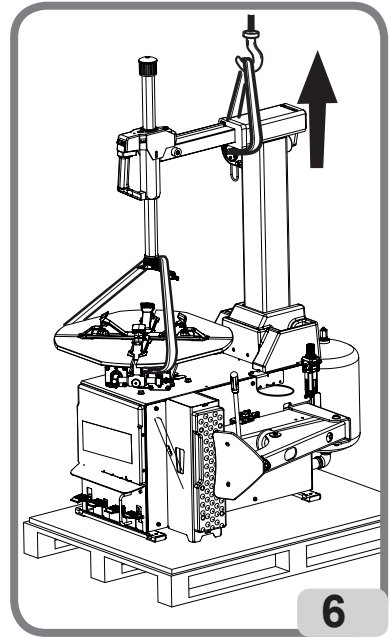


- Assemble the rear guard of the P column with the screws S.
- Open the bead breaker arm Z.
- Insert the spacer pad U on the bead breaker cylinder V pin, close the bead breaker arm doing wipe the cylinder pin bead through the swivel block.
- The T nut screwed onto the cylinder will pivot bead V only when the machine will be installed and connected to the pneumatic line. T tighten the nut until P and 3-4mm.

## 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 CLEARANCES

#### **WARNING**

The machine must be installed in accordance with all applicable safety regulations, including but not limited to those issued by OSHA.

#### **DANGER**

**RISK OF EXPLOSION OR FIRE.** Never use the machine in an area where it will be exposed to flammable vapours (gasoline, paint thinners solvents, etc.). Never install the machine in a recessed area or below floor level.

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

#### **CAUTION**

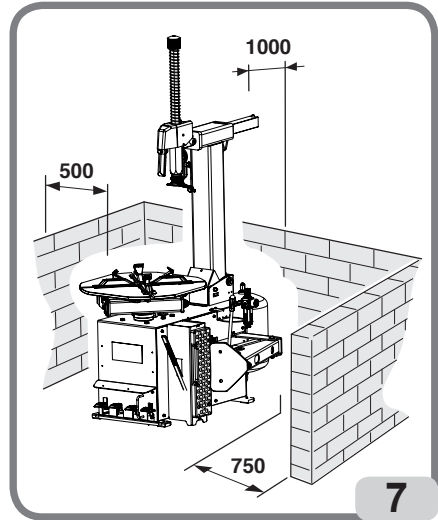
Do not install the machine outdoors.  
It is designed for use in an indoor, sheltered area.

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

The surface must have a load-carrying capacity of at least 1000 kg/m<sup>2</sup>.

### Work environment conditions

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



## WARNING

Each time the machine remains disconnected from the pneumatic line for long periods, check the direct operation of the controls with the relative arm, following the pressure restoration procedure. Carry out the first control operation very slowly.

## 5. M 422 DESCRIPTION

The M 422 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 functions are controlled by the operator via pedals and hand-operated valves and levers.

This tyre changer has been designed exclusively for mounting and demounting tyres, using the tools with which they are equipped as described in this manual.

The machine is equipped with an inflation system independent of all the other functions described above. Take great care when using it (read the INFLATION chapter).

Each machine has a data plate Fig. 8, with information about the machine and some technical data.

As well as the manufacturer's details, the plate indicates:

Mod. - Machine model;

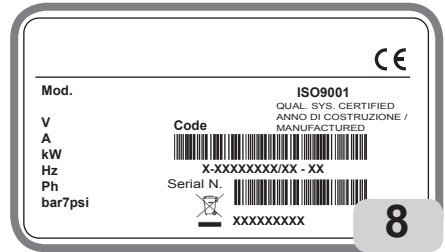
V - power supply voltage in Volts;

A - Input voltage in Amperes;

kW - Absorbed power in kW;

Hz - Frequency in Hz;

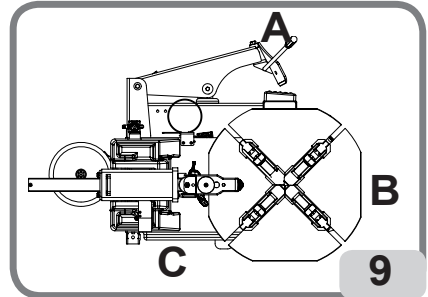
Ph - Number of phases;  
 bar - Operating pressure in bar;  
 Serial No. - Machine serial number;  
 ISO 9001 - Certification of the company's  
 Quality System;  
 EC - EC marking.



## 5.1 OPERATOR POSITION

Figure 9 shows the operator's positions during the various work phases:

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



### NOTICE

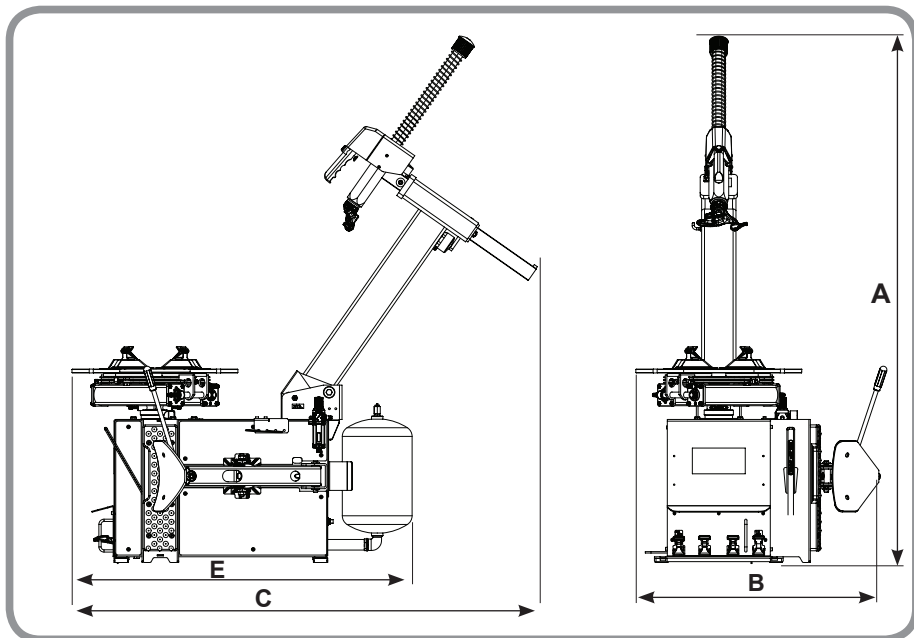
In these conditions, the operator can carry out, monitor and check the outcome of all tyre change operations and take action in the case of any unforeseen events.

### WARNING

**RISK OF CRUSH INJURY.** Column tilting must be performed from work position B (fig.9), keeping the hands away from moving machine parts.

## 5.2 OVERALL DIMENSIONS (MM)

Max. length	B = 880 mm
Min. width	E = 1320 mm
Max. width	C = 1880 mm
Max. height	A = 1640 mm



### 5.3 EQUIPMENT COMPONENTS (MAIN WORKING ELEMENTS OF THE MACHINE)

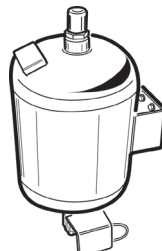
#### **WARNING**

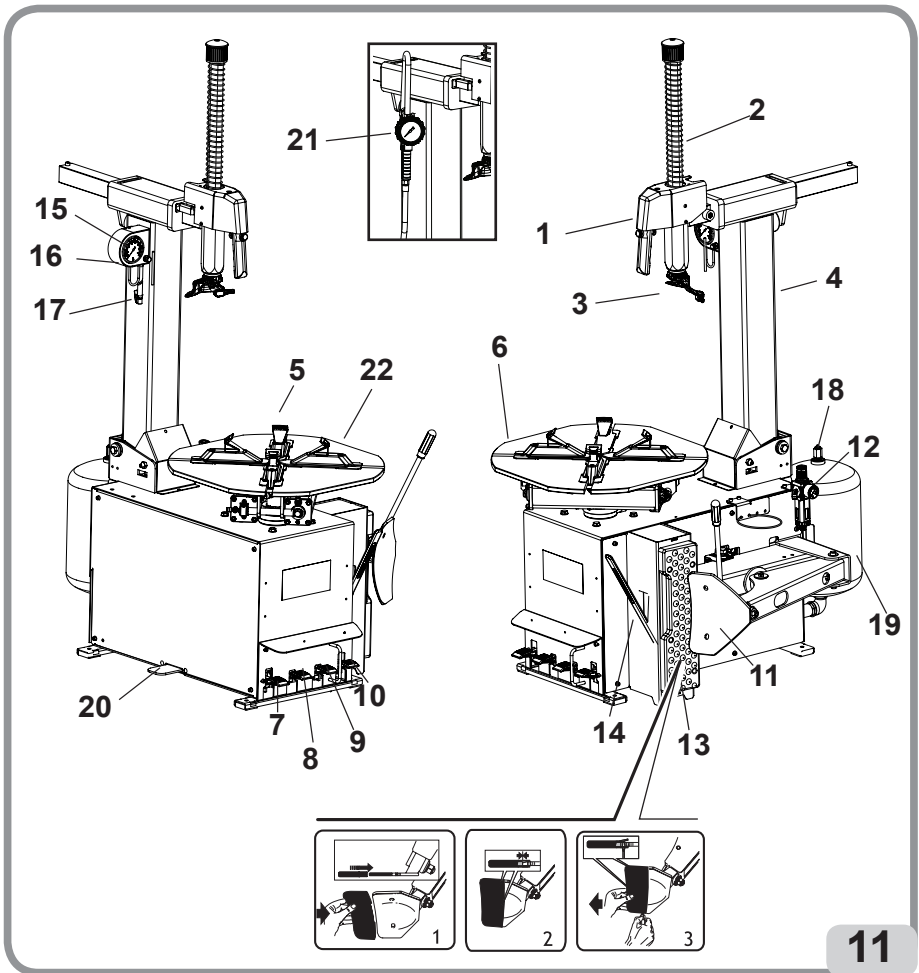
Before using the machine, learn exactly how the machine works. This is the best way to optimize safety and machine performance. Carefully check that all controls on the machine are working properly. The machine must be installed properly, operated correctly and serviced regularly in order to prevent accidents and injuries.

#### **WARNING**

##### **EXPLOSION HAZARD**

For technical characteristics, warnings, maintenance and any other information about the air tank (optional), consult the relevant operator and maintenance manual provided with the accessory documentation.





11

- 1 Locking knob.
- 2 Vertical slide / swing arm (to position the mount/demount head)
- 3 Mount/demount head (for fitting and removing tyre)
- 4 Tilt tower
- 5 Sliding clamp (secures wheel to table top)
- 6 Sliding clamp table (rotary platform supporting the wheel)
- 7 Tower (4) tilt pedal (2-position pedal to operate tower tilt)
- 8 Clamp (5) control pedal (3-position pedal for opening and closing rim clamps)
- 9 Bead breaker pedal (2-position pedal to operate the bead breaker (11))
- 10 Table top (6) pedal (3-position pedal)
  - position 0: table top stationary
  - depressed (held with foot): clockwise rotation at speed proportional to pedal

pressure

- raised (held with foot): single speed counter-clockwise rotation

11 Bead breaker shoe (mobile shoe to detach bead from rim)

12 Rim support.

13 LFilter/lubricator and pressure regulator (regulates pressure, removes water, lubricates and filters the compressed air supply)

14 Bead lifting tool (raises and positions the tyre bead on the mount/demount head)

15 Pressure gauge (for reading the tyre pressure), (T.I. version only).

16 Deflation button (press this button to discharge excess air from inside the tyre), (T.I. version only).

17 Doyfe union (union to be fitted on the wheel valve for inflation).

18 Relief valve (max. pressure 12 bar) (in T.I. versions only).

19 Air tank (in T.I. versions only).


20 Inflation pedal (in T.I. versions only).

21 Inflation gun.

## 6. OPTIONAL ACCESSORIES

For a complete list of optional accessories supplied on request, see the document "ORIGINAL ACCESSORIES FOR TIRE CHANGER"

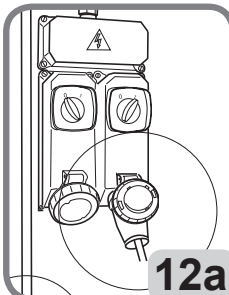
## 7. BASIC PROCEDURES - USE

 **WARNING**

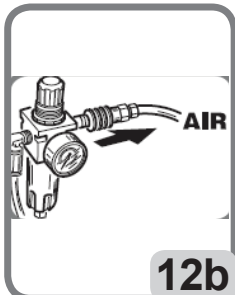
**AVOID PERSONAL INJURY**

**Before working on the machine:**

- disconnect the power supply plug (Fig. 12a);
- isolate the compressed air line by disconnecting the shutoff valve (quick-release connector) (Fig. 12b).



**12a**



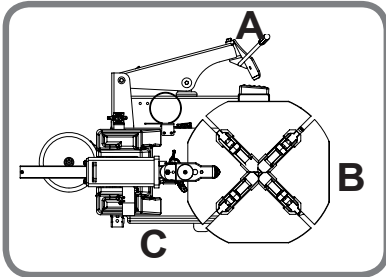
**12b**

## WARNING

### CRUSHING HAZARD:

Some parts of the machine, such as the head, arms, legs, the bead breakers and turntable move by themselves.

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



The tilting post operation must be performed to work position B.



## WARNING

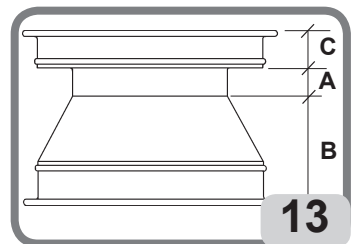
Avoid unintended machine movement or failure. Use only original SIMPES FAIP tools and equipment.

## 7.1. PRELIMINARY CHECKS

Check that there is a pressure of at least 8 bar on the Filter Regulator pressure gauge. If the pressure is lower, the operation of some automatic procedures is not guaranteed. After the correct pressure has been restored, the machine will function properly. Check that the machine has been adequately connected to the power mains.

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

See Fig. 13. Find the position of rim well A on the wheel rim. 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.

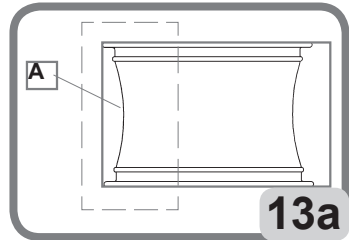




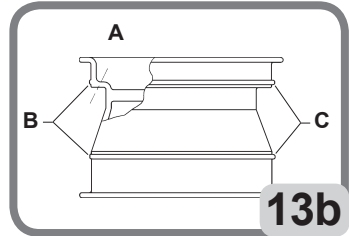
## Special wheels

**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.

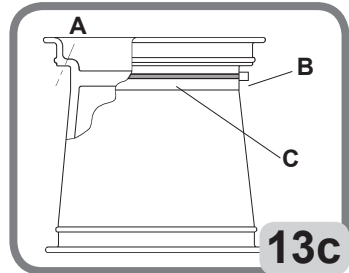
The initials DOT certify that tyres comply with the safety standards adopted by the United States and Canada (these wheels cannot be sold on these markets).



**High-performance wheels (asymmetric curvature)** - Fig. 13-b: 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.



**Wheels with pressure sensor** - Fig.13c. To operate correctly on these wheels and avoid damaging the sensor (which is incorporated in the valve, fixed with the belt, glued inside the tyre, etc.) appropriate mounting/demounting procedures should be followed (ref. Approved mounting/demounting procedure for runflat and UHP tyres)



### NOTICE

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

### NOTICE

Remove any old balancing weights from the rim.

## 7.3. BEAD BREAKING

- Fully deflate the tyre, removing the valve  
To adjust the rim support in the correct position for the width of the wheel the bead of which is to be broken.
- Position the wheel as shown in fig.11 And bring the bead breaker shoe to the edge of the rim.  
**IMPORTANT:** during the bead breaking operation, you are advised to keep the table top closed (locking clamp towards center) (a fig.11).
- Press the pedal 10 (fig.11) To operate the bead breaker and detach the bead from the rim.  
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.  
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 the demounting and avoid damaging the beads (fig.12).
- Tilt the tower backwards by holding the button in the “locked” position (on the a 2005, keep the lever locked) (fig.13).
- Set the clamps to the open or closed position (fig.14).  
Place the wheel on the table top (with the narrow part of the rim structure facing upwards), push lightly downwards and use the control pedal to lock the wheel in position (fig.13).
- Tilt the tower forward again (fig.15). Release the locking button to free both the vertical slide and the swing arm and to set the mounting/demounting device in the correct position against the edge of the rim (fig.16).  
**IMPORTANT:** when the button is pressed, this will simultaneously lock both the vertical slide and the swing arm, with the mounting/demounting vertical slide moving slightly up and away from the edge of the rim (fig.16A).  
This space between the rim and the vertical slide will be maintained for as long as the button 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.
- Insert and position the bead lifting tool on the mounting vertical slide (fig.17).  
When working with alloy wheels or wheels with delicate paintwork, you are advised to remove the bead lifting tool before proceeding with the demounting.



### WARNING

**Avoid unintended lever movement and injury. Grip the lever firmly when using.**

- Raise the upper bead to above the rear part of the demounting vertical slide (fig.17a) and force part of the upper bead into the rim groove by pushing down on the side wall of

the tyre nearest to the operator.

- Press the pedal to turn the table top clockwise. The upper bead will automatically be guided up and over the rim (fig.18). Repeat the last three points to detach the lower bead.

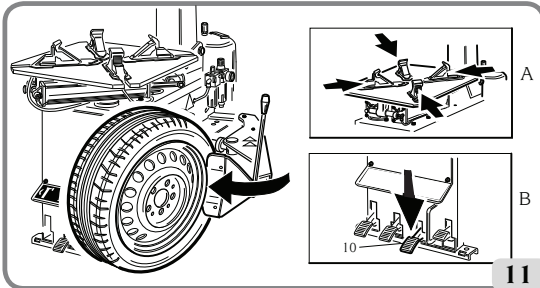
- Tilt the tower backwards.

**NOTE:** If the tyre has an inner tube, after detaching the upper bead, tilt the tower back and remove the inner tube before proceeding to demount the lower bead. The rotation of the table top can be stopped at any time by releasing the pedal. To rotate in the opposite direction, simply raise up the pedal.

- Fully deflate the tyre, removing the valve

- Adjust the position of the shovel through the pin (1 fig. 10A) based on the size of the tire.

- Position the wheel as shown in fig.11 and bring the bead breaker shoe to the edge of the rim.



**IMPORTANT:** During the bead breaking operation, you are advised to keep the table top closed (locking clamp towards center) (A fig.11).

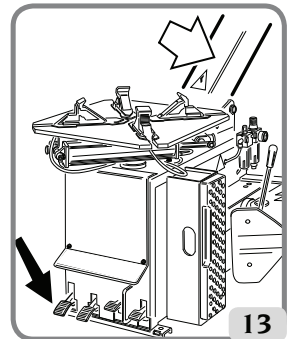
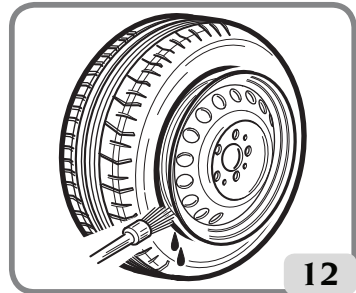



- Press the pedal (fig.11) to operate the bead breaker and detach the bead from the rim. Repeat this operation on the other side of the wheel.

It may be necessary to break the bead at several points to free it completely.


After detaching the beads, remove the old balancing weights.

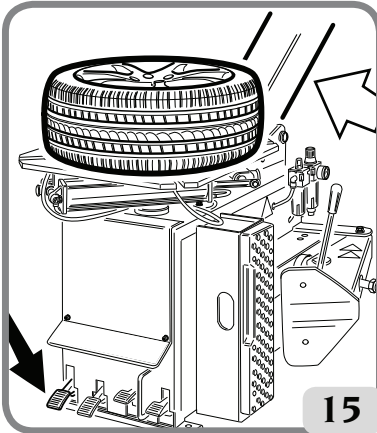
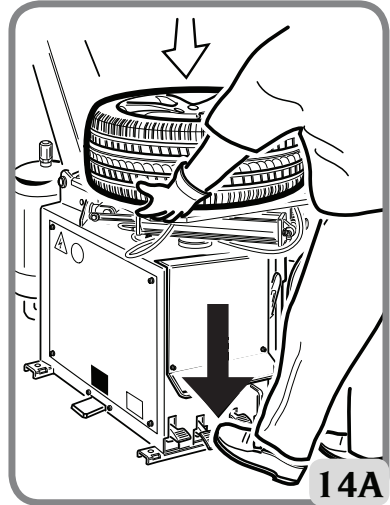
- Thoroughly lubricate the sides of the tyre around the entire circumference of the lower and upper bead to facilitate the demounting and avoid damaging the beads (fig.12).




- Tilt the tower backwards  by holding the knob in the “locked” position (Fig. 13).
- Set the clamps to the open or closed position (fig.14).

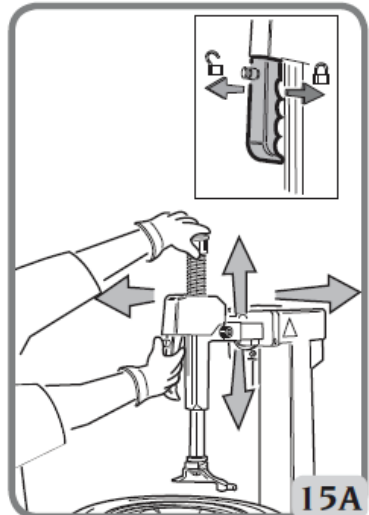
Place the wheel on the table top (with the narrow part of the rim structure facing upwards), push lightly downwards and use the control pedal

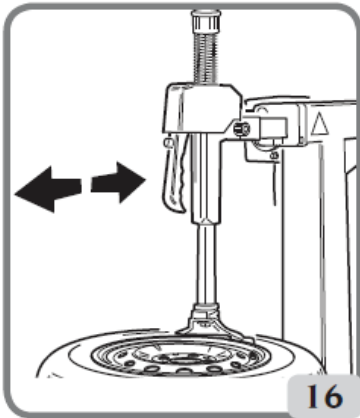
 to lock the wheel in position (fig.14a).



- Tilt the tower forward again  (fig.15).

Release the locking knob to free both the vertical slide and the swing arm (fig.15a) and to set the mounting/demounting device in the correct position against the edge of the rim (fig.16).





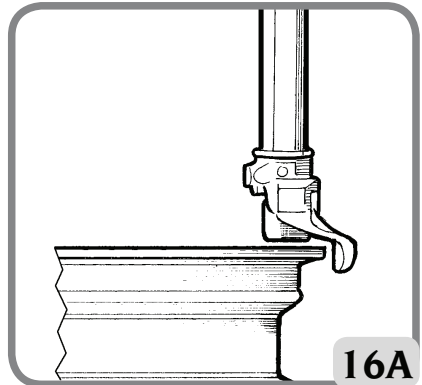
16

**IMPORTANT:** Operating the knob, this will simultaneously lock both the vertical slide and the swing arm, with the mounting/demounting vertical slide moving slightly up and away from the edge of the rim (fig. 16a).

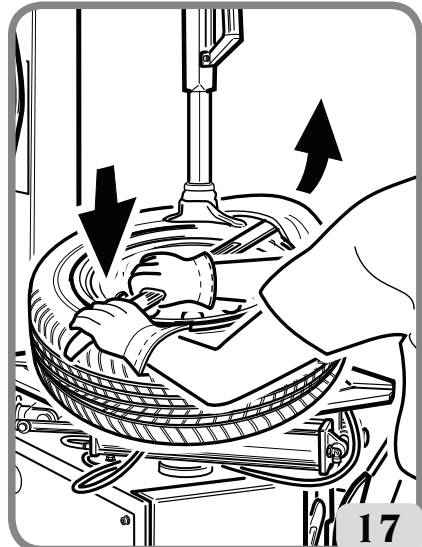
This space between the rim and the vertical slide will be maintained for as long as the knob is in the locking position. The operator can tilt the tower freely (eg. when demounting wheels of the same size) without repositioning the vertical slide.

- Insert and position the bead lifting tool on the mounting vertical slide (fig. 17).

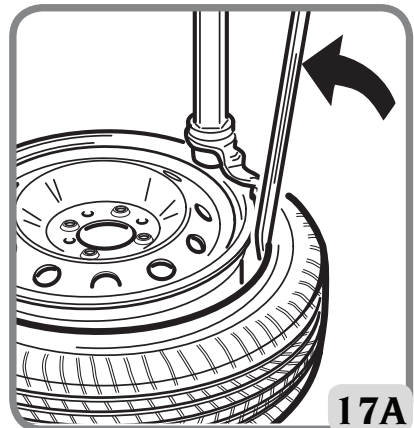
When working with alloy wheels or wheels with delicate paintwork, you are advised to remove the bead lifting tool before proceeding with the demounting.



16A



17



17A




## WARNING

Grip the lever firmly when using.

- Raise the upper bead to above the rear part of the demounting vertical slide (fig. 17a) and force part of the upper bead into the rim groove by pushing down on the side wall of the tyre nearest to the operator.



- Press the pedal  to turn the table top clockwise. The upper bead will automatically be guided up and over the rim (fig.18). Repeat the last three points to detach the lower bead.



- Tilt the tower backwards

**NOTE:** If the tyre has an inner tube, after detach-




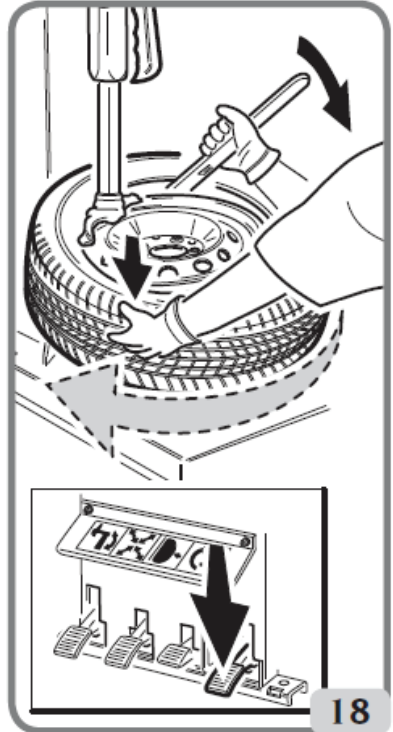
ing the upper bead, tilt the tower back and remove the inner tube before proceeding to demount the lower bead.

The rotation of the table top can be stopped at



any time by releasing the pedal. To rotate in the opposite direction, simply raise

up the pedal .



18

## 7.4. TYRE MOUNTING

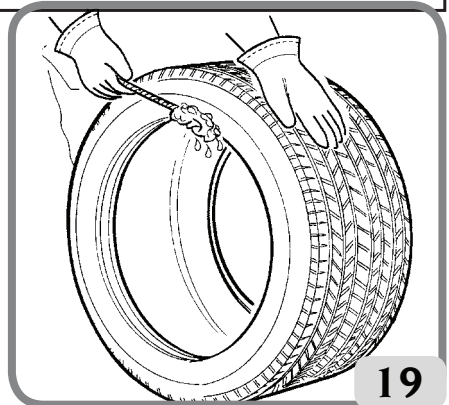


### WARNING

**Always check that the size of the tyre is compatible with the size of the wheel before proceeding with mounting.**

- Before you start with tyre mounting operations, apply a liberal amount of tyre manufacturer approved rubber lubricant to both beads (fig.19). Lubricated beads require less force to mount/seat and are protected against torsional damage.

Make sure that the tyre is in good condition without any signs of undue wear or damage.



19

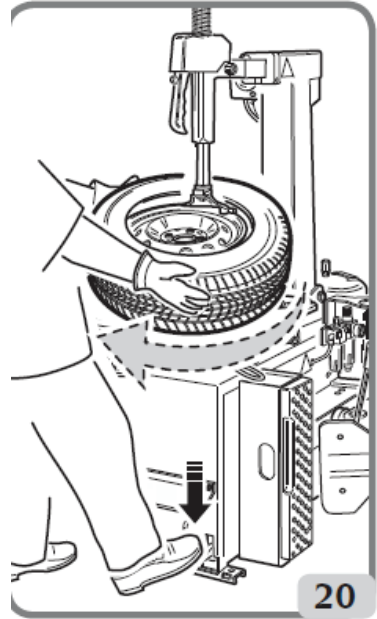
- Place the tyre over the wheel and tilt the tower



forward. Position the bottom bead (fig.20) beneath the right hand side of the mount/demount head .



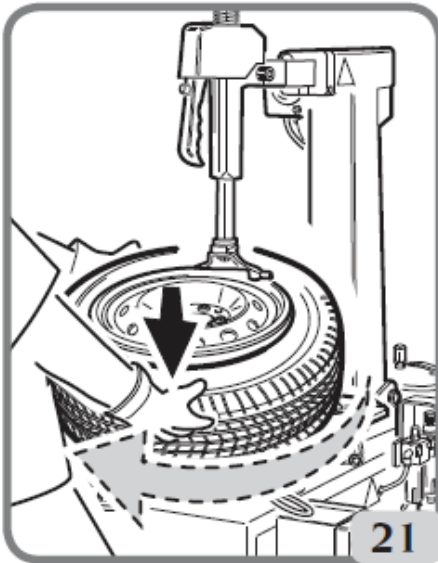
Press the table top control pedal to turn the table clockwise and mount the bead. Use the drop centre by pressing the sidewall opposite the head to reduce tensional force on the bead as the wheel rotates (fig.20).



- Once you have mounted the bottom bead, repeat the same steps for the upper bead (fig.21).



- Tilt the tower back, free the wheel and take it off the tyre changer.



### SPECIAL TOOLS

To facilitate mounting/demounting of low profile tyres, it is advisable to use the bead presser pliers (optional accessory).

## 7.5. TYRE INFLATION

### 7.1 APPROVED M/D PROCEDURE FOR UHP AND RUN FLAT TYRES

For the detailed M/D procedure for UHP and RUN FLAT tyres, please refer to the instruction manual wrote by WDK (German Association of the Tyre Industry)

### 7.2 INFLATING TYRES

#### 7.3.a. SAFETY INDICATIONS

	<p style="text-align: center;"><b>!</b> <b>DANGER</b></p> <ul style="list-style-type: none"><li>• <b>EXPLOSION HAZARD</b></li><li>• <b>Never exceed tire pressure recommended by tire manufacturer. Never mismatch tire size and rim size.</b></li><li>• <b>Avoid personal injury or death</b></li></ul>
---	--

**!** **DANGER**

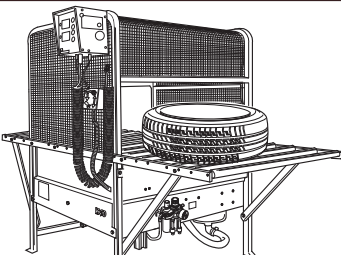
The use of inflation devices (e.g. guns) connected to power sources outside of the machine is not permitted.

**NOTICE**

Always comply with national safety regulations as they could be more restrictive than what is indicated in the manual, according to the principle that a more restrictive standard takes precedence over the less restrictive one.

**!** **DANGER**

If tires being mounted require more than the tire manufacturer's maximum bead seating pressure and , the wheel should be removed from the tire changer, placed in an inflation cage, and inflated per manufacturer's instructions.



Verify that both upper and lower tyre beads and the rim bead seat have been properly lubricated with an approved mounting paste.



Safety goggles with plain lenses and safety footwear must be worn.

 **WARNING**

**DO NOT Lock the rim on the turntable during inflation.**

Remove valve stem core if not already done.

Connect inflation hose to valve stem.

Step down partially on the pedal to inflate the tyre and seal beads with the inflation hose.

Frequently stop to check bead seating pressure on the gauge.

 **WARNING**

**Avoid personal injury. Carefully read, understand and observe the following instructions.**

1. Overinflated tyres can explode, producing hazardous flying debris that may result in an accident.
2. Tyres and Rims that are not the same diameter are “mismatched”. Never attempt to mount or inflate any tyre and rim that are mismatched. For example, never mount a 16” tyre on a 16.5” rim (or vice versa). This is very dangerous. A mismatched tyre and rim could explode, resulting in an accident.
3. Never exceed the bead setting pressure (gauge on hose) provided by the tyre manufacturer, as stated on the sidewall of the tyre.
4. Never place your head or any part of your body over a tyre during the inflation process or when attempting to seat beads.  
**This machine is not intended to be a restraining device for exploding tyres, tubes or rims.**
5. Always stand back from the tyre changer when inflating, never lean over.

 **WARNING**



**During this operation, noise levels assessed at 85 dB(A) may occur.  
Wear hearing protection devices.**

 **DANGER**

**EXPLOSION HAZARD. An exploding tyre and rim may be propelled upward and outward with enough force to cause serious injury or death.**

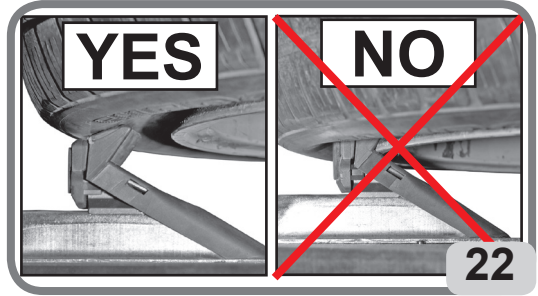
**Do not mount any tyre unless the tyre size (molded into the sidewall) matches the rim size (stamped into the rim) exactly or if the rim or tyre are defective or damaged.**

**This tyre changer is not a safety device and will not restrain exploding tyres and rims.**

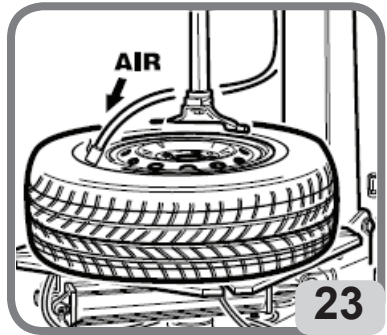
**Keep the area clear of bystanders.**

### 7.3.b. INFLATING TYRES

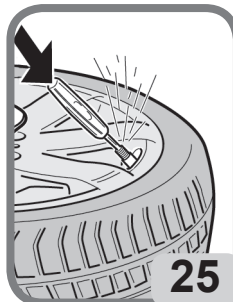
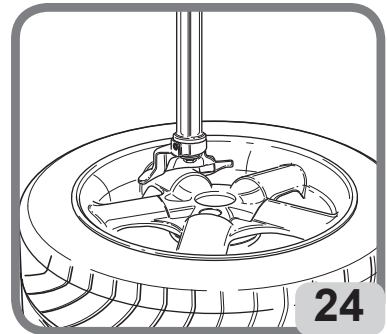
- Ensure the wheel is NOT clamped on the turntable by the clamps (Fig. 22).
- Move the horizontal arm fully into the working position (Fig. 23)
- Lower the vertical arm to touch the wheel (fig. 24), then lock the arm in this position.



- Remove the valve core if it has not already been removed (Fig. 25).
- Connect the air hose Doyfe inflator connector to the valve stem (Fig. 26).
- Inflate the tyre by pressing the relative pedal briefly and repeatedly, checking the pressure gauge frequently to ensure that the pressure NEVER exceeds the maximum pressure specified by the tyre manufacturer.



- Disconnect the inflation hose from the valve stem.
- Move the manipulator arm away from the working position.
- Remove the wheel from the tyre changer.



### 7.3.c. INFLATING TUBELESS TYRES (FS VERSION ONLY)

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

#### CAUTION

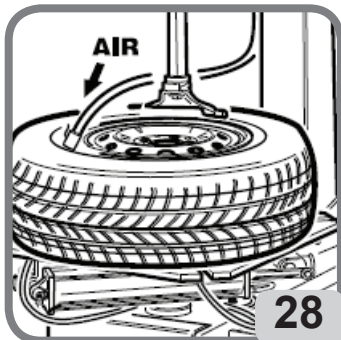
**Before starting with the operations described below, make sure there is no dirt, dust or other impurities near the inflation nozzles.**

- Check that both the upper and lower beads and the rim bead seat have been suitably lubricated with approved paste for mounting.
- Move the horizontal arm fully into the working position (Fig. 28)
- Ensure that the wheel is clamped onto the turntable from the inner side (fig. 29).
- Lower the vertical arm to touch the wheel (fig. 28), then lock the arm in this position
- Remove the valve core if it has not already been removed (Fig. 29).
- Connect the air hose Doyle inflator connector to the valve stem (Fig. 30).

#### NOTICE

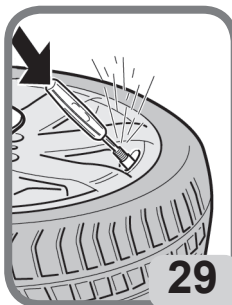
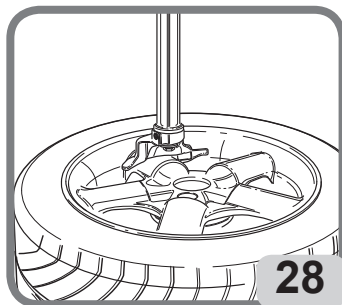
**To increase the effectiveness of the inflation jets, always liberally lubricate beads and raise the lower bead while activating inflation jets.**

- Fully depress the inflation tyre briefly (fig. 32). The tyre expands, pushing the beads into the seating position.



#### NOTICE

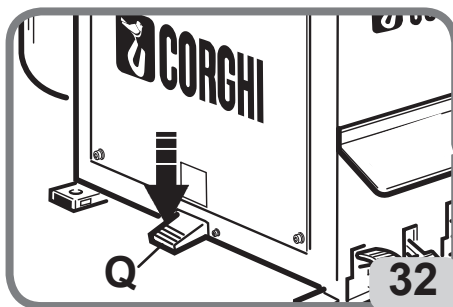
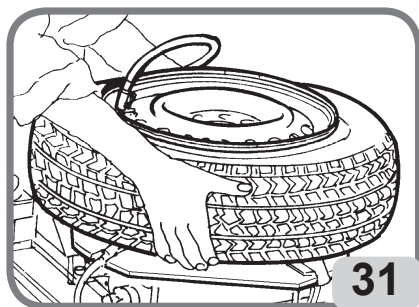
**To improve the operation of the tubeless tyre inflation system the compressed air line pressure must be between 8/10 bar.**



- Detach the wheel from the grippers (fig. 33).



- Press the inflation pedal in the intermediate position to inflate the tyre. Check the pressure gauge frequently to ensure that the pressure NEVER exceeds the maximum pressure specified by the tyre manufacturer.



## WARNING

**Explosion hazard. Do not exceed the manufacturer's maximum pressure as stated on the sidewall of the tyre when seating beads.**

Reinstall valve stem core into the valve stem after beads have been seated, and then inflate tire to vehicle manufacturer recommended pressure.

## WARNING

**Activate air inflation jets only when sealing the bead. Do not point jets towards people.**

Bleed air pressure from system before disconnecting supply line or other pneumatic

components. Air is stored in a reservoir for operation of inflation jets.

## **DANGER**

**Only activate the air inflation jets if the rim securing device is locked in place and the tire is properly clamped.**

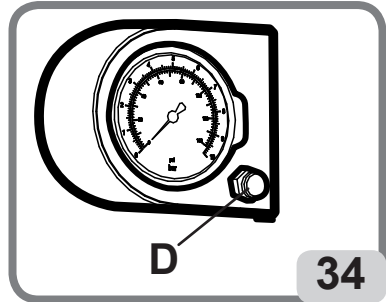
## **WARNING**

**ESPLOSION HAZARD. Never mount a tire to a rim that is not the same diameter (e.g., 16 1/2 inch tire mounting on a 16 inch rim).**

If the tyre is over-inflated, air may be removed from the tyre by pressing the brass manual air release button located below the air pressure gauge (D - Fig. 34).

- Disconnect the inflation hose from the valve stem.

Remove the wheel from the tyre changer



## **8. TROUBLESHOOTING**

### **Turntable will not turn**

#### **Earth line wire.**

➔ Check the wiring.

#### **Motor in short-circuit.**

- ➔ Replace the fuses.
- ➔ Replace the motor.

### **Rotation control pedal fails to return to central position**

#### **Control spring broken.**

➔ Replace the command spring.

### **Bead breaker pedal and table top pedal do not return to home position**

#### **Control spring broken.**

➔ Replace the pedal return spring.

#### **No oil in lubricator.**

➔ Top up lubricator with SAE20 non-detergent oil.

### **Air leak inside the machine**

#### **Air leak from bead breaker cock.**

➔ Replace the cock.

- Replace the bead breaker cylinder.

**Air leak from the table top cock.**

- Replace the turntable cylinder.
- Replace the swivel connector.

**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.

**Bead breaker cylinder leaks air around the rod**

**Air gaskets worn.**

- Replace the gaskets.
- Replace the bead breaker cylinder.

**Turntable will not rotate in either direction**

**Inverter faulty.**

- Replace the inverter.

**Belt broken.**

- Replace the belt.

**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.

**Turntable fails to clamp rims**

**Turntable does not clamp rim.**

- Replace the turntable cylinder.

**Clamp grippers are worn.**

- Replace the clamp grippers.

**Turntable mounts or demounts wheels with difficulty**

**Insufficient belt tension.**

- Adjust belt tension (fig.36) or replace it.

**Vertical head does not raise or does it too far from rim**

**Clamping plate not adjusted.**

- Adjust the plate.

**Vertical slide ascends under strain**

**Defective clamping plate.**

➔ Replace the plate.

**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.

**Vertical and horizontal limit stops do not operate**

**No air passage through cock.**

➔ Replace the cock.

**Column not tilted**

**Faulty tower tilt cylinder.**

➔ Replace the column tilting cylinder.

**No air supply to cylinder.**

➔ Replace the cock.

**Air escapes from cock.**

➔ Replace the cock or column tilting cylinder.

**Air leaks from the vertical and horizontal arm locking cock**

**Valve seal damaged.**

➔ Replace the handle cock.

**Clamping arm cylinders leak air**

**Faulty piston or gaskets.**

➔ Replace the pistons and gaskets.

**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.



## WARNING

Avoid personal injury or death.

The “Spare parts” handbook does not authorise the user to carry out any work on the machine other than the operations specifically described in the User Manual, and is only intended to enable the user to provide the technical assistance service with precise information in order to minimise response times.

## 9. MAINTENANCE



## WARNING

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



## WARNING



Before adjusting or servicing the machine, disconnect the electricity and compressed air supplies and ensure that all moving parts are suitably immobilised.



## WARNING



Do not remove or alter any part of this machine (only technical assistance personnel is permitted to do so).



## WARNING



When the machine is disconnected from the air supply, the devices bearing the sign shown above may remain pressurised.



## WARNING

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

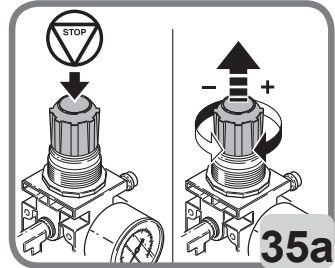


## NOTICE

**SIMPES FAIP declines all liability for claims deriving from the use of non-original spares or accessories.**

The filter-regulator unit filters the air and regulates air pressure.

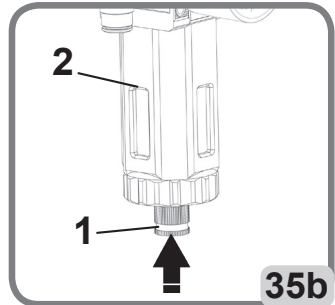
The FRL unit supports a maximum input pressure of 15 bar and has an adjustment range of 0.5 to 10 bar. The setting may be modified by pulling the handle out and then turning. After adjusting, return the handle to the locked position by pushing down (fig. 35a).



The regulating filter unit is equipped with a semiautomatic device to drain the condensate.

This device is automatically activated whenever pneumatic supply to the machine is cut off.

Drain the condensate manually (1, Fig. 35b) when the level rises above level 2, Fig. 35b.



## NOTICE

**Keep the work area clean.**

**Never use compressed air, water jets or solvents to remove dirt or deposits from the machine. When cleaning the area, take steps to avoid building up and raising dust as far as possible.**

## 10. 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.

## 11. ENVIRONMENTAL INFORMATION

The following disposal procedure must be applied to the machines having the crossed-out bin symbol on their data plate.

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 environment 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.

# 12. INFORMATION AND WARNINGS

## CONCERNING HYDRAULIC FLUID

### Disposing of spent fluid

Do not dispose of used oil in sewers, storm drains, rivers or streams; collect it and consign it to an authorised disposal company.

### Fluid leaks or spills

Contain the spilled 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:
  - avoid spatters (suitable clothing, protective shields on machines);
  - wash frequently with soap and water; do not use cleaning products or solvents that irritate the skin or remove its natural protective oil;
  - do not dry your hands using soiled or greasy rags;
  - change your clothes if soaked and, in any case, at the end of the work shift;
  - do not smoke or eat with greasy hands.
- Also adopt the following preventive and protective equipment:
  - mineral oil resistant gloves with plush lining;
  - goggles, in case of spatters;
  - mineral oil resistant aprons;
  - protective shields, in case of spatters.

### 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.

# 13. FIREFIGHTING MEANS USABLE

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

	Dry materials	Inflammable liquids	Electrical equipment
Water	YES	NO	NO
Foam	YES	YES	NO
Powder	YES*	YES	YES
CO2	YES*	YES	YES

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

## ⚠ WARNING

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.

# 14. GLOSSARY

## Tyre

A tyre consists of: **I-the actual tyre**, **II- the rim** (wheel), **III-the air chamber** (in tube type tyres), **IV-pressurised air**.

The tyre must:

- withstand a load,
- ensure driving power,
- steer the vehicle,
- aid handling and braking,
- aid vehicle suspension.

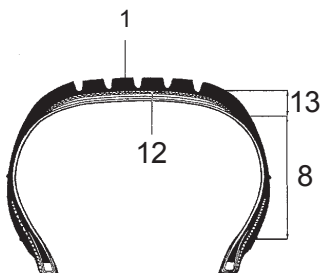
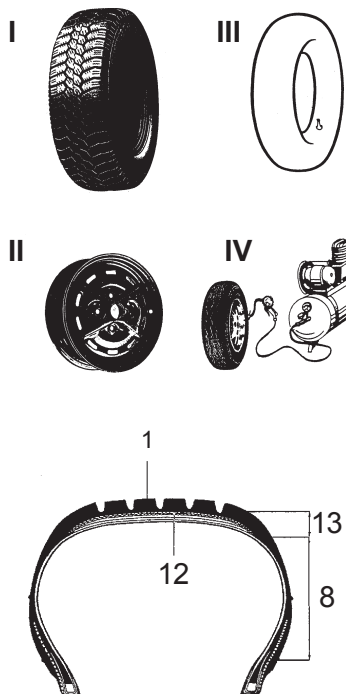
**I - Tyre** The actual tyre is the main part of the overall tyre in contact with the road and is therefore designed to withstand internal air pressure and all other stress arising from use.

A tyre section shows the various parts it consists of:

**1 - The tread.** This is the part in contact with the ground when the tyre rolls. It comprises a rubber compound and a "pattern" that is 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 plies from rubbing against the rim.

**3 - Casing.** This is the resistant structure and com-



prises 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 bad tread movement in the area of contact with the ground, the casing and the undertread are reinforced with an annular structure, usually called 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.

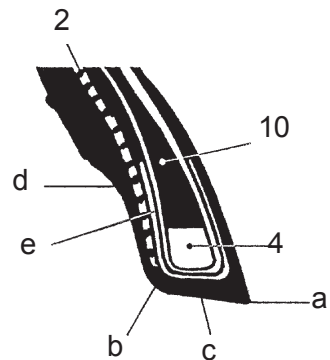
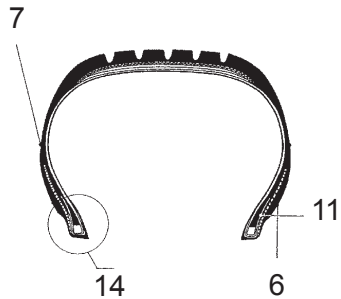
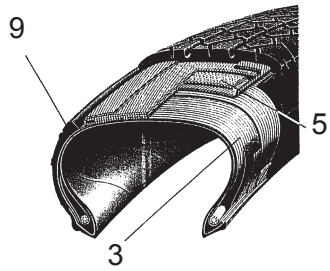
6 - *Centring band.* This is a small marking which indicates the circumference of the top part of the bead and is used as a reference to check exact tyre centring on the rim after mounting.

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



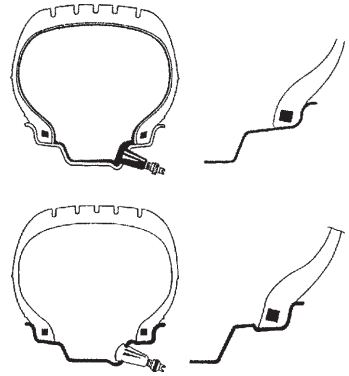
thickness caused by the side ring.

**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 tyre) with the last casing ply.

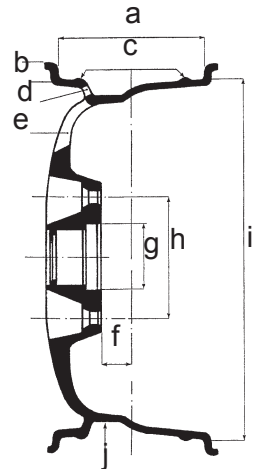
**13 - Shoulder.** This is the outer part of the tread, between the corner and start of the sidewall.

**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 fairly long 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.



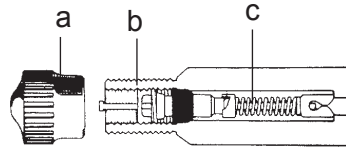
**II - Rim (Wheel).** The wheel is the rigid metal part which connects the vehicle hub to the tyre, on a fixed but non-permanent basis.

**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 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 Inflater.** 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 fitted so that it grips the shoulder of the rim and holds the tyre upper bead inside the rim 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.

# 15. GENERAL ELECTRIC LAYOUT DIAGRAMS

## 1Ph Tyre changer (Fig. 51)

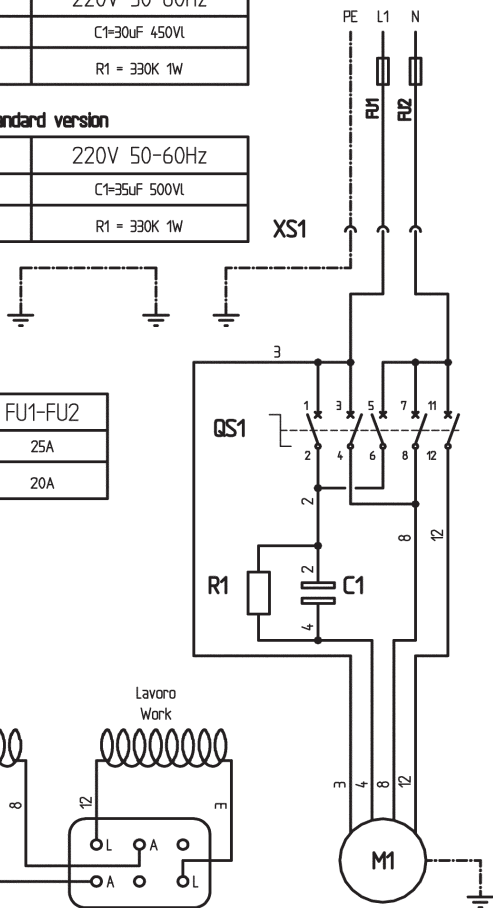
- XS1 Power supply socket
- QS1 Inverter
- M1 Motor
- R1 Resistor
- C1 Capacitor

### Solo versione CSA - CSA version only

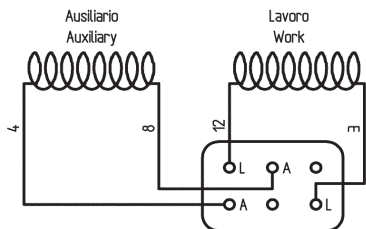
115V 50-60Hz	220V 50-60Hz
C1=40uF 450Vt	C1=30uF 450Vt
R1 = 330K 1W	R1 = 330K 1W

### Versione standard - Standard version

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



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

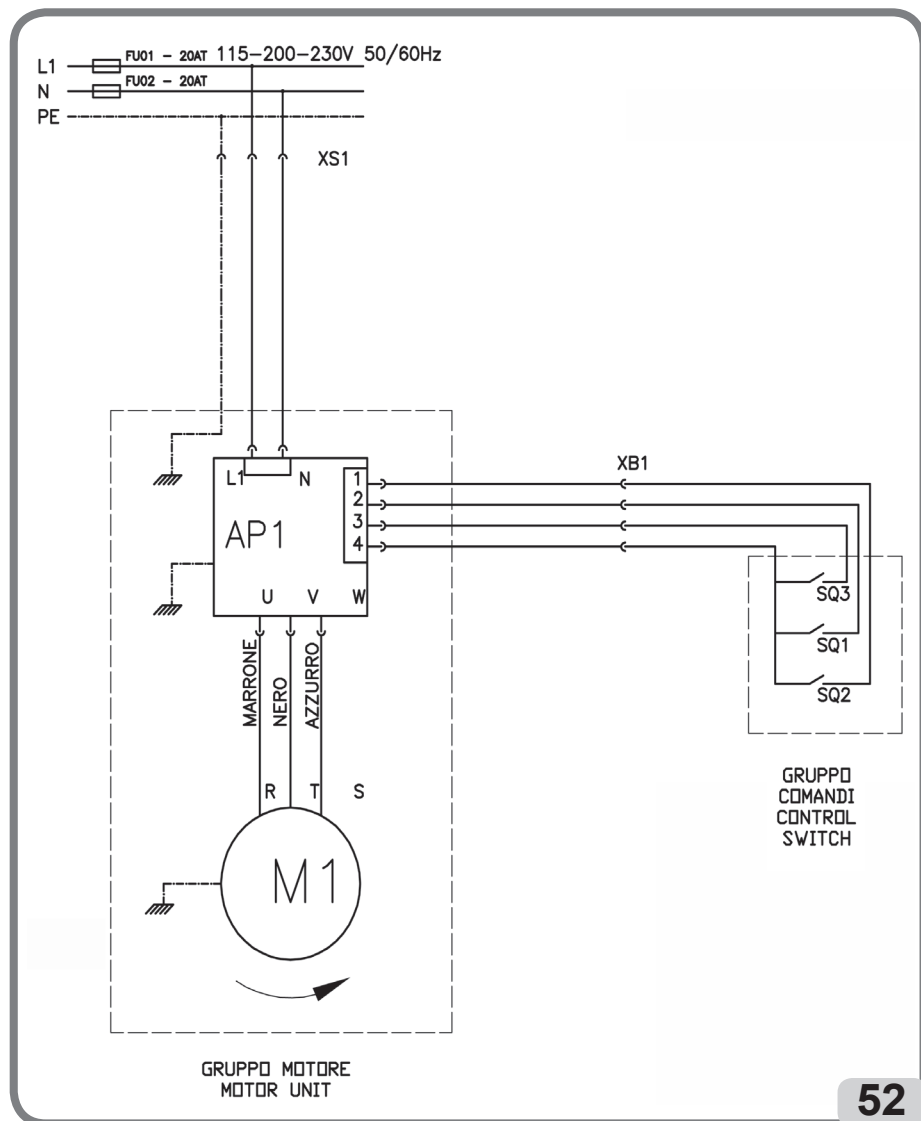


Schema cablaggio morsettiera  
Wiring diagram terminal-blok



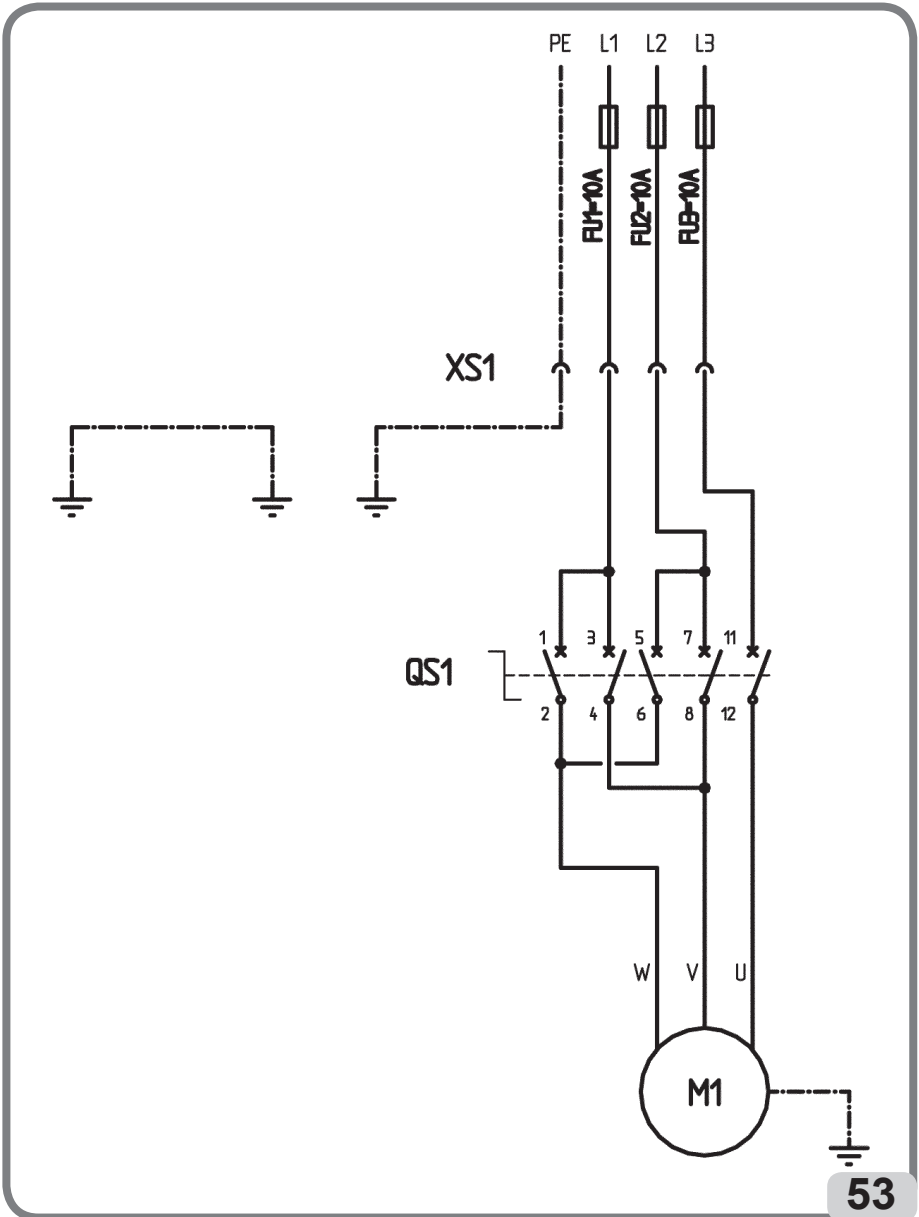
## 100-115-200-230V DV Tyre changer (Fig. 52)

- XS1 Power supply socket
- AP1 Single / two-speed motor motor
- M1 Motor
- SQ1 Two-speed micro-switch
- SQ2 Microswitch (CLOCKWISE rotation)
- SQ3 Microswitch (ANTICLOCKWISE rotation)



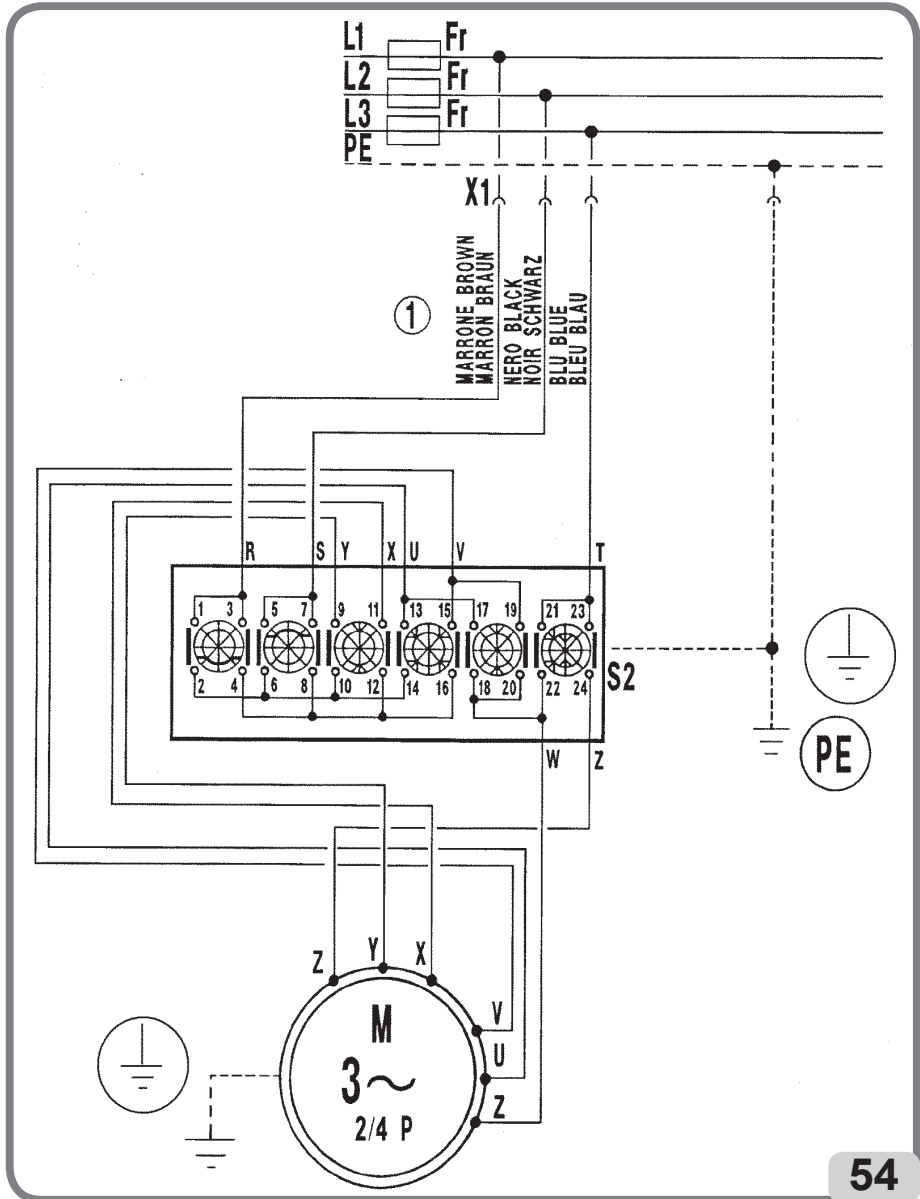
### 3Ph Tyre changer (Fig. 53)

- XS1 Power supply socket
- QS1 Inverter
- M1 Motor



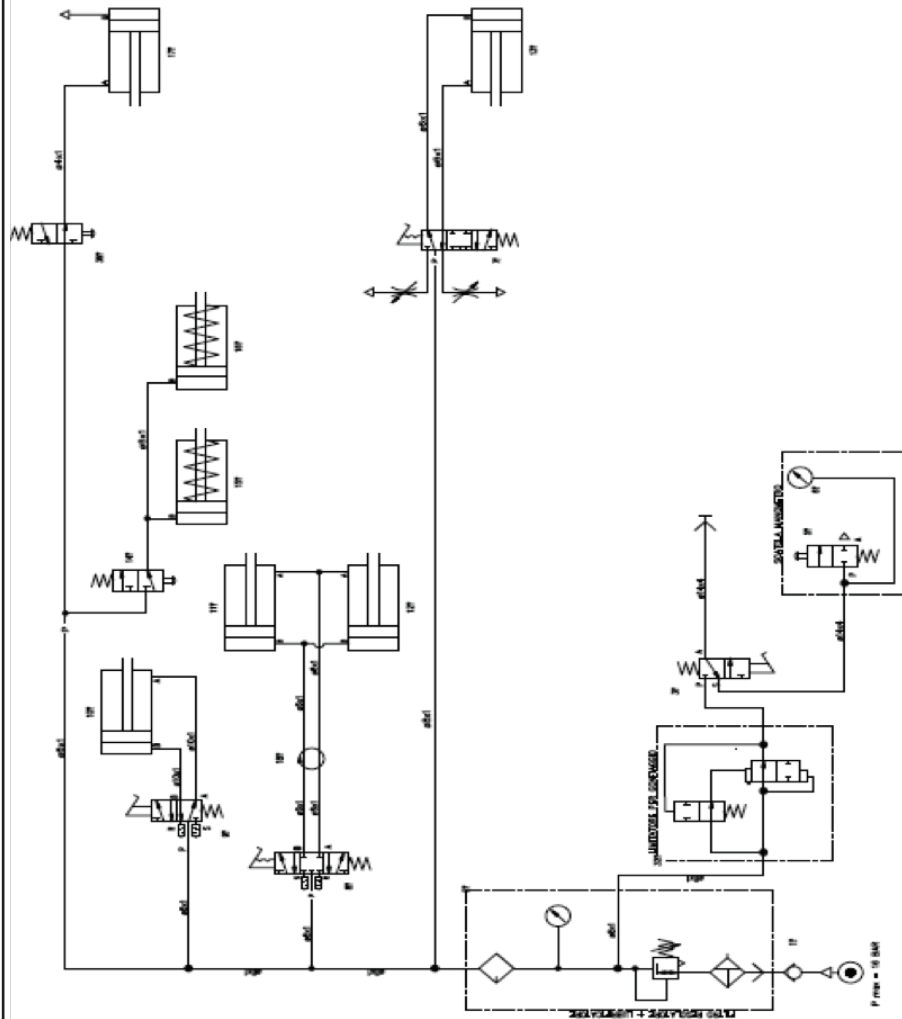
### 3Ph 2-speed Tyre changer (Fig. 54)

- XS1 Power supply plug
- QS1 Double speed switch
- M3 3Ph. Motor
- FR Fuse



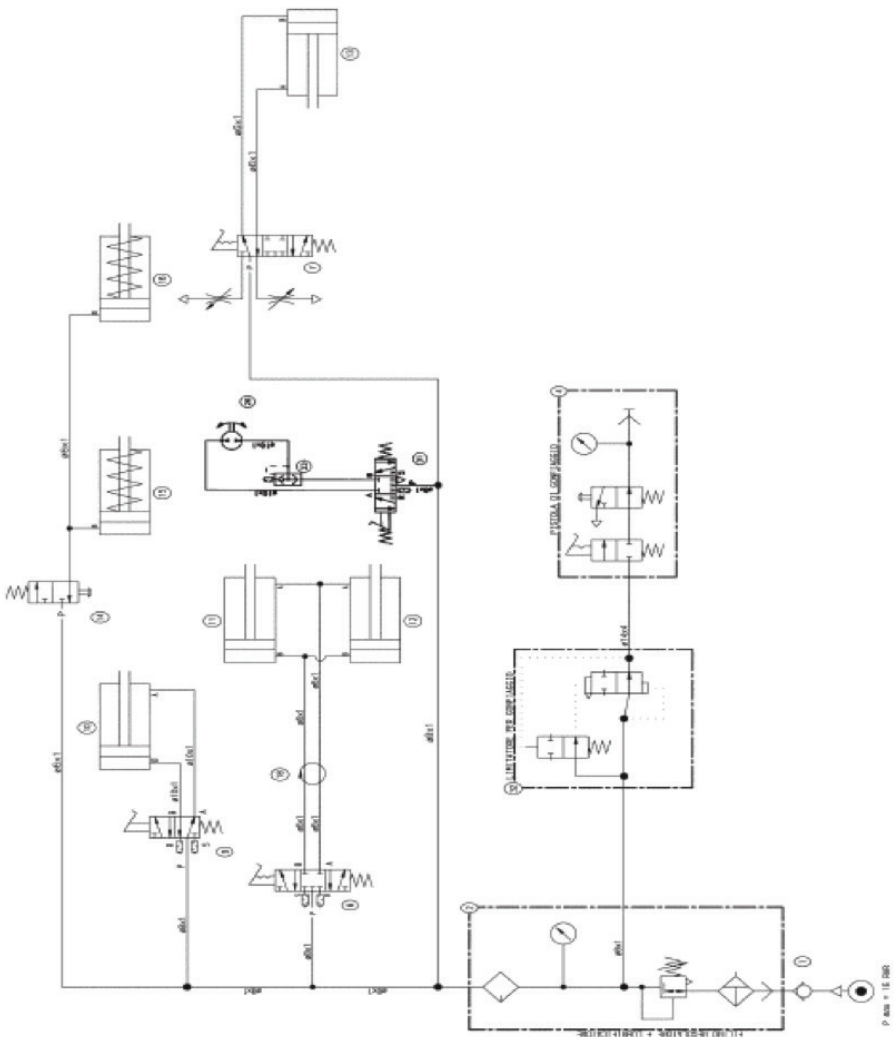
## 16. PNEUMATIC SYSTEM DIAGRAM

- 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 5/2 NO Valve
- 23 Tool actuator cylinder
- 26 Air motor pump
- 31 Air motor pump valve
- 32 Inflation limiter unit





# M 422 AIR MOTOR



P. 000 - 1.0.000





# Notes

A series of 18 horizontal dashed lines for writing notes.