

7505-M001-3_B

**NAV11N
NAV11NT
NAV11EI
NAV11TEI**

INSTRUCTION MANUAL

GB

TRANSLATION FROM THE
ORIGINAL INSTRUCTIONS

For spare parts drawings refer to the section "LIST OF COMPONENTS" enclosed to this manual.

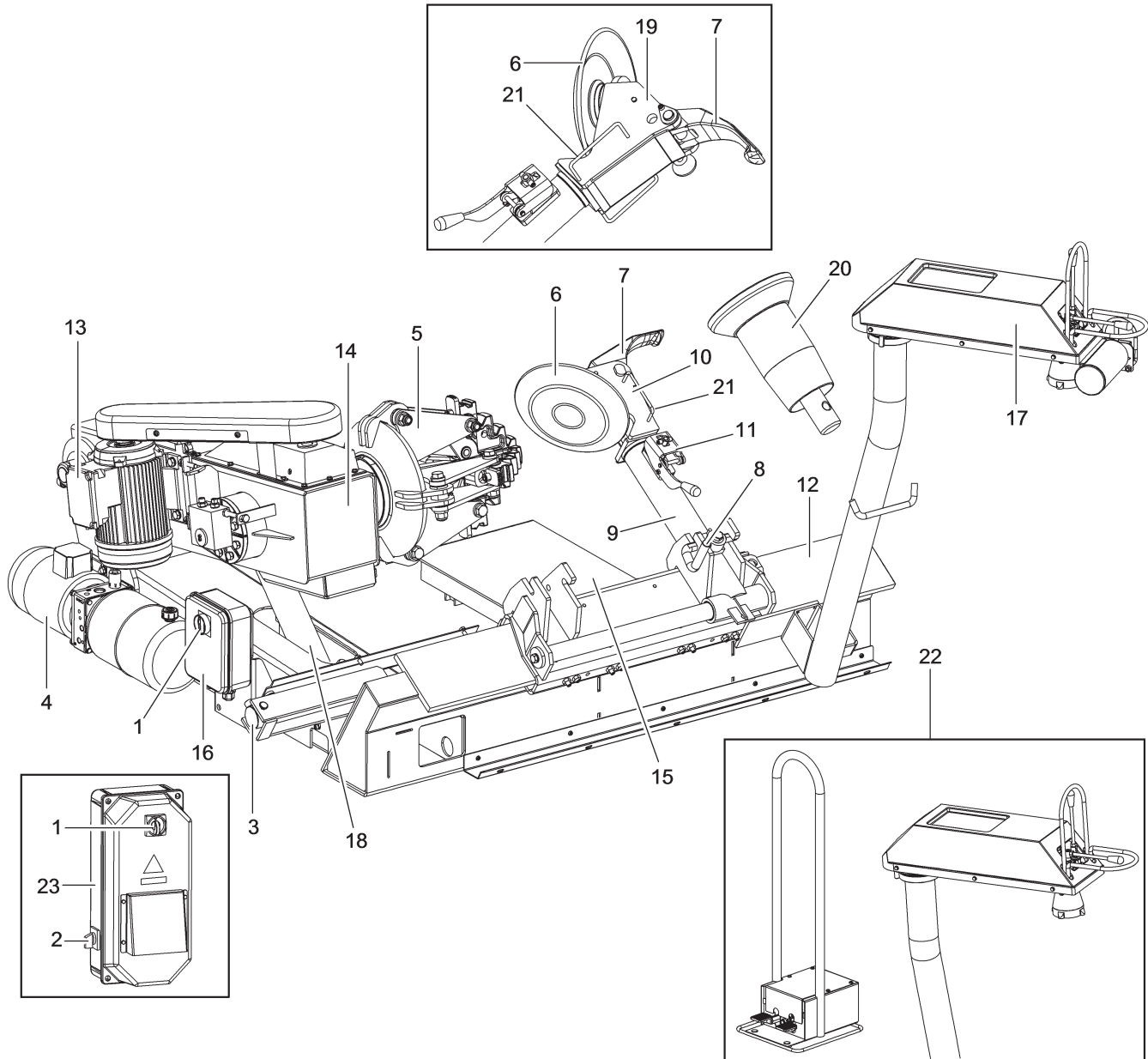
- For any further information please contact your local dealer or call:

BUTLER ENGINEERING and MARKETING S.p.A. a s. u.
Via dell'Ecologia, 6 - 42047 Rolo - (RE) Italy
Phone (+39) 0522 647911 - Fax (+39) 0522 649760 - e-mail: Info@butler.it

SUMMARY

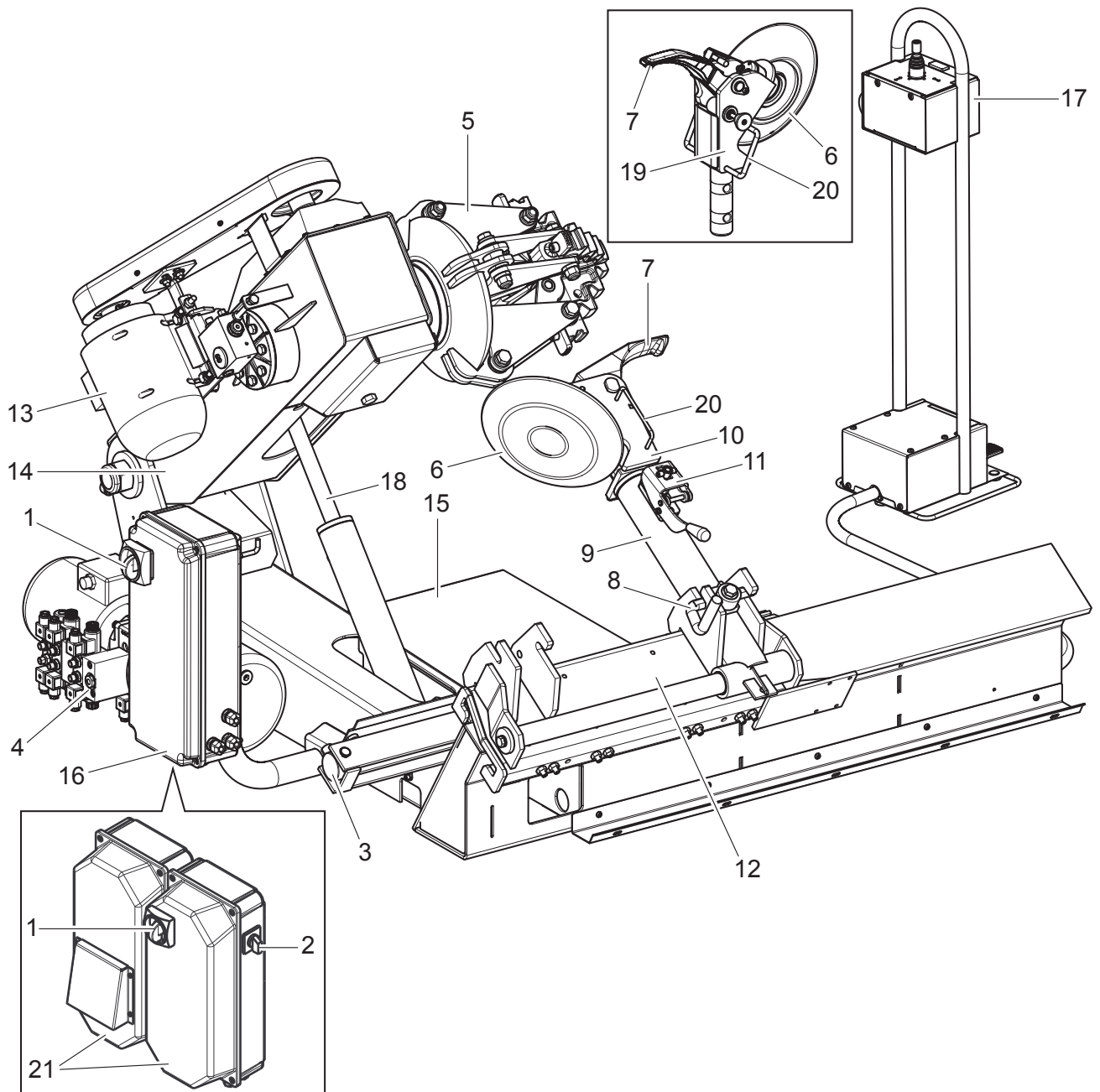
SYMBOLS USED IN THE MANUAL AND ON THE MACHINE	5	12.3 Preparing the wheel	18
1.0 GENERAL INTRODUCTION	8	12.4 Wheel clamping	18
1.1 Introduction	8	12.5 Functioning of tool holder arm	20
2.0 INTENDED USE	8	12.5.1 Tools rotation	21
2.1 Training of personnel	8	12.6 Tubeless tyres	21
3.0 SAFETY DEVICES	9	12.6.1 Bead breaking	21
3.1 Residual risks	10	12.6.2 Demounting	22
4.0 GENERAL SAFETY RULES	10	12.6.3 Mounting	25
5.0 PACKING AND MOBILIZATION FOR TRANSPORT	11	12.7 Tyres with inner tube	27
6.0 UNPACKING	11	12.7.1 Bead breaking	27
7.0 MOBILIZATION	11	12.7.2 Demounting	27
8.0 WORKING ENVIRONMENT CONDITIONS	12	12.7.3 Mounting	28
8.1 Working position	12	12.8 Wheels with bead wire	30
8.2 Installation space	12	12.8.1 Beading and demounting	31
8.3 Lighting	12	12.8.2 Mounting	32
9.0 MACHINE ASSEMBLY	13	13.0 ROUTINE MAINTENANCE	33
9.1 Anchoring system	13	14.0 TROUBLESHOOTING TABLE	35
9.2 Accessories contained in the packing	13	15.0 TECHNICAL DATA	37
10.0 ELECTRICAL CONNECTION	13	15.1 Technical data	37
10.1 Oil check on oil-pressure power unit	14	15.2 Dimensions	38
10.2 Check of motor rotation direction	14	16.0 STORING	40
10.3 Electrical checks	14	17.0 SCRAPPING	40
11.0 CONTROLS	16	18.0 REGISTRATION PLATE DATA	40
11.1 Control device (valid for NAV11N and NAV11NT models)	16	19.0 FUNCTIONAL DIAGRAMS	40
11.2 Control device (only for NAV11N and NAV11NT models with VARGNAV11ND version with inverter)	16	Table A - Three-phase electric diagram (NAV11N - NAV11NT)	41
11.3 Control device (valid for NAV11EI and NAV11TEI models)	17	Table B - Electric diagram (NAV11EI - NAV11TEI)	43
12.0 USING THE MACHINE	18	Table C - Electric diagram (monophasic version 220V 60HZ) (NAV11N)	50
12.1 Precaution measures during tyre removal and fitting	18	Table D - Electric diagram (VARGNAV11ND)	52
12.2 Preliminary operations	18	Table E - Electric diagram (VARGNAV11EID)	56
		Table F - Oil-pressure diagram (NAV11N - NAV11NT)	63
		Table G - Oil-pressure diagram (NAV11EI - NAV11TEI)	65
		20.0 LIST OF COMPONENTS	

FIG. 1 - NAV11N - NAV11NT




KEY











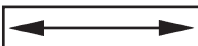

- | | |
|--|---|
| 1 - Main switch | 12 - Tools carriage |
| 2 - Selector 1-0-2 self-centring chuck speed control (version with inverter) | 13 - Mandrel rotation motor |
| 3 - Tools carriage translation cylinder | 14 - Mandrel arm |
| 4 - Hydraulic power unit | 15 - Movable footboard |
| 5 - Self-centring chuck | 16 - Electric panel |
| 6 - Bead breaking disc | 17 - Control unit |
| 7 - Tool | 18 - Mandrel arm cylinder |
| 8 - Coupling lever | 19 - Tools unit (only for NAV11NT) |
| 9 - Tool holder arm | 20 - Bead breaking roll (only for NAV11N) |
| 10 - Tools unit (only for NAV11N) | 21 - Tools unit lifting handle |
| 11 - Quick fit tool | 22 - Control unit (version with inverter) |
| | 23 - Electrical panel (version with inverter) |

FIG. 2 - NAV11EI - NAV11TEI**KEY**

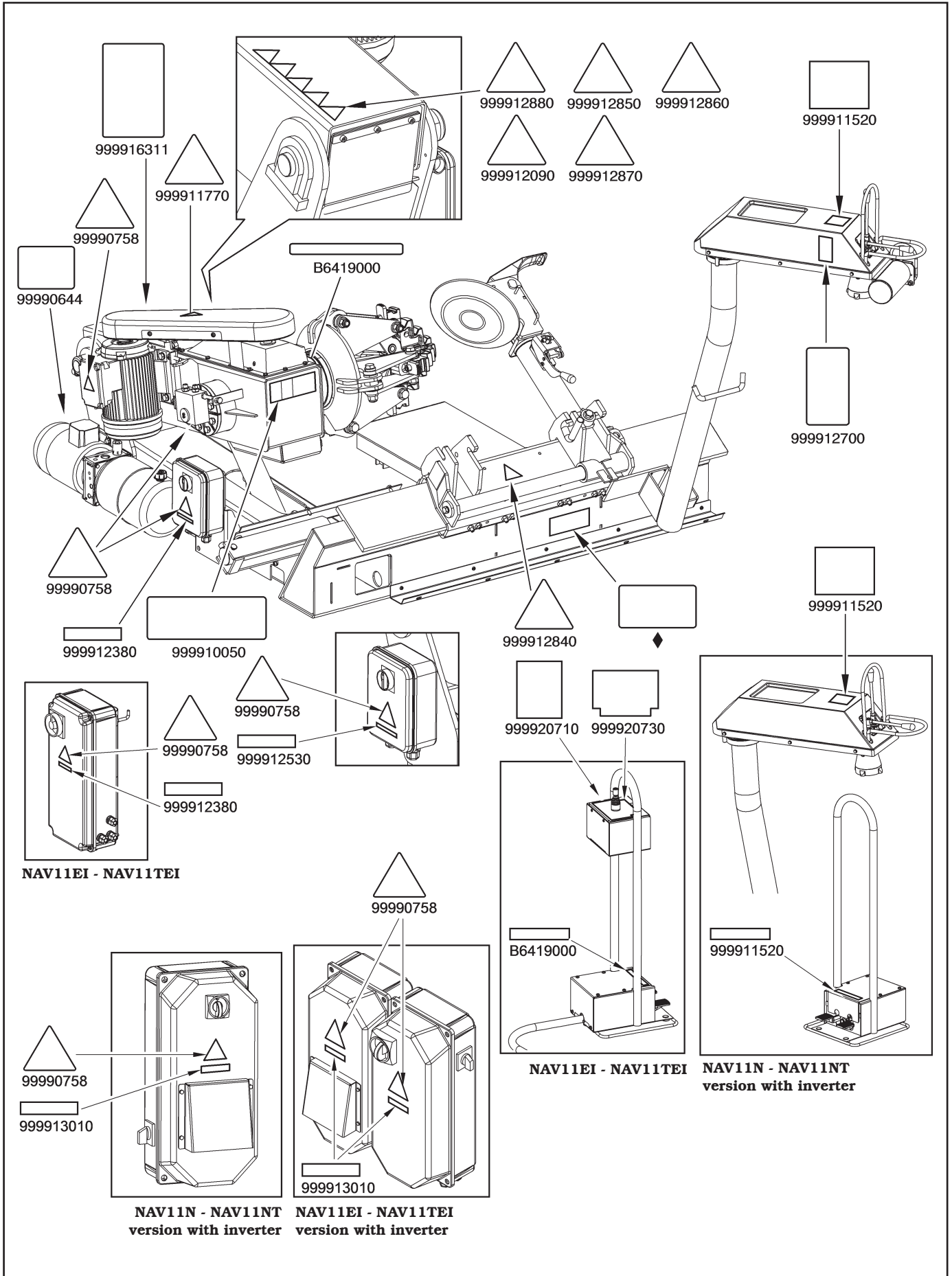
- | | |
|--|--|
| 1 - Main switch | 12 - Tools carriage |
| 2 - Selector 1-0-2 self-centring chuck speed control (version with inverter) | 13 - Mandrel rotation motor |
| 3 - Tools carriage translation cylinder | 14 - Mandrel arm |
| 4 - Hydraulic power unit | 15 - Movable footboard |
| 5 - Self-centring chuck | 16 - Electric panel |
| 6 - Bead breaking disc | 17 - Control unit |
| 7 - Tool | 18 - Mandrel arm cylinder |
| 8 - Coupling lever | 19 - Tools unit (only for NAV11TEI) |
| 9 - Tool holder arm | 20 - Tools unit lifting handle |
| 10 - Tools unit (only for NAV11EI) | 21 - Electrical boxes with (version with inverter) |
| 11 - Quick fit tool | |

SYMBOLS USED IN THE MANUAL AND ON THE MACHINE

Symbols	Description
	Read instruction manual.
	FORBIDDEN!
 B2167000	Wear work gloves.
	Wear work shoes.
 B2167000	Wear safety goggles.
	Wear safety earcaps.
 99990758	Shock hazard.
 999911770	Danger! Moving mechanical parts.
	Caution: hanging loads.
	Mandatory. Operations or jobs to be performed compulsorily.
	Danger! Be particularly careful.
	Warning. Be particularly careful (possible material damages).

Symbols	Description
	Move with fork lift truck or pallet truck.
	Lift from above.
 B1541000	General danger.
	Technical assistance necessary. Do not perform any intervention.
 999912870	Risk of crushing and collisions (self-centring chuck)
 999912880	Risk of crushing and collisions (self-centring chuck)
 999912850	Risk of limb crushing.
 999912860	Risk of limb crushing.
 999912840	Risk of crushing and collisions (tools holder shaft)
 999912090	Danger: tyres could drop.
 B6419000	Mandrel rotation index plate.
	Note. Indication and/or useful information.

PLATES LOCATION ON MACHINE INFORMATION TABLE



Code numbers of plates

99990758	<i>Electricity danger plate</i>
99990644	<i>Mandrel rotation index plate.</i>
999910050	<i>Protection device use plate</i>
999911520	<i>2-lever distributor plate</i>
999911770	<i>Unit move indicating plate</i>
999912090	<i>Tyres fall danger plate</i>
999912380	<i>400V 50Hz 3 Ph plate</i>
999912530	<i>Monophasic voltage plate (only for NAV11N - monophasic version 220V 60Hz)</i>
999912700	<i>1 lever distributor plate</i>
999912840	<i>Danger plate 1</i>
999912850	<i>Danger plate 2</i>
999912860	<i>Danger plate 3</i>
999912870	<i>Danger plate 4</i>
999912880	<i>Danger plate 5</i>
999916311	<i>Rubbish skip label</i>
999913010	<i>400V 50Hz 3 Ph+N voltage plate</i>
999920730	<i>Control plate (only for NAV11EI - NAV11TEI)</i>
999920710	<i>Mandrel open/close plate (only for NAV11EI - NAV11TEI)</i>
B6419000	<i>Rotation plate (only for NAV11EI - NAV11TEI)</i>
•	<i>Serial number plate</i>
*	<i>Machine nameplate</i>
♦	<i>Manufacturer nameplate</i>



IF ONE OR MORE PLATES DISAPPEARS FROM THE MACHINE OR BECOMES DIFFICULT TO READ. REPLACE IT AND QUOTE ITS/THEIR CODE NUMBER/S WHEN REORDERING.



SOME OF THE PICTURES PRESENT IN THIS MANUAL HAVE BEEN OBTAINED FROM PICTURES OF PROTOTYPES, THEREFORE THE STANDARD PRODUCTION MACHINES AND ACCESSORIES CAN BE DIFFERENT IN SOME COMPONENTS.

1.0 GENERAL INTRODUCTION

This manual is an integral part of the product and must be retained for the whole operating life of the machine.

Carefully study the warnings and instructions contained in this manual. It contains important instructions regarding **FUNCTIONING, SAFE USE and MAINTENANCE.**



KEEP THE MANUAL IN A KNOWN, EASILY ACCESSIBLE PLACE FOR ALL ACCESSORY OPERATORS TO CONSULT IT WHENEVER IN DOUBT.



THE MANUFACTURER DISCLAIMS ALL RESPONSIBILITY FOR ANY DAMAGE OCCURRED WHEN THE INDICATIONS GIVEN IN THIS MANUAL ARE NOT RESPECTED: AS A MATTER OF FACT, THE NON-COMPLIANCE WITH SUCH INDICATIONS MIGHT LEAD TO EVEN SERIOUS DANGERS.

1.1 Introduction

Thank you for preferring this electro-hydraulic tyre changer. We feel sure you will not regret your decision. This machine has been designed for use in professional workshops and in particular it stands out for its reliability and easy, safe and rapid operation: with just a small degree of maintenance and care, this tyre changer will give you many years of trouble-free service and lots of satisfaction.

2.0 INTENDED USE

The machines model "NAV11N, NAV11NT, NAV11EI and NAV11TEI", with relevant versions, are tyre changers with electro-hydraulic working, to be used only for the mounting and demounting of any type of wheel with whole rim (with groove and bead wire), with maximum dimensions of 1640 mm/64" and maximum weight of 1500 kg. The machines model "NAV11N, NAV11NT, NAV11EI and NAV11TEI" with relevant versions, are NOT to be used for tyres inflation.



THIS MACHINE MUST BE USED STRICTLY FOR THE INTENDED PURPOSE IT WAS DESIGNED FOR (AS INDICATED IN THIS MANUAL). ANY OTHER USE WILL BE CONSIDERED IMPROPER USE. IN PARTICULAR BEAD FITTING AND INFLATING MUST BE CARRIED OUT IN A SPECIALLY APPROVED INFLATION CAGE.



THE MANUFACTURER CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGE CAUSED BY IMPROPER, ERRONEOUS, OR UNACCEPTABLE USE.



AN INTENSIVE USE OF THE EQUIPMENT IN INDUSTRIAL ENVIRONMENT IS NOT RECOMMENDED.

2.1 Staff training

The machine may be operated only by suitably trained and authorized personnel.

Given the complexity of the operations necessary to manage the machine and to carry out the operations safely and efficiently, the personnel must be trained in such a way that they learn all the information necessary to operate the machine as intended by the manufacturer.



A CAREFUL READING OF THIS INSTRUCTION MANUAL FOR USE AND MAINTENANCE AND A SHORT PERIOD OF TRAINING WITH SKILLED PERSONNEL CAN BE AN ENOUGH PREVENTIVE PREPARATION.

3.0 SAFETY DEVICES



PERIODICALLY, AT LEAST MONTHLY, CHECK THE INTEGRITY AND THE FUNCTIONALITY OF THE SAFETY AND PROTECTION DEVICES ON THE MACHINE.

All the machines are equipped with:

- “man-operated” controls (immediate stop of operation when the control is released).
- **Controls logic disposition**
To prevent the operator from making dangerous mistakes.
- Thermal magnetic switch on the supply line of the oil-pressure power unit motor: avoids the motor overheating in case of intensive use.



NO MODIFICATION OR CALIBRATION OF THE OPERATING PRESSURE OF THE MAXIMUM PRESSURE VALVE OR OF THE HYDRAULIC CIRCUIT PRESSURE LIMITER IS PERMITTED

- Maximum pressure valve on oil-pressure pump delivery, in order to protect the whole line from overpressures caused by accidental overloads;
- controlled check valves on:
 - opening of clamping unit jaws,
Such valves are installed to avoid that accidental oil leakages provoke unwelcome jaws movements (and as a consequence the fall of the wheel).
- Fuses on the electric supply line of the clamping unit motor,
- Automatic power supply disconnection with the opening of the electric panel.

- **Fixed guards and shelters**

The machine is fitted with a number of fixed guards intended to prevent potential crushing, cutting and compression risks. These protections have been realized after risks evaluation and after all machine operative situations have been considered. These protections can be located in the figure below.

- **Motor protection devices (version with inverter)**

The new “Invemotor” motor is equipped with electronic protection devices. They stop the motor if working defected conditions appear to avoid that the motor itself can be damaged and that the operator safety can be compromised (overvoltage, overload, overtemperature). For other details, see the chapt. 14 “Fault-Finding”.

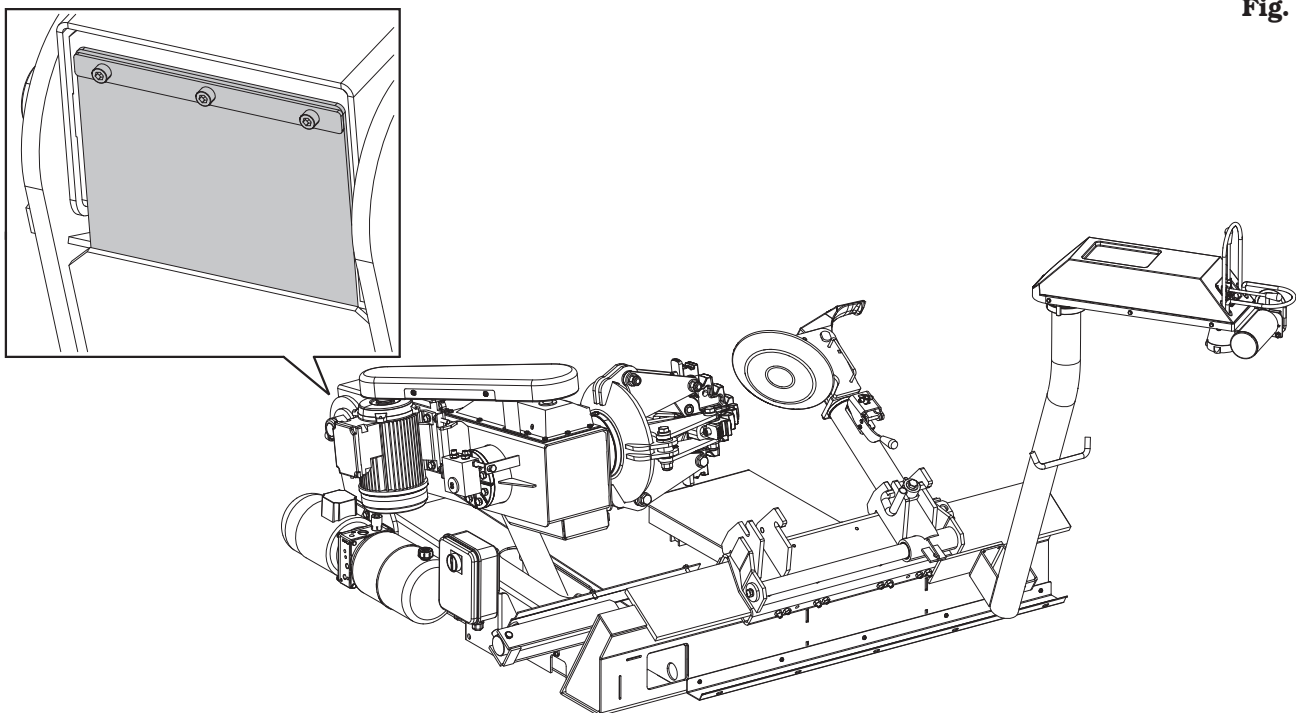


Fig. 3

3.1 Residual risks

The machine was subjected to a complete analysis of risks according to reference standard EN ISO 12100. Risks are as reduced as possible in relation with technology and product functionality.

Possible residual risks have been emphasized through pictorial representations and warnings which placing is indicated in "PLATE POSITIONING TABLE" at page 6.

4.0 GENERAL SAFETY RULES



- Any tampering with or modification to the machine not previously authorized by the manufacturer exempts the latter from all responsibility for damage caused by or derived from said actions.
- Removing of or tampering with the safety devices or with the warning signals placed on the machine leads to serious dangers and represents a transgression of European safety rules.
- Use of the machine is only permitted in places free from **explosion** or **fire** hazard and in **dry places under cover**.
- Original spare parts and accessories should be used.



THE MANUFACTURER DENIES ANY RESPONSIBILITY IN CASE OF DAMAGES CAUSED BY UNAUTHORIZED MODIFICATIONS OR BY THE USE OF NON ORIGINAL COMPONENTS OR EQUIPMENT.

- Installation must be conducted only by qualified personnel exactly according to the instructions that are given below.
- Ensure that there are no dangerous situations during the machine operating manoeuvres. Immediately stop the machine if it miss-functions and contact the assistance service of an authorized dealer.
- In emergency situations and before carrying out any maintenance or repairs, disconnect all supplies to the machine by using the main switch.
- The machine electrical supply system must be equipped with an appropriate earthing, to which the yellow-green machine protection wire must be connected.
- Ensure that the work area around the machine is free of potentially dangerous objects and that there is no oil since this could damage the tyre. Oil on the floor is also a potential danger for the operator.



OPERATORS MUST WEAR SUITABLE WORK CLOTHES, PROTECTIVE GLASSES AND GLOVES, AGAINST THE DANGER FROM THE SPRAYING OF DANGEROUS DUST, AND POSSIBLY LOWER BACK SUPPORTS FOR THE LIFTING OF HEAVY PARTS. DANGLING OBJECTS LIKE BRACELETS MUST NOT BE WORN, AND LONG HAIR MUST BE TIED UP. FOOTWEAR SHOULD BE ADEQUATE FOR THE TYPE OF OPERATIONS TO BE CARRIED OUT.

- The machine handles and operating grips must be kept clean and free from oil.
- The workshop must be kept clean, dry and not exposed to atmospheric agents. Make sure that the working premises are properly lit. The machine can be operated by a single operator. Unauthorized personnel must remain outside the working area, as shown in **Fig. 6**. Avoid any hazardous situations. Do not use air-operated or electrical equipment when the shop is damp or the floor slippery and do not expose such tools to atmospheric agents.
- When operating and servicing this machine, carefully follow all applicable safety and accident-prevention precautions. The machine must not be operated by professionally unskilled persons.



THE MACHINE OPERATES WITH PRESSURIZED HYDRAULIC FLUID. MAKE SURE EVERY COMPONENT OF THE HYDRAULIC CIRCUIT IS ALWAYS PROPERLY LOCKED, ANY PRESSURIZED LEAKS MAY CAUSE SERIOUS INJURIES OR WOUNDS.



IN CASE OF A CHANCE SUPPLY FAILURE (WHETHER ELECTRICITY OR COMPRESSED AIR), MOVE THE CONTROLS TO THE NEUTRAL POSITION.

5.0 PACKING AND MOBILIZATION FOR TRANSPORT

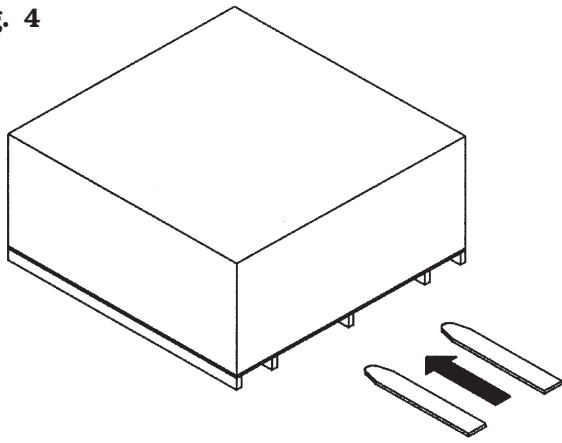


HAVE THE MACHINE HANDLED BY SKILLED PERSONNEL ONLY.

THE LIFTING EQUIPMENT MUST WITHSTAND A MINIMUM RATED LOAD EQUAL TO THE WEIGHT OF THE PACKED MACHINE (SEE PARAGRAPH "TECHNICAL SPECIFICATIONS").

The machine is packed completely assembled. The cardboard box containing the machine is fixed onto a pallet and measures mm 2150x2600x1100. The displacement must be performed through adequate lifting device (pallet truck or fork lift truck). Lift the packaging as indicated in **Fig. 4** (forks introduced in the middle to ensure a correct loads distribution).

Fig. 4



6.0 UNPACKING



DURING UNPACKING, ALWAYS WEAR GLOVES TO PREVENT ANY INJURY CAUSED BY CONTACT WITH PACKAGING MATERIAL (NAILS, ETC.).



After removing the packing, and in the case of the machine packed fully assembled, check that the machine is complete and that there is no visible damage. If in doubt **do not use the machine** and refer to professionally qualified personnel (to the seller). The packaging elements (plastic bags, polystyrene foam, nails, screws, wood, etc.) must be collected up and disposed of through according to the in force laws, except for the pallet, which could be used again for subsequent machine handling.



THE BOX CONTAINING THE FIXTURES IS CONTAINED IN THE WRAPPING. DO NOT THROW IT AWAY WITH THE PACKING.

7.0 MOBILIZATION

If the machine has to be moved.

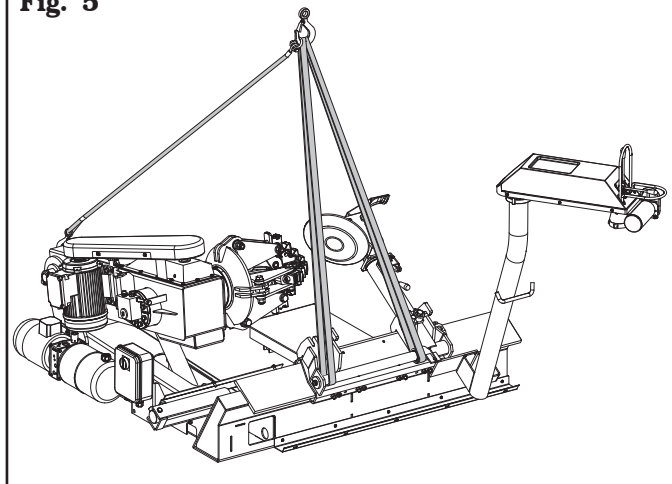


THE LIFTING EQUIPMENT MUST WITHSTAND A MINIMUM RATED LOAD EQUAL TO THE WEIGHT OF THE MACHINE (SEE PARAGRAPH TECHNICAL SPECIFICATIONS). DO NOT ALLOW THE LIFTED MACHINE TO SWING.

If the machine has to be moved from its normal work post, the movement must be conducted following the instructions listed below.

- Protect the exposed corners with suitable material (Pluribol/cardboard).
- Do not use metallic cables for lifting.
- Move the mandrel to completely lowered position and in the centre of the machine in order to ensure a correct load balancing.
- Move the tool carriage to limit switch towards the mandrel.
- Disconnect all machine power supply sources.
- Sling with sufficiently long belts (300 cm at least) and with capacity load at least equal to machine weight (see **Fig. 5**).
- Lift and transport with suitable device with adequate dimensions.

Fig. 5



8.0 WORKING ENVIRONMENT CONDITIONS

The machine must be operated under proper conditions as follows:

- temperature: $0^{\circ} + 55^{\circ} \text{C}$
- relative humidity: 30 - 95% (dew-free)
- atmospheric pressure: 860 - 1060 hPa (mbar).

The use of the machine in ambient conditions other than those specified above is only allowed after prior agreement with and approval of the manufacturer.

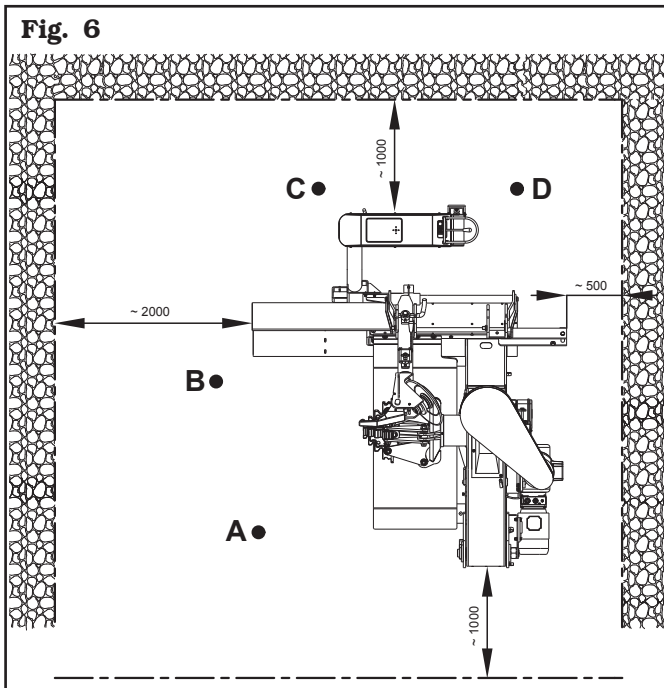
8.1 Working position

In **Fig. 6** it's possible to define working positions **A**, **B**, **C**, **D**, which will be referred to in the description of machine operative phases.

Positions **A** and **B** must be considered as main positions for tyre mounting and demounting and for wheel clamping on the mandrel, while positions **C** and **D** are the best positions to follow tyre bead breaking and demounting operations.

Working in these positions allows better precision and speed during operating phases as well as greater safety for the operator.

8.2 Installation space



The location of the machine requires a usable space as indicated in **Fig. 6**. The positioning of the machine must be according to the distances shown. From the control position the operator is able to observe all the machine and surrounding area. He must prevent unauthorized personnel or objects that could be dangerous from entering the area.

The machine must be fixed on a flat floor surface, preferably of cement or tiled. Avoid yielding or irregular surfaces.

The base floor must be able to support the loads transmitted during operation. This surface must have a strength of at least 500 kg/m^2 .

The depth of the solid floor must be sufficient to guarantee that the anchoring bolts hold.

8.3 Lighting

The machine does not require its own lighting for normal working operations. However, it must be placed in an adequately lit environment.

For correct lighting, use lamps having total power 800/1200 Watt as envisaged by UNI 10380.

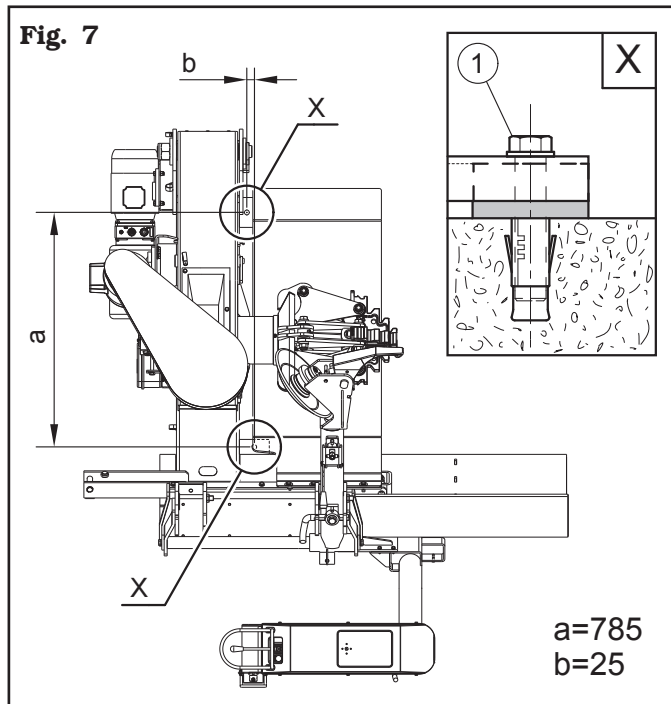


**INSTALL THE MACHINE INDOORS OR IN A
ROOFED AREA. PLACE OF INSTALLATION
MUST BE DRY, ADEQUATELY LIT AND IN
COMPLIANCE WITH APPLICABLE SAFETY
REGULATIONS.**

9.0 MACHINE ASSEMBLY

9.1 Anchoring system

The packed machine is fixed to the support pallet through the holes prearranged on the frame. Such holes can be used also to fix the machine to the ground, through floor anchor small blocks (excluded from supply). Before carrying out the definitive fixing, check that all the anchor points are laid down flat and correctly in contact with the fixing surface itself. If not so, insert shimming profiles between the machine and the fixing lower surface, as indicated in **Fig. 7**.



- Execute 2 holes with 12 mm diameter on the floor by the holes on the bottom floor;
- insert the small blocks (excluded from supply) into the holes;
- fix the machine to the ground with 2 M12x120 mm screws (excluded from supply) (**Fig. 7 ref. 1**) (or with 2 12x80 mm stud bolts (excluded from supply)). Tighten the screws with an approximate tightening torque of 70 Nm.

9.2 Fixtures contained in the packing

The packing case contains also the fixtures box. Check that all the parts listed are there.

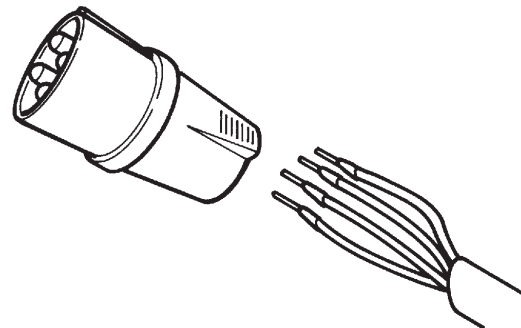
Code	Description	N.
G108A3	Lever with head "C"	1

10.0 ELECTRICAL CONNECTION

EVEN THE TINIEST PROCEDURE OF AN ELECTRICAL NATURE MUST BE CARRIED OUT BY PROFESSIONALLY QUALIFIED STAFF.

BEFORE CONNECTING THE MACHINE MAKE SURE THAT:

- THE MAIN POWER RATING CORRESPONDS TO THE MACHINE RATING AS SHOWN ON THE MACHINE PLATE;
- ALL MAIN POWER COMPONENTS ARE IN GOOD CONDITION;
- THE ELECTRICAL SYSTEM IS PROPERLY GROUNDED (GROUND WIRE MUST BE THE SAME CROSS-SECTION AREA AS THE LARGEST POWER SUPPLY CABLES OR GREATER);
- MAKE SURE THAT THE ELECTRICAL SYSTEM FEATURES A CUTOUT WITH DIFFERENTIAL PROTECTION SET AT 30 mA.



The machine is supplied with 5 m of free cable. A plug corresponding to the following requirements must be connected to the cable:

- Conformity to Norm **IEC 309**
- **230/400 Volt - 16A**
- **3P + Ground**
- **IP 44**

Only for VARGNAV11ND - VARGNAV11EID - versions with inverter

- Conformity to Norm **IEC 309**
- **230/400 Volt - 32A**
- **3P + N + Ground**
- **IP 44**

On delivery, the machine is pre-set to operate at a voltage of 400 V. For any other type of power supply, ask the manufacturer at the time of purchase: a machine functioning under the required voltage conditions will be prepared.



FIT A TYPE-APPROVED (AS REPORTED BEFORE) PLUG TO THE MACHINE CABLE (THE GROUND WIRE IS YELLOW/GREEN AND MUST NEVER BE CONNECTED TO THE PHASE LEADS). MAKE SURE THAT THE ELECTRICAL SYSTEM IS COMPATIBLE WITH THE RATED POWER ABSORPTION SPECIFIED IN THIS MANUAL AND APT TO ENSURE THAT VOLTAGE DROP UNDER FULL LOAD WILL NOT EXCEED 4% OF RATED VOLTAGE (10% UPON START-UP).



IN CASE OF A CHANCE SUPPLY FAILURE, AND/OR BEFORE ANY POWER SUPPLY CONNECTIONS, MOVE THE PEDALS TO THE NEUTRAL POSITION.

10.1 Oil check on oil-pressure power unit



THE OIL-PRESSURE POWER UNIT IS DELIVERED WITHOUT HYDRAULIC OIL, THEREFORE MAKE SURE THE TANK PROVIDED IS FILLED WITH OIL WITH VISCOSITY DEGREE APPROPRIATE TO THE AVERAGE TEMPERATURES IN THE INSTALLATION COUNTRY AND IN PARTICULAR:

- VISCOSITY 32 (FOR COUNTRIES WITH ROOM TEMPERATURE FROM 0 TO 30 DEGREES);
- VISCOSITY 46 (FOR COUNTRIES WITH ROOM TEMPERATURE ABOVE 30 DEGREES).

10.2 Check of motor rotation direction

Once the last electrical connection has been terminated, power the machine with the main switch. Make sure the motor of the hydraulic power unit rotates in the direction indicated by the arrow (**Fig. 8A, 8B, 8C and 8D ref. B**) visible on the electric motor cap.

If rotation should occur in the opposite direction, the machine must be immediately stopped and phase inversion must be executed inside the plug connection in order to reset the correct rotation direction.



FAILURE TO OBSERVE THE ABOVE INSTRUCTIONS WILL IMMEDIATELY INVALIDATE THE WARRANTY.

10.3 Electrical checks



BEFORE STARTING UP THE TYRE-CHANGER, BE SURE TO BECOME FAMILIAR WITH THE LOCATION AND OPERATION OF ALL CONTROLS AND CHECK THEIR PROPER OPERATION (SEE PAR. "CONTROLS").



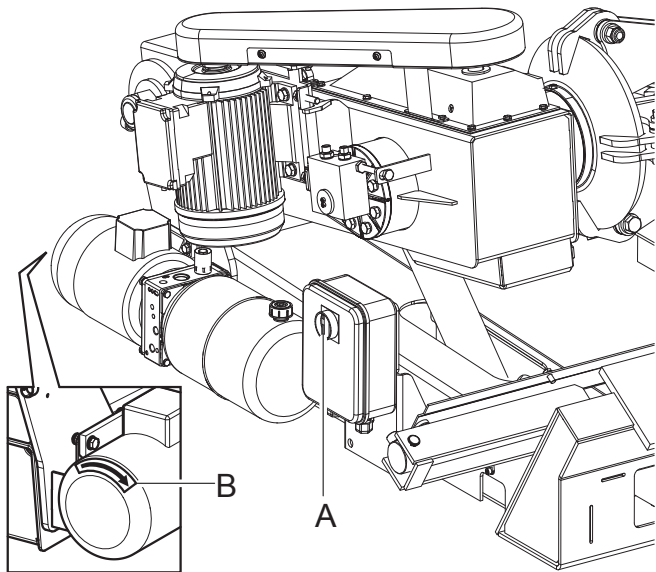
CARRY OUT A DAILY CHECK OF MAINTAINED-TYPE CONTROLS CORRECT FUNCTIONING, BEFORE STARTING MACHINE OPERATION.

Once the plug/socket connection has been made, turn on the machine using the master switch (**Fig. 8A, 8B, 8C and 8D ref. A**).

ONCE THE ASSEMBLY OPERATIONS HAVE BEEN ENDED, CHECK ALL MACHINE FUNCTIONS.

NAV11N and NAV11NT

Fig. 8A

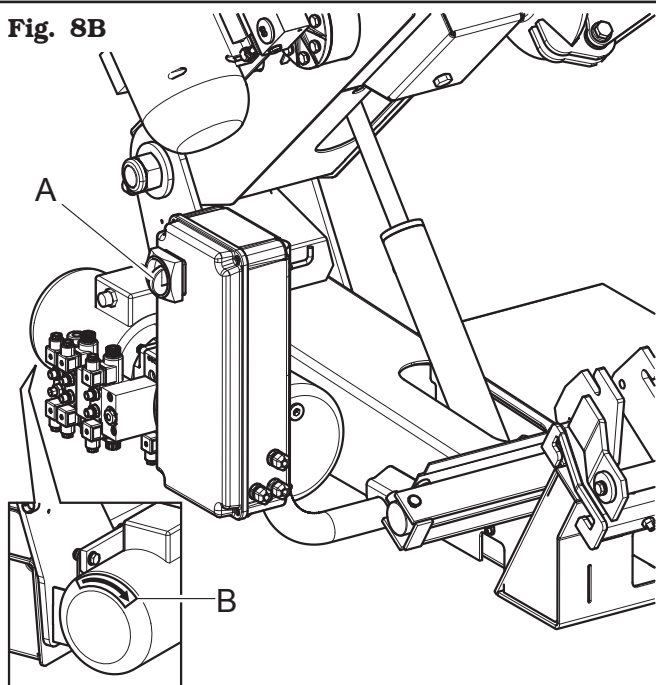


KEY

- A - Main switch
- B - Rotation direction of power unit motor

NAV11EI and NAV11TEI

Fig. 8B

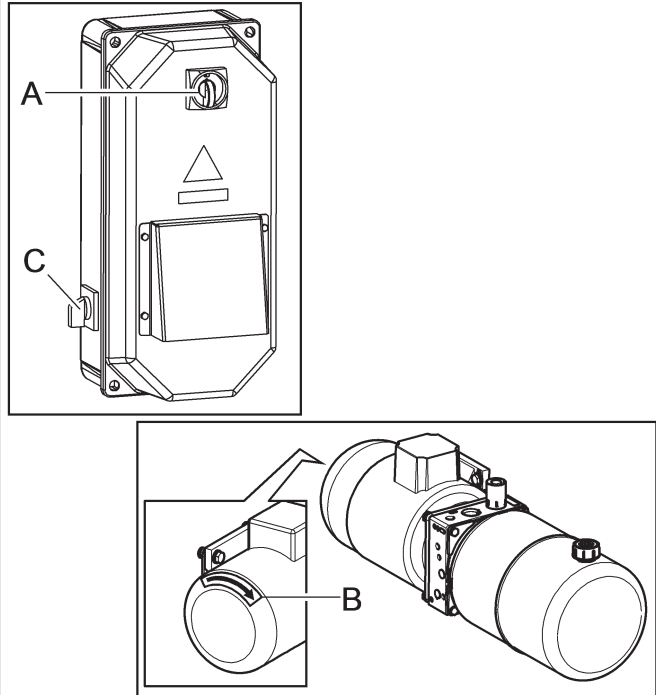


KEY

- A - Main switch
- B - Rotation direction of power unit motor

VARGNAV11ND version with inverter

Fig. 8C

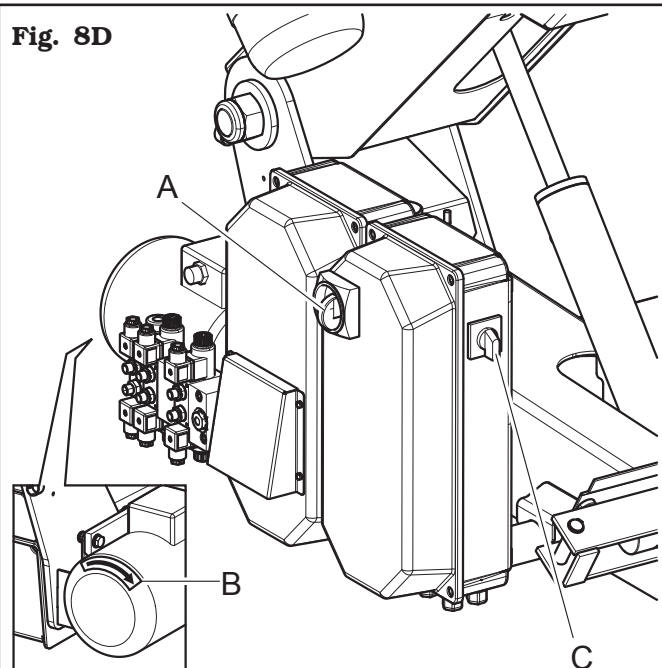


KEY

- A - Main switch
- B - Rotation direction of power unit motor
- C - Selector 1-0-2 (respectively 1-5-10 rpm) self-centring chuck speed control

VARGNAV11EID version with inverter

Fig. 8D



KEY

- A - Main switch
- B - Rotation direction of power unit motor
- C - Selector 1-0-2 (respectively 1-5-10 rpm) self-centring chuck speed control

11.0 CONTROLS

11.1 Control device (valid for NAV11N and NAV11NT models)

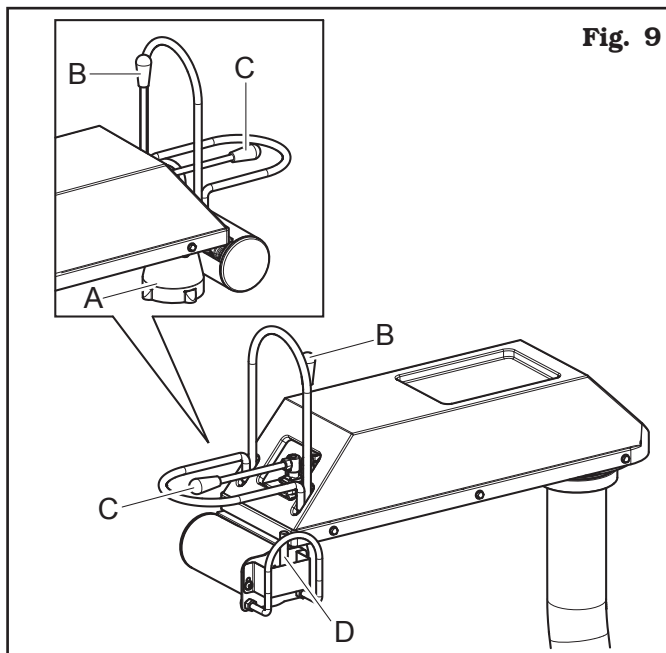
The control (handle control) can be moved according to the positioning necessities of the operator.



MAKE SURE THERE ARE NO PERSONS OR OBJECTS HIDDEN TO THE OPERATOR VISUAL FIELD BY THE WHEEL SIDE PLAY (ESPECIALLY IN CASE OF WHEELS WITH LARGE DIMENSIONS).

The control (**Fig. 9**) consists of:

- **“A” lower selector** (with protection) three-positions control for opening and closing of wheel holder mandrel: a central “firm” position for stop of mandrel opening/closing movement and two “hold activation” positions for mandrel jaws opening/closing;
- **“B” lever** three-positions control for tools holder carriage translation: a central “firm” position for translation stop and two “hold activation” positions for carriage supporting translation towards the mandrel and return;
- **“C” lever** three-positions control for vertical translation of mandrel arm: central “firm” position for movement stop and two “hold activation” positions for arm up and down translation;
- **“D” small lever** control for mandrel clockwise/anti-clockwise rotation;

**Fig. 9**

11.2 Control device (only for NAV11N and NAV11NT models with VARGNAV11ND version with inverter)

This control device consists of 2 units:

- control unit on machine,
- ground control unit.

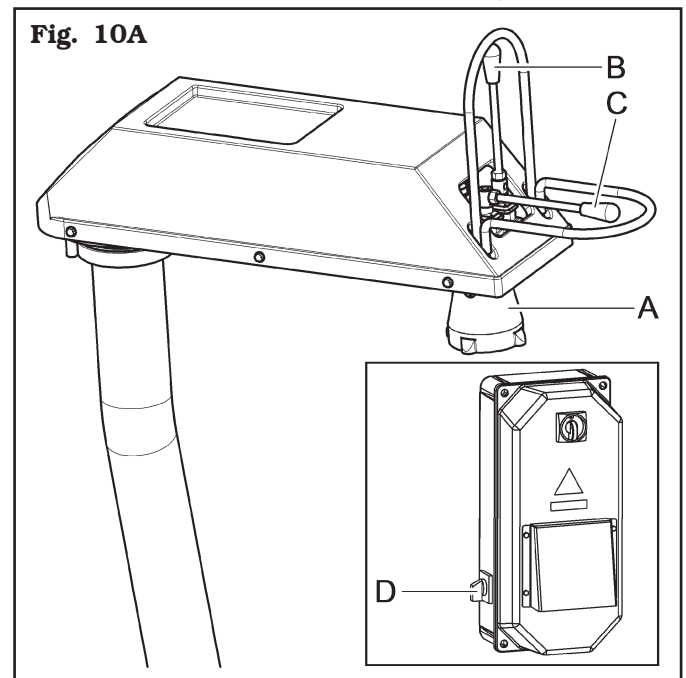
The control unit on machine (see **Fig. 10A**) can be moved according to the positioning necessities of the operator.




MAKE SURE THERE ARE NO PERSONS OR OBJECTS HIDDEN TO THE OPERATOR VISUAL FIELD BY THE WHEEL SIDE PLAY (ESPECIALLY IN CASE OF WHEELS WITH LARGE DIMENSIONS).

The control (**Fig. 10A**) consists of:

- **“A” lower selector** (with protection) three-positions control for opening and closing of wheel holder mandrel: a central “firm” position for stop of mandrel opening/closing movement and two “hold activation” positions for mandrel jaws opening/closing;
- **“B” lever** three-positions control for tools holder carriage translation: a central “firm” position for translation stop and two “hold activation” positions for carriage supporting translation towards the mandrel and return;
- **“C” lever** three-positions control for vertical translation of mandrel arm: central “firm” position for movement stop and two “hold activation” positions for arm up and down translation;
- **“D” selector**, three-positions, for mandrel rotation speed: position “0” for movement stop, position “1” for low speed and position “2” for high speed.


**Fig. 10A**

The ground control unit (see **Fig. 10B**) can be moved according to the positioning necessities of the operator. The operator should place the control in a zone free from obstacles in order to see clearly and completely the operative zone.

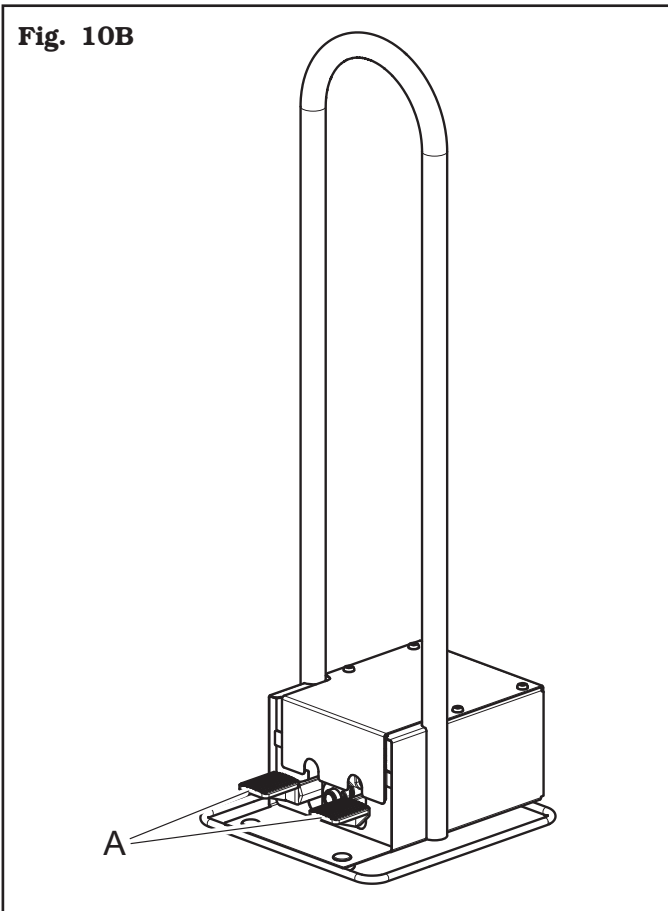


MAKE SURE THERE ARE NO PERSONS OR OBJECTS HIDDEN TO THE OPERATOR VISUAL FIELD BY THE WHEEL SIDE PLAY (ESPECIALLY IN CASE OF WHEELS WITH LARGE DIMENSIONS).

The “pedals **A**” operate the cw and ccw mandrel rotation.




THE HANDLE MUST NOT BE PLACED WHERE WATER STAGNATES.



11.3 Control device (valid for NAV11EI and NAV11TEI models)

The ground control unit (**Fig. 11**) can be moved according to the positioning necessities of the operator. The operator should place the control in a zone free from obstacles in order to see clearly and completely the operative zone.




MAKE SURE THERE ARE NO PERSONS OR OBJECTS HIDDEN TO THE OPERATOR VISUAL FIELD BY THE WHEEL SIDE PLAY (ESPECIALLY IN CASE OF WHEELS WITH LARGE DIMENSIONS).

The “lever **A**” has four maintained control operative positions:

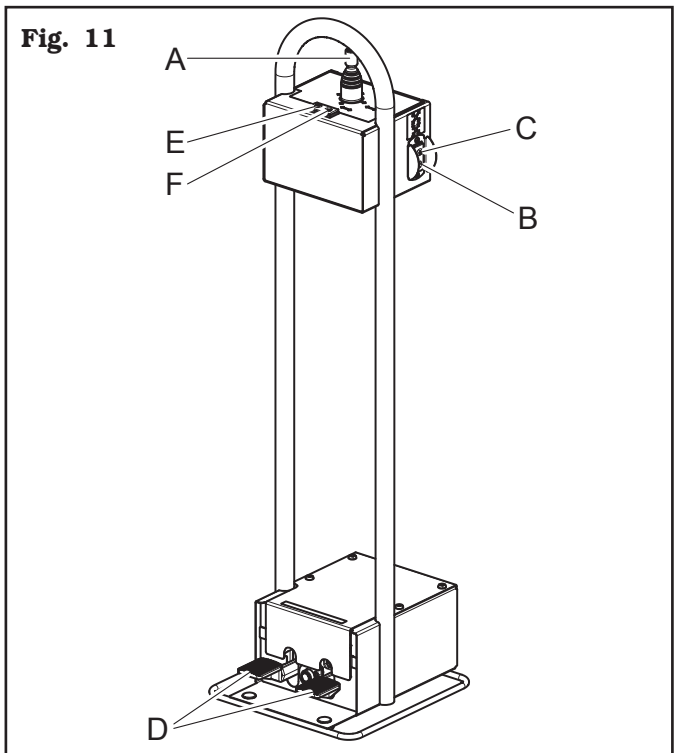
- Lever rightwards or leftwards, operates respectively the tool holder carriage shifting rightwards or leftwards.
 - Lever upwards or downwards: it operates respectively the rising and the lowering of the mandrel holding arm.
- “Push-button **B**” has a maintained control position, and once it is pressed, it operates the self-centring chuck opening.
- “Push-button **C**” has a maintained control position, and once it is pressed, it operates the self-centring chuck closing.

The “pedals **D**” operate the cw and ccw mandrel rotation. The “push-button **E**” operates the leftwards repositioning on the carriage.

The “push-button **F**” operates the leftwards repositioning on the carriage.



THE HANDLE MUST NOT BE PLACED WHERE WATER STAGNATES.



12.0 USING THE MACHINE

12.1 Precaution measures during tyre removal and fitting



Before fitting a tyre, observe the following safety rules:

- always use clean, dry and in good condition rims and tyres; in particular, if necessary, clean the rims after all the balancing weights (as well as the adhesive weights on the inner side) have been removed, and make sure that:
 - neither the bead nor the tread of the tyre are damaged.
 - the rim does not produce dents and/or deformation (especially for alloy rims, dents can cause internal micro-fractures, that pass unobserved at visual inspection, and can compromise the solidity of the rim and constitute danger even during inflation);
- adequately lubricate the contact surface of rim and tyre bead. Use specific tyre lubricants only.
- replace the inner tube valve with a new valve. If the tyre tube has a metal valve, replace the grommet.
- make sure that the tyre is the right size for the rim. Never fit a tyre unless you are sure it is the right size (the rated size of the rim and tyre is usually printed directly on each of them).
- do not use compressed air or water jets to clean the wheels on the machine.

12.2 Preliminary operations

In view of the tyre changer structure and of its intended use, the operator must work with wheels with large diameter (up to 1640 mm) and with remarkable weight (up to 1500 kg).

The utmost care while moving the wheels is recommended: make use of other operators, properly trained and with suitable clothes.

DURING ALL TYRES MOUNTING AND DEMOUNTING OPERATIONS, THE SELF-CENTRING CHUCK ROTATION SPEED CAN BE DOUBLED BY ROTATING THE SELECTOR (FIG. 8C-8D REF. C). LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT.

THE CAREFUL LUBRICATION OF THE TYRES BEADS IS RECOMMENDED, IN ORDER TO PROTECT THEM FROM POSSIBLE DAMAGES AND TO FACILITATE MOUNTING AND DEMOUNTING OPERATIONS.

12.3 Preparing the wheel

- Remove the wheel balancing weights from both sides of the wheel.



REMOVE THE VALVE STEM AND ALLOW THE TYRE TO COMPLETELY DEFLATE.

- Establish from which side the tyre should be demounted, checking the position of the groove.
- Find the rim locking type.

12.4 Wheel clamping



FOR WHAT CONCERNS THE DIMENSIONS AND WEIGHT OF THE WHEEL TO BE LOCKED, MAKE USE OF A SECOND OPERATOR WHO MUST HOLD THE WHEEL INTO VERTICAL POSITION, IN ORDER TO ENSURE SAFE OPERATIVE CONDITIONS.

When handling wheels weighing more than 500 Kg a fork-lift truck or a crane should be used.



MAKE SURE THAT RIM CLAMPING IS DONE PROPERLY AND THAT THE GRIP IS SAFE, TO PREVENT THE WHEEL FROM FALLING DURING MOUNTING OR REMOVAL OPERATIONS.



DO NOT CHANGE THE SET OPERATING PRESSURE VALUE BY MEANS OF THE MAXIMUM PRESSURE VALVES. THE MANUFACTURER SHALL NOT BE RESPONSIBLE FOR INJURY OR DAMAGE ARISING FROM UNAUTHORISED CHANGES.

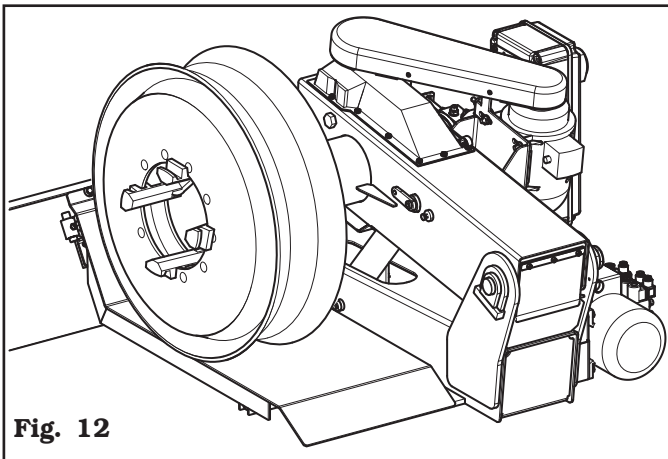


Fig. 12

Clamping on the central hole

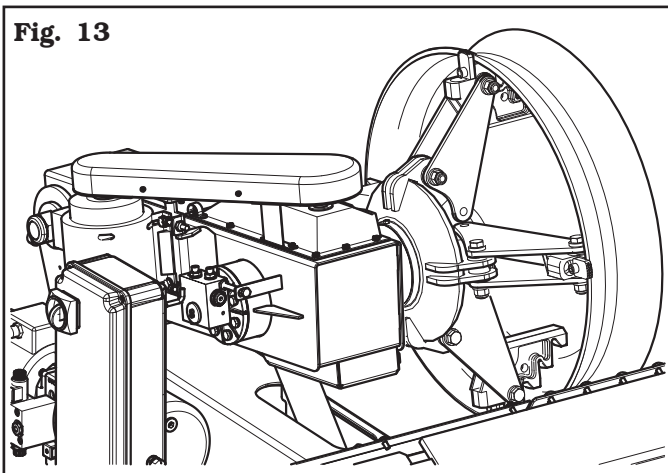


Fig. 13

Clamping on bead seat



OPENING/CLOSING MOVEMENT OF THE SELF-CENTRING MANDREL CAN GENERATE DANGER OF SQUASHING, CUTTING, COMPRESSING. DURING WHEEL LOCKING/UNLOCKING PHASE, AVOID THAT PARTS OF HUMAN BODY COME INTO CONTACT WITH MOVING PARTS OF THE MACHINE.

All wheels must be clamped from the inside.

Clamping on the central flange is always safest.

NOTE: for wheels with grooved rims secure the wheel so the groove is facing outward compared to the mandrel.

If it is not possible to clamp the rim in the hole of the disc, clamp on the bead seat close to the disc.

TO SECURE WHEELS WITH ALLOY RIMS ADDITIONAL PROTECTIVE JAWS ARE AVAILABLE. THEY ALLOW YOU TO WORK ON THE RIMS WITHOUT DAMAGING THEM. THE PROTECTIVE JAWS ARE FITTED ONTO THE MANDREL'S NORMAL JAWS BY MEANS OF A BAYONET CONNECTION.

To clamp the wheel proceed as follows:

- Manually move the tool holder arm to "off-work" position (**Fig. 15 ref. 1**);
- Move the movable footboard (**Fig. 1-2 ref. 15**) outside. Make the wheel rotate on the same footboard;
- Place the lock mandrel (**Fig. 1-2 ref. 5**) approximately in the centre of the wheel; move the footboard towards the mandrel and centre the wheel on it, in the most suitable position using the corresponding control levers;
- Adjust the opening of the self-centring chuck through the corresponding control (**Fig. 9 ref. A and Fig. 11 ref. B**) according to the type of rim to be locked;
- Lock the rim with the lock mandrel (**Fig. 1-2 ref. 5**);
- Make sure the rim is always correctly locked and centred, and the wheel is lifted from the machine platform, in order to prevent the rim from slipping in the following operations.



KEEP ON OPERATING RIM CLAMPING CONTROL, UNTIL REACHING THE MAXIMUM OPERATING PRESSURE (150 BAR), WHICH CAN BE CHECKED THROUGH THE PREARRANGED PRESSURE GAUGE.

DURING ALL TYRES MOUNTING AND DEMOUNTING OPERATIONS, THE SELF-CENTRING CHUCK ROTATION SPEED CAN BE DOUBLED BY ROTATING THE SELECTOR (FIG. 8C-8D REF. C). LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT.

THE CAREFUL LUBRICATION OF THE TYRES BEADS IS RECOMMENDED, IN ORDER TO PROTECT THEM FROM POSSIBLE DAMAGES AND TO FACILITATE MOUNTING AND DEMOUNTING OPERATIONS.

To avoid damages or scratches on light alloy rims, the special jaws supplied with the tyre changer as an optional should be used.



AFTER COMPLETION OF TYRE MOUNT/DEMOUNT OPERATIONS DO NOT LEAVE THE WHEEL CLAMPED ON THE SELF-CENTRING CHUCK AND NEVER LEAVE IT UNATTENDED ANYWAY.

DURING ALL TYRES MOUNTING AND DEMOUNTING OPERATIONS, THE SELF-CENTRING CHUCK ROTATION SPEED CAN BE DOUBLED BY ROTATING THE SELECTOR (FIG. 8C-8D REF. C). LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT.

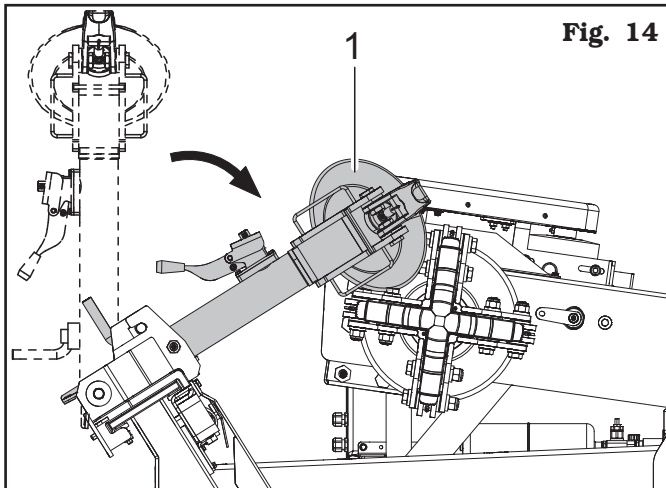
THE CAREFUL LUBRICATION OF THE TYRES BEADS IS RECOMMENDED, IN ORDER TO PROTECT THEM FROM POSSIBLE DAMAGES AND TO FACILITATE MOUNTING AND DEMOUNTING OPERATIONS.

12.5 Functioning of tool holder arm

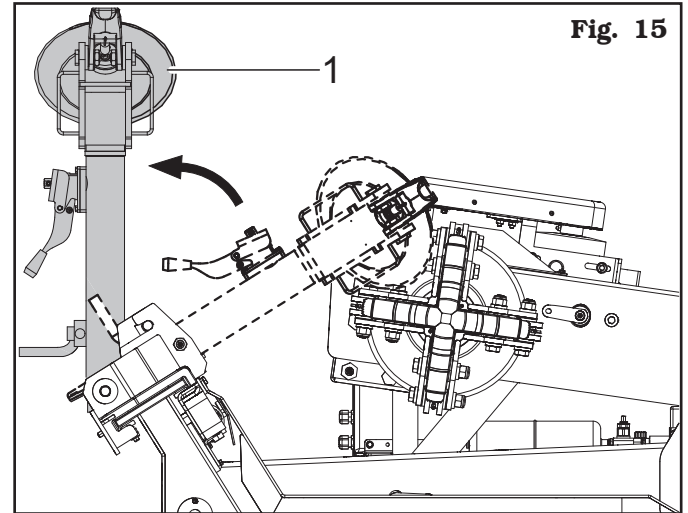
During the working phases, the tool holder arm can maintain two firm positions, that is:

- 1) "Working" position;
- 2) "Out of work" position.

In "working" position (**Fig. 14 ref. 1**) the tool holder arm is lowered towards the mandrel and from this position it executes the various tyre bead breaking, demounting and mounting operations.



In "out of work" position (**Fig. 15 ref. 1**): the tool holder arm is in vertical position and has to be brought in this position every time it is not in use and in order to be shifted from one tyre bead side to another, during working phase.

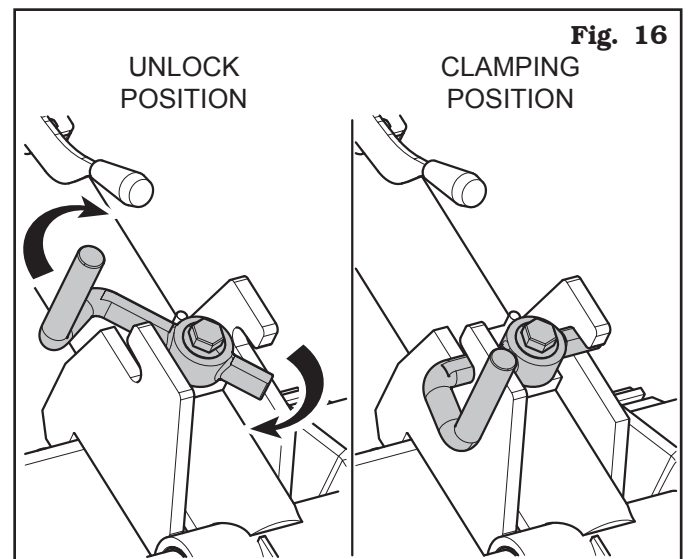


The tool holder arm, shifts from "off-work" position to "working" position and vice versa manually.



IN WORKING POSITION, THE COUPLING LEVER (FIG. 1 REF. 8) MUST BE CORRECTLY HOOKED TO THE TOOL CARRIAGE CLAMPING PROFILES (SEE FIG. 16).

When the tool holder arm is in "off-work" position, it can be laterally shifted in manual mode in one of the two pre-set positions on the carriage, so that it can better positioned (according to the operations to be performed afterwards) before it reaches "working" position again.



12.5.1 Tools rotation

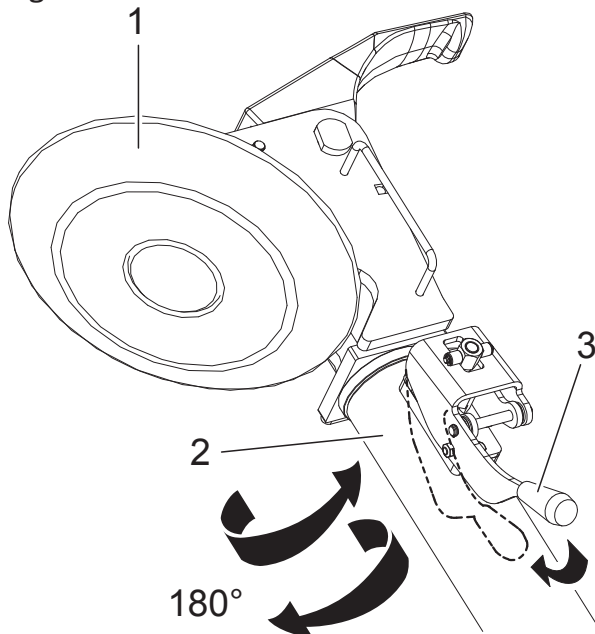


THE FOLLOWING OPERATIONS MUST BE CARRIED OUT WITH THE TOOLS HEAD IN "OFF-WORK" POSITION.

The machine is equipped with a Quick-fit tool, remarkably facilitating the tools unit rotation operations. Here follows the description of these operations.

In order to rotate the tool head (**Fig. 17 ref. 1**) just push the unlocking lever (**Fig. 17 ref. 3**) towards the tool arm (**Fig. 17 ref. 2**). When the new working position of the head is reached (**Fig. 17 ref. 1**) the lever (**Fig. 17 ref. 3**) automatically inserts locking its rotation.

Fig. 17



12.6 Tubeless tyres

12.6.1 Bead breaking



NEVER PLACE ANY PART OF YOUR BODY BETWEEN THE TOOL UNIT AND THE TYRE.



THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

- A. Lock the wheel on the mandrel as described in the previous paragraph.
- B. Remove all balancing weights from the rim. Extract the valve and let air out of tyre.
- C. Move to work position C (**Fig. 6**).
- D. Lower tool holder arm into work position (coupling lever introduced, see **Fig. 16**).



ALWAYS MAKE SURE THAT THE ARM IS CORRECTLY HOOKED TO CARRIAGE.

- E. Place as shown in **Fig. 18** the beading disc (**Fig. 18 ref. 1**) by means of the relevant handle control; the outer profile of the rim (**Fig. 18 ref. 2**) must almost touch the beading disc.

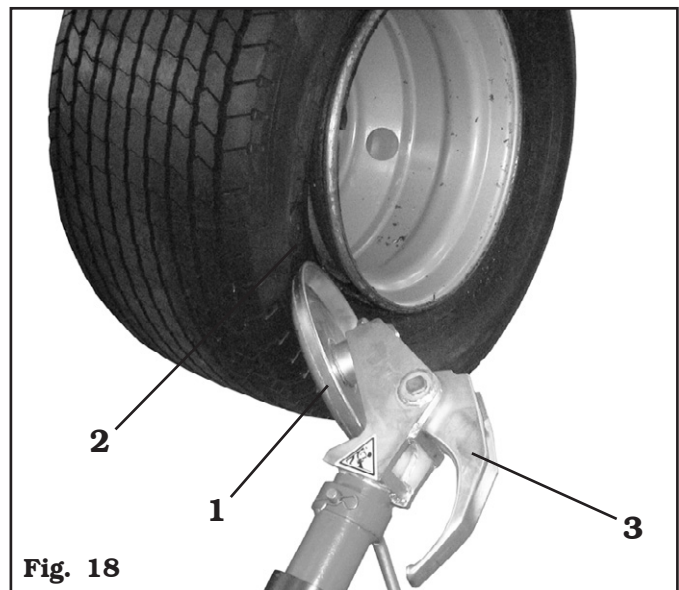


Fig. 18



THE BEADING DISC MUST NOT EXERT PRESSURE ON THE RIM BUT ON THE TYRE BEAD.

- F.** Turn the mandrel counterclockwise and, at the same time, gradually move the tool carrier inwards to bead the tyre. Continue to turn the mandrel while generously lubricating the tyre rim and bead with a suitable lubricant. To avoid risks, lubricate the beads by turning clockwise if you are working on the outer side or counterclockwise if you are working on the inner side. The more the wheel adheres to the rim, the slower should the beading disc advance.



USE ONLY TYRE LUBRICANTS. SUITABLE LUBRICANTS CONTAIN NO WATER, HYDROCARBONS, OR SILICON.

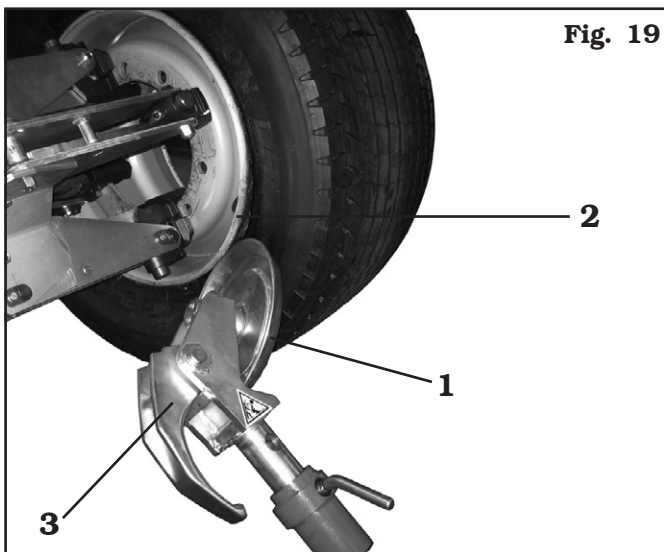
- G.** Once external beading has been carried out, unhook and lift the tool holder arm placing it in "off-work" position (**Fig. 15 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel, then place it in work position (**Fig. 14 ref. 1**) and secure it with the special coupling lever.



PAY ATTENTION WHEN REPOSITIONING THE TOOL HOLDER ARM TO AVOID CRUSHING HANDS.

- H.** Carry out the tools holder head 180° rotation according to the descriptions of the relevant paragraph, so that the beading disc (**Fig. 19 ref. 1**) is placed against the rim edge (**Fig. 19 ref. 2**).
- I.** Move to work position **D** (**Fig. 6**) and repeat the operations described in points **E**, **F** until the tyre has been completely beaded.

During all beading operations it is advisable to bend the hook tool (**Fig 18 and 19 ref. 3**) to avoid obstacles during the operating phases.

**Fig. 19**

12.6.2 Demounting



THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

Tubeless tyres can be removed in two ways:

- A.** If the wheel does not present particular problems, continuing beading operation will completely dislodge the beads from the rim. The inner bead, pushed by the disc, presses against the outer one till it has been completely removed (see **Fig. 20**).

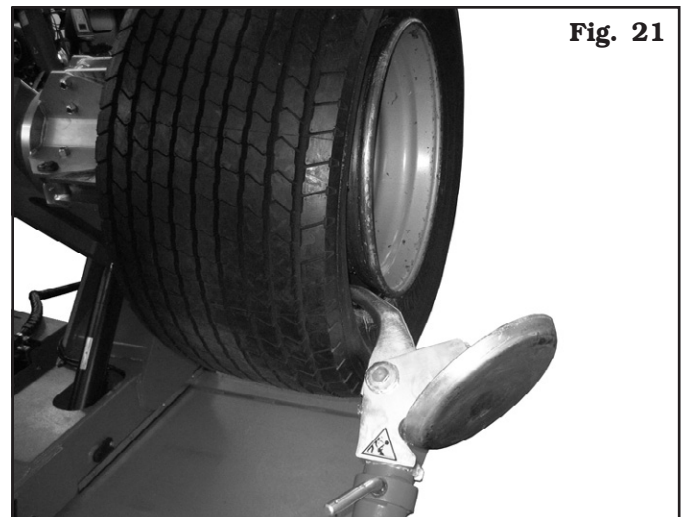
**Fig. 20**

- B.** If the wheel is especially hard, it is not possible to carry out the procedure described in point **A**. A different procedure will be necessary: use the hook tool and follow this sequence of operations:

- Move to work position **C** (**Fig. 6**).

Only for NAV11N and NAV11EI versions

- Position the tool holder arm on the outer side of the wheel and bring forward the hook tool, inserting it between rim and bead until it is secured to the bead itself (see **Fig. 21**).

**Fig. 21**

- Move the rim away from the tool by about 4-5 cm to avoid possible unhooking of the bead from the same tool.
- Move to work position **A** (**Fig. 6**).
- Translate the tool outwards (**Fig. 22 ref. 2**) to allow easy insertion of lever (**Fig. 22 ref. 1**) between the rim and the bead; insert lever (**Fig. 22 ref. 1**) between the rim and the bead on the right-hand side of the tool (**Fig. 22 ref. 2**).

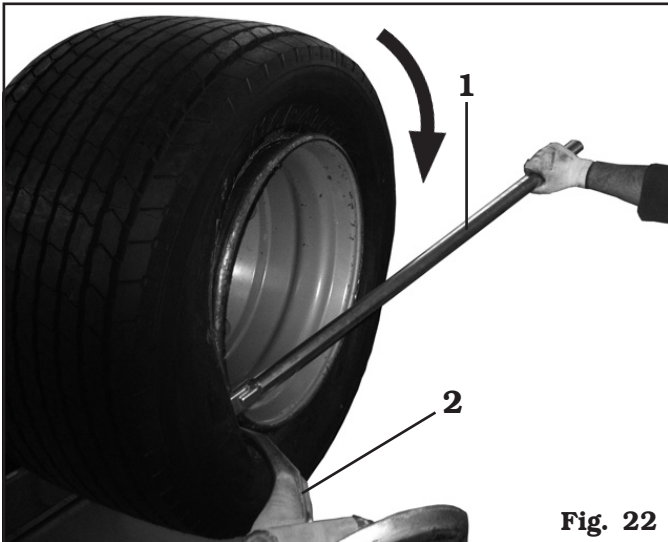


Fig. 22

- Keeping the lever pressed, lower the wheel until the edge of the rim is 5 mm distant from the hook tool.
- Turn the wheel clockwise keeping lever pressed (**Fig. 22 ref. 1**) until the bead has gone completely out.

Only for NAV11NT and NAV11TEI versions



BEFORE STARTING DEMOUNTING THE 1ST BEAD THE SPRING LOCKING DEVICE OF THE TOOL MUST BE EXTRACTED OUTWARDS (FIG. 23 REF. 1).

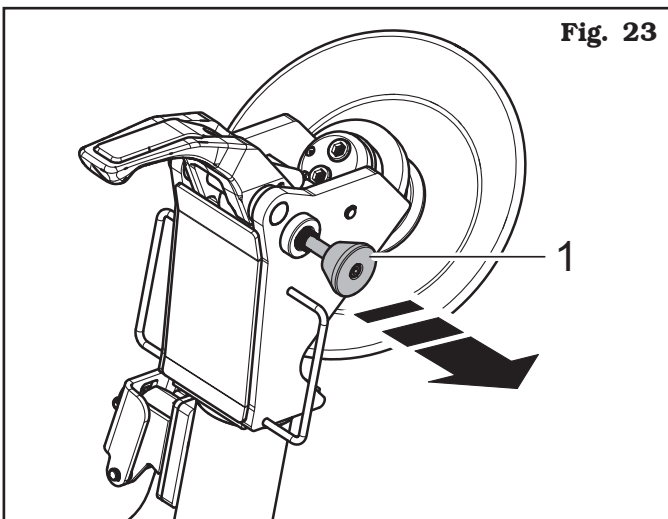


Fig. 23

- Position the tool holder arm on the outer side of the wheel and bring forward the hook tool, inserting it between rim and bead until it is secured to the bead itself (see **Fig. 24 ref. A**).

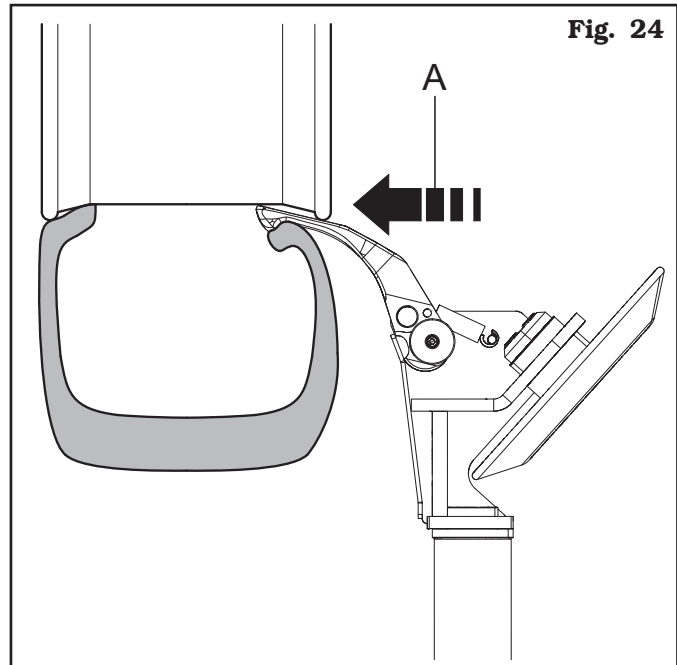


Fig. 24

- Translate the tool outwards (**Fig. 25 ref. B**) until the first bead is brought outside the rim.

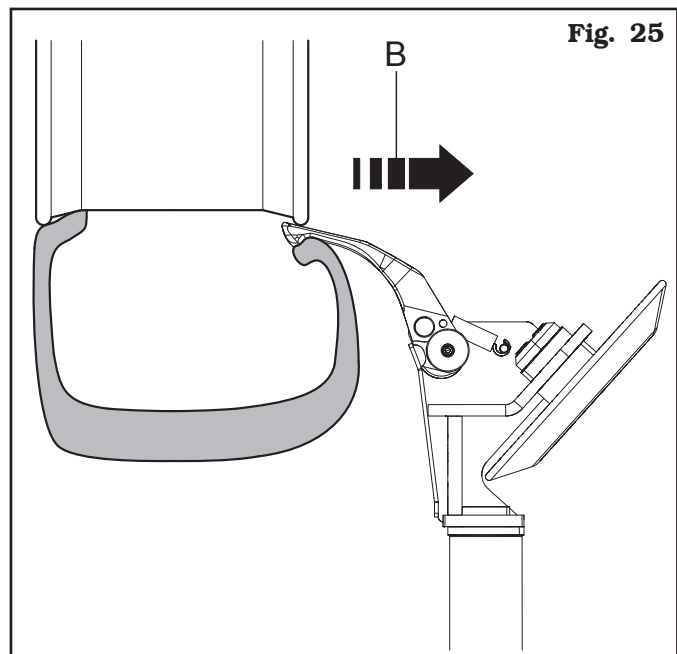
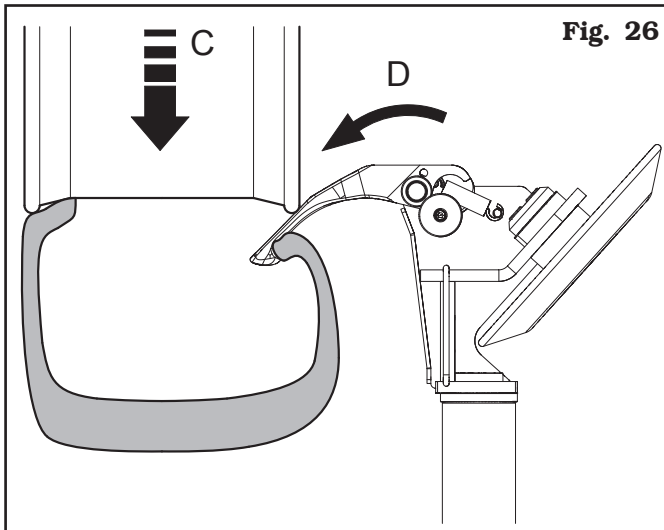
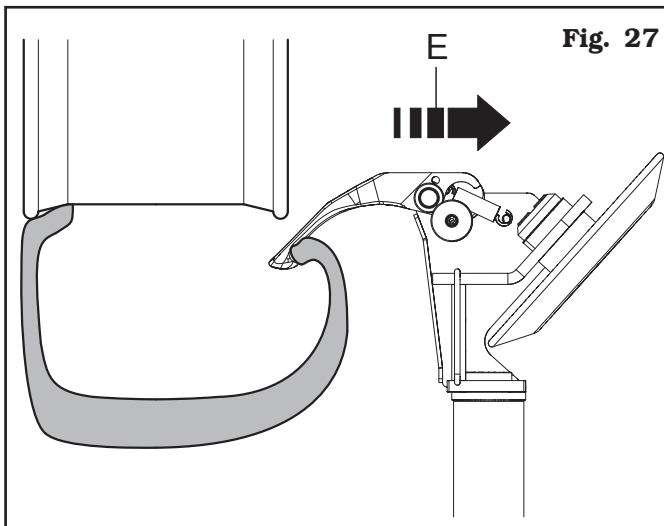


Fig. 25

- Lower the mandrel (**Fig. 26 ref. C**) until locking the tool in the extraction position (**Fig. 26 ref. D**).



- Translate the tool outwards (**Fig. 27 ref. E**) until the bead is brought to mounting position.



- Then rotate the wheel clockwise until the first bead has completely gone out.

For all versions

- Once the external bead has been removed, move tool holder arm away from the wheel, unhook it and lift it bringing it in "off-work" position (**Fig. 15 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel then place it in work position again (**Fig. 14 ref. 1**) and secure with the coupling lever provided.



PAY ATTENTION WHEN REPOSITIONING THE TOOL HOLDER ARM TO AVOID CRUSHING HANDS.



ALWAYS MAKE SURE THAT THE ARM IS CORRECTLY HOOKED TO CARRIAGE.

- Move to work position **D** (**Fig. 6**).
- Carry out the tools holder head 180° rotation in order to insert the hook tool (**Fig. 28 ref. 1**) between the rim edge and the tyre bead.


Fig. 28


- Move the rim away from the tool by about 4-5 cm to avoid possible unhooking of the bead from the same tool.
- Move to work position **B** (**Fig. 6**).
- Translate the hook tool outwards to allow easy insertion of the lever between the rim and the bead on the tool left. Keeping the lever pressed, lower the wheel until the edge of the rim is 5 mm distant from the hook tool then turn the mandrel counterclockwise until the tyre has been completely removed.



THE REMOVAL OF THE BEADS FROM THE RIM CAUSES THE TYRE TO FALL. ALWAYS MAKE SURE THAT NO ONE IS STANDING BY ACCIDENT IN THE WORK AREA.

12.6.3 Mounting

 **WHEN DEMOUNTING VERY HEAVY TYRES, IT IS IMPORTANT TO MOVE THE WHEEL AS CLOSE AS POSSIBLE TO THE BASE BEFORE COMPLETING THE OPERATION.**


 **THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).**

Tubeless tyre fitting is normally done with the disc tool; if the wheel is especially hard to fit, use the hook tool.

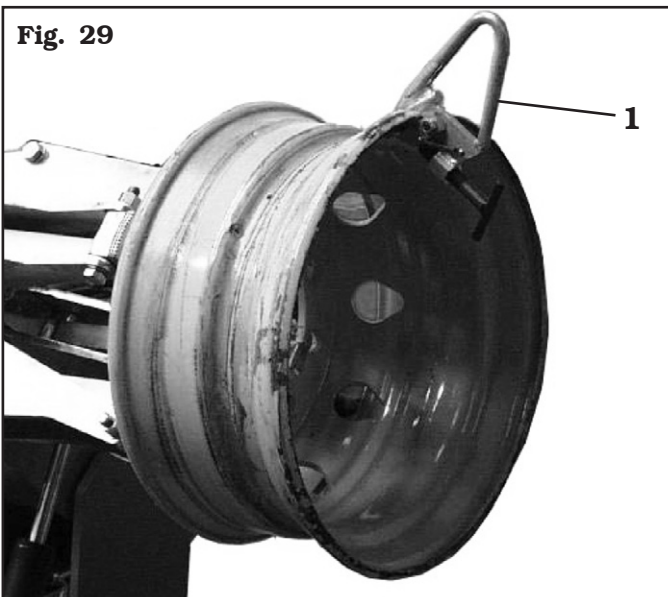
With beading disc


Proceed as follows:

- Secure the rim to the mandrel according to the procedure described in paragraph "WHEEL CLAMPING".
- Adequately lubricate the tyre beads and the rim bead seat with a suitable lubricant using the provided brush.

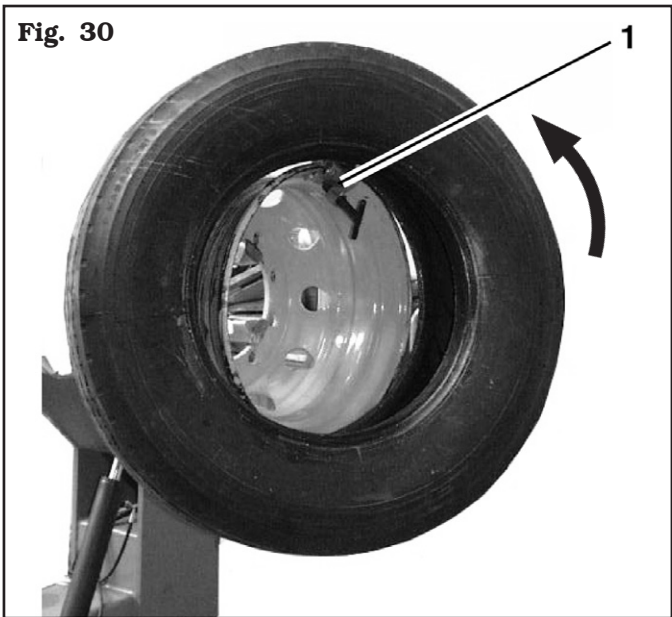
 **USE ONLY TYRE LUBRICANTS. SUITABLE LUBRICANTS CONTAIN NO WATER, HYDROCARBONS, OR SILICON.**

- Mount grippers (**Fig. 29 ref. 1**) on the external edge of the rim in the highest point as shown in **Fig. 29**.

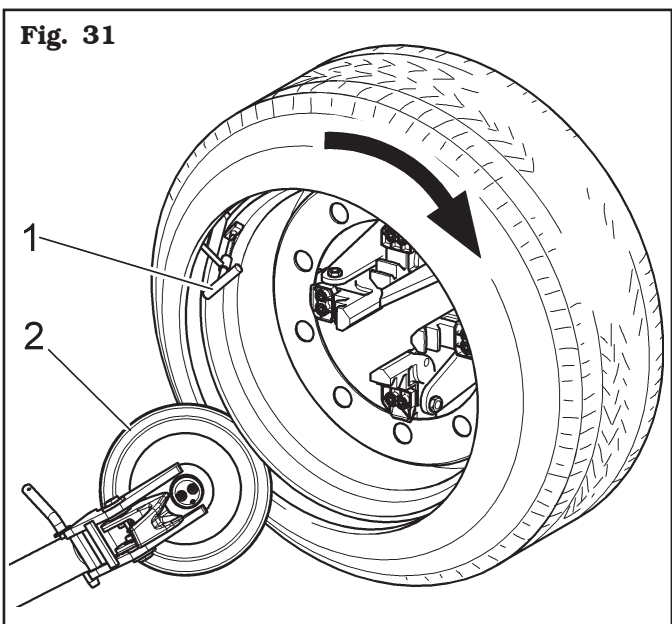


 **THE GRIPPERS MUST BE TIGHTLY SECURED TO THE EDGE OF THE RIM.**

- Move to work position **B (Fig. 6)**.
- Lower the mandrel arm completely. Roll the tyre on the platform and hook it to clamp (**Fig. 30 ref. 1**).
- Lift the mandrel arm with the tyre hooked and turn it counterclockwise by about 15-20 cm; the tyre will position itself sideways with respect to the rim (**Fig. 30**).



- Move to work position **C (Fig. 6)**.
- Position beading disc (**Fig. 31 ref. 2**) so that it is at approximately 1.5 cm (1/2") from the edge of the rim. Fitting clamp (**Fig. 31 ref. 1**) is at 11 o'clock. Turn the mandrel until the grippers reach the lowest point (6 o'clock).



- Move the beading disc away from the wheel.
- Remove the grippers and fit them in the same position (6 o'clock) outside the second bead.
- Turn the mandrel 90° clockwise until the grippers are at 9 o'clock.
- Move the beading disc forward until it is inside the edge of the rim by about 1-2 cm, making sure it is approximately 5 mm from the profile. Begin clockwise rotation making sure that, after a 90° turn, the second bead begins to slide in the rim groove.
- Once insertion is completed, move the tool away from the wheel, turn it over into "out of work" position and remove the grippers.
- Lower the mandrel until the wheel rests on the footboard.
- Move to work position **A** (**Fig. 6**).
- Close the mandrel jaws completely, making sure the wheel is held up to avoid dropping.



MAKE SURE THAT THE WHEEL'S HOLD IS SECURE TO AVOID IT FALLING DURING REMOVAL. FOR HEAVY AND/OR VERY LARGE WHEELS USE AN ADEQUATE LIFTING DEVICE.

- Translate the movable footboard to release the wheel from the same mandrel. With especially soft tyres, simultaneously insert both beads on the jaw so that bead insertion in the tyre is done only once; this single operation is ideal for saving time.

With hook tool

Proceed as follows:

- Secure the rim to the mandrel according to the procedure described in paragraph "WHEEL CLAMPING".
- Adequately lubricate the tyre beads and the rim bead seat with a suitable lubricant using the provided brush.



USE ONLY TYRE LUBRICANTS. SUITABLE LUBRICANTS CONTAIN NO WATER, HYDROCARBONS, OR SILICON.

- Mount grippers (**Fig. 29 ref. 1**) on the external edge of the rim in the highest point.



THE GRIPPERS MUST BE TIGHTLY SECURED TO THE EDGE OF THE RIM.


- Move to work position **B** (**Fig. 6**).
- Lower the mandrel arm completely. Roll the tyre on the platform and hook it to clamp (**Fig. 30 ref. 1**).
- Lift the mandrel arm with the tyre hooked and turn it counterclockwise by about 15-20 cm; the tyre will position itself sideways with respect to the rim (**Fig. 30**).
- Place the tool holder arm in "off-work" position (**Fig. 15 ref. 1**); translate it to the inner side of the tyre and hook it again into work position (**Fig. 14 ref. 1**).
- Carry out the tools head 180° rotation until the hook tool is moved onto the tyre side (see **Fig. 32**).

Fig. 32



- Move to work position **D** (**Fig. 6**).
- Move the tool forward until the reference notch matches the external edge of the rim coincide at about 5 mm from the rim itself.
- Move to work position **C** (**Fig. 6**).
- From the external side of the wheel, check the exact position of the tool and, if necessary, correct it. Then, turn the mandrel clockwise until the grippers reach the lowest point (6 o'clock). The first bead should now be inserted in the rim.
- Remove the grippers.
- Move to work position **D** (**Fig. 6**).
- Extract the tool from the tyre.
- Place the tool holder arm in "off-work" position (**Fig. 15 ref. 1**); translate it to the outer side of the tyre and hook it again into "work" position (**Fig. 14 ref. 1**).
- Carry out the tools head 180° rotation until the hook tool is moved onto the tyre side (see **Fig. 21**).

- Mount the grippers in the lowest point (6 o'clock) outside the second bead.
- Move to work position **C** (Fig. 6).
- Turn the mandrel 90° clockwise until the grippers are at 9 o'clock.
- Move the tool forward until the axis of the reference notch matches that of the external edge of the rim at about 5 mm from the rim itself (Fig. 21). Begin clockwise rotation making sure that, after a 90° turn, the second bead begins to slide in the rim groove. Turn until the grippers reach the lowest point (6 o'clock). The second bead should now be inserted in the rim.
- Move the tool away from the wheel, turn it over into "out of work" position and remove the grippers.
- Lower the mandrel until the wheel rests on the footboard.
- Move to work position **A** (Fig. 6).
- Close the mandrel jaws completely, making sure the wheel is held up to avoid dropping.




MAKE SURE THAT THE WHEEL'S HOLD IS SECURE TO AVOID IT FALLING DURING REMOVAL. FOR HEAVY AND/OR VERY LARGE WHEELS USE AN ADEQUATE LIFTING DEVICE.

- Translate the movable footboard to release the wheel from the same mandrel.


12.7 Tyres with inner tube

12.7.1 Bead breaking




REMOVE THE LOCK NUT OF THE INNER TUBE VALVE TO ALLOW ITS EXTRACTION DURING TYRE REMOVAL PHASES; REMOVE THE NUT WHEN DEFLATING THE TYRE.

The beading procedure is the same one described for tubeless tyres.




WHEN BEADING WHEELS WITH INNER TUBES, INTERRUPT THE FORWARD MOVEMENT OF THE BEADING DISC AS SOON AS THE BEADS HAVE BEEN DISLODGED TO AVOID DAMAGE TO THE INNER TUBE OR TO THE VALVE.

12.7.2 Demounting




THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

- Tilt up tool holder arm, unhook it and lift it placing it in "out of work" position (Fig. 15 ref. 1); use the handle control to position the tool holder arm on the outer side of the wheel then place it in "working" position (Fig. 14 ref. 1) and secure with the coupling lever provided (Fig. 1-2 ref. 8).

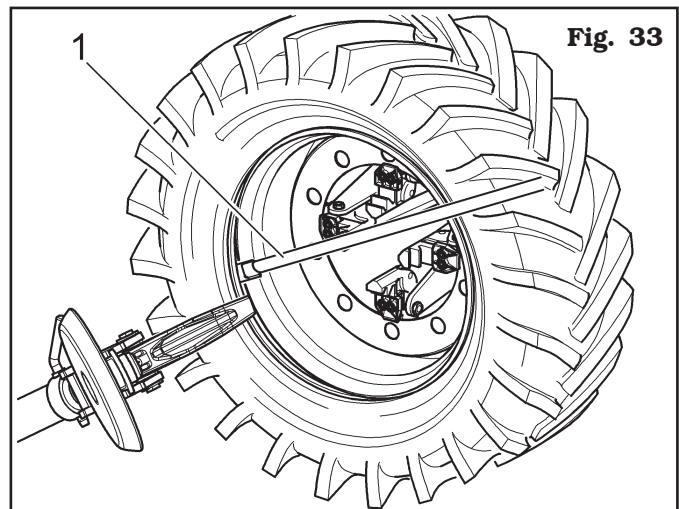


PAY ATTENTION WHEN REPOSITIONING THE TOOL HOLDER ARM TO AVOID CRUSHING HANDS.

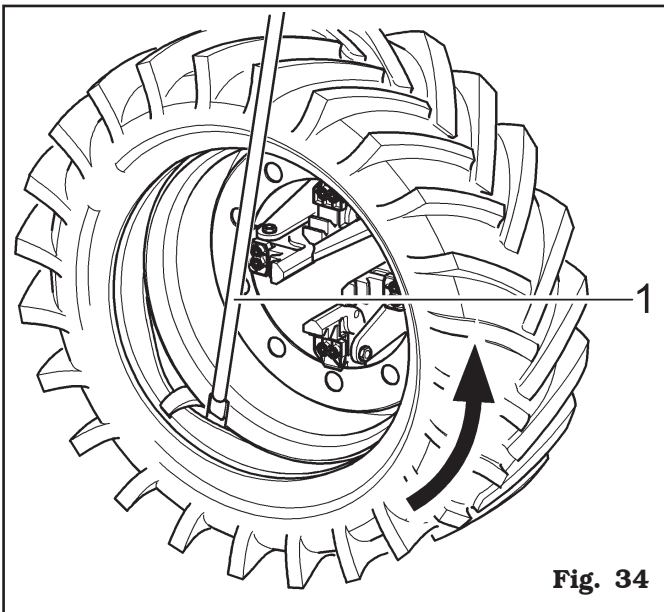


ALWAYS MAKE SURE THAT THE ARM IS CORRECTLY HOOKED TO CARRIAGE.

- Carry out the tools holder head 180° rotation, according to the descriptions in the relevant paragraph, in order to insert the hook between the rim edge and the tyre bead; the operation must be carried out during mandrel rotation.
- Move the rim away from the tool by about 4-5 cm to avoid possible unhooking of the bead from the same tool.
- Translate the hook tool outwards until the reference notch matches the external edge of the rim.
- Move to work position **A** (Fig. 6).
- Insert lever (Fig. 33 ref. 1) between the rim and the bead on the right-hand side of the tool.



- Keeping the lever pressed, lower the wheel until the edge of the rim is approximately 5 mm distant from the hook tool.
- Turn the wheel clockwise keeping lever pressed until the bead has gone completely out.
- Move away the tool holder arm in “out of work” position (**Fig. 15 ref. 1**); lower the mandrel until the tyre rests on the movable footboard; exert a certain pressure on it so that when the movable footboard is moved outwards, this will create enough space to extract the inner tube.
- Extract the inner tube and lift the wheel.
- Move to work position **D** (**Fig. 6**).
- Tilt up tool holder arm, unhook it and lift it placing it in “off-work” position (**Fig. 15 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel then place it in work position (**Fig. 14 ref. 1**) and secure with the coupling lever provided (**Fig. 1-2 ref. 8**).
- Carry out the tools holder head 180° rotation, according to the descriptions in the relevant paragraph, in order to insert the hook between the rim edge and the tyre bead; the operation must be carried out during mandrel rotation.
- Move the rim away from the tool by about 4-5 cm to avoid possible unhooking of the bead from the same tool.
- Move to work position **A** (**Fig. 6**).
- Translate the hook tool outwards until the reference notch is 3 cm inside the rim.
- Insert the lever (**Fig. 34 ref. 1**) between rim (**Fig. 34 ref. 2**) and bead (**Fig. 34 ref. 3**) on the tool right.

**Fig. 34**

- Keeping the lever pressed, lower the wheel until the edge of the rim is approximately 5 mm distant from the hook tool then turn the mandrel counterclockwise keeping the lever (**Fig. 34 ref. 1**) pressed until the tyre has been completely dislodged from the rim.



THE REMOVAL OF THE BEADS FROM THE RIM CAUSES THE TYRE TO FALL. ALWAYS MAKE SURE THAT NO ONE IS STANDING BY ACCIDENT IN THE WORK AREA.



WHEN DEMOUNTING VERY HEAVY TYRES, IT IS IMPORTANT TO MOVE THE WHEEL AS CLOSE AS POSSIBLE TO THE BASE BEFORE COMPLETING THE OPERATION.

12.7.3 Mounting



THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

- Secure the rim to the mandrel according to the procedure described in paragraph “WHEEL CLAMPING”.
- Adequately lubricate the tyre beads and the rim bead seat with a suitable lubricant using the provided brush.



USE ONLY TYRE LUBRICANTS. SUITABLE LUBRICANTS CONTAIN NO WATER, HYDROCARBONS, OR SILICON.

- Mount grippers (**Fig. 29 ref. 1**) on the external edge of the rim in the highest point as shown in **Fig. 29**.



THE GRIPPERS MUST BE TIGHTLY SECURED TO THE EDGE OF THE RIM.

- Move to work position **B** (**Fig. 6**).
- Position the tyre on the footboard and lower the mandrel (make sure that the grippers are in the highest point) to hook the first tyre bead (internal bead).

- Lift the mandrel arm with the tyre hooked and turn it counterclockwise by about 15-20 cm; the tyre will position itself sideways with respect to the rim.
- Tilt up tool holder arm, unhook it and lift it placing it in "off-work" position (**Fig. 15 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel then place it in work position (**Fig. 14 ref. 1**) and secure with the coupling lever provided.



PAY ATTENTION WHEN REPOSITIONING THE TOOL HOLDER ARM TO AVOID CRUSHING HANDS.



ALWAYS MAKE SURE THAT THE ARM IS CORRECTLY HOOKED TO CARRIAGE.

- Carry out the tools holder head 180° rotation, according to the descriptions in the relevant paragraph, in order to insert the hook between the rim edge and the tyre bead; the operation must be carried out during mandrel rotation.
- Move to work position **D (Fig. 6)**.
- Move the tool forward until the axis of the reference notch matches that of the external edge of the rim at about 5 mm from the rim itself (see **Fig. 35**).

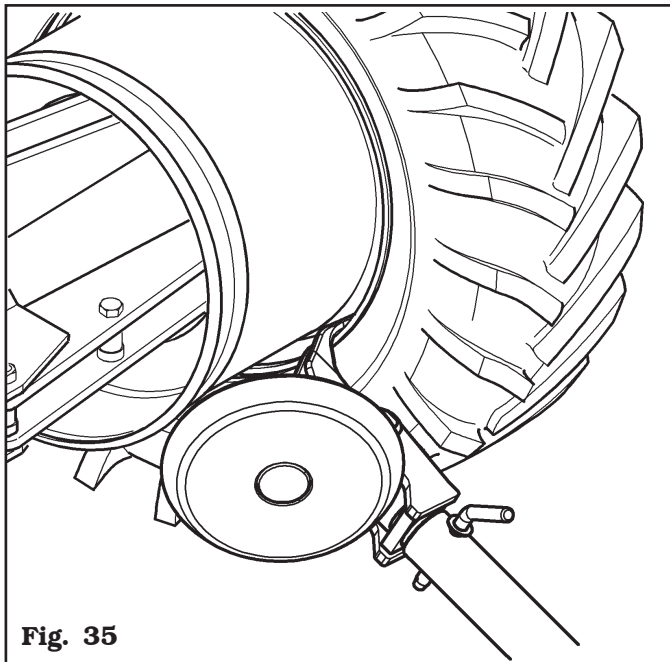


Fig. 35

- Move to work position **C (Fig. 6)**.
- From the external side of the wheel, check the exact position of the tool and, if necessary, correct it. Then, turn the mandrel clockwise until the grippers reach the lowest point (6 o'clock). The first bead should now be inserted in the rim, therefore remove the grippers.

- Move to work position **D (Fig. 6)**.
- Extract the tool hook from the tyre.
- Place the tool holder arm in "out of work" position (**Fig. 15 ref. 1**) and translate it to the outer side of the tyre.
- Carry out the tools holder head 180° rotation, according to the descriptions in the relevant paragraph.
- Move to work position **B (Fig. 6)**.
- Turn the mandrel to position the hole to insert the valve downward (6 o'clock).
- Position mobile platform (**Fig. 1-2 ref. 15**) directly above the wheel and lower the mandrel until the wheel rests on the platform. Translate the movalbe footboard outwards to create enough space between the tyre edge and the rim to insert the inner tube. **Note: the valve hole could be in an asymmetric position with respect to the centre of the rim. In this case it is necessary to position and introduce the inner tube as shown in Figure 36.**

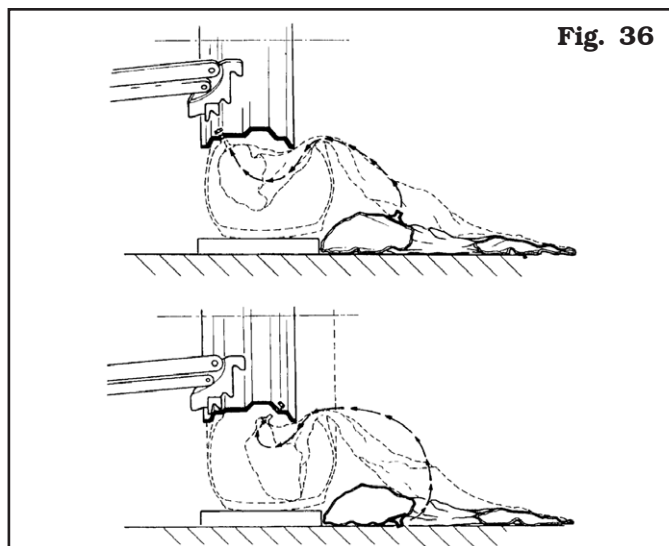
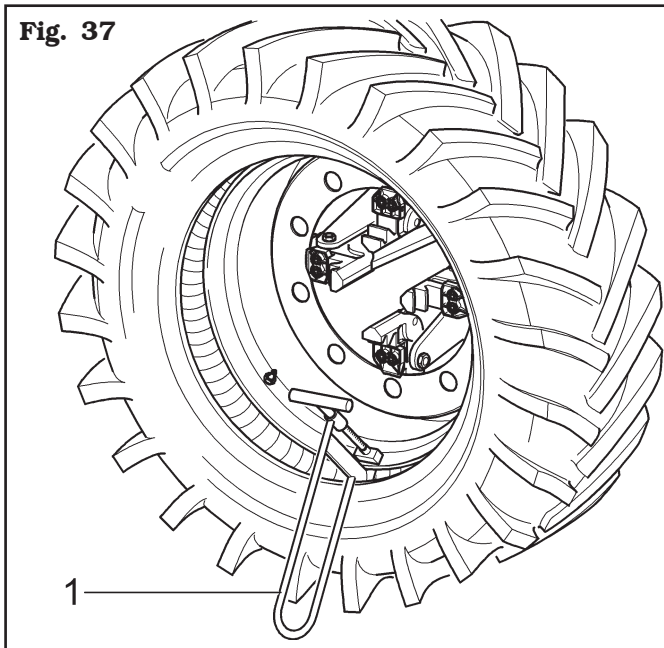


Fig. 36

Introduce the valve in the hole and fix it with the provided ring nut. Introduce the inner tube in the central groove of the rim (to make this operation easier, it is advisable to simultaneously turn the mandrel clockwise).

- Turn the mandrel and position the valve downwards (6 o'clock).
- To avoid damaging the inner tube, slightly inflate it when inserting the second bead.
- To avoid damaging the valve when fitting the second bead, remove the fixing ring nut and mount an extension on the same valve.
- Move to work position **C (Fig. 6)**.
- Lift the mandrel and mount the grippers (**Fig. 37 ref. 1**) on the rim outside the second bead at about 20 cm from the inflating valve on the right.
- Turn the mandrel clockwise until grippers (**Fig. 37 ref. 1**) are positioned at 9 o'clock.

Fig. 37



- Place the tool holder arm in “working” position (**Fig. 14 ref. 1**) on the outer side of the tyre.
- Place the hook tool in work position and bring the tool holder arm forward until the axis of the reference notch matches that of the outer edge of the rim at a distance of 5 mm.
- Turn the mandrel clockwise until lever (**Fig. 38 ref. 1**) is introduced in the housing obtained on the hook tool.
- Turn the mandrel with lever (**Fig. 38 ref. 1**) hooked until complete insertion of the tyre outer rim.
- Remove lever (**Fig. 38 ref. 1**), grippers (**Fig. 38 ref. 2**) and extract the hook tool by turning the mandrel counterclockwise and translating it outwards.

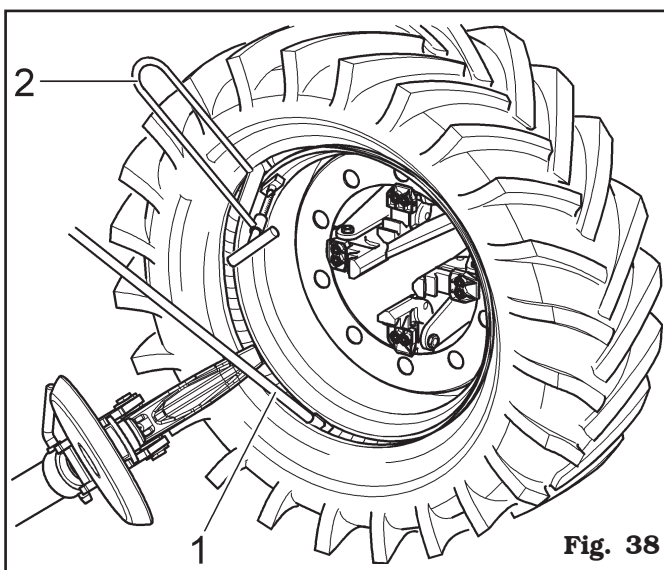


Fig. 38

- Tilt up tool holder arm placing it in “off-work” position (**Fig. 15 ref. 1**) after it has been unlocked.

- Position mobile platform (**Fig. 1-2 ref. 15**) directly under the wheel and lower the mandrel until the wheel is resting on the platform.
- Move to work position **B** (**Fig. 6**).
- Check the state of the tyre valve and centre it, if necessary, in the rim hole by slightly turning the mandrel; fix the valve with the supplied ring nut after having removed the protective extension.
- Close the mandrel jaws completely, making sure the wheel is held up to avoid dropping.



MAKE SURE THAT THE WHEEL'S HOLD IS SECURE TO AVOID IT FALLING DURING REMOVAL. FOR HEAVY AND/OR VERY LARGE WHEELS USE AN ADEQUATE LIFTING DEVICE.

- Translate the movable footboard to release the wheel from the same mandrel.

12.8 Wheels with bead wire

As an example, **Fig. 39** and **40** illustrate sections and compositions of types of wheels with bead wire currently being sold.

Fig. 39

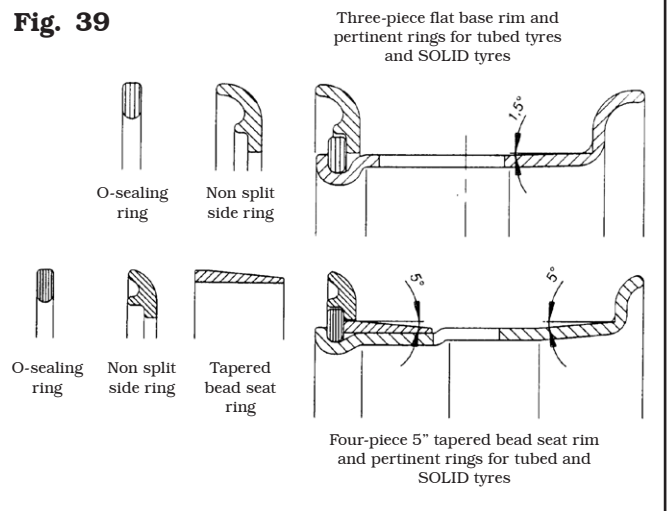
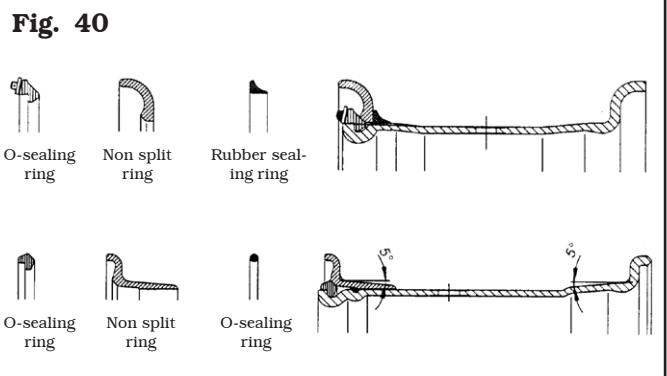


Fig. 40



12.8.1 Beading and demounting



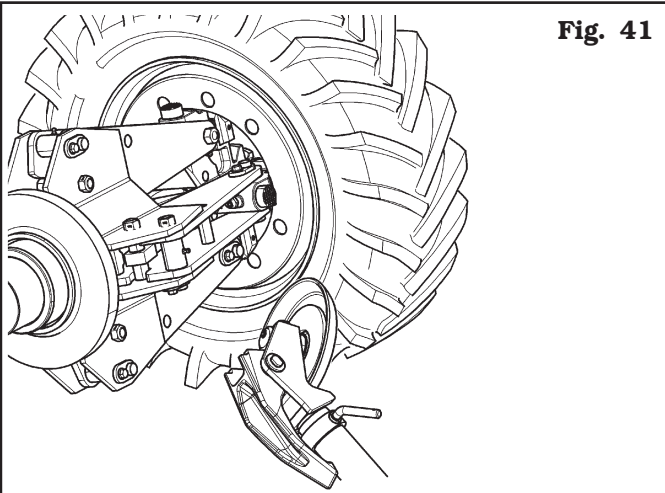
NEVER STAND IN FRONT OF THE WHEEL WHILE THE INFLATION RING IS BEING EXTRACTED FROM THE BEAD WIRE, SINCE IT MAY BE EJECTED VIOLENTLY, CAUSING SERIOUS INJURIES OR WOUNDS.



THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

- Mount the wheel on the mandrel as described in “WHEEL CLAMPING” and make sure it is deflated.
- Move to work position **D** (**Fig. 6**).
- Place the tool arm in “working” position (**Fig. 14 ref. 1**) in the tyre inner side, and make sure it is locked by the provided coupling lever (**Fig. 1-2 ref. 8**).
- Position the beading disc on rim edge (see **Fig. 41**).

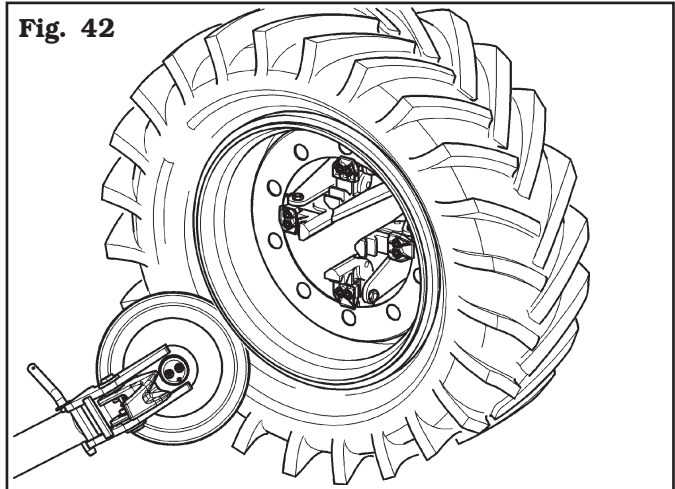
Fig. 41



- Turn the mandrel and smear the entire bead seat of the rim with lubricant. While doing this, jerk the beading disc forward until the first bead is removed (as these wheels feature inner tubes, carry out the operation carefully, paying special attention to when the bead dislodges, trying to stop disc advancement immediately to avoid compromising the integrity of the inner tube and valve).
- Place the tools holder arm in “off-work” position (**Fig. 15 ref. 1**); operate the handle control in order to position the tools holder arm on the wheel outer side, then place it in “working position” (**Fig. 14 ref. 1**) again and lock it with the coupling lever provided.

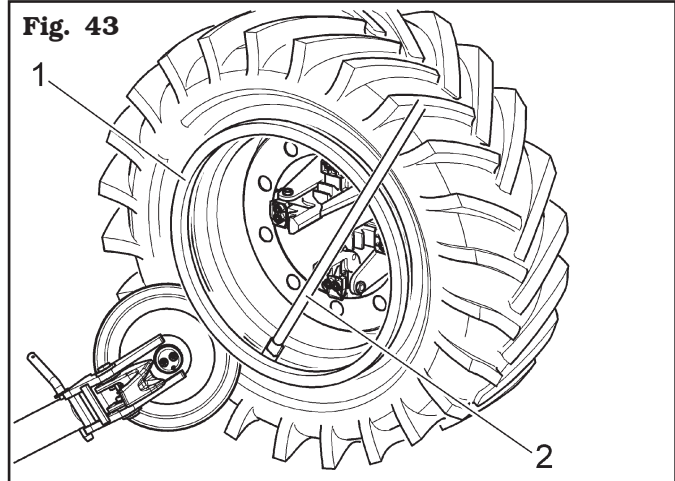
- Carry out the tools holder head 180° rotation according to the description of the relevant paragraph, in order to let the beading disc come into contact with the tyre outer side (see **Fig. 42**).

Fig. 42



- Turn the mandrel and smear the entire bead seat of the rim with lubricant.
- While doing this, jerk the beading disc forward until the first bead is removed.
- Repeat the operation, making the beading disc move forward (see **Fig. 43**) until the stop ring is released (**Fig. 43 ref. 1**). It will be then extracted through lever (**Fig. 43 ref. 2**).

Fig. 43



- Remove the bead wire.
- Remove the O-Ring, when featured.
- Tilt up tool holder arm placing it in “off-work” position (**Fig. 15 ref. 1**) after it has been unlocked.
- Lower the mandrel until the wheel rests on the footboard.
- Move to work position **B** (**Fig. 6**).
- Translate the mobile footboard outwards until the tyre is completely dislodged from the rim (in case of tyres with inner tube, make sure that the valve hasn't been damaged during removal).



THE REMOVAL OF THE BEADS FROM THE RIM CAUSES THE TYRE TO FALL. ALWAYS MAKE SURE THAT NO ONE IS STANDING BY ACCIDENT IN THE WORK AREA.



WHEN DEMOUNTING VERY HEAVY TYRES, IT IS IMPORTANT TO MOVE THE WHEEL AS CLOSE AS POSSIBLE TO THE BASE BEFORE COMPLETING THE OPERATION.



PAY ATTENTION WHEN REPOSITIONING THE TOOL HOLDER ARM TO AVOID CRUSHING HANDS.



ALWAYS MAKE SURE THAT THE ARM IS CORRECTLY HOOKED TO CARRIAGE.

12.8.2 Mounting

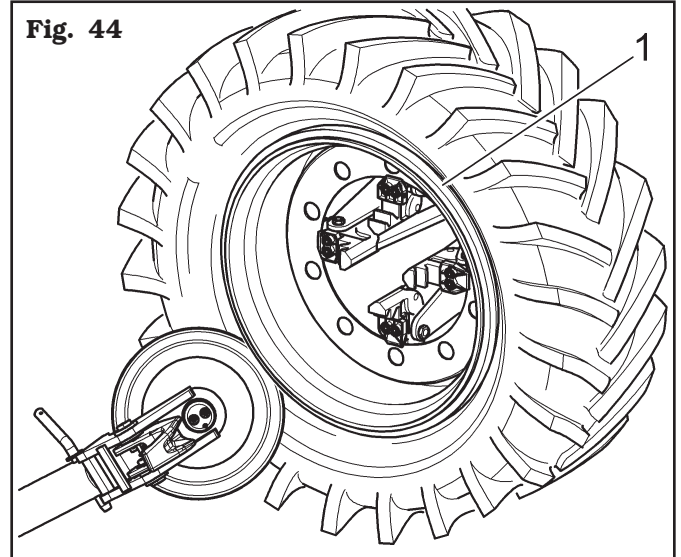


THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (150 BAR).

- Place the tools holder arm in off-work position (**Fig. 15 ref. 1**); if it has been removed, fix the rim to the mandrel as described in "WHEEL CLAMPING" paragraph. If the wheel features an inner tube, position the rim with the valve slot facing downwards (at 6 o'clock).
- Lubricate the entire bead seat of the rim and the tyre beads.
- Move to work position **B (Fig. 6)**.
- Position mobile platform (**Fig. 1-2 ref. 15**) so as to allow the upward motion of the tyre (if the wheel features an inner tube, position the rim with the valve slot facing downwards at 6 o'clock).
- Place the mandrel in order to centre the rim on the tyre.
- Operate the movable footboard forward translation in order to insert the rim in the tyre (in case of air tube tyres, make the valve re-enter not to damage it). Move forward until the rim is completely inserted in the tyre.

- Insert the bead wire on the rim with the stop ring fitted (if the rim and bead wire feature fixing slits, they must be in phase with each other).
- Move to work position **C (Fig. 6)**.
- Place the tool holder arm on the external side then lower it into "working" position (**Fig. 14 ref. 1**) with the beading disc facing the wheel. If the outer edge ring is not sufficiently fitted on the rim, position the mandrel until the bead wire is near the beading disc. Move the beading disc forward and then turn the mandrel until the housing of the O-Ring (if featured) is uncovered.
- Lubricated the O-Ring and place it in its housing.
- Move to work position **B (Fig. 6)**.
- Position the bead wire (**Fig. 44 ref. 1**) on the rim, fit the stop ring with the help of the beading disc as shown in **Fig. 44**.

Fig. 44



- Tilt up tool holder arm placing it in "off-work" position (**Fig. 15 ref. 1**) after it has been unlocked.
- Position mobile platform (**Fig. 1-2 ref. 15**) directly under the wheel and lower the mandrel until the wheel is resting on the platform.
- Close the mandrel jaws completely and translate the footboard outwards until the rim has been completely removed, making sure the wheel is held up to avoid dropping.



CLOSING THE MANDREL CAUSES THE WHEEL TO FALL. ALWAYS MAKE SURE THAT NO ONE IS STANDING BY ACCIDENT IN THE WORK AREA.

13.0 ROUTINE MAINTENANCE



BEFORE CARRYING OUT ANY ROUTINE MAINTENANCE OR ADJUSTMENT PROCEDURE, DISCONNECT THE MACHINE FROM THE ELECTRICITY SUPPLY USING THE SOCKET/PLUG COMBINATION AND CHECK THAT ALL MOBILE PARTS ARE AT A STANDSTILL.



BEFORE EXECUTING ANY MAINTENANCE OPERATION, MAKE SURE THERE ARE NO WHEELS LOCKED ONTO THE MANDREL.



BEFORE REMOVING HYDRAULIC CIRCUIT UNIONS OR PIPES, MAKE SURE THAT THERE ARE NO PRESSURISED FLUIDS PRESENT. PRESSURISED OIL SPILLS MAY CAUSE SERIOUS WOUNDS OR INJURIES.



BEFORE CARRYING OUT ANY MAINTENANCE WORK ON THE HYDRAULIC CIRCUIT, SET THE MACHINE IN THE REST CONDITION.

To guarantee the efficiency and correct functioning of the machine, it is essential to carry out daily or weekly cleaning and weekly routine maintenance, as described below.

Cleaning and routine maintenance must be conducted by authorized personnel and according to the instructions given below.

- Disconnect the mains power supply before starting any cleaning or routine maintenance operations.
- Remove deposits of tyre powder and other waste materials with a vacuum cleaner.
- **DO NOT BLOW IT WITH COMPRESSED AIR.**
- Periodically (preferably once a month) make a complete check on the controls, ensuring that they provide the specified actions.
- Every 100 working hours lubricate the tool carriage sliding guides.
- Periodically (preferably once a month), grease all moving parts of the machine (see **Fig. 45**).

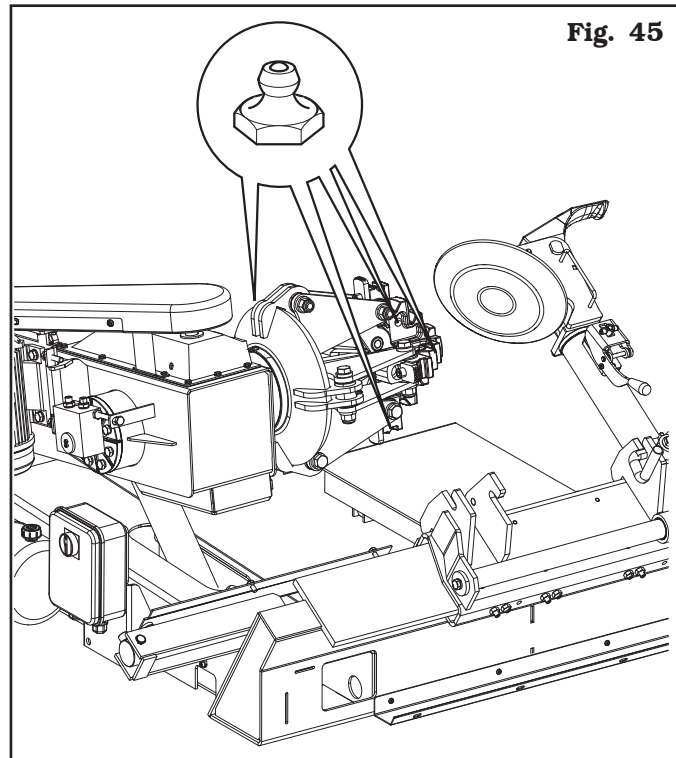


Fig. 45

- Check periodically the oil level of the oil-pressure unit and, in case, carry out the filling up with hydraulic oil having a viscosity degree suitable for the average temperatures of the country where the machine is installed and in particular:
 - viscosity 32 (for countries with room temperature from 0 to 30 degrees);
 - viscosity 46 (for countries with room temperature above 30 degrees).
 At least once a year it is advisable to proceed anyway to the complete replacement of the hydraulic oil of the hydraulic unit itself.

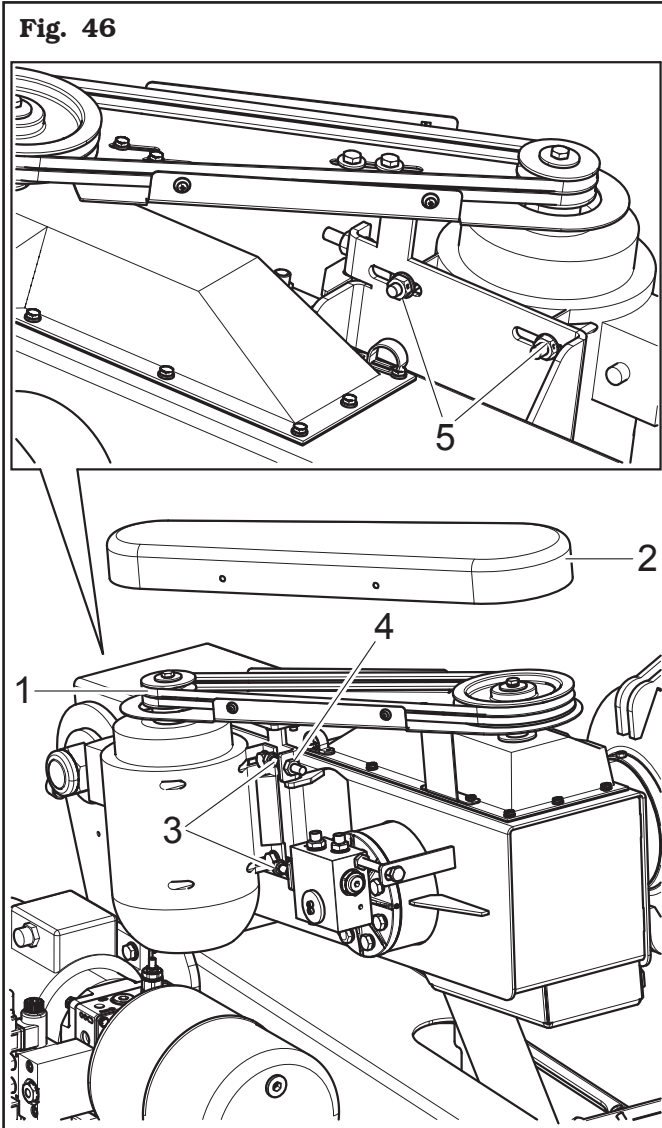


CARRY OUT THIS CONTROL WITH THE MACHINE COMPLETELY CLOSED (WITH HYDRAULIC PISTONS IN).

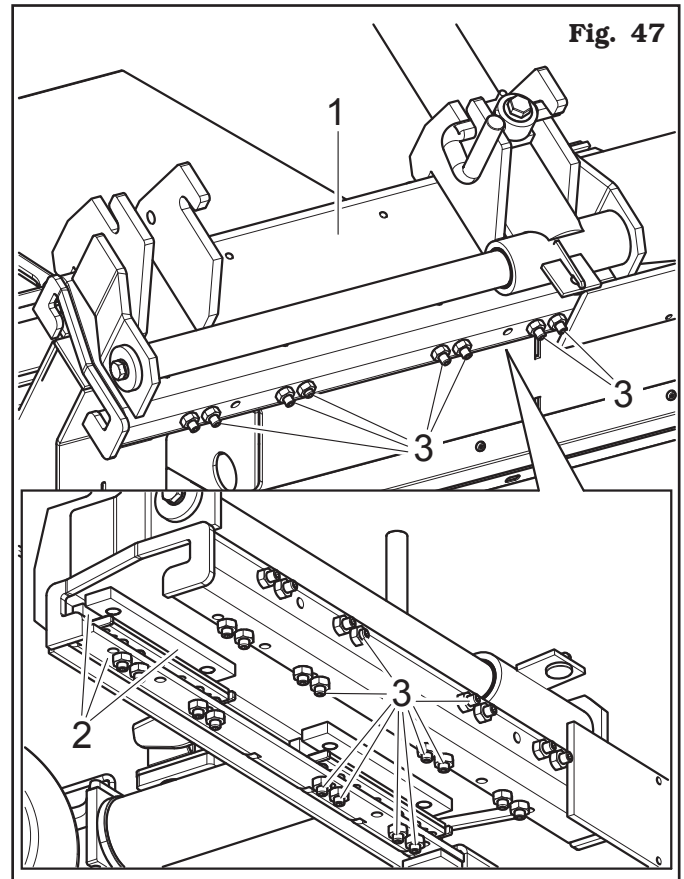
- Periodically (about every 100 hours), check the oil level of the reduction gear and eventually reset the level.
- Check operation of the safety devices every week.
- Periodically (every 50 working hours approximately), carry out the (inner and outer) guides of the tool carriage.

A. Check the belt tensioning (Fig. 46 ref. 1):

- Remove upper guard (Fig. 46 ref. 2) by unscrewing the provided fixing screws;
- stretch the belt (Fig. 46 ref. 1) using the screws (Fig. 46 ref. 3) after the nuts (Fig. 46 ref. 4-5) have been slackened;
- tighten the fixing nuts (Fig. 46 ref. 5) after the adjustment operations, then assemble the protection guard (Fig. 46 ref. 2) again.

Fig. 46

OPERATION TO BE CARRIED OUT ONLY IN CASE THE CARRIAGE MOVES IN A NON-LINEAR WAY (TRIGGER ACTION).

B. Adjust the play of slide (Fig. 47 ref. 1) by means of the adjustment screws (Fig. 47 ref. 3) of the sliding blocks (Fig. 47 ref. 2).

ANY DAMAGE TO THE MACHINE DEVICES RESULTING FROM THE USE OF LUBRICANTS OTHER THAN THOSE RECOMMENDED IN THIS MANUAL WILL RELEASE THE MANUFACTURER FROM ANY LIABILITY!!



ANY EXTRAORDINARY MAINTENANCE OPERATION MUST ONLY BE CARRIED OUT BY PROFESSIONALLY QUALIFIED STAFF.








14.0 TROUBLESHOOTING TABLE





Possible troubles which might occur to the tyre-changer are listed below. The manufacturer disclaims all responsibility for damages to people, animals or objects due to improper operation by non-authorized personnel. In case of trouble, call Technical Service Department for instructions on how to service and/or adjust the machine in full safety to avoid any risk of damage to people, animals or objects.

In an emergency and before maintenance on tyre-changer, set the main switch to "0" and lock it in this position.



CONTACT AUTHORIZED TECHNICAL SERVICE
Do not try and service alone.

Problem	Possible cause	Remedy
Pump motor does not work but wheel holder mandrel motor works perfectly.	a) Hydraulic control unit damaged.	a) Call Technical Service Dept. 
When main switch is turned on, wheel holder mandrel does not turn whereas the pump motor works.	a) Gearbox change-over switch damaged.	a) Call Technical Service Dept. 
Power drop during wheel holder mandrel rotation.	a) Timing belt too loose.	a) Tension up the belt.
No pressure in the hydraulic system.	a) Pump damaged.	a) Replace pump. 
The mandrel opening pressure does not go down.	a) Pressure limiting valve jammed.	a) Download mandrel (remove wheel), completely undo adjusting handle. Perform many opening and closing cycles until jam release. 
The machine does not start.	a) No electricity supply. b) Overload cutouts not set. c) Transformer fuse blown.	a) Connect the electricity supply. b) Set the overload cutouts. c) Change the fuse.
Fluid leaks from union or pipeline.	a) Union not tightened correctly. b) Pipeline cracked.	a) Tighten the union. b) Call the after-sales service. 
A control device is remaining on.	a) The switch has broken. b) A solenoid valve has jammed.	a) Call the after-sales service. b) Call the after-sales service. 
The self-centring chuck cylinder is losing pressure.	a) The directional control valve is leaking. b) The gaskets are worn.	a) Call the after-sales service. b) Call the after-sales service. 
The motor stops during operation.	a) Overload cutout tripped.	Open the electrical panel and reset the overload cutout tripped.

Problem	Possible cause	Remedy
When a control device is operated the machine does not move at all.	<ul style="list-style-type: none"> a) Solenoid valve not receiving power. b) Solenoid valve jammed. c) Transformer fuse blown. d) Control unit not set correctly. 	<ul style="list-style-type: none"> a) Call the after-sales service. b) Call the after-sales service. c) Change the fuse. d) Call the after-sales service. 
No pressure in hydraulic circuit.	<ul style="list-style-type: none"> a) Power unit motor turning in wrong direction. b) Power unit pump has failed. c) No oil in power unit tank. 	<ul style="list-style-type: none"> a) Restore correct rotation direction by changing socket connection. b) Call the after-sales service. c) Fill power unit tank with oil 
Machine operates in jerks.	<ul style="list-style-type: none"> a) Not enough fluid in power unit tank. b) Control unit switch has failed 	<ul style="list-style-type: none"> a) Top up with oil. b) Call the after-sales service. 
VERSIONS WITH INVERTER		
The mandrel doesn't rotate.	<ul style="list-style-type: none"> a) The first current threshold has been exceeded. b) The second current threshold has been exceeded. c) Lack of supply. d) Insufficient net voltage. e) Net voltage too high. f) Sudden and short drop of net voltage. g) The second temperature threshold has been exceeded. 	<ul style="list-style-type: none"> a) Wait for the automatic reset releasing the control. b) Disconnect the machine from the net for 30 seconds at least, then reconnect. If the problem persists, check the harness. c) Connect the supply. d) Shorten the length of possible extension cable to the machine or raise the leads section (disconnect and reconnect). e) Disconnect the machine from the net for 30 seconds at least, then reconnect. f) Disconnect the machine from the net for 30 seconds at least, then reconnect. g) The machine does not start until the temperature does not lower under the safety limit.
The mandrel does not reach the maximum speed.	<ul style="list-style-type: none"> a) The first temperature threshold has been exceeded. b) Raised mechanical resistance. 	<ul style="list-style-type: none"> a) Let the motor body cool. b) Make the mandrel rotate loadless for some minutes. If it does not accelerate, call the after-sales service. 

15.0 TECHNICAL DATA

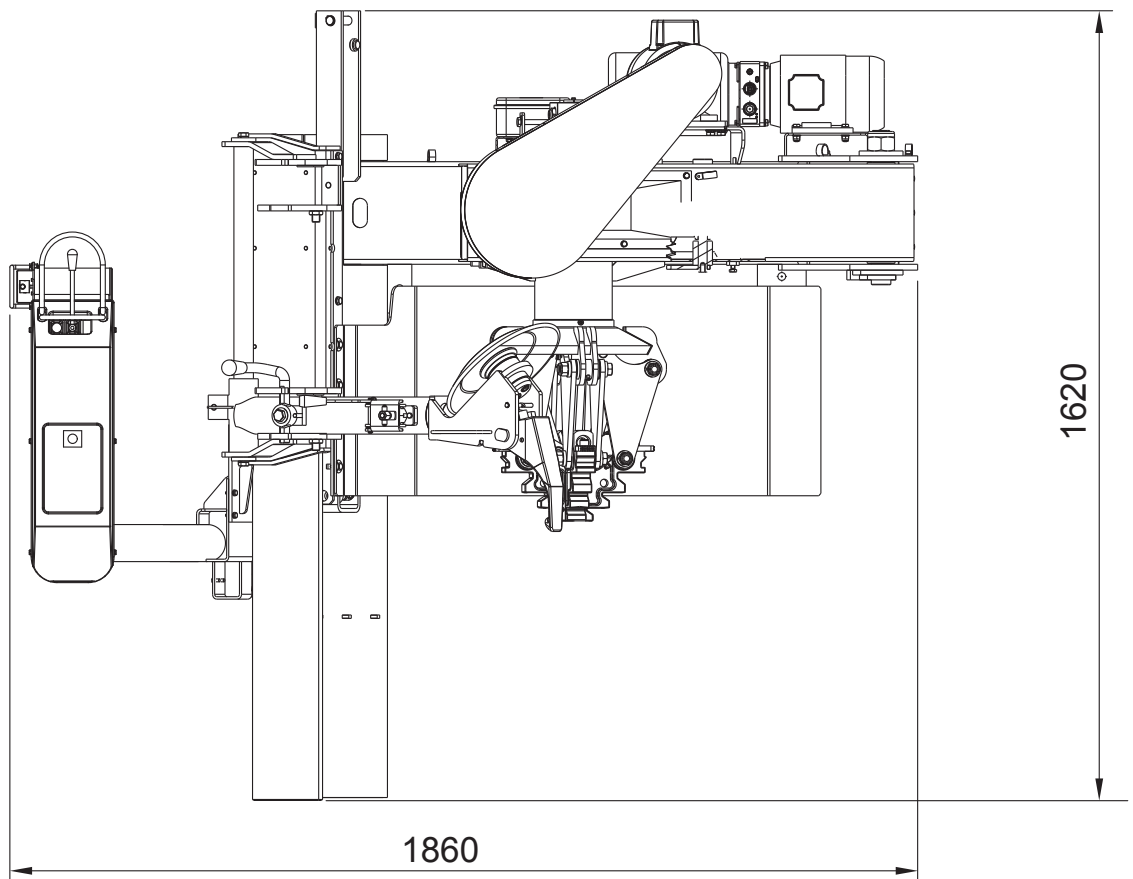
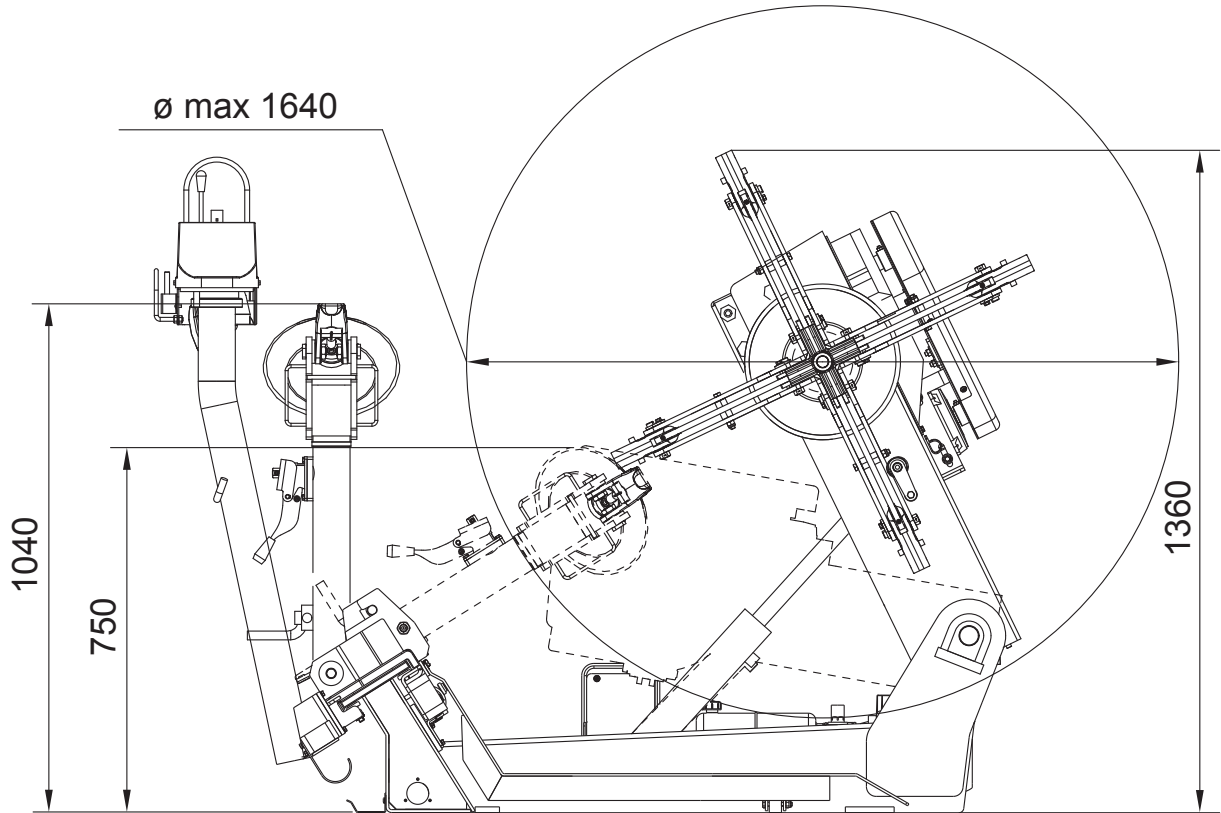
15.1 Technical data

Mandrel motor:	power 2,2 Kw three-phase power supply 400V (50 Hz)
Mandrel rotation maximum speed:	8 rpm
Max. self-centring chuck rotation speed (VARGNAV11ND and VARGNAV11EID - version with inverter):	1-5-10 rpm
Maximum wheel diameter:	1640 mm / 64"
Wheel max. width:	925 mm / 36.4"
Wheel maximum weight:	1500 Kg
Self-centring chuck locking:	11"- 27"
Minimum locking hole:	90 mm
Power unit motor:	power 0,75 Kw three-phase power supply 400V (50 Hz)
Exercised pressure:	150 bar
Weight (NAV11N - NAV11NT):	454 Kg
Weight (NAV11EI - NAV11TEI):	445 Kg
Gear noise:	<80 dB (A)

15.2 Dimensions

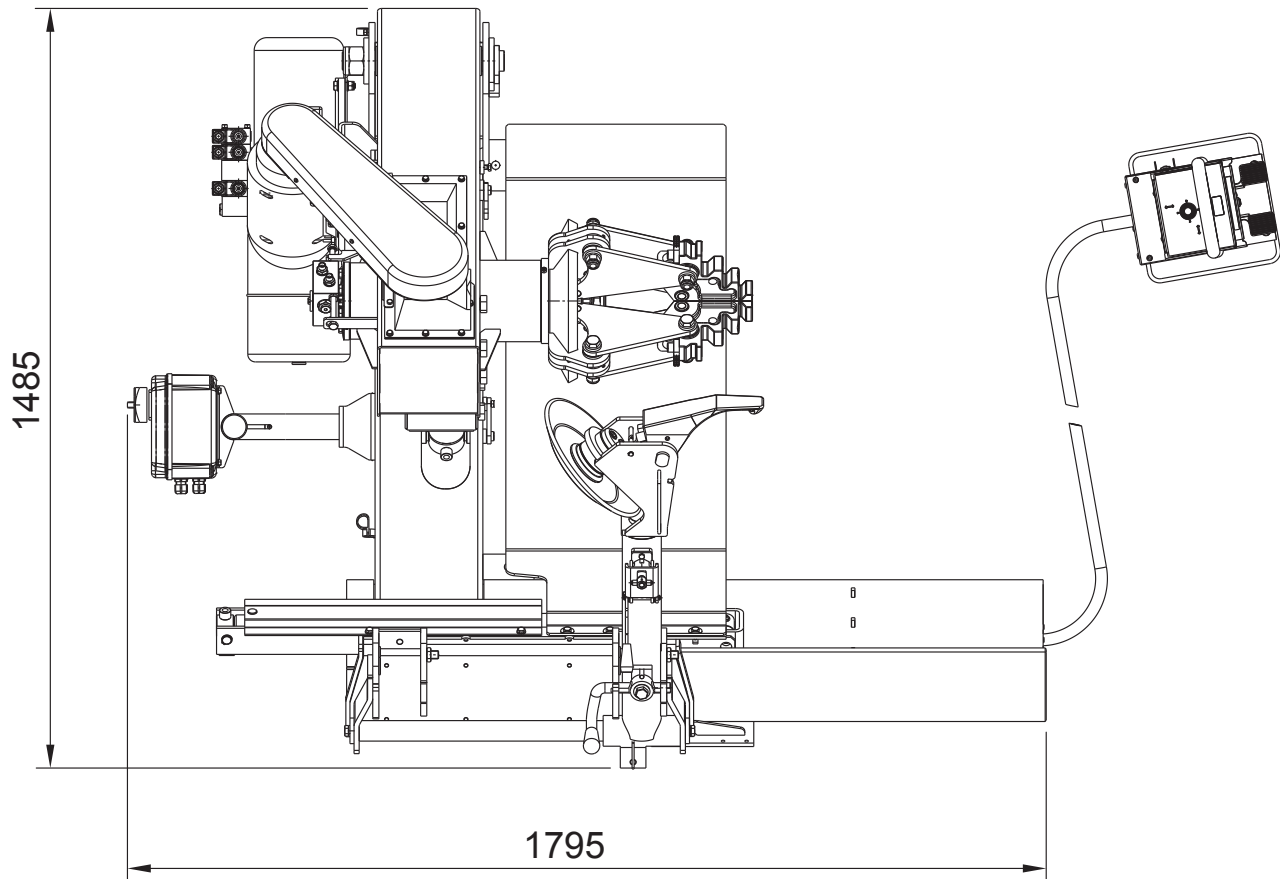
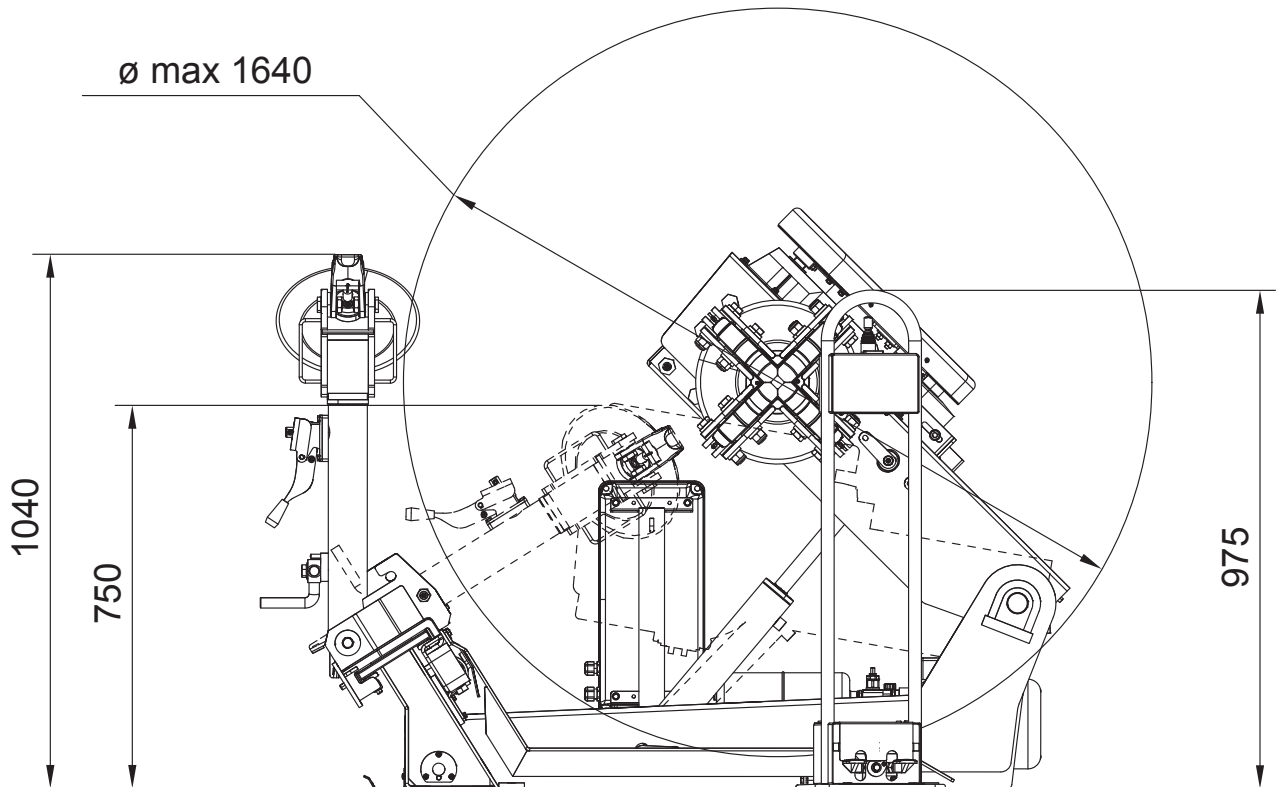
NAV11N - NAV11NT

Fig. 48



NAV11EI - NAV11TEI

Fig. 49



16.0 STORING

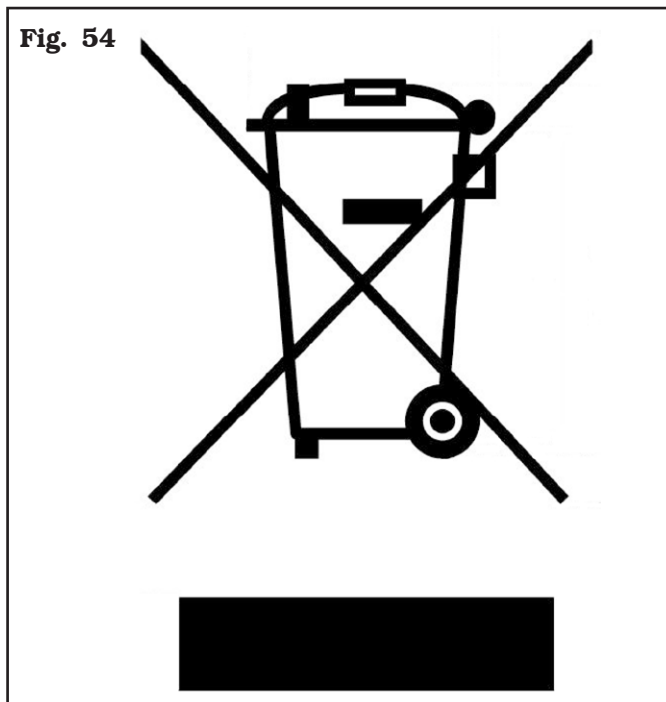
If storing for long periods (6 months or longer) disconnect the main power supply and take measures to protect the machine from dust build-up. Lubricate parts that could be damaged from drying out. When putting the machine back into operation replace the rubber pads and the mounting tool. Moreover, carry out a verification of machine perfect functioning.

17.0 SCRAPPING

When the decision is taken not to make further use of the machine, it is advisable to make it inoperative by removing the connection pressure hoses. The machine is to be considered as special waste and should be dismantled into homogeneous parts. Dispose of it in accordance with current legislation.

Instructions for the correct management of waste from electric and electronic equipment (WEEE) according to the Italian legislative decree 49/14 and subsequent amendments.

In order to inform the users on the correct way to dispose the product (as required by the article 26, paragraph 1 of the Italian legislative decree 49/14 and subsequent amendments), we communicate what follows: the meaning of the crossed dustbin symbol reported on the equipment indicates that the product must not be thrown among the undifferentiated rubbish (that is to say together with the "mixed urban waste"), but it has to be managed separately, to let the WEEE go through special operations for their reuse or treatment, in order to remove and dispose safely the waste that could be dangerous for the environment and to extract and recycle the raw materials to be reused.



18.0 REGISTRATION PLATE DATA



The validity of the Conformity Declaration enclosed to this manual is also extended to products and/or devices the machine model object of the Conformity Declaration can be equipped with.

Said plate must always be kept clean from grease residues or filth generally.

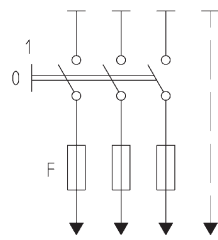


ATTENTION: DO NOT TAMPER WITH, CARVE, CHANGE OR REMOVE THE MACHINE IDENTIFICATION PLATE; DO NOT COVER IT WITH PANELS, ETC., SINCE IT MUST ALWAYS BE VISIBLE.

WARNING: Should the plate be accidentally damaged (removed from the machine, damaged or even partially illegible) inform immediately the manufacturer.

19.0 FUNCTIONAL DIAGRAMS

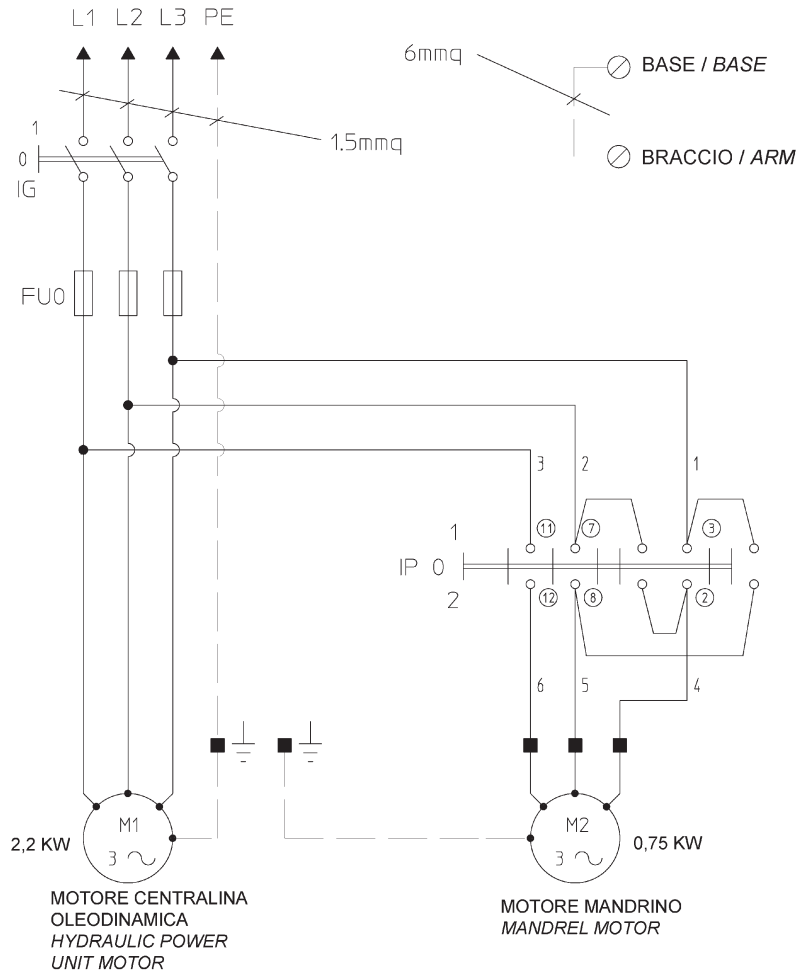
Here follows a list of the machine functional diagrams.



INSTALLAZIONE A CARICO DEL CLIENTE
 INSTALLATION TO BE MADE BY THE USER

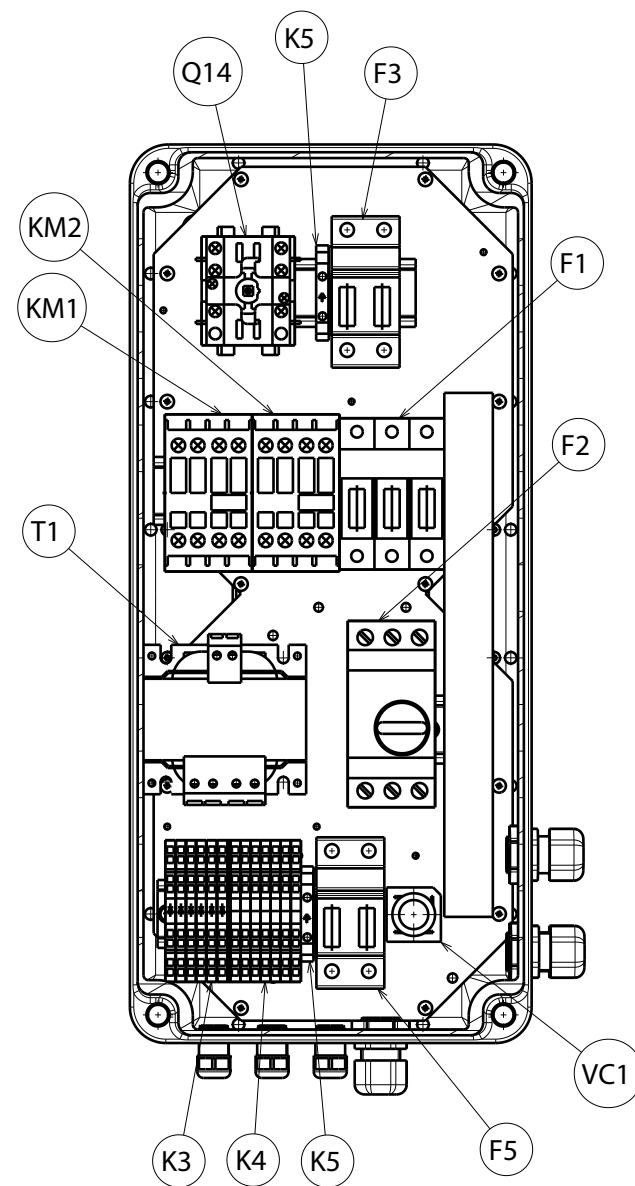
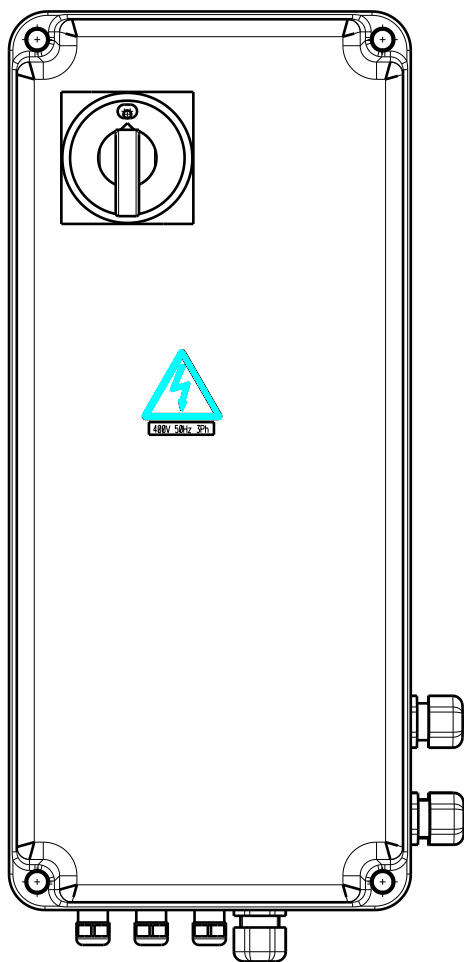
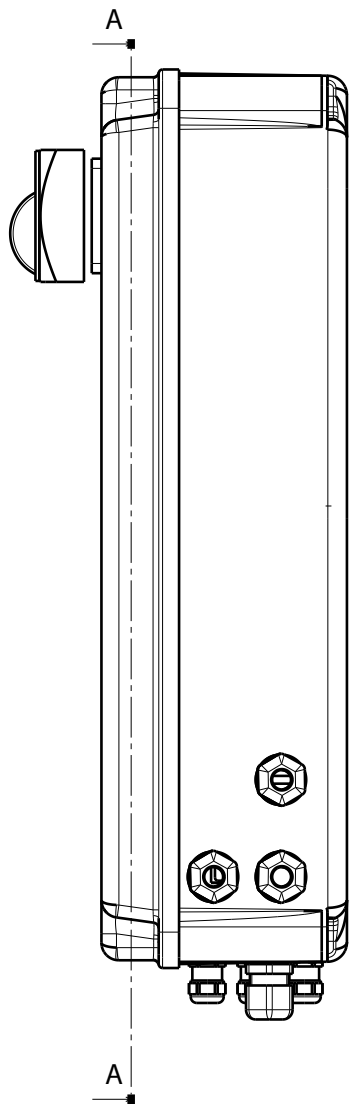
		V	
HZ		230	400
F	50	16A aM	10A aM
	60	16A aM	10A aM

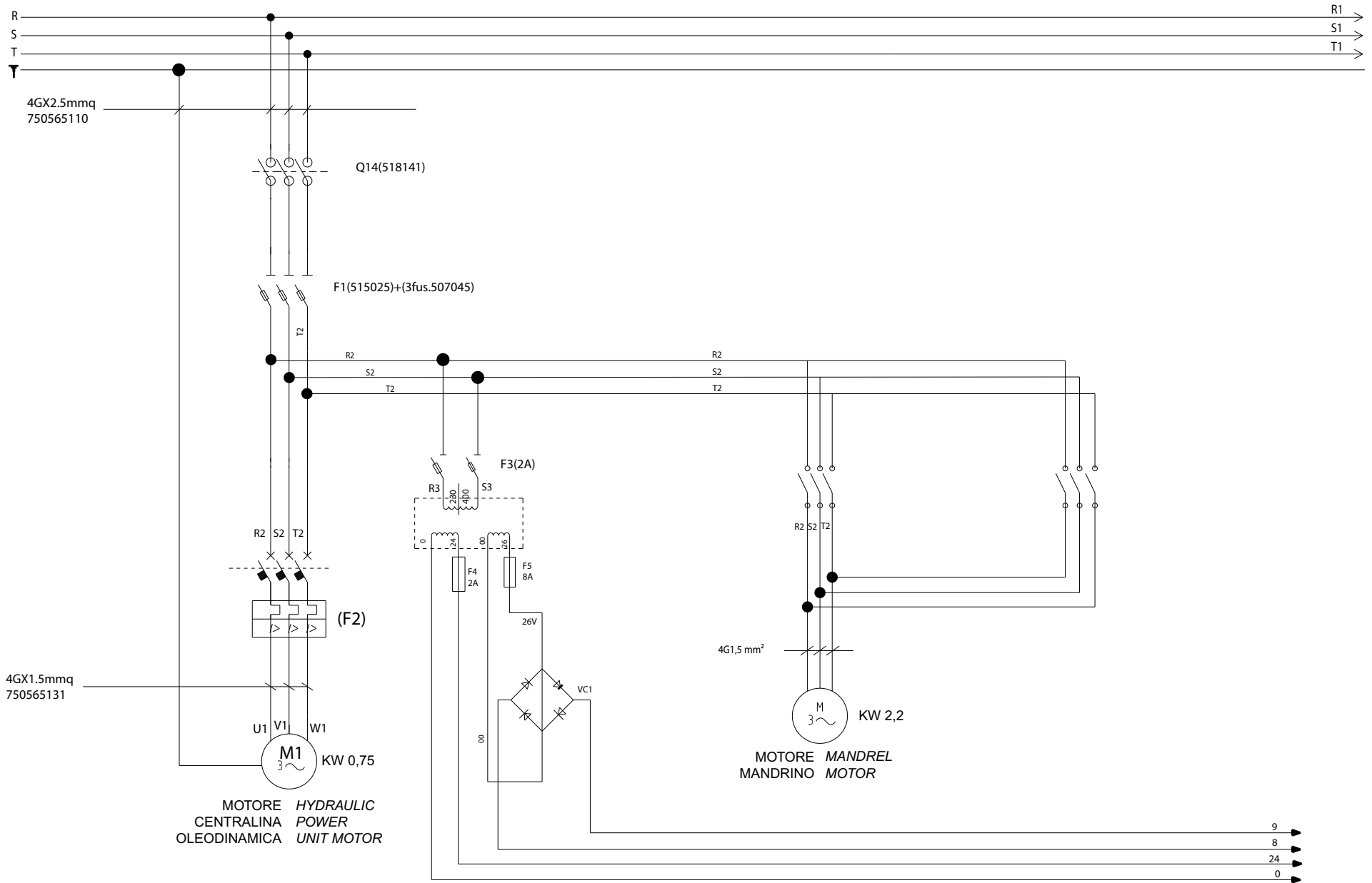
CAVO ALIMENTAZIONE 3P+TERRA x 1,5 mmq
 SUPPLY CABLE 3P+GROUND x 1,5 mmq

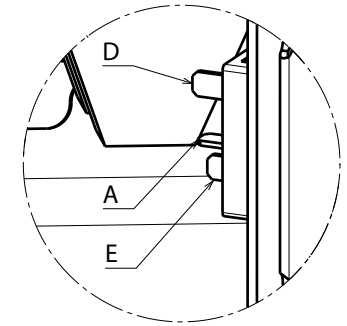
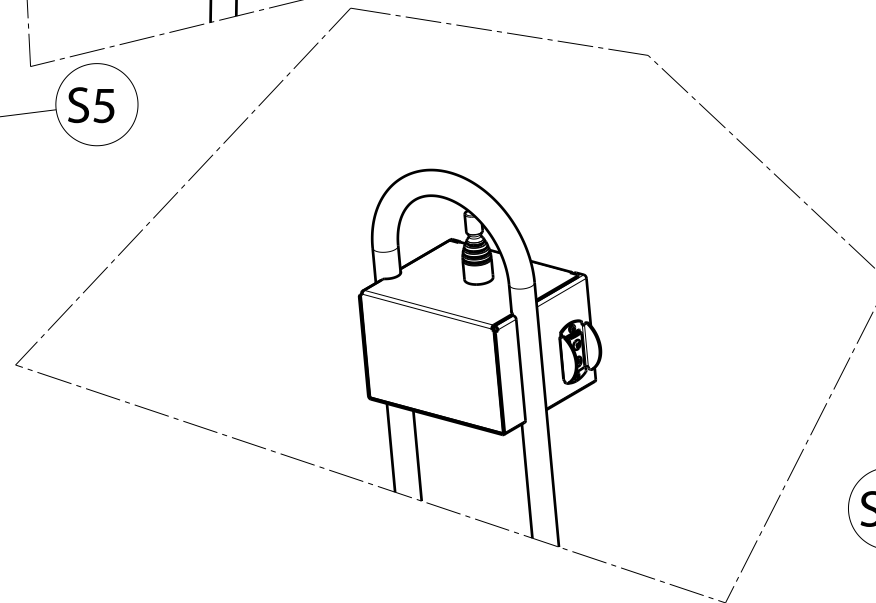
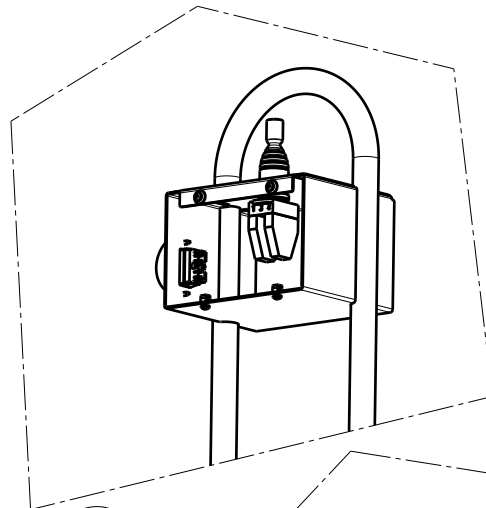
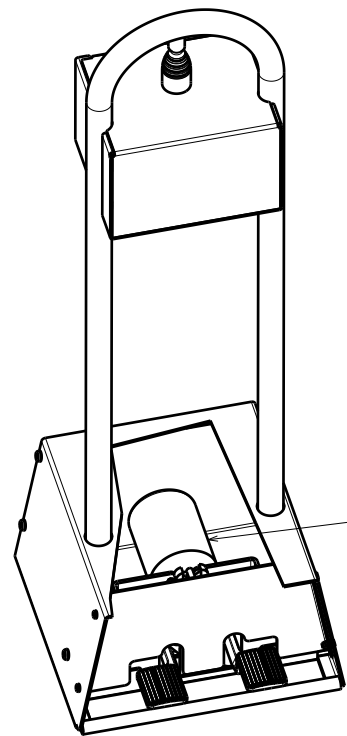


MORSETTI IP / IP CLAMPS

- 11 = T/L3
- 7 = S/L2
- 3 = R/L1
- 12 = W
- 8 = V
- 2 = U

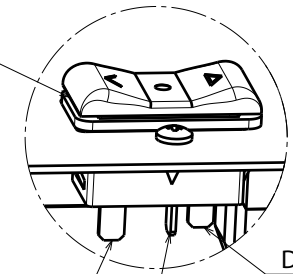






DETTAGLIO B
B DETAIL

S3

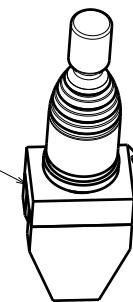


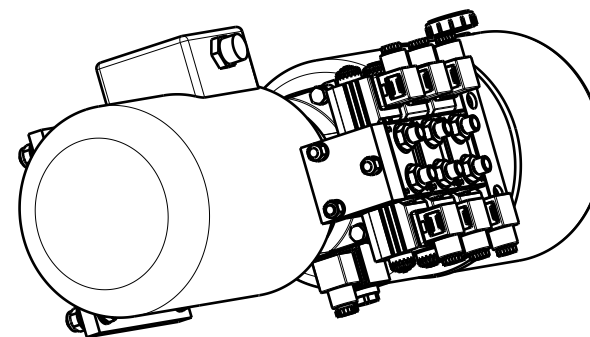
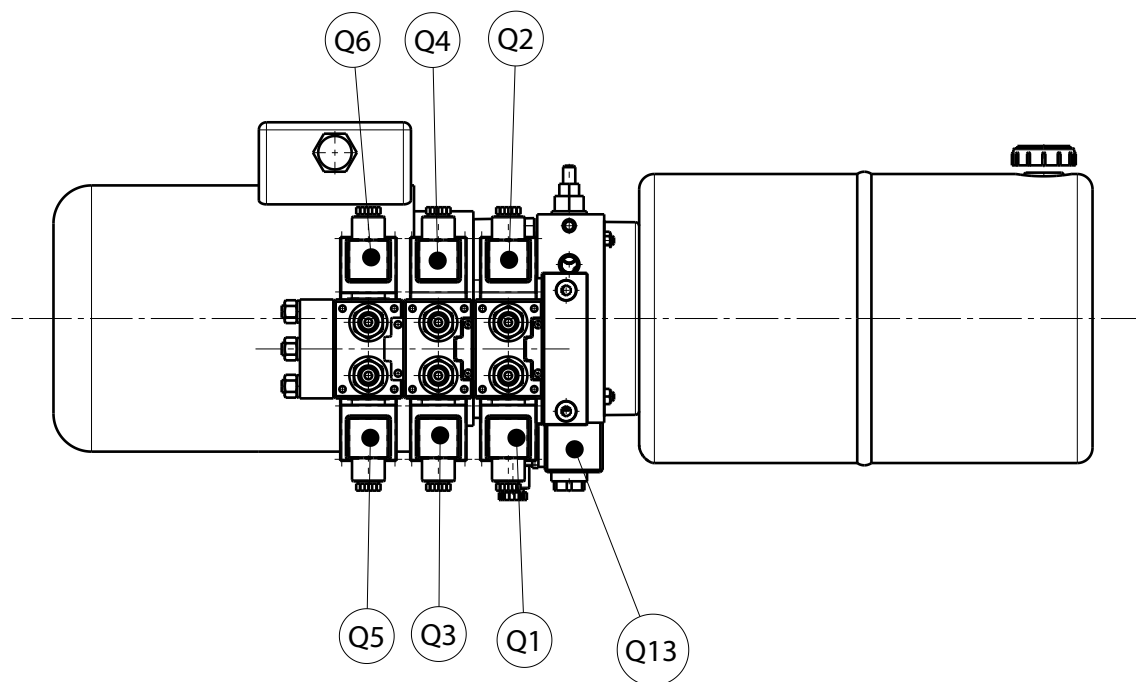
DETTAGLIO A
A DETAIL

MOLLA PER LIBERARE I
CONTATTI VERSO IL LATO
OPPOSTO

SPRINGS FOR CONTACTS
RELEASE TOWARD
OPPOSITE SIDES

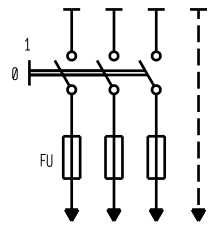
S2





RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
F1	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515025	1	2.7
	FUSIBILE	10,3x38 16A 500V aM RITARDATO	507045	3	
F2	INTERRUTTORE AUTOM. TRIPOLARE	4-6.3A ART.GV2 ME10SCHNEIDER	518276	1	2.7
				1	2.7
F3-F4-F5	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V	515027	1	2.7
	FUSIBILE	10,3X38 2A 500V RAPIDO	507019	2	
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K3	MORSETTO 2.5mmq C/DIODO 1N4007		510218	6	2.7
K4	MORSETTO A MOLLA 2 PIAN.1.5mmq		510217	7	2.7
K5	MORSETTO G/V 4mmq ART.TEO.4 CABUR T0430		510150	2	2.7
VC1	PONTE RADDRIZZATORE VC1	-	B1296200	1	2.7
	CONDENSATORE C1-C2		B1296300	1	2.7
	INS.CAVO ALIMENTAZIONE QUADRO		750565110	1	
	INS.CAVO MOTORE MANDRINO		750565121	1	
	INS.CAVO MOTORE CENTRALINA	-	750565131	1	
	INS.CAVO MANIPOLATORE		750565141	1	
	INS.CAVO ELETTROVALV.Q1-Q2- Q3-Q4-Q5-Q6-Q13		750516151	1	
			750516161	1	
			750516171	1	
			750516181	1	
			750516191	1	
			750516201	1	
			750516211	1	
S2	MANIPOLATORE	4 POS.+CENTR.TEMPORANEE Ø22	517157AS	1	5.7
				1	
S3	PULSANTE BASCULANTE	-	517300	1	5.7
		-			
S5	INVERTITORE TRIPOLARE		518272	1	5.7
		-		1	
T1	TRASFORMATORE	100 VA 50/60 Hz PRI: 0/400V SEC: 0/24V 0/26V	528085	1	2.7
-	-	-	-	-	-
M1	MOTORE CENTRALINA	M. E. KW1.5 T400 M. DX B3-B14 50HZ	900004670	1	3.7
M2	MOTORE MANDRINO	90L/4 B3 2.2KW 230/400V 50Hz	900003290	1	3.7

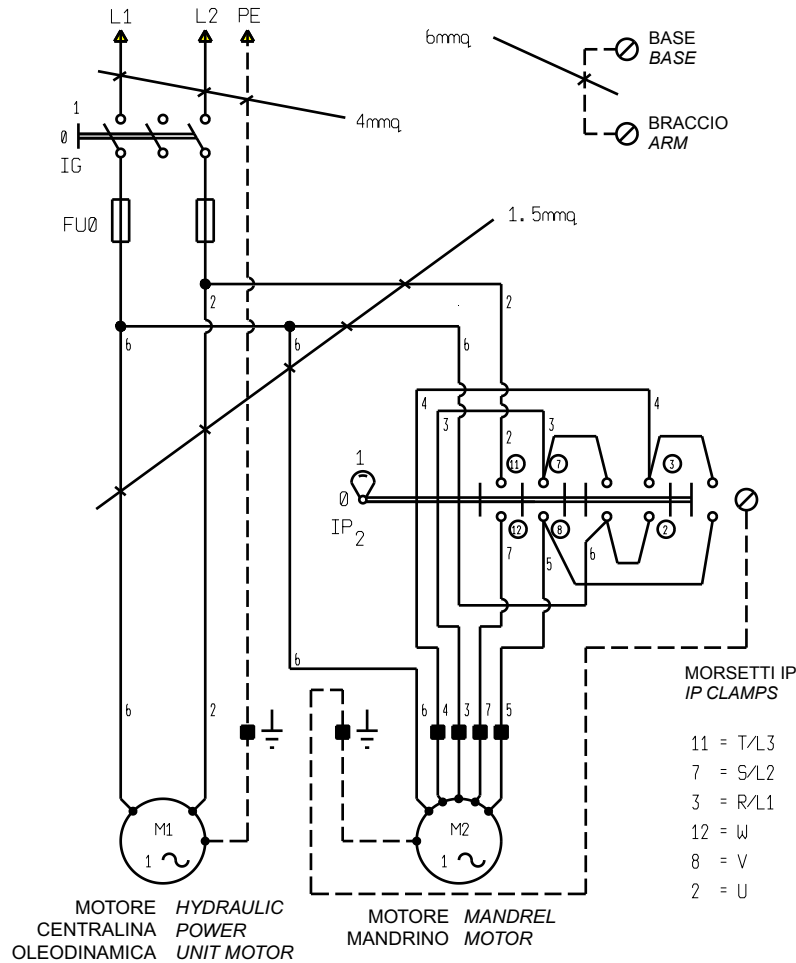
REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT REFERENCE
F1	FUSE HOLDER	10,3x38 32A 690V 3 POLES SECTIONABLE	515025	1	2.7
	FUSE	10,3x38 16A 500V aM DELAYED	507045	3	
F2	TRIPOLAR AUTOMATIC SWITCH	4-6.3A ART.GV2 ME10SCHNEIDER	518276	1	2.7
				1	2.7
F3-F4-F5	FUSE HOLDER	10,3x38 32A 690V2 POLES SECTIONABLE	515027	1	2.7
	FUSE	10,3X38 2A 500V RAPID	507019	2	
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K3	CLAMP 2.5mmq C/DIODO 1N4007		510218	6	2.7
K4	SPRING CLAMP 2 PIAN.1.5mmq		510217	7	2.7
K5	CLAMP G/V 4mmq ART.TEO.4 CABUR T0430		510150	2	2.7
VC1	RECTIFIER BRIDGE VC1	-	B1296200	1	2.7
	CONDENSER C1-C2		B1296300	1	2.7
	SQUARE FEEDING CABLE ASSEMBLY		750565110	1	
	CHUCK UNIT MOTOR CABLE ASSEMBLY		750565121	1	
	HYDR.POWER UNIT MOTOR CABLE ASSEMBLY	-	750565131	1	
	HANDLE CABLE ASSEMBLY		750565141	1	
	Q1-Q2-Q3-Q4-Q5-Q6-Q13 SOLENOID VALVE CABLE ASSEMBLY		750516151	1	
		750516161	1		
		750516171	1		
		750516181	1		
		750516191	1		
		750516201	1		
	750516211	1			
S2	HANDLE	4 POS.+CENTRAL TEMPORARY Ø22	517157AS	1	5.7
				1	
S3	PUSHBUTTON	-	517300	1	5.7
		-			
S5	TRIPOLAR INVERTER		518272	1	5.7
		-		1	
T1	TRANSFORMER	100 VA 50/60 Hz PRI: 0/400V SEC: 0/24V 0/26V	528085	1	2.7
-	-	-	-	-	-
M1	HYDRAULIC POWER UNIT MOTOR	M. E. KW1.5 T400 M. DX B3-B14 50HZ	900004670	1	3.7
M2	CHUCK MOTOR	90L/4 B3 2.2KW 230/400V 50Hz	900003290	1	3.7



INSTALLAZIONE A CARICO DEL CLIENTE
 INSTALLATION CHARGEABLE TO THE CUSTOMER

	v	220
HZ		50
FU	50	25A aM
	60	25A aM

CAVO ALIMENTAZIONE 2P+TERRA x 4mmq
 POWER SUPPLY CABLE 2P+GROUND x 4mmq

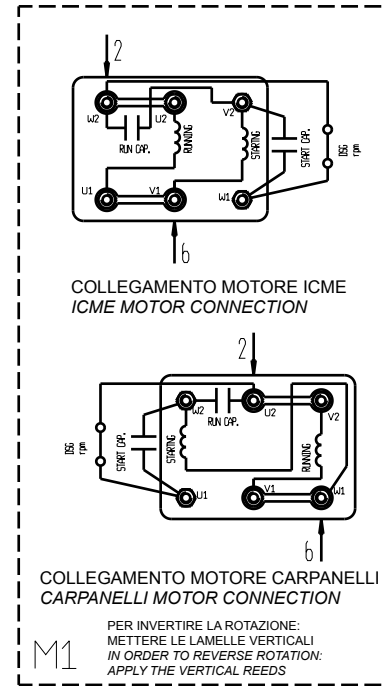


MOTORE HYDRAULIC
 CENTRALINA POWER
 OLEODINAMICA UNIT MOTOR

MOTORE MANDREL
 MANDRINO MOTOR

MORSETTI IP
 IP CLAMPS

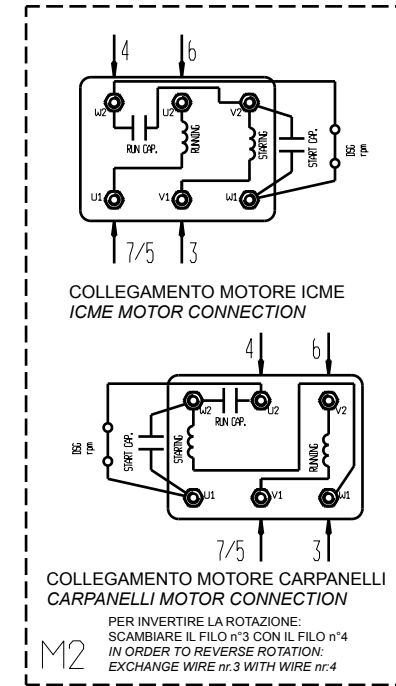
- 11 = T/L3
- 7 = S/L2
- 3 = R/L1
- 12 = W
- 8 = V
- 2 = U



COLLEGAMENTO MOTORE ICME
 ICME MOTOR CONNECTION

M1

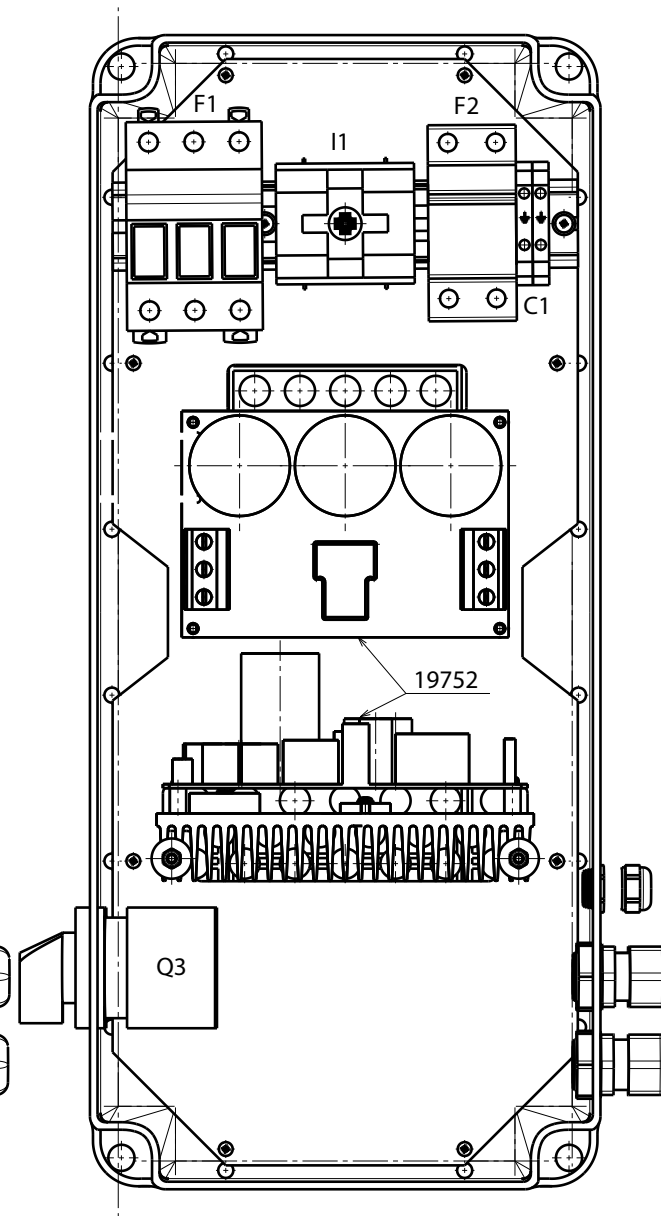
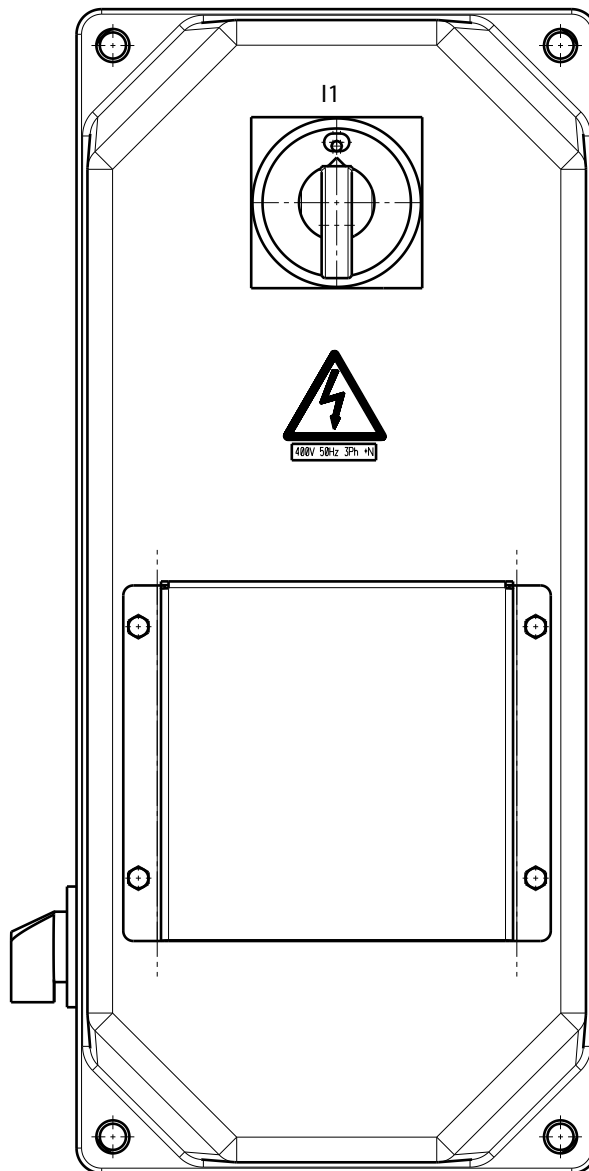
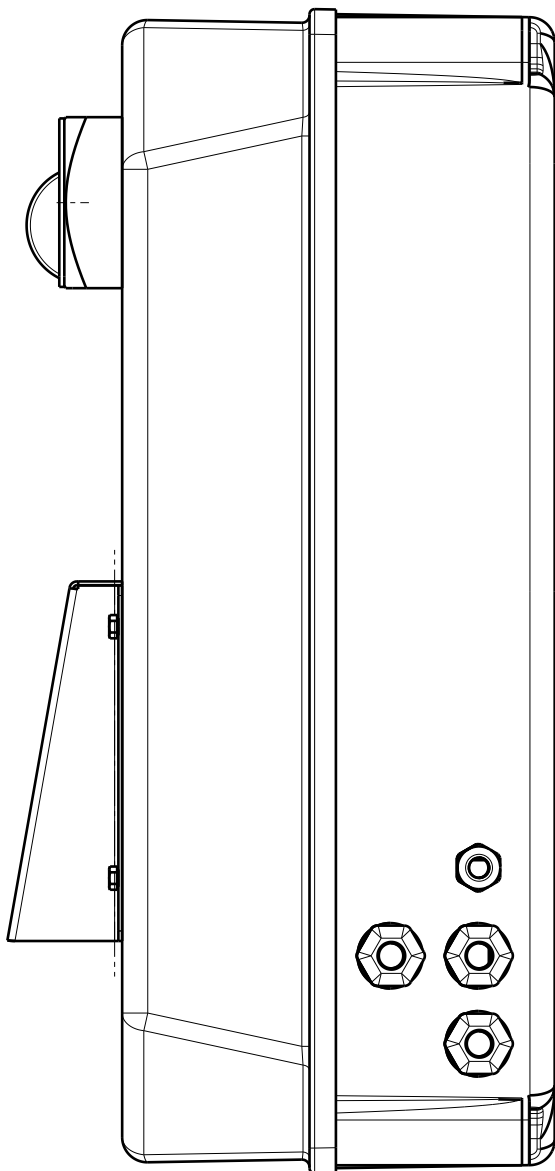
PER INVERTIRE LA ROTAZIONE:
 METTERE LE LAMELLE VERTICALI
 IN ORDER TO REVERSE ROTATION:
 APPLY THE VERTICAL REEDS

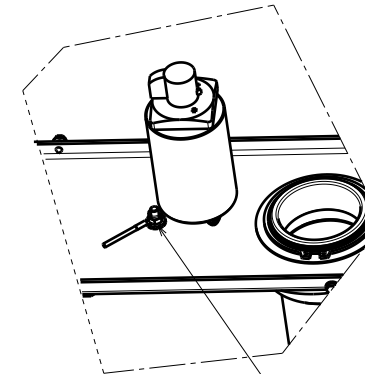
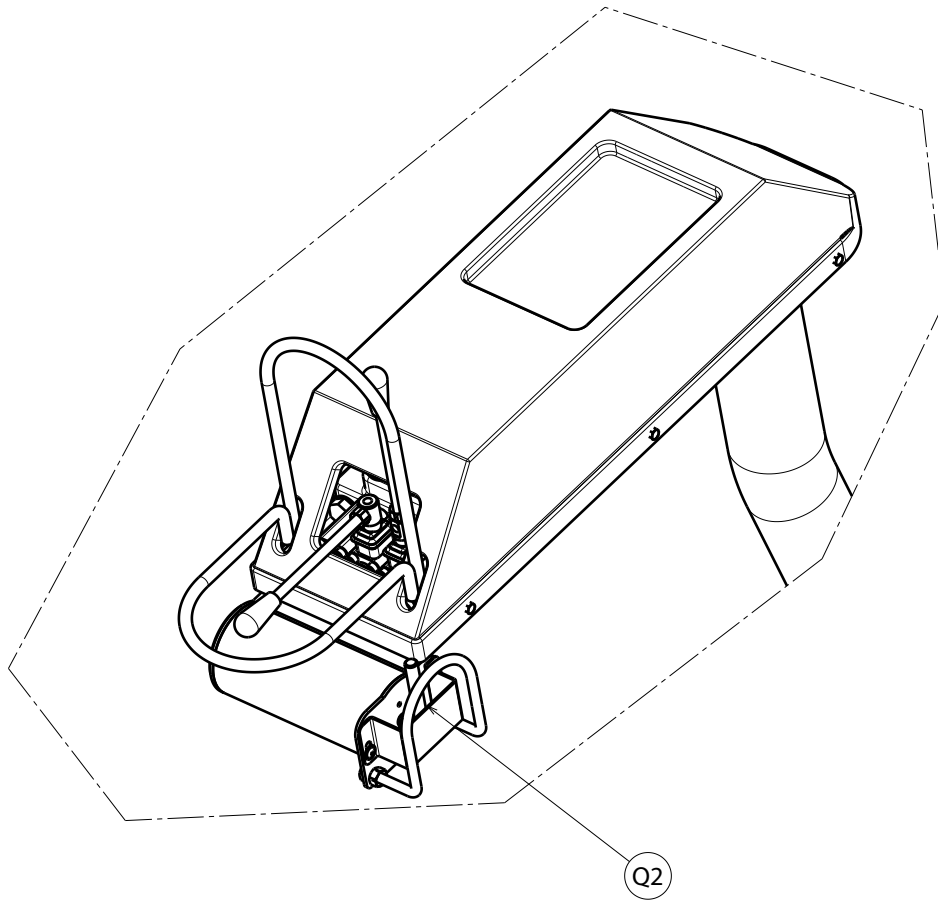


COLLEGAMENTO MOTORE ICME
 ICME MOTOR CONNECTION

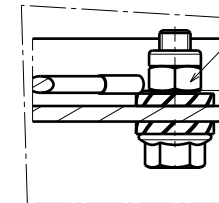
M2

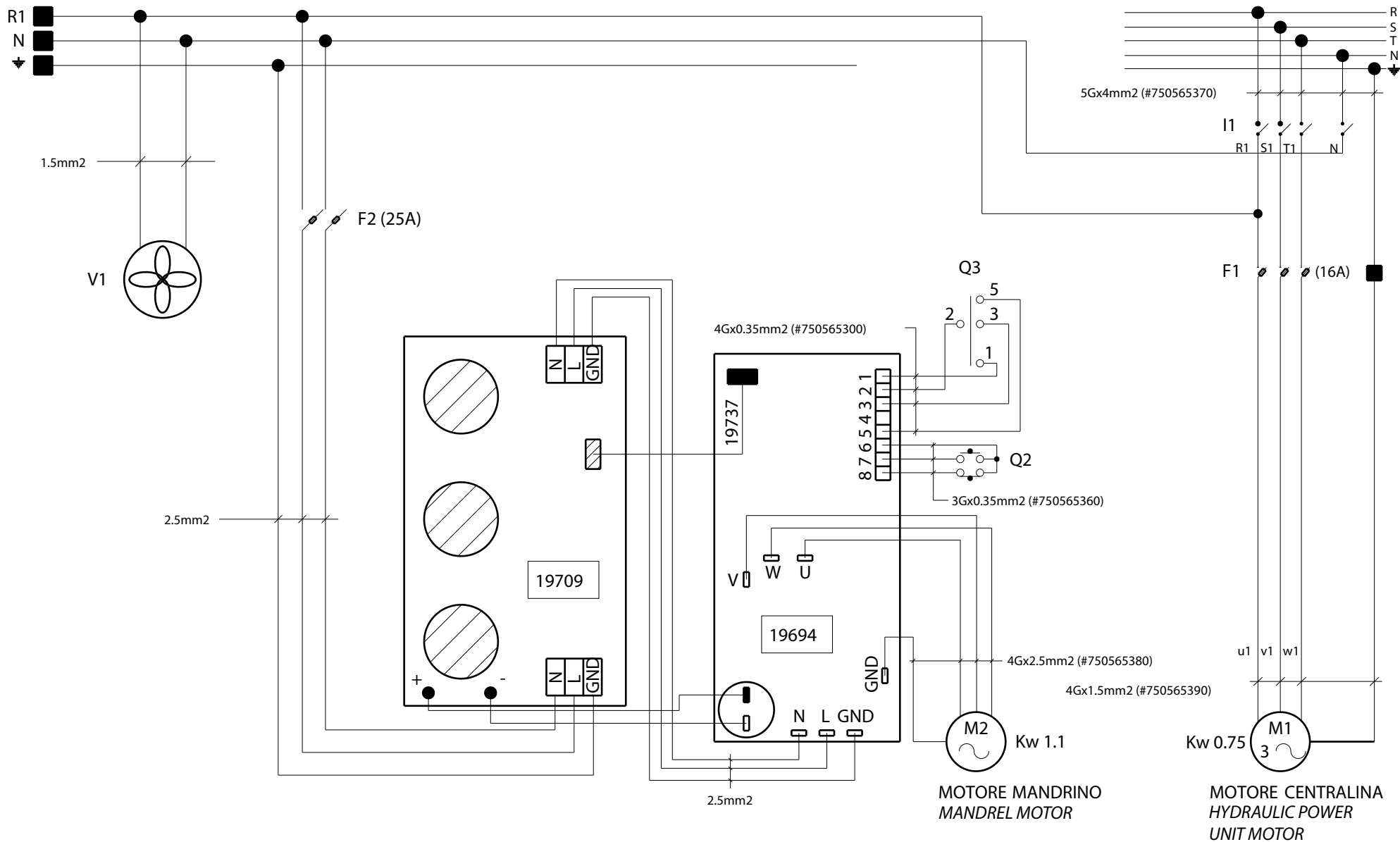
PER INVERTIRE LA ROTAZIONE:
 SCAMBIARE IL FILO n°3 CON IL FILO n°4
 IN ORDER TO REVERSE ROTATION:
 EXCHANGE WIRE nr.3 WITH WIRE nr.4





Collegamento di terra
Ground connection



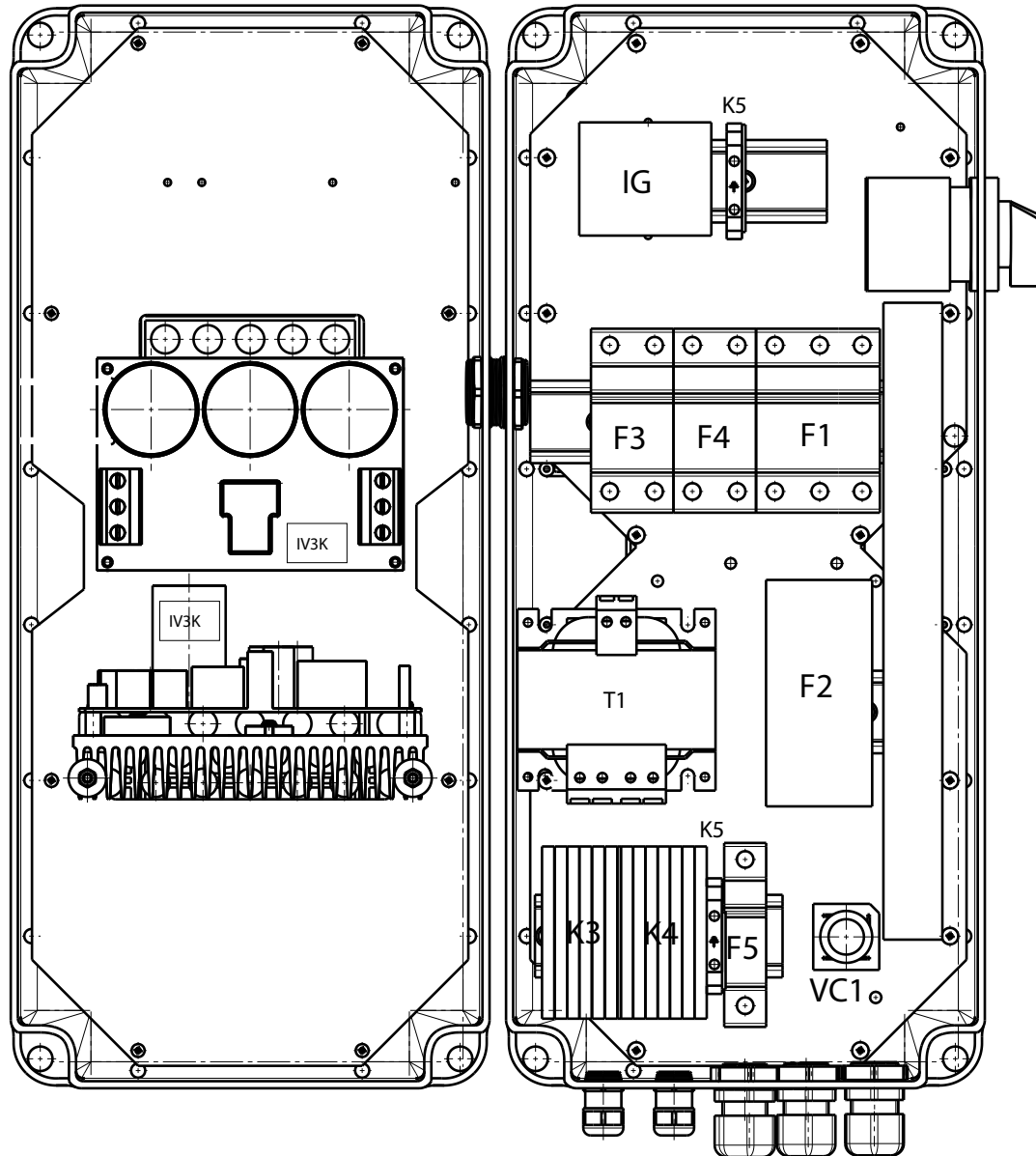


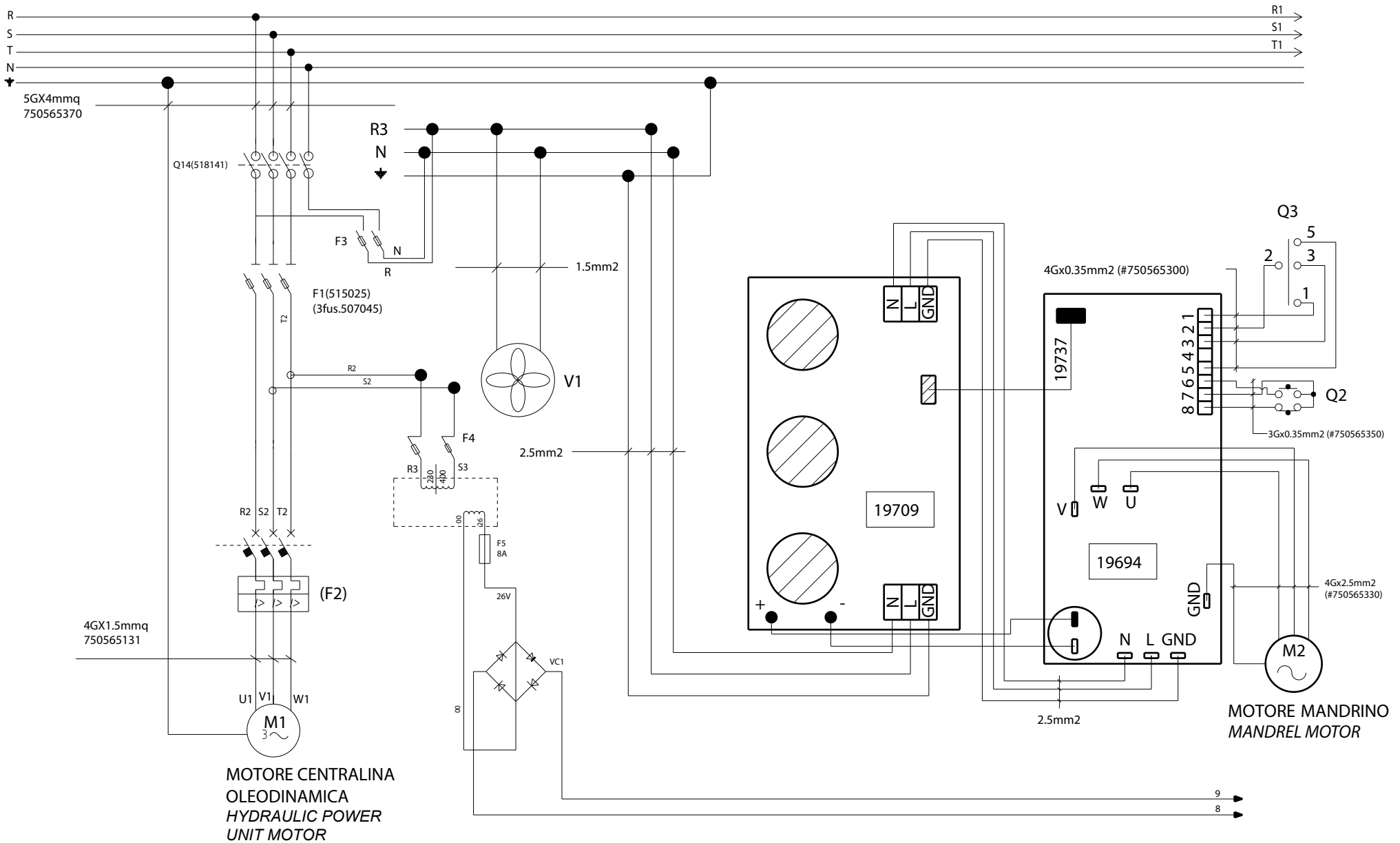
LISTA COMPONENTI

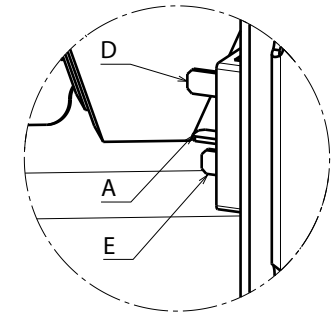
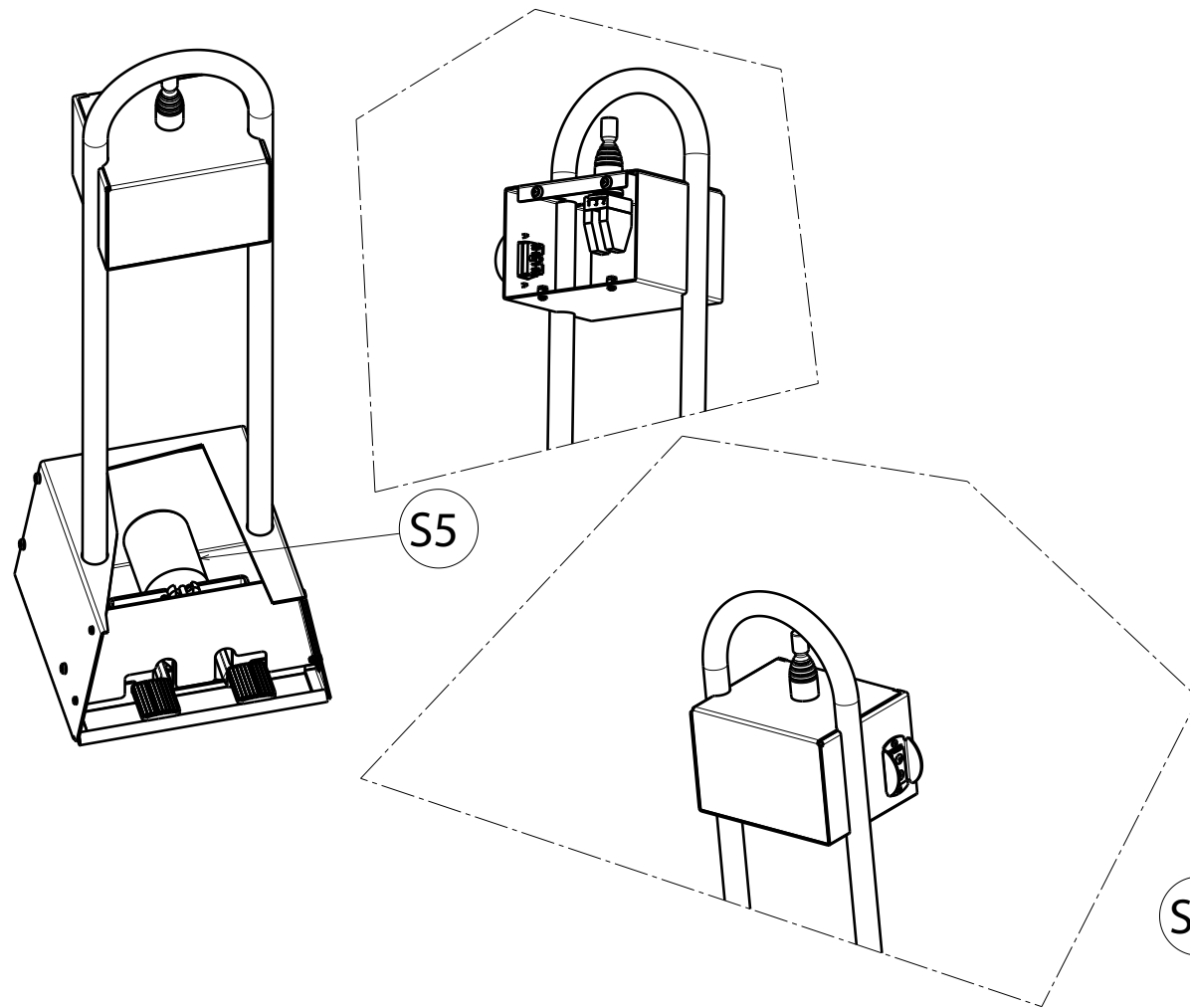
RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
F1	PORTAFUSIBILE	3 POLI P10-3 5450334 WIMEX	515035	1	
	FUSIBILE	FUSIBILE 10x38 16A 500V aM	507045	3	
F2	PORTAFUSIBILE	PORTAF.BIP.GK1-DD 32A F.10X38	515027	1	
	FUSIBILE	FUSIBILE RIT.10,3X38 25A 500V	507048	2	
I1	INTERRUTTORE GENERALE		518250	1	
I1	INTERRUTTORE GENERALE		518226	1	
C1	MORSETTO	G/V4mmq ART.TEO.4 CABUR T0430	510150	2	
Q2	COMMUTATORE	lth 25A Ui 690V-50Hz Uimp 4KW	518227	1	
Q3	COMMUTATORE 3POS. 25A	ST31/8ENSX70A SONTHEIMER	518270	1	
M1	MOTORE CENTRALINA	80.4.B14 KW0,75 230-400 50 S1	900002250	1	
M2	MOTORE MANDRINO	ME 80.B4 KW1.1 185V 50HZ 3PH3	900004800	1	
V1	VENTOLA DI RAFFREDDAMENTO		16718	1	
	ASSIEME IV3K		19752	1	

COMPONENTS LIST

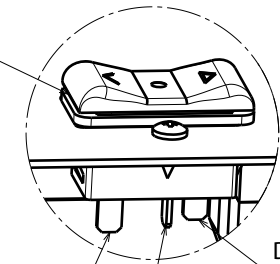
REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT
F1	FUSE HOLDER	3 POLES P10-3 5450334 WIMEX	515035	1	
	FUSE	10x38 16A 500V aM FUSE	507045	3	
F2	FUSE HOLDER	BIP.GK1-DD 32A F.10X38 FUSE HOLDER	515027	1	
	FUSE	10,3X38 25A 500V DELAYED FUSE	507048	2	
I1	GENERAL SWITCH		518250	1	
I1	GENERAL SWITCH		518226	1	
C1	CLAMP	G/V4mmq ART.TEO.4 CABUR T0430	510150	2	
Q2	COMMUTATOR	lth 25A Ui 690V-50Hz Uimp 4KW	518227	1	
Q3	COMMUTATOR 3POS. 25A	ST31/8ENSX70A SONTHEIMER	518270	1	
M1	HYDRAULIC POWER UNIT MOTOR	80.4.B14 KW0,75 230-400 50 S1	900002250	1	
M2	MANDREL MOTOR	ME 80.B4 KW1.1 185V 50HZ 3PH3	900004800	1	
V1	COOLING FAN		16718	1	
	IV3K ASSEMBLY		19752	1	







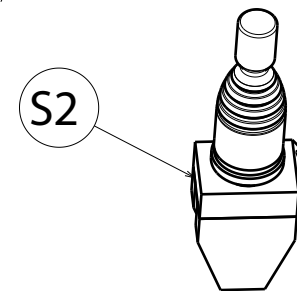
DETTAGLIO B
B DETAIL

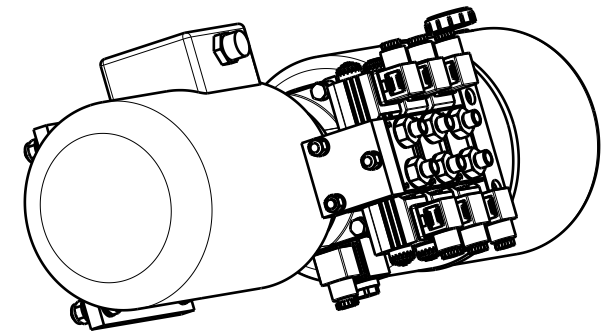
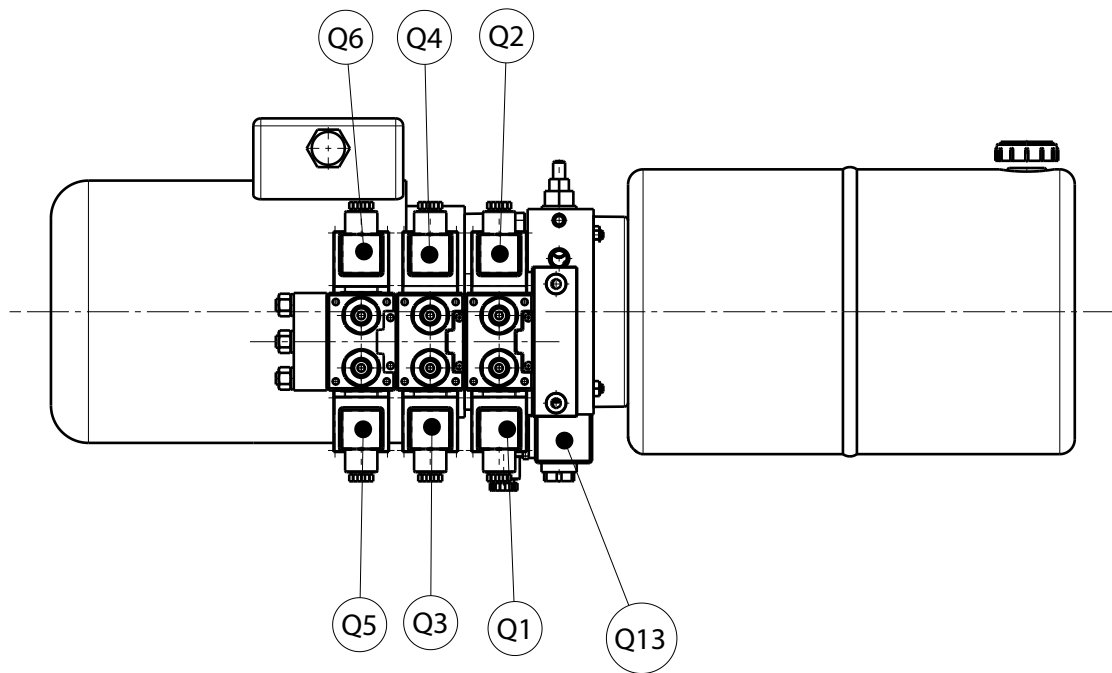


DETTAGLIO A
A DETAIL

MOLLA PER LIBERARE I
CONTATTI VERSO IL LATO
OPPOSTO

SPRINGS FOR CONTACTS
RELEASE TOWARD
OPPOSITE SIDES

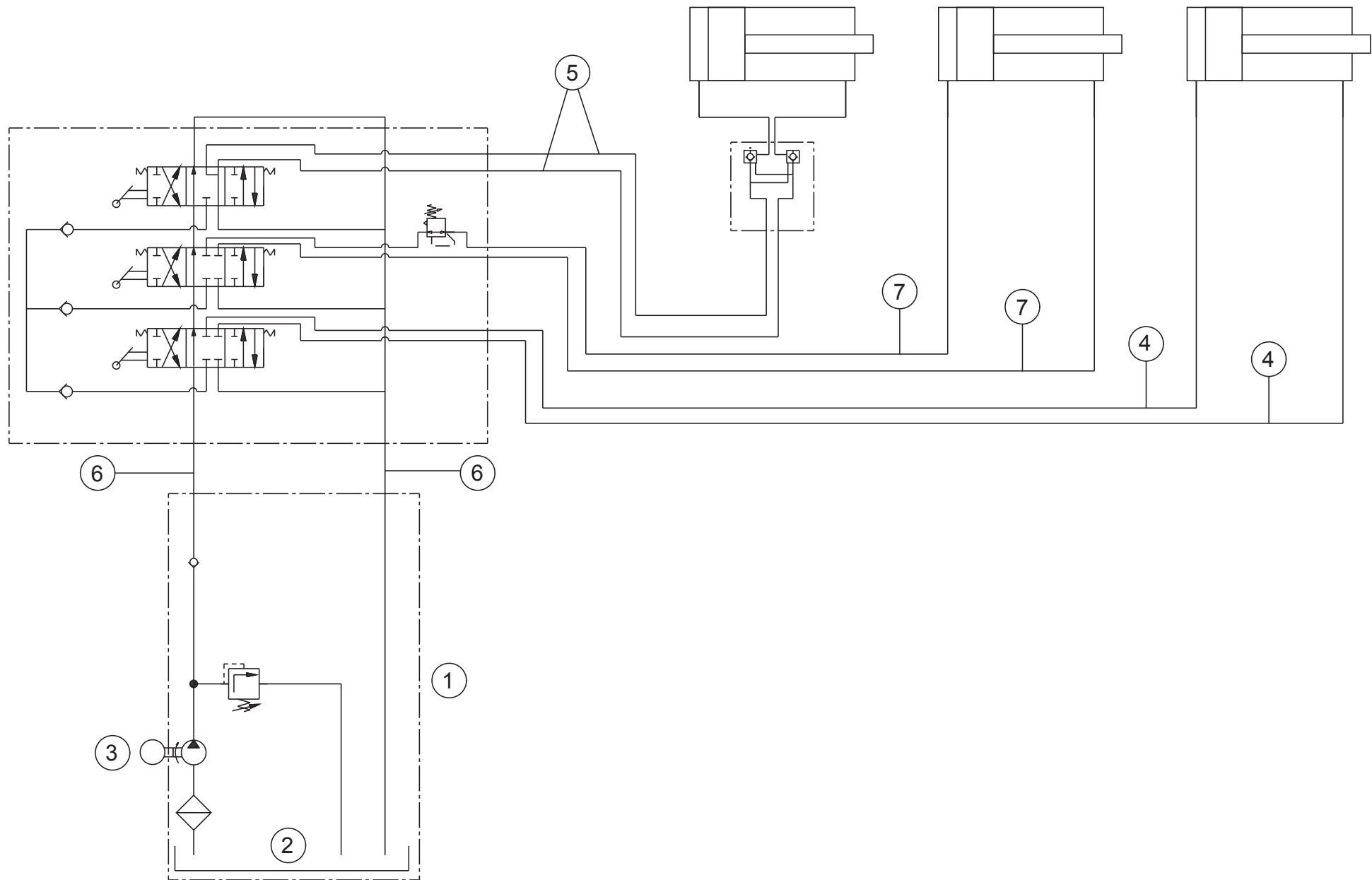


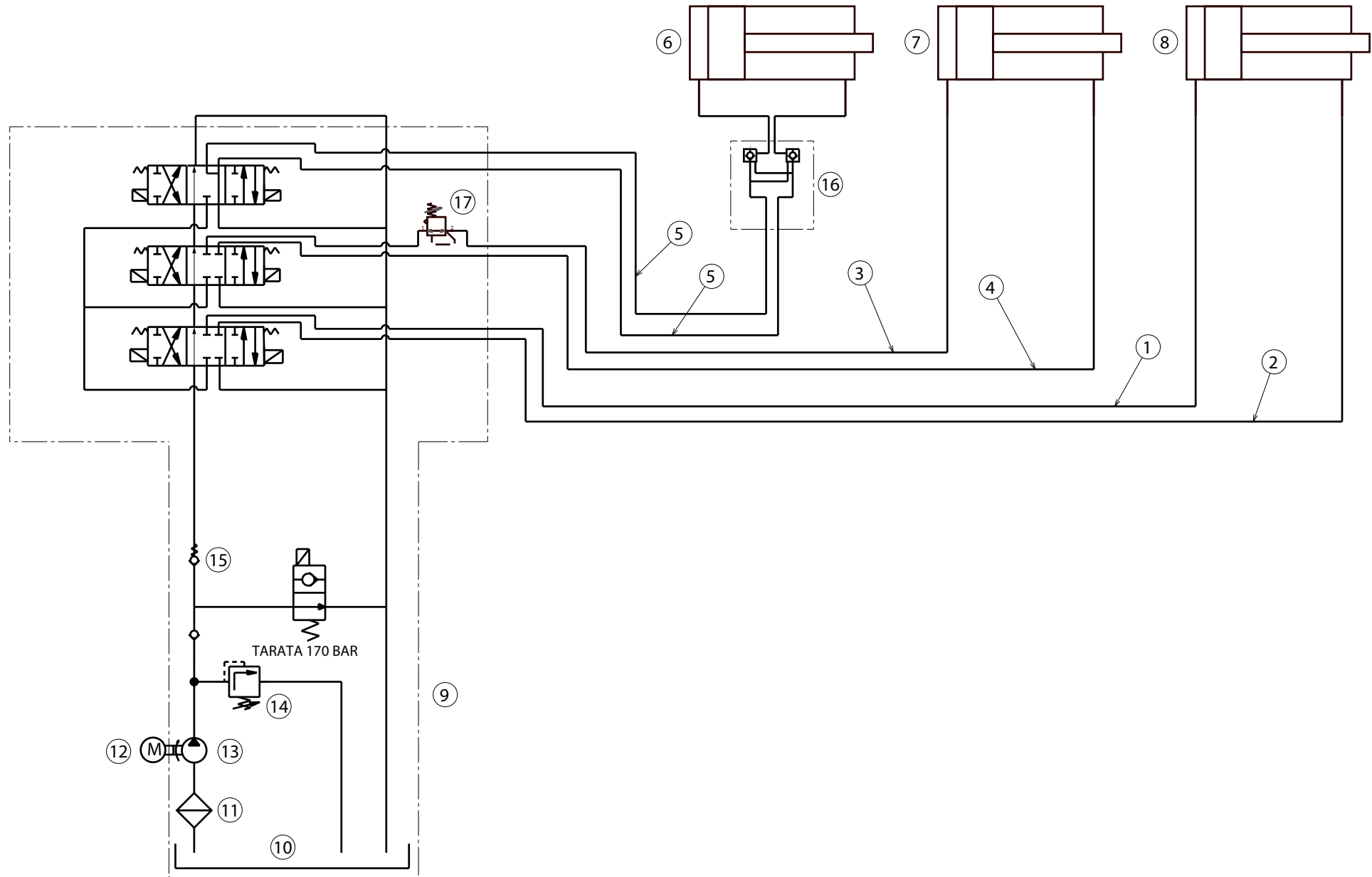


 Butler ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		SCHEMA ELETTRICO 5/7 THREEPHASE ELECTRICAL 5/7 SCHALTPLAN 5/7 SCHEMA ELECTRIQUE 5/7 ESQUEMA ELECTRICO 5/7 (VARGNAV11EID)	Pag. 60 di 66 NAV11N - NAV11NT NAV11EI - NAV11TEI
	Tavola N°E - Rev. 1	750505560		

RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
F1	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515025	1	2.7
	FUSIBILE	10,3x38 16A 500V aM RITARDATO	507045	3	
F2	INTERRUTTORE AUTOM. TRIPOLARE	4-6.3A ART.GV2 ME10SCHNEIDER	518276	1	2.7
				1	2.7
F3-F4	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V	515027	2	2.7
(F3)	FUSIBILE	RIT.10,3X38 25A 500V	507048	2	
(F4)	FUSIBILE	10,3X38 2A 500V RAPIDO	507019	2	
F5	PORTAFUSIBILE	UNIPOLARE 10,3X38 32A 690V	515029	1	2.7
	FUSIBILE	10,3X38 8A 500V AM	507100	1	2.7
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K3	MORSETTO 2.5mmq C/DIODO 1N4007		510218	6	2.7
K4	MORSETTO A MOLLA 2 PIAN.1.5mmq		510217	7	2.7
K5	MORSETTO G/V 4mmq ART.TEO.4 CABUR T0430		510150	2	2.7
VC1	PONTE RADDRIZZATORE VC1	-	B1296200	1	2.7
	CONDENSATORE C1-C2		B1296300	1	2.7
	INS.CAVO ALIMENTAZIONE QUADRO		750565370	1	
	INS.CAVO MOTORE MANDRINO		750565330	1	
	INS.CAVO MOTORE CENTRALINA	-	750565131	1	
	INS.CAVO MANIPOLATORE		750565141	1	
	INS.CAVO ELETTROVALV.Q1-Q2- Q3-Q4-Q5-Q6-Q13		750516151	1	
			750516161	1	
			750516171	1	
			750516181	1	
			750516191	1	
			750516201	1	
			750516211	1	
S2	MANIPOLATORE	4 POS.+CENTR.TEMPORANEE Ø22	517157AS	1	5.7
				1	
S3	PULSANTE BASCULANTE	-	517300	1	5.7
		-			
S5	INVERTITORE TRIPOLARE		518272	1	5.7
		-		1	
T1	TRASFORMATORE	100 VA 50/60 Hz PRI: 0/400V SEC: 0/24V 0/26V	528085	1	2.7
-	-	-	-	-	-
M1	MOTORE CENTRALINA	1,5KW 400V 50HZ 4/6,9A 1400rpm	900004670	1	3.7
M2	MOTORE MANDRINO	1,35/1,85KW 400V 50Hz 4/5.3A 1400/2800rpm	900003930	1	3.7

REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT
F1	FUSE HOLDER	10,3x38 32A 690V 3 POLES SECTIONABLE	515025	1	2.7
	FUSE	10,3x38 16A 500V aM DELAYED	507045	3	
F2	TRIPOLAR AUTOMATIC SWITCH	4-6.3A ART.GV2 ME10SCHNEIDER	518276	1	2.7
				1	2.7
F3-F4	FUSE HOLDER	10,3x38 32A 690V2 POLES SECTIONABLE	515027	2	2.7
(F3)	FUSE	RIT.10,3X38 25A 500V	507048	2	
(F4)	FUSE	10,3X38 2A 500V RAPID	507019	2	
F5	FUSE HOLDER	10,3X38 32A 690V UNIPOLAR	515029	1	2.7
	FUSE	10,3X38 8A 500V AM	507100	1	2.7
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K3	2.5mmq C/DIODO 1N4007 CLAMP		510218	6	2.7
K4	SPRING CLAMP 2 PIAN.1.5mmq		510217	7	2.7
K5	CLAMP G/V 4mmq ART.TEO.4 CABUR T0430		510150	2	2.7
VC1	RECTIFIER BRIDGE VC1	-	B1296200	1	2.7
	CONDENSER C1-C2		B1296300	1	2.7
	SQUARE FEEDING CABLE ASSEMBLY		750565370	1	
	CHUCK UNIT MOTOR CABLE ASSEMBLY		750565330	1	
	HYDR.POWER UNIT MOTOR CABLE ASSEMBLY	-	750565131	1	
	HANDLE CABLE ASSEMBLY		750565141	1	
	Q1-Q2-Q3-Q4-Q5-Q6-Q13 SOLENOID VALVE CABLE ASSEMBLY		750516151	1	
		750516161	1		
		750516171	1		
		750516181	1		
		750516191	1		
		750516201	1		
		750516211	1		
S2	HANDLE	4 POS.+CENTRAL TEMPORARY Ø22	517157AS	1	5.7
				1	
S3	PUSHBUTTON	-	517300	1	5.7
		-			
S5	TRIPOLAR INVERTER		518272	1	5.7
				1	
T1	TRANSFORMER	100 VA 50/60 Hz PRI: 0/400V SEC: 0/24V 0/26V	528085	1	2.7
-	-	-	-	-	-
M1	HYDRAULIC POWER UNIT MOTOR	1,5KW 400V 50HZ 4/6,9A 1400rpm	900004670	1	3.7
M2	CHUCK MOTOR	1,35/1,85KW 400V 50Hz 4/5.3A 1400/2800rpm	900003930	1	3.7





7505-R001-3_B

**NAV11N
NAV11NT
NAV11EI
NAV11TEI**

- I** 20.0 LISTA DEI COMPONENTI
- GB** 20.0 LIST OF COMPONENTS
- D** 20.0 TEILELISTE
- F** 20.0 LISTE DES PIECES DETACHEES
- E** 20.0 LISTA DE PIEZAS



GLI ESPLOSI SERVONO SOLO PER L'IDENTIFICAZIONE DELLE PARTI DA SOSTITUIRE. LA SOSTITUZIONE DEVE ESSERE EFFETTUATA DA PERSONALE PROFESSIONALMENTE QUALIFICATO.



THE DIAGRAMS SERVE ONLY FOR THE IDENTIFICATION OF PARTS TO BE REPLACED. THE REPLACEMENT MUST BE CARRIED OUT PROFESSIONALLY QUALIFIED PERSONNEL.



DIE ZEICHNUNGEN DIENEN NUR ZUR IDENTIFIZIERUNG DER ERSATZTEILE. DIE ERSETZUNG MUSS DURCH QUALIFIZIERTES PERSONAL ERFOLGEN.



LES DESSINS NE SERVENT QU'À L'IDENTIFICATION DES PIÈCES À REMPLACER. LE REMPLACEMENT DOIT ÊTRE EFFECTUÉ PAR UN PERSONNE PROFESSIONNELLEMENT QUALIFIÉ.



LOS DIBUJOS EN DESPIECE SIRVEN ÚNICAMENTE PARA IDENTIFICAR LAS PIEZAS QUE DEBEN SUSTITUIRSE. LA SUSTITUCIÓN DE PIEZAS DEBE EFECTUARLA EXCLUSIVAMENTE PERSONAL PROFESIONALMENTE CUALIFICADO.

- Per eventuali chiarimenti interpellare il più vicino rivenditore oppure rivolgersi direttamente a:
- For any further information please contact your local dealer or call:
- Im Zweifelsfall ober bei Rückfragen wenden Sie sich bitte an den nächsten Wiederverkäufer oder direkt an:
- Pour tout renseignement complémentaire s'adresser au revendeur le Plus proche ou directement à:
- En caso de dudas, para eventuales aclaraciones, póngase en contacto con el distribudor más próximo ó diríjasie directamente a:

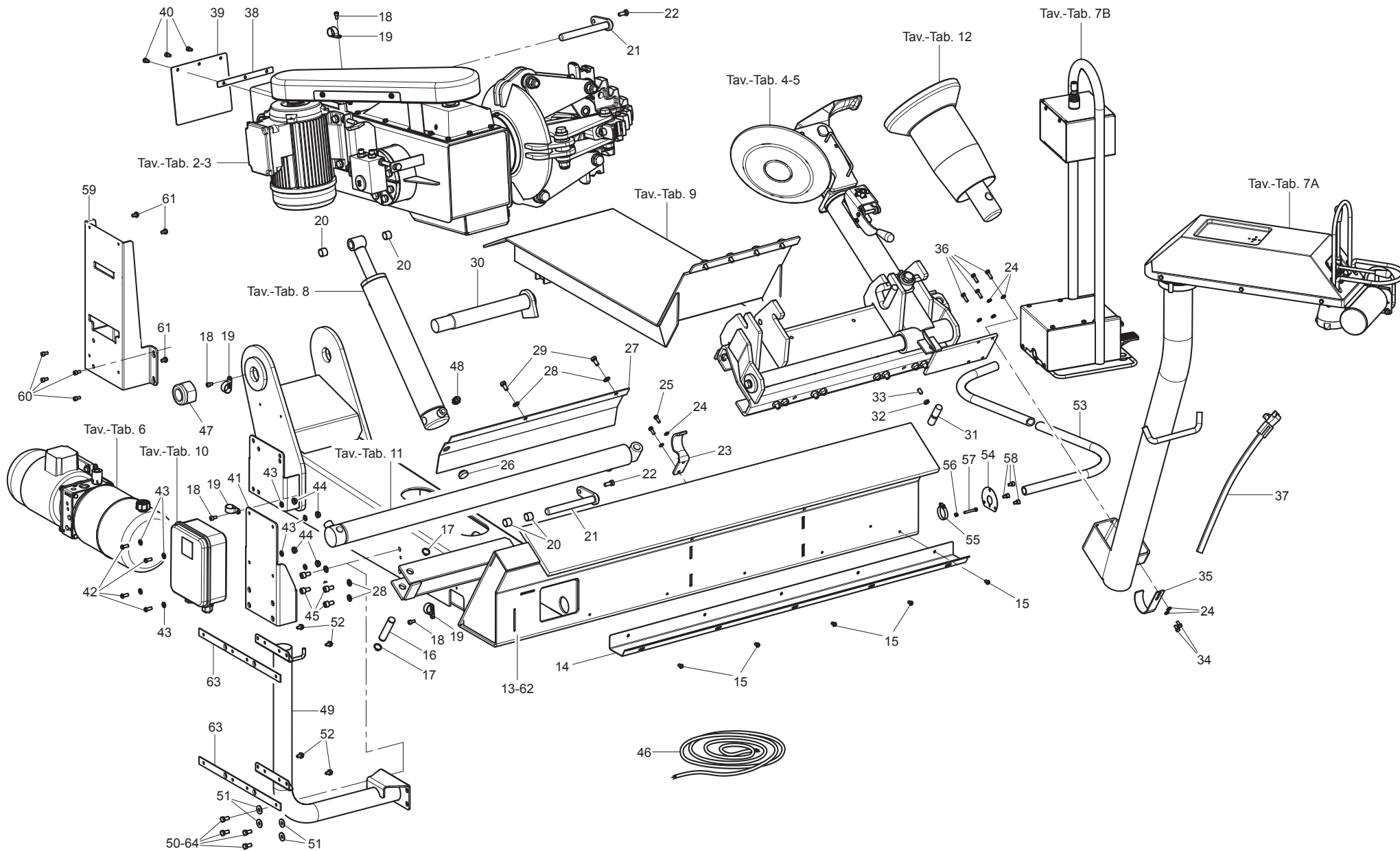
BUTLER ENGINEERING and MARKETING S.p.A. a s. u.

Via dell'Ecologia, 6 - 42047 Rolo - (RE) Italy

Phone (+39) 0522 647911 - Fax (+39) 0522 649760 - e-mail: Info@butler.it

**SOMMARIO - SUMMARY - INHALT
SOMMAIRE - SUMARIO**

Tavola N°1 - Rev. 2 _____ 3 ASSIEME GENERALE MAIN ASSEMBLY GENERALSATZ ASSEMBLAGE GENERAL JUNTO GENERAL	Tavola N°7C - Rev. 0 __ 750590410 17 GRUPPO COLONNETTA PEDALIERA (VARIANTE CON INVERTER) PEDALBOARD COLUMN UNIT (VERSION WITH INVERTER) SATZ PEDALLEISTESÄULE (VERSION MIT INVERTER) GROUPE COLONNE PÉDALES DE DIRECTION (VERS. AVEC INVERSEUR) GRUPO COLUMN PEDALERA (VERSIÓN CON INVERSOR)
Tavola N°2 - Rev. 1 __ 750590120 7 BRACCIO MANDRINO MANDREL ARM SPINDELSARM BRAS MANDRIN BRAZO MANDRIL	Tavola N°7D - Rev. 0 __ 750590580 18 GRUPPO COMANDO PER ROTAZIONE A TERRA (VAR. CON INVERTER) CONTROL UNIT FOR GROUND ROTATION (VERS. WITH INVERTER) BEFEHLUNGSSATZ FÜR GEERDETE DREHUNG (VERS. MIT INVERTER) GROUPE COMMANDE POUR ROTATION AU SOL (VERS. AVEC INVERSEUR) GRUPO MANDO PARA ROTACIÓN EN TIERRA (VERS. CON INVERSOR)
Tavola N°3 - Rev. 0 __ 750390641 8 GRUPPO GRIFFA AUTOCENTRANTE SELF-CENTERING JAW UNIT SELBSTZENTRIERENDES KLAUESATZ GROUPE GRIFFE AUTOCENTREURE GRUPO GANCHO AUTOCENTRANTE	Tavola N°8 - Rev. 0 __ 750590110 19 CILINDRO BRACCIO MANDRINO MANDREL ARM CYLINDER ZYLINDERARM SPINDEL CYLINDRE BRAS MANDRIN CILINDRO BRAZO MANDRIL
Tavola N°4A - Rev. 1 __ 750590030 9 CARRO UTENSILE TOOL CARRIAGE WERKZEUGSWAGEN CHARIOT OUTIL CARRO UTENSILIO	Tavola N°9 - Rev. 0 __ 750590140 20 CARRELLO PORTAGOMMA HOSE NIPPLE CARRIAGE SCHLAUCHHALTERWAGEN CHARIOT RACCORD PORTE-TUYAU CARRO PORTA GOMA
Tavola N°4B - Rev. 1 __ 750590200 10 CARRO UTENSILE TOOL CARRIAGE WERKZEUGSWAGEN CHARIOT OUTIL CARRO UTENSILIO	Tavola N°10A - Rev. 1 _ 146693010 21 MTG CASSETTA ELETTRICA ELECTRICAL BOX MTG MTG ELEKTRISCHEKISTE MTG BOITIER ÉLECTRIQUE MTG CAJITA ELECTRICA
Tavola N°5A - Rev. 1 __ 750590040 11 GRUPPO UTENSILI TOOLS UNIT WERKZEUGSATZ GROUPE OUTILES GRUPO UTENSILIOS	Tavola N°10B - Rev. 0 _ 750503070 22 QUADRO ELETTRICO ELECTRIC CABINET SCHALTAFEL TABLEAU ÉLECTRIQUE CUADRO ELÉCTRICO
Tavola N°5B - Rev. 0 __ 750590170 12 GRUPPO UTENSILI SENZA LEVA TOOLS UNIT WITHOUT LEVER WERKZEUGSATZ OHNE HEBEL GROUPE OUTILES SANS LEVIER GRUPO UTENSILIOS SINE PALANCA	Tavola N°10C - Rev. 0 _ 750303040 23 QUADRO ELETTRICO MONOFASE MONOPHASE ELECTRIC CABINET EINPHASEN SCHALTPULT TABLEAU ÉLECTRIQUE UNIPHASÉ CUADRO ELÉCTRICO MONOFÁSICO
Tavola N°6A - Rev. 1 __ 750590050 13 GRUPPO MOTORE + CENTRALINA MOTOR UNIT + HYDRAULIC POWER UNIT MOTORSATZ + STEUERUNG GROUPE MOTEUR + DISTRIBUTEUR GRUPO MOTOR + CENTRALITA	Tavola N°10D - Rev. 1 _ 750590640 24 INSIEME MTG CASSETTA ELETTRICA CON INVERTER ELECTRICAL BOX MTG ASSEMBLY WITH INVERTER SATZ MTG ELEKTRISCHEKISTE MIT INVERTER ASSEMBLAGE MTG BOITIER ÉLECTRIQUE AVEC INVERSEUR CONJUNTO MTG CAJITA ELECTRICA CON INVERSOR
Tavola N°6B - Rev. 0 __ 750590481 14 GRUPPO MOTORE + CENTRALINA MOTOR UNIT + HYDRAULIC POWER UNIT MOTORSATZ + STEUERUNG GROUPE MOTEUR + DISTRIBUTEUR GRUPO MOTOR + CENTRALITA	Tavola N°10E - Rev. 1 _ 750590720 25 MTG CASSETTE ELETTRICHE (VARIANTE CON INVERTER) MTG ELECTRICAL BOXES (VERSION WITH INVERTER) ELEKTRISCHEKISTEN MTG (VERSION MIT INVERTER) BOÎTES ÉLECTRIQUES MTG (VERSION AVEC INVERSEUR) CAJITAS ELÉCTRICAS MTG (VERSIÓN CON INVERSOR)
Tavola N°7A - Rev. 1 __ 750590061 15 GRUPPO COMANDO CONTROL UNIT BEFEHLUNGSSATZ GROUPE COMMANDE GRUPO MANDO	Tavola N°11 - Rev. 0 __ 146701010 26 INSIEME PISTONE CARRELLO CARRIAGE PISTON ASSEMBLY WAGENKOLBE SATZ ASSEMBLAGE PISTON CHARIOT ENSAMBLADO PISTÓN CARRO
Tavola N°7B - Rev. 0 __ 750590421 16 GRUPPO COMANDO CONTROL UNIT BEFEHLUNGSSATZ GROUPE COMMANDE GRUPO MANDO	Tavola N°12 - Rev. 0 __ 750590360 27 RULLO STALLONATORE BEAD BREAKING ROLL ABDRÜCKWALZE ROULEAU DÉCOLLE-TALONS RODILLO DESTALONADOR





ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS

Tavola N°1 - Rev. 2

ASSIEME GENERALE
MAIN ASSEMBLY
GENERSATZ
ASSEMBLAGE GENERAL
JUNTO GENERAL

Pag. 4 di 27

NAV11N - NAV11NT
NAV11EI - NAV11TEI

Tav.	Cod.	Pos.	NAV11N	NAV11NT	NAV11EI	NAV11TEI		
2	750590120		•	•	•	•		
3	750390641		•	•	•	•		
4A	750590030		•		•			
4B	750590200			•		•		
5A	750590040		•		•			
5B	750590170			•		•		
6A	750590050		•	•				
6B	750590481				•	•		
7A	750590061		•	•				
7B	750590421				•	•		
7C	750590410■		•	•				
7D	750590580■		•	•				
8	750590110		•	•	•	•		
9	750590140		•	•	•	•		
10A	146693010		•	•				
10B	750503070				•	•		
10C	750303040*		•					
10D	750590640■		•	•				
10E	750590720□				•	•		
11	146701010		•	•	•	•		
12	G108A36		•					
	750511831	13	•	•	•	•		
	750510610	14	•	•	•	•		
	271012	15	•	•	•	•		
	750511620	16	•	•	•	•		
	243009	17	•	•	•	•		
	206188	18	•	•	•	•		
	B6131000	19	•	•	•	•		



ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS

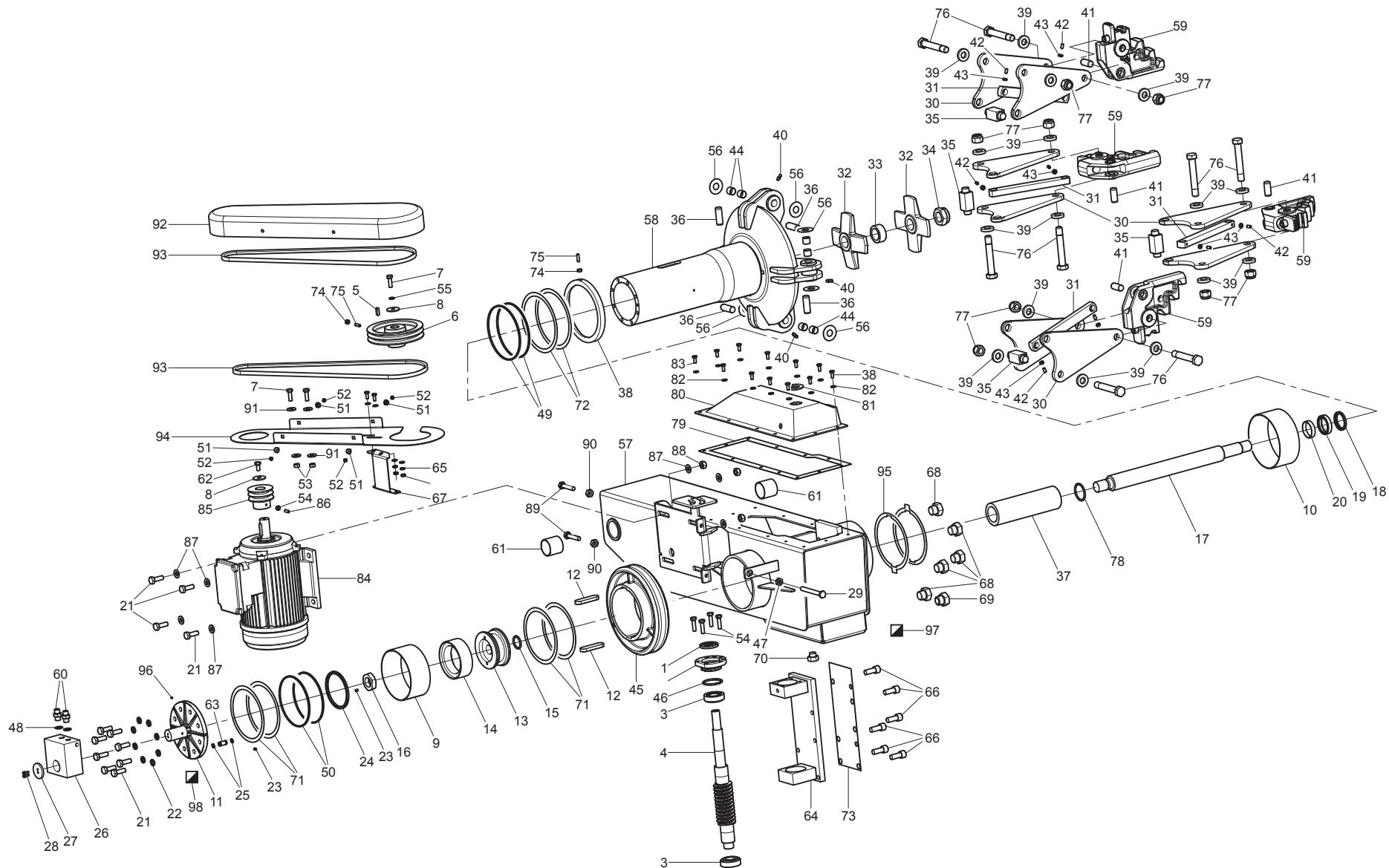
Tavola N°1 - Rev. 2

ASSIEME GENERALE
MAIN ASSEMBLY
GENERALSATZ
ASSEMBLAGE GENERAL
JUNTO GENERAL

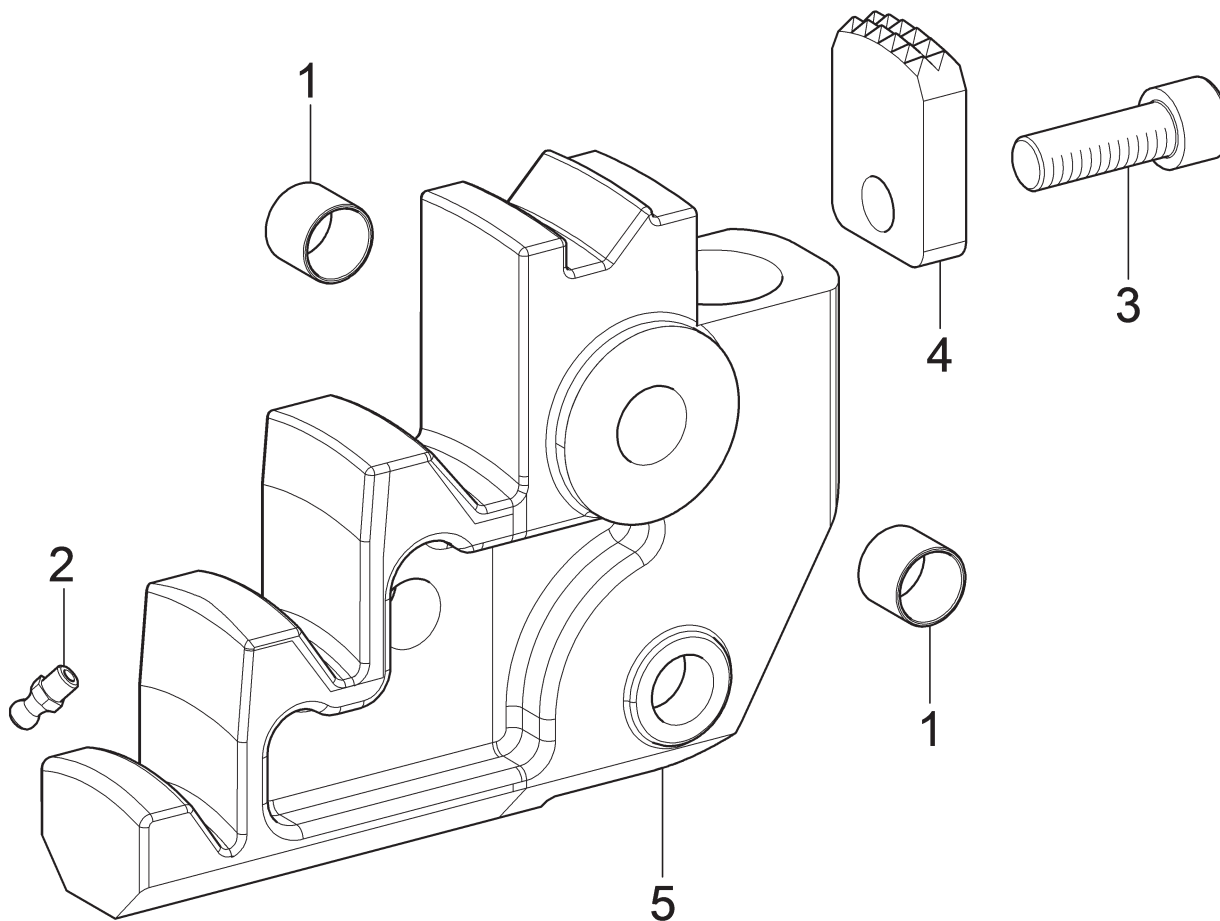
Pag. 5 di 27

NAV11N - NAV11NT
NAV11EI - NAV11TEI

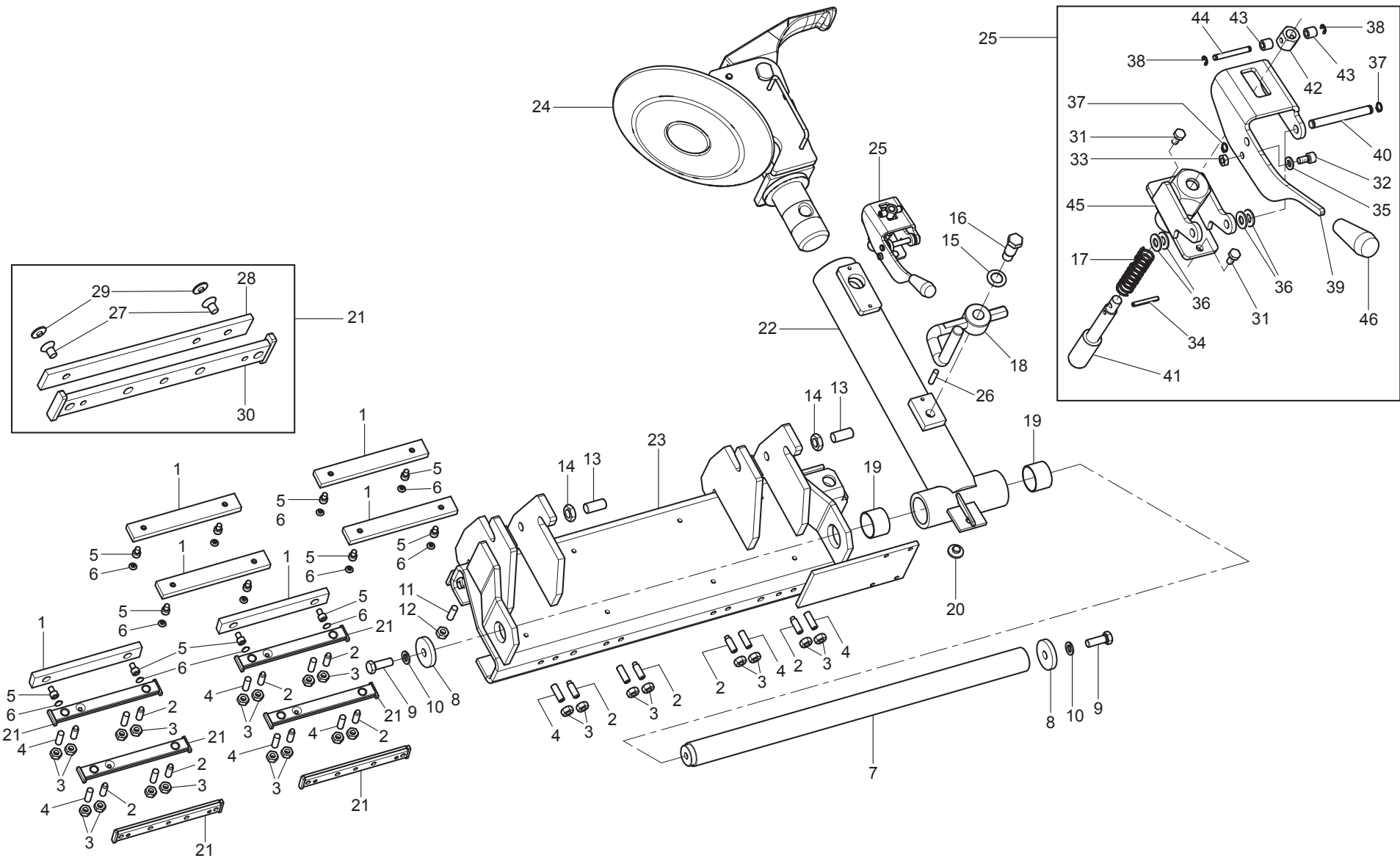
Tav.	Cod.	Pos.	NAV11N	NAV11NT	NAV11EI	NAV11TEI		
	630055	20	•	•	•	•		
	750510270	21	•	•	•	•		
	203035	22	•	•	•	•		
	750511460	23	•	•	•	•		
	238004	24	•	•	•	•		
	203019	25	•	•	•	•		
	058135150	26	•	•	•	•		
	146610340	27	•	•	•	•		
	236006	28	•	•	•	•		
	203221	29	•	•	•	•		
	750510300	30	•	•	•	•		
	146710450	31	•	•	•	•		
	226009	32	•	•	•	•		
	212172	33	•	•	•	•		
	203188	34	•	•				
	750511450	35	•	•				
	203021	36	•	•				
	G108A3	37	•	•	•	•		
	750511480	38	•	•	•	•		
	750511470	39	•	•	•	•		
	206019	40	•	•	•	•		
	750516270	41	•	•				
	271021	42	•	•				
	236004	43	•	•				
	228100	44	•	•				
	206129	45	•	•				
	146765040	46	•	•	•	•		
	228045	47	•	•	•	•		



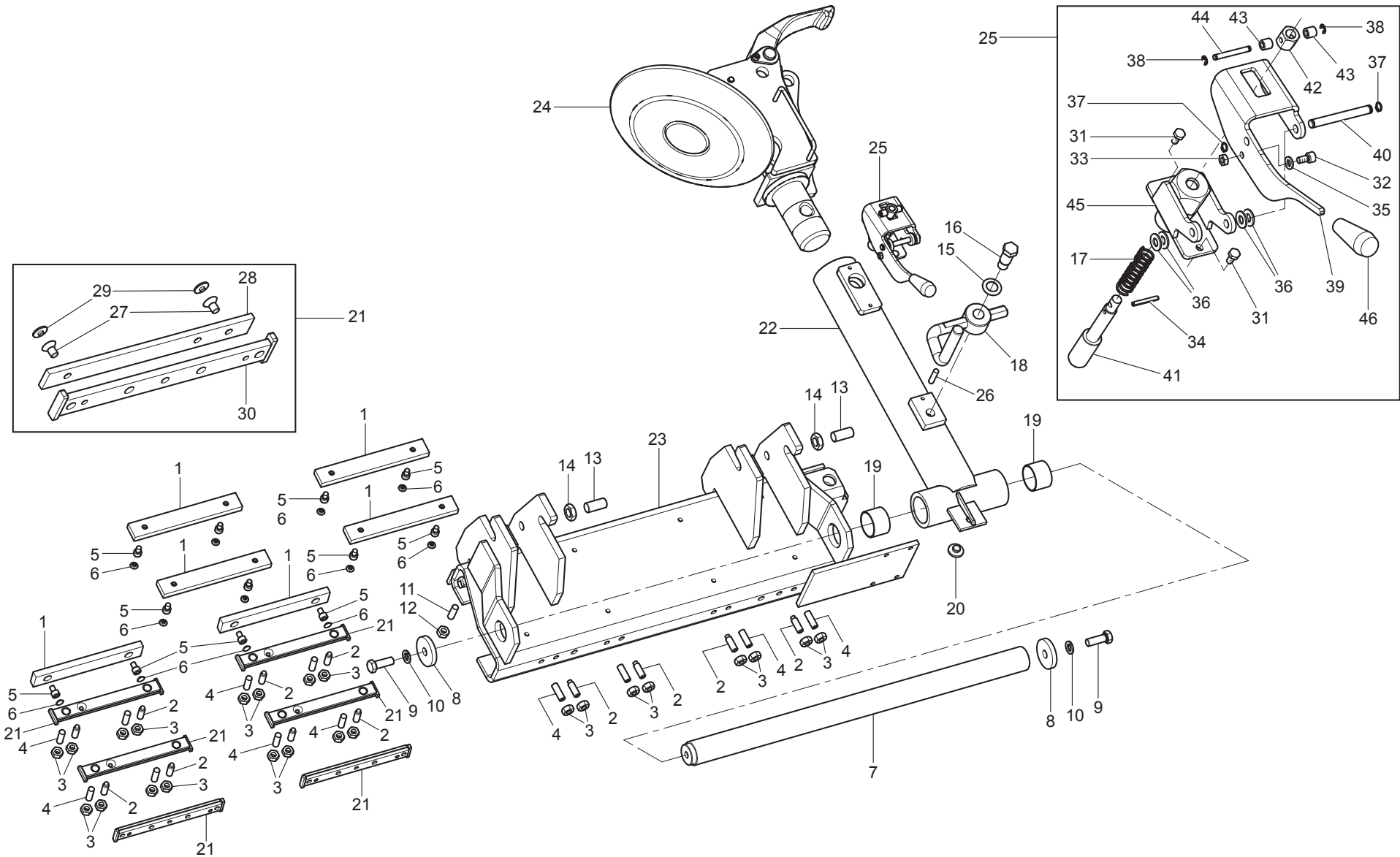
NAV11N	NAV11NT	NAV11EI	NAV11TEI	
•	•	•	•	
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS	
Tavola N°2 - Rev. 1		750590120		BRACCIO MANDRINO MANDREL ARM SPINDELSARM BRAS MANDRIN BRAZO MANDRIL
				Pag. 7 di 27



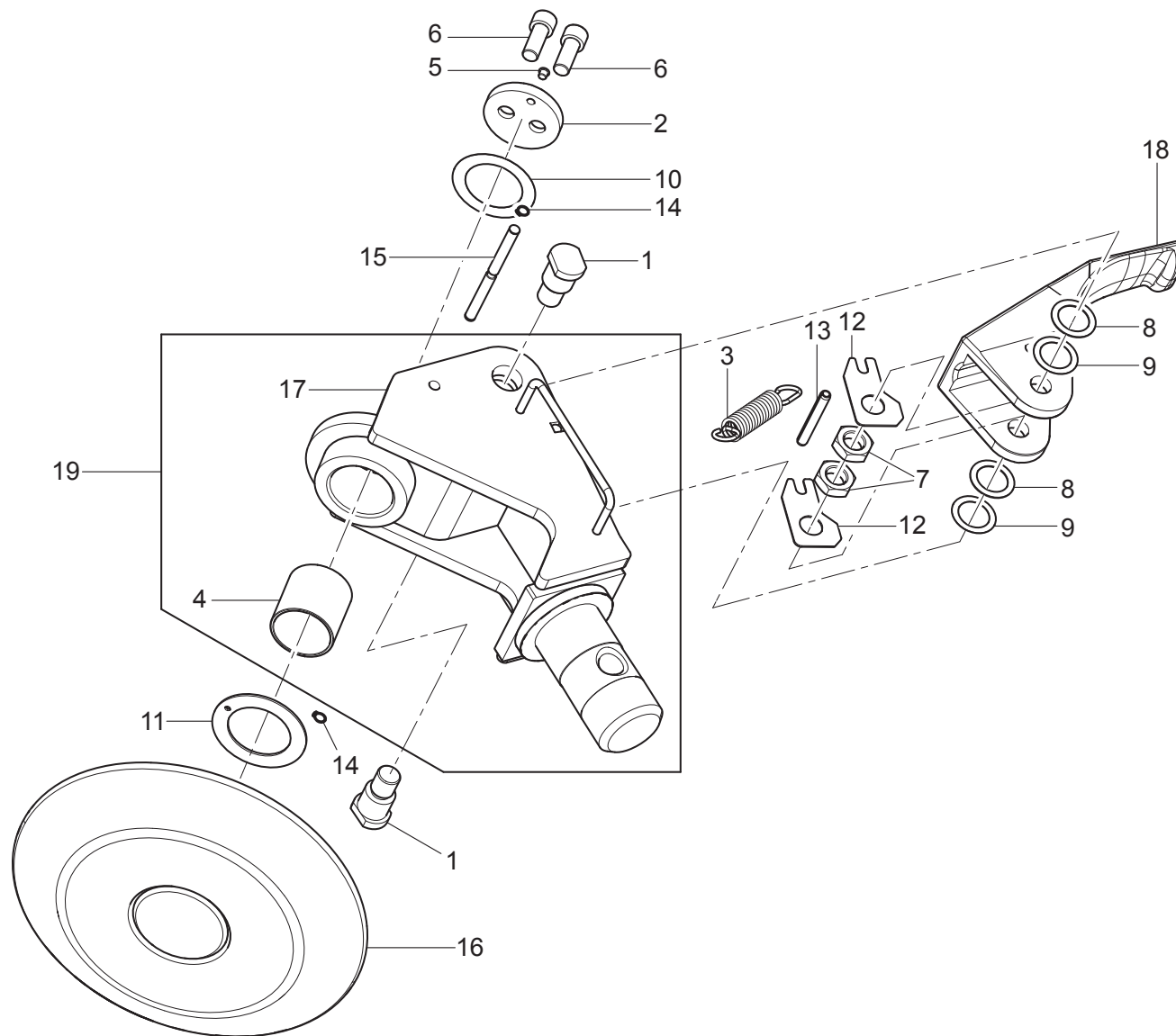
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•	•	•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		GRUPPO GRIFFA AUTOCENTRANTE SELF-CENTERING JAW UNIT SELBSTZENTRIERENDES KLAUESATZ GROUPE GRIFFE AUTOCENTREURE GRUPO GANCHO AUTOCENTRANTE		Pag. 8 di 27
	Tavola N°3 - Rev. 0	750390641			



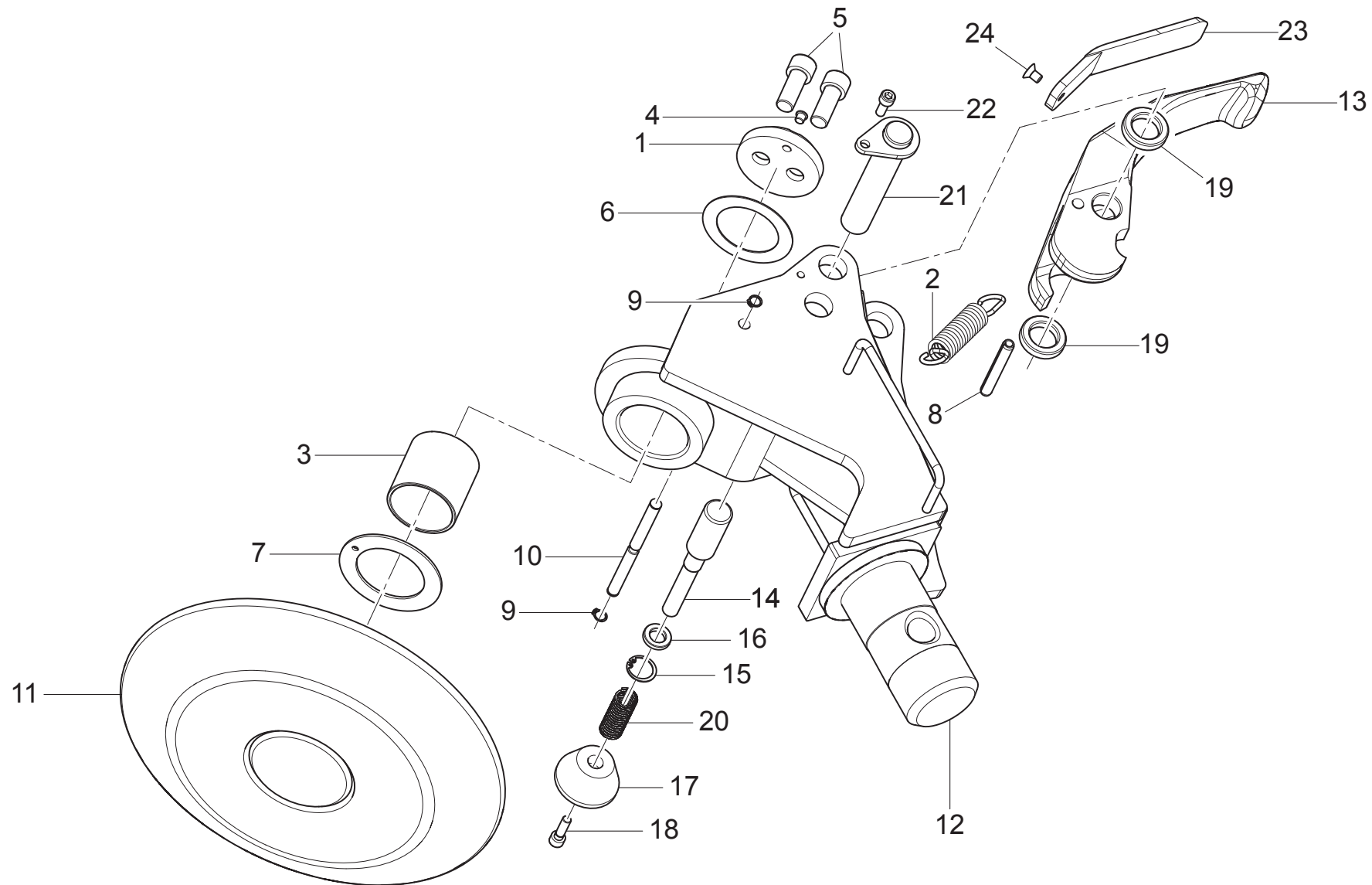
NAV11N	NAV11NT	NAV11EI	NAV11TEI				
•		•					
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS Tavola N°4A - Rev. 1		750590030	CARRO UTENSILE TOOL CARRIAGE WERKZEUGSWAGEN CHARIOT OUTIL CARRO UTENSILIO	Pag. 9 di 27



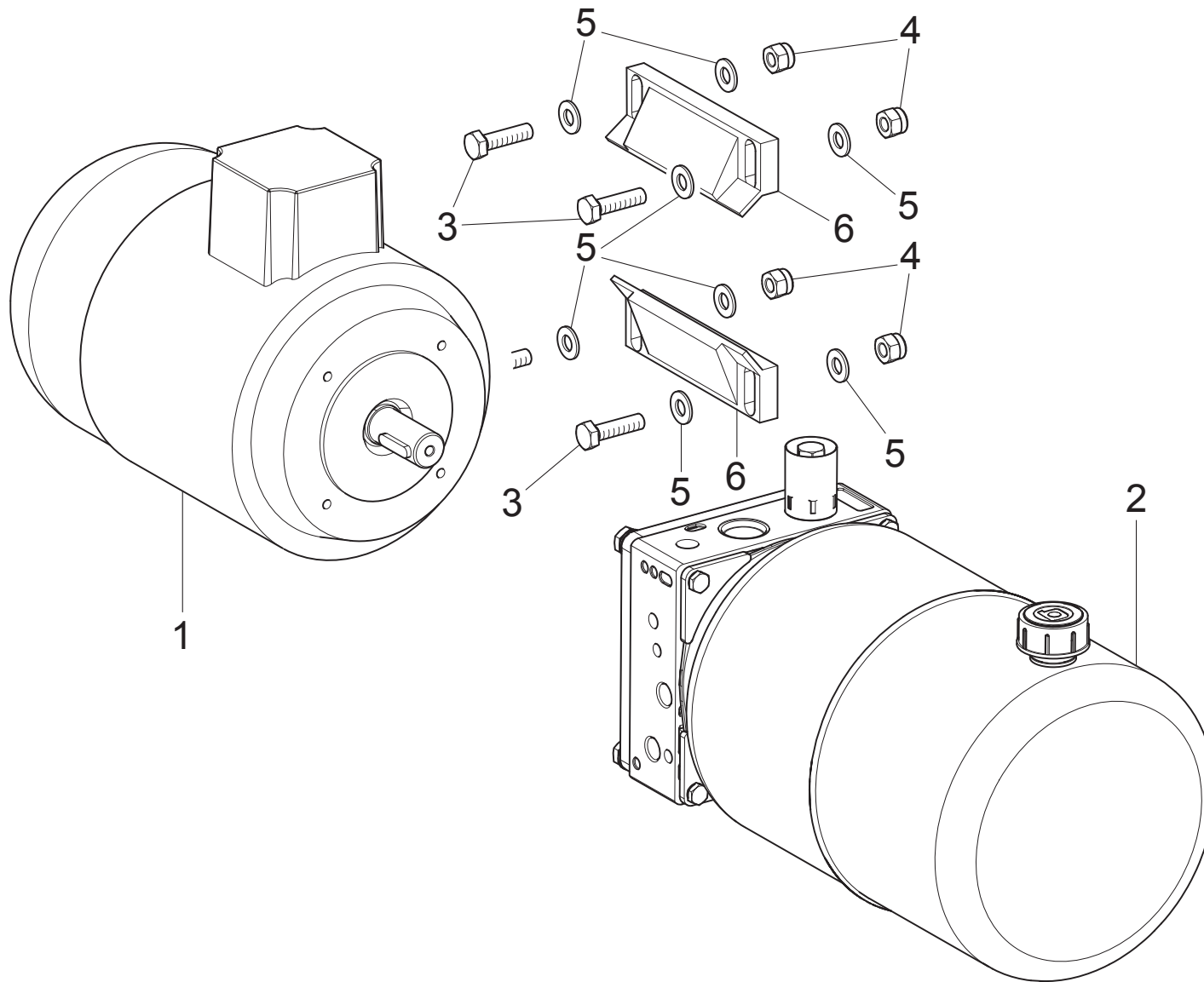
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
	•		•		
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS Tavola N°4B - Rev. 1		750590200
				CARRO UTENSILE TOOL CARRIAGE WERKZEUGSWAGEN CHARIOT OUTIL CARRO UTENSILIO	Pag. 10 di 27



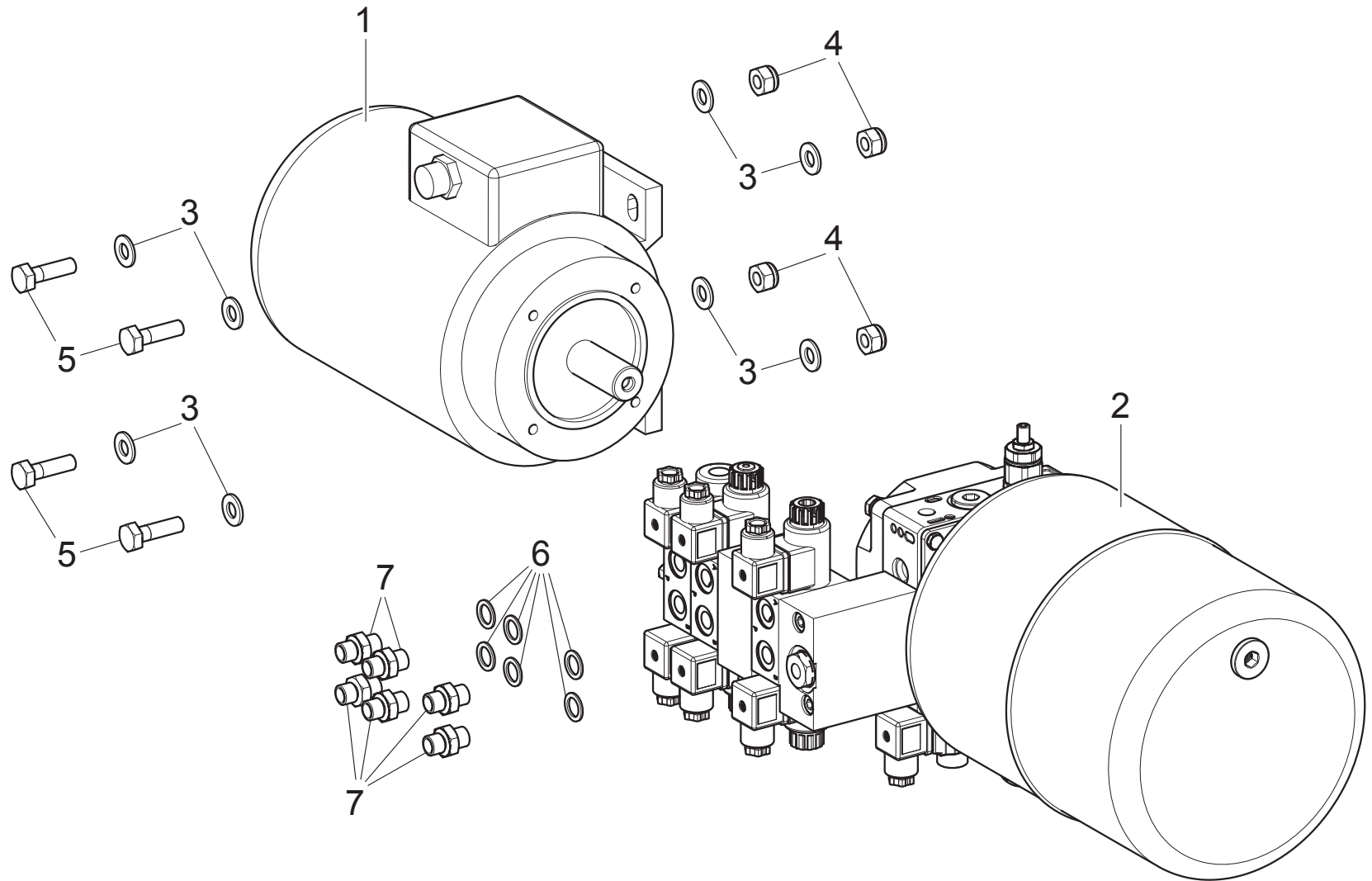
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•		•			
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		GRUPPO UTENSILI TOOLS UNIT WERKZEUGSATZ GROUPE OUTILS GRUPO UTENSILIOS		Pag. 11 di 27
	Tavola N°5A - Rev. 1	750590040			




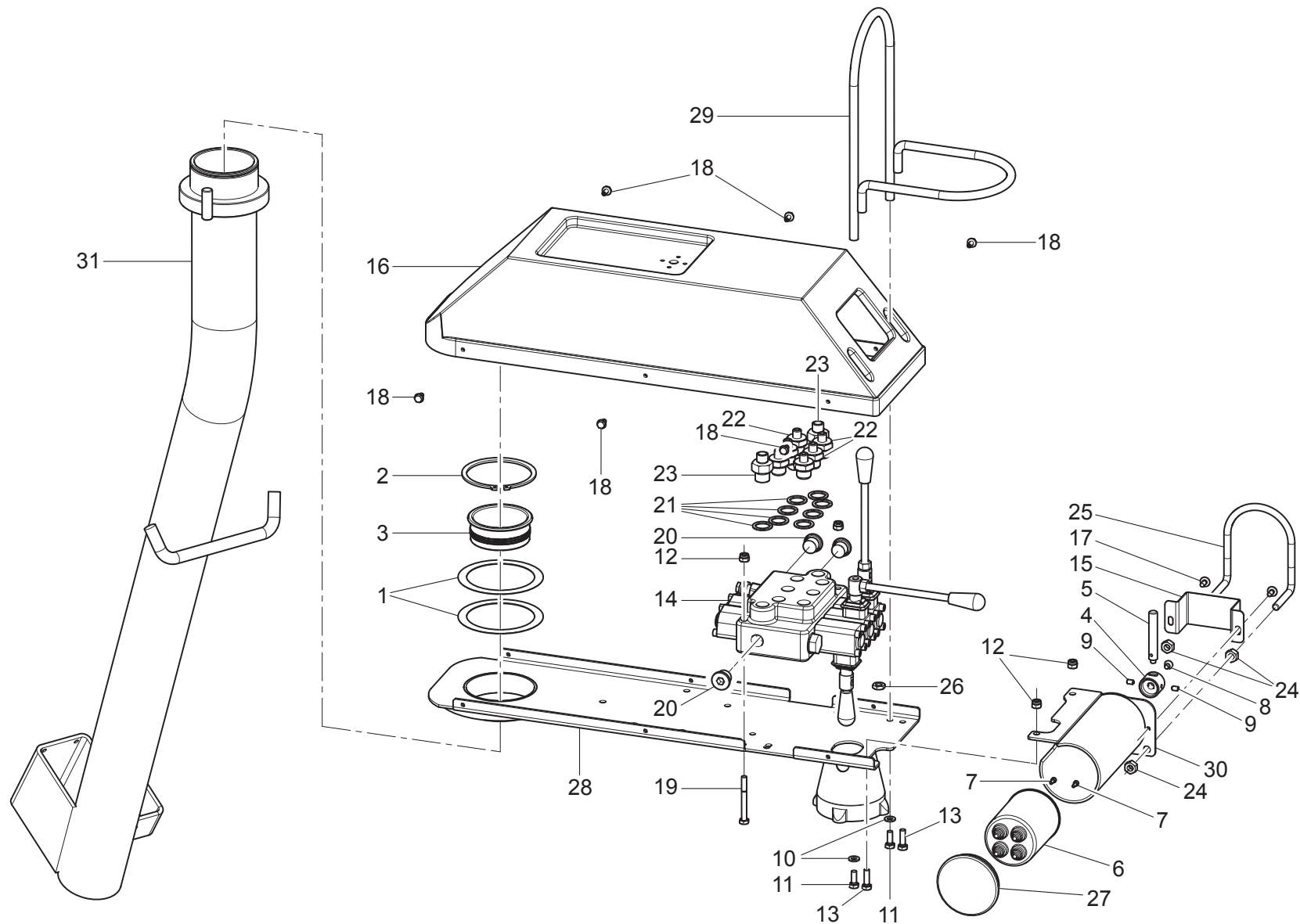
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
	•		•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS			GRUPPO UTENSILI SENZA LEVA TOOLS UNIT WITHOUT LEVER WERKZEUGSATZ OHNE HEBEL GROUPE OUTILS SANS LEVIER GRUPO UTENSILIOS SINE PALANCA	
	Tavola N°5B - Rev. 0		750590170		Pag. 12 di 27



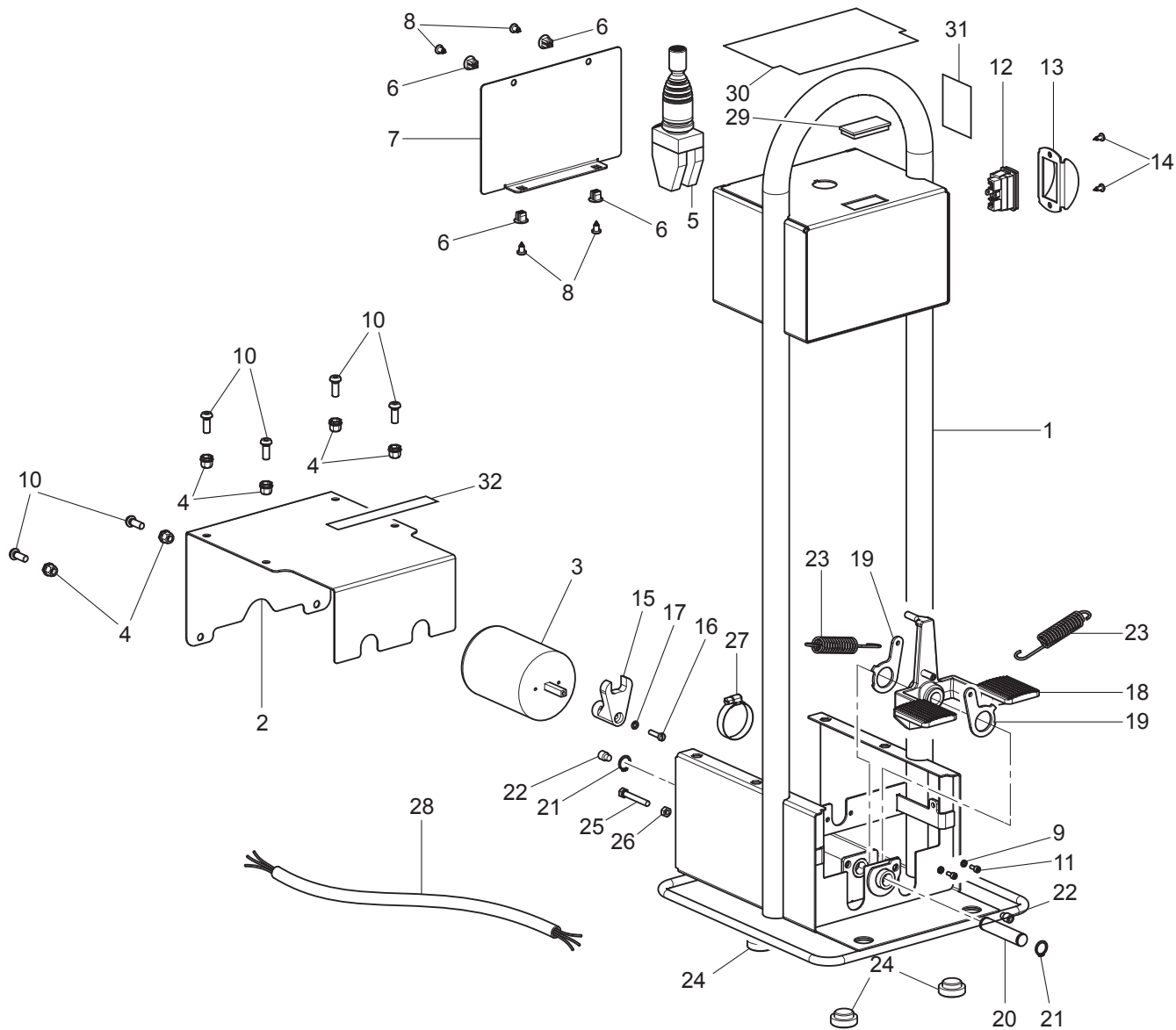
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•				
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		GRUPPO MOTORE + CENTRALINA MOTOR UNIT + HYDRAULIC POWER UNIT MOTORSATZ + STEUERUNG GROUPE MOTEUR + DISTRIBUTEUR GRUPO MOTOR + CENTRALITA		Pag. 13 di 27
	Tavola N°6A - Rev. 1	750590050			



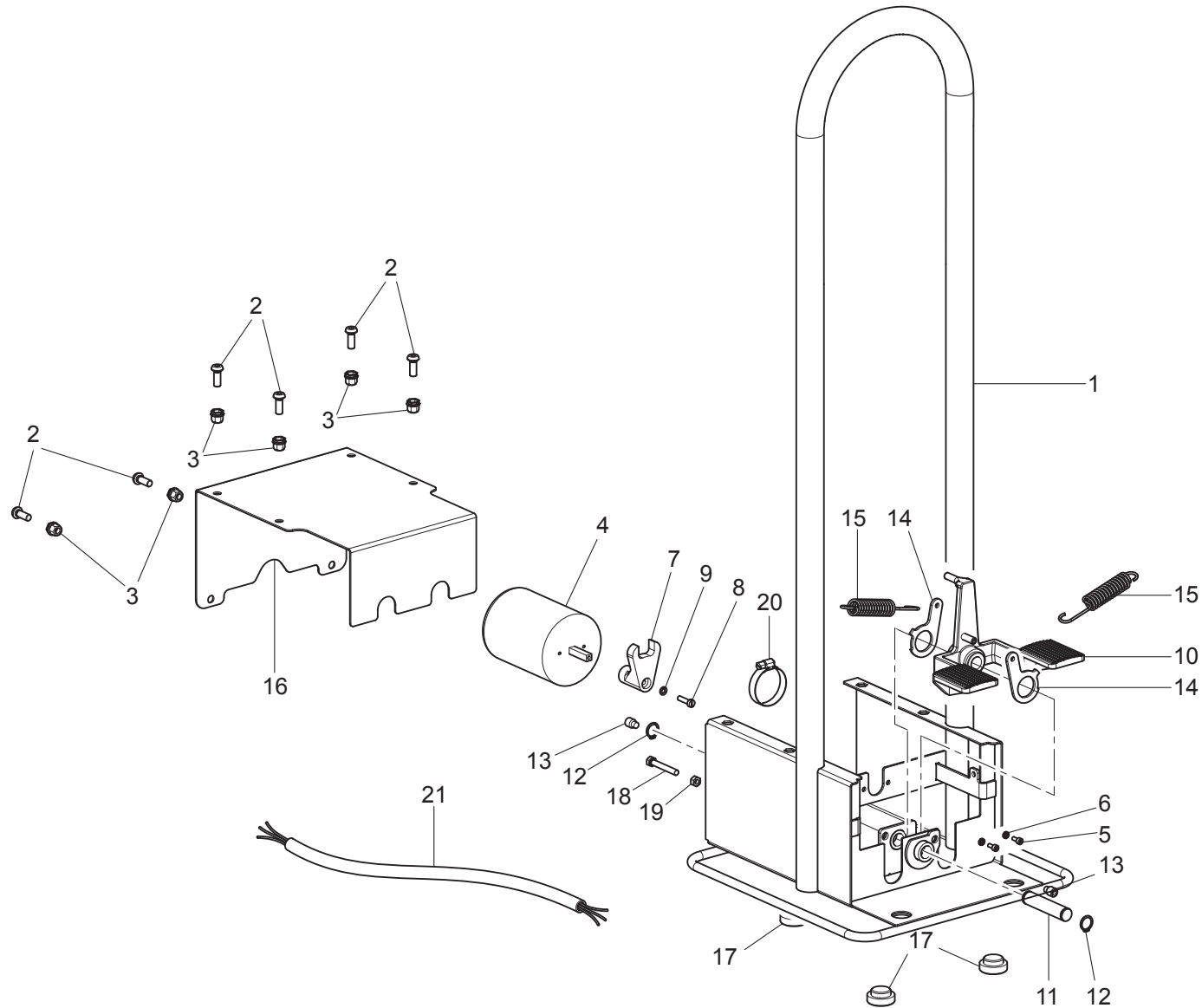
NAV11N	NAV11NT	NAV11EI	NAV11TEI	
		•	•	
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		GRUPPO MOTORE + CENTRALINA MOTOR UNIT + HYDRAULIC POWER UNIT MOTORSATZ + STEUERUNG GROUPE MOTEUR + DISTRIBUTEUR GRUPO MOTOR + CENTRALITA	
	Tavola N°6B - Rev. 0		750590481	
				Pag. 14 di 27



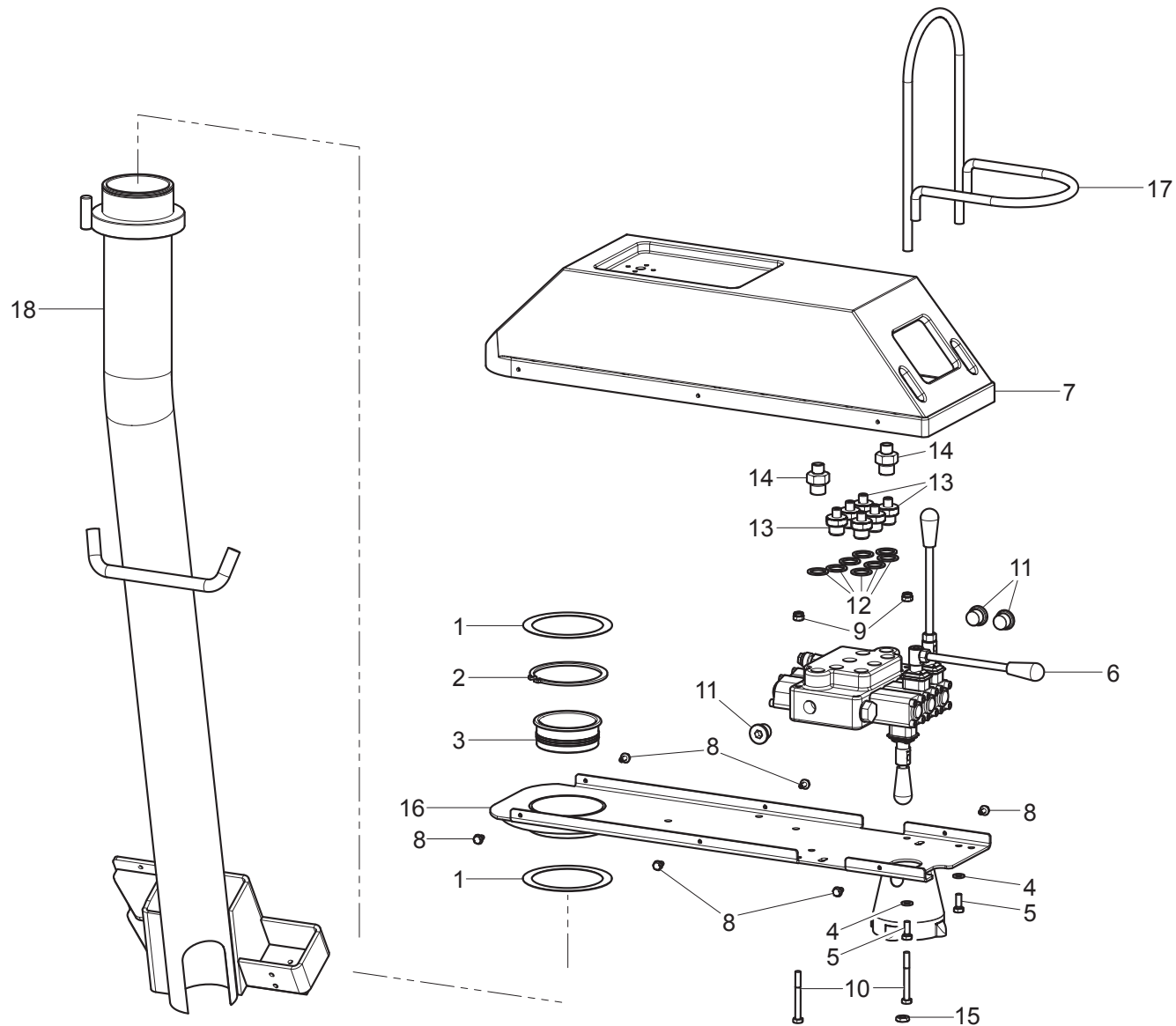
NAV11N	NAV11NT	NAV11EI	NAV11TEI				
•	•						
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS Tavola N°7A - Rev. 1		750590061	GRUPPO COMANDO CONTROL UNIT BEFEHLUNGSSATZ GROUPE COMMANDE GRUPO MANDO	Pag. 15 di 27



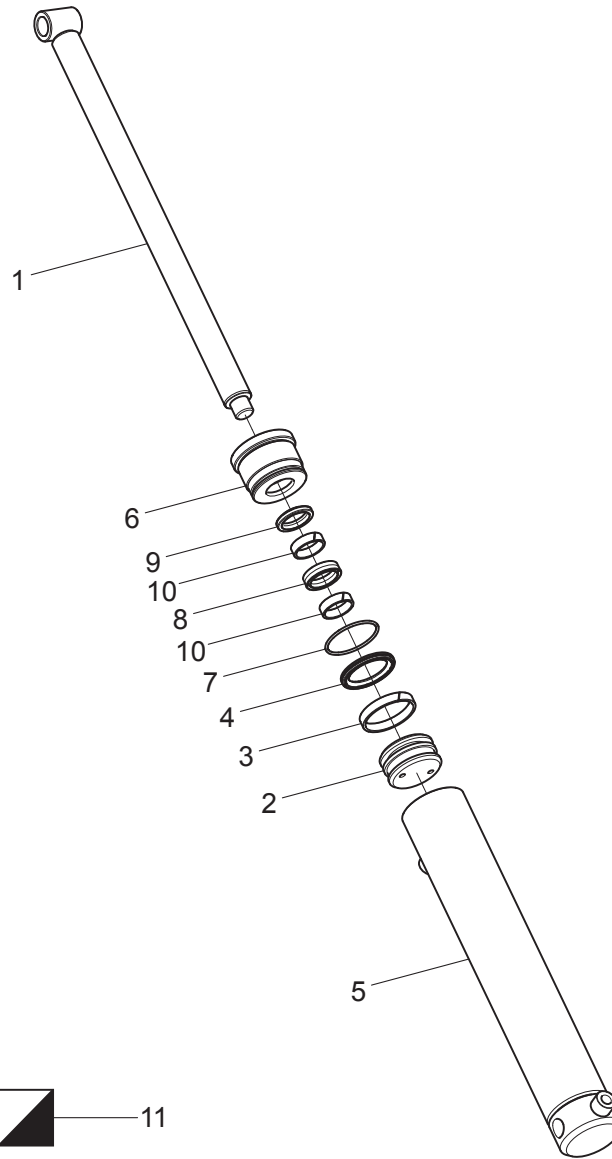
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
		•	•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		GRUPPO COMANDO CONTROL UNIT BEFEHLUNGSSATZ GROUPE COMMANDE GRUPO MANDO		Pag. 16 di 27
	Tavola N°7B - Rev. 0		750590421		



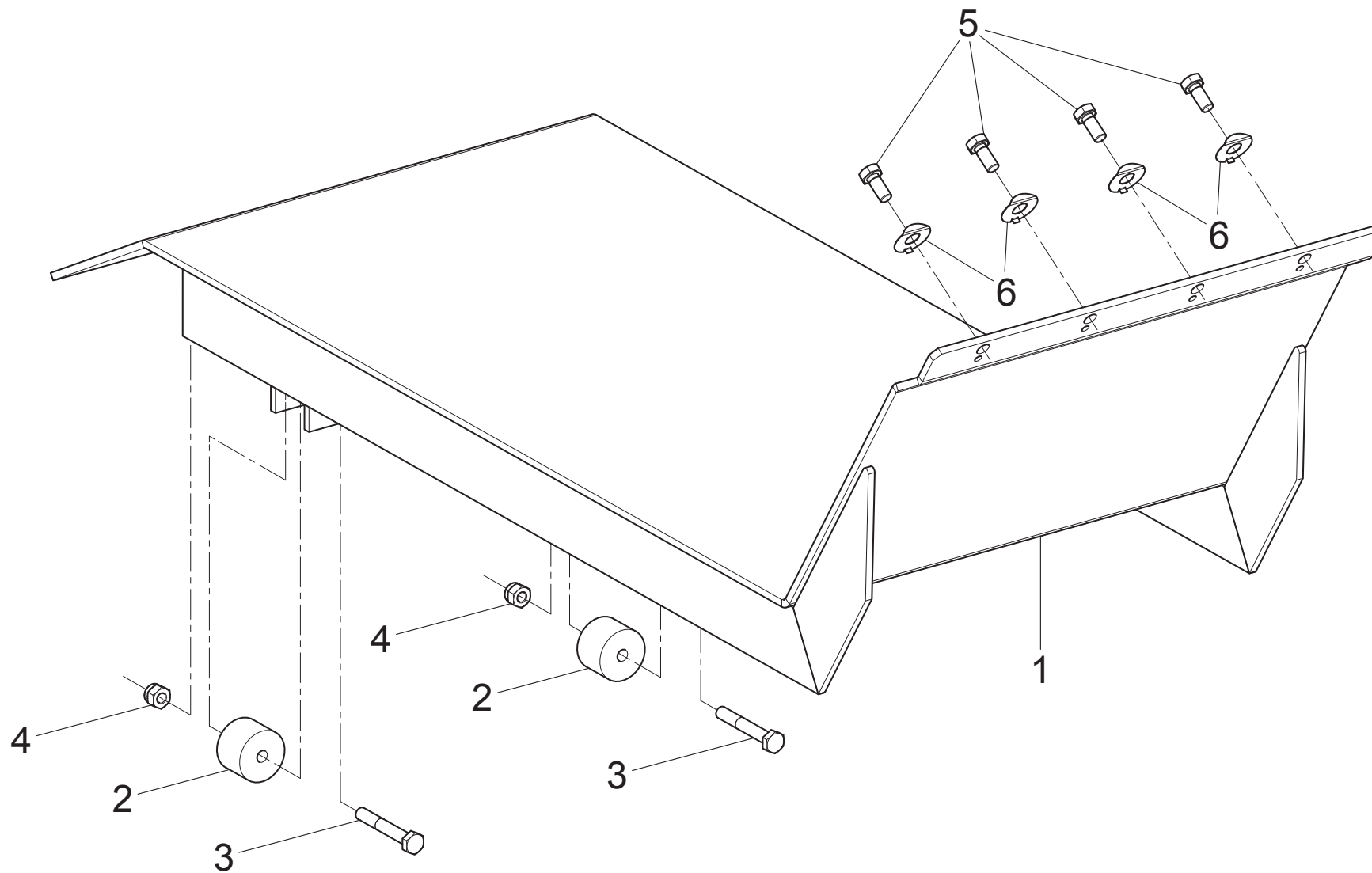
NAV11N	NAV11NT	NAV11EI	NAV11TEI				
•	•						
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS Tavola N°7C - Rev. 0		750590410	GRUPPO COLONNETTA PEDALIERA (VARIANTE CON INVERTER) PEDALBOARD COLUMN UNIT (VERSION WITH INVERTER) SATZ PEDALLEISTESÄULE (VERSION MIT INVERTER) GROUPE COLONNE PÉDALES DE DIRECTION (VERS. AVEC INVERSEUR) GRUPO COLUMNA PEDALERA (VERSIÓN CON INVERSOR)	Pag. 17 di 27



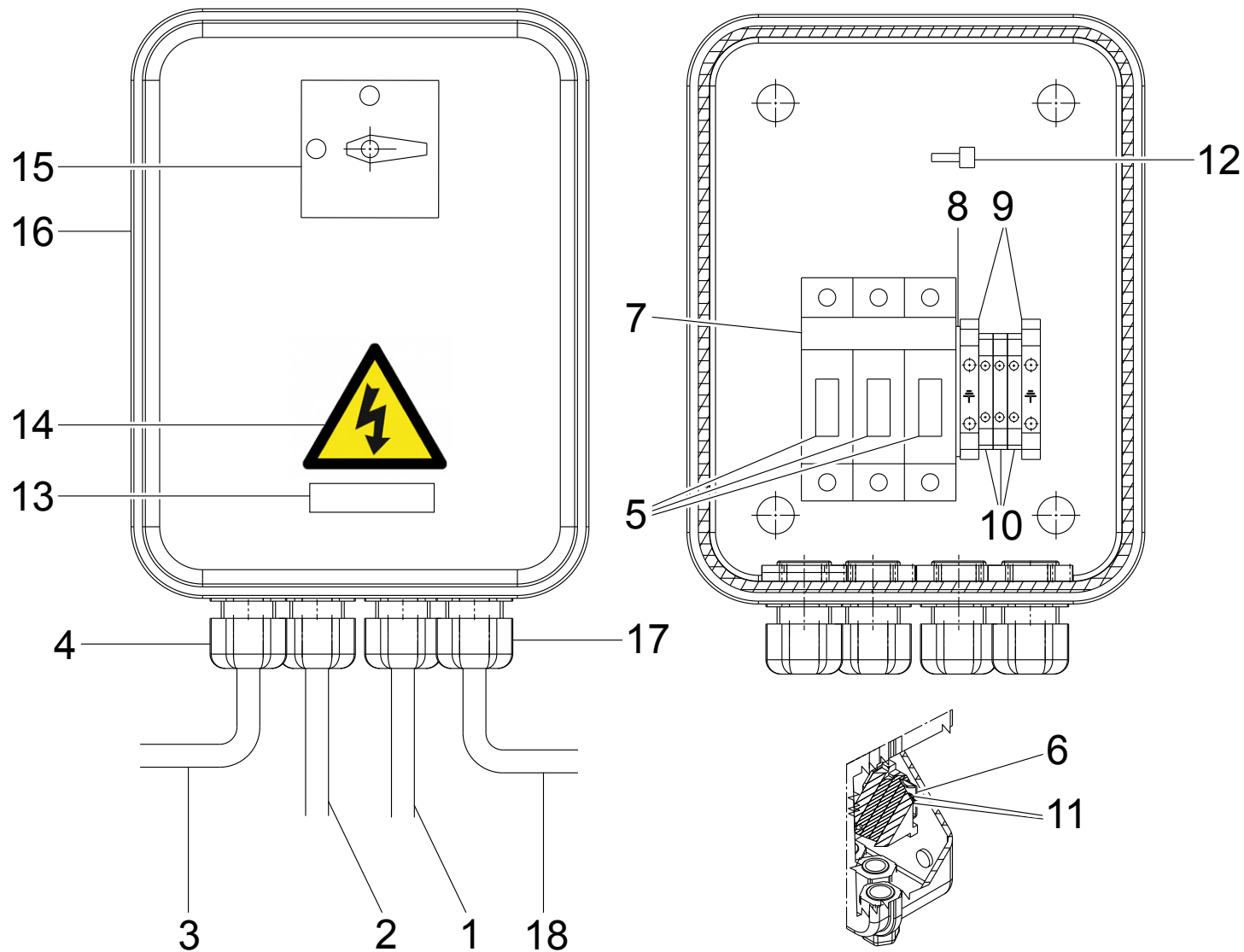
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•				
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS			GRUPPO COMANDO PER ROTAZIONE A TERRA (VAR. CON INVERTER) CONTROL UNIT FOR GROUND ROTATION (VERS. WITH INVERTER) BEFEHLUNGSATZ FÜR GEERDETE DREHUNG (VERS. MIT INVERTER) GRUPE COMMANDE POUR ROTATION AU SOL (VERS. AVEC INVERSEUR) GRUPO MANDO PARA ROTACIÓN EN TIERRA (VERS. CON INVERSOR)	
	Tavola N°7D - Rev. 0	750590580		Pag. 18 di 27	




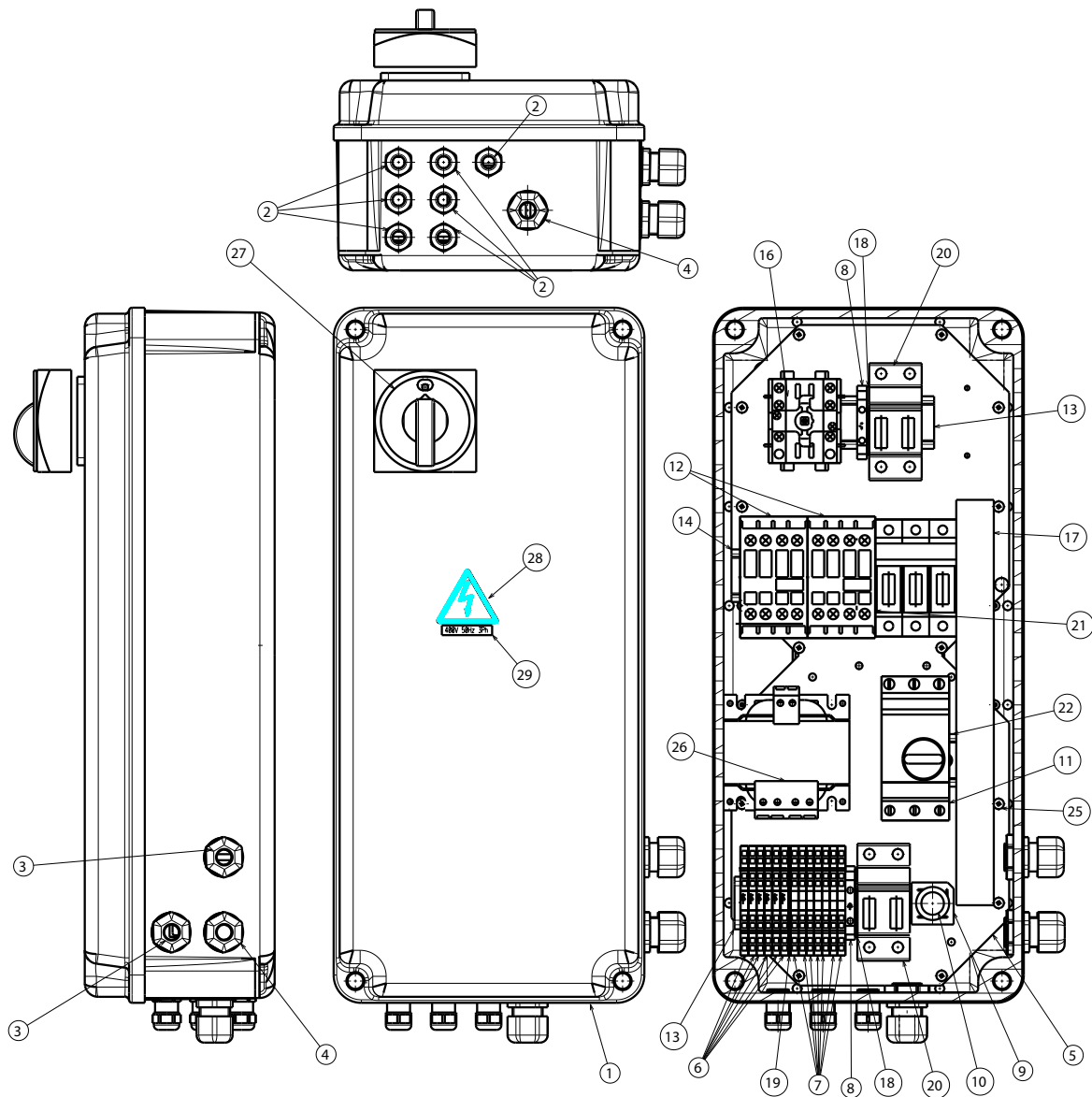
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•	•	•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		CILINDRO BRACCIO MANDRINO MANDREL ARM CYLINDER ZYLINDERARM SPINDEL CYLINDRE BRAS MANDRIN CILINDRO BRAZO MANDRIL		Pag. 19 di 27
	Tavola N°8 - Rev. 0	750590110			



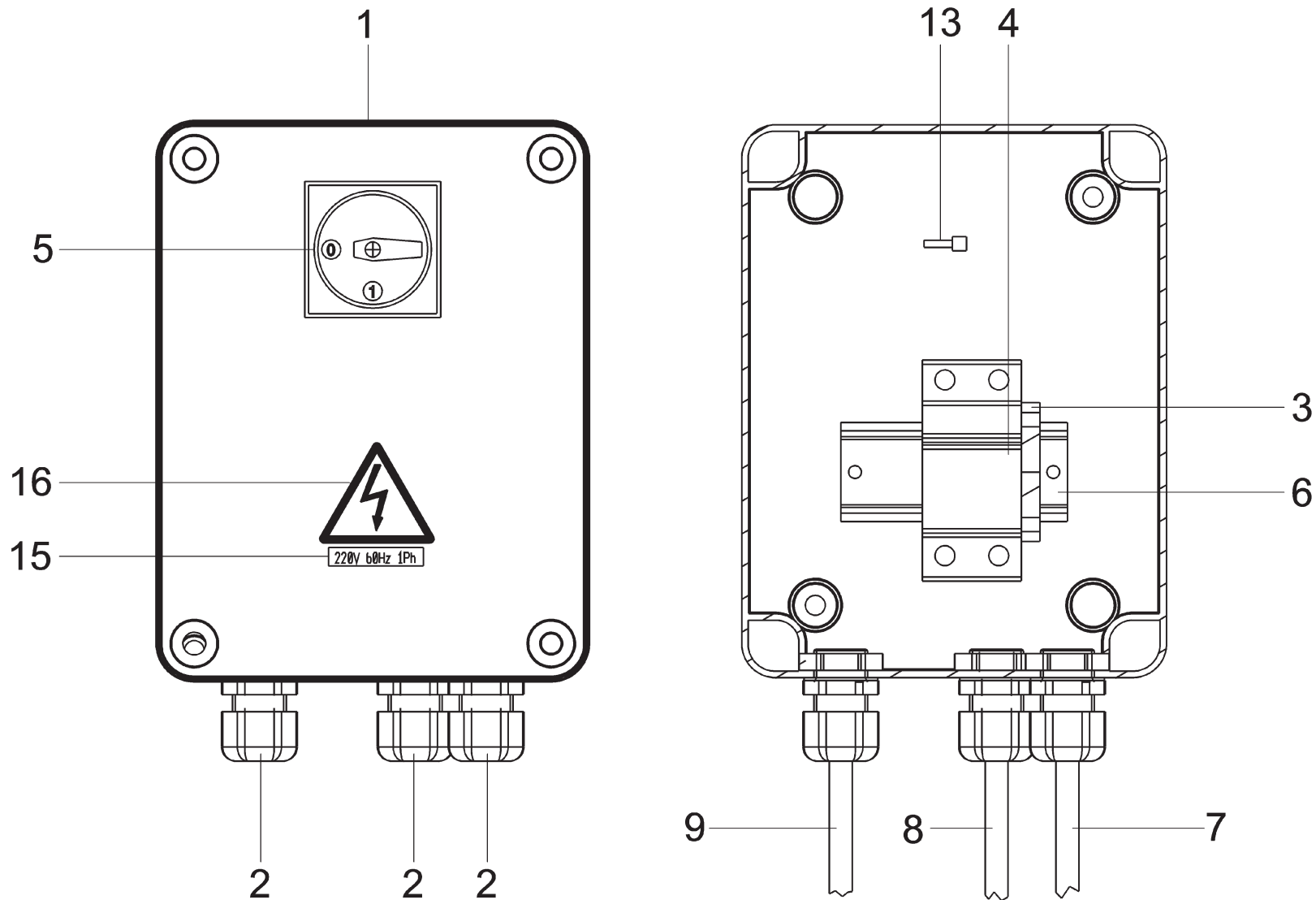
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•	•	•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		CARRELLO PORTAGOMMA HOSE NIPPLE CARRIAGE SCHLAUCHHALTERWAGEN CHARIOT RACCORD PORTE-TUYAU CARRO PORTA GOMA		Pag. 20 di 27
	Tavola N°9 - Rev. 0		750590140		



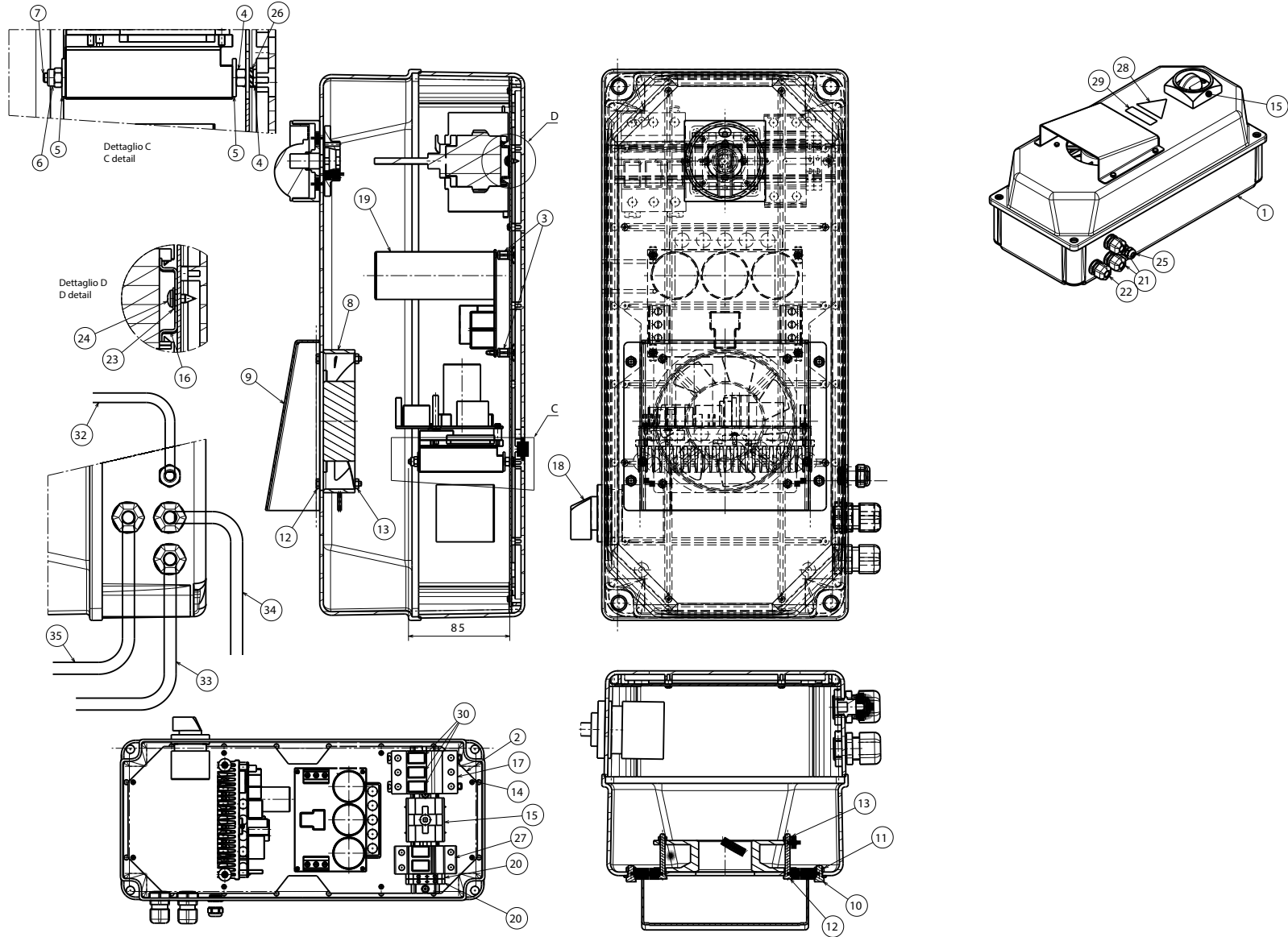
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•				
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		MTG CASSETTA ELETTRICA ELECTRICAL BOX MTG MTG ELEKTRISCHEKISTE MTG BOÏTER ÉLECTRIQUE MTG CAJITA ELECTRICA		Pag. 21 di 27
	Tavola N°10A - Rev. 1	146693010			



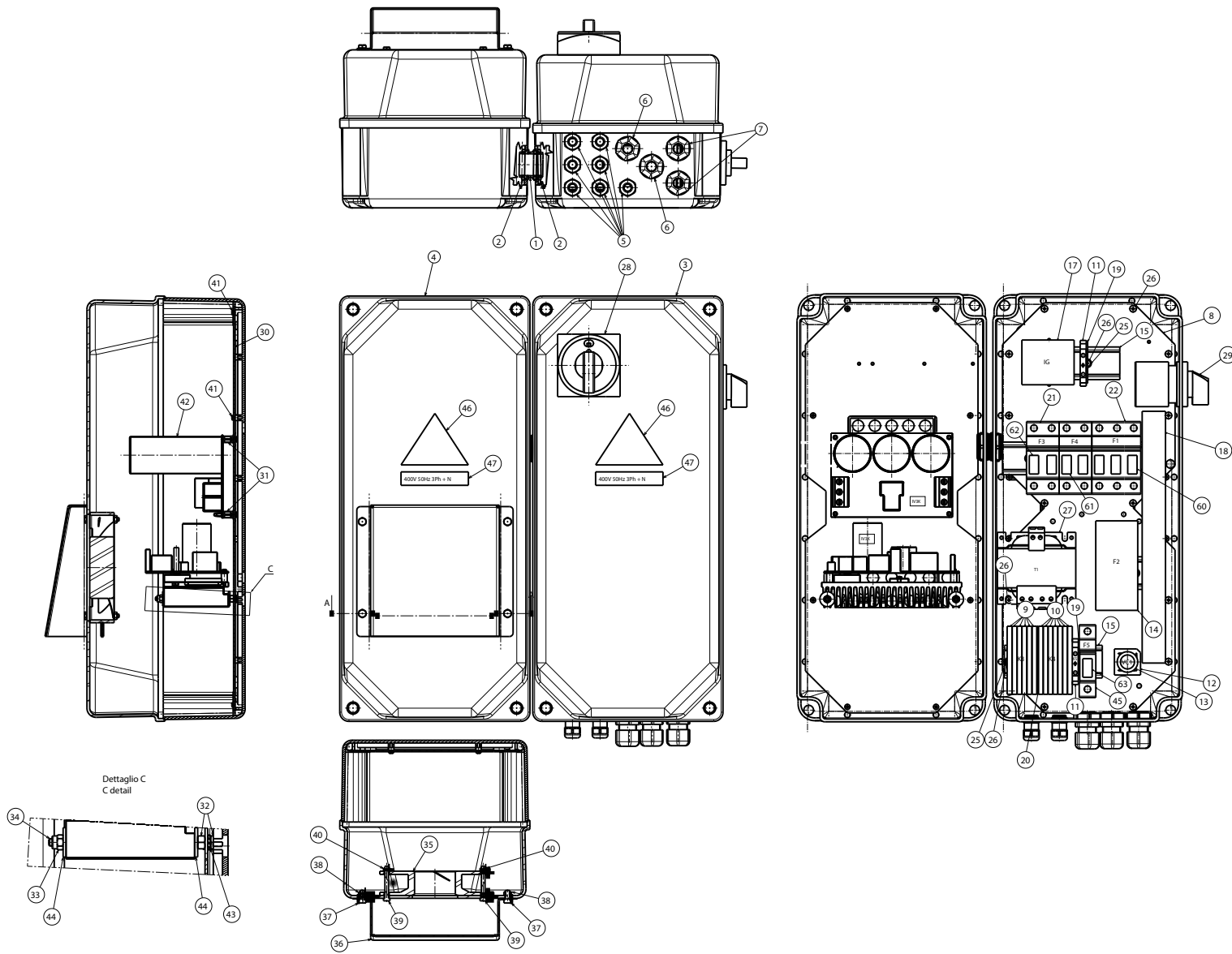
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
		•	•		
 Butler ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS			QUADRO ELETTRICO ELECTRIC CABINET SCHALTAFEL TABLEAU ÉLECTRIQUE CUADRO ELÉCTRICO	
	Tavola N°10B - Rev. 0	750503070		Pag. 22 di 27	




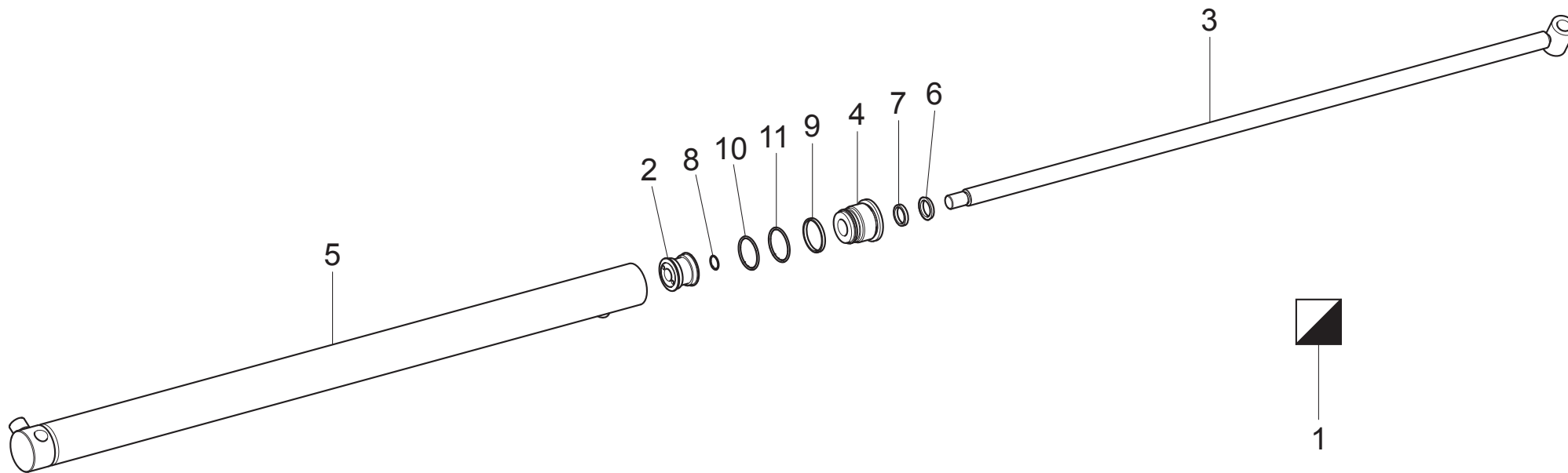
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
Butler ENGINEERING and MARKETING S.P.A.					
LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS			QUADRO ELETTRICO MONOFASE MONOPHASE ELECTRIC CABINET EINPHASEN SCHALTPULT TABLEAU ÉLECTRIQUE UNIPHASÉ CUADRO ELÉCTRICO MONOFÁSICO		Pag. 23 di 27
Tavola N°10C - Rev. 0		750303040			




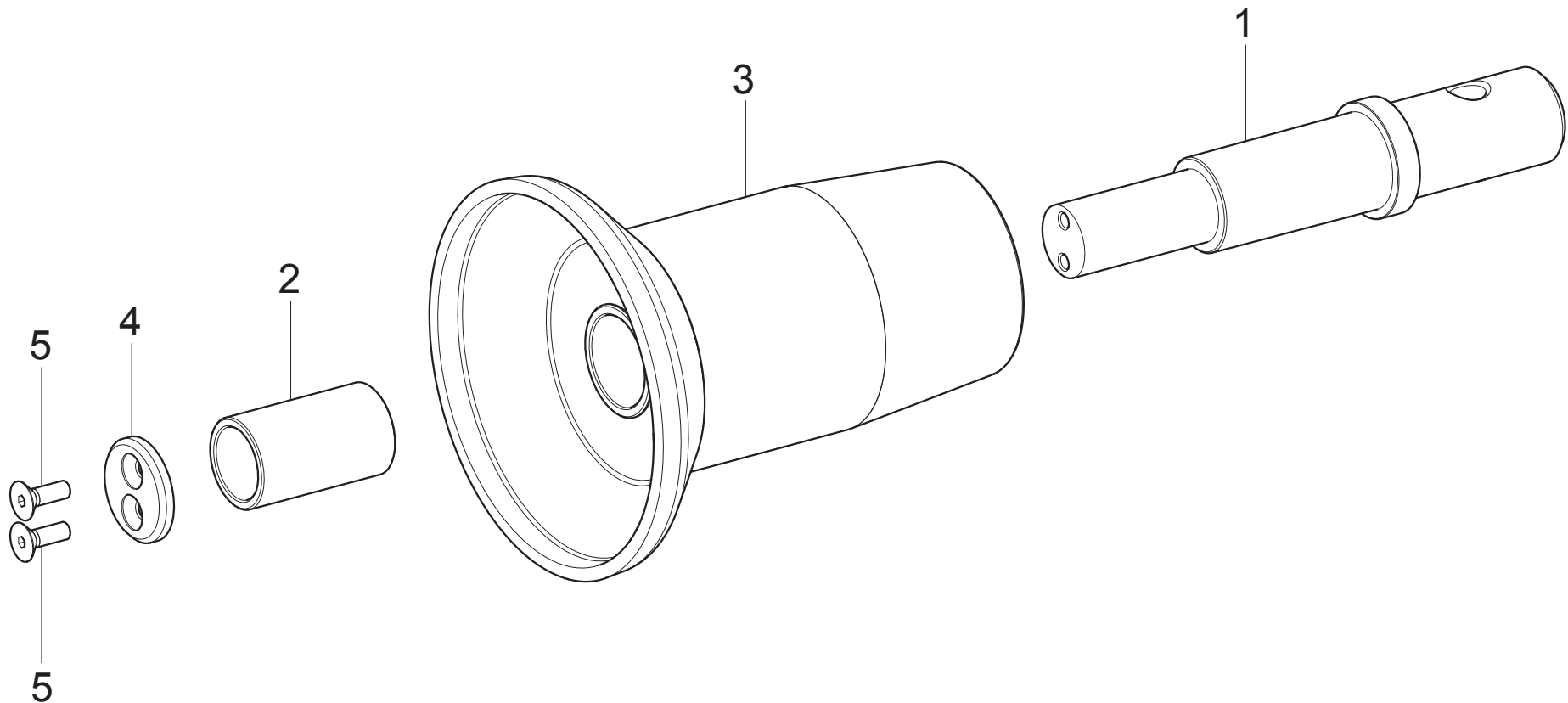
NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•				
 ENGINEERING and MARKETING S.P.A.		LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS Tavola N°10D - Rev. 1		750590640	
			INSIEME MTG CASSETTA ELETTRICA CON INVERTER ELECTRICAL BOX MTG ASSEMBLY WITH INVERTER SATZ MTG ELEKTRISCHKISTE MIT INVERTER ASSEMBLAGE MTG BOITIER ÉLECTRIQUE AVEC INVERSEUR CONJUNTO MTG CAJITA ELECTRICA CON INVERSOR		Pag. 24 di 27



NAV11N	NAV11NT	NAV11EI	NAV11TEI		
		•	•		
 Butler ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		MTG CASSETTE ELETTRICHE (VARIANTE CON INVERTER) MTG ELECTRICAL BOXES (VERSION WITH INVERTER) ELEKTRISCHKISTEN MTG (VERSION MIT INVERTER) BOÎTES ÉLECTRIQUES MTG (VERSION AVEC INVERSEUR) CAJITAS ELÉCTRICAS MTG (VERSIÓN CON INVERSOR)		Pag. 25 di 27
	Tavola N°10E - Rev. 1		750590720		



NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•	•	•	•		
 ENGINEERING and MARKETING S.P.A.	LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		<i>INSIEME PISTONE CARRELLO</i> <i>CARRIAGE PISTON ASSEMBLY</i> <i>WAGENKOLBE SATZ</i> <i>ASSEMBLAGE PISTON CHARIOT</i> <i>ENSAMBLADO PISTÓN CARRO</i>		Pag. 26 di 27
	Tavola N°11 - Rev. 0	146701010			



NAV11N	NAV11NT	NAV11EI	NAV11TEI		
•					
Butler ENGINEERING and MARKETING S.P.A.			LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIÈCES DÉTACHÉES - LISTA DE PIEZAS		RULLO STALLONATORE BEAD BREAKING ROLL ABDRÜCKWALZE ROULEAU DÉCOLLE-TALONS RODILLO DESTALONADOR
Tavola N°12 - Rev. 0		750590360		Pag. 27 di 27	