ENGINEERING and MARKETING S.P.A.

7522-M004-1_B

NAV51.15
NAV51T.15
NAV51.15N

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:

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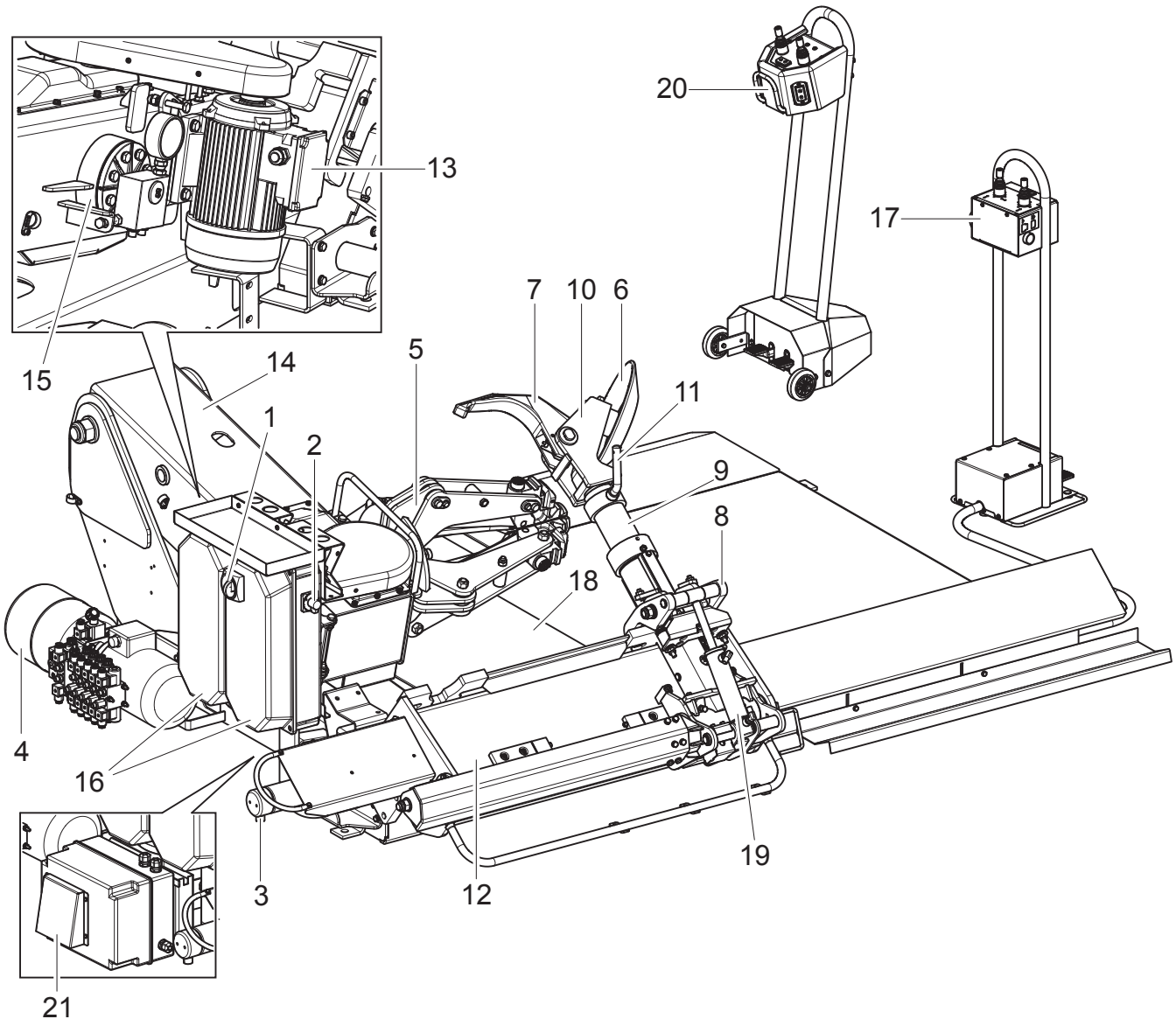
7522-M004-1_B - Rev. n. 1 (11/2015)

SUMMARY

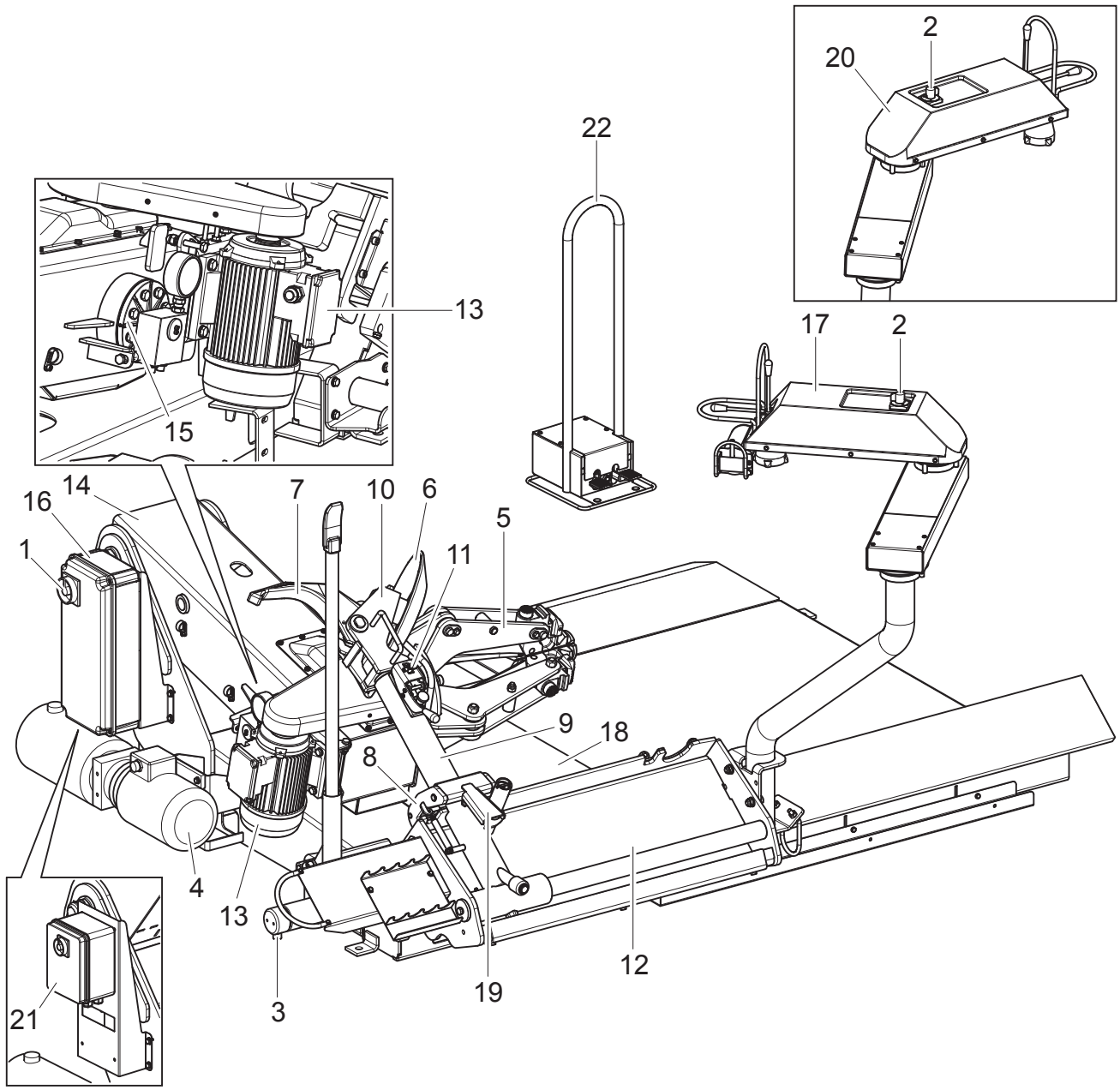
FIG. 1 - NAV51.15 - NAV51T.15



KEY

1 - Main switch
2 - Selector 1-0-2 self-centring speed control
3 - Tools carriage translation cylinder
4 - Hydraulic power unit
5 - Self-centring chuck
6 - Bead breaking disc
7 - Tool
8 - Jack
9 - Tool holder arm
10 -Tools unit
11 -Tool unit positioning lever
12 -Tools carriage
13 -Mandrel rotation motor
14 -Mandrel arm
15 -Mandrel opening/closing cylinder
16 -Electric panel
17 -Control unit
18 -Movable footboard
19 -Tools holder arm unlock cylinder
20 -Bluetooth handle control (version with bluetooth control)
21 -Inverter (version with inverter)

FIG. 2 - NAV51.15N

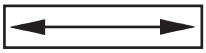


KEY

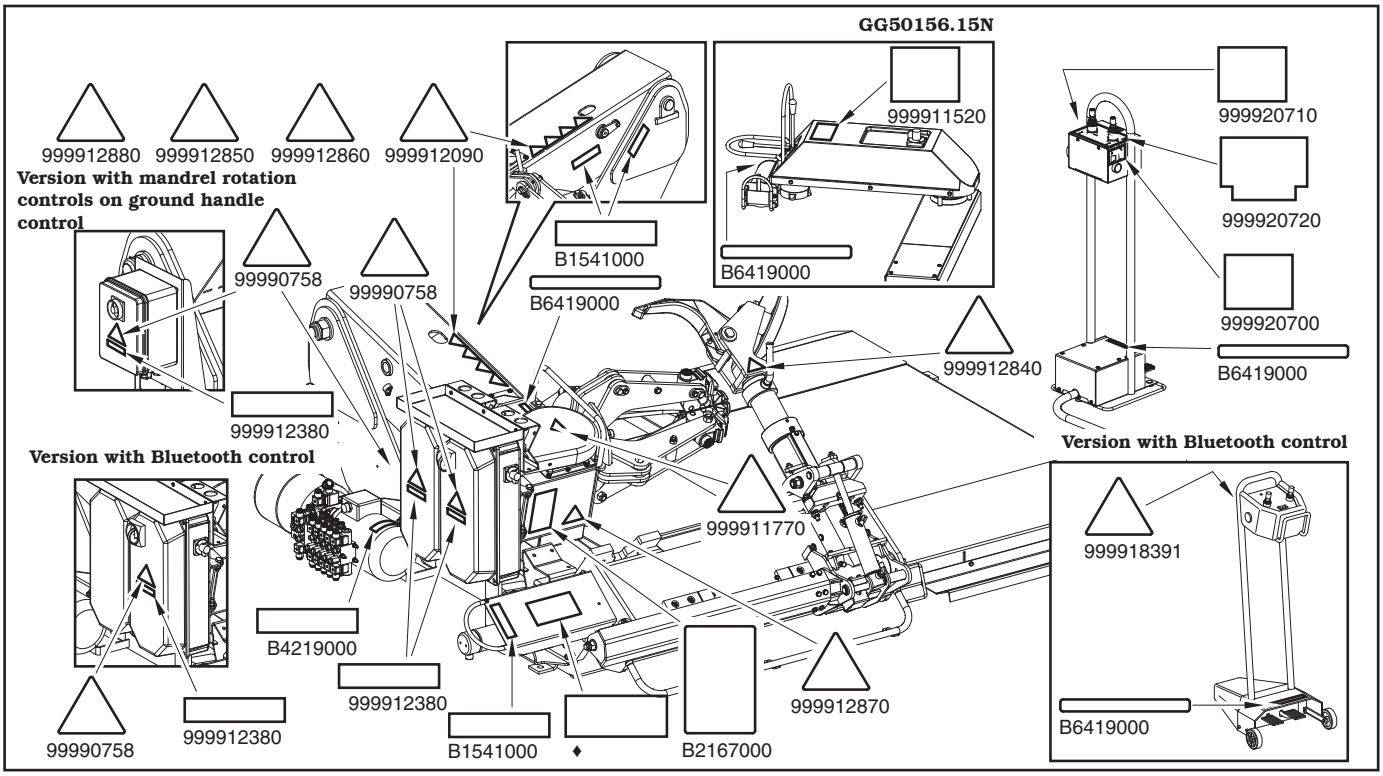
1 - Main switch
2 - Selector 1-0-2 self-centring speed control
3 - Tools carriage translation cylinder
4 - Hydraulic power unit
5 - Self-centring chuck
6 - Bead breaking disc
7 - Tool
8 - Jack
9 - Tool holder arm
10 - Tools unit
11 - Quick fit tool
12 - Tools carriage
13 - Mandrel rotation motor
14 - Mandrel arm
15 - Mandrel opening/closing cylinder
16 - Electric panel
17 - Control unit
18 - Movable footboard
19 - Tools holder arm unlock pedal
20 - Control unit (version with mandrel rotation controls on ground handle control)
21 - Electrical box (version with mandrel rotation controls on ground handle control)
22 - Control unit (version with mandrel rotation controls on ground handle control)

SYMBOLS USED IN THE MANUAL AND ON THE MACHINE

Symbols	Description
	Read instruction manual.
	FORBIDDEN!
 2167000	Wear work gloves.
	Wear work shoes.
 2167000	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.
 1541000	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.
 6419000	Mandrel rotation index plate.
	Note. Indication and/or useful information.

PLATES LOCATION ON MACHINE INFORMATION TABLE



Code numbers of plates

B1541000	*Danger plate*
B2167000	*Obligation to wear protective clothing plate*
B4219000	*Rotation indicating plate*
B6419000	*Rotation plate (valid also for NAV51.15N version with mandrel rotation controls on ground handle control)*
99990758	*Electricity danger plate*
999911520	*2-lever distributor plate (only for NAV51.15N and NAV51.15N version with mandrel rotation controls on ground handle control)*
999911770	*Unit move indicating plate*
999912090	*Tyres fall danger plate*
999912380	*Voltage plate 400V 50Hz 3Ph (only for NAV51.15N and NAV51.15, NAV51T.15 version with Bluetooth control and NAV51.15N version with mandrel rotation controls on ground handle control)*
999912840	*Danger plate 1*
999912850	*Danger plate 2*
999912860	*Danger plate 3*
999912870	*Danger plate 4*
999912880	*Danger plate 5*
999916310	*Rubbish skip label*
999918391	*Bluetooth handle control label (only for NAV51.15 and NAV51T.15 version with Bluetooth control)*
999920700	*Double speed plate (only for NAV51.15 and NAV51T.15)*
999920710	*Mandrel open/close plate (only for NAV51.15 and NAV51T.15)*
999920720	*Control plate (only for NAV51.15 and NAV51T.15)*
•	*Serial number plate*
*	*Machine nameplate*
♦	*Manufacturer nameplate*

IF ONE OR MORE PLATES DISAPPEARS FROM THE MACHINE OR BECOMES DIFFICULT TO READ, IT MUST BE REPLACED. QUOTE THE CODE NUMBER 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 **"NAV51.15, NAV51T.15 and NAV51.15N"**, 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 2550 mm/100" and maximum weight of 2300 kg. The machines model **"NAV51.15, NAV51T.15 and NAV51.15N"** 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.

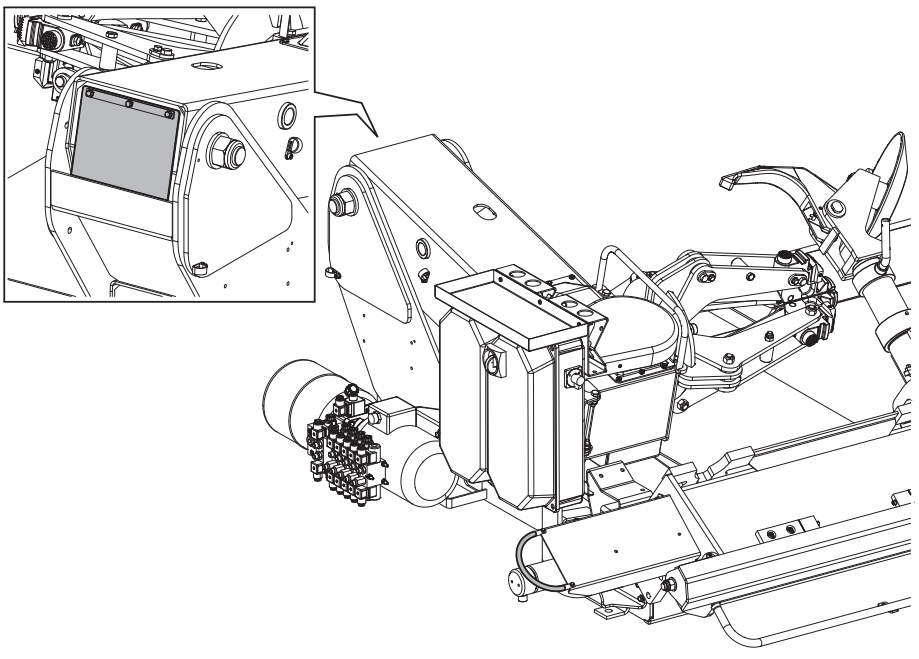
All the machines are equipped with:

- "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: it avoids the motor overheating in case of intensive use (only NAV51.15 - NAV51T.15);

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

- controlled check valves on:
  - opening of mandrel jaws;
  - mandrel arm lifting;
  - tool holder arm tilting (only for versions foreseeing such operation).
    These valves have been fit in order to avoid unexpected movements of the jaws, tool or mandrel arm (and, as a consequence, the wheel fall) caused by accidental oil drippings;
- fuses on the electric supply line of the mandrel motor;
- automatic power supply disconnection with the opening of the electric panel;
- mandrel driven by brake motor (on demand);
- **Motor protection devices (version with inverter)**
  The new "Invemotor" unit 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, undervoltage, overload, overtemperature).
  For more details, see Chapt. 14 "Troubleshooting table".
- **fixed protections and guards.**
  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.

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.

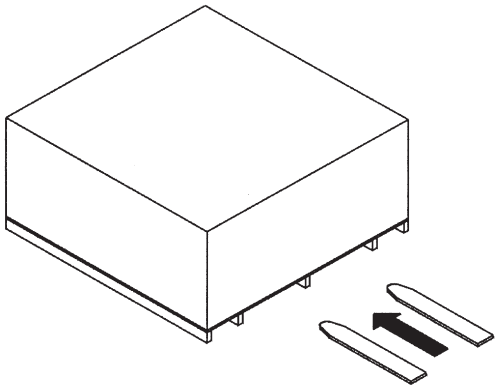
IN CASE OF A CHANCE SUPPLY FAILURE (WHETHER ELECTRICITY OR COMPRESSED AIR), MOVE THE CONTROLS TO THE NEUTRAL POSITION.

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 2105x2085x1030.
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

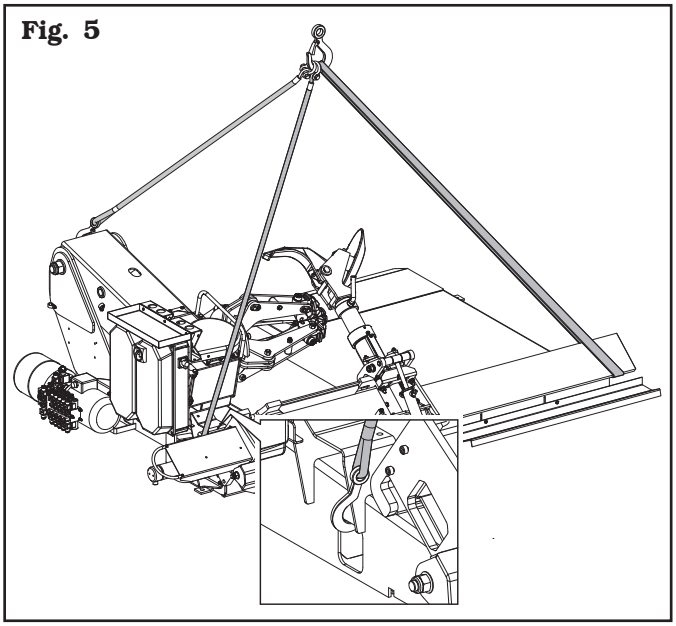
If the machine has to be moved.

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° + 55° C
- relative humidity: 30 - 95% (dew-free)
- atmospheric pressure: 860 - 1060 hPa (mbar).

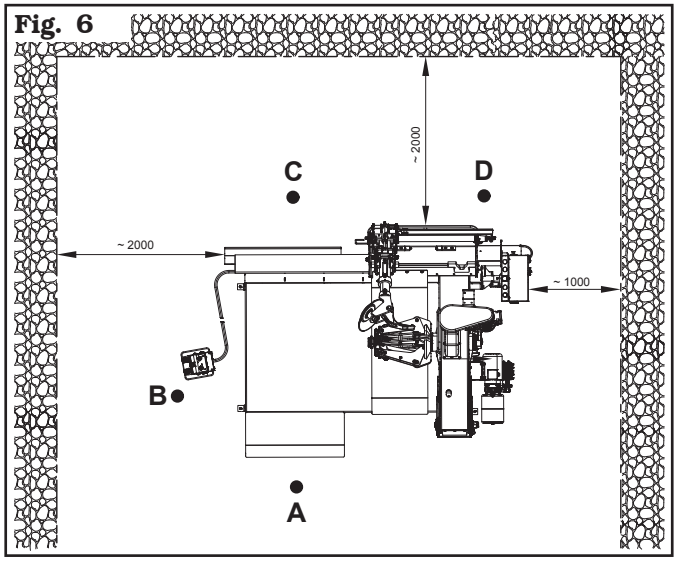
The use of the machine in ambient conditions other than those specified above is only allowed after prior agreement with and approval of the manufacturer.

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

Fig. 6



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

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/m².
The depth of the solid floor must be sufficient to guarantee that the anchoring bolts hold (excluded from supply).

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.

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**.

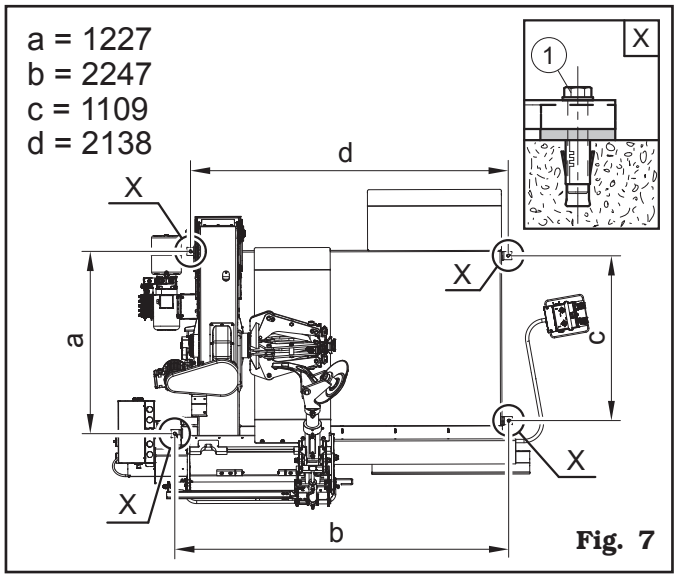


Fig. 7

- Execute 4 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 4 M12x120 mm screws (excluded from supply) (**Fig. 7 ref. 1**) (or with 4 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

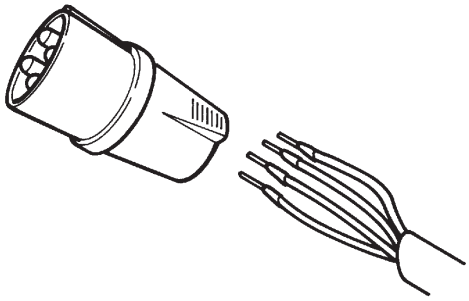
The packing case contains also the fixtures box. Check that all the parts listed are there.

Code	Description	N.
14620010	*Clamp*	**1**
B5119000	*Long lever "A"*	**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**

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.

Only for version with inverter

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

La macchina, alla consegna, è predisposta per funzionare con una tensione di 230/400 V-50 Hz.
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. 8 and 9 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. 8, 9A** and **9B ref. A**).

Only for NAV51.15 and NAV51T.15 with bluetooth control version

Then horizontally or vertically move the lever (**Fig. 13 ref. H**): the red LED (**Fig. 13 ref. B**) will turn on.
Wait a few seconds for the green LED turning on (**Fig. 13 ref. A**) and then release the lever (**Fig. 13 ref. H**).
In the end, the green LED (**Fig. 13 ref. A**) flashes to indicate that the machine is ready for operation.

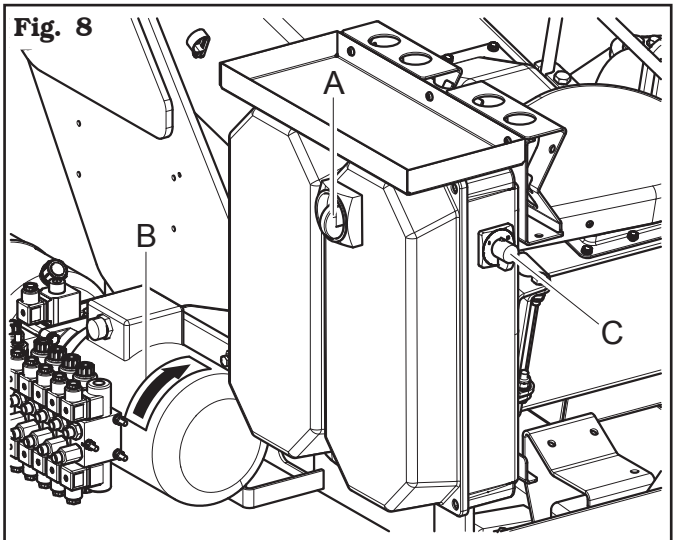
N.B.: when a control is operated, the green LED (Fig. 13 ref. A) light is fixed: it flashes again when it is released.

If during the operations the red LED (**Fig. 13 ref. B**) turns on and the green led turns off, charge the control batteries with the provided socket for battery charger, located under the control (**Fig. 13 ref. M**).
The machine is equipped with a device for the interruption of the communication between the control and the electrical panel, when more than 6 hours have passed after the last executed control. In this case, just repeat the turning on operations described in the "Electrical checks" chapter.

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

NAV51.15 - NAV51T.15

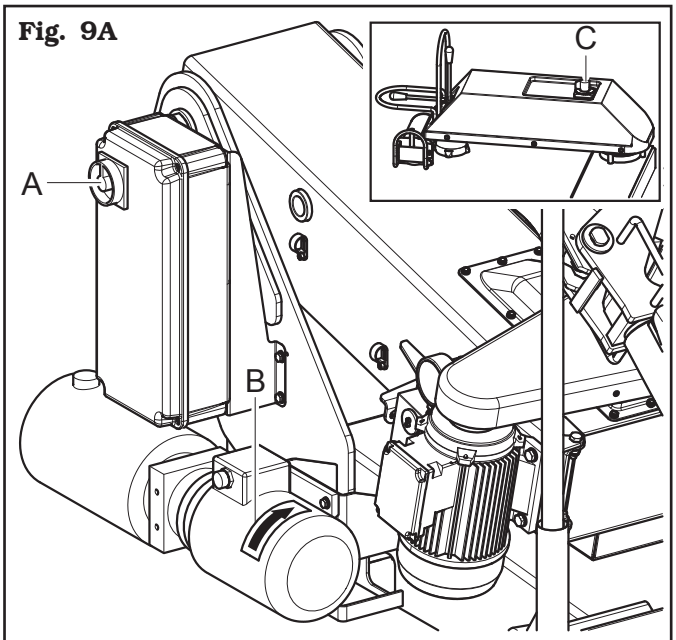
Fig. 8



KEY
A – Main switch
(valid also for version with bluetooth control and version with inverter)
B – Rotation direction of power unit motor
C – Selector 1-0-2 self-centring chuck speed control
(valid also for version with bluetooth control and version with inverter)

NAV51.15N

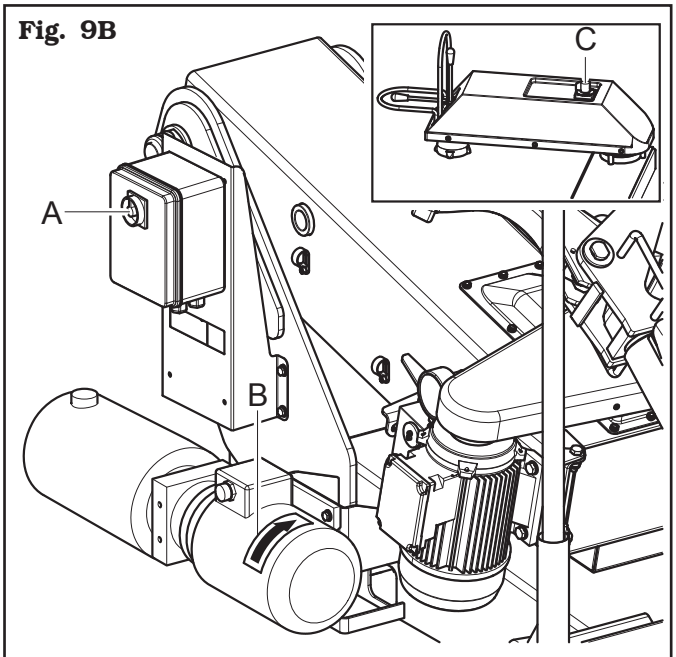
Fig. 9A



KEY
A – Main switch
B – Rotation direction of power unit motor
C – Selector 1-0-2 self-centring chuck speed control

NAV51.15N with version with mandrel rotation controls on ground handle control

Fig. 9B



KEY
A – Main switch
B – Rotation direction of power unit motor
C – Selector 1-0-2 self-centring chuck speed control

11.0 CONTROLS

11.1 Control device (valid for NAV51.15 and NAV51T.15 models)

The control (handle control) (see **Fig. 10**) 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: it operates respectively tool rightwards or leftwards repositioning on the carriage.
- Lever upwards or downwards: it respectively lowers or lifts the tool holder arm.

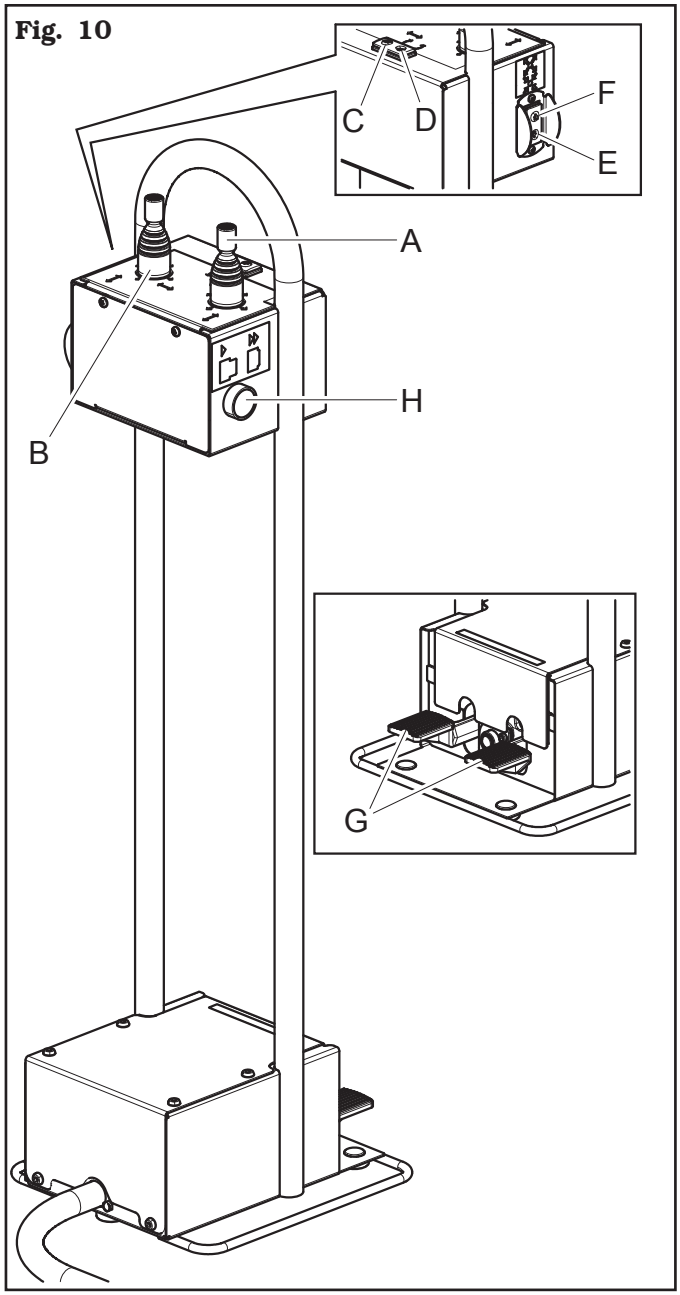
"Lever **B**" has four maintained control positions:

- Lever upwards or downwards: it operates respectively the rising and the lowering of the mandrel holding arm.
- Lever rightwards or leftwards: it moves the mandrel holder carriage rightwards or leftwards.

"Push button **C**" has a maintained control position, and when pressed it rotates the tool holder head counterclockwise (from behind the tool).
"Push button **D**" has a maintained control position, and when pressed it rotates the tool holder head clockwise (from behind the tool).
"Push-button **E**" has a maintained control position, and when pressed, it operates the self-centring chuck opening.
"Push-button **F**" has a maintained control position, and when pressed it operates the self-centring chuck closing.
"Pedal **G**" controls mandrel clockwise and counterclockwise rotation.
"Push-button **H**" pressed together with the lever **"A"** horizontally, doubles the translation speed of the tool carriage.

THE HANDLE MUST NOT BE PLACED WHERE WATER STAGNATES.

Fig. 10



11.2 Control device (valid for NAV51.15N model)

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. 11**) 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/anticlockwise rotation;
- **"E" selector**, three-positions, for mandrel rotation speed: position "0" for movement stop, position "1" for low speed and position "2" for high speed.

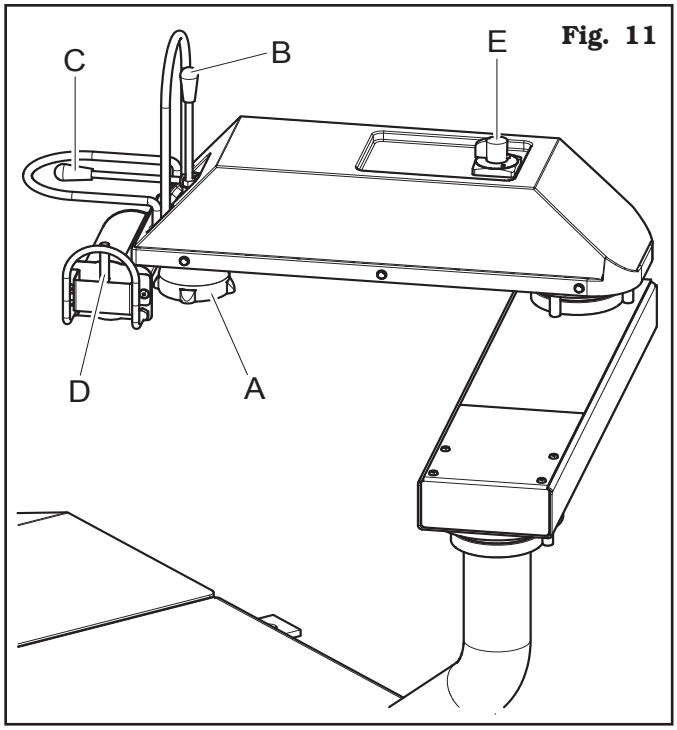


Fig. 11

11.3 Control device (valid for NAV51.15N model, version with mandrel rotation controls on ground handle control)

This control device consists of 2 units:

- control unit on machine,
- ground control unit.

The control unit on machine (see **Fig. 12A**) 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. 12A**) 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.

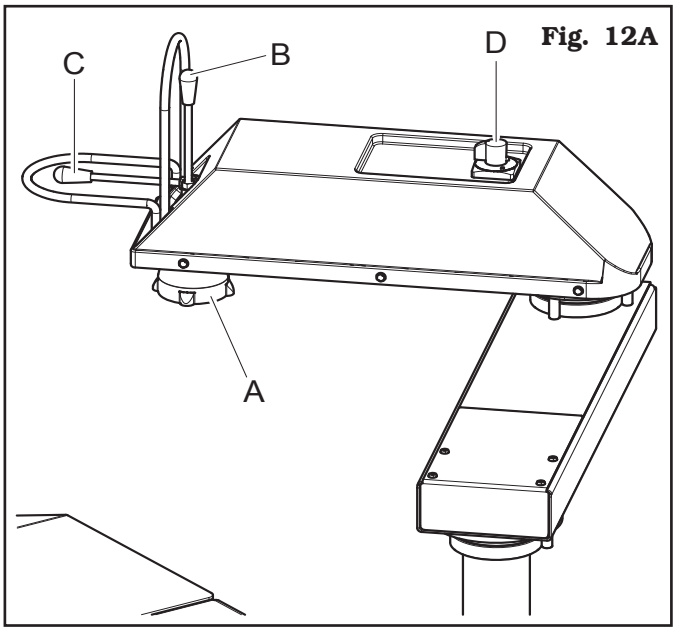


Fig. 12A

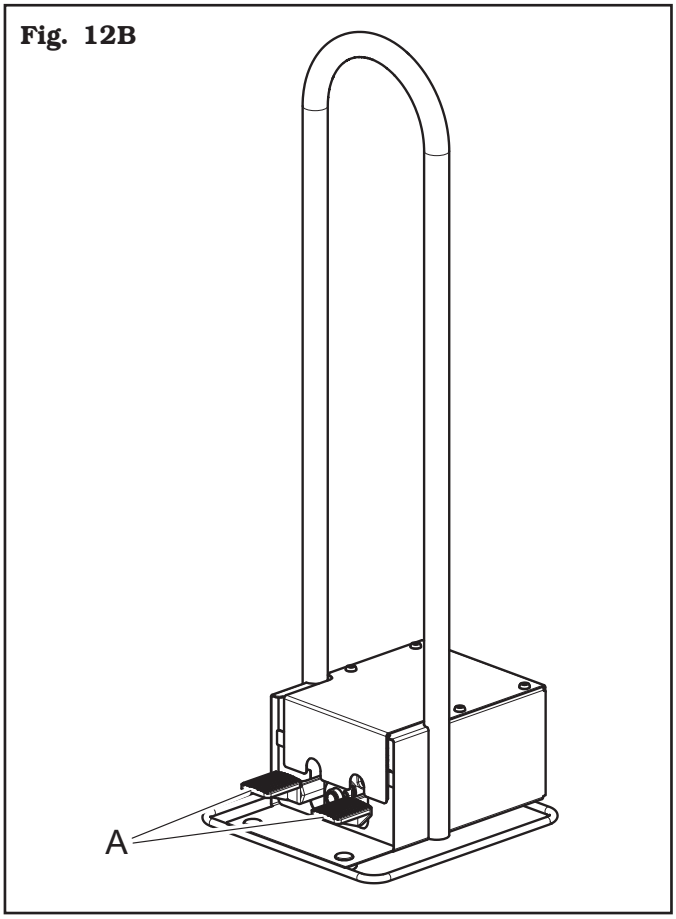
The ground control unit (see **Fig. 12B**) can be moved according to the positioning necessities of the operator. The operator should place the control in a zone free from obstacles in order to see clearly and completely the operative zone.

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.

Fig. 12B



11.4 Control device (valid for NAV51.15 and NAV51T.15 models with bluetooth version)

The control (handle control) (see **Fig. 13**) 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 flashing green led "**A**", indicates the machine stand-by position. When any control is operated, the machine is started and it is ready for operation. During functioning, the led "**A**" is turned on with a fixed light. The red turned on led "**B**" and the green turned off led "**A**" indicate that the manipulator batteries are exhausted: in order to carry on the functioning, the batteries must be charged.

IN ORDER TO ACTIVATE THE COMMUNICATION BETWEEN HANDLE CONTROL AND MACHINE, ON MACHINE SWITCHING AND AFTER EACH POSITIONING IN STAND-BY MODE, IT'S NECESSARY TO OPERATE ANY JOYSTICK (LEVER "H" OR LEVER "I") FOR 5 SECONDS AT LEAST.

"Push button **C**" has a maintained control position, and when pressed it rotates the tool holder head counterclockwise (from behind the tool).
"Push button **D**" has a maintained control position, and when pressed it rotates the tool holder head clockwise (from behind the tool).
"Push-button **E**" has a maintained control position, and when pressed, it operates the self-centring chuck opening.
"Push-button **F**" has a maintained control position, and when pressed it operates the self-centring chuck closing.
"Button **G**" has one "hands-on" operating position: when it is pressed and lever "**I**" or "**H**" is laterally shifted at the same time, it doubles the translation speed of the self-centring carriage and of the tool holder carriage respectively.
"Lever **H**" has four maintained control positions:

- Lever rightwards or leftwards, operates respectively the tool holder carriage shifting rightwards or leftwards.
- Lever upwards or downwards: it respectively lowers or lifts the tool holder arm.

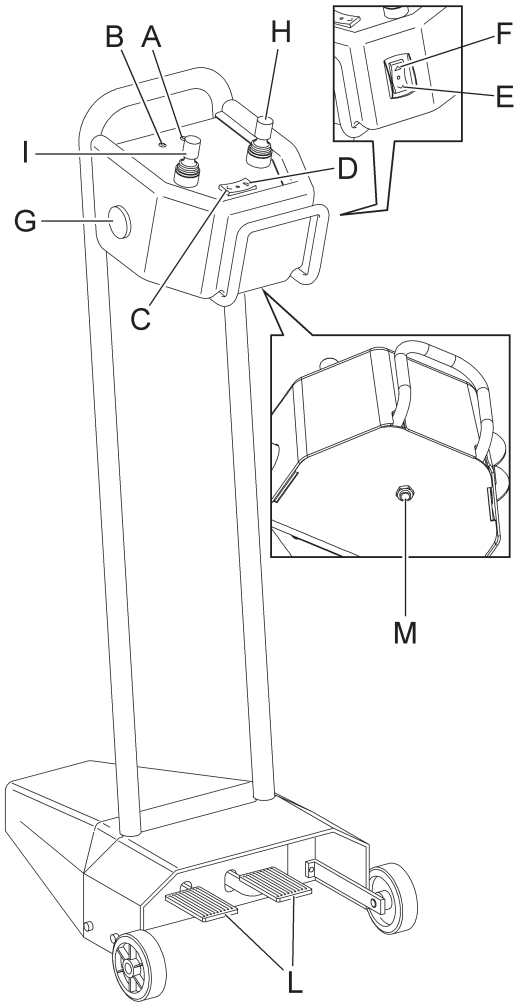
"Lever **I**" has four maintained control positions:

- Lever rightwards or leftwards, operates respectively the mandrel holder carriage shifting rightwards or leftwards.
- Lever upwards or downwards: it operates respectively the rising and the lowering of the mandrel holding arm.

"Pedal **L**" starts clockwise and anti-clockwise rotation of the mandrel.
When any control is operated, the machine is started again, ready for operation: led "**A**" flashes.

THE HANDLE MUST NOT BE PLACED WHERE WATER STAGNATES.

Fig. 13



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 2550 mm) and with remarkable weight (up to 2300 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. 8, 9A E 9B REF. C).
LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT.
THE CAREFUL LUBRICATION OF THE TYRES BEADS IS ALSO 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.

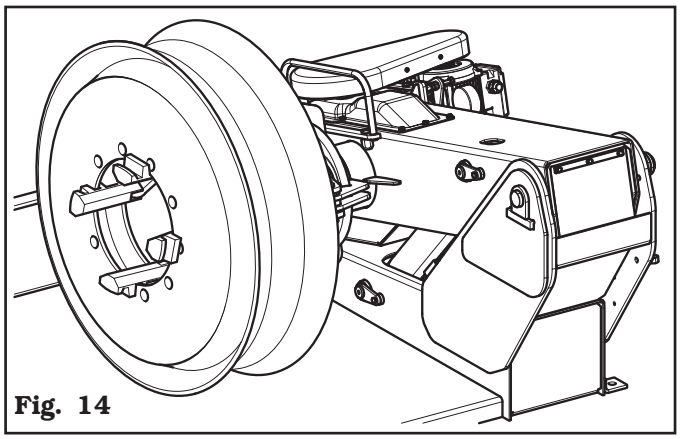


Fig. 14

Clamping on the central hole

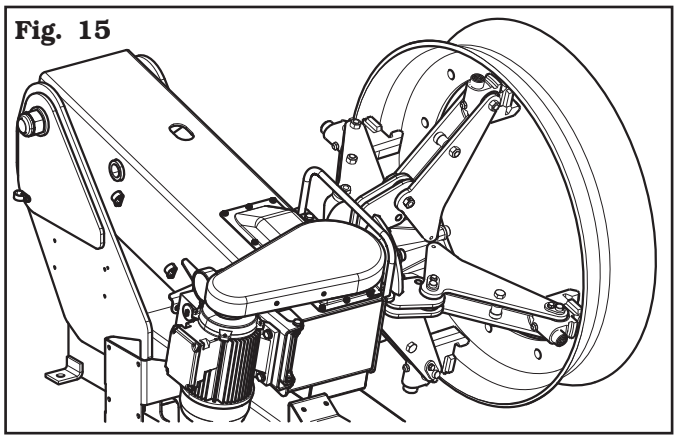


Fig. 15

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:

- Move the tool holder arm (**Fig. 18 ref.1**) to "out of work" position, manually or with the help of the provided controls, according to the model of tyre changer which is being used;
- Move the movable footboard (**Fig. 1 and 2 ref. 18**) outside. Make the wheel rotate on the same footboard;
- Place the lock mandrel (**Fig. 1 and 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. 10 ref. E, Fig. 11 ref. A and Fig. 12A ref. E**) according to the type of rim to be locked;
- Lock the rim with the lock mandrel (**Fig. 1 and 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 (160 BAR - 180 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. 8, 9A E 9B REF. C).
LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT. THE CAREFUL LUBRICATION OF THE TYRES BEADS IS ALSO RECOMMENDED, IN ORDER TO PROTECT THEM FROM POSSIBLE DAMAGES AND TO FACILITATE MOUNTING AND DEMOUNTING OPERATIONS.

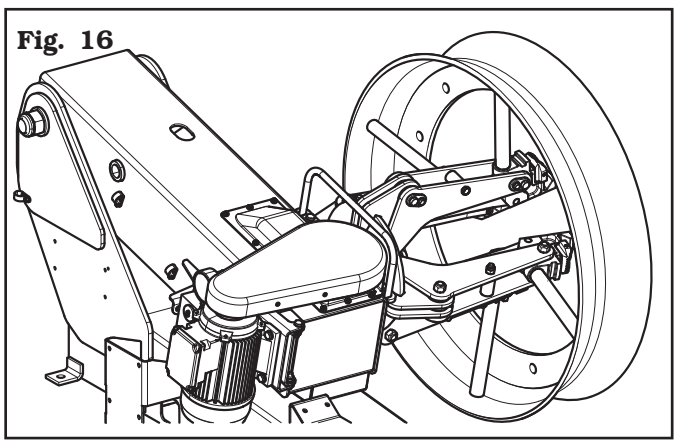


Fig. 16

Locking with extensions

Whenever the rim exceeds the 42", in the locking point, use the appropriate extensions supplied with the tyre-changer. 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. 8, 9A E 9B REF. C).
LOW SPEED IS RECOMMENDED FOR WHEELS WITH GREAT DIAMETER AND WEIGHT.
THE CAREFUL LUBRICATION OF THE TYRES BEADS IS ALSO 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. 17 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.

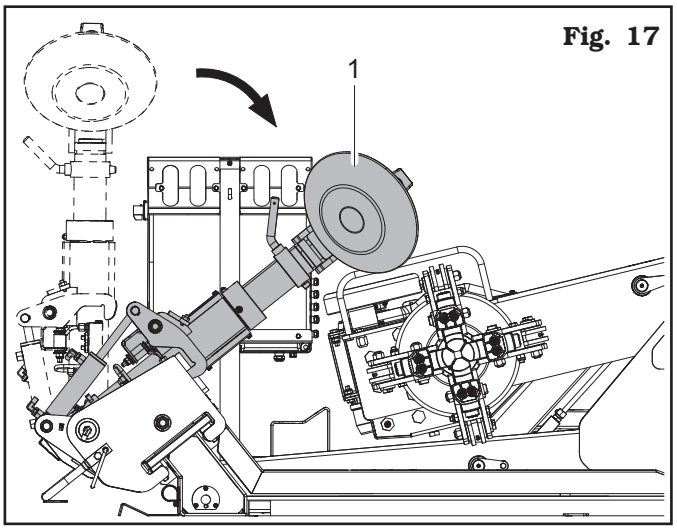


Fig. 17

In "out of work" position (**Fig. 18 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.

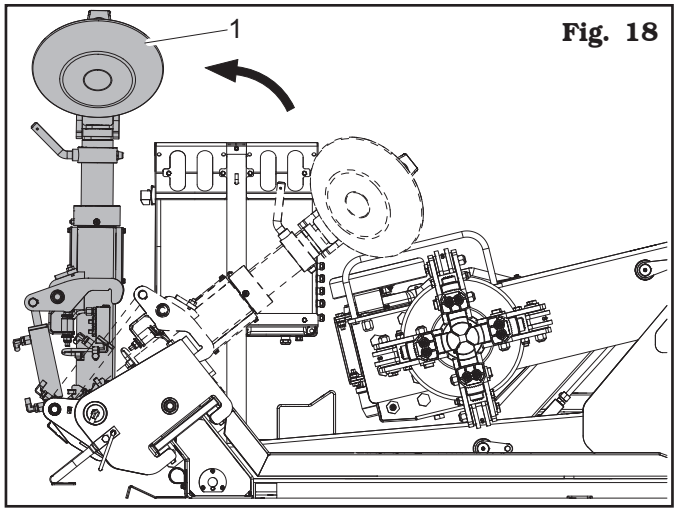


Fig. 18

The tool holder arm moves from "out of work" position to "working position", manually (**NAV51.15N**) or through an hydraulic cylinder (**NAV51.15 - NAV51T.15**).

IN WORK POSITION, THE SAFETY JACKS (FIG. 1 AND 2 REF. 8) MUST BE HOOKED TO THE TOOL CARRIAGE (FIG. 1 AND 2 REF. 12).

On the contrary, in order to reach "out of work" position from "working position", the tool holder arm moves when the pedal provided is pushed (**Fig. 2 ref. 19**) in case of **NAV51.15N** or when the handle control operating the cylinder is controlled (**Fig. 1 ref. 19**) in case of **NAV51.15 - NAV51T.15**.
When the tool holder arm is in "out of work" position, it can be laterally shifted in automatic mode in one of the two positions (**NAV51.15 - NAV51T.15**) or in manual mode in one of the three (**NAV51.15N**) 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 (only for NAV51.15 and NAV51T.15)

Tool holder head 180° rotation is automatic, and it takes place through handle control operation (**Fig. 10-13 pos C and D**).

12.5.2 Tools unit extraction/insertion (only for NAV51.15 and NAV51T.15)

The tools holder head has two working positions.

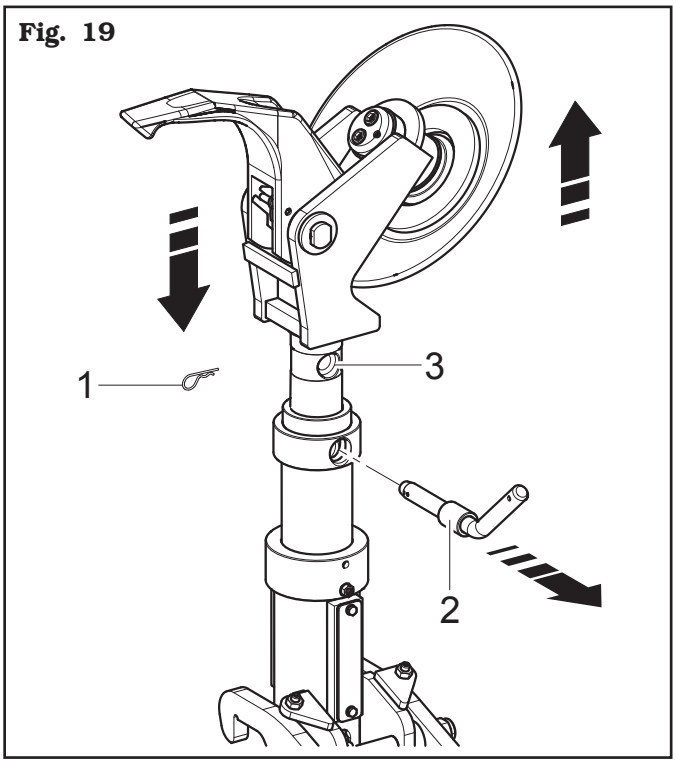
THE FOLLOWING OPERATIONS MUST BE CARRIED OUT WITH THE TOOLS HEAD IN "OFF- WORK" POSITION.

Remove the safety split pin (**Fig. 19 ref. 1**) and manually extract the lever (**Fig. 19 ref. 2**) to change from one position to another. Manually lift or lower the tools holder head until the locking holes match (**Fig. 19 ref. 3**).

WHEN THE TOOL HOLDER HEAD IS LOWERED, MOVE THE HEAD ITSELF DOWNWARDS WITH THE FREE HAND.

When the new position has been reached, insert the lever again (**Fig. 19 ref. 2**) in the provided hole and assemble the safety split pin (**Fig. 19 ref. 1**) again.

Fig. 19



12.5.3 Quick fit device (only for NAV51.15N)

The machine, equipped with a quick-fit tool, remarkably facilitates the tools unit extraction/rotation operations. Here follows the description of these operations:

TOOL ROTATION

To rotate the tool head (**Fig. 20-21 ref. 1**) (both in low (**Fig. 21 ref. 2**) and in high position (**Fig. 20 ref. 3**)) just push the unlocking lever (**Fig. 20-21 ref. 4**) towards the tool arm. When the head new working position is reached (**Fig. 20-21 ref. 1**) the lever (**Fig. 20-21 ref. 4**) automatically inserts locking its rotation.

Fig. 20

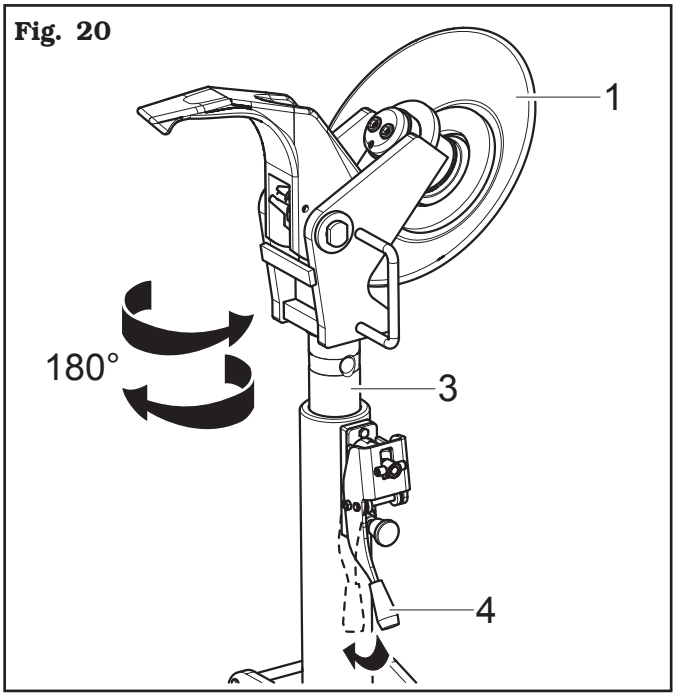
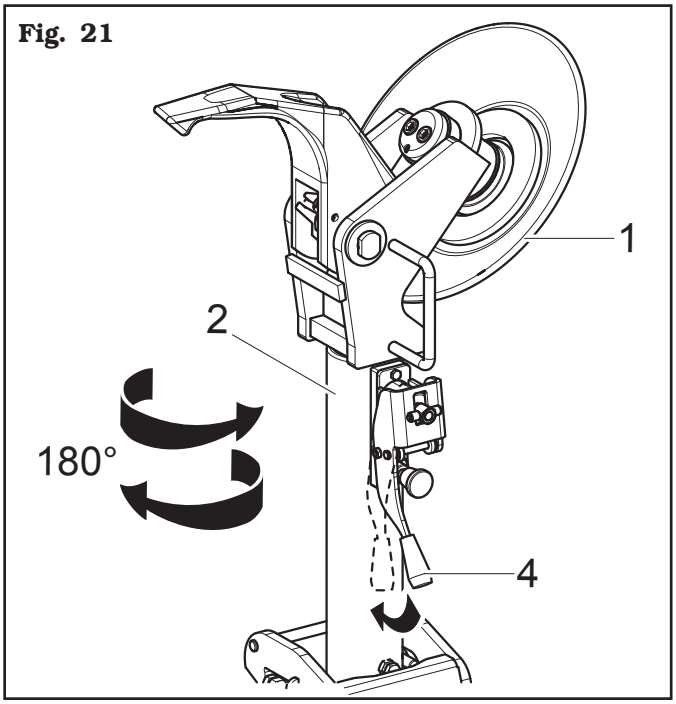


Fig. 21



TOOL EXTRACTION

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

1) Push the lever (**Fig. 22 ref. 1**) towards the tool arm and place the head (**Fig. 22 ref. 2**) at 90° compared to the work position.
2) Lift the head manually until the pin (**Fig. 23 ref. 1**) fits automatically.
3) Now the head (**Fig. 23 ref. 2**) stays up, allowing easily the rotation operations described before.

Fig. 22

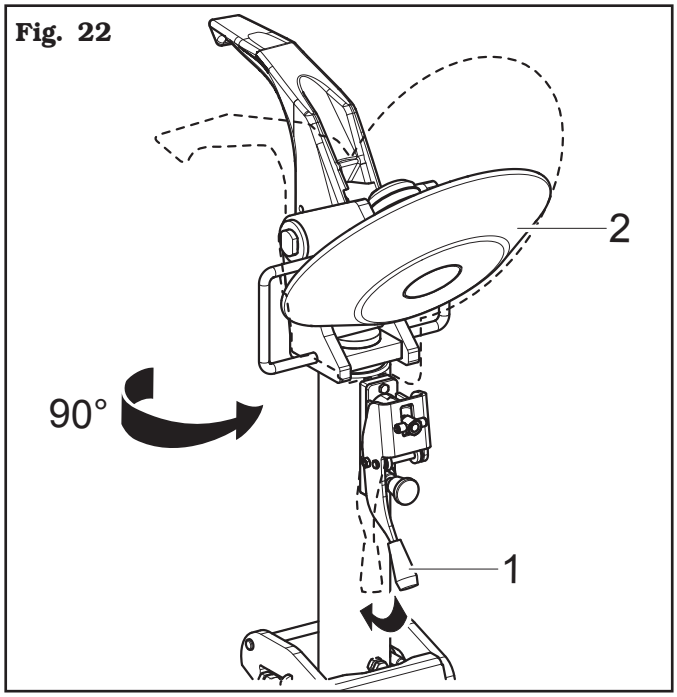
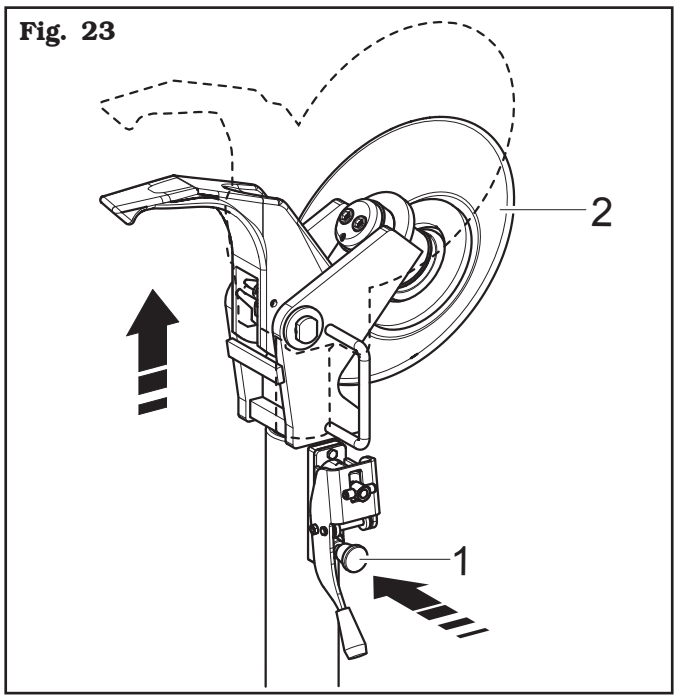


Fig. 23



TOOL INTRODUCTION

1) Push the lever (**Fig. 24 ref. 1**) towards the tool arm and place the head (**Fig. 24 ref. 2**) at 90° compared to the work position.
2) Pulling the check pin (**Fig. 25 ref. 1**) toward the external, the headstock (**Fig. 25 ref. 2**) inserts in its seat.

DURING THIS OPERATION, WITH THE HAND LEFT FREE, MOVE THE HEAD (FIG. 24 REF. 2) DOWN-WARDS.

3) At this point, it is possible to rotate the head (**Fig. 25 ref. 2**) as described before.

PAY ATTENTION NOT TO SQUASH THE HANDS BETWEEN THE TOOL SUPPORT AND THE ARM!

Fig. 24

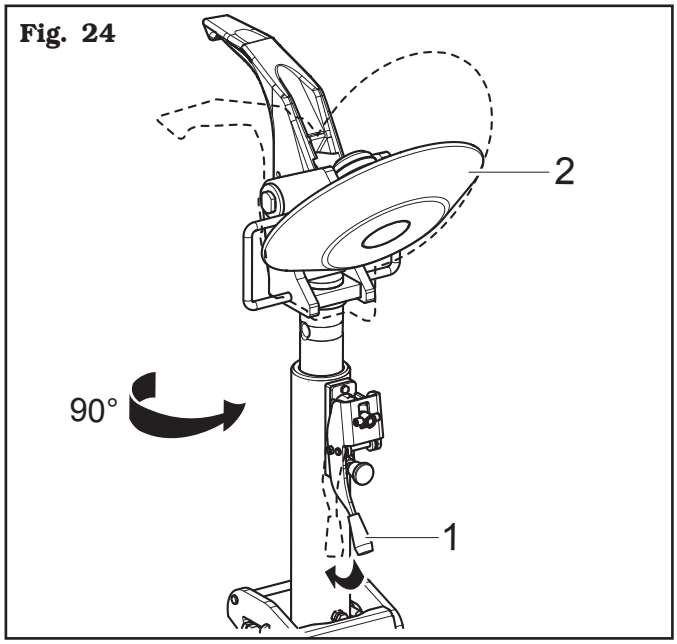
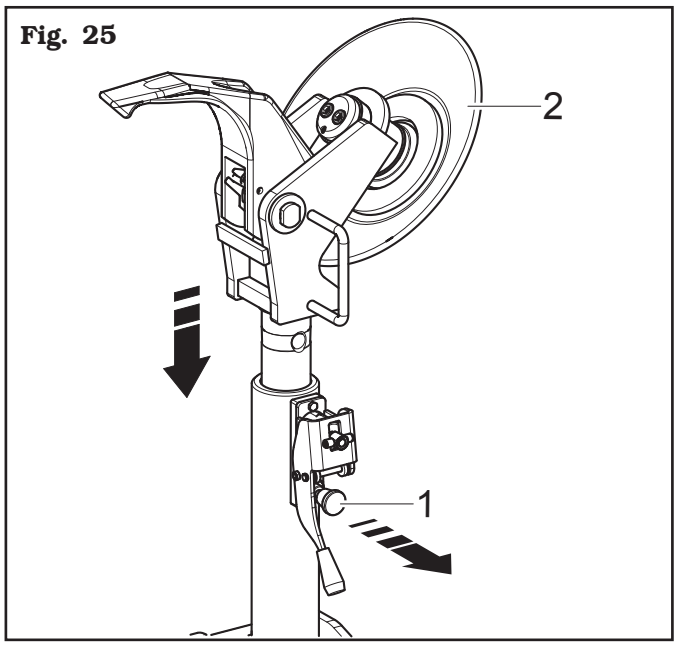


Fig. 25



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 (160 BAR - 180 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 (hooked safety jack) (**Fig. 17**).

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

E. Place as shown in **Fig. 26** the beading disc (**Fig. 26 ref. 1**) by means of the relevant handle control; the outer profile of the rim (**Fig. 26 ref. 2**) must almost touch the beading disc.

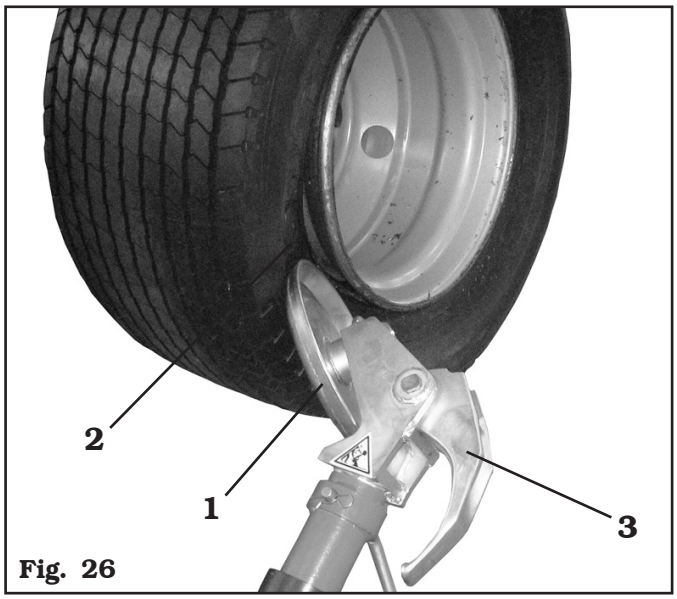


Fig. 26

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 "out of work" position (**Fig. 18 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. 17 ref. 1**) and secure it with the special safety jack.

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. 27 ref. 1**) is placed against the rim edge (**Fig. 27 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 26-27 ref. 3**) to avoid obstacles during the operating phases.

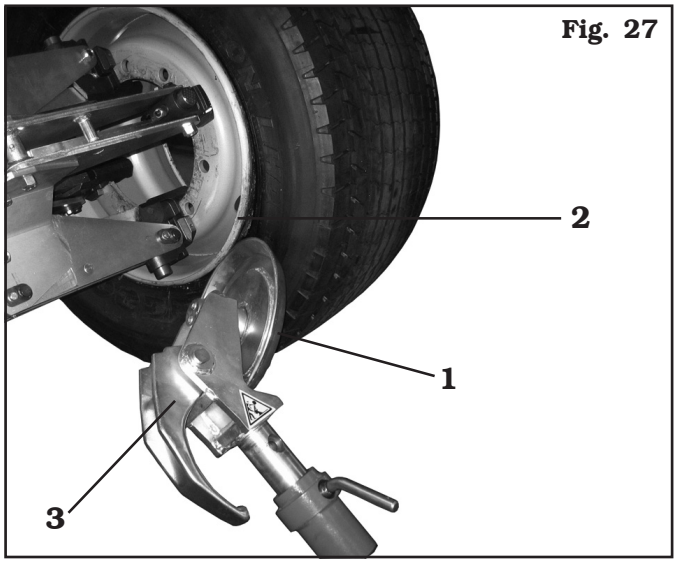


Fig. 27

12.6.2 Demounting

THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (160 BAR - 180 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 **Figure 28**).

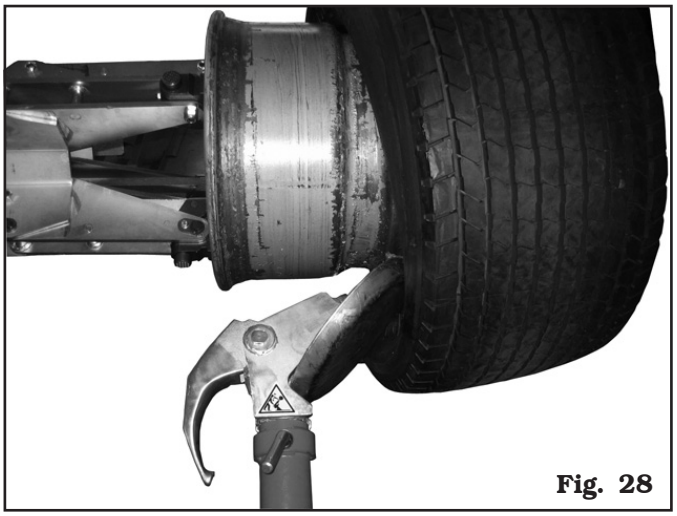


Fig. 28

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**).
- 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. 29**).

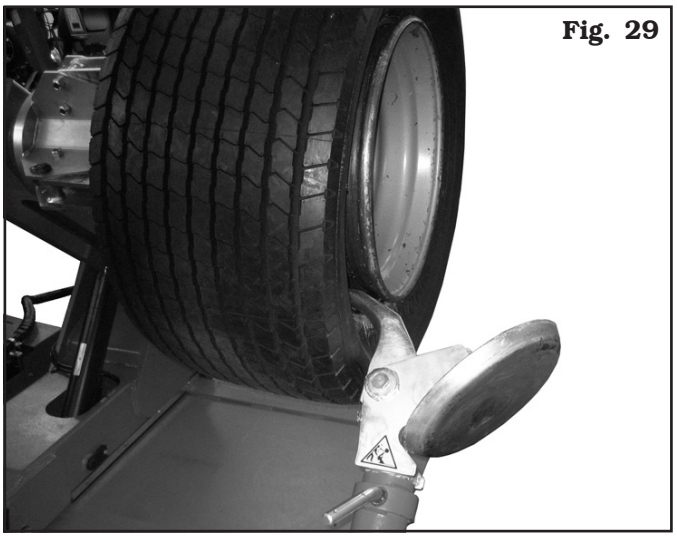


Fig. 29

- 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. 30 ref. 2**) to allow easy insertion of lever (**Fig. 30 ref. 1**) between the rim and the bead; insert lever (**Fig. 30 ref. 1**) between the rim and the bead on the right-hand side of the tool (**Fig. 30 ref. 2**).

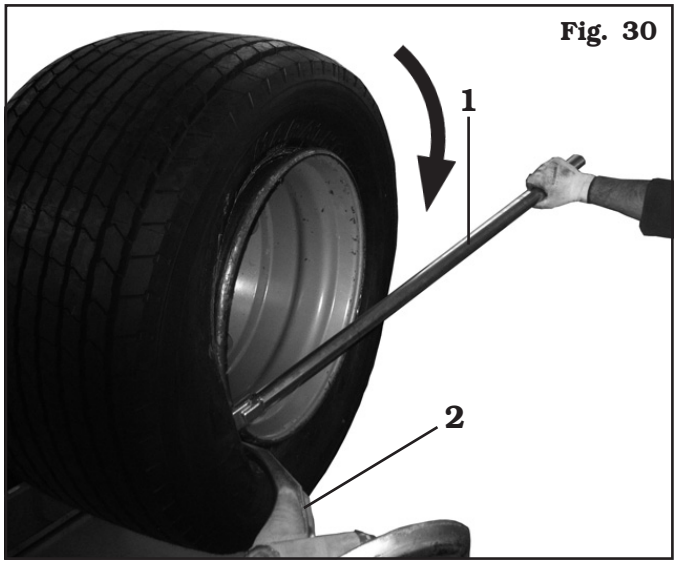


Fig. 30

- 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. 30 ref.1**) until the bead has gone completely out.
- Once the external bead has been removed, move tool holder arm away from the wheel, unhook it and lift it bringing it in "out of work" position (**Fig. 18 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel then place it in "working" position again (**Fig. 17 ref. 1**) and secure with the safety hook 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. 31 ref. 1**) between the rim edge and the tyre bead.

Fig. 31

- 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 (160 BAR - 180 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

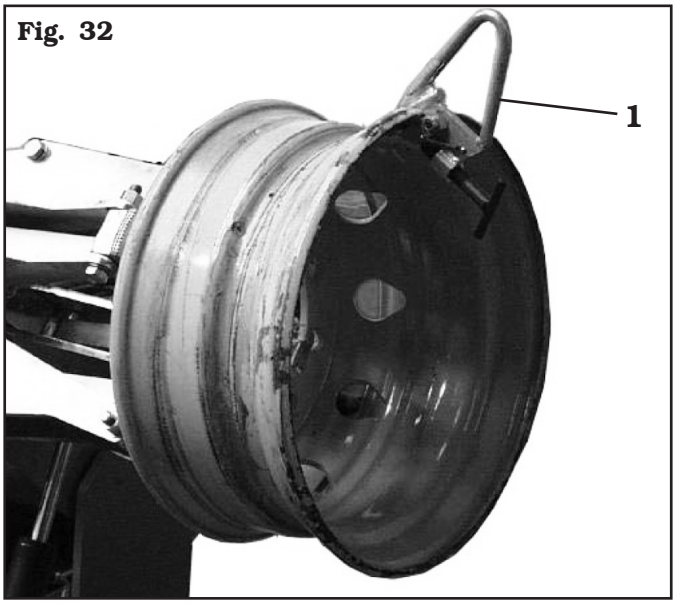
Proceed as follows:

- 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. 32 ref.1**) on the external edge of the rim in the highest point as shown in **Fig. 32**.

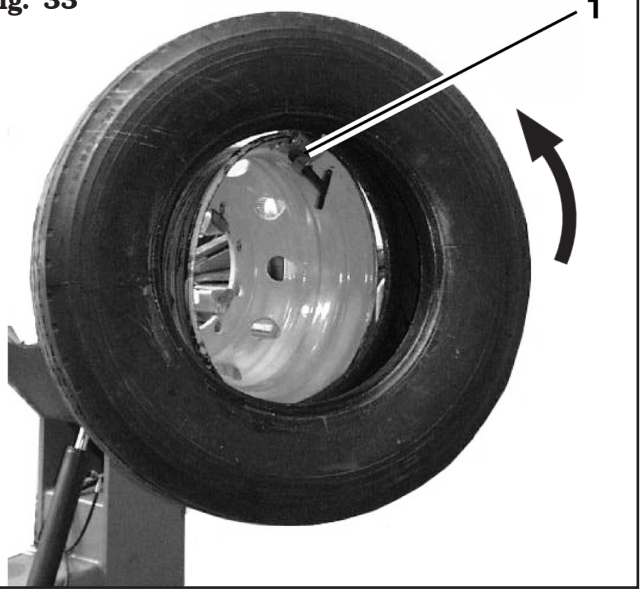
Fig. 32



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

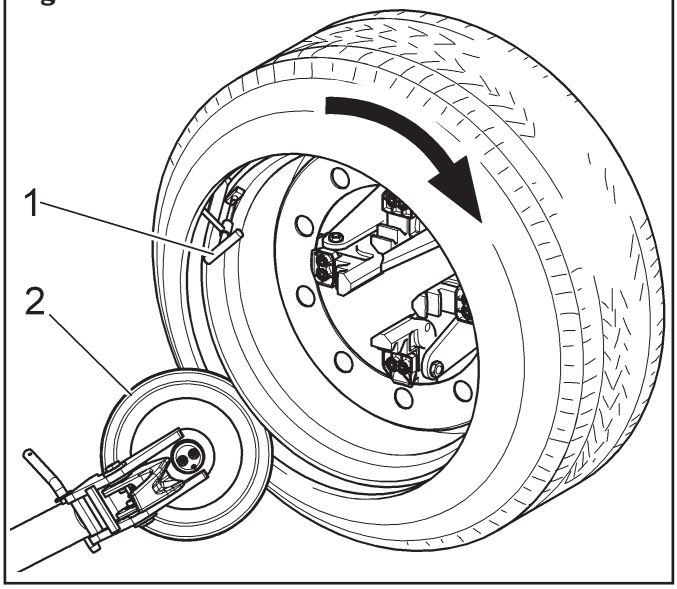
- Move to work position **B** (**Fig. 6**).
- Lower the mandrel arm completely. Roll the tyre on the platform and hook it to clamp (**Fig. 33 ref. 1**).
- Lift the mandrel arm with the tyre hooked and turn it counterclockwise by about 15-20 cm; the tyre will position itself sideways with respect to the rim **Fig. 33**).

Fig. 33



- Move to work position **C** (**Fig. 6**).
- Position beading disc (**Fig. 34 ref. 2**) so that it is at approximately 1.5 cm (½") from the edge of the rim. Fitting clamp **(Fig. 34 ref. 1)** is at 11 o'clock. Turn the mandrel until the grippers reach the lowest point (6 o'clock).

Fig. 34



- 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. 32 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. 33 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. 33**).
- Place the tool holder arm in "out of work" position (**Fig. 18 ref. 1**); translate it to the inner side of the tyre and hook it again into "working" position (**Fig. 17 ref. 1**).
- Carry out the tools head 180° rotation until the hook tool is moved onto the tyre side (see **Fig. 35**).

Fig. 35

- 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 "out of work" position (**Fig. 18 ref. 1**); translate it to the outer side of the tyre and hook it again into "working" position (**Fig. 17 ref. 1**).
- Carry out the tools head 180° rotation until the hook tool is moved onto the tyre side (see **Fig. 29**).
- 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. 29**). 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 (160 BAR - 180 BAR).

- Tilt up tool holder arm, unhook it and lift it placing it in "out of work" position (**Fig. 18 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. 17 ref. 1**) and secure with the safety hook 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. 36 ref. 1**) between the rim and the bead on the right-hand side of the tool.

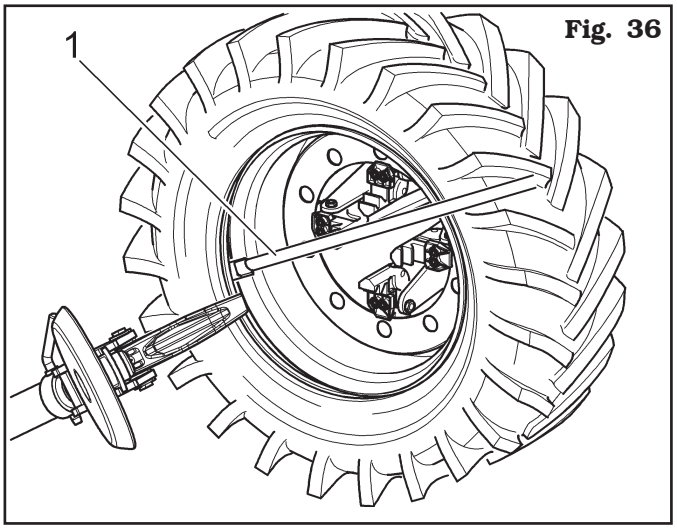


Fig. 36

- 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. 18 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 "out of work" position (**Fig. 18 ref. 1**); use the handle control to position the tool holder arm on the inner side of the wheel then place it in "working" position (**Fig. 17 ref. 1**) and secure with the safety hook 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. 37 ref. 1**) between rim (**Fig. 37 ref. 2**) and bead (**Fig. 37 ref. 3**) on the tool right.

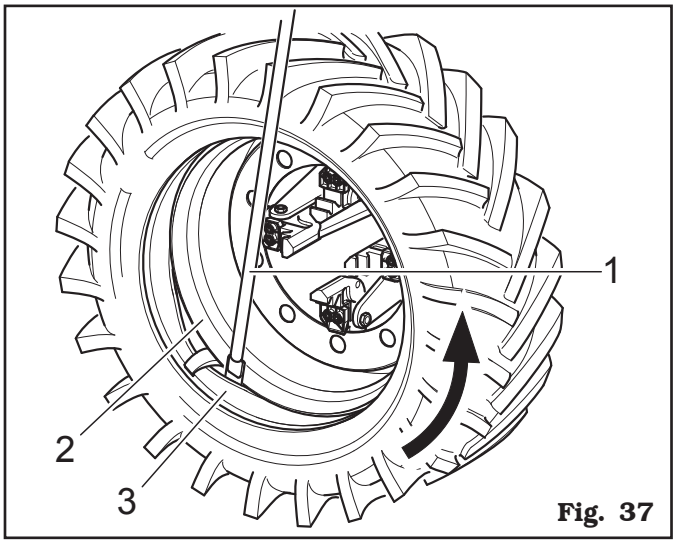


Fig. 37

- 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. 37 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 (160 BAR - 180 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. 32 ref. 1**) on the external edge of the rim in the highest point as shown in **Fig. 32.**

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. 18 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. 17 ref. 1**) and secure with the safety hook 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. 38**).

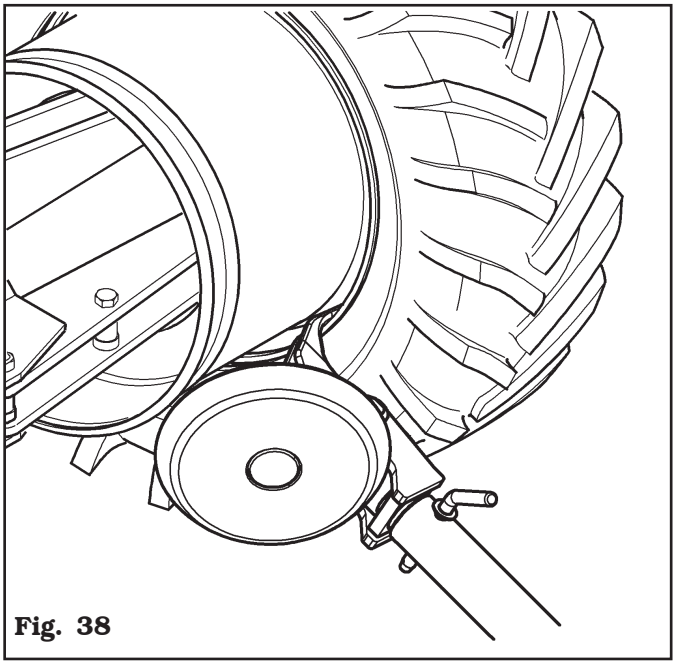


Fig. 38

- 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. 18 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 the movable footboard (**Fig. 1-2 ref. 18**) directly above the wheel and lower the mandrel until the wheel rests on the footboard. Translate the movalbe footboard outwards to create enough space between the tyre edge and the rim to insert the inner tube.

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 39.

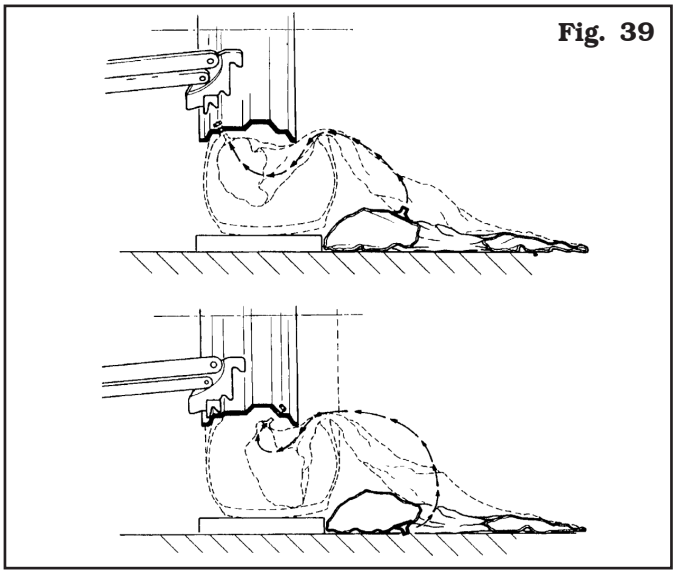


Fig. 39

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. 40 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. 40 ref. 1**) are positioned at 9 o'clock.

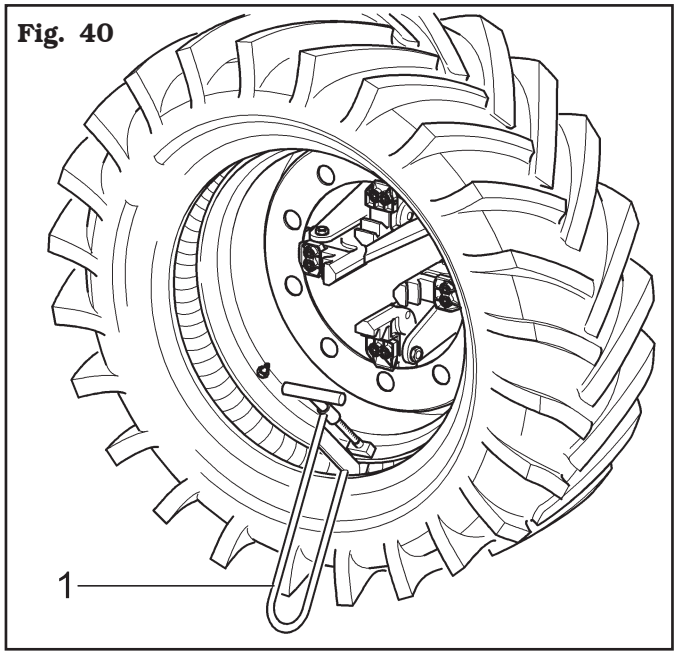


Fig. 40

- Place the tool holder arm in "working" position (**Fig. 17 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. 41 ref. 1**) is introduced in the housing obtained on the hook tool.
- Turn the mandrel with lever (**Fig. 41 ref. 1**) hooked until complete insertion of the tyre outer rim.
- Remove lever (**Fig. 41 ref. 1**), grippers (**Fig. 41 ref. 2**) and extract the hook tool by turning the mandrel counterclockwise and translating it outwards.

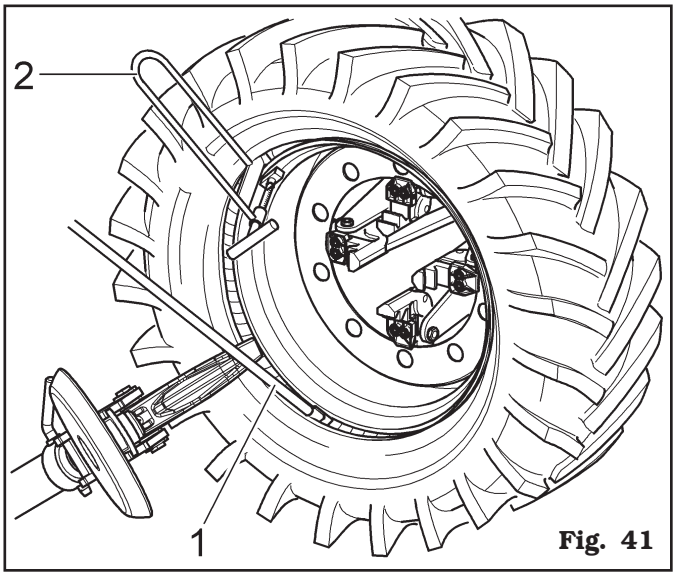


Fig. 41

- Tilt up tool holder arm placing it in "out of work" position (**Fig. 18 ref. 1**) after it has been unhooked.

- Position mobile platform (**Fig. 1-2 ref. 18**) directly under the wheel and lower the mandrel until the wheel is resting on the platform.
- Move to work position **B** (**Fig. 9**).
- 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. 42** and **43** illustrate sections and compositions of types of wheels with bead wire currently being sold.

Fig. 42

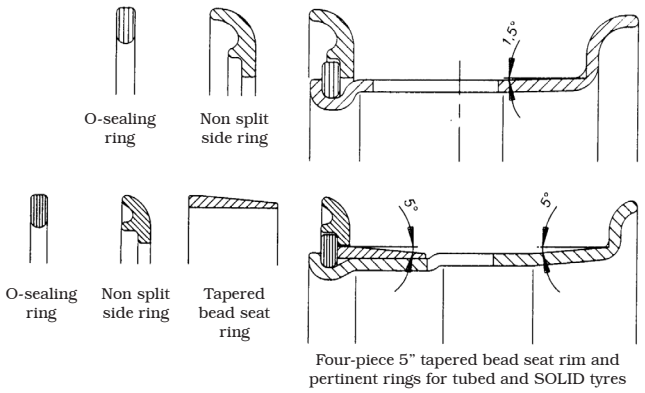
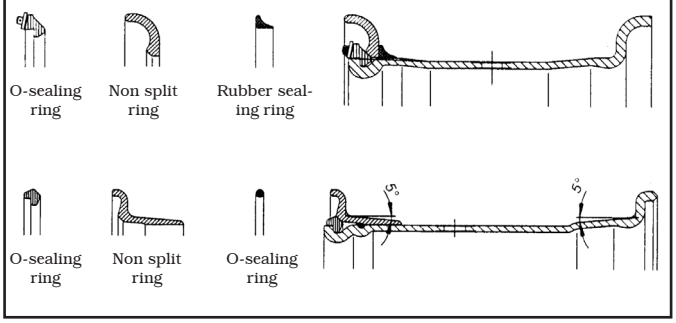


Fig. 43



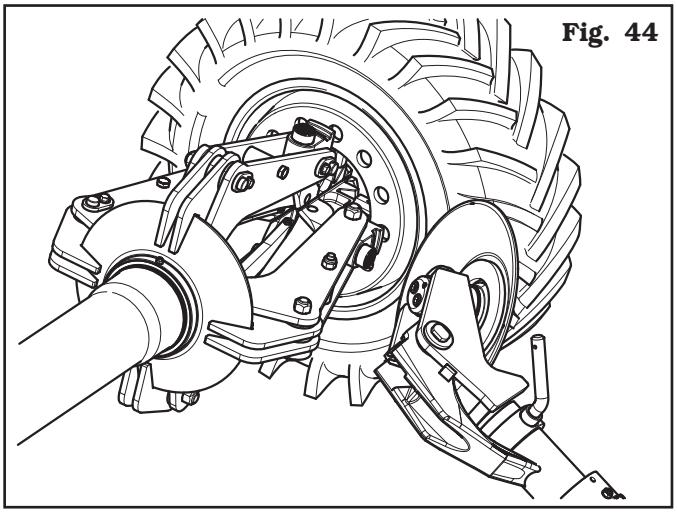
12.8.1 Beading and demounting

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 (160 BAR - 180 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. 17 ref. 1**) in the tyre inner side, and make sure it is locked by the provided safety stop (**Fig. 1-2 ref. 8**).
- Position the beading disc on rim edge (see **Fig. 44**).

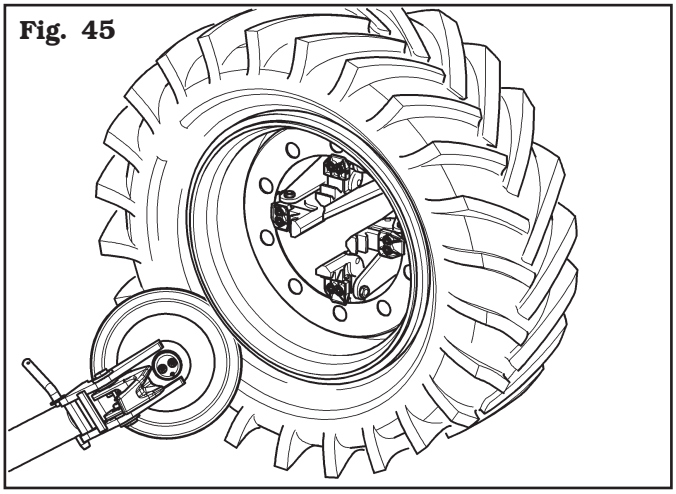
Fig. 44



- 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 "out of work" position (**Fig. 18 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. 17 ref. 1**) again and lock it with the safety hook provided.

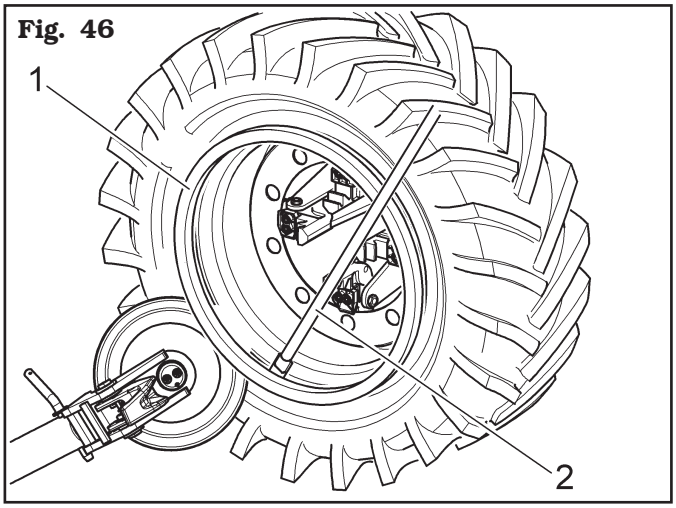
- Carry out the tools holder head 180° rotation according to the description of the relevant paragraph, in order to let the beading disc come into contact with the tyre outer side (see **Fig. 45**).

Fig. 45



- 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. 46**) until the stop ring is released (**Fig. 46 ref. 1**). It will be then extracted through lever (**Fig. 46 ref. 2**).

Fig. 46



- Remove the bead wire.
- Remove the O-Ring, when featured.
- Tilt up tool holder arm placing it in "out of work" position (**Fig. 18 ref. 1**) after it has been unhooked.
- 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.

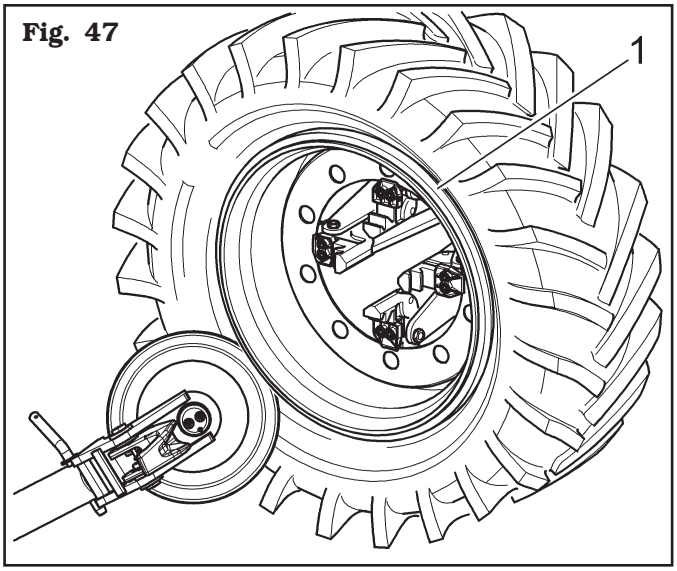
12.8.2 Mounting

THROUGHOUT TYRE MOUNTING/DEMOUNTING OPERATIONS, CHECK THAT THE SELF-CENTRING CHUCK CLAMPING PRESSURE IS CLOSE TO THE MAXIMUM OPERATING VALUE (160 BAR - 180 BAR).

- Place the tools holder arm in "out of work" position (**Fig. 18 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 the movable footboard (**Fig. 1-2 ref. 18**) 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. 17 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. 47 ref. 1**) on the rim, fit the stop ring with the help of the beading disc as shown in **Fig. 47**.

Fig. 47



- Tilt up tool holder arm placing it in "out of work" position (**Fig. 18 ref. 1**) after it has been unhooked.
- Position the movable footboard (**Fig. 1-2 ref. 18**) directly under the wheel and lower the mandrel until the wheel rests on the footboard.
- Close the mandrel jaws completely and translate the footoboard 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.

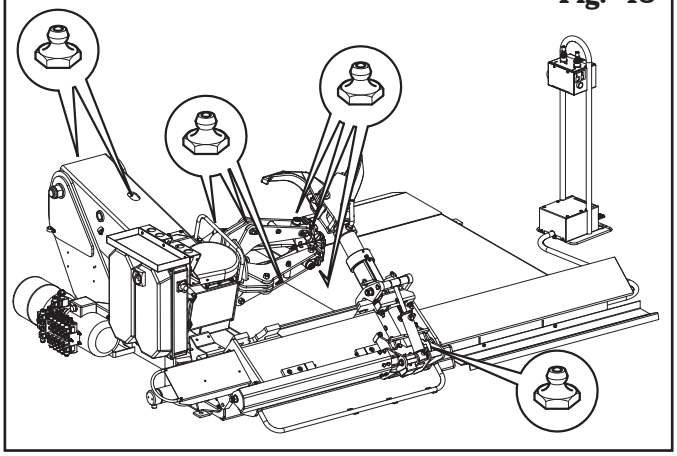
BEFORE REMOVING HYDRAULIC CIRCUIT UNIONS OR PIPES, MAKE SURE THAT THERE ARE NO PRESSURISED FLUIDS PRESENT. PRESSURISED OIL SPILLS MAY CAUSE SERIOUS WOUNDS OR INJURIES.

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. 48**).

Fig. 48



- 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).

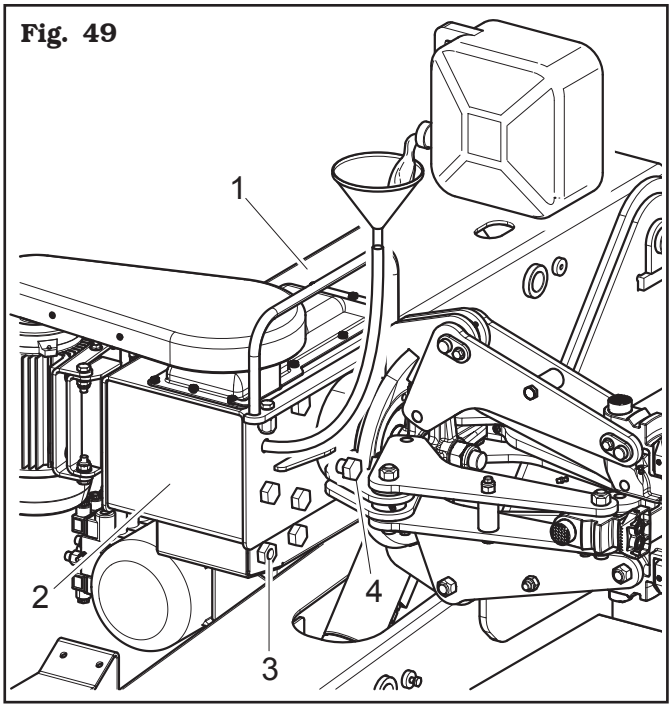
  At least once a year it is advisable to proceed anyway to the complete replacement of the hydraulic oil of the hydraulic unit itself.

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

- 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. Place the whole support (**Fig. 49 ref. 1**) in horizontal position, then check the reduction gear oil level (**Fig. 49 ref. 2**); the level indicator window (**Fig. 49 ref. 3**) must be covered with lubricant, otherwise, remove a closing plug (**Fig. 49 ref. 4**) and top up using appropriate lubricants until the level is reset.

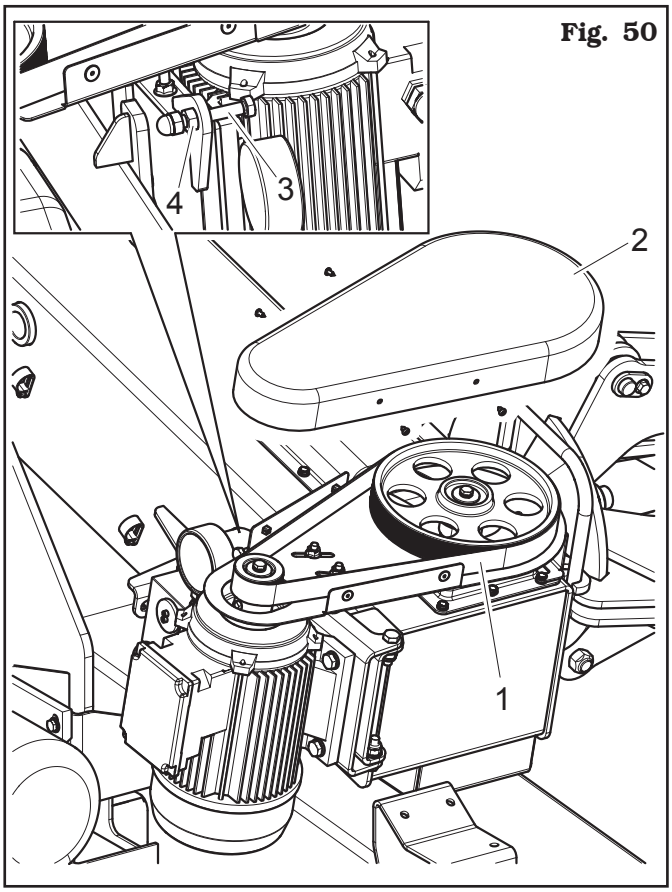
Fig. 49



B. Check the belt tensioning (**Fig. 50 ref. 1**):

- Remove upper guard (**Fig. 50 ref. 2**) by unscrewing the provided fixing screws;
- stretch the belt (**Fig. 50 ref. 1**) using the screw (**Fig. 50 ref. 3**) after the nut (**Fig. 50 ref. 4**) has been slackened;
- tighten the fixing nut (**Fig. 50 ref. 4**) after the adjustment operations, then assemble the protection guard (**Fig. 50 ref. 2**) again.

Fig. 50



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

C. Adjust the play of slide (**Fig. 51 ref. 1**) by means of the adjustment screws (**Fig. 51 ref. 3**) of the sliding blocks (**Fig. 51 ref. 2**), after slackening the nuts (**Fig. 51 ref. 4**).

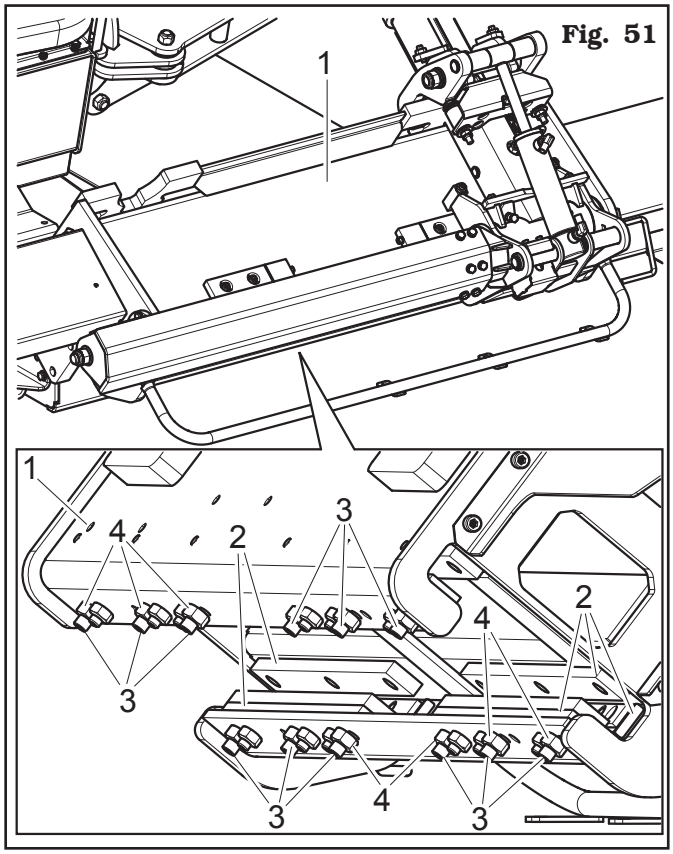


Fig. 51

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-unauthorised 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.	**a)** Solenoid valve not receiving power. **b)** Solenoid valve jammed. **c)** Transformer fuse blown. **d)** Control unit not set correctly.	**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.	**a)** Power unit motor turning in wrong direction. **b)** Power unit pump has failed. **c)** No oil in power unit tank.	**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.	**a)** Not enough fluid in power unit tank. **b)** Control unit switch has failed.	**a)** Top up with oil. **b)** Call the after-sales service.
Version with inverter		
The mandrel doesn't rotate	**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.	**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	**a)** The first temperature threshold has been exceeded. **b)** Raised mechanical resistance.	**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 NAV51.15 and NAV51T.15

Mandrel motor: ..... power **1,3-1,85 Kw** three-phase power supply **400V (50 Hz)**
Mandrel rotation maximum speed: ..... **4 - 8 rpm**
Mandrel rotation maximum speed (version with inverter): ..... **1 - 5 - 10 rpm**
Maximum wheel diameter: ..... **2550 mm / 100"**
Wheel max. width: ..... **1500 mm / 59"**
Wheel maximum weight: ..... **2300 Kg**
Self-centring chuck locking: ..... **11"- 56"** (with extensions)
Minimum locking hole: ..... **90 mm**
Power unit motor: ..... power **1,8-2,5 Kw** three-phase power supply **400V (50 Hz)**
Exercised pressure: ..... **180 bar**
Weight: ..... **1020 Kg**
Gear noise: ..... **< 80 dB (A)**

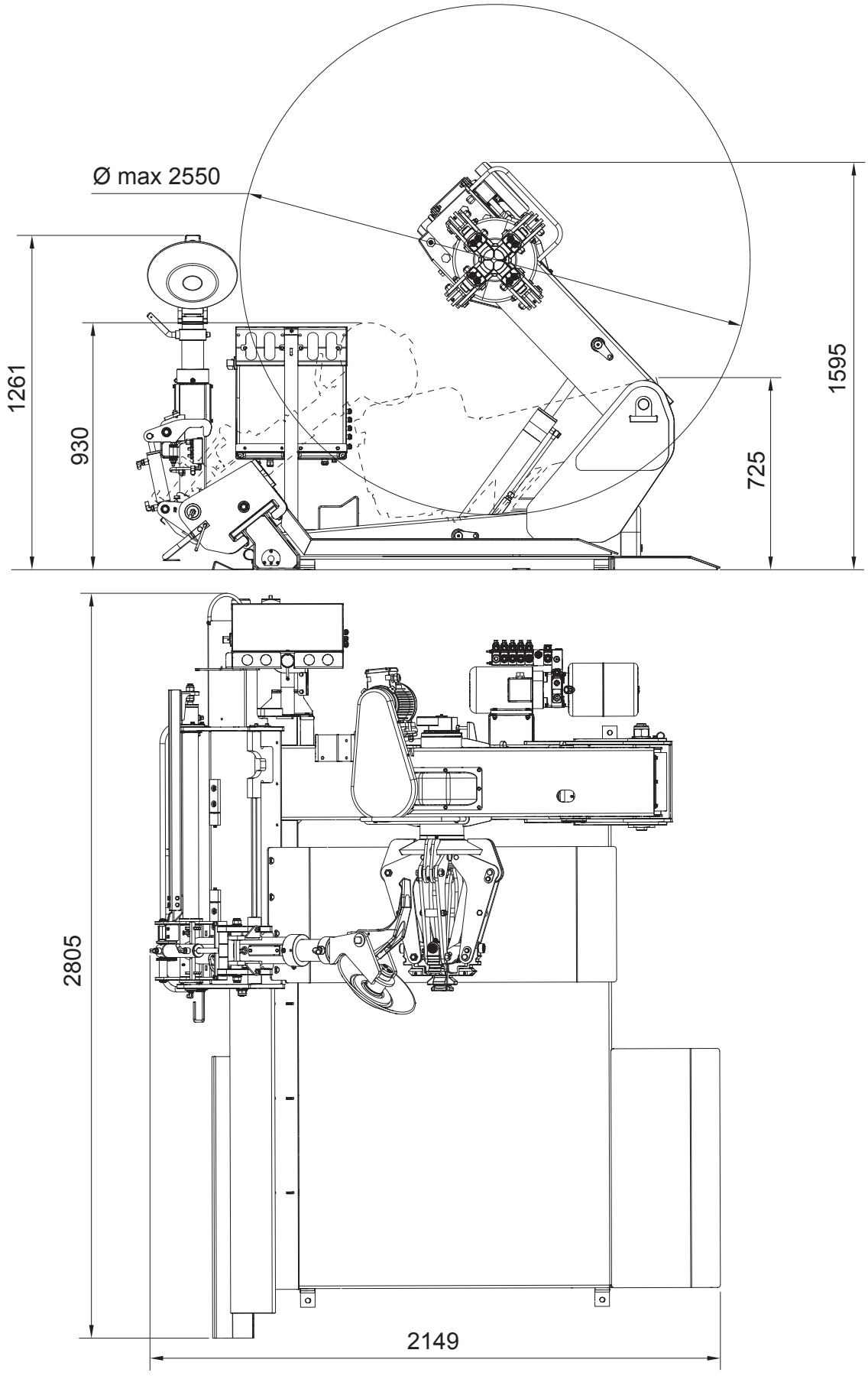
15.2 NAV51.15N technical data

Mandrel motor: ..... power **1,3-1,85 Kw** three-phase power supply **400V (50 Hz)**
Mandrel rotation maximum speed: ..... **4 - 8 rpm**
Maximum wheel diameter: ..... **2550 mm / 100"**
Wheel max. width: ..... **1500 mm / 59"**
Wheel maximum weight: ..... **2300 Kg**
Self-centring chuck locking: ..... **11"- 56"** (with extensions)
Minimum locking hole: ..... **90 mm**
Power unit motor: ..... power **2,6 Kw** three-phase power supply **400V (50 Hz)**
Exercised pressure: ..... **160 bar**
Weight: ..... **980 Kg**
Gear noise: ..... **< 80 dB (A)**

15.3 Dimensions

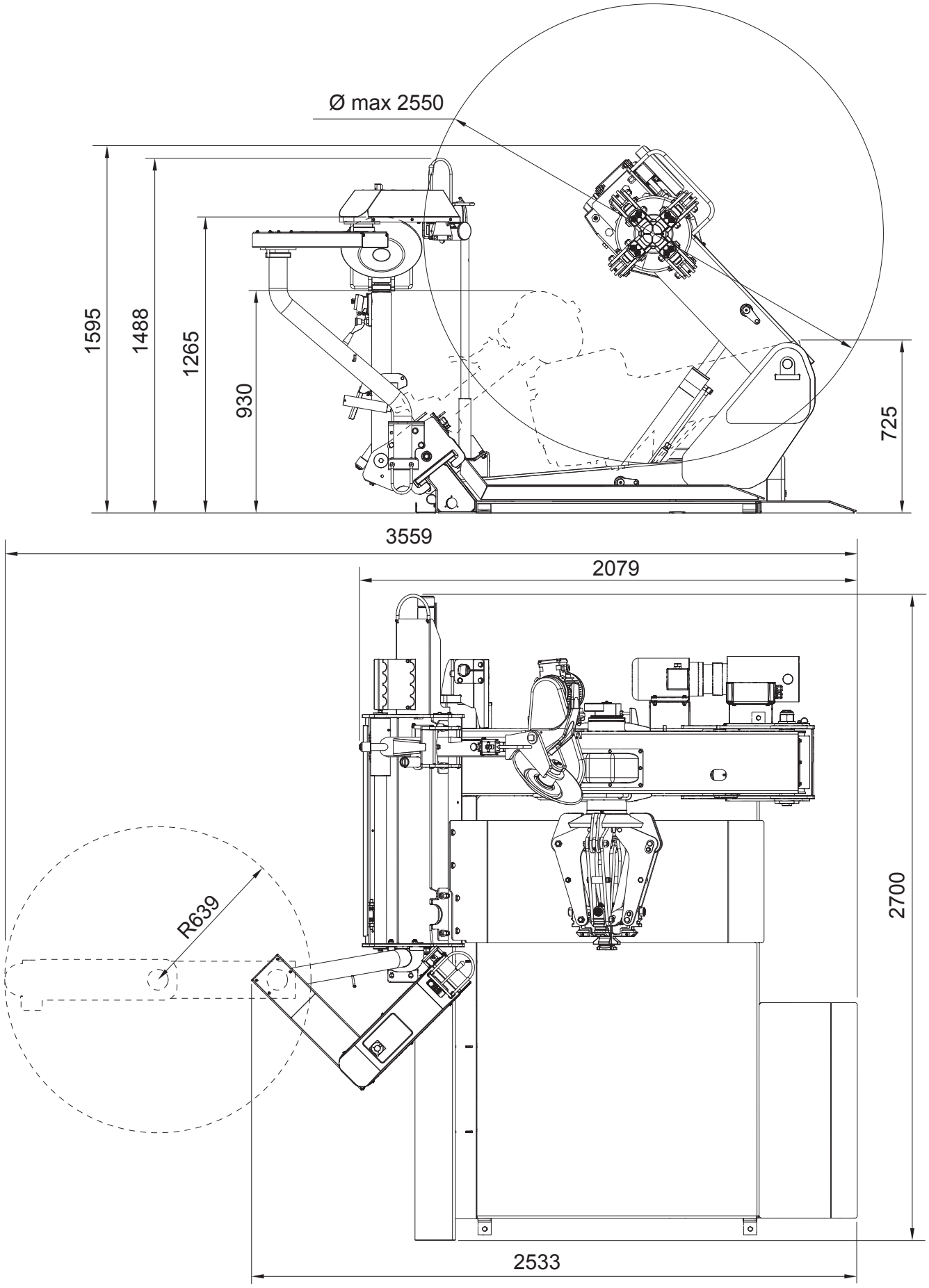
NAV51.15 - NAV51T.15

Fig. 52



NAV51.15N

Fig. 53



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.

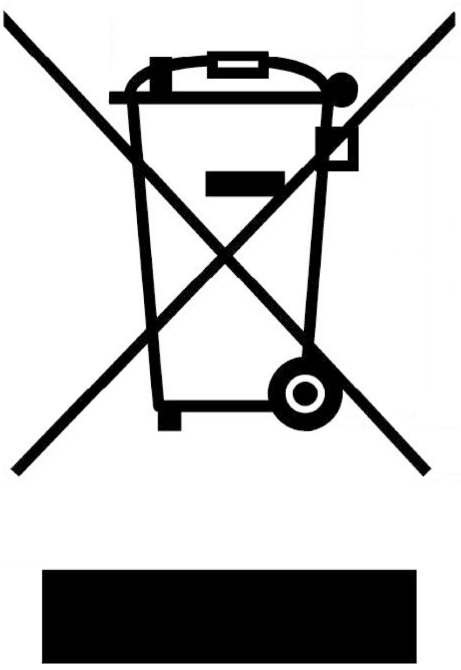
17.0 SCRAPPING

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.

Fig. 54



18.0 REGISTRATION PLATE DATA

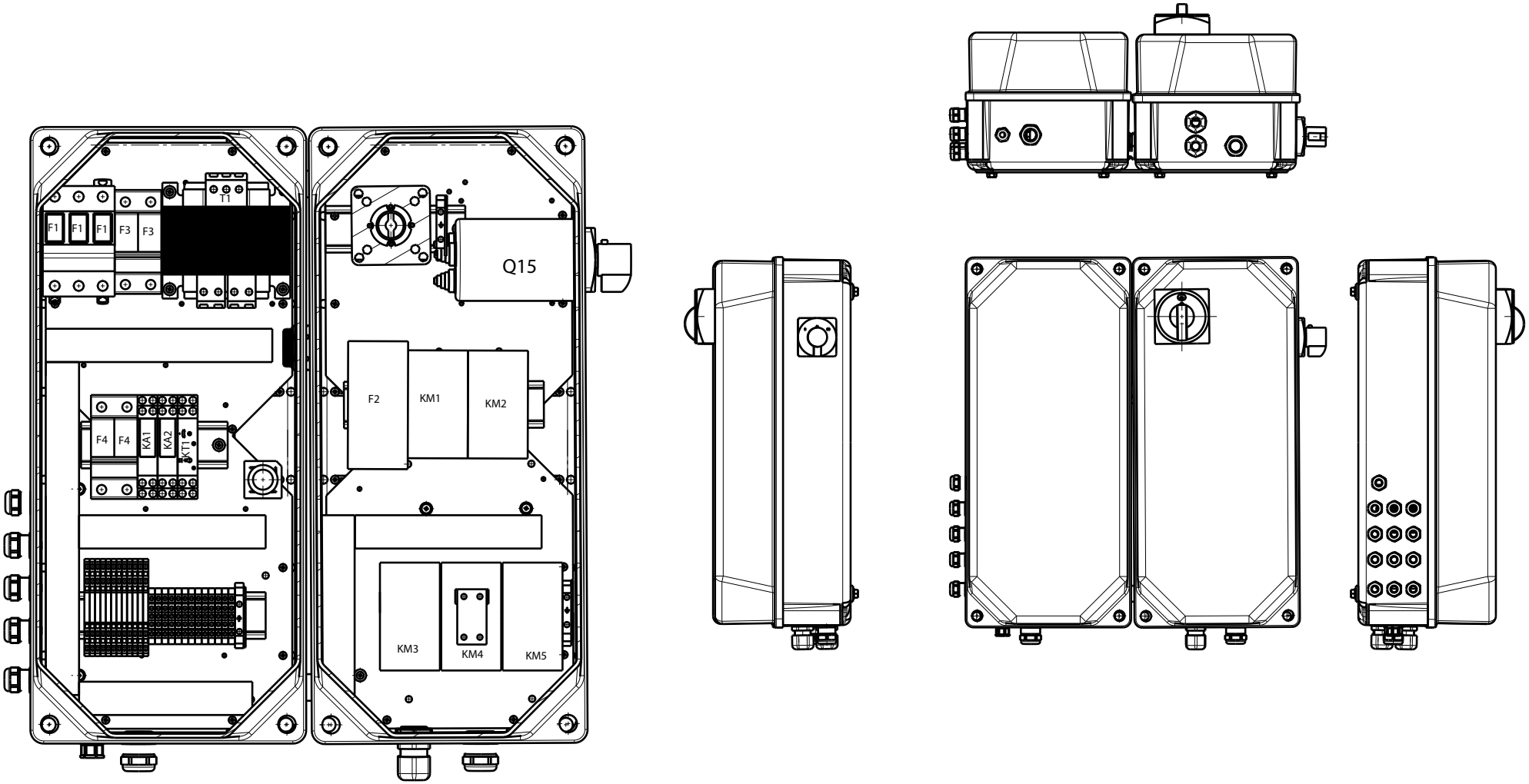
The validity of the Conformity Declaration enclosed to this manual is also extended to products and/or devices the machine model object of the Conformity Declaration can be equipped with.
Said plate must always be kept clean from grease residues or filth generally.

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.

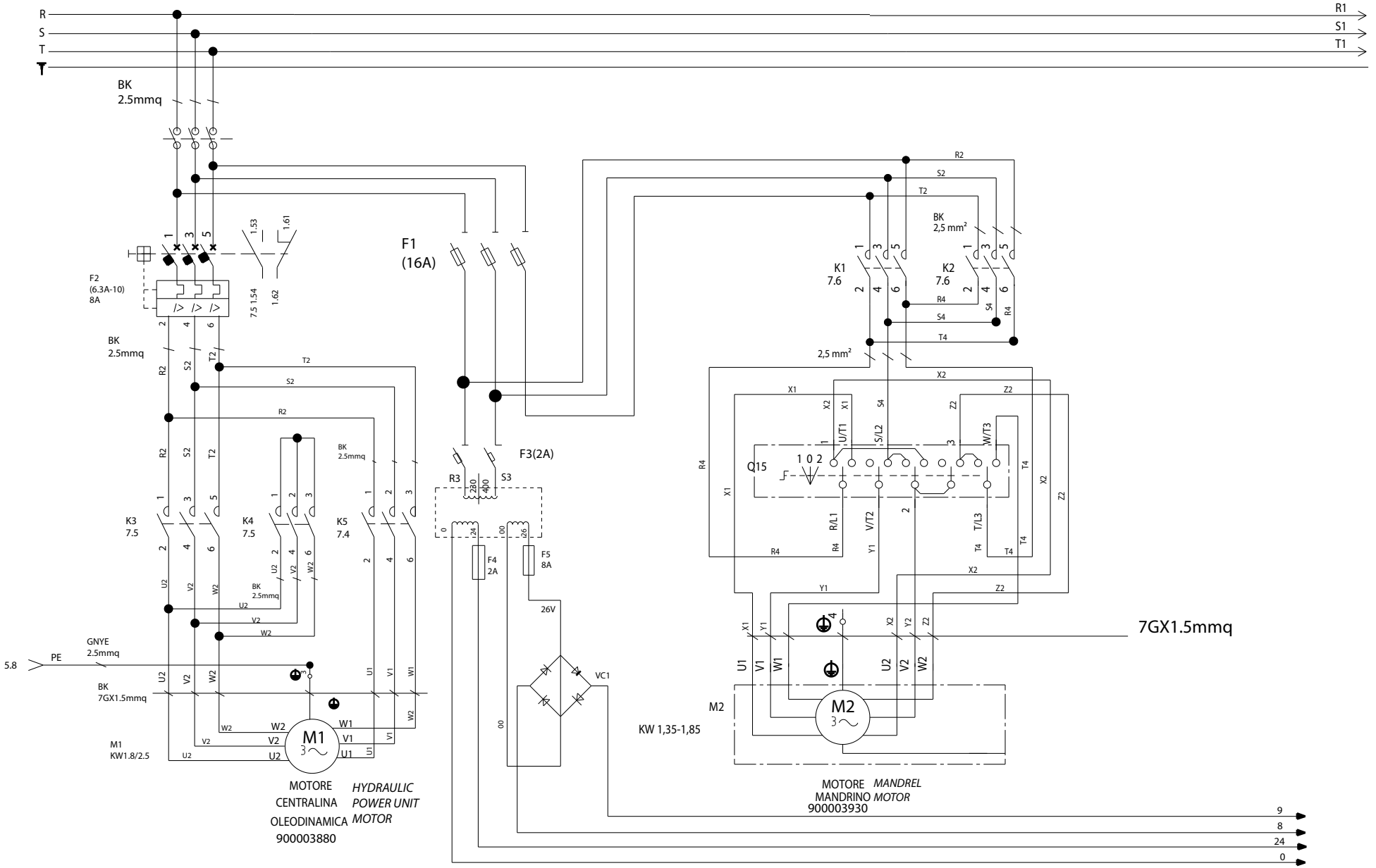
WARNING: Should the plate be accidentally damaged (removed from the machine,damaged or even partially illegible) inform immediately the manufacturer.

19.0 FUNCTIONAL DIAGRAMS

Here follows a list of the machine functional diagrams.

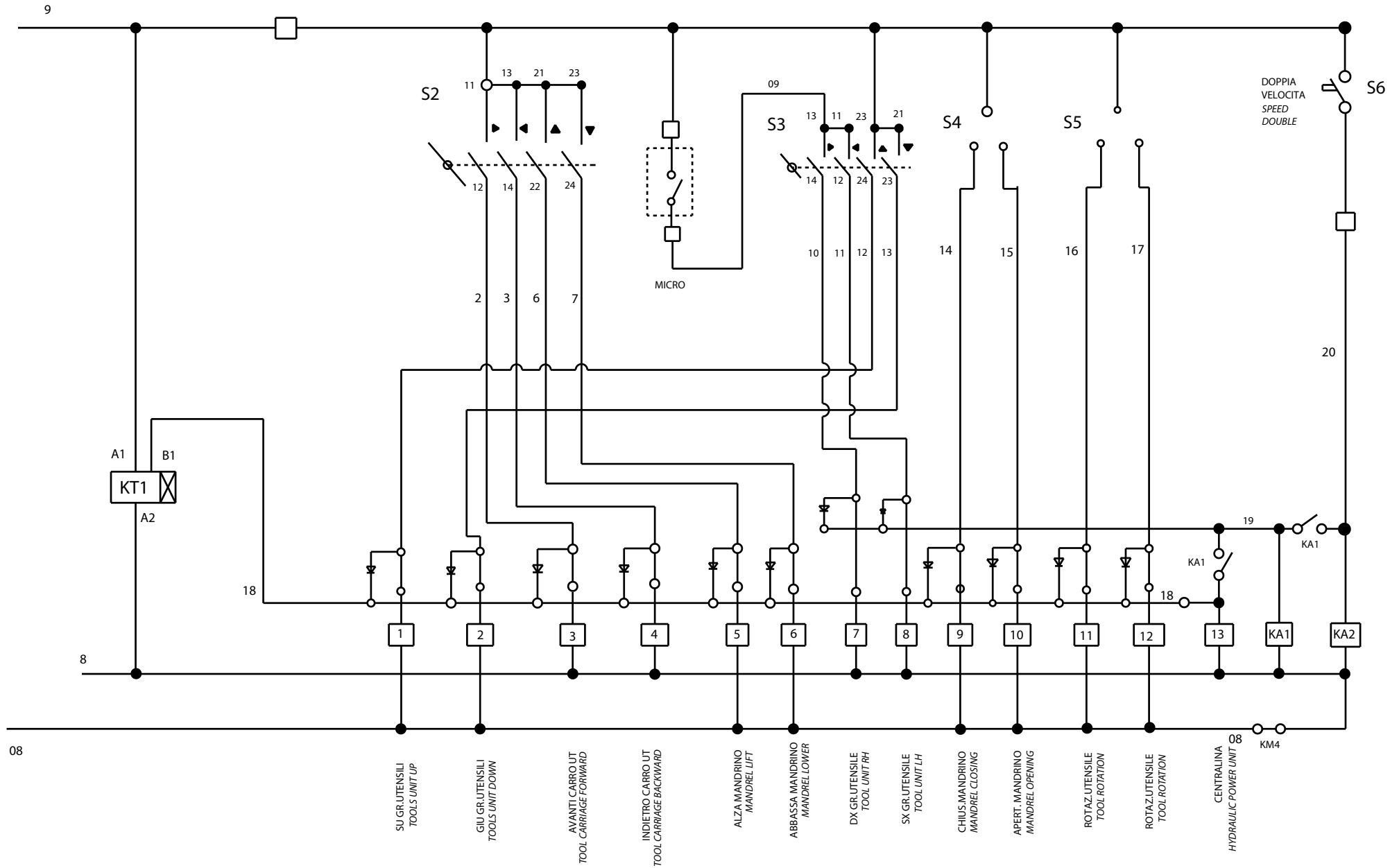


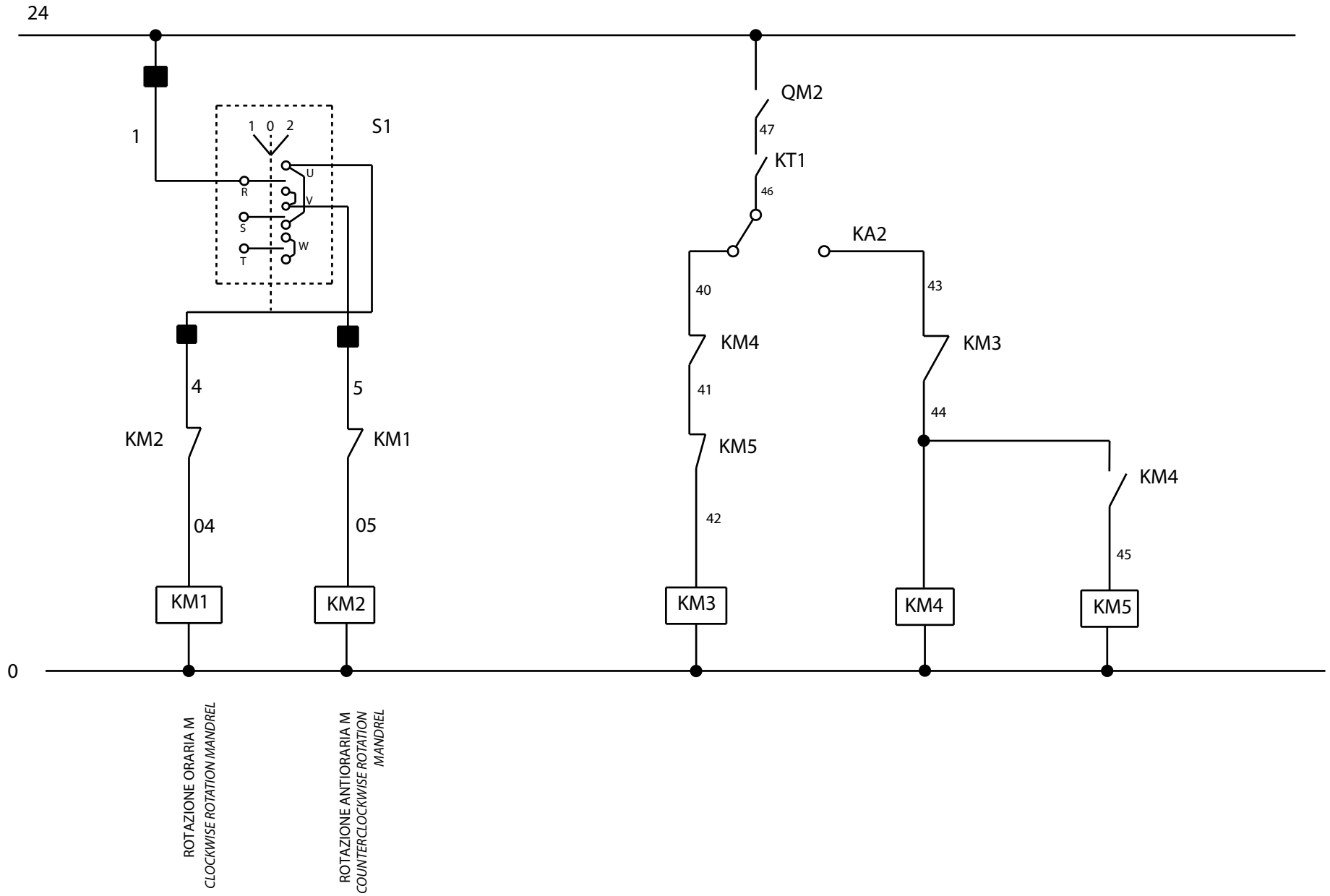
Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO 1/13 ELECTRICAL SCHEME 1/13 SCHALTPLAN 1/13 SCHEMA ELECTRIQUE 1/13 ESQUEMA ELECTRICO 1/13 (NAV51.15 - NAV51T.15)*	***Pag. 43 di 96***
	Tavola N°A - Rev. 1	**752205710**		**NAV51.15 NAV51T.15 NAV51.15N**

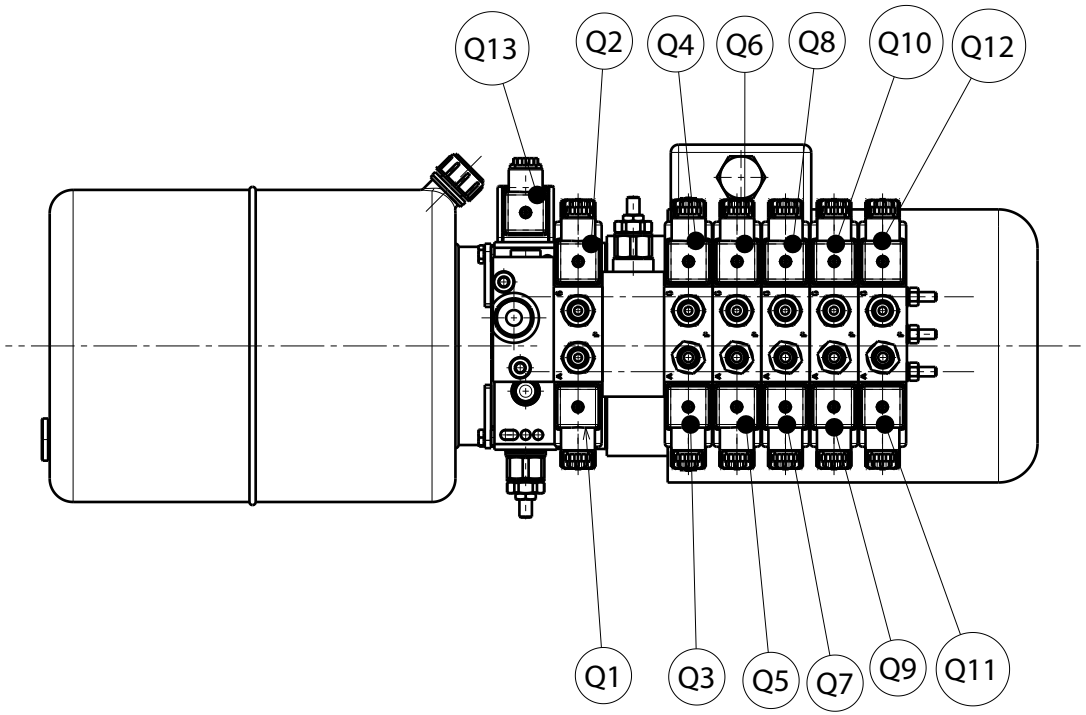


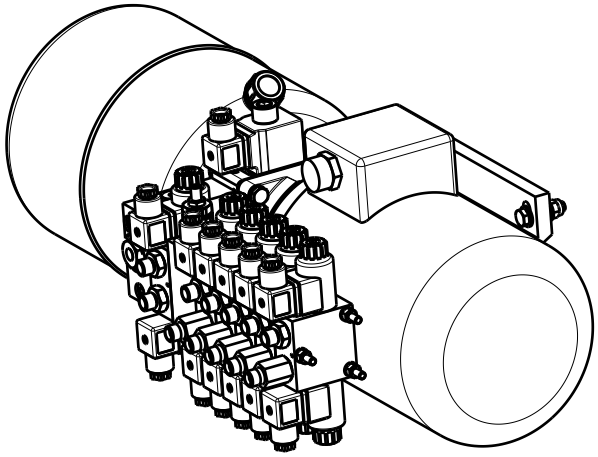
Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO 2/13 ELECTRICAL SCHEME 2/13 SCHALTPLAN 2/13 SCHEMA ELECTRIQUE 2/13 ESQUEMA ELECTRICO 2/13 (NAV51.15 - NAV51T.15)*	***Pag. 44 di 96***
	Tavola N°A - Rev. 1	**752205710**		**NAV51.15 NAV51T.15 NAV51.15N**

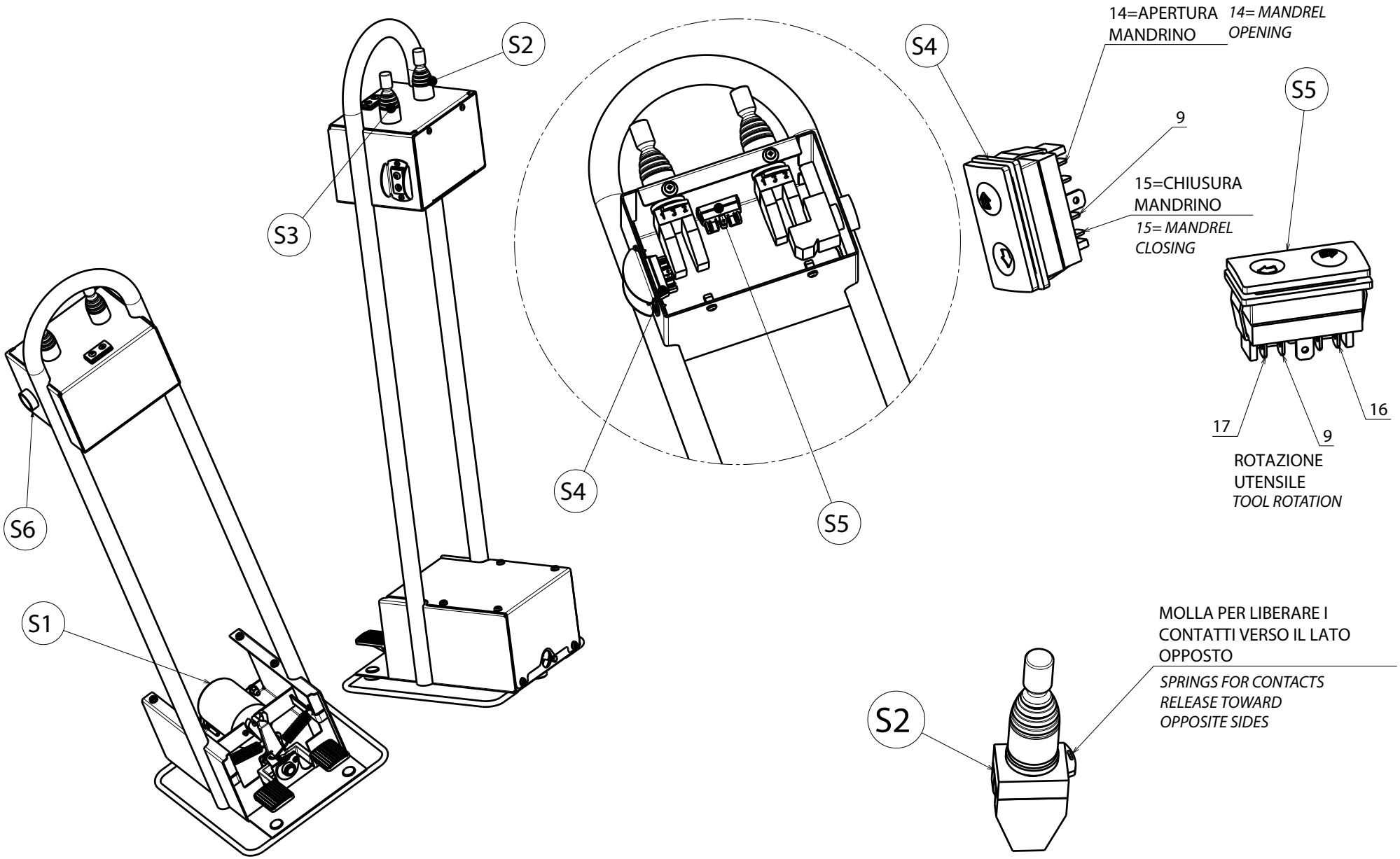
7522-M004-1_B


9
S2
11
13
21
23
12
14
22
24
MICRO
09
S3
13
11
23
21
14
12
24
23
10
11
12
13
S4
S5
S6
DOPPIA
VELOCITA
SPEED
DOUBLE
14
15
16
17
2
3
6
7
20
A1
B1
KT1
A2
18
19
KA1
KA1
18
1
2
3
4
5
6
7
8
9
10
11
12
13
KA1
KA2
8
08
KM4
08
SU GR.UTENSILI
TOOLS UNIT UP
GIU GR.UTENSILI
TOOLS UNIT DOWN
AVANTI CARRO UT
TOOL CARRIAGE FORWARD
INDIETRO CARRO UT
TOOL CARRIAGE BACKWARD
ALZA MANDRINO
MANDREL LIFT
ABBASSA MANDRINO
MANDREL LOWER
DX GR.UTENSILE
TOOL UNIT RH
SX GR.UTENSILE
TOOL UNIT LH
CHIUS.MANDRINO
MANDREL CLOSING
APERT. MANDRINO
MANDREL OPENING
ROTAZ.UTENSILE
TOOL ROTATION
ROTAZ.UTENSILE
TOOL ROTATION
CENTRALINA
HYDRAULIC POWER UNIT


24
1
1 0 2
S1
R
S
T
U
V
W
4
5
KM2
KM1
04
05
KM1
KM2
0
ROTAZIONE ORARIA M
CLOCKWISE ROTATION MANDREL
ROTAZIONE ANTIORARIA M
COUNTERCLOCKWISE ROTATION
MANDREL
QM2
47
KT1
46
40
KM4
41
KM5
42
KM3
KA2
43
KM3
44
KM4
45
KM5

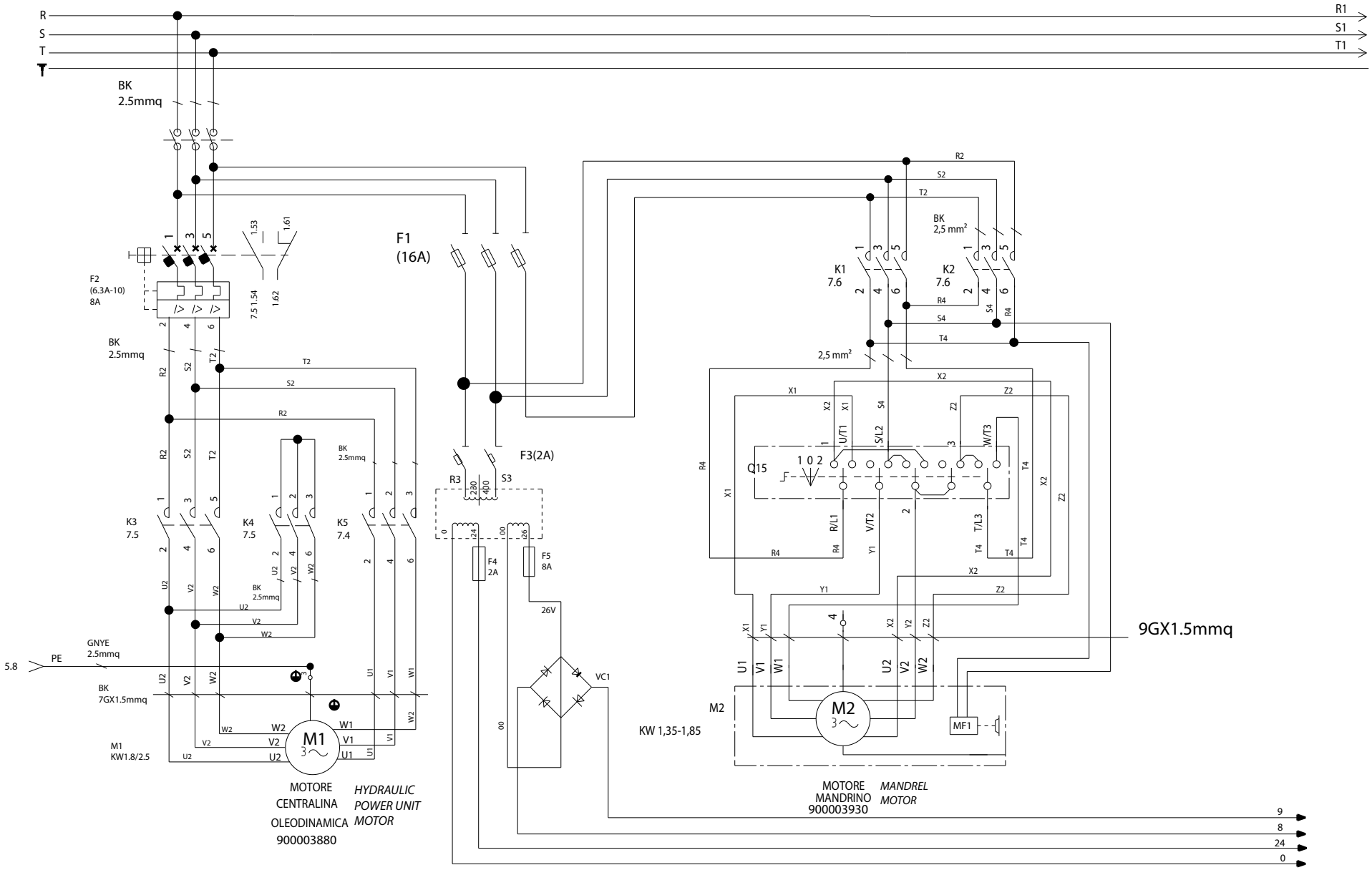

Q13
Q2
Q4
Q6
Q8
Q10
Q12
Q1
Q3
Q5
Q7
Q9
Q11




S1
S2
S3
S4
S5
S6
14=APERTURA MANDRINO
14= MANDREL OPENING
15=CHIUSURA MANDRINO
15= MANDREL CLOSING
9
16
17
ROTAZIONE UTENSILE
TOOL ROTATION
MOLLA PER LIBERARE I CONTATTI VERSO IL LATO OPPOSTO
SPRINGS FOR CONTACTS RELEASE TOWARD OPPOSITE SIDES

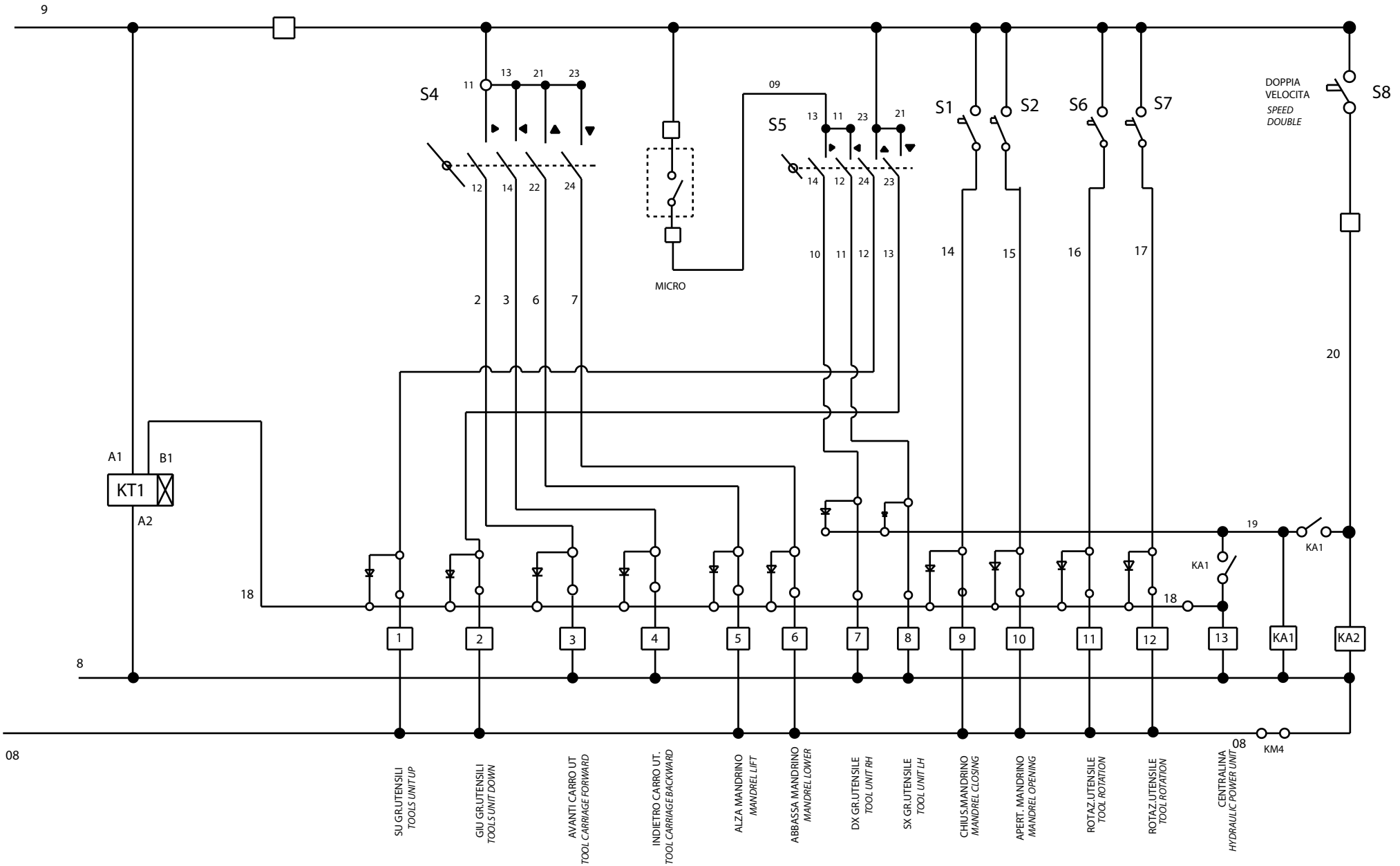
RIFERIMENTO	DESCRIZIONE	DATI TECNICI	CODICE	QUANTITA	RIFERIMENTO DOCUMENTO
	SEZIONATORE 16A 3 POLI	ART.SE163003B 16A 3P BL/POR	518223	1	
	MANOPOLA GIALLO/ROSSA GIOVENZ	a.012/0001-1 LUCCHETTO	518226	1	
KT1	TIMER RIT.DISECCIT.	TIMER RIT.DISECCIT. 12 240 AC DC	521104	1	
Q15	COMMUTATORE 20A	20A C0013.09.11	518189	1	
F1	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515035	1	
	FUSIBILE	10,3x38 16A 500V aM RITARDATO	507045	3	
F2	INTERRUTT.6-10A SLVAMOTORE	4-6.3A ART.GV2 ME14SCHNEIDER	518277	1	
				1	
F3-F4-F5	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V	515027	2	
	FUSIBILE	10,3X38 2A 500V RAPIDO	507019	4	
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K1M-K2M-K3M-K4M-K5M	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	5	
	CONTATTI AUSILIARI BFX 10 11 1N0 1NC		522147	1	
	MORSETTO 2.5mmq C/DIODO 1N4007		510218	12	
	MORSETTO A MOLLA 2 PIAN.1.5mmq		510217	13	
	MORSETTO G/V 4mmq ART.TEO.4 CABUR T0430 +PIASTR.TERM.TEO.4		510150 + 510209	3	
VC1	PONTE RADDRIZZATORE VC1	-	B1296200	1	
	CONDENSATORE C1-C2		B1296300	1	
	INS.CAVO ALIMENTAZIONE QUADRO			1	
	INS.CAVO MOTORE MANDRINO			1	
	INS.CAVO MOTORE CENTRALINA	-		1	
	INS.CAVO MANIPOLATORE			1	
	INS.CAVO ELETTROVALV.Q1-Q2-Q3-Q4-Q5-Q6-Q8-Q9-Q10-Q11-Q12-Q13			1 1 1 1 1 1 1	
KA1-KA2 + ZOCCOLO	RELE'A 2 CONTATTI + ZOCCOLO A 2 CONTATTI	8A 24VAC	557017 + 557018	2 + 2	
S2/S3	MANIPOLATORE	4 POS.+CENTR.TEMPORANEE Ø22	517157AS	2	5.7
S4/S5	PULSANTE BASCULANTE	-	517300	2	5.7
S6	PULSANTE DOPPIA VELOCITA'				
S1	INVERTITORE TRIPOLARE		518272	1	5.7
T1	TRASFORMATORE	100 VA	1296100	1	2.7
M1	MOTORE CENTRALINA	1,8/2,5KW 400V 50Hz 1400/2800rpm	900003880	1	3.7
M2	MOTORE MANDRINO	1,35/1,85KW 400V 50Hz B3G90L 1400/2800rpm AUTOFRENANTE CON FR.RA.	900003930	1	3.7

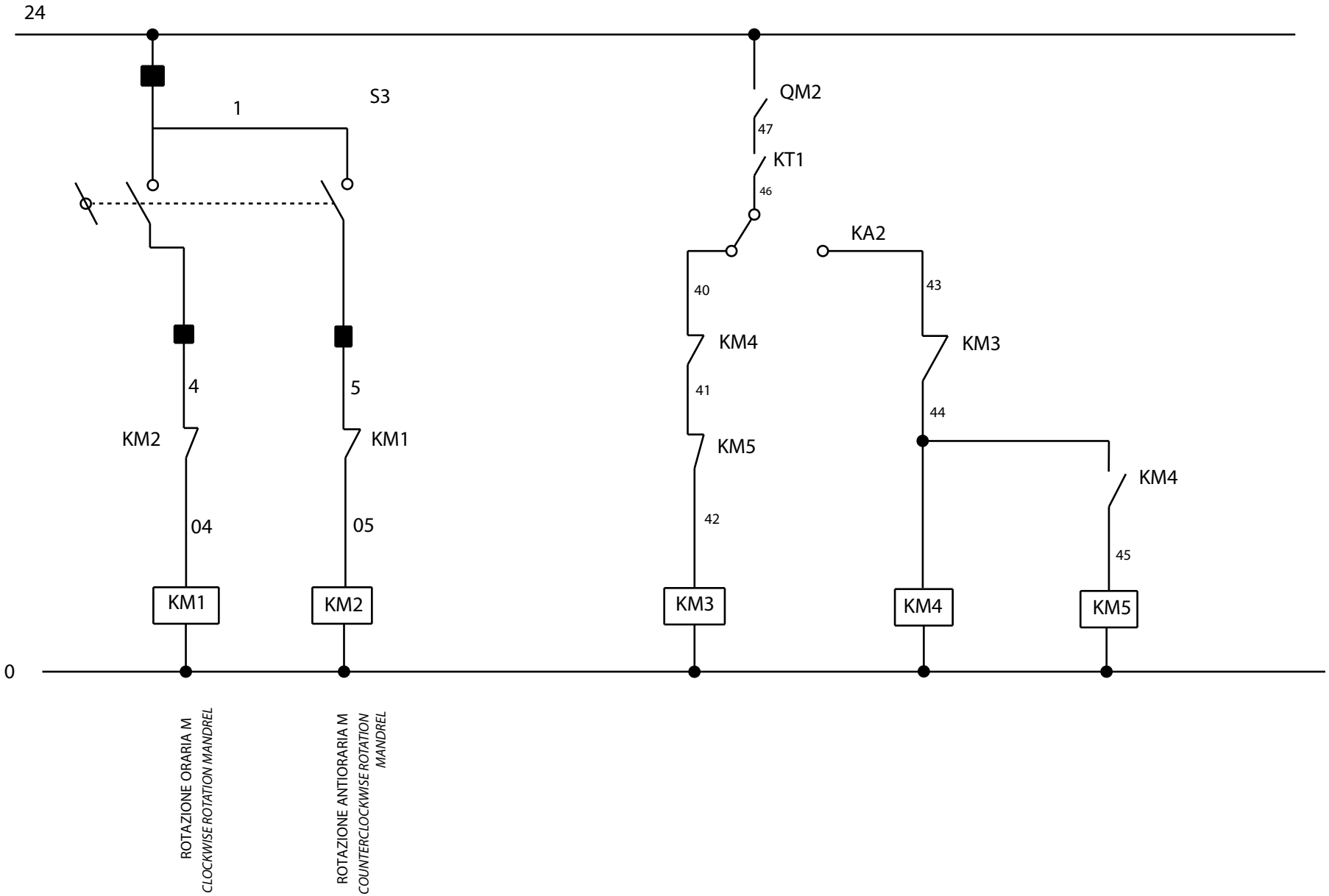
REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	CODE	QUANTITY	DOCUMENT REFERENCE
	16A 3 POLES CUT-OUT SWITCH	ART.SE163003B 16A 3P BL/POR	518223	1	
	GIOVENZ YELLOW/RED KNOB	a.012/0001-1 PADLOCK	518226	1	
KT1	TIMER	TIMER RIT.DISECCIT. 12 240 AC DC	521104	1	
Q15	20A COMMUTATOR	20A C0013.09.11	518189	1	
F1	FUSE HOLDER	10,3x38 32A 690V 3 POLES SECTIONABLE	515035	1	
	FUSE	10,3x38 16A 500V aM DELAYED	507045	3	
F2	6-10A OVERLOAD CUOUT SWITCH	4-6.3A ART.GV2 ME14SCHNEIDER	518277	1	
				1	
F3-F4-F5	FUSE HOLDER	10,3x38 32A 690V 2 POLES SECTIONABLE	515027	2	
	FUSE	10,3X38 2A 500V RAPID	507019	4	
Q1,Q2,Q3,Q4, Q5,Q6,Q13				7	
K1M-K2M-K3M-K4M-K5M	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	5	
	BFX 10 11 1N0 1NC AUXILIARY CONTACTS		522147	1	
	2.5mmq C/DIODO CLAMP 1N4007		510218	12	
	SPRING CLAMP 2 PIAN.1.5mmq		510217	13	
	CLAMP G/V 4mmq ART.TEO.4 CABUR T0430 + TOOL PLATE TEO.4		510150 + 510209	3	
VC1	RECTIFIER BRIDGE VC1	-	B1296200	1	
	CONDENSER C1-C2		B1296300	1	
	SQUARE FEEDING CABLE ASSEMBLY			1	
	CHUCK UNIT MOTOR CABLE ASSEMBLY			1	
	HYDR.POWER UNIT MOTOR CABLE ASSEMBLY	-		1	
	HANDLE CABLE ASSEMBLY			1	
	Q1-Q2- Q3-Q4-Q5-Q6-Q8-Q9-Q10-Q11- Q12-Q13 SOLENOID VALVE CABLE ASSEMBLY			1 1 1 1 1 1 1	
KA1-KA2 + ZOCCOLO	RELAY 2 CONTACTS + 2 CONTACTS SOCKET	8A 24VAC	557017 + 557018	2 + 2	
S2/S3	HANDLE	4 POS.+CENTRAL TEMPORARY Ø22	517157AS	2	5.7
S4/S5	PUSHBUTTON	-	517300	2	5.7
S6	DOUBLE SPEED PUSHBUTTON				
S1	THREE-POLE INVERTER		518272	1	5.7
T1	TRANSFORMER	100 VA	1296100	1	2.7
M1	HYDRAULIC POWER UNIT MOTOR	1,8/2,5KW 400V 50Hz 1400/2800rpm	900003880	1	3.7
M2	CHUCK MOTOR	1,35/1,85KW 400V 50Hz B3G90L 1400/2800rpm SELF BRAKING	900003930	1	3.7

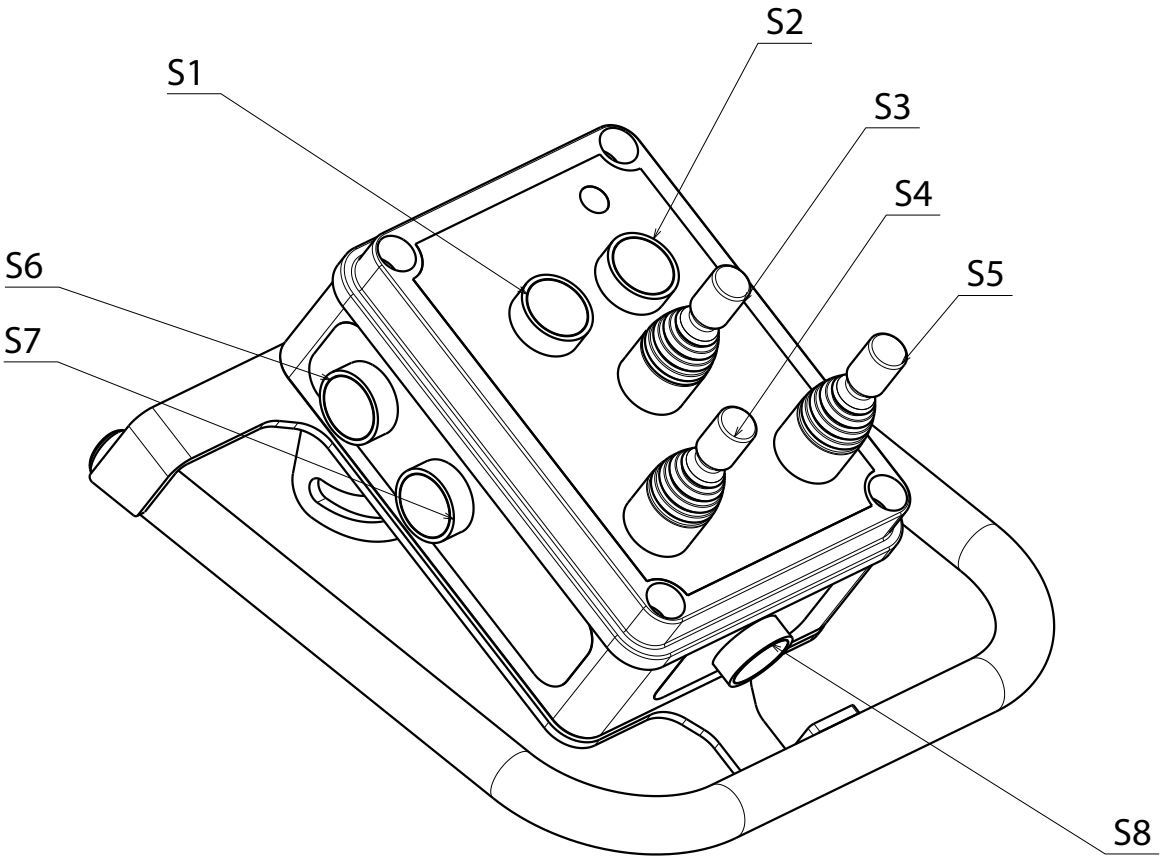


Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO 9/13 ELECTRICAL SCHEME 9/13 SCHALTPLAN 9/13 SCHEMA ELECTRIQUE 9/13 ESQUEMA ELECTRICO 9/13 (NAV51.15 - NAV51T.15)*	***Pag. 51 di 96***
	Tavola N°A - Rev. 1	**752205710**		**NAV51.15 NAV51T.15 NAV51.15N**

7522-M004-1_B


9
S4
11
13
21
23
12
14
22
24
MICRO
09
S5
13
11
23
21
14
12
24
23
10
11
12
13
S1
S2
S6
S7
S8
DOPPIA
VELOCITA
SPEED
DOUBLE
14
15
16
17
2
3
6
7
20
A1
B1
KT1
A2
18
19
KA1
KA1
18
1
2
3
4
5
6
7
8
9
10
11
12
13
KA1
KA2
8
08
08
KM4
SU GR.UTENSILI
TOOLS UNIT UP
GIU GR.UTENSILI
TOOLS UNIT DOWN
AVANTI CARRO UT
TOOL CARRIAGE FORWARD
INDIETRO CARRO UT.
TOOL CARRIAGE BACKWARD
ALZA MANDRINO
MANDREL LIFT
ABBASSA MANDRINO
MANDREL LOWER
DX GR.UTENSILE
TOOL UNIT RH
SX GR.UTENSILE
TOOL UNIT LH
CHIUS.MANDRINO
MANDREL CLOSING
APERT. MANDRINO
MANDREL OPENING
ROTAZ.UTENSILE
TOOL ROTATION
ROTAZ.UTENSILE
TOOL ROTATION
CENTRALINA
HYDRAULIC POWER UNIT


24
1
S3
QM2
47
KT1
46
KA2
40
43
KM4
KM3
41
44
KM5
KM4
42
45
4
5
KM2
KM1
04
05
KM1
KM2
KM3
KM4
KM5
0
ROTAZIONE ORARIA M
CLOCKWISE ROTATION MANDREL
ROTAZIONE ANTIORARIA M
COUNTERCLOCKWISE ROTATION MANDREL

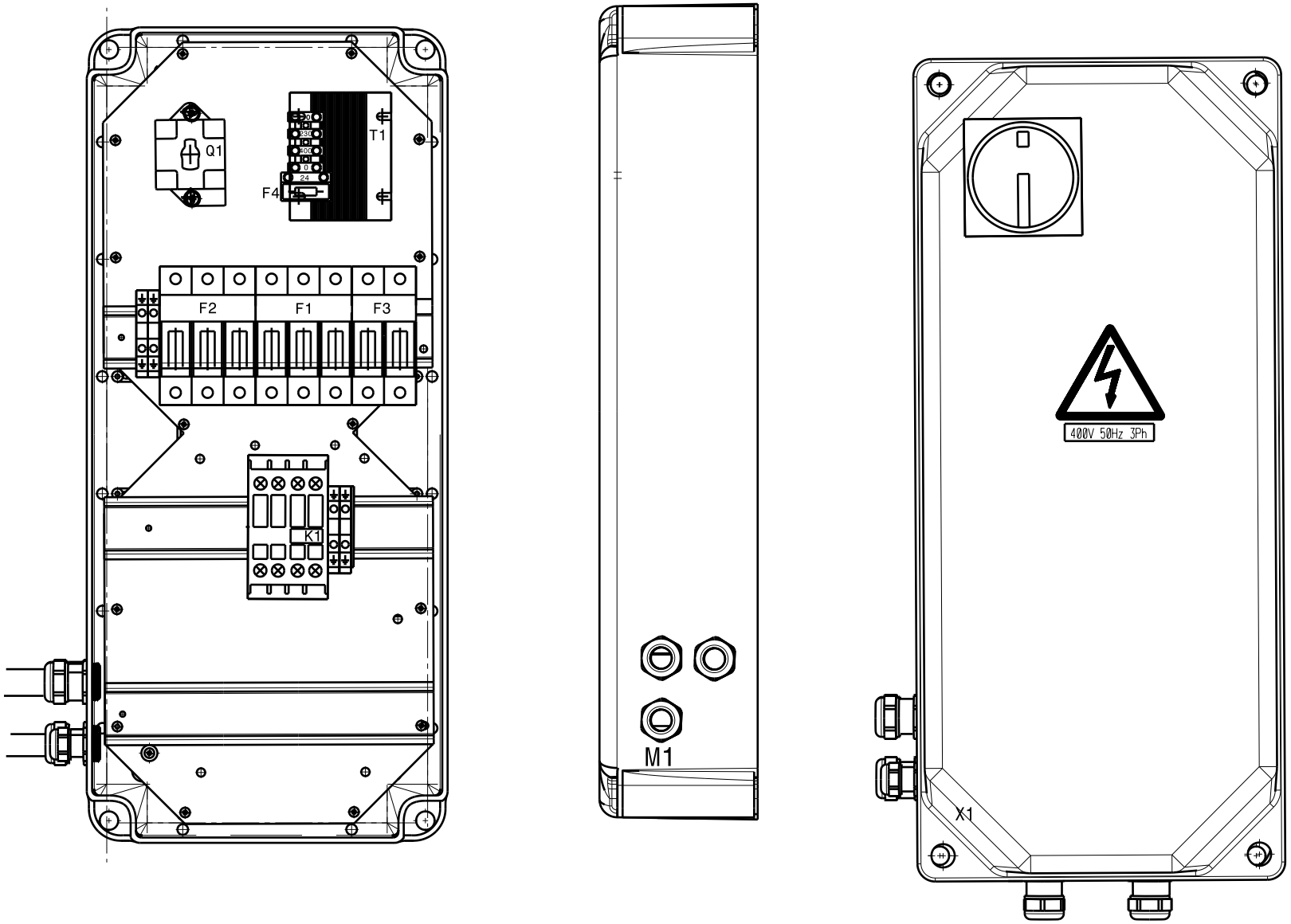

S1
S2
S3
S4
S5
S6
S7
S8

INCOLLARE LA LINGUETTA DEL
MANIPOLATORE ALL'INTERNO
DELLA SCATOLA DELLA COLONNETTA

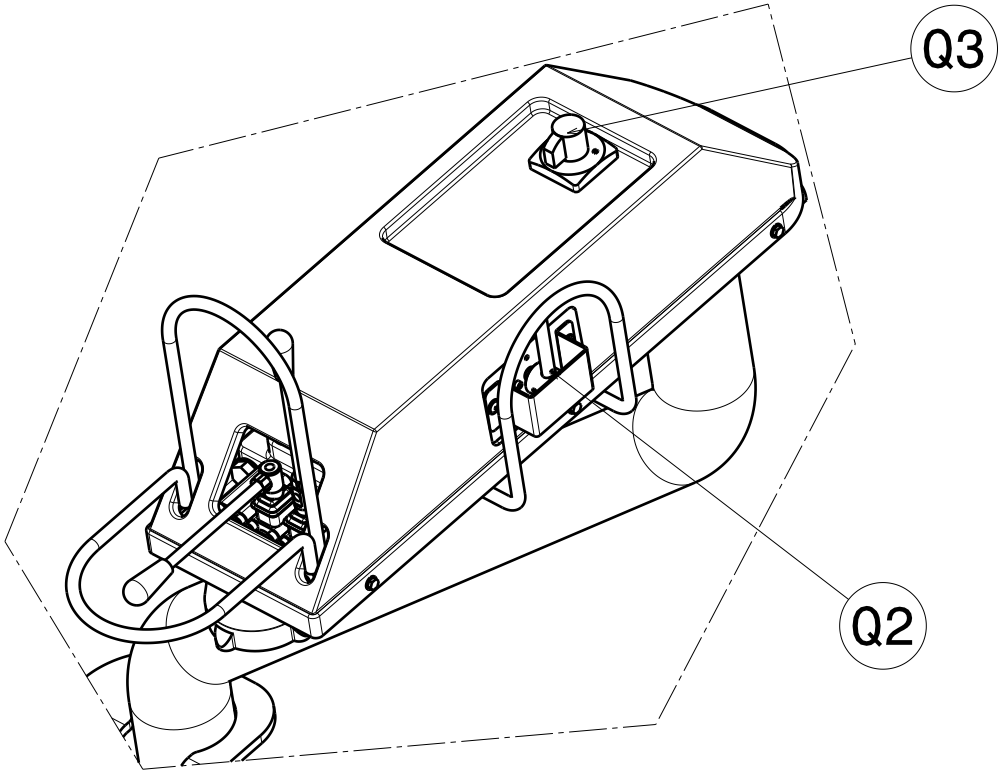
STICK THE HANDLE TANG INSIDE
THE COLUMN BOX

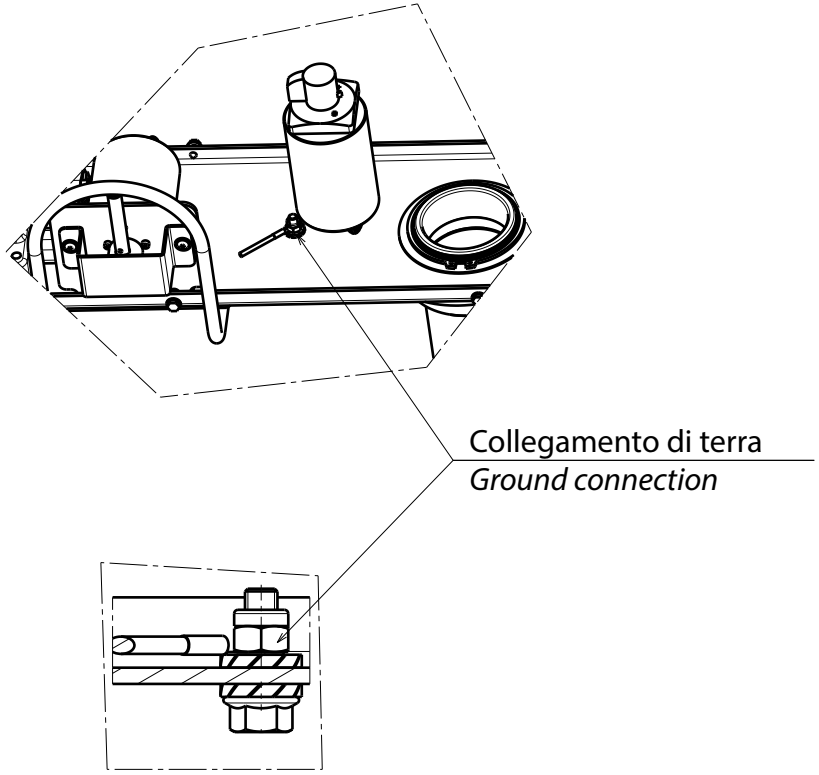
N.B.PER EVITARE CHE SI POSSANO SCOLLEGARE I CONTATTI
NEL CASO LA COLONNETTA COMANDI SUBISCA DEGLI URTI
INCOLLARE I CONTATTI AL MANIPOLATORE CON COLLA A CALDO

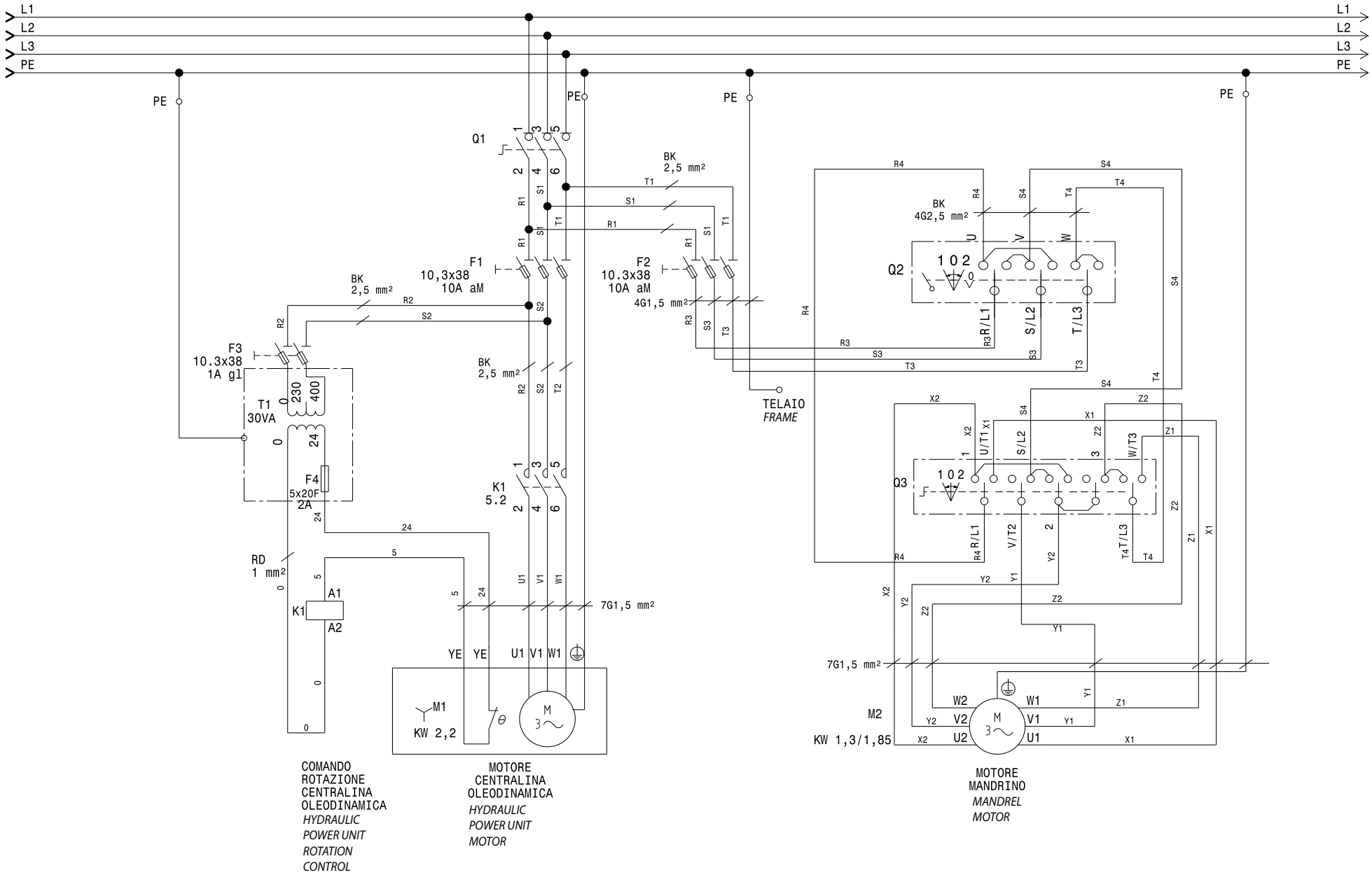
N.B. TO AVOID THE CONTACTS DISCONNECTION
IN CASE OF COLLISIONS WITH THE CONTROLS STUD,
STICK THE CONTACTS ON THE HANDLE WITH HOT GLUE



Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO 1/4 ELECTRICAL SCHEME 1/4 SCHALTPLAN 1/4 SCHEMA ELECTRIQUE 1/4 ESQUEMA ELECTRICO 1/4 (NAV51.15N)*	***Pag. 56 di 96***
	Tavola N°B - Rev. 0	**752205520**		**NAV51.15 NAV51T.15 NAV51.15N**


Q3
Q2


Collegamento di terra
Ground connection

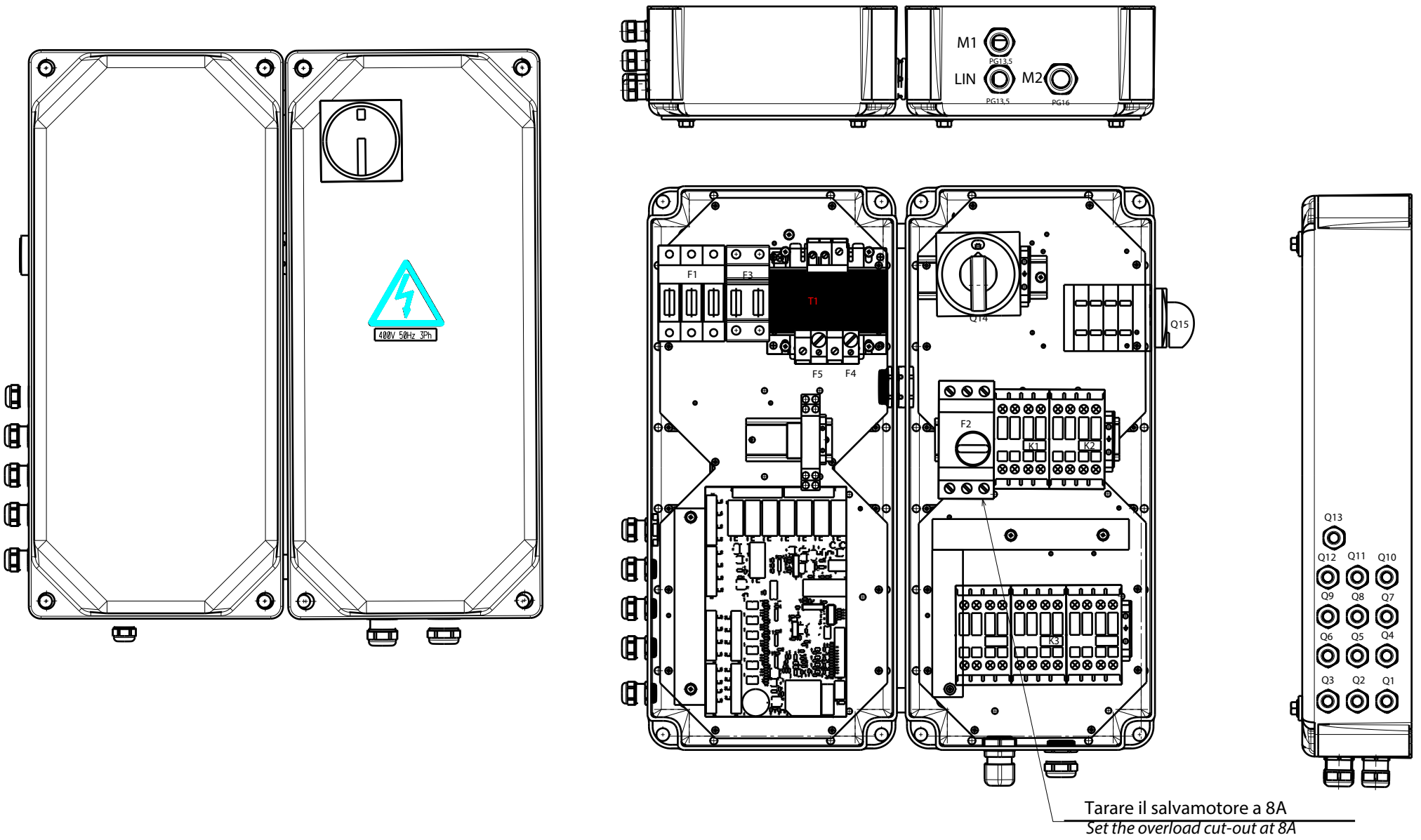

L1
L2
L3
PE
Q1
F1
10,3x38
10A aM
F2
10.3x38
10A aM
F3
10.3x38
1A gl
T1
30VA
230
400
F4
5x20F
2A
K1
5.2
RD
1 mm²
A1
K1
A2
BK
2,5 mm²
BK
4G2,5 mm²
4G1,5 mm²
7G1,5 mm²
M1
KW 2,2
M2
KW 1,3/1,85
Q2
Q3
TELAIO
FRAME
COMANDO
ROTAZIONE
CENTRALINA
OLEODINAMICA
HYDRAULIC
POWER UNIT
ROTATION
CONTROL
MOTORE
CENTRALINA
OLEODINAMICA
HYDRAULIC
POWER UNIT
MOTOR
MOTORE
MANDRINO
MANDREL
MOTOR

LISTA COMPONENTI

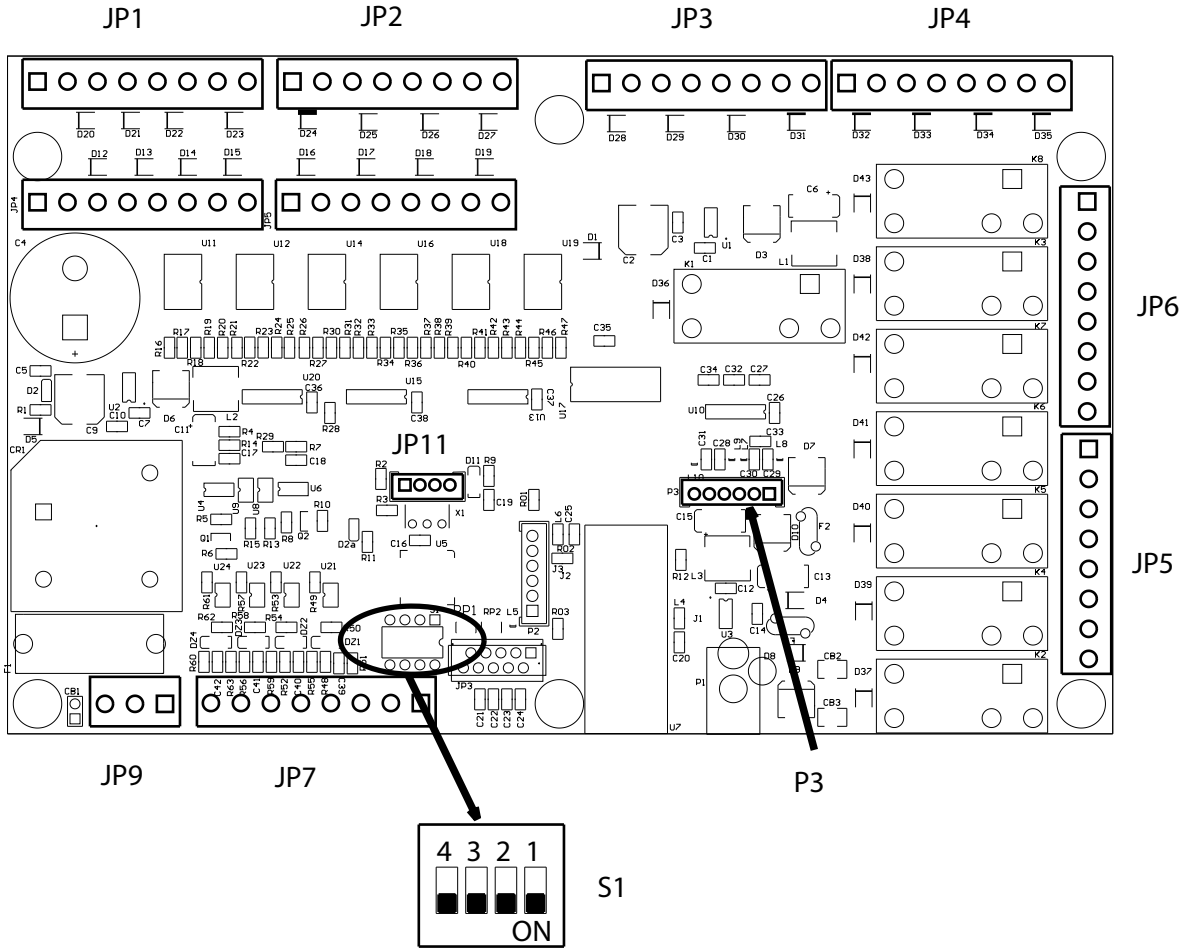
RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
F1	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515025	1	4.4
	FUSIBILE	10,3x38 10A 500V aM	507094	3	
F2	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515025	1	4.5
	FUSIBILE	10,3x38 10A 500V aM	507094	3	
F3	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V	515027	1	4.3
	FUSIBILE	gl 10,3X38 1A 500V RAPIDO	507095	2	
F4	FUSIBILE	5x20F 250V 2A RAPIDO	507043	1	4.3
K1	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522108	1	4.4
Q1	SEZIONATORE TRIPOLARE	Ith 32A Ui 690V-50Hz Uimp 4KW	518141	1	4.4
Q3	COMMUTATORE DI POLI DAHLANDER	25A 500V	518189	1	4.6-4.7
Q2	COMMUTATORE	Ith 25A Ui 690V-50Hz Uimp 4KW	518227	1	4.6-4.7
T1	TRASFORMATORE	30 VA 50/60 Hz PRI: 0/230/400V SEC: 0/24V 1,25A	121KP0331	1	4.3
M1	MOTORE CENTRALINA	2,2KW 230/400V 50HZ 10,2/59A cosØ=0,73/0,70 1300 rpm	**900003830**	1	4.3-4.4
M2	MOTORE MANDRINO	1,3/1,85KW 400V 50Hz 4/5,3A cosØ=0,80/0,84 1400/2800rpm	900003930	1	4.6-4.7

COMPONENT LIST

REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT REFERENCE
F1	FUSE HOLDER	10,3x38 32A 690V SECTIONABLE 3 POLES	515025	1	4.4
	FUSE	10,3x38 10A 500V aM	507094	3	
F2	FUSE HOLDER	10,3x38 32A 690V SECTIONABLE 3 POLES	515025	1	4.5
	FUSE	10,3x38 10A 500V aM	507094	3	
F3	FUSE HOLDER	10,3x38 32A 690V SECTIONABLE 2 POLES	515027	1	4.3
	FUSE	gl10,3x38 1A 500V RAPID	507095	2	
F4	FUSE	5x20F 250V 2A RAPID	507043	1	4.3
K1	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522108	1	4.4
Q1	TRIPOLAR KNIFE SWITCH	Ith 32A Ui 690V-50Hz Uimp 4KW	518141	1	4.4
Q3	DAHLANDER POLES COMMUTATOR	25A 500V	518189	1	4.6-4.7
Q2	COMMUTATOR	Ith 25A Ui 690V-50Hz Uimp 4KW	518227	1	4.6-4.7
T1	TRANSFORMER	30 VA 50/60 Hz PRI: 0/230/400V SEC: 0/24V 1,25A	121KP0331	1	4.3
M1	HYDRAULIC POWER UNIT MOTOR	2,2KW 230/400V 50HZ 10,2/59A cosØ=0,73/0,70 1300 rpm	**900003830**	1	4.3-4.4
M2	MANDREL MOTOR	1,3/1,85KW 400V 50Hz 4/5,3A cosØ=0,80/0,84 1400/2800rpm	900003930	1	4.6-4.7


400V 50Hz 3Ph
M1
PG13.5
LIN
M2
PG13.5
PG16
F1
F3
T1
F5
F4
Q14
Q15
F2
K1
K2
K3
Q13
Q12
Q11
Q10
Q9
Q8
Q7
Q6
Q5
Q4
Q3
Q2
Q1
Tarare il salvamotore a 8A
Set the overload cut-out at 8A

TOPOGRAFICO SCHEDA RICEVENTE 18962
RECEIVING CARD 18962 TOPOGRAPHIC VIEW



IN/OUT SCHEDA RICEVENTE 18962

PIN JP1	NUMERO	FUNZIONE
1	JP1-1	Q1 INDIETRO UTENSILE SU CARRO
2	JP1-2	0V per Q1
3	JP1-3	Q2 AVANTI UTENSILE SU CARRO
4	JP1-4	0V per Q2
5	JP1-5	Q3 AVANTI CARRO UTENSILE
6	JP1-6	0V per Q3
7	JP1-7	Q4 INDIETRO CARRO UTENSILE
8	JP1-8	0V per Q4

PIN JP2	NUMERO	FUNZIONE
1	JP2-1	Q5 CHIUSURA MANDRINO
2	JP2-2	0V per Q5
3	JP2-3	Q6 APERTURA MANDRINO
4	JP2-4	0V per Q6
5	JP2-5	Q7 DISCESA BRACCIO MANDRINO
6	JP2-6	0V per Q7
7	JP2-7	Q8 SALITA BRACCIO MANDRINO
8	JP2-8	0V per Q8

PIN JP3	NUMERO	FUNZIONE
1	JP3-1	Q9 ROTAZIONE ANTIOR. UTENSILE
2	JP3-2	0V per Q9
3	JP3-3	Q10 ROTAZIONE ORARIA UTENSILE
4	JP3-4	0V per Q10
5	JP3-5	Q11 DISCESA BRACCIO UTENSILE
6	JP3-6	0V per Q11
7	JP3-7	Q12 SALITA BRACCIO UTENSILE
8	JP3-8	0V pe Q12

PIN JP4	NUMERO	FUNZIONE
1	JP4-1	Q13 RICIRCOLO OLIO
2	JP4-2	0V per Q13
3	JP4-3	N.U.
4	JP4-4	N.U.
5	JP4-5	N.U.
6	JP4-6	N.U.
7	JP4-7	N.U.
8	JP4-8	N.U.

PIN JP5	NUMERO	FUNZIONE
1	JP5-1	N.U.
2	JP5-2	N.U.
3	JP5-3	0 Vac
4	JP5-4	COLLEGATO A JP5-5
5	JP5-5	COLLEGATO A JP5-4 E JPE-6
6	JP5-6	KM3 COMANDO ROTAZ. CENTRALINA E COLLEGATO A JP5-5
7	JP5-7	KM2 COMANDO ROTAZ. ORARIA MANDRINO
8	JP5-8	KM1 COMANDO ROTAZ. ANTIORARIA MANDRINO

PIN JP7	NUMERO	FUNZIONE
1	JP7-1	COLLEGATO A JP7-2
2	JP7-2	COLLEGATO A JP7-1
3	JP7-3	N.U.
4	JP7-4	N.U.
5	JP7-5	N.U.
6	JP7-6	N.U.
7	JP7-7	N.U.
8	JP7-8	N.U.

PIN JP9	NUMERO	FUNZIONE
1	JP9-1	0 Vac
2	JP9-2	N.U.
3	JP9-3	19 Vac

RECEIVING CARD 18962 IN/OUT

PIN JP1	NUMBER	FUNCTION
1	JP1-1	Q1 TOOL ON CARRIAGE BACKWARD
2	JP1-2	OV for Q1
3	JP1-3	Q2 TOOL ON CARRIAGE FORWARD
4	JP1-4	OV for Q2
5	JP1-5	Q3 TOOL CARRIAGE FORWARD
6	JP1-6	OV for Q3
7	JP1-7	Q4 TOOL CARRIAGE BACKWARD
8	JP1-8	OV for Q4

PIN JP2	NUMBER	FUNCTION
1	JP2-1	Q5 MANDREL CLOSING
2	JP2-2	OV for Q5
3	JP2-3	Q6 MANDREL OPENING
4	JP2-4	OV for Q6
5	JP2-5	Q7 MANDREL ARM DESCENT
6	JP2-6	OV for Q7
7	JP2-7	Q8 MANDREL ARM RISE
8	JP2-8	OV for Q8

PIN JP3	NUMBER	FUNCTION
1	JP3-1	Q9 TOOL COUNTERCLOCKWISE ROT.
2	JP3-2	OV for Q9
3	JP3-3	Q10 TOOL CLOCKWISE ROTATION
4	JP3-4	OV for Q10
5	JP3-5	Q11 TOOL ARM DESCENT
6	JP3-6	OV for Q11
7	JP3-7	Q12 TOOL ARM RISE
8	JP3-8	OV for Q12

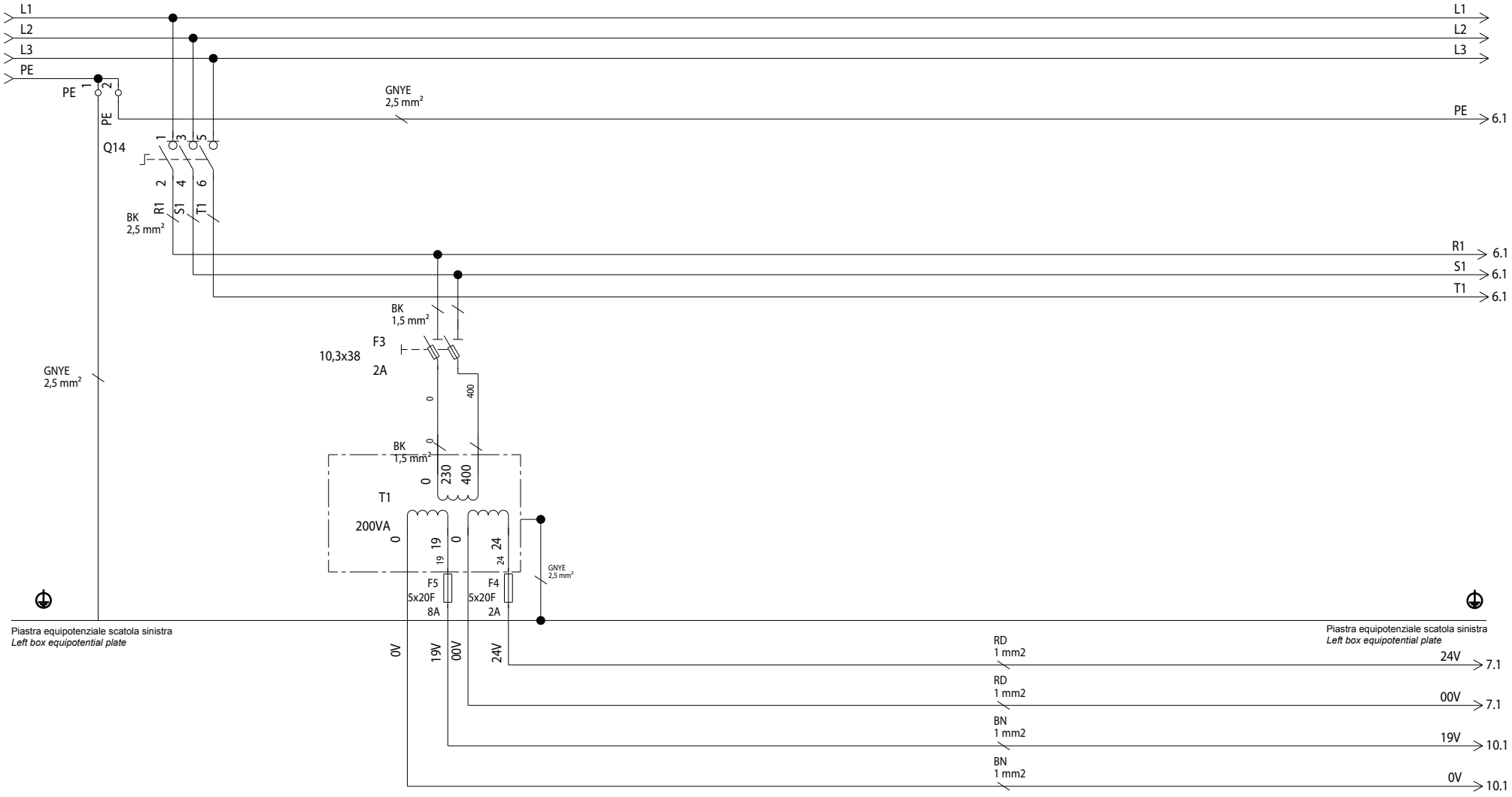
PIN JP4	NUMBER	FUNCTION
1	JP4-1	Q13 OIL RECIRCULATION
2	JP4-2	OV for Q13
3	JP4-3	N.U.
4	JP4-4	N.U.
5	JP4-5	N.U.
6	JP4-6	N.U.
7	JP4-7	N.U.
8	JP4-8	N.U.

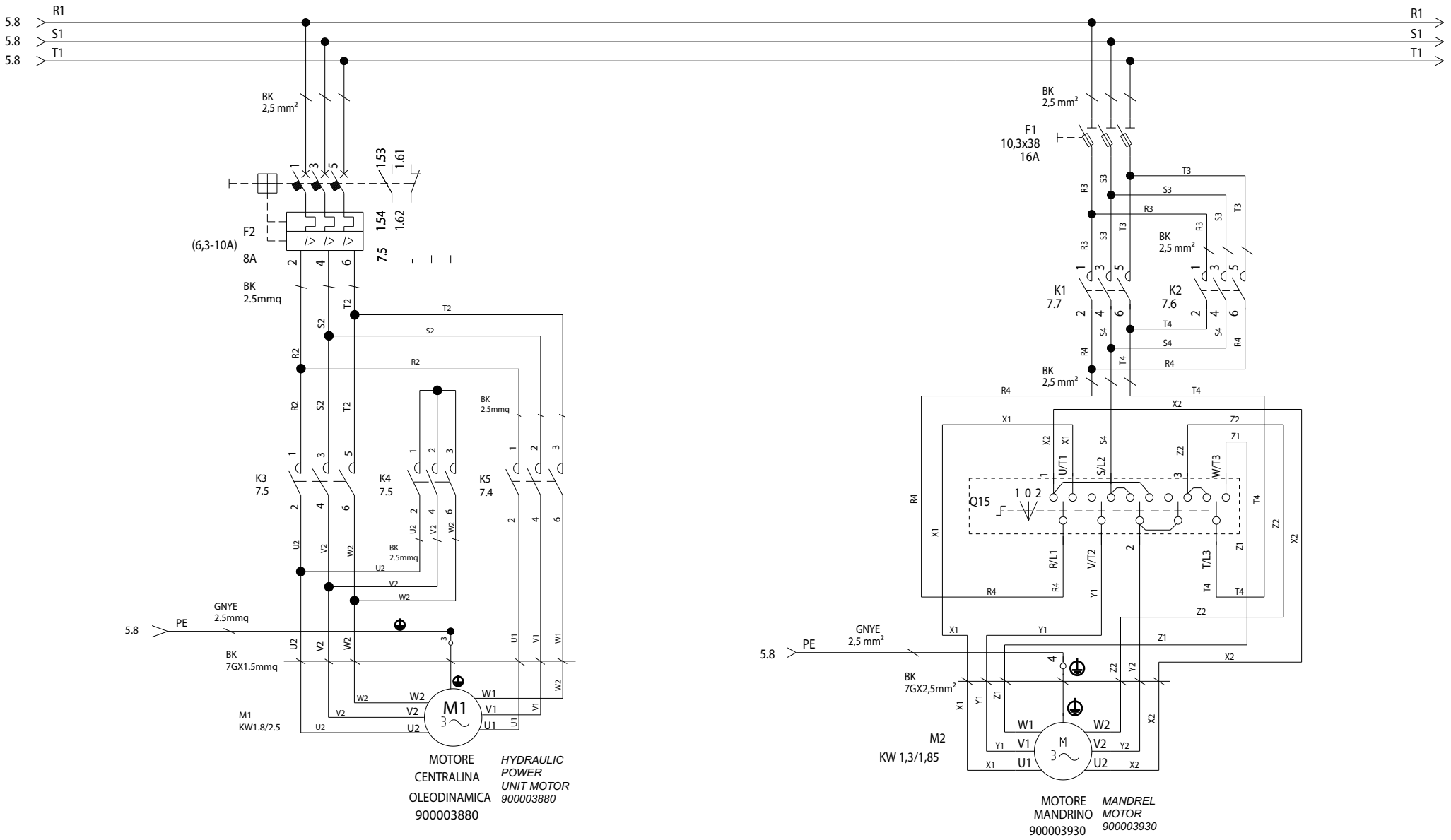
PIN JP5	NUMBER	FUNCTION
1	JP5-1	N.U.
2	JP5-2	N.U.
3	JP5-3	0 Vac
4	JP5-4	CONNECTED TO JP5-5
5	JP5-5	CONNECTED TO JP5-4 AND JPE-6
6	JP5-6	KM3 HYDRAULIC POWER UNIT ROT. CONTROL AND CONNECTED TO JP5-5
7	JP5-7	KM2 MANDREL CLOCKWISE ROTATION CONTROL
8	JP5-8	KM1 MANDREL COUNTERCLOCKWISE ROT. CONTROL

PIN JP7	NUMBER	FUNCTION
1	JP7-1	CONNECTED TO JP7-2
2	JP7-2	CONNECTED TO JP7-1
3	JP7-3	N.U.
4	JP7-4	N.U.
5	JP7-5	N.U.
6	JP7-6	N.U.
7	JP7-7	N.U.
8	JP7-8	N.U.

PIN JP9	NUMBER	FUNCTION
1	JP9-1	0 Vac
2	JP9-2	N.U.
3	JP9-3	19 Vac

SCHEMA CIRCUITI QUADRO ELETTRICO (RICEVITORE)
ELECTRICAL PANEL (RECEIVER) CIRCUITS DIAGRAM





Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO (VARIANTE CON BLUETOOTH) 6/19 ELECTRICAL SCHEME (VERSION WITH BLUETOOTH) 6/19 SCHALTPLAN (VERSION MIT BLUETOOTH) 6/19 SCHEMA ELECTRIQUE (VERSION AVEC BLUETOOTH) 6/19 ESQUEMA ELECTRICO (VERSIÓN CON BLUETOOTH) 6/19*	***Pag. 65 di 96***
	Tavola N°C - Rev. 1	**752205740**		**NAV51.15 NAV51T.15 NAV51.15N**

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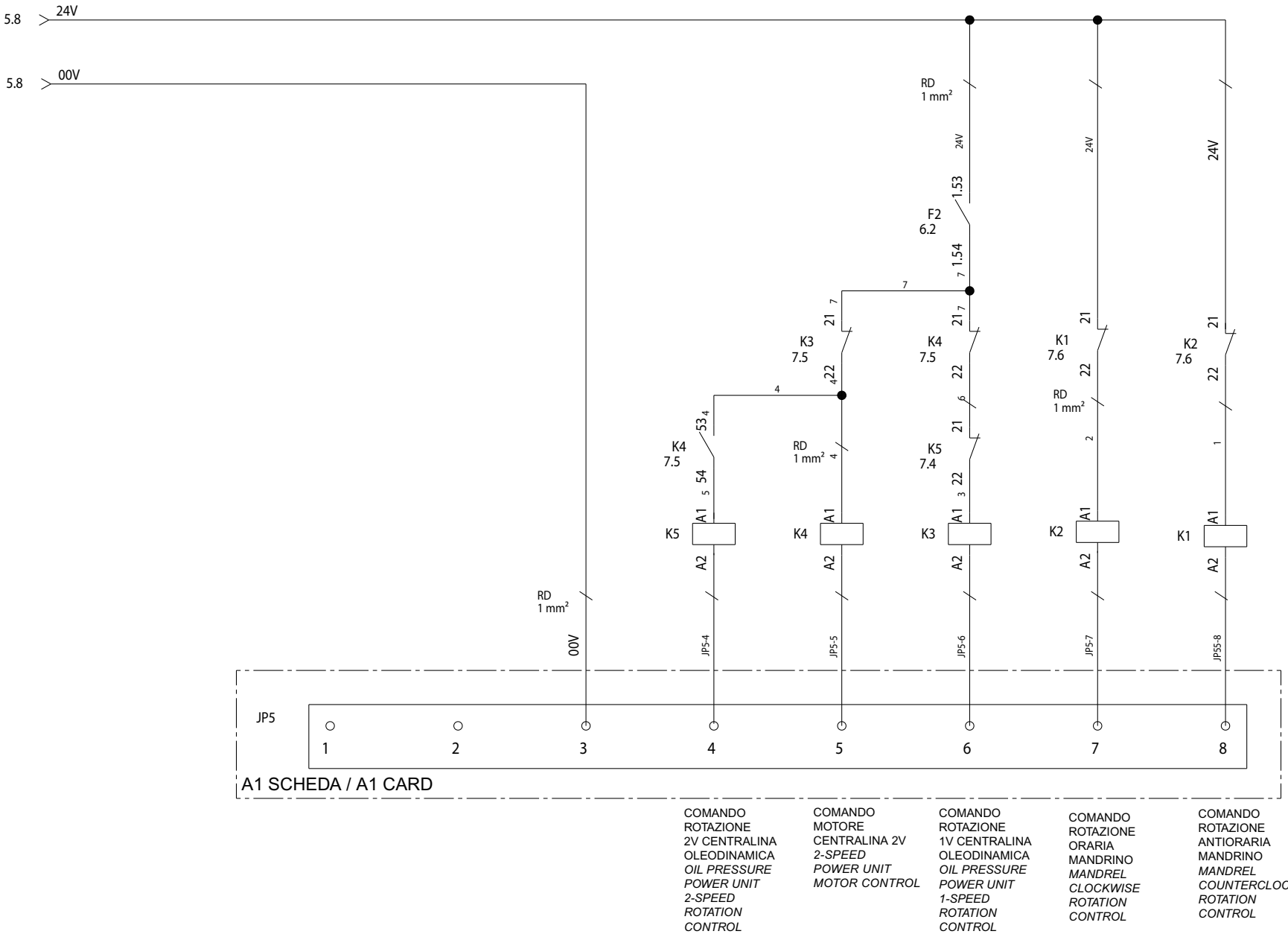
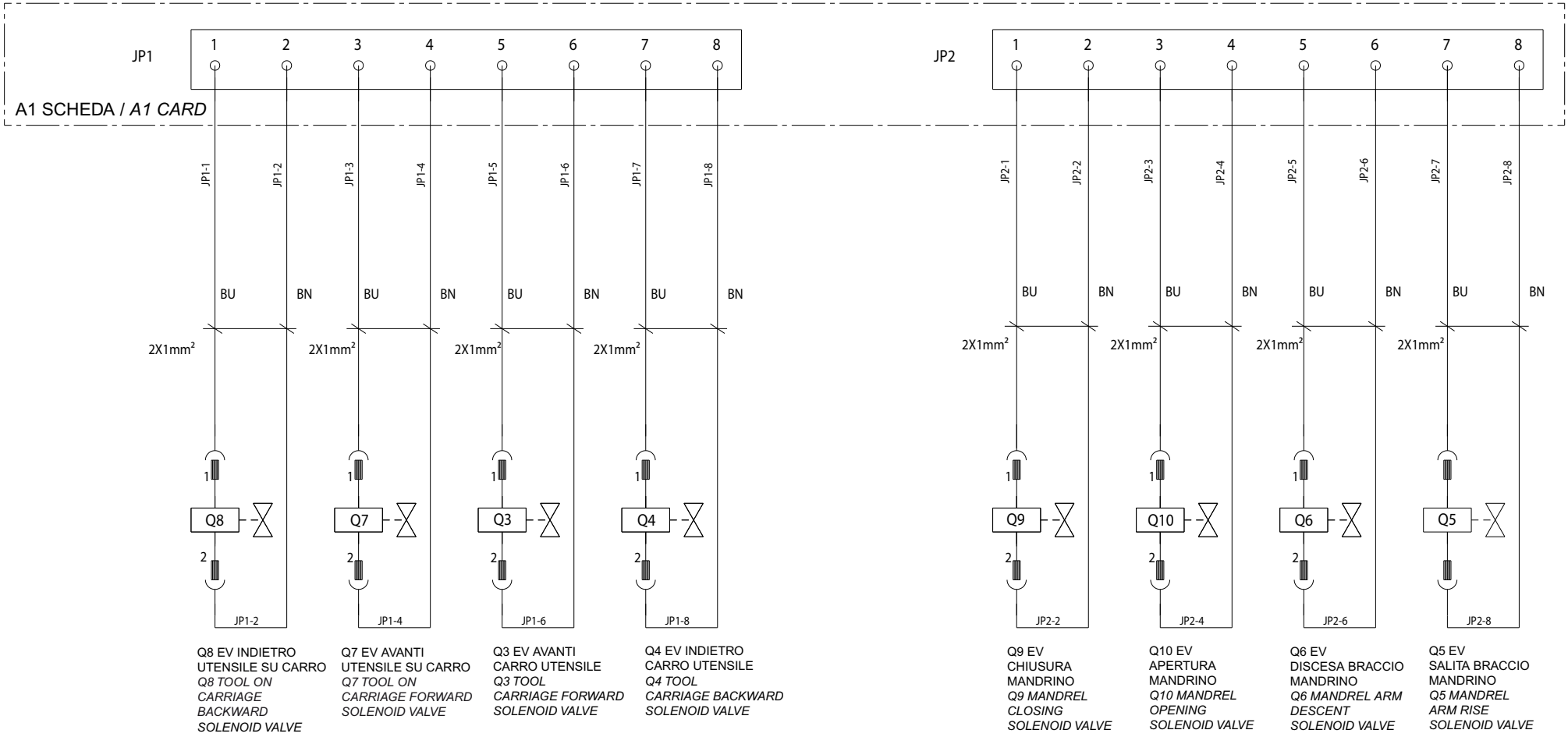
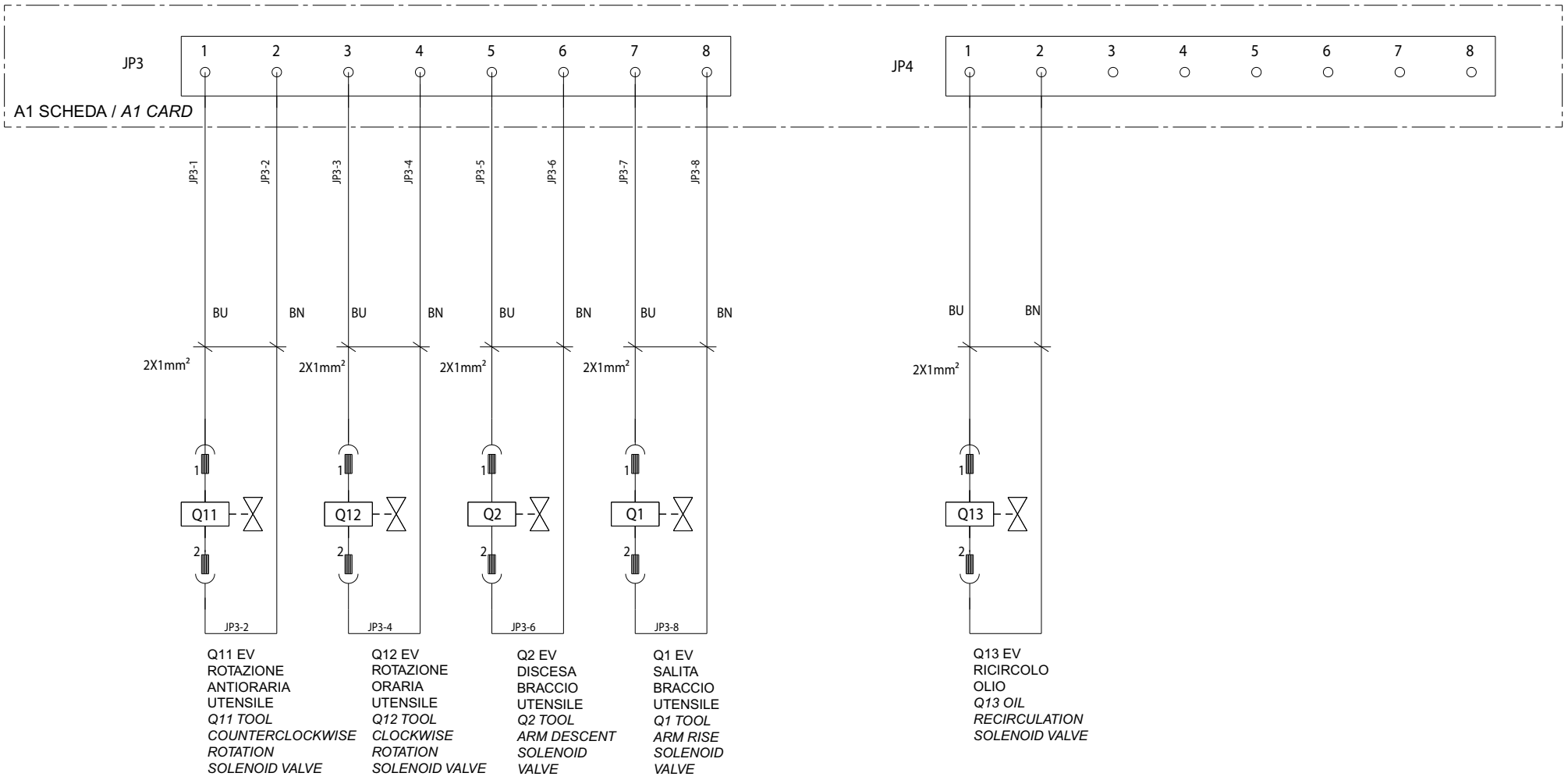
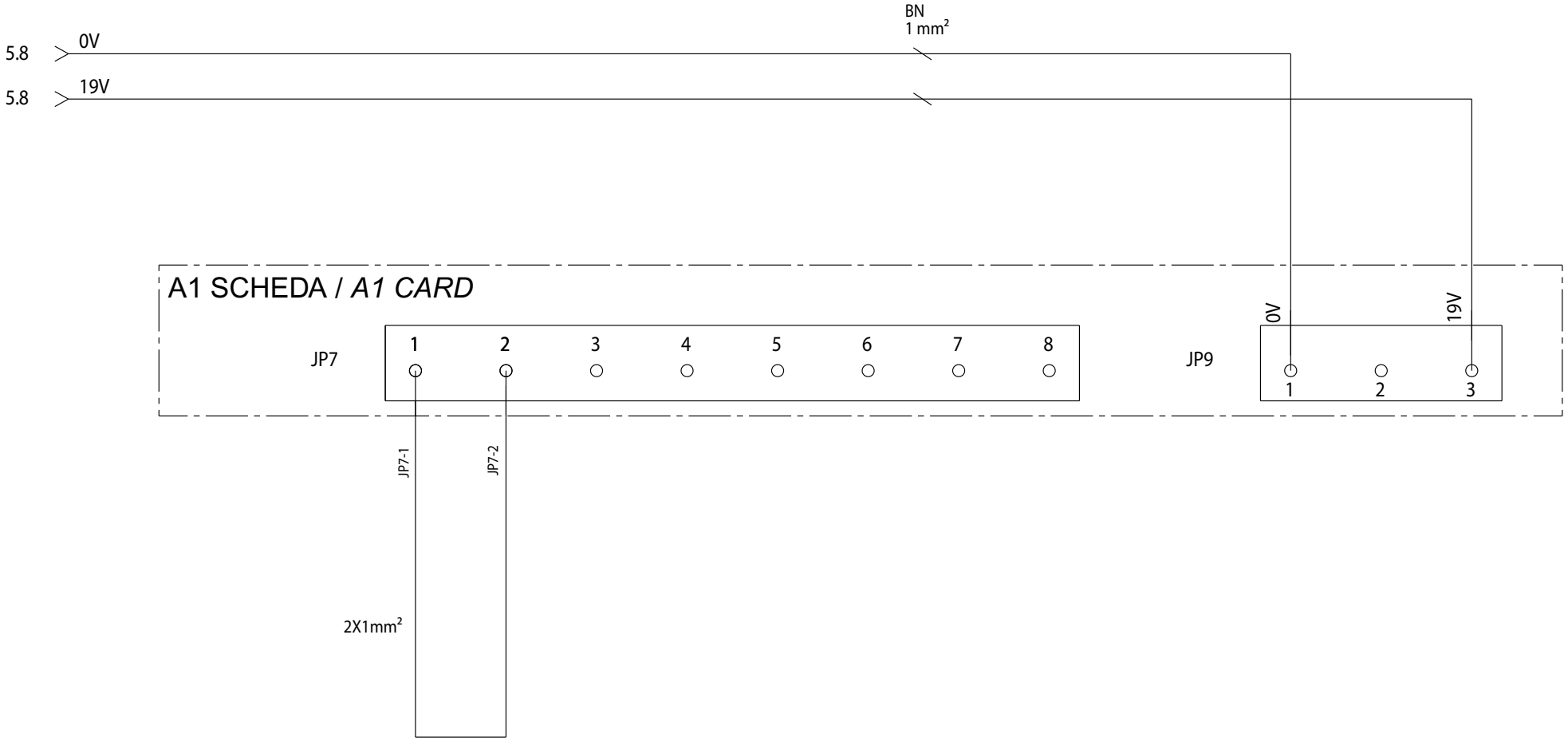
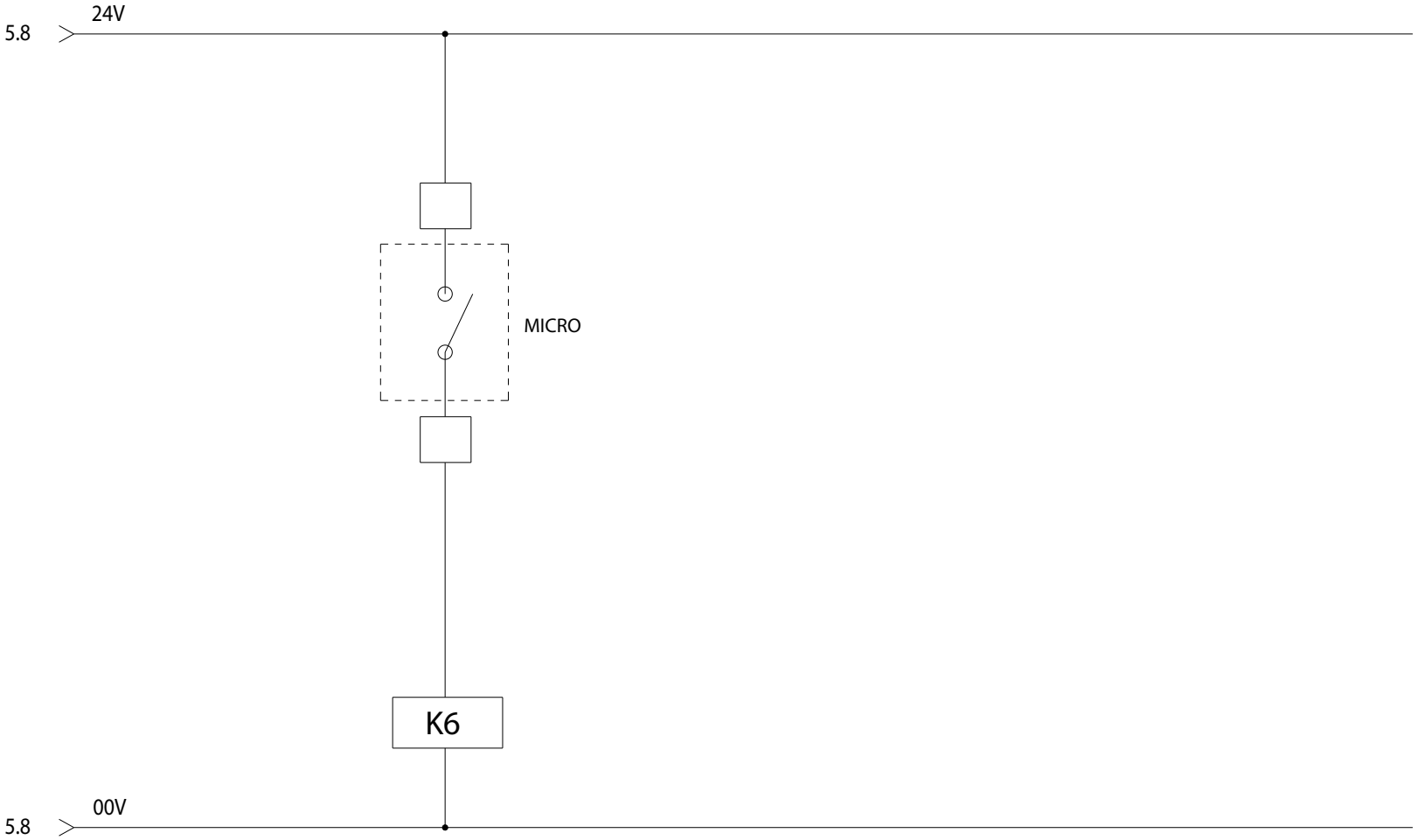
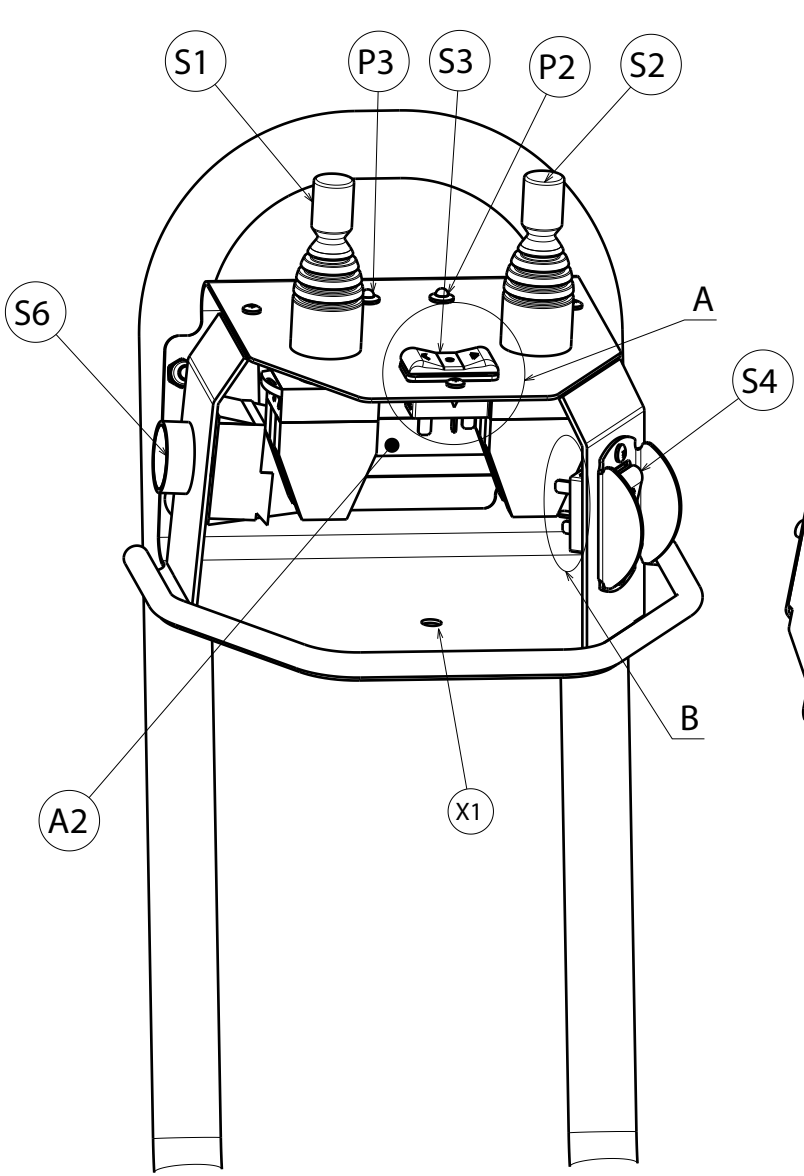

5.8
24V
5.8
00V
RD
1 mm²
F2
6.2
1.53
1.54
K3
7.5
K4
7.5
K1
7.6
K2
7.6
K5
7.4
K4
7.5
RD
1 mm²
RD
1 mm²
RD
1 mm²
RD
1 mm²
00V
JP5-4
JP5-5
JP5-6
JP5-7
JP5-8
JP5
1
2
3
4
5
6
7
8
A1 SCHEDA / A1 CARD
COMANDO ROTAZIONE 2V CENTRALINA OLEODINAMICA
OIL PRESSURE POWER UNIT 2-SPEED ROTATION CONTROL
COMANDO MOTORE CENTRALINA 2V
2-SPEED POWER UNIT MOTOR CONTROL
COMANDO ROTAZIONE 1V CENTRALINA OLEODINAMICA
OIL PRESSURE POWER UNIT 1-SPEED ROTATION CONTROL
COMANDO ROTAZIONE ORARIA MANDRINO
MANDREL CLOCKWISE ROTATION CONTROL
COMANDO ROTAZIONE ANTIORARIA MANDRINO
MANDREL COUNTERCLOCKWISE ROTATION CONTROL

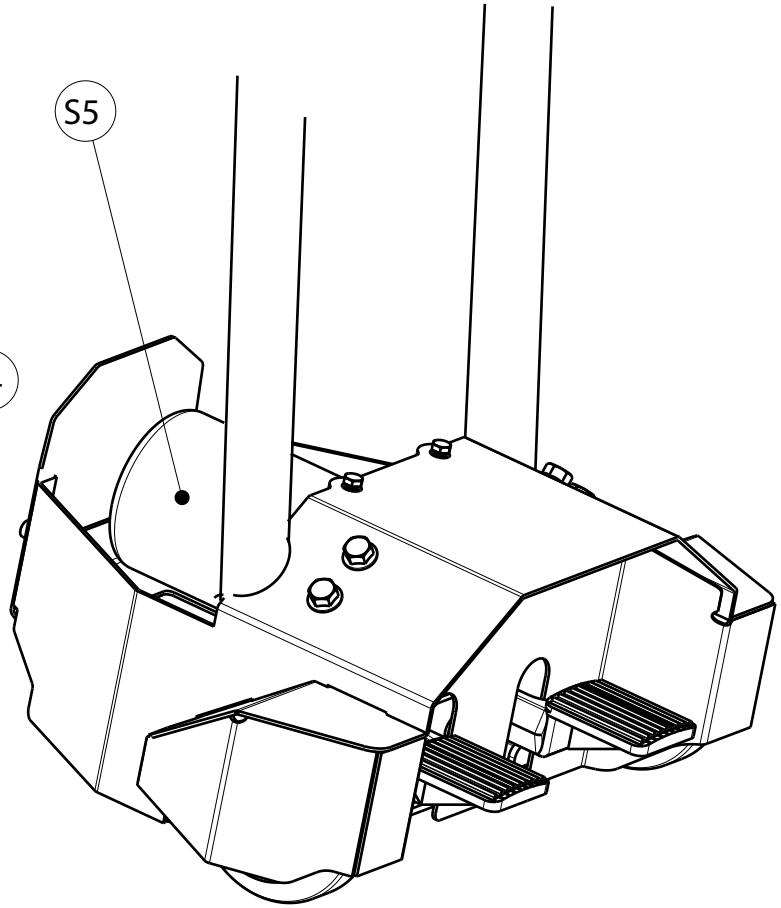

A1 SCHEDA / A1 CARD
JP1
1 2 3 4 5 6 7 8
JP1-1 JP1-2 JP1-3 JP1-4 JP1-5 JP1-6 JP1-7 JP1-8
BU BN BU BN BU BN BU BN
2X1mm²
Q8
Q7
Q3
Q4
JP1-2 JP1-4 JP1-6 JP1-8
Q8 EV INDIETRO UTENSILE SU CARRO
Q8 TOOL ON CARRIAGE BACKWARD SOLENOID VALVE
Q7 EV AVANTI UTENSILE SU CARRO
Q7 TOOL ON CARRIAGE FORWARD SOLENOID VALVE
Q3 EV AVANTI CARRO UTENSILE
Q3 TOOL CARRIAGE FORWARD SOLENOID VALVE
Q4 EV INDIETRO CARRO UTENSILE
Q4 TOOL CARRIAGE BACKWARD SOLENOID VALVE
JP2
1 2 3 4 5 6 7 8
JP2-1 JP2-2 JP2-3 JP2-4 JP2-5 JP2-6 JP2-7 JP2-8
BU BN BU BN BU BN BU BN
2X1mm²
Q9
Q10
Q6
Q5
JP2-2 JP2-4 JP2-6 JP2-8
Q9 EV CHIUSURA MANDRINO
Q9 MANDREL CLOSING SOLENOID VALVE
Q10 EV APERTURA MANDRINO
Q10 MANDREL OPENING SOLENOID VALVE
Q6 EV DISCESA BRACCIO MANDRINO
Q6 MANDREL ARM DESCENT SOLENOID VALVE
Q5 EV SALITA BRACCIO MANDRINO
Q5 MANDREL ARM RISE SOLENOID VALVE

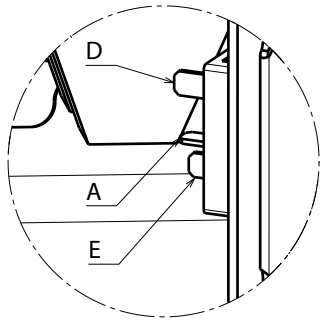

JP3
1 2 3 4 5 6 7 8
JP4
1 2 3 4 5 6 7 8
A1 SCHEDA / A1 CARD
JP3-1 JP3-2 JP3-3 JP3-4 JP3-5 JP3-6 JP3-7 JP3-8
BU BN BU BN BU BN BU BN
BU BN
2X1mm²
Q11
Q12
Q2
Q1
Q13
JP3-2 JP3-4 JP3-6 JP3-8
Q11 EV ROTAZIONE ANTIORARIA UTENSILE
Q11 TOOL COUNTERCLOCKWISE ROTATION SOLENOID VALVE
Q12 EV ROTAZIONE ORARIA UTENSILE
Q12 TOOL CLOCKWISE ROTATION SOLENOID VALVE
Q2 EV DISCESA BRACCIO UTENSILE
Q2 TOOL ARM DESCENT SOLENOID VALVE
Q1 EV SALITA BRACCIO UTENSILE
Q1 TOOL ARM RISE SOLENOID VALVE
Q13 EV RICIRCOLO OLIO
Q13 OIL RECIRCULATION SOLENOID VALVE


BN
1 mm²
5.8
0V
5.8
19V
A1 SCHEDA / A1 CARD
JP7
1
2
3
4
5
6
7
8
JP9
0V
19V
1
2
3
JP7-1
JP7-2
2X1mm²

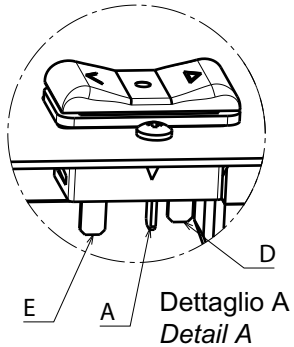

24V
5.8
MICRO
K6
00V
5.8



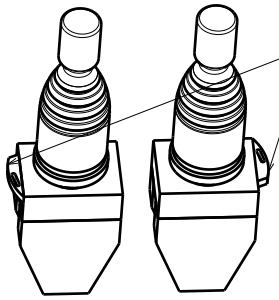




Dettaglio B
Detail B



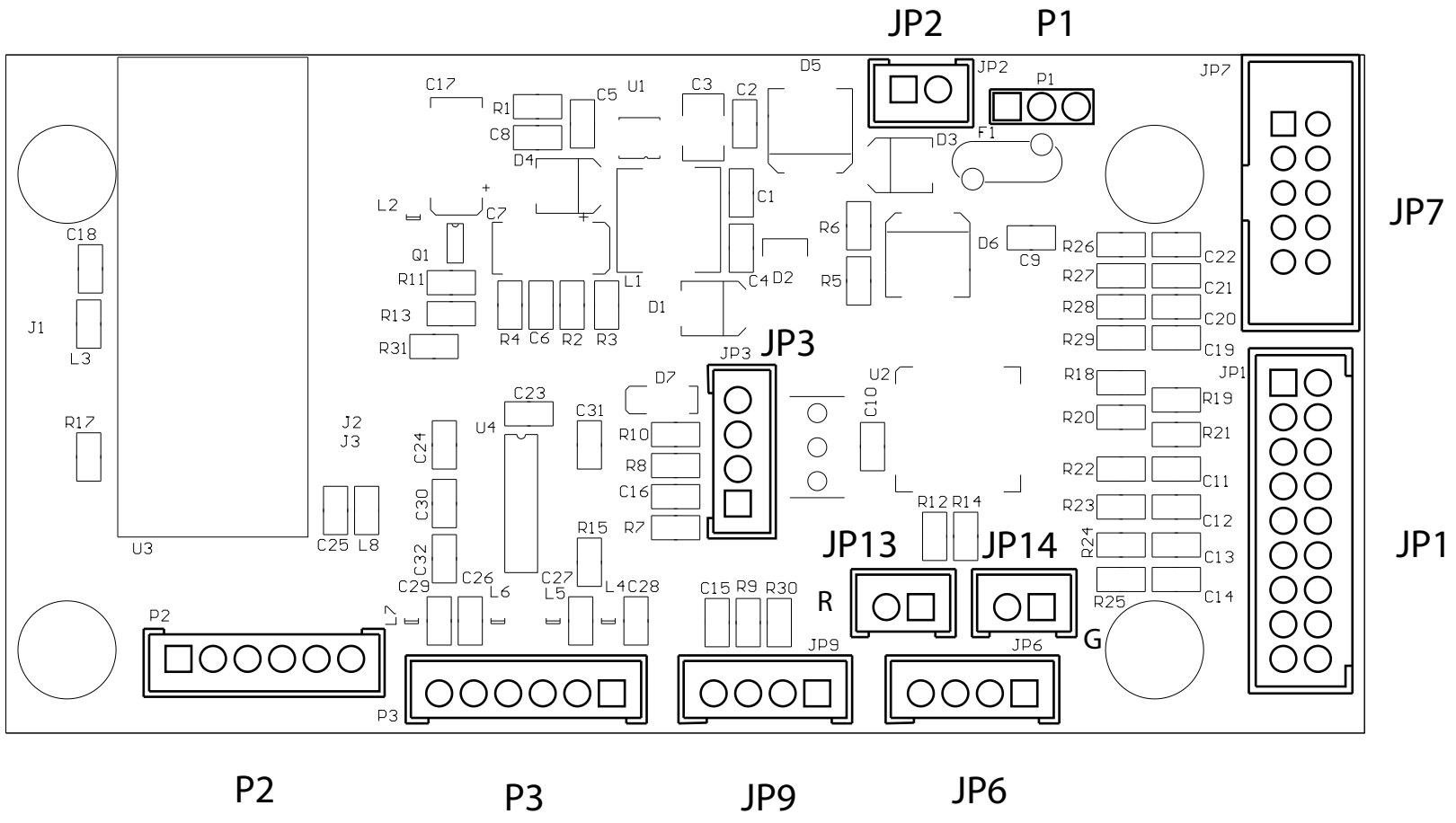
Dettaglio A
Detail A



Molle per liberare i contatti verso lati opposti
Springs for contacts release towards opposite sides

TOPOGRAFICO SCHEDA TRASMITTENTE 18961

TRANSMITTING CARD 18961 TOPOGRAPHIC VIEW



P2 P3 JP9 JP6

IN/OUT SCHEDA TRASMITTENTE 18961

PIN JP1	NUMERO	FUNZIONE
1	JP1-1	S1 INDIETRO CARRO UTENSILE
2	JP1-2	S2 INDIETRO UTENSILE SU CARRO
3	JP1-3	S1 AVANTI CARRO UTENSILE
4	JP1-4	S2 AVANTI UTENSILE SU CARRO
5	JP1-5	S1 SALITA BRACCIO MANDRINO
6	JP1-6	S2 DISCESA BRACCIO UTENSILE
7	JP1-7	S1 DISCESA BRACCIO MANDRINO
8	JP1-8	S2 SALITA BRACCIO UTENSILE
9	JP1-9	S1 (COMUNE)
10	JP1-10	S2 (COMUNE)
11	JP1-11	S4 (COMUNE)
12	JP1-12	N.U.
13	JP1-13	S4 PULSANTE CHIUSURA MANDRINO
14	JP1-14	N.U.
15	JP1-15	S4 PULSANTE APERTURA MANDRINO
16	JP1-16	N.U.
17	JP1-17	S3 PULS. ROTAZ. ANTIOR. UTENSILE
18	JP1-18	N.U.

PIN JP6	NUMERO	FUNZIONE
1	JP6-1	S5 SELETT.ROTAZ.ANTIOR. MANDRINO
2	JP6-2	S5 SELETT. ROTAZ.ORARIA MANDRINO
3	JP6-3	S3 PULS. ROTAZ. ORARIA. UTENSILE
4	JP6-4	S5 COMUNE

PIN JP2	NUMERO	FUNZIONE
1	JP2-1	G2 BATTERIA -
2	JP2-2	G2 BATTERIA +

P1	NUMERO	FUNZIONE
X1		0-12Vdc

PIN JP9	NUMERO	FUNZIONE
1	JP9-1	N.U.
2	JP9-2	N.U.
3	JP9-3	S3 (COMUNE)
4	JP9-4	N.U.

PIN JP13	NUMERO	FUNZIONE
1	JP13-1	P2 LED ROSSO +
2	JP13-2	P2 LED ROSSO -

PIN JP14	NUMERO	FUNZIONE
1	JP14-1	P3 LED VERDE +
2	JP14-2	P3 LED VERDE -

TRANSMITTING CARD 18961 IN/OUT

PIN JP1	NUMBER	FUNCTION
1	JP1-1	S1 TOOL CARRIAGE BACKWARD
2	JP1-2	S2 TOOL ON CARRIAGE BACKWARD
3	JP1-3	S1 TOOL CARRIAGE FORWARD
4	JP1-4	S2 TOOL ON CARRIAGE FORWARD
5	JP1-5	S1 MANDREL ARM RISE
6	JP1-6	S2 TOOL ARM DESCENT
7	JP1-7	S1 MANDREL ARM DESCENT
8	JP1-8	S2 TOOL ARM RISE
9	JP1-9	S1 (COMMON)
10	JP1-10	S2 (COMMON)
11	JP1-11	S4 (COMMON)
12	JP1-12	N.U.
13	JP1-13	S4 MANDREL CLOSING PUSHBUTTON
14	JP1-14	N.U.
15	JP1-15	S4 MANDREL OPENING PUSHBUTTON
16	JP1-16	N.U.
17	JP1-17	S3 TOOL COUNTERCLOCKWISE ROT. PUSHBUTTON
18	JP1-18	N.U.

PIN JP6	NUMBER	FUNCTION
1	JP6-1	S5 MANDREL COUNTERCLOCKWISE ROT. SELECTOR
2	JP6-2	S5 MANDREL CLOCKWISE ROT. SELECTOR
3	JP6-3	S3 TOOL CLOCKWISE ROT. PUSHBUTTON
4	JP6-4	S5 COMMON

PIN JP2	NUMBER	FUNCTION
1	JP2-1	G2 BATTERY -
2	JP2-2	G2 BATTERY +

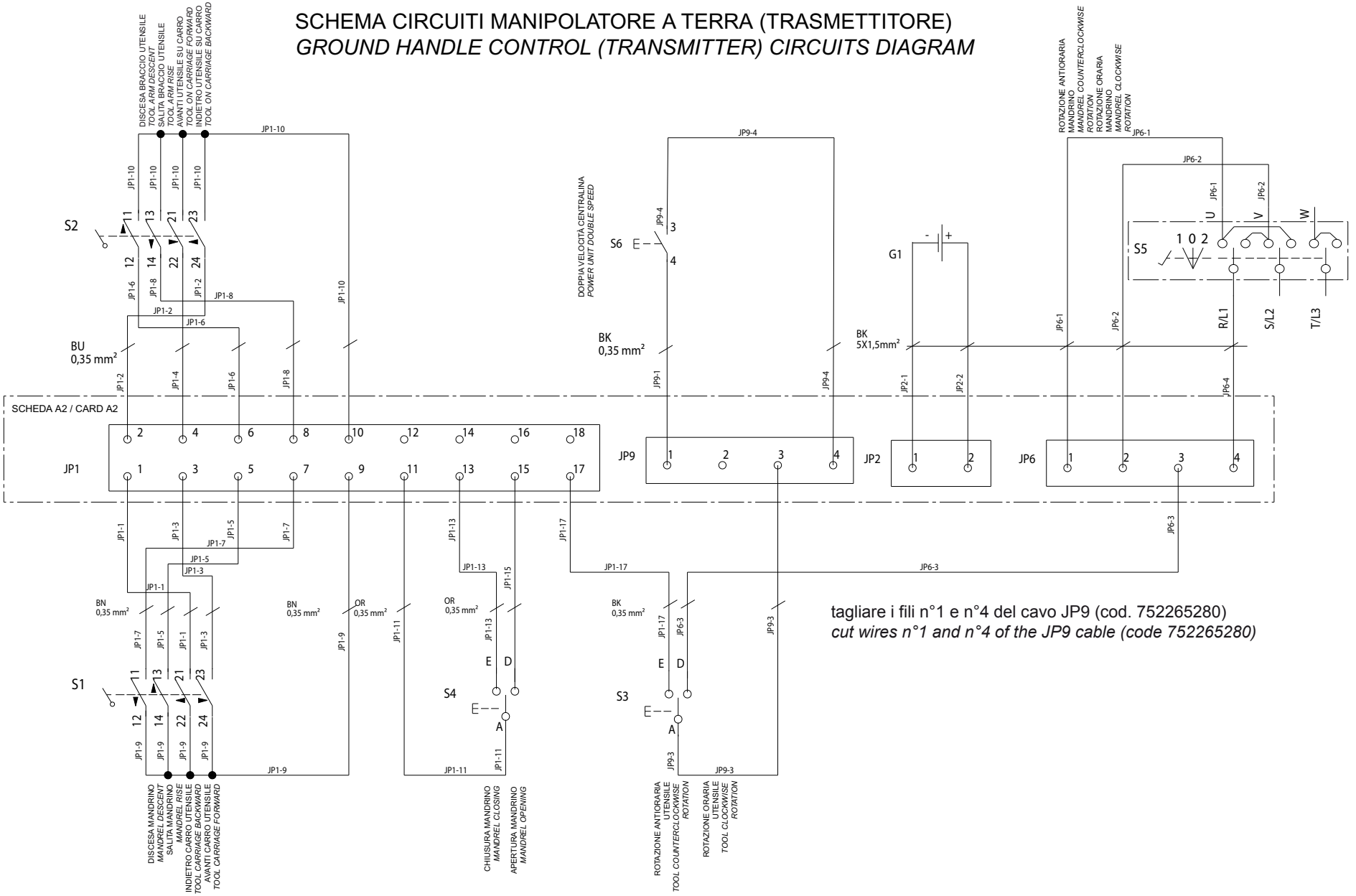
P1	NUMBER	FUNCTION
X1		0 - 12Vdc

PIN JP9	NUMBER	FUNCTION
1	JP9-1	N.U.
2	JP9-2	N.U.
3	JP9-3	S3 (COMMON)
4	JP9-4	N.U.

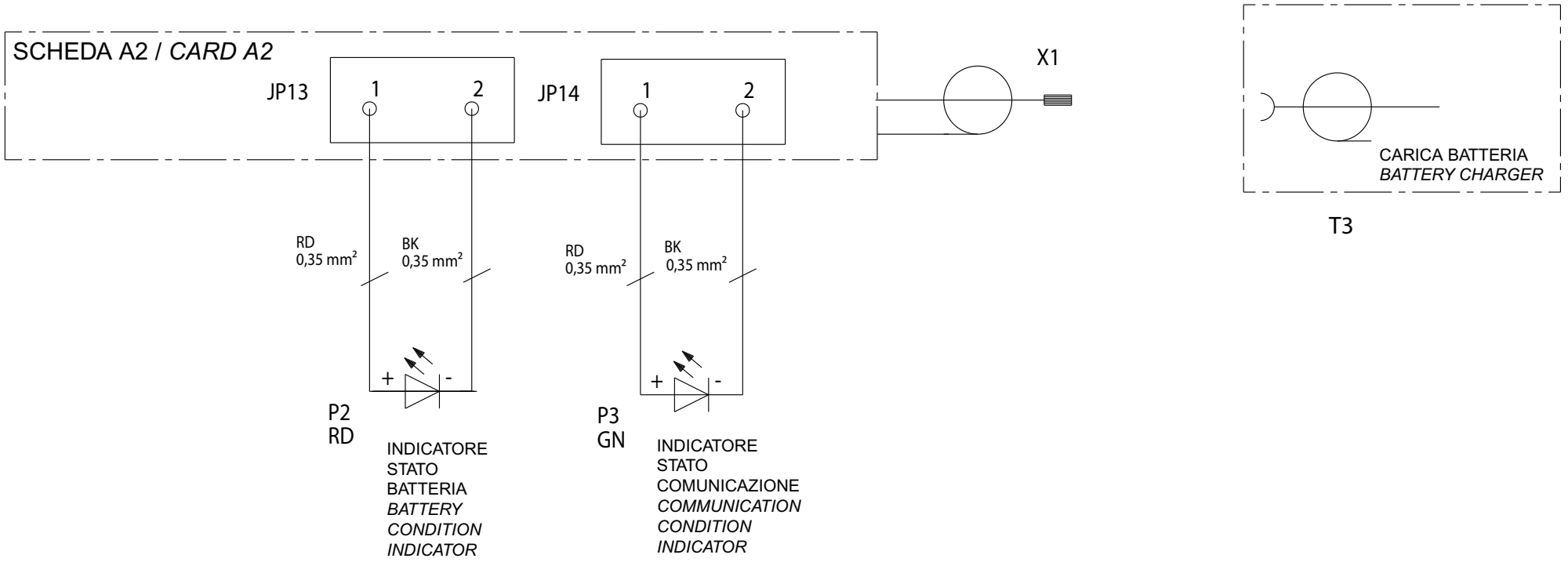
PIN JP13	NUMBER	FUNCTION
1	JP13-1	P2 RED LED +
2	JP13-2	P2 RED LED -

PIN JP14	NUMBER	FUNCTION
1	JP14-1	P3 GREEN LED +
2	JP14-2	P3 GREEN LED -

SCHEMA CIRCUITI MANIPOLATORE A TERRA (TRASMETTITORE)
GROUND HANDLE CONTROL (TRANSMITTER) CIRCUITS DIAGRAM



tagliare i fili n°1 e n°4 del cavo JP9 (cod. 752265280)
cut wires n°1 and n°4 of the JP9 cable (code 752265280)

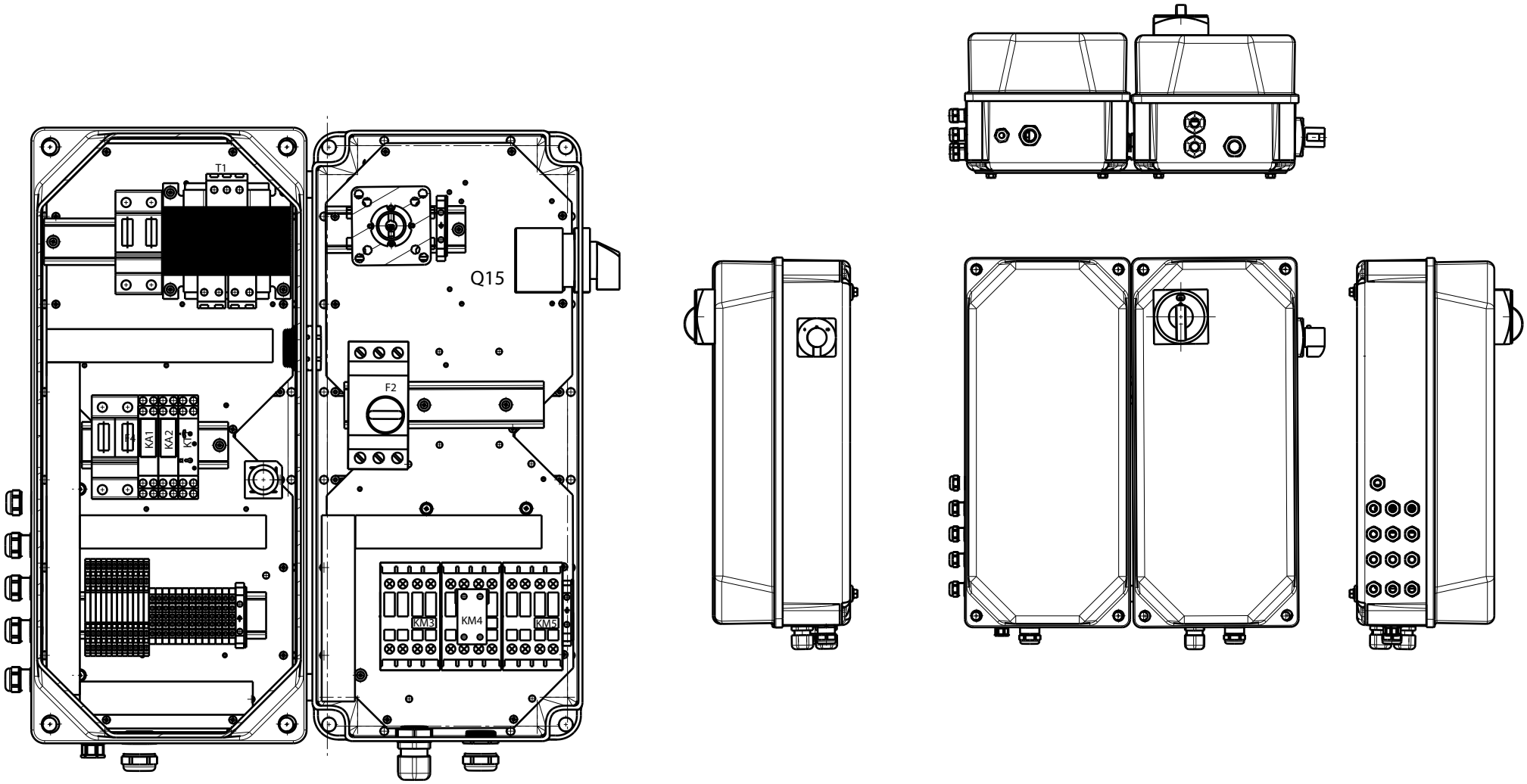

SCHEDA A2 / *CARD A2*
JP13
1
2
JP14
1
2
X1
RD
0,35 mm²
BK
0,35 mm²
RD
0,35 mm²
BK
0,35 mm²
+
-
+
-
P2
RD
INDICATORE
STATO
BATTERIA
BATTERY
CONDITION
INDICATOR
P3
GN
INDICATORE
STATO
COMUNICAZIONE
COMMUNICATION
CONDITION
INDICATOR
CARICA BATTERIA
BATTERY CHARGER
T3

LISTA COMPONENTI

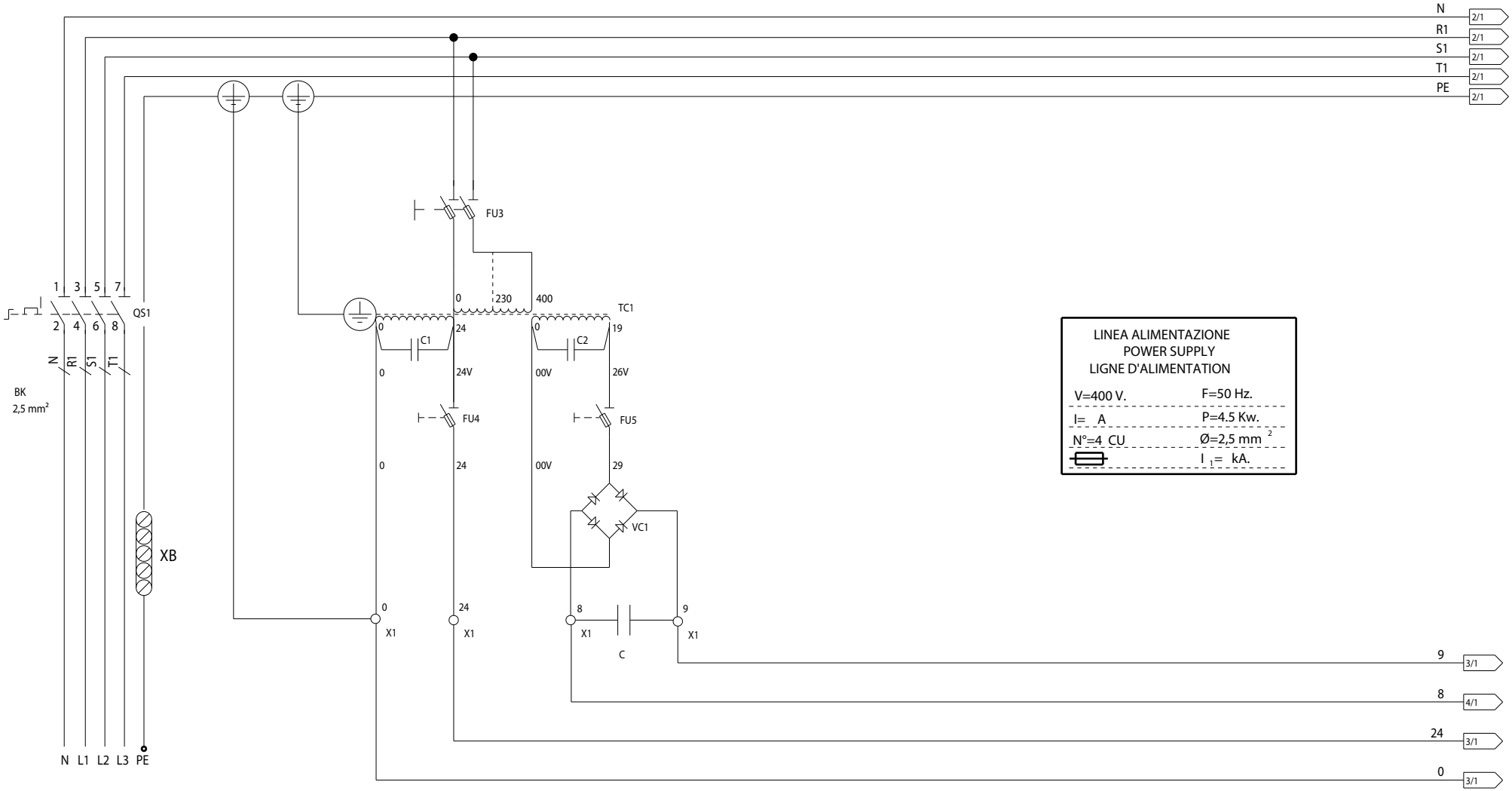
RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
A1	SCHEDA ELETT. RICEVENTE	-	18962	1	2.5
A2	SCHEDA ELETT.TRASMITTENTE		18961	1	11.2
F1	PORTAFUSIBILE	3 POLI SEZIONABILE 10,3x38 32A 690V	515025	1	6.5
	FUSIBILE	10,3x38 16A 500V aM RITARDATO	507045	3	
F2	INTERRUTTORE AUTOM. TRIPOLARE	6,3-10A AC3 400V 2,2KW	518277	1	6.2
	CONTATTI AUSILIARI	1NO+1NC ATTACCO FRONTALE	518279	1	6.3
F3	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V	515027	1	5.3
	FUSIBILE	10,3X38 2A 500V RAPIDO	507019	2	
F4	FUSIBILE	5x20F 250V 2A RAPIDO	507043	1	5.3
F5	FUSIBILE	5x20F 250V 8A RAPIDO	507090	1	5.3
F6	FUSIBILE	5X20 T 8A 250V	507118	1	5.7
G1	BATTERIA	6V 3,3AH/20HR Lead	10066	1	14.6
K1	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.6
K2	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.6
K3	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.5
K6	RELE'	RELE' 2 CONTATTI 8A 24VAC	557017+557018	1	
P2	INDICATORE LUMINOSO (LED)	ROSSO	18065	1	15.4
P3	INDICATORE LUMINOSO (LED)	VERDE	18066	1	15.5
Q1...Q13	ELETTROVALVOLE	-	-	13	8-9
Q14	SEZIONATORE TRIPOLARE	Ith 32A Ui 690V-50Hz Uimp 4KW	518223+518226	1	5.2
Q15	COMMUTATORE DI POLI DAHLANDER	25A 500V	518189	1	6.5-6.6
S1	MANIPOLATORE	4 POS.+CENTR.TEMPORANEE Ø22	517157AS	1	14.2
S2	MANIPOLATORE	4 POS.+CENTR.TEMPORANEE Ø22	517157AS	1	14.2
S3	PULSANTE BASCULANTE	-	517283	1	14.5
S4	PULSANTE BASCULANTE	-	517283	1	14.4
S5	COMMUTATORE	Ith 25A Ui 690V-50Hz Uimp 4KW	518058	1	14.7-14.8
S6	PULSANTE	-	517105AS	1	14.5
T1	TRASFORMATORE	200 VA 50/60 Hz PRI: 0/230/400V SEC: 0/19V 8,95A 0/24V 1,25A	528056	1	5.3
-	-	-	-	-	-
T3	CARICABATTERIA	21.6W 7.2V 3A Lithium ion	18064	1	15.6
M1	MOTORE CENTRALINA	M.E.1.8-2.5T400 SX B3-B14 50HZ	900003880	1	6.2
M2	MOTORE MANDRINO	MEKW1.35/1.85T400/50B3G90L 450 2800/1400 RPM	900003930	1	6.5

COMPONENTS LIST

REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT REFERENCE
A1	RECEIVING ELECTRICAL CARD	-	18962	1	2.5
A2	TRANSMITTING ELECTRICAL CARD		18961	1	11.2
F1	FUSE HOLDER	10,3x38 32A 690V SECTIONABLE 3 POLES	515025	1	6.5
	FUSE	10,3x38 16A 500V aM DELAYED-ACTION	507045	3	
F2	TRIPOLAR AUTOMATIC SWITCH	6,3 - 10A AC3 400V 2,2KW	518277	1	6.2
	AUXILIARY CONTACTS	1NO+1NC FRONT COUPLING	518279	1	6.3
F3	FUSE HOLDER	10,3x38 32A 690V 2 POLES SECTIONABLE	515027	1	5.3
	FUSE	10,3x38 2A 500V RAPID	507019	2	
F4	FUSE	5x20F 250V 2A RAPID	507043	1	5.3
F5	FUSE	5x20F 250V 8A RAPID	507090	1	5.3
F6	FUSE	5x20 T 8A 250V	507118	1	5.7
G1	BATTERY	6V 3,3AH/20HR Lead	10066	1	14.6
K1	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.6
K2	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.6
K3	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	1	7.5
K6	RELE'	RELE' 2 CONTACT 8A 24VAC	557017+557018	1	
P2	BACKLIGHTED INDICATOR (LED)	RED	18065	1	15.4
P3	BACKLIGHTED INDICATOR (LED)	GREEN	18066	1	15.5
Q1...Q13	SOLENOID VALVES	-	-	13	8-9
Q14	TRIPOLAR KNIFE SWITCH	Ith 32A Ui 690V - 50Hz Uimp 4Kw	518223+518226	1	5.2
Q15	DAHLANDER POLES COMMUTATOR	25A 500V	518189	1	6.5-6.6
S1	HANDLE CONTROL	4 POS.+ CENTRAL POS. TEMPORARY Ø22	517157AS	1	14.2
S2	HANDLE CONTROL	4 POS.+ CENTRAL POS. TEMPORARY Ø 22	517157AS	1	14.2
S3	BALANCING PUSHBUTTON	-	517283	1	14.5
S4	BALANCING PUSHBUTTON	-	517283	1	14.4
S5	COMMUTATOR	Ith 25A Ui 690V - 50Hz Uimp 4Kw	518058	1	14.7-14.8
S6	PUSHBUTTON	-	517105AS	1	14.5
T1	TRANSFORMER	200 VA 50/60 Hz PRI: 0/230/400V SEC: 0/19V 8,95A 0/24V 1,25A	528056	1	5.3
-	-	-	-	-	
T3	BATTERY CHARGER	21.6W 7.2V 3A Lithium ion	18064	1	15.6
M1	HYDRAULIC POWER UNIT MOTOR	M.E.1.8-2.5T400 SX B3-B14 50HZ	900003880	1	6.2
M2	MANDREL MOTOR	MEKW1.35/1.85T400/50B3G90L 450 2800/1400 RPM	900003930	1	6.5

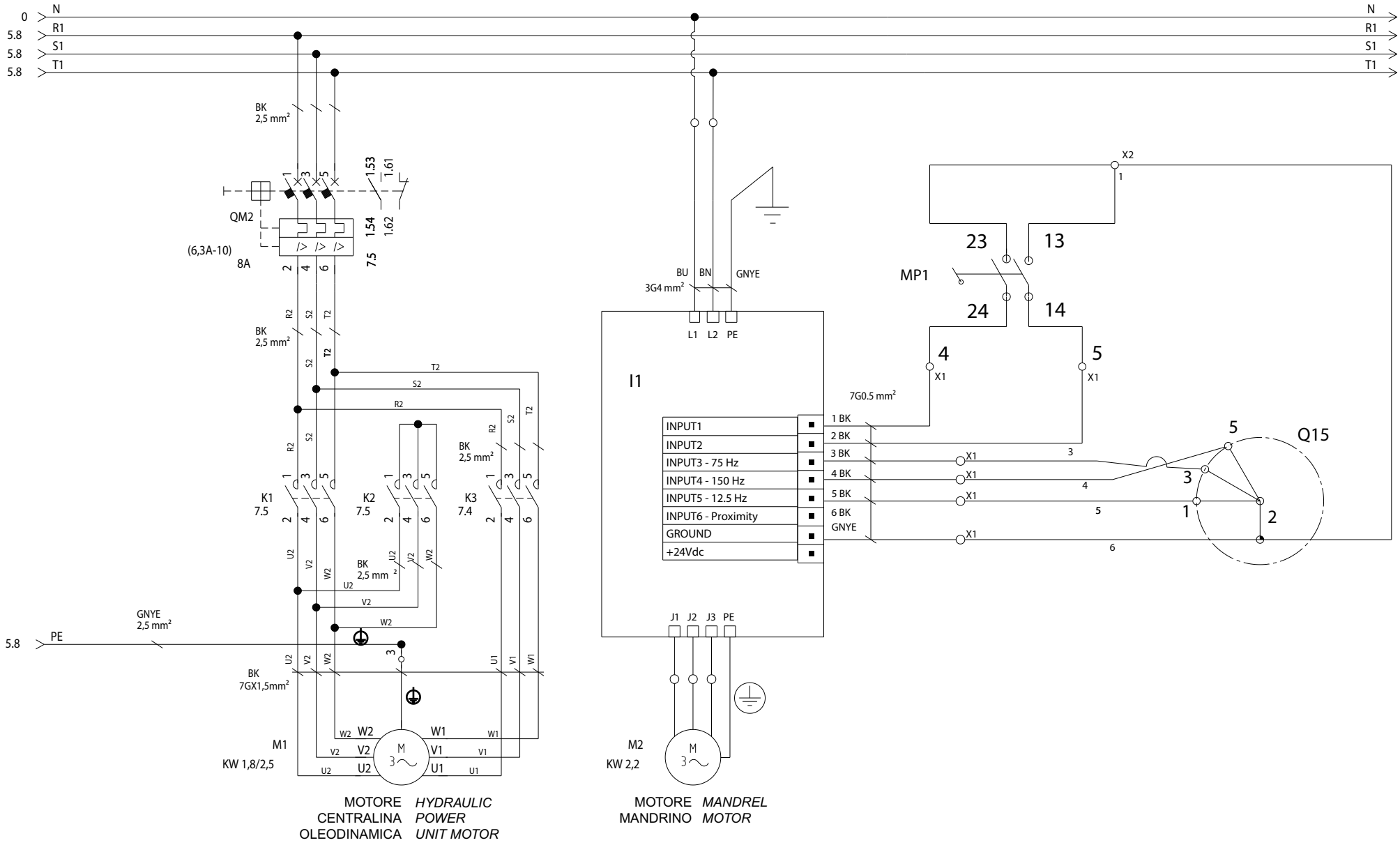


Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO (VARIANTE CON INVERTER) 1/10 ELECTRICAL SCHEME (VERSION WITH INVERTER) 1/10 SCHALTPLAN (VERSION MIT INVERTER) 1/10 SCHEMA ELECTRIQUE (VERSION AVEC INVERSEUR) 1/10 ESQUEMA ELECTRICO (VERSIÓN CON INVERSOR) 1/10*	***Pag. 79 di 96***
	Tavola N°D - Rev. 1	**752205750**		**NAV51.15 NAV51T.15 NAV51.15N**



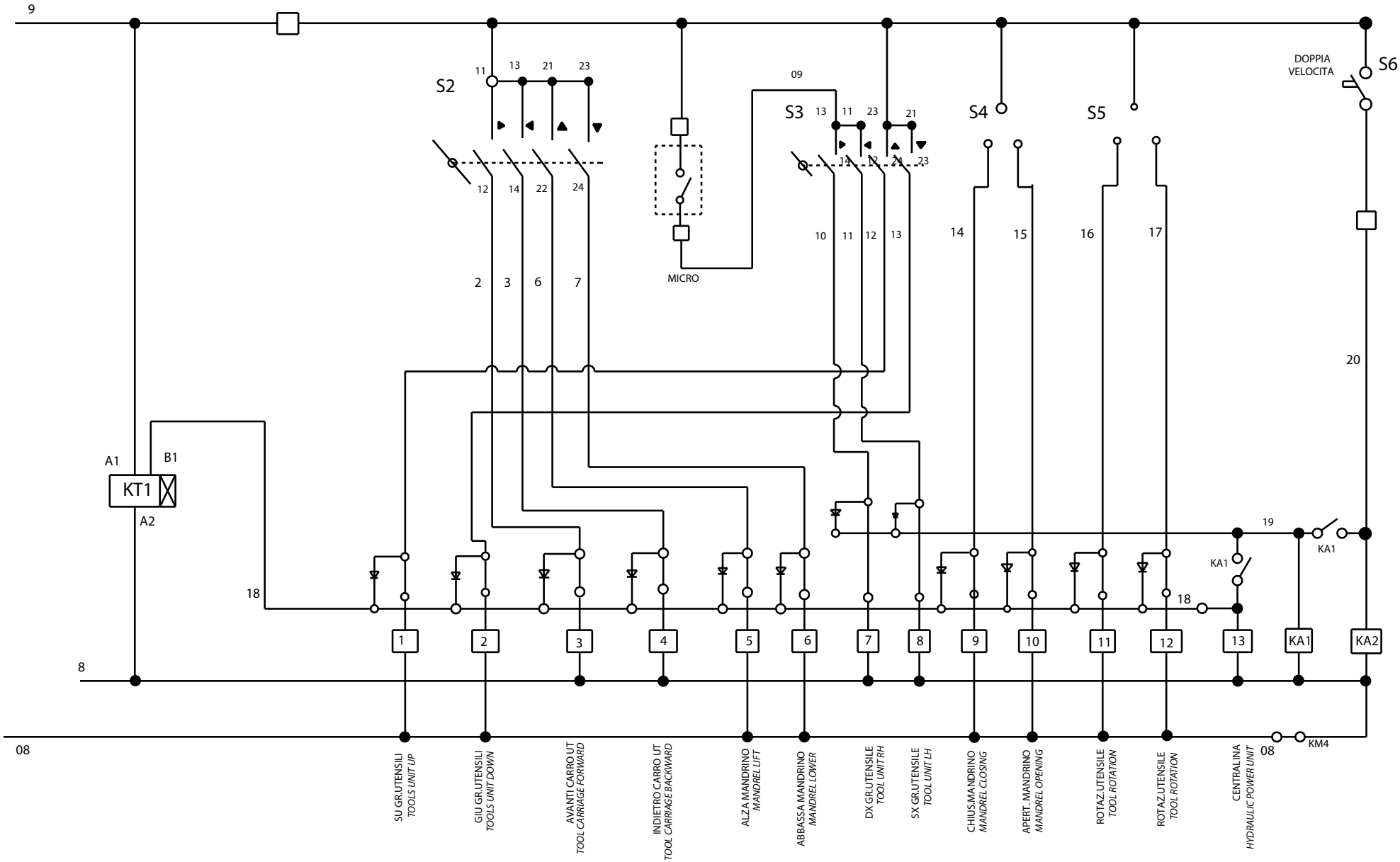
ALIMENTAZIONE AUSILIARI 24VAC
24VAC AUXILIARIES SUPPLY

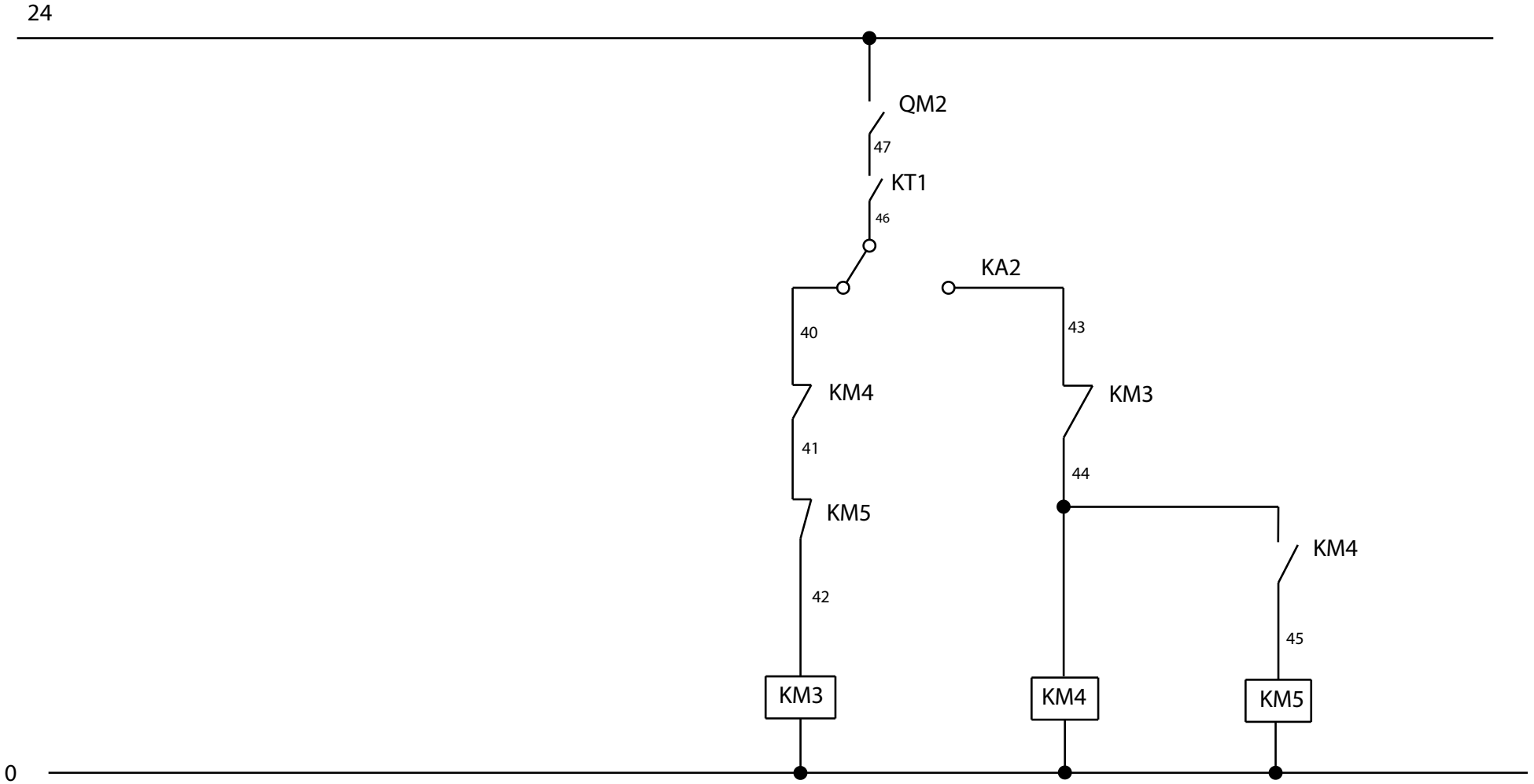
ALIMENTAZIONE AUSILIARI 27VDC
27VDC AUXILIARIES SUPPLY

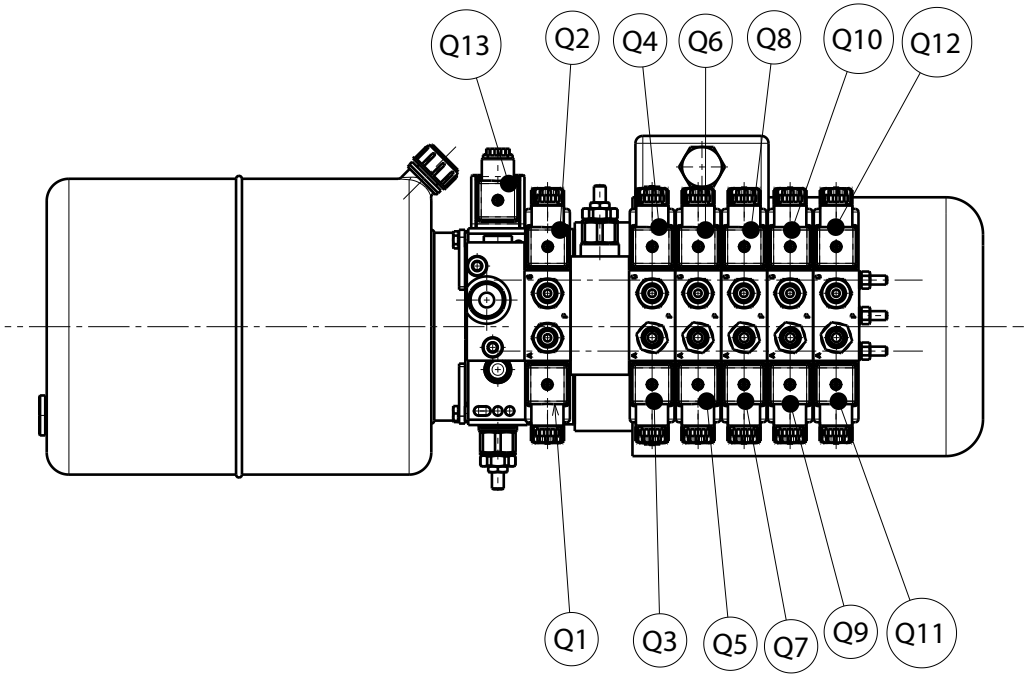


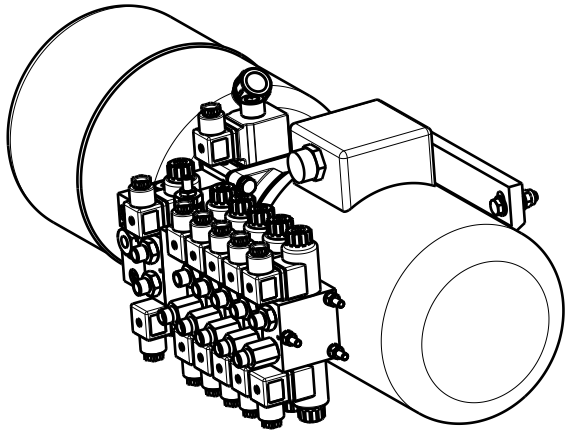
Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO (VARIANTE CON INVERTER) 3/10 ELECTRICAL SCHEME (VERSION WITH INVERTER) 3/10 SCHALTPLAN (VERSION MIT INVERTER) 3/10 SCHEMA ELECTRIQUE (VERSION AVEC INVERSEUR) 3/10 ESQUEMA ELECTRICO (VERSIÓN CON INVERSOR) 3/10*	***Pag. 81 di 96***
	Tavola N°D - Rev. 1	**752205750**		**NAV51.15 NAV51T.15 NAV51.15N**

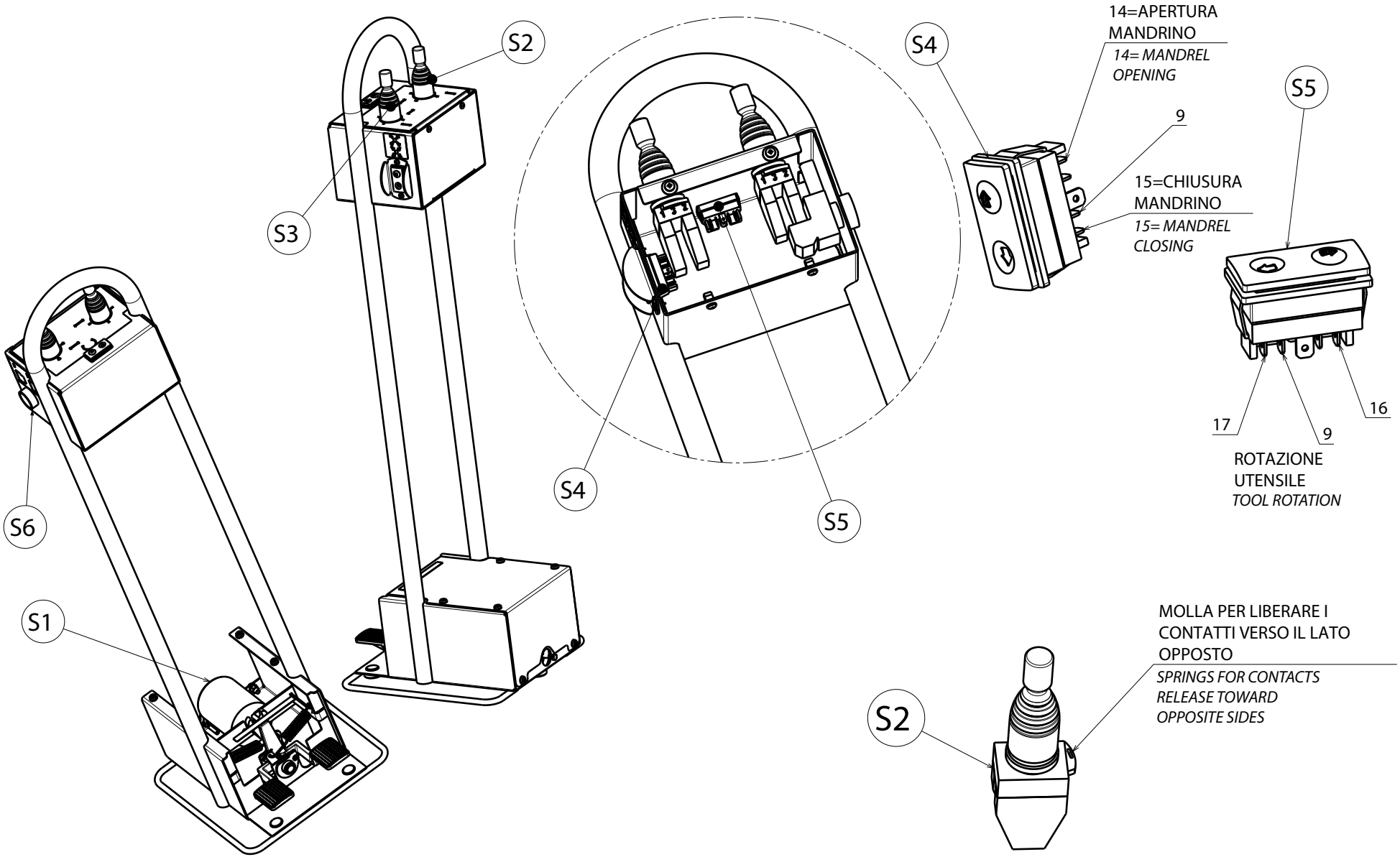
7522-M004-1_B


9
S2
11
13
21
23
12
14
22
24
2
3
6
7
MICRO
09
S3
13
11
23
21
14
12
24
23
10
11
12
13
S4
14
15
S5
16
17
DOPPIA VELOCITA
S6
20
A1
B1
KT1
A2
18
19
KA1
KA1
18
8
1
2
3
4
5
6
7
8
9
10
11
12
13
KA1
KA2
08
08
KM4
SU GR.UTENSILI
TOOLS UNIT UP
GIU GR.UTENSILI
TOOLS UNIT DOWN
AVANTI CARRO UT
TOOL CARRIAGE FORWARD
INDIETRO CARRO UT
TOOL CARRIAGE BACKWARD
ALZA MANDRINO
MANDREL LIFT
ABBASSA MANDRINO
MANDREL LOWER
DX GR.UTENSILE
TOOL UNIT RH
SX GR.UTENSILE
TOOL UNIT LH
CHIUS.MANDRINO
MANDREL CLOSING
APERT. MANDRINO
MANDREL OPENING
ROTAZ.UTENSILE
TOOL ROTATION
ROTAZ.UTENSILE
TOOL ROTATION
CENTRALINA
HYDRAULIC POWER UNIT


24
QM2
47
KT1
46
KA2
40
43
KM4
KM3
41
44
KM5
KM4
42
45
KM3
KM4
KM5
0


Q13
Q2
Q4
Q6
Q8
Q10
Q12
Q1
Q3
Q5
Q7
Q9
Q11



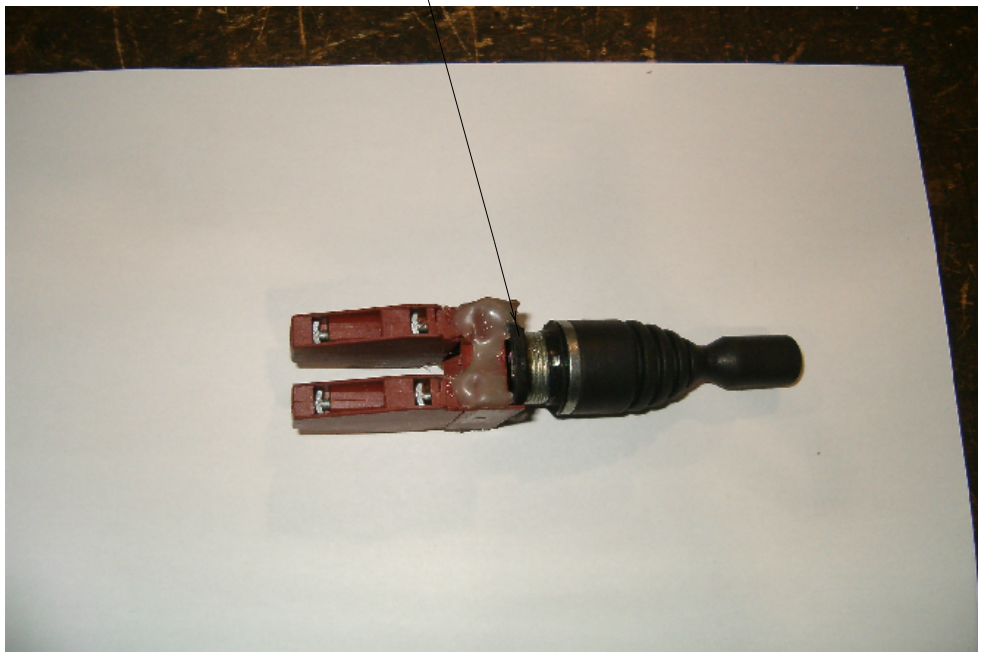

S2
S3
S4
S5
S6
S1
S4
S5
14=APERTURA MANDRINO
14= MANDREL OPENING
9
15=CHIUSURA MANDRINO
15= MANDREL CLOSING
S5
17
9
16
ROTAZIONE UTENSILE
TOOL ROTATION
S2
MOLLA PER LIBERARE I CONTATTI VERSO IL LATO OPPOSTO
SPRINGS FOR CONTACTS RELEASE TOWARD OPPOSITE SIDES

RIFERIMENTO	DESCRIZIONE	DATI TECNICI	CODICE	QUANTITA	RIFERIMENTO DOCUMENTO
	INTERRUTTORE	INTERRUTTORE 32A 4 POLI BL/POR GIOVENZANA art.SE323004B	518250	1	
	MANOPOLA GIALLO/ROSSA GIOVENZANA	a.012/0001-1 LUCCHETTO	518226	1	
KT1	TIMER RIT. DISECCIT.	TIMER RIT.DISECCIT. 12 240 AC DC	521104	1	
Q15	COMMUTATORE	COMM. 3POS. 25A	518270	1	
	PORTAFUSIBILE	2 POLI SEZIONABILE 10,3x38 32A 690V		2	
F3	FUSIBILE	FUSIBILE GL 10,3X38 2A 500V	507019	2	
F4	FUSIBILE	FUSIBILE GL 10,3X38 2A 500V	507019	1	
F5	FUSIBILE	FUSIBILE 10,3X38 8A 500V AM	507100	1	
Q1,Q2,Q3,Q4,Q5, Q6,Q13				7	
K3M-K4M-K5M	CONTATTORE TRIPOLARE	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	3	
	CONTATTI AUSILIARI BFX 10 11 1N0 1NC		522147	1	
	MORSETTO 2.5mmq C/DIODO 1N4007		510218	12	
	MORSETTO A MOLLA 2 PIAN.1.5mmq		510217	13	
	MORSETTO G/V 4mmq ART.TEO.4 CABUR T0430 +PIASTR.TERM.TEO.4		510150 + 510209	3	
VC1	PONTE RADDRIZZATORE VC1	-	B1296200	1	
	CONDENSATORE C1-C2		B1296300	1	
	INS.CAVO ALIMENTAZIONE QUADRO		752265720	1	
	INS.CAVO MOTORE MANDRINO		752265970	1	
	INS.CAVO MOTORE CENTRALINA	-	752265770	1	
	INS.CAVO MANIPOLATORE		752265780	1	
	INS.CAVO ALIMENTAZIONE INVERTER		752265980	1	
	INS.CAVO SEGNALI INVERTER		752265740	1	
	INS. CAVO ELETTROVALVOLA Q1-Q2-Q3-Q4-Q5-Q6-Q8-Q9-Q10-Q11-Q12-Q13			1 1 1 1 1 1 1	
KA1	RELE'A 2 CONTATTI	RELE' 2 CONTATTI 10A 24VDC	557021	1	
KA2	RELE'A 2 CONTATTI	RELE' 2 CONTATTI 8A 24VAC	557017	1	
ZOCCOLO	ZOCCOLO A 2 CONTATTI		557018	2	
S2/S3	MANIPOLATORE	MANIPOLATORE JOYSTICH 4 POS. GE CEMA art.P9MMN4T	517285	2	5.7
S4/S5	PULSANTE BASCULANTE	-	517300	2	5.7
S6	PULSANTE DOPPIA VELOCITA'	PULSANTE IP 65 - SIEMENS	B4511000	1	
S1	INVERTITORE TRIPOLARE	INVERTORE 3 P.art.P020533S	518272	1	5.7
T1	TRASFORMATORE	TRASFORMATORE 160VA	B1296100	1	2.7
M1	MOTORE CENTRALINA	1,8/2,5KW 400V 50Hz 1400/2800rpm	900003880	1	3.7
M2	MOTORE MANDRINO	1,35/1,85KW 400V 50Hz B3G90L 1400/2800rpm AUTOFRENANTE CON FR.RA.	900004320	1	3.7

REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	CODE	QUANTITY	DOCUMENT REFERENCE
	SWITCH	32A 4 POLES BL/POR SWITCH GIOVENZANA art.SE323004B	518250	1	
	GIOVENZ YELLOW/RED KNOB	a.012/0001-1 PADLOCK	518226	1	
KT1	TIMER	TIMER RIT.DISECCIT. 12 240 AC DC	521104	1	
Q15	COMMUTATOR	COMM. 3POS. 25A	518270	1	
	FUSE HOLDER	10,3x38 32A 690V 2 POLES SECTIONABLE		2	
F3	FUSE	GL 10,3X38 2A 500V FUSE	507019	2	
F4	FUSE	GL 10,3X38 2A 500V FUSE	507019	1	
F5	FUSE	10,3X38 8A 500V AM FUSE	507100	1	
Q1,Q2,Q3,Q4,Q5, Q6,Q13				7	
K3M-K4M-K5M	TRIPOLAR CONTACTOR	9A AC3 400V 4,2KW 1NC 24Vac 50/60Hz	522137	3	
	BFX 10 11 1N0 1NC AUXILIARY CONTACTS		522147	1	
	CLAMP 2.5mmq C/DIODO 1N4007		510218	12	
	2 PIAN.1.5mmq SPRING CLAMP 2		510217	13	
	CLAMP G/V 4mmq ART.TEO.4 CABUR T0430 + TOOL PLATE TEO.4		510150 + 510209	3	
VC1	RECTIFIER BRIDGE VC1	-	B1296200	1	
	CONDENSER C1-C2		B1296300	1	
	SQUARE FEEDING CABLE ASSEMBLY		752265720	1	
	CHUCK UNIT MOTOR CABLE ASSEMBLY		752265970	1	
	HYDR.POWER UNIT MOTOR CABLE ASSEMBLY	-	752265770	1	
	HANDLE CABLE ASSEMBLY		752265780	1	
	INVERTER FEEDING CABLE ASSEMBLY		752265980	1	
	INVERTER SIGNAL CABLE ASSEMBLY		752265740	1	
	Q1-Q2-Q3-Q4-Q5-Q6-Q8-Q9-Q10-Q11-Q12-Q13 SOLENOID VALVE CABLE ASSEMBLY			1 1 1 1 1 1 1	
KA1	RELAY 2 CONTACTS	10A 24VDC RELAY 2 CONTACTS	557021	1	
KA2	RELAY 2 CONTACTS	8A 24VAC RELAY 2 CONTACTS	557017	1	
ZOCCOLO	2 CONTACTS SOCKET		557018	2	
S2/S3	HANDLE	JOYSTICH HANDLE 4 POS. GE CEMA art.P9MMN4T	517285	2	5.7
S4/S5	PUSHBUTTON	-	517300	2	5.7
S6	DOUBLE SPEED PUSHBUTTON	PUSHBUTTON IP 65 - SIEMENS	B4511000	1	
S1	THREE-POLE INVERTER	art.P020533S THREE-POLE INVERTER	518272	1	5.7
T1	TRANSFORMER	160VA TRANSFORMER	B1296100	1	2.7
M1	HYDRAULIC POWER UNIT MOTOR	1,8/2,5KW 400V 50Hz 1400/2800rpm	900003880	1	3.7
M2	CHUCK MOTOR	1,35/1,85KW 400V 50Hz B3G90L 1400/2800rpm SELF BRAKING	900004320	1	3.7

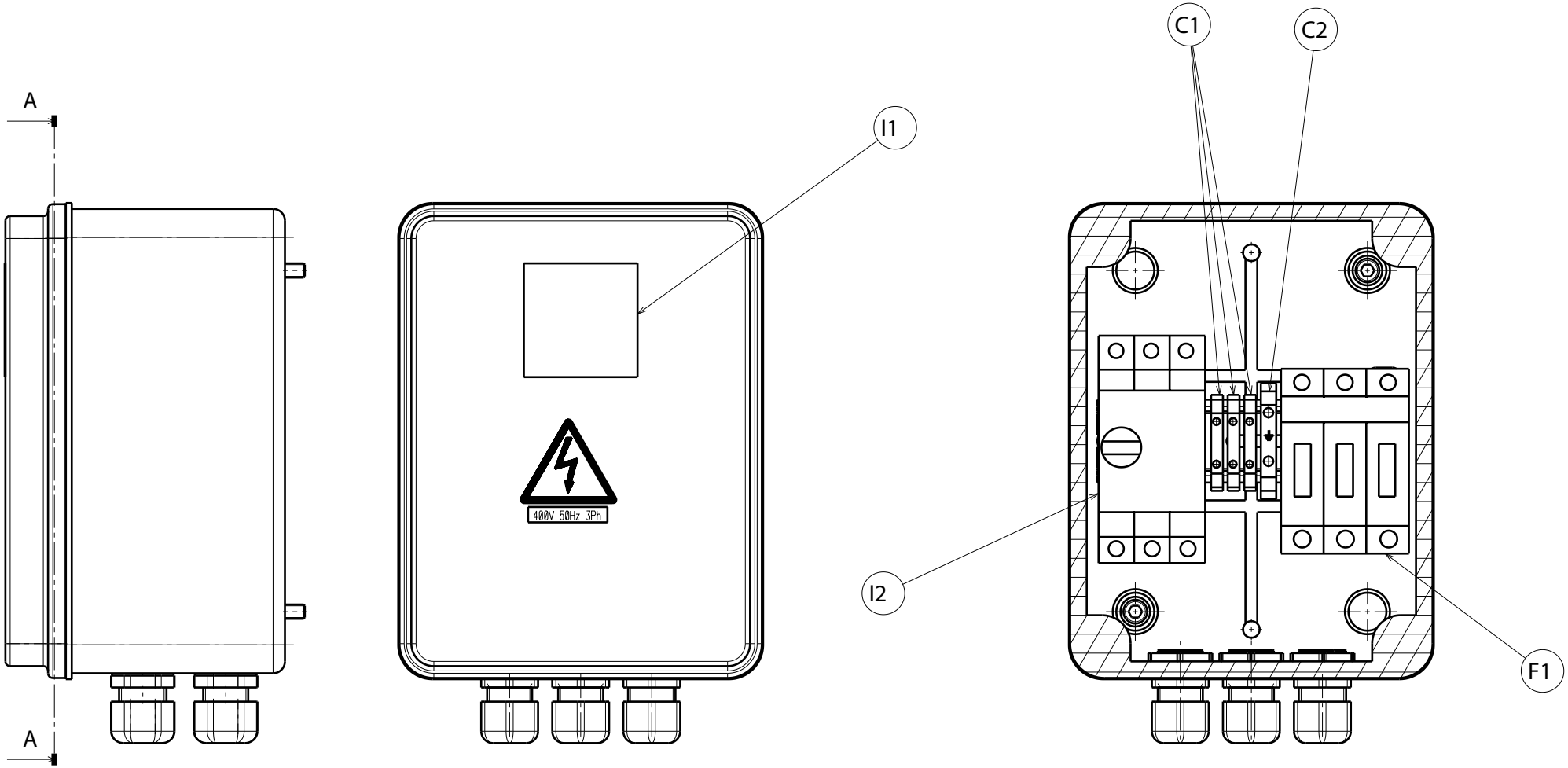
INCOLLARE LA LINGUETTA DEL
MANIPOLATORE ALL'INTERNO
DELLA SCATOLA DELLA COLONNETTA

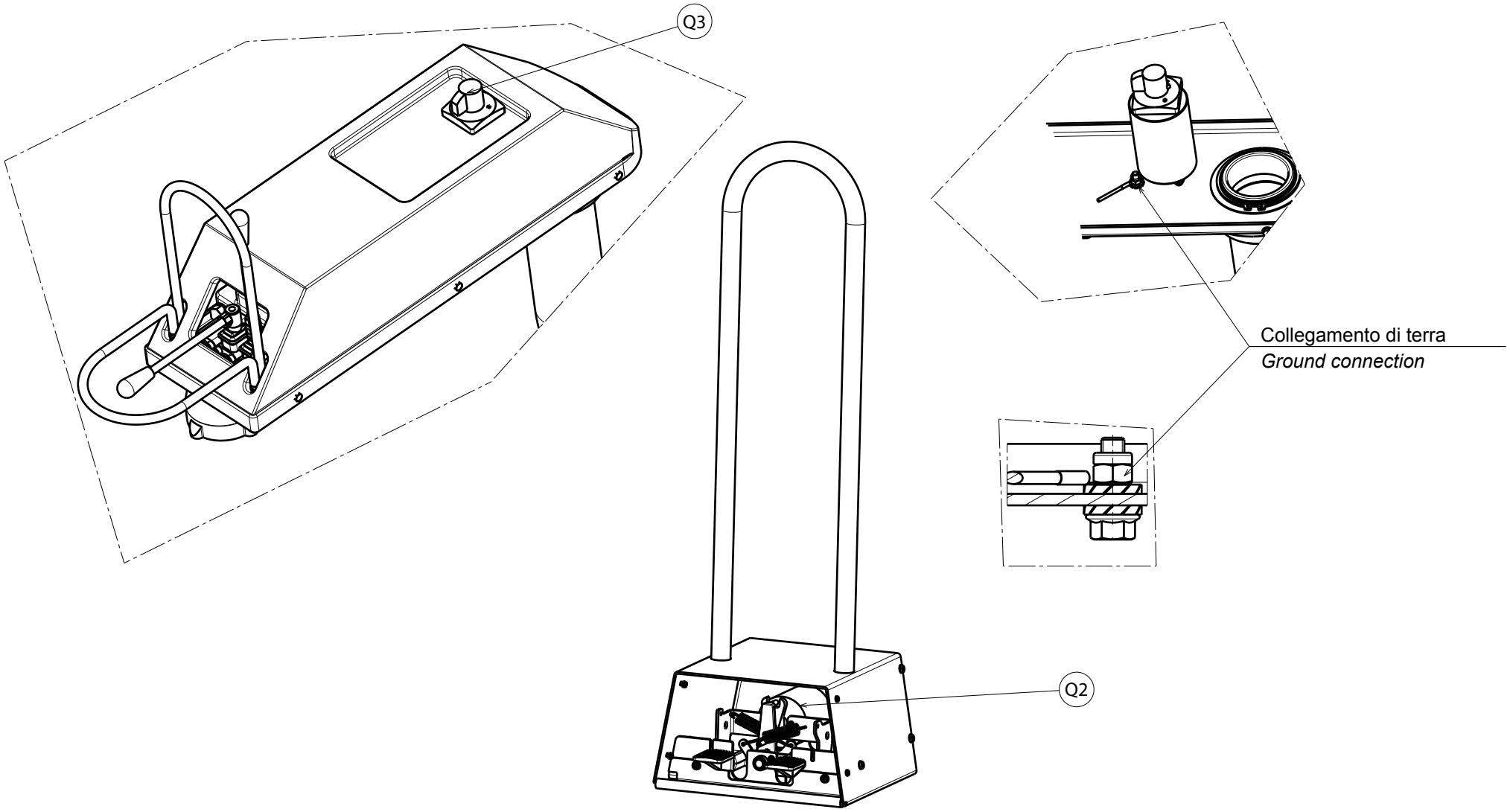
STICK THE HANDLE TANG INSIDE
THE COLUMN BOX

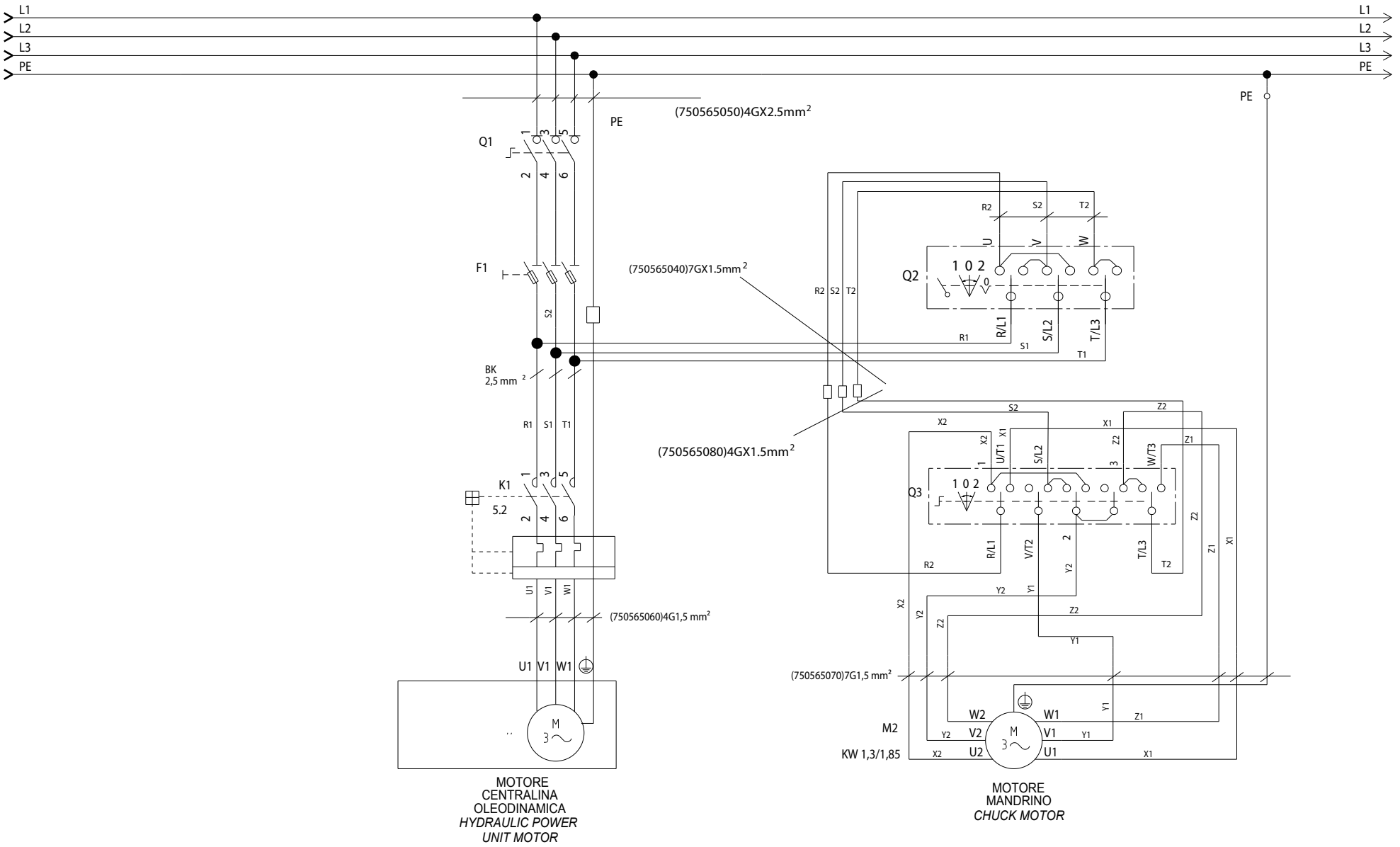


N.B.PER EVITARE CHE SI POSSANO SCOLLEGARE I CONTATTI
NEL CASO LA COLONNETTA COMANDI SUBISCA DEGLI URTI
INCOLLARE I CONTATTI AL MANIPOLATORE CON COLLA A CALDO

N.B. TO AVOID THE CONTACTS DISCONNECTION
IN CASE OF COLLISIONS WITH THE CONTROLS STUD,
STICK THE CONTACTS ON THE HANDLE WITH HOT GLUE


A
A
I1
400V 50Hz 3Ph
C1
C2
I2
F1


Q3
Collegamento di terra
Ground connection
Q2



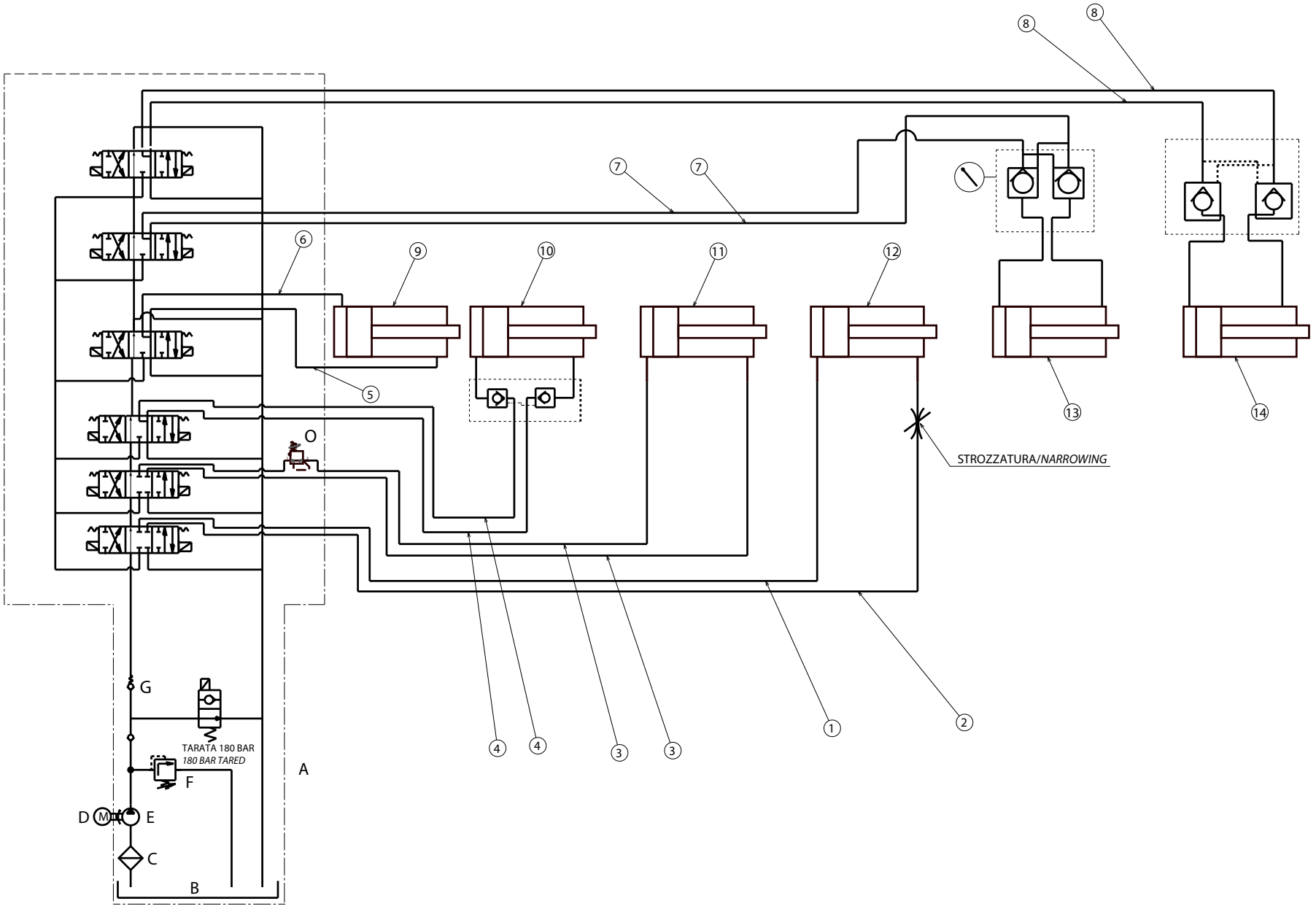
Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA ELETTRICO (VAR. CON MANIPOLATORE A TERRA) 3/4* *ELECTRICAL SCHEME (VERS. WITH GROUND HANDLE CONTROL) 3/4* *SCHALTPLAN (VERS. MIT GEERDETER MANIPULATOR) 3/4* *SCHEMA ELECTRIQUE (VERS. AVEC MANIPULATEUR AU SOL) 3/4* *ESQUEMA ELECTRICO (VERS. CON MANIPULADOR A TIERRA) 3/4*	***Pag. 91 di 96***
	Tavola N°E - Rev. 0	**750505510**		**NAV51.15** **NAV51T.15** **NAV51.15N**

LISTA COMPONENTI

RIFERIMENTO	DESCRIZIONE	DATI TECNICI	SIGLA CATALOGO	QUANTITA	RIFERIMENTO DOCUMENTO
F1	PORTAFUSIBILE	3 POLI P10-3 5450334 WIMEX	515035	1	2.5
	FUSIBILE	10,3x38 10A 500V aM RITARDATO	507094	3	
I1	INTERRUTTORE GENERALE		518007AS	1	2.5
I2	INTERRUTTORE SALVAMOTORE	4-6.3 ART.GV2 ME10 SCHNEIDER	518276	1	2.5
C1	MORSETTO	MORSETTO 2.5mmq	510145	3	2.5
C2	MORSETTO	G/V 4mmq ART.TEO.4 CABUR	510150	1	4.4
Q3	COMMUTATORE DI POLI DAHLANDER	25A 500V	518189	1	4.6 - 4.7
Q2	COMMUTATORE	Ith 25A Ui 690V-50Hz Uimp 4KW	518227	1	4.6 - 4.7
M1	MOTORE CENTRALINA	2,2KW 230/400V 50HZ 10,2/59A cosØ=0,73/0,70 1300 rpm	900003830	1	4.3 - 4.4
M2	MOTORE MANDRINO	1,3/1,85KW 400V 50Hz 4/5,3A cosØ=0,80/0,84 1400/2800rpm	900003930	1	4.6 - 4.7

COMPONENTS LIST

REFERENCE	DESCRIPTION	TECHNICAL SPECIFICATIONS	ABBREVIATION ON CATALOGUE	QUANTITY	DOCUMENT REFERENCE
F1	FUSE HOLDER	3 POLES P10-3 5450334 WIMEX	515035	1	2.5
	FUSE	10,3x38 10A 500V aM DELAYED	507094	3	
I1	GENERAL SWITCH		518007AS	1	2.5
I2	OVERLOAD CUTOUT SWITCH	4-6.3A ART.GV2 ME10 SCHNEIDER	518276	1	2.5
C1	CLAMP	2.5 mmq CLAMP	510145	3	2.5
C2	CLAMP	G/V 4mmq ART.TEO.4 CABUR	510150	1	4.4
Q3	DAHLANDER POLE CHANGE SWITCH	25A 500V	518189	1	4.6 - 4.7
Q2	COMMUTATOR	Ith 25A Ui 690V-50Hz Uimp 4KW	518227	1	4.6 - 4.7
M1	HYDRAULIC POWER UNIT MOTOR	2,2KW 230/400V 50HZ 10,2/59A cosØ=0,73/0,70 1300 rpm	900003830	1	4.3 - 4.4
M2	CHUCK MOTOR	1,3/1,85KW 400V 50Hz 4/5,3A cosØ=0,80/0,84 1400/2800rpm	900003930	1	4.6 - 4.7



Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA OLEODINAMICO HYDRAULIC SCHEME) ÖLDYNAMISCHPLAN SCHEMA HYDRAULIQUE ESQUEMA OLEODINÁMICO (NAV51.15 - NAV51T.15)*	***Pag. 93 di 96***
	Tavola N°F - Rev. 0	**752205100**		**NAV51.15 NAV51T.15 NAV51.15N**

7522-M004-1_B

Butler
ENGINEERING and MARKETING S.P.A.

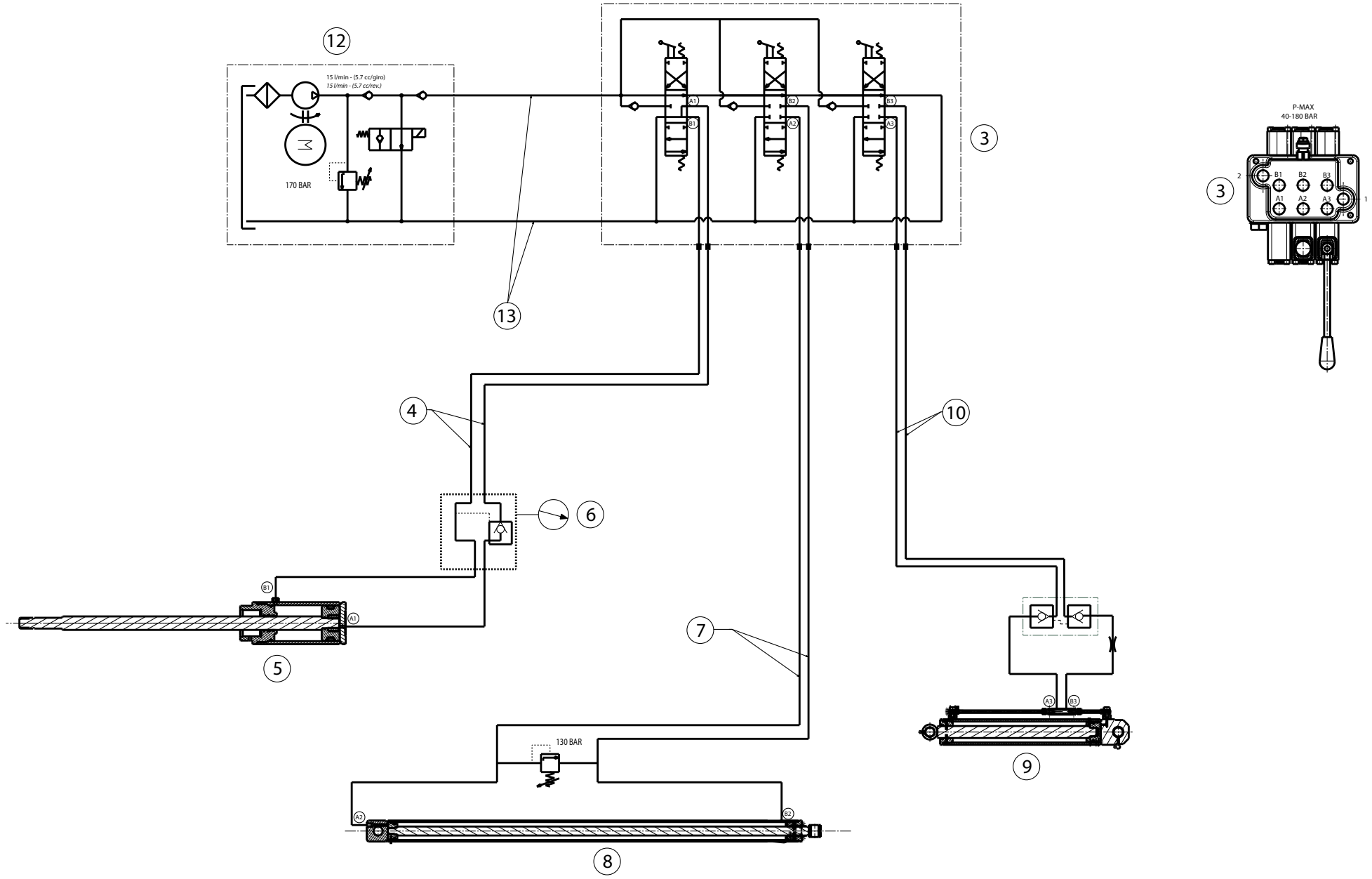
LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°F - Rev. 0 | **752205100**

SCHEMA OLEODINAMICO
HYDRAULIC SCHEME)
ÖLDYNAMISCHPLAN
SCHEMA HYDRAULIQUE
ESQUEMA OLEODINÁMICO
(NAV51.15 - NAV51T.15)

NAV51.15
NAV51T.15
NAV51.15N

N°	Cod.	Descrizione	Description	Beschreibung	Description	Descripción
1	752260380	Tubo oleodinamico 3/16" L=5270	3/16" oil-pressure pipe L=5270	3/16" Öl-Luft Schlauch L=5270	Tuyau oléohydraulique 3/16" L=5270	Tubo oleodinámico 3/16" L=5270
2	752260390	Tubo oleodinamico 3/16" L=5210	3/16" oil-pressure pipe L=5210	3/16" Öl-Luft Schlauch L=5210	Tuyau oléohydraulique 3/16" L=5210	Tubo oleodinámico 3/16" L=5210
3	752260310	Tubo oleodinamico 1/4" L=1460	1/4" oil-pressure pipe L=1460	1/4" Öl-Luft Schlauch L=1460	Tuyau oléohydraulique 1/4" L=1460	Tubo oleodinámico 1/4" L=1460
4	752260300	Tubo oleodinamico 1/4" L=1170	1/4" oil-pressure pipe L=1170	1/4" Öl-Luft Schlauch L=1170	Tuyau oléohydraulique 1/4" L=1170	Tubo oleodinámico 1/4" L=1170
5	752260410	Tubo oleodinamico 3/16" L=5050	3/16" oil-pressure pipe L=5050	3/16" Öl-Luft Schlauch L=5050	Tuyau oléohydraulique 3/16" L=5050	Tubo oleodinámico 3/16" L=5050
6	752260400	Tubo oleodinamico 3/16" L=3960	3/16" oil-pressure pipe L=3960	3/16" Öl-Luft Schlauch L=3960	Tuyau oléohydraulique 3/16" L=3960	Tubo oleodinámico 3/16" L=3960
7	752260430	Tubo oleodinamico 1/4" L=2730	1/4" oil-pressure pipe L=2730	1/4" Öl-Luft Schlauch L=2730	Tuyau oléohydraulique 1/4" L=2730	Tubo oleodinámico 1/4" L=2730
8	752260420	Tubo oleodinamico 3/16" L=5550	3/16" oil-pressure pipe L=5550	3/16" Öl-Luft Schlauch L=5550	Tuyau oléohydraulique 3/16" L=5550	Tubo oleodinámico 3/16" L=5550
9		Cilindro traslazione astuccio utensile	Tool case translation cylinder	Verschiebungszylinder für Werzeugskasten	Cylindre translation étui outil	Cilindro traslado estuche utensilio
10		Cilindro alza/abbassa mandrino	Mandrel up/down cylinder	Zylinder für Anheben-Senken des Spindels	Cylindre soulève/baisse mandrin	Cilindro levanta/baja mandril
11		Cilindro traslazione carro	Carriage shifting cylinder	Zylinder Wagenverschiebung	Cylindre déplacement chariot	Cilindro translazione carro
12		Cilindro alza/abbassa astuccio utensili	Tool case up/down cylinder	Zylinder für Anheben-Senken des Werzeugskasten	Cylindre soulève/baisse étui outils	Cilindro levanta/baja estuche utensilios
13		Cilindro apertura/chiusura mandrino	Mandrel opening/closing cylinder	Zylinder für Öffnung/Schließen des Spindels	Cylindre ouverture/fermeture mandrin	Cilindro abre/cierra mandril
14		Cilindro rotazione utensile	Tool rotation cylinder	Zylinder für Werzeugsdrehung	Cylindre rotation outil	Cilindro rotación utensilio



Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**		*SCHEMA OLEODINAMICO HYDRAULIC SCHEME ÖLDYNAMISCHPLAN SCHEMA HYDRAULIQUE ESQUEMA OLEODINÁMICO (NAV51.15N)*	***Pag. 95 di 96***
	Tavola N°G - Rev. 0	**752205110**		**NAV51.15 NAV51T.15 NAV51.15N**

Butler
ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°G - Rev. 0 | **752205110**

SCHEMA OLEODINAMICO
HYDRAULIC SCHEME
ÖLDYNAMISCHPLAN
SCHEMA HYDRAULIQUE
ESQUEMA OLEODINÁMICO
(NAV51.15N)

NAV51.15
NAV51T.15
NAV51.15N

N°	Cod.	Descrizione	Description	Beschreibung	Description	Descripción
1		*Ingresso centralina*	*Power unit entry*	*Steuerungseintritt*	*Entrée centrale*	*Entrada centralita*
2		*Uscita centralina*	*Power unit exit*	*Steuerungsaustritt*	*Sortie centrale*	*Salida centralita*
3	323054	*Distributore*	*Distributor*	*Verteiler*	*Distributeur*	*Distribuidor*
4	752260440	*Tubo oleodinamico 3/16" L=7620*	*3/16" oil-pressure pipe L=7620*	*3/16" Öl-Luft Schlauch L=7620*	*Tuyau oléohydraulique 3/16" L=7620*	*Tubo oleodinámico 3/16" L=7620*
5	752290460	*Cilindro a stelo corto*	*Short rod cylinder*	*Kurzerstangezylinder*	*Cylindre tige court*	*Cilindro vástago corto*
6	752216020	*Valvola blocco mandrino SE*	*SE mandrel block valve*	*Ventilspindelsblock SE*	*Vanne bloc mandrin SE*	*Válvula bloqueo mandril SE*
7	752260470	*Tubo oleodinamico 3/16" L=5635*	*3/16" oil-pressure pipe L=5635*	*3/16" Öl-Luft Schlauch L=5635*	*Tuyau oléohydraulique 3/16" L=5635*	*Tubo oleodinámico 3/16" L=5635*
8	752290530	*Cilindro carro*	*Carriage cylinder*	*Wagenzylinder*	*Cylindre chariot*	*Cilindro carro*
9	752290700	*Cilindro D.70*	*D. 70 cylinder*	*Zylinder D.70*	*Cylindre D. 70*	*Cilindro D. 70*
10	752260450	*Tubo oleodinamico 3/16" L=5800*	*3/16" oil-pressure pipe L=5800*	*3/16" Öl-Luft Schlauch L=5800*	*Tuyau oléohydraulique 3/16" L=5800*	*Tubo oleodinámico 3/16" L=5800*
A1		*Apertura mandrino*	*Mandrel opening*	*Spilndelöffnung*	*Ouverture mandrin*	*Abertura mandril*
B1		*Chiusura mandrino*	*Mandrel closing*	*Spindelsschließen*	*Fermeture mandrin*	*Cierre mandril*
A2		*Avanti braccio stallonatore*	*Bead breaker arm forward*	*Abdrückerarm vorwärts*	*Bras décolle-talons en avant*	*Bras décolle-talons en avant*
B2		*Indietro braccio stallonatore*	*Bead breaker arm backward*	*Abdrückerarm zurück*	*Bras décolle-talons arrière*	*Brazo destalonador atrás*
A3		*Giù mandrino*	*Mandrel down*	*Spindel unten*	*Mandrin bas*	*Mandril abajo*
B3		*Su mandrino*	*Mandrel up*	*Spindel oben*	*Mandrin haut*	*Mandril arriba*

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7522-R004-1_B

NAV51.15
NAV51T.15
NAV51.15N

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.

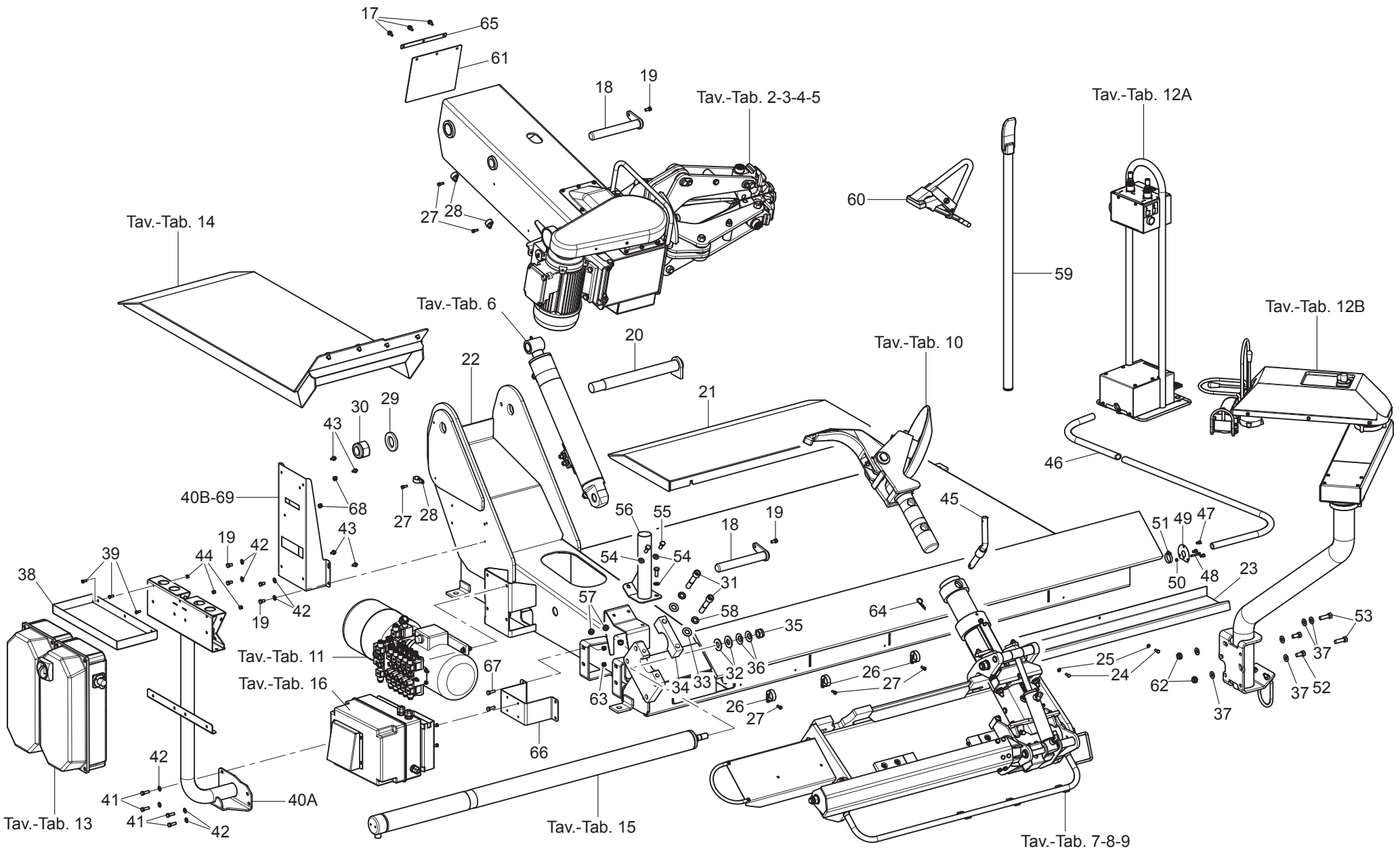
LOS DIBUJOS EN DESPIECE SIRVEN ÚNICAMENTE PARA IDENTIFICAR LAS PIEZAS QUE DEBEN SUSTITUIRSE. LA SUSTITUCIÓN DE PIEZAS DEBE EFECTUARLA EXCLUSIVAMENTE PERSONAL PROFESIONALMENTE CUALIFICADO.

- 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

7522-R004-1_B - Rev. n. 1 (11/2015)

SOMMARIO - SUMMARY - INHALT SOMMAIRE - SUMARIO


17
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19
Tav.-Tab. 2-3-4-5
27
28
Tav.-Tab. 14
60
59
Tav.-Tab. 12A
Tav.-Tab. 6
20
Tav.-Tab. 10
Tav.-Tab. 12B
22
21
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43
46
40B-69
68
27
28
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42
Tav.-Tab. 11
67
Tav.-Tab. 16
63
34
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37
52
26
27
66
42
41
40A
41
42
Tav.-Tab. 13
Tav.-Tab. 15
Tav.-Tab. 7-8-9

Tav./Pos.	Cod.	NAV51.15	NAV51T.15	NAV51.15N	
2	752292640	●	●	●	
3	752292650	●	●	●	
4	B9641000	●	●	●	
5	752292660	●	●	●	
6	752292670	●	●	●	
7A	752292500	●	●		
7B	752292560			●	
8	752292490	●	●		
9	752292470	●	●		
10A	752290890	●			
10B	752292290		●		
10C	752292450			●	
11A	752292540	●	●		
11B	752292580			●	
12A	752292550	●	●		
12B	752291680			●	
12C	752291171*	●	●		
12D	752293000□			●	
12E	750590410□			●	
13A	752203150	●	●		
13B	752203050			●	
13C	752203190*	●	●		
13D	752203200■	●	●		
14	752292680	●	●	●	
15	752290530	●	●	●	
16	752293030■	●	●		

Tav./Pos.	Cod.	NAV51.15	NAV51T.15	NAV51.15N	
17	272019	●	●	●	
18	752215280	●	●	●	
19	203035	●	●	●	
20	752219340	●	●	●	
21	752233600	●	●	●	
22	752232380	●	●	●	
23A	752228580	●	●		
23B	752228780			●	
24	203019	●	●	●	
25	236004	●	●	●	
26	B5871000	●	●	●	
27	206019	●	●	●	
28	B6131000	●	●	●	
29	752222530	●	●	●	
30	228045	●	●	●	
31	206504	●	●	●	
32	237064	●	●	●	
33	236009	●	●	●	
34	752216600	●	●	●	
35	228019	●	●	●	
36	253018	●	●	●	
37	237025			●	
38	752217780	●	●		
39	266019	●	●		
40A	752233070	●	●		
40B	752224250			●	

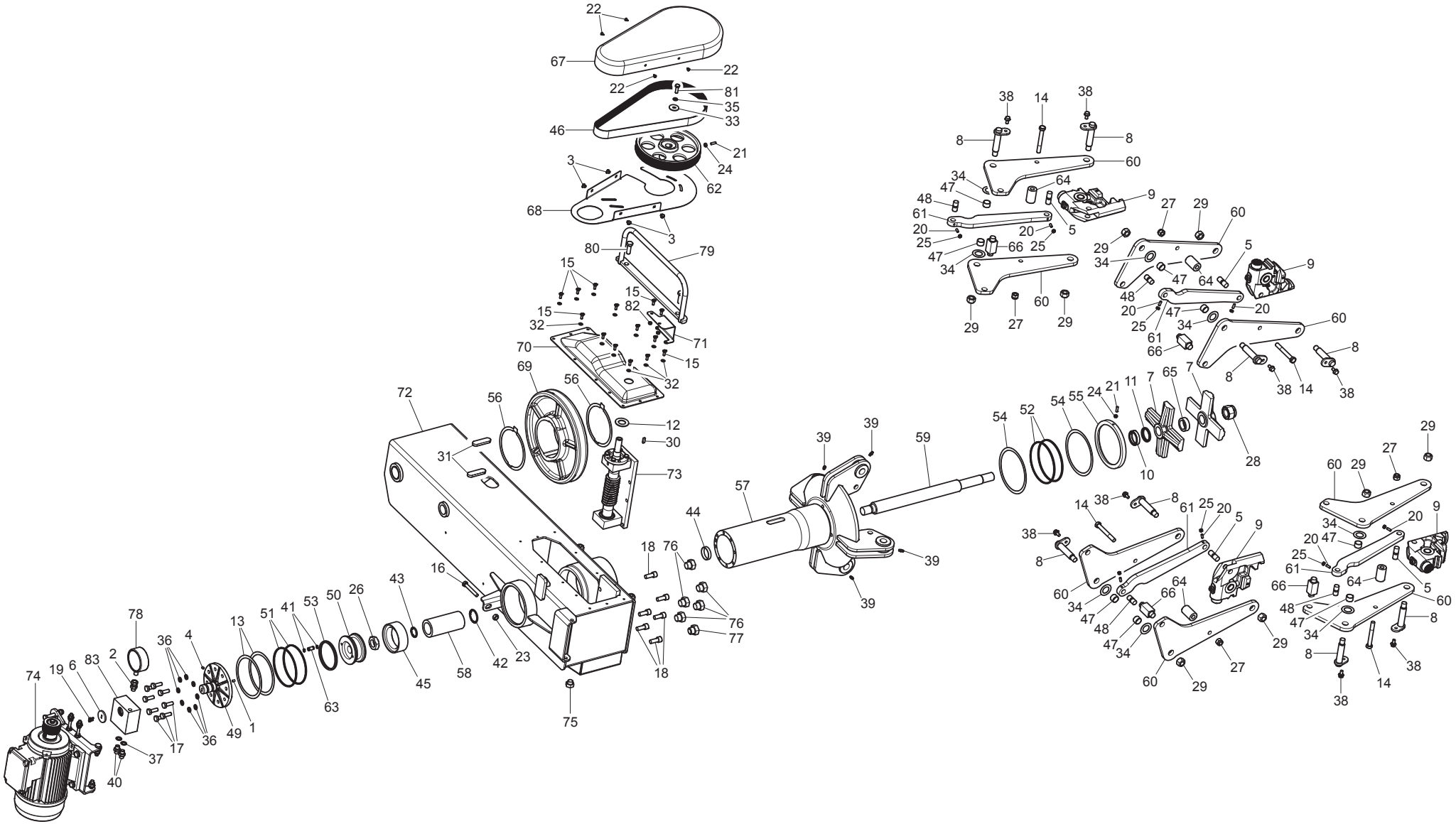
Tav./Pos.	*Cod.*	*NAV51.15*	*NAV51T.15*	*NAV51.15N*	
41	203038	●	●		
42	236006	●	●		
43	220068			●	
44	228010	●	●		
45	752226140	●	●		
46	752233860	●	●		
47	206012	●	●		
48	203330	●	●		
49	750514700	●	●		
50	224005	●	●		
51	319004	●	●		
52	203186			●	
53	203223			●	
54	236007			●	
55	203058			●	
56	752233990			●	
57	228012			●	
58	238020	●	●	●	
59	B5119000	●	●	●	
60	14620010	●	●	●	
61	752227440	●	●	●	
62	228014			●	
63	228017	●	●		
64	299119	●	●		
65	752227450	●	●	●	
66	752234960■	●	●		

Tav./Pos.	Cod.	NAV51.15	NAV51T.15	NAV51.15N	
67	203040■	●	●		
68	228100□			●	
69	752224250□			●	

NAV51.15 - NAV51T.15
* Particolari validi nella versione con manipolatore Bluetooth
* Valid parts for Bluetooth handle control version
* Gültige Details für Version mit Bluetooth-Manipulator
* Détails valides dans la version avec manipulateur Bluetooth
* Detalles válidos en la versión con manipulador Bluetooth

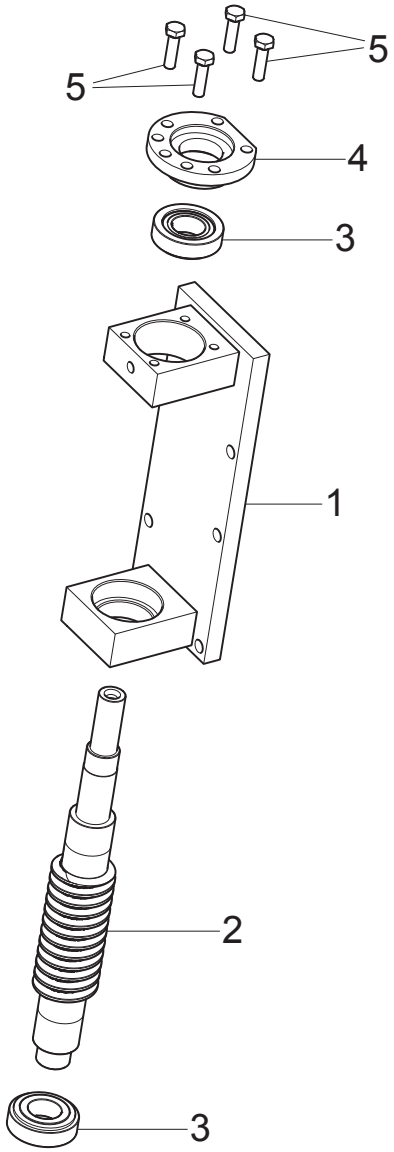
NAV51.15 - NAV51T.15
■ Particolari validi nella variante con inverter
■ Parts valid for version with inverter
■ Gültige Teile für Version mit Inverter
■ Détails valides en la version avec inverseur
■ Componentes válidos en la versión con inversor

NAV51.15N
□ Particolari validi nella versione manipolatore a terra
□ Valid parts for ground handle control version
□ Gültige Details für Version mit Manipulator auf dem Boden
□ Détails valides dans la version avec manipulateur à terre
□ Detalles válidos en la versión con manipulador en tierra



NAV51.15	NAV51T.15	NAV51.15N	
●	●	●	

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO BRACCIO MANDRINO MANDREL ARM UNIT SPINDELARMSATZ GROUPE BRAS MANDRIN GRUPO BRAZO MANDRIL*	***Pag. 9 di 35***
	Tavola N°2 - Rev. 0 / **752292640**		



NAV51.15	NAV51T.15	NAV51.15N	
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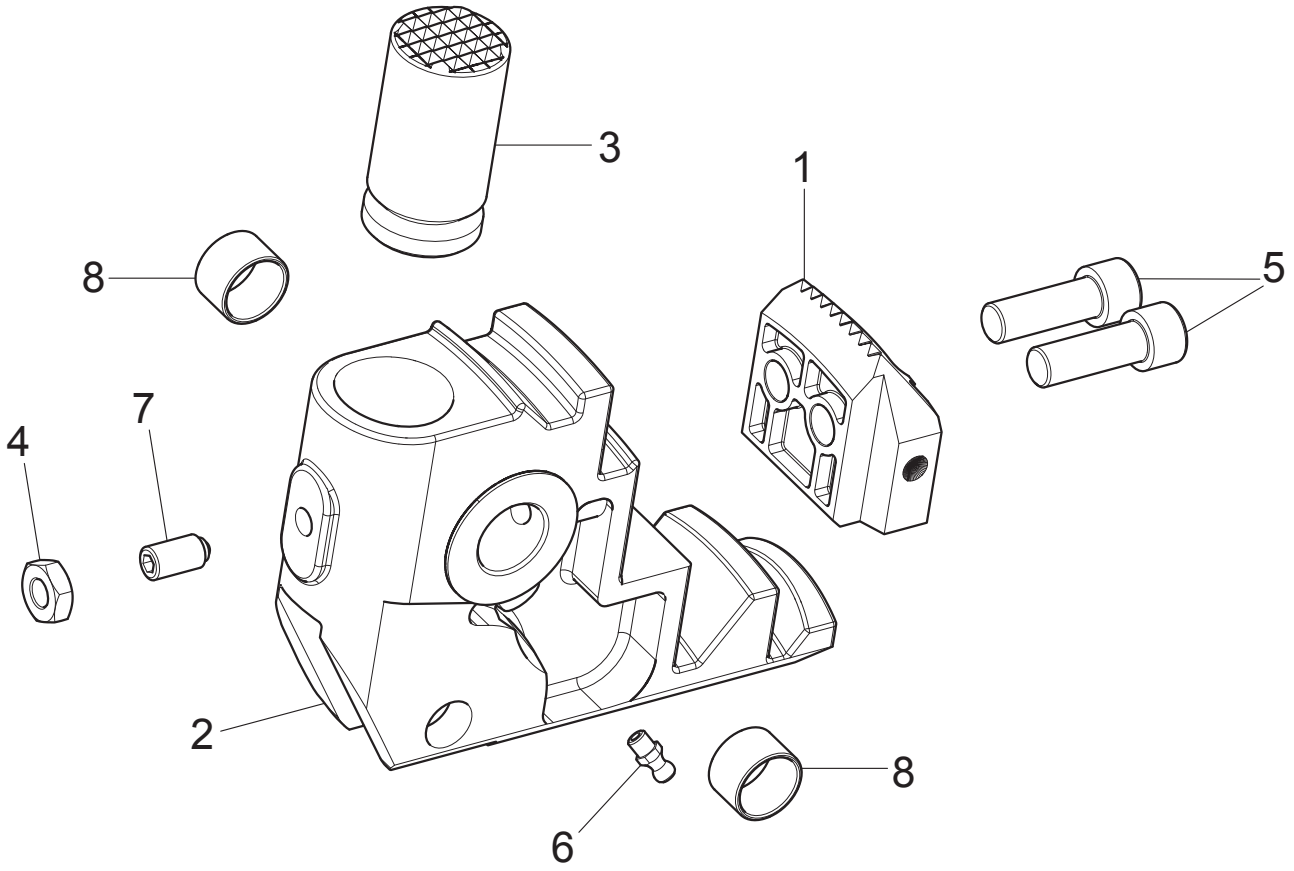
Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO SUPPORTO CON VITE SUPPORT UNIT WITH SCREW TRÄGERSATZ MIT SCHRAUBE GROUPE SUPPORT AVEC VIS GRUPO SOPORTE CON TORNILLO*	***Pag. 10 di 35***
	Tavola N°3 - Rev. 0 / **752292650**		



NAV51.15	NAV51T.15	NAV51.15N	
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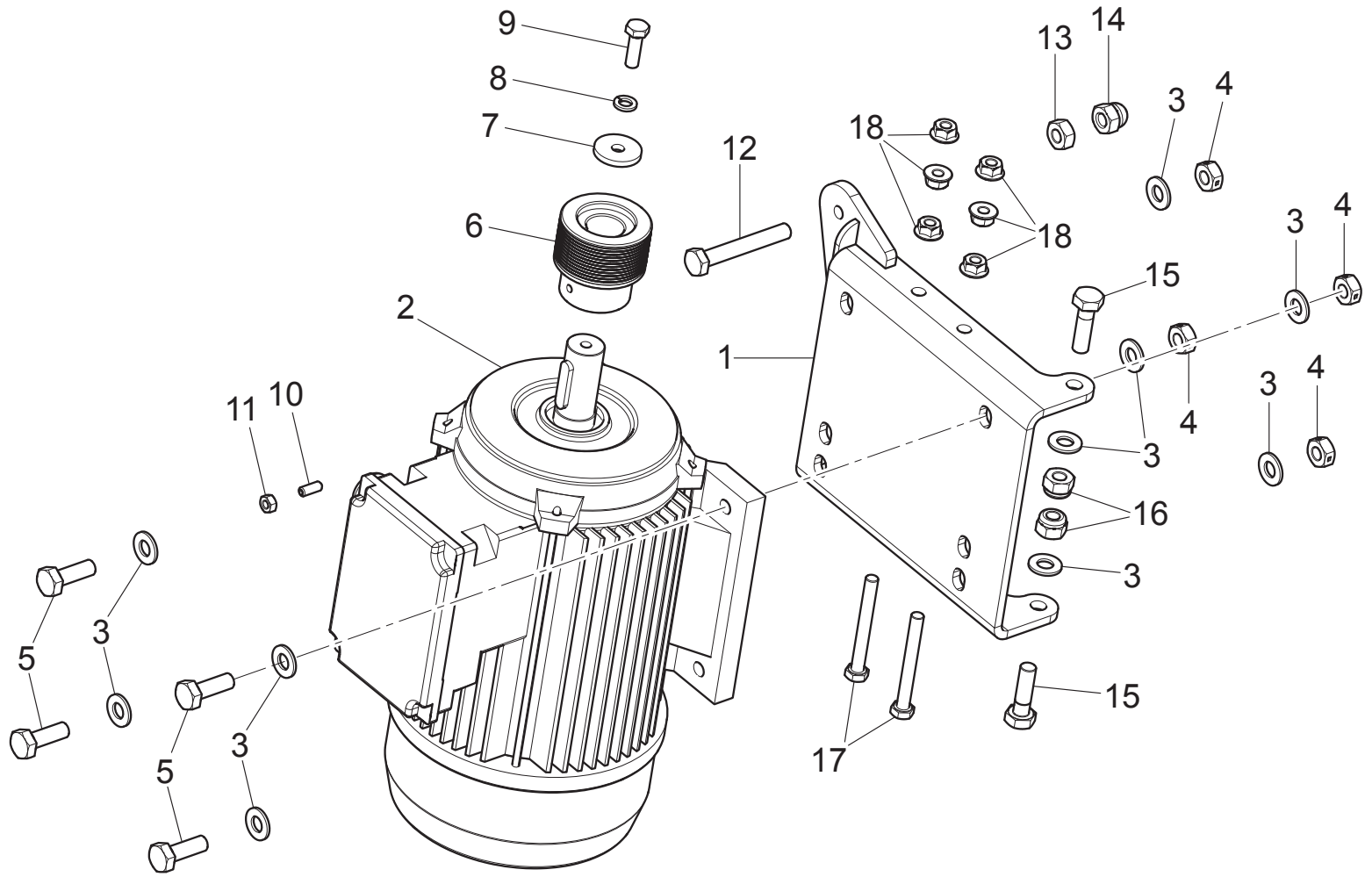
Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°4 - Rev. 0 | **B9641000**

GRIFFA COMPLETA
COMPLETE JAW
KOMPLETTE KLAUE
GRIFFE COMPLÈTE
GANCHO COMPLETO



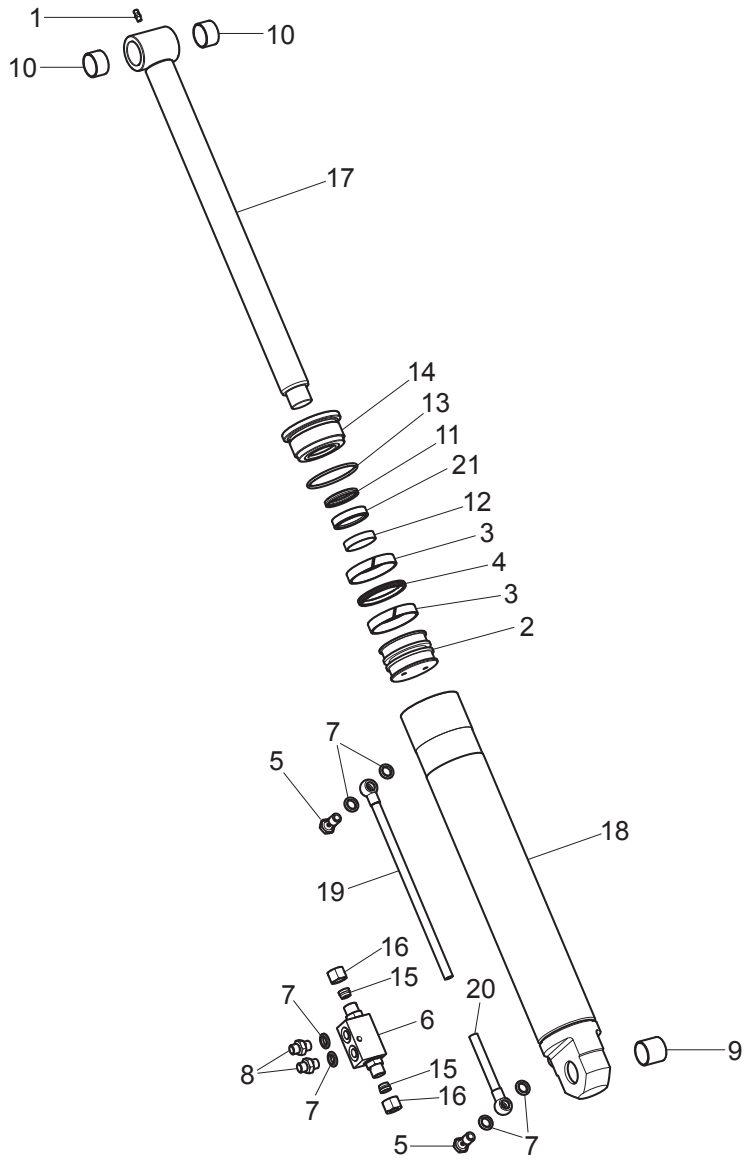
NAV51.15	NAV51T.15	NAV51.15N	
•	•	•	

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°5 - Rev. 0 | **752292660**

GRUPPO SUPPORTO CON MOTORE
SUPPORT UNIT WITH MOTOR
TRÄGERSATZ MIT MOTOR
GROUPE SUPPORT AVEC MOTEUR
GRUPO SOPORTE CON MOTOR



NAV51.15	NAV51T.15	NAV51.15N	
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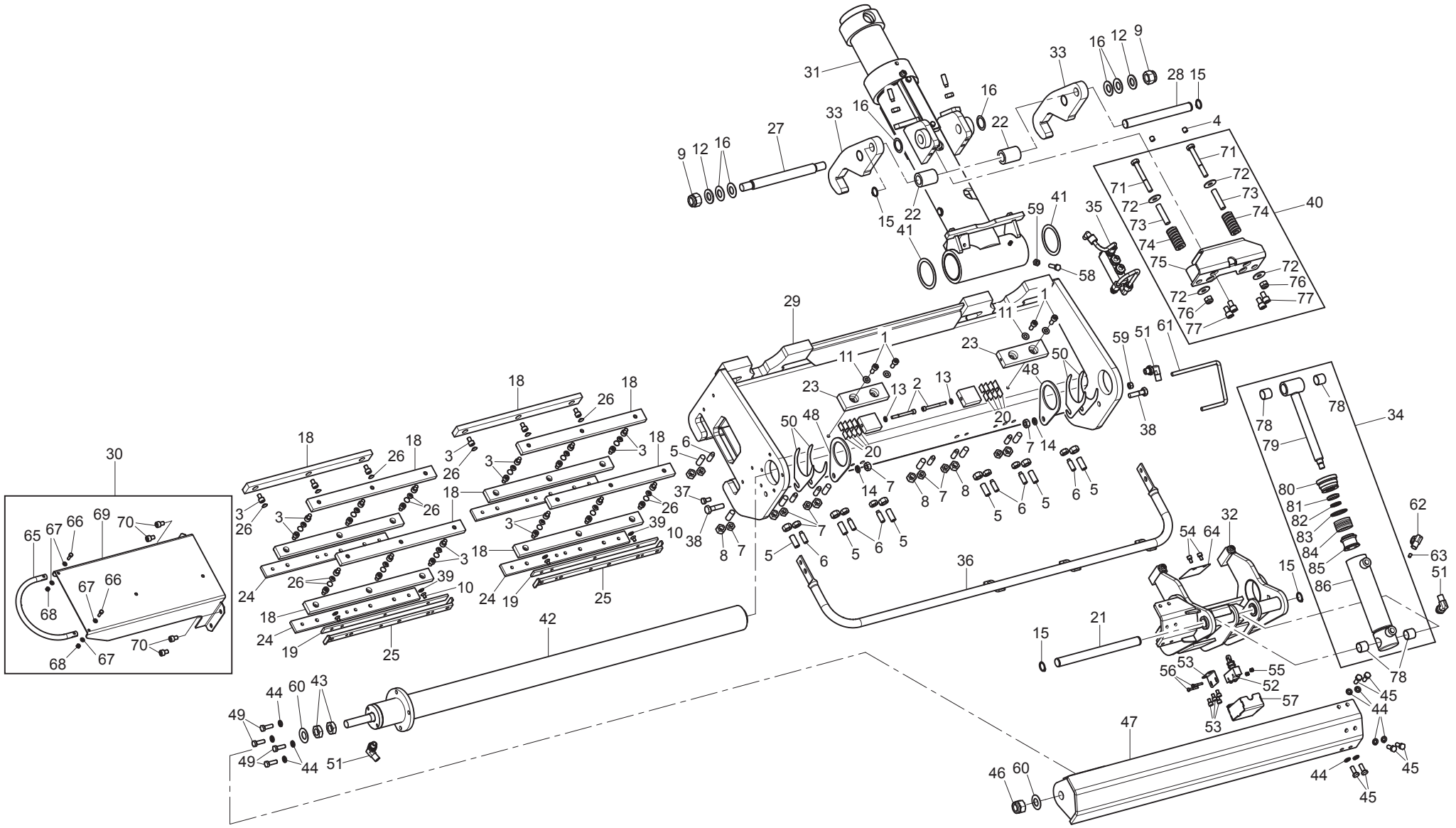
Butler
ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°6 - Rev. 0 | **752292670**

CILINDRO D.70
D. 70 CYLINDER
ZYLINDER D.70
CYLINDRE D. 70
CILINDRO D. 70



NAV51.15	NAV51T.15	NAV51.15N	
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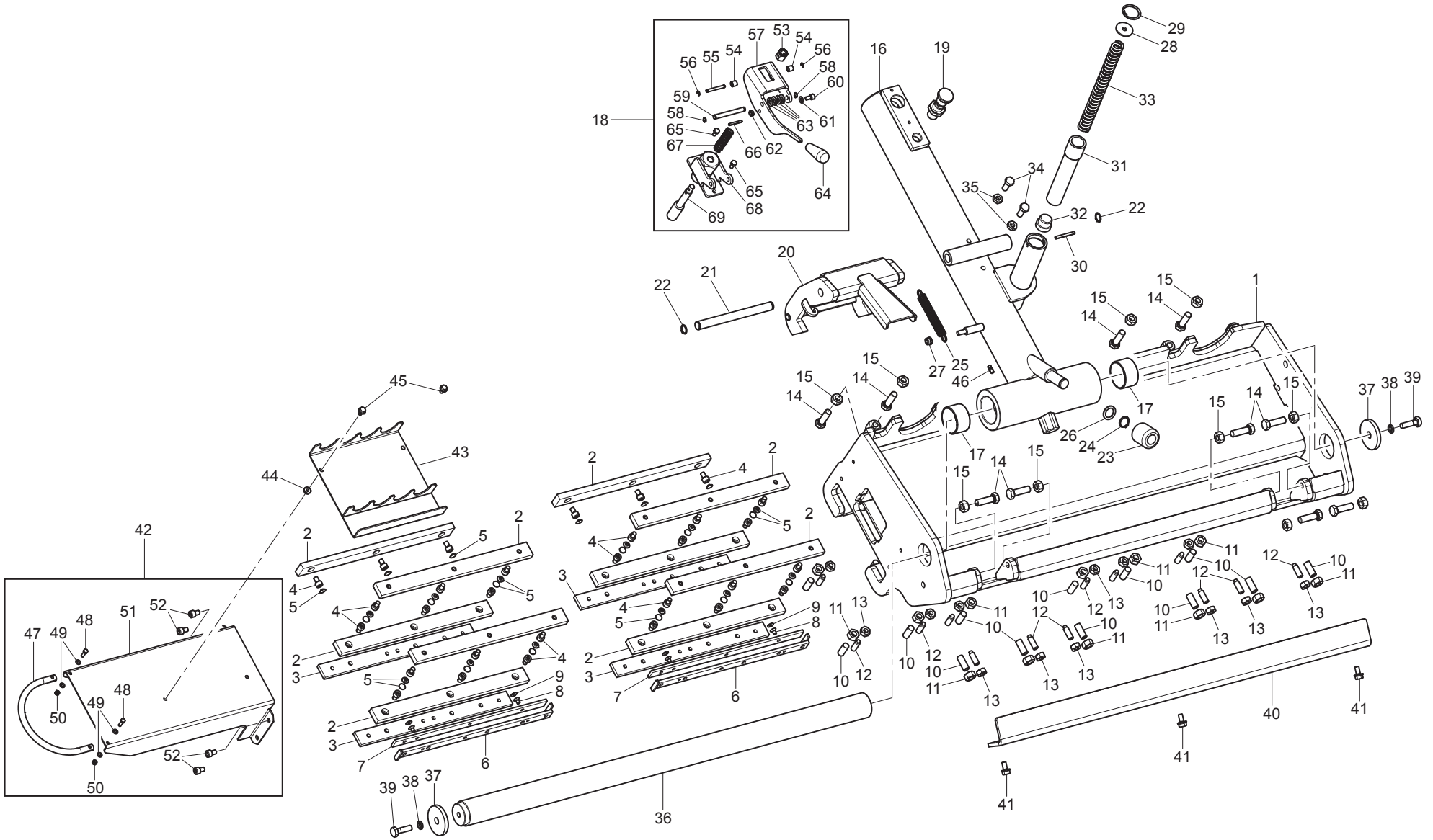
Butler
ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°7A - Rev. 0 | **752292500**

GRUPPO CARRO UTENSILI
TOOLS CARRIAGE UNIT
WERKZEUGSWAGENSATZ
GROUPE CHARIOT OUTILES
GRUPO CARRO UTENSILIOS



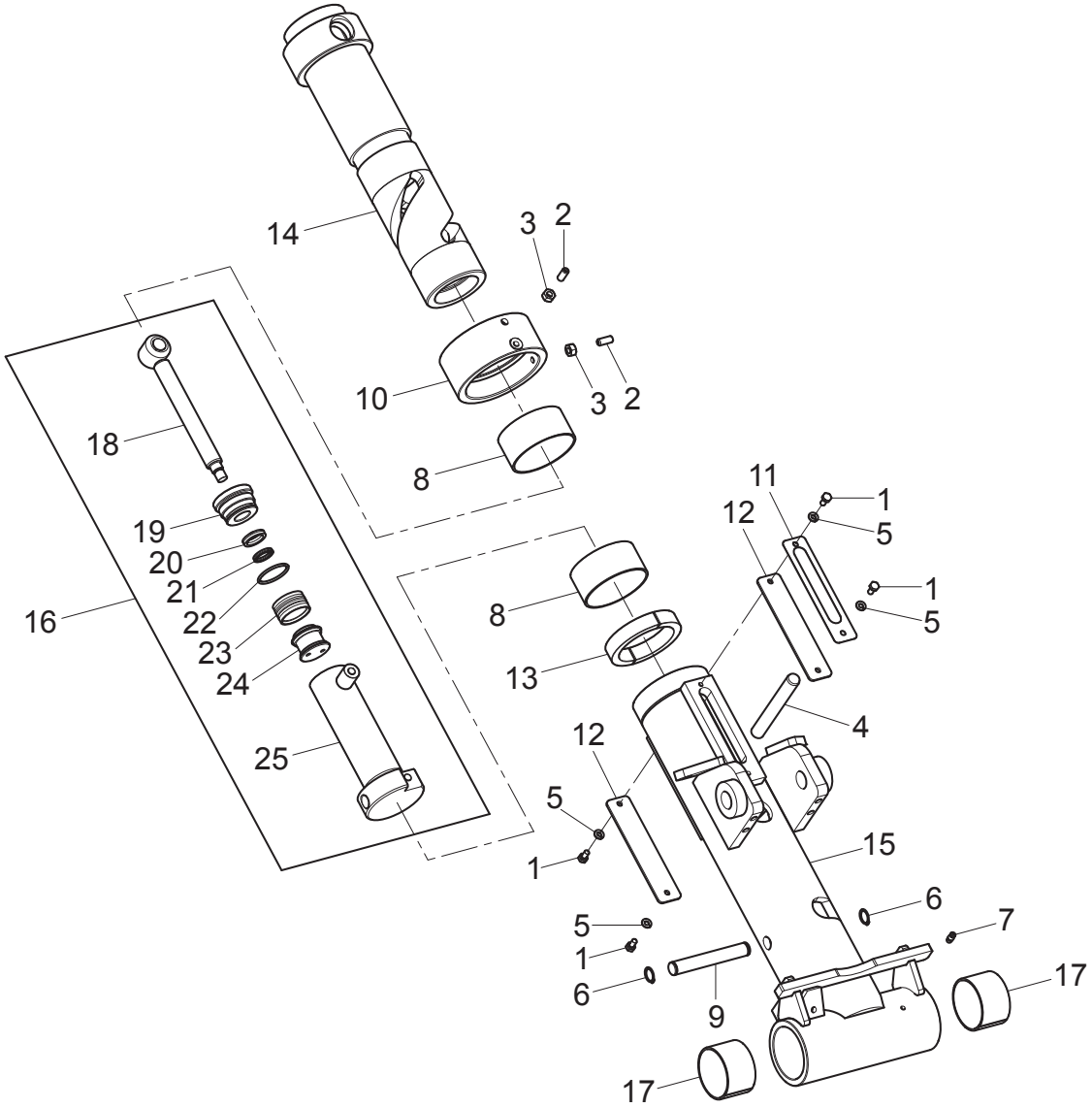
NAV51.15	NAV51T.15	NAV51.15N	
		●	

Butler
ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

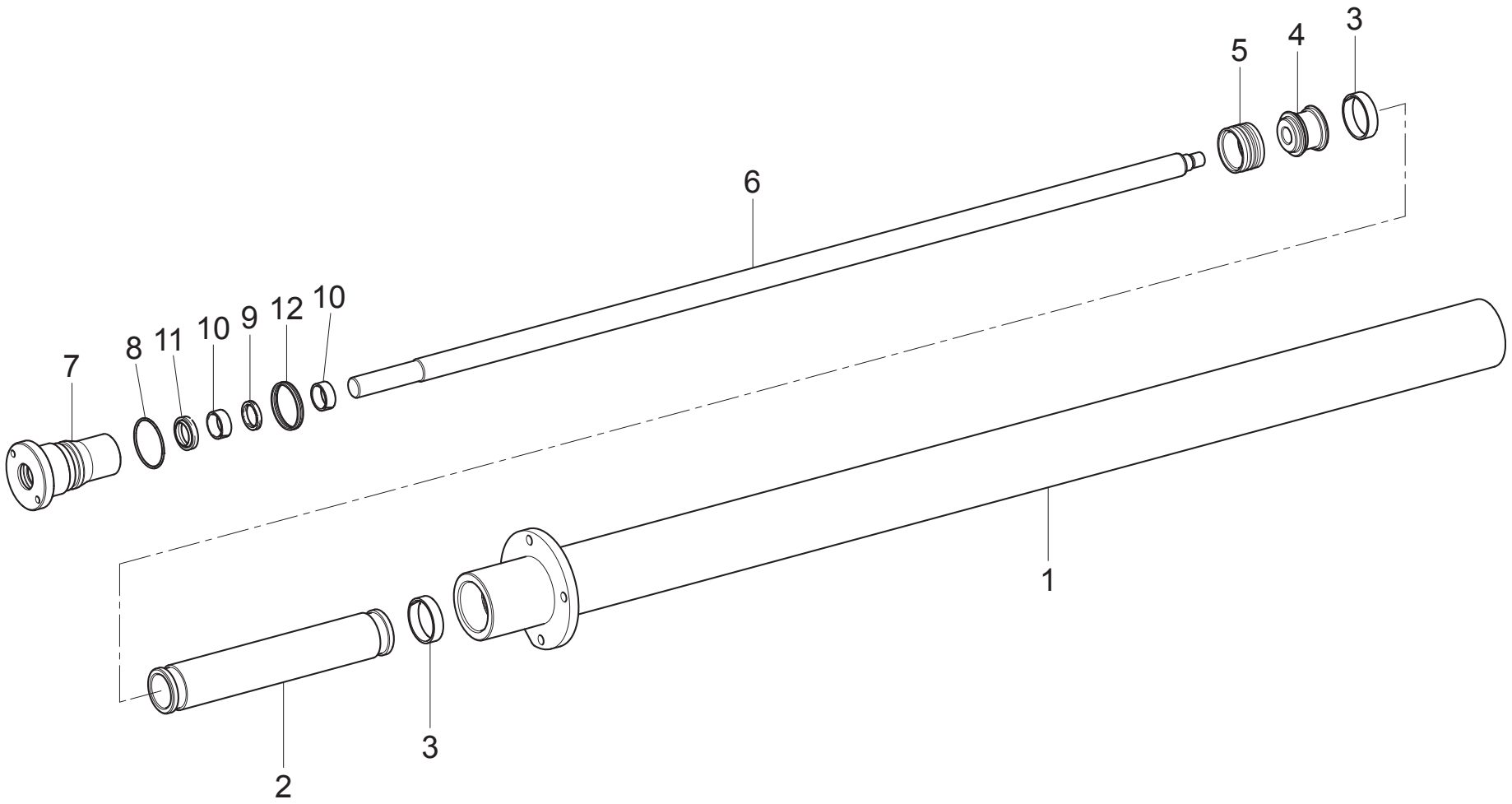
Tavola N°7B - Rev. 0 | **752292560**

INSIEME CARRO MANUALE
MANUAL CARRIAGE ASSEMBLY
HANDWAGENSATZ
ASSEMBLAGE CHARIOT MANUEL
CONJUNTO CARRO MANUAL



NAV51.15	NAV51T.15	NAV51.15N	
•	•		

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO ASTUCCIO CASE UNIT KASTENSATZ GROUPE ÉTUI GRUPO ESTUCHE*	***Pag. 16 di 35***
	Tavola N°8 - Rev. 0 / **752292490**		



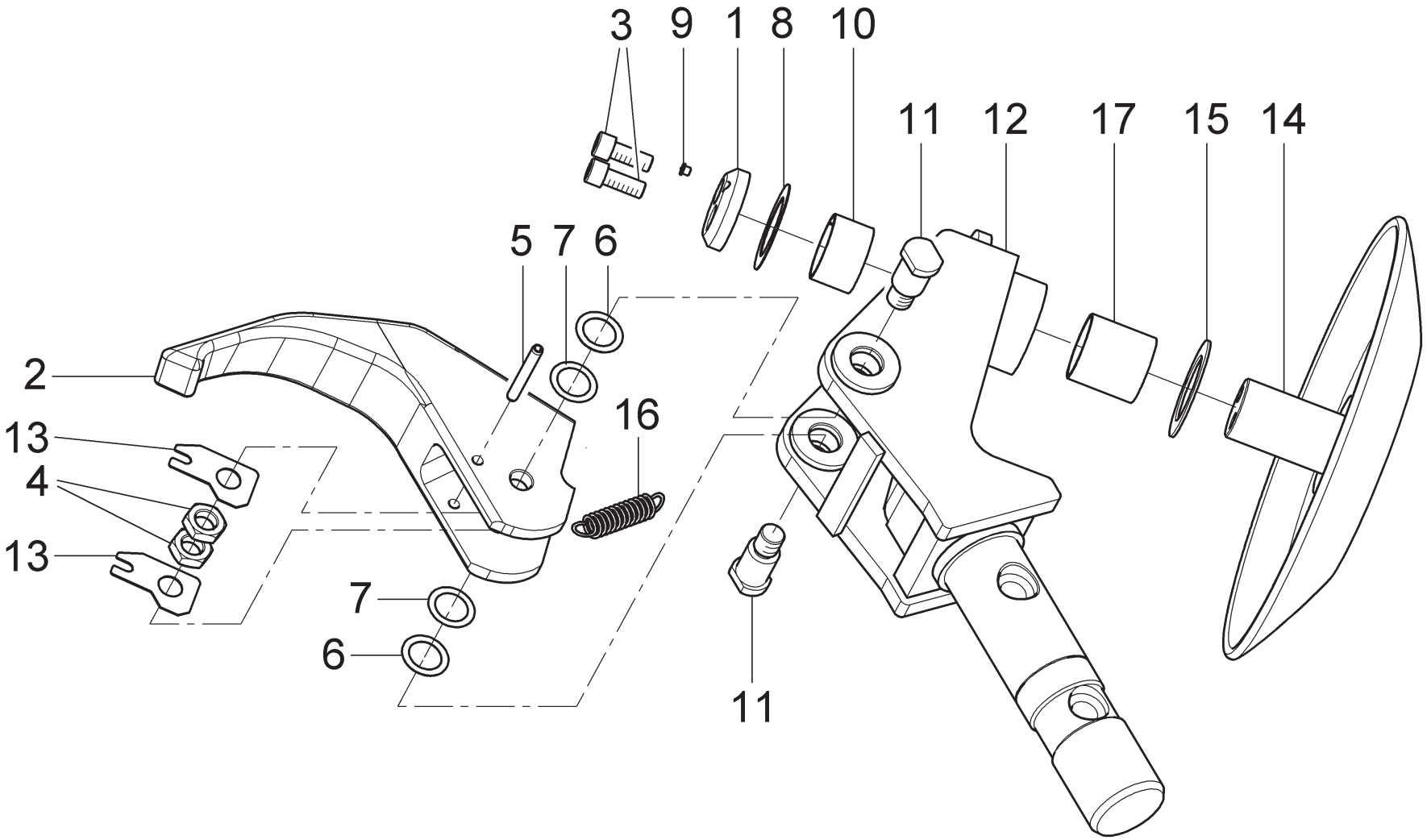
NAV51.15	NAV51T.15	NAV51.15N	
•	•		

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

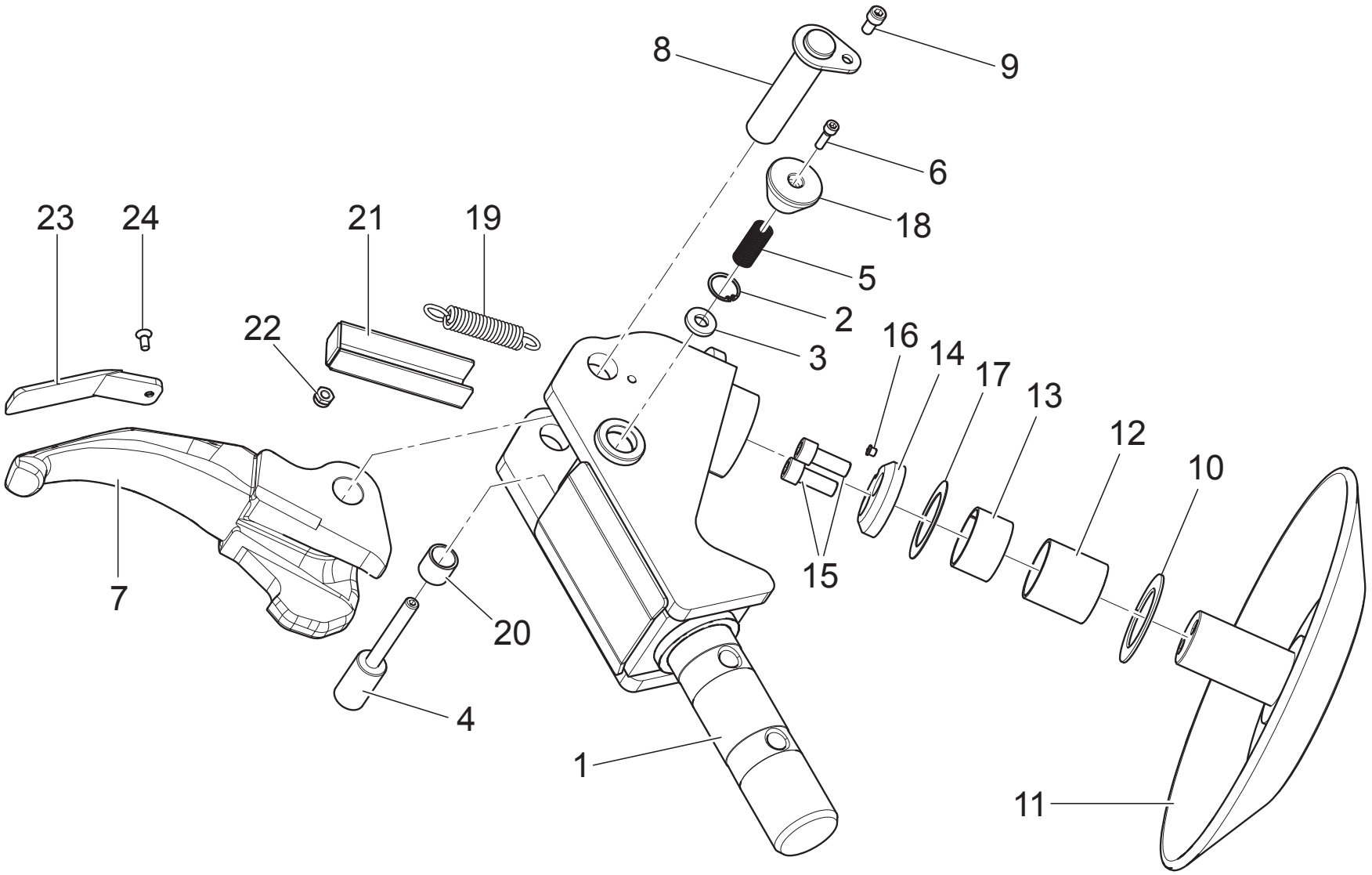
Tavola N°9 - Rev. 0 | **752292470**

CILINDRO IDRAULICO 40X700X20
40X700X20 HYDRAULIC CYLINDER
HYDRAULIKZYLINDER 40X700X20
CYLINDRE HYDRAULIQUE 40X700X20
CILINDRO HIDRÁULICO 40X700X20



NAV51.15	NAV51T.15	NAV51.15N	
•			

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO UTENSILI TOOLS UNIT WERKZEUGSATZ GROUPE OUTILES GRUPO UTENSILIOS*	***Pag. 18 di 35***
	Tavola N°10A - Rev. 0 / **752290890**		



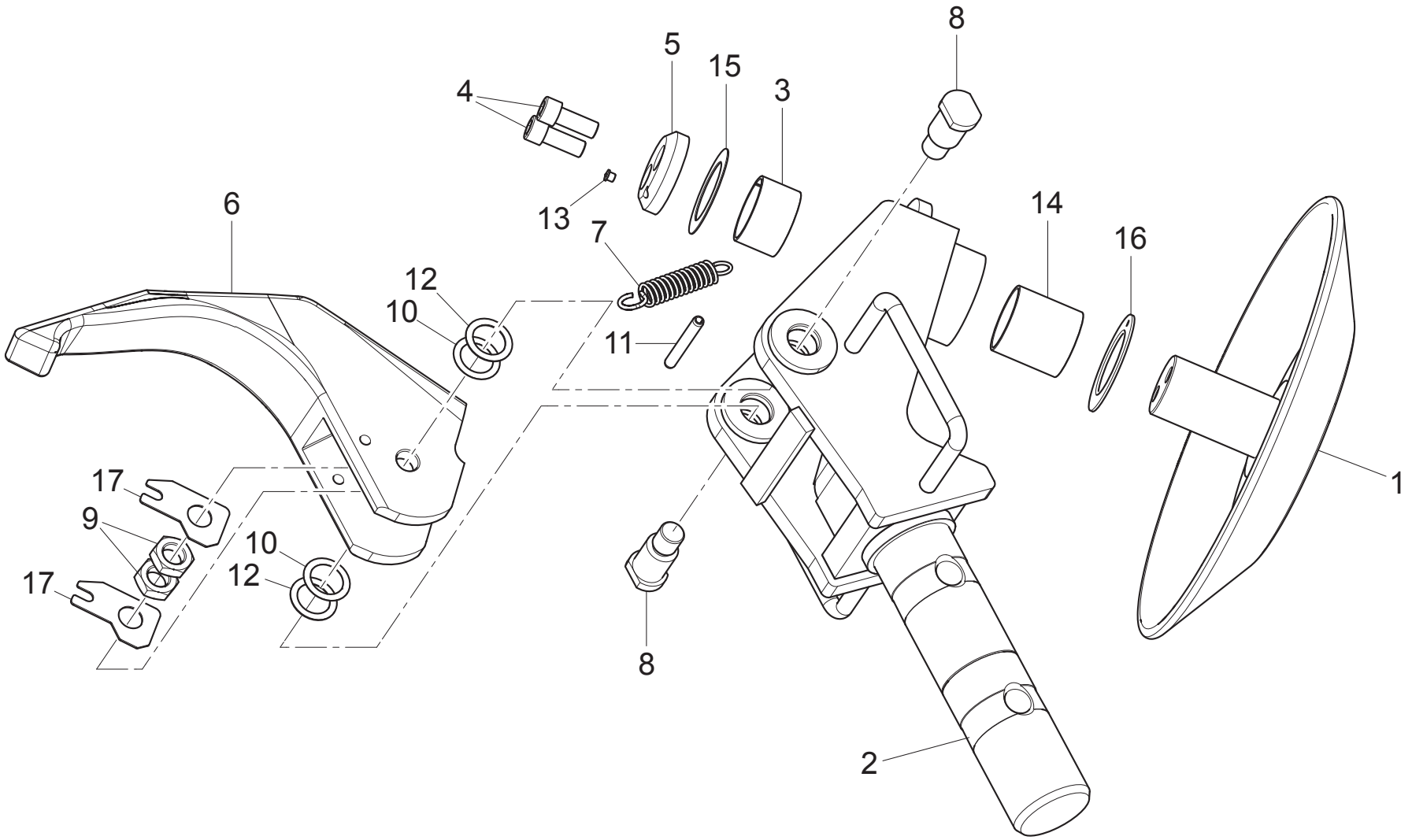
NAV51.15	NAV51T.15	NAV51.15N	
	•		

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

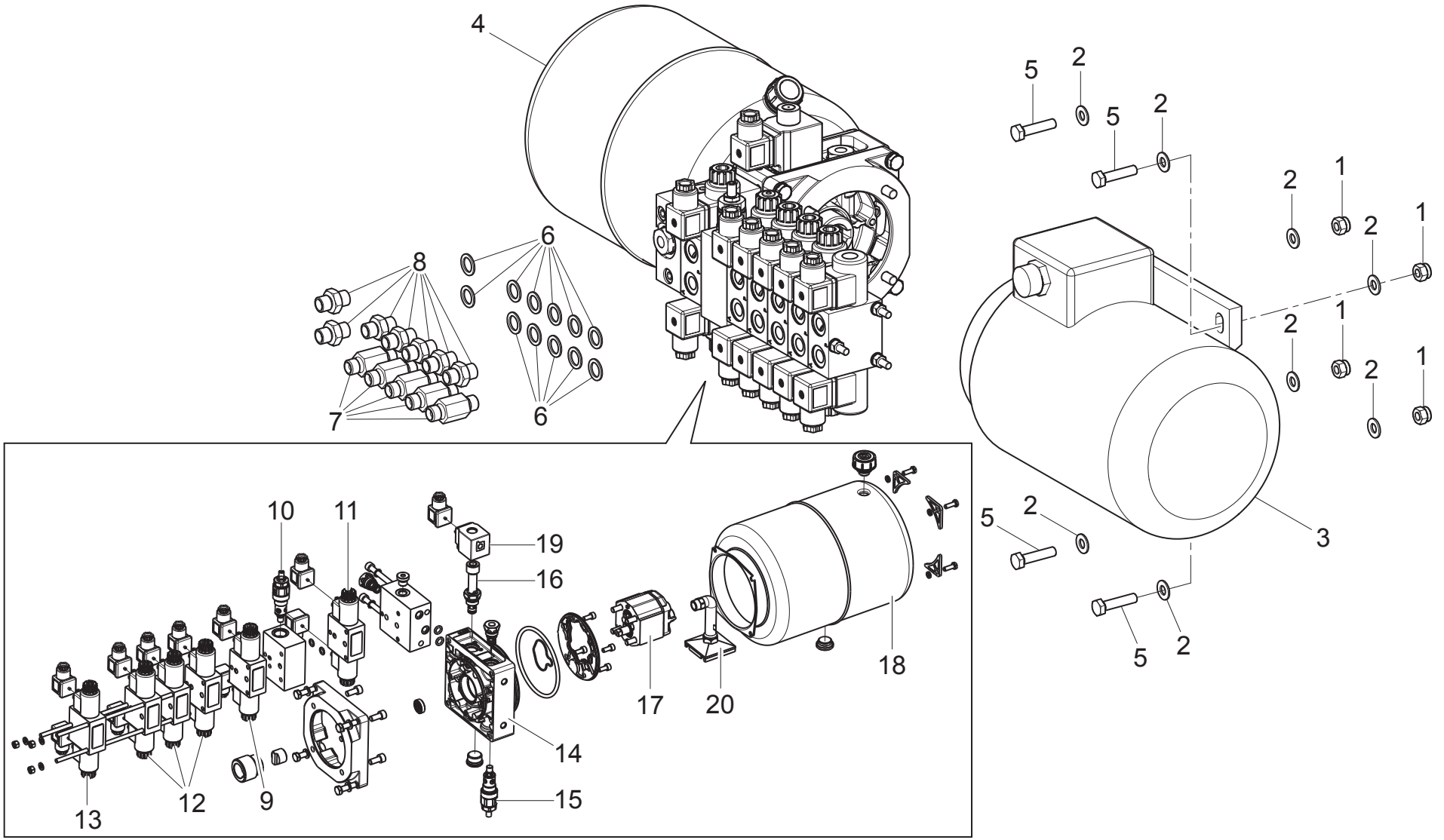
Tavola N°10B - Rev. 0 | **752292290**

GRUPPO UTENSILI SENZA LEVA
TOOLS UNIT WITHOUT LEVER
WERKZEUGSATZ OHNE HEBEL
GROUPE OUTILES SANS LEVIER
GRUPO UTENSILIOS SINE PALANCA



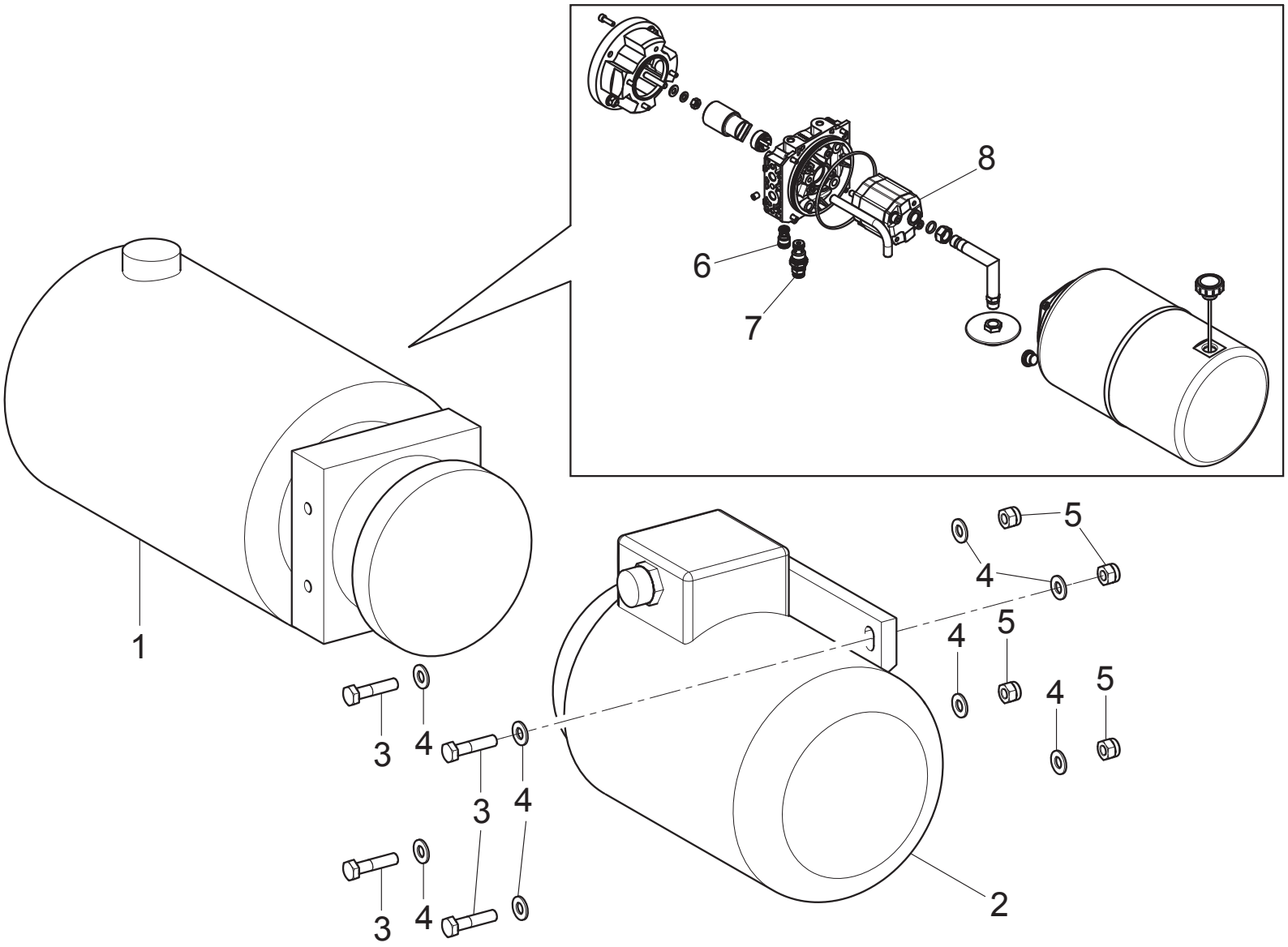
NAV51.15	NAV51T.15	NAV51.15N	
		•	

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO UTENSILE D.60 CON MANIGLIE TOOL UNIT D.60 WITH HANDLES WERKZEUGSATZ D.60 MIT GRIFFEN GROUPE OUTIL D.60 AVEC POIGNÉES GRUPO UTENSILIO D.60 CON MANIJAS*	***Pag. 20 di 35***
	Tavola N°10C - Rev. 0 / **752292450**		



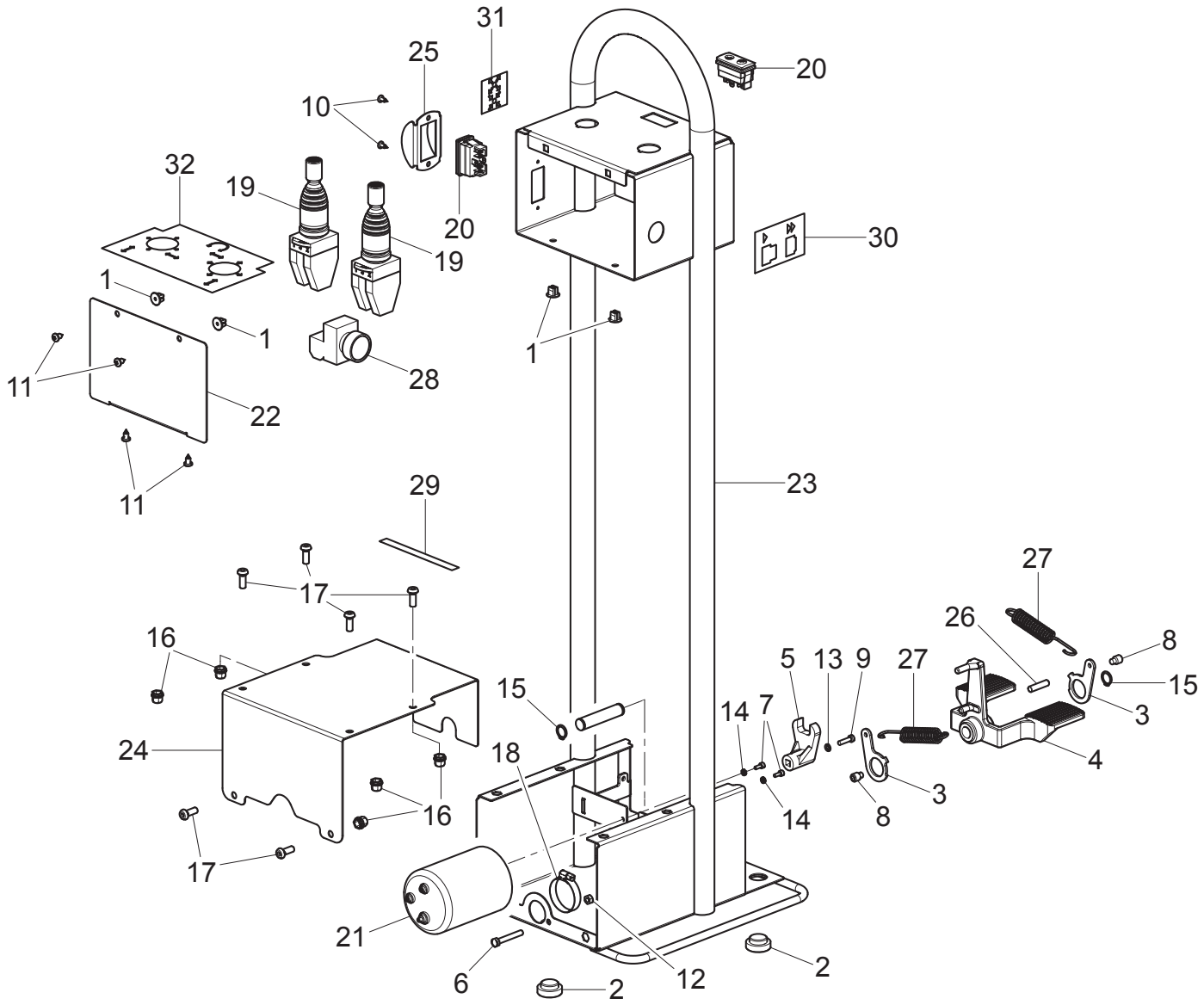
NAV51.15	NAV51T.15	NAV51.15N	
•	•		

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO CENTRALINA HYDRAULIC POWER UNIT ASSEMBLY STEUERUNGSATZ GROUPE DISTRIBUTEUR GRUPO CENTRALITA*	***Pag. 21 di 35***
	Tavola N°11A - Rev. 0 / **752292540**		



NAV51.15	NAV51T.15	NAV51.15N	
		•	

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO CENTRALINA HYDRAULIC POWER UNIT ASSEMBLY STEUERUNGSATZ GROUPE DISTRIBUTEUR GRUPO CENTRALITA*	***Pag. 22 di 35***
	Tavola N°11B - Rev. 0 / **752292580**		



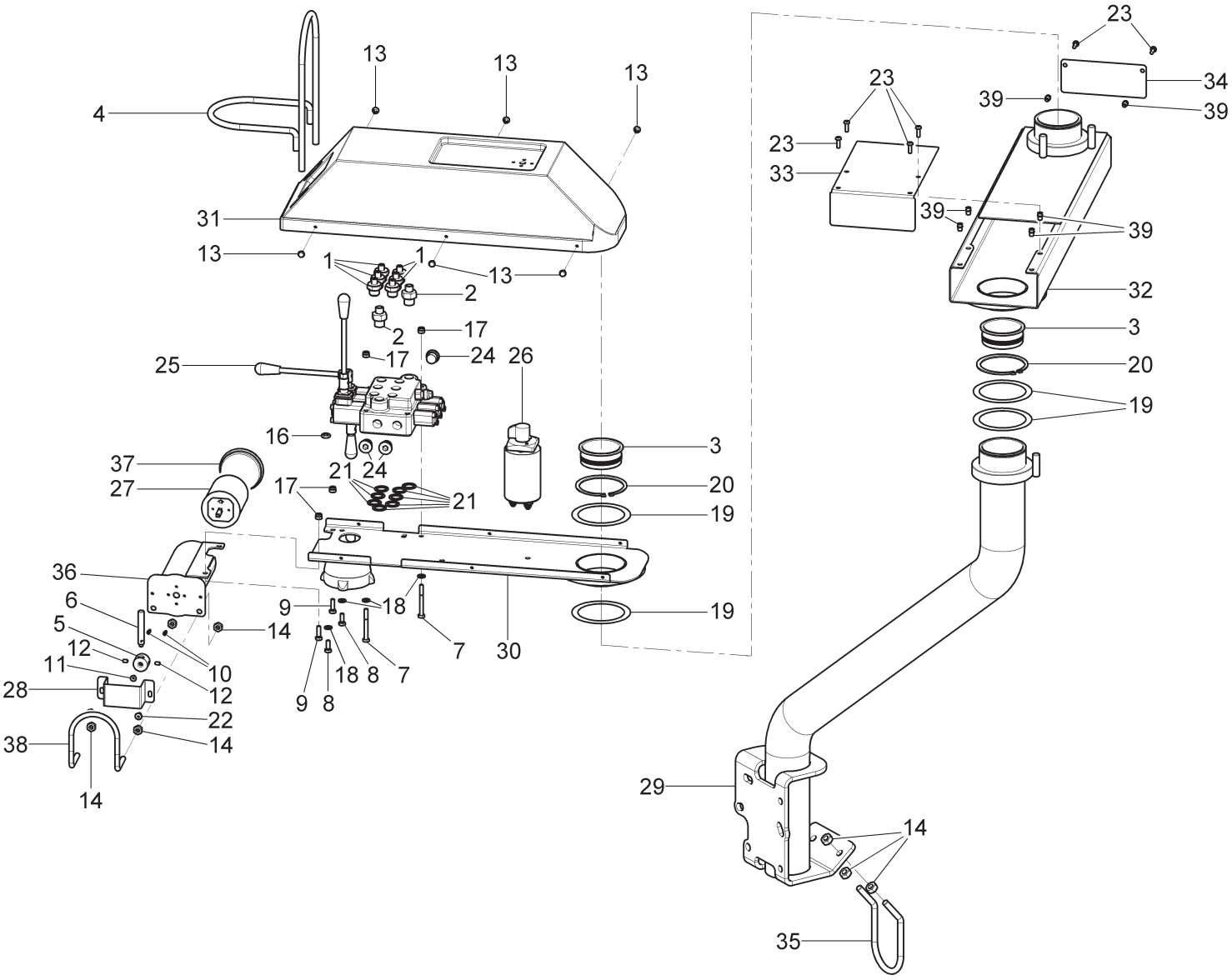
NAV51.15	NAV51T.15	NAV51.15N	
•	•		

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°12A - Rev. 0 | **752292550**

GRUPPO COLONNETTA COMANDI
CONTROLS COLUMN UNIT
SATZ BEFEHLESÄULE
GROUPE COLONNE COMMANDES
GRUPO COLUMNA MANDOS



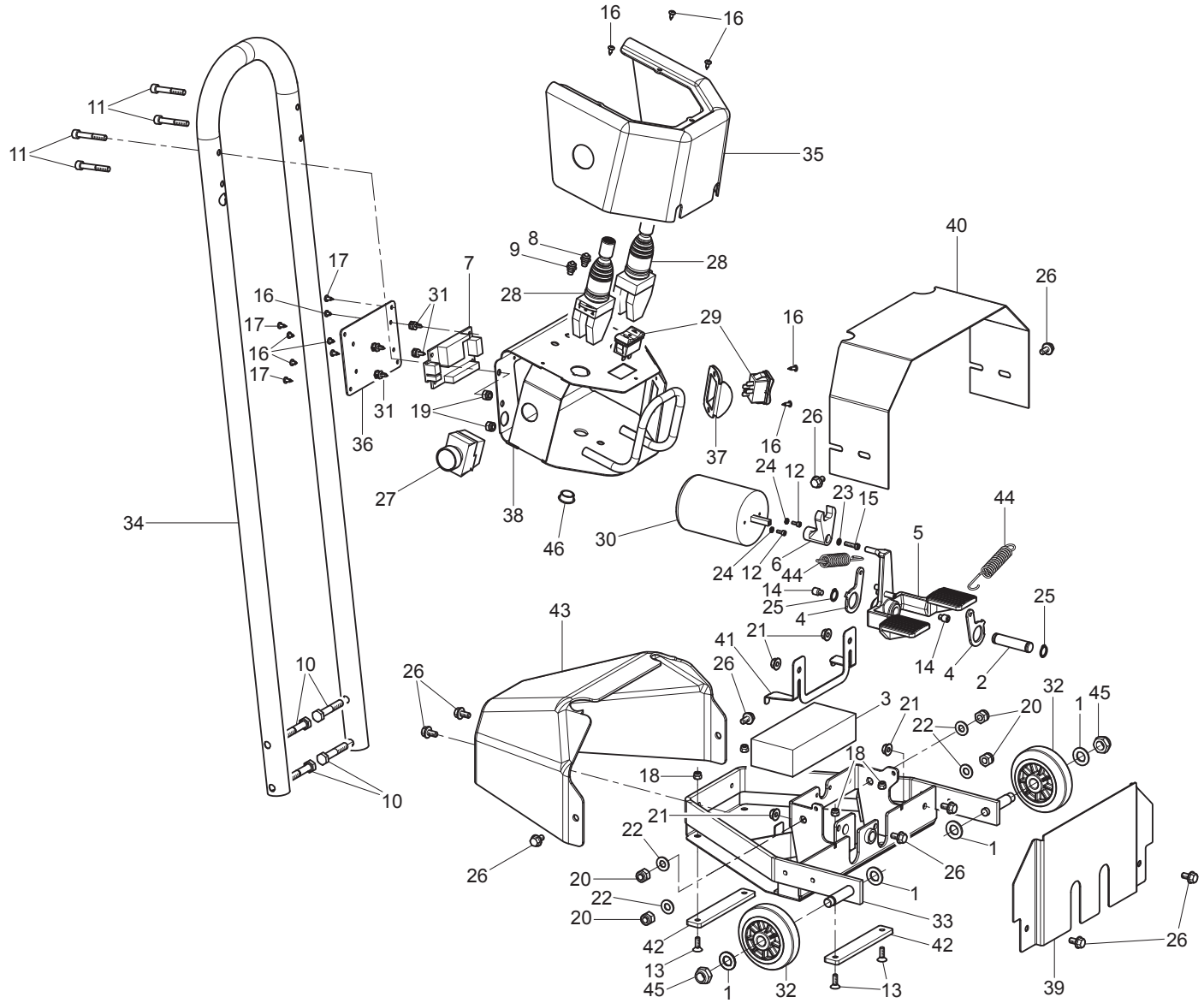
NAV51.15	NAV51T.15	NAV51.15N	
		●	

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°12B - Rev. 0 | **752291680**

GRUPPO COMANDO MOBILE
MOBILE CONTROL UNIT
BEWEGLICHER BEFEHLUNGSATZ
GROUPE COMMANDE MOBILE
GRUPO MANDO MÓVIL



NAV51.15	NAV51T.15	NAV51.15N	
•	•		

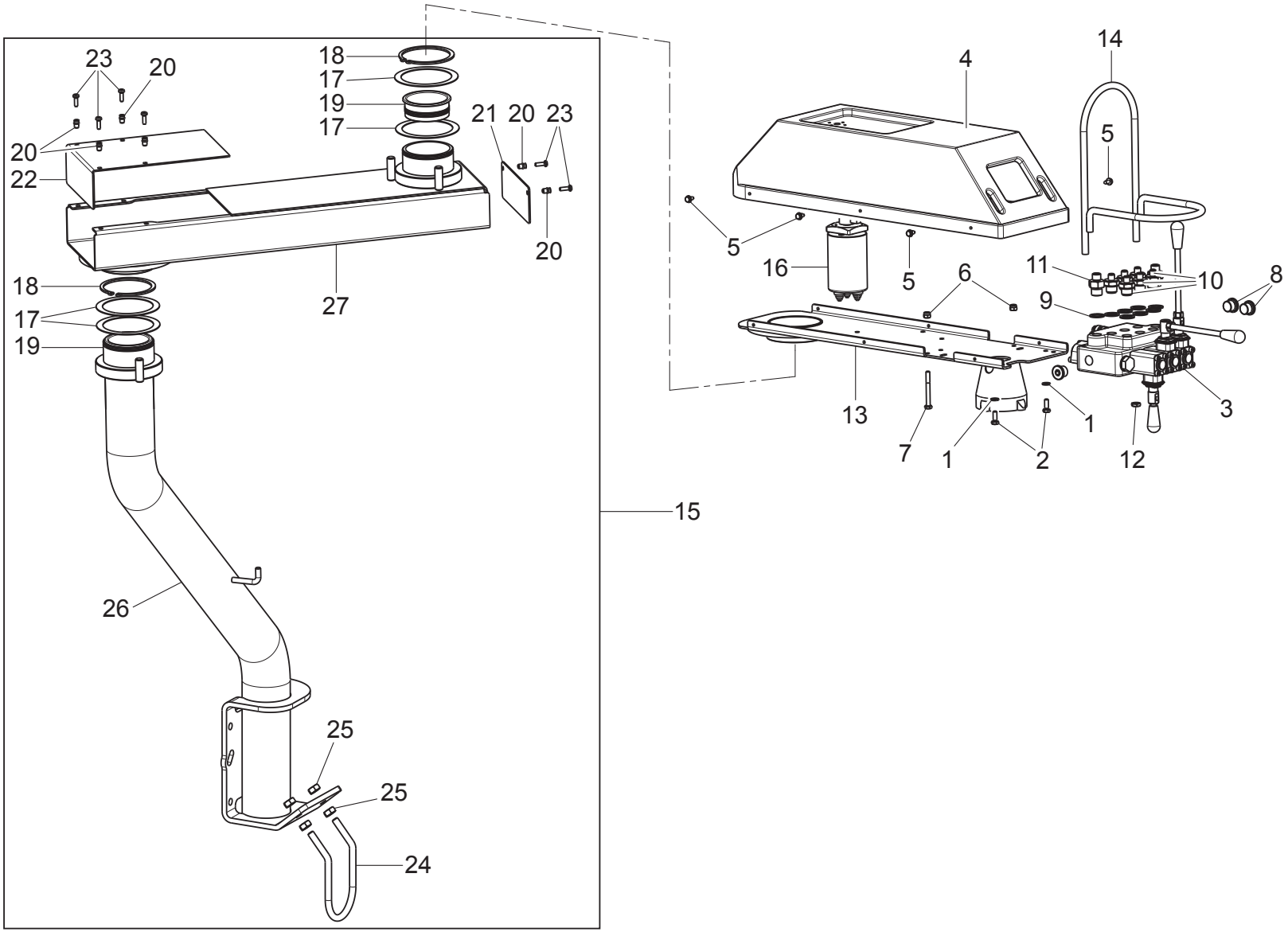
Butler
ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°12C - Rev. 0 | **752291171**

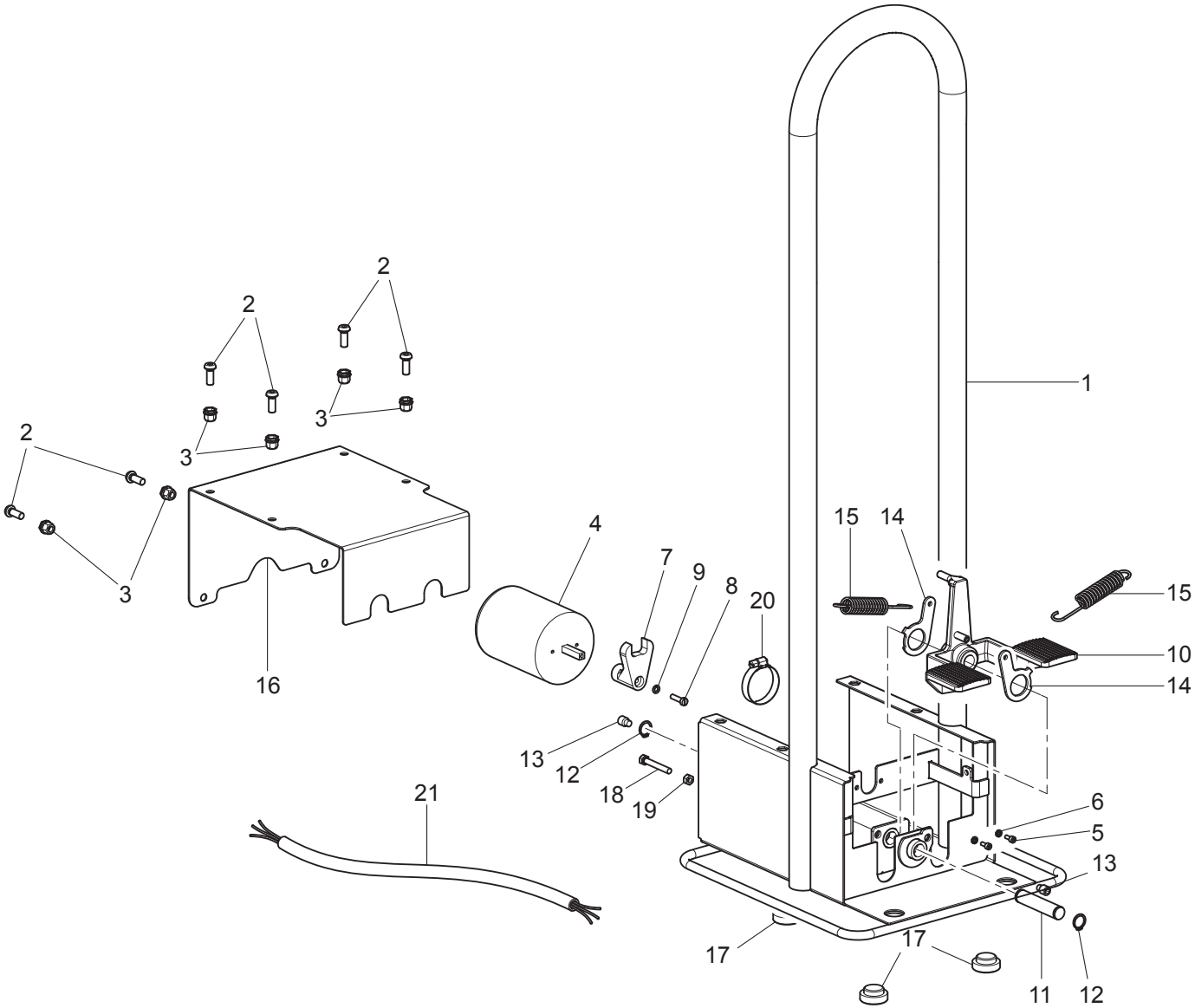
MANIPOLATORE
HANDLE
MANIPULATOR
MANIPULATEUR
MANIPULADOR

7522-R004-1_B



NAV51.15	NAV51T.15	NAV51.15N	
		●	

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*GRUPPO COMANDO PER ROTAZIONE A TERRA CONTROL UNIT FOR GROUND ROTATION BEFEHLUNGSATZ FÜR GEERDETE DREHUNG GROUPE COMMANDE POUR ROTATION AU SOL GRUPO MANDO PARA ROTACIÓN EN TIERRA*	***Pag. 26 di 35***
	Tavola N°12D - Rev. 0 / **752293000**		



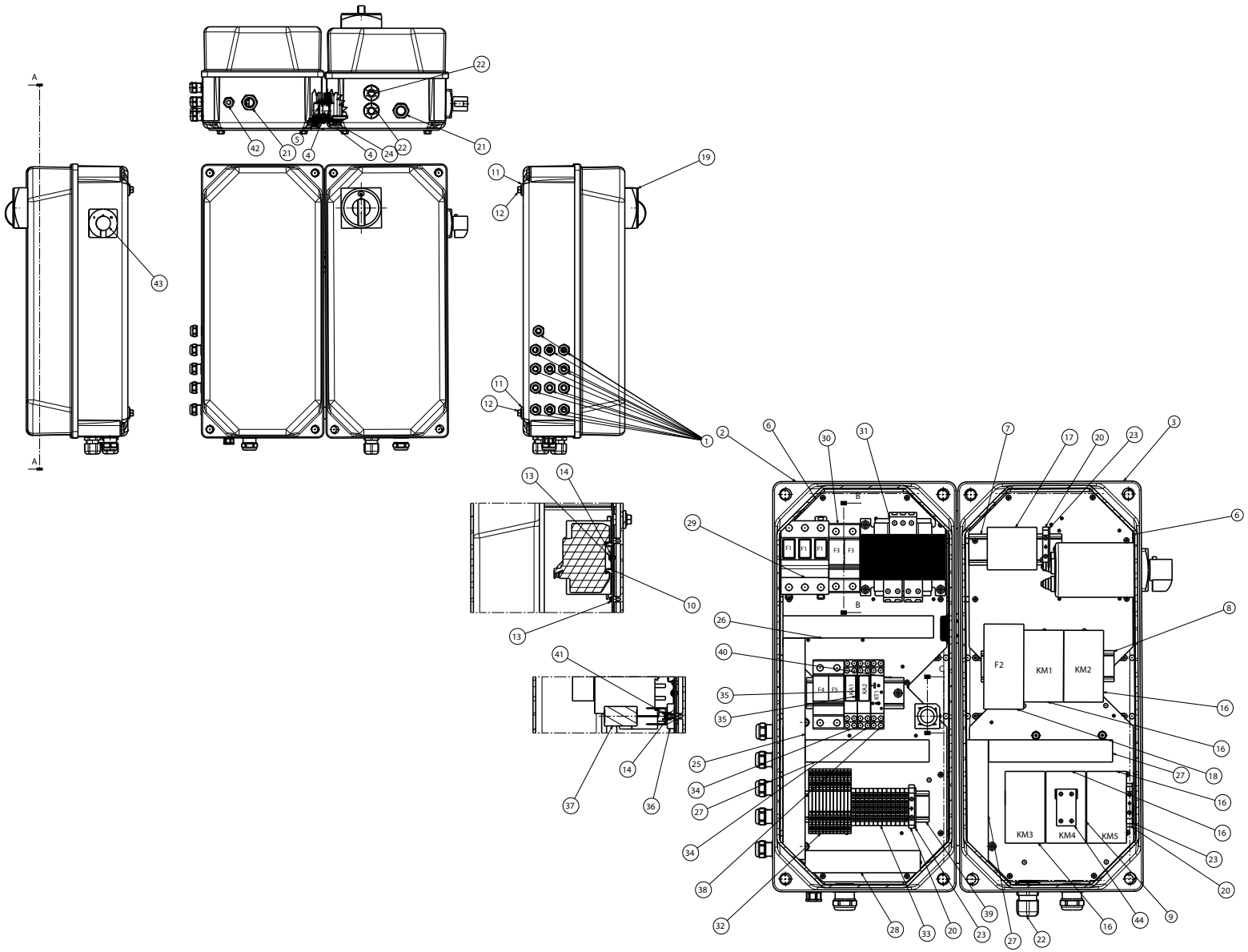
NAV51.15	NAV51T.15	NAV51.15N	
		•	

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

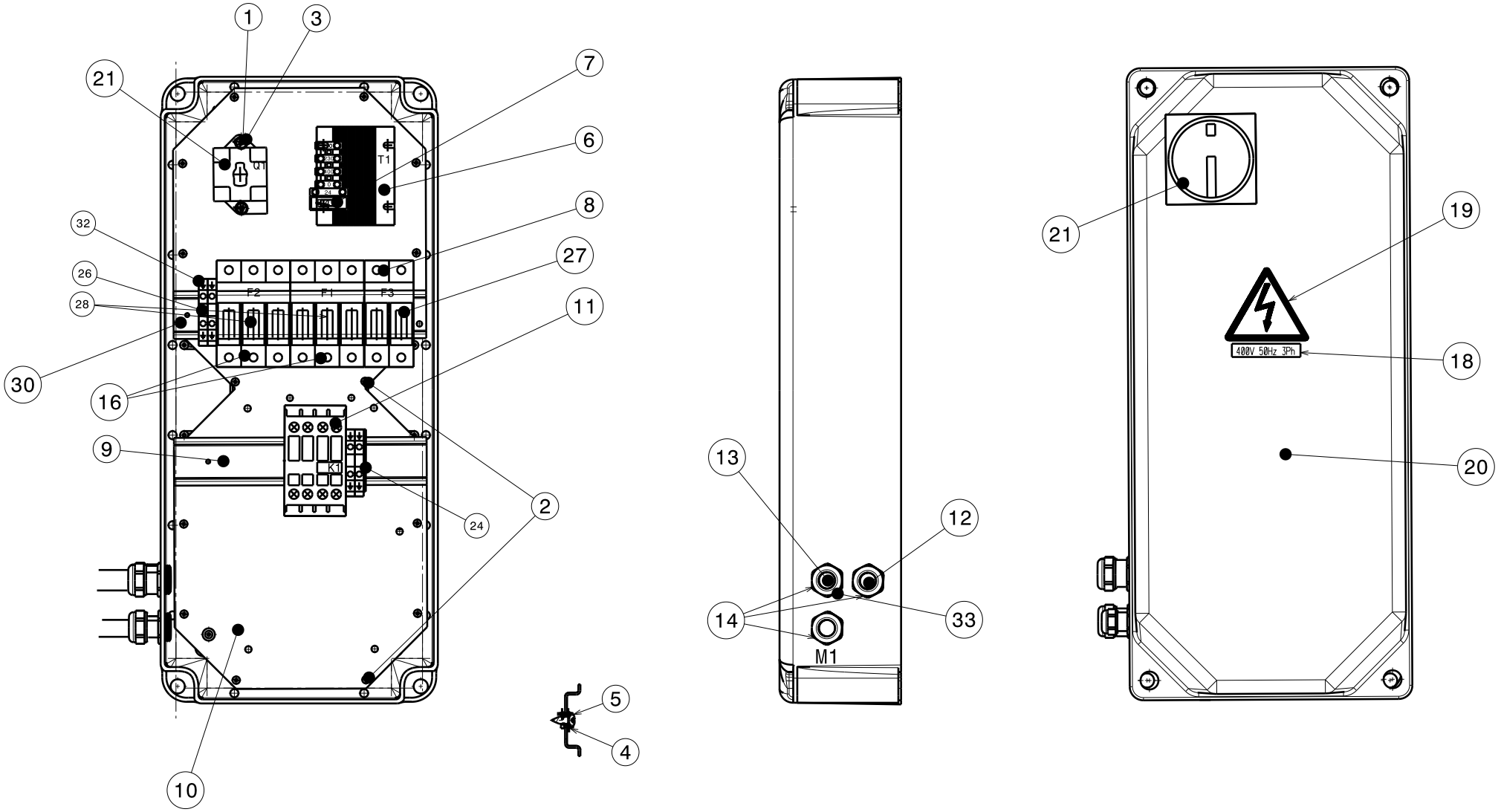
Tavola N°12E - Rev. 0 | **750590410**

GRUPPO COLONNETTA PEDALIERA
PEDALBOARD COLUMN UNIT
SATZ PEDALLEISTESÄULE
GROUPE COLONNE PÉDALES DE DIRECTION
GRUPO COLUMNA PEDALERA



NAV51.15	NAV51T.15	NAV51.15N	
●	●		

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*INSIEME MTG CASSETTA ELETTRICA ELECTRICAL BOX MTG ASSEMBLY SATZ MTG ELEKTRISCHEKISTE ASSEMBLAGE MTG BOITIER ÉLECTRIQUE CONJUNTO MTG CAJITA ELECTRICA*	***Pag. 28 di 35***
	Tavola N°13A - Rev. 0 / **752203150**		



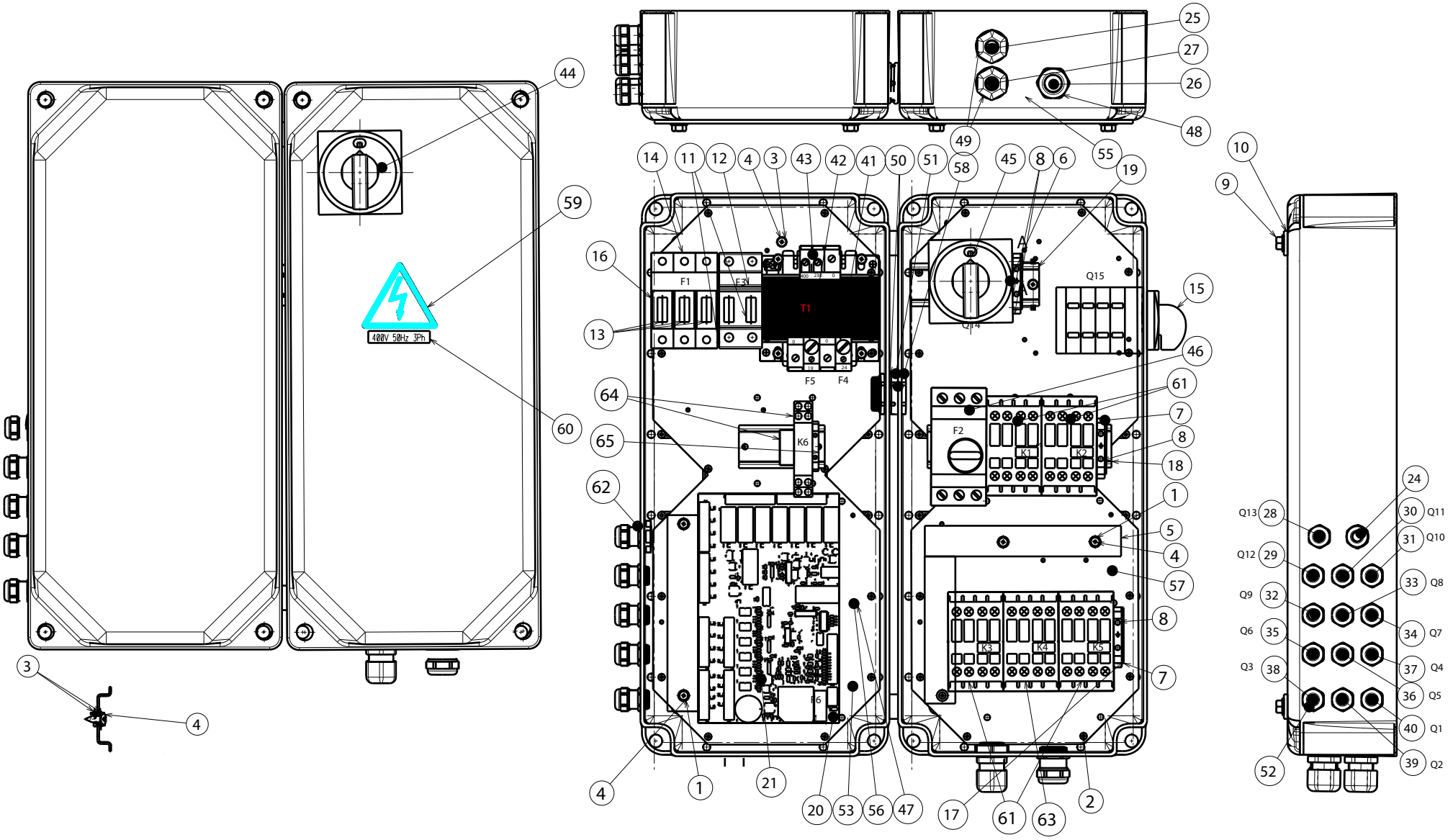
NAV51.15	NAV51T.15	NAV51.15N	
		•	

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°13B - Rev. 0 | **752203050**

INSIEME MTG CASSETTA ELETTRICA
ELECTRICAL BOX MTG ASSEMBLY
SATZ MTG ELEKTRISCHEKISTE
ASSEMBLAGE MTG BOITIER ÉLECTRIQUE
CONJUNTO MTG CAJITA ELECTRICA



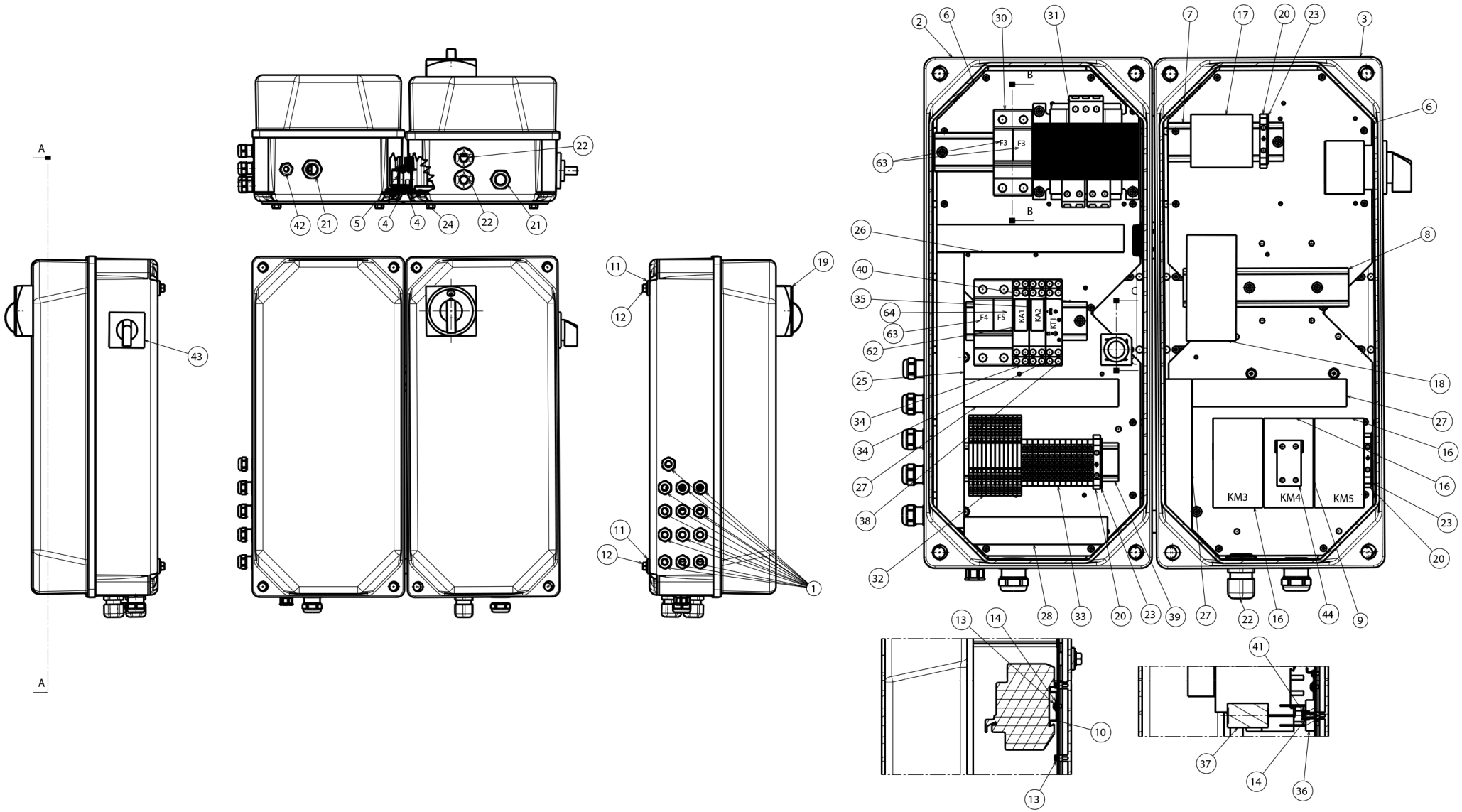
NAV51.15	NAV51T.15	NAV51.15N	
•	•		

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°13C - Rev. 1 | **752203190**

MTG CASSETTE ELETTRICHE
MTG ELECTRICAL BOXES
ELEKTRISCHEKISTEN MTG
BOÎTES ÉLECTRIQUES MTG
CAJITAS ELÉCTRICAS MTG

ENGINEERING and MARKETING S.P.A.



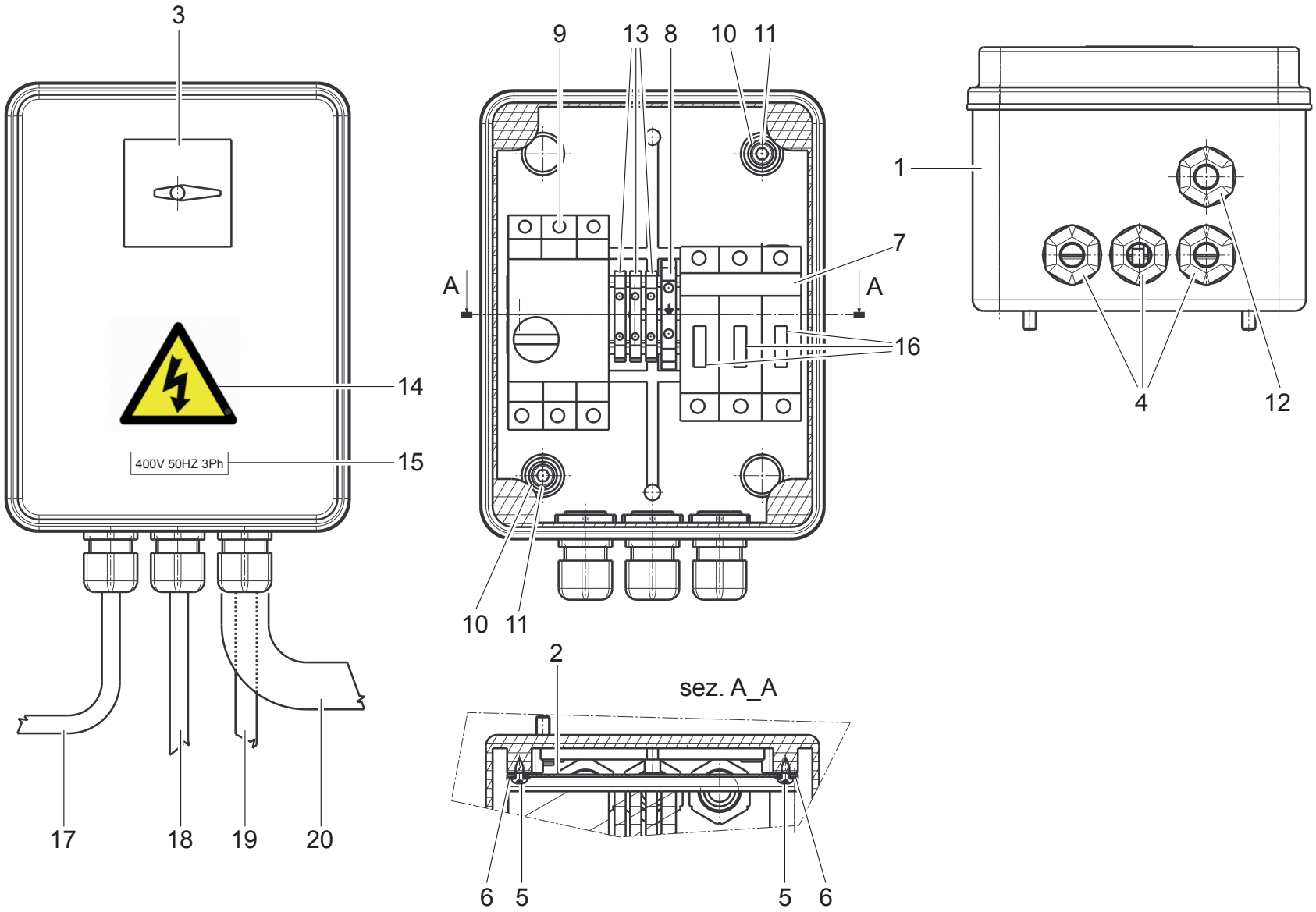
NAV51.15	NAV51T.15	NAV51.15N	
•	•		

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

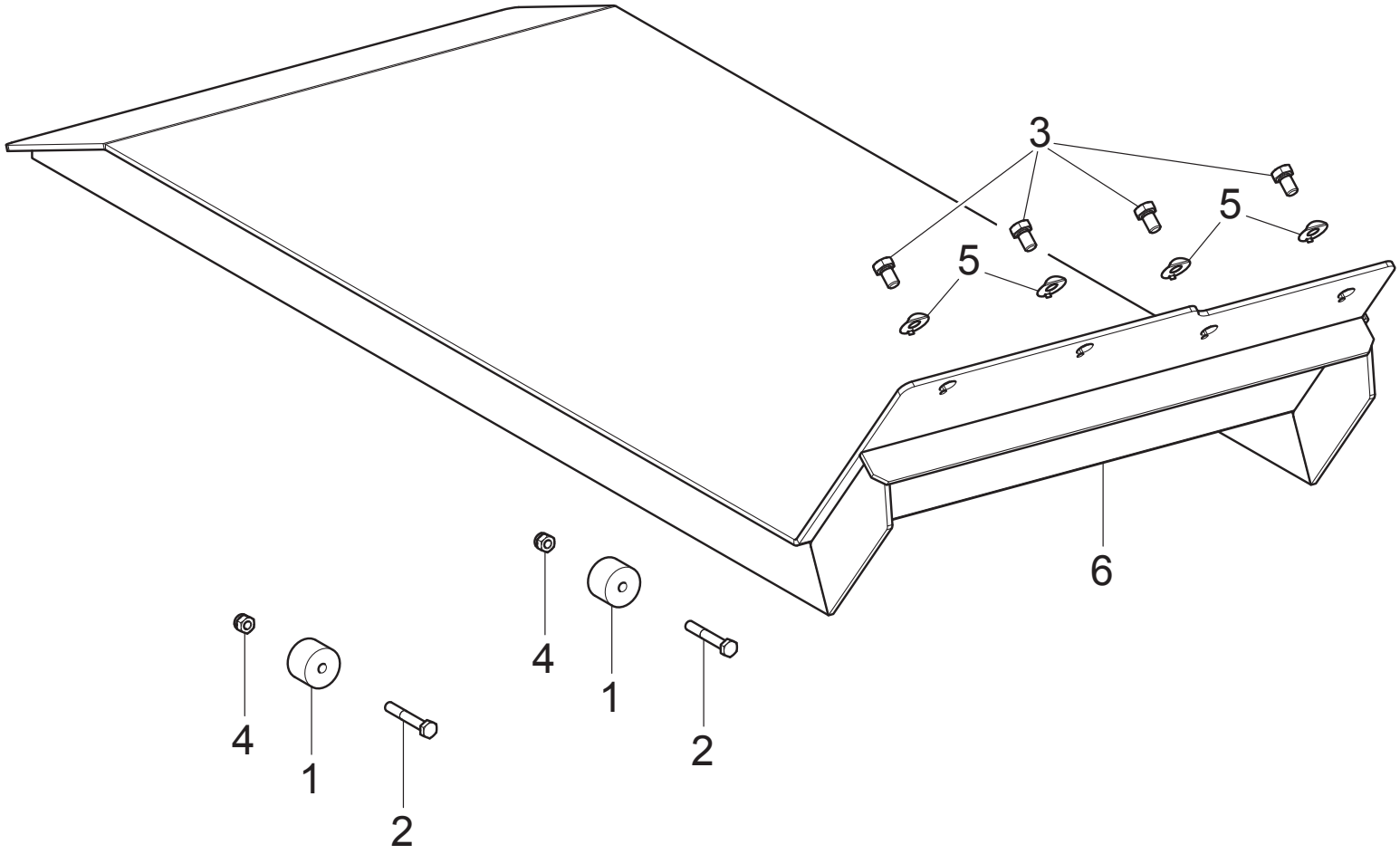
Tavola N°13D - Rev. 1 | **752203200**

MTG CASSETTE ELETTRICHE
MTG ELECTRICAL BOXES
ELEKTRISCHEKISTEN MTG
BOÎTES ÉLECTRIQUES MTG
CAJITAS ELÉCTRICAS MTG



NAV51.15	NAV51T.15	NAV51.15N	
		•	

Butler ENGINEERING and MARKETING S.P.A.	**LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE LISTE DES PIECES DETACHEES - LISTA DE PIEZAS**	*SCATOLA IMPIANTO ELETTRICO ELECTRIC JUNCTION BOX KASTEN ELEKTROANLAGE BOÎTE SYSTÈME ÉLECTRIQUE CAJA SISTEMA ELÉCTRICO*	***Pag. 32 di 35***
	Tavola N°13E - Rev. 0 / **750507030**		



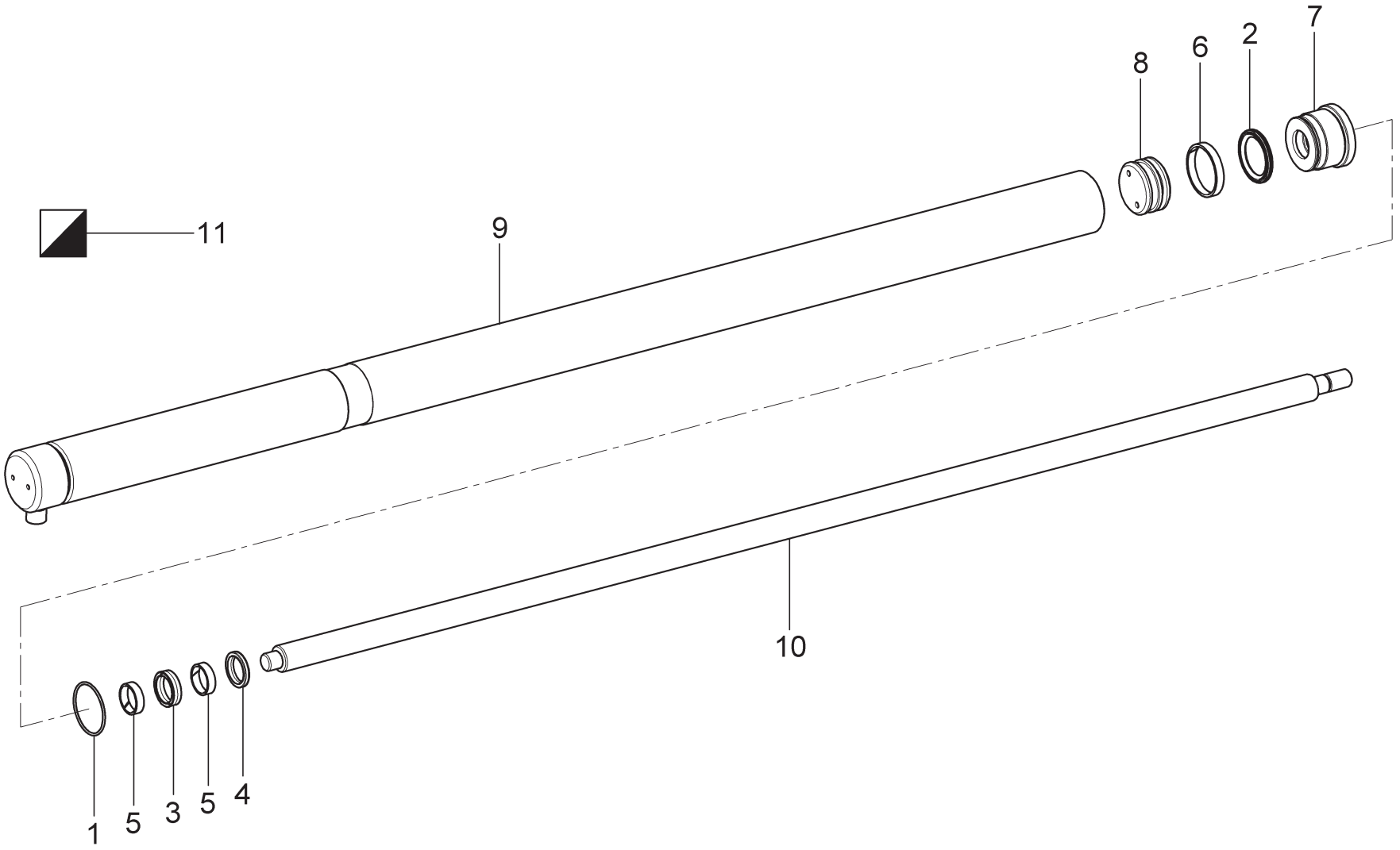
NAV51.15	NAV51T.15	NAV51.15N	
•	•	•	

Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°14 - Rev. 0 | **752292680**

GRUPPO CARRELLO PORTA GOMMA
HOSE NIPPLE CARRIAGE UNIT
SCHLAUCHHALTER WAGENSKASTENS
GROUPE CHARIOT PORTE-TUYAU
GRUPO CARRO PORTA GOMA



NAV51.15	NAV51T.15	NAV51.15N	
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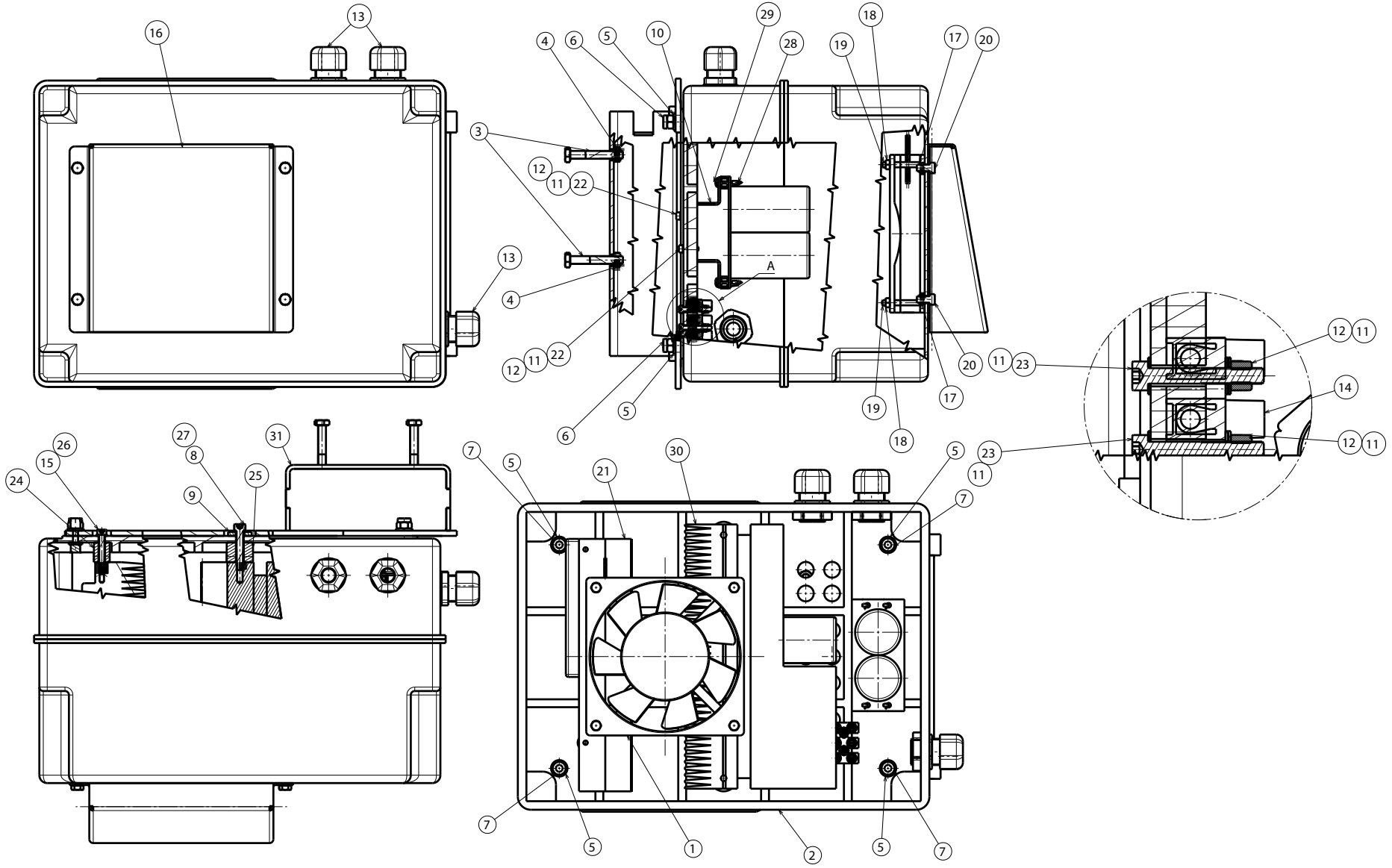
Butler ENGINEERING and MARKETING S.P.A.

LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°15 - Rev. 0 | **752290530**

CILINDRO CARRO
CARRIAGE CYLINDER
WAGENZYLINDER
CYLINDRE CHARIOT
CILINDRO CARRO

7522-R004-1_B



NAV51.15	NAV51T.15	NAV51.15N	
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LISTA DEI COMPONENTI - LIST OF COMPONENTS - TEILELISTE
LISTE DES PIECES DETACHEES - LISTA DE PIEZAS

Tavola N°16 - Rev. 0 | **752293030**

GRUPPO INVERTER
INVERTER UNIT
FREQUENUMFORMERSATZ
GROUPE VARIATEUR
GRUPO INVERSOR