GB941-010-500

TECHNICAL MANUAL

GB BARBERI
AEROSPACE • SPECIAL VEHICLES

HYDRAULIC TEST BENCH m^3

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P/N GB941-010-500

TECHNICAL MANUAL

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GB BARBERI s.r.l. 21018 Sesto Calende - Via Rosselli, 30 - VARESE - ITALY
Phone 0331.923.418 - Fax 0331.920.692
E-mail : info@gbarberi.com - www.gbarberi.com

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Is integral part of this manual :
Electrical schematic diagram GB 679 1102 011 valid for all S/N except
diagram GB 679 1102 012 valid for S/N 1102076 and from S/N 1102080 to S/N 1102095
diagram GB 679 1102 013 valid from S/N 1102096

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WARNING

HIGHT VOLTAGE

Prior connecting power supply electrical cables
To a power source, be sure all electrical switches
Are in off position

HIGHT PRESSURE - HYDRAULIC

Do not connect or disconnect any hoses
When by-pass valve is closed

BACK PRESSURE SELECTOR VALVE

THE BACK PRESSURE SELECTOR VALVE (POS 10 FIGURE 3.1) MUST BE OPERATED ONLY WHEN TEST-BENCH IS OFF. MAKE SURE THE BACK PRESSURE SELECTOR VALVE IS CORRECTLY POSITIONED AT ONE OF TWO POSITIONS BEFORE TURN ON THE BENCH.

SECTION I

INTRODUCTION

1.1 GENERAL

This technical manual provides the operations, service and repair instructions for the hydraulic test bench ***m³***, identified by **P/N GB941-010-500**, (in the following only ***m³)***, manufactured by:

GB BARBERI s.r.l. - Via Rosselli N° 30 - SESTO CALENDE (Va) – ITALIA.

This technical manual is composed by five sections:

SECTION I - Introduction

In this section the test bench is shortly described, specifying its purpose and main characteristics.

SECTION II – Preparation for the use – Return.

This section contains all the instructions to prepare the test bench for use, and all the information necessary for a proper return.

SECTION III – Operation Instructions

This section contains all the operation instructions for personnel and operators

SECTION IV - Emergency Operations

SECTION V – Maintenance and Troubleshooting

This section contains instructions for a correct maintenance, procedures for setting instruments and troubleshooting.

1.2 PURPOSE

The purpose of this Manual is to inform about the correct use of the test bench ***m³***, identified by **P/N GB941-010-500**, to indicate its main technical characteristics, to allow managing its scheduled and not scheduled maintenance, its assembling and enable an easy troubleshooting. This manual can also be used for training personnel responsible for performing operator, organizational, direct support, and general support maintenance of the Hydraulic Test Bench.

1.2.1 Who this Manual is addressed to

This instruction manual is intended for personnel, who is in charge of handling, employing and carrying out inspections and maintenance on the test bench ***m³*.** Particularly, this manual is intended for the people in charge / managing team and for the operative team of the structure, where the equipment in object is employed.

1.2.2 Limits

By considering the skills needed in the operational field of the test bench ***m³***, the operating personnel must have an adequate and specific training, and is identified by the end user. This manual cannot undoubtedly replace, neither completely, nor in part, the operator skilling but it can only integrate the training.

This Manual contains indications and instructions relating the employment of the test bench, those instructions doesn't replace any standards and prescriptions, decrees or laws, both general and specific, in force in the Country where the equipment is in use.

It's anyway appropriate, that operators follow the instructions contained in this manual.

The Company GB BARBERI s.r.l. it's free of any responsibility in case this product isn't employed in conformity with the instructions of this manual or in case of incorrect use, maintenance or installation

1.2.3. Where and How to keep this Manual

The Manual must be always at disposal of personnel during the use of the hydraulic test bench ***m³.***

It must be kept in a well identifiable and easily accessible position, in the documents box or near the product, well protected from the atmospheric agents, which could deteriorate it.

1.2.4. Updating

The Manual is handed along with the hydraulic test bench ***m³***, and refers to the test bench in the original configuration.

In case of replace of components and improvements, this manual cannot be considered inadequate, but it must be updated with the additional pages supplied by the manufacturer.

1.3 CE Marking

The CE marking is placed to guarantee that the design, engineering and manufacture of this product has been carried out in compliance with 42/2006/EEC Machines Standards.

1.3.1 CE Marking Plate.

Along with the “CE” symbol, a plate is applied, which identifies both the manufacturer, by indicating its logo and address, and the product, by indicating the P/N, the S/N, and the date of manufacture.

1.3.2 Position of the Plate

The CE marking must be in a well visible place on the equipment. In the case of the hydraulic test bench ***m³***, the “CE” marking is located on the identification plate of the product; this plate indicates the P/N and the S/N.

1.4 GENERAL INFORMATION

1.4.1. PURPOSE

The hydraulic test bench ***m³*** is an innovative high-tech product designed and manufactured to perform test on hydraulic systems of small and medium helicopters and aircrafts.

Particularly, the hydraulic test bench ***m³*** can perform the following operations:

- Filling up of the aircraft hydraulic system with filtered oil.
- Draining of the aircraft hydraulic system.
- Air Bleeding of the aircraft hydraulic system, with the possibility of performing all hydraulic functions.
- Leak Test of the aircraft hydraulic system

1.4.2 Description

The hydraulic test bench ***m³*** is a completely self-contained unit which require only an external electrical power source for operation. The entire equipment is mounted on a four wheel structure, equipped with brakes. The chassis is provided with four removable tie-down rings which are used for tie-down during shipment or for hoisting the unit with a crane

The test bench hydraulic system is characterized by:

- High filtration capacity, tank to micrometric filters
- Dual line system, with the following characteristics:
  - START-OFF hydraulic circuit, that assure there is no press ion to the aircraft at the starting of the bench.
- Adjustable Flow, by the total flow regulator valve on the control panel
- Easily and reduced maintenance operation
- Low noise, thanks to the use of soundproof covered panels
- Wheels rubber resistant to the MIL oil
- Control panel, with removable cover and led illumination
- Alarms and safety devices
- Cooling circuit that guarantees to maintain the oil temperature under 70°C
- The hydraulic test bench structure is designed in compliance with the requirement for land, naval and air-transport shipping. It is equipped with fork-lift and tie-down. All the commands are covered by the control panel.

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Fig. 1.1 Compact dual-line hydraulic test bench Cubic Meter ***m³***

1.4.2.1 Hydraulic system (Ref. Fig. 1.2 – 1.3)

The hydraulic system of the hydraulic test bench ***m³*** is composed of the following groups:

- *Reservoir assy* *(Pos. 1)*
- *Heat exchanger assy* *(Pos. 2)*
- *Hydraulic control panel* *(Pos. 3)*
- *H.P. delivery filters assy* *(Pos. 4)*
- *Returns assy* *(Pos. 5)*
- *Sampling valves assy* *(Pos. 6)*
- *Hydraulic gauges panel* *(Pos. 7)*
- *Motor driven pump assy* *(Pos. 8)*

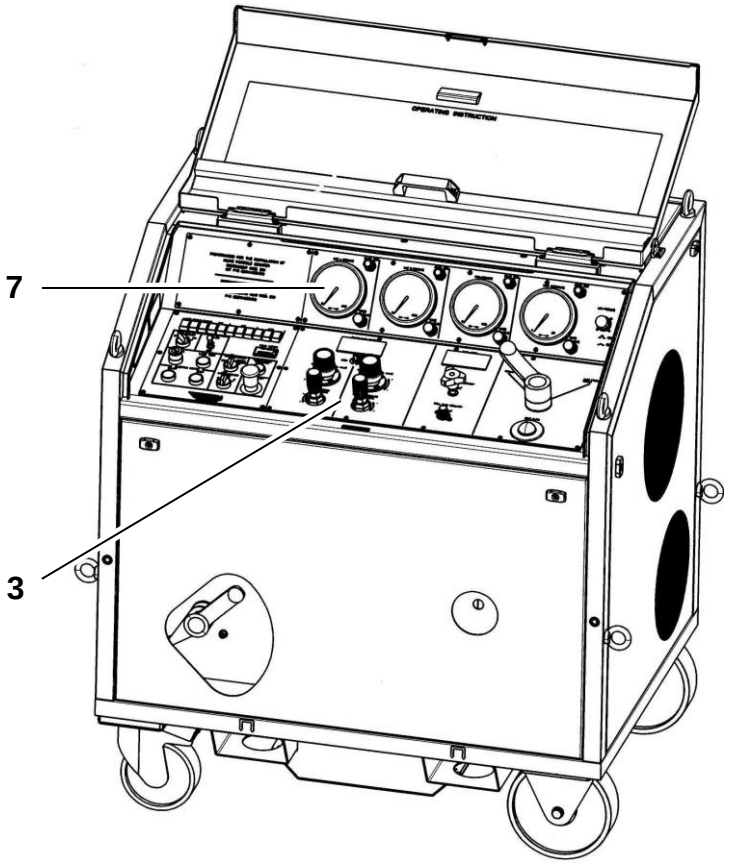


Fig. 1.2 Hydraulic system components

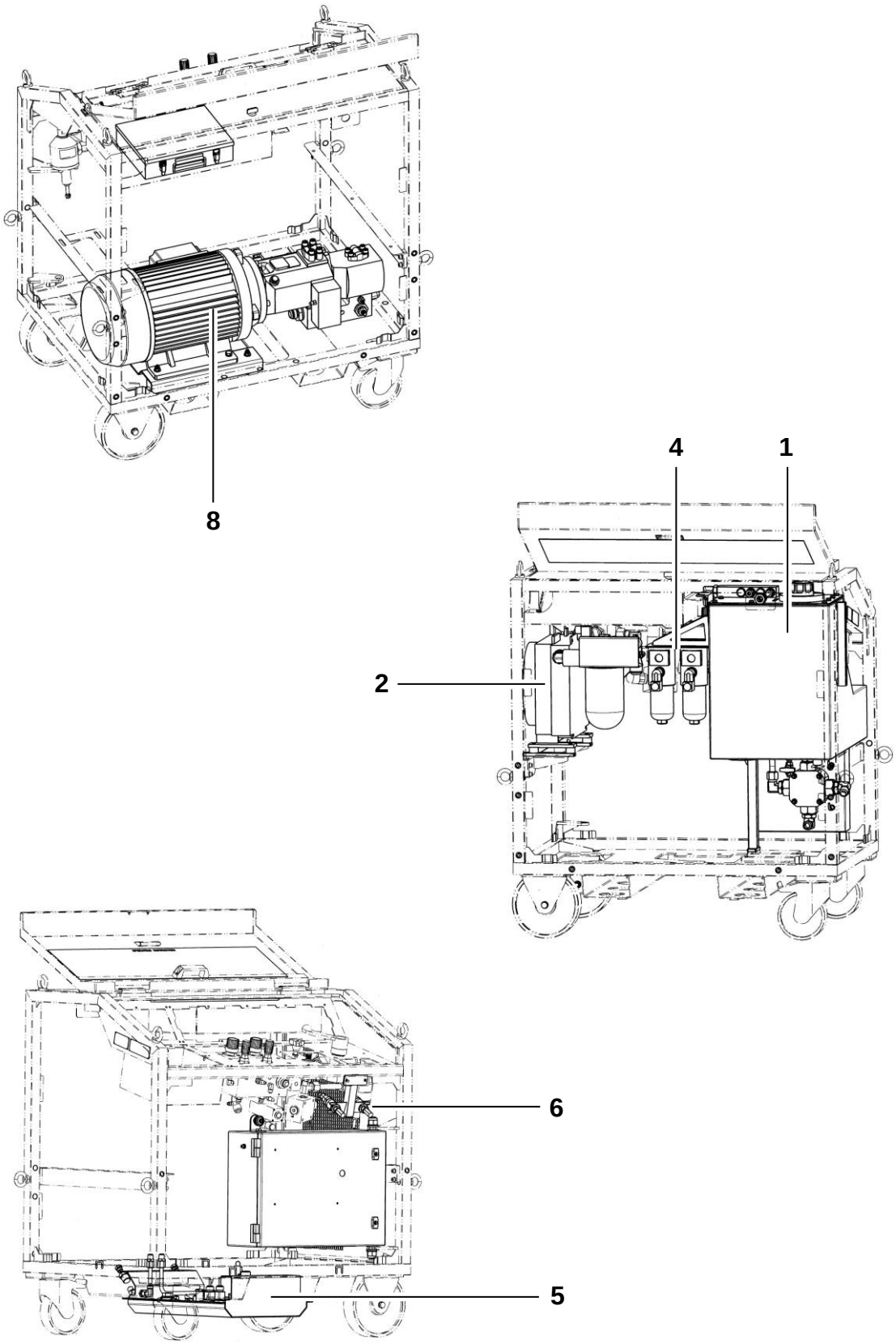


Fig. 1.3 Hydraulic system components

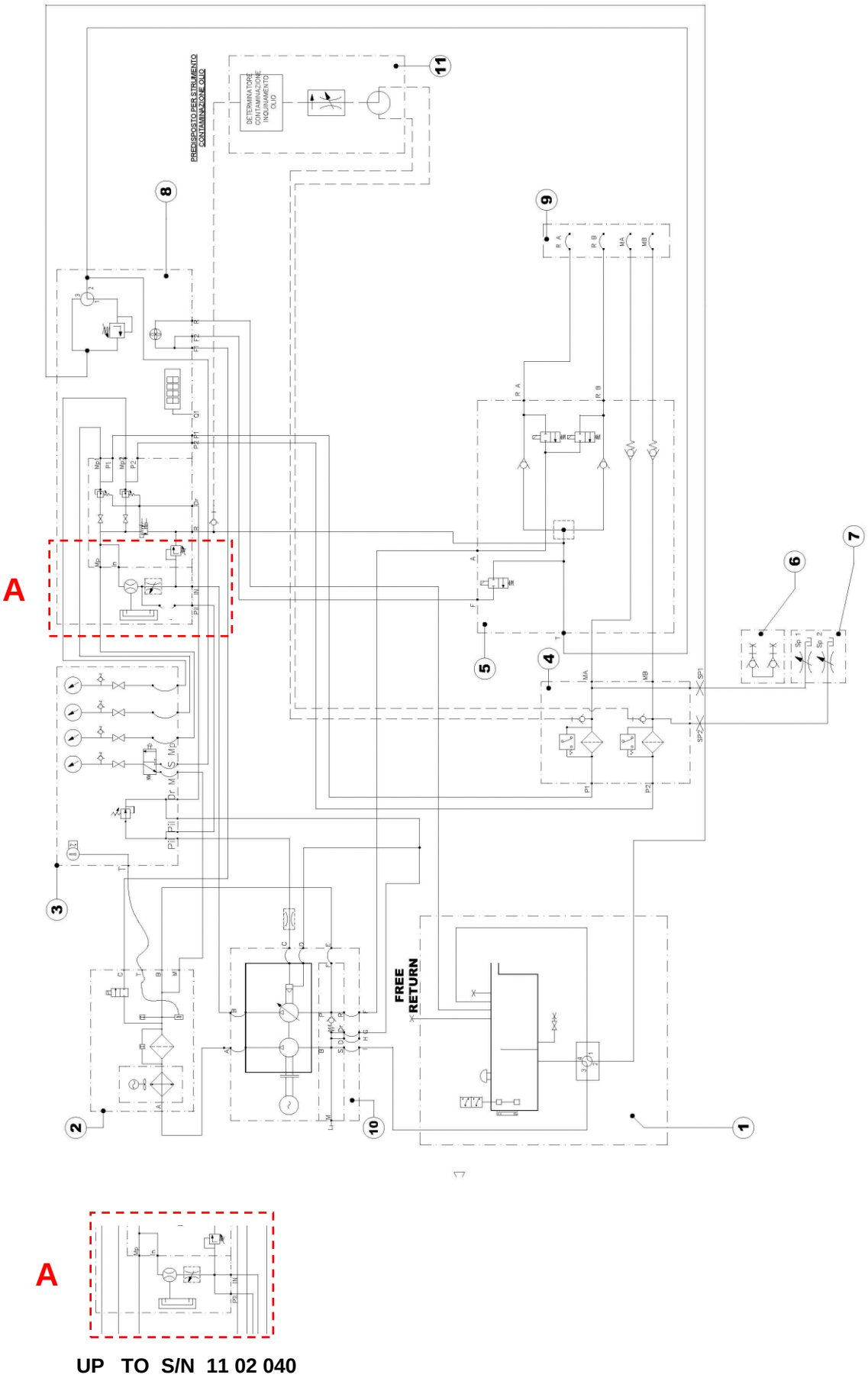


Fig. 1.4 Hydraulic system schematic diagram

Table 1.1 Nomenclature of hydraulic system schematic diagram

POS.	DESCRIPTION
1	RESERVOIR ASSY
2	*HEAT EXCHANGE ASSY*
3	HYDRAULIC CONTROL PANEL
4	H.P. DELIVERY FILTERS ASSY
5	RETURNS ASSY
6	SHORT CIRCUIT ASSY
7	SAMPLING VALVES ASSY
8	HYDRAULIC GAUGES PANEL.
9	HOSES AND FITTINGS, SERIES
10	MOTOR-DRIVEN PUMP ASSY
11	OIL CONTAMINATION INSTRUMENT (OPTIONAL)

1.4.2.2 Electrical system (Ref. Fig. 1.5)

The electrical system of the hydraulic test bench m^3, is composed of the following groups:

- *Electrical system box assy* *(Pos. 1)*
- *Electrical system control panel* *(Pos. 2)*
- *Electrical wiring* *(Pos. 3)*

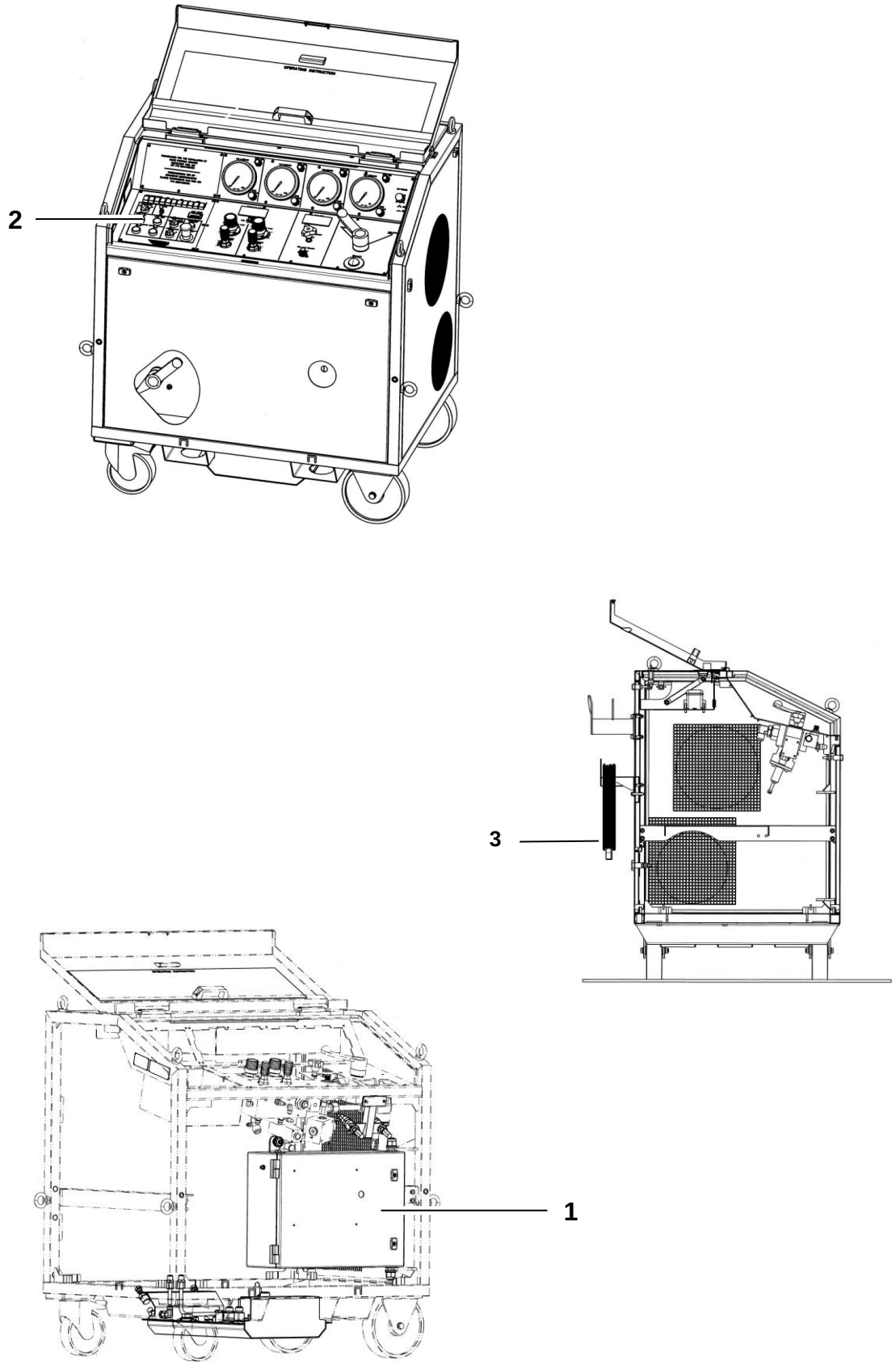


Fig. 1.5 Electrical system

1.5 MAIN CHARACTERISTICS

The main characteristics of the hydraulic test bench **m^3, P/N GB941-010-500** are listed in Table 1.2.

Table 1.2 - Main characteristics

DIMENSIONS

Lenght ..... 1000 mm
Width ..... 1120 mm
Height ..... 1240 mm
Weight empty ..... 570 Kg
Weight whit hydraulic fluid ..... 648 Kg

ELECTRICAL SYSTEM

Power supply ..... 230/400V tri-fase 50/60 Hz
Electric source connection cable ..... 10 mt

HYDRAULIC SYSTEM

Dual system, Independent pressure regulation.
Manual or automatic flow regulation.

Hydraulic fluid ..... MIL-PRF-83282 (MIL-PRF-5606 or other on request)
Reservoir capacity ..... 95 liters
Pressure Range ..... 0 ÷ 3500 psi
Max supported pressure ..... 4500 psi
Back Pressure on returns ..... 50 psi
Max Flow ..... 60lt/min (16 GPM) on one line
..... 30+30 l/min (8+8 GPM) on two lines
Filters (n°3) ..... 3 micron Abs
Operating temperature ..... –10° a +50 °C
Max hydraulic fluid temperature ..... 70° C
Hydraulic fluid contamination ..... ≤ class 5 as specific NAS 1638
The test bench is equipped with sampling valves and connections
for the calibration of the gauges.

INSTRUMENTATION:

Main pump pressure gauge ..... 0-5800 psi (0-400bar)

Delivery pressure gauges ..... 0-5800 psi (0-400bar)

Returns gauges ..... 0-300 psi (0-16bar)

Flow meter .....LPM (or GPM by operator setting)

Digital temperature control, hour meter

Warning lights: “Fluid level, filter clogging, wrong phase, lamp test, blocked pump, emergency”

STANDARD EQUIMENT:

- Hose assembly P(A) – ½” - 6 mt P/N GB529-055-050 (10mt on request)
- Hose assembly P(B) – ½” - 6 mt P/N GB529-055-250 (10mt on request)
- Hose assembly R(A) – ¾” - 6 mt P/N GB529-055-160 (10mt on request)
- Hose assembly R(B) – ¾” - 6 mt P/N GB529-055-360 (10mt on request)
- Protection cover - P/N GB941-856-975
- Standard Test Bench equipment P/N GB941-858-870 (includes a kit of eyebolts for tie-down and lifting operations). Composed of:

P/N GB	DESCRIPTION	QTY
270-055-000	CASE	1
961-066-000	WRENCH TAPE TO REMOVING FILTERS	1
961-003-040	14/15 WRENCH UNI-ISO 10102 /DIN 3110	1
961-003-050	17/19 WRENCH UNI-ISO 10102 /DIN 3110	1
961-003-070	20/22 WRENCH UNI-ISO 10102 /DIN 3110	1
961-003-090	24/27 WRENCH UNI-ISO 10102 /DIN 3110	1
961-003-120	30/32 WRENCH UNI-ISO 10102 /DIN 3110	1
778-300-150	LIGHT BULB 28V	5
747-108-400	FUSE 2 A	2
747-112-010	FUSE 4 A	2
065-611-275	PLATE	1
747-112-080	FUSE 6 A	2
606-080-450	SHORT CIRCUIT ASSY	1
747-112-080	FUSE 6 A	2
747-104-210	FUSE 500 mA	2
019-112-000	EYE BOLT M12 UNI2947 - 340 kg LOAD AT 45° 2 x 240	4

- Interface adapter kit P/N GB487-000-570 between hose test bench and PCM ADAPTER KIT HYDR SYSTEM TEST BENCH P/N GB941-852-110.

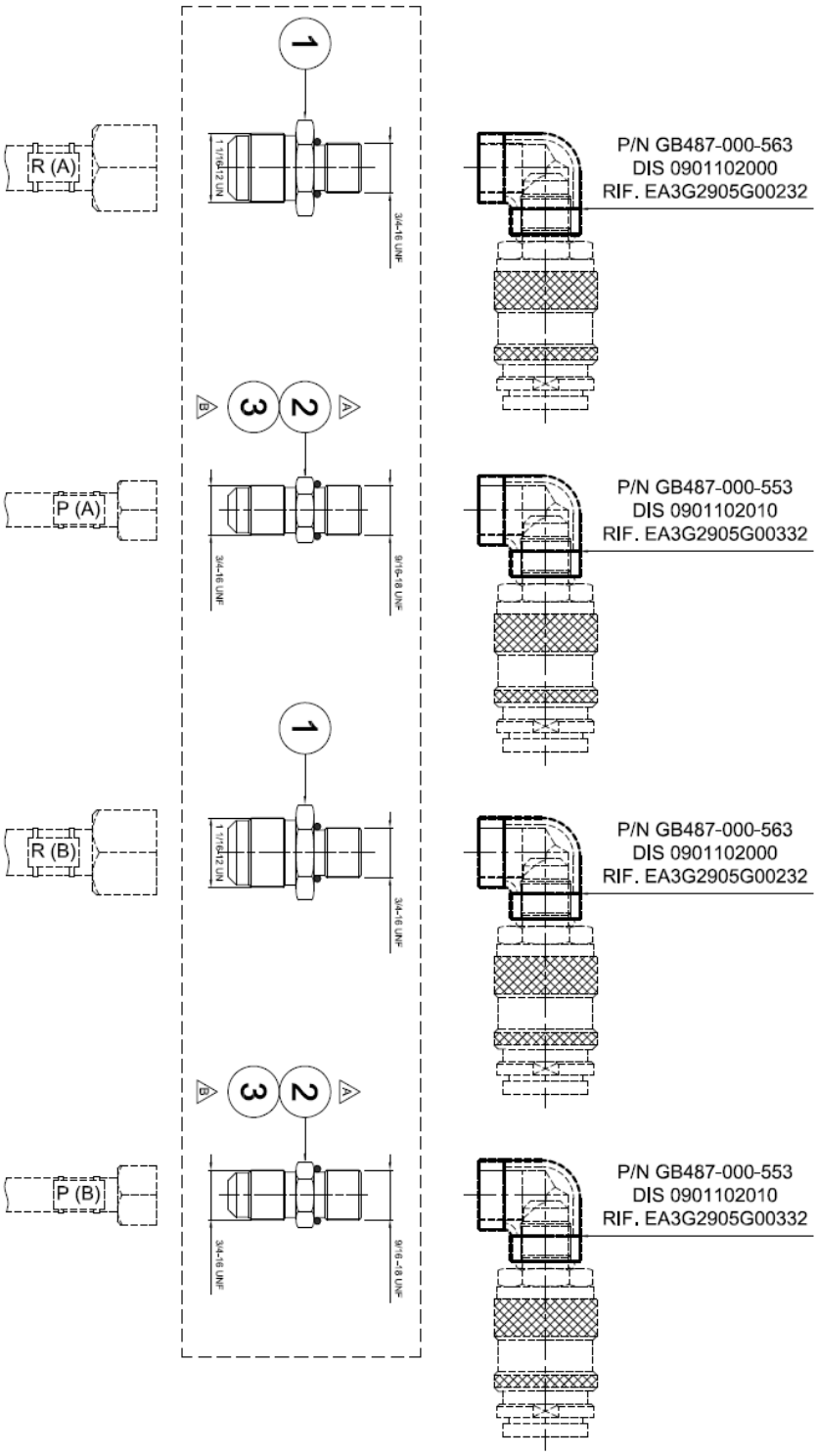


Fig. 1.6 P/N GB487-000-570 interface adapter kit

1.6 OPTIONAL

The Hydraulic test bench ***m³*****,** has the following optional, also installable by the end user:

a) Hose coilers assy P/N GB206-001-850

b) Oil analyzer – Particle counter instrument Model GB DCI P/N GB941-855-510

c) Vacuum pump for filling or emptying reservoir P/N GB941-858-835

d) Replacement filters kit P/N GB941-851-257

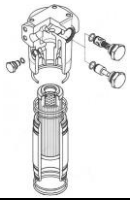
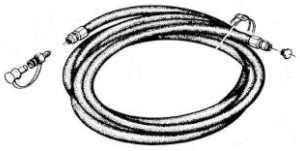
e) Kit of interface test bench/ aircraft (fast couplings) for different types of aircraft as shown below:

Table 1.3 Kit of interface test bench / aircraft

AIRCRAFT	**P/N IDENTIFICATION OF INTERFACE KIT**
AW109/AW119	GB941-851-450
AW139/169/189	GB941-851-480
A129	GB941-851-650
NH90	GB941-851-950
CH47	GB941-851-350
AB204-205-206	GB941-851-570
AB212-412	GB941-851-562
AS365	GB941-851-830

NOTE: OTHER AVAILABLE ON REQUEST

OPTIONAL AVAILABLE -TABLE 1.4

Fig.	P/N	Description	Picture
a)	GB206-001-850	Hose coilers assy	
B)	GB941-858-835	Vacuum pump - for filling or emptying reservoir	
C)	GB941-851-257	Replacement filters kit	
d)	GB038-080-100	Seals kit for HP delivery filter	
e)	GB960-210-600	Pressure gauges calibration kit	
f)	See table pag 1.3 pag.17	Kit of interface test bench / aircraft	
g)	GB606-080-089	Hoses kit lenght 10 m	

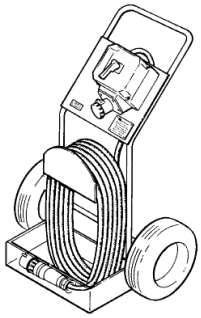
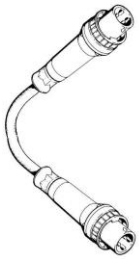
h)	GB914-033-100	Electric cable extension trolley 400V- 63 A 3ph+ N+ T	
i)	GB941-859-100	Towing kit – wheels and towbar	
l)	GB735-703-200	Adapter female 3 P + N + E / male 3 P + N	
…m)	GB 941-855-560	Laboratory bottles kit	 

Table 1.4 Optional available

SECTION II

PREPARATION FOR USE - SHIPMENT

2.1 PREPARATION FOR USE

2.1.1 UNPACKING

The hydraulic test bench ***m³*** is normally supplied completely assembled and adjusted. The packing, and protection against the atmospheric agents, may vary, due to contractual agreements. At arrival, the hydraulic test bench, contains a minimum quantity of fluid, sufficient to protect the mobile parts of the hydraulic components from oxidation. If not otherwise specified, the test stand is equipped to work with **MIL-PRF-83282** fluid and at the tension of **400V, 3 phases, 50/60 Hz**. To change the operating voltage, follow the instructions at paragraph 2.13.

Upon receipt, execute the following operations:

- Remove, if used, the packing in wood and/ or the plastic wrap.
- Follow the informative nameplates that, if present, indicate unpacking and preparation precautions before the use of the apparatus.
- Check the hydraulic fluid in the reservoir and refill with hydraulic fluid previously filtrate (see par. 3.3.1)

2.1.2 PRELIMINARY INSPECTIONS

Upon receipt, thoroughly inspect the unit for obvious damage and, particularly, ascertain that:

- Check controls, switches and indicators on instrument panel for damage;
- Pipelines and links are well shut and entire;
- Panels, electric cable and flexible hoses are not damaged.

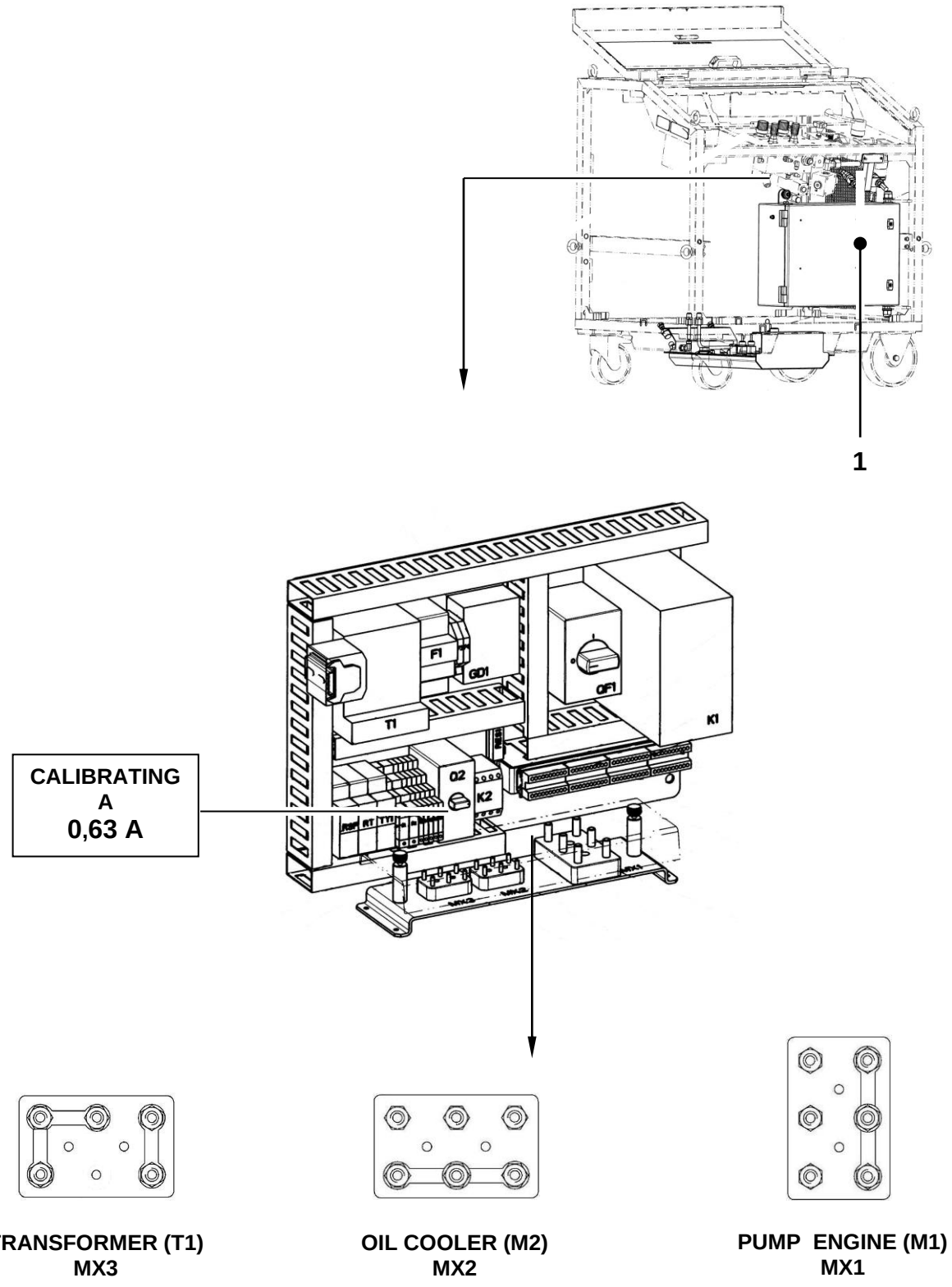


Fig. 2.1 SUPPLY VOLTAGE CONFIGURATION FOR
400V - 3 PHASES – 50/ 60 Hz FUNCTIONING

2.1.3 CHECK OF ELECTRICAL CONNECTIONS

Open the electrical box and check for damages or corrosion.

The test bench is furnished for a **400V - 3 phase – 50/60 Hz** power supply. (Calibration and position of connections as show on Fig. 2.1). To use a voltage of 230V - 3 Phase – 50/60 Hz, place the connections as show on Fig. 2.2.

To start the bench, insert the electrical plug in a 63 A socket and turn on the master switch (pos. 1, Fig. 2.1), placed on the electrical box.
Turn on the key selector "POWER" (pos. 19 fig. 3.2); a green warning light pos. 29 fig. 3.2, light up.
In case the sequence of the phases is not correct, a red warning light "WRONG PHASE SEQUENCE" will start flashing (pos. 21 fig. 3.2),
If so, turn off the master switch of the bench and disconnect the plug from the socket. Check the phases in the plug, and reverse two of that.
Check that Warning light is off and Repeat the sequence at point 2.1.3.

REMARK

The wrong phase sequence inhibits the starting of the electric motor.
When starting, some warning lights (pos. 26, 32 ÷ 33 e 35 ÷ 39 Fig. 3.2) will light up. Reset the warning light before use by clicking on it. If a signal persists, proceed to the corrective suitable action in table 3.3.

After the operation, turn off the bench acting on the key selector (pos. 19 fig. 3.2) "POWER".

Fill the reservoir of the test bench with hydraulic fluid previously filtrate (see par. 3.3.1)

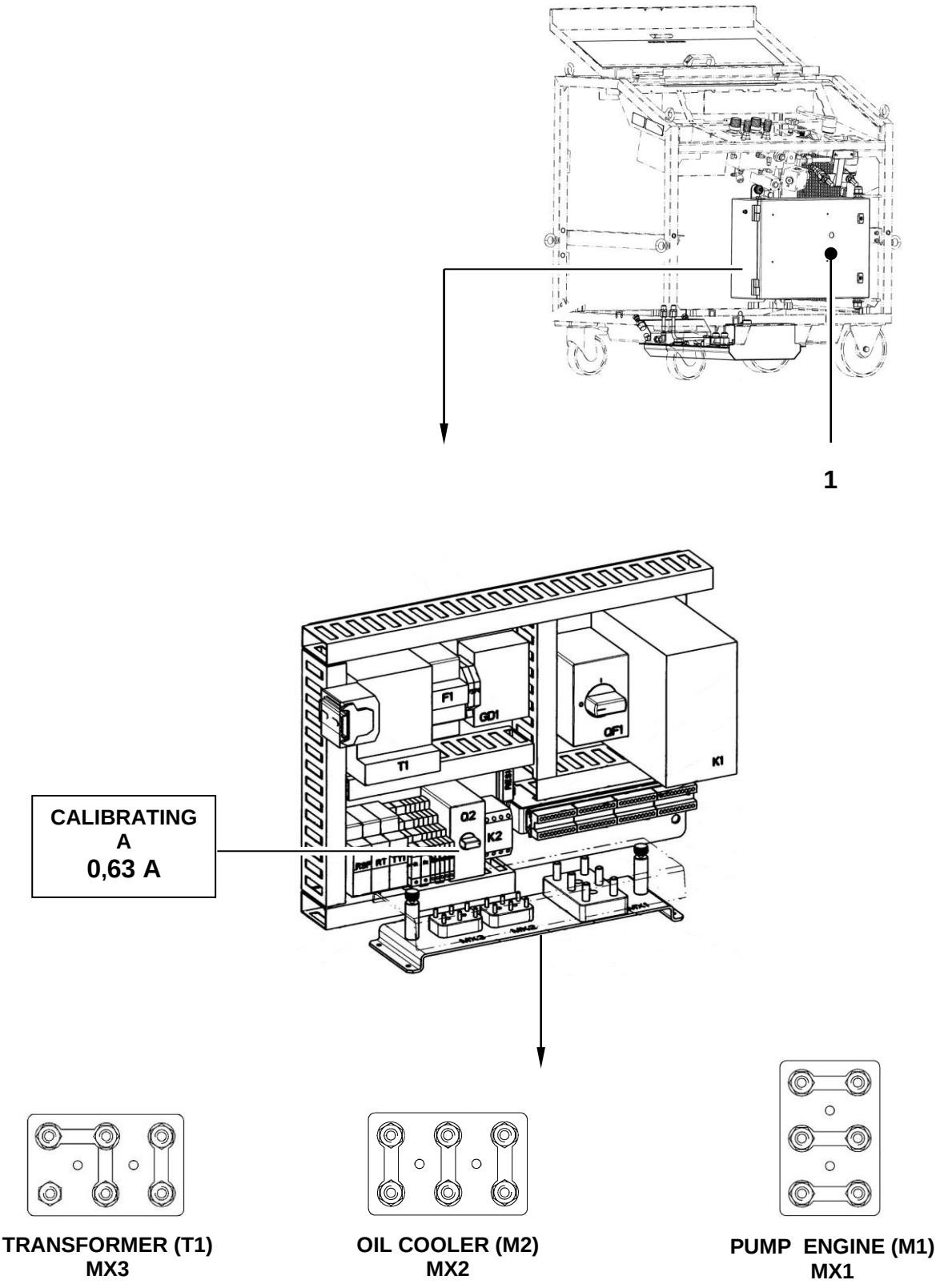


Fig. 2.2 CONFIGURATION OF THE ELECTRICAL BOX FOR 230V - 3 PHASES – 50/60 Hz FUNCTIONING

WARNING

It is essential to fill the reservoir with filtered oil: the test bench must furnish to the aircraft oil in an elevated class of cleanness. Introducing fluid not filtrate involves a rapid clogging of the filter elements installed.

2.2 PREPARATION FOR STORAGE

The temperature range for storage is of –20°C to +60°C.
Prepare the Bench for storage as follows:

- Do not drain completely the hydraulic system. A small quantity of fluid inside the system will protect all moving parts from corrosion, Drain the fluid from the reservoir but leave some inside of the pumps, the filters, and the pipes.
- Protect delivery and return quick-disconnect couplings using appropriate plastic caps/plugs.
- Carefully clean the interior and exterior surfaces of the Stand and protect the Stand with a plastic cover.
- Attach to the Bench, in a visible place, a tag with all necessary information which may assist store personnel for storage operations and type of oil used.
- Once that the above quoted operations have been performed the Banch can be stored for a period not longer than 6 months.

2.3 PREPARATION FOR SHIPMENT

Prepare the Bench for shipment as follows:

- Carry out procedures as per par. 2.2.
- The test bench shall be prepared for shipment in accordance with applicable standard procedure, using a suitable package.

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SECTION III

OPERATION INSTRUCTIONS

3.1 PRELIMINARY OPERATIONS

Before operating the hydraulic test bench for aircraft system testing, perform all required inspections and preliminary operations as at par. 2.1.2 and 2.1.3.
Before Every use, also check that the periodic maintenance program defined in paragraph 5.1, has been followed.

3.2 CONTROL ARRANGEMENT & INSTRUMENTS

The control panel, overseeing all Bench functions, consists of an hydraulic control panel (Fig.3.1) and an electric system control panel (Fig.3.2).

Most of the controls are manually operated and the operational sequences may be carried out at operator's discretion.
Two electric protective devices are installed on the bench, to prevent human error. The “by-pass valve” , the “bench tank/aircraft tank selector” and “backpressure selection valve” will prevent the starting of the bench, or cause its stoppage, in the event of incorrect operation of the controls.

The "GAUGE TEST" fittings on the control panel, allows the calibration of the gauges, with standard procedures or by using the Gauge Calibration Kit P/N GB960-210-600 (optional).

A Pressure selector “LOW PRESSURE” (pos. 7 Fig. 3.1) allows, in lowered position, to visualize on the gauge “LOW PRESSURE” (pos. 4 Fig. 3.1) the suction pressure, while in released position, allows visualizing the booster pressure.

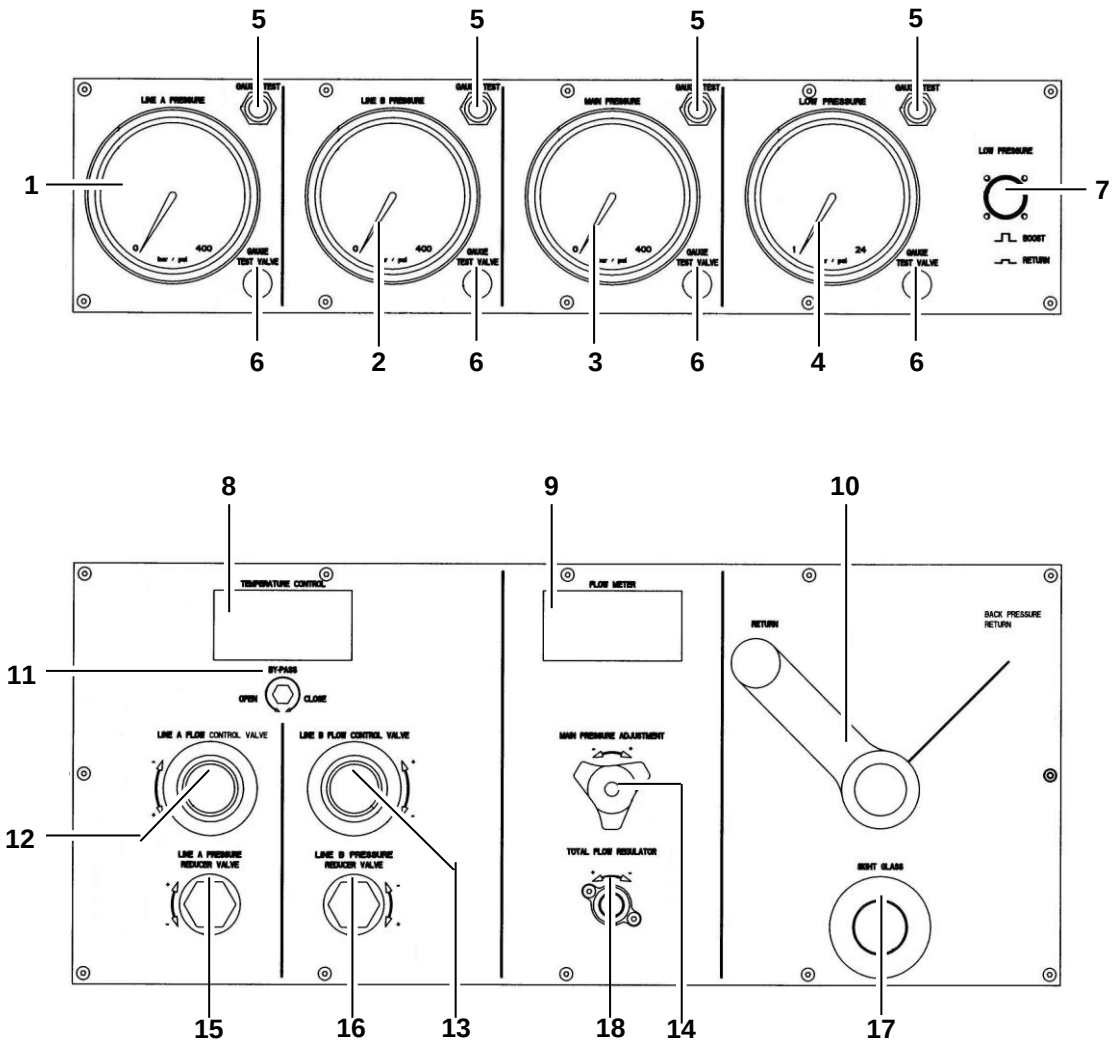


Fig. 3.1 HYDRAULIC SYSTEM CONTROL PANEL

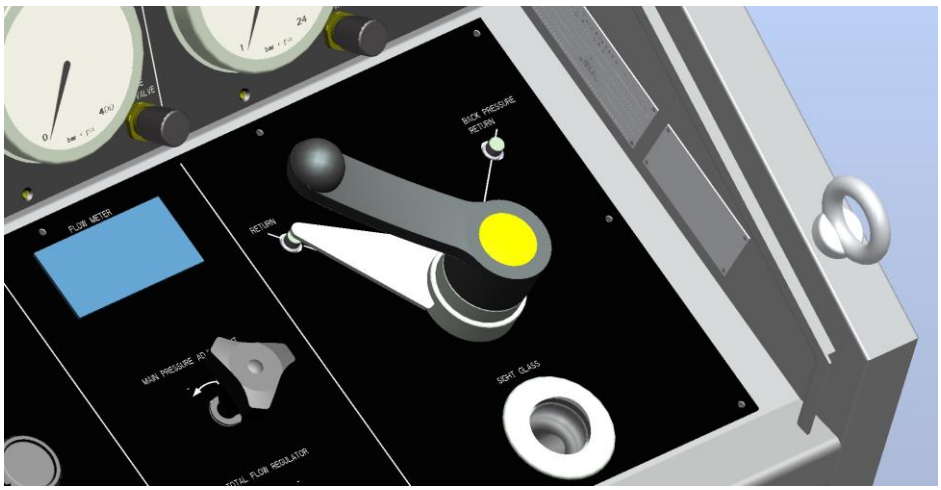


Fig. 3.1A HYDRAULIC SYSTEM CONTROL PANEL
(valid for SN 1102076 and from SN 11020080)

Table 3.1 Nomenclature of hydraulic system control panel

POS.	DESCRIPTION
1	PRESSURE GAUGE DELIVERY “A”
2	PRESSURE GAUGE DELIVERY “B”
3	MAIN PUMP PRESSURE GAUGE
4	LOW PRESSURE GAUGE
5	GAUGE TEST VALVE
6	GAUGE OPEN / CLOSED VALVE
7	PRESSURE SELECTOR
8	HYDRAULIC FLUID TEMPERATURE INDICATOR
9	FLOW METER
10	BACK PRESSURE SELECTOR VALVE
11	BY-PASS POTENTIOMETER
12	FLOW VALVE DELIVERY “A”
13	FLOW VALVE DELIVERY “B”
14	MAIN PRESSURE REGULATION VALVE
15	PRESSURE REDUCER VALVE – DELIVERY “A”
16	PRESSURE REDUCER VALVE – DELIVERY “B”
17	AIR IN SYSTEM INDICATOR
18	FLOW REGULATION VALVE

Tabella 3.1A Nomenclature of hydraulic system control panel
(added items, valid for SN 1102076 and from SN 11020080)

POS.	DESCRZIONE
10A	PROXIMITY
10B	ASSIEME INDICATORE DI POSIZIONAMENTO

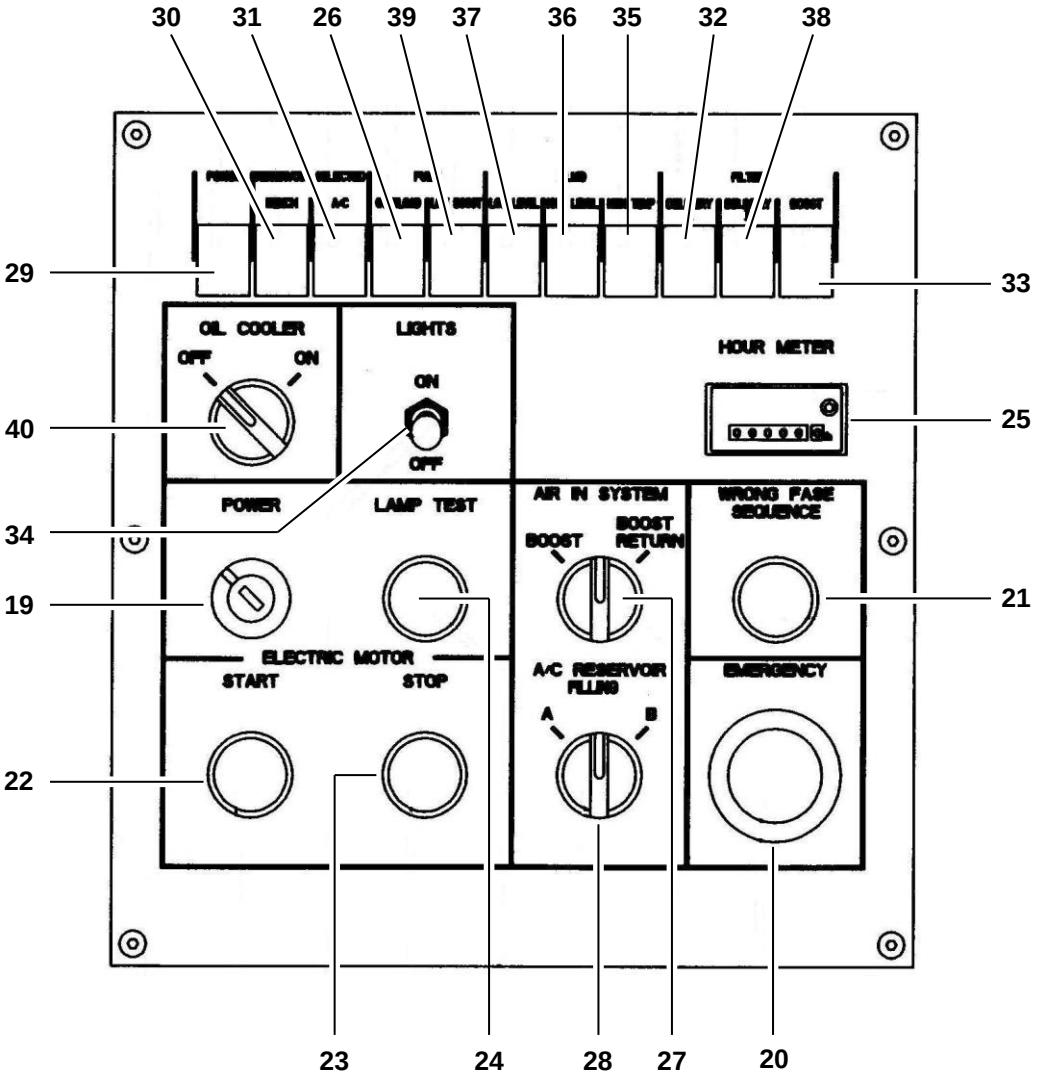


Fig. 3.2 ELECTRICAL SYSTEM CONTROL PANEL

Table 3.2 Nomenclature of electrical system control panel

POS.	DESCRIPTION
19	MASTER SWITCH (POWER)
20	EMERGENCY BUTTON
21	WRONG PHASE SEQUENCE
22	PUMP START BUTTON
23	PUMP STOP BUTTON
24	LAMP TEST BUTTON
25	HOUR METER
26	ELECTRIC MOTOR OVER TEMPERATURE WARNING LIGHT
27	AIR IN SYSTEM SELECTOR
28	AIRCRAFT RESERVOIR FILLING SELECTOR
29	POWER ON WARNING LIGHT
30	BENCH RESERVOIR SELCTED LIGHT
31	AIRCRAFT RESERVOIR SELCTED LIGHT
32	DELIVERY “A” FILTER CLOGGED WARNING LIGHT
33	BOOST-RETURN FILTER CLOGGED WARNING LIGHT
34	LED ILLUMINATION SWITCH
35	HYDRAULIC FLUID HIGH TEMPERATURE WARNING LIGHT
36	HYDRAULIC FLUID HIGH LEVEL WARNING LIGHT
37	HYDRAULIC FLUID LOW LEVEL WARNING LIGHT
38	DELIVERY “B” FILTER CLOGGED WARNING LIGHT
39	PUMP LOW PRESSURE WARNING LIGHT
40	MANUAL AIR COOLER SWITCH

3.3 FIRST EMPLOYMENT

In the following procedures, please referrer to fig. 3.1. / fig. 3.2 and to other figures mentioned in the specific paragraph.

3.3.1 BENCH OIL RESERVOIR REPLENISHMENT (FIG. 3.3)

Check the oil level indicator (2) on the right side of the bench, and manually refill the test bench reservoir from the filling cap (1).

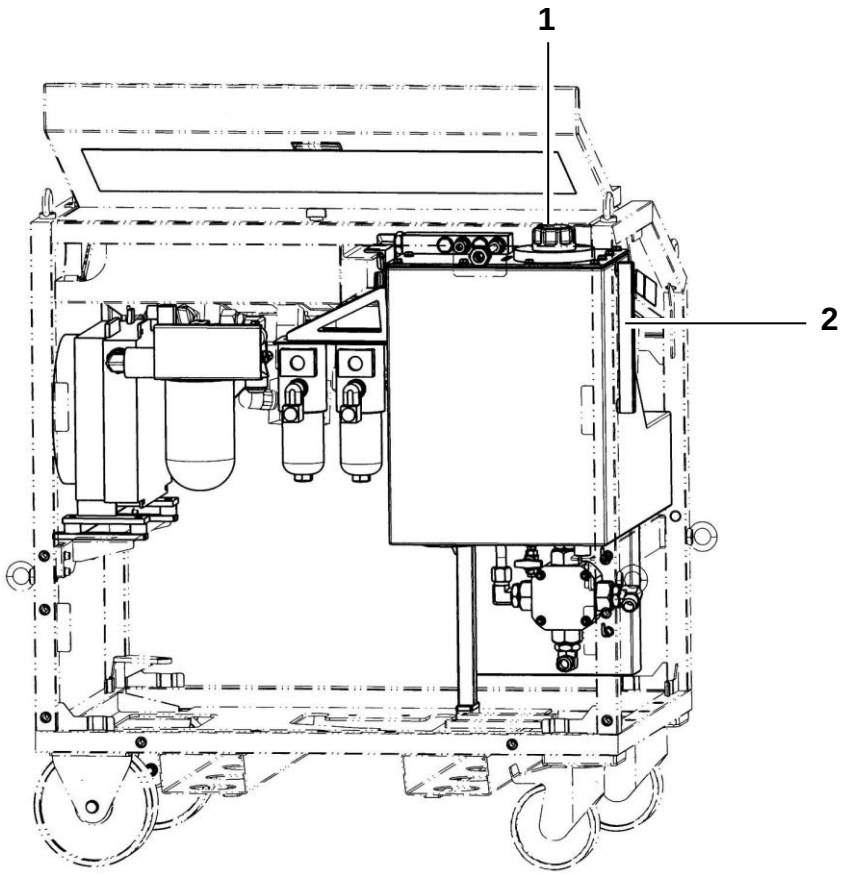


Fig. 3.3 BENCH OIL RESERVOIR REPLENISHMENT

3.3.2 AIR BLEEDING OPERATIONS (FIG. 3.4)

To bleed air from the system, proceed as follows:

a) Open the valve (pos. 11 fig. 3.1) “By-PASS” by rotating the potentiometer completely anticlockwise to "OPEN" position.

b) Close the flow regulating valves (pos. 12 and 13 fig. 3.1) " LINE…FLOW CONTROL VALVE", by rotating completely clockwise.

c) Open the pressure reducing valves "LINE… PRESS. REDUCER VALVE" (pos. 15 and 16 fig. 3.1) by rotating completely clockwise.

d) Rotate “TOTAL FLOW REGULATOR” valve anticlockwise (pos. 18 fig. 3.1) (Max flow).

e) Select the "bench reservoir" by acting on the valve (pos 41 Fig. 3.4) (the green warning light "BENCH" will light up (pos. 30 Fig. 3.2).

f) Open the valve (pos. 14 fig. 3.1) “MAIN PRESSURE ADJUSTMENT” by rotating completely anticlockwise.

WARNING

If the “By-PASS VALVE” (pos. 11 Fig. 3.1), is not completely opened or if the “RESERVOIR SELECTOR” lever is not in a correct position (pos. 41 Fig 3.4) the bench will not start.

The reservoir - selecting lever (pos. 41 Fig. 3.4) could not be operated when electric motor is running; this will stop the bench immediatly.

g) Set master switch "POWER," (pos. 19 fig. 3.2) to on, it will light up the green light (pos. 29 fig. 3.2).

REMARK

The wrong phase sequence inhibits the starting of the electric motor. When starting, some warning lights (pos. 26, 32 ÷ 33 e 35 ÷ 39 Fig. 3.2) will light up. Reset the warning light before use by clicking on it. If a signal persists, proceed to the corrective suitable action in table 3.3.

h) Push start button (pos. 22 fig. 3.2) “START” and let the motor pump run for a few second.

i) Turn the motor pump off pushing stop button (pos. 23 fig. 3.2) “STOP”.

l) Restart the motor pump by pushing start button (pos. 22 fig. 3.2) “START”.

m) Check that the valve (pos. 11 fig. 3.1) “BY-PASS” is opened.

n) Turn switch (pos. 27 fig. 3.2) on “BOOST” until the disappear of air from “SIGHT GLASS” (17 fig. 3.1). Release the switch.

o) Turn switch (pos. 27 fig. 3.2) on “BOOST RETURN” until the disappear of air from “SIGHT GLASS” (pos. 17 fig. 3.1). Release the switch.

p) Turn the motor pump off pushing “STOP” button (pos. 23 fig. 3.2).

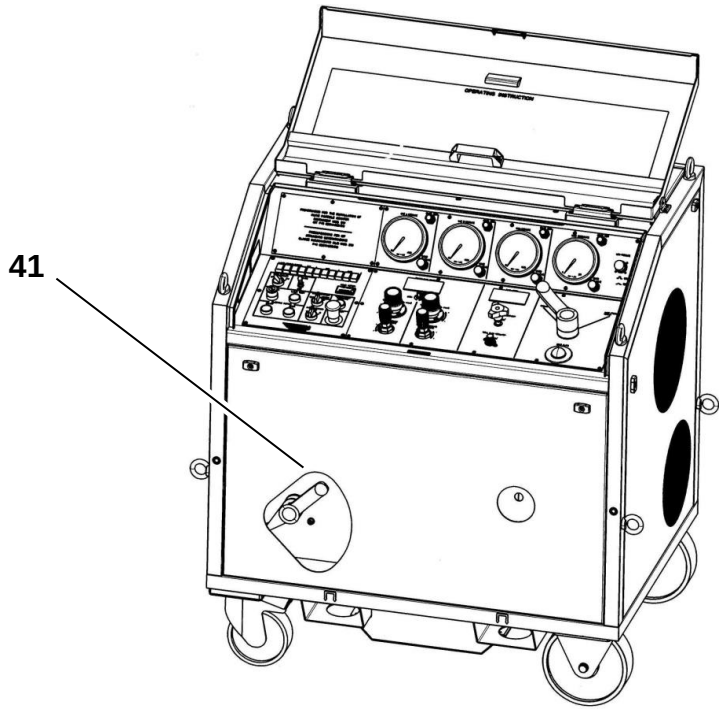


Fig. 3.4 AIR BLEEDING OPERATION

3.3.3 FLUSHING HYDRAULIC PLANT AND FLEXIBLE HOSES LINE “A” (B) - DRAW FLUID SAMPLES (Fig.3.5)

When the air bleeding operation is completed, it is possible to proceed to the flushing of the hydraulic plant and flexible hoses “A” (B) by operating as follows:

a) Rotate line A (B) “FLOW CONTROL VALVE” completely clockwise (pos. 12 fig. 3.1 for line “A”) (pos. 13 fig. 3.1 for line “B”).

b) Rotate line A (B) “PRESSURE REDUCER VALVE” completely clockwise (pos. 15 Fig. 3.1 for line “A”) (pos. 16 fig. 3.1 for line “B”).

c) Connect delivery and return flexible hoses – line “A” (“B”) – use joint P/N GB606-080-450.

d) Open the “By-PASS” valve (pos. 11 fig. 3.1) by rotating completely anticlockwise, to OPEN position.

e) Turn on the "POWER" switch (pos. 19 fig. 3.2); the green ligh will light up (pos. 29 fig. 3.2).

f) Push the “START” button (pos. 22 fig. 3.2).

g) Close “BY-PASS” valve (pos. 11 fig. 3.1) by Rotate completely clockwise, to CLOSE position.

h) Set the pressure at 500 psi by the pressure valve “MAIN PRESSURE ADJUSTMENT” (pos. 14 fig. 3.1) and check on the gauge “MAIN PRESSURE” (pos. 3 fig. 3.1).

i) Rotate “LINE A (B) FLOW CONTROL VALVE” anticlockwise (pos. 12 fig. 3.1 for line “A”) (pos. 13 fig. 3.1 for line “B”).

j) Operate the test bench at maximum flow setting for approximately 30 minutes

k) Drain the hydraulic fluid for a couple of minutes (approximately 300 ml), the same can be successively put in the bench reservoir. Draw fluid sample, in accordance with applicable procedures, from the sampling valve line A (B), by using a glass sterile container. If the flow of fluid is too much, decrease the pressure, by rotating the “MAIN PRESSURE ADJUSTMENT” valve anticlockwise (pos.14 fig. 3.1).

l) Repeat the operation if the fluid analysis is not positive.

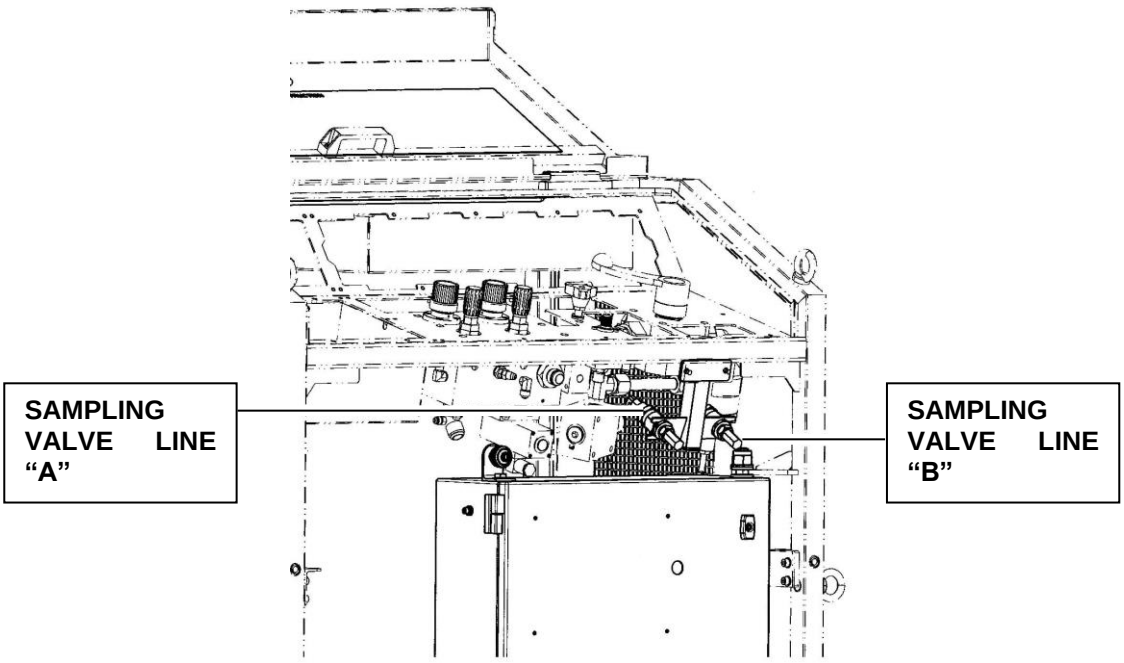


Fig. 3.5 FLUSHING HYDRAULIC PLANT AND FLEXIBLE HOSES

3.3.4 TURN BENCH OFF – END OF FLUSHING OPERATIONS

a) Open the “By-PASS” valve (pos. 11 fig. 3.1 by rotating completely anticlockwise to "OPEN" position.

b) Turn the motor pump off pushing “STOP” button (pos. 23 fig. 3.2).

c) Turn “POWER” switch off (pos. 19 fig. 3.2); light (pos. 29 fig. 3.2) turns off.

d) Disconnect the delivery and return hoses and remove the short circuit assy P/N GB606-080-450. Re-Install to each end of the hoses the quick-disconnect couplings in use.

3.4 OPERATIVE INSTRUCTION

Make sure that all operations listed in the previous paragraphs have been completed. The hydraulic test bench, can operate in two different flow regulation mode: Automatic (Ref. 3.4.1) or Manual (Ref.3.4.2) mode.

3.4.1 AUTOMATIC – REGULATION FLOW MODE

Proceed as follows:

a) Set the back pressure valve (pos. 10 fig.3.1) on “RETURN”.

b) Connect the delivery and return flexible hoses to the aircraft.

c) Open the “By-PASS” (pos. 11 fig. 3.1) by rotating the potentiometer anticlockwise completely to "OPEN" position.

d) Rotate “TOTAL FLOW REGULATOR” valve (pos. 18 fig. 3.1) completely anticlockwise.

e) Rotate “MAIN PRESSURE ADJUSTMENT” valve (pos. 14 fig. 3.1) completely anticlockwise.

f) Select the reservoir by selector (pos. 41 fig. 3.4) - “BENCH” light (pos. 30 fig. 3.2) or “A/C” light (pos. 31 fig. 31) light up.

g) Rotate “LINE A (B) FLOW CONTROL VALVE” and “LINE A (B) PRESSURE REDUCER VALVE” (pos. 12–13-15–16 fig. 3.1) clockwise.

h) Set “POWER” switch to on (pos. 19 fig. 3.2) – Light (pos. 29 Fig. 3.2) light up.

i) Push “START” button (pos. 22 fig. 3.2).

j) CLOSE “BY-PASS” valve (pos. 11 fig. 3.1) – Rotate completely clockwise.

k) Set pressure limit value by “MAIN PRESSURE ADJUSTMENT” valve (pos. 14 fig. 3.2).

l) OPEN the “By-PASS” (pos. 11 fig. 3.1) by rotating completely the potentiometer counterclockwise to "OPEN" position.

m) Open (alternatively) “LINE A FLOW CONTROL VALVE” (pos. 12 fig. 3.1) and “LINE B FLOW CONTROL VALVE” (pos. 13 fig. 3.1)

n) CLOSE “BY-PASS” valve (pos. 11 fig. 3.1) – Rotate completely clockwise.

o) It is possible to set different pressure on delivery “A and B” by regulating “LINE A PRESSURE REDUCER VALVE” (pos. 15 fig. 3.1) and “LINE B PRESSURE REDUCER VALVE” (pos. 16 fig. 3.1).

3.4.2 MANUAL – REGULATION FLOW MODE

Proceed as follows:

a) Set the “BACK PRESSURE VALVE” (pos. 10 fig.3.1) on “RETURN”.

b) Connect the delivery and return flexible hoses to the aircraft.

c) Open the “By-PASS” (pos. 11 fig. 3.1) by rotating the potentiometer anticlockwise completely to "OPEN" position.

d) Rotate “TOTAL FLOW REGULATOR” valve (pos. 18 fig. 3.1) completely anticlockwise.

e) Rotate “MAIN PRESSURE ADJUSTMENT” valve (pos. 14 fig. 3.1) completely anticlockwise.

f) Select the reservoir by selector (pos. 41 fig. 3.4) - “BENCH” light (pos. 30 fig. 3.2) or “A/C” light (pos. 31 fig. 31) light up.

g) Rotate “LINE A (B) FLOW CONTROL VALVE” and “LINE A (B) PRESSURE REDUCER VALVE” (pos. 12–13-15–16 fig. 3.1) clockwise.

h) Set “POWER” switch to on (pos. 19 fig. 3.2) – Light (pos. 29 Fig. 3.2) light up.

i) Push “START” button (pos. 22 fig. 3.2).

j) Set request flow by “TOTAL FLOW REGULATOR” valve (pos. 18 fig. 3.1) and check value on “FLOW METER” (pos. 9 fig. 3.1).
CLOSE “BY-PASS” valve (pos. 11 fig. 3.1) – Rotate completely clockwise.

k) Set pressure limit value by “MAIN PRESSURE ADJUSTMENT” valve (pos. 14 fig. 3.2).

l) OPEN the “By-PASS” (pos. 11 fig. 3.1) by rotating completely the potentiometer counterclockwise to "OPEN" position.

m) Open (alternatively) “LINE A FLOW CONTROL VALVE” (pos. 12 fig. 3.1) and “LINE B FLOW CONTROL VALVE” (pos. 13 fig. 3.1)

n) CLOSE “BY-PASS” valve (pos. 11 fig. 3.1) – Rotate completely clockwise.

o) It is possible to set different pressure on delivery “A and B” by regulating “LINE A PRESSURE REDUCER VALVE” (pos. 15 fig. 3.1) and “LINE B PRESSURE REDUCER VALVE” (pos. 16 fig. 3.1).

NOTE

If necessary is possible to regulate the flow by “TOTAL FLOW REGULATOR” valve (pos. 18 fig. 3.1) if using only one line.

3.4.3 TURN BENCH OFF – END OF OPERATIONS

a) Open the “By-PASS” valve by rotating (pos. 11 fig. 3.1) completly anticlockwise to OPEN position

b) Rotate “TOTAL FLOW REGULATOR” valve (pos. 18 fig. 3.1) anticlockwise.

c) Turn the motor pump off - push “STOP” button (pos. 23 fig. 3.1).

NOTE

When using aircraft pressurized reservoir select bench reservoir by selector (pos. 41 fig. 3.4) (light pos. 30 fig. 3.2 on) and select the “BACK PRESSURE RETURN” by selector (pos. 10 fig. 3.1). Valves selection must be operated when hydraulic test bench in OFF.

3.4.4 FILLING UP OF AIRCRAFT RESERVOIR USING BENCH RESERVOIR

If the hydraulic circuit of the aircraft permits, is possible to re-fill the reservoir of the aircraft using the test bench.

To perform this operation proceed as follows:

a) Select "BENCH RESERVOIR" by acting on the selector (pos 41 Fig. 3.4) and be sure that the relevant warning light “BENCH” (pos. 30, Fig. 3.2), on the control panel, lights up;

b) Connect return hoses (R(A) or R(B) to the quick-disconnect coupling of the aircraft;

c) Open the “By-PASS” valve (pos. 11 fig. 3.1) by rotating the completely anticlockwise to "OPEN". Open the “MAIN PRESSURE ADJUSTMENT” valve (pos. 14 fig. 3.1) rotate compleltly anticlockwise. Set the valve (pos. 10 fig. 3.1) on “BACK PRESSURE RETURN”.

d) Push “START” button (pos. 22 fig. 3.2)

e) CLOSE the “BY-PASS” valve (pos. 11 fig. 3.1) - rotate completely clockwise;

g) Keep the selector “A/C RESERVOIR FILLING” (pos. 28 fig. 3.2) on “A" if you're using the line (A), or “B” if you're using the line (B) to start the re-filling;

CAUTION

The Bench operator should perform the re-fill assisted by other personnel, located in a safe position, where it is possible to see the aircraft reservoir level indicator. Inform bench operator when the fluid in the reservoir has reached the proper level.

h) When the fluid reaches the prescribed level, stop filling operations by releasing selector “A/C RESERVOIR FILLING” (pos. 28 Fig. 3.2;

i) When operation is finished disconnect hoses and open the “By-PASS” valve (pos. 11 fig. 3.1) by rotating completely anticlockwise. Stop the bench by pushing the “STOP” button (pos. 23 fig. 3.2).

3.4.5 SET THE BACK PRESSURE

When the hydraulic test bench m^3 is operating is possible to create a back pressure in the return circuits of about 50 psi. Position the valve (pos. 10 Fig.3.1) on “PRESSURE RETURN BACK”.

CAUTION

The valve (pos. Figure 10. 3.1) must be operated only when test-bench is off. Make sure the valve is correctly positioned at one of two positions before turn on the bench.

3.4.6 DRAINING THE AIRCRAFT RESERVOIR

If the hydraulic circuit of the aircraft permits it is possible to drain the aircraft reservoir using the test bench.

CAUTION

Before draining verify that the bench reservoir may contain the amount of oil removed from aircraft reservoir

To perform this operation proceed as follows:

a) Select "aircraft reservoir" by acting on the valve (pos 41 Fig. 3.4) and make sure that the relevant warning light “A/C” (pos. 31 Fig. 3.2), on the control panel, lights up;

b) Connect hoses P(A) - P(B) - R(A) - R(B) to the quick-disconnect coupling of the aircraft;

c) Open the “By-PASS” valve (pos. 11 fig. 3.1) by rotating the potentiometer completely anticlockwise to "OPEN" position;

d) Start the pump motor by pushing the "START" button (pos. 22 fig. 3.2);

e) Slowly close the “By-PASS” valve (pos. 11 fig. 3.1) by rotating completely clockwise to "CLOSED" position;

f) Keep the selector “AIR IN SYSTEM” (pos. 27 fig. 3.2) on "BOOST" to drain the aircraft reservoir.

Table 3.3 Electric control panel warning lights

WARNING	CONSEQUENCES	CORRECTIVE ACTION
BOOST FILTER CLOGGED (POS. 33 FIG. 3.2 "BOOST")	INDICATION ONLY. IF NECESSARY THE TEST-BEING PERFORMED CAN BE COMPLETED.	REPLACE FILTER CARTRIDGE. FILTER CARTRIDGES ARE **NOT** REUSABLE AND REQUIRE REPLACEMENT.
DELIVERY FILTERS CLOGGED (POS. 32 - 38 FIG. 3.2 "DELIVERY A" RO “DELIVERY B”)	INDICATION ONLY. IF NECESSARY THE TEST-BEING PERFORMED CAN BE COMPLETED.	REPLACE FILTER CARTRIDGE. FILTER CARTRIDGES ARE **NOT** REUSABLE AND REQUIRE REPLACEMENT.
FLUID HIGH TEMPERATURE (POS 35 FIG. 3.2 "HIGH TEMP")	WARNING THE REACHING OF 70°C REMOVES THE PRESSURE FROM THE BENCH BUT DOES NOT SWITCH OFF THE MOTOR.	CHECK HEAT EXCHANGER FAN FOR PROPER OPERATION. THE BENCH REMAINS PERMANENTLY IN BY-PASS. WAIT UNTIL THE ATTAIN OF 55°C, TURN OFF THE BENCH. RESTART THE BENCH TO OPERATE AGAIN.
LOW BOOST PRESSURE (POS. 39 FIG. 3.2 "LOW BOOST")	STOPPAGE OF BENCH WITH PERMANENT ILLUMINATION OF WARNING LIGHT.	CHECK BOOST PUMP OPERATION. DECREASE BOOSTER PRESSURE VALUE UNTILL TEST BENCH REMAIN OPERATING, ANYWAY NOT LESS THAN 20 PSI. REPLACE PRESSURE SWITCH (SET POINT 29 PSI)
RESERVOIR OIL LOW LEVEL (POS 37 FIG. 3.2 "LOW LEVEL")	PERMANENT ILLUMINATION OF WARNING LIGHT	RE-FILL RESERVOIR
RESERVOIR OIL HIGH LEVEL (POS. 36 FIG. 3.2 "HIGH LEVEL)	PERMANENT ILLUMINATION OF WARNING LIGHT	BLEED OIL FROM RESRVOIR
PUMP MOTOR THERMOSWITCH (POS. 26 FIG. 3.2 "OVERLOAD”)	STOPPAGE OF BENCH WITH PERMANENT ILLUMINATION OF WARNING LIGHT.	WAIT FOR COOLING OF THERMAL RELAY AND ITS AUTOMATIC RESETTING THEN RESET WARNING LIGHT.
WRONG PHASE SEQUENCE (POS. 21 FIG. 3.2 WRONG FASE)	STOPPAGE OF BENCH AND FLASHING OF WARNING LIGHT	INVERT TWO PHASES OF THE POWER CABLE PLUG (SEE PAR. 2.1.3)

3.5 CALIBRATION OF THERMO-REGULATOR (See. Fig. 3.6)

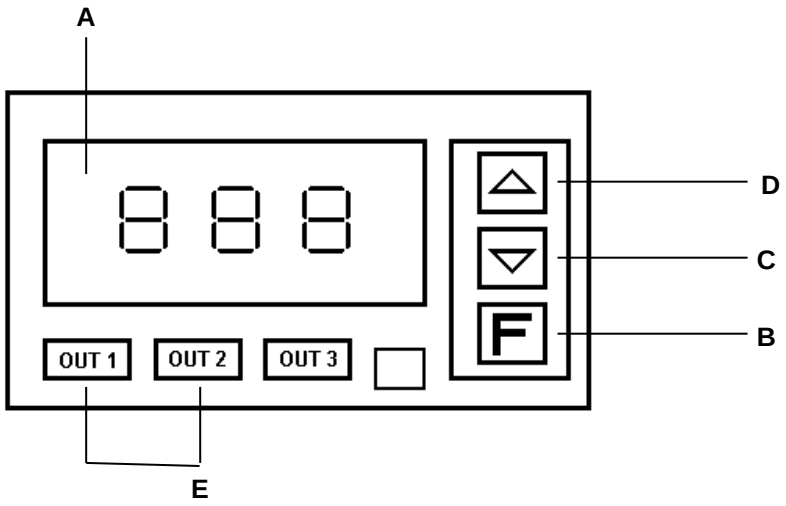
The temperature of the hydraulic fluid is constantly visualized on the display (A).

The thermo-regulator is set from the producer of the bench: the threshold that operates the fan of the heat exchanger is set to 40°C and the Δt between the starting and the arrest of the fan is around 3°C.

The value of the operating temperature of the fan (+40°C) can be checked on the display (A) by pressing the button (B) once. To increase or decrease this value press the button (D) or (C).

The thermo-regulator has a threshold of alarm set at 70°C: when the hydraulic fluid reaches this temperature to the test bench work in by-pass mode and any operation whit pressure it's inhibited.

To restore bench operations, it is necessary to cool oil to a temperature of at least 55 °C.



A VISUALIZATION OF DATA
B BUTTON "FUNCTION"
C BUTTON "DECREASE"
D BUTTON "INCREASE"
E INDICATION MAIN OUTPUT ACTIVE

Fig. 3.6 THERMO-REGULATOR

3.6 FORCED START OF THE HEAT EXCHANGER FAN

During the use of the hydraulic test bench m^3, the heat exchanger can be manually started (item 2 Fig. 1.3) by positioning the switch "OIL COOLER" (item 40 Fig. 3.2) to ON.

3.7 POWER ON SWITCH LED ILLUMINATION CONTROL PANEL

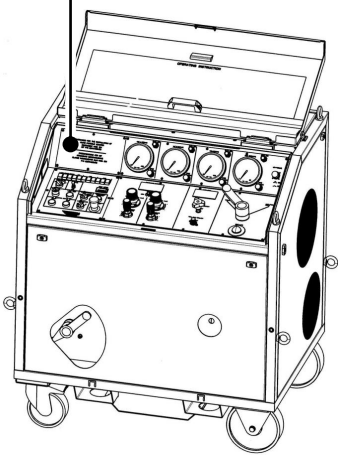
To switch on the light of the control panel turn on the test bench by pushing the "POWER" button (item 19 Fig. 3.2) and position the "LIGHT" switch (item 34 Fig. 3.2) to ON.

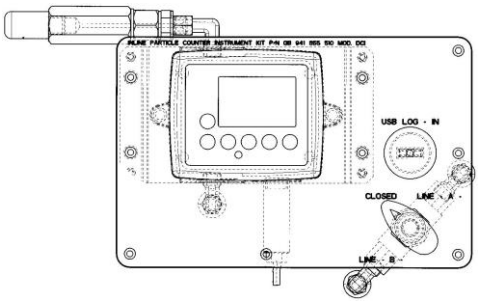
3.8 PRE-ARRANGMENT FOR INSTALLATION OF OIL ANALYZER INSTRUMENT

The test bench ***m³*** is pre-arranged for the installation of an “Oil Analyzer Instrument”, identified by P/N GB941-855-510.

PC FOR DATA DOWNLOAD SUPPLIED WITH OIL ANALYZER INSTRUMENTP/N GB941-855-510

Pre-arrangement on panel
For Oil analyzer Instrument P/N GB941-855-510





OIL ANALYZER INSTRUMENTP/N GB941-855-510

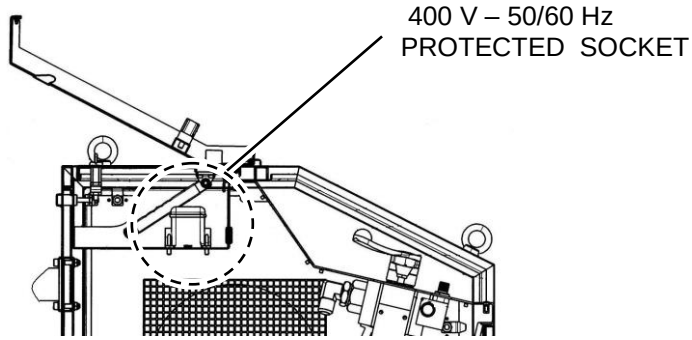
Fig. 3.7 PRE-ARRANGEMENT AND OIL ANALYZER INSTRUMENT

3.9 PRE-ARRANGMENT FOR THE USE OF VACUUM PUMP KIT

The test bench is equipped with a 400 V – 50/60 HZ protected socket, positioned inside of the STORAGE BAY, suitable to connect a vacuum pump kit P/N GB941-858-835, with the following functions:

• Re-fill of filtered fluid in the reservoir

• Air-Bleeding of the hydraulic fluid



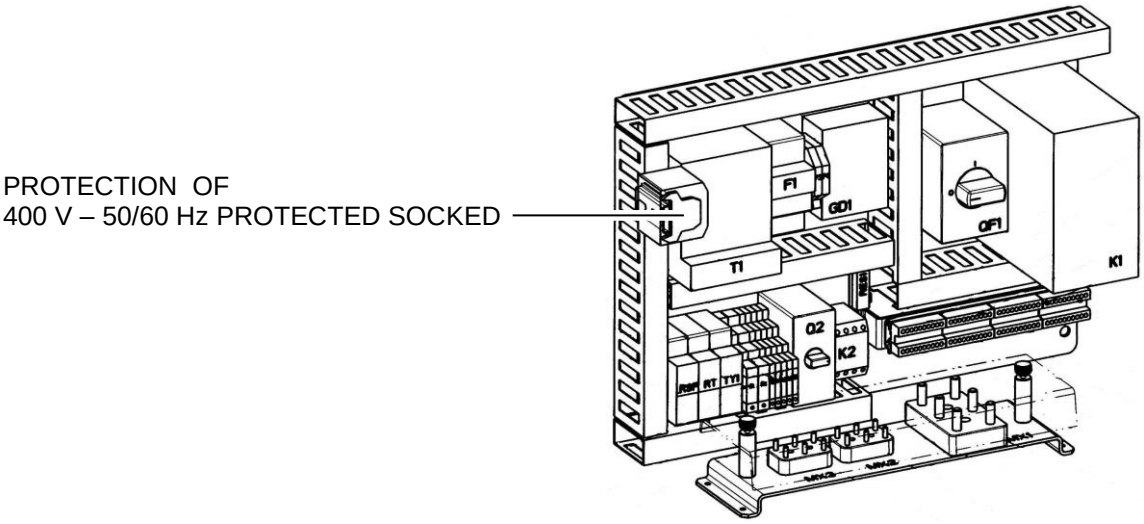


Fig. 3.8 PRE-ARRANGEMENT FOR POWER SUPPLY VACUUM PUMP KIT

SECTION IV

EMERGENCY OPERATION

4.1 EMERGENCY OPERATION

Should an emergency arise while a test of an aircraft is in progress, it's always possible, to stop immediately the bench by pressing the "EMERGENCY" push-button (item 20, Fig.3.2), which remains pressed-down.
To restore Bench operation proceed as follows:

a) Open the "By-PASS" valve (pos. 11 fig. 3.1) by rotating completely anticlockwise to "OPEN" position;

b) Reset "EMERGENCY" push-button (pos. 20 fig. 3.2) by rotating clockwise;

c) Push the "START" button (pos. 22 fig. 3.2). Engine pump will start;

d) Slowly close the by-pass valve (pos. 11 fig. 3.1) by rotating completely clockwise to "CLOSED" position;

e) Proceed with the programmed tests.

4.1.1 ALARM OVERTEMPERATURE (TEMPERATURE REACHES OVER 70 °C OF THE HYDRAULIC FLUID)

When the hydraulic fluid temperature reaches 70°C, the test bench automatically switches to by-pass modes permanently, pressure falls to zero and delivery lines are no longer supplied.
To restore the operability of test bench proceed as follows:

a) Open the by-pass valve (pos. 11 fig. 3.1) by rotating completely anticlockwise to "OPEN" position;

b) Wait until the temperature of the fluid reaches at least 55°C (NOTE: the test bench in these conditions does not permit operational mode, and the bypass valve will remain open).

c) Turn off the test bench (the over temperature condition can be reset only by turning off the test bench)

d) Turn on the test bench and slowly close the by-pass valve (pos. 11 fig. 3.1) by rotating completely clockwise to "CLOSED" position;

SECTION V

MAINTENANCE – TROUBLESHOOTING

5.1 GENERAL

This Section provides maintenance instructions for the test bench and for an easy troubleshooting.

To keep the test bench perfectly efficient strictly refer to the rules and recommendations listed in the following paragraphs.

NOTE

The periodicity foreseen for cleaning, inspection and replacement operations, as per Table 5.1, refers to operating time as indicated on the hour meter (item 25, Fig.3.2).

WARNING

Before execute the operations of maintenance or setting described in this section, remove tension from the test stand by acting on the master switch, (1, Fig. 5.1), placed on the electrical system box and disconnect the power socket.

WARNING

Components damaged or not efficient must be replaced immediately and the entire test bench should be submitted to a careful inspections before using it again.

WARNING

Repair operations on components are not admitted. It’s only admitted the replacement of the failed part.

WARNING

The Company GB BARBERI s.r.l. is free from any responsibility in case the Product is employed beyond it’s limits, or for improper use, in contrast with instruction provided by this manual.

The Company GB BARBERI s.r.l. is free from any responsibility, from the point of view of the law or safety standards or manufacturer’s responsibility for the damages deriving from the employment of the product, in case: the products is not submitted by scheduled controls, or for use of aftermarket or non-specific spare-parts for the test hydraulic bench m^3 P/N GB941-010-500.

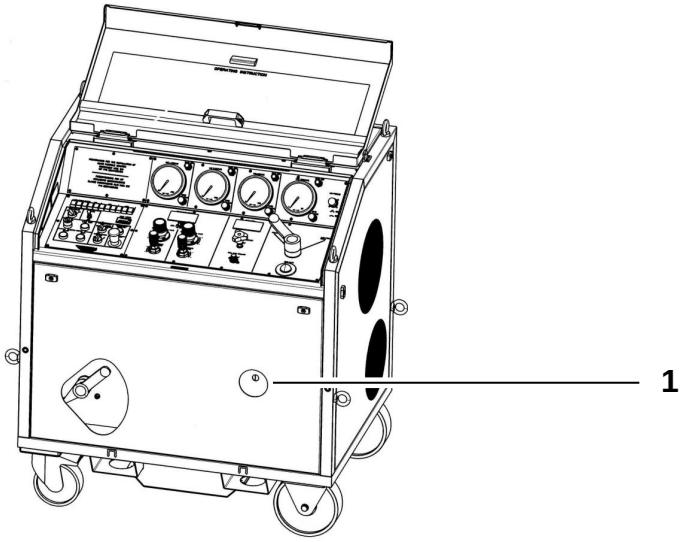


Fig. 5.1 MASTER SWITCH

5.2 PERIODIC INSPECTIONS

The Test Bench ***m³*** must be subjected to periodic inspections listed in table 5.1 such as to guarantee the functionality and safety for operators and aircraft which the bench is combined.

Periodic inspection may be carried out by trained operators of the end user.

To let operators award, in Chap 5.3 maintenance procedure are provided according scheduling in table 5.1.

WARNING

The general inspection after 72 months listed in table 5.1 must be done by the OEM company or by trained personnel of authorized service centres.

5.3 MAINTENANCE OF HYDRAULIC SYSTEM

To correctly perform inspections and maintenance on hydraulic circuit the following tools, equipment and spare parts are needed

STANDARD TOOLS

P/N	DESCRIPTION	Q.TY
Commercial	Set open wrench from Ch 16/17 to 46/50 UNI-ISO 10102 DIN 3110	1
GB961-066-000	Wrench tape to remove booster filter cartridge	1(*)
GB961-003-040	Open wrench, double, Ch 14/15 UNI-ISO 10102 DIN 3110	1(*)
GB961-003-050	Open wrench, double, Ch 17/19 UNI-ISO 10102 DIN 3110	1(*)
GB961-003-070	Open wrench, double, Ch 20/22 UNI-ISO 10102 DIN 3110	1(*)
GB961-003-090	Open wrench, double, Ch 24/27 UNI-ISO 10102 DIN 3110	1(*)
GB961-003-120	Open wrench, double, Ch 30/32 UNI-ISO 10102 DIN 3110	1(*)
Commercial	Open wrench, double, Ch 34/36 UNI-ISO 10102 DIN 3110	1
Commercial	Open wrench, double, Ch 36/41 UNI-ISO 10102 DIN 3110	1
Commercial	Open wrench, double, Ch 41/46 UNI-ISO 10102 DIN 3110	1
Commercial	Open wrench, double, Ch 46/50 UNI-ISO 10102 DIN 3110	1

Note: the items (*) in the Q.TY column are part of the kit GB941-858-870 supplied with the test bench

EQUIPMENTS

P/N	DESCRIPTION	Q.TY
GB960-210-600	Pressure guage calibration kit	1
GB 941-855-560	Laboratory bottles kit	1

SPARE PARTS

P/N	DESCRIPTION	Q.TY
GB523-423-720	FLEXIBLE HOSE	1
GB522-154-079	FLEXIBLE HOSE	1
GB529-871-000	FLEXIBLE HOSE	1
GB523-212-565	FLEXIBLE HOSE	1
GB523-202-485	FLEXIBLE HOSE	1
GB523-203-095	FLEXIBLE HOSE	1
GB523-203-098	FLEXIBLE HOSE	1
GB522-154-110	FLEXIBLE HOSE	1
GB523-203-097	FLEXIBLE HOSE	1
GB523-204-880	FLEXIBLE HOSE	1
GB529-055-480	RETURN FLEXIBLE HOSE LINE B	1
GB529-055-450	DELIVERY FLEXIBLE HOSE LINEA A	1
GB529-055-470	DELIVERY FLEXIBLE HOSE LINEA B	1
GB529-055-460	RETURN FLEXIBLE HOSE LINE A	1
GB525-100-010	MINIFLEX	1
GB525-100-020	MINIFLEX	4
GB525-100-030	MINIFLEX	4
GB525-102-000	MINIFLEX	1
GB525-103-002	MINIFLEX	3
GB525-104-001	MINIFLEX	1
GB675-008-101	BOOSTER LINE FILTER CARTRIDGE	1
GB675-024-100	DELIVERY HP FILTER CARTRIDGE	2
GB038-080-100	HP FILTER GASKET KIT (ON CONDITION)	2
GB038-820-127	RESERVOIR GASKET	1

5.3.1 BOOST / RETURN LINE FILTER (pos. 1 Fig. 5.2)

If Return Line Filter is clogged warning light (item 33, Fig.3.2) will light up.

To replace the filter cartridge proceed as follows:

- Switch off Bench Main Switch (pos. 1, fig 1.5) located on the electric box.

- Loosen and remove the filter cartridge, consisting of the lower part of the filter, by rotating it anti-clockwise.

- Clean the filter support and remove all foreign matters.

- Install a new filter cartridge (P/N GB675-008-101) and taking care of lubricating the new seal using new clean oil.

WARNING

After the replacement of the filter cartridge, restore fluid level inside the reservoir, if required, and perform a flushing of the system. Refer to paragraph 3.3.2 - Section III.

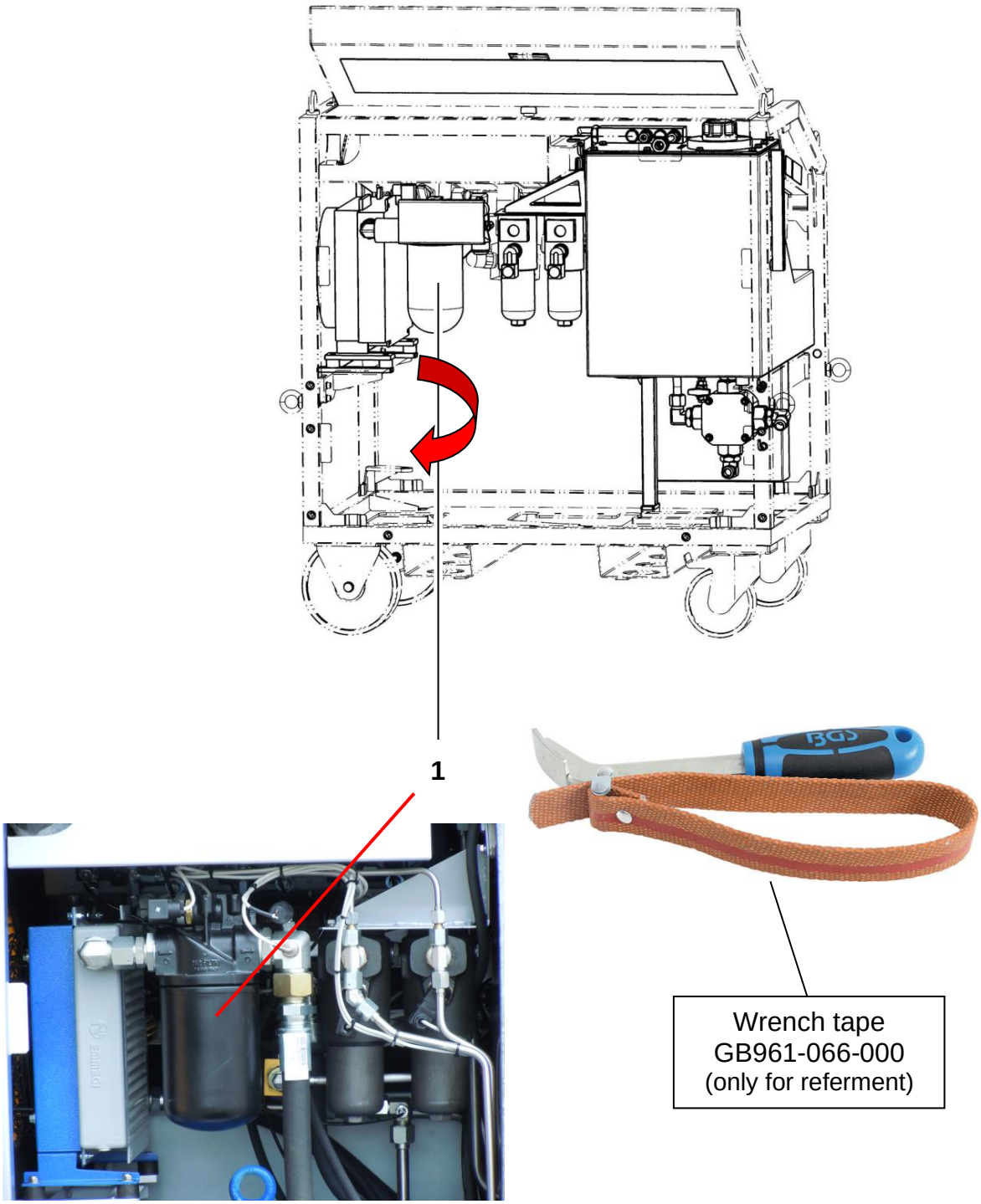


Fig. 5.2 BOOST / RETURN LINE FILTER

5.3.2 DELIVERY LINE FILTERS (pos. 1 – 2 Fig. 5.3)

If Delivery Lines Filters are clogged warning light (item 32 and 38, Fig.3.2) will light up.

To replace the filter cartridge proceed as follows:

- Switch off Bench Main Switch (pos. 1, fig 1.5) located on the electric box.
- Place a container under the filter, loosen and remove the filter cartridge body from the filter head. Use a spanner inserting it on the hexagon at the bottom of the filter body.

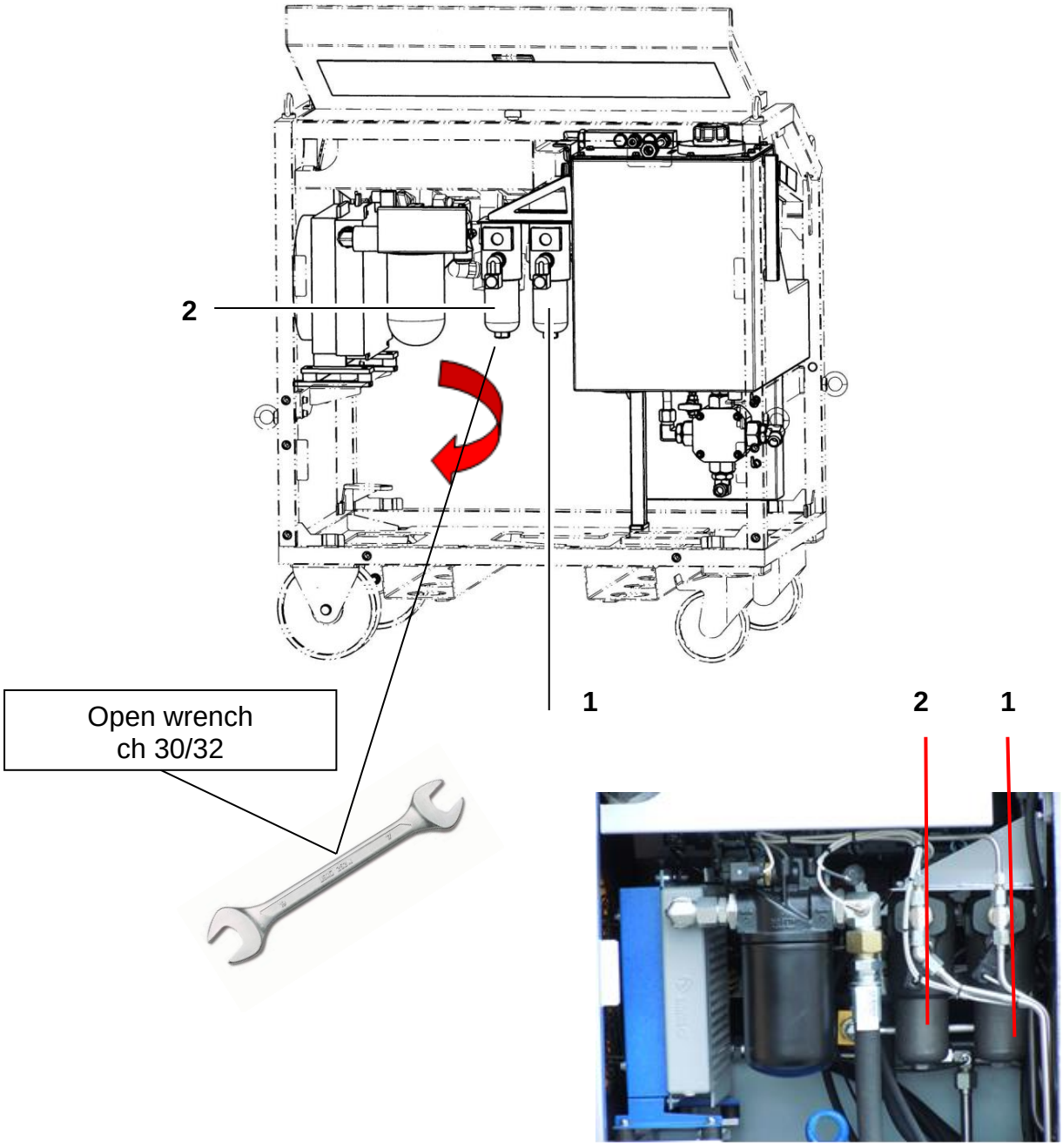
WARNING

During 12 months maintenance the o-rings and the back-up ring are expected to be replace; the replacement is ON CONDITION

- Remove the cartridge and the gasket on the cartridge and the body filter; clean and dry the inner of the filter body.
- Install the new cartridge (P/N GB675-024-100) and the gasket kit (PN GB030-080-100). Screw on and tighten the filter body using the proper wrench.

CAUTION

After the replacement of the filter cartridge, restore fluid level inside the reservoir, if required, and perform a flushing of the system as per par.3.3.2 - Section III.



1 H.P. LINE “A” FILTER

2 H.P. LINE “B” FILTER

Fig. 5.3 DELIVERY LINE FILTERS

5.3.3 CLEANING OF RESERVOIR (RIF. FIG. 5.4)

Every 72 months, during the scheduled inspection, it is good to clean any deposits formed in the reservoir (pos. 1).

To clean the reservoir, use a suitable container and drain the fluid trough the Drain valve (item 2); remove the cover (item 3) and clean the inside of the reservoir. Then replace the cover, making sure the gasket P/N GB038-820-127 (item 4) is still efficient; otherwise replace it.

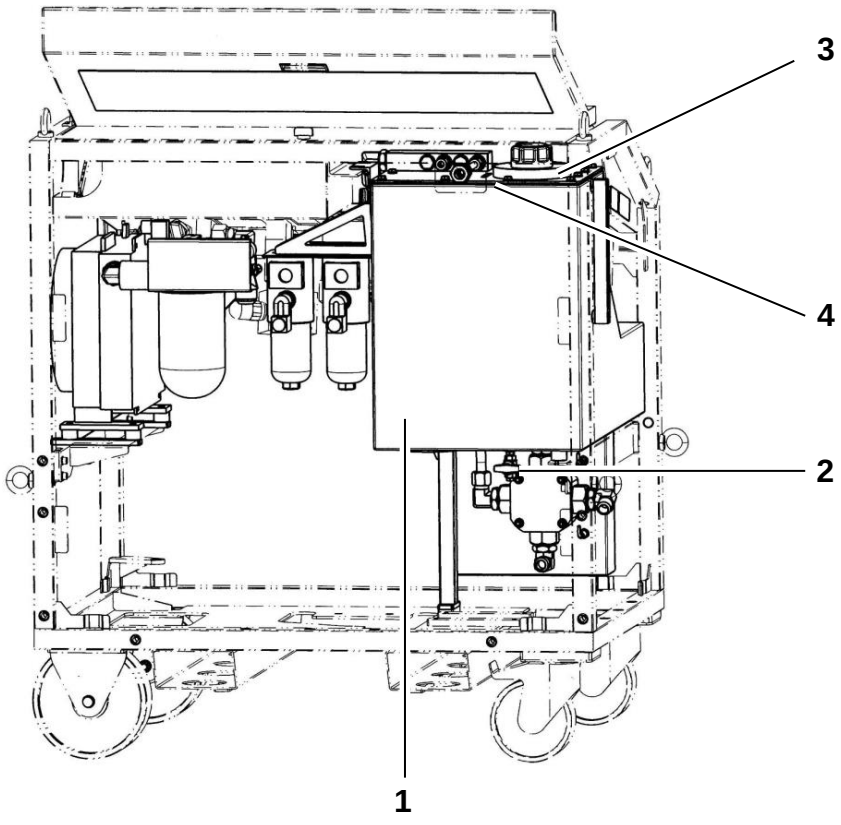


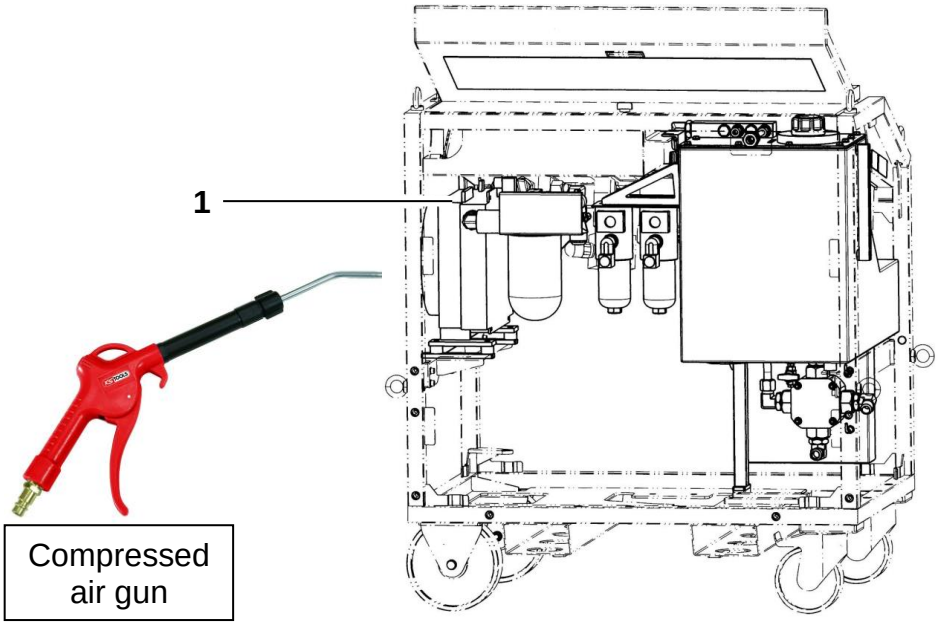
Fig. 5.4 CLEANING OF RESERVOIR

5.3.4 HEAT EXCHANGER (POS. 1 FIG. 5.5)

Remove the left side panel.

Keep the heat exchanger clean by blowing compressed air through the air fins.

Carefully clean the fan and surrounding areas.



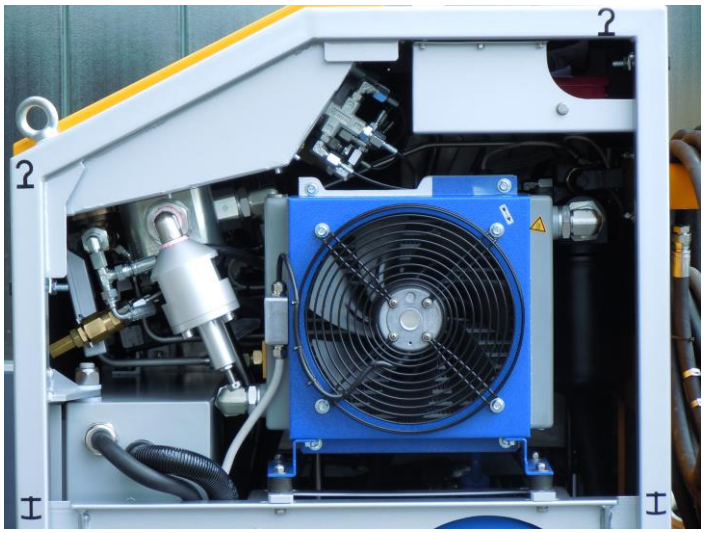


Fig. 5.5 HEAT EXCHANGER

5.3.5 PIPES, HOSES, FITTINGS AND OTHER HYDRAULICS SYSTEM COMPONENTS

Every 12 months staring from the first commissioning, perform a visual inspection of all hydraulic system components.

Check all pipes and hoses for leaks and damages.
Tighten fittings and replace piping as necessary.
Replace worn out or damaged components as necessary.

5.3.6 REPLACEMENT OF INNER FLEXIBLE HOSE, MINIFLEX AND DELIVERY/RETURN HOSE TO A/C

Every 72 months starting from the first commissioning, proceed to replace all flexible hose as reported in table 5.1
After flexible hoses replacement perform the functional test on the test bench as described in par. 5.6.4
The 72 months general overhaul incorporates all the periodic inspection and maintenance scheduled at 12 and 24 months.

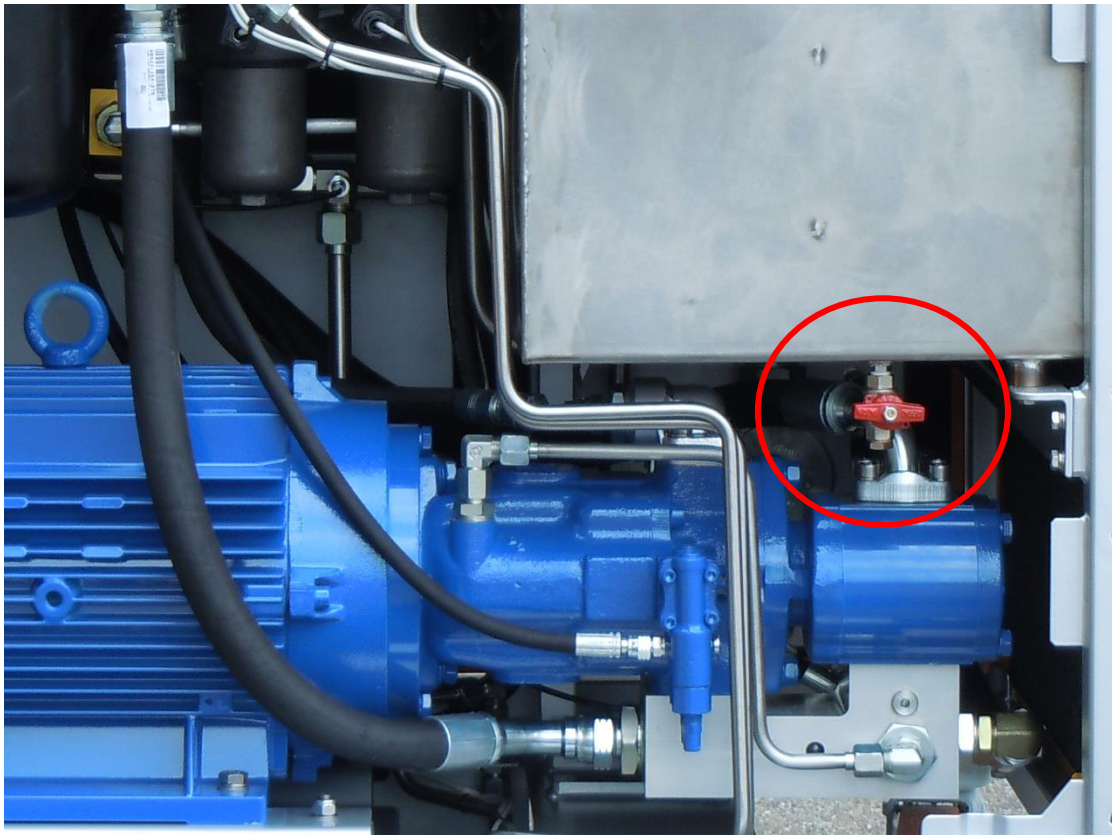
To identify:

- Inner flexible hoses, refer to figure / table 1.13 (fig. 1 of 3 and 2 of 3) in the applicable CR.
- Miniflex, refer to to figure / table 1.12 in the applicable CR.
- Delivery and return flexible hose to A/C, refer to figure / table 1.13 (fig. 3 of 3) in the applicable CR.

Proceed as follow:

- Equipping of a clean container suitable to receive the hydraulic fluid drained from the bench reservoir.
- Remove the panel from the four sides of the test bench;

- Lift the test bech using a fork lift using the proper fork guide;
- Remove the cap from the bottom of the drain valve; the drain valve still remain closed;
- Use a transparent hose or a fannel to drain hydraulic fluid from the reservoir to the container;
- Empty the reservoir opening the drain valve (ref. pos. 2 Fig. 5.6);

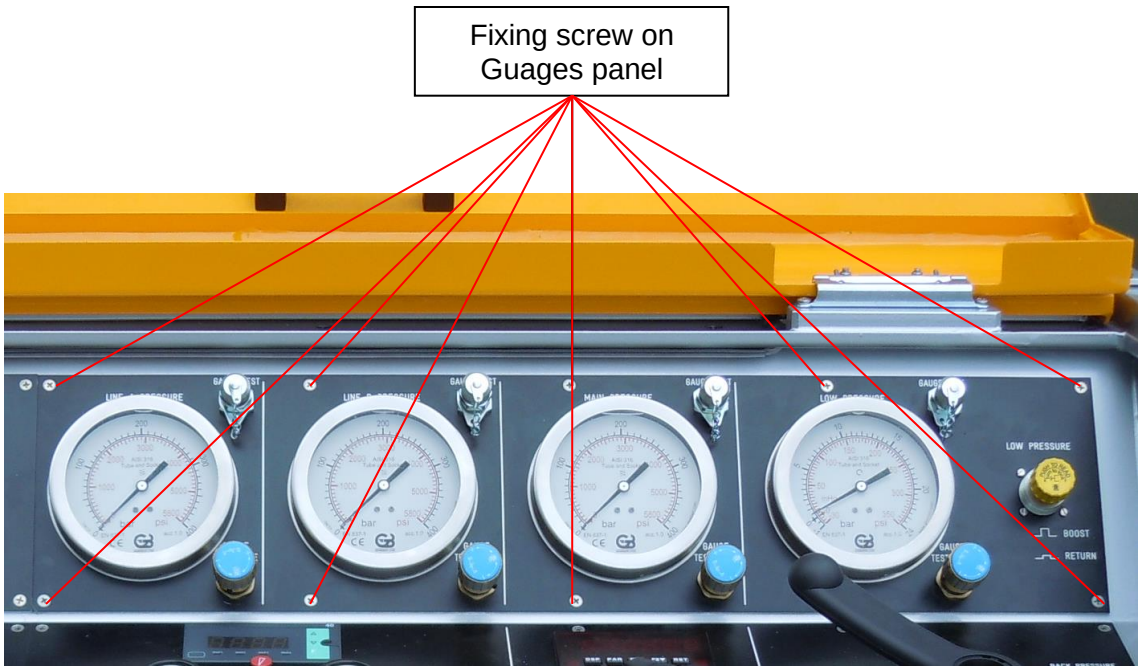


Drain valve positioning

- Remove the quick coupling from the delivery / return flexible hoses, A/C side;
- Loosen the couplings on the delivery / return hoses, test bench side.
- From the side of the removed quick couiplings, drain the hydraulic fluid from the delivery / return flexible hose to the container already used ;
- Remove delivery and return flexible hoses Item 11 to 14 figure / table 1.13 (fig. 3 of 3) in the applicable CR;
- Install the new delivery / return flexible hoses according to the label applied on them;

Delivery and retun flexible hoses, test bench side

To access the guage miniflex, unscrew the fixing screw and remove the gauges panel.



Gauges panel

- to identify, remove and replace the gauges minflex, refer to figure / table 1.12 in the applicable CR

- to identify, remove and replace the flexible hose inside the test bench refer to figure / table 1.13 (fig. 1 of 2 and fig. 2 of 2) in the applicable CR.

  It is not required to observe a specific sequence in the disassembly of the internal flexible hoses. It is suggested to start disassembling from the hose installed on the lowest level in order to make easy as much as possible the drainage of the hydraulic fluid.
  It' a good practice to first loosen the fitting of the highest part of the hose and then unscrew the fitting on the other side taking care to have a suitable container to collect of hydraulic fluid

5.4 MAINTENANCE OF ELECTRICAL SYSTEM

WARNING

Before execute any operations of maintenance or setting described in this paragraph, disconnect the electrical plug of the Test Bench from the power socket.

The electrical system does not require specific maintenance operations.
To correctly perform inspections and maintenance on electric power plant and circuit components the following tools, equipment and spare parts are needed.

STANDARD TOOLS

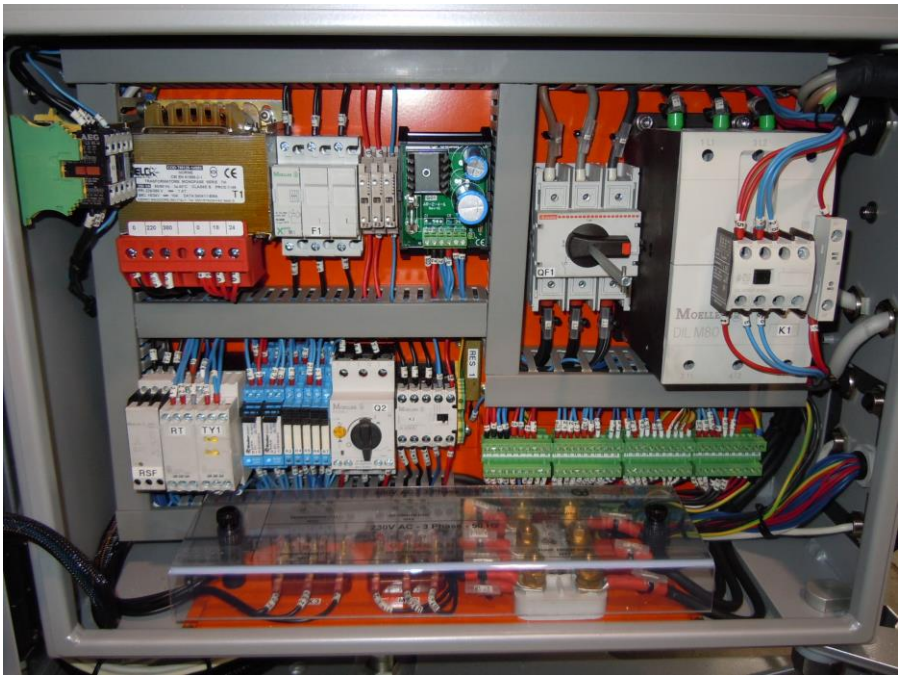
P/N	DESCRIZIONE	Q.TA'
Commercial	set of insulated screwdrivers type USAG 519/091H or equivalent	1
Commercial	Set of Allen Key type USAG 280 N/S9 or equivalent	1
Commercial	Set of open wrench up to ch 13/14 UNI-ISO10102 / DIN 3110	1
Commercial	Digital multimeter	1

Every 12 months verify wear conditions of contact of contactors and the proper fastening of all terminal blocks.

Carefully inspect cables and harnesses for loose contacts and damaged or burned insulations.

Check power cable and plug for safety conditions.

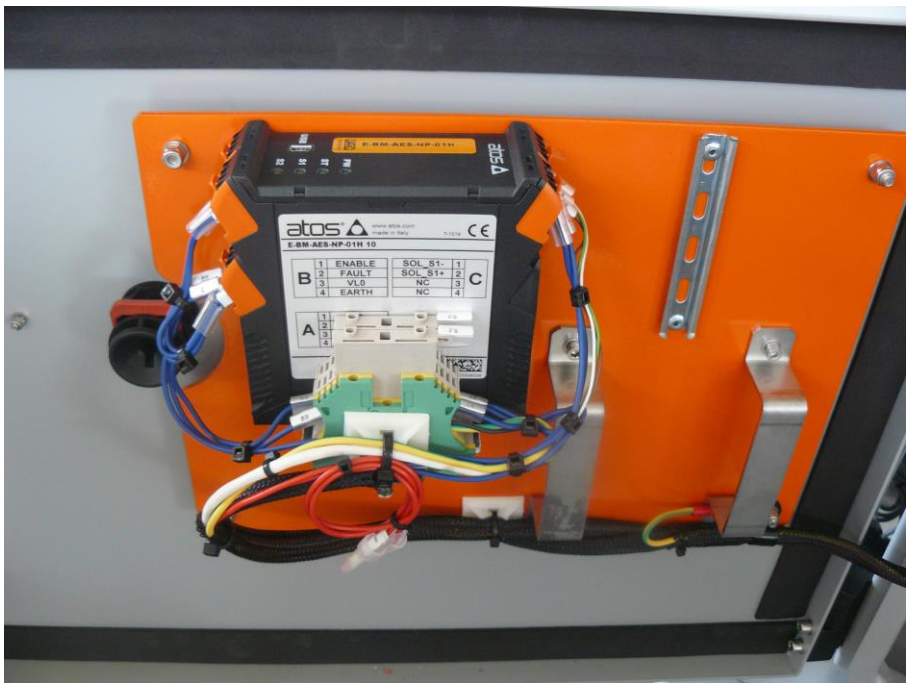
POWER BOX WIRING



Electric components mounting plate

Terminal block for voltage change

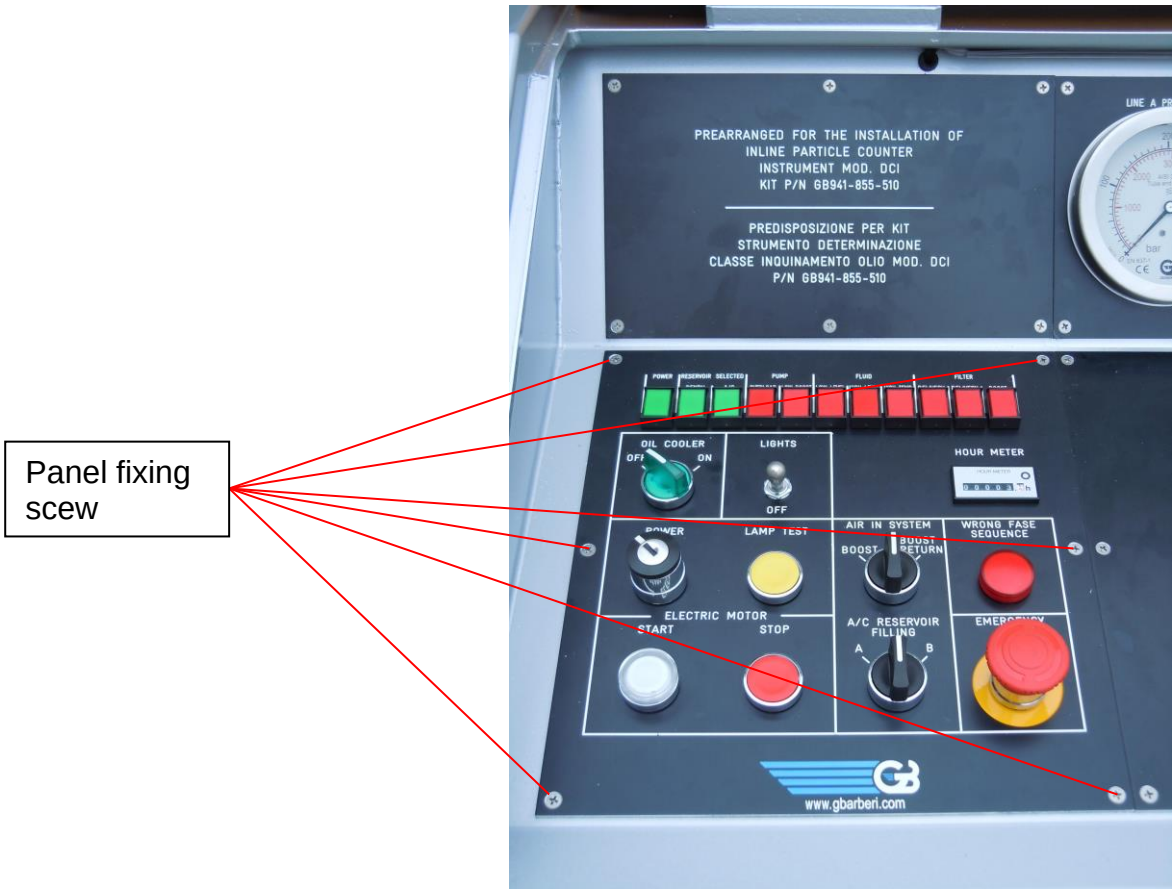
Proportional valve control card up to SN 1102095

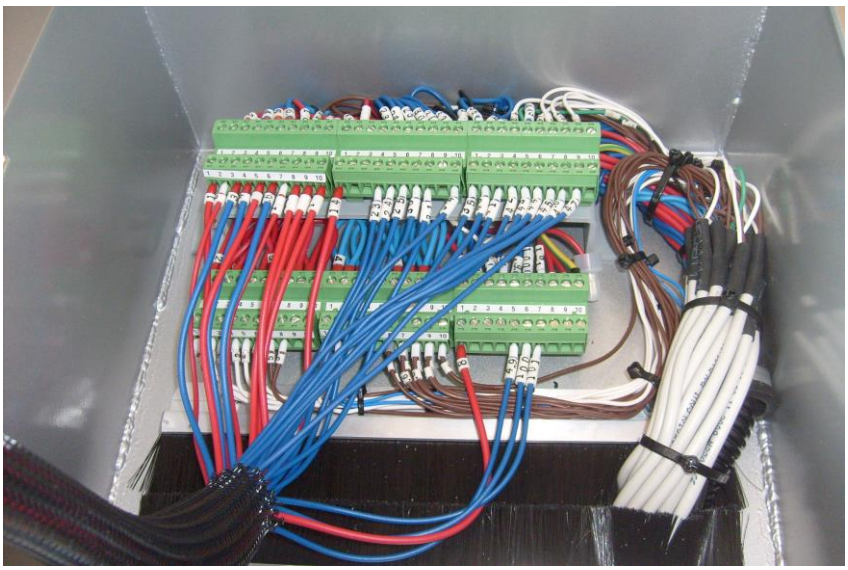


Proportional valve control card from SN 1102096

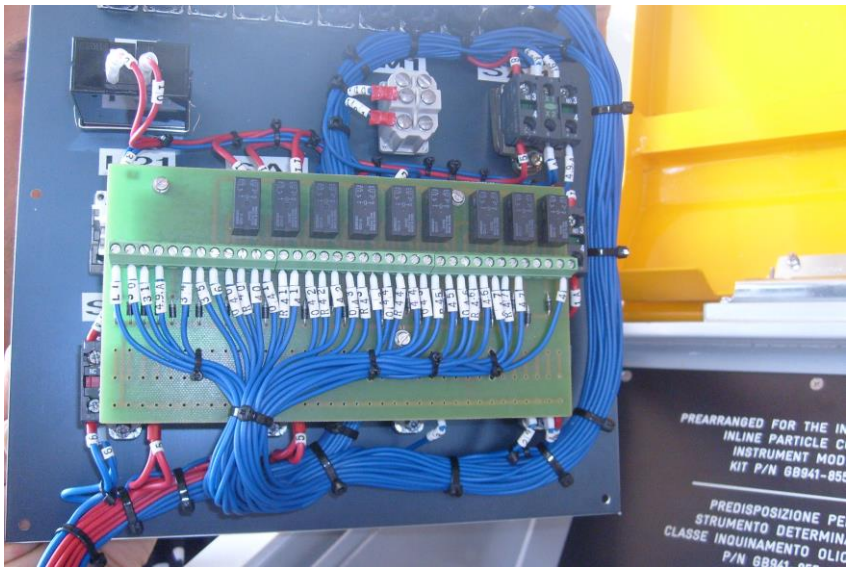
PUSH BUTTON AND LAMPS PANEL

To access to wiring remove the six fixing screws from the frame assy
.



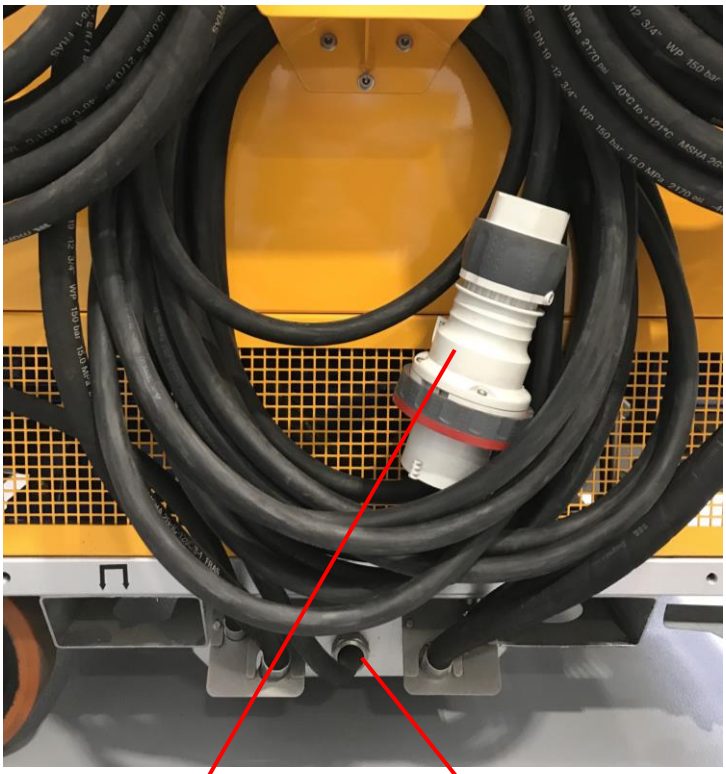


Wiring in the bottom part on the push buttons / lamps box



Wiring on the rear of the push buttons / lamps panel

POWER SUPPLY CABLE AND ELECTRIC PLUG



5.5 FRAME AND ACCESS DOORS

No specific maintenance operations are required but every 12 months perform a visual check for conditions and tightness of connections.

Well tighten as required.

Thoroughly clean internal and external surfaces.

Perform a standard lubrication of hinges and locking hooks of cowlings using oil as per MIL-L-7870 or equivalent.

Remove excess of lubricant and clean.

5.6 REPLACEMENTS OF HYDRAULIC FLUID

5.6.1 REPLACEMENT USING THE SAME TYPE OF FLUID

The replacement of the hydraulic fluid may become necessary because of loss of the original chemical-physic characteristics, pollution due to the mixing with incompatibles fluids, or time limits, as per par. 5,2, and anyway every 72 months.

To replace the fluid proceed as follows:

- Drain the reservoir through the drain valve (pos. 2 Fig. 5.6).

- Remove the reservoir cover (pos. 3 Fig. 5.6) and clean the reservoir interior (ref para 5.3.3) using suitable products.

NOTE

If the fluid to be replaced should result polluted, because of its mixing with incompatibles fluids, such as water, carry out the system drainage as per par. 5.6.2

- Fill up the reservoir, as required, using new fluid.

- execute the flushing cycle as detailed at paragraph 3.3.2 and then take a sample of hydraulic fluid in accordance with the usual procedures for analysis through the sampling valve as specified at par. 3.3.3.

Perform a fluid sampling using kit PN GB941-855-560 and analyse. If the pollution class is not what required, perform a second cleaning cycle to eliminate all foreign matters.

5.6.2 REPLACEMENT USING A DIFFERENT TYPE OF FLUID

To replace the fluid proceed as follows:

- Drain the reservoir through the drain valve (pos. 2 Fig. 5.6).

- Remove the reservoir cover (pos. 3 Fig. 5.6) and clean the reservoir interior using, if required, suitable products.

- In order to remove as much fluid as possible, from the hydraulic circuit, loosen and remove the delivery line filter cartridge bodies (pos. 1 - 2 Fig. 5.2) and drain it.

- Loosen and remove filter cartridge from boost /return circuit (pos. 1 Fig. 5.2) and drain it.

- Disconnect pipe and hose fittings, wherever this operation is made easy by their location, and drain as much fluid as possible from the system (23 lt approx.).

- Reconnect all piping and hoses and reassemble the filters USING NEW CARTRIDGES.

- Fill reservoir with new fluid.

- Execute the flushing cycle as in paragraph 3.3.2 and then take a sample of hydraulic fluid in accordance with the usual procedures for analysis through the sampling valve as required on par. 3.3.3.

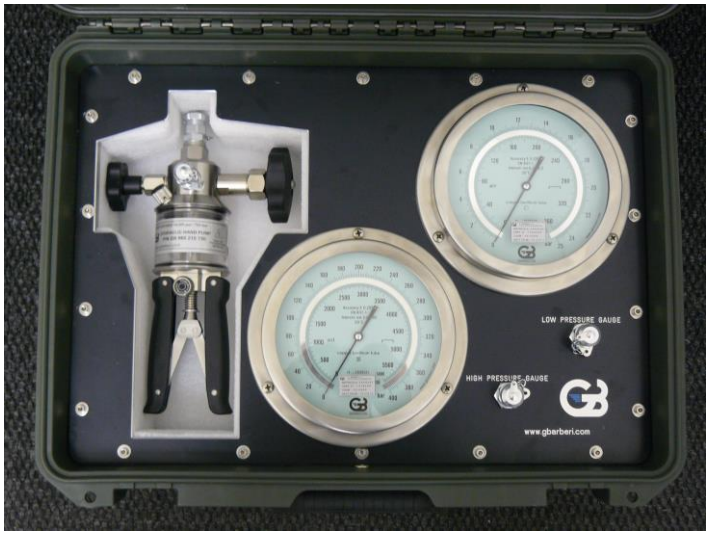
Perform a fluid sampling using kit PN GB941-855-560 and analyse. If the pollution class is not what required, perform a second cleaning cycle to eliminate all foreign matters.

.

5.6.3 CALIBRATION OF GAUGES

This paragraph contains the instructions for the verification of proper calibration of gauges (items 1, 2, 3, and 4, Fig.3.1). A perfect calibration of instruments, beside assuring their efficiency, guarantees the reliability of the data supplied by the Bench itself. The checking of the gauges, for proper calibration, must be performed **every 12 months**. The pressure gauge installed on the test bench are all made in 1% accuracy class.

To facilitate the controls, it's suggested the use of the Gauge Calibration Kit P/N GB960-210-600. The kit is equipped with a pump and two main gauges for calibration.



Gauge calibration klitP/N GB960-210-600

Hand pump and miniflex for gauge chacking

For the correct use of the gauges calibration kit, refer to the appropriate manual.

In the following is listed the generic procedure for gauges calibration:

- Close the “GAUGE TEST VALVE” (pos. 6 fig. 3.1) and exclude the gauge that needs to be controlled from the hydraulic plant;

“GAUGE TEST VALVE”

- Connect a pressure pump (adjustable and equipped with a certified calibration gauge) to the mini-test socket “GAUGE TEST” (pos. 5 fig. 3.1);

PRESSURE PORTS “GAUGE TEST”

- increase the pressure value

- Compare the value on the gauge installed on the bench with the certified external gauge, on at least 5 values, during all the rising scale, and on the same 5 values the decreasing scale.

NOTE

The certified calibration gauge must have a precision class of 4 times more than the bench gauges. The calibration gauges should also be periodically calibrated by an authorized LAT center.

- Apply on each tested gauge a label reporting calibration date and expiring calibration date.

5.6.4 HYDRAULIC SYSTEM FUNCTIONAL TEST (Ref. TAB 5.1)

Perform the following functional test:

Check operation of the back pressure valve.

LINE A

Check operation with flow rate at 50 L / min.

Check operation with pressure P = 500 - 3000 PSI

Check operation with both lines regulated at: 25 L/min@3000 psi.

LINE B

Check operation with flow rate at 50 L / min.

Check operation with pressure P = 500 - 3000 PSI

Check operation with both lines regulated at: 25 L/min@3000 psi.

Table 5.1 Periodic inspections

TIME BETWEEN INSPECTIONS	COMPONENTS	PROCEDURE
BEFORE EVERY EMPLOYMENT	Test bench complete	Verify that the periodic maintenance schedule is correctly performed
	Reservoir	Visually check the level of hydraulic fluid.
	Connecting hoses	Check hoses and quick-disconnect couplings for damages. Replace if necessary
	Warning lights	Operate push-button (24) (Fig. 3.2) and check lighting up of all bulbs.
EVERY 12 MONTHS FROM FIRST USE	Access doors	Check for safety (par. 5.5)
	Hydraulics system piping	Check for conditions and leakages.
	Delivery line filters	Replace filter cartridge as per par. 5.3.2
	Boost line filter	Repalce filter cartridge as per par. 5.3.1
	Reservoir	Perform fluid sampling using kit GB941-855-560 to determine pollution class according to A/C manual.
	Gauges	Check calibration using a reference gauge as per par. 5.7
	Heat excanger	Clean heat exchanger as per par. 5.3.4
	Electrical system	Check all components for conditions. Inspect all cables, harnesses and components, inside the switchboard cabinet , for conditions. Replace as necessary.
EVERY 72 MONTHS FROM FIRST USE	***Test bench complete***	***Replace of the flexible hoses*** ***Replace hydraulic fluid (ref para 5.6.1) and clean the reservoir*** ***Check the electric plant*** ***Calibrate the gauges, if necessary replace.*** ***Visual inspect all hydraulic components ,check for fluid leaks, check tightening of all the pipes, nuts and bolts*** ***Perform the hydraulic system functional test (Par. 5.6.4)***

5.9 TROUBLESHOOTING

The instructions contained in this paragraph, combined with those reported in Table 3.3 - Control panel, bright Signals, allows easy troubleshooting.

Table 5.2 Troubleshooting

TROUBLE	PROBABLE CAUSE	RIMEDY
THE ELECTRIC MOTOR PUMP DOES NOT START	BY PASS VALVE CLOSED (POS. 11 FIG. 3.1)	OPEN THE BY PASS (POS. 11 FIG. 3.1) ROTATING ANTICLOCKWISE
	LIMIT SWITCH (POS. 11 FIG. 3.1) DEFECTIVE	REPLACE THE LIMIT SWITCH
	RESERVOIR SELECTOR LEVEL (POS. 41 FIG. 3.4) IN WRONG POSITION	PROPERLY POSITION THE RESERVOIR SELCTOR LEVEL (POS. 41 FIG. 3.4)
PUSHING THE MASTER SWITCH "POWER" POS. 19 FIG. 3.2 THE TEST BENCH IS NOT POWERED	FUSE F1 IS BURNED OUT	REPLACE THE FUSE
THE MOTOR DRIVEN PUMP DOES NOT WORK CORRECTLY	FUSE F1 IS BURNED OUT	REPLACE THE FUSE
THE ADVISOR LIGHT PLACED NEAR THE CONTROL PANEL DOES NOT LIGHT UP	LIGHT BULB IN BURNED OUT	REPLACE THE LIGHT BULB
	FUSE F4 IS BURNED OUT	REPLACE THE FUSE
CONTROL PANEL IS NOT POWERED	FUSE F2 IS BURNED OUT	REPLACE THE FUSE
HYDRAULIC FLUID TEMPERATURE INDICATOR (POS. 8 FIG. 3.2) AND FLOW METER (POS. 9 FIG. 3.2) ARE NOT POWERED	FUSE F2 IS BURNED OUT	REPLACE THE FUSE
PUSHING THE LAMP TEST BUTTON (POS. 24 FIG. 3.2) DOES NOT LIGHT ANY LIGHT ADVISOR	FUSE F3 IS BURNED OUT	REPLACE THE FUSE
PUSHING THE “START” BUTTON (POS. 22 FIG. 3.2) THE TEST BENCH DOES NOT START	FUSE F2 AND / OR IS BURNED OUT	REPLACE THE FUSE

GB941-010-500

SPARE PARTS LIST

HYDRAULIC TEST BENCH m^3

N.U.C. 4920 15 000 5419

P/N GB941-010-500

SPARE PARTS LIST

Basic Issue: **JULY** **2011**

Change 15 : **JANUARY** **2022**

GB BARBERI s.r.l. 21018 Sesto Calende - Via Rosselli, 30 - VARESE - ITALY

Phone 0331.923.418 - Fax 0331.920.692

E-mail : info@gbarberi.com - www.gbarberi.com

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32 THRU 33	5
34 THRU 39	0
40 THRU 41	1
42 THRU 64	0
PAGE 65	4
PAGE 66	0
PAGE 67	4
PAGE 68	0
69 THRU 71	13
72 THRU 73	0
PAGE 74	2
PAGE 75	9
PAGE 76	10
PAGINA 77	14
DA 78 A 79	9

UPON RECEIPT OF THE SECOND AND SUPSEQUENT CHANGE TO THIS MANUAL, PERSONNEL RESPONSIBLE FOR MAINTAING THIS PUBBLICATION IN CURRENT STATUS WILL ASCERTAIN THAT ALL PREVIOUS CHANGES HAVE BEEN RECEIVED AND INCORPORATED. ACTION SHOULD BE TAKEN PROPTLY IF THE PUBBLICATION IS INCOMPLETE.

(*) ZERO IN THIS COLUMN INDICATES AN ORIGINAL PAGE.

INDEX OF CHANGES

8	30/06/17	Changed Pages Title - A – A1 - 27- 28 – 29	A. Gallone	M. De Fino	N. Barberi
7	06/04/17	Changed Pages Title A - A1 - 21- 27 - 29 – 40 - 41	L. Esposito	M. De Fino	N. Barberi
6	15/02/16	Changed Pages Title – A – A1 – 24 – 25	A. Gallone	M. De Fino	N. Barberi
5	22/04/15	Changed Pages Title – A – A1 – 32 – 33	A. Gallone	M. De Fino	N. Barberi
4	06/11/14	Changed Pages Title – A – A1 – 13 – 15 – 17 – 19 - 22 – 23 - 25 – 65 – 67 – 69 – 76	A. Gallone	M. De Fino	N. Barberi
3	22/07/13	Changed Pages Title-A Inserted pages A1 – A2	A. Gallone	M. De Fino	N. Barberi
2	10/02/12	Changed Pages Title-A-11-20-21-74	A. Gallone	M. De Fino	N. Barberi
1	01/01/12	Changed Pages Title-A-15-17-19-24-25	A. Gallone	M. De Fino	N. Barberi
0	04/07/11	Basic Issue	A. Gallone	M. De Fino	N. Barberi
REV.	**DATE:**	**DESCRIPTION**			
CHANGE			***PREPARATED BY/ SIGNATURE***	***APPROVED BY/ SIGNATURE***	***AUTORIZED BY/ SIGNATURE***

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15	25/01/2022	Changed Pages Title – A – A2 – 24	A. Castelli 	A. Gallone 	M. De Fino 
14	04/05/2021	Changed Pages Title – A – A2 – 26 – 27 - 77	A. Castelli	A. Gallone	M. De Fino
13	05/03/2020	Changed Pages Title – A – A2 – i – iii - 69 – 70 – 71	A. Castelli	A. Gallone	M. De Fino
12	10/07/19	Changed Pages Title – A – A2 - 69 – 70 – 71	A. Gallone	A. Castelli	M. De Fino
11	09/10/18	Changed Pages Title – A – A2 - 25 – 28 – 29 – 30 – 31 – 77	A. Gallone	A. Castelli	M. De Fino
10	30/03/18	Changed Pages Title – A – A2 – i – ii Inserted page 22 – 23 - 76	A. Castelli	A. Gallone	M. De Fino
9	26/01/18	Changed Pages Title – A - A2 - 75	A. Gallone	M. De Fino	N. Barberi
REV.	**DATE:**	**DESCRIPTION**			
CHANGE			***PREPARATED BY/ SIGNATURE***	***APPROVED BY/ SIGNATURE***	***AUTORIZED BY/ SIGNATURE***

TABLE OF CONTENS

SECTION I SPARE PARTS LIST PAGE

LIST OF TABLES

TABLE No. TITLE PAGE

LIST OF ILLUSTRATION

SECTION I

SPARE PARTS LIST

1.1 GENERAL

This Technical Manual supplies a complete list of spare parts of the Mod. m^3 hydraulic system test bench, identified by **P/N GB941-010-500**, manufactured by GB BARBERI s.r.l. - Via Rosselli, 30 - Sesto Calende (VA).

1.2 USE OF THE SPARE PARTS LIST

The columns contained in the spare parts list have the following meanings:

POSITION COLUMN

This column quotes the index numbers which are the same of the parts shown in the figure.

PART NUMBER (P/N) COLUMN

This column quotes the part numbers of the parts which are the same shown in the figure.

DESCRIPTION COLUMN

This column lists the name or supplies a concise description of each part or assembly.

UNIT PER ASSEMBLY COLUMN

This column indicates the quantity of each part required for each assembly or subassembly.

RECOMMENDED SPARE PARTS COLUMN

The letter "X" in this column identifies the recommended spare parts. All spare parts are also recommended summarized in the table "Recommended spare parts list" in section 1.3.

NOTE

SPARE PARTS ORDER MUST INDICATED THE PART NUMBER (P/N) OF THE SPARE AND THE SERIAL NUMBER (S/N) OF THE ASSEMBLY FOR WHICH THE SPARE IS REQUIRED.

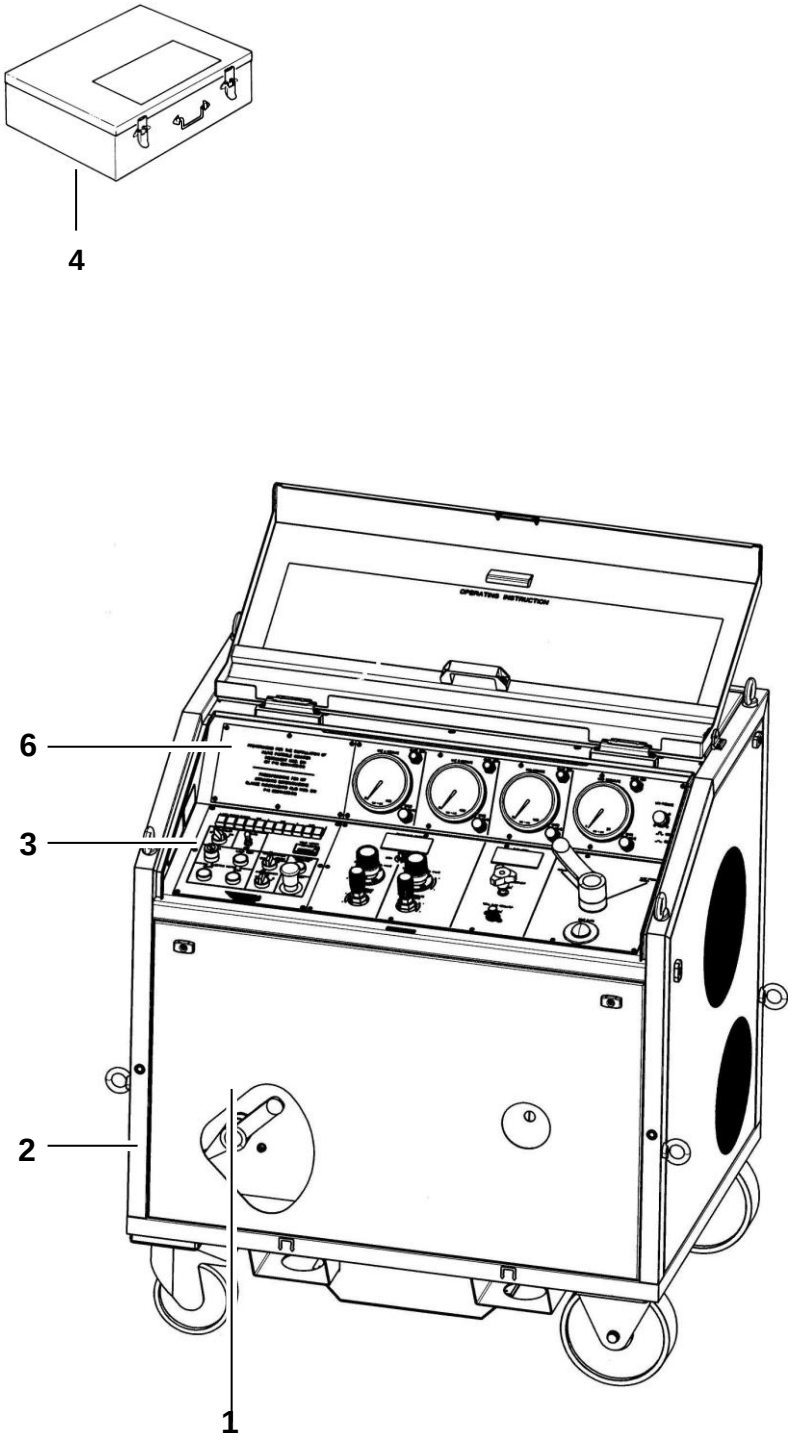


Fig. 1.1 ASSEMBLIES AND SUBASSEMBLIES

Table 1.1 ASSEMBLIES AND SUBASSEMBLIES (Ref. Fig. 1.1)

POS.	REFERENCE N°	DESCRIPTION	QT.Y	RECCOMENDED SPARE PARS
1	GB941-800-560	HYDRAULIC SYSTEM ASSY	1	
2	GB941-805-070	FRAME UNIT ASSY	1	
.3	GB701-808-970	ELECTRICAL SYSTEM ASSY	1	
4	GB941-858-870	TEST BENCH EQUIPMENT *COMPOSED AS FOLLOWING :* *NR. 1 CASE P/N GB270-055-000* *NR. 1 WRENCH TAPE P/N GB961-066-000* *NR. 1 14/15 WRENCH P/N GB961-003-040* *NR. 1 17/19 WRENCH P/N GB961-003-050* *NR. 1 20/22 WRENCH P/N GB961-003-070* *NR. 1 24/27 WRENCH P/N GB961-003-090* *NR. 1 30/32 WRENCH P/N GB961-003-120* *NR. 1 FUSE 2A P/N GB747-108-400* *NR. 2 FUSE 4A P/N GB747-112-010* *NR. 2 FUSE 500 mA P/N GB747-104-210* *NR. 2 FUSE 6A P/N GB747-112-080* *NR. 5 LIGHT BULB P/N GB778-300-150* *NR. 4 EYE BOLT P/N GB019-112-000* *NR. 1 SHORT CIRCUIT ASSY P/N GB 606-080-450* *NR. 1 INTERFACE ADAPTER KIT P/N GB 487-000-570*	1	
5	GB941-856-975	PROTECTIVE COVER *(not pictured)*	1	
6	GB206-000-630	DCI PANEL PRE-ARRANGEMENT	1	

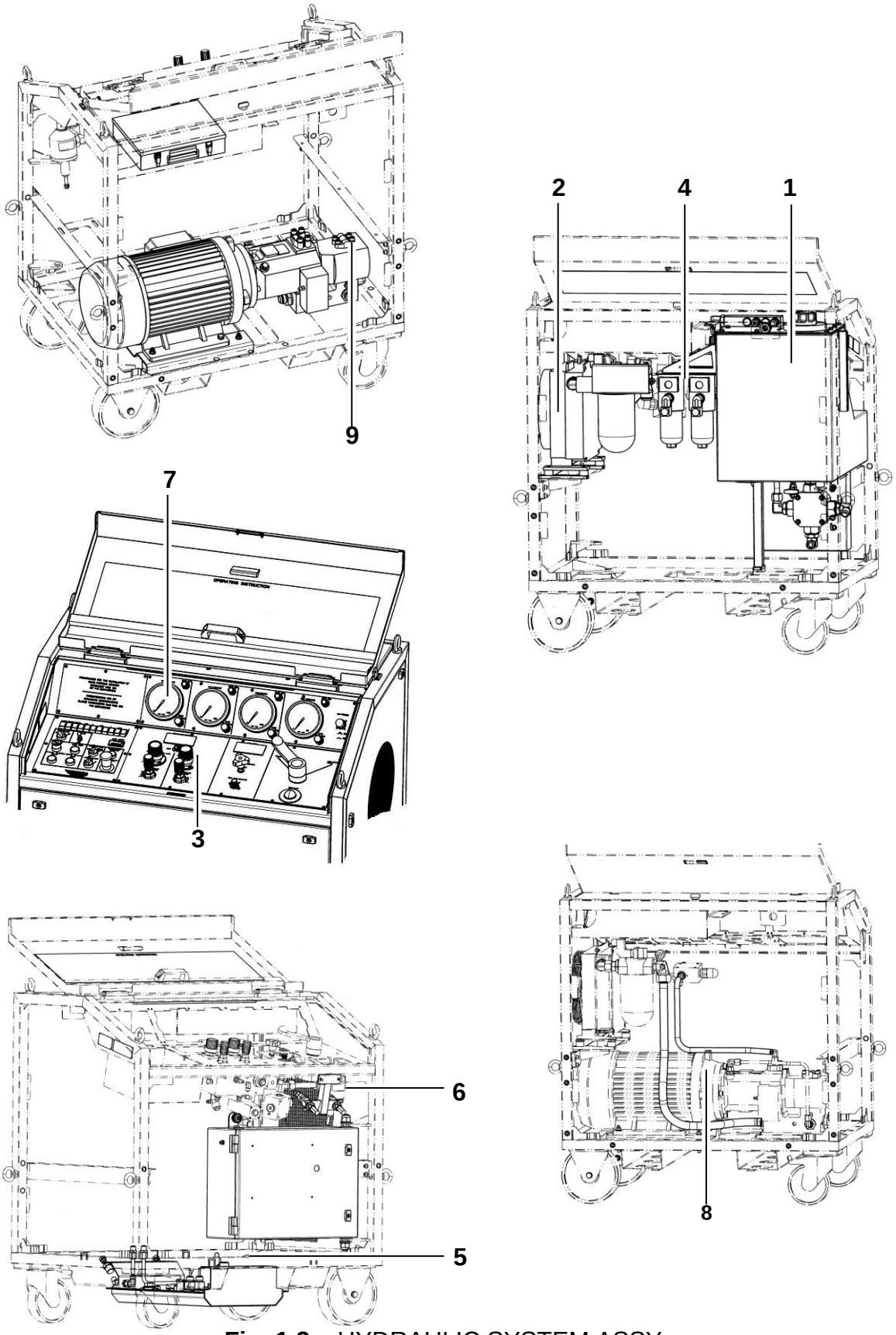


Fig. 1.2 HYDRAULIC SYSTEM ASSY

Table 1.2 HYDRAULIC SYSTEM ASSY (Ref. Fig. 1.2)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB606-080-400	RESERVOIR ASSY	1	
2	GB606-080-410	HEAT EXCHANGER ASSY	1	
3	GB606-080-420	HYDRAULIC CONTROL PANEL	1	
4	GB606-080-430	H.P. DELIVERY FILTERS ASSY	1	
5	GB606-080-440	RETURNS ASSY	1	
6	GB606-080-460	SAMPLING VALVES ASSY	1	
7	GB606-080-470	HYDRAULIC INDICATIONS PANEL	1	
8	Figura 1.13	HOSES ASSY	1	
9	GB606-080-490	MOTOR-DRIVEN PUMP ASSY	1	

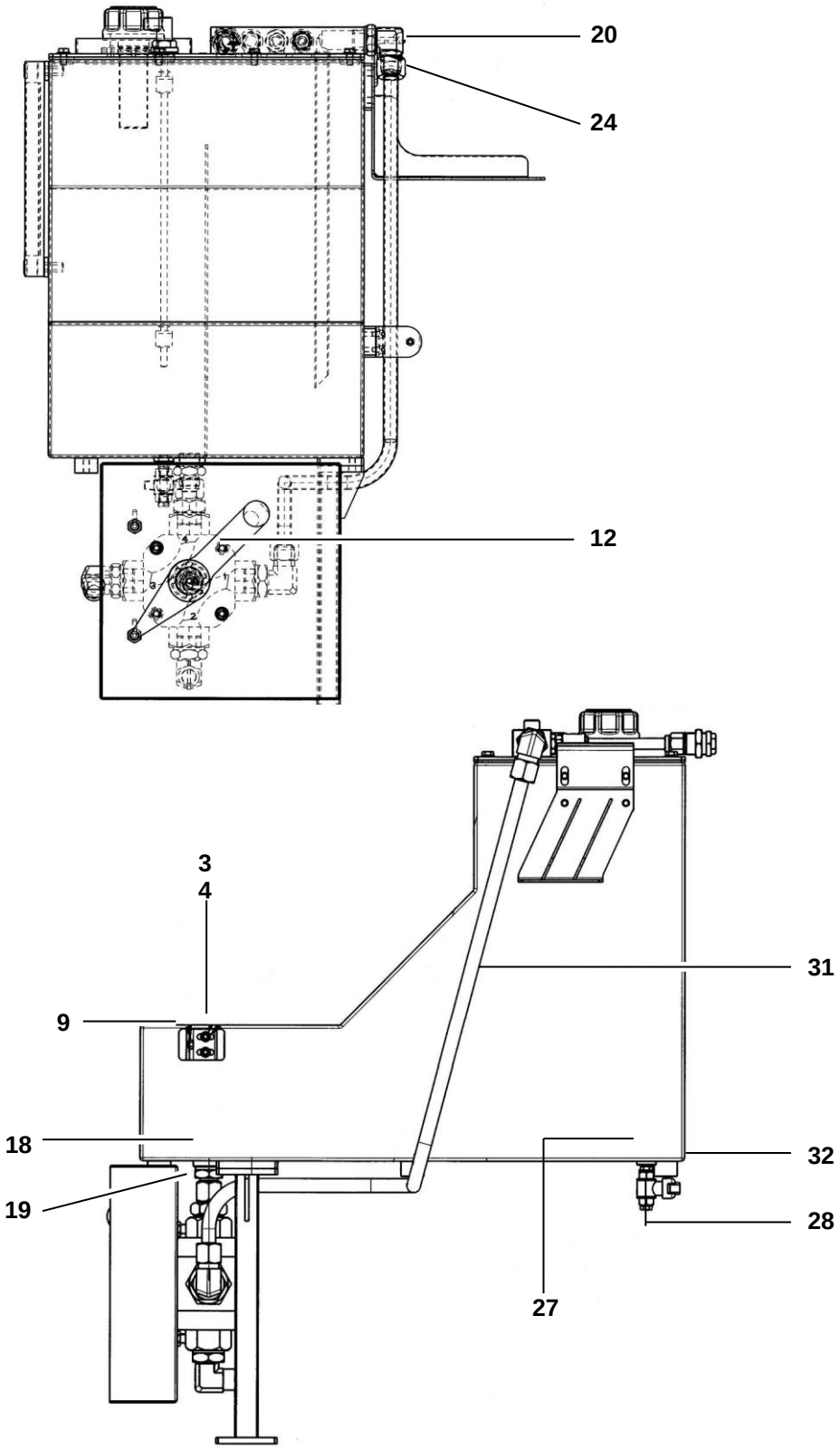


Fig. 1.3 RESERVOIR ASSY (Table 1 of 2)

Table 1.3 RESERVOIR ASSY (Ref. Fig. 1.3)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB835-318-300	OIL LEVEL TRANSMITTER	1	X
2	GB013-041-600	SCREW	11	
3	GB016-031-000	SCREW	2	
4	GB021-103-000	WASHER	2	
5	GB037-015-000	BONDED SEAL	1	
6	GB038-820-127	RESERVOIR GASKET	1	X
7	GB065-720-800	PLATE	1	
8	GB206-001-269	SUPERIOR SUPPORT	1	
9	GB206-001-270	SUPPORT	1	
10	GB206-001-273	RESERVOIR SUPPORT	1	
11	GB206-001-650	FRAME	1	
12	GB206-001-675	RESERVOIR SELECTOR ASSY	1	
13	GB243-009-100	RESERVOIR, COVER	1	
14	GB246-208-254	OIL GAUGE	1	X
15	GB247-240-000	CAP	1	X
16	GB415-162-500	CONNECTION	1	
17	GB420-609-000	CONNECTION	1	
18	GB420-624-000	CONNECTION	1	
19	GB421-328-000	CONNECTION	1	
20	GB423-924-000	CONNECTION	1	
21	GB460-075-040	REDUCTION	1	
22	GB021-104-000	WASHER	11	
23	GB206-001-268	A.P. FILTERS SUPPORT	1	
24	GB420-108-000	NUT TUBE	2	
25	GB423-925-000	CONNECTION	3	
26	GB460-061-000	CONNECTION	2	
27	GB460-071-010	NIPPLE	1	
28	GB460-080-020	CAP	1	
29	GB460-080-040	CAP	2	
30	GB484-100-000	HALF QUICK CONNECTION	1	
31	GB501-108-001	TUBE	1	
32	GB652-010-000	VALVE	1	X

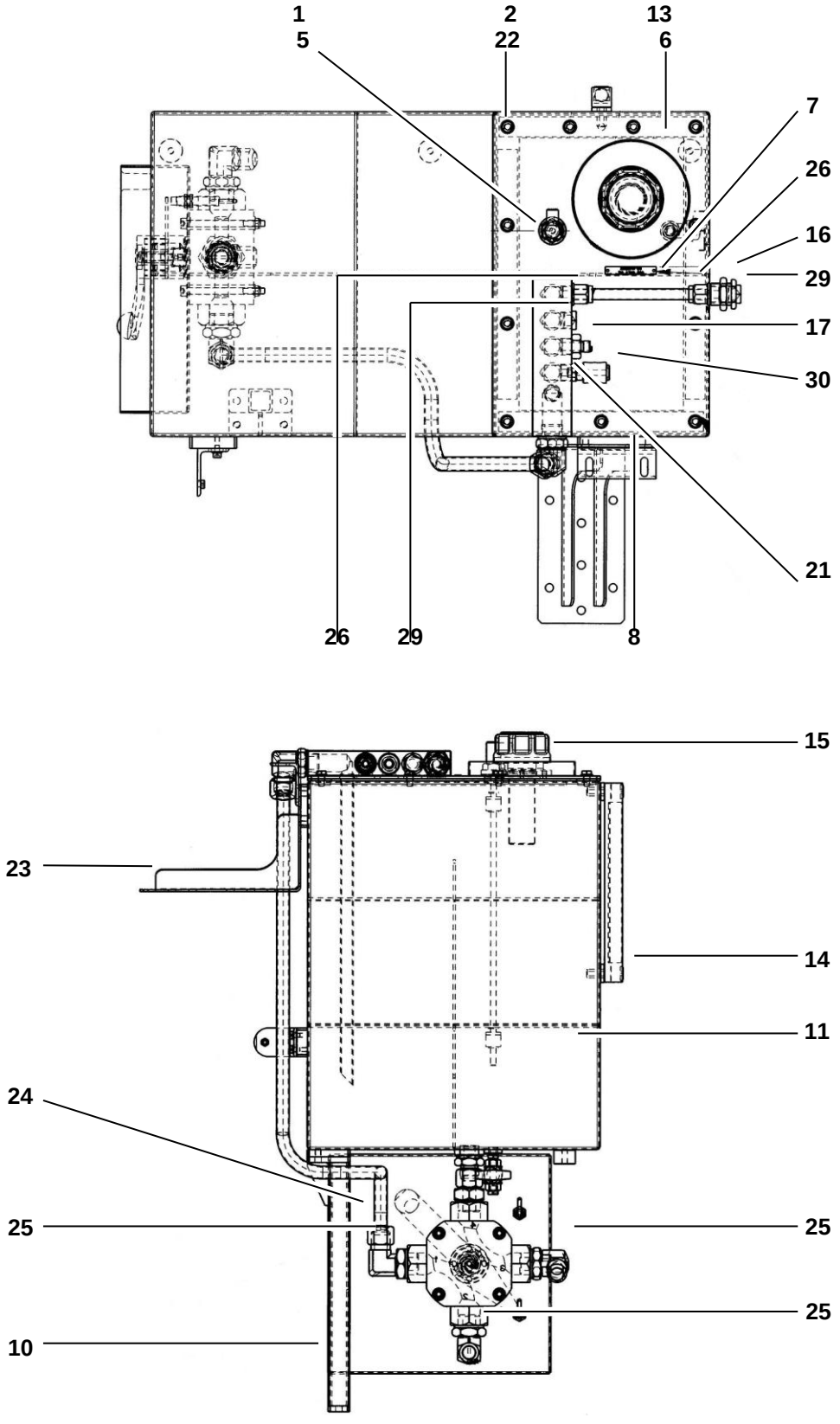


Fig. 1.3 RESERVOIR ASSY (Table 2 of 2)

Table 1.3 RESERVOIR ASSY (Ref. Fig. 1.3)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB835-318-300	OIL LEVEL TRANSMITTER	1	X
2	GB013-041-600	SCREW	11	
3	GB016-031-000	SCREW	2	
4	GB021-103-000	WASHER	2	
5	GB037-015-000	BONDED SEAL	1	
6	GB038-820-127	RESERVOIR GASKET	1	X
7	GB065-720-800	PLATE	1	
8	GB206-001-269	SUPERIOR SUPPORT	1	
9	GB206-001-270	SUPPORT	1	
10	GB206-001-273	RESERVOIR SUPPORT	1	
11	GB206-001-650	FRAME	1	
12	GB206-001-675	RESERVOIR SELECTOR ASSY	1	
13	GB243-009-100	RESERVOIR, COVER	1	
14	GB246-208-254	OIL GAUGE	1	X
15	GB247-240-000	CAP	1	X
16	GB415-162-500	CONNECTION	1	
17	GB420-609-000	CONNECTION	1	
18	GB420-624-000	CONNECTION	1	
19	GB421-328-000	CONNECTION	1	
20	GB423-924-000	CONNECTION	1	
21	GB460-075-040	REDUCTION	1	
22	GB021-104-000	WASHER	11	
23	GB206-001-268	A.P. FILTERS SUPPORT	1	
24	GB420-108-000	NUT TUBE	2	
25	GB423-925-000	CONNECTION	3	
26	GB460-061-000	CONNECTION	2	
27	GB460-071-010	NIPPLE	1	
28	GB460-080-020	CAP	1	
29	GB460-080-040	CAP	2	
30	GB484-100-000	HALF QUICK CONNECTION	1	
31	GB501-108-001	TUBE	1	
32	GB652-010-000	VALVE	1	X

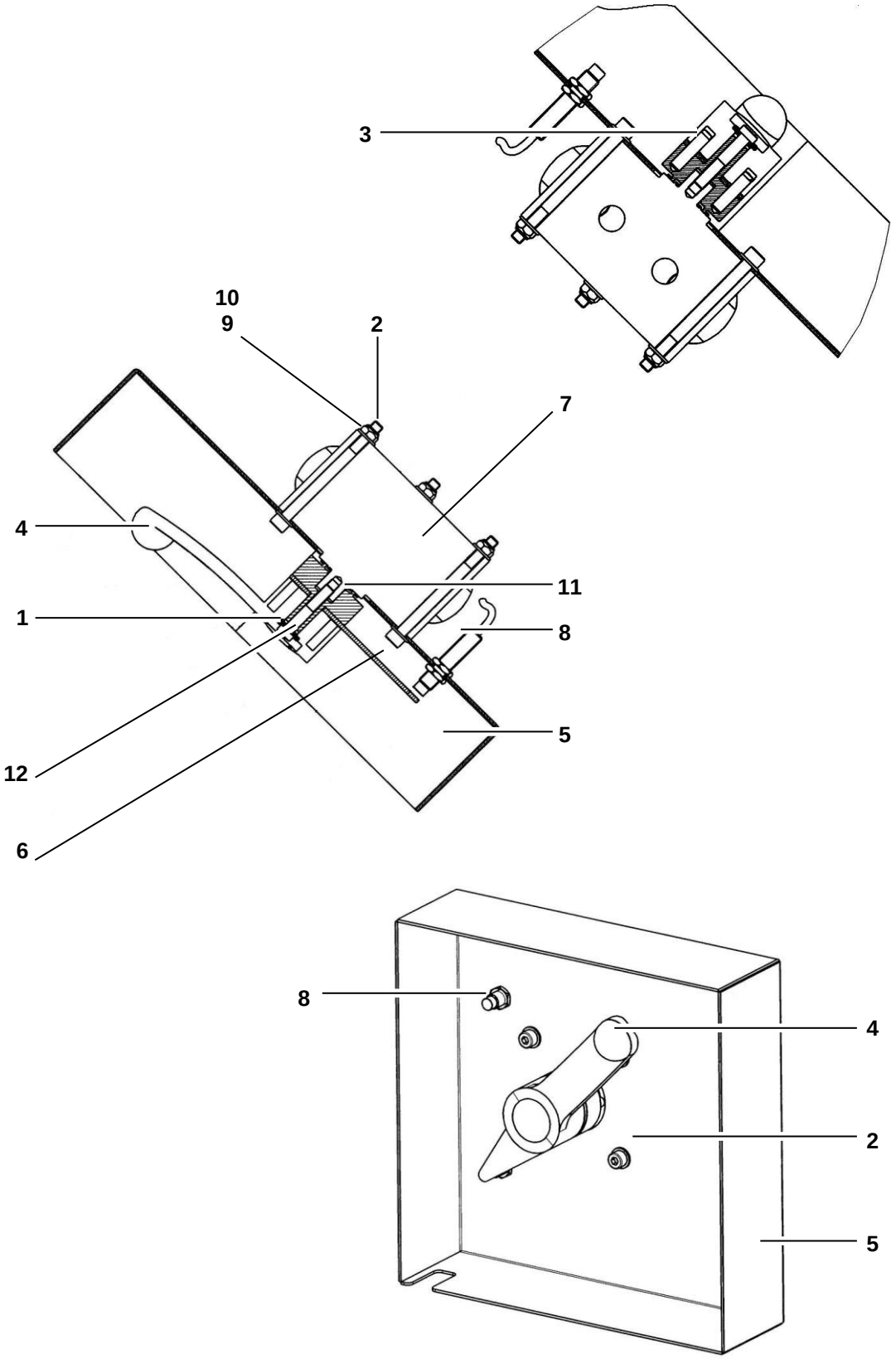


Fig. 1.4 RESERVOIR SELECTOR ASSY

Table 1.4 RESERVOIR SELECTOR ASSY (Ref. Fig. 1.4)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-038-045	SCREW	1	
2	GB016-049-100	SCREW	1	
3	GB024-208-030	PIN	2	
4	GB063-452-100	LEVER	1	
5	GB206-001-639	COVER	1	
6	GB206-001-645	POSITION INDICATOR	2	
7	GB658-500-000	VALVE *(APPLICABLE TO S/N 11 02 001 ÷ 002 , S/N 11 02 004 ÷ 009)*	1	**X**
	GB658-500-001	VALVE *(APPLICABLE TO S/N 11 02 003 , FROM S/N 11 02 010)*		
8	GB725-000-041	PROXIMITY INDICATOR	2	**X**
9	GB020-642-000	NUT	4	
10	GB021-104-000	WASHER	8	
11	GB263-000-047	ADAPTER	1	
12	GB263-000-053	WASHER	1	

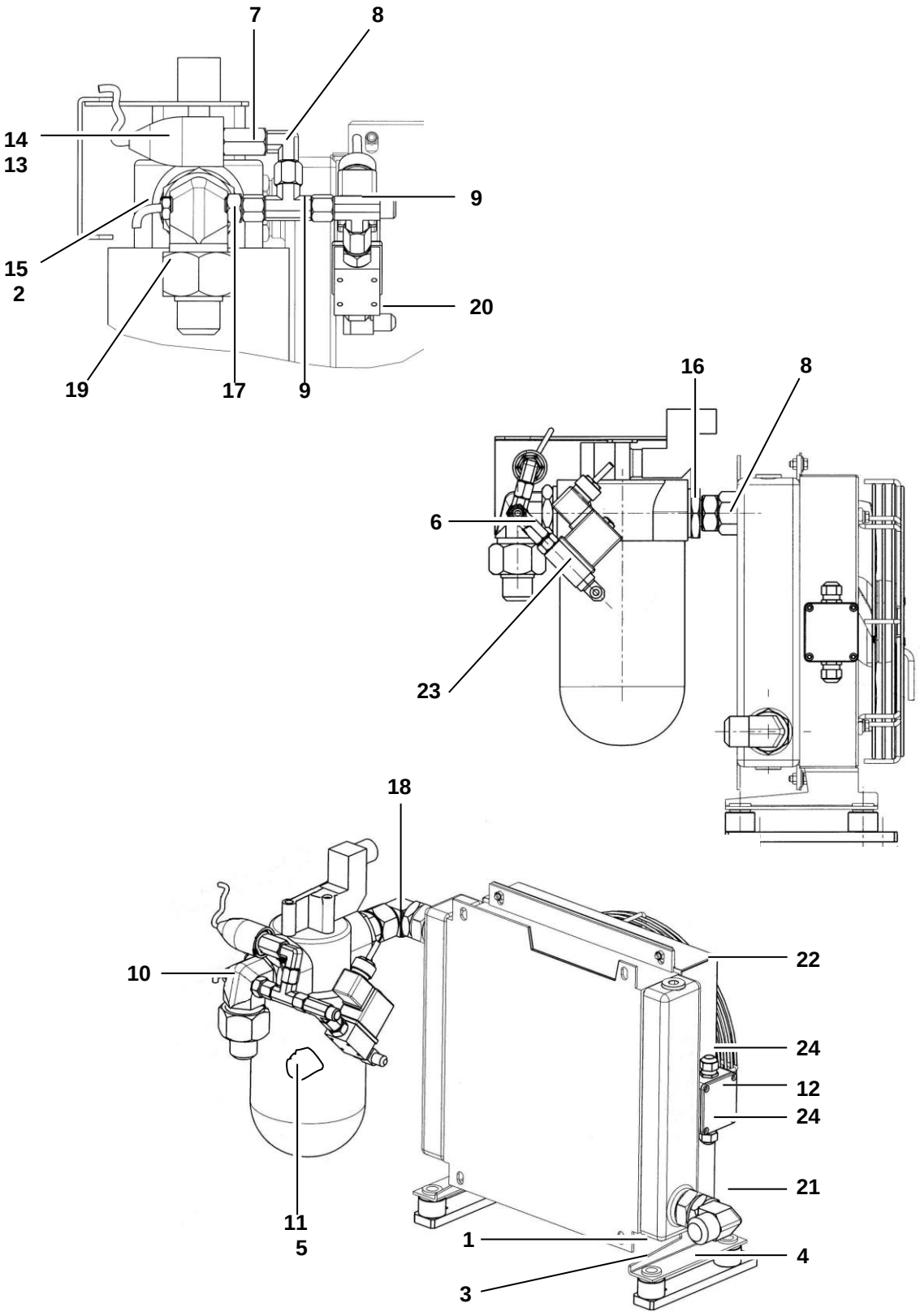


Fig. 1.5 HEAT EXCHANGER ASSY

Table 1.5 HEAT EXCHANGER ASSY (Ref. Fig. 1.5)

POS.	RIFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB017-604-016	SCREW	4	
2	GB037-223-000	WASHER	1	
3	GB070-008-000	SHOCK ABSORBER RUBBER PAD	4	X
4	GB206-001-633	HEAT EXCHANGER SUPPORT	2	
5	GB675-008-101	FILTERING CARTRIDGE	1	X
6	GB421-307-000	CONNECTION	1	
7	GB422-202-000	CONNECTION	1	
8	GB423-702-000	CONNECTION	1	
9	GB426-902-000	CONNECTION	2	
10	GB458-021-082	CONNECTION	1	
11	GB674-808-100	FILTER ASSY	1	
12	GB707-075-034	JUNCTION BOX	1	
13	GB801-200-002	PRESSURE SWITCH	1	X
14	GB809-100-000	PRESSURE SWITCH CAP	1	X
15	GB817-103-000	THERMAL DETECTOR	1	X
16	GB408-642-000	REDUCER	1	
17	GB420-607-000	CONNECTION	1	
18	GB421-330-000	CONNECTION	1	
19	GB422-338-000	CONNECTION	1	
20	GB423-907-000	CONNECTION	1	
21	GB423-931-000	CONNECTION	2	
22	GB635-450-101	HEAT EXCHANGER	1	
23	GB653-000-100	SOLENOID VALVE	1	X
24	GB738-806-100	FAIRLEAD	2	

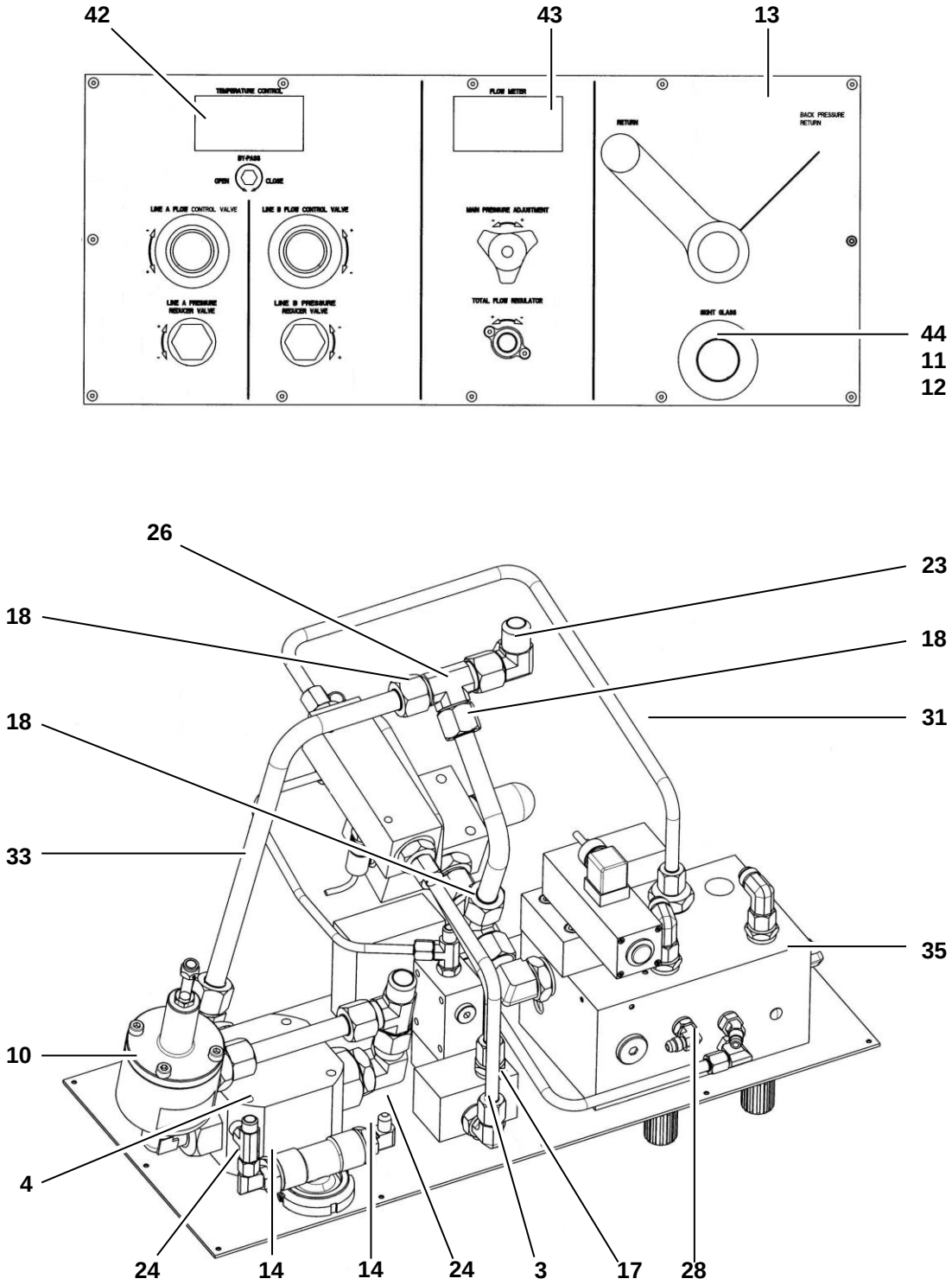


Fig. 1.6 HYDRAULIC CONTROL PANEL (Table 1 of 3)

Table 1.6 HYDRAULIC CONTROL PANEL (Ref. Fig. 1.6)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB018-460-300	SET-SCREW *(UP TO S/N 11 02 040)*	1	
2	GB206-001-947	SPACER	1	
3	GB423-912-000	CONNECTION	1	
4	GB426-902-000	CONNECTION	2	
5	GB426-907-000	CONNECTION	1	
6	GB427-105-000	CONNECTION	1	
7	GB458-021-079	CONNECTION	1	
8	GB470-201-000	CAP	1	
9	GB063-900-350	KNOB	1	**X**
10	GB263-000-055	BACK PRESSURE ASSY	1	
11	GB263-051-013	FLOW INDICATOR RING	1	
12	GB263-051-014	FLOW INDICATOR RING NUT	1	
13	GB263-051-230	PANEL	1	
14	GB408-414-000	CONNECTION	1	
15	GB420-102-000	NUT TUBE	2	
16	GB420-103-000	NUT TUBE	2	
17	GB420-104-000	NUT TUBE	6	
18	GB420-108-000	NUT TUBE	4	
19	GB420-508-000	CONNECTION	2	
20	GB420-612-000	CONNECTION	2	
21	GB421-323-000	CONNECTION	1	
22	GB423-703-000	CONNECTION	1	
23	GB423-707-001	CONNECTION	1	
24	GB423-907-000	CONNECTION	3	
25	GB424-400-000	CONNECTION	1	
26	GB425-707-000	CONNECTION	1	
27	GB426-903-001	CONNECTION	1	
28	GB501-100-002	TUBE	C.R.	
29	GB501-100-003	TUBE	C.R.	
30	GB501-100-003	TUBE	C.R.	
31	GB501-100-003	TUBE	C.R.	
32	GB501-108-001	TUBE	C.R.	
33	GB501-108-001	TUBE	C.R.	
34	GB507-400-450	TUBE	C.R.	
35	GB606-080-700	VALVES MANIFOLD ASSY	1	
36	GB640-130-001	REGULATOR PUMP PRESSURE VALVE	1	**X**
37	GB640-230-000	MAX PRESSURE VALVE	1	**X**
38	GB660-500-000	PRESSURE REGULATING VALVE	1	**X**
39	GB699-401-000	TURBINE FLOW SENSOR	1	**X**
40	GB735-710-000	CONNECTOR	1	**X**
41	GB758-110-200	POTENTIOMETER	1	**X**
42	GB813-052-000	THERMOREGULATOR	1	**X**
43	GB832-010-100	FLOW INDICATOR	1	**X**
44	GB899-000-200	FLOW INDICATOR	1	**X**

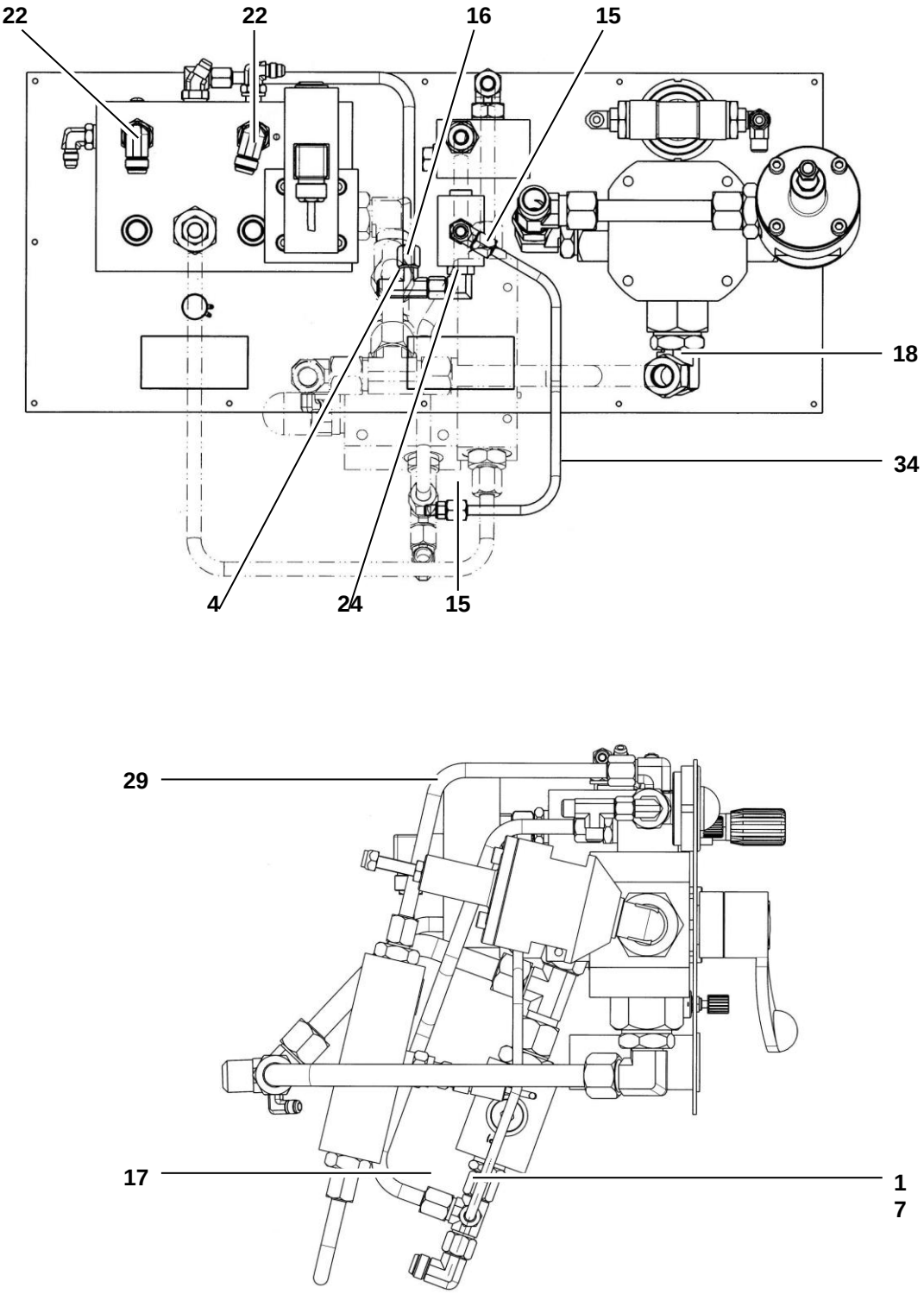


Fig. 1.6 PANNELLO COMANDI IDRAULICI (Table. 2 di 3)

Table 1.6 HYDRAULIC CONTROL PANEL (Ref. Fig. 1.6)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB018-460-300	SET-SCREW *(UP TO S/N 11 02 040)*	1	
2	GB206-001-947	SPACER	1	
3	GB423-912-000	CONNECTION	1	
4	GB426-902-000	CONNECTION	2	
5	GB426-907-000	CONNECTION	1	
6	GB427-105-000	CONNECTION	1	
7	GB458-021-079	CONNECTION	1	
8	GB470-201-000	CAP	1	
9	GB063-900-350	KNOB	1	**X**
10	GB263-000-055	BACK PRESSURE ASSY	1	
11	GB263-051-013	FLOW INDICATOR RING	1	
12	GB263-051-014	FLOW INDICATOR RING NUT	1	
13	GB263-051-230	PANEL	1	
14	GB408-414-000	CONNECTION	1	
15	GB420-102-000	NUT TUBE	2	
16	GB420-103-000	NUT TUBE	2	
17	GB420-104-000	NUT TUBE	6	
18	GB420-108-000	NUT TUBE	4	
19	GB420-508-000	CONNECTION	2	
20	GB420-612-000	CONNECTION	2	
21	GB421-323-000	CONNECTION	1	
22	GB423-703-000	CONNECTION	1	
23	GB423-707-001	CONNECTION	1	
24	GB423-907-000	CONNECTION	3	
25	GB424-400-000	CONNECTION	1	
26	GB425-707-000	CONNECTION	1	
27	GB426-903-001	CONNECTION	1	
28	GB501-100-002	TUBE	C.R.	
29	GB501-100-003	TUBE	C.R.	
30	GB501-100-003	TUBE	C.R.	
31	GB501-100-003	TUBE	C.R.	
32	GB501-108-001	TUBE	C.R.	
33	GB501-108-001	TUBE	C.R.	
34	GB507-400-450	TUBE	C.R.	
35	GB606-080-700	VALVES MANIFOLD ASSY	1	
36	GB640-130-001	REGULATOR PUMP PRESSURE VALVE	1	**X**
37	GB640-230-000	MAX PRESSURE VALVE	1	**X**
38	GB660-500-000	PRESSURE REGULATING VALVE	1	**X**
39	GB699-401-000	TURBINE FLOW SENSOR	1	**X**
40	GB735-710-000	CONNECTOR	1	**X**
41	GB758-110-200	POTENTIOMETER	1	**X**
42	GB813-052-000	THERMOREGULATOR	1	**X**
43	GB832-010-100	FLOW INDICATOR	1	**X**
44	GB899-000-200	FLOW INDICATOR	1	**X**

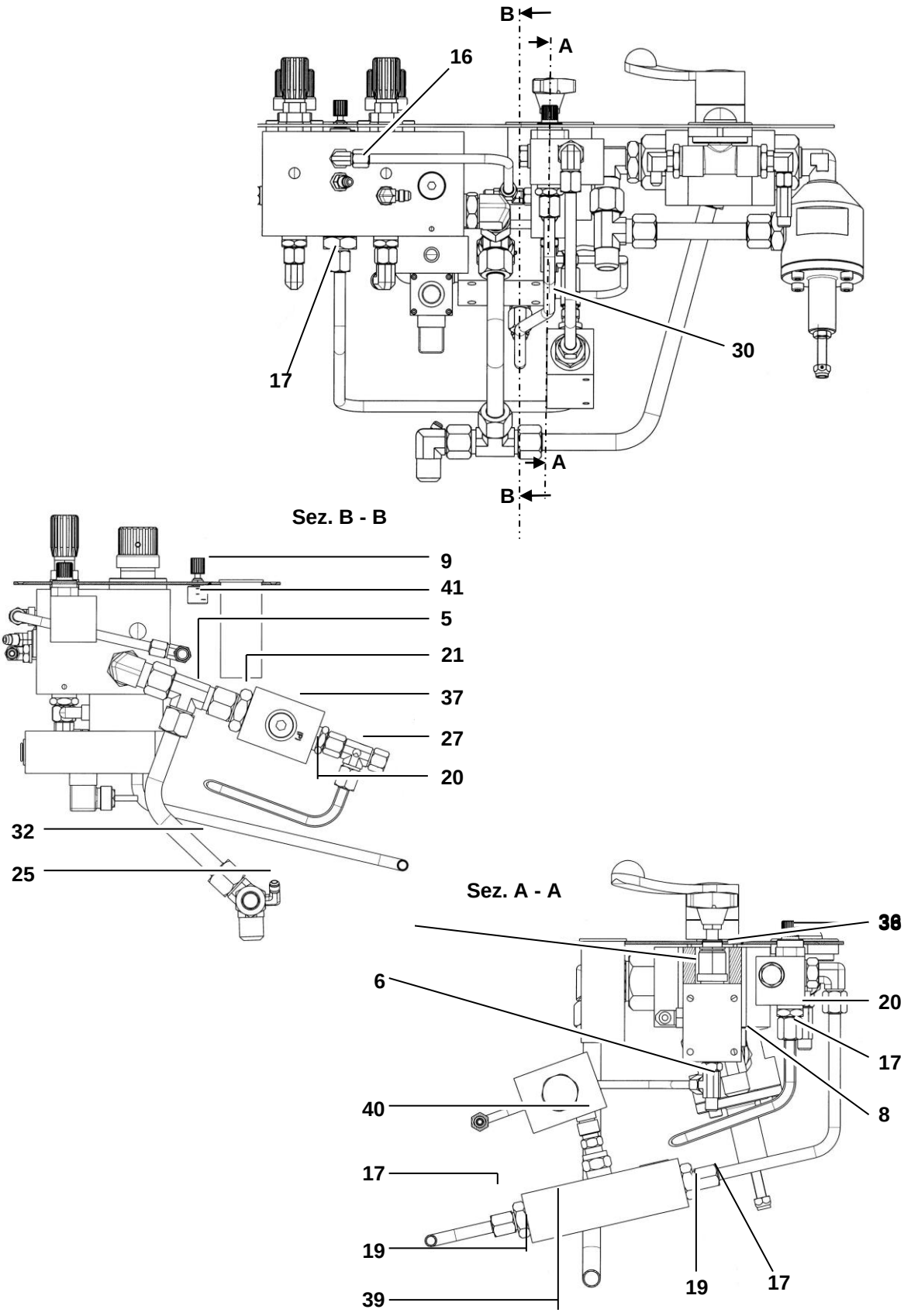
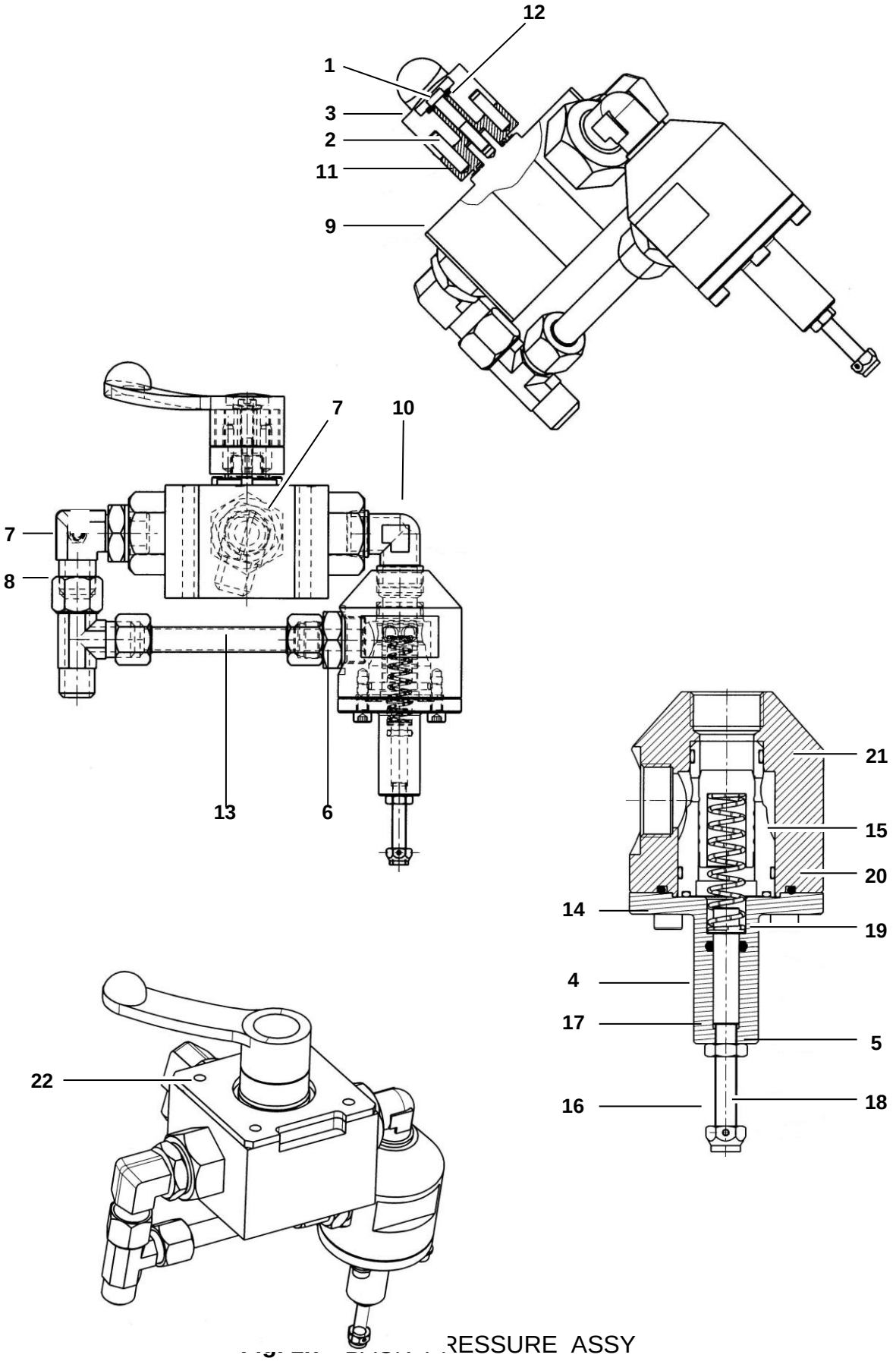


Fig. 1.6 PANNELLO COMANDI IDRAULICI (Table. 3 di 3)

Table 1.6 HYDRAULIC CONTROL PANEL (Ref. Fig. 1.6)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB018-460-300	SET-SCREW *(UP TO S/N 11 02 040)*	1	
2	GB206-001-947	SPACER	1	
3	GB423-912-000	CONNECTION	1	
4	GB426-902-000	CONNECTION	2	
5	GB426-907-000	CONNECTION	1	
6	GB427-105-000	CONNECTION	1	
7	GB458-021-079	CONNECTION	1	
8	GB470-201-000	CAP	1	
9	GB063-900-350	KNOB	1	**X**
10	GB263-000-055	BACK PRESSURE ASSY	1	
11	GB263-051-013	FLOW INDICATOR RING	1	
12	GB263-051-014	FLOW INDICATOR RING NUT	1	
13	GB263-051-230	PANEL	1	
14	GB408-414-000	CONNECTION	1	
15	GB420-102-000	NUT TUBE	2	
16	GB420-103-000	NUT TUBE	2	
17	GB420-104-000	NUT TUBE	6	
18	GB420-108-000	NUT TUBE	4	
19	GB420-508-000	CONNECTION	2	
20	GB420-612-000	CONNECTION	2	
21	GB421-323-000	CONNECTION	1	
22	GB423-703-000	CONNECTION	1	
23	GB423-707-001	CONNECTION	1	
24	GB423-907-000	CONNECTION	3	
25	GB424-400-000	CONNECTION	1	
26	GB425-707-000	CONNECTION	1	
27	GB426-903-001	CONNECTION	1	
28	GB501-100-002	TUBE	C.R.	
29	GB501-100-003	TUBE	C.R.	
30	GB501-100-003	TUBE	C.R.	
31	GB501-100-003	TUBE	C.R.	
32	GB501-108-001	TUBE	C.R.	
33	GB501-108-001	TUBE	C.R.	
34	GB507-400-450	TUBE	C.R.	
35	GB606-080-700	VALVES MANIFOLD ASSY	1	
36	GB640-130-001	REGULATOR PUMP PRESSURE VALVE	1	**X**
37	GB640-230-000	MAX PRESSURE VALVE	1	**X**
38	GB660-500-000	PRESSURE REGULATING VALVE	1	**X**
39	GB699-401-000	TURBINE FLOW SENSOR	1	**X**
40	GB735-710-000	CONNECTOR	1	**X**
41	GB758-110-200	POTENTIOMETER	1	**X**
42	GB813-052-000	THERMOREGULATOR	1	**X**
43	GB832-010-100	FLOW INDICATOR	1	**X**
44	GB899-000-200	FLOW INDICATOR	1	**X**



RESSURE ASSY

Table 1.7 BACK PRESSURE ASSY (Ref. Fig. 1.7)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-038-045	SCREW	1	
2	GB024-208-030	PIN	2	
3	GB063-452-100	MANEUVER LEVER	1	
4	GB263-000-050	CLOSING	1	
5	GB263-000-051	PIN	1	
6	GB420-625-000	CONNECTION	1	
7	GB423-925-000	CONNECTION	2	
8	GB426-907-000	CONNECTION	1	
9	GB658-500-003	VALVE *(APPLICABLE TO S/N 11 02 001÷ 002, S/N 11 02 004 ÷ 11 02 009)*	1	
	GB658-500-004	VALVE *(APPLICABLE TO S/N 11 02 003, FROM S/N 11 02 010)*		
10	GB738-500-151	CONNECTION	1	
11	GB263-000-047	ADAPTER	1	
12	GB263-000-053	WASHER	1	
13	GB263-000-052	TUBE	1	
14	GB016-042-000	SCREW	4	
15	GB654-012-500	VALVE	1	
16	GB020-352-150	SELF-LOCKING NUT	1	
17	GB020-653-100	NUT	1	
18	GB024-312-054	SPRING PIN	1	
19	GB030-200-400	GASKET	1	
20	GB030-230-600	GASKET	1	
21	GB263-000-048	CASING	1	
22	GB263-000-056	SPACER *(APPLICABLE TO S/N 11 02 003, FROM S/N 11 02 010)*	1	

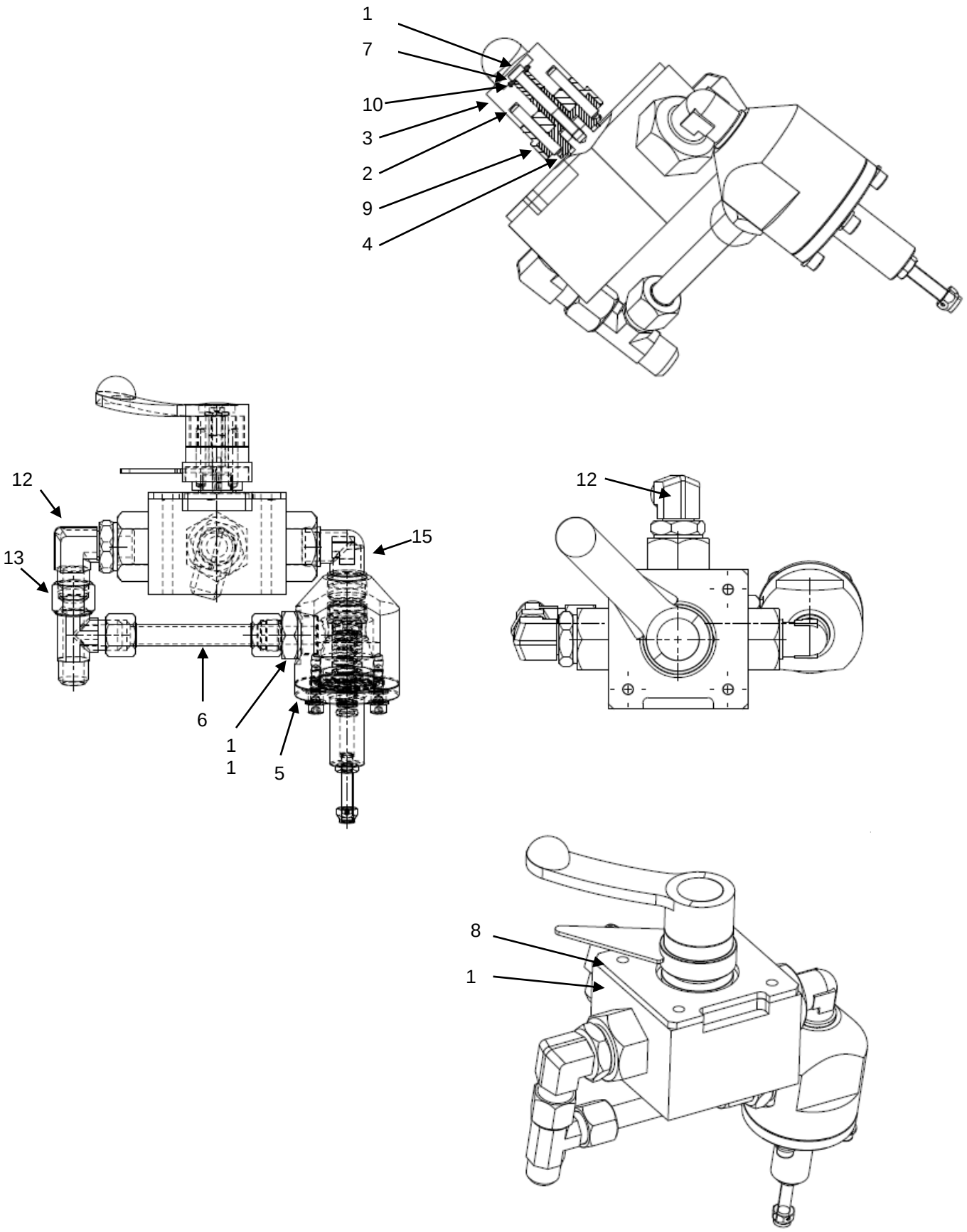


Fig. 1.7A BACK PRESSURE ASSY
(valid for SN 1102076 e from SN 1102080)

Tabella 1.7A BACK PRESSURE ASSY (Rif. Fig. 1.7A)

(valid for SN 1102076 and from SN 1102080)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-038-060	SCREW VTCBEI M80X60 UNI9327	1	
2	GB024-215-048	PIN 8X48	2	
3	GB063-452-100	HANDLING LEVER	1	
4	GB263-000-047	VALVE LEVER ADAPTER	1	
5	GB263-000-050	BACK PRESSURE ASSY, BODY	1	
6	GB263-000-052	BACK PRESSURE ASSY, TUBE	1	
7	GB263-000-053	HANDLING LEVER SPACER	1	
8	GB263-000-056	3 WAY VALVE SPACER	1	
9	GB263000-202	POSITIONING DEVICE, ASSY	1	
10	GB263-000-203	SPACER	1	
11	GB420-625-000	COUPLING 1” GAS – 1”1/16-12 UN-2A	1	
12	GB423-925-000	ELBOW 1” GAS – 1”1/16-12 UN-2A	2	
13	GB426-907-000	COUPLING TEE 1”1/16-12 UN - MMF	1	
14	GB658-500-004	3 WAY VALVE 1” GAS	1	
15	GB738-500-151	ELBOW 1” MM BSPT MODIFIED	1	

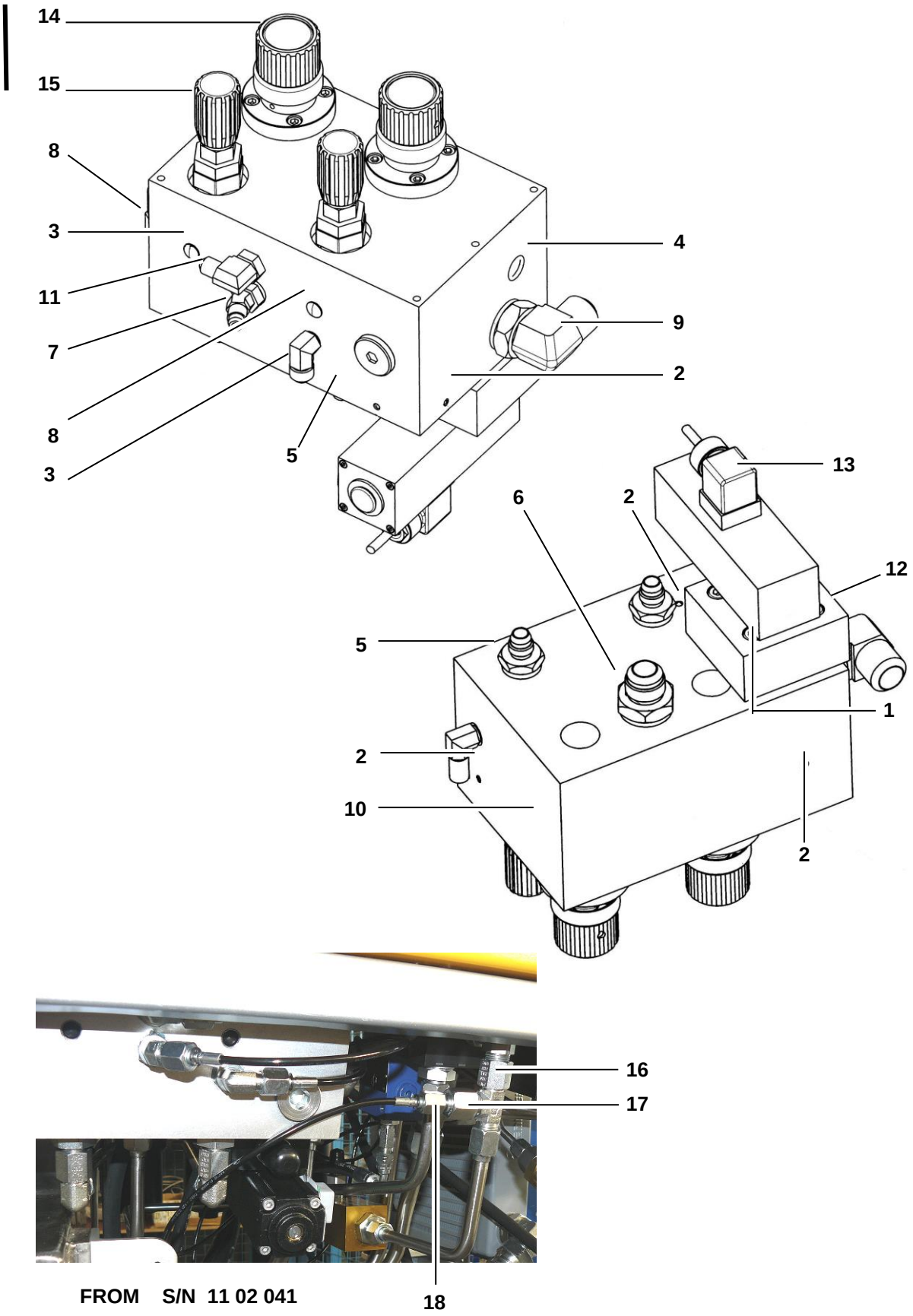


Fig. 1.8 VALVES MANIFOLD ASSY

Table 1.8 VALVES MANIFOLD ASSY (Ref. Fig. 1.8)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-044-500	SCREW	4	
2	GB022-420-000	STAINLESS SEALING PLUG	5	
3	GB022-460-000	STAINLESS SEALING PLUG	2	
4	GB022-490-180	STAINLESS SEALING PLUG	1	
5	GB420-612-000	CONNECTION	2	
6	GB420-613-000	CONNECTION	1	
7	GB422-905-000	CONNECTION	1	
8	GB423-905-000	CONNECTION	2	
9	GB423-924-000	CONNECTION	1	
10	GB264-621-000	MANIFOLD	1	
11	GB423-907-000	CONNECTION	1	
12	GB470-201-000	CAP	1	
13	GB733-651-080	CONNECTOR LIGHT	1	**X**
14	GB662-410-100	FLOW CONTROL VALVE	2	**X**
15	GB647-240-100	PRESSURE REDUCING VALVE	2	**X**
16	GB426-903-000	CONNECTION *(FROM S/N 11 02 041)*	1	
17	GB422-303-100	CONNECTION *(FROM S/N 11 02 041)*	1	
18	GB525-102-100	FLEXIBLE HOSE *(FROM S/N 11 02 041)*	1	

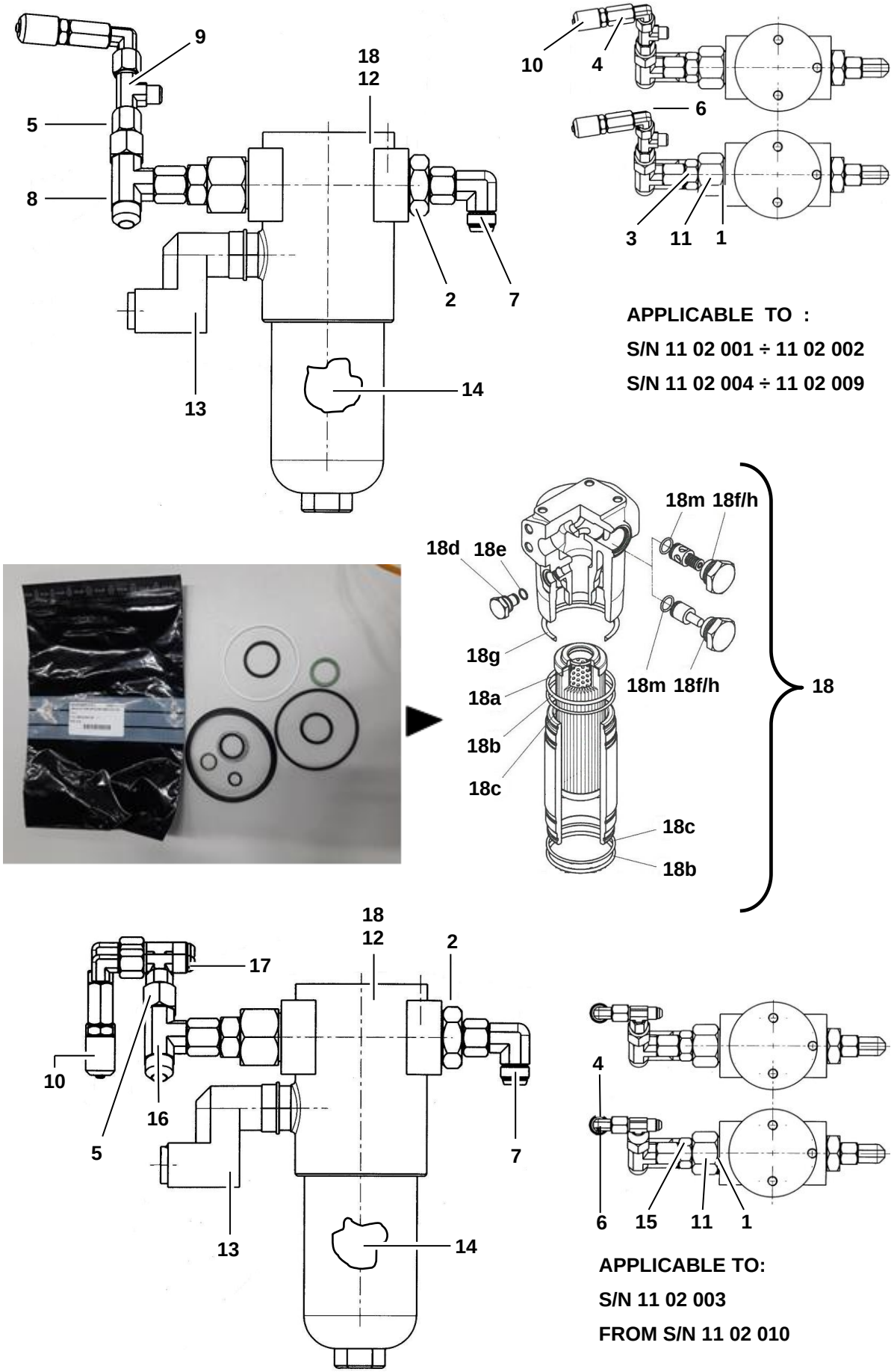


Fig. 1.9 H.P. DELIVERY FILTERS ASSY

Table 1.9 H.P. DELIVERY FILTERS ASSY (Ref. Fig. 1.9)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB037-154-000	WASHER	2	
2	GB420-613-000	CONNECTION	2	
3	GB421-325-000	CONNECTION	2	
4	GB422-201-000	CONNECTION	2	
5	GB422-303-000	CONNECTION	2	
6	GB423-701-000	CONNECTION	2	
7	GB423-703-000	CONNECTION	2	
8	GB426-703-000	CONNECTION	2	
9	GB426-901-000	CONNECTION	2	
10	GB451-111-000	PRESSURE PORT	2	
11	GB472-000-020	CONNECTION	2	
12	GB675-400-010	FILTER ASSY	2	
13	GB679-970-100	ELECTRICAL INDICATOR	2	**X**
14	GB675-024-100	FILTERING CARTRIDGE	2	**X**
15	GB421-325-000	CONNECTION	2	
16	GB426-703-000	CONNECTION	2	
17	GB426-901-000	CONNECTION	2	
18	GB038-080-100	SEALS KIT COMPOSED BY :	2	**X**
18a	GB030-120-600	FILTER ELEMENT SEAL	1	
18b	GB030-160-400	BOWL SEAL	1	
18c	GB032-123-100	BOWL ANTI-EXTRUSION RING	1	
18d	GB038-860-100	GASKET	1	
18e	GB030-020-400	O-RING INDICATOR	1	
18f	GB030-120-410	O-RING METRIC, HNBR, GREEN	1	
18g	GB038-860-200	PROTECTIVE SEAL	1	
18h	GB030-120-150	GASKET	1	
18m	GB030-010-800	GASKET	1	

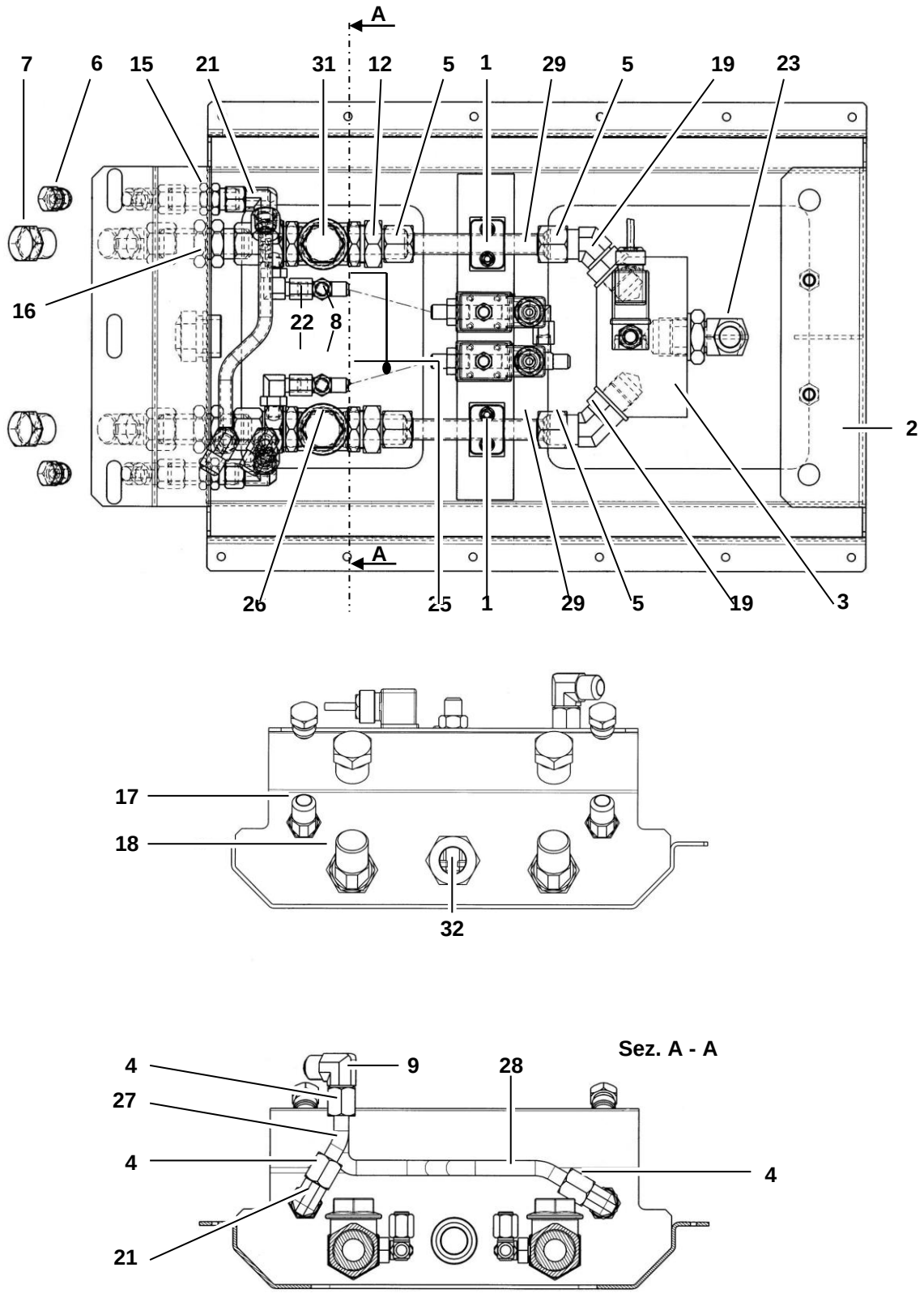


Fig. 1.10 RETURNS ASSY (Table. 1 of 2)

Table 1.10 RETURNS ASSY (Ref. Fig. 1.10)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB091-500-000	TUBE COLLAR	2	
2	GB206-001-665	SUPPORT FRAME RETURNS ASSY	1	
3	GB264-619-000	COLLECTOR	1	
4	GB420-104-000	NUT	4	
5	GB420-108-000	NUT	4	
6	GB420-204-000	CAP	2	
7	GB420-208-000	CAP	2	
8	GB420-302-000	CAP	2	
9	GB420-603-000	CONNECTION	2	
10	GB420-605-000	CONNECTION	2	
11	GB420-607-000	CONNECTION	2	
12	GB420-628-100	CONNECTION	2	
13	GB421-305-000	CONNECTION	2	
14	GB421-307-000	CONNECTION	1	
15	GB422-404-000	CONNECTION	2	
16	GB422-408-000	CONNECTION	2	
17	GB422-703-000	CONNECTION	2	
18	GB422-707-000	CONNECTION	2	
19	GB422-927-000	CONNECTION	2	
20	GB423-701-000	CONNECTION	1	
21	GB423-703-000	CONNECTION	2	
22	GB423-904-000	CONNECTION	2	
23	GB423-925-000	CONNECTION	1	
24	GB425-701-000	CONNECTION	1	
25	GB426-901-000	CONNECTION	2	
26	GB656-555-001	RETURN VALVE ASSY LINE A	1	**X**
27	GB501-100-003	TUBE	C.R.	
28	GB501-100-003	TUBE	C.R.	
29	GB501-108-001	TUBE	C.R.	
30	GB653-000-100	SOLENOIND VALVE	3	**X**
31	GB656-555-002	RETURN VALVE ASSY LINE B	1	**X**
32	GB738-806-300	FAIRLEAD	1	
33	GB016-021600	SCREW ***FROM S/N 1102072***	4	
34	GB020-622-000	NUT ***FROM S/N 1102072***	4	
35	GB021-102-000	WASHER ***FROM S/N 1102072***	8	
36	GB016-031-220	SCREW ***FROM S/N 1102072***	3	
37	GB206-002-274	PLATE ***FROM S/N 1102072***	2	
38	GB206-002-276	BRACKET ***FROM S/N 1102072***	1	

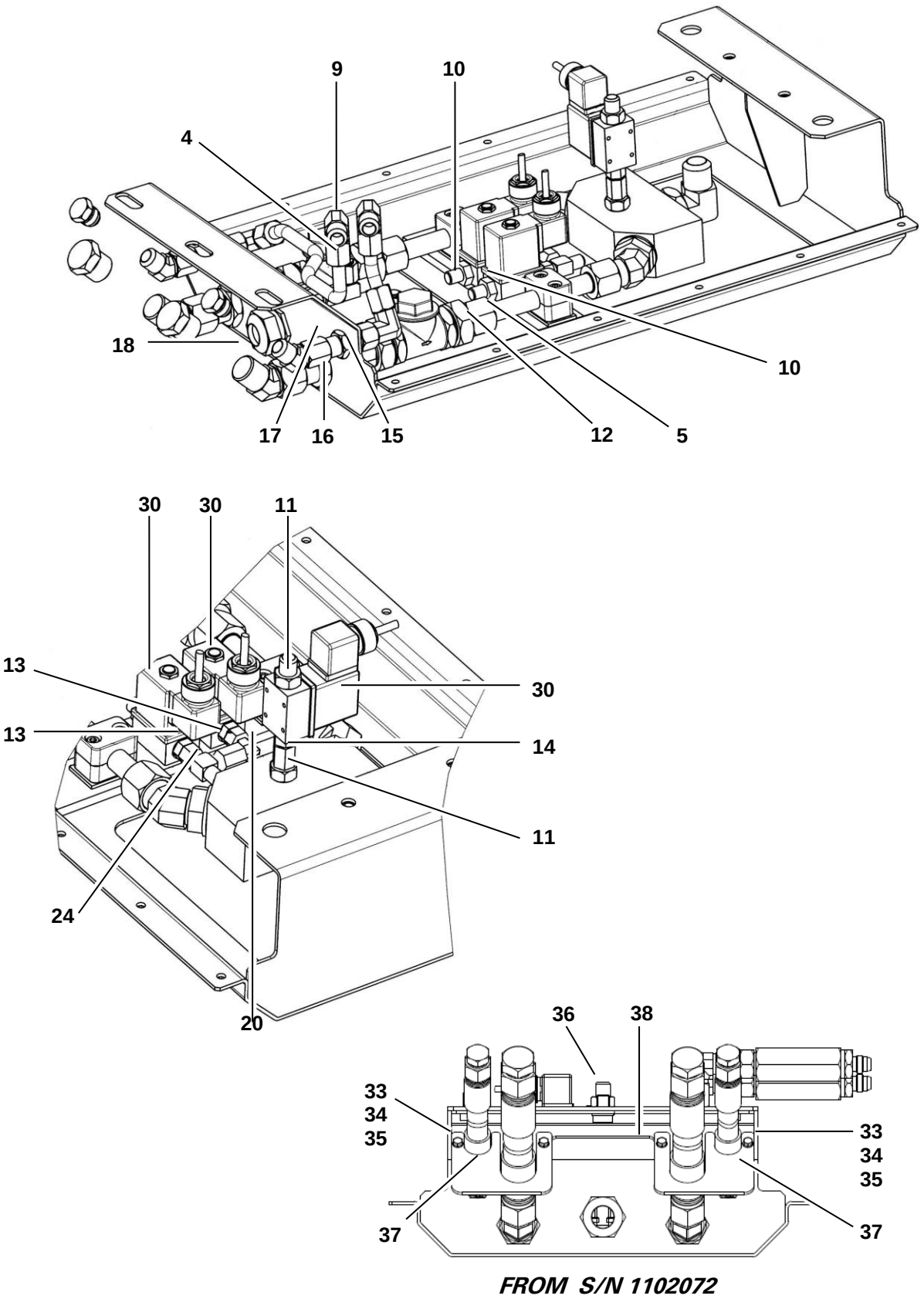


Fig. 1.10 RETURNS ASSY (Table. 2 of 2)

Table 1.10 RETURNS ASSY (Ref. Fig. 1.10)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB091-500-000	TUBE COLLAR	2	
2	GB206-001-665	SUPPORT FRAME RETURNS ASSY	1	
3	GB264-619-000	COLLECTOR	1	
4	GB420-104-000	NUT	4	
5	GB420-108-000	NUT	4	
6	GB420-204-000	CAP	2	
7	GB420-208-000	CAP	2	
8	GB420-302-000	CAP	2	
9	GB420-603-000	CONNECTION	2	
10	GB420-605-000	CONNECTION	2	
11	GB420-607-000	CONNECTION	2	
12	GB420-628-100	CONNECTION	2	
13	GB421-305-000	CONNECTION	2	
14	GB421-307-000	CONNECTION	1	
15	GB422-404-000	CONNECTION	2	
16	GB422-408-000	CONNECTION	2	
17	GB422-703-000	CONNECTION	2	
18	GB422-707-000	CONNECTION	2	
19	GB422-927-000	CONNECTION	2	
20	GB423-701-000	CONNECTION	1	
21	GB423-703-000	CONNECTION	2	
22	GB423-904-000	CONNECTION	2	
23	GB423-925-000	CONNECTION	1	
24	GB425-701-000	CONNECTION	1	
25	GB426-901-000	CONNECTION	2	
26	GB656-555-001	RETURN VALVE ASSY LINE A	1	**X**
27	GB501-100-003	TUBE	C.R.	
28	GB501-100-003	TUBE	C.R.	
29	GB501-108-001	TUBE	C.R.	
30	GB653-000-100	SOLENOIND VALVE	3	**X**
31	GB656-555-002	RETURN VALVE ASSY LINE B	1	**X**
32	GB738-806-300	FAIRLEAD	1	
33	GB016-021600	SCREW ***FROM S/N 1102072***	4	
34	GB020-622-000	NUT ***FROM S/N 1102072***	4	
35	GB021-102-000	WASHER ***FROM S/N 1102072***	8	
36	GB016-031-220	SCREW ***FROM S/N 1102072***	3	
37	GB206-002-274	PLATE ***FROM S/N 1102072***	2	
38	GB206-002-276	BRACKET ***FROM S/N 1102072***	1	

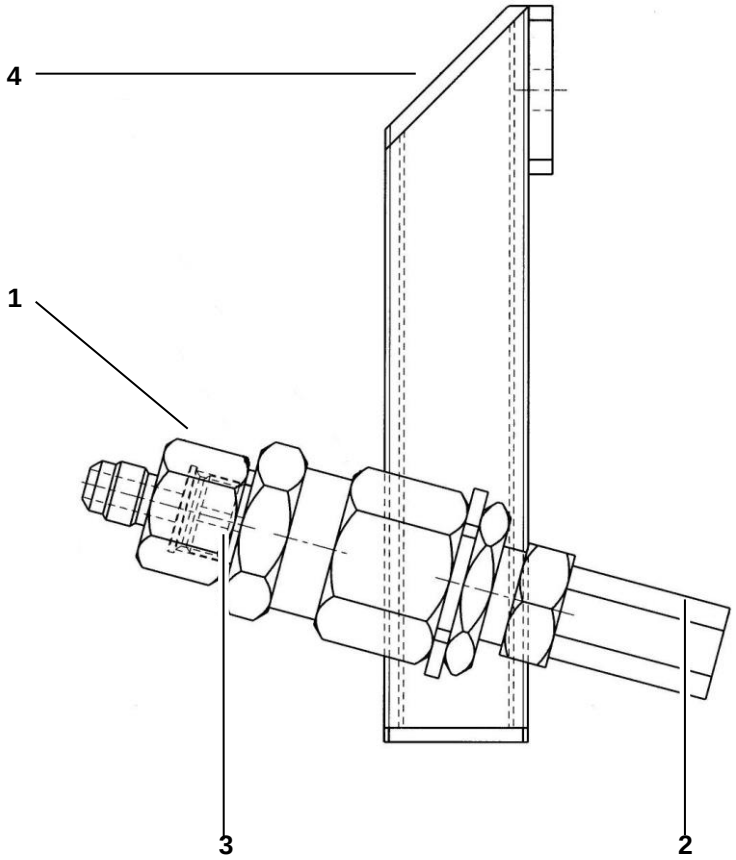


Fig. 1.11 SAMPLING VALVES ASSY

Table 1.11 SAMPLING VALVES ASSY (Ref. Fig. 1.11)

POS.	REFERENCE N°	DESCRPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB458-021-041	CONNECTION	1	
2	GB667-010-000	SAMPLING VALVE	1	X
3	GB037-231-000	WASHER	1	X
4	GB263-051-350	SUPPORT	1	

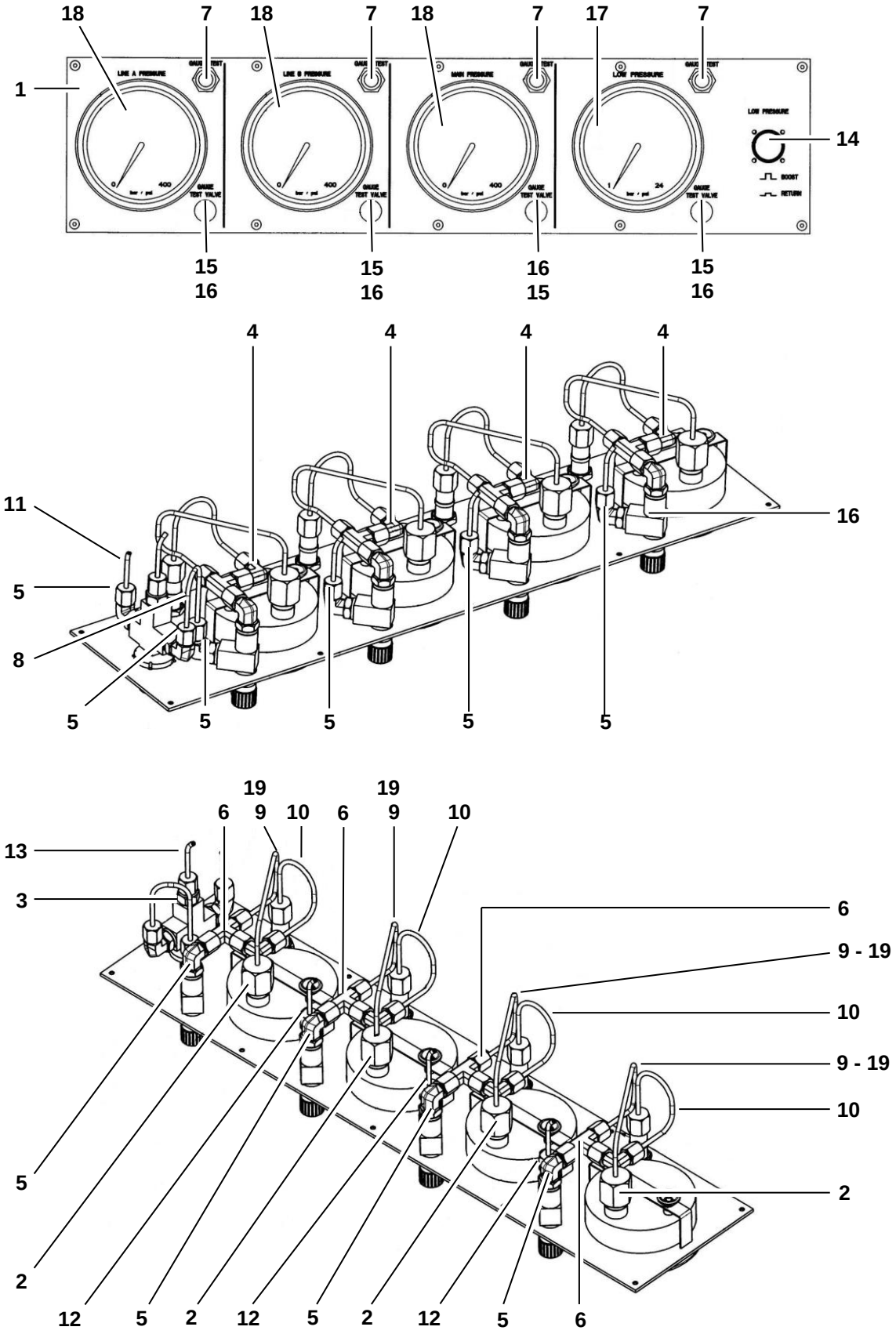


Fig. 1.12 HYDRAULIC INDICATIONS PANEL

Table 1.12 HYDRAULIC INDICATIONS PANEL (Ref. Fig. 1.12)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB263-051-220	PANEL	1	
2	GB415-023-000	WASHER	4	
3	GB420-605-000	CONNECTION	1	
4	GB423-701-000	CONNECTION	4	
5	GB423-905-000	CONNECTION	10	
6	GB426-901-000	CONNECTION	4	
7	GB451-162-000	PRESSURE PORT	4	
8	GB525-100-010	HOSE	1	
9	GB525-100-020	HOSE	4	
10	GB525-100-030	HOSE	4	
11	GB525-102-000	HOSE	1	
12	GB525-103-002	HOSE	3	
13	GB525-104-001	HOSE	1	
14	GB658-171-000	SELECTOR	1	**X**
15	GB206-001-686	RING NUT	4	
16	GB661-105-001	VALVE	4	**X**
17	GB802-343-010	GAUGE	1	**X**
18	GB802-744-100	GAUGE	3	**X**
19	GB030-010-190	GASKET	4	

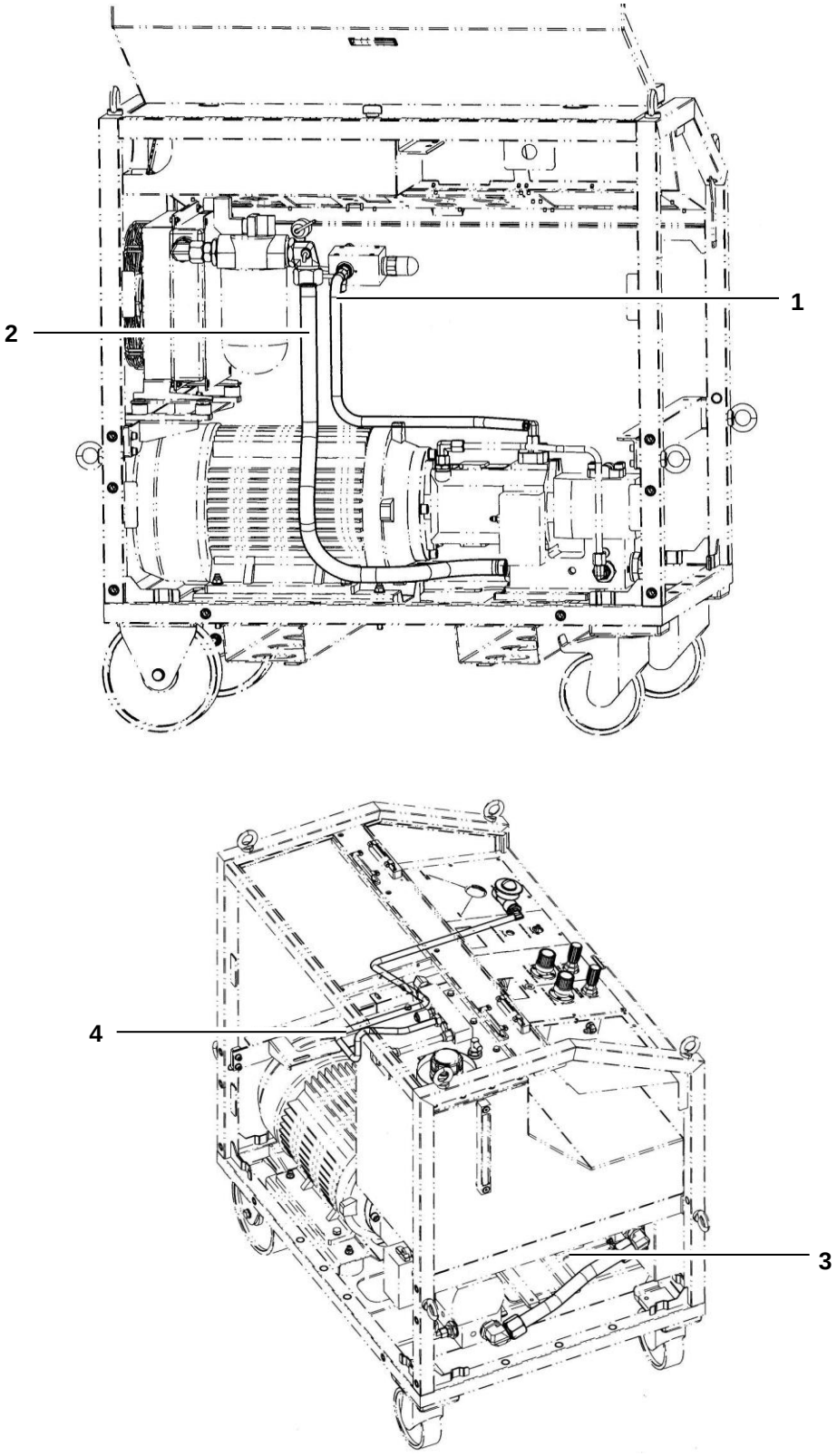


Fig. 1.13 HOSES ASSY (Table 1 of 3)

Table 1.13 HOSES ASSY (Ref. Fig. 1.13)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB523-423-720	HOSE	1	X
2	GB522-154-079	HOSE	1	X
3	GB529-871-000	HOSE	1	X
4	GB523-212-565	HOSE	1	X
5	GB523-202-485	HOSE	1	X
6	GB523-203-095	HOSE	1	X
7	GB523-203-098	HOSE	1	X
8	GB522-154-110	HOSE	1	X
9	GB523-203-097	HOSE	1	X
10	GB523-204-880	HOSE	1	X
11	GB529-055-480	HOSE ASSEMBLY R(B)	1	X
12	GB529-055-450	HOSE ASSEMBLY P(A)	1	X
13	GB529-055-470	HOSE ASSEMBLY P(B)	1	X
14	GB529-055-460	HOSE ASSEMBLY R(A)	1	X

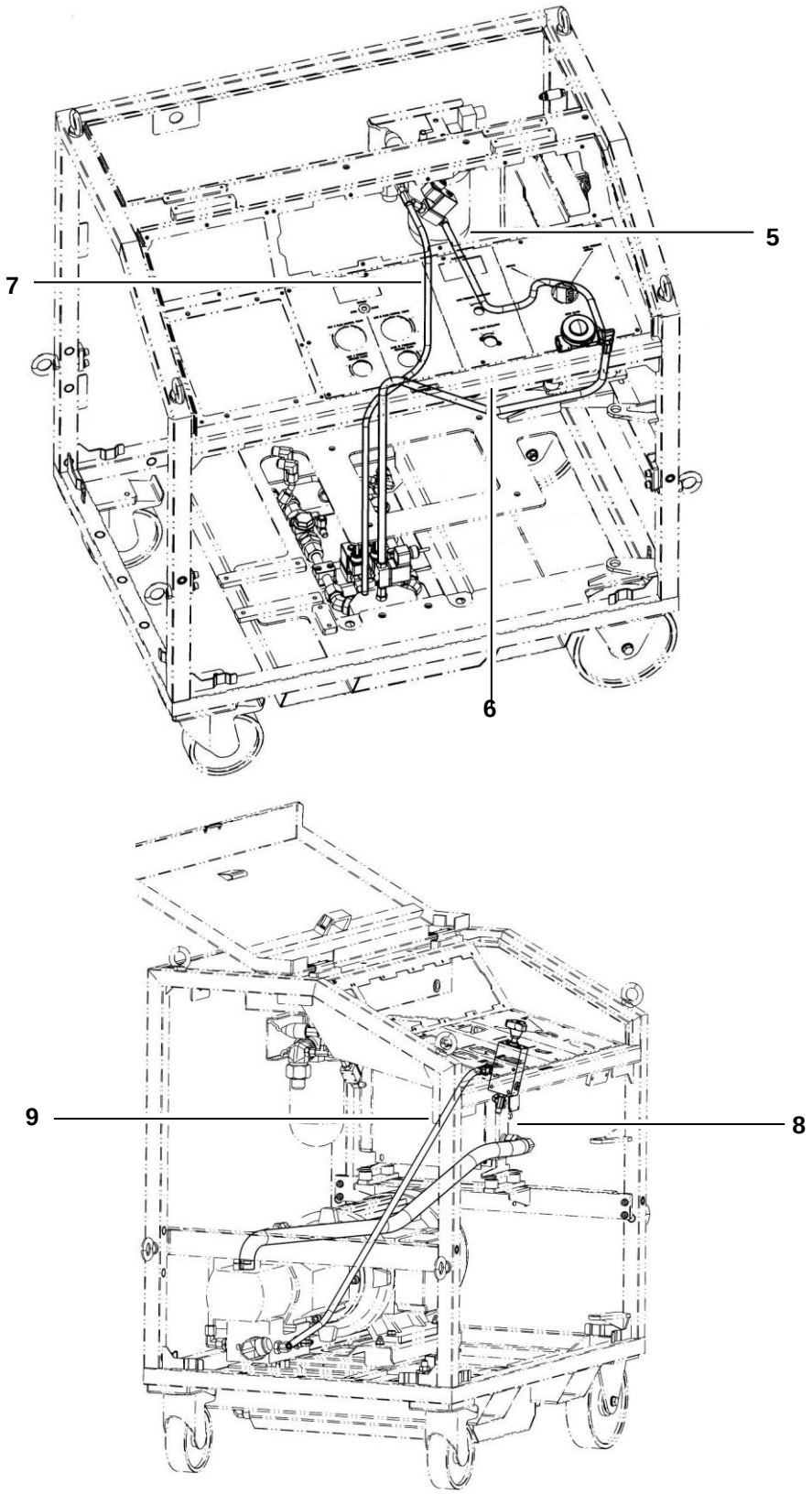


Fig. 1.13 HOSES ASSY (Table 2 of 3)

Table 1.13 HOSES ASSY (Ref. Fig. 1.13)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB523-423-720	HOSE	1	X
2	GB522-154-079	HOSE	1	X
3	GB529-871-000	HOSE	1	X
4	GB523-212-565	HOSE	1	X
5	GB523-202-485	HOSE	1	X
6	GB523-203-095	HOSE	1	X
7	GB523-203-098	HOSE	1	X
8	GB522-154-110	HOSE	1	X
9	GB523-203-097	HOSE	1	X
10	GB523-204-880	HOSE	1	X
11	GB529-055-480	HOSE ASSEMBLY R(B)	1	X
12	GB529-055-450	HOSE ASSEMBLY P(A)	1	X
13	GB529-055-470	HOSE ASSEMBLY P(B)	1	X
14	GB529-055-460	HOSE ASSEMBLY R(A)	1	X

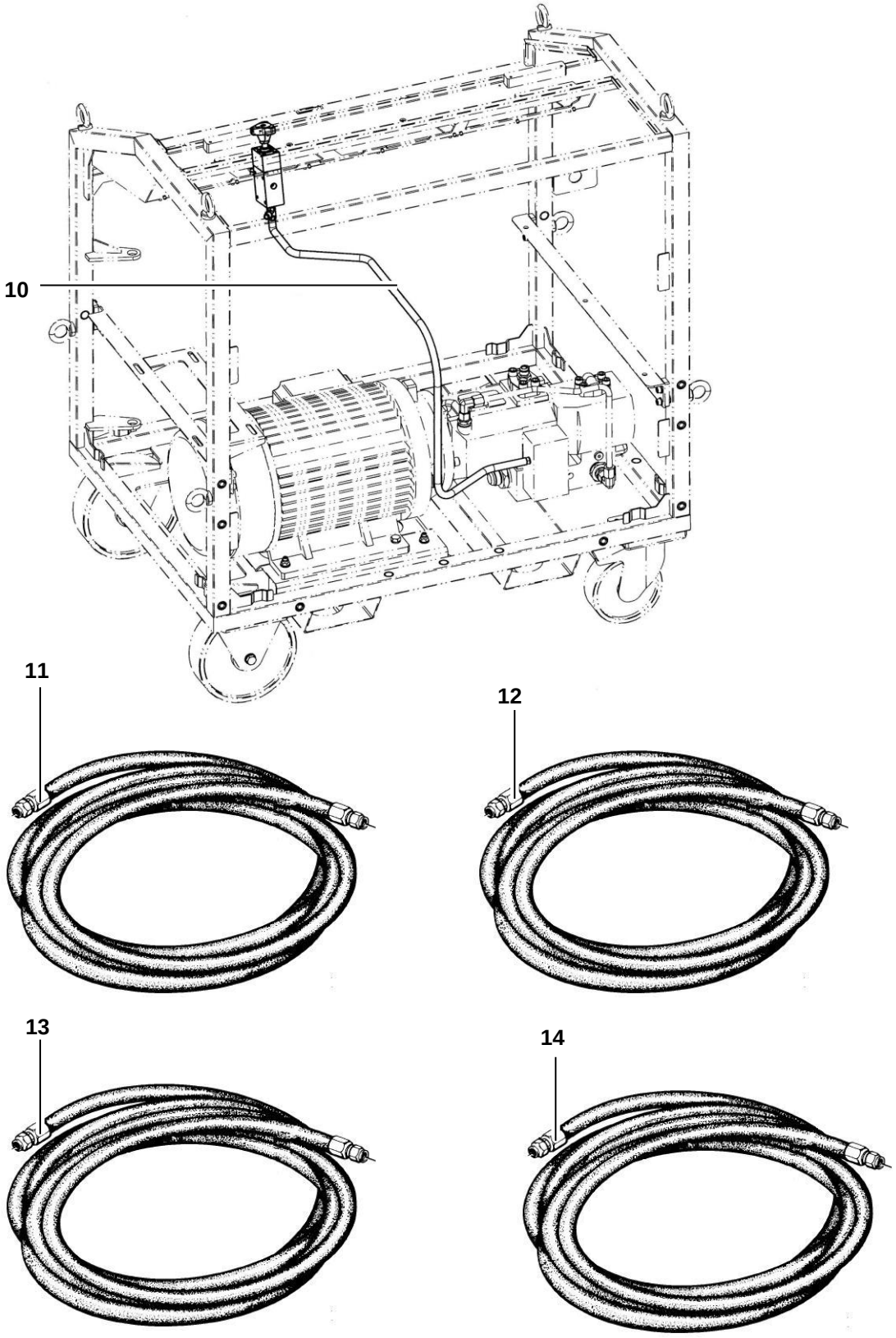


Fig. 1.13 HOSES ASSY (Table 3 of 3)

Table 1.13 HOSES ASSY (Ref. Fig. 1.13)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB523-423-720	HOSE	1	X
2	GB522-154-079	HOSE	1	X
3	GB529-871-000	HOSE	1	X
4	GB523-212-565	HOSE	1	X
5	GB523-202-485	HOSE	1	X
6	GB523-203-095	HOSE	1	X
7	GB523-203-098	HOSE	1	X
8	GB522-154-110	HOSE	1	X
9	GB523-203-097	HOSE	1	X
10	GB523-204-880	HOSE	1	X
11	GB529-055-480	HOSE ASSEMBLY R(B)	1	X
12	GB529-055-450	HOSE ASSEMBLY P(A)	1	X
13	GB529-055-470	HOSE ASSEMBLY P(B)	1	X
14	GB529-055-460	HOSE ASSEMBLY R(A)	1	X

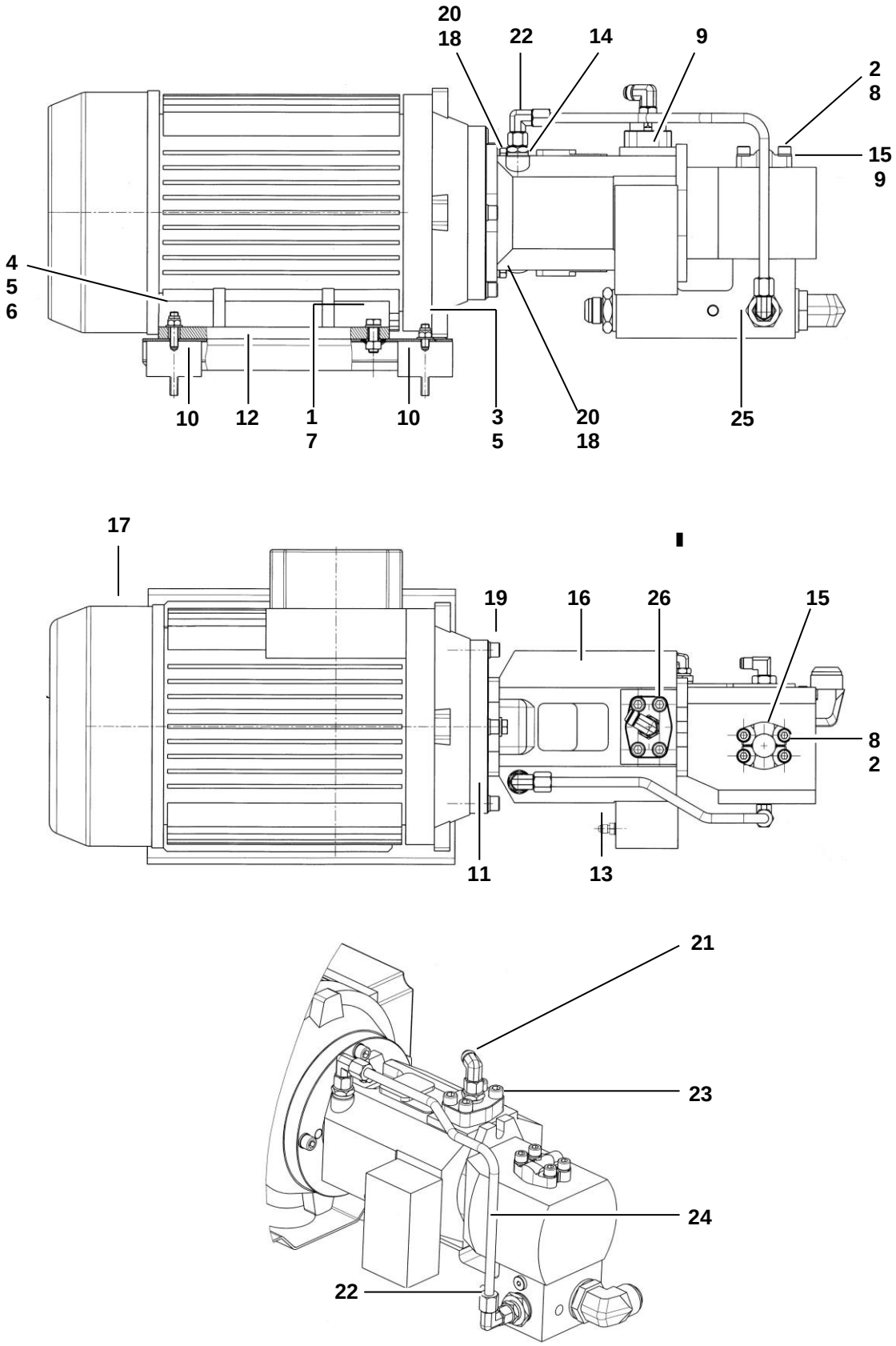


Fig. 1.14 MOTOR-DRIVEN PUMP ASSY

Table 1.14 MOTOR-DRIVEN PUMP ASSY (Ref. Fig. 1.14)

POS.	REFERNCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB013-063-500	SCREW	2	
2	GB016-053-500	SCREW	4	
3	GB018-615-030	SET-SCREW	2	
4	GB018-615-045	SET-SCREW	2	
5	GB020-652-000	SELF-LOCKING NUT	4	
6	GB021-105-000	WASHER	4	
7	GB021-106-000	WASHER	6	
8	GB021-135-000	WASHER	4	
9	GB030-210-200	GASKET	2	X
10	GB070-007-000	SHOCK ABSORBER RUBBER PAD	4	X
11	GB206-001-680	FLANGE	1	
12	GB263-051-215	SUPPORT	1	
13	GB420-604-000	CONNECTION	1	
14	GB420-612-000	CONNECTION	2	
15	GB477-100-300	HALF-FLANGE	2	
16	GB600-045-000	DOUBLE PUMP (GEAR PUMP + PISTON PUMP)	1	
17	GB101-452-050	ELECTRIC MOTOR	1	
18	GB013-072-000	SCREW	2	
19	GB016-065-000	SCREW	8	
20	GB021-137-000	WASHER	2	
21	GB420-104-000	NUT	2	
22	GB423-703-000	CONNECTION	3	
23	GB477-710-601	FLANGE	1	
24	GB501-100-003	TUBE	C.R.	
25	GB655-605-250	SUCTION BLOCK ASSY	1	
26	GB016-064-000	SCREW	4	

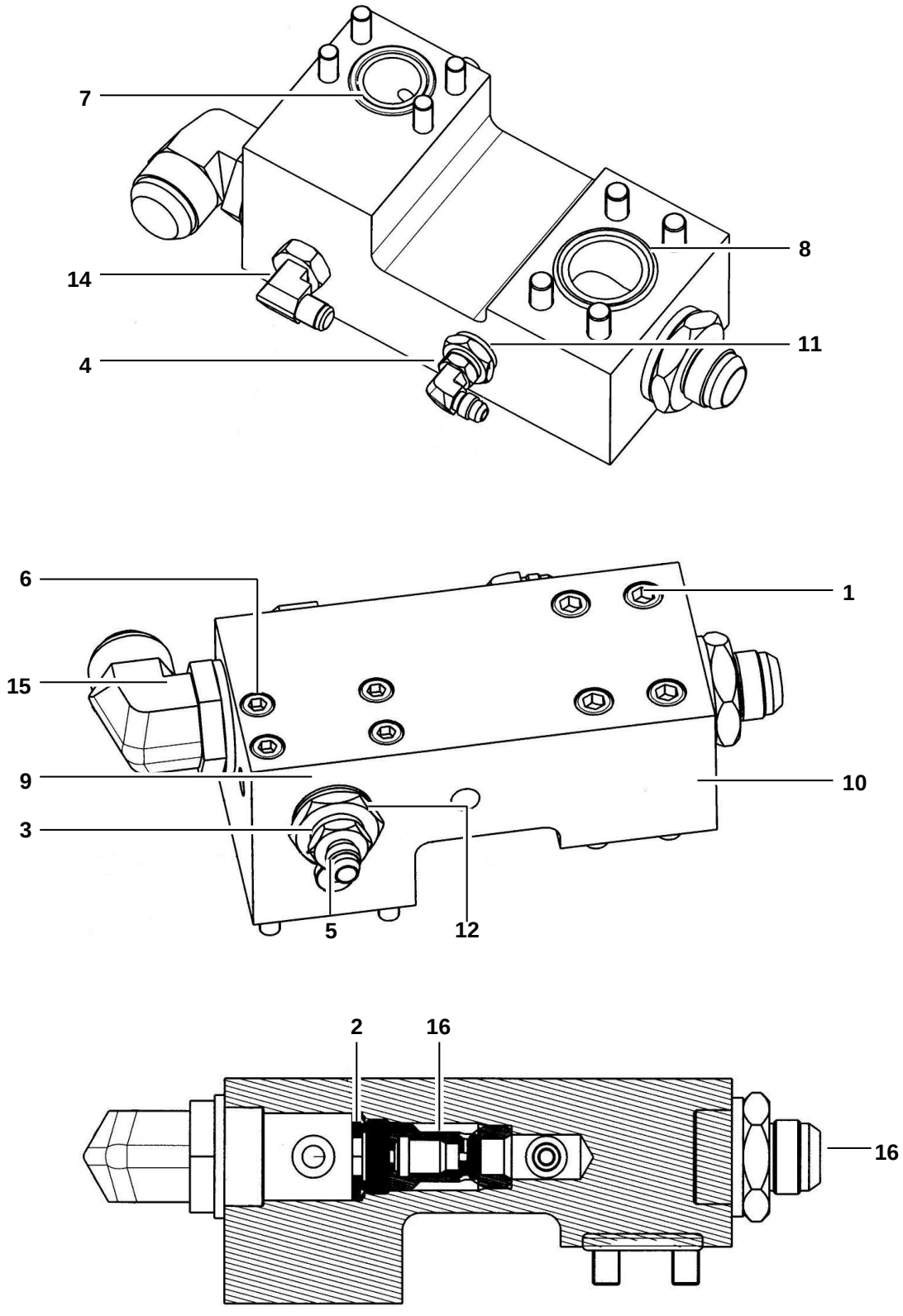


Fig. 1.15 SUCTION BLOCK ASSY

Table 1.15 SUCTION BLOCK ASSY (Ref. Fig. 1.14)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-068-000	SCREW	4	
2	GB264-610-000	CAP	1	
3	GB420-612-000	CONNECTION	1	
4	GB423-905-000	CONNECTION	1	
5	GB470-201-000	CAP	1	
6	GB016-059-110	SCREW	4	
7	GB030-210-700	GASKET	1	**X**
8	GB030-220-700	GASKET	1	**X**
9	GB037-164-000	WASHER	1	
10	GB264-611-100	BLOCK	1	
11	GB408-314-000	REDUCER	1	
12	GB408-532-000	REDUCER	1	
13	GB420-632-000	CONNECTION	1	
14	GB423-909-000	CONNECTION	1	
15	GB423-932-000	CONNECTION	1	
16	GB656-360-700	VALVE	1	**X**

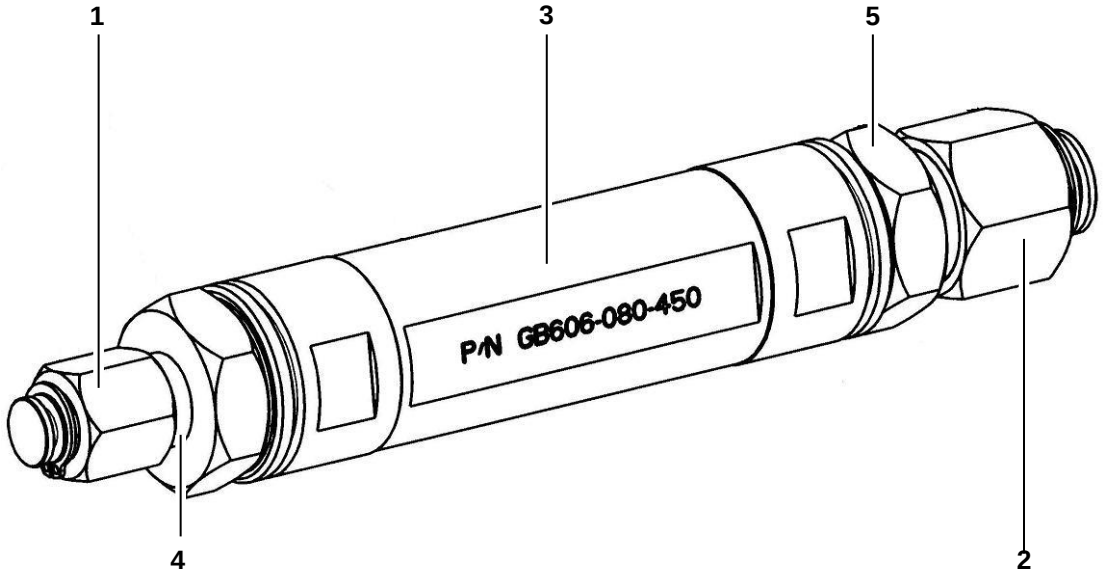


Fig. 1.16 SHORT CIRCUIT ASSY

Table 1.16 SHORT CIRCUIT ASSY (Ref. Fig. 1.16)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB201-001-860	3 / 4 – 16 UNF-2B CAP	1	
2	GB201-001-870	1” 1/16 – 12 UNF – 2B CAP	1	
3	GB206-001-800	SHORT CIRCUIT CASING	1	
4	GB420-613-000	CONNECTION	1	
5	GB420-627-000	CONNECTION	1	

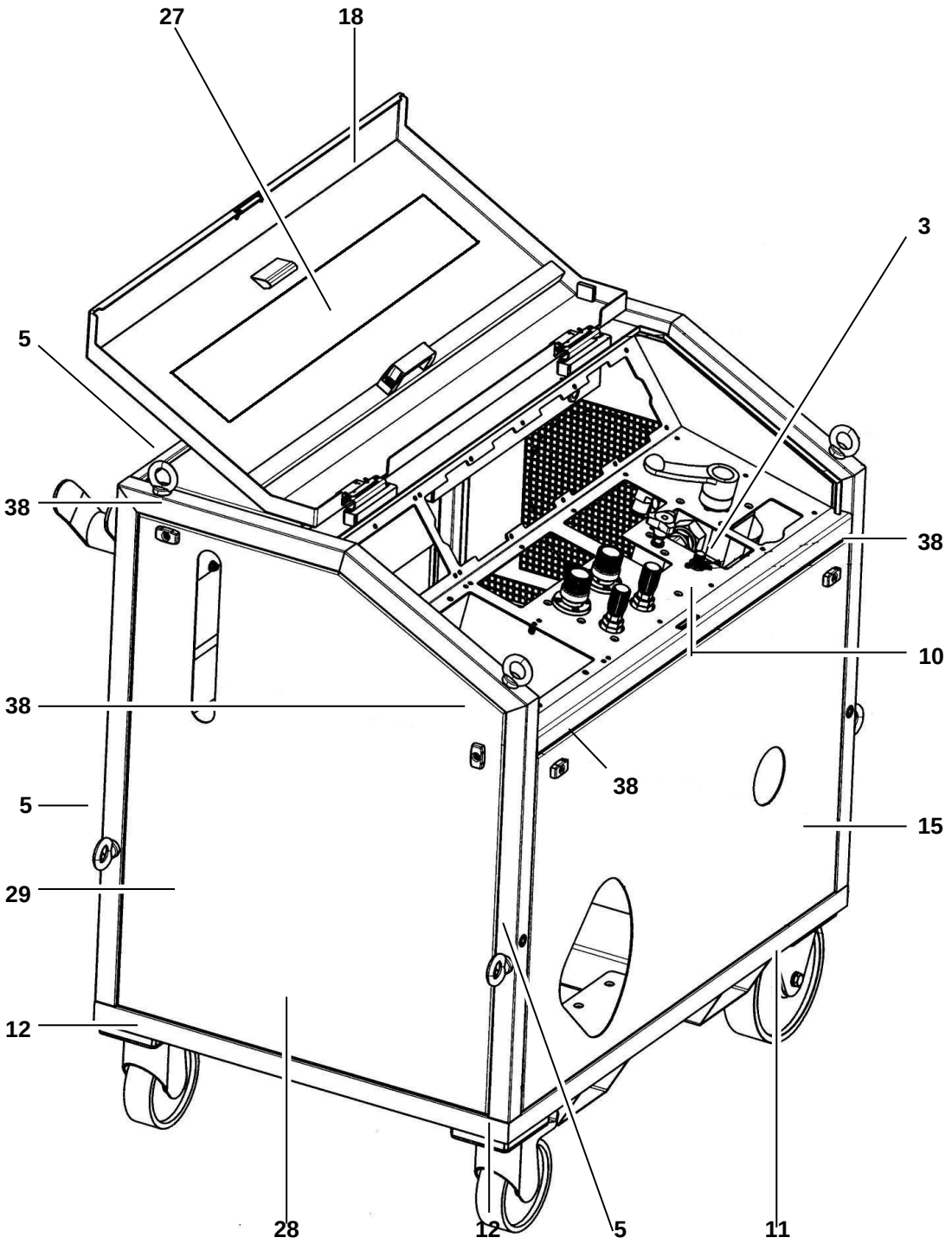


Fig. 1.17 FRAME UNIT ASSY (Table 1 of 5)

Table 1.17 FRAME UNIT ASSY (Ref. Fig. 1.17)

POS.	REFERNCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB011-569-100	SCREW	2	
2	GB013-041-600	SCREW	1	
3	GB016-021-601	SCREW	2	
4	GB016-041-200	SCREW	8	
5	GB019-112-000	EYE BOLT	8	X
6	GB020-662-000	SELF-LOCKING NUT	2	
7	GB021-006-012	WASHER	4	
8	GB027-011-050	THREADED INSERT	4	
9	GB060-804-000	SUPPORT	1	X
10	GB061-800-100	MAGNETIC CLOSING	1	X
11	GB080-603-000	WHEEL, FIXED	2	X
12	GB082-400-160	WHEEL, CASTOR	2	X
13	GB206-001-931	LATERAL SUPPORT RESERVOIR	1	
14	GB206-001-935	HEAT EXCHANGER BRACKET	1	
15	GB206-001-937	FRONT ACCESS DOOR	1	
16	GB206-001-947	REGULATION VALVE SPACER	1	
17	GB206-001-948	CASE SUPPORT	1	
18	GB206-001-960	CONTROL PANEL ACCESS DOOR ASSY	1	
19	GB263-000-029	WHEEL BENCH WASHER	4	
20	GB263-000-030	WHEEL BENCH SPACER	2	
21	GB263-051-076	PROTECTION BOX	1	
22	GB351-880-000	BUSHING	1	
23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1	X
24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1	X
25	GB020-642-000	SELF-LOCKING NUT	1	
26	GB021-104-000	WASHER	10	
27	GB263-051-240	INSTRUCTION PANEL	1	
28	GB206-001-930	FRAME	1	
29	GB206-001-939	LEFT LATERAL ACCESSO DOOR	1	
30	GB206-001-940	RIGHT LATERAL ACCESSO DOOR	1	
31	GB206-001-943	IINFERIOR REAR ACCESS DOOR	1	
32	GB206-001-946	SUPERIOR REAR ACCESS DOOR ASSY	1	
33	GB206-001-957	PIN	1	
34	GB206-001-964	WASHER	1	
35	GB206-001-968	CASE ACCESS DOOR	1	
36	GB733-686-360	SOCKET	1	
37	GB733-805-720	SOCKET CAP	1	
38	GB061-193-000	CLOSING	6	X
39	GB065-420-100	PLATE KIT	1	

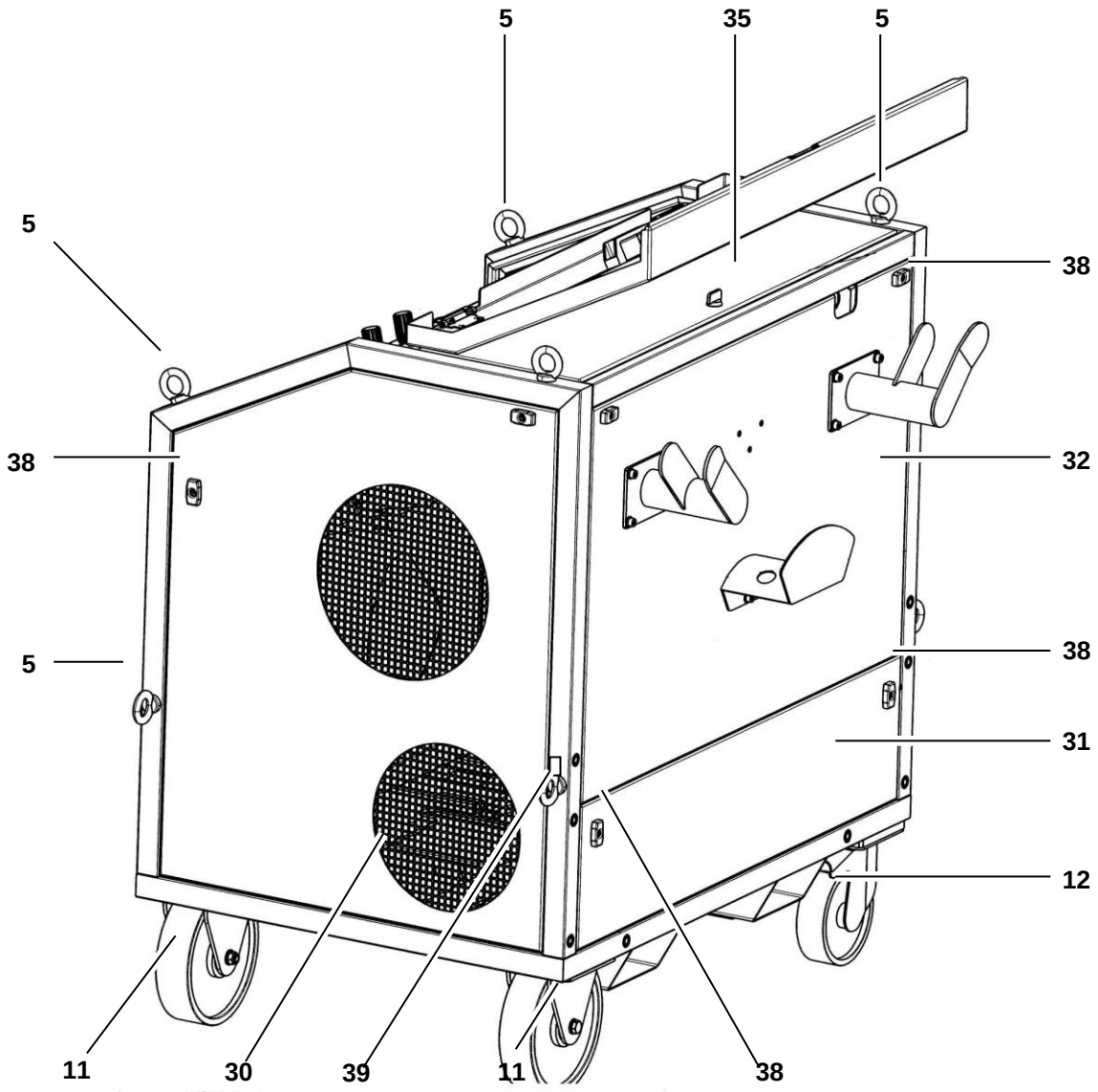


Fig. 1.17 FRAME UNIT ASSY (Table 2 of 5)

Table 1.17 FRAME UNIT ASSY (Ref. Fig. 1.17)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB011-569-100	SCREW	2	
2	GB013-041-600	SCREW	1	
3	GB016-021-601	SCREW	2	
4	GB016-041-200	SCREW	8	
5	GB019-112-000	EYE BOLT	8	X
6	GB020-662-000	SELF-LOCKING NUT	2	
7	GB021-006-012	WASHER	4	
8	GB027-011-050	THREADED INSERT	4	
9	GB060-804-000	SUPPORT	1	X
10	GB061-800-100	MAGNETIC CLOSING	1	X
11	GB080-603-000	WHEEL, FIXED	2	X
12	GB082-400-160	WHEEL, CASTOR	2	X
13	GB206-001-931	LATERAL SUPPORT RESERVOIR	1	
14	GB206-001-935	HEAT EXCHANGER BRACKET	1	
15	GB206-001-937	FRONT ACCESS DOOR	1	
16	GB206-001-947	REGULATION VALVE SPACER	1	
17	GB206-001-948	CASE SUPPORT	1	
18	GB206-001-960	CONTROL PANEL ACCESS DOOR ASSY	1	
19	GB263-000-029	WHEEL BENCH WASHER	4	
20	GB263-000-030	WHEEL BENCH SPACER	2	
21	GB263-051-076	PROTECTION BOX	1	
22	GB351-880-000	BUSHING	1	
23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1	X
24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1	X
25	GB020-642-000	SELF-LOCKING NUT	1	
26	GB021-104-000	WASHER	10	
27	GB263-051-240	INSTRUCTION PANEL	1	
28	GB206-001-930	FRAME	1	
29	GB206-001-939	LEFT LATERAL ACCESSO DOOR	1	
30	GB206-001-940	RIGHT LATERAL ACCESSO DOOR	1	
31	GB206-001-943	IINFERIOR REAR ACCESS DOOR	1	
32	GB206-001-946	SUPERIOR REAR ACCESS DOOR ASSY	1	
33	GB206-001-957	PIN	1	
34	GB206-001-964	WASHER	1	
35	GB206-001-968	CASE ACCESS DOOR	1	
36	GB733-686-360	SOCKET	1	
37	GB733-805-720	SOCKET CAP	1	
38	GB061-193-000	CLOSING	6	X
39	GB065-420-100	PLATE KIT	1	

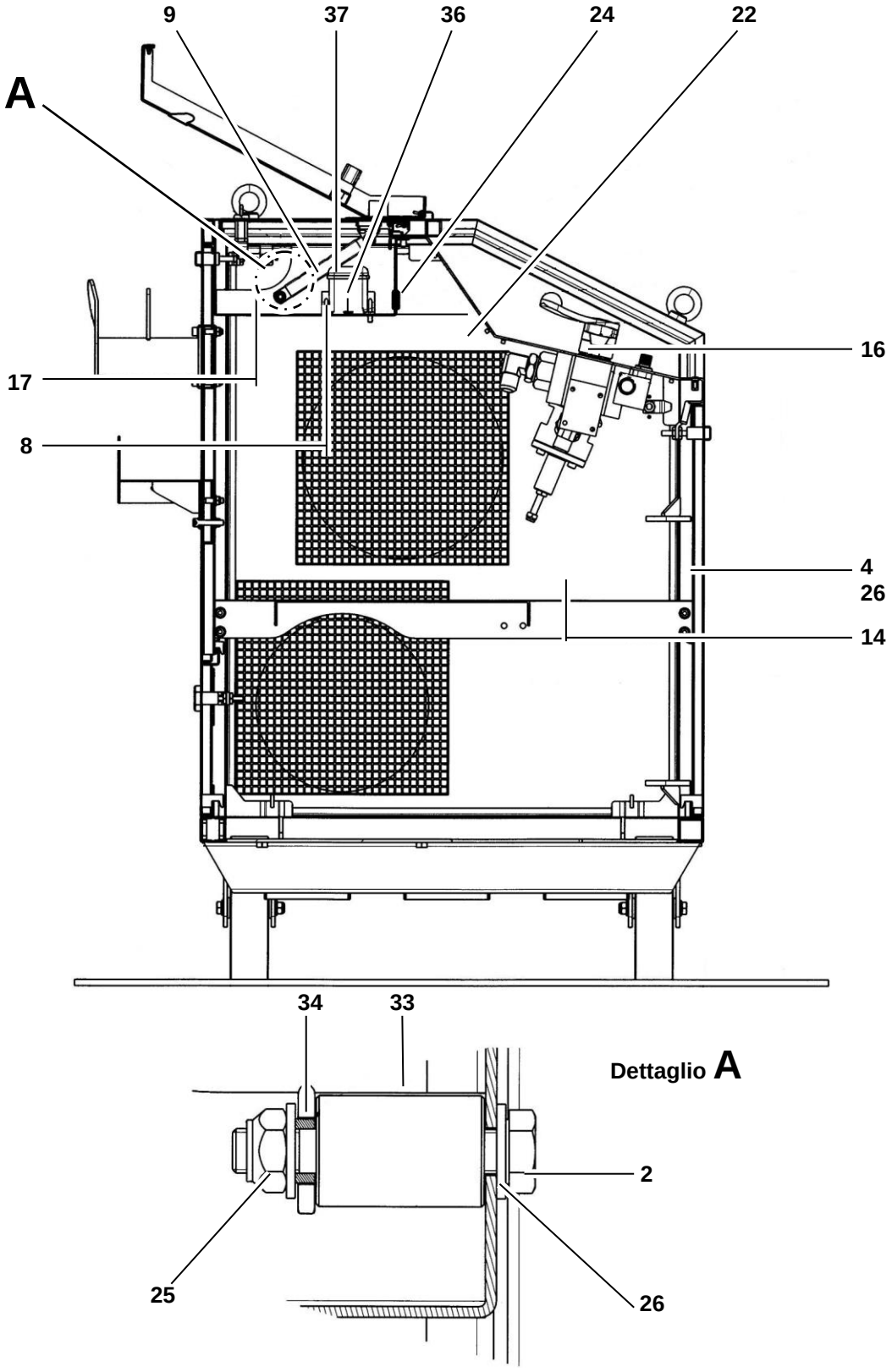
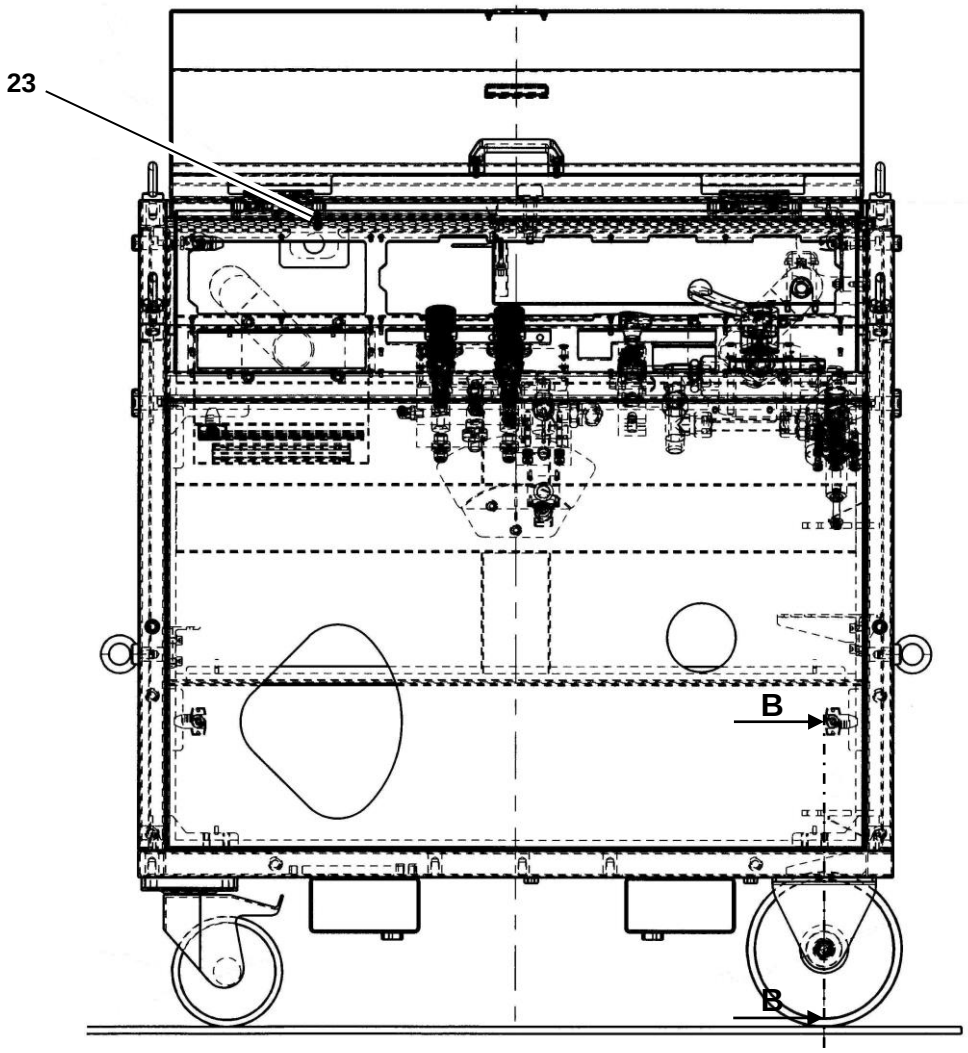


Fig. 1.17 FRAME UNIT ASSY (Table 3 of 5)

Table 1.17 FRAME UNIT ASSY (Ref. Fig. 1.17)

POS.	REFERNCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB011-569-100	SCREW	2	
2	GB013-041-600	SCREW	1	
3	GB016-021-601	SCREW	2	
4	GB016-041-200	SCREW	8	
5	GB019-112-000	EYE BOLT	8	X
6	GB020-662-000	SELF-LOCKING NUT	2	
7	GB021-006-012	WASHER	4	
8	GB027-011-050	THREADED INSERT	4	
9	GB060-804-000	SUPPORT	1	X
10	GB061-800-100	MAGNETIC CLOSING	1	X
11	GB080-603-000	WHEEL, FIXED	2	X
12	GB082-400-160	WHEEL, CASTOR	2	X
13	GB206-001-931	LATERAL SUPPORT RESERVOIR	1	
14	GB206-001-935	HEAT EXCHANGER BRACKET	1	
15	GB206-001-937	FRONT ACCESS DOOR	1	
16	GB206-001-947	REGULATION VALVE SPACER	1	
17	GB206-001-948	CASE SUPPORT	1	
18	GB206-001-960	CONTROL PANEL ACCESS DOOR ASSY	1	
19	GB263-000-029	WHEEL BENCH WASHER	4	
20	GB263-000-030	WHEEL BENCH SPACER	2	
21	GB263-051-076	PROTECTION BOX	1	
22	GB351-880-000	BUSHING	1	
23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1	X
24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1	X
25	GB020-642-000	SELF-LOCKING NUT	1	
26	GB021-104-000	WASHER	10	
27	GB263-051-240	INSTRUCTION PANEL	1	
28	GB206-001-930	FRAME	1	
29	GB206-001-939	LEFT LATERAL ACCESSO DOOR	1	
30	GB206-001-940	RIGHT LATERAL ACCESSO DOOR	1	
31	GB206-001-943	IINFERIOR REAR ACCESS DOOR	1	
32	GB206-001-946	SUPERIOR REAR ACCESS DOOR ASSY	1	
33	GB206-001-957	PIN	1	
34	GB206-001-964	WASHER	1	
35	GB206-001-968	CASE ACCESS DOOR	1	
36	GB733-686-360	SOCKET	1	
37	GB733-805-720	SOCKET CAP	1	
38	GB061-193-000	CLOSING	6	X
39	GB065-420-100	PLATE KIT	1	



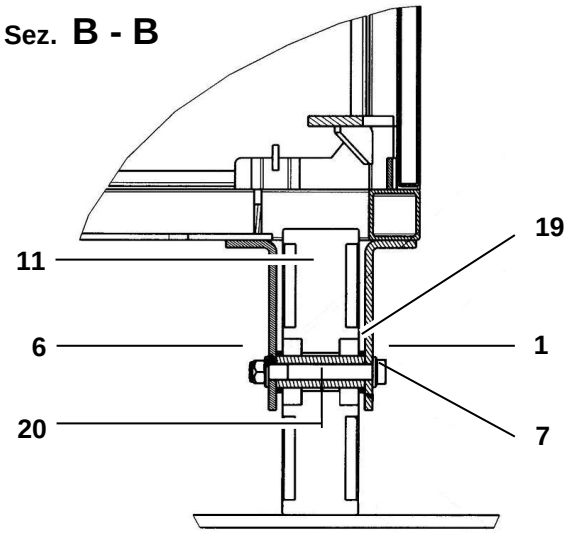


Fig. 1.17 FRAME UNIT ASSY (Table 4 of 5)

Table 1.17 FRAME UNIT ASSY (Ref. Fig. 1.17)

POS.	REFERNCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB011-569-100	SCREW	2	
2	GB013-041-600	SCREW	1	
3	GB016-021-601	SCREW	2	
4	GB016-041-200	SCREW	8	
5	GB019-112-000	EYE BOLT	8	X
6	GB020-662-000	SELF-LOCKING NUT	2	
7	GB021-006-012	WASHER	4	
8	GB027-011-050	THREADED INSERT	4	
9	GB060-804-000	SUPPORT	1	X
10	GB061-800-100	MAGNETIC CLOSING	1	X
11	GB080-603-000	WHEEL, FIXED	2	X
12	GB082-400-160	WHEEL, CASTOR	2	X
13	GB206-001-931	LATERAL SUPPORT RESERVOIR	1	
14	GB206-001-935	HEAT EXCHANGER BRACKET	1	
15	GB206-001-937	FRONT ACCESS DOOR	1	
16	GB206-001-947	REGULATION VALVE SPACER	1	
17	GB206-001-948	CASE SUPPORT	1	
18	GB206-001-960	CONTROL PANEL ACCESS DOOR ASSY	1	
19	GB263-000-029	WHEEL BENCH WASHER	4	
20	GB263-000-030	WHEEL BENCH SPACER	2	
21	GB263-051-076	PROTECTION BOX	1	
22	GB351-880-000	BUSHING	1	
23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1	X
24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1	X
25	GB020-642-000	SELF-LOCKING NUT	1	
26	GB021-104-000	WASHER	10	
27	GB263-051-240	INSTRUCTION PANEL	1	
28	GB206-001-930	FRAME	1	
29	GB206-001-939	LEFT LATERAL ACCESSO DOOR	1	
30	GB206-001-940	RIGHT LATERAL ACCESSO DOOR	1	
31	GB206-001-943	IINFERIOR REAR ACCESS DOOR	1	
32	GB206-001-946	SUPERIOR REAR ACCESS DOOR ASSY	1	
33	GB206-001-957	PIN	1	
34	GB206-001-964	WASHER	1	
35	GB206-001-968	CASE ACCESS DOOR	1	
36	GB733-686-360	SOCKET	1	
37	GB733-805-720	SOCKET CAP	1	
38	GB061-193-000	CLOSING	6	X
39	GB065-420-100	PLATE KIT	1	

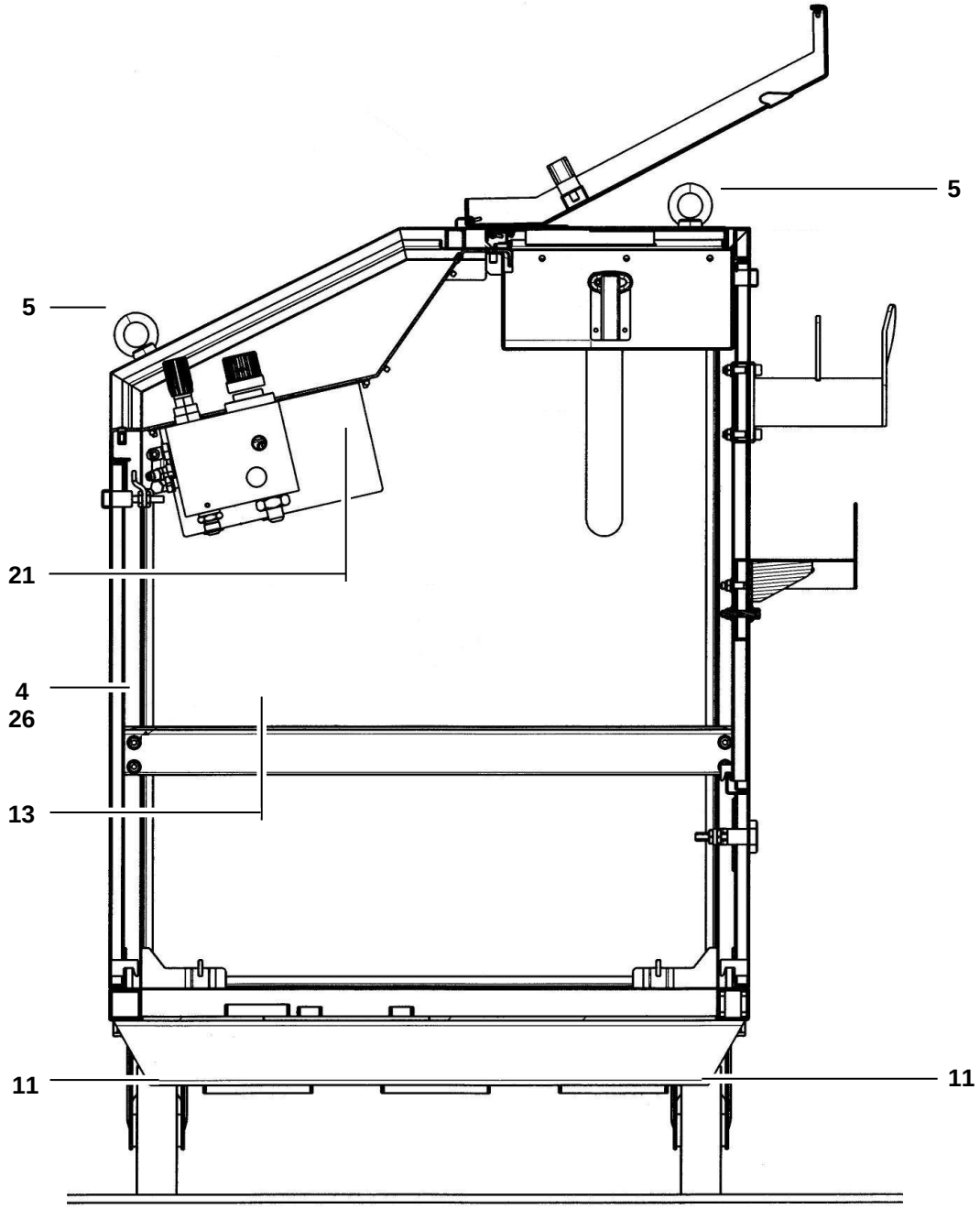


Fig. 1.17 FRAME UNIT ASSY (Table 5 of 5)

Table 1.17 FRAME UNIT ASSY (Ref. Fig. 1.17)

POS.	REFERNCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB011-569-100	SCREW	2	
2	GB013-041-600	SCREW	1	
3	GB016-021-601	SCREW	2	
4	GB016-041-200	SCREW	8	
5	GB019-112-000	EYE BOLT	8	X
6	GB020-662-000	SELF-LOCKING NUT	2	
7	GB021-006-012	WASHER	4	
8	GB027-011-050	THREADED INSERT	4	
9	GB060-804-000	SUPPORT	1	X
10	GB061-800-100	MAGNETIC CLOSING	1	X
11	GB080-603-000	WHEEL, FIXED	2	X
12	GB082-400-160	WHEEL, CASTOR	2	X
13	GB206-001-931	LATERAL SUPPORT RESERVOIR	1	
14	GB206-001-935	HEAT EXCHANGER BRACKET	1	
15	GB206-001-937	FRONT ACCESS DOOR	1	
16	GB206-001-947	REGULATION VALVE SPACER	1	
17	GB206-001-948	CASE SUPPORT	1	
18	GB206-001-960	CONTROL PANEL ACCESS DOOR ASSY	1	
19	GB263-000-029	WHEEL BENCH WASHER	4	
20	GB263-000-030	WHEEL BENCH SPACER	2	
21	GB263-051-076	PROTECTION BOX	1	
22	GB351-880-000	BUSHING	1	
23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1	X
24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1	X
25	GB020-642-000	SELF-LOCKING NUT	1	
26	GB021-104-000	WASHER	10	
27	GB263-051-240	INSTRUCTION PANEL	1	
28	GB206-001-930	FRAME	1	
29	GB206-001-939	LEFT LATERAL ACCESSO DOOR	1	
30	GB206-001-940	RIGHT LATERAL ACCESSO DOOR	1	
31	GB206-001-943	IINFERIOR REAR ACCESS DOOR	1	
32	GB206-001-946	SUPERIOR REAR ACCESS DOOR ASSY	1	
33	GB206-001-957	PIN	1	
34	GB206-001-964	WASHER	1	
35	GB206-001-968	CASE ACCESS DOOR	1	
36	GB733-686-360	SOCKET	1	
37	GB733-805-720	SOCKET CAP	1	
38	GB061-193-000	CLOSING	6	X
39	GB065-420-100	PLATE KIT	1	

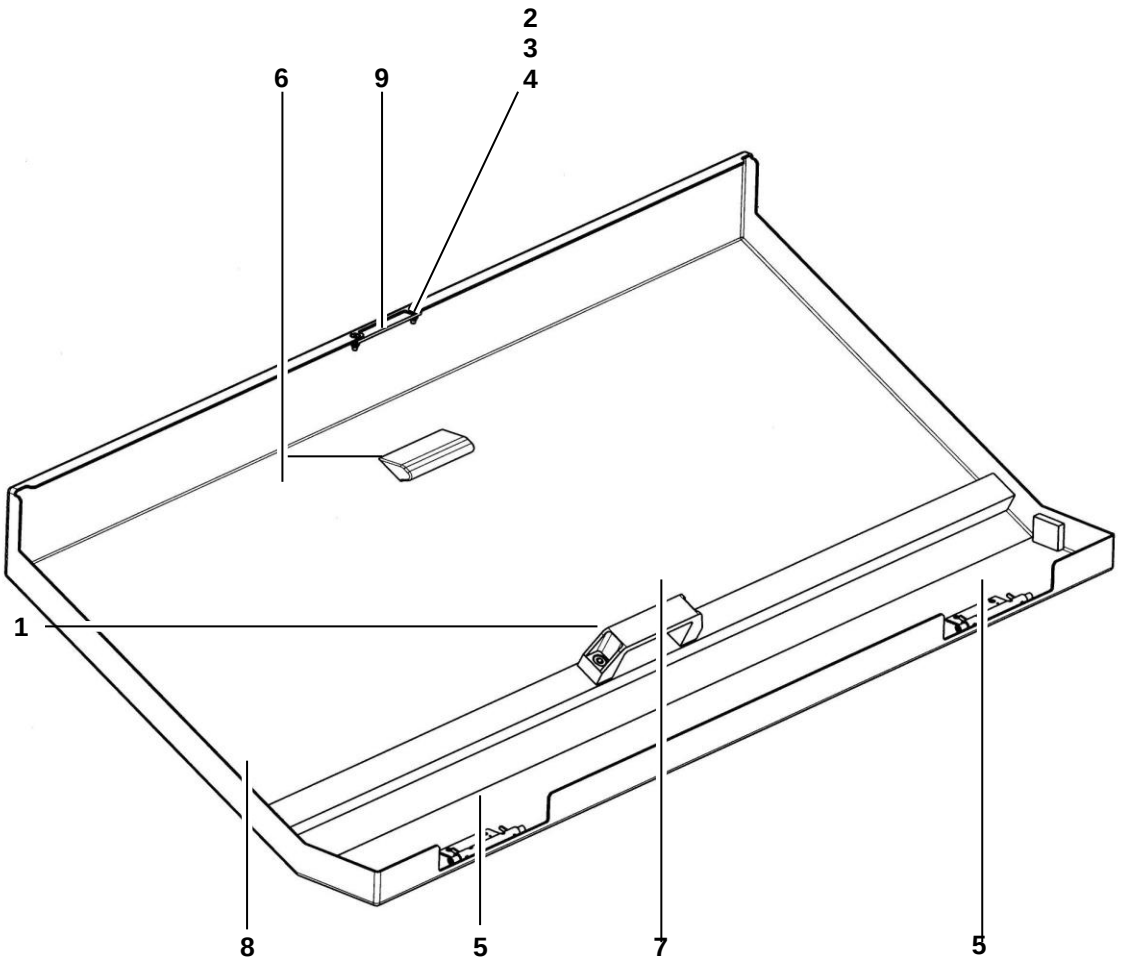


Fig. 1.18 CONTROL PANEL ACCESS DOOR ASSY

Table 1.18 CONTROL PANEL ACCESS DOOR ASSY (Ref. Fig. 1.18)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-042-000	SCREW	2	
2	GB017-601-014	SCREW	2	
3	GB020-612-000	NUT	2	
4	GB021-101-000	WASHER	2	
5	GB060-500-250	SUPPORT	2	
6	GB062-000-044	RECESSED HANDLE	1	**X**
7	GB062-000-117	HANDLE	1	**X**
8	GB206-001-955	ACCESS DOOR	1	
9	GB206-001-956	PLATE	1	

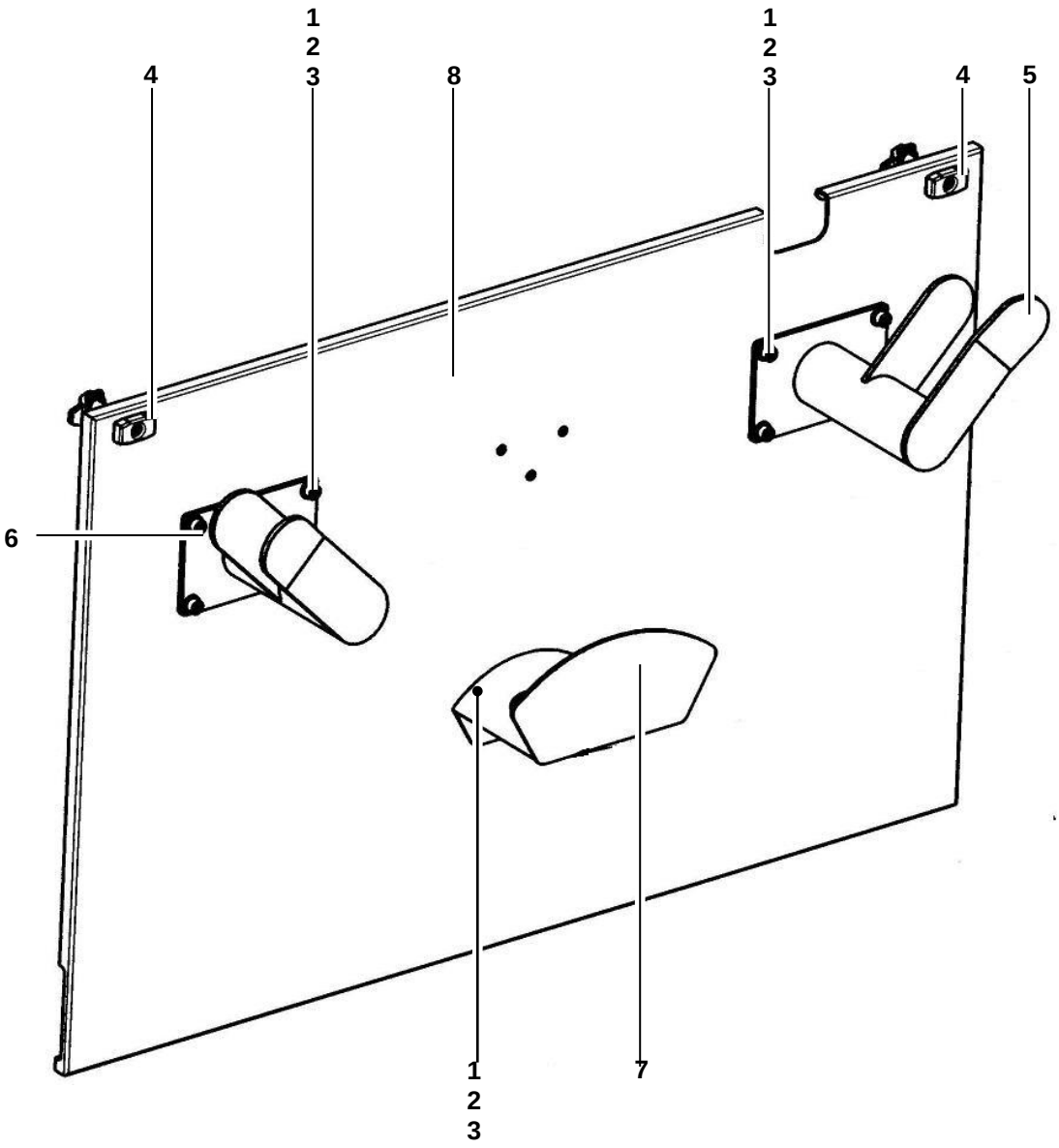


Fig. 1.19 SUPERIOR REAR ACCESS DOOR ASSY

Table 1.19 SUPERIOR REAR ACCESS DOOR ASSY (Ref. Fig. 1.19)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-044-000	SCREW	11	
2	GB020-642-000	NUT	11	
3	GB021-104-000	WASHER	22	
4	GB061-193-000	CLOSING	2	X
5	GB206-001-518	RIGHT HOSE SUPPORT	1	
6	GB206-001-519	LEFT HOSE SUPPORT	1	
7	GB206-001-521	ELECTRIC CABLE SUPPORT	1	
8	GB206-001-945	SUPERIOR REAR ACCESS DOOR	1	

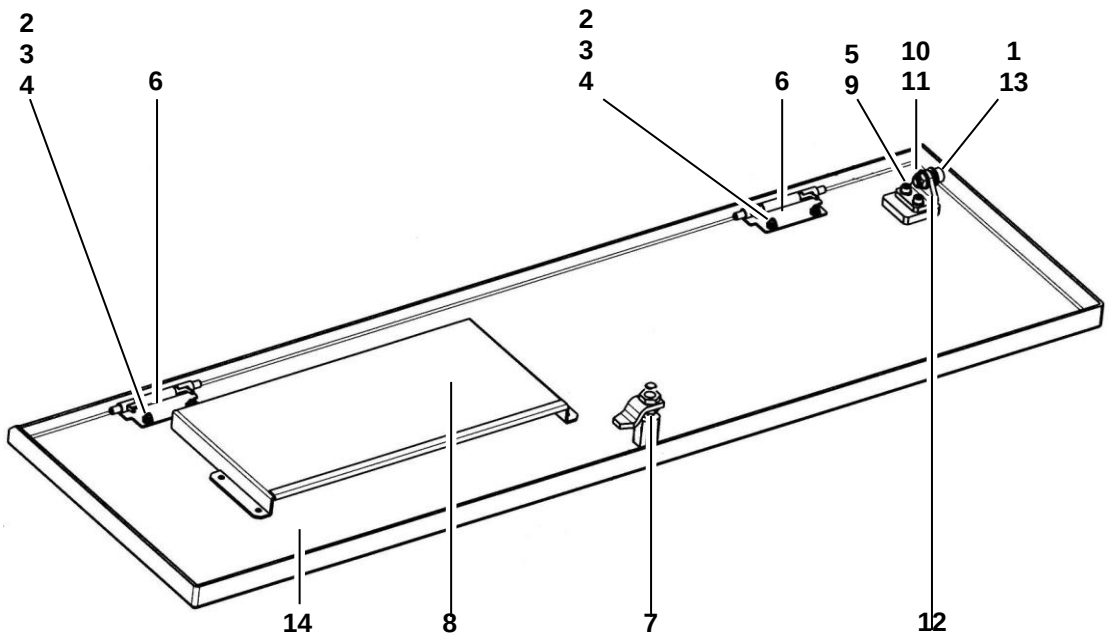


Fig. 1.20 CASE ACCESS DOOR ASSY

Table 1.20 CASE ACCESS DOOR ASSY (Ref. Fig. 1.20)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB016-042-000	SCREW	1	
2	GB017-601-012	SCREW	4	
3	GB020-612-000	SELF-LOCKING NUT	4	
4	GB021-101-000	WASHER	4	
5	GB021-102-000	WSHER	2	
6	GB060-500-250	SUPPORT	2	
7	GB061-100-040	ADJUSTABLE CLOSING	1	X
8	GB206-000-509	DOCUMENTS BOX	1	
9	GB016-020-000	SCREW	2	
10	GB020-642-000	NUT	1	
11	GB021-104-000	WASHER	2	
12	GB206-001-967	PLATE	1	
13	GB206-001-964	WASHER	1	
14	GB206-001-966	CASE ACCESS DOOR	1	

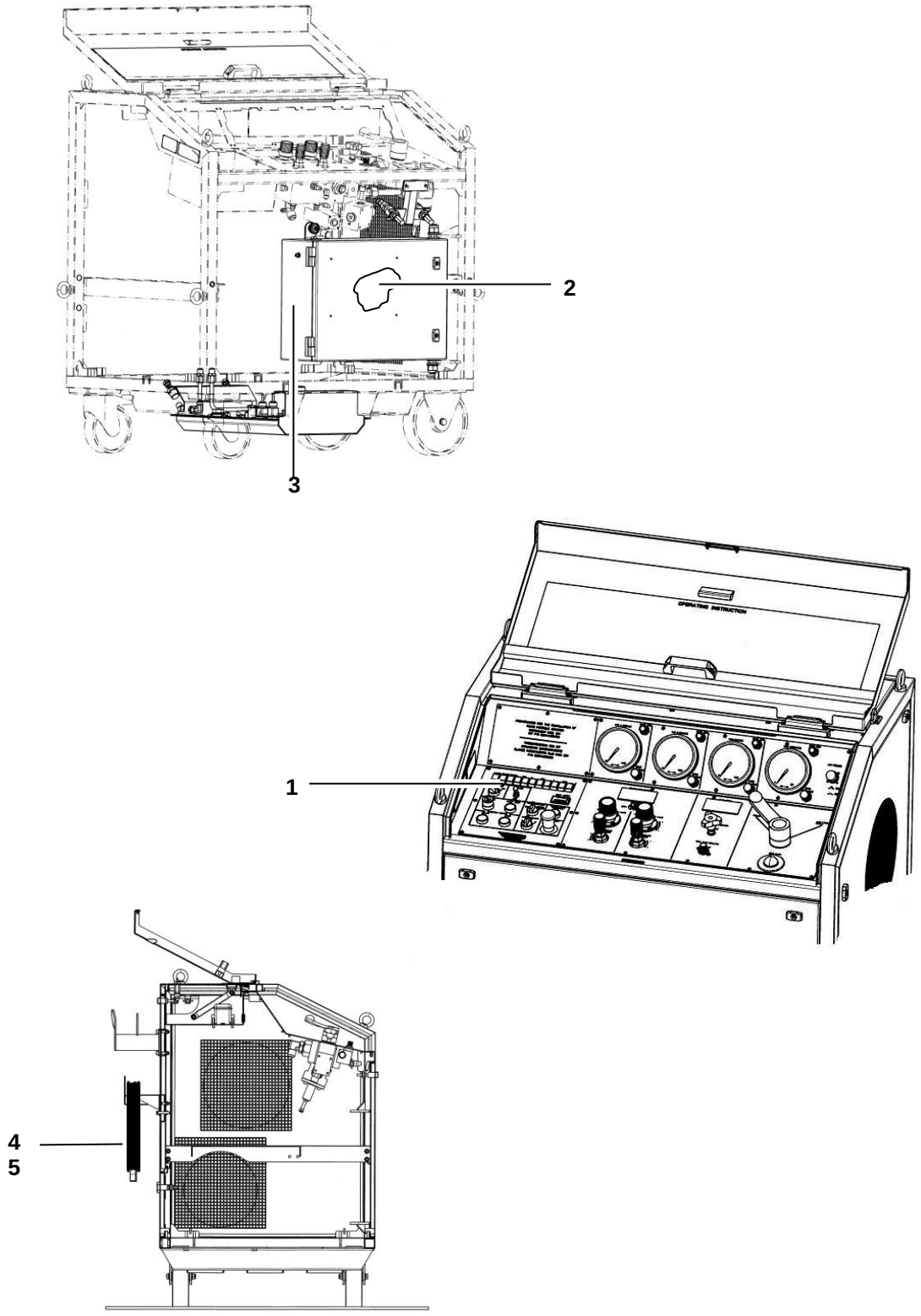


Fig. 1.21 ELECTRICAL SYSTEM ASSY

Table 1.21 ELECTRICAL SYSTEM ASSY (Ref. Fig. 1.21)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB701-220-050	ELECTRICAL SYSTEM CONTROL PANEL	1	
2	GB701-000-176	ELECTRIC BOARD	1	
3	GB701-000-175	ELECTRIC BOX	1	
4	GB 733-040-110	PLUG	1	
5	GB 731-720-100	ELECTRIC SOURCE CONNECTION CABLE	20 mt	

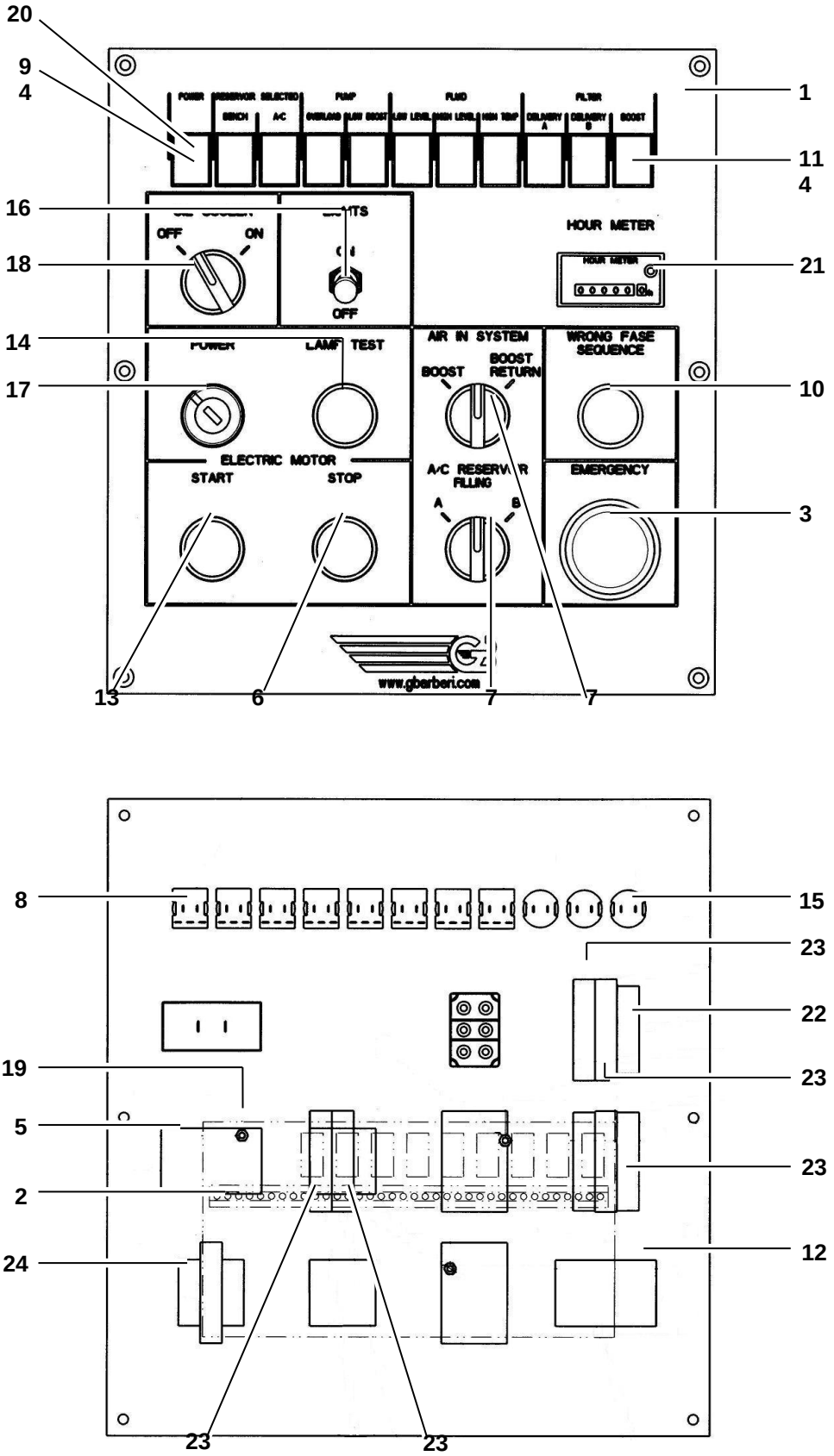


Fig. 1.22 ELECTRICAL SYSTEM CONTROL PANEL

Table 1.22 ELECTRICAL SYSTEM CONTROL PANEL (Ref. Fig. 1.22)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB263-051-250	PANEL	1	
2	GB704-030-000	ELECTRONIC BOARD ASSY	1	X
3	GB721-303-000	PUSH-BUTTON	1	
4	GB721-460-090	INTERRUPTER	11	X
5	GB721-802-800	CORPO CON LED	1	
6	GB721-807-600	BUTTON, RED	1	
7	GB721-807-800	SELECTOR	2	X
8	GB721-817-100	CONTACT	8	
9	GB721-821-030	GREEN LENS	3	X
10	GB721-823-000	GEM, RED	1	
11	GB721-823-085	RED LENS	8	X
12	GB721-830-165	BASAMENT WITH WHITE LED	1	
13	GB721-831-000	LIGHT BUTTON	1	
14	GB721-833-550	BUTTON, YELLOW	1	
15	GB721-839-010	CONTACT	3	
16	GB722-112-200	TOGGLE SWITCH	1	X
17	GB722-213-300	KEY SWITCH	1	X
18	GB722-510-105 GB721-802-850 GB721-810-000	SELECTOR BASE CONTACT	1 1 1	 X
19	GB738-105-030	SPACER	3	
20	GB778-300-150	LIGHT, BULB	11	X
21	GB863-105-000	HOURMETER	1	X
22	GB721-802-850	BASE FLASHING GREEN	1	
23	GB721-810-000	BASE CONTACT	3	
24	GB721-811-000	CONTCT BLOCK	1	

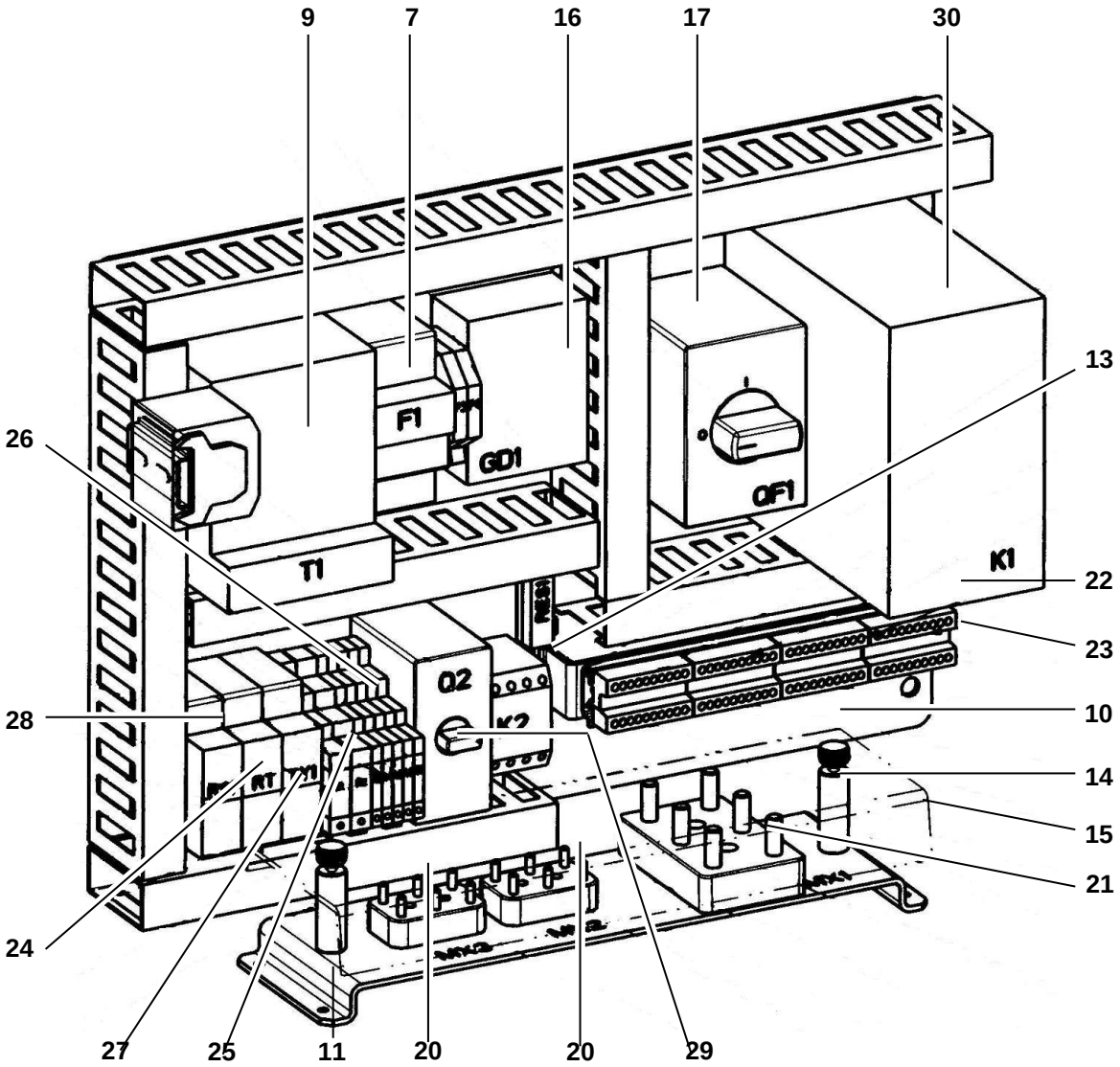


Fig. 1.23 ELECTRIC BOARD (Table 1 of 2)

Table 1.23 ELECTRIC BOARD (Ref. Fig. 1.23)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB744-119-100	CONTACTOR	1	
2	GB745-280-001	CONTACTOR	1	
3	GB747-104-210	FUSE 500 mA	2	X
4	GB747-108-400	FUSE 2 A	1	X
5	GB747-112-010	FUSE 4 A	1	X
6	GB747-112-080	FUSE 6 A	1	X
7	GB747-819-310	FUSE CARRIER	1	
8	GB748-800-000	RESISTANCE	1	X
9	GB760-062-110	TRASFORMATORE	1	
10	GB063-205-400	KNOB	2	
11	GB206-001-264	INFERIOR SUPPORT	1	
12	GB206-001-265	SUPPORT	1	
13	GB206-001-274	BRACKET	1	
14	GB206-001-954	SPACER	2	
15	GB206-001-958	ELECTRICAL WIRING COVER	1	
16	GB713-121-110	POWER CONVERTER	1	
17	GB722-324-100	ELECTRICAL SWITCH	1	
18	GB734-104-200	FUSE CARRIER	5	
19	GB734-152-100	GROUND BLOCK	3	
20	GB734-860-000	TERMINAL BLOCK	2	
21	GB734-860-500	TERMINAL BLOCK	1	
22	GB734-864-000	CONTACT BASE	4	
23	GB734-864-100	TYPE PHOENIX SIDE PUG	4	
24	GB740-410-110	RELAY	1	X
25	GB740-410-115	RELAY	2	
26	GB740-410-120	RELAY	5	
27	GB740-410-410	TIMER	1	
28	GB742-020-300	RELAY	1	X
29	GB743-806-150	FAN MOTOR THERMAL PROTECTION	1	
30	GB744-122-100	CONTACTOR	1	
31	GB664-400-100	ELECTRONIC DRIVER (UP TO S/N 1102095)	1	
	GB664-400-110	DIGITAL ELECTRONIC DRIVER (FROM S/N 1102096)	1	
32	GB747-110-500	FUSE 3A	1	

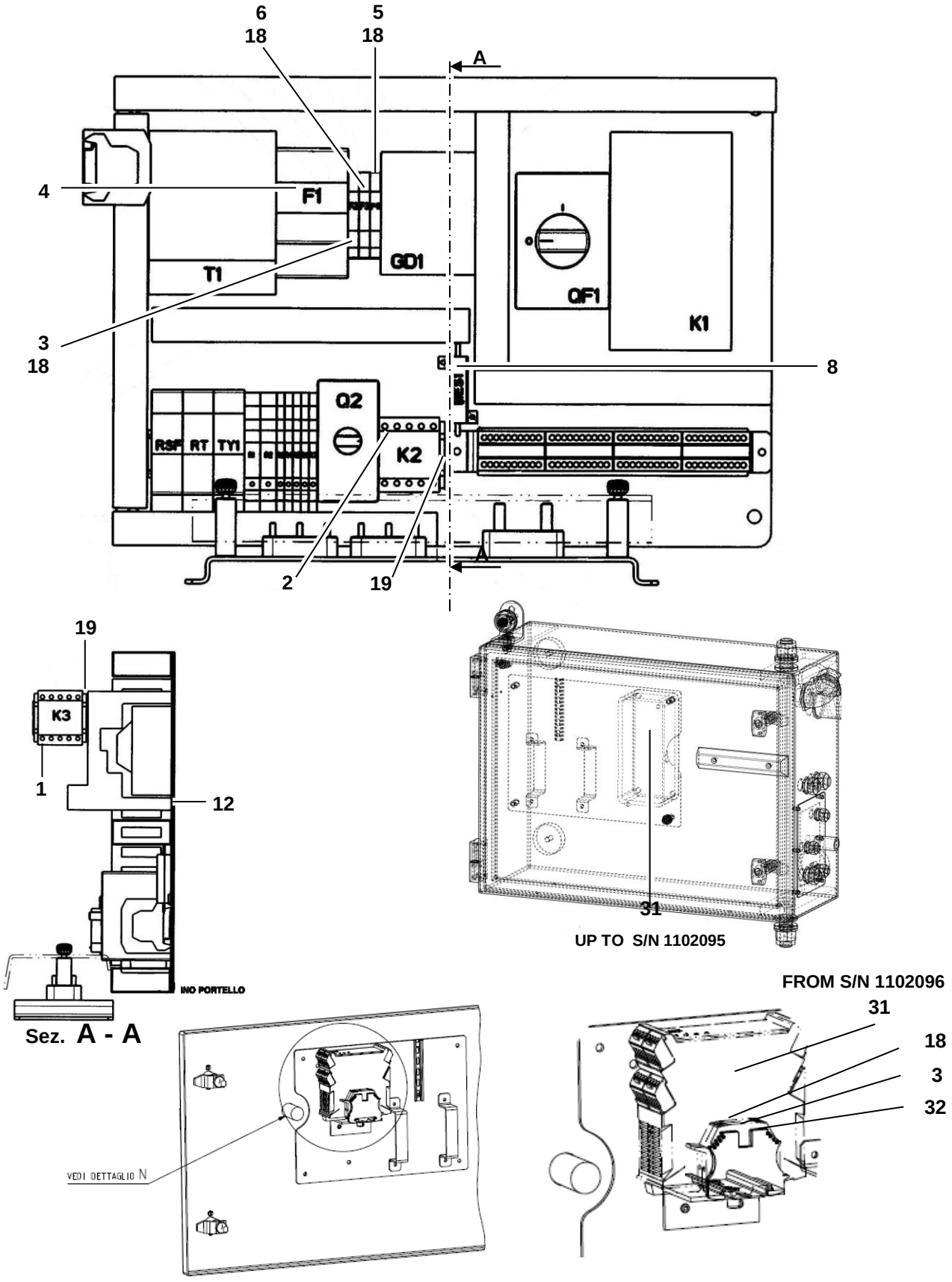


Fig. 1.23 ELECTRIC BOARD (Table 2 of 2)

Table 1.23 ELECTRIC BOARD (Ref. Fig. 1.23)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB744-119-100	CONTACTOR	1	
2	GB745-280-001	CONTACTOR	1	
3	GB747-104-210	FUSE 500 mA	2	X
4	GB747-108-400	FUSE 2 A	1	X
5	GB747-112-010	FUSE 4 A	1	X
6	GB747-112-080	FUSE 6 A	1	X
7	GB747-819-310	FUSE CARRIER	1	
8	GB748-800-000	RESISTANCE	1	X
9	GB760-062-110	TRASFORMATORE	1	
10	GB063-205-400	KNOB	2	
11	GB206-001-264	INFERIOR SUPPORT	1	
12	GB206-001-265	SUPPORT	1	
13	GB206-001-274	BRACKET	1	
14	GB206-001-954	SPACER	2	
15	GB206-001-958	ELECTRICAL WIRING COVER	1	
16	GB713-121-110	POWER CONVERTER	1	
17	GB722-324-100	ELECTRICAL SWITCH	1	
18	GB734-104-200	FUSE CARRIER	5	
19	GB734-152-100	GROUND BLOCK	3	
20	GB734-860-000	TERMINAL BLOCK	2	
21	GB734-860-500	TERMINAL BLOCK	1	
22	GB734-864-000	CONTACT BASE	4	
23	GB734-864-100	TYPE PHOENIX SIDE PUG	4	
24	GB740-410-110	RELAY	1	X
25	GB740-410-115	RELAY	2	
26	GB740-410-120	RELAY	5	
27	GB740-410-410	TIMER	1	
28	GB742-020-300	RELAY	1	X
29	GB743-806-150	FAN MOTOR THERMAL PROTECTION	1	
30	GB744-122-100	CONTACTOR	1	
31	GB664-400-100	ELECTRONIC DRIVER (UP TO S/N 1102095)	1	
	GB664-400-110	DIGITAL ELECTRONIC DRIVER (FROM S/N 1102096)	1	
32	GB747-110-500	FUSE 3A	1	

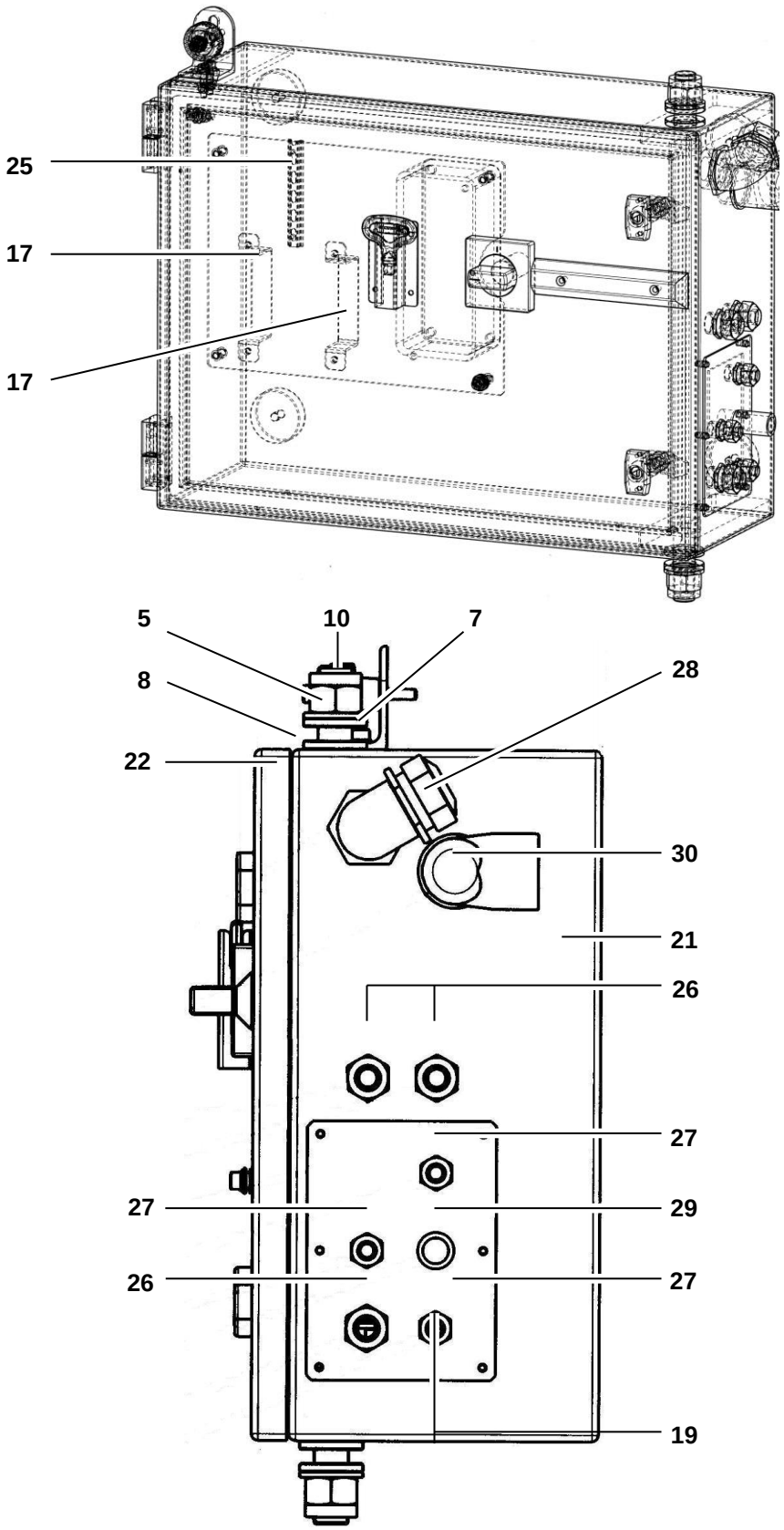


Fig. 1.24 ELECTRIC BOX ASSY (Table 1 of 2)

Table 1.24 ELECTRIC BOX ASSY (Ref. Fig. 1.24)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB013-032-500	SCREW	1	
2	GB016-052-000	SCREW	3	
3	GB016-033-500	SCREW	2	
4	GB020-652-000	NUT	4	
5	GB020-692-020	SELF-LOCKING NUT	2	
6	GB021-103-000	WASHER	9	
7	GB021-109-200	WASHER	2	
8	GB021-800-100	WASHER	4	
9	GB063-230-600	KNOB	1	**X**
10	GB206-001-275	PIN	2	
11	GB206-001-276	SUPPORT	1	
12	GB351-880-000	BUSHING	3	
13	GB060-900-500	HINGE	1	
14	GB060-900-501	HINGE	1	
15	GB061-193-000	CLOSING	2	**X**
16	GB068-250-100	KEY	1	**X**
17	GB206-000-340	IPC ASSY SUPPORT	2	
18	GB206-000-556	KEY STORAGE	1	
19	GB206-001-254	PLATE	1	
20	GB206-001-258	SUPPORT	1	
21	GB206-002-253	ELECTRICAL SYSTEM BOX	1	
22	GB206-003-257	ACCESS DOOR	1	
23	GB206-003-258	PROTECTION PROFILE	1	**X**
24	GB263-000-036	BUSHING	4	
25	GB738-207-000	SUPPORT	C.R.	
26	GB738-805-500	FAIRLEAD	3	
27	GB738-805-600	FAIRLEAD	3	
28	GB738-805-855	FAIRLEAD	1	
29	GB738-808-400	CONNECTION	1	
30	GB738-808-441	CONNECTION	1	

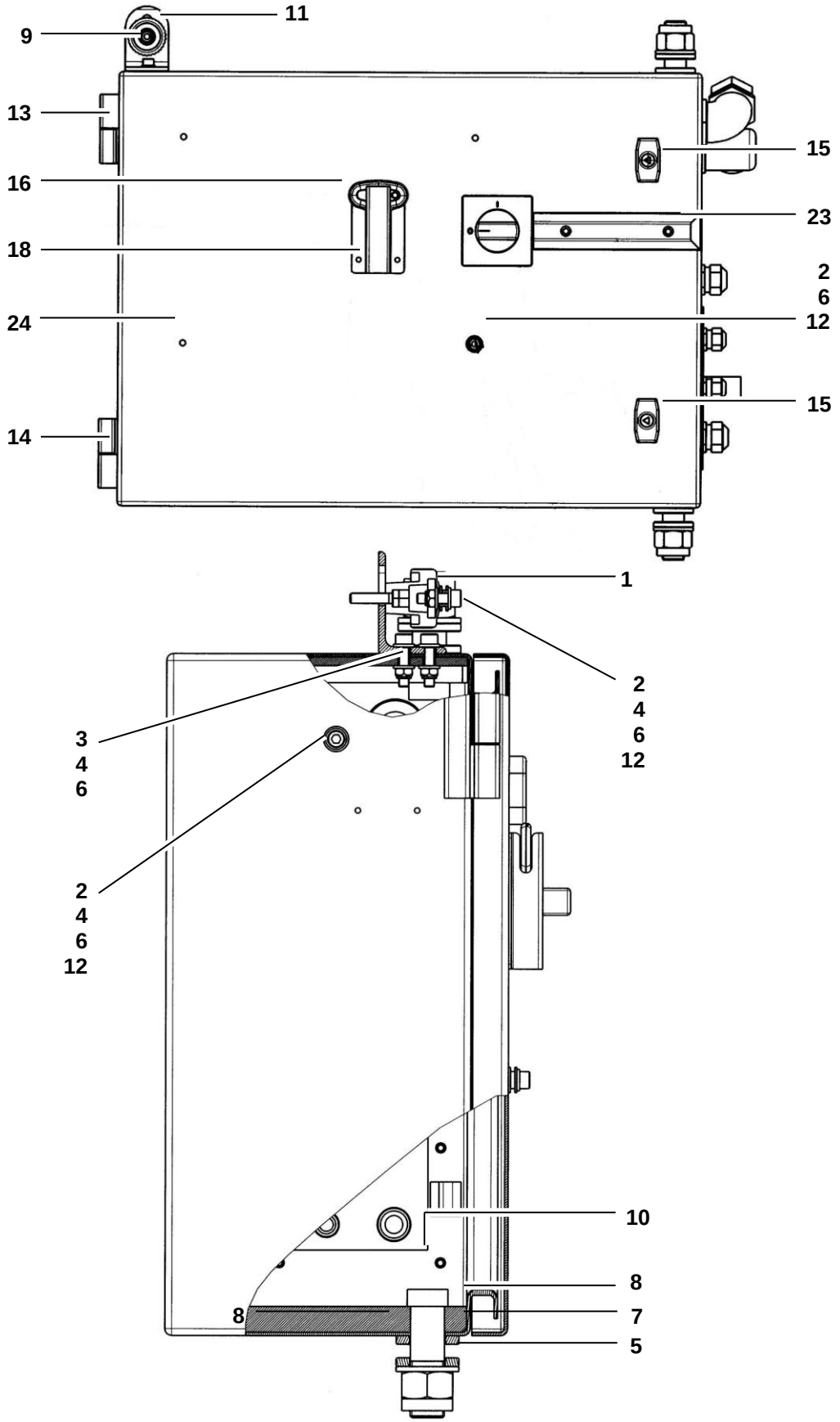


Fig. 1.24 ELECTRIC BOX ASSY (Table 2 di 2)

Table 1.24 ELECTRIC BOX ASSY (Ref. Fig. 1.24)

POS.	REFERENCE N°	DESCRIPTION	Q.TY	RECCOMENDED SPARE PARS
1	GB013-032-500	SCREW	1	
2	GB016-052-000	SCREW	3	
3	GB016-033-500	SCREW	2	
4	GB020-652-000	NUT	4	
5	GB020-692-020	SELF-LOCKING NUT	2	
6	GB021-103-000	WASHER	9	
7	GB021-109-200	WASHER	2	
8	GB021-800-100	WASHER	4	
9	GB063-230-600	KNOB	1	**X**
10	GB206-001-275	PIN	2	
11	GB206-001-276	SUPPORT	1	
12	GB351-880-000	BUSHING	3	
13	GB060-900-500	HINGE	1	
14	GB060-900-501	HINGE	1	
15	GB061-193-000	CLOSING	2	**X**
16	GB068-250-100	KEY	1	**X**
17	GB206-000-340	IPC ASSY SUPPORT	2	
18	GB206-000-556	KEY STORAGE	1	
19	GB206-001-254	PLATE	1	
20	GB206-001-258	SUPPORT	1	
21	GB206-002-253	ELECTRICAL SYSTEM BOX	1	
22	GB206-003-257	ACCESS DOOR	1	
23	GB206-003-258	PROTECTION PROFILE	1	**X**
24	GB263-000-036	BUSHING	4	
25	GB738-207-000	SUPPORT	C.R.	
26	GB738-805-500	FAIRLEAD	3	
27	GB738-805-600	FAIRLEAD	3	
28	GB738-805-855	FAIRLEAD	1	
29	GB738-808-400	CONNECTION	1	
30	GB738-808-441	CONNECTION	1	

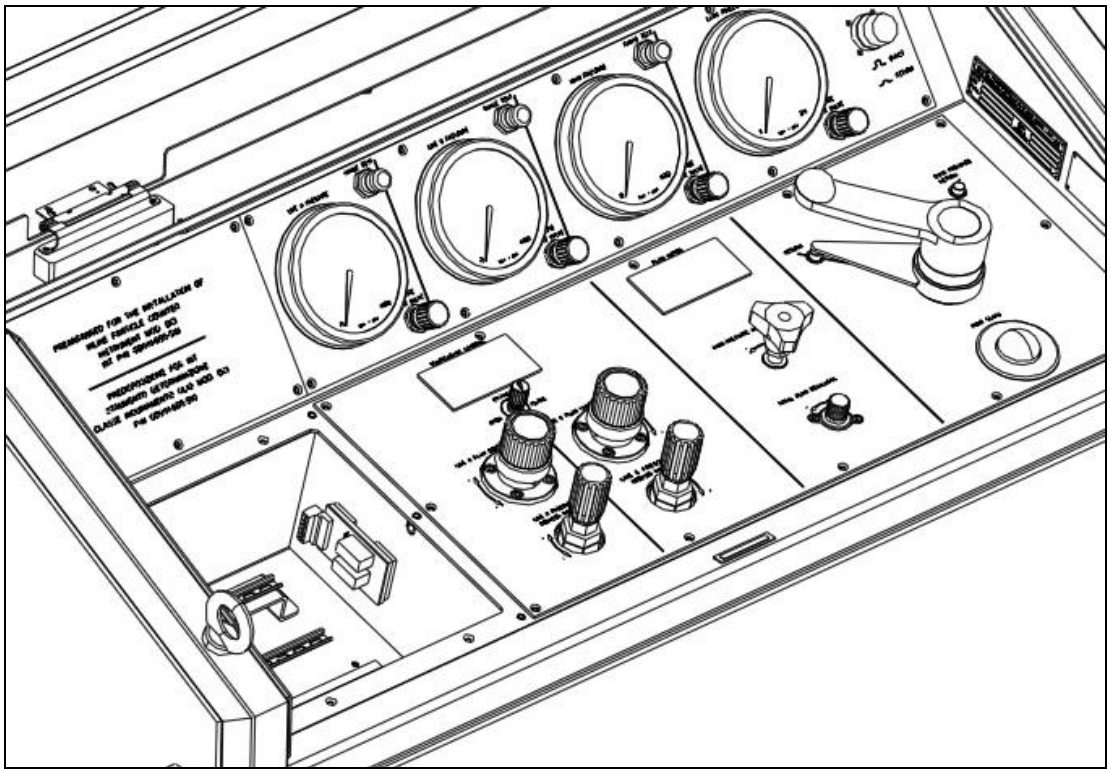


Fig. 1.25 HYDRAULIC INDICATION / CONTROL PANEL
(valid for SN 1102076 and from SN 1102080)

Table 1.25 HYDRAULIC INDICATION / CONTROL PANEL
(valid for SN 1102076 and from SN 1102080)

POS.	N° DI RIFERIMENTO	DESCRIZIONE	QT.À	RICAMBI CONSIGLIATI
1	GB725-000-041	PROXIMITY	1	
2	GB283-000-202	POSITIONING DEVICE ASSY	1	
3	GB704-030-001	PROXIMITY CONTROL CARD	1	

1.3 RECCOMENDED SPARE PARTS

Table 1.25 RECCOMENDED SPARE PARTS

FIGURE	POS.	P/N	DESCRIPTION	Q.TY
1.3	1	GB835-318-300	OIL LEVEL TRANSMITTER	1
1.3	6	GB038-820-127	RESERVOIR GASKET	1
1.3	14	GB246-208-254	OIL GAUGE	1
1.3	15	GB247-240-000	CAP	1
1.3	32	GB652-010-000	VALVE	1
1.4	7	GB658-500-000	VALVE *(APPLICABLE TO S/N 11 02 001 ÷ 002, S/N 11 02 004 ÷ 009)*	1
		GB 658 500 001	VALVE *(APPLICABLE TO S/N 11 02 003, FROM S/N 11 02 010)*	
1.4	8	GB725-000-041	PROXIMITY INDICATOR	2
1.5	3	GB070-008-000	SHOCK ABSORBER RUBBER PAD	4
1.5	5	GB675-008-101	FILTERING CARTIDGE	1
1.5	13	GB801-200-002	PRESSURE SWITCH	1
1.5	14	GB809-100-000	PRESSURE SWITCH CAP	1
1.5	15	GB817-103-000	THERMAL DETECTOR	1
1.5	23	GB653-000-100	SOLENOID VALVE	1
1.6	9	GB063-900-350	KNOB	1
1.6	36	GB640-130-001	REGULATOR PUMP PRESSURE VALVE	1
1.6	37	GB640-230-000	MAX PRESSURE VALVE	1
1.6	38	GB660-500-000	PRESSURE REGULATING VALVE	1
1.6	39	GB699-401-000	TURBINE FLOW SENSOR	1
1.6	40	GB735-710-000	CONNECTOR	1
1.6	41	GB758-110-200	POTENTIOMETER	1
1.6	42	GB813-052-000	THERMOREGULATOR	1
1.6	43	GB832-010-100	FLOW INDICATOR	1
1.6	44	GB899-000-200	FLOW INDICATOR	1
1.8	13	GB733-651-080	CONNECTOR LIGHT	1
1.8	14	GB662-410-100	FLOW CONTROL VLAVE	2
1.8	15	GB647-240-100	PRESSURE REDUCING VALVE	2
1.9	13	GB679-970-100	ELECTRICAL INDICATOR	2
1.9	14	GB675-024-100	FILTERING CARTRIDGE	2
1.9	18	GB038-080-100	SEALS KIT	1
1.10	26	GB656-555-001	RETURN VALVE ASSY LINE A	1
1.10	30	GB653-000-100	SOLENOID VALVE	3
1.10	31	GB656-555-002	RETURN VALVE ASSY LINE B	1
1.11	2	GB667-010-000	SAMPLING VALVE	1
1.11	3	GB037-231-000	WASHER	1

FIGURE	POS.	P/N	DESCRICTION	Q.TY
1.12	14	GB658-171-000	SELECTOR	1
1.12	16	GB661-105-001	VALVE	4
1.12	17	GB802-343-010	GAUGE	1
1.12	18	GB802-744-100	GAUGE	3
1.13	1	GB523-423-720	HOSE	1
1.13	2	GB522-154-079	HOSE	1
1.13	3	GB529-871-000	HOSE	1
1.13	4	GB523-212-565	HOSE	1
1.13	5	GB523-202-485	HOSE	1
1.13	6	GB523-203-095	HOSE	1
1.13	7	GB523-203-098	HOSE	1
1.13	8	GB522-154-110	HOSE	1
1.13	9	GB523-203-097	HOSE	1
1.13	10	GB523-204-880	HOSE	1
1.13	11	GB529-055-480	HOSE ASSEMBLY R(B)	1
1.13	12	GB529-055-450	HOSE ASSEMBLY P(A)	1
1.13	13	GB529-055-470	HOSE ASSEMBLY P(B)	1
1.13	14	GB529-055-460	HOSE ASSEMBLY R(A)	1
1.14	9	GB030-210-200	GASKET	2
1.14	10	GB070-007-000	SHOCK ABSORBER RUBBER PAD	4
1.15	7	GB030-210-700	GASKET	1
1.15	8	GB030-220-700	GASKET	1
1.15	16	GB656-360-700	VALVE	1
1.17	5	GB019-112-000	EYE BOLT	8
1.17	9	GB060-804-000	SUPPORT	1
1.17	10	GB061-800-100	MAGNETIC CLOSING	1
1.17	11	GB080-603-000	WHEEL, FIXED	2
1.17	12	GB082-400-160	WHEEL, CASTOR	2
1.17	23	GB738-822-250	Ø 6 RUBBER FAIRLEAD	1
1.17	24	GB738-822-730	Ø 16 RUBBER FAIRLEAD	1
1.17	38	GB061-193-000	CLOSING	6
1.18	6	GB062-000-044	RECESSED HANDLE	1
1.18	7	GB062-000-117	HANDLE	1
1.19	4	GB061-193-000	CLOSING	2
1.20	7	GB061-100-040	ADJUSTABLE CLOSING	1
1.22	2	GB704-030-000	ELECTRONIC BOARD ASSY	1
1.22	4	GB721-460-090	INTERRUPTER	11
1.22	7	GB721-807-800	SELECTOR	2
1.22	9	GB721-821-030	GREEN LENS	3

FIGURE	POS.	P/N	DESCRIPTION	Q.TY
1.22	11	GB721-823-085	RED LENS	8
1.22	16	GB722-112-200	TOGGLE SWITCH	1
1.22	17	GB722-213-300	KEY SWITCH	1
1.22	18	GB722-510-105	SELECTOR	1
		GB721-802-850	BASE	1
		GB721-810-000	CONTACT	1
1.22	20	GB778-300-150	LIGHT, BULB	11
1.22	21	GB863-105-000	HOURMETER	1
1.23	3	GB747-104-210	FUSE 500 mA	1
1.23	4	GB747-108-400	FUSE 2 A	1
1.23	5	GB747-112-010	FUSE 4 A	1
1.23	6	GB747-112-080	FUSE 6 A	1
1.23	8	GB748-800-000	RESISTANCE	1
1.23	24	GB740-410-110	RELAY	1
1.23	28	GB742-020-300	RELAY	1
1.24	9	GB063-230-600	KNOB	1
1.24	15	GB061-193-000	CLOSING	2
1.24	16	GB068-250-100	KEY	1
1.24	23	GB206-003-258	PROTECTION PROFILE	1