



**IN HOUSE MACHINE MAINTENANCE KIT
FOR
SERDI 50 - 60 - 80 - 100 - 101 - 110**

IN HOUSE MAINTENANCE MANUAL FOR SERDI MACHINES MODELS 50, 60, 80, 100, 101 & 110

STRIPPING THE MACHINE

1 TAKING THE SPINDLE APART

- 1.1 Position the machine head to the extreme left hand side of the machine frame, being careful to align the front part of the aluminum casting of the head with that of the cast iron frame of the machine.
- 1.2 Disconnect the machine from all electrical and pneumatic connections.
- 1.3 Remove all screws from the workhead covers (sketch 16). Remove the left cover after having disconnected the electrical circuit the rubber wire connection bar opens up in two without having to disconnect the wires - see electrical chart, switches A). The right cover can be removed after disconnecting the pneumatic gauge. Please, refer to the "pneumatic union" chart to disconnect the air tubes. Plug the open end of the union.
- 1.4 Turn air back on.
- 1.5 Open three air pressure regulators of the head entirely (sketch 18, #3).
- 1.6 Set spindle at its highest position and lock it in this very position using the workhead travel stop (sketch 14, #3).
- 1.7 Remove top roll pin from the damper (sketch 14, #49).
- 1.8 Remove counterweight by removing the screw (sketch 16, #11).
- 1.9 Remove workhead cover completely (sketch 16, #8).
- 1.10 Loosen secondary belt tension pulley screw (sketch 14A, #35).
- 1.11 Remove secondary belt (sketch 14, #26).
- 1.12 Remove top spindle pulley (sketch 14, #23).
- 1.13 Remove spindle locking system entirely (sketch 14B, #38).
- 1.14 Remove transmission driving pin (sketch 13, #19) and take transmission out of driving axle.
- 1.15 Loosen and remove all three screws (sketch 14, #36) and remove both the aluminum cover and the transmission (sketch 14, #14).

- 1.16 Loosen screw (sketch 14, #54) and remove threaded ring from the tip of the rack pinion.
- 1.17 Remove both pinions.
- 1.18 At this stage, the spindle is bare in its rings. Loosen spindle play adjusting screws (sketch 14, #2). Removing the spindle requires assistance from a second person. One person holds the spindle while the other loosens the mobile stop (sketch 14, #3). The spindle drops by itself.
- 1.19 Loosen lug screw (sketch 14, #52) and remove the eccentric bearing (sketch 14, #50).
- 1.20 Drive the pin out (sketch 14, #48).

2 REMOVING THE SPHERE

- 2.21 Loosen the locking screws of the sphere nut (sketch 12, #16). Caution, make sure that the small tightening brass pieces (sketch 12, #15) do not fall while disassembling.
- 2.22 Loosen nut (sketch 12, #14) with the wrench provided and remove it.
- 2.23 Thread both 6mm threaded shafts (provided) in the holes towards the top of the piston (sketch 12, #11) and use an extractor/bar to extract the piston by screwing both nuts.
- 2.24 Remove the sphere pivot axle (sketch 12, #9).
- 2.25 Remove the sphere from the top.

3 REMOVING BOTH THE WORKHEAD GUIDES AND CLAMPING SYSTEM

- 3.26 Shut off the machine air pressure.
- 3.27 Disconnect the 4mm Rilsan air tubes that feed the head locking pneumatic jacks (sketch 10, #1).
- 3.28 Remove the spring locking screws (sketch 10, #10).
- 3.29 Remove the nuts and lock-nuts (sketch 10, #14 & 15).
- 3.30 Remove both arms (sketch 10, #8) without separating them.
- 3.31 Remove the locking threaded shafts (sketch 10, #13) with the help of the nut and locknut (sketch 10, #14 & 15).
- 3.32 Dissociate the guiding system by means of the screws (sketch 11, #31). The elements (sketch 11, #23) are located within the head and the locking shoes (sketch 11, #22) are located within the frame groove.

- 3.33 Remove the head locking pneumatic jack pistons (sketch 10, #7). Unlock the membrane locking rings (sketch 10, #1) by removing the screws (sketch 10, #6). After several years of use, the membranes are sealed to the body of the pneumatic jack. Pull them with a pair of pliers and replace them.

RECOMMENDATIONS & REASSEMBLY

You now have all the components that make up your machine head laid out on your workbench.

Clean each and every component carefully, replace all o-rings, bearings, membranes and all wear parts. Thorough cleaning and careful reassembling and regulating will literally ready your machine for a second life and ensure peak performance.

Please, be methodic and respect reverse disassembly steps scrupulously. You should start with step 3.33 and end with step 1.1.

4 BEFORE TO START REASSEMBLING

- 4.1 Clean all o-ring housings and install new o-rings with a quality grease that does not corrupt rubber.
- 4.2 Once the sphere is perfectly clean, lap its bottom spherical contact surface against its contact surface within the cylinder and its top spherical contact surface against the piston surface that pushes against the sphere to lock it. Use a fine lapping compound in order to eliminate all imperfections that exist on any contact surface, caused by foreign elements that have penetrated the aluminum.
- 4.3 Clean the inside of the cylinder thoroughly and remove all trace of oxidation that would affect the smooth running of the piston.

5 TRANSMISSIONS

Two (2) types of transmissions have been installed.

5.1 Slide Transmission:

Uncouple the transmission and clean it carefully. Make sure that the blowhole at the bottom of the tube is not clogged. Move the transmission back up making the arrow on the tube coincide with the punch mark at the tip of the fluted male part. Grease exclusively with graphite grease spray.

5.2 Ball Transmission:

Do not take this transmission apart. Merely clean it as much as possible while the transmission is in extension and grease it with a graphite grease spray.

ADJUSTMENTS REQUIRED DURING REASSEMBLY**6 WORKHEAD GUIDES AND CLAMPING SYSTEM**

- 6.1 When the head guiding system is put back together (after reassembly step #26), adjust the play that must exist between the nut (sketch 10, #14) and the locking arm (sketch 10, #8). There should be approximately 15/100 mm (0.0059") play. There should never be, under any circumstances, any frictions between the nuts and the locking arms. The forward and backward movements of the head would otherwise be affected.

7 SPHERE

Once the sphere/cylinder assembly is reassembled (sketch 12), adjust the play of the sphere within its housing. The adjusting of the sphere will take place in two stages, at two different times during reassembly.

- 7.1 After you finish the reassembly step #22, center the sphere in its housing, approximately. In order to do that, lock the nut (sketch 12, #14) until it presses against the piston (sketch 12, #11), the piston itself being in contact with the sphere (sketch 12, #5). Finally, make a mark between the nut #14 and the cylinder and unscrew the nut approximately 80mm in rotation (1/10 of a full rotation).
- 7.2 At the end of reassembly step #6, adjust the spherical air cushion of the head. Please, follow instructions on pages 9, 10 and 11 of the machine user guide.
- 7.3 Adjust the spherical air cushion as indicated in the machine user guide. Once you have achieved smooth spindle oscillation, try to modify the internal play of the sphere by tightening the nut (sketch 12, #14) a few millimeters with respect to the position of the sphere at the end of adjustment step 7.1. Finally, using trial and error, position the sphere so that you get the best oscillation of the spindle possible. Lock the 3 screws (sketch 12, #16) once you are done and do not forget to put the small brass pieces back on (sketch 12, #15).

8 COUNTERWEIGHT

- 8.1 Now that the machine is reassembled and regulated, control the position of the counterweight. Unlock the spindle, set it at its lowest level, incline it as much as possible, wait until it self stabilizes and lock it. At this point, make sure that the spindle is indeed vertical. If it is not vertical, move the counterweight from right to left or from back to front in order to get the spindle to stabilize itself in a vertical position (page 11).

9 TELESCOPIC LEGS

Replacing the o-rings and other gaskets requires that the legs be taken apart. Incline the table and take one of the fully extended legs apart. Clean all the parts and replace the o-rings and other gaskets. Follow drawings provided carefully both when disassembling and reassembling. No adjusting of any kind is needed for the legs.

10 FINAL CHECK

Please verify the following before you start your machine:

- 10.1 Make sure that the machine is level.
- 10.2 Make sure that all nylon tubes connected to the head of the machine are not restricted or hindered in any way.
- 10.3 Make sure that the incoming air pressure is regulated at 5 kg (psi) when the machine is in its centering position, sphere and spindle both unlocked (page 10). Should you need to adjust the pressure, check the regulating of both the spherical and flat air cushions once again, using adequate pressure.
- 10.4 Make sure that the oiler is full and that the drop rate is set properly (approximately 1 drop every 60 to 90 seconds).

11 SPINDLE

The spindle itself seldom needs to be taken apart. However, it does need to be carefully cleaned on the outside. Should you note a gradual seizing of the spindle due to foreign elements between the spindle and the bearings, take the spindle apart and use a fine Norton abrasive stick to eliminate foreign elements and to avoid any problems while reassembling.

12 PROBLEMS, QUESTIONS?

Do not hesitate to contact us should you have any questions or should you need any assistance with the instructions in this manual.

DISCLAIMER

The in-house maintenance of your machine should always be done by someone with minimum mechanical skills who has reasonable experience with the operating process of the machine. NEWEN Inc. cannot be held responsible for improper use of this maintenance kit nor for any resulting malfunction of the machine should the instructions included in the manual not be respected scrupulously.

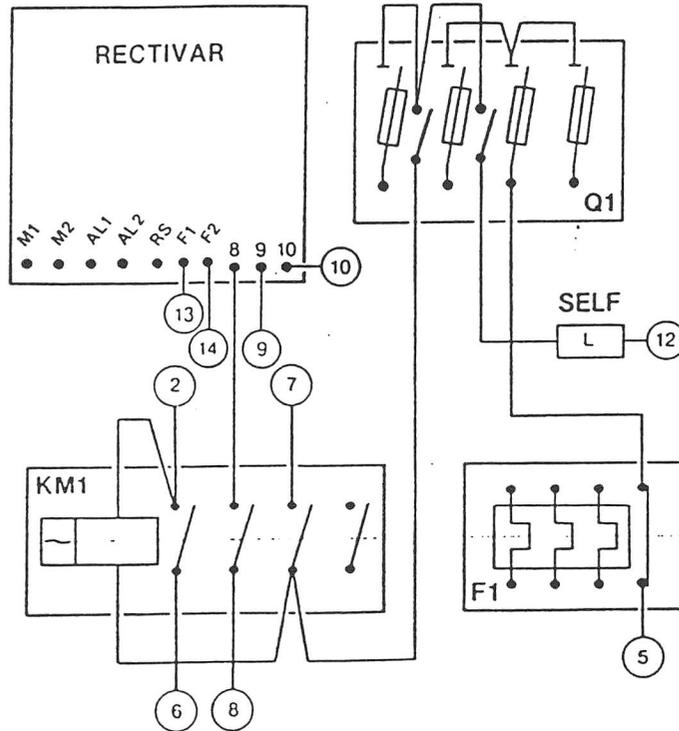
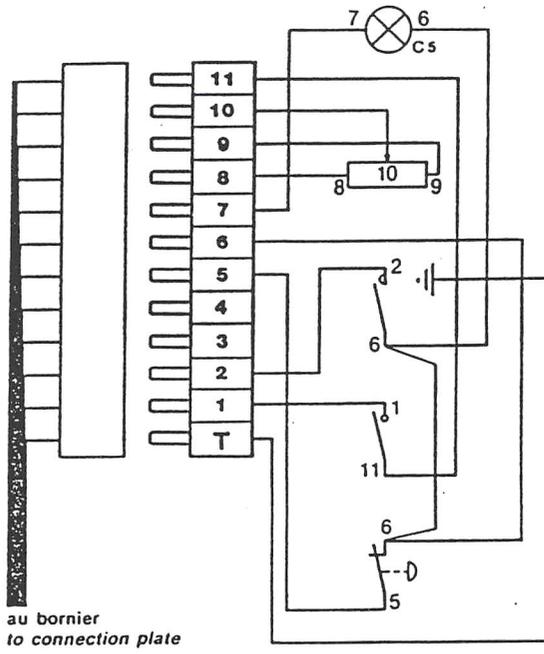
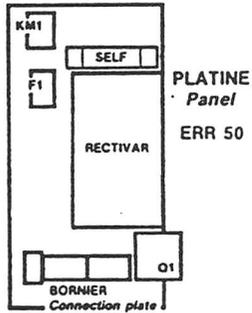
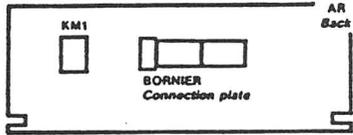
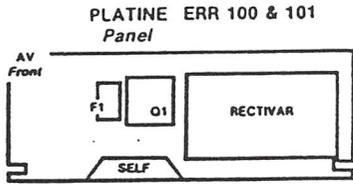
MACHINE MAINTENANCE PARTS**FOR SERDI 50 - 60 - 80 - 100 - 101 - 110**

			Quantity
<u>Pneumatic Switches and Table Distributors</u> (sketch 17)			
Pneumatic control switch	ref.: S.1718	NMS1000	1
	ref.: S.1722	NMS1001	1
<u>Pressure Regulators</u> (sketch 18)			
Machine head	ref.: S.1804	NMS1100	1
<u>Workhead Pneumatic Distributors</u> (sketch 18)			
Machine head & sphere	ref.: S.1810/1710	NMS1200	1
Machine feet	ref.: S.1709	NMS1201	1
<u>O-Rings and Gaskets for Table Legs</u> (sketch 4)			
Sphere o-rings	ref.: S.0406	NMS1300	16
Sphere o-rings	ref.: S.0407	NMS1301	8
Sphere paper gasket	ref.: S.0408	NMS1307	8
Central piston paper gasket	ref.: S.0418	NMS1308	4
Central piston o-ring	ref.: S.0417	NMS1303	4
Central piston o-ring	ref.: S.0416	NMS1302	8
<u>Workhead Guide and Clamping System</u> (sketch 10)			
Head locking membrane	ref.: S.1004	NMS1400	2
<u>Spherical Quill Assembly</u> (sketch 12)			
External nut o-ring	ref.: S.1213	NMS1304	1
Internal piston o-ring	ref.: S.1212	NMS1305	1
External piston o-ring	ref.: S.1213	NMS1304	2
Flat rubber gasket	ref.: S.1206	NMS1309	1
Sphere pivot o-ring	ref.: S.1208	NMS1306	1

<u>DC Motor and Primary Transmission</u>	(sketch 13)		
Motor belt	ref.: S.1313	NMS1500	1
Safety roll pin	ref.: S.1319	NMS1600	2
<u>Spindle and Secondary Transmission</u>	(sketch 14)		
Spindle belt	ref.: S.1426	NMS1501	1
Spindle damper	ref.: S.1447	NMS1700	1
<u>Workhead Covers</u>	(sketch 16)		
Metal cover screws	ref.: S.1603	NMS1800	15
<u>Tooling Screws</u>		NMS1801	
Tool holder screws for S.5003			6
Tool holder screws for S.5001			6
Tip holder screws for S.2000			2
Tip holder screws for S.2001			2
Tip holder screws for S.2002			2
Tip holder screws for S.2003			2
Tip holder screws for S.2004			2
T8 Torx screws			6

SCHEMA ELECTRIQUE * Electrical diagram

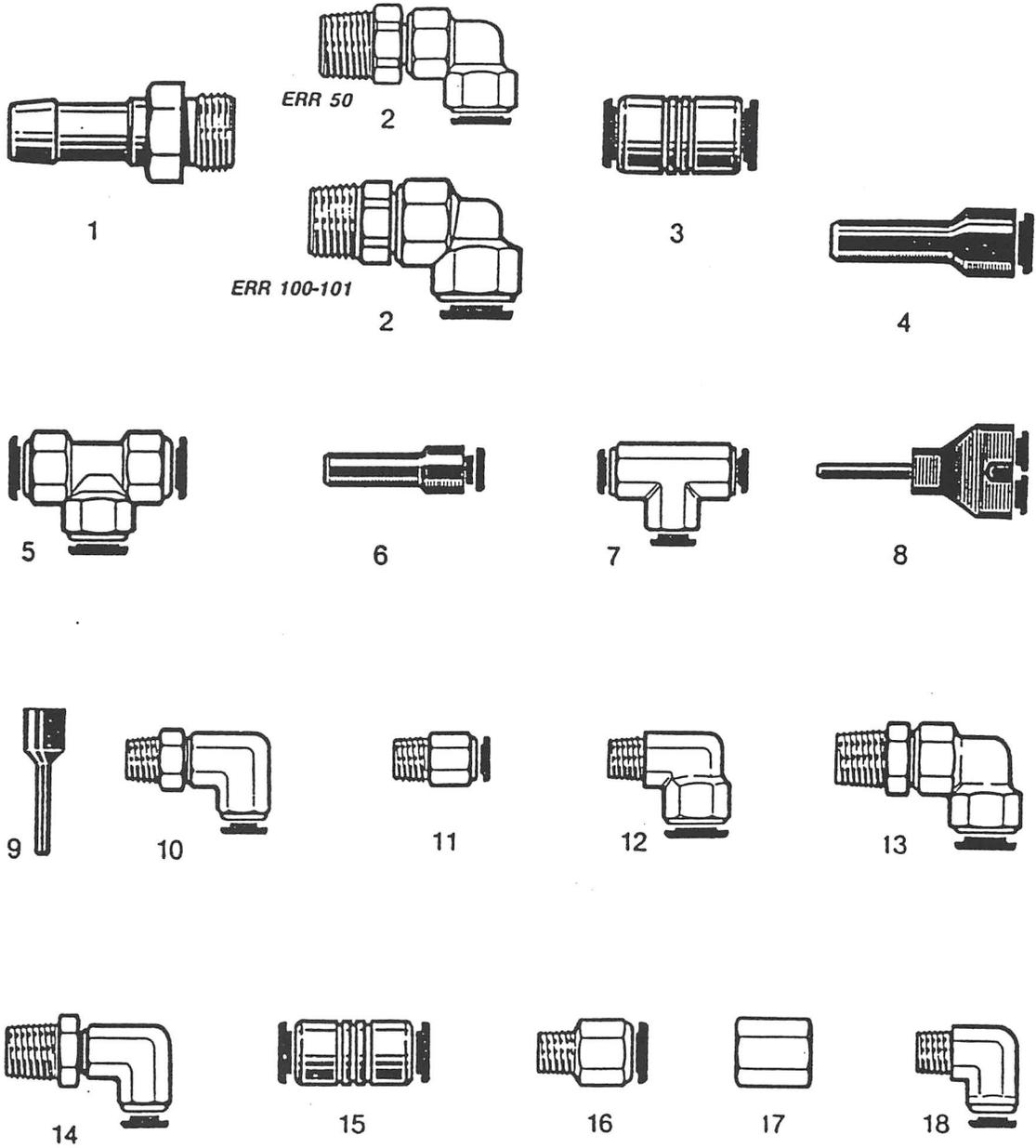
COMMANDES Switches



* à partir des machines
from machines

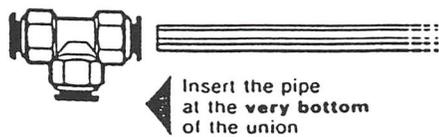
ERR	N°
ERR 50	041
ERR 100	362
ERR 101	047

PNEUMATIC UNIONS

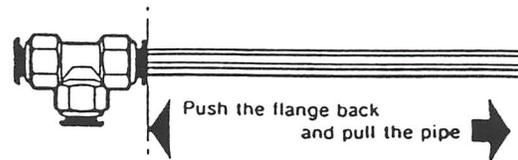


SETTING UP A PIPE IN A UNION AND UNMAKING

SETTING UP



UNMAKING



AIR REGULATORS

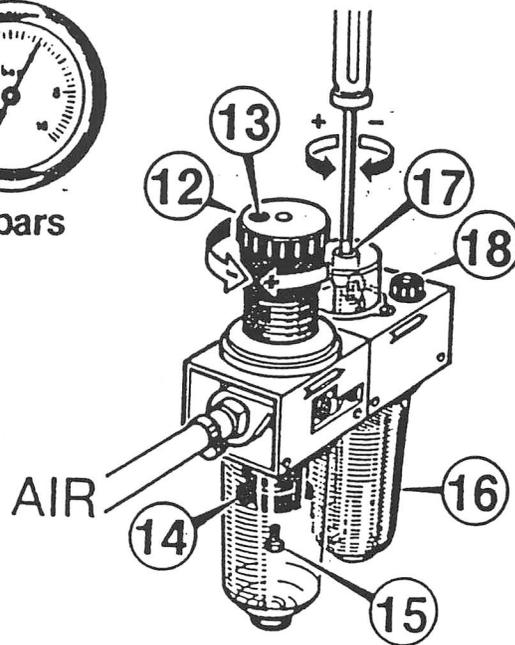
MAIN FILTER REGULATOR

It is situated on the left hand side of the machine. This is the air connection from the compressor.

- Check that the pressure gauge is showing **6 bars**.
- Turn the regulator **12** clockwise or anticlockwise to reach the proper pressure.
- To increase pressure, turn clockwise.
- To decrease pressure, turn anticlockwise
- The screw **13** will prevent the regulator from being unwillingly turned.



6 bars



CLEANING OF THE FILTER 14

Disconnect the air supply.

- Unscrew the tank.
- Remove screw **15**.
- Remove the filter and wash it with soap and water, but no solvent.
- Dry it up thoroughly before reassembling.
- Clean the tank with soap and water and reassemble.

OIL SYSTEM

The tank **16** should be filled to a maximum of 80%.

Use non detergent oil, without aggressive element, viscosity 2 to 3.5° Engler at 50° C. Aniline point 90 to 105.

Recommended oil :

ANTAR Misola AH
BP Energol HL 50 or 65
ESSO Spinesso 38
or Terresso 43

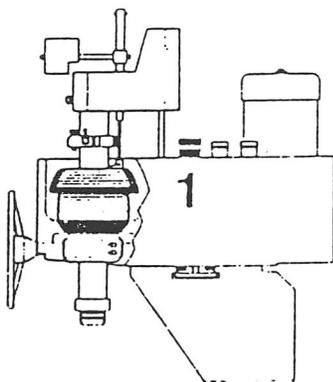
LABO Prima 30
MOBIL DTE Light
SHELL Tellus 21 or 27
TOTAL Azolla 20

ADJUSTING OF THE OIL FLOW

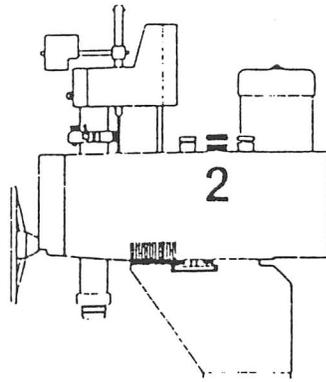
Once the air supply is connected, the oil flow should be one drop per minute when head and sphere air flotation are switched on.

- Turn screw **17** clockwise or anticlockwise to reach this flow. The cap **18** allows the filling up of the tank. It is wise to disconnect the air supply every evening. The water trap will then open automatically.

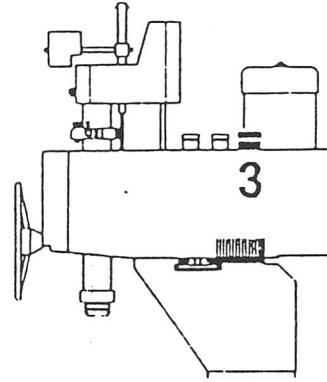
WORKING HEAD AND SPHERE AIR REGULATORS



1. Regulator for balancing of the sphere air flotation



2. Regulator for head front air flotation



3. Regulator for head rear air flotation

These regulators are preset at the factory. However, in case further adjustment is required, proceed as follows :

ADJUSTING OF THE PLANE AIR FLOTATION

IMPORTANT

The spindle counterweight must be fitted.

1st step :

— Shut regulators 2 and 3 (turn anticlockwise).

— Release the workhead, switch C.

— Put pressure on regulator 2 turning clockwise.

2nd step :

— With the finger, push the head backwards and, simultaneously, slowly increase pressure on regulator 3.

As the air cushion appears, the head moves.

3rd step :

Cut pressure on regulator 2 (turn anticlockwise).

4th step :

Put pressure on regulator 2 until the head starts moving when pushed.

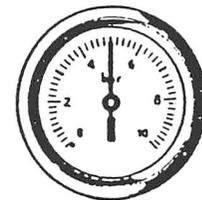
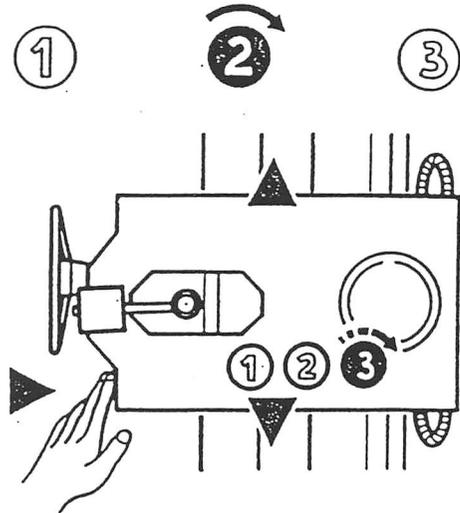
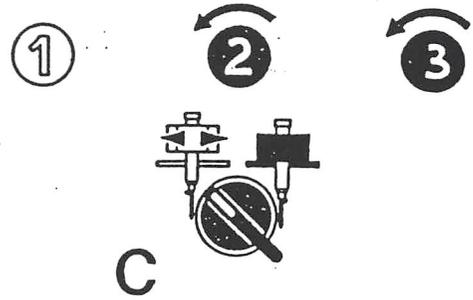
IMPORTANT

With the plane air flotation on, check that air pressure is 5 bars mini.

Under 5 bars, the air cushion will not be sufficient to give free movement of the head.

Too much pressure will give vibration on the head and will prevent its free movement !

These 4 opérations allow an even air cushion on the front and the back of the head.



5 bars mini

To obtain a strainfree movement of the head and keep it parallel to the upper table, increase slightly pressure simultaneously on regulators 2 and 3 until a free movement of the head is obtained. This will be controlled by the forwards-backwards free movement of the head.

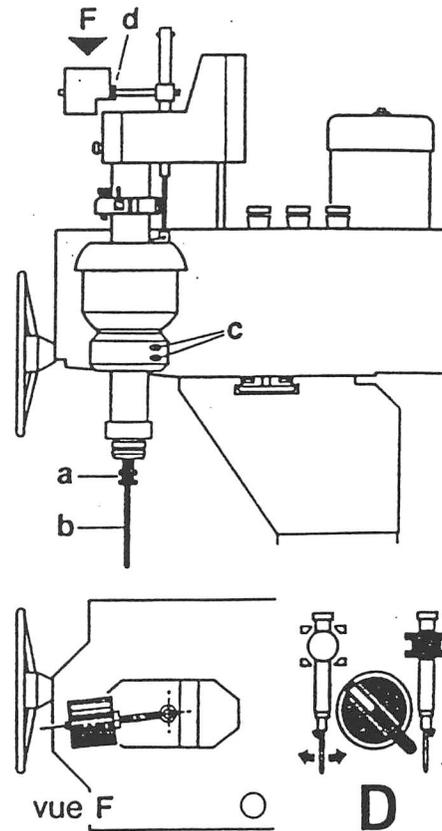


ADJUSTING OF COUNTERWEIGHT

The counterweight is accurately adjusted at the factory. However, during transport and handling, it can be altered. This should be checked as follows :

- assemble the tool holder ERR 5300 (a) and a pilot (b) in the spindle.
- untighten the 2 screws (c) which prevent the spindle from moving (6 mm Allen key).
- tighten slowly one of these screws until the spindle will slide freely.
- lower down the spindle to the bottom.
- release the sphere with the switch D and give a pendulum movement to the spindle.
- when the spindle stops, it should be perfectly vertical.

Otherwise, the counterweight should be adjusted, and slightly offset on the right to counterbalance the weight of the wheel.
(Sketch F)



ADJUSTING THE SPHERE AIR REGULATOR

Leave the spindle at dead bottom point with the tool-holder and pilot fitted.

Shut completely the air pressure on regulator 1 (anticlockwise) and increase slowly pressure until a smooth pendulum movement of the spindle is obtained.

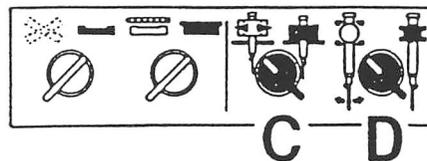
Because of variations in the compressors set-up, it should be checked that excess pressure at the bottom of the sphere will not lift it too much.

Control

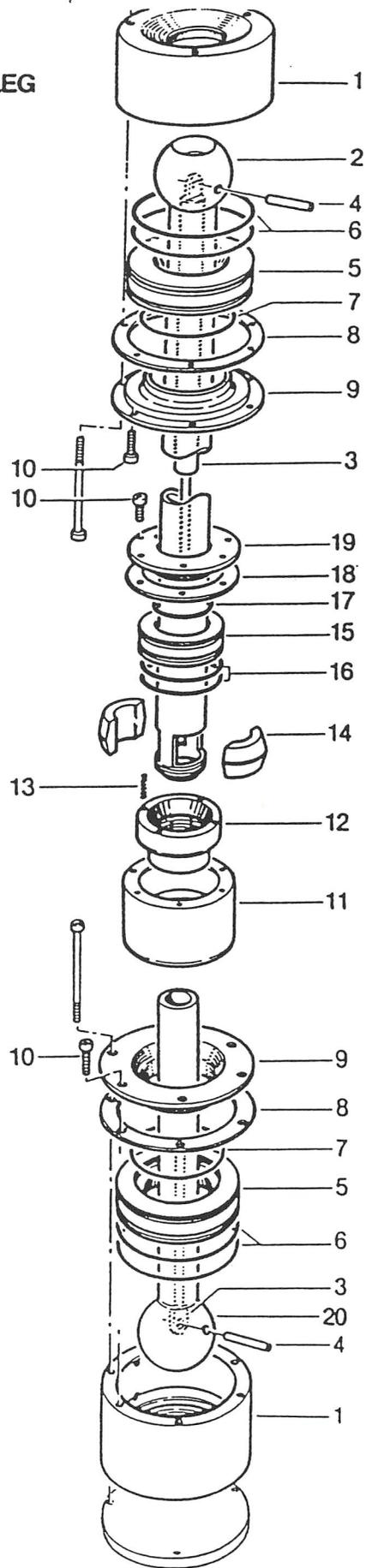
After the complete ajustement of the head and sphere, the pressure should be **5 bars** when both head and sphere are air-floated.



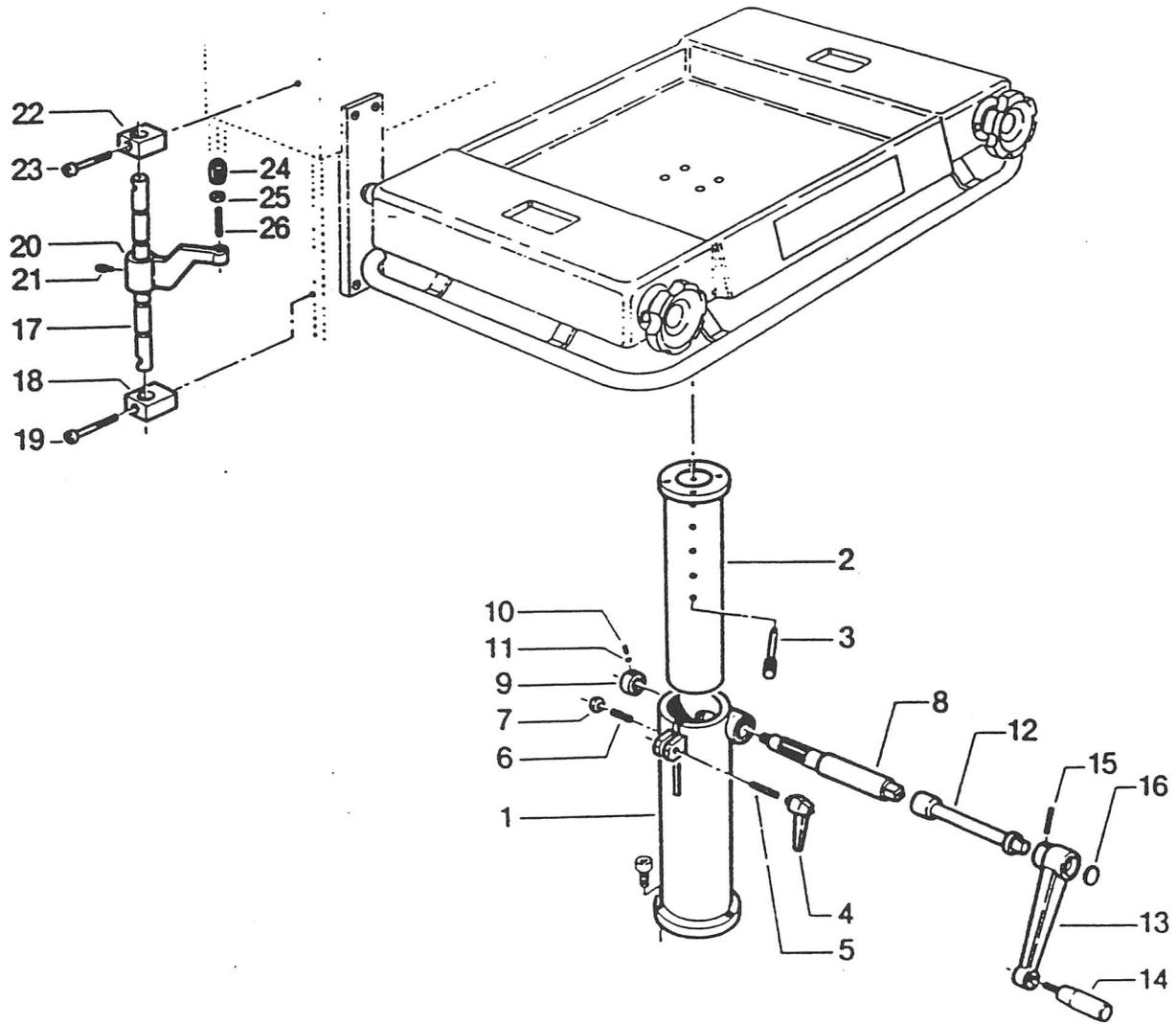
5 bars



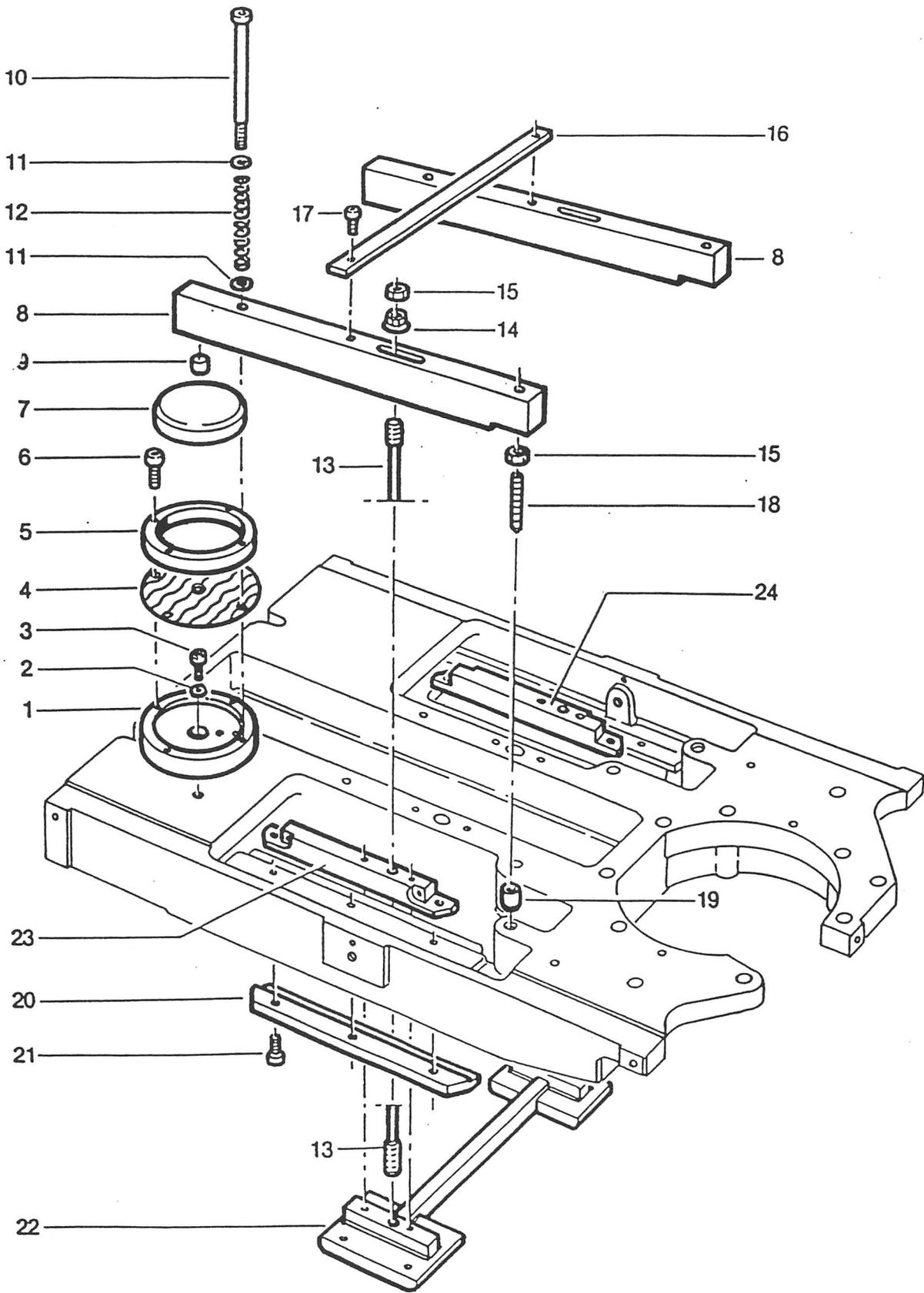
Sketch 4 TABLE TELESCOPIC LEG



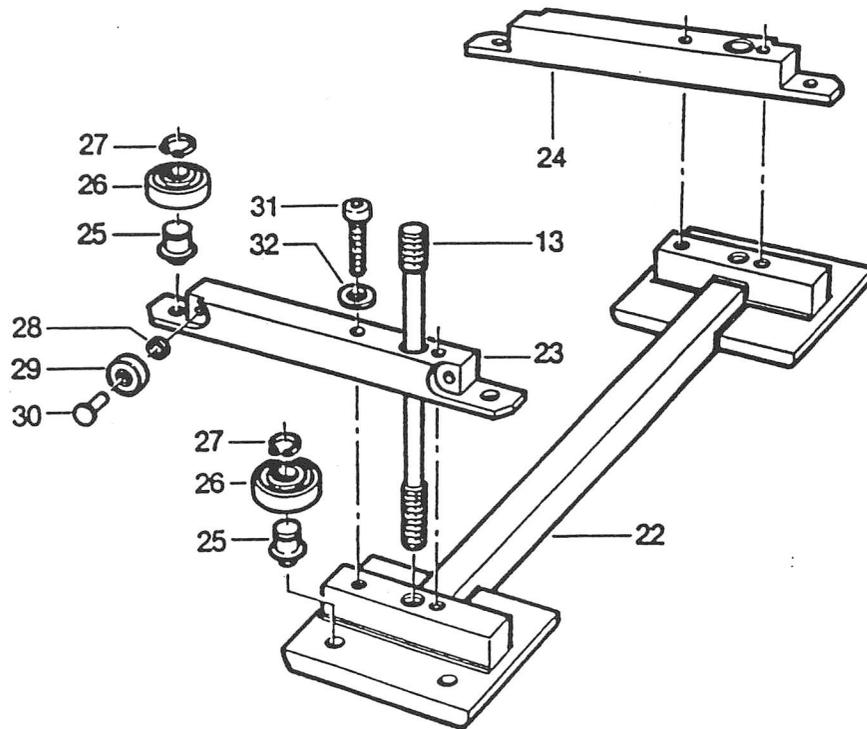
Sketch 5 CENTRAL TABLE ELEVATOR (options)



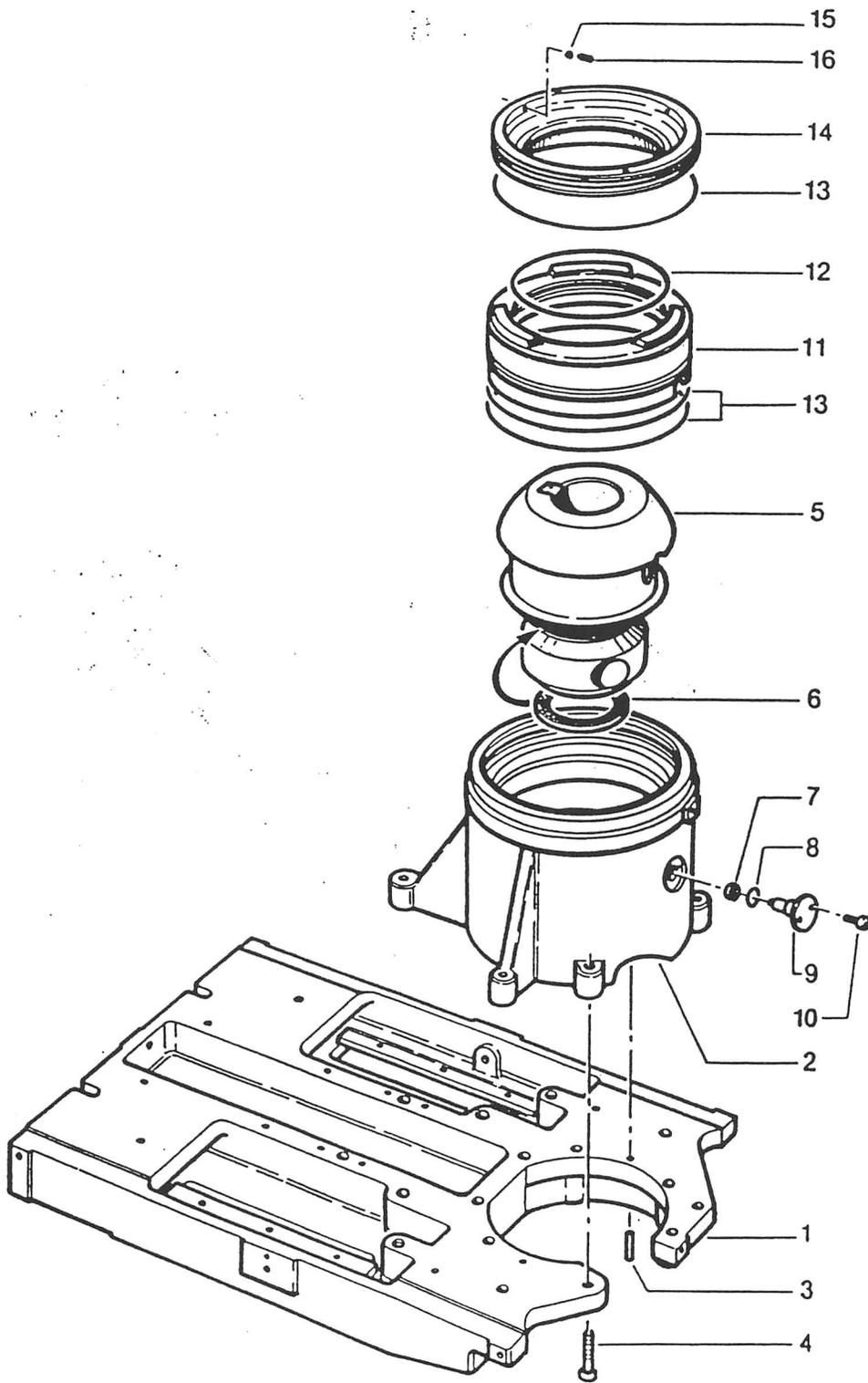
Sketch 10 WORKHEAD GUIDES AND CLAMPING SYSTEM



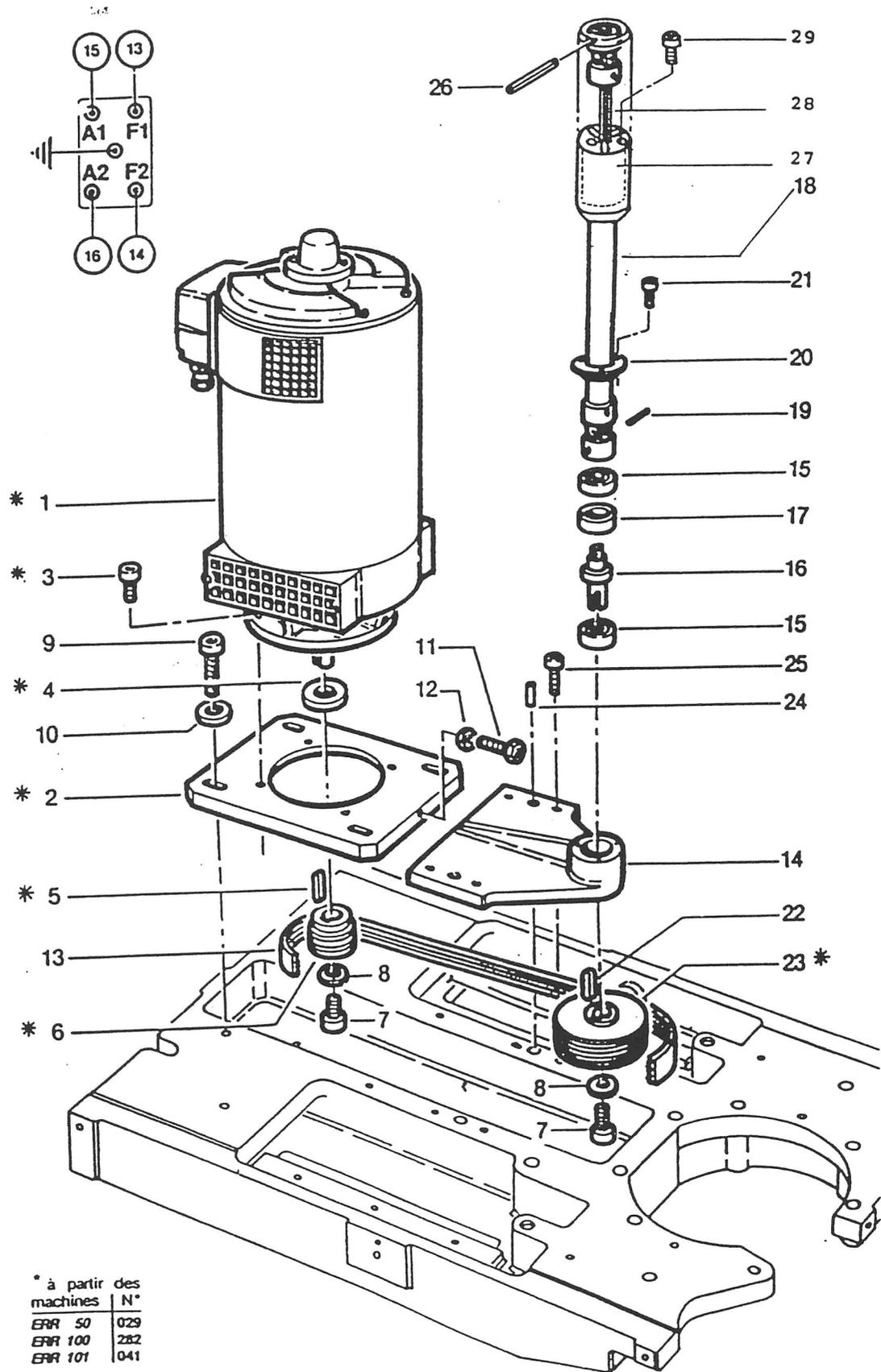
Sketch 11 WORKHEAD GUIDES AND CLAMPING SYSTEM (cont'd)



Sketch 12 SPHERICAL QUILL Assy



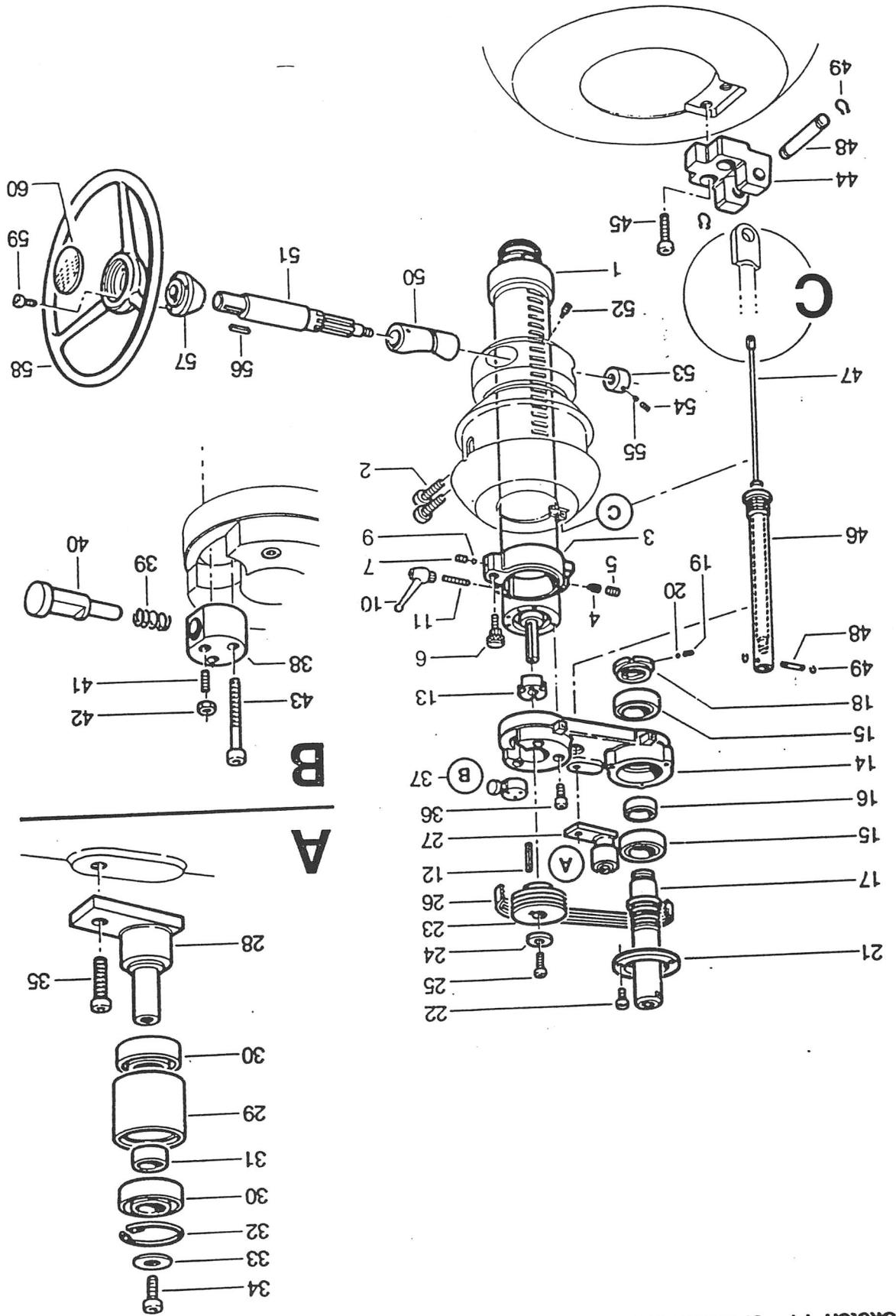
Sketch 13 DC MOTOR AND PRIMARY TRANSMISSION



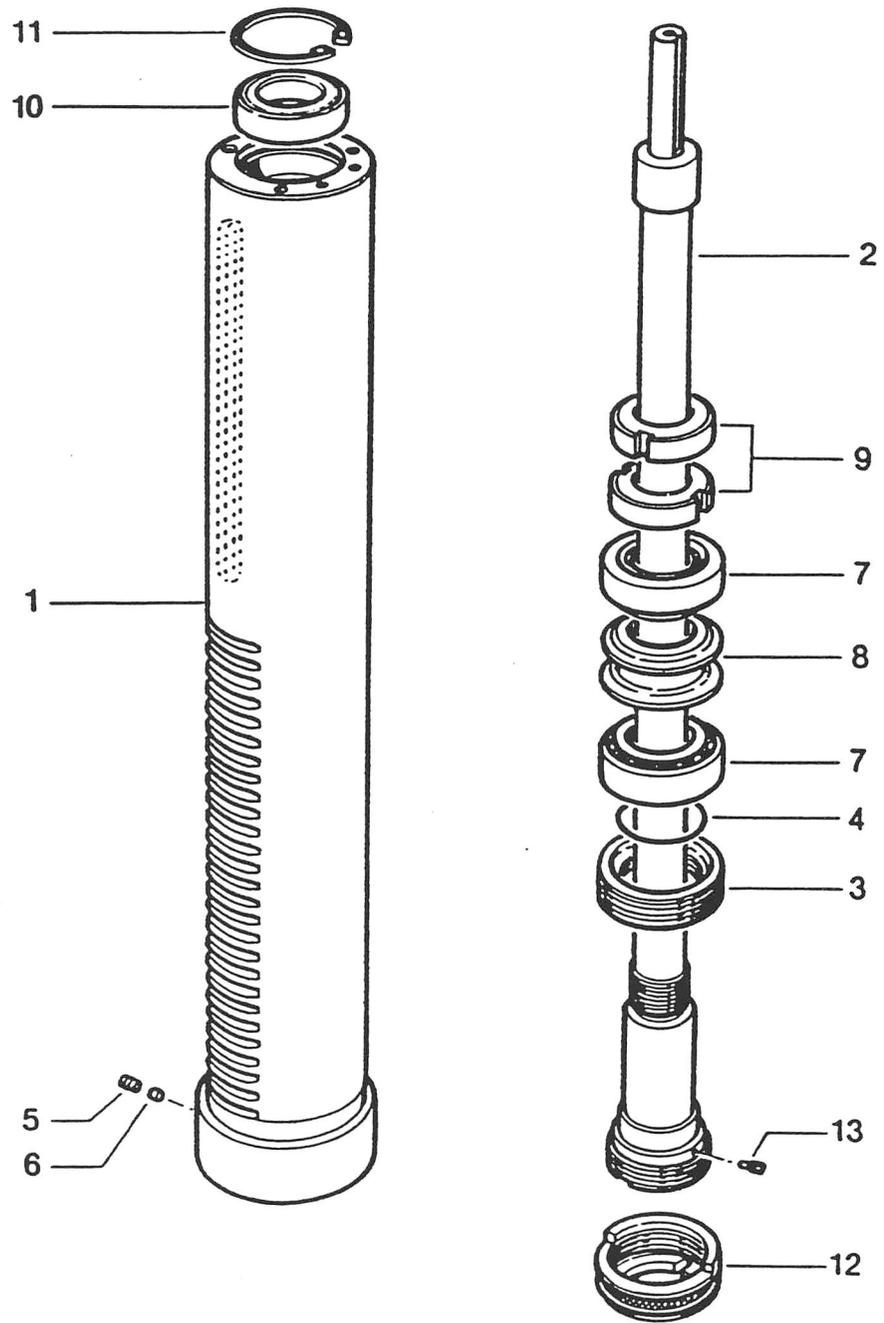
* à partir des machines

machines	N°
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ERR 100	282
ERR 101	041

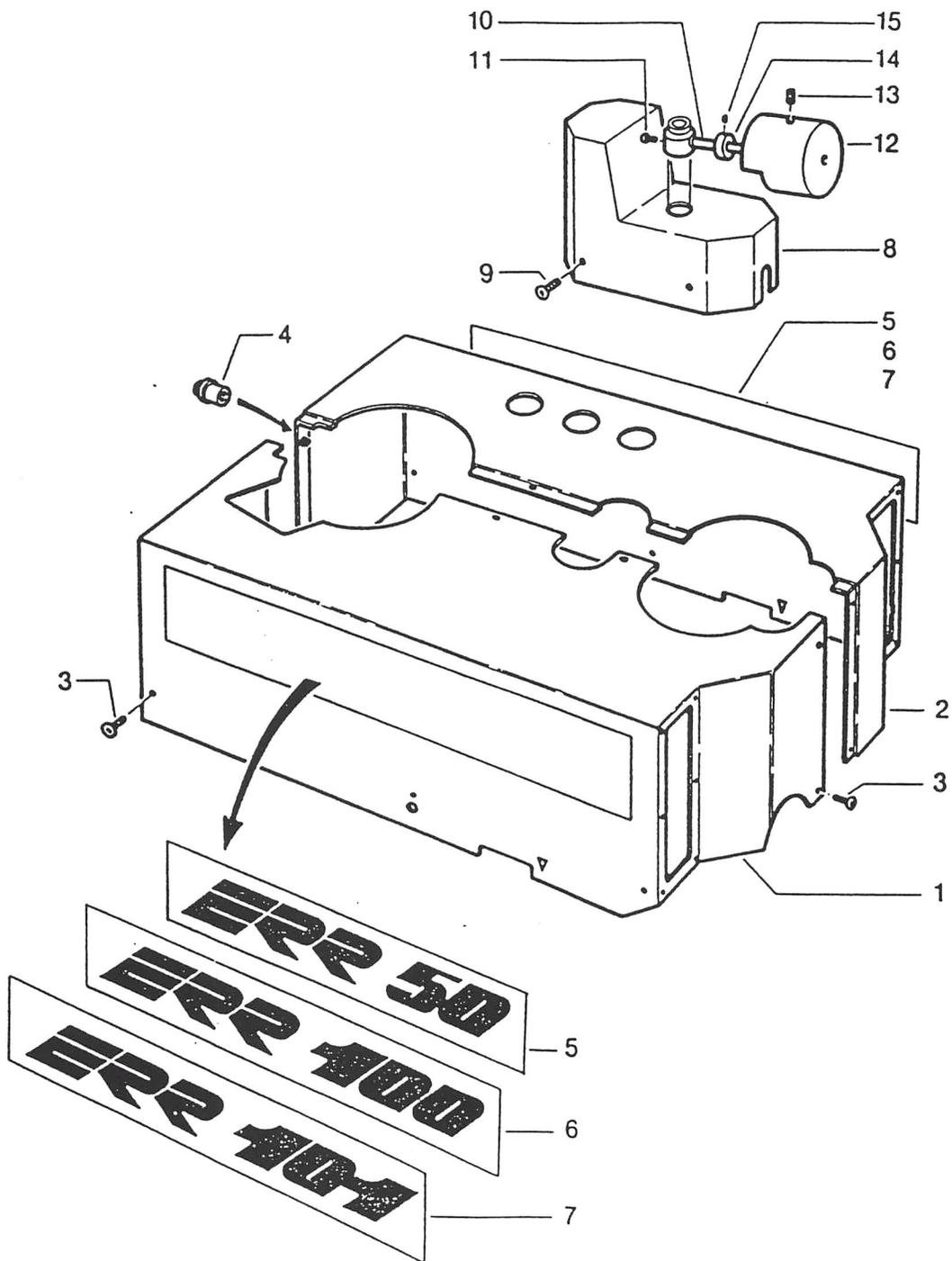
Sketch 14 SPINDLE AND SECONDARY TRANSMISSION



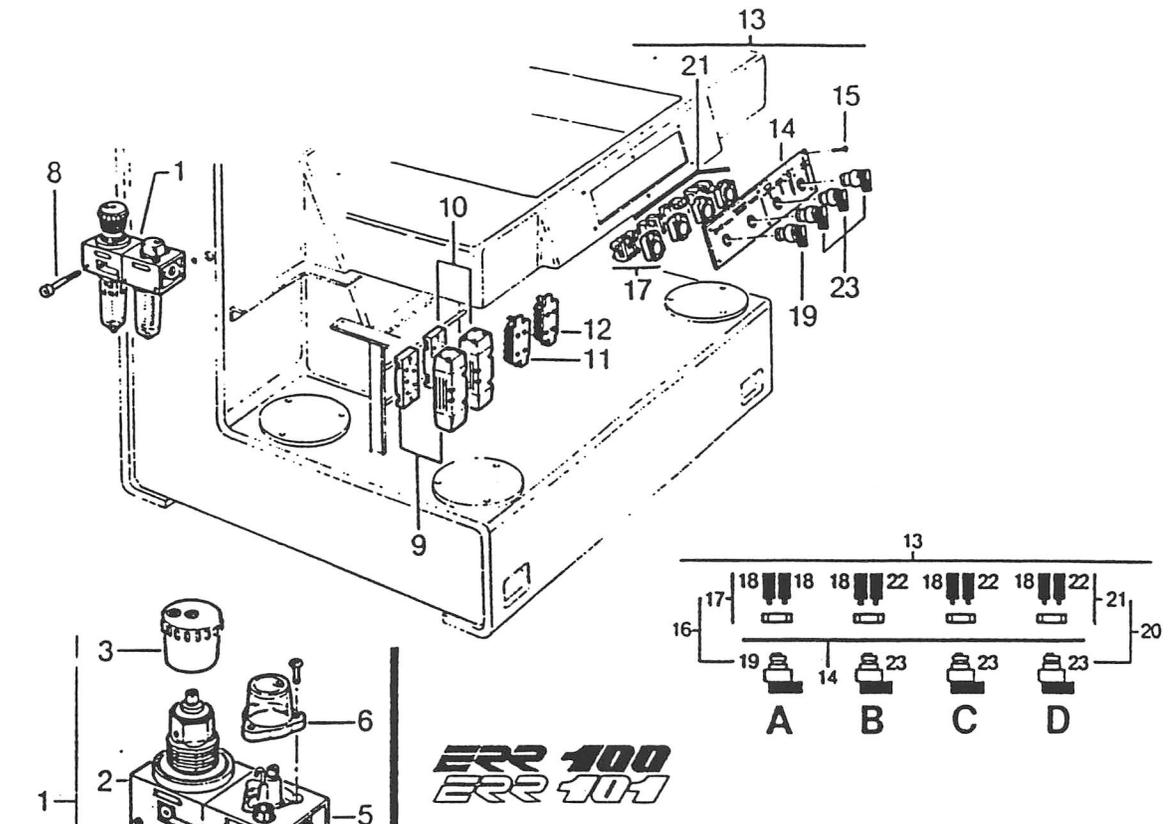
Sketch 15 SPINDLE Assy



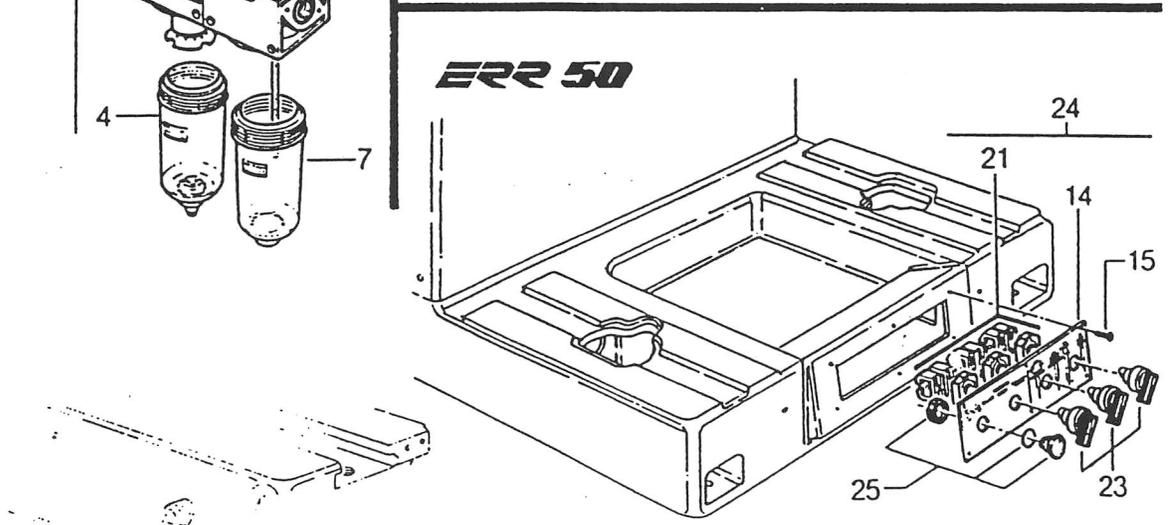
Sketch 16 WORKHEAD COVERS



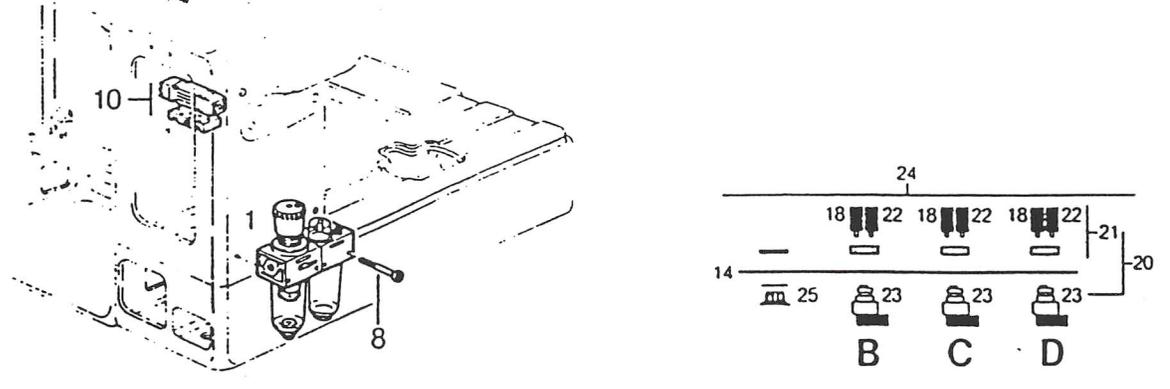
Sketch 17 PNEUMATIC SWITCHES AND TABLE DISTRIBUTORS



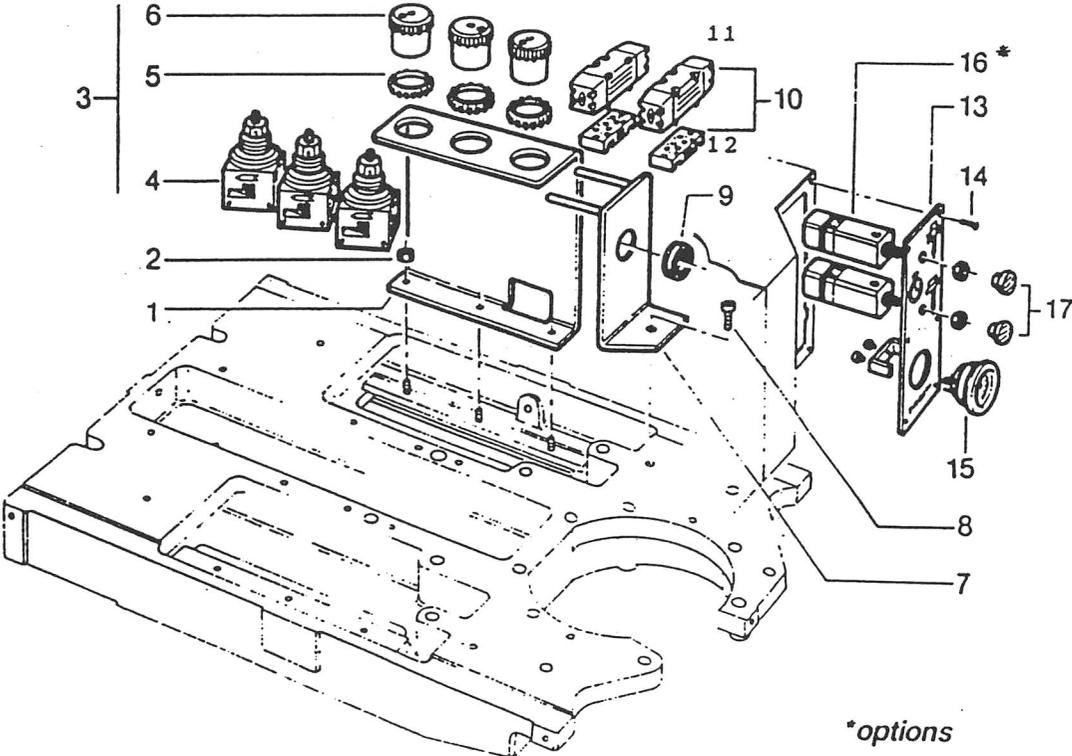
ERR 100
ERR 101



ERR 50

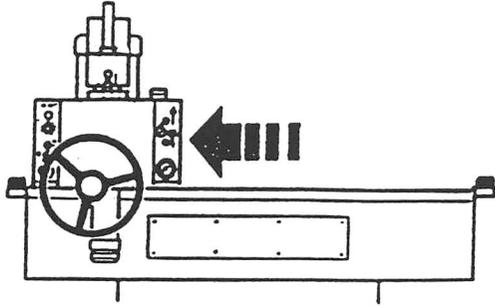


Sketch 18 WORKHEAD PNEUMATIC DISTRIBUTORS



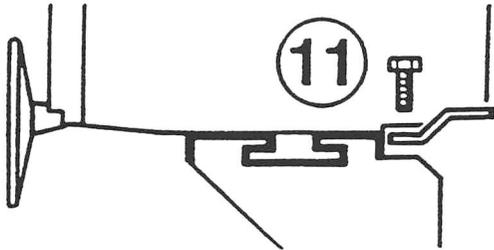
*options

Removing head brackets (cont'd)



If the oil used during assembly of the machine prevents the air flotation, push the head sideways but do not pull the head with the hand-wheel or the spindle.

Clean thoroughly this part of the top table.

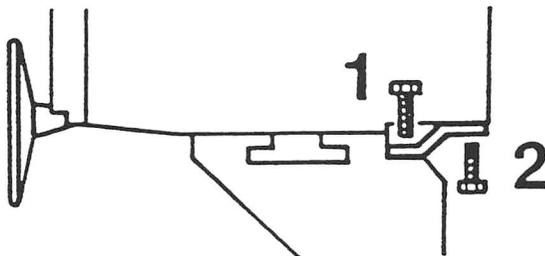


- 11 Remove the screw and the back bracket of the head.

Push the head to one side of the machine and clean thoroughly this part of the top table.

All the above-mentioned brackets should be kept in case the machine should be moved again in the future.

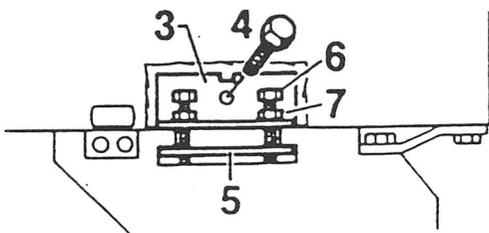
In case the machine should be moved again, it is compulsory that the workhead should be clamped again with the original brackets.



In order to clamp the workhead on the machine :

— Push the head on one side of the table and fit the screw n° 1 in the middle of the table.

— Move the head back in the middle of the table and tighten the screw n° 2.



— Fit the side square clamps 3 on each side of the head, holding them without tightening with the screws 4.

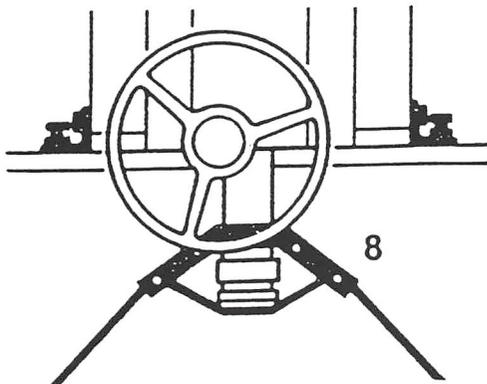
— Place some paper between the brackets and the head to avoid damaging the paint.

— Fit the counterplates 5.

— Tighten the screws 6 until they lock against the bottom.

— Tighten the counternut 7.

— Tighten the screws 4.



— Fit the spindle brackets 8, and hold the spindle to the table.