

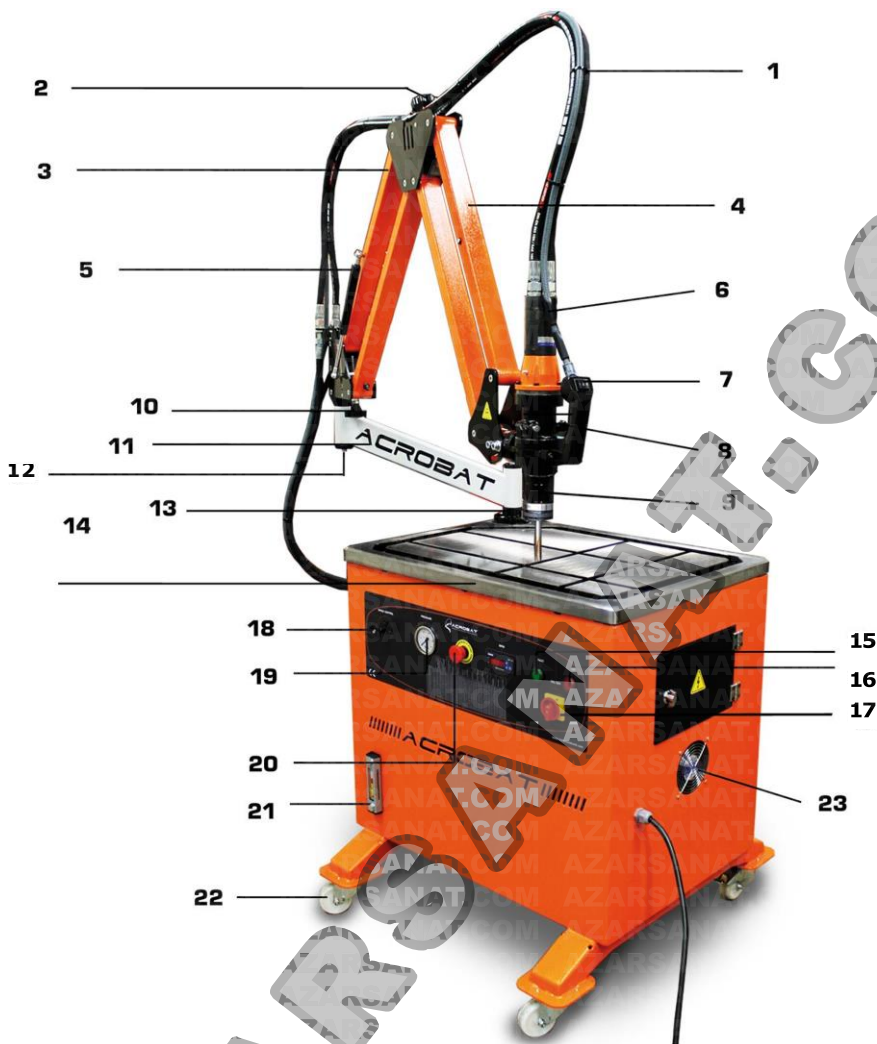


Hydraulic and Pneumatic Tapping Machine

HYDRAULIC TAPPING MACHINE ACROBAT M24



INSTRUCTION MANUAL



- | | | | | | |
|---|--------------------------|----|--------------------------|----|----------------|
| 1 | HYDRAULIC HOSE | 9 | RING | 17 | PACCO SWITCH |
| 2 | PISTON ADJUSTMENT HANDLE | 10 | PISTON ADJUSTMENT HANDLE | 18 | DIMMER |
| 3 | REAR PARALLEL ARM | 11 | BOTTOM ARM | 19 | MANOMETER |
| 4 | FRONT PARALLEL ARM | 12 | FIXATION BOLT | 20 | EMERGENCY |
| 5 | PISTON | 13 | BASE FLANGE | 21 | LEVEL AND HEAT |
| 6 | HYDRO MOTOR | 14 | STONE WASHED PLATINA | | INDUCATOR |
| 7 | TRANSMISSION | 15 | MACHINE START | 22 | WHEEL |
| 8 | HANDLE | 16 | MACHINE STOP | | |

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1- Safety Rules

DEFINING SAFETY INFORMATION

Possible dangers may be prevented by reading explanations carefully. Keep people (especially children) away from working field during tapping process, except for the operator.

UNDERSTANDING SAFETY WARNINGS

Read manual carefully.

Use your machine at a suitable working environment. Unsuitable modifications will affect safe operation and long life of your machine negatively.

HAVE ELECTRIC INSTALLATION CONNECTED BY A COMPETENT ELECTRICIAN

Your machine works at 380 V.

Machine will not work when phases are connected inverse, because there is phase protection relay at the machine.

PRESSURED OIL MAY HARM YOUR BODY

Do not work the machine before putting oil into machine's hydraulic unit. Make sure hydraulic hose fittings are firmly tightened.

WARNING! THERE IS HIGH PRESSURE IN THE MACHINE

SPREADING METAL PARTS MAY HARM YOUR EYES

Metal parts may jump out when tapping. To prevent injuries arising from this reason, you have to wear protective eye glasses for job, with edge protection..

HOT PARTS MAY CAUSE BURNS

Heat will occur because of tap's friction to material. Do not touch hot parts with bare hands.

UNPROPER USE OF THE MACHINE:

This is a very important chapter because in the past purchasers of ACROBAT tapping machines used it in a manner that endangered the persons in the vicinity of the machine and the environment in which the machine was located.

The machine is built mainly of steel and can not be used for combustible materials and harmful. The customer must check whether the processed materials meet these requirements and do not pose a threat to people living in the vicinity.

Placing any part of the body on the machine while the machine is turned on is prohibited. It is also prohibited to place on the machine or near the machine materials that are not mounted on the machine for processing. These materials may be under the influence of a working machine vibrations and cause a threat to the health of people in the vicinity.

It is forbidden to operate the machine by people who are not familiar with the manual.

The user is required to secure the area around the machine to protect bystanders from being hit by a moving part of a machine or workpiece's splinter.

The machine must be operated by no more than one person (the operator) at a time.

Operate wearing clothes with narrow buttoned cuffs.

Long hair should be tied up.

If you notice irregularities in the operation of the machine immediately stop the operation and contact your service representative.

It is forbidden to operate the machinery while intoxicated.

Children can not approach the machine.

When the machine is running, stay clear of the rotating tap

It is forbidden to leave the machine running unattended.

When the machine is running do not perform any operations in its surrounding area.

Never service the machine with motor on.

Never operate, service, repair or adjust machine without proper instruction from your supervisor and without reading and understanding the instruction manual. It is the employer's responsibility to implement the above instructions and to provide proper safety measures necessary for each particular use, operation, setup or service of the machine.

Do not remove the labels from machine for any reason.

NOISE EMITED BY THE MACHINE

The device properties used to measurement.

Model : Delta Ohm HD2110

Serial Number : 14000044R

The measurement condition was made as below :

15 °C and % 55 Rh

Results of measurement

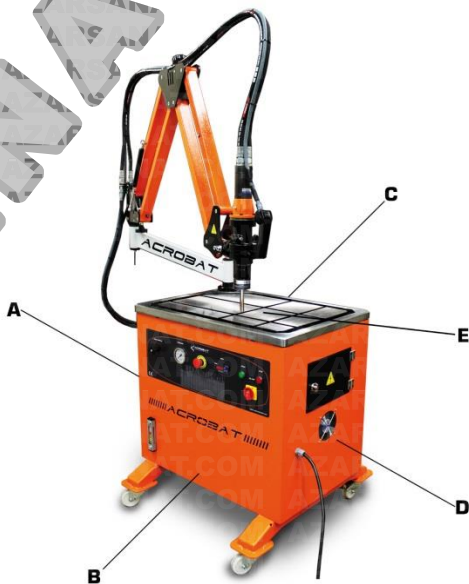
A point 72,2 dB(A)

B point 72,5 dB(A)

C point 71,5 dB(A)

D point 70,5 dB(A)

E point 70,0 dB(A)



2- Machine`s usage

Acrobat M24 Hydraulic tapping machine is designed to help you perform your tapping works easily, quickly and economically. It provides you with fast tapping possibility thanks to special hydraulic system with high torque. Connection is vertical to ground thanks to its acrobatic arm, horizontal operation is possible if you desire. Prevents the breakage of tap thanks to safe type tap holders, and provides savings for you.

Thanks to its mobile table you can easily carry and operate it anywhere.

3- Technical Properties

Working pressure:	60 bar - 120 bar
Power:	3 kw
Speed:	0-600 rpm & 0-150 rpm
Machine weight:	250 kg
Reaching capacity:	2050 mm
Elevation capacity:	920 mm
Rotating capacity:	360 degree
Table height:	900 mm
Width of table:	700 mm
Length of table:	900 mm

4- Standard Accessories

- 1-Angle head system
- 2-Connection bolts
- 3-Tap holder placement socket
- 4-Hydraulic system

5- optional Accessories

- 1-Tap holders with or without safety
- 2-Fixed head system
- 3-Mobile table at any size

6- Machine Assembly

Place the base flange of machine in such a way to fit table connection holes. Make sure you tighten bolts after you place them with suitable Allen wrench.

WARNING! Make sure the connection surface of table is clean.

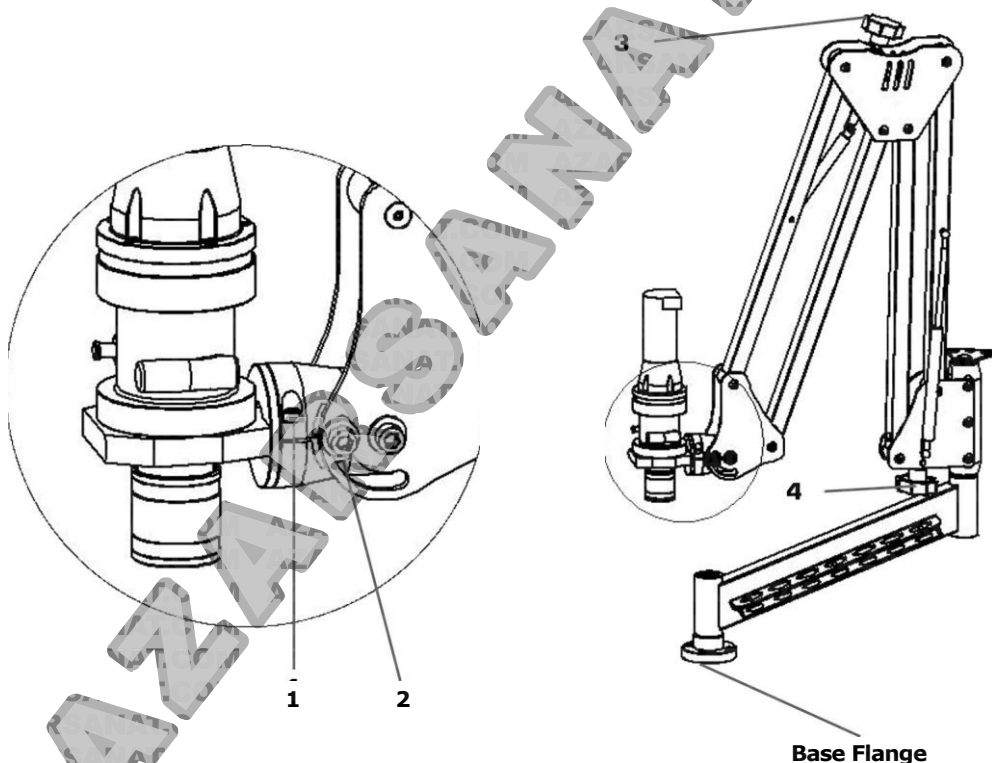
The smallest defect here (burr, small metal pieces) will prevent your machine to work vertically to ground. After you place the bolts, remove package bands and uncover the machine.

To make machine adjustment for 90 degrees (See Picture-1) loosen bolts with number 1 and number 2 as in the picture (2 bolts facing each other). So that front head group will become free.

Press the mouth to which safe tap holder is connected, firmly on the surface you want to carry out tapping. (PICTURE 4/ 90 degrees of leaning mouth) Tighten bolts with number 1 and number

2 again after surface leans. Make sure surface leaning does not change during the process of tightening bolts. In that way 90 degrees adjustment of your machine will be done.

YOUR MACHINE IS SENT AFTER THE ADJUSTMENT IS MADE FOR 90 DEGREES.



PICTURE -1

Hardness adjustment mechanism which allows lifting its weight is available on the acrobatic arm. [See Picture 1)
Front parallel arm group hardness adjustment can be done via handle with number 3 as seen on the picture, and
handle with number 4 is used for rear parallel arm group's hardness adjustment.

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7- Operation of Machine

Machine includes a 3 kw electric motor. Firstly measure the currents coming to plug you will use before connecting your machine to plug and operating it. It must be 380 V between the phases and 220 V between phase-neutral. If alternating current is reaching to system, it will damage electrical system of your machine. In this situation, use a regulator to balance phases before operating the machine.

WARNING! Otherwise electric faults which may occur will not be in scope of guarantee.

Electric installation has phase protection relay. So that when phase with reverse order reaches to electric motor, phase protection relay activates and prevents the reverse operation of electric motor and hydraulic pump which is connected to motor from working in reverse direction, and protects the system. (See Picture 2) In such a situation if the machine is not working, remove machine's three-phase electric cable and connect to another suitable three-phase socket. When the phase coming to motor is correct, system will activate.



Both green
and red lamps
turn on.

FLAT PHASE



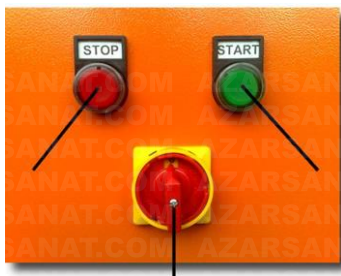
Only red lamp
turns on.

REVERSE PHASE

PICTURE - 2

To start the machine open pacco switch on unit and press on motor start button (green button) after waiting for 5 seconds. (See Picture 3) And hydraulic system will become activated

MOTOR STOP



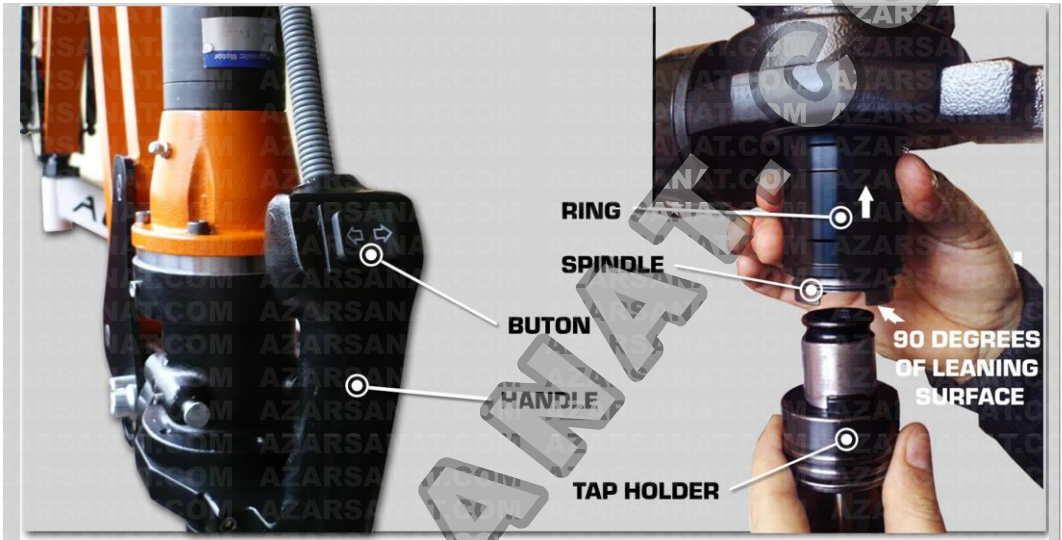
MOTOR START

PICTURE - 3 PACCO SWITCH

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7-Operation of Machine

Button on handle at the end of acrobatic arm (See Picture 4) adjusts machine's spindle rotation direction. Button stays at middle position automatically when machine is not used and spindle does not rotate. To be able to turn spindle clockwise, press and hold the button to left. In that way spindle will rotate clockwise. When you press and hold the button to right, spindle will rotate counter-clockwise.



PICTURE - 4

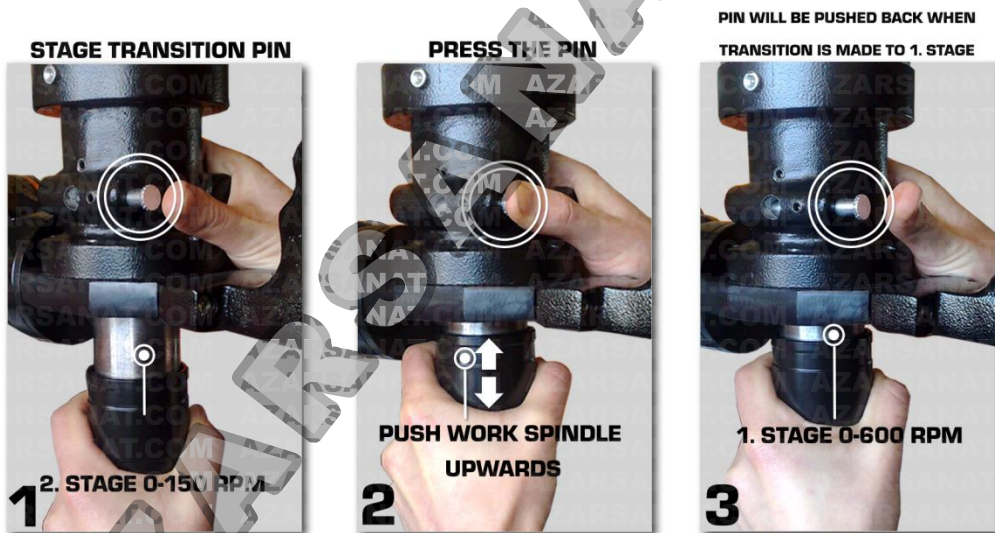
Attach the tap you want for tapping to tap holder with suitable metric according to your tap. If the tap you will use is attached to a tap holder of different metric, your tap may break because of torque disagreement. Place the teeth near tap holder in such a way to fit teeth sockets at the end of module, by pushing the ring on module at the end of spindle upwards, and release the ring; locking mechanism will work automatically and fix the tap holder. (See Picture 4)

To remove tap holder from its place, it will be enough to lift ring on module upwards. Bring the tap (which is suitable for the hole you drilled beforehand, or which you will tap) on the hole and press slightly and provide machining (diameters of holes to be drilled according to taps for tapping can be found at the end of guide).

Then by pressing button to left side, make spindle turn clockwise. This way tapping tool will begin process of tapping for hole. When the process is done, by holding button pressed to the right, make the spindle turn counter-clockwise. In that way tap tool will come back from tapped hole. If you lubricate the tap with suitable grease before contacting with the material it will increase cutting speed and extend the life of the tap.

7- OPERATION OF MACHINE

Machine's transmission assembly has two stages and it works at 600 rpm speed at 1. stage for tapping processes between M5 and M12 (by making slower as tooth gets bigger via precision speed adjustment reducer) and it works at 2. stage 150 rpm speed for your tapping processes between M14 and M24 (by making slower as tooth gets bigger via precision speed adjustment reducer). **WARNING!** You need to work at 2. stage after M14. Otherwise hydraulic system and transmission system may get damaged. If you use it otherwise your machine will be out of guarantee's scope. Stage transitions are adjusted via stage transition pin located at the left side of two-stage transmission assembly at the front head. [See Picture 5] Transmission assembly's work spindle becomes free after pin is pressed. When pin is in pressed state, transmission work spindle is pushed upwards, turned around its own axis and placed into its place and the pin is left. In case transmission work spindle is in the housing, the pin will be pushed back and lock the work spindle. Therefore transmission assembly will work at 1. Stage at 600 rpm speed.



PICTURE 5

IT WILL BE ENOUGH TO PRESS THE PIN AND PULL THE WORK SPINDLE DOWNWARDS TO GO TO 2. STAGE FROM 1. STAGE.

Pin is pressed again to go to 2. stage and transmission work spindle becomes free. Work spindle is pulled downwards for transition to 2. stage, pin will be pushed back again and will lock the transmission work spindle. Therefore transmission assembly will be working at 2. stage at 150 rpm speed.

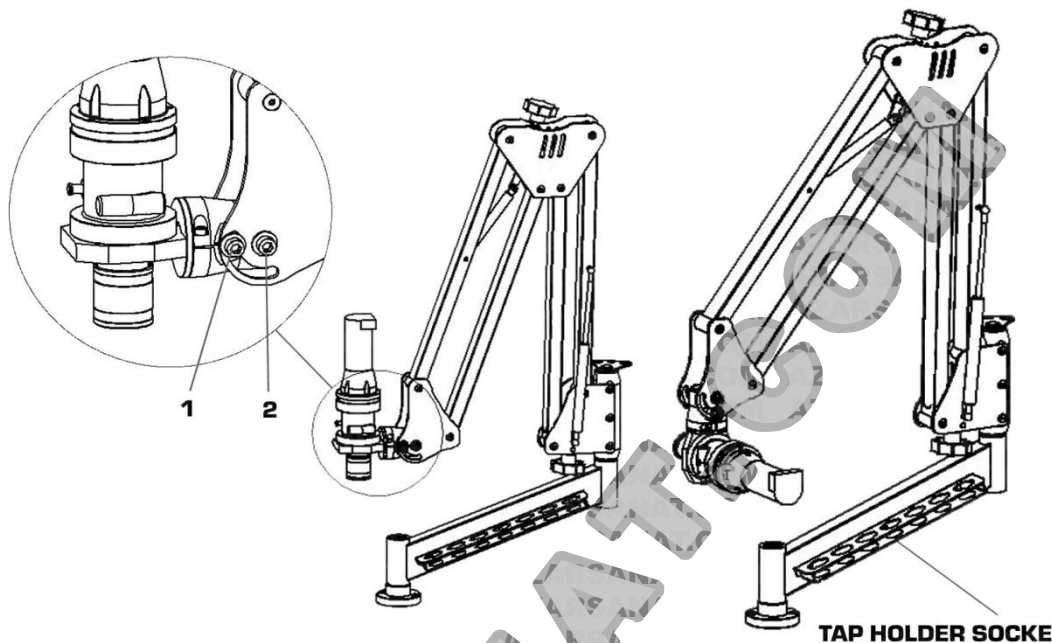
7 - Operation of Machine

Acrobat M24 hydraulic tapping machine works at 600 rpm speed for tapping processes between M5 and M24. It is possible to adjust spindle cycle at speed adjustment dimmer, according to size of teeth you will tap. You can use it at any speed by reducing cycle by using accurate speed adjustment dimmer for bigger teeth; and increase cycles with accurate speed adjustment for smaller teeth. Acrobat M24 hydraulic tapping machine can carry out tapping horizontally.

When you want to carry out tapping (See Picture 6) slightly loosen bolts with number 1 and number 2 as seen on the picture (two bolts looking at each other). This way the front head will turn to horizon and tapping head will be able to rotate 360 degrees.

Then only tighten bolts with number 2 and leave bolt with number 1 loose. Because head group needs to be free during horizontal tapping process. It is to ensure that head and related tap move easily at the axis of hole you drilled during horizontal tapping, and being able to adjust itself according to angle.

Your machine is ready for horizontal tapping process.



PICTURE - 8

If you put tap holders whose job finished to the tap holder sockets at sides you can prevent possible accidents.

When your job ends with the machine, press the motor stop (red button) button at the unit and close pacco switch. Keep acrobatic arm at closed condition when you are not working with the machine.

3- Maintenance of Machine

Fill oil tank in the table with minimum 90lt, maximum 100 lt with hydraulic oil (grade 46).

Periodically change hydraulic oil after 2500 hours of usage to use hydraulic motor and machine at desired performance with long life.

Track oil level with indicator at certain periods. Clean the inside of safe tap holders with pressured air at certain periods. Otherwise there may be breakage possibility for the taps.

Thin machine oil and grease shall be applied to suitable grease fittings at transmission unit at certain periods depending on machine's operation frequency.

8-1 Filling Hydraulic Oil

When you want to fill machine with hydraulic oil, you can fill hydraulic oil (grade 46) at minimum 90 It, maximum 100 It with the help of funnel by opening storage cover as in the picture (See Picture-7).

STORAGE COVER



PICTURE - 7

To change hydraulic oil, open blind plug at the bottom of machine and evacuate hydraulic oil. After hydraulic oil is completely emptied, tighten blind plug again at its place. You can fill hydraulic oil (grade 46) with funnel (minimum 90 It, maximum 100 It) by opening storage cover.

9- Maintenance Control List

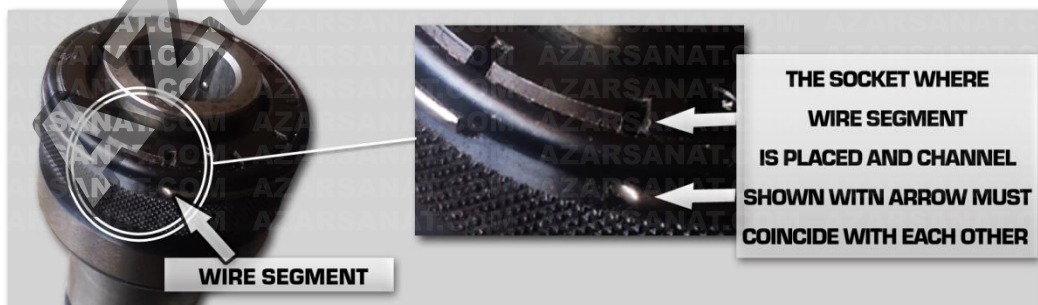
CONTROL POINTS	15 DAY	MONTHLY	EVERY 2500 HOURS
HYDRAULIC OIL LEVEL CONTROL	*		
HYDRAULIC OIL LEAKAGE CONTROL		*	
HYDRAULIC OIL REPLACEMENT			*
GENERAL CLEANING		*	
CONTROLLING CONNECTION BOLTS		*	
CONTROLLING ELECTRIC CONNECTIONS			*
CLEANING TAP HOLDERS	*		

10-Safe Tap Holder System

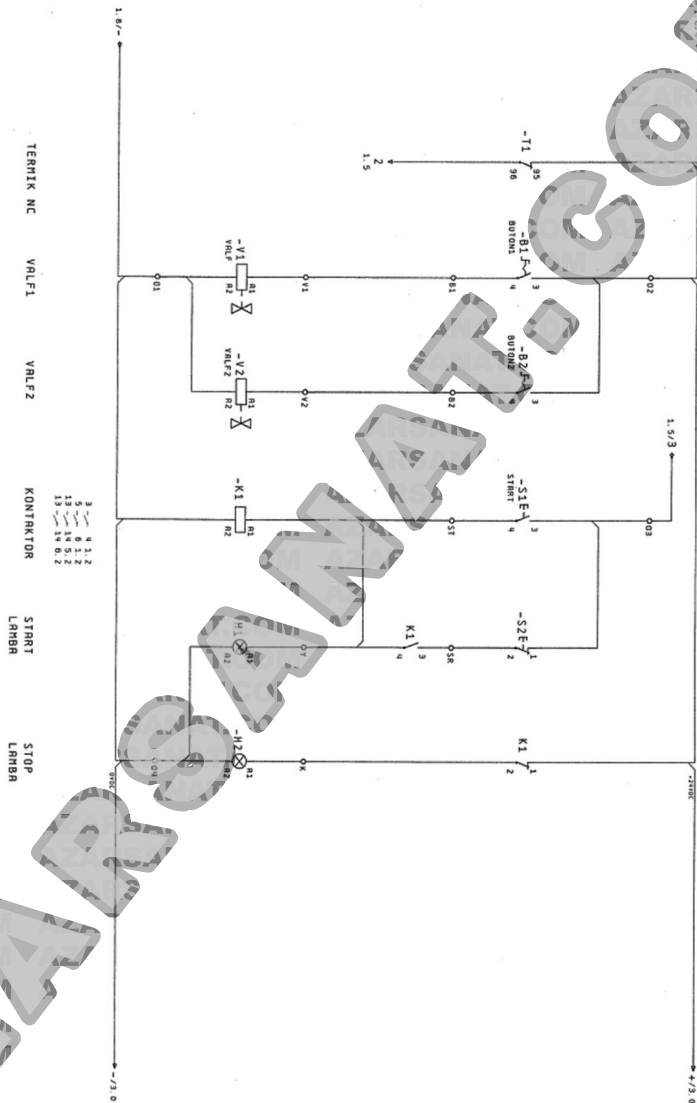
Safe type tap holders are produced separately for each metric tooth and they have a torque-adjusted system inside of them. This system is adjusted by producing company according to torque values which prevent breakage of tap you use, and prevents being exposed to too much force. It reduces tap breakage risk to minimum. If the hole you use for tapping is a blind hole and if tap reached to bottom or if tap cannot move because of the jamming of burr created during tapping process or similar reasons, this torque-adjusted safe tap holder will become activated and even if you continue working for tapping, the machine's spindle will turn but will not rotate the tap and tap will not move. So that tap breakage risk will be reduced to minimum. Also decay of tapped part and tap tool costs will be minimum.

According to variety of the tap you use and the hardness of part for which you are carrying out tapping, torque values of tap holders can be adjusted manually. Torque hardness of safe tap holder can be increased or reduced. If your tap breaks before tap holder is activated remove wire segment at the front side of tap holder (See Picture 8) as seen in the picture, rotate interior hub of holder one grade in counter-clockwise direction in such a way to fit wire segment entrance holes on the hub, and place wire segment again to its place. In that way torque value of your tap holder will be reduced and your tap will not break with the activation of safe torque system before your tap breaks. To operate safe torque system at later and higher torque values, apply the above mentioned process by rotating clockwise. In that way torque value of tap will be increased and torque system will be activated later.

WARNING! Attention must be paid at this process because the breakage risk of tap will increase as it will be exposed to bigger force



11- Control Circuit



12- Drill Diameters Necessary for Taps

METRİK ISO VİDALAR DIN 13

Anma Çapı (inç)	Matkap Çapı (mm)
M 1 x 0,25	0,75
M 1,1 x 0,25	0,85
M 1,2 x 0,25	0,95
M 1,4 x 0,3	1,1
M 1,6 x 0,35	1,25
M 1,7 x 0,35	1,3
M 1,8 x 0,35	1,45
M 2 x 0,4	1,6
M 2,2 x 0,45	1,75
M 2,3 x 0,4	1,9
M 2,5 x 0,45	2,05
M 2,6 x 0,45	2,1
M 3 x 0,5	2,5
M 3,5 x 0,6	2,9
M 4 x 0,7	3,3
M 4,5 x 0,75	3,7
M 5 x 0,8	4,2
M 5,5 x 0,9	4,6
M 6 x 1	5
M 7 x 1	6
M 8 x 1,25	6,8
M 9 x 1,25	7,8
M 10 x 1,5	8,5
M 11 x 1,5	9,5
M 12 x 1,75	10,2
M 14 x 2	12
M 16 x 2	14
M 18 x 2,5	15,5
M 20 x 2,5	17,5
M 22 x 2,5	19,5
M 24 x 3	21
M 27 x 3	24
M 30 x 3,5	26,5
M 33 x 3,5	29,5
M 36 x 4	32
M 39 x 4	35
M 42 x 4,5	37,5
M 45 x 4,5	40,5
M 48 x 5	46
M 52 x 5	47
M 56 x 5,5	50,5
M 60 x 5,5	54,5
M 64 x 6	58
M 68 x 6	62

METRİK İNCE ISO VİDALAR DIN 13

Anma Çapı (inç)	Matkap Çapı (mm)
M 4 x 0,35	3,6
M 4 x 0,5	3,5
M 5 x 0,5	4,5
M 6 x 0,5	5,5
M 6 x 0,75	5,25
M 7 x 0,75	6,25
M 8 x 0,5	7,5
M 8 x 0,75	7,25
M 8 x 1	7
M 9 x 1	8
M 10 x 0,75	9,25
M 10 x 1	9
M 10 x 1,25	8,8
M 11 x 1	10
M 12 x 0,75	11,25
M 12 x 1	11
M 12 x 1,5	10,5
M 13 x 1	12
M 14 x 1	13
M 14 x 1,25	12,8
M 14 x 1,5	12,5
M 16 x 1	15
M 16 x 1,5	14,5
M 18 x 1	17
M 18 x 2	16
M 20 x 1	19
M 20 x 1,5	18,5
M 20 x 2	18
M 22 x 1	21
M 22 x 1,5	20,5
M 22 x 2	20
M 24 x 1	23
M 24 x 2	22
M 25 x 1,5	24,5
M 27 x 1,5	25,5
M 27 x 2	25
M 30 x 1,5	26,5
M 30 x 2	28,5
M 36 x 2	28

WHITWORTH VİDA DIN11

Anma Çapı (inç)	Matkap Çapı (mm)
1/16	1,15
1/8	2,55
3/16	3
1/4	5,1
5/16	6,5
3/8	7,0
7/16	9,5
1/2	10,5
9/16	12,1
5/8	15,5
11/16	15
3/4	16,25
13/16	18
7/8	19,25
15/16	21
1	22
1 1/8	24,75
1 1/4	28
1 1/2	30
1 3/4	33,5
2	39
2 1/8	41,5
2 1/2	44,5

KABA VİDA UNC - NC

Anma Çapı (inç)	Matkap Çapı (mm)
Nr. 1	1,5
Nr. 2	1,6
Nr. 3	1,8
Nr. 4	2,3
Nr. 5	2,5
Nr. 6	2,65
Nr. 8	3,45
Nr. 10	3,9
Nr. 12	4,5
1/4"	5,2
5/16"	6,6
3/8"	8
1/2"	9,4
5/8"	10,8
3/4"	12,2
7/8"	13,5
1"	16,5
1 1/8"	19,5
1 1/4"	22,25
1 1/2"	25
1 3/4"	28
2"	34

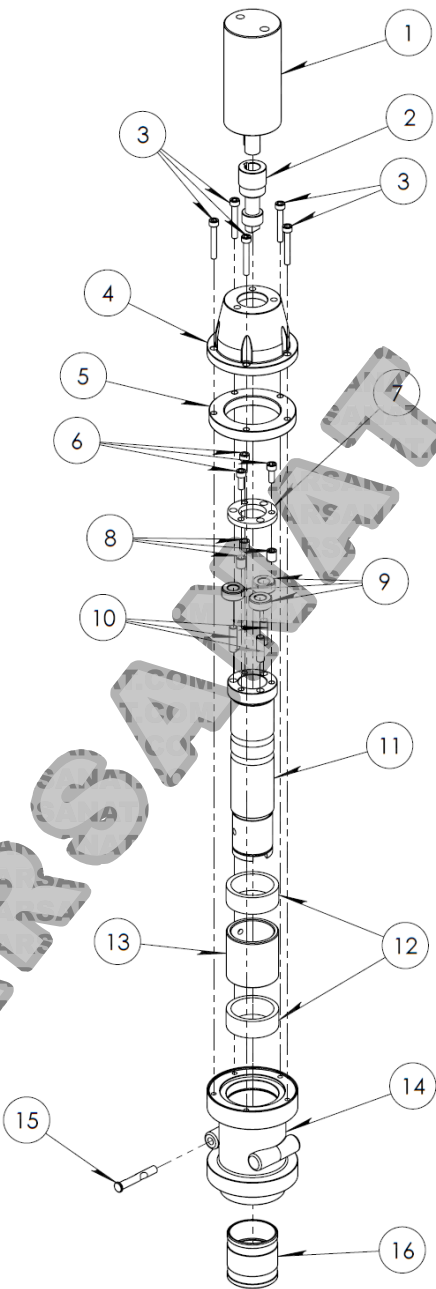
İNCE VİDA UNF - NF

Anma Çapı (inç)	Matkap Çapı (mm)
Nr. 0	1,25
Nr. 1	1,55
Nr. 2	1,9
Nr. 3	2,15
Nr. 4	2,4
Nr. 5	2,7
Nr. 6	2,95
Nr. 8	3,5
Nr. 10	4,1
Nr. 12	4,7
1/4"	5,5
5/16"	6,9
3/8"	8,5
7/16"	9,9
1/2"	11,5
9/16"	12,9
5/8"	14,5
3/4"	17,5
7/8"	20,5
1"	23,25
1 1/8"	26,5
1 1/4"	29,5
1 1/2"	36

WHITWORTH BORU VİDA

Anma Çapı (inç)	Matkap Çapı (mm)
G 1/8	8,8
G 1/4	11,8
G 3/8	15,25
G 1/2	19
G 5/8	21
G 3/4	24,5
G 7/8	28,25
G 1	30,75
G 1 1/8	35,5
G 1 1/4	39
G 1 3/8	42,5
G 1 1/2	45,5
G 1 3/4	51
G 2	57
G 2 1/4	63
G 2 1/2	72,5
G 2 3/4	79
G 3	85,5
G 3 1/4	91,5
G 3 1/2	98
G 3 3/4	104
G 4	110,5

Spindle – parts list



1. HYDRAULIC MOTOR
2. PINION GEAR
3. M6 X 40 BOLT
4. HYDRAULIC MOTOR FLANGE
5. OUT SUN GEAR
6. M6 X 25 BOLT
7. GEAR FLANGE
8. NEEDLE BEARING
9. PLANET GEAR
10. PLANET GEAR PIN
11. SPINDLE
12. SPINDLE BEARING
13. SPINDLE RING
14. SPINDLE MAIN BODY
15. SPINDLE LOCKING PIN
16. TAP COLLET LOCKING RING