

INSTRUCTION MANUAL

NSW Schools / TAFE - GHD-38B Geared Head Drill (415V) 40mm



K8210

D1325 GHD38D 23-11-15
DRILLING MACHINE
OWNER'S MANUAL



ALWAYS READ THE MANUAL BEFORE OPERATING THE MACHINE

CONTENTS

1.	NOTE-----	2
2.	PASSPORT DATA-----	3
3.	LIMITED WARRANTY -----	3
4.	TEST PROTOCOL-----	4
5.	MAIN SPECIFICATIONS-----	5
6.	TRANSPORT-----	6
7.	INSPECTION-----	6
8.	CLEANING-----	6
9.	GENERAL DESCRIPTION-----	7
10.	FILLING WITH OIL-----	7
11.	LUBRICATION-----	8
12.	SPEED SELECTOR-----	9
13.	FEEDS SELECTOR-----	9
14.	AUTOMATIC TOOL EJECTOR-----	9
15.	RETRUN SPRING -----	9
16.	AUTOMATIC FEED-----	10
17.	TORQUE LIMITER -----	10
18.	TABLE SUPPORT AND COOLANT-----	11
19.	SPEED BOX-----	13
20.	FEED BOX-----	17
21.	HEAD STOCK-----	19
22.	OPERATION PANEL-----	23
23.	WIRING DIAGRAM-----	24
24.	ELECTRICAL SCHEMATIC SYMBOL GLOSSARY-----	25
25.	DRILL PROTECTION GUARD-----	26
26.	ELECTRIC CONNECTION-----	26
27.	SAFETY AND GENERAL INFORMATION-----	28
	SAFETY-----	28
	FORSEEN USE OF THE MACHINE-----	29
	CORRECT USE OF THE MACHINE-----	29
	PIECE CLAMPING-----	29
	TOOL FIXING-----	30
	CHIPS DURING MACHINING -----	30
28.	MACHINE CARE AND MAINTENANCE-----	31

NOTE

This manual has been prepared for the owner and operators of this machine. Its purpose, aside from machine operation, is to promote safety through the use of accepted correct operating and maintenance procedures. Completely read the safety and maintenance instructions before operating or servicing the machine. To obtain maximum life and efficiency from your machine, and to aid in using the machine safely, read this manual.

Since we continually strive to incorporate latest developments in the construction of the machine, it is quite possible at time, due to printing and shipping requirements, some data may not correspond to the machine in the question.

PASSPORT DATA

MODEL:

SERIAL NO:

MANUFACTURING YEAR:

MAIN EL. POWER

V

Ph

Hz



When ordering replacement parts, please furnish:

MODEL NO / SERIAL NO / PART NO

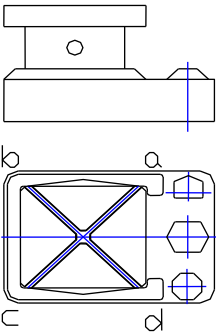
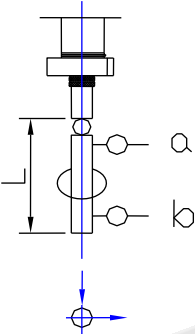
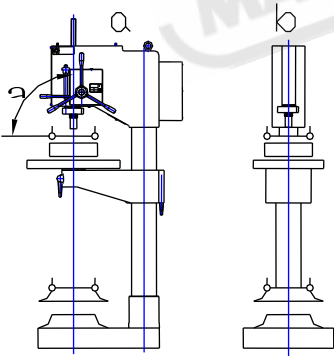
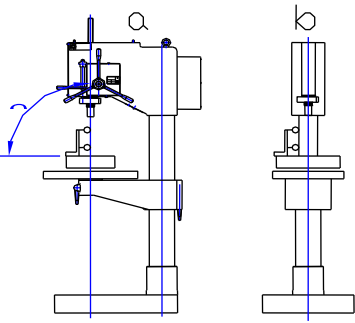
LIMITED WARRANTY

We makes every effort to assure that our products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follow: ONE YEAR LIMITED WARRANTY ON ALL PRODUCTS UNLESS SPECIFIED OTHERWISE. This Warranty dose not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear and tear or alterations outside our facilities, or to a lack of maintenance.

We shall in no event be liable for death, injuries to persons or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, the product or part must be returned to for examination, postage prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, we will either or replace the product, or refund the purchases price if we cannot readily and quickly provide a repair or replacement, if you are willing to accept a refund. We will return repaired product or replacement at our expense, but if it is determined there in no defect, or that the defect resulted from causes not within the scope of our warranty, then the user must bear the cost of storing and returning the product.

TEST PROTOCOL

No	Diagram of measuring method	Inspection item	Tolerance	Data
G1		Plane ness of table and base	0.12	
G2		Spindle taper run out a. At the end of spindle nose b. At the end of 200mm test bar	a. 0.03 b. 0.06	
G3		Verticality of spindle center line to table a. Transverse direction b. Longitudinal direction	a. 0.10/300 ($a \leq 90^\circ$) b. 0.10/300	
G4		Verticality of spindle sleeve vertical travel to table a. Transverse direction b. Longitudinal direction	a. 0.10/150 ($a \leq 90^\circ$) b. 0.10/150	

MAIN SPECIFICATIONS

Maximum drilling diameter	40mm
Taper of spindle hole	MT4#
Distance from the center of spindle to The surface of the vertical column	350mm
Maximum travel of spindle	180mm
Range of spindle speed	50~1450rpm
Maximum distance from spindle nose to Base plate working surface	1215mm
Maximum distance from spindle nose to working table	770mm
Dimensions of working table	560×560mm
Dimensions of base	730×500mm
Width of T-slot	18mm
Distance of T-slot of base	150mm
Range of feed	0.1,0.2mm/rev
Power of main motor	1.5kw
Power of coolant pump	40W
Overall dimension (L×W×H)	940×560×2260mm
Packing size (L×W×H)	1150×700×2280mm
Gross weight/Net weight	610/460kg

TRANSPORT

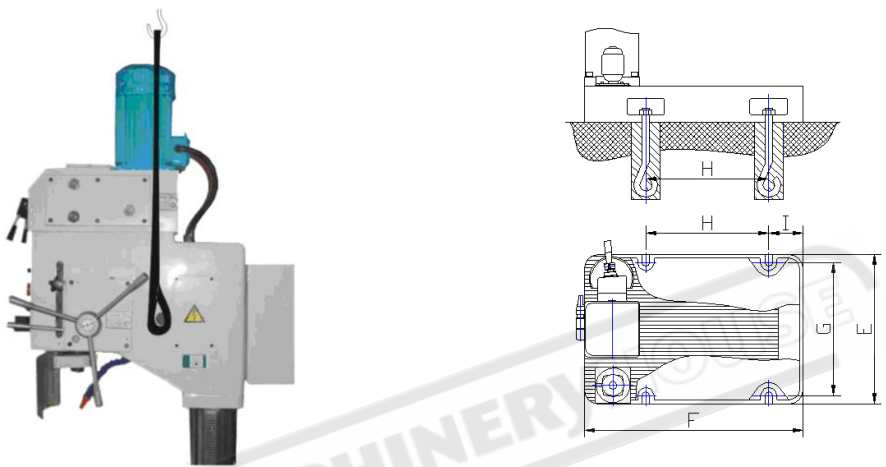
Insert an iron bar through the transversal hole in the machine head which, with the aid of a rope, will be used for lifting the machine

INSPECTION

The machine should be carefully examined on arrival, to check that it is complete and in good order, so that claims can be made, if necessary.

CLEANING

Remove all anti-rust compounds. Clean and lubricate all movable parts.



	E	F	G	H	I
Mm	500	730	360	410	115
inch	19 3/4"	28 3/4"	14 1/8"	16 1/8"	4 1/2"

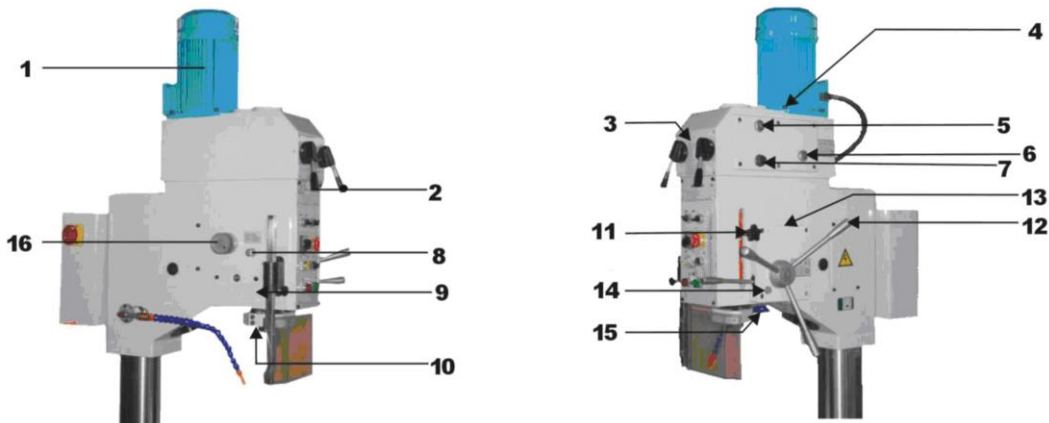
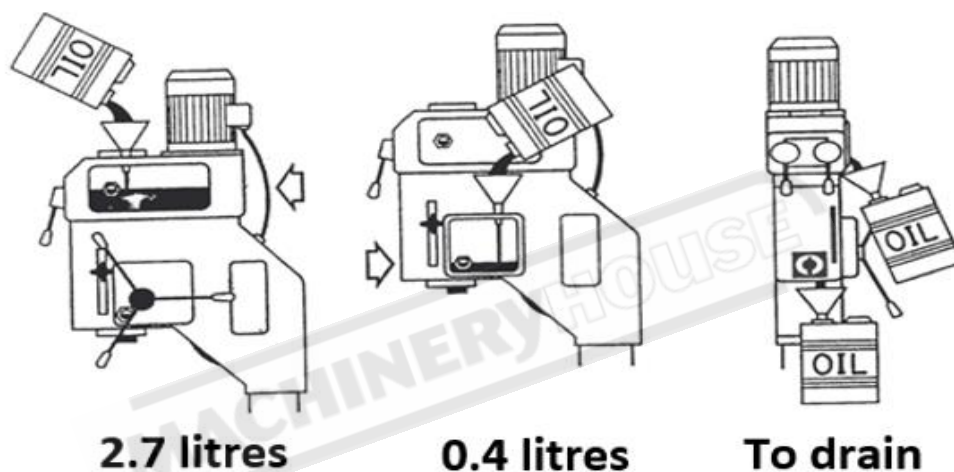


Fig. 1

GENERAL DESCRIPTION

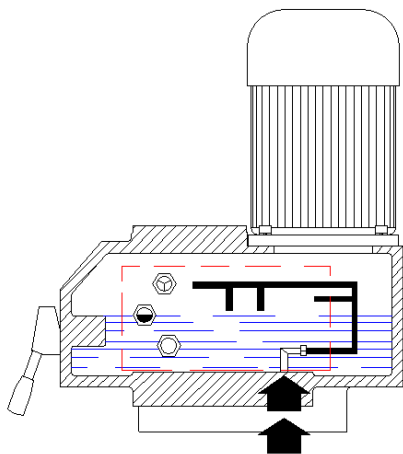
See Fig. 1

- | | |
|-------------------------------|------------------------------|
| 1 Driving motor | 10 Manual control gear box |
| 2 Speed selectors | 11 Deep stop |
| 3 Speed plate | 12 Rapid manual feed control |
| 4 Oil filling opening | 13 Oil filling opening |
| 5 Oil pump control sight gage | 14 Oil level window |
| 6 Oil level window | 15 Oil draining plug |
| 7 Oil draining plug | 16 Feed selector |
| 8 Tool ejector | |
| 9 Spiral spring housing | |



FILLING WITH OIL

Oil quantities shown above are only approximate.
Only ever filled to the red mark on the oil sites as described below



Attention! The machine is supplied without oil for transport reasons.

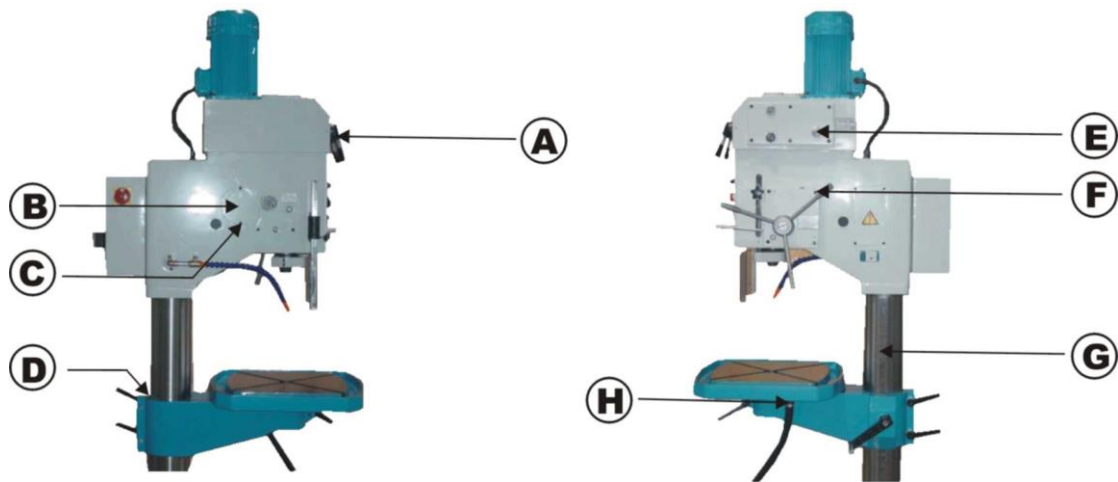
The top speed box incorporates an oil pump to lubricate the gears. Remove the upper plug, Fill oil by using a funnel. Stop filling oil when oil level reaches the red mark on level window.

The Lower feed box is just an oil bath type oiler, Remove plug in the top of the feed box and fill as needed to the red mark on level window

These red marks must be never exceeded; as otherwise, the oil will overflow out the machine.

If this occurs, remove plug and drain oil until oil level goes down to red mark on level window.

LUBRICATION



- A** Quill Spindle Daily lubricate with oil the greaser located next the spiral spring cover.
- B** Quill gearing shaft Daily lubricate with oil the lubrication port on the spiral spring cover.
- C** Quill Clean and lubricate with grease the rack for upward and downward displacement of quill-spindle.
- D** Column Clean and grease with oil every 50 hours.
- E** Speed box Fill the box with oil until reaching the indicated level. Change oil every 2000 hours.
- F** Feed box Fill the box with oil until reaching the indicated level. Change oil every 2000 hours.
- G** Rack Clean and lubricate with grease every 50 hours.
- H** Table Daily lubricate with oil the two lubrication points.



SPEED SELECTOR

By means of levers spindle speeds are selected. Left lever selects a colour. Depending on the color selected. Right lever selects a spindle speed value. For moving these levers, slightly pull them and then rotate.

FEEDS SELECTOR

To select the feed speed, turn the side selector until the required point (value).



AUTOMATIC TOOL EJECTOR

To remove tool from the spindle, perform the following operations:

1. -Lower the spindle from the reels a little bit and introduce the extractor bolt.
2. -Raise the spindle from the reels.
3. -Hold the tool with the hand when raising the spindle or it will fall on to the table

ATTENTION: Do not leave the extractor bolt introduced.

RETURN SPRING

To tighten the return spring in model extract the quill until the teeth of the working gear can move freely. Then move the reels in the arrow direction and introduce the quill again.

Unfasten the screws in the plastic cover and turn this cover in positive direction, once it is tightened, fasten the screws again.





AUTOMATIC FEED

Models incorporate mechanical automatic feed.

The way to proceed is the following:

1. -Regulate the stroke at the depth top.
2. -Select the feed.
3. -Place the lever of the automatic feed.

At the end of the stroke, the depth top displaces the lever of the automatic feed.

The lever can also be displaced manually.

TORQUE LIMITER

The gearbox is fitted with a stopping device which works in the event of overload.

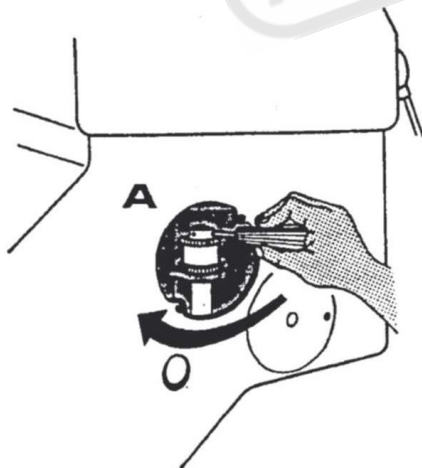
If the feed stops during drilling and the tool continue to revolve, it is a sign that it is overloaded.

When the load is reduced, the feed starts up again.

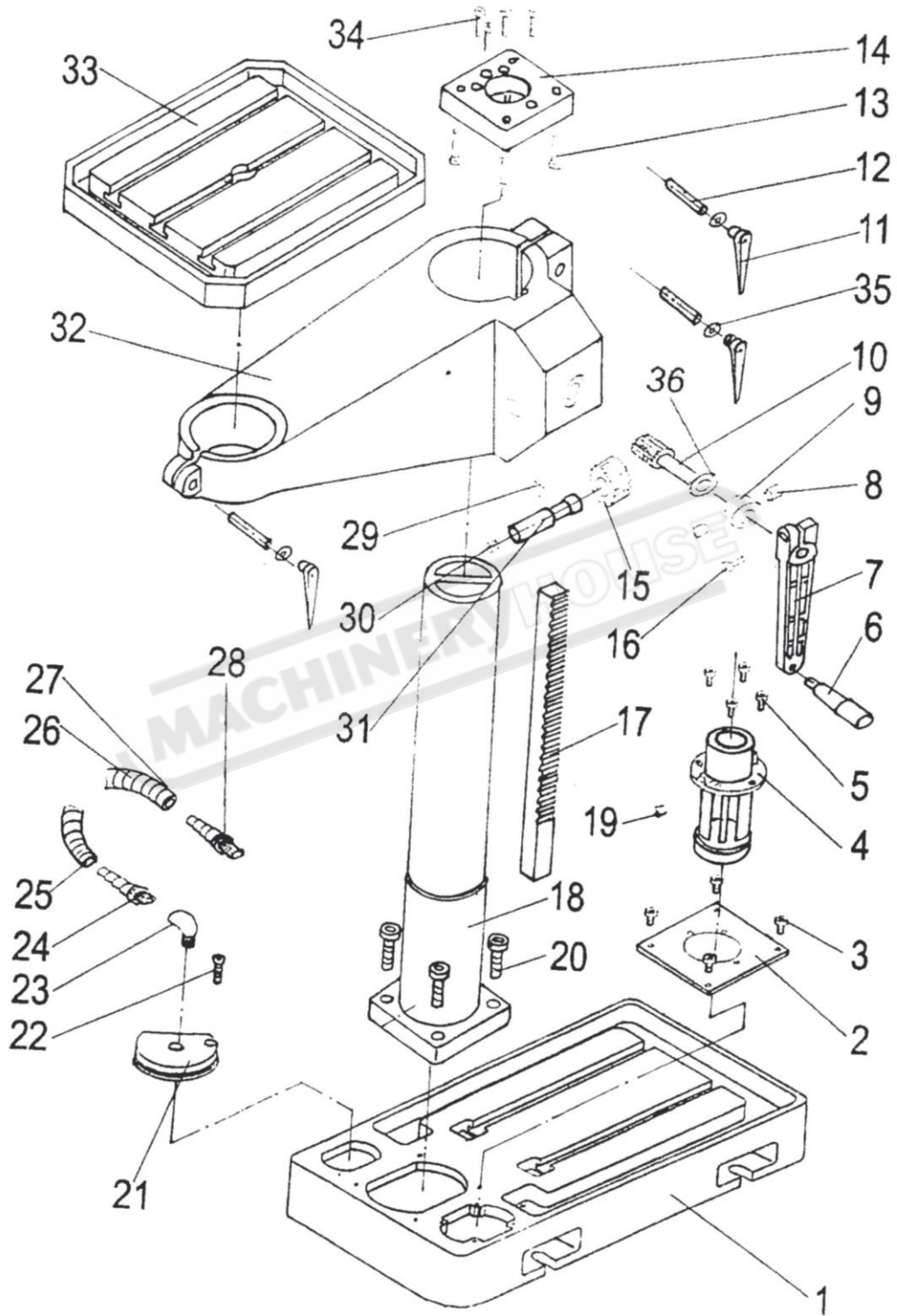
If for any reason, such as due to wear of the limiter discs or the need for a higher working load, it is required to readjust it, we recommend the following action.

---From the inspection hole and guided by the limiter assembly shown on page 17 tighten the nut Z5040.03-56 (index No.79)

This mechanism has been adjusted in our works, by measuring the maximum admissible axial load, with a tens meter. Therefore, do not tighten the nut too much, so as to avoid risk of breaking the mechanism.



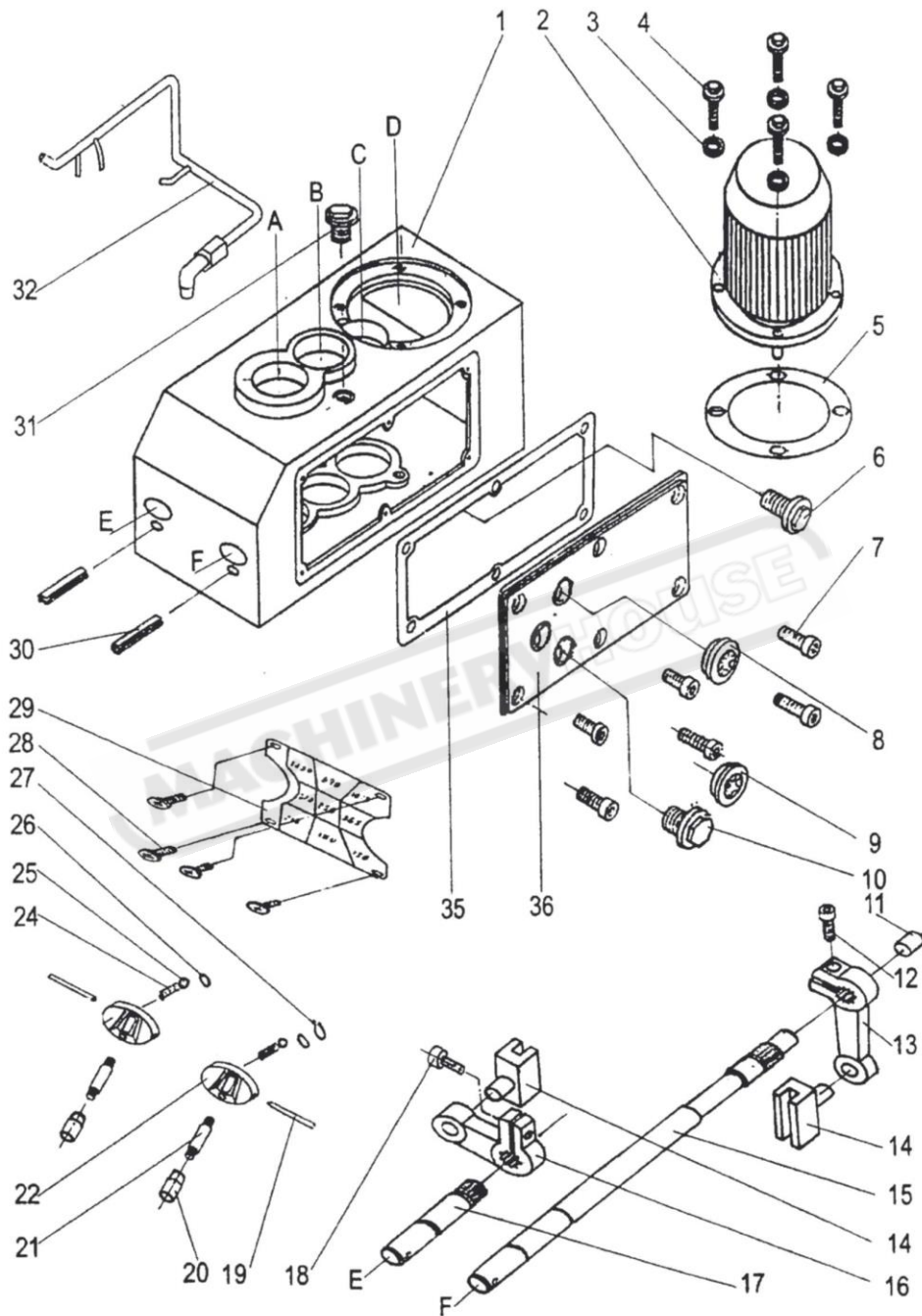
I .Table Support and Coolant



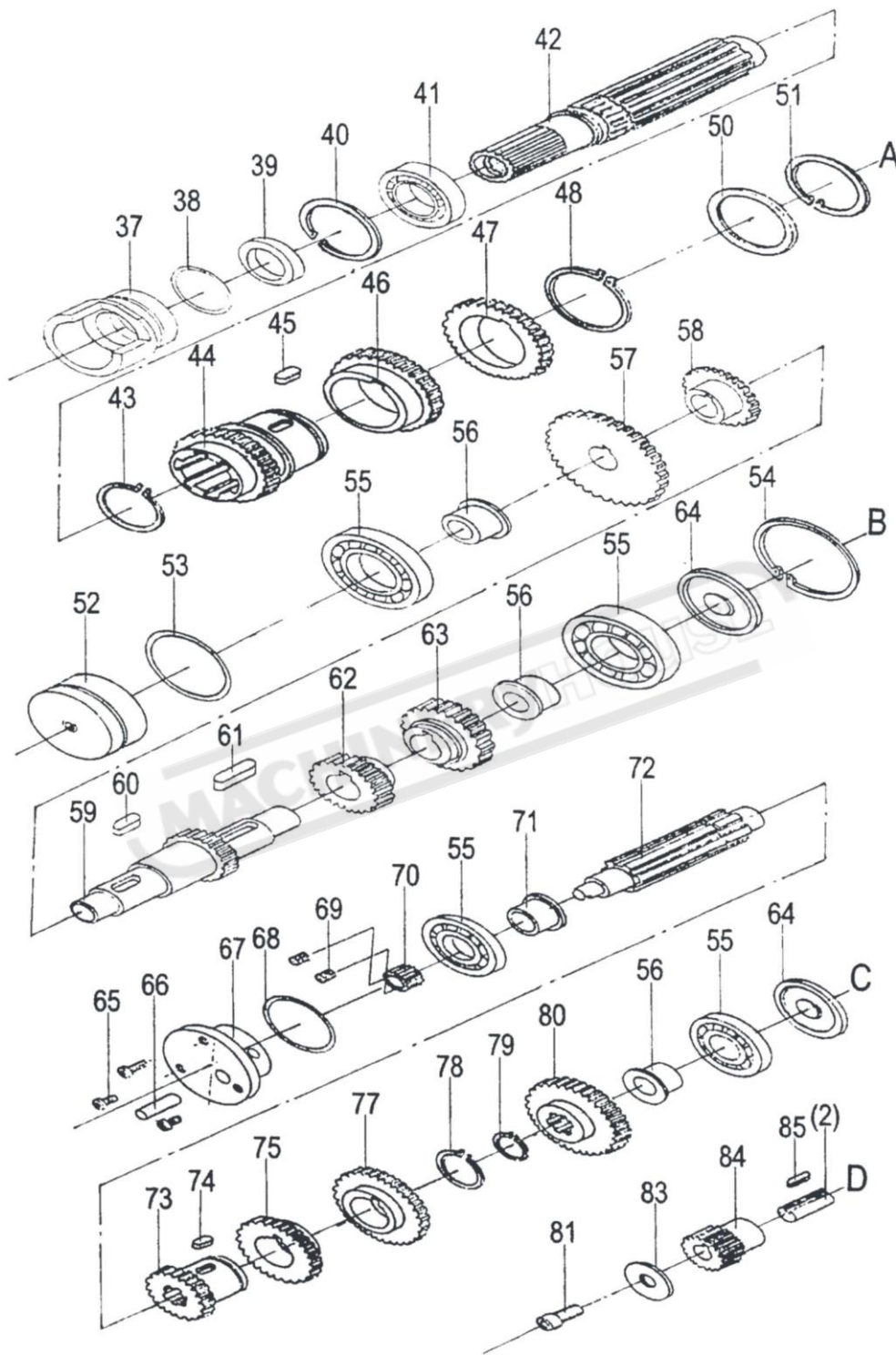
I .Table Support and Coolant

Index No.	Parts No.	Description	Qty.
1	Z5040.01-01	Base	1
2	Z5040.01-03	Plate	1
3	GB70/M6×12	Screw	4
4	DB-12	Coolant Pump	1
5	GB70/M5×8	Screw	4
6	GB4141.5/M10	Knob	1
7	Z5040.01-17	Handle	1
8	GB79/M10×10	Screw	2
9	Z5040.01-18	Clamp Collar	1
10	Z5040.01-19	Worm	1
11	Z52-2/A-M16×114	Knob	3
12	M16×85C	Handle Shaft	3
13	GB70/M14×55	Screw	4
14	Z5040.01-04	Plate	1
15	Z5040.01-11	Gear	1
16	GB70/M8×20	Screw	1
17	Z5040.01-20	Rack	1
18	Z5040.01-02	Column	1
19	G38-3A/Z3/8``	Plug	1
20	GB70/M14×55	Screw	4
21	Z5040.01-08	Cover Plate	1
22	GB70/M8×16	Screw	1
23	G32894/ /2``	Reducing Nipple	1
24	Z5040.01-09	Elbow	1
25	φ6×1.5×1300	Flexible Tube	1
26	DN23×1.520.2100.14	Flexible Tube	1
27	ZBJ51002/32	Coupling	4
28	Z5040.01-13	Tee	1
29	GB77/M8×12	Screw	1
30	GB1155/8	Oil Cup	1
31	Z5040.01-10	Gear Shaft	1
32	Z5040.01-07	Table Support	1
33	Z5040.01-06	Table	1
34	GB70/M14×55	Screw	4
35	GB97/16	Washer	3
36	GB/T301 51104	Bearing	1

II .Speed Box (1/2)



II .Speed Box (2/2)

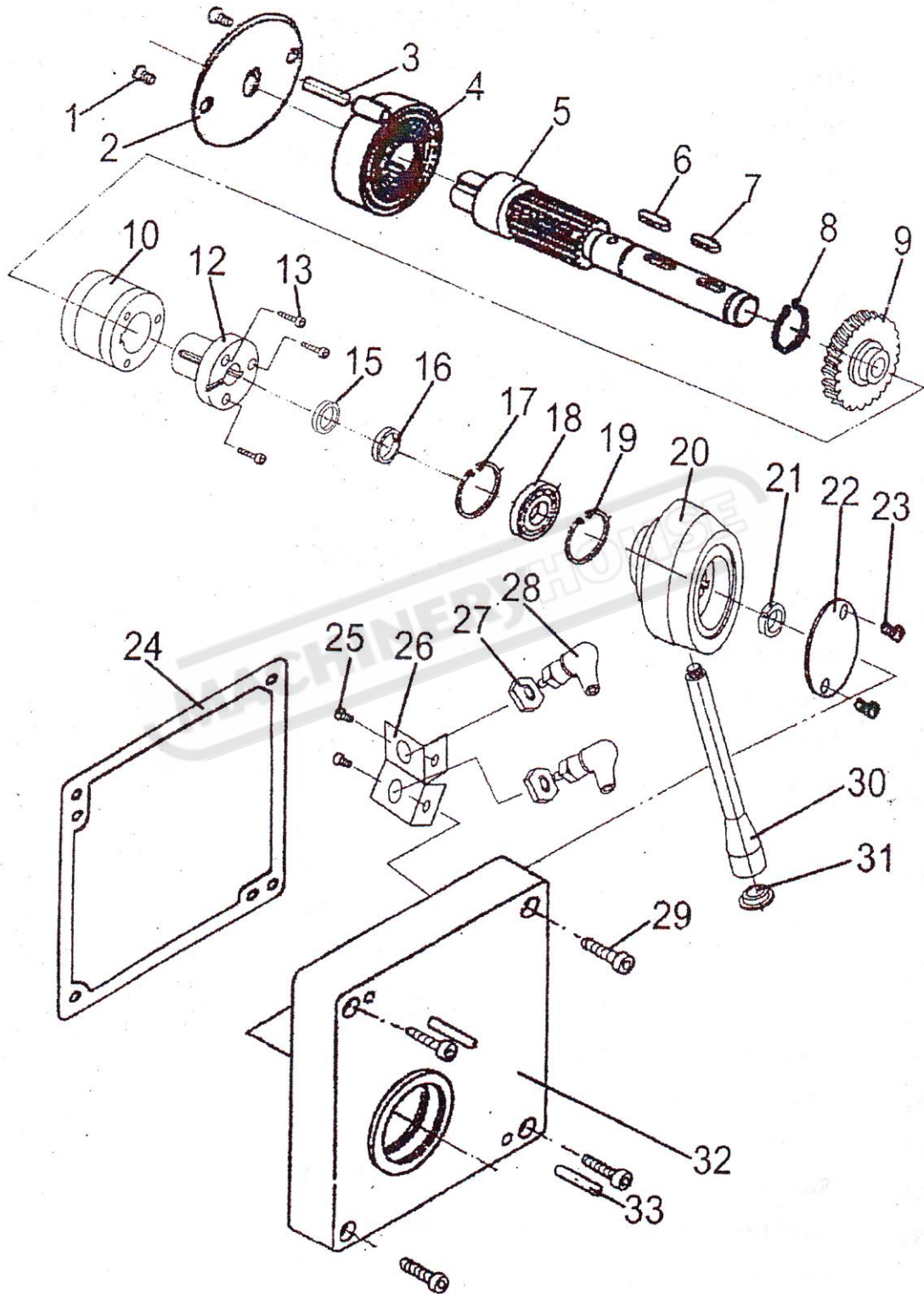


II .Speed Box

Index No.	Parts No.	Description	Qty.
1	Z5040.02-01	Gear Box	1
2	YD100L	Driving Motor	1
3	GB/T93/10	Washer	4
4	GB70/M10×35	Screw	4
5	Z5040.02-13	Gasket	1
6	G38-3A/Z3/8``	Drain Plug	1
7	GB70/M8×16	Screw	6
8	M27×1.5	Sight Glass	1
9	M27×1.5	Sight Hub	1
10	G38-2A/M27×1.5	Screw	1
11	Z5040.02-38	Plug	1
12	GB70/M8×25	Screw	1
13	Z5040.02-37	Shift Lever	1
14	Z5040.02-39	Shift Fork	2
15	Z5040.02-36	Shaft	1
16	Z5040.02-40	Shift Lever	1
17	Z5040.02-41	Shaft	1
18	GB70/M8×25	Screw	1
19	Z5040.02-05	Pin	2
20	GB4141.14/BM10×50	Knob	2
21	BM10×50	Handle	2
22	Z5040.02-04	Handle	2
24	GB2089/1×8×20	Spring	2
25	GB308/9.35	Steel Ball	2
26	GB3452.1/15×2.65	O-Ring	2
27	GB894.1/20	Retainer Ring	1
28	GB67/M3×6	Screw	4
29	Z5040.02-08	Plate	4
30	GB879/5×12	Pin	2
31	G38-3A/Z3/8``	Drain Plug	2
32	Z5040.02-42	Lubrication Tube	1
35	Z5040.02-10	Gasket	1
36	Z5040.02-03	Speed Box Lover	1
37	Z5040.02-09	Flange	1
38	GB3452.1/61.5×3.55	O-Ring	1
39	GB9877.1/FB405508	Spacer	1
41	GB276 6008	Bearing	2

42	Z5040.02-22	Shaft	1
43	GB894.1/48	Retainer Ring	1
44	Z5040.02-21	Gear	1
45	GB1567/8×5×36	Key	1
46	Z5040.02-20	Gear	1
47	Z5040.02-23	Gear	1
48	GB894.1/60	Retainer Ring	1
50	Z5040.02-06	Flange	1
51	GB70/M5×16	Retainer Ring	5
52	Z5040.02-25	Plug	1
53	GB3452.1/54.5×3.55	O-Ring	1
55	GB276/206	Bearing	4
56	Z5040.02-15	Sleeve	3
57	Z5040.02-26	Gear	1
58	Z5040.02-24	Gear	1
59	Z5040.02-19	Gear Shaft	1
60	GB1567/8×5×36	Key	1
61	GB1567/8×5×50	Key	1
62	Z5040.02-18	Gear	1
63	Z5040.02-17	Gear	1
64	Z5040.02-07	Flange	2
65	GB70/M6×16	Screw	3
66	GB119/B10×30	Pin	1
67	Z5040.02-27	Flange	1
68	GB3452.1/56×2.65	O-Ring	1
69	GB879/2.5×10	Pin	2
70	Z5040.02-30	Gear	2
71	Z5040.02-29	Sleeve	1
72	Z5040.02-32	Shaft	1
73	Z5040.02-31	Gear	1
74	GB1567/6×4×36	Key	1
75	Z5040.02-33	Gear	1
77	Z5040.02-34	Gear	1
78	GB894.1/35	Retainer Ring	1
79	GB894.1/25	Retainer Ring	1
80	Z5040.02-16	Gear	1
81	GB70/M6×10	Screw	1
83	GB5287/6	Washer	1
84	Z5040.02-11	Gear Shaft	1
85	GB1567/C6×4×28	Key	1

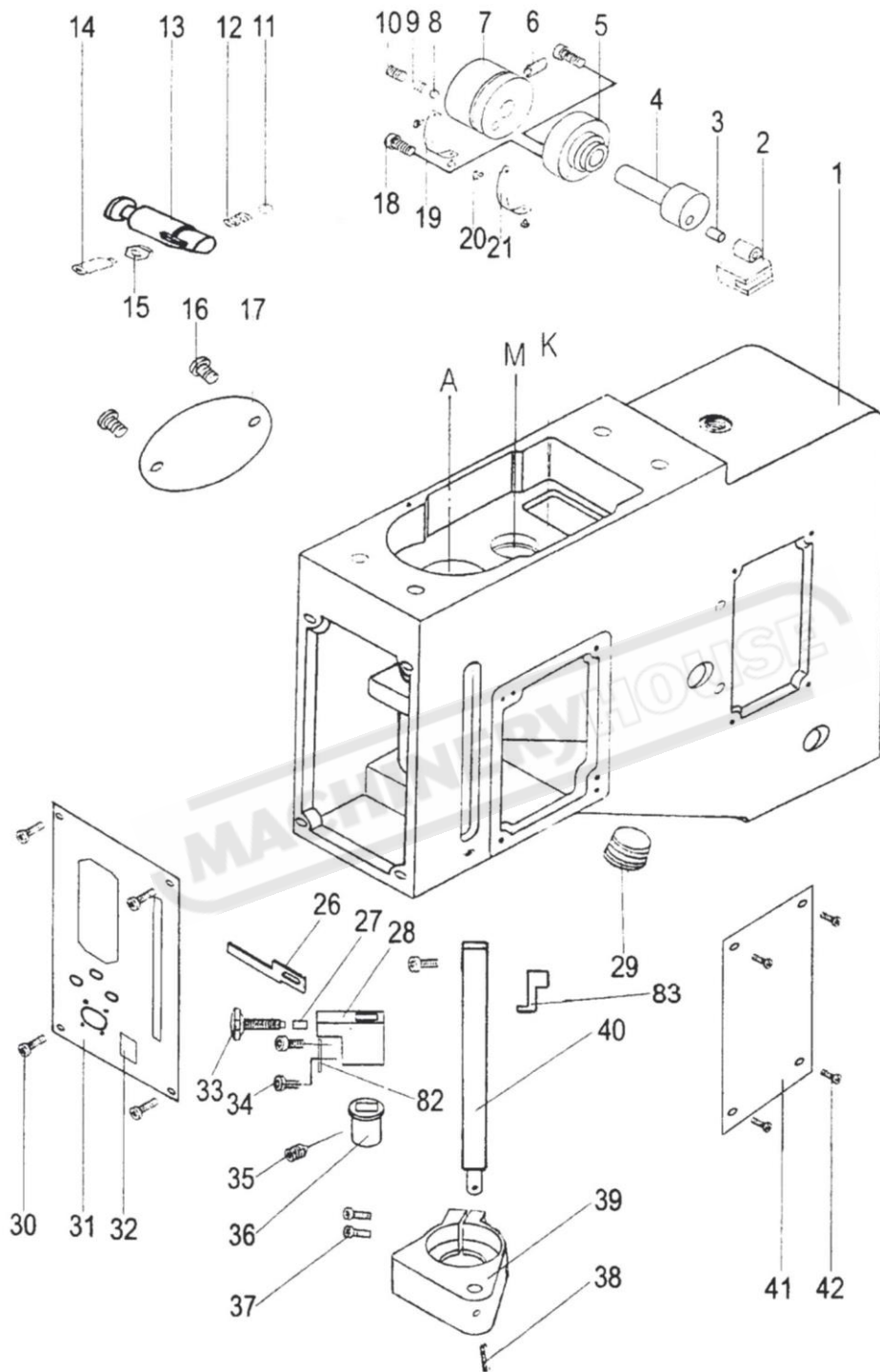
III.Feed Box



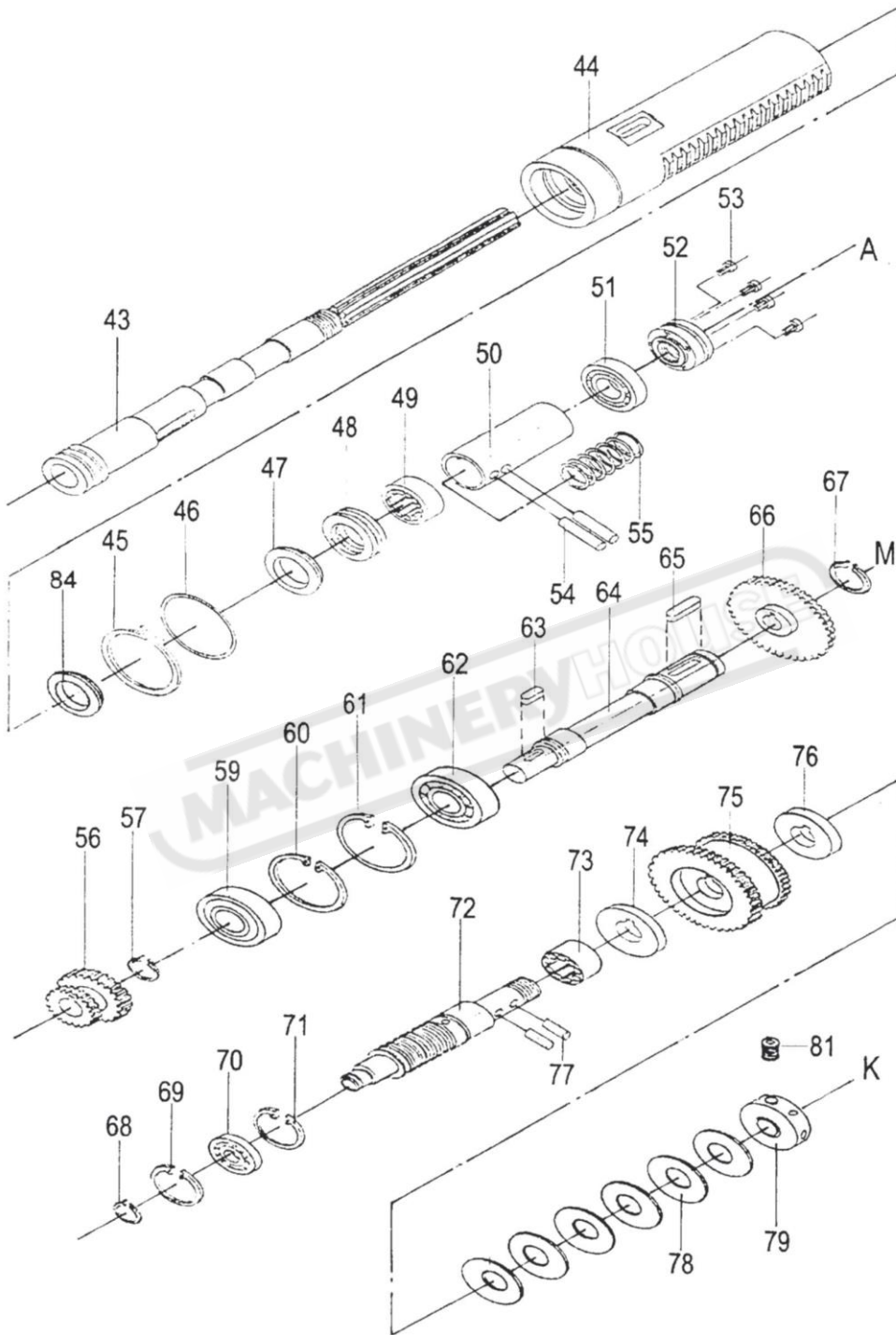
III.Feed Box

TmdeNo	Parts No	Desvription	Qty
1	Screw	GB823/M6×12	2
2	Plate	Z5040-03-18A	1
3	Pin	GB879/6×50	1
4	Spring	Z5040-03-42A	1
5	Gear Shaft	Z5040-03-43A	1
6	Key	GB/T1096 8×25	1
7	Key	GB/T1096 8×25	1
8	Retainer Ring	GB/T894.1 25	1
9	Worm gear	Z5040-03-45A	1
10	Electromagnet ic Tooth Clutches With Positioning		1
12	Collar		1
13	Scyew	GB70/M4×16	3
15	Collar	Z5040-03-75A	1
16	Collar	Z5040-03-76A	1
17	Retainer Ring	GB893.1/47	1
18	Bearing	GB276/7000105	1
19	Retainer Ring	GB893.1/47	1
20	Handle	Z5040-03-49A	1
21	Nut	GB/T812 M24×1.5	1
22	Plate	Z5040-03-77A	1
23	Screw	GB/T818 M4×6	2
24	Gasket	Z5040-03-46A	1
25	Screw	GB/T70.1 M5×8	2
26	Bracket	Z5040-03-74A	1
27	Nut		2
28	Brush		2
29	Screw	GB70/M8×40	4
30	Handleshaft	Z5040-03-06A	3
31	Handle	Z5040-03-73A	3
32	Cover	Z5040-03-50A	1
33	Pin	GB879/8×45	2

IV.Headstock (1/2)



IV.Headstock (2/2)

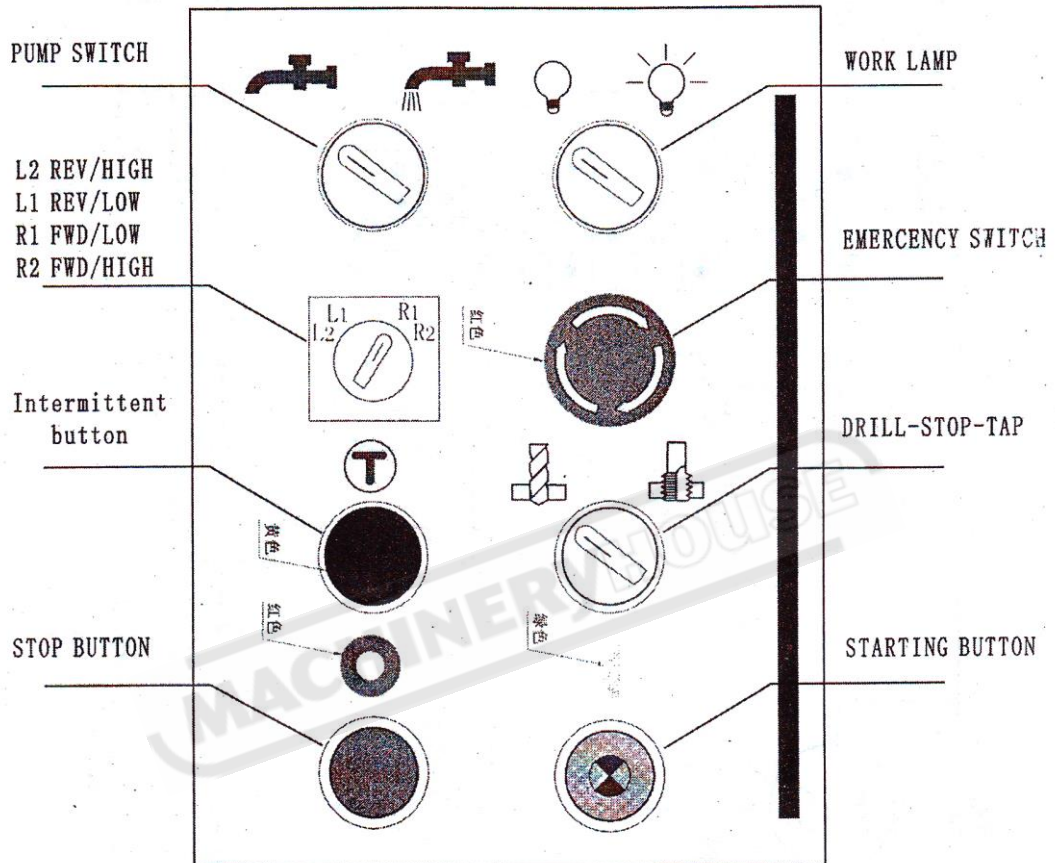


IV.Headstock

Index No.	Parts No.	Description	Qty.
1	Z5040.03-01	Headstock	1
2	Z5040.03-65	Shift Fork	1
3	GB119/10×25	Pin	1
4	Z5040.03-66	Shift Lever	1
5	Z5040.03-70	Handle	1
6	GB79/M8×12	Screw	1
7	Z5040.03-69	Handle	1
8	GB308/M8×8	Ball	1
9	GB2089/1×5×25	Spring	1
10	GB77/M8×8	Screw	1
11	GB308/8	Ball	1
12	GB2089/0.8×5×15	Spring	1
13	Z5040.03-64	Shaft	1
14	GB79/M8×25	Screw	1
15	GB6172/M8	Nut	1
16	GB823/M6×8	Screw	2
17	Z5040.03-17	Plate	1
18	GB70/M6×20	Pin	2
19	Z5040.03-68	Plate	1
20	GB827/2×4	Pin	4
21	Z5040.03-67	Index Ring	1
26	Z5040.03-61	Slate Plate	1
27	GB119/8×20	Pin	1
28	Z5040.03-60	Bracket	1
29	GB38/3A/Z3/8`	Plug	1
30	GB70/M6×8	Screw	4
31	Z5040.03-04	Cover Plate	1
32	Z5040.03-02	Plate	1
33	Z5040.03-15	Handle	1
34	GB70/M5×6	Screw	2
35	GB78/M6×12	Screw	1
36	Z5040.03-63	Collar	1
37	GB70/M8×45	Screw	2
38	GB78/M6×12	Pin	1
39	Z5040.03-40	Holder	1
40	Z5040.03-39	Shaft	1
41	Z5040.03-12	Cover plate	1

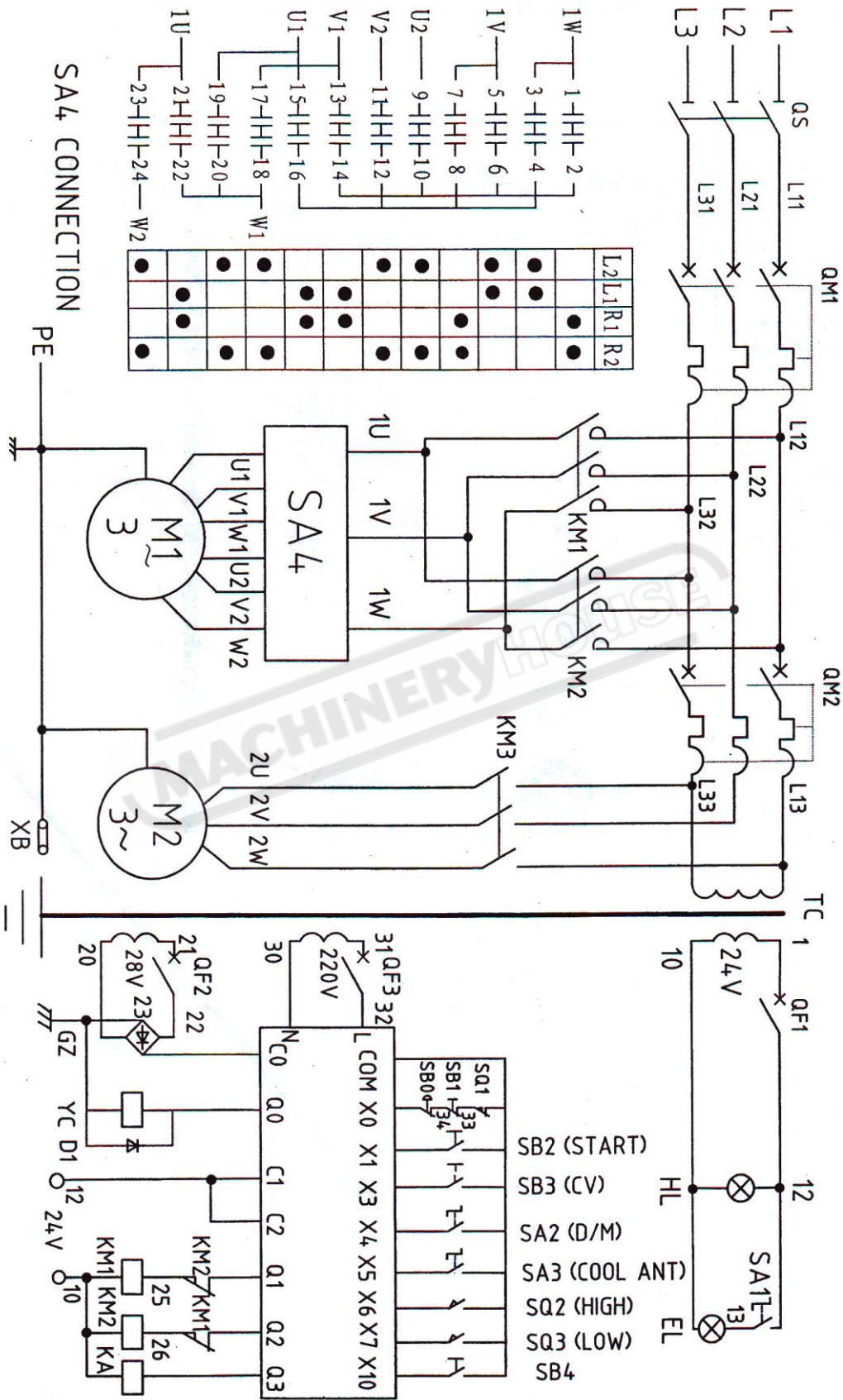
42	GB823/M6×8	Screw	4
43	Z5040.03-28	Spindle	1
44	Z5040.03-27	Quill	1
45	GB894.1/75	Retainer Ring	1
46	GB1235/73×5.3	O-Ring	1
47	Z5040.03-41	Washer	1
48	GB301/D8108	Bearing	1
49	GB/T5801/RUA49/32	Bearing	1
50	Z5040-03-26	Small Quill	1
51	GB279/180106G	Bearing	1
52	Z5040.03-29	Clamp Nut	1
53	GB70/M5×12	Screw	2
54	GB119/12×45	Pin	2
55	Z5040.03-25	Spring	1
56	Z5040.03-38	Gear	1
57	GB894.1/25	Retainer Ring	1
59	GB279/180205	Bearing	1
60	GB893.1/52	Retainer Ring	1
61	GB893.1/52	Retainer Ring	1
62	GB279/180205	Bearing	1
63	GB1096/A6×28	Key	1
64	Z5040.03-31	Shaft	1
65	GB1096/A6×12	Key	1
66	Z5040.03-30	Gear	1
67	GB894.1/25	Retainer Ring	1
68	GB894.1/15	Retainer Ring	1
69	GB893.1/32	Retainer Ring	1
70	GB279/180102	Bearing	1
71	GB893.1/32	Retainer Ring	1
72	Z5040.03-57	Worm	1
73	GB290/46941/25	Bearing	1
74	Z5040.03-54	Collar	1
75	Z5040.03-53	Gear	1
76	Z5040.03-54	Collar	1
77	GB119/6×8	Pin	2
78	GB1972/45×24×1.75	Spring	6
79	Z5040.03-56	Clamp Nut	1
81	GB77/M8×8	Screw	1
82	Z5040.03-59	Plate	1
83	Z5040.03-58	Plate	1
84	Z5040.03-24	Washer	1

OPERATION PANEL



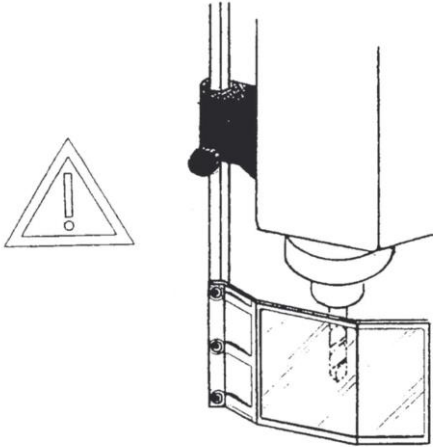
50--1450rpm

Wiring diagram



ELECTRICAL SCHEMATIC SYMBOL GLOSSARY

CODE	NAME	FUNCTION	SPECIFICATION
M1	MAIN MOTOR	SPINDIE	YD100L-4/8
M2	PUMP	COOLANT	DB12
QF1	CIRCUIT BREAKERS	M1 PROTECTION	3VU13400MJ00
QF2	CIRCUIT BREAKERS	M2 PROTECTION	DZ47-60/D1, 2P
QF3	CIRCUIT BREAKERS	CONTROL CIRCUIT PROTECTION	DZ47-60/C3, 1P
SA1	MAIN SWITCH	POWER ON/OFF	JCH13-20/3
SA2	SWITCH	FWD-REV/HIGH-LOW SELECTION	LW8PS-20
SA3	SWITCH	PUMP SWITCH	LAY3-11X/2
SA4	SWITCH	LAMP SWITCH	LAY3-11X/2
SA5	SWITCH	DRILL-STOP-TAP	BJA-D2B22S
KM1	AC CONTACTOR	FORWARD CONTROL	3TB4122
KM2	AC CONTACTOR	REVERSE CONTROL	3TB4122
KM3	RELAY	PUMP CONTROL	3TH8031 24V
KA	RELAY	AUTORESTART PROTECTION	3TH8031
SB1	BUTTON	EMERGENCY STOP	LA38-11MXS/209B
SB2HL1	BUTTON+PILOT LAMP	STOP BUTTON+PILOT LAMP	BJA-ER0124L
SB3HL2	BUTTON+PILOT LAMP	START BUTTON+PILOT LAMP	BJA-ER0124L
SB4	BUTTON	RETURN BUTTON	BJA-AY11
SQ1	LIMIT SWITCH	TOP LIMIT SWITCH	LWW5-11N1
SQ2	LIMIT SWITCH	BOTTOM LIMIT SWITCH	LXW5-11N1
SQ3	LIMIT SWITCH	CHUCK COVER SWITCH	LXW16-5/1C2
EL	WORKING LAMP	WORKING LAMP	SC-108E,24V, 35W
TC	TRANSFORMER	CONTROL VOLTAGE	JBK5-100 24V



DRILL PROTECTION GUARD

The machine is provided with a security micro drill guard.

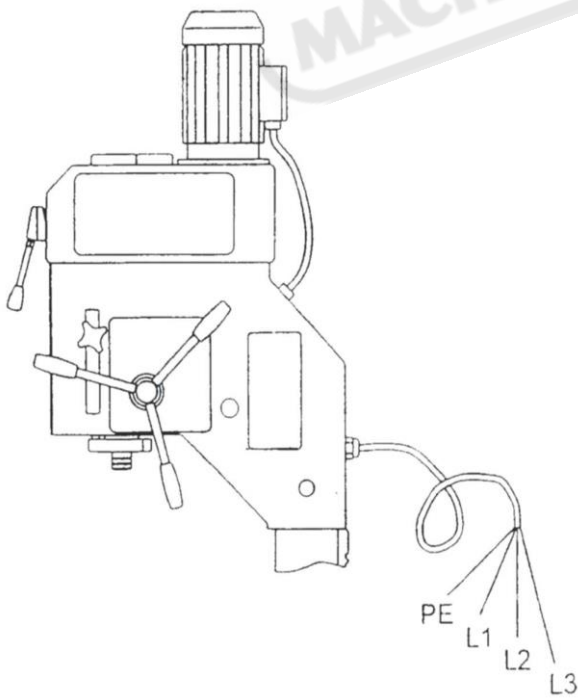
Before pressing the starting push button, set the drill guard in the working position, otherwise the machine controls will not start. Note: If the guard is opened when operating the machine, the machine will stop.

Do not remove the guard under any circumstances.

● ELECTRIC CONNECTION

The electric connection is a dangerous operation. This task must be carried out by trained or authorized staff for such purpose.

WARNING: The electric cabinet of the machine does not include the protection differential switch. The user must install an individual power supply for the machine, including a protection differential switch of 0,300 amps sensibility and the earth connection.



The present machine has a 4 wire electric hose to connect it to the electric power supply through a protection differential switch. Do always connect the PE protection wire first and after that all the others. Connection voltage: the features sheet shows the voltage the machine must be connected to.

Total power installed 1.5KW

WARNING: Once the electric connection has been made, make sure that has been made, make sure that the main screw turns clockwise and that the motor pump (if required on machine model) pumps the coolant liquid. Should not this happen so, invert the current inlet phases.

ATTENTION: Auxiliary circuit under tension once the main power switch of machine has been deactivated

Attention: In this machine, when the main power switch is placed at "0" position, the minimum tension auxiliary circuit remains under tension.

For minimum tension auxiliary circuit maintenance or reparation jobs, put first at "0" position the protection differential switch to which the machine has been connected. In this way, the whole machine electric circuits will remain without electric tension.

In some machine models, the operator must open the machine head cover of changing spindle speeds. In that case, press the emergency pushbutton first and then, only the minimum tension auxiliary circuit will remain under tension. The circuit under tension is identified by the orange color wiring or otherwise, corresponding warning tables will be stuck to the associated wiring. The rest of the electric circuit will remain without electric tension.

Please, check thoroughly the electric drawing of the supplied machine in the instruction book for any maintenance or reparation job.

Note: The machine must be connected to the electric power through a protection differential switch. Any electrical maintenance or reparation job must be made for qualified and trained technician.



SAFETY AND GENERAL INFORMATION

1.SAFETY:

A drilling machine, due to its purpose, is considered an “open machine” Therefore, some safety measures have to be taken to avoid accidents.

Bear in mind the following safety instructions:

- The machine must always be operated for the purpose for which was designed.
- Do not ever stand under a hanging machine or nearby, when it is been loaded for transportation.
- Connect the machine to an exclusive electric connection, which includes a differential switch of protection. Plug in first the green-yellow protection wire and then the others.
- The piece must always be fastened with suitable devices. Do not ever handhold the pieces.
- Sharpened tools in good condition must always be used.
- Appropriate tools must always be used, Do not ever adapt a tool for a use for which it was not designed.
- Use the correct speeds and feeds for the material being machined as well as for the tool being used.
- Use glasses to prevent small chips from getting in the eyes.
- Insert the tools correctly in the tool holder cone.
- Fix the piece fastening devices to the machine table.
- Do not wear baggy clothes, loose gloves, etc, which can be caught by the tool while drilling.
- Keep the working place clean.
- Gather the chips with suitable instruments (brush, gloves, etc.).
- Before carrying out any operation which is not strictly drilling, tapping etc. (like lubricating, changing of tools, etc.) turn the main switch to the “0” position.
- Before changing speeds, stop the machine and wait until all moving elements are completely brought to a halt.
- Do not ever leave the machine on without supervision. When leaving the machine, check that the general switch is in the “0” position and that moving elements are stopped.
- Check periodically the correct operating of all security controls and elements of the machine.
- Before pressing the starting pushbutton, set the drill protector guard in the working position.
- Consider work area environment. Don't use electric power driven tools in damp or wet locations. Keep work area well lit. Don't use electric power tools in presence of flammable liquids or gases.

- Keep children away.
- Use only such accessories and attachments as are recommended in the operating instructions or the catalogue for the power tool concerned.

2. FORESEEN USE OF THE MACHINE

The drilling machine was designed to be used with specific tools and for certain machining operations.

The most common machining operation is the drilling of holes with helicoidal drills. The drilling of hole is carried out by the combination of a drill turning movement and a feed movement in the turning spindle direction.

Besides the helicoidal drill, other tools can be used to drill holes. There is a great variety of drill types and shapes in the market which can be used on this machine, provided that they are designed for such a purpose and that can be fixed in the spindle taper. They will usually be the Morse taper or ISO type. The drill shanks should have the corresponding taper to the spindle in which they are to be fitted, or parallel shank if they are going to be fitted by means of a tool holder. Contact the tool manufacturer for any further information. Do not ever use tools which were not designed to be used in a drilling machine and that have been adapted.

A drilling machine can also perform other machining operations a part from the drilling, such as tapping, reaming, chamfering, punch marking, countersinking, spot facing, to perform such operations, it is necessary to have appropriate tools, specially designed for this sort of jobs. In the tapping case, besides using correct tool, the machine has to be provided with such a device that verses the turning direction of the tool when it reaches the depth previously fixed.

3.CORRECT USE OF THE MACHINE

- Not exceeding its working capacity.
- Operating the machine by qualified and trained staff and according to the points mentioned in the instruction book.
- Working under the safety systems provided with the machine, checking them and keeping them.
- Watching the safely measures mentioned in the instruction book and notices on the machine.
- Wearing clothes which provide personal as mentioned in the instruction book.
- Watching the safely measures which may affect work in the machine and that can be lawfully expected, as well as those demanded in the workshops.

4.PIECE CLAMPING.

Tangential cutting forces and axial forces in the feed direction of the tool are

mainly produced during the drilling process. The tangential forces produce a moment of forces which make the piece being drilled turn. Therefore, the pieces to be drilled (or to be machined by one of the operations mentioned above) must be clamped in an appropriate device such as a drill chuck and the drill chuck must be correctly clamped to the machine table. For this reason the machine tables are provided with "T" slots.

The pieces must be clamped conveniently by some clamping device.

The clamping devices in turn must be clamped to the machine table.

The machine table is provided with "T" slots for such purpose.

5.TOOL FIXING

The tools generally used in this machine will have parallel or taper shanks.

Drill holders are normally used to fix to the main spindle of the machine the parallel shank tools. This fixing device is used for small drill diameters (max. up to dia.16mm). Bigger diameter drills, usually have taper shank of Morse taper (the ones of smaller diameters to 16mm can have taper shanks).

The housing in the main spindle to insert the tool is of Morse taper type. It is very important to insert the tool taper correctly in the main spindle taper to avoid the tool falling from its housing when turning and provoke an accident.

The coupling system itself of the tool male taper in the female taper of the main spindle is auto-locking, but for it the surfaces of the tool taper and spindle taper must be in contact. To get the best possible contact, the surfaces of the tool taper as well as the spindle taper should be in good conditions. Therefore, it is advisable to handle the tool as well as the spindle of the machine carefully.

6. CHIPS DURING MACHINING

The machining process removes material from the piece. This material is released in chips, which can be of different shapes depending on the material itself. The most common ones are of three types: fragmented chips in small bits, short helicoidal chips and long helicoidal chips.

The chips fragmented in small bits can be rejected from the machining area and can be dangerous if they reach the eyes of the operator. To avoid this, it is advisable to wear safety glasses.

The long helicodal chips tend to roll up the tool and gain considerable volume before breaking, which is dangerous if they reach the operator as they may produce injuries.

The reached volume may also displace the dill protector from its security position, increasing the risk of an accident. It is advisable to use chip breaking tools to machine materials which produce such chips. For further information contact the tool manufacturer.

MACHINE CARE AND MAINTENANCE

Drilling machines are highly accurate machine tool designed to operate around the clock if properly operated and maintained. Machine must be lubricated and checked for adjustment before operation. Improper lubrication or loose nuts and bolts can cause excessive wear and dangerous operating conditions.

1. Check the machine prior to operation for any missing parts or broken shear pins. Refer to the manual before attempting to lift the machine.
2. Newly installed machine should be properly leveled before any operation to prevent vibration and wobble.
3. When the machine is transported out of a normal shop environment should be protected from dust, excessive heat, and very cold conditions.
4. Change the lubricant frequently if working in dusty conditions.
5. In hot working areas, use care to avoid overheating the motor or damaging any seals.
6. Operate the machine at slower speeds than normal when working in cold environments.
7. During the operation, the chips that fall onto the table surface should be cleaned timely.
8. After the operation every day, eliminate all the chips and clean different part of the machine tool and apply machine tool oil to prevent rusting.
9. In order to maintain the machining accuracy, take care of the center, the surface of the machine tool for the chuck and avoid mechanical damage and the wear due to improper guide.
10. If the damage is found, the maintenance should be done immediately.

ATTENTION: before performing any checking, repairing or maintenance operation, switch off the main switch and make an additional check to ensure that the machine is not under voltage.

Oil, grease and cleaning agents are pollutants and must not be disposed of through the drains or in normal refuse. Dispose of those agents in accordance with current legal requirements on the environment. Cleaning rags impregnated with oil, grease and cleaning agents are easily inflammable. Collect cleaning rags or cleaning wool in a suitable closed vessel and dispose of them in an environmentally sound way-do not put them with normal refuse!