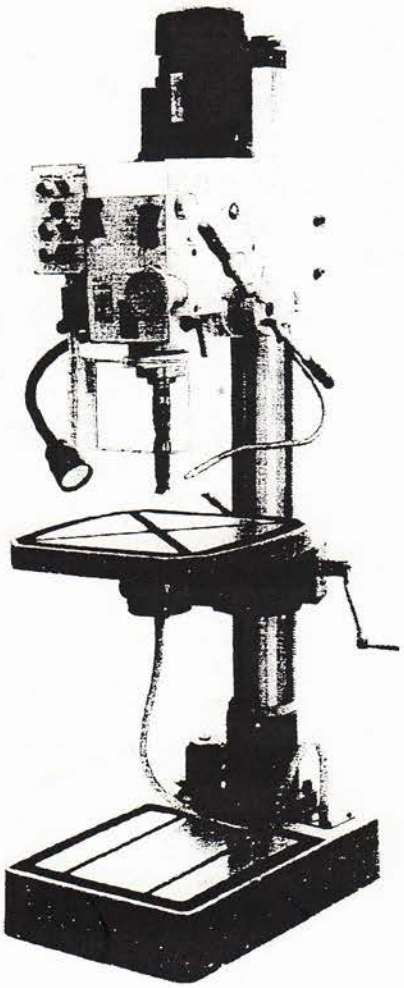
OWNER'S MANUAL

GEARED HEAD
MILLING & DRILLING MACHINE

Model 40BSF



READ ALL INSTRUCTIONS CAREFULLY

Keep for future reference!

WARNING:FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine. NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you have had detail instruction from your dealer.

SAFETY RULES FOR ALL TOOLS

1.FOR YOUR OWN SAFETY ,READ THIS INSTRUCTION MANUAL BEFORE OPERATING THE TOOL. Learn the tool's application and limitations as well as the specific hazards peculiar to it.

2.KEEP GUARDS IN PLACE and in working order .

3.GROUND ALL TOOLS .If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong plug receptacle, the adapter lug must be attached to a know ground. Never remove the third prong.

4.REMOVE ADJUSTING AND WRENCHES.

Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it"on."

5.KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.

6.DON'T USE IN DANGEROUS ENVIRONMENT .Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.

7.KEEP CHILDRE AND VISITORS AWAY. All children and visitors should be keep a safe distance from work area.

8.MAKE WORKSHOP CHILDROOF -with padlocks, master switches, or by removing starter keys.

9.Don't force tool. It will do the job better and be safer at the rate for which it was designed.

10.USE RIGHT TOOL .Don't force tool or attachment to do a job for which it was not designed.

11.WEAR PROPER APPAREL. No loose clothing,gloves,neckties,rings, bracelets, or other jewelry to get caught in moving parts. Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.
12.ALWAYS WEAR EYE PROTECTION. Refer to ANSIZ87.1 Standard for appropriate recommendations. Also use face or dust mask if cutting operation is dusty.
13.SECURE WORK. Use clamps or a vise to hold work when practical. It's safer than using your hand and frees both hands to operate tool.
14.DON'T OVERREACH. Keep proper footing and balance at all times.
15.MAINTAIN TOOLS IN TOP CONDITION.
Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
16.DISCONNECT TOOLS before servicing and when changing accessories such as blades,bits,cutters,ect.
17.USE RECOMMENDED ACCESSORIES.
Consult the owner's manual for recommended accessories .The use of improper accessories may cause hazards.
18.AVOID ACCIDENTAL STARTING. Make sure switch is in "OFF" position before plugging in power cord.
19.NEVER STAND ON TOOL. Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted
20.CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function check for alignment of moving parts binding of moving parts, breakage of parts mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
21.DIRECTION OF FEED. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
22.NEVER LEAVE TOOL RUNNING UNATTENDED.TURN POWER OFF.
Don't leave tool until it comes to a complete stop.
23.DRUGS,ALCOHOL ,MEDICATION. Do not operate tool while under the influence of drug, alcohol or any medication.
24.MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY while motor is being mounted, connected or reconnected.

ADDITIONAL SAFETY RULES FOR MILL DRILL

1. BE SURE drill bit or cutting tool is securely locked in the chuck.
2. BE SURE chuck key is removed from the chuck before turning on power.
3. Adjust the table or depth stop to avoid drilling into thg table.
4. SHUT OFF the power,remove the drill bit or cutting tool,and clean the table before leaving the machine.
5. CAUTION. When practical,use clamps or a vise to secure workpiece to keep the workpiece from rotating while the drill bit or cutting tool.
6. WARNING:FOR Your Own Safety. Don't wear gloves when operating a mill/drill.

SPECIFICATION

Drilling capacity		31.5mm(MT3) 40mm(MT4)	
Spindle taper(option)		MT3,MT4 or R8	
Max.distance from spindle axial to column surface		297.5mm	
Working table size		500mm×460mm	
Base size		670mm×470mm	
Dimeter of column		Φ115mm	
Max distance spindle nose to worktable		715mm	
Max distance spindle nose to base		1180mm	
Spindle stroke		120mm	
Spindle speed(rpm) (option)	Motor 0.85KW/1.1KW	I	75 180 280 600 1000 1600
		II	150 360 560 1200 2000 3200
	Motor 1.1KW	50HZ	75 170 280 540 960 1600
		60HZ	90 210 345 670 1180 1970
Packing dimension		740mm×760mm×1870mm	
NW/GW Weight		320/370Kg	

WARNING:CHANGE SPEED ONLY WHEN MACHINE IS STOPPED

CHANGING THE GEAR BOX OIL

Tilt the head stock over as shown in Fig 1.Open the drain plug to allow the oil to drain from the opening completely.The lock the oil drain plug and turn the head to be upright position.Remove the oil filler plug foll the oil

to the gear box until the oil lever reach the middle of oil fluid lever indicator. Then lock the plug.

CLEANING

(1) Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.

(2) After cleaning, coat all bright work with a light lubrication . Lubricate all points with a medium consistency machine oil.

LUBRICATION:

All ball bearings in your mill/drill are sealed for life ,requiring no lubrication. Points requiring lubrication are:

(1)Internal spline drive assembly. Keep this area well lubricated with a good grade grease , insert grease in the hole at the top of spindle pulley spline driver,lube twice yearly.

(2)A light film of oil applied to the quill and column will reduce wear, prevent rust, and assure ease of operation.

(3) Quill return spring should receive oil(sae 20) once yearly. Remove cover plate and apply oil with squirt can or small brush.

(4) IMPORTANT: The gear box should be oiled with a lubricant such as sae 68 oil in level. CHANGE OIL EVERY ONE YEAR.

(5) Apply lubriplate to quill pinion every 90 days.

NOTE: use extreme care when performing this operation and keep hands clear of pinch points. When using paraffin bar, do this only by turning the sheaves by hand. Do not apply with motor running.

USE OF MAIN MACHINE PARTS

(1) To raise and lower the head by head handle.

(2) Equipped with an electric switch for tapping operation clockwise or counterclock wise.

(3) To adjust the quick or slow feeding by feed handle.

(4) To adjust the table left and right travel by table handle wheel.

(5) To adjust the table fore and after travel by table handle wheel.

(6) To operate the spindle handle wheel for micro feed.

(7) To adjust the scale size according to working need.

PRECAUTION FOR OPERATION

Check all parts for proper condition before operation; if normal safety precautions are noticed carefully, this machine can provide you withstanding of accurate service.

(1) Before Operation

(a) Fill the lubricant

(b) In order to keep the accurate precision, the table must be free from dust and oil deposits.

(c) Check to see that the tools are correctly set and the workpiece is set firmly.

(d) Be sure the speed is not set too fast.

(e) Be sure everything is ready before use

(2) After Operation

(a) Turn off the electric switch.

(b) Turn down the tools.

(c) Clean the machine and coat it with lubricant.

(d) Cover the machine with cloth to keep out the dust.

(3) Adjustment of head

(a) To raise and lower the head, loosen the leaf screw located on the right side of the raise and lower base. When the desired height is reached tighten leaf screw to avoid vibration.

(b) Head may be rotated 360° by loosening the same bolts mentioned above. Adjust the head to the desired angle, then fix the heavy duty head locknuts, It is tighten the same to fix the head if drilling &milling too much.

(c) Unscrew 3 nuts while the workpiece needs to be drilled. Turn to the degrees you wish on the scale, then screw the 3 nuts.

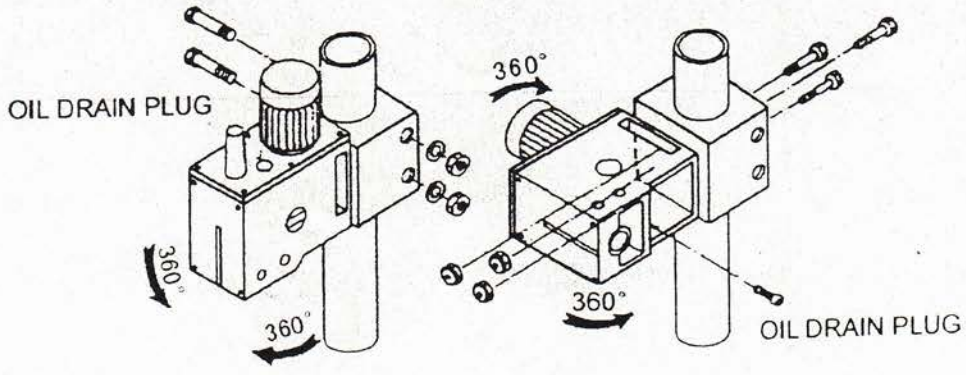


Fig.1

(4) Adjustment of the lifting table

(a) Loosening the locking handles, rocking the crank to move the lifting table up and down along the column, when arrived the height of your request, tighten the handles to prevent loose.

(b) When need to working large parts, loosening the locking handles, rotating the lifting table of 180° , then tighten the handles, and place the part on the base to work on it.

Power feed device

This machine be equipped with the Power feed device see Fig.1.

1.Power feed switch
2.Speed lever
3.Spindle stroke dial
4.Handle
5.Limited screw
6.Locked nut
7.Micro feed dial
8.Locked screw
9.Hand wheel

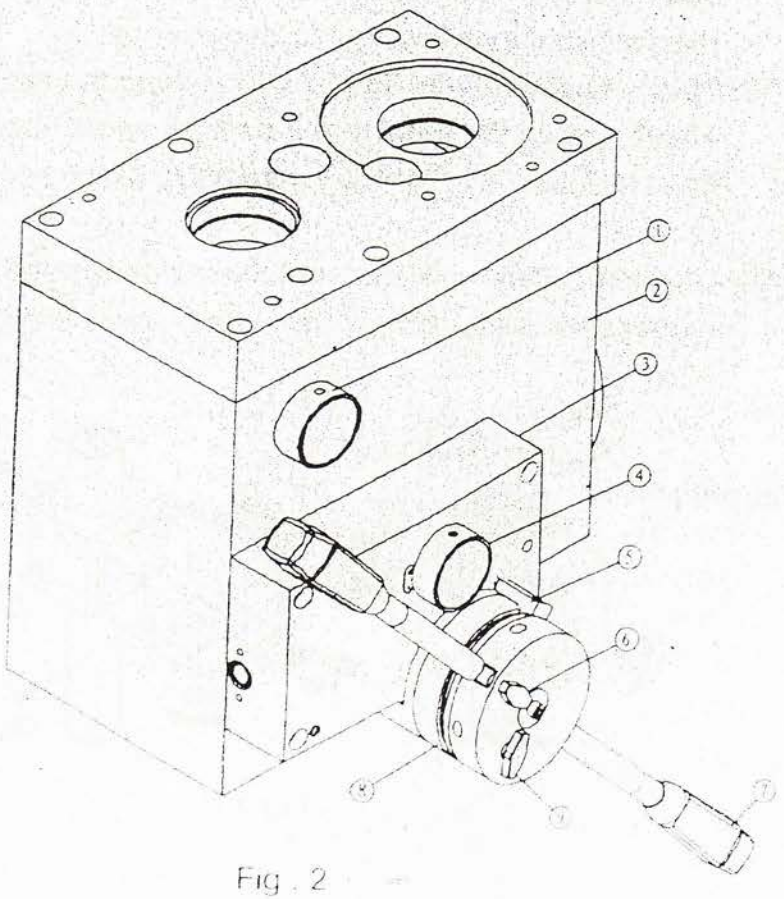


Fig . 2

OPERATION PROCEDURE

Manual feed

Turn the Power feed switch 1 off, handle 4 will be vertical with the axis of Spindle stroke dial 3,rotate limited screw 5 and be contacted with handle 4,then can be manually feed spindle.

When the Power feed switch 1 on ,make handle 4 vertical ,locked limited screw 5,rotate Speed lever 2 to "0",then can be manually feed spindle.

When want to trade off manual feed and power feed, stop the machine and turn on Power feed switch 1 and Speed lever 2.Make handle 4 vertical can be manually feed Spindle ,Push handle 4 right can be power feed Spindle.

Power feed

Turn on Power feed switch 1 and Speed lever 2,Start the machine and push handle 4 right can be power feed spindle, the machine can be automatically shut down when spindle arrived at the designed Depth.(max Depth 120mm,availability Depth 115mm),and spindle send back. Turn Speed lever 2 can realize 0.10, 0.18 ,0.26 three kinds depth feed to choose.

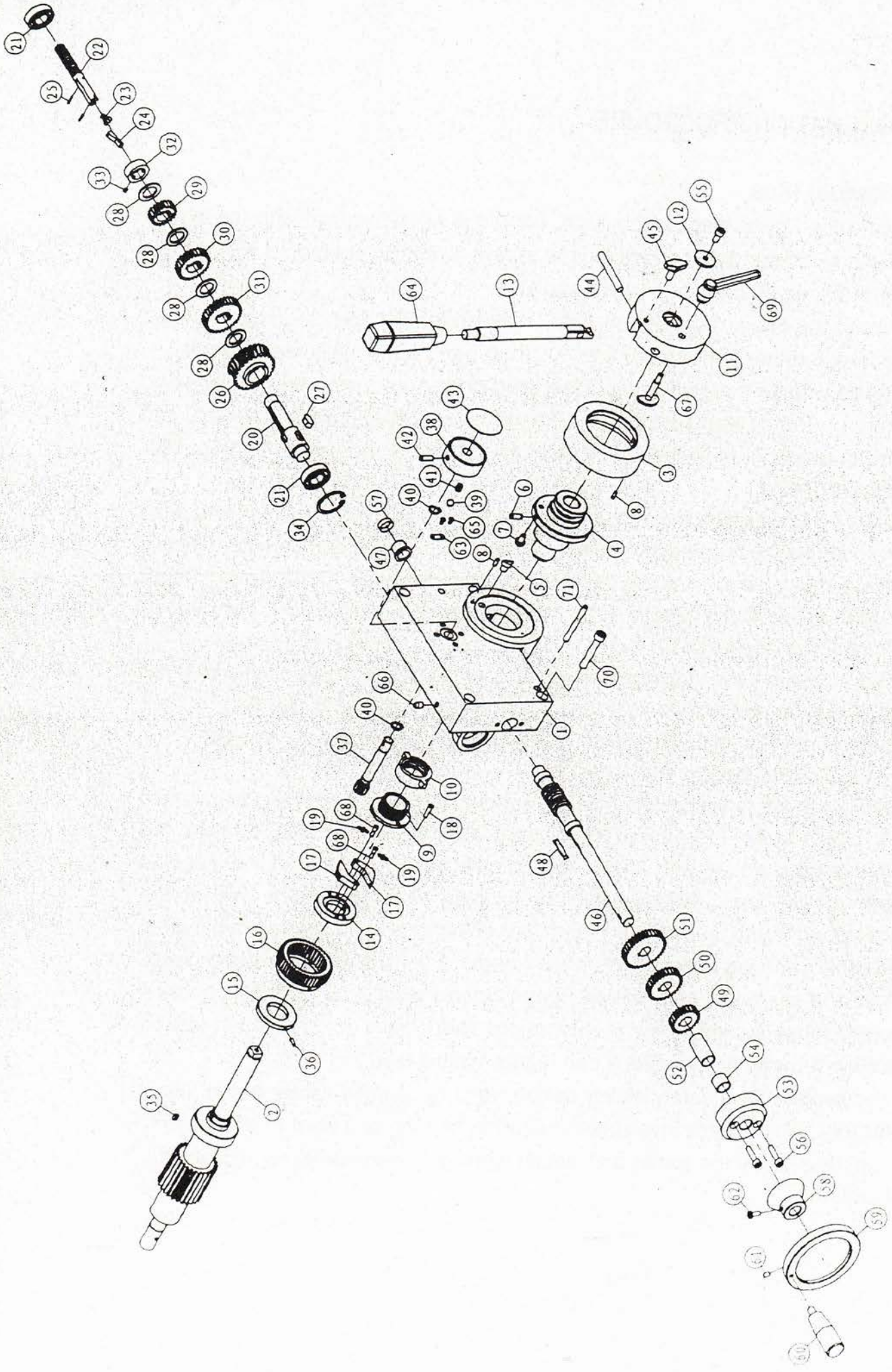
Want to make the machine spindle direct into power feed, loose locket nut 6,make Spindle stroke dial 3 to max stroke depth dial position, tighten locked nut 6 from Spindle stroke dial 3 can read spindle the position.

Adjustment power feed depth

Move spindle to the designed position, shut down the machine. Push handle 4 right, loose locked nut 6,adjusted Spindle stroke dial 3,make the designed dial level with "0",locked Spindle stroke dial 3,start the machine can ,power feed. Automatically shut down when spindle arrived at the designed Depth, and spindle send back. During power feed, make handle 4 vertical can stop power feed. make handle 4 vertical can stop power feed.

Need to use micro feed device, rotate Speed lever 2 to "0",push handle 4 right, loose locked screw 8,ajust micro feed dial 7 to "0",tighten locked screw 8,rotate hand wheel 9 can realize micro feed.

The system have safety clutch device, and be on use estate before leave factory .When clutch invalidation because of fray, and want to adjustment, can take away the panel and adjust spring can immediately recover the function.



No.	Code	Qty.	Name
1	20102	1	Feed box
2	20234	1	Pinion shaft
3	20243	1	Spindle stroke dial
4	20242	1	Clutch bushing set
5	20241	1	Backing pin
6		1	Pin 6×12
7	20247	1	Ball head pin
8		2	Pin4×10
9	20239	1	Square thread set
10	20240	1	Square thread nut
11	20244	1	Handle body
12	20245	2	Washer
13	20203	1	Handle
14	20237	1	Clutch key base set
15	20236-2	1	Bush
16	20236-1	1	Worm gear
17	20231	2	Clutch screw set
18	20235	2	Screw
19	20232	2	Spring
20	20223	1	II Shaft
21		2	Bearing 6003
22	20215	1	Change gear lever set
23	20220	1	spring
24	20222	1	Pull key
25		2	Pin 2×10
26	20304	1	Worm gear
27		1	Key 8×16
28	20217	4	Bushing
29	20218	1	Gear
30	20219	1	Gear
31	20221	1	Gear
32	20216	1	Bushing bracket
33		2	ScrewM4×6
34		1	Retainer ring 35
35		2	Key 4×8
36		3	Screw M4×12

No.	Code	Qty.	Name
37	20202	1	Gear
38	20201	1	Speed lever
39		1	Steel ball 8
40		2	Retainer ring 12
41		1	Spring
42		1	Screw M6×20
43	20303	1	Plate
44	20206	1	Knurled pin
45	20204	1	Limited screw
46	20233	1	Worm shaft
47	20306	1	Bush
48		1	Key
49	20228	1	Gear
50	20229	1	Gear
51	20230	1	Gear
52	20106	1	Bush
53	20227	1	Worm covet
54	20305	1	Bush
55		1	Screw M6×12
56		2	ScrewM6×25
57	20107	1	Bushing
58	20226	1	Mirco feed dial
59	20105	1	Hand wheel
60		1	Handle
61		1	Screw M5×8
62		1	Locked screw M5×12
63	20307	1	"0"Scale
64	20301	2	Knob
65		2	Rivet 2×5
66		1	Oil cup
67	20246	1	Screw
68	20308	2	Pin
69		1	Locked handle
70		4	Screw M6×50
71		2	Taper pin6x60

Head parts for spindle power feed

No.	Qty.	Code	Name
1	1	20010B	head body
2	1	20011B	head body cover
3	2		retaining ring
4	2		retaining ring
5	1	20018B	airtight base
6	2		airtight ring
7	1		motor
8	1		screw
9	1		washer
10	1	20201	plate
11	1	20304-1B	arbor bolt cover
12	1	20304-2B	arbor bolt cover base
13	1		screw
14	1		pin
15	1	20025B	joint
16	1	20026B	sleeve
17	1	20027B	nut
18	1		bolt
19	2	20020B	cap
20	2	20307B	speed lever
21	2		pin
22	1		oil plug
23	1		screw
24	1		screw
25	1		oil pointer
26	1	20105B	I shaft
27	1	20105-1-B	gear
28	1		bearing
29	3		bearing
30	1		key
31	1	20106B	II shaft
32	1	20108-B	gear
33	1	20110-1-B	gear
34	1	20111-B	gear
35	1	20106-1-B	gear
36	4		bearing
37	1		key
38	1		key
39	2		ball
40	2		spring
41	2		retaining ring
42	1		key
43	4		screw
44	1	20107B	III shaft
45	1	20109-B	gear
46	1	20110-2-B	gear
47	1	20112-B	gear
48	1	20113-B	gear
49	1	20115-B	gear
50	1		key
52	1		key
53	1	20019	spindle sleeve
54	1	20104B	spindle
55	1		bearing
56	1		bearing
57	1	20114-B	splined sleeve
58	1	20116-B	gear
59	1		retaining ring
60	1	20012	feed base
61	1	20128	support base
62	1	20129	nut
63	1	20130	knob
64	1	20131	graduated rod
65	1	20021	fixed bolt
66	1	20132	scale board
67	1		lock washer
68	1		lock nut
69	1	20308	rubber washer
70	1		screw
71	1		split pin
72	1		bolt
73	1	20024B	separating ring

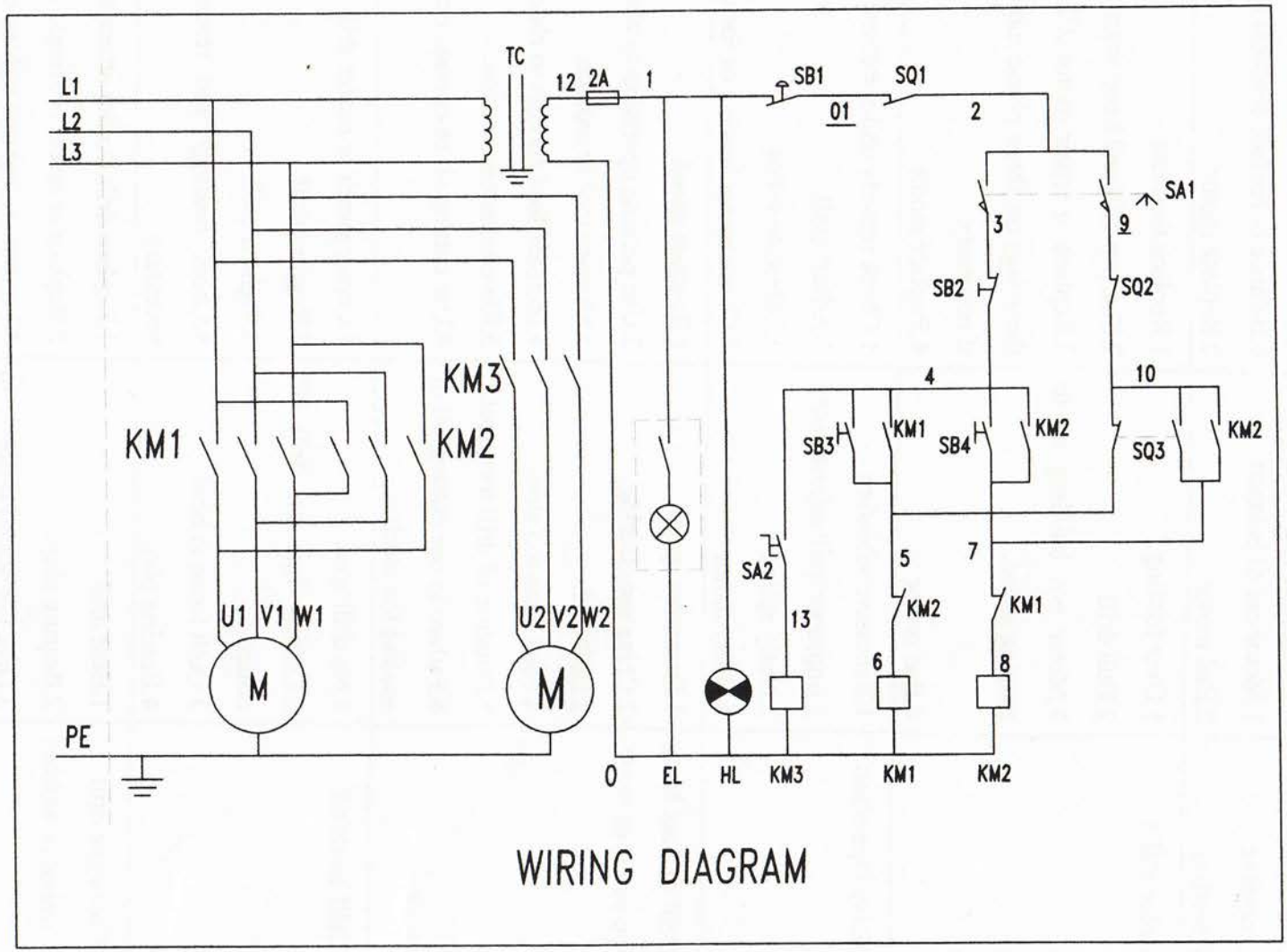
Head parts for spindle power feed

No.	Qty.	Code	Name
74	1	20133B	oil tight cover
75	1		air tight
76	1		pin
85	1	20118	spring base
86	1	20123	spring cap
87	1	20122	spring plate
97	1	20102	washer
98	1		bolt
100	1		screw
101	2		pin
105	1	20124B	fixed bolt
106	1	20203B	fixed tight block
107	1	20202B	fixed tight block
108	1		adjust handle
109	1	20125B	lever shaft
110	1	20022-1B	lever
111	1	20204-2B	lever bracket
112	2		retaining ring
113	2		screw
114	2	20204-3B	lever rod
115	2		oil seal
116	1	20126B	long lever shaft
117	1	20204-1B	lever bracket
118	1	20022-2B	lever
119	1		bearing
120	2		retaining ring
121	1		washer
122	1	20209	spring
123	1	20207A	worm shaft
124	1		bearing
125	1	20208B	clutch base
126	3		screw
127	1		locked nut
128	1	20205B	spring
129	1	20108A	fixed sleeve
130	2		oil seal

No.	Qty.	Code	Name
131	1	20103A	washer
132	1		retaining ring
133	1		bearing
134	1	20213A	I shaft
135	2		key
136	1		key
137	1		bearing
138	1	20104A	flange
139	3		screw
140	1		retaining ring
141	1	20212A	gear
142	1	20109A	quill
143	1	20214A	lever shaft
144	1		O-airtight
145	1	20250	flange cover
146	2		screw
147	1		retaining ring
148	1		steel ball
149	1		spring
150	1		screw
151	1	20201	speed lever
152	1	20303	label

TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSE	REMEDY
Excessive Vibration	1.Motor out of balance 2.Bad motor	1.Balance or replace problem motor. 2.Replace motor
Motor stalls	1.Over feeding. 2.Dull drill. 3.Motor not building up to running speed. 4.Bad motor	1.Replace feed rate. 2.Sharpen drill and keep sharp. 3.Replace or repair motor .Check fuses in all three legs on three phase motors and replace if necessary. 4.Replace motor
Noisy Operation	1.Excessive vibration 2.Improper quill adjustment. 3.Nosiy spline. 4.Noisy motor	1.Check remedy under excessive vibration. 2.Adjust quill. 3.Lubricate spline. 4.Check motor bearing or for loose motor fan.
Drill or Tool heats Up or burns work	1.Excessive speed. 2.Chips not clearing. 3.Dull tool. 4.Feed reate too slow. 5.Rotation of drill incorrect. 6.Failure to use cutting oil or coolant (on steel)	1.Readuce speed. 2.Use pecking operation to clear chips. 3.Sharpen tool or replace. 4.Increase feed enough to clear chips. 5.Reverse motor rotation. 6.Use cutting oil or coolant on steel
Drill leads off	1.No drill spot. 2.Cutting lips on drill off center. 3.Quill loose in head. 4.Bearing play.	1.Center punch or center drill workpiece. 2.Regrind drill. 3.Tighten quill. 4.Check bearings and reseat or replace if necessary.
Excessive drill Runout or wobble	1.Bent drill. 2.Bearing play. 3.Drill not seated properly in chucks.	1.Replace drill.Do not attempt to straighten. 2.Replace or reseat bearings. 3.Loosen , reseat and tighten chuck.
Work or fixture Comes loose or spins	1.Failure to clamp workpiece or work holding device to table.	1.Clamp workpiece or work holding device to table surface.



WIRING DIAGRAM