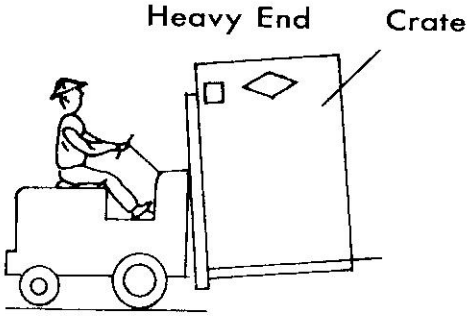
CONTENTS

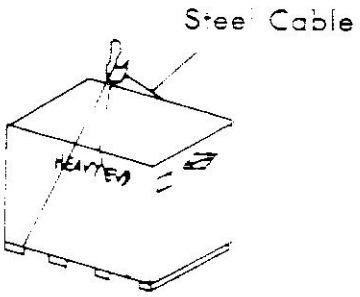
* THIS MACHINE HAS BEEN FULLY TESTED, ADJUSTED AND INSPECTED FOR CORRECT ALIGNMENT AND OPERATION PRIOR TO SHIPMENT. WHEN IN TRANSIT OR INSTALLATION, PLEASE ENSURE THAT THE MACHINE IS NOT BUMPED WHEN BEING ROLLED OR SET DOWN TO AVOID ANY DAMAGE

A).Transit

By Fork Lift



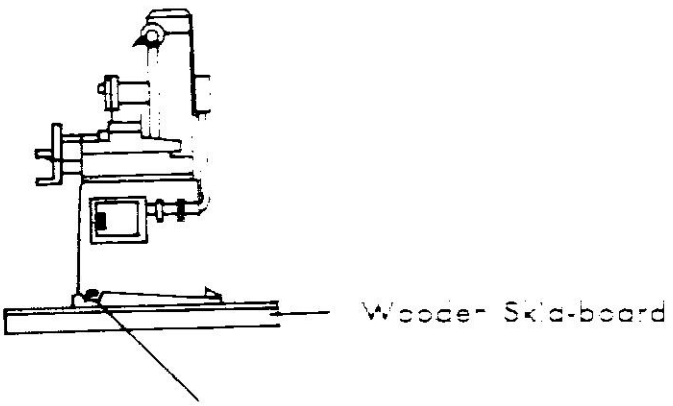
By Hoist or Chain Block

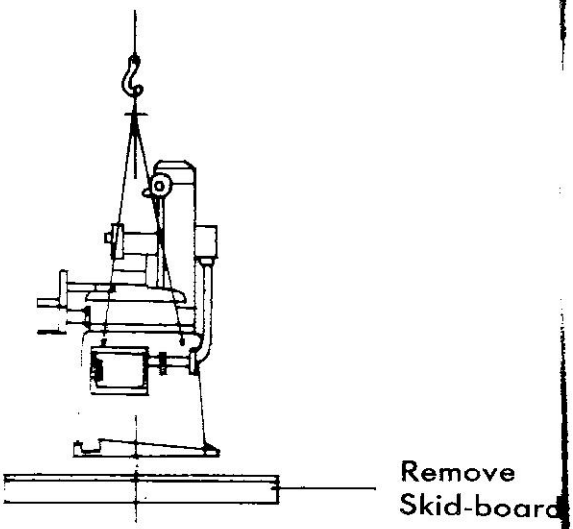


Machine Weight Chart. Unit: lbs.

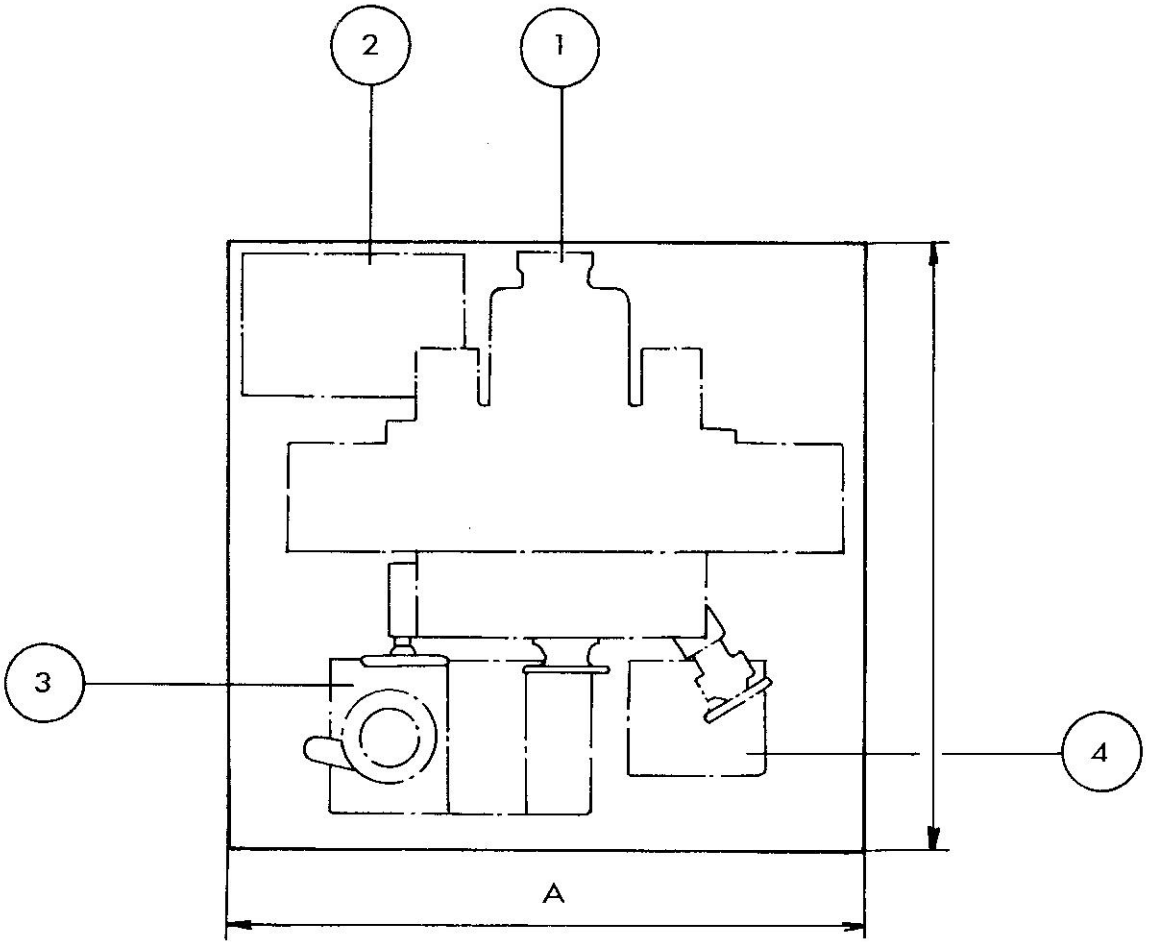
M/C WGT	AGS-1020 AHD	AGS-1224 AHD	AGS-1632 AHD
Net	2860lbs (1300kgs)	4180lbs (1900kgs)	6160lbs (2800kgs)
Gross	3410lbs (1550kgs)	4840lbs (2200kgs)	7260lbs (3300kgs)

1. When unpacking the crate, starts from the upper cover, then follow the sequence of front, rear, left and right.
2. Do not use hammer to break down the crate, please use nail extruder instead.
3. To avoid damaging the machine or paint, please pay extra attention when taking off the wooden cover.
4. Loosen the fixing screws before lifting machine.





B). PACKING DIAGRAM



1. Machine
2. Hydraulic Tank
3. Dust-Suction Coolant System or Magnetic Seperator Paper Filter System
4. Standard Accessories

unit: inch/mm

Model	A	B	Height
AGS-1020AHD	64 1/2'' (1640)	72 1/2''(1840)	84'' (2134)
AGS-1224AHD	73 3/4''(1873)	83 1/2''(2134)	89'' (2260)
AGS-1632AHD	106''(2700)	87''(2210)	90'' (2286)

C). Choice of Site

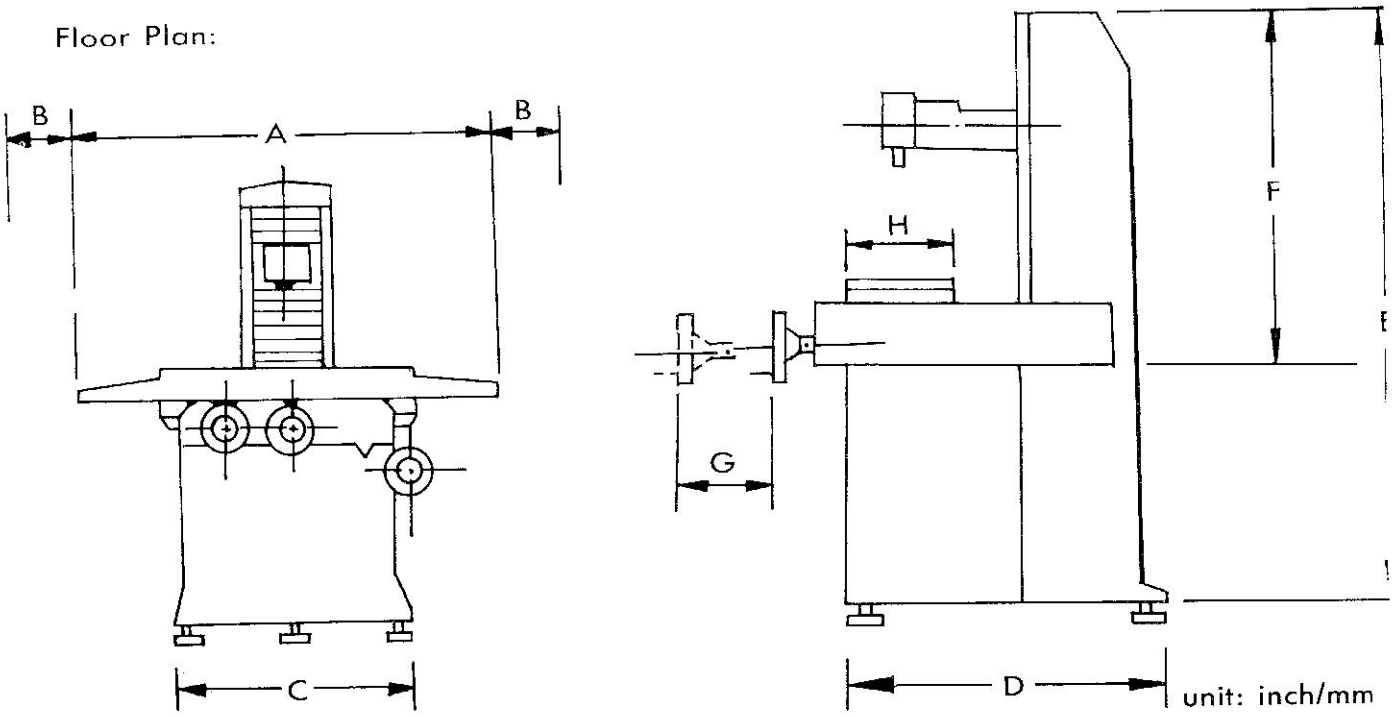
The output of the machine and the degree of accuracy of the components produced depend on the correct choice of site for the erection of the machine.

The grinding machine should be handled just as carefully as a jig-borer. After all extreme precision is demanded for both types of machine.

Grinding machines are often found between miling, shaping, drilling and even slotting machines, without any thought of the consequences of such planning. In such case , it is impossible to achieve good surface finishes, as the vibrations from the miling machines or jerks from the reversal of the shaper stroke, etc. are transmitted to the grinding machine. Chatter marks can be found on the ground surface, which are due to these extraneous influences.

Unsolid floor is unsuitable for situating the machine as it results in distortion of the machine bed.

Floor Plan:



unit: inch/mm

ITEM \ MODEL		1020 AHD	1224 AHD	1632 AHD
A		60'' (1520)	72 7/8'' (1850)	98 1/2'' (2500)
B		10 1/4'' (260)	13'' (330)	16 3/4'' (425)
C		35'' (886)	39 3/4'' (1010)	41 3/8'' (1050)
D		36'' (910)	42 3/8'' (1075)	56 (1425)
E	normal column	65'' (1650)	69 3/4'' (1770)	————————
	high column	68 1/2'' (1740)	74'' (1880)	78 3/4'' (2000)
F	normal column	36 5/8'' (930)	41 3/8'' (1050)	————————
	high column	40'' (1020)	45 3/4'' (1160)	50 3/8'' (1280)
G		10 1/2'' (265)	13 1/2'' (345)	17 3/4'' (450)
H		13'' (330)	14 3/8'' (364)	15 3/4'' (400)

Installation

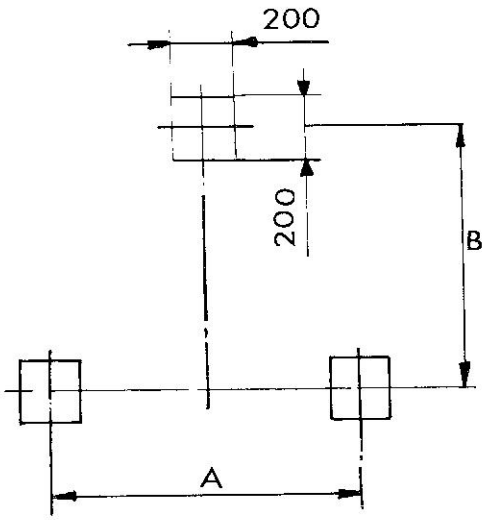
Power Consumption

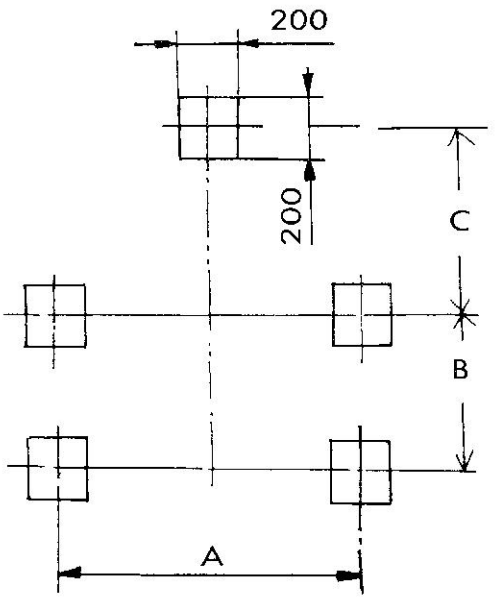
(Spindle + Hydraulic + Crossfeed + Dounnfeed H.P.)/ 0.75 = Machine kw unit: kw

C Type Statement	AGS-1020φ AHD 2HP	AGS-1020 AHD 3HP	AGS-1224 AHD 3HP	AGS 1224 AHD 5HP	AGS-1632 AHD 5HP	AGS-1632 AHD 7.5HP
Machine	2.58	3.33	4.08	5.58	4.87	6.37
Coolant	0.093	0.093	0.093	0.093	0.093	0.093
Dust-Suction	0.373	0.373	0.373	0.373	0.373	0.373
Ele. Mag. Chuck	0.15	0.15	0.15	0.15	0.15	0.15
Magnetic/Paper	0.4	0.4	0.4	0.4	0.4	0.4

(2) Foundation

a. Dimension



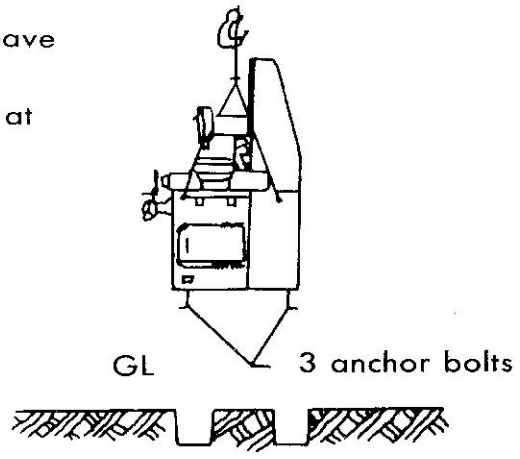


unit: inch/mm

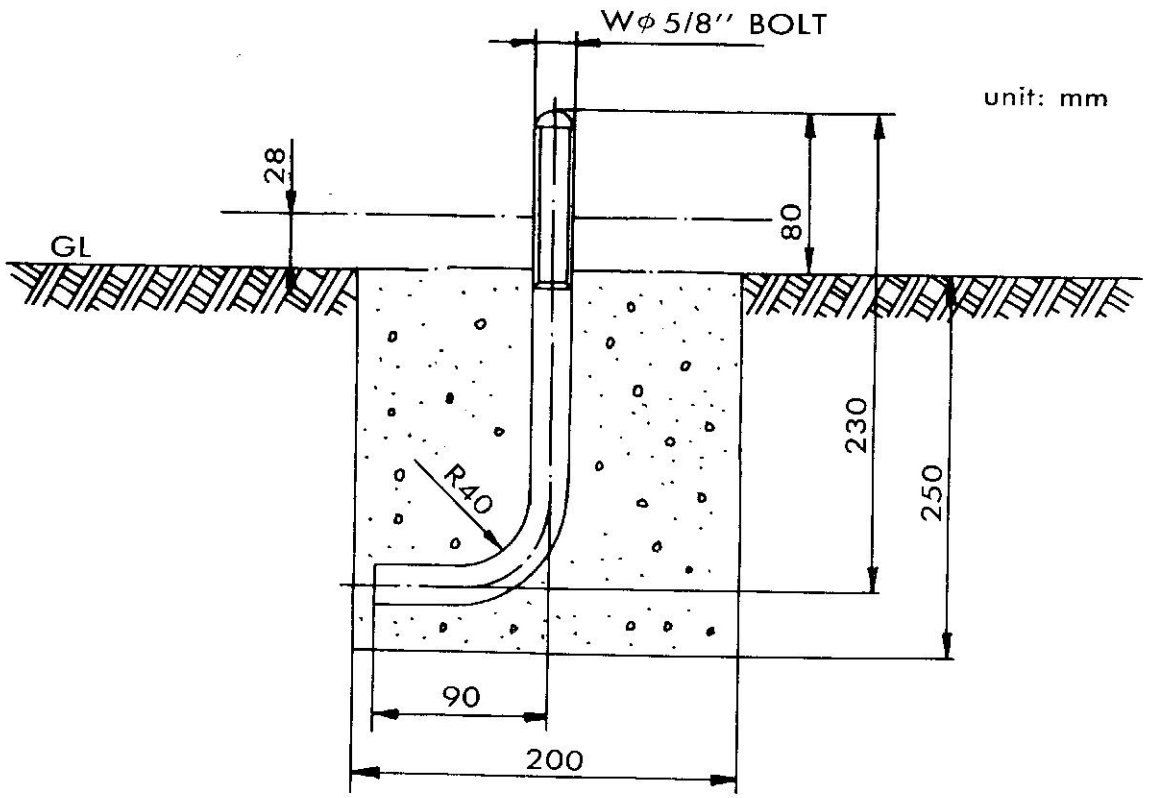
MIC TYPE DIMENSION	AGS-1020	AGS-1224AHD	AGS-1632AHD
A	32,520'' (826)	41,339'' (1050)	39,370'' (1000)
B	34,449'' (875)	40,945'' (1040)	21,063'' (535)
C	----	----	26,771'' (680)

b. Use the Anchor bolts

* Lock the anchor bolts on the machine by nuts, and leave the thread portion at least 30mm for adjustment.
* Lay down the machine slowly and aim anchor bolts at foundation holes.
* level the machine by taper block.
* Fill up foundation holes with concrete.

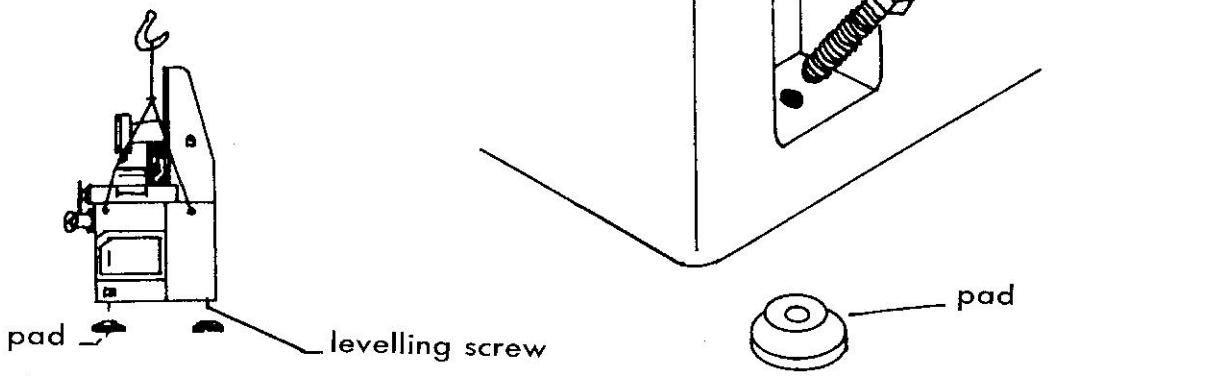


* Anchor bolts

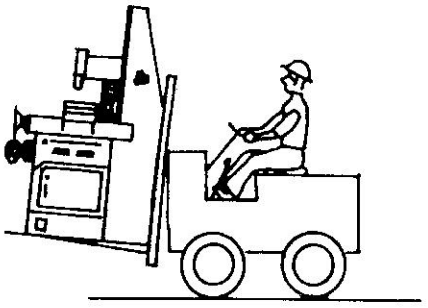


c. Use the leveling pads and screws

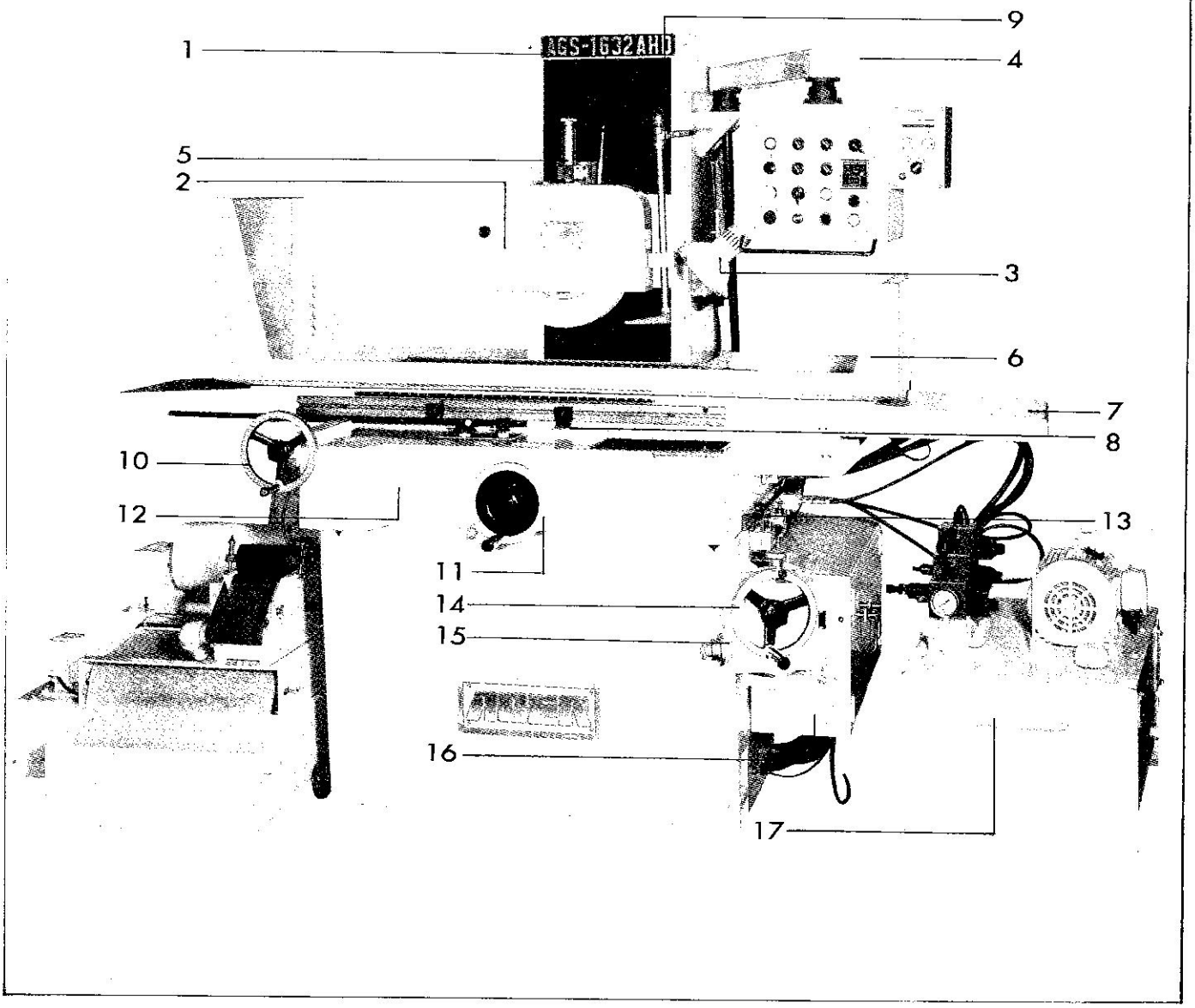
* Tighten the leveling screws on the machine base as in the shown figure. For easy levelling and more steady of the machine, make leveling screw as deep as possible.
* Lay down the machine slowly to let the screws fall into the center hole of leveling pads .
* Leveling the machine.



Caution: If you use Fork Lifter in stead of Hoist, please lift as figure shown under:



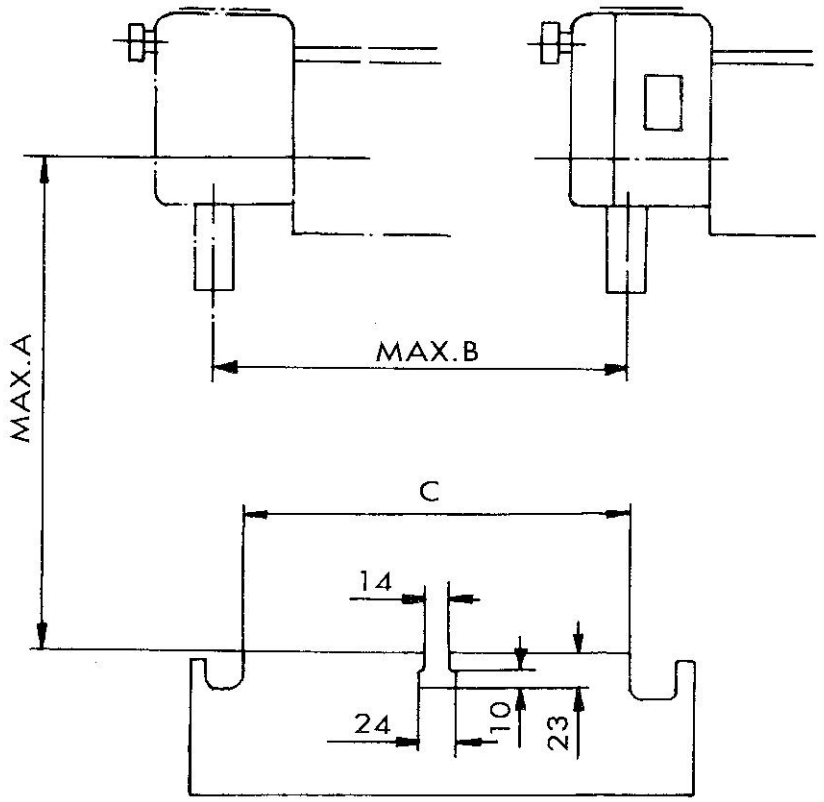
3) Con tour and Nomerclature for AGS 1020 1024 1632 AHD)



1. Upright
2. Wheel guard
3. Work light
4. Electrical control panel
5. Parallel dresser (special accessory)
6. Waterproof guard
7. Table
8. Longitudinal travel stroke adjuster
9. Flow control lever
10. Table handwheel
11. Cross feed handwheel
12. Saddle
13. Crossfeed travel stroke adjuster
14. Down feed handwheel
15. Down feed unit
16. Electrical control box
17. Hydraulic pump unit

(4). Table Size And Grinding Capacity

unit:mm



Unit: inch/mm

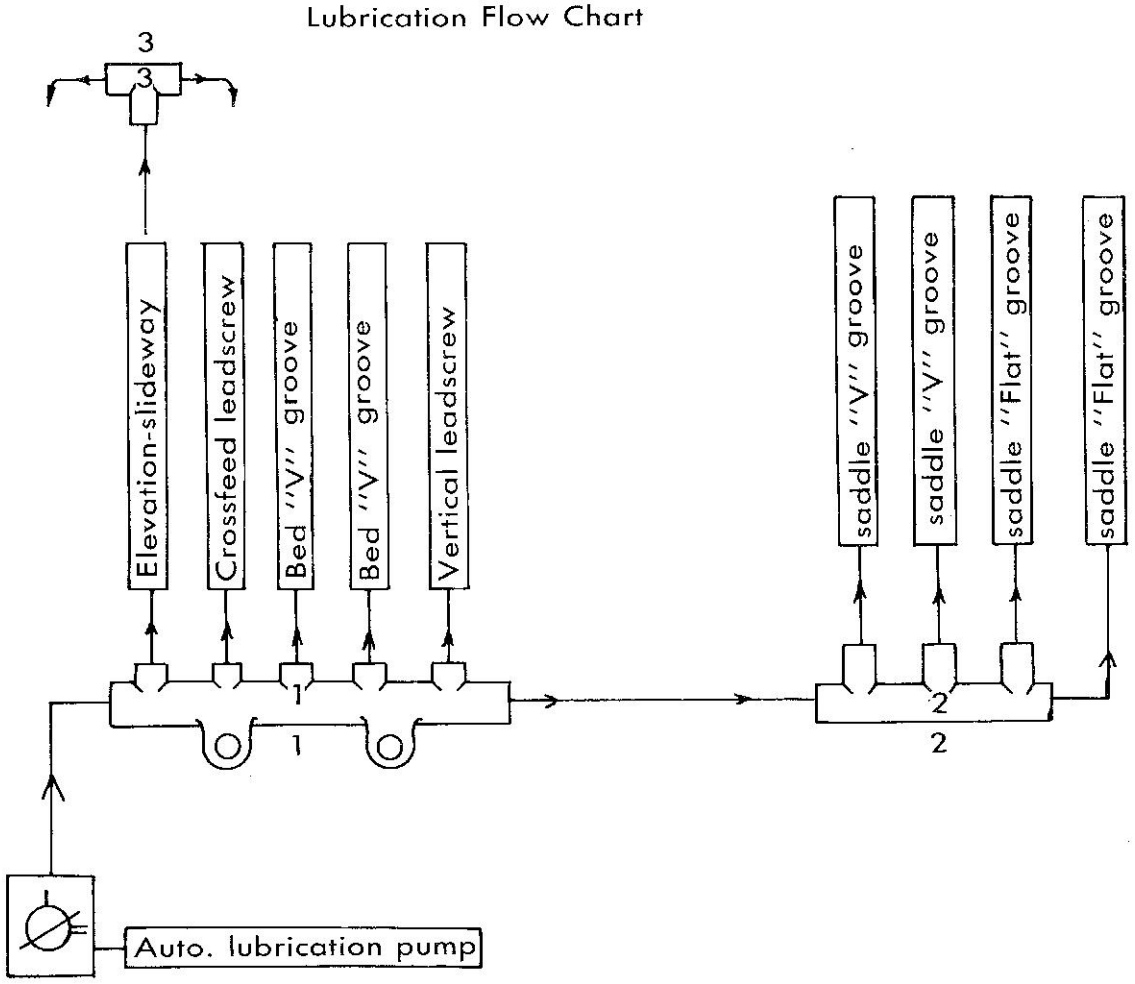
Model	A	B	C
AGS-1020AHD	19"(485)	10 1/5"(260)	10"(254)
AGS-1224AHD	23 1/2"(600)	13"(330)	12"(300)
AGS-1632AHD	23 1/2"(600)	17"(450)	16"(405)

(5) Lubrication Instruction

For AGS-1020AHD, AGS-1224AHD, AGS-1632AHD.

Intornal	Quantity	BP	ESSO	MOBIL	SHELL
Every 10 minutes	Each time 3cc—6cc	SAE30	SAE30	SAE30	SAE30

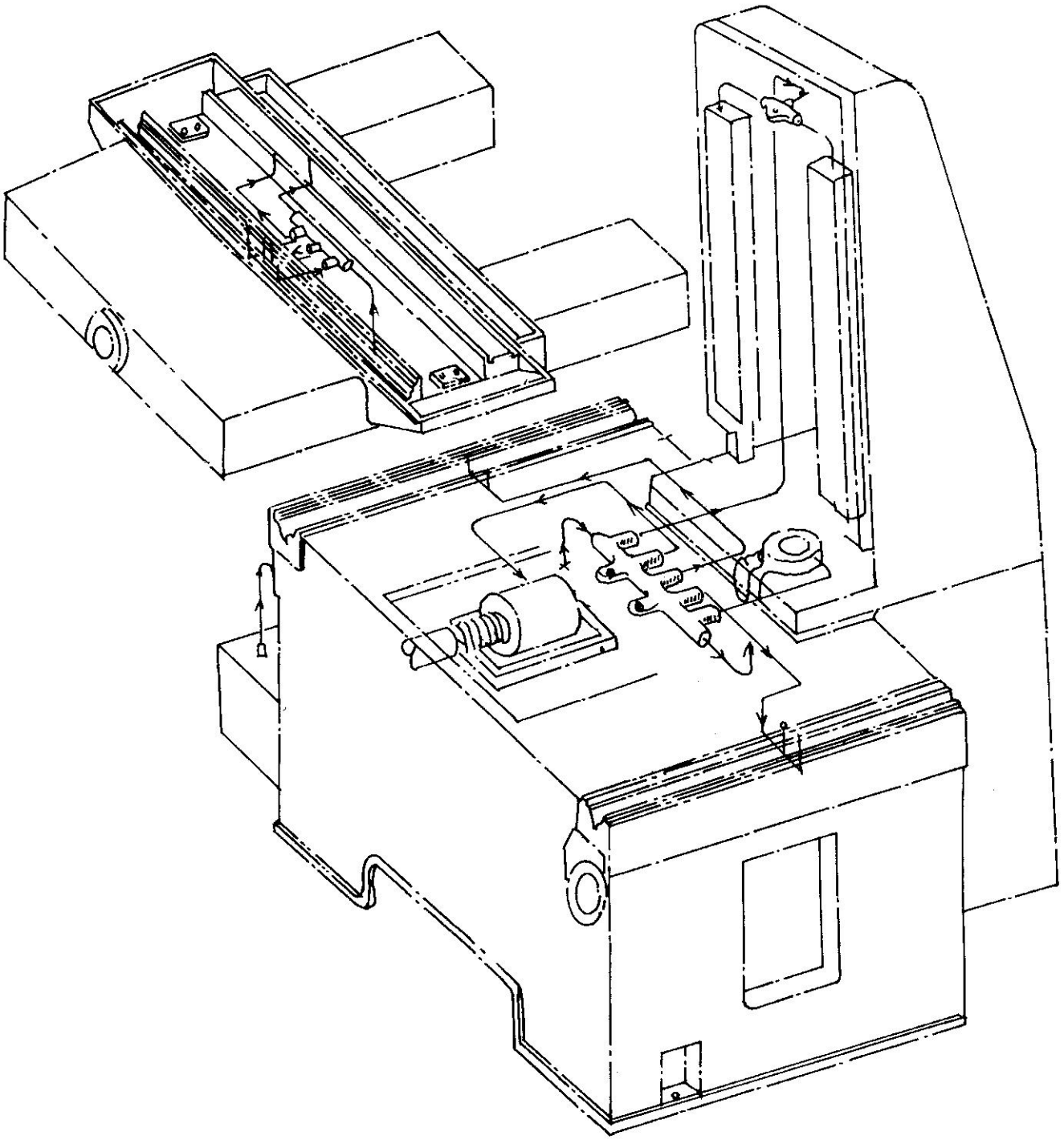
Lubrication Flow Chart

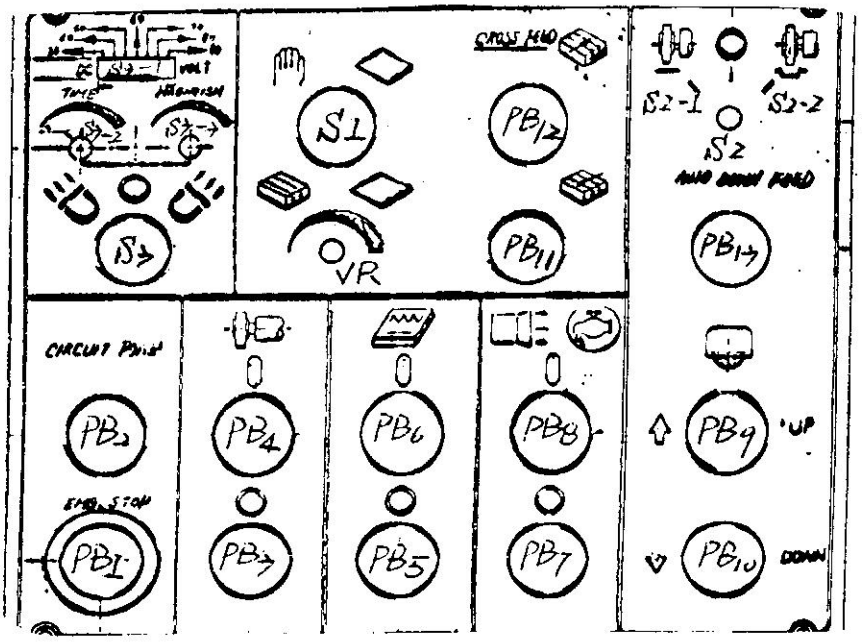


1. 7 ways distributor
2. 5 ways distributor
3. 3 ways distributor

* This is an one-direction ratio distribution controller
* After Hydraulic pump is switched on, the timing lubricant pump will apply automatic lubrication once every ten minutes.
* Please refill lubricant as deemed necessary as often as necessary

Lubrication System Diagram





PB2 : Open Switch - When button is pressed, inner bulb lights and power stands by.

PB1 : Emergency "Off" Switch - When button is pressed, whole machine stops. This is designed for emergency conditions.

PB4 : Spindle Start Button - When pressed, spindle is at "on" position.

PB3 : Spindle Stop Button - When pressed, spindle is at "off" position.

PB6 : Oil Tank Start Button - When pressed, oil tank motor is at "on" position.

PB5 : Oil Tank Stop Button - When pressed, oil tank is at "off" position.

PB8 : Coolduster Start Button - When pressed, coolduster motor is at "on" position.

PB7 : Coolduster Stop Button - When pressed, coolduster motor is at "off" position.

PB9 : Spindle Rapid Up Feed Push Button.

PB10: Spindle Rapid Down Feed Button.

S 1 : Cross Feed Selecting Switch - Turn right for "automatic"; turn left for "handfeed". S1 has to be coordinated with PB12, PB11 and S2 to obtain right function. When S2 is pressed to S2-1, S1, PB12 and PB11 function; when S2 is pressed to S2-2, S1, PB12 and PB11 do not function.

VR : Cross Feed Capacity Adjusting Button - it functions only when S1, PB12, PB11 and S2-1 are selected for automatic feeding. The right turn angle is bigger making the auto feeding capacity larger; if otherwise, feeding capacity is smaller.

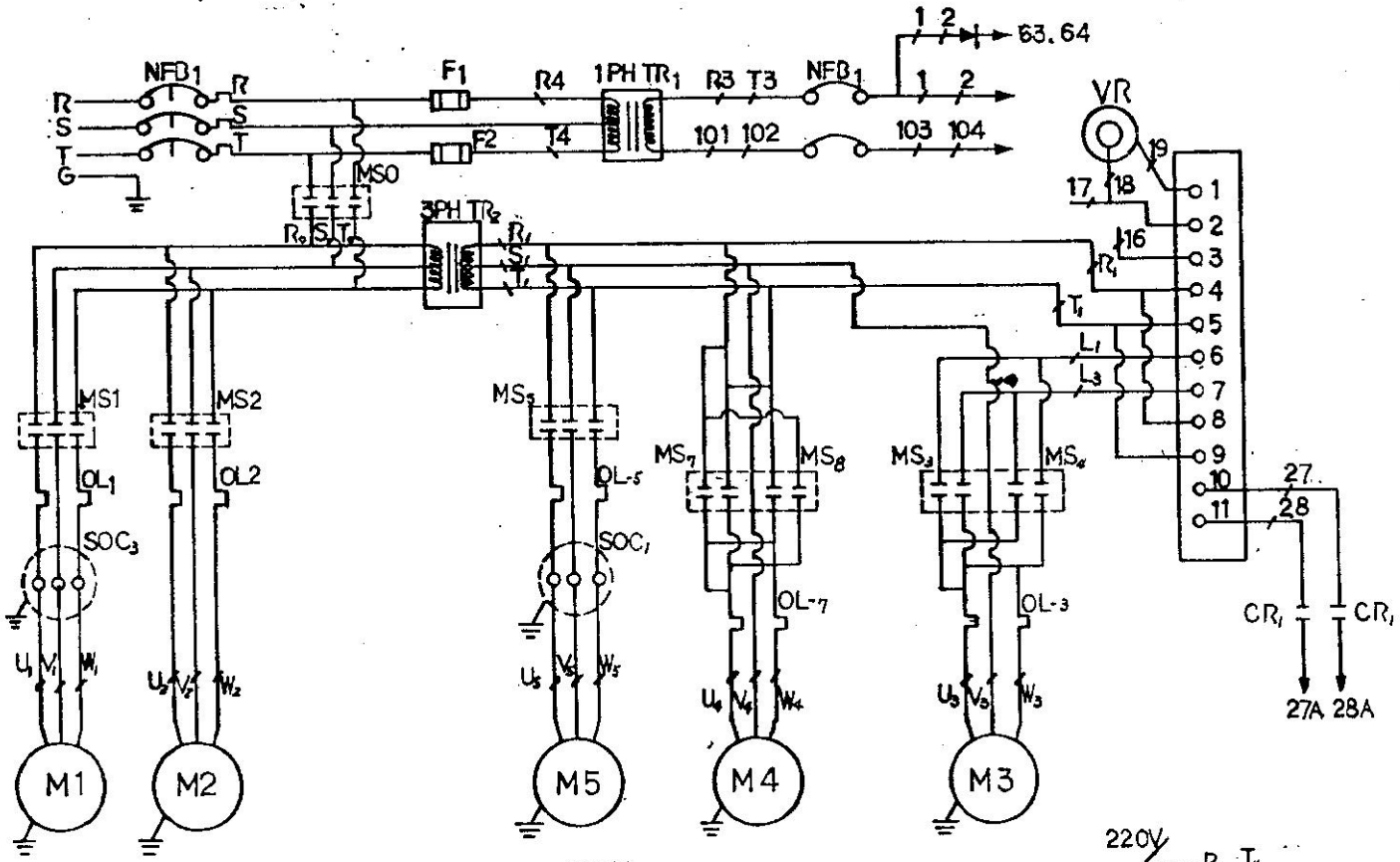
PB12: Table Forward Push Button - When S1 is at handfeed position, press PB12, then table continuously moves rapidly forward; loosen hand to stop table.

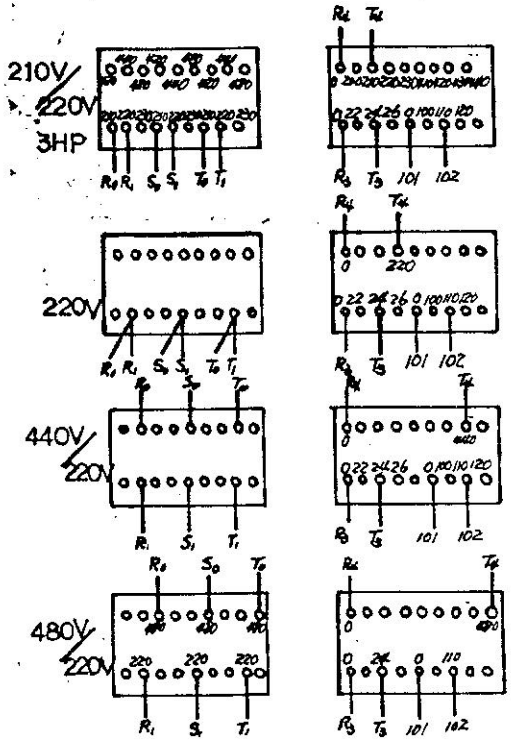
PB11: Table Backward Push Button - When S1 is at handfeed position, press PB11 making table continuously move rapidly backward; loosen hand to stop table. When S1 is at automatic position, press PB11 to get automatic backward feed.

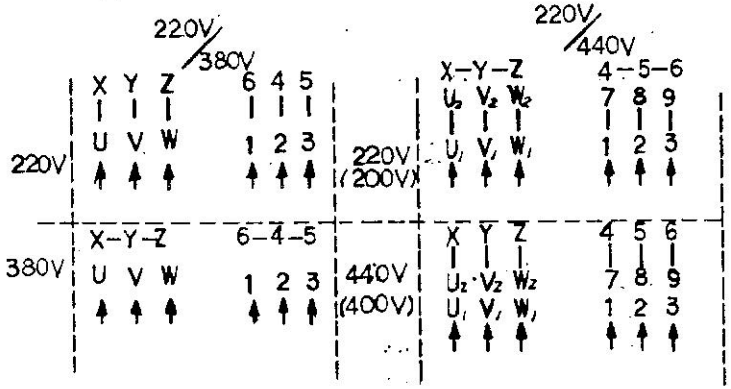
S 2 : Selecting Switch - When switch is at middle position, press PB11 and PB12 and table does crossfeed; when switch is at S2-1, it does flat grinding; when at S2-2, it does cutting.

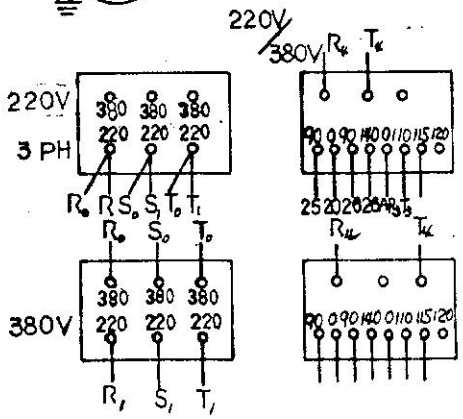
PB13: Auto Down Feed Push Button - When S2 is located at S2-1, press PB13 and wait till bulb lights and the feeding starts. When bulb does not light, it means downfeed limit switch is at "O", readjust the feeding capacity for automatic feed.

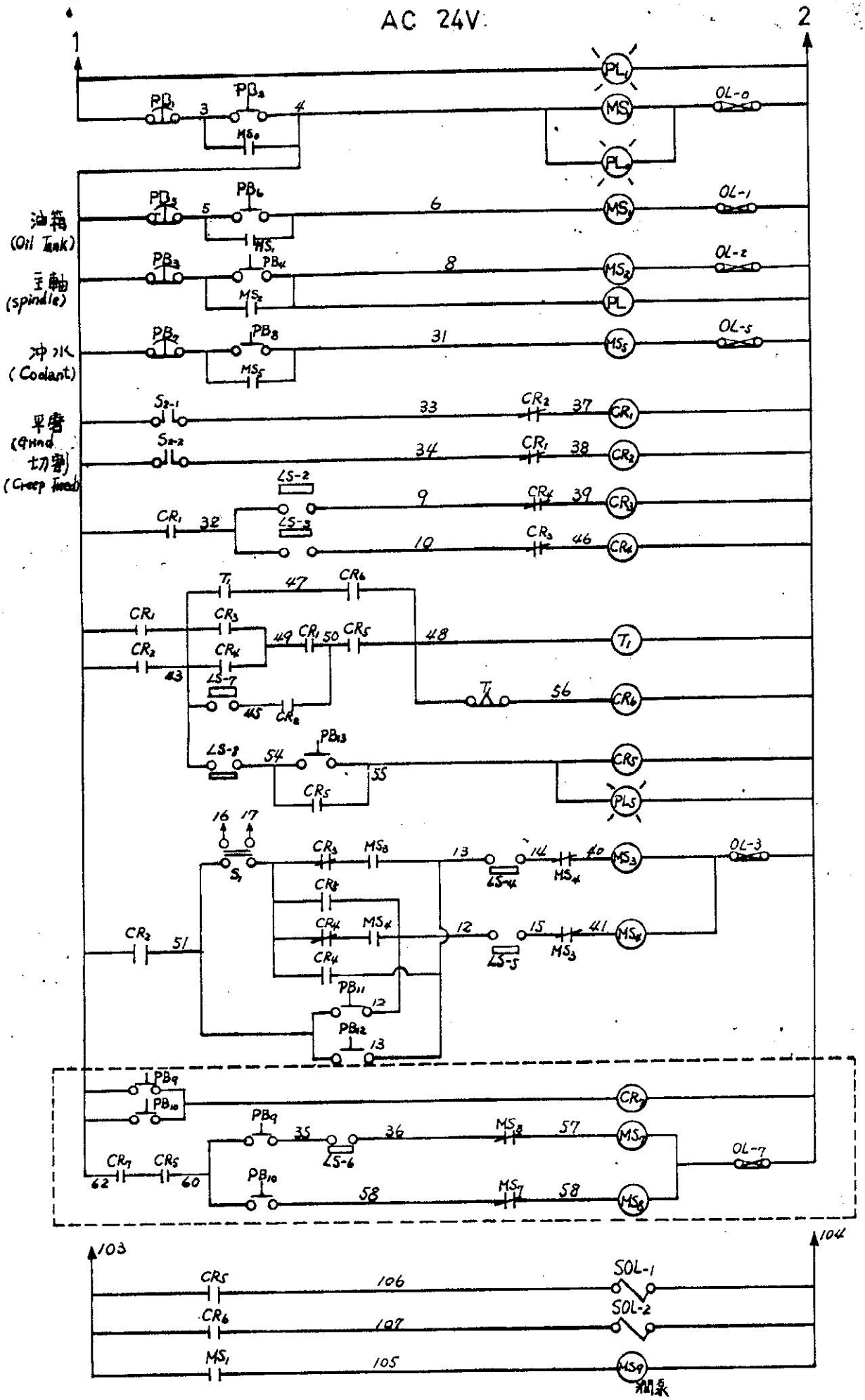
S 3 : Selecting Switch for Electro-Magnetic Chuck - Right turn for magnetizer; left turn for demagnetizer; middle is neutral. S3-2 is for adjusting time of demagnetizer; S3-3 for adjusting magnetic capacity; S3-1 shows magnetic capacity.

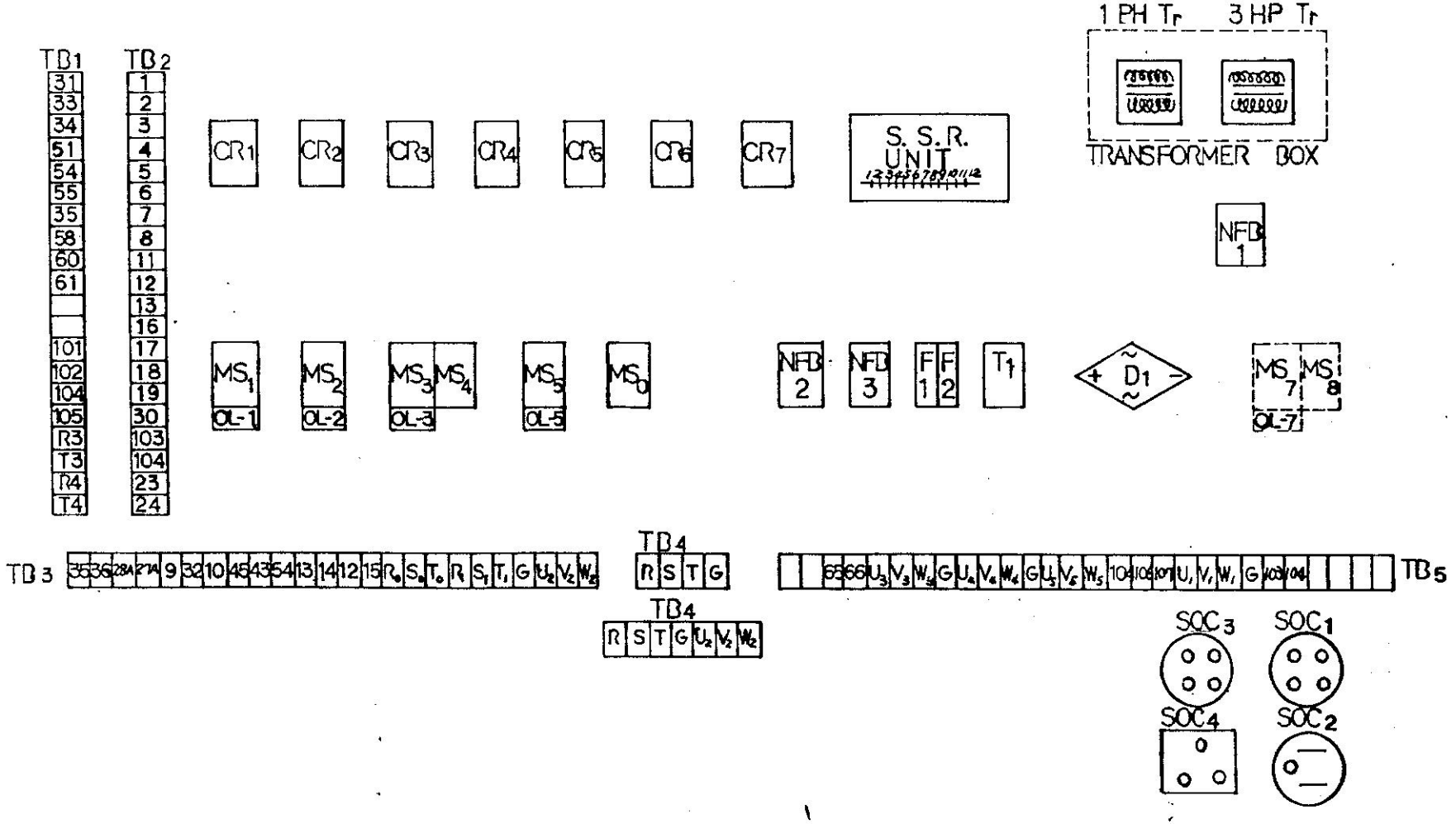

NFB1
R
S
T
G
F1
F2
R4
T4
1PH TR1
R3 T3
NFB1
1 2
63. 64
101 102
103 104
MS0
3PH TR2
R0 S0 T0
R1 S1 T1
VR
19
17 18
16
1
2
3
4
5
6
7
8
9
10
11
27
28
CR1
CR1
27A 28A
MS1
MS2
MS5
MS7
MS8
MS3
MS4
OL1
OL2
OL-5
OL-7
OL-3
SOC3
SOC1
M1
M2
M5
M4
M3


210V
220V
3HP
220V
440V
220V
480V
220V
101
102


220V
380V
X Y Z
6 4 5
U V W
1 2 3
220V
(200V)
X-Y-Z
U2 V2 W2
7 8 9
U1 V1 W1
1 2 3
X-Y-Z
6-4-5
380V
U V W
1 2 3
440V
(400V)
X Y Z
U2 V2 W2
4 5 6
7 8 9
U1 V1 W1
1 2 3


220V
3 PH
380 380 380
220 220 220
R0 R S0 S T0 T1
R0 S0 T0
380V
380 380 380
220 220 220
R1 S1 T1
220V
380V
R4 T4
0 90 140 0 110 115 120
25 20 20 20 AB T5
R4 T4
0 90 140 0 110 115 120


AC 24V
1
2
油箱 (Oil Tank)
主軸 (spindle)
冲水 (Coolant)
平磨 (Hand)
切削 (Creep Feed)
PL1
MS
OL-0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
MS1
MS2
MS3
MS4
MS5
OL-1
OL-2
OL-3
OL-5
PL
S2-1
S2-2
CR1
CR2
CR3
CR4
LS-2
LS-3
T1
CR6
LS-7
CR5
PB13
LS-8
PL5
S1
PB11
PB12
LS-4
LS-5
CR7
PB9
PB10
LS-6
MS6
MS7
OL-7
103
104
SOL-1
SOL-2
106
107
105


TB1
31
33
34
51
54
55
35
58
60
61
101
102
104
105
R3
T3
R4
T4
TB2
1
2
3
4
5
6
7
8
11
12
13
16
17
18
19
30
103
104
23
24
CR1
CR2
CR3
CR4
CR5
CR6
CR7
S. S. R. UNIT
1 2 3 4 5 6 7 8 9 10 11 12
1 PH Tr
3 HP Tr
TRANSFORMER BOX
NFB 1
MS1
OL-1
MS2
OL-2
MS3
MS4
OL-3
MS5
OL-5
MS6
NFB 2
NFB 3
F 1
F 2
T1
D1
MS7
MS8
OL-7
TB3
TB4
R S T G
TB4
R S T G U2 V2 W2
TB5
SOC3
SOC1
SOC4
SOC2

ELECTRIC PARTS LIST

MARK	NAME	FUNCTION
PB1	Push button	To turn the power source "off"
PB2	Push button with lamp	To turn the power source and PL2 "on"
PB3	Push button	Spindle stop switch
PB4	Push button	Spindle open switch
PB5	Push button	Oil tank stop switch
PB6	Push button	Oil tank open switch
PB7	Push button	Coolduster stop switch
PB8	Push button	Coolduster open switch
PB9	Push button	Spindle rapid up feed switch
PB10	Push button	Spindle rapid down feed switch
PB11	Push button	Table rapid backward switch
PB12	Push button	Table rapid forward switch
PB13	Push button	Automatic feed switch
S1	Select switch	Switch of auto/manual cross feed
S2	Select switch	Switch of flat/slot grinding
VR	Variable resistance	Control crossfeed capacity
S3	Select switch	For electro-magnetic chuck
S3-1	Indicater	Shown on the magnetic capacity
S3-2	Turn switch	Time of demagnetizer
S3-3	Turn switch	Magnetic capacity
MS0	Magnetic switch	Control power source
MS1	Magnetic switch	For Hydraulic pump
MS2	Magnetic switch	For spindle motor
MS3, MS4	Magnetic switch	For saddle forward and backward.
MS5	Magnetic switch	For coolduster motor
CR1...CR6	Relay	Auxiliary relay of electric control system
NFB1	No fuse breaker	No fuse breaker of power source
NFB1,2	No fuse breaker	No fuse breaker of electric control system.
F1, F2	Fuse	Fuse for protect electric circuit
T1	Timer	Auto down feed cycle controller
SOC1	Socket	For coolant or dust suction
SOC2	Socket	For work light
SOC3	Socket	For hydraulic motor
SOC4	Socket	For solenoid valve
1 PH TR.	Transformer	For electric control system
3 PH TR.	Transformer	For power source
TB1,2,3,5	Terminal board	For wire connect
OL1,2,3,4,5,6	Over load relay	Motor over load protect replay
S.S.R. UNIT	Crossfeed controller	For controlling auto/manual connect
SM-5B05A	Demagnetizer	For electro-magnetic chuck.

AUTO DOWN FEED ASSEMBLY

Index No.	Part No.	Part Name	Quantity
1.	1020-N8-001	Graduation Dial (mm size)	1
		Graduation Dial (inch size)	1
2.	1020-N8-004	Graduation Dial Bush	1
3.	1020-N8-005	Spacer	1
4.	1020-N8-006	Fixed Nut	1
5.	6204ZZ	Bearing	1
6.	1020-N8-003	Graduation Dial Holder (mm size)	1
		Graduation Dial Holder (inch size)	1
7.	1020-N8-010	Holder	1
8.	1020-N8-011	Holder	1
9.	1020-N8-012	Ratchet	1
10.	W¼" x ½"L	Socket Head Cap Screw	8
11.	1020-N8-041	Cylinder Base	2
12.	P-20	O-Ring	1
13.	1020-N8-040	Cylinder Fixed Ring	4
14.	P-16	O-Ring	2
15.	1020-N8-038	Cylinder	2
16.	1020-N8-037	Cylinder Rod	2
17.	1020-N8-035	Spacer	2
18.	1020-N8-034	Cylinder Cover	2
19.	P-10	O-Ring	2
20.	1020-N8-022-1	Spring	1
21.	W⅜" x ½"L	Socket Head Cap Screw	1
22.	1020-N8-030	Bevel Gear	1
23.	Ø3 x 30L	Pin	1
24.	1020-N8-032	Bush	1
25.	1224-08-055	Spring	1

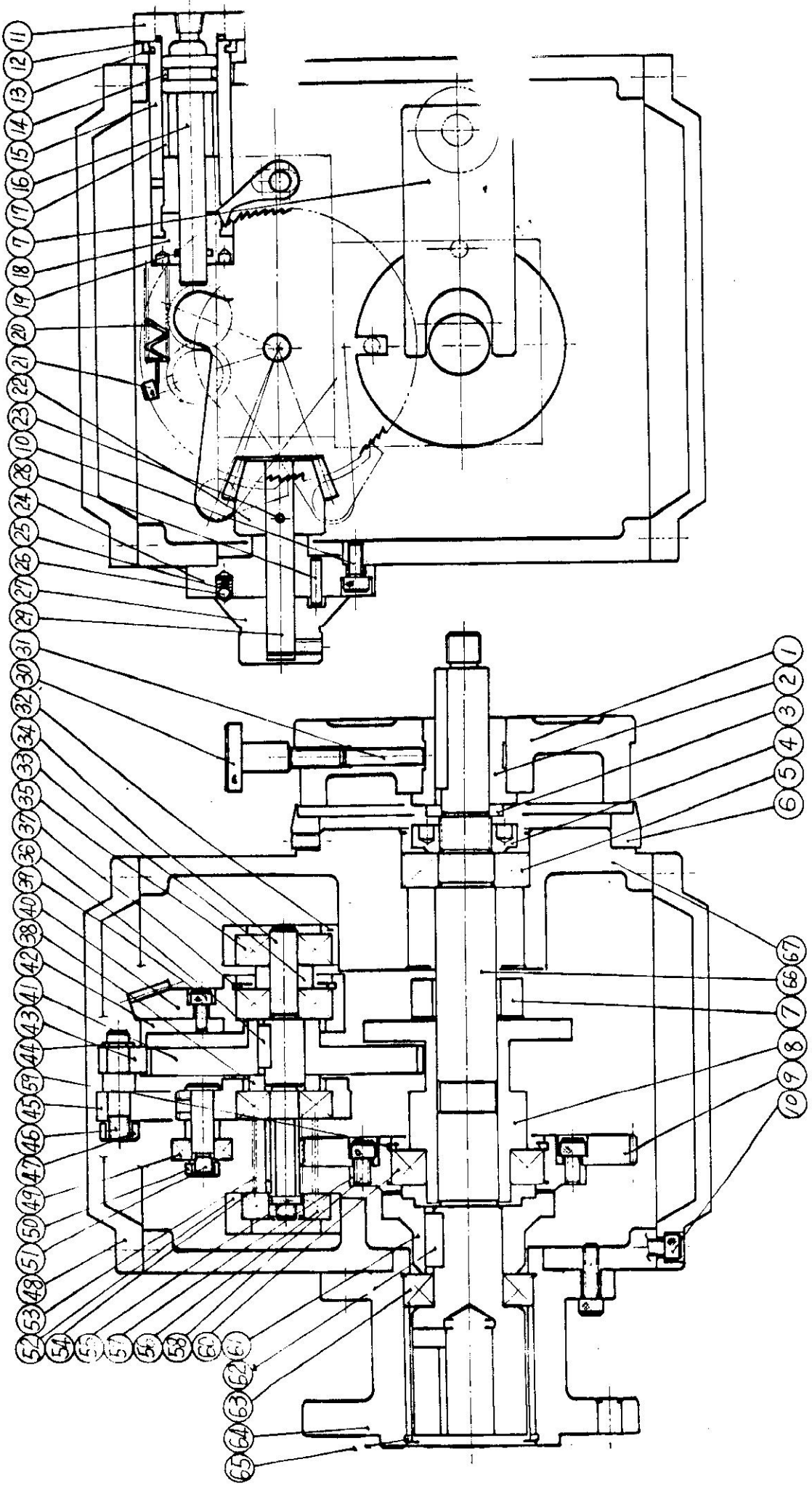
AUTO DOWN FEED ASSEMBLY

Index No.	Part No.	Part Name	Quantity
26.	Ø5	Steel Ball	1
27.	1020-N8-033	(Preset Dial (mm size)	1
		(Preset Dial (inch size)	1
28.	Ø4 x 18L	Pin	1
29.	1020-N8-031	Pin	1
30.	1020-N8-008	Fixed Screw	1
31.	Ø6 x 30L	Pin	1
32.	1020-N8-015	Bracket	1
33.	1020-N8-017	Spacer	1
34.	1020-N8-016	Pin	1
35.	6300ZZ	Bearing	3
36.	5 x 5 x 15L	Key	1
37.	R-35	Snap Ring	1
38.	1020-N8-021	Spacer	1
39.	W3/16" x 5/16"L	Socket Head Cap Screw	2
40.	1020-N8-018	Bevel Gear (Half)	1
41.	1020-N8-020	Ratchet	1
42.	1020-N8-019	Slipper	1
43.	1020-N8-025	Claw	2
44.	S-17	Snap Ring	1
45.	1020-N8-022	Transmission Arm	1
46.	1020-N8-026	Pin	1
47.	W5/16"	Hexagonal Nut	1
48.	1020-N8-009	Side Cover	2
49.	608ZZ	Bearing	1
50.	W1/4"	Hexagonal Nut	1

AUTO DOWN FEED ASSEMBLY

Index No.	Part No.	Part Name	Quantity
51.	1020-N8-023	Pin	1
52.	1020-N8-029	Bracket	1
53.	1632-N8-028	Gear (1632 Use)	1
54.	1020-N8-028	Gear	1
55.	Ø3 x 10L	Pin	1
56.	6201ZZ	Bearing	1
57.	1020-N8-013	Clutch	1
58.	W¼" x 5/16"L	Socket Head Cap Screw	2
59.	R55	Snap Ring	1
60.	6006ZZ	Bearing	1
61.	1020-N8-014	Clutch	1
62.	7 x 7 x 20L	Key	1
63.	6005ZZ	Bearing	1
64.	1224-08-001-1	Housing	1
65.	R-47	Snap Ring	1
66.	1020-N8-007	Shaft	1
67.	1020-N8-002	Gear Box	1

AUTO DOWN FEED ASSEMBLY



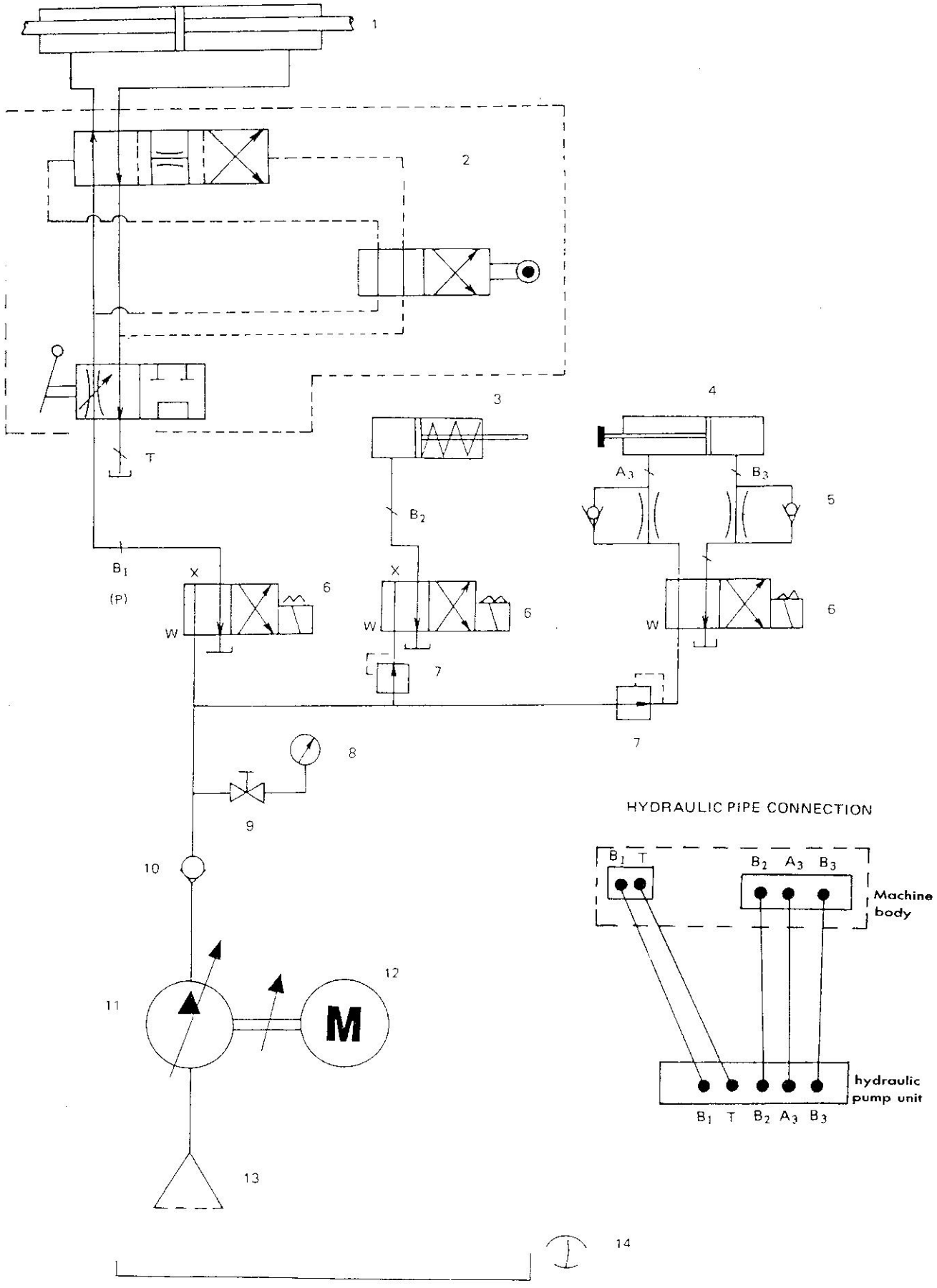
(7) Hydraulic System

Hy draulic oil needs to be maintained in adequate viscosity. More or less viscosity will decrease working effeciency and increase wearing of the machine. So please use our suggested brand and number of hydraulic oil in order to obtain best results. Hydraulic oil will become less efficient after use for a period of time. Therefore that it has to be changed regularly to prevent from greasy dirt. The sediments will cause hydraulic system to function abnormally, and will even decrease the expected life of hydraulic equipment. The normal hydraulic oil is transparent and flavorless in general. Beside periodically change of hydraulic oil, should you discover hydraulic oil below optional, condition please change oil immediately to protect hydraulic system.

a. Oil is dark brown color and produce odor.
b. Oil is creamwhite cldor because of water permeation.

BRAND	KAO-KUANG	BP	ESSO	MOBIL	SHELL
OIL NO	R-53	ENERGUL HL1000 4.5°E/50°C 33cst/50°C	ESSTIC50°C 4.7°EI 50°	D.T.E. Medium oil	Teilus oil 29

* First time to change new hydraulic oil is after three months of usage; then, change once every year. (Please compensate for the wearing away of oil in order to maintain a standard capacity of working oil.)
* Hydraulic pressure has to be kept within 18-22kg/m^2
* The capacity of hydraulic tank is approximately 601. (1632 SERIES IS 801)

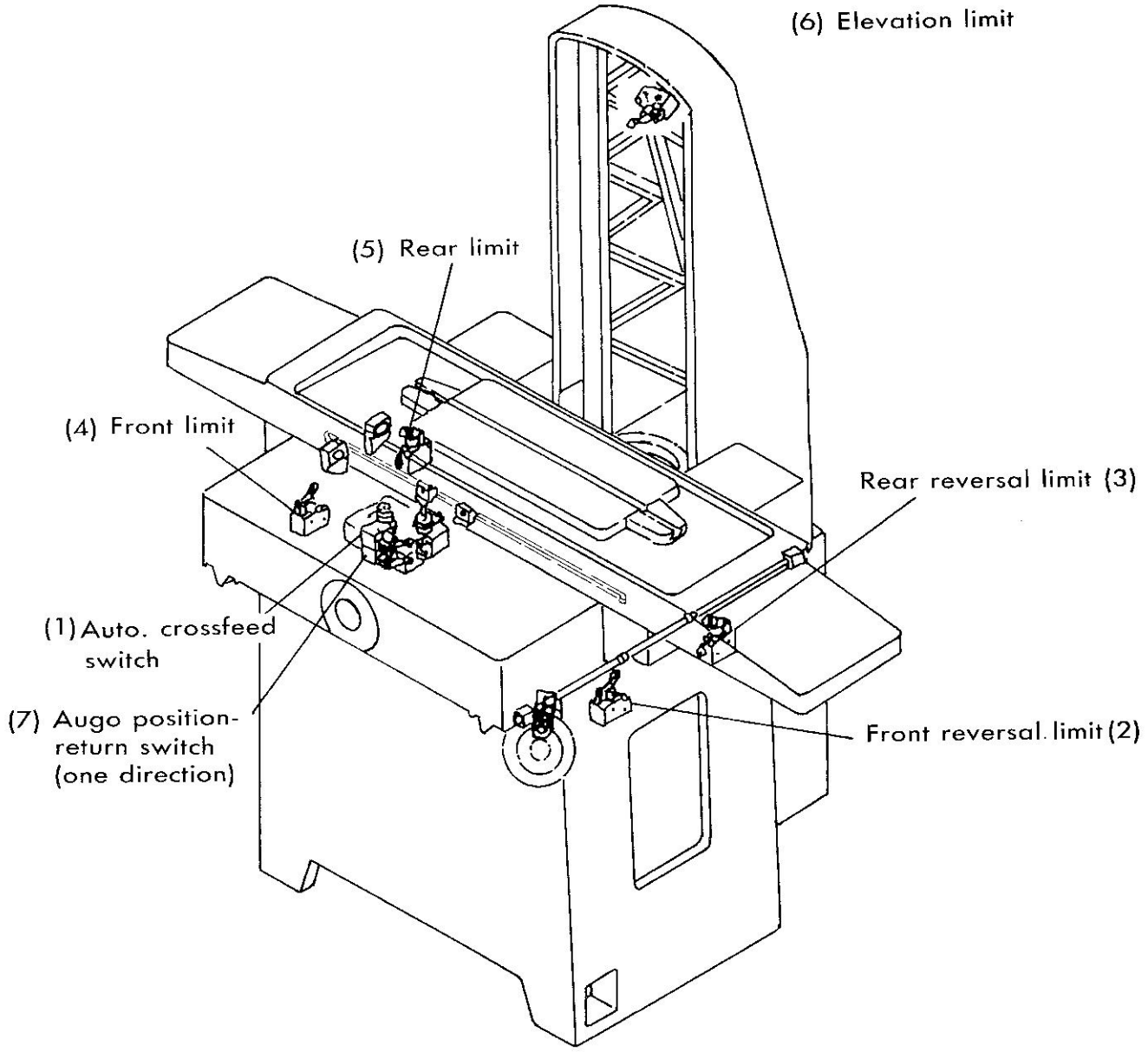


HYDRAULIC PIPE CONNECTION

HYDRAULIC SYSTEM PARTS LIST

NO.	PART NO.	NAME	REMARK
1.	1020 1224 Cylinder Assembly	Cylinder of table	
2.	1020 1224 Valve Assembly	Flow and direction control unit	
3.	1224-A7	Cylinder of cultch (downfeed)	
4.	1224-A6	Cylinder of feed (downfeed)	
5	MT-02W-1	Modular flow control valve	
6	SW-G02-B2-A110	Solenoid operated directional valve	
7	MPR-02P-1	Modular relief valve	
8	DG-G1	Pressure gauge (2-1/2''×70KG)	
9	GCT-02	Gauge cock (1/4''PT)	
10	CIT-06	Check valve	
11	VPCV-F26-A2	Variable displacement vane pump	
12	HP-M1	Motor(2HP×4P) (3HP×4P FOR 1632 AHD)	
13	SS-1	Oil filter	
14	LS-5101-D	Reservoir level indicator	

E . Limit Switch Position



Description:

(1) Auto. cross feed switch: 27A-28A

(2) Front reversal limit: 32-9

(3) Rear reversal limit: 32-10

(4) Front limit: 12-15

(5) Rear limit: 13-14

(6) Elevation limit: 36-35

(7) Auto position-return switch: 43-45

* For the above mentioned cord number, please refer to electric circuit control and electric circuit diagram.

(9) Balancing the grinding wheel

Efficient balancing is essential to eliminate unnecessary and additional stress in the wheel. It is also unavoidable to obtain high quality results. Grinding accuracy and surface finish as well as life of grinding wheel, wheel spindle and bearings depend to some considerable extent on careful wheel balancing. Static balancing will frequently be sufficed for this purpose.

The grinding wheel together with the wheel flange is fitted to balancing arbor and this assembly is then placed on two accurate parallel knife edges of the wheel balancing base, and balancing can be effected as follows: (see Fig. 2)

* The wheel balancing base must be levelled (Fig. 1)
* Allow the wheel to oscillate to find the center of gravity which is then marked "S" with chalk (Fig. 3)
* Apply the first balancing weight "G" opposite to this point "S" and screw it up. It can not be moved again (Fig. 4)
* Place two correction weight "K" anywhere around the periphery, but at equal distance "a" from weight "G" (Fig. 5)
* Turn the wheel through 90° at a time and see if it is in balance. If not, the correction weight "K" must be moved until the wheel is in balance in any position (Fig. 6)
* After balancing, the wheel must be given a test run of at least five minutes at full working speed before being used or starting re-balance.

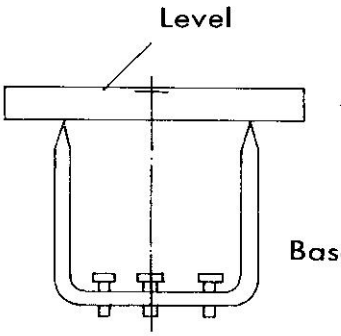


Fig. 1

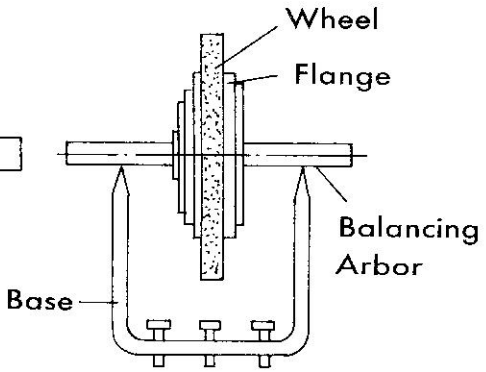


Fig.2

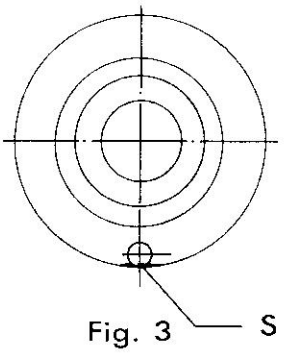


Fig. 3

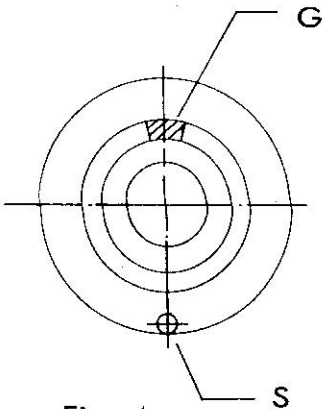


Fig. 4

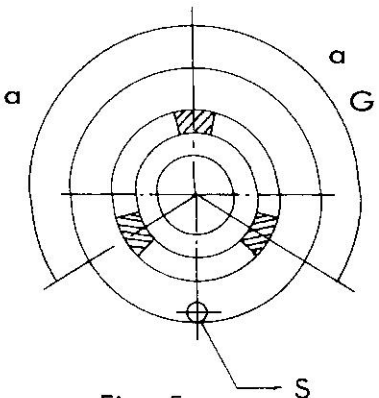


Fig. 5

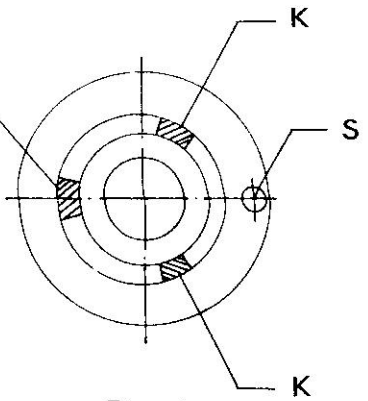


Fig. 6

After being balanced for the first time, the wheel must be mounted on the grinding spindle of the machine and dressed. This can be done with the parallel dresser on the spindle front seat or with one fitted on the table. When dressing the wheel from the table, the table must be locked longitudinally and then cross-traversed with handwheel. The wheel must be dressed until it runs dead true. The grinding finish is improved, if any out-of-truth in the side walls of the wheel is also removed.
After this first balancing, the wheel must be removed from the spindle again and then carefully re-balanced. After being fixed to the spindle again and re-dressed, it is ready for use.

As wear can lead to unbalance, the wheel should be re-checked and, if necessary, re-balanced.
Grinding wheel absorbs humidity and coolant, it is therefore advisable not to start coolant supply when the wheel is stationary, otherwise the wheel will absorb liquid on one side only and will then be out of balance. If the wheel is allowed to stand for any length of time coolant will collect at the lowest point. Unbalance will also be generated if the wheel is not allowed to idle after operation. Idling is essential to throw-off coolant by centrifugal force.

(10) Installatin and dismantling of the grinding wheel

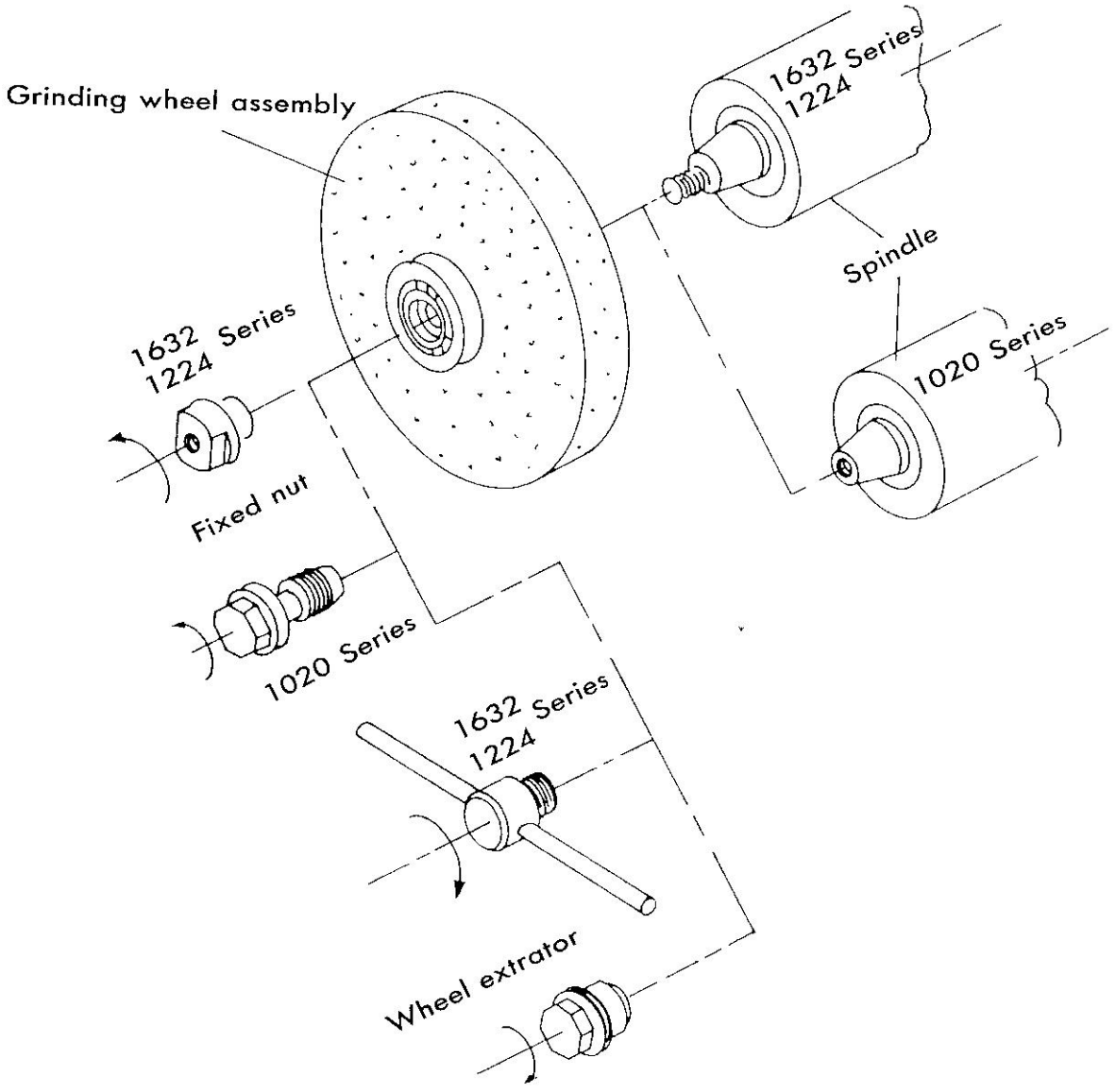
Installation:

1. Carefully rotate the bigger conical surface of grinding wheel toward inside, and carefully put it on the spindle.
2. Firmly tighten the fixed nut counterclockwise (by moveable wrench or open wrench)

Dismantling:

1. Loosen the fixed nut clockwise.
2. In the wheel extractor and Firmly hold the grinding wheel by one hand, rotate it clockwise until the grinding wheel breaks away from spindle. Then, carefully take down the grinding wheel.

* Prior to placethe flange-mounted grinding wheel to the spindle make sure flange bore and spindle taper are absolutely clean.



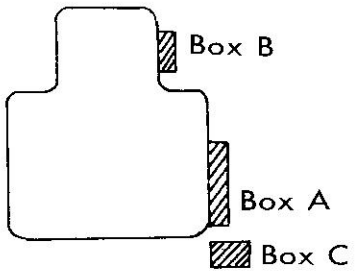
E). Putting The Machine Into Operation

NOTICE BEFORE MACHINING

1. Wire the machine according to the power source.
2. Install the machine with adequate "body" clearance beyond the maxium travels.
3. Operator always wears protecting eye-glasses.
4. Check wheel rotation, it must be clockwise.
5. Do not operate the grinding wheel faster than the speed shown on the wheel blotter.
6. Before starting machine, please verify that the grinding wheel is secure.
7. Do not operate the machine if the wheel guard has not locked.
8. Verify that the work is secure and/or the magnetic chuck energized
9. Verify that the grinding wheel clears the work.

(I). Wiring of power source

Be sure that the wire connection is same as your power source before power "ON" the machine.



Box A: Electric cabinet

Box B: Three-phase transformer for:

1. Crossfeed motor
2. Electro-magnetic chuck (Optional)

Box C: Control panel and control circuit (AHD model)

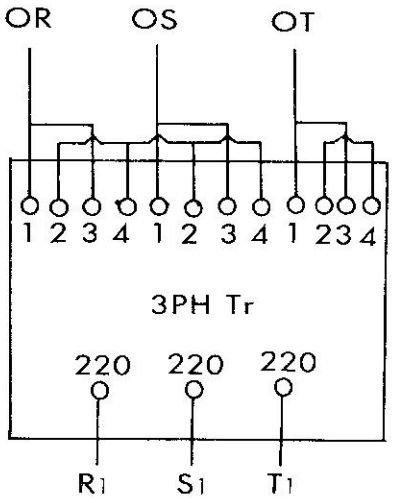
Attention: Following motors must be wired in accordance with power source voltage.

* General motor is constructed with two voltages, but we always preconnect it with customers' ordered voltage. In case you need the other voltage, please remember to order them to your style before connection. Otherwise, these equipments will be burned or will be shore of power.

1. Spindle motor.
2. Hydraulic motor
3. Coolant and duster motor

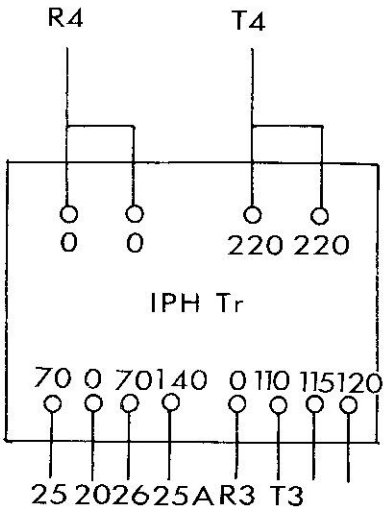
   Three phase transformer
4. Single phase transformer

For 220V Power Source
Box B

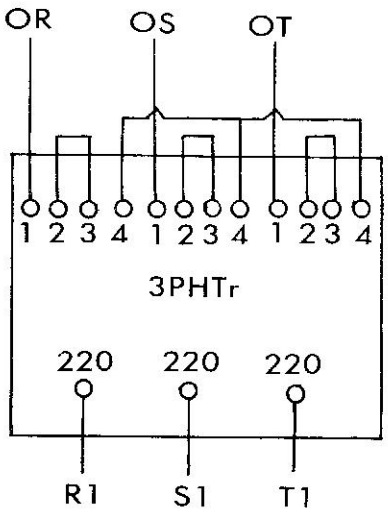


(3 PHASE AND 1 PAHSE)
TRANSFORMER CONNET

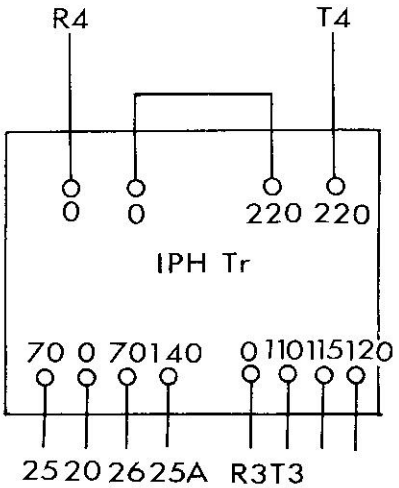
220V



FOR 440 V power Source
BOX B



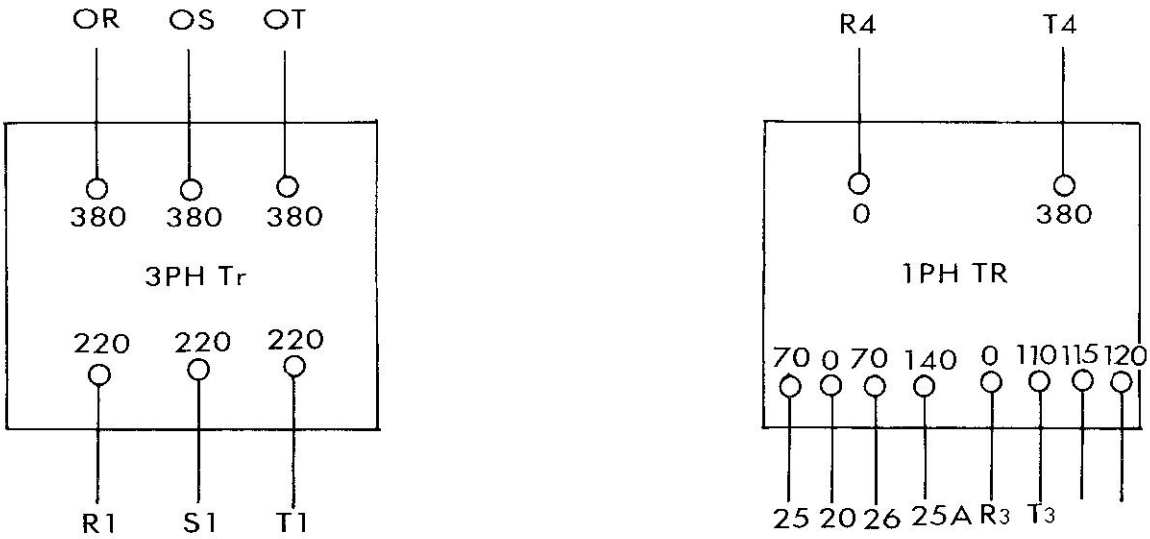
440V



For 380V power source:
Box B

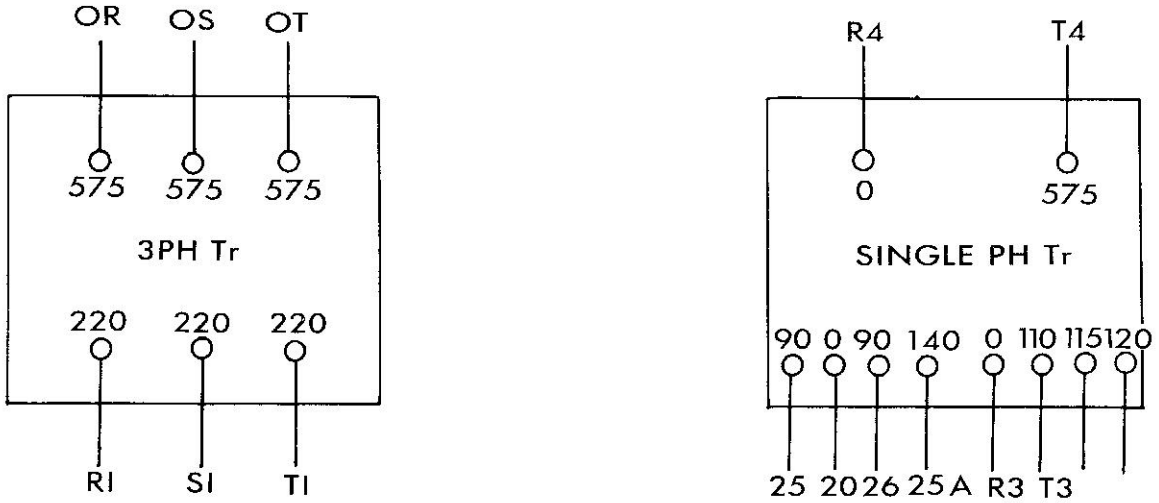
3 PHASE AND SINGLE PHASE TRANSFORMER CONNECTION

380V



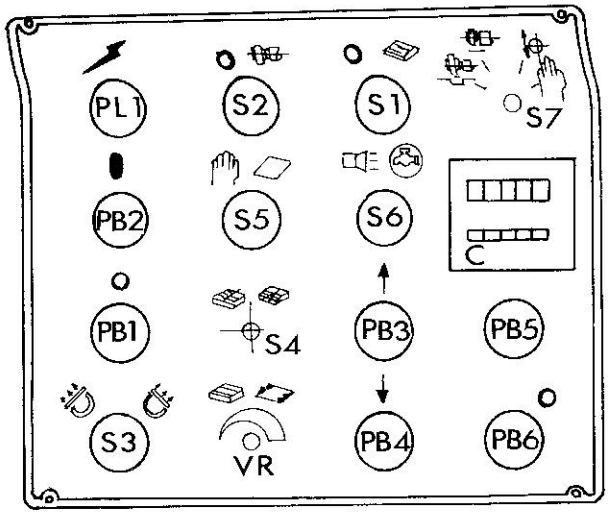
(3PHASE AND SINGLE PHASE)
TRANSFORMER CONNECTION
For 575V power source:
BOX B

575V



E ?_ing the machine into Operation

Control panel & Descriptions.



PL1: Power lamp. (When breaker of single and three phase is at "on", main power is opened, the lamp is lighted).

PB2: Open switch (After you pressed the button, the power stands by your order, inner bulb is lighted)

PB1: Emergency "off" switch (Whole machine will stop as soon as you pressed down the button. It is designed for emergency condition. In case you are going to open PB2 again, please lightly turnclockwise to let it uprise to original condition)

S3: Selecting switch for electro-magnetic chuck. (Turn right to magnetize, turn left to demagnitize middle is neutral)

S2: Spindle switch (Turn right "on", turn left "off")

S5: Crossfeed selecting switch (Turn right "automatic" "handfeed")

*S5: has to be coordinated with S4 and S7 to obtain best function. Only put S7 at, S5 and S4 can work; if S7 is placed at, then S5 and S4 these two switches won't have any function.

S4: Crossfeed direction selecting switch (Right is forward, left is backward) * When S5 is automtic turn S4 to rquired direction; when S5 is hand feed, continuously turn S4 until working table rapidly arrive required place.

VR: Crossfeed capacity adjusting button (This button is workable only when S4, S5, S7 are select for automatic feeding. The right turn angel is bigger, the auto feeding capacity is larger; on the other hand, the feeding capacity is smaller.)

S1: Hydraulic tank switch (Right is "on", left is "off" it always coordinate with PB5 and PB6)

S6: Coolant/Duster swith (Right is coolant, left is duster, off is in the middle)(S6 is workable only switch' of Coolant/Duster is pressed "on")

PB3: Grinding wheel rapid uprising switch (This button is workable only if S2 is pressed "on", and S is selected at ⊕)

(2) Operation Procedure

a). Before Operation

Please pay best attention to the following instructions before operate the machine:

1. Choice of a location free from vibration.
2. Clean the machine free of anti-rust oil and grease.
3. Installation and levelling of the machine.
4. Lubricate the machine according to lubrication instructions.
5. Checking the direction of the spindle (wheel) rotation, it must be clockwise.

* Please take off the wheel prior to start spindle or it might cause danger if it rotates in counter-clockwise.

For hydraulic models:

6. Filling the hydraulic tank with suitable oil.

   AGS-1020AHD, AGS-1224AHD, AGS-1632AHD 50 liters (12.5 gallons)
7. Lever "H1" of the hydraulic table traverse must be parallel to the crossfeed direction "a" (Ref. to drawing below).
8. Adjust suitable stroke of the table. The longitudinal stroke is limited by two pieces of stopper dog on the front side of table. The distance can be adjust by loosening the screws, sliding the stopper dogs and fastening screws again.
9. And mention again: Please re-check your power source is same as that of the voltage pre-wired when shipping.

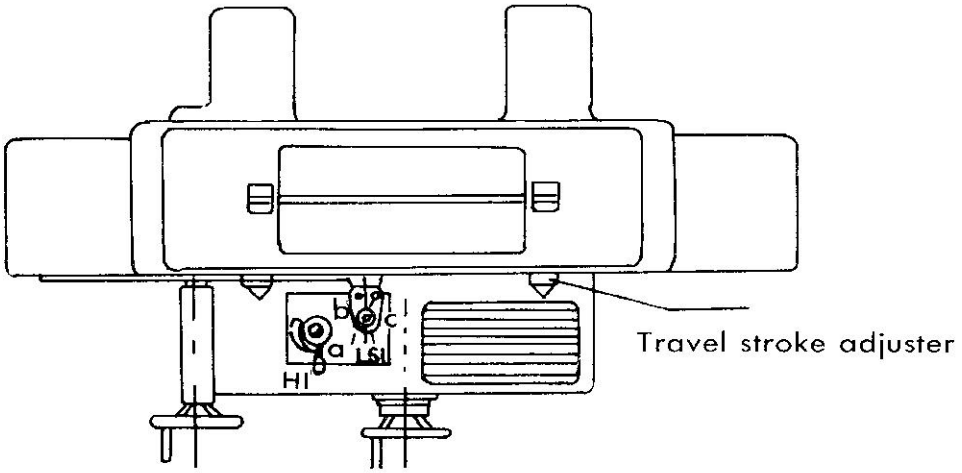


Figure P26

5). Operation

1). Power ON & OFF

For AGS-1020AHD, AGS-1224AHD, AGS-1632AHD:

1. PL1 indicator will light when electronic control box is ready.
2. Press. PB2 to power on.
3. PB1 is for emergency stop.

(2) Table Longitudinal Movement

1. Switch on S1 for starting the hydraulic pump motor. (Then push down PB5 make the valve of table on)
2. Turn the lever "H1" clockwise until the table starts slowly.(see figure P26)
3. If the table unable to travel automatically, you can rotate at anti-direction "b.c." by hand, in this case, You can check the neutral point and set the right position "LS1"

(3) Table crossfeec Movement

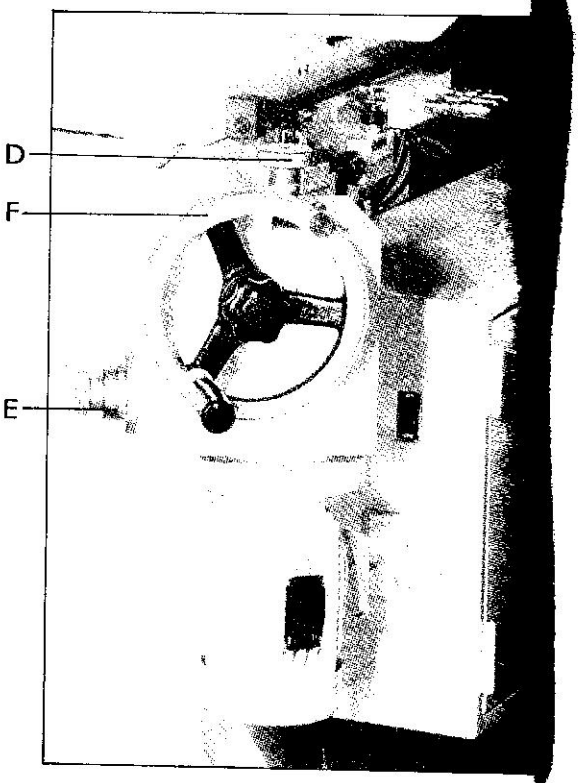
1. Switch S5 in position  = Manual
2. Switch S5 in position  = Automatic crossfeed.
   Turn Switch S4 in position  then saddle move away from the operator
   Switch S4 in position  then saddle move toward the operator
3. The cross-traverse distance is controlled by the limit switch on the right side of the saddle base.
4. Before starting the automatic feed, switch S5 to automatic position then turn on S4 for backward or forward according to your need and control the infeed by the regulationknob "VR".
5. If after switch on S5 and S4, crossfeed doesn't work, (or one of the switch is out of order) it probably means the limit switch below LS1 is in wrong position and unable to contact cam. In this case, adjustment is necessary.

(4) Automatic downfeed control

Introduction of dowfeed unit

1. D is the dial of the micro regulator of downfeed.
   Vertical downfeed on dial D are:
   0.002mm per graduation
   (0.0001")
   0.2mm per revolution
   (0.01")

DOWN FEED UNIT



2. E is the 10 steps setting regulator of adjustable downfeed per auto downfeed cycle.
   Vertical downfeed on regulator E per auto down feed cycle are:
   0.002mm per graduation (1st step).
   (0.0001")
   0.02mm max down feed per auto down feed cycle
   (0.001")

3. F is the handwheel of downfeed.
   Vertical downfeed on hand wheel are:
   0.01mm per graduation
   (0.001")
   2mm per revolution
   (0.1")

OPERATIONS OF DOWN FEED

1. Situation 1: Switch S7 pointed to

In this case, auto control downfeed for plunge grinding will be executed.
Turn S2 to on position, set counter to desire number, adjust each downfeed increment by setting regulator and control dogs of table travel, then press PB5 to open hydraulic table control lever to operate longitudinal movement of table. After above operation, the spindle housing will grind automatically till preset counter number. Then the table will automatically stop at left side after spark-out. Depending on the position of S2, grinding wheel will uprise automatically or stop at original place.
When PB5 is not pushed, spindle housing can go up and down by cranking the hand-wheel; hydraulic table control lever will not function; though the switch is at plunge grinding mode. When PB% is presed, handwheel is locked by downfeed clutch. Thus enable rapid up and down of the spindle housing when either PB3 or PB4 is pushed. (Note: PB3 and PB4 can not work simultaneously.) At this situation, the spindle housing can also rise up or down slowly through turning the micro regulator of the downfeed unit. Hydraulic table control lever and counter will be in awaiting order. Turning the table control lever will then start the machine.

2. Situation 11: Switch S7 pointed to

In this case, auto control downfeed for surface gring will be executed.
Turn S2 to on position, set counter to desire number, adjust each downfeed increment by setting regulator and control dogs of table and saddle travel, then press PB5 to open hydraulic table control lever to operate the lonitudinal movement of table. After Turn S5 to right, slightly turn S4 to desired direction of saddle, (chuck) adjust VR for each crossfeed inorement The spindle housing will downfeed once when crossfeed finishes one travel. (whitle travel control dog contacts with limit switch
Working table table will stop at left automatically after counter number is reachedant spark-out time is finished. Then Spindle housing will automacally uprise or stay in original place depening on the position of SW-2. Finally the saddle will move rapidly to a fixed point. (while saddle control dog contacted with previous feeding limit switch)
***caution: when starting again at this position, before pushing PB5, please set counte number one less than previous one.

3. Situation III: Switch S7 pointed to

In this case, spindle housing can go up and down rapidly. Regardless of S2's position, press PB3 for rapid up movement and press PB4 for rapid down motion.
***In case switch 7 is at this position, PB5 is useless and handwheel is not functionable.

4. Situation I: Switch S7 pointed to

In this case, manually down feed can be executed. Turn S2 to on position, adjust downfeed increment by setting regulator, and press PB5 to get one automatic downfeed of spindle housing; press once more to get another feed.
***Press PB5 to turn on the function of hydraulic table control leverl. (only temporily)
Press PB6 to turn off the function of hydrualic table control lever.

5. Situation 11: Switch S7 pointed to

In case of lights went out during auto control down feed cycles being operated. It remains the times of auto down feed cycle has been operated.

6. Situation 111: Switch S7 pointed to

The battery in the counter should be changed every two years.

5) Coolant system (optional accessory)

1. Turn S6 to the "Right" side
2. Adjust valve to get suitable coolant flow
3. "OFF" is in the middle

6) Dust-suction coolant system (optional accessory)

1. Turn so to the "Left" side for dust suction, to right for coolant system.
2. Adjust valve to get suitable coolant flow (when wet grinding)
3. "OFF is in the middle

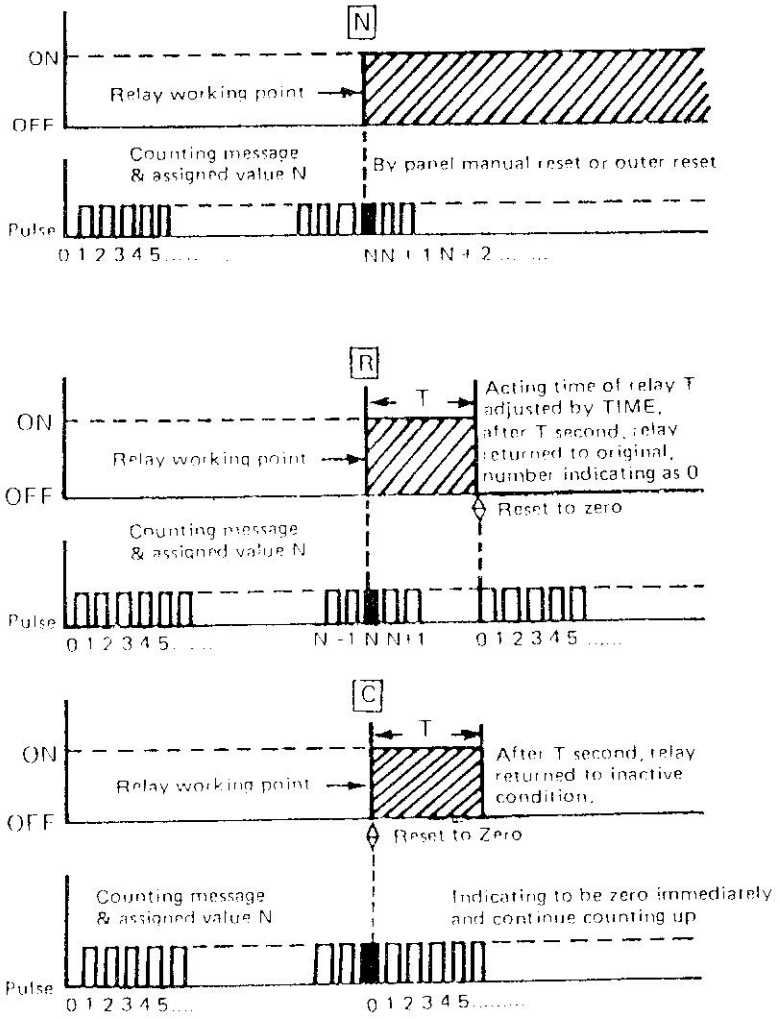
Caution: S6 is workable only in one condition ("Right" or "Left")

Note: the "on" botton of both switch set must be on,

7) Magnetic separator and paper filter system

1. Turn S6 to "Right" side.
2. Adjust valve for suitable coolant flow.
3. "OFF" is in the middle.

FUNCTIONS OF COUNTER N.R.C. SWITCH



N Position: Manual Reset. The counter display will return to zero only when we press down the RESET button on the counter panel.

R position: Automatic Reset, When counter reach preset number, the relay will ON and display continue to count. After 0.1 to 5 seconds controlled by Timer, the relay will OFF and display return to zero automatically.

C position: Automatic Instant Reset. When counter reach preset number, the relay will ON and display return to zero instantly and then continue to count. The relay will OFF after 0.1 to 5 seconds controlled by Timer.

Reset button: You can press the RESET button if you want the counter to start counting from figure "0" (zero).

F). General Comments Of Grinding

The grinding results obtained depend to a very degree on the choice of the correct grinding wheel and suitable operation.

(1) Stock removal efficiency

For intensive stock removal a coarse grain (about 30-36) should be used. The wheel is dressed by passing the diamond over quickly so that the surface of the wheel is roughened and bites well.

(2) Surface finish required

If fine finish is to be produced, a finer grain wheel is required (40-80). The diamond in this case is passed slowly over the wheel so as to break up the grain.

(3) Distortion of the workpiece

If the workpiece shows too much distortion when being ground, this means that the stock removal was too great and the longitudinal and cross movements of the table was too slow, or the grinding wheel is "clogged".

(4) Undesirable burns and grinding cracks

If burn marks and grinding cracks appear, this means that the wheel is too hard, or wheel "clogged"

G).Wheel Inspection and Vibration Check up

1) It is absolutely essential to comply fully with safety rules. These are intended to protect the operator against danger.

Wheel inspection and fitting:

Prior to fitting any grinding wheel, it should always be tested. Sounding the wheel is a generally accepted test method.

The wheel should be suspended from a mandrel secured to its bore and should then be lightly sounded with a wooden hammer. Even wheels with hair cracks not visible with the bare eye will produce a distorted note in comparison with perfect wheel from which the sound is clear. Defective grinding wheels must not be used.

There are two pieces of paper washer on both faces of wheel and serve as plastic packings between wheel and mounting flange. The packing washer must not be removed, when mounting the wheel should be slided onto the flange easily by hand without the need for force. Wheel flange must be absolutely clean especially on the clamping and location surface, in the spindle bore and thread.

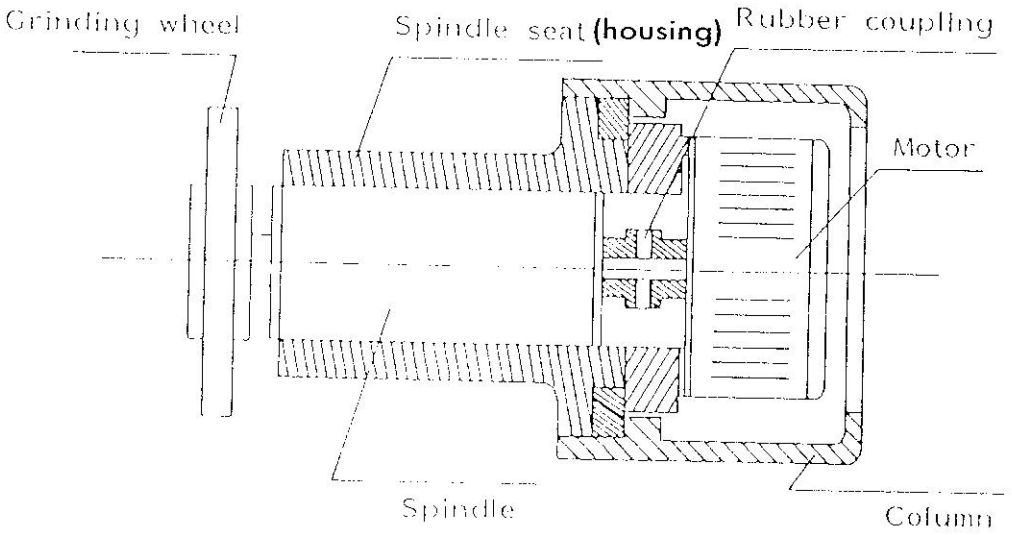
2) If the spindle virbates, please take off the wheel, and then turn on spindle motor again, and check the following points:

a) If no vibration occurs on spindle, it means the vibration comes from the wheel, please re-balance the wheel and wheel flange.

b) If the spindle still vibrates, please take off the motor and check the coupling cushion.

c) As the spindle is under precision assemble, so please do not disassemble it yourself.

d) As the spindle is running at a very high speed, it must be very well balanced otherwise it will cause the spindle vibrates and the wheel breaks.



H). Dressing The Wheel And Correct Treatment Of Dressing Diamond

The diamond is inserted in the dressing device. The sleeve of the dressing device is arranged at an angle of about 6° ; so that, when the diamond loses its keenness, it can be turned in the sleeve, along with its holder, thus ensuring that there is always a sharp diamond edge available.

Various degrees of roughness can be produced in the ground component by varying the speed at which the diamond is passed over the grinding wheel.

If there is only about 0.2mm to 0.3mm stock removal, it is advisable to roughen the grinding wheel. This is done by feeding the diamond in about 0.03mm and turning the handwheel rapidly, so that the dressing diamond moves quickly over the wheel. This makes the wheel bite well and the stock removal is good.

If the component is to finish ground to size with the same grinding wheel. The wheel must be dressed again, this time slowly, in two or three passes, with the diamond fed in only about 0.01mm.

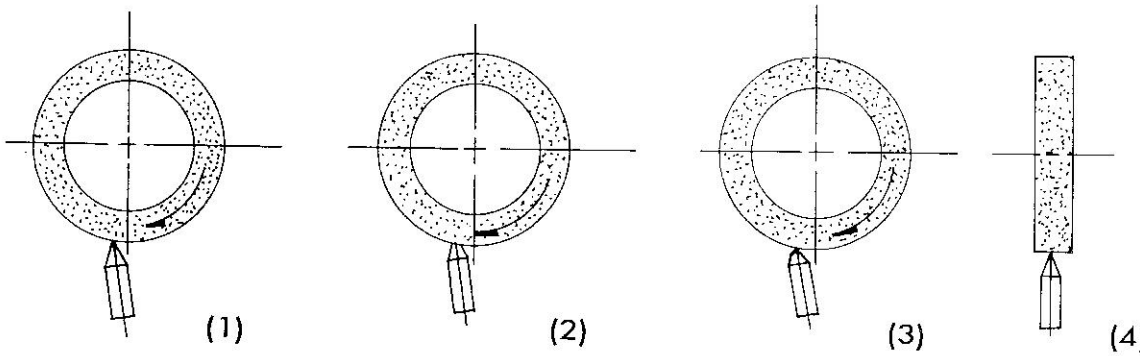
Frequent light dressing is advisable for prolonging the life of the grinding wheel and the diamond than a heavy one.

When dressing, the diamond should always be cooled, if possible, but sudden cooling is dangerous, as it can lead to the diamond being split.

As the diamond is very brittle because of its extraordinary hardness and being sensitive to even the slightest knock, naturally it cracks easily.

When dressing, begin in the center, as the edges are usually worn down further. If dressing is begun at the worn edges, there is a danger of the higher pressure in the center overstressing the daimond and shattering it.

Expreiences have shown that, with highly accurate grinding, dressing with the hand-operated dressing device on the spindle carrier is inadequate. The hand operation necessarily causes slight undulations in the surface of the wheel.



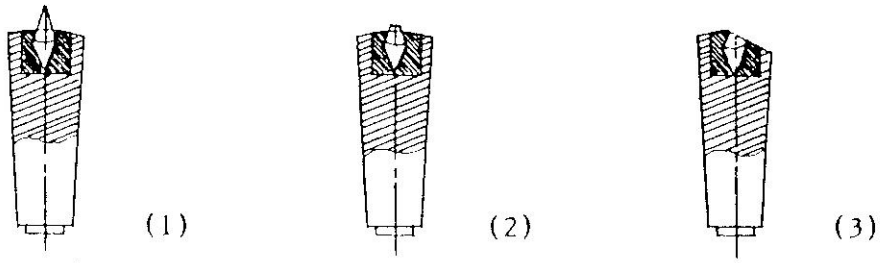
(1) The new diamond is inclined at the correct angle to the wheel.

(2) As a face has formed on the diamond, it must be turned about its axis.

(3) The new point acts like a new diamond again.

(4) Begin in the middle of the width.

After a certain time, the diamond must be changed in its holder, i.e. it must be reset to ensure economical operation. This re-setting should be undertaken in time, before any of the holder itself has been grounded off. Otherwise, there is, first of all, the danger of breaking the diamond and losing it, or secondly, of its being too small to be reset. This is really a false economization.



(1) The new diamond.

(2) The diamond now being reset.

(3) Too late. The diamond can no longer be reset, as it has no more holder. Resetting should be done by specialists only.

I). Storage Of Grinding Wheels

The wheels should be kept in special racks in a dry place and must be protected from knocks and jolts, especially when they are being transported.

As a rule, they should be stood on edge, but thin wheels and wheels with a sharp edge must be laid flat on a flat even surfac.e

Grinding wheel must never be allowed to come into contact with oil or grease. An oilsoaked wheel loses its bite and its utilization is very limited.

J). Selection Of Suitable Grinding Wheels

Grinding wheel markings: For instance WA 46K8V

WA : Kind of abrasive

46 : Grain size

K : Grade

8 : Structure

V : Bond type

(a). Kinds of abrasive

A: For common steel grinding

WA: For higher hardness material grinding, such as heat-treated steel, alloy steel, etc.

H: Suitable for higher hardness material, particularly high speed steel

C: For cast iron and non-ferrous grinding

CG: For super hard grinding such as tungsten carbide steel

(b). Grain size

Coarse: 10, 12, 14 ,16 20, 24

Medium: 30, 36, 46, 54, 60

Fine: 70, 80, 90, 100, 120, 150, 180

K). Wheel Be Recommended

Material be ground \ Wheel diameter		Under 205mm	205 to 355mm
Carbon steel	under HRC25°	WA A 46 K	WA A 46 J
	above HRC25°	WA 46 J	WA 46 I
Alloy steel	under HRC55°	SA WA 46 J	SA WA 46 I
	above HRC55°	SA WA 46 H	SA WA 46 G
Tool steel	under HRC60°	SA WA 46 I	SA WA 46 H
	above HRC60°	SA WA 46 H	SA WA 46 H
Stainless steel		SA WA 46 I	SA WA 46 H
Cast iron		C 46 J	C 46 I
Brass		C 30 J	C 30 I
Aluminum alloy		C 30 J	C 30 I
Tungsten Carbide		GC 60 H-100 I	GC 60H-100 I
Glass		C 60 K	C 60 K
Marble		C GC 36 M	C GC 36 M

L). Choice Of The Grinding Condition

(1). Down feed of grinding wheel

Work material / Finish	Down-feed			Cross feed
	Cast iron, Soft steel, Hardened steel	Stainless & Heat resistant steel	Tool steel	
Fine	0.0002-0.0004" 0.005-0.01mm		0.0002-0.0006" 0.005-0.015mm	under 1/4 of wheel thickness
Rough	0.0006-0.0012" 0.015-0.03mm	0.0008-0.0012" 0.02-0.03mm	0.0008-0.0012" 0.02-0.03mm	under 1/2 of wheel thickness

Down feed	Great	Small
Grinding resistance	great	small
Heat produced	much	less
Surface	rough	fine
Wheel worn out	much	little

(2). Cross feed

Cross feed	Great	Small
Grinding resistance	great	small
Heat produced	much	less
Surface finish	rough	fine
Wheel worn out	much	little

(3). Table longitudinal traverse

Table traverse	Quick	Slow
Grinding resistance	great	small
Heat produced	less	much
Surface finish	rough	fine
Wheel worn out	much	little

Suitable speeds of the table traverse

Work material	Soft steel	Heat treated steel	Tool steel	Cast iron
Speed: M/Min.	6-15	20-25	6-25	16-20

(4). Suitable peripheral speeds of wheel: 1200-1800M/Min.

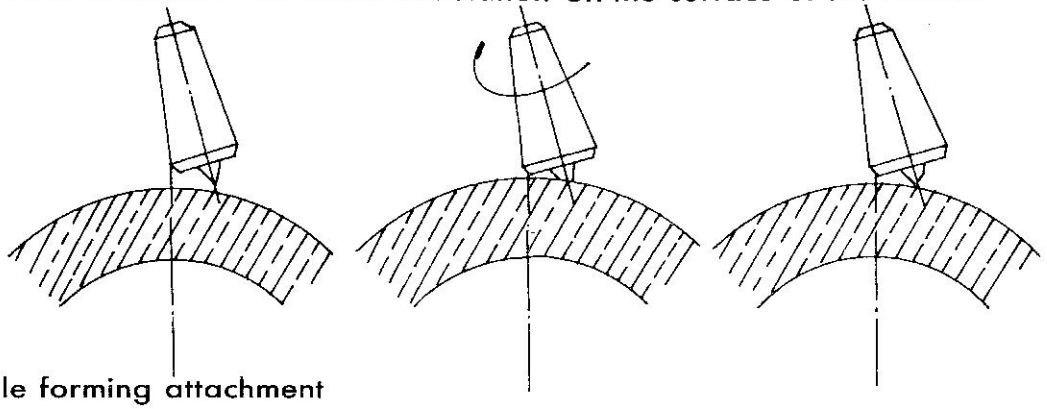
Wheel speed / Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	better

Material	Peripheral speed
Steel	20-30M/Min.
Cast iron	18-20M/Min.
Tungsten Carbide	8-18M/Min.
Zinc Alloy and light metal	25-30M/Min.

M).Use Of The Optional Attachment

(a).Parallel Dressing attachment

The wheel can be dressed either by diamond tool on the chuck or on the parallel dressing attachment which mounted on a spindle carrier. The diamond tool is arranged at an angle to the center line of the wheel as shown on figure, so that when the diamond loses its keenness it can be turned at an angle, ensuring that there is always a sharp diamond edge available. The dressing method and points are the same as "Dress the wheel". Experiences have shown that, with highly accurate grinding, dressing with the diamond which mounted on the magnetic chuck is better than that on the spindle carrier (the former is more stable than the latter) as the latter condition will cause undulation on the surface of the wheel.



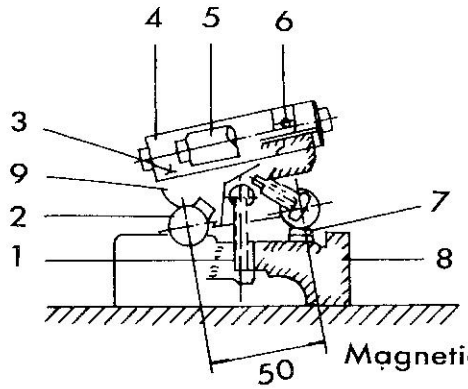
(b).Angle forming attachment

(1) Let the Attachment be attracted to the magnetic chuck, keeping a 90° right angle between the attachment and the wheel. The magnetic chuck should be kept low.

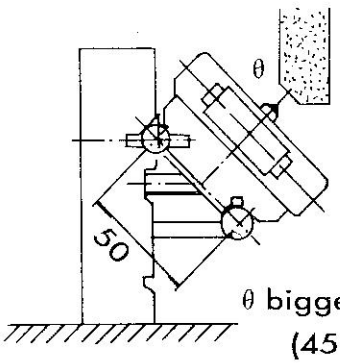
(2) The value in question will be the Sine of the angle times 50. That is $B = \sin\theta \times 50$

(3) Get a gauge Block the thickness of which equals that of B (or make one)

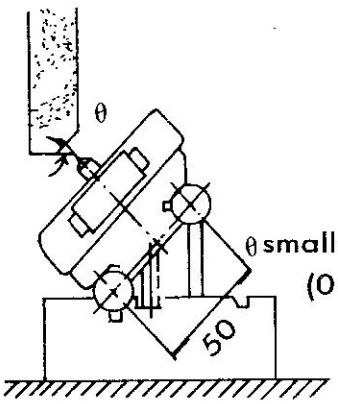
(4) Put this gauge Block under the base of the Sine Bar stand. Tighten with the fastening bolts and the produre is complete.



Magnetic chuck



θ bigger than 45°
(45°-90°)



θ smaller than 45°
(0°-45°)

1. Fastening bolt
2. Mandrel
3. Slide adjustment bolt
4. Slide base
5. Handle
6. Diamond fixed hole
7. Block gauge
8. Build-in base
9. Sine Bar stand

(5). Degree and block gauge thickness conversion table

Deg.	Sin.	Block gauge thickness	Deg.	Sin.	Block gauge thickness	Deg.	Sin.	Block gauge thickness
1°	0.0175	0.875	22°	0.3746	18.730	43°	0.6820	34.100
2°	0.0349	1.745	23°	0.3907	19.535	44°	0.6947	34.735
3°	0.0523	2.615	24°	0.4067	20.335	45°	0.7071	35.355
4°	0.0698	3.490	25°	0.4226	21.130			
5°	0.0872	4.360	26°	0.4384	21.920			
6°	0.1045	5.225	27°	0.4540	22.700			
7°	0.1219	6.095	28°	0.4695	23.475			
8°	0.1392	6.960	29°	0.4848	24.240			
9°	0.1564	7.820	30°	0.5000	25.000			
10°	0.1736	8.680	31°	0.5150	25.750			
11°	0.1908	9.540	32°	0.5299	26.495			
12°	0.2079	10.395	33°	0.5446	27.230			
13°	0.2250	11.250	34°	0.5592	27.960			
14°	0.2419	12.095	35°	0.5736	28.680			
15°	0.2588	12.940	36°	0.5878	29.390			
16°	0.2756	13.780	37°	0.6018	30.090			
17°	0.2924	14.620	38°	0.6157	30.785			
18°	0.3090	15.450	39°	0.6293	31.465			
19°	0.3256	16.280	40°	0.6428	32.140			
20°	0.3420	17.100	41°	0.6561	32.805			
21°	0.3584	17.920	42°	0.6691	33.455			

* The value of Block gauge thickness must times 2 when apply this table to Sine Bar attachment.

(c). Sine Bar

The Sine Bar is used to chuck the inclined angle of the magnetic chuck, when the angle forming surface is large.

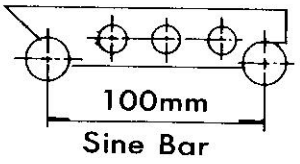
(1) The value in question equals the Sine of the angle times 100, $B = \sin\theta \times 100$

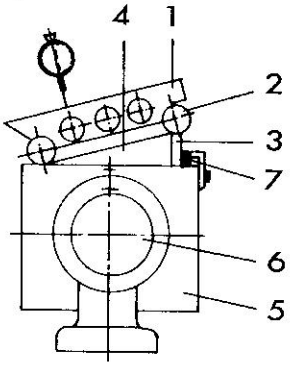
(2) Get a gauge block the thickness of which equals that of B.

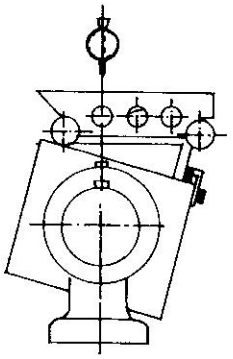
(3) Put this gauge at one end of the Sine Bar and let it be attracted to the inclinable magnetic chuck. This Sine Bar must be kept parallel to the longitudinal direction of the machine.

(4) Press the dial gauge against the surface of the Sine Bar and turn the cross feed hand wheel, so that the saddle moves back and forth for the checking of the accuracy of the angle of the magnetic chuck

1. Mandrel
2. Sine Bar
3. gauge Block
4. Application of the trigonometry
5. Inclinable Magnetic Chuck
6. Mandrel of the Magnetic Chuck
7. Stop block



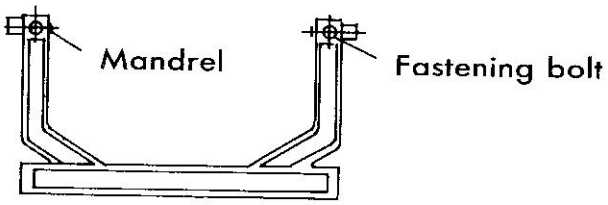




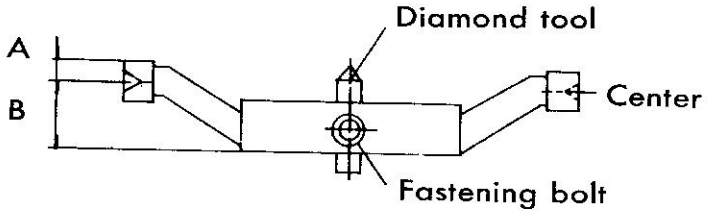
(d). Radius Forming Attachment

The Radius Forming Attachment is composed of a main stand, several swing rods and a diamond tool.

(1) Main Stand



(2) Swing rod and diamond tool



A name plate is attached to the swing rod with the A and B

A: the distance between the upper rim and the center

B: the distance between the bottom rim and the center

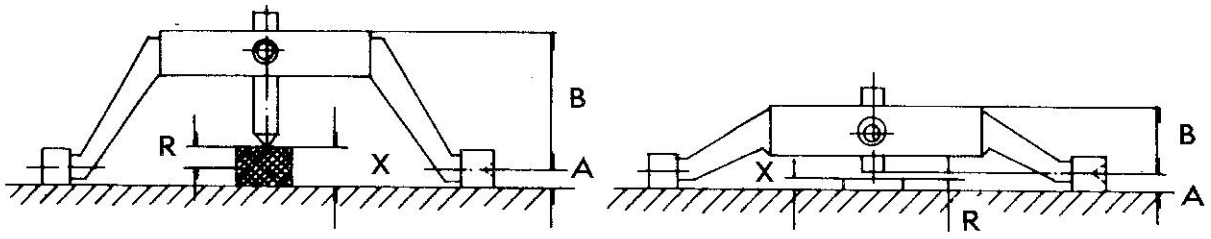
The R forming is the adjustment of the distance between the diamond tool and the rod center so that they form a R shape.

(3) To determine the concave and convex R:

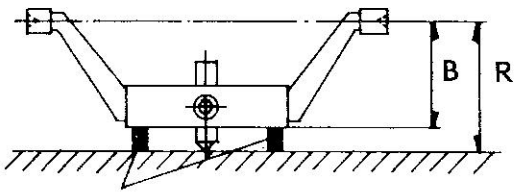
a. If the tool is parallel to the center line, it equals to OR.

b. To determine the convex R: Put the swing rod on a place disk. Put a block gauge of proper thickness under the diamond tool. Then R = X-A

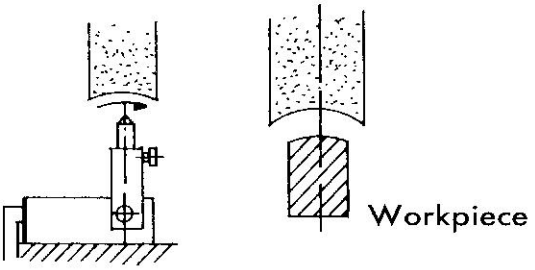
c. To determine the smaller concave R; R = A-X



d. To determine the larger concave R: R = B + X.



Same thickness gauge block (X)

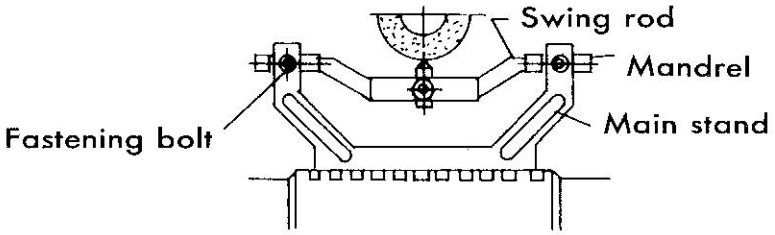


e. Note:

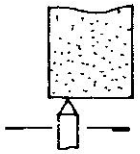
1. The base and side of the grinding wheel should be well-dressed.
2. The Radius Forming Attachment shall be parallel to the grinding wheel.
3. The diamond tool shall be parallel to the Radius Forming Attachment.

(4) Operation of the Radius forming attachment:

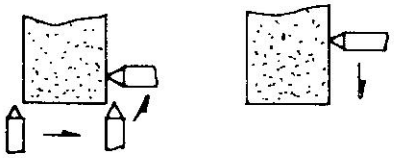
a. Find the center of the grinding wheel, then secure the work table.



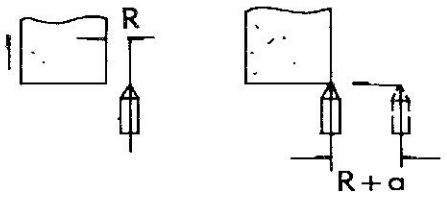
b. Turn the down-feed handwheel at 1/3 on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.



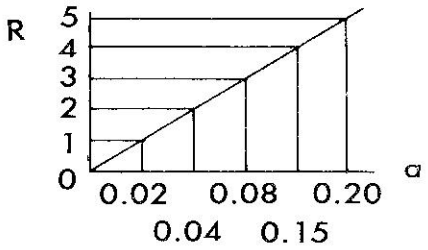
c. Turn the diamond tool 90°.. and elevate it into a proper position (greater than the R size in question)



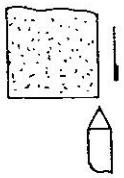
d. Elevate the grinding wheel so that it stays away from the diamond tool and the wheel is in such a position such that the distance between the side of the wheel and the center of the Diamond tool is just R.



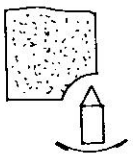
e. Move the diamond tool (R + a) leftward, with "a" found in the following table.



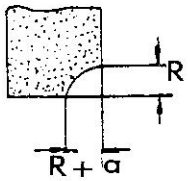
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



g. Turn the swing rods 90° each time, inching 0.05mm per step till the R is determined.

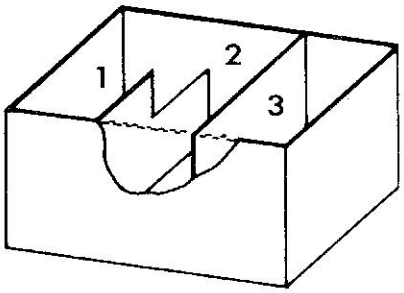


h. The final position the wheel assumes is as follows.



(e).Coolant System

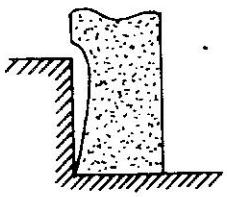
Insert the power source plug in socket (at the rear side of the electric control box). Press the pushbutfon switch to start the coolant pump, the pump should rotate in a clockwise direction. If not, interchange any of the two cords of the three-cord cable. Adjust coolant flow by turning the ball valve to a suitable rate. Cooling water collected from the table will return to coolant tank thrugh return hose. It will then be filtered in the coolant tank by turns of cabinet #1,2,3.

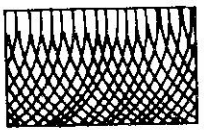


* Coolant tank capacity: 40 liters
* Coolant pump: 1/8 HP x2P

(f). Common cases in Side Grinding

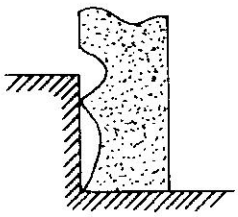
(1)

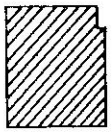


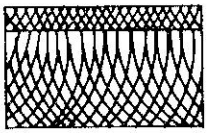


In the case shown in the figure above, the side-grinding wheel and the work have a smaller contact surface, so that the efficiency is higher, and the surface roughness is better.

(2)

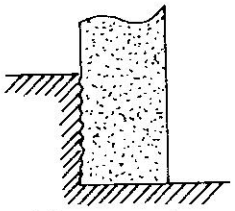






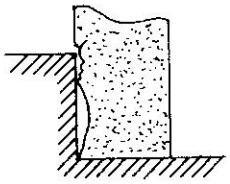
In the figure above, the wheel and the work have two sections of contact, and the surface of grinding is bad. The surface has to be corrected into the shape shown in (1).

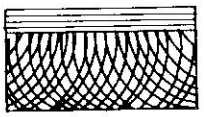
(3)



The wheel has not been cut to 'Relief Angle', thus it contacts the whole face of the work, causing the surface of processing rough and rugged. Also, the greater face of contact will cause burns and cracks.

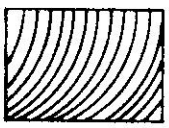
(4)

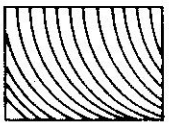




The "Relief Angle" of the wheel is lower than the surface of the work, so that the work face becomes two sections, the upper section resembling that in (3) and the lower section in (1). Now it is necessary to enlarge the "Relief Angle" part so that it will be higher than the face of the work.

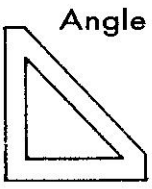
(5) If the spindle does not constitute a right angle with the work table surface, the side faces will turn out to be as shown:

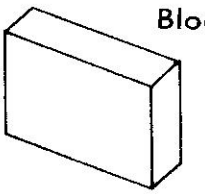


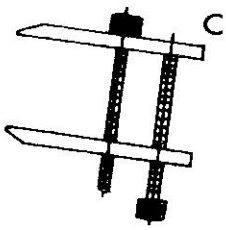


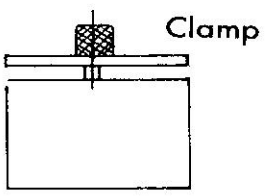
(g).Right Angle Grinding

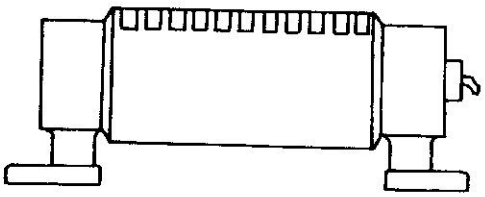
(1) Tools



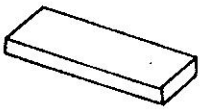




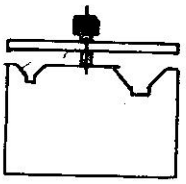




Inclinable Magnetic Chuck



gauge Block,

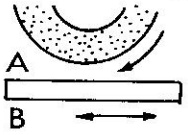


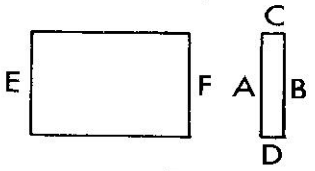
Clamp

(2) Use of the jigs and tools: take the grinding of the block of six faces A, B, C, D, E, F. For example:

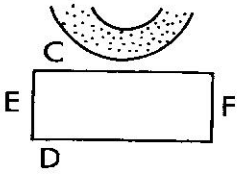
a. Under 200mm:

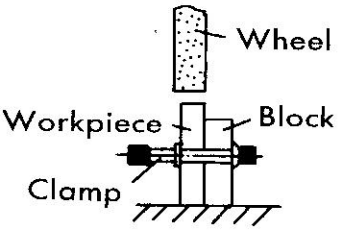
* Grinding of the first basic face, or the surface grinding of A and B,



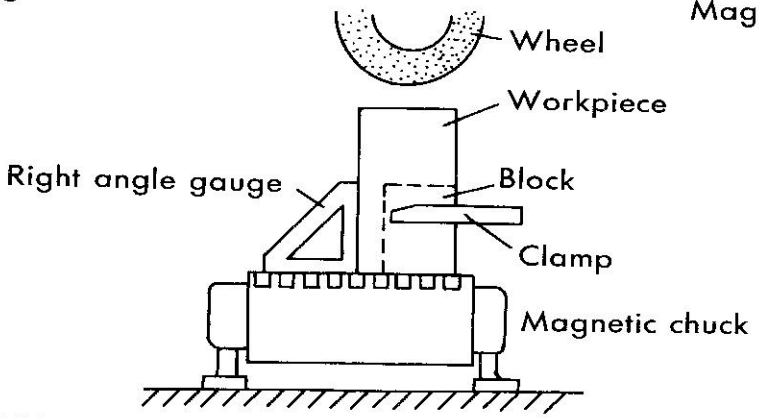


* Grinding of C and D





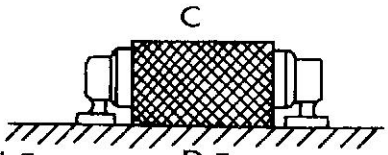
* Grnding of E and F



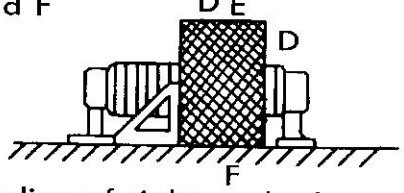
b. Over 200 mm:

* Grinding of the first basic face or A,

* Grinding of C and D: turn the inclinable magnetic chuck into 90°



* Grinding of E and F



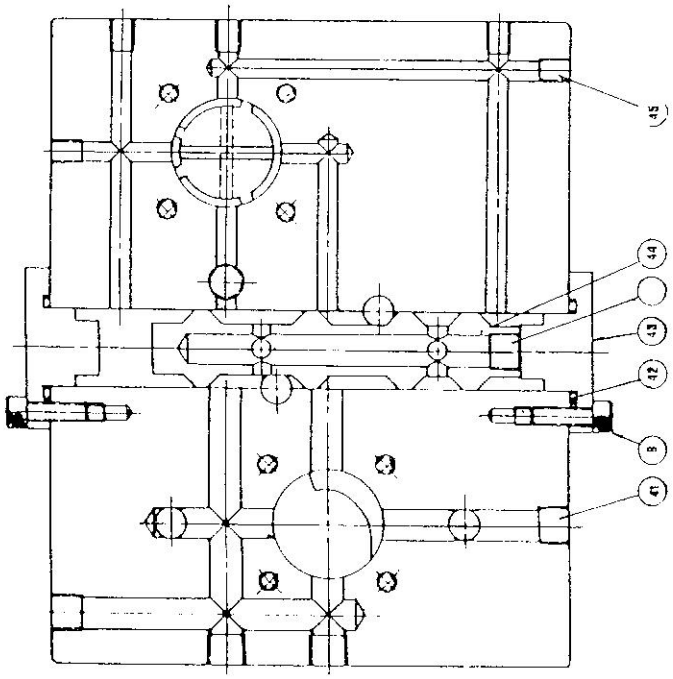
(3) Precaution: The grinding of right angle depends on the patience and clever mindedness of the operator for its precision. For inatance, whether the burrs after grinding is done well, whether the tools ae kept clean, whether the work table are kept clean, the accuracy of the angle gauge, etc. all will have a direct influence over the precision of the product.

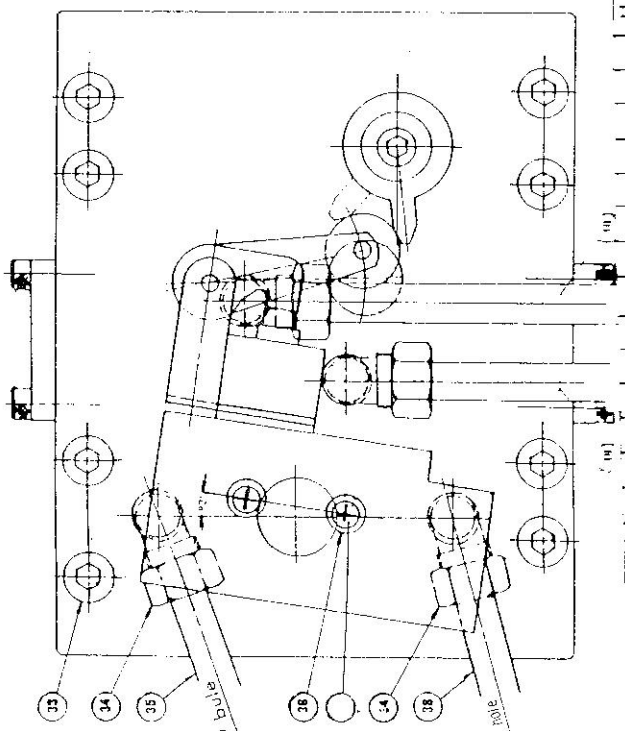
* COMPLETE KNOCKDOWN DRAWINGS & PARTS LISTS *

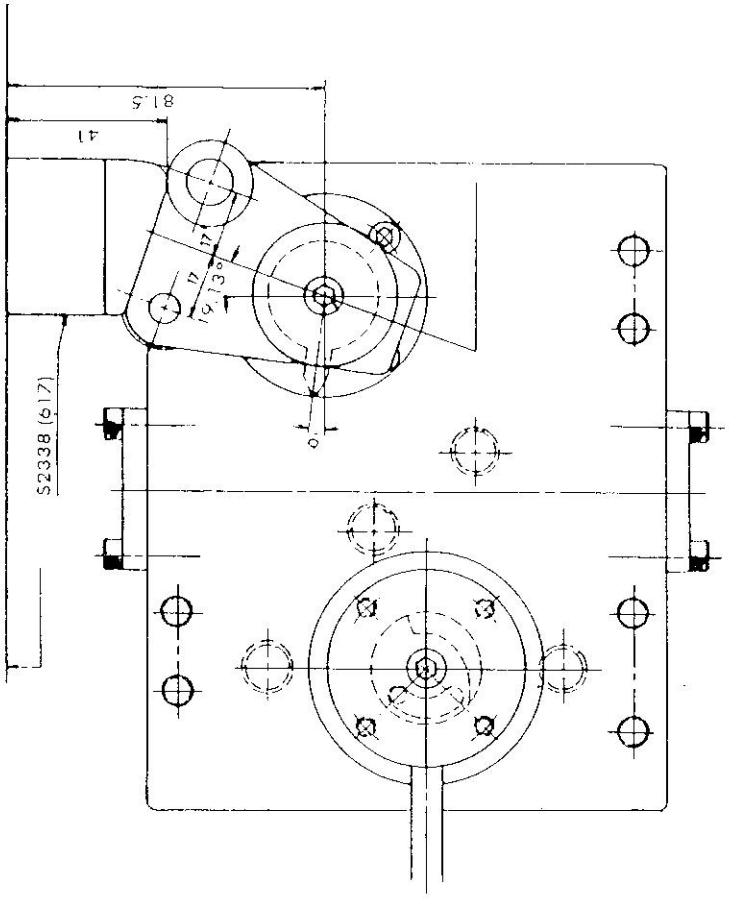
WHEN ORDERING PARTS, PLEASE MENTION:

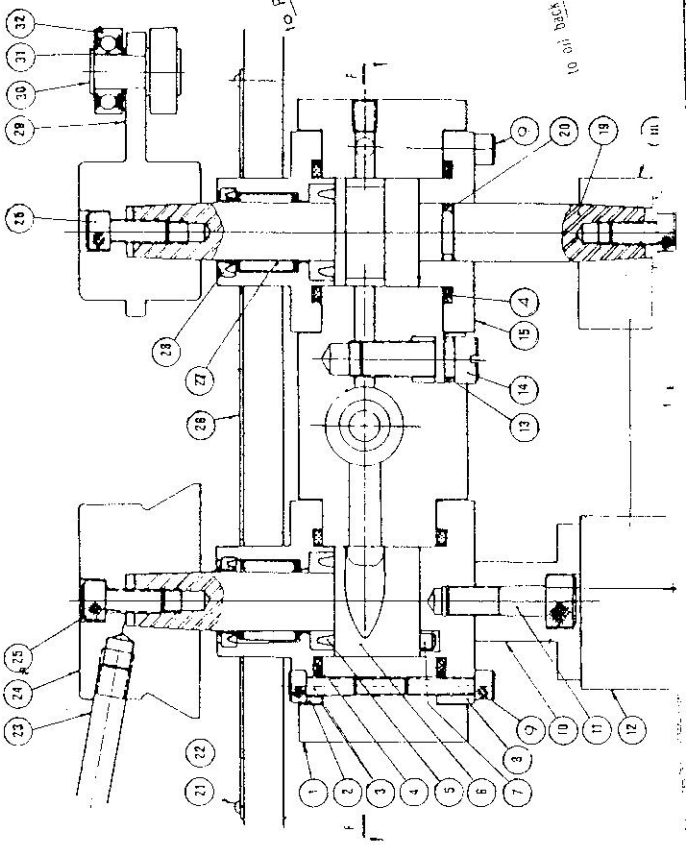
1. MACHINE MODEL & SERIAL NUMBER,
2. INDEX NUMBER,
3. PARTS NO. AND PARTS NAME,
4. QUANTITY.

VALVE BODY









VALV

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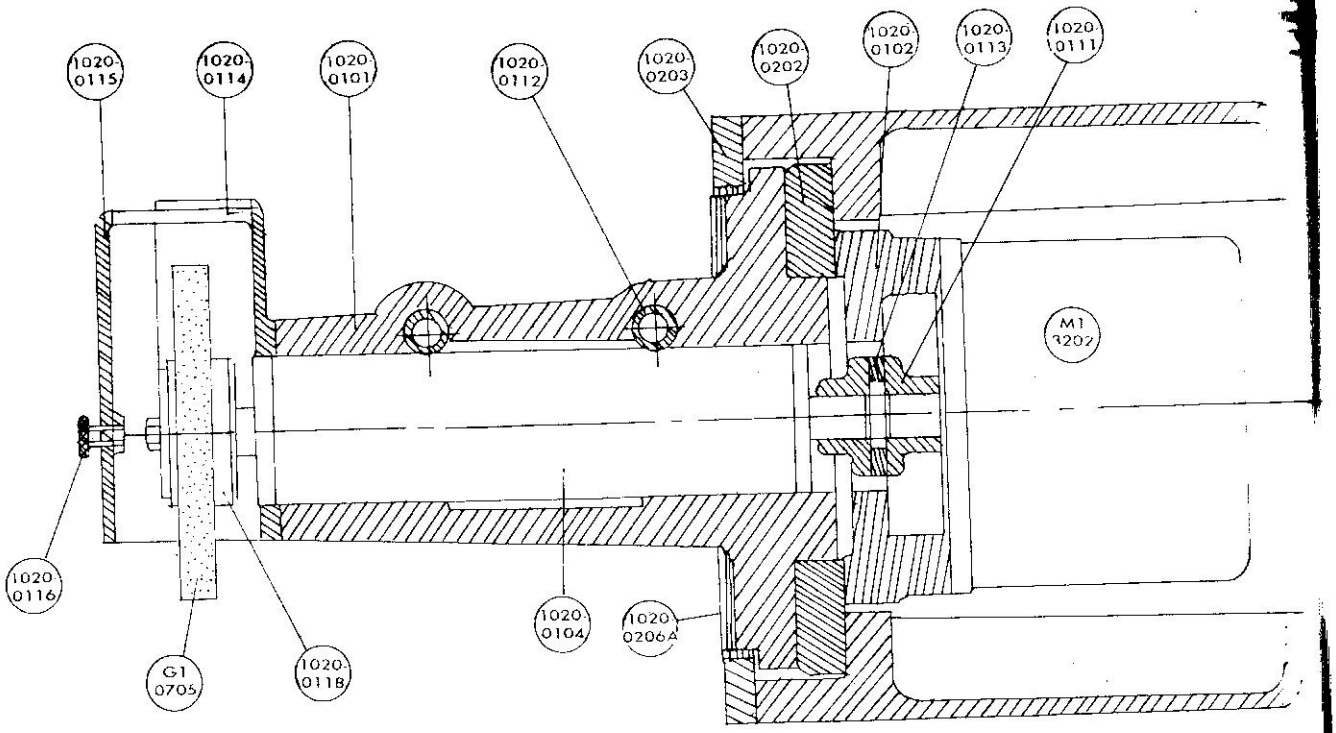
VALVE BODY PARTS LIST

PART NO	PART NAME	REMARK
1	Valve body	
2	Cover (upper side)	
3	Hexagonal headed set bolt (3/16" x 1/2"ℓ)	
4	O ring (P # 28)	
5	Oil seal (RE # 15)	
6	Throttle shaft	
7	Pin	
8	Lower gland	
9	Hexagonal hesded set bolt (3/16" x 5/8"ℓ)	
10	Limited switch fixed base	
11	Hexagonal headed set bolt (5/16" x 1"ℓ)	
12	Limited switch	
13	O ring (P # 9)	
14	Adjustable screw	
15	Cover (lower side)	
16	Hexagonal headed set bolt (1/4" x 5/8"ℓ)	
17	Plate washer (1/4")	
18	Cam	
19	Changeover shaft	
20	O ring (P # 11)	
21	Rivet (2ϕ x 5ℓ)	
22	Saddle	
23	Handle of flow control	
24	Handle of flow valve	
25	Hexagonal headed set bolt (1/4" x 3/4"ℓ)	
26	Operation nameplate of speed of table	
27	Niddle bearing (HK1516)	
28	Dustless seal (# DH15)	
29	Directional valve rocker	
30	Shaft	
31	Washer	
32	Ball bearing (# 608–ZZR)	
33	Hexagonal headed set bolt (5/16" x 2" ℓ)	
34	Elbow joint (Lin-3/8–PT1/4)	
35	Hydraulic pipe	
36	Washer	
37	Set screw (M4)	
38	Hydraulic pipe	
39	Hydraulic pipe	
40	Hydraulic pipe	
41	Screw 1/8PT	
42	O ring (P # 20)	
43	Side cover	
44	Screw shaft	
45	Hexagonal sinkheaded set screw (1/4"x5/16" ℓ)	
46		

SPINDLE & COLUMN

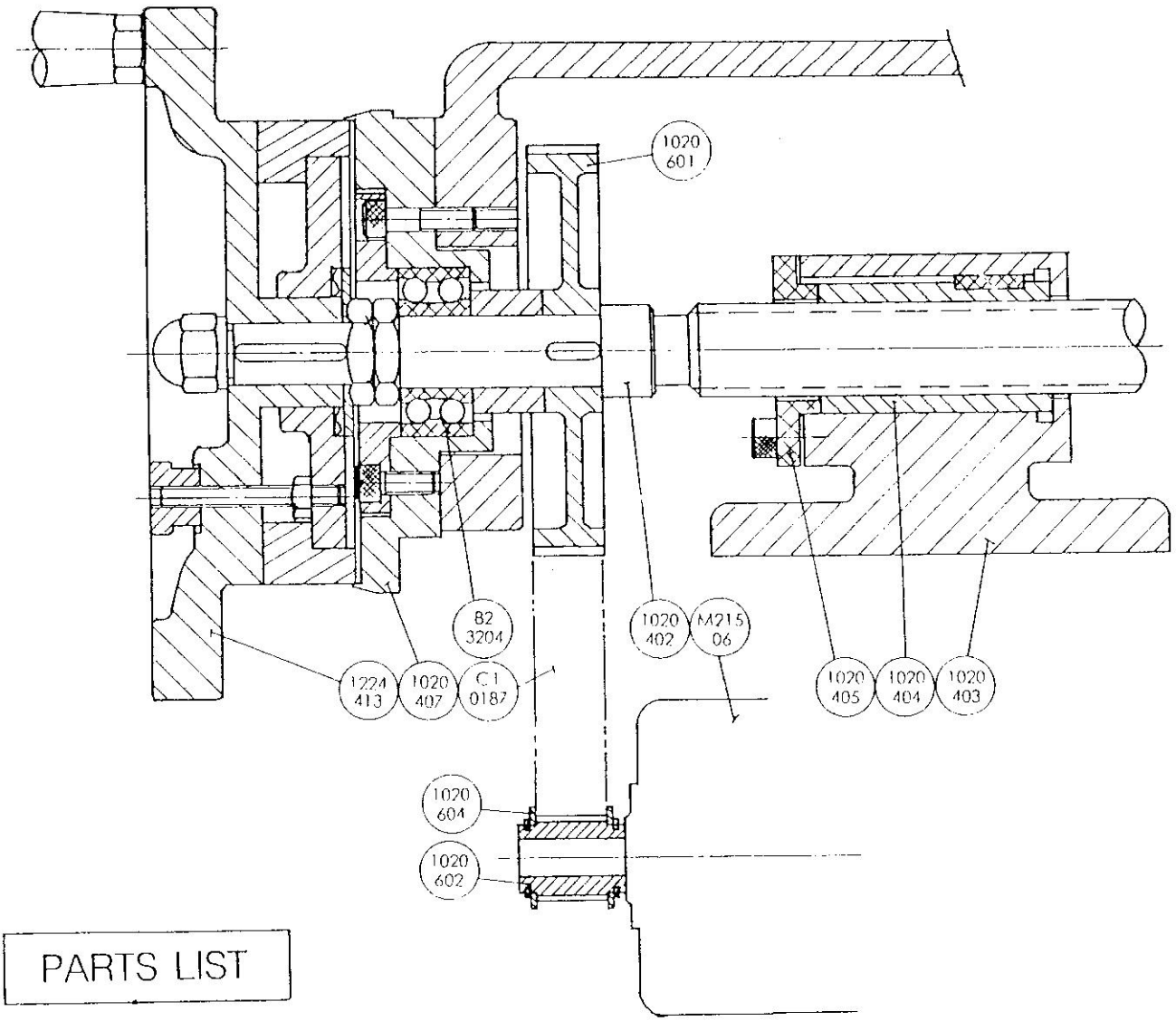


PARTS LIST

Parts No.	Name	Parts No.	Name
1020-0115	Wheel front cover	1020-0113	Rubber coupling
1020-0114	Wheel end cover	1020-0111	Rubber coupling
1020-0116	Wheel cover setting bolt	1020-0201	Upper column
1020-0101	Spindle front seat	G-10715	Grinding wheel
1020-0112	Spindle setting bush	1020-0118	Wheel flange set
1020-0203	Guide rail of dust guard	1020-0104	Spindle
1020-0202	Upper & Lower sliding plate	M 13202	Spindle motor 2 HPX2=
1020-0102	Spindle back seat	1020-0206A	Dust guard set

*If the model is 1224 series the figure of 1020 will change to 1224.

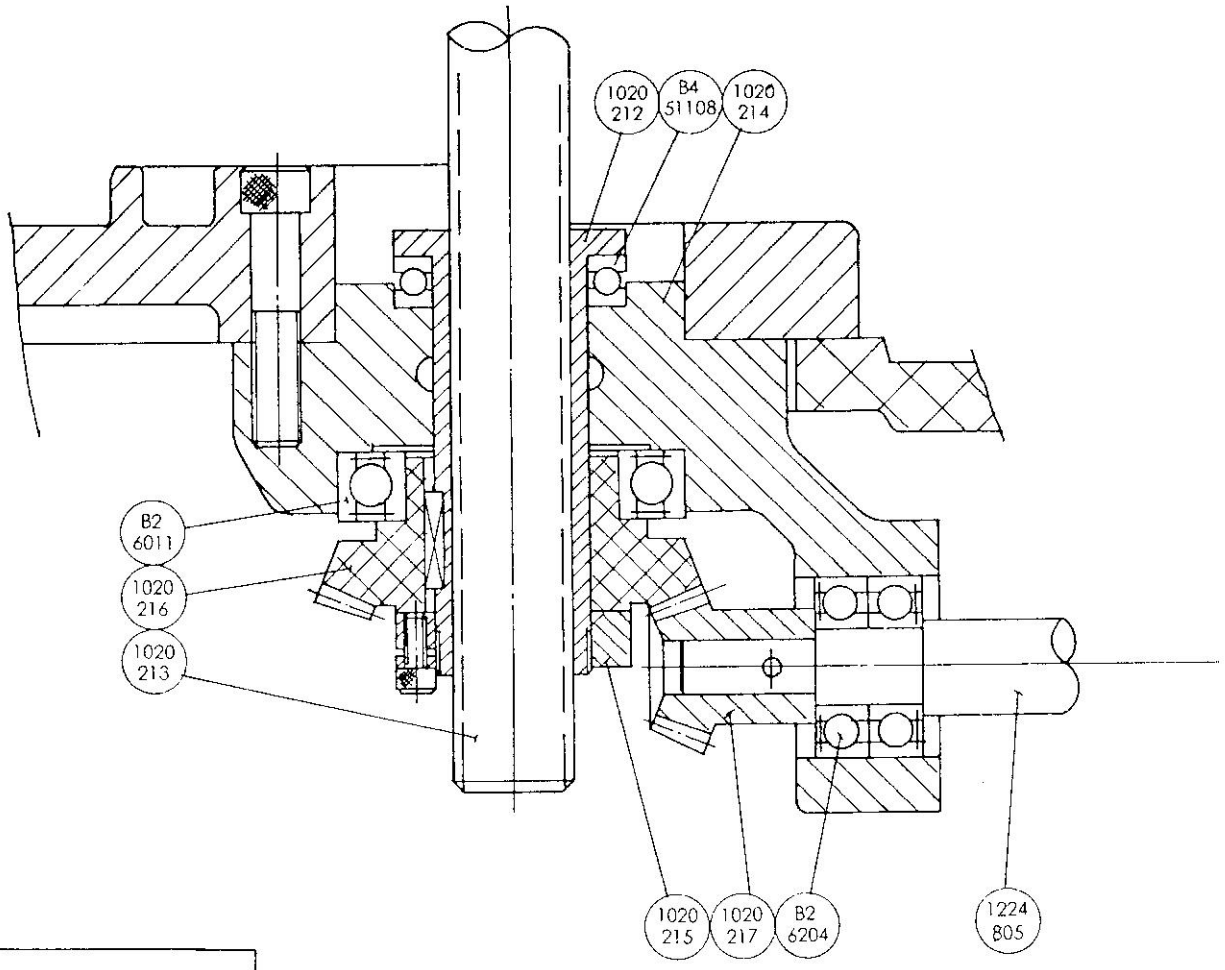
CROSS FEED MECHANISM



PARTS LIST

Parts No	Name	Parts No.	Name
1224413	Hand wheel	1020405	Adjusting guard
B23204	Bearing	1020601	Gear
010187	Time belt	1020602	Pinion
1020404	Screw socket	1020604	Washer
1020402	Lead screw		

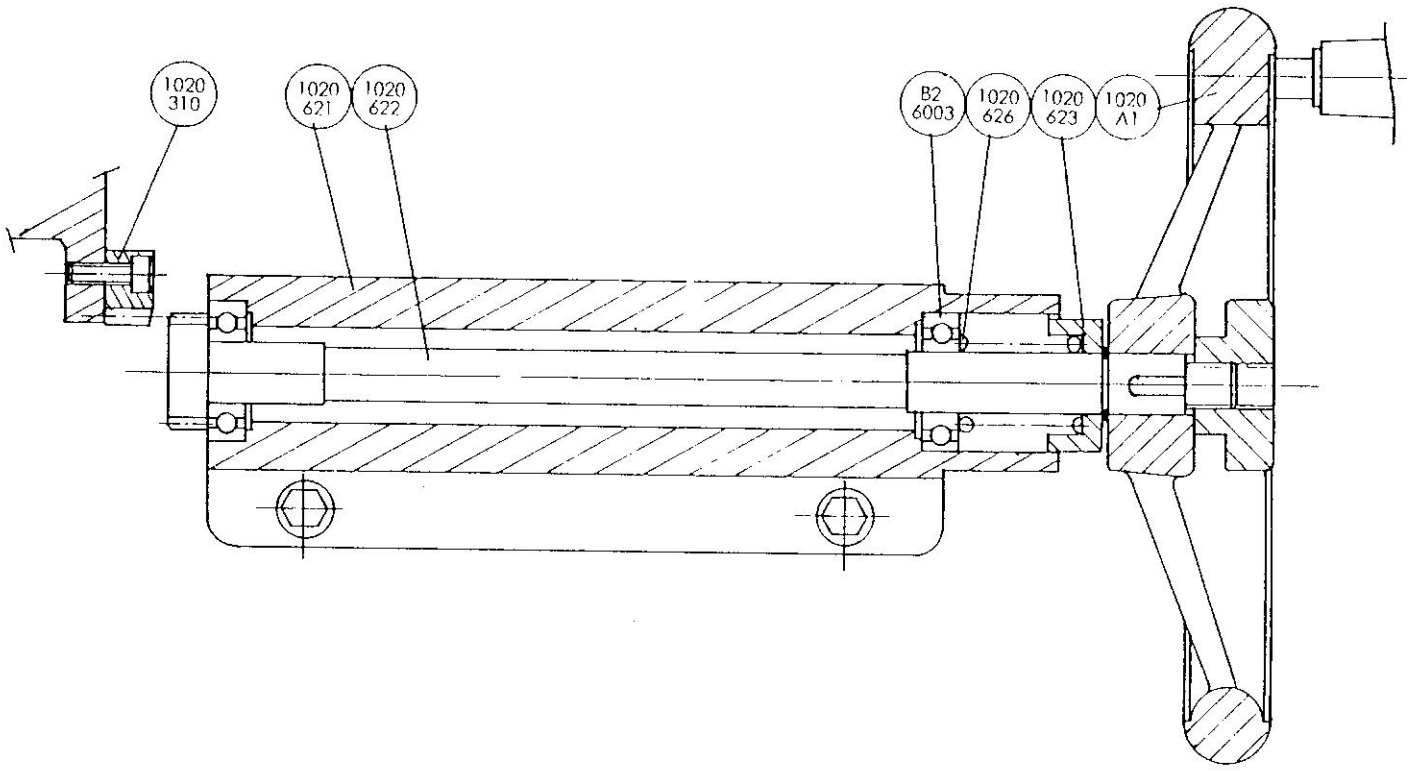
UPPER & LOWER TRANSMISSION MECHANISM



PARTS LIST

Parts No	Name	Parts No.	Name
1020212	Upper and lower lead screw socket	1020217	Bevel pinion
1020213	Upper and lower lead screw	1224805	Transmission shaft
1020214	Gear seat	B4 51108	Bearing
1020215	Lock nut	B2 6011	Bearing
1020216	Big gear	B2 6204	Bearing

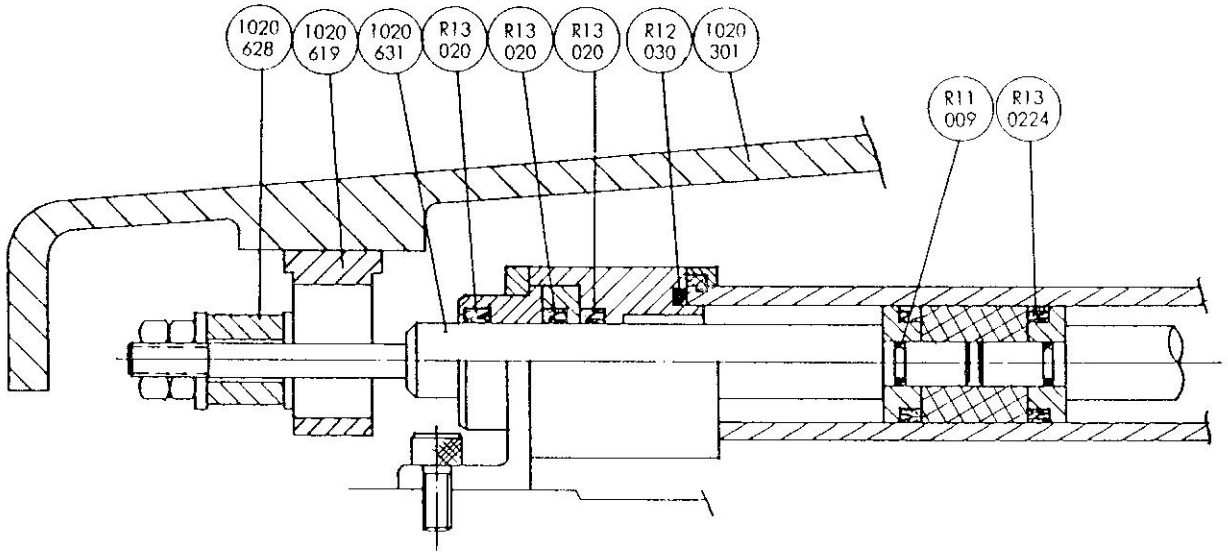
TABLE HAND FEED MECHANISM



PARTS LIST

Parts No.	Name	Parts No.	Name
1020A1	Hand wheel	1020622	Gear shaft
B26003	Bearing	1020623	Cover
1020310	Rack	1020626	Spring
1020621	Longitudinal hand feed bearing seat		

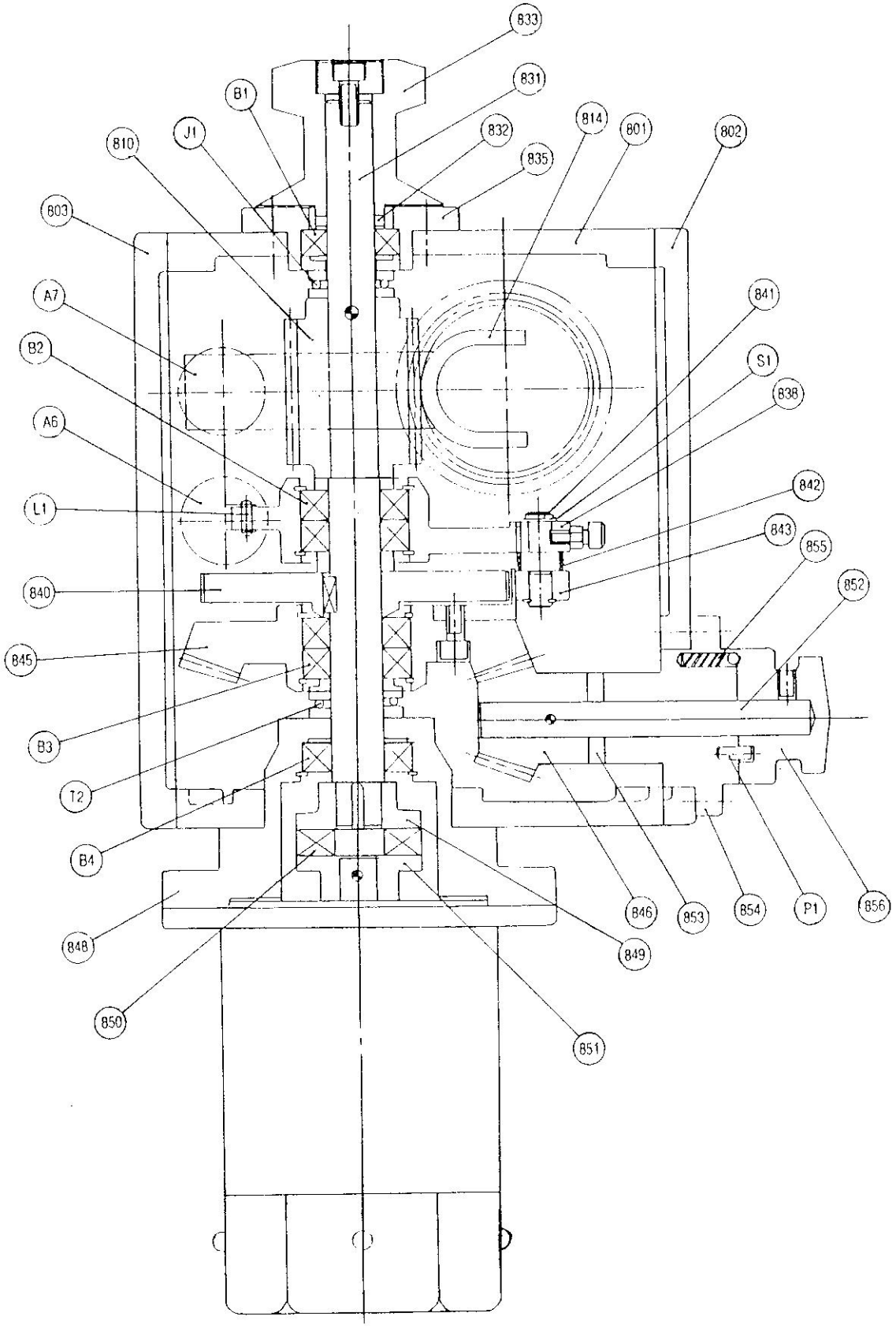
TABLE POWER FEED MECHANISM

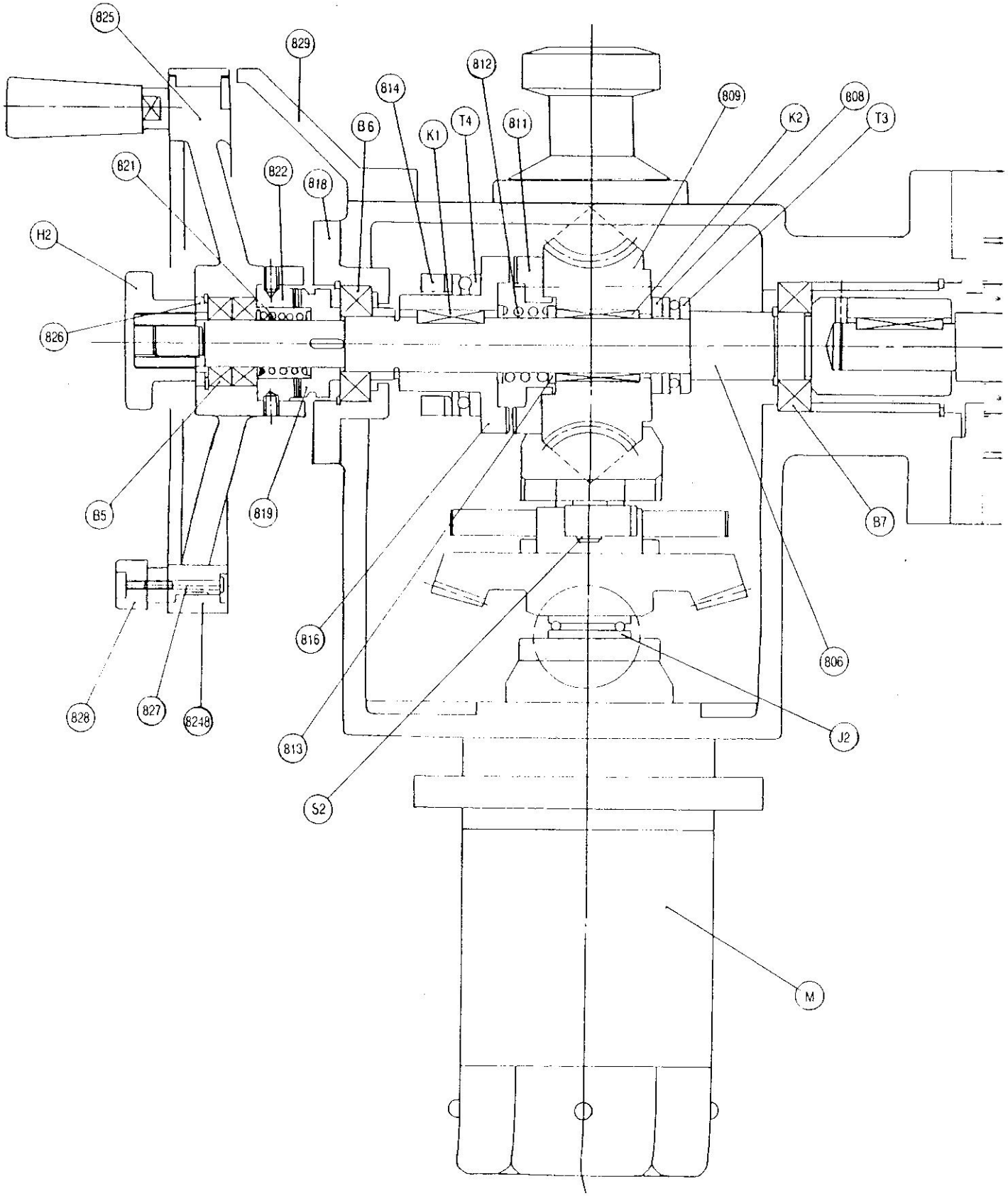


PARTS LIST

Parts No.	Name	Parts No.	Name
1020619	Drawing seat	R13020	RE 20
1020628	Rubber pad	R12030	G30# O ring
1020631	Piston rod	R11009	PG# O ring
		R130224	S-22.4 U packing

DOWN FEED UNIT ASSEMBLY




825
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812
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B6
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T4
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K2
T3
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822
818
H2
826
B5
819
B7
816
806
828
827
824B
813
J2
S2
M

DOWN FEED UNIT PARTS LIST

For AGS-1020AHD, AGS-1224AHD,

PART NO.	PART NAME	
1224-801	Gear box	
1224-802	Box cover (left side)	
1224-803	Box cover (right side)	
1224-806	Shaft of handwheel	
1224-808	Washer	
1224-809	Worm wheel	
1224-810	Worm	
1224-811	Gear of clutch	
1224-812	Spring	
1224-813	Washer	
1224-814	Clutch lever	
1224-816	Gear of clutch	
1224-818	Flange of transmission shaft	
1224-819	Gear of clutch	
1224-821	Spring	
1224-822	Gear of clutch	
1224-824	Dialring	
1224-825	Hand wheel	
1224-826	Bush	
1224-827	Jam bolt	
1224-828	Jam nut	
1224-829	Indicator	
1224-831	Shaft of auto downfeed	
1224-832	Bush	
1224-835	Indexring	
1224-838	Rocker	
1224-840	Ratchet	
1224-841	Shaft of pawl	
1224-842	Flexible spring	
1224-843	Pawl	
1224-845	Bevelgear	
1224-946	Bevelpinion	
1224-848	Flange of motoer	
1224-849	Coupling	
1224-850	Bumper	
1224-951	Coupling of motor	
1224-852	Madrel	
1224-853	Washer	
1224-854	Dividing base	
1224-855	Spring	
1224-856	Feed index ring	
1224-A6	Cylinder of feed	
1224-A7	Cylinder of clutch	
1224-DB1	6002 # Ball bearing	
1224-DB2	6003 # Ball bearing	
1224-DB3	6003 # Ball bearing	
1224-DB4	6003 # Ball bearing	
1224-DB5	6003 # Ball bearing	
1224-DB6	6004 # Ball bearing	
1224-DB7	6005 # Ball bearing	
1224-DT1	51102 # Thrust bearing	
1224-DT2	51103 # Thrust bearing	
1224-DT3	51104 # Thrust bearing	
1224-DT4	51107 # Thrust bearing	
1224-DH1	3/8" Handle bar	
1224-DH2	1/2" -4" Handle bar	
1224-DM3	PH 4P 1/4HP Motor	

P). Trouble Shooting

Grinding Defects

Defects	Causes	Remedy
* Chatter marks on grinding surface	Machine not free from vibration	Balance grinding wheel in the usual ways Check hydraulic pump & hose, Check spindle motor coupling, Check levelling screws on machine base,
	Unsteady running of grinding wheel	Dress wheel on Peripheries of both sides, Re-balance grinding wheel, Check table speed, Reduce downfeed cutting depth, Reduce crossfeed amount,
	Grinding wheel too hard or clogged	Use softer or coarser grinding wheel, Reduce depth of cut (when plunge grinding) Check dressing diamond, Dress grinding wheel rougher, Dress grinding wheel more frequently
	Table not fully supported	Check steel balls, Check steel ball guide ways,
* Burned mark on grinding surface	Grinding wheel too hard or too fine	Use softer or coarser wheel or reduce periphery speed of grinding wheel,
	Grinding wheel dull or clogged	Dress grinding wheel coarser, make it rougher,
	Downfeed too great	Reduce downfeed amount, Reduce crossfeed amount,
	Inefficient cooling	Increase flow of coolant, Fill up coolant tank with fresh Coolant, Use stronger mixture,

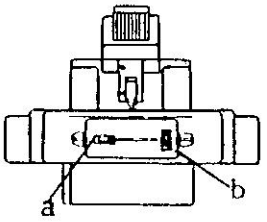
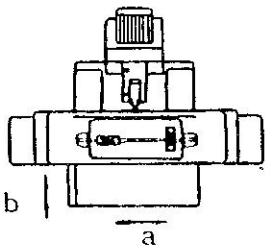
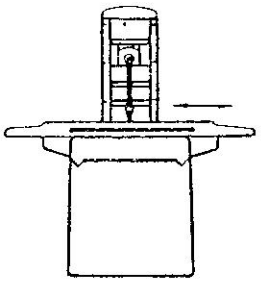
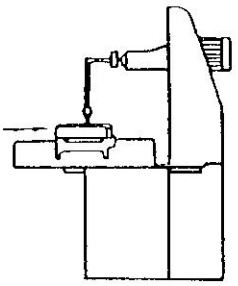
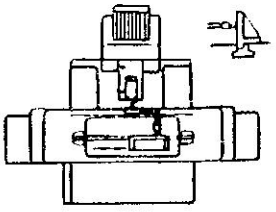
(2) Operational Defects

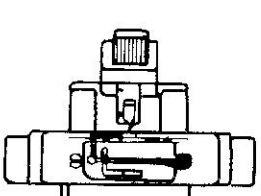
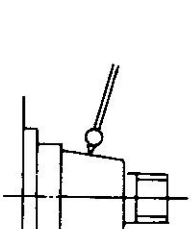
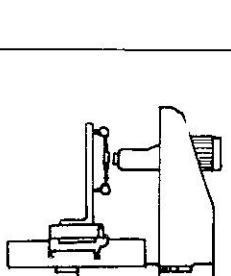
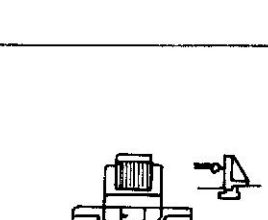
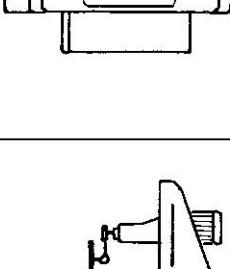
Defects	Causes	Remedy
Spindle noisy & run unevenly	Coupling loose	Check the set screw on spindle coupling,
	Tighten screws on spindle holder	Loose and reset the copper bush 251424 & 251423, please refer to operation manual,
	Spindle bearings	Please don't disassemble it without our advise,
* Table shock at both sides of traverse	Direction control valve	Check the pressure of hydraulic system, should be within 15-20kgs/cm^2, Adjust the flow control screw at the bottom of direction control valve,
* Table moves only in one direction	Direction control arm	Release the screw and remove the direction control arm into a suitable position,
* Crossfeed travel unreversible	Direction changing limit switch	Check Ls-3 Ls-4 when backward, check Ls-2, Ls-5 when forward,
	Action angle of cam to limit switch (at bottom of direction)	Loose set screw and adjust to exact position,
* No increment in crossfeed (for AH, AHD models)	Crossfeed inching limit switch	Measure 10-17 on SSR unit should be connected when limit switch is at ON position
	Variable resistance	Measure 18-19 on S.S.R UNIT should have 50K resistance,
	S.S.R.	Measure R_2-T_2 should get 220V (when contactor M3 is ON), if not changea new SSR unit

For AHD model:

Downfeed uint oil ledic	cause	Remedy
Downfeed uint noisy & run unevenly	oil sealis broken	change the oil seal
	part 7224-843 (PAW1) is broken or not in right position	change the PART 1224-843 (PAW1) OR Correct to right position

CNS4300
JIS 6213

No.	Check Taken	Illustration	Permissible Errors
1.	Working Table a). Level or flatness in longitudinal direction b). Level or flatness in cross direction		a). 0.02mm per 1000mm b). 0.02mm per 1000mm
2.	Flatness of table movement a). Longitudinal direction b). Cross direction		a). 0.02mm per 1000 1000mm b). 0.02mm per 1000mm
3.	Rise and fall of table in longitudinal traverse		0.01mm per 1000mm
4.	Surface of table parallel with its cross traverse		0.01mm per table width
5.	T-slot parallel with table longitudinal traverse		0.015mm per 1000mm

No.	Check taken	Illustration	Permissible Errors
6.	Clamping table to table cross traverse		0.02mm per 300mm
7.	Taper of grinding spindle for true running		0.005mm
8.	Grinding spindle parallel with table (test made by turn-round method with 150mm arm)		0.02mm per 300mm
9.	Grinding spindle square with table (test made by turn-round method with 150mm arm)		0.02mm per 300mm
10.	Vertical traverse of grinding spindle carrier square with table in cross plane of machine		0.01mm per 100mm

SAFETY RULES

1. Before you operate your machine, please read this operation manual carefully.
2. Please check power source before your grinding every time.
3. Choice correct grinding wheel for your work piece.
4. When you set the number of auto downfeed counter over 10, please be careful of you setting. It could be danagerous to you.
5. If you have any question about grinding please contact us immediately.