KGS-1020M
Manual Surface Grinder
Operation Manual

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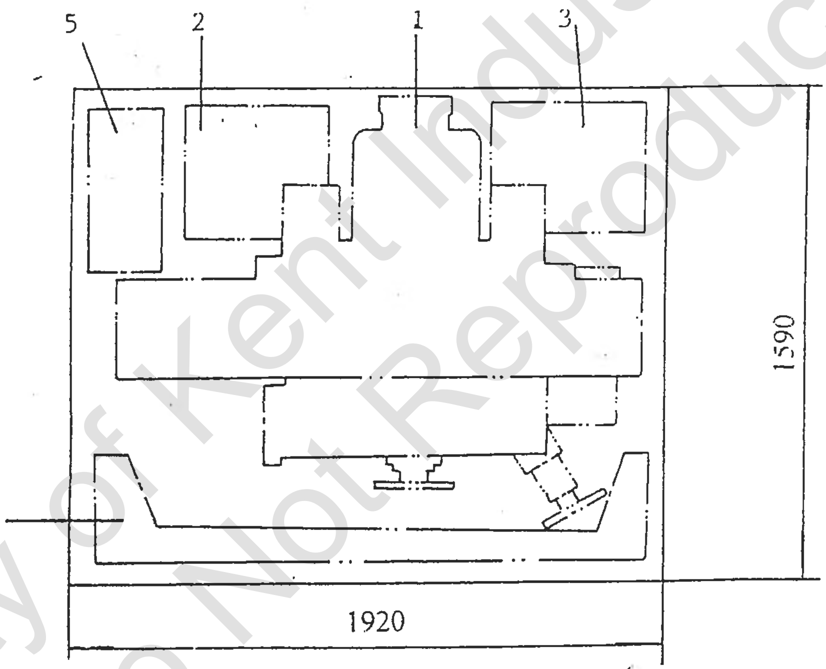
THIS MACHINE HAS BEEN FULLY TESTED, ADJUSTED AND INSPECTED FOR CORRECT ALIGNMENT AND OPERATION PRIOR TO SHIPMENT, IN TRANSIT OR INSTALLATION, PLEASE ENSURE THAT THE MACHINE IS NOT BUMPED WHEN BEING ROLLED OR SET DOWN TO AVOID ANY FAILURE.

A). TRANSIT AND UNPACKING

1. Machine weight: Net 1730Kg
   Gross 1480Kg
2. To avoid damaging the machine or paint, please pay more attention when transit and unpacking.
3. Loosen the fixing screws before lifting machine, then remove the skid-board.
4. Packing Diagram



1. Machine
2. Standard Accessories
3. Coolant Tank
4. Table and Splash Guard
5. Blancing Base

B). CHOICE OF SITE

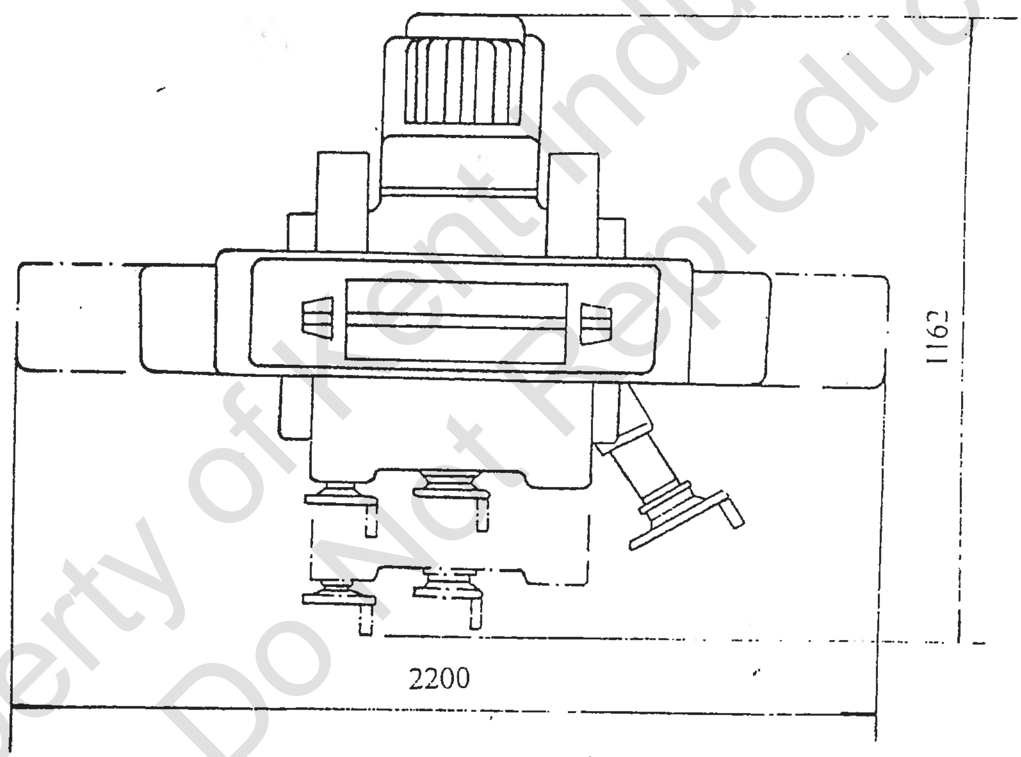
The output of the machine and the degree of accuracy of the components produced depend to a very special on the correct choice of site for the erection of the machine.

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

Grinding machine are often found between milling, shaping, drilling and even slotting machine, without any thought of the consequences of such planning. In such cases, it is impossible to achieve good surface finishes, as the vibrations from the milling machine 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 taking the machine as it results in distortion of the machine bed.

Floor plan:



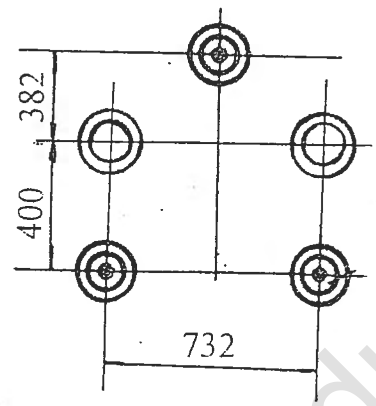
C). INSTALLATION

(1). Power Consumption

Machine	2.2Kw
Coolant	0.09Kw
Ele.Mag.Chuck	0.063Kw
Total	2.353Kw

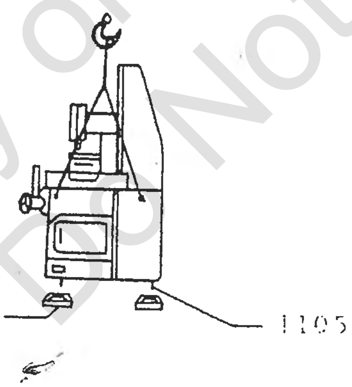
(2). Foundation

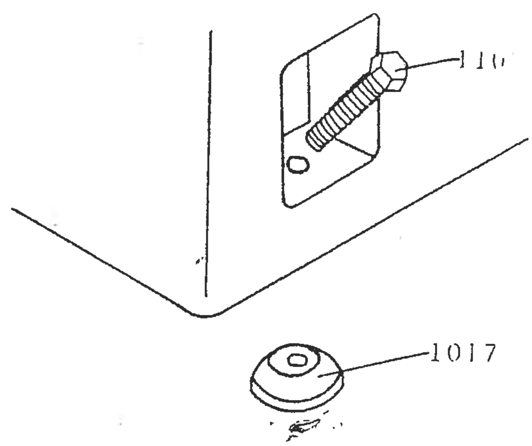
a. Dimension



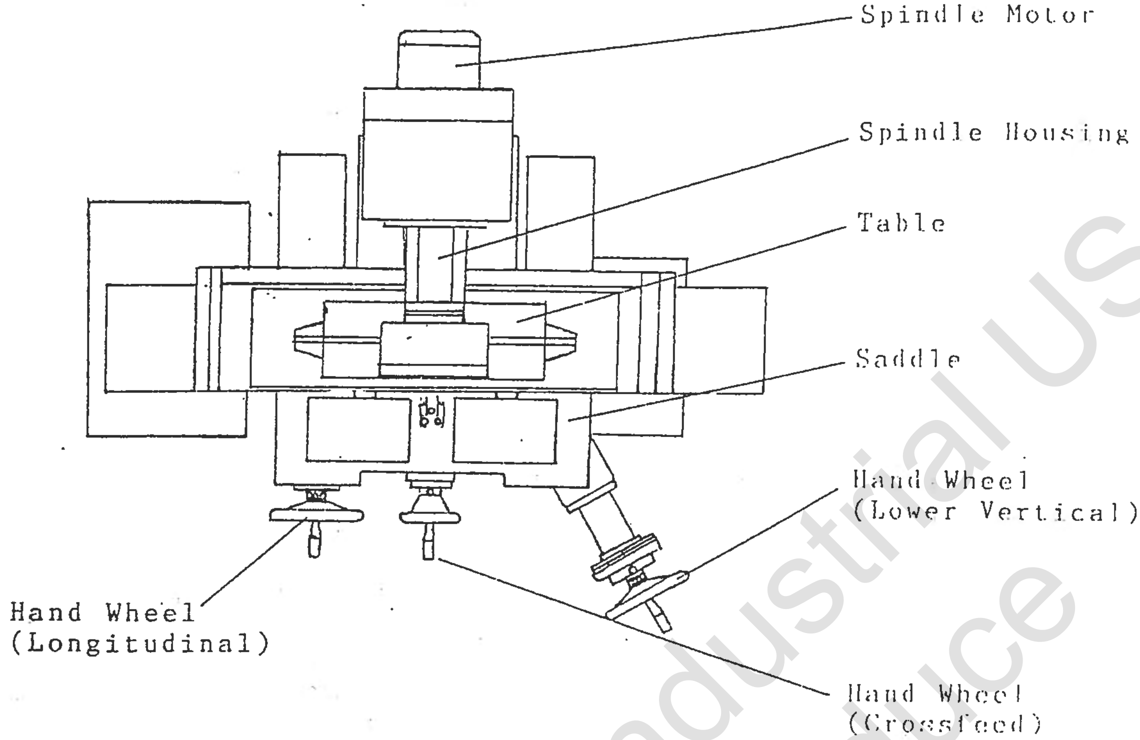
b. Use the levelling pads and screws

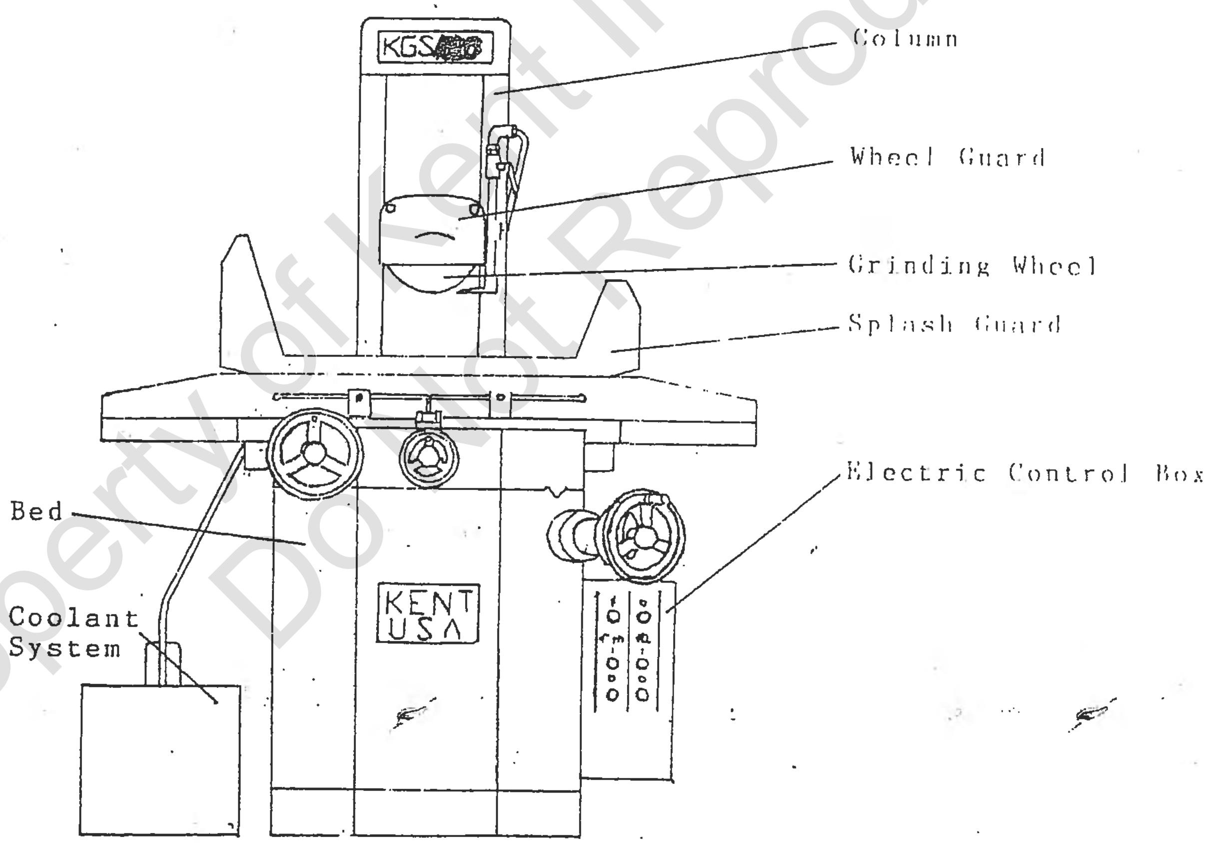
* Screw the levelling screws (1105, nut M20) on the machine base as figure shown. For easy levelling and more steady of the machine, make levelling screw as deep as possible.
* Lay down the machine slowly to let screws fall into the center hole of Levelling pads (1017).
* Levelling the machine.





(3) Contour and Nomenclature





(4). Cleaning Up the Machine

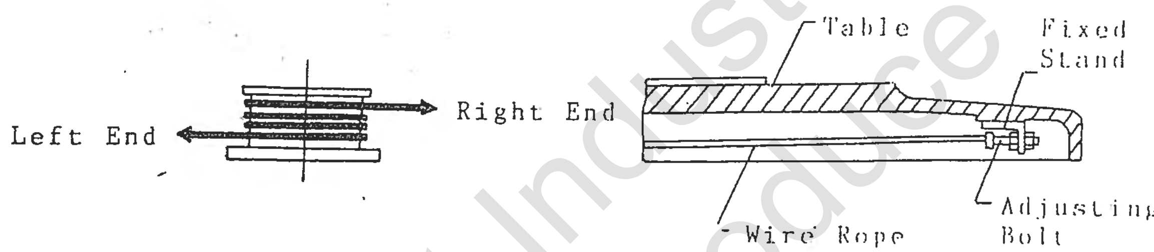
This machine has been packed with anti-dust grease before shipping out, so for better operation and lubrication effect, please clean up the following two point before moving the three-axis travel:

1. Elevation slide way.
2. Saddle "V" groove.

(5). Mounting The Table

The machine is despatched completed with the exception of table, so as to protect the harden and ground slideways from demage during shipment. When installed, mounting the table as following procedures:

a. Wind the wire rope on the "Drum"3 cycles as figure shown, tightening the wire and fix it temporarily.



b. Put the steel ball retainers right in the middle of slideways.
c. Lift up the table and place it on the steel ball retainers. To prevent slideways from damaging, please handle with care.
d. Fix the wire rope on the fixed stand.
e. The wire will loose after long use, and will cause table move unsmoothly. In this case please adjust the adjusting bolt the right end till it's in tightening condition.
f. The quantity of steel ball
   The front retainer has 22 steel balls.
   The back retainer has 23 steel balls.
   This machine has 45 steel balls all.

(6). Levelling the machine

As following procedures:

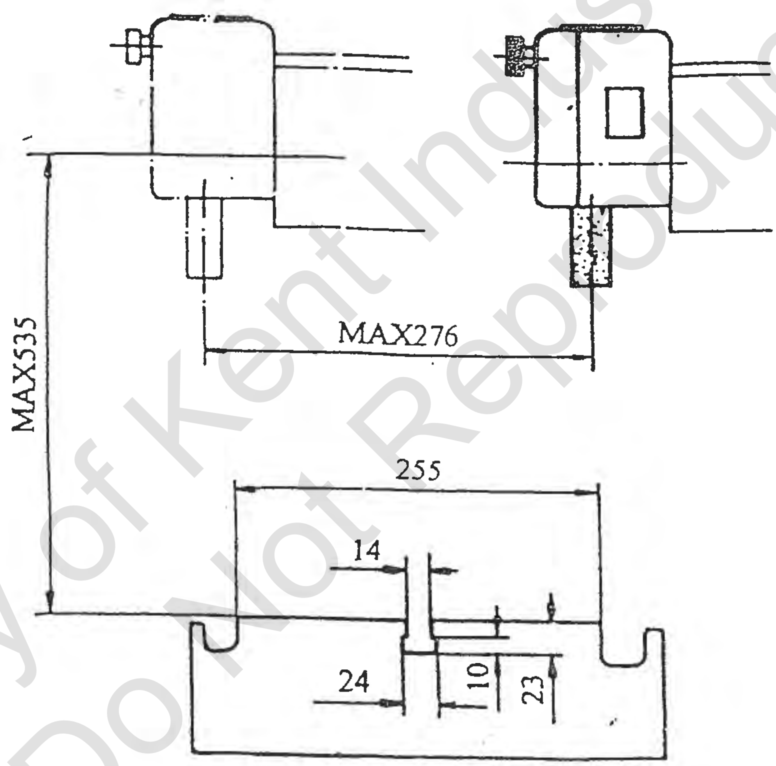
a). Use longitudinal handwheel to let table at left end position. Levelling the machine by a Spirit Level in longitudinal and latitudinal direction.(Fig. A)

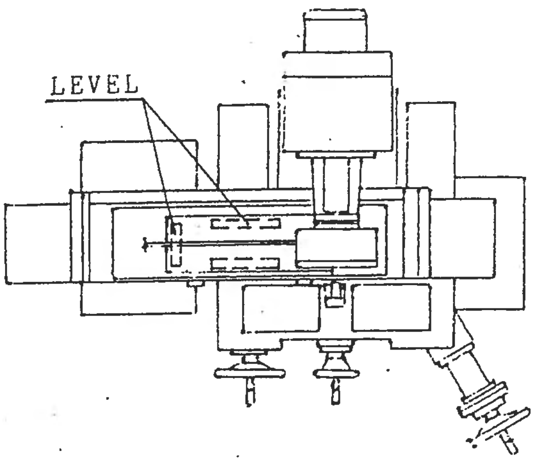
b). Use longitudinal handwheel to let table at right end position. Levelling the machine in longitudinal and latitudinal direction.(Fig. B)

c). Use crossfeed handwheel to let table at front end position. Levelling the machine by a Spirit Level in longitudinal and latitudinal direction. (Fig. C)

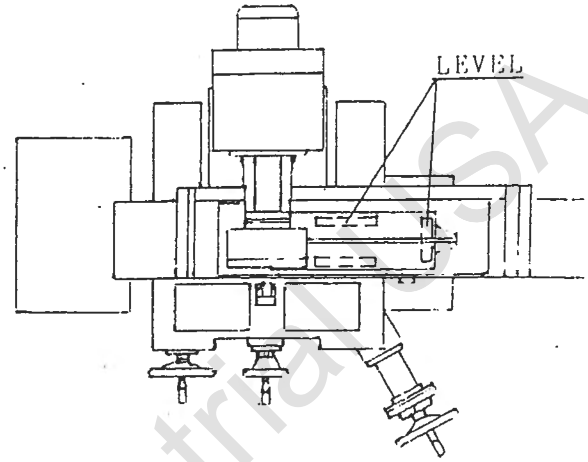
d). Use crossfeed handwheel to let table at rear end position. Levelling the machine in longitudinal and latitudinal direction. (Fig. D)

(7). Table size and grinding capacity

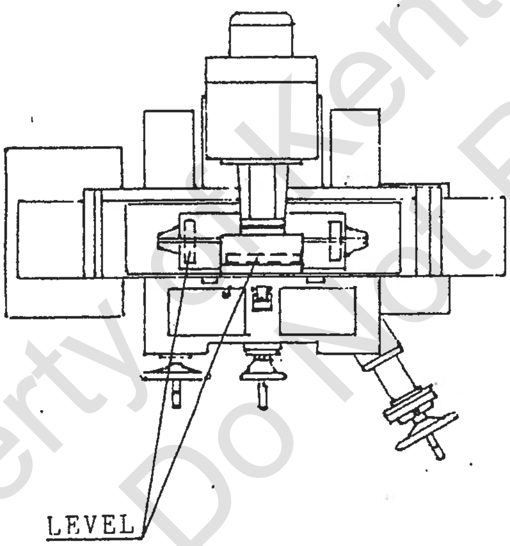




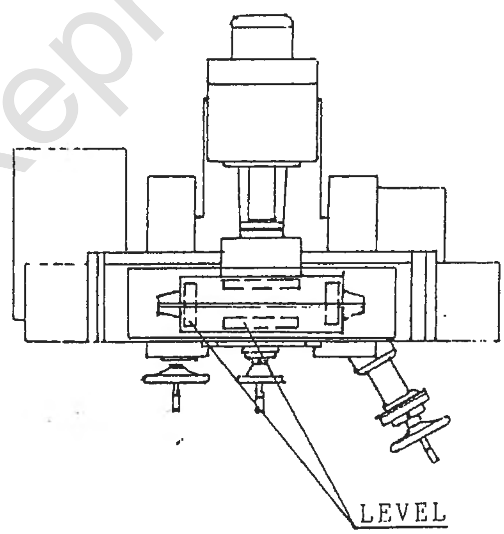
A.



B.



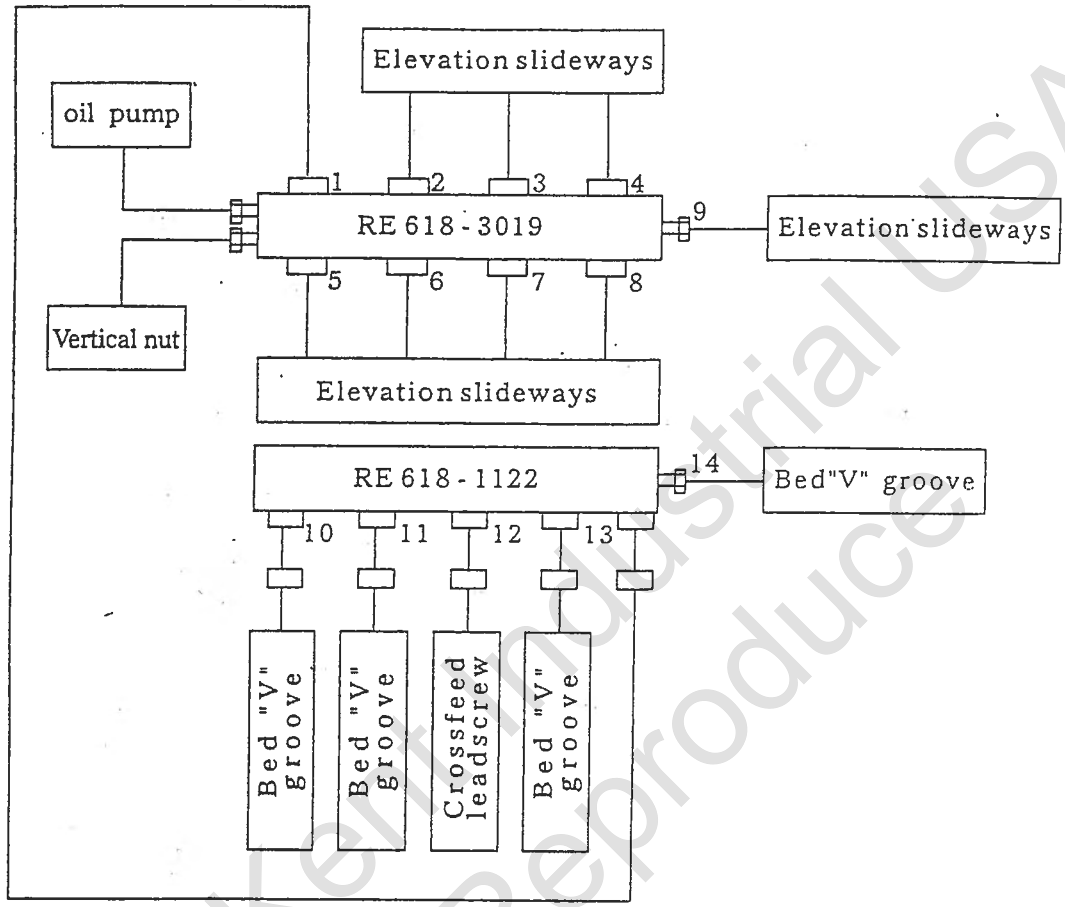
C.



D.

8). Lubrication instruction

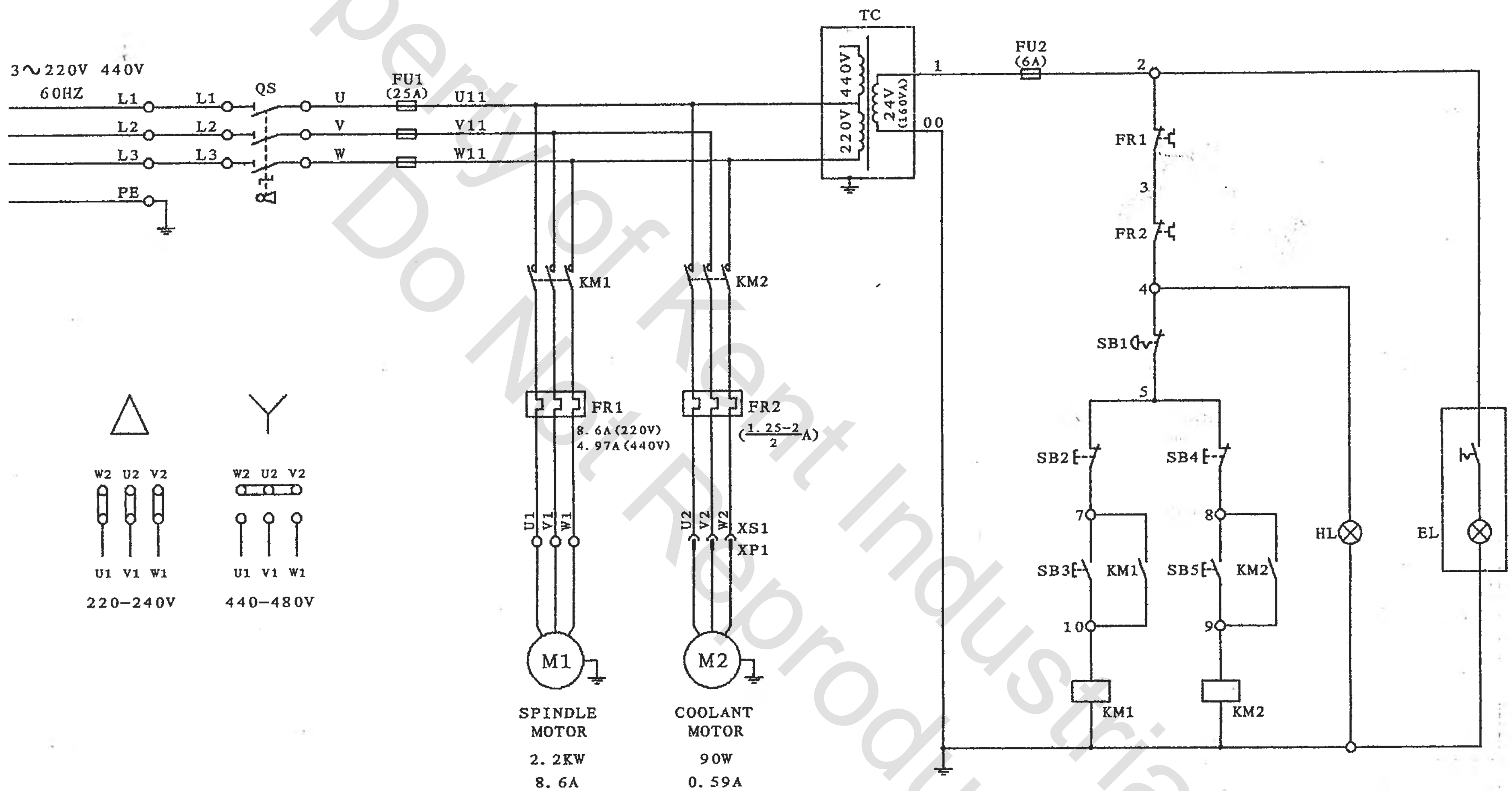
Lubrication flow chart



Reliability of the machine and economic running are ensured only by the correct choice of lubricant for the individual lubricating points.

1). Lubrication pump: Manual lubrication pump module.
2). Lubricant: SAE30, Lubrication oil of BP, ESSO, MOBIL, or SHELL.
3). Lubricant tank: 1 liters.
4). Lubricating points: Crossfeed leadscrew
Machine bed "V" groove
Vertical leadscrew
Elevation slideways
5). Oil distributor: No.1 ~ 9 Model: AJB-1T
No.10 ~ 14 Model: AJB-5T

Manufacturer: Nanjing Bijur Machinery Products Ltd.



KGS1020M-1 ELECTRICAL DRAWING

Description:

SB1: Emergency push button

XD1: Indicator of power source

SB2: Push button "OFF" of Spindle motor

SB3: Push button "ON" of spindle motor

SB4: Push button "OFF" coolant or dust-collector power source

SB5: Push button "ON" of coolant or dust-collector power source

3-phase Tr.: Transformer to change local voltage to 220v

TC: Transformer for 24v control circuit

CT2.CZ2: Socket for illuminator

CT1.CZ1: Socket for coolant or dust-collector

M1: Magnetic contactor for spindle motor

M2: Magnetic contactor for coolant or dust-collector

Fu: Fuse

FR1: Overload relay of M1

FR2: Overload relay of M2

(9). Blancing the grinding wheel

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

The grinding wheel together with be 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 following: (see Fig.2).

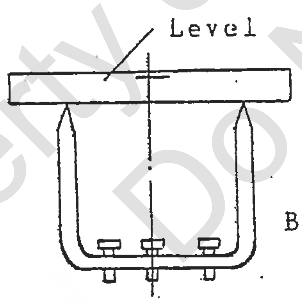


Fig.1

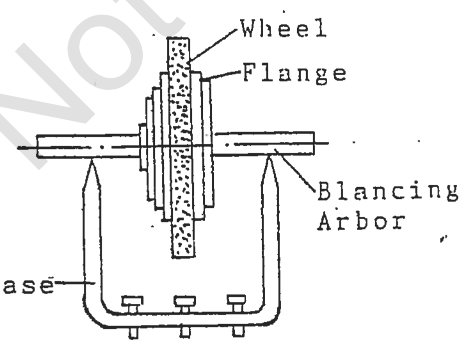


Fig.2

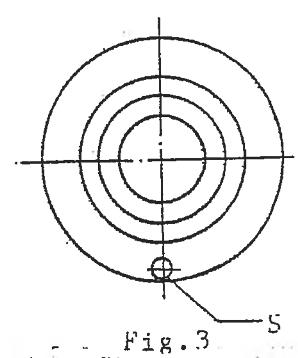


Fig.3

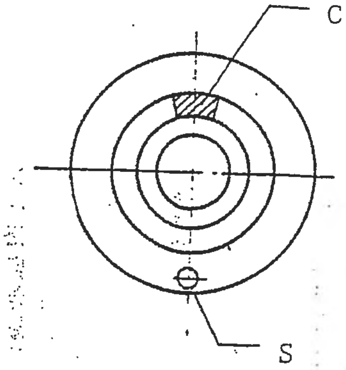


Fig.4

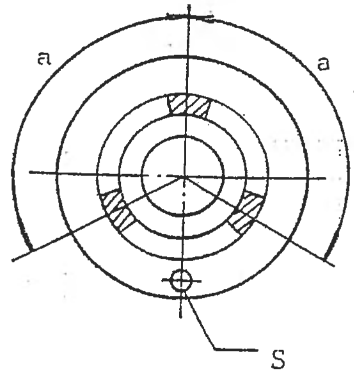


Fig.5

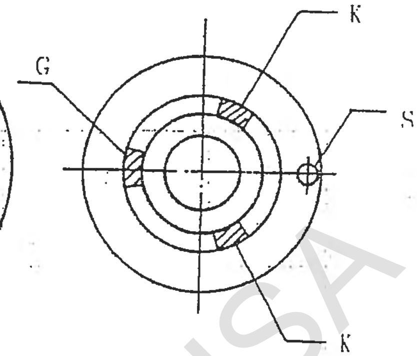


Fig.6

* 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 timeand see if it is 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

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 carrier 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-dressed. After being fitted to the spindle again re-dressed, it is ready for use.

As wear can leads to unbalance, the wheel should be re-checked and if necessary, rebalanced.

Grinding wheel absorbs humidity and coolant, it is therefore advisable not to shart 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.

Prior to place the flange-mounted grinding wheel to the spindle, flange bore and spindle taper must be absolutely clean, and the wheel is pushed by hand onto the spindle taper. Subsequently, tighten wheel flange securely with fixed bolt or nut. (Fig. 7)
To release wheel flange from spindle taper with extractor. (Fig. 8)

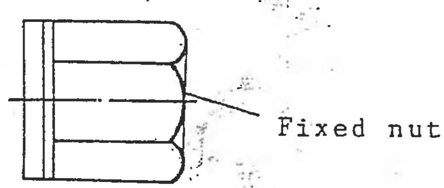


Fig.7

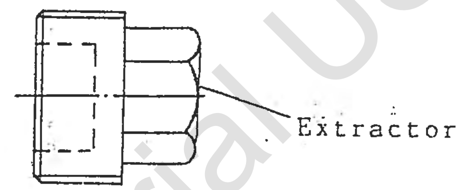


Fig.8

* If various material have to be ground, so that the wheel has to be changed frequently, it is more advantageous to change the wheel complete with flange. It would involve unnecessary loss of time and wheel waste to remove the wheel from its mounting every time and re-balance and re-dress it.

D). SPECIFICATIONS

Size of working table	250mm×510mm (10 " ×20 ")
Table traverses	
Longitudinal traverse	620mm(24.4 ")
Cross traverse	280mm(11 ")
Distance from spindle axis to table surface	70-530mm (2.76 " -21 ")
Spindle vertical traverse	460mm(18 ")
Wheel size	200mm×25mm×32 mm 8 " ×1 " ×1.25 "
Spindle motor	60Hz 3420r/min
Overall dimension (LxWxH)	1650 mm×1520 mm×1925 mm (65 " ×59.8 " ×75.8 ")

E). Putting The Machine Into Operation

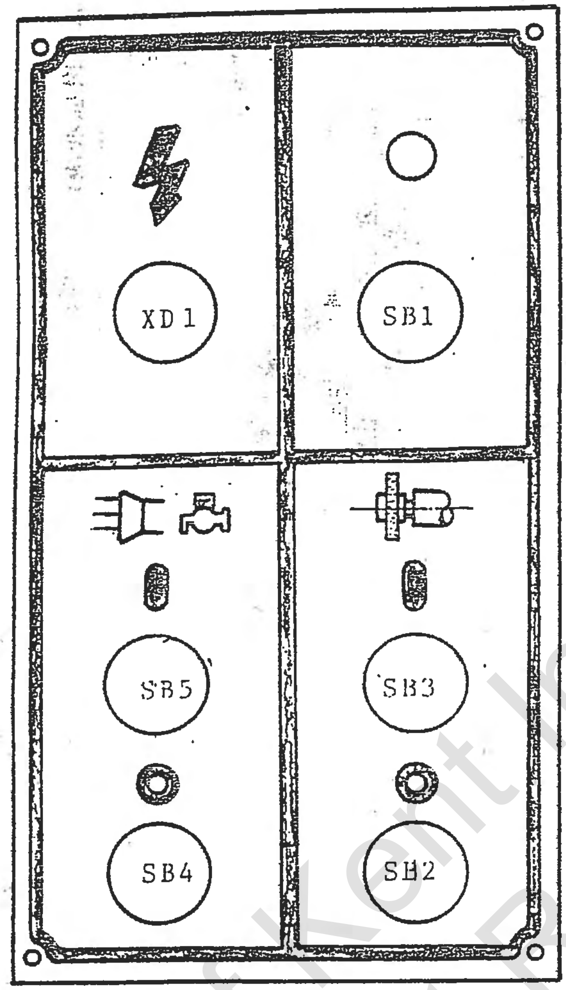
(1). Wiring of power source

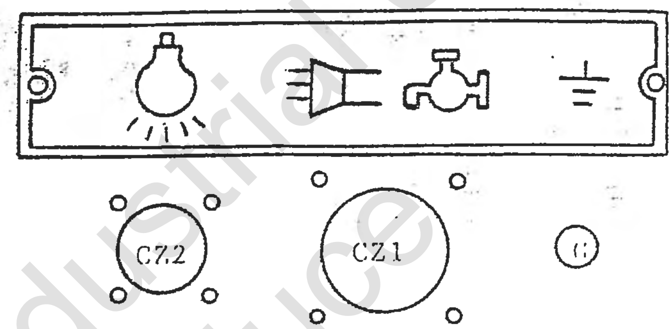
Be sure that the wire connection is same as your power source before power "ON" the machine.

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

1. Spindle motor.
2. Coolant or dust-collector motor (Optional accessory)

(2). Control panel & Description





SB1: Emergency push button
XD1: Indicator of power source
SB2: Push button "OFF" of spindle motor
SB3: Push button "ON" of spindle motor
SB4: Push button "OFF" of coolant power source
SB5: Push button "ON" of coolant power source
CZ2: Socket for illuminator
CZ1: Socket for coolant

(3). Operation

a). Before operation

It's only after the following instructions have been fully complied with that the machine can be started:

1. Choics of a location free from vibration.
2. Clean up the machine of those anti-rust oil and grease.
3. Installation and levelling of the machine.
4. Lubrication of the machine according to lubrication instruction.
5. Checking the spindle (wheel) rotation direction, must be in clockwise. Please take off the wheel prior to start spindle or it will cause danger if it rotates in counter-clockwise.

b). Operation

1). Power ON & OFF

1. XD1 indicator will lights when electric control box is ready.
2. SB1 is for emergency stop.

2). Coolant system (Optional accessory)

1. Press SB5 to start coolant pump.
2. Adjust valve to get suitable coolant flow.

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 slowlyover 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 in "clogged".

(4) Undesirable burns and grinding cracks

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

G) Wheel Inspection

It is absolutely essential to comply fully with following safety rules.

These are intended to protect the operator abainst 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 where the sound is clear. Defective grinding wheel must not be used.

There 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 slide 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.

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

The diamond is inserts in the dressing device. The sleeve of the device is arranged at an angle of about 5°, 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 dia-mondedge available.

Various degrees of roughness can be produced in the ground com-ponent 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 grindingwheel. This is done by feeding the diamond in about 0.03mm and turning the handwheel rapidky, 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 be 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 onlyabout 0.01mm.

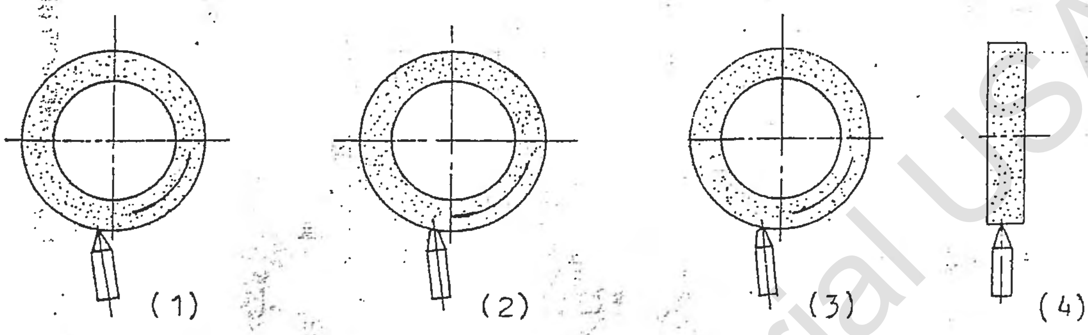
Freouent light dressing is better for the life of the grinding wheel and the diamond than a heavy cut.

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 cracks easily.

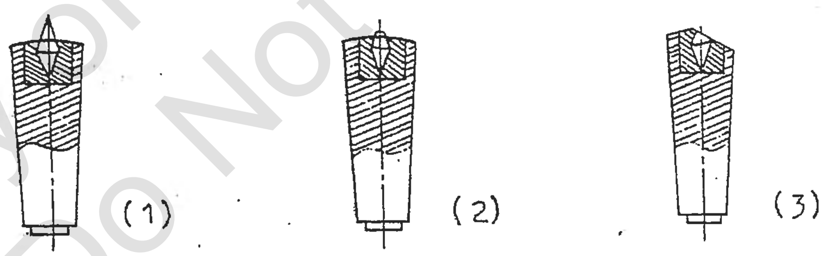
When dressing, begin in the center, as the edges are usually worn down further. If dressing is begun at the worn edges, there is danger of the higher pressure in the center overstressing the diamond and shattering it.

Experience has 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 is 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 actslike 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 economocal operation. This resetting should be under taken in time, before any of the holder itself has been ground off. Otherwise, there is first of all the danger of breaking the diamond out and losing, or secondly, of its being too small to be reset. This is really false economy.



(1) The new diamond.
(2) The diamond now be 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 pretected 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 an even surface. Grinding wheels must not be allowed to come into contact with oil or grease. An oilsoaked wheel loses its bite and its application 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

GC: 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

Grinding condition \ Grain	Coarse	Fine
Stock removal	much	little
Surface roughness	coarse	fine
Works hardness	soft	hard
Surface contacted	wide	narrow
Dia. of the wheel	big	small

(c). Grade: It indicate the strength of the bond which hold abrasive.
Soft: A-H
Medium: I to P
Hard: Q to Z

Grinding condition \ Grade	Soft	Hard
Works hardness	hard	soft
Surface be contacted	wide	narrow
Movement of work	slow	quick
Wheel speed	quick	slow

(d). Structure: The structure number of a wheel refers to the relative spacing of the grains of abrasive; the larger number, the wider the grain spacing.
Close: 0,1,2,3,4,5,
Medium: 6,7,8,9,
Wide: 10,11,12.

Grinding condition \ Structure	Wide	Close
Surface roughness	coarse	fine
Surface be contacted	wide	narrow
Wowks hardness	soft	hard

(e). Bond:
V: Vitrified,
S: Silicate,
B: Resinoid,
R: Rubber
E: Shellac

K). Wheel Be Recommended

Material be ground \ Wheel diameter		Under 205mm
Carbon steel	under HRC25°	WA A 46K
	above HRC25°	WA 46J
Alloy steel	under HRC55°	SA WA 46J
	above HRC55°	SA WA 46H
Tool steel	under HRC60°	SA WA 46I
	above HRC60°	SA WA 46H
Stainless steel		SA WA 46I
Cast iron		C 46J
Brass		C 30J
Aluminum alloy		C 30J
Tungsten Carbide		GC 60H-100I
Glass		C60K
Marble		C GC 36M

L). Choice Of The Grinding Condition

(1). Down feed of grinding wheel

Work material \ Finish	Down feed: Cast iron, Soft steel, Hardened steel	Down feed: Stainless & Heat resistant steel	Down feed: Tool steel	Cross feed
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 finish	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

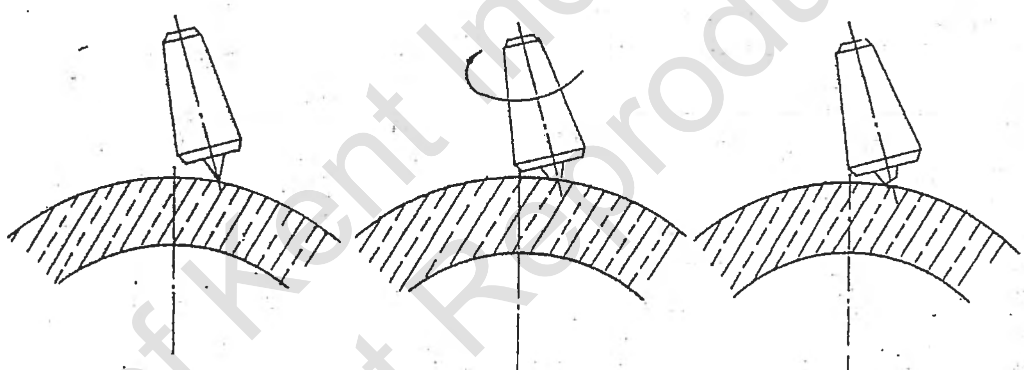
Wheel speed Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	better

Material	Peripheral
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 spondle 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 an angle, ensuring that there is always a sharp diamond edge available. The dressing method and points are same as "Dressing the wheel". Experience has shown that, with highly accurate grinding. dressing with the diamond which mounted on the magnetic chuck is better than which on the spindle carrier (the former is more stable than latter) as the latter condition will cause slight undulation in the surface of the wheel.



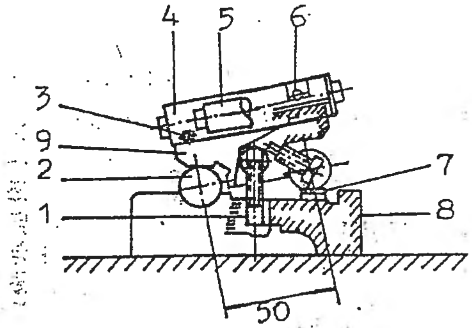
(b). Angle forming attachment

(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 level.

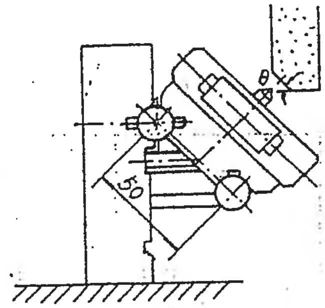
(2). The value in question will be the Sine of the angle times 50. That is $B=\sin\theta \times 50$

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

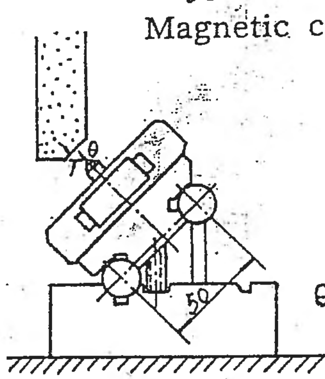
(4). Put this Block gauge under the base of the Sine Bar stand. Fix with the fastening bolts and the forming is done.



Magnetic chuck



θ bigger than 45°
(45°-90°)



θ small than 45°
(0°-45°)

(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 thicknessmust 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.

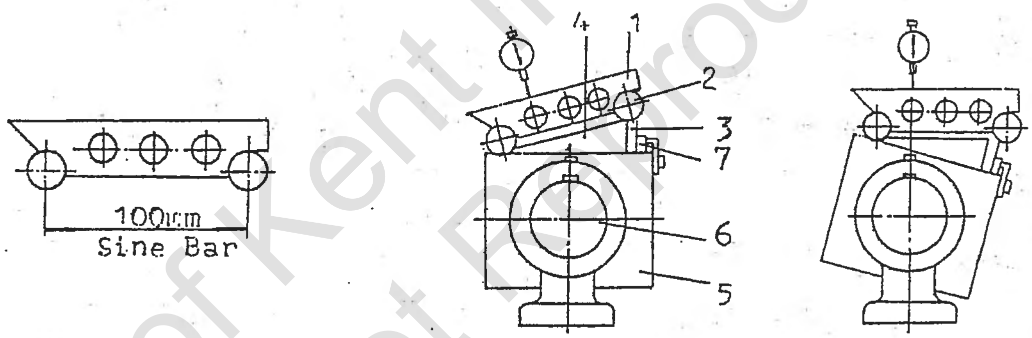
(1) The value in question equals the Sine of the angle times 100, B=Sinθ x100

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

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

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

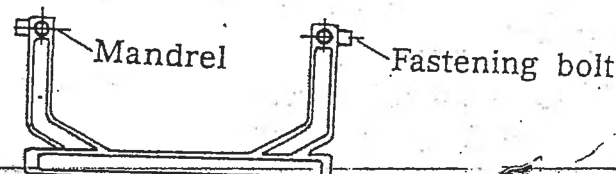
1. Mandrel
2. Sine Bar
3. Block gauge
4. Application of the trigonometry
5. Inclincalb Magnetic Chuck
6. Mandrel of the Magnetic Chuck
7. Stop block



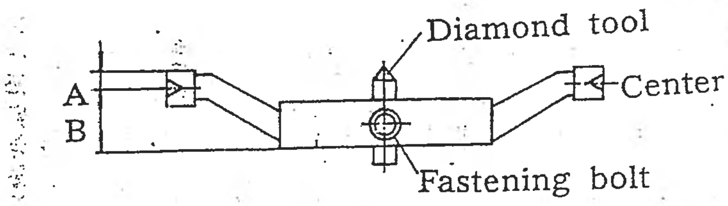
(d). Radius Forming Attachment

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 to mean:

A: the distance between the upper rim and the center

B: the distance between the bottom rim and the center

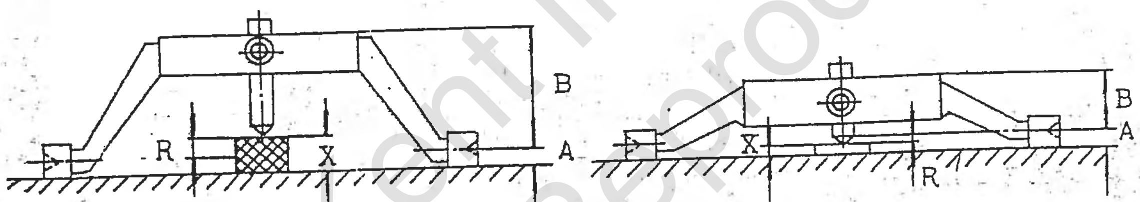
The R forming is the adjustment of the distance between the diamond tool and the swing rod center so that the R shaping results.

(3) To determine the concave and convex R:

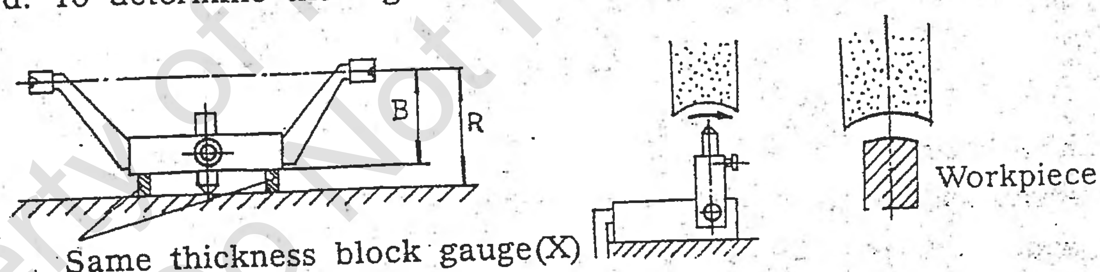
a. If the tool is parallel to the center line, it equals OR.

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

c. To determine the small concave R=A-X



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

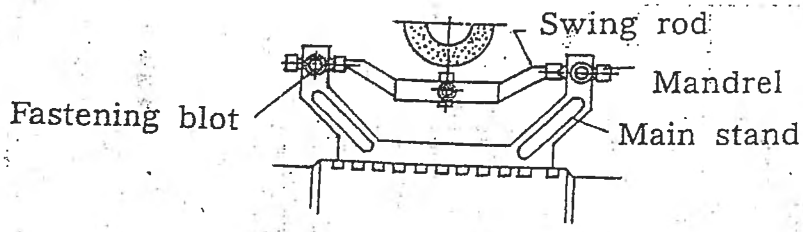


e. Note:

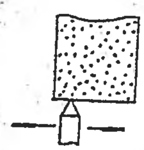
1. The base and side of the grinding wheel shall be well -dressed.
2. The Radius Forming Attachment shall be parallel to the grinding wheel.
3. The diamond tool shall be parallel to the Radius Forming Attachment.

(4) Operation of the Radius forming attachment:

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

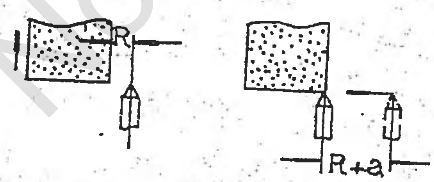


b. Turn the down-feed handwheel at 1/3 on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.

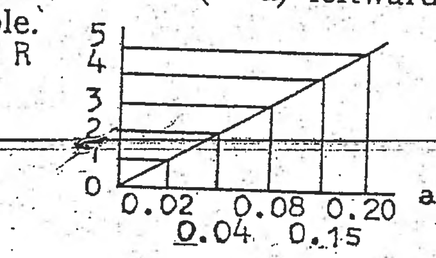


c. Turn the diamond tool over an angle 90° and elevate it into a proper position (greater than the R size in question).

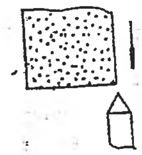
d. Elevate the grinding wheel so that it goes away from the diamond tool and the wheel in such a position that the distance between the side of the wheel and the center of the diamond tool is just R.



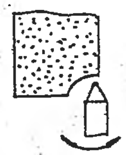
e. Move the diamond tool (R+a) leftward, with "a" found in the following table.



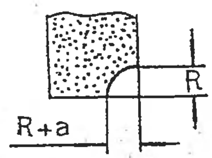
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



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



h. The wheel finally becomes the following shape.

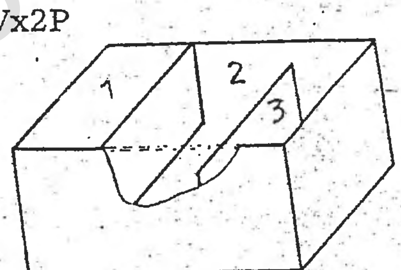


(e). Coolant System

Insert the power source plug in socket (at the rear side of electric control box). Press the pushbutton switch to start the coolant pump, the pump should rotates in clockwise direction, if not, interchange the any two cords of three-cord cable. Adjust coolant flow by turning the ball valve to suitable rate.

Cooling water collected from table and returns to coolant tank through return hose then filtered in the coolant tank by turns of cabinet #1,2,3.

* Coolant tank capacity: 46 liters
* Coolant pump: 90Wx2P

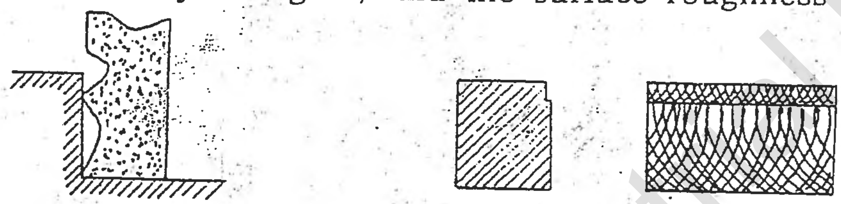


(f) Common cases in Side Grinding

(1)

In the case shown in the figure above, the side-grinding wheel and the work have a smaller contact surface, in which case 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 did not 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.

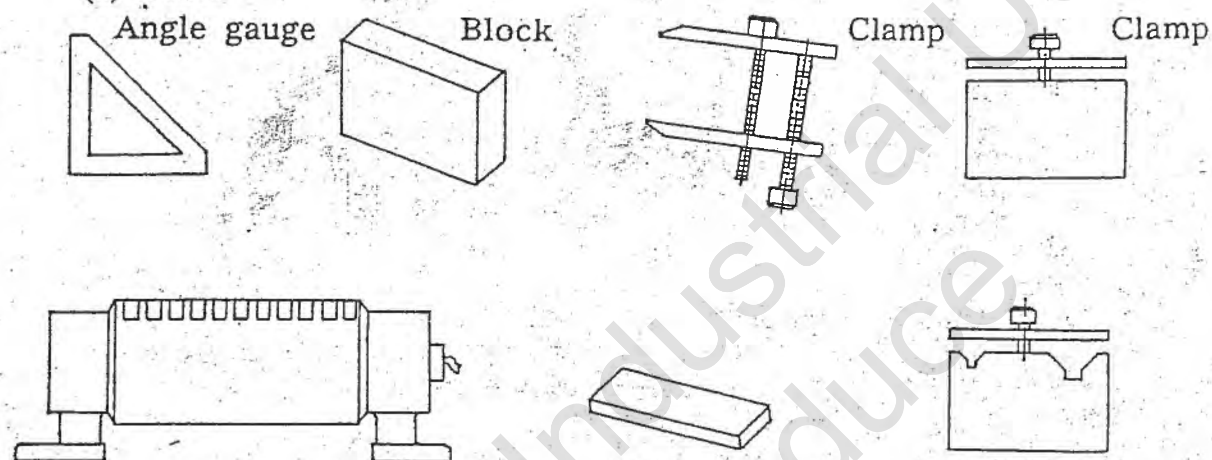
(4)

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 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



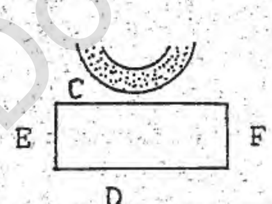
Inclinable Magnetic Chuck Block gauge Clamp

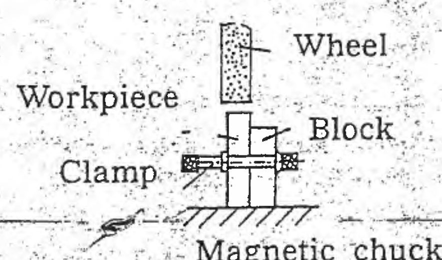
(2) Use of the jigs and tools: take the grinding of the bolck of six faces A,B,C,D,E,F. For example:

a. Under 200mm:

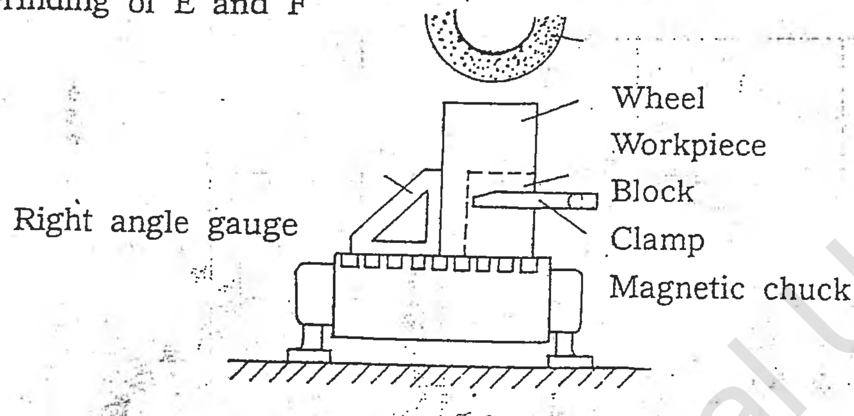
* Grinding of the first basic face, or the surface grinding of A and B.

* Grinding of C and D



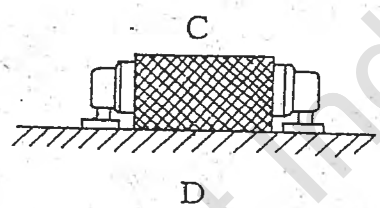


* Grinding of E and F

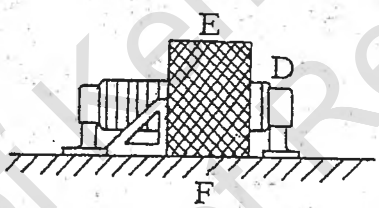


b. Over 200mm:

* 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 gringing of right angle depends on the patience and clever mindedness of the operator for its precision. For instance, whether the burrs after grinding is done well, whether the tools are 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.

N. COMPLETE KNOCK DOWN DRAWINGS & PARTS LISTS

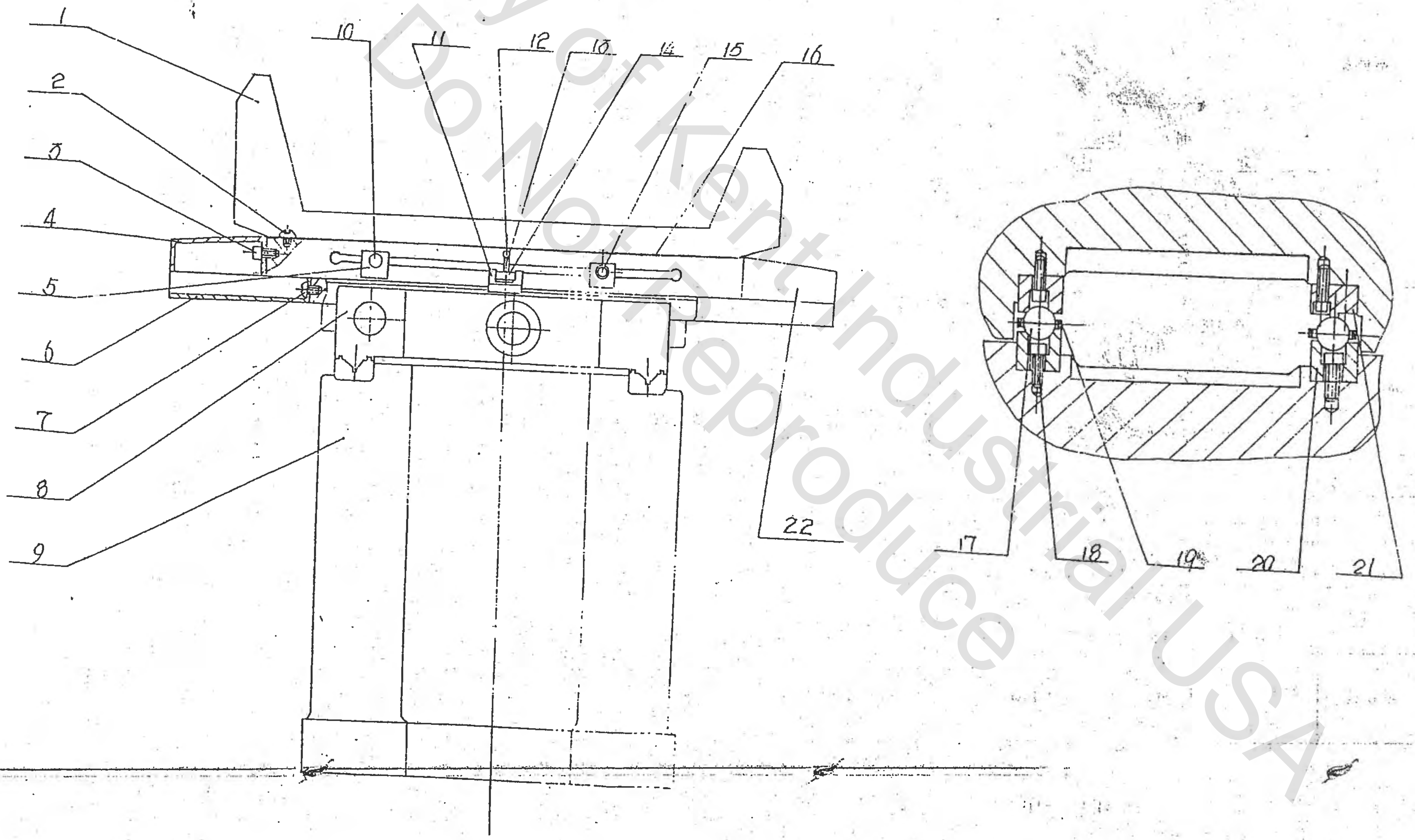
WHEN ORDERING PARTS, PLEASE MENTION:

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

CONTENTS

Table Saddle Ass'y.................... 34
Column Ass'y.................... 36
Downfeed (Lower) Ass'y.................... 39
Spindle Ass'y.................... 42
Crossfeed Ass'y.................... 44
Longitudinal Hand Feed Ass'y.................... 46

TARLE SADDLE ASS'Y



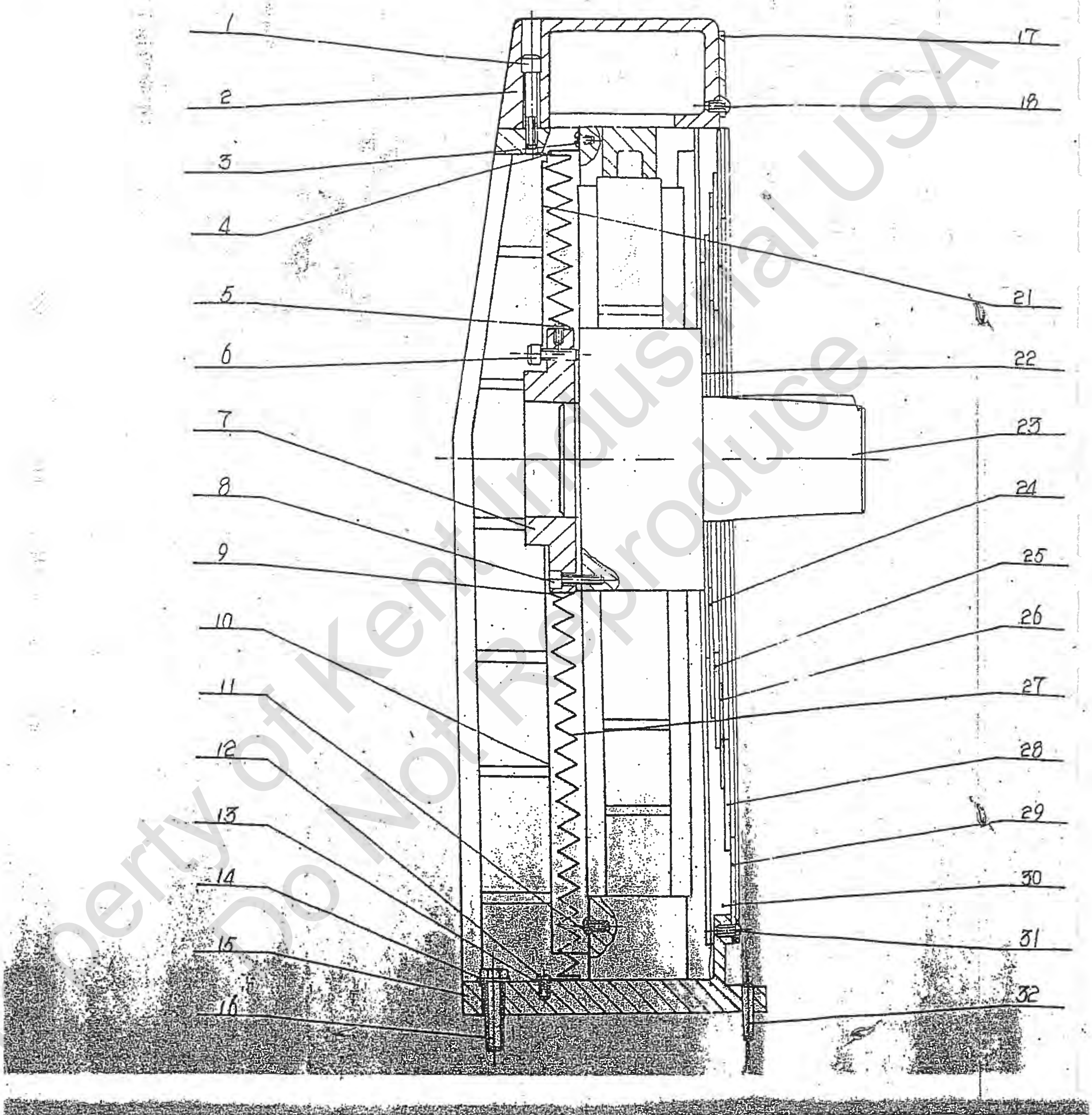
COLUMN ASS'Y

Index No.	Parts No.	Parts Name	Q'ty
31	M6X12/GB818-85	Screw	2
32	A10x60/GB118-86	Taper Bolt	1
	A10x50/GB118-86		1

TABLE SADDLE ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
1	2105	Solash Shield	1
2	M6x12/GB818-85	Screw	6
3	M12x40/GB70-85	Socket Head Cap Screw	8
4	2201	Bracket	1
5	2106	Stop Block	2
6	2104	Shield Dust	2
7	M6x16/GB70-85	Socket Head Cap Screw	8
8	2011	Saddle	1
9	1012	Bed	1
10	2107	T-Nut	2
11	2110	Bracket	1
12	BM6x20/GB141.11-84	Handle Knob	1
13	2109	Handle Lever	1
14	2108	Striker	1
15	M8x30/GB70-85	Socket Head Cap Screw	2
16	2302	Plate	1
17	15.875/GB308-77	Ball	39
18	M6x20/GB70-85	Socket Head Cap Screw	28
19	2306	Hold rack	2
20	2130	Slide way	3
21	2131	Slide way	1
22	2202	Bracket	1

COLUMN ASS'Y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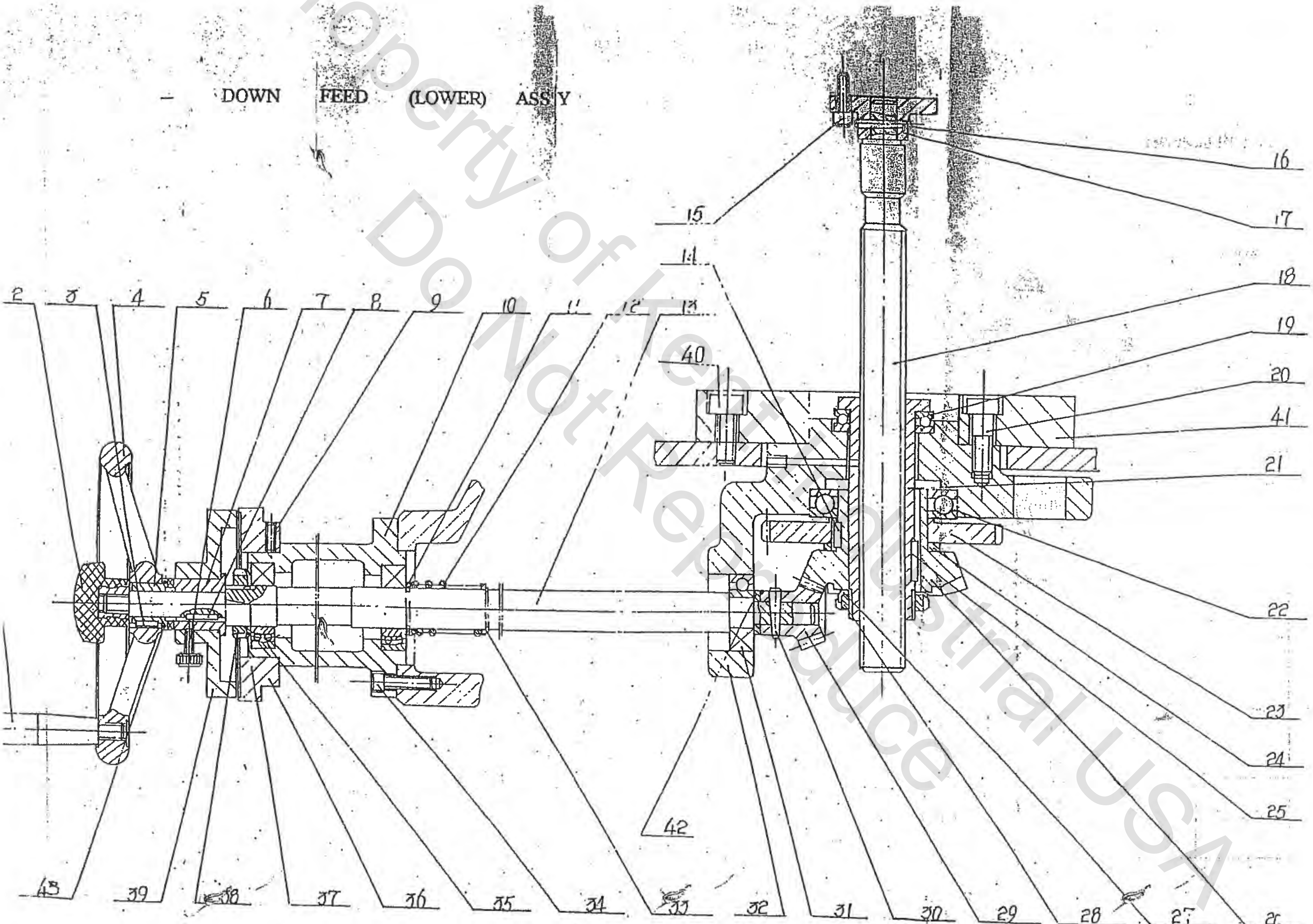
COLUMN ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
1	M8X80/GB70-85	Socket Head Cap Screw	5
2	3017	Upper Cover Of Column	1
3	M5X10/GB65-85	Cup Head Machine Screw	23
4	3122	Upper Hold Plate	1
5	M5x10/GB65-85	Cup Head Machine Screw	2
6	M10x30/GB70-85	Socket Head Cap Screw	4
7	4011	Motor Bracket	1
8	M10x40/GB70-85	Socket Head Cap Screw	2
9	M5X10/GB65-85	Cup Head Machine Screw	2
10	3130	Shield Guide	2
11	M4X8/GB65-85	Cup Head Machine Screw	4
12	M5X8/GB65-85	Cup Head Machine Screw	2
13	3129	Bottom Hold Plate	1
14	20/GB95-85	Washer	6
15	3011	Column	1
16	M20X60/GB5780-86	Hexagonal Head Tap Bolt	4
	M20X70/GB5780-86		2
17	M6X25/GB70-85	Socket Head Cap Screw	4
18	3018	Right Cover Of Column	1
21	3124	Shield Dust	2
22	3128A	Shield Dust	1
23	4014	Spindle Holding	1
24	3127A	Shield Dust	2
25	3126A	Shield Dust	1
26	3125A	Shield Dust	2
27	3302	Dust Direction Fold Fabric	2
28	3124A	Shield Dust	1
29	3123A	Shield Dust	1
30	M6X20/GB70-85	Socket Head Cap Screw	10
	3114A	Shield Dust Guide Rail	2

COLUMN ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
31	M6X12/GB818-85	Screw	2
32	A10x60/GB118-86	Taper Bolt	1
	A10x50/GB118-86		1

— DOWN FEED (LOWER) ASS'Y



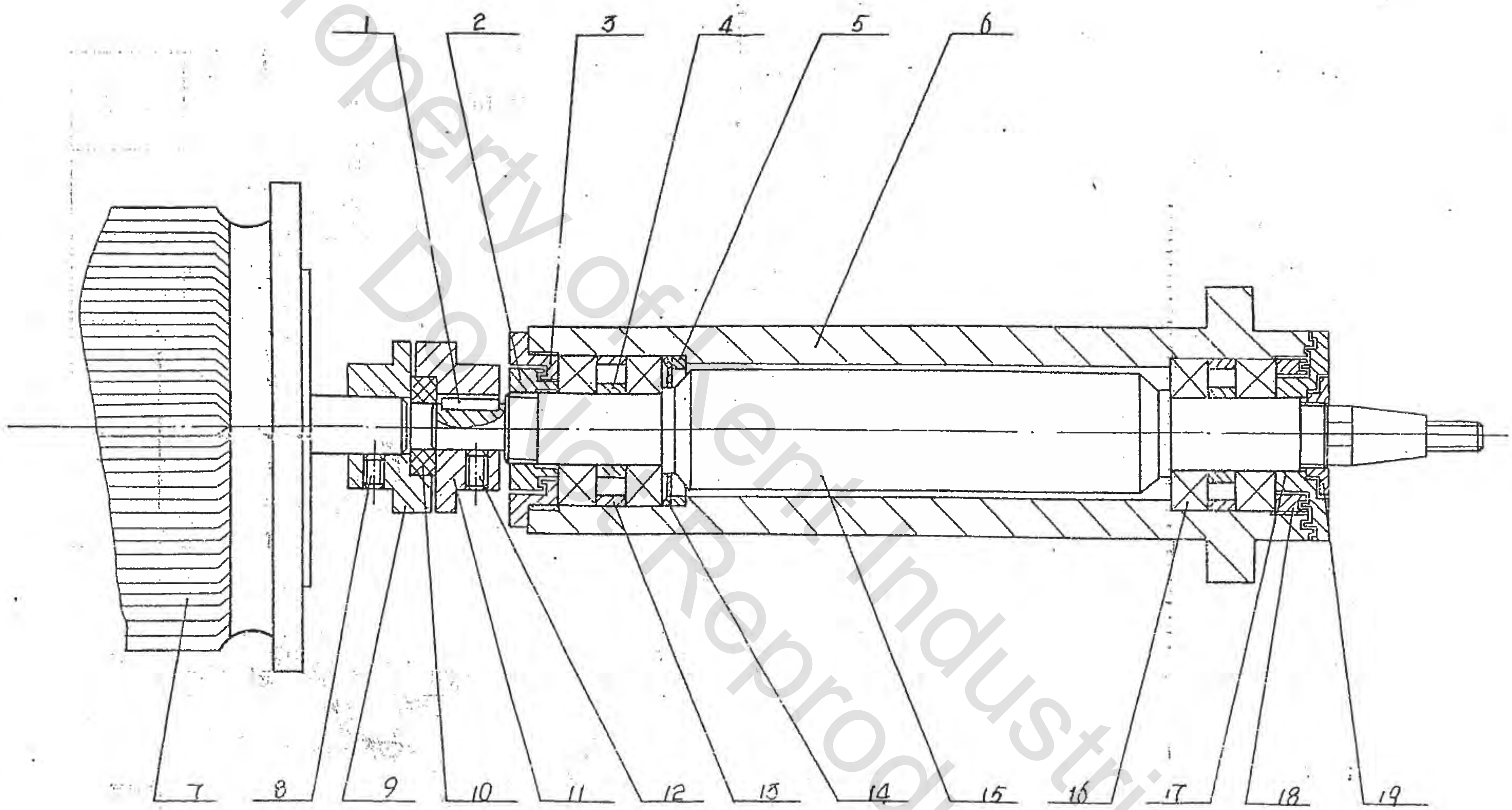
DOWN FEED (LOWER) ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
1	M10x80/GB4141.5-84	Grip	1
2	M12x50/GB4141.29-84	Handwheel Nut	1
3	4x14/GB1096-79	Key	1
4	1014	Handwheel	1
5	1114	Handwheel Bush	1
6	1112	Adjusting Screw	1
7	1113	Graduation Dial Bush	1
8	5x25/GB1096-79	Key	1
9	M6x20/GB79-85	Adjusting Screw	1
10	1013	Bearing Housing	1
11	1108	Washer	1
12	4x30x80/Q81-1	Spring	1
13	1109	Shaft	1
14	6x14/GB1096-79	Key	1
15	M8x25/GB70-85	Socket Head Cap Screw	2
16	A4x32/GB117-86	Taper Bolt	1
17	3014	Connector	1
18	3111	Elevating Leadscrew	1
19	D8108/GB301-84	Thrust Ball Bearing	1
20	M10x30/GB70-85	Socket Head Cap Screw	3
21	1204	Elevating Leadscrew Nut	1
22	D8111/GB301-84	Thrust Ball Bearing	1
23	1118	Gear	1
24	1119	Adjusting Spacer	1
25	6x25/GB1567-79	Thin Key	1
26	1120	Bevel Gear	1
27	40/GB858-88	Ratchet Washer	1
28	M40x1.5/GB812-88	Check Nut	1
29	1107	Small Bevel Gear	1
30	A5x28/GB117-86	Taper Bolt	1
31	204/GB292-83	Ball Bearing	1

DOWN FEED (LOWER) ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
32	1016A	Bevel Gear Bracket	1
33	25/GB894.1-86	Snap Ring	1
34	M8x30/GB70-85	Socket Head Cap Screw	3
35	D1205/GB281-84	Self-Aligning Ball Bearing	2
36	1110	Graduation Dial Holder	1
37	25/GB858-76	Ratchet Washer	1
38	M25x1.5/GB812-76	Check Nut	1
39	1111	Graduation Dial	1
40	M12X35/GB70-85	Socket Head Cap Screw	3
41	1121	Link Plate	1
42	14/GB97.1-85	Washer	1

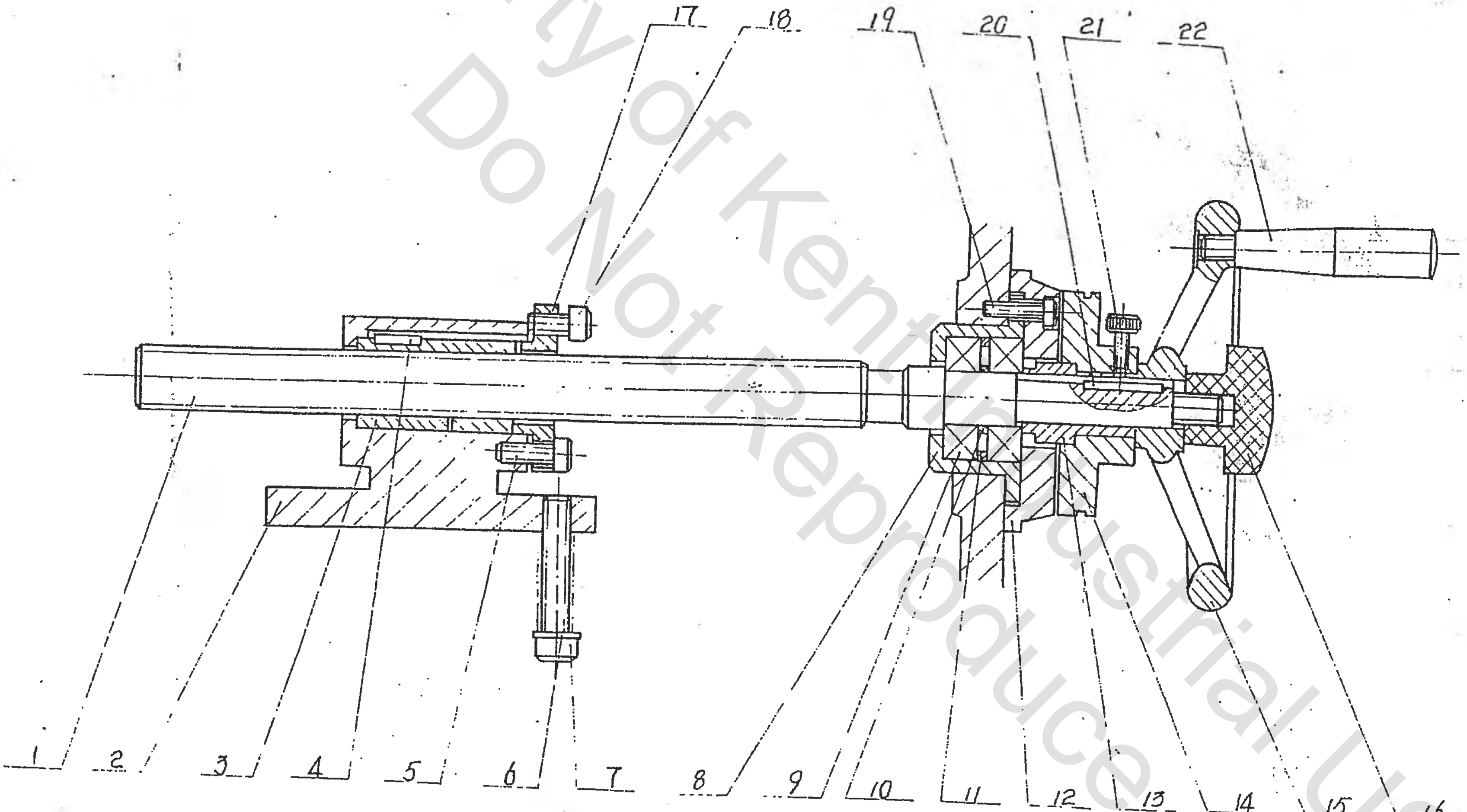
SPINDLE ASS'Y



SPINDLE ASS'Y

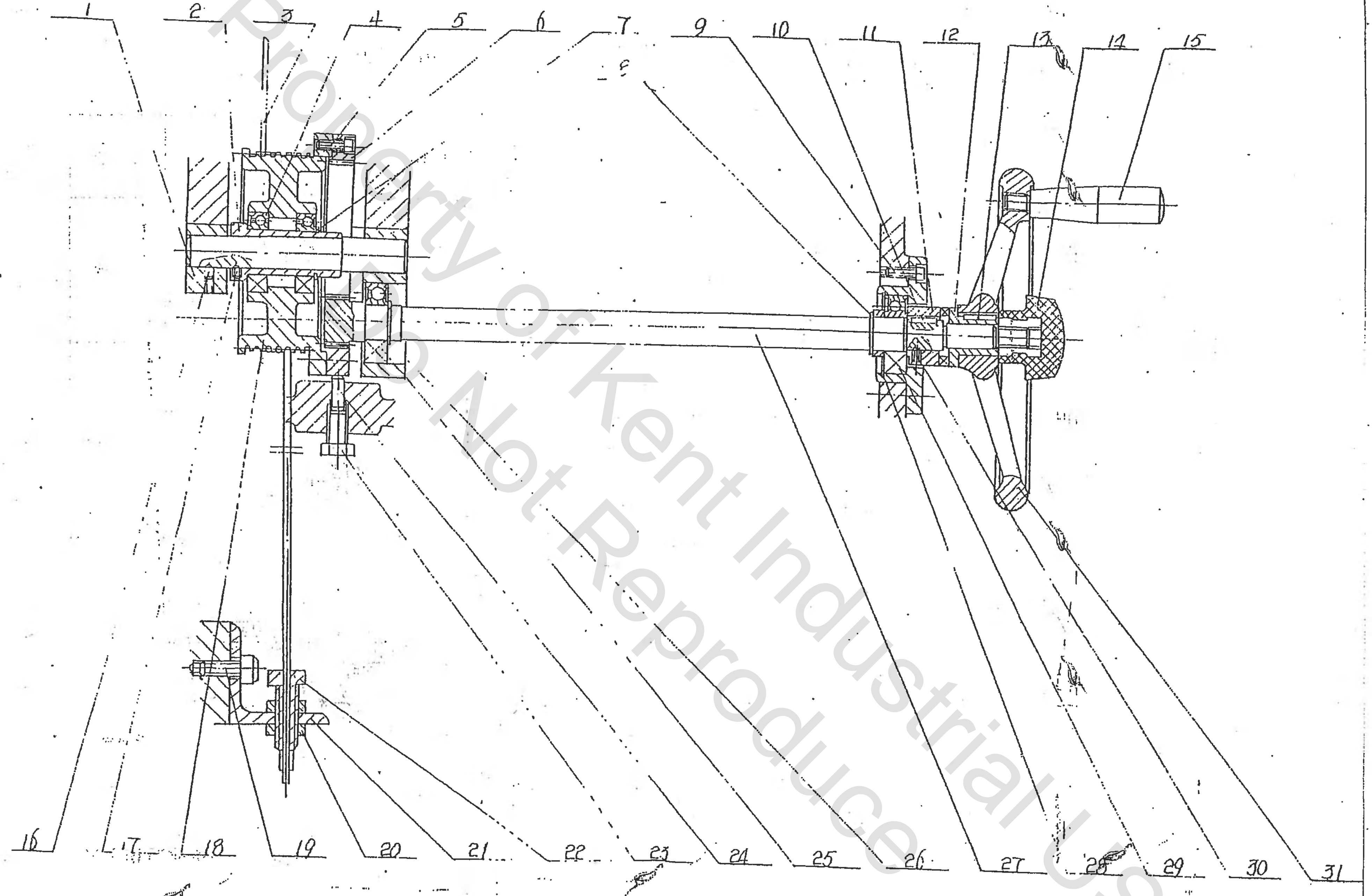
Index No.	Parts No.	Parts Name	Q'ty
1	6x25/GB1096-79	Key	1
2	4114	Spindle Cover	1
3	4115	Spindle Cover	1
4	4109	Inner Spacer	2
5	4113	Spacer	1
6	4112	Spindle Housing	1
7	YU/ZC90S-A	Spindle Motor	1
8	M5x16/GB73-85	Set Screw	1
9	4118	Coupling	1
10	4302	Rubber Coupling	1
11	4116	Coupling	1
12	M5x16/GB73-85	Set Screw	1
13	4110	Outer Spacer	2
14	62	Waveform Washer	1
15	4111	Spindle Shaft	1
16	B46206/GB292-83	Angular Contact Bearing	4
17	4102	Spindle Cover	1
18	4101	Spindle Cover	1
19	4103	Spindle Nut	1

CROSSFEED ASS'Y



CROSSFEED ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
1	2117	Crossfeed Leadscrew	1
2	1011	Crossfeed Nut Base	1
3	1201	Leadscrew Nut	1
4	5x20/GB1096-79	Key	1
5	M8x25/GB70-85	Socket Head Cap Screw	2
6	10/GB93-87	Washer	4
7	M10x55/GB70-85	Socket Head Cap Screw	4
8	2116	Bearing Housing	1
9	36204/GB292-83	Angular Contact Ball Bearing	2
10	2115	Inner Spacer	1
11	2114	Outer Spacer	1
12	2113	Graduation Dial Holder	1
13	2112	Graduation Dial Bush	1
14	2111	Graduation Dial	1
15	16x160/GB4141.24-84	Handwheel	1
16	M12x50/GB4141.29-84	Handwheel Nut	1
17	1101	Leadscrew Backlash Adjuster	1
18	M8x16/GB70-85	Socket Head Cap Screw	2
19	M6x20/GB70-85	Socket Head Cap Screw	4
20	5x32/GB1096-79	Key	1
21	1112	Adjusting Screw	1
22	M10x80/GB4141.4-84	Grip	1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LONGITUDINAL HAND FEED ASS'Y

Index No.	Parts No.	Parts Name	Q' ty
1	2013	Frame Drum	1
2	2125	Bushing	1
3	1x19-3.0-170	Wire Rope	1
4	60105/GB278-89	Ball Bearing With Shields	2
5	M6x16/GB70-85	Socket Head Cap Screw	6
6	2114	Inner Gear	1
7	25/GB894.1-85	Snap Ring	1
8	20/GB894.1-85	Snap Ring	1
9	M6x16/GB70-85	Socket Head Cap Screw	4
10	4x16/GB1096-70	Key	1
11	2121	Bush	1
12	2120	Handwheel Bush	1
13	4x20/GB1096-70	Key	1
14	M12x50/GB4141.29-84	Handwheel Nut	1
15	M10x80/GB4141.4-84	Grip	1
16	M5x8/GB78-85	Set Screw	1
17	M5x8/GB78-85	Set Screw	3
18	2014	Drum	1
19	M8x16/GB70-85	Socket Head Cap Screw	4
20	M10/GB6172-86	Hexagonal Nut	4
21	2102	End Plate	2
22	2103	Adjusting Bolt	2
23	M12x25/GB5783-86	Hexagonal Nut	1
24	2304	Brake Pin	1
25	80104/GB278-89	Ball Bearing With Shields	1
26	20/GB894.1-86	Snap Ring	1
27	2124	Pinion Shaft	1
28	27/GB893.1-86	Snap Ring	1
29	80204/GB278-89	Ball Bearing With Shields	1
30	M5x8/GB78-85	Set Screw	1
31	18x200/GB4141.24-84	Handwheel	1

O). Electrical parts list

NAME	SPECIFICATION	QUANTITY
CONTACT	3TB40 10-0A 24V 50Hz/60Hz	2
HEAT RELAY	3UA50 5-8A	1
HEAT RELAY	3UA50 1.25-2A	1
PUSH BUTTON	LAY3-11	RED 2, GREEN 2
PUSH BUTTON	LAY3-01ZS/1	RED 1, LOCK
TRANSFORMER	JBK3-160VA-TH 480V,440V,240V,220V /110V, 24V, 6.3V 60VA 90VA 10VA	1
PLUG	P28J3Q	1
PLUG	P20J7Q	1
OUTLET	P28K3A	1
OUTLET	P20K7A	1

P). Trouble Shooting

(1). Grinding Defects

Defects	Causes	Remedy
*chatter marks on grinding surface	Machine not free from vibration	Balance grinding wheel in usual ways Check spindle motor's coupling, Check levelling screw on machine base,
	Unsteady running of grinding wheel	Dress wheel on periphery on 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 more rougher, Dress grinding wheel more frequency,
	Table not fully supported	Check steel ball, 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,

Defects	Causes	Remedy
*Spindle noisy & run unevenly	Coupling loose	Check the set screw on spindle coupling,
	Spindle bearings	Please don't disassemble it without our advise,

Installation procedure for timing belt

A. Fasten two inner hex screws for aluminum housing 1 on both end of table 2.

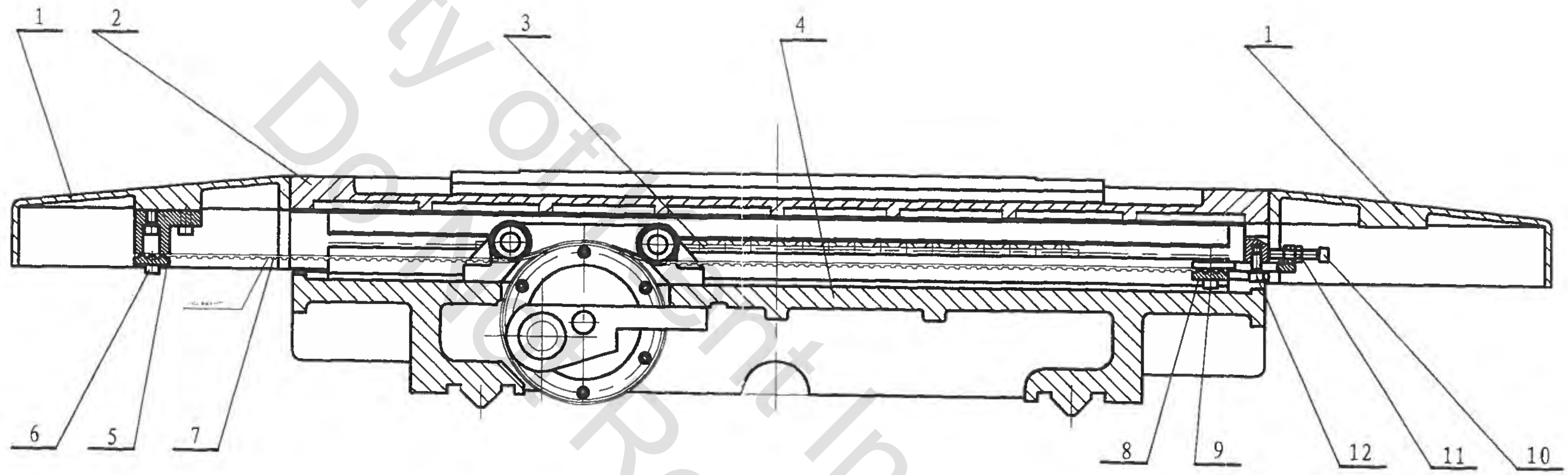
B. Clean steel balls & retainers 3, table 2, guideways on saddle 4, then apply clean lubricant oil. Put clean retainers & balls in middle position of guideways.

C. Put table 2 in the middle position of saddle 4

D. Pull left end of belt and fasten it on left bracket by using clamping plate 5 & screws 6.

E. Pull right end of belt and fasten it on right bracket by using clamping plate 8 & screw 9.

F. Release screw 12 a little bit, release nut 11, insert screw 10 into belt to suitable position and lock it by using nut 11 & screw 10, fasten screw 12.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