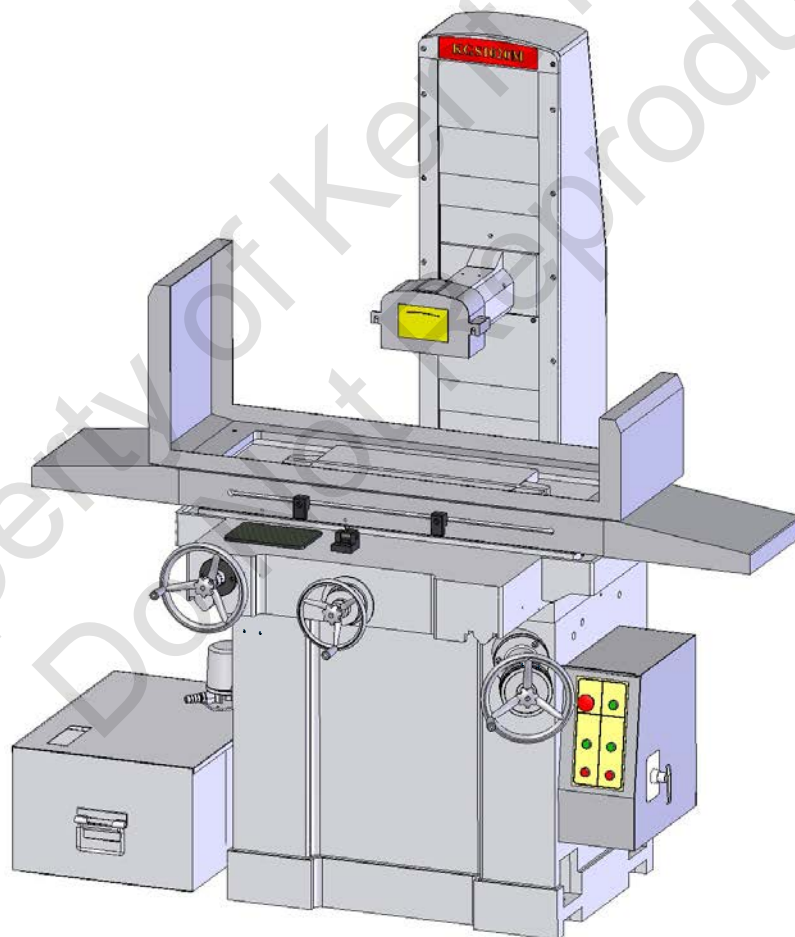


# **INSTRUCTION MANUAL FOR PRECISION SURFACE GRINDER**

**MODEL : KGS618**

**KGS818M**

**KGS1020M**



**KENT INDUSTRIAL (U.S.A.) INC**

# Chapter One

## Installation Guidelines

### 1.1 General safety rules

#### Do

- (1).The employer must select trained,qualified personnel to machine.
- (2).The employer must adhere to local national safety laws and regulations for teaching operators safety and hygiene education.
- (3).The employer must caution operators to watch for unsafe operation practices.
- (4).The brightness of the lighting equipment at the machine work environment must conform to local government regulations.
- (5).The machine's fire extinguisher must use non-conducting CO<sub>2</sub> fire extinguisher or ABC dry fire extinguisher.
- (6).The operation manual must be read before operating the machine and the danger notices and instructions on the machine should be noted.
- (7).The operation manual must be kept ready at all times.If an accident should happen ,please contact our company's representatives.
- (8).For persons with long hair,their hair must be properly restrained or wear a hat before operating or maintaining the machine.
- (9).When operating the machine,safety glasses,a filter masks and work safety shoes must be worn.
- (10).The machine and its surrounding area must be kept clean and orderly so to prevent slippery surfaces and to remove unnecessary obstacles.
- (11).A maximum 600mm of movement space for the machine should be reserved to prevent personnel from being crushed by coming into contact with the machine.Moreover,a yellow line should be drawn to mark those areas where personnel are restricted from entering.
- (12).Operation and maintenance personnel must only work inside work areas for safe operation or maintenance.
- (13).When moving work pieces that exceed 30 kilograms,use a hoist operated by licensed personnel to lift and lower these pieces.
- (14).All protective guards and electric doors must be closed at all times,excepting when maintenance work is being done.
- (15).Before maintenance work,the power source should be turned off and only proper tool should be used.

#### Don't

- (1).Persons wearing ties,gloves,loose fitting clothing and shirts with very long sleeves must not operate or maintain the machine.
- (2).Operation personnel within their work area must not lean on the machine.
- (3).When the machine is in operation,wheel guard,right and left storke adjusters and nozzles must not be adjusted by hand or with tools.

(4).To prevent eye injury to personnel by dusts and particles,compressed air should not be used to clean the machine.

## 1.2 Safety rules for this machinery

### **Do**

(1).Only use grinding wheel with a maximum peripheral speed of 2000m/min or greater.

(2).Before inspecting or maintaining the power source,first make sure that you are adhering the instructions on the related warning signs.

(3).If warning or instruction signs should fall off the machine or become illegible, reaffix with replacement signs or contact your sales representative or this company for replacements.

(4).When inspecting electrical sections of the machine,insulating gloves,rubber or leather boots and other non-conducting protective items should be used.

(5).Electrical parts need earthing must be earthed according to the diagrams.

(6).Before inspecting electrical circuits,first confirm with instruments that the circuit is turned off.

(7).When the electrical portions malfunction only qualified personnel should carry out the maintenance work.

(8).Check with the grinding wheel manufacturer about grinding wheel specifications for work pieces with a hardness of HRC65.

(9).The grinding wheel balancing should be done by trained personnel only.After balancing the grinding wheel,it can be mounted onto the wheel spindle.Before mounting, wipe clean the flange and the mounting portion of wheel spindle.

(10).Before starting the machine,check the location of the machine stop and emergency stop pushbuttons.

(11).Before starting up the wheel spindle motor,first inspect the grinding wheel and check the turning direction of the wheel spindle.After starting the wheel spindle motor,let the grinding wheel spin freely for at least five minutes before starting to grind the work piece.

(12).Make sure the surface of the electric magnetic chuck is clean before mounting work pieces.If there is scarring on the surface,first grind its surface.

(13).Use the proper clamps when mounting non-magnetic material work pieces such as aluminum,graphite,etc,or work pieces that are difficult to be hold on the magnetic chuck.These clamps cannot come into contact with the grinding wheel.

(14).When the grinding wheel is not turning,the operator should check with his hands and see whether the work piece is firmly attached to the magnetic plate.

(15).Adjust the left or right stroke only when the table stops.

(16).For wet grinding,before turning off the spindle motor,first turn off the coolant system.

(17).Please wet grind materials which produce dust during grinding process.

## Don't

- (1).The machine must not be installed in areas with explosive powders or materials.
- (2).Combustible liquids must not be used as a cutting fluid.
- (3).The machine should not be used to grind lumber,plastics or other combustible materials.Please contact KENT Industrial Co,Ltd.if you wish to use optional or special accessories provided by the company to grind graphite or porcelain.
- (4).The grinding wheel on the wheel spindle head cannot be worked as a disk sander.
- (5).Do not haphazardly change the use and/or capacity setting on the machine and do not use grinding wheels which do not conform to listed specifications or work pieces that are excessively large or heavy.
- (6).To avoid risk of accident,user should not modify the electrical circuitry without prior authorization.
- (7).Do not change interlocking circuits into bypass circuits.
- (8).Do not come into contact with those areas of the machine that are labeled with lightning signs.
- (9).Do not come into contact with the electrical box or circuits when one's body or hands are wet.
- (10).When inspecting or maintaining electrical sections,keep all metallic personal items away from possible contact.In addition,hang a warning sign to prevent other personnel from inadvertently starting the machine.
- (11).Do not use very thin and short work pieces or work pieces which have complex shapes or unstable centers of gravity on the magnetic chuck for grinding.
- (12).When grinding,besides securely mounting the work piece,one should make sure no other object is placed on the machine.
- (13).During wet grinding,the nozzles cannot be adjusted when the wheel spindle is rotating .
- (14).When the work table is in motion or when the wheel spindle is rotating,the work piece can not be moved or changed.
- (15).After the wheel spindle motor is turned off,do not use your hand or any other object to stop or slow down the grinding wheel.
- (16).During grinding and before the grinding wheel stops rotating after work is finished,do not attempt to clean the shavings of the work piece or to move the workpiece.
- (17).When taking off the grinding wheel,use a flange remover to detach it.Do not use any method that involves pounding the grinding wheel.This could result in damage to the grinding wheel.

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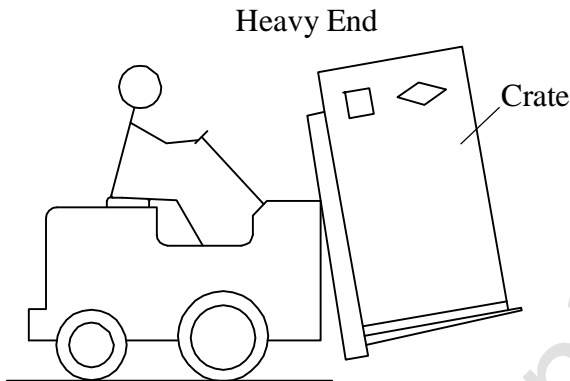


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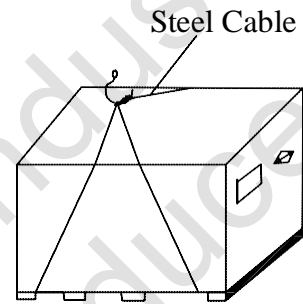
\*THIS MACHINE HAS BEEN FULLY TESTED,ADJUSTED AND INSPECTED FOR CORRECT ALIGNMENT AND OPERATION PRIOR TO SHIPMENT,IN TRANSIT OR INSTALLATION,PLEASE ENSURE THAT THE MACHINE IS NOT BUMPED WHEN BEING ROLLED OR SET DOWN TO AVOID ANY FAILURE.

**A).Transit**

By Fork Lift



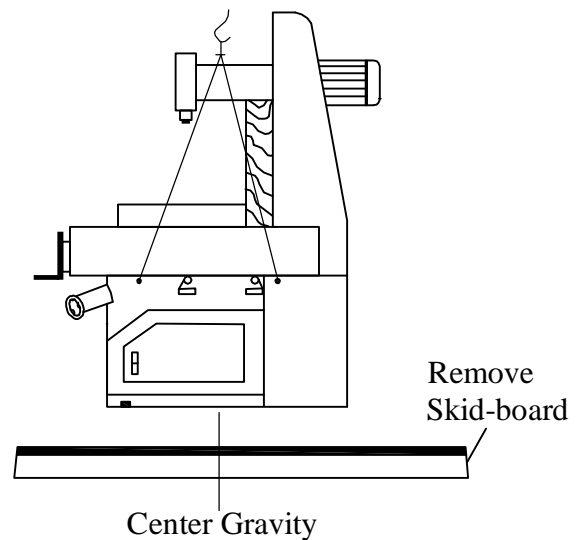
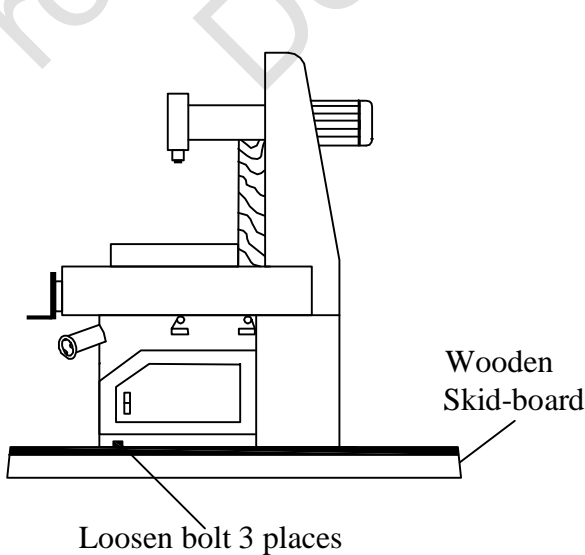
By Hoist or Chain Block



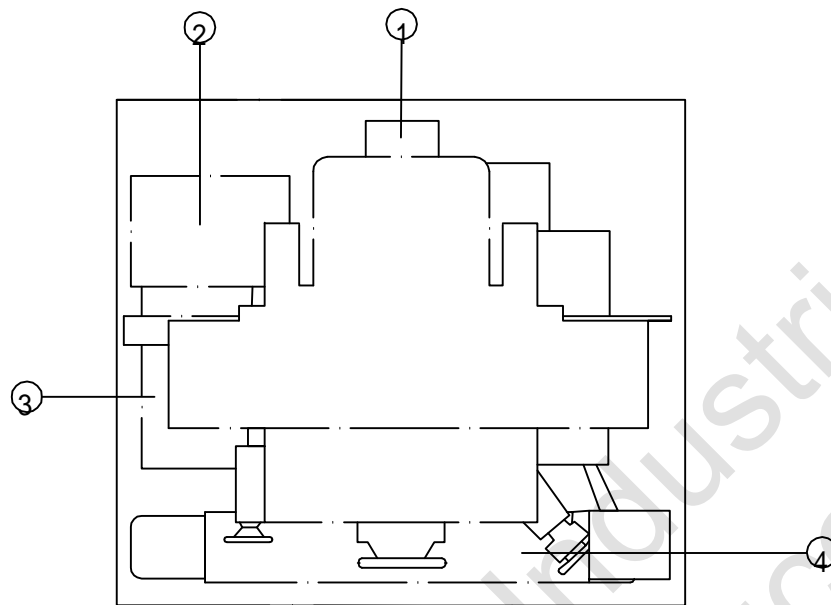
*Machine weight	KGS618	KGS818	KGS1020
Net	1100kg	1320kg	1680kg
Gross	1300kg	1520kg	1930kg

**B).Unpacking**

1. When unpacking the crate,take apart the upper cover,then follow the sequence of front and rear board,left and right.
2. Do not use hammer to break down the crate,please use nail extruder in stead.
3. To avoid damaging the machine or paint,pay more attention when take away the wooden covers.
4. Loosen the fixing screws before lifting machine,then remove the skid-board.



## 5. Packing Diagram



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

### **C).CHOICE OF SITE**

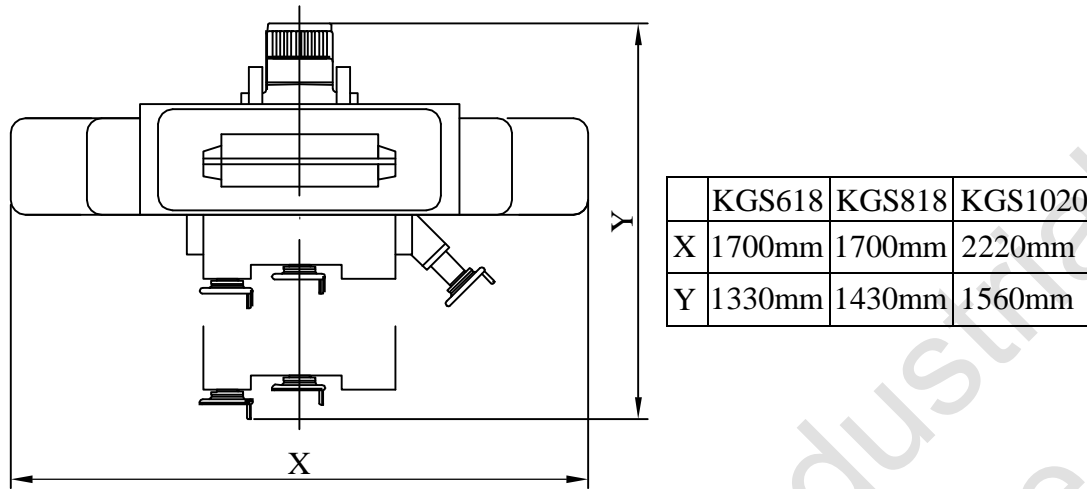
The output of the machine and the degree of accuracy of the components produced depend to a very special on the correct choice of site for the erection of the machine.

The grinding machine are often found between milling,shaping,drilling and even slotting machine,without any thought of the cons equences 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 machin



**Floor plan:**



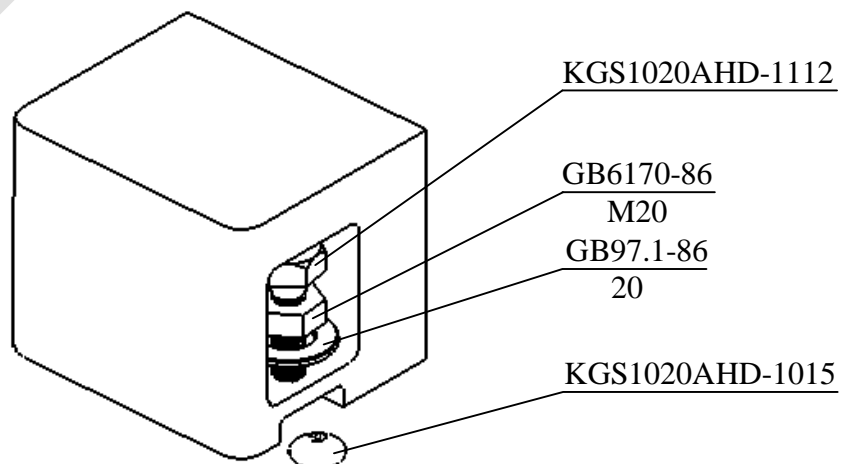
**D).Installation**

(1).Power Consumption

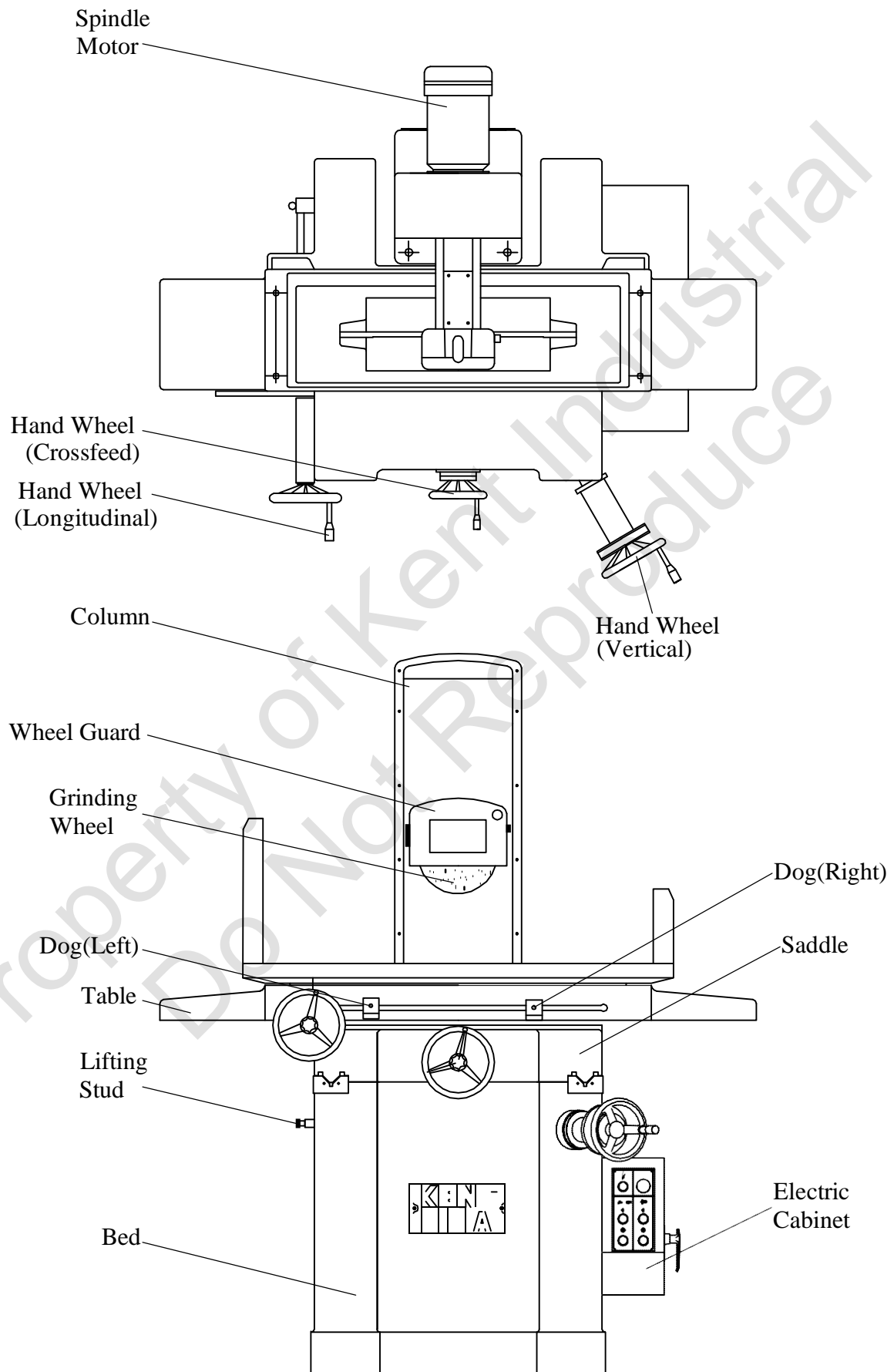
	Spindle Motor	Coolant Motor	Dust Collection Motor
KGS618	1.5KW	90W	550W
KGS818M	1.5KW	90W	550W
KGS1020M	2.2KW	90W	550W

(2).Foundation(Use the leveling pads and screws)

- \* Lowering the machine slowly into position.
- \* Insert the leveling pad into the hole of machine base.
- \* Adjusting the leveling screws 1112 and making the machine level.

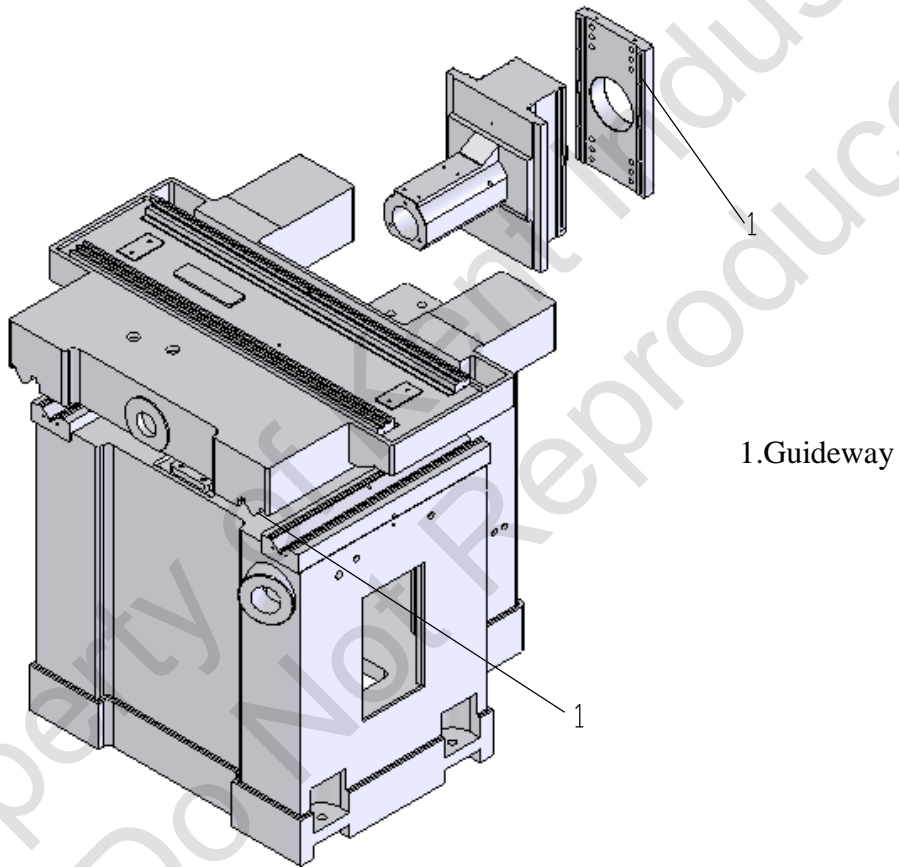


(3).Contour and Name of Components



#### (4).Cleaning Up The Machine

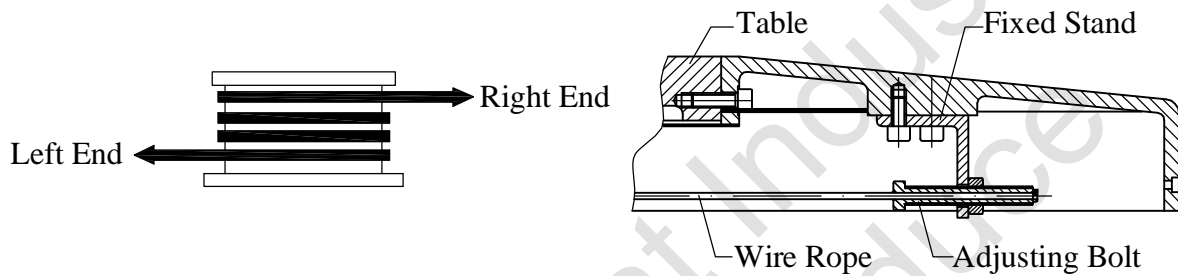
This machine has been moist-proof,dust-proof,rust-proof before packing.Please clean up the machine before moving the longitudinal 、 cross and up & down otherwise it will affect grinding accuracy.



(5).Mounting the table

The machine is dispatched completed with the exception of table,so as to protect the harden and ground slideways from damage 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 un -smoothly.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.

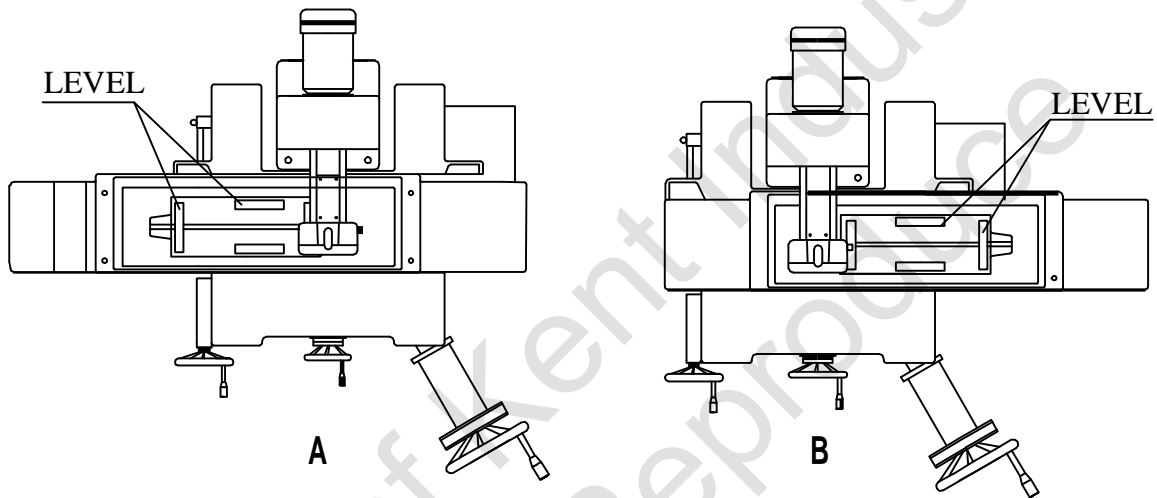
The machine has 45 steel balls all.

(6).Leveling the Machine

As following procedures:

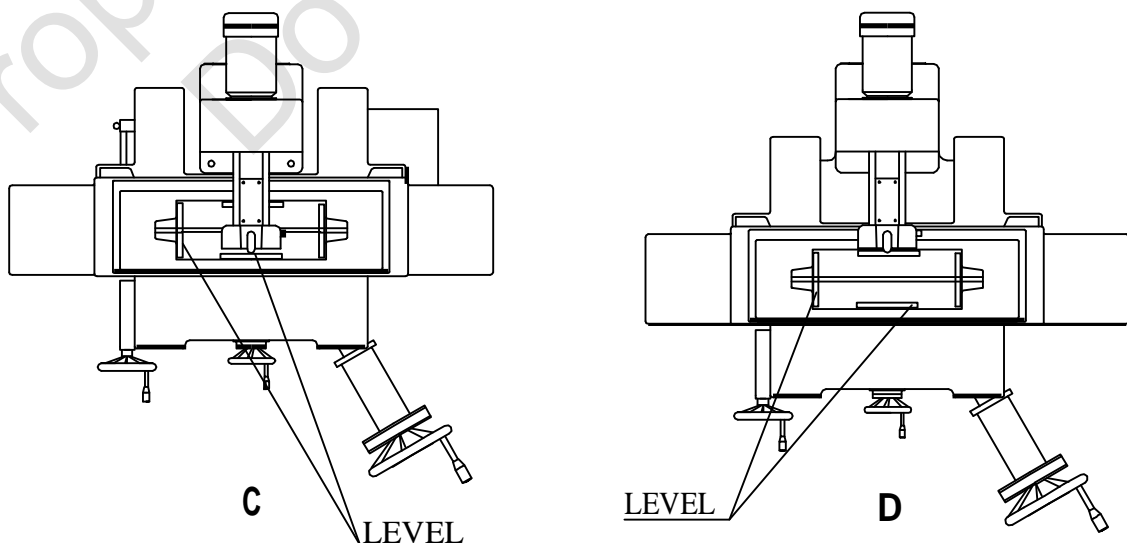
a).Use longitudinal hand wheel to let table at left end position.Leveling the machine by a Spirit Level in longitudinal and latitudinal direction(Fig.A)

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



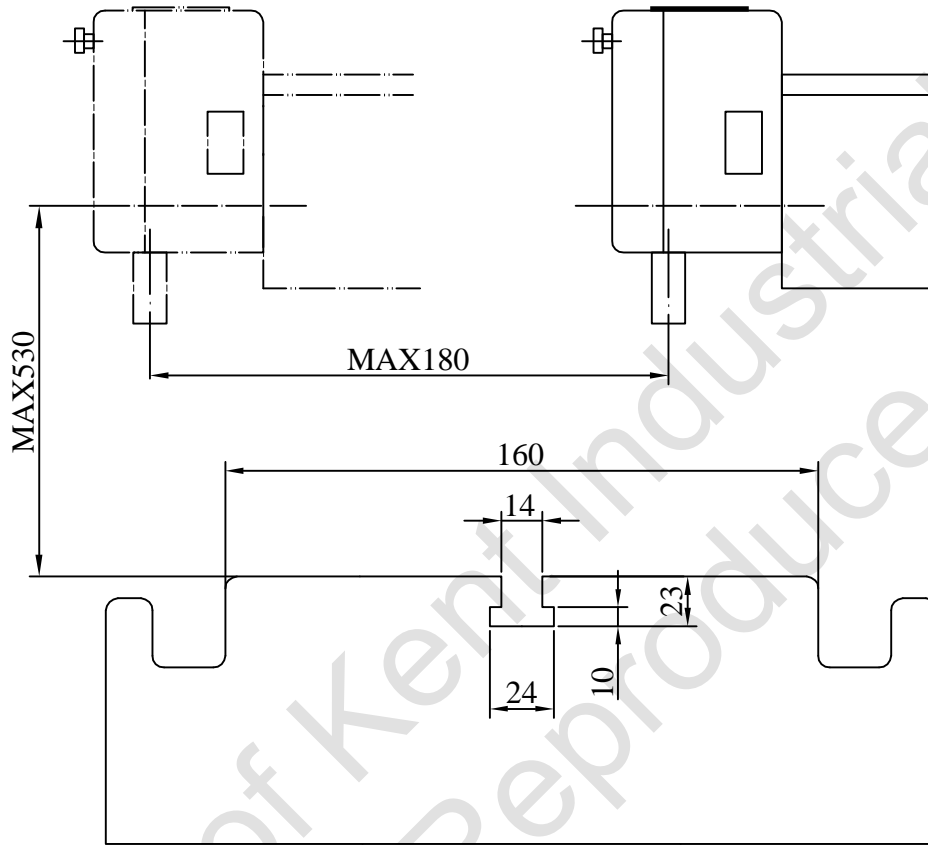
c).Use crossfeed hand wheel to let table at front end position.Leveling the machine by a Spirit Level in longitudinal and latitudinal direction(Fig.C)

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



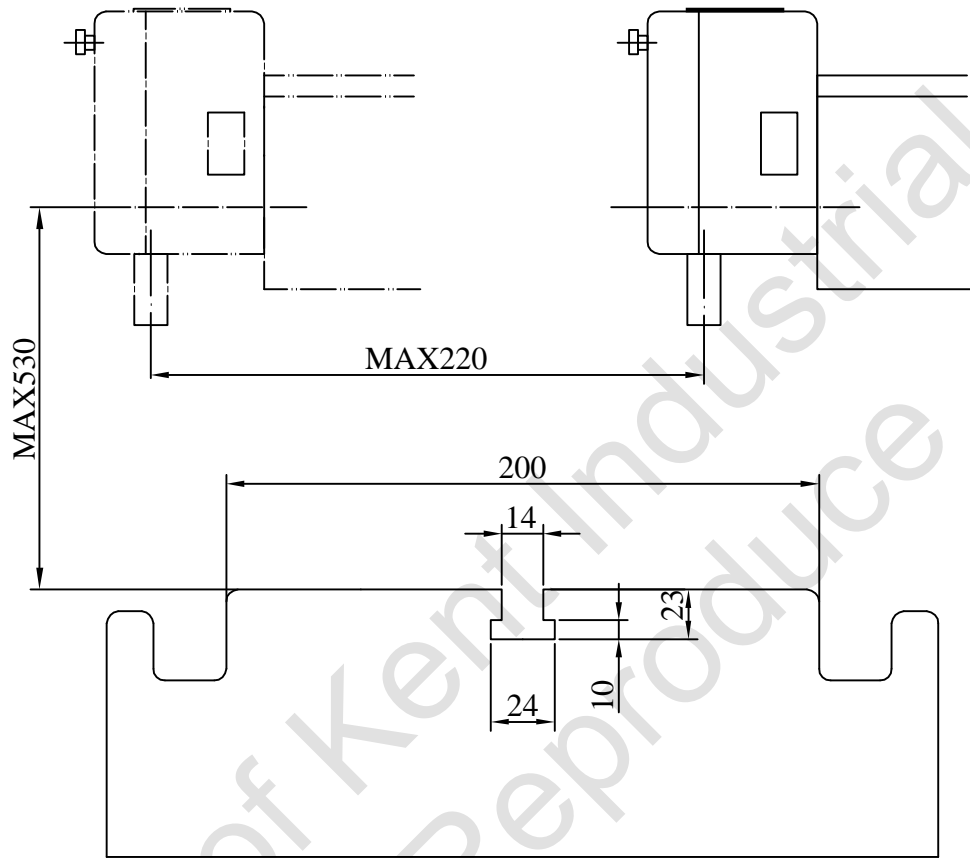
(7).Table size and movement scope

a.KGS618



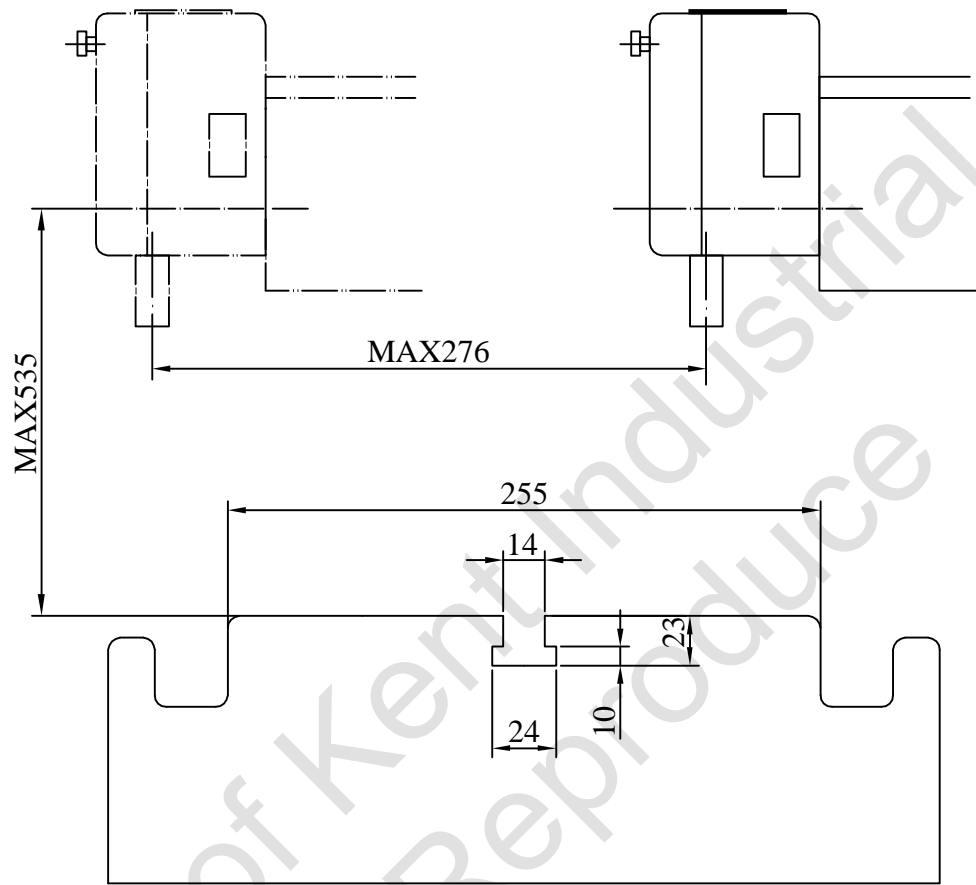
SPECIFICATION		KGS618
Size of working table		160mm×460mm
Table traverse	Longitudinal traverse	495mm
	Cross traverse	220mm
Distance from spindle axis to table surface		70-530mm
Spindle vertical traverse		460mm
Wheel size		200mm×25mm×32mm
Spindle motor		2850r/min 50HZ
Overall dimension(L×W×H)		1470mm×1170mm×2120mm

b.KGS818M



SPECIFICATION		KGS818M
Size of working table		200mm×460mm
Table traverse	Longitudinal traverse	510mm
	Cross traverse	250mm
Distance from spindle axis to table surface		70-530mm
Spindle vertical traverse		460mm
Wheel size		200mm×25mm×32mm
Spindle motor		2850r/min 50HZ
Overall dimension(L×W×H)		1570mm×1990mm×2120mm

c.KGS1020M

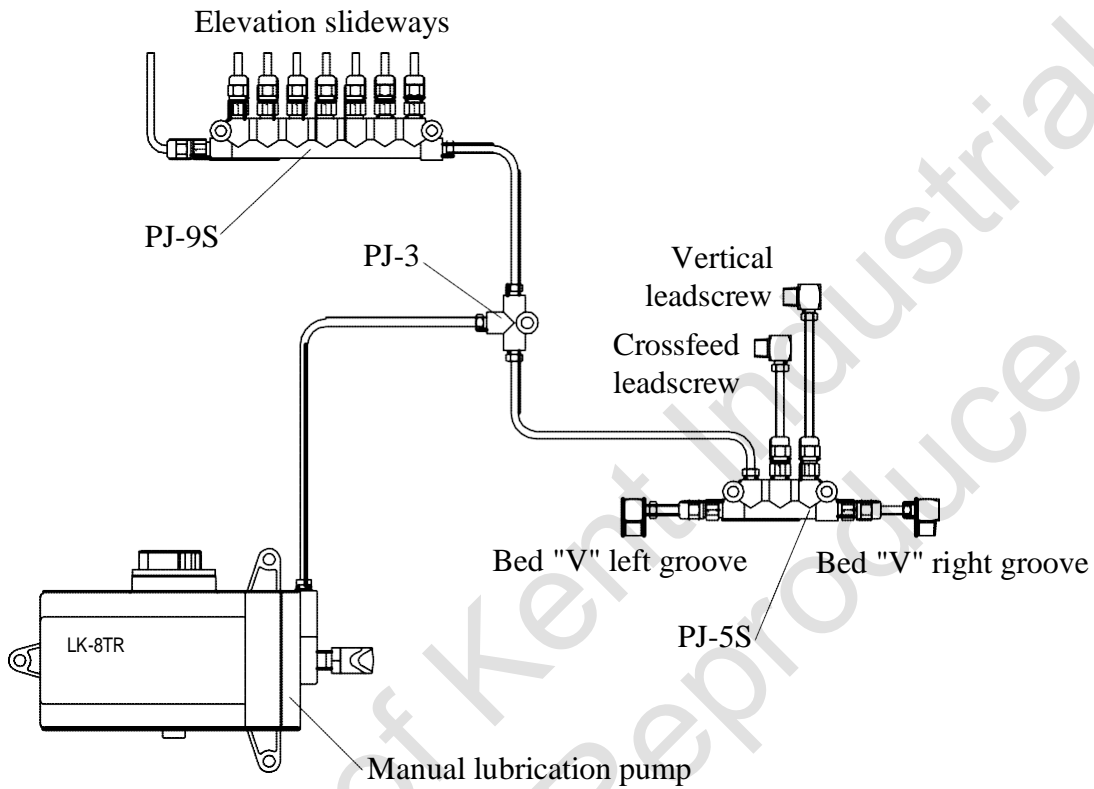


SPECIFICATION		KGS1020M
Size of working table		250mm×510mm
Table traverse	Longitudinal traverse	575mm
	Cross traverse	280mm
Distance from spindle axis to table surface		70-535mm
Spindle vertical traverse		460mm
Wheel size		200mm×25mm×32mm
Spindle motor		2850r/min 50HZ
Overall dimension(L×W×H)		1680mm×2030mm×2110mm



(8).Lubrication

**Lubrication Flow Chart**



MODEL:LK-8TR

Reliability of the machine and economic running are ensured only by the correct choice of lubrication 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

### (9).Balancing the Grinding Wheel

Efficient balancing is essential to eliminate unnecessary and additional stress in the wheel. It can obtain high quality surface finish. Grind accurate and extend life of grinding wheel. In this case, grinding wheel has to be balanced carefully. Static balancing can better meet requirement of machining.

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)

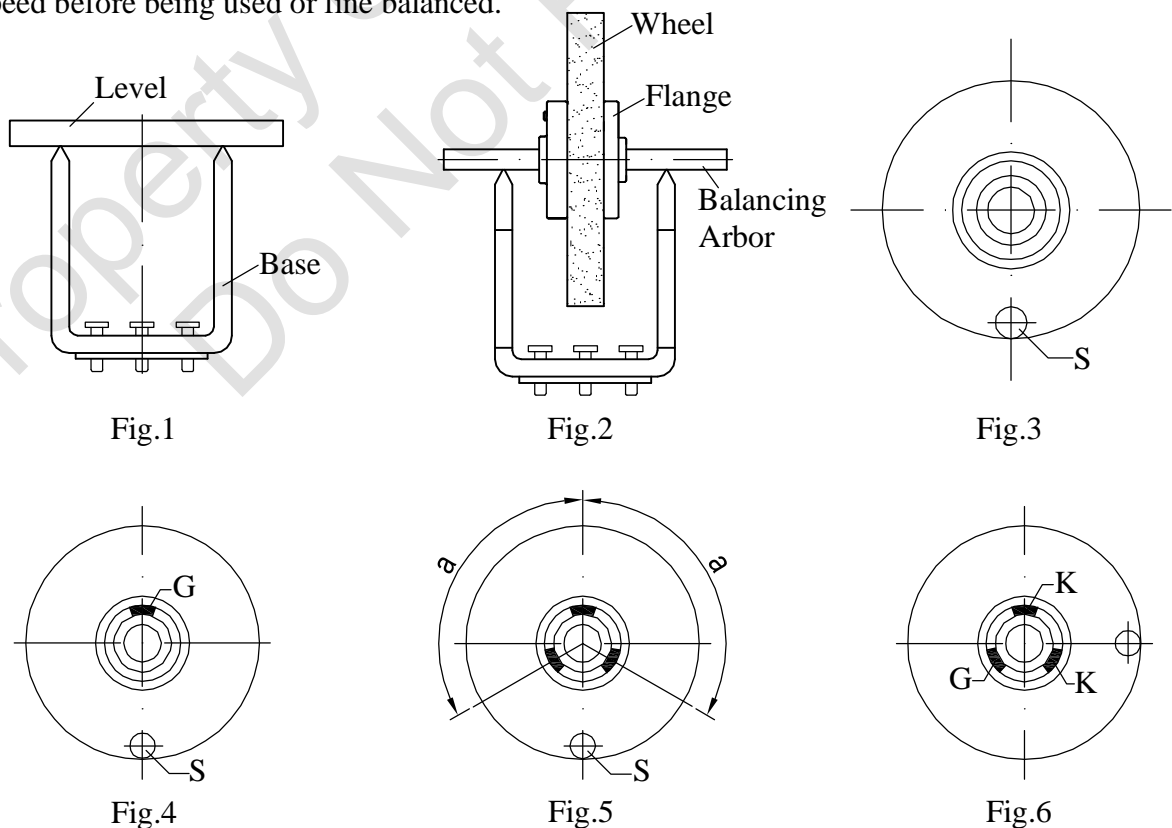
\*Allow the wheel to oscillate to find the center of gravity which is then marked "S" with chalk(Fig.3)

\*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 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 fine balanced.



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 lead to unbalance, the wheel should be re-checked and if necessary, rebalanced.

Grinding wheel absorbs humidity and coolant, it is therefore advisable not to shut 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. It is essential to throw-off coolant by centrifugal force.

Prior to place the flange-mounted grinding wheel to spindle, flange bore and spindle taper must be absolutely clean, and the wheel is pushed by hand onto the spindle. Subsequently, tighten wheel flange securely with fixed bolt or nut. (Fig.7 or Fig.9 )

To release wheel flange from spindle taper with extractor. (Fig.8 or Fig.10)

General type spindle:

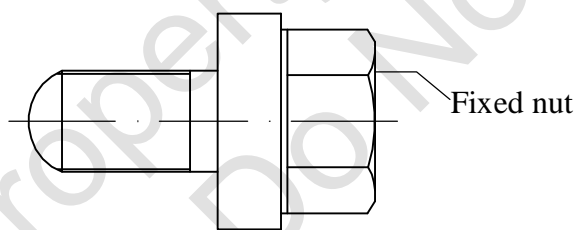


Fig.7

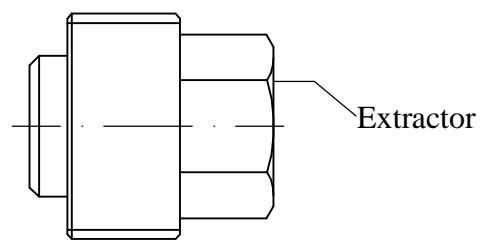


Fig.8

American type spindle:

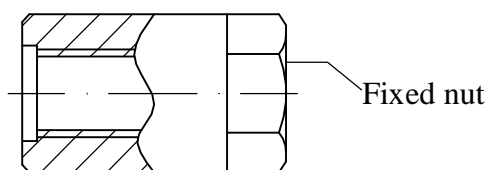


Fig.9

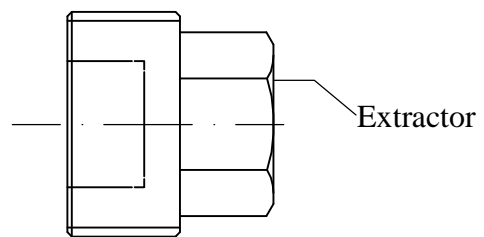


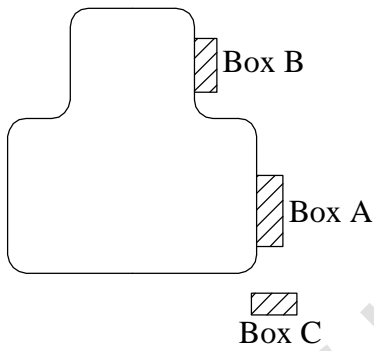
Fig.10

\*If various materials 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.

### 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.



Box A:Electric cabinet

Box B:Three-phase transformer for:

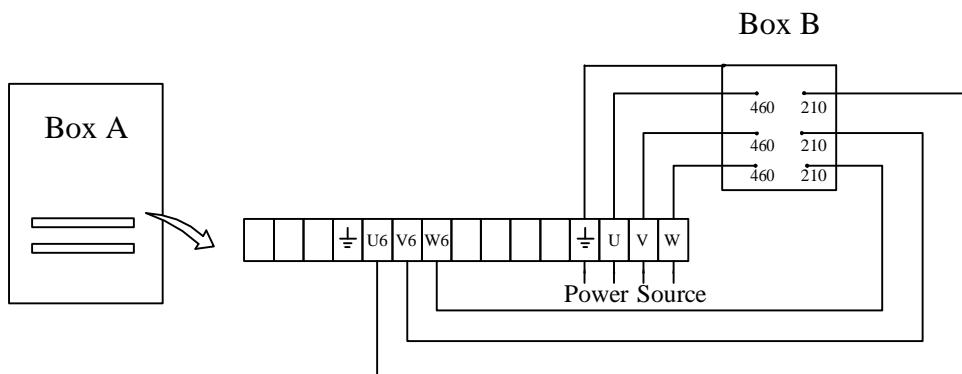
- 1.Cross motor
2. Solenoid valve
3. Ele ctro-magnetic chuck
- 4.Auto.lubrication pump

Box C:Control panel and control circuit

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

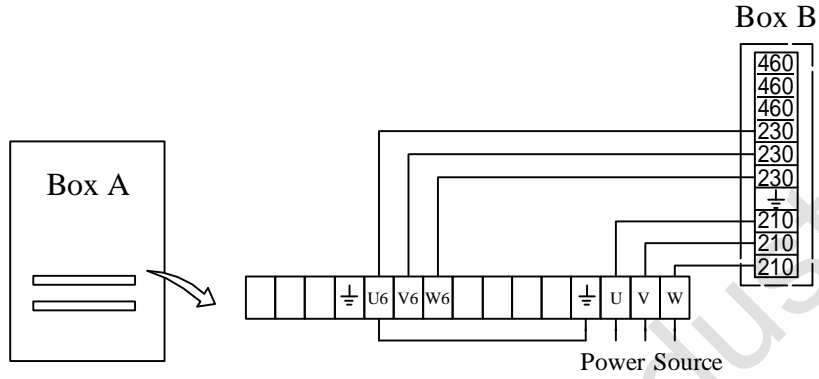
- 1.Spindle motor
- 2.Hydraulic motor
- 3.Coolant or dust-collector motor(Optional accessory)

a. For 440V power source:

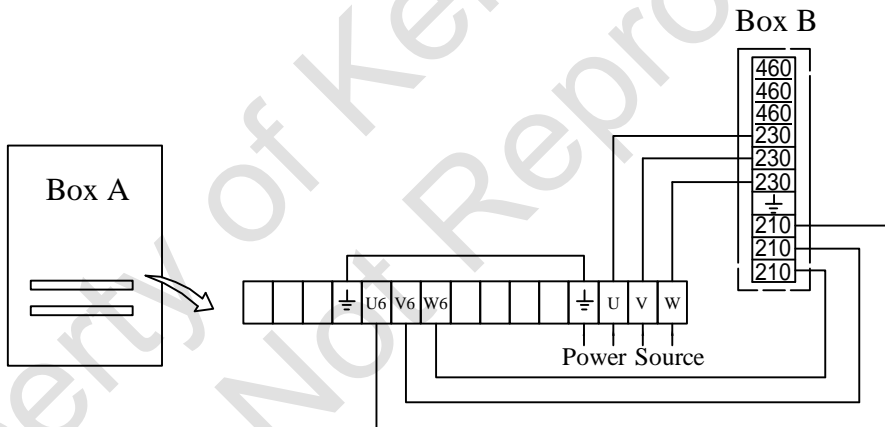


b. For U.S.A area:

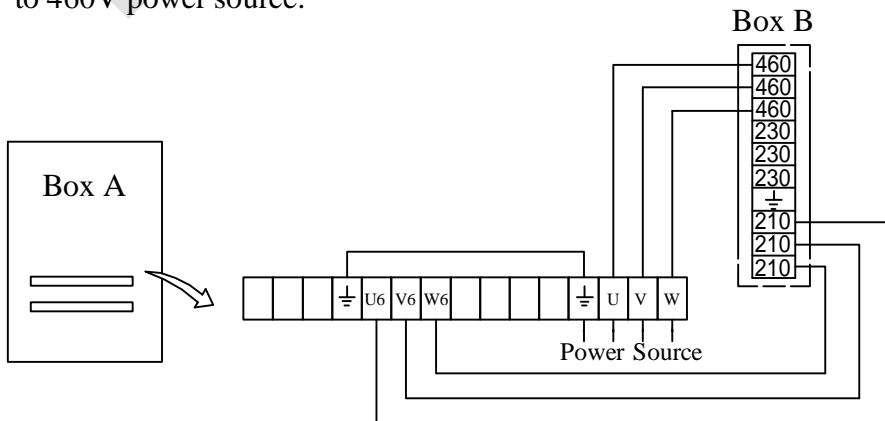
200V to 220V power source:



220V to 240V power source:

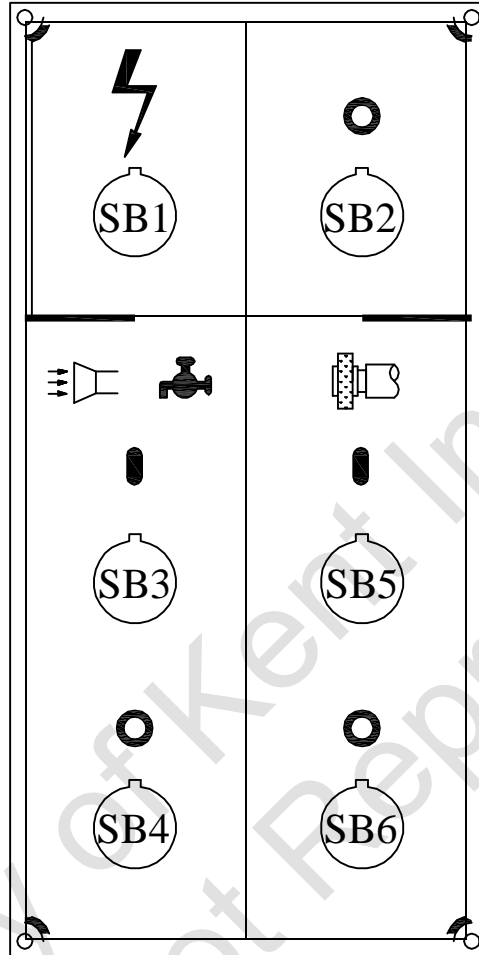


440V to 460V power source:



(2).Control Panel & Description

a.KGS618,KGS818M,KGS1020M



SB1: Power"ON"

SB2: Emergency pushbutton

SB3: Coolant motor "ON"

SB4: Coolant motor "OFF"

SB5: Grinding wheel spindle "ON"

SB6: Grinding wheel spindle "OFF"

### (3)Operation

#### a).Before operation

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

- 1.Choice 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 instruction 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 rotated in counter-clockwise.

#### b).Operation

##### 1).Power ON & OFF

- 1.SB1 indicator will lights when electric control box is ready.
- 2.SB2 is for emergency stop.

##### 2).Coolant system

- 1.Press SB3 to start coolant pump.
- 2.Adjust valve to get suitable coolant flow.

## **F) 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 roughed 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 the wheel "clogged".

## **G) Wheel Inspection**

It is absolutely essential to comply fully with following 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 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 packing 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  $5^\circ$ ,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.Variou 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 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 only about 0.01mm.

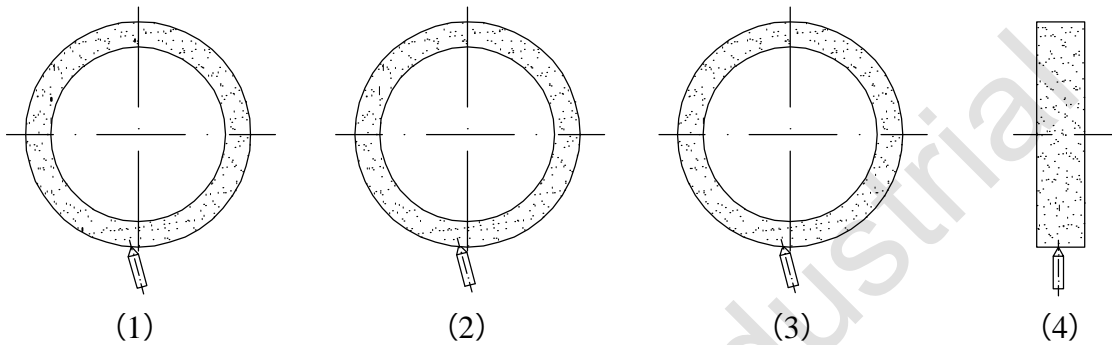
Frequent light dressing is better for life of the grinding wheel and the diamond than a heavy cut.

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.

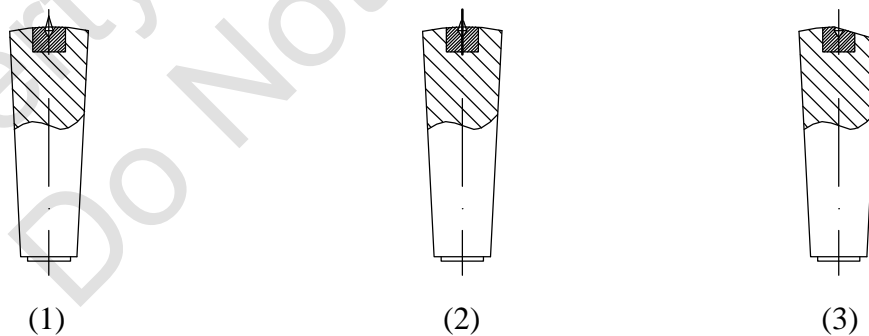
When dressing,begin in the center,as the edges are usually worn down further.If dressing is begun at the worn edges,there is danger of the higher pressure in the center overstressing the diamond and shattering it.

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 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, it must be reset to ensure economical operation. This resetting should be undertaken 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, is 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 Wheel**

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 an even surface.

Grinding wheels must not be allowed to come into contact with oil or grease.An oil soaked 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

<b>Grinding condition \ Grain</b>	<b>Coarse</b>	<b>Fine</b>
Feed increment	much	little
Surface roughness	coarse	fine
Works hardness	soft	hard
Surface contacted	wide	narrow
Dia. of the wheel	big	small

(c).Grade:It indicates the strength of the bond witch hold abrasive.

Soft: A to H

Medium:I to P

Hard:Q to Z

<b>Grade</b> <b>Grinding condition</b>	<b>Soft</b>	<b>Hard</b>
Workpiece hardness	hard	soft
Surface contacted	wide	narrow
Movement of work	slow	quick
Wheel speed	quick	slow

(d).Structure:The structure number of a wheel refers to be 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

Loose:10,11,12

<b>Structure</b> <b>Grinding condition</b>	<b>Loose</b>	<b>Close</b>
Surface roughness	coarse	fine
Surface contacted	wide	narrow
Workpiece hardness	soft	hard

(e).Bond

V:vitrified,

S:silicate,

B:Besinoid,

R:Rubber,

E:shellac.

### K). Wheel To Be Recommended

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

### 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 thick- ness
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 thick- ness

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

(2).Cross feed

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

(3).Longitudinal feed

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

Suitable speed of the table traverse

<b>Workpiece material</b>	<b>Soft steel</b>	<b>Heat treated steel</b>	<b>Tool steel</b>	<b>Cast iron</b>
Speed:m/min	6-15	20-25	6-25	16-20

(4).Range of spindle speed:1200-1800m/min

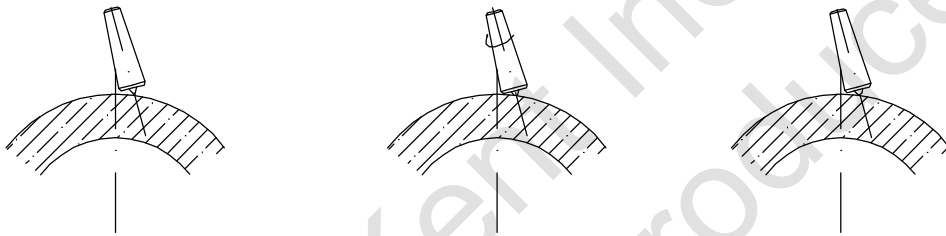
<b>Spindle speed</b> <b>Condition</b>	<b>Quick</b>	<b>Slow</b>
Grinding resistance	small	big
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	good

<b>Material</b>	<b>Range speed</b>
Steel	20-30m/s
Cast iron	18-20m/s
Tungsten carbide	8-18m/s
Zinc alloy and light metal	25-30m/s

## M).Use of The Optional Attachment

### (a).Parallel Dressing Attachment

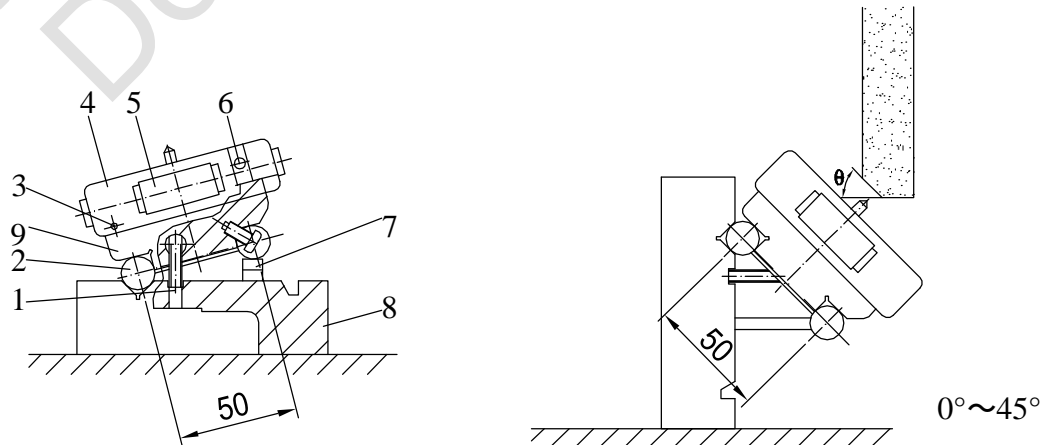
The wheel can be dressed either by diamond tool on the chuck or on the parallel dressing attachment which mounted on spindle carrier. The diamond tool is arranged at an angle to the center line of the wheel as shown on Figure, so that when the diamond tool is arranged at an angle, ensuring that there 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 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.

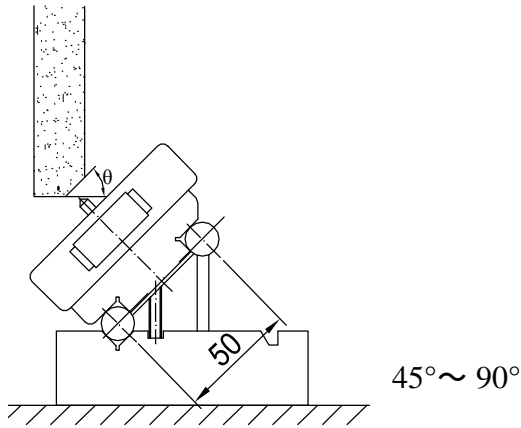


### (b).Brief Introduction To attachment

- (1). Let the Attachment be attracted to the magnetic chuck, keeping a  $90^\circ$  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 stands.

Fix with the fastening bolts and the forming is done.





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

(5). Conversion table of degree and block gauge thickness

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

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



(c).Sine Bar

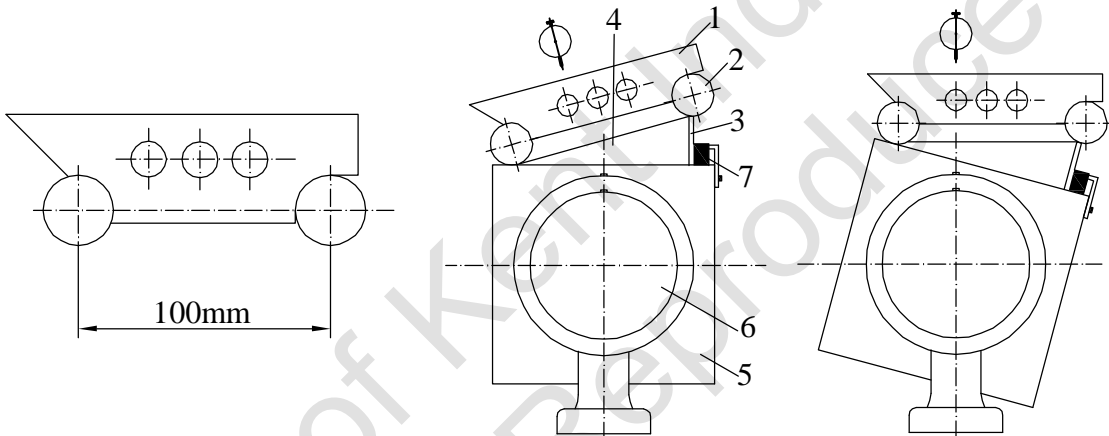
The Sine Bar is used to chuck the inclined angle of the magnetic chuck,when the angle forming surface is large.

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

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

(3)Put this gauge at one end of 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 crossfeed handwheel,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.Inclinalb Magnetic Chuck

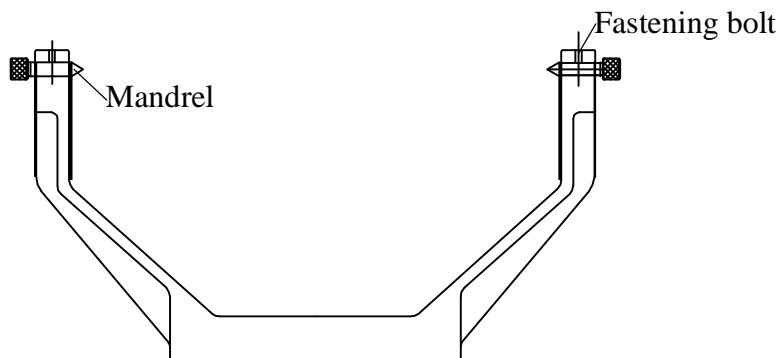
6.Mandrel of the Magnetic Chuck

7.Stop block

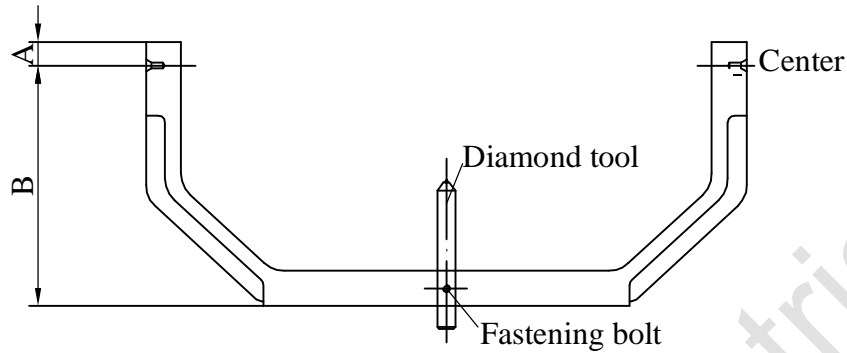
(d).Radius Forming Attachment

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



Name plate is attached to 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:

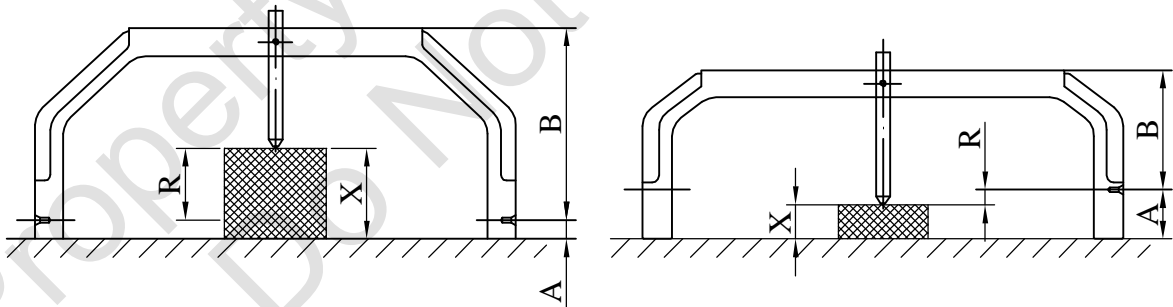
a. If the tool is parallel to the center line, it equals OR.

b. To determine the convex R: Put the swing rod on a place disk.

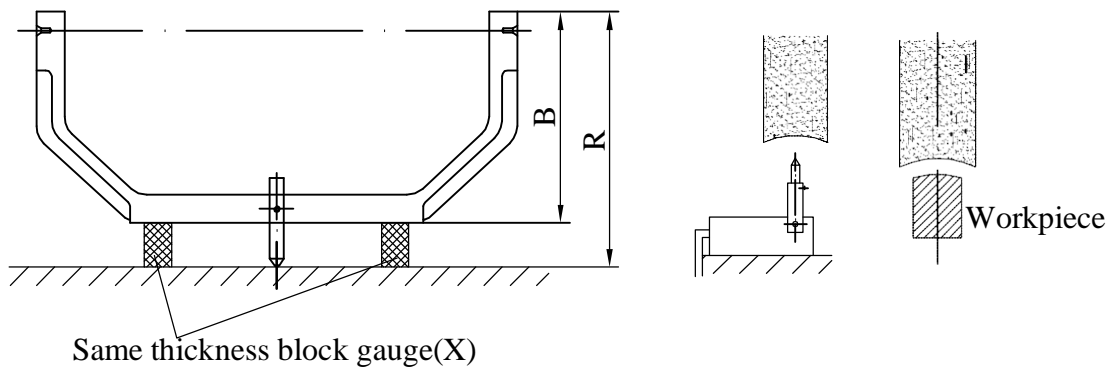
Put a block gauge of proper thickness under the diamond tool.

Then  $R = X - A$

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



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

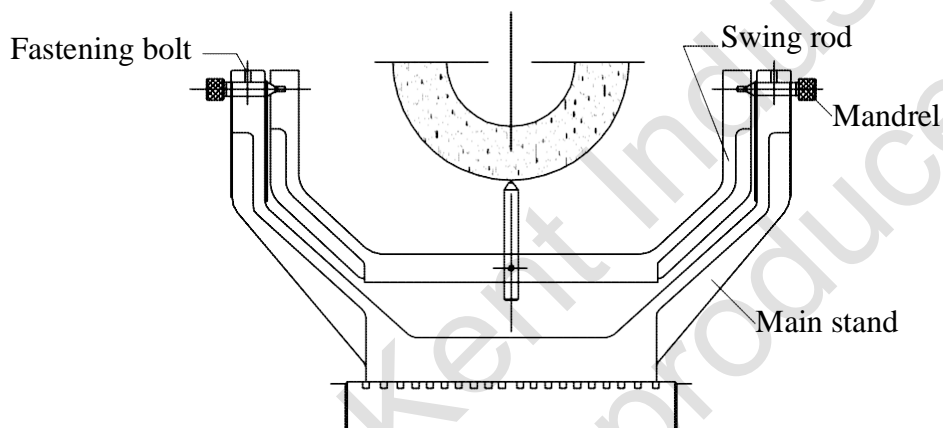


e.Note:

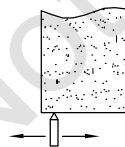
1. The base and side of the grinding wheel shall be well-dressed.
2. The Radius Forming Attachment shall be parallel to the grinding wheel.
3. The diamond tool shall be parallel to the Radius Forming Attachment.

(4)Operation of the Radius forming attachment:

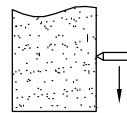
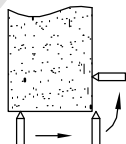
a.Find the center of the grinding wheel,then fix the work table.



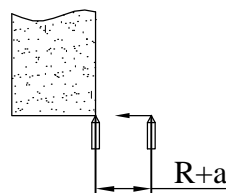
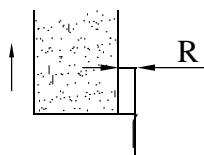
b.Turn the down-feed handwheel at  $\frac{1}{3}$  on the width of the wheel so that the wheel cuts into 0.02mm of diamond tool.Now turn the crossfeed handwheel to dress the grinding wheel,and turn the calibration reading on the downfeed back to zero.



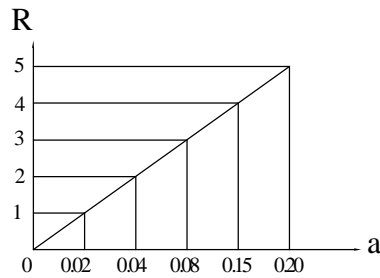
c.Turn the diamond tool over an angle  $90^\circ$  and elevate it into a proper position (greater than the R size in question).



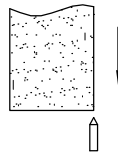
d.Elevate the grinding wheel so that it goes away from the diamond tool and the wheel in such a position that the distance between the side of the wheel and the center of the diamond tool is just R.



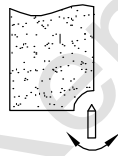
e. Move the diamond tool ( $R+a$ ) leftward, with "a" found in the following table.



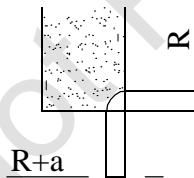
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



g. Turn the swing rods  $90^\circ$  each time, inching 0.05mm till the R is determined.



h. The wheel finally becomes the following shape.



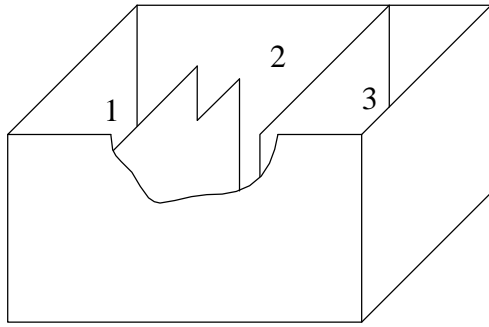
(e). Coolant System

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 rotate 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

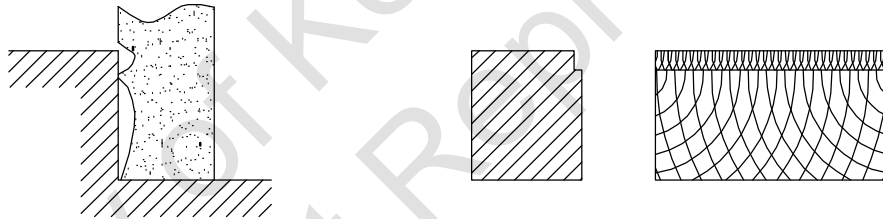
\*Coolant pump: 90Wx2P



(f).Common cases in Side Grinding



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.



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).



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.



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).

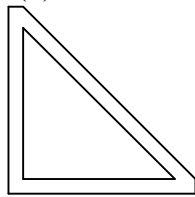
Now it is necessary to enlarge the "Relief Angle" part so that it will be higher than the face of the work.

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

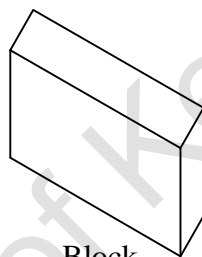


(g). Right Angle Grinding

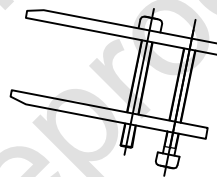
(1) Tools



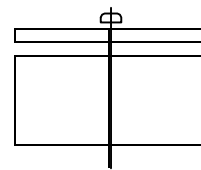
Angle gauge



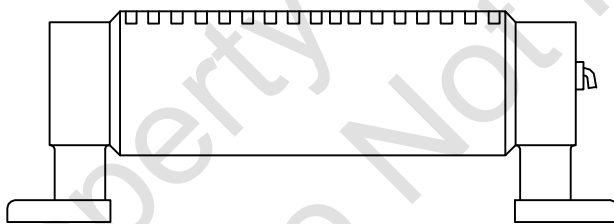
Block



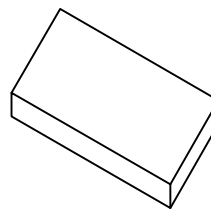
Clamp



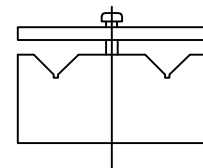
Clamp



Inclinable Magnetic Chuck



Block gauge



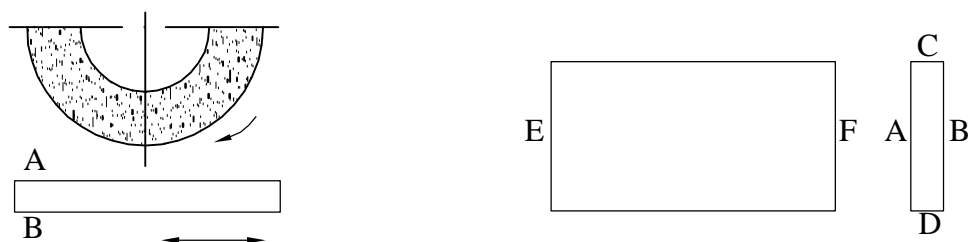
Clamp

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

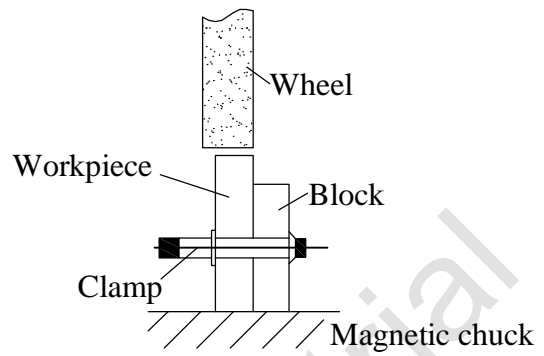
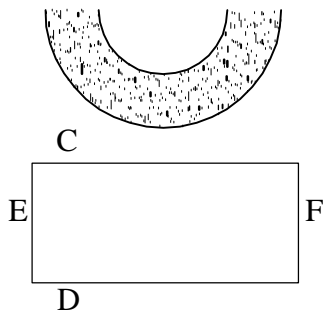
For example:

a. Under 200mm:

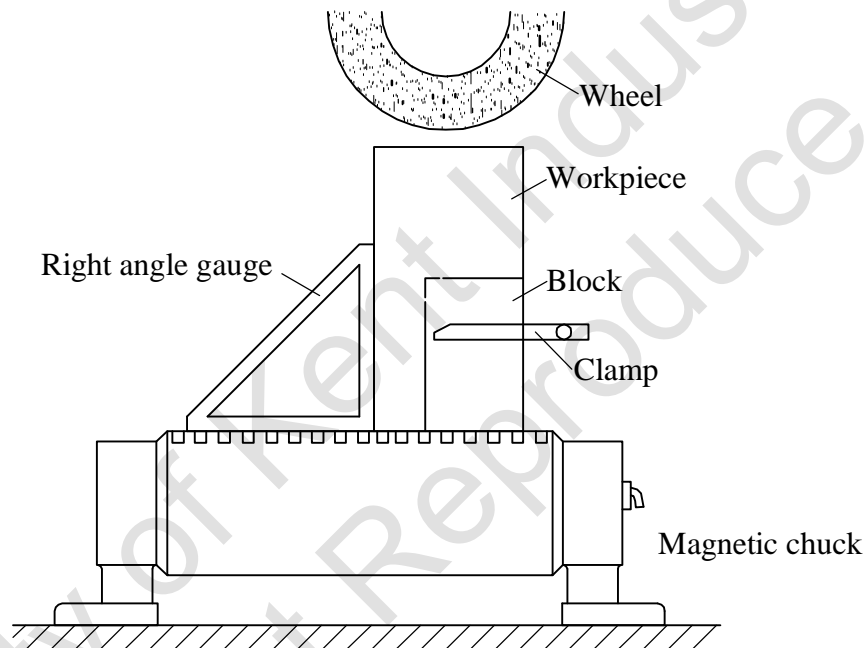
\*Grinding of the first basic face, or the surface grinding of A and B.



\*Grinding of C and D



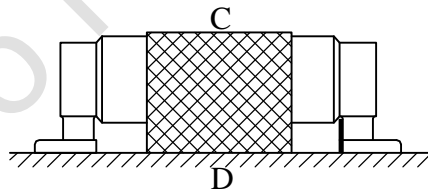
\*Grinding of E and F



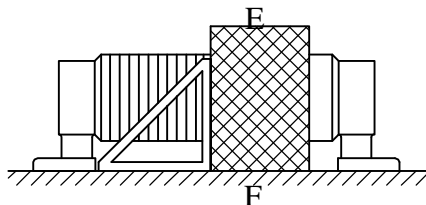
b. Over 200mm:

\*Grinding of the first basic face A

\*Grinding of C and D



\*Grinding of E and F



(3)Precaution:The grinding of right angle depends on the patience and clever mindedness of 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:

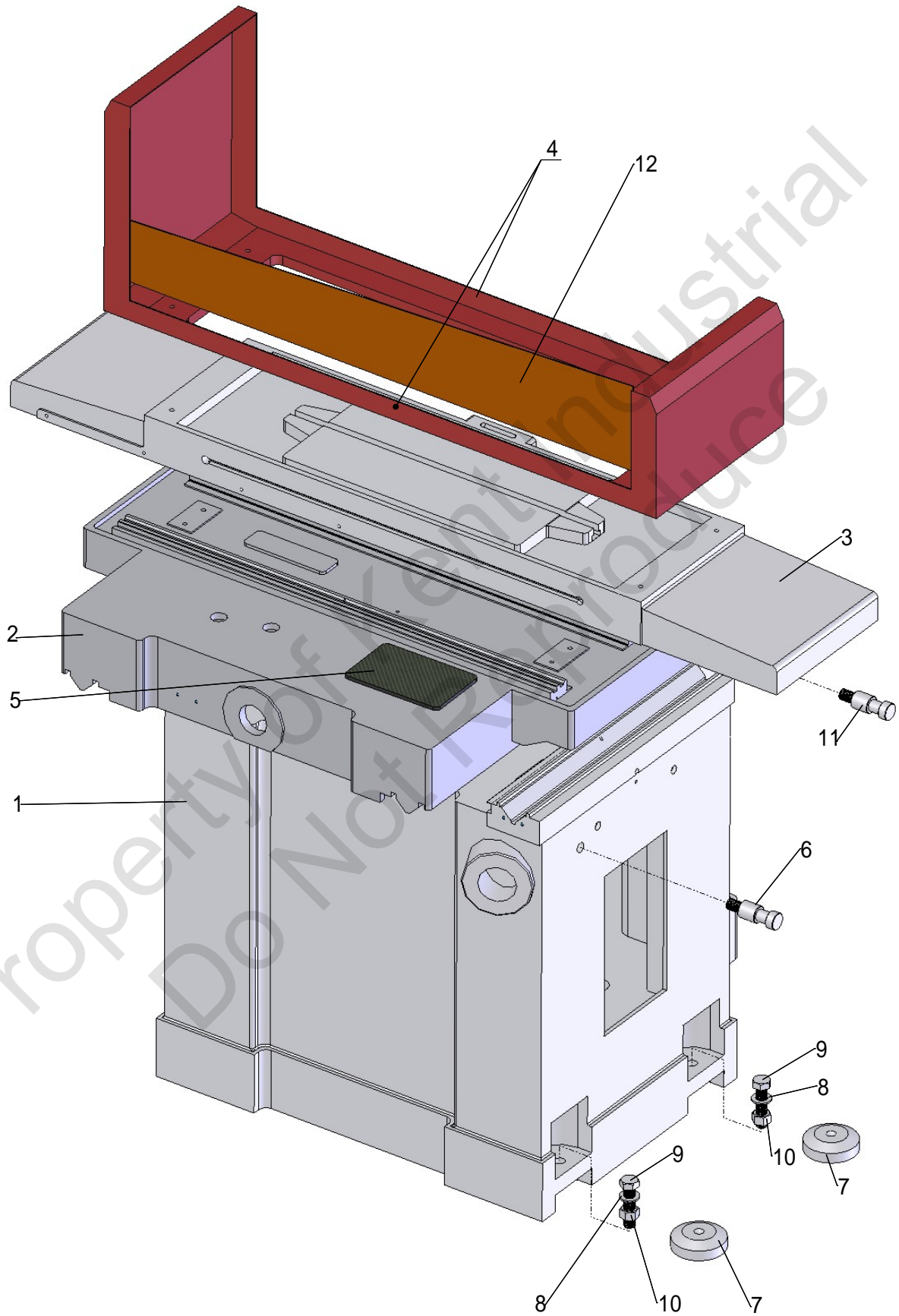
- 1.MACHINE MODEL & SERIAL NUMBER
2. INDEX NUMBER
3. PARTS NO.AND PARTS NAME
- 4.QUANTITY

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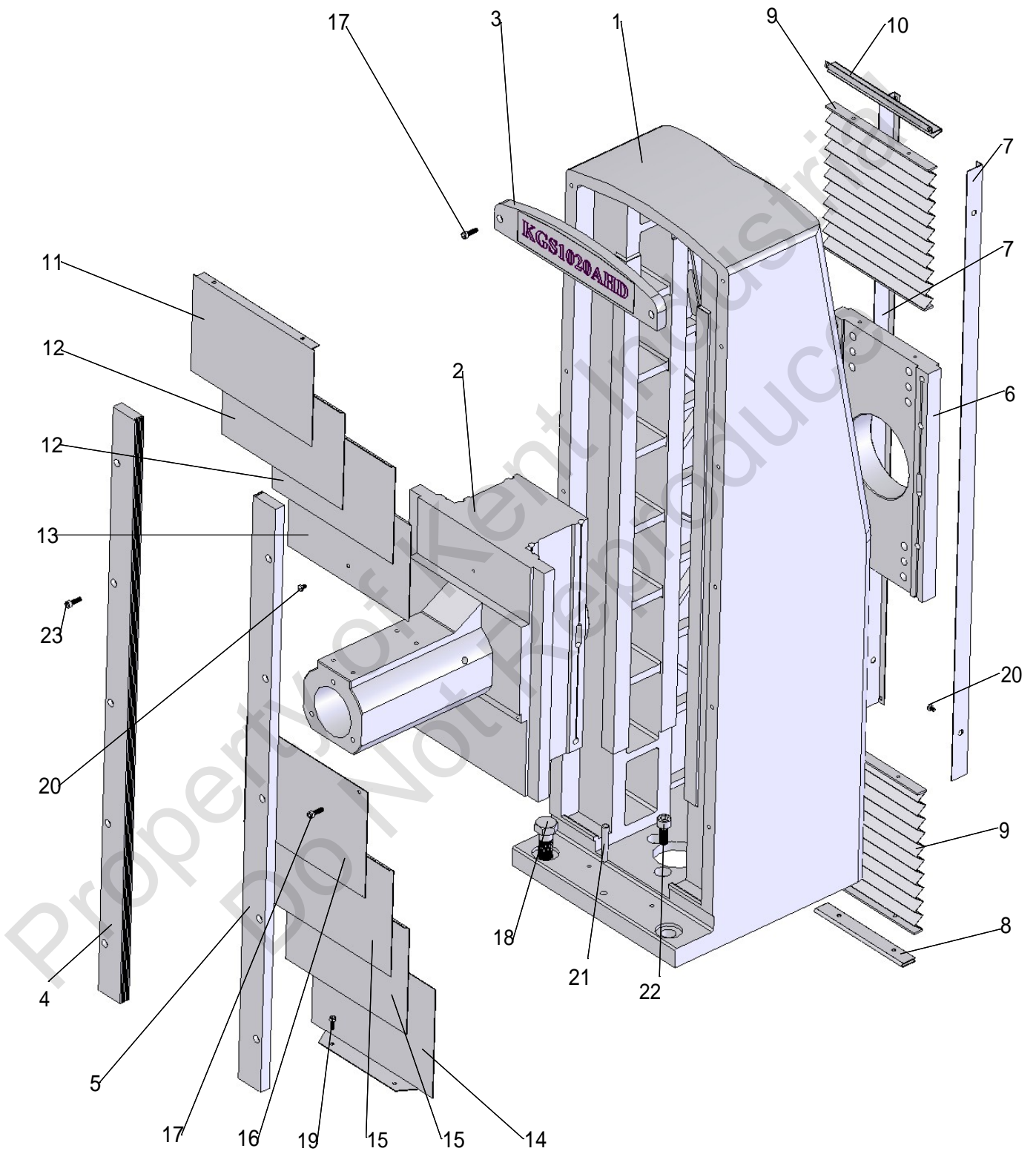
BED,SADDLE,TABLE ASS'Y



**BED, SADDLE , TABLE ASS'Y**  
(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.			Parts Name	Q'ty
	KGS618	KGS818M	KGS1020M		
1	KGS818AHD-1011		KGS1020AHD-1011	Bed	1
2	KGS618-2011	KGS818AHD-2011	KGS1020AHD-2011	Saddle	1
3	KGS618-2012	KGS818AHD-2012	KGS1020AHD-2012	Table	1
4	KGS618-2015	KGS818AHD-2105	KGS1020AHD-5110	Splash Guard	1
5	KGS1020AHD-2303		KGS1020AHD-2303	Rubber Plate	1
6	KGS1020AHD-1108		KGS1020AHD-1108	Lifting Bolt	2
7	KGS1020AHD-1015		KGS1020AHD-1015	Levelling Pad	5
8	GB97.1-85/20			Washer	5
9	KGS1020AHD-1112		KGS1020AHD-1112	Levelling Screw	5
10	GB6170-86/M20			Hexagnol Nut	5
11	KGS1020AHD-1110		KGS1020AHD-1110	Lifting Bolt	2
12	KGS618-5104A/5105A		KGS1020AHD-5108	Splash Guard	2

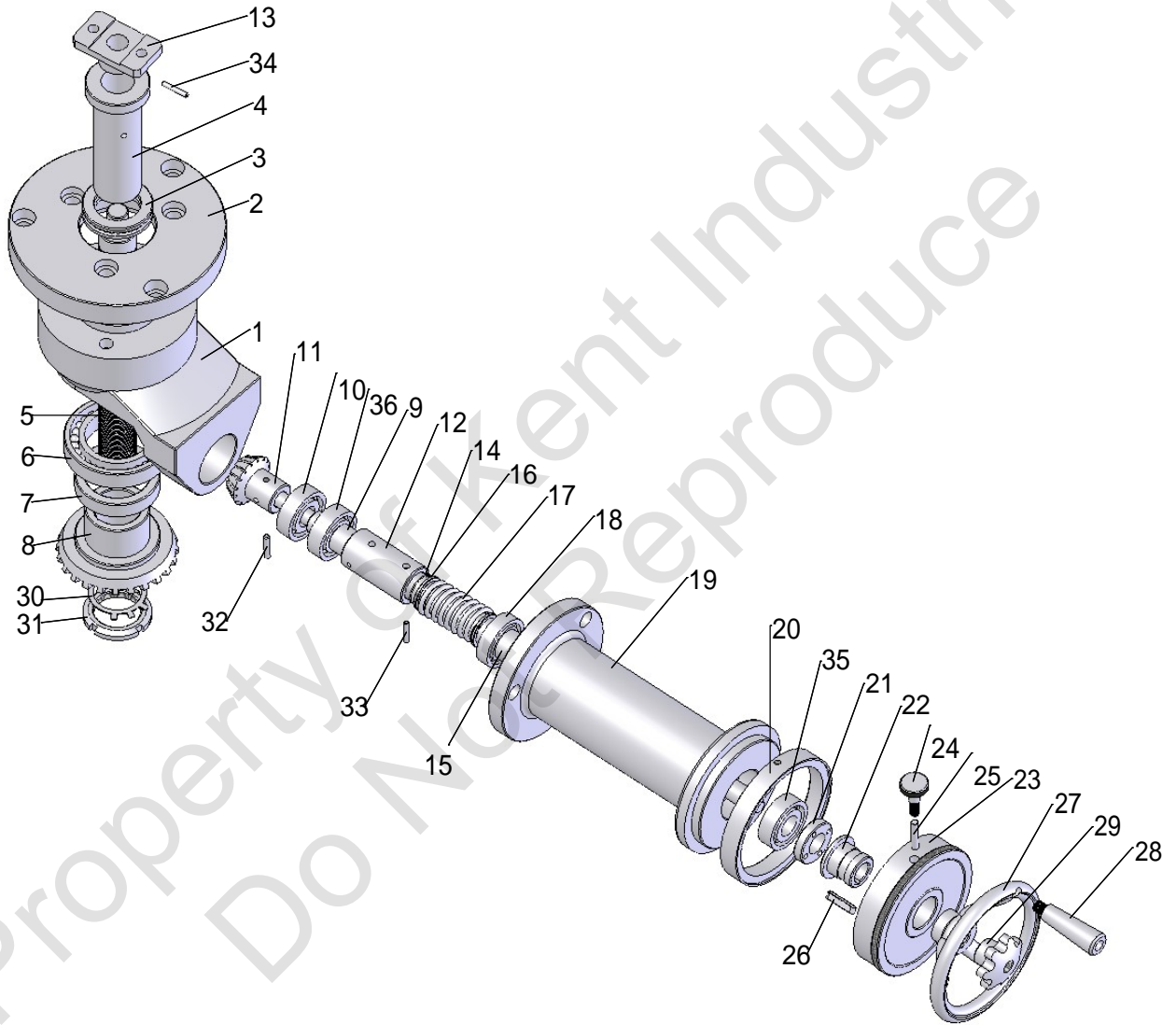
COLUMN ASS'Y



**COLUMN ASS'Y**  
(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.		Parts Name	Q'ty
	KGS618 ·KGS818M	KGS1020M		
1	KGS618-3011	KGS1020AHD-3011	Column	1
2	KGS618-4011	KGS1020AHD-4011	Spindle Holder	1
3	KGS618-3201	KGS1020AHD-3103	Upper Cover of Column	1
4	KGS618-3013	KGS1020AHD-3104	Shield Dust Guide Rail	1
5	KGS618-3013	KGS1020AHD-3102	Shield Dust Guide Rail	1
6	KGS618-4012	KGS1020AHD-4012	Motor Bracket	1
7	KGS618-3108	KGS1020AHD-3108	Shield Guide	2
8	KGS618-3107	KGS1020AHD-3107	Shield Guide	1
9	KGS618-3301	KGS1020AHD-3301	Dust Protection Fold Fabric	2
10	KGS618-3109	KGS1020AHD-3109	Upper Hold Plate	1
11	KGS618-3101	KGS1020AHD-3101	Shield Dust	1
12	KGS618-3102	KGS1020AHD-3102	Shield Dust	2
13	KGS618-3103	KGS1020AHD-3103	Shield Dust	1
14	KGS618-3104	KGS1020AHD-3106	Shield Dust	1
15	KGS618-3105	KGS1020AHD-3105	Shield Dust	2
16	KGS618-3106	KGS1020AHD-3104	Shield Dust	1
17	GB70-85/M6×20		Socket Head Cap Screw	12
18	GB5782-86/M20×60		Hexagonal Head Screw	4
19	GB70-85/M5×15		Socket Head Cap Screw	13
20	GB818-85/M5×8		Flat Head Machine Screw	5
21	GB118/φ10×70		Taper Bolt	1
22	GB70-85/M12×30		Socket Head Cap Screw	3
23	GB70-85/M16×20		Socket Head Cap Screw	10

MANUAL DOWNFED ASS'Y



**MAMUAL DOWN FEED ASS'Y**  
(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.		Parts Name	Q'ty
	KGS618 KGS818M	KGS1020M		
1	KGS618-1015	KGS1020AHD-1013	Screw Stand	1
2	KGS618-1113	KGS1020AHD-1101	Connecting Plate	1
3	D51108		Bearing	1
4	KGS618-1202	KGS1020M-1201	Screw Nut	1
5	KGS618-1102	KGS1020M-1101	Lead Screw	1
6	D51111	6011	Bearing	1
7	KGS618-1118	KGS1020AHD-1114	Ring	1
8	KGS618-1112	KGS1020AHD-1105	Gear	1
9	KGS618-1103A	KGS1020AHD-1107	Shaft	1
10	6204-2Z		Bearing	1
11	KGS618-1111	KGS1020AHD-1106	Gear	1
12	KGS1020AHD-1107-1		Cover	1
13	KGS1020AHD-1014		Prop Stand	1
14	25 GB94.1		Split Baffle Ring	1
15	KGS618-1110	KGS1020M-1116	Shaft	1
16	KGS618-1105	KGS1020AHD-1103	Ring	2
17	KGS618-1104	KGS1020AHD-1104	Spring	1
18	D1205	6005-2Z	Bearing	1
19	KGS618-1013	KGS1020M-1013	Bearing Housing	1
20	KGS618-1106B	KGS1020M-1102	Graduation Dial II	1
21	M25 GB812	KGS1020AHD-1129	Nut	1
22	KGS618-1109	KGS1020AHD-1130	Bushing	1
23	KGS618-1108B	KGS1020M-1103	Graduation Dial	1
24	KGS618-1107	KGS1020AHD-1147	Bolt	1

Index No.	Parts No.		Parts Name	Q'ty		
	KGS618 KGS818M	KGS1020M				
25	KGS618-1205	KGS1020AHD-1146	Pin	1		
26	6×45	GB1096	Key	1		
27	φ200	JB/T7273.5	Hand Wheel	1		
28	M10×80	JB/T7270.6	Grip	1		
29	M12×50	GB4141.29	Hand Wheel Nut	1		
30	40	GB58	Ratchet Washer	1		
31	M40×1.5	GB812	Hexagonal Nut	1		
32	5×30	GB879	5×24	GB879	Pin	1
33	4×36	GB879	Pin	2		
34	4×32	GB879	Pin	1		
35	D1205	6204-2Z	Bearing	1		
36	—	6204-2Z	Bearing	1		

SPINDLE ASS'Y

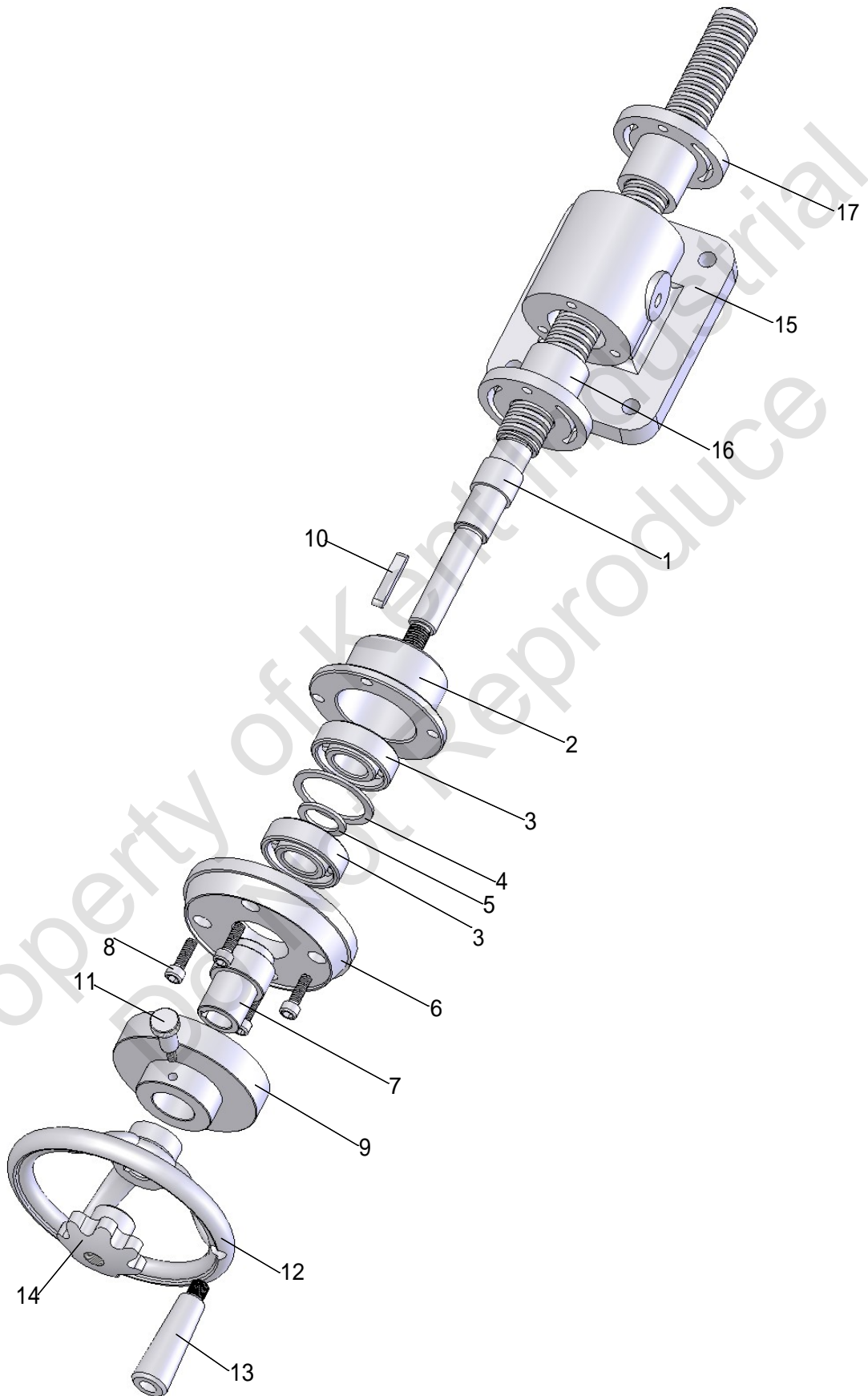




**SPINDLE ASS'Y**  
(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.		Parts Name	Q'ty
	KGS618 KGS818M	KGS1020M		
1	YUZC90L-A/B5		Spindle Motor	1
2	KGS1020AHD-4118A		Coupling	2
3	GB1096-90/8×25		Key	1
4	KGS1020AHD-4302		Rubber Coupling	1
5	KGS618-4102	KGS1020AHD-4111	Spindle Shaft	1
6	KGS1020AHD-4115		Spindle Cover	1
7	KGS1020AHD-4114		Spindle Cover	1
8	7206 CTYSUL P4		Angular Contact Bearing	4
9	KGS1020AHD-4109		Spacer	2
10	KGS1020AHD-4110		Spacer	2
11	KGS1020AHD-4103A		Spindle Nut	1
12	KGS1020AHD-4102B		Spindle Cover	1
13	KGS618-4103	KGS1020AHD-4112A	Spindle Housing	1
14	KGS1020AHD-4101B		Spindle Cover	1
15	KGS1020AHD-4013A		Installation Link	1

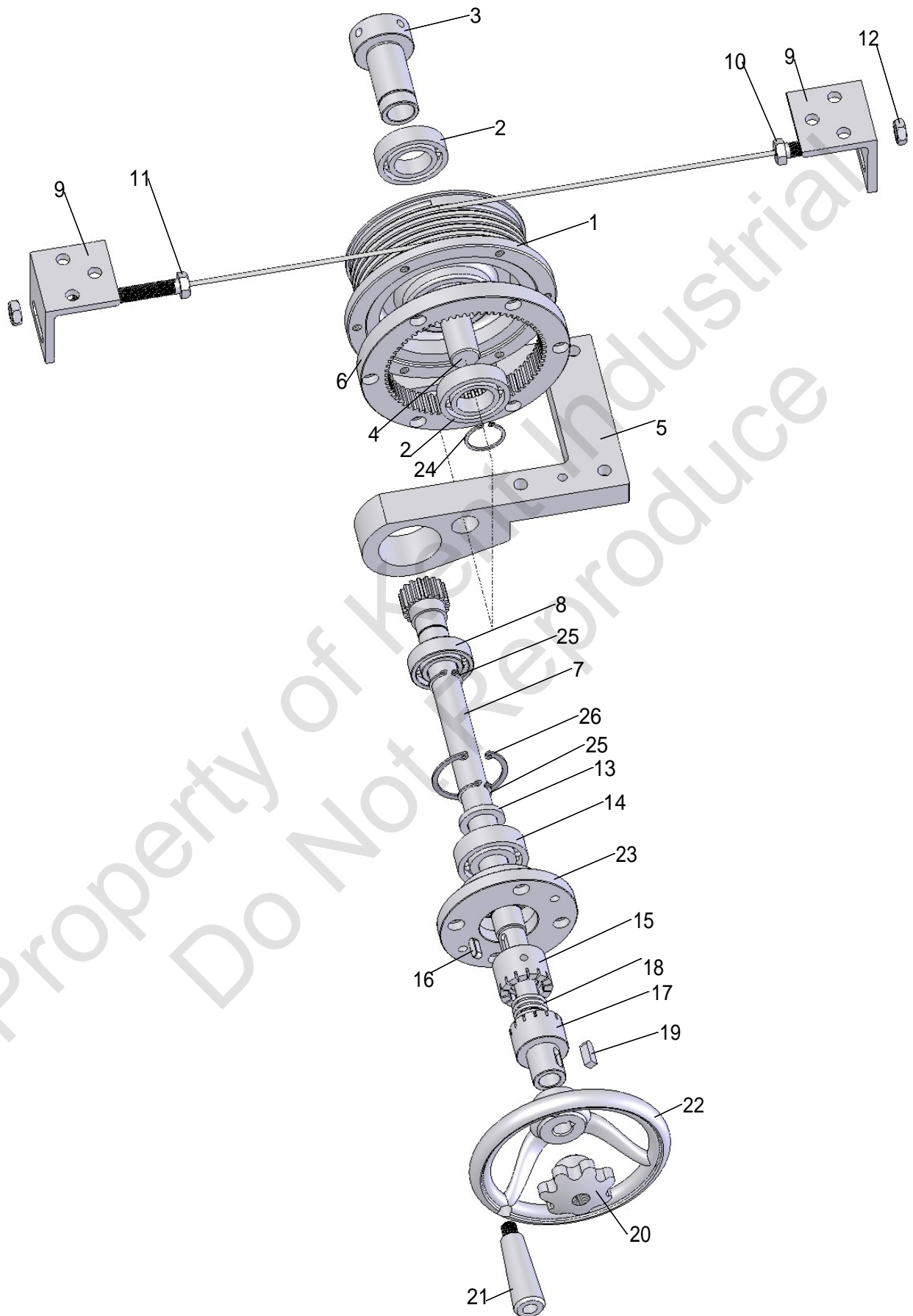
MANUAL CROSSFEED ASS'Y



**CROSS FEED ASS'Y**  
(KGS618,KGS818M,KGS1020M)

	Parts No.		
Index No.	KGS618、KGS818M、KGS1020M		Parts Name
			Q'ty
1	KGS618-2117-1		Cross Feed Leadscrew
2	KGS618-2116		Bearing Holder
3	7204C/GB292		Bearing
4	KGS618-2114		Washer
5	KGS618-2115		Washer
6	KGS618-2113B		Graduation Dial I
7	KGS618-2112		Cover
8	GB70-85/M6×20		Socket Head Screw
9	KGS618-2111B		Graduation Dial II
10	GB1096/5×32		Key
11	KGS618-2133		Bolt
12	φ200	JB/T7273.5	Hand Wheel
13	M10×80	JB/T7270.6	Grip
14	M12×50	GB4141.29	Hand Wheel Nut
15	KGS1020AHD-1012		Crossfeed Nut Base
16	KGS1020AHD-1207A		Leadscrew Backlash Adjuste
17	KGS1020AHD-1207A-1		Leadscrew Backlash Adjuste

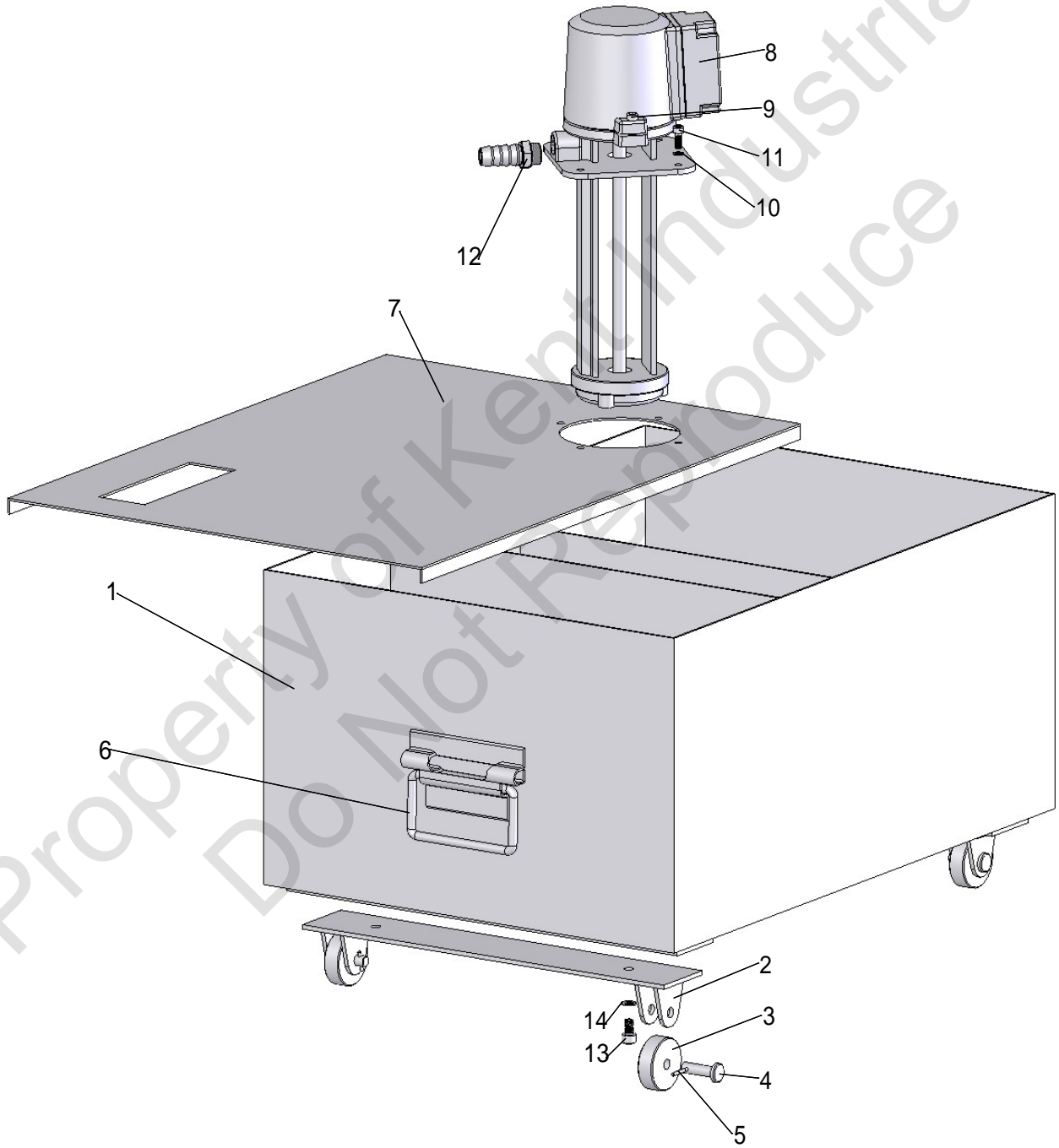
LONGITUDINAL HAND FEED ASS'Y



**LONGITUDINAL HANDFEED ASS'Y**  
(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.			Parts Name	Q'ty
	KGS618	KGS818M	KGS1020M		
1	KGS618-2014			Steel Rope Wheel	1
2	6005-2Z			Bearing	2
3	KGS618-2125		KGS1020M-2134	Shaft Sleeve	1
4	KGS618-2126		KGS1020M-2133	Shaft	1
5	KGS618-2013		KGS1020M-2013	Wheel Housing	1
6	KGS618-2119			Gear	1
7	KGS618-2124	KGS818M-2124	KGS1020M-2130	Gear Shaft	1
8	6004-2Z			Bearing	1
9	KGS618-2102		KGS1020M-2132	Angle Iron	2
10	KGS618-2103			Fixed Screw	1
11	KGS618-2103A			Fixed Screw	1
12	M10			Nut	2
13	KGS618-2123			Bead Flange	1
14	6204-2Z			Bearing	1
15	KGS618-2121			Clutch	1
16	5×16 /GB1094			Key	1
17	KGS618-2120		KGS1020M-2135	Clutch	1
18	KGS618-2132			Spring	1
19	5×20 GB1094			Key	1
20	GB4141.29-84B/M12			Hand Wheel Nut	1
21	HY8310.4-1/M10×80			Grip	1
22	JB/T7273.5-94			Hand Wheel	1
23	KGS618-2122			Bearing Holder	1
24	25 /GB894.1			Shaft Bead Flange	1
25	20 /GB894.1			Shaft Bead Flange	2
26	47 /GB893.1			Hole Bead Flange	1

COOLANT SYSTEM ASS'Y



## COOLANT SYSTEM

(KGS618,KGS818M,KGS1020M)

Index No.	Parts No.		Parts Name	Q'ty
	KGS618,KGS818M	KGS1020M		
1	KGS618-5101	KGS1020AHD-5101	Coolant Tank	1
2	—	KGS1020AHD-5101/3	Support Coolant Tank	2
3	—	KGS1020AHD-5101/5	Wheel	4
4	—	KGS1020AHD-5101/4	Shaft	4
5	—	GB91-86	Pin	4
6	KGS618-5101/1	KGS1020AHD-5101/2	Handle	2
7	KGS618-5102	KGS1020AHD-5102A	Coolant Tank Cover	1
8	AB-25TH90W		Coolant Pump	1
9	GB6170/M6×25		Socket Head Screw	4
10	GB93-86/φ6		Washer	4
11	GB70-85/M6×14		Socket Head Screw	4
12	G72-1/ G1/2		Connector	1
13	—	GB70-85/M8×14	Socket Head Screw	4
14	—	GB93-86/φ8	Washer	4