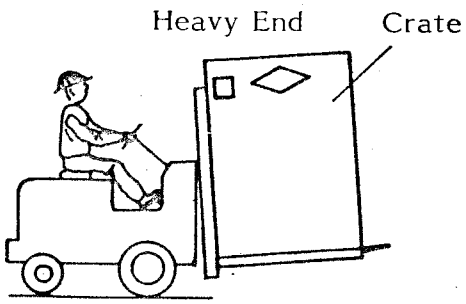
KGS-360AHD Grinder
Manual

CONTENTS

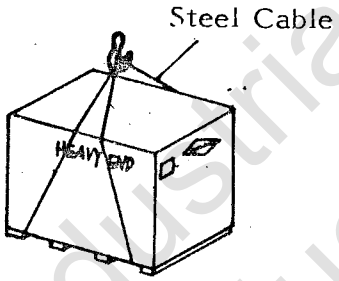
* THIS MACHINE HAS BEEN FULLY TESTED, ADJUSTED AND INSPECTED FOR CORRECT ALIGNMENT AND OPERATION PRIOR TO SHIPMENT. IN TRANSIT OR INSTALLATION, PLEASE ENSURE THAT THE MACHINE IS NOT BUMPED WHEN BEING ROLLED OR SET DOWN TO AVOID ANY FAILURE.

A . Transit

By Fork Lift



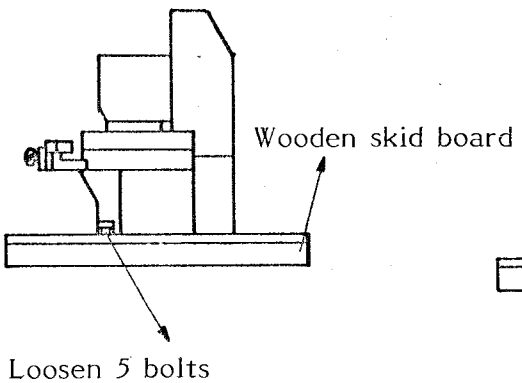
By Hoist or Chain Block

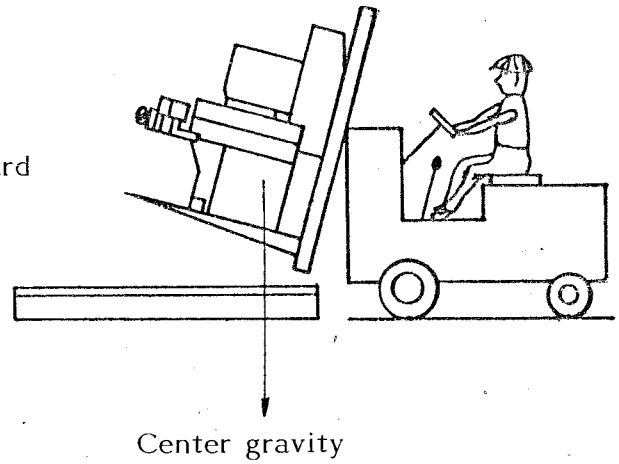


Net weight : 2050 kgs (4510lbs)
Gross weight : 2380 kgs (5236lbs)

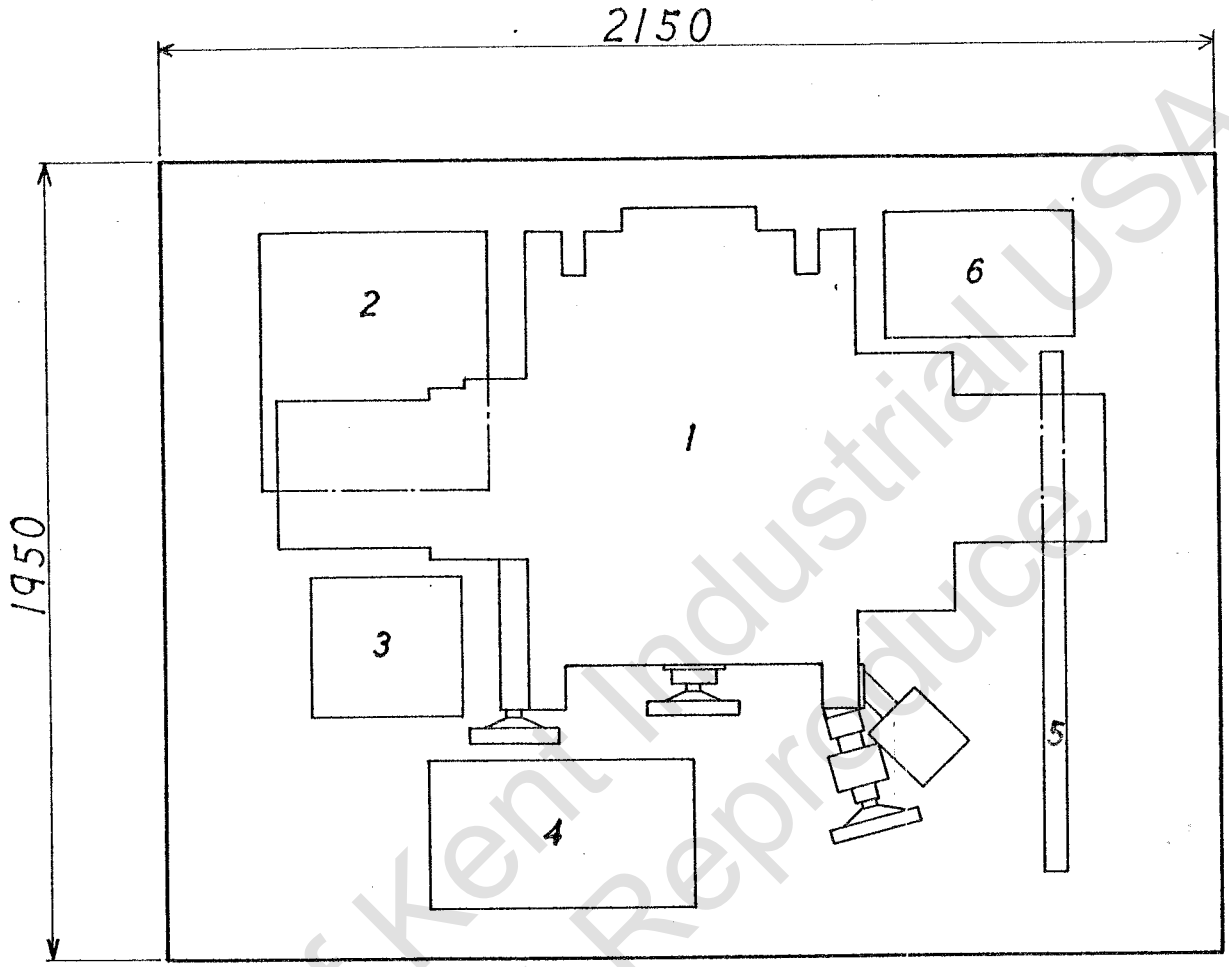
B . Unpacking

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





PACKING DIAGRAM



1. Machine base
2. Hydraulic tank
3. Grinding wheel and optional accessories
4. Dust suction coolant system
5. Splash guard (front and rear)
6. Standard accessories

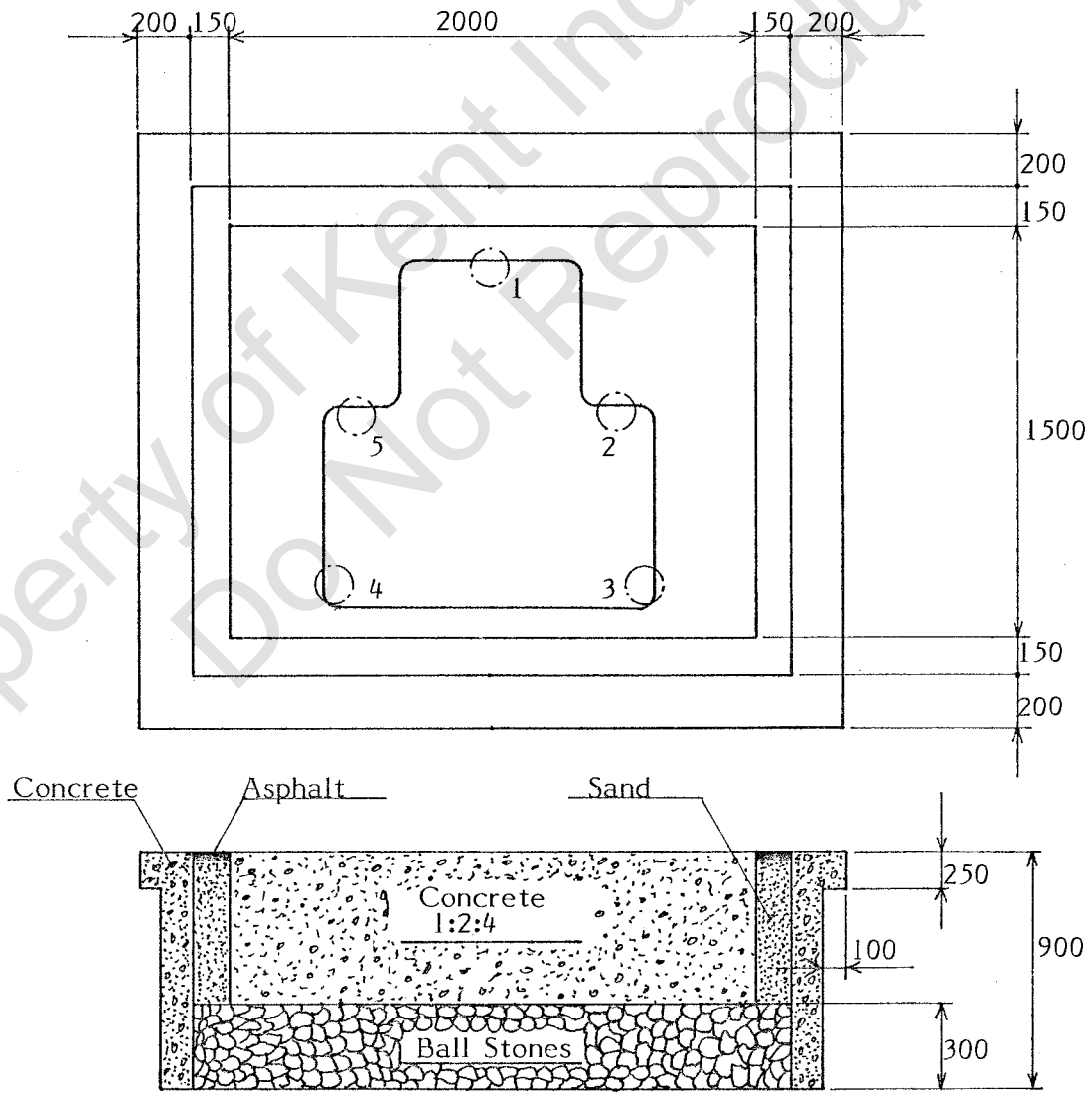
C . Choice of site

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

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

Grinding machines are often found between milling, shaping, drilling and even slotting machines, 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 machines or the 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.



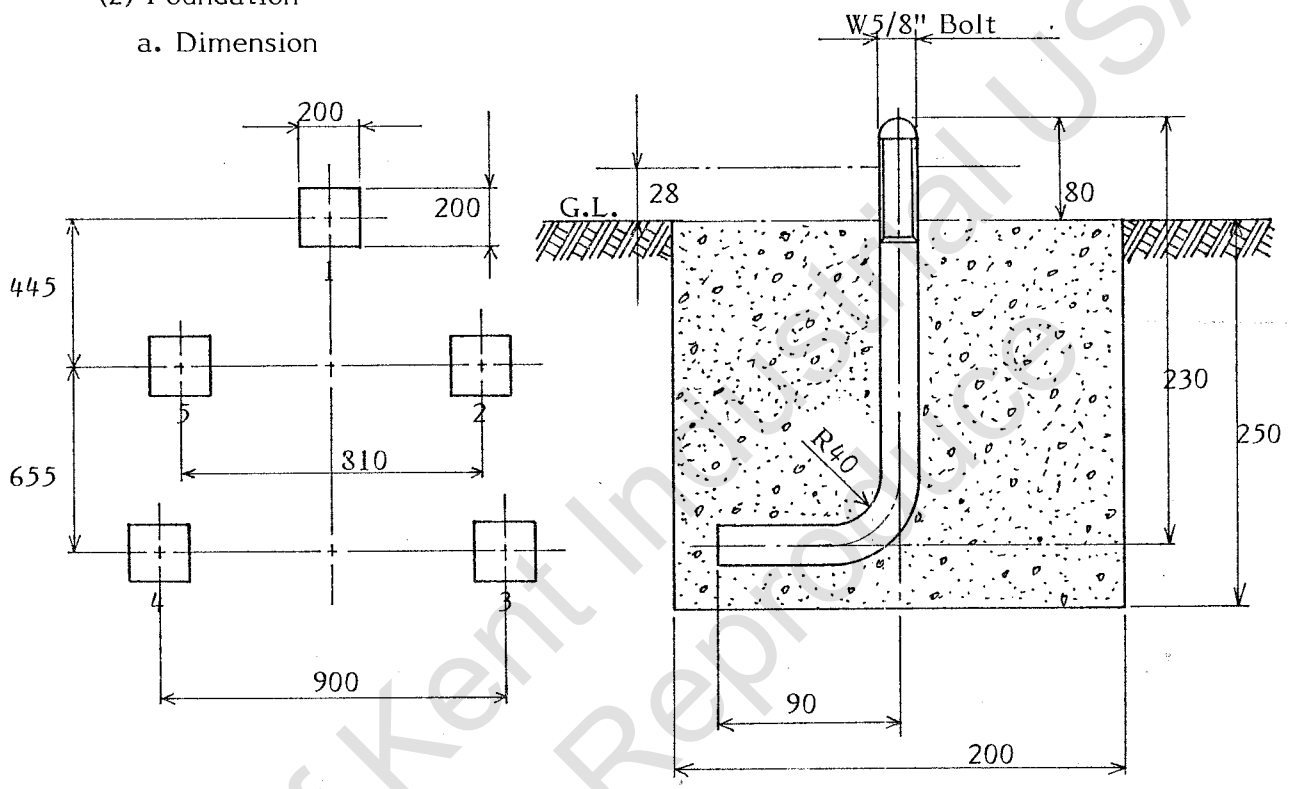
D . Installation

(1) Power consumption

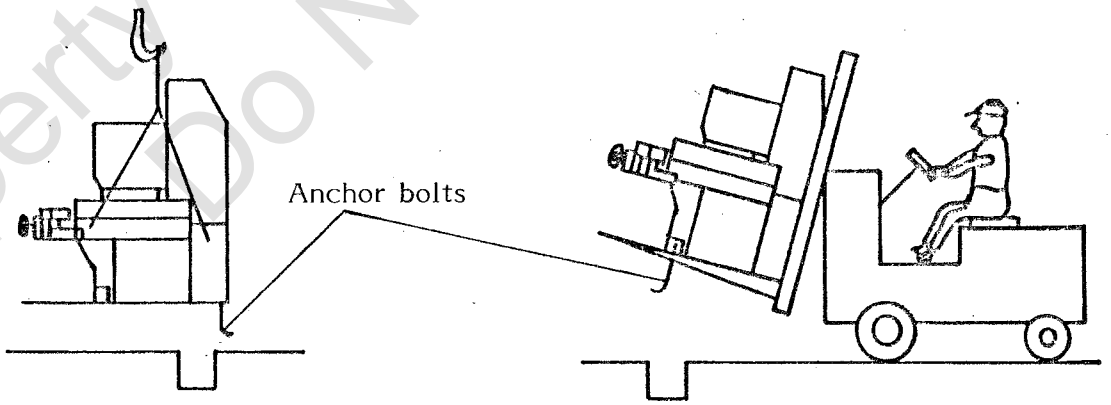
Machine Base	Ele. Mag. Chuck	Dust-collector	Total
5.7KW	0.1KW	0.5KW	6.3 KW

(2) Foundation

a. Dimension



b. Use the anchor bolts



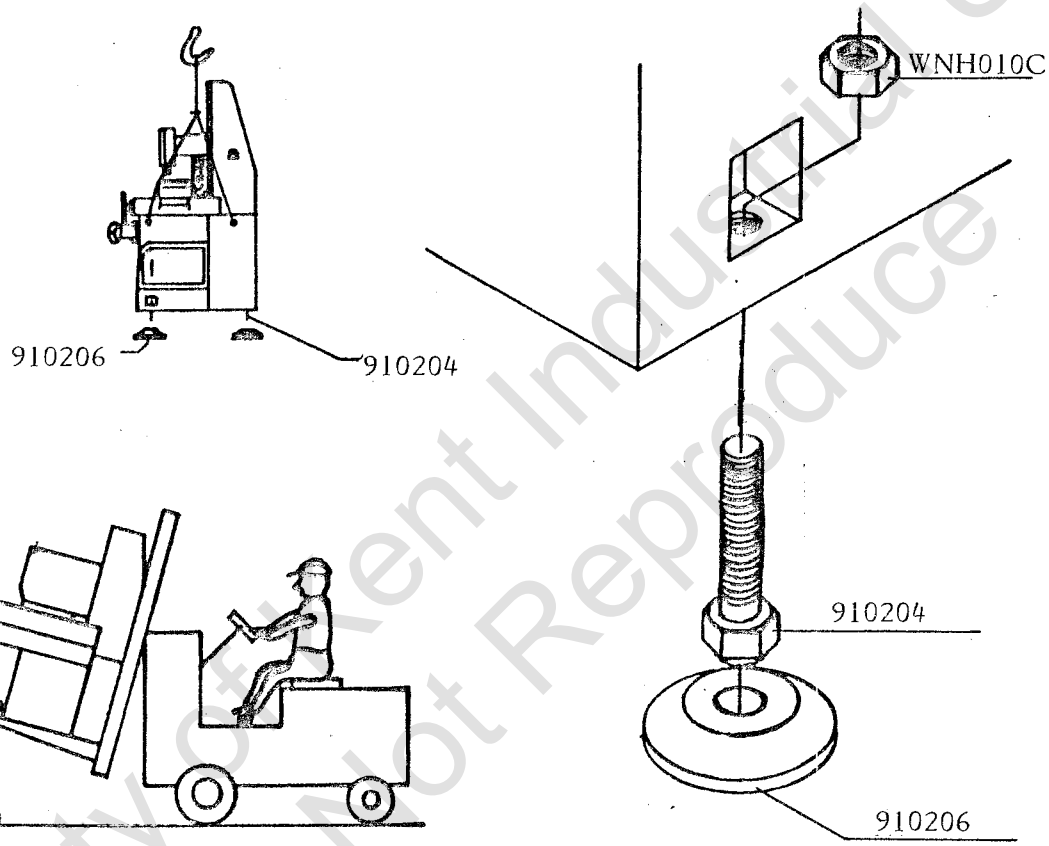
* Lock the anchor bolts on the machine by nuts, and let the thread portion at least 35mm for adjust.
* Lay down the machine slowly to aim anchor bolts at foundation holes.
* Levelling the machine by taper blocks.
* Fill up the holes with concrete.

c. Use the levelling pads and levelling screws

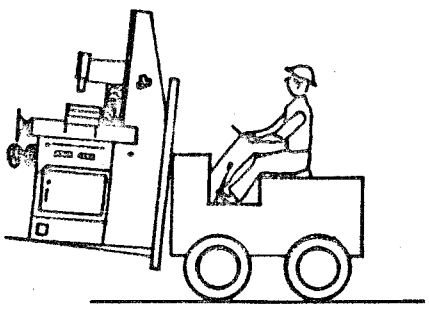
* Screw the levelling screws (911204) on the machine base with two nuts. For easy levelling and more steady of the machine, make screws as deep as possible

* Lay down the machine slowly to let the round head of levelling screws fall into the center hole of levelling pads (910206).

* Levelling the machine.



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



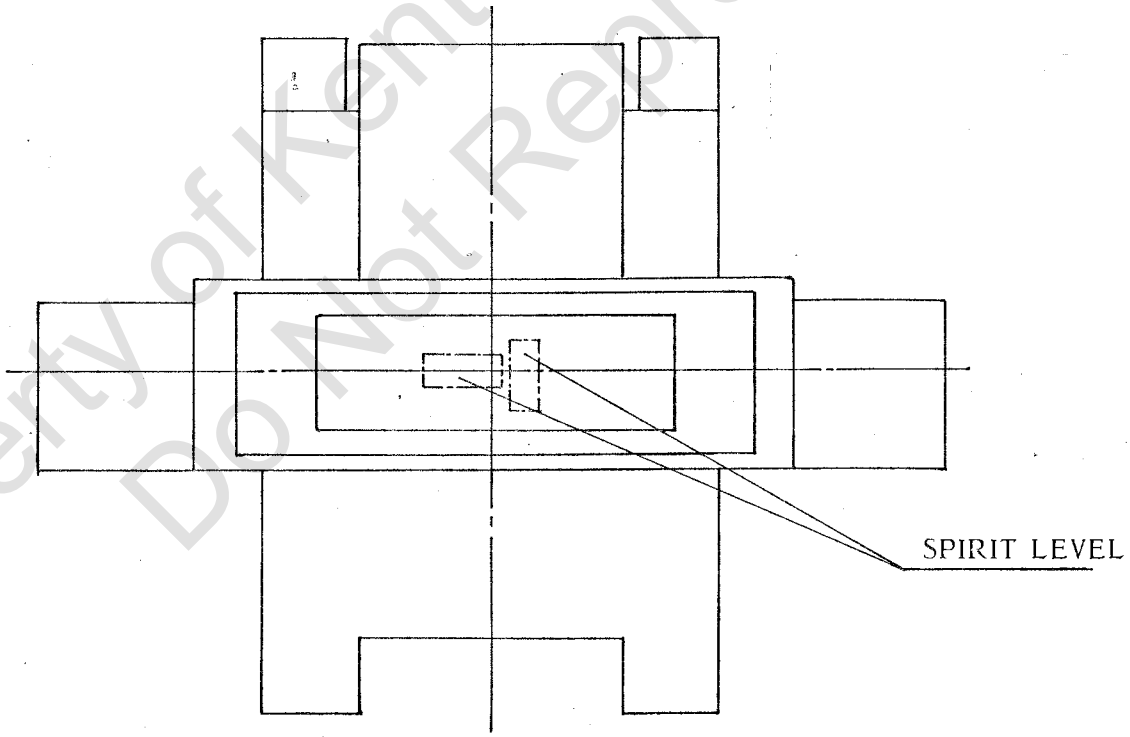
(3). Levelling the Machine

As following procdures:

(a). Use Longitudinal handwheel to let table at the middle position.

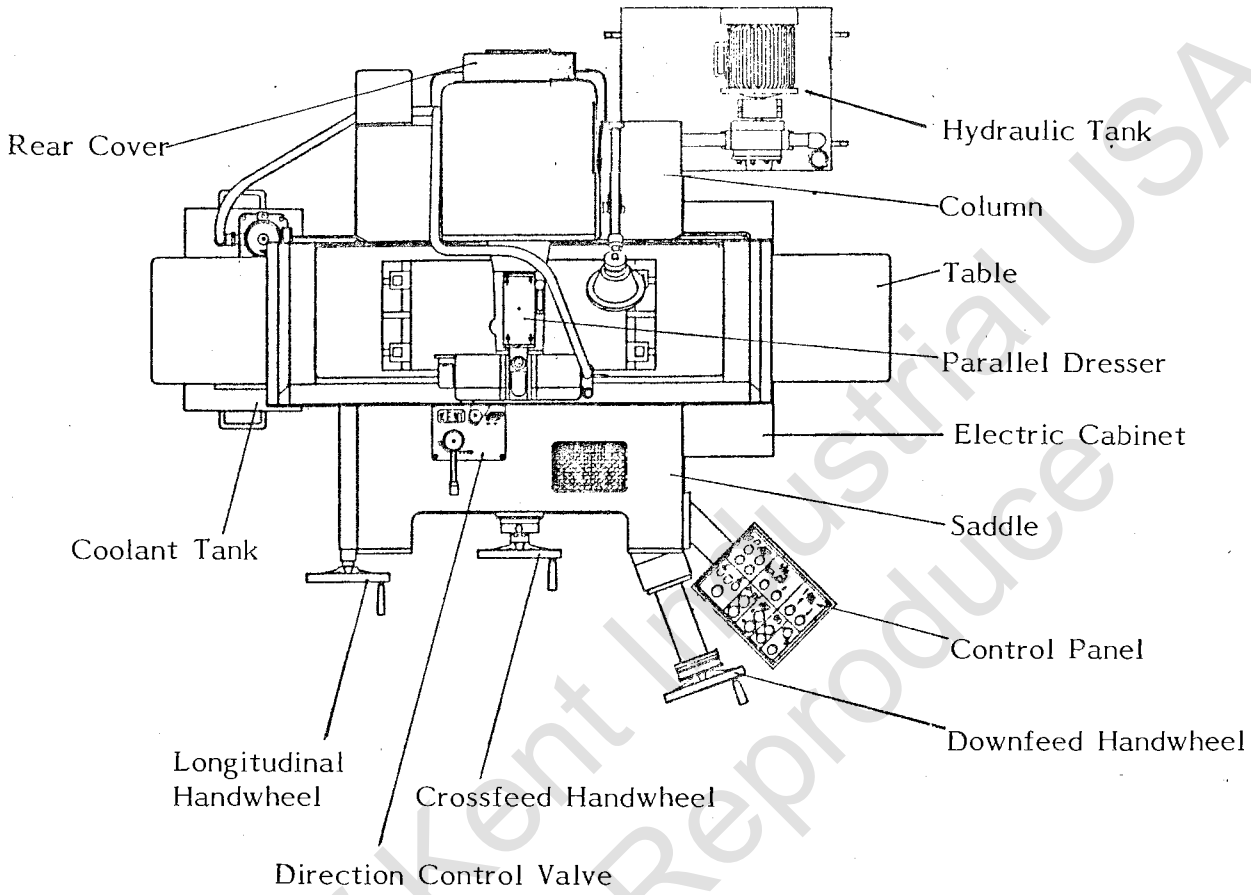
(b). And then, use crossfeed handwheel to let Saddle at the middle position.

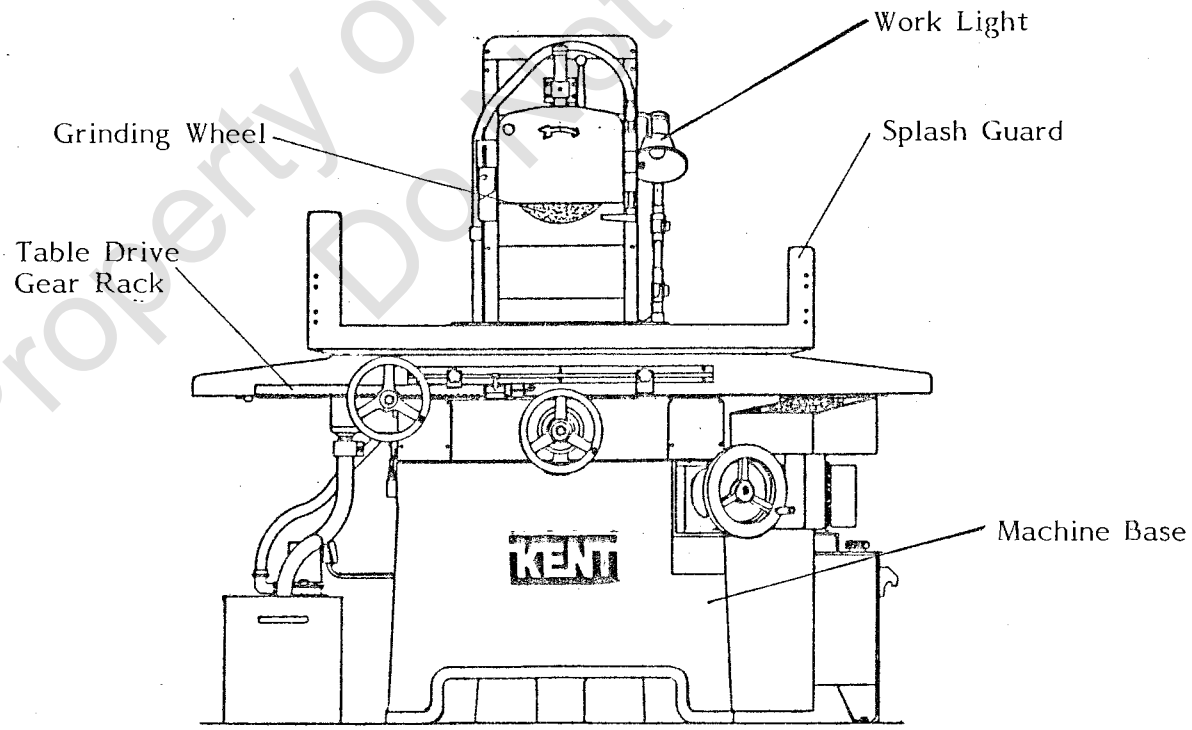
(c). Levelling the machine by a (or two) Spirit Level in Longitudinal and latitudinal direction, as Fig. shown.



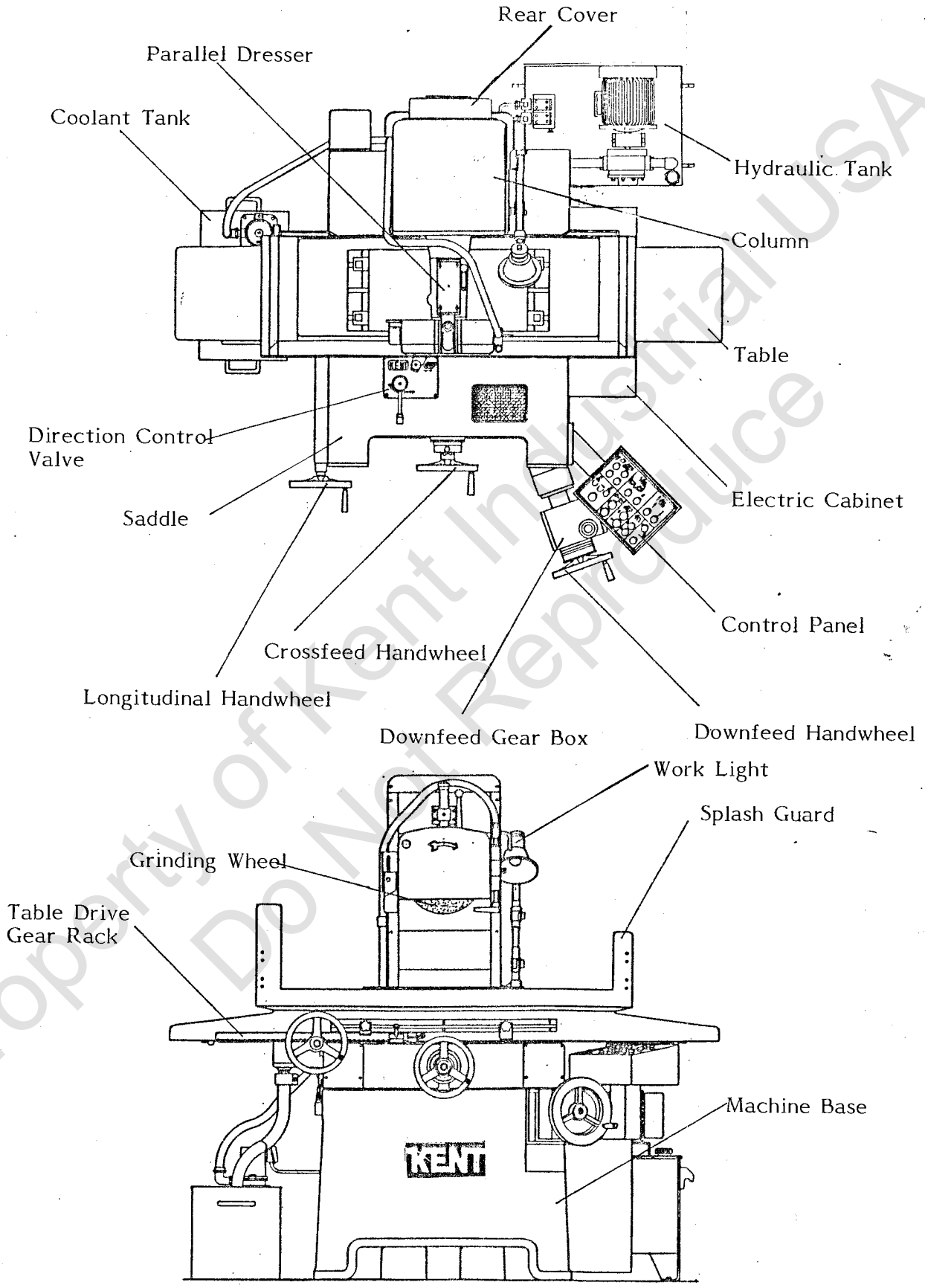
(4). Contour And Nomenclature

a). KGS-360AH



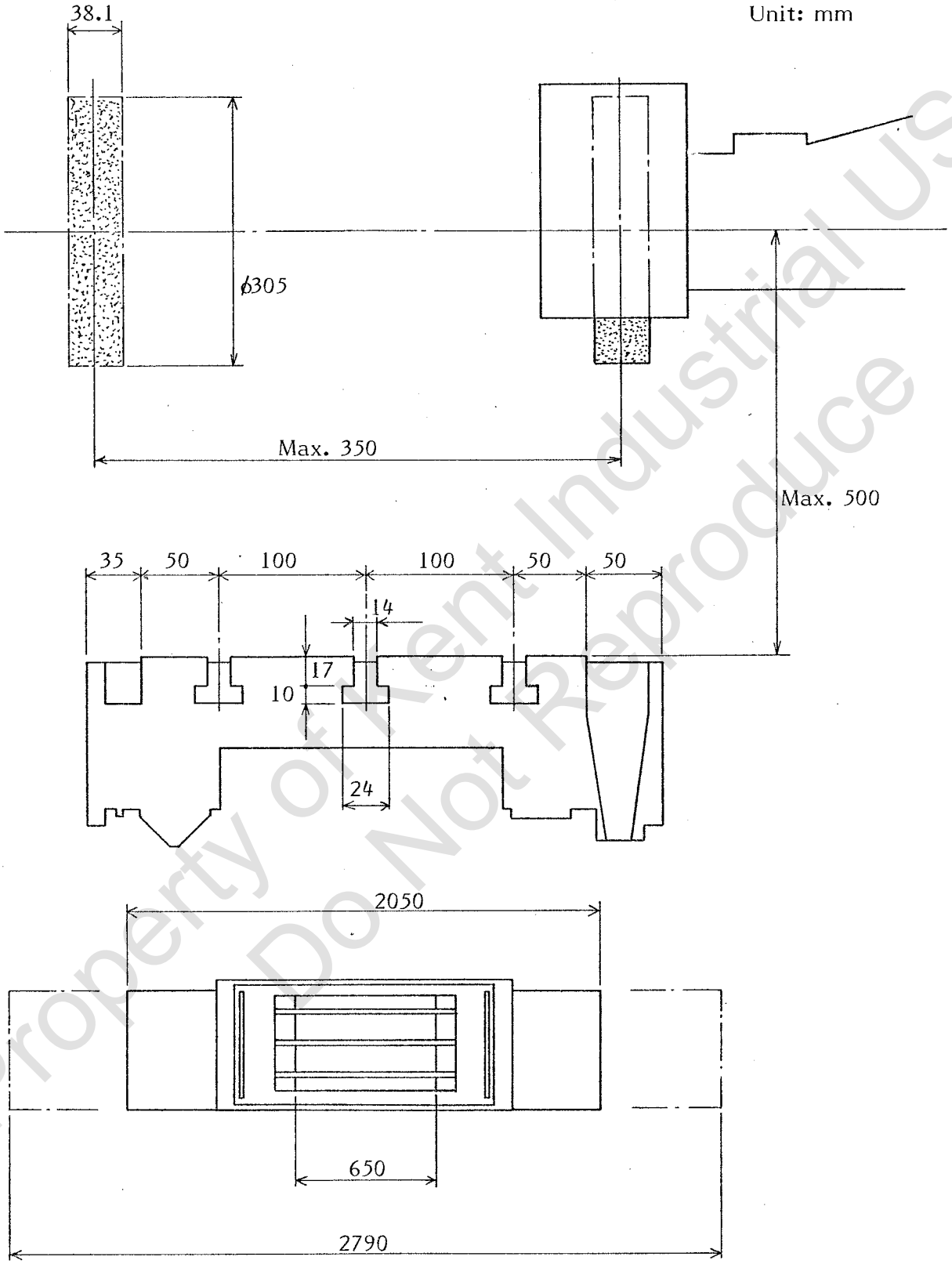


b). KGS-360AHD



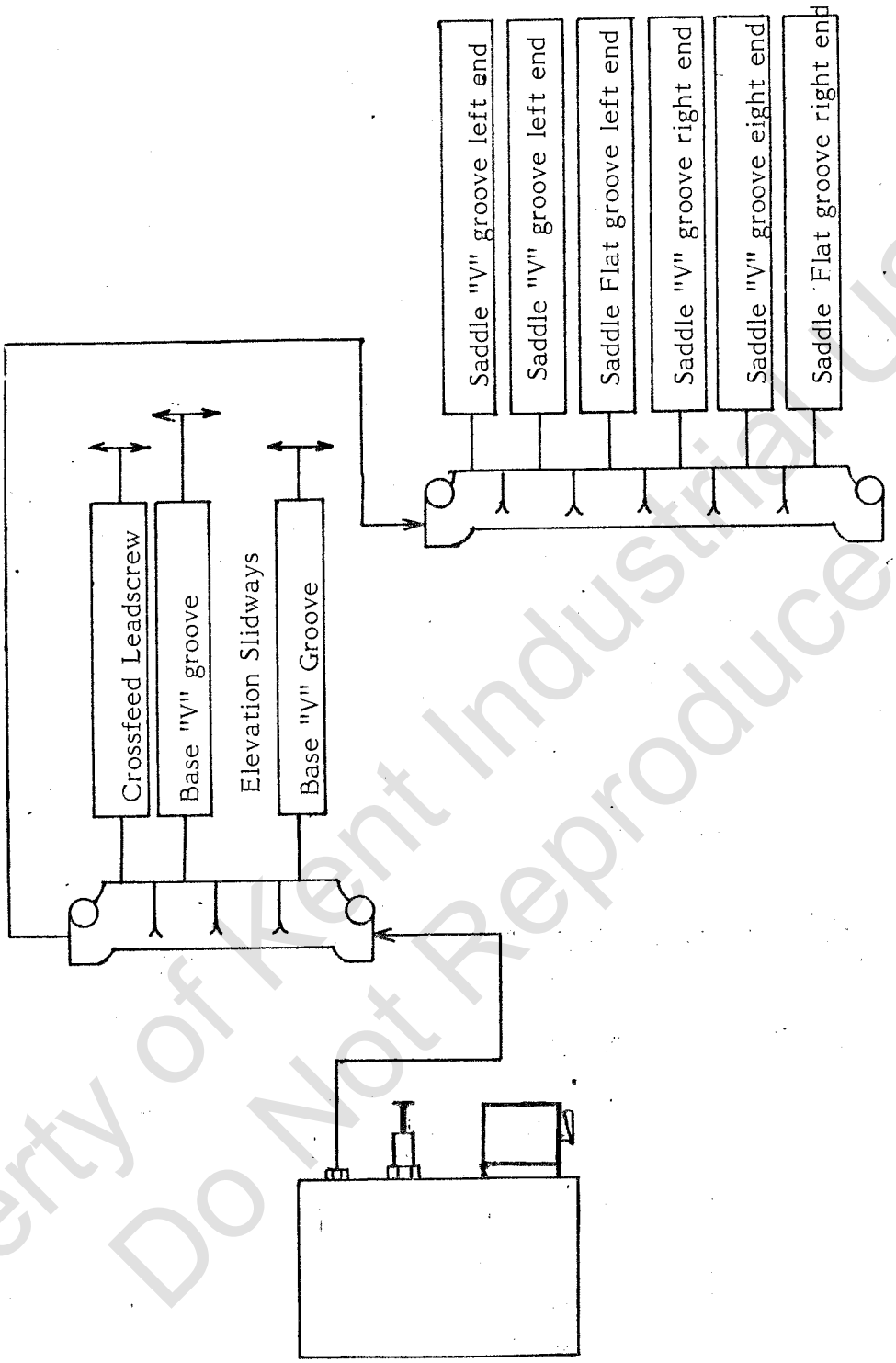
(5). Table Size And Grinding Capacity

Unit: mm



(6). Lubrication Instruction

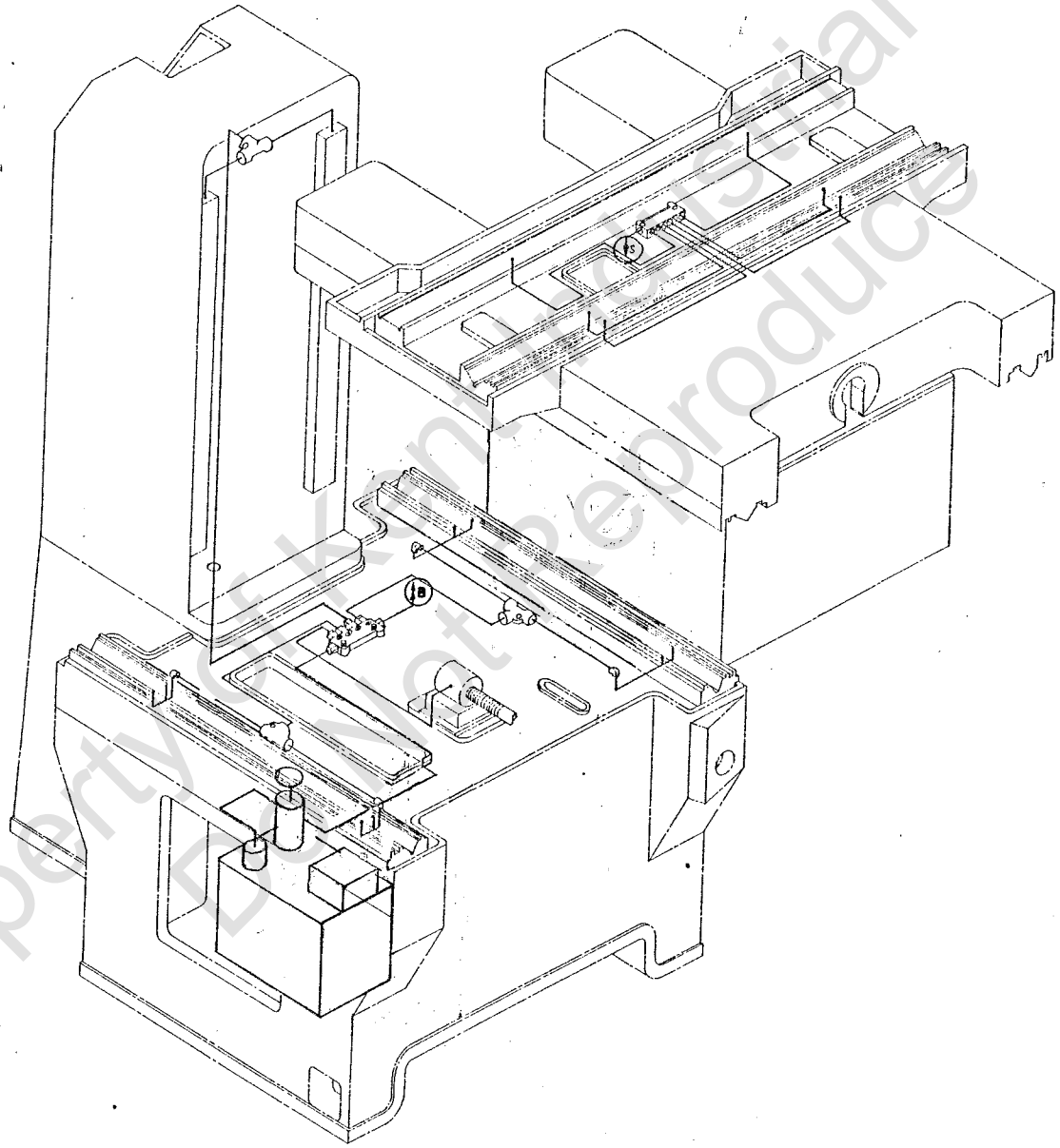
(a). Lubrication flew Chart:



Reliability of the machien and exonomic runnign ensured only by the correct choice of lubrication for the individual lubricating points.

1. Lubrication pump : Auto lubrication pump will be operated when machine power is ON, then pump 3-6 cc. (adjustable) in every minutes.
2. Lubricant Tank: 1.5 liters
3. Lubricant: SAE30, or lubrication oil of BP, ESSO, MOBIL or SHELL.
4. Lubricating points: Saddle "Flat" groove Saddle "V" groove
   Crossfeed leadscrew
   Bed "V" grooves Elevation slidway
   * Auto. downfeed gear box (by grease gun)

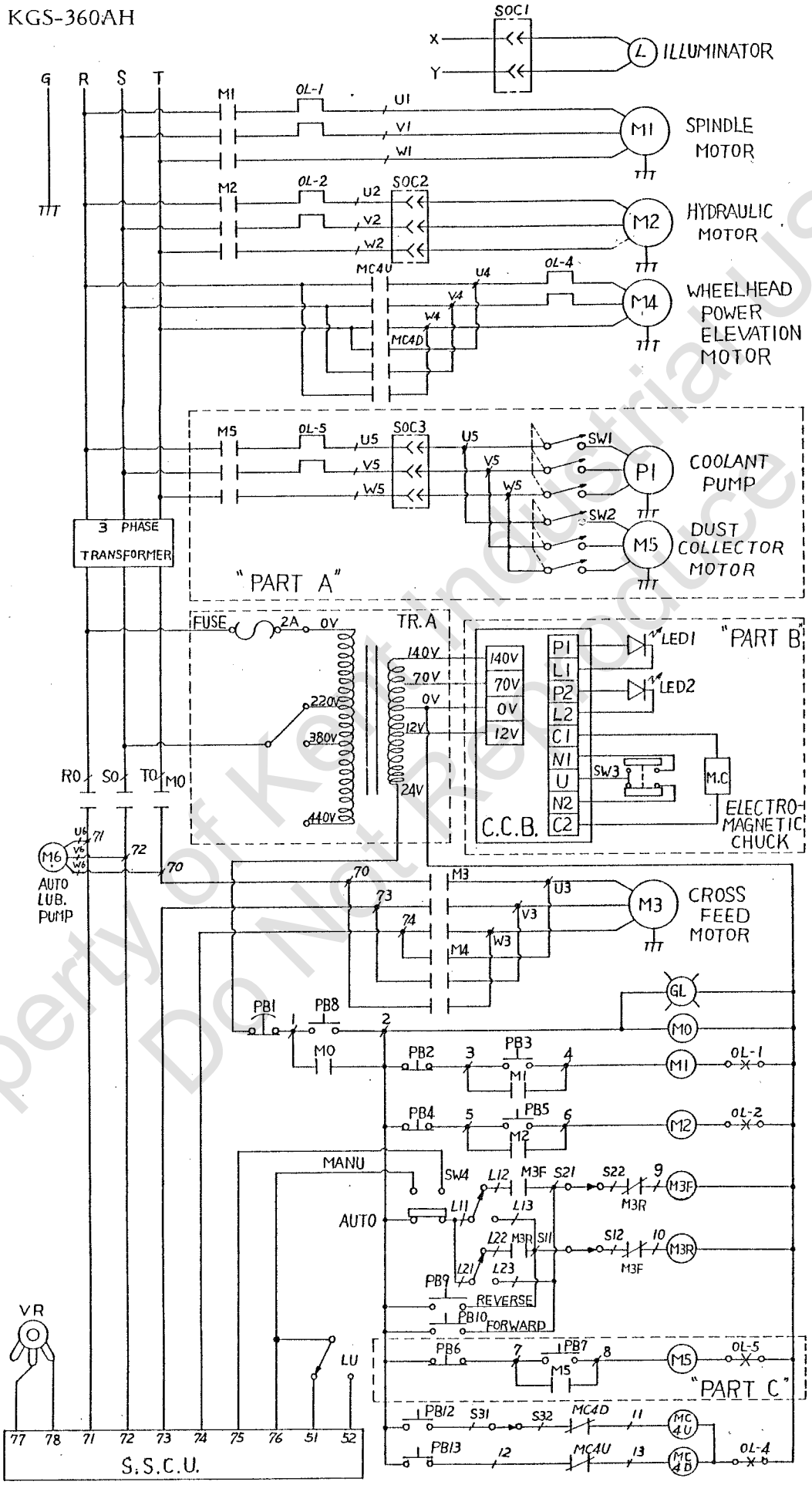
b). Lubricating system



* B connect to S

(7). Circuit Diagram And Connection Diagram

a). KGS-360AH

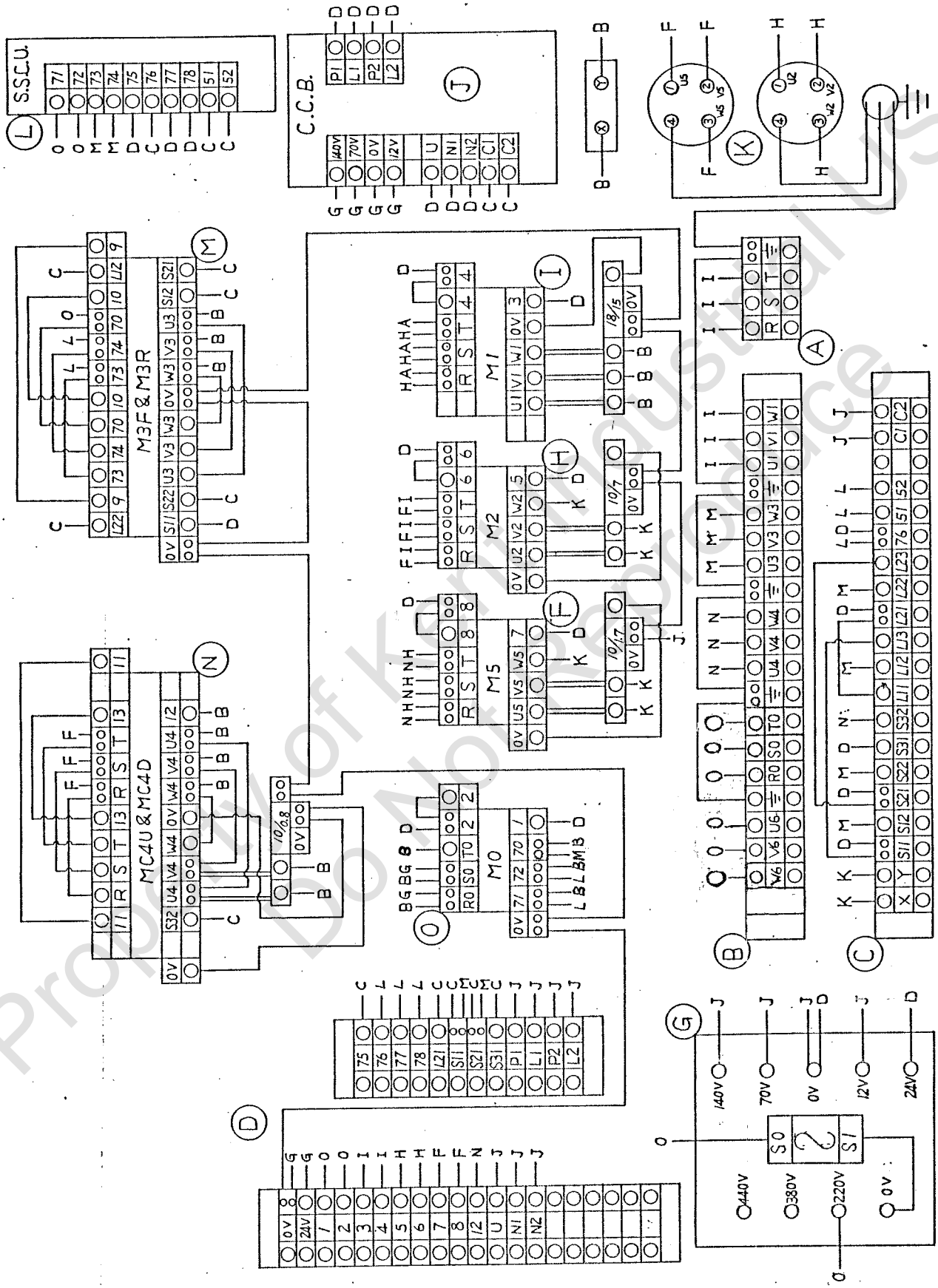


Description

PB1: Emergency pushbutton
GL&PB8: Pushbutton "ON" & indicator of power source
PB2: Pushbutton "OFF" of spindle motor
PB3: Pushbutton "ON" of spindle motor .
PB4: Pushbutton "OFF" of hydraulic motor
PB5: Pushbutton "ON" of hydraulic motor
PB6: Pushbutton "OFF" of coolant or dust-collector power source
PB7: Pushbutton "ON" of coolant or dust-collector power source
PB9: Pushbutton of continuous crossfeed, approach to operator
PB10: Pushbutton of continuous crossfeed, away from operator
SW1: ON-OFF switch for coolant pump
SW2: ON-OFF switch for dust-collector motor
SW3: Selector switch of electro-magnetic chuck
SW4: Selector switch of auto/manu. crossfeed
VR: Variable resistance for crossfeed incremental control
LED1: Magnetizerism indicator
LED2: Demagnetizerism indicator
3-phase Tr.: Transformer to change local voltage to 220V
Tr. A: Transformer for electro-magnetic chuck & 24V control circuit & crossfeed motor
SOC1: Socket for illuminator
SOC2: Socket for hydraulic power source
SOC3: Socket for coolant or dust-collector
M0: Magnetic contactor for power source
M1: Magnetic contactor for spindle motor
M2: Magnetic contactor for hydraulic motor
M3F&M3R: Internal mechanical lock magnetic contactor for crossfeed motor
M4U&M4D: Internal mechanical lock magnetic contactor for elevation motor
M5: Magnetic contactor for coolant pump or dust-collector motor
Fu: Fuse
OL1: Overload relay of M1
OL2: Overload relay of M2
OL4: Overload relay of M4F&M4R
OL5: Overload relay of M5
S21-S22, S11-S12: Limit switch for maximum crossfeed stroke control
L11-L12-L13, L21-L22-L23: Limit switch for adjustable crossfeed stroke control
Lu: Limit switch for crossfeed inching
S.S.C.U.: Solid state control unit
C.C.B.: Chuck control box

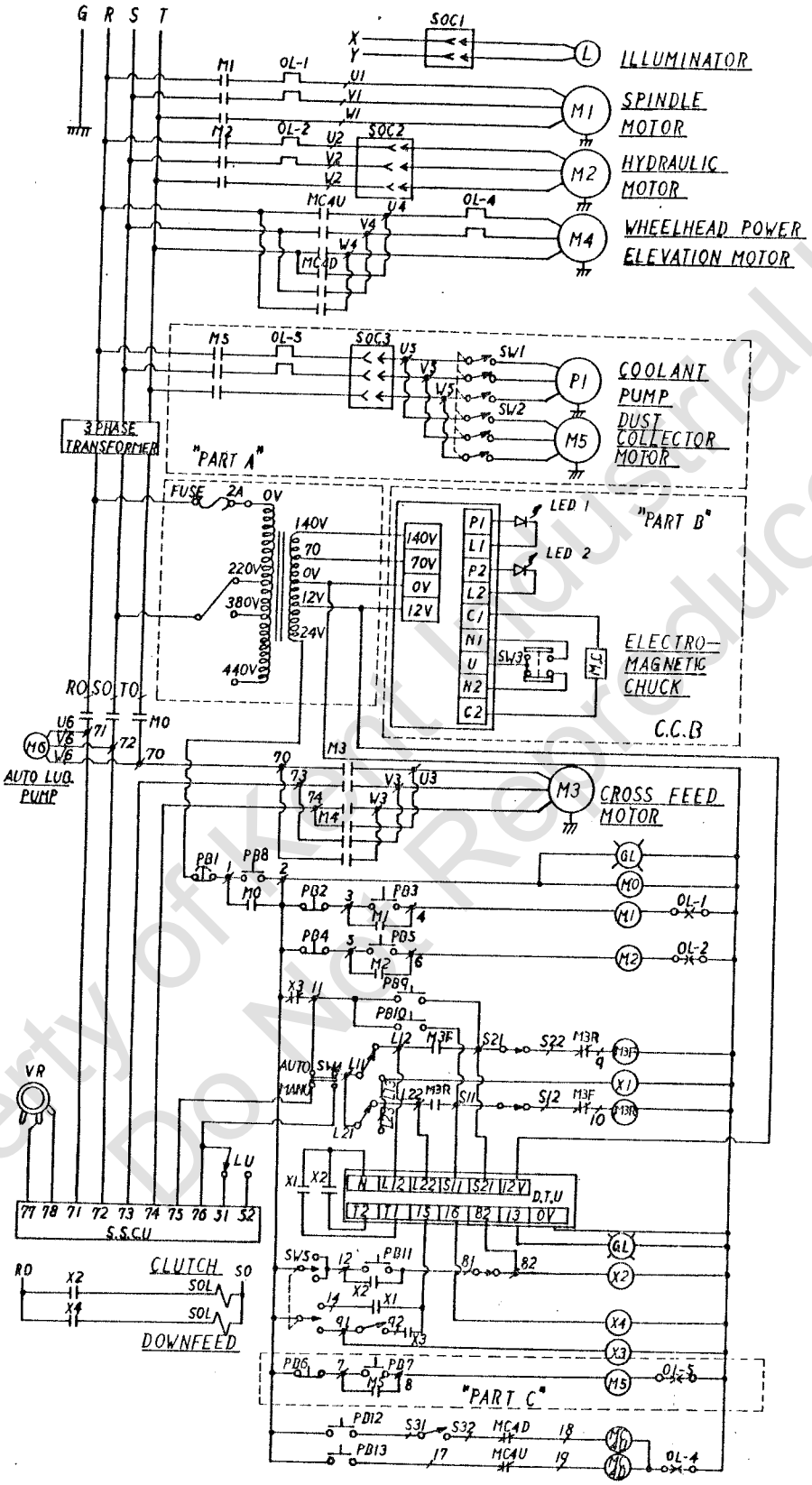
Note

Wheel spindle motor, Hydraulic motor, Wheel elevation motor, Coolant pump or Dust-collector motor must be complied with your local power voltage.



Connection Diagram (KGS-360AH)

b). KGS-360AHD



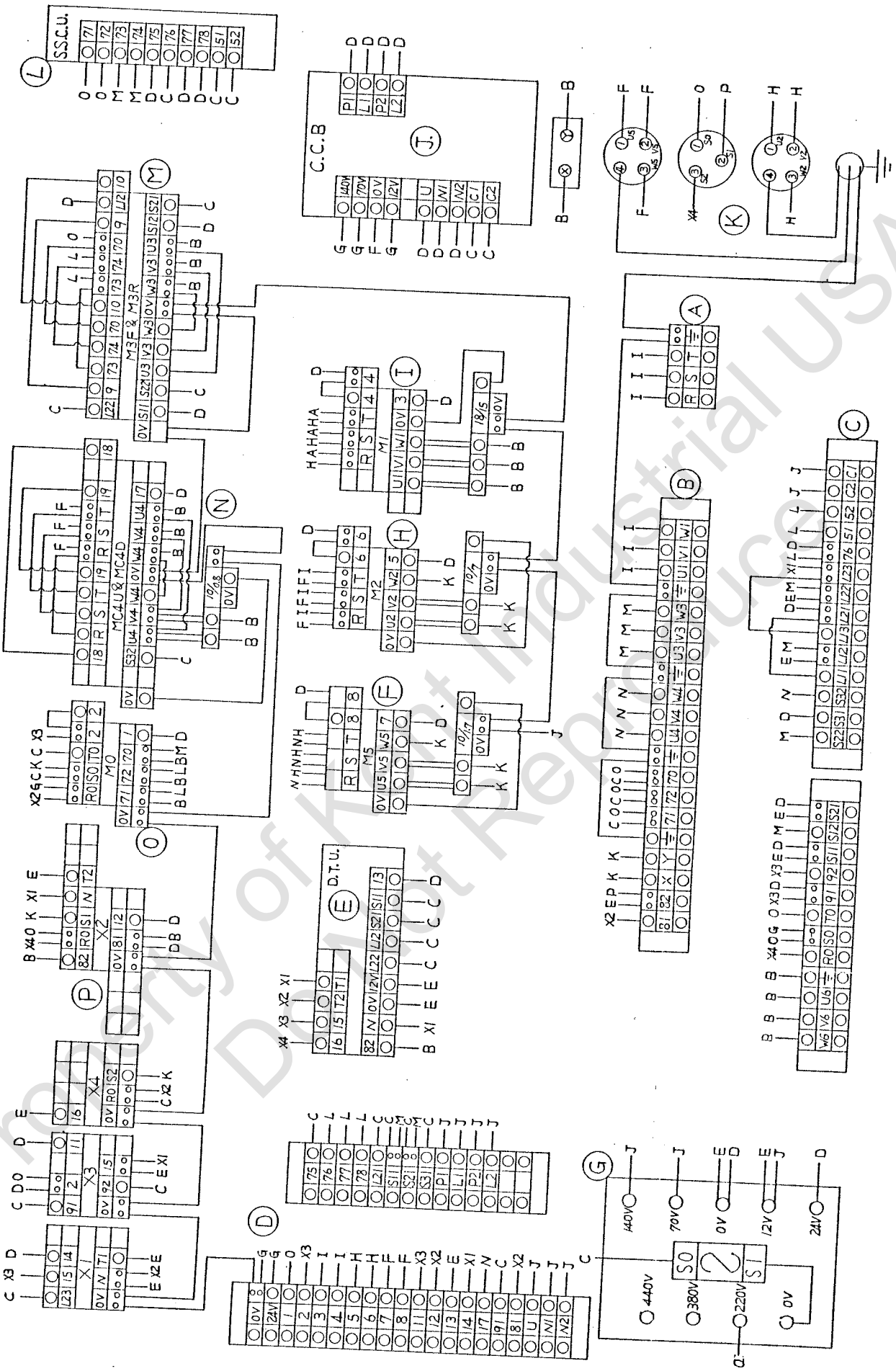
Circuit Diagram (KGS-360AHD)

Description

PB1: Emergency pushbutton
GL&PB8: Pushbutton "ON" & indicator of power source
PB2: Pushbutton "OFF" of spindle motor
PB3: Pushbutton "ON" of spindle motor
PB4: Pushbutton "OFF" of hydraulic motor
PB5: Pushbutton "ON" of hydraulic motor
PB6: Pushbutton "OFF" of coolant or dust-collector power source
PB7: Pushbutton "ON" of coolant or dust-collector power source
PB9: Pushbutton of continuous crossfeed, approach to operator
PB10: Pushbutton of continuous crossfeed, away from operator
PB11&GL: Pushbutton "ON" & indicator of automatic downfeed
SW1: ON-OFF switch for coolant pump
SW2: ON-OFF switch for dust-collector motor
SW3: Selector-switch of electro-magnetic chuck
SW4: Selector switch of auto/manu. crossfeed
SW5: Selector switch of surface/plunge grinding
VR: Variable resistance for crossfeed incremental control
LED1: Magnetizerism indicator
LED2: Demagnetizerism indicator
3-phase Tr.: Transformer to change local voltage to 220V
Tr.A: Transformer for electro-magnetic chuck & 24V control circuit & crossfeed motor & automatic downfeed solenoid valves
SOC1: Socket for illuminator
SOC2: Socket for hydraulic power source
SOC3: Socket for coolant pump or dust-collector motor
M0: Magnetic contactor for power source
M1: Magnetic contactor for spindle source
M2: Magnetic contactor for hydraulic motor
M3F&M3R: Internal mechanical lock magnetic contactor for crossfeed motor
M4U&M4D: Internal mechanical lock magnetic contactor for elevation motor
M5: Magnetic contactor for coolant pump or dust-collector motor
X1: Relay for crossfeed reversal
X2: Relay for automatic downfeed clutch engage solenoid valve
X3: Relay for circuit lock of crossfeed when plunge grinding
X4: Relay for automatic downfeed solenoid valve
OL1: Overload relay of M1
OL2: Overload relay of M2
OL4: Overload relay of M4U&M4D
OL5: Overload relay of M5
S11-S12, S21-S22: Limit switch for maximum crossfeed stroke control
L11-L12-L13, L21-L22-L23: Limit switch for adjustable crossfeed stroke control
Lu: Limit switch for crossfeed inching
81-82: Limit switch for automatic downfeed stroke control
91-92: Limit switch for plunge grinding signal
SOL1: Solenoid valve for automatic downfeed clutch engage
SOL2: Solenoid valve for automatic downfeed
S.S.C.U.: Solid state control unit
C.C.B.: Chuck control box
D.T.U.: Delay timer unit

** Note**

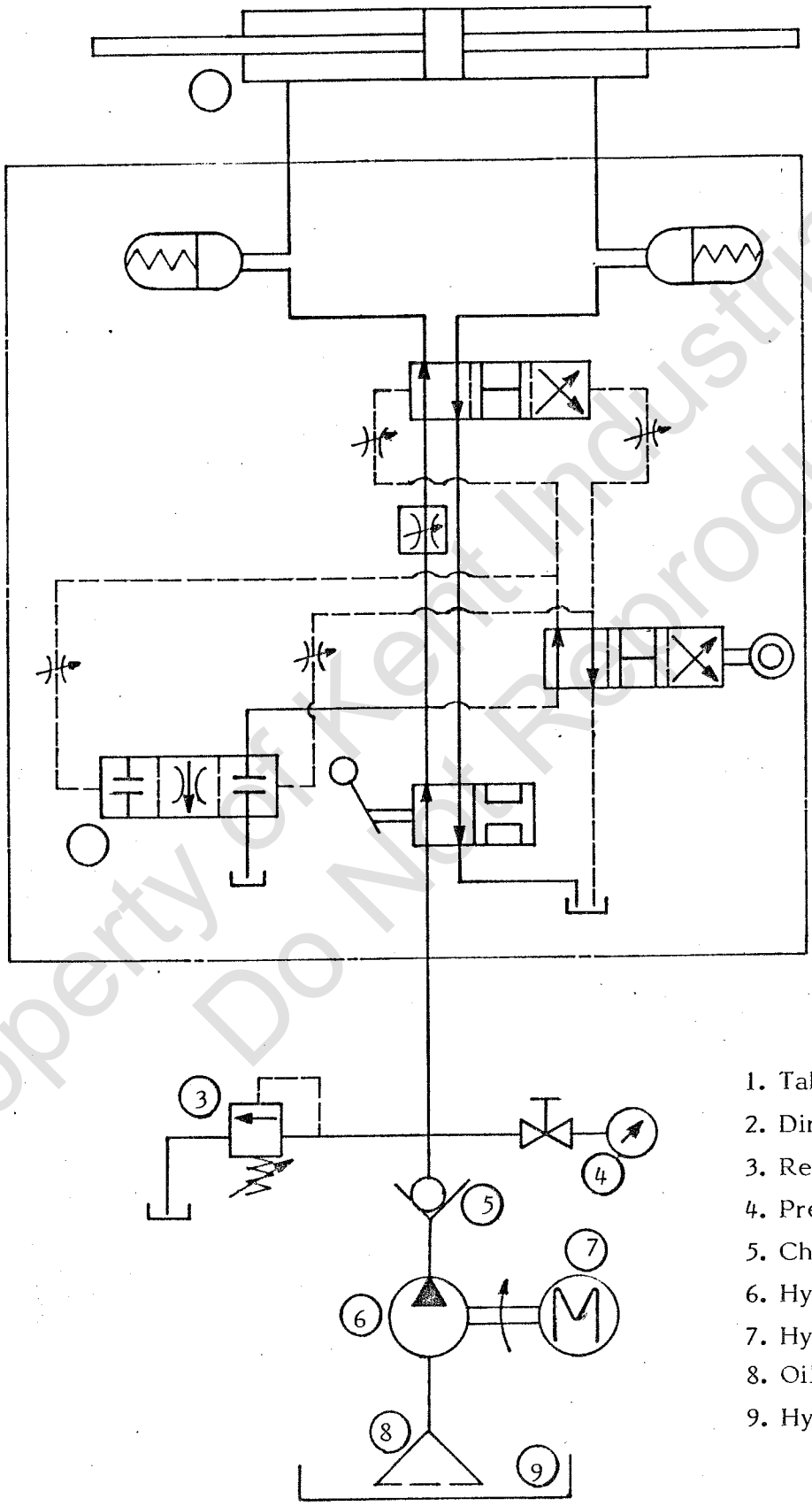
Wheel spindle motor, Hydraulic motor, Wheel elevation motor, Coolant pump or Dust-collector motor must be complied with your local power voltage.



Connection Diagram (KGS-360AHD)

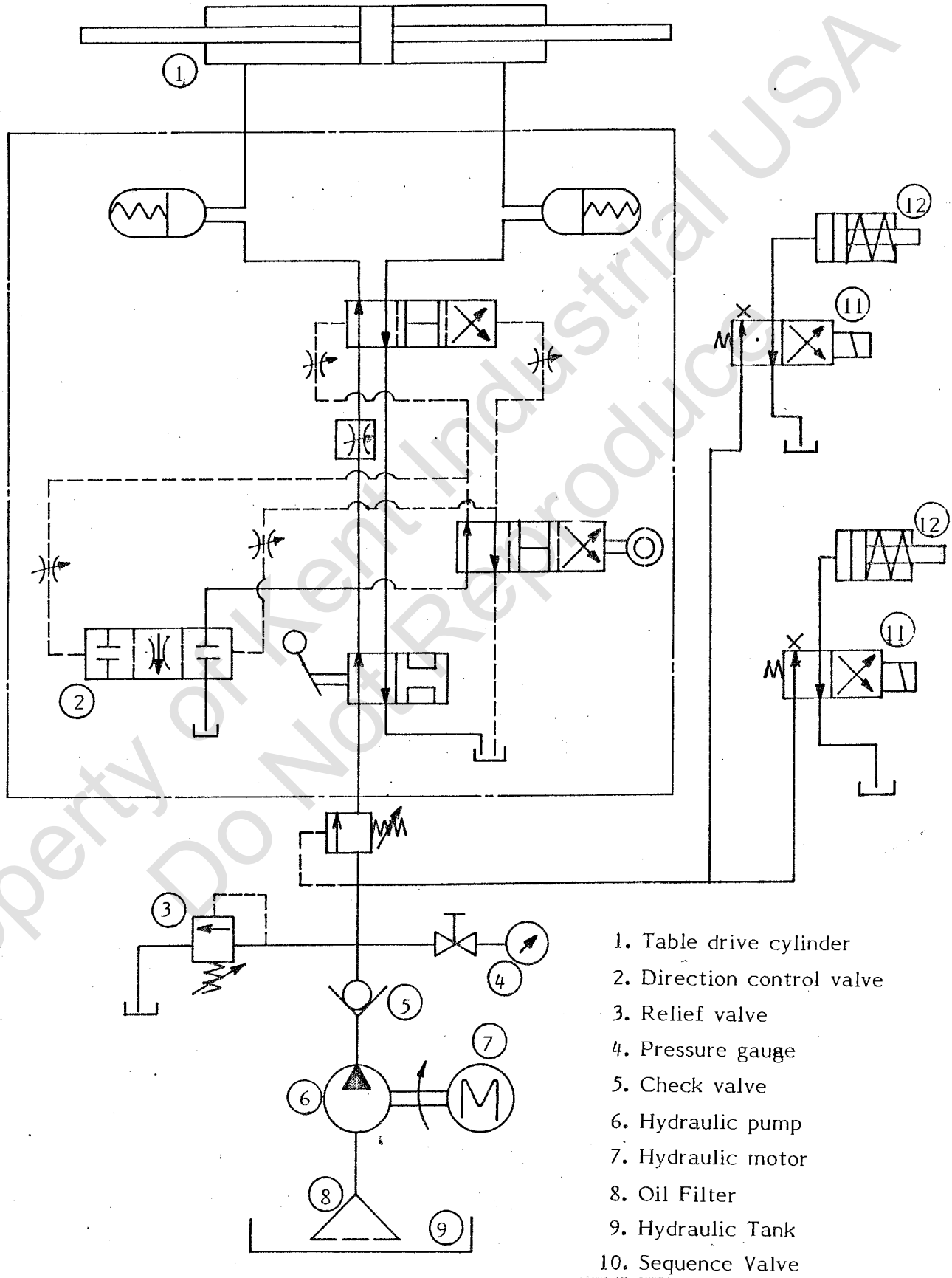
(8). Hydraulic System

a). KGS-360AH Hydraulic diagram.



1. Table drive cylinder
2. Direction control valve
3. Relief valve
4. Pressure gauge
5. Check valve
6. Hydraulic pump
7. Hydraulic motor
8. Oil Filter
9. Hydraulic Tank

b). KGS-360AHD Hydraulic Diagram.



1. Table drive cylinder
2. Direction control valve
3. Relief valve
4. Pressure gauge
5. Check valve
6. Hydraulic pump
7. Hydraulic motor
8. Oil Filter
9. Hydraulic Tank
10. Sequence Valve
11. Solenoid valve
12. Downfeed cylinder

c). Hydraulic oil

Hydraulic tank volumn: 100 liters (25 gals)

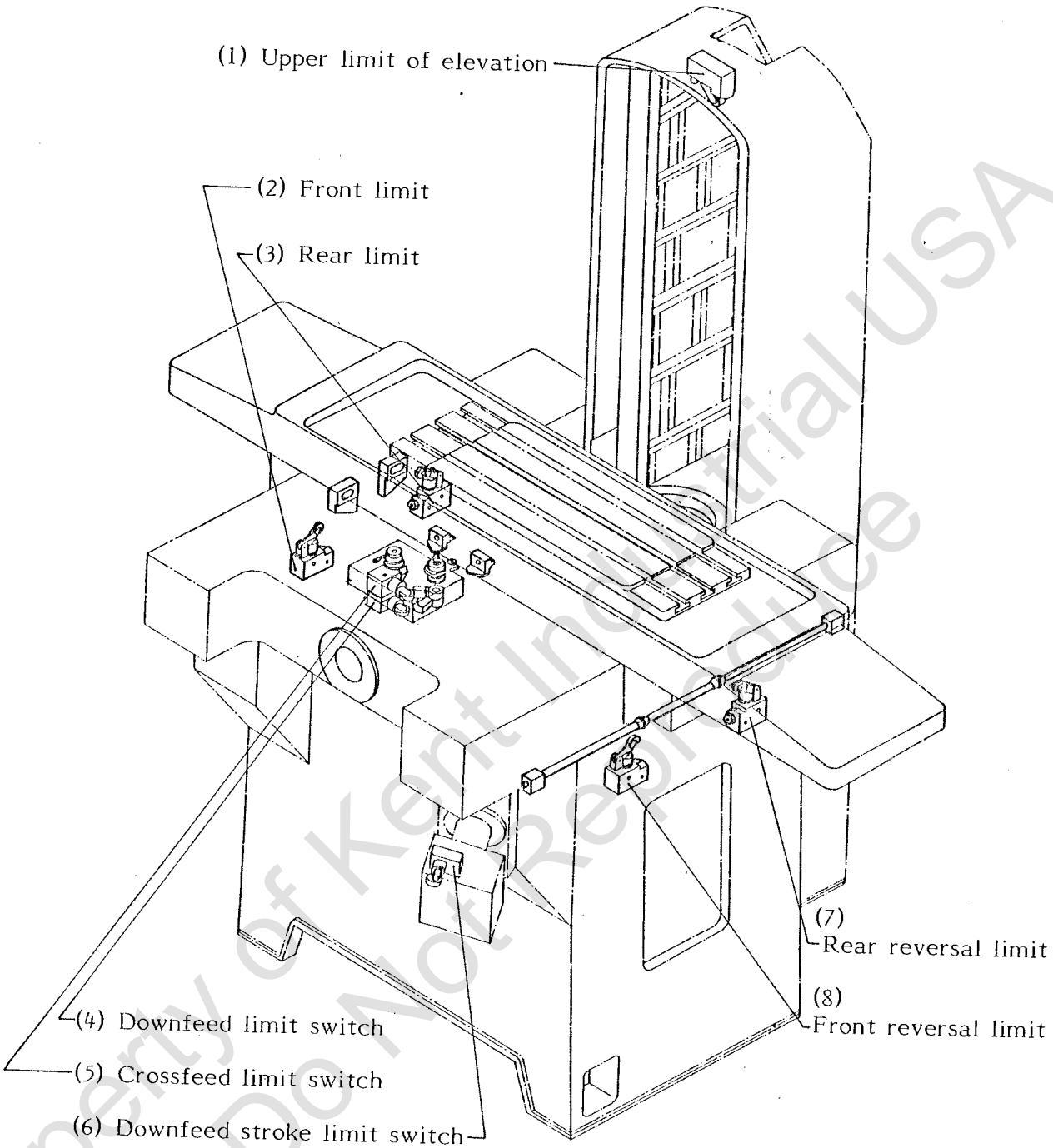
Re-fill frequency: After first one month change new hydraulic oil and clean hydraulic tank. then every six months.

Hydraulic oil:

CPC	BP	ESSO	MOBIL	SHELL
R-68	ENGRGOL	ESSTIC 50	D.T.E. oil	SHELL
	HL100		Medium	Tellus Oil 29
	4.5°E/50°C	4.7°E/50°C	3.93°E/50°C	4.0°E/50°C
	33cst/50°C	35cst/50°C	28.9cst/50°C	29cst/50°C

* Fill up the hydraulic oil before starting.
* Table driven by hydraulic force, please ensure that there is no people or matter within the range of table movement before starting the longitudinal travel.
* Maximum hydraulic pressure: 30kgs/cm^2.
* Clean filter or change a new one if damaged when changing new oil.

(9). Limit Switch Position



Description:

(1). S31-S32

(2). S21-S22

(3). S11-S12

(4). 91-92 (for AHD model only)

(5). 76-51-52

(6). 81-82

(7). L21-L22-L23

(8). L11-L12-L13

* For above mentioned cord number, please refer to Circuit Diagram

(10). Balancing the grinding wheel

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

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

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

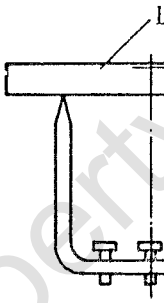


Fig. 1

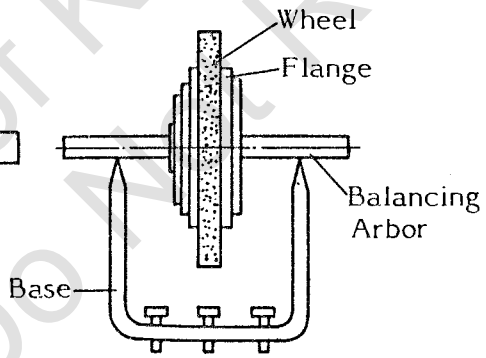


Fig. 2

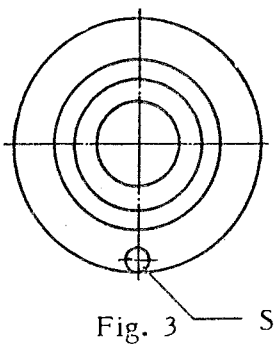


Fig. 3

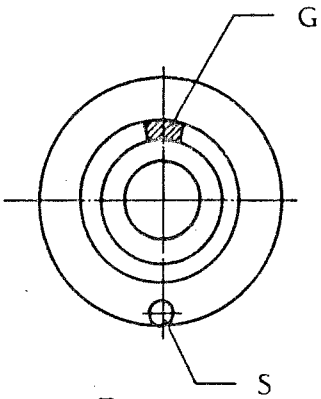


Fig. 4

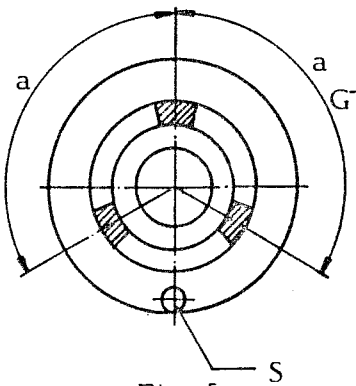


Fig. 5

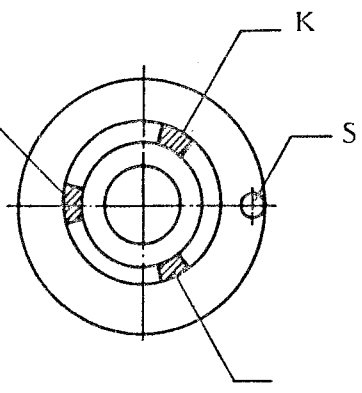


Fig. 6

After being balanced for the first time, the wheel must be mounted on the grinding spindle of the machine and dressed. This can be done with the parallel dresser on the spindle 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-balanced. After being fitted to the spindle again and re-dressed, it is ready for use.

* The wheel attached with the machine are accurately balanced together with their mountings. As wear can lead to unbalance, the wheel should be re-checked and, if necessary, re-balanced.

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

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. (Fig. 7). To release wheel flange from spindle taper with extractor. (Fig. 8).

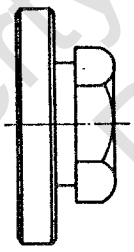


Fig. 7

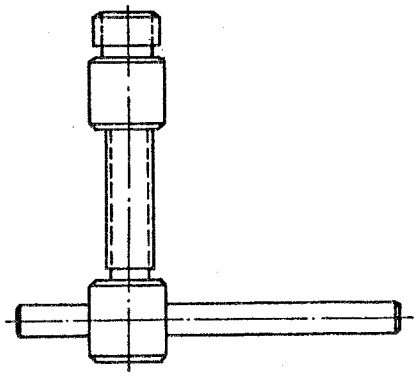


Fig. 8

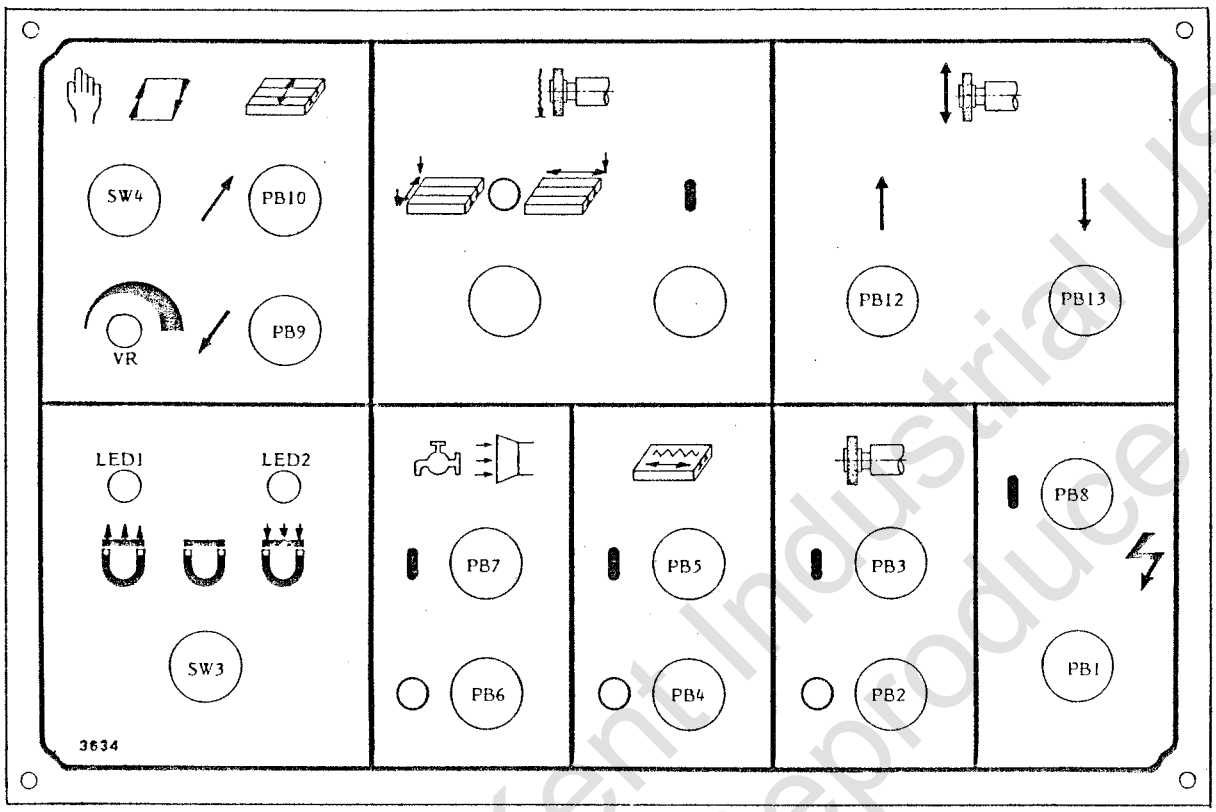
* If various materials have to be ground, so that the wheel has to be changed frequently, it is more advantageous to change the wheel complete with flange. It would involve unnecessary loss of time and wheel waste to remove the wheel from its mounting every time and re-balance and re-dress it.

Specifications	KGS-360AH	KGS-360AHD
Working surface of table	300x650 (11-3/4"x25-1/2")	
Maximum surface ground	310x670 (12-1/8"x26-3/8")	
Maximum distance between table and spindle center	500 (19-5/8")	
Table speed (Hydraulic)	2-22 M/Min (6.5-72 FPM)	
Automatic crossfeed of saddle per stroke, variable	0.02-8 (0.001"-0.4")	
Power crossfeed of saddle	930 mm/Min (36.6 in/Min)	
Power elevation	174 mm/Min (7 in/Min)	
Crossfeed on handwheel 1 revolution 1 graduation	4 (0.2") 0.02 (0.001")	
Vertical downfeed on handwheel 1 revolution 1 graduation	0.25 (0.01") 0.002 (0.0001")	0.5 (0.02") 0.005 (0.0002")
Automatic downfeed increment variable in 10 steps		0.005-0.05mm (0.0002"-0.002")
Wheel speed (rpm), 60hz	1740 rpm	
Wheel dimension (O.D.xTxI.D.)	305x38x127 (12"x1-1/2"x5")	
Spindle motor (V-3 grade)	5HP (3.75 KW)	
Hydraulic pump motor	2HP (1.5 KW)	
Automatic crossfeed motor	1/5HP (150W)	
Power elevation motor	1/4HP (187.5W)	
Coolant pump	1/8HP (93W)	
Machine net weight	2050kg (4510lb)	
Machine gross weight	2380kg (5236lb)	
Packing dimension (WxDxH)	2150x1950x2000 (84½"x77"x80")	

E. Putting The Machine Into Operation

(1). Control Panel & Description

a). KGS-360AH



PB1: Emergency stop pushbutton

PB8: Pushbutton "ON" & indicator of power source

PB2: Pushbutton "OFF" of grinding wheel motor

PB3: Pushbutton "ON" of grinding wheel motor

PB4: Pushbutton "OFF" of hydraulic motor

PB5: Pushbutton "ON" of hydraulic motor

PB6: Pushbutton "OFF" of coolant pump

PB7: Pushbutton "ON" of coolant pump

PB9: Pushbutton for saddle continuous travel, forward

PB10: Pushbutton for saddle continuous travel, backward

PB12: Pushbutton for grinding wheel elevation, upward

PB13: Pushbutton for grinding wheel elevation, downward

SW3: Selector switch for electric magnetic chuck, mag./demag.

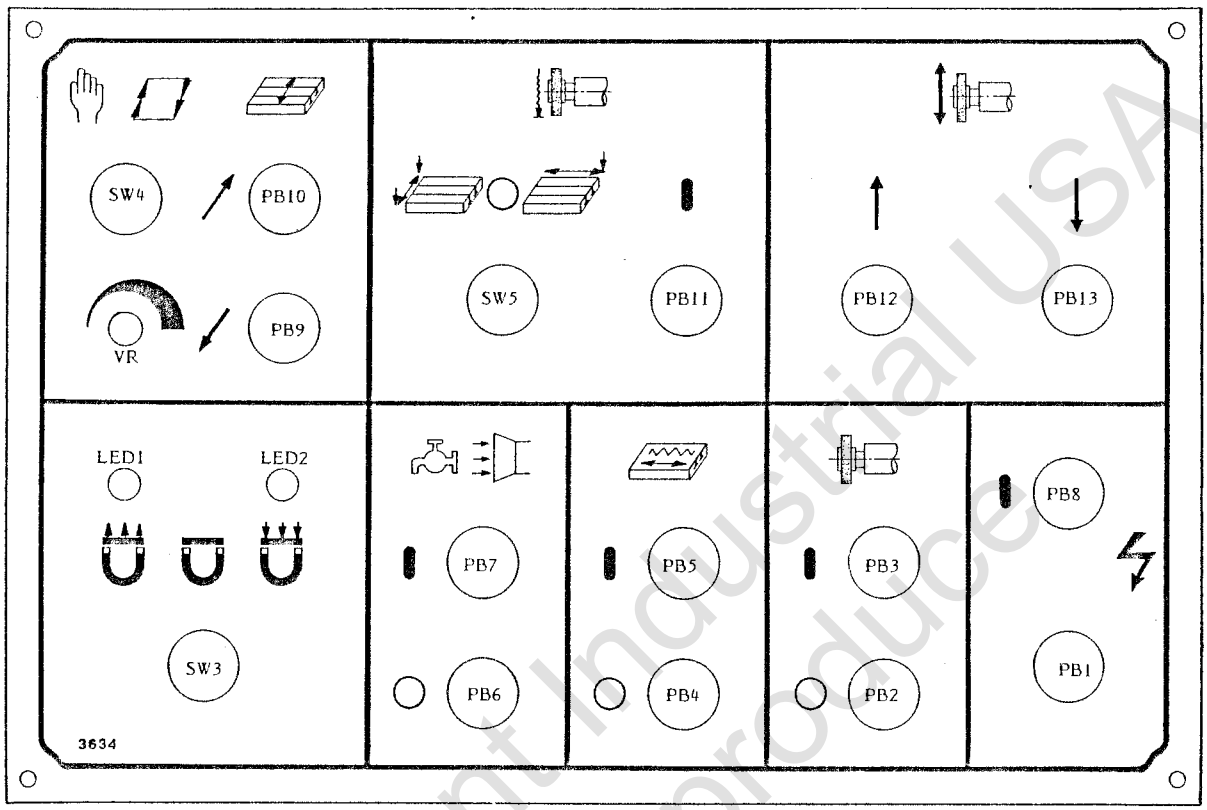
SW4: Selector switch for saddle auto./manu. functions

LED1: Indicator of electric magnetic chuck, demag.

LED2: Indicator of electric magnetic chuck, mag.

VR: Variable resistance for crossfeed incremental control

b). KGS-360AHD



PB1: Emergency stop pushbutton
PB8: Pushbutton "ON" & indicator of power source
PB2: Pushbutton "OFF" of grinding wheel motor
PB3: Pushbutton "ON" of grinding wheel motor
PB4: Pushbutton "OFF" of hydraulic motor
PB5: Pushbutton "ON" of hydraulic motor
PB6: Pushbutton "OFF" of coolant pump
PB7: Pushbutton "ON" of coolant pump
PB9: Pushbutton for saddle continuous travel, forward
PB10: Pushbutton for saddle continuous travel, backward
PB11: Pushbutton "ON" & indicator of auto. downfeed system
PB12: Pushbutton for grinding wheel elevation, upward
PB13: Pushbutton for grinding wheel elevation, downward
SW3: Selector switch for electric magnetic chuck, mag./demag.
SW4: Selector switch for saddle auto./manu. functions
SW5: Selector switch for surface grinding/ plunge grinding
LED1: Indicator of electric magnetic chuck, demag.
LED2: Indicator of electric magnetic chuck, mag.
VR: Variable resistance for crossfeed incremental control

(2). Operation

a). Before operation

It's only after the 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-dust 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, it must be in clockwise. Please take off the wheel prior to start spindle or it will cause danger if it rotates in counter-clockwise.
6. Fill up the hydraulic tank with suitable oil.
7. Flow control lever for hydraulic table traverse must be in close position.
8. Adjust suitable stroke of the table. The longitudinal stroke is limited by two pieces of stopper dog on the front side of table. The distance can be adjusted by loosening the screws, sliding the stopper dogs and fastening again.
9. And mention again: Please re-check your power source is same as that of the voltage pre-wired when shipping.

b). Operation

1. Power ON & OFF
   a. Press PB8, GL indicator lights, electric control box is ready.
   b. Press PB1 to stop power. Re-set PB1 and re-press PB8 for power ON again.
2. Wheel spindle
   Press PB2, the wheel spindle motor starts; press PB3 to stop.
3. Power elevation
   a. Press PB12, the wheel elevation upward, release to stop. Press PB13, the wheel elevation downward, release to stop.
   b. When the grinding wheel is going to touch workpiece, change to control downfeed by handwheel.
4. Table longitudinal travel
   a. Press PB4 to start hydraulic motor.
   b. Turn the flow control lever clockwise until the table starts slowly, when it turns to 90° it gets maximum table speed.
   c. If the table starts jerkily, may be there is air in the hydraulic hose. The air will escape easily if the table be operated at high speed and long stroke.
   d. Press PB5 to stop hydraulic motor, now the table can be operated by handwheel.

5. Cross travel

a. Turn SW4 to left ( position), press PB9 makes saddle traverse backward continuously; press PB10 makes saddle traverse forward continuously. For AHD model, this function only effective when SW5 is in left position (surface grinding), it's the safety device to interlock saddle traverse when SW5 in right position for plunge grinding.

b. Turn SW4 to right ( position), press PB9 or PB10 and release, adjust VR, the saddle now feeds automatically which effected with each reversal of the table when surface grinding. By acturating SW4 to left, this function can be interrupted at once. The crossfeed distance can be limited by setting the two stopper dogs' distance to touch the two limit switches located on the right side of the machine base, which effects the reversal of the saddle.

c. There are two limit switches, in addition, on the left side of machine base for limitting the maximum cross travel of the saddle. They are also used as safety device in case of accident when any failure of the crossfeed mechanism.

6. Automatic downfeed control (For AHD model)

a. Turn selector switch SW5 on  (plunge grinding) position, press pushbutton PB11 then grinding wheel will auto. downfeed when table longitudinal traverse at left end; turn selector switch SW5 on  (surface grinding) position, press PB11, then grinding wheel will auto. downfeed at both ends of crossfeed travel; turn selector switch SW5 on neuture position, grinding wheel stop auto. downfeed.

b. Downfeed increment can be pre-set by preset dial at 0.005, 0.01, 0.015, 0.02, 0.025, 0.03, 0.035, 0.04, 0.045, 0.05mm, 10 steps (metric type); or 0.0002, 0.0004, 0.0006, 0.0008, 0.001, 0.0012, 0.0014, 0.0016, 0.0018, 0.002inch, 10 steps (inch type). Figure shown under is downfeed increment be set at 0.025mm.

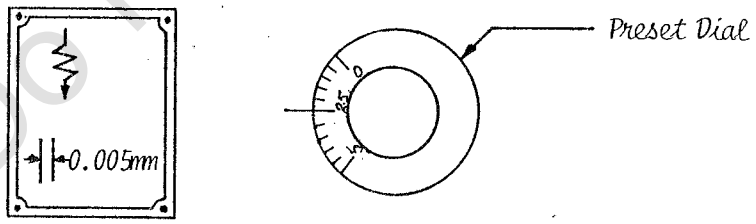
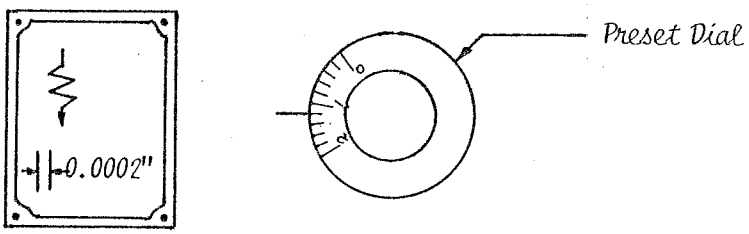
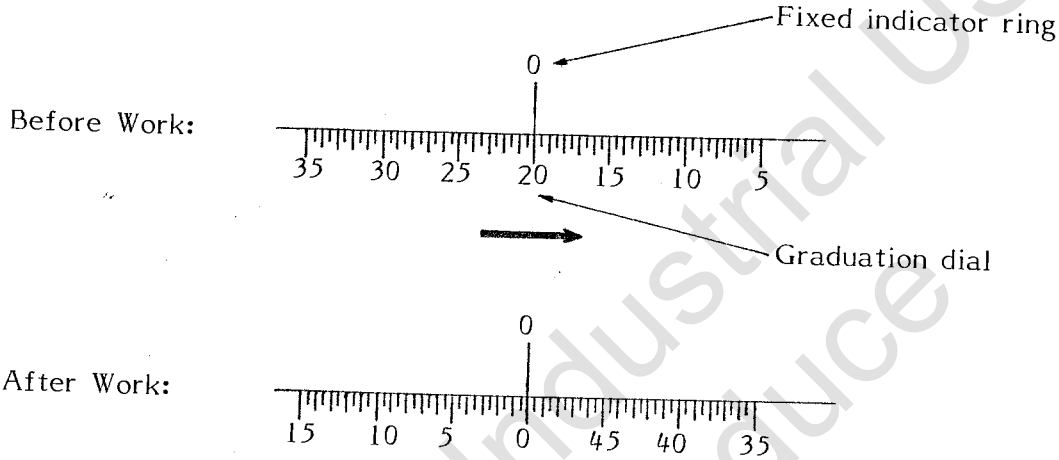


Figure shown under is downfeed increment be set at 0.0012"



c. For instance, total work piece downfeed removal is 0.3mm, and automatic downfeed increment be set at 0.02mm:

Loosen the set screw on graduation dial and turn the dial to let the scale "20" aim at the mark "0" on the fixed indicator ring. (1 revolution of downfeed handwheel is 0.5mm minus total removal 0.3mm leaves 0.2mm) After automatic downfeed 15 times at each time 0.02mm (0.02mm x 15 = 0.3mm), the mark "0" of graduation dial will meet "0" of fixed indicator ring and automatic downfeed stop.



d. Stop the table longitudinal traverse by press pushbutton PB4; stop grinding wheel by press pushbutton PB2 when work is done.

Caution: Don't push the auto downfeed button while the table is traveling close to the right end. (or the left stop dog is approaching the direction control arm.) The Cylinder might be hit at its left end, especially when the longitudinal traverse is at its maximun distance.

The best time to push the auto downfeed button:

When the direction control arm is near the middle range of the two dogs.

7. Coolant system (optional accessory)
   a. Press PB6 to start coolant pump.
   b. Adjust cock valve to get suitable coolant flow.
8. Dust-suction coolant system (optional accessory)
   a. Press PB6 to start suction motor or coolant pump.
   b. Adjust cock valve to get suitable coolant flow (when wet grinding).
   c. Press PB7 to stop.

** Caution: There are two sets of ON-OFF switches on Dust-suction coolant system: one is for dust-collector (dry grinding) and the other one is for coolant pump (wet grinding), it depends on your work situation. These two switches can not be used simultaneously.

9. Electro-magnetic Chuck
   a. Turn SW3 to right position for chuck magnetism, LED2 indicator light.
   b. Turn SW3 to left position for chuck demagnetism, LED1 indicator light, then LED2→ LED1→ LED2→ LED1 total 5 times. After vanished, the chuck is in full demagnetism condition.

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 distorrion 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) Undersirable 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 are two pieces of paper washer on both faces of wheel and serve as plastic packings between wheel and mounting flange. The packing washer must not be removed, when mounting the wheel should 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. The flange fixing screws should be tightened gradually and diagonally. The wrench should be applied at least 4 to 6 times to each screw in turn. When the wheel has run under coolant for sometime the paper packing washers will be damped, so it must re-tighten the fixing screws again diagonally.

H. Dressing The Wheel And Correct Treatment Of Dressing Diamond

The diamond is inserts in the dressing device. The sleeve of the dressing device is arranged at an angle fo 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 diamond edge available.

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

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

If the component is to 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.

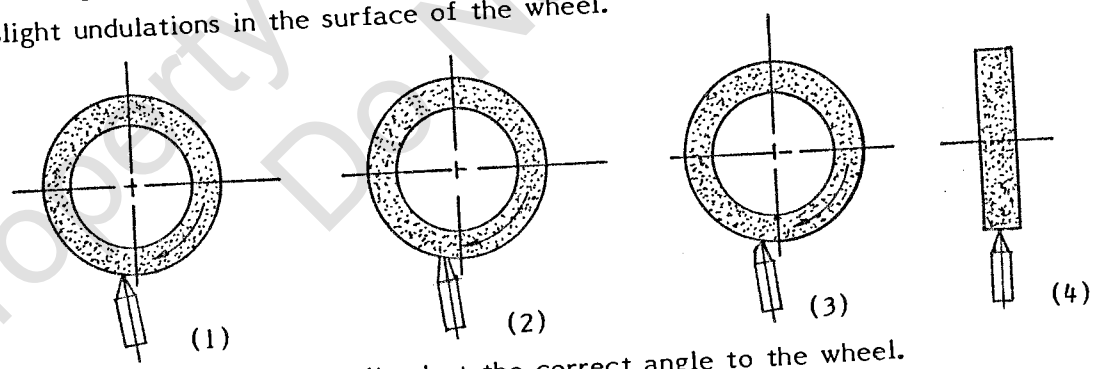
Frequent light dressing is better for the life of the grinding wheel and the diamond than a heavy cut.

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 uaually worn down further. If dressing is begun at the worn edges, there is danger of the higher pressure in the center overstressing the daimond 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.



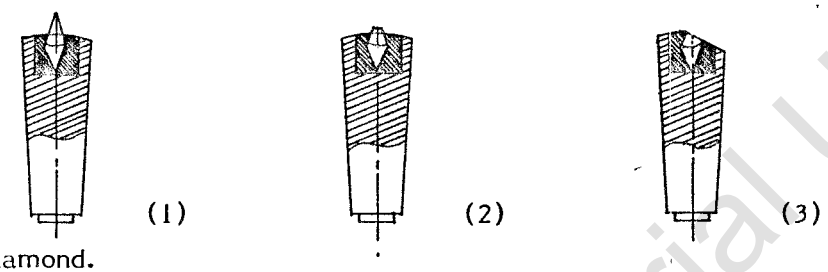
(1) The new diamond is inclined at the correct angle to the wheel.

(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, i.e. it must be reset to ensure economical operation. This re-setting should be undertaken in time, before any of the holder itself has been ground off. Otherwise, there is first of all the danger of breaking the diamond out and losing it, 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 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 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 to 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 \ Sturcture	Wide	Close
Surface roughness	coarse	fine
Surface be contacted	wide	narrow
Works 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	205 to 355mm
Carbon steel	under HRC25°	WA A 46K	WA A 46J
	above HRC25°	WA 46J	WA 46I
Alloy steel	under HRC55°	SA WA 46J	SA WA 46I
	above HRC55°	SA WA 46H	SA WA 46G
Tool steel	under HRC60°	SA WA 46I	SA WA 46H
	above HRC60°	SA WA 46H	SA WA 46H
Stainless steel		SA WA 46 I	SA WA 46H
Cast iron		C 46J	C 46I
Brass		C 30J	C 30 I
Aluminum alloy		C 30J	C 30 I
Tungsten Carbide		GC 60H-1001	GC 60H-1001
Glass		C 60K	C 60K
Marble		C GC 36M	C GC 36M

L. Choice Of The Grinding Conditions

(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 $\frac{1}{4}$ 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 $\frac{1}{2}$ 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.

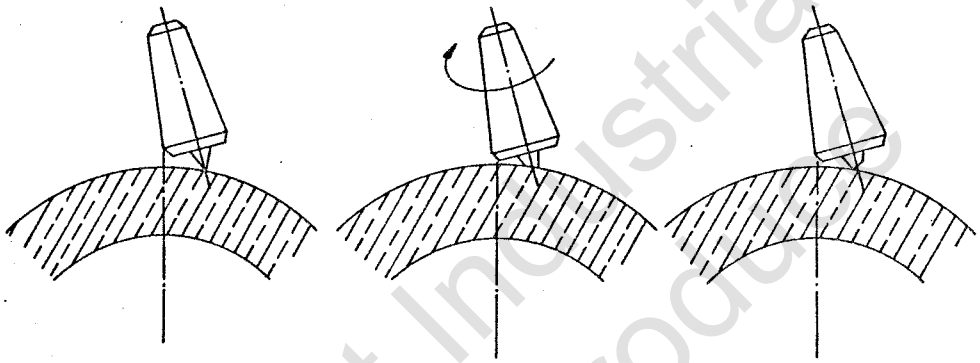
Wheel speed / Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	better

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

M. Use Of The Optional Attachments

(a),Parallel Dressing attachment (Standard Accessory)

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 Fig. , 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.



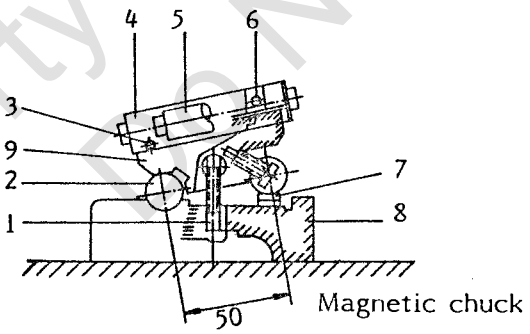
(b). Angle forming attachment

(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.

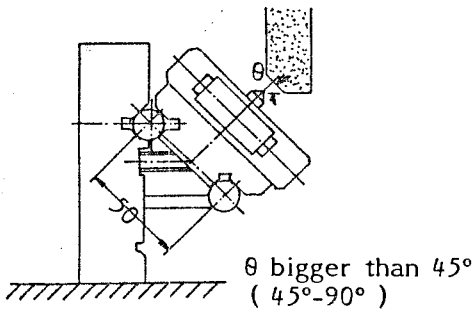
(2) The value in question will be the Sine of the angle times 50. That is B=Sinθ x 50

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

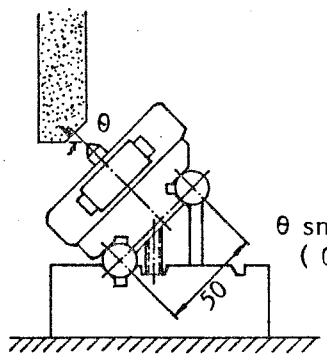
(4) Put this Block gauge under the base of the Sine Bar stand. Fix with the fastening bolts and the forming is done.



Magnetic chuck



θ bigger than 45°
(45°-90°)



θ smaller than 45°
(0°-45°)

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

(c). Sine Bar

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

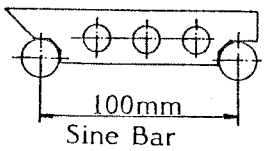
(1) The value in question equals the Sine of the angle times 100, B=Sinθ x 100

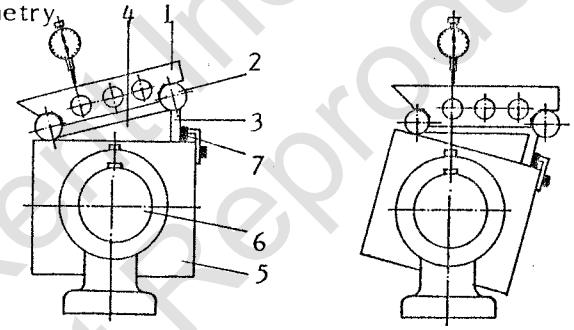
(2) Get a block gauge the thickness of which equals that of B.

(3) Put this gauge at one end of the Sine Bar and let it be attacted 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 accurancy of the angle of the magnetic chuck

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

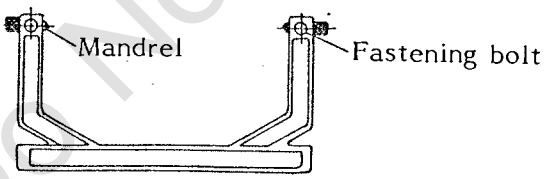




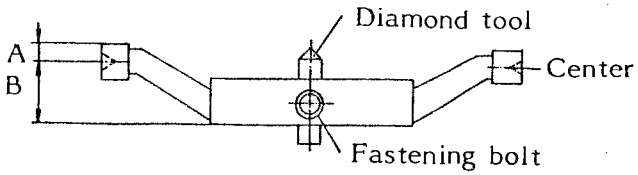
(d) . Radius Forming Attachment

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

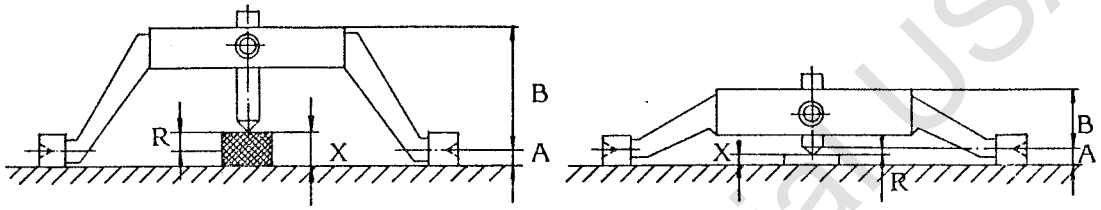
The R forming is the adjustment of the distance between the diamond tool and the swing rod center so that the R shaping results.

(3) To determine the concave and convex R:

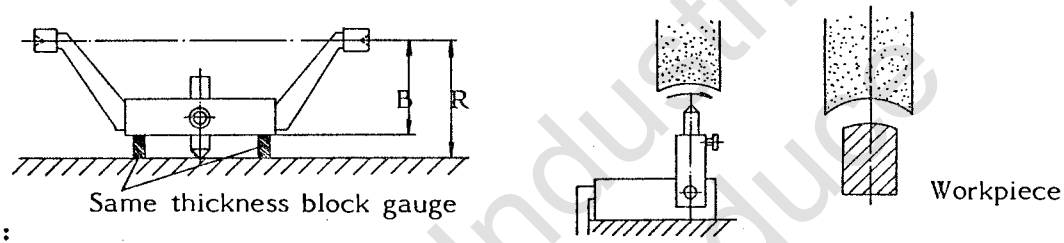
a. If the tool is parallel to the center line, it equals OR.

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

c. To determine the small concave R



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

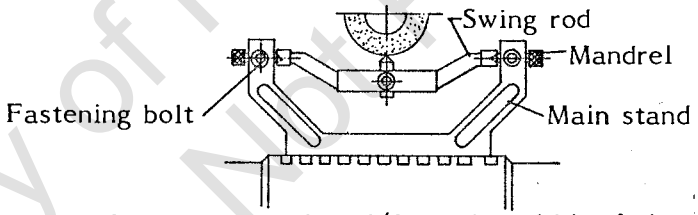


e. Note:

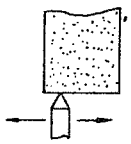
1. The base and side of the grinding wheel shall be well-dressed.
2. The Radius Forming Attachment shall be parallel to the grinding wheel.
3. The diamond tool shall be parallel to the Radius Forming Attachment.

(4) Operation of the Radius forming attachment:

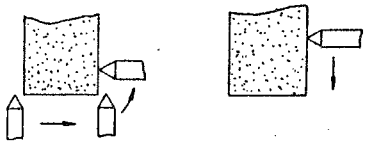
a. Find the center of the grinding wheel. then fix the work table.



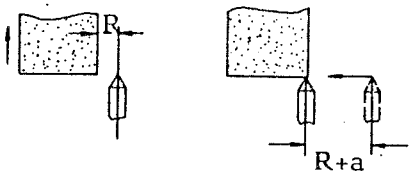
b. Turn the down-feed handwheel at 1/3 on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.



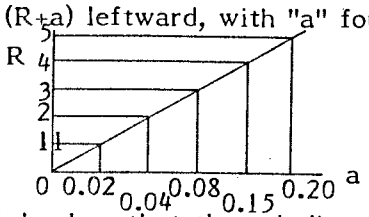
c. Turn the diamond tool over an angle 90^{o} and elevate it into a proper position (greater than the R size in question)



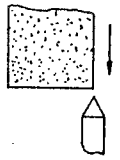
d. Elevate the grinding wheel so that it goes away from the diamond tool and the wheel in such a position that the distance betwen the side of the wheel and the center of the Diamond tool is just R.



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

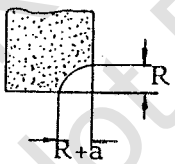


f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



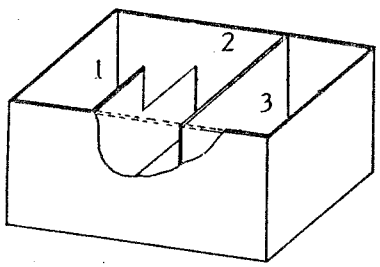
g. Turn the swing rods 90° each time, inching 0.05mm till the R is determined.

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.



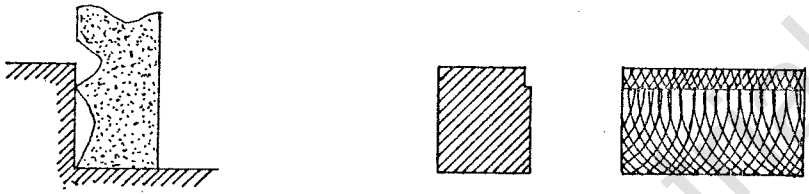
* Coolant tank capacity: 40 liters
* Coolant pump: 1/8 HP x2P

(f) . Common cases in Side Grinding

(1)

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

(2)



Inthe 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.

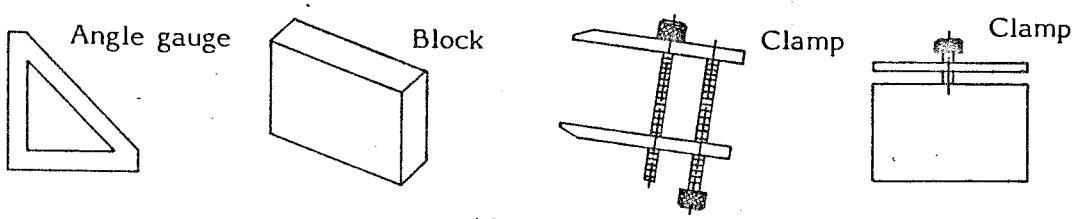
(4)

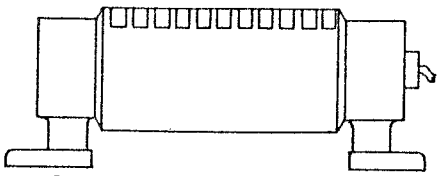
The "Relief Angle" of the wheel is lower than the surface of the work, so that the work face becomes two sections, the upper section resembling that in (3) and the lower section in (1). Now it is necessary to enlarge the "Relief Angle" part so that it will higher than the face of the work.

(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

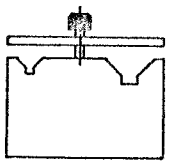
(1) Tools





Inclinable Magnetic Chuck

Block gauge

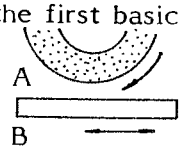


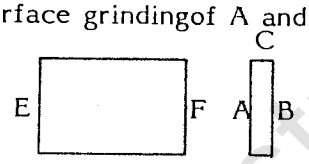
Clamp

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

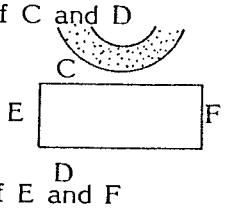
a. Under 200mm:

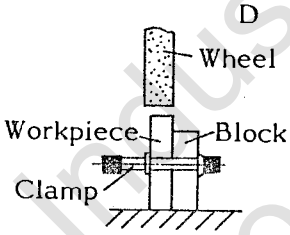
* Grinding of the first basic face, or the surface grindingof A and B,



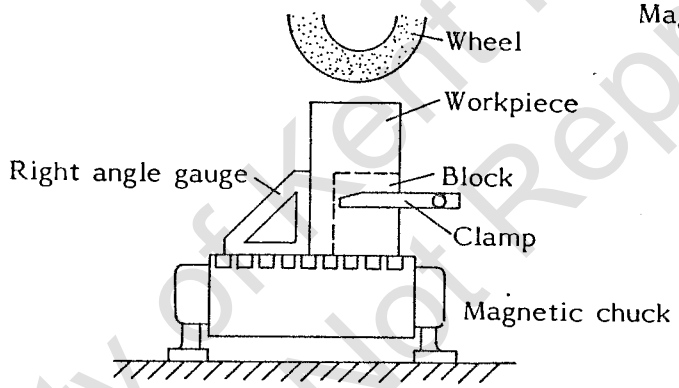


* Grinding of C and D





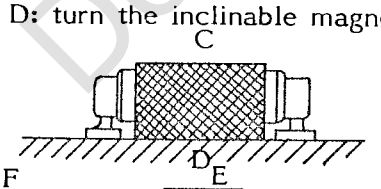
* Grinding of E and F



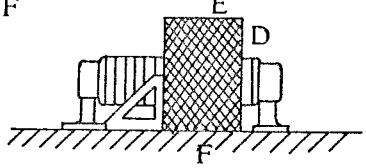
b. Over 200mm:

* 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 grinding of right angle depends on the patience and clever mindedness of the operator for its precision. For inatance, whether the burrs after grinding is done well, whether the tools 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 KNOCKDOWN DRAWINGS & PARTS LISTS

****

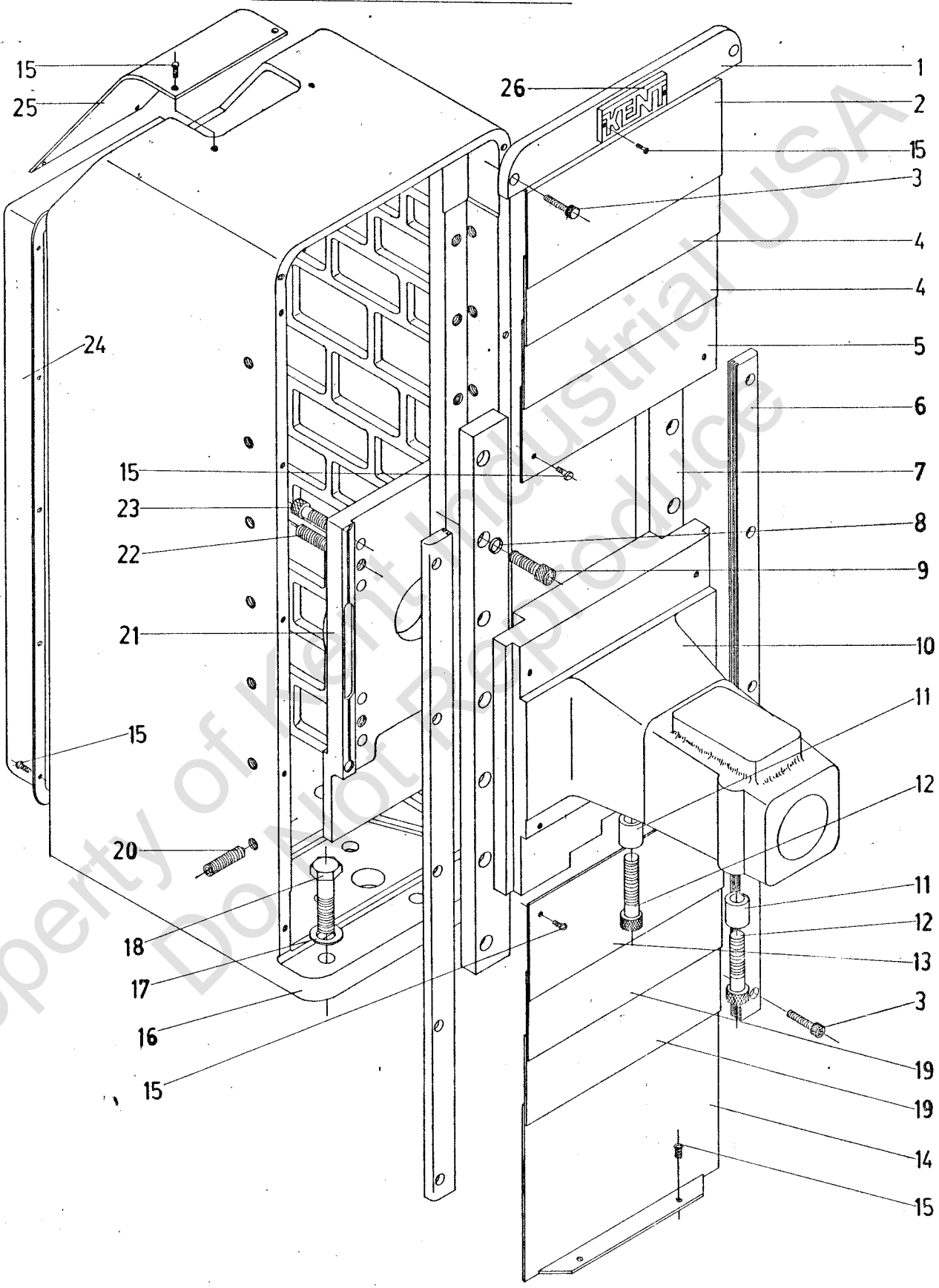
WHEN ORDERING PARTS, PLEASE MENTION:

1. MACHINE MODEL & SERIAL NUMBER,
2. ITEM NUMBER,
3. PARTS NUMBER AND NAME,
4. QUANTITY.

COMPLETE KNOCKDOWN DRAWINGS & PARTS LISTS
****

CONTENTS

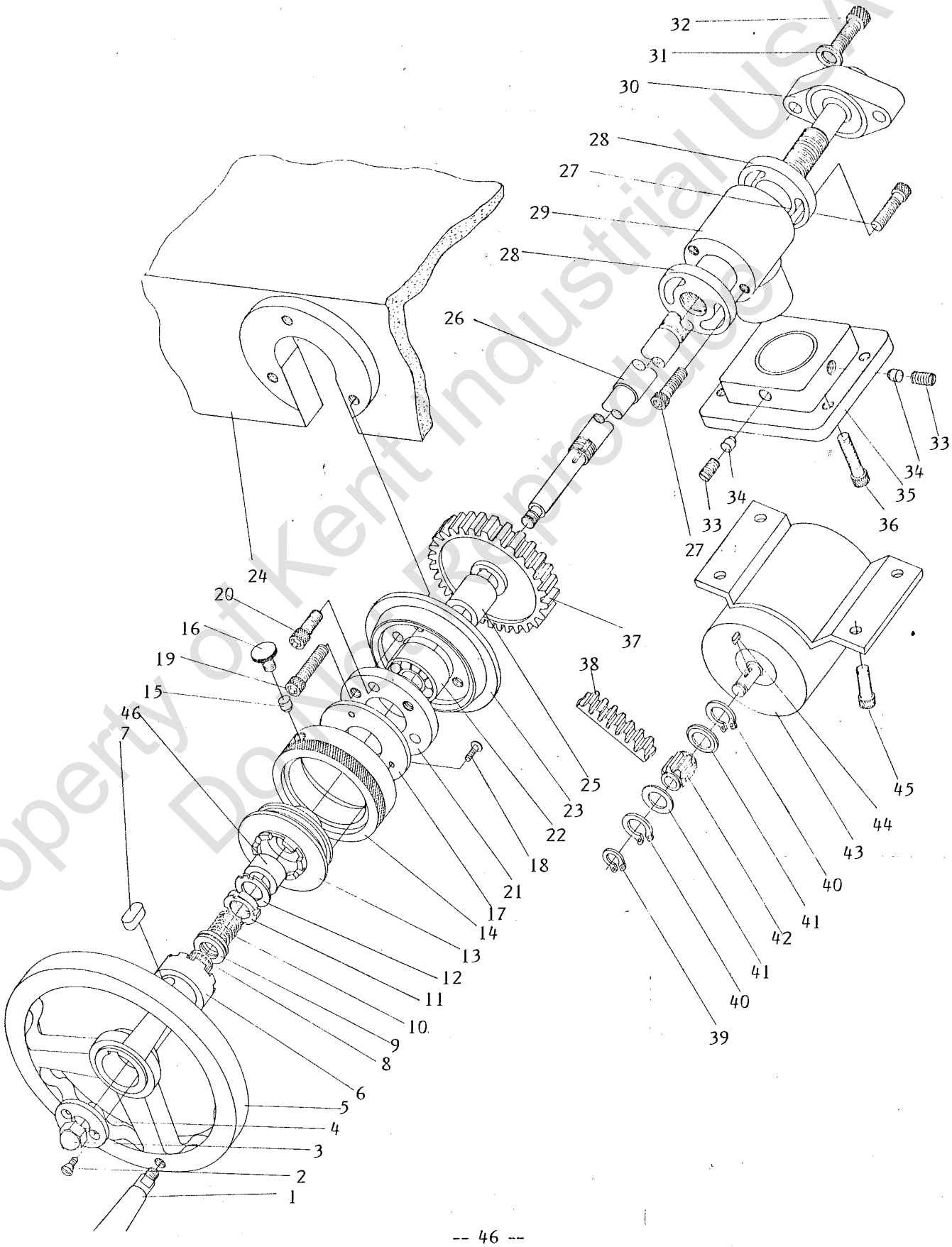
KGS-360AH, AHD Column Ass'y



KGS-360AH, 360AHD Column Ass'y

Index No.	Parts No.	Parts Name	Q'ty
1.	361408	Column front cover	1
2.	361414	Dust shield	1
3.	F10406C	Socket head-cap screw	2
4.	361412	Dust shield	2
5.	361415	Dust shield	1
6.	361406	Shield guide	2
7.	361407	Vertical slide way	2
8.	WWS0006	Spring washer	14
9.	F10610C	Socket head-cap screw	14
10.	361401	Spindle housing	1
11.	361405	Spindle fixing bush	2
12.	F11018C	Socket head-cap screw	2
13.	361413	Dust shield	1
14.	361411	Dust shield	1
15.	F40303C	Round head screw	10
16.	361102	Column	1
17.	WWS0012	Spring washer	4
18.	F31220C	Hexagonal screw	4
19.	361416	Dust shield	2
20.	F20606C	Set screw	14
21.	361403	Motor fixing plate	1
22.	F10812C	Socket head-cap screw	4
23.	F10814C	Socket head-cap screw	8
24.	361121	Column rear cover	1
25.	361122	Column upper cover	1
26.	361409	Column Name Plate	1

KGS-360AH, AHD Crossfeed Ass'y

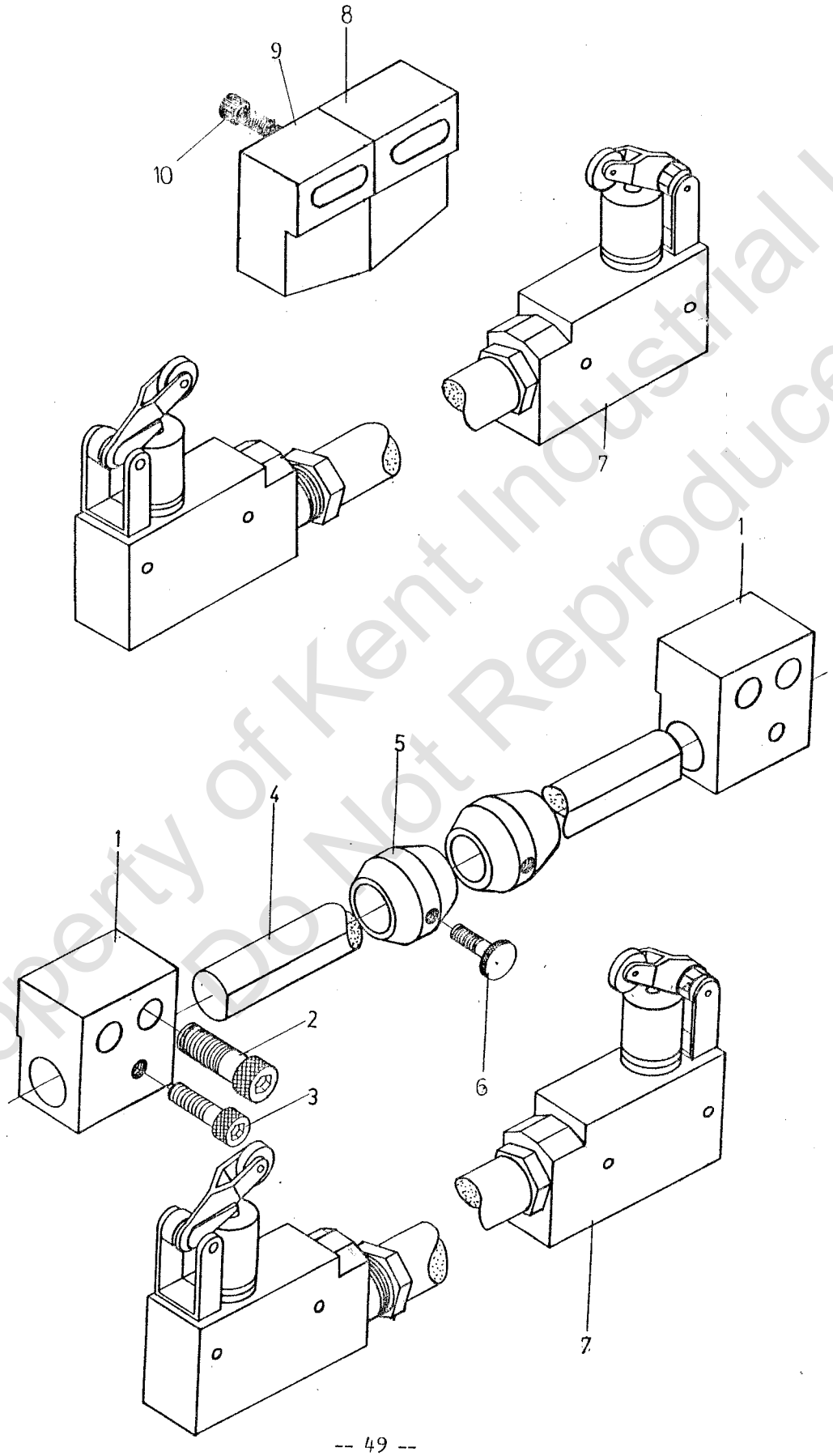


KGS-360AH, 360AHD Crossfeed Ass'y

Index No.	Parts No.	Parts Name	Q'ty
1.	910129	Grip	1
2.	F50303C	Machine screw	2
3.	910101	Cap nut	1
4.	361209	Fixing plate	1
5.	910127	Handwheel	1
6.	361202	Handwheel clutch	1
7.	WDK7720	Key	1
8.	BST1722	Niddle bearing	1
9.	B51103	Trust bearing	1
10.	361205	Spring	1
11.	WNA004R	Check nut	1
12.	WWA0004	Ratchet washer	1
13.	361203	Clutch	1
14.	361201	Graduation dial (inch size 361281)	1
15.	361208	Fixing pin	1
16.	461205	Fixing screw	1
17.	361206	Fixing plate	1
18.	F50305C	Machine screw	3
19.	F10407C	Socket head-cap screw	3
20.	F10404C	Socket head cap screw	3
21.	251206	Bearing retainer	1
22.	B520400	Bearing	1
23.	361204	Graduation dial holder(inch size 361282)	1
24.	361103	Saddle	1
25.	361293	Spacer	1
26.	361211	Crossfeed leadscrew (inch size 361291)	1
27.	F10510C	Socket head-cap screw	4
28.	361212	Leadscrew nut (inch size 361292)	1
29.	361222	Leadscrew nut holder	1
30.	BSUL204	Bearing	1
31.	WWS0006	Spring washer	2
32.	F10608C	Socket head-cap screw	2
33.	F20804C	Set screw	2
34.	361224	Fixing pin	2
35.	361223	Leadscrew nut base	1

Index No.	Parts No.	Parts Name	Q'ty
36.	F10514C	Socket head-cap screw	4
37.	251232	Timing belt pulley	1
38.	DTZ10L3	Timing belt	1
39.	W000S11	Snap ring	1
40.	W000S18	Snap ring	2
41.	251233	Washer	2
42.	251234	Timing belt pulley	1
43.	MHB2062	Motor	1
44.	WDK4410	Key	1
45.	F10505C	Socket head-cap screw	4
46.	361210	Collar	1

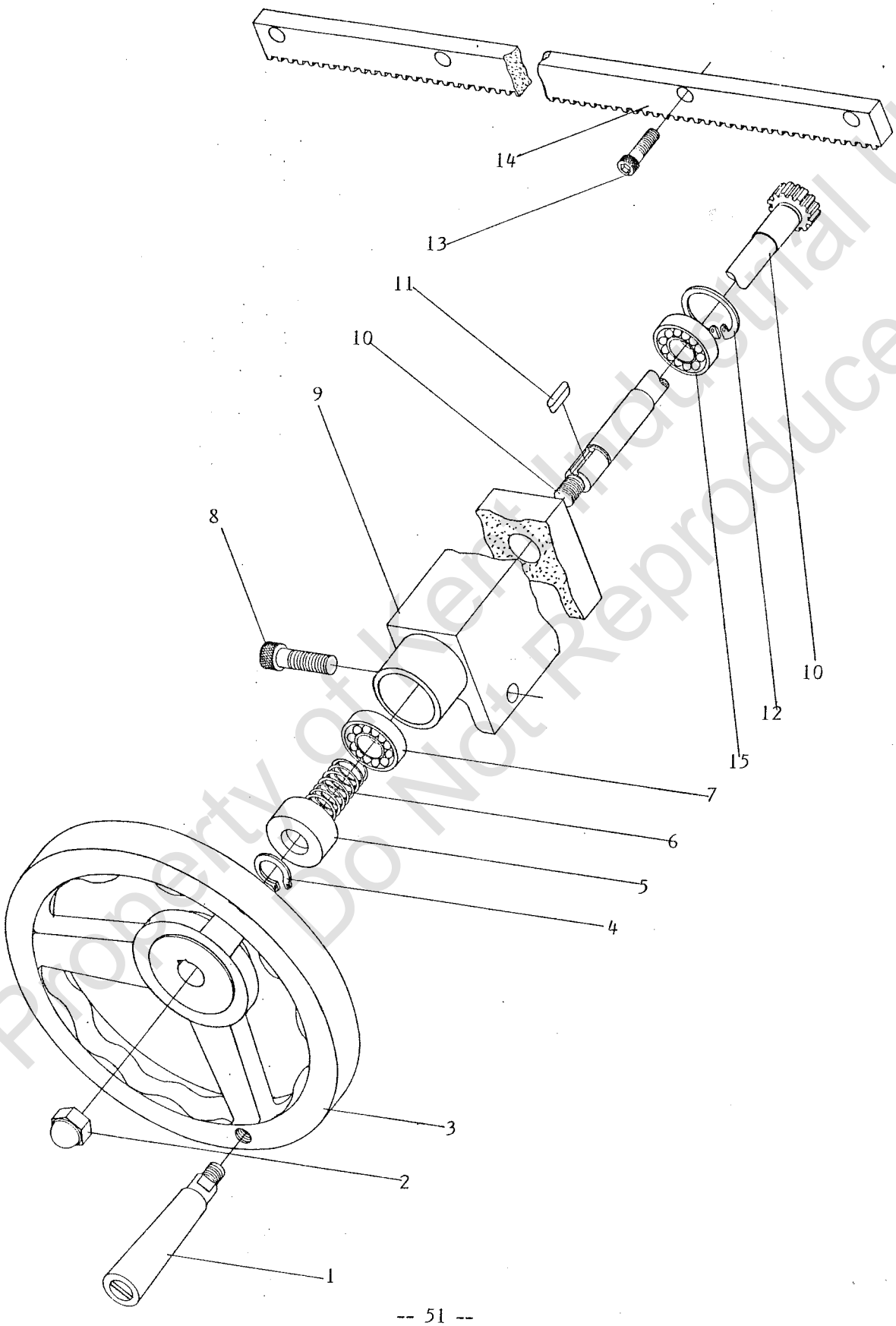
Crossfeed Control Limit Switch



Crossfeed Control Limit Switch

Index No.	Parts No.	Parts Name	Q'ty
1.	251551	Mounting bracket	2
2.	F10408C	Socket head-cap screw	4
3.	F10404C	Socket head-cap screw	4
4.	301251	Pad rod	1
5.	251553	Dog	2
6.	251205	Fixed screw	2
7.	ES9001	Limit switch	4
8.	251554	Dog	1
9.	251555	Dog	1
10.	F10406C	Socket head-cap screw	2

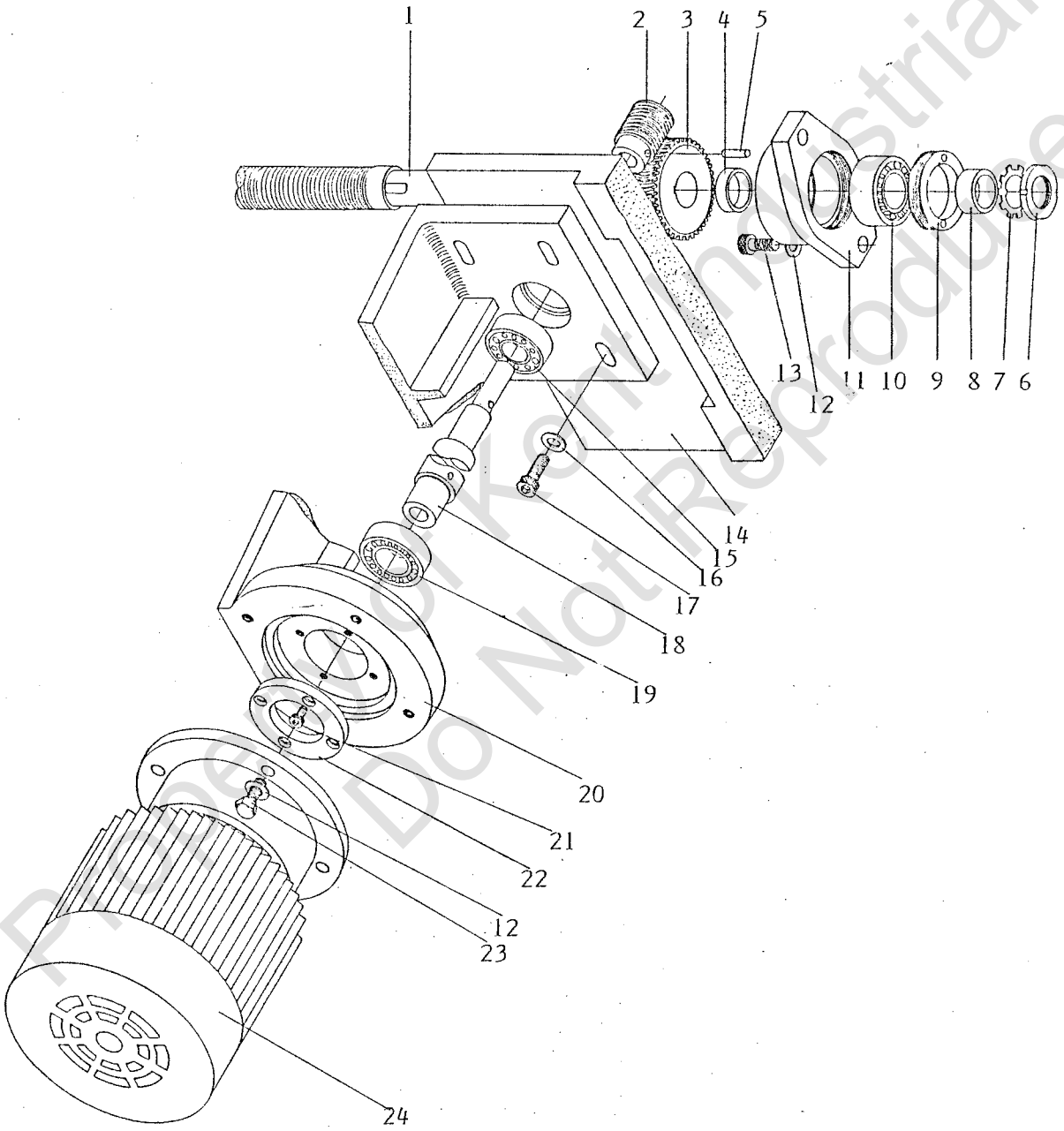
Longitudinal Hand Feed Ass'y



Longitudinal Hand Feed Ass'y

Index No.	Parts No.	Parts Name	Q'ty
1.	910129	Grip	1
2.	910101	Cap nut	1
3.	910128	Handwheel	1
4.	W000S17	Snap ring	1
5.	361355	Bush	1
6.	251352	Spring	1
7.	B120300	Bearing	1
8.	F10610C	Socket head-cap screw	3
9.	361353	Frame	1
10.	361354	Pinion shaft	1
11.	WDK5520	Key	1
12.	W000R35	Snap ring	1
13.	F10405C	Socket head-cap screw	7
14.	301355	Gear rack	1
15.	B6003Z0	Bearing	1

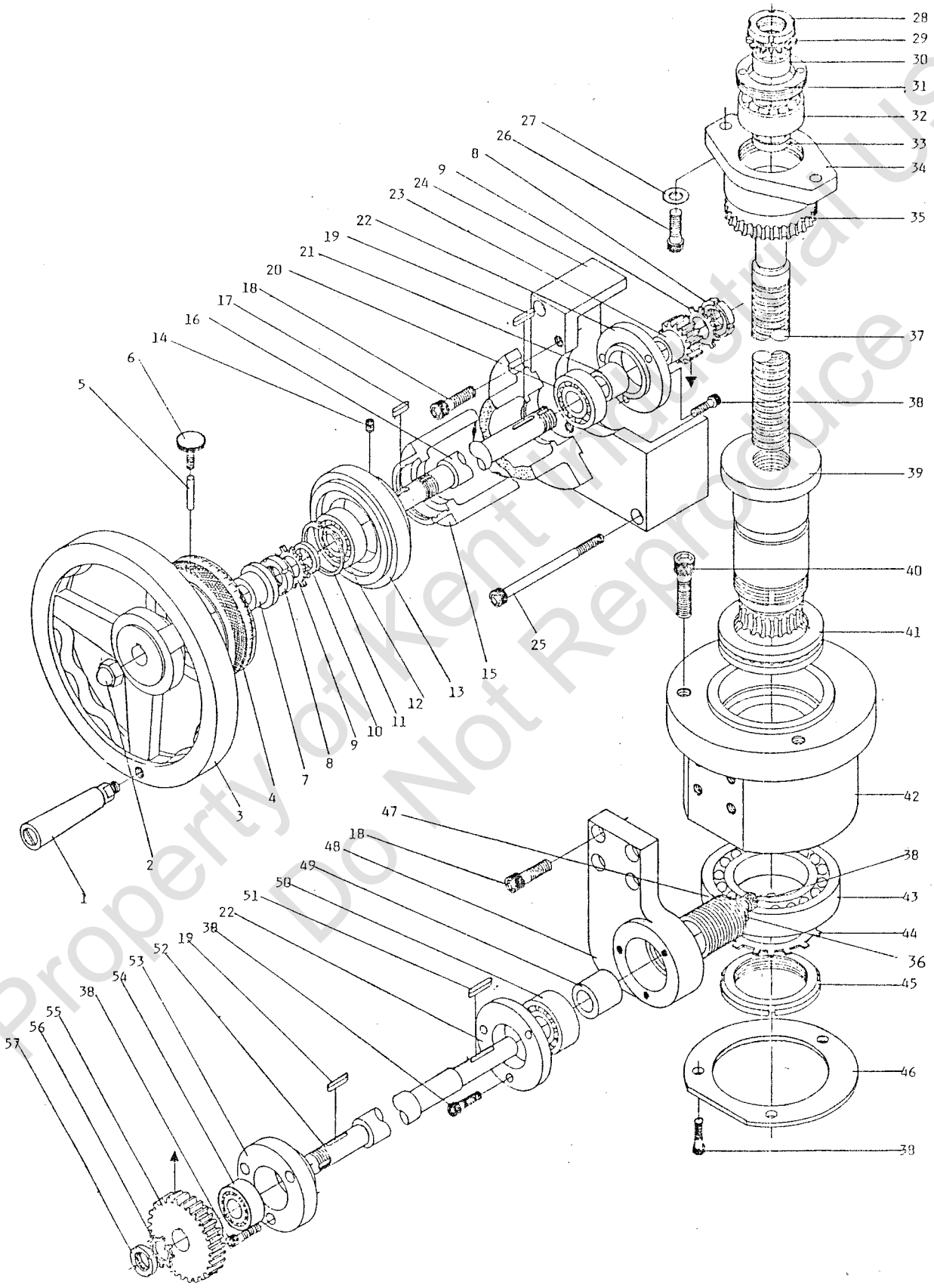
Power Elevation Ass'y



Power Elevation Ass'y

Index No.	Parts No.	Parts Name	Q'ty
1.	361431	Elevation leadscrew(mm size)	1
	361491	Elevation leadscrew(inch size)	
	361493	Elevation leadscrew(inch size lefthand thread)	
2.	361453	Worm	1
3.	361454	Worm gear	1
4.	361433	Collar	1
5.	WPS0530	Spring pin	1
6.	WNA005T	Check nut	1
7.	WWA0005	Ratchet washer	1
8.	361436	Collar	1
9.	361435	Nut	1
10.	B520500	Bearing	1
11.	361434	Connector	1
12.	WWS0006	Spring washer	6
13.	F10610C	Socket head-cap screw	2
14.	361403	Motor fixing plate	1
15.	B720400	Bearing	1
16.	WWS0005	Spring washer	4
17.	F10510C	Socket head-cap screw	4
18.	361451	Shaft	1
19.	B720500	Bearing	1
20.	361450	Power elevation motor base	1
21.	F10406C	Socket head-cap screw	4
22.	361452	Bearing cover	1
23.	F30608C	Hexagonal bolt	4
24.	MVB2562	Motor	1

Vertical Feed Ass'y (KGS-360AH, 360AHD)

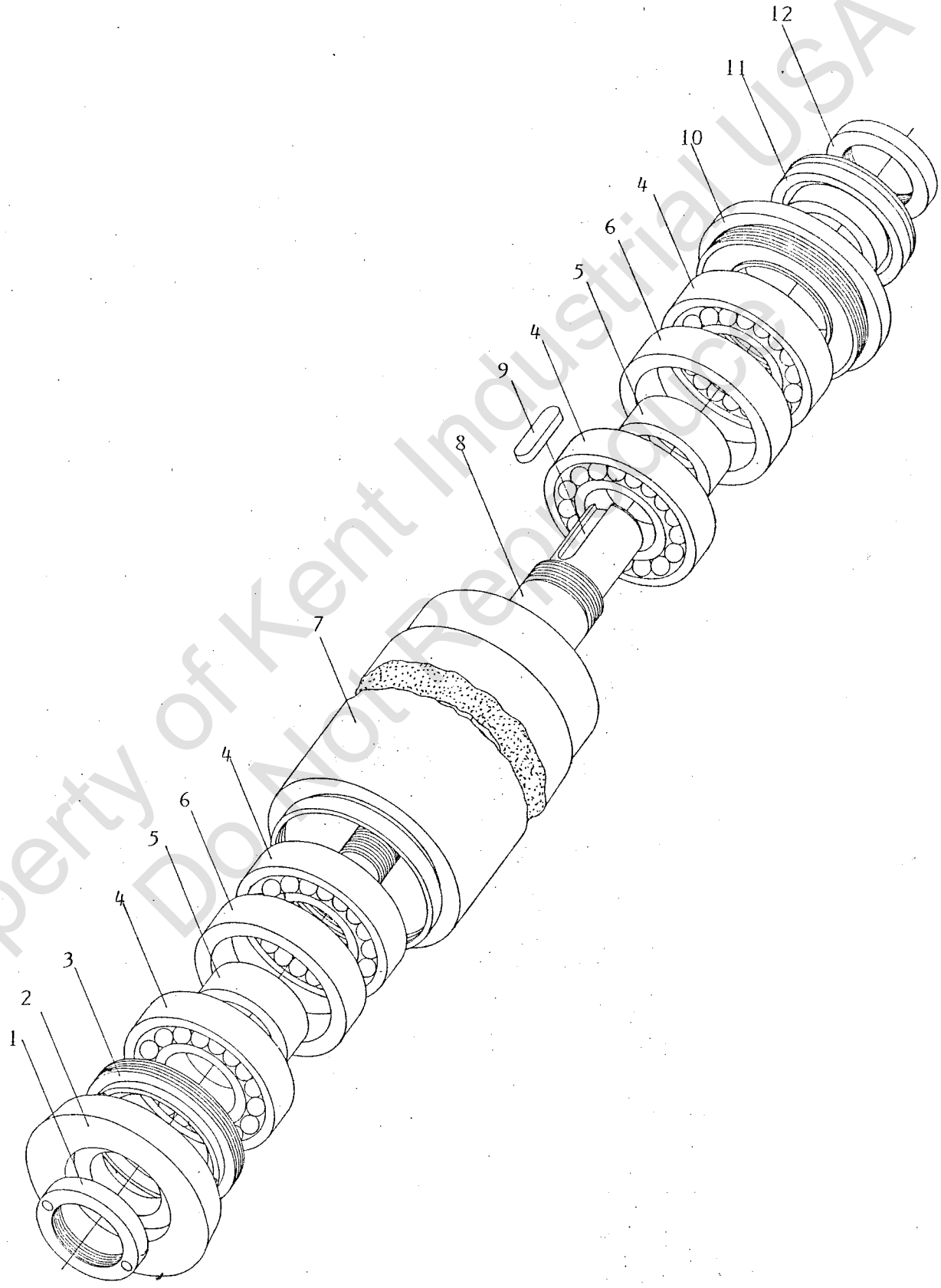


Vertical Feed Ass'y (KGS-360AH, 360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	910129	Grip	1
2.	910101	Cap nut	1
3.	910128	Handwheel	1
4.	361421	Graduation Dial (mm size)	1
	361481	Graduation Dial (inch size)	
	361483	Graduation Dial (inch size lefthand thread)	
5.	251403	Fixed pin	1
6.	251205	Adjusting screw	1
7.	251402	Graduation dial bush	1
8.	WNA004R	Check nut	2
9.	WWA0004	Ratchet washer	2
10.	361423	Spacer	1
11.	W000R47	Snap ring	1
12.	B120400	Bearing	1
13.	361422	Graduation dial holder (mm size)	1
	361482	Graduation dial holder (inch size)	
14.	F20203C	Set screw	1
15.	361425	Bearing housing	1
16.	361426	Shaft	1
17.	WDK5520	Key	1
18.	F10610C	Socket head-cap screw	7
19.	WDK5525	Key	2
20.	B620400	Bearing	1
21.	361428	Collar	1
22.	361443	Bearing cover	2
23.	361429	Pinion	1
24.	361427	Gear housing	1
25.	F10526C	Socket head-cap screw	4
26.	F10609C	Socket head-cap screw	2
27.	WWS0006	Spring washer	2
28.	WNA005T	Check nut	1
29.	WWA0005	Ratchet washer	1
30	361436	Collar	1
31.	361435	Bearing nut	1
32.	B520500	Bearing	1
33.	361433	Collar	1
34.	361434	Connector	1
35.	361454	Worm gear	1

Index No.	Parts No.	Parts Name	Q'ty
36.	361447	Washer	1
37.	361431	Elevation leadscrew (mm size)	1
	361491	Elevation leadscrew (inch size)	
	361493	Elevation leadscrew (inch size lefthand thread)	
38.	F10406C	Socket head-cap screw	13
39.	361432	Leadscrew nut (mm size)	1
	361492	Leadscrew nut (inch size)	
	361494	Leadscrew nut (inch size lefthand thread)	
40.	F10814C	Socket head-cap screw	3
41.	B511130	Trust bearing	1
42.	361440	Bearing housing	1
43.	B721300	Bearing	1
44.	WWA0013	Ratchet washer	1
45.	WNA013R	Check nut	1
46.	361446	Bearing fixed ring	1
47.	361437	Worm	1
48.	361444	Fixed bracket	1
49.	361445	Collar	1
50.	B520400	Bearing	1
51.	WDK5535	Key	1
52.	361441	Shaft	1
53.	361430	Bearing bracket	1
54.	B220300	Bearing	1
55.	361442	Gear	1
56.	WWA0002	Ratchet washer	1
57.	WNA0002R	Check nut	1

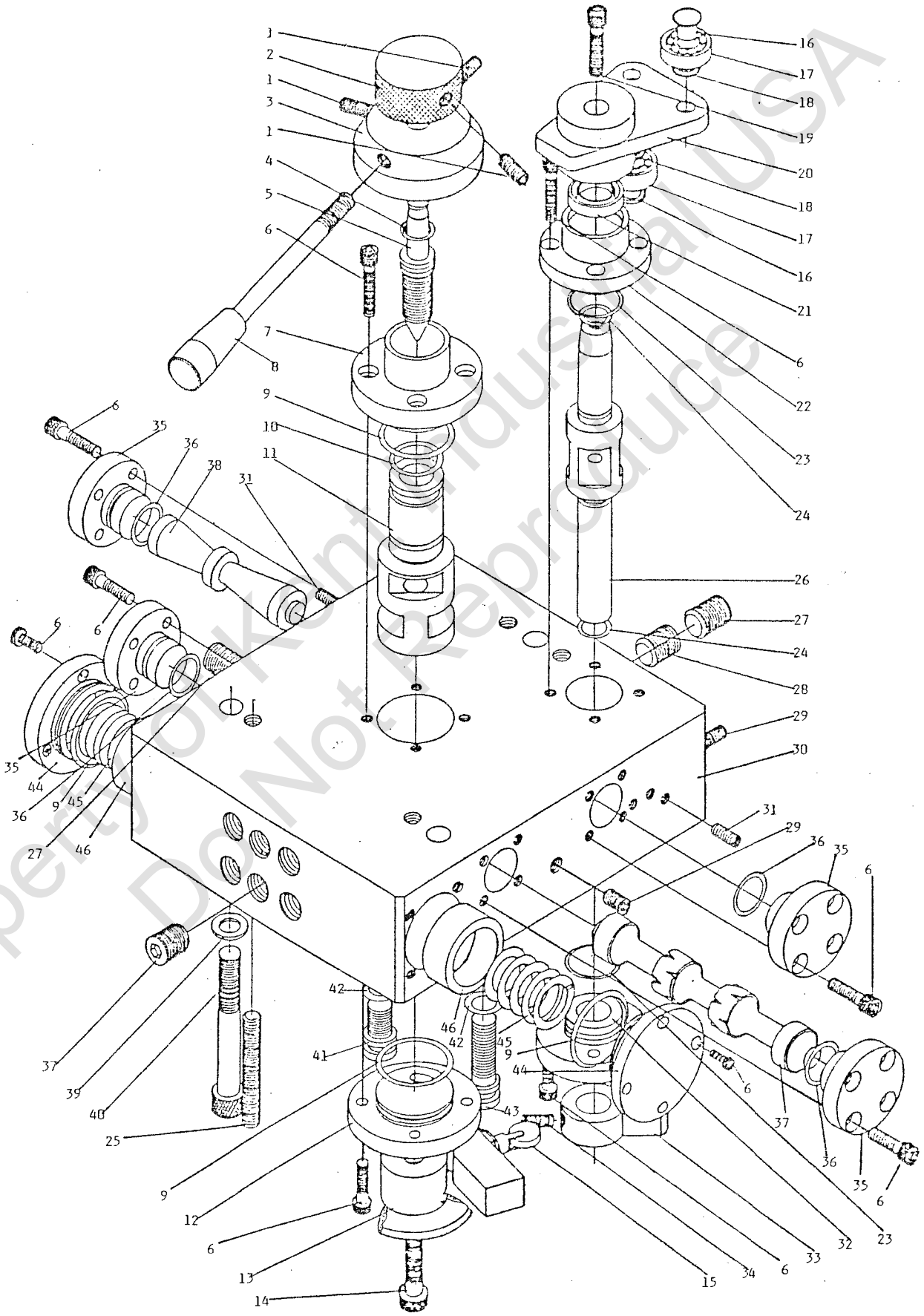
Spindle Ass'y (KGS-360AH, 360AHD)



Spindle Ass'y (KGS-360AH, 360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	301503	Fixed cover	1
2.	301505	Anti-dust cover	1
3.	301504	Spindle nut	1
4.	BS7207G	Bearing	4
5.	301506	Spacer	2
6.	301507	Spacer	2
7.	361501	Spindle housing	1
8.	361502	Spindle shaft	1
9.	WDK7735	Key	1
10.	301508	Spindle nut	1
11.	301509	Anti-dust cover	1
12.	301510	Fixed cover	1

Direction Control Valve (KGS-360AH)

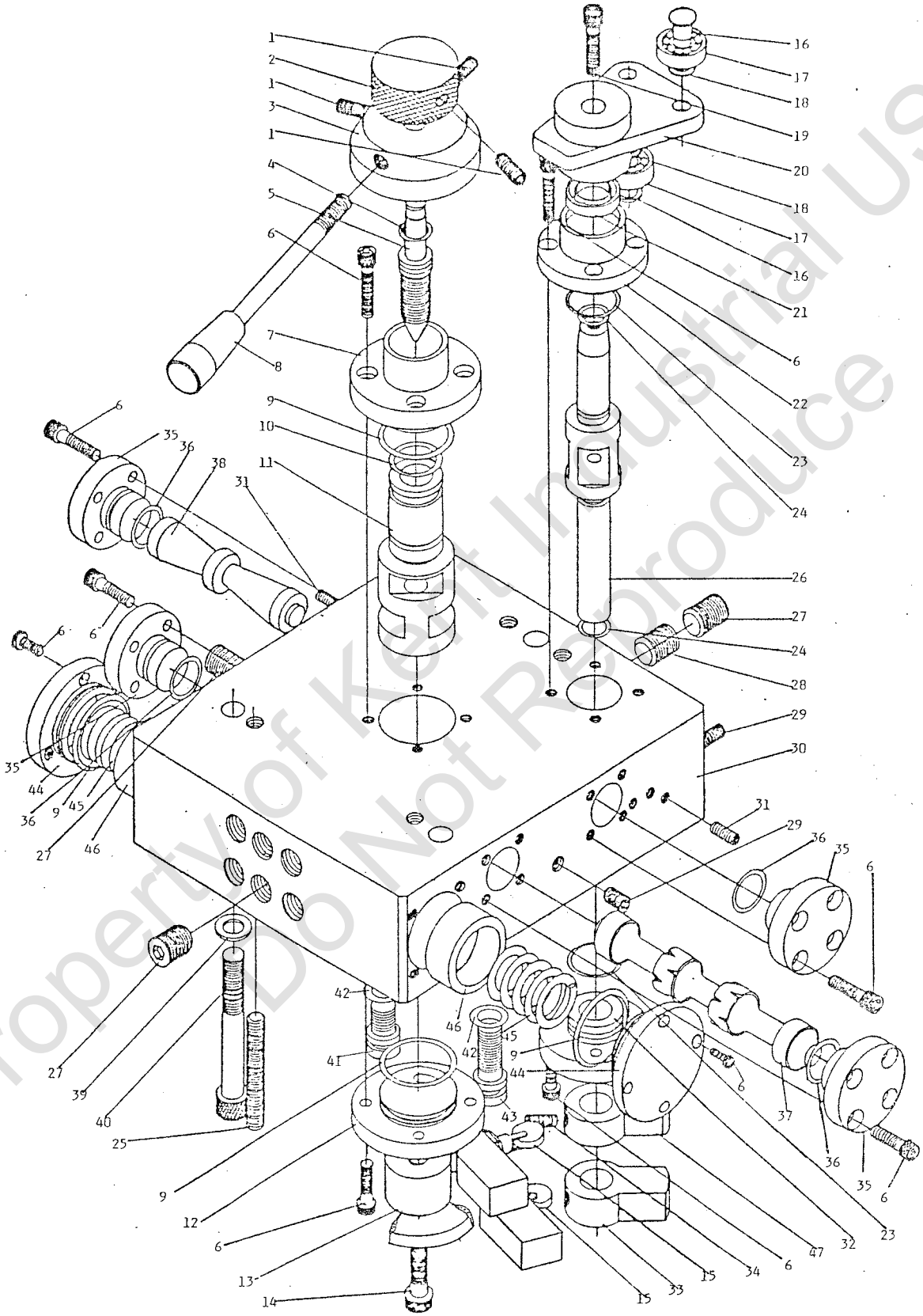


Direction Control Valve (KGS-360AH)

Index No.	Parts No.	Parts Name	Q'ty
1.	F20305C	Set screw	3
2.	361621	Flow control ring	1
3.	361622	Flow control knob	1
4.	G000P12	O-ring	1
5.	361631	Flow adjusting shaft	1
6.	F10304C	Socket head-cap screw	40
7.	361633	Upper cover	1
8.	251645	Flow control lever	1
9.	G000G30	O-ring	2
10.	G000P21	O-ring	1
11.	361632	Flow control shaft	1
12.	361634	Bottom cover	1
13.	251648	Limit switch fixed plate	1
14.	F10508C	Socket head-cap screw	1
15.	ES9005	Limit switch	1
16.	251643	Bearing stud	2
17.	B608ZZ0	Bearing	2
18.	251642	Bearing washer	2
19.	F10405C	Socket head-cap screw	1
20.	251641	Direction control arm	1
21.	GS177SC	Dust seal	1
22.	361639	Upper cover	1
23.	G000P22	O-ring	2
24.	G000P11	O-ring	2
25.	F20512C	Set screw	4
26.	361638	Direction control shaft	1
27.	F20804C	Set screw	8
28.	F20803C	Set screw	2
29.	F20403C	Set screw	4
30.	361630	Direction control valve body	1
31.	F20303C	Set screw	7
32.	361640	Bottom cover	1
33.	361645	Cam	1
34.	F20402C	Set screw	2
35.	361635	Side cover	4
36.	G000P16	O-ring	4
37.	361636	Pivot piston	1
38.	361637	Direction control pivot piston	1

Index No.	Parts No.	Parts Name	Q'ty
39.	WWF0006	Washer	3
40.	F10622A	Socket head-cap screw	3
41.	361641	Adjusting screw	2
42.	G000P6	O-ring	4
43.	361642	Adjusting screw	2
44.	361646	Side cover	2
45.	361647	Spring	2
46.	361648	Piston	2

Direction Control Valve (KGS-360AHD)

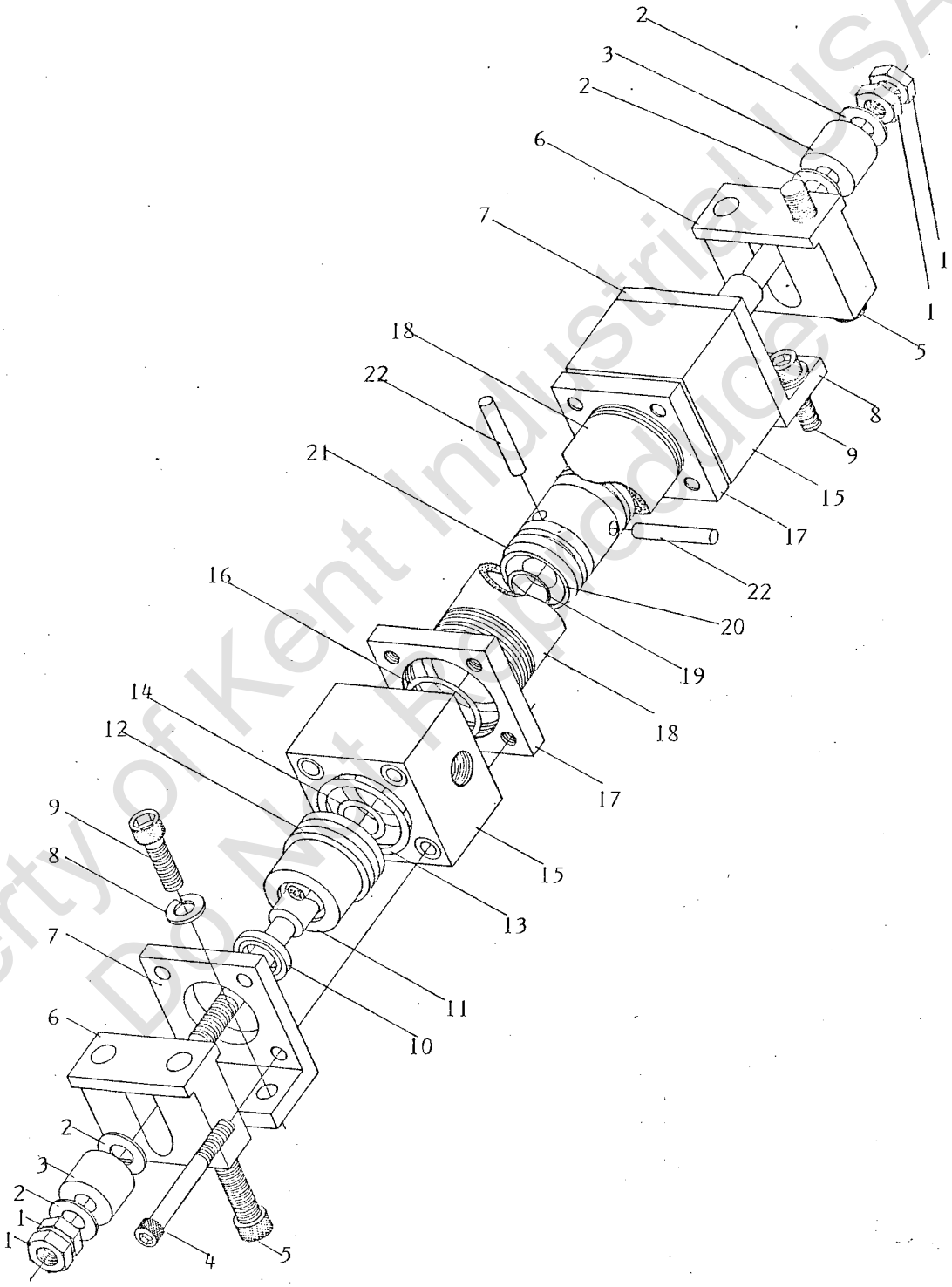


Direction Control Valve (KGS-360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	F20305C	Set screw	3
2.	361621	Flow control ring	1
3.	361622	Flow control knob	1
4.	G000P12	O-ring	1
5.	361631	Flow adjusting shaft	1
6.	F10304C	Socket head-cap screw	40
7.	361633	Upper cover	1
8.	251645	Flow control lever	1
9.	G000G30	O-ring	2
10.	G000P21	O-ring	1
11.	361632	Flow control shaft	1
12.	361634	Bottom cover	1
13.	251648	Limit switch fixed plate	1
14.	F10508C	Socket head-cap screw	1
15.	ES9005	Limit switch	2
16.	251643	Bearing stud	2
17.	B608ZZ0	Bearing	2
18.	251642	Bearing washer	2
19.	F10405C	Socket head-cap screw	1
20.	251641	Direction control arm	1
21.	GS177SC	Dust seal	1
22.	361639	Upper cover	1
23.	G000P22	O-ring	2
24.	G000P11	O-ring	2
25.	F20512C	Set screw	4
26.	361638	Direction control shaft	1
27.	F20804C	Set screw	8
28.	F20803C	Set screw	2
29.	F20403C	Set screw	4
30.	361630	Direction control valve body	1
31.	F20303C	Set screw	7
32.	361640	Bottom cover	1
33.	361645	Cam	1
34.	F20402C	Set screw	4
35.	361635	Side cover	4
36.	G000P16	O-ring	4
37.	361636	Pivot piston	1
38.	361637	Direction control pivot piston	1

Index No.	Parts No.	Parts Name	Q'ty
39.	WWF0006	Washer	3
40.	F10622A	Socket head-cap screw	3
41.	361641	Adjusting screw	2
42.	G000P6	O-ring	4
43.	361642	Adjusting screw	2
44.	361646	Side cover	2
45.	361647	Spring	2
46.	361648	Piston	2
47.	301646	Cam	1

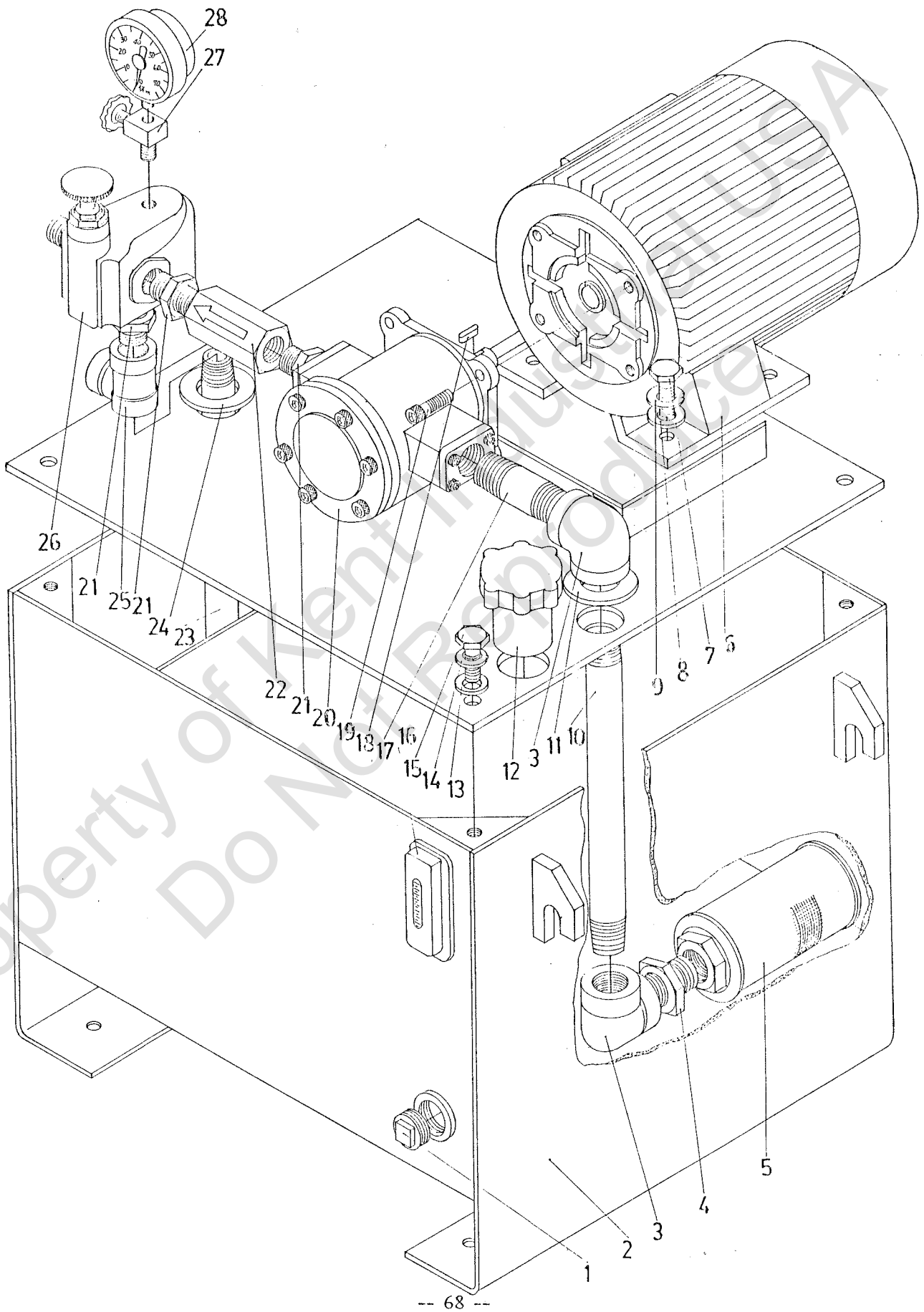
Cylinder Ass'y (KGS-360AH, 360AHD)



Cylinder Ass'y (KGS-360AH, KGS-360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	WNH006F	Hexagonal nut	4
2.	WWF0006	Washer	4
3.	251672	Spacer	2
4.	F10420A	Socket head-cap screw	8
5.	F10617C	Socket head-cap screw	4
6.	251673	End bracket	2
7.	361653	Cylinder bracket	2
8.	WWS0005	Spring washer	4
9.	F10507C	Socket head-cap screw	4
10.	GS15204	Dust seal	2
11.	361652	Cylinder rod	1
12.	361654	Oil seal bracket	2
13.	G000G35	O-ring	2
14.	GU00S16	U-packing	2
15.	361656	End cover	2
16.	G000G30	O-ring	2
17.	361657	Cylinder clamper	2
18.	361651	Cylinder	1
19.	G000P16	O-ring	2
20.	G000P29	O-ring	2
21.	361658	Piston	1
22.	WPS0632	Spring pin	2

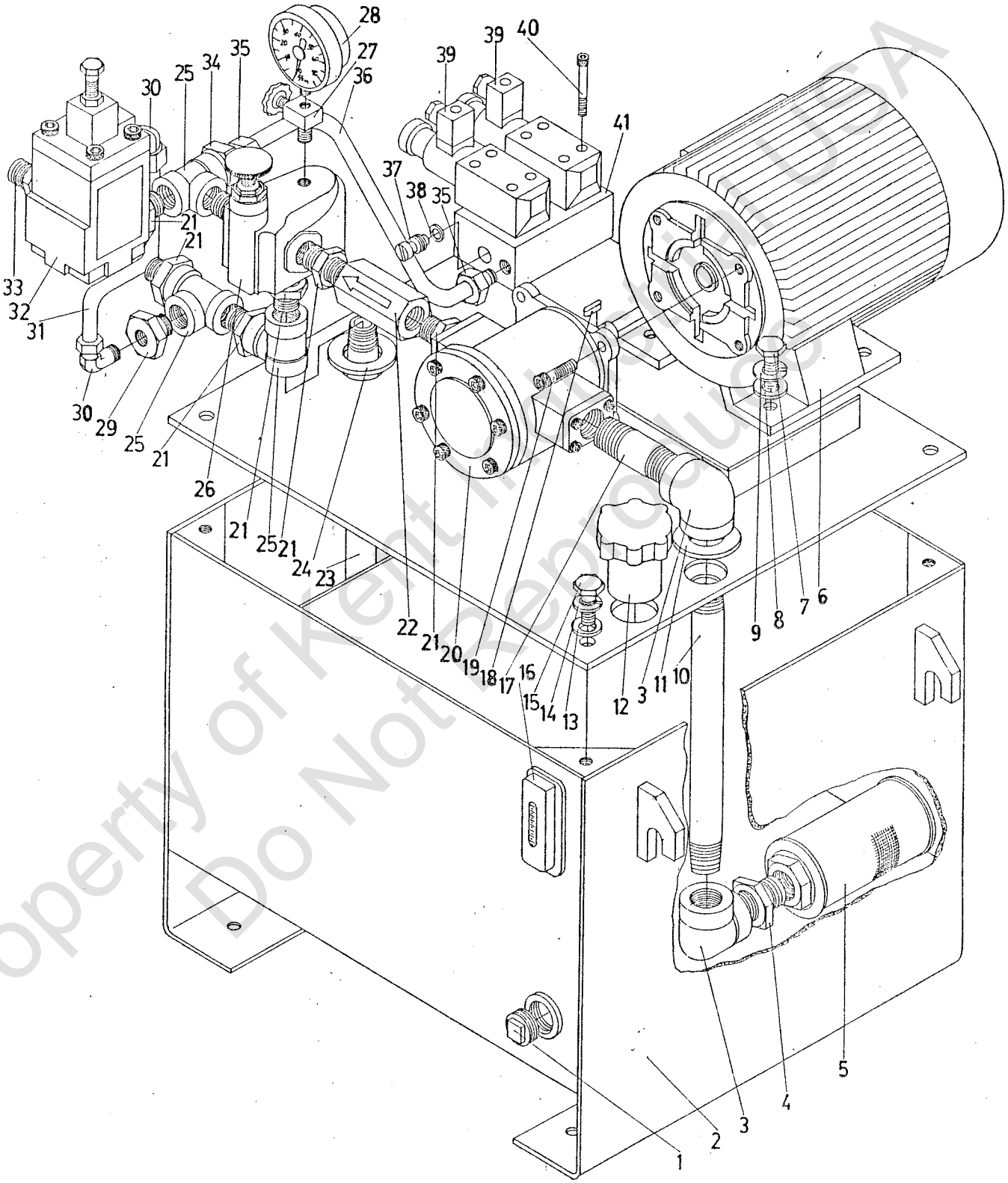
Hydraulic Tank Ass'y (KGS-360AH)



Hydraulic Tank Ass'y (KGS-360AH)

Index No.	Parts No.	Parts Name	Q'ty
1.	HL00008	Plug	1
2.	361601	Oil Tank	1
3.	HELF008	Elbow	2
4.	HN00808	Nipple	1
5.	HZ00008	Oil Filter	1
6.	MS3616A	Motor	1
7.	F30608C	Hexagonal Screw	4
8.	WWF0006	Flat Washer	4
9.	WWS0006	Spring Washer	4
10.	361602	Hydraulic Pipe	1
11.	411612	Washer	1
12.	GY00001	Hydraulic Oil Inlet Cap	1
13.	WWF0008	Flat Washer	4
14.	WWS0008	Spring Washer	4
15.	F30808C	hexagonal Screw	4
16.	GA00001	Oil Gauge and Thermometer	1
17.	361604	Hydraulic Pipe	1
18.	WDK5522	Key	1
19.	F11006T	Socket Head-Cap Screw	4
20.	HPFC14R	Pump	1
21.	HN00606	Nipple	3
22.	HC00006	Check Valve	1
23.	361605	Hydraulic Pipe	1
24.	411611	Washer	1
25.	HT00006	Tee Joint	1
26.	HR00006	Relief Valve	1
27.	HS00302	Hydraulic Oil Inlet Cap	1
28.	HG26070	Pressure Gauge	1

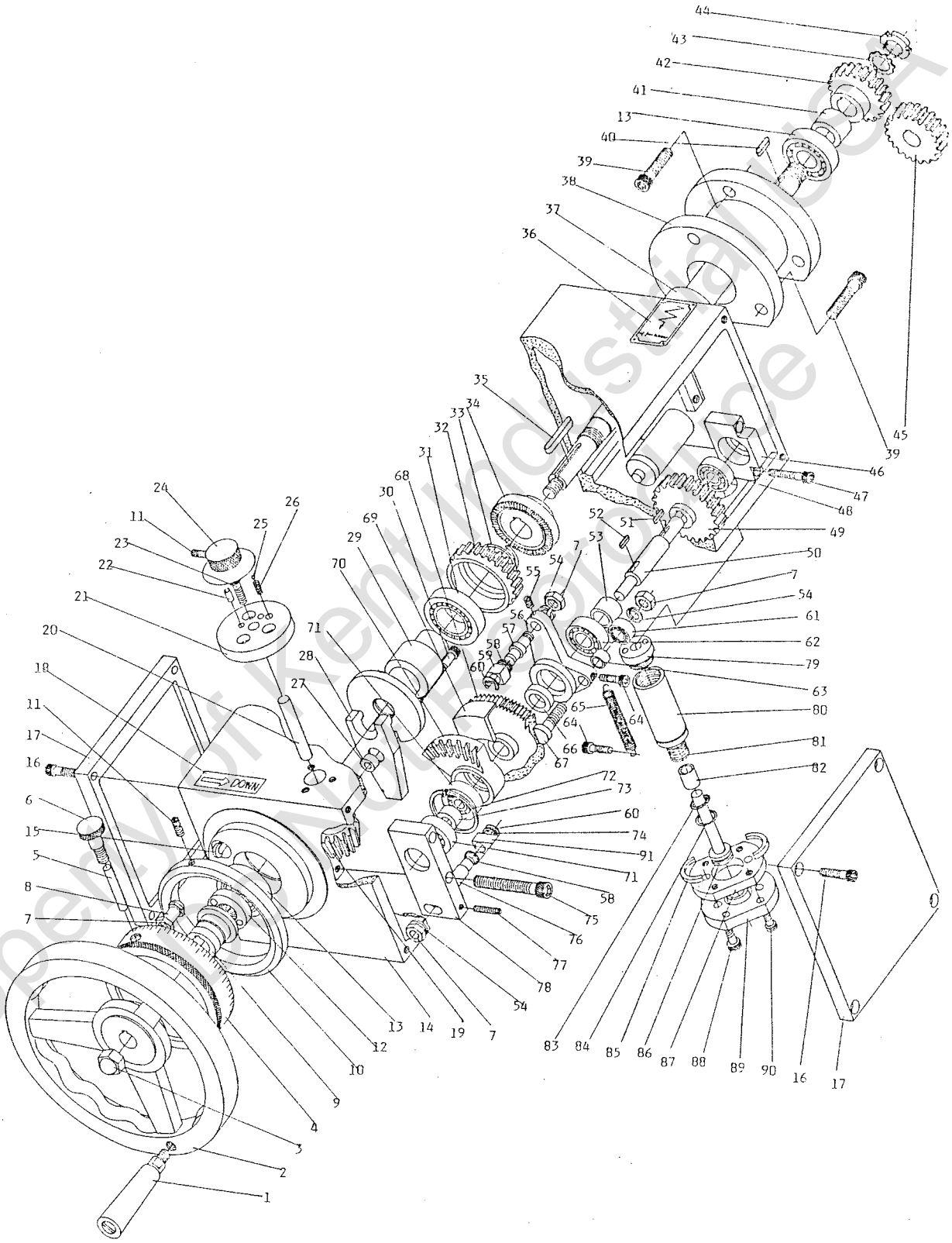
Hydraulic Tank Ass'y (KGS-360AHD)



Hydraulic Tank Ass'y (KGS-360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	HL00008	Plug	1
2.	361601	Oil Tank	1
3.	HELF008	Elbow	2
4.	HN00808	Nipple	1
5.	HZ00008	Oil Filter	1
6.	MS3616A	Motor	1
7.	F30608C	Hezagonal Screw	4
8.	WWF0006	Flat Washer	4
9.	WWS0006	Spring Washer	4
10.	361602	Hydraulic Pipe	1
11.	411612	Washer	1
12.	GY00001	Hydraulic Inlet Cap	1
13.	WWF0008	Flat Washer	4
14.	WWS0008	Spring Washer	4
15.	F30808C	Hexagonal Screw	4
16.	GA00001	Oil Gauge and Thermometer	1
17.	361604	Hydraulic Pipe	1
18.	EDK5522	Key	1
19.	F11006T	Socket Head-Cap Screw	4
20.	HPFC14R	Pump	1
21.	HN00606	Nipple	3
22.	HC00006	Check Valve	1
23.	361605	Hydraulic Pipe	1
24.	411611	Washer	1
25.	HT00006	Tee Joint	1
26.	HR00006	Relief Valve	1
27.	HS00302	Hydraulic Oil Inlet Cap	1
28.	HG26070	Pressure Gauge	1
29.	HB00602	Bush	1
30.	HALN3T2	Copper Joint	2
31.	HIN0300	Nylon Pipe	1
32.	HR00004	Sequence Valve	1
33.	HN0404H	Nipple	1
34.	HN0303A	Nipple	1
35.	HB00604	Bush	1
36.	HH03035	Copper Piep	1
37.	461618	Adjusting Screw	2
38.	GO000P9	O-Ring	2
39.	HDA0002	Solenoid Valve	2
40.	F10509P	Socket Head-Cap Screw	8
41.	361842	Downfeed Valve	1

Auto Downfeed Ass'y (KGS-360AHD)



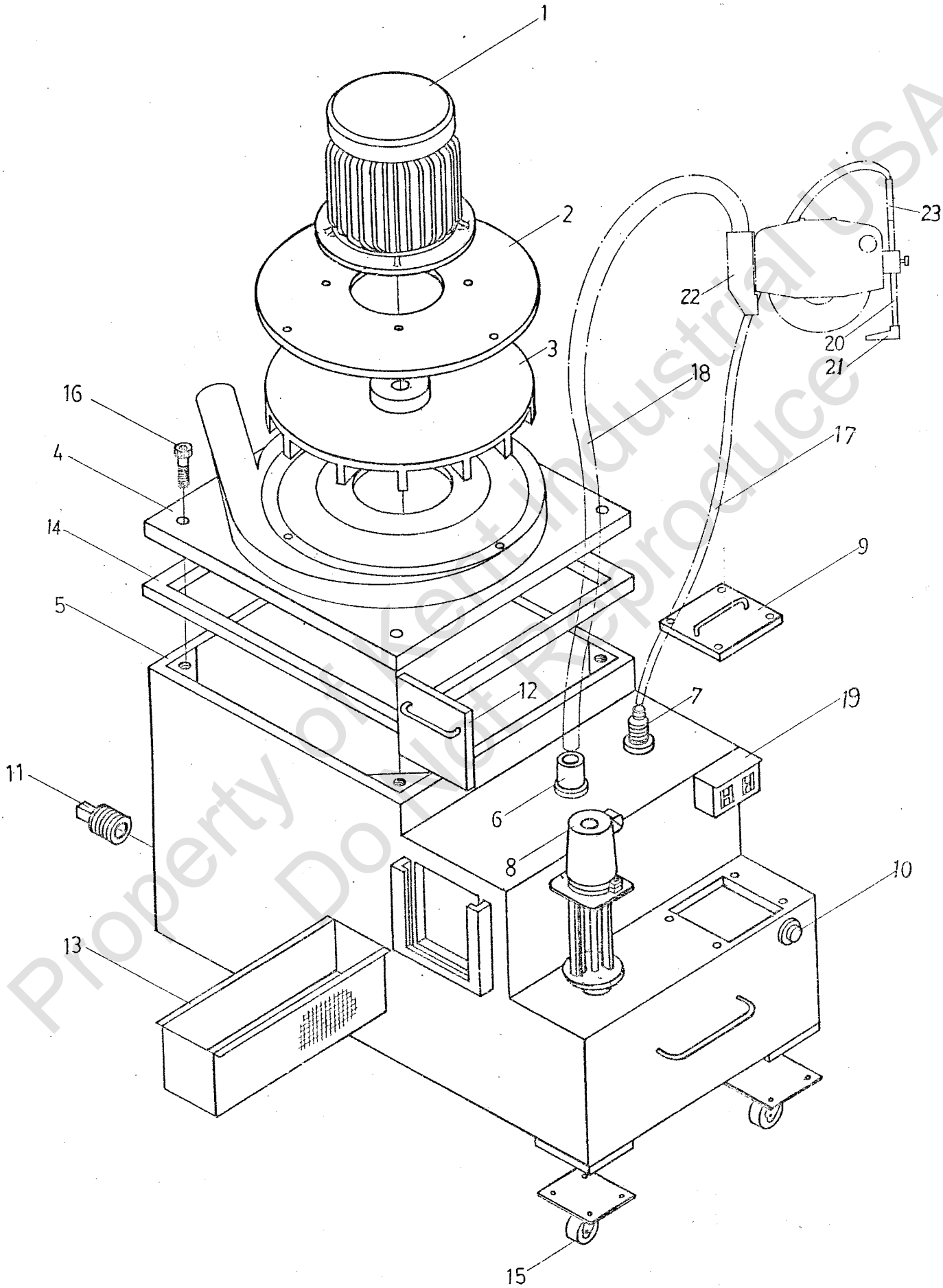
Auto Downfeed Ass'y (KGS-360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	910129	Grip	1
2.	910128	Handwheel	1
3.	910101	Cap nut	1
4.	361802	Graduation dial (mm size)	1
		Graduation dial (inch size)	
5.	251843	Fixed pin	1
6.	251849	Fixed screw	1
7.	WNH005C	Hexagonal nut	4
8.	251848	Touch screw	1
9.	251842	Collar	1
10.	361803	Indicating ring	1
	361882	Indicating ring	
11.	F20403C	Set screw	2
12.	251833	Fixed nut	1
13.	B620400	Bearing	2
14.	361811	Gear box	1
15.	ES9005	Limit switch	1
16.	F10406C	Socket head-cap screw	8
17.	361812	Side cover	2
18.	251126	Name plate	1
19.	251803	Bevel gear	1
20.	251806	Pin	1
21.	251804	Bush	1
22.	WPS0408	Spring pin	3
23.	F10405C	Socket head-cap screw	3
24.	361831	Preset dial (mm size)	1
		Preset dial (inch size)	
25.	WSB0003	Steel ball	1
26.	251841	Spring	1
27.	251832	Collar	1
28.	251820	Holder	1
29.	361813	Holder	1
30.	F10416C	Socket head-cap screw	1
31.	B600600	Bearing	1
32.	361814	Clutch	1
33.	251831	Spring	1
34.	361815	Clutch	1

Index No.	Parts No.	Parts Name	Q'ty
35.	WDK5545	Key	1
36.	361821	Name plate (mm size)	1
	361883	Name plate (inch size)	
37.	B6005ZZ	Bearing	1
38.	361818	Housing	1
39.	F10610C	Socket head-cap screw	6
40.	WDK5525	Key	1
41.	361428	Spacer	1
42.	361819	Gear	1
43.	WWA0004	Ratchet washer	1
44.	WNA004R	Check nut	1
45.	361820	Gear	1
46.	251815	Bracket	1
47.	F10411C	Socket head-cap screw	2
48.	B6201ZZ	Bearing	1
49.	361817	Gear	1
50.	361816	Pin	1
51.	WDK4417	Key	1
52.	WDK5514	Key	1
53.	361832	Spacer	1
54.	WWS0005	Spring washer	3
55.	F20402C	Set screw	1
56.	251812	Transmission arm	1
57.	251811	Pin	1
58.	251810	Spring	2
59.	251809	Transmission claw	1
60.	W000E07	Snap ring	2
61.	B608ZZ0	Bearing	1
62.	B6202ZZ	Bearing	1
63.	361823	Collar	1
64.	251866	Spring Fixed Screw	2
65.	251837	Spring	1
66.	251819	Spacer	1
67.	361822	Pin	1
68.	251818	Ratchet gear	1
69.	251808	Slipper	1
70.	251807	Bevel gear (half)	1

Index No.	Parts No.	Parts Name	Q'ty
71.	B6300ZZ	Bearing	2
72.	W000R35	Snap ring	1
73.	251802	Spacer	1
74.	251852	Washer	2
75.	F10418C	Socket head-cap screw	2
76.	251817	Pin	1
77.	F20304C	Set screw	1
78.	251801	Bracket	1
79.	251852	Cylinder cover	2
80.	251854	Cylinder	2
81.	251853	Spring	2
82.	251855	Spacer	1
83.	GB00P16	Back-up ring	2
84.	G000P16	O-ring	2
85.	251856	Cylinder fixed ring	4
86.	251851	Cylinder rod	2
87.	251861	Ring holder	1
88.	F10409C	Socket head-cap screw	4
89.	251860	Cylinder base	1
90.	F10304C	Socket head-cap screw	8
91.	251827	Stop claw	1

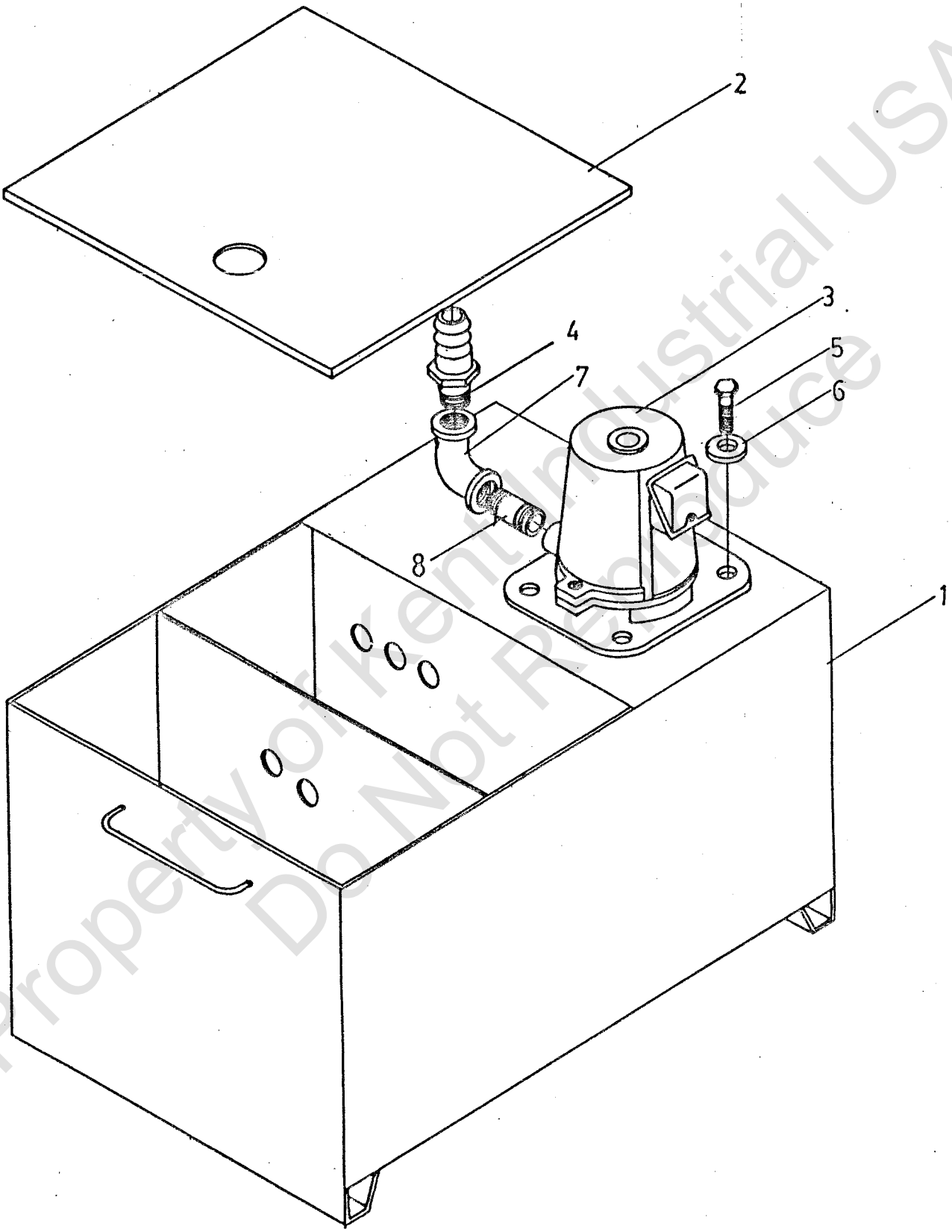
Dust-Suction Cooling System (Optional Accessory)



Dust-suction Cooling System (Optional Accessory)

Index No.	Parts No.	Parts Name	Q'ty
1.	MVB5222	Motor	1
2.	921408	Motor fixed plate	1
3.	921407	Suction fan	1
4.	921406	Upper cover	1
5.	921401	Tank	1
6.	921409	Suction hose connector	1
7.	921421	Coolant hose connector	1
8.	MPB1322	Coolant pump	1
9.	921404	Cover	1
10.	GM00006	Coolant indicator	1
11.	921417	Plug	1
12.	921403	Filter cover	1
13.	921402	Filter	1
14.	921416	Cover packing	1
15.	JA00003	Roller bracket	4
16.	F30610C	Hexagonal head screw	4
17.	VA04050	Coolant hose	1
18.	VB21050	Suction hose	1
19.	ES9600	On-Off switch	2
20.	301123	Coolant pipe	1
21.	921425	Coolant nozzle	1
22.	921422	Dust collector	1
23.	411122	Coolant pipe	1

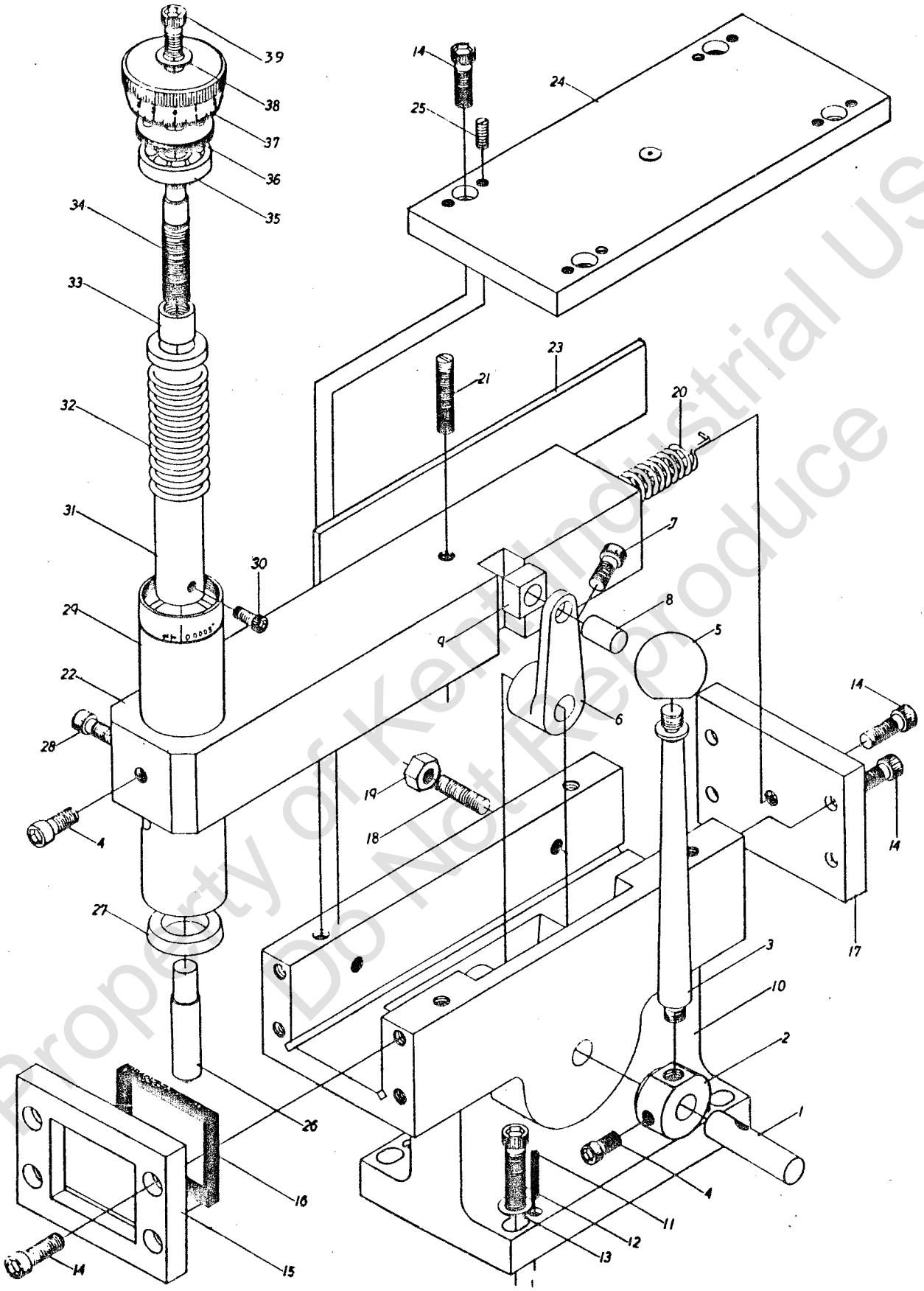
Coolant System (Optional Accessory)



Coolant System (Optional Accessory)

Index No.	Parts No.	Parts Name	Q'ty
1.	921501	Coolant tank	1
2.	921502	Coolant tank cover	1
3.	MPB1322	Coolant pump	1
4.	921421	Coolant pipe connector	1
5.	F30404C	Hexagonal head screw	4
6.	WWS0004	Washer	4
7.	HELF003	90° elbow	1
8.	HW00003	Nipple	1

Parallel Dressing Attachment (Optional Accessory)

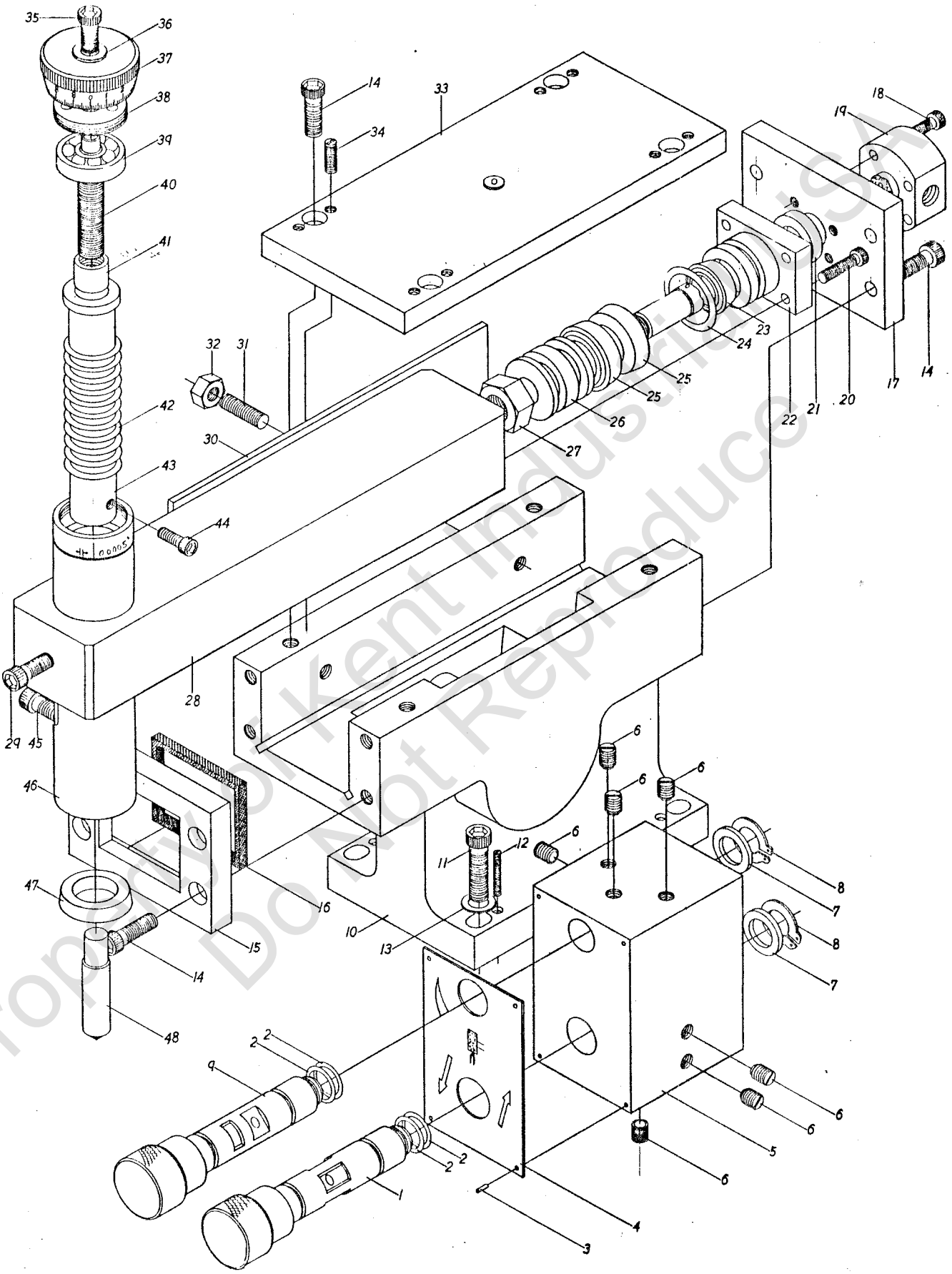


Parallel Dressing Attachment (KGS-360AH, 360AHD)

Index No.	Parts No.	Parts Name	Q'ty
1.	411702	Shaft	1
2.	411703	Transmission cap	1
3.	411704	Transmission lever	1
4.	F10404C	Socket head-cap screw	2
5.	411705	Cap	1
6.	411706	Transmission arm	1
7.	F10403C	Socket head-cap screw	1
8.	411707	Shaft	1
9.	411708	Slipper	1
10.	411701	Dresser body	1
11.	F10206C	Set screw	4
12.	F10512C	Set screw	4
13.	WWS0005	Spring washer	4
14.	F10408C	Socket head-cap screw	13
15.	411709	Front cover	1
16.		Asbestos gasket	1
17.	411711	Back cover	1
18.	F20410C	Set screw	2
19.	WNH004C	Hexagonal nut	2
20.	411713	Spring	1
21.	F20407C	Set screw	1
22.	411710	Sliding body	1
23.	411712	Adjusting plate	1
24.	411714	Top cover	1
25.	F20305C	Set screw	8
26.	911108	Diamond dresser	1
27.	GU0RE20	U-packing	1
28.	F10304C	Socket head-cap screw	1
29.	411727	Out-holder	1
30.	F10203C	Socket head-cap screw	1
31.	411726	Moving muff	1
32.	411725	Spring	1
33.	411724	Nut	1
34.	411723	Transmission rod	1
35.	B620000	Bearing	1
36.	411722	Nut	1

Index No.	Parts No.	Parts Name	Q'ty
37.	411721	Graduation dial	1
38.	WWS0004	Spring washer	1
39.	F10408C	Socket head-cap screw	1

Hydraulic Dresser (Optional Accessory)



Hydraulic Dresser (Optional Accessory)

Index No.	Parts No.	Parts Name	Q'ty
1.	461715	Direction control shaft	1
2.	G000P12	O-ring	4
3.	WRV0002	Rivet	4
4.	461718	Panel plate	1
5.	461711	Valve body	1
6.	F20402C	Set screw	7
7.	461714	Washer	2
8.	W000S14	Snap ring	2
9.	461712	Flow control shaft	1
10.	461703	Base	1
11.	F10512C	Socket head-cap screw	4
12.	F20208C	Set screw	4
13.	WW50005	Spring washer	4
14.	F10406C	Socket head-cap screw	12
15.	411709	Front cover	1
16.		Asbestos cover	1
17.	461706	Rear cover	1
18.	F10310C	Socket head-cap screw	4
19.	461705	Piston shaft	1
20.	F10308C	Socket head-cap screw	4
21.	GS15245	Oil seal	1
22.	461710	Nut	1
23.	GU0UN14	U-packing	1
24.	G000P24	O-ring	1
25.	GU0RE20	U-packing	2
26.	461709	Piston	1
27.	WNH008C	Hexagonal nut	1
28.	461704	Sliding body	1
29.	F10404C	Socket head-cap screw	1
30.	411712	Adjusting plate	1
31.	F20410C	Set screw	2
32.	WNH004C	Hexagonal nut	2
33.	411714	Upper cover	1
34.	F20304C	Set screw	8
35.	F10408C	Socket head-cap screw	1
36.	WWS0004	Spring washer	1

Index No.	Parts No.	Parts Name	Q'ty
37.	411721	Graduation dial	1
38.	411722	Nut	1
39.	B620000	Bearing	1
40.	411723	Transmission screw	1
41.	411724	Nut	1
42.	411725	Spring	1
43.	411726	Diamond cutter holder	1
44.	F10203C	Socket head-cap screw	1
45.	F10304C	Socket head-cap screw	1
46.	411782	Adapter	1
47.	GU0RE20	U-packing	1
48.	911108	Diamond cutter	1

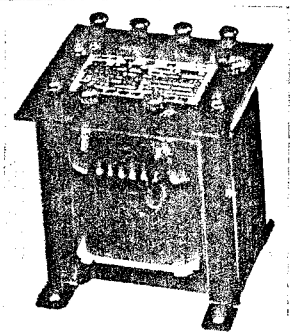
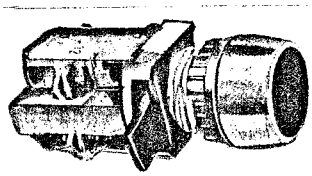
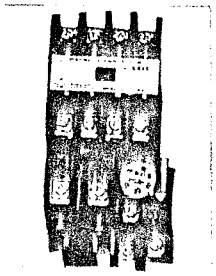
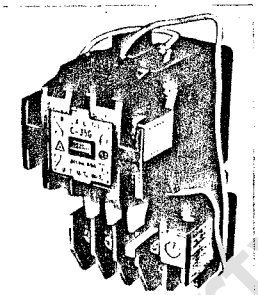
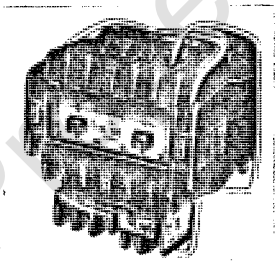
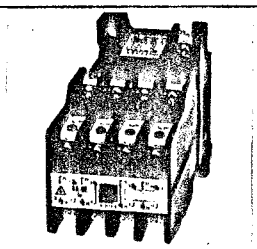
O. ELECTRIC PARTS LIST
****

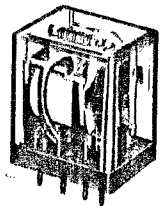
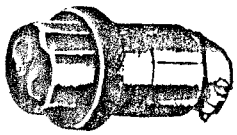
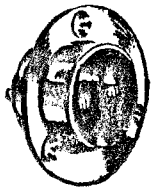
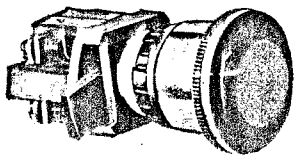
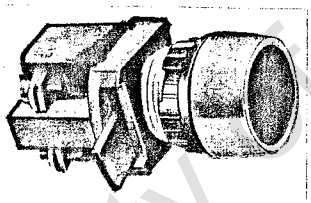
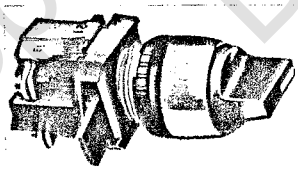
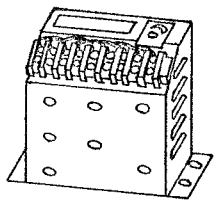
WHEN ORDERING ELECTRIC PARTS, PLEASE MENTION:

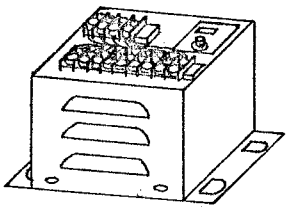
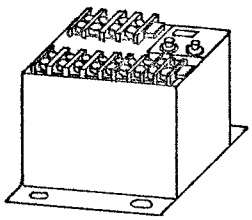
1. MACHINE MODEL & SERIAL NUMBER

2. ORDERING NUMBER & QUANTITY

O. Electric Parts List

Contour	Ordering No.	Specification	Code No.	Remarks
	EF2403	260-240-220-200-0 70-0-70	AH: Tr. AHD:Tr.	
	EL5245	22Ø 24V Green	AH: PB8 AHD: PB8, PB11	
	EM2241	24VHO-11ERH 10/1.7	AH: MC5 AHD: MC5	For coolant pump
	EM2245	24VHO-16ERH 10/7	AH: MC2 AHD: MC2	For hydraulic motor
	EM2248	24VHO-18ERH 18/15	AH: MC1 AHD: MC1	For spindle motor
	EM3246	24VCL-4ERH 10/1.7	AH: MC4 AHD: MC4	For elevation motor
	EM1241	24V C-11G	AH: MC0 AHD: MC0	For power supply

Contour	Ordering No.	Specification	Code No.	Remarks
	EM5242	24V 2P	AHD: X1, X2, X3	
	EM5244	24V 4P	AHD: X4	
	EN5030 EN5031	HRS-21-3P	AHD: Sol. Soc.	Socket for solenoid valve
	EN5040 EN5041	HRS-21-4P	AH: Soc2, Soc3 AHD: Soc2, Soc3	Hydraulic motor & Coolant pump
	ES0512	22Ø Red (Lock type)	AH: PB1 AHD: PB1	
	ES2512	22Ø Red	AH: PB2, PB4, PB6 AHD: PB2, PB4, PB6	
	ES2600	22Ø Black	AH: PB9, PB10, PB12, PB13 AHD: PB9, PB10, PB12, PB13	
	ES2605	22Ø Green	AH: PB3, PB5 PB7 AHD: PB3, PB5, PB7	
	ES4613	22Ø 3-position	AH: SW3 AHD: SW3	For chuck control
	ES4723	22Ø 3-position	AHD: SW5	
	EU0001	S2A	AH: S.S.C.U. AHD: S.S.C.U.	

Contour	Ordering No.	Specification	Code No.	Remarks
	EU0003		C. C. B.	Chuck Control Box
	EU0004		D.T.U.	Delay Timer Unit