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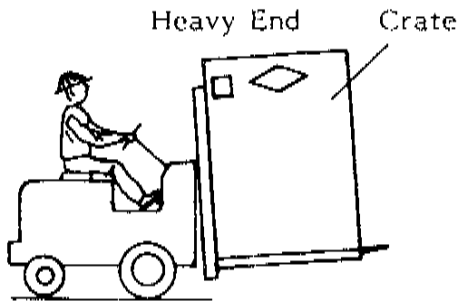
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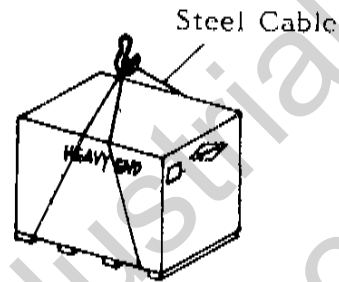
\* THIS MACHINE HAS BEEN FULLY TESTED, ADJUSTED AND INSPECTED FOR CORRECT ALIGNMENT AND OPERATION PRIOR TO SHIPMENT. IN TRANSIT OR INSTALLATION, PLEASE ENSURE THAT THE MACHINE IS NOT BUMPED WHEN BEING ROLLED OR SET DOWN TO AVOID ANY FAILURE.

A). Transit

By Fork Lifter



By Hoist or Chain Block



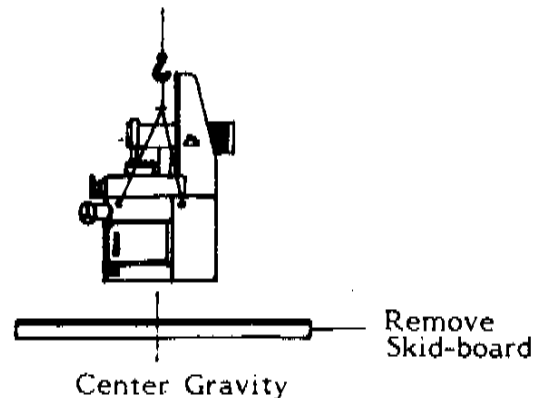
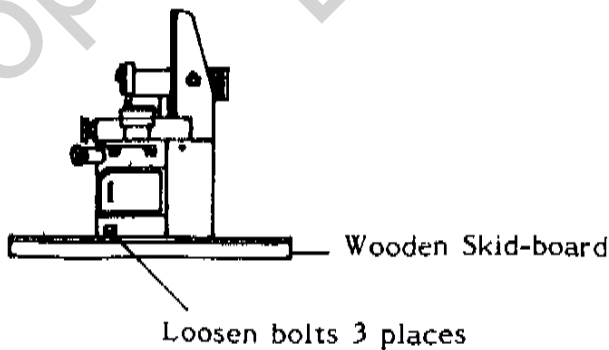
Machine weight chart

Unit: kgs

M/C WGT.	KGS-200	KGS-616H	KGS-250	KGS-250H	KGS-250AH	KGS-250AHD	818AHD	1020AHD
Net	630	900	1100	1200	1250	1300	1264	1430
Gross	730	1100	1290	1400	1450	1500	1465	1650

B). Unpacking

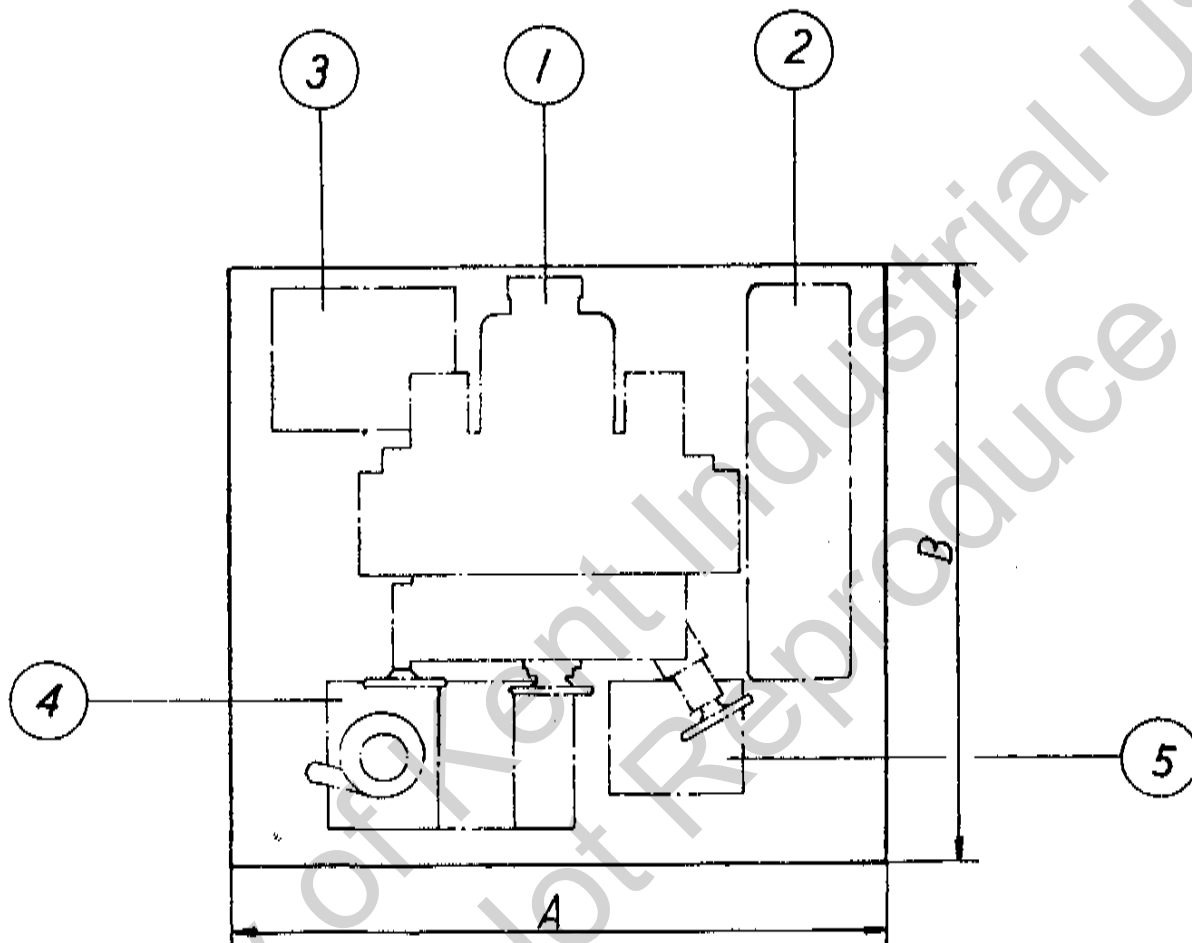
1. When unpacking the crate, starts from the upper cover, then follow the sequence of front, rear, left and right.
2. Do not use hammer to break down the crate, please use nail extruder in stead of.
3. To avoid damaging the machine or paint, please pay more attention when take away the wooden cover.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



5. Packing Diagram

a. For KGS-200, KGS-250, KGS-250H, KGS-250AH, KGS-250AHD

PACKING DIAGRAM

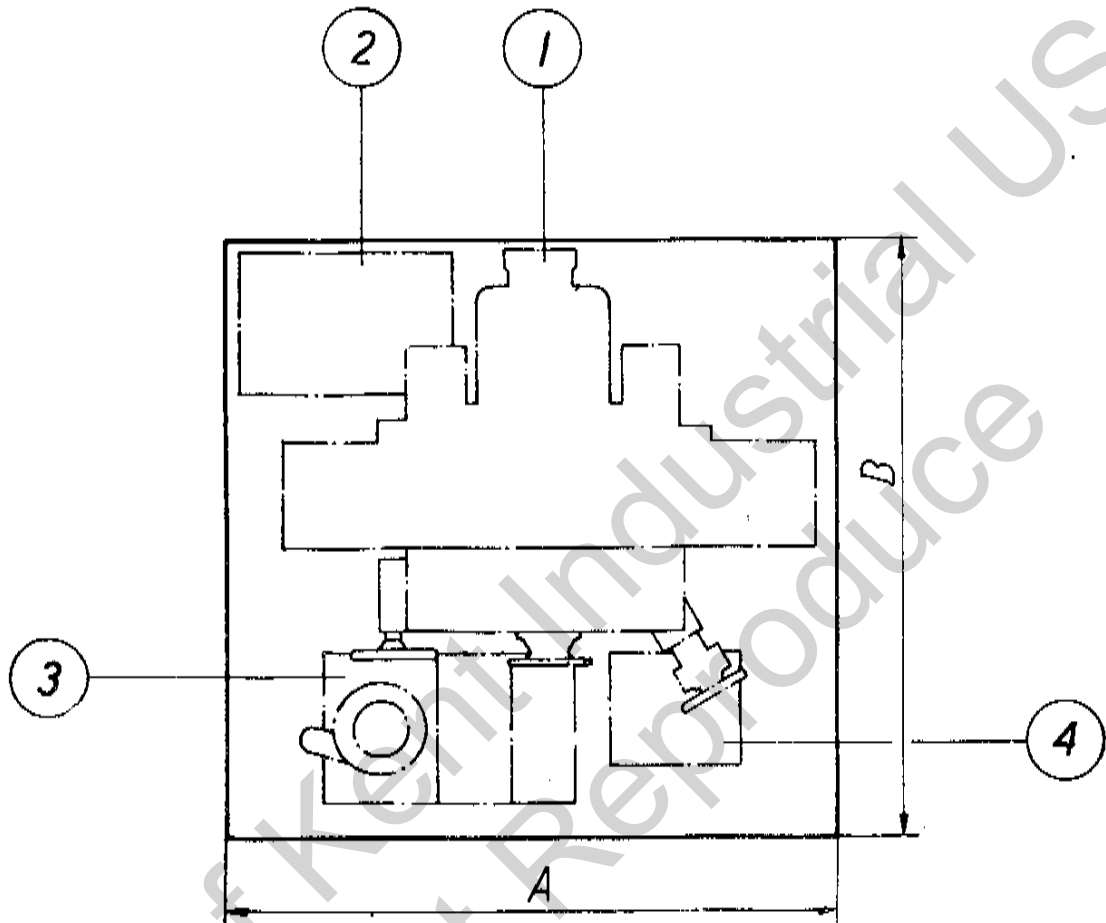


- 1. Machine
- 2. Table
- 3. Hydraulic Tank
- 4. Dust-Suction Coolant System
- 5. Standard Accessories

Model	A	B	Height
KGS-200	1470(58")	1140(45")	1780(70")
KGS-250	1524(60")	1575(62")	1829(72")
KGS-250H,AH	1580(62")	1530(60")	1840(72")
KGS-250AHD	1670(66")	1530(60")	1840(72")

b. For KGS-616H, 818AHD, 1020AHD

PACKING DIAGRAM



- 1. Machine
- 2. Hydraulic Tank
- 3. Dust-Suction Coolant System
- 4. Standard Accessories

Model	A	B	Height
KGS-616H	1486(58")	1539(60")	1805(71")
KGS-818AHD	1532(60")	1676(66")	1854(73")
KGS-1020AHD	1715(68")	1676(66")	1854(73")

C). Choice of site

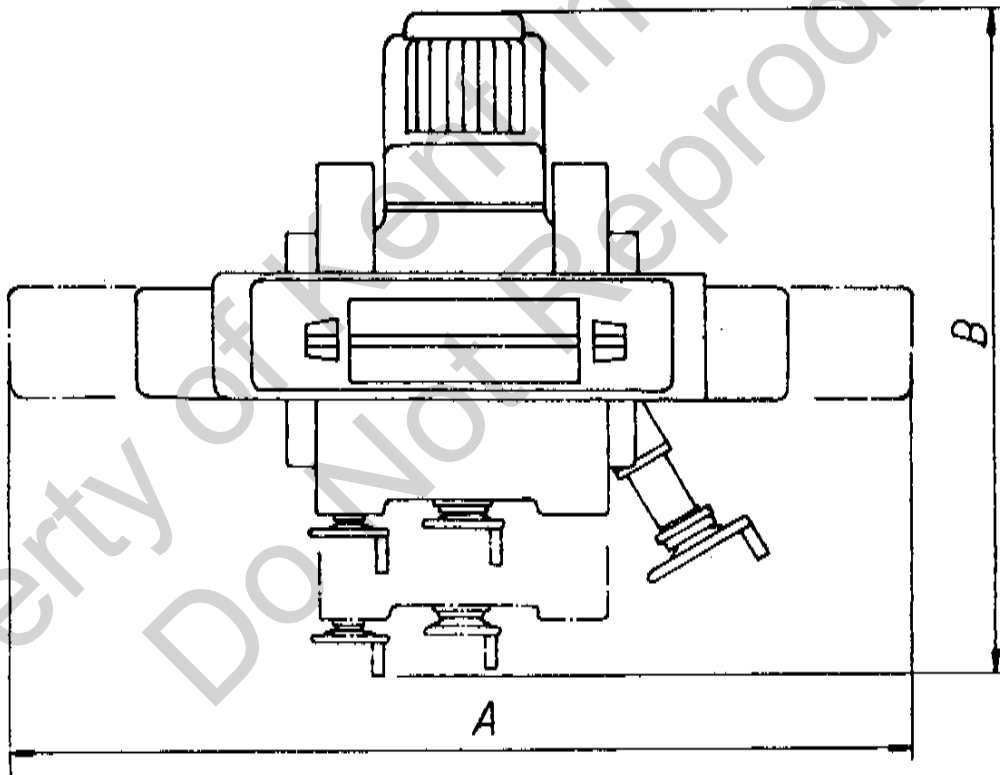
The output of the machine and the degree of accuracy of the components produced depend to a very special degree on the correct choice of site for the erection of the machine.

The grinding machine should be handled 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 jerks from the reversal of the shaper stroke, etc. are transmitted to the grinding machine. Chatter marks can be found on the ground surface, which are due to these extraneous influences.

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

Floor Plan:



Unit: mm

M/C Type Statement	KGS-200 KGS-616H	KGS-250, 250H, 250AH KGS-250AHD, 818AHD	KGS-1020AHD
A	1610	2020	2170
B	1270	1400	1540

D). Installation

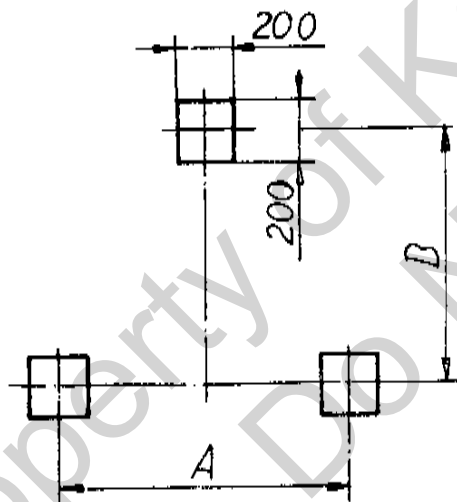
(1). Power Consumption

M/C Type Statement	KGS-200	KGS-616H	KGS-250	KGS-250H	KGS-250AH	KGS-250AHD
Machine	2.034KW	2.9KW	2.034KW	2.9KW	3.584KW	3.584KW
Coolant	0.093KW	0.093KW	0.093KW	0.093KW	0.093KW	0.093KW
Dust-Suction	0.373KW	0.373KW	0.373KW	0.373KW	0.373KW	0.373KW
Ele. Mag. Chuck	0.15KW	0.15KW	0.15KW	0.15KW	0.15KW	0.15KW
Total	2.6KW	3.5KW	2.6KW	3.5KW	4.2KW	4.2KW

M/C Type Statement	KGS-818AHD	KGS-1020AHD
Machine	3.584KW	4.084KW
Coolant	0.093KW	0.093KW
Dust-Suction	0.373KW	0.373KW
Ele. Mag. Chuck	0.15KW	0.15KW
Total	4.2KW	4.7KW

(2). Foundation

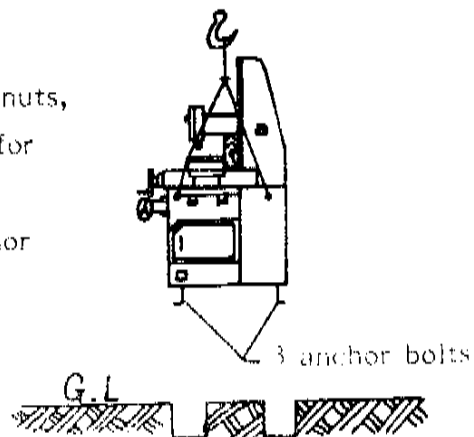
a. Dimension



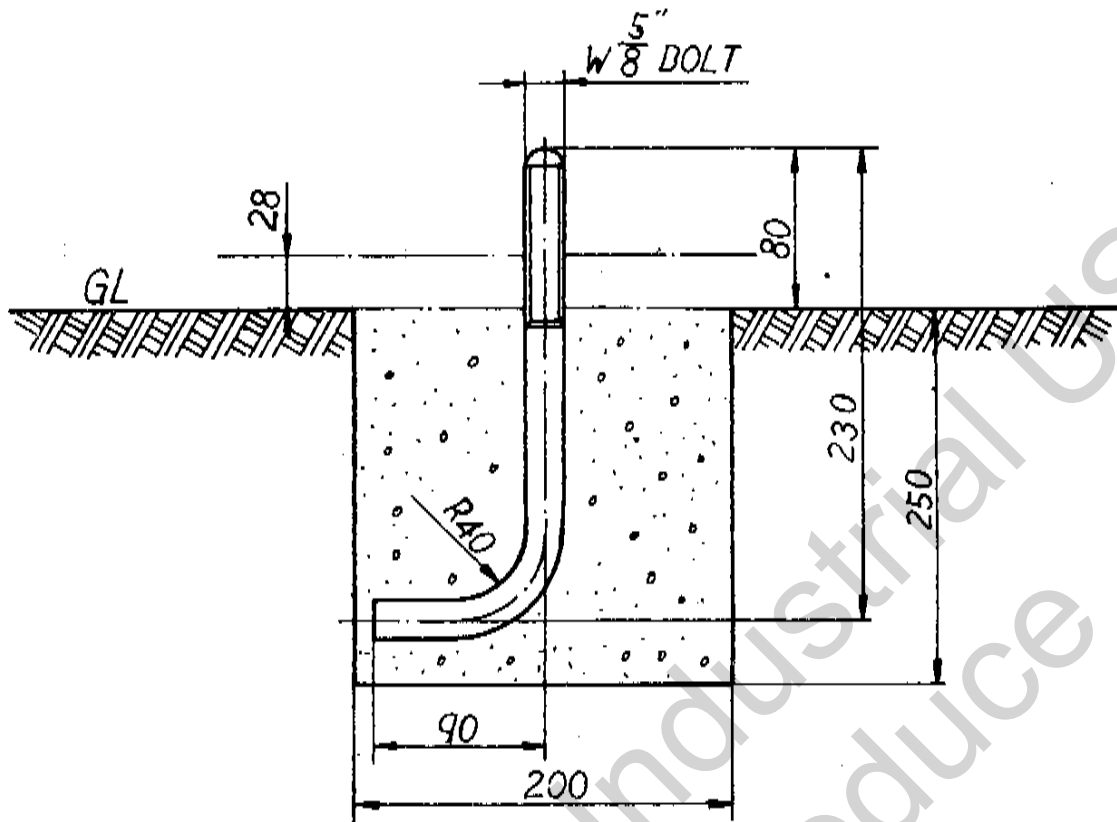
M/C Type Dimension	A	B
KGS-200, 616H	570	660
KGS-250, 250H, 250AH, 250AHD, 818AHD	700	730
KGS-1020AHD	700	816

b. Use the Anchor bolts

- \* Lock the anchor bolts on the machine by nuts, and let the thread portion at least 30mm for adjust.
- \* Lay down the machine slowly to aim anchor bolts at foundation holes.
- \* Levelling the machine by taper block.
- \* Fill up foundation holes with concrete.

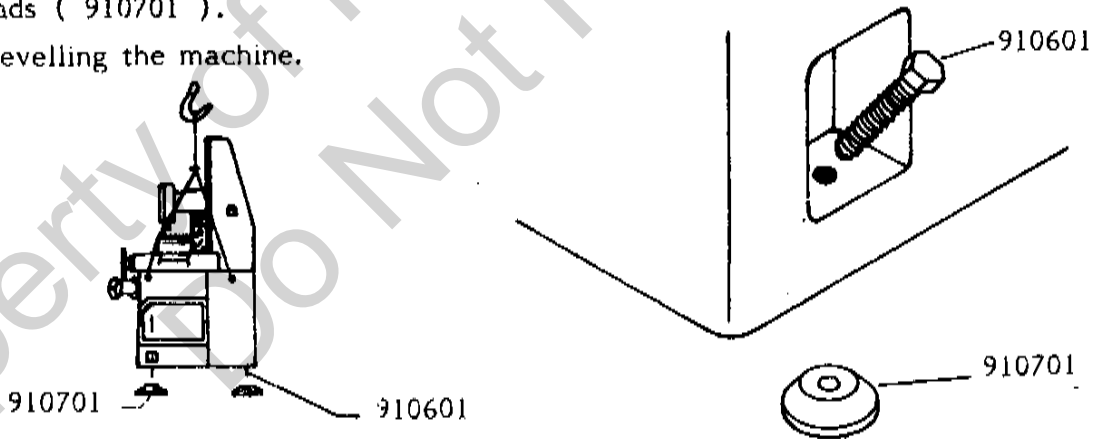


\* Anchor bolts

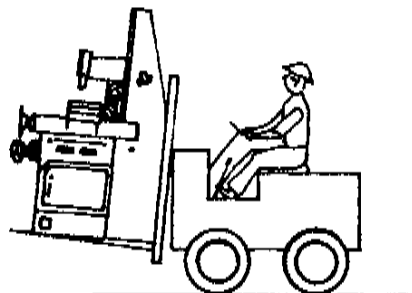


c. Use the levelling pads and screws

- \* Screw the levelling screws ( 910601 ) on the machine base as figure shown. For easy levelling and more steady of the machine, make levelling screw as deep as possible.
- \* Lay down the machine slowly to let screws fall into the center hole of levelling pads ( 910701 ).
- \* Levelling the machine.



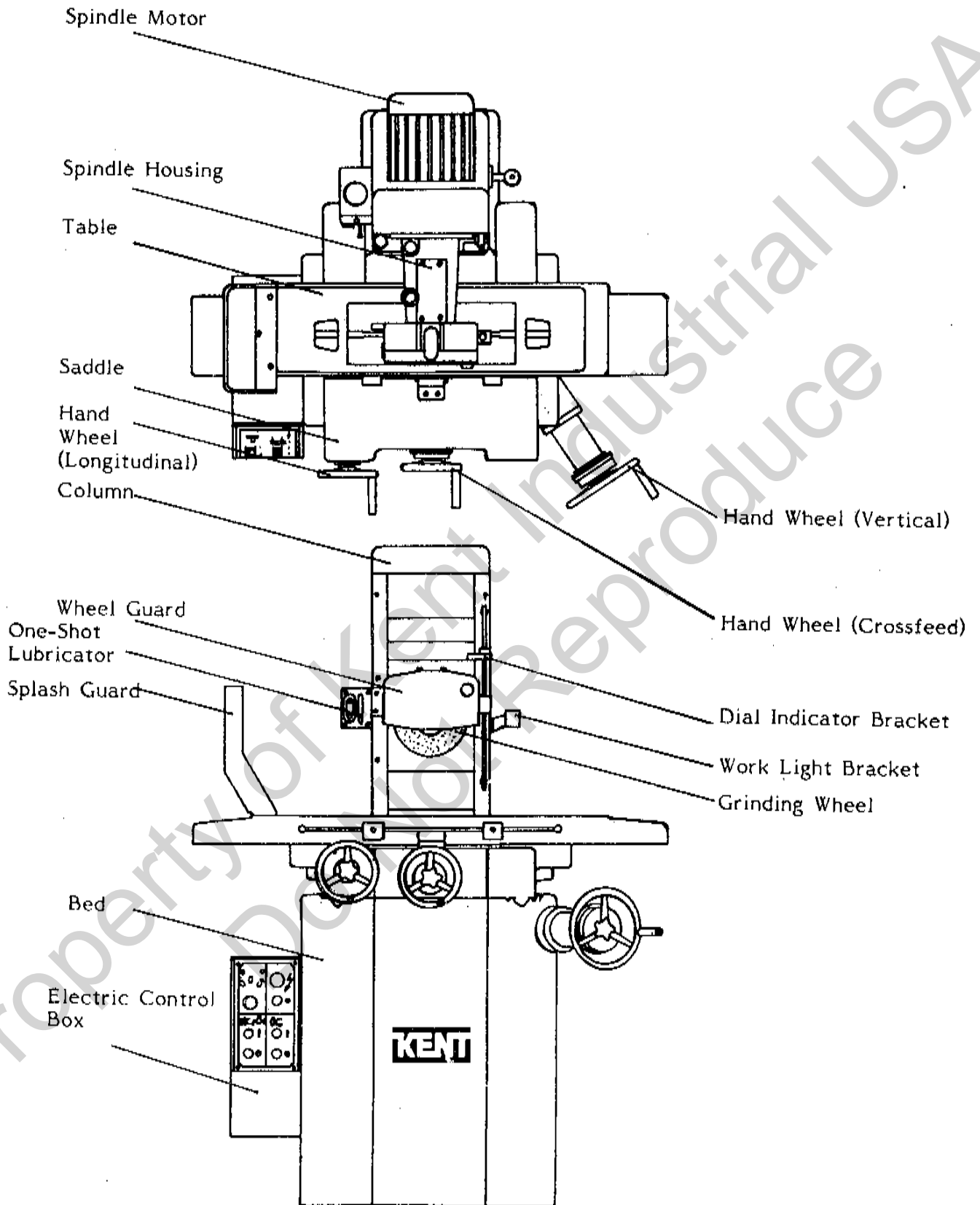
Caution: If you use Fork Lifter in stead of Hoist, please lift as figure shown under:



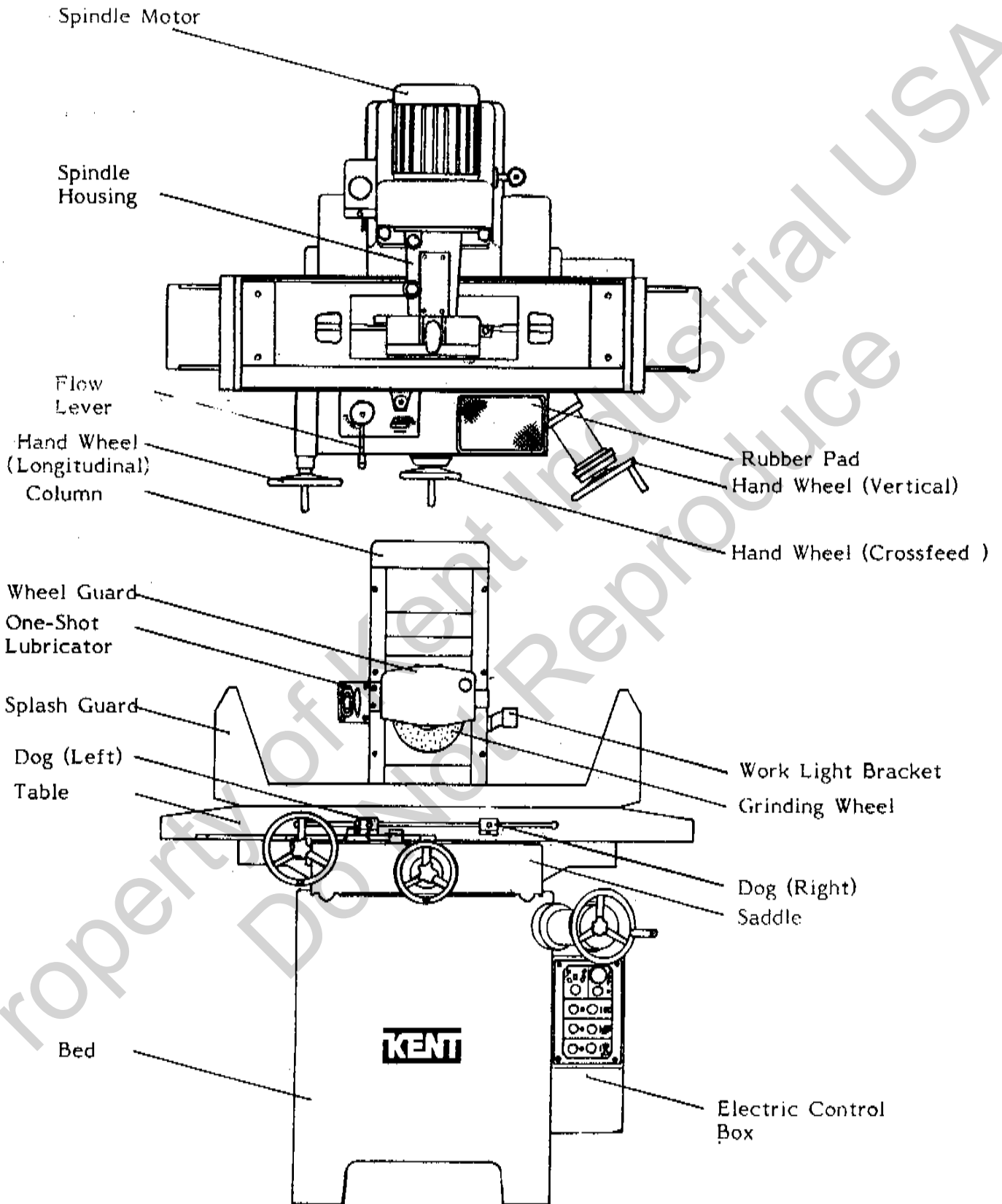


(3). Contour and Nomenclature

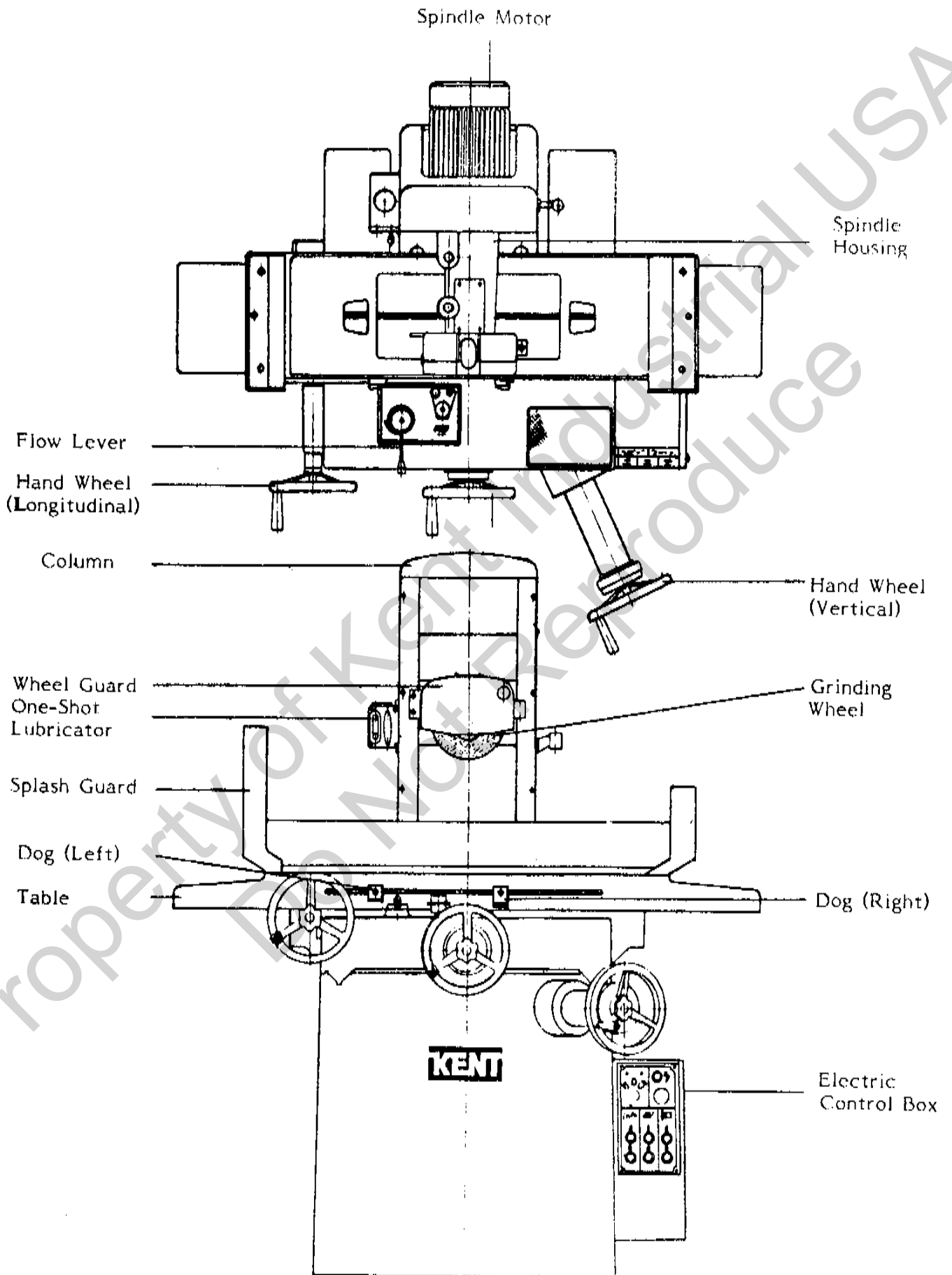
a. KGS-200



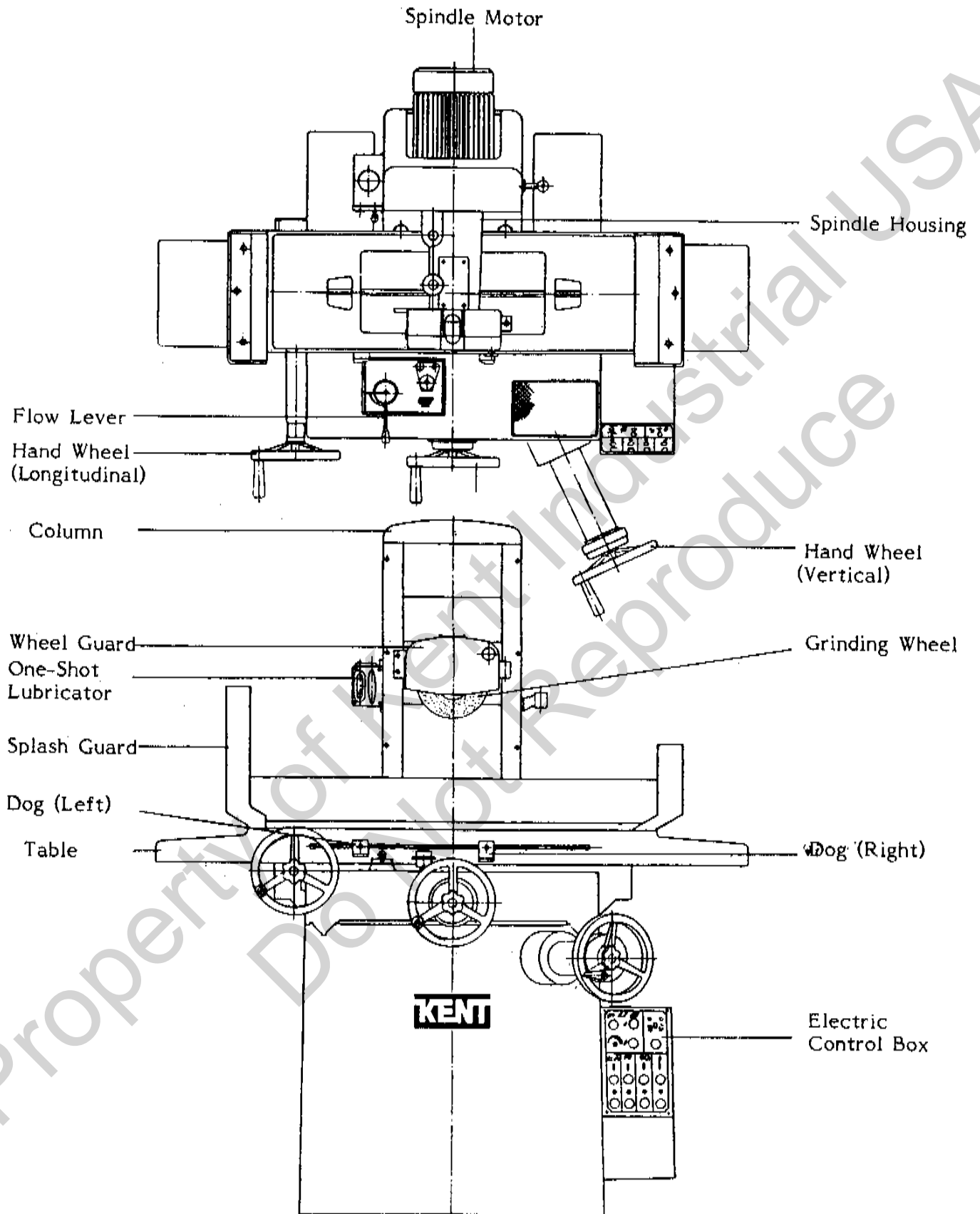
b. KGS-616H



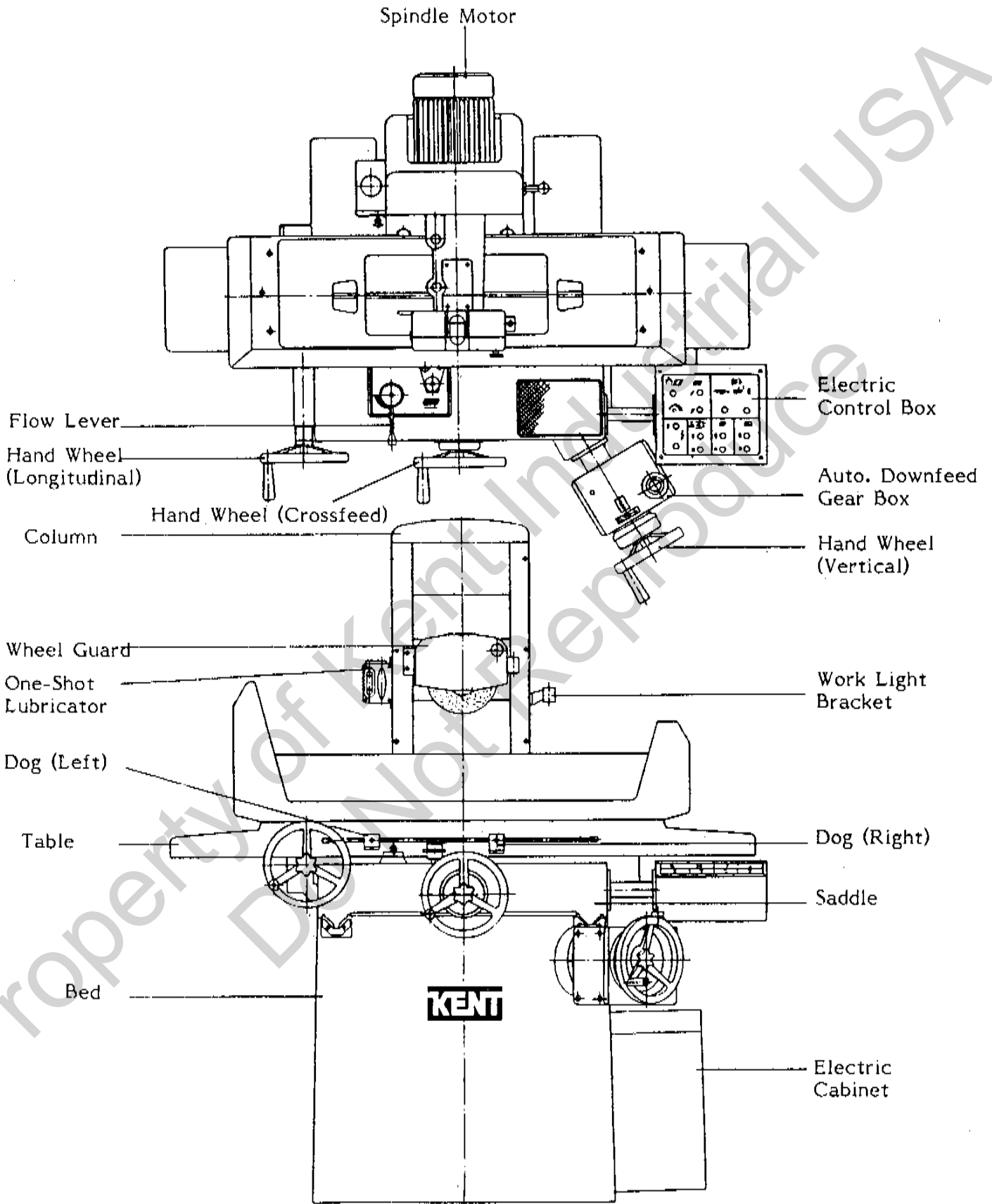
c. KGS-250H



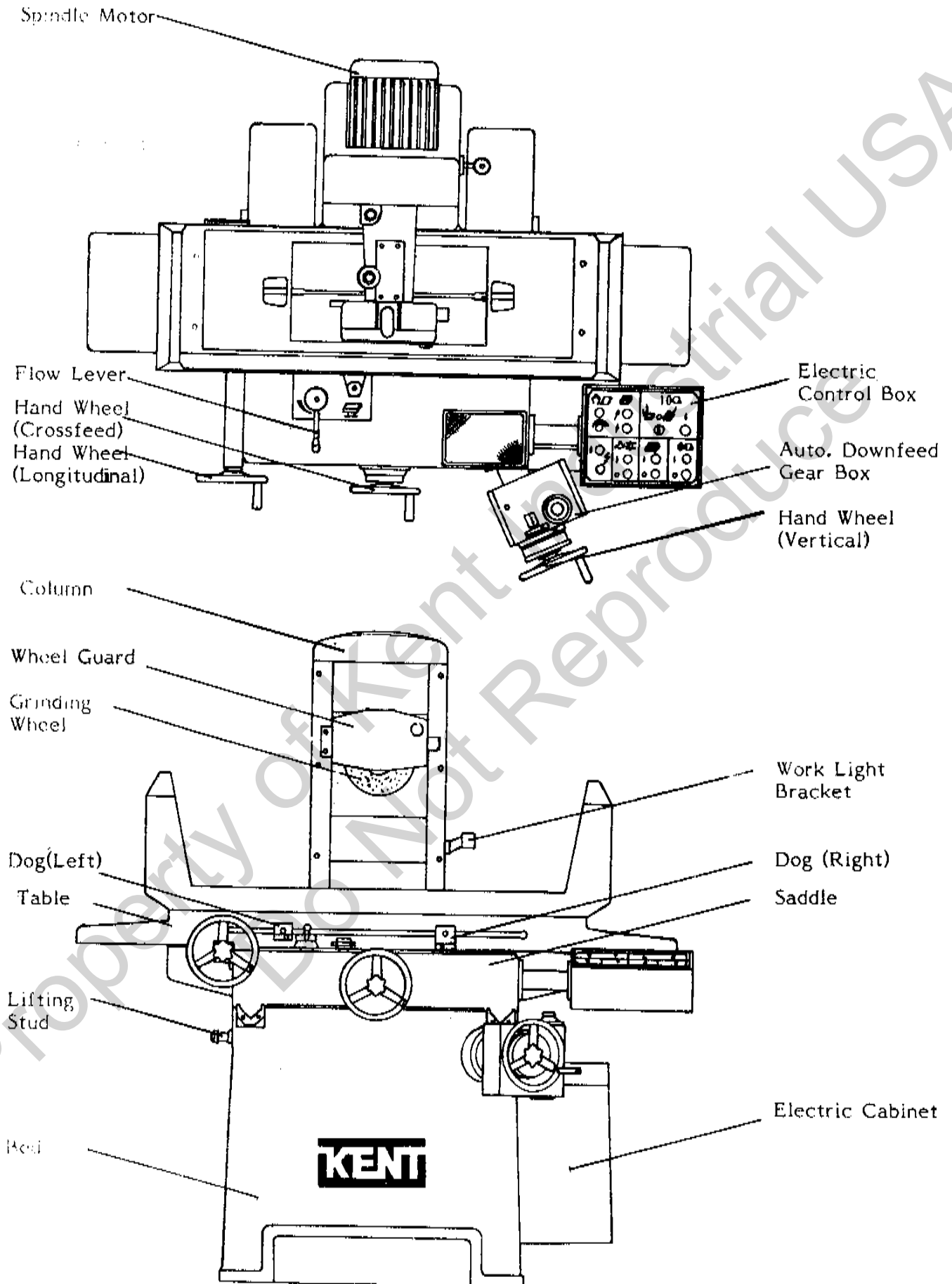
d. KGS-250AH



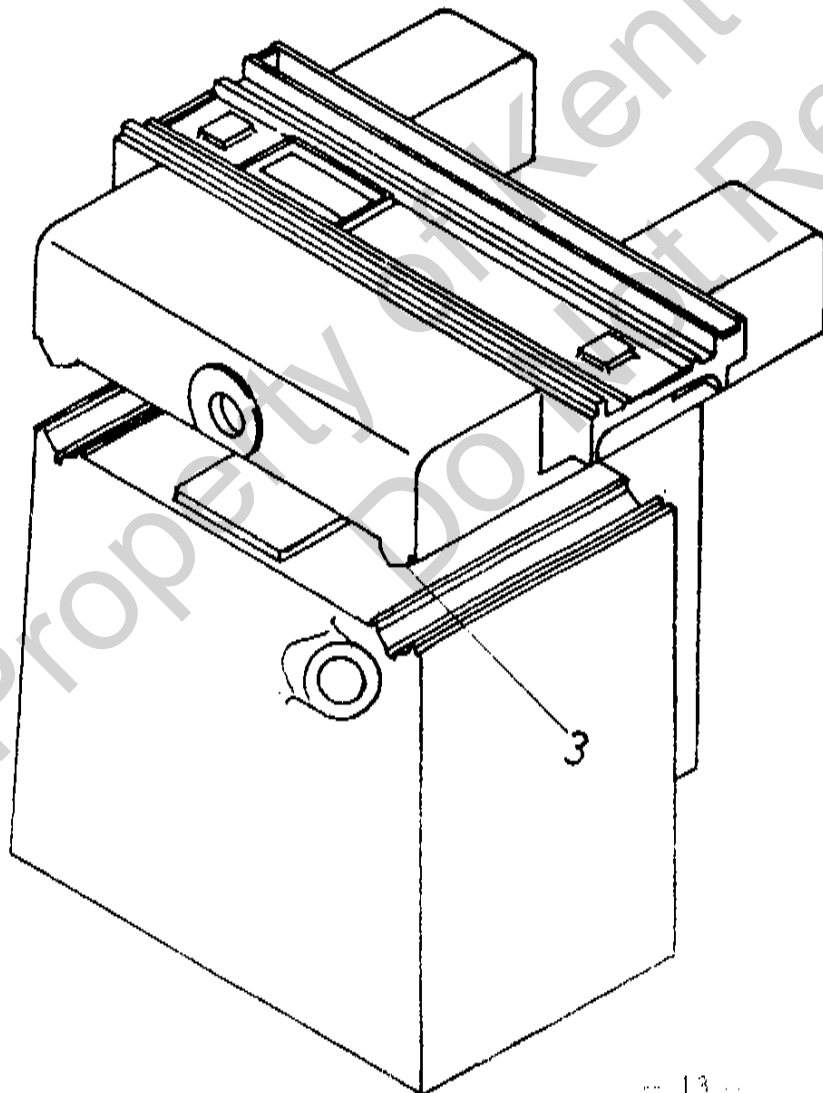
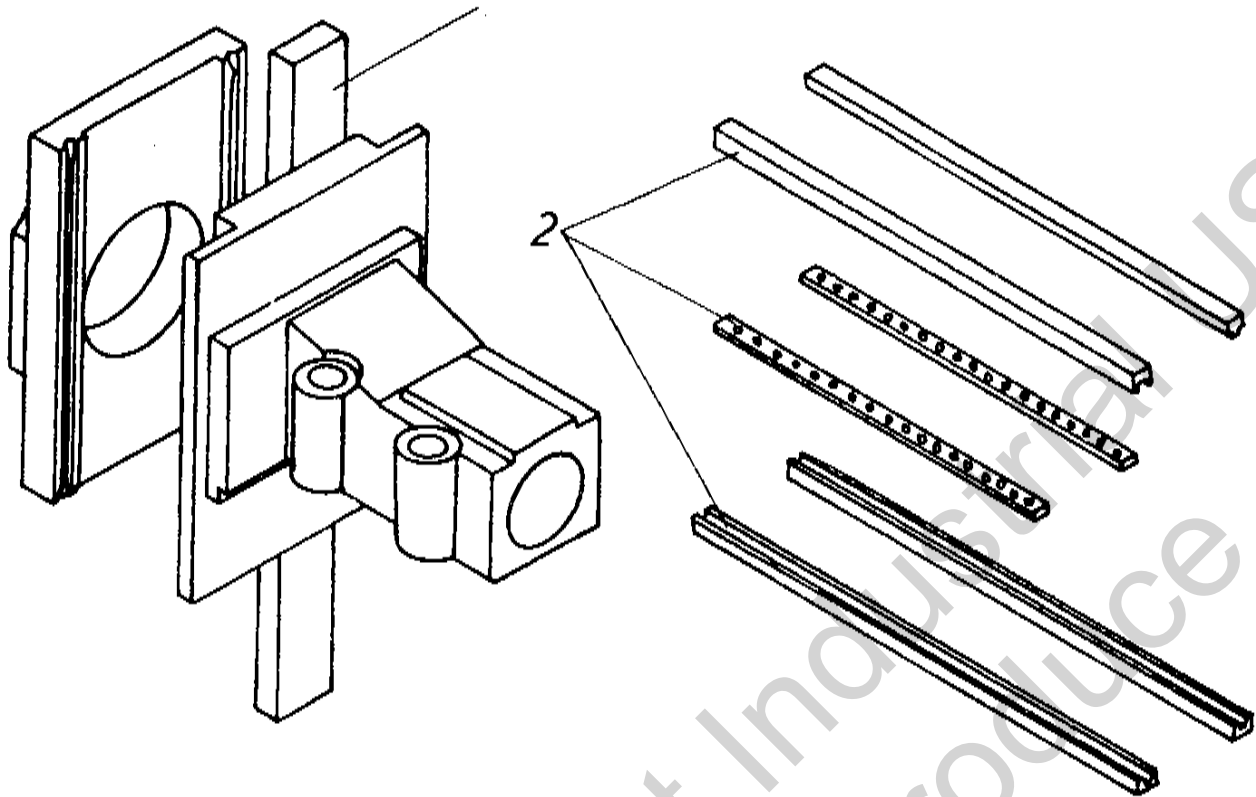
e. KGS-250AHD, KGS-818AHD



1. KGS-1020AHD



(4). Cleaning Up the Machine.



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

1. Elevation slide way.
2. Steel ball guide way.
3. Saddle "V" groove.

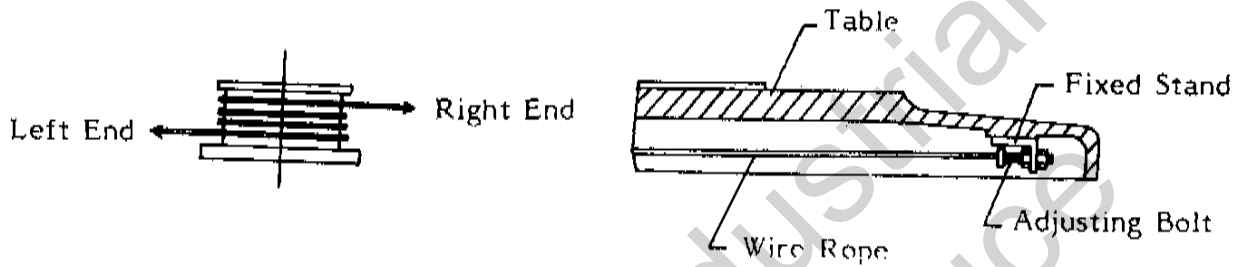
(5). Mounting The Table

a. For KGS-200, 250, 250H, 250AH, 250AHD models

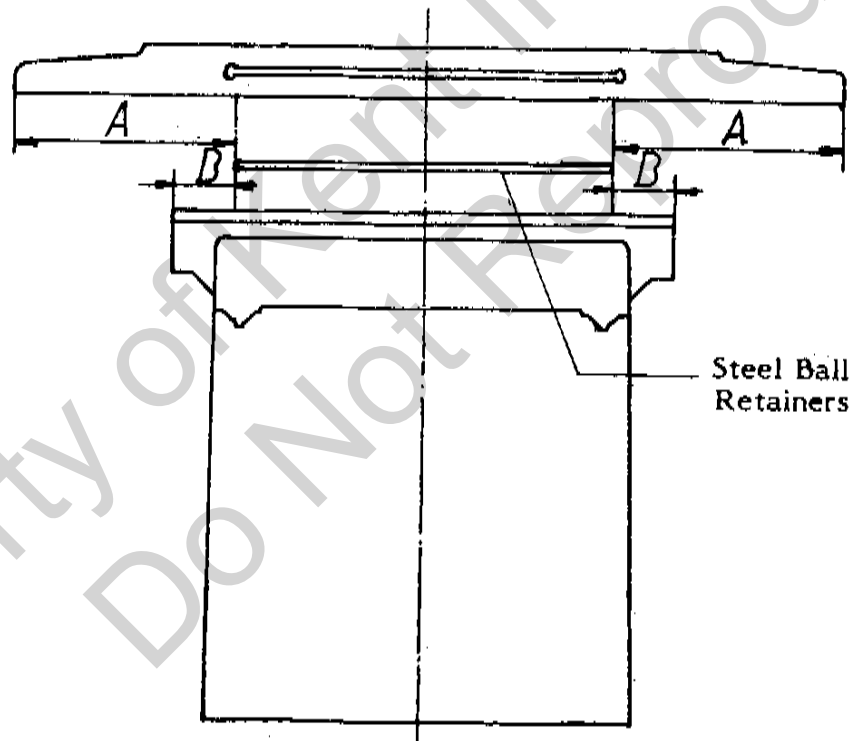
The machine is despatched completed with the exception of table, so as to protect the harden and ground slideways from damage during shipment. When the machine installed, mounting the table as following procedures:

Manual type:

1. Wind the wire rope on the "Drum" 4 cycles as figure shown, tightening the wire and fix it temporarily.



2. Put the steel ball retainers right in the middle of slideways.

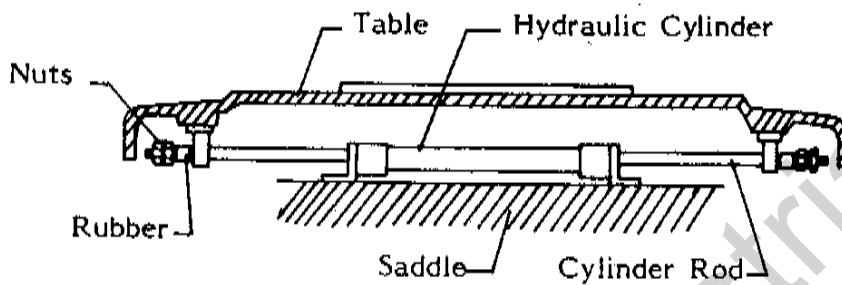


3. Lift up the table and place it on the steel ball retainers. To prevent slideways from damaging, please handle with care.
4. Fix the wire rope on the fixed stand.
5. The wire will loose after long use, and will cause table move unsmoothly. In this case please adjust the adjusting bolt at the right end till it's in tightening condition.

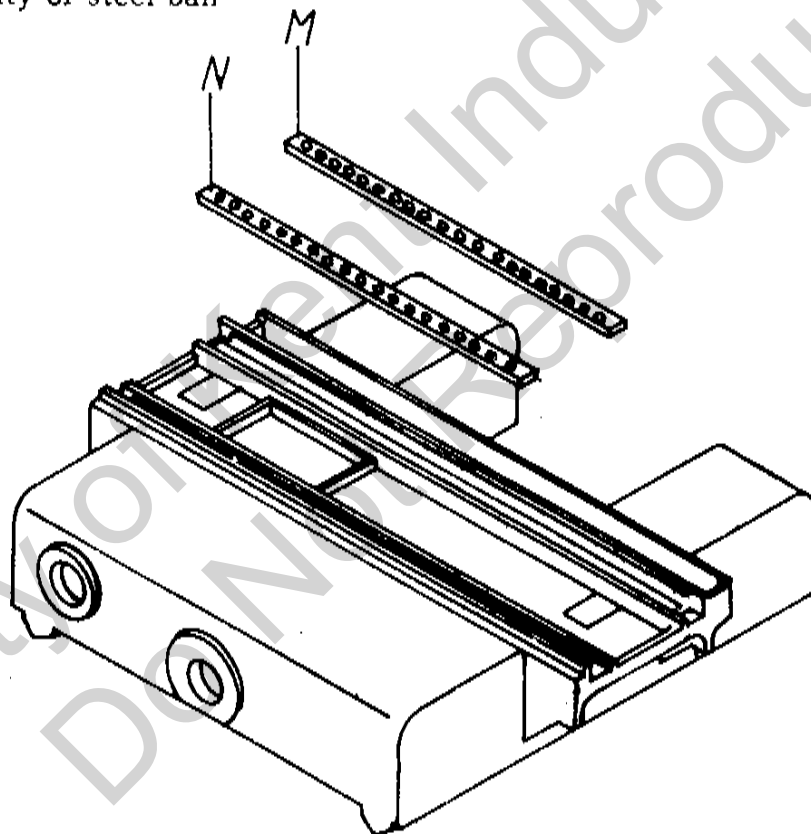


Hydraulic type:

1. Put the steel ball retainers right in the middle of slideways.
2. Lift up the table and place it on the steel ball retainers. To prevent slideways from damaging, please handle with care.
3. Fix the cylinder rod under the table as figure shown.



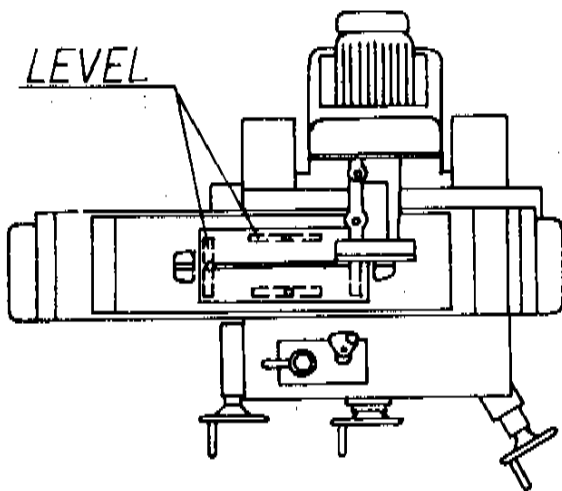
b. The quantity of steel ball



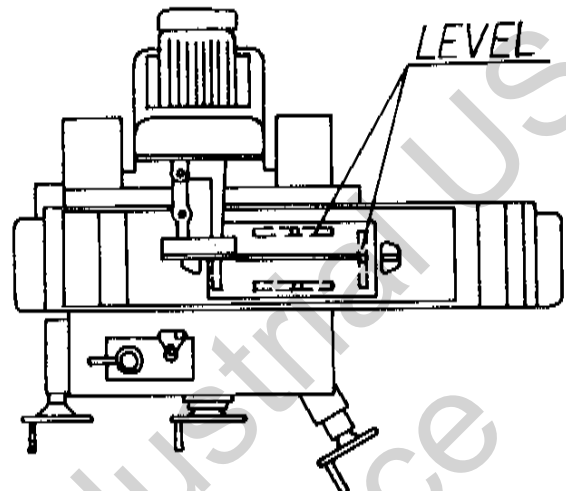
Model	M: sub total	N: sub total	Total amount
KGS-200	20	19	39
KGS-250 series	29	26	55

(6). Levelling The Machine

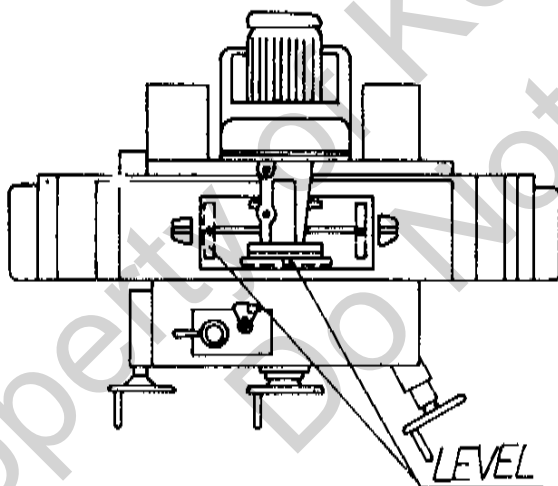
As following procedures:



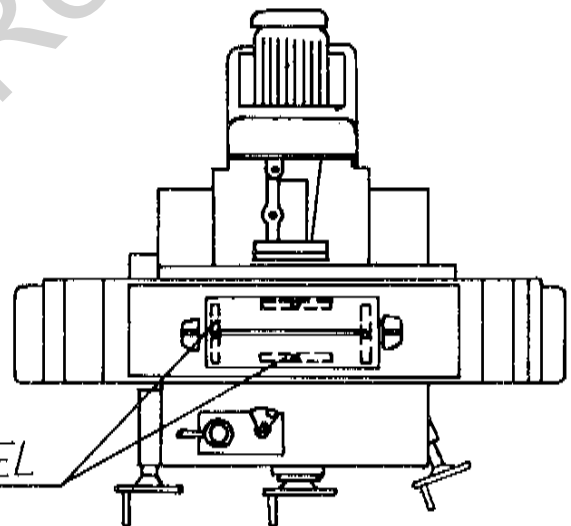
- a). Use longitudinal handwheel to let table at left end position.  
Levelling the machine by a Spirit Level in longitudinal and latitudinal direction.



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

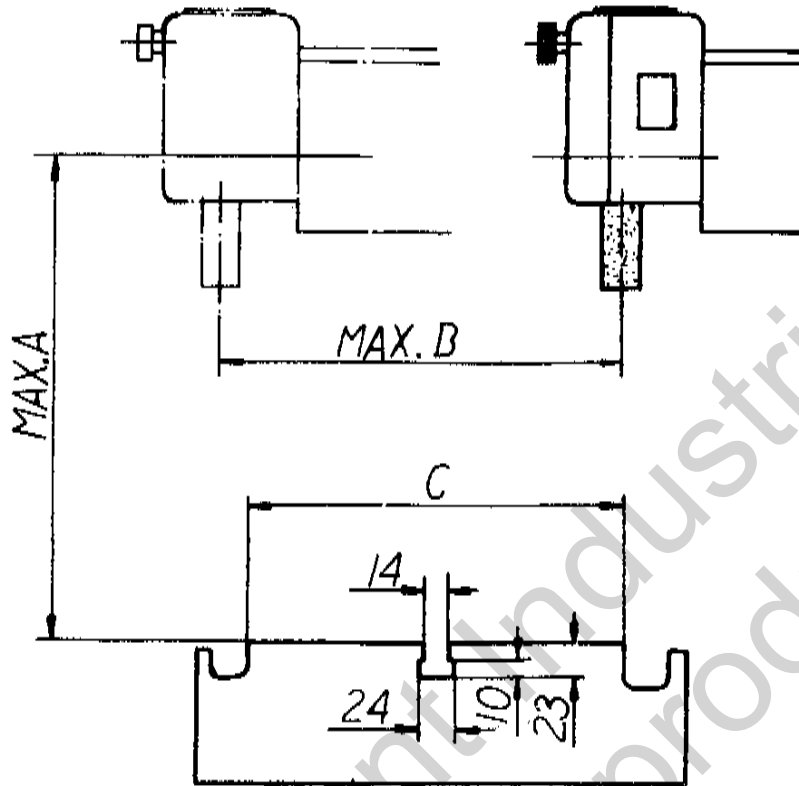


- c). Use crossfeed handwheel to let table at front end position.  
Levelling the machine by a Spirit Level in longitudinal and latitudinal direction.



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

(7). Table Size And Grinding Capacity



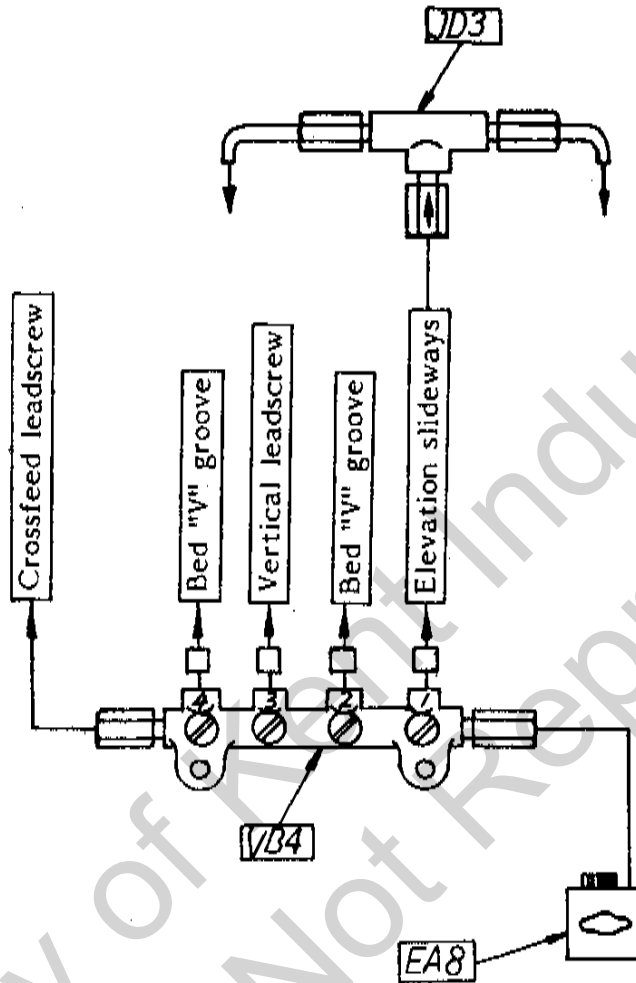
Unit:mm

Model	A	B	C
KGS-200	375	200	160
KGS-616H	380	220	160
KGS-250	380	250	200
H KGS-250AH AHD	380	250	200
KGS-818AHD	380	260	200
KGS-1020AHD	380	275	250

(8). Lubrication Instruction

a. For KGS-200, 250, 250H, 250AH, 250AHD

Lubrication Flow Chart



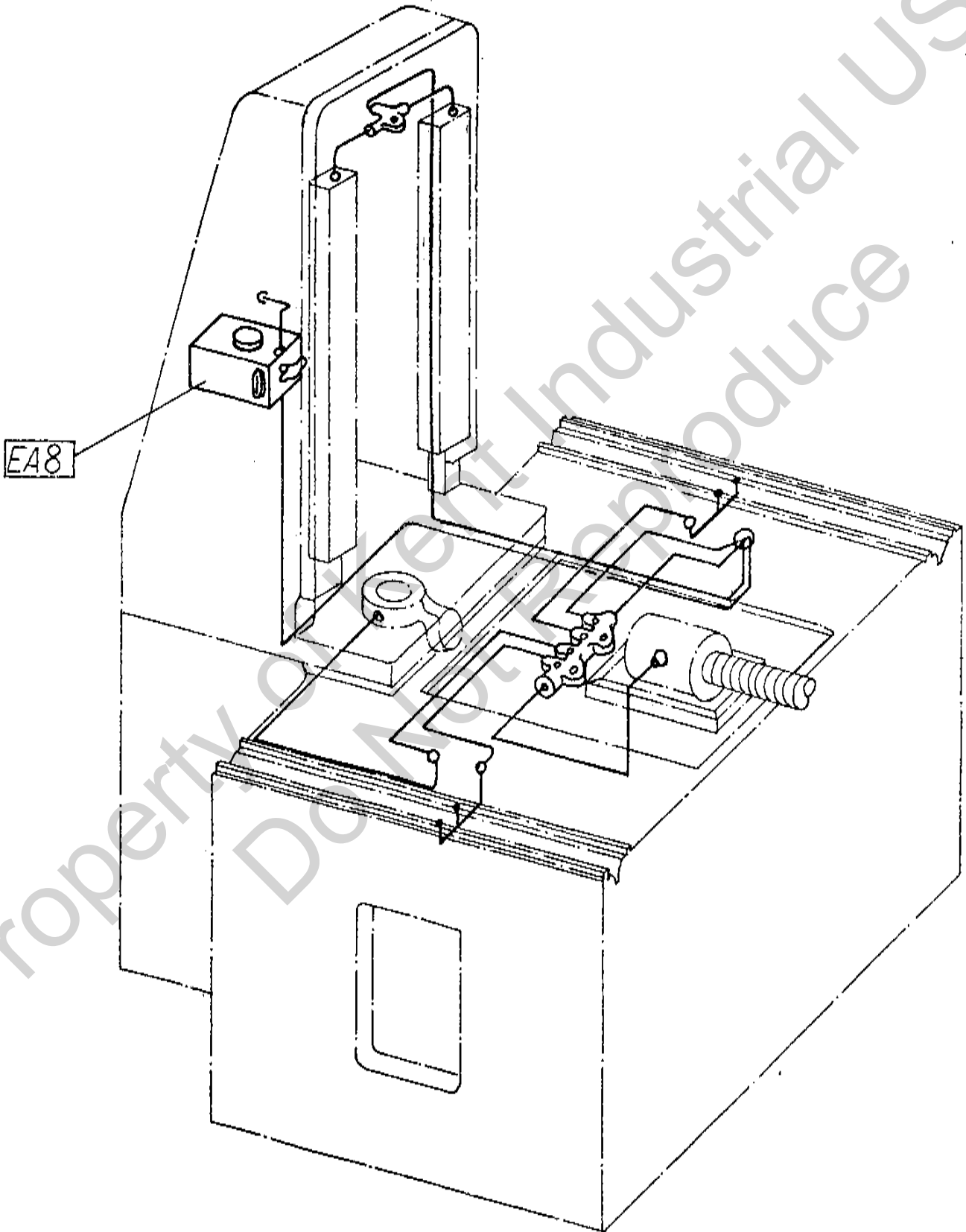
Reliability of the machine and economic running are ensured only by the correct choice of lubricant for the individual lubricating points.

1. Lubrication pump: One-shot lubricator, operated by hand, 8cc each time.
2. Lubricant: SAE30, Lubrication oil of BP, ESSO, MOBIL or SHELL.
3. Lubricant tank: 0.6 liters.
4. Lubricating points: Crossfeed leadscrew

Machine bed "V" groove  
Vertical leadscrew  
Elevation slideways

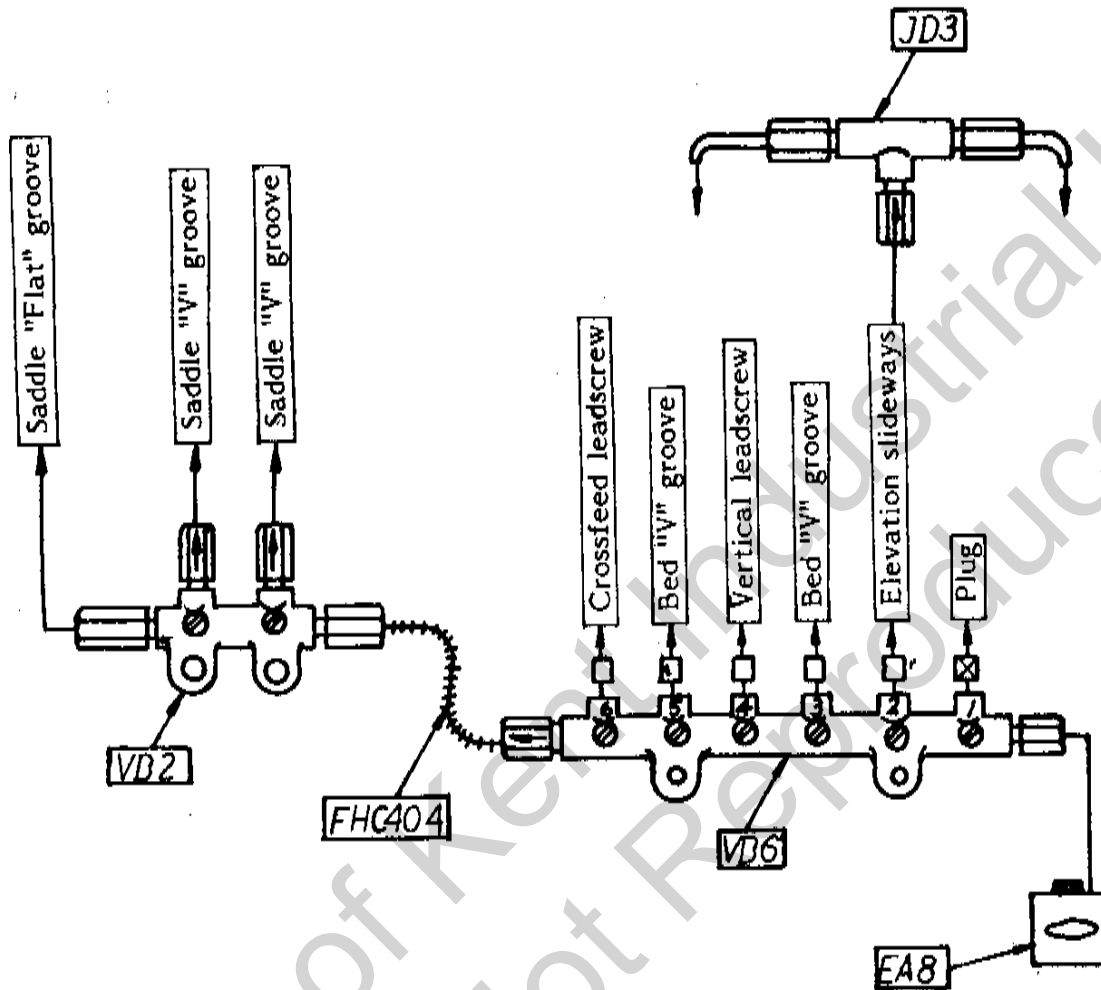
\*For KGS-250AHD only: Auto. downfeed gear box ( By grease gun )

Lubrication System Diagram



b. For KGS-616H

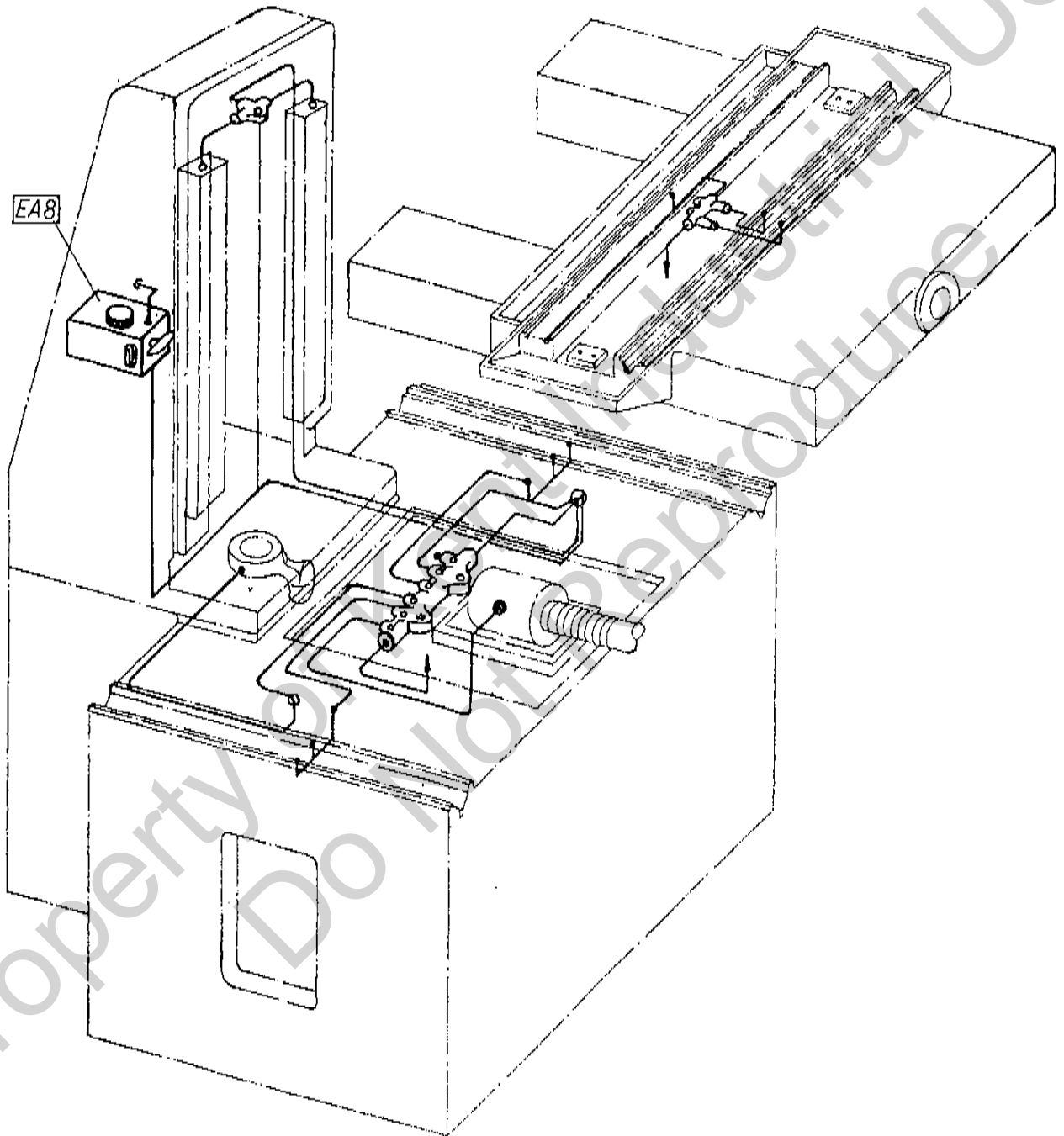
Lubrication Flow Chart



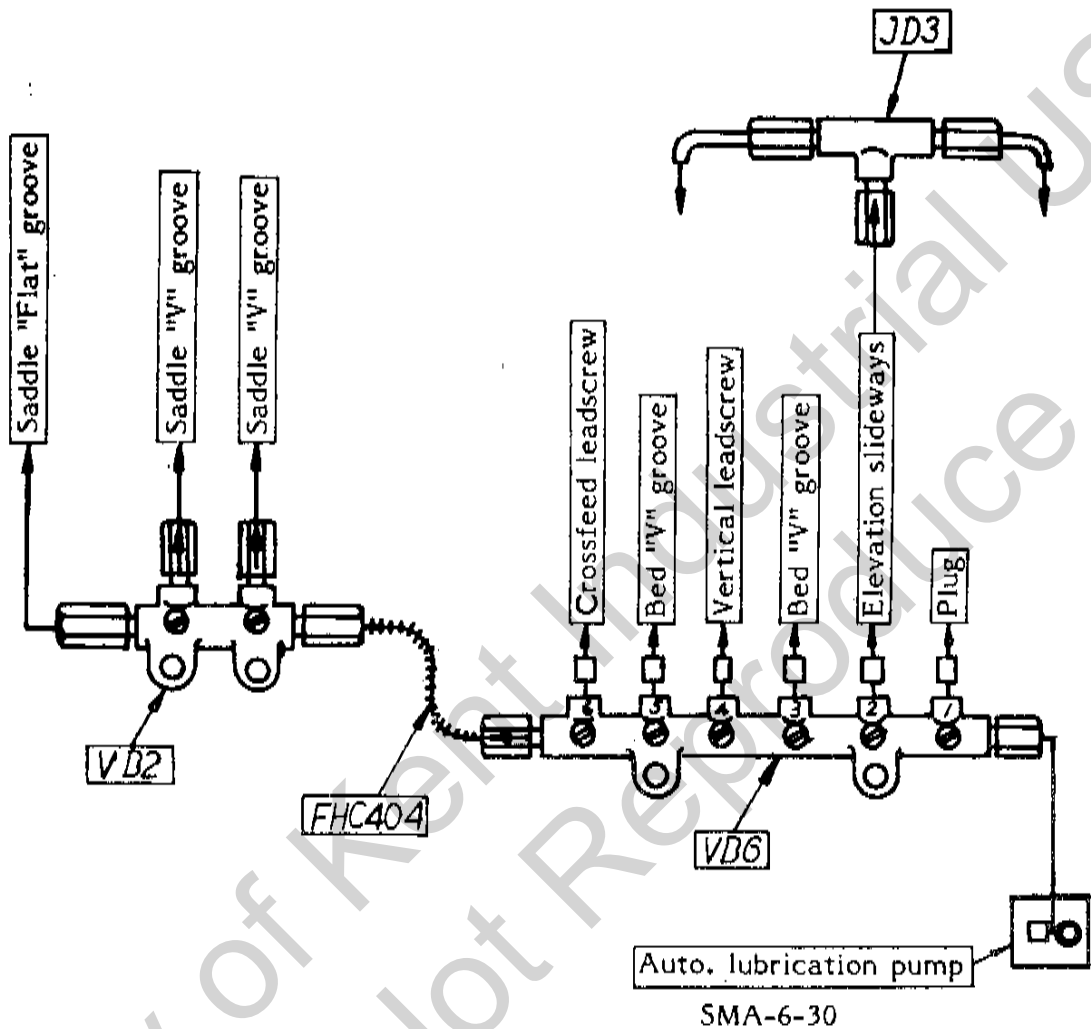
Reliability of the machine and economic running are ensured only by the correct choice of lubricant for the individual lubricating points.

1. Lubrication pump: One-shot lubricator, operated by hand, 8cc each time.
2. Lubricant: SAE30, Lubrication oil of BP, ESSO, MOBIL or SHELL.
3. Lubricant tank: 0.6 liters.
4. Lubricating points: Saddle "Flat" groove  
Saddle "V" groove  
Crossfeed leadscrew  
Bed "V" groove  
Vertical leadscrew  
Elevation slideways

Lubrication System Diagram



Lubrication Flow Chart



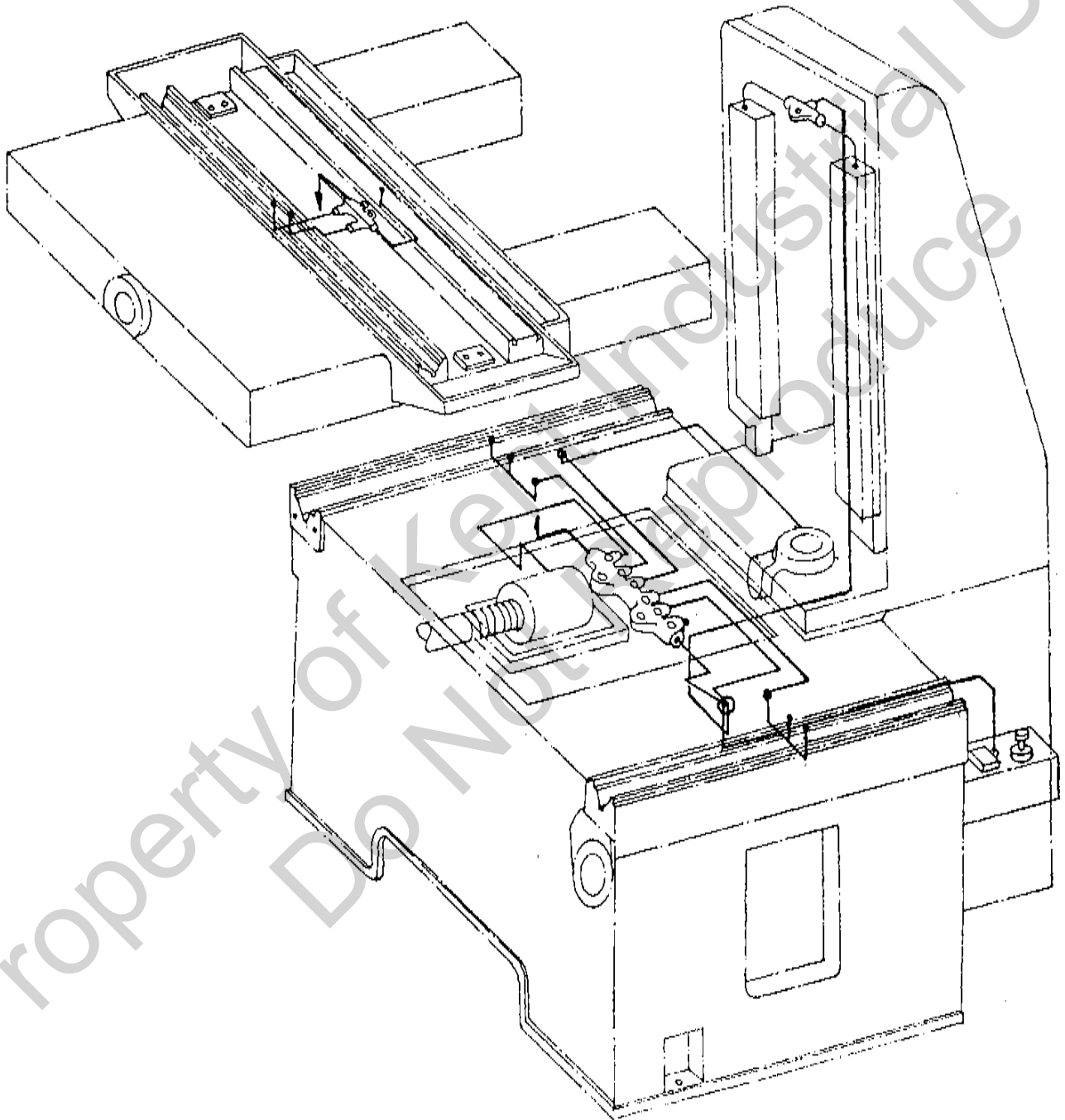
Reliability of the machine and economic running are ensured only by the correct choice of lubricant for the individual lubricating points.

1. Lubrication pump: Auto. lubrication pump will be operated when machine power is ON, then pumps 3-6cc ( adjustable ) in every 30 minutes.
2. Lubricant: SAE30, Lubrication oil of BP, ESSO, MOBIL or SHELL.
3. Lubricant tank: 1.5 liters.
4. Lubricating points: Saddle "Flat" groove  
Saddle "V" groove  
Crossfeed leadscrew  
Bed "V" groove  
Vertical leadscrew  
Elevation slideways

\* Auto. downfeed gear box ( By grease gun )

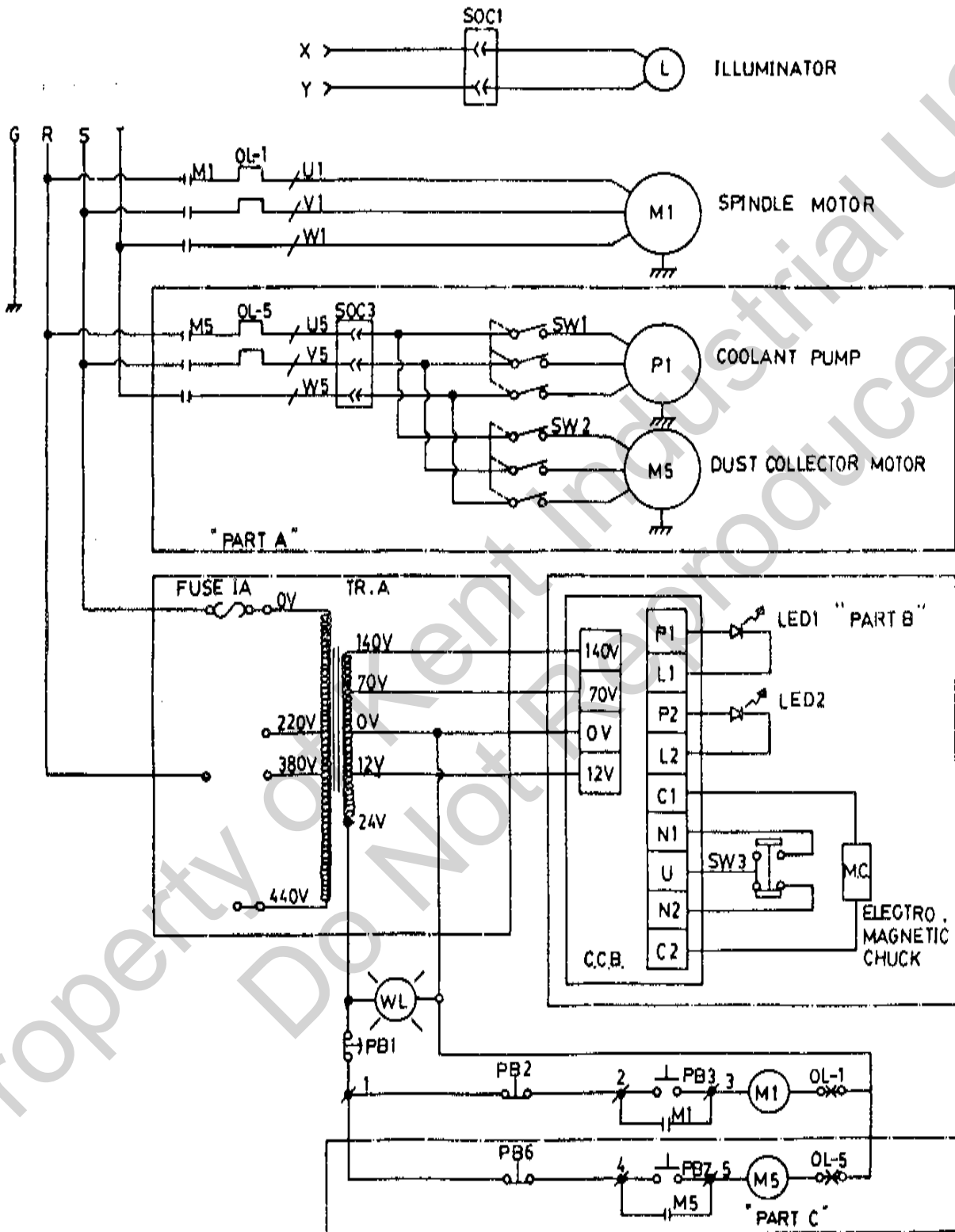


Lubrication System Diagram



(9). Circuit Diagram & Connection Diagram

a. KGS-200, 250



KGS-200, 250 ( I.I-2504 )

**Description:**

PB1: Emergency pushbutton

WL: Indicator of power source

PB2: Pushbutton "OFF" of spindle motor

PB3: Pushbutton "ON" of spindle motor

PB6: Pushbutton "OFF" of coolant or dust-collector power source

PB7: Pushbutton "ON" of coolant or dust-collector power source

SW1: ON-OFF switch for coolant pump

SW2: ON-OFF switch for dust-collector motor

SW3: Selector-switch of electro-magnetic chuck

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

SOC1: Socket for illuminator

SOC3: Socket for coolant or dust-collector

M1: Magnetic contactor for spindle motor

M5: Magnetic contactor for coolant or dust-collector

Fu: Fuse

OL1: Overload relay of M1

OL5: Overload relay of M5

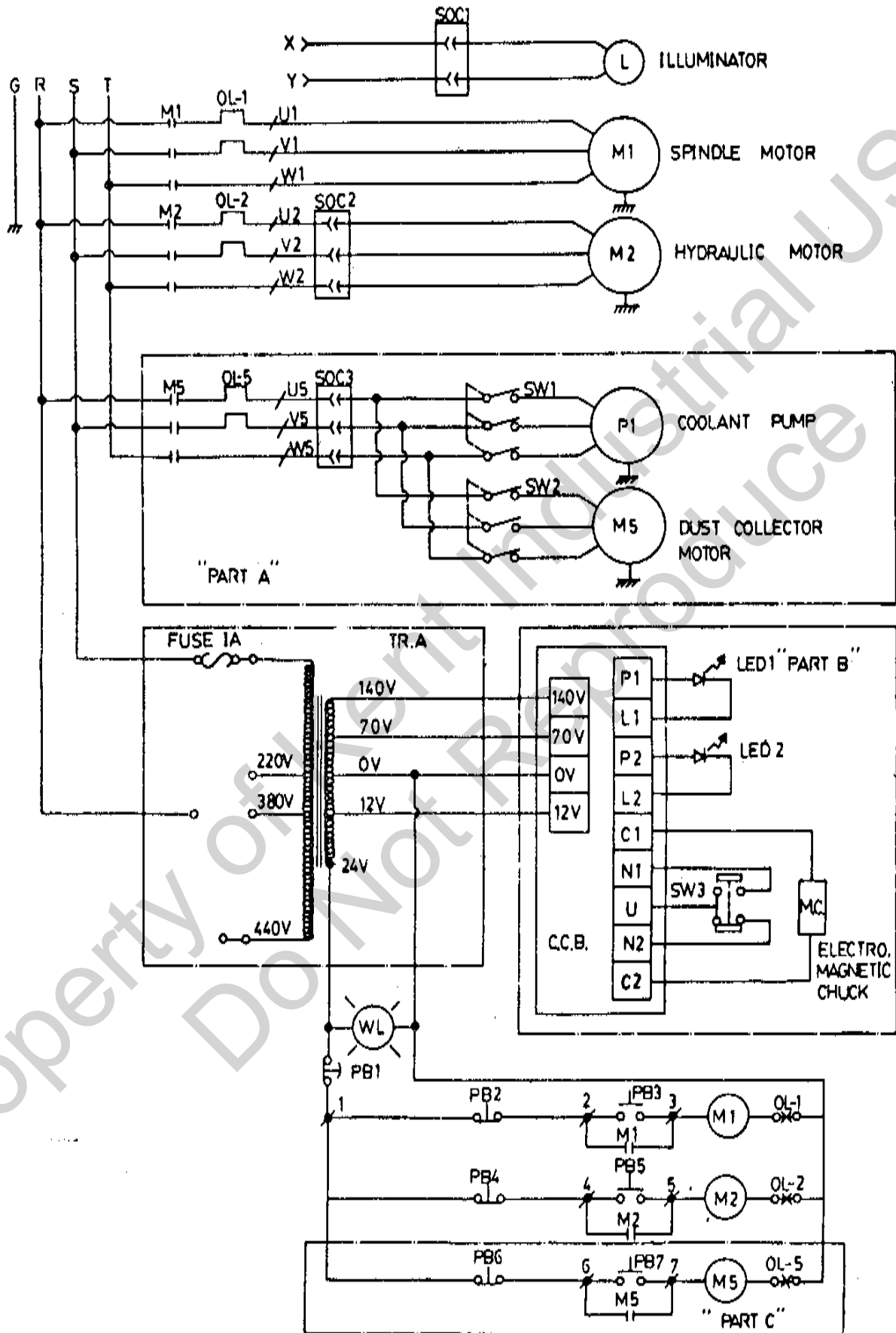
C.C.B.: Chuck control box

\* Part A and Part C will be omitted if coolant or dust-collector not equipped.

\* C.C.B. will be omitted if electro-magnetic chuck not equipped.



b. KGS-616H, 250H



KGS-616H, 250H (EJ-2514)

Description:

PB1: Emergency pushbutton

WL: 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

SW1: ON-OFF switch for coolant pump

SW2: ON-OFF switch for dust-collector motor

SW3: Selector-switch of electro-magnetic chuck

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

SOC1: Socket for illuminator

SOC2: Socket for hydraulic power source

SOC3: Socket for coolant or dust-collector

M1: Magnetic contactor for spindle motor

M2: Magnetic contactor for hydraulic motor

M5: Magnetic contactor for coolant or dust-collector

Fu: Fuse

OL1: Overload relay of M1

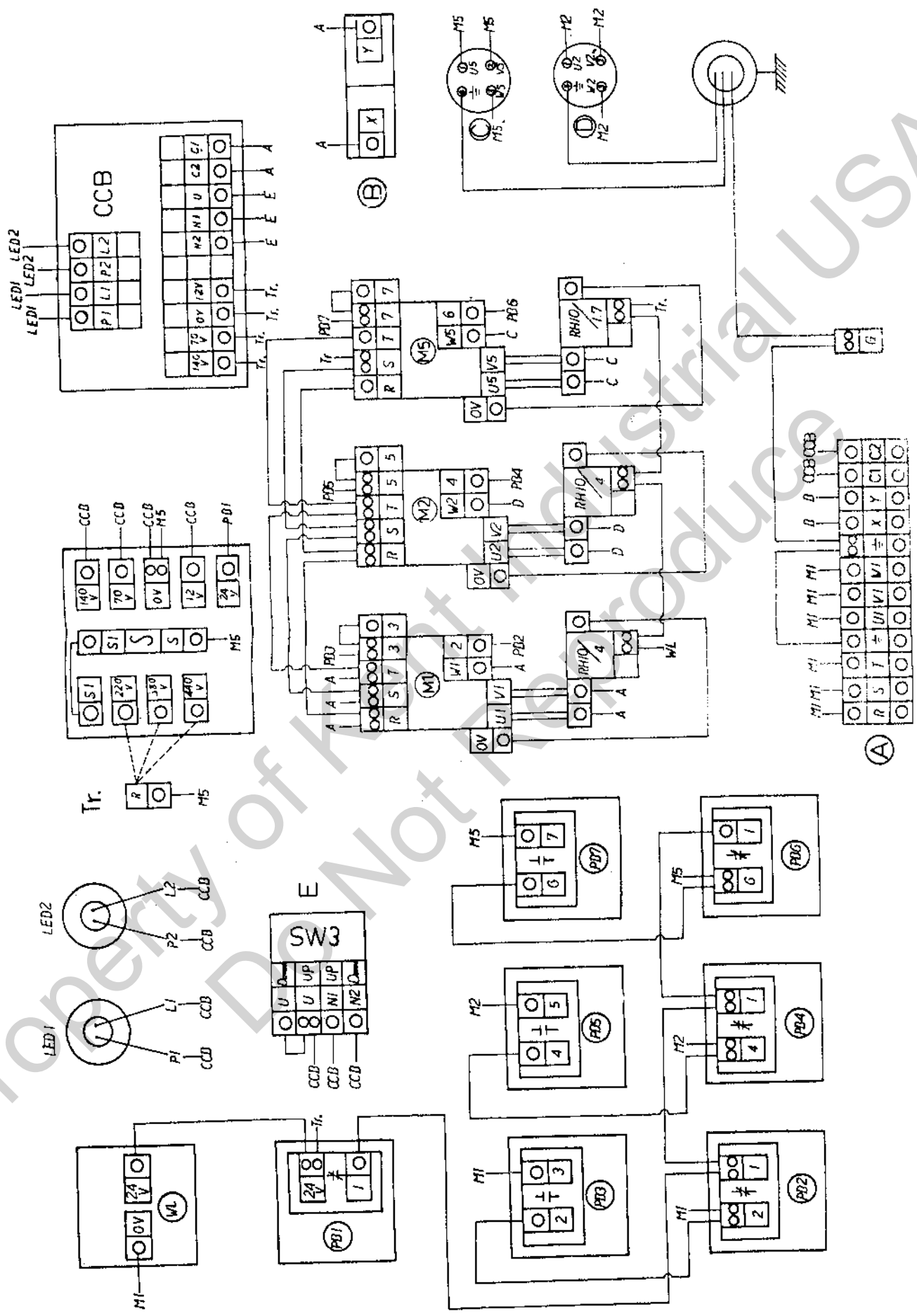
OL2: Overload relay of M2

OL5: Overload relay of M5

C.C.B.: Chuck control box

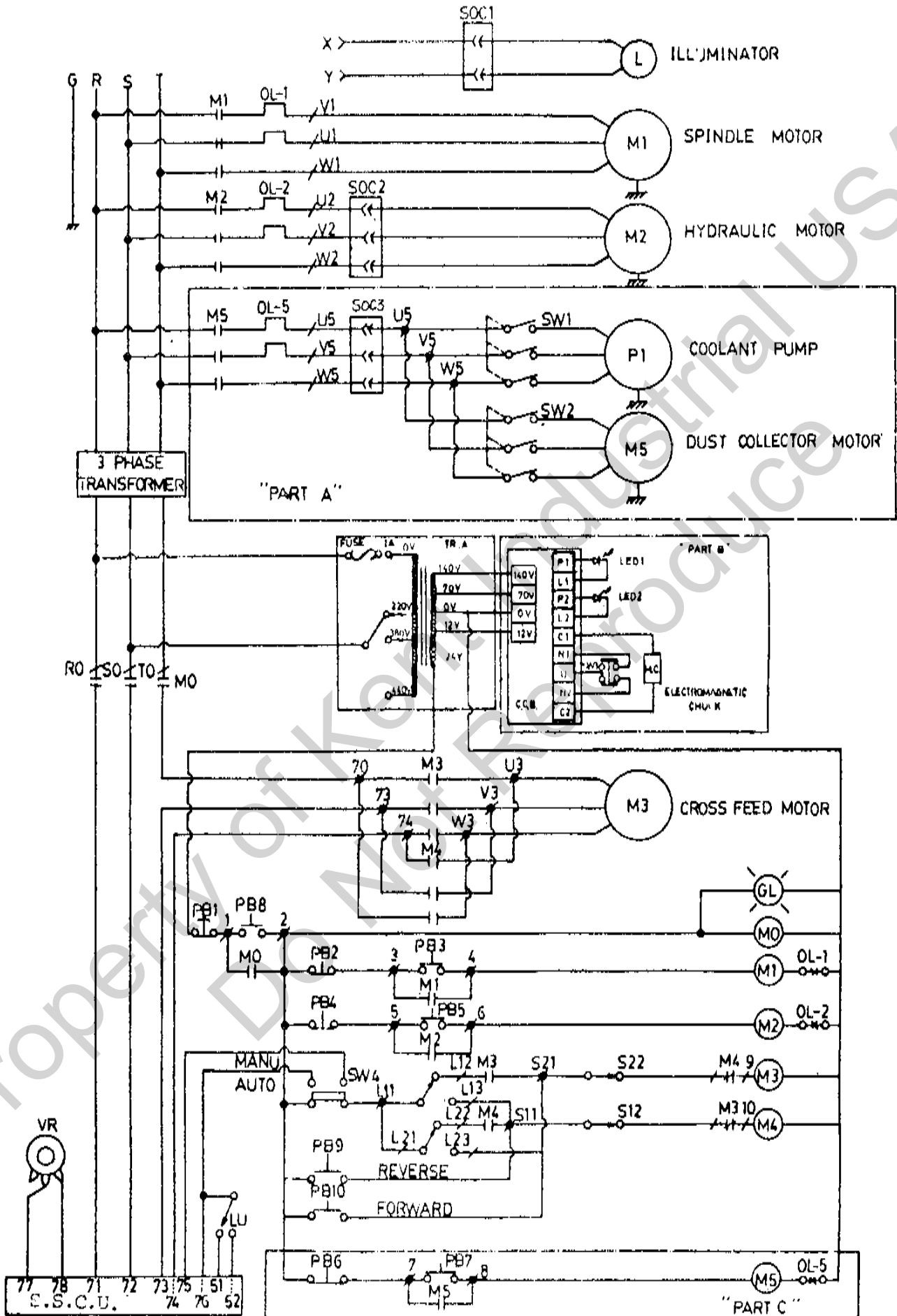
\* Part A and Part C will be omitted if coolant or dust-collector not equipped.

\* C.C.B. will be omitted if electro-magnetic chuck not equipped.



KGS-2501H, 016111 (REV. 2/1977)

c. KGS-250AH



KGS-250AH (1/2/24)



## 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/man. 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

M1: Magnetic contactor for spindle motor

M2: Magnetic contactor for hydraulic motor

M3&M4: Internal mechanical lock magnetic contactor for crossfeed motor

M5: Magnetic contactor for coolant or dust-collector

M0: Magnetic contactor for power source

Fu: Fuse

OL1: Overload relay of M1

OL2: Overload relay of M2

OL5: Overload relay of M5

S21-S22, S11-S12: Limit switch for max. crossfeed stroke control

L21-L22, L11-L12: Limit switch for adjustable crossfeed stroke control

Lu: Limit switch for inching crossfeed

S.S.C.U.: Solid state control unit

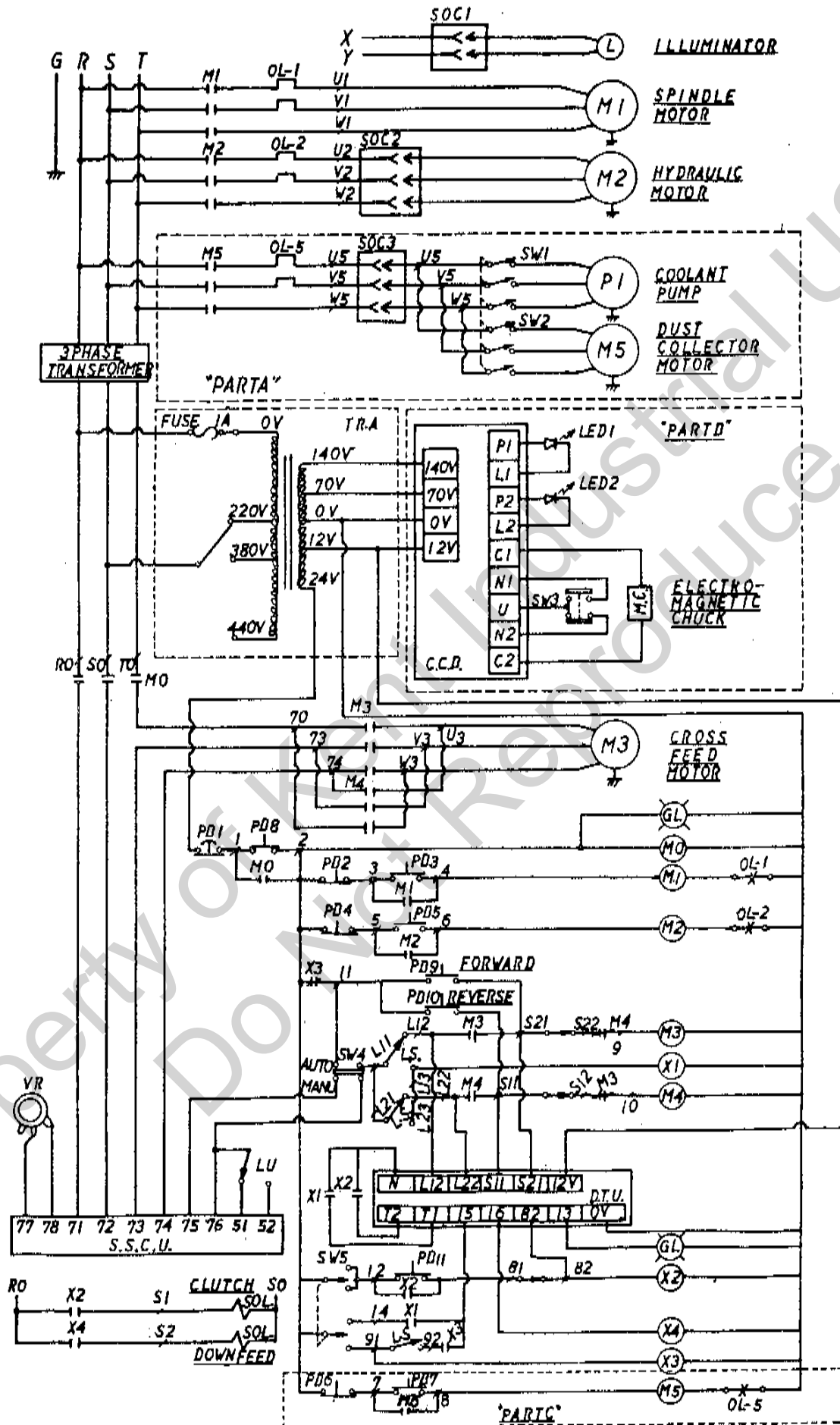
C.C.B.: Chuck control box

\* Part A and Part C will be omitted if coolant or dust-collector not equipped.

\* C.C.B. will be omitted if electro-magnetic chuck not equipped.



d. KGS-250AHD, 818AHD, 1020AHD



KGS-250AHD, 818AHD, 1020AHD ( EJ-2534 )

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 auto. 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./man. 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 & auto. downfeed solenoid valves  
SOC1: Socket for illuminator  
SOC2: Socket for hydraulic power source  
SOC3: Socket for coolant or dust-collector  
M1: Magnetic contactor for spindle motor  
M2: Magnetic contactor for hydraulic motor  
M3&M4: Internal mechanical lock magnetic contactor for crossfeed motor  
M5: Magnetic contactor for coolant or dust-collector  
M0: Magnetic contactor for power source  
X1: Relay for crossfeed reversal  
X2: Relay for auto. downfeed clutch engage solenoid valve  
X3: Relay for circuit lock of crossfeed when plunge grinding  
X4: Relay for auto. downfeed solenoid valve  
OL1: Overload relay of M1  
OL2: Overload relay of M2  
OL5: Overload relay of M5  
S11-S12, S21-S22: Limit switch for max. crossfeed stroke control  
L11-L12, L21-L22: Limit switch for adjustable crossfeed stroke control  
Lu: Limit switch for inching crossfeed  
81-82: Limit switch for auto. downfeed stroke control  
91-92: Limit switch for auto. downfeed  
SOL1: Auto. downfeed clutch engage solenoid valve  
SOL2: Auto. downfeed solenoid valve  
S.S.C.U.: Solid state control unit  
C.C.B.: Chuck control box  
D.T.U.: Delay timer unit

\* Part A and Part C will be omitted if coolant or dust-collector not equipped.

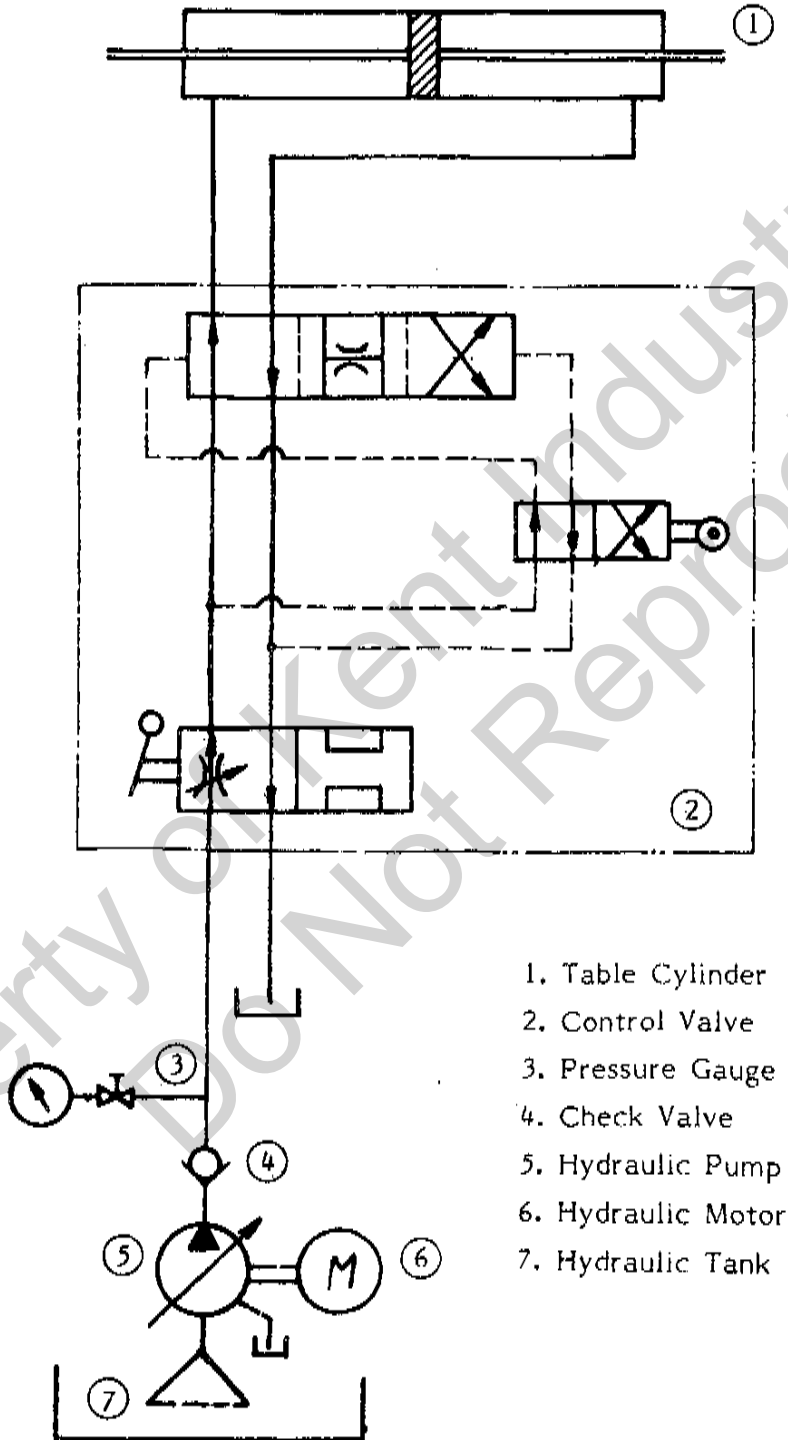
\* C.C.B. will be omitted if electro-magnetic chuck not equipped.



(10). Hydraulic System

a. For KGS-616H, 250H, 250AH

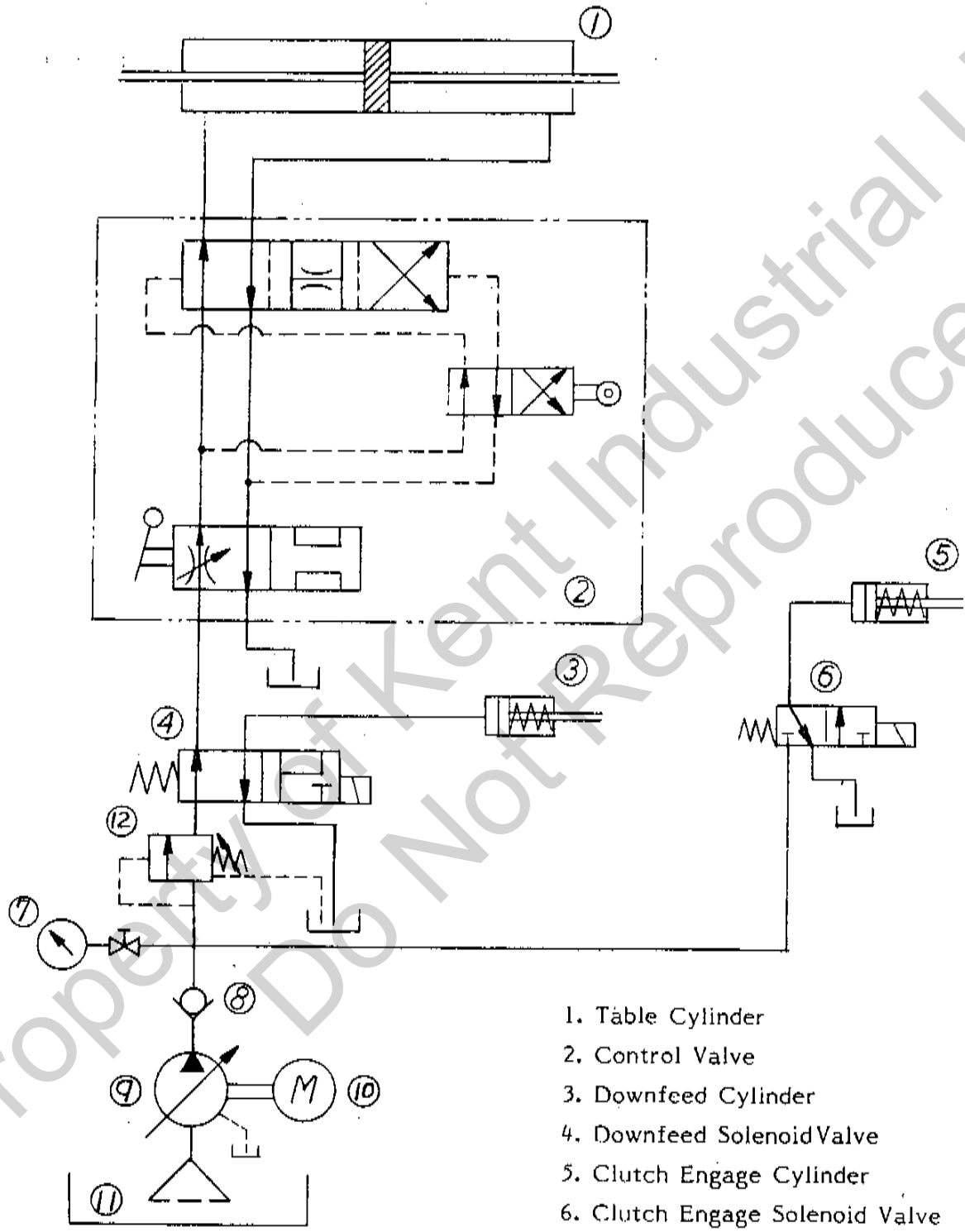
Hydraulic Diagram



1. Table Cylinder
2. Control Valve
3. Pressure Gauge
4. Check Valve
5. Hydraulic Pump
6. Hydraulic Motor
7. Hydraulic Tank

b. For KGS-250AHD, 818AHD, 1020AHD

Hydraulic Diagram



- 1. Table Cylinder
- 2. Control Valve
- 3. Downfeed Cylinder
- 4. Downfeed Solenoid Valve
- 5. Clutch Engage Cylinder
- 6. Clutch Engage Solenoid Valve
- 7. Pressure Gauge
- 8. Check Valve
- 9. Hydraulic Pump
- 10. Hydraulic Motor
- 11. Hydraulic Tank
- 12. Sequence Valve

c. Hydraulic Oil

Hydraulic tank volume:

KGS-250H, 616H, 250AH, 250AHD, 818AHD, 1020AHD 50 liters ( 12.5 gallons )

Re-fill frequency:

After first month change new hydraulic oil and clean hydraulic tank, then every six months.

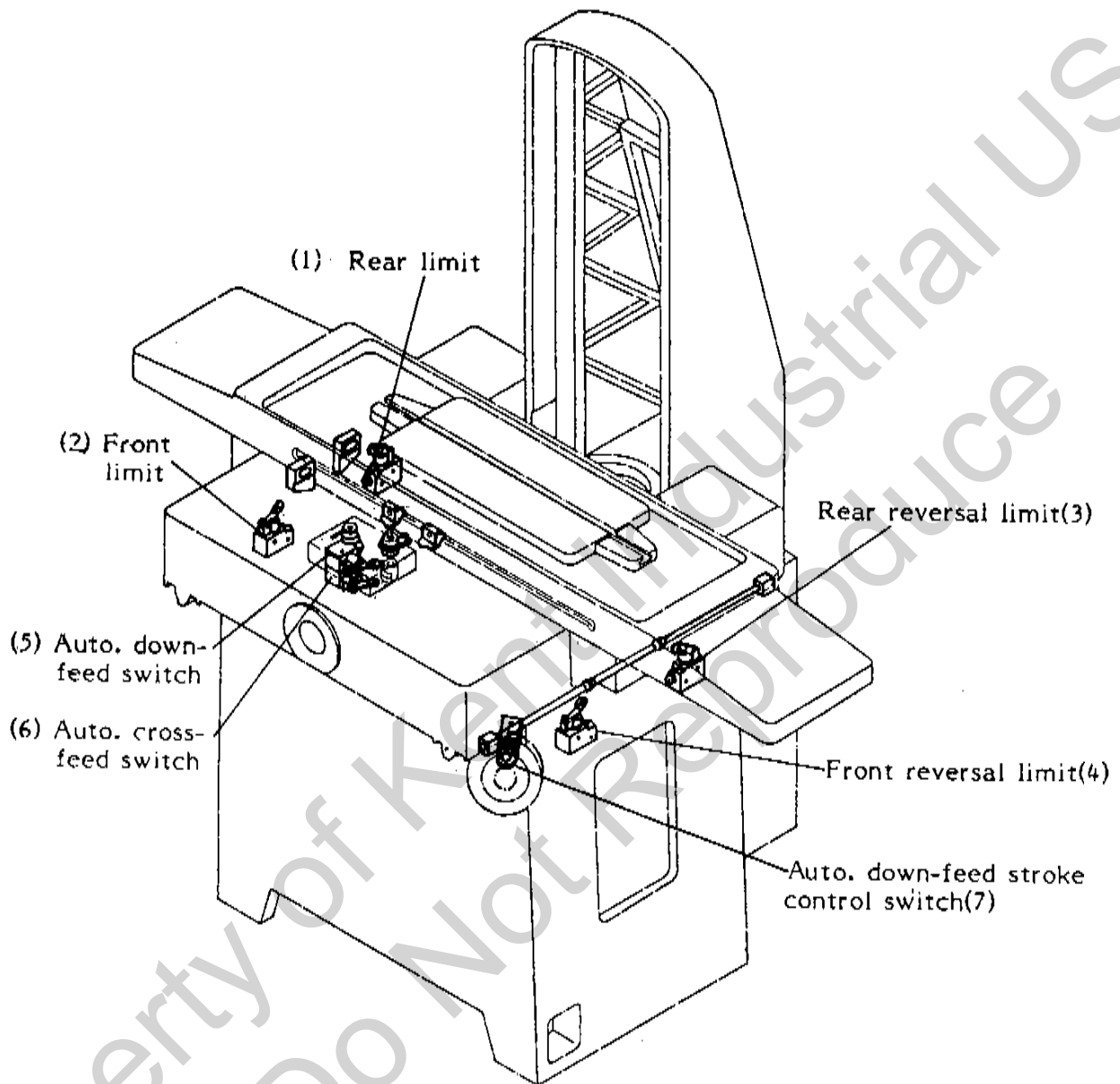
Hydraulic oil:

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 the hydraulic motor.
- \* Table driven by hydraulic force, please ensure that there is no people or objects within the range of table movement before starting the longitudinal travel.
- \* Maximum hydraulic pressure: 22 kgs/cm<sup>2</sup>.
- \* Clean filter or change a new one if damaged when changing new oil.



(11). Limit Switch Position



Description:

- (1) Rear limit: S11-S12 (for AH, AHD models only)
- (2) Front limit: S21-S22 (for AH, AHD models only)
- (3) Rear reversal limit: L11-L12 (for AH, AHD models only)
- (4) Front reversal limit: L21-L22 (for AH, AHD models only)
- (5) Auto. down feed switch: 91-92 (for AHD model only)
- (6) Auto. cross feed switch: 76-51-52 (for AH, AHD models only)
- (7) Auto. down-feed stroke control switch: 81-82 (for AHD model only)

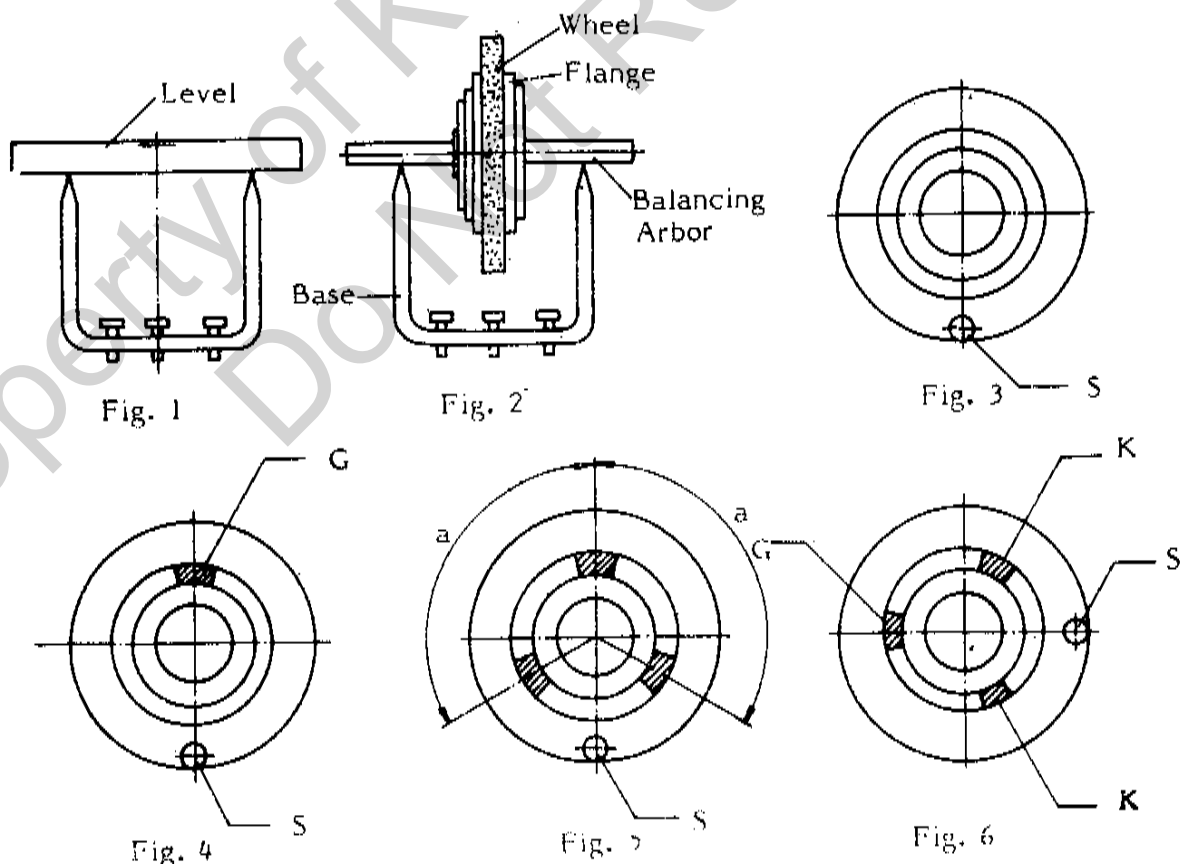
\* For above-mentioned cord no., please refer to Circuit Diagram.

## (12). 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.



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.

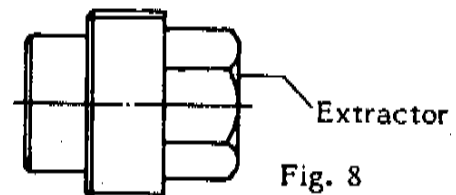
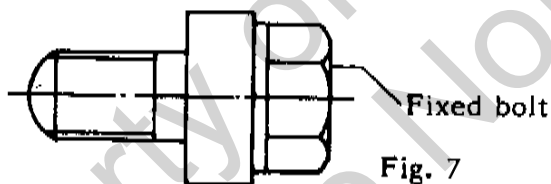
After this first balancing, the wheel must be removed from the spindle again and then carefully re-balanced. After being fitted to the spindle again and re-dressed, it is ready for use.

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

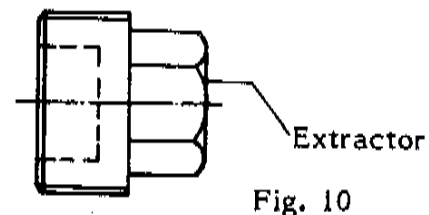
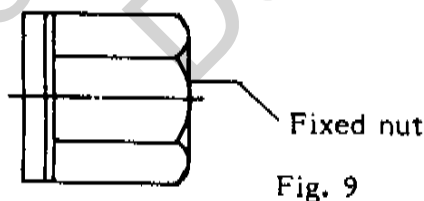
Grinding wheel absorbs humidity and coolant, it is therefore advisable not to start coolant supply when the wheel is stationary, otherwise the wheel will absorb liquid on one side only and will then be out of balance. If the wheel is allowed to stand for any length of time coolant will collect at the 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 or nut. ( Fig. 7 or Fig. 9 ) To release wheel flange from spindle taper with extractor. ( Fig. 8 or Fig. 10 )

General type spindle:



American type spindle:

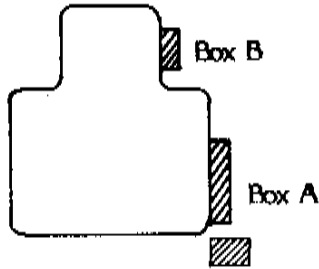


\* If various material have to be ground, so that the wheel has to be changed frequently, it is more advantageous to change the wheel complete with flange. It would involve unnecessary loss of time and wheel waste to remove the wheel from its mounting every time and re-balance and re-dress it.

## 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:

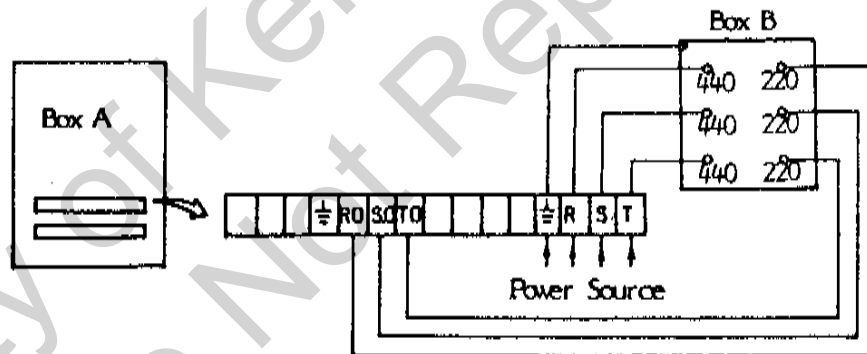
1. Crossfeed motor
2. Solenoid valve ( AHD model )
3. Electro-magnetic chuck ( Optional )
4. Auto. lubrication pump ( KGS-818AHD, 1020AHD )

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

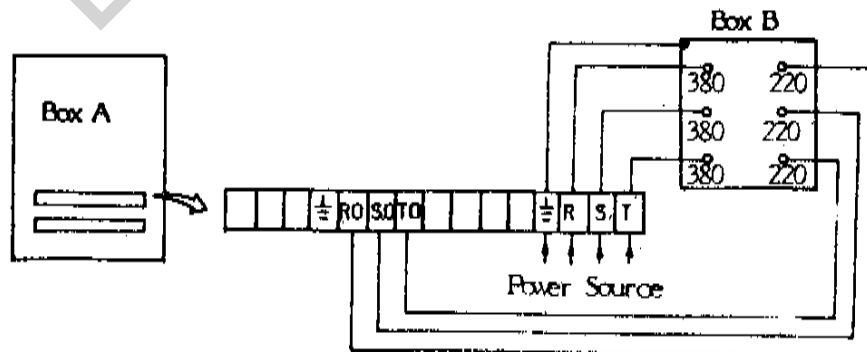
Attention: Following motors must be wired in accordance with power source voltage.

1. Spindle motor
2. Hydraulic motor ( For H, AH, AHD models )
3. Coolant or dust-collector motor ( Optional accessory )

a. For 440V power source areas:

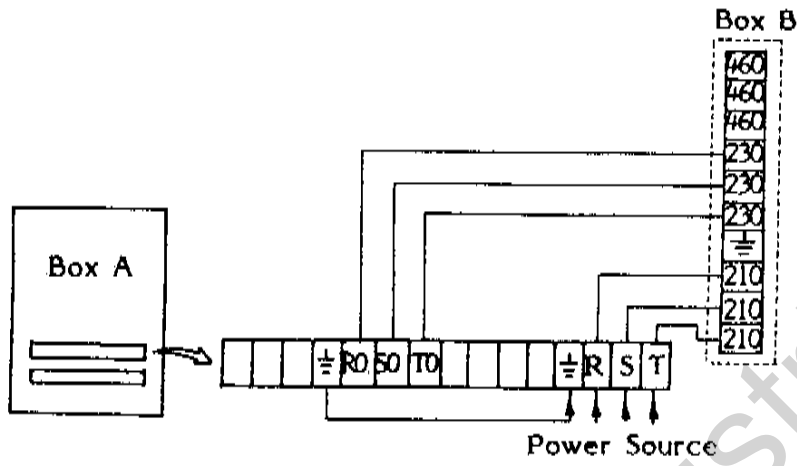


b. For 380V power source areas:

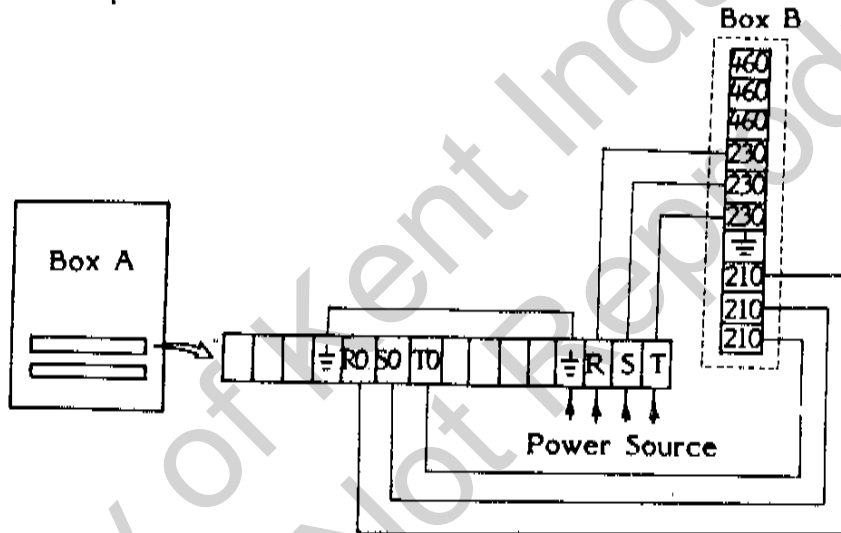


c. For U.S.A. area:

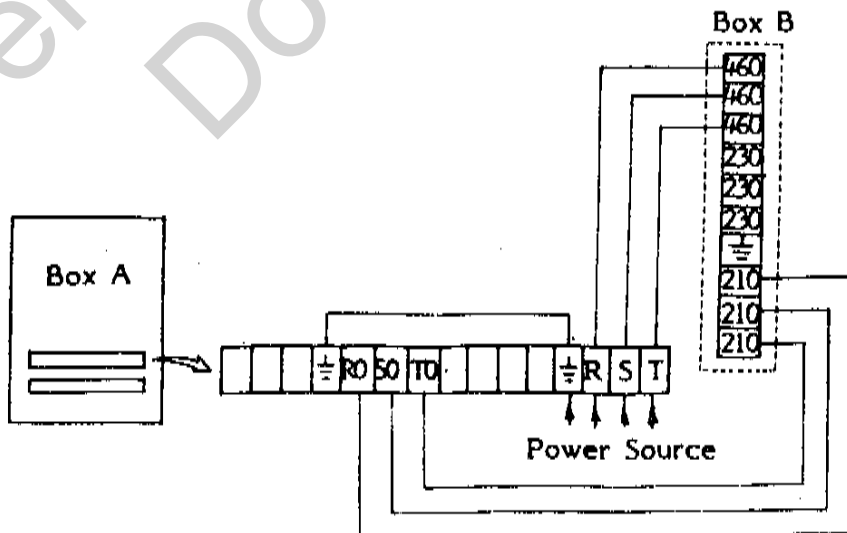
200V to 220V power source:



220V to 240V power source:

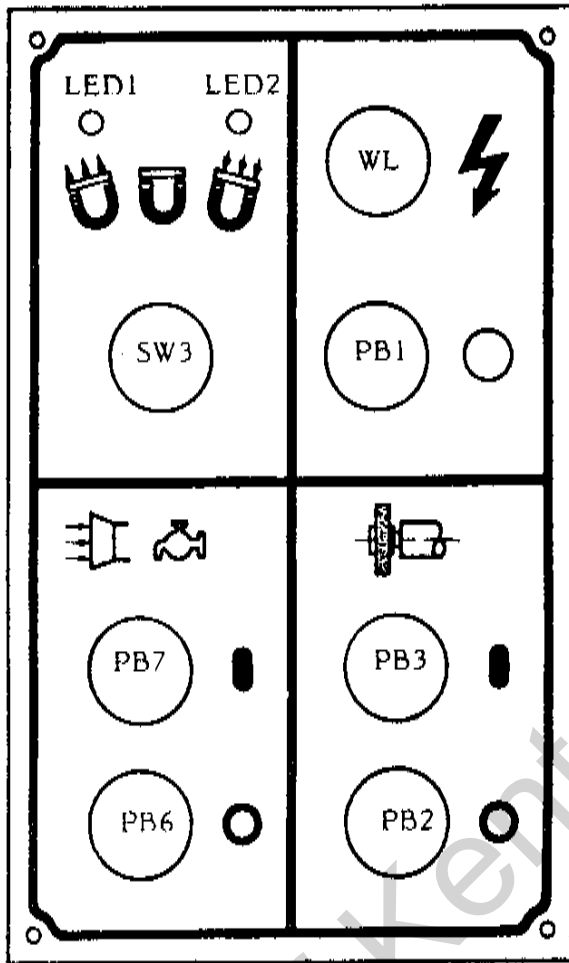


440V to 460V power source:

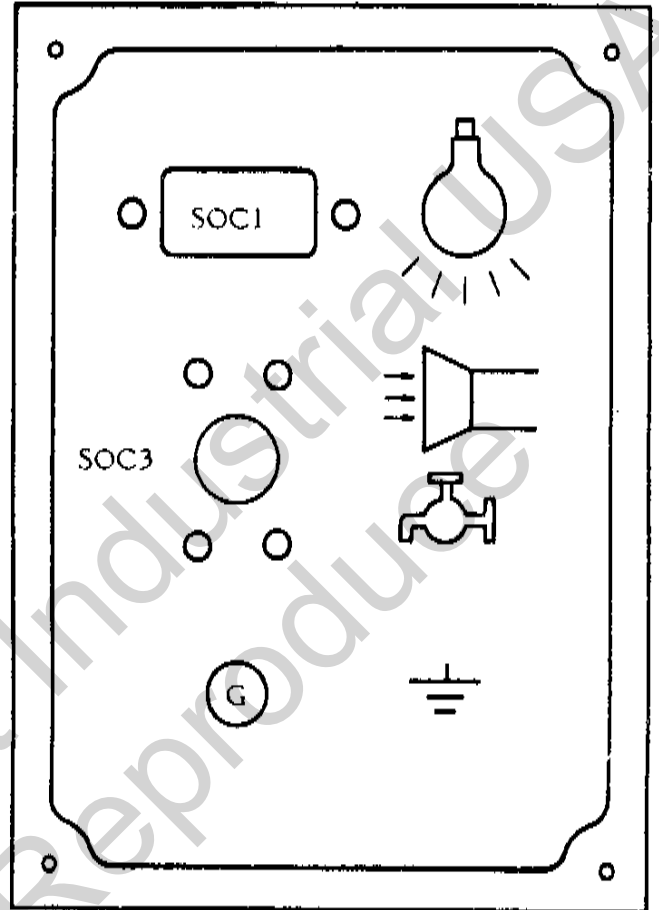


(2). Control Panel & Description

a. KGS-200, 250



EA-2504



B1

PB1: Emergency pushbutton

WL: Indicator of power source

PB2: Pushbutton "OFF" of spindle motor

PB3: Pushbutton "ON" of spindle motor

PB6: Pushbutton "OFF" of coolant or dust-collector power source

PB7: Pushbutton "ON" of coolant or dust-collector power source

SW1: ON-OFF switch for coolant pump ( on coolant system )

SW2: ON-OFF switch for dust-collector motor ( on dust-collector )

SW3: Selector-switch for electro-magnetic chuck

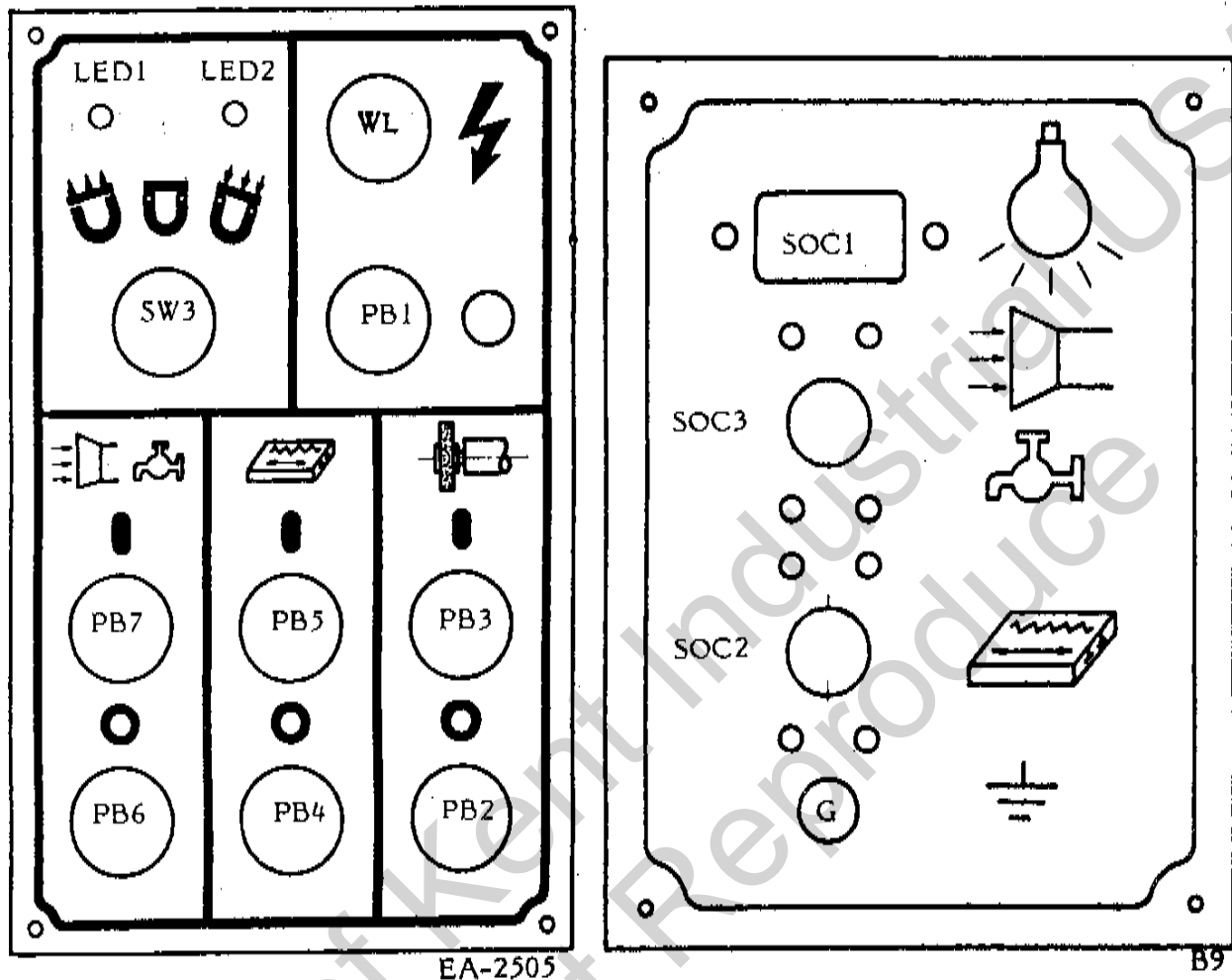
LED1: Magnetizerism indicator

LED2: Demagnetizerism indicator

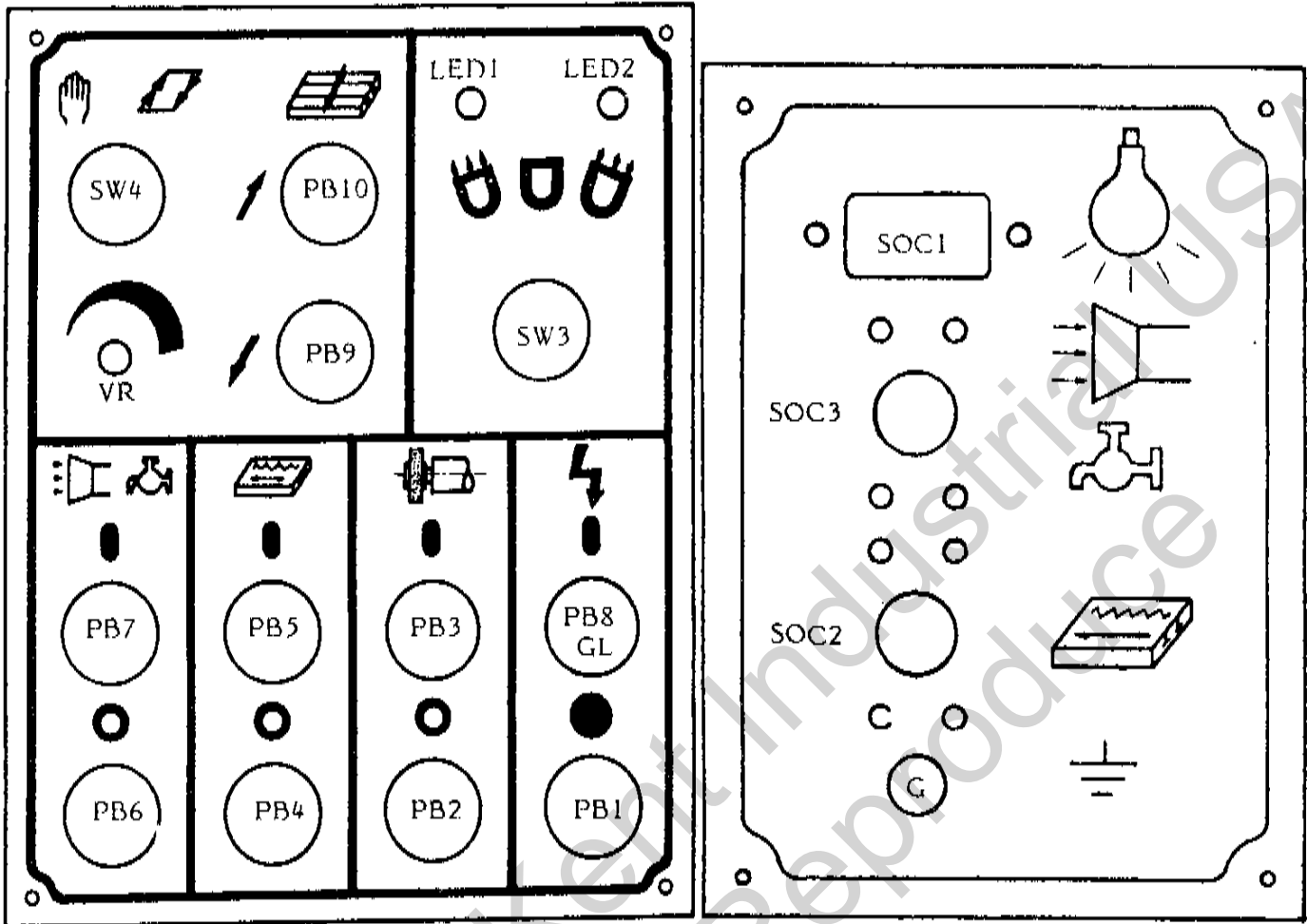
SOC1: Socket for illuminator

SOC3: Socket for coolant or dust-collector

b. KGS-616H, 250H



- PB1: Emergency pushbutton  
WL: 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  
PB7: Pushbutton "ON" of coolant or dust-collector  
SW3: Selector-switch of electro-magnetic chuck  
LED1: Magnetizerism indicator  
LED2: Demagnetizerism indicator  
SOC1: Socket for illuminator  
SOC2: Socket for hydraulic power source  
SOC3: Socket for coolant or dust-collector



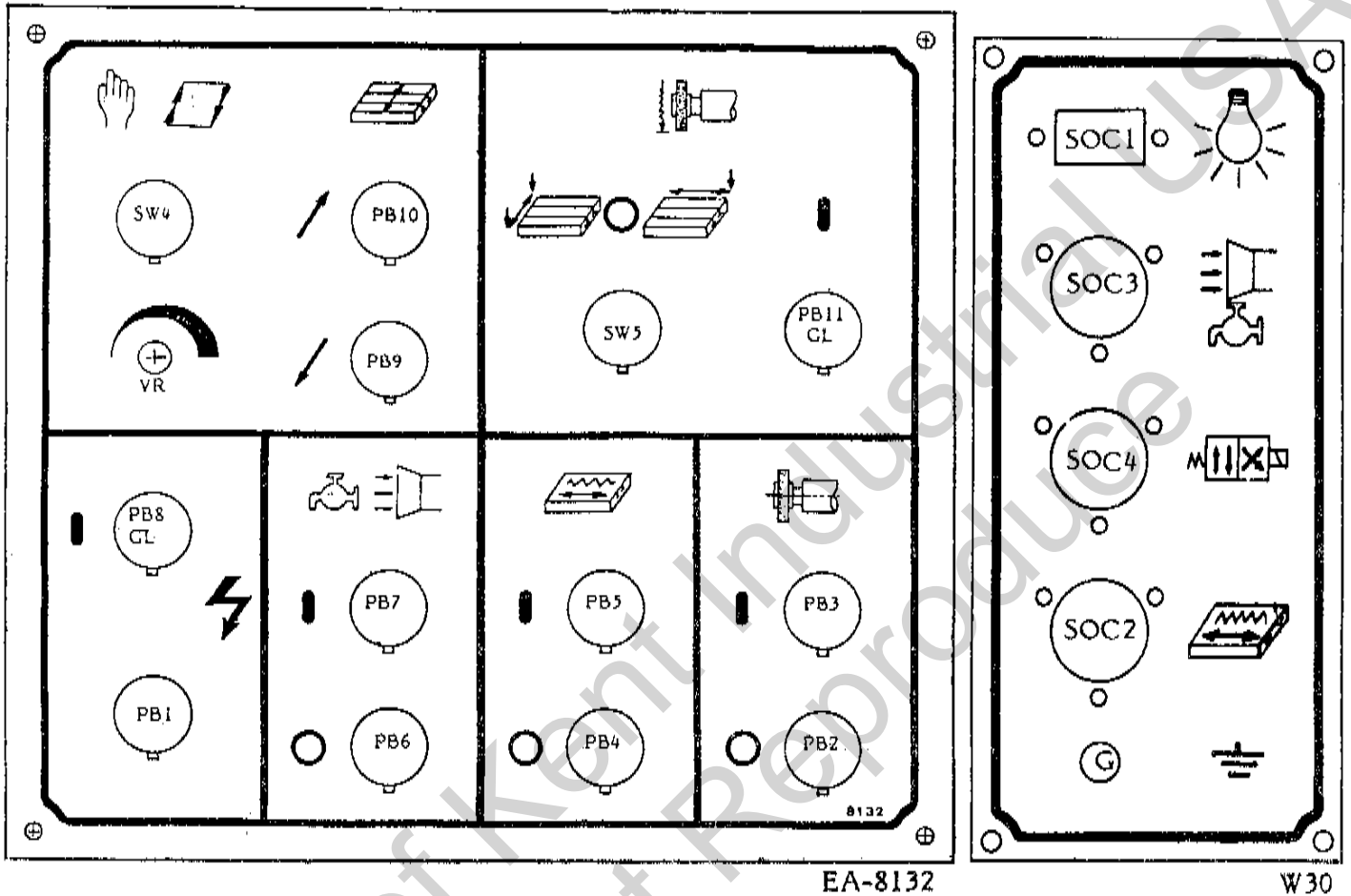
EA-2508

B9

- 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
- PB7: Pushbutton "ON" of coolant or dust-collector
- PB9: Pushbutton of continuous crossfeed, approach to operator
- PB10: Pushbutton of continuous crossfeed, away from operator
- SW3: Selector-switch of electro-magnetic chuck
- SW4: Selector-switch of auto./man. crossfeed
- VR: Variable resistance for crossfeed incremental control
- LED1: Magnetizerism indicator
- LED2: Demagnetizerism indicator
- SOC1: Socket for illuminator
- SOC2: Socket for hydraulic power source
- SOC3: Socket for coolant or dust-collector



d. KGS-250AHD, 818AHD, 1020AHD



EA-8132

W30

- 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 auto. downfeed
- SW3: Selector-switch of electro-magnetic chuck
- SW4: Selector-switch of auto./man. crossfeed
- SW5: Selector switch of surface/plunge grinding
- VR: Variable resistance for crossfeed incremental control
- LED1: Magnetizerism indicator
- LED2: Demagnetizerism indicator
- SOC1: Socket for illuminator
- SOC2: Socket for hydraulic power source
- SOC3: Socket for coolant or dust-collector
- SOC4: Socket for auto. downfeed solenoid valve power source

### (3). 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-rust oil and grease.
3. Installation and levelling of the machine.
4. Lubrication of the machine according to lubrication instruction.
5. Checking the spindle ( wheel ) rotation direction, must be in clockwise. Please take off the wheel prior to start spindle or it will cause danger if it rotates in counter-clockwise.

For hydraulic models:

6. Filling the hydraulic tank with suitable oil.  
KGS-616H, 250H, 250AH, 250AHD, 818AHD, 1020AHD 50 liters ( 12.5 gallons )
7. Flow control lever for hydraulic table traverse must be in close position ( vertical 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 screws 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

For KGS-200, 250, 616H, 250H:

1. WL indicator will lights when electric control box is ready.
2. PBI is for emergency stop.

For KGS-250AH, 250AHD, 818AHD, 1020AHD:

1. Press PB8, GL indicator lights, the electric control box is ready.
2. Press PB1 to stop power. Re-set PBI and re-press PB8 for power ON again.

##### 2). Table longitudinal travel ( For hydraulic models )

1. Press PB5 to start hydraulic motor.
2. Turn the flow control lever clockwise until the table starts slowly, when it turns 90° it gets the max. table speed.
3. 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.

3). Cross travel ( For AH, AHD models )

1. Turn SW4 to left, press PB10 makes saddle traverse backward continuously; press PB9 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.
2. Turn SW4 to right, 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.
3. There are two limit switches, in addition, on the left side of machine base for limiting 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.

4). Automatic downfeed control ( For AHD model )




1. 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  position, grinding wheel stop auto. downfeed.
2. Downfeed increment can be pre-set by preset dial at 0.002, 0.004, 0.006, 0.008 0.01, 0.012, 0.014, 0.016, 0.018, 0.02mm, 10 steps ( metric type ); or 0.0001, 0.0002, 0.0003, 0.0004, 0.0005, 0.0006, 0.0007, 0.0008, 0.0009, 0.001 inch, 10 steps ( inch type ).

Figure shown under is downfeed increment be set at 0.02mm

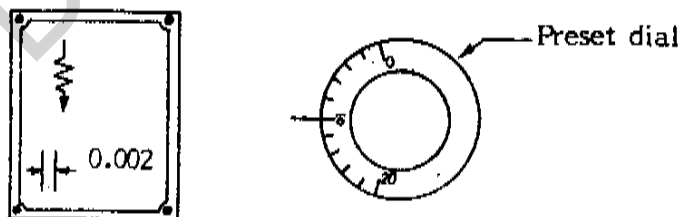
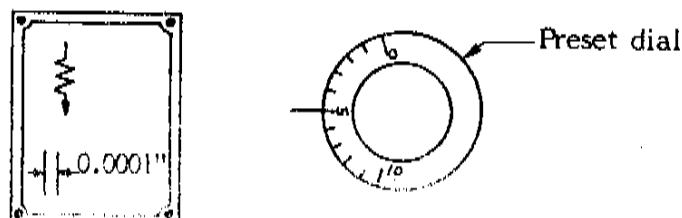
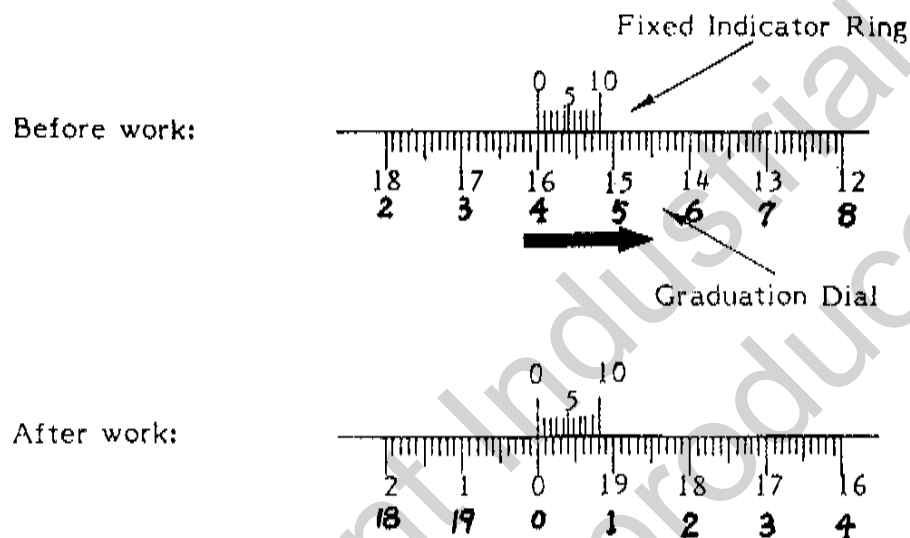


Figure shown under is downfeed increment be set at 0.0005inch



- For instance, total work piece downfeed removal is 0.4mm, and auto. downfeed increment be set at 0.02mm:

Loosen the set-screw on the graduation dial and turn the dial to let the scale "4" aim at the mark "0" on the fixed indicator ring. ( 1 revolution of downfeed hand wheel is 2mm minus total removal 0.4mm leaves 1.6mm ) After auto. downfeed 20 times at each time 0.02mm (  $0.02\text{mm} \times 20 = 0.4\text{mm}$  ), the mark "0" of graduation dial will meet "0" of fixed indicator ring and auto. downfeed stop.



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

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 maximum distance.

The best time to push the auto downfeed button:

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

- Coolant system ( optional accessory )

- Press PB7 to start coolant pump.
- Adjust valve to get suitable coolant flow.

- Dust-suction coolant system ( optional accessory )

- Press PB7 to start suction motor or coolant pump.
- Adjust valve to get suitable coolant flow ( when wet grinding ).
- Press PB6 to stop.

Caution: There are two sets of ON-OFF switches on this accessory: 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.

## F). General Comments Of Grinding

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

### (1) Stock removal efficiency

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

### (2) Surface finish required

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

### (3) Distortion of the workpiece

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

### (4) Undesirable burns and grinding cracks

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

## 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 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.

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.

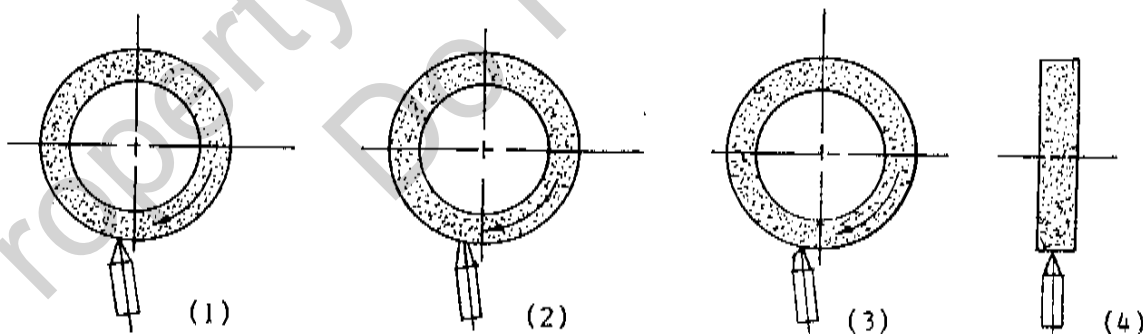
Frequent light dressing is better for the life of the grinding wheel and the diamond than a heavy cut.

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 usually 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.

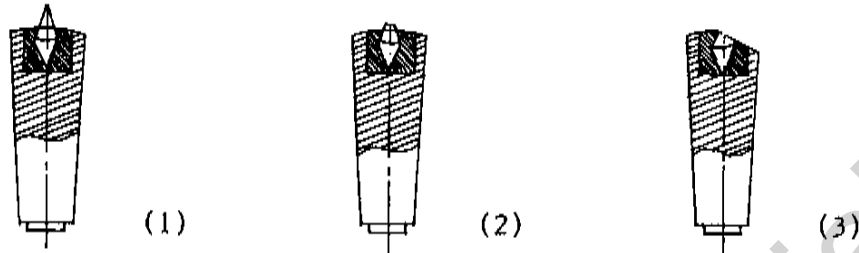
Experience has shown that, with highly accurate grinding, dressing with the hand-operated dressing device on the spindle carrier is inadequate. The hand operation necessarily causes slight undulations in the surface of the wheel.



- (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 \ Structure	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-100I	GC 60H-100I
Glass		C 60K	C 60K
Marble		C GC 36M	C GC 36M

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 $\frac{1}{4}$ 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.

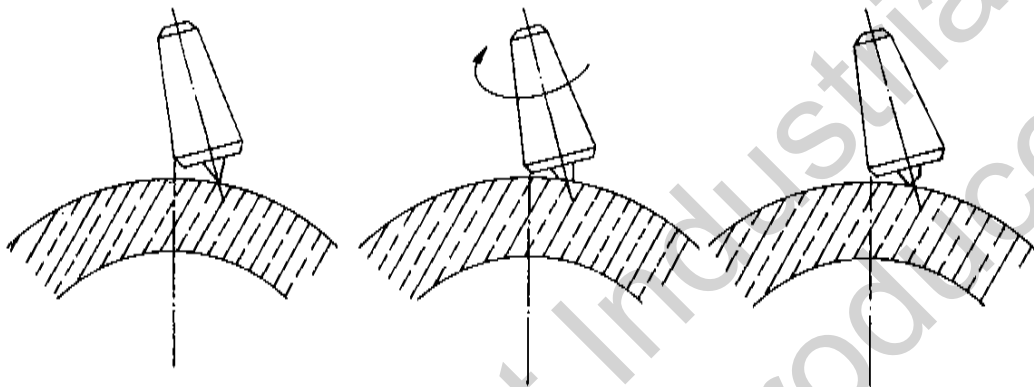
Wheel speed Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	better

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 Attachment

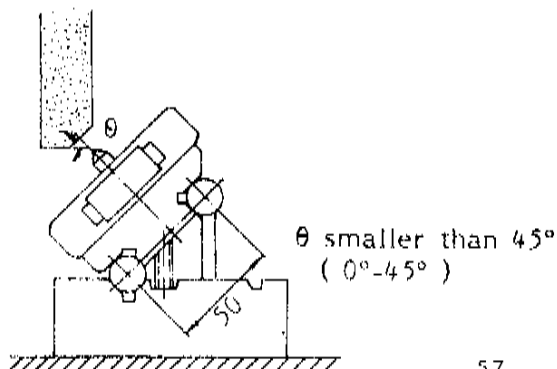
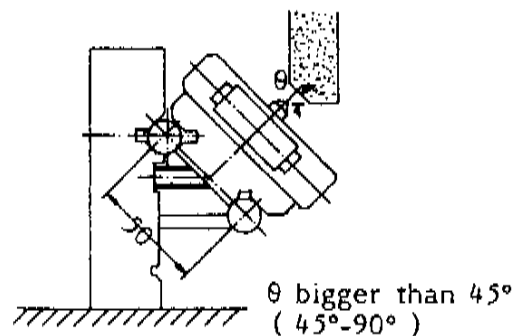
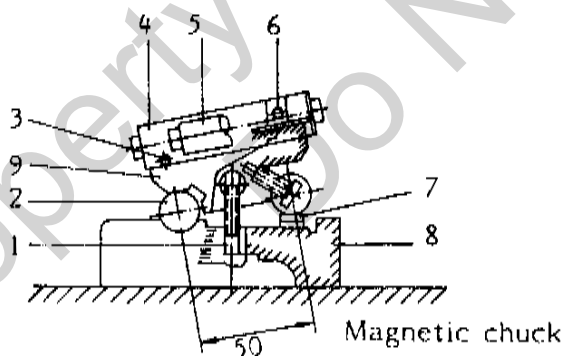
### (a), Parallel Dressing attachment

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 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  $90^\circ$  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 stand. 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
9. Sine Bar stand

(5). Degree and block gauge thickness conversion table

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

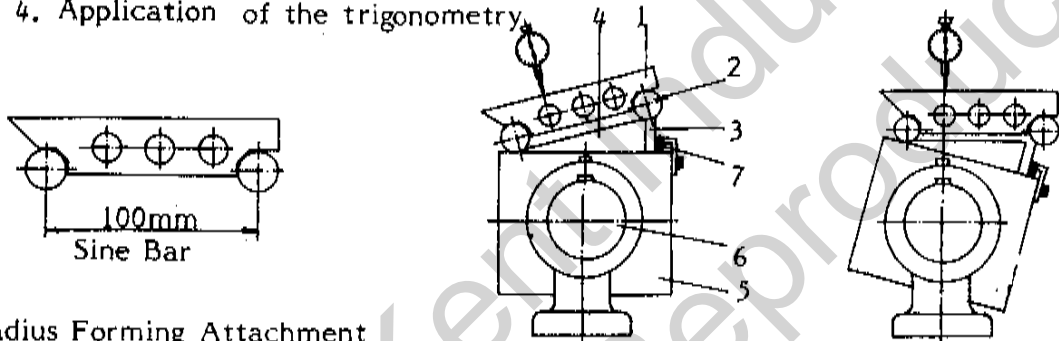
\* The value of Block gauge thickness must times 2 when apply this table to Sine Bar attachment.

(c). Sine Bar

The Sine Bar is used to check 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 the Sine Bar and let it be attracted to the inclinable magnetic chuck. This Sine Bar shall be kept parallel to the longitudinal direction of the machine.
- (4) Press the dial gauge against the surface of the Sine Bar and meanwhile turn the cross feed hand wheel, so that the saddle moves back and forth for the checking of the accuracy of the angle of the magnetic chuck

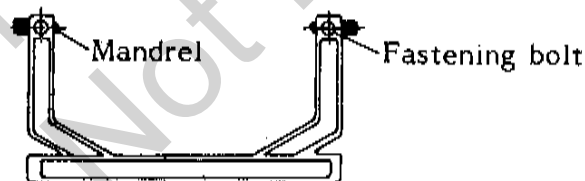
- |                                     |                                  |
|-------------------------------------|----------------------------------|
| 1. Mandrel                          | 5. Inclinal Magnetic Chuck       |
| 2. Sine Bar                         | 6. Mandrel of the Magnetic Chuck |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



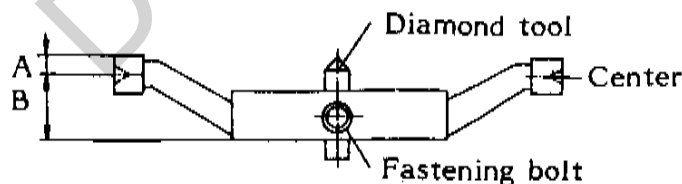
(d) . Radius Forming Attachment

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:

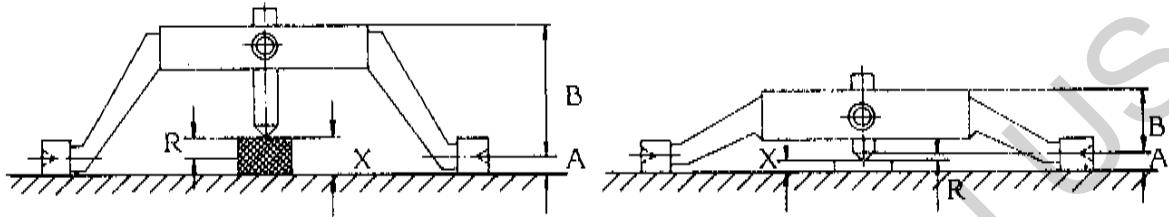
A: the distance between the upper rim and the center

B: the distance between the bottom rim and the center

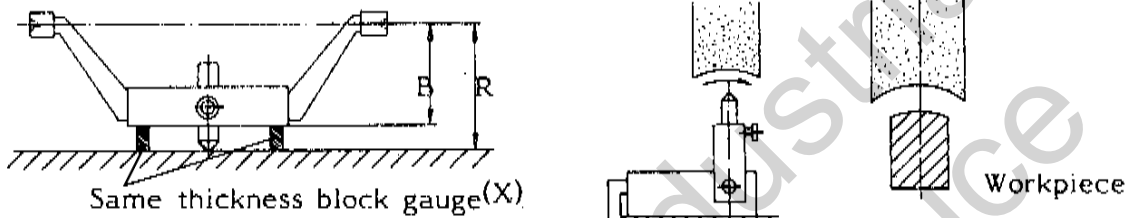
The R forming is the adjustment of the distance between the diamond tool and the swing rod center so that the R shaping results.

(3) To determine the concave and convex R:

- If the tool is parallel to the center line, it equals OR.
- 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  $R = X - A$
- To determine the small concave R:  $R = A - X$



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

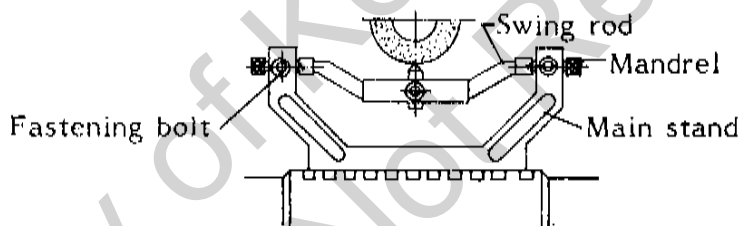


e. Note:

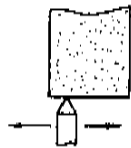
- The base and side of the grinding wheel shall be well-dressed.
- The Radius Forming Attachment shall be parallel to the grinding wheel.
- The diamond tool shall be parallel to the Radius Forming Attachment.

(4) Operation of the Radius forming attachment:

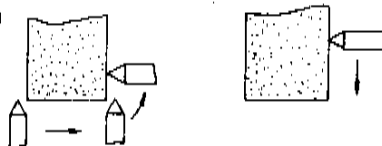
a. Find the center of the grinding wheel, then fix the work table.



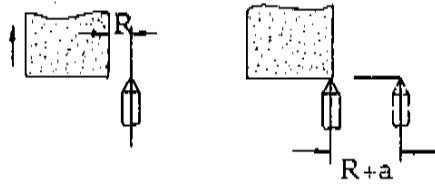
b. Turn the down-feed handwheel at  $1/3$  on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.



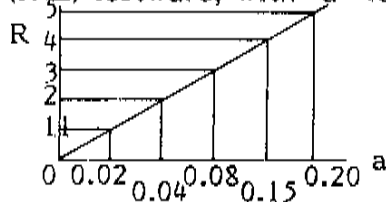
c. Turn the diamond tool over an angle  $90^\circ$  and elevate it into a proper position (greater than the R size in question)



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.



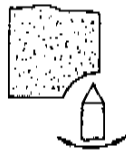
e. Move the diamond tool ( $R+a$ ) leftward, with "a" found in the following table.



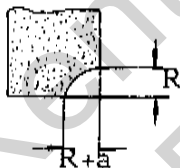
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



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



h. The wheel finally becomes the following shape.



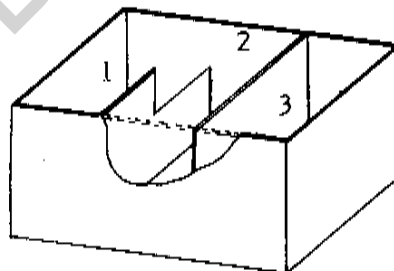
(e). Coolant System

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.

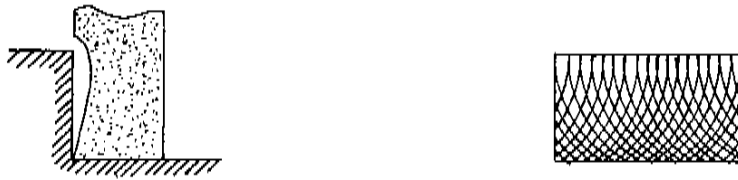


\* Coolant tank capacity: 40 liters

\* Coolant pump: 1/8 HP x2P

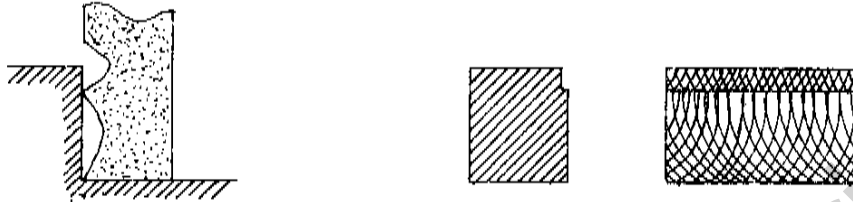
(f) . Common cases in Side Grinding

(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)



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

(3)



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

(4)



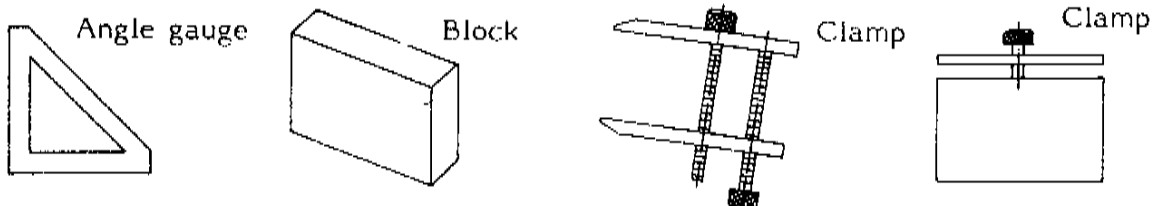
The "Relief Angle" of the wheel is lower than the surface of the work, so that the work face becomes two sections, the upper section resembling that in (3) and the lower section in (1). Now it is necessary to enlarge the "Relief Angle" part so that it will be higher than the face of the work.

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

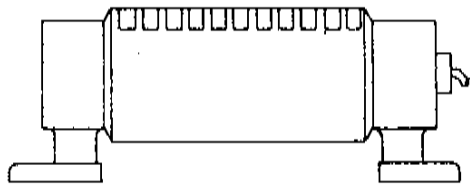


(g) . Right Angle Grinding

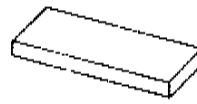
(1) Tools



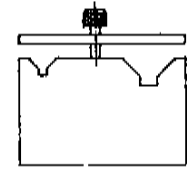




Inclined Magnetic Chuck



Block gauge

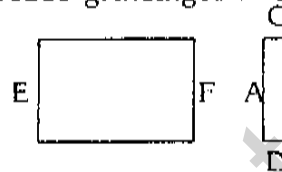


Clamp

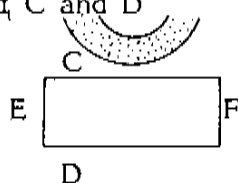
(2) Use of the jigs and tools: take the grinding of the block of six faces A, B, C, D, E, F. For example:

a. Under 200mm:

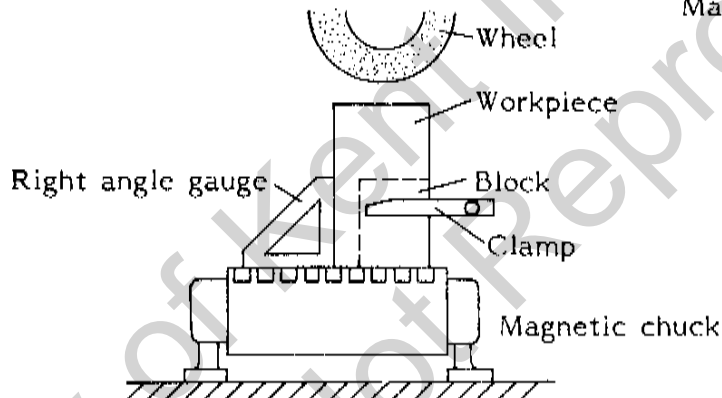
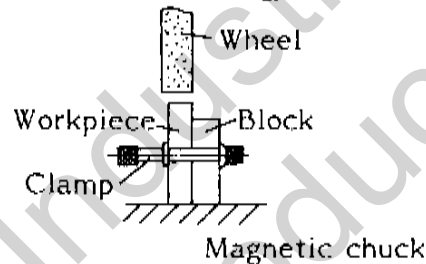
\* Grinding of the first basic face, or the surface grinding of A and B,



\* Grinding of C and D



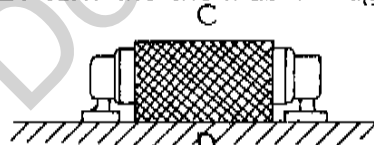
\* Grinding of E and F



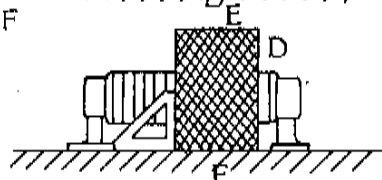
b. Over 200mm:

\* Grinding of the first basic face 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 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 KNOCKDOWN DRAWINGS & PARTS LISTS \*  
 \*\*\*\*\*

WHEN ORDERING PARTS, PLEASE MENTION:

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

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TABLE SADDLE ASS'Y ( KGS-200, 250 )

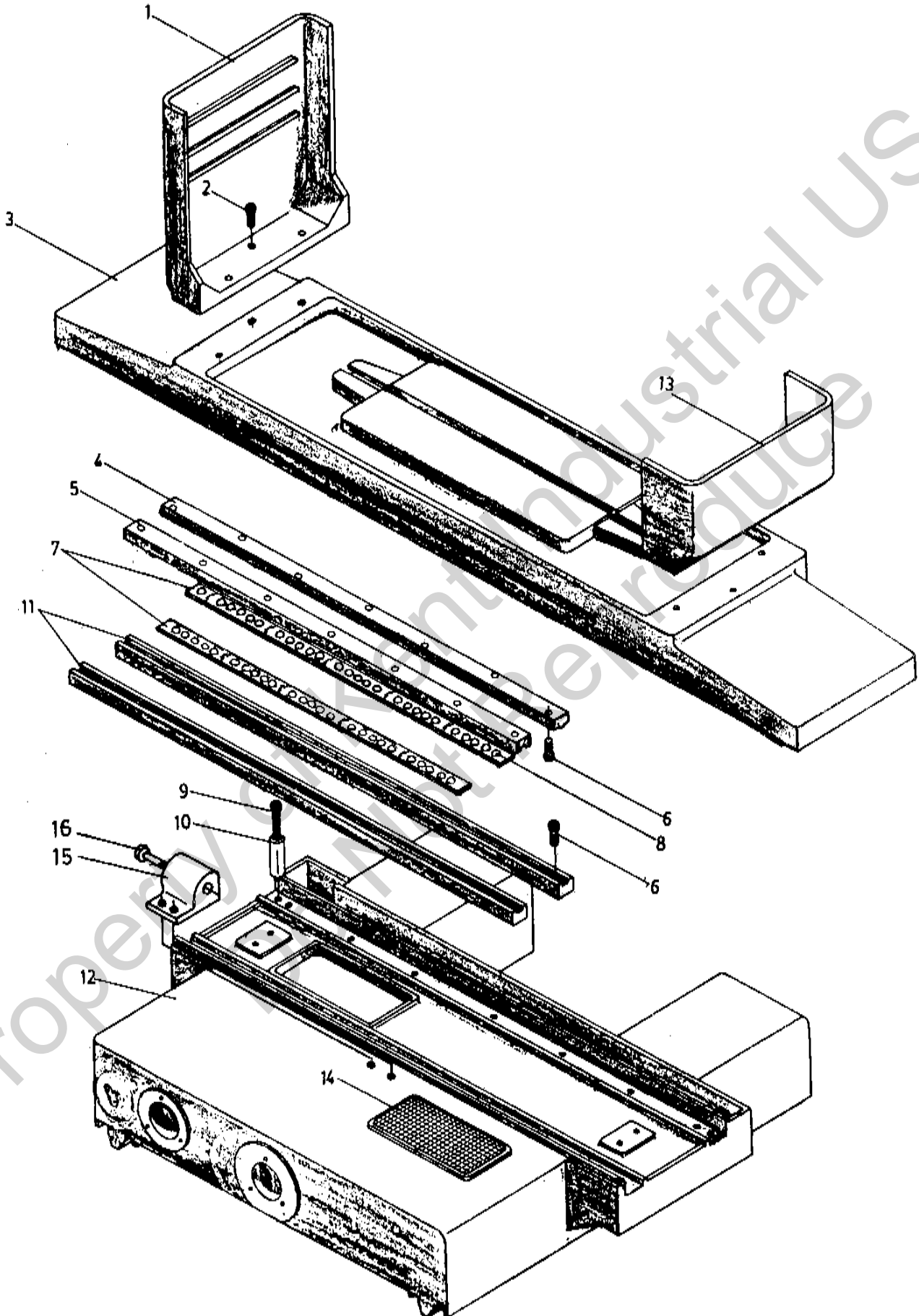


TABLE SADDLE ASS'Y ( KGS-200, 250 )

Index No.	Parts No.		Parts Name	Q'ty
	KGS-200	KGS-250		
1.	201310	251310	Splash Shield ( Left )	1
2.	F10506C	F10506C	Socket Head Cap Screw	3
3.	201104	251104	Table	1
4.	201302	251302	Slide Way	1
5.	201303	251303	Slide Way	1
6.	F10406C	F10406C	Socket Head Cap Screw	28
7.	251304		Steel Ball Retainer	9
7.		251304	Steel Ball Retainer	11
8.	WSB0005		Steel Ball	39
8.		WSB0005	Steel Ball	55
9.	F10410C	F10410C	Socket Head Cap Screw	4
10.	251305	251305	Retainer stopper	4
11.	201301	251301	Slide Way	2
12.	201103	251103	Saddle	1
13.	201311	251311	Splash Shield ( Right )	1
14.	251131	251131	Rubber Plate	1
15.	251341	251341	Stopper Base	1
16.	251342	251342	Stopper	2

TABLE SADDLE ASS'Y ( KGS-250H, 250AH, 250AHD )

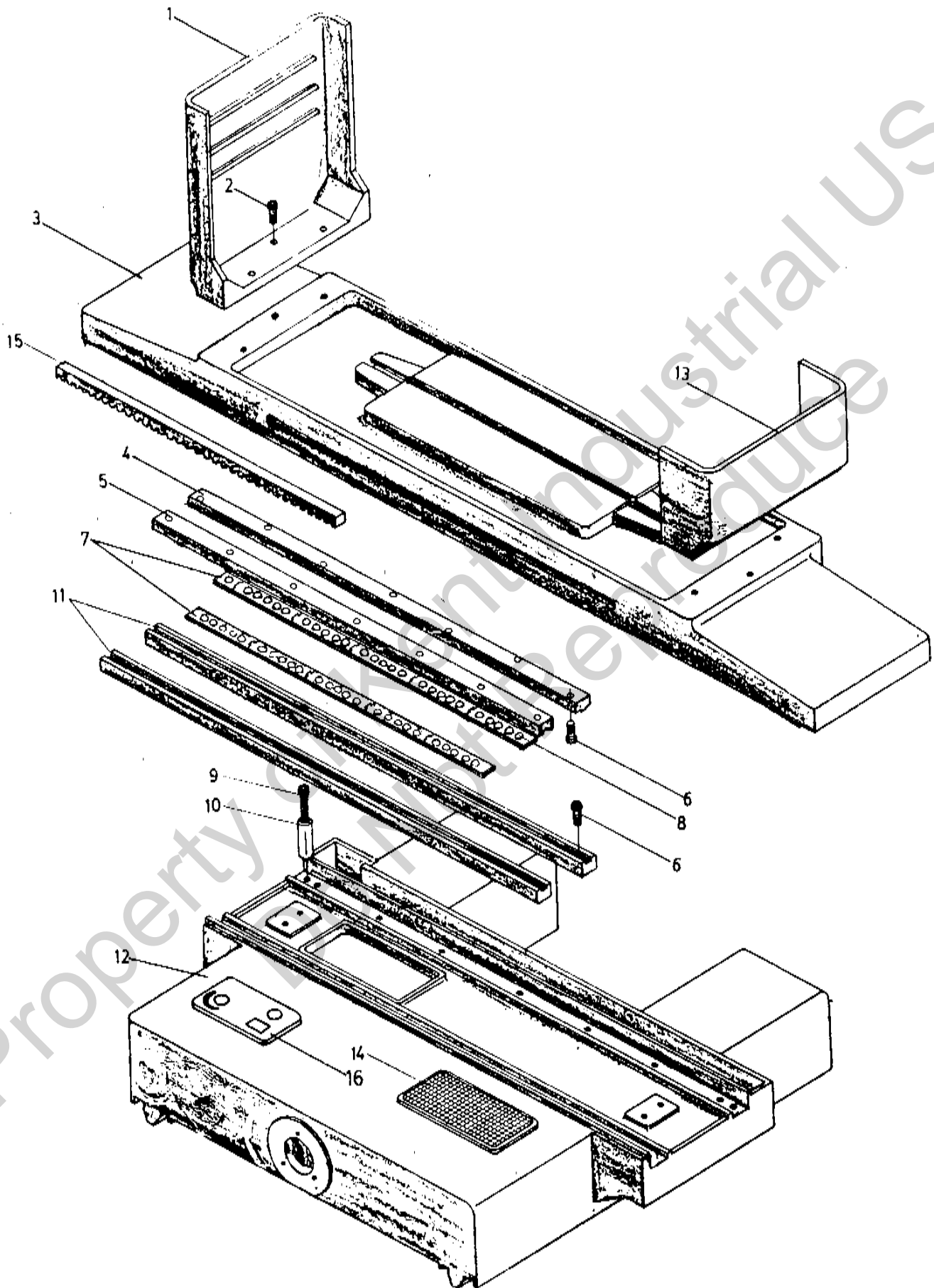
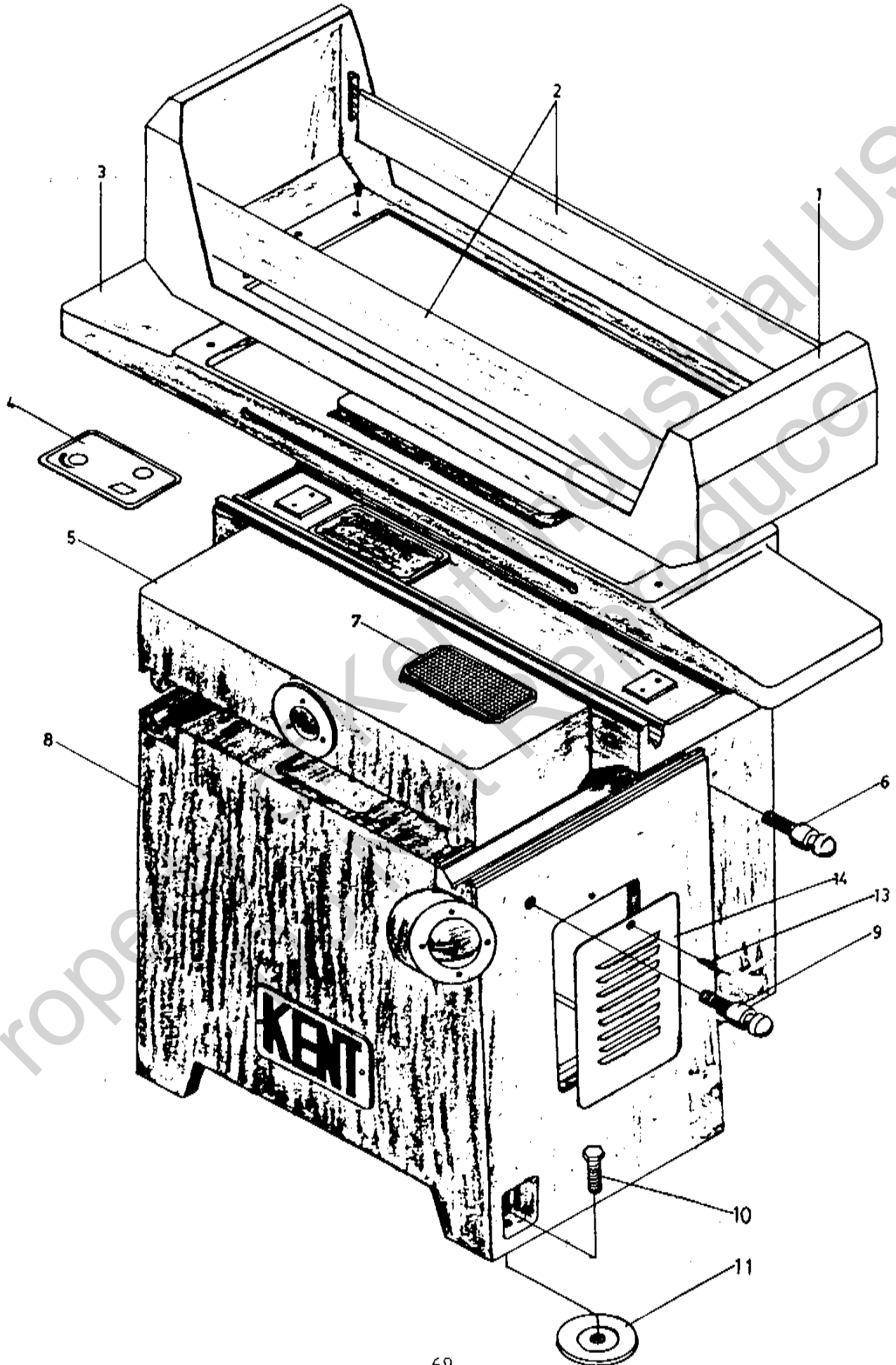


TABLE SADDLE ASS'Y ( KGS-250H, 250AH, 250AHD )

Index No.	Parts No.	Parts Name	Q'ty
1.	251310	Splash Shield ( Left )	1
2.	F10506C	Socket Head Cap Screw	6
3.	251104	Table	1
4.	251302	Slide Way	1
5.	251303	Slide Way	1
6.	F10406C	Socket Head Cap Screw	28
7.	251304	Steel Ball Retainer	11
8.	WSB0005	Steel Ball	55
9.	F10410C	Socket Head Cap Screw	4
10.	251305	Retainer Stopper	4
11.	251301	Slide Way	2
12.	251103	Saddle	1
13.	251311	Splash Shield ( Right )	1
14.	251131	Rubber Plate	1
15.	251355	Gear Rack	1
16.	251132	Name Plate	1

BED, SADDLE, TABLE ASS'Y ( KGS-616H, 818AHD, 1020AHD )

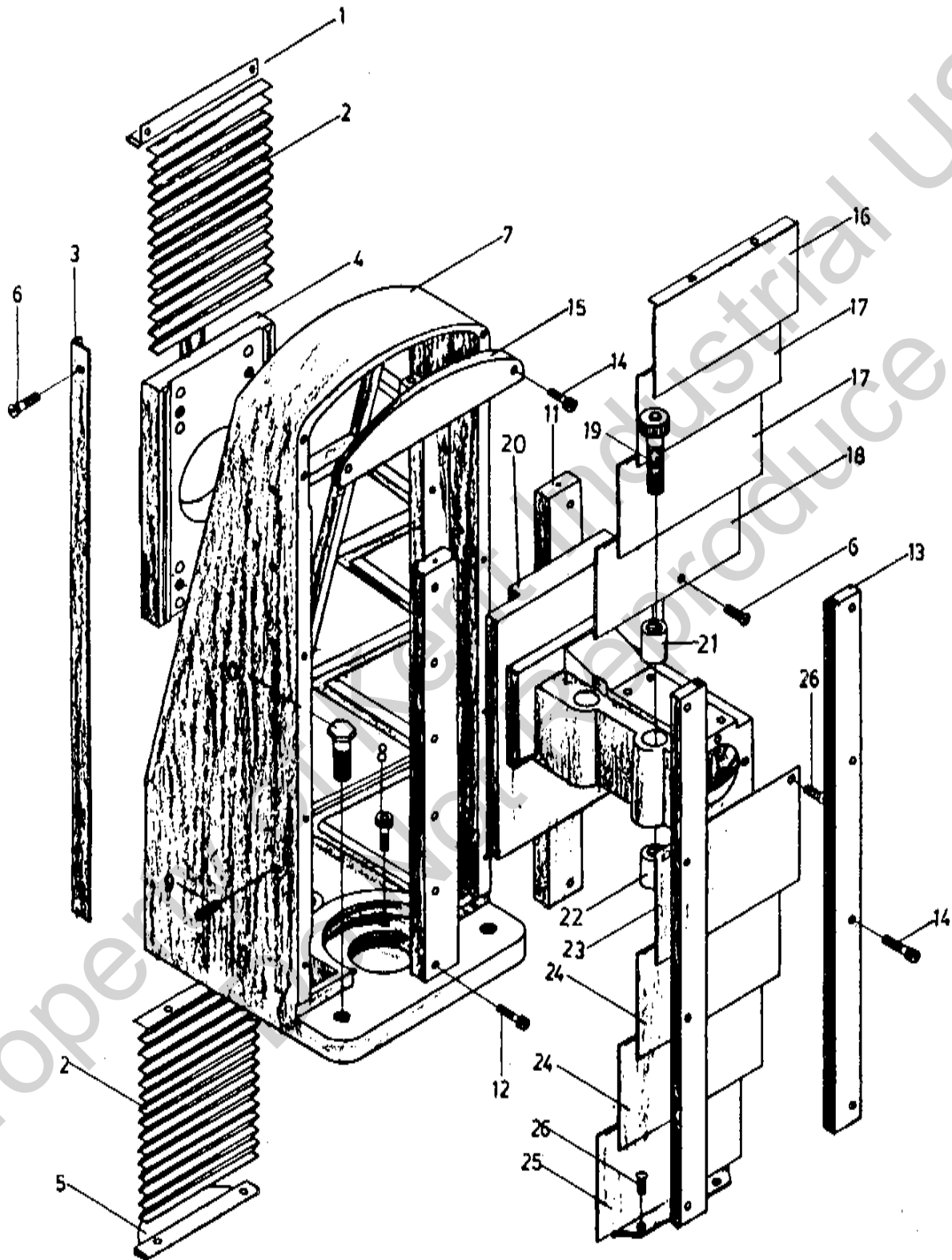


BED, SADDLE, TABLE ASS'Y ( KGS-616H, 818AHD, 1020AHD )

Index No.	KGS-616H	Parts No. 818AHD	1020AHD	Parts Name	Q'ty
1.	611314	251314	101317	Splash Shield	1
2.	611315	251315	101315	Splash Shield	4
3.	611104	811104	101104	Table	1
4.	251132	251132	251132	Indicating Plate	1
5.	611103	811103	101103	Saddle	1
6.	910302	"	"	Lifting Bolt	2
7.	251131	"	"	Rubber Plate	1
8.	611101	811101	101101	Bed	1
9.	910301	"	"	Lifting Bolt	2
10.	910201	"	"	Levelling Screw	3
11.	910203	"	"	Levelling Pad	3
12.	251111	"	"	Trade Mark Plate	1
13.	F40408C	"	"	Round Head Screw	2
14.	251112	251112	251112	Side Cover	2



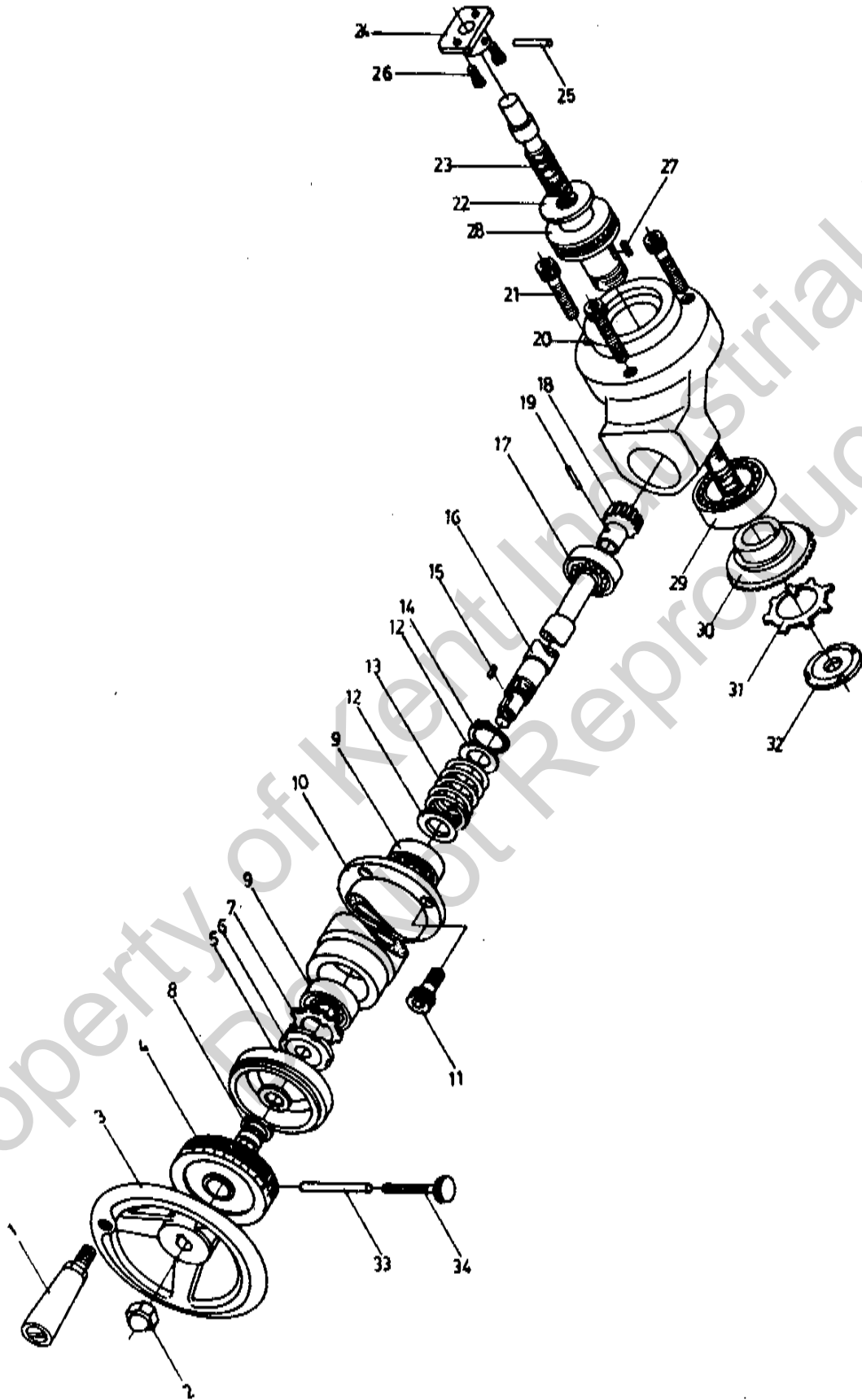
COLUMN ASS'Y ( KGS-200, 616H, 250, 250H, 250AH, 250AHD, 818AHD, 1020AHD )



COLUMN ASS'Y ( KGS-200, 616H, 250, 250H, 250AH, 250AHD, 818AHD, 1020AHD )

Index No.	Parts No.		Parts Name	Q'ty
	200,616H	250 Series 818AHD,1020AHD		
1.	2014221	241421	Upper Hold Plate	1
2.	201422	251422	Dust Protection Fold Fabric	2
3.	201423	251423	Shield Guide	2
4.	201412	251412	Motor Bracket	1
5.	201424	251424	Bottom Hold Plate	1
6.	F50303C	"	Flat Head Machine Screw	5
7.	201102	251102	Column	1
8.	F10616C	"	Socket Head Cap Screw	3
9.	F20308C	"	Set Screw	12
10.	F31240C	"	Hexagonal Head Screw	4
11.	201416	251416	Vertical Guide Rail	2
12.	F10608	F10608	Socket Head Cap Screw	12
13.	201415	251415	Shield Dust Guide Rail	2
14.	F10406	"	Socket Head Cap Screw	10
15.	201417	251417	Upper Cover Of Column	1
16.	201425	251425	Shield Dust	1
17.	201426	251426	Shield Dust	2
18.	201427	251427	Shield Dust	1
19.	F11040	"	Socket Head Cap Screw	2
20.	201411	251411	Spindle Holder	1
21.	251414	"	Copper Collar	2
22.	251413	"	Copper Collar Nut	2
23.	201428	251428	Shield Dust	1
24.	201429	251429	Shield Dust	2
25.	201430	251430	Shield Dust	1
26.	F40303	"	Cup Head Machine Screw	13

DOWN FEED ASS'Y ( KGS-200, 616H )



DOWN FEED ASS'Y ( KGS-200, 616H )

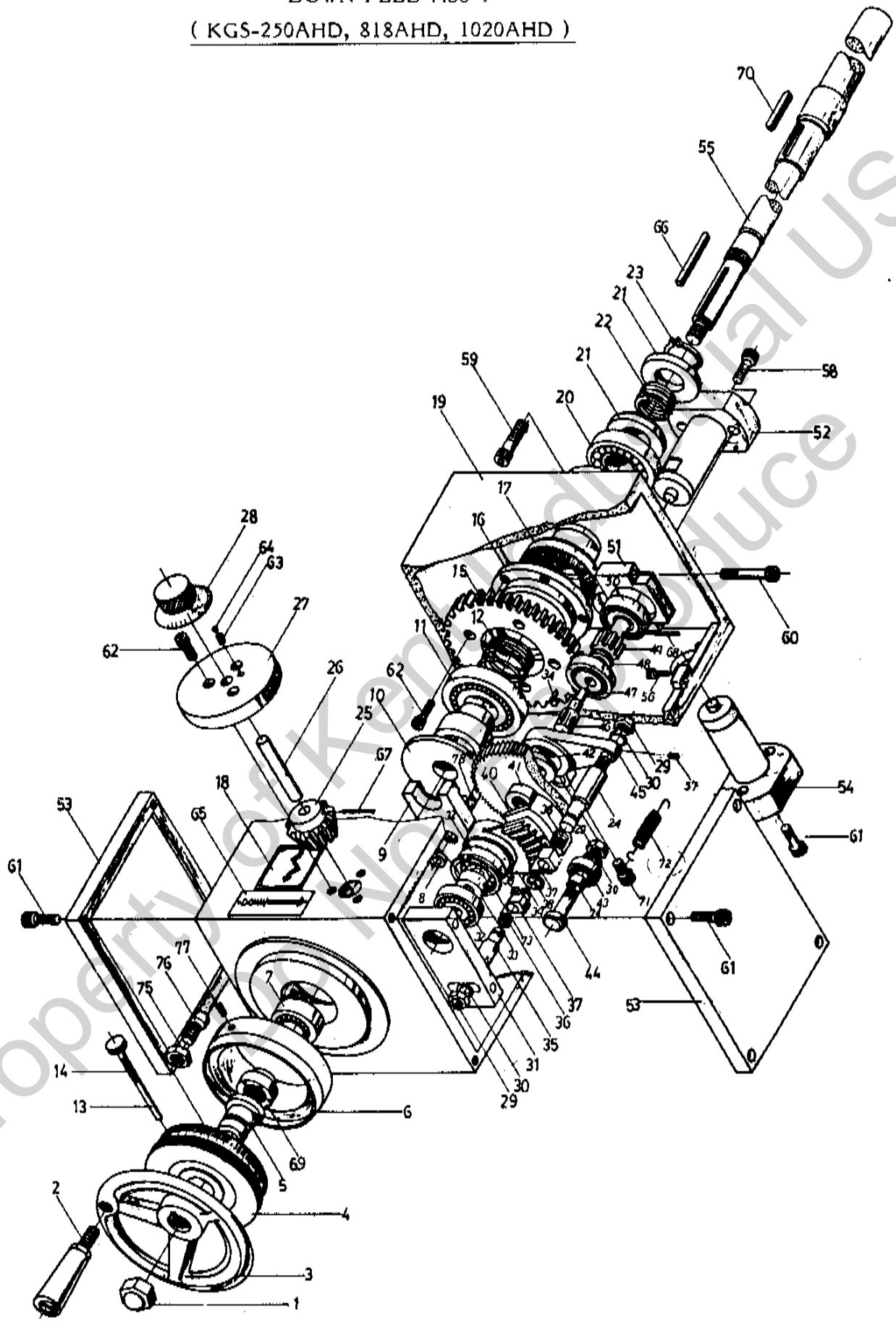
Index No.	Parts No.	Parts Name	Q'ty
1.	910131	Grip	1
2.	910101	Handwheel Nut	1
3.	910121	Handwheel	1
4.	251401	Graduation Dial	1
5.	251404	Graduation Dial Holder	1
6.	WNA005T	Check Nut	1
7.	WWA0005	Ratchet Washer	1
8.	251402	Graduation Dial Bush	1
9.	B120500	Self-Aligning Ball Bearing	1
10.	201405	Bearing Housing	1
11.	F10508C	Socket Head Cap Screw	3
12.	251407	Washer	2
13.	251408	Spring	1
14.	W000S25	Snap Ring	1
15.	WDK5518	Key	1
16.	201406	Shaft	1
17.	B620400	Ball Bearing	1
18.	251409	Small Bevel Gear	1
19.	WPS0628	Spring Pin	1
20.	251434	Bevel Gear Bracket	1
21.	F10616C	Socket Head Cap Screw	3
22.	251432	Elevating Leadscrew Nut	1
23.	251431	Elevating Leadscrew	1
24.	251433	Connector	1
25.	WPS0430	Spring Pin	1
26.	F10506C	Socket Head Cap Screw	2
27.	WDK7525	Key	1
28.	B511080	Thrust Ball Bearing	1
29.	B601100	Ball Bearing	1
30.	251435	Bevel Gear	1
31.	WWA0008	Ratchet Washer	1
32.	WNA008T	Check Nut	1
33.	251403	Pin	1
34.	251205	Adjusting Screw	1



## DOWN FEED ASS'Y ( KGS-250, 250H, 250AH )

Index No.	Parts No.	Parts Name	Q'ty
1.	910131	Grip	1
2.	910121	Handwheel	1
3.	910101	Handwheel Nut	1
4.	251401	Graduation Dial	1
5.	251404	Graduation Dial Holder	1
6.	WNA005R	Check Nut	1
7.	WWA0005	Ratchet Washer	1
8.	W000R52	Snap Ring	1
9.	B120500	Self-Aligning Ball Bearing	1
10.	251407	Washer	2
11.	251408	Spring	1
12.	W000S25	Snap Ring	1
13.	WDK5518	Key	1
14.	251405	Bearing Housing	1
15.	F10508C	Socket Head Cap Screw	3
16.	251406	Shaft	1
17.	B620400	Ball Bearing	2
18.	251409	Small Bevel Gear	1
19.	WPS0528	Spring Pin	1
20.	251434	Bevel Gear Bracket	1
21.	F10616C	Socket Head Cap Screw	3
22.	251432	Elevating leadscrew Nut	1
23.	251431	Elevating Leadscrew	1
24.	251433	Connector	1
25.	WPS0430	Spring Pin	1
26.	F10506C	Socket Head Cap Screw	2
27.	WDK7525	Key	1
28.	B511080	Thrust Ball Bearing	1
29.	B601100	Ball Bearing	1
30.	251435	Bevel Gear	1
31.	WWA0008	Ratchet Washer	1
32.	WNA008T	Check Nut	1
33.	251403	Fixed Pin	1
34.	251205	Adjusting Screw	1
35.	251430	Washer	1
36.	251202	Graduation Dial Bush	1

DOWN FEED ASS'Y  
( KGS-250AHD, 818AHD, 1020AHD )



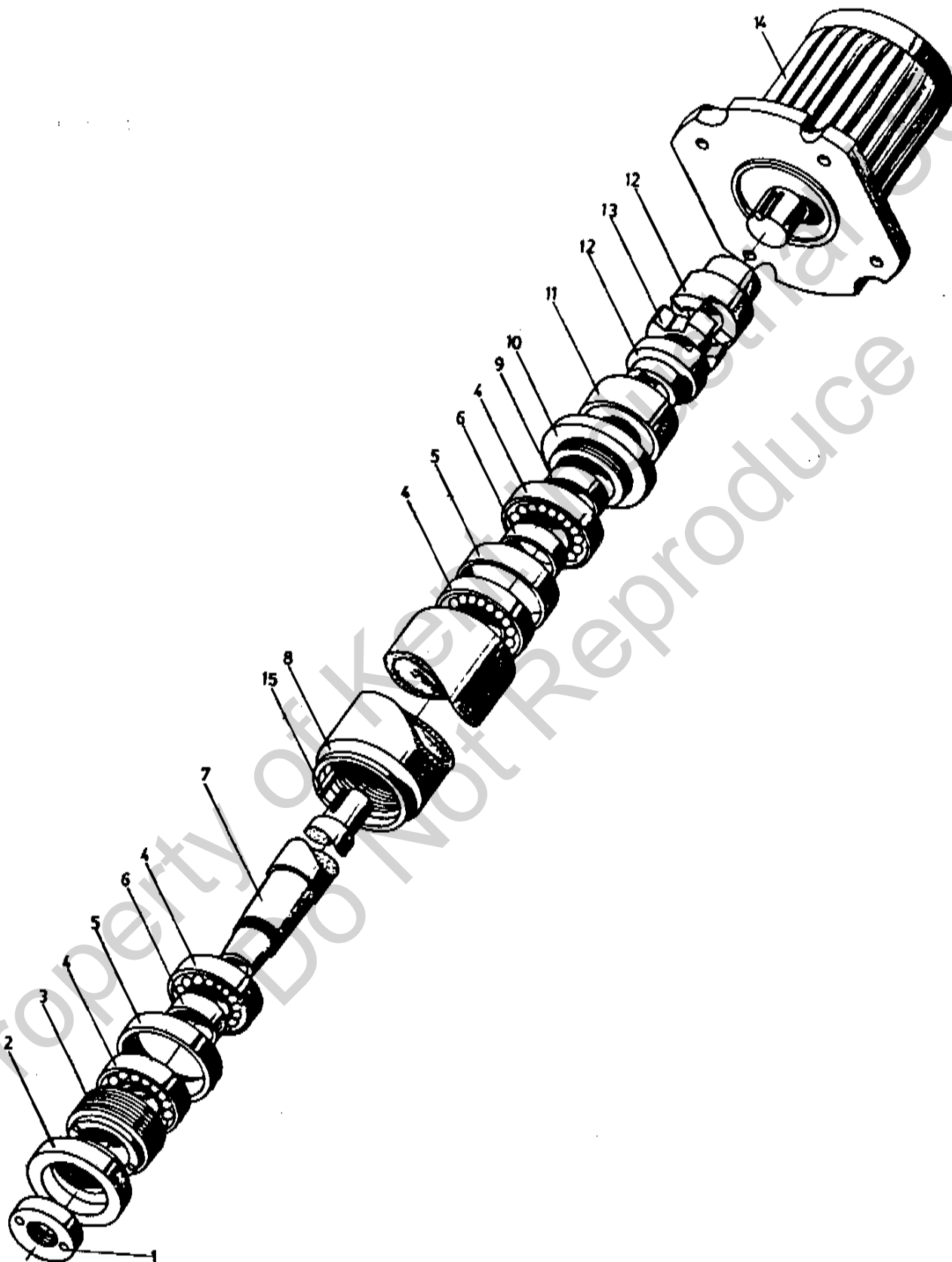
DOWN FEED ASS'Y  
KGS-250AHD, 818AHD, 1020AHD

Index No.	Parts No.	Parts Name	Q'ty
1.	910101	Hand Wheel Nut	1
2.	910103	Grip	1
3.	910121	Hand Wheel	1
4.	251881	Graduation Dial	1
5.	251842	Collar	1
6.	251834	Ring	1
7.	B620400	Bearing	1
8.	251832	Collar	1
9.	251820	Holder	1
10.	251821	Holder	1
11.	B600600	Bearing	1
12.	251831	Spring	1
13.	251843	Pin	1
14.	251854	Fixed Screw	1
15.	251822	Gear	1
16.	251823	Clutch	1
17.	251824	Clutch	1
18.	251851	Name Plate	1
19.	251826	Gear Box	1
20.	B600500	Bearing	1
21.	251422	Washer	2
22.	251417	Spring	1
23.	W000525	Snap Ring	1
24.	251811	Pin	1
25.	251803	Bevel Gear	1
26.	251806	Pin	1
27.	251804	Bush	1
28.	251805	Pre-set Dial	1
29.	WNH005C	Hexagonal Nut	2
30.	WWS0005	Spring Washer	2
31.	251801	Bracket	1
32.	B630000	Bearing	2
33.	251802	Spacer	1
34.	WDK5515	Key	1
35.	251817	Pin	1
36.	251810	Spring	2
37.	251809	Transmission Claw	1
38.	W0000E7	Snap Ring	2



Index No.	Parts No.	Parts Name	Q'ty
39.	251807	Bevel Gear ( Half )	1
40.	251808	Slipper	1
41.	251818	Ratchet Gear	1
42.	251819	Spacer	1
43.	B608F00	Small Bearing	1
44.	251836	Pin	1
45.	251812	Transmission Arm	1
46.	251816	Shaft	1
47.	B630000	Bearing	1
48.	251813	Collar	1
49.	251814	Small Gear	1
50.	B620100	Bearing	1
51.	251815	Bracket	1
52.	251854	Cylinder	1
53.	251840	Cover	2
54.	251845	Cylinder	1
55.	251825	Shaft	1
56.	F10504C	Socket Head Cap Screw	1
57.	F20402C	Set Screw	1
58.	F10408C	Socket Head Cap Screw	4
59.	F10508C	Socket Head Cap Screw	3
60.	F10412C	Socket Head Cap Screw	2
61.	F10406C	Socket Head Cap Screw	8
62.	F10304C	Socket Head Cap Screw	4
63.	251841	Spring	1
64.	WSBM4B8	Steel Ball	1
65.		Name Plate	1
66.	WDK5540	Key	1
67.	WPS0428	Spring Pin	1
68.	WPS0212	Spring Pin	1
69.	251833	Nut	1
70.	WDK0728	Key	1
71.	F10403C	Socket Head Cap Screw	1
72.	251837	Spring	1
73.	W000R35	Snap Ring	1
74.	251838	Collar	1
75.	WNH005C	Nut	1
76.	251853	Screw	1
77.	F20403C	Set Screw	1
78.	F10408C	Socket Head Cap Screw	1

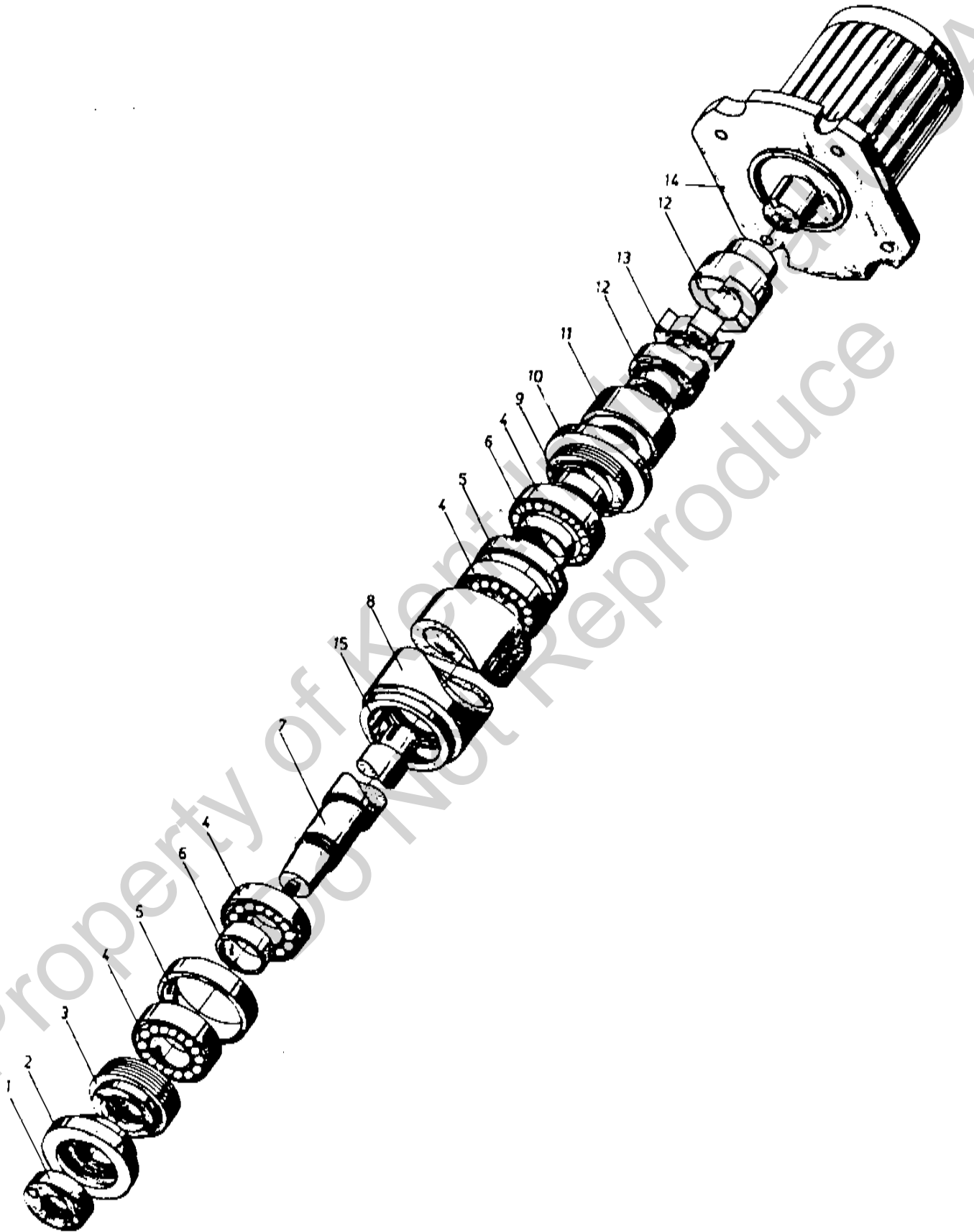
SPINDLE ASS'Y ( Normal Type )  
( KGS-200, 250, 250H, 250AH, 250AHD, 616H, 818AHD, 1020AHD )



SPINDLE ASS'Y( Normal Type )  
 ( KGS-200, 250, 250H, 250AH, 250AHD, 616H, 818AHD, 1020AHD )

Index No.	Parts No.			Parts Name	Q'ty
	KGS-200,616H	250series 818AHD	1020AHD		
1.	251503	"	"	Spindle Nut	1
2.	251504	"	"	Spindle Cover	1
3.	251505	"	"	Spindle Cover	1
4.	B720600	B720600	"	Angular Contact Bearing	4
5.	251507	"	"	Spacer	2
6.	251506	"	"	Spacer	2
7.	201502	251502	101502	Spindle Shaft	1
8.	201501	251501	101501	Spindle Housing	1
9.	251508	251508	"	Spacer	1
10.	251509	251509	"	Spindle Cover	1
11.	251510	"	"	Spindle Cover	1
12.	251511	"	"	Coupling	2
13.	251513	"	"	Rubber Coupling	1
14.	MH1B222	"	MH00222	Spindle Motor	1
15.	WDK7725	"	"	Key	1

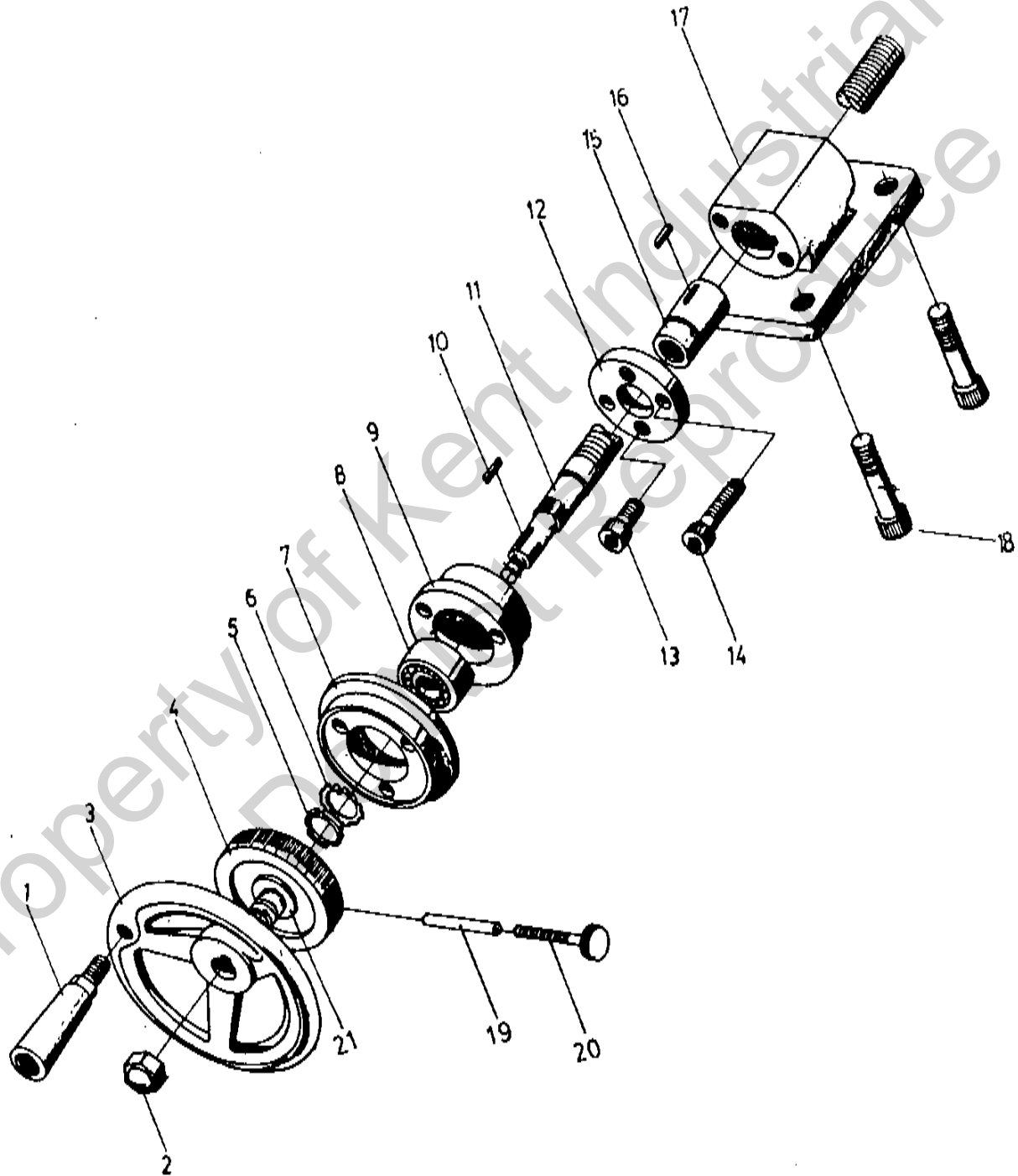
SPINDLE ASS'Y ( American Type )  
( KGS-200, 250, 250H, 250AH, 250AHD, 616H, 818AHD )



SPINDLE ASS'Y ( American Type )  
 ( KGS-200, 250, 250H, 250AH, 250AHD, 616H, 818AHD )

Index No.	Parts No.		Parts Name	Q'ty
	KGS-200,616H	250 series,818AHD		
1.	251503	"	Spindle Nut	1
2.	251504	"	Spindle Cover	1
3.	251505	"	Spindle Cover	1
4.	B720600	"	Angular Contact Bearing	4
5.	251507	"	Spacer	2
6.	251506	"	Spacer	2
7.	201502	"	Spindle Shaft	1
8.	201501	"	Spindle Housing	1
9.	251508	"	Spacer	1
10.	251509	"	Spindle Cover	1
11.	251510	"	Spindle Cover	1
12.	251511	"	Coupling	2
13.	251513	"	Rubber Coupling	1
14.	MH1B522	"	Spindle Motor	1
15.	WDK7725	"	Key	1

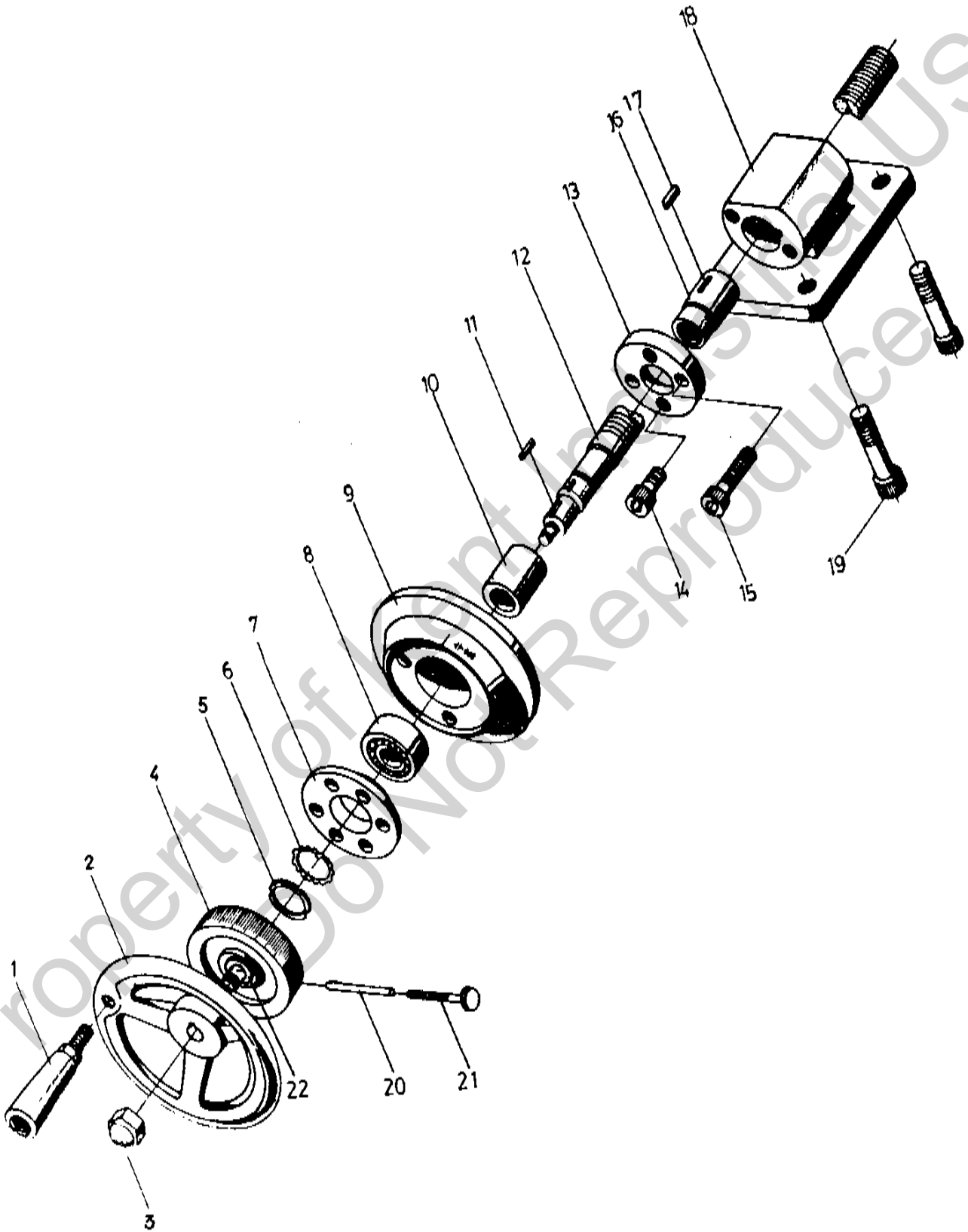
CROSSFEED ASS'Y ( KGS-200, 616H )



CROSSFEED ASS'Y ( KGS-200, 616H )

Index No.	Parts No.	Parts Name	Q'ty
1.	910103	Grip	1
2.	910101	Handwheel Nut	1
3.	910122	Handwheel	1
4.	201201	Graduation Dial	1
5.	WNA005R	Hexagonal Nut	1
6.	WWA0005	Ratchet Washer	1
7.	201204	Graduation Dial Holder	1
8.	B520400	Ball Bearing	1
9.	201206	Bearing Housing	1
10.	WDK5530	Key	1
11.	201211	Crossfeed Leadscrew	1
12.	251221	Leadscrew Backlash Adjuster	1
13.	F10506C	Socket Head Cap Screw	2
14.	F10508C	Socket Head Cap Screw	2
15.	251212	Leadscrew Nut	1
16.	WDK5520	Key	1
17.	251222	Crossfeed Nut Base	1
18.	F10618C	Socket Head Cap Screw	1
19.	201203	Pin	1
20.	251205	Adjusting Screw	1
21.	201202	Graduation Dial Bush	1

CROSSFEED ASS'Y ( KGS-250, 250H )

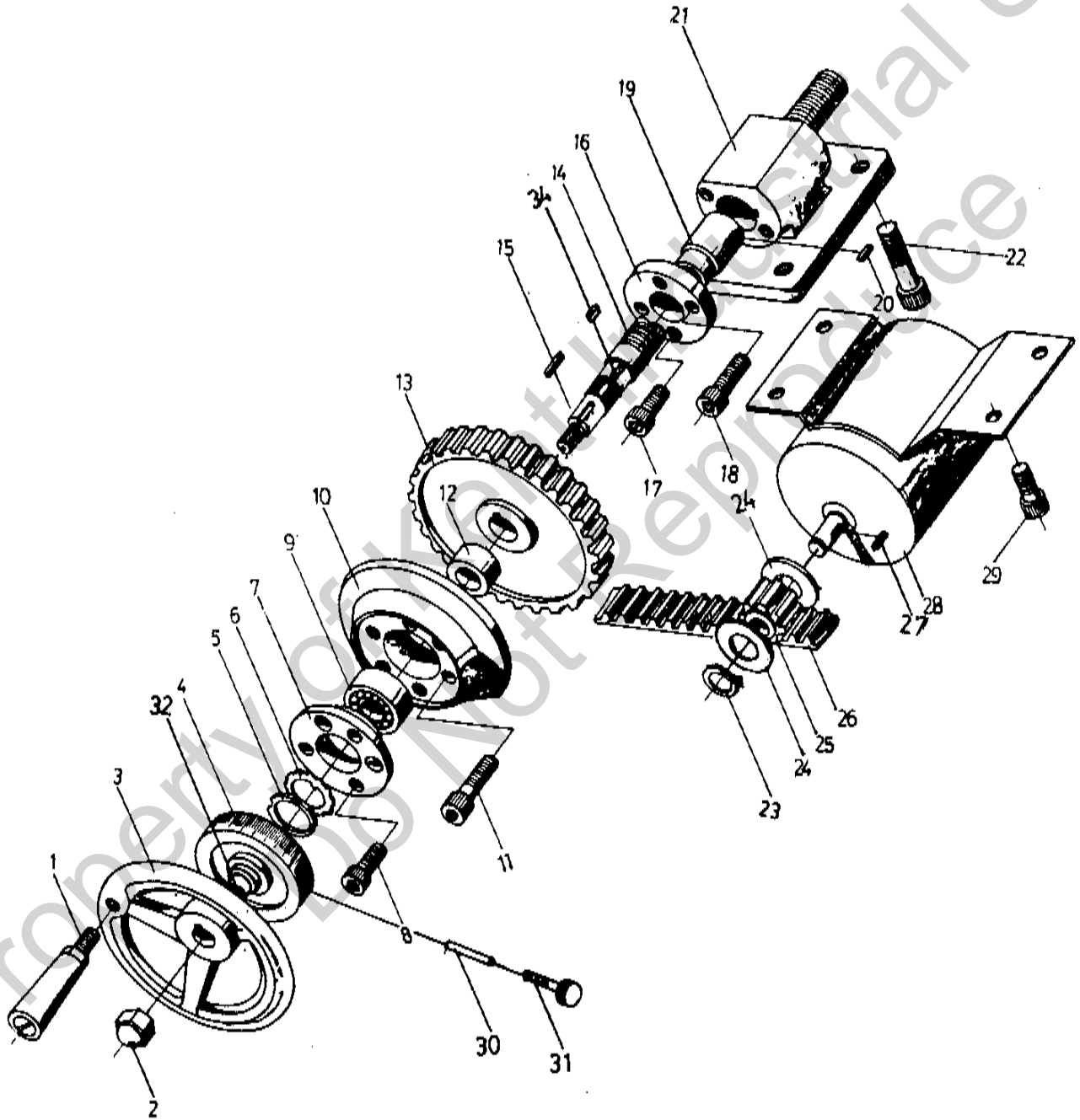




CROSSFEED ASS'Y ( KGS-250, 250H )

Index No.	Parts No.	Parts Name	Q'ty
1.	910103	Grip	1
2.	910121	Handwheel	1
3.	910101	Handwheel Nut	1
4.	251201	Graduation Dial	1
5.	WNA005R	Check Nut	1
6.	WWA0005	Ratchet Washer	1
7.	251206	Bearing Housing	1
8.	B520400	Bearing	1
9.	251204	Graduation Dial Holder	1
10.	251207	Spacer	1
11.	WDK5530	Key	1
12.	251211	Crossfeed Leadscrew	1
13.	251221	Leadscrew Backlash Adjuster	1
14.	F10506C	Socket Head Cap Screw	2
15.	F10508C	Socket Head Cap Screw	2
16.	251212	Leadscrew Nut	1
17.	WDK5520	Key	1
18.	251222	Crossfeed Leadscrew Nut Base	1
19.	F10618C	Socket Head Cap Screw	4
20.	251203	Pin	1
21.	251205	Adjusting Screw	1
22.	251202	Graduation Dial Bush	1

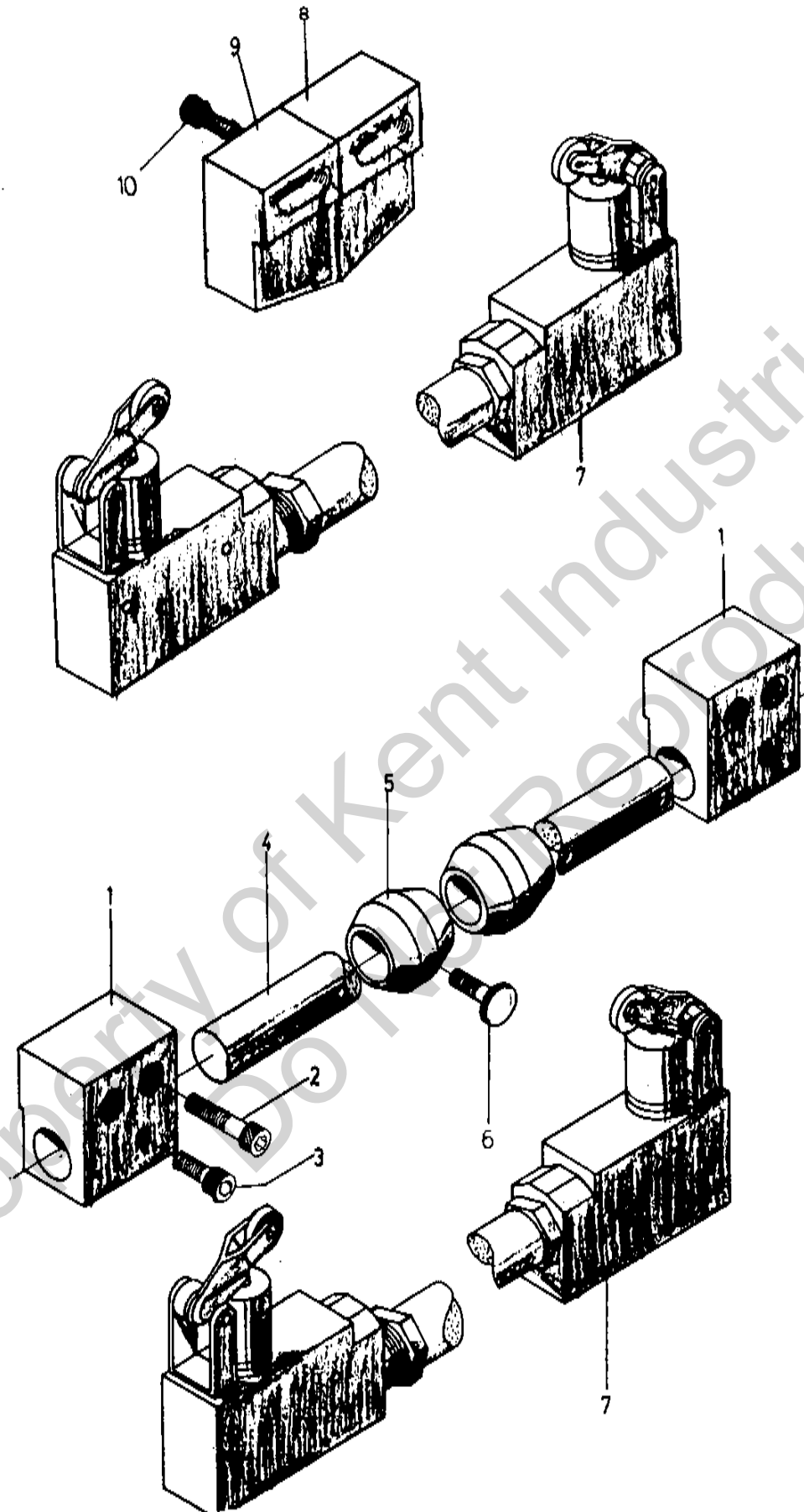
CROSS FEED ASS'Y ( KGS-250AH, 250AHD, 818AHD, 1020AHD )



CROSS FEED ASS'Y ( KGS-250AH, 250AHD, 818AHD, 1020AHD )

Index No.	Parts No.		Parts Name	Q'ty
	KGS-250AH,AHD 818AHD	KGS-1020AHD		
1.	910103	"	Grip	1
2.	910101	"	Handwheel Nut	1
3.	910121	"	Handwheel	1
4.	251201	"	Graduation Dial	1
5.	WNA005R	"	Hexagonal Nut	2
6.	WWA0005	"	Ratchet Washer	1
7.	251206	"	Bearing Retainer	1
8.	F10404C	"	Socket Head Cap Screw	3
9.	B520400	"	Bearing	1
10.	251204	"	Graduation Dial Holder	1
11.	F10408C	"	Socket Head Cap Screw	3
12.	251231	"	Spacer	1
13.	251232	"	Timing Belt Pulley	1
14.	251211	"	(mm) Cross Feed Leadscrew	1
	251291	"	(inch) Cross Feed Leadscrew	1
15.	WDK5530	"	Key	1
16.	251221	"	Leadscrew Backlash Adjuster	1
17.	F10506C	"	Socket Head Cap Screw	2
18.	F10508C	"	Socket Head Cap Screw	2
19.	251212	"	Leadscrew Nut	1
20.	WDK5520	"	Key	1
21.	251222	"	Crossfeed Nut Base	1
22.	F10618C	"	Socket Head Cap Screw	4
23.	W000S11	"	Snap Ring	1
24.	W000S18	"	Snap Ring	2
25.	251233	"	Washer	2
26.	DTL0503	"	Timing Belt	1
27.	WDK4410	"	Key	1
28.	MS2512A	"	Crossfeed Motor	1
29.	F10506C	"	Socket Head Cap Screw	4
30.	251203	"	Pin	1
31.	251205	"	Adjusting Screw	1
32.	251202	"	Graduation Dial Bush	1
33.	251234	"	Timing Belt Pulley	1
34.	WDK5515	"	Key	1

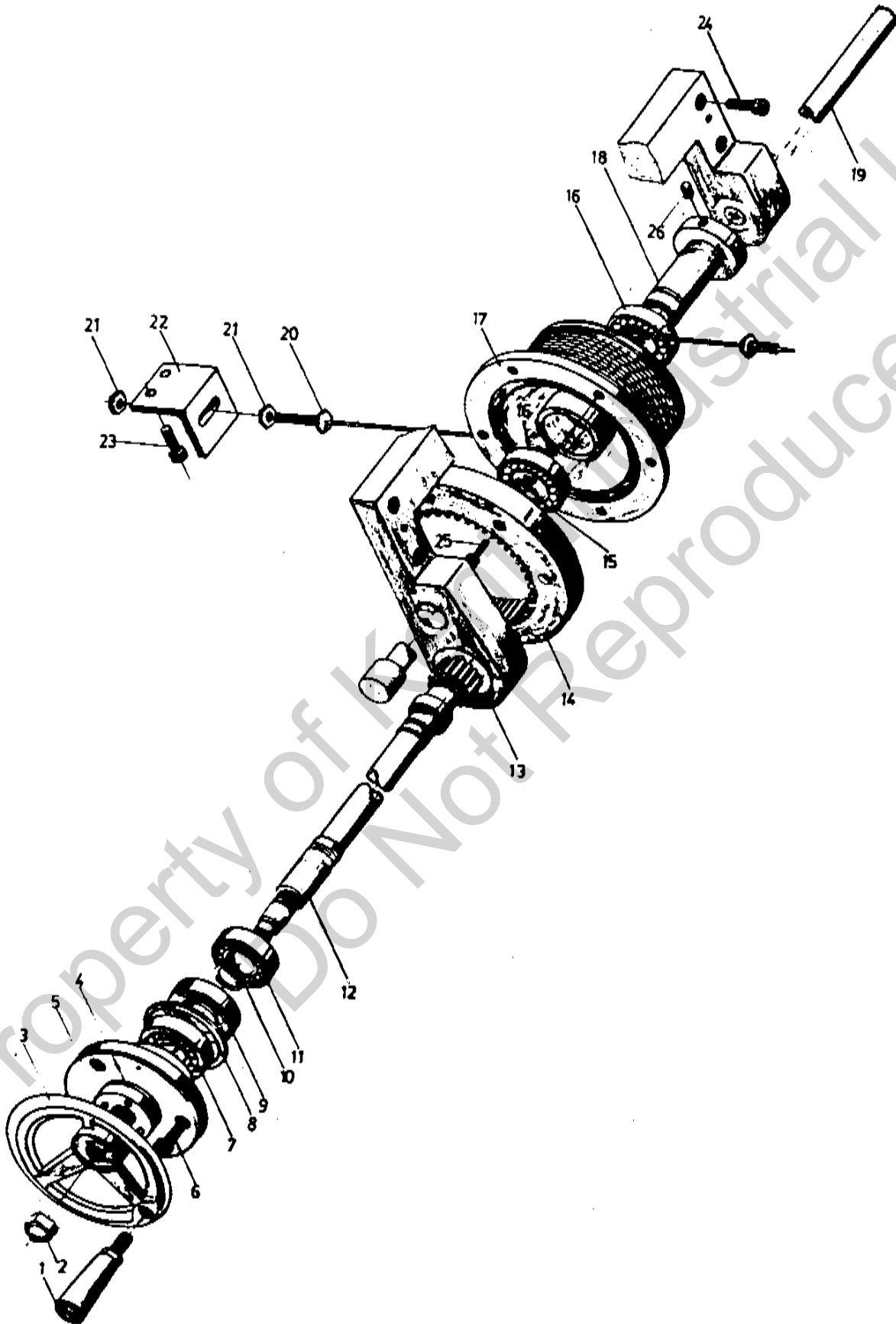
CROSSFEED CONTROL LIMIT SWITCH ( KGS-250AH, AHD, 818AHD, 1020AHD)



CROSSFEED CONTROL LIMIT SWITCH  
( KGS-250AH, 250AHD, 818AHD, 1020AHD )

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.	251552	Pad Rod	1
5.	251553	Dog	2
6.	251501	Fixed Screw	2
7.	E31151	Limit Switch	4
8.	251554	Dog	1
9.	251555	Dog	1
10.	F10406C	Socket Head Cap Screw	2

LONGITUDINAL HAND FEED ASS'Y ( KGS-200, 250 )

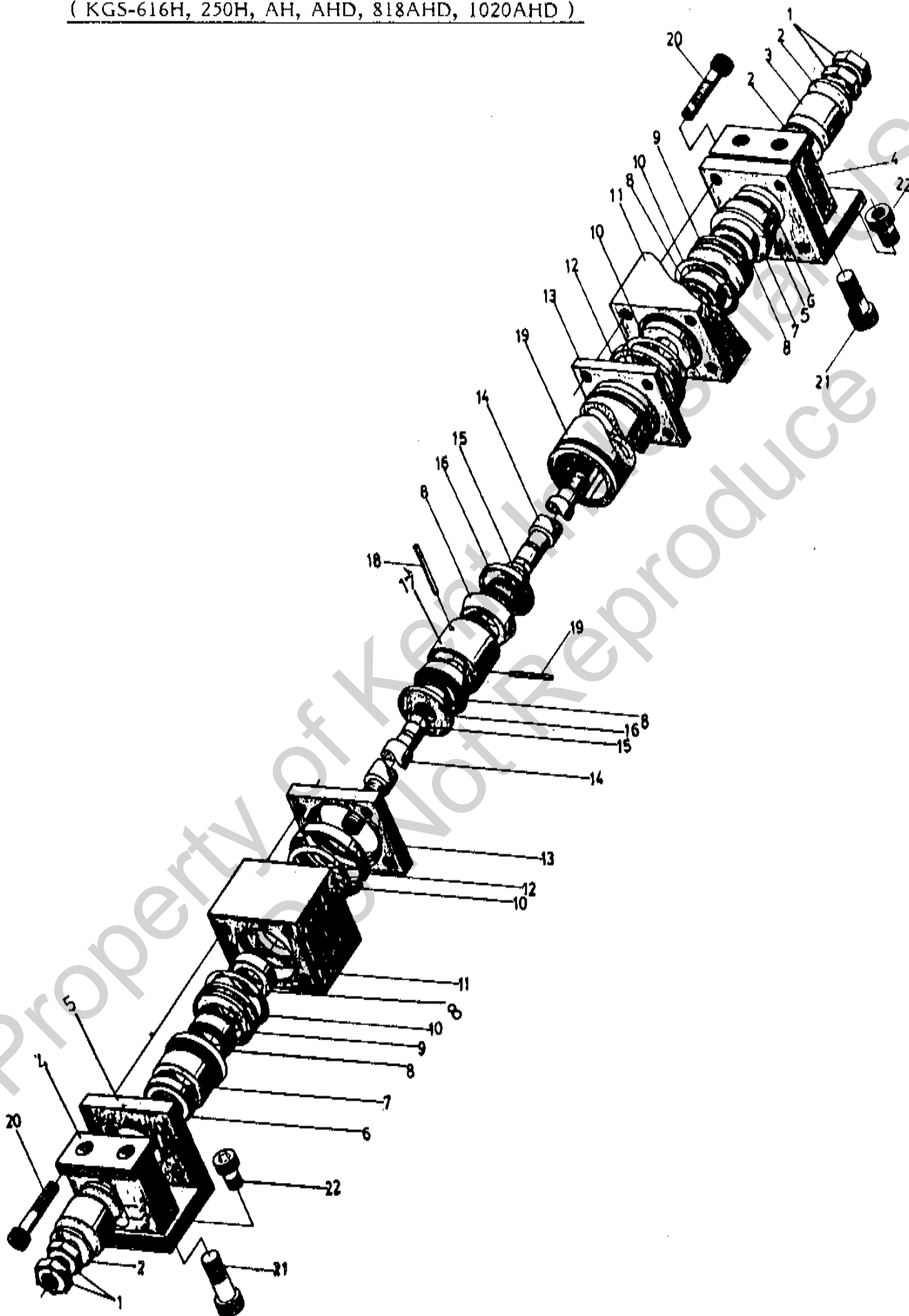


LONGITUDINAL HAND FEED ASS'Y ( KGS-200, 250 )

Index No.	Parts No.		Parts Name	Q'ty
	KGS-200	KGS-250		
1.	910103	910103	Grip	1
2.	910101	910101	Handwheel Nut	1
3.	910122	910121	Handwheel	1
4.	251323	251323	Nut	1
5.	201321	251321	Bearing Housing	1
6.	F10406C	"	Socket Head Cap Screw	3
7.	B6204ZZ	"	Ball Bearing	1
8.	W000R47	"	Snap Ring	1
9.	251324	"	Spacer	1
10.	W000S20	"	Snap Ring	2
11.	B6004ZZ	"	Ball Bearing	1
12.	201322	251322	Pinion Shaft	1
13.	201325	251325	Frame Drum	1
14.	201326	251326	Internal Gear	1
15.	W000S25	"	Snap Ring	1
16.	B6005Z0	"	Ball Bearing	2
17.	201327	251327	Drum	1
18.	251328	"	Bushing	1
19.	201329	251329	Shaft	1
20.	D80001	D80001	Wire Rope	1
21.	WNH004C	"	Hexagonal Nut	4
22.	251331	"	End Plate	2
23.	F10406C	"	Socket Head Cap Screw	4
24.	F10506C	"	Socket Head Cap Screw	4
25.	F10404C	"	Socket Head Cap Screw	4
26.	F20504C	"	Set Screw	3

CYLINDER

( KGS-616H, 250H, AH, AHD, 818AHD, 1020AHD )



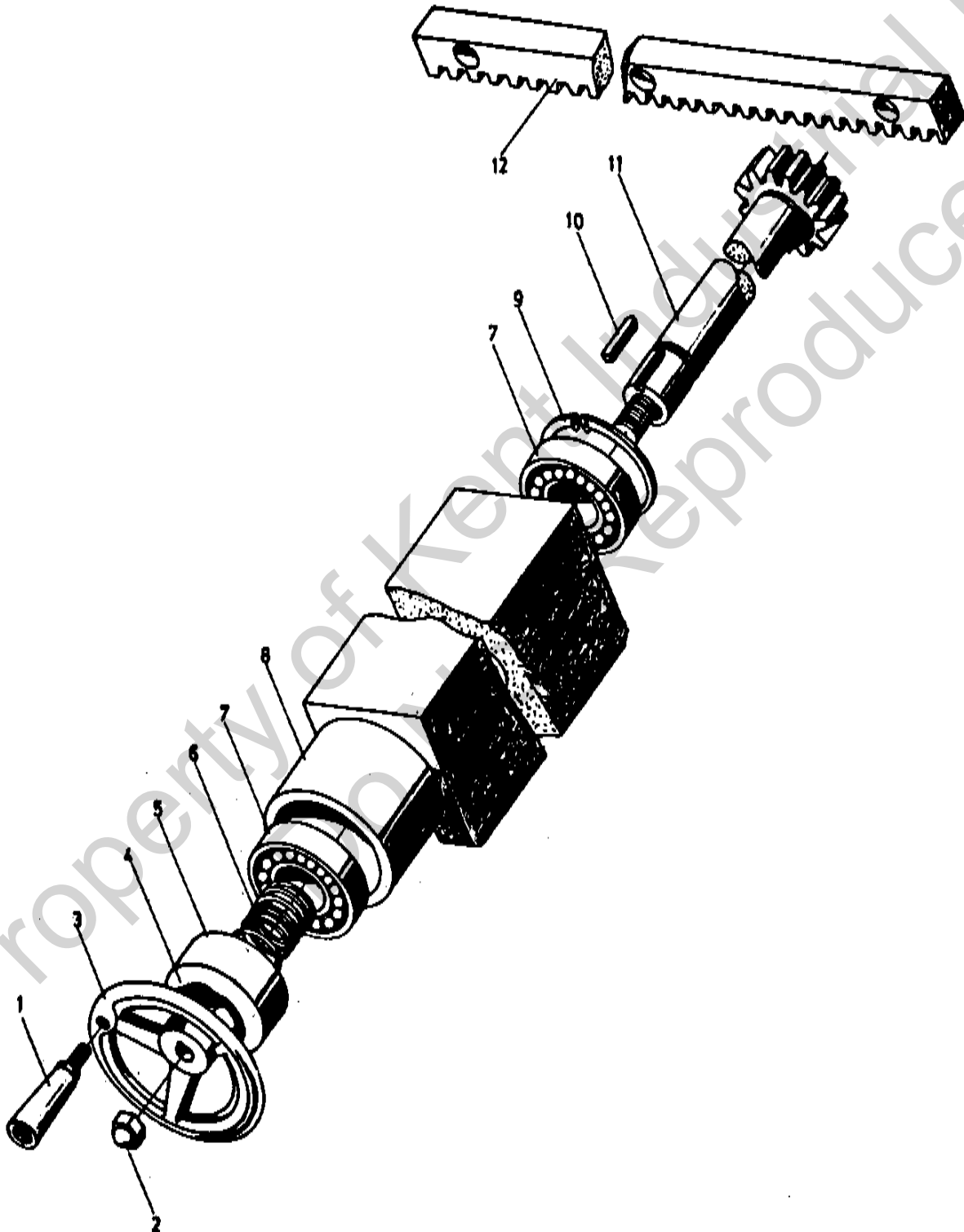


CYLINDER

( KGS-616H, 250H, AH, AHD, 818AHD, 1020AHD )

Index No.	Parts No.			Parts Name	Q'ty
	KGS-616H	250,818AHD	1020AHD		
1.	WNH006C	"	"	Hexagonal Nut	4
2.	911402	"	"	Washer	4
3.	251672	"	"	Spacer	2
4.	251673	"	"	End Bracket	2
5.	251653	"	"	Cylinder Bracket	2
6.	GS19284	"	"	Dust Seal	2
7.	251654	"	"	Dust Seal Bracket	2
8.	GU0RE20	"	"	U-Packing	6
9.	251655	"	"	O-Ring Seat	2
10.	G000G35	"	"	O-Ring	4
11.	251656	"	"	End Cover	2
12.	251657	"	"	Clamp Ring	2
13.	251658	"	"	Cylinder Clamper	2
14.	611652	251652	101652	Piston Rod	2
15.	G0000P9	"	"	O-Ring	2
16.	251659	"	"	Auxiliary Piston	2
17.	251660	"	"	Piston	1
18.	WP0528	"	"	Spring Pin	2
19.	611651	251651	101651	Cylinder	1
20.	F10418C	"	"	Socket Head Cap Screw	8
21.	F10618C	"	"	Socket Head Cap Screw	4
22.	F10506C	"	"	Socket Head Cap Screw	4

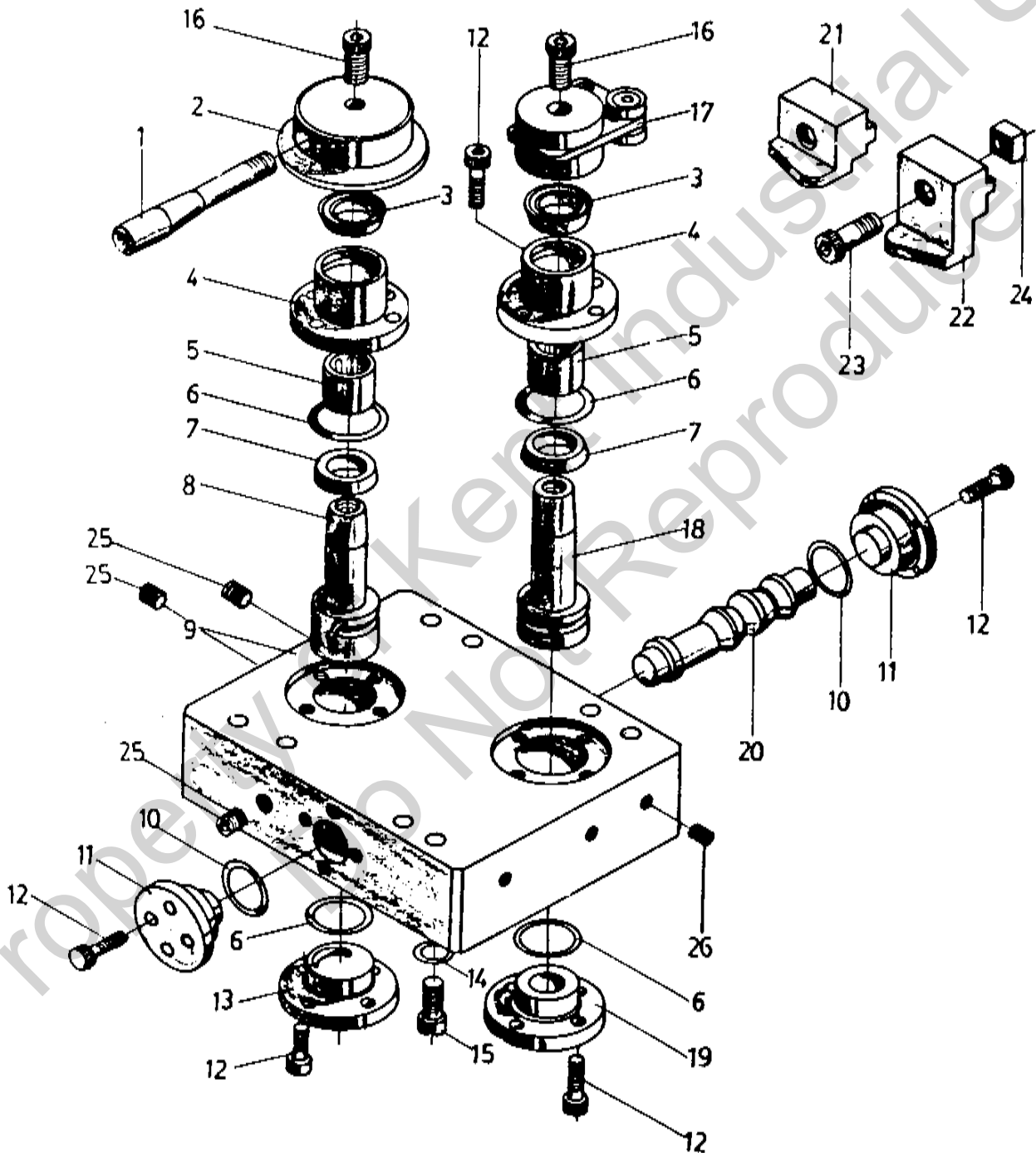
LONGITUDINAL HAND FEED ASS'Y  
( KGS-250H, AH, AHD, 616H, 818AHD, 1020AHD )



LONGITUDINAL HAND FEED ASS'Y  
 ( KGS-250H, AH, AHD, 616H, 818AHD, 1020AHD )

Index No.	Parts No.		Parts Name	Q'ty
	KGS-616H,818AHD 250H,AH,AHD	KGS-1020AHD		
1.	910103	"	Grip	1
2.	910101	"	Handwheel Nut	1
3.	910121	"	Handwheel	1
4.	W000S17	"	Snap Ring	1
5.	251351	"	Bush	1
6.	251352	"	Spring	1
7.	B600320	"	Bearing	2
8.	251353	101353	Frame	1
9.	W000R35	"	Snap Ring	1
10.	WDK5520	"	Key	1
11.	251354	101354	Pinion Shaft	1
12.	251355	"	Gear Rack	1

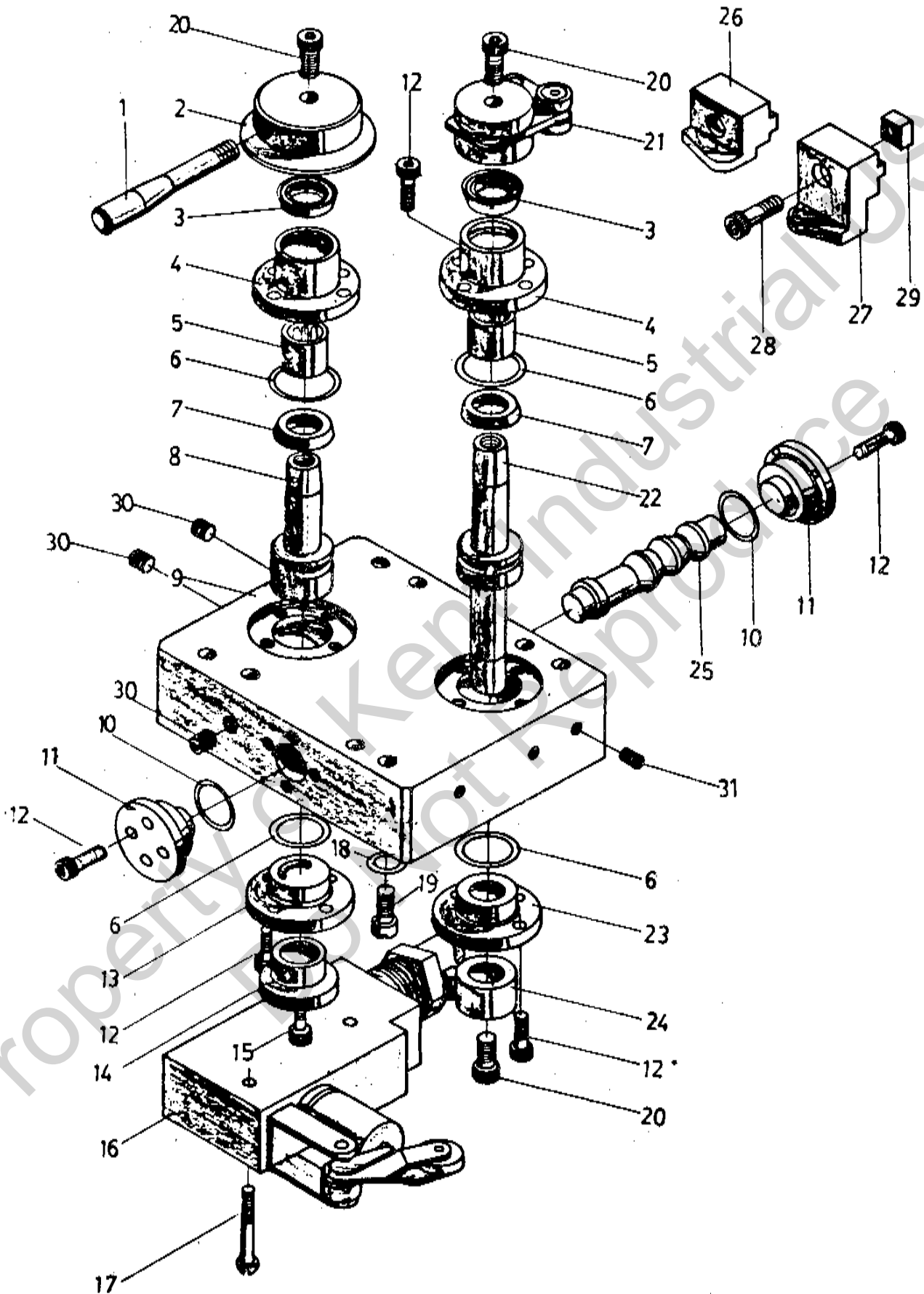
VALVE ( KGS-616H, 250H )



VALVE ( KGS-616H, 250H )

Index No.	Parts No.	Parts Name	Q'ty
1.	251645	Flow Control Lever	1
2.	251644	Flow Control Knob	1
3.	GS23154	Dust Seal	2
4.	251631	Upper Cover	2
5.	BHK1516	Needle Bearing	2
6.	GO00P28	O-Ring	4
7.	GU00E15	U-Packing	2
8.	251632	Flow Control Shaft	1
9.	251630	Valve Body	1
10.	GO00P20	O-Ring	2
11.	251636	Side Cover	2
12.	F10304C	Socket Head Cap Screw	24
13.	251633	Bottom Cover	1
14.	GO000P9	O-Ring	1
15.	251638	Adjusting Screw	1
16.	F10404C	Socket Head Cap Screw	2
17.	251641	Direction Control Arm	1
18.	251691	Direction Control Shaft	1
19.	251633	Bottom Cover	1
20.	251637	Pivot Piston	1
21.	251675	Dog	1
22.	251674	Dog	1
23.	F10508C	Socket Head Cap Screw	2
24.	251345	Nut	2
25.	F20603C	Set Screw	4
26.	F20302C	Set Screw	5

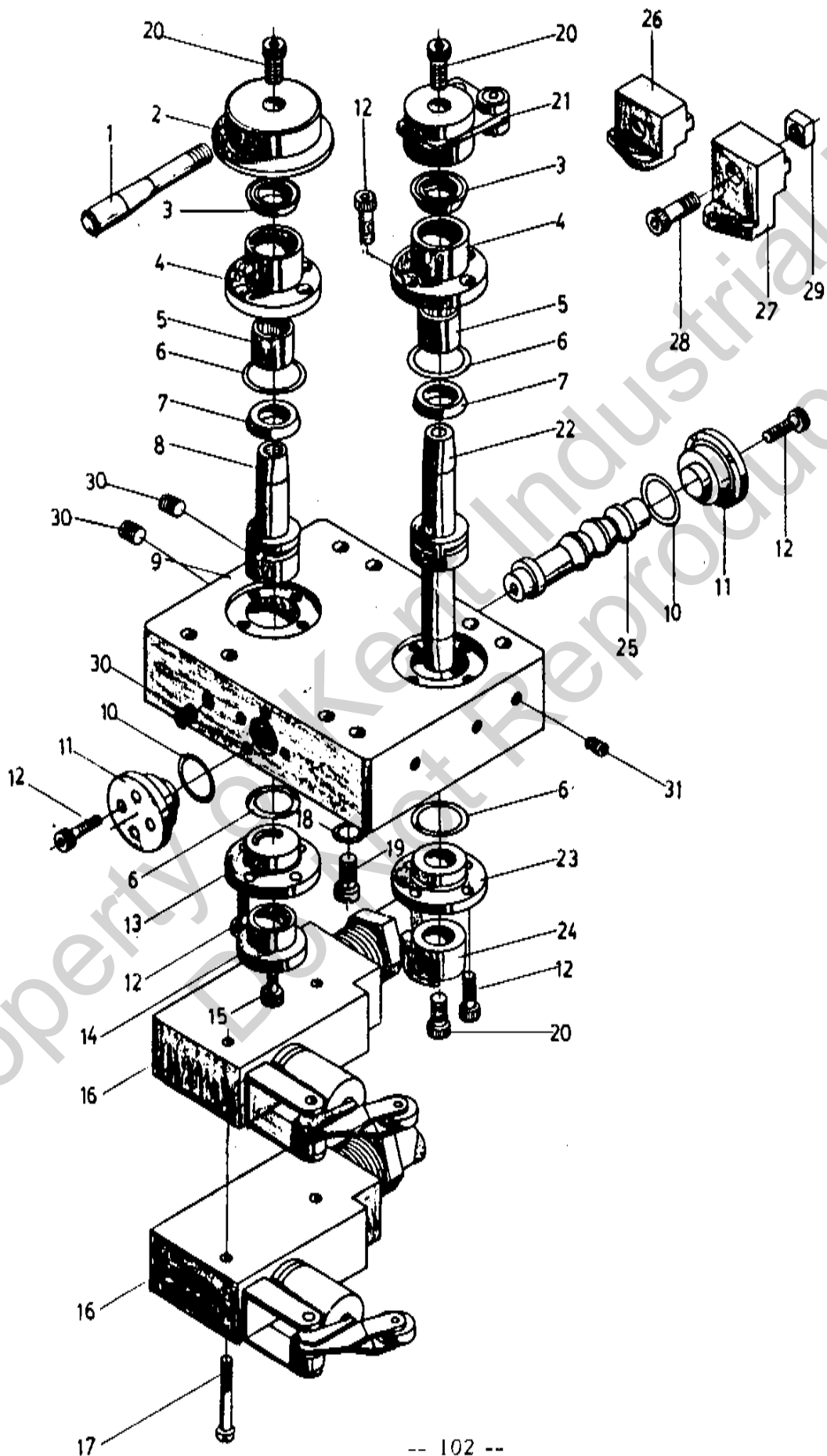
VALVE ( KGS-250AH )



VALVE ( KGS-250AH )

Index No.	Parts No.	Parts Name	Q'ty
1.	251645	Flow Control Lever	1
2.	251644	Flow Control Knob	1
3.	GS23154	Dust Seal	2
4.	251631	Upper Cover	2
5.	BHK1516	Needle Bearing	2
6.	GO00P28	O-Ring	4
7.	GU0RE15	U-Packing	2
8.	251632	Flow Control Shaft	1
9.	251630	Valve Body	1
10.	GO00P20	O-Ring	2
11.	251636	Side Cover	2
12.	F10304C	Socket Head Cap Screw	24
13.	251633	Bottom Cover	1
14.	251648	Limit Switch Bracket	1
15.	F10504C	Socket Head Cap Screw	1
16.	E31151	Limit Switch	1
17.	F40408M	Cup Head Screw	2
18.	GO000P9	O-Ring	1
19.	251638	Adjusting Screw	1
20.	F10404C	Socket Head Cap Screw	3
21.	251641	Direction Control Arm	1
22.	251634	Direction Control Shaft	1
23.	251635	Bottom Cover	1
24.	251646	Cam	1
25.	251637	Pivot Piston	1
26.	251675	Dog	1
27.	251674	Dog	1
28.	F10508C	Socket Head Cap Screw	2
29.	251345	Nut	2
30.	F21002T	Set Screw	4
31.	F20302C	Set Screw	5

VALVE ( KGS-250AHD, 818AHD, 1020AHD )

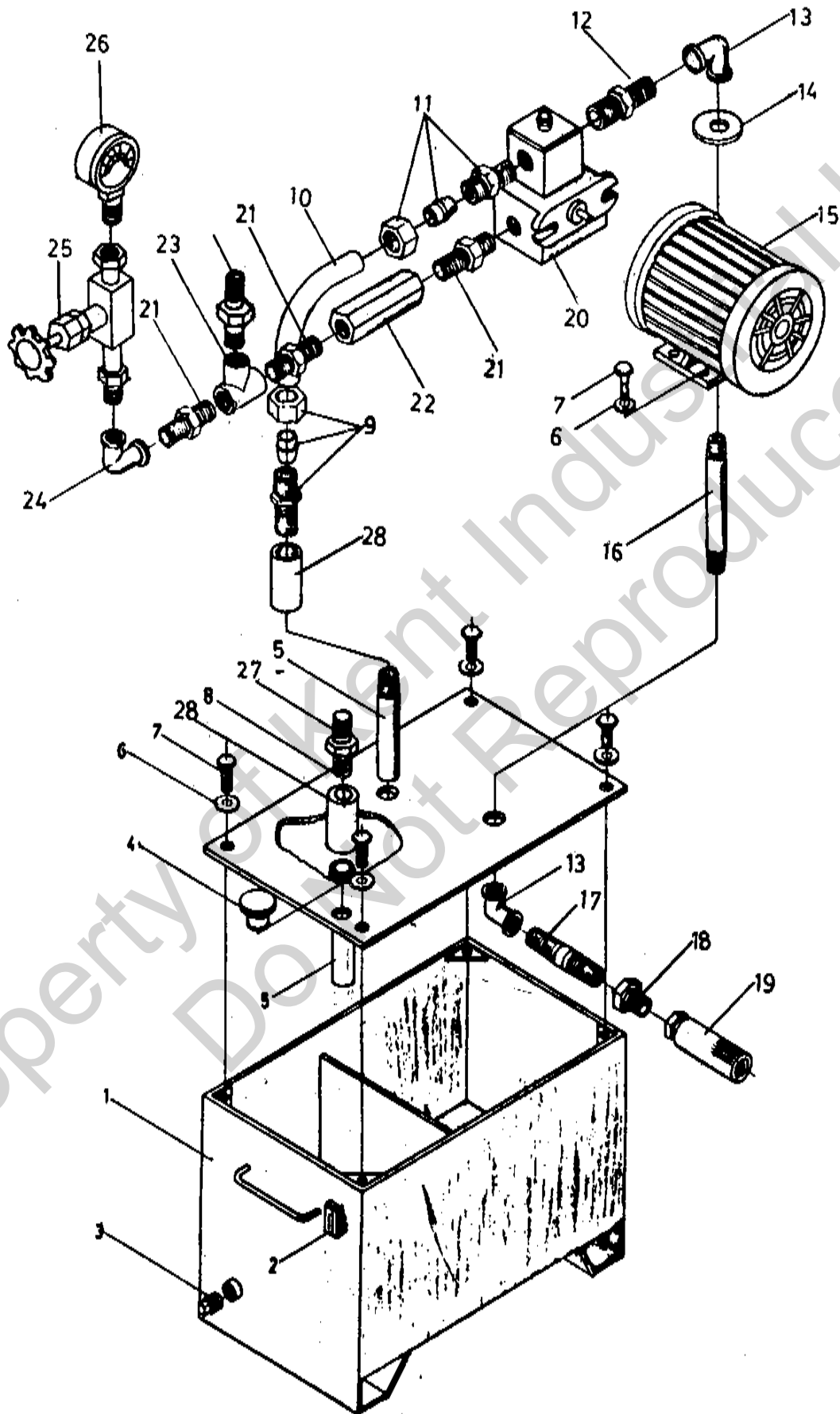




VALVE ( KGS-250AHD, 818AHD, 1020AHD )

Index No.	Parts No.	Parts Name	Q'ty
1.	251645	Flow Control Lever	1
2.	251644	Flow Control Knob	1
3.	GS23154	Dust Seal	2
4.	251631	Upper Cover	2
5.	BHK1516	Needle Bearing	2
6.	GO00P28	O-Ring	4
7.	GU00E15	U-Packing	2
8.	251632	Flow Control Shaft	1
9.	251630	Flow Control Valve Body	1
10.	GO00P29	O-Ring	2
11.	251636	Side Cover	2
12.	F10304C	Socket Head Cap Screw	24
13.	251633	Bottom Cover	1
14.	251648	Limit Switch Mounting Bracket	1
15.	F10504C	Socket Head Cap Screw	1
16.	E31151	Limit Switch	2
17.	F40412M	Round Head Screw	2
18.	GO000P9	O-Ring	1
19.	251638	Adjusting Screw	1
20.	F10404C	Socket Head Cap Screw	3
21.	251641	Direction Control Arm	1
22.	251634	Direction Control Shaft	1
23.	251635	Bottom Cover	1
24.	251693	Cam	1
25.	251637	Pivot Piston	1
26.	251675	Dog	1
27.	251674	Dog	1
28.	F10508C	Socket Head Cap Screw	2
29.	251345	Nut	2
30.	F20603C	Set Screw	4
31.	F20302C	Set Screw	5

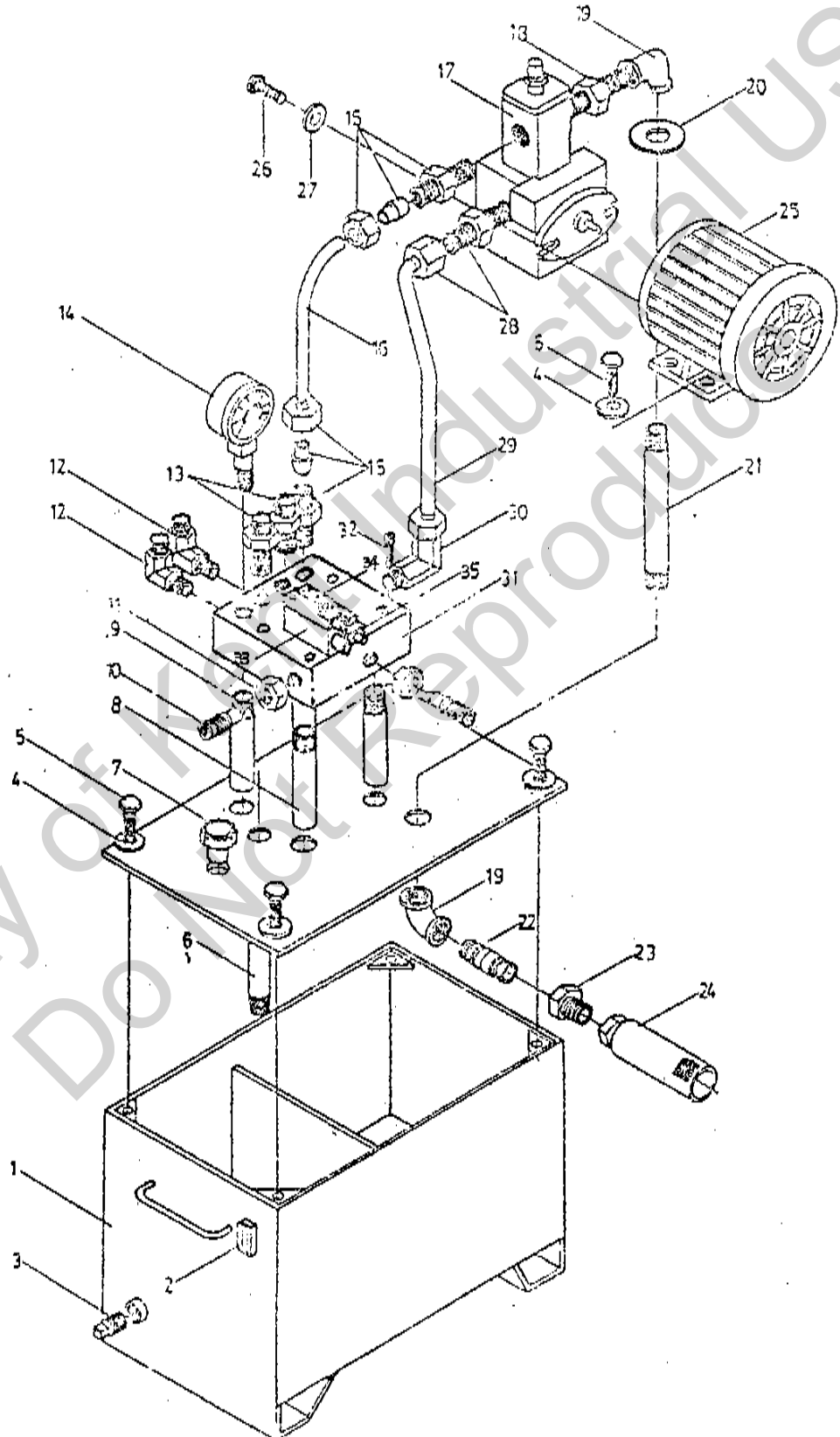
HYDRAULIC TANK ( KGS-616H, 250H, 250AH )



HYDRAULIC TANK ( KGS-616H, 250H, 250AH )

Index No.	Parts No.	Parts Name	Q'ty
1.	251601	Hydraulic Tank	1
2.	GM00006	Oil Gauge	1
3.	HL00004	Plug	1
4.	GY00001	Hydraulic Oil Inlet Cap	1
5.	251603	Oil Return Pipe	2
6.	WWF0006	Washer	8
7.	F30608C	Hexagonal Head Screw	8
8.	251602	Hydraulic Tank Cover	1
9.	HACN3T3	Copper Connector	1
10.	HW03025	Nylon Tube	1
11.	HACN3T2	Copper Connector	1
12.	HN00403	Copper Nipple	1
13.	HELF003	90° Elbow	2
14.	251604	Dust Seal	1
15.	MH00142	Hydraulic Motor	1
16.	251605	Oil Inlet Pipe	1
17.	HM00003	Nipple	1
18.	HB00603	Bushing	1
19.	HZ00006	Oil Filter	1
20.	HPLC26R	Pump	1
21.	HN00303	Nipple	3
22.	HC00003	Check Valve	1
23.	HT00003	T-Elbow	1
24.	HELF003	90° Elbow	1
25.	HS00202	Meter Gauge	1
26.	HG26035	Pressure Gauge	1
27.	HN00304	Nipple	1
28.	HK00003	Socket	2

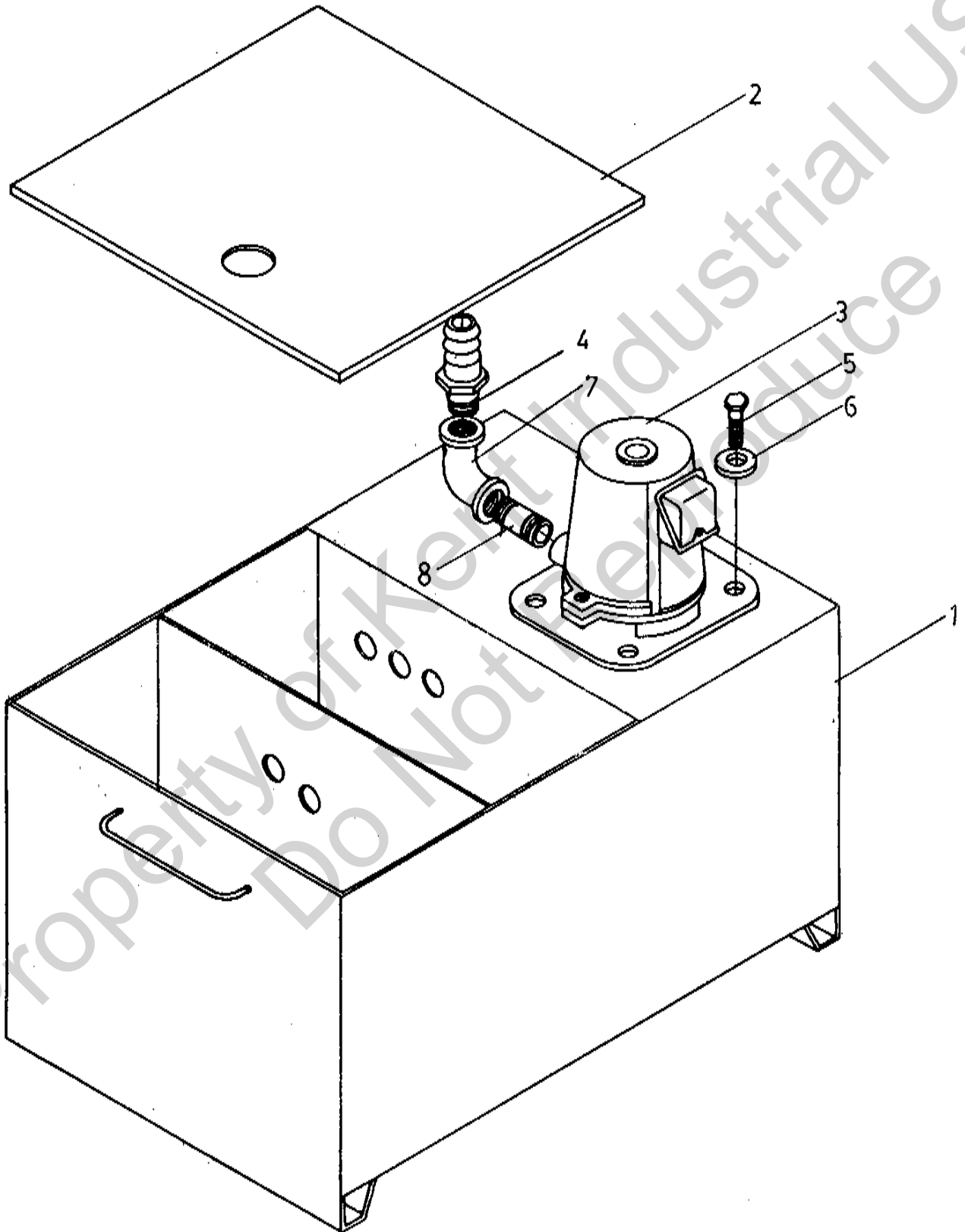
HYDRAULIC TANK (KGS-250AHD, 818AHD, 1020AHD)



HYDRAULIC TANK ( KGS-250AHD, 818AHD, 1020AHD )

Index No.	Parts No.	Parts Name	Q'ty
1.	251601	Hydraulic Tank	1
2.	GM00006	Oil Gauge & Thermometer	1
3.	HL00004	Plug	1
4.	WWS0006	Washer	8
5.	F30608C	Hexagonal Head Screw	8
6.	251607	Oil Return Pipe	1
7.	GY00001	Hydraulic Oil Inlet Cap	1
8.	251607	Oil Return Pipe	3
9.	251603	Oil Return Pipe	1
10.	251624	Adjusting Screw	3
11.	251623	Fixed Nut	3
12.	HALN4T3	90° Connector	2
13.	HN00303	Nipple	2
14.	HG26035	Pressure Gauge	1
15.	HACN3T2	Copper Connector	2
16.	HW03025	Nylon Tube	1
17.	HPLC26R	Pump	1
18.	HN00304	Nipple	1
19.	HELF003	90° Elbow	2
20.	251604	Dust Seal	1
21.	251605	Oil Inlet Pipe	1
22.	HM00003	Nipple	1
23.	HB00603	Bushing	1
24.	HZ00006	Oil Filter	1
25.	MH00142	Hydraulic Motor	1
26.	F30306C	Hexagonal Head Screw	2
27.	WWF0003	Washer	2
28.	HACN3T3	Copper Connector	1
29.	GTC0320	Copper Pipe	1
30.	HALN4T4	90° Connector	1
31.	251621	Valve Body	1
32.	F10418C	Socket Head Cap Screw	4
33.	HR00002	Sequence Valve	1
34.	HDE0002	Solenoid Valve	1
35.	HDA0002	" "	1

COOLANT SYSTEM ( Optional Accessory )

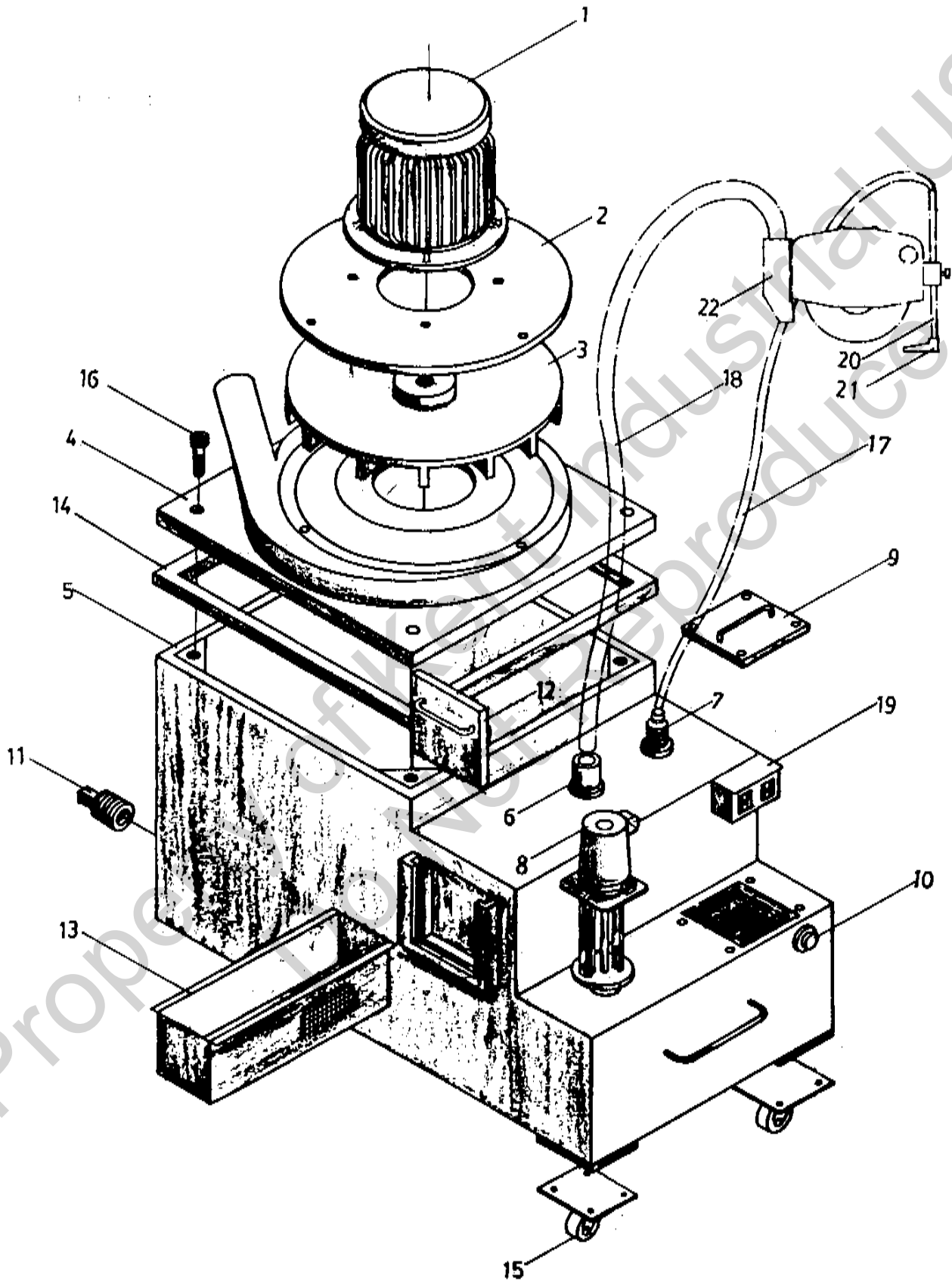


COOLANT SYSTEM ( Optional Accessory )

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	Pipe Connector	1
5.	F30404C	Hexagonal Head Screw	4
6.	WWS0004	Washer	4
7.	HELF003	90° Elbow	1
8.	HM00303	Nipple	1

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DUST-SUCTION COOLING SYSTEM ( Optional Accessory )

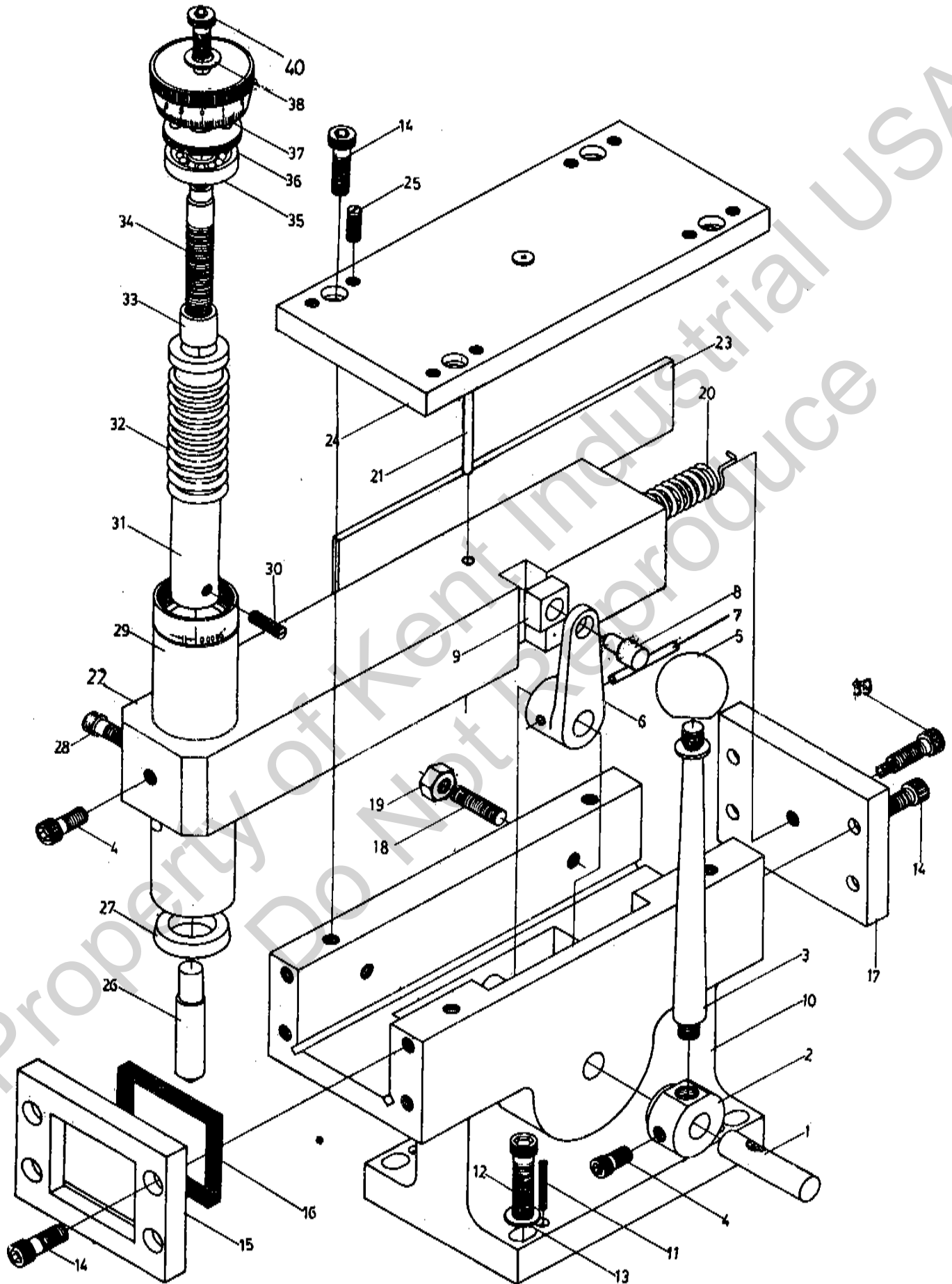




DUST-SUCTION COOLING SYSTEM

Index No.	Parts No.	Parts Name	Q'ty
1.	MVB1322	Motor	1
2.	921408	Motor Fixed Plate	1
3.	921407	Suction Fan	1
4.	921404	Upper Cover	1
5.	921401	Tank	1
6.	921409	Suction Hose Connector	1
7.	921421	Coolant Hose Connector	1
8.	MVB1322	Coolant Pump	1
9.	921404	Cover	1
10.	GM00006	Coolant Indicator	1
11.	HL00004	Plug	1
12.	921403	Filter Cover	1
13.	921402	Filter	1
14.	921405	Cover Packing	1
15.	JA00003	Roller Bracket	4
16.	F30610C	Hexagonal Head Screw	4
17.	VA04010	Coolant Hose	1
18.	VB21020	Suction Hose	1
19.	ES9600	On-Off Switch	1
20.	921424	Coolant Pipe	1
21.	921425	Coolant Nozzle	1
22.	921422	Dust-Collector	1

PARALLEL DRESSER ( Optional Accessory )



PARALLEL DRESSER ( Optional Accessory )

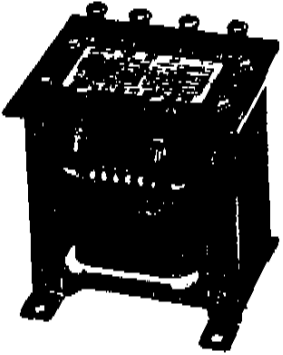

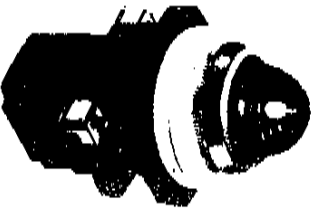


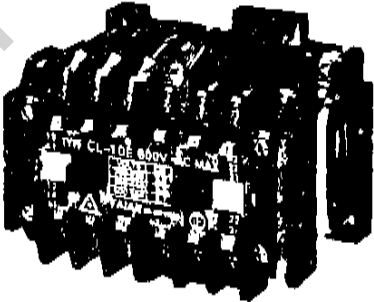
Index No.	Parts No.	Parts Name	Q'ty
1.	921444	Lever Shaft	1
2.	921445	Shaft Bushing	1
3.	921111	Lever	1
4.	F10404C	Socket Head Cap Screw	2
5.	921110	Knob	1
6.	921446	Arm	1
7.	WPR0422	Pin	1
8.	921447	Pin Shaft	1
9.	921448	Slide Block	1
10.	921449	Parallel Dresser Base	1
11.	F20403C	Set Screw	2
12.	F10407C	Socket Head Cap Screw	4
13.	WWF0004	Washer	4
14.	F10304C	Socket Head Cap Screw	12
15.	921450	Front Cover	1
16.	921451	Oil-Immersed Pad	1
17.	921452	Rear Cover	1
18.	F20404C	Set Screw	3
19.	WNH0004	Nut	3
20.	921453	Spring	1
21.	WPR0524	Pin	1
22.	921454	Slider	1
23.	921455	gib	1
24.	921442	Upper Cover	1
25.	F10403C	Socket Head Cap Screw	8
26.	911108	Diamond Tip	1
27.	GU0RE20	U-Packing	1
28.	F20304C	Socket Head Cap Screw	1
29.	921112	Adapter	1
30.	921120	Set Screw	1
31.	921113	Diamond Tip Holder	1
32.	921119	Spring	1
33.	921114	Copper Bush	1
34.	921117	Leadscrew	1
35.	B620000	Bearing	1
36.	921115	Cover	1
37.	921116	Graduation Dial	1
38.	921118	Washer	1
39.	921143	Spring Fix Screw	1
40.	F10204C	Socket Head Cap Screw	1

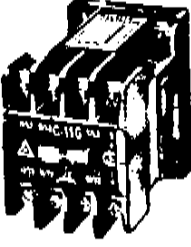

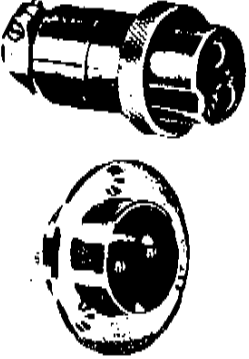



O.           ELECTRICAL PARTS LIST  
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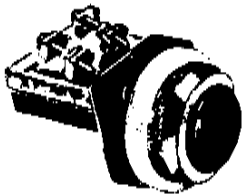



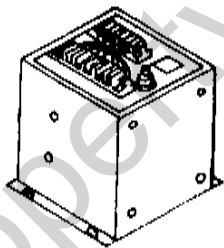
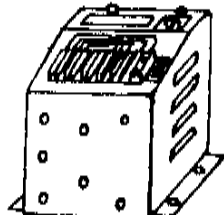
WHEN ORDERING ELECTRICAL PARTS, PLEASE MENTION:

1. MACHINE MODEL & SERIAL NUMBER,
2. ORDERING NO. & QUANTITY.

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Contour	Ordering No.	Specification	Code No.
	EF2401	440-380-220-0 160-80-0-12-24	M:Tr. H:Tr. AH:Tr. AHD:Tr.
	EL5245	22Ø 24V green	AHD:PB8, PB11
	EL3249	30Ø 24V white	M:WL H:WL
	EL7249	30Ø 24V white	AH:PB8, GL
	EM2241	HO-11ERH10/1.7 24V	M:MC5 H:MC5 AH:MC5 AHD:MC5
	EM2244	HO-11ERH10/4 24V	M:MC1, MC5 H:MC1, MC2, MC5 AH: MC1, MC2, MC5 AHD:MC1, MC2, MC5
	EM3241	CL-4E 24V	AH:MC3 AHD:MC3

Contour	Ordering No.	Specification	Code No.
	EM1241	C-11E 24V 4a	AH: M0 AHD: M0
	EM5242	2P 24V	AHD: X1, X2, X3
	EM5244	4P 24V	AHD: X4
	EN503 <sup>0</sup> <sub>1</sub>	HRS-21-3P	AHD: SOC4
	EN504 <sup>0</sup> <sub>1</sub>	HRS-21-4P	M: SOC3 H: SOC2, SOC3 AH: SOC2, SOC3 AHD: SOC2, SOC3
	ES0512	22Ø red, lock	AHD: PB1
	ES1012	30Ø red	M: PB1 H: PB1 AH: PB1
	ES2512	22Ø red	AHD: PB2, PB4, PB6
	ES2600	22Ø black	AHD: PB9, PB10
	ES2605	22Ø green	AHD: PB3, PB5, PB7

Contour	Ordering No.	Specification	Code No.
	ES3012	30∅ red	M:PB2, PB6 H:PB2, PB4, PB6 AH:PB2,PB4,PB6
	ES3100	30∅ black	AH:PB9, PB10
	ES3105	30∅ green	M:PB3, PB7 H:PB3, PB5, PB7 AH:PB3, PB5, PB7
	ES5112	30∅ black 2-position	AH:SW4
	ES7113	30∅ black 3-position	M:SW3 H:SW3 AH:SW3
	ES4613	22∅ 3-position	AHD:SW3
	ES4723	22∅ 3-position	AHD:SW5
	EU0003	Chuck control box	M:C.C.B. H:C.C.B. AH:C.C.B. AHD:C.C.B.
	EU0004	Delay timer unit	AHD:D.T.U.
	EU0002	Solid state control unit	AH:S.S.C.U. AHD:S.S.C.U.

P). Trouble Shooting

(1). Grinding Defects

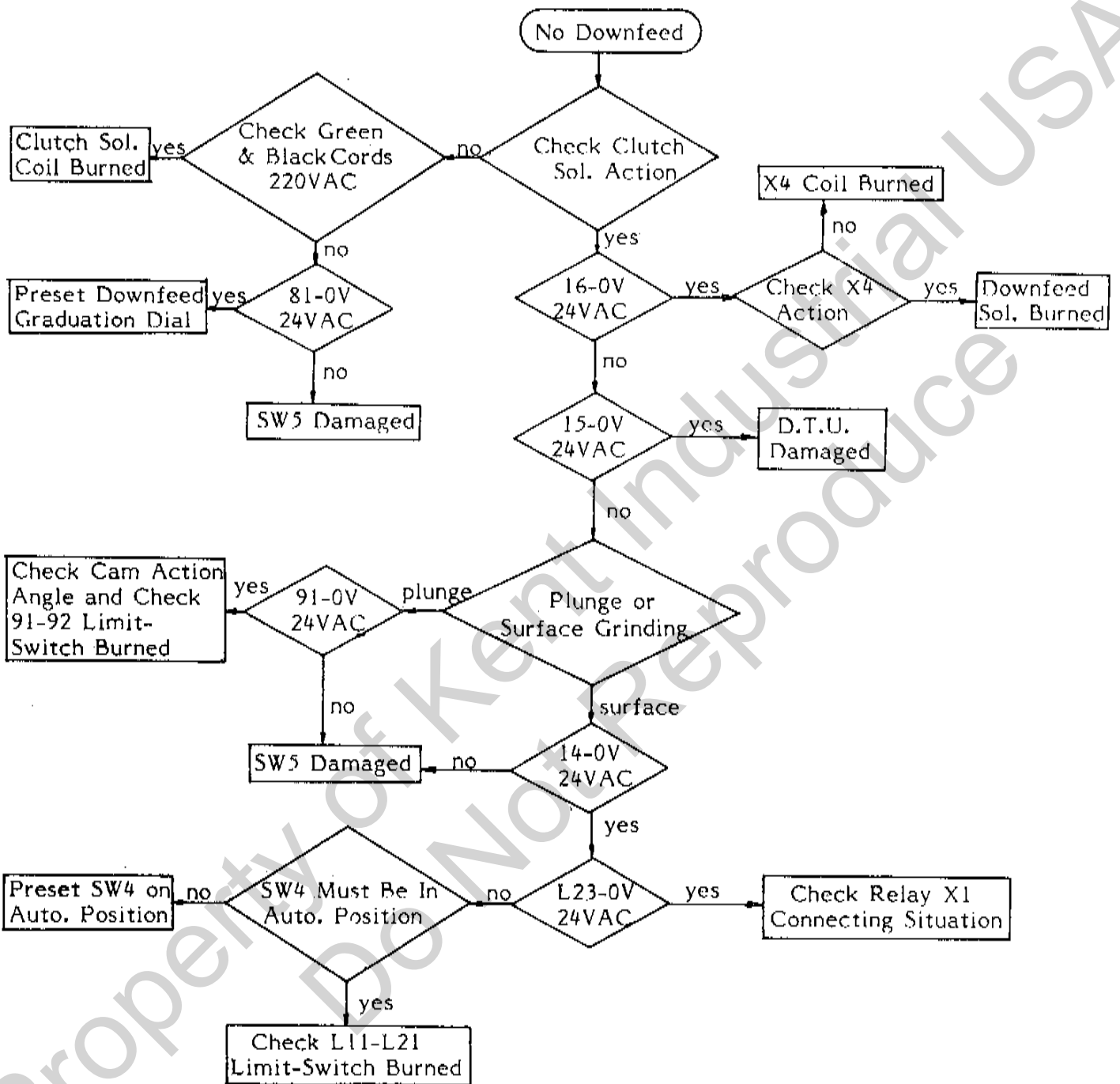
Defects	Causes	Remedy
* Chatter marks on grinding surface	Machine not free from vibration	Balance grinding wheel in usual ways Check hydraulic pump & hose, Check spindle motor's coupling, Check levelling screw on machine base,
	Unsteady running of grinding wheel	Dress wheel on periphery on both sides,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



(2). Operational Defects

Defects	Causes	Remedy
* Spindle noisy & run unevenly	Coupling loose	Check the set screw on spindle coupling,
	Tighten screws on spindle holder	Loose and reset the copper bush 251424 & 251423, please refer to operation manual,
	Spindle bearings	Please don't disassemble it without our advise,
* Table shock at both sides of traverse	Direction control valve	Check the pressure of hydraulic system, should be within 12-20kgs/cm <sup>2</sup> , Adjust the flow control screw at bottom of direction control valve,
* Table moves only in one direction	Direction control arm	Release the screw and remove the direction control arm into suitable position,
* Crossfeed travel un-reversible ( for AH, AHD models)	Direction changing limit switch	Check L11, L13 when backward, check L21, L23 when forward,
	D.T.U. or delay timer ( AHD model )	Check L12 & S21, L22 & S11 should be connected ( use AC24V ), if not change a D.T.U.,
	Contactor ( cross feed control )	Check 9-0V, 10-0V should have AC24V between cords,
	Action angle of cam to limit switch ( at bottom of direction )	Loose set screw and adjust to exact position,
* No increment in crossfeed ( for AH, AHD models)	Crossfeed inching limit switch	Measure 76-52 on S.S.C.U. should be connected when limit switch at ON position
	Variable resistance	Measure 77-78 on S.S.C.U. should have 50K resistance,
	S.S.C.U.	Measure 73-74 should get 220V ( when contactor M3 is ON ), if not change a new S.S.C.U.
For AHD model:		
* Downfeed one time then out of work	Solenoid valves wrong connecting	Interchange the A, B solenoid valve hydraulic hoses,
* Downfeed effects irregularly ( it feeds sometimes )	Voltage of power source is not enough for solenoid valve to function	Use 3-phase transformer to get enough voltage ( attached on the rear side of machine, please see page-42 Wiring of power source )
	The action angle of direction change cam onto limit switch is not suitable	Check 91-92 when plunge grinding, check L11-L13, L21-L23 when surface grinding,

\* Auto. downfeed out of order,  
Please check as following procedure:



\* Note: Above-mentioned cords number and limit-switch number, please refer to Circuit Diagram.