OPERATION MANUAL

HYDRAULIC & AUTO DOWN FEED
PRECISION SURFACE GRINDER

MODEL : SGS-1020 AHD
SGS-N1224 AHD
SGS-1224 AHD
SGS-1230 AHD
SGS-1632 AHD
SGS-1640 AHD

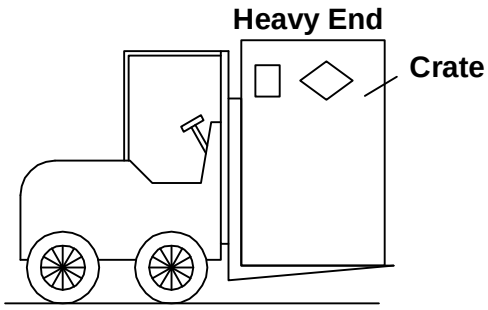
P72424

CONTENTS

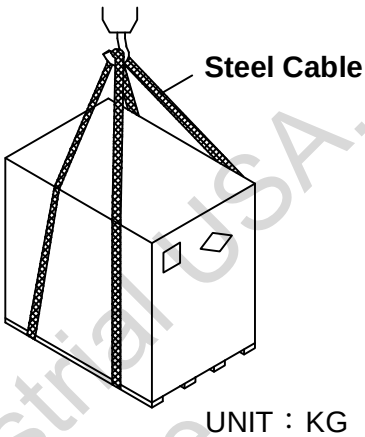
This machine has been fully rested, adjusted and inspected for correct alignment and operation prior to shipment, in transit or installation, please ensure that the machine is not bumped or damaged when being rolled or set down to avoid any failure.

A. TRANSIT

by Fork-Lift



by Hoist or Chain Block



Machine weight chart

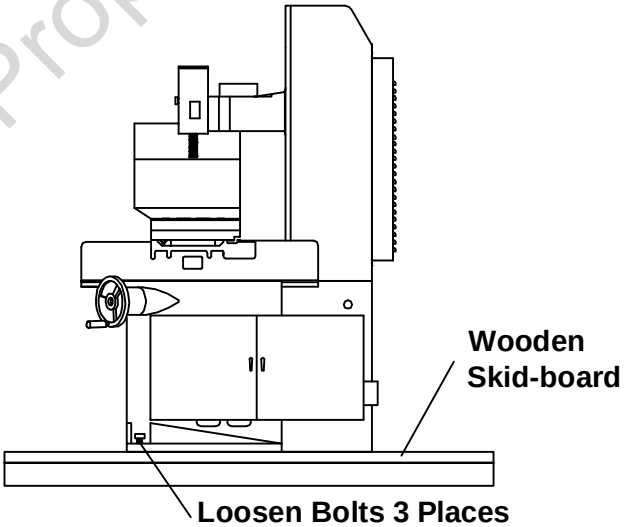
UNIT：KG

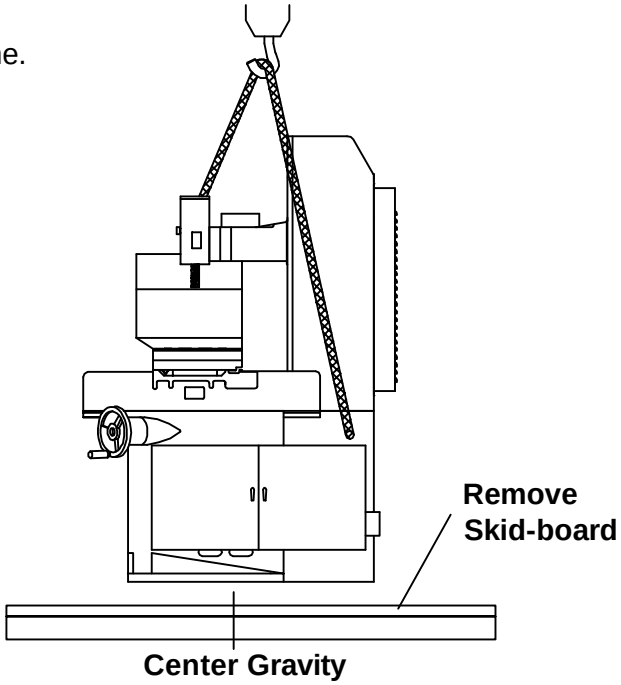
M/C WGT	1020	1020H	1020AH	1020AHD	N1224AH	N1224AHD	1224AH	1224AHD	1230AH	1230AHD
NET	1200	1200	1250	1300	1300	1350	1850	1900	1900	1950
Gross	1450	1450	1450	1550	1550	1600	2150	2200	2250	2300

M/C WGT	1632AH	1632AHD
NET	2750	2800
Gross	3250	3300

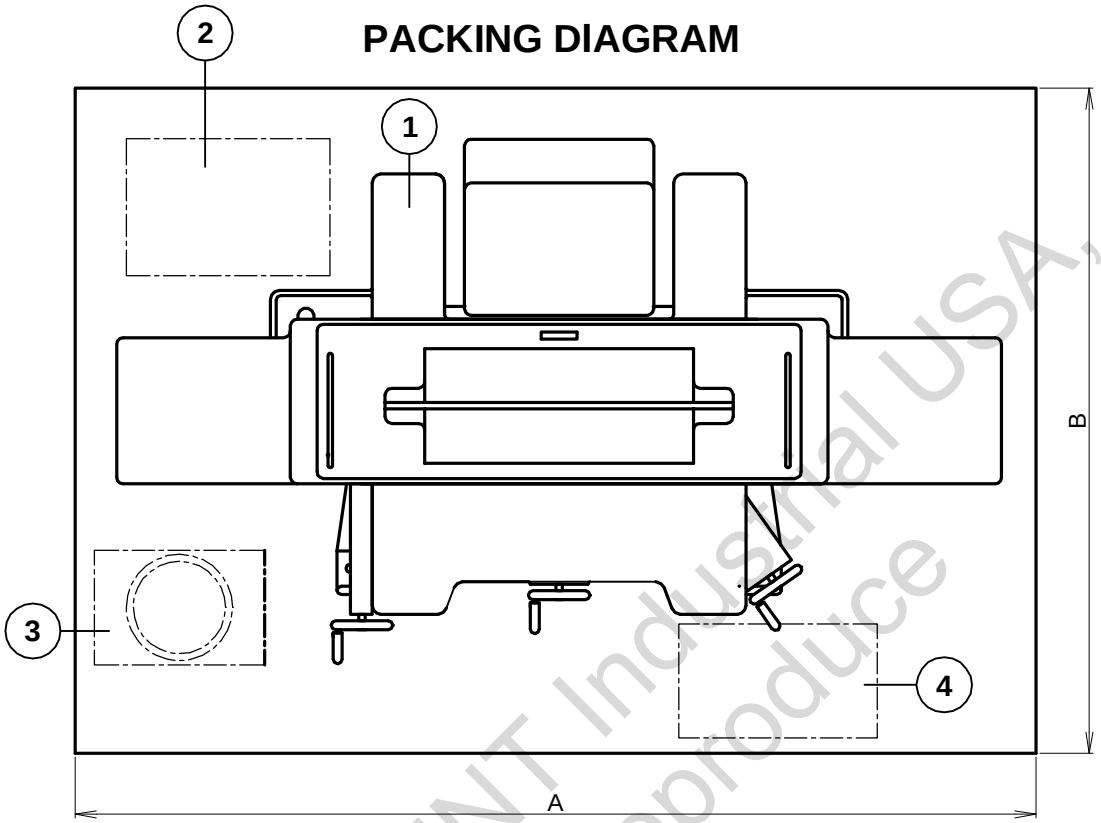
B. UNPACKING

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





PACKING DIAGRAM



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

UNIT : mm

Model	A	B	Height
1020H, AH	1500(59")	1840(72 1/2")	2000 (79")
1020AHD	1700(67")	2070(81 1/2")	2100 (83")
N1224AH 1224AH	1560(61 1/2")	2120(83 1/2")	2000 (79")
N1224AHD 1224AHD	1690(66 1/2")	2120(83 1/2")	2260(89")
1230AH	1690(66 1/2")	2120(89 1/2")	2260(89")
1230AHD	1690(66 1/2")	2270(89 1/2")	2260(89")
1632AH	1690(66 1/2")	2270(89 1/2")	2260(89")
1632AHD	2700(106 1/2")	2220(87 1/2")	2285(90")

C. CHOICE OF SITE

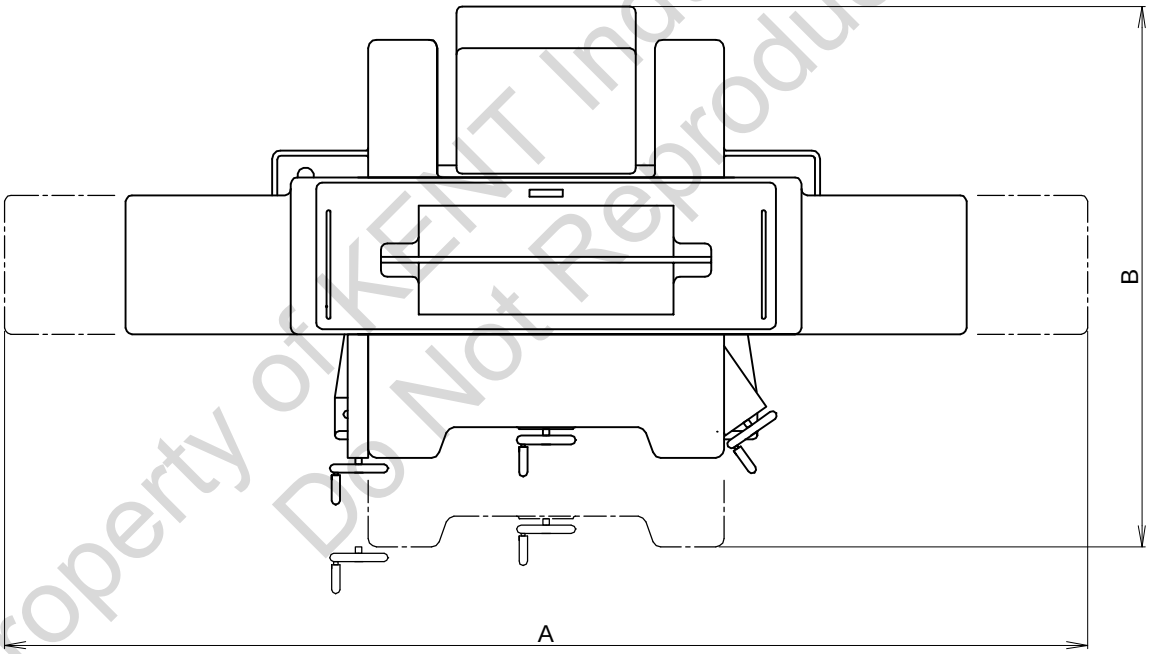
The output of the machine and the degree of accuracy of the components produced depend to a very special degree on the correct choice of site for the erection of the machine.

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 castings.

Floor Plan：



UNIT：mm

M/C Type / Statement	1020 M, H ,AH ,AHD	N1224 H ,AH ,AHD	1224 AH ,AHD	12304 AH ,AHD	1632 AH ,AHD
A	2040	2475	2510	2930	3350
B	1796	1845	2085	2085	2475

D. INSTALLATION

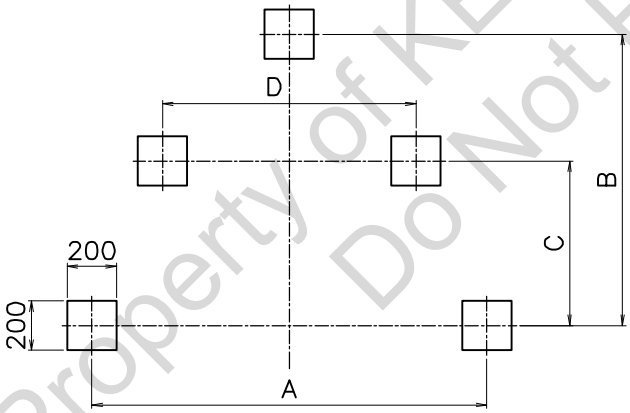
1. Power Consumption

M/C Type / Statement	1020	1020H N1224H	1020AH N1224AH	1020AHD N1224AHD	1224AH 1230AH
Machine	1.5KW	2.4KW	2.4KW	3.3KW	5.4KW
Coolant	0.093KW	0.093KW	0.093KW	0.093KW	0.093KW
Dust-Suction	0.373KW	0.373KW	0.373KW	0.373KW	0.373KW
Ele.Mag Chuck	0.15KW	0.15KW	0.15KW	0.15KW	0.15KW
Total	2.2KW	3.1KW	3.1KW	4KW	6.1KW

M/C Type / Statement	1224AHD 1230AHD	1632AH	1632AHD
Machine	5.4KW	7.125KW	7.125KW
Coolant	0.093KW	0.093KW	0.093KW
Dust-Suction	0.373KW	0.373KW	0.373KW
Ele.Mag Chuck	0.15KW	0.15KW	0.15KW
Total	6.1KW	7.8KW	7.8KW

2. Foundation

a. Dimension

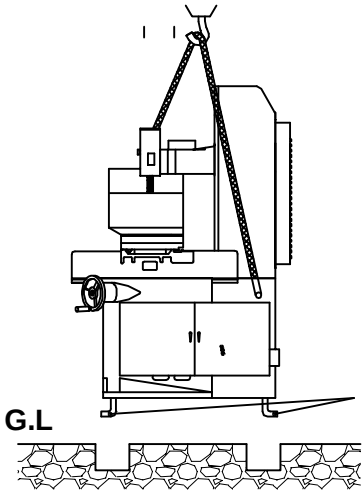


b. Use the Anchor bolts

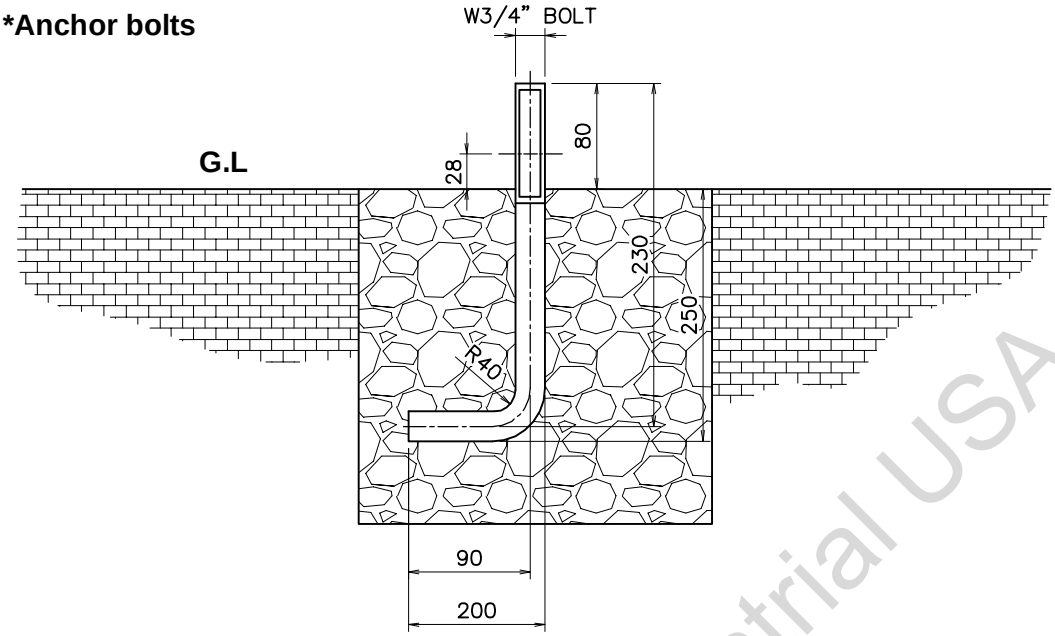
* Lock the anchor bolts on the machine by nuts, and left out the thread portion at least 30mm for adjustment.

* Lay down the machine slowly to aim anchor bolts at foundation holes.
* Levelling the machine by taper block.
* Fill up foundation holes with mixed concrete

Dimension / M/C Type	A	B	C	D
1020 H,AH,AHD	840	785		
N1224 AH,AHD	850	953		
1224AH,AHD 1230AH,AHD	950	945	565	650
1632AH,AHD	1000	1215	680	1000

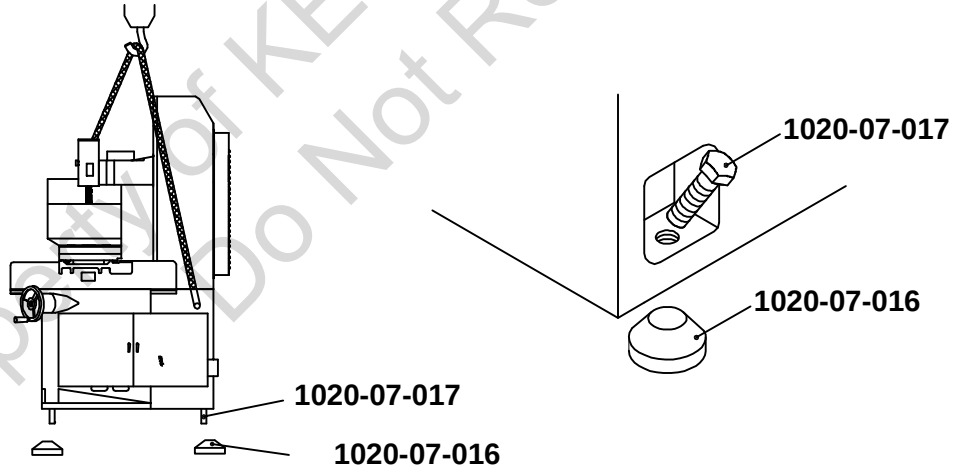


***Anchor bolts**

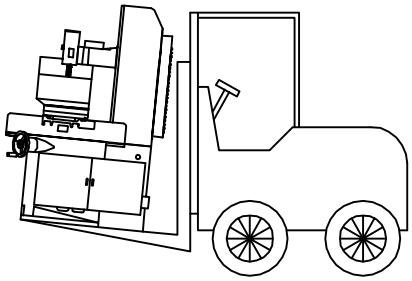


C. Use the leveling pads and screws

* Screw the leveling screws (1020-07-017) on the machine base as figure shown. For easy leveling and more steady of the machine, make leveling screw as deep as possible.
* Lay down the machine slowly to let screws fall into the center hole of leveling pads (1020-07-016)
* Lay (1020-07-016)
* Leveling the machine.

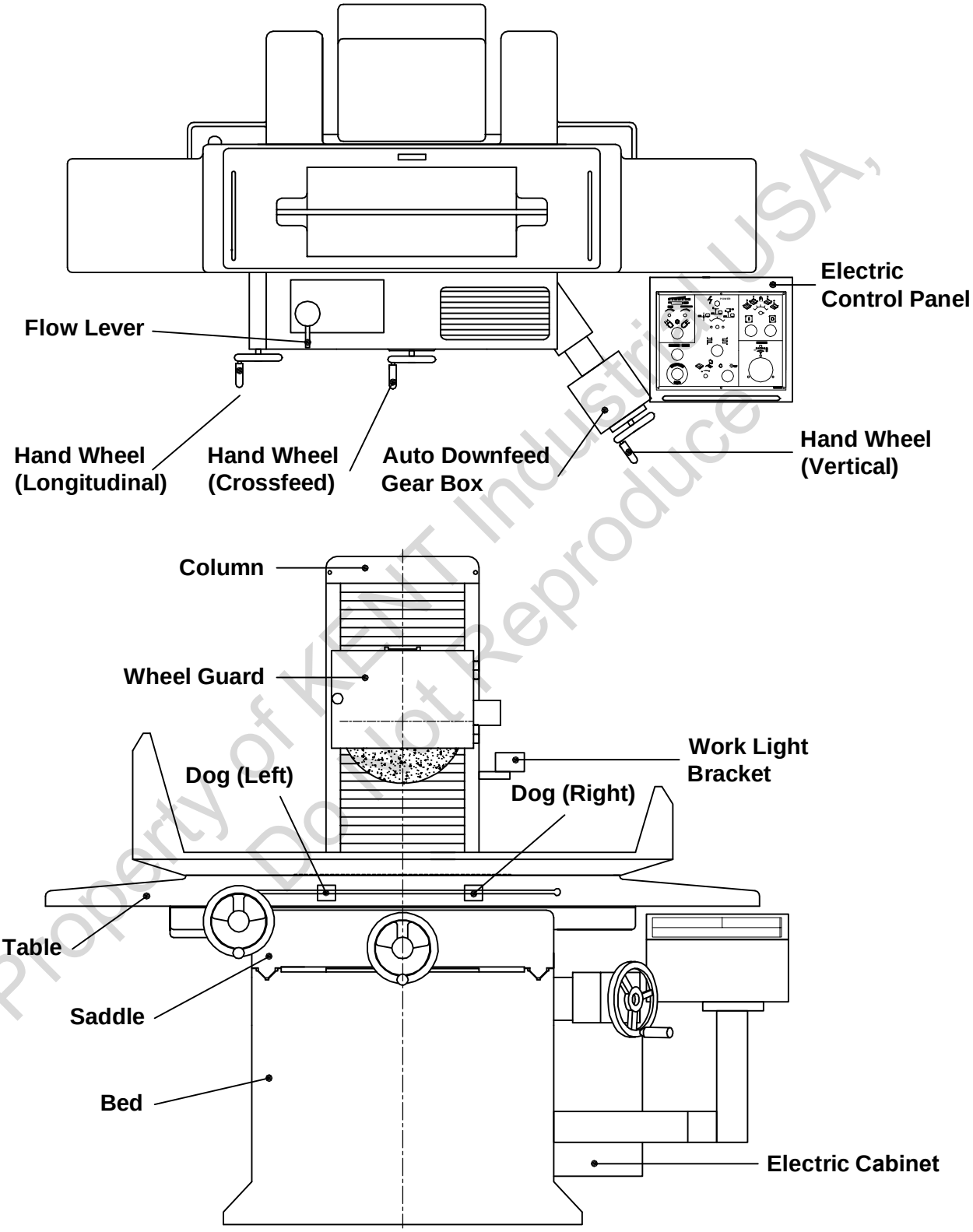


Caution：If you use fork-lift instead of hoist, please lift as figure shown under

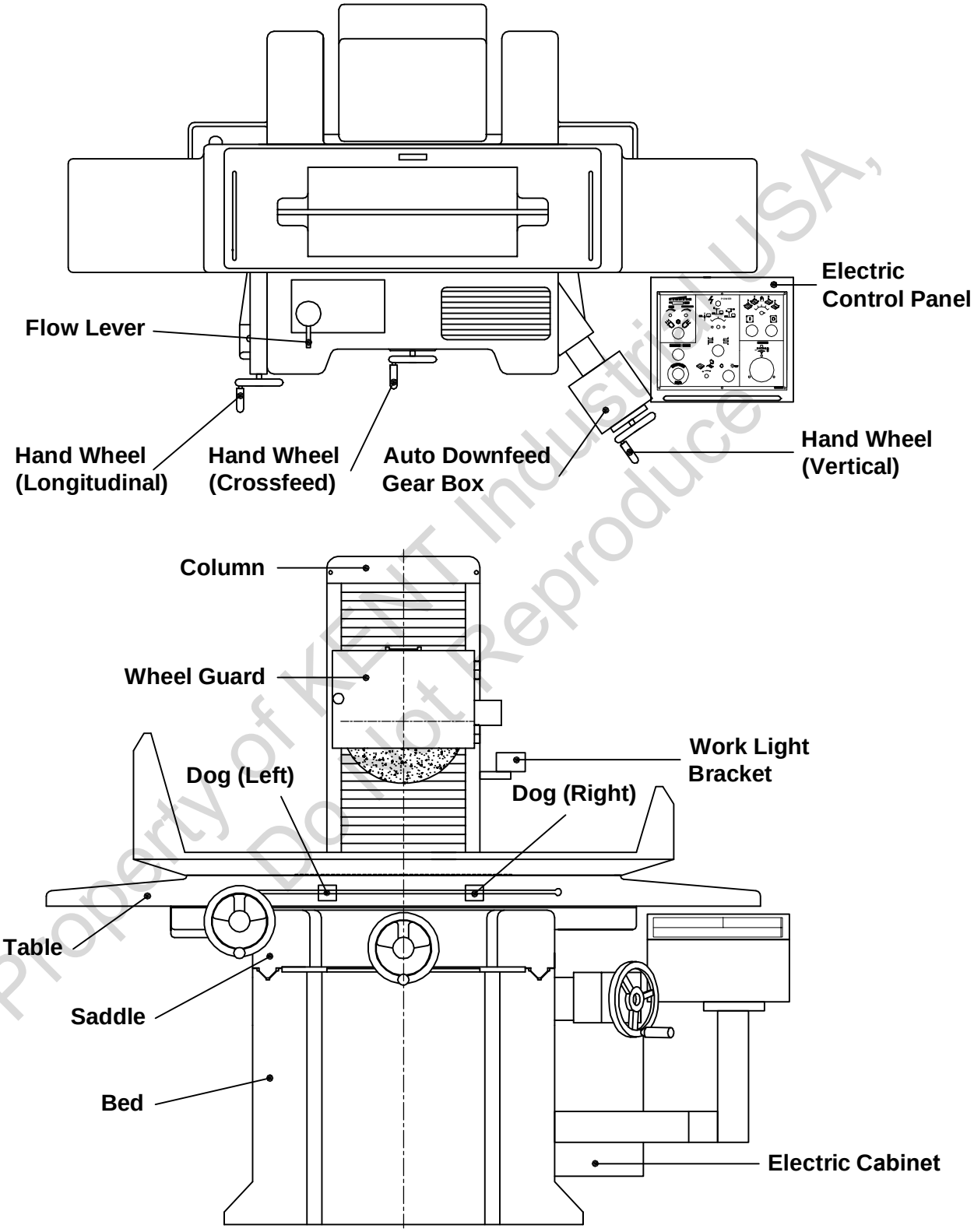


3.Contour And Nomenclature

a. 1020AHD, N1224AHD



b. 1224AHD, 1230AHD, 1632AHD



4. Cleaning & Location the Machine

Clean machine

After opening the wooden case, you have to prevent working surface from rusting. You will find the machine is coated with thin rust proof oil. Please wipe off the rust proof oil by soft cloth and light oil. Iron plate or knife will damage the paint.

Fastening equipment for movement or packing

When move (or pack) the machine. working table is fixed from front-left and rear right sides, and crossfeed of saddle is fixed from the right and left sides of saddle and base body. This is only used while transferring of the machine. As soon as the machine is well installed, you have to loosen the fixed brackets.

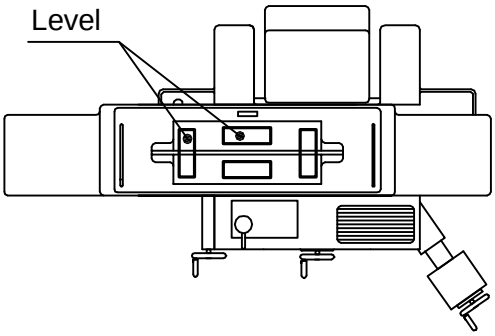
Location of the machine

Location of the machine will influence the grinding precision and efficiency. You have to carefully position it as well as a boring machine. Very precise process is asked by any kind of grinding machine.
But in the fact, many grinding machines always be located among with milling machine, drilling machine, shaping machine and slotting machine. Obviously, we won't be satisfied with the process from these grinding machines, because the vibration from other machines will transmit to grinding machine and produce lines on grind surface.

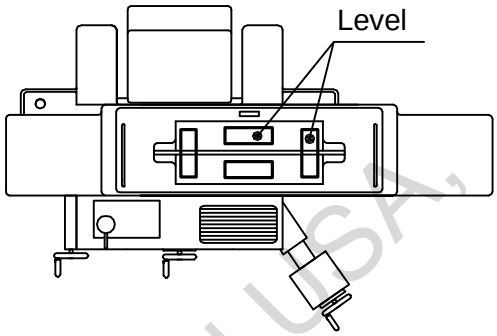
* Unsteady land cannot be used to locate grinding machine, otherwise, the machine will lose its required shape.

5. Leveling the Machine

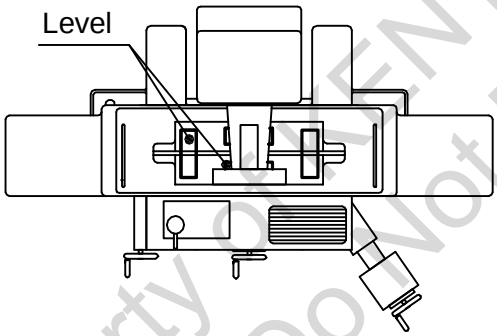
As following procedure：



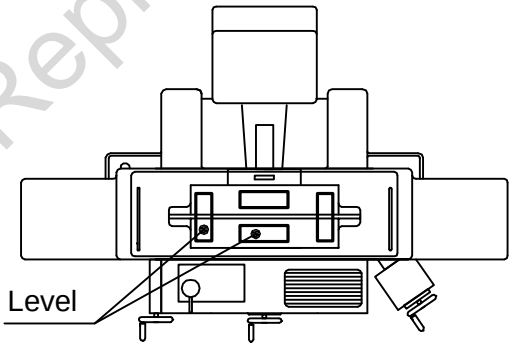
a). Use longitudinal handwheel to move table to left end position.
Leveling the machine by a spirit level in longitudinal and latitudinal direction.



b). Use longitudinal handwheel to move table to right end position.
Leveling the machine in longitudinal and latitudinal direction.

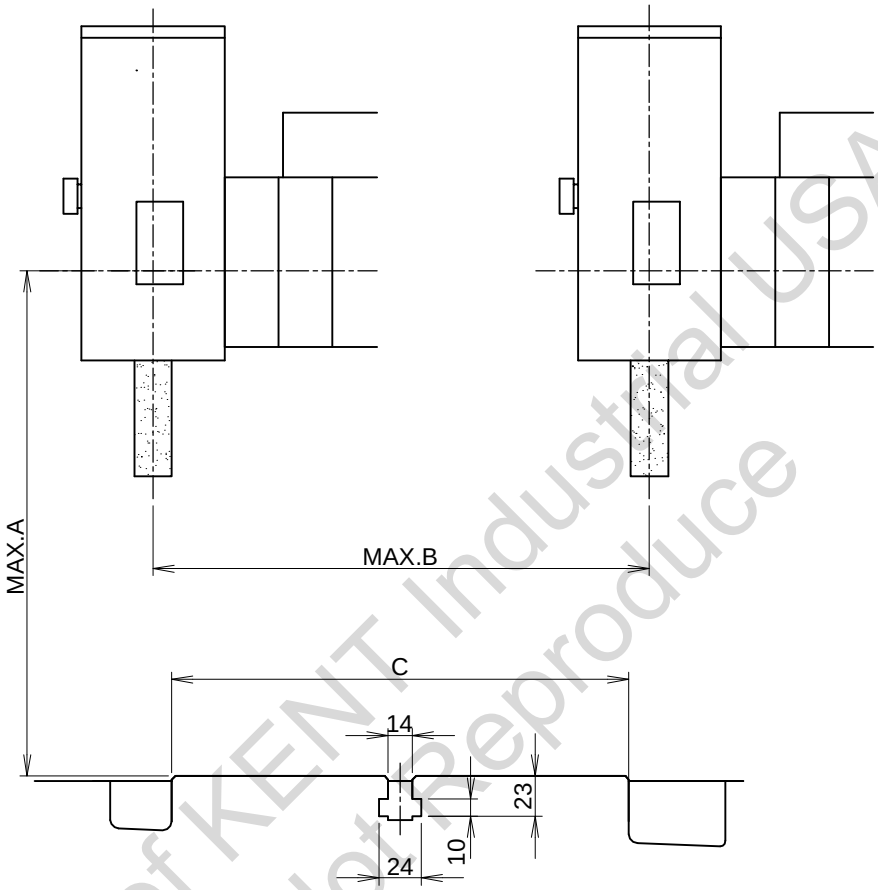


C). Use crossfeed handwheel to move table to front end position.
Leveling the machine by a spirit level in longitudinal and latitudinal direction.



D). Use crossfeed handwheel to move table to rear end position.
Leveling the machine in longitudinal and latitudinal direction.

6. Table Size and Grinding Capacity



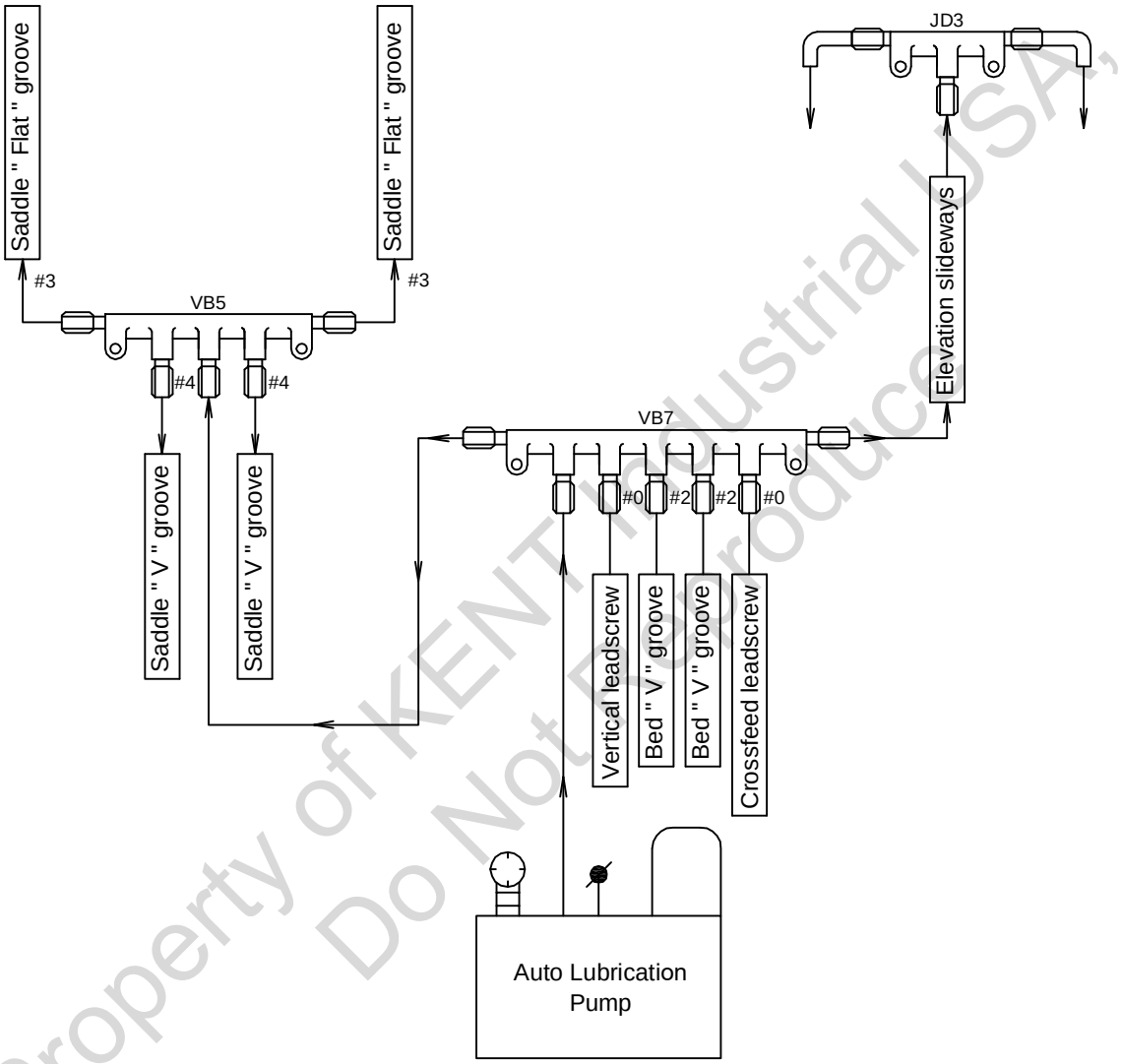
UNIT : mm

Model	A	B	C
1020 M, H,AH,AHD	520	250	230
N1224AH, AHD 1224AH, AHD	520	300	260
1230AH, AHD	635		
1632AH, AHD	635	405	400

7. Lubricant Instruction

For 1020H, 1020AH, 1020AHD, N1224H, N1224AH, N1224AHD, 1224AH, 1224AHD
1230AH, 1230AHD, 1632AH, 1632AHD, 1640AH, 1640AHD

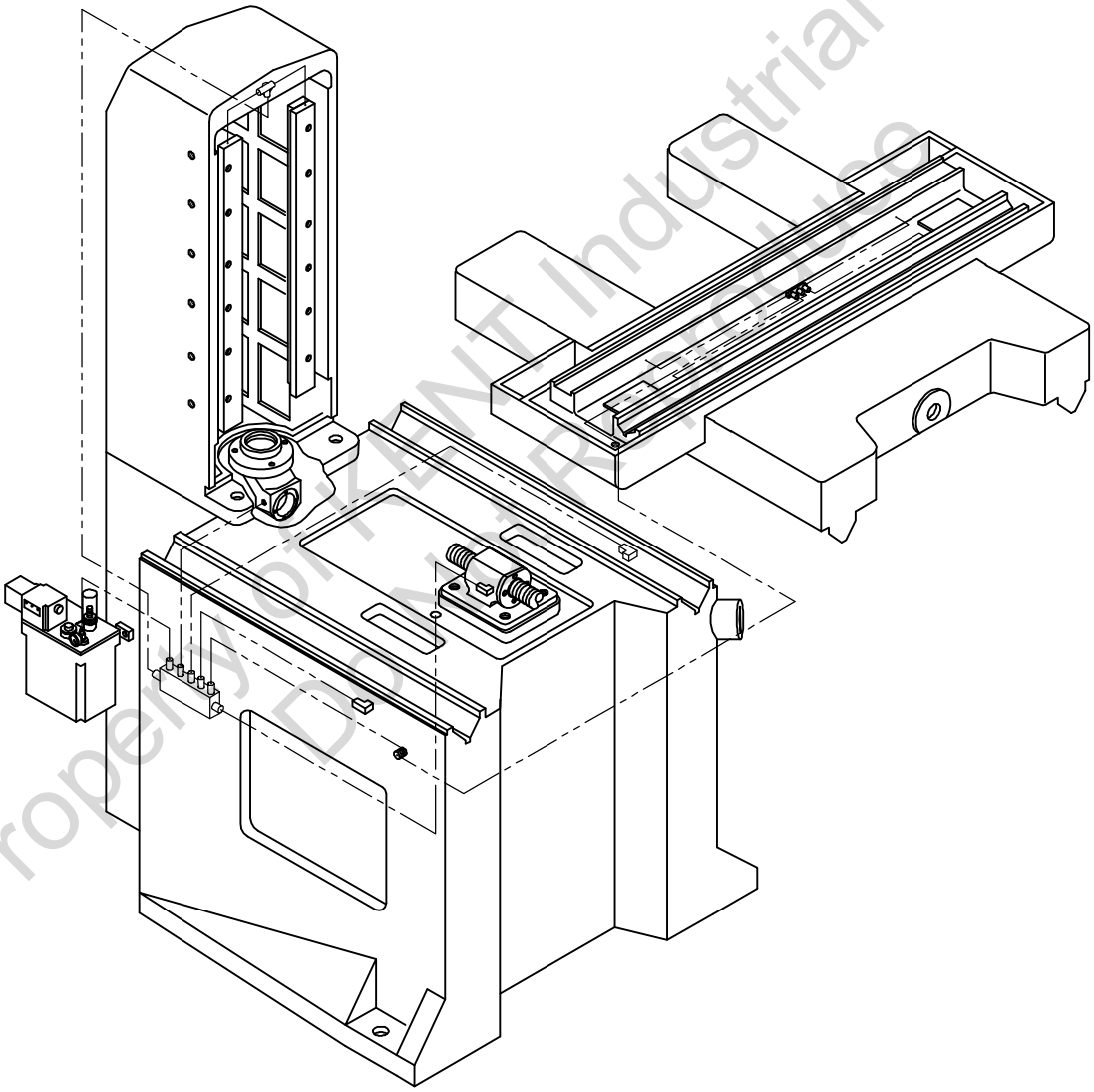
Lubrication Flow Chart



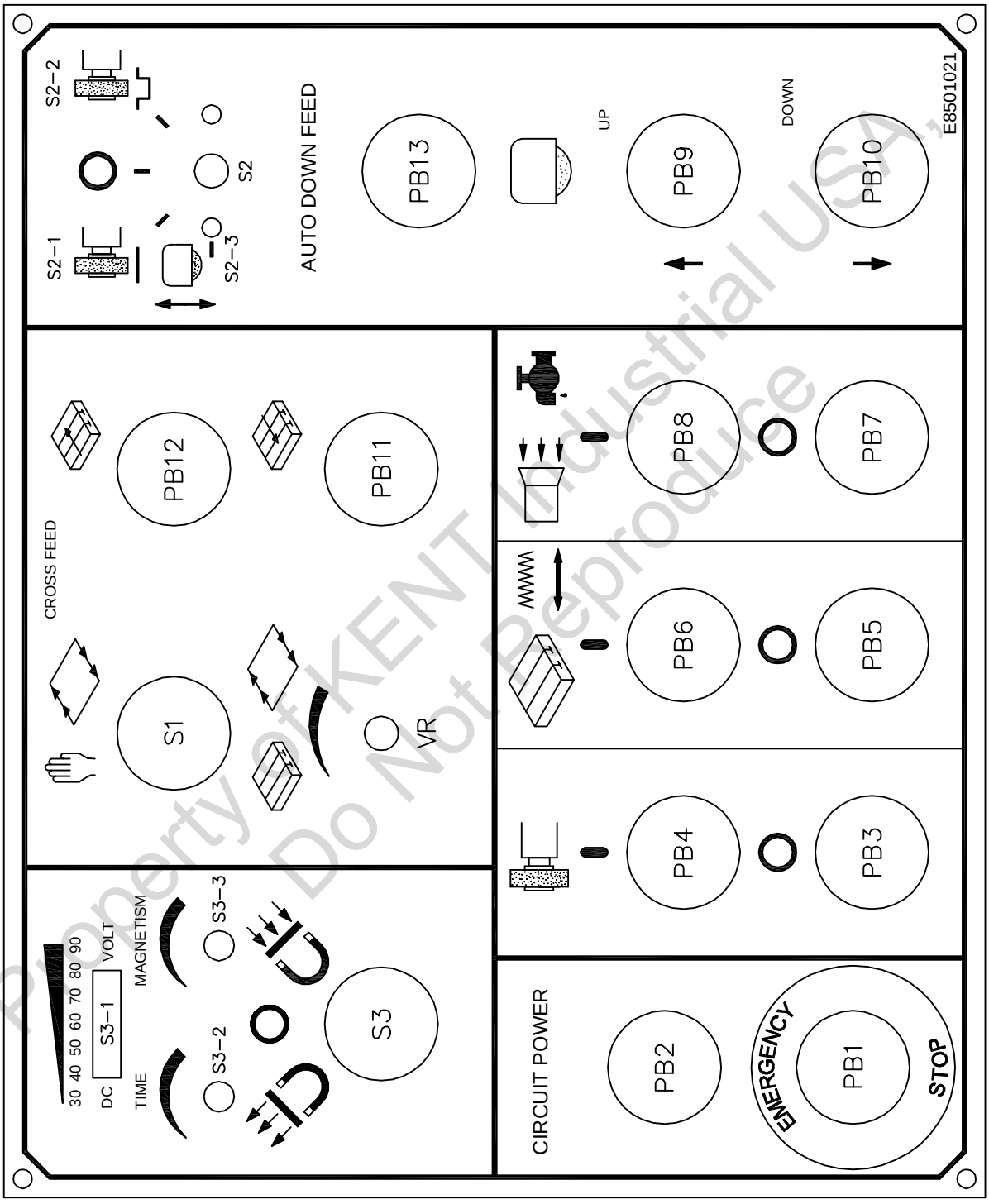
Reliability of the machine and continuous running of the machine is only ensured by the correct choice of lubrication oil for the individual lubricating points.

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

LUBRICATION SYSTEM DIAGRAM



1020~1640 AHD CONTROL PANEL



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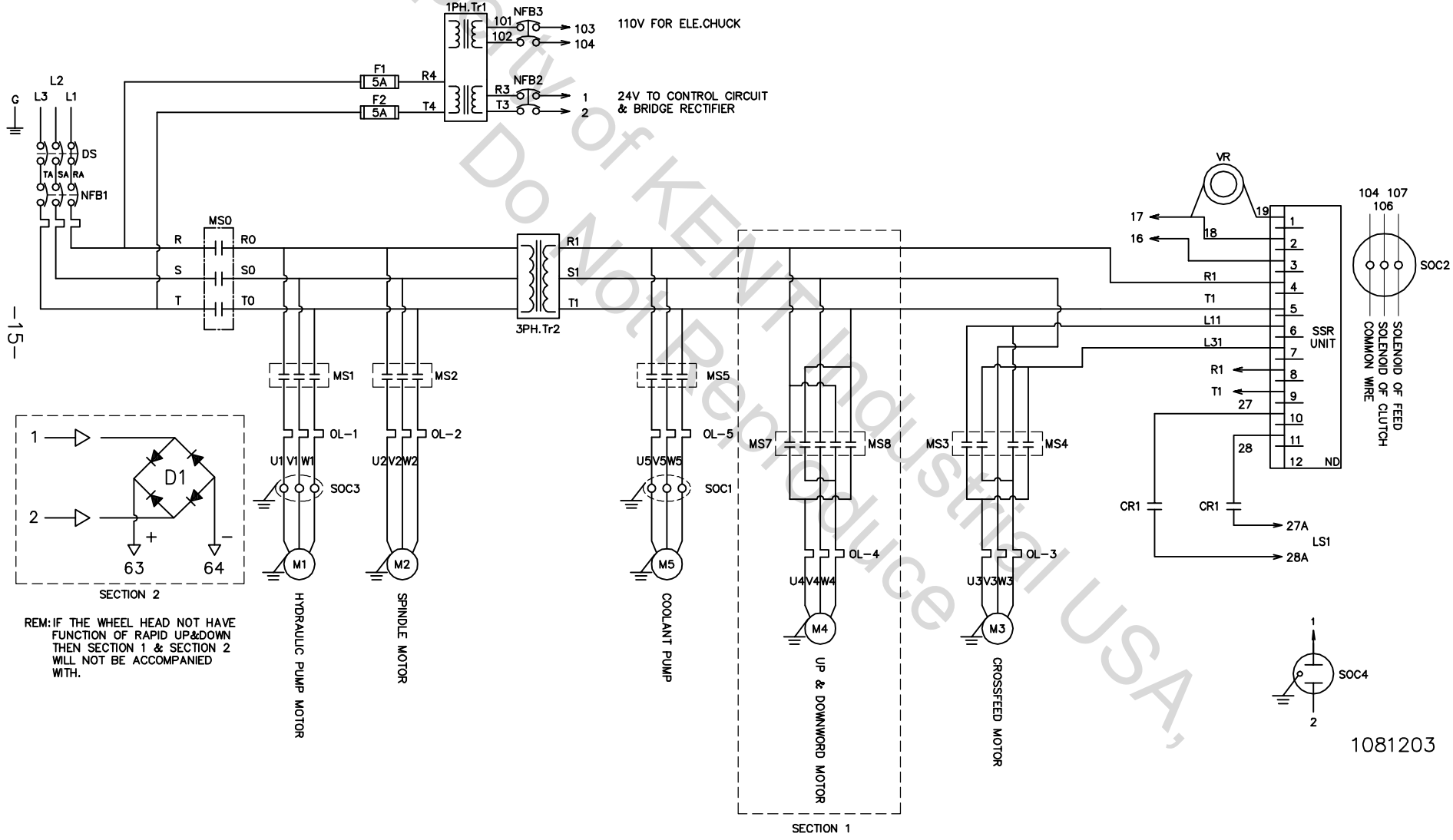
PB2	Open switch when button is pressed, inner bulb light and power stands by.
PB1	Emergency “OFF” switch when button is pressed, whole machine stops. This is design for Emergency conditions.
PB4	Spindle start button when pressed, spindle is at “ON” position
PB3	Spindle stop button when pressed, spindle is at “OFF” position
PB6	Oil tank start button when pressed, oil tank motor is at “ON” position.
PB5	Oil tank stop button when pressed, oil tank is at “OFF” position.
PB8	Cool duster start button when pressed, cool duster motor is at “ON” position.
PB7	Cool duster stop button when pressed, cool duster motor is at “OFF” position.
PB9	Spindle rapid up feed push button.
PB10	Spindle rapid down feed button.
S1	Cross feed selecting switch turn right for “automatic” turn left for “hand feed” S1 has to be coordinated with PB12, PB11 and S2 to obtain right function, when S2 is turned to S2-1, thenS1, PB12 and PB11 function, when S2 is turned to S2-2, the switches S1, PB12 and PB11 do not function.
VR	Cross feed capacity adjusting button it functions only when S1, PB12, PB11 and S2-1 are selected for automatic feeding, the right turn angle is bigger making the auto feeding capacity larger, if otherwise, feeding capacity is smaller.
PB12	Table backward push button when S1 is at hand feed position, press PB11 marking table continuously moves rapidly backward, loosen hand to stop table.
PB11	Table backward push button when S1 is at hand feed position, press PB11 making table Continuously move rapidly backward, loosen hand to stop table. When S1 is at automatic position, press PB11 to get automatic backward feed.
S2	Selecting switch when switch is at middle position, press PB11 and PB12 and table does cross feed, when switch is at S2-1, it does flat grinding, when at S2-2 it does cutting, when switch is at S2-3, it goes up and down working. PB13 auto down feed push button when S2 is located at S2-1, press PB13 and wait till bulb Lights and the feeding starts, when bulb does not light, it means down feed limit switch is at “0”, readjust the feeding capacity for automatic fee.
S3	Selecting switch for electro magnetic chuck right turn for magnetizer, life turn for demagnetizer Middle is neutral S3-2 is for adjusting time of demagnetizer S3-3 for adjusting magnetic Capacity, S3-1 shows magnetic capacity.

1020~1640 AHD SERIES MAIN CIRCUIT DIAGRAM



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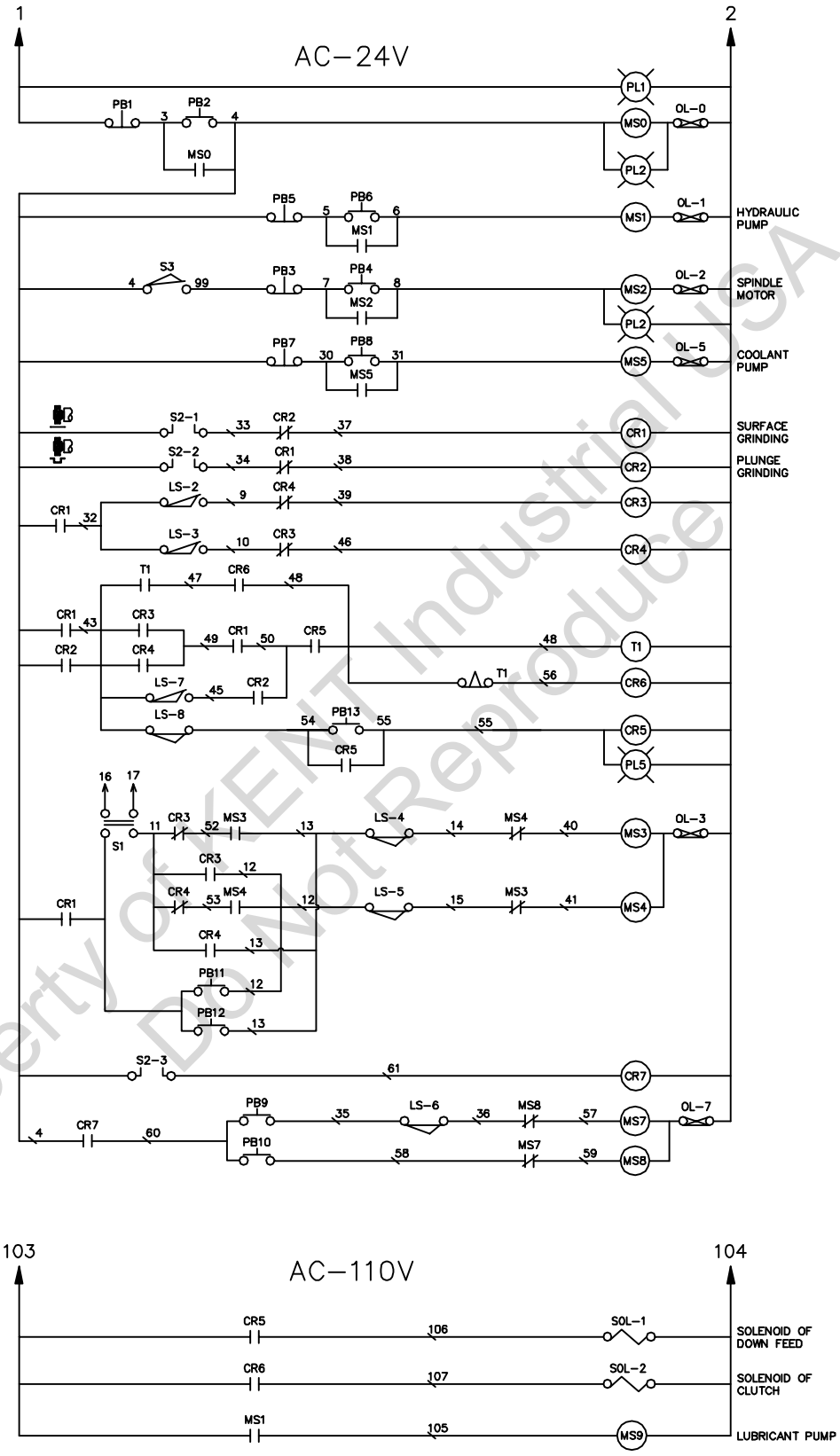
1020 ~ 1640 AHD SERIES CONTROL CIRCUIT DIAGRAM



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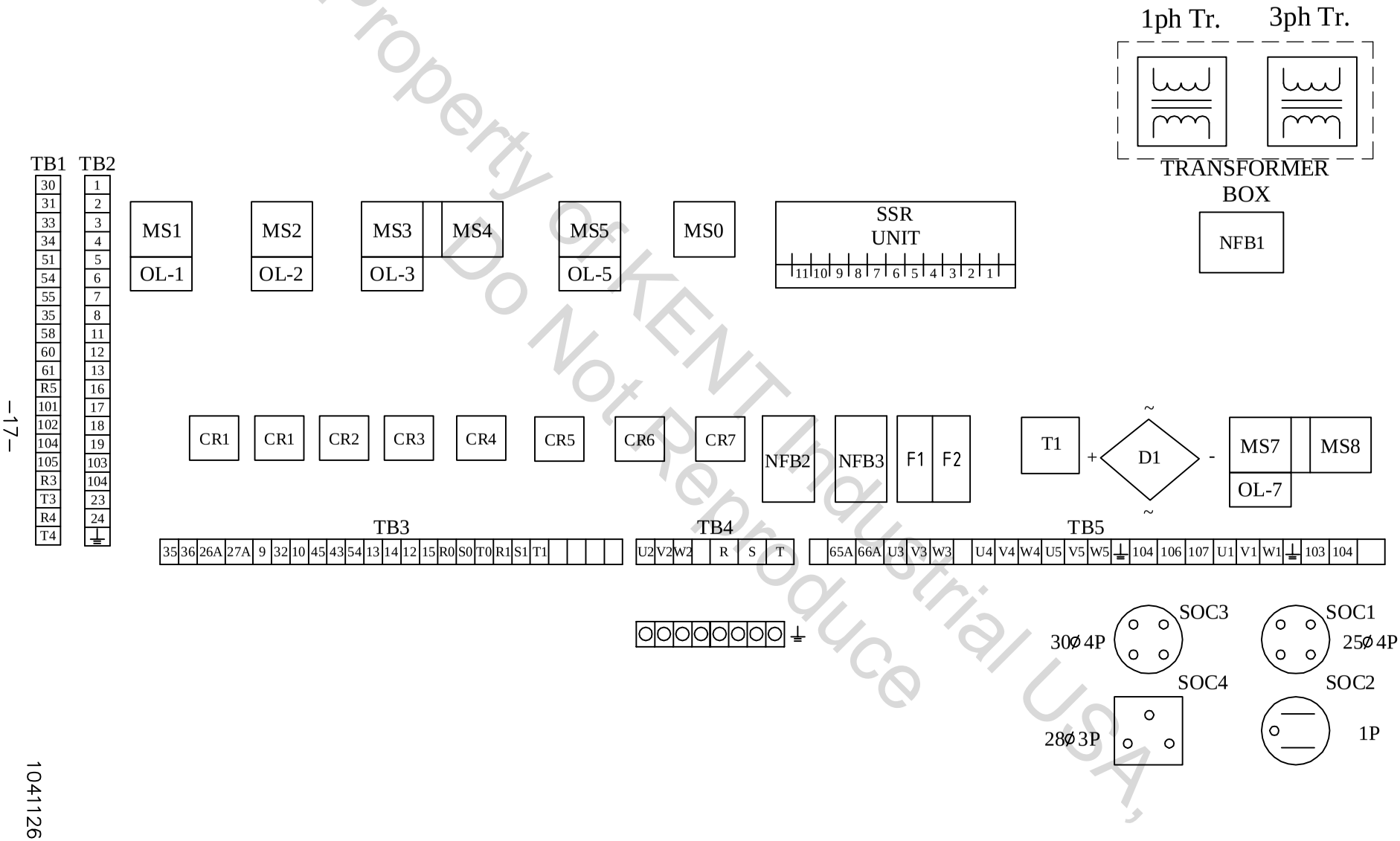
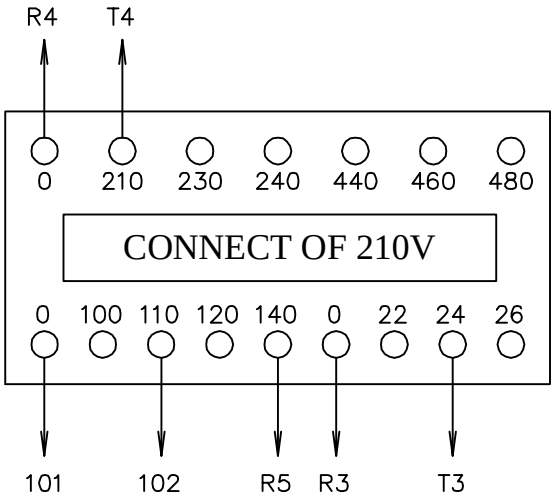
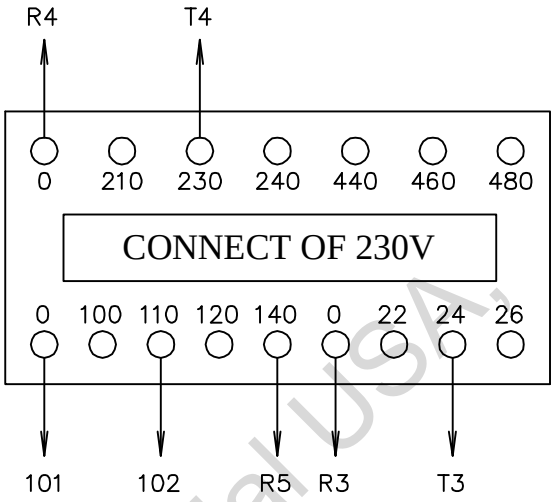
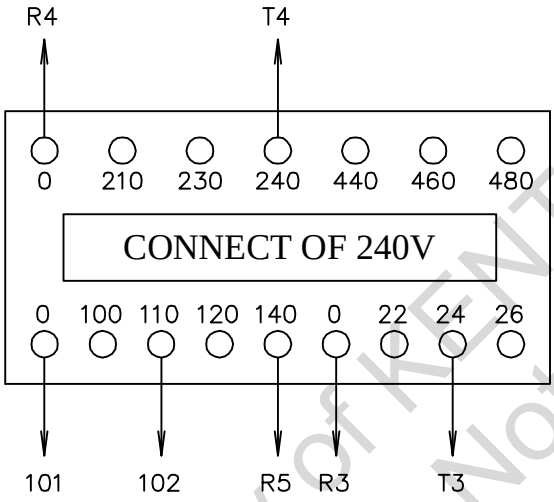
1020 ~ 1640 AHD LAYOUT OF MAIN ELECTRICAL CABINET

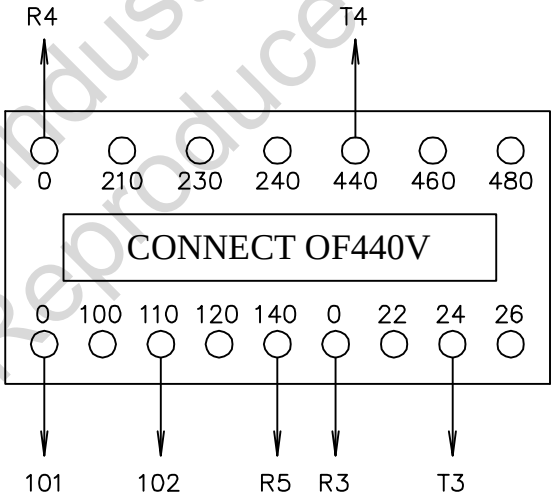


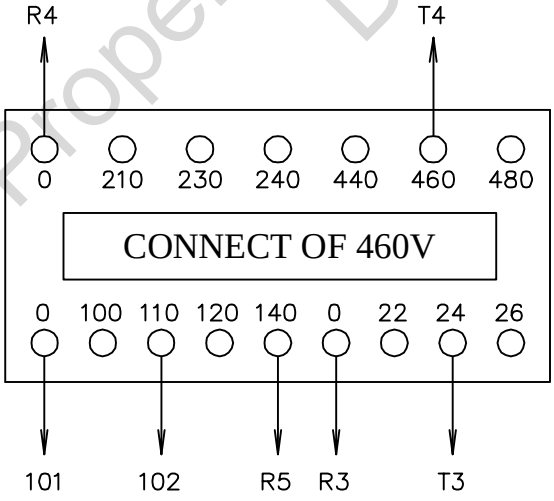
CONNECTION OF SINGLE PHASE TRANSFORMER

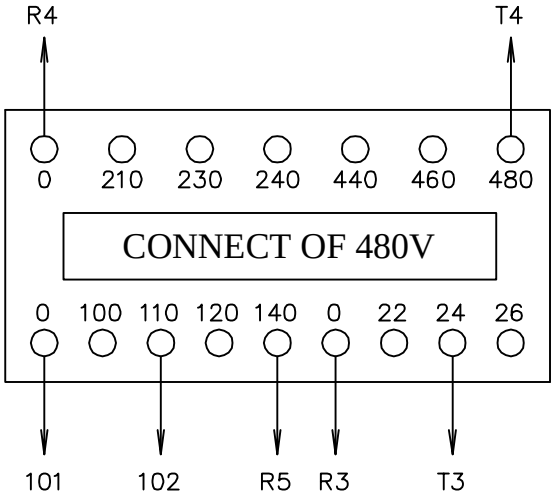












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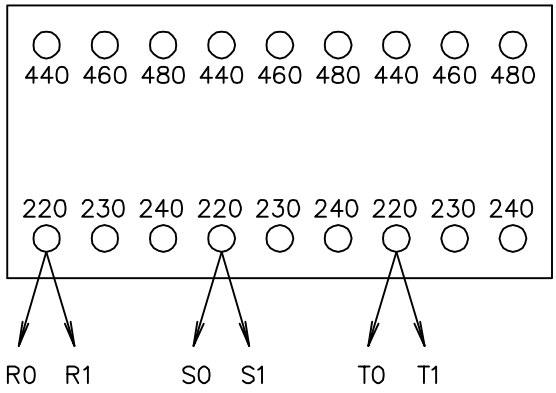
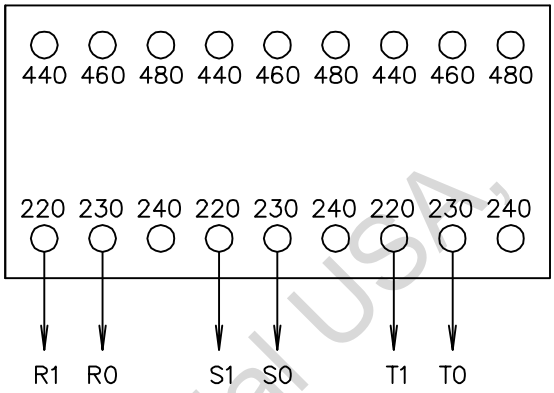
CONNECTION OF THREE PHASE TRANSFORMER

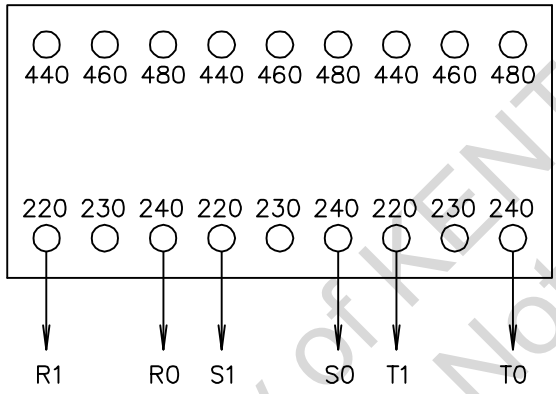
CONNECT OF AC220V



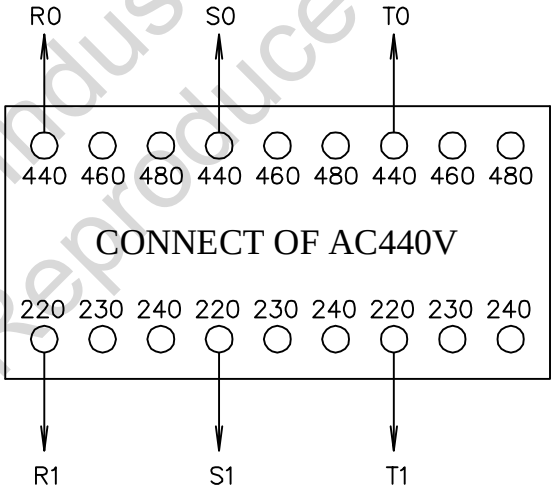
CONNECT OF AC230V



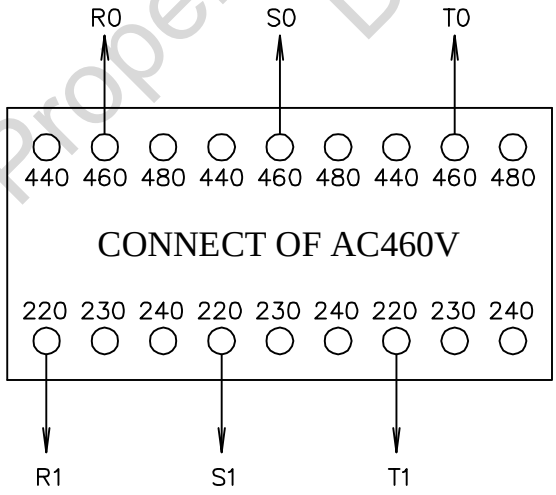
CONNECT OF AC240V



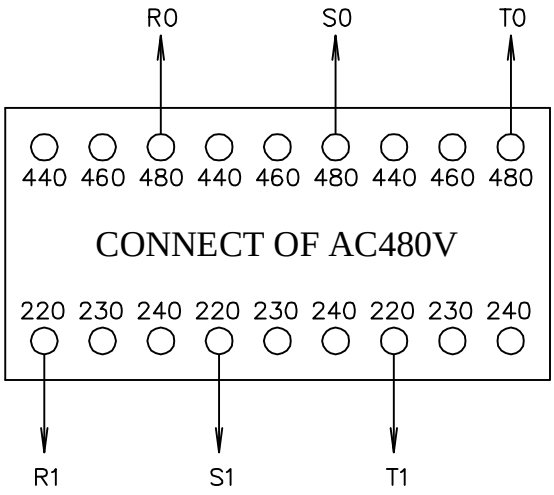
CONNECT OF AC440V



CONNECT OF AC460V



CONNECT OF AC480V



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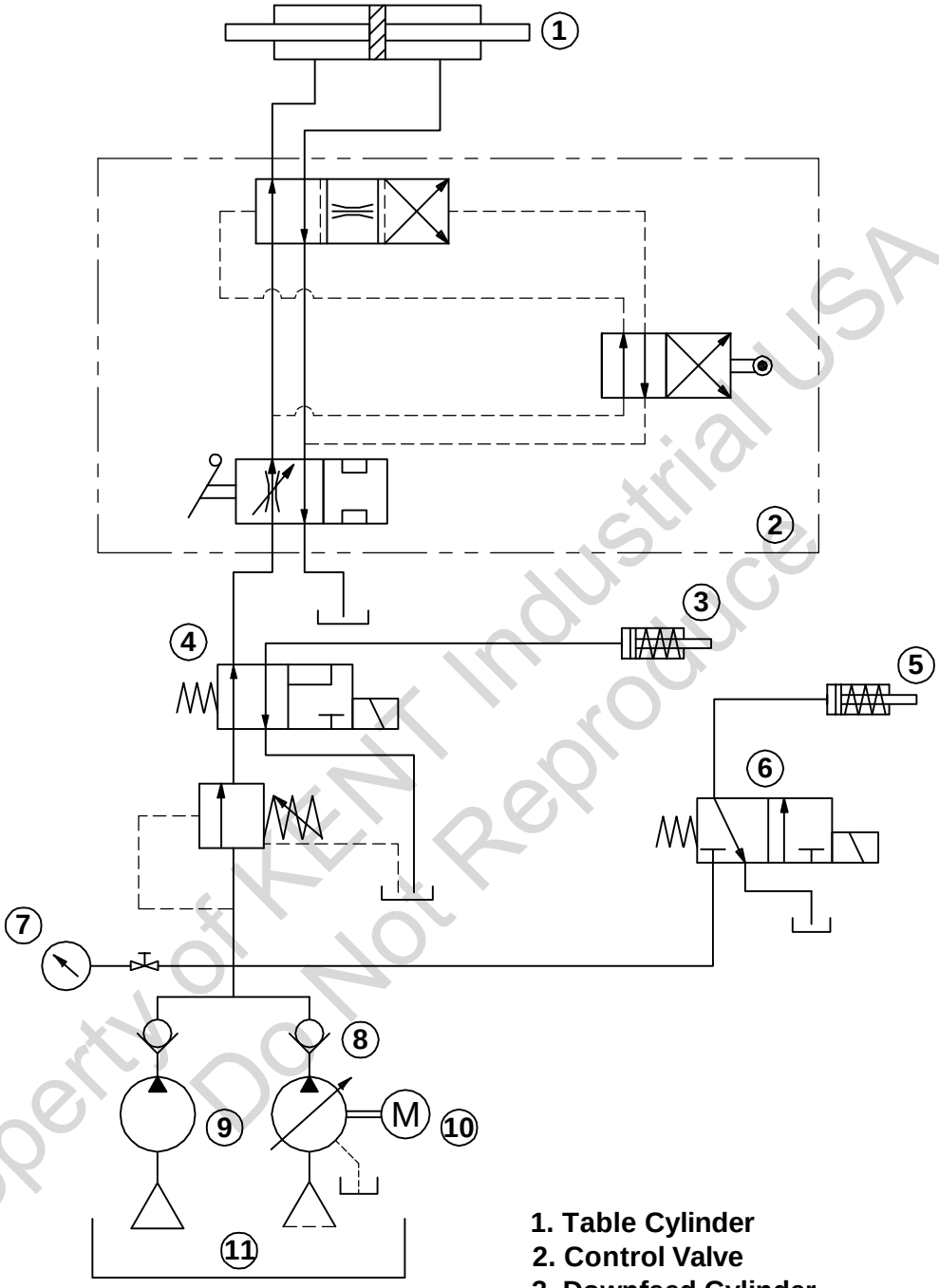
PB1	Push button to turn the power source “OFF”	SHAN HO-SHA S801B
PB2	Push button (With lamp) to turn the power source and PL2 “ON”	YK-PHAI-3-24V
PB3	Push button spindle stop switch	YK-FAI-4
PB4	Push button spindle open switch	YK-PFAI-3-24V
PB5	Push button oil tank stop switch	YK-FAI-4
PB6	Push button oil tank open switch	YK-FAI-3
PB7	Push button cool duster stop switch	YK-FAI-4
PB8	Push button cool duster open switch	YK-FAI-3
PB9	Push button spindle rapid up feed switch	SHAN HO-SHAB-301-1A-Y
PB10	Push button spindle rapid down feed switch	SHAN HO-SHAB-301-1A-B
PB11	Push button table rapid backward switch	SHAN HO-SHAB-301-1A-G
PB12	Push button table rapid forward switch	SHAN HO-SHAB-301-1A-G
PB13	Push button automatic feed switch	YK-PFAI-5-24V
S1	Select switch, switch of auto/manual cross feed	SHAN HO-SHAS-301-1A
S2	Select switch, switch of flat/slot grinding	YK-E30D-2
VR	Variable resistance control cross feed capacity	RV24YN20S-B503
S3_	Select switch for electro magnetic chuck	A30SN31
S3-1	Indicator shown on the magnetic capacity	S5805
S3-2	Turn switch time of demagnetizer	B-100K
S3-3	Turn switch magnetic capacity	B-500K
MS0	Magnetic switch control power source	TECO-CU18-B
MS1	Magnetic switch for hydraulic pump	TECO-HUO11G-B-10A
MS2	Magnetic switch for spindle motor	TECO-HUO11G-B-7.5A
MS3 MS4	Magnetic switch for saddle forward and backward	TECO-HUOL11G-B-2.5A

MS5	Magnetic switch for cool duster motor	TECO-HUO11G-B-2.5A
CR1…CR6	Relay Auxiliary relay of electric control system	OMRON-MY4NJ-AC2.4V
NFB1	No fuse breaker no fuse breaker of power source	TECO-TO50EC-3P30A
NFB1, 2	No fuse breaker no fuse breaker of electric control system	TEMPEARL-BIE-10A
F1, F2	Fuse for protect electric circuit	DF-PMF-10x38-690V-10A
T1	Timer auto down feed cycle controller	CEO-CSA-E-03S
SOC1	Socket for coolant or dust suction	PLT-254RF+GPM3
SOC2	Socket for work light	LK-3021F-15A-125V
SOC3	Socket for hydraulic motor	PLT-304RF+GPM3
SOC4	Socket for solenoid valve	PLT-283RF+GPM4
1 PH TR.	Transformer for electric control system	CH-1 § 750VA
3 PH TR.	Transformer for power source	CH-3 § 500VA
TB1, 2,3,5	Terminal board for wire connect	SHAN HO-TB-20A
OL1, 2, 3, 4, 5, 6	Over load relay motor over load protect replay	TECO-RHU-10G
S.S.R UNIT	Cross feed controller for controlling auto/manual connect	HD-319C
SM-5B05A	Demagnetizer for electro magnetic chuck	SM-5805A
M1	HYDRAULIC PUMP MOTOR	TATUNG-2HP6P
M2 (1020)	SPINDLE MOTOR	ACO-2HP2P
M2 (1224)	SPINDLE MOTOR	ACO-5HP4P
M2 (1632)	SPINDLE MOTOR	TATUNG-7.5HP4P
M3	CROSSFEED MOTOR	ACO-516 40W
M4	UP & DOWNWORD MOTOR	ACO-516FC 40W
M5	COOLANT PUMP	YC-1/8HP2P+ TATUNG 1/2HP2P

9. Hydraulic system

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

10. COMMENT FOR HYDRAULIC OIL CHOICE AND USAGE

Hydraulic oil **has to be maintainted in adequate viscosity**. More or less viscosity will decrease working efficiency and increase wear of the hydraulic system of machine.
So please use our suggested brand and number of hydraulic oil in order to get best results.
Hydraulic oil will become inferior after use a period of time.
So that it has to be changed regularly to prevent from greasy residue.
The sediments will cause hydraulic system inconvenient in working, and even will decrease using life of hydraulic equipment. The normal hydraulic oil is transparent and flavor generally.
Beside periodically change hydraulic oil, in case you find below status, please change oil immediately to protect the hydraulic system.
(a). Oil became dark brown color and produced odor caused by rapid inferior.
(a). Oil became cream white color because of water permeation.

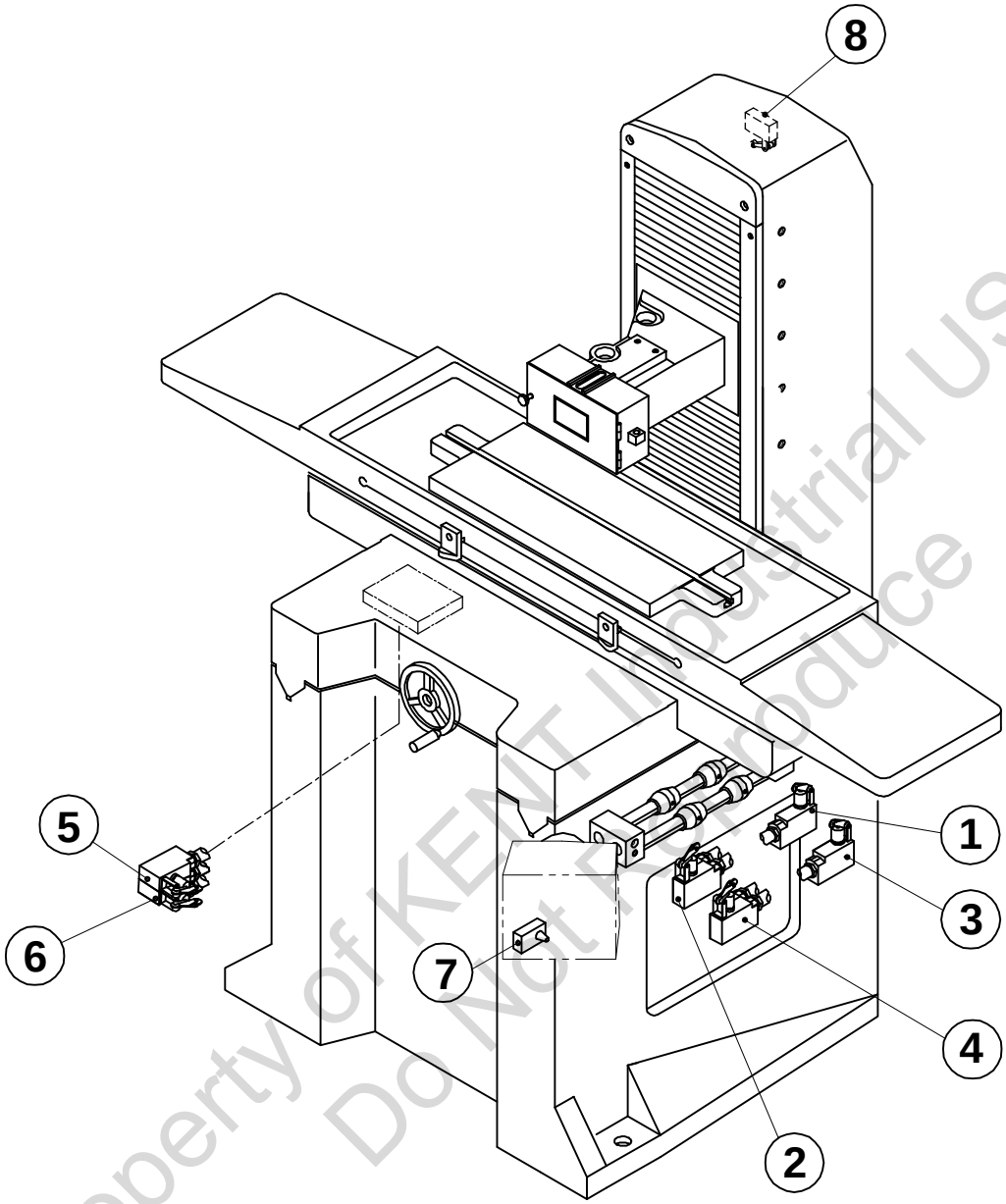
BRAND	KAO-KUANG	BP	ESSO	MOBIL	SHELL
Oil NO.	R - 32 R - 46	ENERGUL HL100 4.5° E/50°C 33cst/50°C	ESSTIC 50°C 4.7° E/50°C	D.T.E. Oil Medium	Teilus oil 29

※ First time to change of new hydraulic oil is after three months usage；then alter again once every year. (Please compensate the wear away oil anytime inorder to maintain a standard capacity of working oil.
※ Hydraulic pressure of main pump has to be kept within 18-22kg/cm². (remark1)
※ Hydraulic pressure of auxiliary pump has to be kept within 10-12kg/cm². (remark2)
※ The capacity of hydraulic tank is approximately 60L. (1632 series is 80L).

Remark1：**Ajust the hydraulic pressure**；**Please refer the Hydraulic tank unit assembly diagram.**
item no. 14-1(relief valve) is for the hydraulic pressure of main pump.
item no. 14-2(relief valve) is for the hydraulic pressure of auxiliary pump.

Remark2：**This setting is very important, because it is concerned about the steady**
of auto-downfeed. Too high or too low hydraulic presure will loss the accuracy of downfeed.

11. Limit Switches Position



Description :

1. Rear Max Limit **:** LS-5
2. Front Max Limit **:** LS-4
3. Rear Reversal Limit **:** LS-2
4. Front Reversal Limit **:** LS-3
5. Auto Downfeed Trigger Switch **:** LS-7
6. Auto Crossfeed Trigger Switch **:** LS-1
7. Auto Downfeed Stroke Control Switch **:** LS-8
8. Upper Limit Of Elevation Switch **:** LS-6

* For Above-Mention Item No., Please Refer To Circuit Diagram.

12. BALANCE OF WHEEL

Accurate grinding. brightness of work-piece, spindle and bearing life are greatly concerned with the balance of wheel, and also eliminate the wheel's internal stress.
First balance of the grinding wheel；fixed grinding whel on the spindle tightly, then dress it by diamond dresser till it is precise, But in order to obtain real precision of grinding wheel. you have to take off the grinding wheel and rebalance once more after first balance.
Because different material workpiece has to be grinded by different quality grinding wheel, we suggest you prepair a seldom used grinding wheels with their special flanges.
So that you can prevent trouble from taking off and rebalancing the grinding wheel.
After assemble the wheel and wheel flange (Fig2), put on the balance rod and place on the balancing stand (Fig2), then follow the points below：

1. Adjust the balancing stand level (Fig3).
2. Let the wheel swings to find out the center of gravity and then mark with a (V). (Fig4)
3. Lock the balancing blocks (B) on the opposite side of center of gravity and do not move any more. (Fig5).
4. Put two balancing blocks (P) at equal distance from (B) (Fig6).
5. To check balance, rotate the wheel at about 90° each time. If not balance, just move the balancing blocks (P) to a well balanced place.
6. After balancing, you must let the wheel running under normal speed for at least five . minutes.
7. Since long-time grinding will make the wheel loses it's balance. You must check and re-balance it occasionally.
8. If use coolant supply during grinding, do not start coolant unless the wheel is running, otherwise the wheel will be out of balance because of absorbing the water. If the wheel stand for a long time, will make the water concentrate at the lowest point, Therefore, after grinding for a period of time, idle running is necessary for eliminating un-balance.

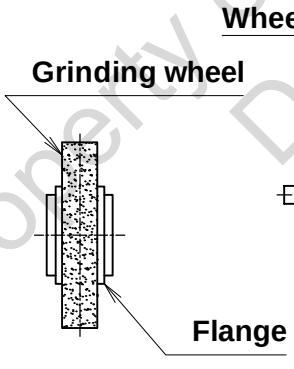


Fig. 1

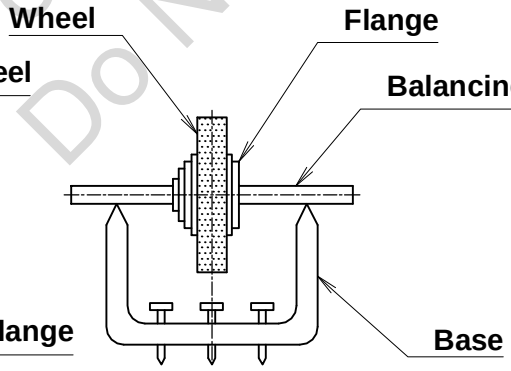


Fig. 2

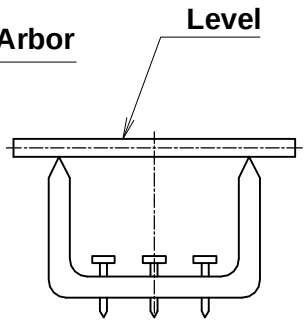


Fig. 3

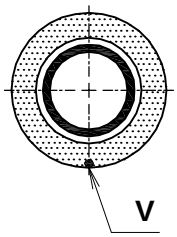


Fig. 4

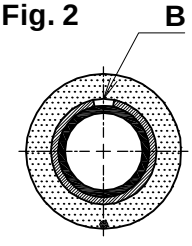


Fig. 5

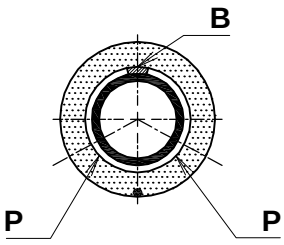


Fig. 6

After being balanced for the first time, the wheel must be mounted on the grinding spindle of the machine and dressed. This can be done with the parallel dresser on the spindle housing 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.

* 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.

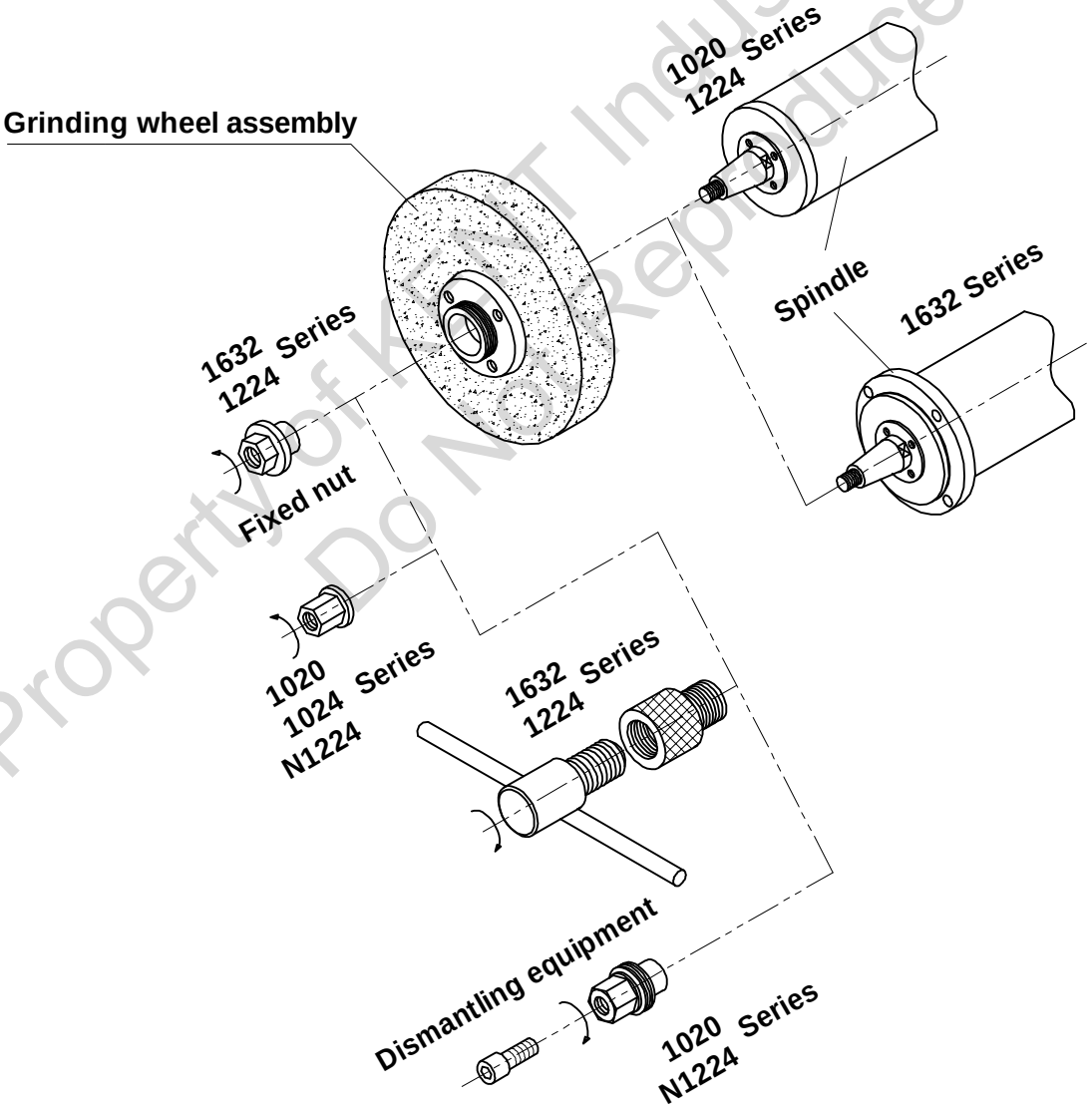
13. Installation and dismantling of the grinding wheel

Installation：

1. Prior to place the flange-mounted grinding wheel to the spindle, flange bore and spindle taper must be absoulutely clean.
2. Choose install the bigger conical surface of grinding wheel toward inside, and carefully put it on the spindle
3. Firmly tighten the nut counterclockwise (by moveable wrench or open wrench).

Dismantling：

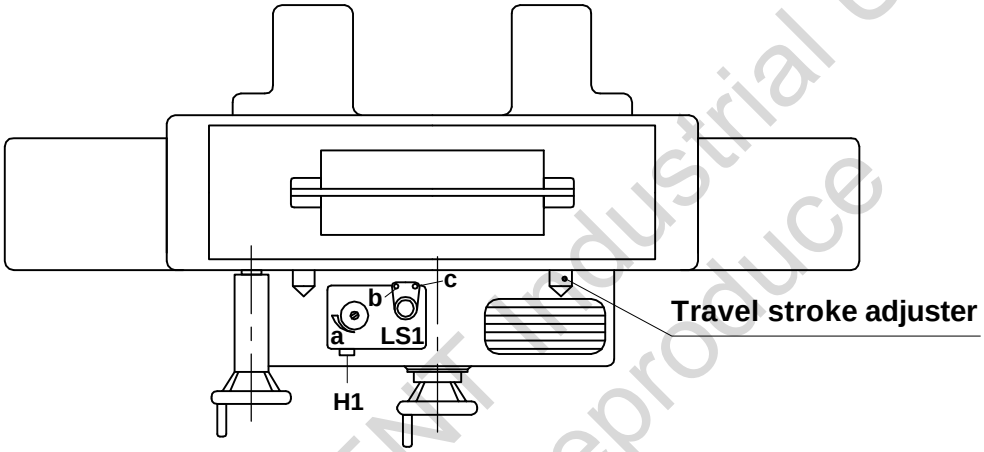
1. Loosen the fixed nut clockwise.
2. Firmly hold the grinding wheel by one hand, and dismantle it clockwise until the grinding wheel breaks away spindle. Then, you can take down the grinding wheel.



14. Operation of machine

(A). Please pay best attention to the following instruction before operating the machine：

1. The machine must be located on the vibration-proof ground.
2. Installation and leveling of the machine.
3. Lubrication.
4. The hydraulic tank must have adequate oil.
5. Lever "H1" of the hydraulic table traverse must be parallel ot the crossfeed direction "a" (Ref. to drawing below).
6. Before starting the spindle motor. please do not install the wheel until you ensure it rotates at clockwise direction.



(B). Table longitudinal movement：

1.Press the push button PB6 for starting the hydraulic pump motor.
2.Turn the lever "H1" clockwise until the table moving slowly.
3.If the table unable to travel automatically, you can rotate at anti-direction "b.c" by hand, in this case, you can check the neutral point and set the right position"LS1".

(C). Cross travel (For AH, AHD models)：

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

2. Turn SW4 to right, press PB9 or PB10 and release, adjust VR,the saddle now feeds automatically and is 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 bt 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 limitting the maximum cross travel fo the saddle, they are also used as safety device in case of accident when any failure of the crossfeed mechanism.

(D). Automatic downfeed control (For AHD model)

1. Turn selector switch SW5 on  (plunge grinding position, press push button PB11 then grinding wheel will be auto downfeed when table longitudinal traverse at left end. turn selectro switch SW5 on  (surface grinding) position, press PB11,then grinding wheel will be auto downfeed at both ends of crossfeed travel turn selector switch SW5 on  position, grinding wheel stops auto downfeed

2. Downfeed increment can be preset 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 below is downfeed increment be set at 0.02mm

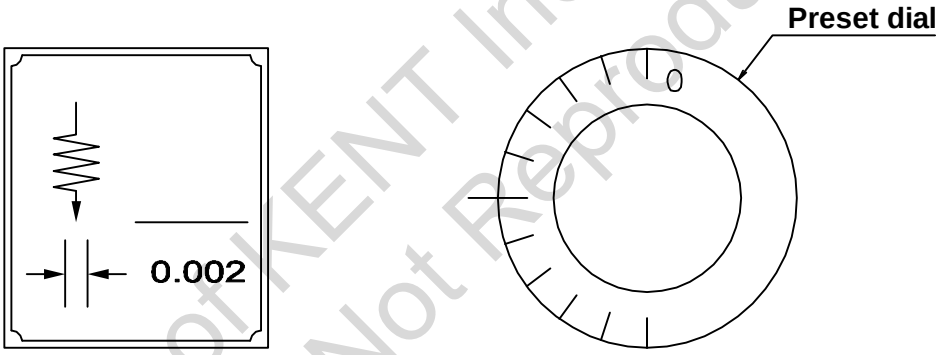
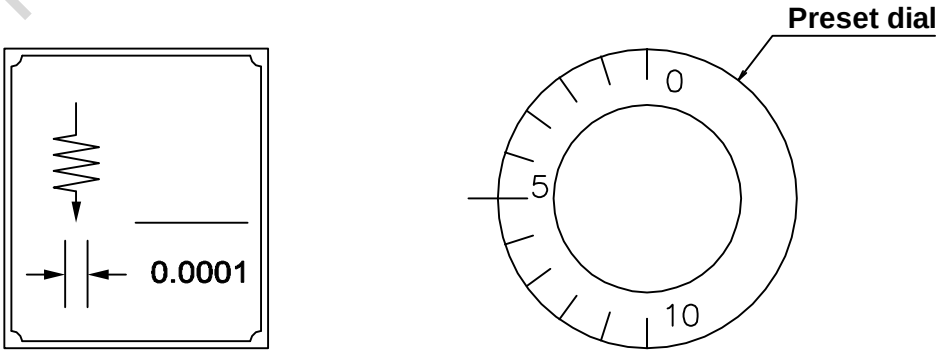
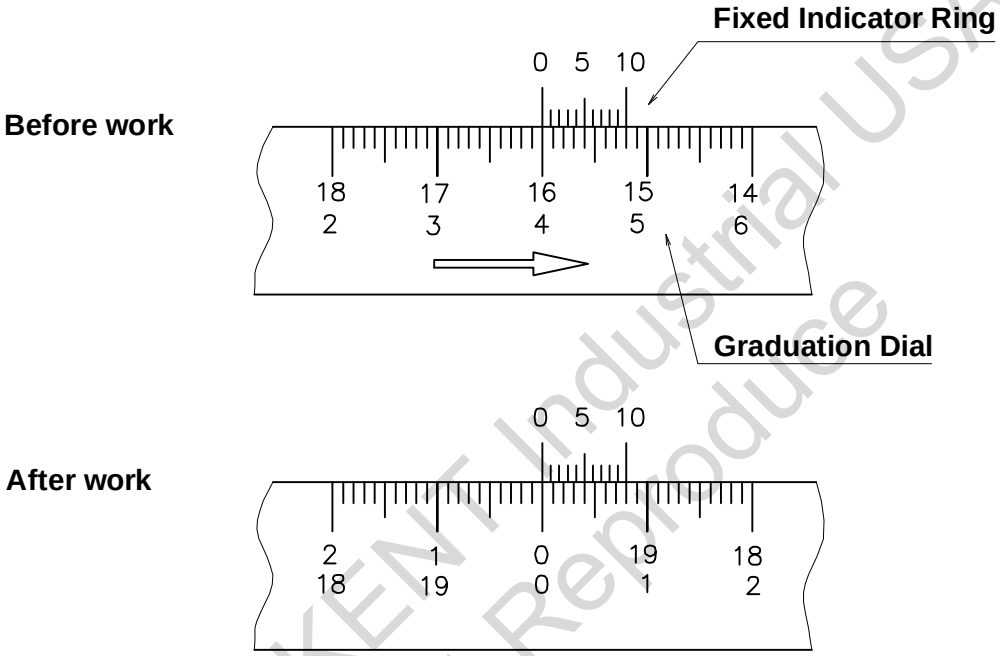


Figure shown below is downfeed increment be set at 0.0005 INCH



3. 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. (one 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 (0.02mm x 20 = 0.4mm) the mark "0" of graduation dial will meet "0" of fixed indicator ring and auto. downfeed stop.



4.Stop grinding wheel by press push button PB2 when work is done, stop the table longitudinal traverse by press push button PB4.

Caution：Don't push the auto downfeed button while the table is traveling close to the right 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.

(E). Coolant system (optional accessory)

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

(F). Dust suction coolant system (optional accessory)

1. Press PB7 to start suction motor or coolant pump
2. Adjust valve to get suitable coolant flow. (when wet grinding).
3. 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.

(E). General Comments of Grinding

The grinding results 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 30-60) should be used. The wheel is dressed by passing the diamond over quickly so that the surface of the wheel is roughened and sharpened 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 joined grain.

(3). Distortion of the workplece

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 is "clogged".

(F). 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 shoudl 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.

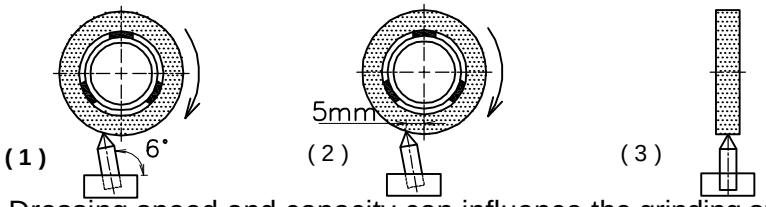
There are two pleces of paper washer on both faces of wheel and serve as plastic packings between wheel and mounting flange. The packing washer must not be removed, when mounting the wheel should slide onto the flange easlly by hand without the need for force. Wheel flange must be absolutely clean especially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

(G). How to dress grinding wheel and use diamond dresser

※When you dress grinding whel, diamond inevitably wear along the machining direction, so that the diamond dresser has to be put at the position of angle 6° slant to keep its sharp. (fig1)

※When you are going to dress the grinding wheel, put the sharp top of diamond dresser at approximately 5mm to the left bottom of grinding wheel, and stop longitudinal movement of working table, then move cross feed front and rear slowly to dress. (fig2)

※When you dress the grinding wheel, you have to start from the middle because grinding wheel usually wear more on two sides than in the middle. If you dress from two sides to middle, then, it will produce pressure. (fig3)

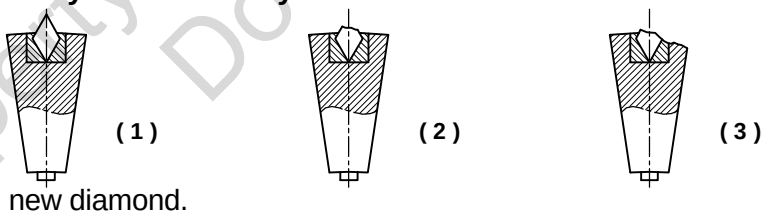


Dressing speed and capacity can influence the grinding surface, If you don't ask for best surface or you want bigger grinding capacity, the rough dressing is enough. (dressing capacity 0.01-0.03mm each time and coordinate with fast speed across the grinding wheel three or four times). If you ask for best surface or last finished grinding, then the grinding wheelhas to be treated with precision dressing (dressing capaity form 0.02mm, 0.01mm, 0.005mm reduced gradually and coordinate with slow and steady speed across grinding wheel).

Generally speaking, the usage life of grinding wheel and diamond dresser, precise dressing is longer than rough dressing.

After a certain time, the diamond must be changed in its holder 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 and losing it, and secondly, it might become 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 speciallsts only.

(H). Storage of Grinding Wheels

The wheels should be kept in special racks in a dry place and must be protected from knocks and jolts, expecially when they are being transported. Normally a rule, they should be stood on edge, but thin wheels and wheels with a sharp edge must be laid flat on an even surface.

Grinding wheels must not be allowed to come into contact with oil or grease An oil-soaked wheel will lose tis bite and its appllcation is very limited.

(I). 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 hiher 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

Grain / Grainding Condition	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

Grain / Grainding Condition	Soft	Hard
Works Hardness	hard	soft
Surface be Contacted	wide	narrow
Movement of work	slow	quick
Wheel speed	quick	slow

D. Structure : number of a wheel refers to the relative spacing of the grains of abrasive ; the larger number, the wider the grain spacing will be.

Close : 0,1,2,3,4,5,　　Medium : 6,7,8,9,　　Wide : 10,11,12,

Grain / Grainding Condition	Wide	Close
Works Hardness	coarse	fine
Surface be Contacted	wide	narrow
Movement of work	soft	hard

E. Bond :

V : Vitrified,　　S : Sillicate,　　B : Resinold,　　R : Rubber,　　E : Shellac

(J) Wheel be Recommended

Wheel Diameter / Material		Under 205mm	205mm - 355mm
Carbon Stell	Under HRC25°	WA 46K	WA 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 46I	SA WA 46H
Cast Iron		C46I	C46I
Brass		C30J	C30I
Aluminum alloy		C30J	C30I
Tungsten Carbide		GC 60H-100I	GC 60H-100I
Glass		C60K	C60K
Marble		C GC 36M	C GC 36M

(K) Choice of the Grinding Condition

(1) Down feed of grinding wheel

Material / Finish	Cast Iron, Soft / harden steel	Stainless and heat resistant steel	Tool steel	Cross Feed
Rough	0.0006- 0.0012" 0.015 - 0.03mm	0.0008- 0.0012" 0.02 - 0.03mm	0.0008- 0.0012" 0.02 - 0.03mm	under 1/2 of wheel thickness
Fine	0.0002- 0.0004" 0.005 - 0.01mm		0.0002 - 0.0006" 0.005 - 0.015mm	under 1/4 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). Crossfeed

Crossfeed	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 - 30 M/Min.
Cast iron	18 - 20 M/Min.
Tungsten Carbide	8 - 18 M/Min.
Zinc alloy and light metal	25 - 30 M/Min.

(5) Degree and block gauge thickness conversion table

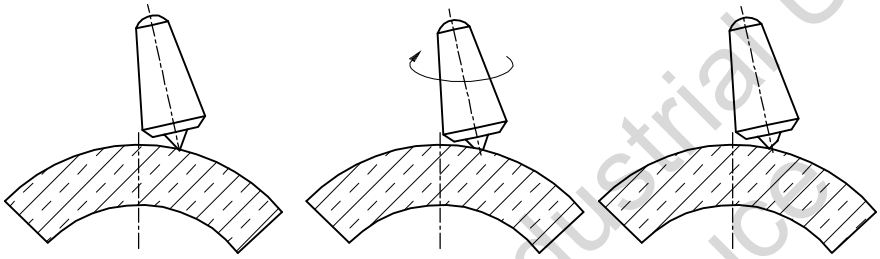
Deg.	Sin	Block gauge thickness	Deg.	Sin.	Block gauge thickness
1°	0.0175	0.875	24°	0.4067	20.335
2°	0.0349	1.745	25°	0.4226	21.130
3°	0.0523	2.615	26°	0.4384	21.920
4°	0.0698	3.490	27°	0.4540	22.700
5°	0.0872	4.360	28°	0.4695	23.475
6°	0.1045	5.225	29°	0.4848	24.240
7°	0.1219	6.095	30°	0.5000	25.000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

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

(L) USE OF THE OPTIONAL ATTACHMENT

(a). Parallel Dressing attachment (Standard Accessory)

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



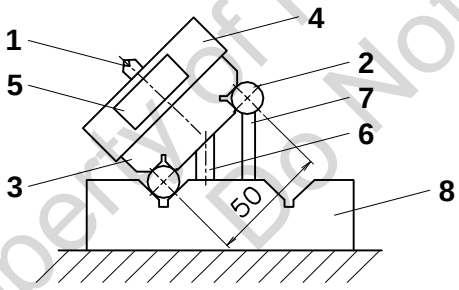
(b). Angle forming attachment

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

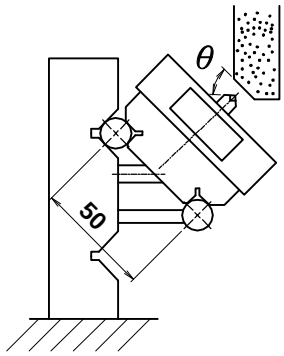
(2). The value in question will be the Sine of the angle time 50. That is B Sinθ x 50

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

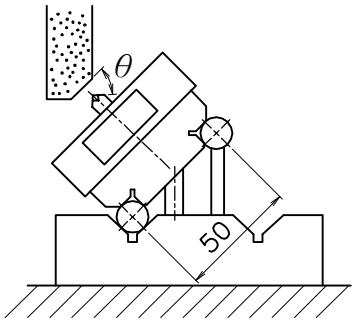
(4). Put this Block gauge under the base of the Sine Bar stand. Fix with the fastening bolts and the forming is done.



Magnetic Chuck



θ bigger than 45°
(45°~ 90°)



θ smaller than 45°
(0°~ 45°)

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

(c). Sine Bar

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

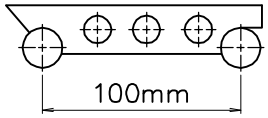
(1). The value in question equals the Sine of the angle time 100, B Sinθ x 100

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

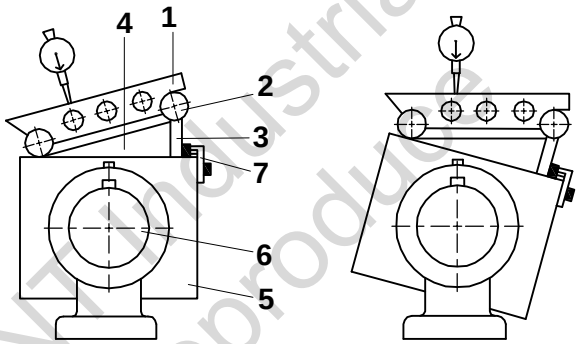
(3). Put this gauge at one end of the Sine Bar and let it be attacted to the inelinable magnetic chuck. This Sine Bar shall be kept parallel to the longitudinal. direction of the machine.

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

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



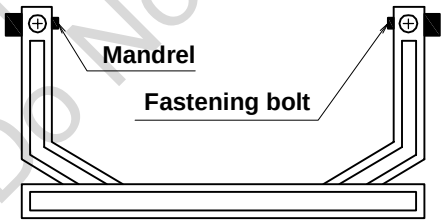
Sine Bar



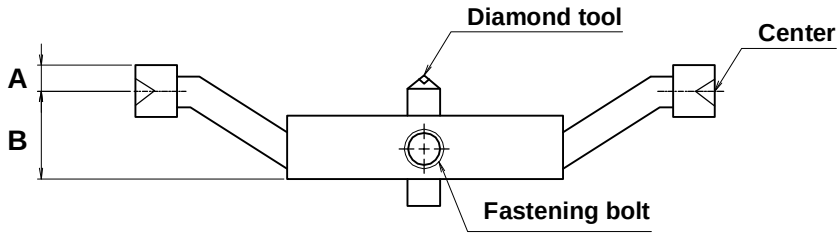
(d). Radius Forming Attachment

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

(1). Main Stand



(2). Swing rod and diamond tool



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

A : The distance between the upper rim and the center

B : The distance between the bottom rim and the center

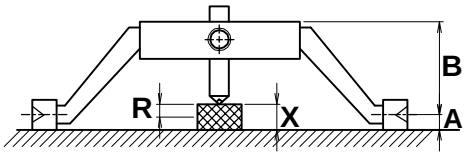
The R forming is the adjustment of the distance between the diamond Tool and the swing rod center so that the R shaping results.

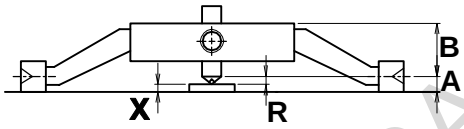
(3). To determine the concave and convex R :

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

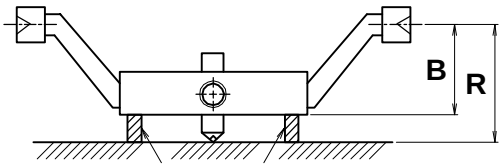
b. To determine the convex R : Put the swing rod on a place disk. Put a block gauge of proper thickiness under the diamond tool. Then R = X - A

c. To determine the small concave R

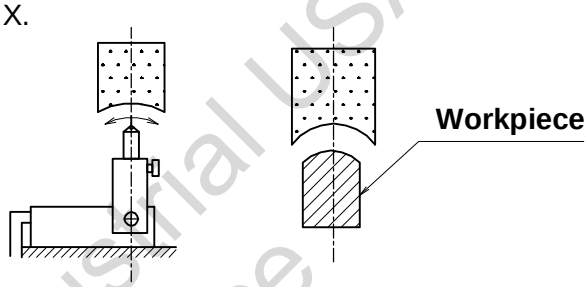




d. To determine the big concave R : R = B + X.



Same thickness block gauge

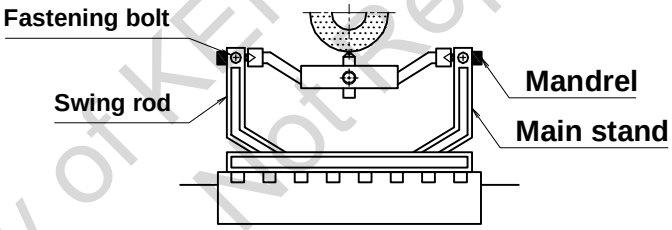


e. Note :

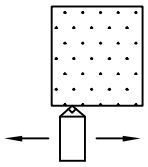
1. The base and side of the grinding wheel shall be well-dressed.
2. The Radius Forming Attachment shall be parallel to the grinding wheel.
3. The diamond tool shall be parallel to the Radius Forming Attachment.

(4). Operation of the Radius forming attachment :

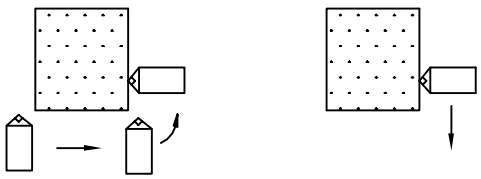
a. Find the center of the grinding wheel. then fix the work table.



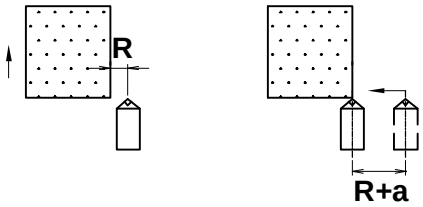
b. Turn the down-feed handwheel at 1/3 on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.



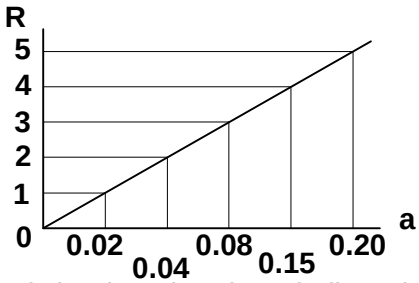
c. Turn the diamond tool over an angle 90° and elevate it into a proper position (greater than the R size in question)



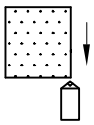
d. Elevate the grinding wheel so that it goes away from the diamond tool and the wheel in such a position that the distance between the side of the wheel and the center of the Diamond tool is just R.



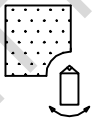
e. Move the diamond tool (R+a) leftward, with "a" found in the following table.



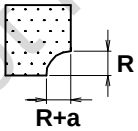
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



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

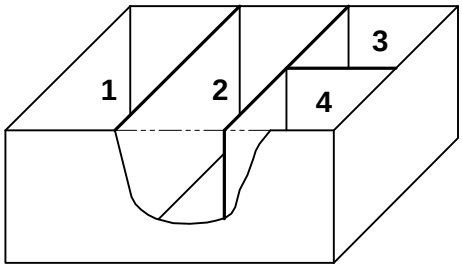


h. The wheel finally becomes the following shape.



(e). Coolant system (Standard accessory)

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 #1,2,3,4.



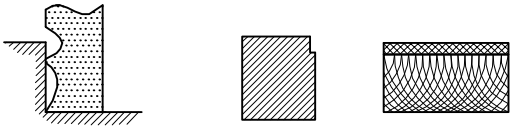
*Coolant tank capacity : 40 liters
*Coolant pump : 1/8 HP

(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 crecks.

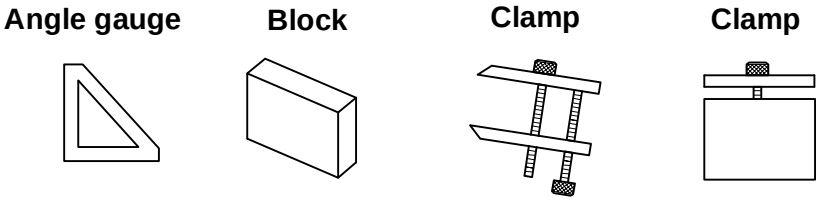
(4)

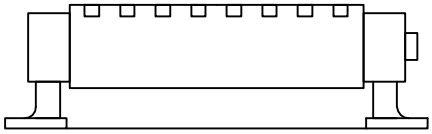
The "Relief Angle" of the wheel is lower than the surface of the work, so that the work face becomes two sections, the upper section resembling that in (3) and the lower section in (1). Now it is necessary to enlarge the "Relief Angle" part so that it will higher than the face of the work.

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

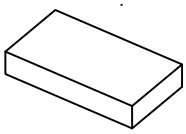
(g). Right Angle Grinding

(1) Tools

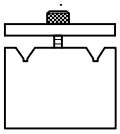




Inclinable Magnetic chuck



Block gauge

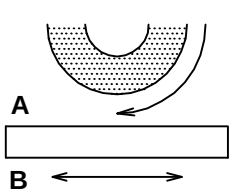


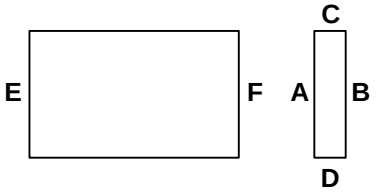
Clamp

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

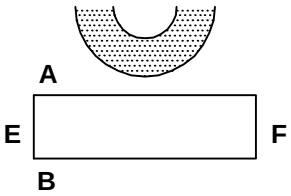
a. Under 200mm :

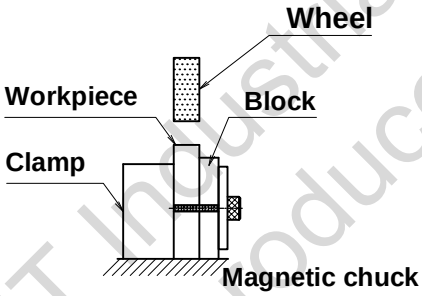
*Grinding to the first basic, or the surface grinding of A and B,



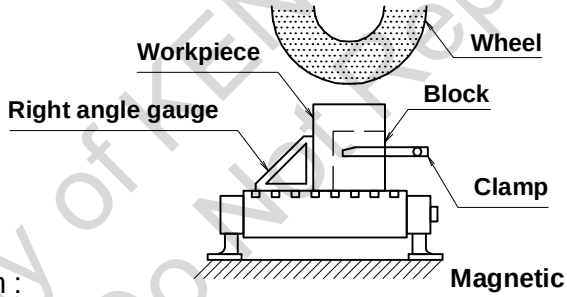


*Grinding of C and D





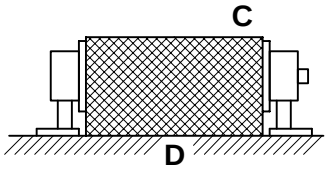
*Grinding of E and F



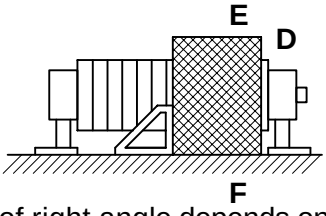
b. Over 200mm :

*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 inatance, whether the burrs after grinding is done well, whether the tools are kept clean, whether the work table are kept clean, the accuracy of the angle gauge, etc. all will have a direct influence over the precision of the product.

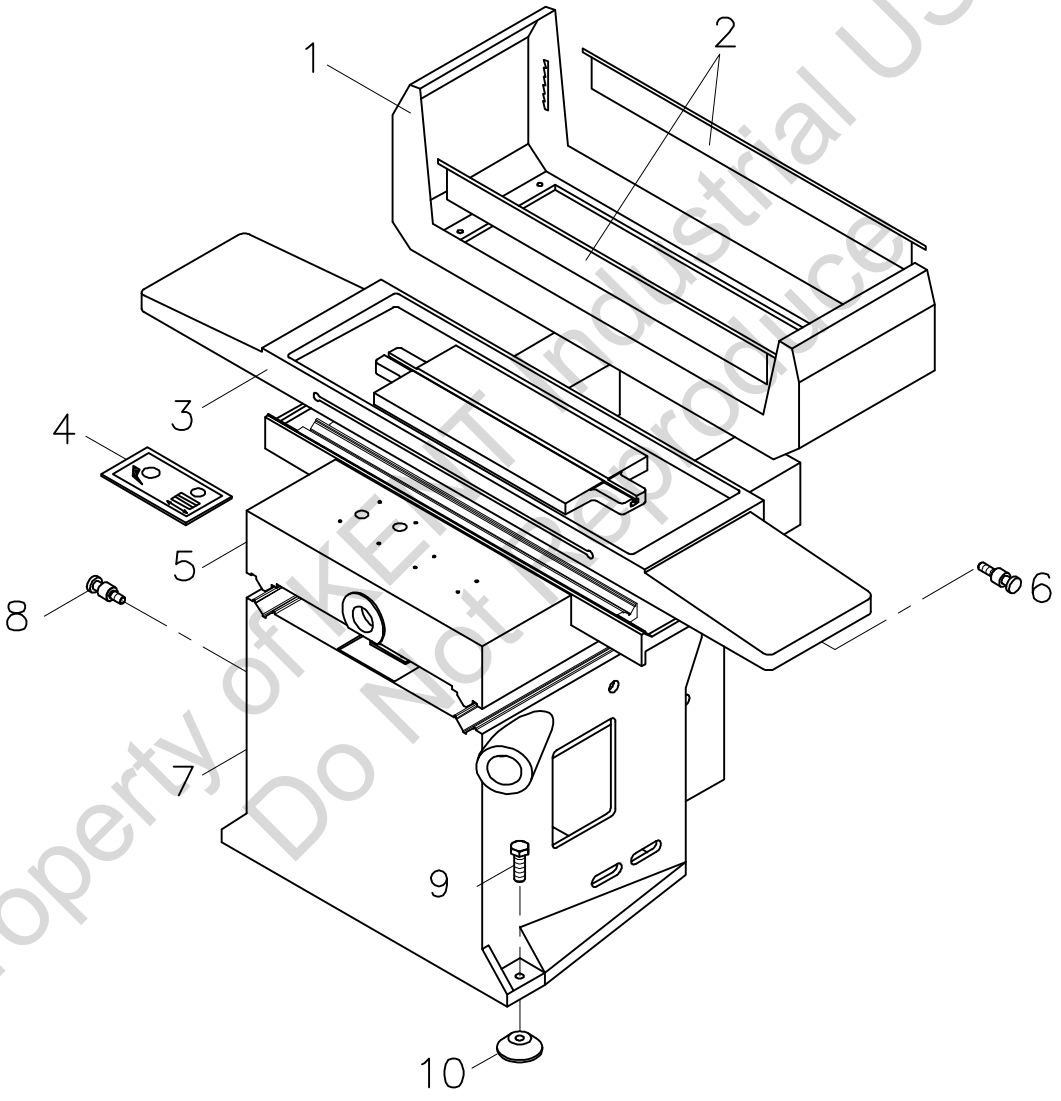
(M) Complete Knockdown Drawing & Parts List

When ordering parts, Please mention:

1. **Machine Model Serial Number & Year of Production**
2. **Index Number**
3. **Quantity**

TABLE, SADDLE& BASE ASS'Y

(1020, N1224 SERIES)



TABLE, SADDLE & BASE ASS'Y

(1020 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1020-308	Splash Guard (Frame)	1	
2	1020-308	Splash Guard (Plate)	4	
3	1020-301	Table	1	
4	1020-725	Indication Plate	1	
5	1020-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	1020-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

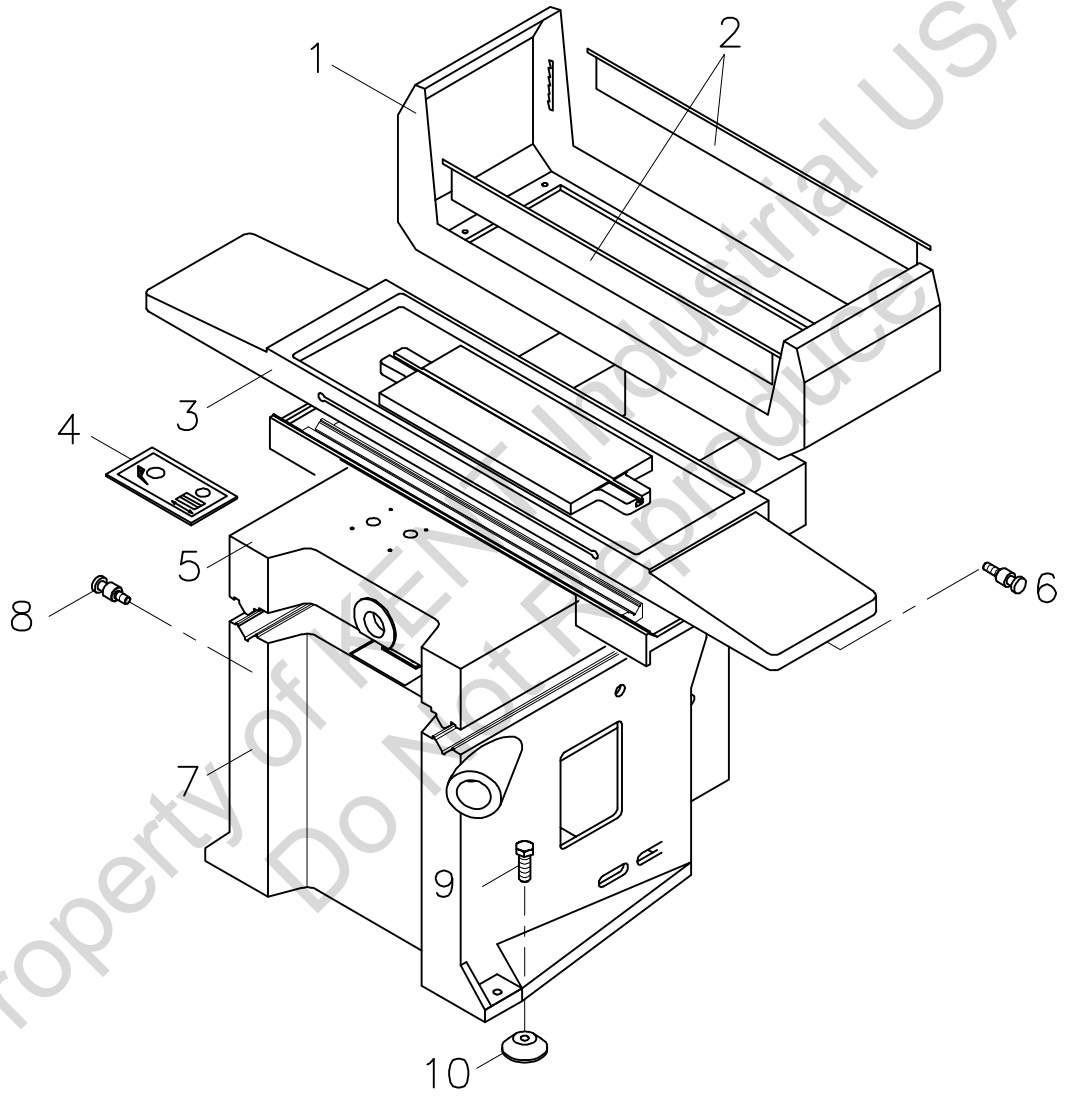
TABLE, SADDLE & BASE ASS'Y

(N1224 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1224-308	Splash Guard (Frame)	1	
2	1224-308	Splash Guard (Plate)	4	
3	1224-301	Table	1	
4	1020-725	Indication Plate	1	
5	N1224-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	N1224-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

TABLE, SADDLE & BASE ASS'Y

(1224, 1230, 1632, 1640 SERIES)



TABLE, SADDLE & BASE ASS'Y

(1224 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1224-308	Splash Guard (Frame)	1	
2	1224-308	Splash Guard (Plate)	4	
3	1224-301	Table	1	
4	1020-725	Indication Plate	1	
5	1224-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	1224-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

TABLE, SADDLE & BASE ASS'Y

(1230 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1230-308	Splash Guard (Frame)	1	
2	1230-308	Splash Guard (Plate)	4	
3	1230-301	Table	1	
4	1020-725	Indication Plate	1	
5	1224-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	1224-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

TABLE, SADDLE & BASE ASS'Y

(1632 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1632-308	Splash Guard (Frame)	1	
2	1632-308	Splash Guard (Plate)	4	
3	1632-301	Table	1	
4	1632-725	Indication Plate	1	
5	1632-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	1632-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

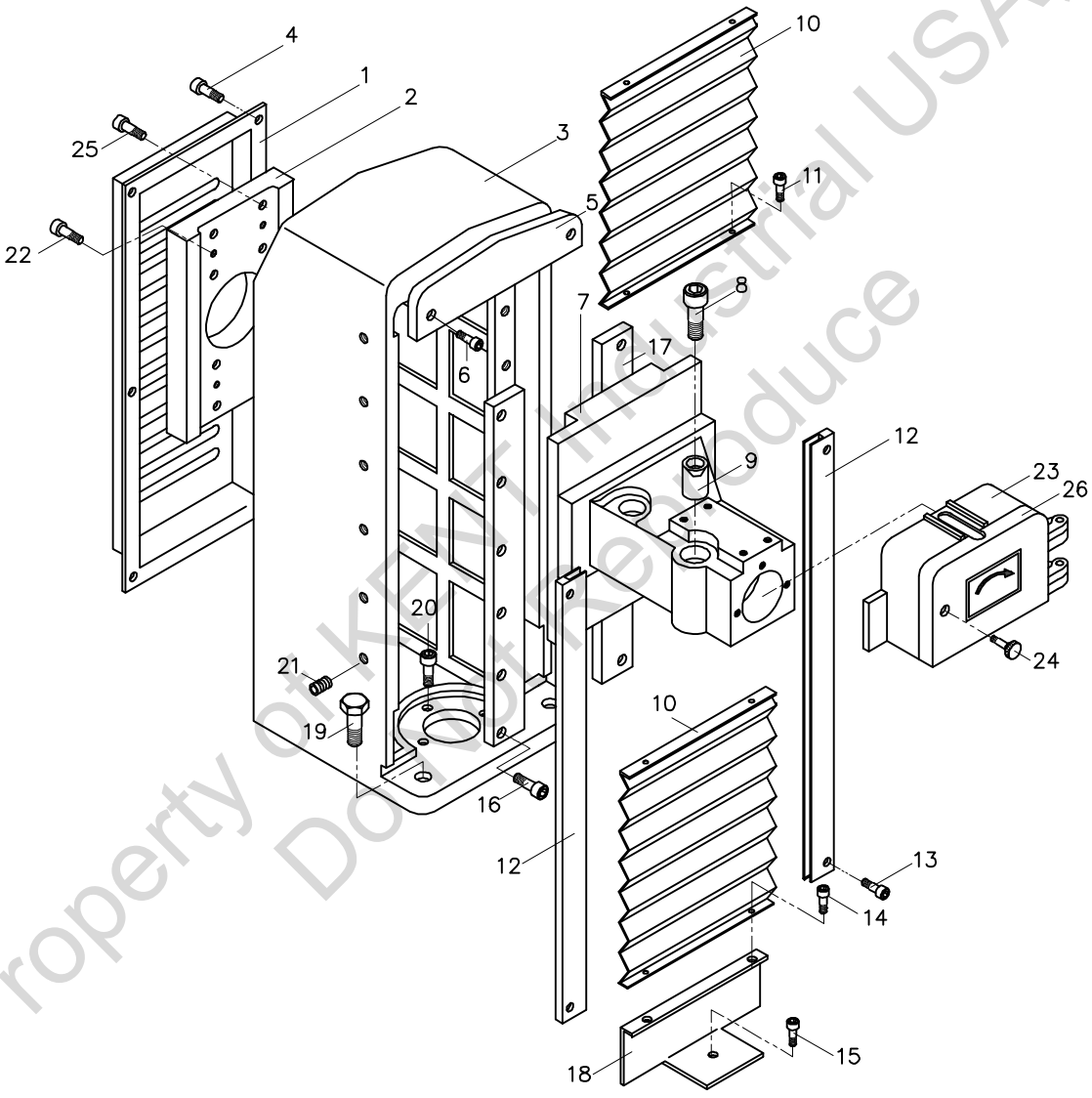
TABLE, SADDLE & BASE ASS'Y

(1640 SERIES)

Index No.	Parts No.	Part Name.	QTY	
1	1640-308	Splash Guard (Frame)	1	
2	1640-308	Splash Guard (Plate)	4	
3	1640-301	Table	1	
4	1632-725	Indication Plate	1	
5	1632-401	Saddle	1	
6	1020-703	Lifting Bolt	2	
7	1632-501	Base	1	
8	1020-704	Lifting Bolt	2	
9	1020-717	Leveling Screw	3	
10	1020-716	Leveling Pad	3	

COLUMN ASS'Y

(1020, N1224, 1224, 1230 SERIES)



COLUMN ASS'Y

(1020, N1224 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-205	Column Rear Cover	1	
2	1020-102	Head B	1	
3	1020-201	Column	1	
4	1/4"x1/4"L	Round Head Screw	6	
5	1020-204A	Upper Cover Of Column	1	
6	1/4"X3/4"L	Socket Head Cap Screw	2	
7	1020-101	Head A (1020 serial)	1	
	N1224-101	Head A (N1224 serial)	1	
8	5/8"X3"L	Socket Head Cap Screw	2	
9	1020-112	Copper collar	2	
10	1020-224	Dust Protection Fold Fabric	2	
11	1/4"x1/4"L	Round Head Screw	4	
12	1020-203A	Shield Dust Guide Rail	2	
13	3/16"X3/8"L	Round Head Screw	8	
14	1/4"x1/4"L	Round Head Screw	4	
15	1/4"x1/4"L	Socket Head Cap Screw	1	
16	3/8"x1"L	Socket Head Cap Screw	12	
17	1020-202A	Vertical Guide Rail	2	
18	1020-207A	Shield Dust	1	
19	3/4"x2"L	Hexagonal Head Screw	4	
20	1/2"x2 1/2"L	Socket Head Cap Screw	3	
21	3/8"x1"L	Set Screw	12	
22	W1/2"L x 1"L	Socket Head Cap Screw	8	
23	1020-114-1	Wheel Guard	1	
24	1020-116	Wheel Guard Set Screw	1	
25	W1/2" x 1"L	Socket Head Cap Screw	8	
26	1020-115B	Wheel Guard	1	

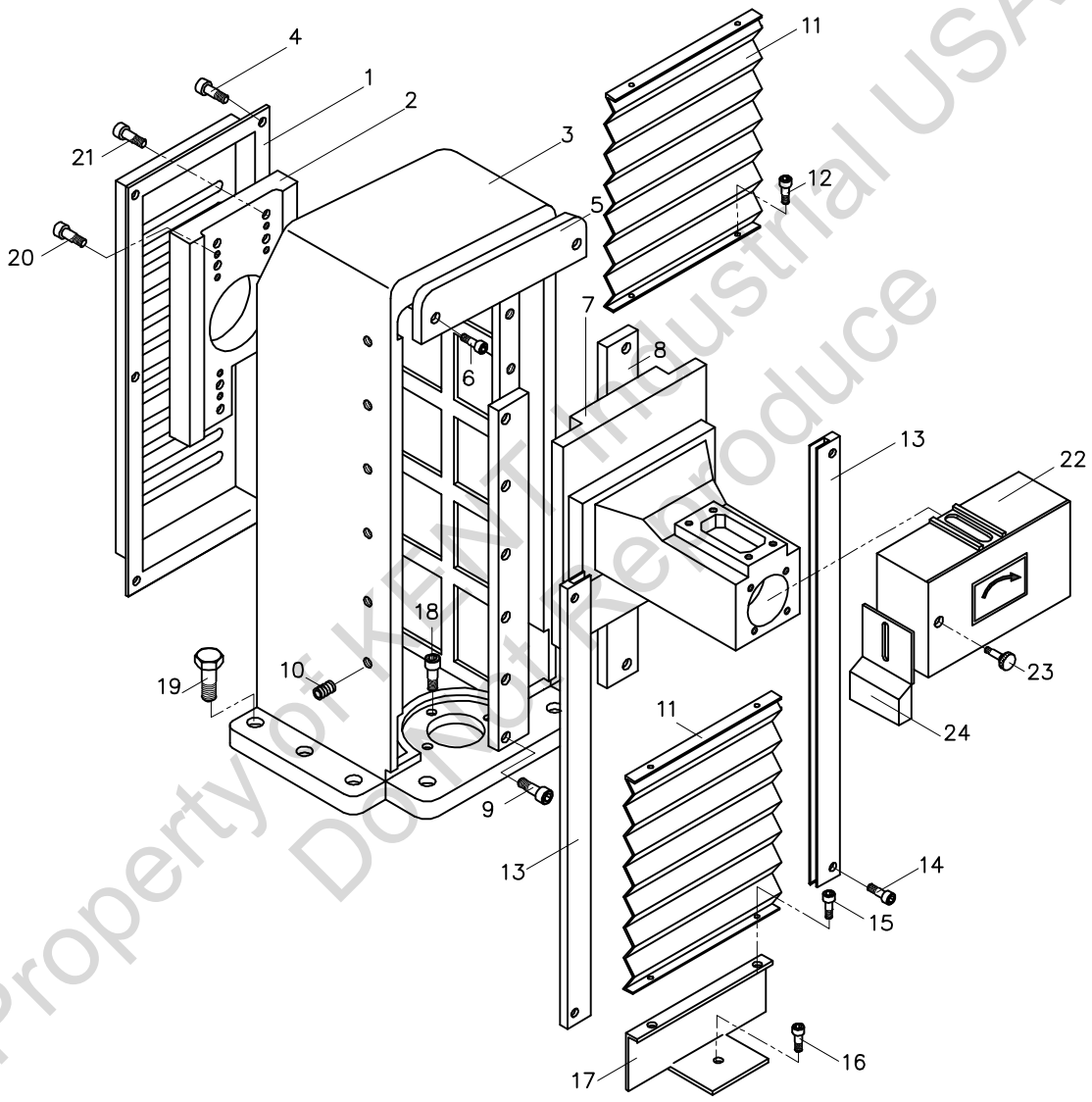
COLUMN ASS'Y

(1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1224-205-1	Column Rear Cover	1	
2	1224-102	Head B	1	
3	1224-201	Column	1	
4	1/4"x1/4"L	Round Head Screw	6	
5	1224-204	Upper Cover Of Column	1	
6	1/4"X3/4"L	Socket Head Cap Screw	2	
7	1224-101	Head A	1	
8	5/8"X3"L	Socket Head Cap Screw	2	
9	1224-112	Copper collar	2	
10	1224-224	Dust Protection Fold Fabric	2	
11	1/4"x1/4"L	Round Head Screw	4	
12	1224-203A	Shield Dust Guide Rail	2	
13	3/16"X3/8"L	Round Head Screw	8	
14	1/4"x1/4"L	Round Head Screw	4	
15	1/4"x1/4"L	Socket Head Cap Screw	1	
16	3/8"x1"L	Socket Head Cap Screw	12	
17	1224-202	Vertical Guide Rail	2	
18	1224-207	Shield Dust	1	
19	3/4"x2"L	Hexagonal Head Screw	4	
20	1/2"x2 1/2"L	Socket Head Cap Screw	3	
21	3/8"x1"L	Set Screw	12	
22	W1/2"L x 1"L	Socket Head Cap Screw	8	
23	1224-114A	Wheel Guard	1	
24	1020-116	Wheel Guard Set Screw	1	
25	W1/2' x 1"L	Socket Head Cap Screw	8	

COLUMN ASS'Y

(1632,1640 SERIES)



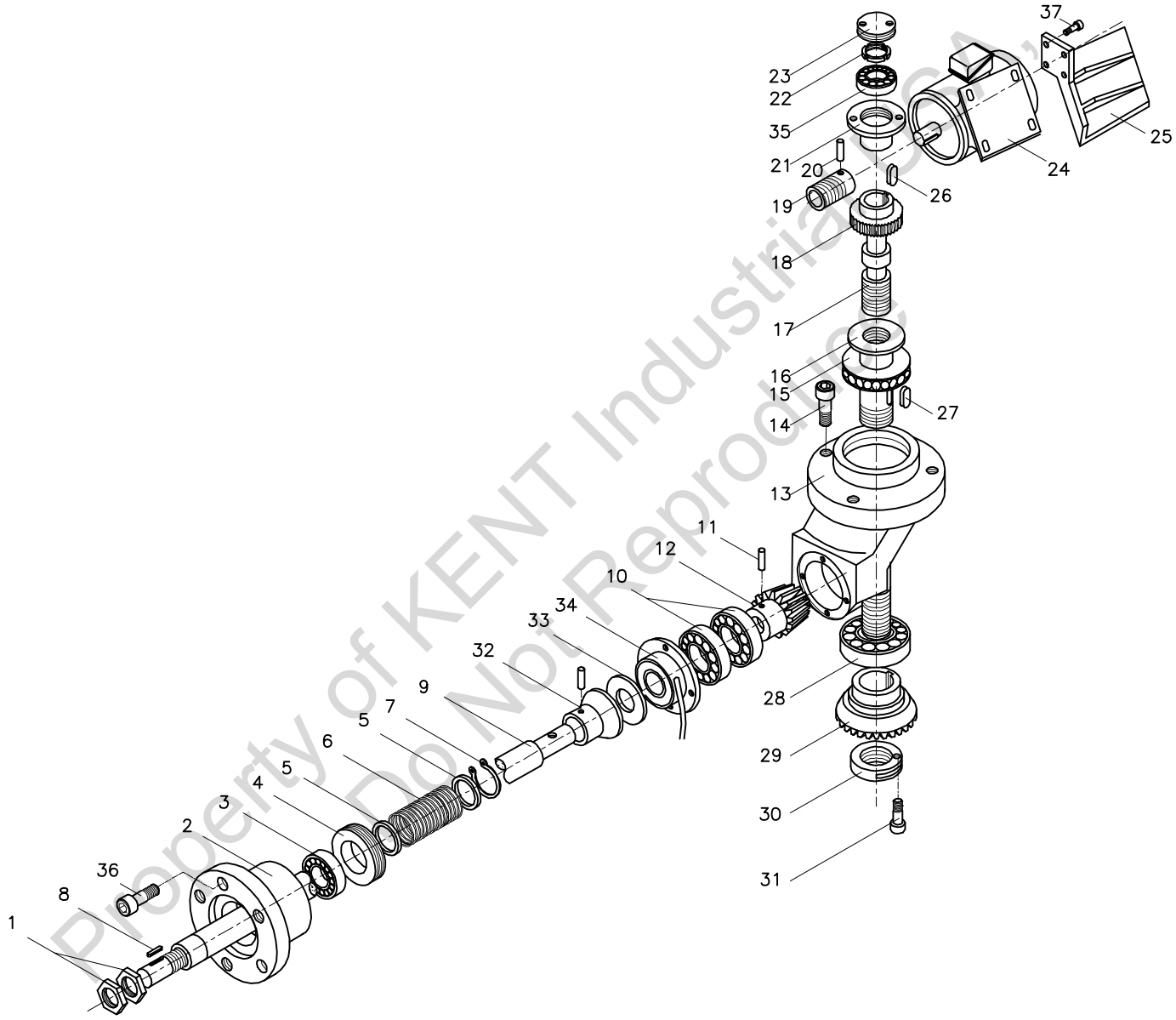
COLUMN ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1632-205	Column Rear Cover	1	
2	1632-102A	Head B	1	
3	1632-201	Column	1	
4	1/4"x1/4"L	Round Head Screw	6	
5	1632-204	Upper Cover Of Column	1	
6	1/4"X1"L	Socket Head Cap Screw	2	
7	1632-101	Head A	1	
8	1632-202	Vertical Guide Rail	2	
9	1/2"x2 1/2"L	Socket Head Cap Screw	16	
10	1/2"x1"L	Set Screw	16	
11	1632-206	Dust Protection Fold Fabric	2	
12	3/16"X1/4"L	Round Head Screw	4	
13	1632-203	Shield Dust Guide Rail	2	
14	3/16"X1/4"L	Round Head Screw	10	
15	3/16"X1/4"L	Round Head Screw	4	
16	3/16"X1/4"L	Round Head Screw	2	
17	1632-207	Shield Dust	1	
18	1/2"x2 1/2"L	Socket Head Cap Screw	3	
19	3/4"x2"L	Hexagonal Head Screw	8	
20	W5/8" x 1"L	Socket Head Cap Screw	8	
21	W5/8" x 1"L	Socket Head Cap Screw	8	
22	1632-114C	Wheel Guard	1	
23	1020-116	Wheel Guard Set Screw	1	
24	1512-115	Splash Guard Cover	1	

UPPER & LOWER TRANSMISSION ASS'Y

(1020~1640 SERIES)



UPPER & LOWER TRANSMISSION ASS'Y

(1020, N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-410	Hexagonal Nut	2	
2	1224-804	Connect Flange	1	
3	6005	Ball Bearing	1	
4	1224-871	Nut Of Flange	1	
5	1020-506	Washer	2	
6	1020-507	Spring	1	
7	S25	Snap Ring	1	
8	5 x 5 x 20L	Key	1	
9	1020-805	Transmission Shaft	1	
	N1224-805	Transmission Shaft	1	
	1224-805 (1224,1230)	Transmission Shaft	1	
10	6204	Ball Bearing	2	
11	Ø6 x 30L	Spring Pin	1	
12	1020-217	Bevel Pinion	1	
13	1020-214	Gear Seat	1	
14	W1/2" x 2"L	Socket Head Cap Screw	3	
15	51108	Thrust Bearing	1	
16	1020-213 (1020,N1224)	Upper & lower Lead Screw Socket	1	
	1224-213 (1224,1230)	Upper & lower Lead Screw Socket	1	
17	1020-212 (1020,N1224)	Upper & lower Lead Screw	1	
	1224-212 (1020,1230)	Upper & lower Lead Screw	1	
18	1632-225	Worm Gear	1	
19	1632-229	Worm Screw	1	

UPPER & LOWER TRANSMISSION ASS'Y

(1020, N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
20	Ø6 x 30L	Spring Pin	1	
21	1632-226	Connect Bracket	1	
22	M20 x P1	Nut	1	
23	1632-227	Connect Bracket Cover	1	
24	1/5HP x 6P	Rapid Up & Down Motor	1	
25	1020-226	Motor Base	1	
	1224-226	Motor Base	1	
26	5 x 5 x 30L	Key	1	
27	7 x 7 x 25L	Key	1	
28	B6011Z	Ball Bearing	1	
29	1020-216	Bevel Gear	1	
30	1020-215	Lock Nut	1	
31	W1/4" x 1/2"L	Socket Head Cap Screw	1	
32	1224-515	Clutch Base	1	
33	0.75kg – M	Clutch A	1	
34	0.75kg – M	Clutch B	1	
35	B1204	Bearing	1	
36	W1/4" x 3/4"L	Socket Head Cap Screw	3	
37	W5/16" x 1"L	Socket Head Cap Screw	4	

UPPER & LOWER TRANSMISSION ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-410	Hexagonal Nut	2	
2	1224-804	Connect Flange	1	
3	6005	Ball Bearing	1	
4	1224-871	Nut Of Flange	1	
5	1020-506	Washer	2	
6	1020-507	Spring	1	
7	S25	Snap Ring	1	
8	5 x 5 x 20L	Key	1	
9	1632-805	Transmission Shaft	1	
10	6204	Ball Bearing	2	
11	Ø6 x 30L	Spring Pin	1	
12	1632-221	Bevel Pinion	1	
13	1632-223	Gear Seat	1	
14	W1/2" x 2"L	Socket Head Cap Screw	3	
15	51110	Thrust Bearing	1	
16	1632-213	Upper & lower Lead Screw Socket	1	
17	1632-212	Upper & lower Lead Screw	1	
18	1632-225	Worm Gear	1	
19	1632-229	Worm Screw	1	

UPPER & LOWER TRANSMISSION ASS'Y

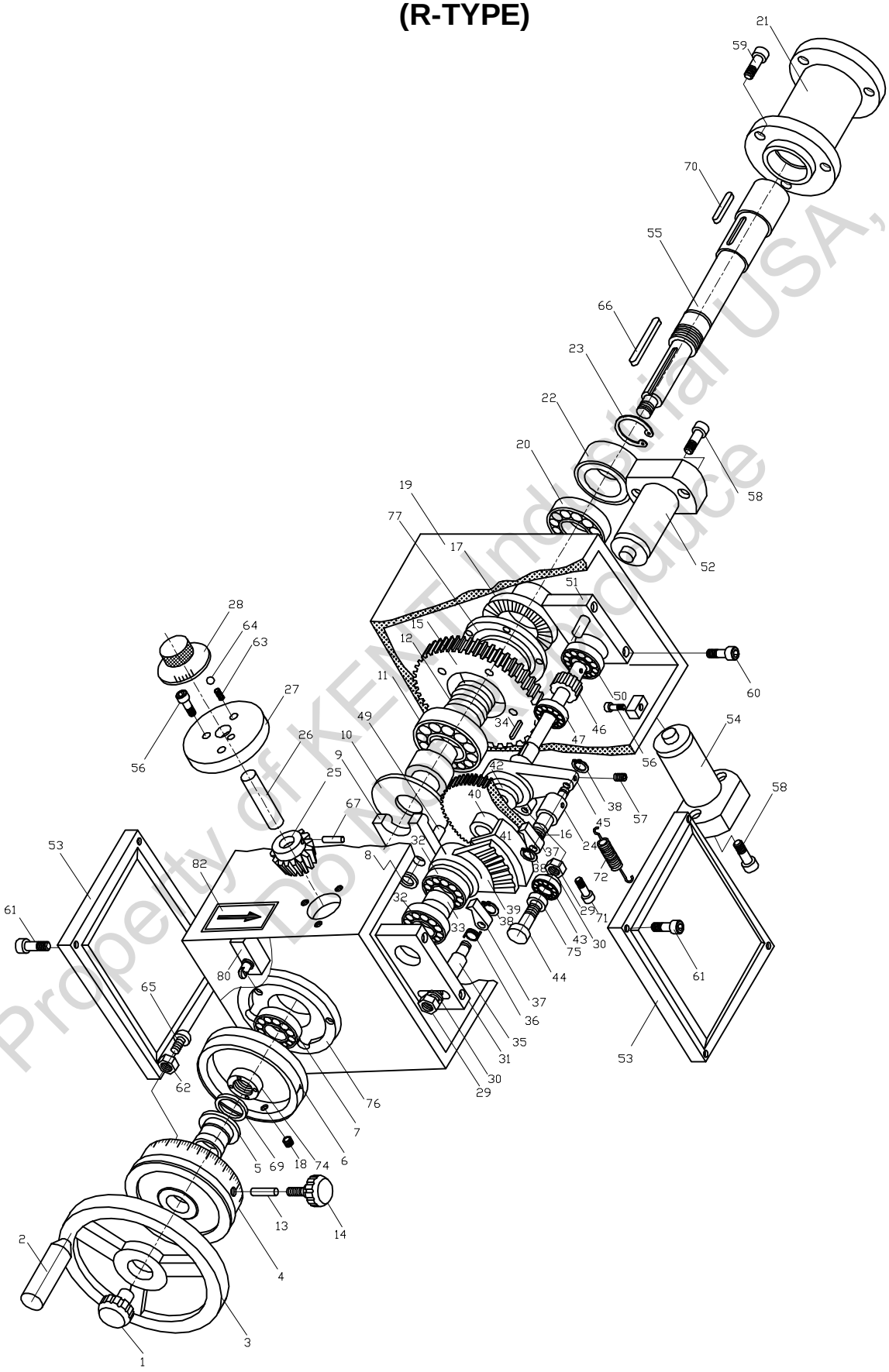
(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
20	Ø6 x 30L	Spring Pin	1	
21	1632-226	Connect Bracket	1	
22	M20 x P1	Nut	1	
23	1632-227	Connect Bracket Cover	1	
24	1/5HP x 6P	Rapid Up & Down Motor	1	
25	1632-228	Motor Base	1	
26	5 x 5 x 30L	Key	1	
27	7 x 7 x 25L	Key	1	
28	B6213Z	Ball Bearing	1	
29	1632-222	Bevel Gear	1	
30	1632-215	Lock Nut	1	
31	W1/4" x 1/2"L	Socket Head Cap Screw	1	
32	1224-515	Clutch Base	1	
33	0.75kg – M	Clutch A	1	
34	0.75kg – M	Clutch B	1	
35	B1204	Bearing	1	
36	W1/4" x 3/4"L	Socket Head Cap Screw	3	
37	W5/16" x 1"L	Socket Head Cap Screw	4	

DOWN FEED UNIT ASS'Y

(1020~1640 Series)

(R-TYPE)



DOWN FEED UNIT ASS'Y (R Type)

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-729	Cap Nut	1	
2	1020-728	Grip	1	
3	1020-714	Head Wheel	1	
4	1020-N801	Graduation Dial	1	
	1632-N801	Graduation Dial	1	1632
5	1020-N804	Collar	1	
6	1020-N803A	Graduation Dial Holder	1	
7	B6204Z	Bearing	1	
8	1020-N842	Spacer	1	
9	1020-N810	Holder	1	
10	1020-N811	Holder	1	
11	B6006Z	Bearing	1	
12	1020-N813-2	Spring	1	
13	Ø6 x 30L	Pin	1	
14	Ø5/16	Cap Screw	1	
15	1020-N812	Gear	1	
	1632-N812	Gear	1	1632
16	1020-N828	Spring	1	
17	1020-N814	Clutch	1	
18	W1/4" x 3/8"L	Set Screw	1	
19	1020-N802A	Gear Box	1	
20	B6005Z	Bearing	1	
21	1020-N845	Connect Bracket	1	
22	1020-N843	Spacer	1	
23	R-47	Snap Ring	1	
24	1020-N826	Shaft	1	
25	1020-N830	Bevel Gear	1	
26	1020-N831	Pin	1	
27	1020-N832	Plate	1	
28	1020-N833	Pre-Set Dial	1	

DOWN FEED UNIT ASS'Y (R Type)

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
29	W1/4"	Hexagonal Nut	2	
30	W1/4"	Spring Washer	2	
31	1020-N815	Bracket	1	
32	B6300Z	Bearing	3	
33	1020-N817	Spacer	1	
34	5 x 5 x 15L	Key	1	
35	1020-N815-1	Pin	1	
36	1020-N827	Spring	1	
37	1020-N825	Transmission Claw	1	
38	E7	Snap Ring	3	
39	1020-N818	Bevel Gear (Half)	1	
40	1020-N820	Ratchet Gear	1	
41	1020-N819	Slipper	1	
42	1020-N821	Spacer	1	
43	B608ZZ	Bearing	1	
44	1020-N823	Pin	1	
45	1020-N822	Transmission Arm	1	
46	1020-N816	Gear Shaft	1	
	1632-N816	Gear Shaft	1	1632
47	B6202	Bearing	1	
48		Gear	1	
49	W1/4" x 3"L	Socket Head Cap Screw	1	
50	B6201	Bearing	1	
51	1020-N829	Bracket	1	
52	1020-N834A	Cylinder Of Clutch	1	
53	1020-N809	Cover	2	
54	1020-N834B	Cylinder Of Feed	1	
55	1020-N807	Shaft	1	
56	W3/16" x 1/2"L	Socket Head Cap Screw	4	

DOWN FEED UNIT ASS'Y (R Type)

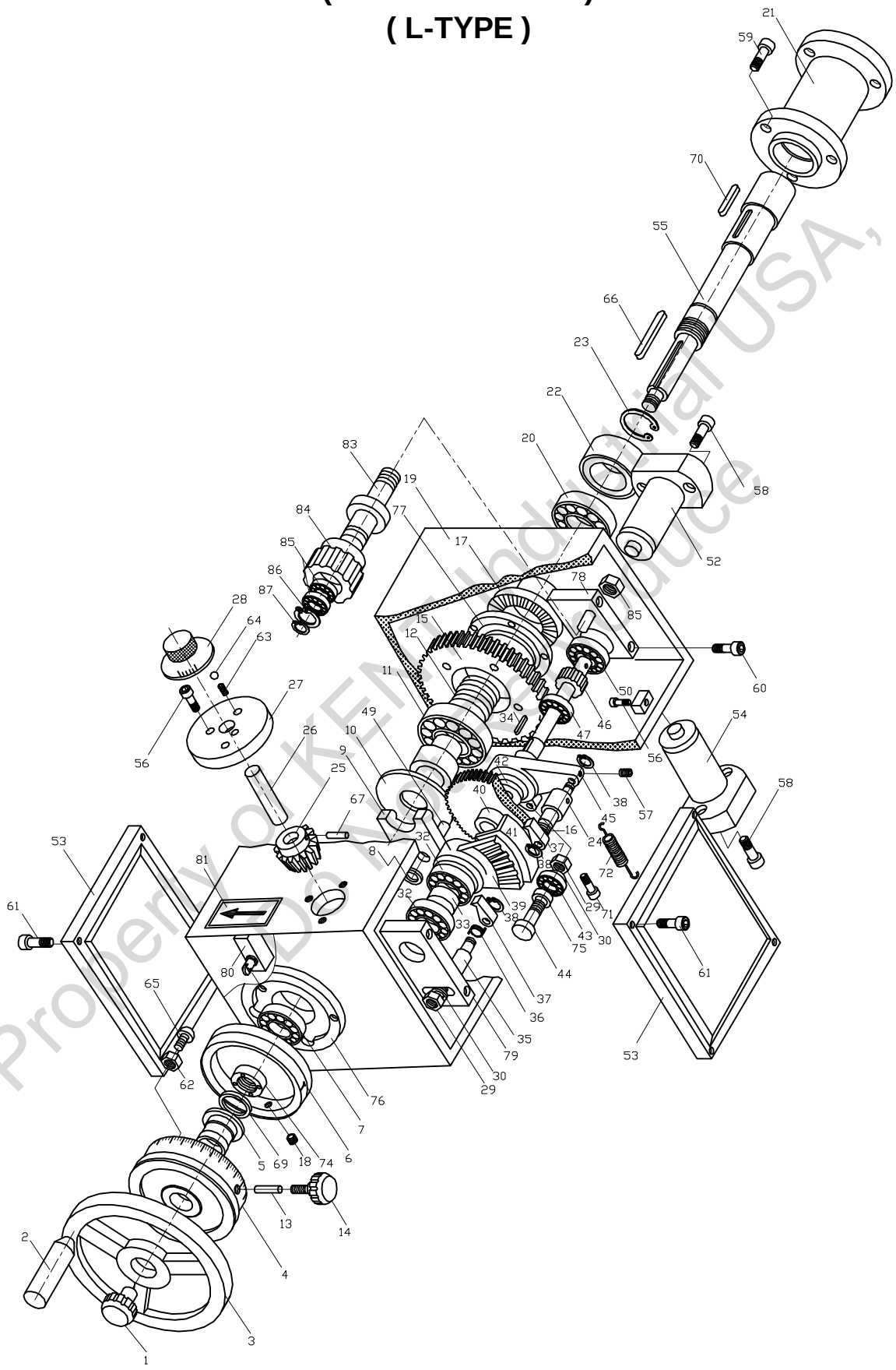
(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
57	W3/16" x 1/4"L	Set Screw	1	
58	W3/16" x 1"L	Socket Head Cap Screw	4	
59	W1/4" x 3/4"L	Socket Head Cap Screw	3	
60	W1/4" x 1 1/4"L	Socket Head Cap Screw	4	
61	W1/4" x 3/8"L	Socket Head Cap Screw	8	
62	W1/4"	Hexagonal Nut	1	
63	1020-N833-2	Spring	1	
64	Ø4	Steel Ball	1	
65	W1/4" x 5/8"L	Round Head Screw	1	
66	5 x 5 x40L	Key	1	
67	Ø3 x 30 L	Pin	1	
68				
69	1020-N805	Spacer	1	
70	7 x 7 x 15L	Key	1	
71	W3/16" x 3/8"L	Socket Head Cap Screw	1	
72	1020-N822-1	Spring	11	
73				
74	1020-N806	Nut	1	
75	1020-N824	Spacer	1	
76	1020-N808-1	Spacer	1	
77	1020-N813	Clutch	1	
78				
79				
80	LS7 (Z-15GQ22-B)	Limit Switch	1	
81				
82	1020-R	Rotate Indicate Name Plate	1	

DOWN FEED UNIT ASS'Y

(1020~1640 Series)

(L-TYPE)



DOWN FEED UNIT ASS'Y (L Type)

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-729	Cap Nut	1	
2	1020-728	Grip	1	
3	1020-714	Head Wheel	1	
4	1020-N801	Graduation Dial	1	
	1632-N801	Graduation Dial	1	1632
5	1020-N804	Collar	1	
6	1020-N803A	Graduation Dial Holder	1	
7	B6204Z	Bearing	1	
8	1020-N842	Spacer	1	
9	1020-N810	Holder	1	
10	1020-N811	Holder	1	
11	B6006Z	Bearing	1	
12	1020-N813-2	Spring	1	
13	Ø6 x 30L	Pin	1	
14	Ø5/16	Cap Screw	1	
15	1020-N812	Gear	1	
	1632-N812	Gear	1	1632
16	1020-N828	Spring	1	
17	1020-N814	Clutch	1	
18	W1/4" x 3/8"L	Set Screw	1	
19	1020-N802A	Gear Box	1	
20	B6005Z	Bearing	1	
21	1020-N845	Connect Bracket	1	
22	1020-N843	Spacer	1	
23	R-47	Snap Ring	1	
24	1020-N826	Shaft	1	
25	1020-N830	Bevel Gear	1	
26	1020-N831	Pin	1	
27	1020-N832	Plate	1	
28	1020-N833	Pre-Set Dial	1	

DOWN FEED UNIT ASS'Y (L Type)

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
29	W1/4"	Hexagonal Nut	2	
30	W1/4"	Spring Washer	2	
31	1020-N815	Bracket	1	
32	B6300Z	Bearing	3	
33	1020-N817	Spacer	1	
34	5 x 5 x 15L	Key	1	
35	1020-N815-1	Pin	1	
36	1020-N827	Spring	1	
37	1020-N825	Transmission Claw	1	
38	E7	Snap Ring	3	
39	1020-N818	Bevel Gear (Half)	1	
40	1020-N820	Ratchet Gear	1	
41	1020-N819	Slipper	1	
42	1020-N821	Spacer	1	
43	B608ZZ	Bearing	1	
44	1020-N823	Pin	1	
45	1020-N822	Transmission Arm	1	
46	1020-N816	Gear Shaft	1	
	1632-N816	Gear Shaft	1	1632
47	B6202	Bearing	1	
48		Gear	1	
49	W1/4" x 3"L	Socket Head Cap Screw	1	
50	B6201	Bearing	1	
51	1020-N829	Bracket	1	
52	1020-N834A	Cylinder Of Clutch	1	
53	1020-N809	Cover	2	
54	1020-N834B	Cylinder Of Feed	1	
55	1020-N807	Shaft	1	
56	W3/16" x 1/2"L	Socket Head Cap Screw	4	

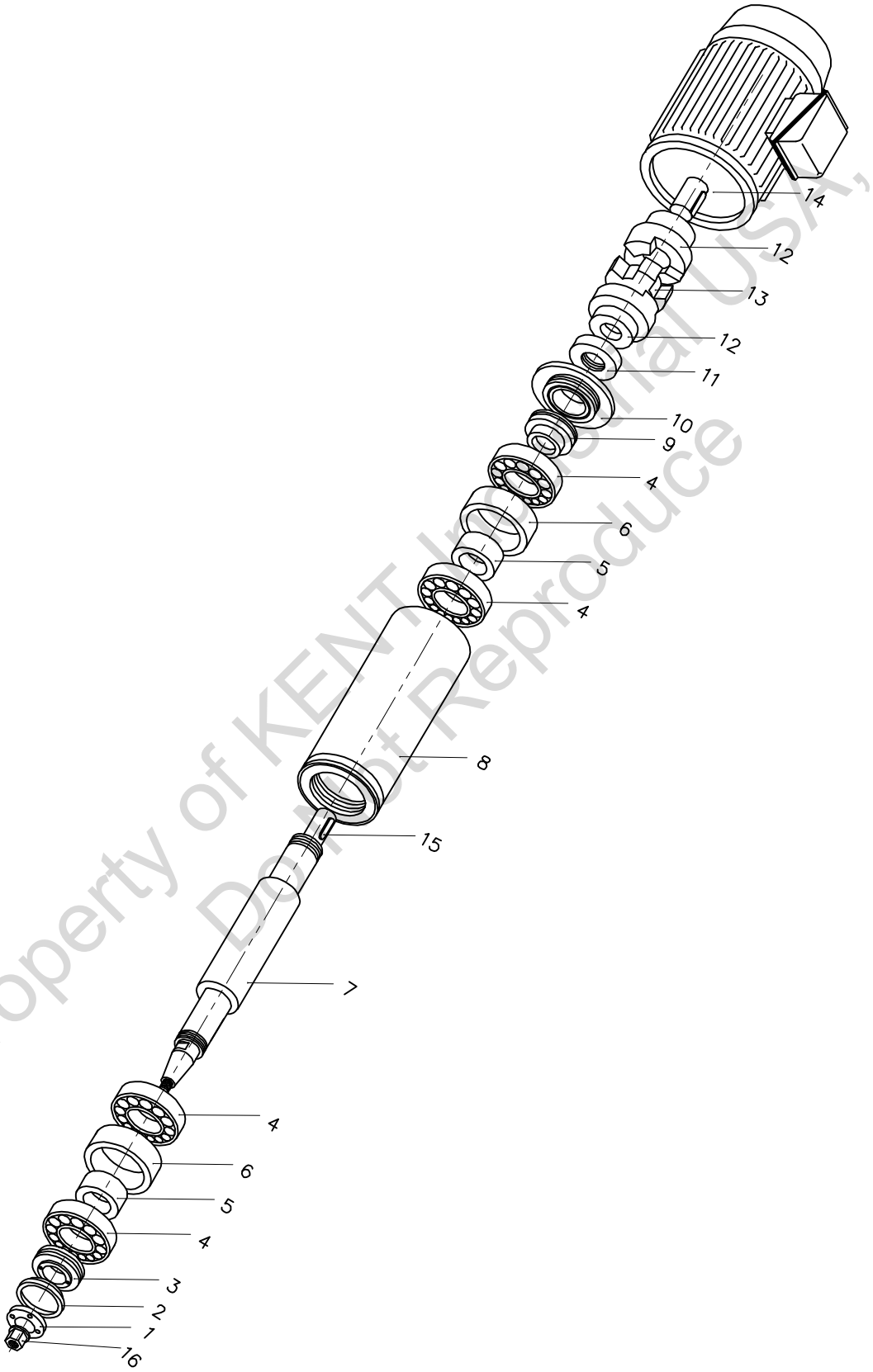
DOWN FEED UNIT ASS'Y (L Type)

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
57	W3/16" x 1/4"L	Set Screw	1	
58	W3/16" x 1"L	Socket Head Cap Screw	4	
59	W1/4" x 3/4"L	Socket Head Cap Screw	3	
60	W1/4" x 1 1/4"L	Socket Head Cap Screw	4	
61	W1/4" x 3/8"L	Socket Head Cap Screw	8	
62	W1/4"	Hexagonal Nut	1	
63	1020-N833-2	Spring	1	
64	Ø4	Steel Ball	1	
65	W1/4" x 5/8"L	Round Head Screw	1	
66	5 x 5 x40L	Key	1	
67	Ø3 x 30 L	Pin	1	
68				
69	1020-N805	Spacer	1	
70	7 x 7 x 15L	Key	1	
71	W3/16" x 3/8"L	Socket Head Cap Screw	1	
72	1020-N822-1	Spring	11	
73				
74	1020-N806	Nut	1	
75	1020-N824	Spacer	1	
76	1020-N808-1	Spacer	1	
77	1020-N813	Clutch	1	
78				
79				
80	LS7 (Z-15GQ22-B)	Limit Switch	1	
81	1020-L	Rotate Indicate Name Plate	1	
82				
83	1020-N862-L	Shaft	1	
84	1020-N861-L	Idle Wheel	1	
85	B6901	Bearing	2	
86	R24	Snap ring	1	
87	S-12	Snap ring	1	

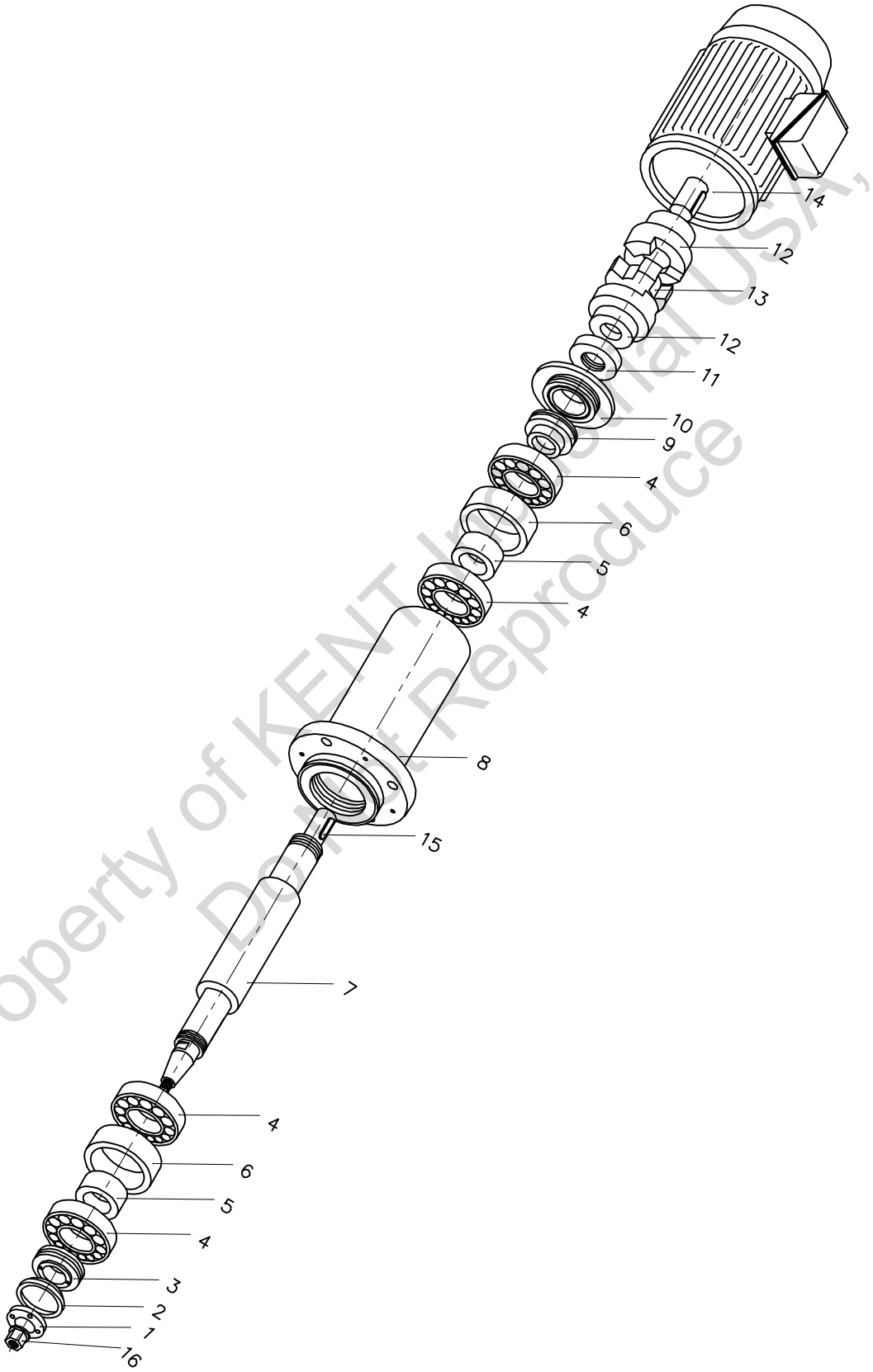
SPINDLE SET ASS'Y

(1020~1230 SERIES)



SPINDLE SET ASS'Y

(1632~1640 SERIES)



SPINDLE ASS'Y

(1020,N1224 SERIES)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-106	Spindle Nut	1	
2	1020-105	Spindle Cover	1	
3	1020-107	Spindle Cover Bush	1	
4	7206 CP4	Angular Contact Bearing	4	
5	1020-109	Spacer	2	
6	1020-108	Spacer	2	
7	1020-144	Spindle Shaft	1	
	N1224-144	Spindle Shaft	1	
8	1020-103	Spindle Housing	1	
	N1224-103	Spindle Housing	1	
9	1020-110	Spindle Cover Bush	1	
10	1020-128	Spindle Cover	1	
11	1020-127	Spindle Nut	1	
12	1020-111	Coupling	2	
13	1020-113	Rubber Coupling	1	
14	2HPx2P	Spindle Motor	1	
15	7 x 7 x 20	Key	1	1020
16	1020-149	Spindle Set Screw	1	1020
	1224-120A	Spindle Set Screw	1	1224

SPINDLE ASS'Y

(1224,1230 SERIES)

Index No.	Parts No.	Parts Name	QTY	Note
1	1224-106	Spindle Nut	1	
2	1224-105	Spindle Cover	1	
3	1224-107	Spindle Cover Bush	1	
4	7208 CP4	Angular Contact Bearing	4	
5	1224-109	Spacer	2	
6	1224-108	Spacer	2	
7	1224-104	Spindle Shaft	1	
8	1224-103	Spindle Housing	1	
9	1224-110	Spindle Cover Bush	1	
10	1224-128	Spindle Cover	1	
11	1224-127	Spindle Nut	1	
12	1224-111	Coupling	2	
13	1224-113	Rubber Coupling	1	
14	5HPx4P	Spindle Motor	1	
15	8 x 8 x 35	Key	1	
16	1224-120A	Spindle Set Screw	1	

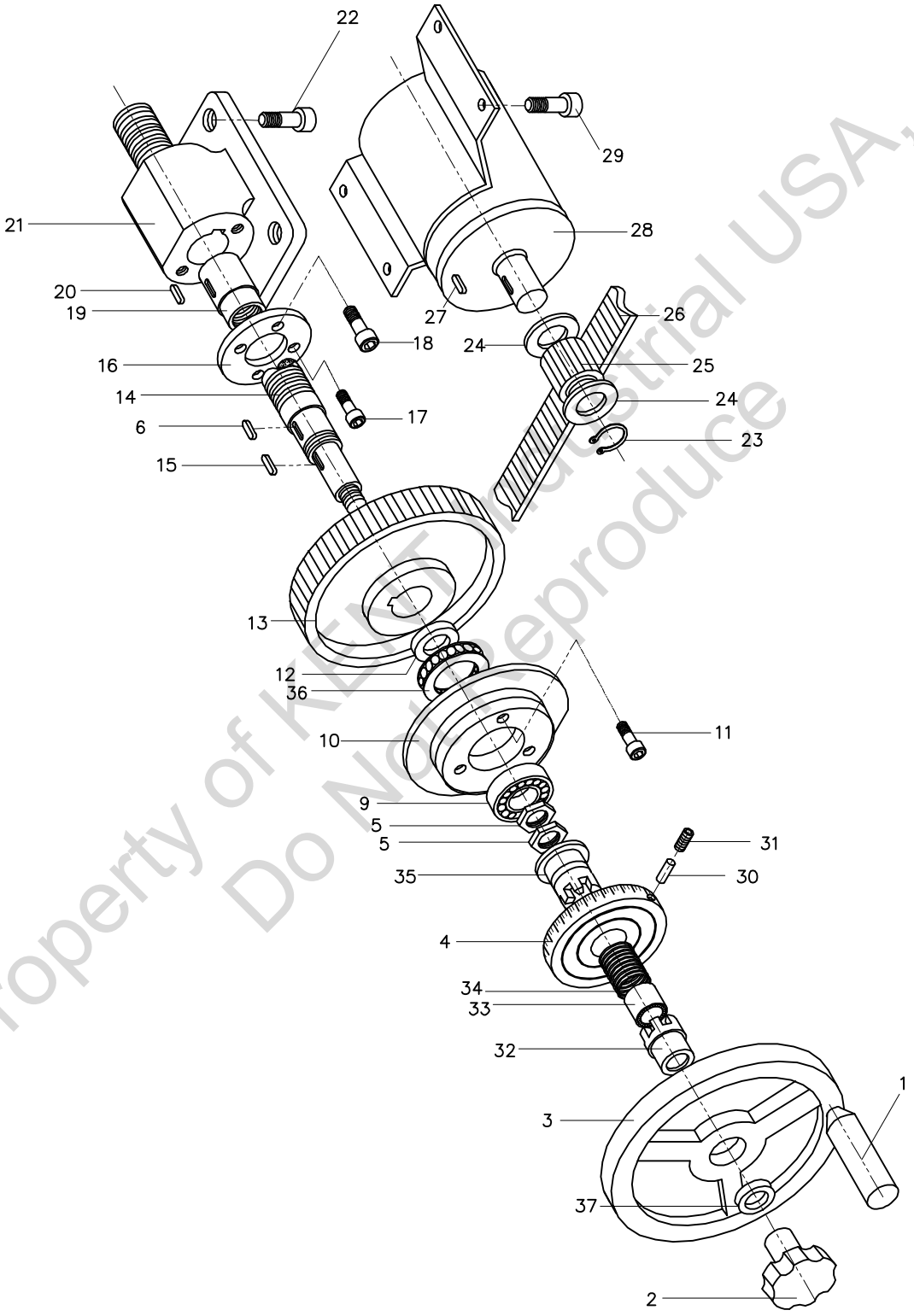
SPINDLE ASS'Y

(1632,1640 SERIES)

Index No.	Parts No.	Parts Name	QTY	Note
1	1632-112	Spindle Nut	1	
2	1632-105	Spindle Cover	1	
3	1632-106	Spindle Nut	1	
4	7209 CP4	Angular Contact Bearing	4	
5	1632-109	Spacer	2	
6	1632-108	Spacer	2	
7	1632-104	Spindle Shaft	1	
8	1632-103	Spindle Housing	1	
9	1632-107	Spindle Cover Bush	1	
10	1632-108	Spindle Cover	1	
11	1632-115	Spindle Nut	1	
12	1632-111	Coupling	2	
13	1632-113	Rubber Coupling	1	
14	7.5HPx4P	Spindle Motor	1	
15	10 x 10 x 35	Key	1	
16	1632-120	Spindle Nut	1	

CROSS FEED ASS'Y

(1020~1640 SERIES)



CROSS FEED ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-728	Grip	1	
2	1020-729	Cap Nut	1	
3	1020-714	Hand wheel	1	
4	1020-406	Graduation Dial	1	
5	1020-410	Hexagonal Nut	2	
6	5x5x30L	Key	1	
7				
8				
9	5204ZZ	Bearing	1	
10	1020-407	Graduation Dial Holder	1	
11	1/4"x1"L	Socket Head Cap Screw	3	
12	1020-603	Spacer	1	
13	1020-601	Timing Belt Pulley (Large)	1	
14	1020-402	Cross feed Lead screw	1	
15	5x5x30L	Key	1	
16	1020-405	Lead screw Backlash Adjuster	1	
17	5/16"x1/2"L	Socket Head Cap Screw	2	

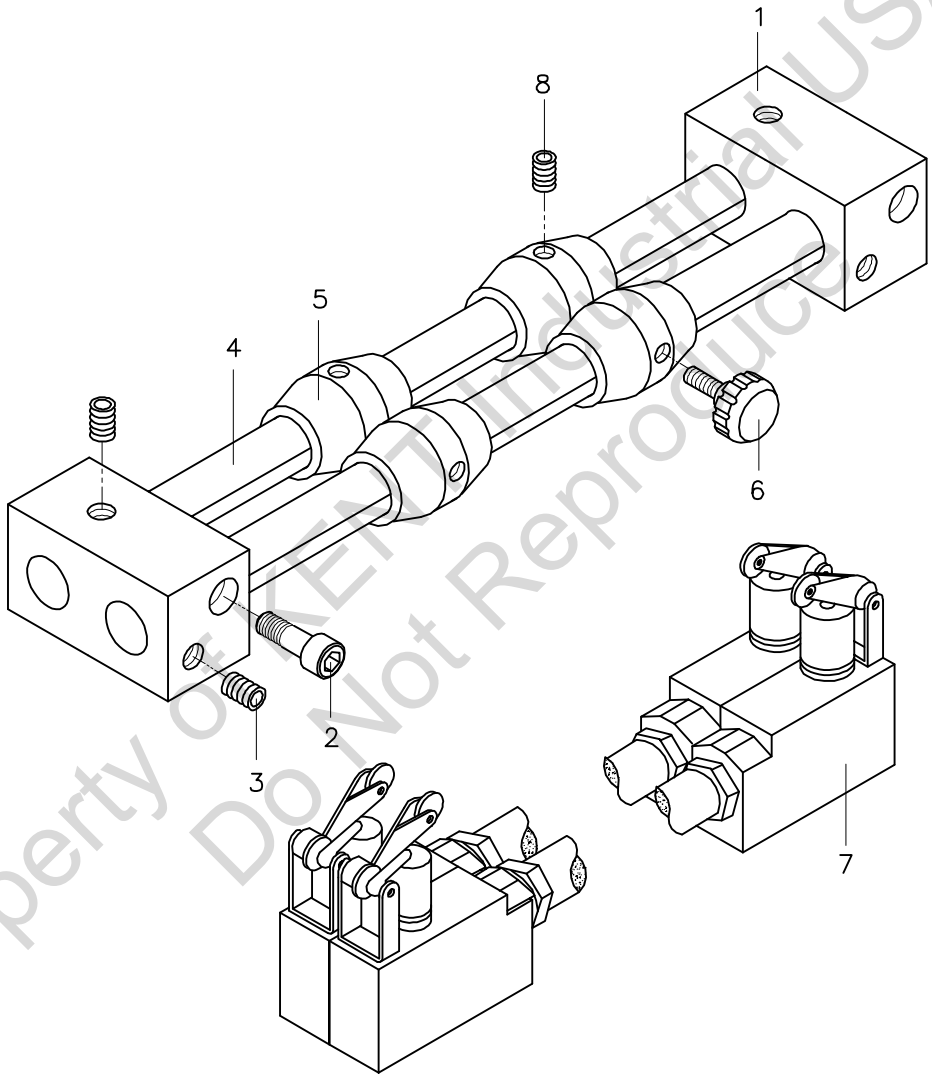
CROSS FEED ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
18	5/16"x3/4"L	Socket Head Cap Screw	2	
19	1020-404	Lead screw Nut	1	
20	5x5x20L	Key	1	
21	1020-403	Lead screw Nut Base	1	
22	3/8"x2"L	Socket Head Cap Screw	4	
23	S-11	Snap Ring	1	
24	1020-604	Spacer	2	
25	1020-602	Timing Belt Pulley (Small)	1	
26	187L075	Timing Belt	1	
27	4x4x20L	Key	1	
28	1/5HPx6P	Cross feed Motor	1	
29	1/4"x3/4"L	Socket Head Cap Screw	4	
30	Ø5x10L	Pin	1	
31	1/4"x15L	Set Screw	1	
32	1224-422A	Clutch B	1	
33	TA1715	Bearing	1	
34	1224-425-1	Spring	1	
35	1224-424A	Clutch A	1	
36	51104	Bearing	1	

CROSSFEED CONTROL LIMIT SWITCH ASS'Y

(1020~1640 SERIES)



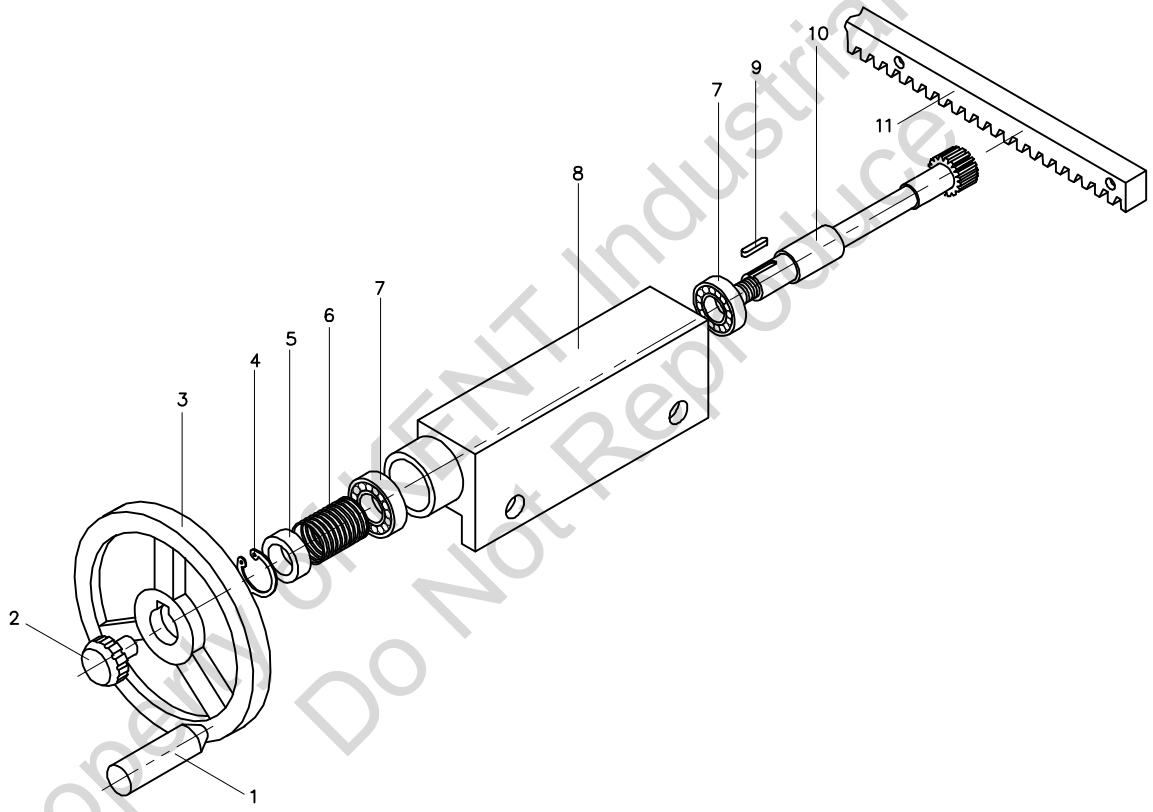
CROSS FEED CONTROL LIMIT SWITCH ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-609-1	Mounting Block	2	
2	W1/4" x 2-1/2"L	Socket Head Cap Screw	2	
3	W1/4" x 5/8"L	Set Screw	4	
4	1020-607	Pad Rod	2	
	1224-607	Pad Rod	2	
	1632-607	Pad Rod	2	
5	1020-608	Dog	4	
6	1020-N808	Set Screw	2	
7	ZE-NA2-2	Limit Switch	4	
8	W1/4" x 1/4"L	Set Screw	2	

LONGITUDINAL HAND FEED ASS'Y

(1020~1640 SERIES)



LONGITUDINAL HAND FEED ASS'Y

(1020 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-728	Grip	1	
2	1020-729	Cap Nut	1	
3	1020-714	Hand wheel	1	
4	S-17	Snap Ring	1	
5	1020-623	Bushing	1	
6	1020-626	Spring	1	
7	6003ZZ	Ball Bearing	2	
8	1020-621	Frame	1	
9	5 x 5 x 15L	Key	1	
10	1020-622	Pinion Shaft	1	
11	1020-310	Gear Rack	1	

LONGITUDINAL HAND FEED ASS'Y

(N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-728	Grip	1	
2	1020-729	Cap Nut	1	
3	1020-714	Hand wheel	1	
4	S-17	Snap Ring	1	
5	1020-623	Bushing	1	
6	1020-626	Spring	1	
7	6003ZZ	Ball Bearing	2	
8	1224-621	Frame	1	
9	5 x 5 x 15L	Key	1	
10	1224-622	Pinion Shaft	1	
11	1224-310	Gear Rack	1	
	1230-310	Gear Rack	1	

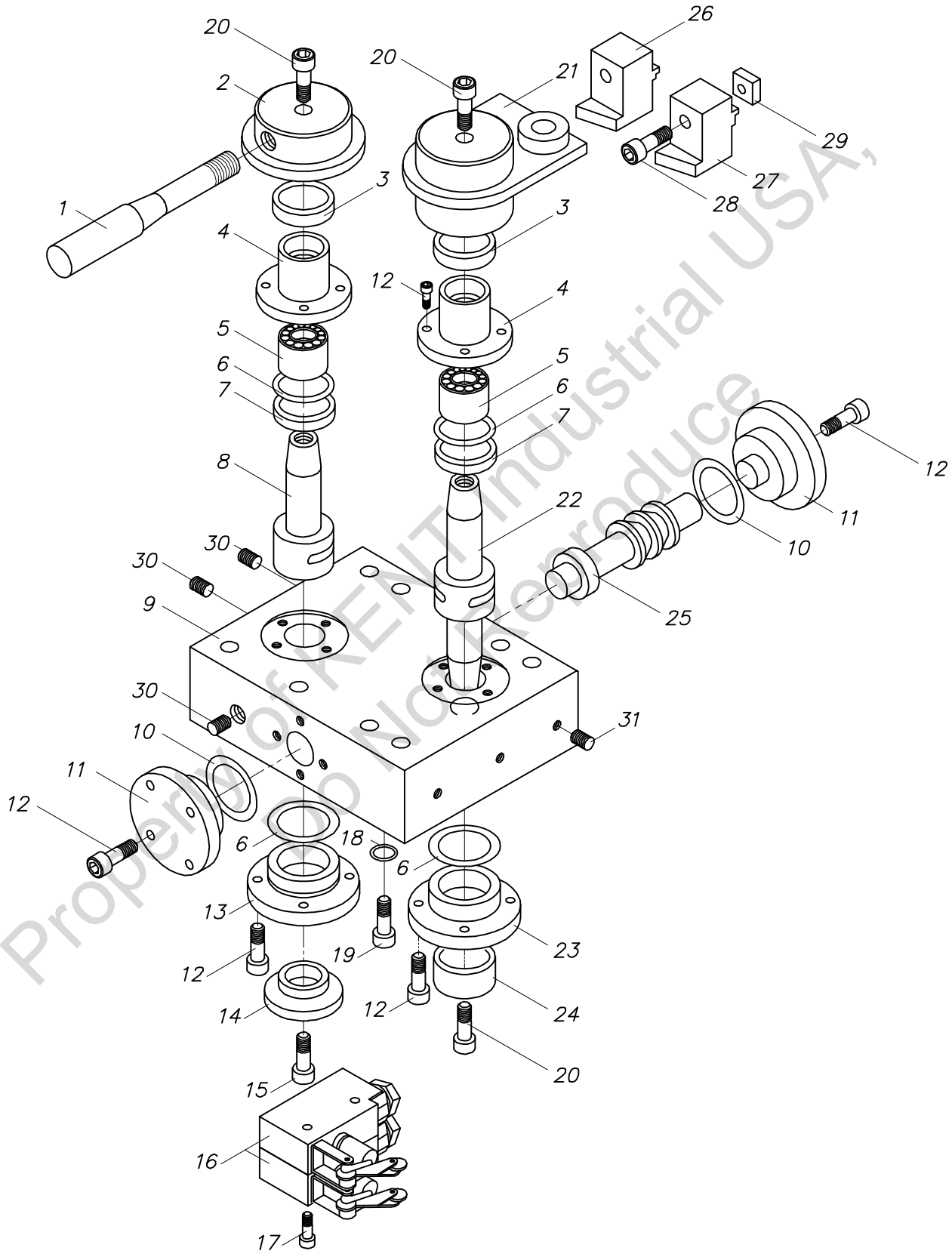
LONGITUDINAL HAND FEED ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-728	Grip	1	
2	1020-729	Cap Nut	1	
3	1020-714	Hand wheel	1	
4	S-17	Snap Ring	1	
5	1020-623	Bushing	1	
6	1020-626	Spring	1	
7	6003ZZ	Ball Bearing	2	
8	1632-621	Frame	1	
	1640-621	Frame	1	
9	5 x 5 x 15L	Key	1	
10	1632-622	Pinion Shaft	1	
11	1632-310	Gear Rack	1	
	1640-310	Gear Rack	1	

VALVE ASS'Y

(1020~1640 SERIES)



VALVE ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	S2334	Flow Control Lever	1	
2	S2333	Flow Control Knob	1	
3	DH14 x 24 x 6	Dust Seal	2	
4	S2615	Upper Cover	2	
5	CB1512	DU Bush	2	
6	28.25 x 2.62	O-Ring	4	
	26.7 x 2.62 (1632series)	O-Ring	4	
7	UN15	U-Packing	3	
	VP15238 (1632series)	U-Packing	3	
8	S2612	Flow Control Shaft	1	
9	S2611	Flow Control Valve Body	1	
10	P21	O-Ring	2	
	P25 (1224&1632series)	O-Ring	2	
11	S2619	Side Cover	1	
12	W3/16" x 5/8"L	Socket Head Cap Screw	24	
13	S2614	Bottom Cover	1	
14	S2332	Limit Switch Fixed Seat	1	
15	W5/16" x 1"L	Socket Head Cap Screw	2	
16	ZE-ZA2-2	Limit Switch	1	
	Z-15GW2277B	Limit Switch	1	

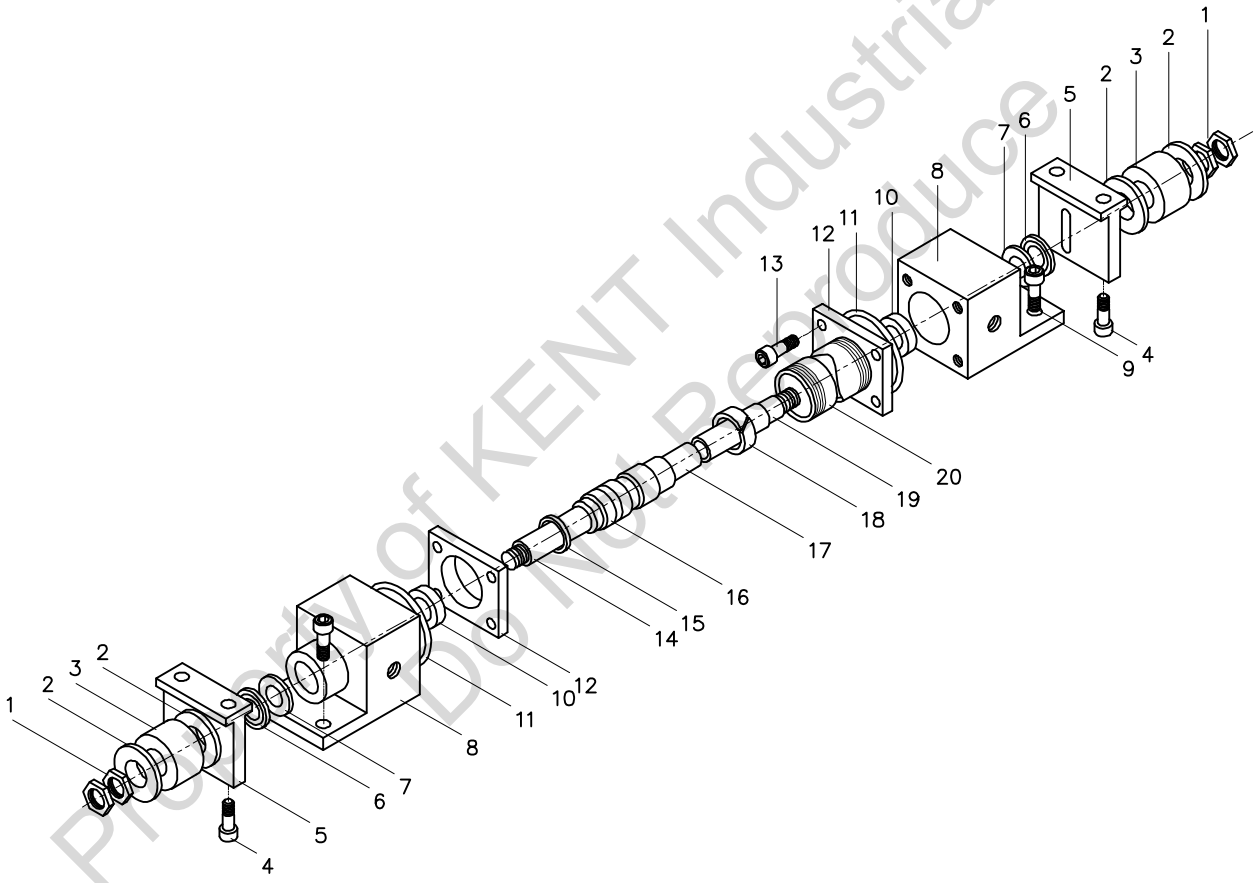
VALVE ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
17	M4 x 2-1/2"L	Round Head Cap Screw	2	
18	P8	O-Ring	4	
19	S2618	Adjusting Screw	1	
20	W1/4" x 3/4"L	Socket Head Cap Screw	3	
21	S2335	Direction Control Arm	1	
22	S2616	Direction Control Shaft	1	
23	S2617	Bottom Cover	1	
24	1020-605	Cam	1	
	1632-605 (1632series)	Cam	1	
25	S2620	Pivot Piston	1	
26	1020-617	Dog	1	
27	1020-618	Dog	2	
28	W5/16" x 1/4"L	Socket Head Cap Screw	2	
29	1020-312	Nut	2	
30	W1/8PT	Set Screw	4	
31	W1/4" x 5/16"L	Set Screw	4	
32	W3/8" x 30L x P24T	Square head Adjusting Screw	3	
33	P8	O-Ring	3	

HYDRAULIC CYLINDER ASS'Y

(1020 ~ 1640 SERIES)



HYDRAULIC CYLINDER ASS'Y

(1020, N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	M10 x P1.25	Hexagonal Nut	4	
2	1020-629	Washer	4	
3	1020-628	Rubber pad	2	
4	W3/8" x 1-3/4"L	Socket Head Cap Screw	4	
5	1020-619	Drawing Seat	2	
6	LBH 20x28x4.5x6	Dust Seal	2	
7	USH 20x28x5	U-Packing	2	
8	1020-A4-06	End Cover	2	
9	W5/16" x 3/4"L	Socket Head Cap Screw	4	
10	MB2012	Du Bush	2	
11	G30	O-Ring	2	
12	1020-A4-08	Fixed Plate	2	
13	W1/4" x 1"L	Socket Head Cap Screw	4	
14	1020-A3-01	Piston Rod	1	
15	P24	O-Ring	1	
16	1020-A4-09	Piston A	1	
17	1020-A4-09-1	Piston B	1	
18	Ø25 x Ø30 x 9.7W	Slide Ring	1	
19	P16	O-Ring	1	
20	1020-A3-02	Cylinder	1	

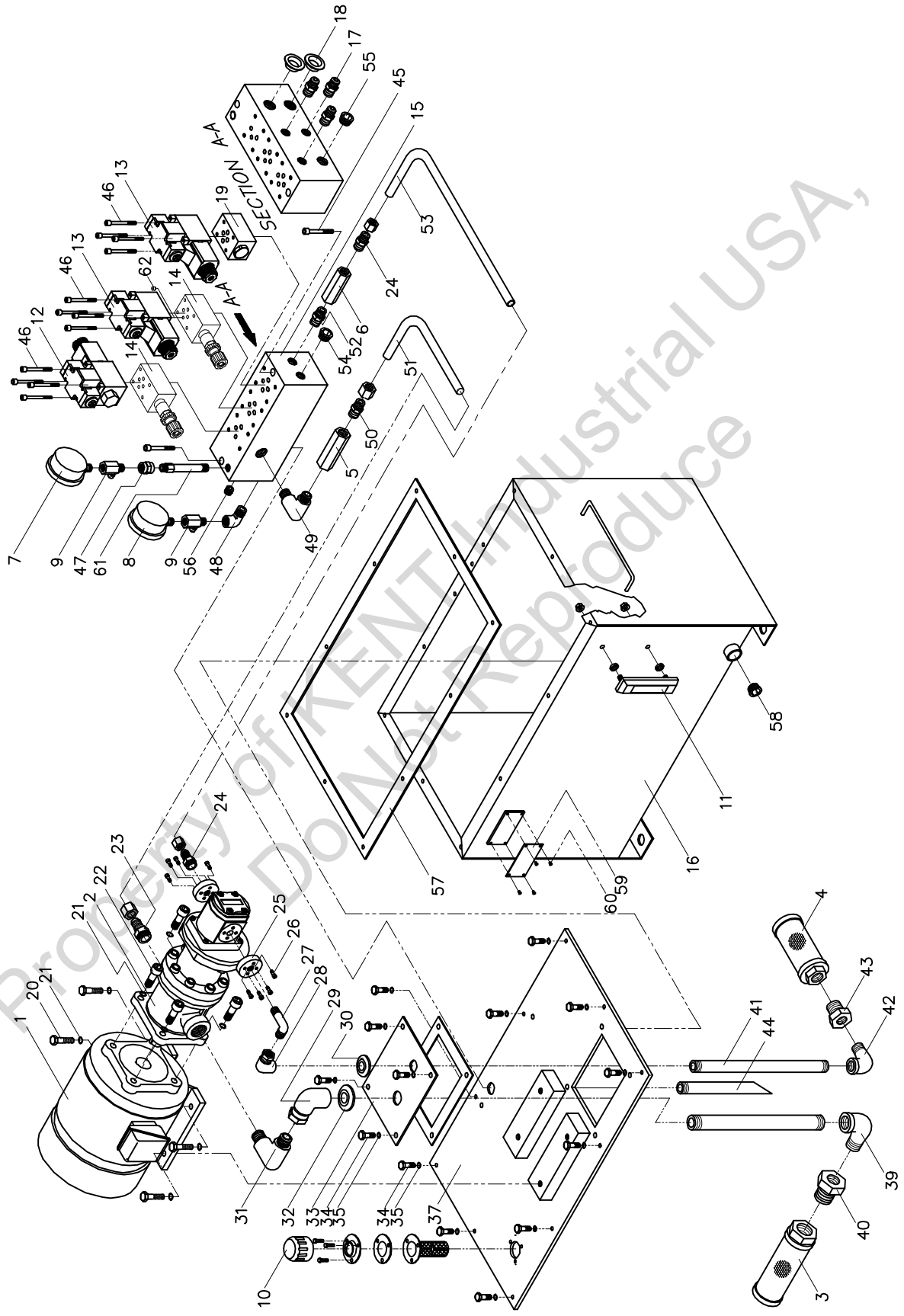
HYDRAULIC CYLINDER ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	M10 x P1.25	Hexagonal Nut	4	
2	1632-629	Washer	4	
3	1632-628	Rubber pad	2	
4	W3/8" x 1-3/4"L	Socket Head Cap Screw	4	
5	1632-619	Drawing Seat	2	
6	LBH 25x33x4.5x6	Dust Seal	2	
7	USH 25x33x5	U-Packing	2	
8	1632-A4-06	End Cover	2	
9	W5/16" x 3/4"L	Socket Head Cap Screw	4	
10	1632-A3-03	Dust Bush	2	
11	G35	O-Ring	2	
12	1632-A4-08	Fixed Plate	2	
13	W1/4" x 1"L	Socket Head Cap Screw	4	
14	1632-A3-01	Piston Rod	1	
15	P34	O-Ring	1	
16	1632-A4-09	Piston A	1	
17	1632-A4-09-1	Piston B	1	
18	Ø35 x Ø40 x 9.7W	Slide Ring	1	
19	P21	O-Ring	1	
20	1632-A3-02	Cylinder	1	

HYDRAULIC PUMP UNIT ASS'Y

(1020~1640 SERIES)



HYDRAULIC PUMP UNIT ASS'Y

(1020, N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	2HP x 6P	Motor	1	
2	VPNCG-F12/4,3-30	Pump (1020 Series)	1	
	VPNCG-F17/4,3-30	Pump (1224 Series)	1	
3	SS-1-100	Oil Filter	1	
4	PS-06	Oil Filter	1	
5	CI-T04-05	Check Valve	1	
6	CI-T03-05	Check Valve	1	
7	2-1/2" x 70KG	Pressure Gauge	1	
8	2-1/2" x 35KG	Pressure Gauge	1	
9	1/4"PT	Gauge Cook	2	
10	AB-1163	Cover Of Hydraulic Oil Filler	1	
11	KS-5	Oil Level Indicator	1	
12	SWH-G02-C6B-A100-10	Solenoid Valve	1	
13	SWH-G02-B2S-A100-10	Solenoid Valve	2	
14	MRF-02P-O-K	Modular Relief Valve	2	
15	EM-165A	Combination border	1	
16	70T(560x500x460)	Hydraulic Tank	1	
17	1/4"PT x 1/4PS	Connector	3	
18	3/8"	Plastic Plug	2	
19	MC-02P-50	Check Valve	1	
20	M10 x 30L	Hexagonal Head Screw	4	
21	SWM10	Spring Washer	8	
22	M10 x 30:L	Socket Head Cap Screw	4	
23	3/4"PT x 3/8"PS	Connector	1	
24	3/8"PT x 1/4"PS	Connector	2	
25	TFP4.3	Flange	2	
26	M5 x 20L	Socket Head Cap Screw	8	
27	3/8"PT x 1/2"PS	Connector (90° Elbow)	1	
28	1/2"PT x 1/2"PS (Female)	Connector (90° Elbow)	1	
29	3/4"PT x 1/2"PS (Female)	Connector (90° Elbow)	1	
30	ST-04	Dust Rubber	1	
31	1"PT x 3/4"PS	Connector (90° Elbow)	1	

HYDRAULIC PUMP UNIT ASS'Y

(1020, N1224, 1224, 1230 Series)

Index No.	Parts No.	Parts Name	QTY	Note
32	ST-04	Splash Guard (Frame)	1	
33	CP-A01	Splash Guard (Plate)	1	
34	M8 x 20l	Table	14	
35	SWM8	Indication Plate	14	
36	SS-A01	Saddle	1	
37	CT-A01	Cover Of Tank	1	
38	3/4"PT x 420L	Connector	1	
39	3/4"PT (F) x 3/4"PT (M)	Connector (90° Elbow)	2	
40	3/4"PT (F) x 1"PT	Bushing	1	
41	1/2"PT x 420L	Zinc-Plate Pipe	1	
42	1/2"PT (F) x 1/2"PT (M)	Connector (90° Elbow)	2	
43	1/2"PT x 210L	Bushing	1	
44	1/2"PT (F) x 3/4"PT (M)	Zinc-Plate Pipe	1	
45	M6 x 65L	Socket Head Cap Screw	2	
46	M5 x 85L	Socket Head Cap Screw	1	
47	1/4"PT x 1/4"PT	Socket	1	
48	1/4"PT (F) x 1/4"PT (M)	Connector (90° Elbow)	2	
49	1/2"PT x 1/2"PT	Connector (90° Elbow)	12	
50	1/2"PT x 3/8"PS	Connector	1	
51	3/8"PS x 3/8"PS x 290L	High Pressure Tube	1	
52	3/8"PT x 3/8"PT	Connector	1	
53	1/4"PS x 1/4"PS x 400L	High Pressure Tube	1	
54	3/8"PT	PT Plug	1	
55	1/4"PT	PT Plug	1	
56	1/16"PT	PT Plug	1	
57	SS-A02	Asbestos Seal	1	
58	1/2"PT	PT Plug	1	
59	NP-A01	Name Plate	1	
60	Ø2 x 6L	Rivet	4	
61	1/4"PT x 1/4"PT	Connector Of Pressure Gauge	1	
62	Ø1.4	Throttle Plug	1	

HYDRAULIC PUMP UNIT ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	3HP x 6P(50T)	Motor	1	
2	VPNCG-F23/4.3-30	Pump	1	
3	SS-1-100	Oil Filter	1	
4	PS-06	Oil Filter	1	
5	CI-T04-05	Check Valve	1	
6	CI-T03-05	Check Valve	1	
7	2-1/2" x 70KG	Pressure Gauge	1	
8	2-1/2" x 35KG	Pressure Gauge	1	
9	1/4"PT	Gauge Cock	2	
10	AB-1163	Cover Of Hydraulic Oil Filler	1	
11	KS-5	Oil Level Indicator	1	
12	SWH-G02-C6B-A110-10	Solenoid Valve	1	
13	SWH-G02-B2S-A110-10	Solenoid Valve	2	
14	MRF-02P-0-K	Modular Relief Valve	2	
15	EM-165A	Combination Border	1	
16	70T(800x550x340)	Hydraulic Tank	1	
17	1/4"PT x 1/4"PS	Connector	3	
18	3/8"PT	Plastic Plug	2	
19	MC-02P-50	Check Valve	1	
20	M10 x 30L	Hexagonal Head Screw	4	
21	SWM10	Spring Washer	8	
22	M10 x 30L	Socket Head Cap Screw	4	
23	3/4"PT x Ø15mm	LE Connector	1	
24	3/8"PT x Ø12mm	LE Connector	2	
25	TFP4.3	Flange	2	
26	M5 x 20L	Socket Head Cap Screw	8	
27	3/8"PT x 1/2"PS	Connector (90° Elbow)	1	
28	1/2"PT x 1/2"PS (Female)	Connector (90° Elbow)	1	
29	3/4"PT x 1/2"PS (Female)	Connector (90° Elbow)	1	
30	ST-04	Dust Rubber	1	
31	1"PT x 3/4"PS	Connector (90° Elbow)	1	

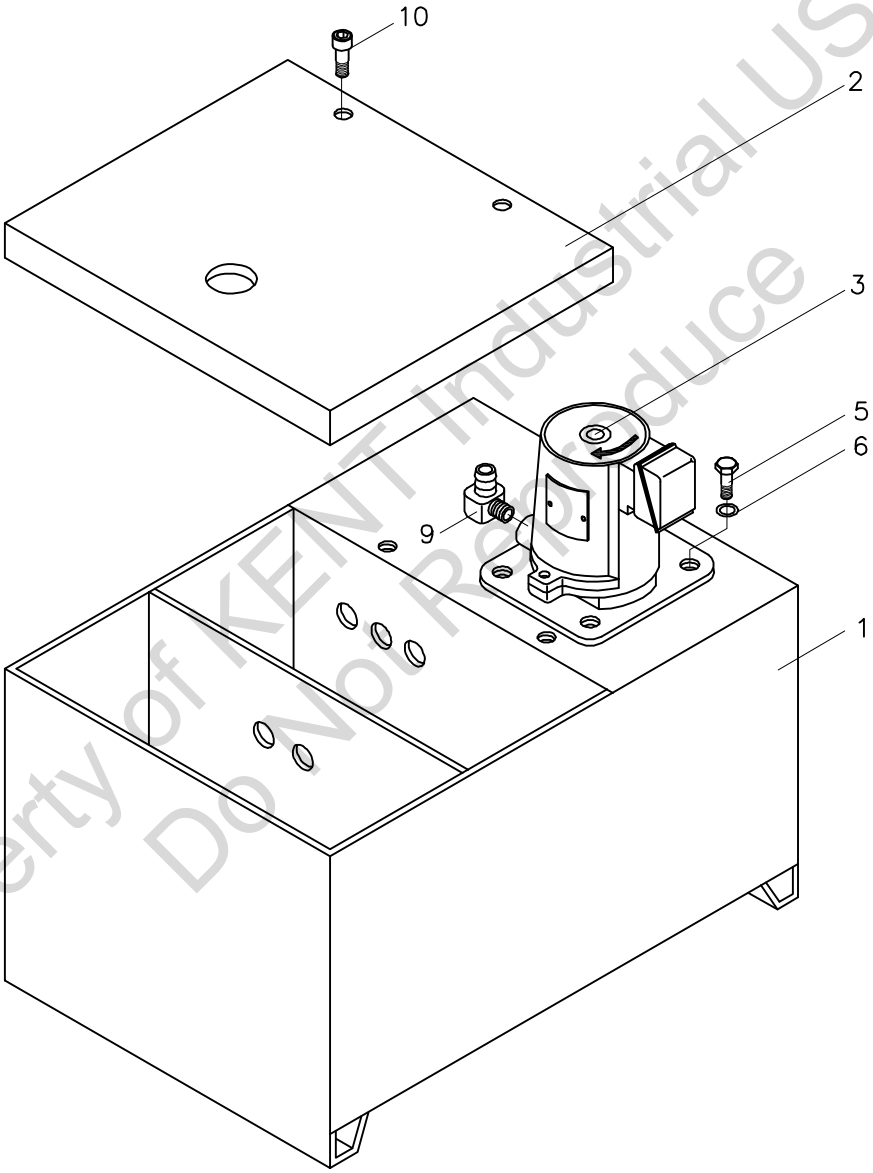
HYDRAULIC PUMP UNIT ASS'Y

(1632, 1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
32	ST-06	Dust Rubber	1	
33	CP-D01	Cover	1	
34	M8 x 20L	Hexagonal Head Screw	14	
35	SWM8	Spring Washer	14	
36	SS-D01	Asbestos Seal	1	
37	CT-D01	Cover Of Tank	1	
38	3/4"PT x 360L	Connector	1	
39	3/4"PT (F) x 3/4"PT (M)	Connector (90° Elbow)	2	
40	3/4"PT (F) x 1"PT	Bushing	1	
41	1/2"PT x 360L	Zinc-Plate Pipe	1	
42	1/2"PT (F) x 1/2"PT (M)	Connector (90° Elbow)	2	
43	1/2"PT x 210L	Bushing	1	
44	1/2"PT (F) x 3/4"PT (M)	Zinc-Plate Pipe	1	
45	M6 x 65L	Socket Head Cap Screw	2	
46	M5 x 85L	Socket Head Cap Screw	12	
47	1/4"PT x 1/4"PT	Socket	1	
48	1/4"PT (F) x 1/4"PT (M)	Connector (90° Elbow)	1	
49	1/2"PT x 1/2"PT	Connector (90° Elbow)	1	
50	1/2"PT x Ø 50mm	LE Connector	1	
51	Ø15mm x 2.0t	OST2 Pipe	1	
52	3/8"PT x Ø15mm	LE Connector	1	
53	Ø15mm x 1.5t	OST2 Pipe	1	
54	3/8"PT	PT Plug	2	
55	1/4"PT	PT Plug	1	
56	1/16"PT	PT Plug	1	
57	SS-D02	Asbestos Seal	1	
58	1/2"PT	PT Plug	1	
59	NP-D01	Name Plate	1	
60	Ø2 x 6L	Rivet	1	
61	1/4"PT x 1/4"PT	Connector Of Pressure Gauge	4	
62	Ø1.4	Throttle Plug	1	

COOLANT SYSTEM ASS'Y

(1020~1640 SERIES)



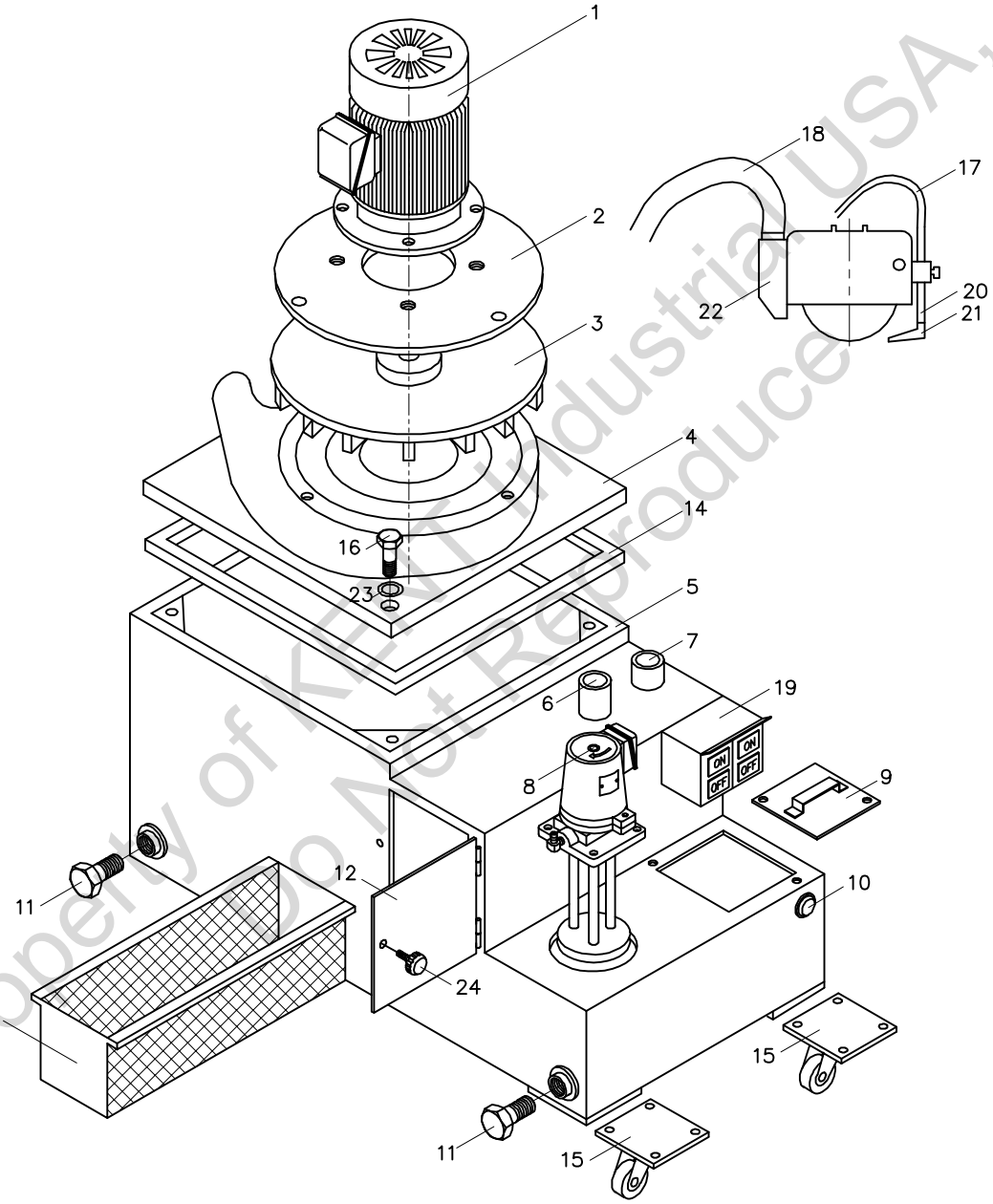
COOLANT SYSTEM ASS'Y

(1020~1640 SERIES)

Index No.	Parts No.	Parts Name	QTY	Note
1	1020-780	Coolant Tank	1	
2	1020-781	Motor Fixed Plate	1	
3	1/8"HP x 2P	Coolant Pump	1	
4	1/2"	90° Elbow	1	
5	W1/4" x 3/4"L	Hexagonal Head Screw	4	
6	1/4"	Washer	4	
7	M6 x 7L	Socket Head Cap Screw	2	

DUST-SUCTION COOLING SYSTEM ASS'Y

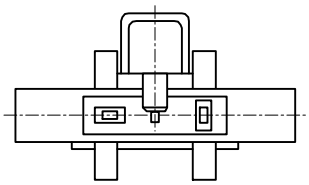
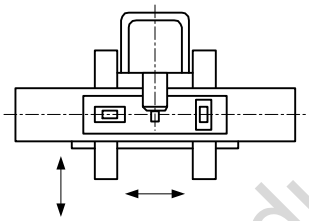
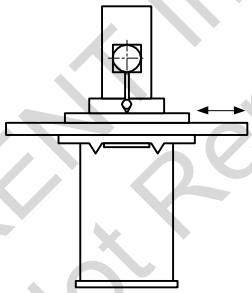
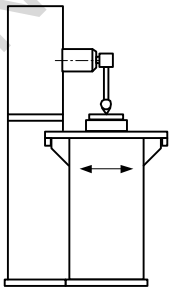
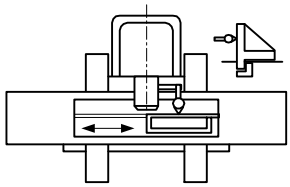
(1020~1640 SERIES)

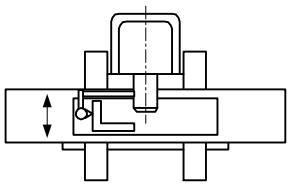
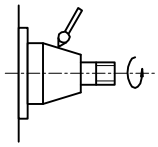
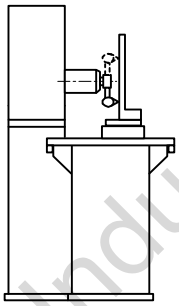
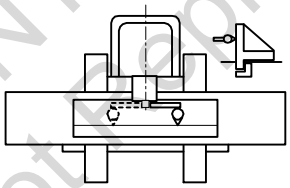
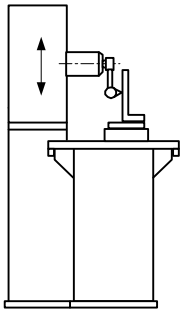


DUST-SUCTION COOLING SYSTEM ASS'Y

(1020~1640 Series)

Index No.	Parts No.	Parts Name	QTY	Note
1	1/2HP x 2P	Motor	1	
2	1020-763	Motor Fixed Plate	1	
3	1020-762	Suction Fan	1	
4	1020-761	Upper Cover	1	
5	1020-760	Tank	1	
6	1020-768	Suction Hose Connector	1	
7	1020-769	Coolant Hose Connector	1	
8	1/8HP x 2P	Coolant Pump	1	
9	1020-764	Cover	1	
10	SCI	Coolant Indicator	1	
11	W1"	Plug	1	
12	1020-765	Filter Cover	1	
13	1020-766	Filter	1	
14	1020-767	Cover Packing	1	
15	SRB	Roller Bracket	4	
16	W3/8" x 1"L	Hexagonal Head Screw	4	
17	SCH	Coolant Hose	1	
18	SSH	Suction Hose	1	
19	SS	On-Off Switch	1	
20	1020-770	Coolant Pipe	1	
21	1020-708	Coolant Nozzle	1	
22	1020-771	Dust-Collector	1	

No.	Chock taken	Illustration	Permissible Erros
1	a) Level longitudinally (spirit level) b) Level across (spirit level)		a) 0.02 Per 1000 mm b) 0.02 Per 1000 mm
2	Straightness of table movement. a) Longitudinally b) Cross traverse		a) 0.02 per 1000 mm b) 0.02 per 1000 mm
3	Rise and fall of table in Longitudinal traverse		0.01 Per 1000 mm
4	Table surface parallelity To its cross traverse		0.01 Per table width
5	Parallellty of clamping Slots to table traverse		0.015 Per 1000 mm

6	Clamping slots at right angles to table cross traverse		0.02 Per 300 mm
7	True running of taper of grinding spindle		0.01 mm
8	Parallelity of grinding spindle to table (transition test with 100mm arm)		0.02 Per 300 mm
9	Grinding spindle at right angles to clamping slots (transition test with 200mm arm)		0.02 Per 300 mm
10	Vertical traverse of grinding spindle carrier at right angles to table in cross plane of machine		0.01 Per 100 mm