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* We following a policy of continous improvement of all our products, reserve the right to change specification, mechanics, or designs at any time without notice or obligation.

PRECISION SURFACE GRINDING MACHINE

MODEL : SGS-2448AH SGS-2448AHD

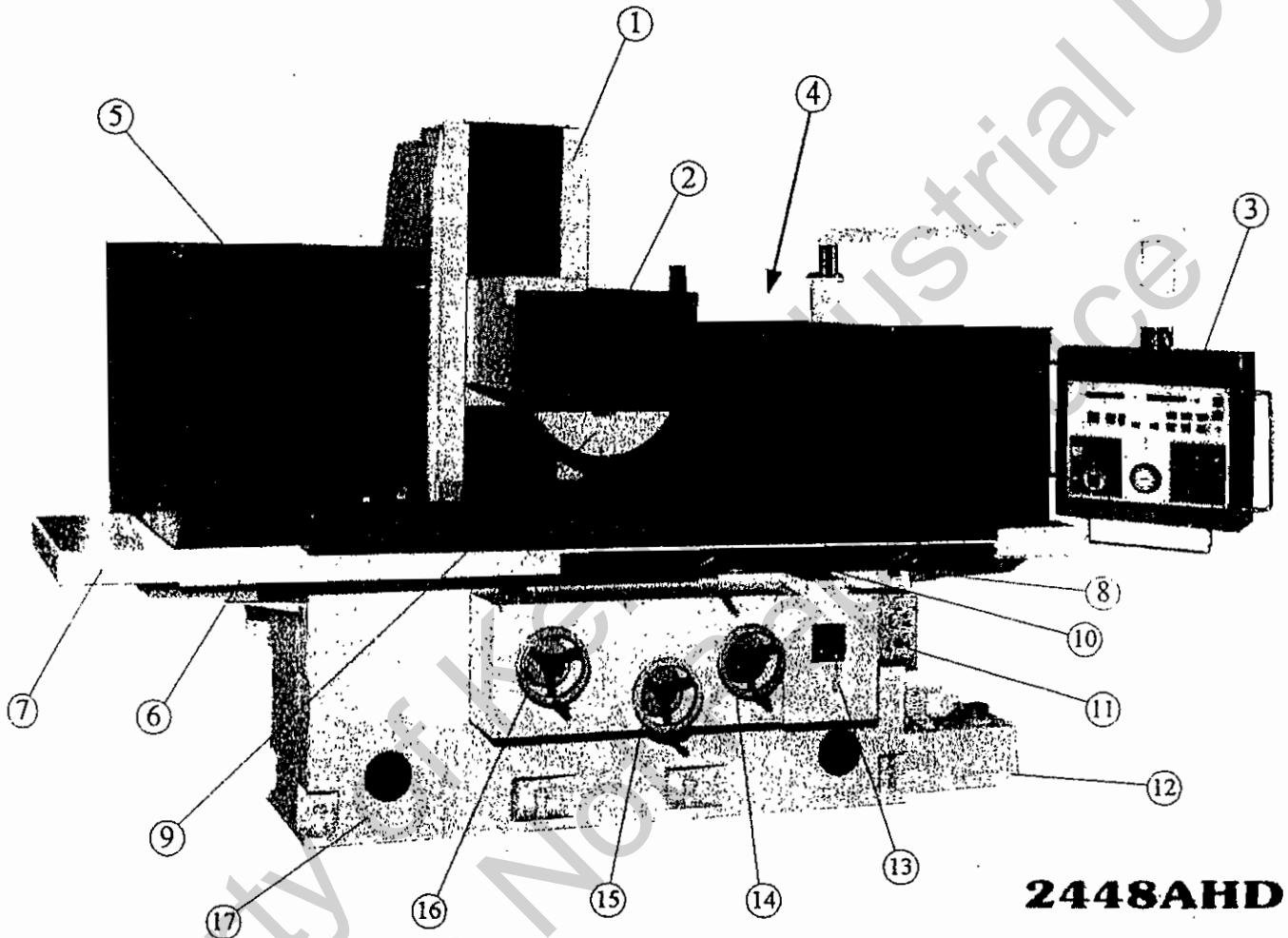
SGS-2448AH SGS-2448AHD

This series machine is hydraulic and electric combined precision machine tool. The operator is asked to know general operational methods of precision machines and special features of this machine.

So that the machine can be machined correctly.

When the machine is wrong in machining, please advise us immediately with model number, serial number, and manufacturing date of the machine.

2448/2480 SERIES CONTOUR AND NOMENCLATURE



- 1.UP COLUMN
- 3.PENDANT CONTROL PANEL(Rem.1)
- 5.SPLASH GUARD SET
- 7.DUST COVER OF TABLE (Rem.3)
- 9.WHEEL
- 11.ELE.MAG.CHUCK: CONTROLLER(Rem.4)
- 13.FLOW CONTROL LEVER
- 15.HANDWHEEL (CROSS-FEED)
- 17.BASE

- 2.WHEEL GUARD
- 4.ELECTRIC CABINET (Rem.2)
- 6.TABLE
- 8.LONGITUDINAL TRAVEL STROKE ADJUSTER
- 10.DIRECTION CHANGE ARM
- 12.CONTINUE LUBRICANT PUMP
- 14.HANDWHEEL (VERTICAL)
- 16.HANDWHEEL (LONGITUDINAL)

Rem1 : If machine model is AH type ,This set will be a option accessory).

Rem2 : Electric cabinet is installed behind the pendant control panel support stand.

Rem3 : If ELE. MAG. CHUCK is not ordered , then This equipment won't be installed.

Rem4 : If machine model is 2480 series, This will be a bellows type dust cover.

SPECIFICATION & STANDARD ACCESSORIES:

UNIT:MM

ITEM	MODEL	2448AH 2448AHD	2480AH 2480AHD
GRIND RANGE (L*W*H)		1200*600*550	2000*600*550
MAX.TABLE TRAVEL		1300	2100
MAX.DISTANCE BETWEEN TABLE SURFACE AND SPINDLE CENTER		800	800
TABLE DIMENSION L*W		1200*600	2000*600
ELECTRO-MAG. CHUCK L*W		1200*600	2000*600
GRINDING WHEEL O.D*H.D*T.		510*127*50	510*127*50
TABLE SPEED		5-25m/min	5-25m/min
AUTO. CROSS-FEED CARRIAGE		0-38	0-38
CROSS HAND WHEEL DIAL		0.02	0.02
VERTICAL TRAVEL HAND WHEEL DIAL		0.005	0.005
MOTOR OF SPINDLE		10HP*6P	10HP*6P
MOTOR OF HYDRAULIC TANK		5HP*6P	7.5HP*6P
MOTOR OF UP-DOWN RAPID FEED		1HP*4P(AH TYPE) 400W DC SERVO (AHD TYPE)	1HP*4P(AH TYPE) 400W DC SERVO (AHD TYPE)
NET. WEIGHT		6850KGS	11450KGS

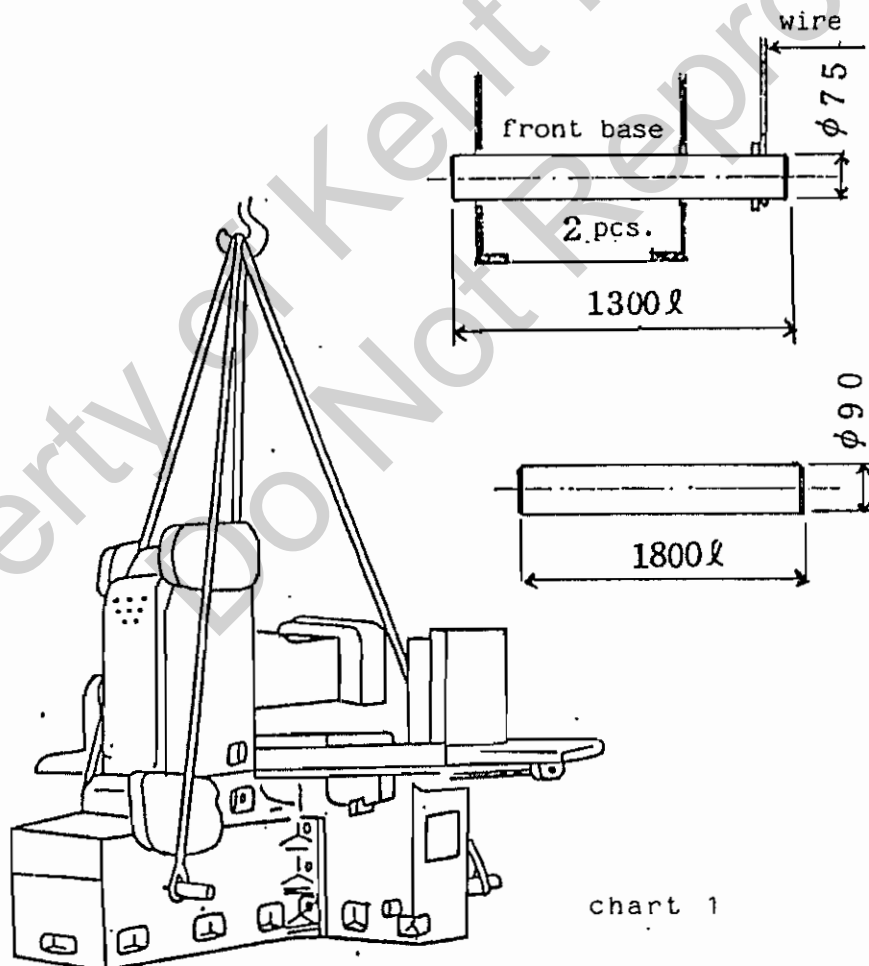
ACCESSORIES:

Standard accessories

- | | |
|---|---|
| 1.Grinding wheel.....1 pc. | 2.Wheel flange and weight.....1 pc. |
| 3.Tool box with tools.....1 set. | 4.Splash guard.....1 set. |
| 5.Base screw & Plate.....1 set. | 6.Wheel balancing arbor.....1 pc. |
| 7.Wheel balancing arbor.....1 pc. | 8.Flange extractor.....1 set. |
| 9.Diamond dresser.....1 pc. | 10.Automatic lubricant equipment.1 set. |
| 11.Coolant equipment with paper filter.....1 set. | |

2. MOVEMENT & INSTALLATION

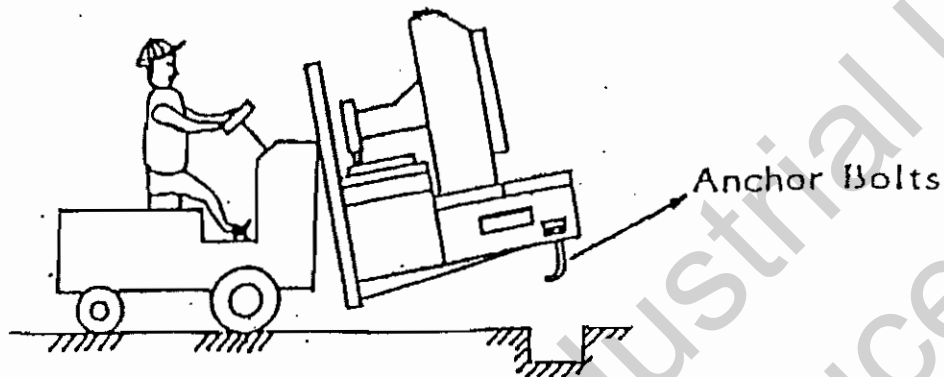
- 2-a. When move the machine, it is very important to surely prevent machine from vibration and crash in order to keep precision of the machine.
- 2-b. After take off the wooden case, use hoist to transport the machine. you have to prepare three steel pegs and hanging wire. Put two pegs into front base holes, and one peg into rear base hole under the saddle, then put some soft separator between steel wire and machine to protect two sides of up column. after that procedure, then hang up slowly .(see chart 1). and must pay attention to the balance of the machine.
- 2-c. There are four hooks on the outside of hydraulic tank, please also use steel wire to hang up the tanks.



2-d. Foundation

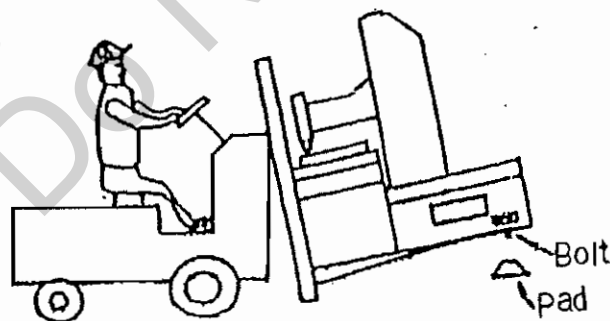
When foundation the machine, except using hoist, You can also use the fork lifter to install the machine.

d-1. Use the anchor bolts;



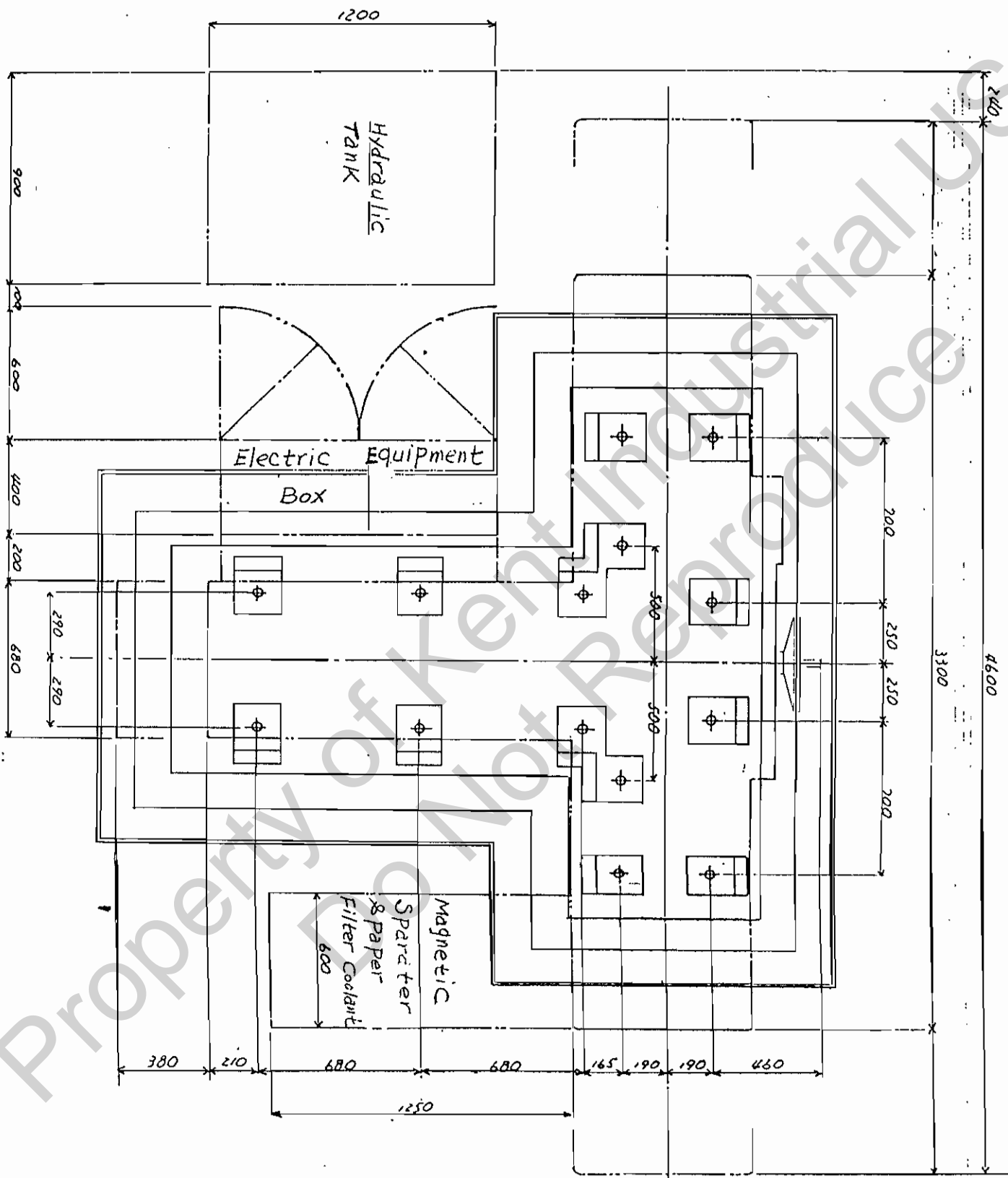
- * Lock the anchor bolts on the machine by nut, and let the thread portion at least 35 mm for adjust.
- * Lay down the machine slowly to aim anchor bolts at foundation holes.
- * Levelling the machine by taper block.
- * Fill up the holes with concreat.

d-2. Use the levelling pads and screws;



- * Screw the levelling screws on the machine base. For easy levelling and more steady of the machine, make screws as deep as possible.
- * Lay down the machine slowly, to let the round head of levelling screws fall into the center holes of levelling pad.
- * Levelling the machine .

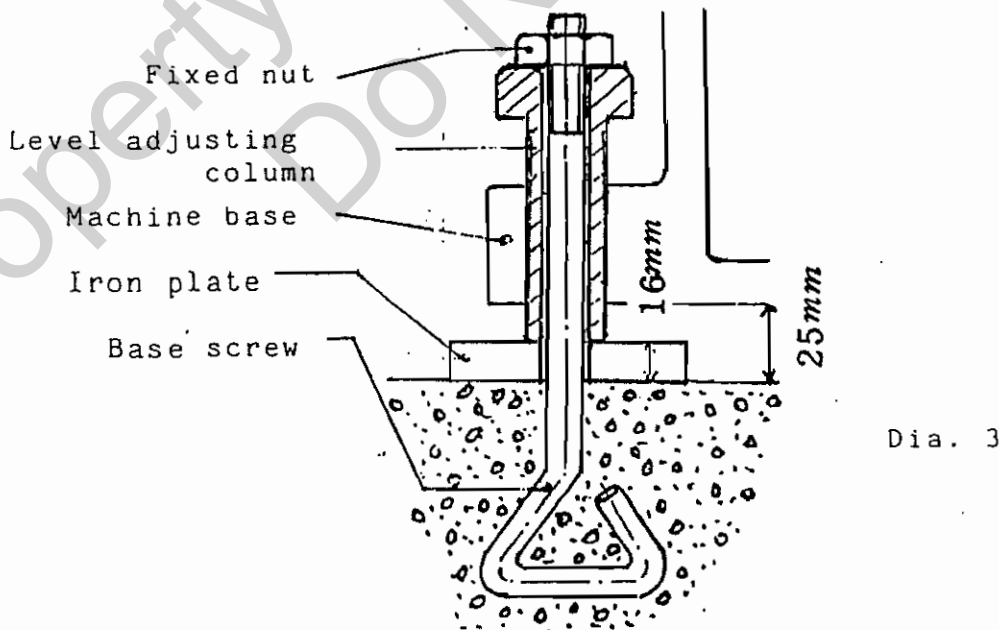
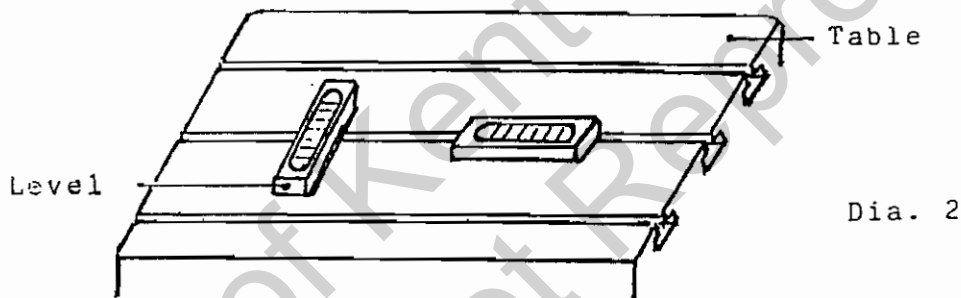
(2-2) 2448 Series Foundation & floor Space



[illegible]

3. ADJUSTMENT

- 3-a. Level adjustment : put precision leveler(0.02 mm/m) on left side of the table to adjust till front, rear, left, right sides of the table are all within 0.04 mm/m. (diagram 2)
- 3-b. There is described in next page, use adjusting screw to adjust the level of the machine.
- 3-c. Adjust left and right two places on the front and rear base, then readjust other adjusting screws till the asked precision, and tighten the nuts of base screws.
- 3-d. You have to readjust the level once every two weeks within one month after the first adjustment. Then steady readjust again every four or five months to maintain the grinding precision.



4.1 CLEANING

Before pack, some places of the machine are coated with rustproof grease to prevent the surface from rust.

You have to wipe off it by soft cloth and light oil.

NOTICE: Any volatile oil and cutting liquid are prohibited.

4.2 SETUP

4.2-a. Location of the machine has to be escaped from unsteady land, direct sunshine, and changeable temperature.

4.2-b. Build the ground work as per setup diagram.

4.2-c. Dig foundation screw holes at indicated places on the concrete ground. (strongly suggestion).

4.2-d. Setup order; hang up the machine(same procedure if you use the fork truck), put foundation screws into machine base screw holes and tighten the nuts.

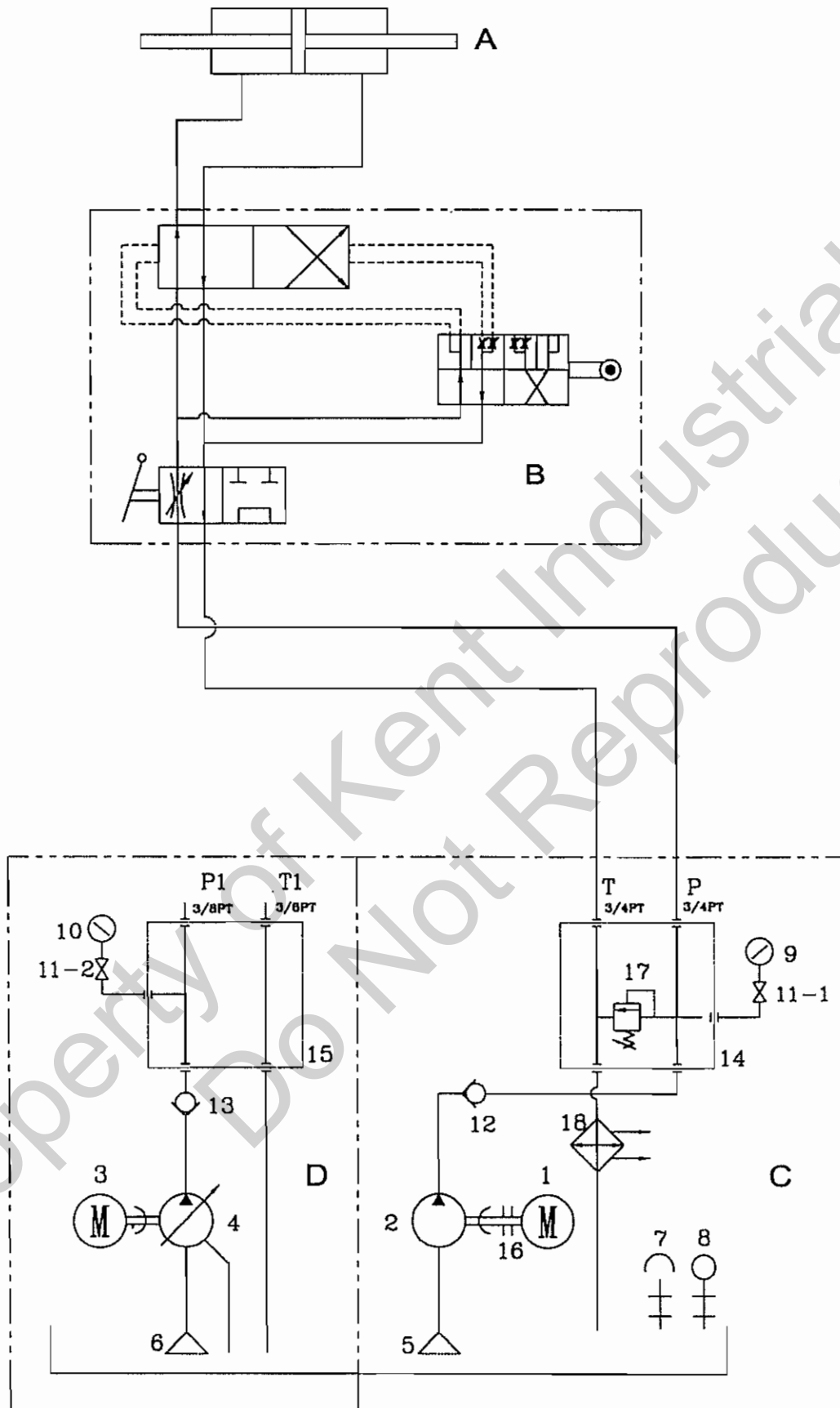
4.2-e. Aim at the foundation screw holes on the ground and slowly put down the machine.

4.2-f. Then put iron plate at rear base of the saddle, and one each at right & left sides of front base, too. (iron plate are prepared by user.) Meanwhile, it has to be kept 25mm parallel space between machine base and concrete, be sure there is no rest shape on the ground.

4.2-g. Fill the foundation screw holes with concrete, be sure there is no nest shape on the ground.

4.2-h. After concrete solidified, adjust the screw till machine is in good parallel as per above section adjustment described. (took out the iron plates.)

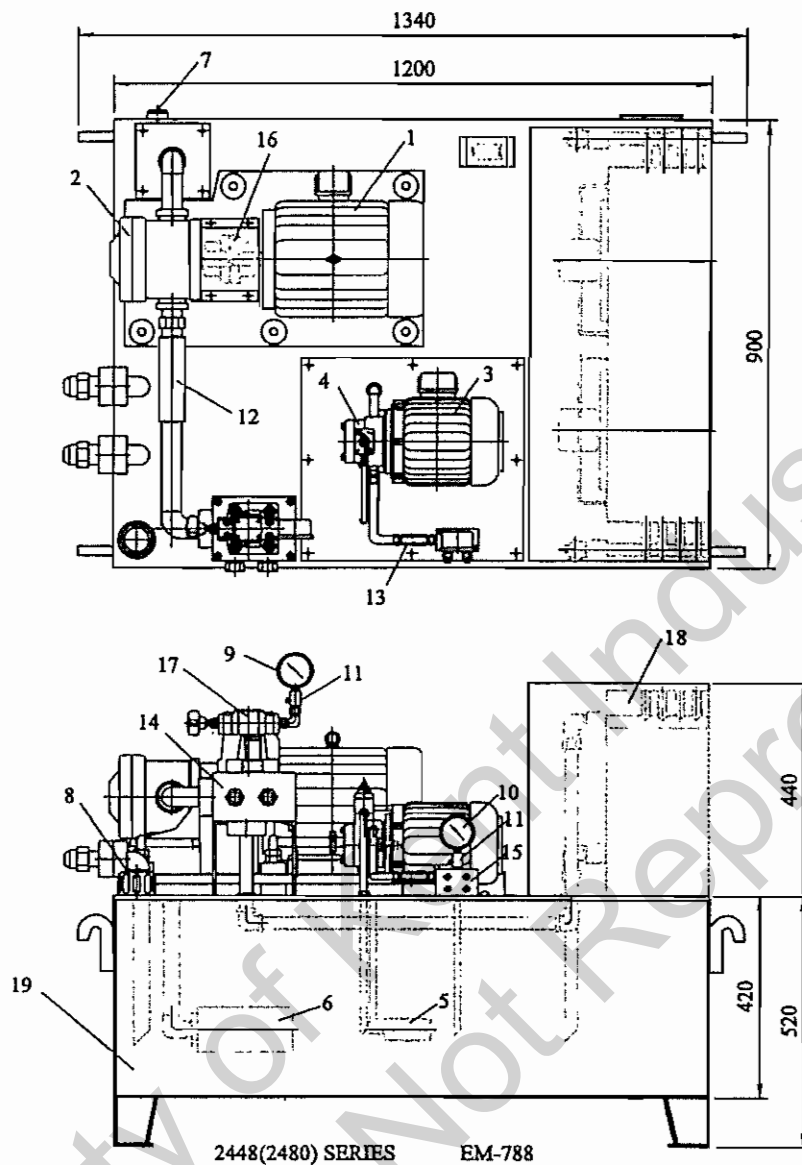
CYLINDER OF TABLE



2448/2480 SERIES HYDRAULIC SYSTEM PARTS LIST

NO.	PART NO.	PARTS NAME	REMARK
A	Cylinder Assembly	Cylinder Of Table	If the user not order the hydraulic parallel dresser , then "D" section won't be installed.
B	Vavle Assembly	Flow and direction Control Unit	
C D	Hydraulic Pump Unit		
C	(Main Pump Unit)		
1		Motor	
2		Pump	
5		Suctioner Strainer	
6		Oil Filter	
7		Level Gauge	
8		Oil Filter	
9		Pressure Guage	
11-1		Pressure Guage Cock	
12		Inlet Check Valve	
14		Manifold	
16		Coupling	
17		Relief Valve	
18		Cooler	
D	(Auxiliary Pump Unit)		
3		Motor	
4		Pump	
6		Suctioner Strainer	
10		Pressure Guage	
11-2		Pressure Guage Cock	
13		Inlet Check Valve	
15		Manifold	

HYDRAULIC TANK LAYOUT & PARTS LISTS



19	TANK	1200x900x520	1	
18	COLLER	EM-373	1	
17	RELIEF VALVE	HRF-G06-1-10	1	
16	COUPLING	E-97	1	
15	MANIFOLD	EM-374	1	
14	MANIFOLD	EM-372	1	
13	INLET CHECK	CIT-03-05-10	1	
12	INLET CHECK	CIT-10-05-10	1	
11	GAUGE COCK	1/4"(CU)	2	
10	PRESSURE GAUGE	2-1/2"x35KG	1	
9	PRESSURE GAUGE	2-1/2"x100KG	1	
8	OIL FILLER	AB-1163	1	
7	LEVER GAUGE	LS-7"	1	
6	SUCTIONER STRAINER	PS-06	1	
5	SUCTIONER STRAINER	19.SS-2-100	1	
4	PUMP	VPVC-F12-A2-02	1	
3	ELEC. MOTOR	1HP4P	1	
2	PUMP	VPNE-61-2-30	1	
1	ELEC. MOTOR	5HP6P	1	
NO	DESCRIPTION	SPECIFICION	QTY	NOTE

COMMENT FOR HYDRAULIC OIL CHOICE AND USAGE

Hydraulic oil has to be maintained 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 dirt.

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 hydraulic system.

(a). Oil Became darkbrown color and produced odor caused by rapid inferior.

(b). Oil became creamwhite color because of water permeation.

BRAND	KAO-KUANG	BP	ESSO	MOBIL	SHELL
OIL NO.	R-53	ENERGUL HL100 4.5° E/50°C 33cst/50°C	ESSTIC 50°C 4.7° E/50°C	D.T.E. Oil Medium 3.93° E/50°C 28.9cst/50°C	Teilus oil 29 4.0° E/50°C 29cst/50°C

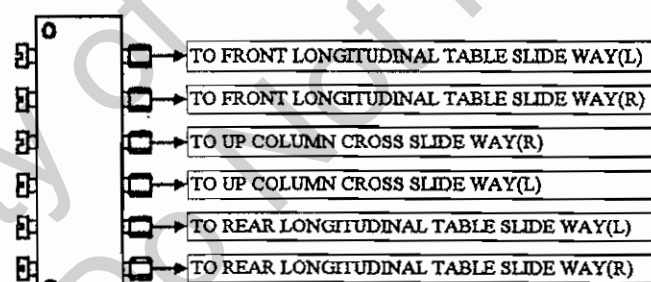
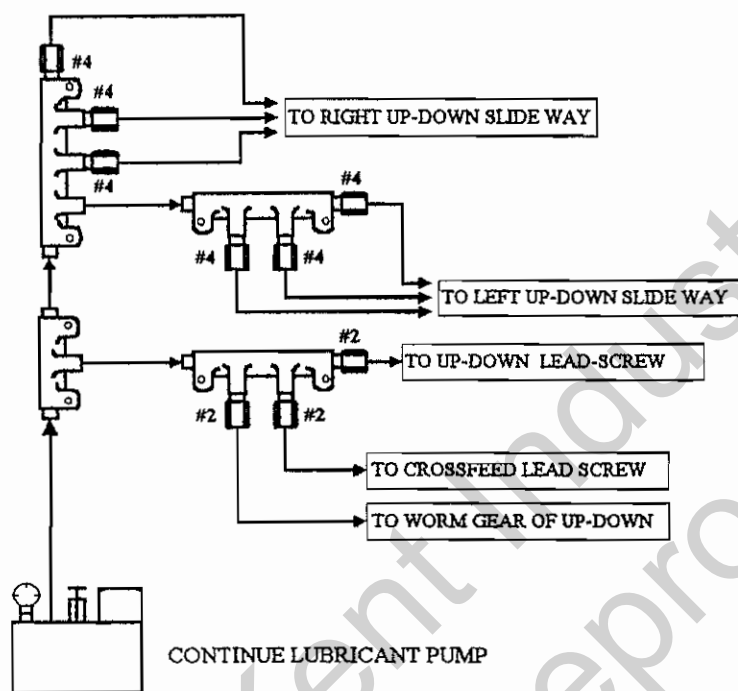
- * First time to change of new hydraulic oil is after three months usage; then alter again once every year. (Please compensate the wear away oil anytime in order to maintain a standard capacity of working oil.)
- * Hydraulic Pressure of main pump has to be kept between 20--25kg/cm². (remark1)
- * Hydraulic Pressure of auxiliary pump has to be kept between 18--22kg/cm². (remark2)
- * The oil capacity of hydraulic tank is approximately 320 L.

Remark1: Adjust the hydraulic Pressure; Please refer the Hydraulic tank unit assembly diagram.

Remark2: This section "D", won't be installed, if the customer not order the hydraulic parallel dresser.

LUBRICANT INSTRUCTION SYSTEM & DIAGRAM 1/2

2448/2480 SERIES



LUBRICANT INSTRUCTION SYSTEM & DIAGRAM 2/2

2448/2480 SERIES

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

(1).Lubricant pump:

- 1-1. Continue lubricant pump will be cyclically operated, When the hydraulic pump is turned on, and the fluid of the pump is about 500c.c every minute, but please keep the pressure between 6--9kg/cm².
- 1-2. Auto Timing Lubricant Pump will also be activated when the control power is turned on; It is a internal one-shot type lubricant. It pumps 3-6c.c once every 30 minutes. (user can chose the lubricant quantity range one of 3,4,5,6c.c and the factory default is the range of 6c.c).

(2).Lubricant:SAE30,BP,ESSO,MOBIL or SHELL slide way oil.

(3).Lubricant tank:

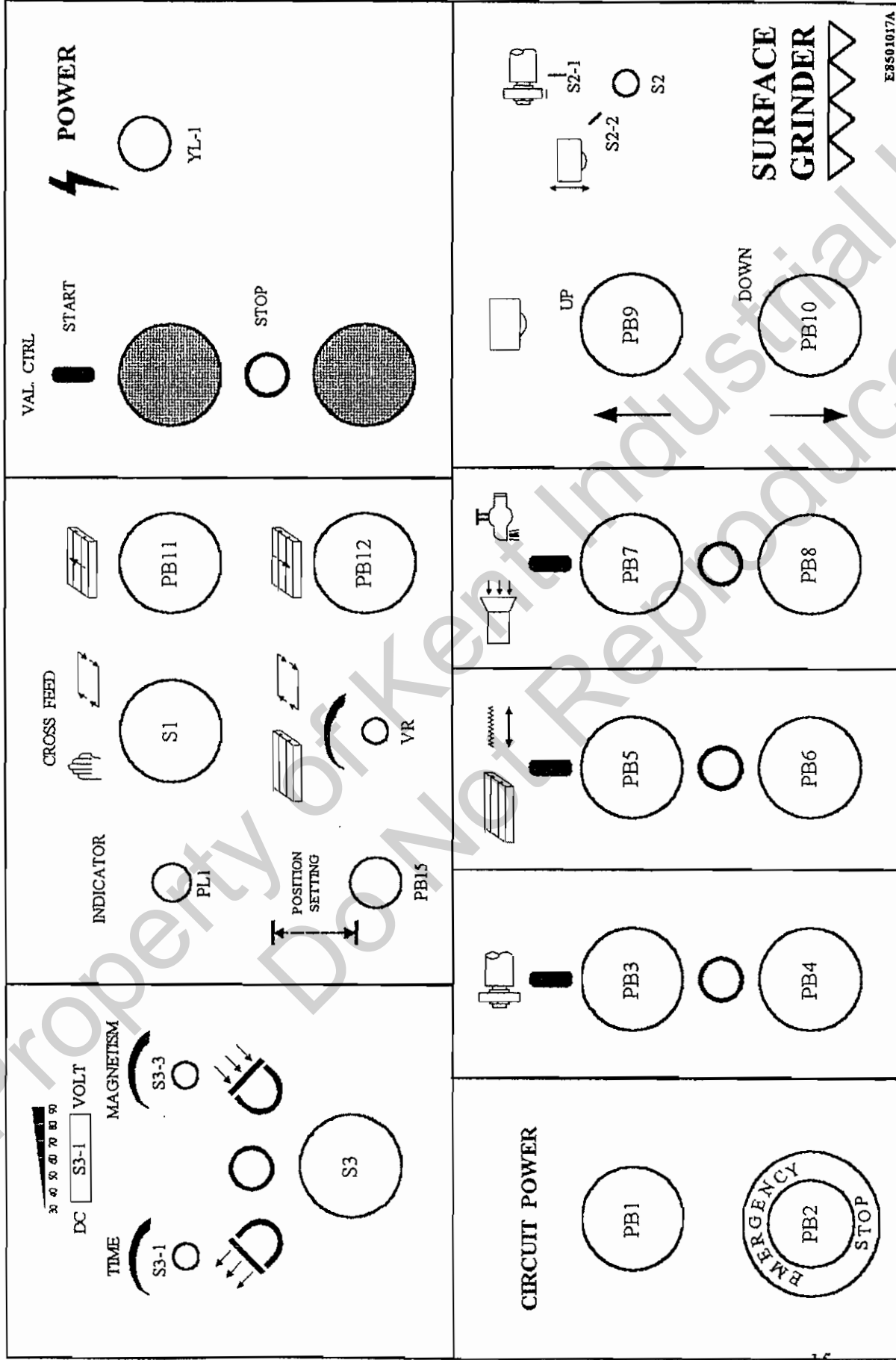
- 3-1. Continue Lubricant pump; about 26L(26000 c.c).
- 3-2. Auto timing lubricant pump; about 1.5L(1500 c.c).

(4).Lubricant point: Please see the diagram previous page.

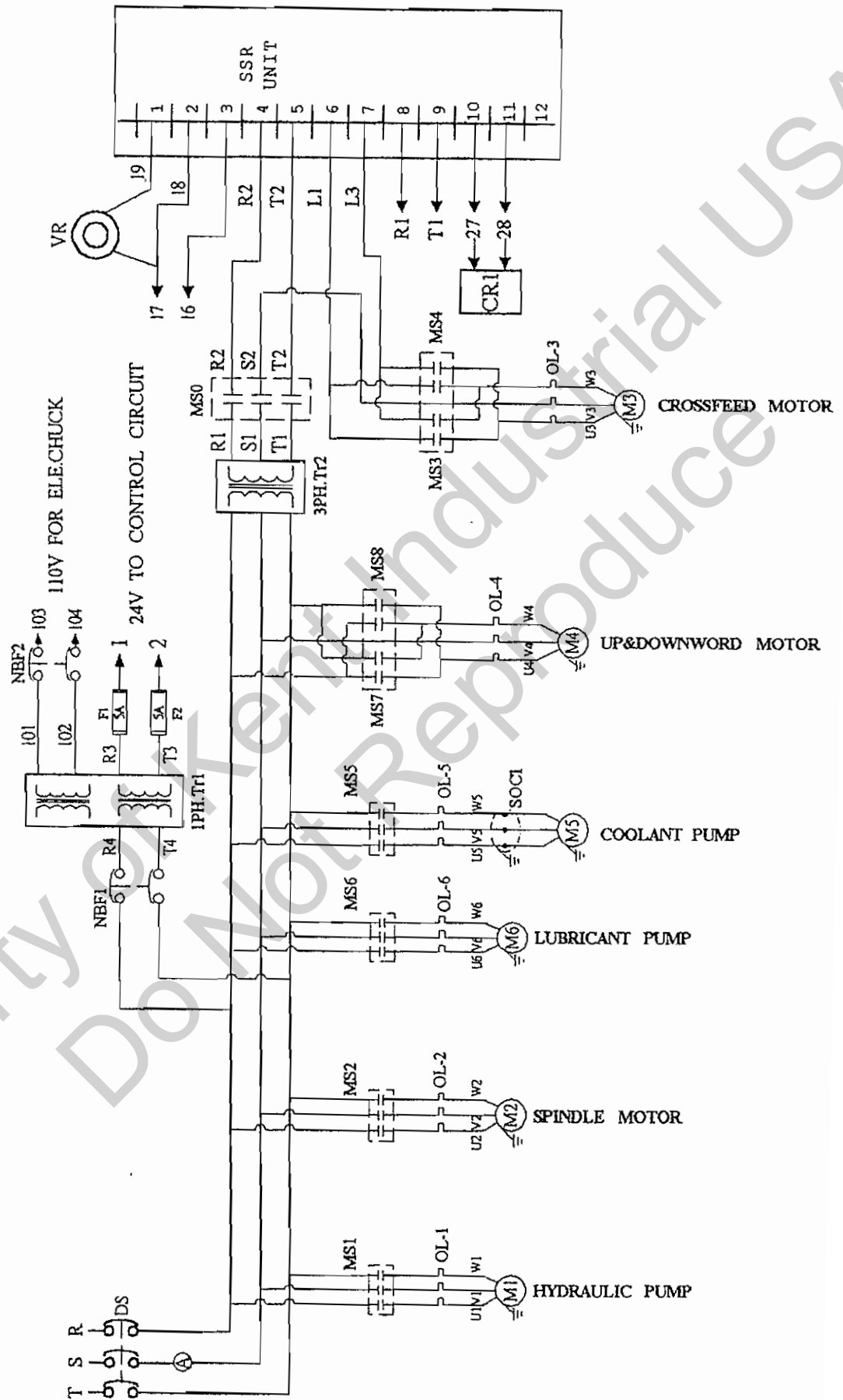
(5).Please check the oil quantity of lubricant tank every often, and always keep the oil tanks full of 70%.

(6).Please check every lubricant point sometimes , make sure every point working properly, it is a important maintain of machine.

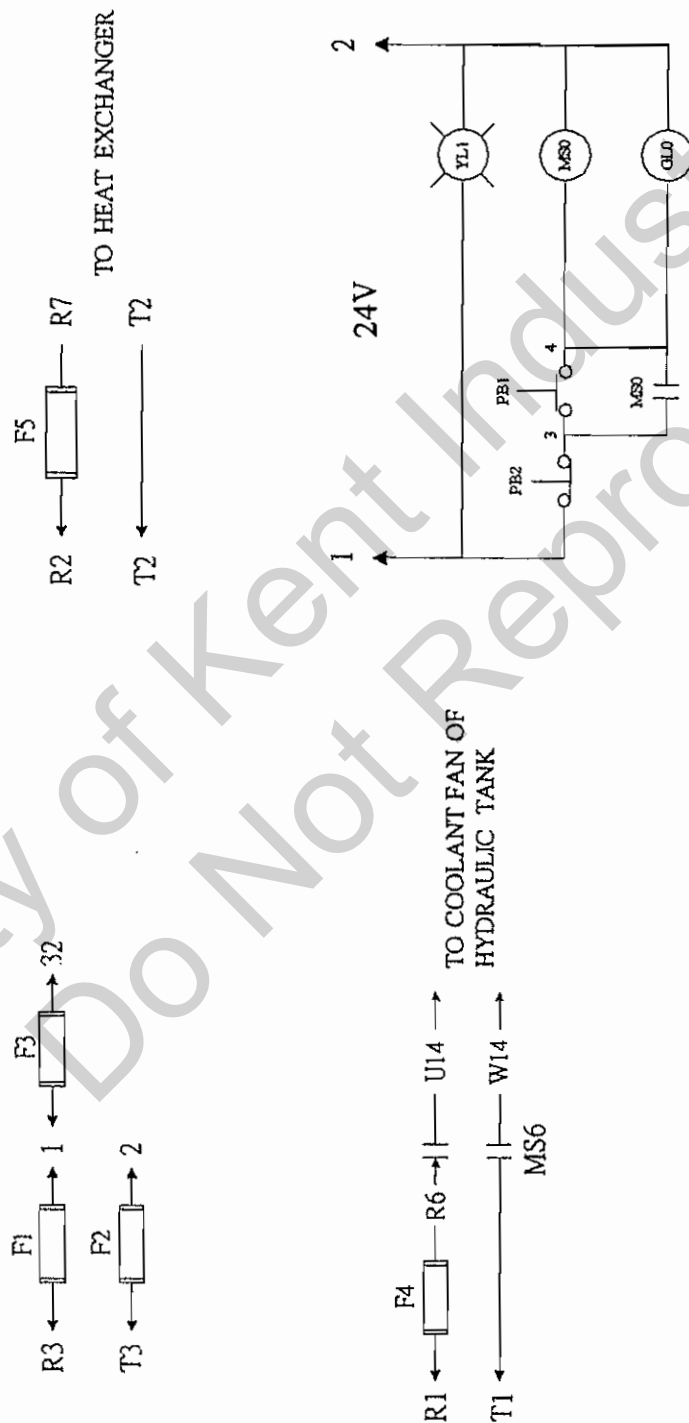
2448/2480AH CONTROL PANEL



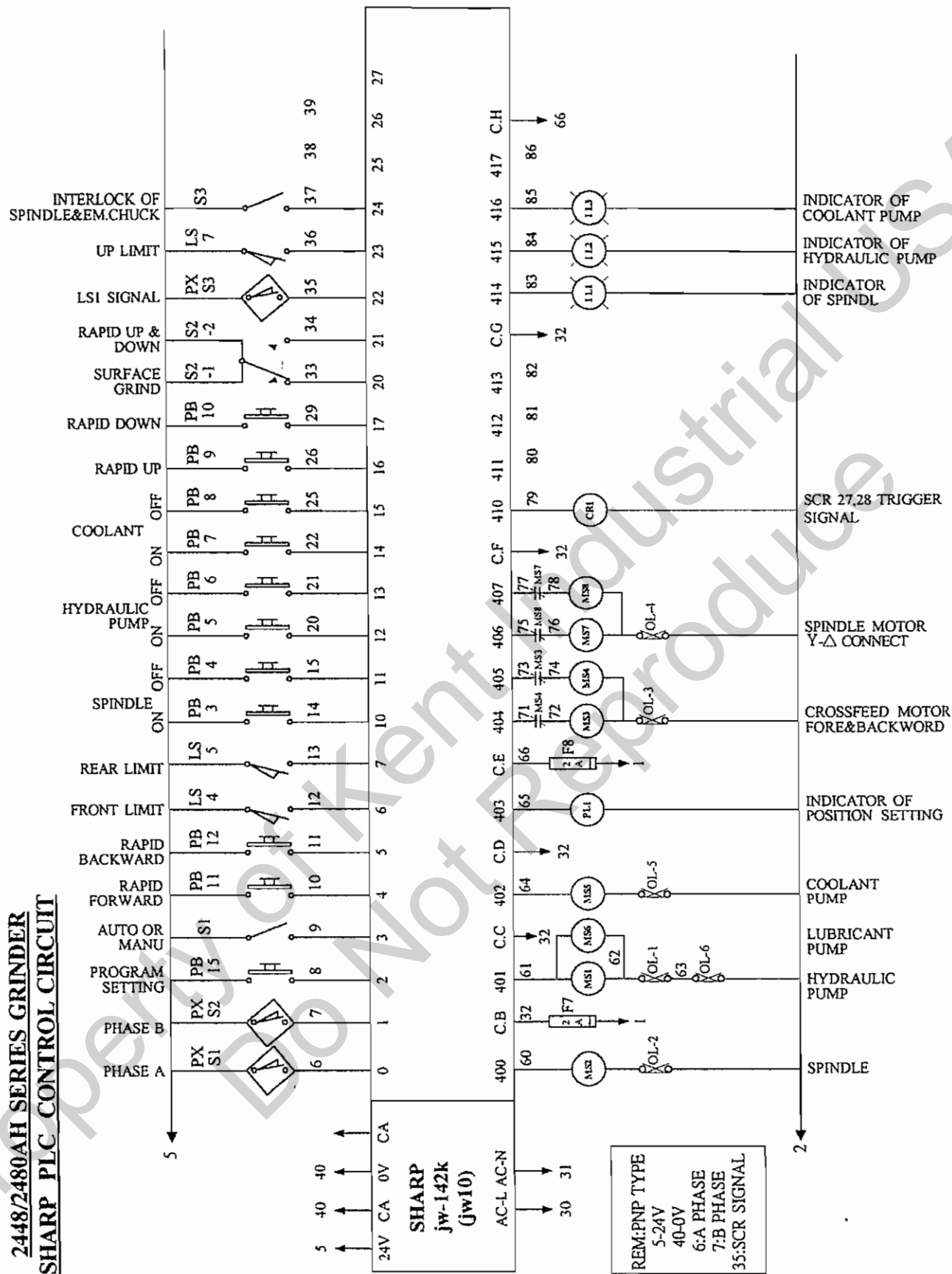
2448/2480AH SERIES MAIN ELECTRIC CIRCUIT DIAGRAM 1/2



2448/2480AH SERIES MAIN ELECTRIC CIRCUIT DIAGRAM 2/2



2448/2480AH SERIES GRINDER SHARP PLC CONTROL CIRCUIT



2448/2480AH LAYOUT OF MAIN ELECTRICAL BOX

A

NFB

MS0

CR0
(MS0)

CR1

MS6
OL-6

MS1
OL-1

MS2
OL-2

MS3
OL-3

MS4

MS7
OL-4

MS8

MS5
OL-5

SHARP
PLC

F
1

F
2

F
3

F
4

F
5

F
6

F
7

F
8

NFB1

NFB2

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

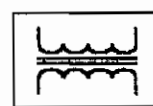
SSR
UNIT

3PH Tr.



TR1

1PH Tr.



TR2

TB1

5	8	9	10	11	14	15	16	17	18	19	20	21	22	25	26	29	33	34	1	2	3	4	65	83	84	85	103	104	23	24	G
---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---	---	---	---	----	----	----	----	-----	-----	----	----	---

TB3

R	S	T	G
---	---	---	---

TB2

U2	V2	W2	G
----	----	----	---

TB4

5	35	40	5	39	5	6	7	40	5	12	13	36	38	U7	W7	U4	V4	W4	G	U3	V3	W3	G	U6	V6	W6	G	U5	V5	W5	G	U1	V1	W1	G	103	104	G
---	----	----	---	----	---	---	---	----	---	----	----	----	----	----	----	----	----	----	---	----	----	----	---	----	----	----	---	----	----	----	---	----	----	----	---	-----	-----	---



2448/2480 AH CONTROL PANEL & ELECTRIC PARTS DESCRIPTION

YL1	INDICATE LAMP OF POWER SOURCE.
PB1	PUSH BUTTON "ON" OF CONTROL CIRCUIT SOURCE WITH INDICATE LAMP (IL0).
PB2	PUSH BUTTON "OFF" OF CONTROL CIRCUIT SOURCE.(ALSO AS A EMERGENCY STOP).
PB3	PUSH BUTTON "ON" OF SPINDLE MOTOR WITH INDICATE LAMP(IL1).
PB4	PUSH BUTTON "OFF" OF SPINDLE MOTOR.
PB5	PUSH BUTTON "ON" OF HYDRAULIC PUMP WITH INDICATE LAMP(IL2).
PB6	PUSH BUTTON "OFF" OF HYDRAULIC PUMP.
PB7	PUSH BUTTON "ON" OF COOLANT OR DUST-SUCTION WITH INDICATE LAMP(IL3).
PB8	PUSH BUTTON "OFF" OF COOLANT OR DUST-SUCTION .
PB9	PUSH BUTTON FOR SPINDLE HEAD RAPID UPWARD. (ONLY S2 SWITCH CHOOSE ON MODE IS WORKABLE)
PB10	PUSH BUTTON FOR SPINDLE HEAD RAPID DOWNWARD.(ONLY S2 SWITCH CHOOSE ON MODE IS WORKABLE)
PB11	PUSH BUTTON FOR SPINDLE SEAT FORWARD.
PB12	PUSH BUTTON FOR SPINDLE SEAT BACKWARD.
PB15	PUSH BUTTON"OFF" FOR AUTO CROSS-FEED STORKE SETTING.
PL1	INDICATOR OF AUTO CROSS-FEED STORKE SETTING CONDITION.
S1	MULTI-SELECT SWITCH OF OPERATION MODE.
VR	VARIABLE SPEED OF AUTO CROSS-FEED.
S2	SELECT SWITCH OF RAPID UP&DOWN OR SURFACE GRIND..
S2-1	SURFACE GRINDING MODE.
S2-2	SPINDLE HEAD RAPID UP&DOWN MODE.
S3	SELECT SWITCH FOR CHUCK MAGNETIC OR DEMAGNETIC CONTROL.
S3-1	INDICATE LED OF STRENGTH OF MAGNETISM.
S3-2	VARIABLE RESISTANCE FOR DEMAGNETIZE TIME ADJUSTING.
S3-3	VARIABLE RESISTANCE FOR STRENGTH OF MAGNETISM ADJUSTING.
MS0	MAGNETIC CONTACTOR FOR CIRCUIT CONTROL SOURCE.
MS1	MAGNETIC CONTACTOR FOR HYDRAULIC PUMP MOTOR.
MS2	MAGNETIC CONTACTOR FOR SPINDLE MOTOR.
MS3 MS4	MAGNETIC CONTACTOR FOR SPINDLE SEAT CROSS-FEED MOTOR.
MS5	MAGNETIC CONTACTOR FOR COOLANT OR DUST-SUCTION MOTOR.
MS6	MAGNETIC CONTACTOR FOR LUBRICANT PUMP.
MS7 MS8	MAGNETIC CONTACTOR FOR SPINDLE SEAT UP&DOWN MOTOR.
M1	HYDRAULIC PUMP MOTOR.
M2	SPINDLE MOTOR.
M3	SPINDLE SEAT FORWARD&BACKWARD CONTROL MOTOR.
M4	COOLANT&DUST-SUCTION MOTOR.
M5	SPINDLE SEAT UP&DOWN MOTOR.
LS1	APPROXIMATE SWITCH FOR AUTO CROSS-FEED TRIGGER SIGNAL.
PXS1 PXS2	APPROXIMATE SWITCH FOR SETTING STROKE OF AUTO CROSS-FEED.
LS4 LS5	LIMIT SWITCH FOR MAX. TRAVEL OF SPINDLE SEAT.
OL1,OL2 OL3,OL4 OL5,OL6	CURRENT OVERLOAD.
1PH tr.	1 PHASE TR.(FOR CONTROL CIRCUIT &EM.CHUCK POWER SUPPLY. AND POWER OF FAULT SIGNAL OF SERVO DRIVER).
3PH tr.	3 PHASE TR.(FOR SPINDLE SEAT RAPID UP&DOWN AND CROSS-FEED,LUBRICANT PUMP,PAPER FILTER MOTOR).

UNIT:0.0001" FEEDS

LDD1

UNIT:0.0001" FEEDS SETTING

CPS

FEED TIMES SETTING

CHS2

SPARK OUT SETTING

PS

POWER



SURFACE GRINDER MICROCOMPUTER CONTROLLER

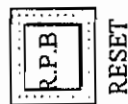


DISPLAY OF GRINDING WHEEL POSITION

PB 2-1 RAPID TRAVERSE UP	PB 3-1 SLOW TRAVERSE UP	PB 4-1 STEP UP
PB 2-2 RAPID TRAVERSE DOWN	PB 3-2 SLOW TRAVERSE DOWN	PB 4-2 STEP DOWN



AUTO START



RESET

ON



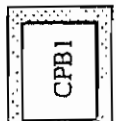
OFF



CPBb



ORIGIN



MANUAL

2448/2480AHD CONTROL PANEL(INCH)

MULTIPLIER

CS1

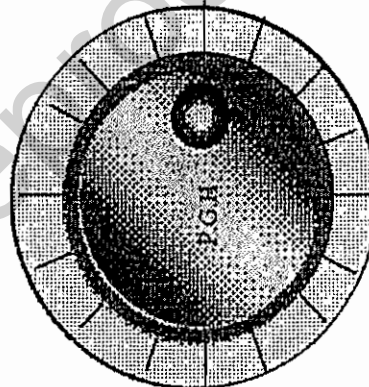


P

C

CS2

x1 x2 x8



CIRCUIT POWER

PBa

S3

S7

S4

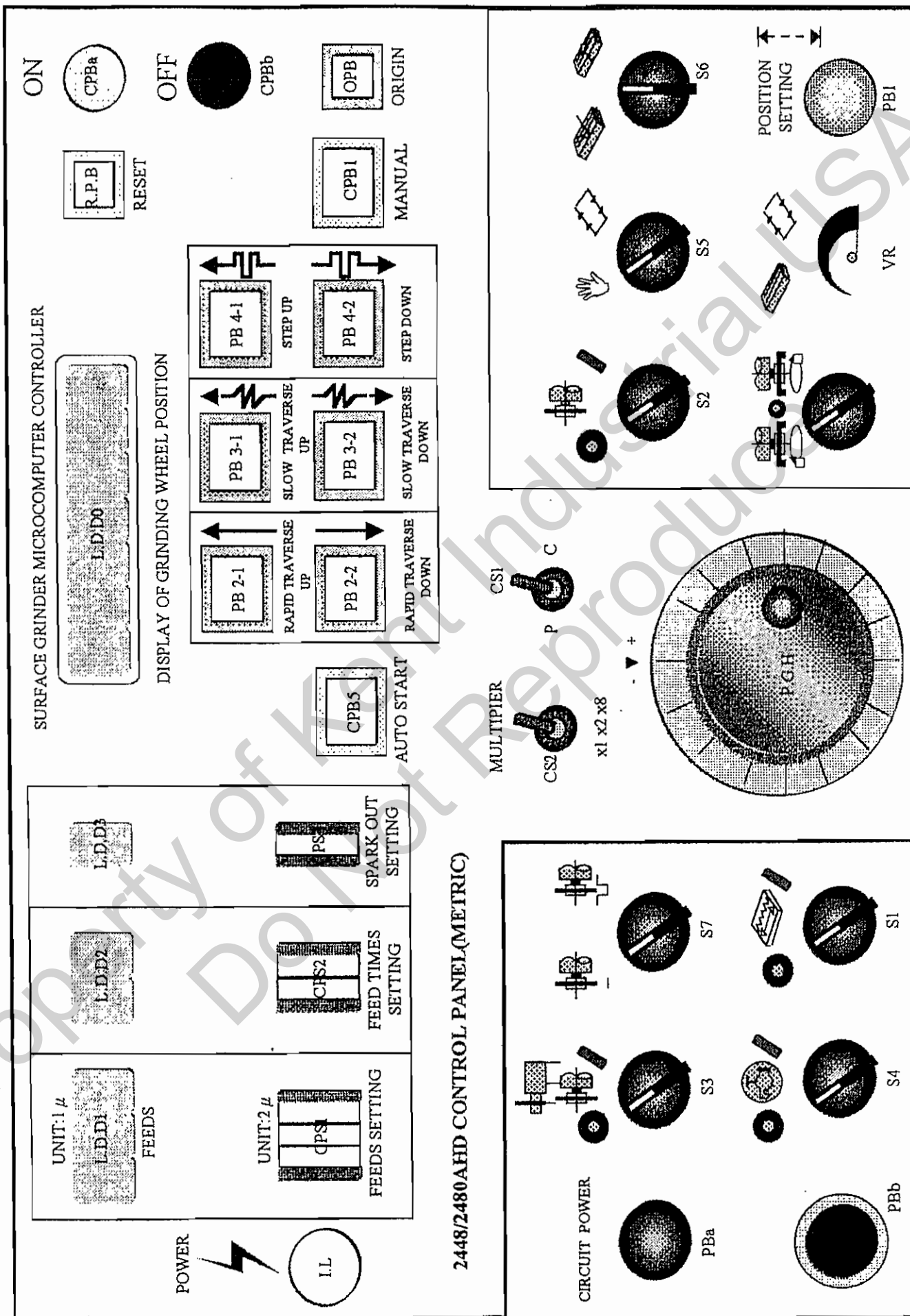
S1

PBb

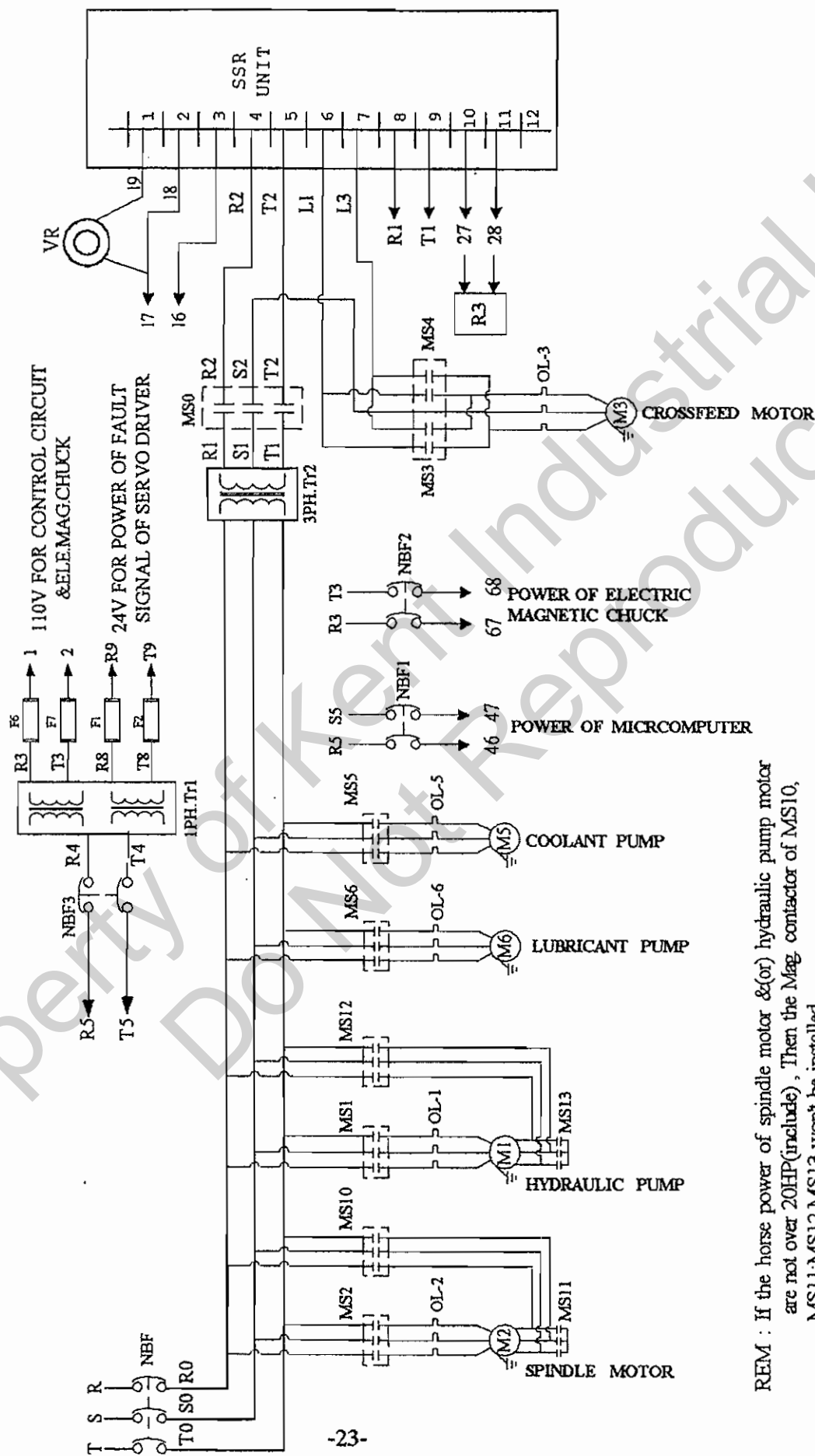
VR

POSITION SETTING

CPB1

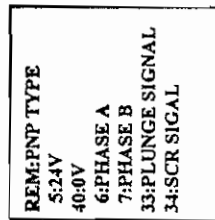


2448/2480AHD SERIES MAIN ELECTRIC CIRCUIT DIAGRAM 1/2

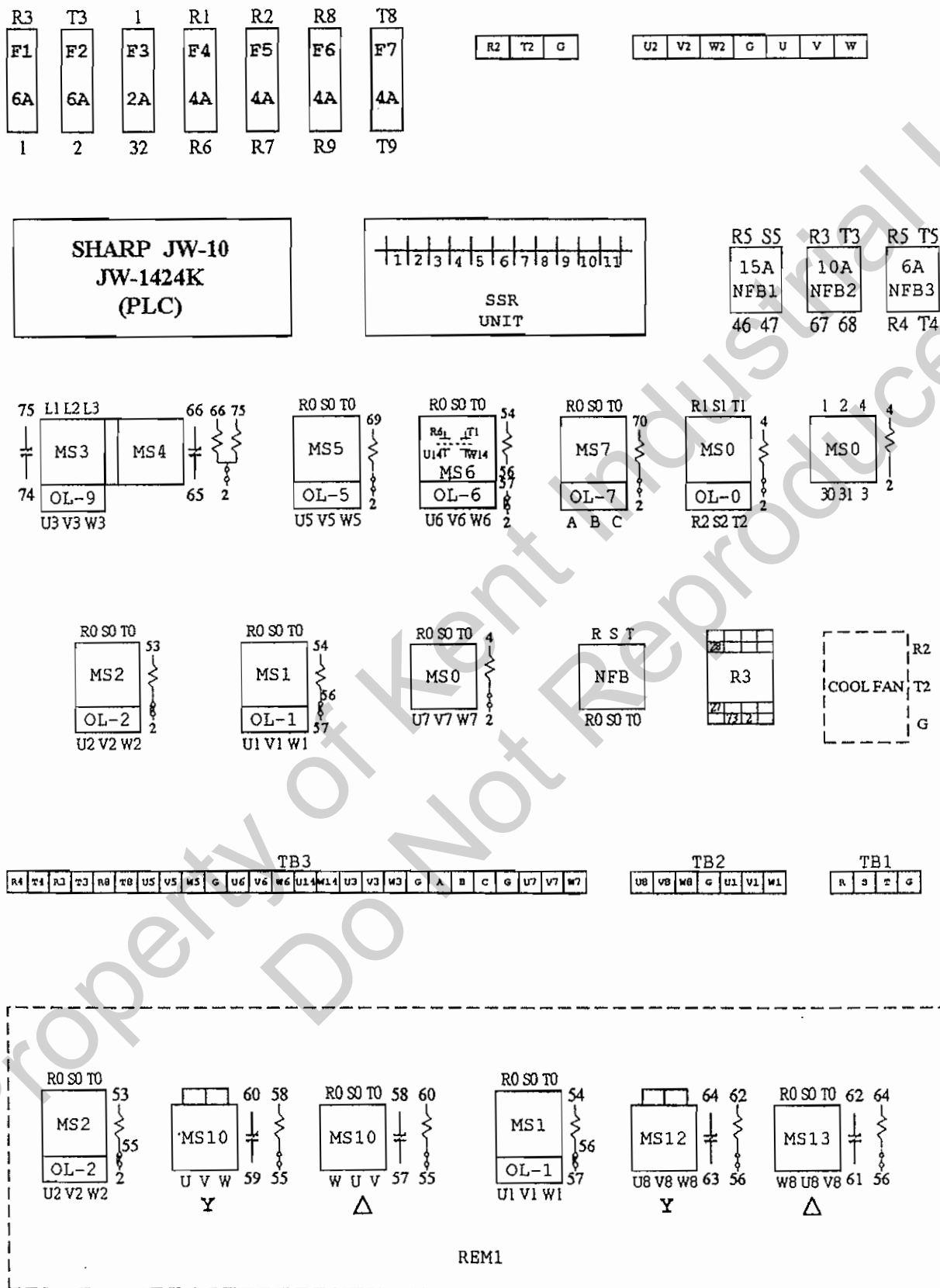


REM : If the horse power of spindle motor &(or) hydraulic pump motor are not over 20HP(include) , Then the Mag. contactor of MS10, MS11;MS12,MS13 won't be installed.

SHARP PLC CONTROL CIRCUIT

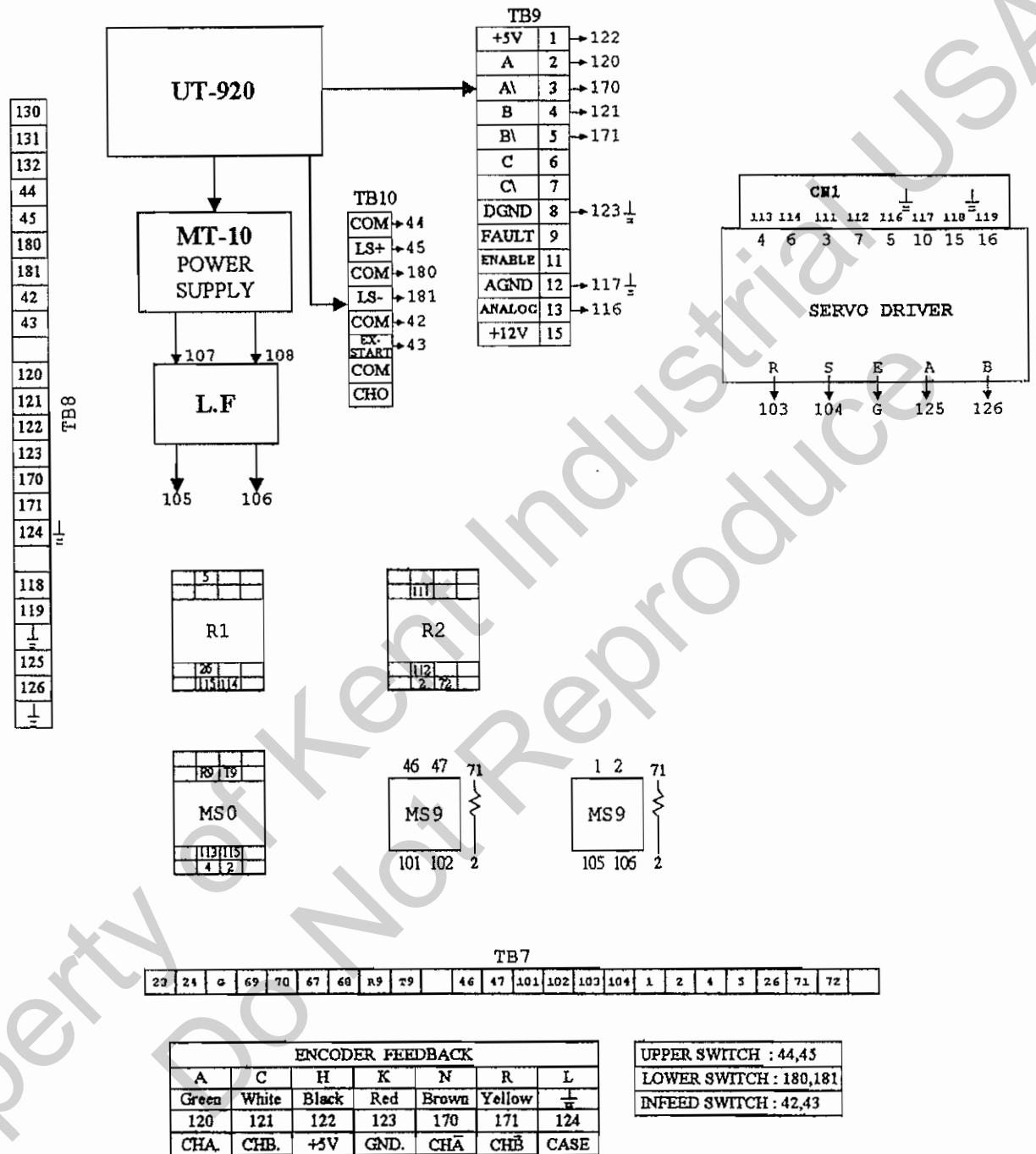


2448/2480AHD LAYOUT OF MAIN ELECTRICAL BOX 1/2



REM1 : IF THE SPINDLE MOTOR OR HYDRAULIC PUMP MOYOR IS OVER 20 HP
THE WIRE CONNECT OF MOTOR IS USED Y-Δ CONNECTION

2448/2480AHD LAYOUT OF MAIN ELECTRICAL BOX 2/2



2448/2480 AHD CONTROL PANEL & ELECTRIC PARTS DESCRIPTION 1/2



I.L	INDICATE LAMP OF POWER SOURCE.
PBa	PUSH BUTTON "ON" OF CONTROL CIRCUIT SOURCE WITH INDICATE LAMP (IL0).
PBb	PUSH BUTTON "OFF" OF CONTROL CIRCUIT SOURCE.(ALSO AS A EMERGENCY STOP).
S1	SWITCH OF HYDRAULIC MOTOR .
S2	SWITCH OF SPINDLE MOTOR.
S3	SWITCH OF HYDRAULIC PARALLEL DRESSER PUMP .(OPTION ACCESSORY)
S4	SWITCH OF COOLANT PUMP.
S5	SWITCH OF CROSS-FEED MANUAL OR AUTO MODE.
S6	RETURN SWITCH OF CROSS-FEED.
S7	SELECT SWITCH OF SURFACE OR PLUNGE MODE.
VR	VARIABLE STEP SPEED OF AUTO CROSS-FEED MODE.
PB1	INDICATOR OF AUTO CROSS-FEED STORKE SETTING CONDITION.
CPBa	PUSH BUTTON "ON" OF MICROCOMPUTER CONTROL.
CPBb	PUSH BUTTON "OFF" OF MICROCOMPUTER CONTROL.
OPB	PUSH BUTTON OF ORIGIN RETURN (TO SET THE WHEEL HEAD RETURN TO REFERENTIAL ZERO POINT).
RPB.	PUSH BUTTON OF ZERO RESET (TO SET THE L.D.D0 TO REFERENTIAL ZERO POINT).
CPB1	PUSH BUTTON OF MANUAL CONTROL MODE WITH INDICATE LAMP(IT IS A NORMAL TURN ON CONDICTION TILL PUSHING THE "PB5". (REM.1)
L.D.D0	LED DISPLAY OF GRINDING WHEEL REFERENTIAL POSITION.
L.D.D1	LED DISPLAY OF FEEDS SETTING (SETTING NUMERAL UNIT).
L.D.D2	LED DISPLAY OF FEEDING TIMES (AUTO MODE).
L.D.D3	LED DISPLAY OF SPARK OUT TIMES (AUTO MODE).
CPS1	DIP SWITCH OF FEEDS SETTING.
CPS2	DIP SWITCH OF FEEDING TIMES.
CPS3	DIP SWITCH OF SPARK OUT TIMES.
CPB5	PUSH BUTTON OF AUTO CONTROL MODE WITH INDICATE LAMP.(AS SOON AS PUSH THE "PB1" THE CONTROL CONDICTION WILL CHANGE TO THE MANUAL MODE) .
PB2-1	PUSH BUTTON OF DRIVING THE WHEEL HEAD RAPID TRAVERSE UP.
PB2-2	PUSH BUTTON OF DRIVING THE WHEEL HEAD RAPID TRAVERSE DOWN.
PB3-1	PUSH BUTTON OF DRIVING THE WHEEL HEAD SLOW TRAVERSE UP.
PB3-2	PUSH BUTTON OF DRIVING THE WHEEL HEAD SLOW TRAVERSE DOWN.
PB4-1	PUSH BUTTON OF DRIVING THE WHEEL HEAD STEP UP (THE QUANTITY IS SETTING BY "PS1".
PB4-2	PUSH BUTTON OF DRIVING THE WHEEL HEAD STEP DOWN (THE QUANTITY IS SETTING BY "PS1".
CS1	SELECT SWITCH OF MICROCOMPUTER OR ROTARY HANDLE CONTROL. (C:MICROCOMPUTER CONTROL. P:ROTARY HANDLE CONTROL).
CS2	SELECT SWITCH OF MULTIPLE OF 1, 2, 8 UNIT OF ROTARY HANDLE CONTROL.
P.G.H	ROTARY HANDLE OF PULSE GENERATOR.

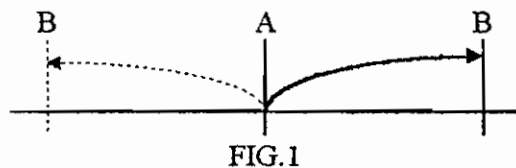
REM1:IT IS ALSO A INTERRUPTER, WHEN SOMETIME THE "PB" IS PRESSED,THE USER CAN INTERRUPT THE FUCTION ANYTIME BY PRESSING THE "PB1".


2448/2480 AHD CONTROL PANEL & ELECTRIC PARTS DESCRIPTION 2/2


MS0	MAGNETIC CONTACTOR FOR CIRCUIT CONTROL SOURCE.
MS1	MAGNETIC CONTACTOR FOR HYDRAULIC PUMP MOTOR.
MS2	MAGNETIC CONTACTOR FOR SPINDLE MOTOR.
MS3 MS4	MAGNETIC CONTACTOR FOR SPINDLE SEAT CROSS-FEED MOTOR.
MS5	MAGNETIC CONTACTOR FOR COOLANT.
MS6	MAGNETIC CONTACTOR FOR LUBRICANT PUMP.
MS7	MAGNETIC CONTACTOR FOR HYDRAULIC PARALLEL DRESSER PUMP.
MS9	MAGNETIC CONTACTOR FOR POWER OF SERVO DRIVER & NC CONTROLLER.
MS10 MS11	MAGNETIC CONTACTOR OF Y-Δ STARTING&RUNNING CONNECT FOR HYDRAULIC PUMP MOTOR IS OVER 20 HP.
MS12 MS13	MAGNETIC CONTACTOR OF Y-Δ STARTING&RUNNING CONNECT FOR SPINDLE MOTOR IS OVER 20 HP.
R1,R2,R3	AUXILIARY RELAY FOR NC. CONTROL SYSTEM.
NFB	NO FUSE BREAKER FOR MAIN POWER SUPPLY.
NFB1	NO FUSE BREAKER FOR POWER OF MICROCOMPUTER.
NFB2	NO FUSE BREAKER FOR POWER OF ELECTRIC MAGNETIC CHUCK.
NFB3	NO FUSE BREAKER FOR POWER OF SERVO DRIVER.
M1	HYDRAULIC PUMP MOTOR.
M2	SPINDLE MOTOR.
M3	SPINDLE SEAT FORWARD&BACKWARD CONTROL MOTOR.
M6	COOLANT PUMP MOTOR.
M6	LUBRICANT PUMP
LS1	APPROXIMATE SWITCH FOR AUTO CROSS-FEED TRIGGER SIGNAL.
PXS1 PXS2	APPROXIMATE SWITCH FOR SETTING STROKE OF AUTO CROSS-FEED
LS4 LS5	LIMIT SWITCH FOR MAX. TRAVEL OF SPINDLE SEAT.
OL1,OL2 OL3,OL4 OL5,OL6	CURRENT OVERLOAD.
F1,F2,F3 F4,F5,F6,F7	FUSES
1PH tr1.	1 PHASE TR.(FOR CONTROL CIRCUIT &EM.CHUCK POWER SUPPLY. AND POWER OF FAULT SIGNAL OF SERVO DRIVER).
3PH tr2.	3 PHASE TR.(FOR SPINDLE SEAT RAPID UP&DOWN AND CROSS-FEED,LUBRICANT PUMP,PAPER FILTER MOTOR).
1PH tr3.	1 PHASE TR.(FOR SERVO MOTOR DRIVER)..
S.S.R UNIT	CROSS-FEED MOTOR CONTROL UNIT.

OPERATE PROCEEDING FOR 2448/2480 AH SERIES OF AUTO CROSS-FEED STROKING SYSTEM


- (1) At first, make the S2 select at surface mode ( S2-1).
Then choice S1 select switch on the menu operate mode ().
After that, operation the PB11 or PB12 push button switch
(for rapid forward or backward). to sent the spindle seat to the
first grinding edge of workpiece "A" (please refer FIG.1)




After the above procedures, press PB1 push button switch
(position setting switch with condition indicator PL1) once,
Then indicator of PL1 will be flashed continue with 1 second frequency.
And operation PB11 or PB12 switch to sent the spindle seat
to the second edge of workpiece "B".
Then one more pressing the PB15 push button, and indicator of PL1
is going to stop flashing and keep lighting, till the S1 select switch
changeover to auto mode ().
with the indicator of PL1 turn off, the procedure is completed.

- (2). If the setting is not correct; for instance: setting "A" & "B" two points
almost close together, or only just setting one point "A". then switching
S5 select switch to the auto mode ().
this moment the indicator of PL1 will be quickly flashed with 0.1
second frequency. It means the setting is mistake please resetting
again.
- (3). This system has auto memory function; when the machine is operation
and power is failure suddenly or the emergency stop switch is pushed
to interrupt operation.
unless the user turn the cross-feed leadscrew manually, before restarting
the power supply. otherwise the previous setting won't be changed.

OPERATE PROCEEDING FOR 2448/2480 AHD SERIES OF AUTO CROSS-FEED STROKING SYSTEM

(1) At first, make the S7 select at surface mode().

Then choice S5 select switch on the menu operate mode().

After that, operation the S6 switch(for rapid forward or backward). to sent the spindle seat to the first grinding edge of workpiece "A"(please refer FIG.1)

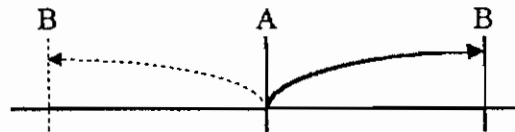




FIG.1

After the above procedures, press PB1 push button switch (position setting switch with condition indicator PL1) once, Then indicator of PL1 will be flashed continue with 1 second frequency. And operation S6 switch to sent the spindle seat to the second edge of workpiece "B".

Then one more pressing the PB1 push button, and indicator of PL1 is going to stop flashing and keep lighting, till the S5 select switch changeover to auto mode().

with the indicator of PL1 turn off, the procedure is completed.

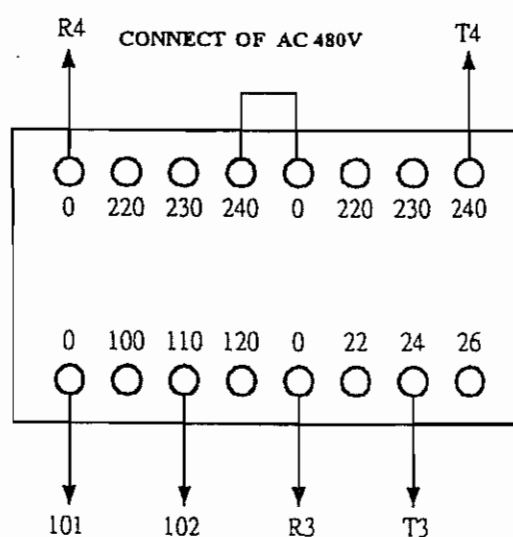
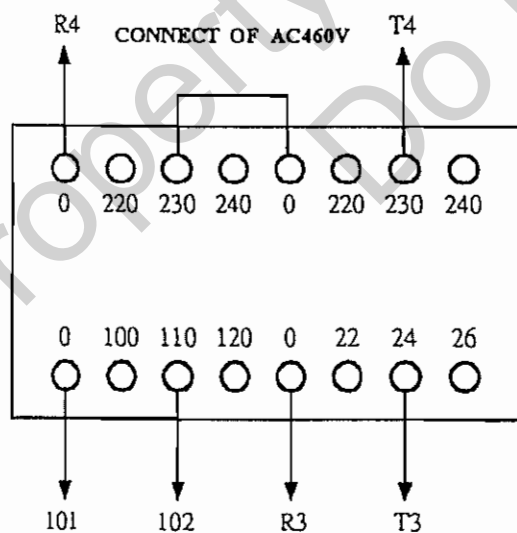
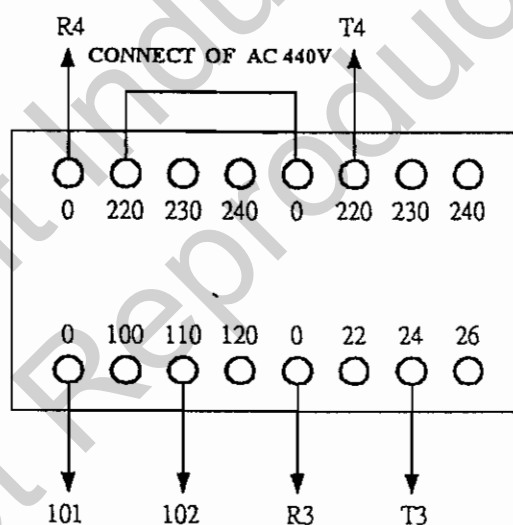
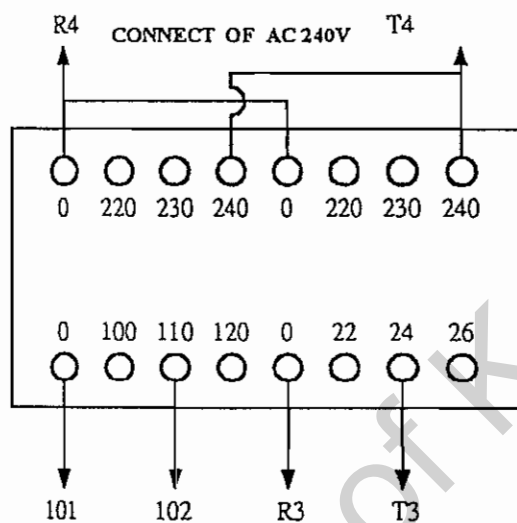
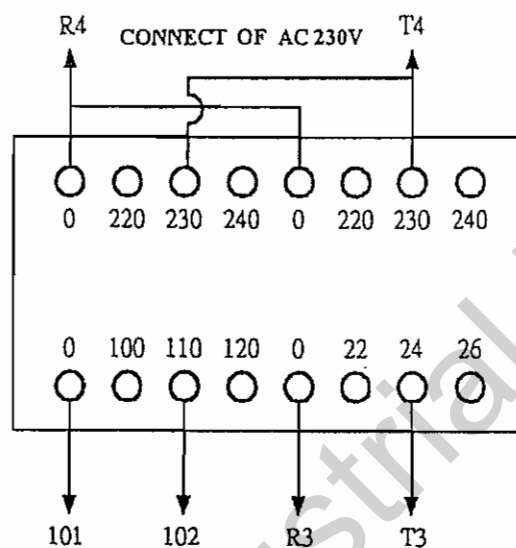
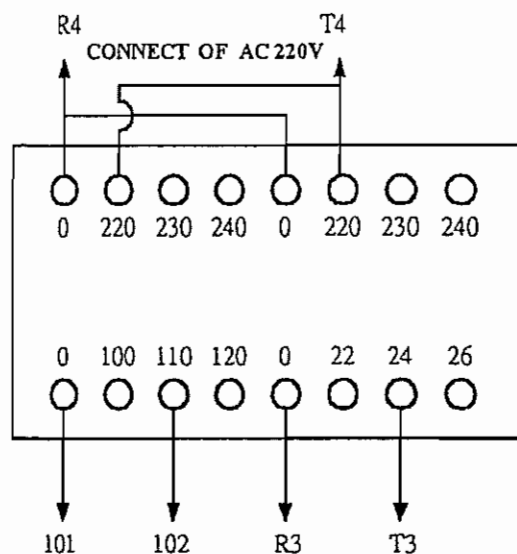
(2). If the setting is not correct, for instance: setting "A"&"B" two points almost close together, or only just setting one point "A". then switching S5 select switch to the auto mode().

this moment the indicator of PL1 will be quickly flashed with 0.1 second frequency. It means the setting is mistake please resetting again.

(3). This system has auto memory fuction ; when the machine is operation and power is failure suddenly or the emergency stop switch is pushed to interrupt operation.

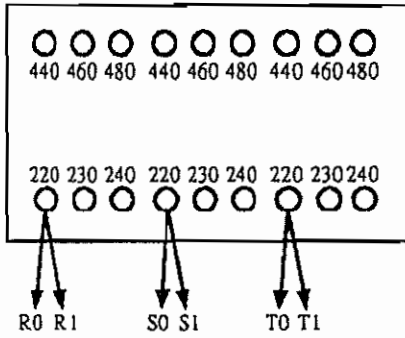
unless the user turn the cross-feed leadscrew manually, before resarting the power supply. otherwise the previous setting won't be changed.

CONNECT OF 1PH. TRANSFORMER

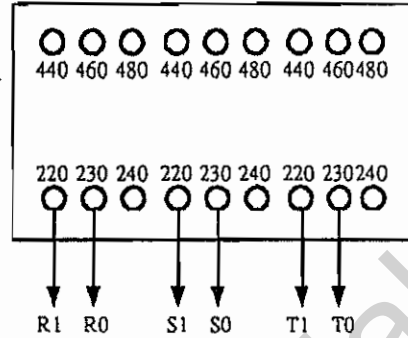


CONNECT OF 3PH. TRANSFORMER

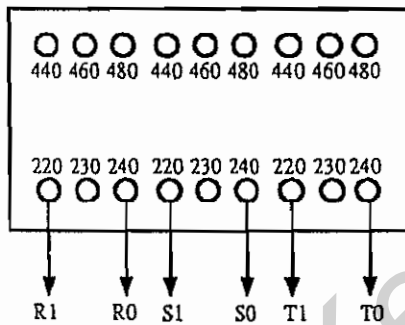
CONNECT OF AC 220V



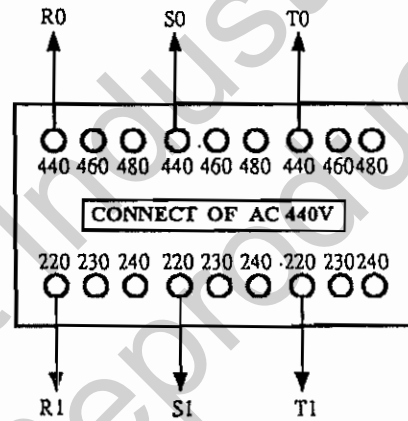
CONNECT OF AC 230V



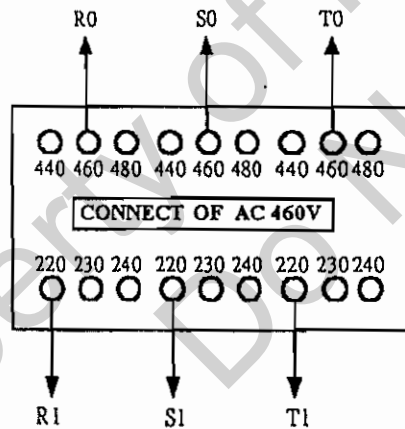
CONNECT OF AC 240V



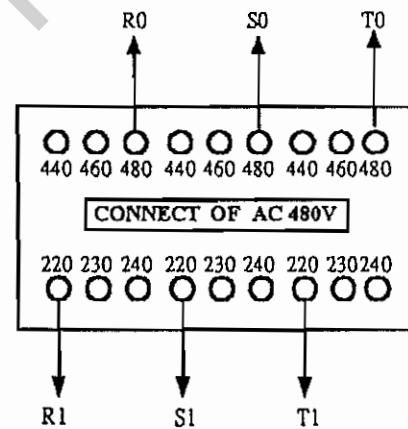
CONNECT OF AC 440V



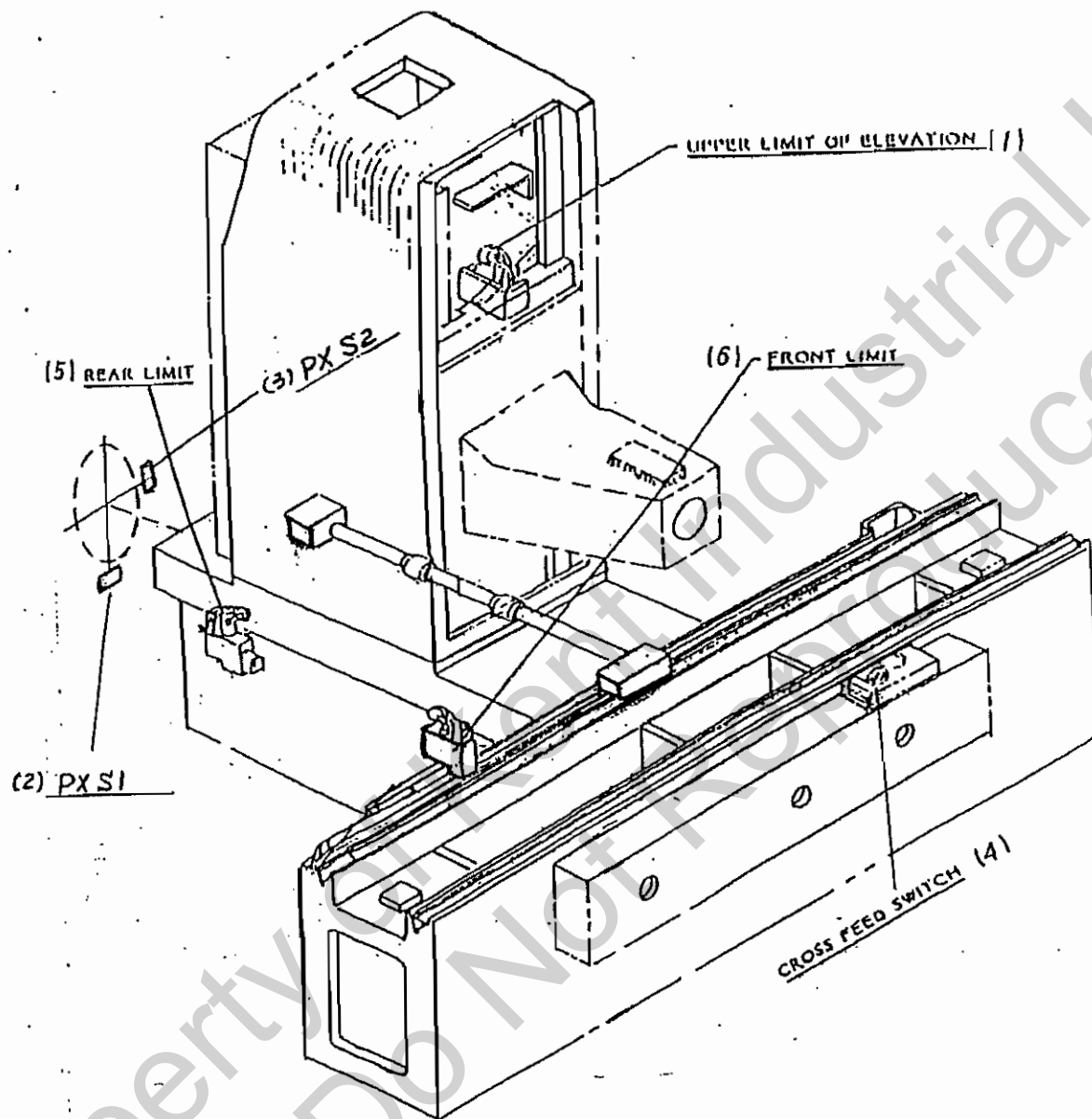
CONNECT OF AC 460V



CONNECT OF AC 480V



2448/2480AH Limit switch Position

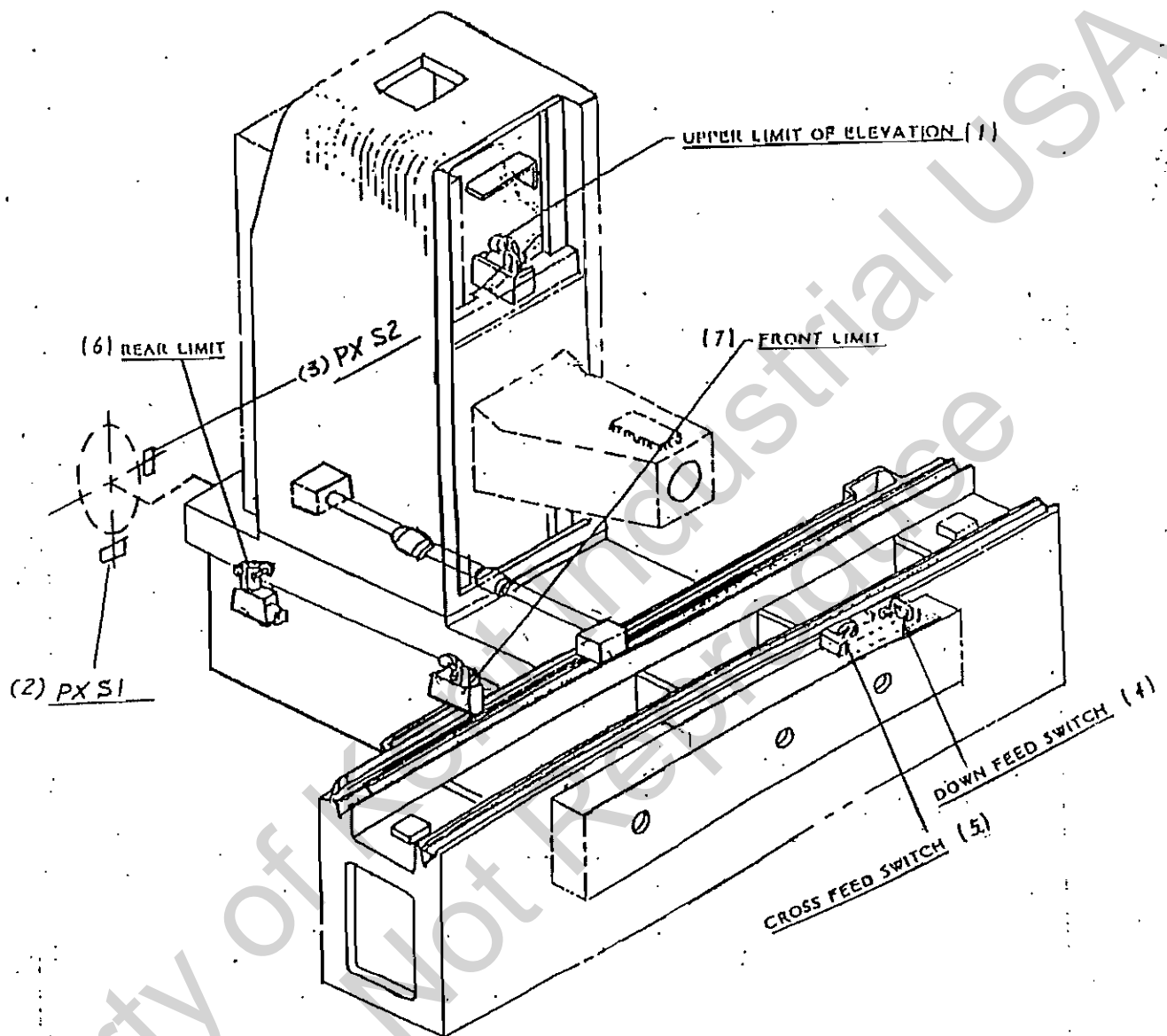


Description:

1. LS-7
2. PXS1
3. PSX2
4. PSX3
5. LS-4
6. LS-5

* For Above Code NO. ,Please Refer To Circuit Diagram

2448/2480AHD Limit switch Position



Description:

1. LS-7
2. PXS1
3. PSX2
4. PSX3
5. LS1
6. LS-4
7. LS-5

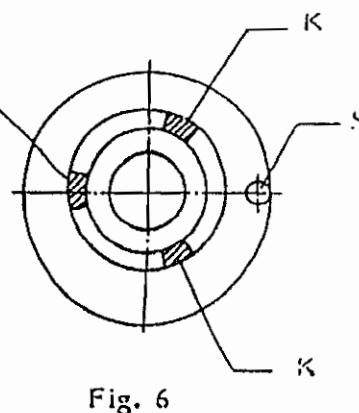
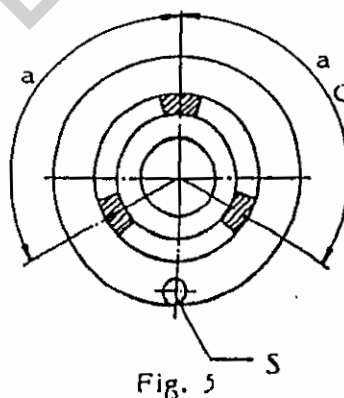
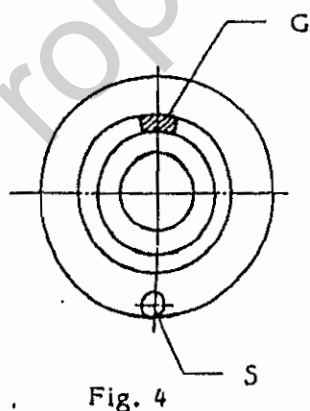
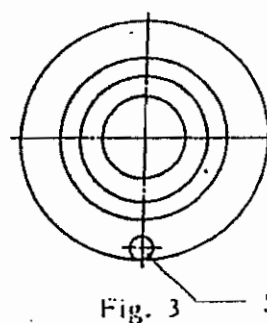
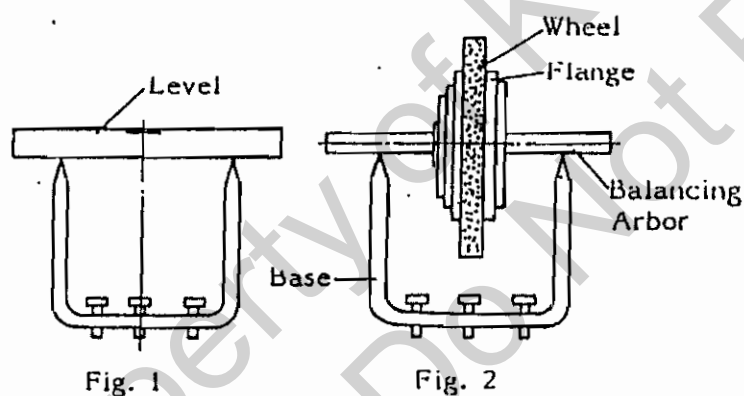
* For Above Code NO. ,Please Refer To Circuit Diagram

13. Balancing the grinding wheel

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

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

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



14. GENERAL COMMENTS OF GRINDING

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

(1) Stock removal efficiency

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

(2) Surface finish required

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

(3) Distortion of the workpiece

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

(4) Undersirable burns and grinding cracks

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

15. WHEEL INSPECTION

It is absolutely essential to comply fully with following safety rules. These are intended to protect the operator against danger.

Wheel inspection and fitting:

Prior to fitting any grinding wheel, it should always be tested. Sounding the wheel is a generally accepted test method.

The wheel should be suspended from a mandrel secured to its bore and should then be lightly sounded with a wooden hammer. Even wheels with hair cracks not visible with the bare eye will produce a distorted note in comparison with perfect wheel where the sound is clear. Defective grinding wheel must not be used.

There are two pieces of paper washer on both faces of wheel and serve as plastic packings between wheel and mounting flange. The packing washer must not be removed, when mounting the wheel should slide onto the flange easily by hand without the need for force. Wheel flange must be absolutely clean especially on the clamping and location surface, in the spindle bore and thread. The flange fixing screws should be tightened gradually and diagonally. The wrench should be applied at least 4 to 6 times to each screw in turn. When the wheel has run under coolant for sometime the paper packing washers will be damped, so it must re-tighten the fixing screws again diagonally.

After being balanced for the first time, the wheel must be mounted on the grinding spindle of the machine and dressed. This can be done with the parallel dresser on the spindle carrier or with one fitted on the table. When dressing the wheel from the table, the table must be locked longitudinally and then cross-traversed with handwheel. The wheel must be dressed until it runs dead true. The grinding finish is improved, if any out-of-truth in the side walls of the wheel is also removed.

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

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

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

Prior to place the flange-mounted grinding wheel to the spindle, flange bore and spindle taper must be absolutely clean, and the wheel is pushed by hand onto the spindle taper.

Subsequently, tighten wheel flange securely with fixed bolt. (Fig. 7). To release wheel flange from spindle taper with extractor. (Fig. 8).



Fig. 7

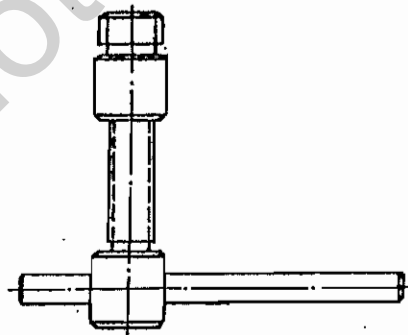


Fig. 8

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

16.DRESSING THE WHEEL AND CORRECT TREATMENT OF DRESSING DIAMOND

The diamond is inserts in the dressing device. The sleeve of the dressing device is arranged at an angle fo about 5° , so that , when the diamond loses its keenness, it can be turned in the sleeve, along with its holder, thus ensuring that there is always a sharp diamond edge available.

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

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

If the component is to be finish ground to size with the same grinding wheel, the wheel must be dressed again, this time slowly, in two or three passes, with the diamond fed in only about 0.01mm.

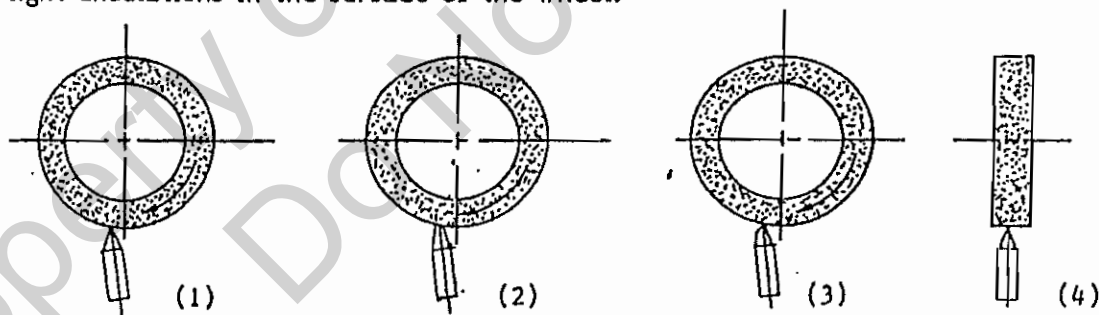
Frequent light dressing is better for the life of the grinding wheel and the diamond than a heavy cut.

When dressing, the diamond should always be cooled, if possible, but sudden cooling is dangerous, as it can lead to the diamond being split.

As the diamond is very brittle because of its extraordinary hardness and being sensitive to even the slightest knock, naturally cracks easily.

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

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

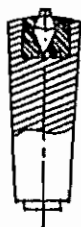


- (1) The new diamond is inclined at the correct angle to the wheel.
- (2) As a face has formed on the diamond, it must be turned about its axis.
- (3) The new point acts like a new diamond again.
- (4) Begin in the middle of the width.

After a certain time, the diamond must be changed in its holder, i.e. it must be reset to ensure economical operation. This re-setting should be undertaken in time, before any of the holder itself has been ground off. Otherwise, there is first of all the danger of breaking the diamond out and losing it, or secondly, of its being too small to be reset. This is really false economy.



(1)



(2)



(3)

(1) The new diamond.

(2) The diamond now be reset.

(3) Too late. The diamond can no longer be reset, as it has no more holder. Resetting should be done by specialists only.

17. STORAGE OF GRINDING WHEELS

The wheels should be kept in special racks in a dry place and must be protected from knocks and jolts, especially when they are being transported.

As a rule, they should be stood on edge, but thin wheels and wheels with a sharp edge must be laid flat on an even surface.

Grinding wheels must not be allowed to come into contact with oil or grease. An oilsoaked wheel loses its bite and its application is very limited.

18. SELECTION OF SUITABLE GRINDING WHEELS

Grinding wheel markings: For instance WA 46K8V

WA: Kind of abrasive

.6: Grain size

K: Grade

8: Structure

V: Bond type

A. Kinds of abrasive

A: For common steel grinding

WA: For higher hardness material grinding, such as heat-treated steel, alloy steel, etc.

H: Suitable for higher hardness material, particularly high speed steel

C: For cast iron and non-ferrous grinding

GC: For super hard grinding such as tungsten carbide steel

B. Grain size

Coarse: 10,12,14,16,20,24

Medium: 30,36,46,54,60

Fine: 70,80,90,100,120,150,180

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

C. Grade: It indicate the strength of the bond which hold abrasive

Soft: A to H

Medium: I to P

Hard: Q to Z

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

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

Close: 0,1,2,3,4,5,

Medium: 6,7,8,9,

Wide: 10,11,12,

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

E. Bond:

V: Vitrified,

S: Silicate,

B: Resinoid,

R: Rubber,

E: Shellac

19. WHEEL SELECTION TABLE

Wheel Specification		Wheel Diameter		150mm-205mm	205mm-355mm	355-510mm
Material						
STEEL	< HRC 25	WA	46K	WA	46J	WA 36J
	< HRC 25	WA	46J	WA	46I	WA 36I
ALLOY STEEL	< HRC 55	WA	46J	WA	46I	WA 36I
	< HRC 55	WA	46I	WA	46H	WA 36H
TOOL STEEL	< HRC 60	WA	46I	WA	46H	WA 36H
	< HRC 60	WA	46H	WA	46G	WA 36G
STAINLESS STEEL	Series 400	WA	46I	WA	46H	WA 36H
	Series 300	WA	36J	WA	30J	WA 36I
CAST IRON	Ordinary	C	46J	C	46I	C 36I
	Special	GC	46I	GC	46H	GC 36H

20. REFERENCE FOR GRINDING CONDITION

(1). Downfeed

Material Finish	Cast Iron, Soft/harden steel	Stainless and heat resistant steel	Tool steel	Cross Feed
Rough	0.0006-0.0012" 0.0015-0.03mm	0.0008-0.0012" 0.02-0.03mm	0.0008-0.0016" 0.02-0.04mm	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

(2). Cross feed

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

(3). Table longitudinal traverse

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

Suitable speeds of the table traverse

Work material	Soft steel	Heat treated steel	Tool steel	Cast iron
Speed: M/Min.	6-15	20-25	6-25	16-20

(4). Suitable peripheral speeds of wheel : 1200-1800M/Min.

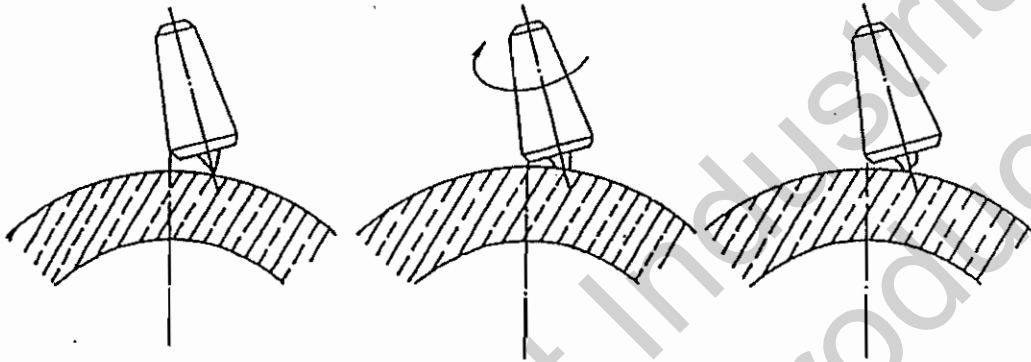
Wheel speed Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn out	small	great
Safety	bad	better

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

USE OF THE OPTIONAL ATTACHMENT

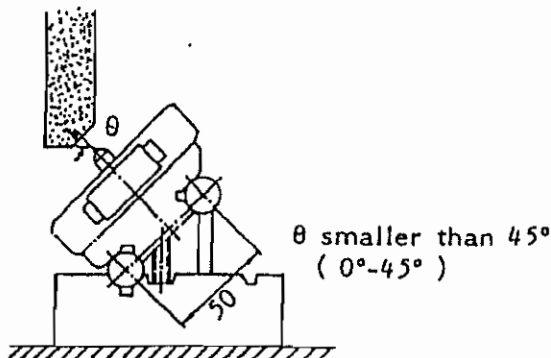
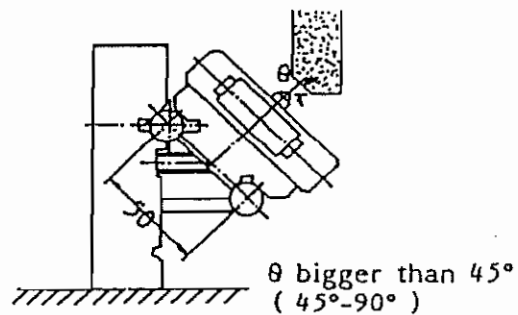
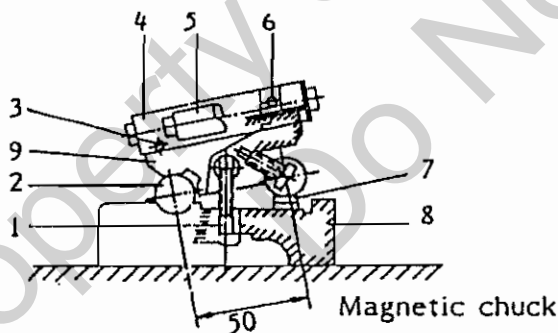
(a). Parallel Dressing attachment (Standard Accessory)

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



(b). Angle forming attachment

- (1) Let the Attachment be attracted to the magnetic chuck, keeping a 90° right angle between the attachment and the wheel. The magnetic chuck should be kept level.
- (2) The value in question will be the Sine of the angle times 50. That is $B = \sin \theta \times 50$
- (3) Get a Block gauge the thickness of which equals that of B (or make one)
- (4) Put this Block gauge under the base of the Sine Bar stand. Fix with the fastening bolts and the forming is done.



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

(c). Sine Bar

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

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

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

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

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

1. Mandrel

5. Inclinal Magnetic Chuck

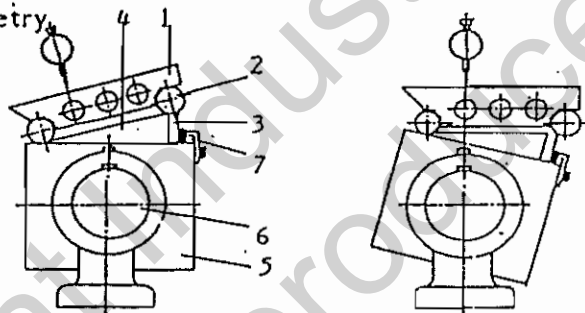
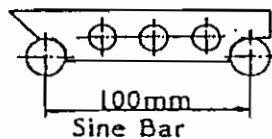
2. Sine Bar

6. Mandrel of the Magnetic Chuck

3. Block gauge

7. Stop block

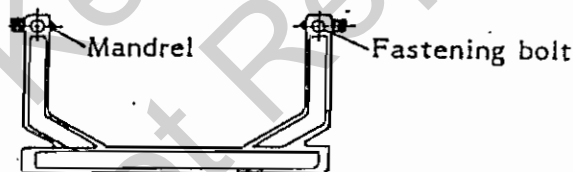
4. Application of the trigonometry



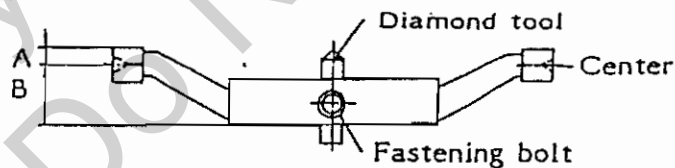
(d). Radius Forming Attachment

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

(1) Main Stand



(2) Swing rod and diamond tool



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

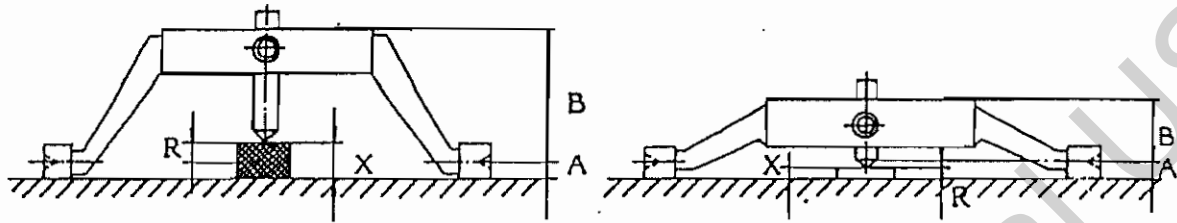
A: the distance between the upper rim and the center

B: the distance between the bottom rim and the center

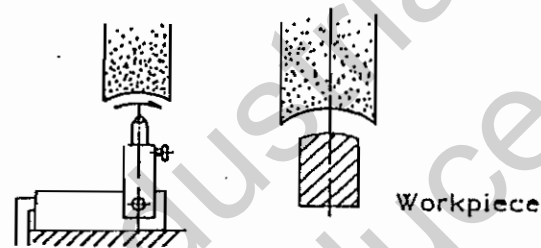
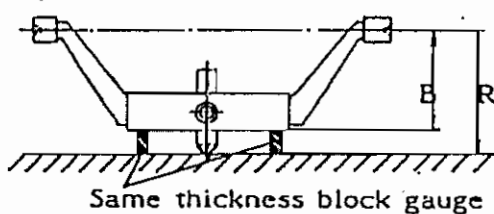
The R forming is the adjustment of the distance between the diamond tool and the swing rod center so that the R shaping results.

(3) To determine the concave and convex R:

- If the tool is parallel to the center line, it equals OR.
- To determine the convex R: Put the swing rod on a place disk. Put a block gauge of proper thickness under the diamond tool. Then $R = X - A$
- To determine the small concave R



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

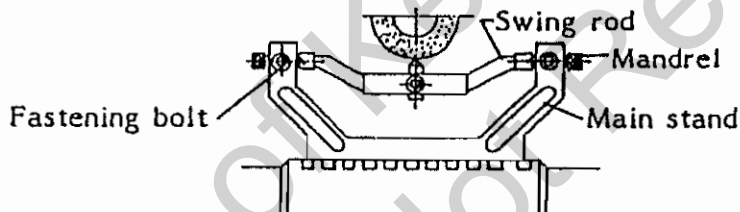


e. Note:

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

(4) Operation of the Radius forming attachment:

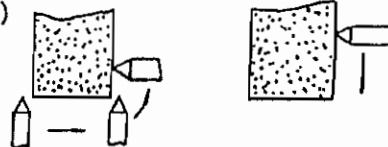
a. Find the center of the grinding wheel, then fix the work table.



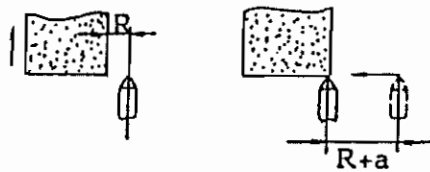
b. Turn the down-feed handwheel at $1/3$ on the width of the wheel so that the wheel cuts into 0.02mm of the diamond tool. Now turn the cross feed handwheel to dress the grinding wheel, and turn the calibration reading on the down feed back to zero.



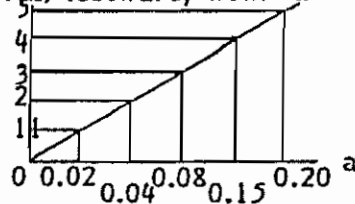
c. Turn the diamond tool over an angle 90° and elevate it into a proper position (greater than the R size in question)



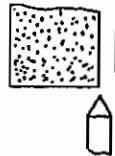
d. Elevate the grinding wheel so that it goes away from the diamond tool and the wheel in such a position that the distance between the side of the wheel and the center of the Diamond tool is just R.



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



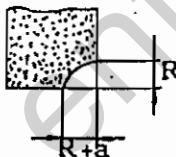
f. Turn the downfeed handwheel so that the grinding wheel approaches the diamond tool.



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



h. The wheel finally becomes the following shape.



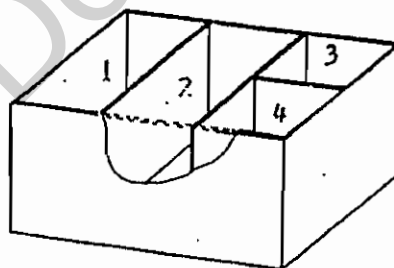
(e). Coolant System (Standard accessory)

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 rotate in clockwise direction, if not, interchange the any two cords of three-cord cable.

Adjust coolant flow by turning the ball valve to suitable rate.

Cooling water collected from table and returns to coolant tank through return hose then filtered in the coolant tank by turns of cabinet #1,2,3,4.



* Coolant tank capacity: 110 liters

* Coolant pump: 1/8 HP

(g).

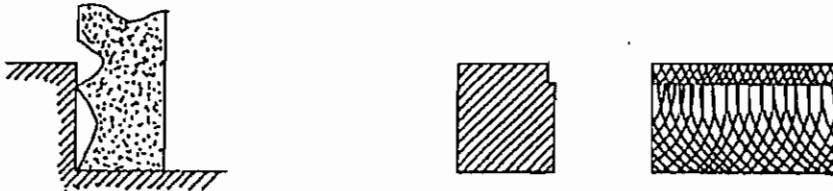
(f) . Common cases in Side Grinding

(1)



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

(2)



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

(3)



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

(4)



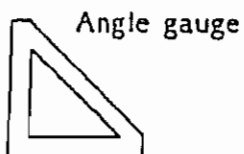
The "Relief Angle" of the wheel is lower than the surface of the work, so that the work face becomes two sections, the upper section resembling that in (3) and the lower section in (1). Now it is necessary to enlarge the "Relief Angle" part so that it will be higher than the face of the work.

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

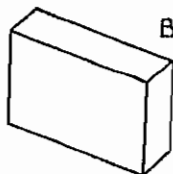


(g) . Right Angle Grinding.

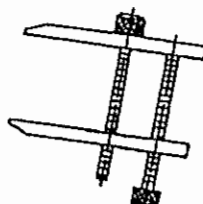
(i) Tools



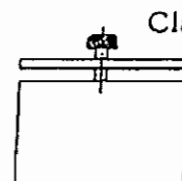
Angle gauge



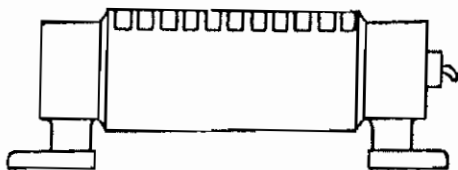
Block



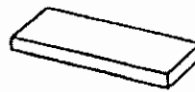
Clamp



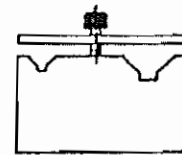
Clamp



Inclined Magnetic Chuck



Block gauge

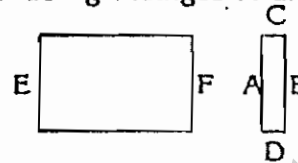


Clamp

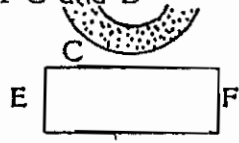
(2) Use of the jigs and tools: take the grinding of the block of six faces A, B, C, D, E, F. For example:

a. Under 200mm:

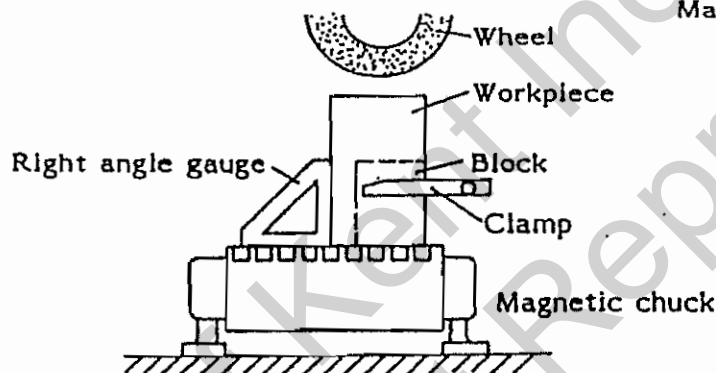
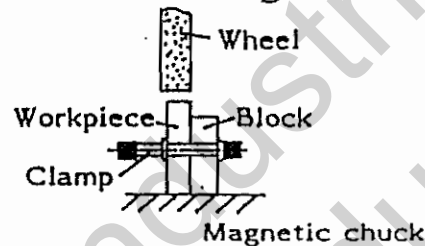
* Grinding of the first basic face, or the surface grinding of A and B,



* Grinding of C and D



* Grinding of E and F

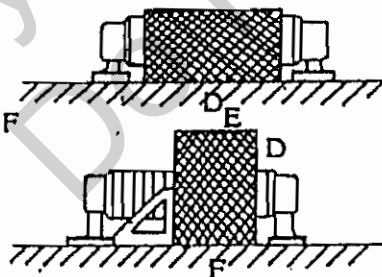


b. Over 200mm:

* Grinding of the first basic face or A,

* Grinding of C and D: turn the Inclined magnetic chuck into 90°

* Grinding of E and F

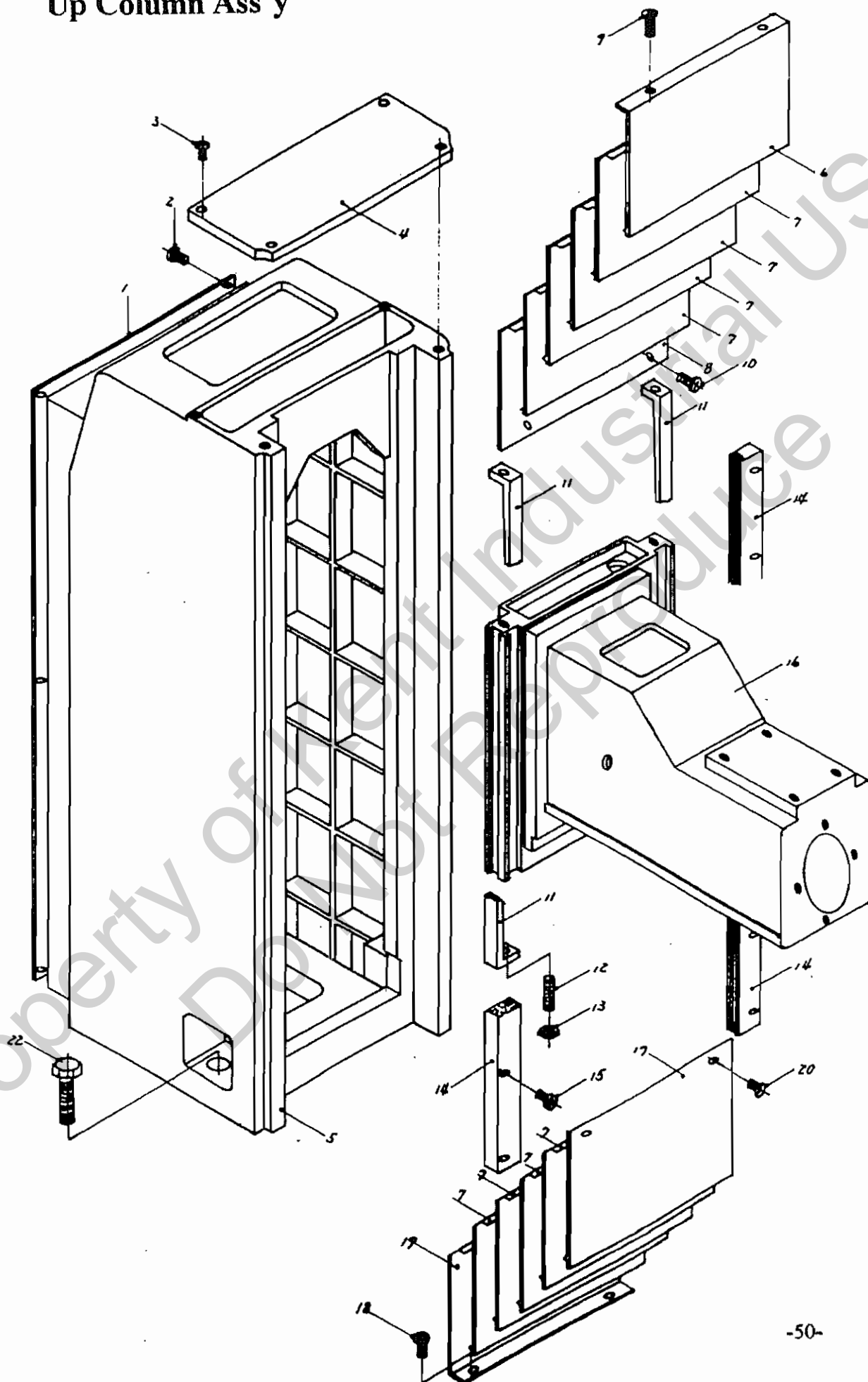


(3) Precaution: The grinding of right angle depends on the patience and clever mindedness of the operator for its precision. For instance, whether the burrs after grinding is done well, whether the tools are kept clean, whether the work table are kept clean, the accuracy of the angle gauge, etc. all will have a direct influence over the precision of the product.

22. Complete Knockdown Drawing & Parts Lists

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Cross-feed Ass'y.....	57
Longitudinal Handfeed Ass'y.....	59
Cylinder Set Ass'y.....	62
Hydraulic ass'y.....	64

Up Column Ass'y



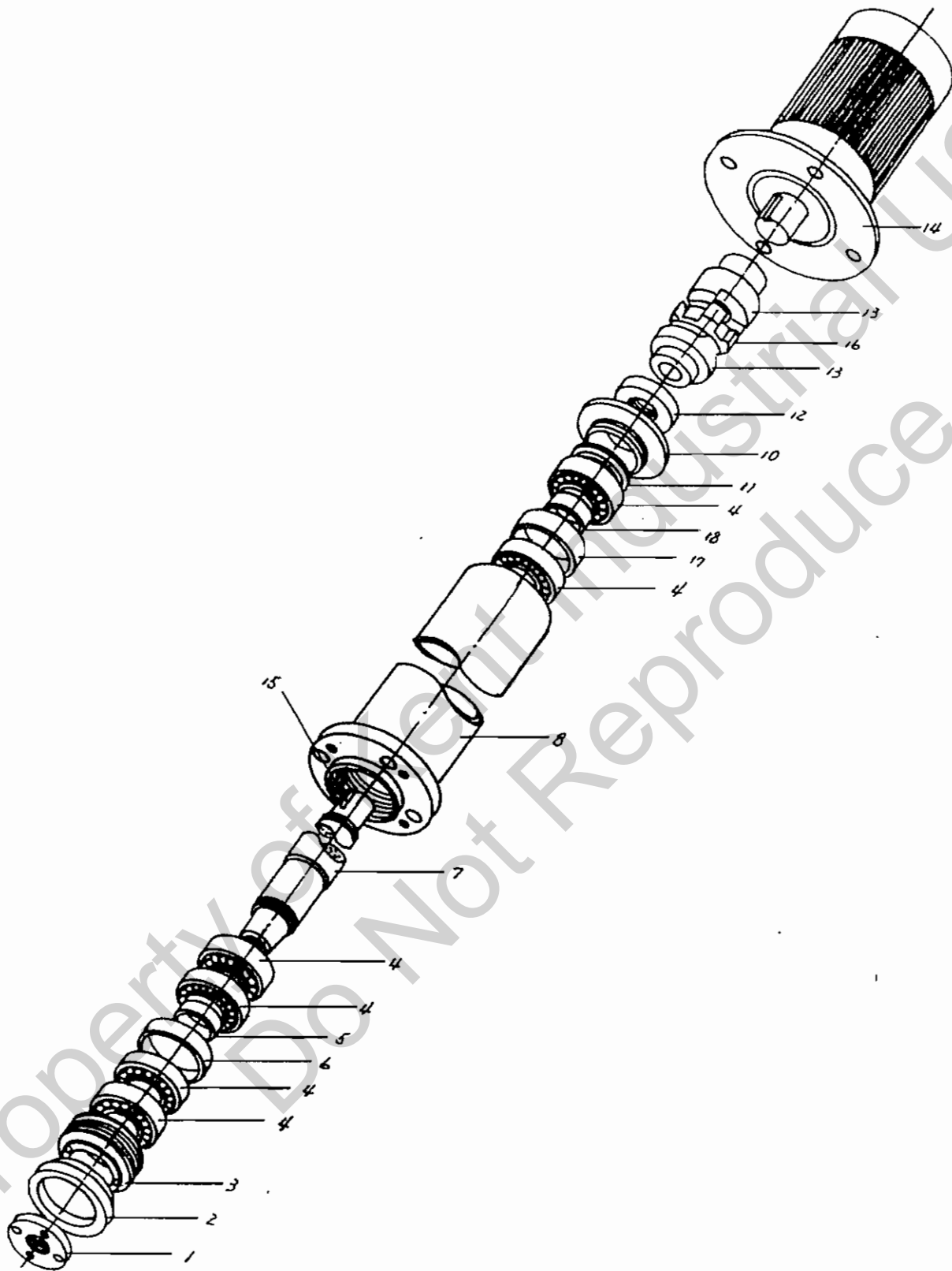
UP COLUMN ASS'Y

(2448,2480 SERIES)

Index No.	Parts No.	Parts Name	Q'ty
1.	2448-313A	Column Rear Cover	1
2.	W1/4 " × 1/2 "L	Round Head Screw	8
3.	W1/4 " × 3/4 "L	Socket Head Cap Screw	4
4.	2448-314	Column Upper Cover	1
5.	2448-301	Column	1
6.	2448-316	Dust Shield	1
7.	2448-318	Dust Shield	8
8.	2448-317	Dust Shield	1
9.	W3/16 " × 1/2 "L	Round Head Screw	2
10.	W3/16 " × 1/2 "L	Round Head Screw	2
11.	2448-325A	Tapper Plate	3
12.	W1/8 " × 4 "L	Adjusting Screw	3
13.	W 3/8"	Nut	6
14.	2448-315	Shield Guide	2
15.	W1/4 " × 1 1/2 "L	Socket Head Cap Screw	28
16.	2448-202	Head A (Spindle Seat)	1
17.	2040-320	Dust Shield	1
18.	W3/16 " × 1/2 "L	Fixed Dust Shield	2
19.	2448-319	Dust Shield	1
20.	W3/16 " × 1/2 "L	Round Head Screw	2
21.			
22.	W 1"*2 1/2"L	Hexagonal Head Cap Screw	5

OP2448e5

Spindle Set Ass'y

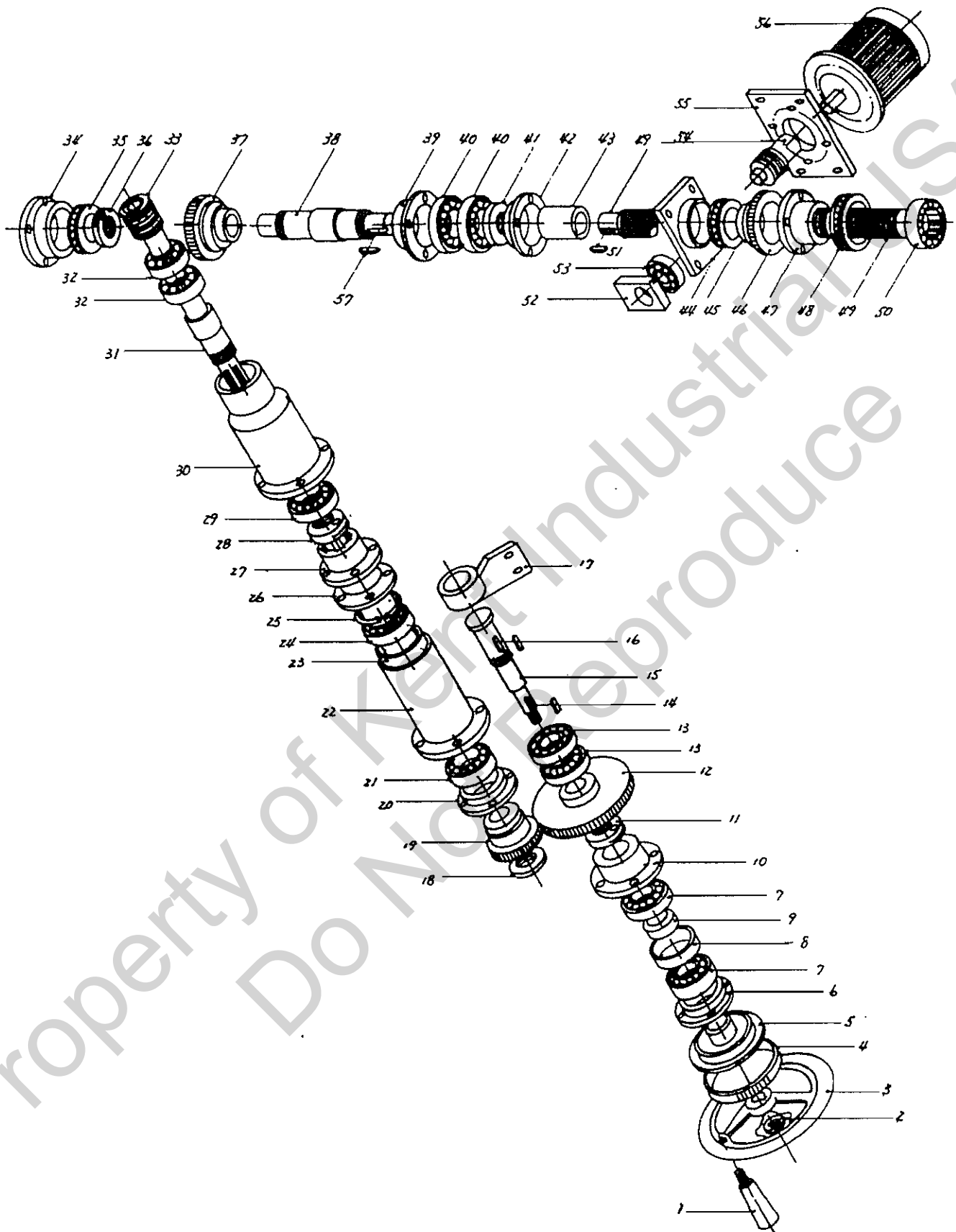


SPINDLE SET ASS'Y
(2448,2480 SERIES)

Index No.	Parts No.	Parts Name	Q'ty
1.	2040-107	Spindle Cover (Fornt)	1
2.	2040-105	Spindle Cover (Front)	1
3.	2040-106	Spindle Nut	1
4.	B7210 P4	Bearing	4
5.	2040-108	Spacer	2
6.	2040-109	Spacer	2
7.	2040-104	Spindle Shaft	1
8.	2040-103	Spindle Houshing	1
9.	-----	-----	-
10.	2040-112	Spindle Cover (Rear)	1
11.	2040-110	Spacer	1
12.	2040-111	Spindle Nut	1
13.	1632-111	Coupling	2
14.	10HP*4P	Spindle Motor	1
15.	10*8*35L	Key	1
16.	1632-113	Rubber Coupling	1

Op2448e2

Down Feed Unit Ass'y



DOWN FEED UNIT ASS'Y

(2448,2480 SERIES)

P. 1OF2

Index No.	Parts No.	Parts Name	Q'ty
1.	1020-728	Hand Grip	1
2.	1020-729	Cap Nut	1
3.	1020-714	Hand Wheel	1
4.	2448-254	Graduation Dial	1
5.	2448-253	Graduation Dial Holder	1
6.	2448-255	Bearing Cover	1
7.	B6204Z	Bearing	2
8.	2448-256	Spacer	1
9.	2448-257	Spacer	1
10.	2448-227	Dial Holder	1
11.	2448-432	Locking Nut	1
12.	2448-437	Gear	1
13.	B6005Z	Bearing	2
14.	5*5*20	Key	1
15.	2448-211	Shaft	1
16.	5*5*15	Key	1
17.	2448-212	Bracket	1
18.	AN-10	Lock Nut	1
19.	2448-232	Gear	1
20.	2448-233	Bearing Cover	1
21.	B6210Z	Bearing	1
22.	2448-234	Bracket	1
23.	2448-234-1	Spacer	1
24.	NA4911UU	Neddle bearing	1
25.	R-80	Snap Ring	1
26.	2448-235	Shaft Pipe	1
27.	2448-236	Transmission Nut	1
28.	2448-241	Locking Nut	1
29.	B6207	Bearing	1
30.	2448-216	Bracket	1

DOWN FEED UNIT ASS'Y

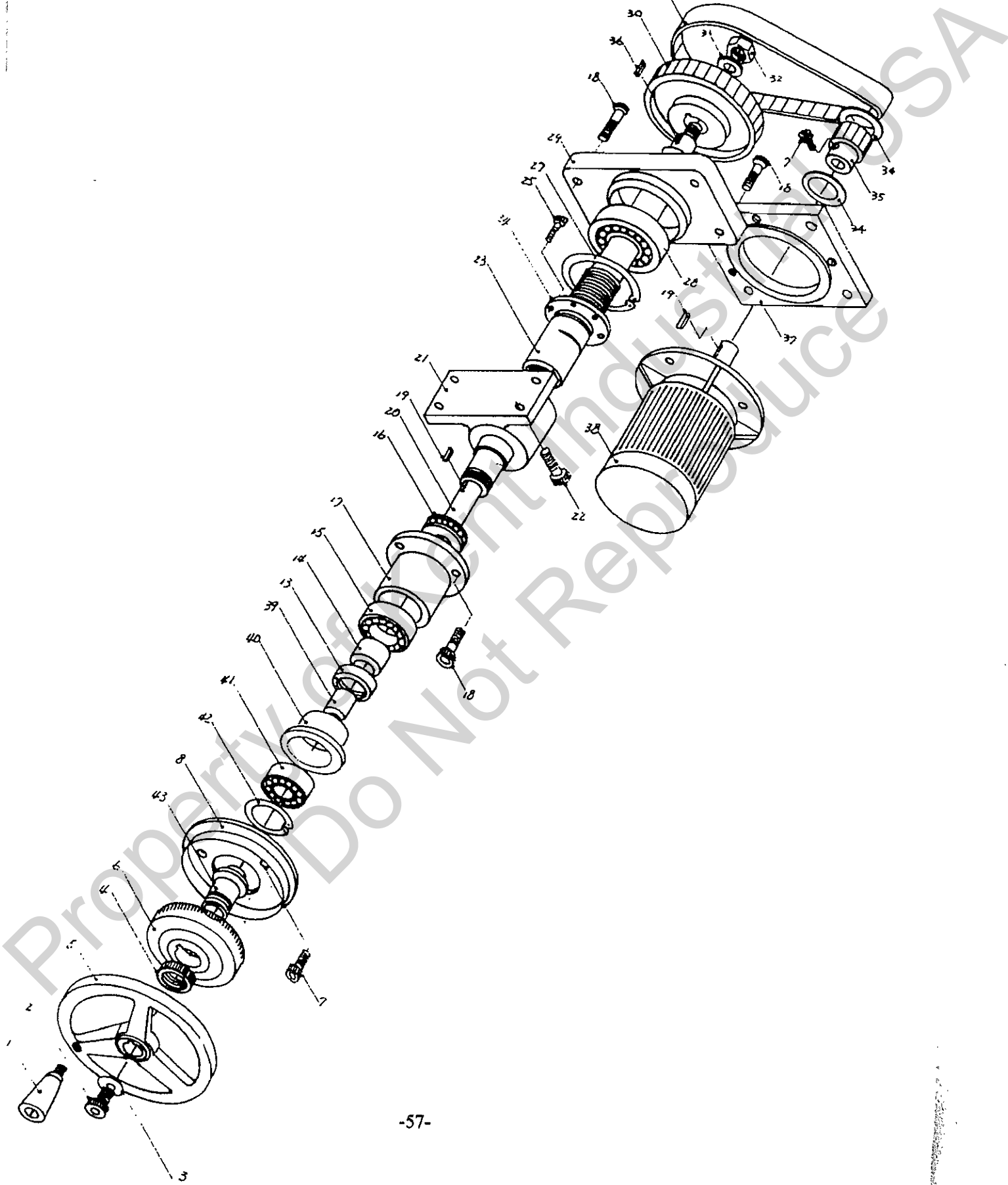
(2448,2480 SERIES)

P.2OF2

Index No.	Parts No.	Parts Name	Q'ty
31.	2448-217	Transmission Shaft	1
32.	B7205	Bearing	2
33.	2448-218	Worm	1
34.	2448-220	Bearing Cover	1
35.	B51306	Thrust Bearing	1
36.	2040-210	Lock Nut	1
37.	2448-222	Worm Gear	1
38.	2448-221	Shaft	1
39.	2448-223	Bearing Housing	1
40.	B7206	Bearing	2
41.	AN-06	Lock Nut	1
42.	2448-225	Bearing Cover	1
43.	2448-240	Coupling	1
44.	2448-210	Bearing Housing	1
45.	NTB5578	Niddle Bearing	1
46.	2448-207	Worm Gear	1
47.	2448-239	Lead-Screw Nut	1
48.	NTB5578	Niddle Bearing	1
49.	2448-238	Down Feed Lead-Screw	1
50.	TA5525	Niddle Bearing	1
51.	6*6*25	Key	1
52.	2448-209	Bearing Housing	1
53.	B6002Z	Bearing	1
54.	2448-208	Worm	1
55.	24448-203	Motor Base	1
56.	1/4HP*6P(For AH Type)	AC Motor	1
	CN-400T(For AHD Type)	DC Servo Motor(400W)	1

Op2448e6

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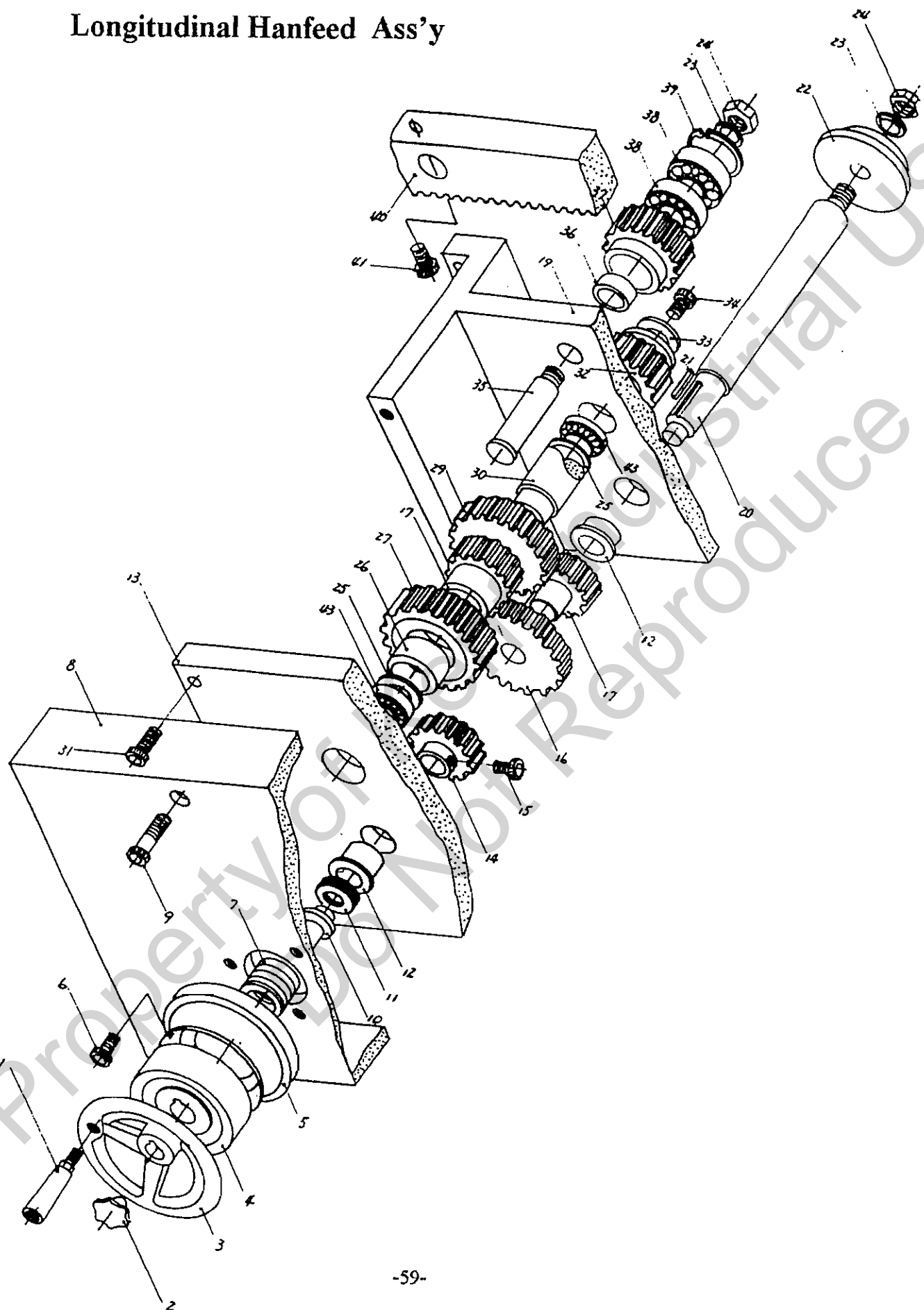
CROSS-FEED ASS'Y

(2448,2480 SERIES)

Index No.	Parts No.	Parts Name	Q'ty
1.	1020-728	Hand Grip	1
2.	W 1/4"*5/8"L	Socket Head Cap Screw	1
3.	2040-414	Washer	1
4.	2040-402	Nut	1
5.	1020-714	Hand Wheel	1
6.	2040-404	Graduation Dial	1
7.	W 1/4"*1/2"L	Socket Head Cap Screw	7
8.	2040-405	Dial Holder	1
13.	2448-432B	Lock Nut	1
14.	2040-409	Washer	1
15.	B5205	Bearing	1
17.	2448-435A	Bearing Housing	1
18.	W 3/8"*1"L	Socket Head Cap Screw	15
19.	5*5*20L	Key	1
20.	2040-439	Cross Feed Ball Screw	1
21.	2040-478	Ball Screw Nut Base	1
22.	W 1/2"*1 3/4"L	Socket Head Cap Screw	4
23.	2448-439-1	Cross Feed Nut Of Ball Screw	1
25.	W 5/16"*1 1/4"L	Socket Head Cap Screw	6
27.	R-52	Snap Ring	1
28.	B 1205Z	Bearing	1
29.	2448-443	Bearing Housing	1
30.	2040-411	Timing Belt Pulley	1
31.	W 1/2"	Washer	1
32.	W 1/2"	Hexagonal Nut	1
33.	P 3/8"*330H	Timing Belt	1
34.	2040-413	Timing Belt Pulley Flange	2
35.	2040-412	Timing Belt Pulley	1
36.	5*5*25L	Key	1
37.	2448-447A	Cross Feed Motor Fixed Plate	1
38.	1/4 HP*6P	Cross Feed Motor	1
39.	2040-442	Washer	1
40.	2040-440	Bearing Seat	1
41.	B 2203	Bearing	1
42.	R 40	Snap Ring	1
43.	2040-441	Set Spacer	1

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Longitudinal Hanfeed Ass'y



LONGITUDINAL HANDFEED ASS'Y (2448,2480 SERIES)

P. 10F2

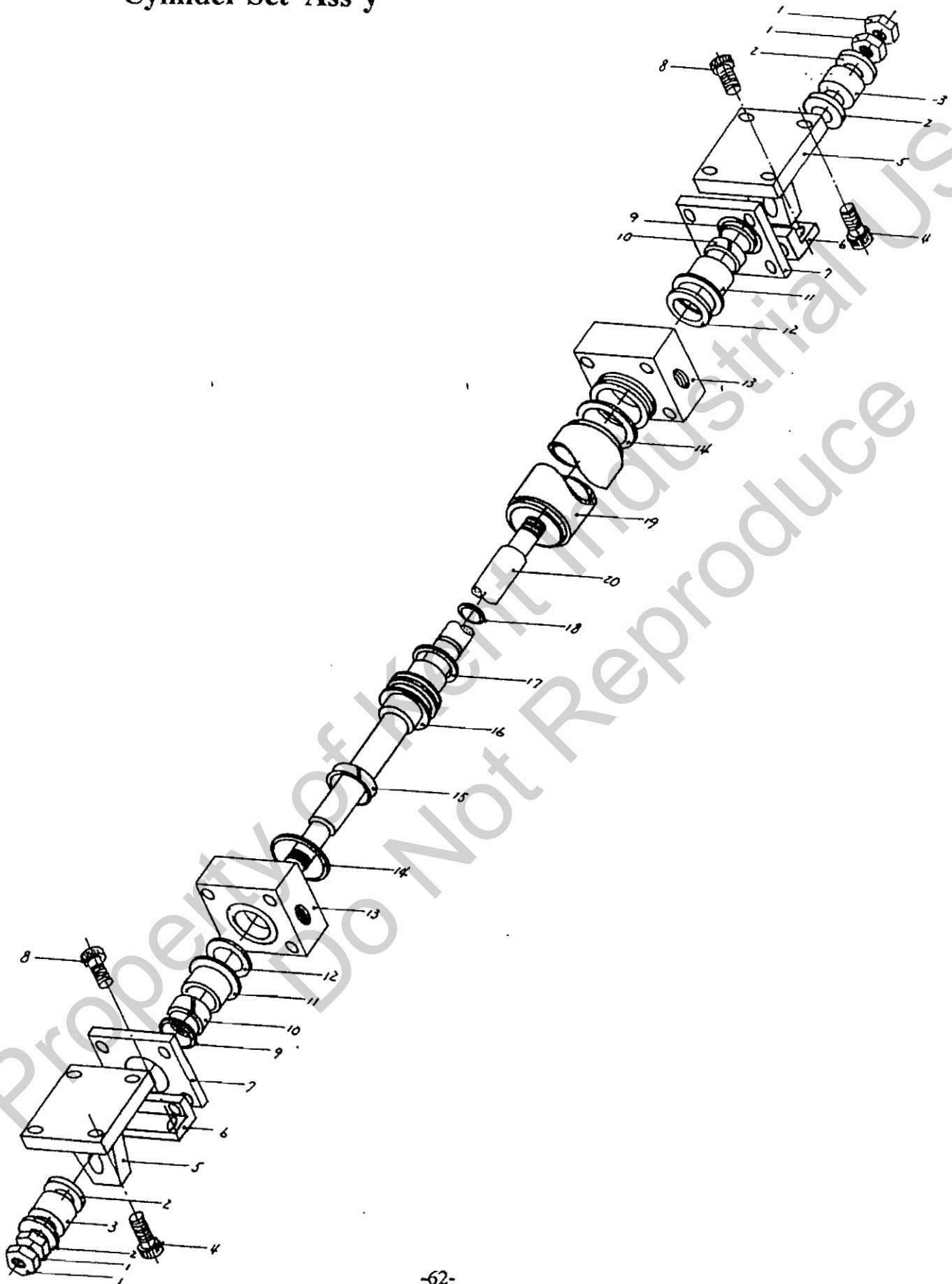
Index No.	Parts No.	Parts Name	Q'ty
1.	1020-728	Hand Grip	1
2.	1020-729	Cap Nut	1
3.	1020-714	Hand Wheel	1
4.	2040-521	Dial	1
5.	2040-523	Dial Holder	1
6.	W 1/4"*3/4"L	Socket Head Cap Screw	3
7.	2040-520	Spring	1
8.	2448-103	Base Plate	1
9.	W 5/16"*10"L	Socket Head Cap Screw	6
10.	2040-519	Sleeve	1
11.	NTB-2035	Needle Bearing	1
12.	2040-505	Bush	1
13.	2448-505	Gear Housing Plate	1
14.	2040-517	Gear	1
15.	W 1/4"*1/2"L	Set Screw	1
16.	2040-513	Gear	1
17.	2040-512	Gear	2
18.	-----	-----	-
19.	2448-504	Gear Housing Plate	1
20.	2448-506	Shaft	1
21.	5*5*40L	Key	1
22.	2040-516	Power Plate	1
23.	W 1/2"	Washer	2

LONGITUDINAL HANDFEED ASS'Y (2448,2480 SERIES)

P.2OF2

Index No.	Parts No.	Parts Name	Q'ty
24.	W 1/2"	Hexagonal Nut	2
25.	1020-N805	Spacer	2
26.	2040-514	Spacer	1
27.	2040-524	Gear	1
28.	-----	-----	-
29.	2040-511	Gear	1
30.	2040-515	Shaft	1
31.	W 5/16"*1"L	Socket Head Cap Screw	4
32.	2040-510	Gear	1
33.	W 1/4"	Washer	1
34.	W 1/4"*1/2"L	Socket Head Cap Screw	1
35.	2040-509	Shaft	1
36.	2040-508	Washer	1
37.	2040-507	Gear	1
38.	B6203Z	Bearing	2
39.	R-40	Snap Ring	1
40.	2448-114	Rack	1
41.	W 3/8"*1"L	Socket Head Cap Screw	3
42.	-----	-----	-
43.	B6003Z	Bearing	2

Cylinder Set Ass'y



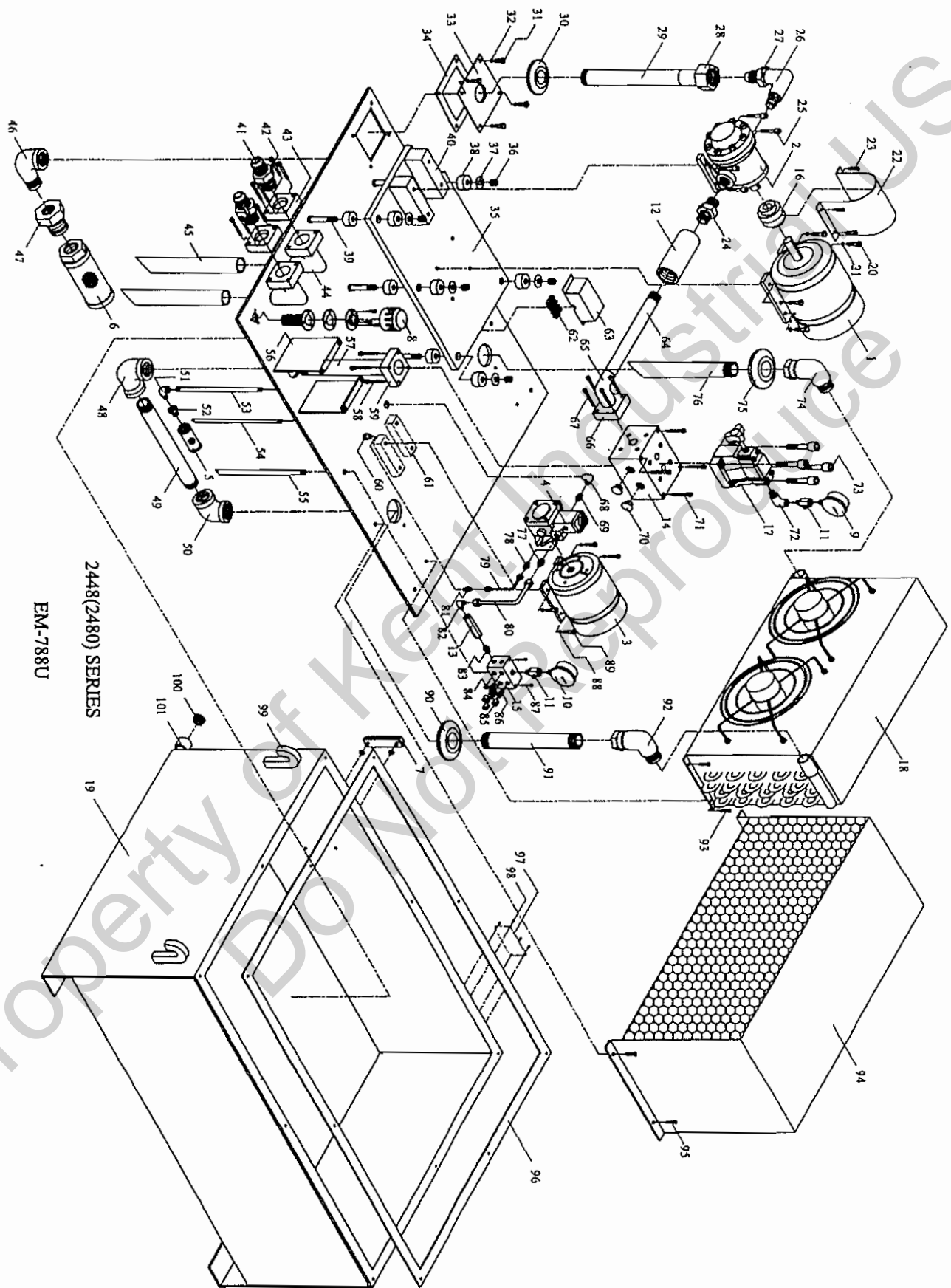
CYLINDER SET ASS'Y

(2448,2480 SERIES)

Index No.	Parts No.	Parts Name	Q'ty
1.	W 3/4"	Hexagonal Nut	4
2.	2448-610	Washer	4
3.	2448-609	Rubber Pad	2
4.	W 1/2"*1 1/2"L	Socket Head Cap Screw	8
5.	2448-611	End Bracket	2
6.	2448-604	Cylinder Brcket	2
7.	2448-608	Cylinder Clamper	2
8.	W 1/2"*1"L	Socket Head Cap Screw	4
9.	LBH 25	Dust Seal	2
10.	30*25*9.7W	Wear Ring	2
11.	2448-607	Oil Seal Bracket	2
12.	USH 25	U-Packing	2
13.	2448-602	End Cover	2
14.	G 45	O Ring	2
15.	50*45*9.7W	Wear Ring	1
16.	2448-605	Piston	1
17.	P 44	O Ring	1
18.	P 21	O Ring	1
19.	2448-601(for 2448 series)	Cylinder Pipe	1
	2480-601(for 2480 series)	Cylinder Pipe	1
20.	2448-603(for 2448 series)	Cylinder Rod	1
	2480-603(for 2480 series)	Cylinder Rod	1

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Hydraulic Pump Unit Ass'y



HYDRAULIC PUMP UNIT ASS'Y (2448,2480 SERIES)

P. 1OF3

Index No.	Parts No.	Parts Name	Q'ty
1.	5HP*4P	Motor	1
2.	VPNE-61-2-20	Pump	1
3.	1HP*4P	Motor	1
4.	VPVC-F12-A2-02	Pump	1
5.	SS-2-100	Oil Filter	1
6.	PS-06	Oil Filter	1
7.	LS-7"	Oil Level Indicator	1
8.	AB-1163	Cover Of Oil Fill Cover	1
9.	2-1/2"*100KG	Pressure Gauge	1
10.	2-1/2"*35KG	Pressure Gauge	1
11.	1/4"PT	Gauge Cock	2
12.	CIT-15-05-10	Check Valve	1
13.	CIT-03-05-10	Check Valve	1
14.	EM-372	Manifold Board	1
15.	EM-374	Manifold Board	1
16.	E-97	Coupling	1
17.	HRF-G06-1-10	Relief	1
18.	EM-373	Oil Cooler	1
19.	1200*900*520	Tank	1
20.	M12*40L	Hexagonal Head Screw	4
21.	SWM12	Spring Washer	4
22.		Cover Of Coupling	1
23.	M5*12L	Round Head Cap Screw	4
24.	1-1/4"PT*1-1/4"PT	Connector	1
25.	M12*30L	Socket Head Cap Screw	4
26.	1-1/2"PT*1-1/2"PT	Connector (90°)	1
27.	1-1/2"PS	Bushing	1
28.	1-1/2"PS	Nut	1
29.	1-1/2"PS	Zine-Plate Pipe	1
30.	ST-12	Dust Rubber	1
31.	M8*20L	Hexagonal Head Screw	4
32.	SWM8	Spring Washer	4
33.	CP-2448-1-1	Cover	1
34.	SS-2448-1-1	Asbestos Packing	1
35.		Auxiliary Enhance Plate	1
36.	M16	Nut	12

HYDRAULIC PUMP UNIT ASS'Y (2448,2480 SERIES)

P.2OF3

Index No.	Parts No.	Parts Name	Q'ty
37.	WM16	Washer	6
38.	φ 50*φ 16*25H	Rubber Pad	12
39.	M16*110L	Hexagonal Head Screw	6
40.	EM-375	Plate Pad	2
41.	1-1/4"PT*1-1/4PH	Asbestos Packing	2
42.	M12*45L	Round Head Screw	8
43.	1-1/4" with Oring-G40	Flange	2
44.	1-1/4"PT*1-1/4PT"	Connector	2
45.	1-1/4"PT*300L(Slope)	Zinc-Plate Pipe	2
46.	1-1/2"PT(F)*1-1/2PT"(M)	Connector (90°)	1
47.	1-1/2"PT(F)*2PT"(M)	Bushing	1
48.	1"PT*1"PT	Connector	1
49.	1"PT	Zinc-Plate Pipe	1
50.	1"PT*1"PT	Connector	1
51.	1/2"PT(F)*1/2PT"(M)	Connector (90°)	1
52.	1/2"PT(F)*3/4PT"(M)	Bushing	1
53.	1/2"PT*1/2"PT	Zinc-Plate Pipe	1
54.	1/4"PT*300L(slope)	Zinc-Plate Pipe	1
55.	3/8"PT*300L(slope)	Zinc-Plate Pipe	1
56.	2448-HP1	Holding Plate	2
57.	1"PT	Zinc-Plate Pipe	1
58.	M12*45L	Round Head Socket Cap Screw	4
59.	1-1/4" with Oring-G40	Flange	1
60.	1/4"PT*1/4"PT	Socket	1
61.	2448-MP1	Pad Of Motor	2
62.	SJT-15-3P	Terminal broad	1
63.	2448-TB1	Cover Of Terminal broad	1
64.	1-1/4"PT	Steel Pipe	1
65.		90° Pipe	1
66.	1-1/4" with Oring-G40	Flange	1
67.	M12*45L	Round Head Socket Cap Screw	4
68.	1/2"PT(F)*1/2"PT(F)	Connector (90°)	1
69.	1/2"PT*1/2"PT	Connector	1
70.	1"PT	PT Plug	2
71.	M8*110L	Round Head Socket Cap Screw	4
72.	1/2"PT(F)*1/2"PT(M)	Connector (90°)	1

HYDRAULIC PUMP UNIT ASS'Y

(2448,2480 SERIES)

P.3OF3

Index No.	Parts No.	Parts Name	Qty
73.	M16*50L	Universal Connector (90°)	1
74.	1"PT(M)*1"PS(F)	Round Head Socket Cap Screw	4
75.	ST-08	Dust-Rubber	1
76.	1"PT*300L(Slope)	Zine-Plate Pipe	1
77.	3/4"PT* ϕ 22mm	LE Connector (90°)	1
78.	1/4"PT* ϕ 5/16 "	LE Copper Connector	1
79.	ϕ 5/16"	Copper Pipe	1
80.	ϕ 12	Zine-Plate Pipe	1
81.	1/4"PT* ϕ 5/16 "	LE Copper Connector	1
82.	3/8"PT* ϕ 12	LE Connector (90°)	1
83.	3/8"PT*1/4"PT	Connector	1
84.	1/4"PT	PT Plug	1
85.	1/4"PS	Plug Screw	3
86.	1/4"PT*1/4"PS	Connector	3
87.	M5*65L	Socket Head Cap Screw	2
88.	SWM8	Spring washer	4
89.	M8*20L	Hexagonal Head Screw	4
90.	ST-08	Dust Rubber	1
91.	1"PT	Zine-Plate Pipe	1
92.	1"PT(F)*1"PS(M)	Universal Connector (90°)	1
93.	M5*12L	PT Plug	4
94.	2448C1	Cover Of Cooler	1
95.	M5*12L	Round head Screw	4
96.	2448-AP1	Asbestos Packing	1
97.	2448-NP1	Name Plate	1
98.	ϕ 2.5mm	Rivet	4
99.	2448-HB	Hang Bar	4
100.	1/2PT"	PT Plug	1
101.	1/2PT"	Socket	1