

Operation Manual

For

SG-618-2A

SG-820-2A

The Precision Surface Grinding Machine

Version: 2022/11/B

Version revision notes

date	version	notes/Page

CONTENT

1	General Description	5
1.1	Construction.....	5
1.1.1	Front View	6
1.1.2	Slide View	8
1.1.3	WORKING RANGE & EXTERNAL DIAGRAM	10
1.2	Specification	12
1.3	Standard Accessories	13
2	INSTALLATION	15
2.1	Floor plan of machines.....	15
2.2	Transportation	18
2.2.1	Use crane to lift & carry the machine	18
2.2.2	Use forklift to lift and carry the machine.....	19
2.4	Installation.....	21
2.5	Leveling Adjustment.....	21
3	Hydraulic Circuit System	25
3.1	Flow control valve type	25
3.2	Parts of hydraulic circuit system.....	26
3.2.1	SG618-2A/820-2A.....	26
3.3	Hydraulic wiring diagram.....	27
3.3.1	SG618-2A/820-2A.....	27
3.4	Hydraulic adjustment.....	28
4	OILING AND LUBRICATION.....	30
4.1	Lubrication System	30
4.2	Lubrication Adjustment	31
4.3	The Reminders While Oiling.....	31
5	Operating instruction	33
5.1	Control panel.....	33
	SG-618-2A panel	33
5.1.1	Explain of all panel symbol	35
5.1.2	Table feed control	39
5.2	The X axis.....	39
5.3	The cross axis.....	41

5.3.1	Rapid feed Y axis(R used only)	42
5.3.2	Hand wheel	42
	Y axis hand wheel	42
	Rise C.W. Decrease C.C.W.....	42
	Cross feed hand wheel	42
	Forward C.W. Backward C.C.W.....	42
	Longitudinal feed hand wheel.....	42
	Right C.W. Left C.C.W.	42
5.4.1	Mounting of the grinding wheel	43
5.4.2	Dismounting of the grinding wheel	43
5.4.3	Balancing of the grinding wheel.....	44
5.4.4	Dressing operation of grinding wheel.....	45
6	Operator's checking before operation.....	47
	6.2.2 SG-820-2A	51
7	Machine Operation.....	53
	7.1 Machine Operation.....	53
	7.2 The Saddle Clamp Device	55
	7.3 Magnetic Separator Coolant System : (OPT.).....	57
8	Maintenance	58
	8.1 General Maintenance	58
	8.2 Notice for Usage	58
	8.3 Chuck	59
	8.4 Grinding Wheel Spindle	59
	8.5 Procedure for the replacement of the wheel spindle.....	60
9	Grinding faults and their corrections	60

1 General Description

1.1 Construction

The machine is a hydraulic table, vertical/cross axis are both by manual(SG-820-2A is driven by motor).

This machine had a simple construction, each part of which has an enough rigidity to meet high accuracy requirements.

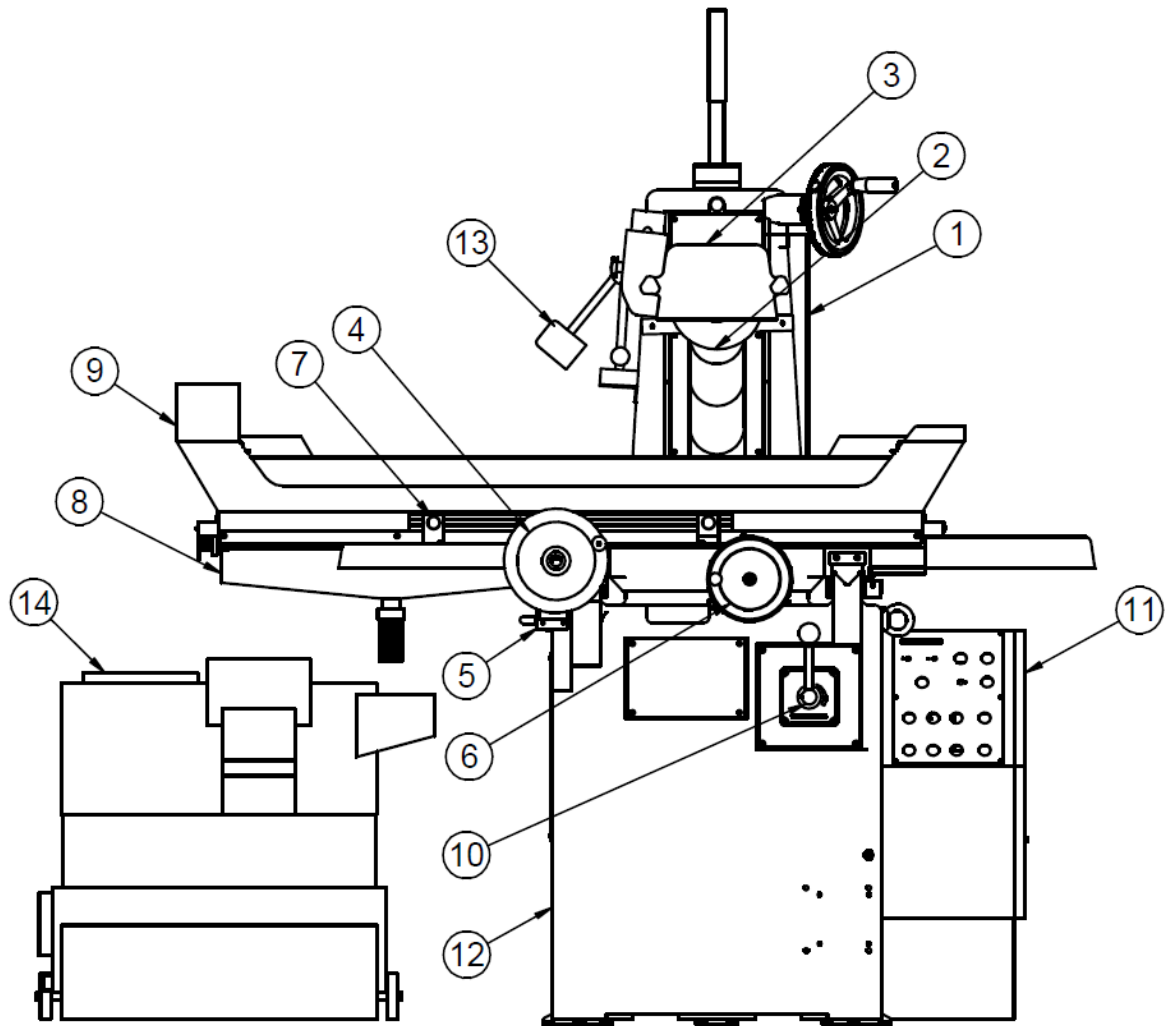
The construction of the machine :

Machine body	Spindle	Vertical system、 Spindle motor
	Column	
	Table	Longitudinal system
	Saddle	Cross system
	Base	Electrical cabinet、 Saddle lock
Optional accessories		Dey grinding device
		Wet grinding device

Hydraulic unit	Table feed control
	Hydraulic systems

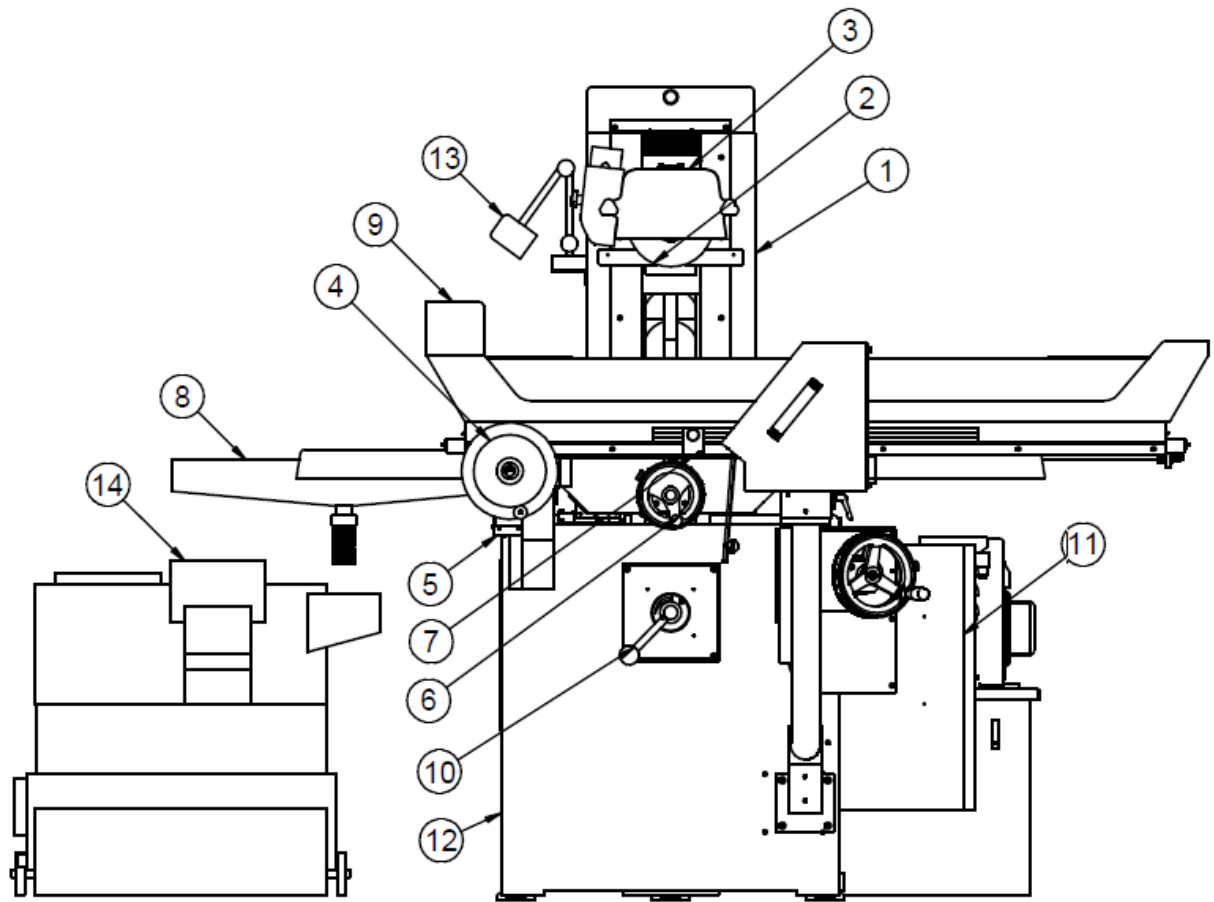
1.1.1 Front View

1.SG-618-2A



1.Column	9.Spalsh guard(OPT)
2.Grinding wheel	10.Table feed control
3 Grinding wheel guard	11. Electrical cabinet
4.Table wheel	12.Base
5.Cross sensor	13.Wroking lamp
6.Cross wheel	14.Coolant system(OPT.)
7. Longitudinal sensor	
8.Drainage groove	

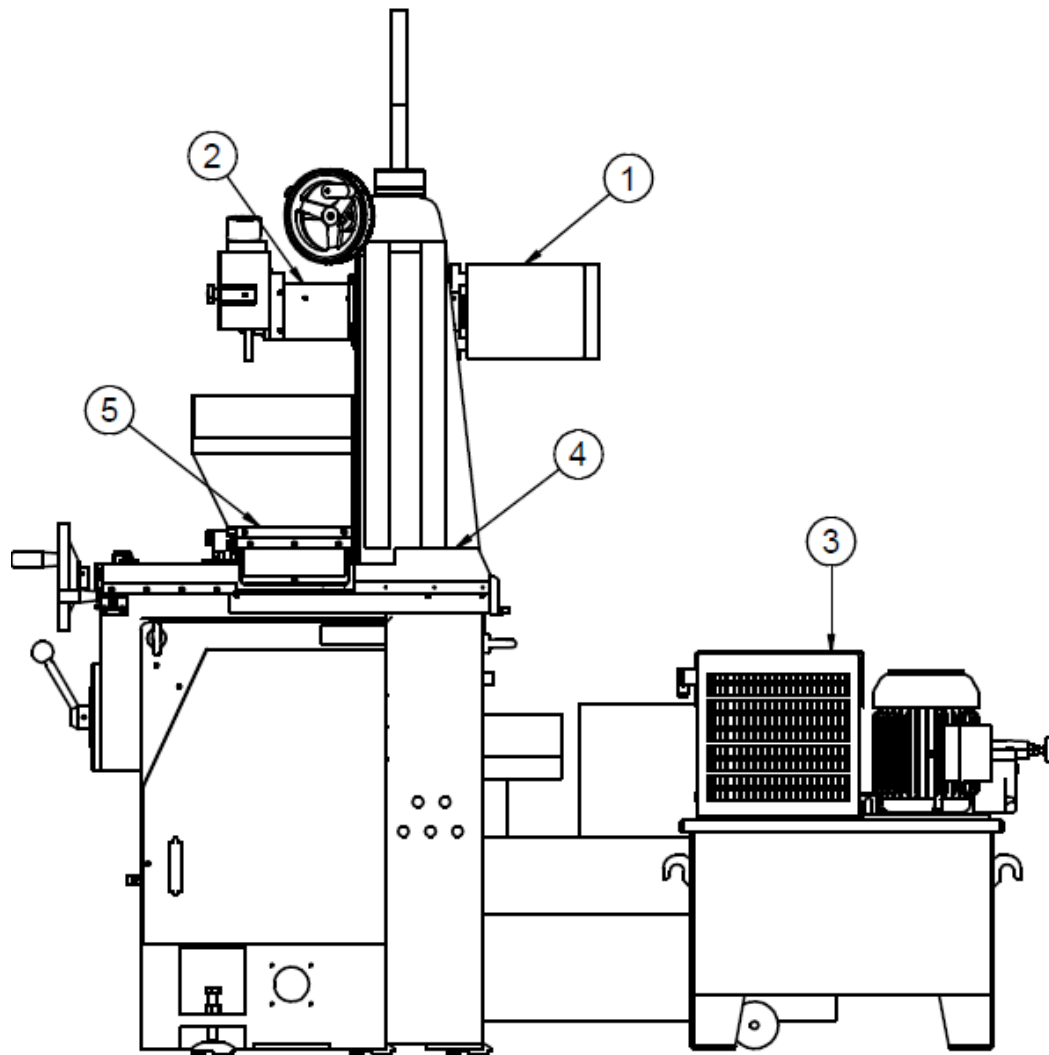
2.SG-820-2A



1. Column	9. Splash guard (OPT)
2. Grinding wheel	10. Table feed control
3. Grinding wheel guard	11. Electrical cabinet
4. Table wheel	12. Base
5. Cross sensor	13. Working lamp
6. Longitudinal sensor	14. Coolant system (OPT.)
7. Sensor Gog	
8. Drainage groove	

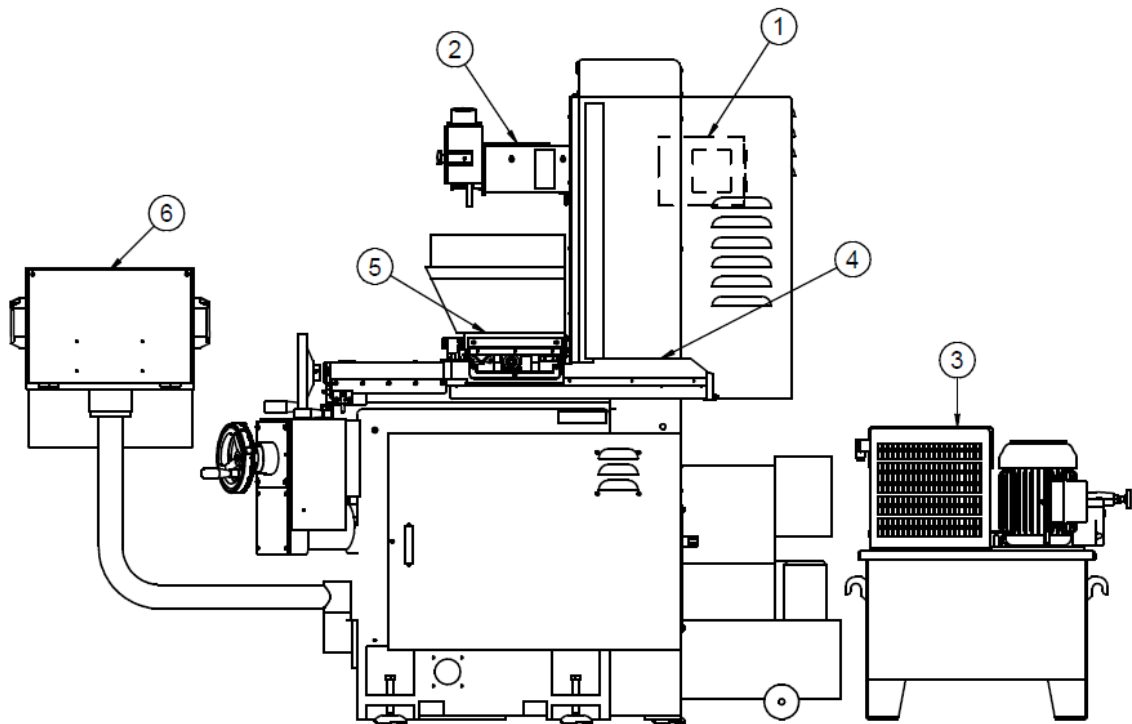
1.1.2 Slide View

1.SG-618-2A



1.Spindle motor
2.Spindle box
3. Hydraulic systems
4.Saddle
5.Table

2.SG-820-2A

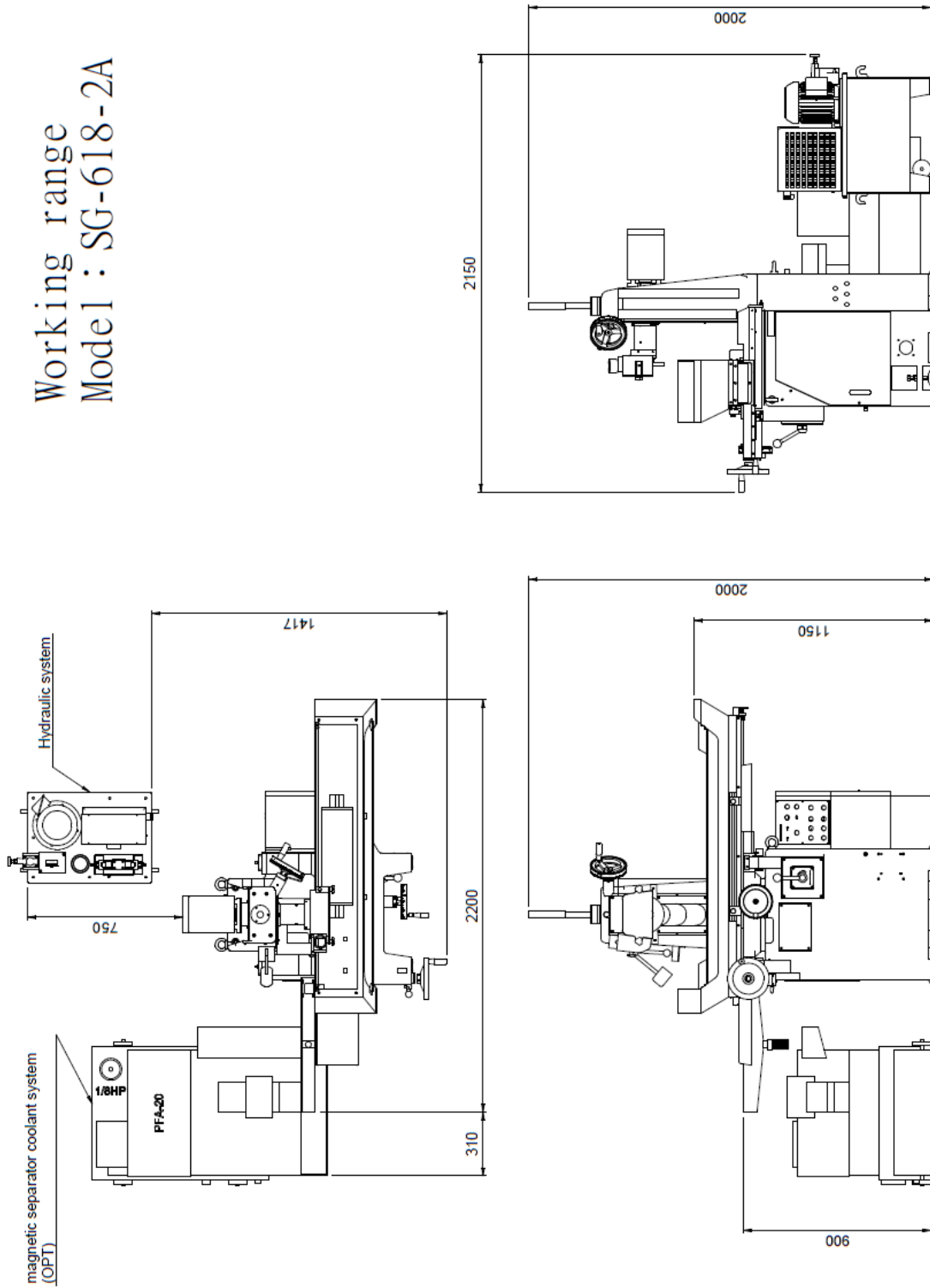


1.Spindle motor
2.Spindle box
3. Hydraulic systems
4.Saddle
5.Table
6.Operation box

1.1.3 WORKING RANGE & EXTERNAL DIAGRAM

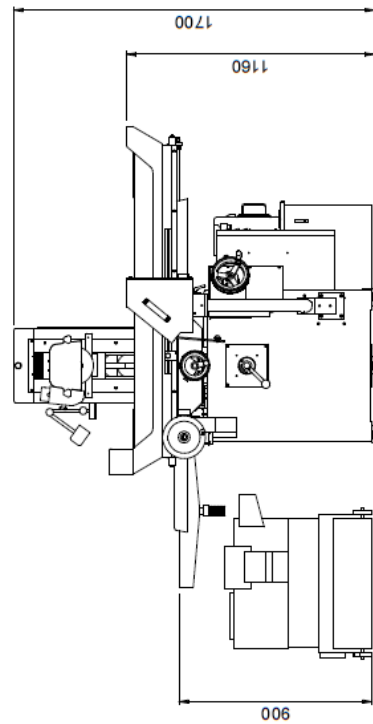
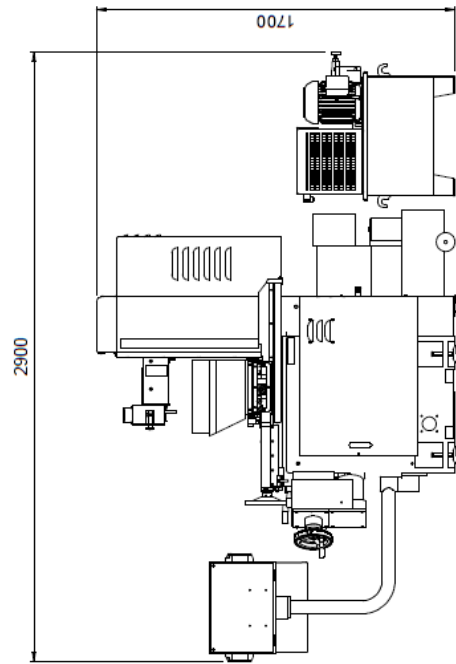
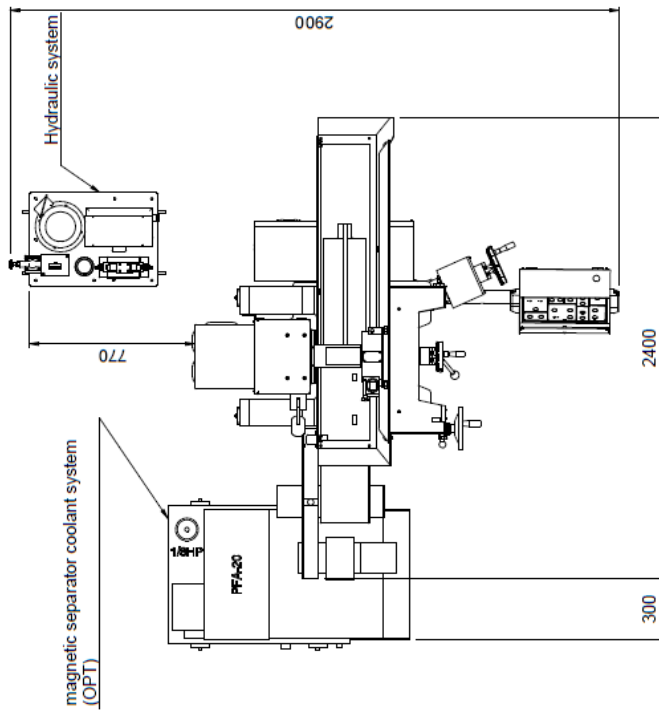
1.SG-618-2A

Working range
Model : SG-618-2A



2.SG-820-2A

Working range
Model : SG-820-2A



1.2 Specification

	Item	SG-618-2A	SG-820-2A	
Table capacity	Maximum distance from table top to spindle center line	15.4"/390mm	15.4"/390mm	
	Table surface (length x width)	18"x6"/465x150mm	20"x8"/500x200mm	
	Maximum longitudinal travel	19.1"/485mm	20.5"/520mm	
	Maximum cross travel	6.62"/168mm	8.82"/224mm	
	T-slot (No. x width)	1x0.669"/1x17mm	1x0.669"/1x17mm	
	Workpiece tolerance weight (include magnetic chuck)	165.34lb/75kg	242.5lb/110kg	
Feed	Longitudinal movement of table(X axis)			
	Hydraulic feed	16.4~82fpm/5~25M/min	16.4~82fpm /5~25M/min	
	Hand feed per revolution	2.481"/63mm	2.481"/63mm	
	Cross movement(Z axis)			
	Intermittent feed	0.005905"-0.394"/0.15mm-10mm	0.005905"-0.394"/0.15mm-10mm	
	Continuous transverse feed	47in/min/1200mm/min	47in/min /1200mm/min	
	Hand feed per revolution	0.197"/5mm	0.197"/5mm	
	Graduation of handwheel	0.000788"/0.02mm	0.000788"/0.02mm	
	Vertical movement of wheel head(Y axis)			
	Hand feed per revolution	0.0394"/1mm	0.0394"/1mm	
	Graduation of handwheel	0.0001969"/0.005mm	0.0001969"/0.005mm	
	Rapid feed	8.66 in/min /220mm/min(OPT)	11.8in/min /300mm/min	
	Spindle and wheel	Spindle motor		2HP
		Spindle speed	50HZ	2910rpm
60HZ			3515rpm	
Grinding wheel		50HZ	ψ8"x0.51"xψ1.25"	
	60HZ	ψ7.1"x0.51"xψ1.25"		
Motor	Hydraulic motor		2HP/4P	
	Cross motor		25W	
	Vertical motor		25W(OPT)	
Dimensions weights	Floor plan (LxWxH)		83"x51.2"x70.9"	
	Packing dimensions (LxWxH)		75.6"x44.1"x77.2"	
	Weight (Approx)		1980lb/900kg	
			2756lb/1250kg	

※ Is constantly improving the design of its machines. Appearance, specifications and dimensions are subject to be changed without prior notice.

1.3 Standard Accessories

Specification /SG-618-2A		Quantity
1	Grinding wheel (Dia x Thickness x Bore) $\psi 8" \times 0.51" \times \psi 1.25"$ (50Hz) Grinding wheel (Dia x Thickness x Bore) $\psi 7.1" \times 0.51" \times \psi 1.25"$ (60Hz)	1pc
2	Flange	1set
3	Arbor for wheel balancing	1stick
4	Grinding wheel adaptor and puller	1set
5	Diamond tool (1/4Carat) with a base	1 each
6	Dust sweeping plate	1stick
7	Leveling plates	5 pc
8	bolts with nuts	5 pc
9	T-nut & screws	2 each
10	Screws	4 pc
11	Necessary tools with a tool box	1set
	A: Hexagon-headed spanner (2.5、 3、 4、 5、 6、 8)mm	1 each
	B: Adjustable wrench: 8"	1stick
	C: Cross screw driver	1 stick
	D: Single-end spanner: #27	1 stick
	E: Single-end spanner: #46	1 stick
12	Lubrication oil (4 liters), Mobil #1405	1 can
13	Operation manual and inspection certificate	1 each
14	Spare paint	1can

Specification /SG-820-2A		Quantity
1	Grinding wheel (Dia x Thickness x Bore) $\psi 8" \times 0.75" \times \psi 1.25"$ (50Hz) Grinding wheel (Dia x Thickness x Bore) $\psi 7.1" \times 0.75" \times \psi 1.25"$ (60Hz)	1pc
2	Flange	1set
3	Arbor for wheel balancing	1stick
4	Grinding wheel adaptor and puller	1set
5	Diamond tool (1/4Carat) with a base	1 each
6	Dust sweeping plate	1stick
7	Leveling plates	5 pc
8	bolts with nuts	5 pc
9	T-nut & screws	2 each
10	Screws	4 pc
11	Necessary tools with a tool box	1set
	A: Hexagon-headed spanner (2.5、 3、 4、 5、 6、 8)mm	1 each
	B: Adjustable wrench : 8"	1stick
	C: Cross screw driver	1 stick
	D: Single-end spanner: #27	1 stick
	E: Single-end spanner: #46	1 stick
12	Lubrication oil (4 liters), Mobil #1405	1 can
13	Operation manual and inspection certificate	1 each
14	Spare paint	1can

2 INSTALLATION

2.1 Floor plan of machines

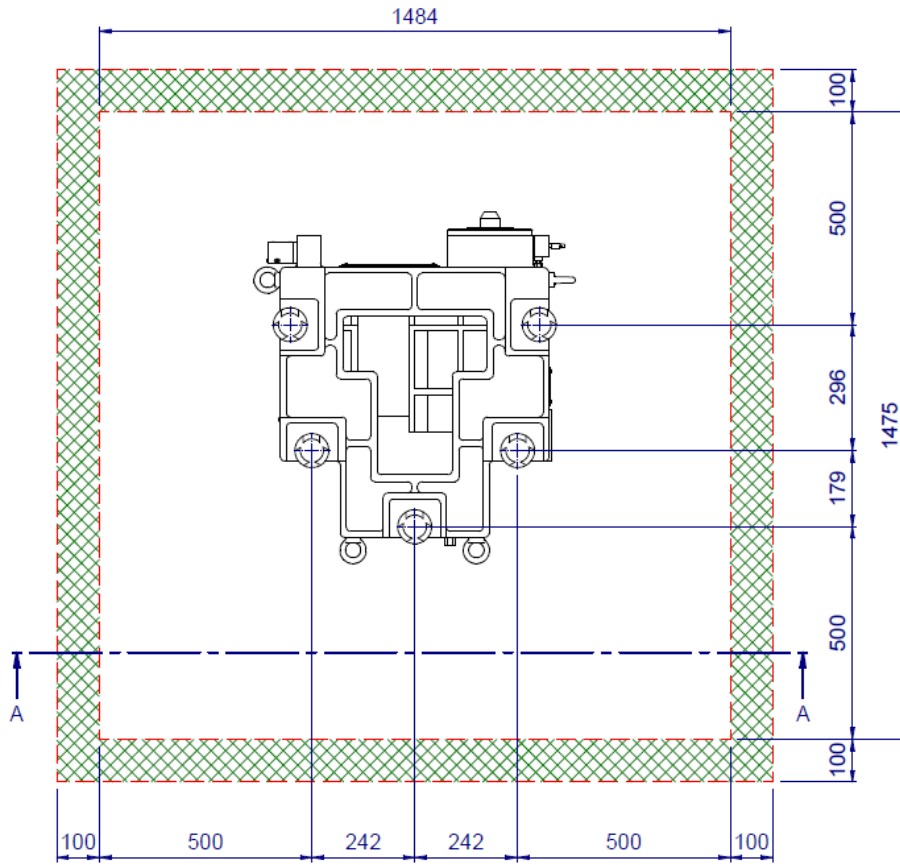
1. Foundation notes:

Generally, the ground (soil) load of the factory building should reach 7400 kg/m². Concrete and steel bars are added to isolate vibration and increase the rigidity of the machine body by relying on the concrete foundation.

(a) When the machine weight is less than 2 tons, its rigidity is usually sufficient, and only vibration isolation is required.

(b) For floors above the ground floor (or ground floor with basement), the floor load capacity varies from floor to floor (building), and the placement position also affects the rigidity and vibration of the floor. Therefore, it can only be suggested to add a steel plate or concrete layer to the original floor.

(c) When installing the small machines to old/current plant, without refilling the concrete, it is recommended to cut then have shockproof ditch, the depth of which must be cut off the steel bars. To install large machinery (for 2 metric or more) at the new plant, and the shockproof ditch will be completed at one time during concrete filling (if Styrofoam is used).



※SG-618-2A, The picture is for reference only, and the actual needs to be evaluated with a professional before applying

2.2 Transportation

When transporting the machine, care should be taken, so that any shock will not be given to the machine in the transportation. The machine has to be lifted by a crane or forklift which can bear the weight of the machine. The machine cannot be exposed to sunlight for a long period, as it will affect the precision of the machine.

Weight of the machine (approximately)

SG-820-2A: 2756lb/1250 kg.

SG-618-2A: 1980lb /900 kg.

※Notice:

The weight shows here is only the standard machine with standard guards, if there is any other optional accessories, for example: Left hand fully enclosed guard, fully enclosed guard, magnetic chuck, please add those accessories' weight in order of the safety concern.

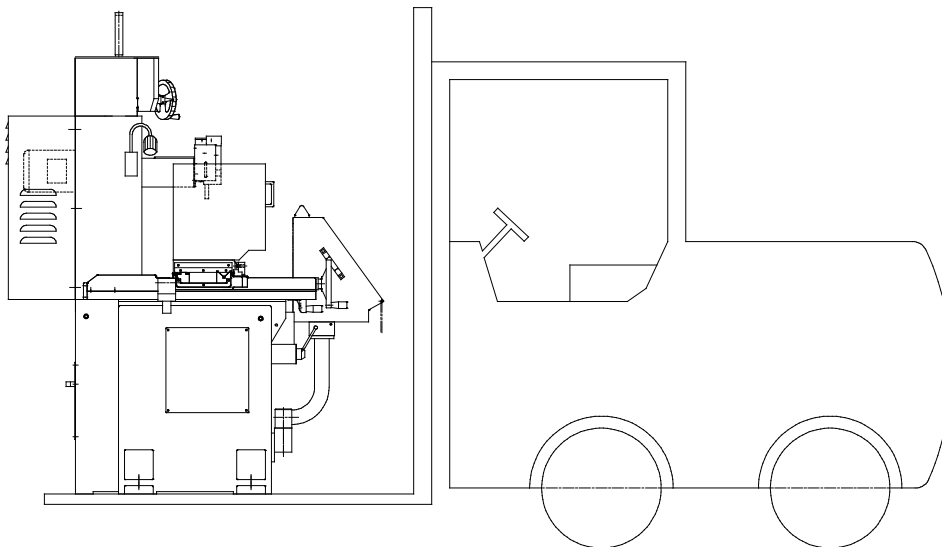
2.2.1 Use crane to lift & carry the machine

Please prepare steel cables of Ø 10 mm pass through the eyebolts. Please put protective materials (such as cloth) on the places where the steel cables and the machine surface could worn. The steel cable are adjusted to balance the machine when hoisted to prevent danger.



2.2.2 Use forklift to lift and carry the machine

In order to make sure the stability, please use a pallet to lift and carry the machine by forklift.



※Notices

- (1) The center of gravity is on the column. When lifting the machine by crane or forklift, please take special care on the balance.
- (2) Before dismantling the wooden box, the machine can only be lifted by forklift.
- (3) When dispatching the machine, the movement mechanisms are all fixed to prevent from damage. When the machine is delivered on user side, the fixed devices can be dismantled accordingly.

2.3 Cleaning

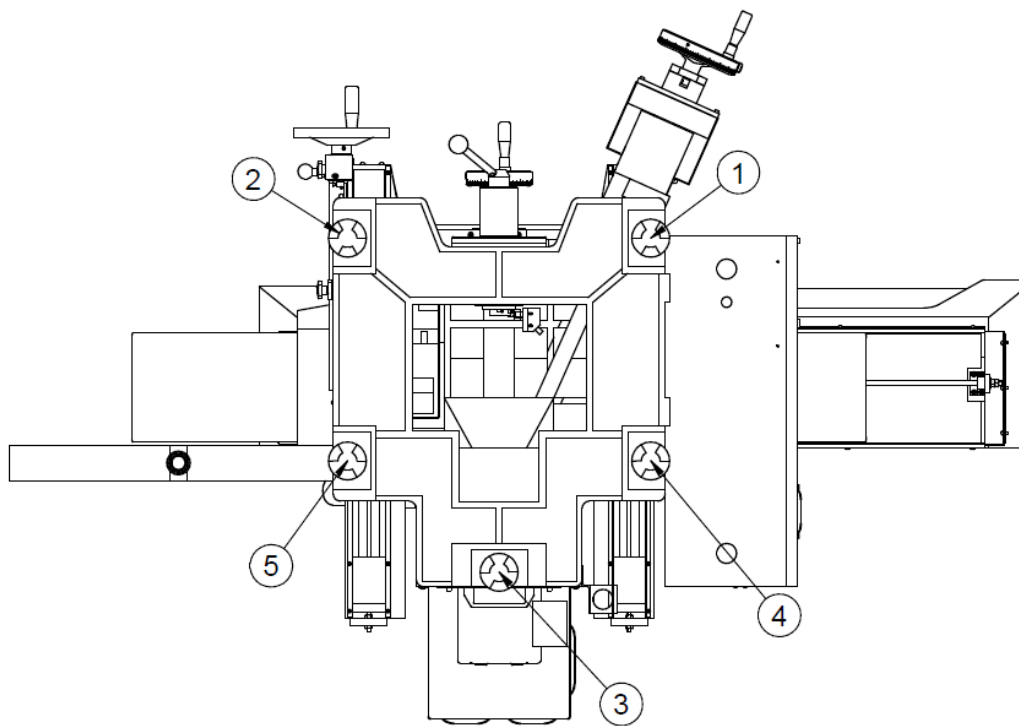
Use light-oil immersed soft cloth, in order to remove rust, preventive oil applied on the machine. Avoid a use of gasoline or thinner.

2.4 Installation

1. Avoid places where there is much vibration or the machine might be exposed directly to the sun
2. Put the four plates on a place to be mounted. Then, place the machine on them so that each of the four leveling bolts of the machine will be placed in conformity with each of those plates.
3. Put the hydraulic Unit on proper position and connect the oil pipes to the machine according to the marked color. Then connect the electric wire to the machine.

2.5 Leveling Adjustment

1. Please put the base on the floor and all the leveling bolts and nuts are placed at each position.
2. To do the leveling, please adjust bolt ① ② ③ to lift the machine a bit. After finishing fine-tune leveling again, use a torque wrench to reconfirm in order.
3. Tighten all the bolts manually, and every bolt does firmly touch the leveling plate.



※Notice

- A. When adjusting the level, the sensitivity of the level must be 0.02mm/m.
- B. To adjust the base, place the level vertically and horizontally on the working table alternately, adjust the bolt to firmly touch the leveling plate, and then confirm the measured value of the level meter again until the measured value is within 0.02mm/m.
- C. Machine center of gravity in low is more stable, do not lock the foundation bolt too long.
- D. When the adjustment is completed, check that all the adjustment bolts should contact the leveling plate.
- E. It is recommended to check the level once a month and confirm in order according to the same weight as above mentioned.

2.6 Power Sources Wiring

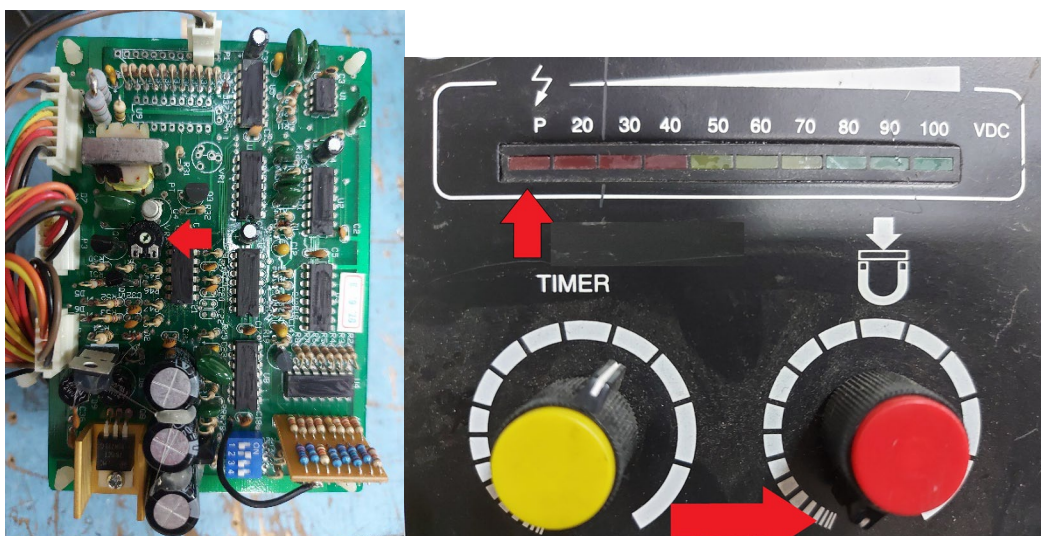
1. Before connection, make sure if the voltage is correct. Then, connect the source (through your source switch) to the source cord on the rear part of the base.

Caution: Never press push button switch power "ON" before oiling.

2. The correct rotation direction of grinding wheel motor (without inverter) must be clockwise which is same as spindle rotation direction. If not, one phase of the power supply connection must be changed over.
3. If hydraulic showed no pressure on control panel, please check if the motor fan of hydraulic pump rotation direction is same as rotation symbol. If not, one phase of the power supply connection must be changed over.



4. When calibration the VR of demagnetizing controller, turn the magnetic strength switch to the lowest, and make sure the magnetic intensity indicator is light on "10" position.



Turn the magnetic strength switch to the lowest, and see if the magnetic

intensity indicator (VDC) is light on "10" position.

※Notices

- A. Do not change the wire connection inside the electric box
- B. Avoid of the spindle running counter clockwise. After the spindle is running clockwise, make sure the hydraulic motor is running correctly and properly. The direction of its revolution must be clockwise, viewing from the front of the machine. If not, one phase of the power supply connection must be changed over.
- C. Unless the oil pressure tank is oiling, do not start the oil pump.
- D. If the worktable is unable to start after the magnetic chuck has been mounted well on the worktable. Please check if the wires of magnetic chuck have been connected properly and have enough exciting current input.

3 Hydraulic Circuit System

3.1 Flow control valve type

We strongly suggest that the user replace the lubricant every 6-12 months, make an oiling SG-618-2A/820-2A , 70 liters into the oil tank.

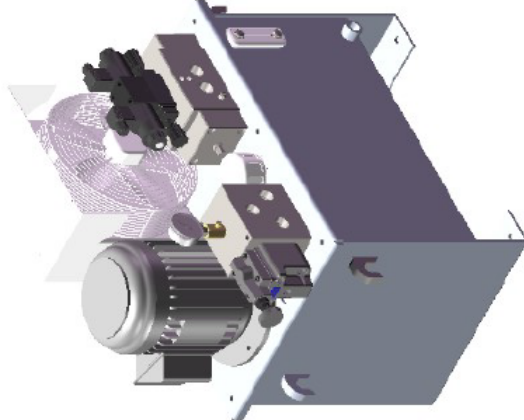
There are holes with plugs under the tank for oil draining out. As unplugging the holes, it is easy to wash the bottom of the hydraulic tank and the filter after hydraulic oils draining out.

Hydraulic oil

ITEM	Amount	Oil Specification	Remarks
flow control valve hydraulic system	SG-618-2A/820-2A -60 liters	ISO 68 Moble NUTO H68	Replenish in every 6~12 months

3.2 Parts of hydraulic circuit system

3.2.1SG618-2A/820-2A



Hydraulic tank voltage : AC220V/AC380V
 solenoid valve voltage : DC24V
 Air cooler voltage : AC220V

Oil coolant : PT3/4"

3-3/4"PT

A、B Outlet PT3/4"

Oil outlet

400

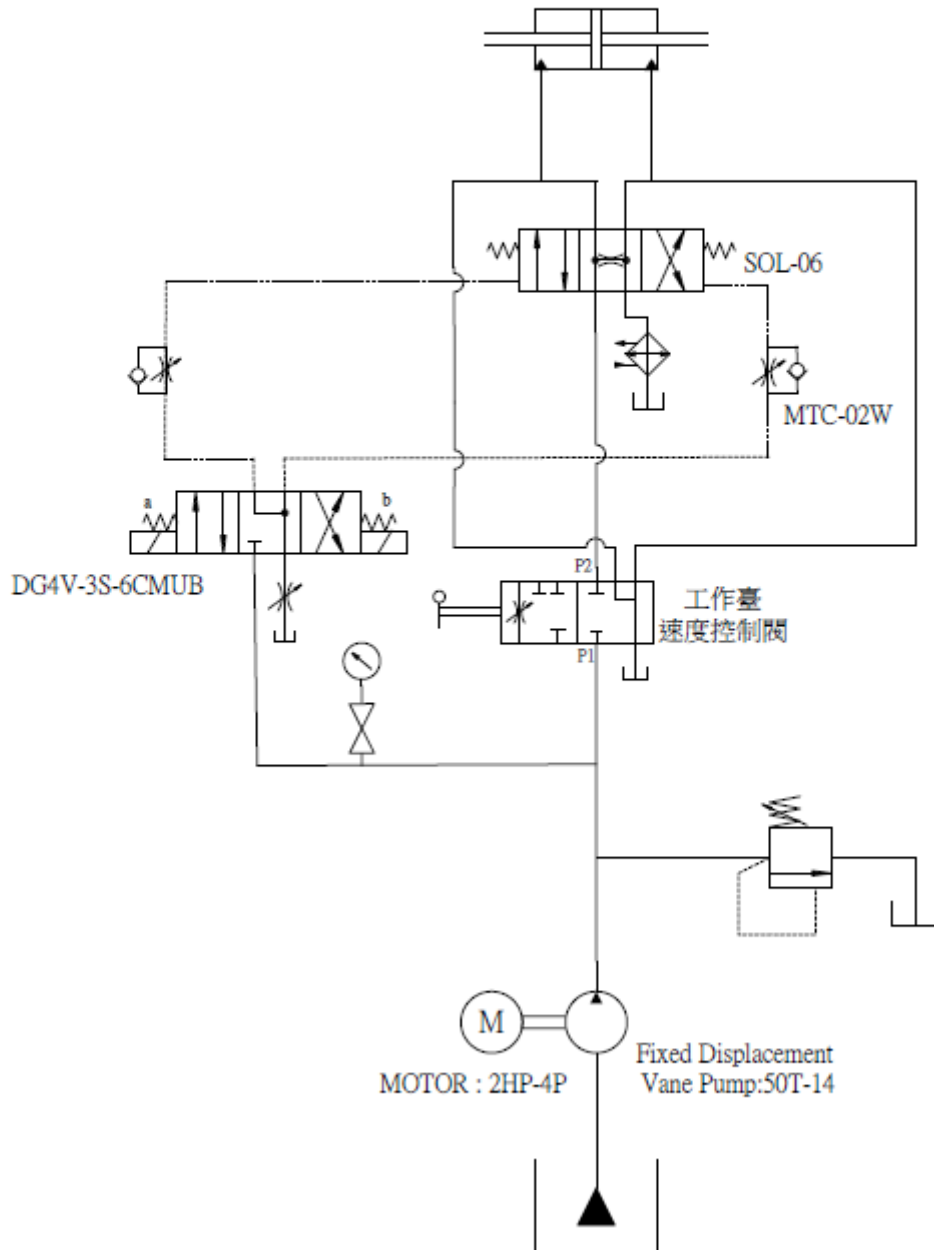
NO	ITEM	Specification	Quantity	Notices
1	Hydraulic tank(70L)	560*400*420	1	JUN CHUNG
2	Quantitative vaise pump	50T-14PR	1	JUN CHUNG
3	Motor	2HP/4P	1	
4	Air cooler	AC220V	1	
5	Pressure regulating valve	BG-03-1-31	1	JUN CHUNG
6	Block	BG-03	1	JUN CHUNG
7	Solenoid reversing valve	DG4V-5S-6CMUB	1	
8	Stacked check valve	MTU-02W	1	JUN CHUNG
9	Pilot operated valve	SOL-06-2S	1	JUN CHUNG
10	Oil level gauge	LS-3R	1	
11	Oil filling port	AB-1163R	1	
12	Pressure gauge	LA-100KG	1	JUN CHUNG
13	Hydraulic absorber	NU-02	1	
14	Filter	MF-08	1	

1	數量	mm	日期	2022-04-02
1:9	圖號	單位	備註	618-1磨床系統 618-2磨床系統
sf	審核	核准	比例	HU-YSG618TS-24B-A00
	繪圖	核對	视图	駿全興股份有限公司

3.3 Hydraulic wiring diagram

3.3.1 SG618-2A/820-2A

SG-618-2A
SG-820-2A

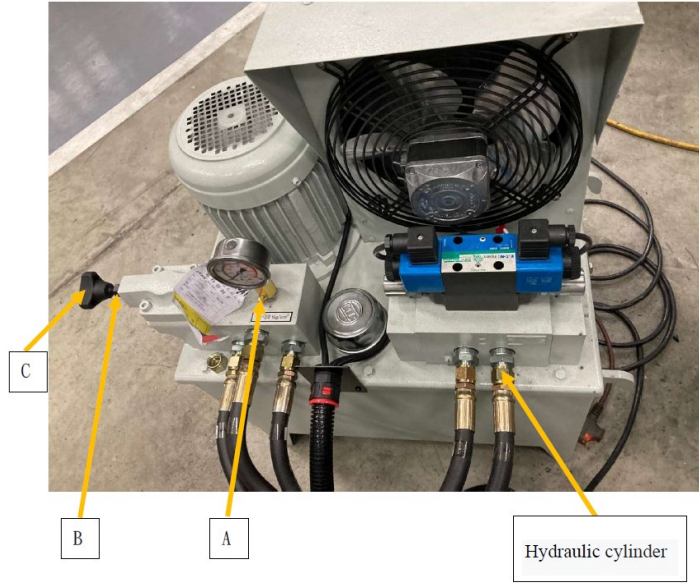


3.4 Hydraulic adjustment

Its ideal the hydraulic pressure is about 10-16kg / cm². Every grinder' s hydraulic pressure is fixed before delivery. It is suggested doing hydraulic pressure adjustment when the grinders are carried to the clients' end.

To check the pressure of hydraulic system :

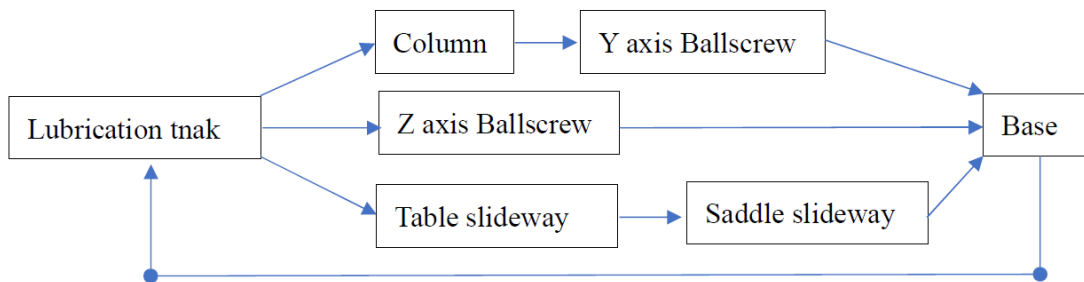
1. Start the table by hydraulically with a slow speed of less than 1-2 m/min. As hydraulic pressure is unloaded when the table is stopped correct pressure can not be observed.
2. Open the gauge cock **A** located just under the pressure gauge and observe the hydraulic pressure.
3. Loose **B** nut C.C.W.
4. Turn Screw **C**.
 - i. C.W. to increase pressure
 - ii. C.C.W. to decrease pressure.
5. Fasten nut **B**, after the adjustment is done.
6. Close gauge cock **A** to maintain the life of the pressure gauge.



4 OILING AND LUBRICATION

4.1 Lubrication System

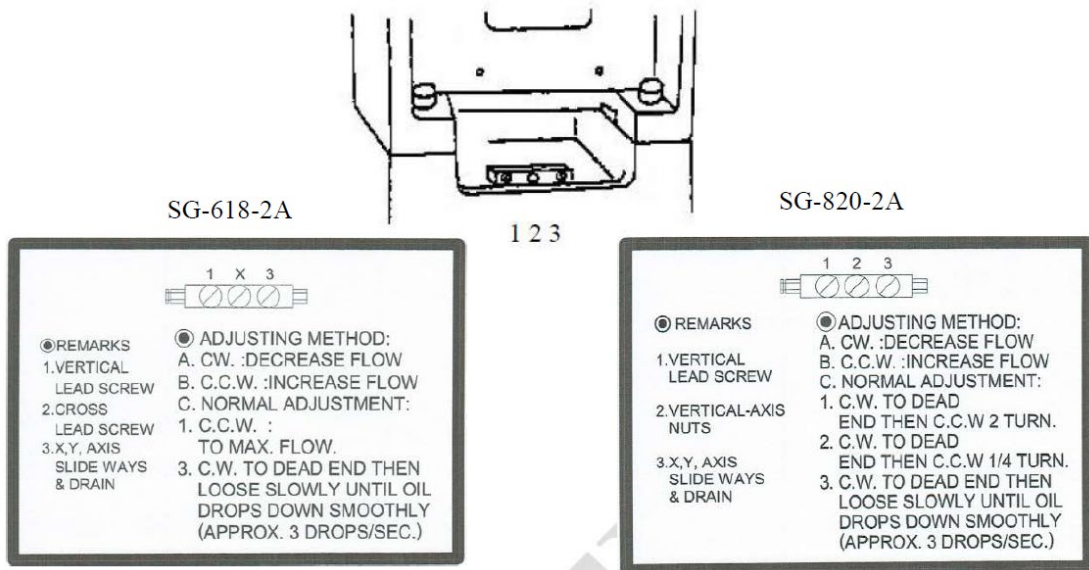
This machine uses a fully automatic lubrication system. When connecting the plug socket to the source, oiling to every part will be accomplished through the lubricating pump:



Lubricating Oil

ITEM	Amount	Oil Specification	Remarks
Lubrication tank	2 litres	Mobil: 1405 ISO: 32	Replenish in every 3~6 months

4.2 Lubrication Adjustment



※ Notice

It is strongly recommended to replace the lubricating oil after a new machine is used for 1 month. Replace every 3-6 months thereafter. Proper replacement of the lubricating oil can maintain the initial precision of the machine for a long time. Regularly replace/clean the lubricating oil, and avoid the unstable voltage to burn the oil pump

4.3 The Reminders While Oiling

1. Remove the oil tank cover and fill in about 2 liters of oil.
2. When the main power is running, the oil pump is activated, which can be confirmed from the oil window on the top of the column.
3. If the oil pump is idling, it is very easy to fail. Please pay attention to the oil amount in the oil tank. The lubricating oil filter must be kept below the oil level at all times to avoid inhalation of air, which may cause damage to the oil pump.
4. The amount of lubricating oil on the up and down, front and rear, left and right

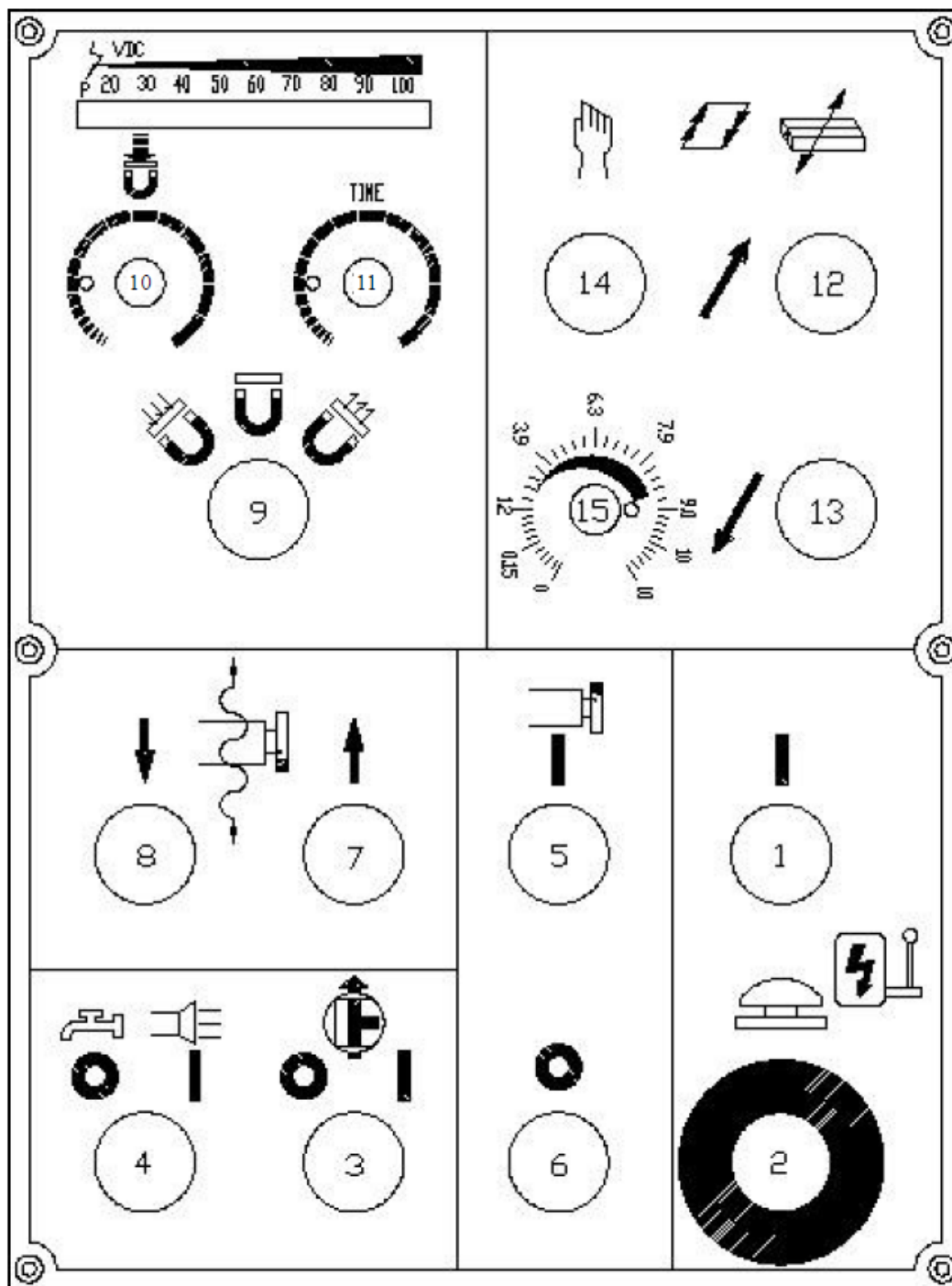
sliding surfaces is controlled by the oil distributor in the oil tank, and the oil amount can be adjusted as needed. Please refer to the illustration.

5. If the machine has not been used for a period of time, it must run for a while when it is turned on, so that the lubricating oil can lubricate the ballscrews.

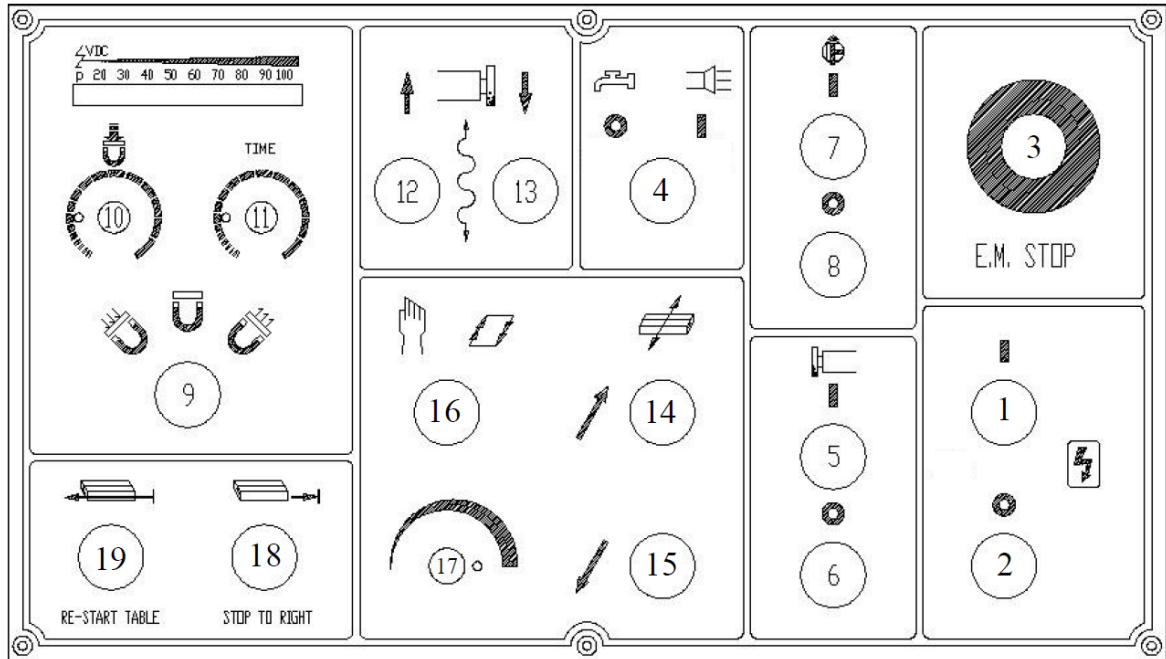
5 Operating instruction

5.1 Control panel

SG-618-2A panel



SG-820-2A panel



5.1.1 Explain of all panel symbol

SG-618-2A

NO.	Name	Description
1	Main Power	Main power ON
2	Emergency stop	Main power OFF(Restart must rotate to release this button)
3	Hydraulic motor	Turn right : Hydraulic motor ON Turn left : Hydraulic motor OFF
4	Dust Suction Control	Turn right: Dust Suction ON Turn left: Dust Suction OFF
5	Spindle motor	Spindle motor ON
6	Spindle motor	Spindle motor OFF
7	Rapid feed up(Y axis) (OPT.)	Raises the wheel head rapidly while this switch is pressed and stop when released .
8	Rapid feed down(Y axis) (OPT.)	Lowers the wheel head rapidly while this switch is pressed and stop when released .
9	Automatic demagnetizing controller (OPT.)	Left: Magnetic clamping force is provided Center: Stops magnetic clamping force Right: Demagnetization is provided
10	Magnetic chuck clamping force adjustment (OPT.)	CW: To increase the clamping force.
11	Demagnetizing time adjustment (OPT.)	CW: To increase the demagnetizing time.
12	Cross feed forward	Moves the table forward rapidly while this switch is pressed and stop when released .
13	Cross feed backward	Moves the table backward rapidly while this switch is pressed

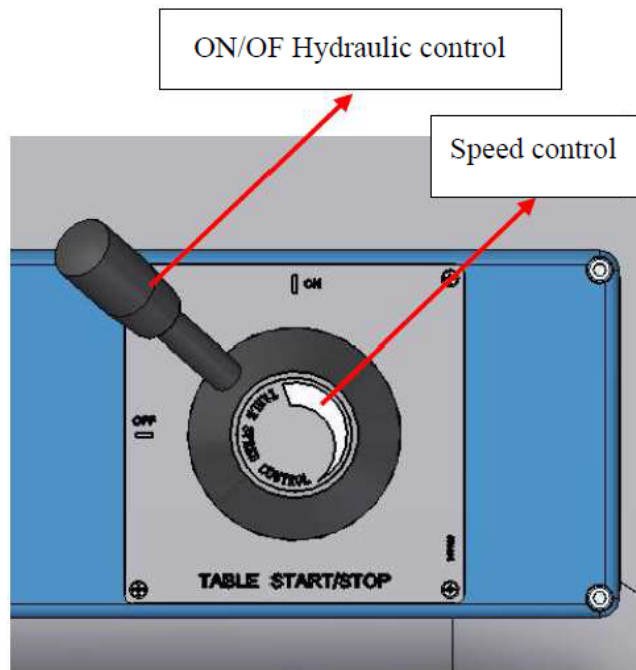
		and stop when released .
14	Cross feed control	Right: Cross feed and automatic reversal. Left: Cross feed for manual.
15	Step feed rate control	CW: To increase the step feed rate.

SG-820-2A

NO.	Name	Description
1	Main Power	Main Power ON
2	Main Power	Main Power OFF
3	Emergency stop	Main power OFF(Restart must rotate to release this button)
4	Dust Suction Control	Turn right: Dust Suction ON Turn left: Dust Suction OFF
5	Spindle motor	Spindle motor ON
6	Spindle motor	Spindle motor OFF
7	Hydraulic motor	Hydraulic motor ON
8	Hydraulic motor	Hydraulic motor OFF
9	Automatic demagnetizing controller (OPT.)	Left: Magnetic clamping force is provided Center: Stops magnetic clamping force Right: Demagnetization is provided
10	Magnetic chuck clamping force adjustment (OPT.)	CW: To increase the clamping force.
11	Demagnetizing time adjustment (OPT.)	CW: To increase the demagnetizing time.
12	Rapid feed up(Y axis) (OPT.)	Raises the wheel head rapidly while this switch is pressed and stop when released
13	Rapid feed down(Y axis) (OPT.)	Lowers the wheel head rapidly while this switch is pressed and stop when released.
14	Cross feed forward	Moves the table forward rapidly while this switch is pressed and stop when released .
15	Cross feed backward	Moves the table backward rapidly while this switch is pressed and stop when released .
16	Cross feed control	Right: Cross feed and automatic reversal.

		Left: Cross feed for manual.
17	Step feed rate control	CW: To increase the step feed rate.
18	Table stop to right(OPT.)	Table moves to right end and stop here.
19	Re-start table(OPT.)	Re-start the table movement.

5.1.2 Table feed control



Clockwise	Increase the table speed
counterclockwise	Decrease the table speed to stop

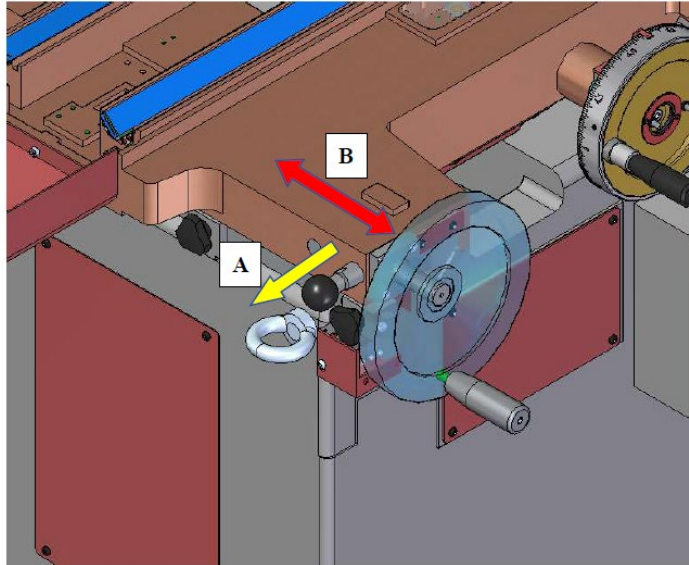
5.2 The X axis

● Hydraulic control

To engage the hydraulic table travel, turn the table speed control lever C.W unit desired speed is obtained. Hydraulic pressure is unloaded when the lever is in the table stop position(C.C.W dead point).

Table stroke length is set by two table dogs and two proximity switches located inside of saddle which provides easy setting and safe heading of the machine.

※Be sure the table hand wheel is in pull-out position before starting the hydraulic table travel. Pull the handwheel (B) outward, and the left safety pin (A) will be inserted into the handwheel (B), as shown in the figure below.



- **Table hand feed**

The table hand wheel is located on the left side of front controls and moves the table by rack with a pinion at the end of hand wheel shaft.

※Notice:

When driven by hydraulic pressure, the handwheel is outside, so that the pinion of the handwheel is separated from the tooth row.

When driving manually, pull the ball handle on the left side of the saddle outwards and the handwheel will automatically bounce inwards, so that the pinion of the handwheel is in close contact with the tooth row, and it can be operated manually.

5.3 The cross axis

It can be divided into continuous feeding and automatic intermittent feeding by AC motor driving forward and backward movement. (SG-618-2A/SG-820-2A)

- **Continuous feeding**

SG-618-2A: Turn left **14**, then press button **12** or **13** to make the saddle move forward or backward at speed of 1200mm/min. Release **12** or **13**, the saddle stops.

SG-820-2A: Turn left **16**, then press button **14** or **15** to make the saddle move forward or backward at speed of 1200mm/min. Release **14** or **15**, the saddle stops.

- **Automatic intermittent feeding**

SG-618-2A: This is an electronic control, which can automatically feed intermittently when the feed rate is set. First, turn the button **14** to the right to select the intermittent feeding mode, and then turn the button **15** to adjust the feed rate.(increase C.W, slow down C.C.W) adjust the position of the sensor on the left side of the saddle, and adjust only the stroke according to the working Longitudinal.

Turn right the button **3**, and then press the button **12** or **13** to start the intermittent automatic feeding. For each stroke, it will not turn back until it hits the end switch set on the left.

SG-820-2A: This is an electronic control, which can automatically feed intermittently when the feed rate is set. First, turn the button **16** to the right to select the intermittent feeding mode, and then turn the button **17** to adjust the feed rate.(increase C.W, slow down C.C.W) adjust the position of the sensor on the left side of the saddle, and adjust only the stroke according to the working Longitudinal.

Press the button **⌚**, and then press the button **⌚** or **⌚** to start the intermittent automatic feeding. For each stroke, it will not turn back until it hits the end switch set on the left.

5.3.1 Rapid feed Y axis(R used only)

SG820-2A: The wheel spindle is driven by a motor , which can perform rapid up and down movement operations, that is, press the button **⌚** or **⌚** to meet the requirements of the spindle up and down.

5.3.2 Hand wheel

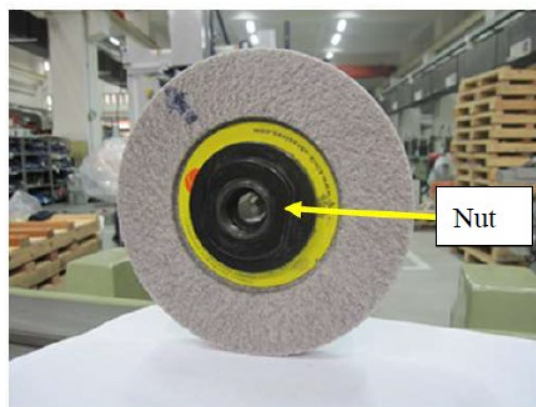
Y axis hand wheel	Rise C.W. Decrease C.C.W.
Cross feed hand wheel	Forward C.W. Backward C.C.W.
Longitudinal feed hand wheel	Right C.W. Left C.C.W.

5.4 Installation about the grinding wheel

5.4.1 Mounting of the grinding wheel

Tighten nut enough to hold the wheel firmly in the position of the adaptor. Do not tighten too much, as excess clamping pressure may crack the wheel.

To put the wheel unit onto the spindle, first see that both the wheel adaptor hole and spindle nose are perfectly clean. Then mount the wheel unit on the spindle and tighten the spindle nut by the wheel adaptor and puller.



5.4.2 Dismounting of the grinding wheel

To remove the wheel unit from the spindle, first remove the spindle nut (left hand thread) using wheel adaptor and puller. Then tighten an adaptor puller nut (also supplied with the machine) into the wheel adaptor and puller until the bottom of the wheel adaptor and puller & nut contacts against the end of the adaptor. Then turn the wrench clock until its end touch the end of spindle nose so that adaptor can be loosened from spindle nose.

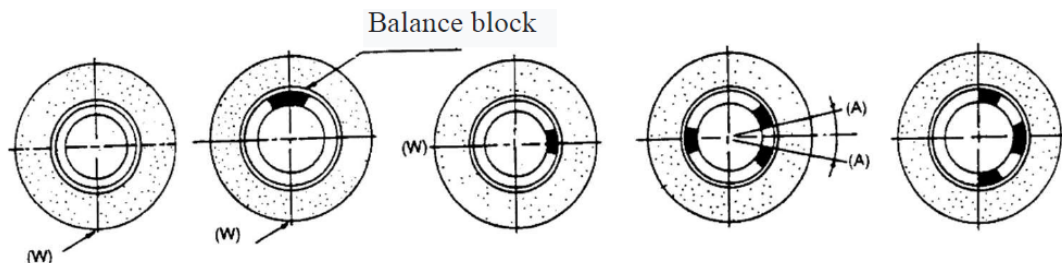


5.4.3 Balancing of the grinding wheel

It is essential that the grinding wheel run without vibration on the machine after well balanced.

Proceed as follows in balancing a wheel on its adaptor.

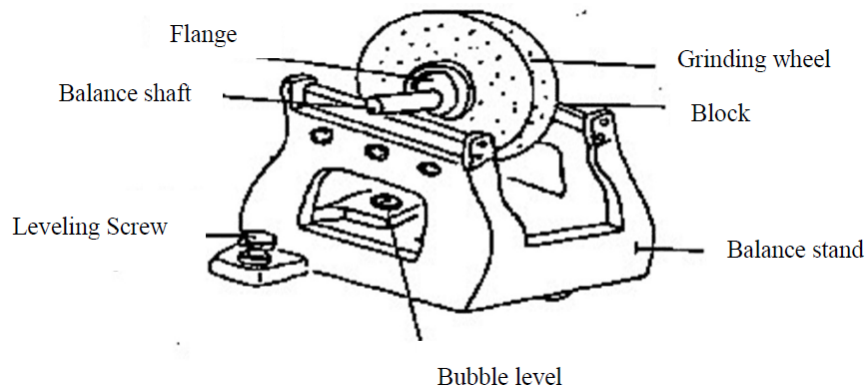
1. Mount the entire wheel unit with an adaptor onto the spindle and rough true the wheel so that it may be trued cylindrically.
2. Remove this unit from the machine. Insert the balancing arbor and place the unit on the balancing stand.
3. Allow the unit to run free until it comes to rest. Bottom point (W) will be the heavier side and mark this point (W) with a chalk.
4. Tighten one of three weights into the groove of adaptor at the opposite of the heavier side (W).
5. Turn the wheel by 90° and check which sides heavier.
6. If the side (W) is observed to be light, tighten two weights in symmetry as shown on the right. Each opening angle (A) must be adjusted according to the amount of in balance.
7. If the side (W) is heavier, weights are tightened as also shown on the right.
8. Adjust the position of two weights repeatedly until the wheel is in well balance when turned in any positions on the stand.



※Notice

In balancing of a grinding wheel after applied a coolant in the grinding operation, run the wheel on the machine several minutes in the dry so that the coolant in the

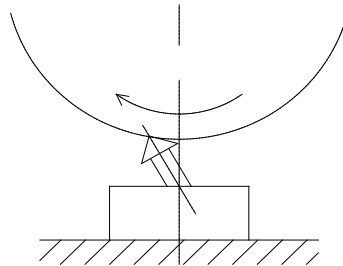
wheel may be eliminated.



※Notice:

In balancing of a grinding wheel after applied a coolant in the grinding operation, run the wheel on the machine several minutes in the dry so that the coolant in the wheel may be eliminated.

5.4.4 Dressing operation of grinding wheel



Followings are important factors to be considered in the dressing operations of the grinding wheel.

- 1.The diamond tool must be placed on the table at an offset position from the vertical center line of the wheel as shown on above for preventing the digging of the wheel.
- 2.Excess dressing amount must be avoided for preventing of the or burn of diamond. With a same purpose, coolant must be amply applied on the diamond while dressing operation.
- 3.A sharp diamond must be used for higher productivity. A dull diamond will cause a glazing of the wheel.
- 4.In order to obtain a sharp edge of the diamond, turn it in the holder so that new

sharp edge can dress the wheel.

5. In order to obtain a better surface finish of the work piece ground, uniform cross feed of dressing is required. A glazed wheel with a dull diamond will tend to give better surface finish of the work piece. The use of diamond tool on the table with a saddle cross feed usually provides better surface finish as compared to the use of dresser mounted on the wheel head.

6 Operator's checking before operation

6.1 Operator's checking before operation

Prior to the grinding operation, once again check the following items to insure successful operation.

1. Cleaning of the machine. Remove rust preventative.
2. Fill the hydraulic tank with hydraulic oil. Check the quantity of oil by observing an oil indicator attached at the side of the tank.
3. Confirm the voltage before connecting the power. The voltage is recorded on the machine nameplate.
4. Check the rotation of the wheel with the arrow on the wheel guard. If incorrect, one phase of the power supply line must be changed over.
5. Make sure there is certain amount of lubricant on the grinders
6. Inspect the grinding wheel specification and its safety requirements. Consult your wheel supplier for recommended grades of wheel for various materials to be ground.
7. Grinding wheels should be dressed regularly.
8. Care should be taken for the mounting and handling of the wheel to wheel adaptor and also their unit to spindle nose
9. The table of this machine has been ground and does not require further regrinding. A light cut of mounting surface of magnetic chuck, if necessary, must be taken to prevent the bending of table after clamped.
10. Before the table is started, the speed valve must be placed in the OFF (9 o'clock) position.
11. The coolant and Dust Suction must be placed in the OFF position.
12. Check the rotation of the coolant and Dust Suction with correct direction. Then

turn OFF.

13. Check the rotation of the hydraulic motor with correct direction. Then turn OFF.

6.2 Checking before daily operation

6.2.1SG-618-2A

1. Press the button Φ ,. Start the main power.
2. Check the quantity of oil by observing an oil indicator attached at the side of the tank.
3. Press the button \mathfrak{S} ,. Start the spindle motor.
4. Check the rotation of the wheel. It should be C.W.
5. Turn on the right \mathfrak{B} ,. Start the hydraulic motor. It should be C.W.
6. Rotation the handwheel, and stop the table in a proper position so that the proximity switch is located between the two sensors.
7. Start the speed valve to bring the table speed to 5~6 M/min. Verify that the table moves smoothly.
8. Rapid cross feed
 - A. Turn on the right \mathfrak{A} .
 - B. Turn on the middle \mathfrak{C} .
 - C. Press the button \mathfrak{D} or \mathfrak{E} , the saddle moved to forward or backward.
 - D. Verify that the saddle moves smoothly.
9. Stop the speed valve.
10. Turn on the right \mathfrak{F} ,. Start the coolant and Dust Suction.
11. Press the button \mathfrak{G} Check the spindle motor have stopped running. Turn on the right \mathfrak{B} , \mathfrak{F} , Check the hydraulic motor, coolant and Dust Suction have stopped running.

12. Press the button 5, Turn on the right 3、4, then press the button 2

Emergency stop, Check the hydraulic motor, spindle motor, coolant and Dust Suction have stopped running, and whether they will stop at the same time immediately.

13. If the above tests are normal, the test run is completed.

6.2.2SG-820-2A

1. Press the button Φ ,. Start the main power.
2. Check the quantity of oil by observing an oil indicator attached at the side of the tank.
3. Press the button \mathfrak{S} ,. Start the spindle motor.
4. Check the rotation of the wheel. It should be C.W.
5. Press the button \mathfrak{O} ,. Start the hydraulic motor. It should be C.W.
6. Rotation the handwheel, and stop the table in a proper position so that the proximity switch is located between the two sensors.
7. Start the speed valve to bring the table speed to 5~6 M/min. Verify that the table moves smoothly.
8. Rapid cross feed
 - A. Turn on the right $\mathfrak{16}$.
 - B. Turn on the middle $\mathfrak{17}$.
 - C. Press the button $\mathfrak{14}$ or $\mathfrak{15}$, the saddle moved to forward or backward.
 - D. Verify that the saddle moves smoothly.
9. Stop the speed valve.
10. Turn on the right $\mathfrak{4}$,. Start the coolant and Dust Suction.
11. Press the button $\mathfrak{6}$ 、 $\mathfrak{8}$ Check the spindle motor and hydraulic motor have stopped running. Turn on the left $\mathfrak{4}$ Check the coolant and Dust Suction have stopped running.
12. Press the button $\mathfrak{5}$,. Turn on the right $\mathfrak{7}$ 、 $\mathfrak{4}$, then press the button $\mathfrak{3}$ Emergency stop, Check the hydraulic motor, spindle motor, coolant and Dust

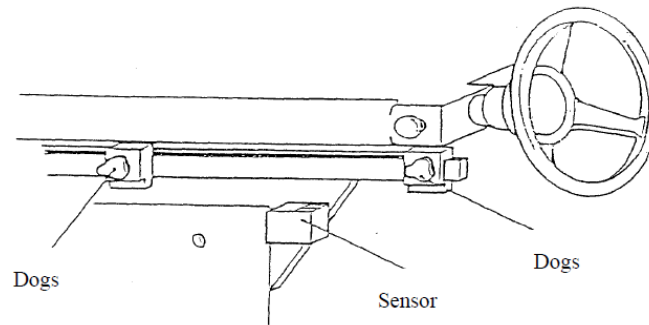
Suction have stopped running, and whether they will stop at the same time immediately.

13. If the above tests are normal, the test run is completed.

7 Machine Operation

7.1 Machine Operation

1. Mount the wheel, the balance of which has been attained. A wheel out of balance worsens accuracy of the work-piece and shortens a service life of the wheel spindle.
2. Wipe well the surface of the chuck with a sweeping plate, wiper of wastes, and put quietly the work-piece onto the chuck for fixing the work-piece on it.
3. Clamp the work-piece on the chuck.
4. Adjust the clamping force by actuating knob 10 if you have this option.
5. Adjust the position of the table dogs on the right and left side in accordance with the length of the work-piece.
6. Start the main power ①.
7. Start the spindle motor 5.
8. Start the hydraulic motor ③ (SG-618-2A). Press the button ⑦ (SG-820-2A).
9. Turn table speed control slowly to get a smooth table speed about 6M/min. After a reverse or two then up to your desired speed.
10. Re-adjust the dogs to get suitable travel length to meet the work-piece.
11. Re-adjust the dogs to get suitable travel length (cross axis) to meet the work-piece.



12. When the vertical feed hand wheel is revolved, the wheel is allowed to cut in the work. In this case, great care should be taken so that the wheel will not encroach upon the work-piece on account of overfeeding on occasion when it approaches the work-piece. It is also recommended that in-feed will be made, allowing the longitudinal hand wheel to operate slowly
13. After the wheel had come in contact with the work-piece, proceed to the grinding operation, giving a suitable amount of in feed to the wheel.

A Criterion of the amount of in-feed

Dry traverse grinding	Coarse	Vertical feed	0.01-0.03 mm (0.0004" - 0.0012")
		Cross feed	2.5-5 mm (0.1" - 0.2")
	Fine	Vertical feed	0.0025-0.005 mm (0.0001" - 0.0002")
		Cross feed	1-3 mm (0.04" - 0.12")
Dry plunge grinding	Coarse & Fine	Vertical feed	0.0025-0.015 mm (0.0001" - 0.0006")

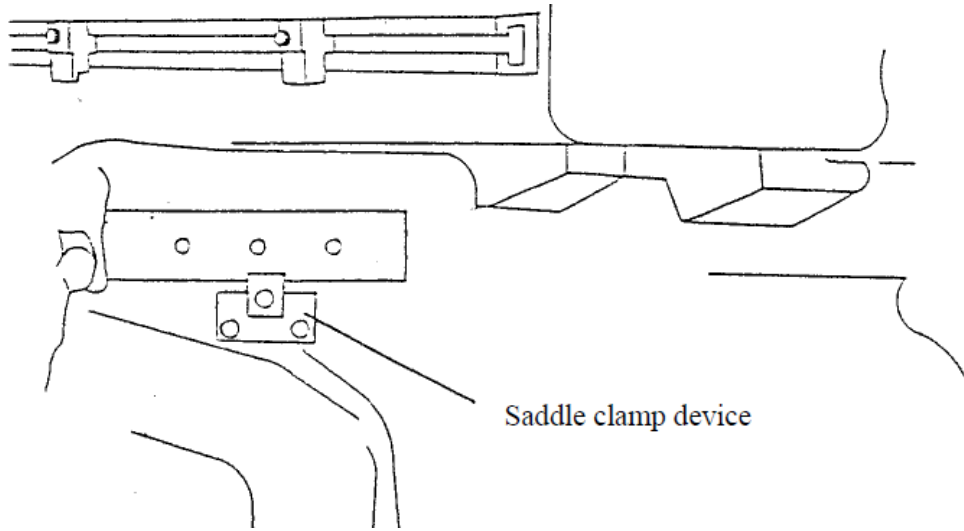
※Notices:

1. The feed amount of wet grinding (pouring water) should be 50-100% more than that of dry grinding.
2. Select the amount of feed properly in accordance with grain size hardness of the wheel and material or hardness of the work-piece.

7.2 The Saddle Clamp Device

This design is specially used for single groove grinding, forming grinding, etc.

It don't want processing that moves back and forth.

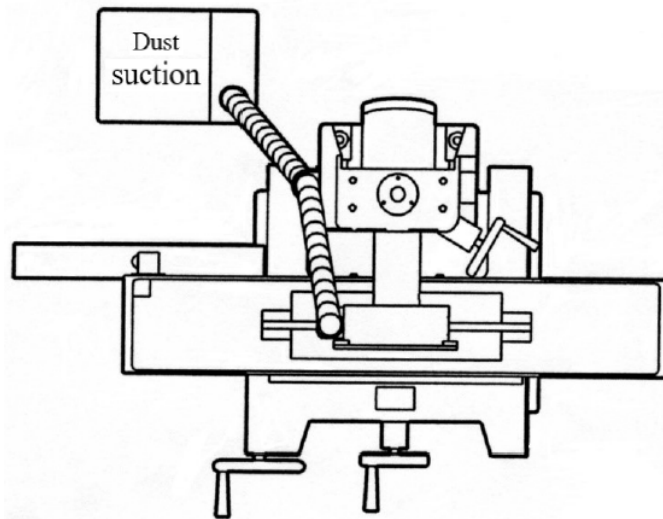


7.3 Magnetic Separator Coolant System : (OPT.)

During dry grinding, usage of magnetic separator coolant system is suggested due to the facts the dust/particle caused by dry grinding is hazardous to machine and human health.

Grinding dusts pollute the air in the shop and are harmful to the security of the machine and the health. The height of the mouth of the dust suction is adjustable. Accordingly, efficiency of dust suctioning can be enhanced, when the mouth is lowered enough within the limits of that is does not impede with the work-piece.

Note: Never use the dust suction system in the case of wet grinding (pouring water).



Notices:

1. The dust suction system is placed on the left rear of the column.
2. Fill the dust suction system with water before using it.
3. Please change the water in the suction system cleaner regularly.

8 Maintenance

8.1 General Maintenance

It is essential that the following periodical maintenance will be kept, in order to keep the original accuracy within a long period of time.

1. Wipe every part of the machine, in particular, its polished part with Oil-immersed cloth after wiping it with dry cloth at the time of completion of the operation.
2. Remove grinding chips in the inner part of the wheel guard or on the surface of the table.
3. Place rust proof oil on certain parts of the machines.

8.2 Notice for Usage

1. Before starting grinding, please balance the wheel properly.
2. Please according to the work piece material and hardness to choose corresponding wheel carefully.
3. Please have a thin layer of the oil between the spindle and flange to prevent the rusty when maintenance.
4. It's prohibited to use air gun to clean the work piece and machine, or to use fan to cool down/blowing the machine.
5. Please check the oil level in reservoir before starting the machine.
6. For the lubrication oil, please choose Mobil 1405 or ISO 32 equivalent lubricant, and change the lubricant every 3~6 months.
7. Please clean the lubrication pump filter by weekly.
8. (For hydraulic models) For hydraulic oil, please choose Mobil NUTO H68 or ISO 68 equivalent hydraulic oil, and change the hydraulic oil every year.
9. (For hydraulic models) Please clean the hydraulic filter by yearly.

10. (Optional accessory) Dust suction device, when the suction is weak, please check if there is any dust/dirt obstruct suction pipe, and also do keep the pipe clean or it will cause burning.
11. Always wear eye protector.
12. Keep fingers away from grinding wheel, and it's prohibited to wear a glove to operate the grinder.
13. Hold the work piece firmly against the table.
14. When operating the control panel, please keep your hand clean and dry, to prevent the moisture into the electrical cabinet.
15. After grinding is finished, please wait for the wheel is fully stop, then it is allowed to remove the workpiece for safety concern.
16. Please read and understand the instruction manual and every warning sign on the machine carefully for your own safety.
17. Please do not remove or damage this warning sticker.

8.3 Chuck

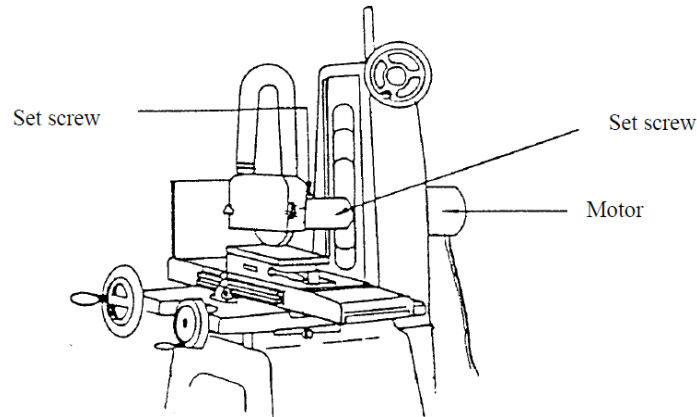
The surface of the chuck is an important surface which becomes a standard of accuracy, but it has a tendency to be scratched, because it is made of soft steel material. It is, therefore, necessary to treat it with consideration as much as possible. It becomes necessary to grind the surface of the chuck over again, if its accuracy gets out of order or there come out some scratches on it.

Note: for the grinding of the surface of the chuck it is recommended that grinding wheel to the grade WA46H will be used and its rough dressing performed with a small amount of in-feed. Be sure that grinding will be done after excitation. Also, clean the surface of the chuck well and oil it thinly.

8.4 Grinding Wheel Spindle

As grease lubrication is given for the grinding wheel spindle bearings, oiling is not required for it. In case its accuracy will be reduced after a few years usage of it

(its service life is dependent upon the condition of usage), return it to our company for its repair or replace it with a new spindle.



Notice: Place the wheel on the spindle counter clockwise.

8.5 Procedure for the replacement of the wheel spindle

Remove the grinding wheel spindle is as follows:

1. Press the Emergency stop.
2. Remove the spindle motor power wire.
3. Remove wheel & wheel guard , supporting rod and side cover of wheel head. .
4. Loosen the 12 spindle fixing screws and the locking screws.
5. Hold the motor with both hands and pull it out.

9 Grinding faults and their corrections

Type of trouble	Probable cause	Suggestions for correction
Chatter Mark	Outside vibrations	Install the machine on the place where vibrations and shocks are separated from other machineries such as planer, press, crane, etc.
	Unbalance of grinding wheel	Balance the wheel
	Wheel face out of true	Re-true the wheel

	Inadequate installation	Check the leveling are rested securely on the leveling plates
	Table reversing shock	Adjust the tarry valve on the hydraulic tank.
	Wear of wheel spindle bearing	Replace the new bearings
Burn	Glazed wheel	Dress the wheel
	Wrong grinding wheel	Change the wheel specifications Use the wheel with * Softer bond (low grade) * Coarse structure. *Larger grit (Coarser size)
	Grinding condition	* Higher table speed * Smaller down-feed * Smaller cross-feed
	Coolant	* Plenty of coolant * Use of solution type coolant from non-soluble type
	Wheel Dressing Required	* Use of sharp diamond tool
Type of trouble	Probable cause	Suggestions for correction
Patterned scratches	Dressing	* Uniform dressing feed of diamond tool * Smaller wheel dressing amount

	Overhead type dresser	Readjust the alignment of tank
Irregular scratches	Dirty coolant	<ul style="list-style-type: none"> * Cleaning of coolant tank * Replacement of coolant to new one * Cleaning of inside surface of wheel guard
Rough finishing	Dressing	<ul style="list-style-type: none"> * Slower dressing speed * Uniform dressing speed * Use table type dresser instead of overhead type dresser
	Grinding condition	<ul style="list-style-type: none"> * Smaller down-feed * Smaller cross-feed * Increased spark-out times
	Unbalance of the wheel	Balance the wheel
	Selection of the wheel	Use finer wheel
	Wear of wheel spindle bearings	Replace to new bearings
	Inadequate installation	Check the leveling bolts are rested securely on the leveling plates
	Table reversing shock	Adjust the tarry valve on the front of the machine