

Mitsui MSG

250M 250MHi

200M 200MHi

Surface - Grinder

Instructions and Parts

Mitsui Precision Surface Grinders
MSG-250M/250MHi,MSG-200M/200MHi

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1. SPECIFICATIONS

1.MITSUI SURFACE GRINDER MODEL MSG-250M/250MHI

1) Max. longitudinal movement of the table	18"
Max. cross movement of the table	10"
2) Max. height from table surface to grinding wheel spindle center	15-3/4" *19-1/2"
3) Max. grinding length and width	17-3/4"×9-1/4"
4) Dimensions of table working surface	19" × 8"
5) Table movement per a handwheel revolution	5"/rev.
6) Handwheel for vertical feed	
per one revolution	0.05"
per one division	0.0001"
7) Handwheel for cross feed	
per one revolution	0.1"
per one division	0.001"
by vernier	0.0001"
8) Height from floor to table working surface	40"
9) Overall length and width of table	53"×11"
10) Number of revolution of wheel spindle	2,900rpm/50Hz 3,400rpm/60Hz
11) Size of grinding wheel (Outer dia.×width× bore)	7"×1/2"×1-1/4"
12) Motor for wheel spindle, standard	1-1/3HP 1.OKW 2P 220V
Optional	1-1/3HP 1.OKW 2P 460V
"	2 HP 1.5KW 2P 220V
"	2 HP 1.5KW 2P 460V
"	2 HP 1.5KW 4P 220V
"	2 HP 1.5KW 4P 460V
13) Net weight of machine	*2,000LBS
14) Optional vertical drive gear direction (to suit customer's choice)	Right hand/Left hand

* applies to Model MSG-250MHi

2.MITSUI SURFACE GRINDER MODEL MSG-200M/200MHI

1) Max. longitudinal movement of table	15"
Max. cross movement of table	8"
2) Max. height from table surface to the grinding wheel spindle center	18"
3) Max. grinding length and width	14"×7"
4) Dimensions of table working surface	14"×6-1/4"
5) Table movement per a handwheel revolution	4"/rev.
6) Handwheel for vertical feed	
per one revolution	0.05"
per one division	0.0001"
7) Handwheel for crossfeed	
per one revolution	0.1"
per one division	0.001"
by vernier	0.0001"
8) Height from floor to table working surface	42"
9) Overall length and width of table	43"×9"
10) Number of revolution of wheel spindle	2,900rpm/50 Hz 3,400rpm/60 Hz
11) Size of grinding wheel (Outer dia.×width×bore)	7"×1/2"×1-1/4"
12) Motor for wheel spindle, standard	1-1/3HP 1.0KW 2P 220V
Optional	1-1/3HP 1.0KW 2P 460V
↙	2 HP 1.5KW 4P 220V
↘	2 HP 1.5KW 4P 460V
13) Net weight of machine	1,830LBS
14) Optional vertical drive gear direction (to suit customer's choice)	Right hand/Left hand

2. SELECTION AND PREPARATION OF RIGHT PLACE FOR GRINDING OPERATION

The efficiency of the machine and the precision of the ground surface of the work piece parts depend largely on the operation site of the machine.

So the careful selection of the place is very important.

Make sure the machine will not be placed close to the quenching furnace or oil bath. Otherwise chemical gases from them can damage the electricals of the machine. The ideal place for the Mitsui Surface Grinder is ventilated room, air conditioned to the temperature of 20 degrees centigrade (68 degrees Fahrenheit). The concrete floor 1-1/4" thick or more preferably can be strong enough to bear the weight of machine where the influence of the vibration causing machine such as presses is negligible.

1. Vibrationless locality

Select in all cases a vibrationless locality and avoid immediate neighborhood of large machines such as press machines.

Problems or faulty operations, caused due to the wrong location of the machine placed in between vibration-causing-machines, seem not to be recognized by many users. Grinders set in such locality can produce chatter marks on the ground surface, but many users regard this to be caused by the spindle and adjust it, resulting in the unusable spindle.

Where the circumstances do not allow ideal place, make sure the concrete floor will be no less than 10" thick (Refer to Fig.1).

2. No fluctuation of temperature

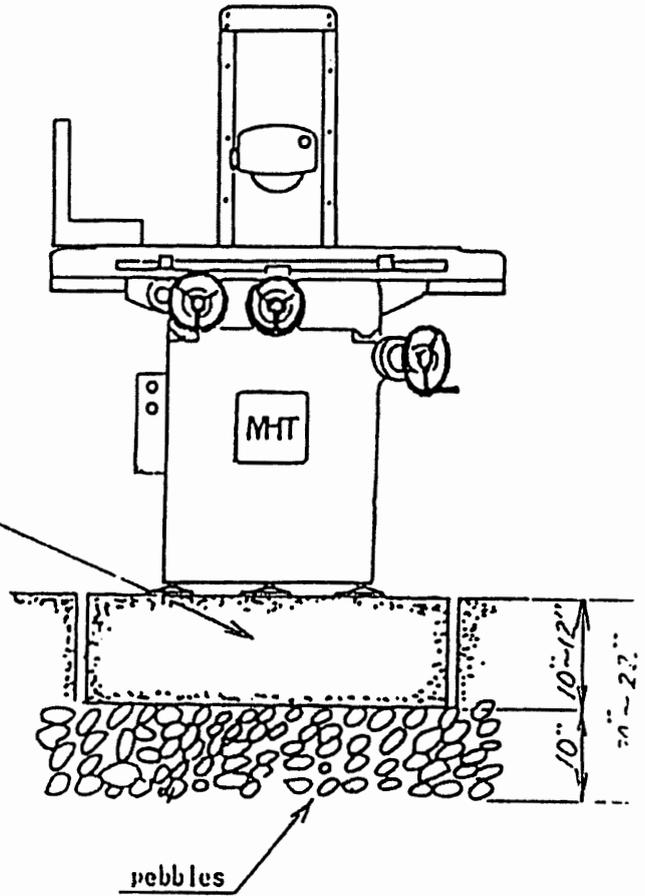
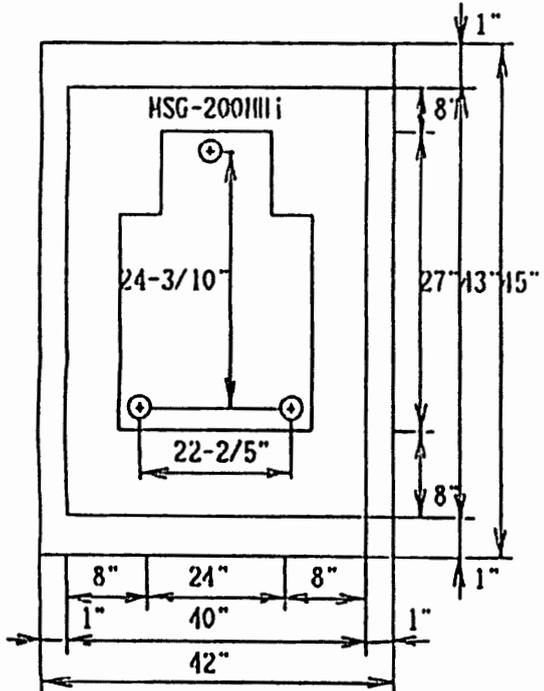
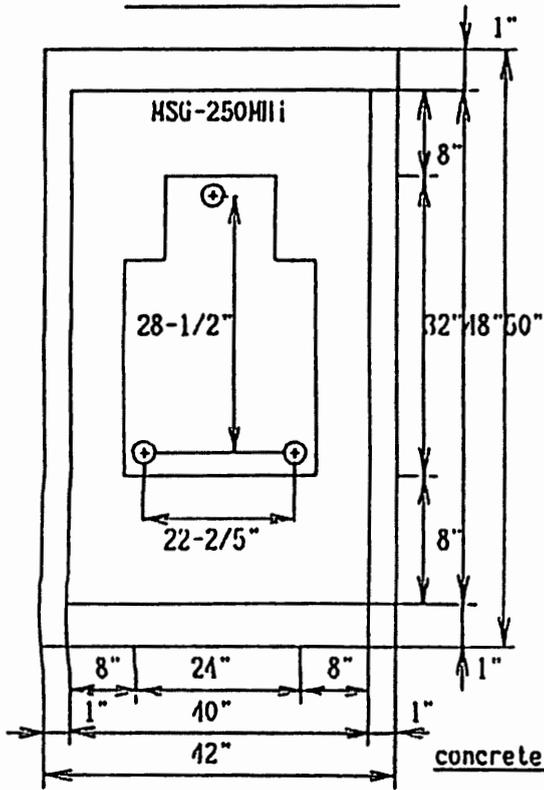
For the best performance the room temperature should be maintained at 20 degrees centigrade (68 degrees Fahrenheit) all the time.

Too great variation of the temperature can cause the distortion and disturb precision of the machine, because larger machine parts (frame, slides, grinding heads, etc.) can not follow the temperature variation as fast as the smaller parts. It is also important to have the machine not exposed directly to the sun light.

3. Floor space requirements

Floor space required for each machine is shown in Fig.2, next page. Note the positions of the leveling saucers for installation of the machine.

Floor Plans (Fig.2)



Foundation (Fig.1)

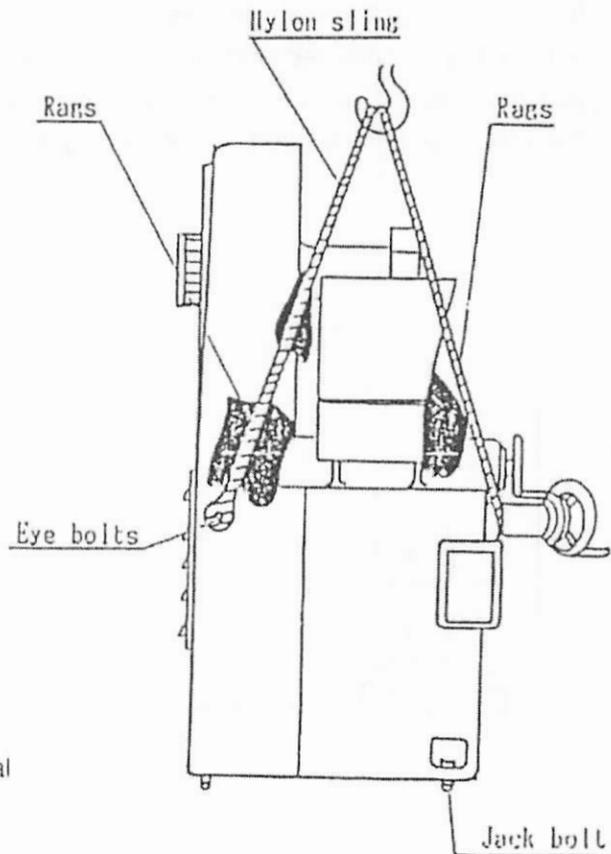
3. UNPACKING

This machine is completely assembled and perfectly adjusted before packing in the crate. Careful handling is important to assure maximum performance of the grinder.

A sudden shock to or tipping over of the machine can be a serious reason to deteriorate accuracy of the machine. Such careless treatment causes variations in the minutely adjusted parts and thus reduces the perfect precision. Be extremely cautious throughout entire courses of unpacking and setting up.

After bringing in the machine to the installation site, unpack the crate.

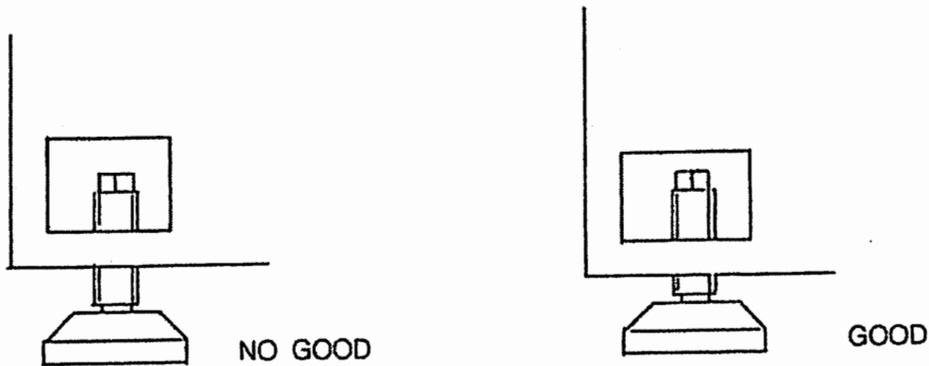
1. Remove the top and sides of the crate.
2. Remove the three bolts locking the machine to crate floor, and separate it from the crate.
3. Lift up the machine by hanging it with nylon slings or steel wires hooked at the eye bolts. Always lift from the center. If the lifting point is off the center, the machine might be tipped over.
4. It is also important to put some rags or cushioning material between the machine surface and the ropes or wires for the protection of the machine.
5. Before lowering the machine, screw in 3 leveling jackbolts enclosed in the same crate (Parts No.17) from above



(Fig. 3)

into the 20mm dia. cavities, 2 at both sides and 1 at the back center of the machine, and place 3 leveling saucers at the positions specified in Fig.2 on the foundation to support the machine.

6. Lower the machine so that the 3 leveling screws will reach the center of the 3 leveling saucers, respectively and snugly. Make sure the jackbolts and the saucers are aligned.
7. Use the level to secure the horizontal setting of the machine by adjusting the jackbolts.
Level the Machine as low as possible, otherwise it may cause vibration.
8. After unpacking the machine, check the enclosed accessory specifications with what you have received. If you find any item missing, or anything wrong with the machine, please inform us or our representative immediately with the serial number stamped in the name plate of the machine.



CRAMPING OF TABLE AND SADDLE

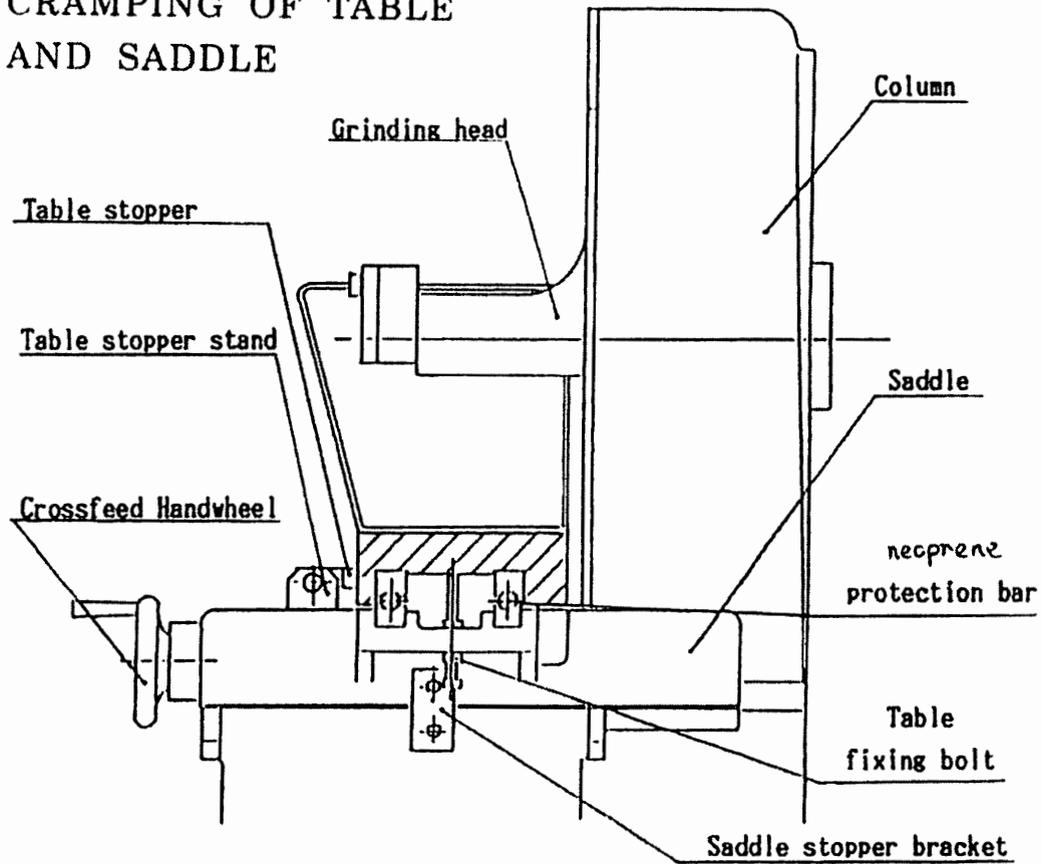


Fig. 4

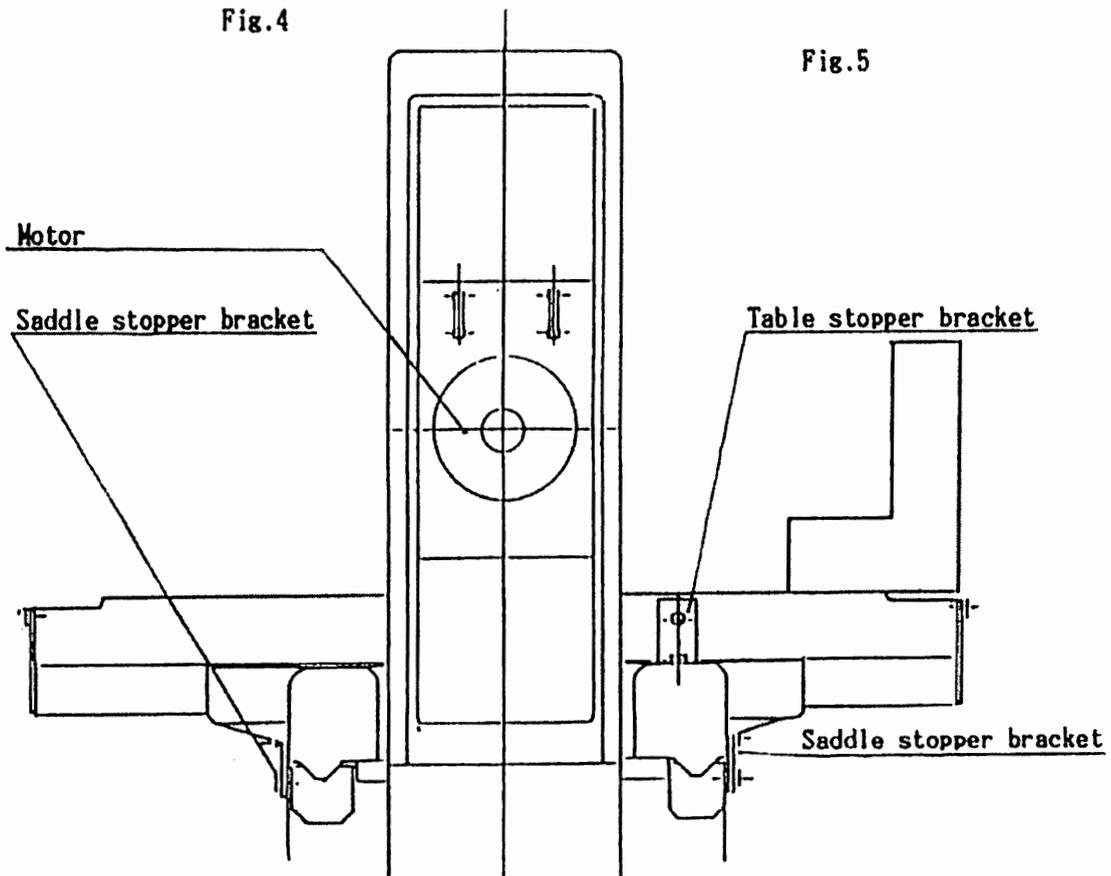


Fig. 5

4. SETTING UP THE MACHINE

The table and saddle are firmly clamped for the protection of the machine during transportation. The clamping should be released for setting it up.

Anti-rust oil must be removed and new oil applied. Table way protection bakelite bars must be replaced with the ball bearing retainers in the table-sliding ways.

RELEASING THE CLAMPS

1. Loose the bolts and detach the saddle stoppers brackets from both sides of the machine. Saddle is free now.
2. Loose and detach the table fixing bolts from the bottom of both ends of the table.

With Model MSG-250M/250MHi, loose the bolts and detach the table stopper brackets clamping the table and saddle, from back left hand of the table.

Loose the screw of the table stoppers and slide them away from the table stopper bar. (Refer Fig.4 and 5)

Table is free but must not be moved until the neoprene protection bars in the table slideways are replaced by the ball bearing retainers.

REMOVAL OF ANTI-RUST OIL AND WASHING

For the protection of machine from rust during transportation, important parts are coated with anti-rust agent. They have to be wiped and washed off completely with solvent like a kerosene in the following order.

1. Slideways of the Saddle and Base

When the machine is delivered to the customer, the saddle is being clamped at a position nearest the column. Wipe off Anti-rust grease Heavy coated to the bottom V-ways of the saddle extending out of the base, wash the V-ways with solvent and apply MOBIL Vactra No.2 (Heavy Medium) or equivalent to the V-way surfaces.

Then pull the saddle toward the operator by turning the handwheel for table traverse. Counter-clockwise until the saddle is no further pulled.

Apply same treatment to the V-ways extending out from the front end of the base.

2. Slideways to guide the grinding head

With the saddle positioned closest to the operator, detach the frame for the vertical way-cover and way-cover itself.

Wipe out and wash the grease used as anti-rust agent from the slideways.

Coat them with Vactra No.2 or equivalent.

Reassemble the frame and way-covers.

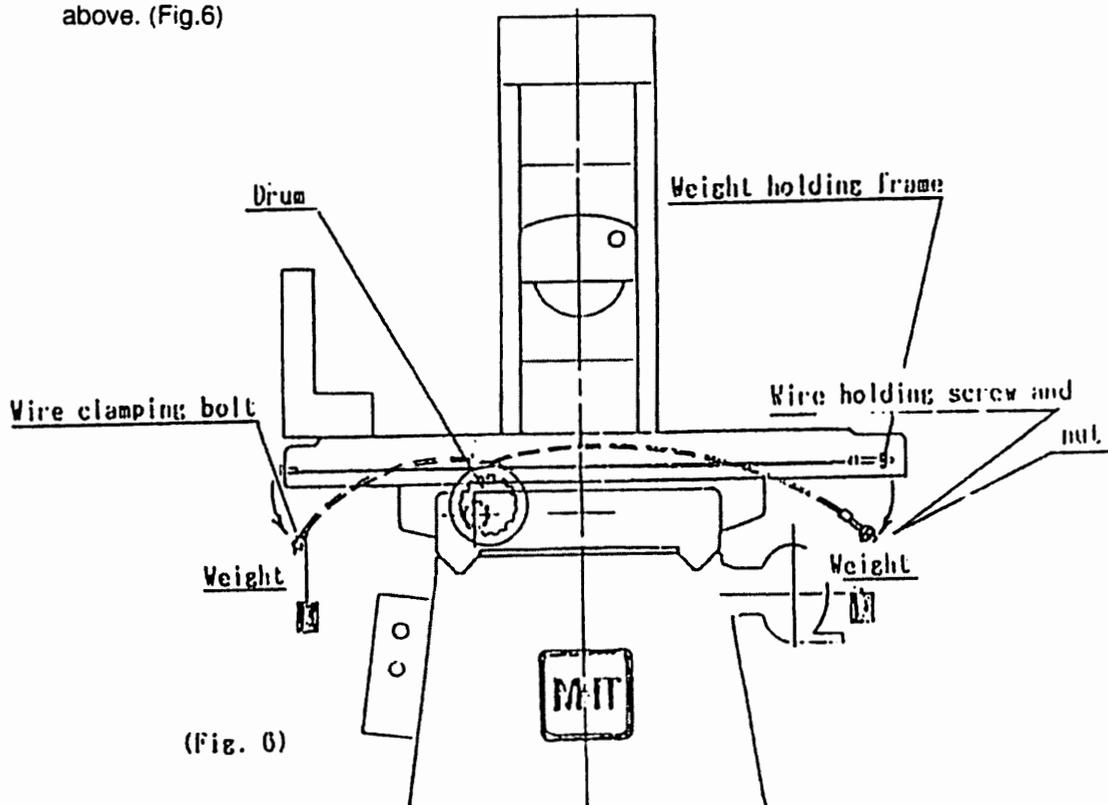
3. Slideways of the table longitudinal drive

a. Loose and detach the nut fixing the table driving wire rope

(extending from the drum) at the right end of the table bottom. (See Fig.6)

CAUTION: Make sure the wire is kept taut and pulled outward (rightward) while the wire holding screw at its end is released from the wire holding frame. Keep it pulled outward and attach a weight no less than 1/2 pound heavy to the screw end and let it hang down.

b. Pull the wire clamping bolt outward (leftward) at the left end of the table bottom, and let the wire come out through the slit. Let the wire clamping bolt hang down with a weight no less than 1/2 pound heavy attached as above. (Fig.6)



- c. Lift up the table from the saddle surface and put it aside.
Be very careful not to hurt the sliding surface of the table bottom.
- d. Remove the grease from the slideways of both table and saddle.
Coat them lightly with Vactra No.2.

(The neoprene protection bars in the saddle slideways are replaced with the ball bearing retainers (enclosed in the same crate as the machine) in this process.)

- e. After the ball retainers are placed in the slideways of the saddle,
put the table back to its place very quietly and carefully onto the saddle top.
Be very careful not to hurt the ways and bearing balls.
- f. Pull the table driving wire and keep it taut while removing the weights. Put both ends of the wire to the original place by the reverse order of b. and a. above.

The table can be run by the handwheel from now on.

4. Spindle nose

Clean up Anti-rust grease with rag.

5. Working surface of table

Anti-rust grease coated on the table should be wiped and washed off with solvent.
Apply machine oil on the table's working surface.

6. Male screw for Vertical drive

Grease is rather amply coated as anti-rust agent.
Wipe it away, and apply Vactra No.2 lightly.

7. Male screw for Cross feed drive

Same as item 6 above.

8. Dial scales for Handwheels for Cross and Vertical drives

Anti-rust agent is used for outside and inside of the dial scales.

Clean it up with solvent.

REPLACEMENT OF NEOPRENE BARS WITH LINEAR BALL BEARINGS

The Linear ball bearings for longitudinal table feed system are removed from the table slideways for protection of the balls during transportation.

When the table is lifted, remove the 6 pieces of neoprene shipping bars placed between table and saddle slideways.

Wipe and wash the linear ball bearings with solvent, make sure they are free from dust, and place them on the ways. (The linear ball bearings are wrapped and packed in the same crate as the machine).

When setting linear ball bearings on the slideways, put the shorter linear ball bearings center, front (close to operator) of the longitudinal feed slideway. And also longer one has to be placed center of backside rail (close to column).

CAUTION : When moving the machine from one location to another, the steel balls and ways may be damaged by shock, if the machine is moved with linear ball bearings left in the slideways.

Make sure they are removed whenever the machine is moved.

After the above are over, supply the specified lubricant.

FINAL CHECK

1. Measure the horizontal setting of the machine again by putting the level on the table. Adjust the three leveling jack bolts if necessary. Total error in levelness is not exceed 0.0002" per 40".
2. Check to see if any of the bolts or screws are loose or lost.
3. Check and see if the way-covers and bellows are functioning correctly.
4. Does each handwheel drive the related part correctly and smoothly?

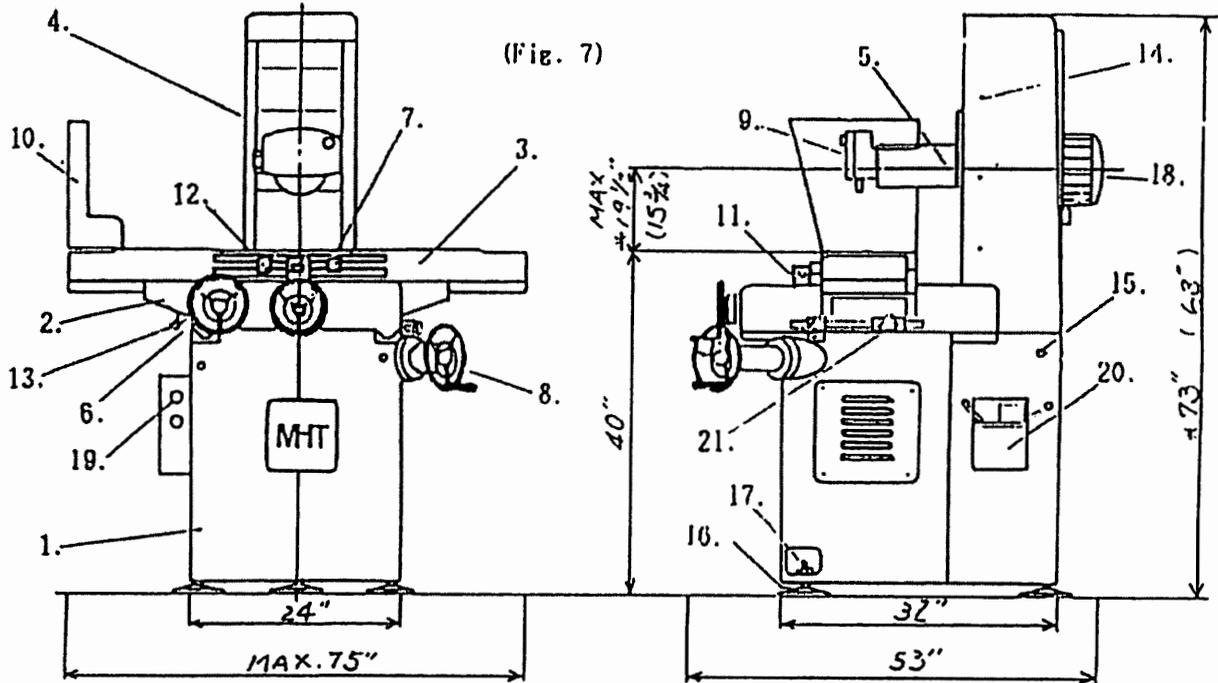
NOTE : In the vertical feed of the grinding head, handwheel, turning direction is reversed according to the choice of the customer by using 'right hand screw' or 'left hand screw'.

5. Is the lubrication complete?

Above being over, the machine will be ready as soon as correctly connected electrically with the source voltage.

5. PART' S NAMES

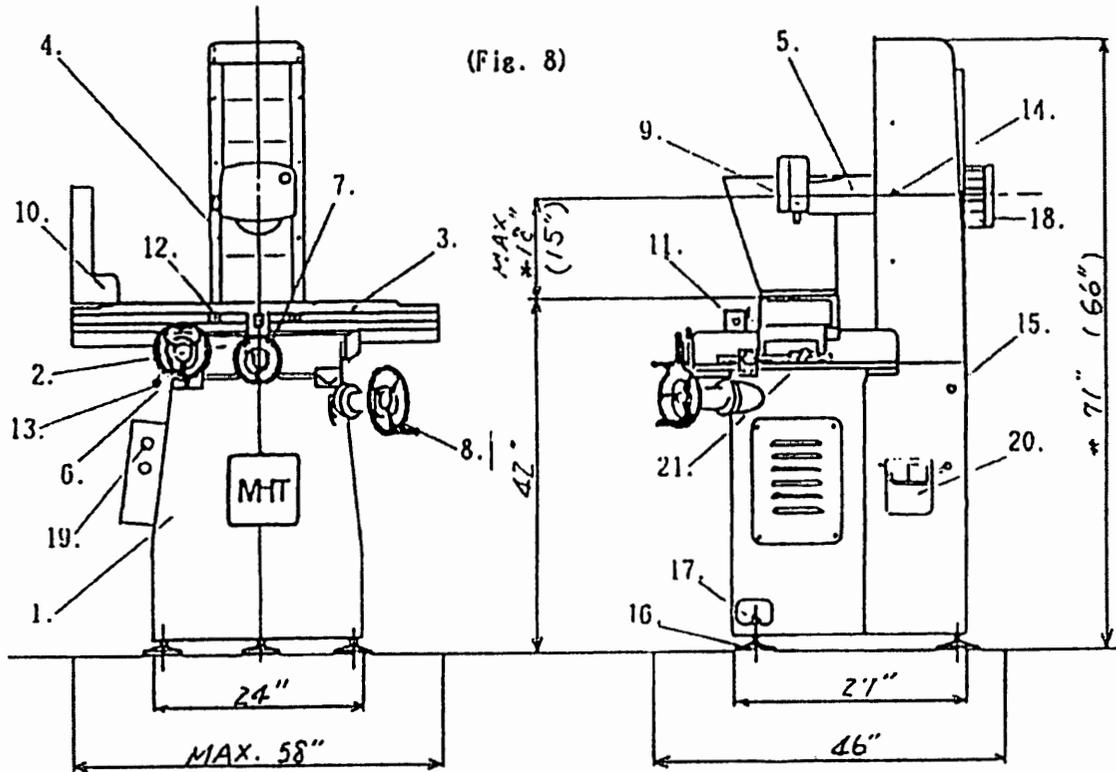
1. NAMES OF THE MAIN PARTS-MODEL MSG-250M/250MHI



- | | |
|--------------------------------|---|
| 1. Base | 13. Table stopper lever |
| 2. Saddle | 14. Slideway adjusting bolts |
| 3. Table | 15. Bolts for lifting up the machine |
| 4. Column | 16. Leveling saucer |
| 5. Head | 17. Leveling screw (Jack bolt) |
| 6. Longitudinal feed Handwheel | 18. Motor for spindle drive |
| 7. Crossfeed Handwheel | 19. Push button for wheel spindle motor |
| 8. Vertical feed Handwheel | 20. Automatic Lubricator |
| 9. Wheel guard | 21. Crossfeed locking handle |
| 10. Dust cover for table | |
| 11. Table stopper stand | |
| 12. Table stopper | |

*applies to model 250MHi

2. NAMES OF THE MAIN PARTS-MODEL MSG-200M/200MH1



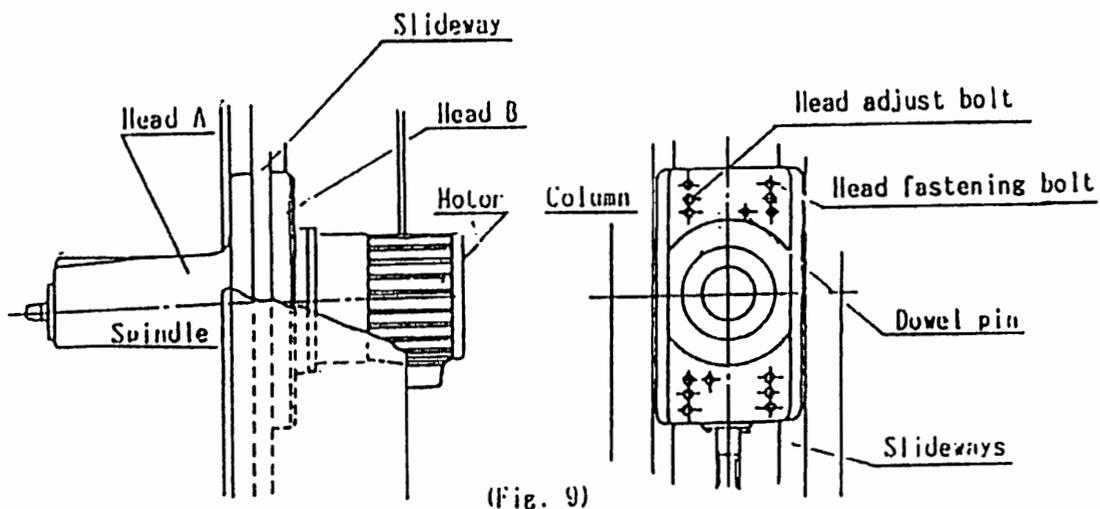
- | | |
|----------------------------|---|
| 1. Base | 13. Table stopper lever |
| 2. Saddle | 14. Slideway adjusting bolts |
| 3. Table | 15. Bolts for lifting up the machine |
| 4. Column | 16. Leveling saucer |
| 5. Head | 17. Leveling screw (Jack bolt) |
| 6. Longitudinal Handwheel | 18. Motor for Spindle drive |
| 7. Crossfeed Handwheel | 19. Push button for wheel spindle motor |
| 8. Vertical feed Handwheel | 20. Automatic Lubricator |
| 9. Wheel Guard | 21. Crossfeed locking handle |
| 10. Dust cover for Table | |
| 11. Table stopper stand | |
| 12. Table stopper | |

6. STRUCTURE, MECHANISM AND ADJUSTING OF MACHINE' S MAIN PARTS

Thorough knowledge of the structure, mechanism and adjusting of the machine's main parts is very much desired for the operator to make the most of this surface grinder, for optimal performance and preventive maintenance as well as safety.

A. GRINDING HEAD (Common to MSG-250M/250MH1 and MSG-200M/200MH1)

1. The head is composed of "A" and "B" portions, with the slideways in between, fixed with the bolts and dowel pins to each other.
2. The spindle and the motor are connected by the synthetic rubber coupling in order to prevent vibration.
3. The wear resistant, non-deforming steel, finished by hardening (to HRC 60 or more) and grinding, is used for the slideways. Strong against abrasion and deformation, it enables you to keep the original precision for a long period of time. Since the sliding parts hardly wears, adjusting is hardly necessary.

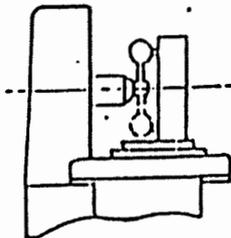


Adjustment of head-slideway clearance

The beautiful cross marks on the ground surface of the work can be obtained when both "A" and "B" Heads are well aligned constituting parallel spindle and table surface, and right angle of the spindle to the longitudinal table drives. When adjustment of this alignment is necessary, follow the procedures as below

- a. Adjust the bolts on the backside of Head "B" (Fig.9).
- b. By loosening the head fastening bolt and by tightening the head adjusting bolt, the head proceeds toward the operator.
- c. By opposite manipulation-by tightening the head fastening bolt and by loosening the head adjusting bolt, the head recedes.
- d. Adjusting by the fastening bolt only, or by the adjusting bolt only, may suffice depending on the amount of adjustment needed.
- e. This adjustment can be made at the four corners. Sometimes, adjustment of one corner only may suffice, but all of the four corners may need adjusting depending on the actual situation.
- f. Amount of adjustment can be determined by the following checks.

Parallel Spindle axis and table top

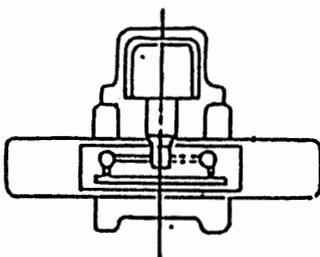


(Fig.10)

Place a cylindrical square gauge on the table top to get in touch with the dial indicator pointer attached to the spindle head. Read the value at the top, then swing the spindle 180 degree to the bottom position and read the value again.

The difference in readings should be less than $.0008"/12"$ (top end to bottom end).

Right angle of Spindle axis to longitudinal Table drive



(Fig. 11)

Place a square surface plate on the table parallel to the longitudinal table drive. Read the dial indicator value attached to the spindle head as above at one end, then swing the spindle head 180 degree and read the value at the diametrically opposite position.

The difference in reading should be less than $.0008"/12"$ (between two horizontally opposite positions of dial indicator).

IMPORTANT:

This is a very sensitive manipulation and should not be practiced by unskilled personnel not experienced in this kind of adjustment.

- In case no such person is available, please contact our distributor.

- The spindle runs in super precision angular contact ball bearings, used two each in front and back, which keep it at low temperature and prevent stretching of the spindle, thus ensuring the precision for long. Specially selected grease is sealed in and the necessity of lubrication is eliminated.
- The spindle is removable. When the life of spindle is exhausted, replacement spindle is always available for early delivery. Replacement is easy. Just take off the set collar and then the smooth replacement can be made. One of the features of this machine is the long spindle life without lubrication (more than 10 normal working years) and the easy replacement of it if necessary.

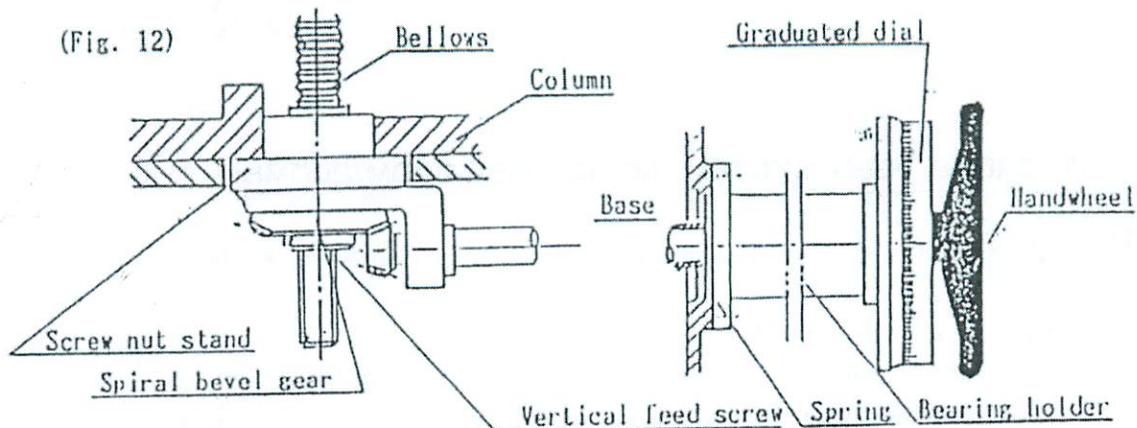
B. VERTICAL FEED SYSTEM (Common to MSG-250M/250MHi, MSG-200M/200MHi)

- Right hand screw and Left hand screw are available to the choice of the customer.

Right hand screw : Clockwise rotation of the vertical feed handwheel lowers the grinding head, and counter clockwise rotation raises it.

Left hand screw : Rotation direction of the handwheel is reversed.

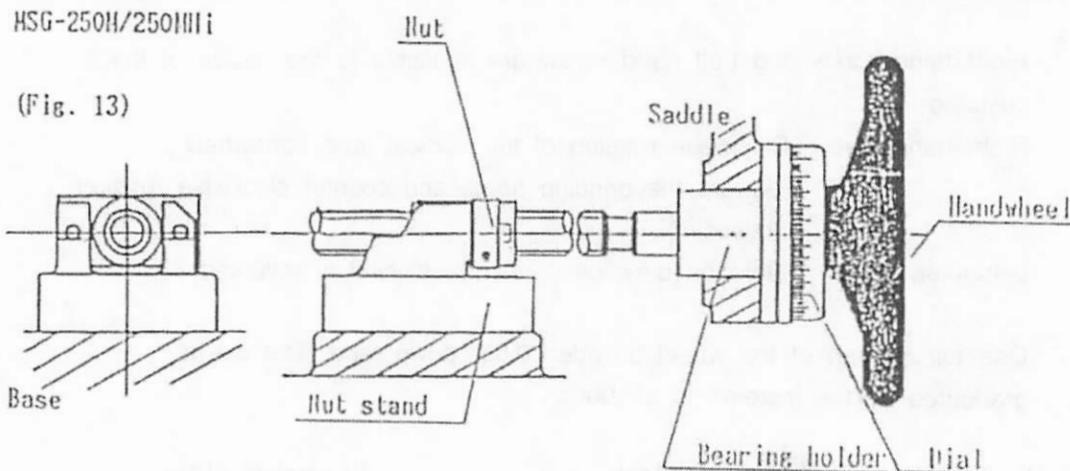
- One full rotation of the wheel provides 0.05" down feed. The dial is graduated by the increments of .0001".



3. By the spiral bevel gears and ball bearings of this parts, the light driving of feed without and play and noise is completely assured. Also, the below around the male screw doubly protects the feed from the dust, and there is scarcely any damage due to the dust.

C. CROSS FEED SYSTEM, MODEL 250M/250MHI

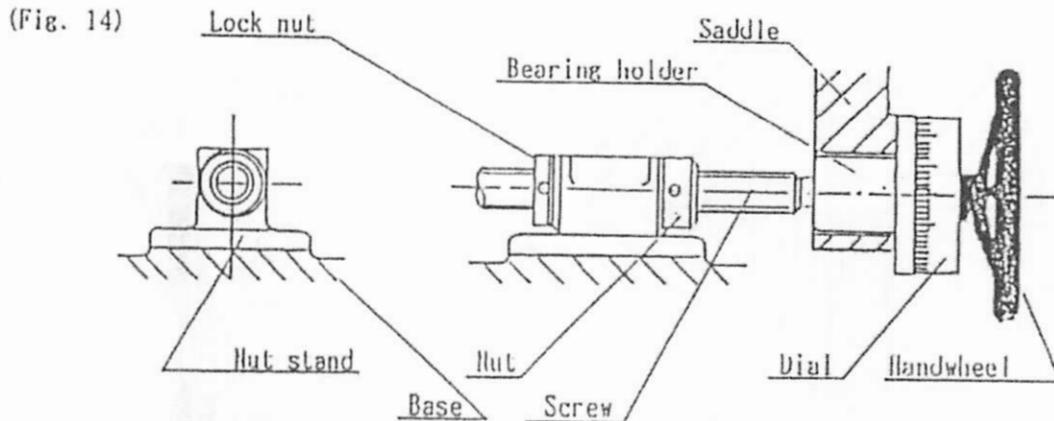
1. Refer to Fig.13 below for mechanism and structure. Thrust ball bearings ensure light motion of the saddle.
2. By clockwise rotation of the handwheel, the saddle toward the column. By counter-clockwise turn it is pulled backward to the operator. One full rotation of the handwheel feeds the saddle by 0.1". The dial is graduated by increment of 0.001".
3. Should unevenness of the screw occur, loosen the female screw holder fixing bolts, and compensate the height of the holder. Tighten the bolt after this adjustment.



D. CROSS FEED SYSTEM, MODEL MSG-200M/200MHI

1. Mechanism and structure similarly composed of are shown in Fig.14 below.
2. By clockwise rotation of the hand wheel, the saddle advances toward the column. By counter-clockwise turn it is pulled backward to the operator. One full rotation of the handwheel feeds the saddle by 0.1". The dial is graduated by increment of 0.001".

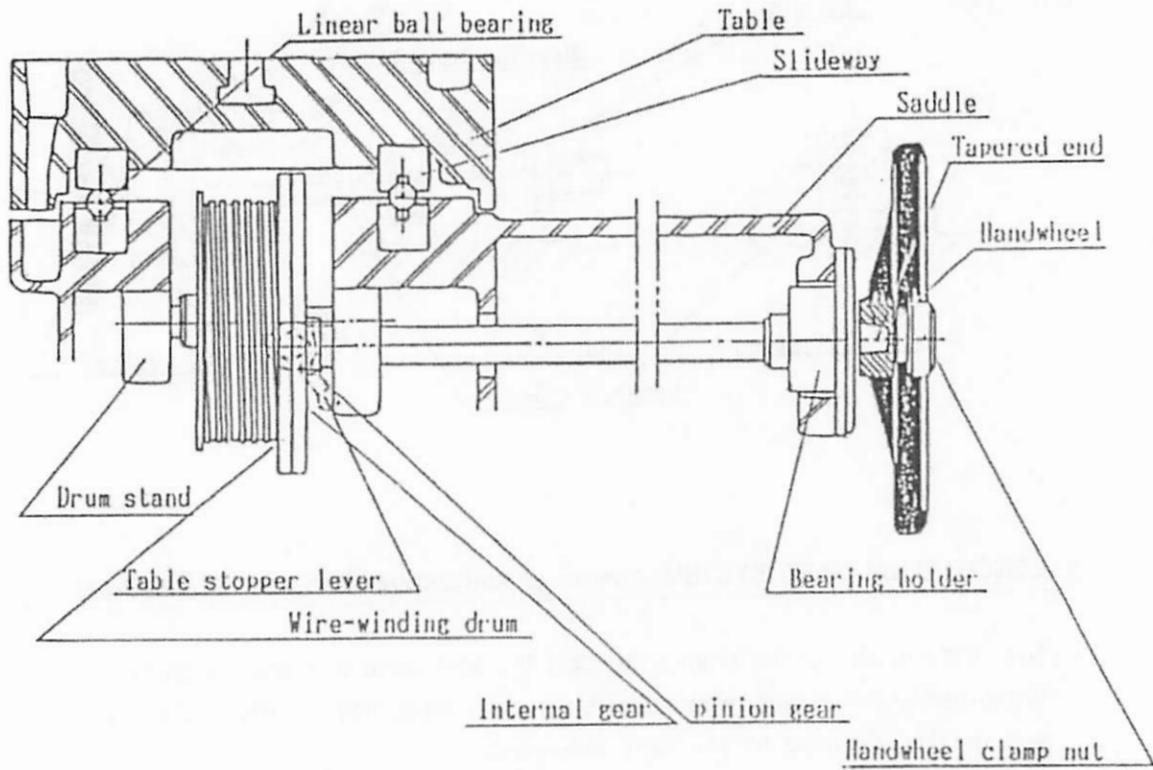
- The screw height may be adjusted similarly as per C, 3, above.



E. LONGITUDINAL FEED SYSTEM (Common to MSG-250M/250MHi, MSG-200M/200MHi)

- This is composed of the drum of winding the wire cable and internal gear, etc. Wear-resistant, non-deforming steel, finished by hardening (to HRC 60 or more) and grinding, is used for the table slideways. This prevents the sliding parts from abrasion and deformation and enables them to keep the original precision for a long period of time.
- The light driving of the table is materialized by ball bearings which are used in the ball retainers at the slide parts.
- Locking the table after a work or while dressing a wheel can be made by the stopper lever (parts no.13) at the left side of the saddle.
- As is shown in the illustration below, the axis of the handwheel is tapered at where it is fitted to axis of the drum, so that the operator can choose the optimum position of the handwheel's grip by loosening the handwheel clamp nut, for the right amount of feed.
- Clockwise turn of the Handwheel drives the table to the right, and opposite turn to the Left. One full rotation of the handwheel drives the table by 4.92" (Model 250/250MHi) or 3.94" (Model 200M/200MHi).
- When the wire is loose, just adjust it by tightening the nut at the extreme end of the table bottom. (Fig.6, Fig.23)

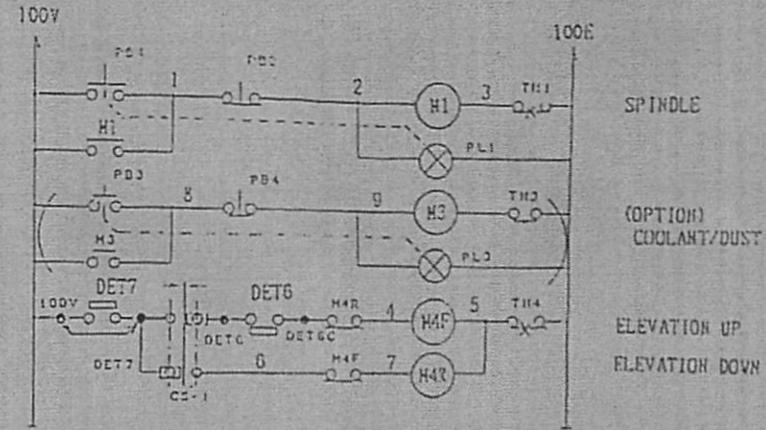
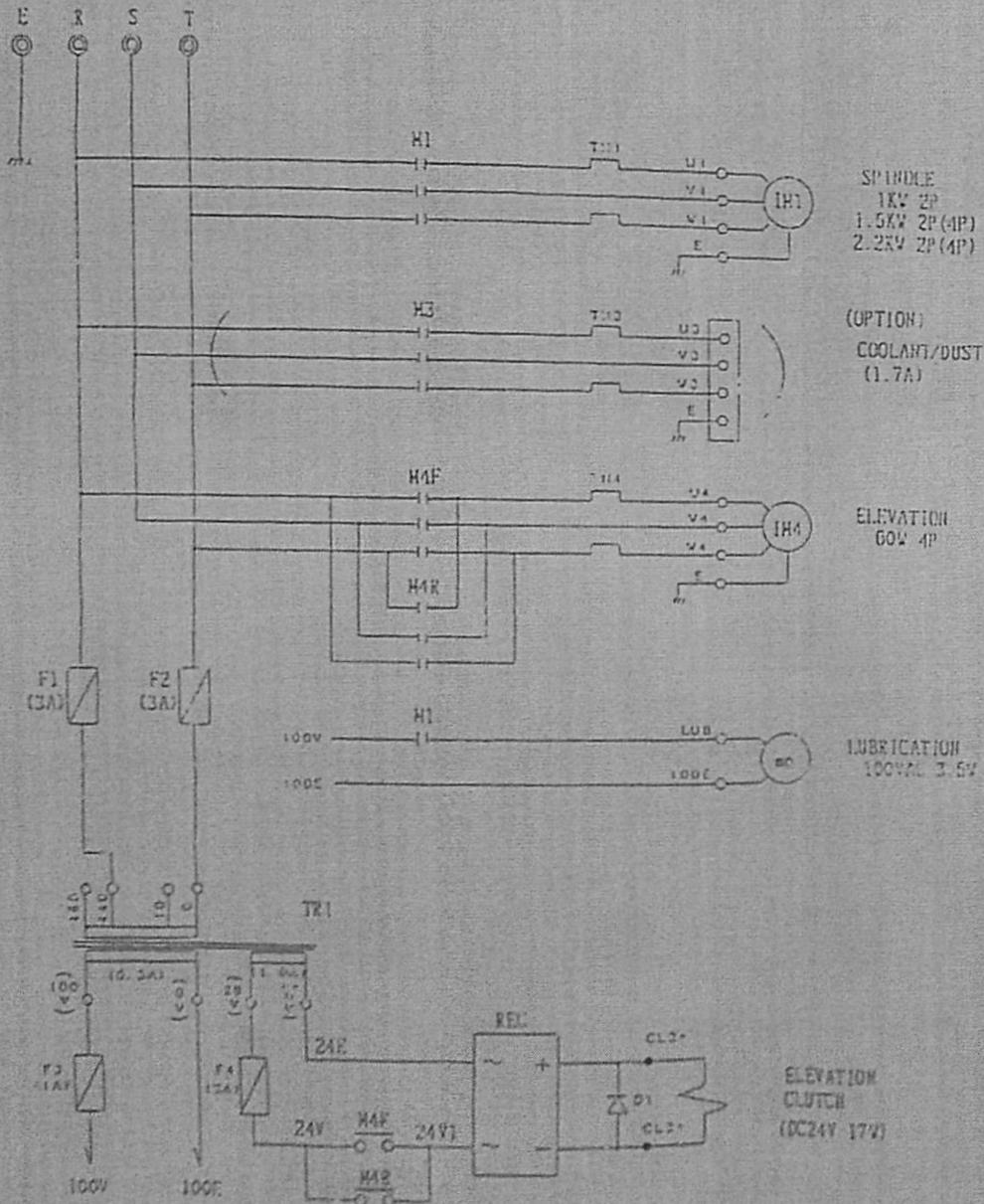
(Fig. 15)



Optional power elevation Model AC460V 60Hz Diagram

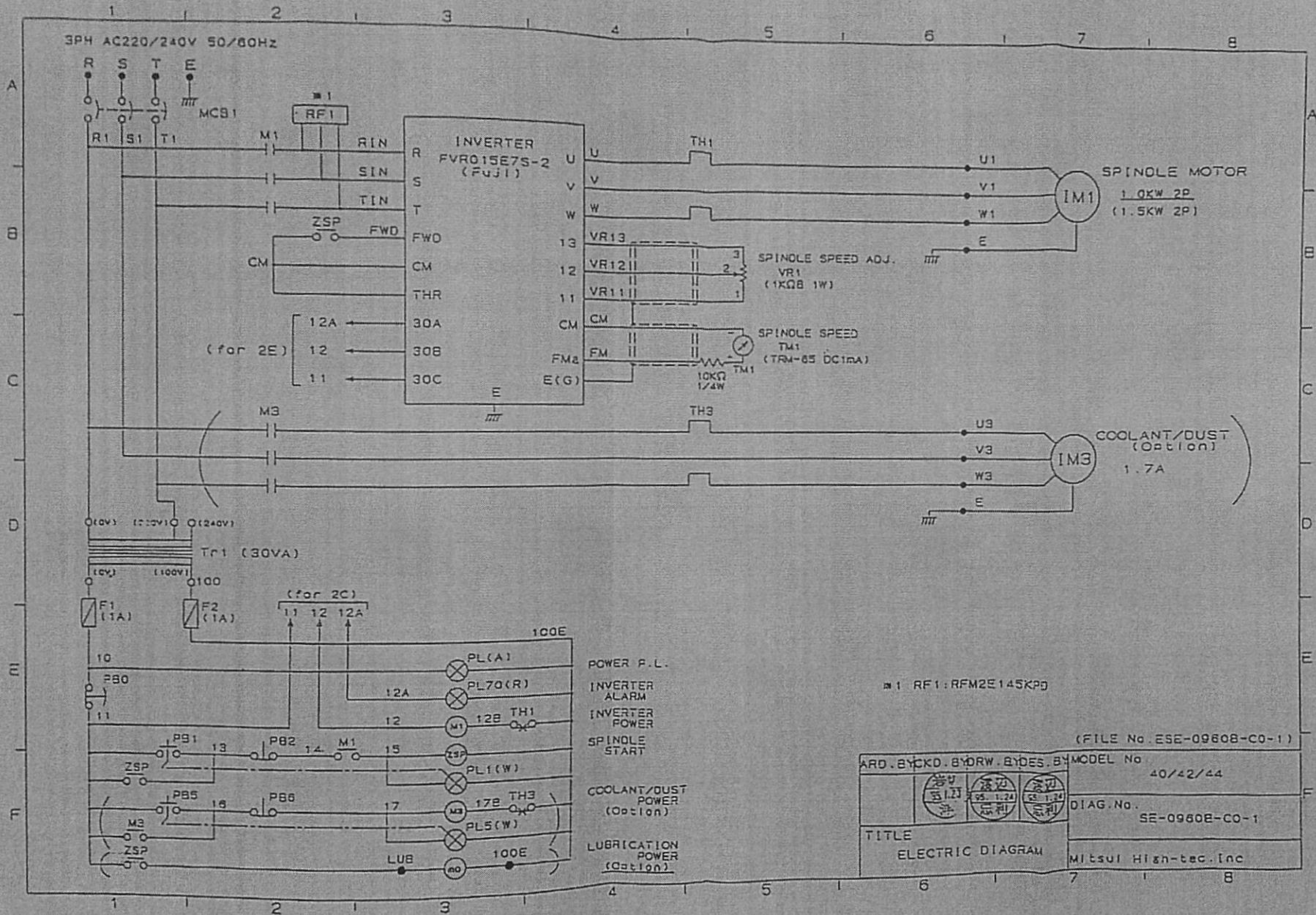
(Fig. 19)

3PH, 460V 60Hz



DET6. ELEVATION UP LIMIT SWITCH
 DET7. FINE VERTICAL FEED INTER LOCK LIMIT SWITCH. (OPTION)
 (NORMAL SHORT)

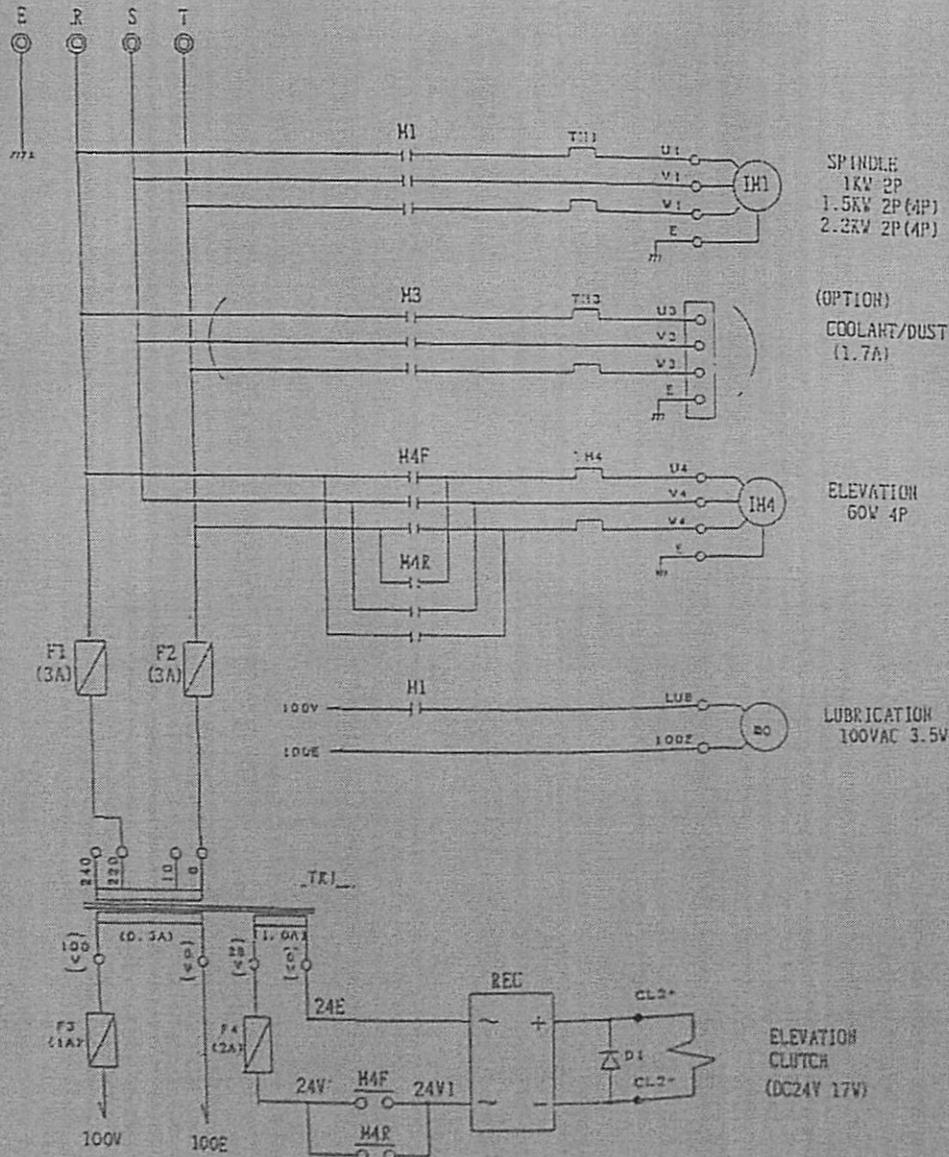
Optional variable motor speed control Model
AC 220/240V 50/60Hz Diagram



Optional power elevation Model AC200-220V 60Hz Diagram

(Fig.18)

3PH. 220V 60Hz



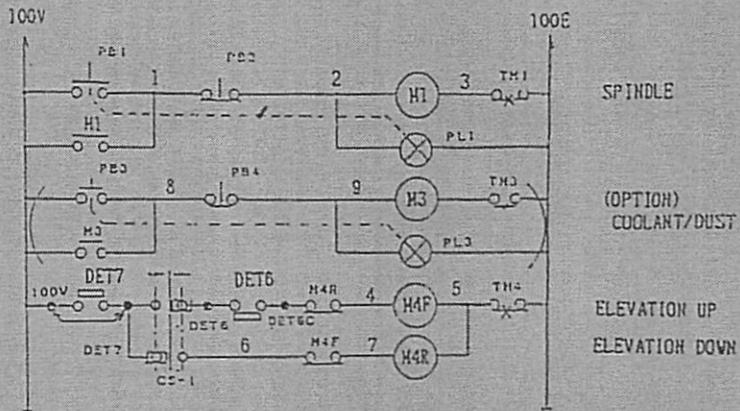
SPINDLE
1KV 2P
1.5KV 2P (4P)
2.2KV 2P (4P)

(OPTION)
COOLANT/DUST
(1.7A)

ELEVATION
60V 4P

LUBRICATION
100VAC 3.5W

ELEVATION
CLUTCH
(DC24V 17W)

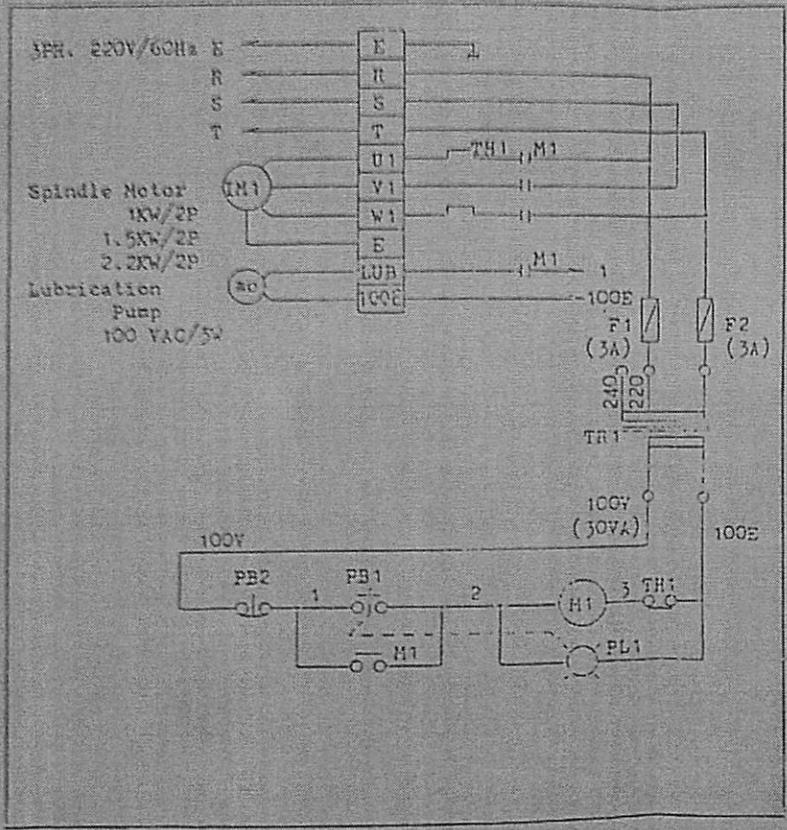


DET6. ELEVATION UP LIMIT SWITCH
DET7. FINE VERTICAL FEED INTER LOCK LIMIT SWITCH. (OPTION)
(NORMAL SHORT)

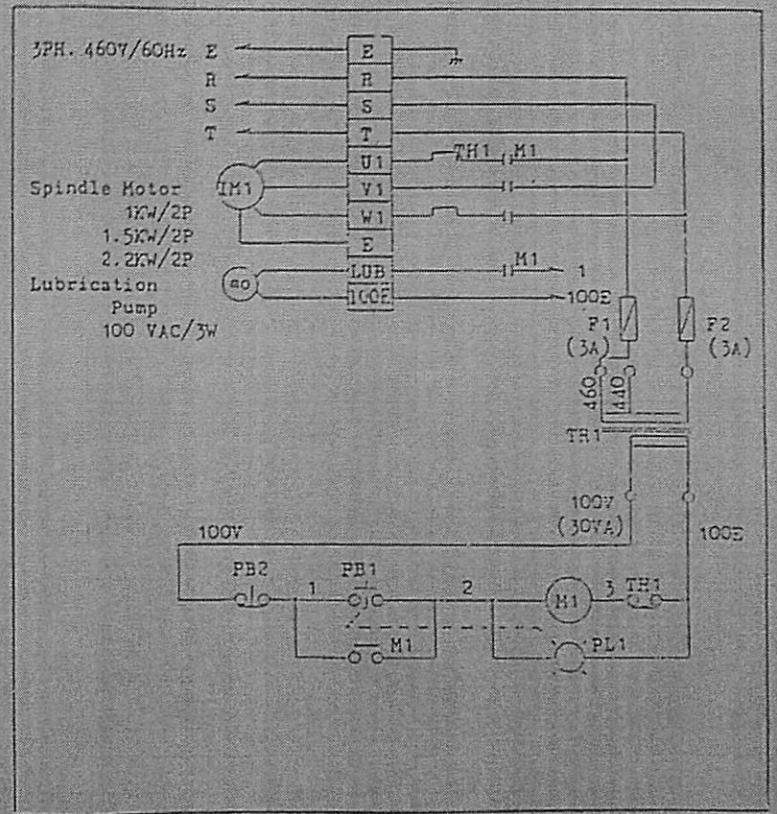
7. ELECTRICALS (Common to MSC-250M/250MH and 200M/200MH)

The main electricals are assembled in the switchboard at the left side of the machine. Connect electric source of AC 200-220V or 460V with input terminals R, S, and T.

STANDARD AC 200-220V 60Hz WIRING DIAGRAM (Fig.16)



AC 460V 60Hz WIRING DIAGRAM (Fig.17)



8. OPERATION

A. MOUNTING GRINDING WHEEL TO THE SPINDLE

Never depress the push button to turn on the spindle motor before the flange fastening screw is removed from spindle head to confirm the rotation direction.

1. Remove the flange fastening screw by clockwise rotation of it. This screw is threaded opposite the regular thread so that it will fasten when spindle is correctly rotating clockwise. (The allow mark on the wheel cover shows the correct direction.)
2. Turn on the spindle motor by depressing the switch button (Parts No.19) and confirm it is turning clockwise.
3. If the flange fastening screw is not removed and the rotation is counter-clockwise, the screw will jump off at tremendous speed and hurt the machine and even the operator. So, make sure the rotation is clockwise.

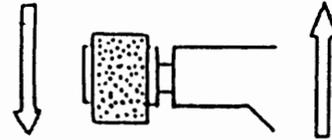
If not, check again the wiring and interchange input terminals R and S, or R and T, or S and T. Interchange of any combination will reverse the rotation direction.

4. Wheel fastening nut is also reversely threaded. After the flange with the wheel fastened to it is mounted to the spindle, fasten the flange to the spindle by the flange fastening screw again.

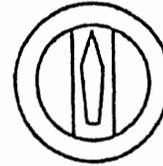
B. VERTICAL FEED SYSTEM

1. Choice of the right hand screw or left hand screw is available according to the customer's selection .
2. Manual feed of the grinding wheel may be provided by rotation of the hand wheel.
3. Power elevation (Special execution, see Fig. 20)
 - a. Turn the selector switch knob above the spindle motor starter switch to the right for head up, and to the left for lowering of the head.

- b. The head will keep moving up or down while the selector switch is kept set at either right or left position at the speed of about 5" per minute.



- c. Releasing the grip of the selector switch, it automatically returns to the neutral position (center).



C. CROSS FEED SYSTEM

(Fig. 20)

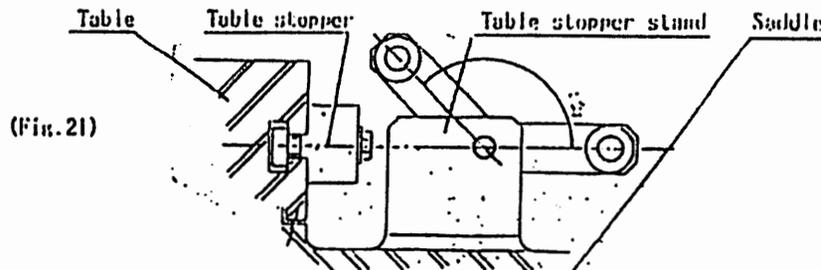
Rotation of the handwheel (7) drives the saddle forward or backward.

1. Clockwise rotation pushes the saddle away from the operator, or forward to the column, and the counter-clockwise rotation pulls the saddle backward to the operator.
2. The amount of feed can be read out by the main scale of the graduated dial by increment of 0.001".

D. LONGITUDINAL FEED SYSTEM

Rotation of the leftside handwheel (6) drives the table to the left or right.

1. Clockwise turning of the handwheel drives the table to the right of the operator, and by the counter-clockwise turning to the left.
2. The shaft and the handwheel are taper-fitted and locked by the handwheel clamp nut. Adjust the nut so that the handwheel grip may be set at the optimum position for the operator.
3. With the combination of table stopper stand (11) and table stopper (12) the table travel can be limited for safe and accurate feedings. The stopping lock can be freely set as shown below.



9. SAFETY PRECAUTIONS

Bear in mind that the grinding wheel running at a very high speed can hurt the careless operator anytime.

This danger, however, may be avoided by observing necessary precautions as follows:

1. Limit to the grinding wheel size

Always use a wheel less than 8" in outside diameter. This is to use the wheel within the prescribed peripheral speed range.

(The peripheral speed can be calculated by:

Wheel OD \times 3.14159... \times 2,900 rpm/50Hz, or

Wheel OD \times 3.14159... \times 3,400 rpm/60Hz)

If the peripheral speed is faster than the prescribed speed, the centrifugal force might break the wheel which in turn will damage the work and the machine, and even hurt the operator.

The larger the wheel OD, the faster the peripheral speed.

A wheel larger than 8" OD can exceed the safety speed, hence this danger.

2. Confirm, before the main motor is turned on and the wheel starts to rotate, that the spindle and the flange to which the wheel is set are firmly fastened.

Make sure the wheel guard is closed while the wheel is running.

3. Once the grinding wheel begins to rotate, never touch it with your hand or finger.

To implement this warning, follow the precautions as below:

a. When wiping or otherwise cleaning the magnetic surface:

- (1) Stop the main motor, or
- (2) Move the table either to left or right, or pull the saddle so that the magnetic chuck will be sufficiently away from the running wheel.
- (3) Make sure to lock the table at that position by the lever for table locking 13.

b. When loading the work on the magnetic chuck:

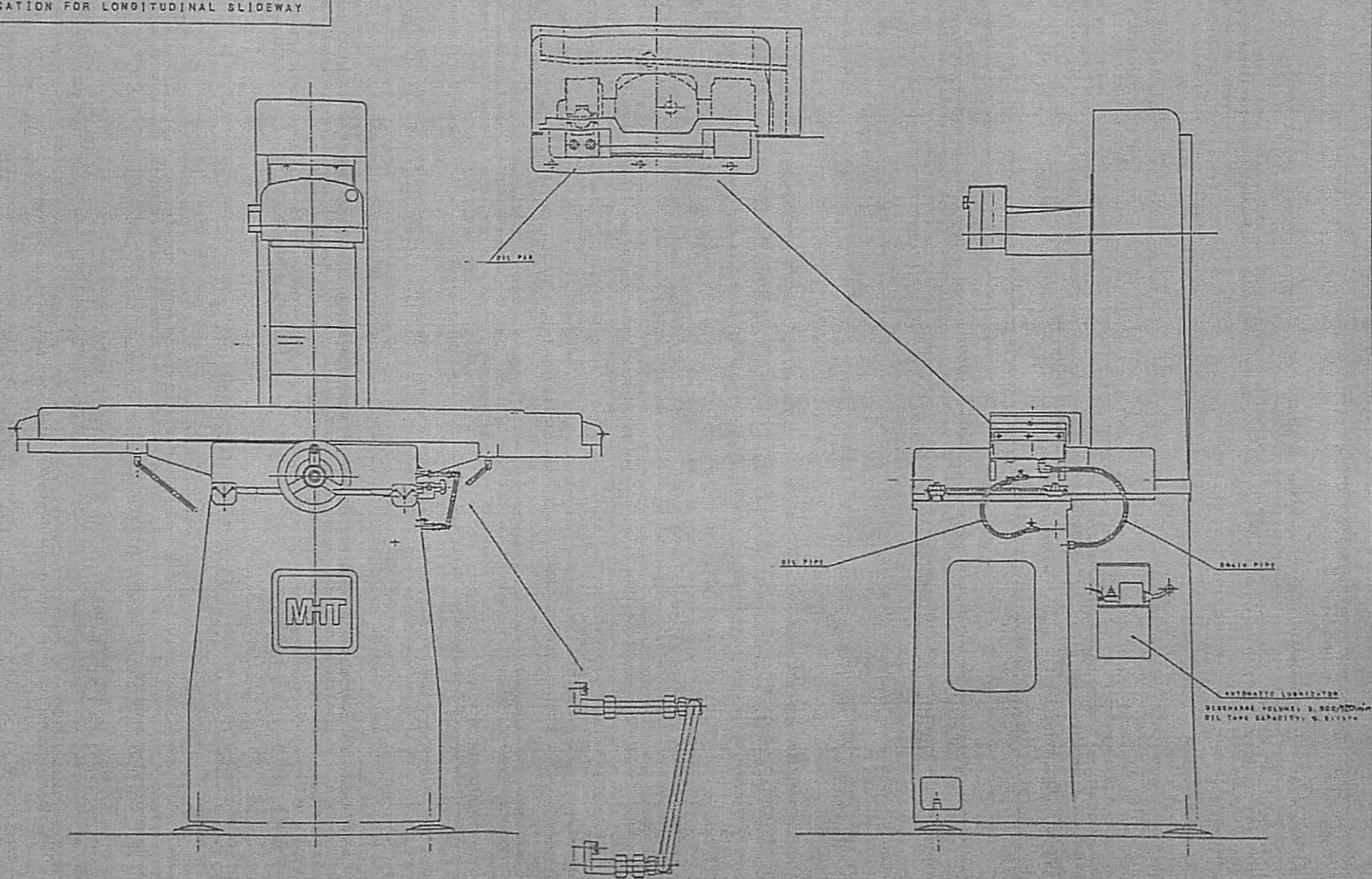
- (1) Make sure that the chuck controller works properly.
- (2) Confirm the work is firmly gripped by the magnetic chuck before grinding it. If the work is very small or high, fasten them with auxiliary magnetic or blocks. If not held firmly, the work can spin or fly and damage the wheel and the machine, and even can hurt the operator.

c. When unloading the work from the magnet chuck:

Exactly same precaution as in 3. a. above must be exercised when the works are being removed from the magnetic chuck.

OPTIONAL FEATURE:
 AUTOMATIC LUBRICATION FOR LONGITUDINAL SLIDEWAY

File No. MO42-2904-01



(NOTE) AUTOMATIC LUBRICATOR FEEDS OIL TO ALL SLIDEWAYS AND SCREWS
 PICTURE SHOWS ONLY MODEL M39-205/618 HAND FEED

ADD STOCK PARTS ONLY TO		TITLE	
			LUBRICATIONS
MATERIAL	QUANTITY	MODEL NO.	200/205/250
QUANTITY	PART	QUANTITY	1/2
		PART NO.	USA
MILWAUKEE M39-205, 618, 818, 820			

10. MAINTENANCE OF THE MACHINE

Cleaning and oiling of the lubricating parts are of the great importance to keep the machine in good working order and to maintain the accuracy of the machine. They are liable to get soiled easily by the particles of ground works and grains removed from the grinding wheels. Attention should be paid to keep the machine clean all the time.

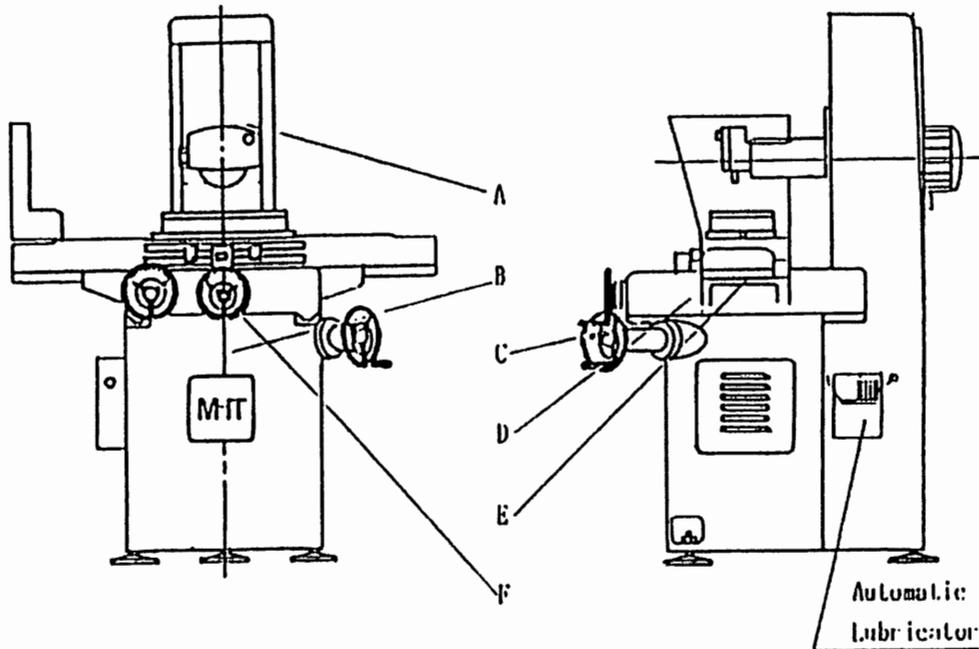
Mitsui will not take a responsibility for the problem, caused by wrong brand lubricants and wrong lubrication cycle.

A. LUBRICATIONS

The proper choice of lubricating oil and grease assures the high precision and efficiency of the machine. Following are the recommended lubricants for Mitsui Surface Grinders:

The spots to lubricate			Lubrication cycle	Lubrication method	Recommended way oil and Grease		
	No.	Parts			APOLLO	SHELL	MOBIL
A	2	Sliding parts of head	Fill up every day	Automatic Lubricator	Daphne mechanic oil 52	Tellus oil 29	Vactra No.2 heavy medium
B	1	Vertical feed Screw					
C	2	Cross feed Vee-way					
D	1	Cross feed Screw					
E	2	Longitudinal Slideway	every month	Clean slide & Put New oil			
F	1	Bearing holder for crossfeed	every year	Clean holder & regrease	Daphne Coronex grease	Alvania grease 2	Mobil grease 2

(Fig. 22)



A,B,C and D are automatically lubricated by Model-MLZ Automatic Lubricator located right-hand side back of machine base.

Pump motor for lubricator starts when spindle switch starter is ON.

Every 120 minutes pump motor for Automatic lubricator kicks Oil-cylinder, then feeds oil to the sliding parts, above described.

Keep the oil level in the lubricator higher than the white line, printed side of the Tank, all the time.

In case of using other way oil, which we did not show on the lubrication chart, choose same hardness oil.

B. PREVENTIVE MAINTENANCE OF THE MACHINE

To ensure the satisfactory operation of precision machines, daily cleaning and care are the most essential.

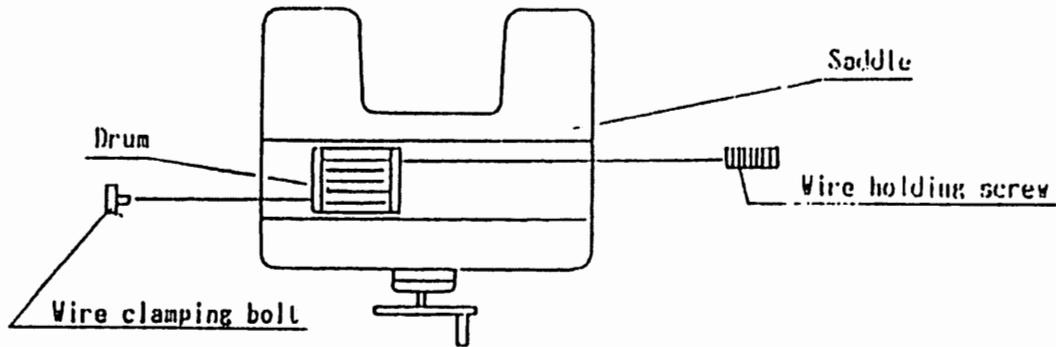
The life of machine depends entirely on this matter.

Especially for the machine like grinders which produce a lot of small chips grains, the cleaning and the lubrication are of major importance.

As ball bearings are used in the slideways, take off the table and clean the ball and sliding parts and regrease them every month or at least once every two months.

Refer to and follow the same procedures as shown in par. 3. a-f, pages 9 and 10. Clean both the ways and balls and coat them with fresh grease.

C. Maintenance for the steel cable for Table driving



1. The optimal tension for the steel cable is such that it deflects by 1/4 to 1/2" when depressed by your finger.
2. In the course of usage the steel cable stretches out slightly. Tighten the cable holding screw at its right end under the table to maintain the optimal tension once every two months or so.
3. If and when the wire rope is damaged, replace it by the following procedures:
 - a. Same as 3. a - c on page 9 ~ 10.
 - b. Unwind the steel cable from the drum and remove it from machine.
 - c. Wind the new steel cable around drum following its slots, from the operator side first, making 4 round at the central slot of the drum.
 - d. Make the lengths of both ends extending to right and left of the drum even.
 - e. Attach weights at each end of the steel cable. (Fig. 6, page 8) Do not let the steel cable run out of the drum slots.
 - f. Follow the same procedures as par. 3 and f., page 10, to complete replacement.

11. INSTRUCTION MANUAL FOR AUTOMATIC LUBRICATOR

MODEL MLZ

Specifications

Synchronous Motor	100V AC, 50/60 HZ, 3W, 1 phase
Discharge Volume	1.5 ~ 2.5 cc/shot (Adjustable)
Pump Discharge Pressure	3.5 kg/cm ²
Oil Reservoir Capacity	0.8 litre
Reservoir Material	Synthetic resin
Weight	1.8 kg

On this lubricator, synchronous motor is used to drive oil pump (cylinder) through worm gear, cam and swing arm.

Synchronous motor power code is wired into spindle motor control box (located left side of machine bed).

By depressing spindle motor starter switch, synchronous motor on lubricator starts at same time.

As far as spindle motor starter switch is ON, automatic lubricator keeps discharge oil every 120 minutes.

Automatic lubricator feeds oil to the following points:

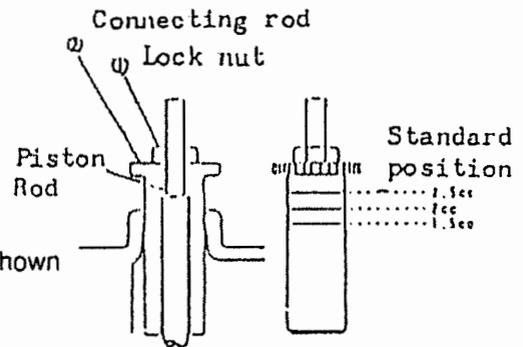
- Cross feed screw
- Cross feed vee way
- Vertical slide way
- Vertical feed screw

If the level of oil in the oil reservoir drops to the position of the suction port, immediately replenish new oil.

Mobil Vactra No.2 Heavy Mideum Oil should be used on this lubricator.

Pump discharge amount can be adjusted as follows:

- (1) Loosen lock-nut 1 counterclockwise.
- (2) After loosening the lock-nut 1, and turn the connecting rod 2, to set it at the standard position, and fix it firmly in that position.
- (3) The graduation and discharge amount are shown in the figure on the right.



Caution 1:

Please do not use spindle oils, gear oils, motor oils, or way oils for other brand surface grinder etc. on this machine.

Oil filters, metering units were adjusted to suitable for Mobil Vactra No.2 Oil or other same grade oils.

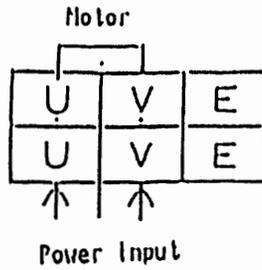
Mitsui Precision Machinery Corp. (Importer of Mitsui Grinder)

76 N.Lively blvd., Elk Grove Village, ILL 60007 (312) 593-1634 Handles Vactra

No.2 way oil, so please contact service agent on the above address.

Caution 2 :

Motor terminal wiring diagram is shown as follows :



The suction filter of the pump should be replaced with a new one once a year or more often.

