

# OPERATOR'S MANUAL

JSG-612 & 618 & 718

Surface Grinding Machines

**JET Equipment & Tools**



1901 JEFFERSON AVENUE / TACOMA WASHINGTON 98402 / (206) 572-5000

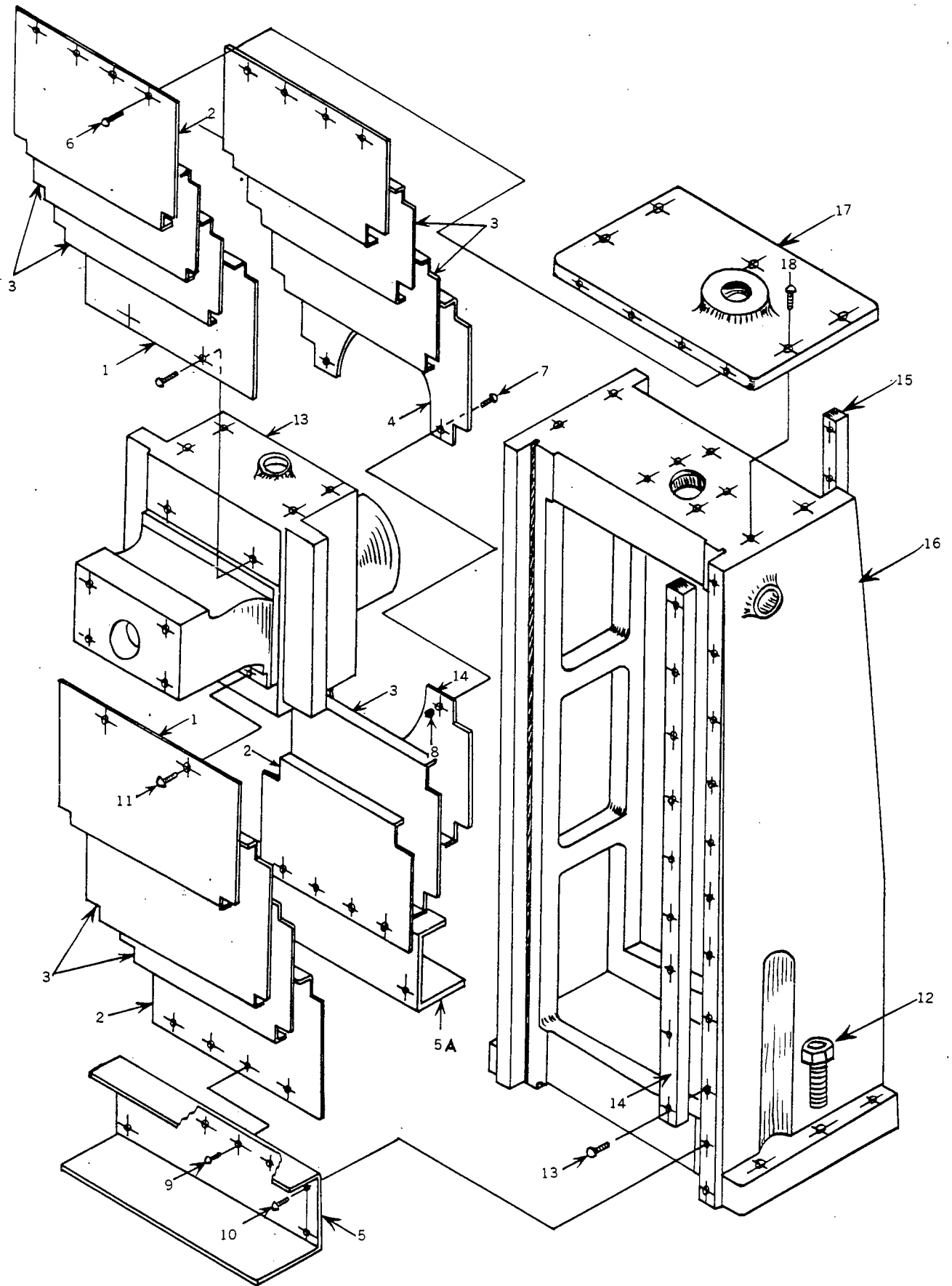


# PARTS LIST

| INDEX<br>NO. | PART NAME  | INDEX<br>NO. | PART NAME                    |
|--------------|--|--------------|------------------------------|
| 1            | Wet Grinding Rear Guard                            | 21           | Coolant Tank                 |
| 2            | Auxiliary Rear Guard                               | 22           | Coolant Nozzle               |
| 3            | Coolant Deflector                                  | 23           | Round Head Screw             |
| 4            | Washer   | 24           | Coolant Chute                |
| 5            | Coolant Deflector Thumb Screw                      | 25           | Round Head Screw             |
| 6            | Round Head Screw                                   | 26           | Coolant Chute Gasket         |
| 8            | Coolant Nozzle Clamp Bracket, includes<br>7 and 12 | 27           | Table Trough                 |
| 10           | Washer   | 28           | Hex Nut                      |
| 11           | Socket Head Screw                                  | 29           | Round Head Screw             |
| 13           | Coolant Orifice Nipple                             | 30           | Round Head Screw             |
| 14           | Worm Drive Hose Clamp                              | 31           | Wet Grind End Guard          |
| 15           | Plastic Hose                                       | 32           | Wet Grind Front Guard        |
| 16           | Worm Drive Hose Clamp                              | 33           | Guard Gasket                 |
| 17           | Coolant Nipple                                     | 34           | Bed Trough Guard             |
| 18           | 45° Elbow  | 35           | Wet Grind Machine Bed Trough |
| 19           | Nipple   | 36           | Bet Trough Gasket            |
| 20           | Coolant Pump and Motor 1/8 h.p.                    | 37           | Round Head Screw             |
|              |  | 38           | Hose Clamp                   |
|              |  | 39           | Rubber Hose                  |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

## **SURFACE GRINDING MACHINE**



UPRIGHT 718 ONLY

# HANDWHEEL OPERATED AND LEVER OPERATED TABLE DRIVE

## PARTS LIST

### INDEX

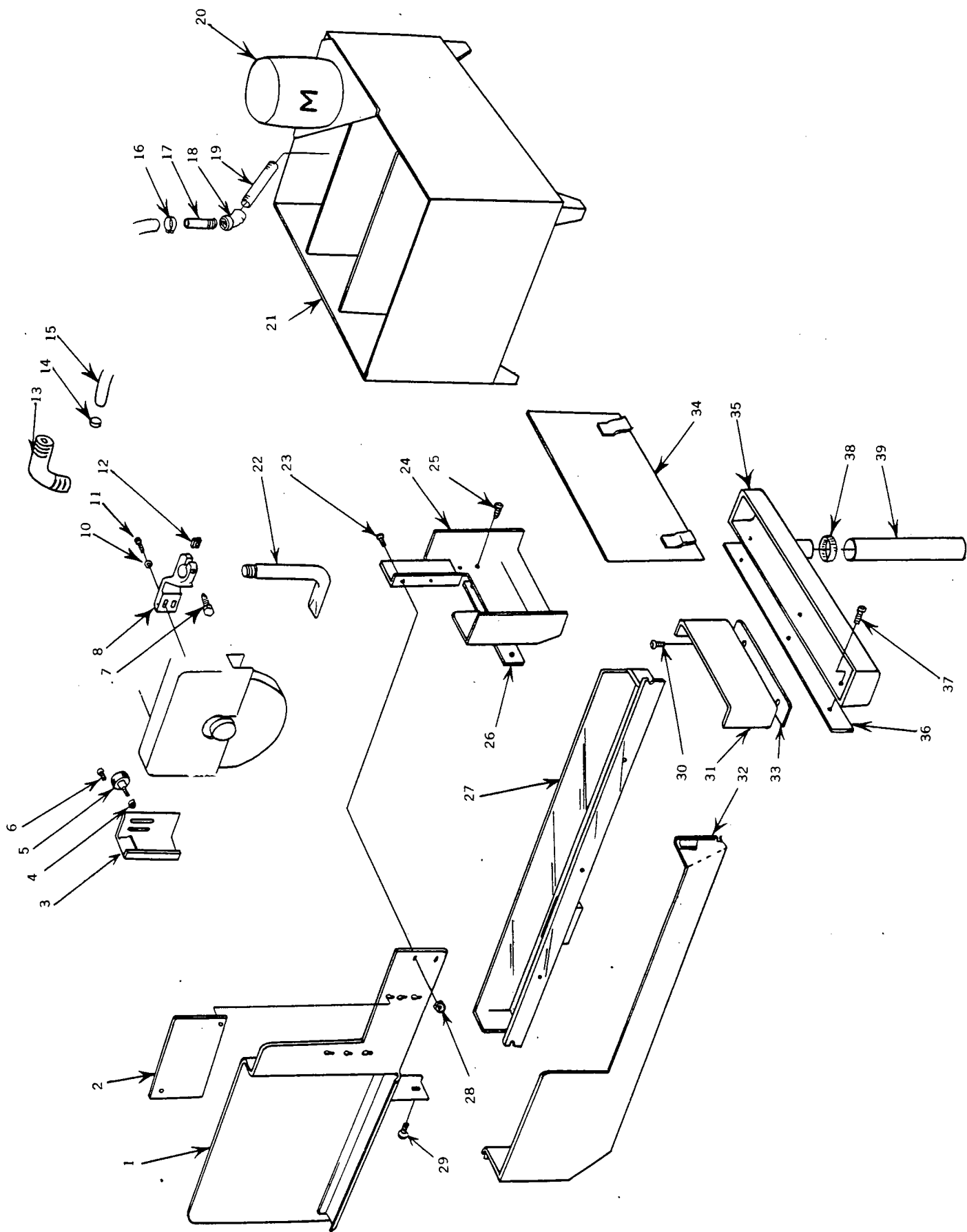
| NO. | PART NAME |
|-----|-----------|
|-----|-----------|

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|        |                            |
|--------|----------------------------|
| 1      | Pulley Retaining Nut       |
| 2      | Washer                     |
| 3      | 10 Tooth Pulley            |
| 4      | Pulley Key                 |
| 5      | Pulley Shaft               |
| 6      | Handwheel Key              |
| 7      | Pulley Bracket             |
| 8      | Thrust Washer              |
| 9      | Bearing                    |
| 10     | Bearing                    |
| 11     | Retaining Ring             |
| 12     | Retaining Ring             |
| 13     | Socket Head Screw          |
| 14     | Socket Head Screw          |
| 15     | Pulley Bracket Cover       |
| 16     | Stud                       |
| 17     | Handle                     |
| 18     | Collar                     |
| 19     | Washer                     |
| 20     | Socket Head Screw          |
| 22     | Table Handwheel            |
| 23     | 20 Tooth Pulley            |
| 24     | Timing Belt                |
| 25     | External Retaining Ring    |
| 26     | Double Seal Ball Bearing   |
| 27     | Table Traverse Lever Shaft |
| 27 - 1 | Key                        |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

**SURFACE GRINDING MACHINE**



**WET GRINDING ATTACHMENT**

# DIRECT DRIVE SPINDLE

## PARTS LIST

### INDEX

NO.

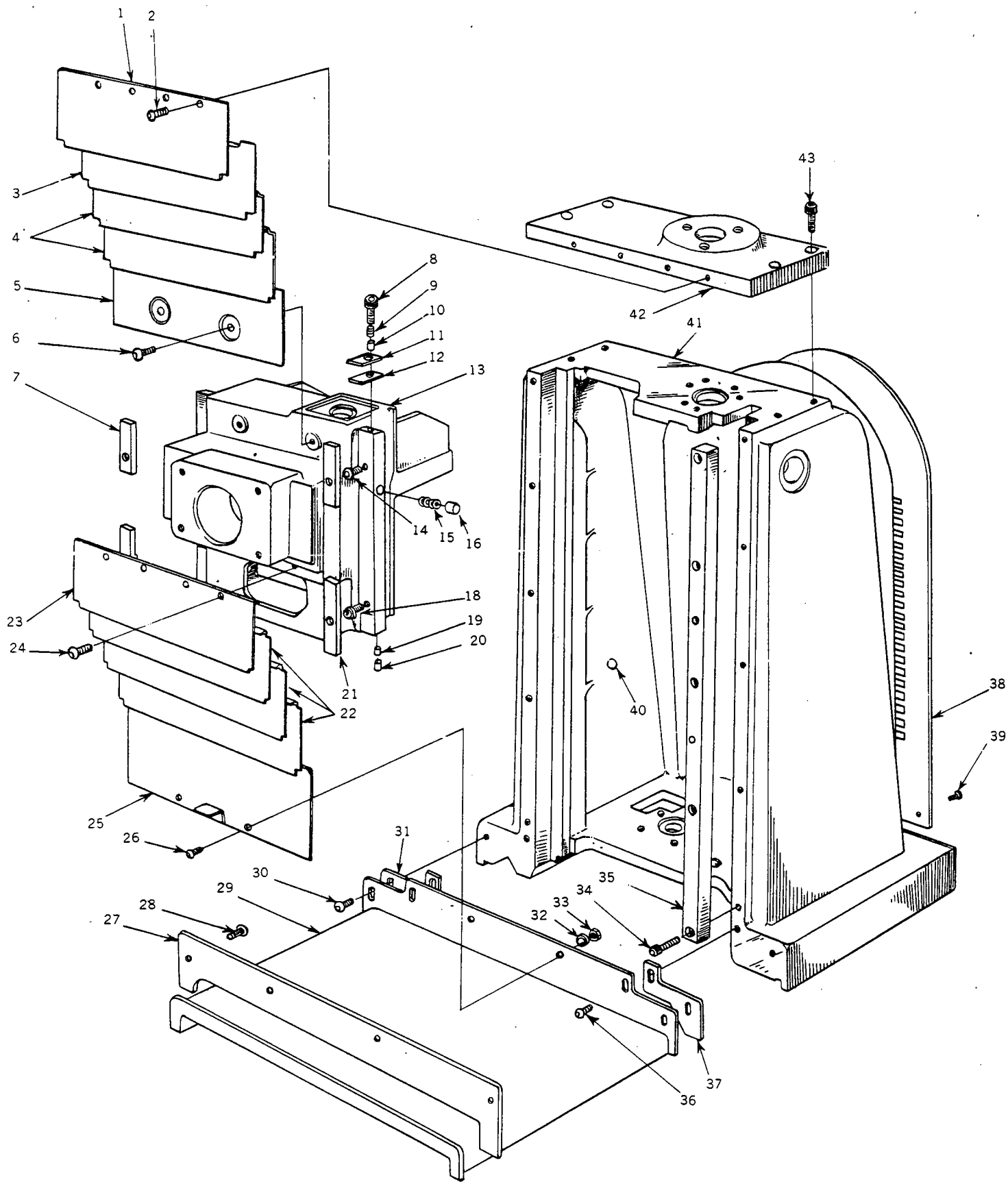
PART NAME

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|    |  |
|----|--|
| 1  | Motor Housing Mounting Cap                               |
| 2  | Socket Head Screw  |
| 3  | Spindle Motor, 1 1/2 H.P., 3 Ph.                         |
| 4  | Spindle Washer.  |
| 5  | Elastic Locknut.   |
| 6  | Socket Head Screw.                                       |
| 7  | Spindle Sleeve   |
| 9  | Spindle Ball Bearing, includes 23 (matched set) (# 7007) |
| 10 | Friction Seal Washer                                     |
| 12 | Bearing Fitting Washer                                   |
| 13 | Ball Bearing Lock Nut                                    |
| 14 | Set Screw  |
| 15 | Motor Housing Nut,                                       |
| 16 | Motor Housing Cover Gasket                               |
| 17 | Motor Housing Cover                                      |
| 18 | Rivet  |
| 19 | Connecting indication plate                              |
| 20 | Spindle Motor Cable Complete                             |
| 21 | Motor Housing  |
| 22 | Round Head Screw   |
| 23 | Spindle Ball Bearing, includes 9 (matched set) (# 7007)  |
| 24 | Friction Seal Washer                                     |
| 25 | Spindle Bearing Dust Guard                               |
| 26 | Ball Bearing Retainer Nut                                |
| 27 | Ball Bearing Spacer                                      |
| 28 | Spindle  |
| 29 | Socket Head Screw  |
| 30 | Wheel Sleeve, includes 31 and 32                         |
| 31 | Wheel Sleeve Washer                                      |
| 32 | Wheel Sleeve Nut   |
| 33 | Spindle Nut  |
| 34 | Teated Set Screw   |
| 35 | Hex Nut  |
| 36 | Spindle Sleeve Support                                   |
| 37 | Socket head Screw  |
| 38 | Wheel Sleeve Wrench                                      |
| 39 | Square Head Screw  |
| 40 | Wheel Sleeve Puller, includes 39                         |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

**SURFACE GRINDING MACHINE**



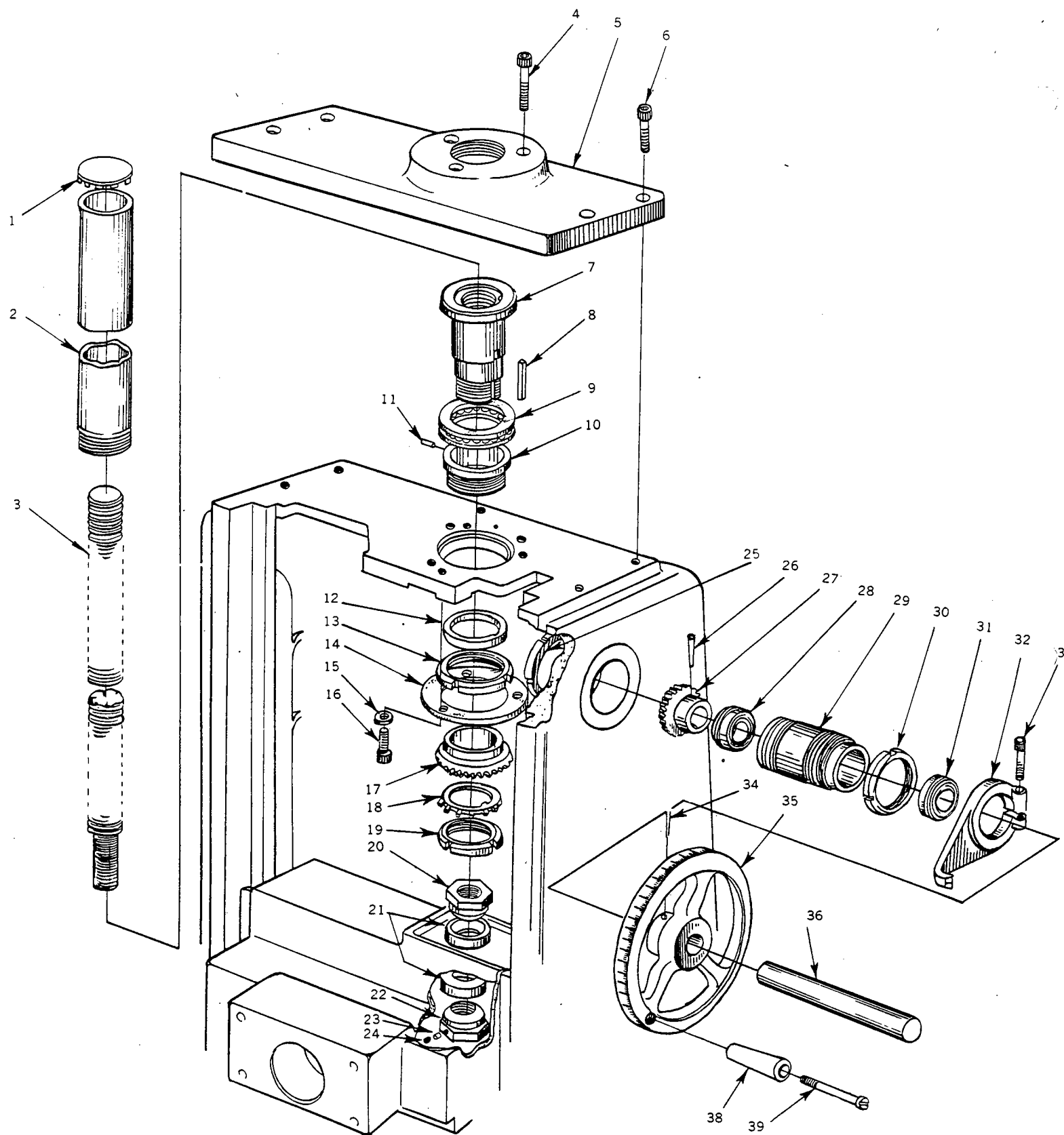
UPRIGHT 612 618 ONLY



# UPRIGHT PARTS LIST

| INDEX<br>NO. | PART NAME                            |
|--------------|--------------------------------------|
| 1            | Elevating Screw Guard, Upper         |
| 2            | Round Head Screw                     |
| 3            | Elevating Screw Guard, Upper         |
| 4            | Elevating Screw Guard, Intermediate  |
| 5            | Elevating Screw Guard                |
| 6            | Round Head Screw                     |
| 7            | Spindle Head Gib                     |
| 8            | Socket Head Screw                    |
| 9            | Set Screw                            |
| 10           | Brass Pin                            |
| 11           | Wiper Plate                          |
| 12           | Spindle Head Ways Felt Wiper         |
| 13           | Spindle Head                         |
| 14           | Spindle Head Gib Adjusting Screw     |
| 15           | Spring                               |
| 16           | Spindle Head Stabilizer Button       |
| 18           | Spindle Head Gib Adjusting Screw     |
| 19           | Brass Pin                            |
| 20           | Set Screw                            |
| 21           | Spindle Head Gib                     |
| 22           | Elevating Screw Guard, Intermediate  |
| 23           | Outer Dust Guard                     |
| 24           | Round Head Screw                     |
| 25           | Front Dust Guard, Lower              |
| 26           | Round Head Screw                     |
| 27           | Table Bed Rear Guard                 |
| 28           | Round Head Screw                     |
| 29           | Upright Splash Guard                 |
| 30           | Round Head Screw                     |
| 31           | Upright Splash Guard Gasket          |
| 32           | Lockwasher                           |
| 33           | Hex Nut                              |
| 34           | Socket Head Screw                    |
| 35           | Upright Strap, Right Side            |
|              | Upright Strap, Left Side (not shown) |
| 36           | Round Head Screw                     |
| 37           | Upright Splash Guard Gasket          |
| 38           | Upright Rear Cover                   |
| 39           | Round Head Screw                     |
| 40           | Plug Button                          |
| 41           | Upright                              |
| 42           | Elevating Screw Guard Flange         |
| 43           | Socket Head Screw                    |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE



**ELEVATING MECHANISM**

# ELEVATING MECHANISM

## PARTS LIST

### INDEX

NO. PART NAME

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|    |                                  |
|----|----------------------------------|
| 1  | Plug Button                      |
| 2  | Elevating Screw Guard            |
| 3  | Head Elevating Screw             |
| 4  | Socket Head Screw                |
| 5  | Elevating Screw Guard Flange     |
| 6  | Socket Head Screw                |
| 7  | Head Elevating Nut               |
| 8  | Key                              |
| 9  | Ball Thrust Bearing              |
| 10 | Head Elevating Nut Support       |
| 11 | Pin                              |
| 12 | Elevating Nut Spacer             |
| 13 | Round Nut                        |
| 14 | Elevating Mechanism Support      |
| 15 | Washer                           |
| 16 | Socket Head Screw                |
| 17 | Head Elevating Screw Gear        |
| 18 | Lockwasher                       |
| 19 | Round Nut                        |
| 20 | Elevating Screw Clamp Nut, Upper |
| 21 | Washer                           |
| 22 | Elevating Screw Clamp Nut, Lower |
| 24 | Set Screw                        |
| 25 | Round Nut                        |
| 26 | Head Elevating Screw Pinion Pin  |
| 27 | Head Elevating Screw Pinion      |
| 28 | Double Seal Ball Bearing         |
| 29 | Head Elevating Nut Spacer        |
| 30 | Round Nut                        |
| 31 | Double Seal Ball Bearing         |
| 32 | Elevating Hand Wheel Indicator   |
| 33 | Socket Head Screw                |
| 34 | Handwheel Taper Pin              |
| 35 | Elevating Screw Handwheel        |
| 36 | Elevating Handwheel Shaft        |
| 38 | Handle                           |
| 39 | Handle Stud                      |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

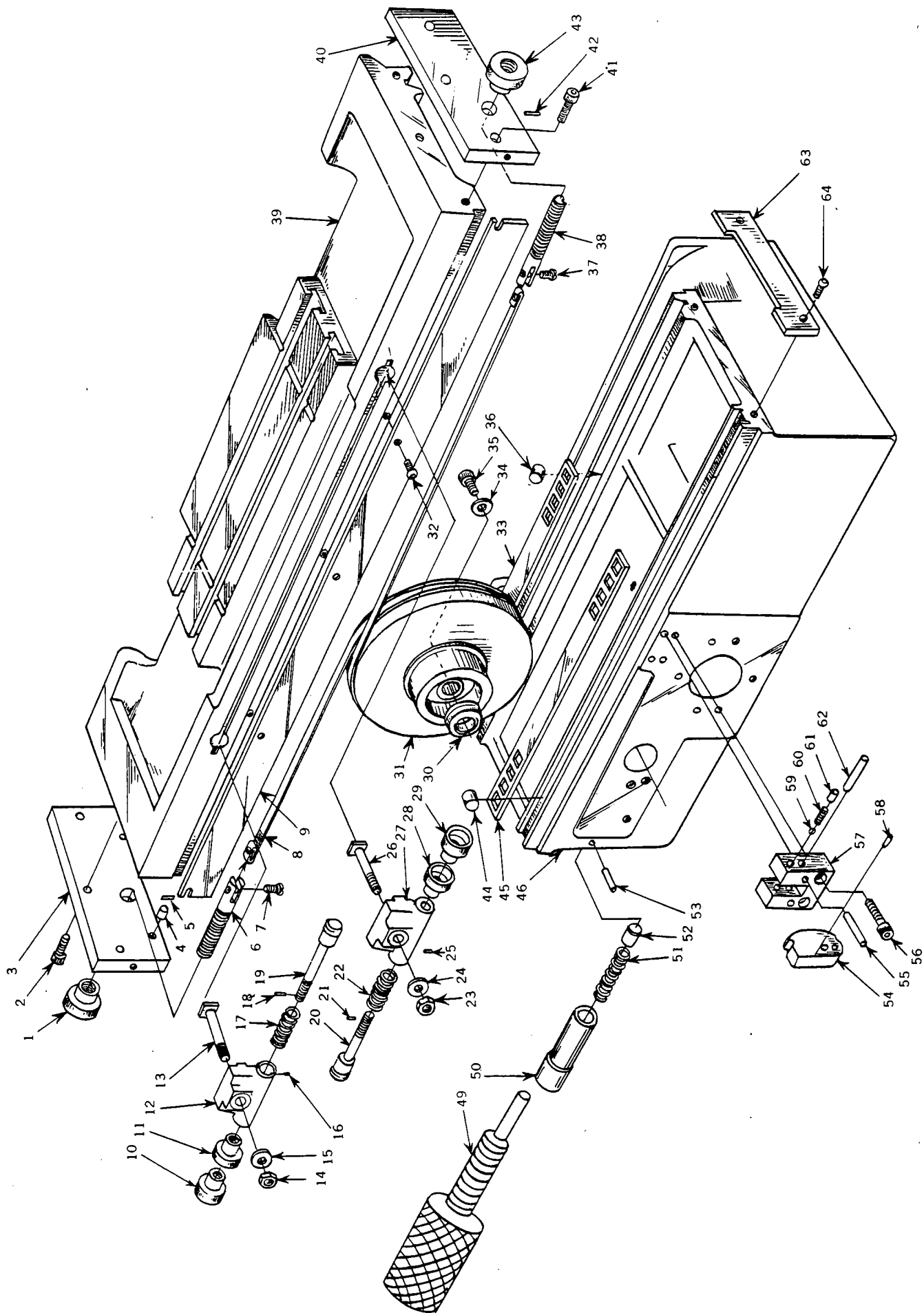


TABLE 612 618 ONLY

# PARTS LIST

| INDEX<br>NO. | PART NAME  | INDEX<br>NO. | PART NAME                   |
|--------------|--|--------------|-----------------------------|
| 1            | Cross Feed Stop Collar, includes Washer and Pins | 23           | Lockwasher                  |
| 2            | Shoe   | 24           | Dowel                       |
| 3            | Hex Socket Set Screw                             | 25           | Round Head Screw            |
| 4            | Pin  | 26           | Cross Feed Handwheel Finger |
| 5            | Cross Feed Screw Bearing Sleeve                  | 28           | Cross Feed Indicator Ring   |
| 6            | Self-Aligning Ball Thrust Bearing                | 29           | Cross Feed Handwheel        |
| 7            | Cross Feed Screw Bearing Sleeve                  | 30           | Knurled Screw (Q' ty 2 )    |
| 8            | Socket Head Screw                                | 30 - 1       | Washer                      |
| 9            | Dowel  | 31           | Cross Feed Handwheel Plug   |
| 10           | Self-Aligning Ball Thrust Bearing                | 32           | Hex Nut                     |
| 11           | Socket Head Screw                                | 33           | Washer                      |
| 12           | Cross Feed Bearing Nut, includes 11 Pin          | 34           | Handle Stud                 |
| 13           |  | 35           | Handle                      |
| 14           | Cross Feed Nut Support, includes 13 and 15       | 36           | Washer                      |
| 15           | Cross Feed Nut                                   | 37           | Round Head Screw            |
| 16           | Cross Feed Screw, includes 4                     | 38           | Pin                         |
| 17           | Socket Head Screw                                | 39           | Socket Head Screw           |
| 18           | Junction Bar Mounting Plate                      | 40           | Cross Feed Bracket          |
| 19           | Socket Head Screw                                | 41           | Cross Feed Bearing Spacer   |
| 20           | Junction Bar                                     | 42           | Double Seal Ball Bearing    |
| 21           | Socket Head Screw                                | 43           | Key                         |
| 22           | Hex Nut  | 44           | Table Bed                   |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

## SURFACE GRINDING MACHINE

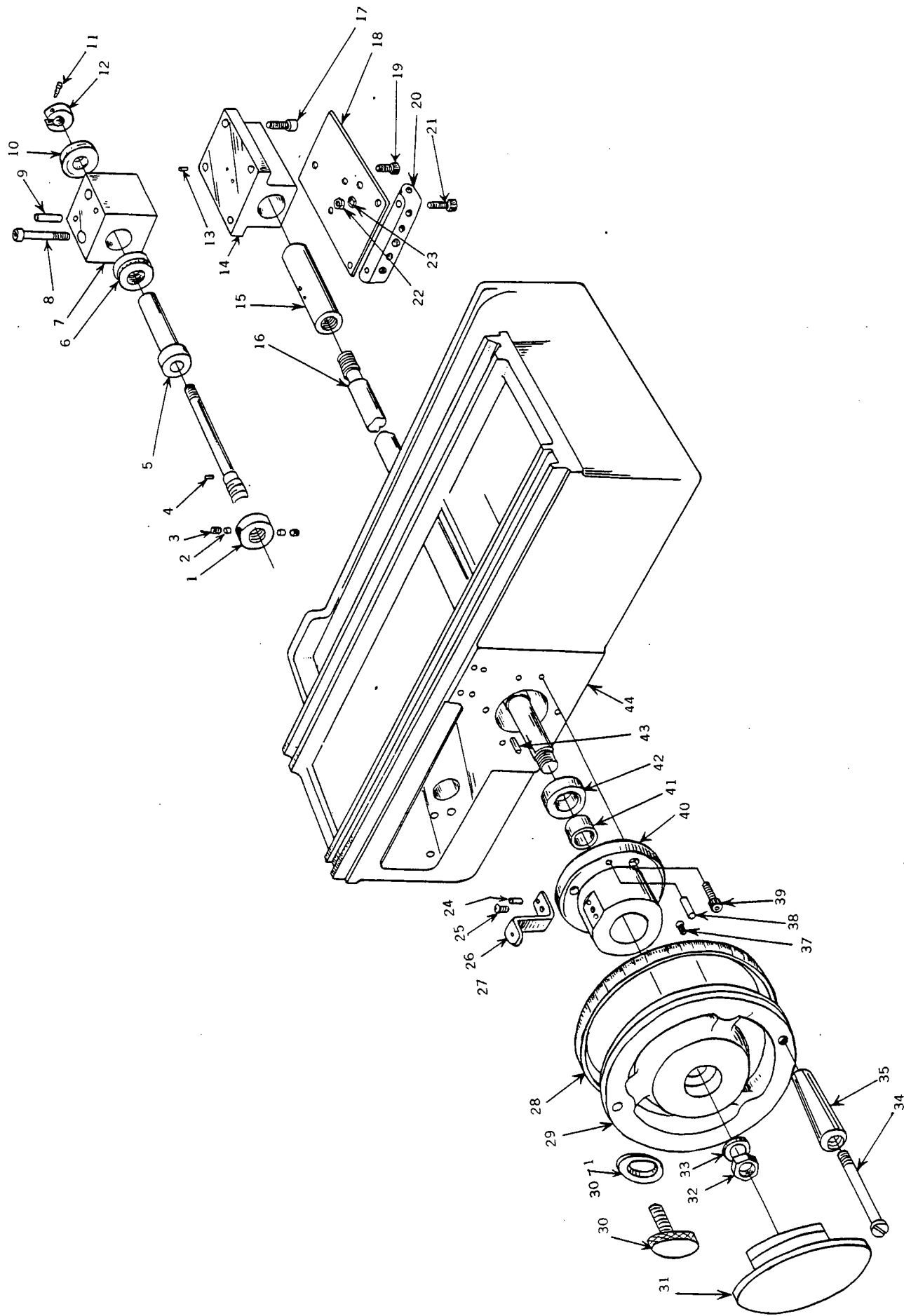


# PARTS LIST

| INDEX<br>NO. | PART NAME                           | INDEX<br>NO. | PART NAME                         |
|--------------|-------------------------------------|--------------|-----------------------------------|
| 1            | Knurled Nut                         | 34           | Washer                            |
| 2            | Cross Head Screw                    | 35           | Socket Head Screw                 |
| 3            | Table End Plate, L.H.               | 36           | Roller                            |
| 4            | Table Bumper                        | 37           | Cross Head Screw                  |
| 5            | Pin                                 | 38           | Table Drum Band Holder            |
| 6            | Table Drum Band Holder              | 39           | Table                             |
| 7            | Slot Head Screw                     | 40           | Table End Plate, R.H.             |
| 8            | Table Drum Band                     | 41           | Socket Head Screw                 |
| 9            | Table Guard (Front and Rear)        | 42           | Pin                               |
| 10           | Knurled Nut                         | 43           | Knurled Nut                       |
| 11           | Knurled Nut                         | 44           | Roller                            |
| 12           | Table Dog L.H., includes 10 thru 19 | 45           | Table Roll Case, Flat-Way         |
| 13           | T-Bolt                              | 46           | Table Bed, includes 50 and 53     |
| 14           | Hex Nut                             | 47           | Roll Pin                          |
| 15           | Washer                              | 49           | Lock Stud                         |
| 16           | Pin                                 | 50           | Lock Sleeve                       |
| 17           | Spring                              | 51           | Locking Stud Spring               |
| 18           | Pin                                 | 52           | Lock Shoe                         |
| 19           | Table Dog Plunger                   | 53           | Roll Pin                          |
| 20           | Table Dog Plunger                   | 54           | Table Stop Dog                    |
| 21           | Pin                                 | 55           | Pin                               |
| 22           | Spring                              | 56           | Socket Head Screw                 |
| 23           | Hex Nut                             | 57           | Table Stop Dog Bracket            |
| 24           | Washer                              | 58           | Pin                               |
| 25           | Pin                                 | 59           | Steel Ball                        |
| 26           | T-Bolt                              | 60           | Spring                            |
| 27           | Table Dog R.H., includes 20 thru 29 | 61           | Plug                              |
| 28           | Knurled Nut                         | 62           | Roll Pin                          |
| 29           | Knurled Nut                         | 63           | Bed End Plate (use for both ends) |
| 30           | Ball Bearing                        | 64           | Round Head Screw                  |
| 31           | Table Travel Drum                   |              |                                   |
| 32           | Round Head Screw                    |              |                                   |
| 33           | Table Roll Cage, V-Way              |              |                                   |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

## SURFACE GRINDING MACHINE



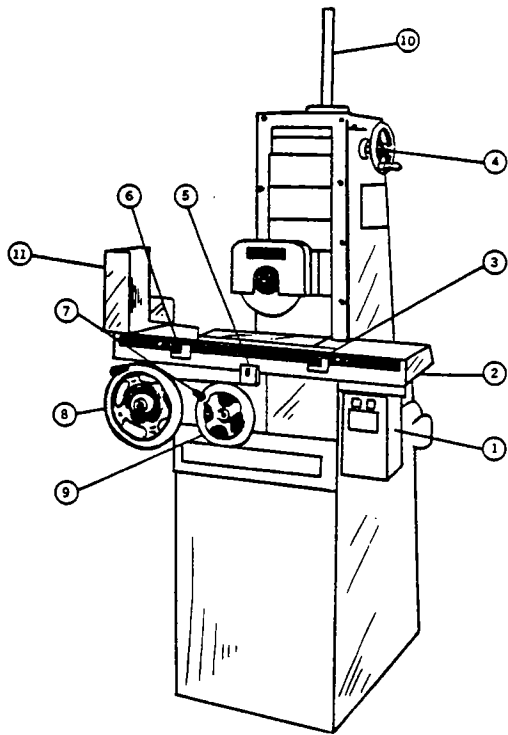
CROSS FEED HANDWHEEL 612 618 ONLY



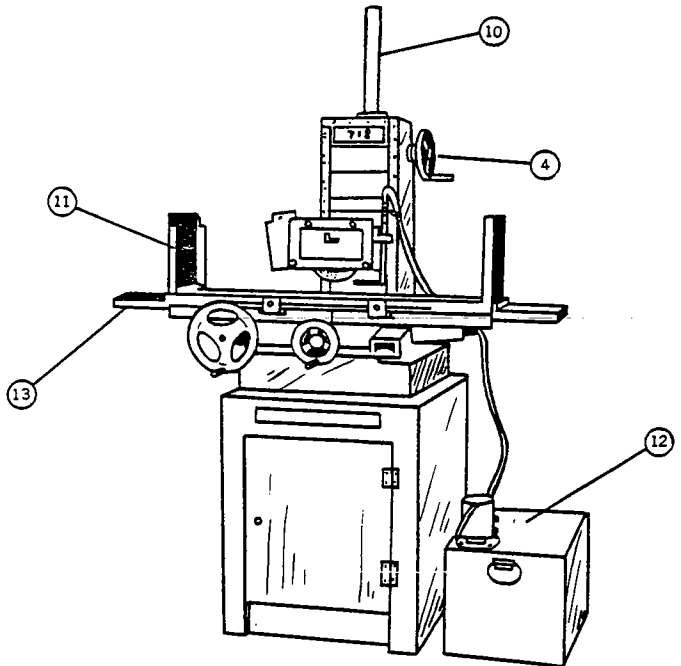
# CONTENTS

|   | Page |
|---|------|
| Introductory Illustration .....   | 2    |
| Operating Controls and Set-Up Adjustments of the Micromaster<br>Surface Grinding Machine identified (2)                     |      |
| CHAPTER 1 – Installing or Relocating the Machine .....  | 3    |
| Lifting, locating and installing (3) ; connecting to Power Supply (3)   |      |
| Checking Motor Rotation (3)   |      |
| CHAPTER 2 – Set-Up Adjustments and Operating Controls .....   | 4    |
| Care and Use of Grinding Wheels (4) ; Table Movement (6) ;  |      |
| Cross Feed (6) ; Suggestions on Set-up and Operation (6)  |      |
| CHAPTER 3 – Typical Operations .....  | 7    |
| Representative Set-ups Illustrated and Described.   |      |
| CHAPTER 4 – Optional Mechanism and Additional Equipment .....   | 8    |
| Exhaust Attachment (8) ; Exhaust Nozzle (8) ; Wet Grinding Attachment (9) ;   |      |
| Magnetic Chucks (9) ; Precision Grinding Vise (10)  |      |
| CHAPTER 5 – Maintenance .....   | 11   |
| Lubrication (11) ; Wheel Spindle (11) ; Removing Spindle Unit From<br>Machine (11) ; Antifriction-Bearing Spindle Unit (11) |      |
| CHAPTER 6 – Detailed Parts Drawing and Description .....  |      |
| Direct Drive Spindle (12,13 )   |      |
| Upright ( 14,15 )   |      |
| Elevating Mechanism ( 16,17 )   |      |
| Table ( 18,19 )   |      |
| Cross Feed Handwheel ( 20,21 )  |      |
| Handwheel Operated and Table Drive ( 22,23 )  |      |
| Wet Grinding Attachment ( 24,25 )   |      |
| Upright (Model 718 ) ( 26,27 )  |      |
| Table Traverse and Cross Feed ( 28,29 )   |      |

# **Operating Controls and Set-Up Adjustments of the Precision Micromaster Surface Grinding Machine**



- 1 Spindle "Start-Stop" Buttons.
- 2 Adjustable Tension Tape Nut.
- 3 Table Dog.
- 4 Vertical Adjustment Handwheel.
- 5 Table Dog Stop.
- 6 Table Dog.
- 7 Cross Feed Indicator Ring Clamp Nut.



- 8 Table Travel Handwheel.
- 9 Cross Feed Handwheel.
- 10 Elevating Screw Guard.
- 11 Coolant Chute.
- 12 Coolant tank.
- 13 Table Wing.

## CHAPTER 1

# Installing or Relocating the Machine

In lifting or moving the machine it is recommended that the rope be rigged as shown in Figs. 1 and 2. Place wooden blocks or protective material between the rope and the machine wherever the rope is liable to damage any part.

If available, a "fork-lift truck" can be used to move the machine. The lift is located under steel bars positioned in the holes in the base of the machine (bars located same as in Figs. 1 and 2). CAUTION; Do not push on the upright when moving the machine unless the rods and strap used in shipping are in place. The upright is a sliding member held on by its own weight and the cross feed screw. Considerable damage can be caused to the cross feed screw if the upright is tilted on its ways.

The machine should be located on a level foundation or floor, a solid vibrationless foundation being essential where the finest finish must be produced. If the machine must be set on a wooden floor, locate it over a beam and on a portion of the floor which is free of vibration. In case the foundation or floor

Fig. 1. Proper method of rigging machine

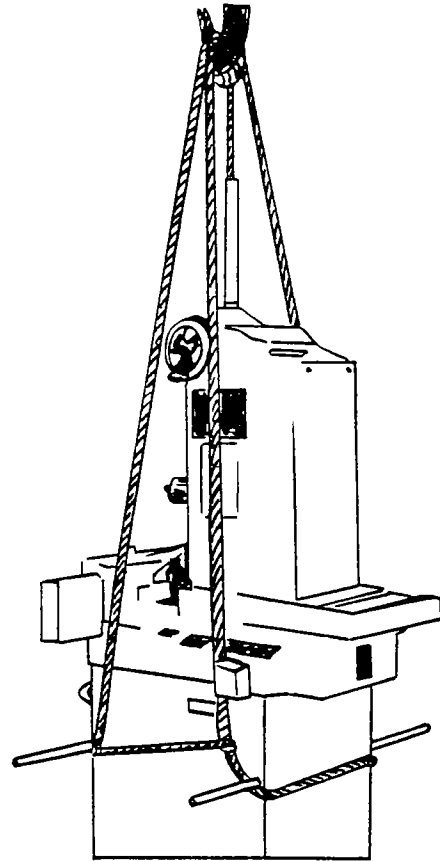
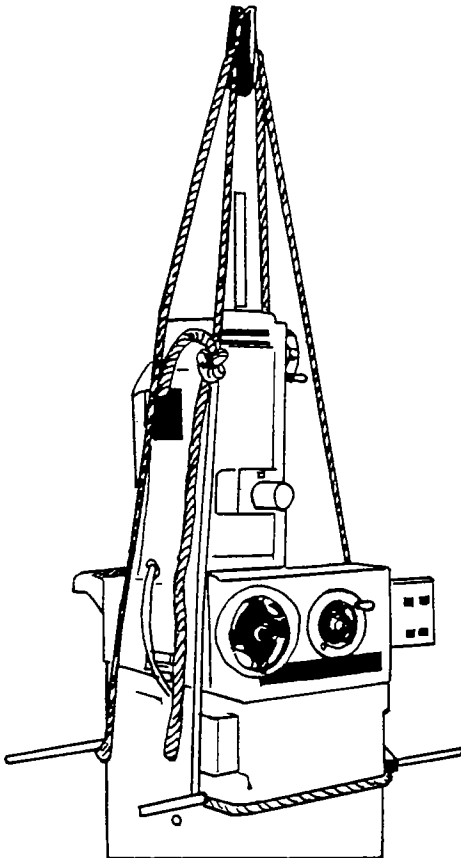


Fig. 2. Rear View of Machine

unavoidably transmits vibration to the machine, set the machine on a shock-absorbing pad.

With the machine in position, test the surface of the table both longitudinally and transversely with a precision spirit level and drive a wooden shingle under any corner or corners that may be low. Make sure that all four corners are supported; then tighten the lag screws, test the level of the table surface again in both directions and readjust if necessary.

Connecting to Power Supply. The machine should be connected to the power line and properly grounded. The lines from the power source should be connected to the magnetic starter, mounted on the right side of the machine.

Checking Motor Rotation. Press the magnetic starter "start" and observe the direction of spindle rotation. The spindle should rotate clockwise as seen from the front of the machine. If the direction of rotation is counterclockwise, transpose two line wires at the starter.

## Set-Up Adjustments and Operating Controls

Since the clamp screw merely holds the thrust collar in position and does not govern the closeness of adjustment, there is no reason to use excessive clamping pressure.

For normal surface grinding or when grinding shoulders with the outer face of the wheel, the clamp screw can be released, leaving the thrust springs to take up end play automatically.

**Wheel Speed.** When the Spindle is driven by a 60 cycle direct drive motor, the full load speed is 3450 R.P.M. using a 7" diameter wheel,  $\frac{1}{2}$ " ( $\frac{5}{8}$ ") thick.

**Wheel Guard.** The wheel guard is a one-piece unit cover on the front. The cover opens upward and is held closed by four knurled-head screws. All that is required to remove the wheel is to lift the cover.

However, it is necessary to remove the wheel to remove the wheel guard.

Two clamp screws located on the clamping edge of the wheel guard support can be loosened and the guard tipped either side of horizontal if necessary.

**Warning:** Always make sure that the guard is securely clamped before starting the machine; and never run a wheel without having the guard and its cover in place.

### Care and Use of Grinding Wheels

**Selecting the Wheel.** In order to produce the desired quality of work in the shortest time real care is necessary in choosing the wheel which is best for the job at hand.

**Mounting Wheels.** One general-purpose grinding wheel and one wheel sleeve are furnished with the machine. When additional wheels are used, extra wheel sleeves should be procured so that each wheel can be kept on its own sleeve. Thus, in changing from one type of wheel to another, the wheel and sleeve can be changed as a unit and will remain concentric, requiring only a minimum amount of truing.



Fig. 3. The vertical adjustment hand wheel is shown near the top of the upright

The wheel should fit easily on the wheelsleeve, yet not loosely, for if it is loose it cannot be centered accurately and will consequently be out of balance. Do not wrap the sleeve with paper etc. to make a wheel fit when the hole is too large. It is better from all standpoints either to discard such a wheel or recast the core.

A wheel that fits a trifle tightly may crack if forced on the sleeve. If the hole is only a little under size it can easily be scraped out to fit.

**Warning:** Before mounting a wheel, hang it in the air on one finger; then lightly tap the edge of the wheel and see if it gives a clear ringing sound. A wheel that does not ring clear is probably cracked and should not be used.

The inner of the two flanges between which the wheel is mounted is a part of the wheel sleeve (see Fig. 4.). The outer flange consists of a steel disk or washer which is keyed to the wheel sleeve to keep it from turning and loosening the clamping nut.

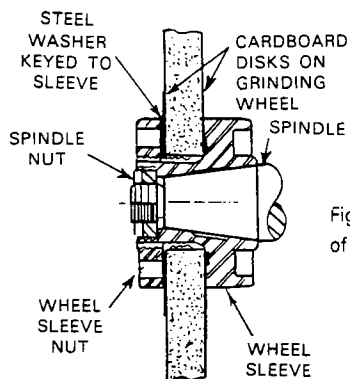


Fig. 4 Proper mounting of grinding wheel.

To equalize the clamping pressure, washers of cardboard or rubber should be placed between the wheel and the two flanges. Most wheels of the size used on this machine have a ring of heavy blotting paper on each side, which serves the purpose.

Using the pin wrench furnished, tighten the clamping nut enough to hold the wheel firmly in place on the sleeve. Do not tighten too much, however, as excessive clamping pressure will crack the wheel.

**Changing Wheels.** In removing a wheel sleeve from the spindle, always use the wheel sleeve puller (furnished with the machine) to avoid any chance of racking the wheel or damaging the spindle bearings by pounding. Remove the spindle nut (this nut has a left-hand thread); then thread the outer member of the wheel sleeve puller into the wheel sleeve and tighten the inner screw against the spindle, thus loosening the wheel sleeve without harmful jarring.

In putting a wheel on the spindle, first see that both the wheel sleeve hole and the spindle end are perfectly clean. Then slip the sleeve onto the spindle, seat it by hand and tighten by means of the clamping nut and wrench.

**Balance of Wheel.** It is essential that the wheel run perfectly true and without vibration. Grinding wheels are balanced by the manufacturer and, in the case of wheels of the size used on this machine, should not require attention in this respect other than truing. A wheel that runs badly out of balance after truing should be discarded or returned to the wheel manufacturer - though in cases of necessity the condition may be corrected by digging out part of the wheel beneath the flange and filling with lead as indicated by a test for static balance.

**Wheel Truing.** A wheel truing fixture is furnished with the machine. The truing diamond (furnished) may be applied to the wheel along any line on the lower half of the wheel circumference, though preferably at the bottom of the wheel as shown in Fig. 5. To prevent gouging, the center line of the diamond tool should point slightly beyond the center of the wheel in the direction of movement of the wheel surface.

The wheel should be trued each time it is put on the spindle and whenever it becomes loaded, dull or glazed. Pass the diamond across the wheel with a slow, steady manual cross feed, taking care to avoid any longitudinal movement of the table.

In truing a wheel for rough grinding, take a cut about 0.000,5" deep in one pass of the diamond across the wheel and finish with a similar cut 0.000,25" deep. If the wheel is to be used for finish grinding, take two 0.000,5" cuts; then take two or three additional cuts removing about 0.000,25" each time, and finally pass the diamond across the wheel once or twice without further advance of the wheel.

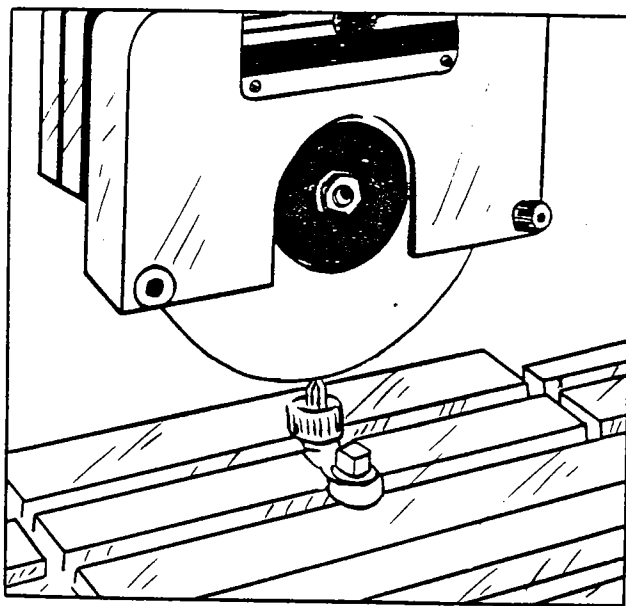


Fig. 5. Wheel truing fixture in use.

The figures stated are approximate and under some conditions should be varied somewhat to give desired results.

## Table Movement

The table is mounted on the bed on ground and precision lapped steel rollers that give an extremely easy gliding movement. The rollers under the front of the table are on a flat way. The rollers under the rear are in a 90° V-way (Fig. 6). This arrangement gives extreme accuracy for side-wheel grinding, such as grinding of slots, forms, etc.

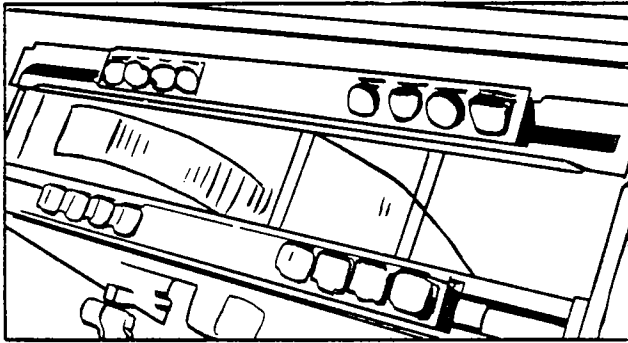


Fig. 6 Arrangement of precision-ground rollers for easy table movement.

Table movement is by means of a handwheel located at the left front of the machine. One revolution of the handwheel moves the table approximately 12".

A Knob, on the left side of the bed below the table, permits applying any amount of "drag" on the table movement. The same Knob is used to lock the table in the proper position for wheel truing, without the necessity of moving the table does. (612 .618 only)

Backlash is eliminated as drive is by means of a steel tape wrapped around a drum (360° contact) and fastened to each end of the table. Drum movement is controlled by the handwheel on the front of the machine. Knurled nuts at each end of the table adjust the tension in the steel tape. (612, 618, only)

Stop Dogs. Adjustable table dogs operating against a positive stop can be set to limit table travel in either direction. If desired, the positive stop can be swung out of the way to allow movement of the table beyond the limits set by the dogs.

Model 718 is driven by a pair of rack and pinion, and make the table movement more slighter. (see page 29)

## Cross Feed

The Cross Feed Handwheel has a dull chrome finish with clear wide-spaced graduations reading to 0.0002" for precise adjustment of the grinding wheel.

The dial on the rim of the Cross Feed Handwheel is adjustable and has graduation markings that read both clockwise and counterclockwise. One turn of the Handwheel gives 1/8" feed and clockwise rotation moves the wheel forward.

## Suggestions on Set-Up and Operation

Clamping Work to Table. In clamping workpieces, chucks, vises etc. to the table of the machine, use only enough clamping pressure to hold the part from slipping. Tight clamping is not necessary, since the forces exerted on the work are quite small; and excessively hard clamping might spring the table enough to cause inaccuracies in the work.

Rough and Finish Grinding. In general, it is not advisable to use one machine consistently for heavy hogging cuts and for highest-quality finish grinding as well. If large amounts of heavy roughing work are to be done, it is best to use one machine for that class of work and do the finish grinding on a machine reserved for finish grinding only.

Form Grinding. Under proper conditions of maintenance and by using adequate care in operation, highly accurate form grinding can be performed on these machines.

Spindle Alignment. The contacting surfaces of the spindle head and spindle sleeve flange are ground at our factory to give a good commercial accuracy of alignment of the spindle with relation to the table ways. For shoulder grinding jobs which demand greater-than-ordinary closeness of parallelism between the side of the wheel and the table travel, the required alignment can be secured by carefully scraping the spindle sleeve flange. Note that any alteration by scraping should be done on the flange and not on the face of the spindle head; for the spindle head should remain untouched so as to permit other spindles to be used in the machine.

Dry Grinding. In dry grinding operations use an exhaustor to protect the operator, the machine itself and neighboring machines from the grit and dust produced. Either connect the machine to a central exhaust system or use an exhaust attachment such as the one described on page 8.

## CHAPTER 3

### Typical Operation

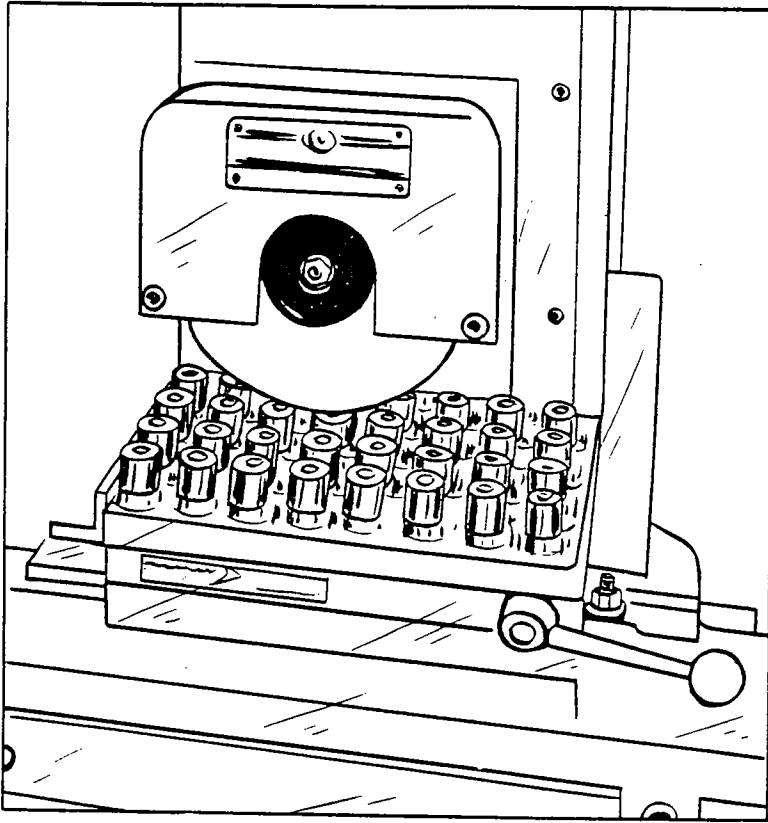


Fig. 7. A representative production job grinding the surfaces of thirty-two pieces with one loading of the permanent magnet-type chuck.

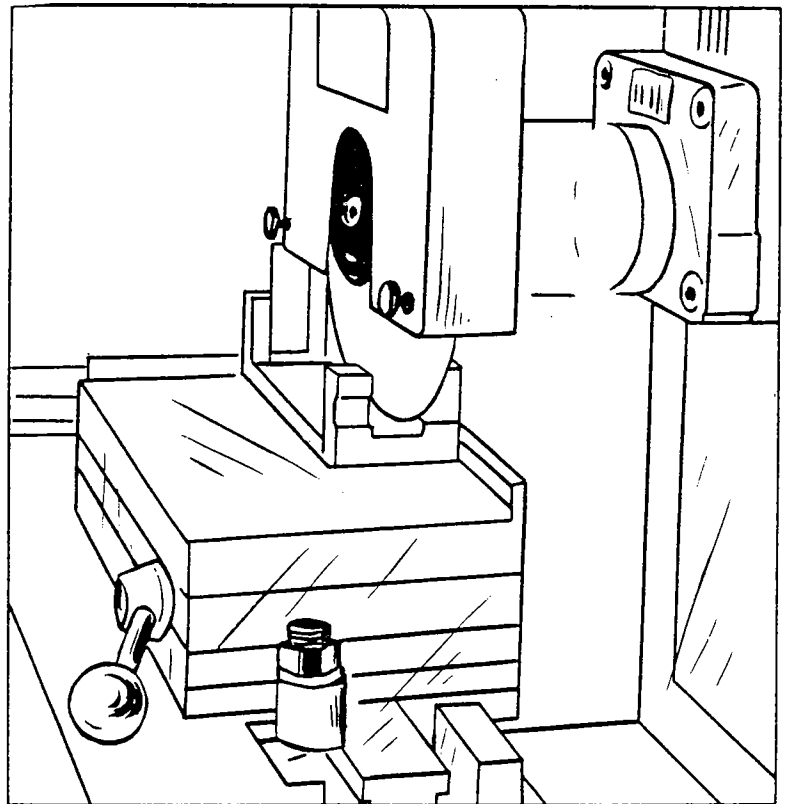


Fig. 8. Movable wheel slide upright contributes immeasurably to accurate slot grinding

## CHAPTER 4

# Optional Mechanism and Additional Equipment

(Furnished at Extra Cost)

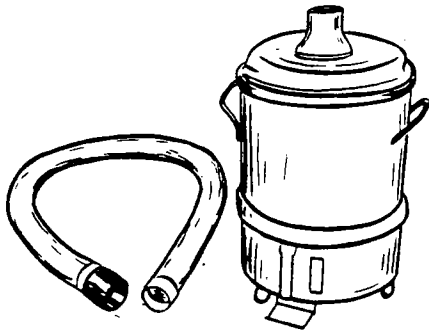
Various items of additional equipment available as extras are described and illustrated in this chapter. Instructions are also given on their set-up and use.

These extras include an Exhaust Attachment, Wet Grinding Attachment, Magnetic Chucks, Precision Grinding Vise.

### Exhaust Attachment

This attachment removes grit and dust-laden air from the region of the grinding operation and separates out the foreign matter, leaving the air well-cleaned. It is readily moved from one machine to another, and is recommended for all dry grinding operations as a means of providing the necessary protection to the operator and machine. The attachment is shown in Fig. 9.

Fig. 9. Exhaust Attachment.



The motor-driven fan on the separator tank draws the air at high speed through a flexible pipe from an adjustable exhaust nozzle attached to the wheel guard and blows it into a spiral separator, where the heavier particles are removed by centrifugal force. The air then passes slowly out through two viscous-coated renewable filter pads which remove the remaining finer particles. The separator chamber is emptied through the vertical sliding gate at the right front of the tank, while the filter pads are released for replacement by lifting out the two vertical rods which hold them in position.

For most efficient dust removal, adjust the position of the exhaust nozzle on its supporting stud so as to keep the nozzle close to the work.

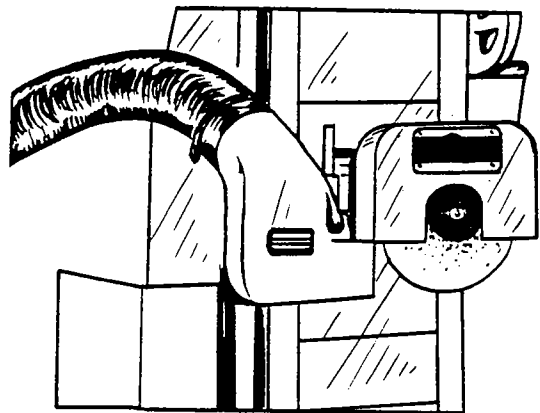
The  $\frac{1}{2}$  h.p. 2-pole fan motor is controlled by a starting switch having overload protection, and is designed to be connected directly to the powerline. However, if the grinding machine is fitted with the receptacle used with the Wet Grinding Attachment, the Exhaust Attachment can be equipped with a plug and cable for plugging into the receptacle.

### Exhaust Nozzle

#### for Use with Central Plant Exhaust System

The Exhaust Nozzle (Fig. 10) offers a convenient means for connecting the machine to a central exhaust system. A special stud is included for attaching the nozzle to the wheel guard of the machine and permits adjusting the position of the nozzle. A flexible pipe with a 4" hole is used for connecting to the exhaust system.

Fig. 10. Nozzle for connection to plant exhaust system.





## Wet Grinding Attachment

The Wet Grinding Attachment starts and stops independent of the machine spindle motor. The attachment pump switch and receptacle are located on the left side of the machine.

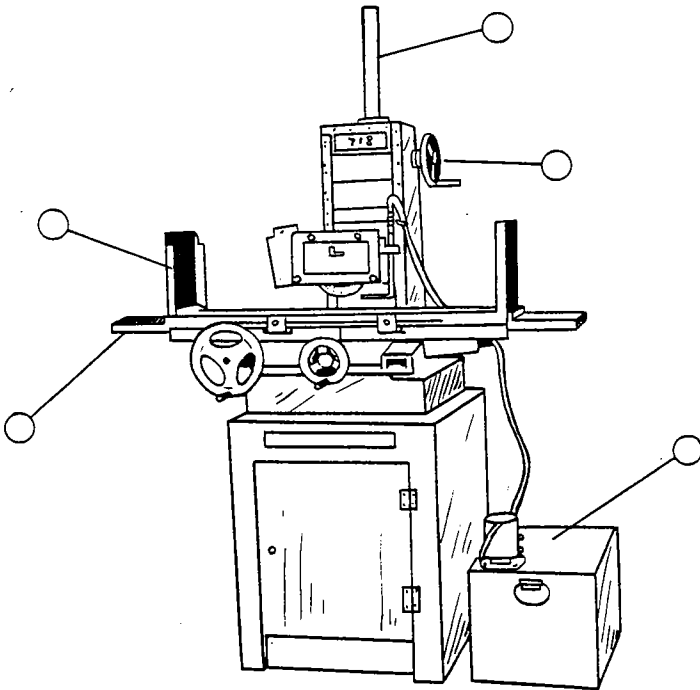


Fig. 11. Wet Grinding Attachment

Coolant is supplied to the wheel through a nozzle and flexible piping from a  $\frac{1}{8}$  H.P. motor driven centrifugal pump mounted in the supply tank (Fig. 11.)

The working surface of the table is surrounded by a two-piece overlapping adjustable rear guard, a guard for the right-hand end, a one-piece front guard and the deflector at the left end of the table.

Coolant collects in the table channels and is delivered to a trough in the bed at the rear of the table which then discharges into a trough fastened on the side of the machine and going to the supply tank through a flexible hose. The 18 gallon tank is of welded steel construction and has a two-plate removable baffle unit which provides for efficient settling.

## Magnetic Chucks

The Rectangular Model Permanent Magnet Chucks provide a quick, easy means of holding a variety of ferrous work for surface grinding. A 180° movement of the control lever (see Fig. 12.) turns the chuck on or off; and since the chuck does not use electric current, it can be left turned on for as long as desired without heating.

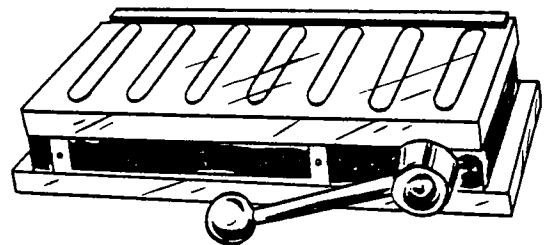


Fig. 12. Permanent Magnet Chuck.

For highest accuracy in grinding work parallel, the top surface of the chuck should be ground each time the chuck is mounted on the machine. Be sure that the chuck is turned on before doing this, and remove only the minimum amount of metal required to grind the entire top surface.

The chuck should not be subjected to excessive heat, shocks or blows, and the top should be kept free from pits and scratches. Regrind the top surface occasionally if necessary, as a smooth surface is essential for grinding work parallel.

Wet grinding is preferable to dry grinding if the machine is equipped for this in order to reduce the possibility of distortion in the top plate which might be caused by heat from the grinding.

Electromagnetic chucks and controlling equipment together with a Neutrofier are also available. Information on application. ( see Fig. 13. )

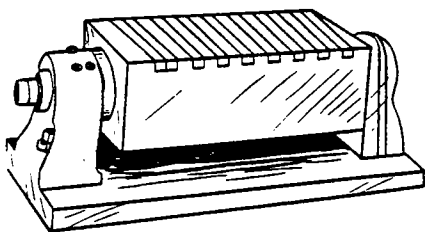


Fig. 13. Inclinable electro magnetic chuck

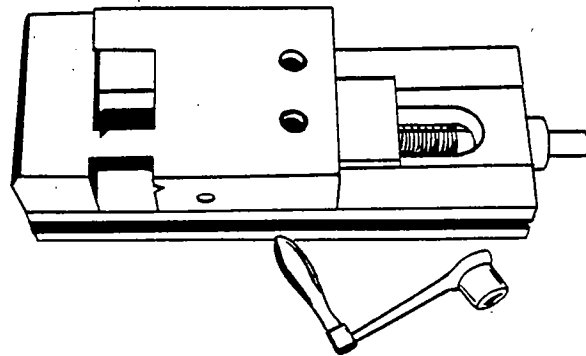


Fig. 14. Precision Grinding Vise

### Work Positioning Table

This is a high precision locating and measuring unit. A 5" x 10" or 6" x 12" or 6" x 18" or 7" x 18" (718 model) magnetic chuck can be mounted on the table, or the workpiece can be set up directly on its surface.

The high precision grinding vise provides the desired quality of work in the shortest time ( Fig. 14 ). The setting-up of the vise can be easily and directly mounted on the top of magnetic chuck or screwed at T-slot by means of two bolts and nuts. Since the bottom and the slide-way has precisely ground it assure the best quality and accuracy for the operator's need.

## CHAPTER 5

# Maintenance

### Lubrication

A "one shot" oiler lubricates all moving machine parts and is mounted on the right side of machine towards the rear (Fig. 15)

Before starting a machine, be sure the oil reservoir is filled to the level of the spillway with a good grade, high lubricity table way oil having a viscosity of 300 S.S.U. at 100 F. Use Gargoyle Vacuumline No. 1409 (Socony-Vacuum Oil Co.) or an equivalent table way oil. (such as Esso Febis K 43)

Lubrication of the plain-bearing wheel spindle is covered below. Never start a new plain-bearing spindle without first filling the oil reservoir.

### Wheel Spindle

Wheel Spindle. This machine is equipped with a super-precision antifriction-bearing unit with a 1.5 h.p. Direct motor drive.

A grinding machine spindle may be properly classified as a high-precision tool. The accuracy of construction required will be realized from the fact that a variation of one hundred-thousandth of an inch (0.000,01") in a ground flat surface will be visible to the naked eye as a wheel mark. Consequently, the best results can be obtained only if the spindle is treated with the consideration due to any fine precision instrument. Hammering on the ends of the spindle, dropping it on the floor or work bench, or any other undue application of force or impact must be carefully avoided if the spindle is to be kept in proper running condition.

If eventually a spindle should need repair or adjustment, we recommend that it be returned to our factory for reconditioning. By installing an extra

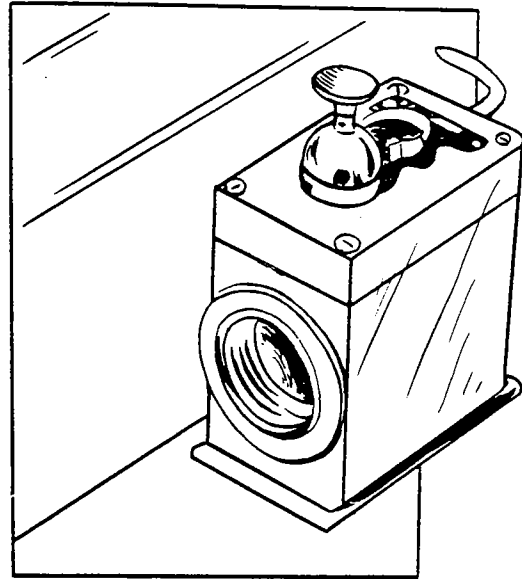


Fig. 15 "One Shot" Oiler lubricates entire machine

spindle unit kept on hand for such contingencies, production can continue with little interruption; for it is a quick and simple matter to change spindles on these machines. If necessary, however, detailed instructions for the plain-bearing spindle on the following page will frequently permit the required work to be done successfully in the customer's shop by a careful workman having adequate skill and equipment.

#### Removing Spindle Unit From Machine

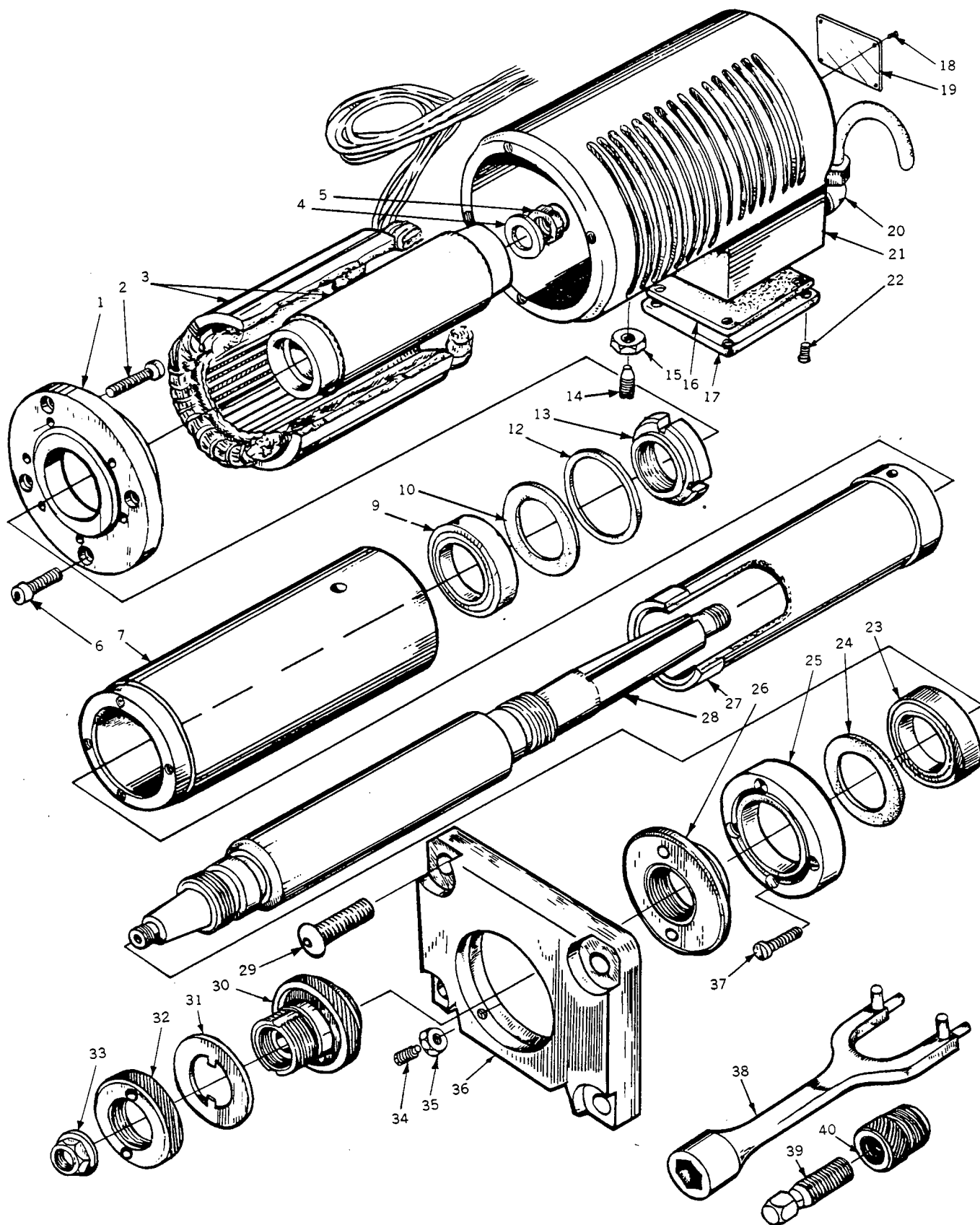
Uncamp the wheel guard and remove it from the spindle unit. Next take off the grinding wheel, using the wheel sleeve puller. Then take out the four clamping screws in the spindle unit flange.

#### Antifriction-Bearing Spindle Unit

This spindle unit has the spindle mounted on super-precision, preloaded ball bearings at both front and rear. Grease lubrication is used and the spindle's cool running temperature is quickly reached. The unit is sealed and requires no additional lubrication after it leaves our factory. As dirt cannot enter past the seal this spindle has a long trouble-free life.

**Lubrication.** All the spindle bearings are packed with a special grease at the factory and the unit requires no further lubrication.

**Maintenance.** Because of the extreme care required in disassembling and reassembling this spindle, we strongly recommend that any antifriction-bearing spindle unit which needs repair be returned to our factory for reconditioning.



**DIRECT DRIVE SPINDLE**

# "718" UPRIGHT

## PARTS LIST

### INDEX

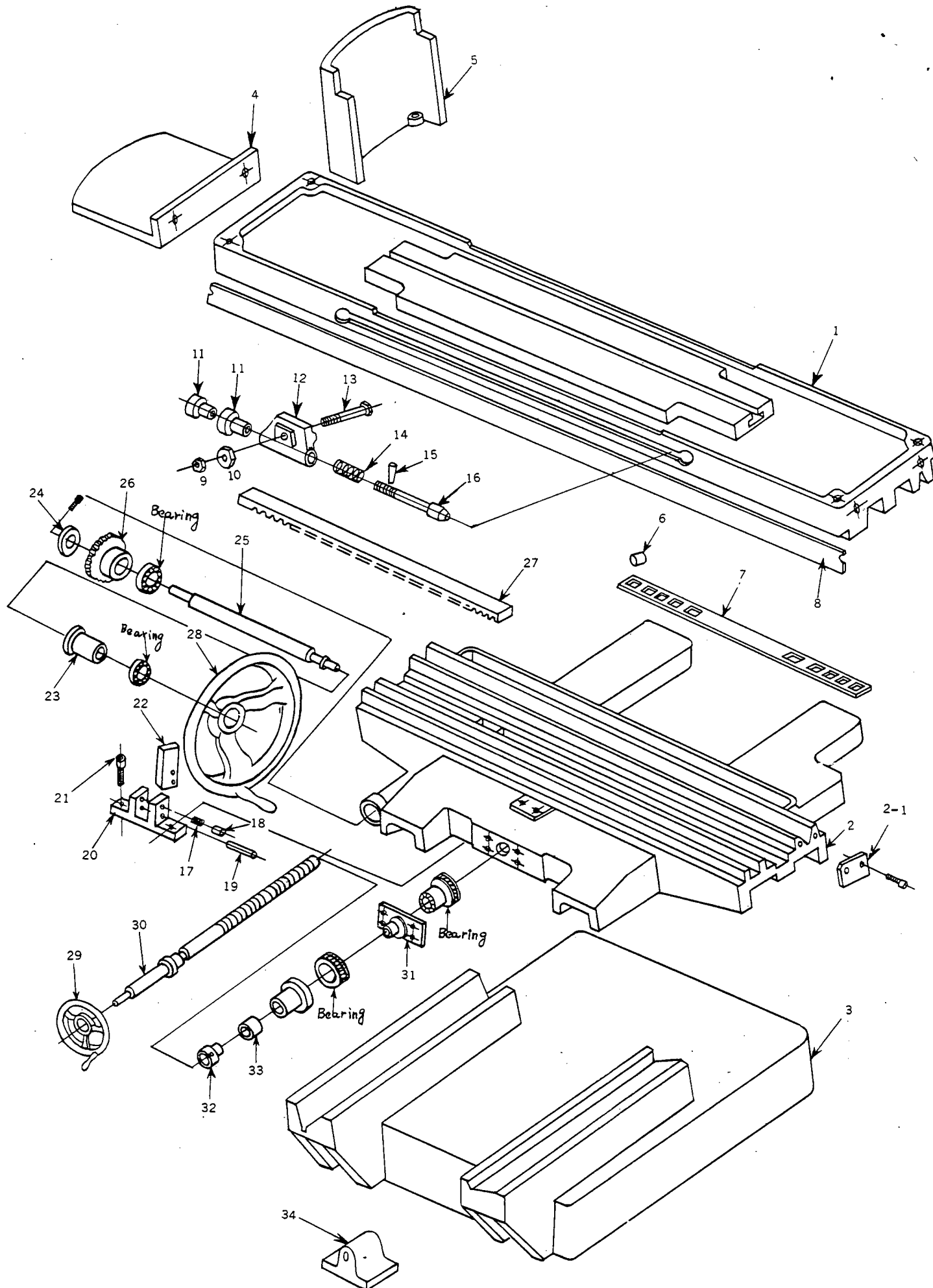
| NO | PART NAME |
|----|-----------|
|----|-----------|

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|     |  |
|-----|--|
| 1   | Elevating Screw Guard                                |
| 2   | Upper Screw Guard                                    |
| 3   | Intermediate Elevating Screw Guard (Front and Rear ) |
| 4   | Elevating Screw Guard (Rear )                        |
| 5   | Front Dust Guard                                     |
| 5 A | Rear Dust Guard                                      |
| 6   | Round Head Screw ( Front )                           |
| 7   | Round Head Screw (Rear )                             |
| 8   | Nut  |
| 9   | Round Head Screw                                     |
| 10  | Round Head Screw                                     |
| 11  | Round Head Screw                                     |
| 12  | Socket Head Screw                                    |
| 13  | Socket Head Screw                                    |
| 14  | Upright Strap (Right Side, Front )                   |
| 15  | Upright Strap (Right Side, Rear )                    |
| 16  | Upright  |
| 17  | Elevating Screw Guard Flange                         |
| 18  | Socket Head Screw                                    |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

***SURFACE GRINDING MACHINE***



# "718" TABLE TRAVERSE & CROSS FEED

## PARTS LIST

### INDEX

#### NO.

#### PART NAME

---

|       |                                    |
|-------|------------------------------------|
| 1     | Table                              |
| 2     | Traverse Movement Bed              |
| 2 - 1 | Bed End Plate ( use for both ends) |
| 3     | Longitudinal Movement Bed          |
| 4     | Table Wing ( Left side )           |
| 5     | Coolant Chute ( Left side )        |
| 6     | Roller ( Complete Set of 20 )      |
| 7     | Table Roller Cage V-way            |
| 8     | Table Guard, Front                 |
| 9     | Lock Nut                           |
| 10    | Washer                             |
| 11    | Knurled Nut ( use for both sides ) |
| 12    | Table Dog ( Left side )            |
| 13    | T-Bolt ( use for both sides )      |
| 14    | Spring                             |
| 15    | Pin                                |
| 16    | Table Dog Plunger                  |
| 17    | Spring                             |
| 18    | Plug                               |
| 19    | Roll Pin                           |
| 20    | Table Dog Stop Bracket             |
| 21    | Socket Head Screw                  |
| 22    | Table Stop Dog                     |
| 23    | Thimble                            |
| 24    | Washer                             |
| 25    | Traverse Feed Shaft                |
| 26    | Pinion                             |
| 27    | Rack                               |
| 28    | Traverse Feed Handwheel            |
| 29    | Longitudinal Feed Handwheel        |
| 30    | Longitudinal Feed Screw            |
| 31    | Bracket                            |
| 32    | Cross Feed Indicator Ring          |
| 33    | Cross Feed Sleeve                  |
| 34    | Cross Feed Nut                     |

ORDER BY PART NUMBER AND NAME, ALSO GIVE SIZE, STYLE AND SERIAL NUMBER OF MACHINE

**MEMO:**