

# **ABRASIVE** **Surface Grinders**

**PARTS LIST and INSTRUCTION MANUAL**

for

**No. 3B, No. M3, No. 3S, No. M3S HORIZONTAL SPINDLE  
and No. 34, No. M34 VERTICAL SPINDLE SURFACE GRINDING MACHINES**



**ABRASIVE MACHINE TOOL COMPANY, East Providence 14, R. I., U. S. A.**



**ABRASIVE MACHINE TOOL COMPANY • DEXTER ROAD, EAST PROVIDENCE 14, R. I.**

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# ABRASIVE SURFACE GRINDERS

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# ABRASIVE SURFACE GRINDERS

## FOREWORD

The information herein contained consists of an assimilation of facts concerning THE 8" x 24" ABRASIVE SURFACE GRINDER, which is made in four types. Essentially a single machine, these variances in manufacture produce a multi-purpose combination of Grinders as follows:

**No. 3B Standard Horizontal (Motor in Base) Surface Grinder.**

**No. M3 Standard Motorized Horizontal Spindle Surface Grinder.**

**No. 3S Horizontal Spindle (Motor in Base) Grinder with Hardened and Ground Tool Steel Ways on Bed, Saddle and Table — Hardened and Thread Ground Cross Feed and Elevating Screws and Automatic Pressure Lubrication.**

**No. M3S Grinder combines the above Specifications of the No. M3 and No. 3S Machines.**

**No. 34 Vertical Spindle Surface Grinder.**

**No. M34 Standard Motorized Vertical Spindle Surface Grinder.**

The No. 3B and No. 3S machines may be made with High Column Beds permitting clearance from table to bottom of Standard 10 inch Grinding Wheel of 15½ inches instead of 12 inches as is usually supplied.

The No. 3B and No. 3S machines require 3 HP Motors. The No. M3 and No. M3S machines use a special bed designed with 2 HP Built-in Motor on Spindle, the Gear Case (Table Feed) being operated by a separate ½ HP Motor.

Describing these grinders in detail, the following pages provide Full Instructions with Line Drawings and Photographs covering Uncrating, Setting Up, Operation and Maintenance, including Spare Parts Manual.

Placement of any part in assembly or sub-assembly is reproduced as nearly as possible by respective position of part with other parts on Photographic Plate.

Photographic reproduction is ¼ actual size (sizes of parts shown within shaded areas are shown in Double Proportion to the rest of the Photograph—and are, therefore, approximately ½ actual size).

On Plates XII and XXII will be found Covers and Water Tanks that are obviously exceptions.

Below or otherwise near each part is noted the Part Number—for easy identification.

On page opposite or adjacent each Part Photograph will be found Part Numbers and Names together with designation by "X" showing in which Grinders the part is used.

Line Drawings with General Instructions give information regarding the equipment and clearly show method of assembly.

### Key to Part Numbers:

- A. The prefix SP indicates a Stock Part and is followed by dimensions of this part as an aid to customers preferring to procure this part locally when possible, thereby avoiding unnecessary delay.
- B. Prefix SA indicates Sub-Assembly Unit.
- C. Grinder Part Numbers are characteristically indicated as follows:
  - 1st. Prefix to indicate the machine on which basically used as—  
3 for No. 3B or No. 3S machine, M3 for No. M3 machine, 34 for No. 34 and No. M34 machine. (Some parts are applicable to more than one machine.)
  - 2nd. The section or Unit in which the part is located, as—

B—for Bed Parts	K—for Start and Stop Unit
C—for Cross Feed Parts	L—for Generator Parts
E—for Exhauster Parts	M—for Motor Parts
F—for Friction Gear Unit Parts	P—for Wet Attachment Parts
G—for Gear Case Parts	S—for Saddle Parts
	T—for Table Parts
	W—for Wheel Head Parts
  - 3rd. The number of the part in the Unit.
  - 4th. This followed by B, C, D, etc., indicates revision in design.

*Example:* M3-W-309B is arrived at as follows:  
M3 — indicates Part from No. M3 Grinder  
W — indicates Part from Wheel Head  
309 — indicates Part No.  
B — indicates first revision of original design.

By referring to the page opposite Plate XVIII on which this number appears, it will be learned that M3-W-309B, is a CARTRIDGE CLOSURE CAP and is used on the M3 Grinder exclusively.

# ABRASIVE SURFACE GRINDERS

## GENERAL INSTRUCTIONS

### FOR THE OPERATION AND MAINTENANCE OF ABRASIVE GRINDERS

#### (A) Uncrating and Positioning of Machine

1. Remove Front and Rear of Crate or Case.
2. Remove Table and Packed Accessories.
3. Remove Top and two Sides—leaving Machine on Skids.
4. Inside Cupboard in base of Machine are to be found ENVELOPE containing PACKING LIST, INSPECTION REPORT and INSTRUCTION & PARTS MANUAL which includes FLOOR PLAN PRINTS. Also inside are Small Parts and essential tools. Check all materials received against PACKING LIST.

*Note*—On all new Grinders INSTRUCTION CARDS will be found attached to critical or important locations as noted herewith.

5. In INSTRUCTION and PARTS MANUAL note and check PLATE XVI, Line Drawing of No. M3 Grinder, General Instructions for method of slinging Machine for hoisting. Handle Machine accordingly. BE SURE TO MOVE SADDLE TO FORWARD POSITION. Particular attention is called to the fact that the bottom Dust Guard must always be removed when machine is to be hoisted. See INSTRUCTION CARD attached to bottom Dust Guard packed with box of Small parts in base of Machine.

*Note*—INSTRUCTIONS ON CARD. "This Guard must be screwed on at base of column below (and behind) the wheel slide straps."

6. Clean off all slushing grease from Machine parts, particularly Table, Saddle, and Column Ways—(It is well to use a cleaning solvent or so-called "Spirits" in connection with this cleaning)—Clean grease from oil holes on Saddle Top Ways. DO NOT REMOVE FELT PLUGS. See Card attached to Saddle.

*Note*—INSTRUCTIONS ON CARD. "Remove slushing grease on Ways of Saddle and Table, also grease in OIL HOLES in Top of Saddle to obtain proper lubrication".

7. Set Machine into position laid out according to Line Drawing of FLOOR (or Foundation) PLAN in INSTRUCTION AND PARTS MANUAL PLATE I or XXIV.

8. True Machine carefully to level position by adjusting leveling screw.

9. Insert Lag Screws, if desirable, through holes in Leveling Screws to fasten Machine securely to floor.

#### (B) Assembly

##### 1. TELESCOPING GUARDS PLATE XIII

As a safe shipping precaution, the lower set of Telescoping Guards, with the Single exception of the bottom Guard, are tied up under the Wheel Slide. The bottom Guard will be found tagged as noted above with other parts in the base of the machine. First screw this bottom Guard into position. The other lower Guards may then be freed and permitted to drop. Be sure these work freely. The upper Set (known as Top Column Dust Guards) are shipped in position. The lower Guard of this group must be screwed to the top of the Wheel Slide — completing the Telescoping Dust Guard installation. Screws for both upper and lower sets will be found screwed in position.

##### 2. TABLE PLATES I and II

Hand clean Saddle and Table Ways thoroughly and apply light film of clean machine oil to scraped surfaces before setting Table in position. Set Table into Position as gently as possible.

##### 3. SADDLE AND TABLE END GUARDS PLATES VI and XXVII

(a) Saddle and Table End Guards are shipped packed in the base of Machine. Attach Saddle End Guards in their respective positions. Each is stamped R and L. Also with Bed Number. Screws for Saddle End Guards will be found screwed in position.

*Note*—Right and Left is considered as viewed by the operator when facing the machine.

(b) Fit Table End Guards — Each is also Stamped R and L Also with Bed Number. Be sure these are fitted to properly clear the Saddle End Guards.

The importance of installing these Saddle and Table End Guards cannot be over emphasized, as it is quite evident that loose abrasive dust would cause great damage to the Table Ways and Saddle Top Ways should the machine be permitted to operate without them. Screws for Table End Guards are packed in Cloth Bag and placed with tools in base of machine with Screws for Water Guards, etc.

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## 4. WHEEL SLEEVE, GRINDING WHEEL AND COVER PLATES I, III, XIII, XVI, XVII, XVIII and XIX

Remove Wheel Guard Cover by loosening the two knurled clamp screws and lifting Cover off pin in top of Guard. Clean slushing grease from Wheel Sleeve assembly and around front of Spindle. THE WHEEL SLEEVE NUT and SPINDLE NUT have LEFT HAND THREADS and may be removed by turning them in the direction of Spindle rotation. Install Grinding Wheel on Wheel Sleeve carefully and tighten securely with wrench provided.

## 5. ELECTRIC WIRING

Wiring of machines will differ with installations. This is left to the judgment of the customer. It is well to check your available Electric Power characteristic with those of Motors in machines before starting.

When Grinder is shipped complete with Motor and Controls it will be found that all wiring is complete and it is only necessary to connect to the main power lines. It may be desirable to install a main disconnect switch as near the machine as possible.

Be sure to check direction of rotation. Wheel Guards are provided with arrows to show proper direction of Wheel Rotation.

## (C) Accessories

### 1. DUST EXHAUST ATTACHMENT PLATE XXI

No. 3B or No. 3S Machines may be equipped with Dust Exhauster driven by main motor in base of machine. No. 1½, No. M3 and No. M3S Machines—having Motorized Spindles—MUST use Motorized Dust Exhausters. Regular Machine Driven Dust Exhausters are shipped unattached to machine. It is necessary to mount this unit and install belt;—also, to screw the Exhaust Hose Supports into the left side of the upper part of Bed, the longer at the top—the shorter one below, in holes provided for the purpose. Connect the Exhaust Hose Nozzle to the Wheel Guard. The Exhaust Hose may now be installed from the Exhaust Nozzle to the Exhauster. Installation of Separator consists of placement of Separator intake pipe on Outlet of Exhauster. Adjust height of Separator legs to support Separator in level position. The Motorized Dust Exhauster is set up in similar manner except for the additional necessary electrical wiring.

### 2. WET GRINDING ATTACHMENT PLATE XXII

Place Coolant Tank to the right of machine in proper position to receive drain hose and install same. Place Coolant Pump at proper position in Coolant Tank so Motor extends thru opening at center of end in Tank Cover.

Attach Coolant Nozzle to Grinding Wheel Guard. Secure the long hose from the Nozzle to the Coolant Pump outlet. This, with wiring and installation of Table Water Guards completes this unit for service.

*Note*—In wiring up Wet Grinding Attachment Coolant Pump Motors, Motorized Dust Exhausters, and Motor Generator Sets, it is sometimes better to use a separate Switch for each. This is, however, not absolutely necessary.

### 3. MAGNETIC CHUCKS

Chucks should be mounted in the usual manner on the Flat Table Surface. Table Tops on Abrasive Grinders are ground to within .00025" of perfect flatness—many Magnetic Chucks are ground to within .002" tolerance. Therefore it is well to first check the bottom and top of any Magnetic Chuck for close tolerance. Steps must be taken to provide satisfactory accuracy at this point to assure best results.

Ready connection may be made to Chuck Switch by connectors at ends of cables from Switch and from Chuck. Check wiring diagram PLATE XV.

### 4. No. 1 GENERATOR AND MOTOR GENERATOR SETS PLATE XV

No. 3B and No. 34 Machines usually use Machine Driven No. 1 Generators.

No. 1½, No. M3, No. M3S and No. M34 Machines having Motorized Spindles, use Motor Generator Sets developing 115 Volts D.C. when not specified to the contrary. A Motor Generator Set must also be used with No. 3S Machine due to location of Pressure Lubrication Pump and Tank.

Regular Machine Driven No. 1 Generators are shipped mounted and belted to machine. After mounting Magnetic Chuck it is only necessary to plug together the connectors on the wiring between Generator and Switch, also between Switch and Chuck to complete preparations for operation of Chuck Unit.

Motor Generator Sets are hooked up in similar manner as far as the D.C. Side of the Unit is concerned while the A.C. Side is connected to Power Lines in usual manner by the Customer.

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## (D) Operation

### CONTROLS

#### 1. START AND STOP LEVERS:

Before Starting — read Instructions thoroughly.

- (a) Start Lever is lifted to start Machine.

*Note* — INSTRUCTIONS ON CARD. "Lift this lever to engage Table Feed. It will not lift if table Hand Wheel is engaged."

- (b) Stop Lever is pushed to right to stop Machine.

*Note* — INSTRUCTIONS ON CARD. "To disengage table feed push lever to the right."

For further detailed Instructions check thoroughly Line Drawing General Instructions on Plates I, XVI, XVII, and XXIV.

#### 2. LONGITUDINAL TABLE FEED:

Facing machine the Hand Wheel to the right controls longitudinal feed. This must be disengaged before automatic power feed can be applied.

*Note* — INSTRUCTIONS ON CARD. "Disengage this Hand Wheel by pulling out before lifting Starting Lever for Automatic Feed."

This Hand Feed is limited by the Safety Stops affixed to Table and is not affected by the Adjustable Dogs which operate the Table Trip Lever.

#### 3. TABLE TRIP LEVER UNIT:

Controls direction of longitudinal motion of the table. Dogs should be set to desired limits to properly cover work for Automatic Control.

*Note* — INSTRUCTIONS ON CARD. "If Table fails to operate when starting lever is up, check following—

- (a) "Move hand reversing lever." (*This hand reversing lever is part of the table trip lever unit sub-assembly. Moving this lever either right or left will affect the action of the cam and should cause the table to operate.*)
- (b) "Cross Feed Safety Dogs against Knockout Plunger on left side of Machine." (*Move saddle so plunger is not in contact with dogs before lifting starting lever.*)

- (c) "Gear Case belt loose." (*Shorten gear case belt.*)

- (d) "Friction gear slipping" (accessible through hand hole in column.) (*See Plate I, General Instructions on 3B Grinder. Safety Gear Adjustment. If table feed hesitates or stops, first remove "G" spring, tighten friction adjusting nut Part SP 110, thereby tightening gear spring 3-F-22B against Gear Sleeve Washer 3-F-23 so that Gear 3-F-24C slips less than 1/4 inch at reversal of table.*)

*To determine amount of slippage, mark Gear and Gear Sleeve Washer. This Gear is accessible through hand hole at rear of column. Replace "G" spring after readjustment.*)

- (e) "Change speed knob may be in neutral." (*Change speed knob controls speed lever action.*) Note the following:

#### 4. TABLE SPEED CHANGE KNOB:

Below and to the right of Hand Wheel is located the Two Speed Change Knob or Lever controlling the speed of Longitudinal Table Feed. Position of this Lever should be noted together with the fact that there is a possible neutral position between the speeds.

*Note* — INSTRUCTIONS ON CARD. "This Push and Pull Knob controls fast and slow table speeds. IN for slow feed and OUT for fast feed".

#### 5. CROSS FEED ACTION:

On Nos. 3B, M3, 3S, and M3S Horizontal Spindle Surface Grinders the Cross Feed is either Automatic or by Hand.

- (a) The Direction (In or Out) of the Automatic Feed is controlled by position of lever on Hand Wheel.
- (b) Amount of Cross Feed is controlled by positioning the Cross Feed Adjustment Stops and same MUST be locked with Knurled Nuts. These are located to the right of Machine above the large Table Hand Wheel.
- (c) Dogs mounted in T-Slot on left side of Machine limit travel of Saddle. Two Safety Dogs are provided as well as two Adjustable Dogs to be used as desired.
- Note* — INSTRUCTIONS ON CARD. "Adjust amount of Cross Feed here when Table is NOT moving."

This is important as breakage of the Stops is likely to occur if it is attempted to make this adjustment while the machine is in operation. DO NOT ADJUST WHILE IN OPERATION.

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## 6. VERTICAL ADJUSTMENT OF WHEEL HEAD ON NOS. 3B, M3, 3S, AND M3S HORIZONTAL SPINDLE SURFACE GRINDERS:

On Horizontal Spindle Surface Grinders, the Wheel Head is operated by Hand only. On the Right side of Head of Machine is located the Rapid Control while on the Left side is located the fine adjustment or Micrometer Control. Each graduation on this scale indicates an adjustment of .0001 inch. Since these .0001 graduations are approximately  $\frac{1}{16}$ " apart, it is possible to obtain even finer adjustment by moving Hand Wheel a fraction of this distance. Fast adjustment of Wheel Head is obtained by using Right Hand Wheel which is geared to shaft in a ratio of approximately 3 to 1.

## 7. VERTICAL ADJUSTMENT OF WHEEL HEAD ON NOS. 34 AND M34 VERTICAL SPINDLE SURFACE GRINDERS:

On the Vertical Spindle Surface Grinder (No. 34), the Down Feed is either Automatic or by Hand. As noted later under "Operating Hints" on the Nos. 34 and M34, it is generally more desirable to use the Automatic Power Down Feed for all types of grinding. This method gives better wheel wear and usually results in better ground surfaces. The Power Down Feed is controlled by a ratchet. Each tooth on this ratchet represents .00025 inches. Adjustment is controlled by the same mechanism that controls amount of Cross Feed on Horizontal Spindle Grinders viz., The Adjustment Stops located to the right of machine above the large Table Hand Wheel. These Stops MUST be locked with Knurled Nuts. DO NOT ADJUST WHILE IN OPERATION. Power feed may be either engaged or disengaged by means of the small Pawl Plunger mounted in the Feed Rack Lever which adjoins the left hand Elevating Hand Wheel. This Pawl Plunger may be locked out of operating position by lifting the teeth out of engagement with the Ratchet and giving the knurled knob a quarter turn.

### (E) Safety Devices

ABRASIVE SURFACE GRINDERS are provided with certain Safety Devices which are listed herewith:

1. Automatic Feed and Hand Feed may not be engaged at the same time. It will be found necessary to pull out the Hand Wheel thereby disengaging same before it is possible to operate the Automatic Feed.
2. Longitudinal Table Feed and Transverse Saddle Feed are both provided with extreme limits through the use of Safety Dogs.
3. Down Feed on Nos. 34 and M34 Vertical Spindle Surface Grinder is provided with Automatic Cut Out.
4. A Safety Friction Gear is provided which acts not only as a shock absorber (secondary to the Hydraulic Shock Absorber built into the Gear Case) but is a positive prevention of damage to machine caused by table in motion meeting an obstruction.

5. Steel Wheel Guards are provided on Horizontal Spindle Machines and Bronze or Steel on Vertical.

### (F) Maintenance

#### 1. GEAR CASE LUBRICATION Plates VII thru X

On Gear Case Oil Cup—is located Instruction Card.

*Note*—INSTRUCTIONS ON CARD. "Fill Gear Case to top of this Cup with a good grade of Machine Oil. Keep filled to top thereafter".

A Top Grade Machine Oil of approximately 400 Seconds Sayboldt at 100° F. (Navy Symbol No. 2075) will be found satisfactory. The Gear Case capacity is 5 quarts. It is well to check this oil occasionally, changing the same when it is obviously good judgment to do so.

#### 2. SADDLE LUBRICATION:

The saddle oil wells should be filled when the machine is set up. This will require 2 quarts of machine oil of approx. 400 Sec. Saybolt at 100° F.

These oil wells may be filled through the Gits filler oil cup at front center of the saddle.

#### 3. BIJUR ONE SHOT LUBRICATION:

The reservoir of the Bijur pump holds (1) one pint of machine oil—same viscosity as noted above for saddle and gear case.

See Plates I, XVI and XXIV for line drawings and plates IV and XX for photographs.

These diagrams show how the oil is distributed to all essential parts of machine with the exception of course of the motor and spindle.

*Note*—Paragraphs 2 and 3 do not apply to the No. 3S machine which has an automatic pressure lubricating system.

#### 4. NO. 3B AND NO. 3S SPINDLE LUBRICATION:

The Spindle bearings are so closely made and fitted as to demand a high grade light SPINDLE OIL of approximately 100 Seconds Sayboldt at 100° F. (Navy Symbol No. 2135).

MACHINE OIL should NEVER be used in these bearings. A GOOD GRADE OF SPINDLE OIL IS ESSENTIAL.

DO NOT attempt to ADJUST SPINDLE BEARINGS in a NEW MACHINE. These Spindles have been run for several hours prior to shipment, and have been correctly adjusted by experts in this art, therefore, let them alone until actual wear is evident.

First, before starting open sight feed oilers, (which we ship filled with Spindle Oil) and allow to drip for several moments, then rotate spindle a number of times by hand. This distributes the



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oil over bearing surfaces. Now turn on power and let machine run for an hour or two. When bearings have been warmed up nicely, adjust the sight feed oilers so there will be about one drop every five minutes. Always close oilers when machine is not in use.

## 5. SPINDLE ON NO. 3B AND NO. 3S HORIZONTAL SPINDLE SURFACE GRINDERS (PLATE III)

**Speed:** After machine has been placed in position and levelled-up, it is important that the Spindle Speed of approximately 2290 plus or minus 50 RPM, should be verified by means of speed indicator applied directly to the Spindle.

Direction of Spindle Rotation must be verified by reference to Arrow on Wheel Guard.

**Important:** The SPINDLE of a Surface Grinding Machine is the most delicate part of the mechanism. When shipped from our shops they are guaranteed to be perfect in every respect, but FAILURE TO REGARD OUR INSTRUCTIONS MAY RESULT IN SERIOUS DAMAGE WITHIN A VERY FEW MOMENTS.

Instruction Card will be found attached to Spindle Oil Cup Pipe on No. 3B and No. 3S Machines.

*Note* — INSTRUCTIONS ON CARD

**"Warning!** This spindle is in proper adjustment and should continue to be so for a long time.

"A chatter in finish grinding usually results from improper wheel for the material, or some cause other than loose spindle bearing.

"To adjust box remove same from housing, grind one or two thousandths from liner and replace."

To close box in about .001", it is necessary to grind approximately .003" off liner. Scrape bearing to allow approximately .00075" oil space. Make sure there are no "high spots" in bronze bearing which will cause overheating of spindle (resulting in cracked or checked spindles). Replace bearing and spindle; oil with limited amount of oil. Make sure spindle turns freely by hand before applying power.

**Spindle Guarantee:** The spindle Assembly for this machine is guaranteed to function properly and satisfactorily for one year from date of shipment, providing it has had reasonable care and attention. If for any reason it fails to give this satisfaction, we will replace it without charge immediately upon written or telegraphic notice from the customer, giving the Serial Number of the machine. Attempts upon the part of the customer or any other person not an authorized agent or representative of this company to adjust the Spindle; the use of low grade or other than recognized spindle oil; abuse through lack of oiling; or any other evident proofs of carelessness, will be sufficient basis for us to charge the customer for the cost of putting the returned assembly back into salable condition.

## 6. SPINDLES ON NO. M3 AND M3S MACHINES PLATE XVIII

Spindles on M3 and M3S Machines when constructed with Super-Precision Ball Bearings are not adjustable. When constructed with same Bronze Box type Spindle bearing as used on No. 3B or 3S machines, the Spindle rotates at Motor Speed of 1750 R.P.M. (60 cycles only). Same instructions regarding both Spindle bearing Adjustment and lubrication will apply.

## 7. SPINDLE ON NO. 34 VERTICAL SPINDLE SURFACE GRINDERS PLATES XXIV and XXV

**Speed:** After machine has been located and levelled-up it is important to verify the spindle speed of 3070 RPM for 5" Wheels or 2560 RPM for 6" Wheels by means of a speed indicator, applied directly to spindle.

Direction of Spindle Rotation must be verified by reference to Arrow on Wheel Guard.

Where it is necessary to install a belt when machine is shipped without Motor it is essential to follow diagram.

## 8. NO. 34 SPINDLE AND HEAD LUBRICATION PLATE XXIV and XXV

Two separate lubrication systems are used, viz:

First: For the upper and lower sets of Spindle Ball Bearings on the Vertical Spindle, by Spindle Oil of 100 seconds Sayboldt at 100° F., through Oil Cup at top of Head. Set adjustment for one drop every five minutes.

Second: For the Spiral Mitre Gears, a gear case oil of 400 seconds Sayboldt at 100° F. This oil is introduced into the Head Gear Case through the hole filled by the screw at the point of the arrow marked OIL LEVEL.

Maintain oil at this level as you would the level of the oil in the Transmission or Differential of your automobile. The glass window in the side of the Head enables one to determine that oil is being circulated.

## 9. OPERATING HINTS:

(a) On Vertical Spindle Surface Grinders, DO NOT USE DIAMOND for truing wheel. Use Truing Device sent with equipment,—but seldom.

(b) Touch face of Wheel occasionally with Carborundum Brick.

(c) When using No. 2 Cylinder Type Wheel of 5" diameter, DO NOT ATTEMPT TO GRIND OVER 4" in width in one setting of the work. The Wheel must always have at least an inch overhang to clear itself of grinding chips, otherwise it will fill up and burn the work.

(d) The ideal Wheel is one that is just soft enough to keep itself sharp and clear of chips without excessive wear.

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(e) **COOLANT:** Use full flow. We recommend "Sunoco" Emulsifying Oil, made by Sun Oil Company, mixed in proportion of one part to thirty parts of water. A little Kerosene added will control any tendency to foam.

(f) After work and machine are adjusted, use Automatic Longitudinal and Down Feeds provided. **DO NOT ATTEMPT TO OPERATE TABLE OR WHEEL HEAD BY HAND.** Better results are obtained by using the Automatic Table Travel and Automatic Down Feed. It should not be set for less than two teeth on ratchet, nor more than six, except for some special purpose. One tooth on ratchet represents .00025". Feed an equal amount at each reversal of Table. Feed is controlled by Adjustable Stops and same **MUST** be locked with Knurled Nuts. These are located to the right of the Machine above the Table Hand Wheel.

(g) If Table has jerky or hesitating motion, the Feed Belt should be tightened, or the Safety Friction Gear needs adjusting. Access to Safety Friction Gear is through upper hand hole at rear column.

## 10. SPINDLE ON NO. M34 VERTICAL SPINDLE SURFACE GRINDERS PLATE XXIII A

**Speed:** After machine has been located and levelled up it is important to verify the spindle speed of 3400 R.P.M. by means of a speed indicator, applied directly to spindle.

Direction of spindle rotation must be verified by reference to arrow on wheel guard.

## 11. NO. M34 SPINDLE LUBRICATION

No. M34 spindle is sealed and requires **NO FURTHER LUBRICATION.**

## (G) Wheel Selection

### 1. SIZES OF WHEELS NORMALLY SUPPLIED WITH ABRASIVE SURFACE GRINDERS

Type	Machine Type	Wheel	Diameter	Thickness	Dia. of Spindle Hole	Spindle RPM	Surface Feet PM
Horizontal	No. 11½	1	12"	½"	3"	1750	5500
Horizontal	No. 3B	1	10"	¾"	3"	2290	6000
Horizontal	No. M3	1	12"	¾"	3"	1750	5500
Horizontal	No. 3S	1	10"	¾"	3"	2290	6000
Horizontal	No. M3S	1	12"	¾"	3"	1750	5500
Vertical	No. 34	G (Steel Back)	5"	3"	3½"	3070	4000
Vertical	No. 34 & M34	G (Steel Back)	6"	3"	4½"	2560	4000
Vertical	No. M34 Segment	6"	.....	.....	.....	3400	5340

**ABRASIVE MACHINE TOOL COMPANY**  
EAST PROVIDENCE, RHODE ISLAND, U. S. A.

## 2. GENERAL OBSERVATIONS

In the Grinding Industry, the course of World War II has been marked by several new developments in grinding wheels. Such developments have tended toward faster, freer and cooler cutting of the objects to be ground. The porous or open structure style of wheel has been a notable factor in such progress in wheels used on Horizontal Spindle Surface Grinders.

The Segmental type wheel comprising Segments having pointed ends and which segments are held in a wheel chuck, has proved popular on many applications requiring both heavy stock removal with minimum wheel wear, also flatness and good finish on heat treated steels. Such equipment as best fits conditions are supplied on special order with, or for, Abrasive Grinders at extra cost.

In selecting the most practical Wheel for a job, it is well to bear in mind that Grinding Conditions are affected by:—

- The Nature of the Operation.
- The Type and Condition (rigidity) of Machine and Wheel Carrying Element.
- The Physical Properties of the Work to be ground.
- The Amount of Stock to be removed.
- The Accuracy and Finish desired.
- The Wheel Speed.
- The Work Speed.
- The Method of Dressing the Wheel.
- The Skill of the Operator.

A more Detailed Explanation follows:—

### (a) The Nature of the Operation.

Different Grinding operations as, Surface Grinding, Internal or External (Cylindrical), Tool or Cutter Grinding, Face Grinding, Etc., all necessitate a different technique and require, or are affected by, differing conditions in all of the following:—

### (b) The Type and Condition (rigidity) of Machine and Wheel Carrying Element.

Results obtained depend upon conditions of the grinder and more particularly on the condition of Spindle Bearings. A Surface Grinder is a precision instrument and should be treated as such. Proper lubrication and care is essential. Top Quality—High Precision Work can only be expected from equipment that is properly conditioned and sound.

### (c) The Physical Properties of the Work to be ground.

Materials of higher tensile strength including Low and High Carbon Steels generally can be ground more efficiently with Aluminum Oxide abrasives.

Materials of lower tensile strength, including Cast Iron, Bronze, and other Non-Ferrous Metals are best ground with Silicon Carbide abrasives.

There are a few exceptions to this rule in case of some of the newer alloys.

# ABRASIVE SURFACE GRINDERS

**(d) The Amount of Stock to be removed.**

For Roughing operations, it is desirable to use coarser grained and harder Wheels. In Surface Grinding, because of the large area of contact, best results are obtained with Wheels or Segments having an open porous structure.

**(e) The Accuracy and Finish desired.**

High finish and accuracy are best obtained with fine grained and softer Wheels. The closer the grains in the wheel are spaced, the smoother will be the resulting finish. Finish grinding to be followed by a lapping operation may require Wheels with grain as fine as 120.

**(f) The Wheel Speed.**

If a Wheel burns, it is usually because it is too hard a grade or too fine or perhaps both. Try one or two grades softer.

**(g) The Work Speed.**

In general, it may be said that the faster the Work Speed, the harder the wheel and vice versa; softer wheels are desirable with slower work speeds.

**(h) The Method of Dressing the Wheel.**

Dressing of the Wheel is very important where accuracy and finish are desired. It is best done with a sharp Diamond (on

Horizontal Spindle Grinders): The axis of the Diamond Nib should make an angle of about 75° with a line which is tangent to the Wheel at point of contact. This inclination should be such that the face of the wheel runs off the point of the Diamond rather than on to it.

**(i) The Skill of the Operator.**

Last but not least, the experienced Operator can get practically as fine work from a medium grained wheel as the less experienced can get from a much finer wheel. The trick is largely in the Wheel Truing, special attention should be given to securing a suitable Diamond for the Wheel Truing Operation and instructions noted in Paragraph (e) above.

**3. WHEEL SELECTION FOR ABRASIVE HORIZONTAL SPINDLE SURFACE GRINDERS**

Fortunately, the **Horizontal Spindle Surface Grinding Machine** does not demand a wide variety of wheels. For nearly all hard and soft steel grinding wheels Full Friable No. A46V of Aluminum Oxide will be found very satisfactory for Abrasive Nos. 1½, 3B, M3, 3S, and M3S Grinders. Some thin work may require a Silicate wheel. High-Speed Steel requires a grade or two softer. For Cast Iron, No. C30HV is efficient.

The following table will serve as a guide toward a proper selection of TYPE 1 or STRAIGHT WHEELS for Nos. 1½, 3B, M3, 3S and M3S Horizontal Spindle Surface Grinders

MATERIAL GROUND	GRAIN	GRADE†	ABRASIVE	PROCESS
Aluminum.....	30 to 46	H or I	C	Vitrified
Brass and Soft Bronze.....	30 or 36	I	C	Vitrified
Bronze (Hard).....	36 or 46	H	C	Vitrified
Copper.....	30 or 36	H or I	C	Vitrified
Magnesium.....	30 or 36	G or H	C	Vitrified
Cast Iron (Grey).....	30 or 36	I or J	C	Vitrified
Cast Iron (Chilled).....	30 or 36	H or I	C	Vitrified
Soft or Mild Steel (including Steel Castings).....	36 or 46	I, J or K	A	Vitrified
Hard Tool Steel (Thick).....	36 or 46	H	A	Vitrified
Hard Tool Steel (Thin).....	36 or 46	G or H	A	Silicate
Hard High Speed Steel (Thick).....	46	G or H	A	Vitrified
Hard High Speed Steel (Thin).....	46	G or H	A	Silicate
Stellite.....	46	G or H	A	Vitrified
Nitralloy (Before Nitriding).....	36 or 46	J*	A	Vitrified
Nitralloy (After Nitriding).....	60 to 100	H*	A or C	Vitrified
Tungsten Carbide (Roughing).....	60 or 80	G or H*	C	Vitrified
Tungsten Carbide (Finishing).....	80 or 100	F or G*	C	Vitrified
Stainless Steel (Soft).....	36	H*	C	Vitrified
Monel Metal.....	46	G	A	Vitrified

# ABRASIVE SURFACE GRINDERS

To get best results, be sure the Wheel is in balance. True it off very carefully in position by means of a sharp diamond. Other dressing devices are useless for this Machine. The diamond should be applied at bottom of Wheel, right where it contacts with work. (Diamond holder sent with Machine.)

#### 4. WHEEL SELECTION FOR ABRASIVE VERTICAL SPINDLE SURFACE GRINDER

Unlike the Horizontal Spindle type of Surface Grinder, the

**Vertical Spindle Surface Grinding Machine** requires a somewhat more critical selection of wheels for varying jobs. Surface Grinding on Vertical Spindle Type Grinders, where there is a large area of contact resulting in insufficient stresses to readily break down grinding wheels it will be found that better results are obtained with the more friable abrasives. For the average run of work experience shows that the coarse grained wheels are preferable.

The following table will serve as a guide toward a proper selection of WHEELS for No. M34 Vertical Spindle Surface Grinders

MATERIAL GROUND	GRAIN	GRADE†	ABRASIVE	PROCESS
Aluminum.....	24 or 30	H or I	C	Vitrified
Brass and Soft Bronze.....	24 or 30	G or H	C	Vitrified
Bronze (Hard).....	24 or 30	G	C	Vitrified
Copper.....	24 or 30	G or H	C	Vitrified
Magnesium.....	24	G	C	Vitrified
Cast Iron (Grey).....	24	H	C	Vitrified
Cast Iron (Chilled).....	24	G	C	Vitrified
Soft or Mild Steel (including Steel Castings).....	24	I or J	A	Vitrified
Hard Tool Steel (Thick).....	24	H	A	Vitrified
Hard Tool Steel (Thin).....	24	F or G	A	Vitrified
Stellite.....	30	H	A	Vitrified or Silicate
Nitralloy (Before Nitriding).....	30	I*	A	Vitrified
Nitralloy (After Nitriding).....	30	G*	C	Vitrified
Tungsten Carbide (Roughing).....	24	G*	C	Vitrified
Tungsten Carbide (Finishing).....	60	G*	C	Vitrified
Stainless Steel (Soft).....	24	H*	A	Vitrified
Monel Metal.....	24 or 30	G	A	Vitrified

The above table will also conform in general to many requirements of Segmental Wheels. Notable success has, however, been obtained through the use of finer grit sizes when grinding very hard surfaces. Contact factory for further detailed information.

Note: The letter "A" represents abrasive equivalent to Aloxite, Alundum, Aluminox, Oxaluma, etc., which is Aluminous Oxide. The letter "C" represents abrasive equivalent to Carborundum, Carbolite, Carbora, Crystolon, etc., which is Silicon Carbide.

\*When ordering wheels for grinding the newer types of steels it is well to clearly specify on the order such items as the exact type of steel, the amount of stock to be removed, and the finish required.

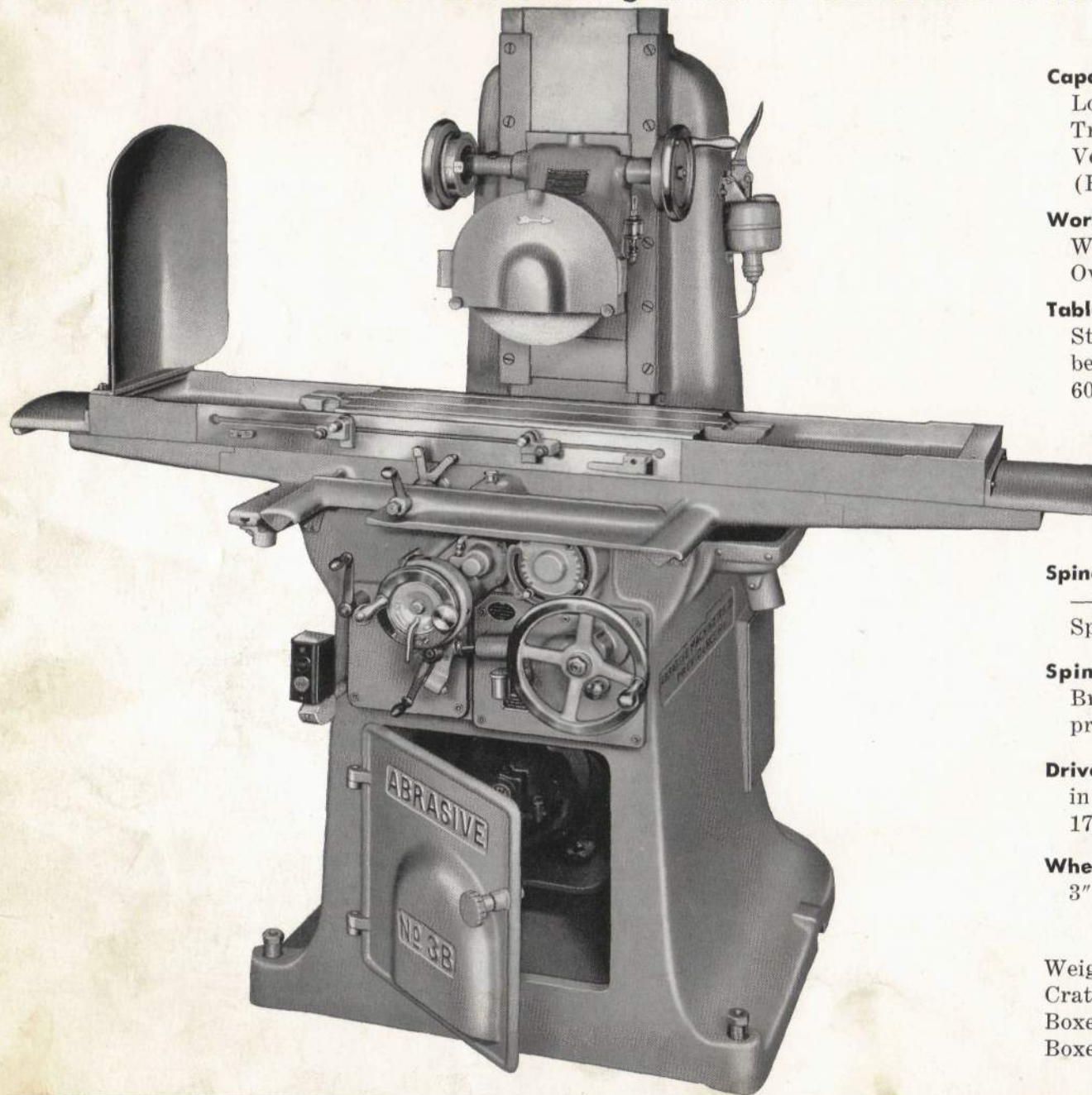
†Grinding Wheel Manufacturers mark the different grades of Grinding Wheels, starting the Alphabet with letters signifying soft running to medium and harder grades as one progresses through the alphabet. \*See Page 62 for new method of wheel markings.

#### (H) Spare Parts

Always include Serial Number of machine when ordering Spare Parts. It is a policy of this company to ship out Spare Parts whenever possible the same day that order is received. Full information is given on the following pages.

# ABRASIVE SURFACE GRINDERS

## PLATE I General Instruction Line Drawing of No. 3B HORIZONTAL SPINDLE SURFACE GRINDER (inside)



### SPECIFICATIONS:

#### Capacity:

Longitudinal .....	24"
Transverse .....	8"
Vertical .....	12"
(High column) .....	15½"

#### Work Table:

Work Surface .....	24" x 8"
Overall .....	59" x 10½"

#### Table Speeds per Minute:

Standard 20 ft. & 40 ft. Pick off gears may be furnished at extra cost to give 30 ft. & 60 ft. speeds.

Floor Space .....	98" x 48"
Height .....	72"

**Spindle Assembly:** Completely Removable Cartridge Type.

**Spindle:** 1½" diam. taper nose-chrome steel —Hardened, Ground, and Lapped. Normal Spindle Speed — 2290 RPM.

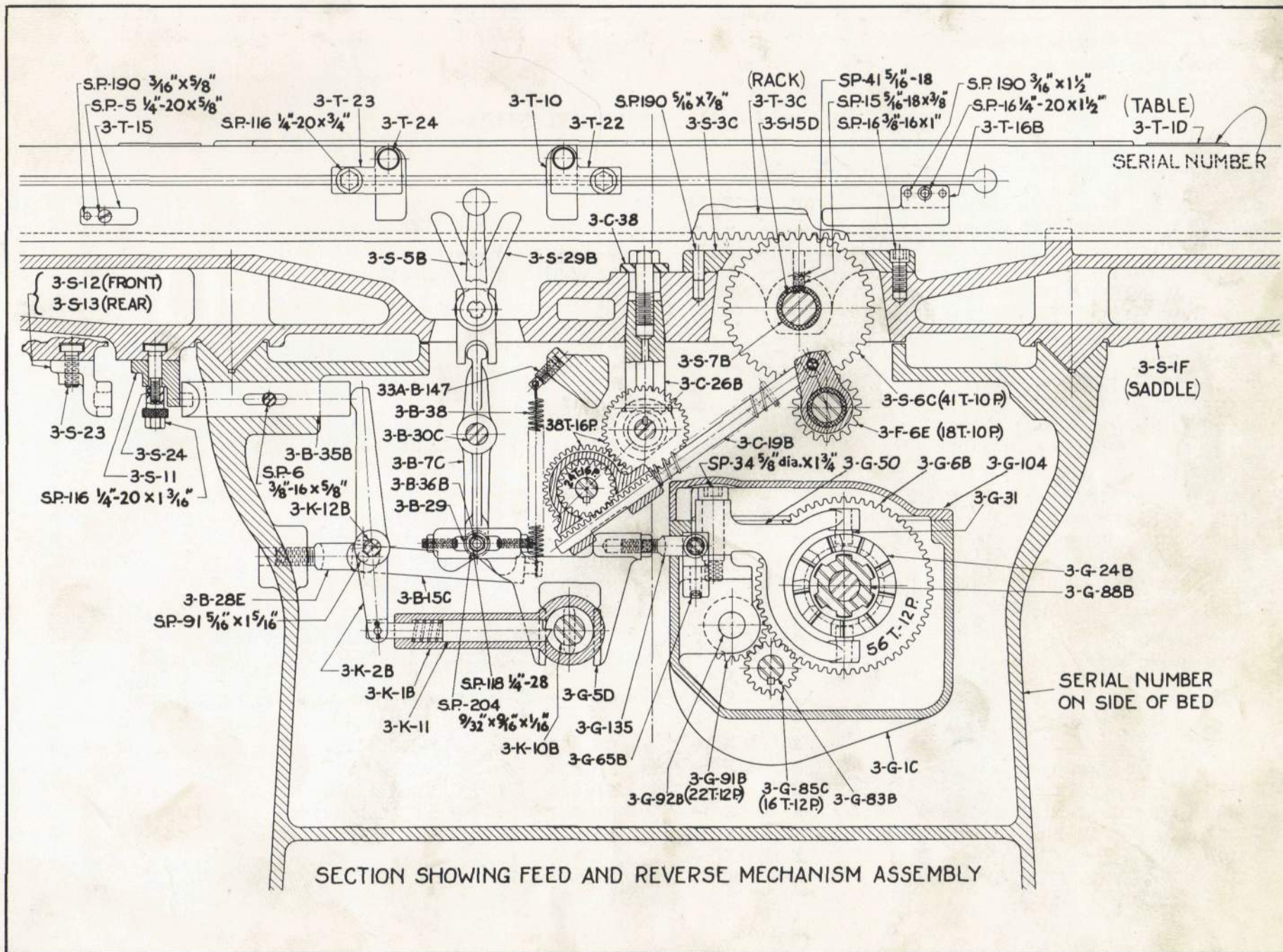
**Spindle Bearings:** At front — Phosphor Bronze, adjustable for wear with super-precision ball bearings at rear.

**Drive:** Endless flat belt 2" wide from motor in base, to Spindle Pulley. Motor: 3 HP, 1750 RPM, (60 cy), 1450 RPM (50 cy).

**Wheels:** Standard — 10" diam. x ¾" thick x 3" hole.

Weight — Net .....	2670 lbs.
Crated (domestic) .....	2910 lbs.
Boxed for Export .....	3240 lbs.
Boxed with Wet Attachment .....	3550 lbs.

PLATE II Line Drawing — Front View Cross Section No. 3B



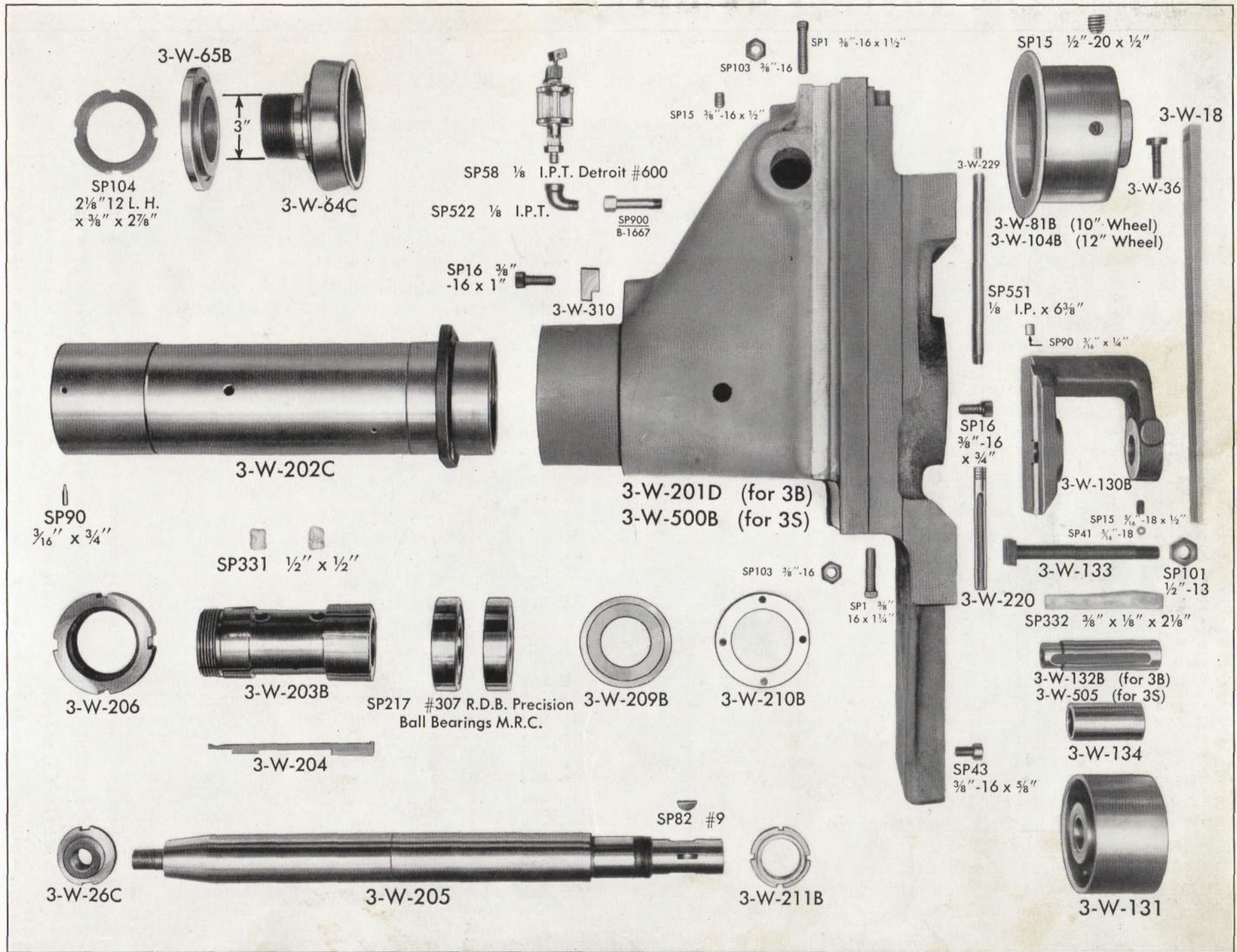
ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

# ABRASIVE SURFACE GRINDERS

## Parts for No. 3B WHEEL SLIDE

		3B	M3	3S	34			3B	M3	3S	34
3-B-6B	Wheel Slide Strap (see plate I)	X	X	-	-	3-W-505	Wheel Slide Idler Pulley Stud (for 3S)	-	-	X	-
3-B-100	Wheel Slide Strap (see plate XXIV)	3B Hi Col. & 34				3-W-507	Wheel Slide Gib (for 3S)	-	-	X	-
3-B-515	Vertical Way Oil Pan (not shown)	-	-	X	-	34-W-31	Wheel Slide Gib (for 34)	-	-	-	X
3-B-522	Wheel Slide Strap (see plate XVII)	3S & M3S				SP 1	3/8" - 16 x 1 1/4" Square Head Set Screw	X	X	X	X
3-B-525	Wheel Slide Strap (not shown)	3S Hi Col. only				SP 15	5/16" - 18 x 1/2" Socket Set Screw	X	X	X	-
3-W-18	Wheel Slide Gib (see below for 3S & 34)	X	X	-	-	SP 15	3/8" - 16 x 1/2" Socket Set Screw	X	X	X	X
3-W-26C	Wheel Spindle Nut	X	-	X	-	SP 15	1/2" - 20 x 1/2" Socket Set Screw	X	-	X	X
3-W-36	Wheel Slide Gib Screw	X	X	X	X	SP 16	3/8" - 16 x 3/4" Socket Cap Screw	X	-	X	-
3-W-64C	Wheel Sleeve	X	-	X	-	SP 16	3/8" - 16 x 1" Socket Cap Screw	X	X	X	-
3-W-65B	10" & 12" Wheel Sleeve Flange	X	-	X	-	SP 41	5/16" - 18 Hollow Lock Screw	X	-	X	X
3-W-81B	Spindle Pulley for 10" Wheel	X	-	X	-	SP 43	3/8" - 16 x 5/8" Fillister Head Cap Screw	X	-	X	X
3-W-104B	Spindle Pulley for 12" Wheel	X	-	X	-	SP 58	1/8 I.P.T. Detroit No. 600 Sight Feed Oil Cup (Bottom Outlet)	X	X	X	-
3-W-130B	Wheel Slide Idler Pulley Bracket	X	-	X	-	SP 82	No. 9 Woodruff Key	X	-	X	-
3-W-131	Wheel Slide Idler Pulley	X	-	X	-	SP 90	3/16" x 1/4" Straight Pin	X	-	X	-
3-W-132B	Wheel Slide Idler Pulley Stud	X	-	-	-	SP 90	3/16" x 3/4" Straight Pin	X	-	X	X
3-W-133	Idler Pulley Clamp Bolt	X	-	X	-	SP 101	1/2" - 13 Hex. Nut	X	-	X	X
3-W-134	Wheel Slide Idler Pulley Bushing	X	-	X	-	SP 103	3/8" - 16 Hex. Thin Nut	X	X	X	X
3-W-201D	Wheel Slide (for 3B)	X	-	-	-	SP 104	2 1/8" - 12 L.H. x 3/8" x 2 7/8" Round Nut With Cuts	X	-	X	-
3-W-202C	Spindle Bearing Cartridge	X	-	X	-	SP 217	No. 307 R.D.B. Precision Ball Bearings	X	-	X	-
3-W-203B	Spindle Box	X	-	X	-		M.R.C. Radial Ball Bearing	X	-	X	-
3-W-204	Spindle Box Liner	X	-	X	-	SP 331	1/2" x 1/2" Felt Plug	X	-	X	-
3-W-205	Wheel Spindle	X	-	X	-	SP 332	3/8" x 1/8" x 2 1/8" Felt Strip	X	-	X	-
3-W-206	Spindle Box Adjusting Nut	X	-	X	-	SP 522	1/8 I.P.T. Street Elbow	X	X	X	-
3-W-209B	Rear Bearing Seal	X	-	X	-	SP 551	1/8 I.P. x 6 3/8" Brass Pipe (Thread One End)	X	-	X	-
3-W-210B	Outer Race Clamp Nut	X	-	X	-	SP 900	} 2" Straight Connector (Bijur)	X	X	X	-
3-W-211B	Inner Race Clamp Nut	X	-	X	-	B-1667					
3-W-220	Idler Pulley Oil Tube Support	X	-	X	-						
3-W-229	Oil Pipe Bushing	X	-	X	X						
3-W-310	Wheel Guard Clamp Lug	X	X	X	-						
3-W-500B	Wheel Slide (For 3S)	-	-	X	-						

PLATE III Parts for No. 3B WHEEL SLIDE



ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS



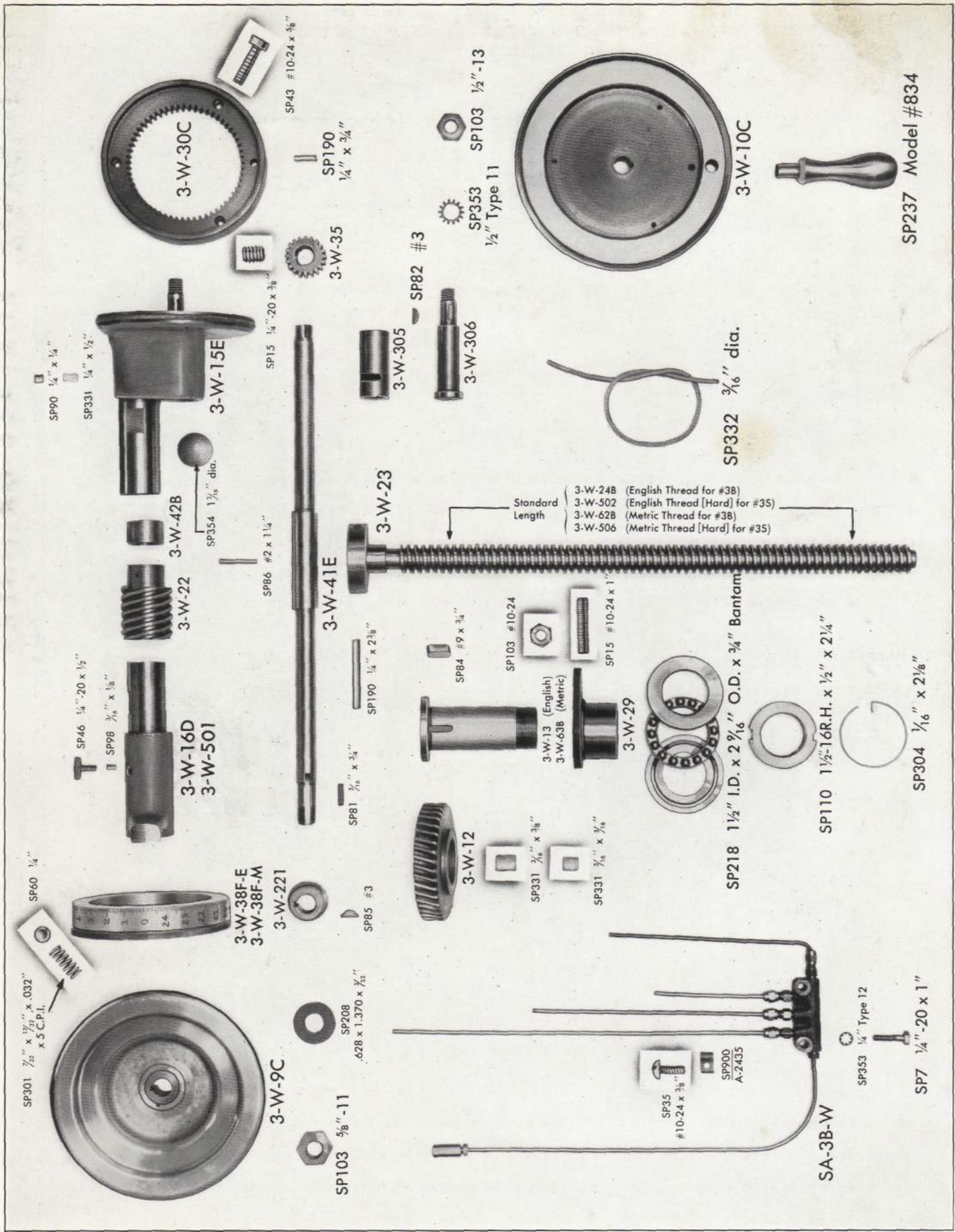
# ABRASIVE SURFACE GRINDERS

## Parts for VERTICAL FEED ASSEMBLY

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-W-9C, D	Elevating Hand Wheel (left)	X	X	X	-	SP 43	No. 10—24 x 5/8" Fillister Head Mach. Screw	X	X	X	X
3-W-10C	Elevating Hand Wheel (right)	X	X	X	X	SP 46	1/4"—20 x 1/2" Knurled Set Screw	X	X	X	X
3-W-12	Elevating Worm Wheel 40T	X	X	X	X	SP 60	1/4" Steel Ball	X	X	X	X
3-W-13	Elevating Screw Nut 1" dia. 1/4 Single Thread (English)	X	X	X	-	SP 81	3/16" x 3/4" Plain Key (Square)	X	X	X	-
3-W-15E	Elevating Hand Wheel Bush. R.	X	X	X	-	SP 82	No. 3 Woodruff Key	X	X	-	-
3-W-16D	Elevating Worm Shaft Bushing	X	X	-	-	SP 84	No. 9 x 3/4" Pratt & Whitney Key	X	X	X	X
3-W-22	Elevating Worm 2/7 P Quadruple R.H.	X	X	X	X	SP 85	No. 3 Dyett Key	X	X	X	-
3-W-23	Elevating Screw Thrust Nut	X	X	X	-	SP 86	No. 2 x 1 1/4" Taper Pin	X	X	X	X
3-W-24B	Elevating Screw 18 1/2" x 1" dia. 1/4 P (English)	X	-	-	-	SP 90	1/4" x 1/4" Straight Pin	X	X	X	X
3-W-29	Elevating Screw Bushing	X	X	X	X	SP 98	3/16" x 1/8" Brass Plug (Shoe)	X	X	X	X
3-W-30C	Elevating Hand Wheel Inter. Gear 60 T, 16 P	X	X	X	X	SP 103	No. 10—24 Hex. Thin Nut	X	X	X	X
3-W-35	Internal Gear Pinion 20 T, 16 P	X	X	X	X	SP 103	1/2"—13 Hex. Thin Nut	X	X	X	X
3-W-38F-E	Elevating Hand Wheel Dial (English)	X	X	X	-	SP 103	5/8"—11 Hex. Thin Nut	X	X	X	-
3-W-38F-M	Elevating Hand Wheel Dial (Metric)	X	X	X	-	SP 110	1 1/2"—16 R.H. x 1/2" x 2 1/4" Grooved Nut With Cuts	X	X	X	X
3-W-41E	Elevating Worm Shaft	X	X	X	-	SP 190	1/4" x 3/4" Hardened and Ground Dowel	X	X	X	X
3-W-42B	Elevating Worm Shaft Spacer	X	X	X	X	SP 190	1/4" x 2 3/8" Hardened and Ground Dowel	X	X	X	X
3-W-62B	Elevating Screw 18 1/2" overall (Metric)	X	-	-	-	SP 208	.628" x 1.370" x 3/32" Beveled Corner Steel Washer	X	X	X	-
3-W-63B	Elevating Screw Nut (Metric)	X	X	X	-	SP 218	1 1/2" I.D. x 2 9/16" O.D. x 3/4" Bantam Thrust Bearing	X	X	X	X
3-W-221	Elevating Hand Wheel Bushing (left)	X	X	X	-	SP 237	Cinn. Model No. 834 Smooth Machine Handle	X	X	X	X
3-W-305	Elevating Hand Wheel Stud Bushing	X	X	X	X	SP 301	7/32" x 1 7/32" x .032" x 5 C.P.I. Compression Spring	X	X	X	-
3-W-306	Elevating Hand Wheel Stud	X	X	X	X	SP 304	1/16" x 2 1/8" Nut Spring ("G" Wire)	X	X	X	X
3-W-501	Elevating Worm Shaft Bushing (left)	-	-	X	-	SP 331	3/16" x 5/16" Felt Plug	X	X	X	X
3-W-502	Elevating Screw 18 1/2" x 1" dia. 1/4 P (English) (hardened and thread ground for 3S)	-	-	X	-	SP 331	3/16" x 3/8" Felt Plug	X	X	X	X
3-W-506	Elevating Screw 18 1/2" overall (Metric)	-	-	X	-	SP 331	1/4" x 1/2" Felt Plug	X	X	X	X
SA-3B-W	Bijur Tubes and Fittings	X	-	-	-	SP 332	3/16" dia. Felt Strip	X	X	X	X
SP 7	1/4"—20 x 1" Hex. Head Cap Screw	X	X	X	X	SP 353	1/4" Type 12 "Shakeproof" Lock Washer	X	X	X	X
SP 15	No. 10—24 x 1" Socket Set Screw	X	X	X	X	SP 353	1/2" Type 11 "Shakeproof" Lock Washer	X	X	X	X
SP 15	1/4"—20 x 3/8" Socket Set Screw	X	X	X	X	SP 354	1 3/16" dia. Welsh Expansion Plug	X	X	X	X
SP 35	No. 10—24 x 3/8" Button Head Machine Screw	X	X	X	X	SP 900 A-2435	{ Tubing Clip—Single	X	-	-	-

# PLATE IV Parts for VERTICAL FEED ASSEMBLY



STANDARD LENGTH ELEVATING SCREW  $18\frac{1}{2}$ " LONG — LONG LENGTH ELEVATING SCREW 22" LONG  
 ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

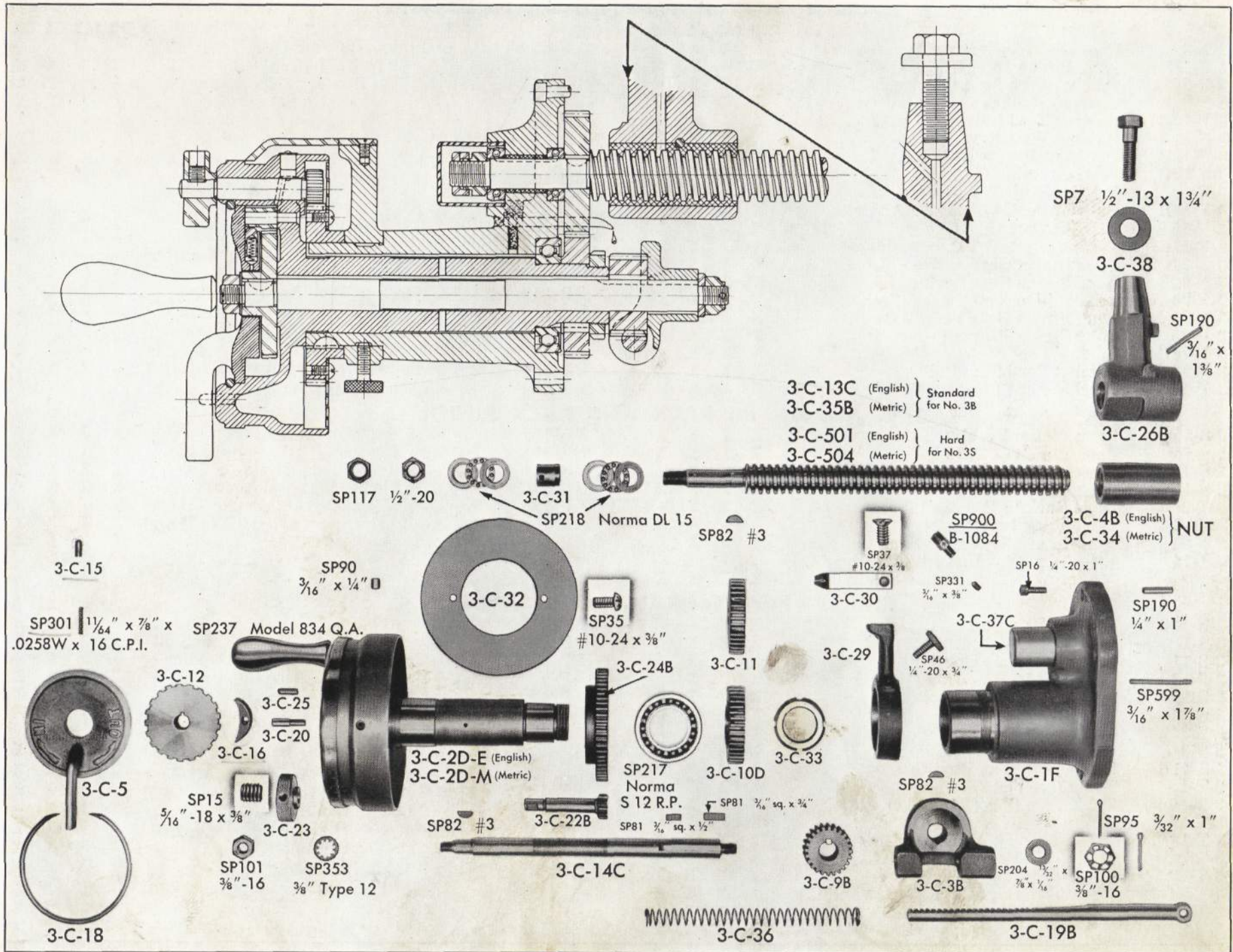
# ABRASIVE SURFACE GRINDERS

## Parts for CROSS FEED UNIT

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-C-1F	Cross Feed Bracket	X	X	X	X	3-C-501	Cross Feed Screw (hardened and thread ground) (English)	-	-	X	-
3-C-2D-E	Cross Feed Hand Wheel (English) (see below for 3S)	X	X	-	-	3-C-503B	Cross Feed Screw Nut Bracket	-	-	X	-
3-C-2D-M	Cross Feed Hand Wheel (Metric) (see below for 3S)	X	X	-	-	3-C-504	Cross Feed Screw (hardened and thread ground) (Metric)	-	-	X	-
3-C-3B	Cross Feed Rack Bearing	X	X	X	-	SP 7	1/2" - 13 x 1 3/4" Hex. Head Cap Screw	X	X	X	X
3-C-4B	Cross Feed Screw Nut 1/4 P (English)	X	X	X	X	SP 15	5/16" - 18 x 3/8" Socket Set Screw	X	X	X	-
3-C-5	Cross Feed Hand Wheel Cover	X	X	X	-	SP 16	1/4" - 20 x 1" Socket Cap Screw	X	X	X	X
3-C-9B	Cross Feed Rack Gear 24 T, 16 P	X	X	X	-	SP 35	No. 10 - 24 x 3/8" Button Head Machine Screw	X	X	X	-
3-C-10D	Cross Feed Gear 38 T, 16 P	X	X	X	X	SP 37	No. 10 - 24 x 3/8" Flat Head Machine Screw	X	X	X	-
3-C-11	Cross Feed Screw Gear 38 T, 16 P	X	X	X	X	SP 46	1/4" - 20 x 3/4" Knurled Set Screw	X	X	X	-
3-C-12	Cross Feed Ratchet	X	X	X	-	SP 81	3/16" sq. x 1/2" Plain Key (Square)	X	X	X	-
3-C-13C	Cross Feed Screw 1" dia. 1/4 P R.H. Single (English)	X	X	-	X	SP 81	3/16" sq. x 3/4" Plain Key (Square)	X	X	X	-
3-C-14C	Cross Feed Ratchet Shaft	X	X	X	-	SP 82	No. 3 Woodruff Key	X	X	X	X
3-C-15	Pawl Plunger	X	X	X	-	SP 90	3/16" x 1/4" Straight Pin	X	X	X	-
3-C-16	Cross Feed Pawl	X	X	X	-	SP 95	3/32" x 1" Cotter Pin	X	X	X	-
3-C-18	Cross Feed Cover Ring	X	X	X	-	SP 100	3/8" - 16 Castellated Nut	X	X	X	-
3-C-19B	Cross Feed Rack 16 P	X	X	X	-	SP 101	3/8" - 16 Hex. Nut	X	X	X	-
3-C-20	Cross Feed Pawl Stud	X	X	X	-	SP 117	1/2" - 20 Drake Lock Nut (2 Pieces - 1 Lock)	X	X	X	X
3-C-22B	Planetary Pinion 11 T, 16 P	X	X	X	-	SP 190	3/16" x 1 3/8" Hardened and Ground Dowel	X	X	X	X
3-C-23	Planetary Pinion Knob	X	X	X	-	SP 190	1/4" x 1" Hardened and Ground Dowel	X	X	X	X
3-C-24B	Planetary Gear 55 T, 16 P	X	X	X	-	SP 204	1 3/32" x 7/8" x 1/16" Beveled Corner Steel Washers	X	X	X	-
3-C-25	Hand Wheel Cover Stop	X	X	X	-	SP 217	Norma S 12 R.P. Radial Ball Bearing	X	X	X	X
3-C-26B	Cross Feed Screw Nut Bracket (see below for 3S)	X	X	-	X	SP 218	Norma DL 15 Thrust Bearing	X	X	X	X
3-C-29	Dial Pointer Bracket	X	X	X	-	SP 237	Model 834 Q.A. Smooth Machine Handle	X	X	X	X
3-C-30	Dial Pointer	X	X	X	-	SP 301	1 1/64" x 7/8" x .0258W x 16 C.P.I. Compression Spring	X	X	X	-
3-C-31	Cross Feed Screw Bushing	X	X	X	X	SP 331	3/16" x 3/8" Felt Plug	X	X	X	X
3-C-32	Planetary Gear Guard	X	X	X	X	SP 353	3/8" Type 12 "Shakeproof" Lock Washer	X	X	X	-
3-C-33	Hand Wheel Lock Nut	X	X	X	X	SP599	3/16" x 1 7/8" Copper Tubing	X	X	X	X
3-C-34	Cross Feed Screw Nut (Metric)	X	X	X	X	SP900	Straight Meter Unit	X	X	-	X
3-C-35B	Cross Feed Screw (Metric)	X	X	-	X	B-1084					
3-C-36	Cross Feed Rack Spring	X	X	X	-						
3-C-37C	Cross Feed Screw Cover	X	X	X	X						
3-C-38	1 7/32" x 1 3/8" x 1/4" Steel Washers	X	X	X	X						
3-C-500-E	Cross Feed Hand Wheel (English) (for 3S)	-	-	X	-						
3-C-500-M	Cross Feed Hand Wheel (Metric) (for 3S)	-	-	X	-						

# PLATE V Parts for CROSS FEED UNIT



ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

## A. Parts for LONG PINION TRANSVERSE, SAFETY FRICTION GEAR UNIT

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-F-3	Cross Feed Rack Lever	X	X	X	X	3-F-31	Long Pinion Pick-off Gear 74 T, 12 P (for 60 ft. P. M.) replacing 3-F-24C	X	X	X	X
3-F-6E	Long Pinion 18 T, 10 P	X	X	X	X	3-F-36	Friction Nut Spacer	X	X	X	X
3-F-8C	Ratchet Feed Stop Cover	X	X	X	X	SP 15	5/16" — 18 x 3/8" Socket Set Screw	X	X	X	X
3-F-9	Cross Feed Rack Lever Stud	X	X	X	X	SP 16	5/16" — 18 x 2 3/4" Socket Cap Screw	X	X	X	X
3-F-10C	Ratchet Feed Ratchet	X	X	X	X	SP 85	No. 11 Dyett Key	X	X	X	X
3-F-11	Ratchet Feed Pawl	X	X	X	X	SP 90	3/16" x 1/4" Straight Pin	X	X	X	X
3-F-12B	Pawl Governor, 5/8" hole	X	X	X	X	SP 103	1/2" — 13 Hex. Thin Nut	X	X	X	X
3-F-12C	Pawl Governor, 3/4" hole	X	X	X	X	SP 110	1 5/8" — 16 R.H. x 2 1/4" x 1/4" Grooved Nut With Cuts	X	X	X	X
3-F-13	Friction Adj. Washer, 5/8" hole	X	X	X	X	SP 116	1/4" — 20 x 3/4" Knurled Hex. Nut	X	X	X	X
3-F-13B	Friction Adj. Washer, 3/4" hole	X	X	X	X	SP 204	9/32" x 9/16" x 1/16" Beveled Corner Steel Washer (Hard)	X	X	X	X
3-F-15	Friction Compensating Nut	X	X	X	X	SP 213	5/8" x 1 5/8" x 1/8" Leather Washer	X	X	X	X
3-F-17B	Cross Feed Rack Lever Bushing	X	X	X	X	SP 213	3/4" x 1 5/8" x 1/8" Leather Washer	X	X	X	X
3-F-21	Long Pinion Gear Sleeve	X	X	X	X	SP 301	7/32" x 9/16" x .041 x 12 C.P.I. Compress- ion Spring	X	X	X	X
3-F-22B	Long Pinion Gear Spring	X	X	X	X	SP 304	2 1/8" I.D. x 1/16" Nut Spring ("G" Wire)	X	X	X	X
3-F-23	Long Pinion Gear Sleeve Washer	X	X	X	X	SP 350	1/2" x 7/8" x 1/8" Lock Washer	X	X	X	X
3-F-24C	Long Pinion Gear 84T, 12 P	X	X	X	X						
3-F-25E	Long Pinion Bearing Housing	X	X	X	X						
3-F-26C	Ratchet Feed Stop	X	X	X	X						
3-F-27	Ratchet Feed Stop Bolt	X	X	X	X						
3-F-28B	Ratchet Feed Pawl Stud	X	X	X	X						

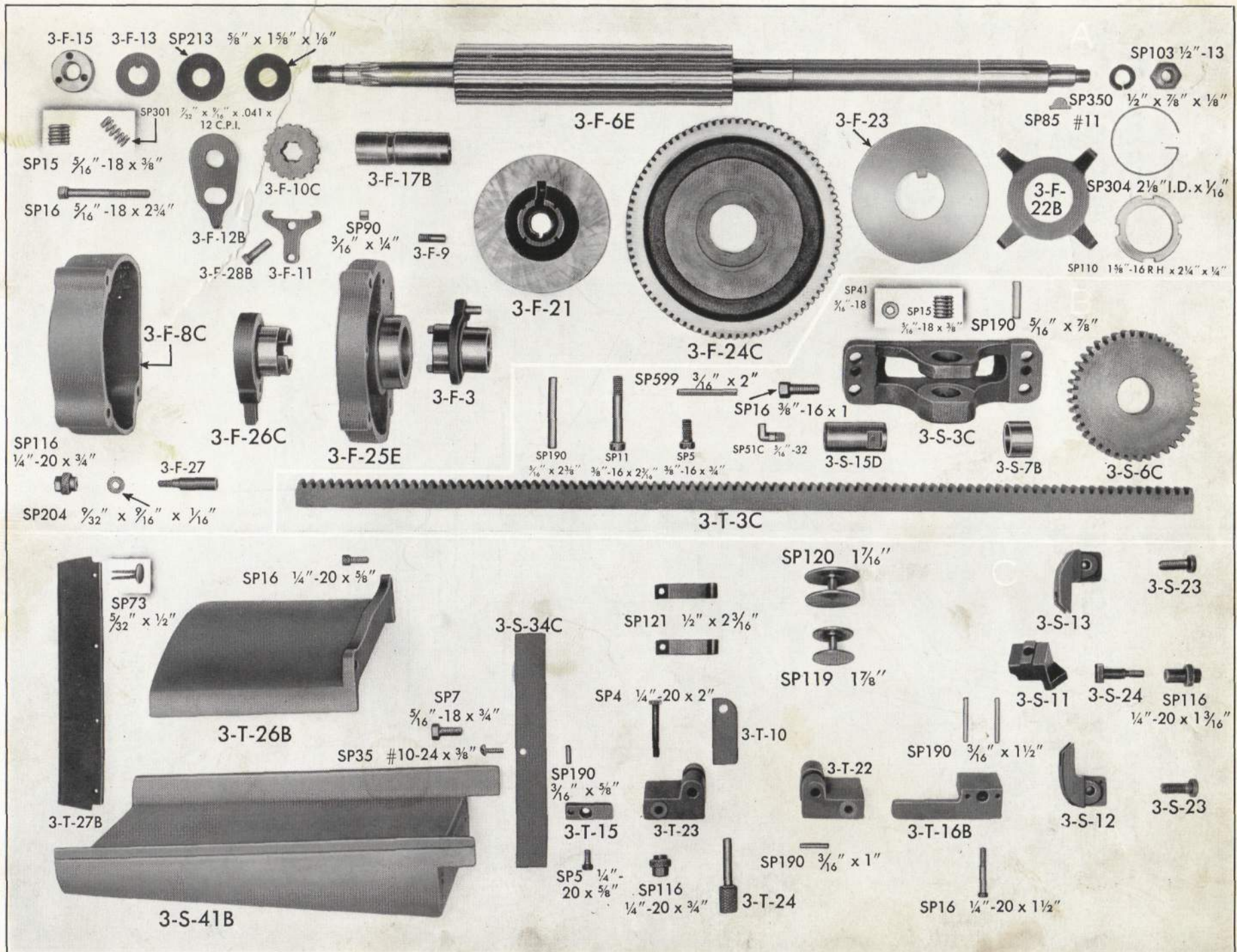
## B. Parts for RACK AND RACK PINION

3-S-3C	Rack Pinion Bracket	X	X	X	X	SP 15	5/16" — 18 x 3/8" Socket Set Screw	X	X	X	X
3-S-6C	Rack Pinion 41 T, 10 P	X	X	X	X	SP 16	3/8" x 16 x 1" Socket Cap Screw	X	X	X	X
3-S-7B	Rack Pinion Bushing	X	X	X	X	SP 41	5/16" — 18 Hollow Lock Screw	X	X	X	X
3-S-15D	Rack Pinion Stud	X	X	X	X	SP 51C	5/16" — 32 Elbow Oil Cup Without Cover	X	X	X	X
3-T-3C	Table Rack 10 P	X	X	X	-	SP 190	5/16" x 7/8" Hardened and Ground Dowel	X	X	X	X
34-T-3	Table Rack 10P	-	-	-	X	SP 190	5/16" x 2 3/8" Hardened and Ground Dowel	X	X	X	X
SP 5	3/8" — 16 x 3/4" Fillister Head Cap Screw	X	X	X	X	SP 599	3/16" x 2" Copper Tube	X	X	X	X
SP 11	3/8" — 16 x 2 3/16" Flat Fillister Head Cap Screw	X	X	X	X						

## C. Parts for TABLE AND SADDLE

3-B-106	Bedway Drip Cup	X	X	-	X	34-T-1	Table (see plate XXIV)	-	-	-	X
3-S-1	Saddle	X	X	X	X	SP 4	1/4" — 20 x 2" Square Head Planer Bolt	X	X	X	X
3-S-11	Cross Feed Trip Dog	X	X	X	-	SP 5	1/4" — 20 x 5/8" Fillister Head Cap Screw	X	X	X	X
3-S-12	Cross Feed Safety Dog (Front)	X	X	X	-	SP 7	5/16" — 18 x 3/4" Hex. Head Cap Screw	X	X	X	X
3-S-13	Cross Feed Safety Dog (Rear)	X	X	X	-	SP 16	1/4" — 20 x 5/8" Socket Cap Screw	X	X	X	X
3-S-23	Cross Feed Safety Dog Screw	X	X	X	-	SP 16	1/4" — 20 x 1 1/2" Socket Cap Screw	X	X	X	X
3-S-24	Cross Feed Trip Dog Screw	X	X	X	-	SP 35	No. 10 — 24 x 3/8" Button Head Machine Screw	X	X	X	X
3-S-34C	Cover for Saddle End Pocket	X	X	X	X	SP 73	5/32" x 1/2" Split Rivet	X	X	X	X
3-S-41B	Saddle Top Way Dust Guard	X	X	X	-	SP 116	1/4" — 20 x 3/4" Knurled Hex. Nut	X	X	X	X
3-T-1	Table (see plate I)	X	X	X	-	SP 116	1/4" — 20 x 1 3/16" Knurled Hex. Nut	X	X	X	-
3-T-10	Table Trip Dog (R. and L.)	X	X	X	X	SP 119	1 7/8" Flat Way Oil Roll	X	X	X	X
3-T-15	Safety Dog (Left Hand)	X	X	X	X	SP 120	1 7/16" Vee Way Oil Roll	X	X	X	X
3-T-16B, C	Safety Dog (Right Hand)	X	X	X	X	SP 121	1/2" x 2 3/16" Roller Springs	X	X	X	X
3-T-22	Table Trip Dog Holder (Right)	X	X	X	X	SP 190	3/16" x 5/8" Hardened and Ground Dowel	X	X	X	X
3-T-23	Table Trip Dog Holder (Left)	X	X	X	X	SP 190	3/16" x 1" Hardened and Ground Dowel	X	X	X	X
3-T-24	Table Trip Dog Hinge Pin (R. and L.)	X	X	X	X	SP 190	3/16" x 1 1/2" Hardened and Ground Dowel	X	X	X	X
3-T-26B	Table Way Dust Guard	X	X	X	-						
3-T-27B	Table Way Dust Guard End	X	X	X	X						

PLATE VI Parts for FEED UNITS, TABLE and SADDLE



## PLATE VII Line Drawing — TOP VIEW — GEAR CASE (inside)

### GEAR CASE

#### INSTRUCTIONS FOR REMOVAL FROM BED:—

Gear Case Servicing is extremely infrequent. However, where it is considered necessary to check the actions in this unit, first remove from the bed by following this procedure:—

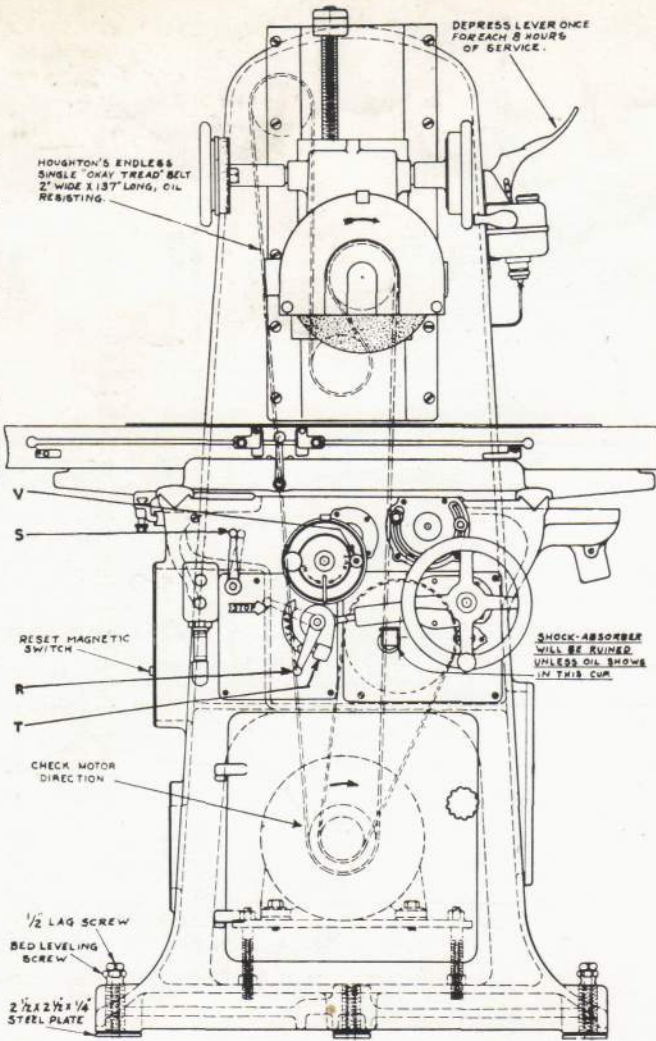
- 1st.** Remove Belt on Gear Case Pulley.
- 2nd.** Remove this Pulley.
- 3rd.** Remove Start and Stop Unit before attempting to remove Gear Case. This will greatly facilitate removal and replacement of Reserve Connecting Lever Link.
- 4th.** Remove Link Screw and move Reverse Connecting Link out of way. Caution: Take care not to permit shake proof Washer on this Reverse Connecting Link to drop into Gear Case.
- 5th.** Remove 4 Bolts in front of Gear Case.
- 6th.** Pull Gear Case forward and remove.

**Caution:** After replacement Check oil in Gear Case and maintain at Top Level.

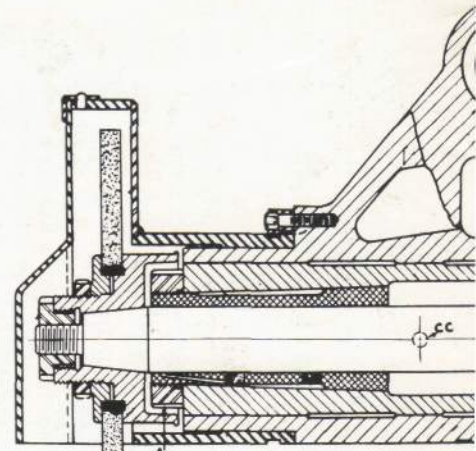




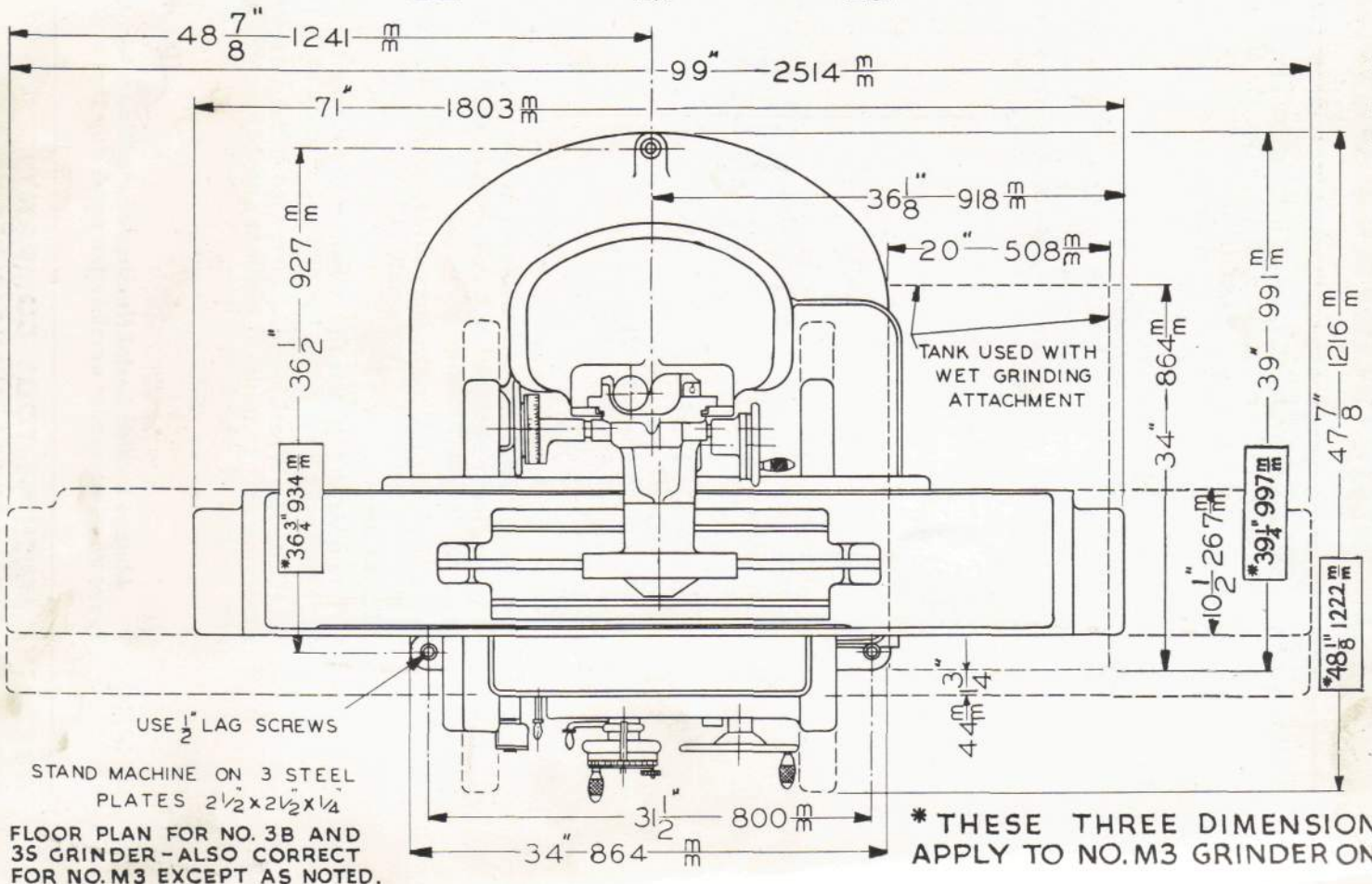
**TO START MACHINE:-** SET DOGS FOR PROPER LENGTH OF TABLE TRAVEL, START MOTOR, PULL UP LEVER "R" (WHICH STARTS TABLE), TURN HANDLE "V" COUNTER-CLOCKWISE TO FEED SADDLE TOWARD OPERATOR. SLIGHT MOVEMENT OF LEVER "S" TOWARD RIGHT STOPS AUTOMATIC TABLE TRAVEL. LEVER "R" SHOULD BE DOWN AGAINST "T" WHEN FEEDING TABLE BY HAND. BEFORE STARTING TABLE FOR THE FIRST TIME OR AFTER CHANGING OIL, BE SURE THE OIL IN GEAR BOX CUP IS HIGH AFTER GEAR BOX HAS RUN IDLE FOR FIVE MINUTES THE HIGH TABLE SPEED OF THIS MACHINE IS MADE POSSIBLE BY THE USE OF A SHOCK-ABSORBER. THIS SHOCK-ABSORBER WOULD SOON BE RUINED IF OPERATED WITHOUT OIL.



**SPINDLE SPEED**  
 2300 R.P.M. FOR 10" WHEEL EQUIP. (STD)  
 1920 R.P.M. FOR 12" WHEEL EQUIP. (SPECIAL)



**A**  
 TO ADJUST SPINDLE BOX FOR SLIGHT AND WEAR, TIGHTEN NUT "A". IF MORE ADJUSTMENT REQUIRED REMOVE BOX AND GRIND BOX L. THINNER FOR EACH .0003 LIFT OVER .001. CAN BE DETERMINED WITH A DIAL INDICATOR. WASH BOX AND SPINDLE IN GASOLINE, REASSEMBLE. AFTER READJUSTING, SHOULD BE .001 FOR AVERAGE SPINDLE OIL AND NOT LESS THAN .0007 FOR EXTRA LIGHT SPINDLE OIL. THE BALL BEARING SHOULD BE SUPER PRECISION.  
 TO ADJUST ELEVATING WORM WHEEL FOR WEAR, LOOSEN AND ADJUST ECCENTRIC BUSHING "H" BY TURNING "H" COUNTER-CLOCKWISE UNTIL BACKLASH IS TAKEN UP, THEN TIGHTEN.



USE 1/2" LAG SCREWS  
 STAND MACHINE ON 3 STEEL PLATES 2 1/2 X 2 1/2 X 1/4  
 FLOOR PLAN FOR NO. 3B AND 3S GRINDER - ALSO CORRECT FOR NO. M3 EXCEPT AS NOTED.

\* THESE THREE DIMENSIONS APPLY TO NO. M3 GRINDER ONLY.

## PLATE VIII Line Drawing — SIDE VIEW — GEAR CASE (inside)

The Gear Case Shock Absorber cushions both the shock of Table Reversal and the shock of the Starting Load.

Should machine apparently cease to cushion effectively at reversals and each change of direction be accompanied by a heavy knock, it is probable that oil has been permitted to run low or that the Valves in the Shock Absorber have become inoperative.

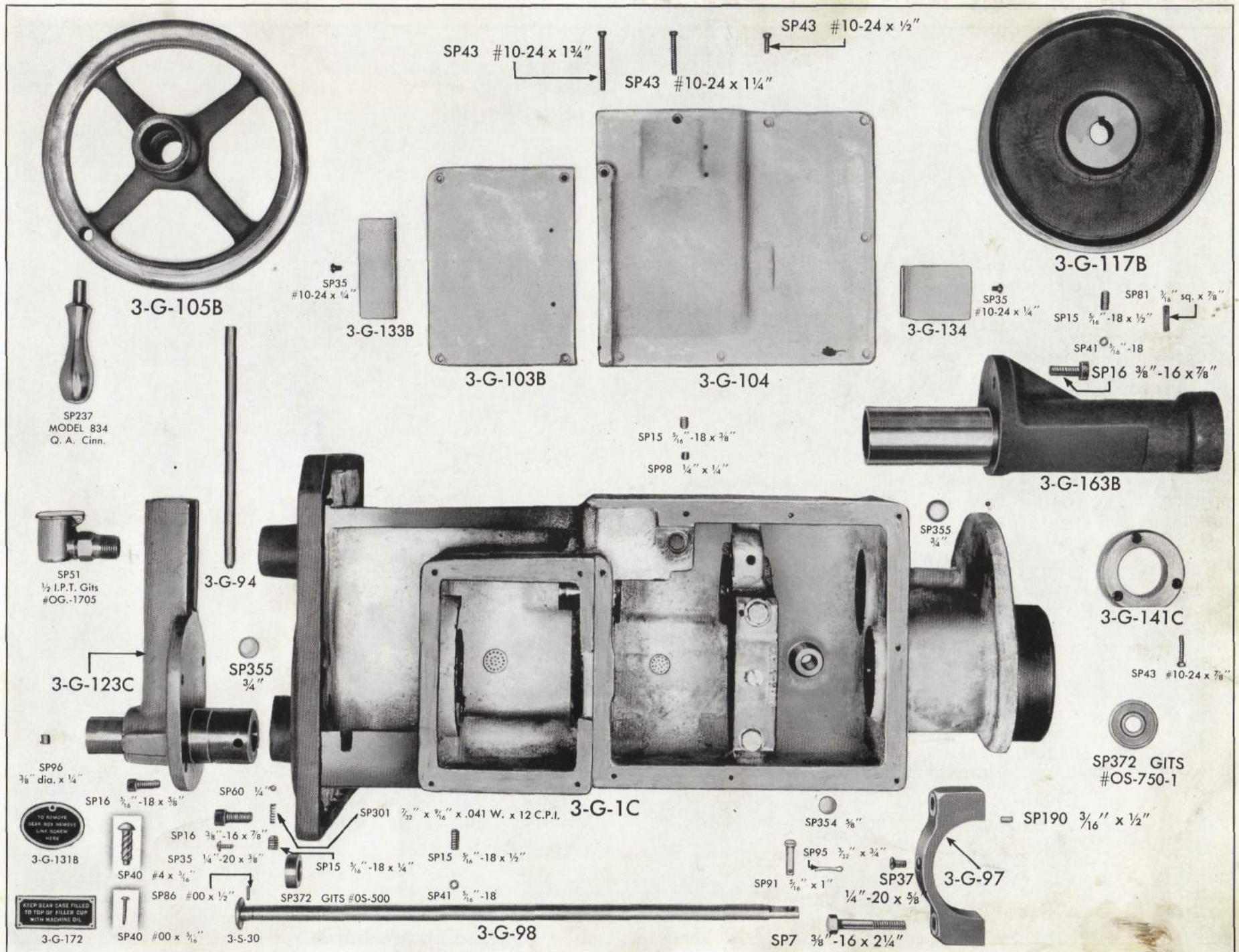
# ABRASIVE SURFACE GRINDERS

## Parts for GEAR CASE EXTERIOR

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-G-1C	Gear Box	X	X	X	X	SP 40	No. 00 x 5/16" Drive Screw	X	X	X	X
3-G-94	Hand Wheel Lock Pin	X	X	X	X	SP 40	No. 4 x 5/16" Drive Screw	X	X	X	X
3-G-97B	Bearing Cap	X	X	X	X	SP 41	5/16"—18 Hollow Lock Screw	X	X	X	X
3-G-98	Shifting Rod	X	X	X	X	SP 43	No. 10—24 x 1/2" Fillister Head Machine Screw	X	X	X	X
3-G-103B	Gear Box Front Cover	X	X	X	X	SP 43	No. 10—24 x 7/8" Fillister Head Machine Screw	X	X	X	X
3-G-104	Gear Box Rear Cover	X	X	X	X	SP 43	No. 10—24 x 1 1/4" Fillister Head Machine Screw	X	X	X	X
3-G-105B	Table Hand Wheel	X	X	X	X	SP 43	No. 10—24 x 1 3/4" Fillister Head Machine Screw	X	X	X	X
3-G-117B	Gear Box Pulley	X	X	-	-	SP 51	1/2 I.P.T. GITS No. OG-1705 Elbow Oil Cup	X	X	X	X
3-G-123C	Table Hand Wheel Bracket	X	X	X	X	SP 60	1/4" Steel Ball	X	X	X	X
3-G-131B	Link Screw Cover	X	X	X	X	SP 81	3/16 sq. x 7/8" Plain Key (Square)	X	X	X	X
3-G-133B	Gear Box Front Cover Baffle	X	X	X	X	SP 86	No. 00 x 1/2" Taper Pin	X	X	X	X
3-G-134	Gear Box Rear Cover Baffle	X	X	X	X	SP 91	5/16" x 1" Clovis Pin	X	X	X	X
3-G-141C	Drive Shaft Housing Cover	X	X	X	X	SP 95	3/32" x 3/4" Cotter Pin	X	X	X	X
3-G-163B	Gear Box Drive Shaft Housing	X	X	X	X	SP 96	3/8" dia. x 1/4" C.I. Plug	X	X	X	X
3-G-172	Gear Box Lub. Inst. Box	X	X	X	X	SP 98	1/4" x 1/4" Brass Plug	X	X	X	X
3-G-500	Gear Box Pulley (for 3S) See Plate XIV	-	-	X	-	SP 190	3/16" x 1/2" Hardened and Ground Dowel Pin	X	X	X	X
3-S-30	Shifter Knob	X	X	X	X	SP 237	Model 834 Q.A. Cinn. Smooth Machine Handle	X	X	X	X
SA-34-G-117B	Gear Box Pulley (for 34) See Plate XXVII	-	-	-	X	SP 301	7/32" x 9/16" x .041W. x 12 C.P.I. Compression Spring	X	X	X	X
SP 7	3/8"—16 x 2 1/4" Hex. Head Cap Screw	X	X	X	X	SP 354	5/8" Welsh Expansion Plug	X	X	X	X
SP 15	5/16"—18 x 1/4" Socket Set Screw	X	X	X	X	SP 355	3/4" Cupped Plug	X	X	X	X
SP 15	5/16"—18 x 3/8" Socket Set Screw	X	X	X	X	SP 372	GITS No. OS-500 Oil Seal	X	X	X	X
SP 15	5/16"—18 x 1/2" Socket Set Screw	X	X	X	X	SP 372	GITS No. OS-750-1 Oil Seal	X	X	X	X
SP 16	5/16"—18 x 5/8" Socket Cap Screw	X	X	X	X						
SP 16	3/8"—16 x 7/8" Socket Cap Screw	X	X	X	X						
SP 35	No. 10—24 x 1/4" Button Head Machine Screw	X	X	X	X						
SP 35	1/4"—20 x 3/8" Button Head Machine Screw	X	X	X	X						
SP 37	1/4"—20 x 5/8" Flat Head Machine Screw	X	X	X	X						

# PLATE IX Parts for GEAR CASE EXTERIOR



ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

# ABRASIVE SURFACE GRINDERS

## Parts for GEAR CASE INTERIOR

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

	3B	M3	3S	34			3B	M3	3S	34	
3-G-5D	Reverse Connecting Lever	X	X	X	X	3-G-121C	Table Hand Wheel Bushing Rear	X	X	X	X
3-G-6B	Rear Rvsg. Gear 56T, 12P—R.H. Spiral	X	X	X	X	3-G-122B	Table Hand Wheel Shaft 25 T, 16 P	X	X	X	X
3-G-9B	Shock Absorber Cover	X	X	X	X	3-G-124B	Table Hand Feed Gear 38 T, 16 P	X	X	X	X
3-G-10	Shock Absorber Case	X	X	X	X	3-G-126	Reversing Gear Pinion Key	X	X	X	X
3-G-11B	Shock Absorber Impeller	X	X	X	X	3-G-127	Hand Feed Idler Stud	X	X	X	X
3-G-12B	Shock Absorber Valve Guide	X	X	X	X	3-G-128	Hand Feed Idler 26 T, 16 P	X	X	X	X
3-G-13B	Shock Absorber Valve	X	X	X	X	3-G-129	Hand Feed Idler Bushing	X	X	X	X
3-G-14	Shock Absorber Spring	X	X	X	X	3-G-132	Shock Absorber Cover Bushing	X	X	X	X
3-G-15	Pinion Shaft Spacer	X	X	X	X	3-G-135	Rev. Conn. Lever Clevis	X	X	X	X
3-G-16	Spring Lever Pin	X	X	X	X	3-G-142B	Drive Shaft Housing Bushing	X	X	X	X
3-G-17	Shock Absorber Spring Pin	X	X	X	X	3-G-143	1 $\frac{5}{16}$ " OD x 1 $\frac{5}{16}$ " ID x 5 $\frac{1}{16}$ " Bushing	X	X	X	X
3-G-24B	Reverse Sliding Clutch	X	X	X	X	3-G-161	Intermediate Gear Spacer	X	X	X	X
3-G-25	Reversing Gear Clutch	X	X	X	X	3-G-164	Gear Box Drive Shaft	X	X	X	X
3-G-26B	Feed Driv. Gear 37 T, 12 P—R.H. Spiral	X	X	X	X	3-G-165	Front Rvsg. Gear 56T, 12P—R.H. Spiral	X	X	X	X
3-G-27	Feed Driv. Gear 49 T, 12 P—R.H. Spiral for 60 ft. P. M. replacing 3-G-26B	X	X	X	X	SP 5	1 $\frac{1}{4}$ "—20 x 1 $\frac{1}{2}$ " Fillister Head Cap Screw	X	X	X	X
3-G-31	Reversing Clutch Shoe	X	X	X	X	SP 15	1 $\frac{1}{4}$ "—20 x 3 $\frac{3}{8}$ " Socket Set Screw	X	X	X	X
3-G-48B	Clutch Shaft	X	X	X	X	SP 15	5 $\frac{1}{16}$ "—18 x 3 $\frac{3}{8}$ " Socket Set Screw	X	X	X	X
3-G-50	Reversing Clutch Lever	X	X	X	X	SP 15	5 $\frac{1}{16}$ "—18 x 1 $\frac{1}{2}$ " Socket Set Screw	X	X	X	X
3-G-53	Rev. Gear Clutch Bushing	X	X	X	X	SP 16	1 $\frac{1}{4}$ "—20 x 1" Socket Cap Screw	X	X	X	X
3-G-65B	Reversing Lever Hinge	X	X	X	X	SP 34	5 $\frac{1}{8}$ " dia. x 1 $\frac{3}{4}$ " Stripper Bolt	X	X	X	X
3-G-66B	Rev. Conn. Lever Screw	X	X	X	X	SP 37	1 $\frac{1}{4}$ "—20 x 5 $\frac{3}{8}$ " Flat Head Machine Screw	X	X	X	X
3-G-67B	Driving Gear 35 T, 12P—R.H. Spiral	X	X	X	X	SP 41	1 $\frac{1}{4}$ "—20 Hollow Lock Screw	X	X	X	X
3-G-68	Two Speed Clutch	X	X	X	X	SP 41	5 $\frac{1}{16}$ "—18 Hollow Lock Screw	X	X	X	X
3-G-69B	Driven Gear 47 T, 12 P—R.H. Spiral	X	X	X	X	SP 81	3 $\frac{1}{16}$ " sq. x 1 $\frac{3}{4}$ " Plain Key (Square)	X	X	X	X
3-G-70B	Quill Gear 21 T, 12 P and 33 T, 12 P— L.H. Spiral	X	X	X	X	SP 81	1 $\frac{1}{4}$ " sq. x 1 $\frac{1}{8}$ " Plain Key (Square)	X	X	X	X
3-G-71C	Table Hand Wheel Bush. Front	X	X	X	X	SP 82	No. 9 Woodruff Key	X	X	X	X
3-G-72B	Clutch Shaft Bushing	X	X	X	X	SP 85	No. 3 Dyett Key	X	X	X	X
3-G-73	Reversing Int. Gear Bushing	X	X	X	X	SP 85	No. 9 Dyett Key	X	X	X	X
3-G-79	Gear Case Clutch Bushing	X	X	X	X	SP 85	No. 13 Dyett Key	X	X	X	X
3-G-80	Impeller Ret. Spring Lever	X	X	X	X	SP 95	1 $\frac{1}{8}$ " x 3 $\frac{3}{4}$ " Cotter Pin	X	X	X	X
3-G-81	Driven Gear Bushing	X	X	X	X	SP 118	3 $\frac{3}{8}$ "—24 Hex. Nut	X	X	X	X
3-G-82	Two Speed Clutch Yoke	X	X	X	X	SP 103	1 $\frac{1}{4}$ "—20 Hex. Thin Nut	X	X	X	X
3-G-83B	Reversing Gear Pinion Shaft	X	X	X	X	SP 103	5 $\frac{1}{8}$ "—11 Hex. Thin Nut	X	X	X	X
3-G-85C	Reversing Gear Pinion 16 T, 12 P—R.H. and L.H. Spiral	X	X	X	X	SP 117	5 $\frac{1}{8}$ "—18 Drake Lock Nut (2 Piece)	X	X	X	X
3-G-86	Pinion Shaft Liner Front	X	X	X	X	SP 118	7 $\frac{1}{8}$ "—14 S.A.E. Nut	X	X	X	X
3-G-88B	Clutch Sleeve	X	X	X	X	SP 131	1 $\frac{1}{4}$ "—20 x 1" Headless Set Screw	X	X	X	X
3-G-89B	Clutch Shifting Lever Stud	X	X	X	X	SP 190	1 $\frac{1}{8}$ " x 7 $\frac{1}{8}$ " Hardened and Ground Dowel	X	X	X	X
3-G-91B	Reversing Int. Gear 22 T, 12 P—Spiral	X	X	X	X	SP 190	1 $\frac{1}{4}$ " x 1 $\frac{1}{2}$ " Hardened and Ground Dowel	X	X	X	X
3-G-92B	Intermediate Gear Stud	X	X	X	X	SP 204	2 $\frac{1}{32}$ " x 1 $\frac{3}{8}$ " x 3 $\frac{3}{32}$ " Beveled Washer	X	X	X	X
3-G-95	Pinion Shaft Bushing Front	X	X	X	X	SP 217	SKF No. 6204-Z Radial Ball Bearing	X	X	X	X
3-G-100B	Quill Gear Bushing	X	X	X	X	SP 217	ND No. 88505 Radial Ball Bearing	X	X	X	X
3-G-102	Clutch Shifting Lever	X	X	X	X	SP 353	7 $\frac{1}{16}$ " Type 12 — No. 1222 "Shakeproof" Lock Washer	X	X	X	X
3-G-108	Two Speed Clutch Sleeve	X	X	X	X	SP 353	7 $\frac{1}{8}$ " Type 12 — No. 1234 "Shakeproof" Lock Washer	X	X	X	X
3-G-120B	Pump	X	X	X	X	SP 355	3 $\frac{1}{4}$ " Cupped Plug	X	X	X	X
						SP 599	5 $\frac{1}{16}$ " O.D. x 10" Copper Tubing	X	X	X	X



# ABRASIVE SURFACE GRINDERS

## A. Parts for START AND STOP UNIT

(Sizes of Parts within Shaded Areas are shown in Double Proportion. White Lines designate Sub-Assemblies)

	3B	M3	3S	34			3B	M3	3S	34
3-B-35B	X	X	-	-	SP 16	1/4"—20 x 1 1/4" Socket Cap Screw	X	X	X	X
3-K-1B	X	X	X	X	SP 16	3/8"—16 x 3/4" Socket Cap Screw	X	X	X	X
3-K-2B	X	X	X	-	SP 86	No. 0 x 1" Taper Pin	X	X	X	X
3-K-3	X	X	X	X	SP 91	1/4" x 1" Clevis Pin	X	X	X	X
3-K-10B	X	X	X	X	SP 95	1/16" x 3/4" Cotter Pin	X	X	X	X
3-K-11	X	X	X	X	SP 100	1/4"—28 Castellated Nut	X	X	X	X
3-K-12B	X	X	X	X	SP 190	3/16" x 1 1/4" Hardened and Ground Dowel	X	X	X	X
3-K-13	X	X	X	X	SP 301	1 7/32" x 3/4" x .101W x 6 C.P.I. Compression Spring	X	X	X	X
3-K-17B	X	X	X	X	SP 301	1 9/32" x 1 3/8" x .067W x 5 C.P.I. Compression Spring	X	X	X	X
3-K-18	X	X	X	X	SP 599	5/32" x 3/4" Copper Tubing	X	X	X	X
3-K-22	X	X	X	X						
34-K-2	-	-	-	X						
SP 6	X	X	X	X						

## B. Parts for TABLE TRIP LEVER ASSEMBLY

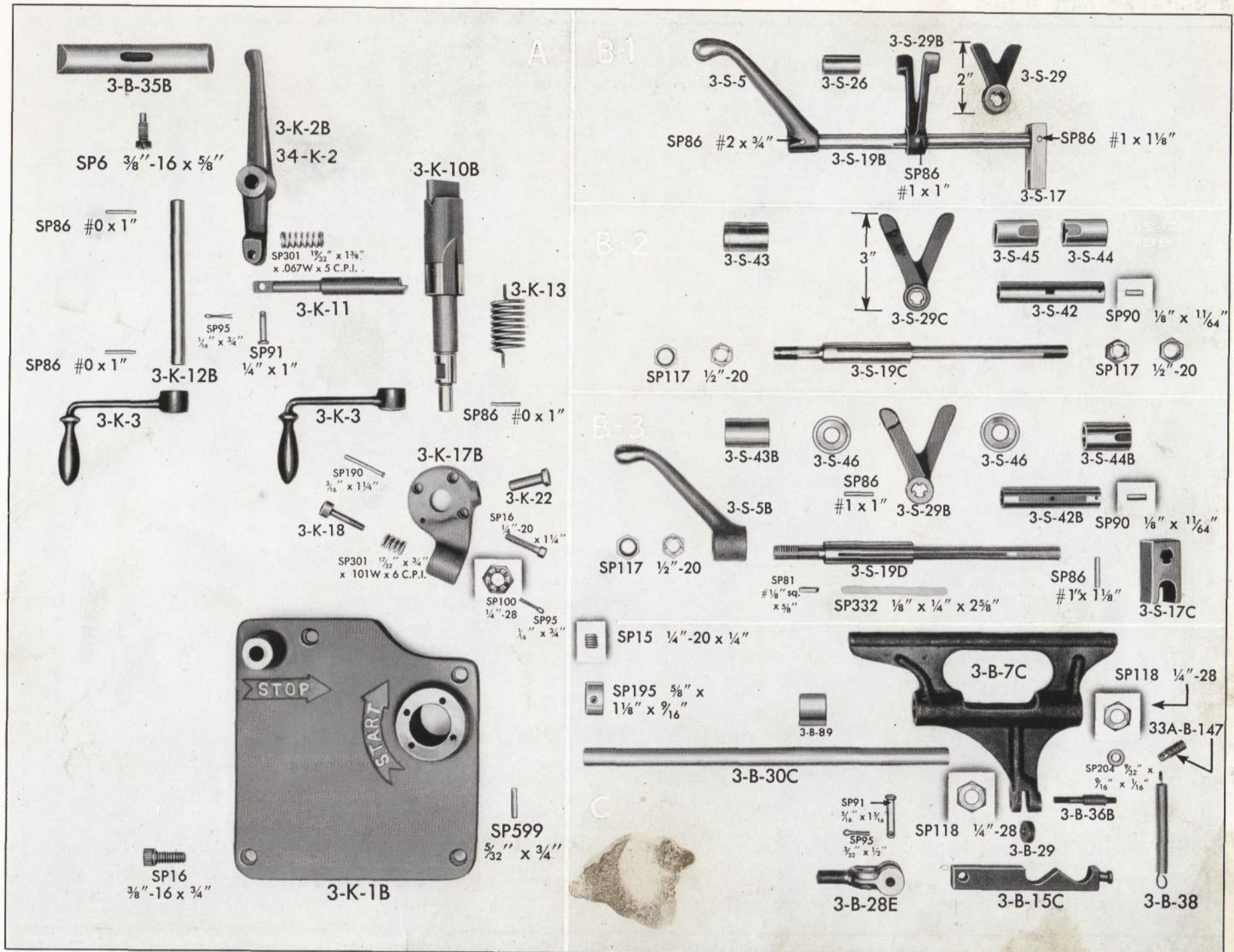
(B-1 and B-2 are Former Styles — B-3 is Revised)

	3B	M3	3S	34			3B	M3	3S	34
3-S-5	X	X	X	X	3-S-43	Front Trip Lever Shaft Bushing	X	-	X	X
3-S-5B	X	X	X	X	3-S-43B	Front Trip Lever Shaft Bushing	X	X	X	X
3-S-17	X	X	X	X	3-S-44	Rear Trip Lever Shaft Bushing	X	-	X	X
3-S-17B	X	-	X	X	3-S-44B	Rear Trip Lever Shaft Bushing	X	X	X	X
3-S-17C	X	X	X	X	3-S-45	Rear Trip Lever Shaft Bushing	X	-	X	X
3-S-19B	X	X	X	X	3-S-46	Trip Lever Dust Cap	X	X	X	X
3-S-19C	X	-	X	X	SP 81	No. 1/8" sq. x 5/8" Plain Key (Square)	X	X	X	X
3-S-19D	X	X	X	X	SP 86	No. 1 x 1" Taper Pin	X	X	X	X
3-S-26	X	X	X	-	SP 86	No. 1 x 1 1/8" Taper Pin	X	X	X	X
3-S-29	X	X	X	X	SP 86	No. 2 x 3/4" Taper Pin	X	X	X	X
3-S-29B	X	X	X	X	SP 90	1/8" x 1 1/64" Straight Pin	X	X	X	X
3-S-29C	X	-	X	X	SP 117	1/2"—20 Drake Lock Nut (2 Pieces— 1 Lock)	X	X	X	X
3-S-42	X	X	X	X	SP 332	1/8" x 1/4" x 2 5/8" Felt Strip	X	X	X	X
3-S-42B	X	X	X	X						

## C. Parts for REVERSE LOCK LEVER ASSEMBLY

	3B	M3	3S	34			3B	M3	3S	34
3-B-7C	X	X	X	X	33A-B-147	Reverse Spring Adjusting Screw	X	X	X	X
3-B-15C	X	X	X	X	SP 15	1/4"—20 x 1/4" Socket Set Screw	X	X	X	X
3-B-28E	X	X	X	X	SP 91	5/16" x 1 5/16" Clevis Pin	X	X	X	X
3-B-29	X	X	X	X	SP 95	3/32" x 1/2" Cotter Pin	X	X	X	X
3-B-30C	X	X	X	X	SP 118	1/4"—28 S.A.E. Nut	X	X	X	X
3-B-36B	X	X	X	X	SP 195	5/8" x 1 1/8" x 9/16" Die Cast Shaft Collar	X	X	X	X
3-B-38	X	X	X	X	SP 204	9/32" x 9/16" x 1/16" Beveled Corner Washers (hard)	X	X	X	X
3-B-89	X	X	X	X						

**PLATE XI Parts for START & STOP UNIT, TRIP LEVER and REVERSE LOCK LEVER ASSEMBLIES**



**ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS**



# ABRASIVE SURFACE GRINDERS

## DOORS — COVERS — MOTOR MOUNTINGS, ETC.

(Size of Part within Shaded Area is in Double Proportion or 1/2 Size. White Lines segregate Sub-Assemblies.

A (Doors) and B (Motor Mountings) are shown in One-Half Proportion or 1/8 Size)

		3B	M3	3S	34			3B	M3	3S	34
3-B-10	Bed Door (for 3B)	X	-	-	-	34-M-6	Motor Platform Adjusting Screw	-	-	-	X
3-B-32C	Upper and Lower Rear Bed Cover	X	-	X	X	M3-B-8	Rear Bed Cover	-	X	-	-
3-B-69B	Bed Leveling Screw	X	X	X	X	M3-B-9	Bed Door (for M3)	-	X	-	-
3-B-71	Switch Compartment Cover (For G.E. Switch Only)	X	X	X	X	SA-3-B-108	Switch Reset Rod Sub-Assembly	X	X	X	X
3-B-82B	Switch Box Shield	X	X	X	X	SA-3-B-112	Door Knob and Cam Sub-Assembly	X	X	X	X
3-B-85C	Exhauster Hole Cover	X	X	X	X	SP 23	1/2"—13 x 1 3/8" Door Hinge	X	X	X	X
3-B-88	Rear Bed Cover Spring	X	X	X	X	SP 35	No. 10—24 x 1/4" Button Head Machine Screw	X	X	X	X
3-B-94	Oil Drain Tank	X	X	-	X	SP 35	No. 10—24 x 3/8" Button Head Machine Screw	X	X	X	X
3-B-107	Switch Compartment Cover (for other than GE Switch)	X	X	X	X	SP 35	No. 10—24 x 1/2" Button Head Machine Screw	X	X	X	X
3-B-108	Switch Compartment Rod (shown in S-A-3B-108)	X	X	X	X	SP 35	5/16"—18 x 1/2" Button Head Machine Screw	X	X	-	X
3-B-111	Door Knob Cam	X	X	X	X	SP 101	5/8"—11 Hex. Nut	X	X	X	X
3-B-112	Door Knob Cam Stud (shown in S-A-3B-112)	X	X	X	X	SP 101	3/4"—10 Hex. Nut	X	X	X	X
3-B-113	Door Knob Cam Stud (long)	X	X	X	X	SP 103	1/2"—13 Hex. Thin Nut	X	X	X	X
3-B-523	Bed Door (for 3S)	-	-	X	-	SP 190	3/8" x 1 1/2" Harden and Ground Dowel Pin	X	X	X	X
3-M-55B	Motor Platform	X	X	X	-	SP 208	1 7/32" x 1 1/16" Beveled Corner Steel Washer	X	X	X	X
3-M-58C	Motor Platform Adjusting Screw	X	X	X	X	SP 519	1/8 I.P.T. Square Head Pipe Plug	X	X	-	X
34-B-15	Bed Door (for 34)	-	-	-	X						
34-M-1B	Motor Platform	-	-	-	X						



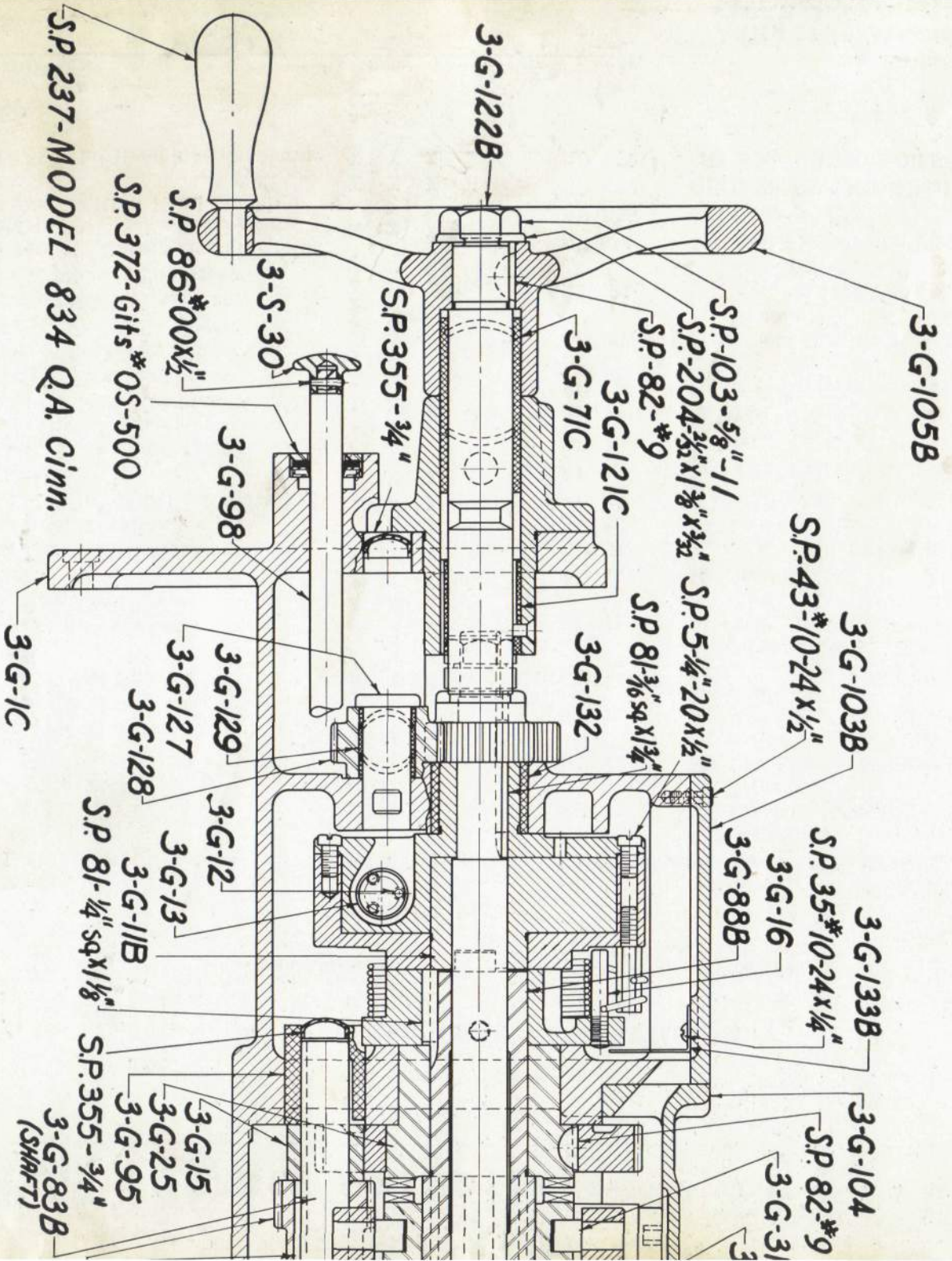
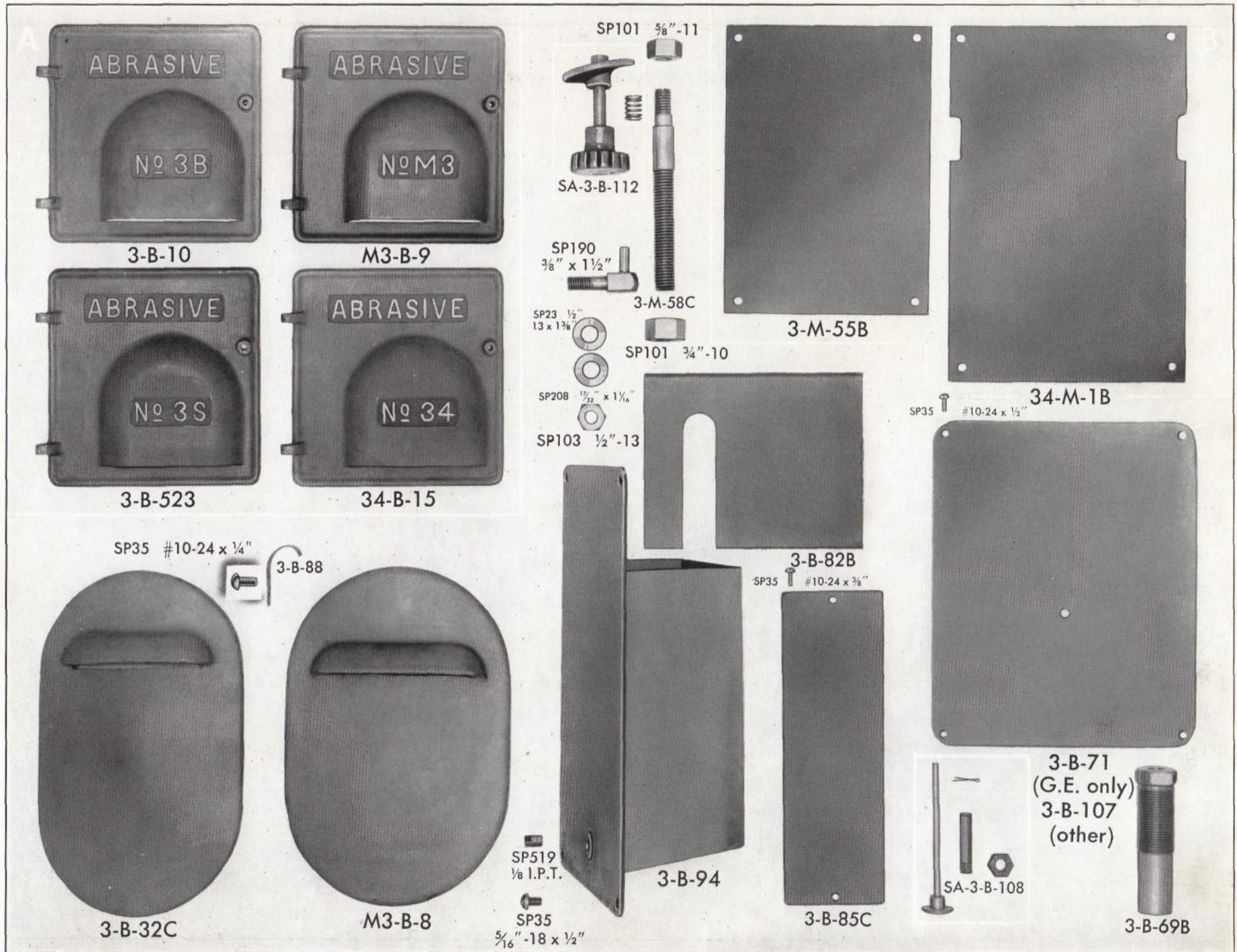


PLATE XII DOORS, COVERS, MOTOR MOUNTINGS, ETC.



ABRASIVE  
No 3B

3-B-10

ABRASIVE  
No M3

M3-B-9

ABRASIVE  
No 3S

3-B-523

ABRASIVE  
No 34

34-B-15

3-B-32C

M3-B-8

SP101 5/8"-11  
SA-3-B-112

SP190 3/8" x 1 1/2"  
3-M-58C  
SP23 1/2" 13 x 1 3/8"  
SP101 3/4"-10  
SP208 1 1/2" x 1 1/8"  
SP103 1/2"-13

3-M-55B

34-M-1B

3-B-82B  
3-B-85C

SP519 1/8 I.P.T.  
SP35 5/16"-18 x 1/2"

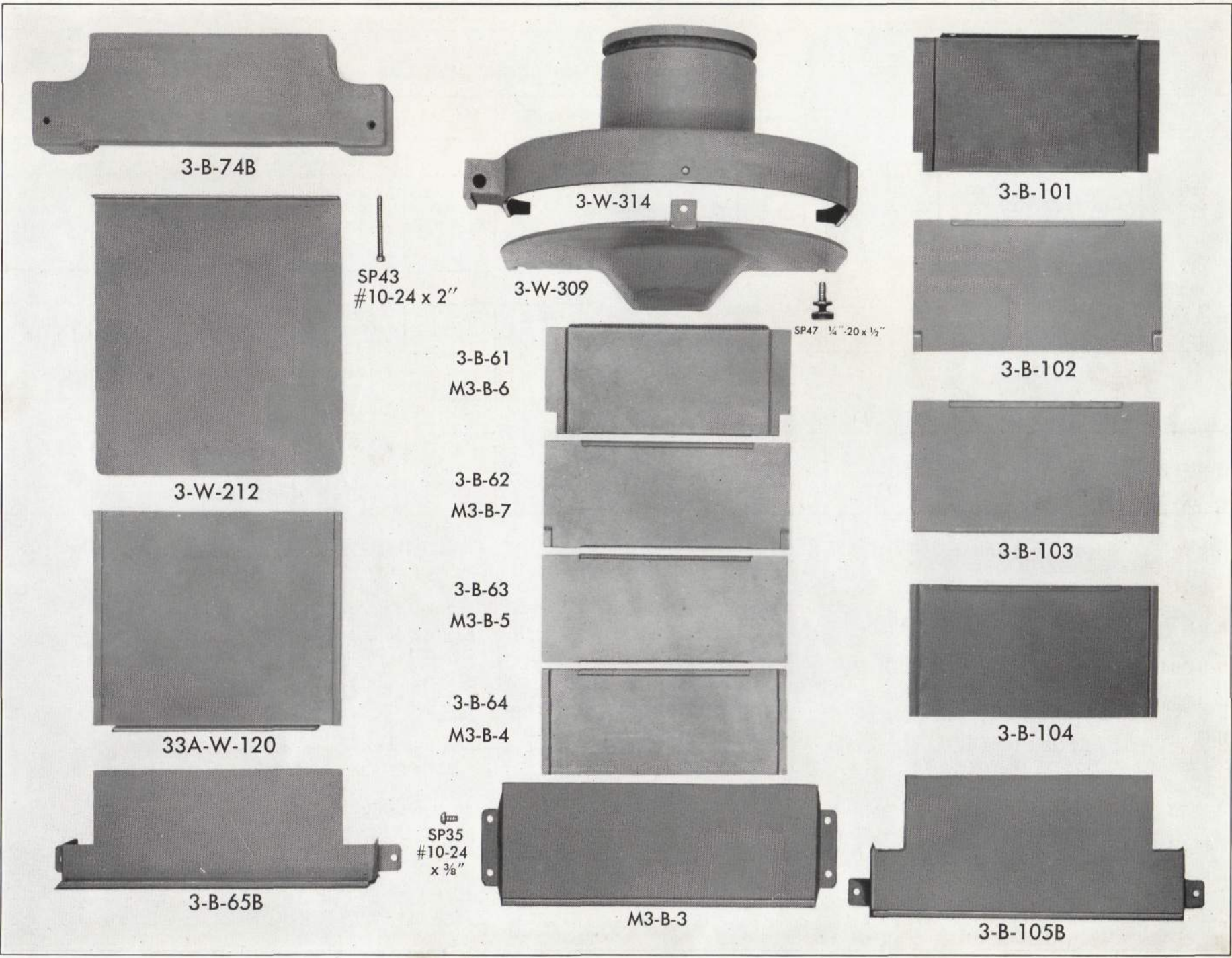
3-B-71 (G.E. only)  
3-B-107 (other)  
3-B-69B

# ABRASIVE SURFACE GRINDERS

## GUARDS

		3B	M3	3S	34			3B	M3	3S	34
3-B-61	Column Way Guard (1st.)	X	-	X	-	3-W-226	Tel. Dust Guard Slide (12½" high) (replaces 3-W-212)				3B High Col. only
3-B-62	Column Way Guard (2nd.)	X	-	X	-	3-W-309	10" Wheel Guard Cover	X	-	X	-
3-B-63	Column Way Guard (4th.)	X	-	X	-	3-W-314	10" Steel Wheel Guard	X	-	X	-
3-B-64	Column Way Guard (3rd.)	X	-	X	-	33A-W-120	Tel. Dust Guard Body	X	X	X	X
3-B-65B	Column Way Guard (5th.)	X	-	X	-	M3-B-3	Column Way Guard (5th.)	-	X	-	-
3-B-74B	Column Top Cover	X	X	X	X	M3-B-4	Column Way Guard (4th.)	-	X	-	-
3-B-101	Column Way Guard (1st.)	-	-	-	X	M3-B-5	Column Way Guard (3rd.)	-	X	-	-
3-B-102	Column Way Guard (2nd.)	-	-	-	X	M3-B-6	Column Way Guard (1st.)	-	X	-	-
3-B-103	Column Way Guard (4th.)	-	-	-	X	M3-B-7	Column Way Guard (2nd.)	-	X	-	-
3-B-104	Column Way Guard (3rd.)	-	-	-	X	SP 35	No. 10—24 x ⅜" Button Head Machine Screw	X	X	X	X
3-B-105B	Column Way Guard (5th.)	-	-	-	X	SP 43	No. 10—24 x 2" Fillister Head Machine Screw	X	X	X	X
3-T-7B	Table Dust Guard (shown on left end of table—photograph plates, I & XVII)	X	X	X	-	SP 47	¼"—20 x ½" Knurled Shoulder Screw	X	X	X	-
3-W-212	Tel. Dust Guard Slide (9" high)	X	X	X	X						

PLATE XIII GUARDS



# ABRASIVE SURFACE GRINDERS

## BELTS for ABRASIVE SURFACE GRINDERS

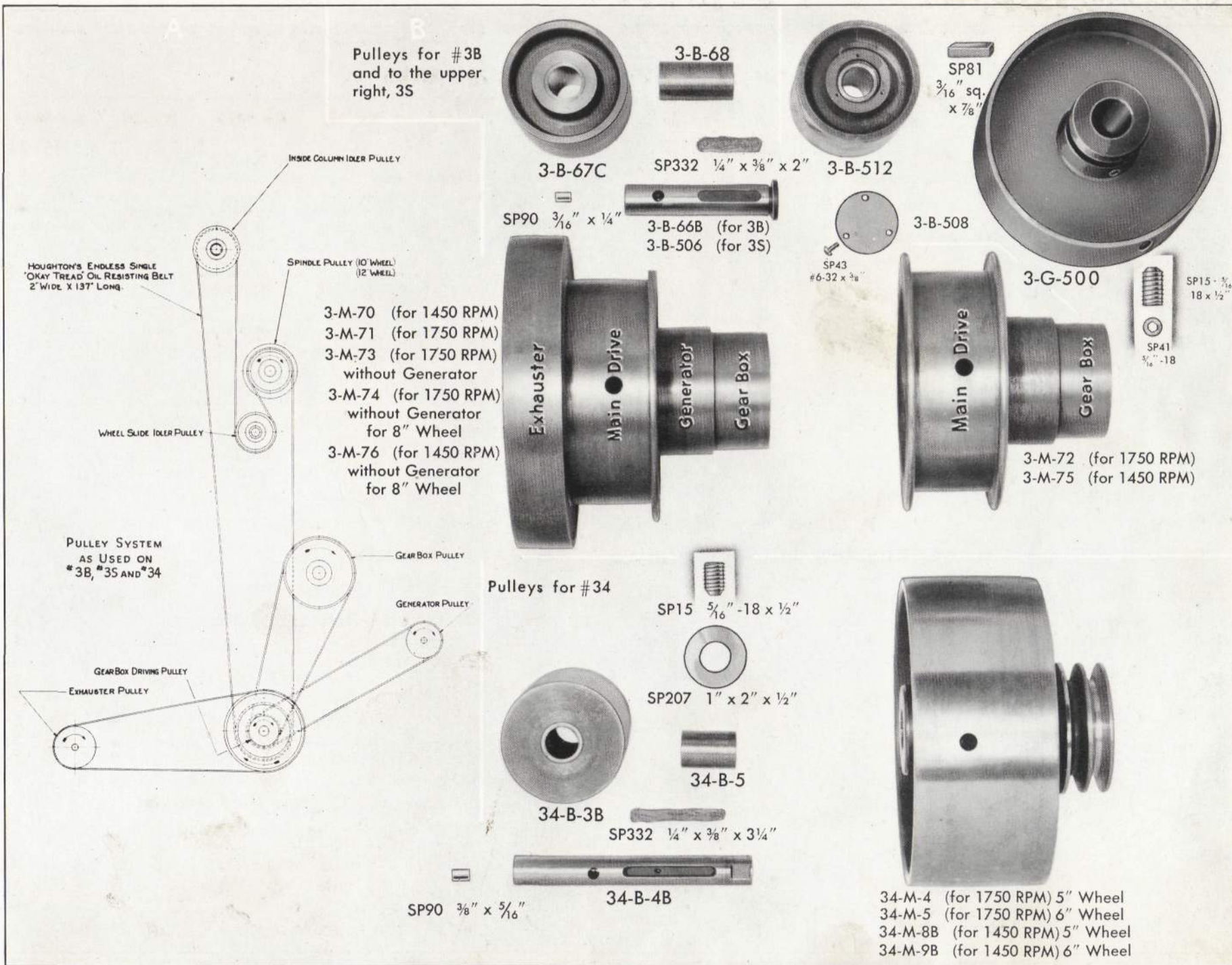
R.P.M. and Cycle	No. 3B	No. M3 No. M34	No. 3S	No. M3S	No. 34	No. 3B	No. M3	No. 3S	No. M3S	No. 34	No. M34
MAIN BELT						GENERATOR BELT					
For 1750 RPM (60 cycle operation)	SP 346 2" x 142"	None	SP 346 2" x 142"	None	SP 346 For 5" Wheel 3 1/2" x 155 1/2" For 6" Wheel 3 1/2" x 153"	SP 347 1 1/4" x 54" or 55" endless single leather belt	Must use Motor Generator	Must use Motor Generator	Must use Motor Generator	SP 349 Dayton Vee Belt No. AR-46	Must use Motor Generator
For 1450 RPM (50 and 25 cycle operation)	SP 346 2" x 142"	None	SP 346 2" x 142"	None	For 5" Wheel 3 1/2" x 158 1/2" For 6" Wheel 3 1/2" x 155 1/2"	DUST EXHAUSTER BELT					
						SP 347 1 1/4" x 53" to 55" endless single leather belt	Must use MOTORIZED Exhauster	SP 347 1 1/4" x 53" to 55" endless single leather belt	Must use MOTORIZED Exhauster	Not Used	Not Used
GEAR BOX BELT						OIL LUBRICATING PUMP BELT					
Same regardless of cycle	SP 347 1" x 44 1/4" single leather belt	SP 349 Dayton AR-53	SP 347 1" x 44 1/4" single leather belt	SP 349 Dayton AR-53	SP 349 Dayton Vee Belt No. AR-42	None	None	SP 349 Dayton Vee OMO-26	SP 349 Dayton Vee OMO-26	SP 349 Dayton Vee Belt No. AR26	None

## PULLEYS ETC. for ABRASIVE SURFACE GRINDERS

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-B-66B	Column Idler Stud (for 3B)	X	-	-	-	34-B-3B	Column Idler Pulley	-	-	-	X
3-B-67C	Column Idler Pulley	X	-	-	-	34-B-4B	Column Idler Stud	-	-	-	X
3-B-68	Column Idler Bushing	X	-	X	-	34-B-5	Column Idler Bushing	-	-	-	X
3-B-506	Column Idler Stud (for 3S)	-	-	X	-	34-M-4	Motor Pulley (for 1750 RPM) 5" Wheel	-	-	-	X
3-B-508	Column Idler Pulley Cover	-	-	X	-	34-M-5	Motor Pulley (for 1750 RPM) 6" Wheel	-	-	-	X
3-B-509	Column Idler Stud Collar	-	-	X	-	34-M-8B	Motor Pulley (for 1450 RPM) 5" Wheel	-	-	-	X
3-B-512	Column Idler Pulley	-	-	X	-	34-M-9B	Motor Pulley (for 1450 RPM) 6" Wheel	-	-	-	X
3-G-500	Gear Box Pulley (for 3S)	-	-	X	-	SP 15	5/16" - 18 x 1/2" Socket Set Screw	X	-	X	X
3-M-70	Motor Pulley (for 1450 RPM)	X	-	X	-	SP 41	5/16" - 18 Hollow Lock Screw	-	-	X	-
3-M-71	Motor Pulley (for 1750 RPM)	X	-	X	-	SP 43	No. 6 - 32 x 3/8" Fillister Head Machine Screw	-	-	X	-
3-M-72	Motor Pulley (for 1750 RPM)	X	-	X	-	SP 90	3/16" x 1/4" Straight Pin	X	-	X	-
3-M-73	Motor Pulley (for 1750 RPM) without Generator	X	-	X	-	SP 90	3/8" x 5/16" Straight Pin	-	-	-	X
3-M-74	Motor Pulley (for 1750 RPM) without Generator, for 8" Wheel	X	-	X	-	SP 207	1" x 2" x 1/2" Countershaft Collar	-	-	-	X
3-M-75	Motor Pulley (for 1450 RPM)	X	-	X	-	SP 332	1/4" x 3/8" x 2" Felt Strip	X	-	X	-
3-M-76	Motor Pulley (for 1450 RPM) without Generator, for 8" Wheel	X	-	X	-	SP 332	1/4" x 3/8" x 3 1/4" Felt Strip	-	-	-	X

PLATE XIV BELTING DIAGRAM, PULLEYS, ETC.



Pulleys for #3B and to the upper right, 3S

HOUGHTON'S ENDLESS SINGLE OKAY TREAD OIL RESISTING BELT 2' WIDE X 137' LONG.

PULLEY SYSTEM AS USED ON #3B, #3S AND #34

- 3-M-70 (for 1450 RPM)
- 3-M-71 (for 1750 RPM)
- 3-M-73 (for 1750 RPM) without Generator
- 3-M-74 (for 1750 RPM) without Generator for 8" Wheel
- 3-M-76 (for 1450 RPM) without Generator for 8" Wheel

Pulleys for #34

- 34-M-4 (for 1750 RPM) 5" Wheel
- 34-M-5 (for 1750 RPM) 6" Wheel
- 34-M-8B (for 1450 RPM) 5" Wheel
- 34-M-9B (for 1450 RPM) 6" Wheel



# ABRASIVE SURFACE GRINDERS

## A. Parts for ELECTRICAL CONTROLS

		3B	M3	3S	34			3B	M3	3S	34
3-B-72B	Magnetic Chuck Switch Bracket.....	X	X	X	-	SP 863	(Open type) Automatic Switch (State				
3-B-86	Switch Compartment Liner (not shown)	X	X	X	X		Make, Voltage, Phase and Cycles).....	X	X	X	X
SP 35	1/4"—20 x 5/8" Button Head Machine Screw .....	X	X	X	-	SP 874	1/2" x 2" Conduit .....	-	X	-	-
SP 502	1/2" Close Nipple .....	X	X	X	X	SP 874	1/2" x 8" Conduit .....	-	X	-	-
SP 861	Push Button Station .....	X	X	X	X	SP 874	1/2" x 10 3/4" Conduit .....	X	-	X	X
SP 862	Chuck Switch (Magnetic) .....	X	X	X	X	SP 879	1/2" Elbow Condulet .....	X	X	X	X
SP 863	(Closed Type) Automatic Switch (State Make, Voltage, Phase and Cycles).....	-	X	-	-	SP 880	1/2" Side Outlet Elbow Condulet .....	-	X	-	-

## B. Parts for GENERATOR ATTACHMENT

(Size of Part within Shaded Area is in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-L-9	Generator Bracket .....	X	-	X	X	SP 15	3/8"—16 x 1/2" Socket Set Screw.....	X	-	X	X
3-L-10	Generator Pulley (on 3B) for 1725 RPM General Electric Generator .....	X	-	X	-	SP 35	1/4"—20 x 3/8" Button Head Machine Screw .....	X	-	X	X
3-L-12	Belt Guard .....	X	-	X	X	SP 208	1 1/32" x 3/4" x 1/16" Beveled Corner Steel Washer .....	X	-	X	X
3-L-13	Generator Pulley (on 3B) for 1725 RPM Westinghouse Generator .....	X	-	X	-	SP 213	5/8" x 1 5/8" x 1/8" Leather Washer.....	X	-	X	X
34-L-10	Generator Pulley (on 34) for 1725 RPM Westinghouse Generator .....	-	-	-	X	SP 347	Leather Belt .....	X	-	X	X
34-L-11	Generator Pulley (on 34) for 1725 RPM General Electric Generator .....	-	-	-	X	SP 878	Generator .....	X	*	X	X
SP 7	5/16"—18 x 1" Hex. Head Cap Screw.....	X	-	X	X	*M-3 Grinders use Motor Generator Sets and Motorized Dust Ex- hausters. When ordering electrical spares, state make and volt- age characteristics of your equipment.					

VOLTAGE CONN. FOR MAG. CHUCKS

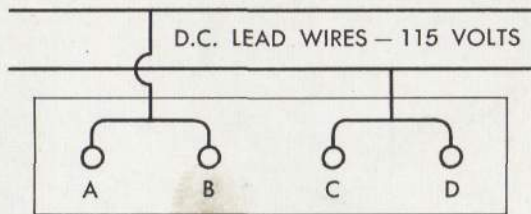


FIGURE 1 - SERIES-PARALLEL CONNECTIONS FOR 115 VOLTS

Connect Terminals A and B together to one lead wire.  
Connect Terminals C and D together to other lead wire.

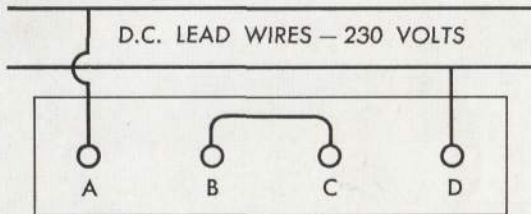
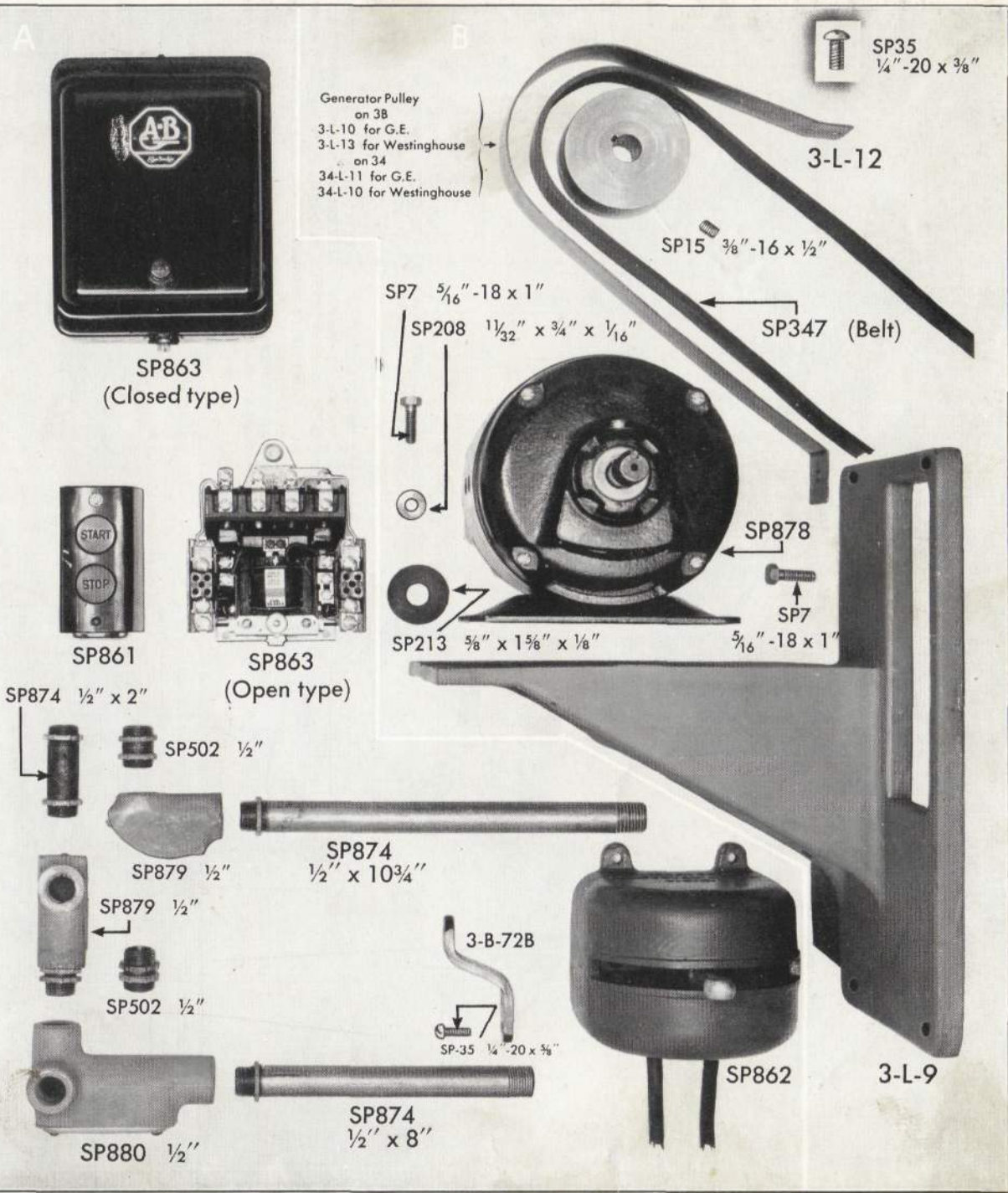


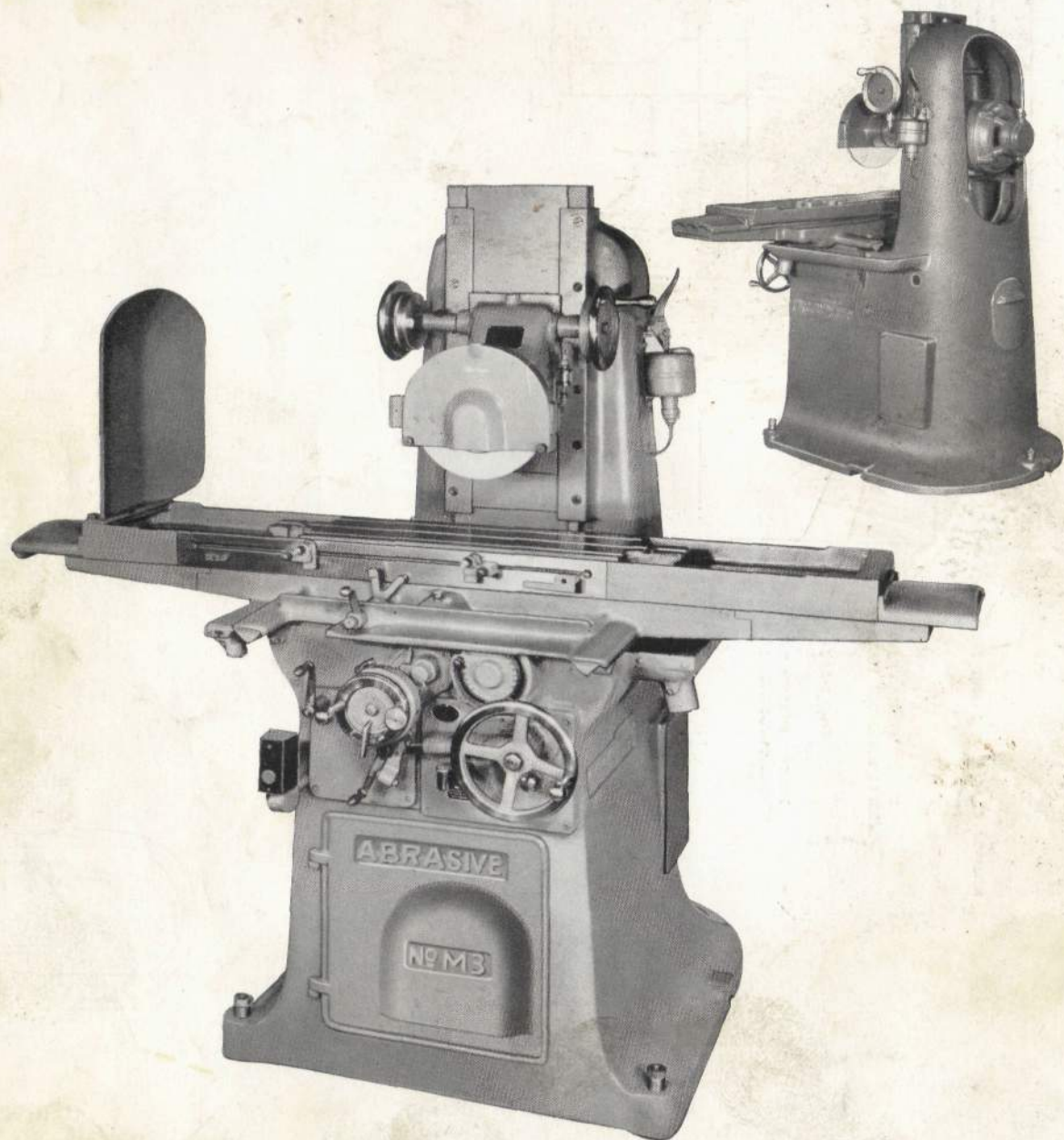
FIGURE 2 - SERIES CONNECTIONS FOR 230 VOLTS

Connect Terminals B and C together.  
Connect Terminal A to one lead wire,  
Terminal D to other.



# ABRASIVE SURFACE GRINDERS

PLATE XVI General Instruction Line Drawing of No. M3 MOTORIZED HORIZONTAL SPINDLE SURFACE GRINDER (inside)



## SPECIFICATIONS:

### Capacity:

Longitudinal .....	24"
Transverse .....	8"
Vertical .....	12" only

### Work Table:

Work Surface .....	24" x 8"
Overall .....	59" x 10½"

### Table Speeds per Minute:

Standard 20 ft. and 40 ft. Pick off gears may be furnished at extra cost to give 30 ft. and 60 ft. speeds.

Floor Space .....	98" x 48"
Height .....	72"

**Drive:** Motor on Spindle 2 HP, 1750 RPM precision balanced statically, dynamically and electrically. ½ HP Motor for Power Feeds.

**Wheels:** Standard — 12" diam. x ¾" thick x 3" hole.

**Spindle Assembly:** Completely Removable Motorized Spindle Cartridge Type.

**Spindle:** Alloy Steel — Three Bearings — Heavy Plain Phosphor Bronze in Front, Super-Precision Ball Bearings at Center and Rear.

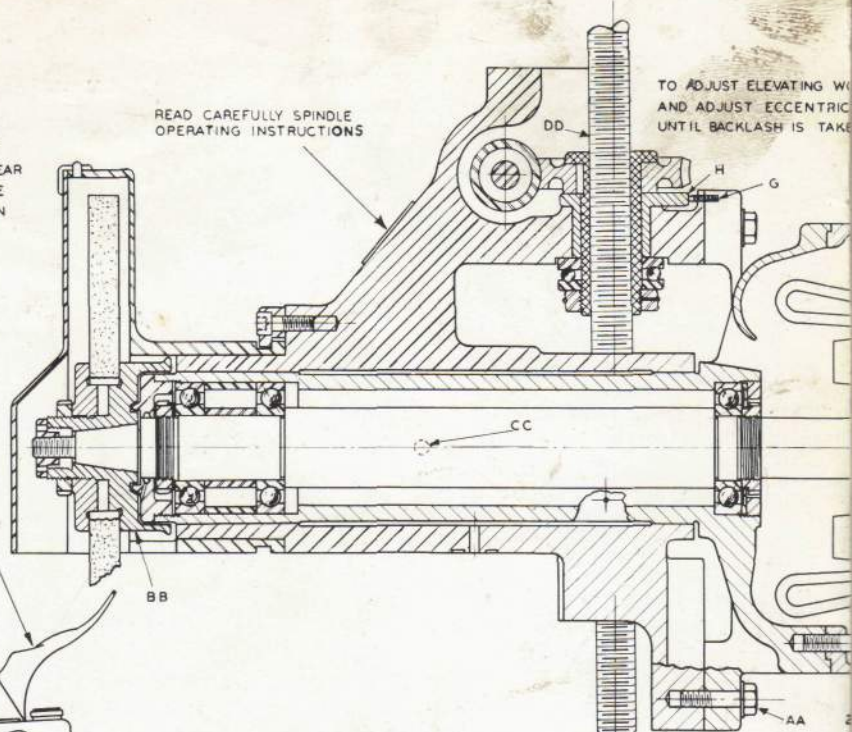
Weight — Net .....	2565 lbs.
Crated (domestic) .....	2805 lbs.
Boxed for Export .....	3135 lbs.
Boxed with Wet Attachment .....	3445 lbs.

TO START MACHINE;- SET DOGS FOR PROPER LENGTH OF TABLE TRAVEL, START MOTOR IN BASE, PULL UP LEVER "R" (WHICH STARTS TABLE), TURN HANDLE "V" COUNTER CLOCKWISE TO FEED SADDLE TOWARD OPERATOR. SLIGHT MOVEMENT OF LEVER "S" TOWARD RIGHT STOPS AUTOMATIC TABLE TRAVEL. LEVER "R" SHOULD BE DOWN AGAINST "T" WHEN FEEDING TABLE BY HAND. BEFORE STARTING TABLE FOR THE FIRST TIME OR AFTER CHANGING OIL BE SURE THE OIL IN GEAR BOX CUP IS HIGH AFTER GEAR BOX HAS RUN IDLE FOR FIVE MINUTES. THE HIGH TABLE SPEED OF THIS MACHINE IS MADE POSSIBLE BY THE USE OF A SHOCK ABSORBER. THE SHOCK ABSORBER WILL SOON BE RUINED IF OPERATED WITHOUT OIL.

**LUBRICATION-**

SPINDLE BEARINGS REQUIRE A LIGHT SPINDLE OIL-APPROXIMATELY 100 SECONDS SAYBOLDT AT 100° F. DO NOT USE MACHINE OIL. PUT OIL IN SIGHT FEED OILER. ADJUST TO ONE DROP ABOUT EVERY FIVE MINUTES.  
KEEP GEAR CASE FILLED TO TOP OF FILLER CUP WITH A RELIABLE MACHINE OIL HAVING VISCOSITY OF APPROXIMATELY 400 SECONDS SAYBOLDT AT 100° F.

PRESS LEVER ONCE FOR EACH 8 HOURS OF SERVICE.

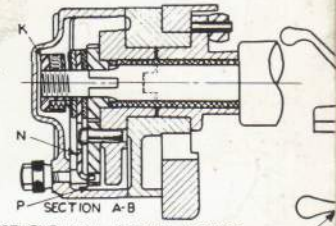
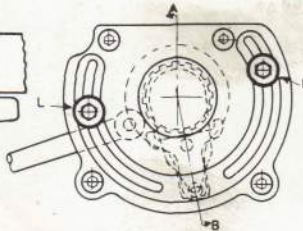
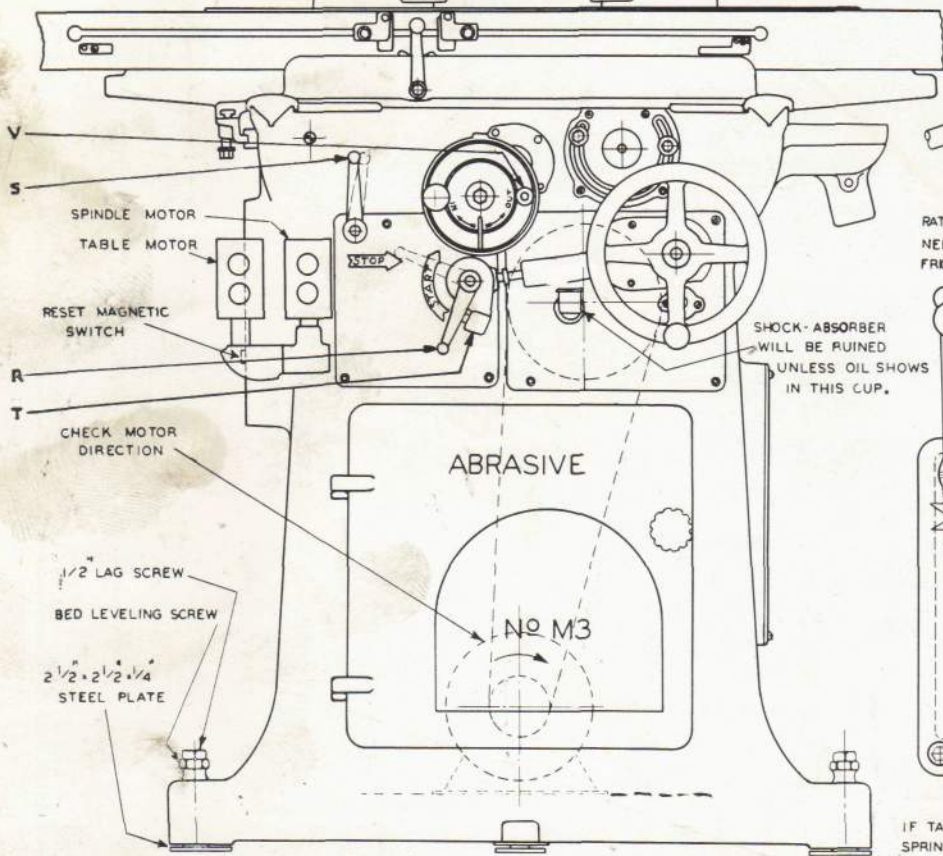


READ CAREFULLY SPINDLE OPERATING INSTRUCTIONS

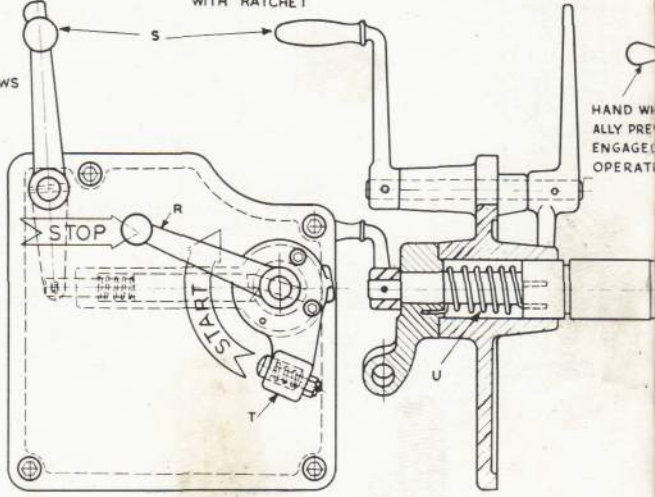
TO ADJUST ELEVATING WHEEL AND ADJUST ECCENTRIC UNTIL BACKLASH IS TAKEN

TO REPLACE OR INSPECT SPINDLE BEARINGS, REMOVE SPINDLE CARTRIDGE ASSEMBLY BY REMOVING OIL PIPE "CC", FOUR CAP SCREWS "AA" AND WHEEL SLEEVE ASSEMBLY "BB", THEN LOWER WHEEL HEAD UNTIL CARTRIDGE CLEARS ELEVATING SCREW "DD".

FRICITION DOES NOT DRIVE CROSS FEED MECHANISM. THE FRICITION IS MERELY TO ALTERNATELY THE RIGHT AND LEFT END OF PAWL. THE RATCHET DRIVES PAWL. SHOULD BE EQUIDISTANT FROM "B" TO GIVE EQUAL FEED AT EACH REVERSAL OF TABLE. IMPORTANT CAUTION: DO NOT ADJUST PAWL DOGS "L" WHILE MACHINE IS BEING OPERATED AUTOMATICALLY. THIS RATCHET FEED OPERATES THE AUTOMATIC CROSSFEED ON HORIZONTAL SPINDLE MACHINES AND POWER DOWN FEED ON NO. 34 VERTICAL GRINDER.



RATCHET FEED SHOULD REQUIRE NO ADJUSTMENT UNTIL LEATHER WASHERS NEED REPLACING. SPRINGS IN NUT "K" AUTOMATICALLY PRODUCE SUFFICIENT FRICTION ON PAWL OPERATING FINGER "N" TO THROW PAWL "P" INTO ENGAGEMENT WITH RATCHET



IF TABLE DOES NOT STOP WHEN LEVER "S" IS PUSHED TOWARD THE RIGHT, REMOVE LEVER SPRING TENSION SLEEVE "T" AND SPRING "U", NOTING IN WHICH HOLE END OF SPRING IS ADVANCE END OF SPRING ONE HOLE CLOCKWISE AND REPLACE PARTS AS BEFORE. THIS START AND STOP UNIT IS THE SAME ON NOS. 3B, M3, 3S, M3S AND 3A.

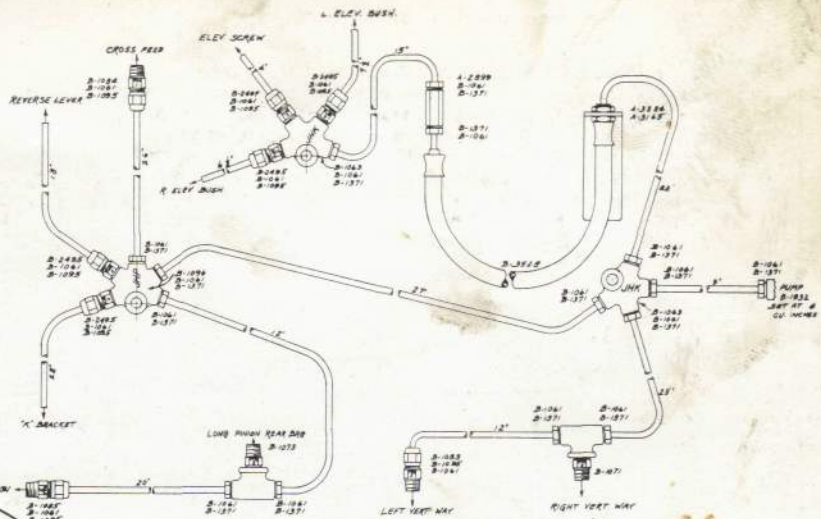
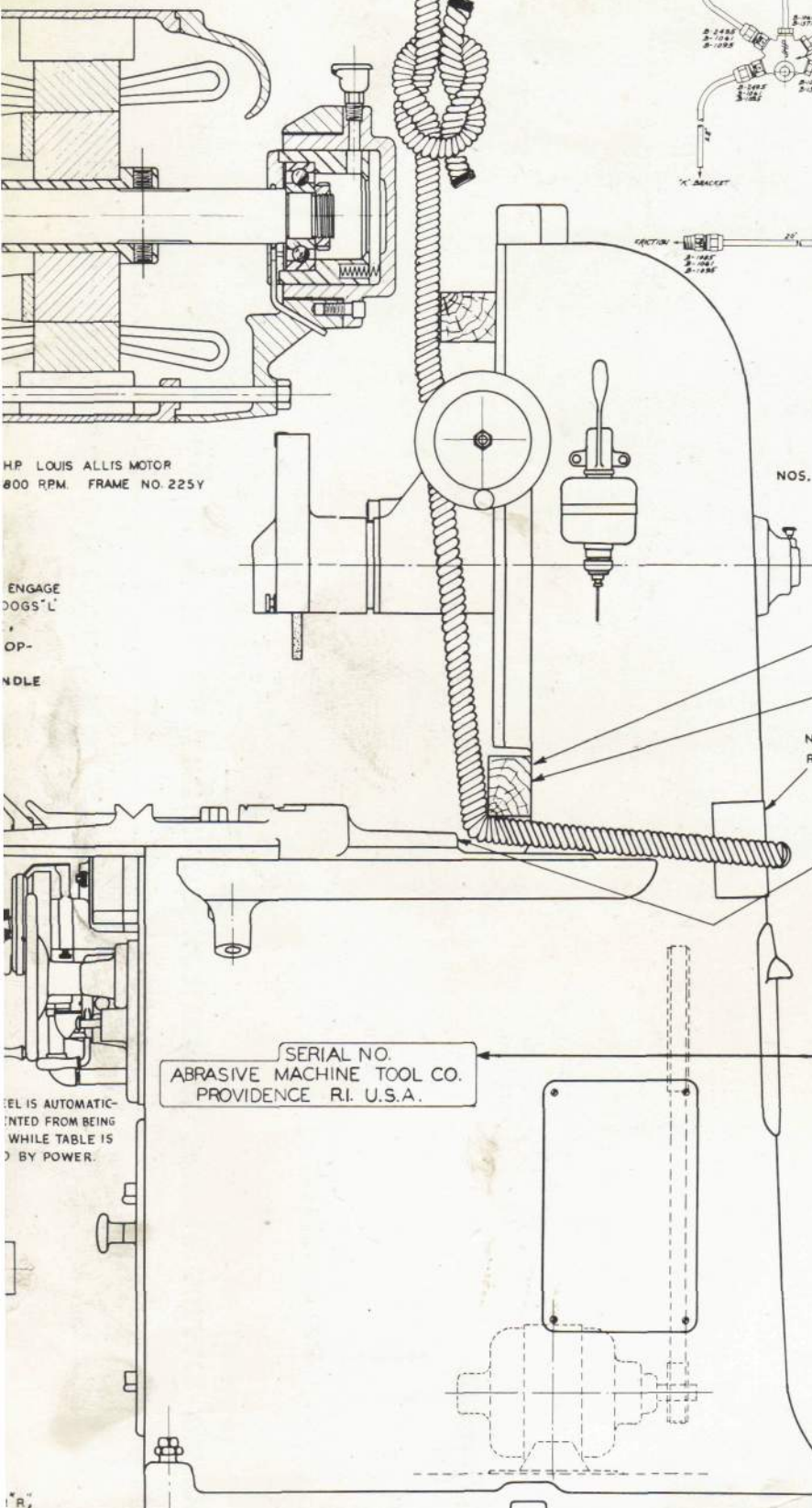
FLOOR PLAN SAME AS 3B EXCEPT THREE DIMENSIONS AS NOTED ON 3B FLOOR PLAN DRAWING

- 1/2 LAG SCREW
- BED LEVELING SCREW
- 2 1/2 x 2 1/2 x 1/4 STEEL PLATE

SHOCK ABSORBER WILL BE RUINED UNLESS OIL SHOWS IN THIS CUP.

HAND WILL BE FULLY RE-ENGAGED OPERATOR

WHEEL FOR WEAR, LOOSEN SCREW "G"  
 BUSHING "H" BY TURNING "H" COUNTER CLOCKWISE  
 UP, THEN TIGHTEN SCREW "G".



**OILING SYSTEM FOR NO. M3 GRINDER**

CORRECT METHOD OF  
HOISTING MACHINE  
 WEIGHT OF MACHINE 2,600# APPROX.

THIS METHOD OF HOISTING APPLIES ALSO TO  
 NOS. 3B, 3S, M3S, AND 34. ABRASIVE SURFACE GRINDERS

- REMOVE TELESCOPING GUARDS BEFORE HOISTING MACHINE
- 2" x 4" x 2 FT-3" LONG
- NEWS PAPER PROTECTOR TO KEEP ROPE FROM PAINTED SURFACE

MOVE SADDLE TO FORWARD POSITION

SERIAL NO.  
 ABRASIVE MACHINE TOOL CO.  
 PROVIDENCE RI. U.S.A.

SERIAL NUMBER ON ALL ABRASIVE SURFACE GRINDERS IS STAMPED IN THIS SAME LOCATION ON RIGHT SIDE OF BED.

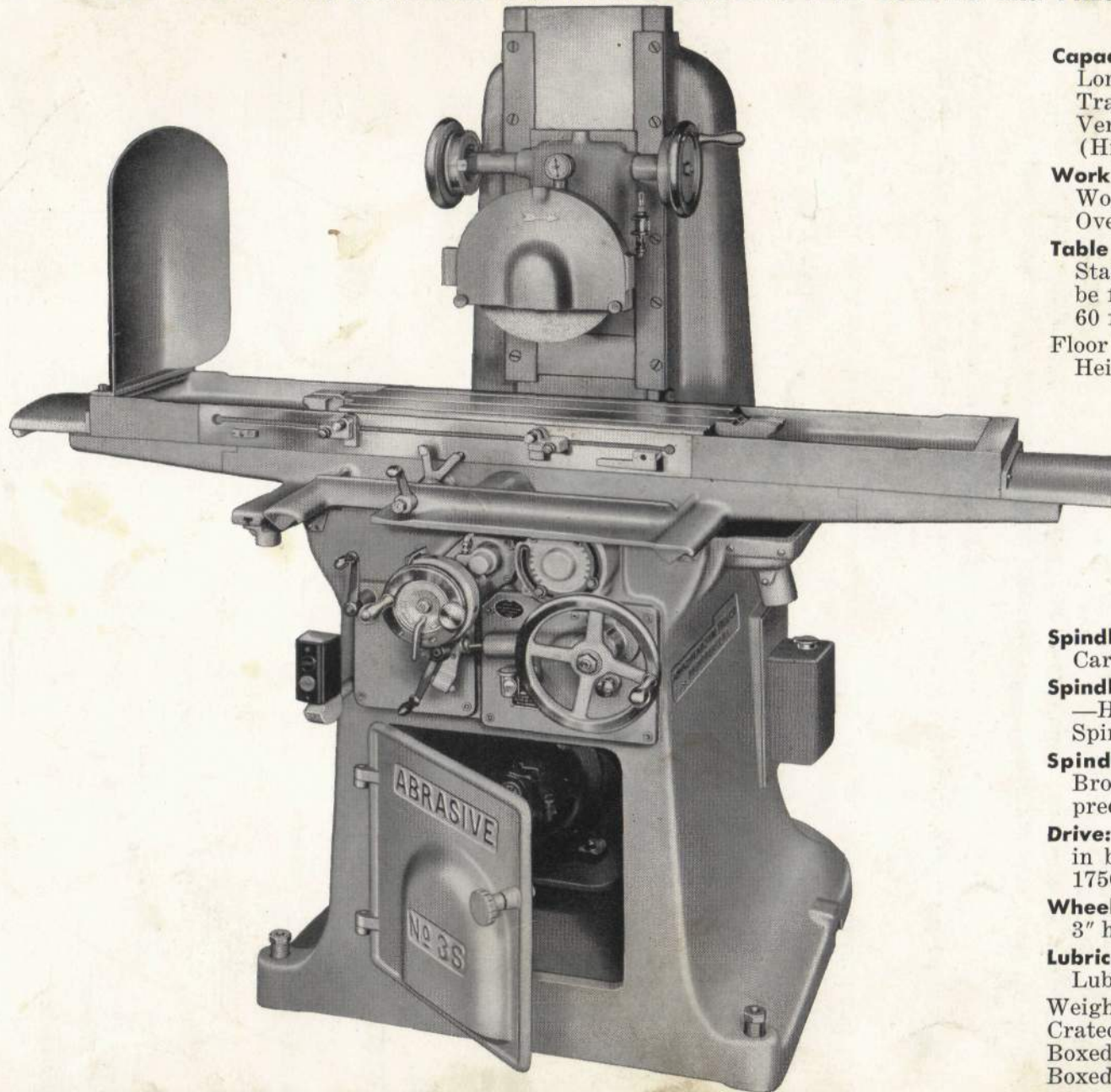
REL IS AUTOMATIC-  
 INTED FROM BEING  
 WHILE TABLE IS  
 BY POWER.

ENGAGED.

**No. M3**  
 General Instructions  
 for Abrasive  
 Surface Grinder No. M3  
 Revised June 15, 1942  
 Abrasive Machine Tool Co.  
 East Providence, R. I.

# ABRASIVE SURFACE GRINDERS

PLATE XVII General Instruction Line Drawing of No. 35 HORIZONTAL SPINDLE SURFACE GRINDER with HARDENED and GROUND WAYS, HARDENED and THREAD GROUND FEED SCREWS and PRESSURE LUBRICATION (inside)



## SPECIFICATIONS:

### Capacity:

Longitudinal .....	24"
Transverse .....	8"
Vertical .....	12"
(High column) .....	15½"

### Work Table:

Work surface .....	24" x 8"
Overall .....	59" x 10½"

### Table Speeds per Minute:

Standard 20 ft. & 40 ft. Pick off gears may be furnished at extra cost to give 30 ft. & 60 ft. speeds.

Floor Space .....	98" x 48"
Height .....	72"

### SPECIAL WAYS AND FEED SCREWS

**Ways:** Bed, Saddle and Table are equipped with Removable Hardened and Ground Tool Steel Ways.

**Screws:** Hardened and thread ground steel Micrometer Cross feed and elevating Screws.

**Spindle Assembly:** Completely Removable Cartridge Type.

**Spindle:** 1½" diam. taper nose-chrome steel —Hardened, Ground, and Lapped. Normal Spindle Speed — 2290 RPM.

**Spindle Bearings:** At front — Phosphor Bronze, adjustable for wear with super-precision ball bearings at rear.

**Drive:** Endless flat belt 2" wide from motor in base to Spindle Pulley. Motor: 3 HP, 1750 RPM, (60 cy), 1450 RPM (50 cy).

**Wheels:** Standard — 10" diam. x ¾" thick x 3" hole.

**Lubrication:** By use of a built-in Automatic Lubricating System.

Weight —Net .....	2670 lbs.
Crated (domestic) .....	2910 lbs.
Boxed for Export .....	3240 lbs.
Boxed with Wet Attachment .....	3550 lbs.

ABRASIVE MACHINE TOOL COMPANY  
EAST PROVIDENCE, RHODE ISLAND, U. S. A.

# ABRASIVE SURFACE GRINDERS

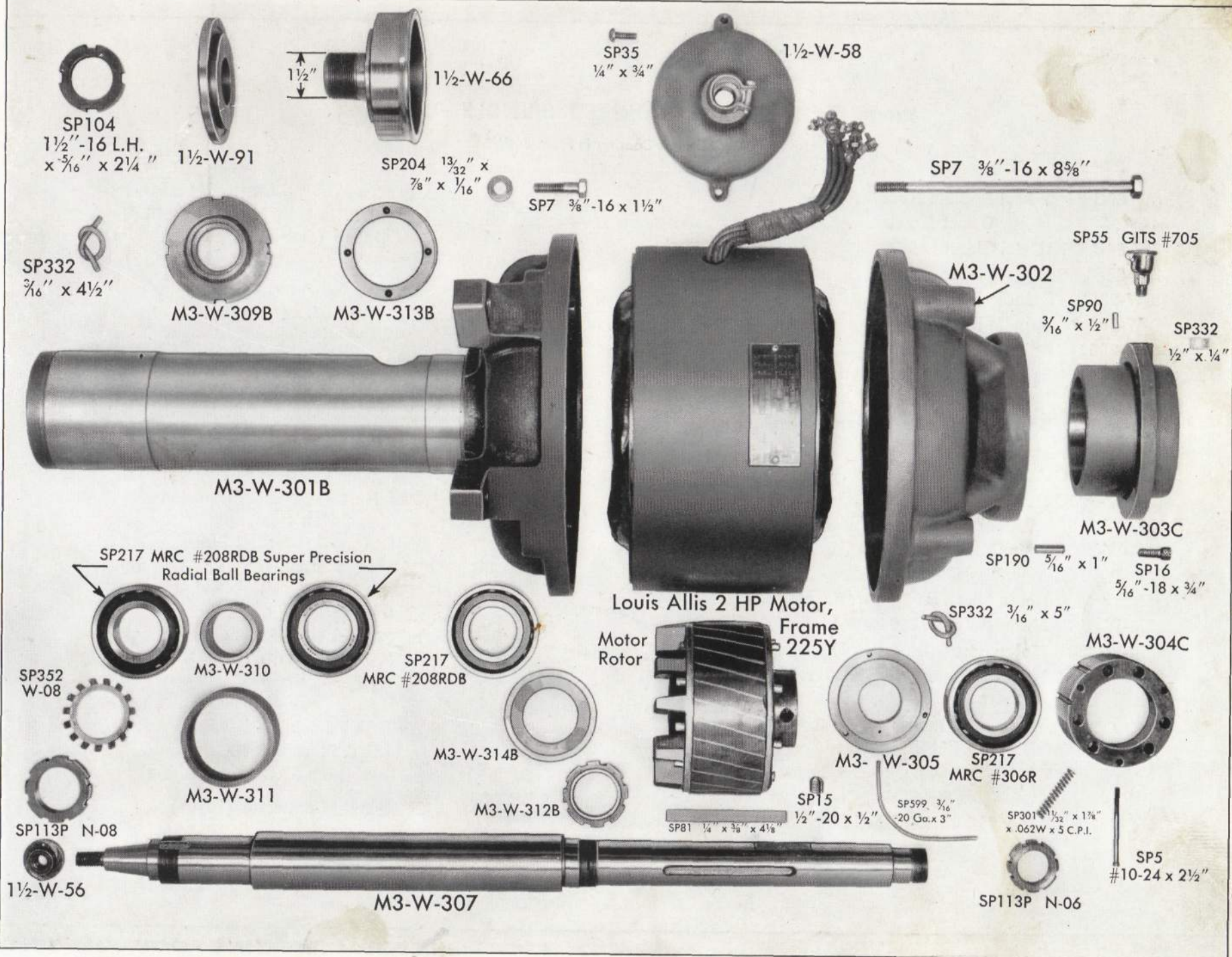
## Parts for No. M3 MOTORIZED SPINDLE ASSEMBLY

(With Full Ball Bearing Spindle)

1½-W-56	Wheel Spindle Nut .....	SP 16	5/16"—18 x 3/4" Socket Cap Screw .....
1½-W-58	Motor Outlet Bracket .....	SP 35	1/4" x 3/4" Button Head Machine Screw .....
1½-W-66	Ball Bearing Wheel Sleeve .....	SP 55	GITS No. 705 Oil Cup (Bottom Outlet)
1½-W-91	Wheel Sleeve Flange (10" and 12") .....	SP 81	1/4" x 3/8" x 4 1/8" Plain Key (Square) .....
M3-W-301B	Motorized Spindle Cartridge .....	SP 90	3/16" x 1/2" Straight Pin .....
M3-W-302	Motor End Shield (R) .....	SP 104	1 1/2"—16 L.H. x 5/16" x 2 1/4" Round Nut With Cuts .....
M3-W-303C	Adj. Cup Holder .....	SP 113P	N-06 Prec. Lock Nut (8 Slots) .....
M3-W-304C	Bearing Adj. Cup .....	SP 113P	N-08 Prec. Lock Nut (8 Slots) .....
M3-W-305	Adjusting Cup Cover .....	SP 190	5/16" x 1" Hardened and Ground Dowel Pin .....
M3-W-307	Spindle .....	SP 204	1 3/32" x 7/8" x 1/16" Beveled Corner Washers .....
M3-W-309B	Cartridge Closure Cap .....	SP 217	MRC No. 208RDB Super Precision Radial Ball Bearing .....
M3-W-310	Forward Bearing Spacer (Inner) .....	SP 217	MRC No. 208RDB Radial Ball Bearing
M3-W-311	Forward Bearing Spacer (Outer) .....	SP 217	MRC No. 306R Radial Ball Bearing .....
M3-W-312B	Inner Race Clamp Nut .....	SP 301	1 1/32" x 1 7/8" x .062W x 5 C.P.I. Compres- sion Spring .....
M3-W-313B	Outer Race Clamp Nut .....	SP 332	3/16" x 4 1/2" Felt Strip .....
M3-W-314B	Rear Bearing Seal .....	SP 332	3/16" x 5" Felt Strip .....
Motor	Louis Allis 2HP Motor, Frame 225Y .....	SP 332	1/2" x 1/4" Felt Strip .....
M3-W-318	Motor Rotor (1750 RPM) .....	SP 352	W-08 SKF Lock Washer .....
M3-W-320	Motor Rotor (3450 RPM) .....	SP 599	3/16"—20Ga. x 3" Copper Tubing .....
SP 5	No. 10—24 x 2 1/2" Fillister Head Cap Screw .....		
SP 7	3/8"—16 x 1 1/2" Hex. Head Cap Screw .....		
SP 7	3/8"—16 x 8 5/8" Hex. Head Cap Screw .....		
SP 15	1/2"—20 x 1/2" Socket Set Screw .....		

Note: For Spindle with Bronze Front Bearing see Pages 42 and 43.

**PLATE XVIII No. M3 MOTORIZED SPINDLE ASSEMBLY**  
 (With Full Ball Bearing Spindle)



ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS



# ABRASIVE SURFACE GRINDERS

## Parts for No. M3 MOTORIZED SPINDLE ASSEMBLY

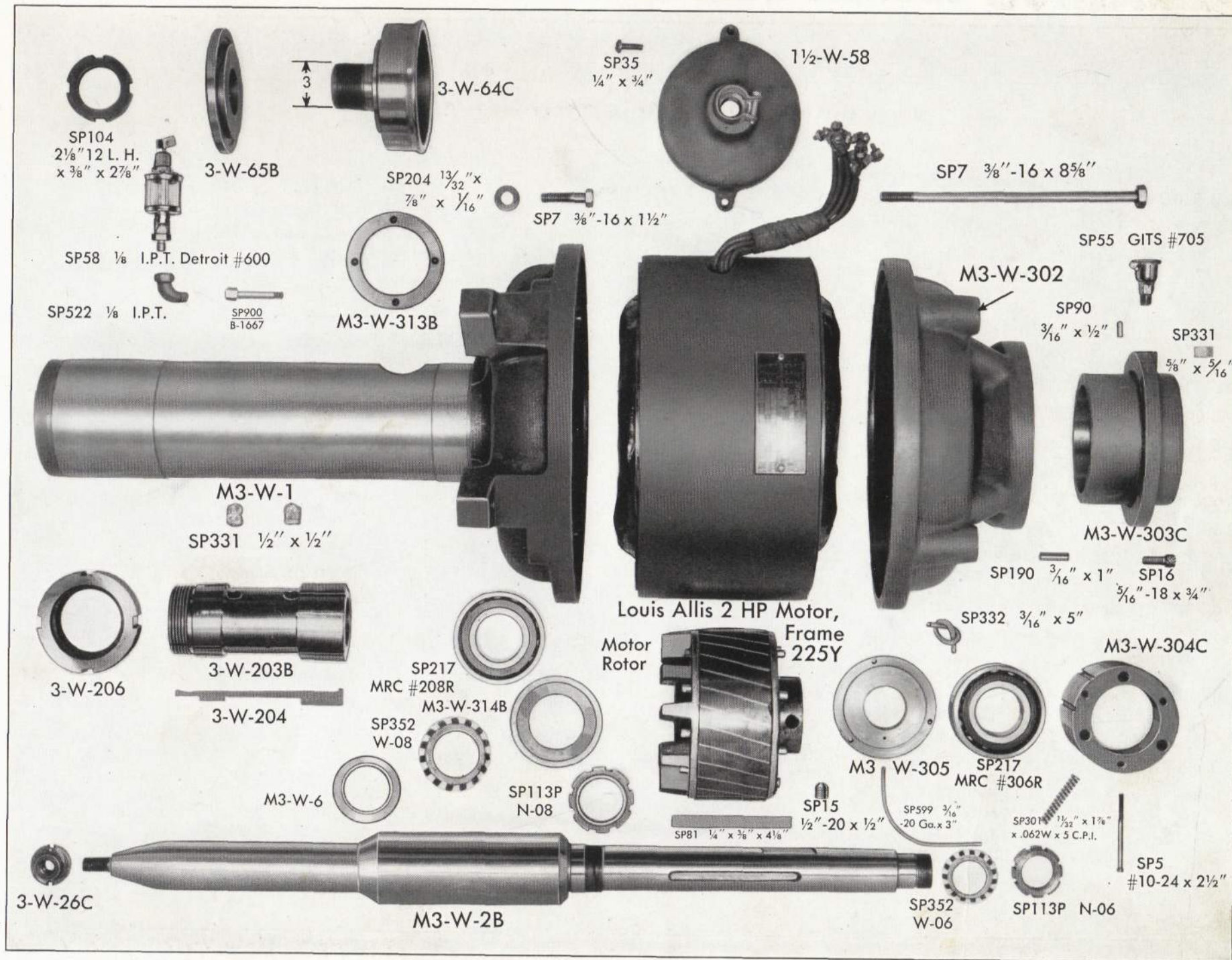
(With Bronze Bearing in Front End)

3W-26C	Wheel Spindle Nut .....	SP 55	GITS No. 705 Oil Cup (Bottom Outlet)
1½-W-58	Motor Outlet Bracket .....	SP 58	⅛" I.P.T. Detroit No. 600 Sight Feed Oil Cup (Bottom Outlet) .....
3W-64C	Wheel Sleeve .....	SP 81	¼" x ⅜" x 4⅛" Plain Key (Square) .....
3W-65B	Wheel Sleeve Flange (10" and 12") .....	SP 90	⅜" x ½" Straight Pin .....
3-W-203B	Spindle Box .....	SP 104	1½"—16 L.H. x ⅝" x 2¼" Round Nut With Cuts .....
3-W-204	Spindle Box Liner .....	SP 113P	N-06 Prec. Lock Nut (8 Slots) .....
3-W-206	Spindle Box Adj. Nut .....	SP 113P	N-08 Prec. Lock Nut (8 Slots) .....
M3-W1	Motorized Spindle Cartridge .....	SP 190	⅜" x 1" Hardened and Ground Dowel Pin .....
M3-W-2B	Spindle .....	SP 204	1⅜" x 7⁄8" x ⅛" Beveled Corner Washers .....
M3-W-6	Bearing Clamping Collar .....	SP 217	MRC No. 208R Super Precision Radial Ball Bearing .....
M3-W-302	Motor End Shield (R) .....	SP 217	MRC No. 306R Radial Ball Bearing .....
M3-W-303C	Adj. Cup Holder .....	SP 301	1½" x 1⅞" x .062W x 5 C.P.I. Compression Spring .....
M3-W-304C	Bearing Adj. Cup .....	SP 331	½" x ½" Felt Plug .....
M3-W-305	Adjusting Cup Cover .....	SP 331	⅝" x ⅝" Felt Plug .....
M3-W-313B	Outer Race Clamp Nut .....	SP 332	⅜" x 5" Felt Strip .....
M3-W-314B	Rear Bearing Seal .....	SP 332	½" x ¼" Felt Strip .....
Motor	Louis Allis 2 HP Motor, Frame 225Y .....	SP 352	W-08 SKF Lock Washer .....
M3-W-318	Motor Rotor (1750 RPM) .....	SP 352	W-06SKF Lock Washer .....
M3-W-320	Motor Rotor (3450 RPM) .....	SP 522	⅛" I.P.T. Street Elbow .....
SP 5	No. 10—24 x 2½" Fillister Head Cap Screw .....	SP 599	⅜"—20Ga. x 3" Copper Tubing .....
SP 7	⅜"—16 x 1½" Hex. Head Cap Screw .....	SP 900	} 2" Straight Connector (Bijur) .....
SP 7	⅜"—16 x 8⅝" Hex. Head Cap Screw .....	B-1667	
SP 15	½"—20 x ½" Socket Set Screw .....		
SP 16	⅝"—18 x ¾" Socket Cap Screw .....		
SP 35	¼" x ¾" Button Head Machine Screw .....		

Note: For Full Ball Bearing Spindle see Pages 40 and 41.

# PLATE XVIII No. M3 MOTORIZED SPINDLE ASSEMBLY

(With Bronze Bearing in Front End)



ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

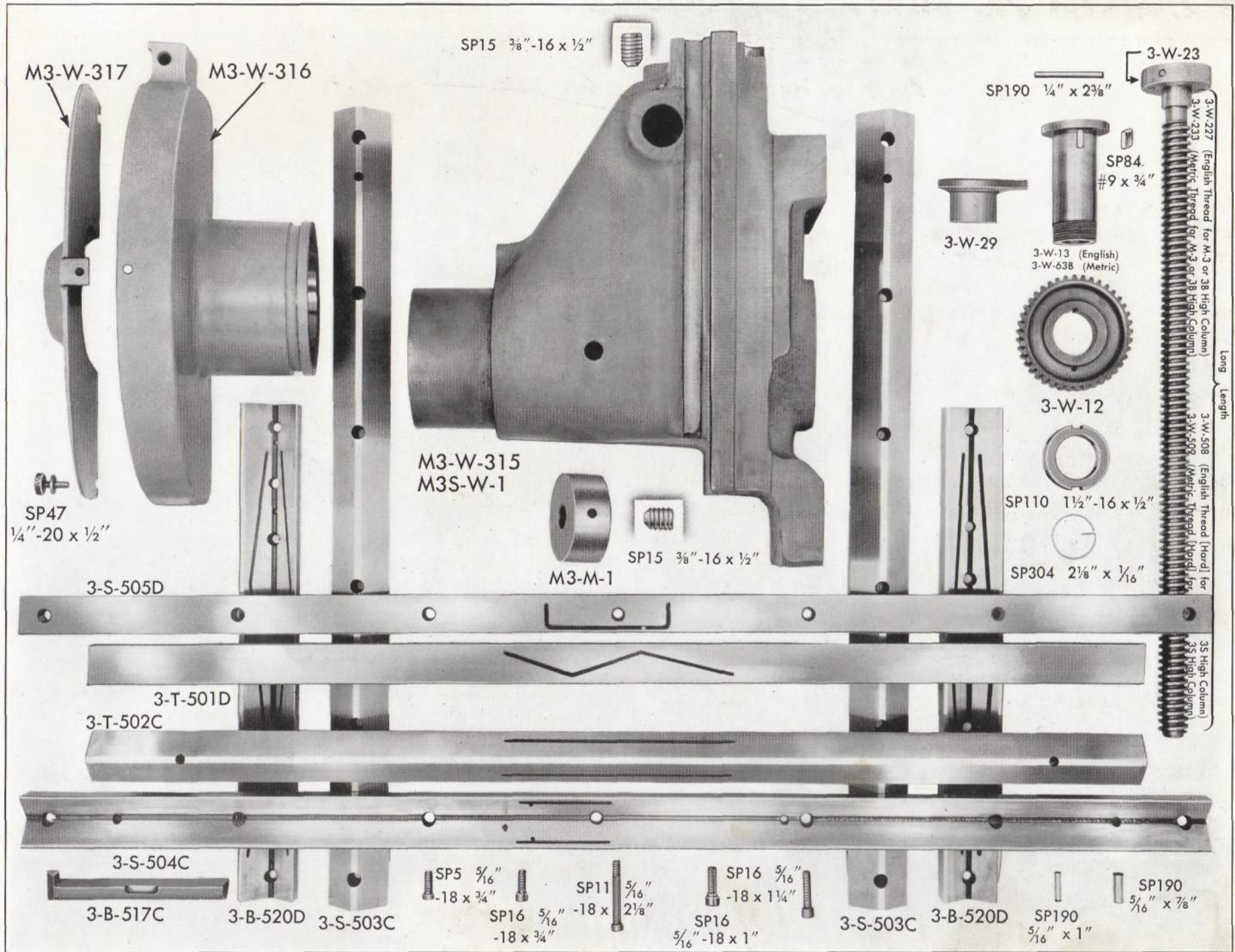
# ABRASIVE SURFACE GRINDERS

## Parts for No. M3 WHEEL SLIDE AND No. 3S WAYS

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

		3B	M3	3S	34			3B	M3	3S	34
3-B-517C	Cross Feed Trip Plunger.....	-	-	X	-	3-W-508	Elevating Screw 22" overall x 1" dia. 1/4 P (English, Hard for 3S High Column) .....	-	-	X	-
3-B-520D	Bed Way.....	-	-	X	-	3-W-509	Elevating Screw 22" overall (Metric, Hard for 3S High Column) .....	-	-	X	-
3-S-500	Saddle (not shown).....	-	-	X	-	M3-M-1	Motor Pulley .....	-	X	-	-
3-S-501	Guard Around Bull Wheel Opening in Saddle (not shown) .....	-	-	X	-	M3-W-315	Wheel Slide (for M3).....	-	X	-	-
3-S-502	Guard for Table Trip Lever Opening in Saddle (not shown) .....	-	-	X	-	M3-W-316	12" Welded Wheel Guard .....	-	X	-	-
3-S-503C	Saddle Way .....	-	-	X	-	M3-W-317	12" Wheel Guard Cover .....	-	X	-	-
3-S-504C	Saddle "V" Way (top).....	-	-	X	-	M3S-W-1	Wheel Slide .....	(on M3S only)			
3-S-505D	Saddle Flat Way (top).....	-	-	X	-	SP 5	5/16"—18 x 3/4" Fillister Head Cap Screw	-	-	X	-
3-S-509	Cover Plate (not shown).....	-	-	X	-	SP 11	5/16"—18 x 2 1/8" Flat Fillister Head Cap Screw .....	-	-	X	-
3-T-501D	Table Flat Way .....	-	-	X	-	SP 15	3/8"—16 x 1/2" Socket Set Screw .....	-	X	-	-
3-T-502C	Table "V" Way .....	-	-	X	-	SP 16	5/16"—18 x 3/4" Socket Cap Screw .....	-	-	X	-
3-W-12	Elevating Worm Wheel 40 T.....	X	X	X	X	SP 16	5/16"—18 x 1" Socket Cap Screw .....	-	-	X	-
3-W-13	Elevating Screw Nut 1" dia. 1/4 P, Single Thread (English) .....	X	X	X	-	SP 16	5/16"—18 x 1 1/4" Socket Cap Screw.....	-	-	X	-
3-W-23	Elevating Screw Thrust Nut .....	X	X	X	-	SP 47	1/4"—20 x 1/2" Knurled Shoulder Screw...	X	X	X	-
3-W-29	Elevating Screw Bushing .....	X	X	X	X	SP 84	No. 9 x 3/4" Pratt & Whitney Key.....	X	X	X	X
3-W-63B	Elevating Screw Nut (Metric).....	X	X	X	-	SP 110	1 1/2"—16 x 1/2" Grooved Nut With Cuts..	X	X	X	X
3-W-227	Elevating Screw 22" overall (English, for No. M3, No. 3B High Column and No. 34).....	X	X	-	X	SP 190	1/4" x 2 3/8" Hardened and Ground Dowel Pin .....	X	X	X	X
3-W-233	Elevating Screw 22" overall (Metric, for No. M3, No. 3B High Column and No. 34).....	X	X	-	X	SP 190	5/16" x 7/8" Hardened and Ground Dowel Pin .....	-	-	X	-
3-W-502	Elevating Screw 18 1/2" overall (English, Hard for 3S).....	-	-	X	-	SP 190	5/16" x 1" Hardened and Ground Dowel Pin .....	-	-	X	-
3-W-506	Elevating Screw 18 1/2" overall (Metric, Hard for 3S).....	-	-	X	-	SP 304	2 1/8" x 1/16" Nut Spring ("G" Wire).....	X	X	X	X

PLATE XIX Parts for No. M3 WHEEL SLIDE and No. 35 WAYS



STANDARD LENGTH ELEVATING SCREW  $18\frac{1}{2}$ " LONG — LONG LENGTH ELEVATING SCREW 22" LONG  
 ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS

# ABRASIVE SURFACE GRINDERS

## Parts for OILING SYSTEMS for No. M3, No. 35 and No. M3S GRINDERS

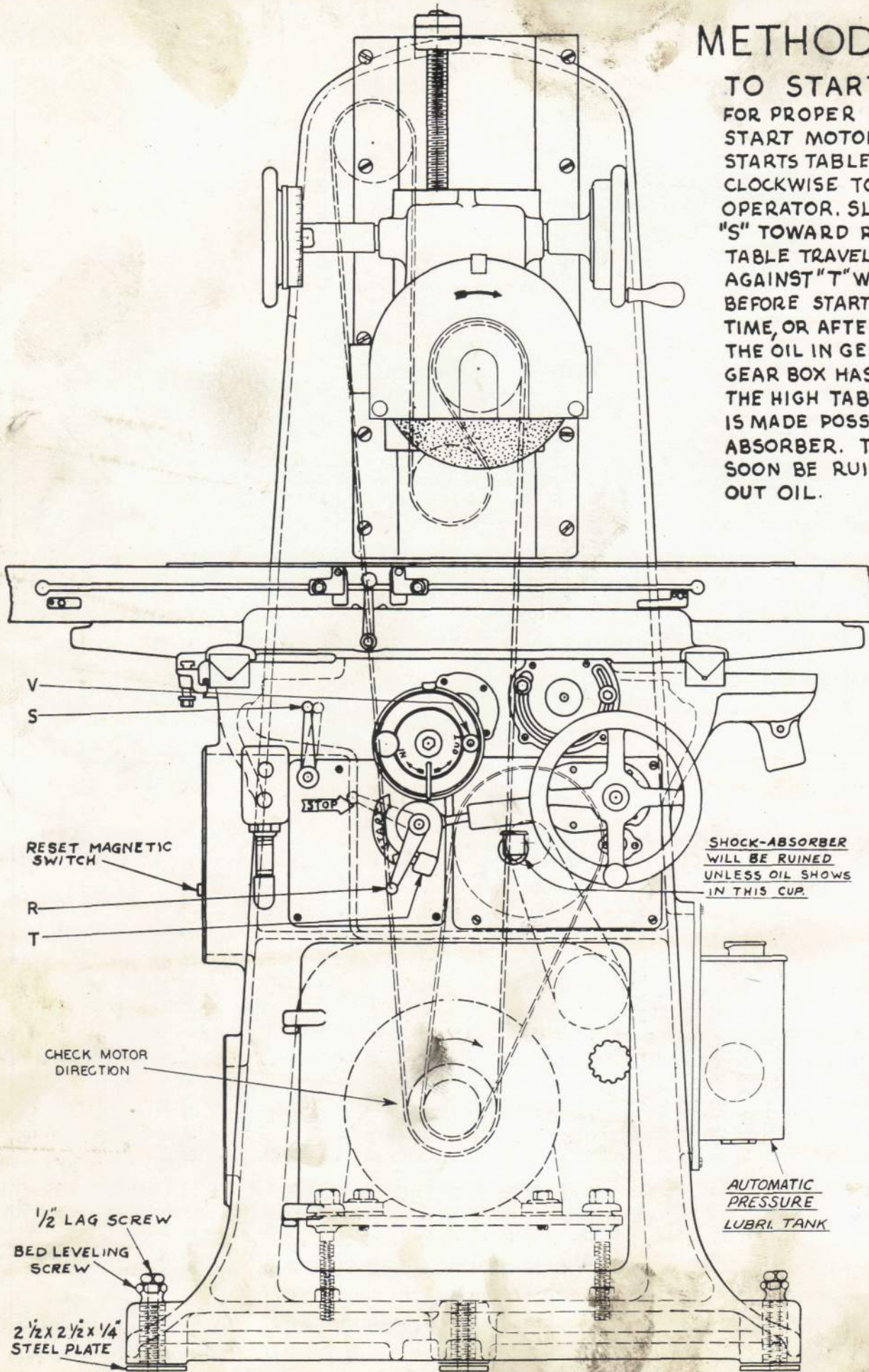
(Size of Part within Shaded Area is shown in Double Proportion. White Lines designate Sub-Assemblies)

		3B	M3	35	34			3B	M3	35	34
3-B-516B	Lubricating Oil Tank.....	-	-	X	-	SP 35	1/4"—20 x 1/2" Button Head Machine				
3-B-526	Filter Adapter (not shown).....	-	-	X	-		Screw.....	-	-	X	-
3-B-528	Oil Tank Cover.....	-	-	X	-	SP 75	GITS No. 4035 Glass Window Style CW	-	-	X	-
SA-3S-B	Bijur Tubes and Fittings.....	-	-	X	-	SP 301	3/4" x 1 1/2" x .062" x .292P Compression				
SA-3S-C	Bijur Fittings.....	-	-	X	-		Spring.....	-	-	X	-
SA-3S-S	Bijur Tubes and Fittings.....	-	-	X	-	SP 335	1 3/16" x 1 1/2" x 1/8" Cork Washer.....	-	-	X	-
SA-3S-W	Bijur Tubes.....	-	-	X	-	SP 349	Dayton No. OMO-26 Vee Belt.....	-	-	X	-
SA-M3-W	Bijur Tubes and Fittings.....	-	X	-	-	SP 889	FRAM No. C-1103-A-M Filter.....	-	-	X	-
SA-M3S-W	(included with) Bijur Tubes and Fit- tings.....				(on M3S only)	SP 900 D-2177	} Lubrication Unit.....	-	-	X	-
SP 35	No. 10—24 x 3/8" Button Head Machine Screw.....	-	-	X	-	SP 900 B-3841		} No. 10 Pressure Gage.....	-	-	X



# METHOD OF OPERA

**TO START MACHINE:-** si  
 FOR PROPER LENGTH OF TABLE  
 START MOTOR, PULL UP LEVER "R"  
 STARTS TABLE), TURN HANDLE "V"  
 CLOCKWISE TO FEED SADDLE TO  
 OPERATOR. SLIGHT MOVEMENT OF  
 "S" TOWARD RIGHT STOPS AUTO  
 TABLE TRAVEL. LEVER "R" SHOULD  
 AGAINST "T" WHEN FEEDING TABLE  
 BEFORE STARTING TABLE FOR THE  
 TIME, OR AFTER CHANGING OIL, BE  
 THE OIL IN GEAR BOX CUP IS HIGH  
 GEAR BOX HAS RUN IDLE FOR FIVE  
 THE HIGH TABLE SPEED OF THIS M  
 IS MADE POSSIBLE BY THE USE OF  
 ABSORBER. THIS SHOCK-ABSORBER  
 SOON BE RUINED IF OPERATED  
 OUT OIL.



FLOOR PLAN SAME AS 3B

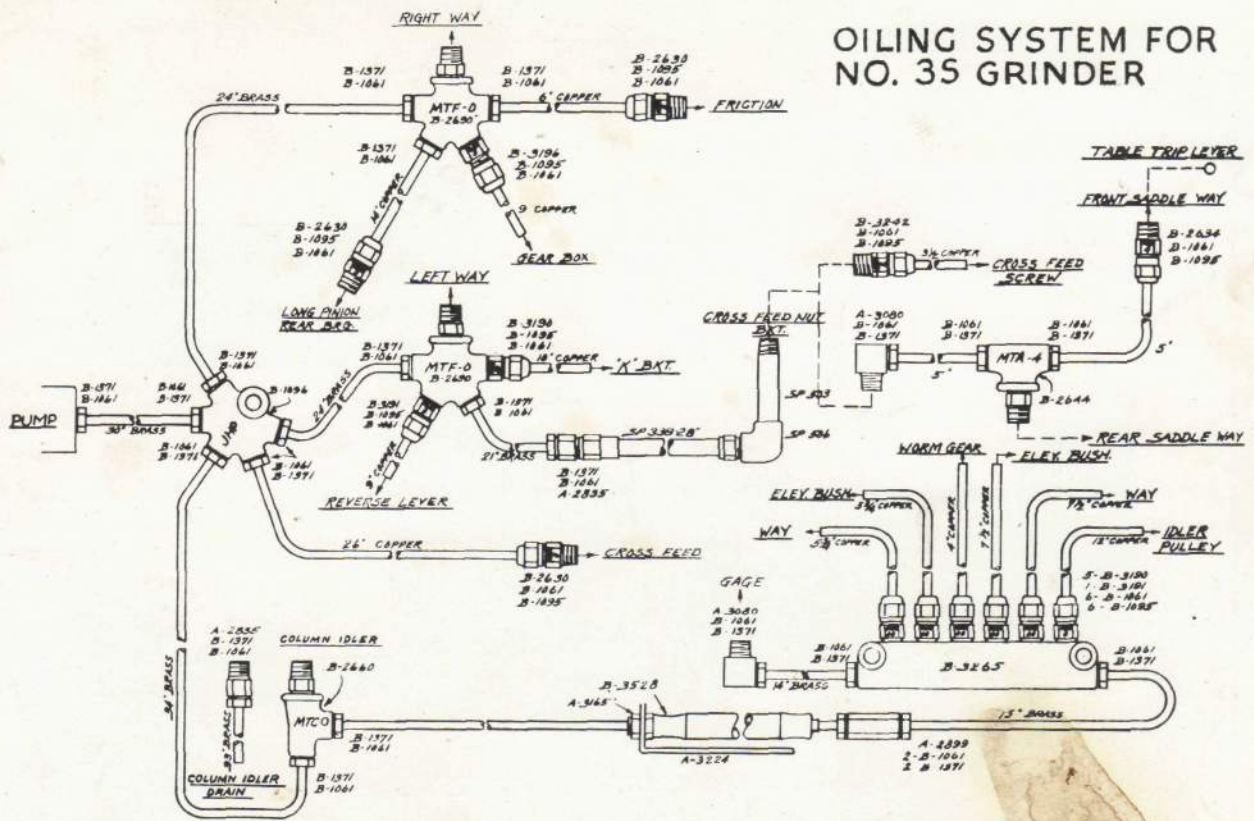
## Speci Grind

1. Machine must b
2. Before Table is p  
ways before pu
3. Spindle bearing  
oiler on right ha
4. The lubrication  
not, fill periodic  
400 sec. Saybol
5. Should machine  
revolutions. Fai  
and stopped 3 c
6. Use only clean  
oils or oils cont  
all conditions. /  
located under th  
then note the pr  
tional to this pre  
adjustment shou  
revised feed. A  
to bearings.
7. Do not let oil lev

TION

T DOGS  
TRAVEL,  
WHICH  
COUNTER-  
WARD  
LEVER  
ATIC  
BE DOWN  
BY HAND.  
FIRST  
SURE  
AFTER  
MINUTES.  
ACHINE  
A SHOCK-  
R WOULD  
WITH-

# OILING SYSTEM FOR NO. 35 GRINDER



## General Instructions for initial starting and lubrication of No. 35 Surface Grinder with Bijur Automatic Continuous Lubrication System.

Be accurately leveled by adjusting the 3 Bed leveling screws.

When in place make sure Table and Saddle ways are clean and oil holes are not plugged up. Apply oil by hand to the top of the Table in place.

Ways require a light spindle oil—approximately 100 sec. Saybolt at 100° F. Do not use machine oil. Put oil in sight feed on top side of wheel head. Adjustment should be one drop about every five minutes.

The lubricating system should keep gear case filled to middle of glass in filler cup after once filled when machine is set up. If it does not fill with Gargoyle Vactra Heavy Oil or Gargoyle Etna Heavy Oil. Other reliable oils having viscosity of approximately 100 at 100° F. may be used.

If machine remains idle more than 2 weeks, spindle belt should be pulled over by hand to turn spindle in its bearings for a few minutes. To do this will result in spindle "freezing up" in bearing and possibly damaging the spindle. Motor should be started for 4 times for approximately 1/2 minute intervals to warm up properly.

Use mineral oil similar to Vactra Heavy or oils of approximately 400 sec. Saybolt at 100° F. Never use so called "dripless" oils or greases containing graphite or other fillers. The lubricating system is designed to feed the proper quantities of oil to the machine under normal conditions. Means, however, are provided to increase or decrease this amount if necessary, by means of the by-pass adjusting screw on the pump. A small cover on the top of the pump. Before making any adjustment, run the machine until it is at operating temperature, and note the pressure gauge reading. Under this condition, the amount of oil fed to the system is proportional to the pressure. Turning adjustment clockwise increases feed and counterclockwise decreases it. Any adjustment should be limited to a change of about 10% in the pressure, until the machine has been run with a pressure below 5 lbs. is not advisable, as a lower pressure may result in poor oil distribution.

Oil should be placed below the glass at rear of oil tank on the lower right hand side of the machine.

<p>No. 35</p> <p>General Instructions for Abrasive Surface Grinder No. 35</p> <p>Revised June 15, 1942</p> <p>Abrasive Machine Tool Co. East Providence, R. I.</p>
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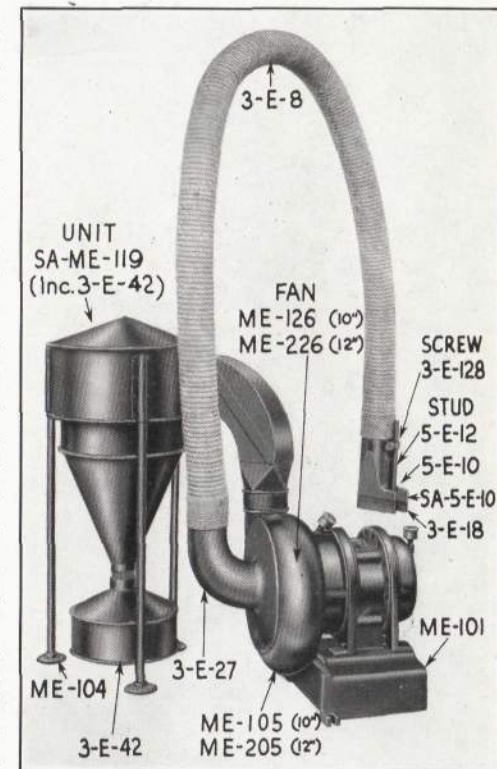


# ABRASIVE SURFACE GRINDERS

## Parts for DUST EXHAUST ATTACHMENT

(Sizes of Parts within Shaded Areas are shown in Double Proportion)

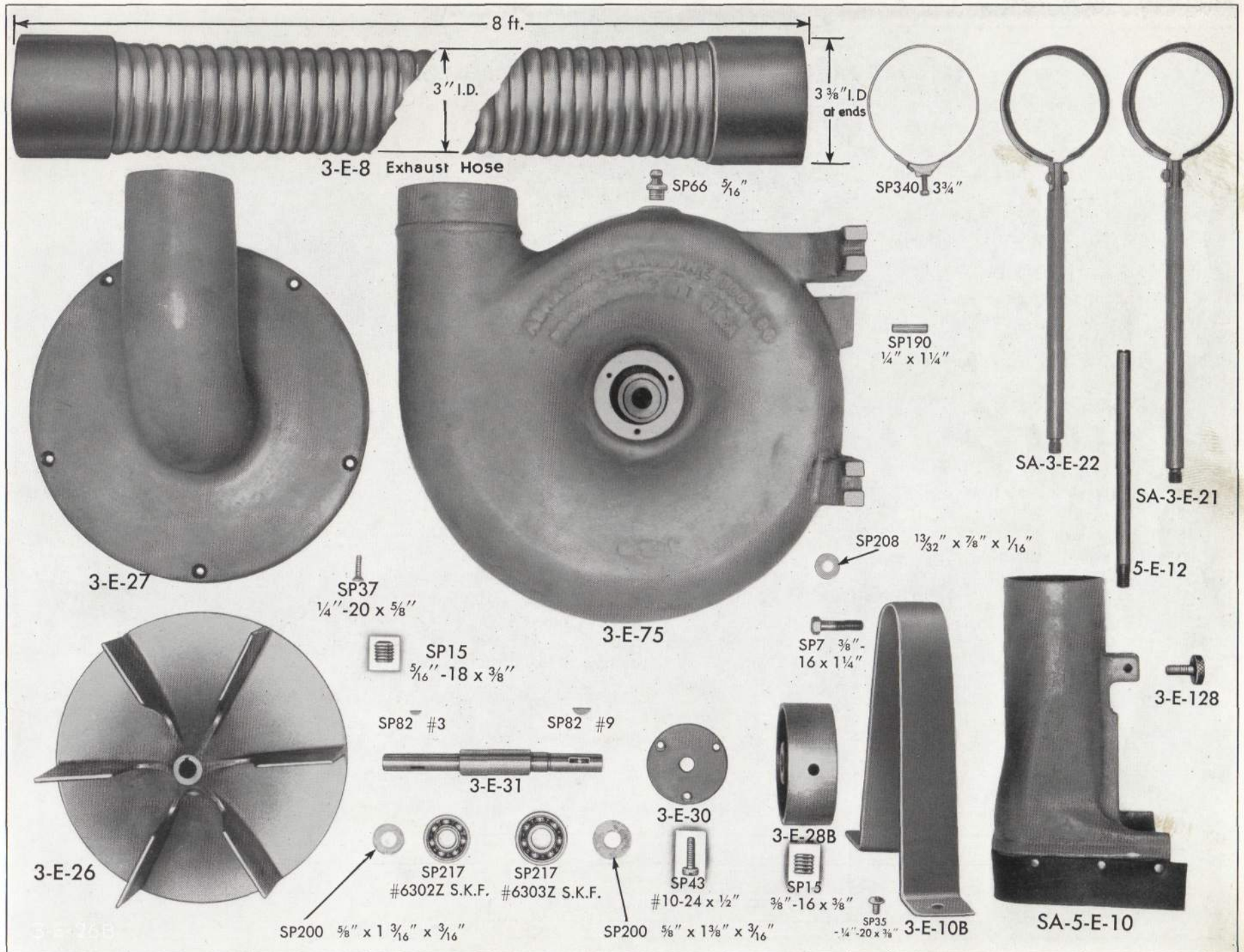
3-E-8	Exhaust Hose (8 ft. long)	SA-3-E-22	Lower Hose Support Sub-Assembly
3-E-10B	Exhauster Pulley Belt Guard	SA-5-E-10	Exhauster Nozzle (Sub-Assembly)
3-E-18	Exhaust Nozzle Rubber	SA-ME-119	Separator (Including Dust Collector)
3-E-26	Exhauster Fan (Aluminum)	SP 7	$\frac{3}{8}$ "—16 x $1\frac{1}{4}$ " Hex. Head Cap Screw
3-E-26B	Exhauster Fan (Fabricated Sheet Steel)	SP 15	$\frac{5}{16}$ "—18 x $\frac{3}{8}$ " Socket Set Screw
		SP 15	$\frac{3}{8}$ "—16 x $\frac{3}{8}$ " Socket Set Screw
		SP 35	$\frac{1}{4}$ "—20 x $\frac{3}{8}$ " Button Head Machine Screw
3-E-27	Exhauster Ell		
3-E-28B	Exhauster Pulley	SP 37	$\frac{1}{4}$ "—20 x $\frac{5}{8}$ " Flat Head Machine Screw
3-E-30	Exhauster Bearing Cover	SP 43	No. 10—24 x $\frac{1}{2}$ " Fillister Head Machine Screw
3-E-31	Exhaust Fan Shaft		
3-E-42	Separator Dust Collector	SP 66	$\frac{5}{16}$ " Zerk Grease Nipple (Drive Type)
3-E-75	Exhauster Housing	SP 82	No. 3 Woodruff Key
3-E-128	Clamp Screw (hard)	SP 82	No. 9 Woodruff Key
5-E-10	Exhaust Nozzle	SP 190	$\frac{1}{4}$ " x $1\frac{1}{4}$ " Hardened and Ground Dowel Pin
5-E-12	Exhaust Nozzle Stud		
ME-101	Motor and Exhauster Base	SP 200	$\frac{5}{8}$ " x $1\frac{3}{16}$ " x $\frac{3}{16}$ " Felt Washer
ME-104	Separator Legs (3 to a Set)	SP 200	$\frac{5}{8}$ " x $1\frac{3}{8}$ " x $\frac{3}{16}$ " Felt Washer
ME-105	Motor Driven Exhauster Housing—10"	SP 208	$1\frac{3}{32}$ " x $\frac{7}{8}$ " x $\frac{1}{16}$ " Beveled Corner Steel Washer
ME-119	Separator		
ME-126	Exhaust Fan 10"	SP 217	No. 6302Z—S.K.F. Radial Ball Bearing
ME-205	Motor Driven Exhauster Housing—12"	SP 217	No. 6303Z—S.K.F. Radial Ball Bearing
ME-226	Exhaust Fan 12"	SP 340	$\frac{3}{4}$ " Hose Clamp
ME-227	Exhaust Ell Adapter (for 12") (Not Shown)	SP 347	$1\frac{1}{4}$ " wide—single—53" to 55" long Exhauster Belt—Leather Belt
SA-3-E-21	Upper Hose Support Sub-Assembly		



The Motorized Dust Exhauster is used with the M3 and M3S Grinders.

PERFORMANCE CHART		
$\frac{3}{4}$ H.P. MOTORIZED DUST EXHAUST ATTACHMENT		
CUBIC FEET PER MINUTE 220 Cu. ft.	INCHES OF WATER IN U-TUBE 7.0"	
EFFICIENCY		
Cast Iron Dust 90%	Steel Chips 95%	Sawdust (Fine) 98%

**PLATE XXI Parts for DUST EXHAUST ATTACHMENT**



The Machine Driven Dust Exhaust Unit is used with No. 3B and No. 3S Grinders only.

**ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS**

# ABRASIVE SURFACE GRINDERS

## Parts for WET GRINDING ATTACHMENT including MOTORIZED COOLANT PUMP

(White Lines show All Parts included in Sub-Assembly SP865 and segregate Tanks shown in other than Standard Proportion)

1½-P-15	Water Tank Cover for No. 1½ Unit .....	SP 47	¼"—20 x 5/8" Knurled Shoulder Screw	<b>3B M3 3S 34</b> Wet Attachments may be supplied for Nos. 1½, 3B, M3, 3S and M3S Machines and are Standard Equipment on the No. 34 Grinder.
3-P-10B	Water Nozzle 10" Wheel .....	SP 204	3/32" x 7/8" x 1/16" Beveled Corner Washers .....	
3-P-15C	Spray Guard .....	SP 217	No. 6202-2Z—S.K.F. Radial Ball Bearing .....	
3-P-101B	Water Tank Cover for No. 3B Unit .....	SP 217	ND No. 88503 Radial Ball Bearing .....	
3-P-117	Clamping Screw Shoe .....	SP 339	¾" ID x 1 3/16" O.D. x 8 ft. Rubber Hose	
3-P-118	Water Nozzle Support .....	SP 339	2" ID x 2 3/8" OD x 18" Rubber Hose .....	
3-P-119	Nozzle Clamping Screw .....	SP 340	2 3/8" OD No. 4-AC Hose Clamp .....	
MP-11B	Pump Column Cover .....	SP 340	1 3/16" O.D. Hose Clamp .....	
MP 18	Pump Impeller .....	SP 500	½" I.P.T. x 11" Pipe .....	
MP 22	Motorized Pump Column .....	SP 508	½" I.P.T. Elbow (45°) .....	
SA-1½-P-14B	Coolant Tank (for No. 1½ Unit) .....	SP 537	½" I.P.T. Lever Handle Stop Cock .....	
SA-3-P-100D	Coolant Tank (for No. 3B Unit) .....	SP 550	½" I.P.T. x 2" Pipe—One End Threaded (Iron) .....	
SP 16	3/8"—16 x 1/2" Socket Cap Screw .....	SP 551	½" I.P.T. x 3" Pipe—One End Threaded (Brass) .....	
SP 35	¼"—20 x 3/4" Button Head Machine Screw .....	SP 857	¾" Conduit Clip—One Hole .....	
SP 37	No. 10—24 x 1/2" Flat Head Machine Screw .....	SP 903*	Pump Motor .....	
SP 43	¼"—20 x 1/2" Fillister Head Machine Screw .....			

The No. 1½ Tank is used with the No. 1½ Grinder.

The No. 3B Tank is used with larger grinders.

\*SP 903 includes Water Pump Motor, Motor Rotor and Shaft, Motor Cover, Spring Washer, Bolts, Washers, Nuts, etc. as shown.

PERFORMANCE CHART					
¼ H.P. MOTORIZED COOLANT PUMP WITH CLOSE FITTING MP-18 IMPELLER					
HEAD FEET	4	5	6	8	10
R.P.M. 1750	APPROXIMATE QUANTITY — GALLONS PER MINUTE				
	7	6½	5¾	4	2

**PLATE XXII Parts for WET GRINDING ATTACHMENT including MOTORIZED COOLANT PUMP**

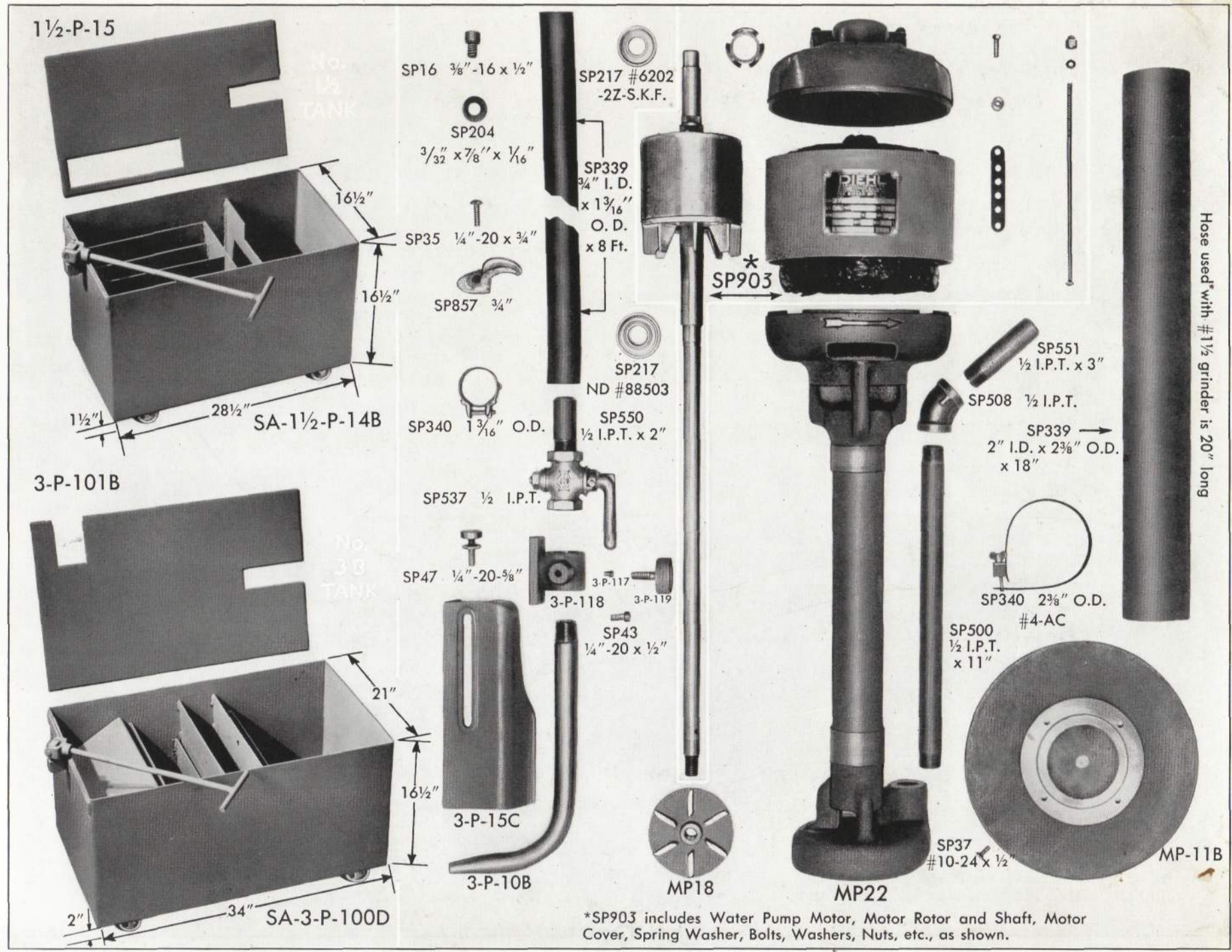
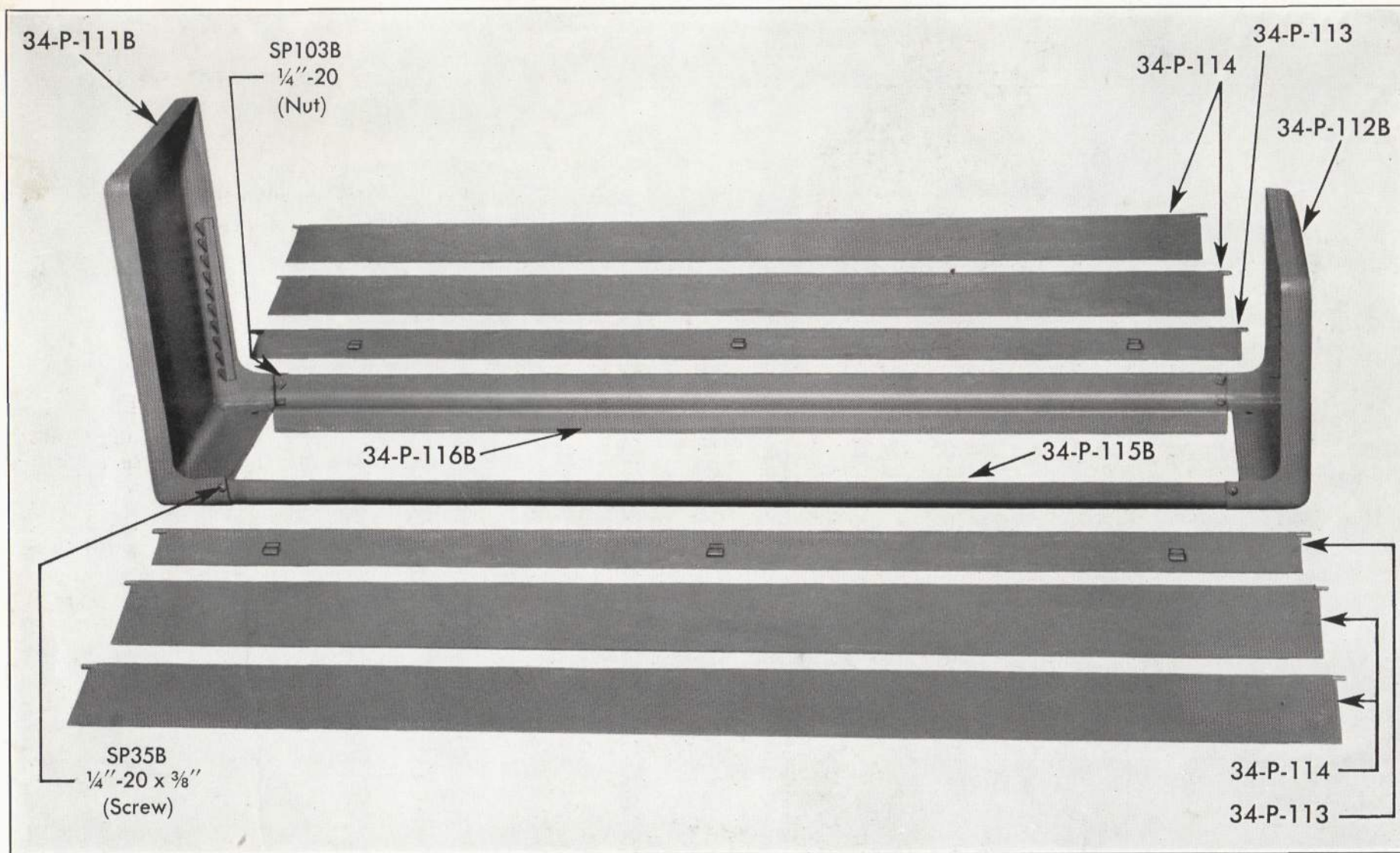


PLATE XXIII TABLE WATER GUARDS



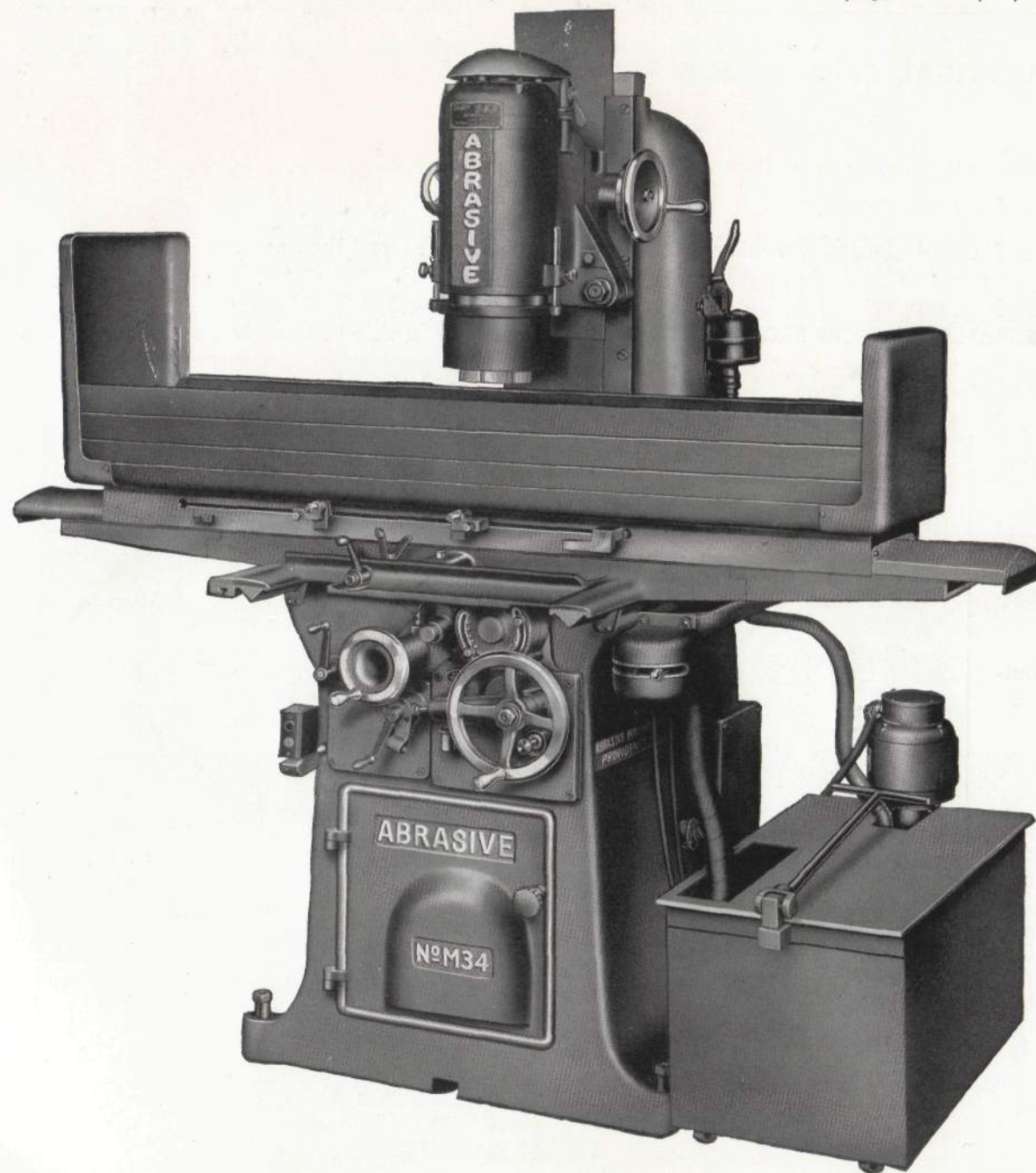
SA-34-P-111B — includes all of the following parts

34-P-111B	Table Water Guard (L.H.) .....	SP 35B	1/4" —20 x 3/8" Button Head Machine Screw (Brass) .....
34-P-112B	Table Water Guard (R.H.) .....	SP 103	1/4" —20 Hex. Thin Nut .....
34-P-113	Lower Adjustable Guard .....		
34-P-114	Upper Adjustable Guard .....		
34-P-115B	Front Stationary Guard .....		
34-P-116B	Rear Stationary Guard .....		

This Table Water Guard used on  
Nos. 3B, M3, 3S, M3S and 34 Grinders.

# PLATE XXIII A General Instruction Line Drawing of No. M34 VERTICAL SPINDLE SURFACE GRINDER

(Same as for No. 34 Vertical Spindle Surface Grinder shown inside page 55 except spindle is of motor driven Pope-SKF design.)



## SPECIFICATIONS

### Capacity:

Transverse, hand .....	8"
Longitudinal .....	24"
Vertical, automatic .....	12"

### Work Table:

Work Surface .....	8" x 24"
Floor Space .....	48" x 108"
Height .....	76"

**Spindle:** Most modern design of Pope-SKF with combinations of ball and roller bearings, sealed-in lubrication and built-in 5 HP, 3450 R.P.M. Motor. A powerful, trouble-free unit provided with automatic adjustment for wear and end thrust.

**Drive:** Two motors—one 5 HP built-in on spindle, one 1/2 HP mounted in base, magnetic starter with overload and under-voltage protection, push button control. All wiring fully enclosed in rigid conduit wherever possible.

**Wheels:** Segment type, 6" diameter, Cortland type wheel chuck. By using a special adapter, Type 2 steelback wheel can be accommodated. 3450 R.P.M. with 60 cycle motor; 2950 R.P.M. with 50 cycle motor.

### Weights:

Net weight, about .....	3000 lbs.
Gross domestic shipping weight, about .....	3240 lbs.
Gross foreign shipping weight, about .....	3620 lbs.

# ABRASIVE SURFACE GRINDERS

## No. M34 VERTICAL SPINDLE SURFACE GRINDERS

### REPAIRS TO SPINDLE

The spindles on all No. M34 Vertical Spindle Surface Grinders are of Pope SKF design and construction.

These spindles have sealed-in lubrication hence require NO OILING.

If repairs ever become necessary write or wire us for replacement assembly. Return original spindle assembly to us for repairing, invoice for which will be rendered on the basis of labor and material necessary to put spindle in first class condition.

**REPAIR PARTS FOR NO. M34 VERTICAL SPINDLE SURFACE GRINDERS EXCEPT WHEEL SPINDLE** are listed in this book as No. 34 parts and are similar for both No. M34 and No. 34 machines.

### SEGMENTAL CHUCK AND PARTS FOR M34 VERTICAL SPINDLE SURFACE GRINDER

- UA-34-W-110 6" Segmental Chuck Assembly Complete (Less Wheel Segments)
- 34-W-110 6" Segmental Chuck Body
- 34-W-111 Segment Clamp
- 34-W-112 Clamp Screw
- 34-W-113 Segment Spacer
- SP-16  $\frac{5}{16}$ "-18 x  $\frac{3}{4}$ " Socket Cap Screw
- SP-270 Wheel Segments (4 per set—advise material to be ground)

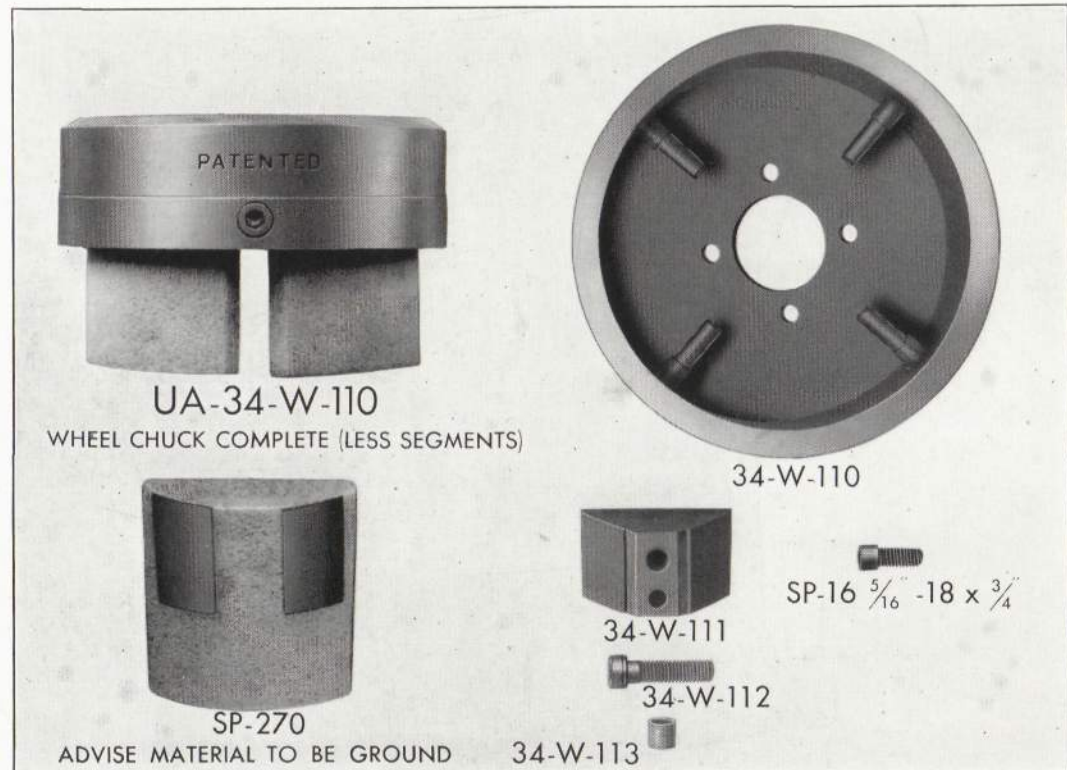
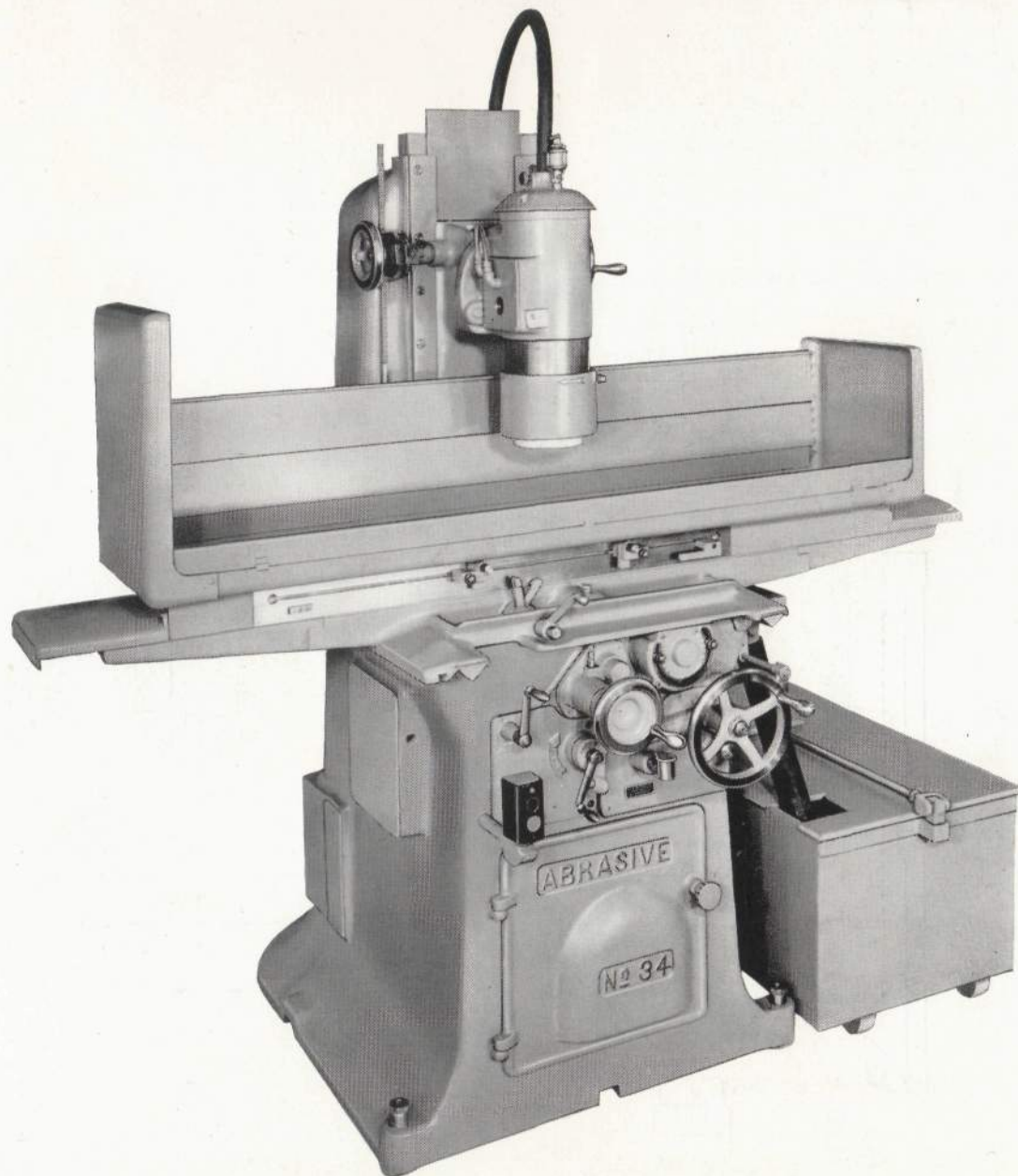


PLATE XXIII B

# ABRASIVE SURFACE GRINDERS

PLATE XXIV General Instruction Line Drawing of No. 34 VERTICAL SPINDLE SURFACE GRINDER (inside)



## SPECIFICATIONS:

### Capacity:

Longitudinal .....	24"
Transverse .....	8"
Vertical .....	12"

### Work Table:

Work Surface .....	8" x 24"
Overall .....	59" x 10 $\frac{1}{2}$ "

Floor Space .....	48" x 108"
Height .....	76"

**Spindle Assembly Head and Wheel Slide** are Constructed as a single Unit.

**Spindle:** Of Massive proportions to eliminate torsional vibration.

**Normal Spindle Speed:** 3050 RPM with 5" diam. wheel. 2560 RPM with 6" diam. wheel.

**Spindle Bearings:** Large Radial Thrust Ball Bearings provided with automatic adjustment for wear and end thrust.

**Drive:** To Spindle Assembly Head — thru endless flat belt 3 $\frac{1}{2}$ " wide from Ball Bearing Motor in base — 7 $\frac{1}{2}$  HP, 1750 RPM, (60 cycles), 1450 RPM, (50 cycles).

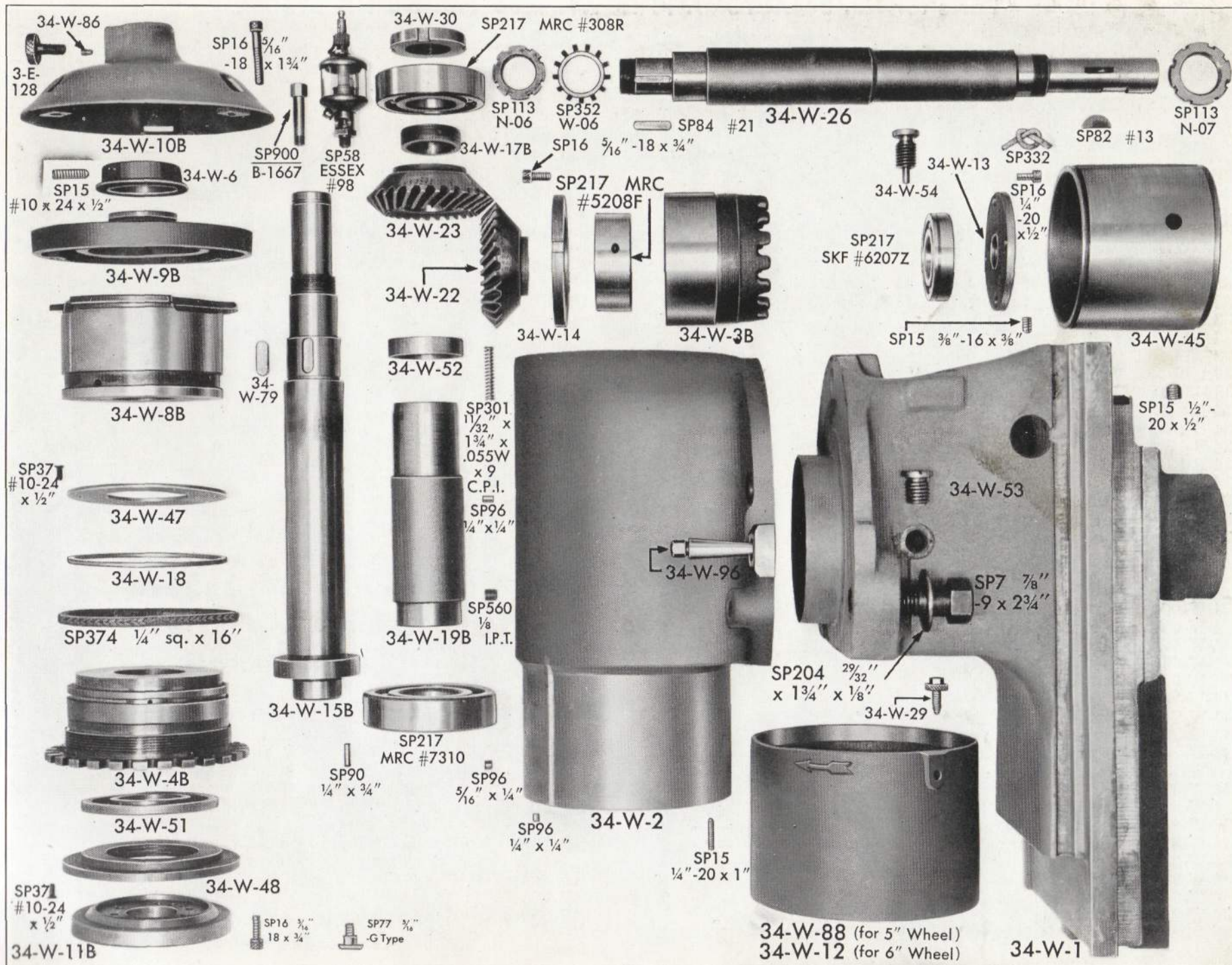
**Wheel:** Standard — Type G (Steel Back) 5" diam. Cylinder. Special — Type G (Steel Back) 6" diam. Cylinder.

Weight — Net .....	3290 lbs.
Crated (domestic) .....	3540 lbs.
Boxed for Export including Wet Attachment .....	4180 lbs.





**PLATE XXV Parts for No. 34 WHEEL SLIDE**



34-W-116 (for Segment Chuck)

**ALWAYS GIVE SERIAL NUMBER WHEN ORDERING PARTS**

**TO START MACHINE:-** SET DOGS FOR PROPER LENGTH OF TABLE TRAVEL, START MOTOR, PULL UP LEVER "R" (WHICH STARTS TABLE), TURN HANDLE "V" COUNTER-CLOCKWISE TO FEED SADDLE TOWARD OPERATOR. SLIGHT MOVEMENT OF LEVER "S" TOWARD RIGHT STOPS AUTOMATIC TABLE TRAVEL. LEVER "R" SHOULD BE DOWN AGAINST "T" WHEN FEEDING TABLE BY HAND. BEFORE STARTING TABLE FOR THE FIRST TIME, OR AFTER CHANGING OIL, BE SURE THE OIL IN GEAR BOX CUP IS HIGH AFTER GEAR BOX HAS RUN IDLE FOR FIVE MINUTES. THE HIGH TABLE SPEED OF THIS MACHINE IS MADE POSSIBLE BY THE USE OF A SHOCK-ABSORBER. THIS SHOCK-ABSORBER WOULD SOON BE RUINED IF OPERATED WITHOUT OIL.

**BELTING ARRANGEMENT**

FOR MOTOR DRIVE - HOUGHTON'S ENDLESS SINGLE "O" TREAD BELT 3/8" WIDE x 138" LONG, FOR 6" WHEEL.

155 1/2" LONG FOR S WHEEL. DO NOT DISCONNECT OIL PIPES IN REAR TO PUT ON MAIN DRIVE BELT.

TO GRIND WITH TILTED OR FLAT WHEEL LOOSEN CAP SCREWS AND INSERT PIN IN HOLE INDICATED BY ARROW ON PAD AND RETIGHTEN SCREWS.

DEPRESS LEVER ONCE FOR EACH 16 HOURS OF SERVICE.

S  
V  
R  
T

RESET MAGNETIC SWITCH CHECK MOTOR DIRECTION

1/2 LAG SCREW  
BED LEVELING SCREW

108" 2743 mm

75" 1905 mm

52 7/8"

36 1/2" 927 mm

38 1/8" 968 mm

20" 508 mm

34" 864 mm

39" 991 mm

47 7/8" 1216 mm

TANK USED WITH WET GRINDING ATTACHMENT

10 1/2" 267 mm

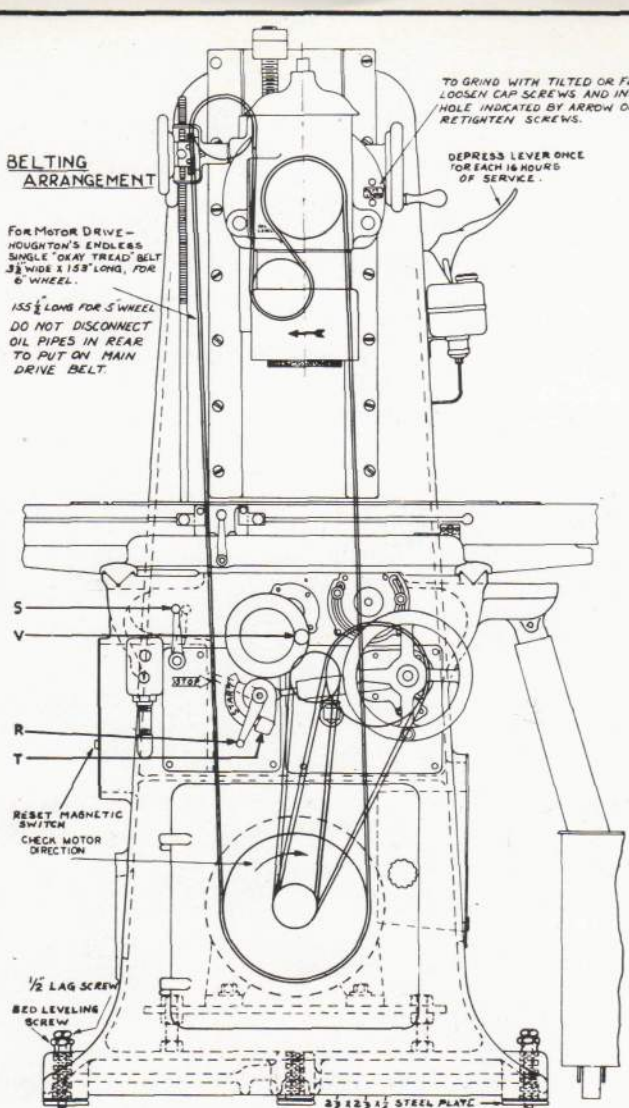
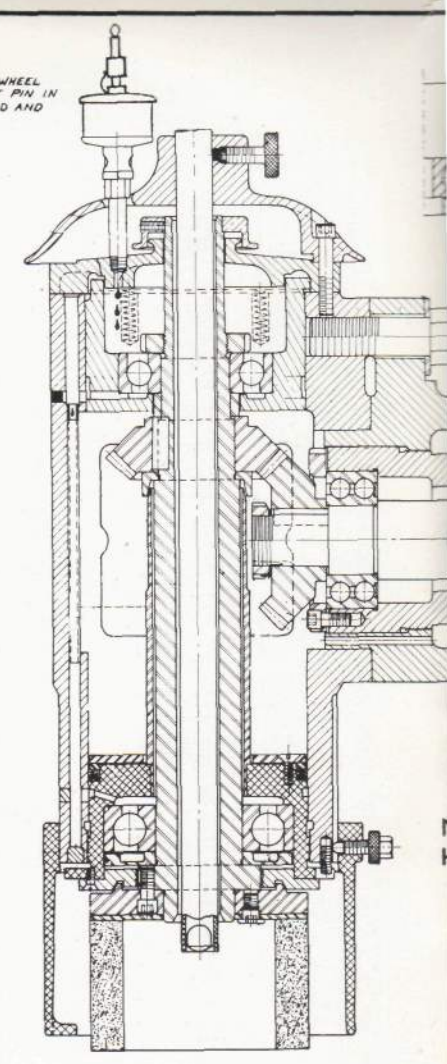
44 mm

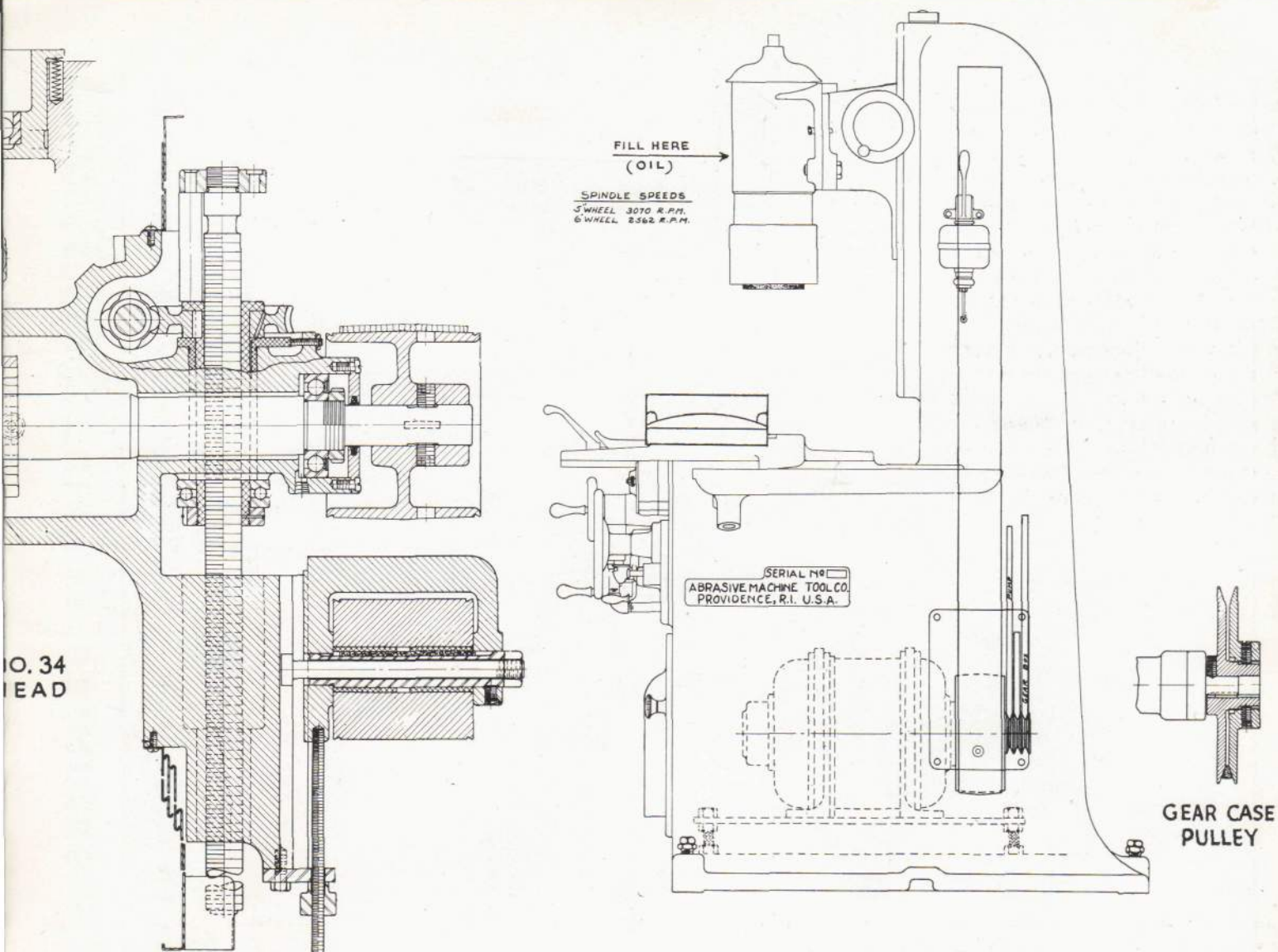
USE 1/2" LAG SCREWS  
STAND MACHINE ON 3 STEEL PLATES 2 1/2" x 2 1/2" x 1/4"

31 1/2" 800 mm

34" 864 mm

FLOOR PLAN OF # 34 VERTICAL SURFACE GRINDING MACHINE



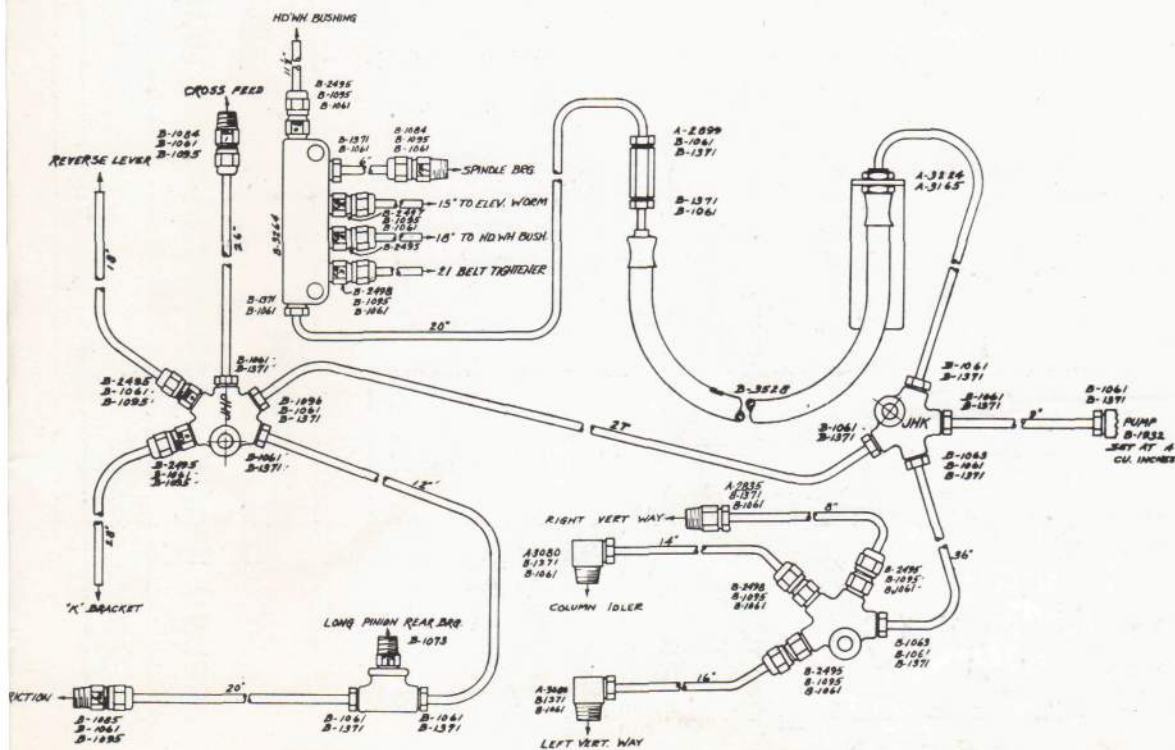


### LUBRICATION

SIGHT FEED OILER AT TOP OF THE NO. 34 HEAD FEEDS SPINDLE BALL BEARINGS AND REQUIRES LIGHT SPINDLE OIL APPROXIMATELY 100 SECONDS SAYBOLDT AT 100°F. - DO NOT USE MACHINE OIL HERE - ADJUST TO ONE DROP ABOUT EVERY FIVE MINUTES.

THE MAIN OIL RESERVOIR IN THE NO. 34 HEAD REQUIRES THE SAME TYPE MACHINE OIL AS IS USED IN THE GEAR CASE. FILL TO LINE INDICATED.

KEEP GEAR CASE FILLED TO TOP OF FILLER CUP WITH A RELIABLE MACHINE OIL HAVING A VISCOSITY OF APPROXIMATELY 400 SECONDS SAYBOLDT AT 100°F.



OIL SYSTEM FOR NO. 34 GRINDER

No. 34,  
General Instructions  
for Abrasive  
Surface Grinder No. 34  
Revised June 15, 1942  
Abrasive Machine Tool Co.  
East Providence, R. I.

**Parts for No. 34 AUTOMATIC DOWN FEED and OILING SYSTEM**

		3B	M3	3S	34			3B	M3	3S	34
3-F-28	Ratchet Feed Pawl Screw	-	-	-	X	34-W-233	Elevating Screw (Metric, for No. 34, No. M3 and No. 3B High Column)	X	X	-	X
3-W-12	Elevating Worm Wheel 40 T	X	X	X	X	SA-34-W	Bijur Fittings Sub-Assembly	-	-	-	X
3-W-22	Elevating Worm $\frac{2}{7}$ P Quadruple R.H.	X	X	X	X	SA-34-B-16C	Oil Pump and Bracket Sub-Assembly	-	-	-	X
3-W-23B	Elevating Screw Thrust Nut	-	-	-	X	SP 1	$\frac{3}{8}$ "—16 x 1" Square Head Set Screw	-	-	-	X
3-W-29	Elevating Screw Bushing	X	X	X	X	SP 7	$\frac{5}{8}$ "—11 x $1\frac{3}{4}$ " Hex. Head Cap Screw	-	-	-	X
3-W-30C	Elevating Hand Wheel Inter. Gear	X	X	X	X	SP 15	$\frac{1}{4}$ "—20 x $\frac{1}{4}$ " Socket Set Screw	-	-	-	X
3-W-35	Internal Gear Pinion	X	X	X	X	SP 15	$\frac{1}{4}$ "—20 x $\frac{3}{8}$ " Socket Set Screw	X	X	X	X
3-W-42B	Elevating Worm Shaft Spacer	X	X	X	X	SP 16	$\frac{1}{4}$ "—20 x $\frac{5}{8}$ " Socket Cap Screw	-	-	-	X
3-W-305	Elevating Hand Wheel Stud Bushing	X	X	X	X	SP 16	$\frac{1}{4}$ "—20 x $\frac{3}{4}$ " Socket Cap Screw	-	-	-	X
3-W-306	Elevating Hand Wheel Stud	X	X	X	X	SP 35	$\frac{1}{4}$ "—20 x $\frac{1}{2}$ " Button Head Machine Screw	-	-	-	X
33A-W-144	Vertical Feed Ratchet	-	-	-	X	SP 35	No. 10—24 x $\frac{1}{2}$ " Button Head Machine Screw	-	-	-	X
33A-W-147	Vertical Feed Dial (English)	-	-	-	X	SP 43	$\frac{1}{4}$ "—20 x $\frac{5}{8}$ " Fillister Head Machine Screw	-	-	-	X
33A-W-153	Vertical Feed Rack Screw	-	-	-	X	SP 43	No. 10—24 x $\frac{5}{8}$ " Fillister Head Machine Screw	X	X	X	X
33A-W-157	Oscillating Shaft Lever	-	-	-	X	SP 46	$\frac{1}{4}$ "—20 x $\frac{1}{2}$ " Knurled Set Screw	X	X	X	X
33A-W-158	Oscillating Shaft Link	-	-	-	X	SP 60	$\frac{1}{4}$ " Steel Ball	X	X	X	X
33A-W-159	Vertical Feed Rack Lever	-	-	-	X	SP 82	No. 3 Woodruff Key	X	X	X	X
33A-W-161	Vertical Feed Dial Stop	-	-	-	X	SP 84	No. 9 x $\frac{3}{4}$ " Pratt & Whitney Key	X	X	X	X
33A-W-162	Oscillating Shaft Lever Pin	-	-	-	X	SP 86	No. 2 x $1\frac{1}{4}$ " Taper Pin	X	X	X	X
33A-W-165	Vertical Feed Rack Bushing	-	-	-	X	SP 90	$\frac{3}{32}$ " x $\frac{5}{16}$ " Straight Pin	-	-	-	X
33A-W-171	Vertical Feed Dial (Metric)	-	-	-	X	SP 90	$\frac{7}{64}$ " x $\frac{7}{16}$ " Straight Pin	-	-	-	X
34-B-11B	Pump Pulley (shown on SA-34B-16C)	-	-	-	X	SP 95	$\frac{1}{16}$ " x 1" Cotter Pin	-	-	-	X
34-B-14C	Pump Bracket Stud	-	-	-	X	SP 96	$\frac{1}{4}$ " x $\frac{1}{4}$ " Cast Iron Plug	X	X	X	X
34-B-17	Tite-Flex Hose Clamp	-	-	-	X	SP 98	$\frac{3}{16}$ " x $\frac{1}{8}$ " Brass Plug	X	X	X	X
34-B-18	Oil Drip Catcher	-	-	-	X	SP 103	$\frac{3}{8}$ "—16 Hex. Thin Nut	-	-	-	X
34-W-25C	Inspection Hole Cover	-	-	-	X	SP 103	$\frac{1}{2}$ "—13 Hex. Thin Nut	X	X	X	X
34-W-32B	Vertical Feed Worm Shaft	-	-	-	X	SP 110	$1\frac{1}{2}$ "—16 x $\frac{1}{2}$ " x $2\frac{1}{4}$ " Grooved Nut With Cuts	X	X	X	X
34-W-40	Lever Connecting Link	-	-	-	X	SP 190	$\frac{1}{4}$ " x $\frac{3}{4}$ " Hardened and Ground Dowel Pin	X	X	X	X
34-W-41	Oscillating Shaft	-	-	-	X	SP 190	$\frac{1}{4}$ " x $2\frac{3}{8}$ " Hardened and Ground Dowel Pin	X	X	X	X
34-W-62	Vertical Feed Rack Bearing	-	-	-	X	SP 195	$\frac{5}{8}$ " x $1\frac{1}{8}$ " x $\frac{9}{16}$ " Die Cast Shaft Collar	-	-	-	X
34-W-64	Elevating Screw Nut 1" dia. $\frac{1}{4}$ P (English)	-	-	-	X	SP 208	$2\frac{1}{32}$ " x $1\frac{3}{8}$ " x $\frac{3}{32}$ " Beveled Corner Steel Washer	-	-	-	X
34-W-65	Vertical Feed Rack 16 P	-	-	-	X	SP 250	$\frac{1}{4}$ I.P.T. to $\frac{5}{16}$ " tube Brass Tube Union	-	-	-	X
34-W-66	Ratchet Lever Block	-	-	-	X	SP 301	$\frac{5}{16}$ " x $\frac{3}{4}$ " x .035 x 6 C.P.I. Compression Spring	-	-	-	X
34-W-67	Ratchet Lever Latch	-	-	-	X	SP 301	$\frac{5}{16}$ " x $\frac{3}{4}$ " x .0135 x 13 C.P.I. Compression Spring	-	-	-	X
34-W-68	Feed Pawl (Front)	-	-	-	X	SP 301	$\frac{7}{32}$ " x $1\frac{7}{32}$ " x .028W x 5 C.P.I. Compression Spring	X	X	X	X
34-W-69	Feed Pawl (Rear)	-	-	-	X	SP 304	$2\frac{1}{4}$ " x $\frac{1}{16}$ " Nut Spring ("G" Wire)	X	X	X	X
34-W-70	Plunger Knob	-	-	-	X	SP 331	$\frac{1}{4}$ " x $\frac{1}{2}$ " Felt Plug	X	X	X	X
34-W-71	Locking Pin Bushing	-	-	-	X	SP 332	$\frac{3}{16}$ " dia. Felt Strip	X	X	X	X
34-W-72B	Feed Rack Lever	-	-	-	X						
34-W-74C	Elevating Hand Wheel Bushing (Right)	-	-	-	X						
34-W-78	Elevating Screw Nut (Metric)	-	-	-	X						
34-W-82	Wheel Slide Stop Pin	-	-	-	X						
34-W-83	Bevel Gear Oil Nozzle	-	-	-	X						
34-W-84	Idler Oil Tube Support	-	-	-	X						
34-W-85	Oil Tube Support	-	-	-	X						
34-W-90	Elevating Hand Wheel (Left)	-	-	-	X						
34-W-92	Vert. Feed Gear 58 T, 16 P	-	-	-	X						
34-W-94	Vert. Feed Gear Bushing	-	-	-	X						
34-W-227	Elevating Screw $\frac{1}{4}$ P (English, for No. 34, No. M3 and No. 3B High Column)	X	X	-	X						

Continued on Page 56

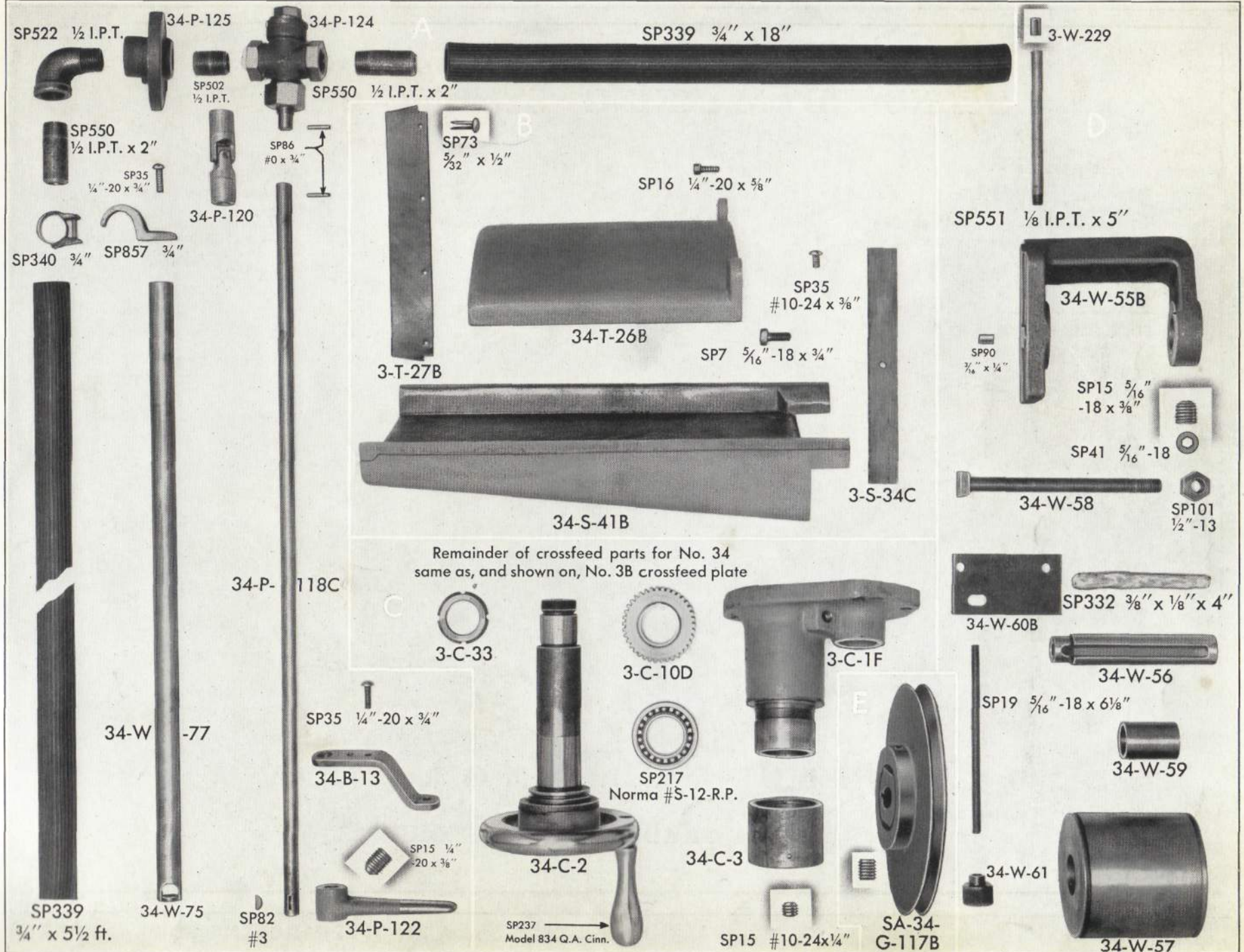


## Parts for No. 34 COOLANT SHUTOFF, TABLE END GUARDS, CROSS FEED, WHEEL SLIDE IDLER PULLEY and GEAR BOX PULLEY

(Sizes of Parts within Shaded Areas are shown in Double Proportion. White Lines divide Assemblies)

		3B	M3	3S	34			3B	M3	3S	34
<b>A. WATER SHUTOFF SYSTEM</b>											
34-B-13	Magnetic Chuck Switch Bracket	-	-	-	X						
34-P-118C	Shutoff Extension	-	-	-	X						
34-P-120	Shutoff Universal Joint	-	-	-	X						
34-P-122	Shutoff Valve Handle	-	-	-	X						
34-P-124	Shutoff Valve	-	-	-	X						
34-P-125	Shutoff Valve Flange	-	-	-	X						
34-W-75	Vert. Sp. Water Nozzle	-	-	-	X						
34-W-77	Vert. Sp. Water Pipe	-	-	-	X						
SP 15	1/4" — 20 x 3/8" Socket Set Screw	-	-	-	X						
SP 35	1/4" — 20 x 3/4" Button Head Machine Screw	-	-	-	X						
SP 82	No. 3 Woodruff Key	-	-	-	X						
SP 86	No. 0 x 3/4" Taper Pin	-	-	-	X						
SP 339	3/4" x 18" Rubber Hose	-	-	-	X						
SP 339	3/4" x 5 1/2 ft. Rubber Hose	-	-	-	X						
SP 340	3/4" Hose Clamp	-	-	-	X						
SP 502	1/2 I.P.T. Close Nipple	-	-	-	X						
SP 522	1/2 I.P.T. Street Elbow	-	-	-	X						
SP 550	1/2 I.P.T. x 2" Pipe—One End Threaded (Iron)	-	-	-	X						
SP 857	3/4" Conduit Clip—One Hole	-	-	-	X						
<b>B. TABLE END GUARDS</b>											
3-S-34C	Cover for End Pockets	X	X	X	X						
3-T-27B	Table Dust Guard End	X	X	X	X						
34-S-41B	Saddle Dust Guard	-	-	-	X						
34-T-26B	Table Way Dust Guard	-	-	-	X						
SP 7	5/16" — 18 x 3/4" Hex. Head Cap Screw	X	X	X	X						
SP 16	1/4" — 20 x 5/8" Socket Cap Screw	X	X	X	X						
SP 35	No. 10—24 x 3/8" Button Head Machine Screw	X	X	X	X						
SP 73	5/32" x 1/2" Split Rivet	X	X	X	X						
<b>C. CROSS FEED PARTS</b>											
3-C-1F	Cross Feed Bracket	X	X	X	X						
3-C-10D	Cross Feed Gear 38 T, 16 P	X	X	X	X						
3-C-33	Hand Wheel Lock Nut	X	X	X	X						
34-C-2	Cross Feed Hand Wheel	-	-	-	X						
34-C-3	Hand Wheel Dust Ring	-	-	-	X						
SP 15	No. 10—24 x 1/4" Socket Set Screw	-	-	-	X						
SP 217	Norma No. S-12-R.P. Radial Ball Bearing	X	X	X	X						
SP 237	Model 834 Q. A. Cinn. Smooth Mach. Handle	X	X	X	X						
<b>D. WHEEL SLIDE IDLER PULLEY</b>											
3-W-229	Oil Pipe Bushing	X	X	X	X						
34-W-55B	Idler Pulley Bracket	-	-	-	X						
34-W-56	Idler Pulley Stud	-	-	-	X						
34-W-57	Idler Pulley	-	-	-	X						
34-W-58	Idler Pulley Cl. Bolt	-	-	-	X						
34-W-59	Idler Pulley Bushing	-	-	-	X						
34-W-60B	Belt Tightener Support	-	-	-	X						
34-W-61	Belt Tightener Knob	-	-	-	X						
SP 15	5/16" — 18 x 3/8" Socket Set Screw	X	X	X	X						
SP 19	5/16" — 18 x 6 1/8" Stud	-	-	-	X						
SP 41	5/16" — 18 Hollow Lock Screw	X	X	X	X						
SP 90	3/16" x 1/4" C.I. Plug	X	X	X	X						
SP 101	1/2" — 13 Hex. Nut	X	X	X	X						
SP 332	3/8" x 1/8" x 4" Felt Strip	-	-	-	X						
SP 551	1/8 I.P.T. x 5" Pipe—One End Threaded (Brass)	X	X	X	X						
<b>E.</b>											
SA-34-G-117B	Gear Box Sheave Sub-Assembly	-	-	-	X						
<b>Continued from Page 54</b>											
SP 338	Hose, Tite Flex Assembly 42" Long Single .420" O.D., 1/4" Male Thread, 1/4" Female Union	-	-	-	X						
SP 350	5/8" Lock Washer	-	-	-	X						
SP 353	1/2" Type 11 "Shakeproof" Lock Washer	X	X	X	X						
SP 354	1 3/16" Welsh Expansion Plug	X	X	X	X						
SP 502	1/4 I.P.T. Brass Close Nipple	-	-	-	X						
SP 503	1/4 I.P.T. x 1 1/4" Short Nipple	-	-	-	X						
SP 503	1/4 I.P.T. x 1 3/4" Short Nipple	-	-	-	X						
SP 506	1/4 I.P.T. Elbow	-	-	-	X						
SP 509	1/4 I.P.T. Brass Straight Tee	-	-	-	X						
SP 519	1/4 I.P.T. Brass Square Head Plug	-	-	-	X						
SP 550	1/4 I.P.T. x 4 3/4" Pipe—One End Threaded (Iron)	-	-	-	X						
SP 599	5/16" x 42" Copper Tubing	-	-	-	X						
SP 900	Oil Window Gasket	-	-	-	X						
B-3604		Oil Window	-	-	-	X					
SP 900			Oil Window Ring	-	-	-	X				
B-3605											
SP 900											
B-4113											

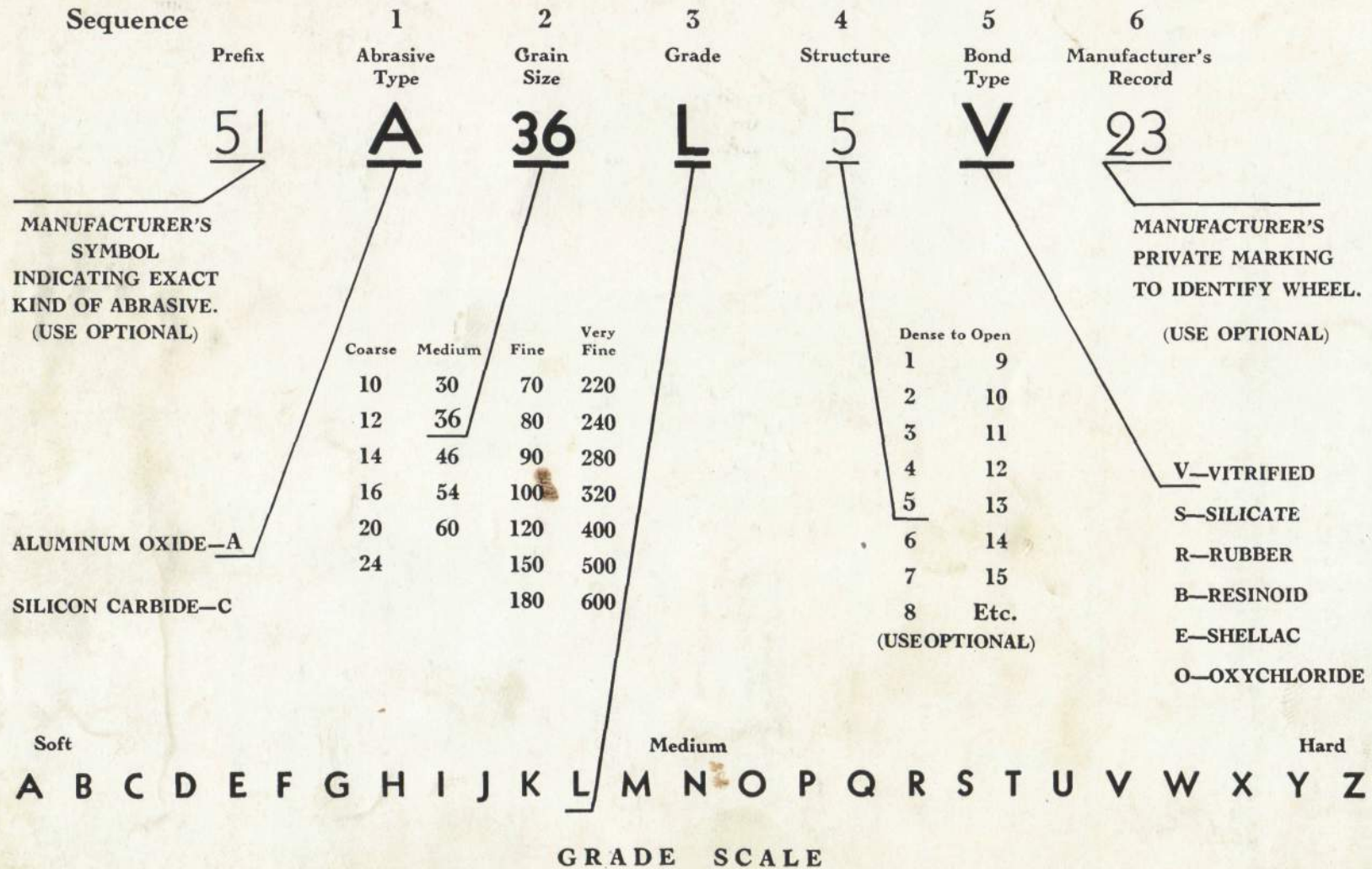
**PLATE XXVII Parts for No. 34 COOLANT SHUTOFF, TABLE END GUARDS, CROSS FEED, WHEEL SLIDE IDLER PULLEY and GEAR BOX PULLEY**





# ABRASIVE SURFACE GRINDERS

## STANDARD MARKING SYSTEM CHART



# ABRASIVE SURFACE GRINDERS

## Authorized Agents

*When ordering repair parts we suggest you do so through our authorized agents listed below. You will find one near you.*

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311-313 Bakewell St., Covington, Ky.

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Broad Street Station Bldg.

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#### SYRACUSE 2, N. Y.

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18609 St. Clair Avenue, Cleveland 10, Ohio

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