Photo 1

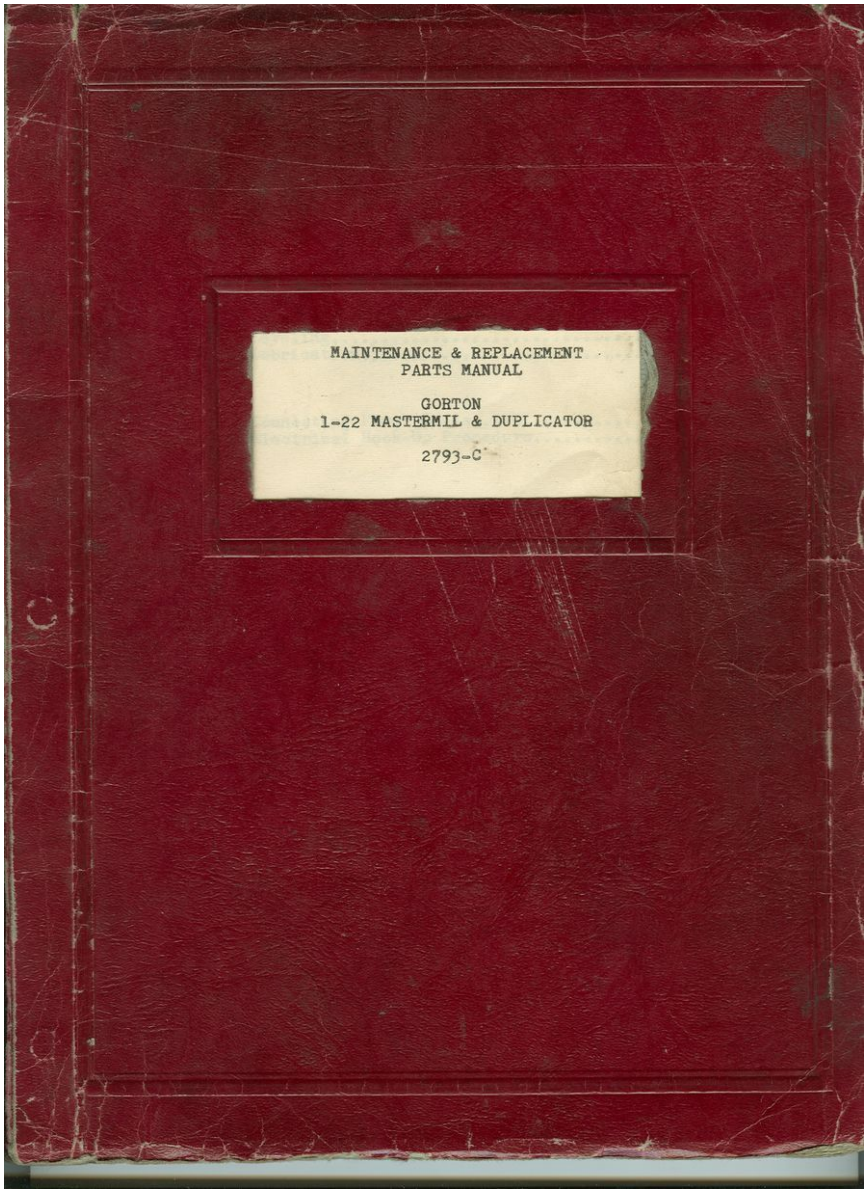
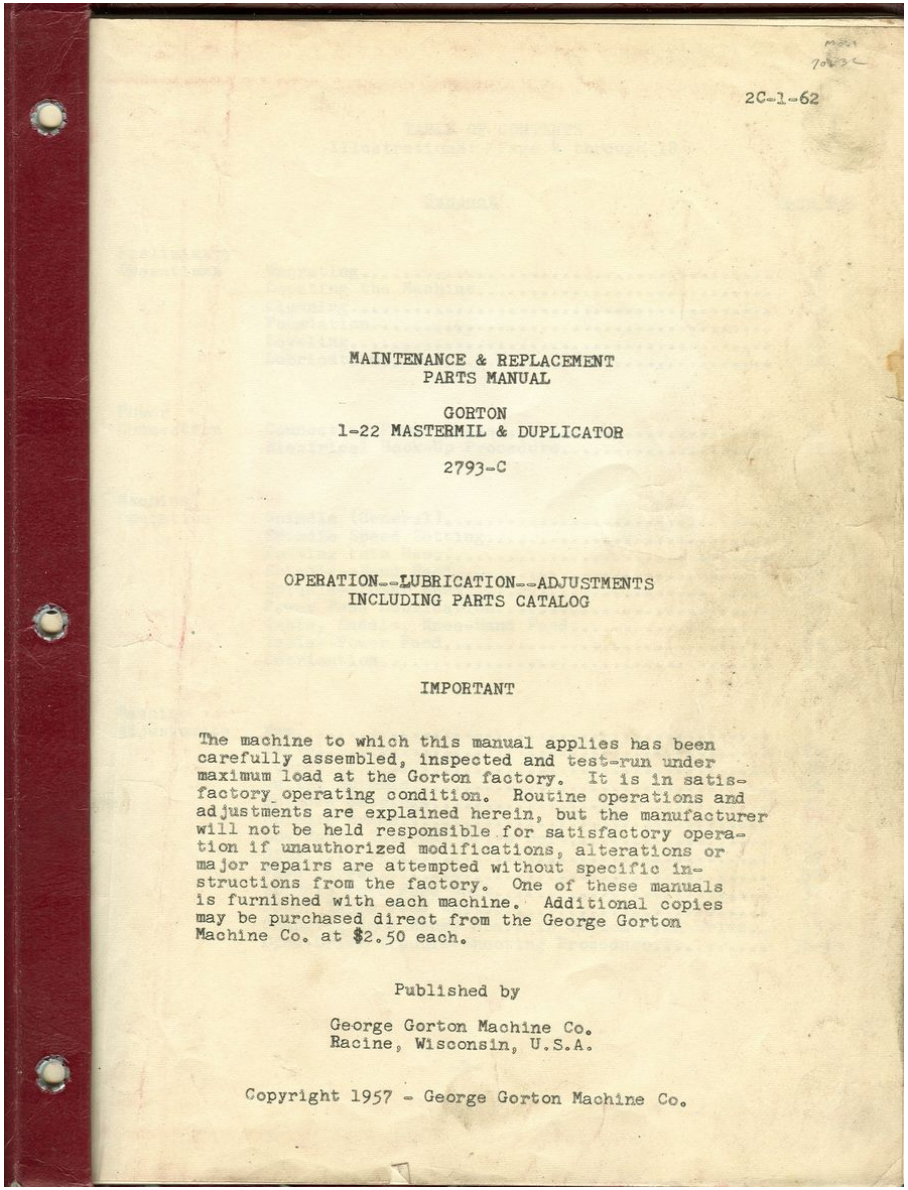

MAINTENANCE & REPLACEMENT
PARTS MANUAL
GORTON
1-22 MASTERMIL & DUPLICATOR
2793-C

Photo 2



2C-1-62

MAINTENANCE & REPLACEMENT
PARTS MANUAL

GORTON
1-22 MASTERMIL & DUPLICATOR

2793-C

OPERATION--LUBRICATION--ADJUSTMENTS
INCLUDING PARTS CATALOG

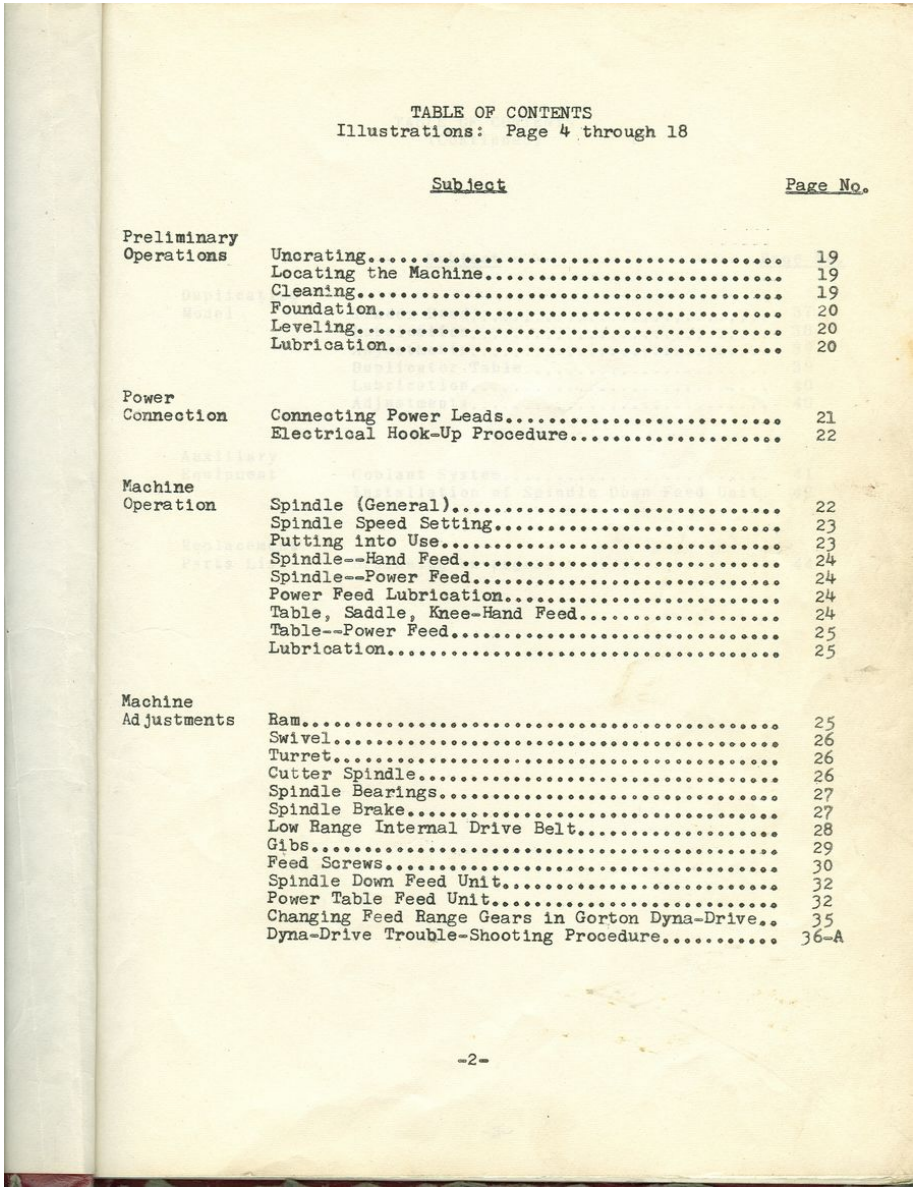
IMPORTANT

The machine to which this manual applies has been carefully assembled, inspected and test-run under maximum load at the Gorton factory. It is in satisfactory operating condition. Routine operations and adjustments are explained herein, but the manufacturer will not be held responsible for satisfactory operation if unauthorized modifications, alterations or major repairs are attempted without specific instructions from the factory. One of these manuals is furnished with each machine. Additional copies may be purchased direct from the George Gorton Machine Co. at $2.50 each.

Published by

George Gorton Machine Co.
Racine, Wisconsin, U.S.A.

Photo 3



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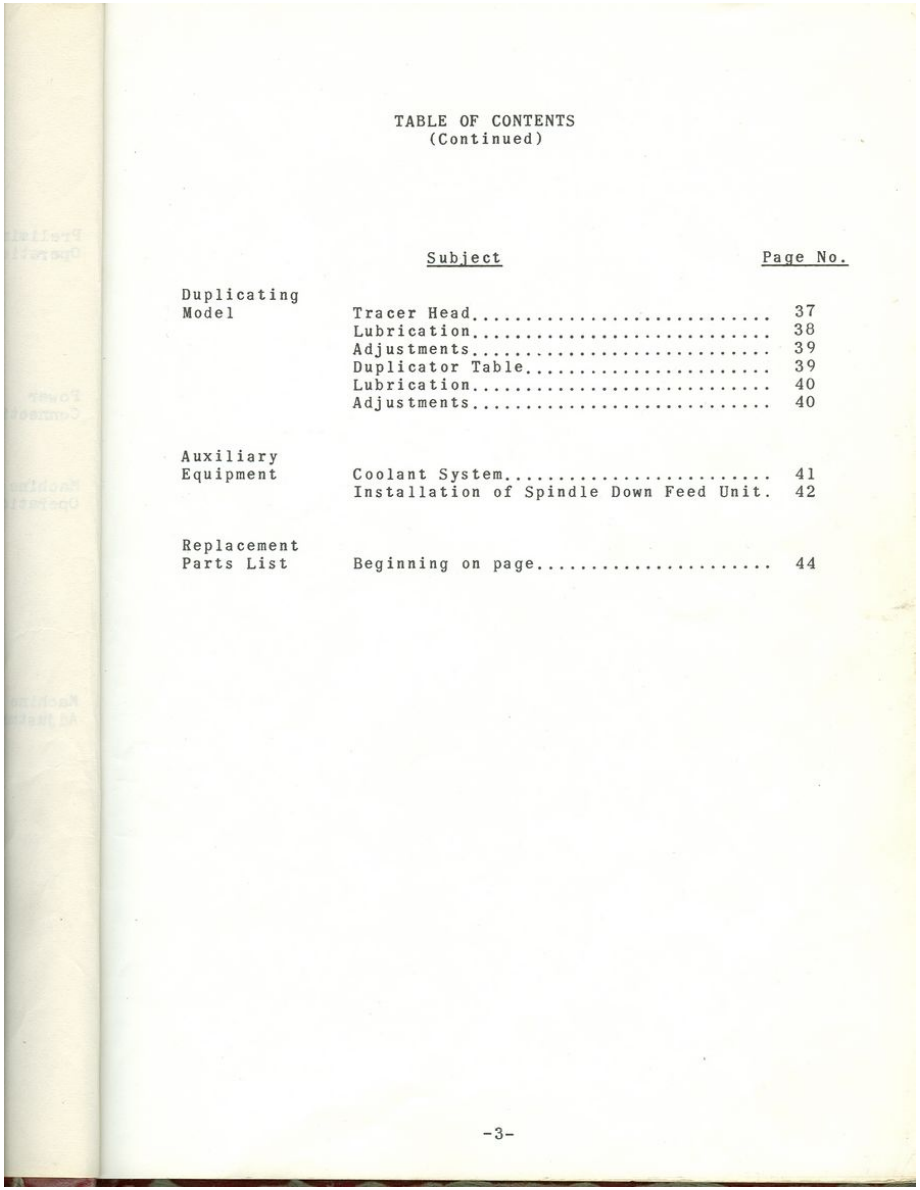

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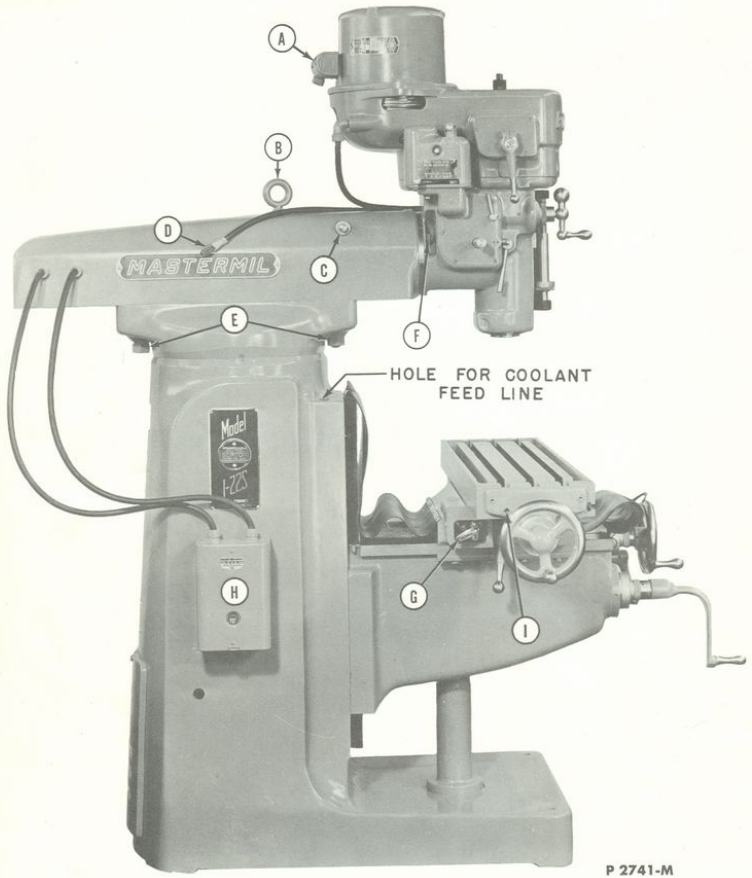
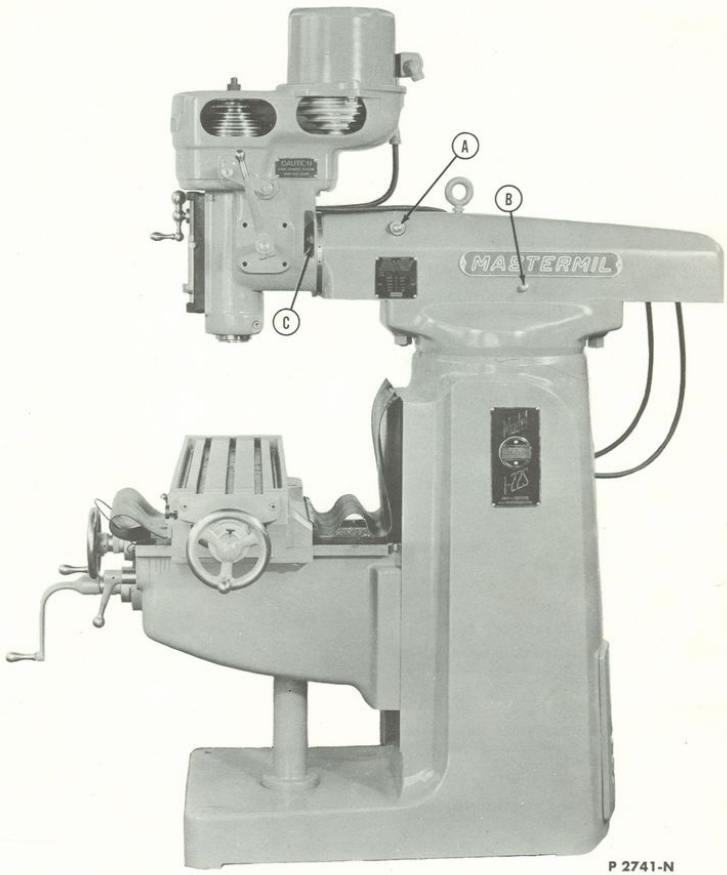


P 2741-M

LEFT SIDE OF GORTON MASTERMIL

A. Terminal housing box on motor.
B. Eye bolt for lifting.
C. Swiveling mechanism adjustment bolt.
D. Power line to motor disconnected for shipment.
E. Front and rear ram clamping bolts.
F. One of 3 swivel clamping nuts.
G. One-shot lubrication pump for table and saddle ways.
H. Overload heater re-set button.
I. Socket head plug.

Photo 6

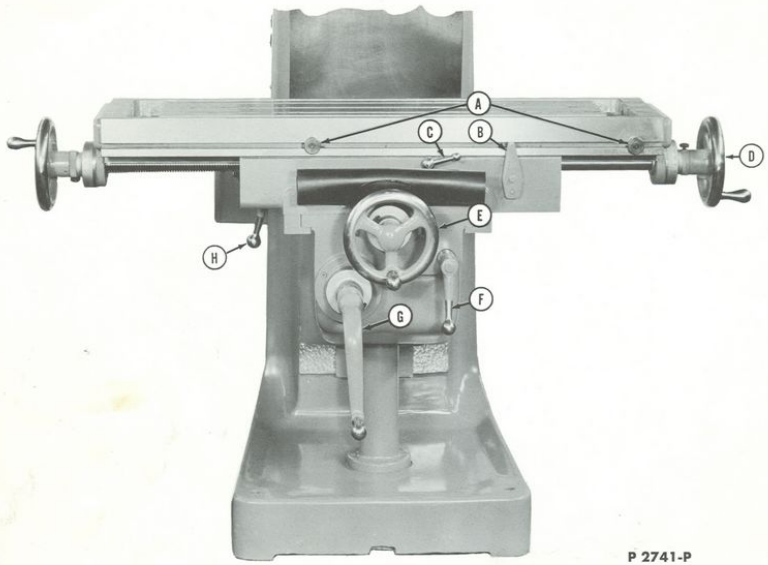


P 2741-N

RIGHT SIDE OF GORTON MASTERMIL

A. Swiveling mechanism adjustment bolt.
B. Ram adjustment bolt.
C. One of 3 swivel clamping nuts.

Photo 7



P 2741-P

TABLE, SADDLE, KNEE

A. Longitudinal feed adjustable stop dogs.

B. Table stop (when machine is equipped with power longitudinal feed, this becomes the longitudinal feed lever).

C. Table clamping lever.

D. Longitudinal feed hand wheel. (2 furnished on hand feed models; only one at left end on Dyna-Drive models.)

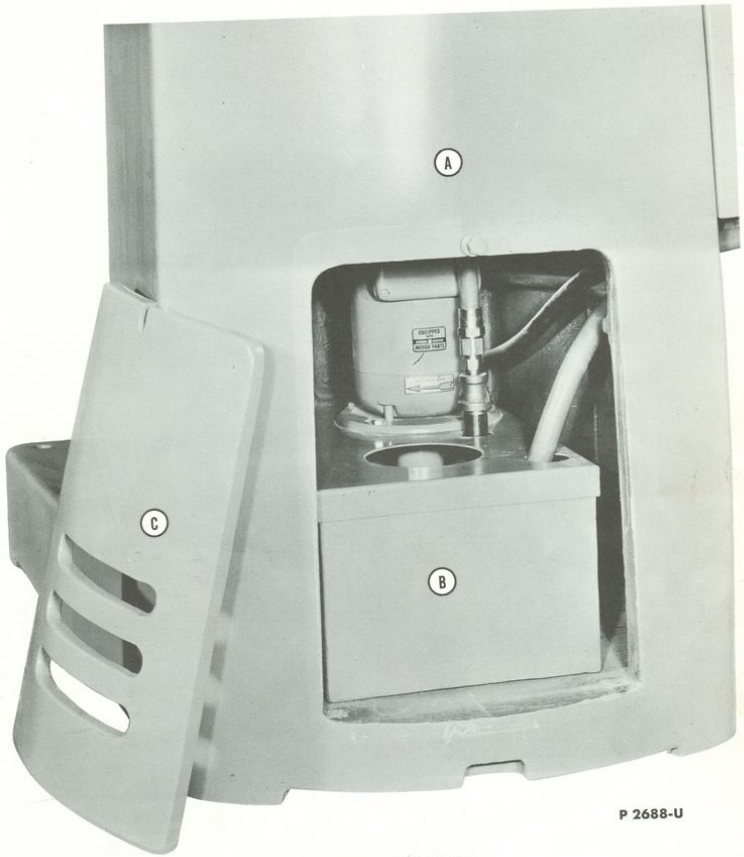
E. Cross feed hand wheel.

F. Knee clamping lever.

G. Knee elevate hand crank.

H. Saddle clamping lever.

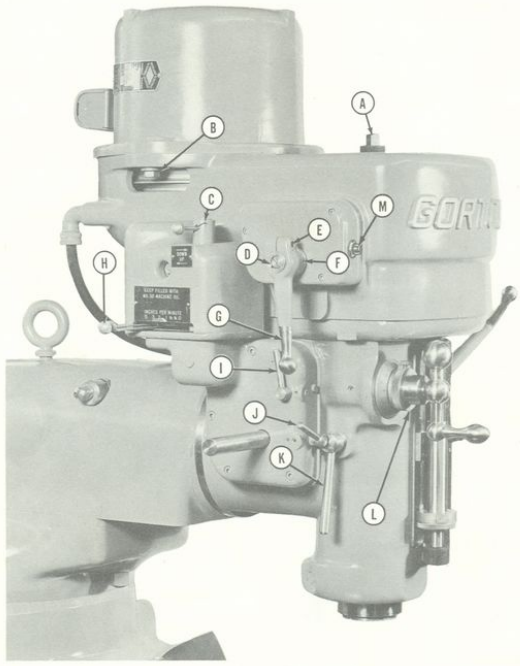
Photo 8



REAR OF COLUMN

A. Machine column.
B. Coolant pump, motor and tank.
C. Coolant compartment cover.

Photo 9

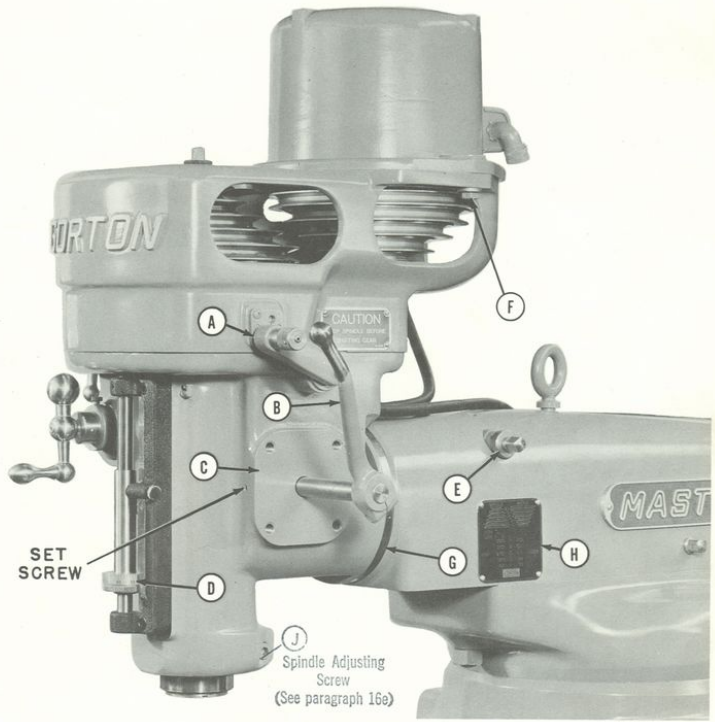


P 2741-Q

LEFT SIDE OF SWIVEL HEAD

A. Draw bar with back-up collar (left hand threads).
B. Motor mounting clamping bolt.
C. Power spindle feed and retraction lever.
D. Slotted spindle brake shaft.
E. Clamping screw.
F. Set screw.
G. Stop-brake lever.
H. Spindle feed rate lever.
I. Spindle down feed engagement lever.
J. Micrometer hand feed clutch lever.
K. Spindle clamping lever.
L. Micrometer hand feed crank with adjustable dial.
M. Start button.

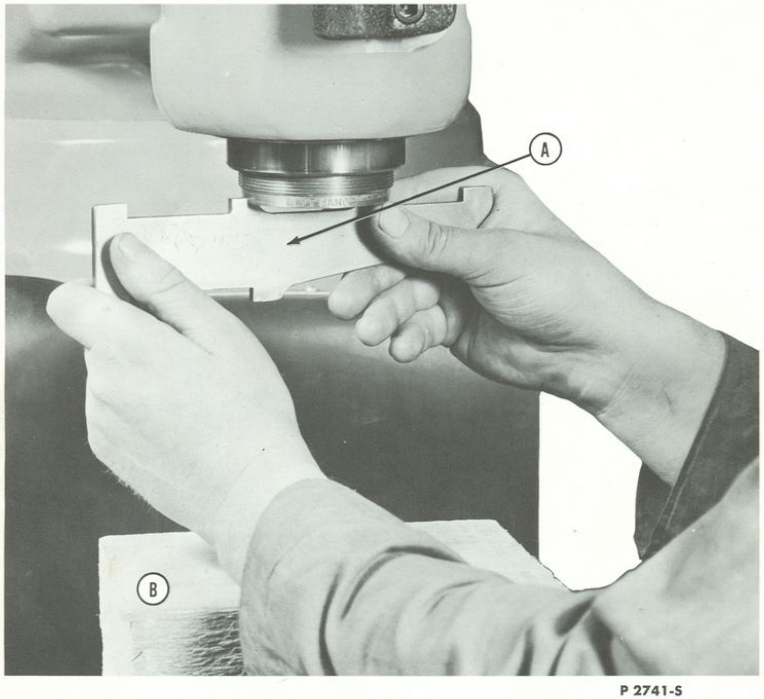
Photo 10



RIGHT SIDE OF SWIVEL HEAD P 2741-R

A. Speed range selector lever.
B. Spindle hand feed lever.
C. Pad drilled and tapped for Duplicator Tracer Head 1018-1.
D. Micrometer depth stop and bracket.
E. Swiveling mechanism adjustment bolt.
F. Spindle belt tension adjustment bolt.
G. Swivel index ring, graduated 90° left and right.
H. Spindle speed plate.

Photo 11



P 2741-S

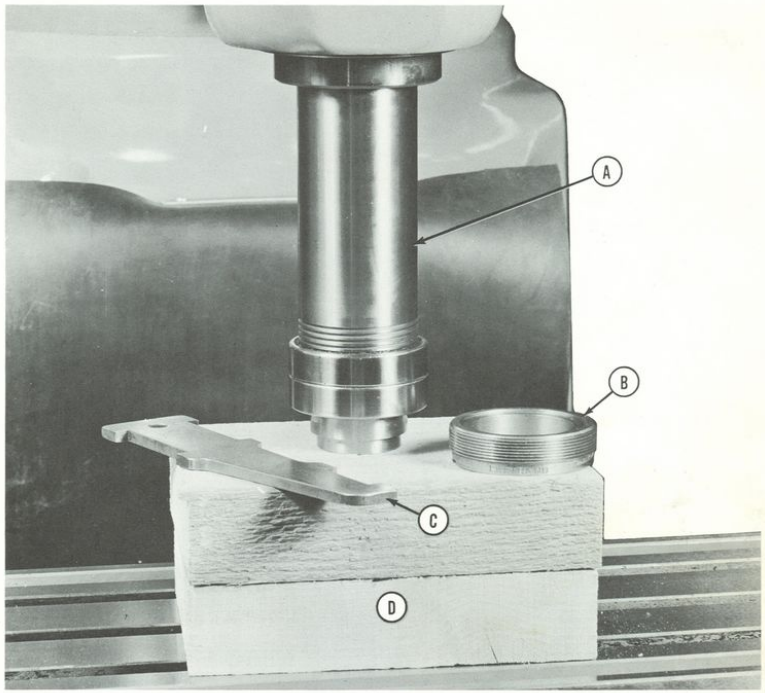
SPINDLE REMOVAL — FIRST STEP

Refer to "Spindle Bearings" in Table of Contents

A. Spanner wrench inserted in slots of spindle retaining ring (left hand threads).

B. Wood blocks to protect spindle nose and table top.

Photo 12



SPINDLE REMOVAL — SECOND STEP P 2741-T

Refer to "Spindle Bearings" in Table of Contents

A. Complete spindle assembly, including spindle, bearings, spacer, lock nut and washer.

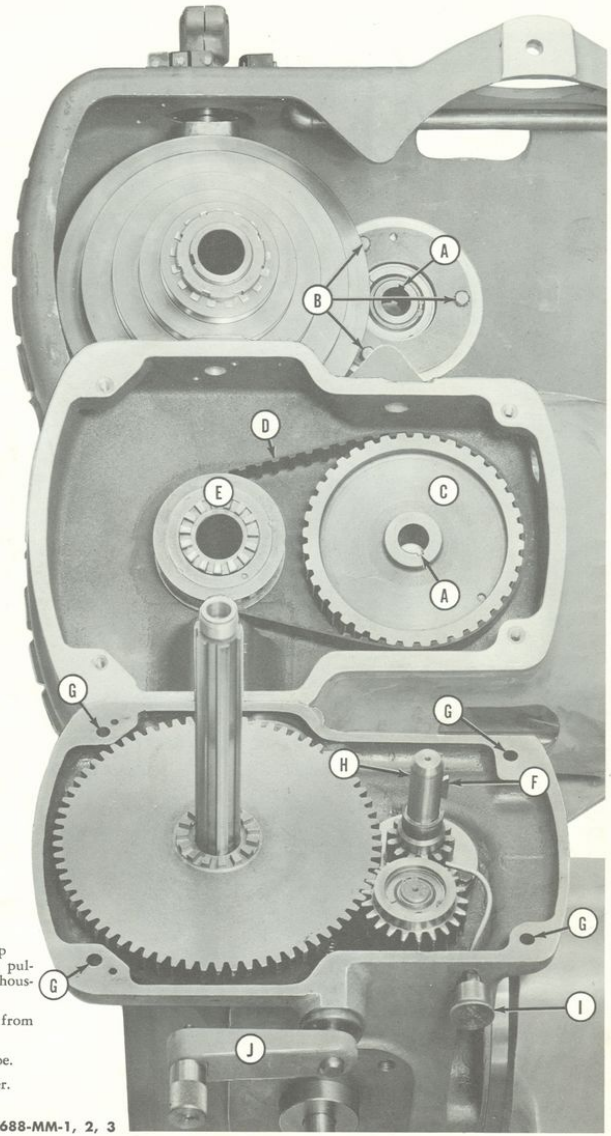
B. Spindle retaining ring.

C. Spanner wrench.

D. Wood blocks to protect spindle nose and table top.

Photo 13

SPINDLE PULLEY HOUSING



A. Large pulley keyway.

B. 3 cap screws.

C. Large pulley.

D. Internal drive (timer) belt.

E. Small pulley.

F. Jack shaft key.

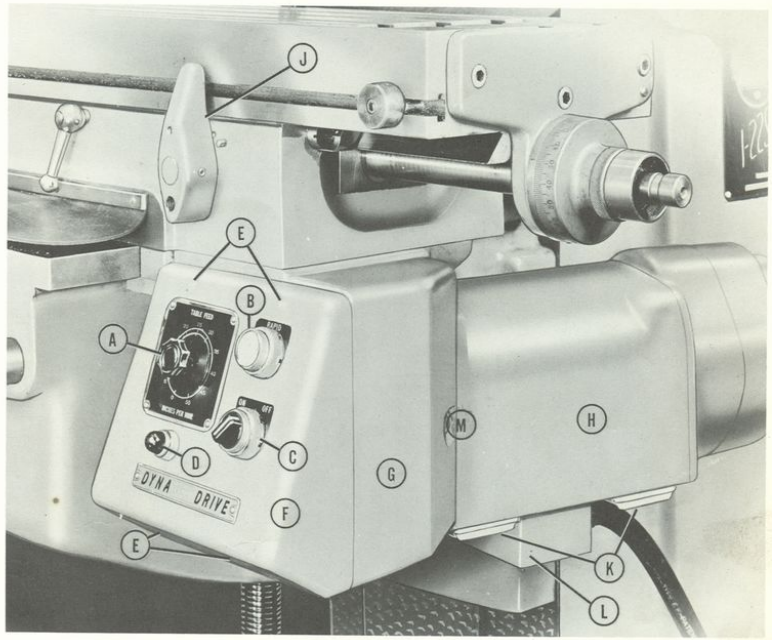
G. Four holes for cap screws holding spindle pulley housing to spindle housing.

H. Snap ring removed from jack shaft.

I. Grease cup and tube.

J. Range selector lever.

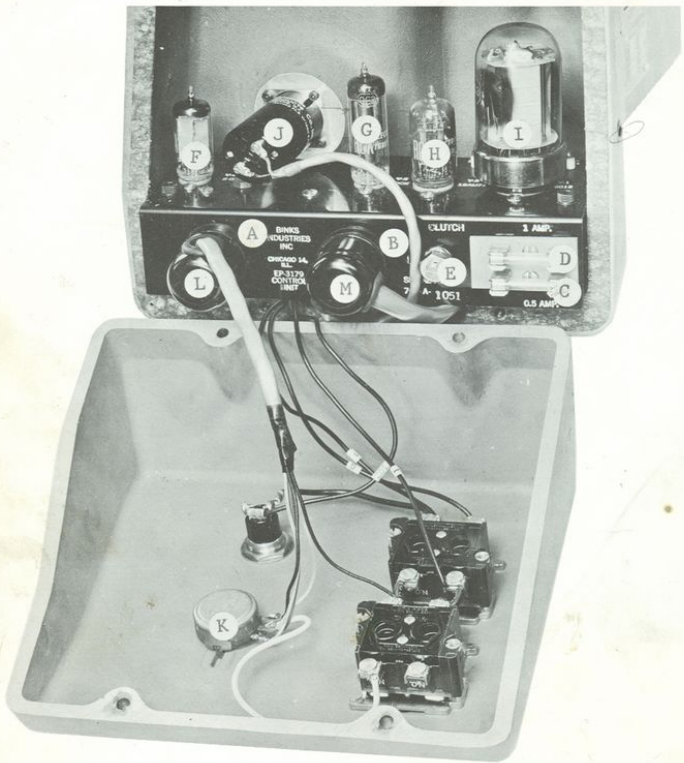
Photo 14



DYNA-DRIVE® LONGITUDINAL TABLE DRIVE P 3121

A. Feed rate control.
B. Rapid traverse button.
C. On-off switch.
D. Signal light.
E. 4 cap screws holding cover in place.
F. Front cover.
G. Gear box and control unit housing.
H. Motor and clutch housing.
J. Table power feed lever.
K. Filters.
L. Conduit box.
M. Grease fitting.

Photo 15



P-3121-A

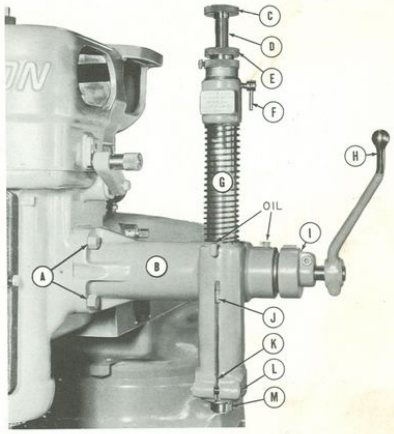
ELECTRONIC CONTROL ASSEMBLY

A. Feed rate connector socket.
B. Power connector plug.
C. Brake fuse.
D. Clutch fuse.
E. Clutch adjustment potentiometer.
F. Brake power tube 2D21.
G. Voltage regulator tube OC2.
H. Control amplifier tube 12AU7.
I. Clutch power tube 6012.
J. Tachometer.
K. Speed control.

Photo 16

TRACER SPINDLE-FRONT

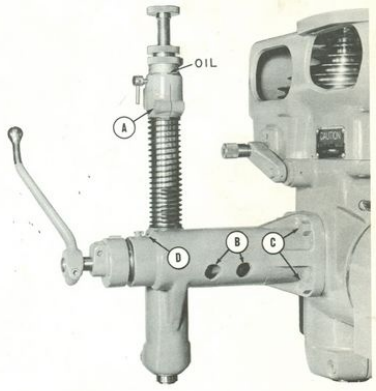
A. Two of 4 hex-head tracer head bolts.
B. Tracer head assembly.
C. Tracer draw bar.
D. Tracer spindle.
E. Micrometer vertical adjustment.
F. Micrometer vertical adjustment locking lever.
G. Tracer head tension spring.
H. Spindle and tracer head hand feed lever.
I. Spindle retraction adjustment collar.
J. Tracer spindle guide key.
K. Spindle nose retaining ring.
L. Retaining ring clamping bolt.
M. Spindle nose.



P 2688-FF

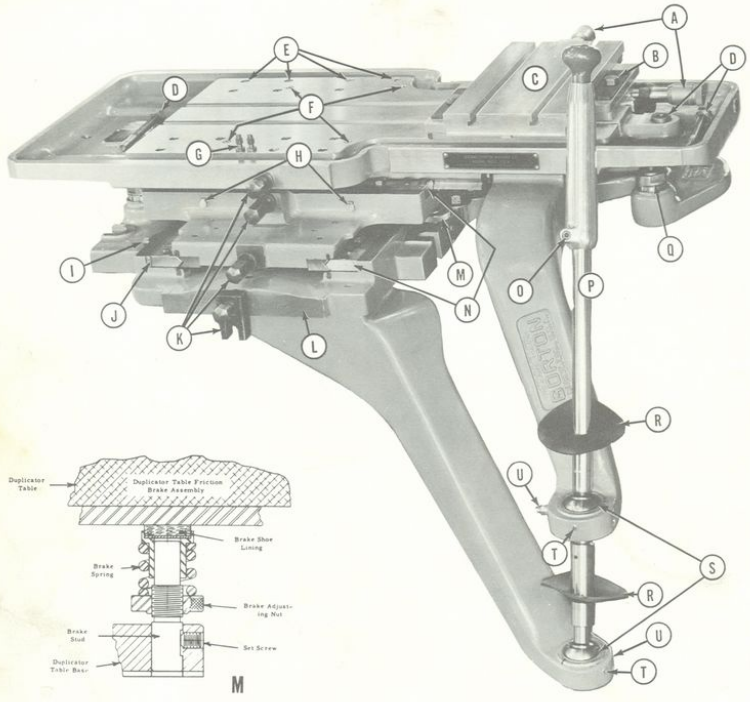
TRACER SPINDLE-BACK

A. Micrometer vertical adjustment housing clamping bolt.
B. Clamping bolts, coupling tracer and cutter spindle feed shafts.
C. Two of 4 hex-head tracer head bolts.
D. Outer bearing set screw.



P 2688-EE

Photo 17



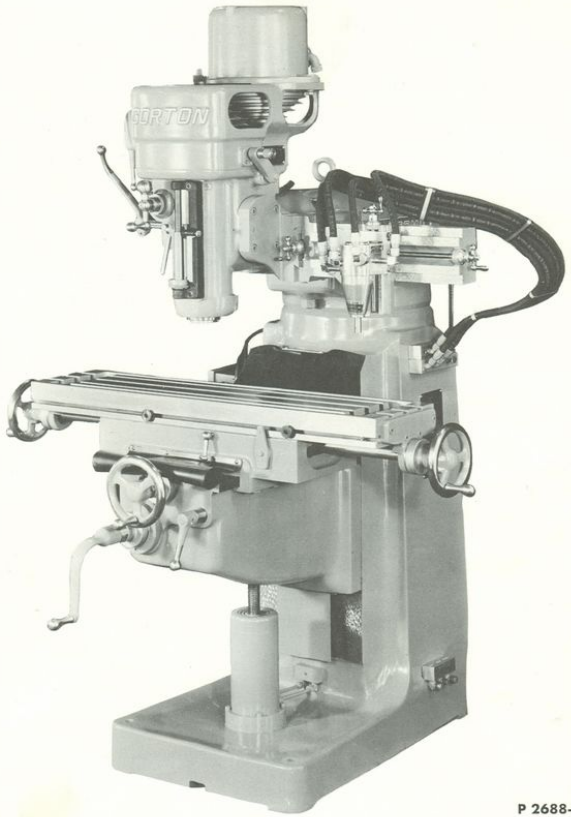
M

P 1885-SS

GORTON DUPLICATOR TABLE

A. Master table micrometer adjusting screws.
B. One of 2 master table clamping bolts.
C. Master table and base — removable.
D. Table and saddle locking bolts and seats.
E. Four of 16 tapped holes for hold-down studs.
F. Four oil pipe plugs for table ball bearings.
G. Slotted screw plugs for tapped hold-down stud holes.
H. Two oil cups — two additional ones at rear.
I. One of 4 gib adjusting screws.
J. Adjustable saddle gib.
K. Longitudinal and cross feed clamping studs and "U" strap.
L. Duplicator table base.
M. Table friction brake — see drawing.
N. Two of 8 ball bearing return blocks — longitudinal and cross.
O. Lever extension sleeve adjustment bolt.
P. Manual duplicating control lever.
Q. One of 2 clamping pads for table and saddle locking bolts.
R. Ball joint protective aprons.
S. Adjustable ball and socket joints.
T. Ball and socket lock screws.
U. Grease fittings.

Photo 18



P 2688-GG

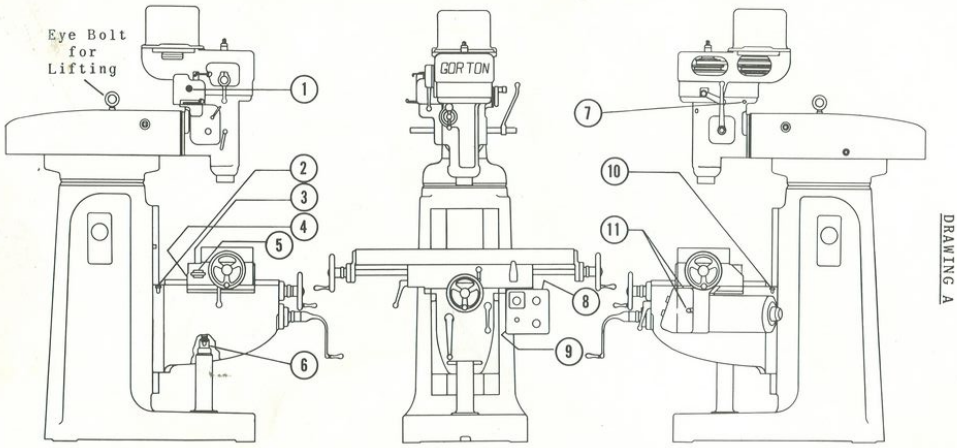
MASTERMIL EQUIPPED WITH TRACE-MASTER® HYDRAULIC TRACER CONTROL

The Gorton 1-22 Mastermil is available with Trace-Master hydraulic tracer control built in at the factory as original equipment. This can be furnished in 180° vertical feed; 360° longitudinal and cross feed, or 3D longitudinal, cross and vertical feed models. Gorton Trace-Master machines are exceptionally accurate and permit rapid duplicating of dies and molds as well as production profiling. If your machine is a Trace-Master model, supplementary instructions on the hydraulic installation have been supplied with this manual.

Photo 19

LUBRICATION CHART FOR GORTON 1-22 MASTERMIL

Lubricant for all points except 3 and 7 should be Gargoyle Vactra Oilheavy Medium X. (Oils are Socony-Mobiloil products; Keystone 122 Grease is manufactured by the Keystone Lubricating Co., Philadelphia. Pa.



DRAWING A

1 Check Weekly; Keep Filled.

2 Fill Daily.

3 Check Daily; *Keep Filled.

4 Drain Out Plug.

5 2 Shots Daily.

6 Fill Daily.

7 ½ Turn Daily; **Keep Filled.

8 Check Weekly; Keep Filled.

9 Drain Out Plug.

10 Fill Daily.

11 Filler Cap and Sight Gage

*Gargoyle Vactra Oil No. 2 (Way Oil) **Use Keystone Grease 122 Heavy Only 2688-Z

Photo 20

Preliminary Operations

Uncrating

1. After crating has been removed, examine carefully for shipping damage. Report at once to transportation company and to Gorton representative any evidence of such damage. Check shipment carefully against itemized packing list for possible shortages.

Locating the Machine
(See page 4)

2. This machine is easily moved by hoist or shop crane. Loosen front and rear ram clamping bolts (front and rear of turret) and move head and ram with ram adjustment nut (right side of ram under "Mastermil" nameplate) so that approximately four inches of the rear of ram overhangs turret at back. Then tighten ram clamping bolts. Move table back against the column using cross feed handwheel. (See paragraph 6b.) Tighten saddle clamping lever under left end of table. (See page 6.) Place lifting hook in eye bolt on top of ram and move machine to its permanent location.

   Note: If machine is equipped with hydraulic controls, move head and ram all the way forward as described above and move table to rear against column. Do not use eye bolt, but a double sling (2-inch rope) placed under ram adjacent to front ram clamping bolt.

3. If hoist or crane is not used, machine can be moved on rollers under shipping skid and lowered to floor with jacks and crowbars.

4. Machine is usually shipped with motor and motor pulleys dismounted. (See pages 8 and 9.) To remount, place motor flange on top of pulley housing flange with terminal housing box to rear. Engage motor mounting clamping bolt at left and spindle belt tension adjustment bolt at right. Install spindle belt and, after adjusting tension, tighten spindle belt tension adjustment bolt and motor mounting clamping bolt.

   Important! Motor and pulleys have been carefully balanced and aligned. Do not remove pulleys at any time.

Cleaning

5. Do not operate any moving part of this machine until it is thoroughly clean and has been given a coating of oil.

Photo 21

Remove shipping grease with clean olium spirits, or other grease solvent. Use lintless rags, not cotton waste. Never use an air hose. When machine is clean, give it a light coat of a good grade clean machine oil to prevent rust spots and other corrosion.

Foundation

6. A solid foundation for this machine is advisable for satisfactory operation when doing heavy work or when running at high speeds. The following suggestions should be followed within the limitations of the building.

a. A 6-inch concrete foundation or floor is an ideal supporting base. When locating machine on a ground level floor of timber or composition, it is best to cut a hole and build a concrete foundation from the ground up to floor level. On upper floors, place machine directly over a supporting beam or upright pillar, if possible. Otherwise, locate machine close to a retaining wall. If concrete base is rough or uneven, it should be smoothed out by whatever method is most practical.

b. Caution! All locking or clamping levers are in locked position when machine leaves factory. They must be released before any attempt is made to move table, saddle or knee either manually or under power.

Leveling Machine

7. After machine has been installed and cleaned, it must be carefully leveled. Make sure it is at room temperature before beginning to level. Use a sensitive, graduated spirit level (10 seconds per graduation) for best results. Level machine by placing level first lengthwise, then crosswise on the table and change the position of the table several times during the process. Remember that this machine must be releveled from time to time due to floor settlement.

Lubrication

See Page 18

8. All lubrication points are to be serviced with Gargoyle Vactra Oilheavy Medium X (a Socony-Mobiloil Product) at intervals determined by the requirements of the parts being serviced. There are two exceptions. The oil reservoir in the saddle should be kept filled with Gargoyle Vactra Oil No. 2, or way

Photo 22

oil, and the grease cup on the right side of the spindle pulley housing should be kept filled with Keystone Grease 122 Heavy. This is manufactured by the Keystone Lubrication Co., Philadelphia, Pennsylvania.

9. If machine is equipped with hydraulic controls to ram, table or knee or has a combination of two or more such controls, then Gargoyle Vactra Oil No. 4 must be used on the machine ways related to the hydraulic cylinders. The oil reservoir in the saddle must be serviced with No. 4 oil if the table is hydraulically controlled. Likewise a reservoir and one-shot pump on the left side of turret for ram ways and a reservoir and one-shot pump on the left side of knee for column must be similarly serviced.

a. Operator should apply sufficient oil to all ways on a hydraulically-operated machine to provide adequate lubrication at all times.

10. Cutter Spindle. This unit is permanently grease-sealed and requires no lubrication.

11. Micrometer pepth Stop. The moving parts or threads of this unit should have a light coating of oil at all times.

Electric Motors

12. Spindle motor is grease-sealed and requires no lubrication. If machine is equipped with a coolant system, the coolant pump motor should be greased about every 1,000 hours of operation with a high grade ball bearing grease, such as Gargoyle Grease BRB No. 1. (A Socony-Mobiloil product.)

Power Connection

Connecting Power Leads

13. Caution! Do not attempt to reverse connections to any of the individual motors in the machine. It is essential that all motors and control equipment remain phased as they are wired and tested at the Gorton plant.

a. When multi-phase alternating current motors are used in the Gorton Mastermil, particular attention must be paid to correct phasing of power leads to assure correct operation of the electrical control equipment and direction of revolution of motors. The machines and control equipment are carefully tested and inspected before shipment

Photo 23

to assure correct performance in the customer's plant. The electrician connecting up the machine must observe the following precautions to insure correct phasing of power leads and correct operating directions of motors.

Electrical Hook-Up Procedure

14. Connect line of correct voltage and phase to terminals in overload heater box or other control box (whichever was specified in your order). This is located on the left side of the column. Make these connections temporary until motor operating direction is checked.

a. When wiring motor, match colors of wires in flexible cable with colors of "tattle tails" in terminal housing box on motor. Remove these "tattle tails" before making final connections.

b. When spindle motor is started, spindle should revolve clockwise when looking down at it from above. If it rotates counterclockwise, reverse the power leads in overload heater box or control panel and again check direction of spindle rotation.

c. To assure full power, voltage at machine should be checked while machine is running and while all other electrical equipment on the same line is operating.

Machine Operation

Spindle

Caution! Before starting spindle, be sure that draw bar is removed or that it is firmly engaged in adapter, collet or cutter to prevent serious accident.

15. To start spindle, pull spindle start-stop-brake lever forward and then return it to its neutral position. (See page 8.) To stop spindle, push lever to rear. To "brake" spindle, continue pushing to rear until spindle stops.

NOTE: Paragraph 15 applies to machines shipped prior to January, 1958. Machines shipped after January, 1958 have a starter button mounted on the front of the stop-brake lever housing, as shown on page 8. After starting spindle motor with this button, spindle is stopped and braked as described above.

Spindle Speed Settings

16. The spindle of the Mastermil has a dual speed range with ten speeds. To adjust for low range, pull out knob of range selector (see page 9) and turn down until plunger engages lower hole. For high speed range, engage plunger in upper hole.

Photo 24

Note! Always stop spindle before changing speed range setting.

a. Speeds available in low range are; 80, 126, 216, 350 and 560 R.P.M. Speeds in high range are: 800, 1,260, 2,160, 3,500 and 5,600 R.P.M.

b. To obtain any of the above speeds in its appropriate speed range, refer to the speed plate. (See page 9.) This shows correct belt positions for each speed.

c. To change belt position, loosen both the spindle belt tension adjustment bolt at right and motor mounting clamping bolt at left. (See pages 8 and 9.) Pivot motor forward until belt is loose enough to re-position. After positioning belt, slide motor back to give proper belt tension and retighten both of the above bolts.

d. If machine is equipped with power down feed to the spindle, the tension on the drive belt to the power down feed unit may need occasional adjustment. To loosen this belt, back off hex-head bolt under flange which supports the unit. This, of course, must be retightened after adjusting spindle belt to a light tension. When adjusting down feed unit belt, see that spindle belt is positioned in center grooves of motor and spindle pulleys.

e. For accurate boring operations, adjusting screw (see page 9) should be tightened so that the quill action is slightly sticky. For high speed spindle work, adjusting screw should be loosened very slightly which will free up the vertical motion of the quill. For low speed heavy-duty work, the adjustment should also be tightened slightly.

Caution: Operator should be careful not to loosen cap screw "J" a great amount, which could cause the quill ring to move away from the lower end of the head casting. There is constant pressure against this quill ring from the quill spring, and it could be forced down from its shouldered position. If this should happen, a pair of parallels should be put onto the machine table, and the table elevated to push the quill ring back into place.

Putting into Use

17. Be sure inside of spindle nose is clean and dry. (See page 8.) When ready to put into service, insert draw bar into spindle from the top, then screw on the draw bar back-up collar (left-hand thread). Insert cutter in nose of spindle, making sure that shank is clean. Draw up cutter by turning square end with wrench while spindle brake lever is set until cutter is tight in spindle.

Photo 25

a. To loosen cutter, set the spindle brake lever and apply wrench to square end; turn counter-clockwise. Initial movement loosens draw bar hold on cutter; continued movement forces cutter out of spindle nose. Do not use hammer on top of draw bar.

Spindle-Hand Feed

18. The machine is equipped with a hand feed lever on the right and a micrometer hand feed crank on the left side of spindle housing. (See pages 8 and 9.) The latter has a feed clutch lever located adjacent to the spindle clamping lever on left side of spindle housing, as well as an adjustable dial graduated in thousandths. To engage micrometer down feed crank, move feed clutch lever clockwise. To disengage, move it counter-clockwise.

a. A precision micrometer depth stop is mounted on the front of the spindle housing. It has a graduated scale and micrometer dial. This dial can be locked in any position by tightening the knurled micrometer depth stop lock in the center of the depth stop bracket.

b. To clamp spindle in place, pull spindle clamping lever out; push back to unclamp.

Spindle--Power Feed
(See page 8)

19. If machine is equipped with power feed to the spindle, the following instructions will apply.

a. Before operating with power feed, be sure that the micrometer depth stop is set for correct depth of cut and that the feed clutch lever is engaged. Next, move spindle down feed engagement lever to rear to engage down feed unit.

b. Set down feed rate with spindle feed rate lever at bottom of down feed unit according to feed rates shown. Finally, move power spindle feed and retraction lever on top of down feed unit to its forward position and spindle will begin to feed down. To retract spindle under power, move this lever to the rear as shown on direction plate.

Power Feed Lubrication

20. Directions for lubricating this unit are on the feed rate plate.

Table, Saddle and Knee-Hand Feed

21. On the standard machine, the table, saddle and knee are hand fed by hand wheels or cranks in conjunction with adjustable

Photo 26

micrometer dials. (See page 6.) The table locking lever is located on the front of saddle; the saddle locking lever is located on the left end of saddle and under the table. The knee locking lever is located on right front of knee.

Table--Power Feed

22. If machine is equipped with a Dyna-Drive Infinitely Variable Power Feed Unit for the table, the following instructions will apply.

a. CAUTION: Before operating this unit, it is necessary to remove the front cover and take out the packing material around the electronic tubes. (See page 13.) Four cap screws marked "E" should be loosened which will release the cover. Before replacing the cover, make sure that all tubes are firmly seated.

b. This unit provides infinitely variable table feeds within the feed range shown on the feed rate control plate "A". Power feed is controlled by power feed lever "J" on the front of saddle. This operates a feed clutch.

c. To operate Dyna-Drive Power Unit, turn "on-off" switch "C" to the "on" position. (It will automatically return to neutral position after power is on.) Signal light "D" will glow to indicate that the unit is activated. (It will take from 30 seconds to one minute for power feed unit to warm up and become operative.)

d. Set feed rate selector knob "A" at feed desired as shown on feed plate, and engage power feed lever "J".

e. For rapid traversing in either direction while power feed lever is engaged, push rapid traverse button "B" and hold in depressed position.

Lubrication

23. See page 13. The letter "M" on this photograph shows the location of the grease fitting for the Dyna-Drive Unit. Lubricate once a week, three (3) shots of #122 Keystone grease. Motor bearings in Dyna-Drive Unit are permanently greased and sealed.

Machine Adjustments

Ram

24. With open end wrench furnished with machine, loosen front and rear ram clamping bolts. Ram adjustment is made with socket wrench also furnished applied to the ram adjustment

Photo 27

bolt on right side of ram. Be sure to retighten front and rear ram clamping bolts after ram adjustment.

Swivel

25. The Mastermil has a swivel head with an index ring located between spindle head and ram. This ring is graduated 90° left and right.

a. To swivel head, loosen the three clamping bolts adjacent to index ring. (See pages 4 and 5.) With socket head wrench, turn either swivel mechanism adjusting bolt (on either side of ram near the top) until head is at required angle and then reclamp with the three clamping bolts.

b. To bring head back to the vertical position, reverse the above procedure. For close work, attach dial indicator to spindle nose and sweep table to assure true vertical position of spindle.

Turret

26. Turret is clamped to top of column by a triangular "spider" held in position by a large center bolt which never needs adjusting. To loosen turret for adjustment, use open end wrench furnished and loosen hex head bolt just inside opening in rear of column, just below rear ram clamping bolt. Turret may now be positioned manually and the hex head bolt retightened.

a. To return turret to "0", match index lines on left side of column and turret at the juncture of these two members.

Cutter Spindle

27. The cutter spindle is non-adjustable; it requires no attention and is permanently lubricated. If an irregular pattern develops during face milling, or if play should develop after a long period of service, the super-precision preloaded ball bearings should be replaced by bearings of the same type from the George Gorton Machine Co., which will put the spindle in "like new" condition.

a. The cutter spindle is mounted on two sets of preloaded super-precision ball bearings, forming a complete unit which may be removed.

Photo 28

Note: It is strongly recommended that spindles requiring service be returned to the factory for expert attention. However, if it is necessary to replace bearings in the field, the following instructions will apply.

Spindle Bearings

28. Caution! Before following the instructions below, move speed range selector lever to the "up" position and keep it there during the following operations.

a. Put match marks on spindle top and upper pulley with grease crayon. When replacing spindle, align these match marks.

29. Place two short 2"x4" wood blocks on machine table under spindle nose. (See page 10 and 11.) Engage spanner wrench in slots in spindle retaining ring and turn to right (left-hand thread). When ring is removed, the spindle, spacer, bearings, grease retaining ring, tang lock washer and lock nut can be withdrawn downward as a unit.

a. To dismantle spindle assembly, release tang lock washer and unscrew lock washer (right-hand thread). Remove nut, washer and grease retaining ring. Finally, slide upper pair of bearings, the spacer and lower pair of bearings off the top of the spindle. To hold assembly in place during this time, clamp splined section of spindle in a protected vise.

b. To install new bearings, place the stamped faces of the two large bearings together and slide onto the spindle and push to spindle nose. Follow this with the spacer, then the two smaller bearings also with stamped faces together. Be sure that "balance marks" on both pair of bearings match.

c. Bearings should slide on spindle with a light push fit. Reinstall grease retaining ring, tang lock washer and tighten lock nut firmly. Be sure lock nut is engaged by one tang on tang lock washer. Put spindle bearings in V-block and, by turning spindle, check splined end for runout. Now re-install spindle assembly by reversing procedure in paragraph 29 above.

Spindle Brake Adjustment (Machines prior to Jan. 1958)

30. *The start-stop-brake lever actuates two limit switches to* start and stop spindle motor plus a brake shoe which exerts a clamping action on a flange on the bottom spindle

Photo 29

pulley. All adjustments for satisfactory operation are made and tested at the factory but occasionally, after some use, an adjustment of this unit may be necessary.

a. In following the instructions contained in paragraph 15, if brake operates before current is cut off by the "off" limit switch, the following will apply. (See page 8.)

b. Loosen the screw which clamps the start-stop-brake lever to the horizontal shaft. Now loosen set screw in front of start-stop-brake lever casting which leads to this same horizontal shaft. Now hold brake lever in vertical-neutral-position and use screwdriver in the slot in end of horizontal shaft. Turn counterclockwise 1/8 of a turn, then tighten both set screw and clamping screw. (In all cases the set screw must engage inside mating hole.) Now try the start-stop-brake lever in starting, stopping and braking the spindle. If brake is still too tight, repeat the above adjustment to loosen it a bit more, etc.

c. If brake is too loose, it will not bring spindle to a quick stop when start-stop-brake lever is pushed clear back. In this event, follow the above procedure but turn slotted spindle brake shaft clockwise in 1/8th turn steps.

Caution! Never flip or snap the start-stop-brake lever. Always pull forward to start and then return it to neutral. The same procedure should be followed when stopping and braking.

(Machines after Jan. 1958)

d. On these machines the spindle is started by push button located on the front of stop-brake lever housing. Spindle is stopped by pushing stop-brake lever to rear. To "brake" spindle, push to extreme rear position. Stop and brake adjustments are the same as those covered in paragraphs 30, a, b, and c. No start adjustments are required.

Replacement of Low Range Internal Drive Belt

31. Inside the lower section of the spindle pulley housing is the low range internal drive belt. While this notched belt operates at all times, it exerts driving power to the spindle only in the low speed range. To replace this belt, the following instructions should be followed.

a. Turn off all power at the control panel. Next, remove spindle belt. In case the machine is equipped with power down feed for the spindle, remove this belt also.

Photo 30

b. Remove motor with motor pulleys as a unit. Reverse procedure described in paragraph 4. To avoid the necessity of disconnecting power line to motor, move machine table to column face and to its upper position; cover with a board and put motor (upside down) on the board. (See page 12.) You have now exposed the top of spindle, pulleys, vertical jack shaft, three cap screws surrounding the jack shaft and the snap ring at top of jack shaft.

c. Remove snap ring from top of jack shaft and loosen the three cap screws. Make sure that the plunger in the speed range selector lever is pulled out during the next step.

d. Remove the four cap screws (one at each corner) holding the upper and lower sections of the pulley housing together. Mark top of spindle and spindle sleeve with match marks to be used later in re-assembly. Lift and pry upper section of belt housing straight up so as not to damage the two dowel pins. During the removal of upper section of pulley housing, make sure you do not develop any burrs along the mating edges. If so, file smooth. Invert the section just removed and place on machine table.

e. If large drive pulley has two flanges, pry the lower one (now in the upper position) off and remove old belt by pushing pulley toward spindle pulley. Install new belt and discard the flange which was removed. (In case there are no flanges on the drive pulley, this operation is even simpler. Merely push toward spindle pulley and remove belt.)

f. To re-assemble, reverse the above procedure. Be sure, when re-installing upper section on lower section, that the key on the jack shaft slides into its keyway as the two sections come together. Also match the marks you made on top of spindle and spindle sleeve.

Gibs

32. Correct gib adjustments depend almost entirely upon judgment and "feel". If adjustment is too loose, loss of machine accuracy results. Too tight an adjustment squeezes out all lubricant and sliding ways are then subject to excessive wear and scoring.

Photo 31

Table Gib

a. This gib is located under the front table bearing slide with the large end at right. There is an adjusting screw here and another at the small end. To adjust, when table gib is loose, back off adjusting screw at the small end of gib one-half turn. Tighten screw at large end of gib one-quarter turn. Next, tighten screw at the small end of gib until snug. Try table movement. Repeat to get desired adjustment. To adjust when table gib is too tight, reverse this procedure.

Saddle Gib

b. The saddle gib is located on the left-hand side of saddle next to knee center guide. The large end of the gib is at front. Adjust this gib as described in paragraph 32a above.

Knee Gib

c. The knee gib is located on the right-hand side of the knee directly behind the column dovetail with the small end at top. Gib adjustment is the same as described in paragraph 32a above.

Feed Screws

Table Screw

33. To adjust for backlash between table screw and nut, locate backlash adjustment under left end of table. Loosen the two socket head locking screws on table screw nut and move nut in a clockwise direction to a snug fit. Re-tighten locking screws and try table feed screw. Correct adjustment will result in from .002" to .003" movement of table screw.

Saddle Screw

34. If too much play eventually develops between the saddle screw and saddle nut, it will be necessary to replace the saddle screw and nut assembly. This is necessary to provide perfect factory fit between the nut and screw. Where shop hoist is available, the following instructions will apply.

Photo 32

a. First, drive out roll pin attaching left-hand wheel to screw shaft. Remove handwheel. Loosen thumb screw on graduated dial and remove it. Disengage tang of tang lock washer and remove lock nut and tang lock washer. Next, turn handwheel at right end of table counterclockwise until ball bearing and snap ring at left end of screw come free. Remove ball bearing and snap ring. (If your machine is equipped with Dyna-Drive table feed unit, remove left-hand handwheel which is not dowelled. Drive roll pin out of spacer collar and put handwheel on right-hand end of screw shaft.)

b. Now, remove four cap screws in right-hand table bracket and clamp table with table clamping lever. Next, turn right-hand table handwheel counterclockwise; end bracket will pull loose from table. Continue turning handwheel until table screw is free of table screw nut. This will permit removal of handwheel assembly, table bracket and screw.

c. Remove table gib adjusting screw at large end of gib--do not touch screw at other end. Remove gib. Table may now be slid to left until it can be lifted free by three men or shop hoist.

d. Now, pull saddle screw handwheel off of shaft. Loosen thumb screw on graduated dial and remove. Next, remove three cap screws exposed. Clamp saddle securely with saddle clamping lever and, with handwheel re-installed, turn in clockwise direction until saddle screw is released from saddle screw nut. Remove screw assembly.

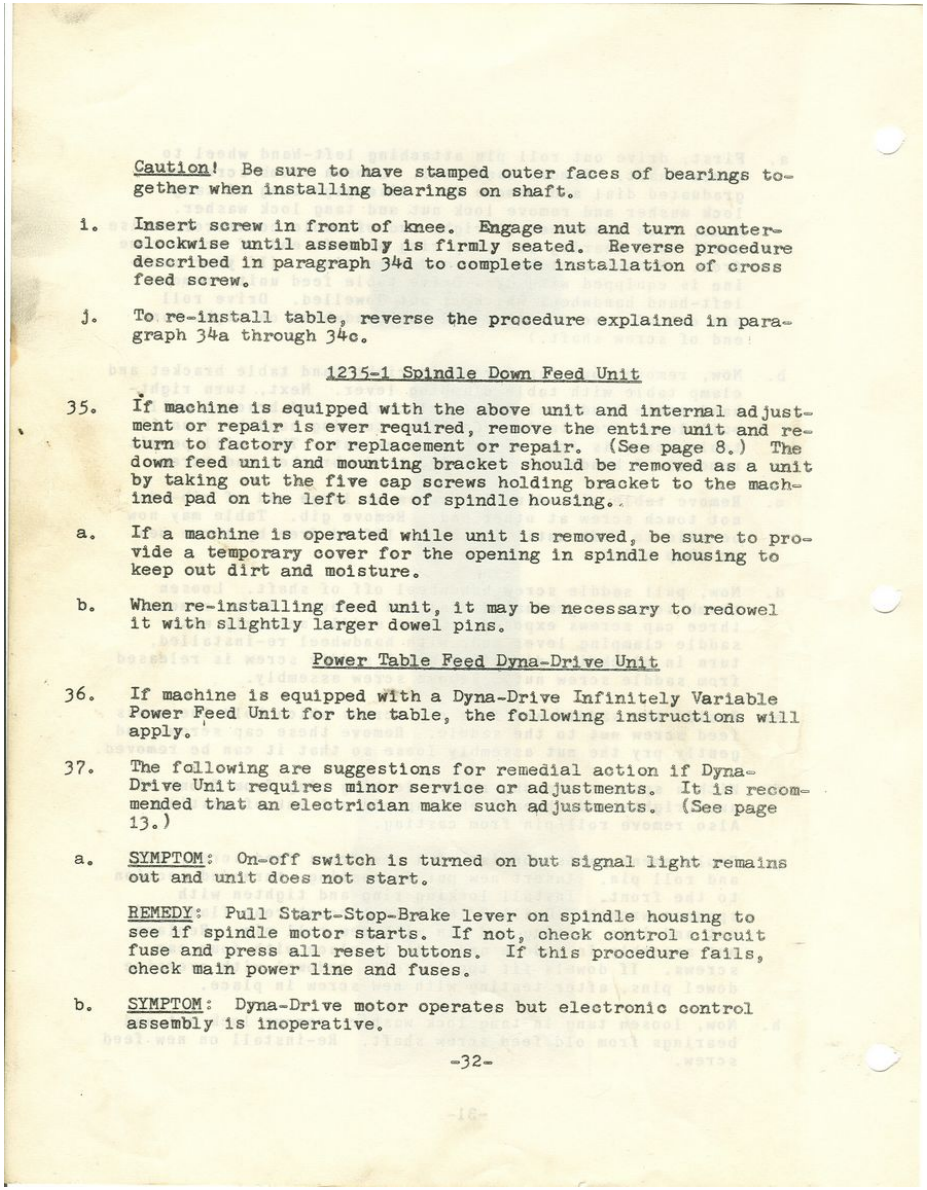
e. Inside the saddle are four cap screws which hold the cross feed screw nut to the saddle. Remove these cap screws and gently pry the nut assembly loose so that it can be removed.

f. With a spanner wrench, remove locking ring from front of nut (right-hand thread) and tap old nut out of casting. Also remove roll pin from casting.

g. Replacement parts consist of a new cross feed screw, nut and roll pin. Insert new nut in casting, threaded section to the front. Install locking ring and tighten with spanner wrench. Drill 3/16" hole through rear flange of nut and into casting and pin with new roll pin. Replace nut assembly in saddle and bolt in place with four cap screws. If dowels fit too loosely, redowel with oversize dowel pins, after testing with new screw in place.

h. Now, loosen tang in tang lock washer, remove lock nut and bearings from old feed screw shaft. Re-install on new feed screw.

Photo 33



Caution! Be sure to have stamped outer faces of bearings together when installing bearings on shaft.

i. Insert screw in front of knee. Engage nut and turn counter-clockwise until assembly is firmly seated. Reverse procedure described in paragraph 34d to complete installation of cross feed screw.

j. To re-install table, reverse the procedure explained in paragraph 34a through 34c.

1235-1 Spindle Down Feed Unit

35. If machine is equipped with the above unit and internal adjustment or repair is ever required, remove the entire unit and return to factory for replacement or repair. (See page 8.) The down feed unit and mounting bracket should be removed as a unit by taking out the five cap screws holding bracket to the machined pad on the left side of spindle housing.

a. If a machine is operated while unit is removed, be sure to provide a temporary cover for the opening in spindle housing to keep out dirt and moisture.

b. When re-installing feed unit, it may be necessary to redowel it with slightly larger dowel pins.

Power Table Feed Dyna-Drive Unit

36. If machine is equipped with a Dyna-Drive Infinitely Variable Power Feed Unit for the table, the following instructions will apply.

37. The following are suggestions for remedial action if Dyna-Drive Unit requires minor service or adjustments. It is recommended that an electrician make such adjustments. (See page 13.)

a. SYMPTOM: On-off switch is turned on but signal light remains out and unit does not start.

REMEDY: Pull Start-Stop-Brake lever on spindle housing to see if spindle motor starts. If not, check control circuit fuse and press all reset buttons. If this procedure fails, check main power line and fuses.

b. SYMPTOM: Dyna-Drive motor operates but electronic control assembly is inoperative.

Photo 34

REMEDY: (See page 14.) Remove front cover and make sure all tubes are lit. If not, replace faulty tubes. (All tubes must be seated firmly.)

CAUTION: As with any electronic unit, it is advisable to have spare tubes readily available.

If tubes are functioning, check brake fuse "C" and clutch fuse "D". Replace if required. Brake fuse is type 3AG, 1/2 ampere; clutch fuse is type 3AG, one ampere. (Do not use fuses of greater capacity--tubes will burn out.)

If fuses are functioning, a check should be made for faulty connections in conduit box "L"; special attention should be given to wires 13 and 14 coming from machine control panel to "on-off" switch.

Also check wires 11 and 12 for approximately 150 V., A.C. If voltmeter does not read close to 150 volts, then the entire Dyna-Drive power feed unit should be returned to factory for repairs. (All voltage readings should be made at power socket "M" on page 14.)

To remove Dyna-Drive Unit from machine saddle, refer to page 13. The unit is attached to the under side of saddle as shown. First, disconnect power leads which enter the control box on the left side of column. Pull cable through column until it is free.

Remove front cover of Dyna-Drive Unit by taking out four cap screws "E", page 13. Shore up unit from the floor. Remove two cap screws going through the top of gear box and control unit housing "G", and two cap screws at rear going through flange into the saddle. This will release the entire Dyna-Drive Unit.

Replace front cover on Dyna-Drive Unit before returning to factory. Be sure to put adequate packing around the tubes.

To re-install the Dyna-Drive Unit after factory servicing, reverse the above procedure by locating the keyway in the lower part of the sleeve in the saddle, so that the key at the end of the Dyna-Drive shaft will engage it as the unit is raised and bolted into place.

c. SYMPTOM: Power feed unit operates erratically; feed rate varies, or there is no feed at all at low settings--or, if table coasts at high rate of feed after rapid traversing, then follow the suggestions below.

Photo 35

REMEDY: See page 13. Erratic feed rate or no feed rate at all at low settings; first set feed rate control knob at zero.

Loosen lock nuts "E" on clutch potentiometers and rotate potentiometer fully counterclockwise with screwdriver.

To adjust clutch, connect an 0-150 A.C. voltmeter to the clutch fuse "C" and chassis. Rotate the clutch "E" potentiometer slowly clockwise until a downward deflection is noted on the meter, then back up counterclockwise slightly until meter deflection is normal. The amount of back-up is critical. (Page 14.)

If the potentiometer is rotated back too far from the point of meter deflection, the servo amplifier loses sensitivity. If it is not backed up enough, the table feed will not be stopped when potentiometer is on zero.

Following above adjustments, tighten lock nut "E".

After above adjustments have been made, engage power feed lever "J" (page 13) and leave feed rate control knob at zero. Now depress rapid traverse button "B" and release. If machine table coasts for more than approximately one second, the following suggestions will apply.

Check wires 12 and 13 for faulty connections.

Replace brake power tube 2D21 at "F" (page 14). If this does not remedy the defect, replace control amplifier tube 12AU7 at "H". The Dyna-Drive Unit should now perform properly. If it does not, replace the entire electronic control assembly as follows:

Disconnect plug "L" (page 14) and socket "M".

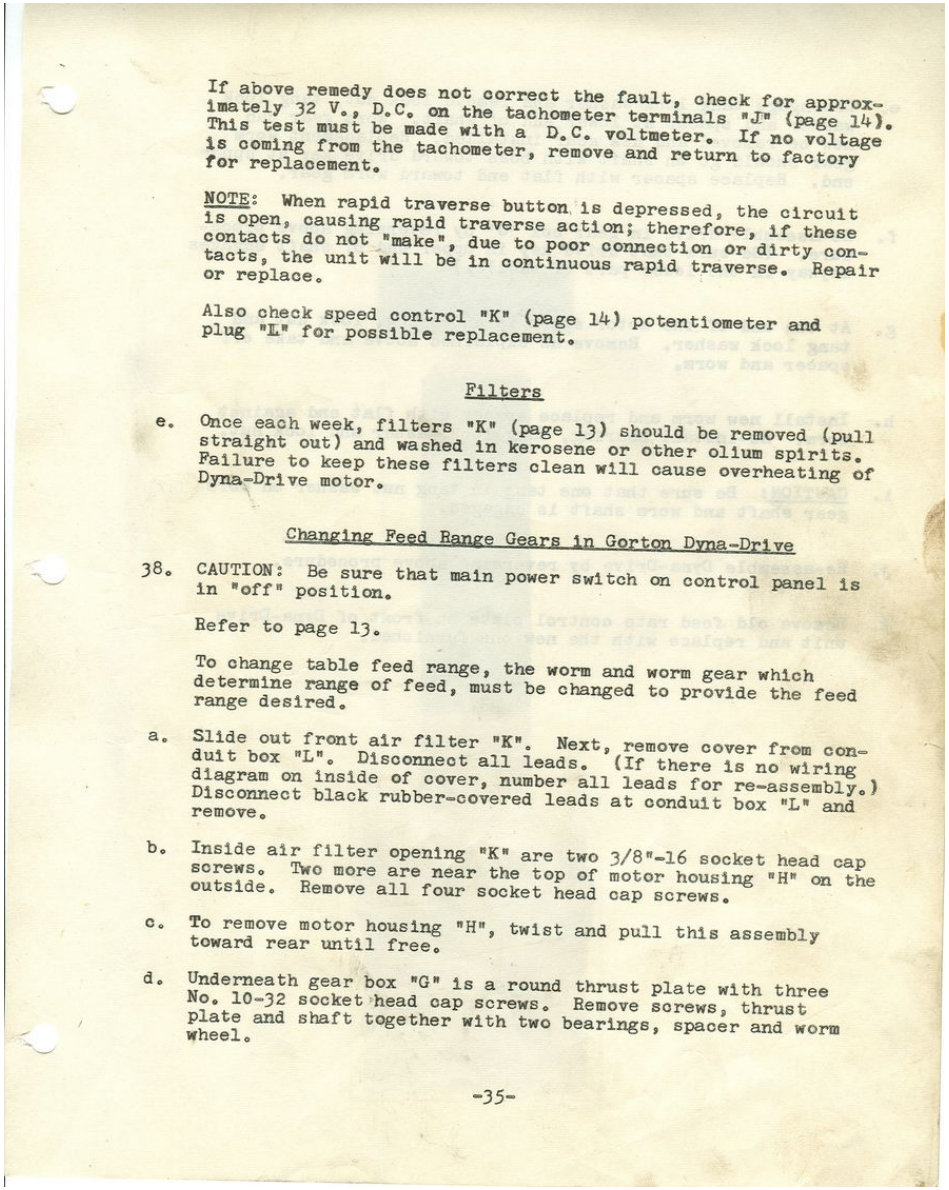
Remove two screws under the gear box and control unit housing "G" (page 13) near front. These hold the electronic control assembly in place.

Lift out electronic control assembly and replace from dealer's stock or direct from factory.

d. SYMPTOM: Regardless of feed rate control knob setting, the unit runs continuously at the high feed rate.

REMEDY: First, determine if main power lines to the control box are connected correctly to rotate the spindle clockwise when looking down at it from above. If not correctly connected, the Dyna-Drive will operate as just described.

Photo 36



If above remedy does not correct the fault, check for approximately 32 V., D.C. on the tachometer terminals "J" (page 14). This test must be made with a D.C. voltmeter. If no voltage is coming from the tachometer, remove and return to factory for replacement.

NOTE: When rapid traverse button is depressed, the circuit is open, causing rapid traverse action; therefore, if these contacts do not "make", due to poor connection or dirty contacts, the unit will be in continuous rapid traverse. Repair or replace.

Also check speed control "K" (page 14) potentiometer and plug "L" for possible replacement.

Filters

e. Once each week, filters "K" (page 13) should be removed (pull straight out) and washed in kerosene or other olium spirits. Failure to keep these filters clean will cause overheating of Dyna-Drive motor.

Changing Feed Range Gears in Gorton Dyna-Drive

38. CAUTION: Be sure that main power switch on control panel is in "off" position.

Refer to page 13.

To change table feed range, the worm and worm gear which determine range of feed, must be changed to provide the feed range desired.

a. Slide out front air filter "K". Next, remove cover from conduit box "L". Disconnect all leads. (If there is no wiring diagram on inside of cover, number all leads for re-assembly.) Disconnect black rubber-covered leads at conduit box "L" and remove.

b. Inside air filter opening "K" are two 3/8"-16 socket head cap screws. Two more are near the top of motor housing "H" on the outside. Remove all four socket head cap screws.

c. To remove motor housing "H", twist and pull this assembly toward rear until free.

d. Underneath gear box "G" is a round thrust plate with three No. 10-32 socket head cap screws. Remove screws, thrust plate and shaft together with two bearings, spacer and worm wheel.

Photo 37

e. Desengage tang lock washer and remove lock nut, tang lock washer and spacer at lower end of shaft. Worm gear can now be removed and new gear installed. Replacement worm gear should go on shaft with boss toward drive key at upper end. Replace spacer with flat end toward worm gear.

f. Re-assemble drive in gear box "G" by reversing above procedure. (Be sure that drive key in upper end of shaft engages keyway in the lower part of saddle.)

g. At the end of the motor shaft is a bearing, lock nut and tang lock washer. Remove as explained above and take off spacer and worm.

h. Install new worm and replace spacer with flat end against worm. Re-install bearing, tang lock washer and lock nut.

i. CAUTION: Be sure that one tang in tang nut washer on worm gear shaft and worm shaft is engaged.

j. Re-assemble Dyna-Drive by reversing above procedure.

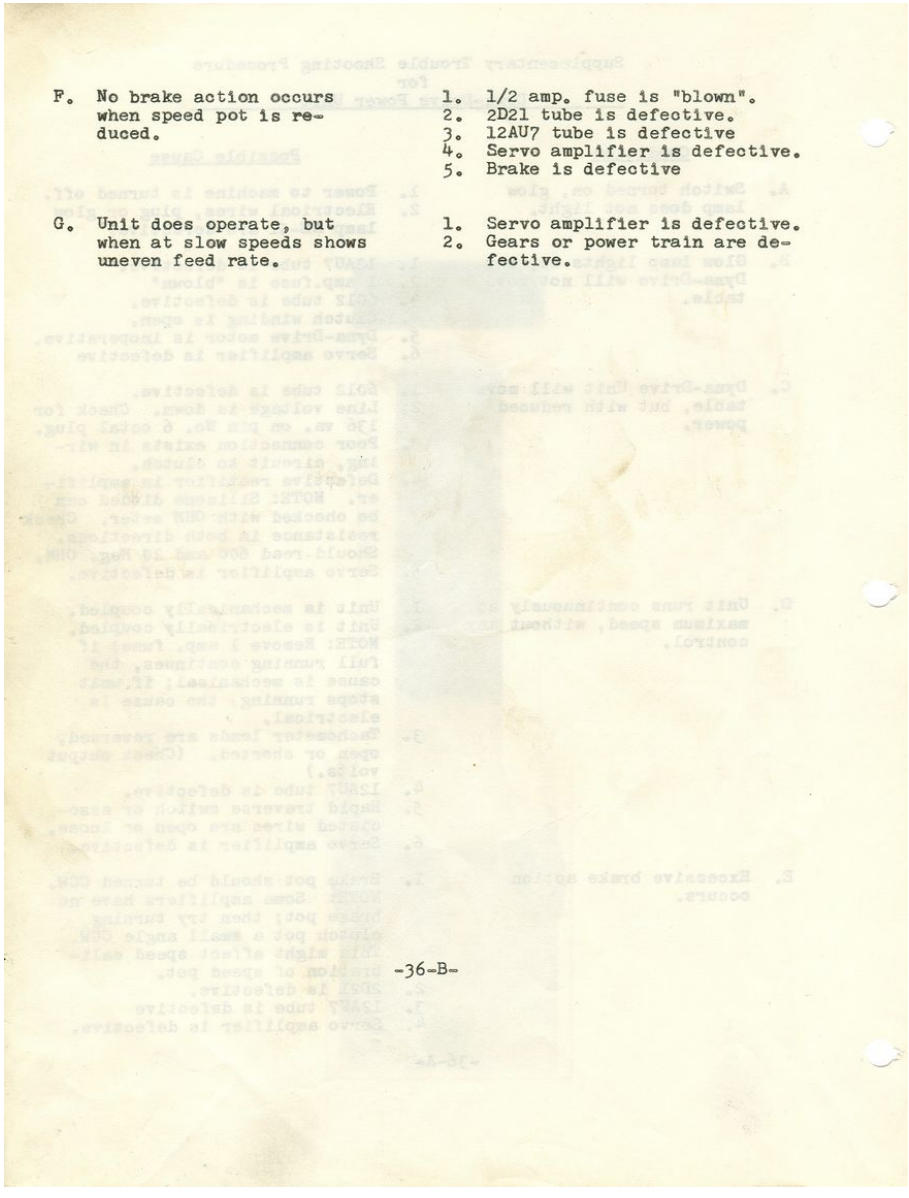
k. Remove old feed rate control plate on front of Dyna-Drive unit and replace with the new one furnished.

Photo 38

Supplementary Trouble Shooting Procedure
for
Dyna-Drive Power Unit

Condition	Possible Cause
A. Switch turned on, glow lamp does not light.	1. Power to machine is turned off. 2. Electrical wires, plug or glow lamp NE-51 are defective.
B. Glow lamp lights up, but Dyna-Drive will not move table.	1. 12AU7 tube is defective. 2. 1 amp.fuse is "blown" 3. 6012 tube is defective. 4. Clutch winding is open. 5. Dyna-Drive motor is inoperative. 6. Servo amplifier is defective
C. Dyna-Drive Unit will move table, but with reduced power.	1. 6012 tube is defective. 2. Line voltage is down. Check for 136 va. on pin No. 6 octal plug. 3. Poor connection exists in wiring, circuit to clutch. 4. Defective rectifier in amplifier. NOTE: Silicone dioded can be checked with OHM meter. Check resistance in both directions. Should read 600 and 20 Meg. OHM. 5. Servo amplifier is defective.
D. Unit runs continuously at maximum speed, without any control.	1. Unit is mechanically coupled. 2. Unit is electrically coupled. NOTE: Remove 1 amp. fuse; if full running continues, the cause is mechanical; if unit stops running, the cause is electrical. 3. Tachometer leads are reversed, open or shorted. (Check output volts.) 4. 12AU7 tube is defective. 5. Rapid traverse switch or associated wires are open or loose. 6. Servo amplifier is defective.
E. Excessive brake action occurs.	1. Brake pot should be turned CCW. NOTE: Some amplifiers have no brake pot; then try turning clutch pot a small angle CCW. This might affect speed calibration of speed pot. 2. 2D21 is defective. 3. 12AU7 tube is defective 4. Servo amplifier is defective.

Photo 39



F.	No brake action occurs when speed pot is reduced.	1. 1/2 amp. fuse is "blown". 2. 2D21 tube is defective. 3. 12AU7 tube is defective 4. Servo amplifier is defective. 5. Brake is defective
G.	Unit does operate, but when at slow speeds shows uneven feed rate.	1. Servo amplifier is defective. 2. Gears or power train are defective.

Photo 40

Die and Mold Duplicating Model

Tracer Head

39. If your machine is a Mastermil die and mold duplicator, the tracer head has already been properly installed at factory. If, however, your machine is a standard Mastermil, the following instructions will explain how to install, operate and adjust the tracer head. (See page 15.)

a. On the right side of the spindle housing where the speed shaft protrudes, there is a square pad which has been machined, drilled and tapped to take the 1018-1 Gorton duplicator tracer head.

b. Remove the hand feed lever at right of spindle.

c. Remove tracer spindle guide key located in the milled vertical slot in tracer spindle housing. This permits drawing out the entire spindle assemble from the tracer spindle housing. Remove tension spring. Next, loosen outer bearing set screw in top of tracer spindle housing and remove hand feed lever shaft complete.

d. Examine surfaces of mounting pads--wipe clean and remove any burrs. Mount tracer head shaft housing on pad on spindle housing with four hex head tracer head bolts, furnished with tracer head assembly. Replace tracer spindle assembly in tracer spindle housing without tension spring. Allow this assembly to seat itself in its lowest position. Clamp dial indicator to tracer spindle nose.

Photo 41

for 10" sweep of table. Sweep the machine table. Tolerance should be from .0005" to .001", depending upon individual requirements.

e. After noting deviations from required tolerances, the top or bottom of the tracer head mounting face should be scraped to bring tracer spindle to the position required. To compensate for any front-to-back error, rotate the tracer head casting either clockwise or counterclockwise on the machined pad. When correct position has been located, tighten the four hex head tracer head bolts firmly.

f. Now drill two 5/16" dowel holes in spindle housing, using pilot holes in tracer mounting bracket as guides. Holes should be reamed for press fit in pad and push fit in mounting bracket. Insert and press home two dowel pins. Re-assemble tracer spindle assembly with tension spring. Insert in tracer spindle housing and replace tracer spindle guide key.

g. Make sure that clamping bolts in coupling at end of tracer spindle feed shaft are loose. Remove coupling and mount on end of cutter spindle feed shaft. Now, remount tracer spindle feed shaft and tighten outer bearing set screw. Lock the cutter spindle in the up position. Install hand feed lever on end of tracer spindle feed shaft and lock in up position.

h. It is now necessary to connect the tracer spindle to the cutter spindle through its feed shaft in such a way that the positive upper cutter spindle stop will also act as a stop for the tracer spindle. The tracer spindle guide key should never be used as a stop.

i. Position the tracer spindle with the guide key approximately 1/4" below its upper limit. With the tracer spindle in this position, center the two clamping bolts coupling tracer and cutter feed shaft in the cored holes at back of tracer head housing. Tighten these bolts firmly. Release spindle locking lever. The tracer spindle is now ready to use.

Lubrication

40. There is an oil hole at rear in the top of the casting at upper end of tracer spindle. This should be oiled daily with medium machine oil. There is an oil cup on the front of the tracer spindle housing at the top This should be filled daily with spindle oil. There is also an oil cup on top of the tracer head outer bearing. This should be filled daily with medium machine oil. A few drops of oil should occasionally be applied to the threaded portion of the tracer spindle.

Photo 42

Adjustments

41. There are two vertical adjustments which can be made to compensate for differences between the work piece and master. The first or rough vertical adjustment is made by first locking the cutter spindle and loosening the outer clamping bolt coupling tracer and cutter spindle feed shafts. Use tracer hand feed lever to position tracer spindle nose. Re-tighten clamping bolt. Fine adjustments are made with the micrometer vertical adjustment.

Duplicator Table--See Page 16

42. If this machine is a Mastermil die and mold duplicator, the duplicator table was mounted on the machine table at the factory. If, however, this machine is a standard Gorton Mastermil, the following instructions will apply.

a. Be sure to remove right-hand adjustable stop dog on machine table and lay it aside or park it next to the left-hand adjustable stop dog at the extreme left end of table slot.

b. When mounting or dismounting the duplicator table on or off of machine table, a shop hoist or crane should be used. Use heavy rope, not chain or wire cable. Locate duplicator table with the "U" slots at either end over machine table "T" slots. Lower gently and clamp in place, being sure that keys on the underside of duplicator table base are engaged in the center "T" slot of machine table.

c. The duplicator table assembly is made up of: 1) the duplicator table proper (heat-treated aluminum alloy); 2) the master table and base with micrometer adjusting screws and clamping bolts; 3) saddle which, with the duplicator table, makes possible longitudinal motion; 4) duplicator table base which, with the saddle, makes possible the cross or transverse motion; 5) manual duplicating control lever attached to the two drop arms.

d. Locate work piece on the duplicator table with its center under the center of the cutter spindle. Two methods of clamping the work piece are available. Two 1/2" "T" slots running longitudinally 1-5/8" either side of center may be used or any of the sixteen tapped holes for 7/16" hold-down studs. If "T" slots are used, Gorton type (elongated) nuts should be used to prevent distortion of table top.

Photo 43

e. Mount the master, pattern or template on the master table and clamp in place. Next, loosen the two master table clamping bolts and position master table so that center of the master is under the center of the tracer spindle. Tighten the master table clamping bolts. For final positioning, the two master table micrometer adjusting screws may be used.

f. To provide free movement of the duplicator table in all directions, remove table and saddle locking bolts and plug the holes. Loosen longitudinal clamping studs and remove "U" strap. If cross movement only is desired, leave this "U" strap clamped tightly in place. If longitudinal movement only is desired, remove "U" strap and insert from below on the cross feed clamping studs, then tighten the studs.

g. For operator convenience, the manual duplicating control lever is adjustable for height by loosening lever extension sleeve adjustment bolt with Allen wrench.

Lubrication

43. In the duplicator table top are four oil pipe plugs marked "oil". These serve the endless stream of ball bearings on which the table moves. Oil once a week with spindle oil in an amount sufficient to come up to the oil pipe plug.

a. On the front and back of the saddle are two oil cups which serve the endless stream of ball bearings on which the saddle moves. Lubricate as described in paragraph above. CAUTION. It is extremely necessary that no grit or foreign matter is permitted to get into the oil pipe plugs in table top or into the oil cups on front and rear of saddle.

b. The oil cup on the upper ball and socket joint at the bottom of the right-hand drop arm should be lubricated with medium machine oil daily. In addition, a few drops of oil should be applied to the master table micrometer adjusting screw threads.

Adjustments

44. Duplicator friction brake. This is located at right on duplicator table base. If less braking action is desired, the brake adjusting nut is turned down. If more braking action is required, turn it up.

a. To adjust for looseness in table, loosen the two screws in the two ball bearing return blocks at back of table. Loosen the five hold-down bolts on top of ball track. Loosen two

Photo 44

jamb nuts on adjustable table gib and take up on the two gib adjusting screws. All loosening and tightening in this operation should be uniform. Now tighten jamb nuts and retighten the five hold-down bolts on top of ball track together with the two screws in the top of both ball bearing return blocks. Check for continued looseness with dial indicator. Looseness is indicated by "snap" movement of needle. Slow needle movement indicates distortion, not looseness.

b. To adjust for looseness between saddle and base, follow the same procedure as described immediately above with the ball tracks running crosswise between saddle and base.

c. After gib adjustments, check the joints between ball bearing return blocks and the ends of the ball races to see that they are tight so that no foreign matter can get into ball races.

d. If table ball bearings become "sticky" after continued use, it is desirable to flush them thoroughly with kerosene. Remove the four oil pipe plugs in table top and flush until balls operate freely. Move table continually while flushing. Re-lubricate with spindle oil until oil has replaced kerosene. In the case of the saddle balls, follow the same procedure, using the two oil cups on the front of the saddle and the two on the rear.

Auxiliary Equipment

Coolant System

45. If machine includes a coolant system, access to the coolant pump, motor and tank is through coolant compartment cover at rear of column. To put into operation, fill coolant tank up to fill mark on pump casting. Press coolant motor starting button so marked on control panel. Coolant should flow when nozzle is turned on.

a. If a coolant system is to be installed in the field, the following instructions will apply. (See page 4 and 7.)

b. On the left side of the column below and to the left of the overload heater box, you will find a hole into which the return coolant line goes from the left end of machine table. Another hole is provided in the top of the column way section of the column at left front.

c. Install coolant tank and pump through opening at rear of column base with pump unit entering first. Attach coolant feed line after dropping connection end through upper hole in column casting. Make connection to vertical feed pipe of pump.

Photo 45

d. Remove socket head plug in the left-hand table and bracket and make connection with coolant return line. Insert other end of return line in lower hole in column casting and insert end of line in coolant tank.

e. Have electrician hook pump motor to power supply and have him check for correct rotation of pump motor. This is indicated by arrow on housing.

Lubrication

f. See paragraph 12.

Adjustments

g. None.

Field Installation of 1235-1 Spindle Down Feed Unit

46. In case you order the above unit for installation on your Mastermil, complete instructions and drawings will be furnished with the unit to make such installation easy.

Photo 46

Parts List

The following pages are furnished for ready identification of all parts in the various assemblies. This section is arranged in the same order as the preceding section, viz:

1. Standard Gorton Mastermil
2. Duplicator Tracer Heads
3. Duplicator Tables

IMPORTANT

Always furnish the serial number and/or model number of machine, duplicator table or tracer head when ordering replacement parts. Serial numbers on Gorton Mastermils and duplicators are located on nameplate on left-hand side of column and on column underneath medallion on left side of column. Serial numbers on Gorton duplicator tables are located on front edge of table base at left end. Model numbers for tracer heads are located on top of the tracer head feed shaft housing.

Photo 47

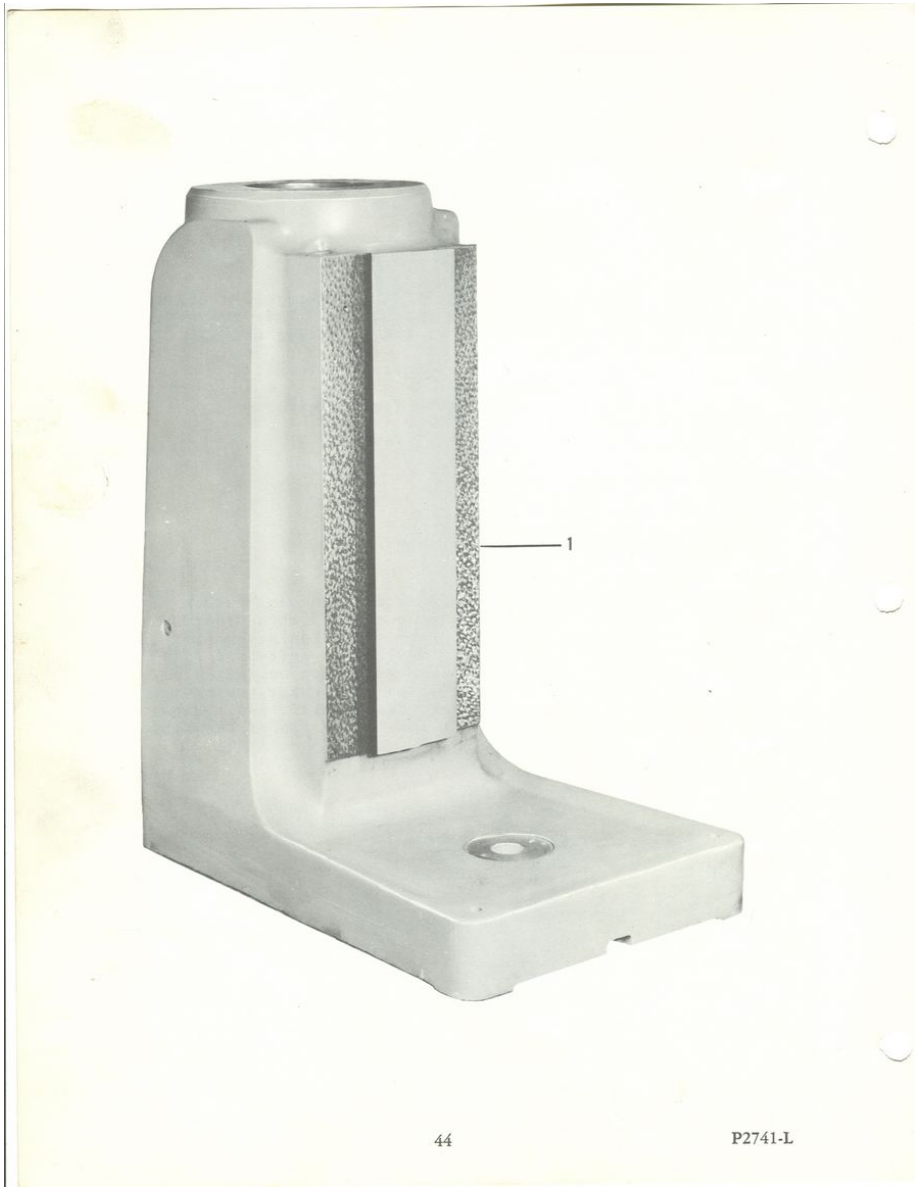


Photo 48

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

COLUMN AND BASE

Always Give Machine Model Number and SERIAL NUMBER

Fig. No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Column and Base	21050			

() Figures in parentheses indicate quantities of identical parts 2741-L

Photo 49

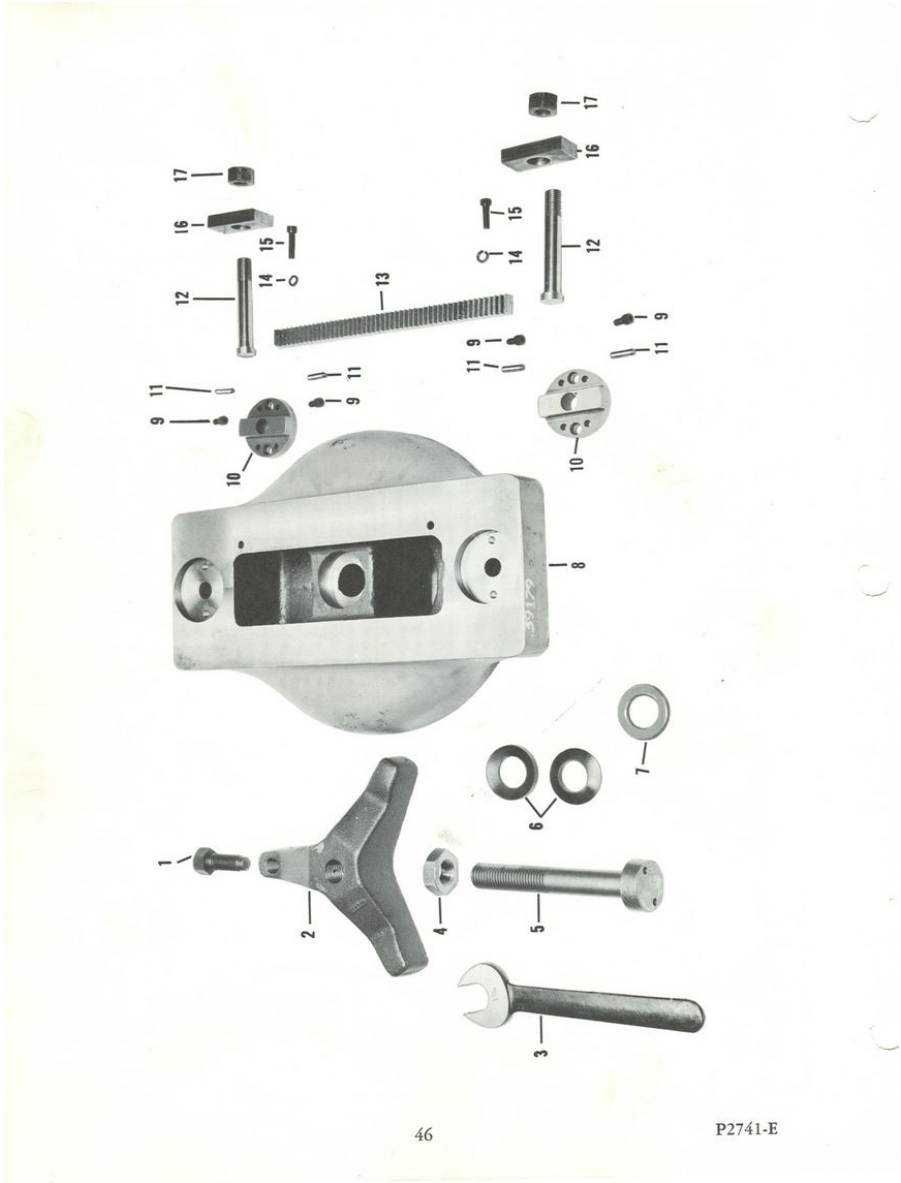


Photo 50

PARTS LIST - - GORTON 1-22 MASTERMILL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

RAM

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Hexagon Nut (3)	K-6009			
2	Not Used				
3	Spindle Head T-Bolt (3)	21143			
4	Set Screw (2)	K-3628			
5	Roll Pin (2)	K-5562			
6	Speed Plate	K-5718			
7	Drive Pin (4)	K-423			
8	Head Adjusting Shaft Collar(2)	21138			
9	Ball Thrust Bearing (2)	KB-44			
10	Head Adjusting Shaft	21137			
11	Spacer	21160			
12	Head Adjusting Worm	21141			
13	Roll Pin	K-5562			
14	Socket Pipe Plug	K-406			
15	Eye Bolt	11512			
16	Taper Pin	K-491			
17	Rack Pinion	7857			
18	Dog Point Socket Set Screw	K-6005			
19	Rack Pinion Shaft	21136			
20	Nameplate (2)	21293			
21	Drive Pin (4)	K-6228			
22	Socket Wrench	K-6151			
23	Ram	21131			
24	Cord Grip (4)	K-6086			

() Figures in parentheses indicate quantities of identical part

2741-D

Photo 51

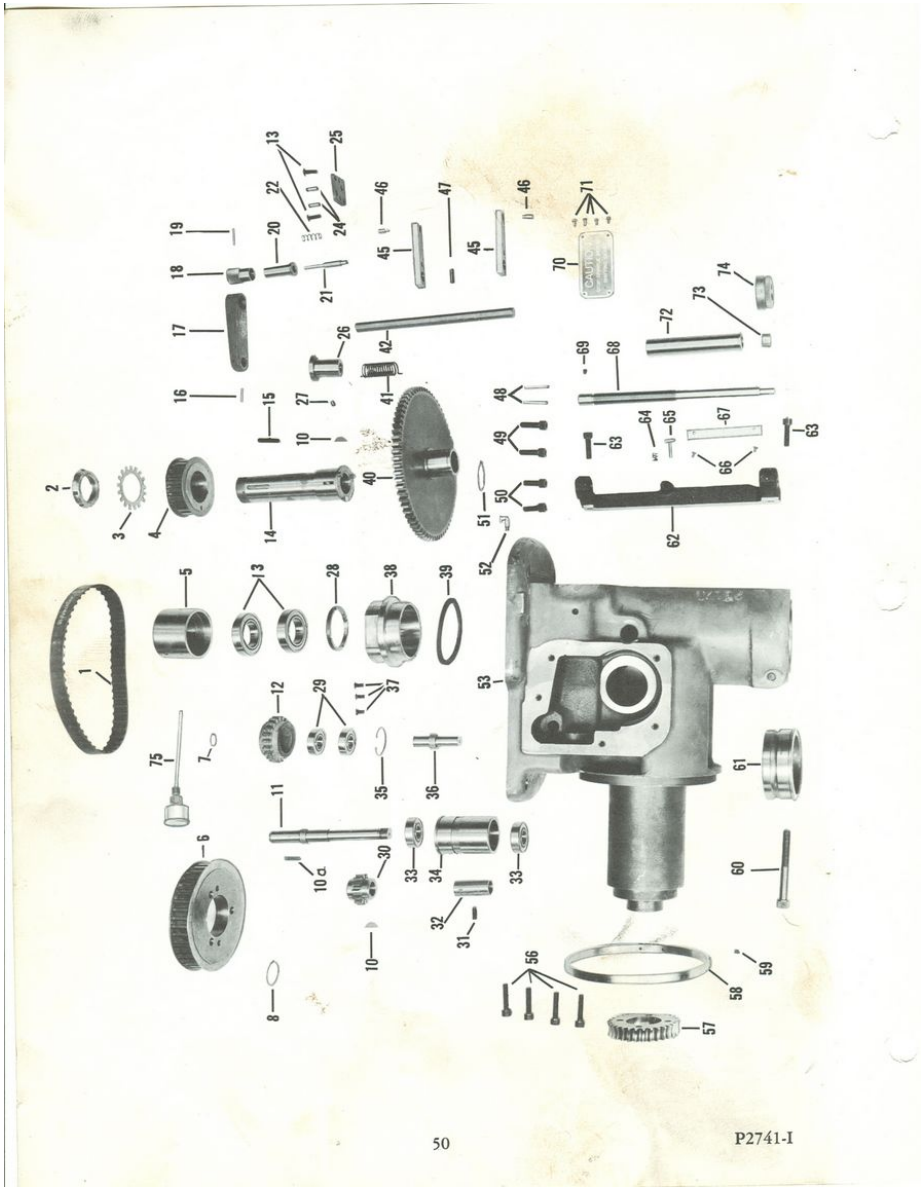


Photo 52

PARTS LIST - - GORTON 1-22 MASTERMILL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

RAM

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Hexagon Nut (3)	K-6009			
2	Not Used				
3	Spindle Head T-Bolt (3)	21143			
4	Set Screw (2)	K-3628			
5	Roll Pin (2)	K-5562			
6	Speed Plate	K-5718			
7	Drive Pin (4)	K-423			
8	Head Adjusting Shaft Collar(2)	21138			
9	Ball Thrust Bearing (2)	KB-44			
10	Head Adjusting Shaft	21137			
11	Spacer	21160			
12	Head Adjusting Worm	21141			
13	Roll Pin	K-5562			
14	Socket Pipe Plug	K-406			
15	Eye Bolt	11512			
16	Taper Pin	K-491			
17	Rack Pinion	7857			
18	Dog Point Socket Set Screw	K-6005			
19	Rack Pinion Shaft	21136			
20	Nameplate (2)	21293			
21	Drive Pin (4)	K-6228			
22	Socket Wrench	K-6151			
23	Ram	21131			
24	Cord Grip (4)	K-6086			
25					
26					
27					
28					
29					

() Figures in parentheses indicate quantities of identical part

2741-D

Photo 53

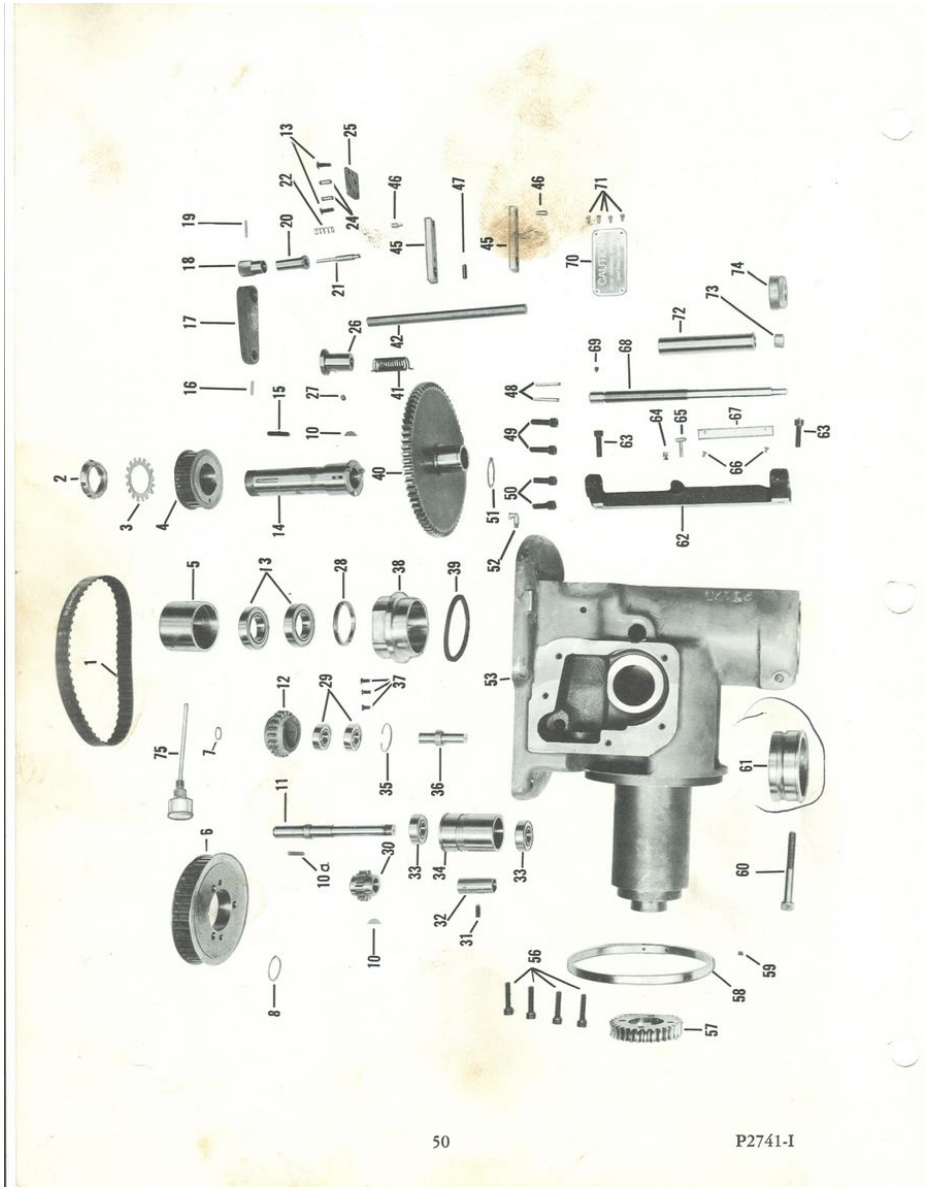


Photo 54

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

SPINDLE HOUSING

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Internal Drive Belt	K-6082	55	Hex Head Cap Screw for above Not Shown	K-266
2	Ball Bearing Lock Nut	K-1349	56	Socket Head Cap Screw (4)	K-153
3	Ball Bearing Lock Washer	K-95	57	Head Adjusting Worm Wheel	21142
4	Small Internal Drive Belt Pulley	21211	58	Graduated Ring	21198
5	Spindle Gear Bearing Retainer	21217	59	Socket Set Screw	K-2529
6	Large Internal Drive Belt Pulley	21789	60	Socket Cap Screw	K-169
7	Snap Ring	K-3930	61	Spindle Barrel Bushing	21148
8	Snap Ring	K-3963	62	Feed Stop Bracket	21199
9	Snap Ring	K-6076	63	Socket Cap Screw (2)	K-152
10	Woodruff Key (2)	K-5436	64	Thumb Screw Spring	6415
10a	Key	21988	65	Thumb Screw	6307
11	Counter Shaft	21987	66	Round Head Machine Screw (2)	K-4712
12	Spindle Idler Gear	21892	67	Depth Stop Scale	21203
13	Ball Bearing (1 set)	KB-6079	68	Feed Stop Micrometer Screw	21200
14	Spindle Pulley Sleeve	21191	69	Socket Set Screw	K-187
15	Key	18049	70	Instruction Plate	K-6145
16	Taper Pin	K-471	71	Drive Pin (4)	K-423
17	Speed Range Lever	21221	72	Feed Stop Micrometer Collar	21201
18	Lever Handle	7638	73	Oilite Bearing	K-6085
19	Taper Pin	K-461	74	Feed Stop Micrometer Wheel	21202
20	Speed Range Lever Bushing	21222	75	Grease Cup and Tube	CP-1933
21	Lever Plunger	7639			
22	Spring	11428			
23	Button Head Screw (2)	K-6075			
24	Dowel Pin (2)	K-4545			
25	Range Lever Index Plate	21228			
26	Shifter Shaft Bushing	21227			
27	Socket Set Screw	K-2009			
28	Ball Bearing Lock Nut	10231			
29	Ball Bearing (2)	KB-6077			
30	Countershaft Gear	21891			
31	Dog Point Socket Set Screw	K-4076			
32	Bearing Spacer (Inner)	21984			
32a	Bearing Spacer (Outer) Not Shown	21985			
33	Ball Bearing (2)	KB-6358			
34	Bearing Housing	21983			
35	Snap Ring	K-6076			
36	Idler Gear Shaft	21205			
37	Button Head Screw (3)	K-6074			
38	Bearing Retaining Guide	21215			
39	Spindle Bumper Stop	21216			
40	Low Speed Spindle Gear	21220			
41	Counterbalance Spring	21224			
42	Gear Shift Shaft	21223			
43	Not Used				
44	Not Used				
45	Gear Shifter Arm (2)	22117			
46	Roll Pin (2)	K-6405			
47	Taper Pin (2)	K-6406			
48	Dowel Pin (2)	K-4545			
49	Socket Cap Screw (2) 1 1/4"long	K-152			
50	Socket Cap Screw (2) 1" long	K-151			
51	Snap Ring	K-5336			
52	Oil Cup	K-3132			
53	Spindle Head	21170			
54	Countershaft Bearing Washer Not Shown	21981			

() Figures in parentheses indicate quantities of identical parts

2741-1

Photo 55

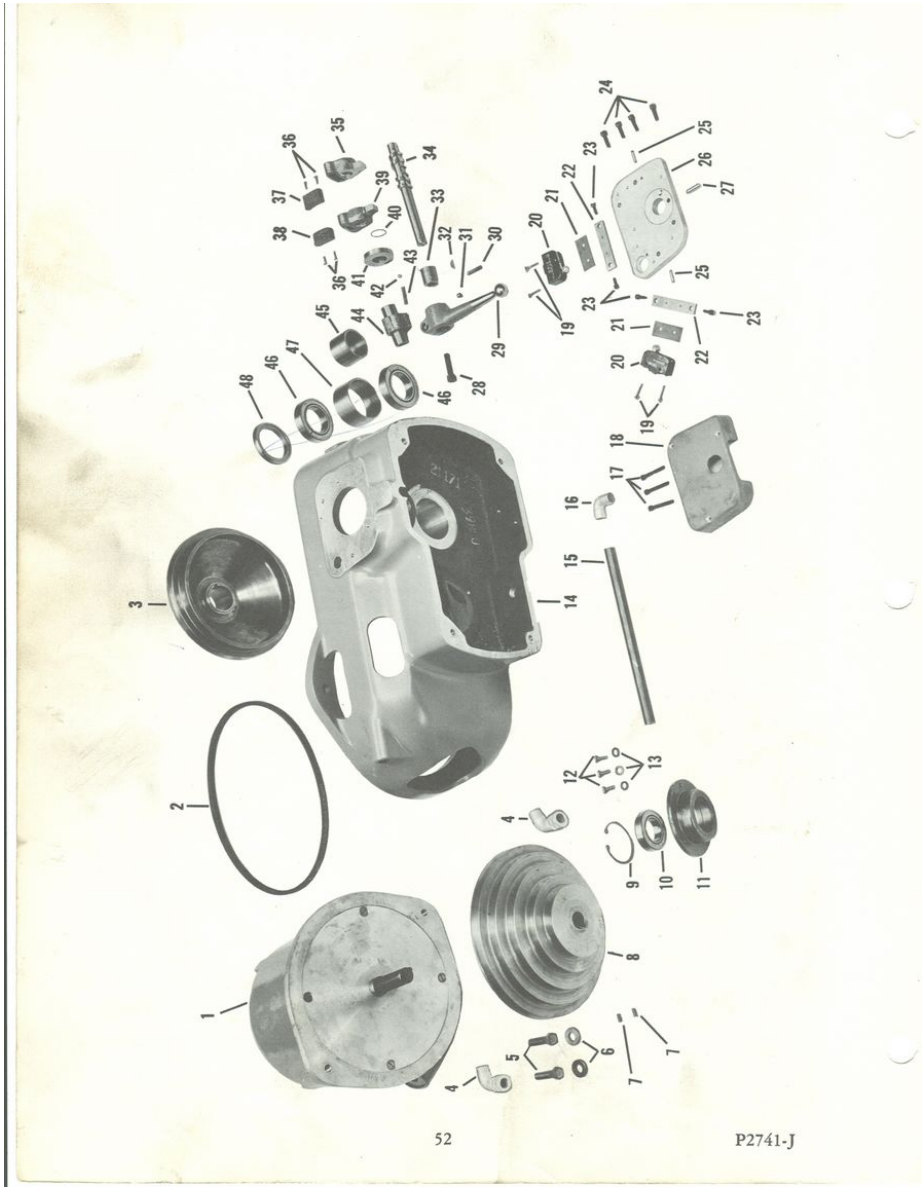


Photo 56

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

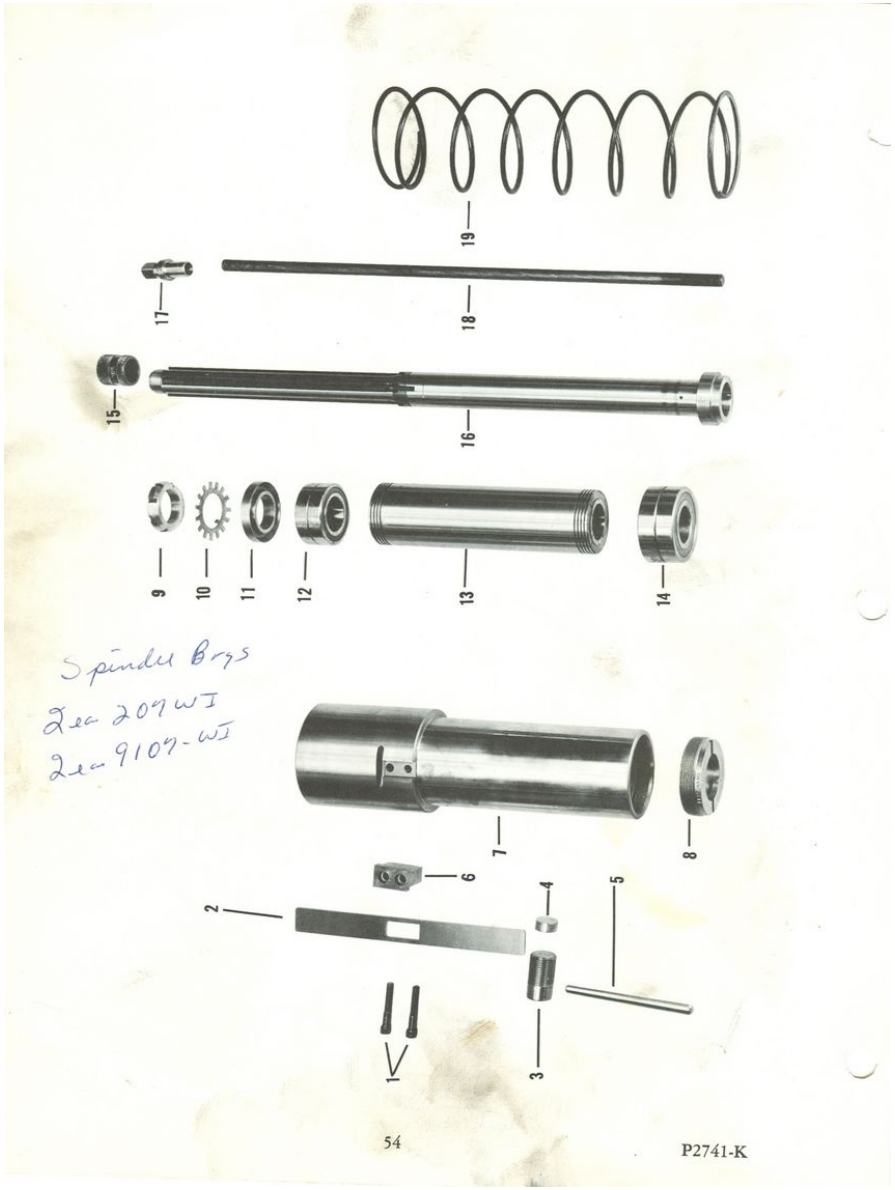
Always Give Machine Model Number and SERIAL NUMBER

PULLEY HOUSING

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Spindle Motor	E-1148	29	Start-Stop Brake Lever	21176
2	Spindle Belt	K-6374	30	Spring	21256
3	Spindle Pulley	21172	31	Socket Set Screw	K-2503
4	Cord Grip (2)	K-6161	32	Woodruff Key	K-4495
5	Hex Head Cap Screw (2)	K-6153	33	Start-Stop-Brake Lever Bushing	21159
6	Washer (2)	12973	34	Brake Screw	21175
7	Socket Set Screw 5/16" Long	K-189	35	Brake Shoe Assembly - Right Hand (Includes No's 36 and 37	CP-1931
7a	Socket Set Screw 1/2" Long	K-2006	39	Brake Shoe Assembly - Left Hand (Includes No's 36 and 38	CP-1932
8	Motor Pulley	21173	40	Snap Ring	K-6146
9	Snap Ring	K-3963	41	Interlock Bushing	21165
10	Ball Bearing	KB-6078	42	Steel Ball	K-76
11	Bearing Housing	21213	43	Spring	22102
12	Hex Head Cap Screw (3)	K-255	44	Switch Cam	21257
13	Shake-Proof Washer (3)	K-5102	45	Inner Bearing Spacer	21193
14	Pulley Housing	21171	46	Ball Bearing (1 set)	KB-6089
15	Pulley Housing Conduit	21166	47	Outer Bearing Spacer	21194
16	Elbow	K-6113	48	Bearing Retaining Nut	21192
17	Socket and Cap Screw (3)	K-6068			
18	Switch Plate Cover	21169			
19	Round Head Machine Screw (4)	K-1347			
20	Microswitch (2)	E-2421			
21	Switch Insulating Plate (2)	21151			
22	Switch Mounting Plate	21181			
23	Socket Cap Screw (4)	K-1991			
24	Socket Cap Screw (4) 3/4" Long	K-135			
25	Dowel Pin (2)	K-3405			
26	Brake and Switch Plate	21168			
27	Dowel Pin	12860			
28	Socket Cap Screw	K-151			

() Figures in parentheses indicate quantities of identical parts

Photo 57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P2741-K

Photo 58

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

SPINDLE

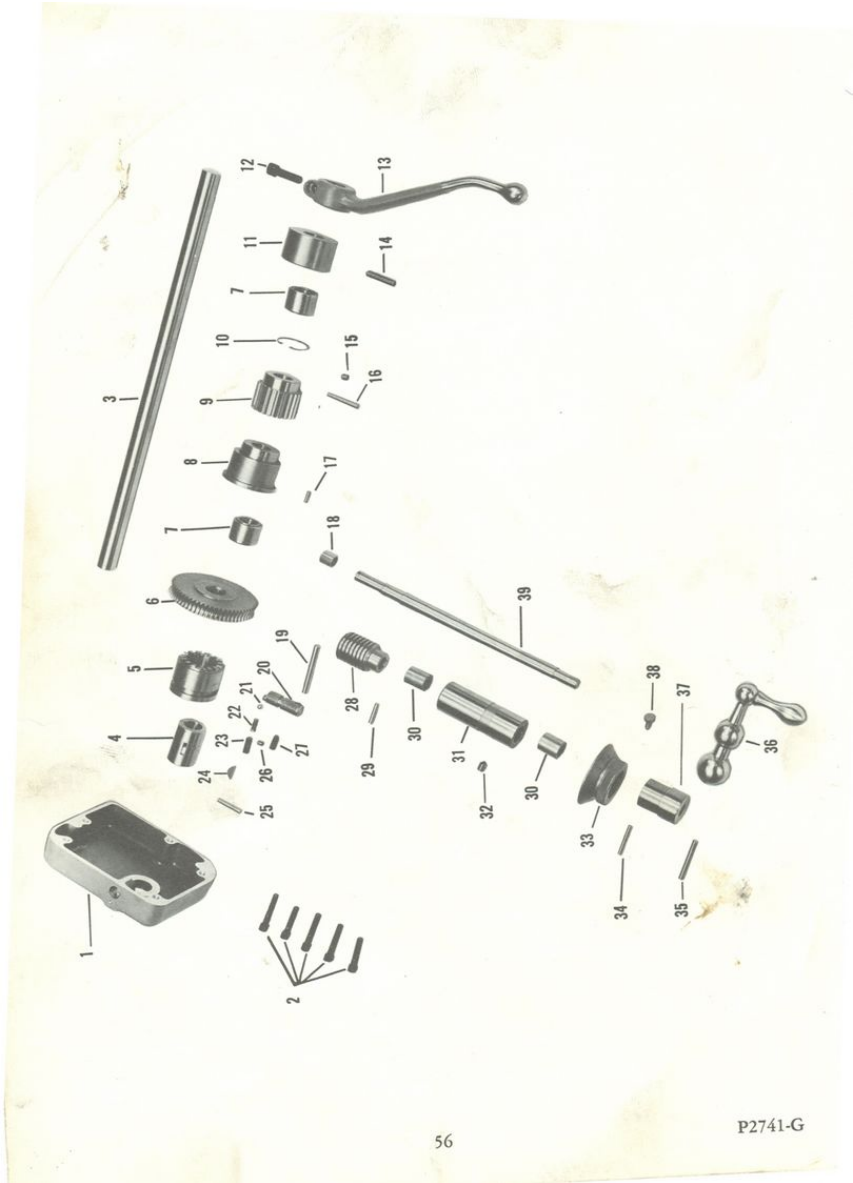
Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Socket Cap Screw	K-148			
2	Depth Stop Cover Plate	21155			
3	Barrel Lock Screw	7017			
4	Brass Shoe	9803			
5	Lock Screw Handle	12881			
6	Feed Stop	15239			
7	Cutler Spindle Barrel	21146			
8	Ball Bearing Lock Nut	21147			
9	Ball Bearing Lock Nut	K-1350			
10	Tang Lock Washer	K-93			
11	Ball Bearing Grease Seal	21149			
12	Upper Ball Bearing (1 set)	KB-3905			
13	Spindle Bearing Spacer	21150			
14	Lower Ball Bearing (1 set)	KB-6065			
15	Draw Bar Thrust Collar	21153			
16	Cutter Spindle	21145			
17	Draw Bar - Rod and Head (Includes No. 18)	CP-1882			
19	Spindle Sleeve Spring	8760			

() Figures in parentheses indicate quantities of identical parts

2741-K

Photo 59



P2741-G

Photo 60

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

SPINDLE FEED WORKS

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Hand Feed Housing	21167	28	Spindle Feed Worm	21197
2	Socket Head Cap Screw (5)	K-2027	29	Taper Pin	K-477
3	Spindle Feed Shaft	21184	30	Cilite Bearing (2)	K-2337
4	Spacer for Spindle Feed Shaft	7959	31	Hand Wheel Bearing Sleeve	21196
5	Feed Clutch	21186	32	Cone Point Socket Set Screw	K-2633
6	Spindle Feed Worm Wheel	21187	33	Micrometer Dial	9236
7	Needle Bearing (2)	1602	34	Taper Pin	K-479
8	Bearing Retaining Sleeve	21188	35	Taper Pin	K-471
9	Spindle Feed Pinion	7961	36	Hand Crank	6656
10	Snap Ring	K-6111	37	Dial Collar	21279
11	Bearing Retaining Sleeve	21189	38	Thumb Screw	4987
12	Socket Cap Screw	K-152			
13	Spindle Feed Lever	8659			
14	Socket Set Screw (2) one 1" long and one 5/8" long	K-206 K-2704			
15	Socket Set Screw	K-189			
16	Taper Pin	K-486			
17	Dowel Pin	12840			
18	Oilite Bearing	K-2038			
19	Shifter Handle	12875			
20	Feed Clutch Shifter	21219			
21	Steel Ball	K-76			
22	Spring	7718			
23	Socket Set Screw	K-2009			
24	Woodruff Key	K-5436			
25	Taper Pin	K-484			
26	Socket Set Screw	K-3628			
26a	Brass Plug for Above Not Shown	11994			
27	Dog Point Socket Set Screw	K-4076			

() Figures in parentheses indicate quantities of identical parts

2741-G

Photo 61

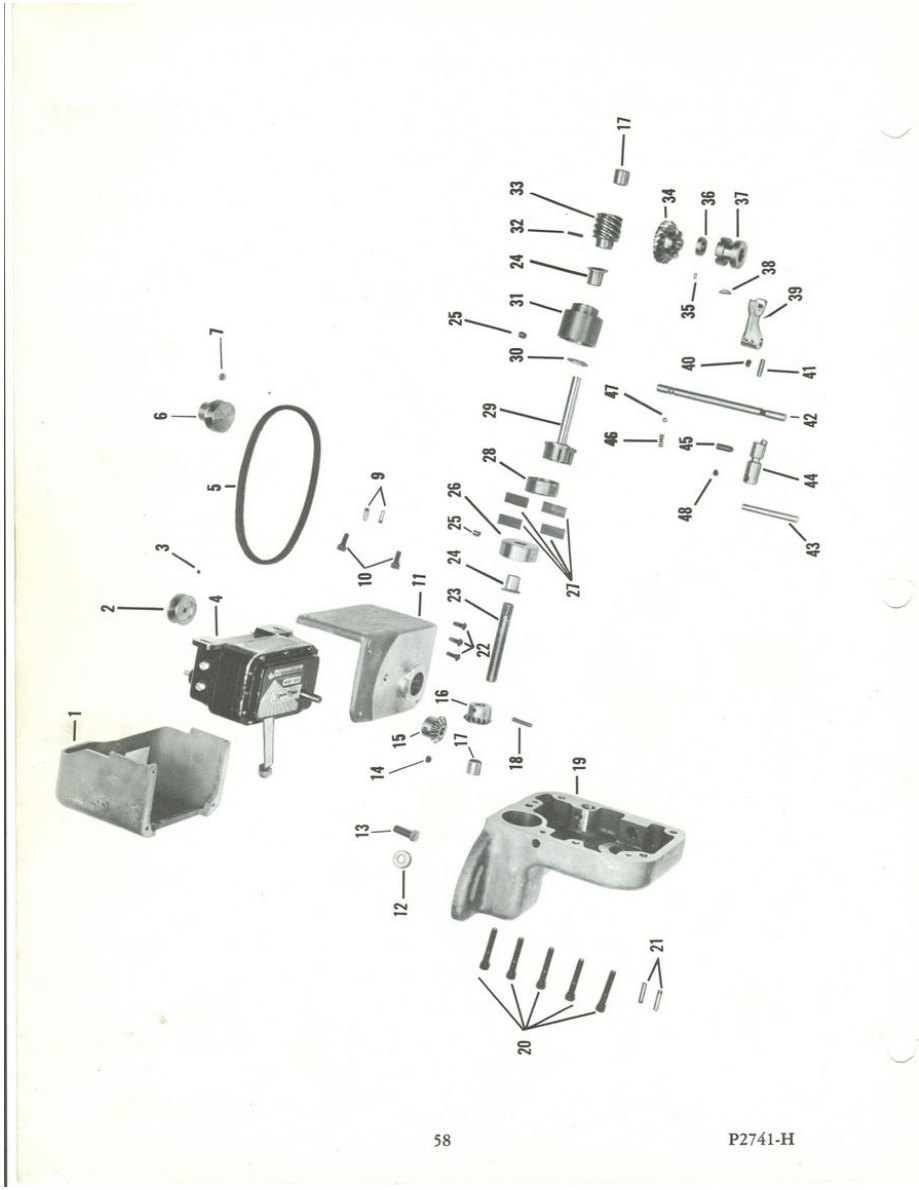


Photo 62

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

SPINDLE POWER FEED

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Transmission Cover	21156	28	Spring Retaining Ring	21252
2	Revco Pulley	21243	29	Slip Coupling	21230
3	Socket Set Screw	K-2529	30	Oilite Thrust Washer	K-3561
4	Transmission	K-6148	31	Slip Clutch Housing	21247
5	Transmission Drive Belt	K-5976	32	Roll Pin	K-5974
6	Feed Drive Pulley	21242	33	Slip Coupling Worm	21157
7	Socket Set Screw ½" Long	K-2006	34	Clutch Worm Wheel	21239
8	Not Used		35	Dowel Pin	12864
9	Dowel Pin (2)	K-6124	36	Worm Gear Spacer	21248
10	Socket Cap Screw (2)	K-1618	37	Clutch	21238
11	Transmission Bracket	21244	38	Woodruff Key	K-4495
12	Washer	13129	39	Down Feed Shifter Fork	21240
13	Hex Head Cap Screw	K-267	40	Socket Set Screw	K-2529
14	Socket Set Screw (2)	K-4702	41	Roll Pin	K-5944
15	Clutch Drive Gear	21234	42	Clutch Shifter Shaft	21241
16	Clutch Driven Gear	21235	43	Shifter Handle	12875
17	Oilite Bearing	K-2038	44	Down Feed Clutch Shifter	21254
18	Roll Pin	K-5440	45	Dog Point Socket Set Screw	K-4177
19	Feed Gear Housing	21251	46	Spring	7718
20	Socket Cap Screw (5)	K-2027	47	Steel Ball	K-76
21	Dowel Pin (2)	K-3808	48	Socket Set Screw	K-3628
21a	Plug (2) Not Shown	17963	48a	Brass Plug Not Shown	11994
22	Button Head Screw (3)	K-6131			
23	Gear Shaft	21231			
24	Oilite Flange Bearing (2)	K-4004			
25	Socket Set Screw (2)	K-187			
26	Gear Shaft Bushing	21233			
27	Slip Spring (4)	21253			

() Figures in parentheses indicate quantities of identical parts

2741-H

Photo 63

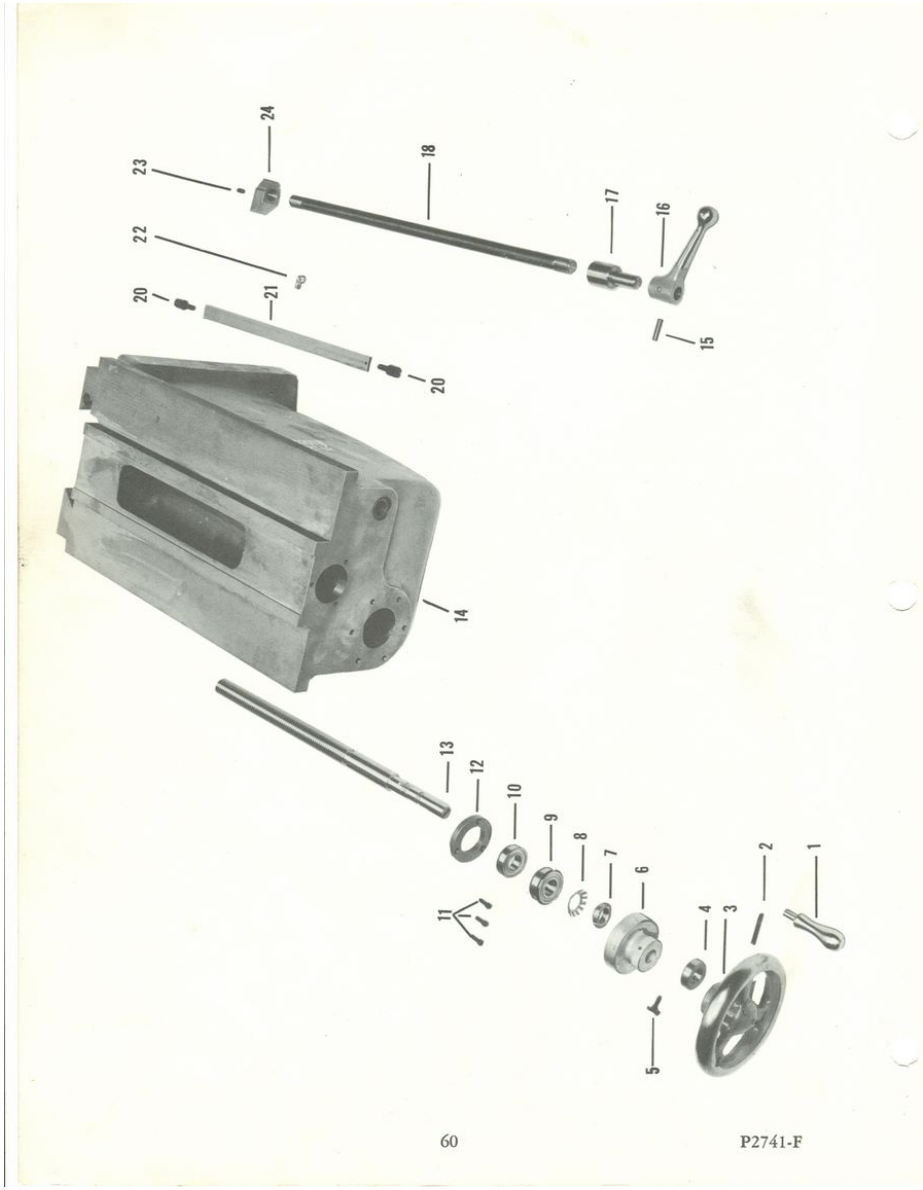


Photo 64

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

KNEE

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Handle	K-542			
2	Roll Pin	21075			
3	Hand Wheel	21071			
4	Dial Collar	21060			
5	Thumb Screw	21136			
6	Micrometer Dial	21118			
7	Lock Nut	K-2478			
8	Lock Washer	K-6988			
9	Ball Bearing - Front	KB-6230			
9a	Bearing Pre-Load Washer Not Shown	K-6235			
10	Ball Bearing - Rear	KB-2527			
11	Socket Head Cap Screw (3)	K-135			
12	Cross Feed Bearing Housing	21058			
13	Cross Feed Screw	21069			
14	Knee	21052			
15	Roll Pin	K-5982			
16	Knee Clamping Lever	21059			
17	Knee Clamping Hub	21061			
18	Knee Clamping Shaft	21065			
19	Not Used				
20	Gib Adjusting Screw (2)	6296			
21	Knee Gib	21073			
22	Oil Cup	K-2132			
23	Socket Set Screw	K-2009			
24	Knee Gib Lock	21066			

() Figures in parentheses indicate quantities of identical parts 2741-F

Photo 65

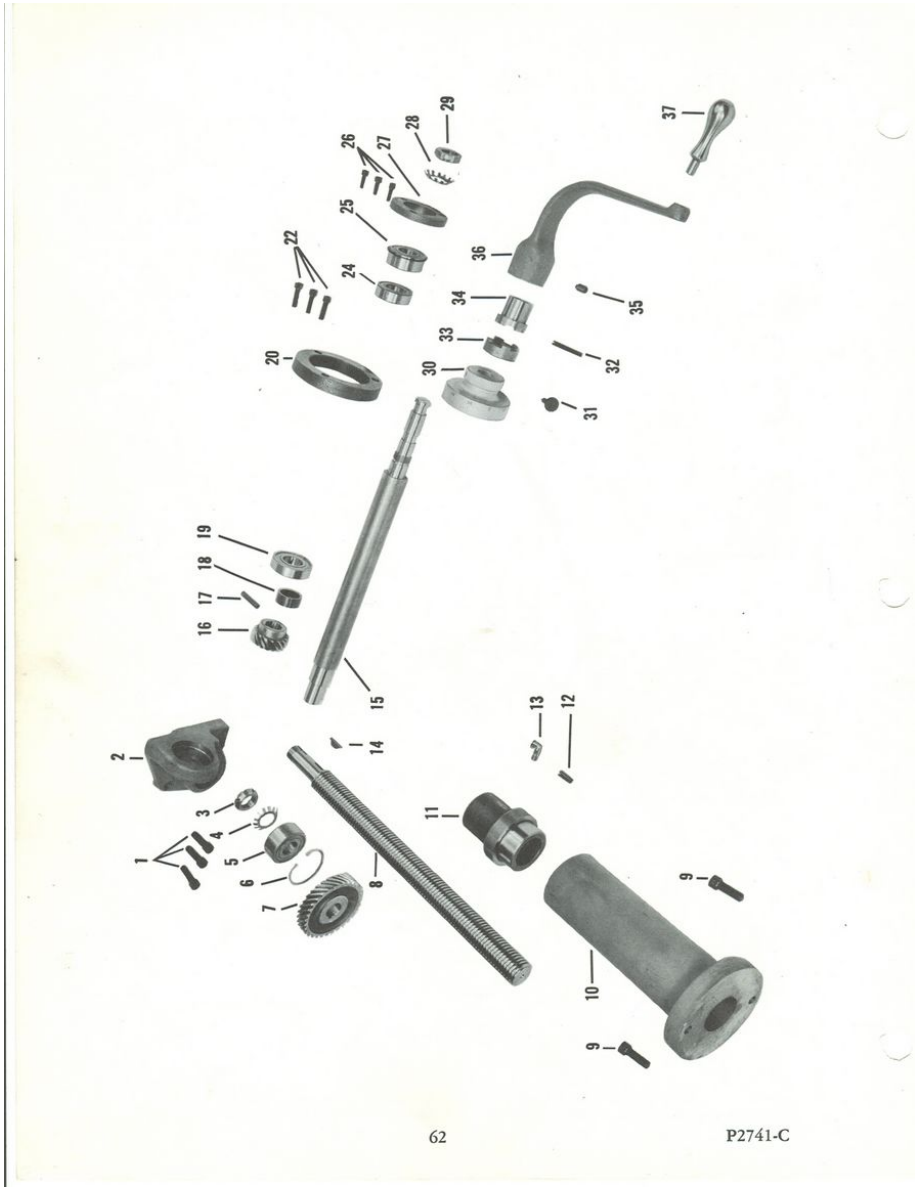

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Photo 66

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts.

KNEE ELEVATE COMPONENTS

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Socket Cap Screw (3)	K-2505	29	Lock Nut	K-2478
2	Elevate Gear Bearing Housing	21053	30	Elevate Micrometer Dial	21062
3	Lock Nut	K-2478	31	Thumb Screw	21126
4	Lock Washer	K-5988	32	Roll Pin	K-5563
5	Ball Bearing	KB-5985	33	Dial Clutch	21121
6	Snap Ring	K-5987	34	Elevate Crank Clutch	21123
7	Elevate Gear	21063	35	Socket Set Screw - Dog Point	K-1379
8	Elevate Screw	21070	36	Elevate Crank	21072
9	Socket Cap Screw (2)	K-175	37	Crank Handle	K-542
10	Elevate Bracket & Nut	22230 ~~21054~~			
~~11~~	~~Elevate Nut~~	~~21057~~			
12	Roll Pin	K-5981			
13	Oil Cup	K-2132			
14	Hypro Key	K-4505			
15	Elevate Hand Crank Shaft	21068			
16	Elevate Drive Gear	21064			
17	Roll Pin	K-5983			
18	Elevate Drive Gear Spacer	21074			
19	Ball Bearing	KB-3418			
20	Elevate Bearing Plate	22164			
21	Not Used				
22	Socket Cap Screw (3)	K-145			
23	Not Used				
24	Ball Bearing - Inner	KB-2527			
24a	Ball Bearing Pre-load Washer Not Shown	K-6225			
25	Ball Bearing - Outer	KB-6230			
26	Socket Cap Screw (3)	K-135			
27	Bearing Plate	21119			
28	Lock Washer	K-5988			

() Figures in parentheses indicate quantities of identical parts

2741-C

Photo 67

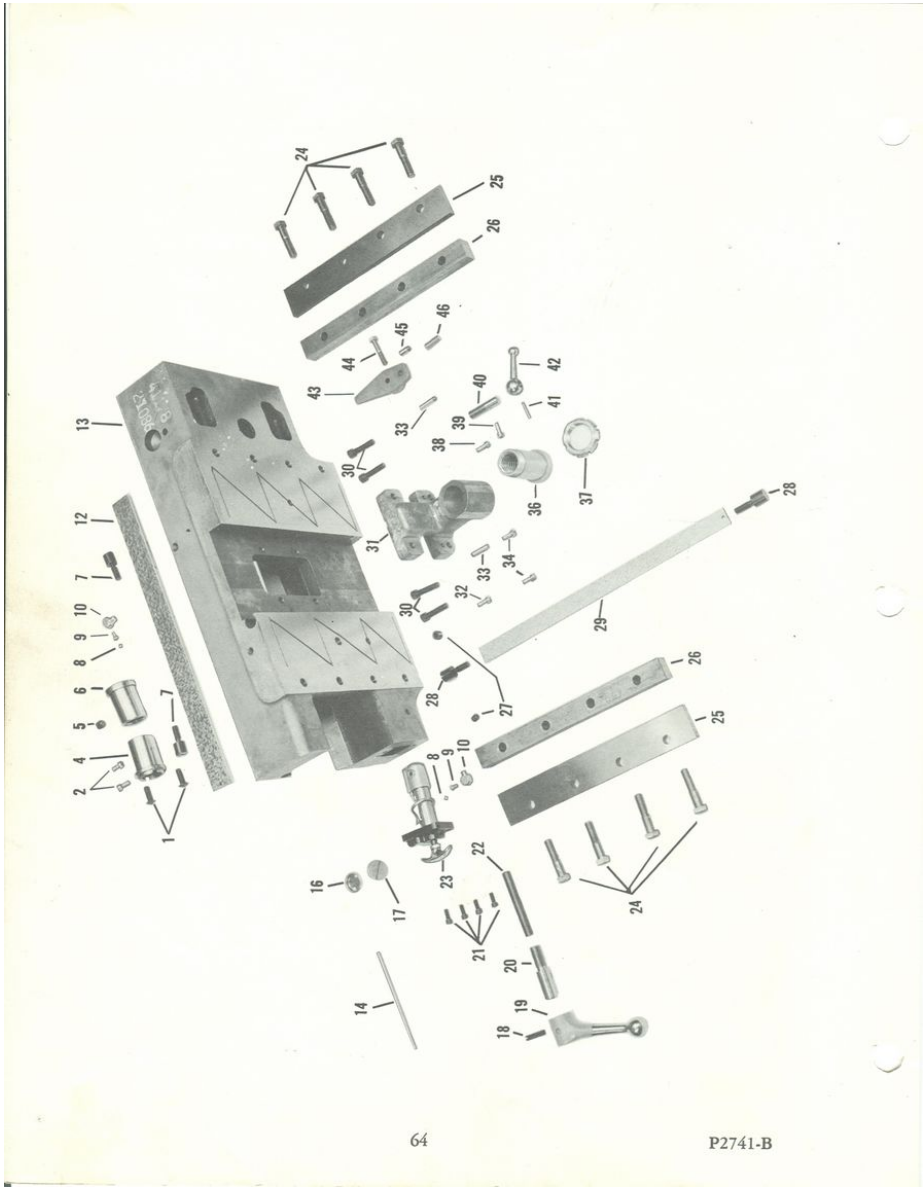


Photo 68

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

SADDLE COMPONENTS

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Button Head Screw (2)	K-6365	30	Socket Head Cap Screw (4)	K-153
2	Oil Metering Unit (2) 3-B Size	K-5993	31	Cross Feed Nut Housing	21082
3	Not Used		32	Oil Metering Unit 1-B Size	K-5996
4	Adjustable Table Nut	21092	33	Dowel Pin (2)	K-3698
5	Fixed Table Nut Key	21111	34	Oil Metering Unit (2) 1-B Size	K-5996
6	Fixed Table Nut	21091	35	Not Used	
7	Gib Adjusting Screw (2)	6296	36	Saddle Feed Nut	21090
8	Oil Line Sleeve (2)	K-4522	36a	Dowel Pin Not Shown	K-6000
9	Oil Line Nut (2)	K-4604	37	Ball Bearing Lock Nut	K-87
10	Oil Fitting (2)	K-5440	38	Oil Metering Unit 3-B Size	K-5993
11	Not Used		39	Oil Metering Unit 1-B Size	K-5996
12	Saddle Gib	21096	40	Table Clamping Screw	21084
13	Saddle	21089	41	Taper Pin	K-470
14	Hand Feed Oil Line	21357	42	Table Clamping Lever	16954
15	Not Used		43	Table Feed Stop	21113
16	Oil Sight Window	K-5992	44	Hex Head Cap Screw	K-6188
17	Oil Filler Plug	18357	45	Dowel Pin	K-6004
18	Roll Pin	K-5982	46	Screw Dog for Table Clamping Screw	14827
19	Saddle Clamping Lever	21059			
20	Saddle Gib Clamp Screw	21110			
21	Socket Head Cap Screw (4)	K-1618			
22	Gib Clamp Rod	21109			
23	One-Shot Lubrication Pump	K-5991			
24	Hex Head Cap Screw (8)	K-5999			
25	Guide Plate (2)	21088			
26	Guide Plate Spacer (2)	21087			
27	Pipe Plug (2)	K-406			
28	Gib Adjusting Screw (2)	6296			
29	Table Nut Adapter (Not on Early Models) Not Shown	21229			

() Figures in parentheses indicate quantities of identical parts

2741-B

Photo 69

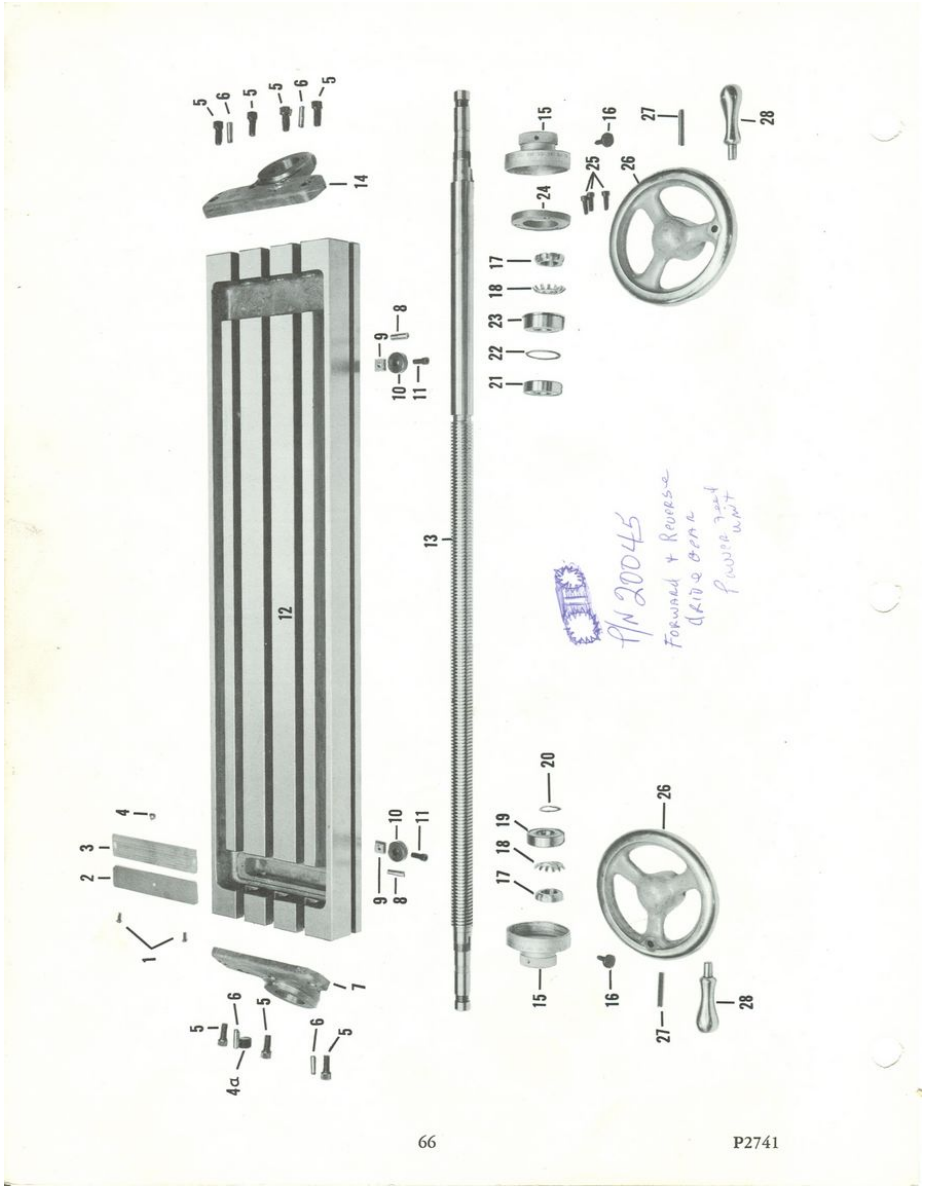

66
P2741
FN 20045
FORWARD + REVERSE
DRIVE & GEAR
POWER TAKE
UNIT

Photo 70

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts.

TABLE COMPONENTS

Always Give Machine Model Number and SERIAL NUMBER

Fig. No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Round Head Machine Screw (2)	K-394			
2	Coolant Screen Cover	21128			
3	Coolant Screen	21127			
4	Coolant Cover Knob	16970			
4a	Pipe Plug	K-414			
5	Socket Cap Screw (7)	K-813			
6	Dowel Pin (4)	K-4627			
7	Left Hand Table End Bracket	21117			
8	Table Dog T-Slot Screw (2)	18083			
9	T-Slot Nut (2)	21130			
10	Adjustable Stop (2)	21129			
11	Socket Head Cap Screw (2)	K-141			
12	Machine Table	21115			
13	Table Screw	21108			
14	Right Hand Table End Bracket	21116			
15	Table Screw Dial (2)	21118			
16	Thumb Screw (2)	21126			
17	Ball Bearing Lock Nut (2)	K-2478			
18	Ball Bearing Lock Washer (2)	K-5988			
19	Ball Bearing - Left End	KB-2527			
20	Snap Ring	K-4591			
21	Ball Bearing-Inner; Right End	KB-2527			
22	Pre-Load Washer	K-6235			
23	Ball Bearing-Outer; Right End	KB-6230			
24	Bearing Plate	21119			
25	Socket Cap Screw (3)	K-135			
26	Hand Wheel (2)	21125			
27	Roll Pin (2)	K-5984			
28	Handle (2)	K-542			

() Figures in parentheses indicate quantities of identical parts

2741

Photo 71

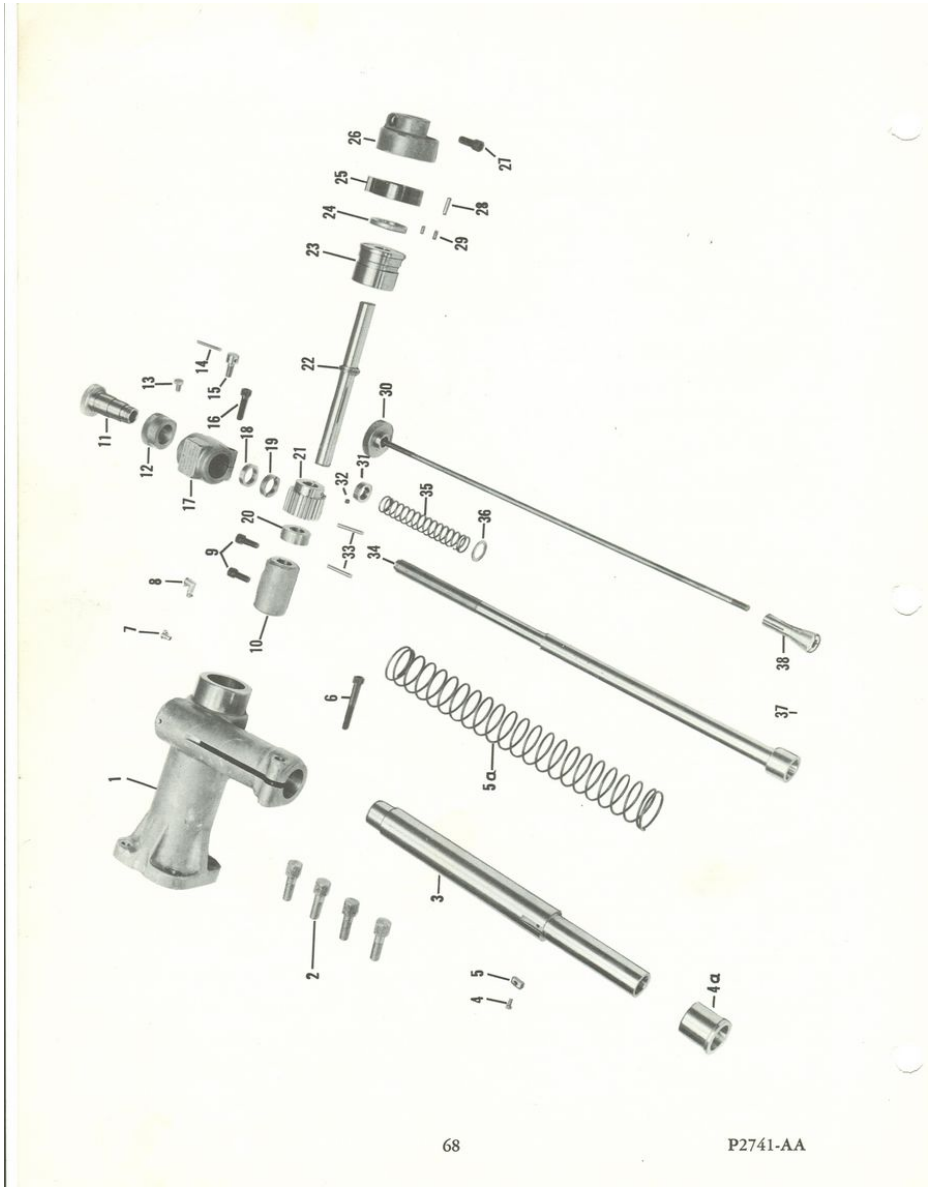


Photo 72

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

MANUAL TRACER HEAD 1018-1

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Tracer Spindle Head	13823	28	Drill Rod Pin	12636
2	Hex Head Cap Screw (4)	1730	29	Drill Rod Pin (2)	12728
3	Traces Spindle Sleeve	17612	30	Draw Bar and Hand Wheel	CP-1783
4	Screw	3271	31	Spring Retainer Nut	8815
4a	Tracer Spindle Sleeve Bushing	9211	32	Socket Set Screw	K-190
5	Tracer Sleeve Key	8745	33	Taper Pin (2)	K-486
5a	Tracer Sleeve Spring	9212	34	Tracer Spindle	9209
6	Socket Cap Screw	K-157	35	Spindle Thrust Spring	8816
7	Oil Cup	K-515	36	Sleeve Washer	9213
8	Oil Cup	K-519	37	Drill Rod Pin	12008
9	Socket Cap Screw (2)	K-151	38	Tracer Spindle Collet	14877
10	Feed Shaft Coupling	8737			
11	Spindle Adjusting Nut	8806			
12	Micrometer Dial	8812			
13	Thumb Screw	4987			
14	Lock Screw Handle	12926			
15	Lock Screw	8807			
16	Socket Cap Screw	K-152			
17	Spindle Adjusting Nut Bearing	8805			
18	Thrust Collar	8813			
19	Thrust Nut	8814			
20	Collar	9219			
21	Tracer Feed Pinion	7961			
22	Tracer Spindle Feed Shaft	13825			
23	Feed Shaft Bearing	14185			
24	Adapter Washer	13827			
25	Counter Balance Spring	8740			
26	Counter Balance Spring Housing	8741			
27	Socket Cap Screw	K-152			

()Figures in parentheses indicate quantities of indentical parts

2741-AA

Photo 73

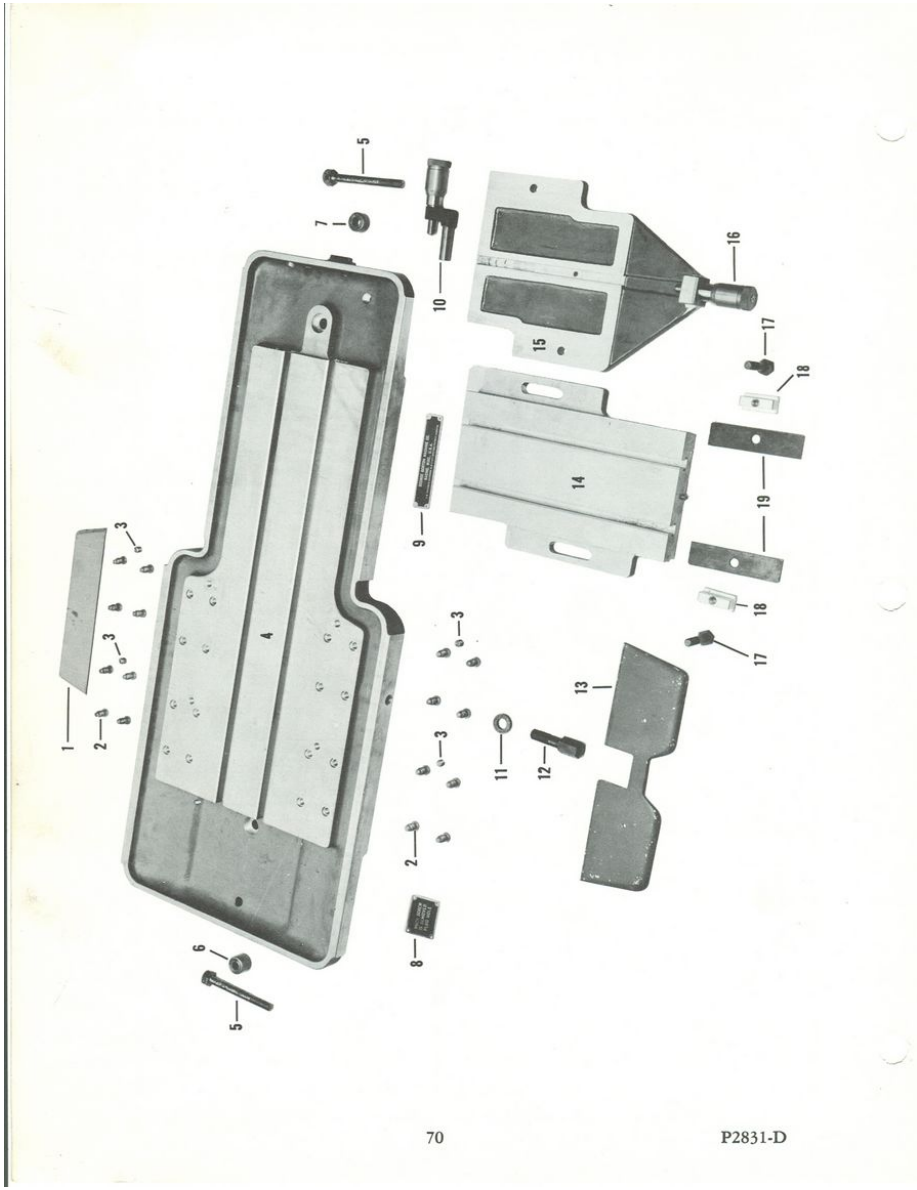


Photo 74

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

DUPLICATOR TABLE TOP

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Saddle Apron - Rear	15117			
2	Stud Hole Plug (16)	9093			
3	Slotted Pipe Plug (4)	K-407			
4	Duplicator Table	CP-231			
5	Table Lock Screw (2)	8652			
6	Table Lock Screw Washer-Left Hand	10997			
7	Table Lock Screw Washer - Right Hand	8653			
8	Instruction Plate	K-6164			
9	Table Nameplate	K-6165			
9a	Drive Pin for Instruction and Nameplates (8) Not Shown				
10	Offset Micrometer Screw and Holder	CP-139			
11	Clamp Screw Washer	9274			
12	Clamp Screw	10996			
13	Saddle Apron - Front	9317			
14	Master Table	8660			
15	Master Table Base	8661			
16	Micrometer Screw and Holder	CP-140			
17	Master Table Clamp Screw (2)	8946			
18	T-Slot Nut (2)	11897			
19	Clamping Plate (2)	8721			

() Figures in parentheses indicate quantities of identical parts 2831-D

Photo 75

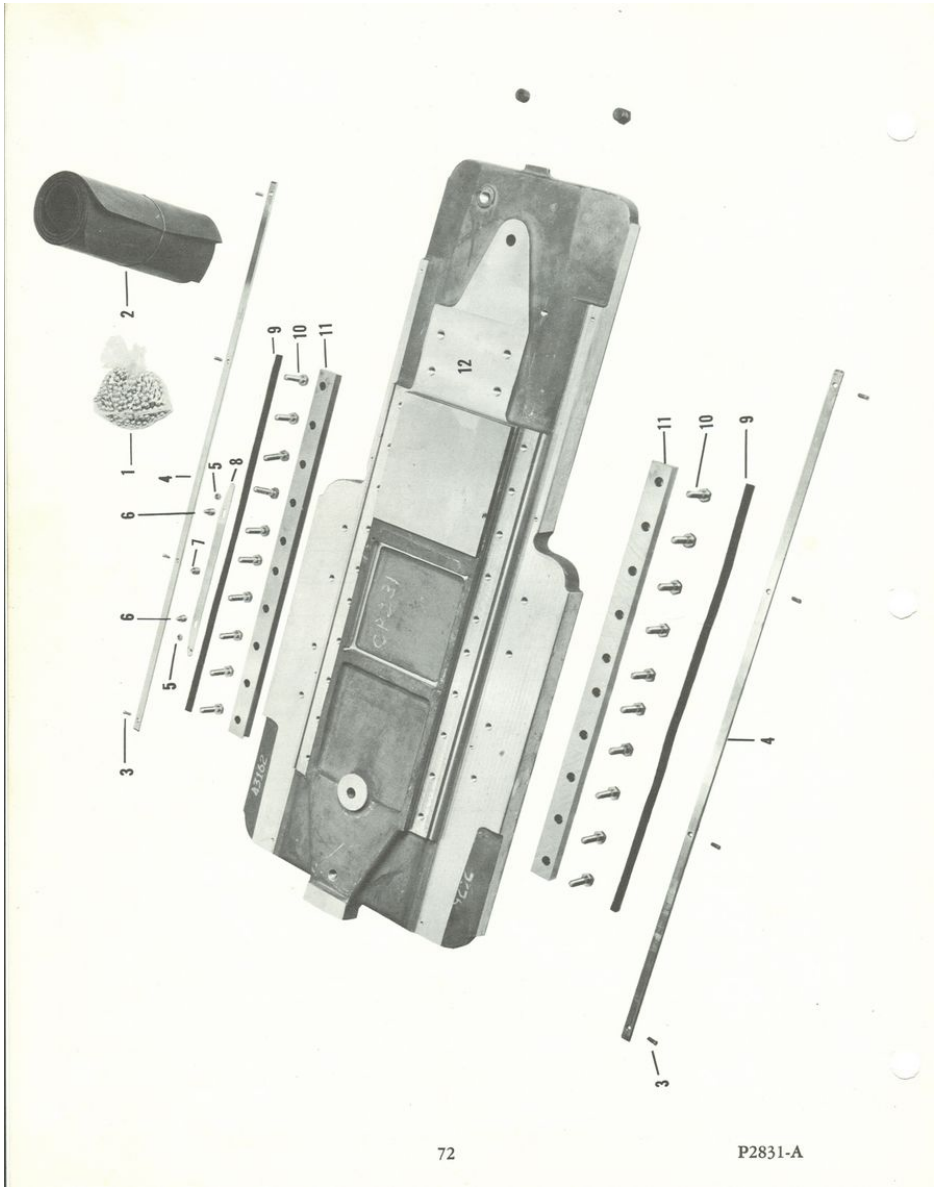


Photo 76

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

DUPLICATOR TABLE - BOTTOM

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Balls for Ball Bearing Slides (336) for All Ball Tracks	KB-77			
2	Chip Aprons - Front and Rear	11233			
3	Screw for Apron Holders (8)	3271			
4	Apron Holder (2)	9266			
5	Hex Head Nut (2)	3335			
6	Apron Spring Screw (2)	9307			
7	Socket Set Screw	K-4076			
8	Apron Spring	9616			
9	Felt Seal (2)	11775			
10	Ball Track Cap Screw (20)	8723			
11	Ball Track (2)	9256			
12	Duplicator Table with Brake Plate	CP-231			

() Figures in parentheses indicate quantities of identical parts 2831-A

Photo 77

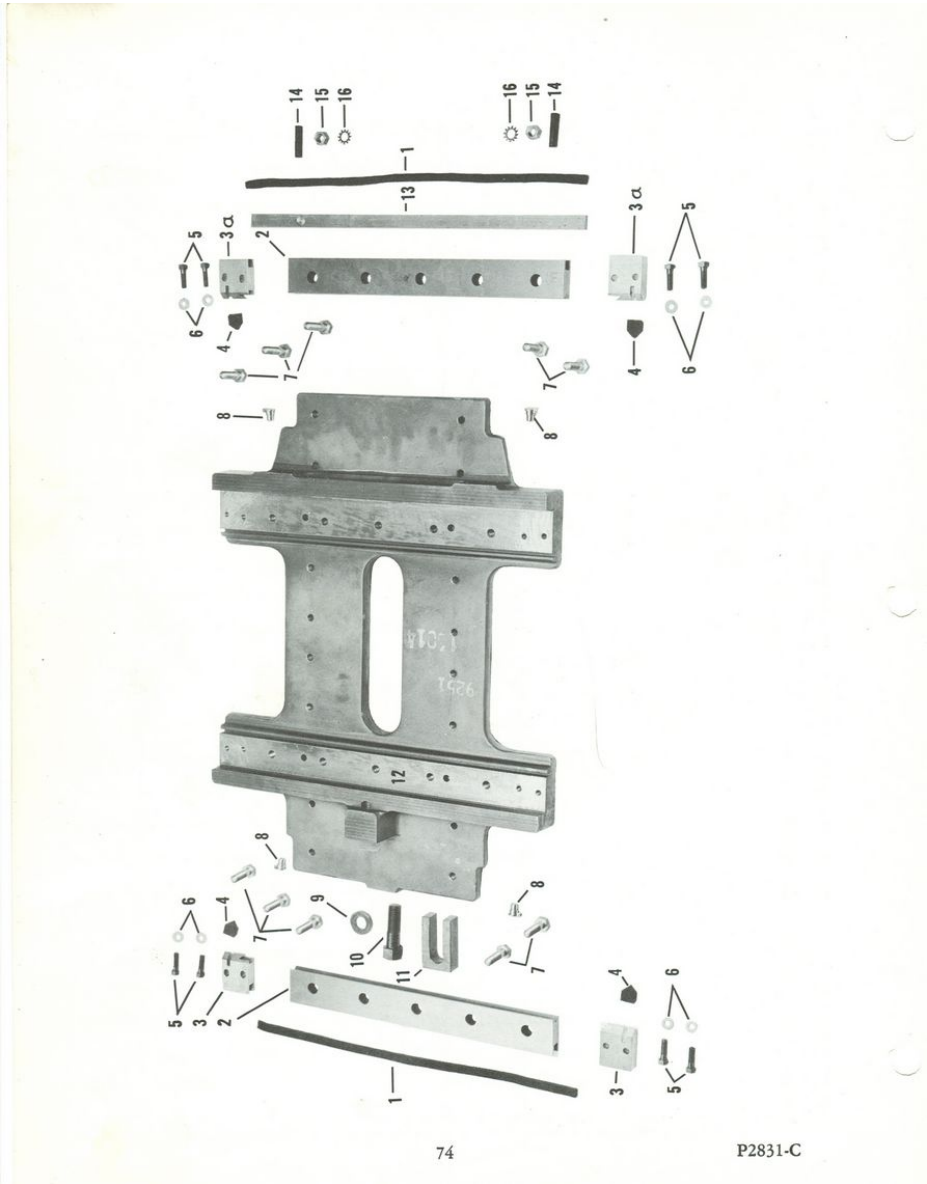


Photo 78

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

DUPLICATOR TABLE SADDLE - TOP

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Felt Seal (2)	11778			
2	Ball Track (2)	9255			
3	Ball Bearing Retainer Positive Side (2)	CP-1609			
3a	Ball Bearing Retainer Gib Side (2)	CP-1608			
4	Felt Seal (4)	11576			
5	Ball Bearing Retainer Cap Screw (8)	14763			
6	Washer for Above (8)	K-459			
7	Ball Track Cap Screw (10)	8723			
8	Oil Cup (4)	K-515			
9	Washer	9274			
10	Clamp Screw	9273			
11	U-Clamp	9272			
12	Duplicator Table Saddle - Top	9251			
13	Saddle Gib	9419			
14	Gib Adjusting Screw (2)	19155			
15	Lock Nut (2)	K-5703			
16	Lock Washer (2)	K-5704			

() Figures in parentheses indicate quantities of identical parts

2831-C

Photo 79

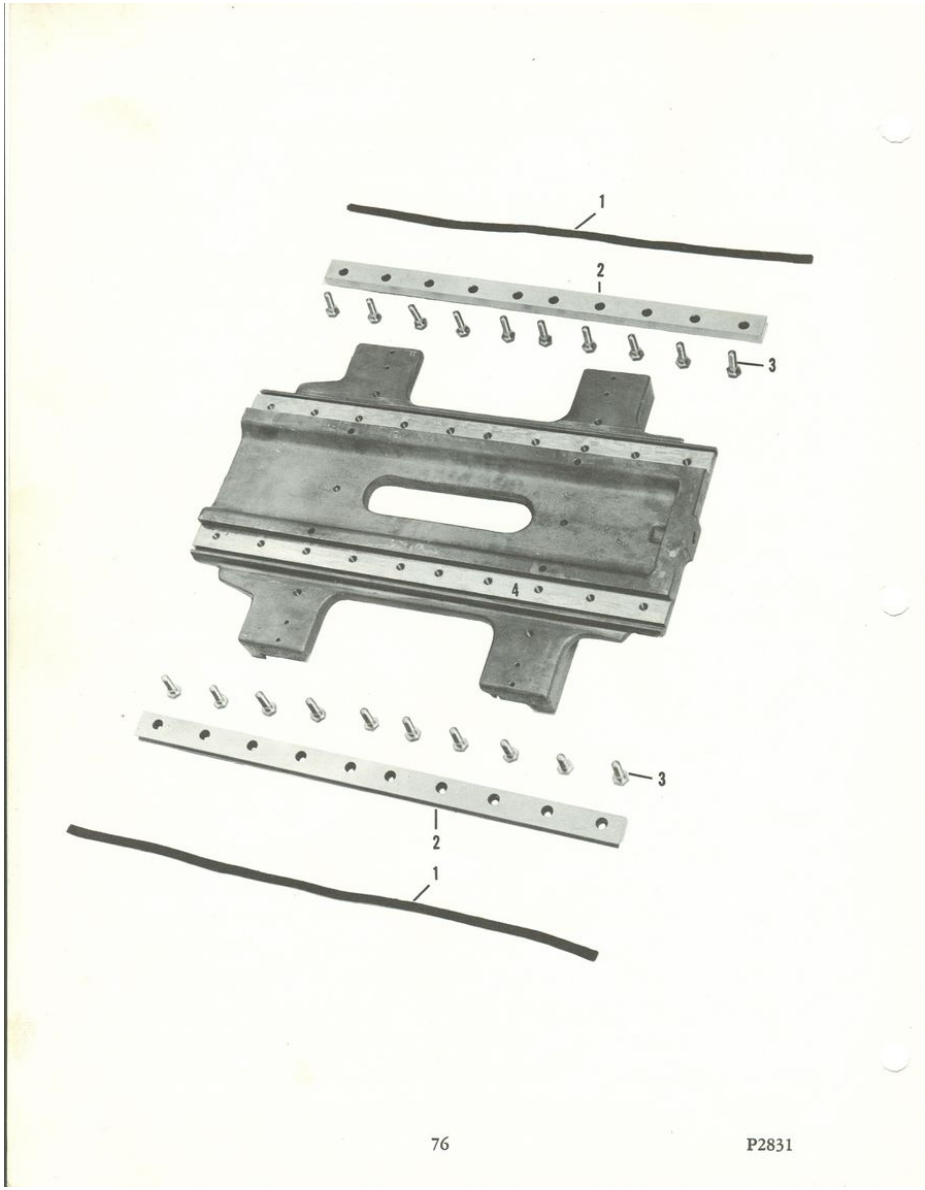


Photo 80

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

DUPLICATOR TABLE SADDLE - BOTTOM

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Felt Seal (2)	11775			
2	Ball Track (2)	9256			
3	Ball Track Cap Screw (20)	8723			
4	Duplicator Table Saddle - Bottom	9251			

() Figures in parentheses indicate quantities of identical parts

2831

Photo 81

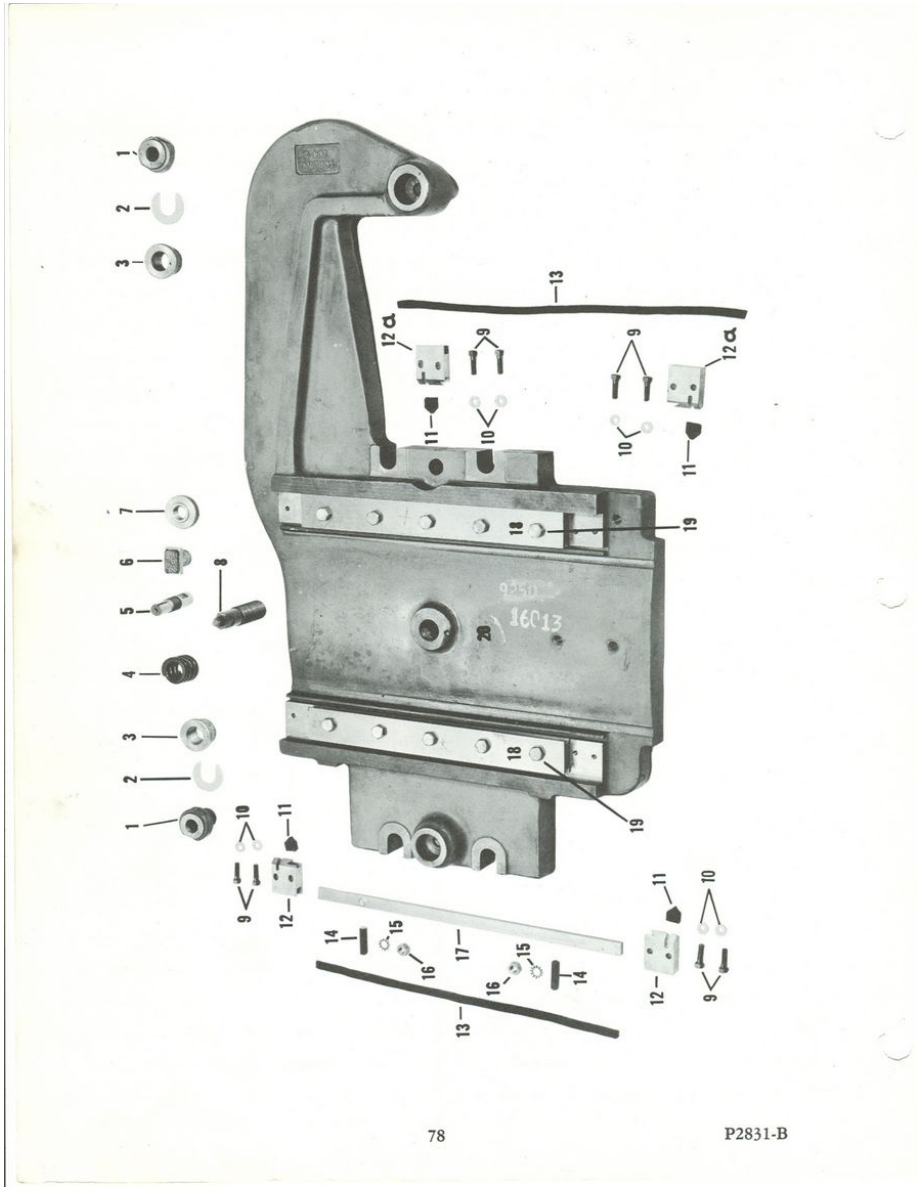


Photo 82

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name Always Use Genuine Gorton Parts

DUPLICATOR TABLE BASE-TOP

Always Give Machine Model Number and SERIAL NUMBER

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Table Lock Adjusting Screw (2)	8722			
2	Washer for above (2)	9392			
3	Table Lock Adjusting Screw Nut (2)	8759			
4	Brake Spring	9316			
5	Brake Stud	9312			
6	Brake Shoe	CP-56			
7	Brake Adjusting Nut	9313			
8	Table Stop Pin	8651			
9	Ball Bearing Retainer - Cap Screw (8)	14763			
10	Washer (8)	K-459			
11	Felt Seal (4)	11576			
12	Ball Bearing Retainer Gib Side (2)	CP-1608			
12a	Ball Bearing Retainer - Positive Side (2)	CP-1609			
13	Felt Seal (2)	11778			
14	Gib Adjusting Screw (2)	19155			
15	Lock Washer (2)	K-5704			
16	Lock Nut (2)	K-5703			
17	Gib	9419			
18	Ball Race (2)	9255			
19	Ball Track Cap Screw (10)	8723			
20	Duplicator Table Base-Top	9250			

() Figures in parentheses indicate quantities of identical parts

2831-B

Photo 83

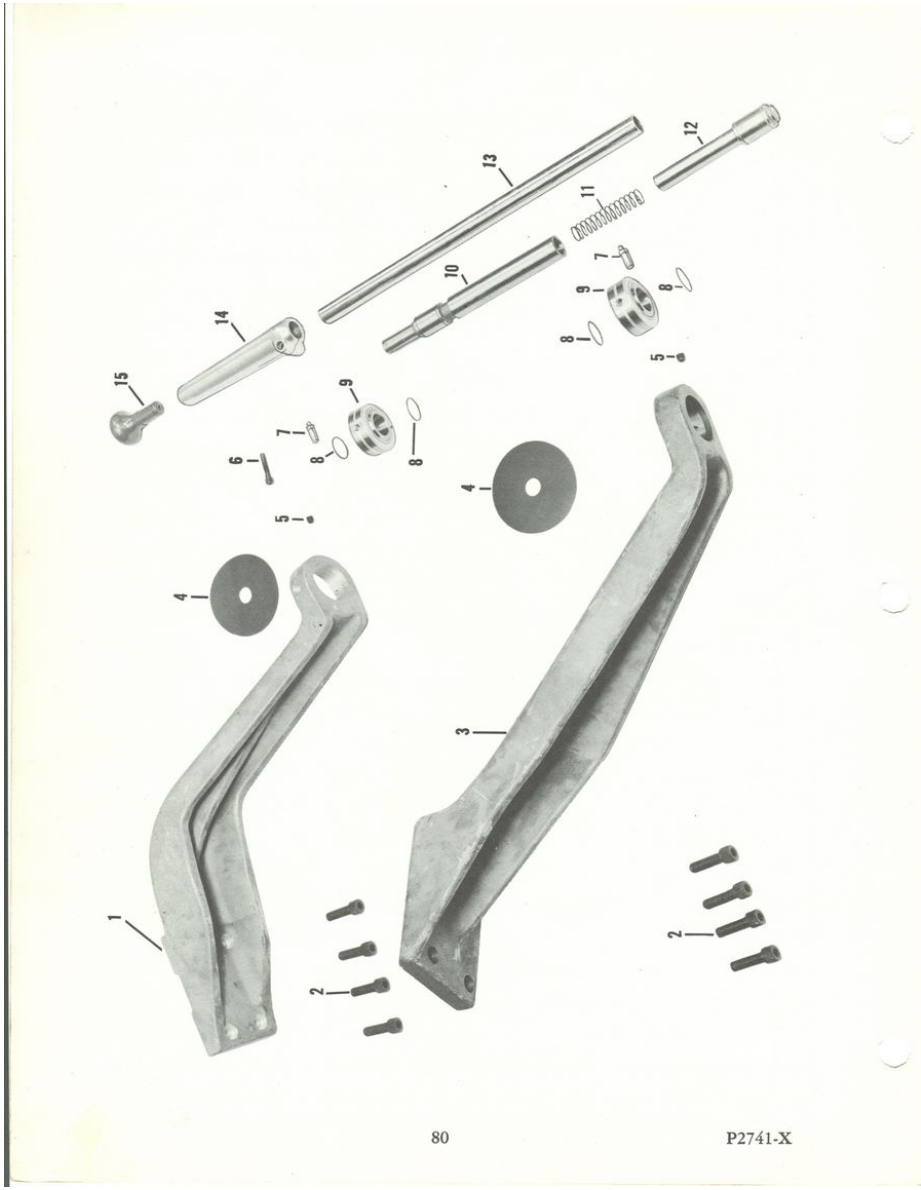


Photo 84

PARTS LIST - - GORTON 1-22 MASTERMIL

Order by Gorton Part Number and Name. Always Use Genuine Gorton Parts

Always Give Machine Model Number and SERIAL NUMBER

TABLE LEVER ASSEMBLY

Fig No.	Part Name	Part No.	Fig No.	Part Name	Part No.
1	Upper Lever Support Bracket	21717			
2	Socket Cap Screw (8)	K-161			
3	Lower Lever Support Bracket	22005			
4	Chip Shield (2)	22077			
5	Socket Set Screw (2)	K-187			
6	Socket Cap Screw	K-148			
7	Grease Fitting (2)	K-6371			
8	Snap Ring (4)	K-6149			
9	Uni-Ball Bearing (2)	K-6150			
10	Lever Sleeve	22006			
11	Plunger Spring	9265			
12	Lever Plunger	22007			
13	Lever Rod	21720			
14	Lever Extension	21712			
15	Lever Rod Handle	8954			

() Figures in parentheses indicate quantities of identical parts 2741-X

Photo 85

Form 2757 1M-8-56

INSTRUCTIONS FOR INSTALLING 1235-1

INFINITELY VARIABLE SPINDLE DOWN FEED

ASSEMBLY ON GORTON MASTERMIL 1-22S

(Refer to Drawings 2755-A and 2755 Attached)

1. Remove old cover plate at left side of head.
2. Remove spindle motor (do not injure wiring or cable).
3. Insert small pulley into bottom of motor pulley and lock in place with set screw.
4. Remove "A" assembly from power down feed unit. First remove hex-head clamping screw from bottom of flange which is part of casting 21251. Next, turn "A" assembly counter-clockwise to stop and lift up (bayonet lock).
5. Remove set screw "B" in left side of spindle housing so that shaft assembly "C" can be extracted by pulling out.
6. Fit new Woodruff key and clutch "D" to shaft "C".
7. Press new pin 12864 into shaft "C" where indicated and file until clutch 21238 slides over it freely.
8. In sliding new spacing washer 21248 over new pin 12864, be sure it is a sliding fit and spacer butts against shoulder of shaft. Now slide new worm wheel 21239 on shaft (running fit).
9. Press "E" (new bushing) into head casting as shown (if not already in place).
10. Now, remove shaft assembly "F" from new down feed unit by loosening two set screws K-187 so that shaft "F" can be tried in bushing "E" (running fit).
11. Remove worm wheel 21239, spacer 21248 and clutch 21238 from hand feed shaft. Replace shaft in head assembly and re-install clutch, spacer and worm wheel when end of shaft clears down feed gear attached to down feed shaft.

Photo 86

12. When above is accomplished, set screw "B" should fit exactly into countersunk hole in shaft "C" so that entire shaft assembly turns freely. It may be necessary to add an extra spacer or to remove some metal from spacer 21248 in order to assure a perfect fit of set screw "B". There should be no more than .002" play in worm wheel 21239.

13. Position yoke 21240 (held with set screw) so final alignment with clutch 21238 can be made by placing casting 21251 including yoke on machine. Position yoke 21240 by sighting through opening left by removing assembly "A". Use lever 12875 for trial engagements of clutch.

14. Remove casting 21251 assembly and pin yoke in place with roll pin K-5944.

15. Reassemble all components and grease. Attach belt to small pulley at bottom of motor shaft. Insert hex-head clamping screw in bottom of flange (part of casting 21251) adjust belt for proper tension and tighten hex-head clamping screw.

16. Tap entire assembly lightly while running to align for doweling.

17. When operating freely, dowel for positive location.

Photo 87

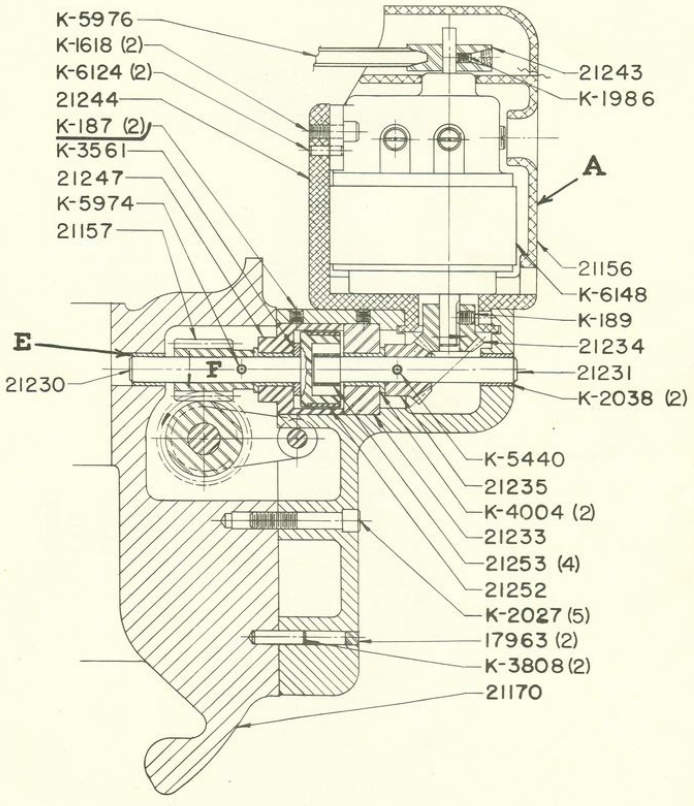

K-5976
K-1618 (2)
K-6124 (2)
21244
K-187 (2)
K-3561
21247
K-5974
21157
E
21230
F
21243
K-1986
A
21156
K-6148
K-189
21234
21231
K-2038 (2)
K-5440
21235
K-4004 (2)
21233
21253 (4)
21252
K-2027 (5)
17963 (2)
K-3808 (2)
21170
2755-A

Photo 88

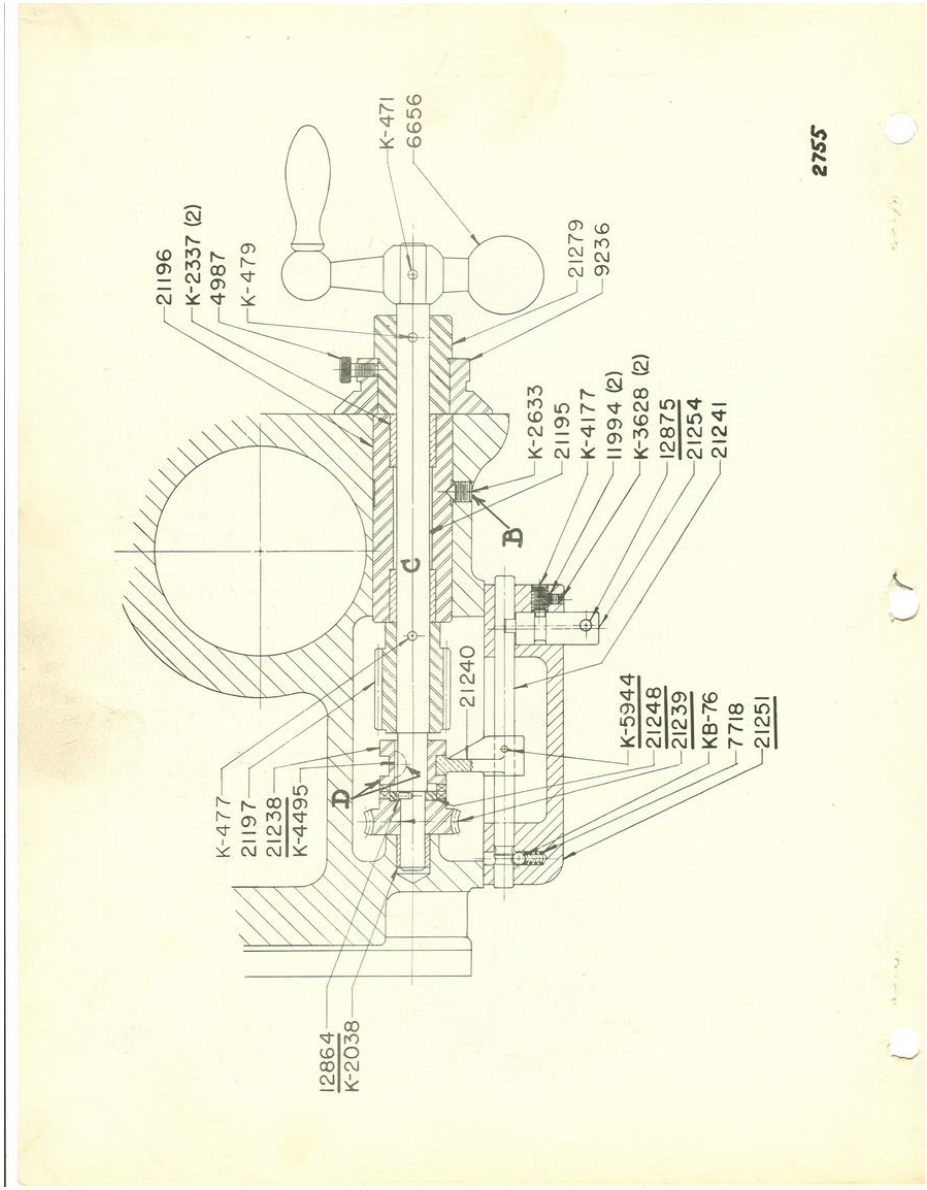

2755
21196
K-2337 (2)
4987
K-479
K-471
6656
21279
9236
K-2633
21195
K-4177
1994 (2)
K-3628 (2)
12875
21254
21241
K-5944
21248
21239
KB-76
7718
21251
21240
K-477
21197
21238
K-4495
12864
K-2038
A
B
C
D

Photo 89

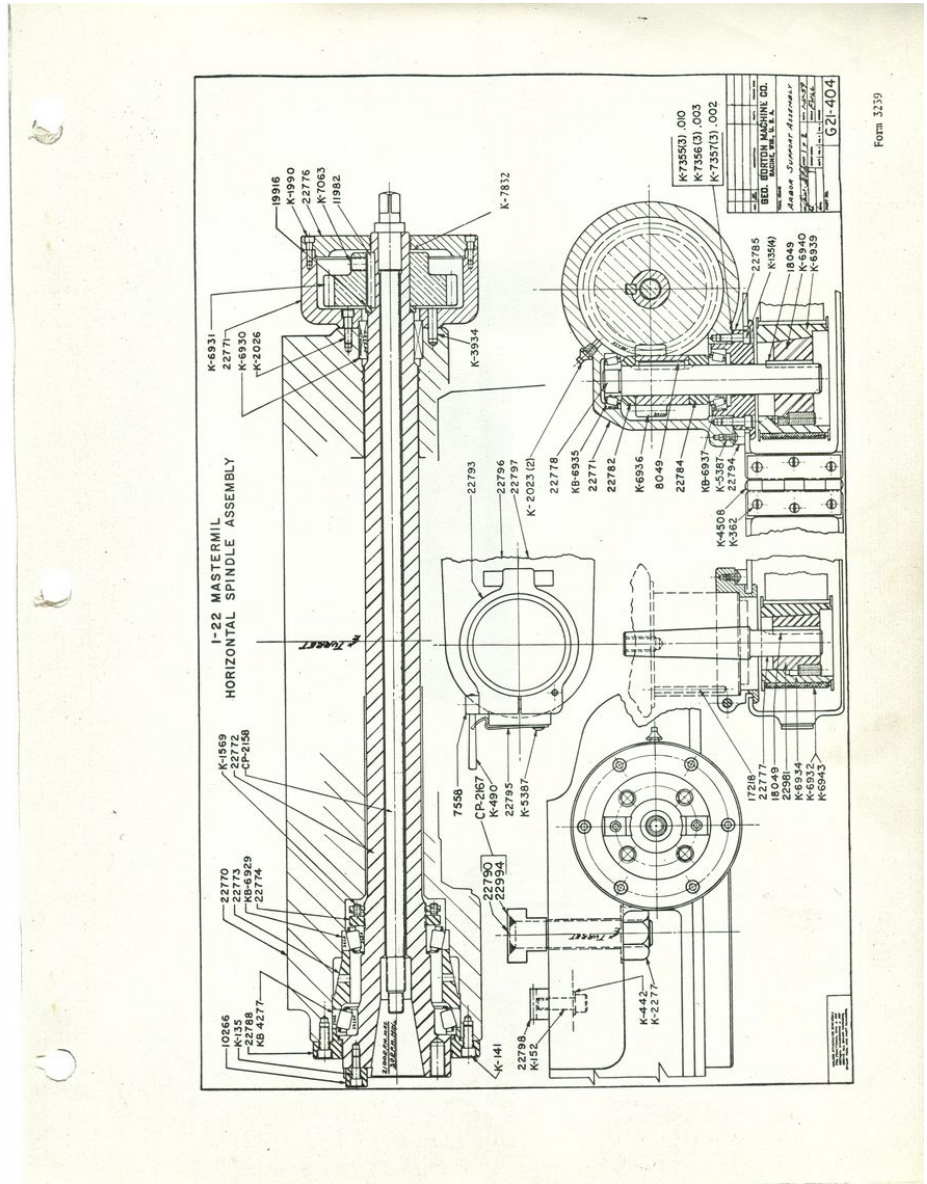

I-22 MASTERMIL
HORIZONTAL SPINDLE ASSEMBLY
G21-404
Form 3239

Photo 90

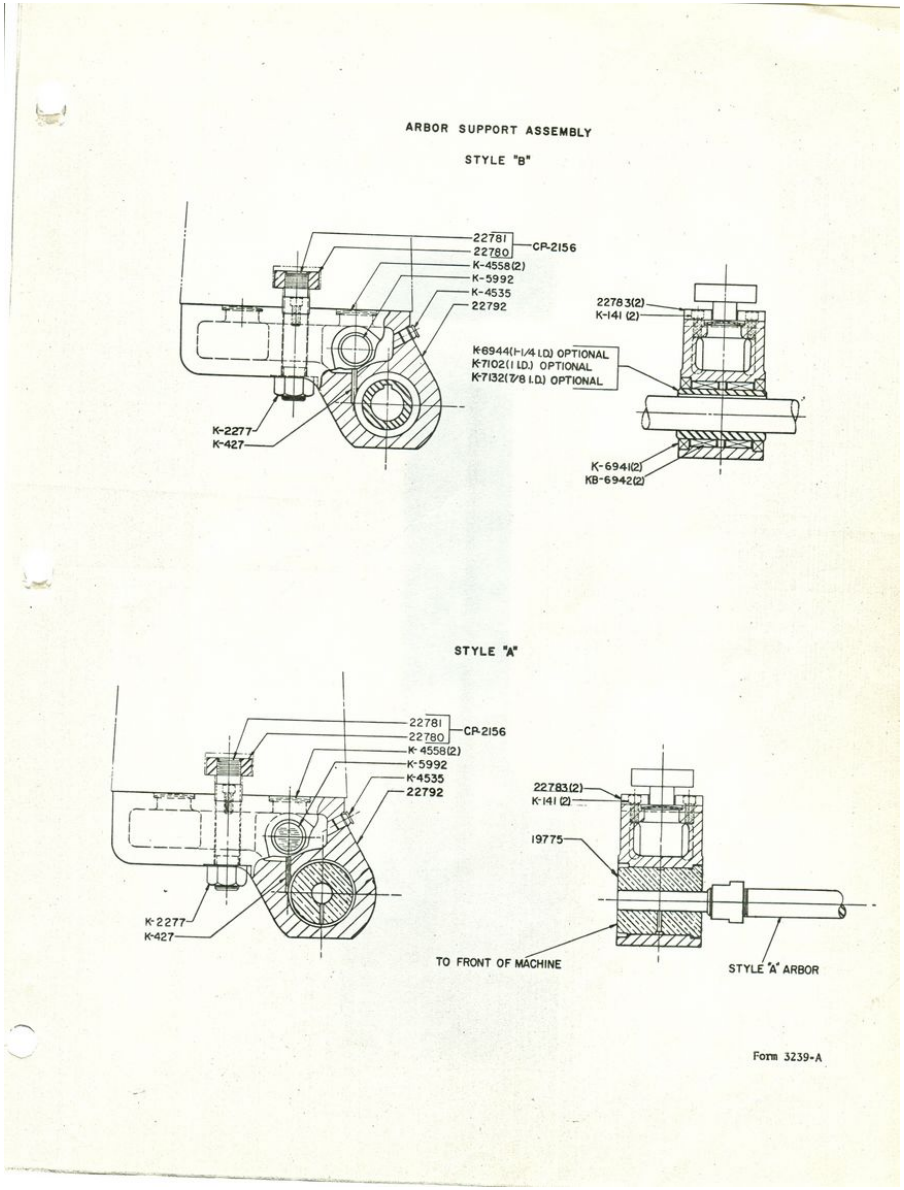
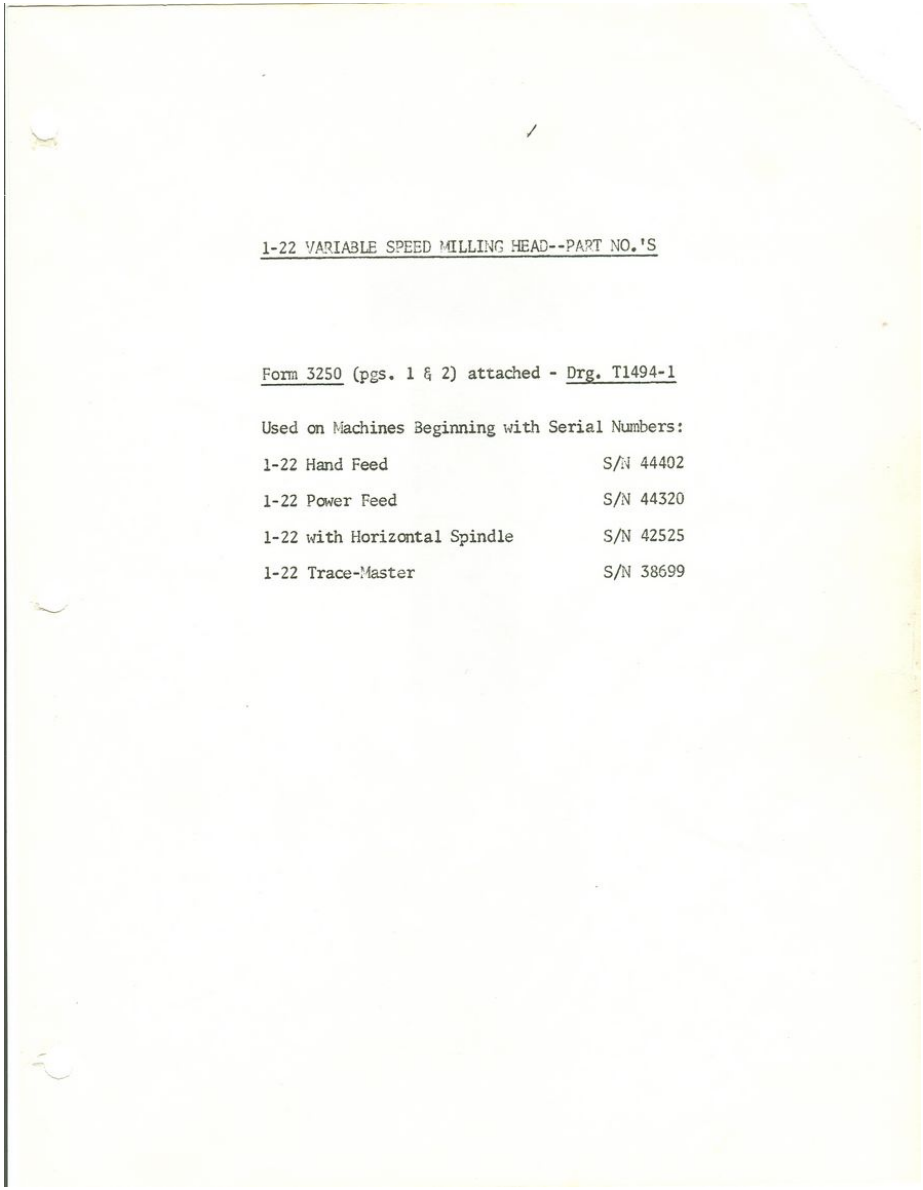

ARBOR SUPPORT ASSEMBLY
STYLE "B"
22781
22780
CP-2156
K-4558(2)
K-5992
K-4535
22792
K-6944(1-1/4 I.D.) OPTIONAL
K-7102(1 I.D.) OPTIONAL
K-7132(7/8 I.D.) OPTIONAL
22783(2)
K-141 (2)
K-2277
K-427
K-6941(2)
KB-6942(2)
STYLE "A"
22781
22780
CP-2156
K-4558(2)
K-5992
K-4535
22792
22783(2)
K-141 (2)
19775
K-2277
K-427
TO FRONT OF MACHINE
STYLE "A" ARBOR
Form 3239-A

Photo 91



1-22 VARIABLE SPEED MILLING HEAD--PART NO.'S

Form 3250 (pgs. 1 & 2) attached - Drg. T1494-1

Used on Machines Beginning with Serial Numbers:

1-22 Hand Feed	S/N 44402
1-22 Power Feed	S/N 44320
1-22 with Horizontal Spindle	S/N 42525
1-22 Trace-Master	S/N 38699

Photo 92

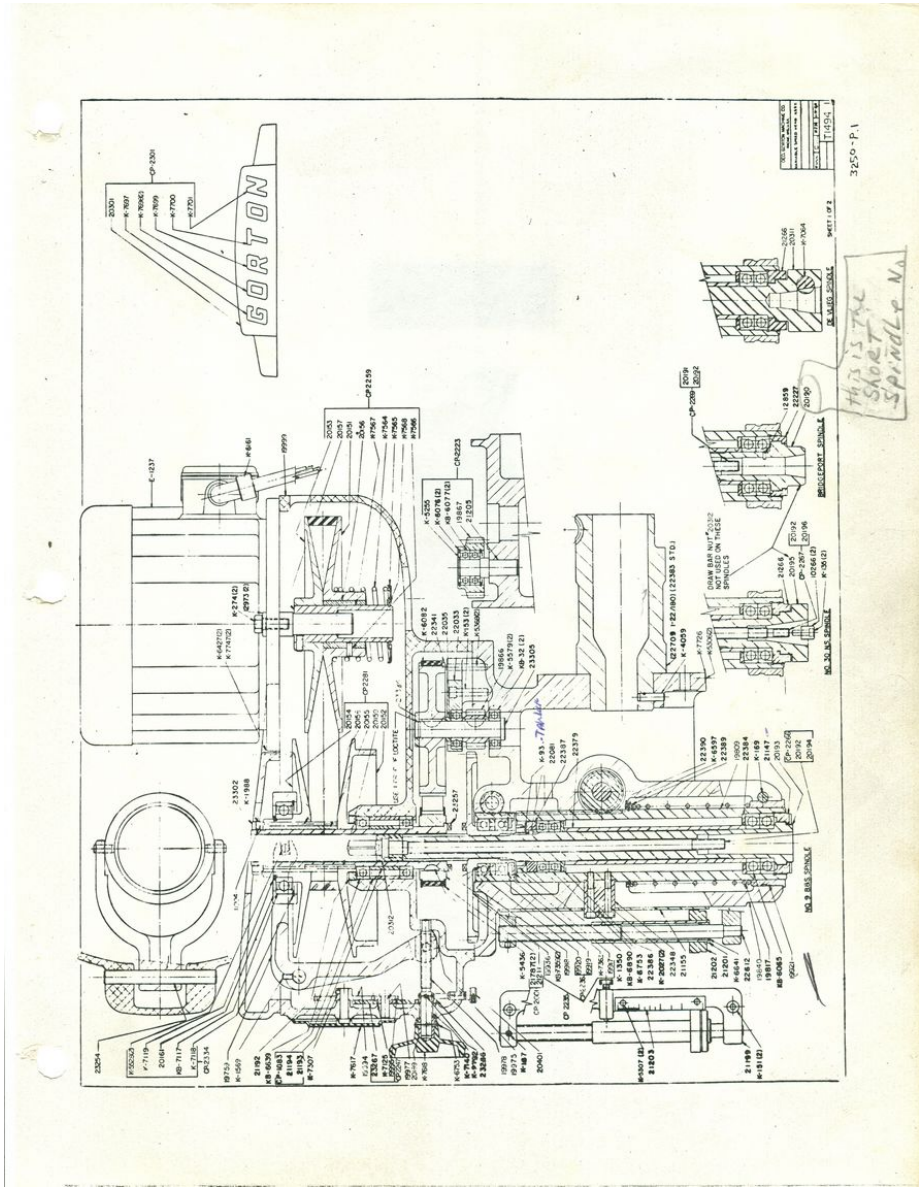

GORTON
3250-P.1
THIS IS THE SHORT SPINDLE NO.
NO.2 BIG SPINDLE
NO.3 LAG SPINDLE
BRIDGEPORT SPINDLE
DRAW BAR NUT (2082 NOT USED ON THESE SPINDLES)

Photo 93

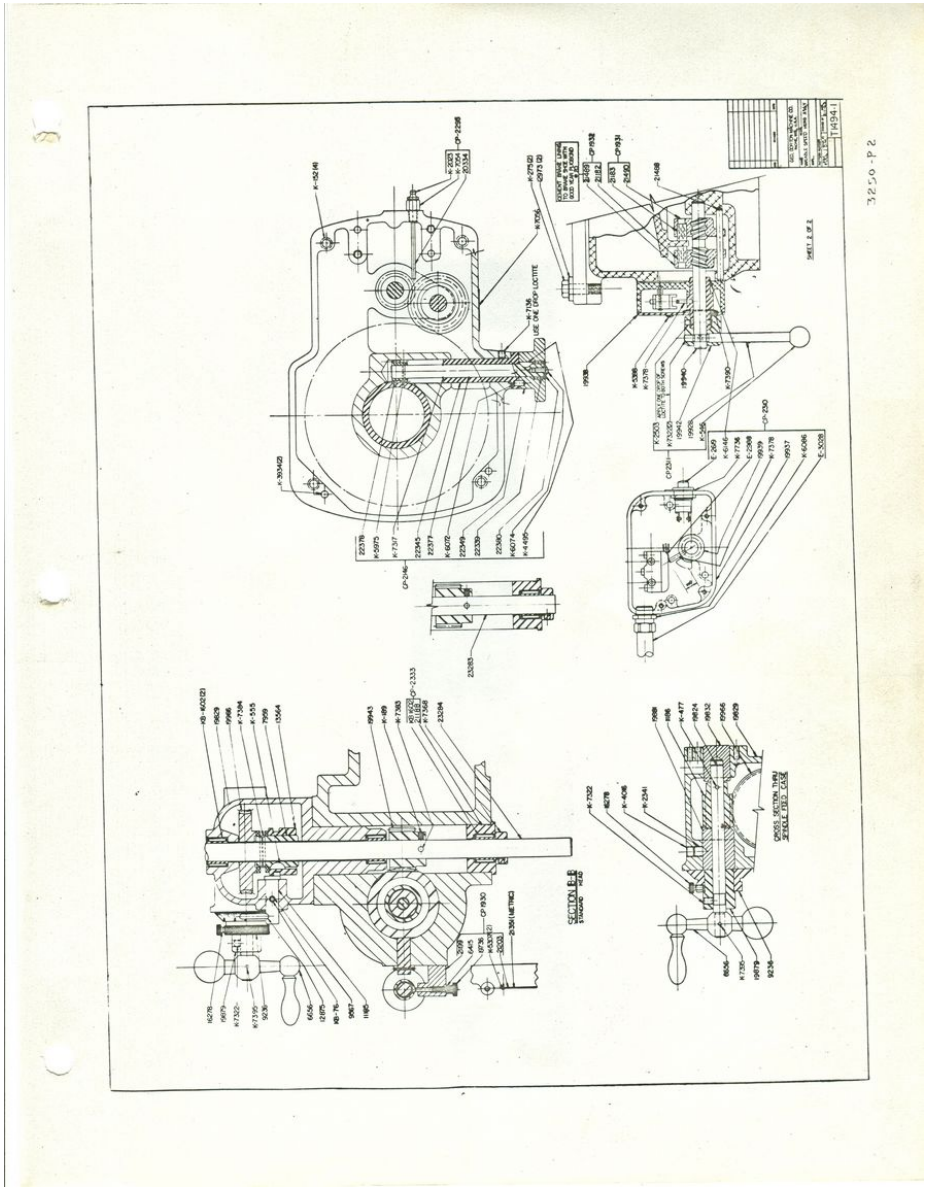
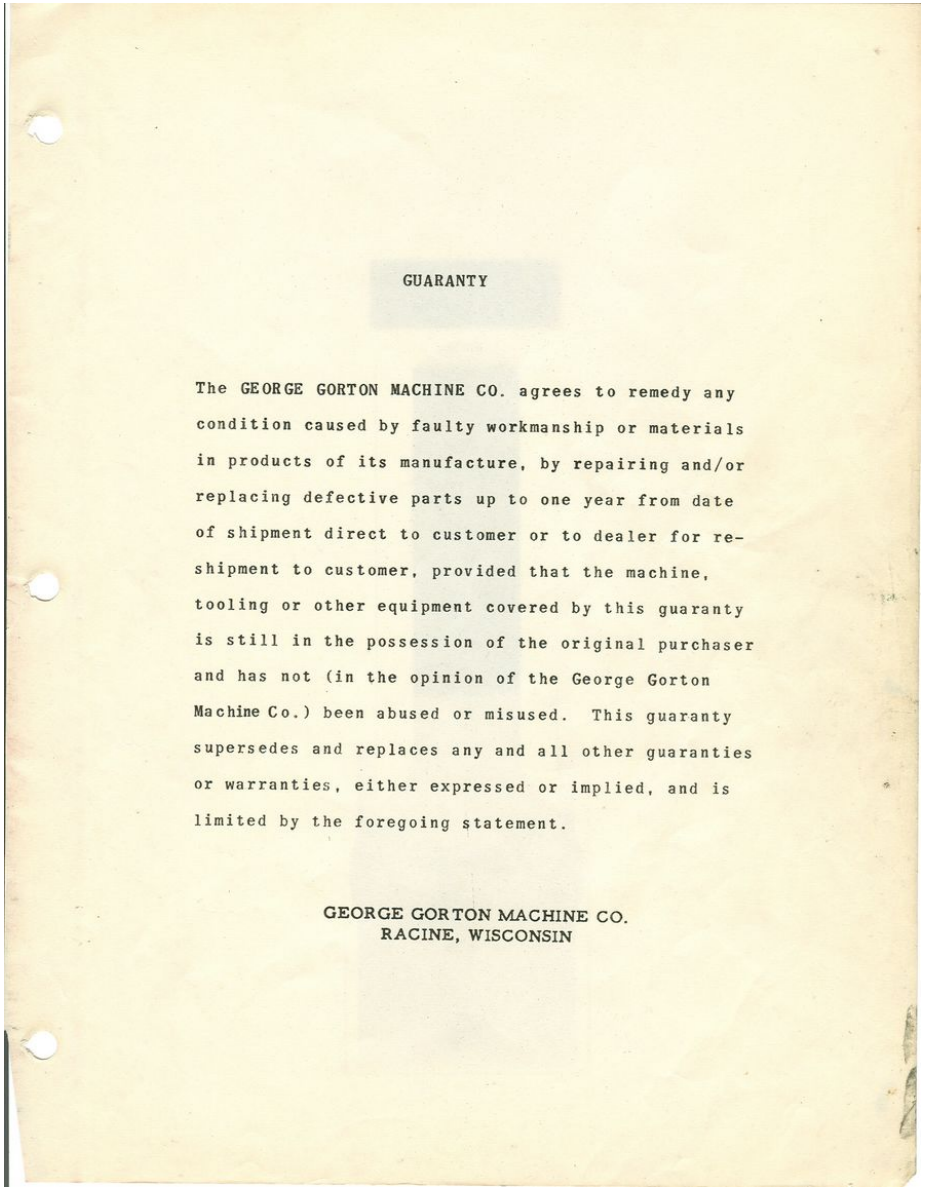


Photo 94



GUARANTY

The GEORGE GORTON MACHINE CO. agrees to remedy any condition caused by faulty workmanship or materials in products of its manufacture, by repairing and/or replacing defective parts up to one year from date of shipment direct to customer or to dealer for re-shipment to customer, provided that the machine, tooling or other equipment covered by this guaranty is still in the possession of the original purchaser and has not (in the opinion of the George Gorton Machine Co.) been abused or misused. This guaranty supersedes and replaces any and all other guaranties or warranties, either expressed or implied, and is limited by the foregoing statement.

GEORGE GORTON MACHINE CO.
RACINE, WISCONSIN