

NORTON

MACHINE TOOLS

6 x 12 TYPE TS - 2

**HAND
SURFACE GRINDER**

INSTRUCTION and PARTS MANUAL

No. 1524-6

***NORTON COMPANY
MACHINE TOOL DIVISION
WORCESTER, MASSACHUSETTS, 01606***



Due to improvements in design, these instructions may not coincide in every detail with machines now in the field. They were correct for the machines built at the time these instructions were prepared.

6 x 12 TYPE TS - 2

HAND

SURFACE GRINDER

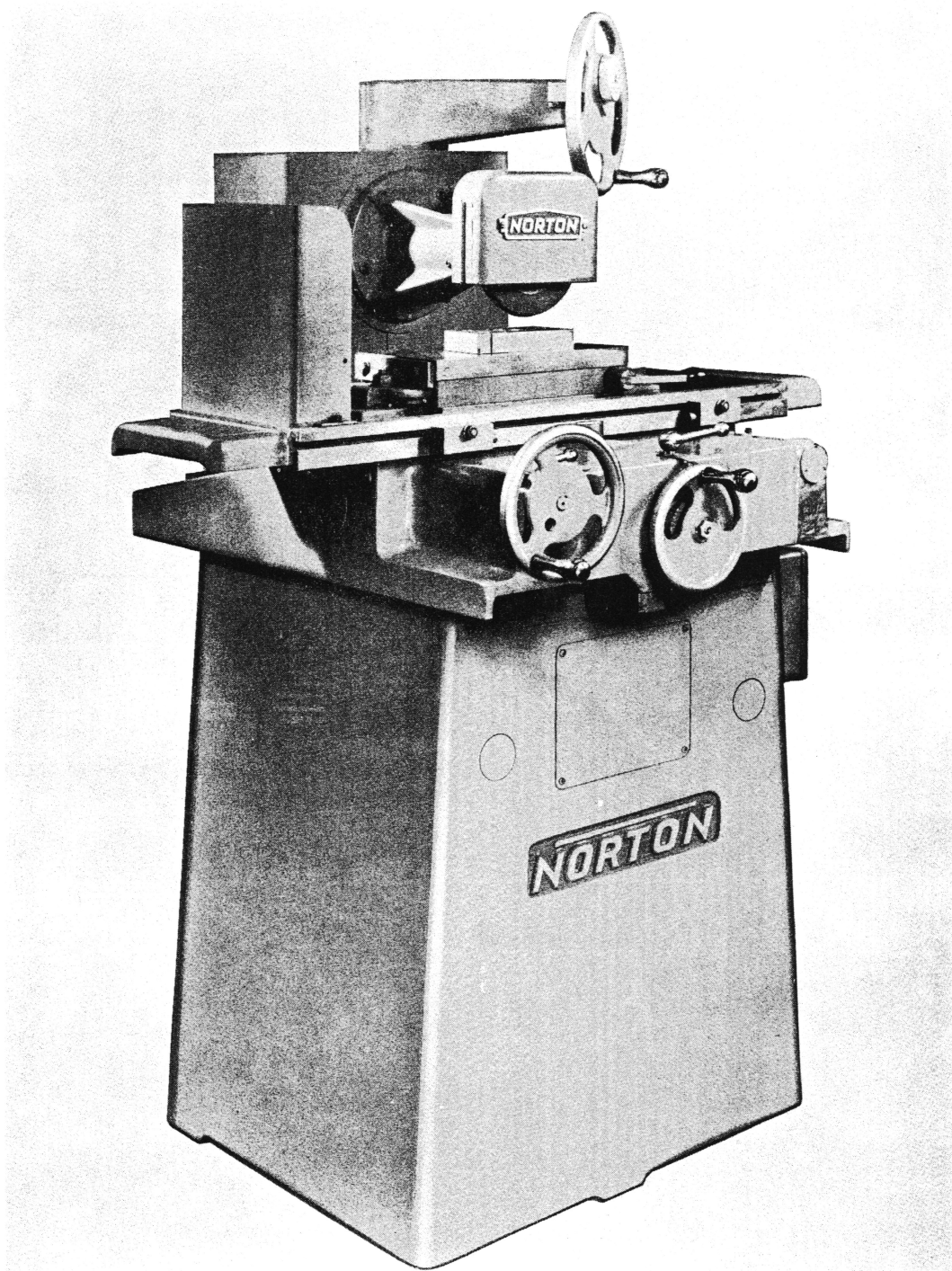
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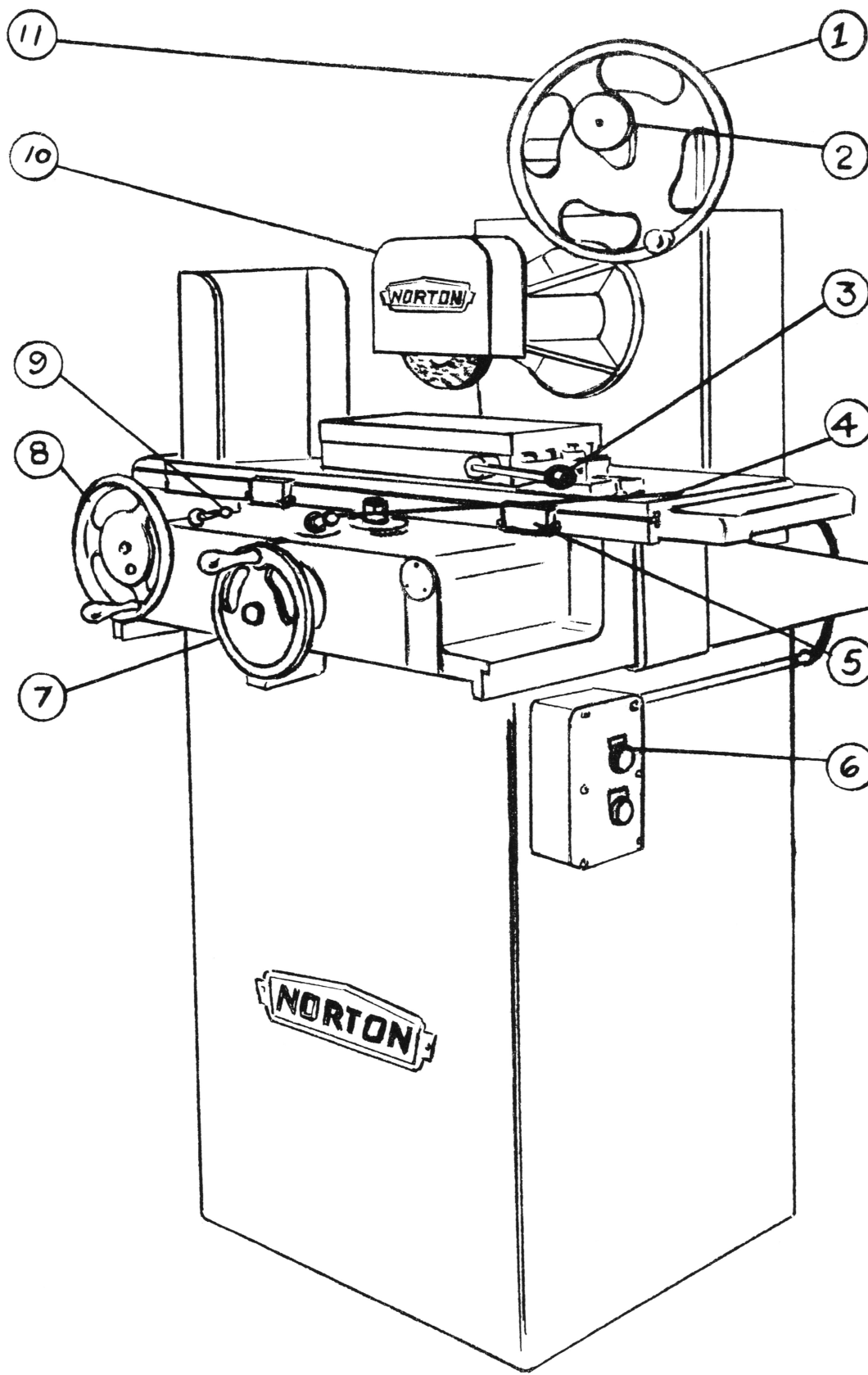
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N8793-B

NORTON 6 x 12" Type TS-2 Hand Surface Grinder



Identification of Controls and Components

(See following page)

IDENTIFICATION OF CONTROLS AND COMPONENTS
(as shown on previous page)

1. Wheel Feed Handwheel. Graduations on rim of handwheel indicate feed of .0005".
2. Fine Downfeed Mechanism. Graduations on pointer (11) indicate .0001" feed.
3. Magnetic Chuck On-off Switch. (Magnetic chucks are furnished at extra cost).
4. Cross Slide Brake. This is used to lock cross slide, or to set up a "drag" on cross-feed, if desired.
5. Table Dog. Table dog stops are spring-loaded for cushioned contact. Reverse dog positions, if positive contact is desired.
6. Manual Starter for Wheel Drive Motor. This is the standard arrangement. Machines built to NMTBA or J.I.C. Electrical Standards (at extra cost) have Combination Starters.
7. Cross-feed Handwheel. Graduations on rim of this handwheel show .001" feed.
8. Table Drive Handwheel. This handwheel is readily oriented to position the handle for the most convenient short-stroke operation.
9. Table Brake. This is used to lock the table, or to set up a "drag" on table movement, if desired.
10. Hinged Grinding Wheel Guard. The cover swings back for wheel change.
11. Wheel Feed Pointer. Graduations on this pointer indicate .0001" feed.

NORTON

6 x 12" TYPE TS -2 HAND SURFACE GRINDER

On Receipt of Machine

Your 6 x 12" Type TS-2 Hand Surface Grinder is built to provide precise service, and must be treated as a precision tool. Remove packing materials with care.

Avoid direct, heavy blows in unpacking. If blocking must be removed, do so in a manner to avoid undue stresses on the machine.

Separately Packed Material

Certain machine components are packed separately. See that these do not become lost, or are thrown away with packing material. Check what is received against the packing list, and report any missing items immediately.

Lifting

Lifting holes are provided through the front and rear base walls. Normally, these holes are also used for machine shipment, and when they are, hold-down hooks run from these to the shipping platform.

Lifting bars can be inserted through these holes, and slings rigged to the ends of the bars. This equipment should be capable of supporting approximately 1,400 pounds. Before lifting, blocks should be placed between the slings and the machine so that damage will not result to machine surfaces when tension is applied to the slings.

Locating the Machine

A floor plan blueprint is shipped with the machine. Refer to this to determine the area necessary to provide adequate clearances for operating activities and maintenance.

Leveling

The Type TS -2 Grinder will operate satisfactorily on a good shop floor. It rests on three floor spots attached to the bottom of the

Leveling (contd.)

base. These are indicated on the floor plan print shipped with the machine.

Insert steel plates approximately 1/4" thick under the three floor spots when the machine is put down. Then insert steel shims between plates and floor spots to level the machine. Use a sensitive spirit level on a flat machined surface, and take readings front and back, and from side to side, and shim accordingly.

Once the level has been established, it should remain so if the base floor surface is of good quality. However, it is good practice to check this from time to time.

If the machine is on a concrete floor, be sure that it is not actually attached to the floor.

Electrical Connections

A wiring diagram print is shipped with the machine. Refer to this in making electrical connections.

Installing the Sliding Table

The sliding table of this machine moves on antifriction rollers which are contained in separators. These are shown in the Cross Slide Assembly parts drawing on Page 16.

Normally, the sliding table is taken off the machine for shipment. It is separately attached to the shipping container in back of the machine.

Before putting the table on the machine, obtain the rollers and separators which are usually shipped in a box, along with other of the smaller machine components. Arrange the rollers and the separators as shown in the Cross Slide Assembly drawing.

The separator with the oval holes is used in the vee way. Note how the rollers are to be "staggered" in this separator. This provides directional stability in movement of the table. The separator for the flat way has rectangular holes.

Note:

In setting the sliding table on the machine, observe care in the meshing of the table drive pinion and the rack on bottom of the table.

Table Drain-Hole Cap

The sliding table will be seen to have a drain-hole at the rear. A sheet metal cap is furnished for this. If the machine has been purchased for dry grinding only, this cap should remain over the hole permanently. If the wet grinding arrangement has been bought, the cap must be removed to permit coolant drainage, but it should be in place whenever dry grinding is done.

Wheel Spindle Unit

The wheel spindle is driven by a single-speed vee belt arrangement. Wheel spindle unit construction is shown by the drawing SE-3464-A on page 12.

Belt tension is adjusted by repositioning the motor mounting bracket. This is done by loosening four hold down bolts and turning an adjusting screw.

Handwheels

If the handwheels are received separately, their identification can be made by reference to the parts drawings. The wheel feed handwheel is shown as #6TS-32 on the Vertical Slide Feed Mechanism drawing. The table drive handwheel is shown as #80 on the Cross Slide Assembly drawing, and the cross-feed handwheel as #66.

The drawings also indicate how they are mounted. In mounting table drive handwheel #80, it will be seen that this can be oriented (because of the serrated washer #82) to bring handle #81 into any position desired by the Operator. This is particularly helpful for short-table-stroke grinding, if the Operator finds it easier to have the handle in a certain position.

LUBRICATION

Vertical Wheel Head Ways

A grease fitting is provided in the right and left vertical wheel head way for lubrication. The one in the left way (when facing the back of the machine) is clearly visible. The one in the right way is recessed. However, its position is indicated by a plate.

As stated on this plate, lubricate the vertical ways with a light grease, once a week.

Vertical Feed Screw and Nut

When the cross slide is fed forward toward the Operator, a grease fitting will be seen on the front side of the vertical slide. This lubricates the vertical feed nut and the feed screw, as it revolves through the nut. Apply light grease, once a week.

Cross-feed Screw and Nut

The cross-feed nut (and the screw as it revolves in the nut) are lubricated by a grease fitting which will be seen on front of the machine as the cross slide is moved to its inmost position. This fitting is shown as #108 on the Cross Slide Assembly drawing. Apply light grease once a week.

Feed Mechanism Bevel Gears

The bevel gears in the feed mechanism are oiled through an oil cup in cover #6TS-46 in the Vertical Slide Feed Mechanism drawing. Apply several drops of 300 machine oil through the oil cup, once a week.

Cross Slide Ways

These ways are lubricated by a Lubricator mounted on the side of the base, and which is identified as #6TS-140 in the Cross Slide Assembly drawing on page 16. The capacity of the Lubricator is approximately nine cubic inches (150 cu. cm.).

Fill the Lubricator with a 145-175 S. U. V. at 100°F. combination hydraulic and way oil.

Note:

This oil is suggested for the hydraulic system of Norton 6 x 18" and 8 x 24" Hydraulic Surface Grinders, and may be in your inventory.

Lift the pull button at the start of each day. The maximum discharge is approximately 60 drops. Experience will show whether once a day is adequate. Keep filled to show in sight glass.

Wheel Spindle

The wheel spindle bearings are packed with grease at assembly of the unit. Periodic lubrication attention is not required.

Operating Information

Wheel Feed

Counterclockwise turning of the wheel feed handwheel feeds the grinding wheel down. The handwheel is graduated .0005", and gives .050" feed at one full turn.

The handwheel has a fine-feed mechanism which is operated by knob #6TS-30 shown on the drawing of the Vertical Slide Feed Mechanism. This knob, and the graduations on pointer, permit feeds of .0001".

Cross-feed

Cross-feed of the slide is done by turning handwheel #6TS-66. This handwheel is graduated .001", and gives .200" feed for one full turn.

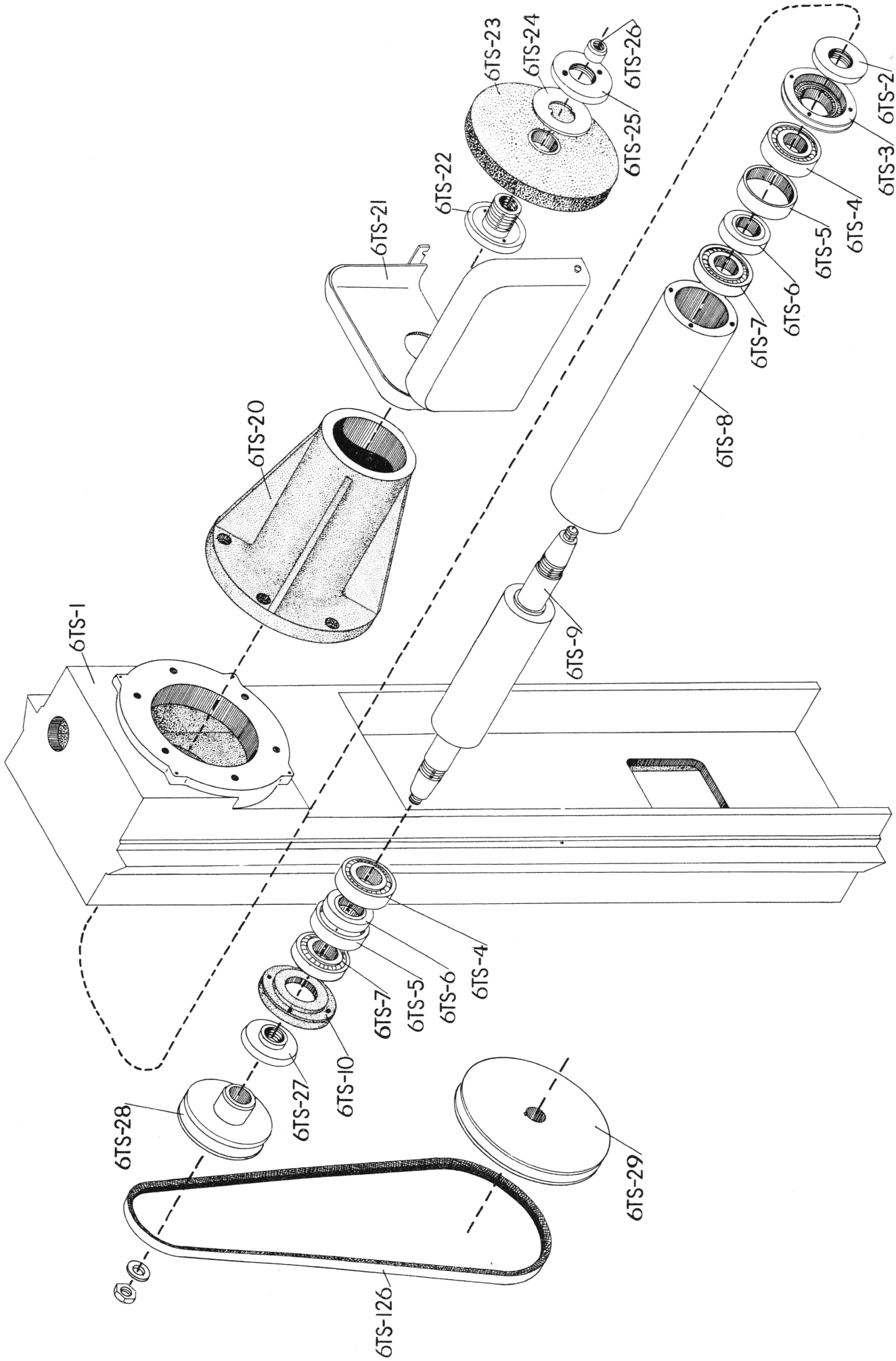
Friction Brakes

Friction brakes are furnished for the table and for the cross slide. These permit setting a "drag" or the locking of these components, if desired.

The table brake is operated by lever #6TS-96. The cross slide brake is operated by lever.

Cleaning

Care should be exercised to prevent grit and dirt from getting into the bearings or becoming lodged in the ways. Use wiping cloths free from lint to clean the machine and DO NOT USE an air hose. A bristle brush can be used to remove dirt from corners. If the machine is to stand idle for any length of time, a thin film of oil should be wiped on exposed surfaces to prevent rusting.



WHEEL SPINDLE

WHEEL SPINDLE

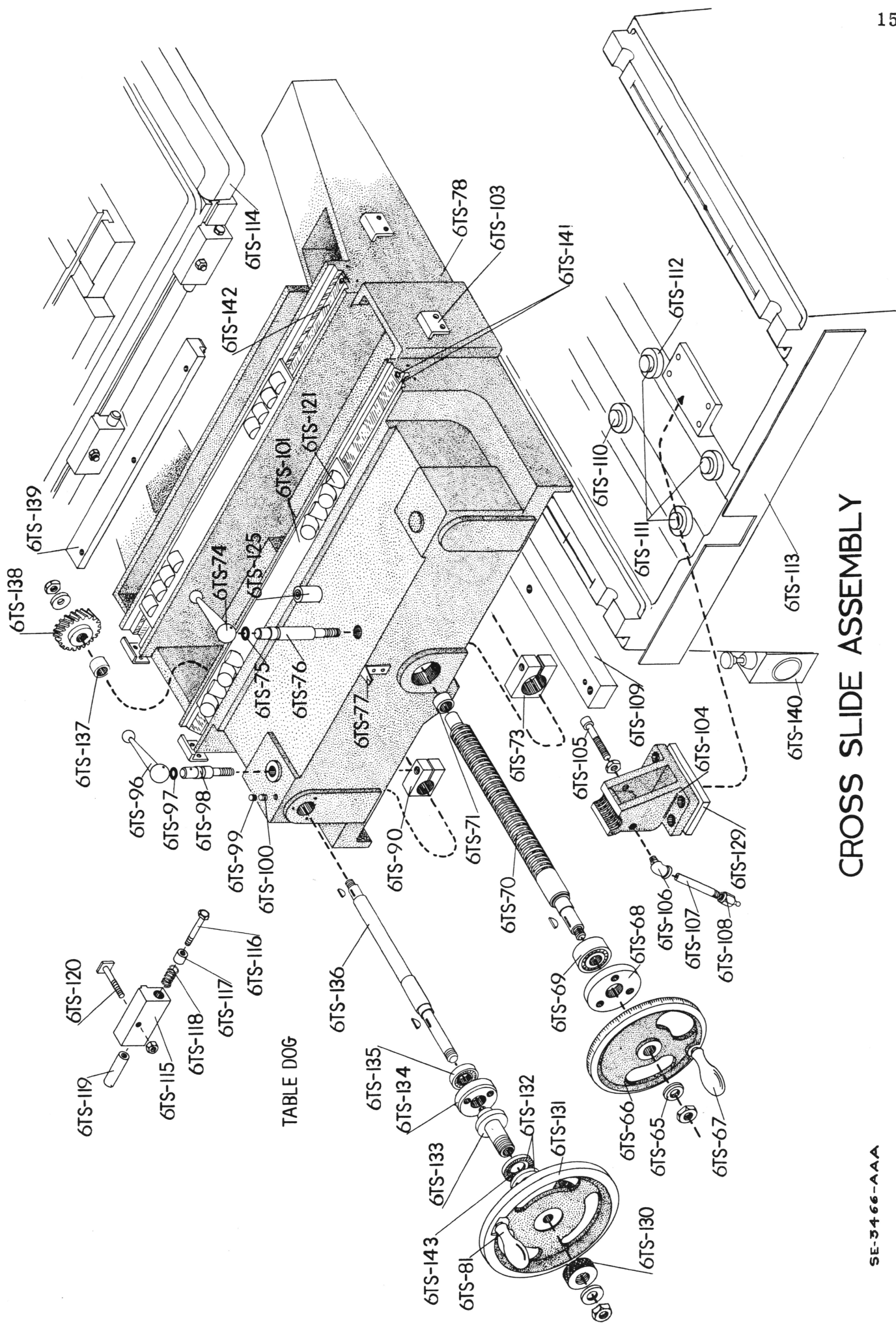
<u>Code Number</u>	<u>Part Name</u>
6TS-1 201493	Vertical Slide
2 201237	Ball Bearing Lock Nut (L.H.)
3 221151	Ball Bearing Cap
4 600628	Ball Bearing (2)
5	Ball Bearing Spacer (2)*
6	Ball Bearing Spacer (2)*
7 600628	Ball Bearing (2)
8 237473	Cartridge
9 237483	Spindle
10 221151	End Cap
20 220944	Spindle Housing
21 220937	Wheel Guard
22	Wheel Collet
23	Wheel
24	Flange Washer
25	Wheel Collet Nut
26	Adaptor Nut
27	Ball Bearing Lock Nut
28 226645	Spindle Sheave
29	Motor Sheave
126	Belt

*Supplied in pairs

Note: Where more than one of a part is required,
the number is given in parenthesis.

VERTICAL SLIDE FEED MECHANISM

<u>Code Number</u>	<u>Part Name</u>
6TS-30	203232 Knob
31	604520 Torrington N. B. (2)
32	213408 Handwheel
33	163799 #3 Plain Machine Handle
34	203224 Spacer
35	203225 Pinion
36	203234 Stationary Gear
37	604001 Nut
38	604021 Washer
39	600123 Ball Bearing
40	203226 Ball Bearing Spacer
41	211418 Horizontal Shaft
42	209573 Guard
43	211420 Wheel Feed Housing
44	600121 Ball Bearing
45	211413 Miter Gear (Driver)
46	203277 Cover
47	Check Nut
48	S-855 Washer
49	211414 Miter Gear (Driven)
50	211416 Bearing Cap
51	600366 Ball Bearing
52	211419 Vertical Feed Screw
53	220026 Elevating Nut
54	"O" Ring
55	Pin
56	Washer
57	Bolt
58	216597 Vertical Slide Guard
59	203235 Pointer



CROSS SLIDE ASSEMBLY

Cross Slide Assembly

<u>Code No.</u>	<u>Part Name</u>	<u>Code No.</u>	<u>Part Name</u>
S-3082	6TS-65 Washer	6TS-109	Center Guide Bar 203305
203271	66 Handwheel	110	Stud 220461
163799	67 #3 Plain Machine Handle	111	Eccentric Stud (3) 220460
203273	68 Ball Bearing Cap	112	Ball Bearing (4) 600127
600357	69 Ball Bearing	113	Front Way Guard 222037
223109	70 Cross-feed Screw	114	Table 224484
604523	71 Torrington N. B.	115	Cushion Block (2) 208837
204968	73 Cross Slide Friction Brg.	116	H. H. Cap Screw 612110
855757	Clamp Lever	117	Plug (2) 208829
615377	75 "O" Ring	118	Spring (2) 616143
211044	76 Clamp Screw	119	Cushion Plunger (2) 208838
203357	Pointer	120	Tee Bolt (2)
224483	78 Cross Slide	121	Roller (16) 203314
163799	81 #3 Plain Machine Handle	125	Stop Block 208840
224344	90 Table Friction Bearing	130	Knob 223237
85575	96 Clamp Lever	131	Hand Wheel 226851
615377	97 "O" Ring	132	Serrated Washer (2) 223236
212667	98 Clamp Screw	133	Sleeve 223235
99	Rd. Pt. Set Screw	134	Bearing Cap
611205	100 Dog Pt. Set Screw	135	Ball Bearing
203308	101 Roll Separator	136	Shaft 224285
218623	104 Half Nut	137	Needle Bearing
105	3/8 x 2 1/2 Soc. Hd. Cap.	138	Gear 223233
106	Scr. and 3/8 Std. Hex. Nut	139	Table Rack 224494
107	St. Elbow	140	Lubricator
108	Pipe Nipple	141	Vee Way Strip (4) 224277 + 224278
	Alemite Hyd. Lub. Fitting	142	Flat Way Strip (2) 224276 + 224275
	1/8 Pipe Thd. Female	143	Roll Pin (2)

FLAT WAY ROLL SEPARATOR
203306