NORTON

6 x 12" TYPE TS

HAND SURFACE GRINDER

Instruction and Parts Manual
No. 1524-1

These instructions were correct at the time of preparation. However, since it is NORTON COMPANY policy to improve its machines constantly, those built at later dates may differ from these details.

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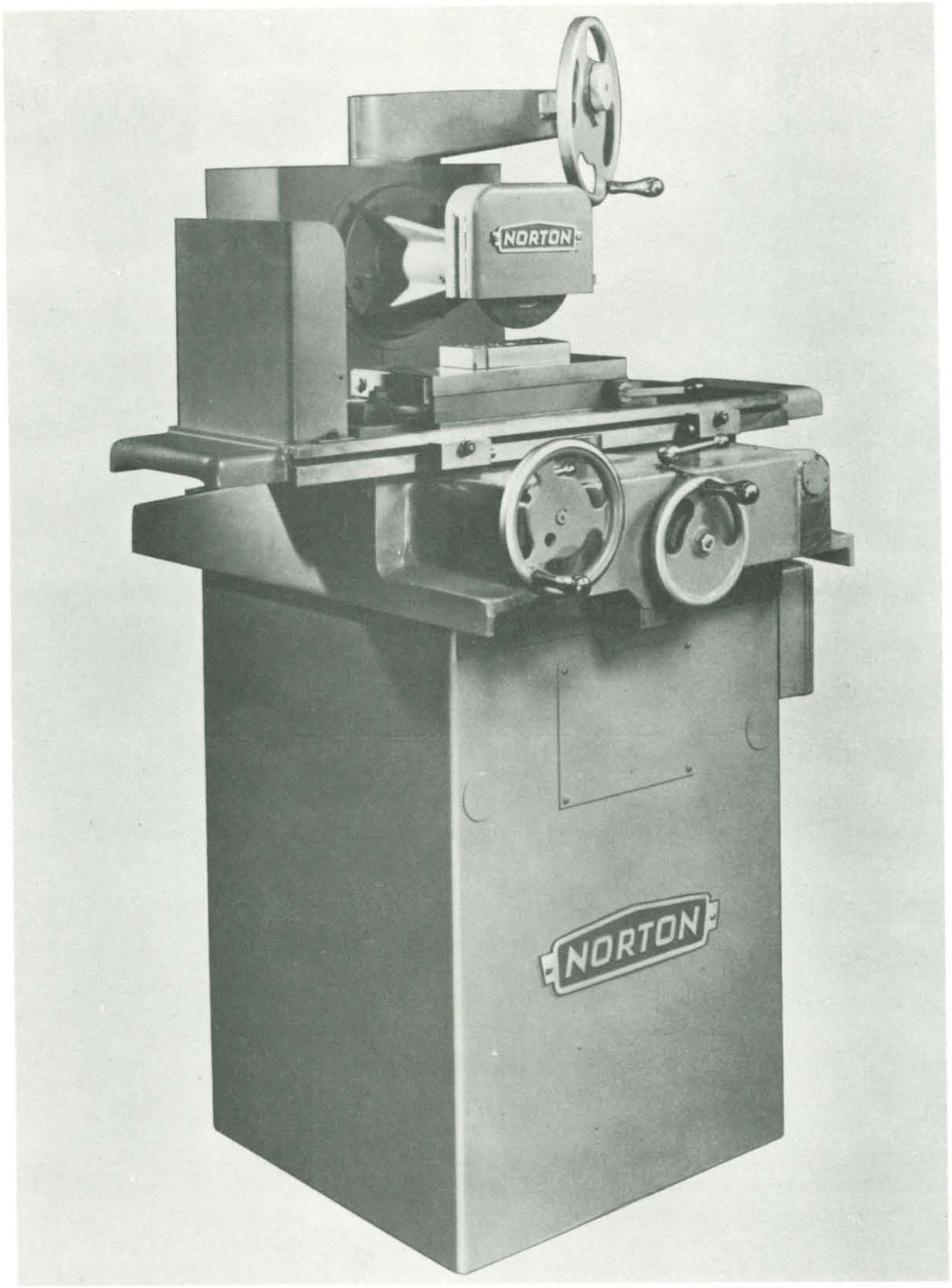
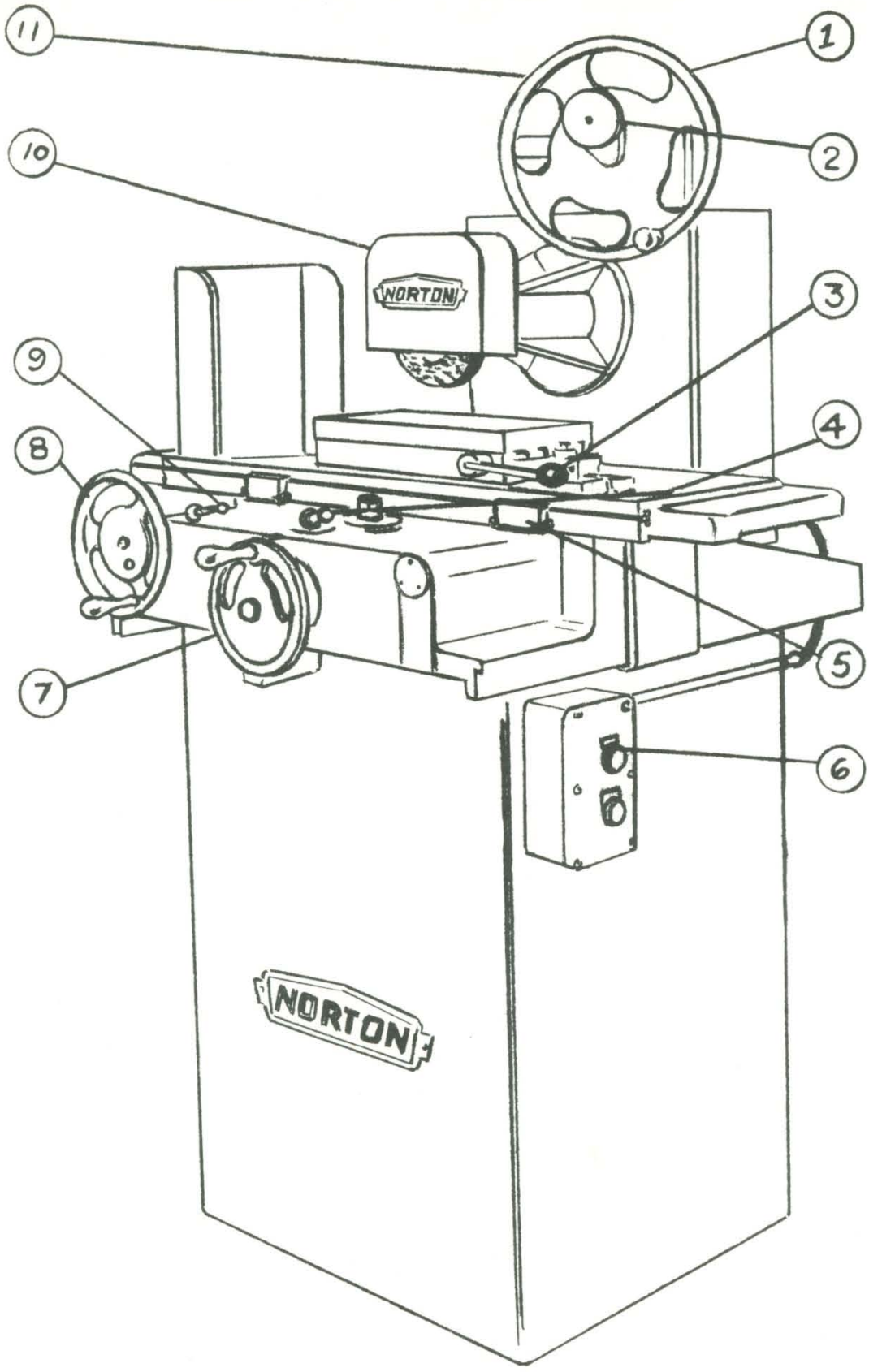


N8793-A

NORTON 6 x 12" Type TS Hand Surface Grinder

(with electrical equipment to NMTBA Standards, at extra cost)



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 HAND SURFACE GRINDER

On Receipt of Machine

Your 6 x 12" Type TS 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, 300 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 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.

Assembly of Components

For safety in shipment, certain components have been removed from the machine. Normally, these include the table, (#6TS-114 in Cross Slide Assembly drawing SE-3466-A), the cross slide (6TS-78), all roller elements (#6TS-121), roll separators (#6TS-102 (3) and 101), and the magnetic chuck, if purchased.

In discussing assembly of the separately shipped components and the special measures that must be taken, reference will continue to be made to Cross Slide Assembly drawing SE-3466-A. Unless otherwise specified, refer to this whenever #6TS- part numbers are mentioned.

Mounting the Cross Slide

Before attempting to mount the cross slide, install the rollers #6TS-121 and separators #6TS-102 and 101 in the two cross slide ways as shown in the drawing. Then remove the rectangular sheet metal plate that is above the NORTON nameplate on the front base. This is to permit access to the adjustments for eccentric studs #6TS-111 "A" and "B."

In preparation for shipment, eccentric studs "A" and "B" are turned to back-off the ball bearings #112 mounted on these studs, the cross slide #6TS-78 is lifted, and the rollers and separators are removed for separate packing (the rollers are shipped in plastic tubes).

Mounting the Cross Slide (contd.)

Note: In further reference to parts of the Cross Slide, the prefix 6TS will be omitted.

When the machine is in operation, the four ball bearings #112, run is snug contact with center guide bar #109 which is attached to the underside of the cross slide. As already mentioned, for lifting the cross slide and for its replacement on the machine, the "right-hand" bearings are backed off.

As the bearing at #110 is fixed (in a concentric stud) and because it is necessary to provide an accurate aligning means when the cross slide is put back on the machine, the setting of stud #110 - carefully made at the factory - is not disturbed. This stud SHOULD NOT BE TOUCHED WHEN THE MACHINE IS RECEIVED. The only exception to this is when actual operation strongly indicates that this setting has somehow been changed in shipment.

Therefore, the settings of these "left-hand" bearings as received, should provide an accurate means of aligning the cross slide when it is put back on the machine. To do this, lower the slide carefully, while turning the handwheel #66 to assure proper mating of cross-feed screw #70 with half nut #104.

Before permitting the slide to rest fully on the rollers, push it slightly to the left so that center guide bar #109 comes into firm contact with the "left-hand" bearings. Then lower it onto the rollers. This should establish accurate positioning, and when established, bring the eccentrically mounted "right-hand" bearings into contact with the guide bar.

To do this, feel through the area opened by removal of the sheet metal plate, and it will be found that the "right-hand" studs are held by check nuts. Put a 5/16" Allen wrench into the bottom of the stud, hold it while backing off the check nut, then move the Allen wrench either way. This will bring the bearing into contact with the guide bar. When both of the "right-hand" bearings are in snug contact with the guide bar, and cross slide movement is firm but free, lock with the check nuts.

Installing the Sliding Table

Before putting the sliding table #114 on the machine, set the separators on the cross slide ways and put in the rollers. The Cross Slide Assembly drawing shows how the rollers in the vee way should be arranged. Use the separator with the oval holes for the vee way. The separator for the flat way has rectangular holes.

Installing the Sliding Table (Contd.)

Table drive cables #94 and 95 must now be arranged so that they will be accessible when the table is put on. First, make sure that each cable has two winds around pulley #92. If the cables have slipped off during shipment, they are easily rewound. The middle groove in the pulley remains open. When each cable is properly wound around the pulley, attach a vise-grip pliers or something to each cable to serve as a weight. With this done, drop cable #94 over the left end of the cross slide, and #95 over the right end, so that these will hang outside when the table is set on.

Now put the table in place, and attach the cables to the lugs at the ends of the table. It will be seen that the means of cable adjustment is by the bolt that attaches cable #95 to the table. This bolt is shown outside part #114.

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 hand wheel 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.

Note:

Naturally, these suggestions as to frequency of lubrication are general. In heavy machine usage, it may be found desirable to shorten lubricating intervals. Where only occasional use of the machine is made, it may be found desirable to lengthen these intervals.

The important point is that lubrication must be adequate for the particular conditions of service, if unnecessary wear and expense are to be avoided.

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.

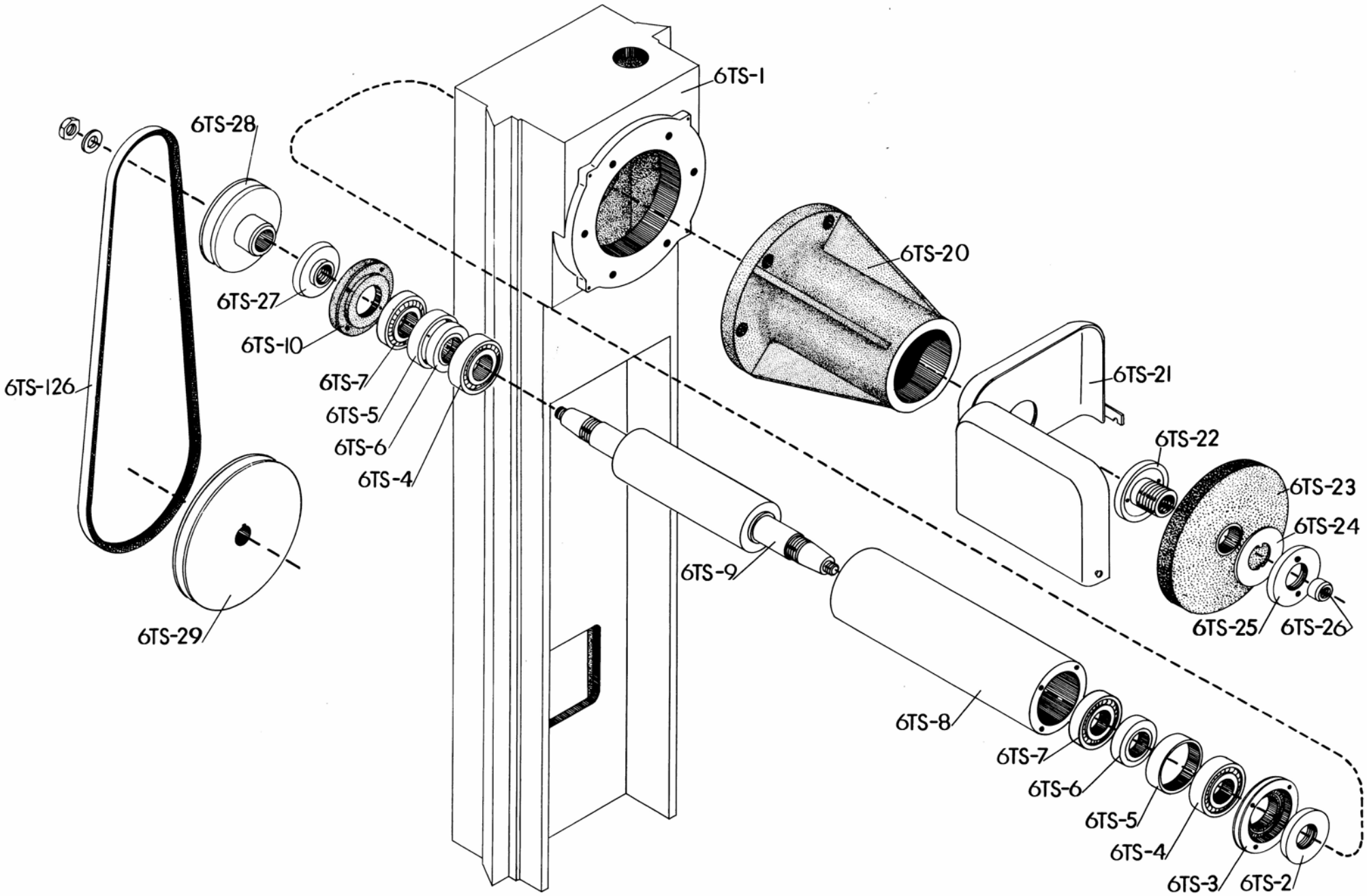
Relocating Table Drive Mechanism

Provision has been made in the design of the TS Hand Surface Grinder, for changing the table drive mechanism from the left hand to the right hand side of the machine.

If it becomes desirable to make this change-over to suit the convenience of the Operator or for any other reason, a review of the Cross Slide Assembly drawing will indicate what is involved, and will assist otherwise in making the change. It will be seen in this drawing that the necessary holes already exist, and that additional machining will not be required.

In making this change, the table must be lifted. Then pulley #92 must be disengaged, and all parts along the #88, 87, 85, etc. line, withdrawn from the machine. Table brake parts #96 and 98, etc. must also be taken out. These are then reassembled in the order shown by the "exploded" views, in their respective holes on the right hand side which are normally covered by parts #122 and 123.

Pulley #92 is then turned 180 degrees, attached to shaft #85 which has been run through the machine, and the cables attached to the lugs at the ends of the table.



WHEEL SPINDLE

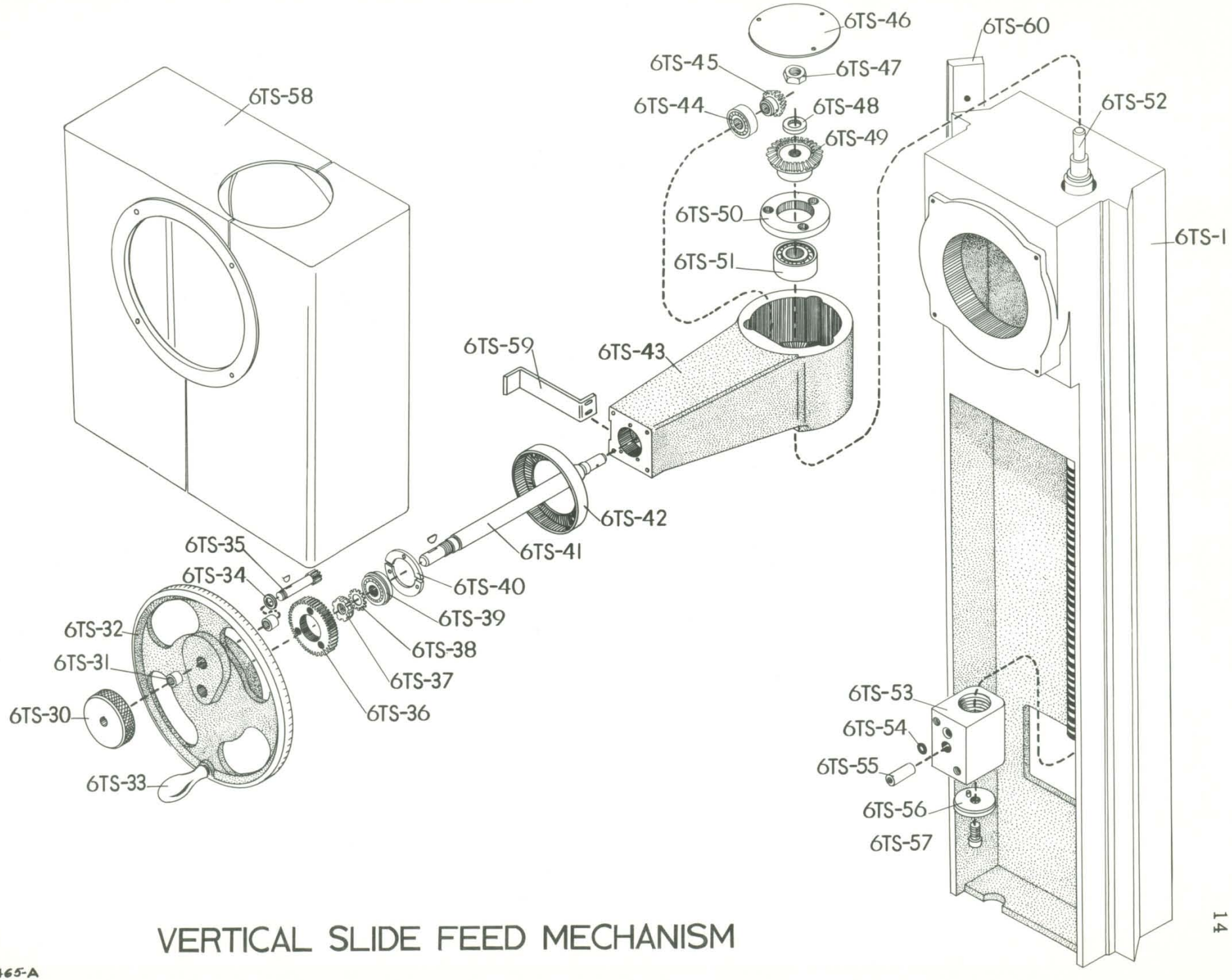
SE-3464-A-R

WHEEL SPINDLE

Code Number	Part Name
6TS-1	Vertical Slide
2	Ball Bearing Lock Nut (L.H.)
3	Ball Bearing Cap
4	Ball Bearing (2)
5	Ball Bearing Spacer (2)*
6	Ball Bearing Spacer (2)*
7	Ball Bearing (2)
8	Cartridge
9	Spindle
10	End Cap
20	Spindle Housing
21	Wheel Guard
22	Wheel Collet
23	Wheel
24	Flange Washer
25	Wheel Collet Nut
26	Adaptor Nut
27	Ball Bearing Lock Nut
28	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.

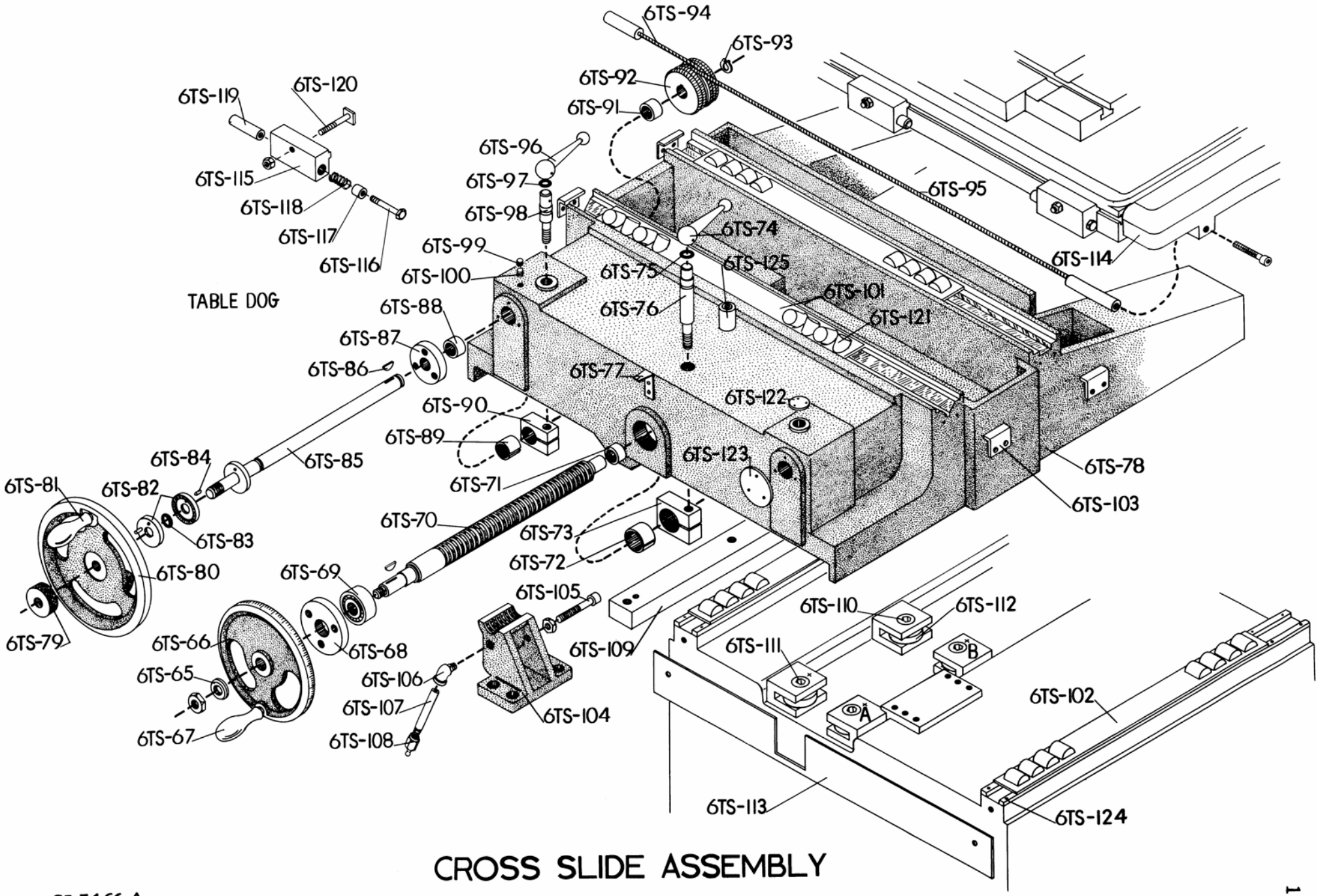


VERTICAL SLIDE FEED MECHANISM

SE-3465-A

VERTICAL SLIDE FEED MECHANISM

Code Number	Part Name
6TS-30	Knob
31	Torrington N. B. (2)
32	Handwheel
33	#3 Plain Machine Handle
34	Spacer
35	Pinion
36	Stationary Gear
37	Nut
38	Washer
39	Ball Bearing
40	Ball Bearing Spacer
41	Horizontal Shaft
42	Guard
43	Wheel Feed Housing
44	Ball Bearing
45	Miter Gear (Driver)
46	Cover
47	Check Nut
48	Washer
49	Miter Gear (Driven)
50	Bearing Cap
51	Ball Bearing
52	Vertical Feed Screw
53	Elevating Nut
54	"O" Ring
55	Pin
56	Washer
57	Bolt
58	Vertical Slide Guard
59	Pointer



CROSS SLIDE ASSEMBLY

SE-3466-A

Cross Slide Assembly

Code No.	Part Name	Code No.	Part Name
6TS-65	Washer	6TS-96	Clamp Lever
66	Handwheel	97	"O" Ring
67	#3 Plain Machine Handle	98	Clamp Screw
68	Ball Bearing Cap	99	Rd. Pt. Set Screw
69	Ball Bearing	100	Dog Pt. Set Screw
70	Cross-feed Screw	101	Roll Separator
71	Torrington N. B.	102	Roll Separator
72	Brz. Brg.	103	Roller Cage Stop (4)
73	Cross Slide Friction Brg.	104	Half Nut
74	Clamp Lever	105	3/8 x 2½ Soc. Hd. Cap. Scr. and 3/8 Std. Hex. Nut
75	"O" Ring		
76	Clamp Screw	106	St. Elbow
77	Pointer	107	Pipe Nipple
78	Cross Slide	108	Alemite Hyd. Lub. Fitting 1/8 Pipe Thd. Female
79	Screw Nut		
80	Handwheel	109	Center Guide Bar
81	#3 Plain Machine Handle	110	Stud
82	Serrated Washer (2)	111	Eccentric Stud (3)
83	"O" Ring	112	Ball Bearing (4)
84	Roll Pin (2)	113	Front Way Guard
85	Shaft	114	Table
86	Key (2)	115	Cushion Block (2)
87	Cap	116	H. H. Cap Screw
88	Torrington N. B.	117	Plug (2)
89	Bronz Brg.	118	Spring (2)
90	Table Friction Bearing	119	Cushion Plunger (2)
91	Torrington N. B.	120	Tee Bolt (2)
92	Pulley	121	Roller (16)
93	Tru Arc Ring	122	Cover
94	Cable Assem. Short	123	Cover
95	Cable Assem. Long	124	Roll Guide (4)
		125	Stop Block

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