



**ROCKWELL**  
MANUFACTURING COMPANY  
PITTSBURGH 8, PENNSYLVANIA



4-15-60

PM-1628

## No. 24-105 TOOLMAKER SURFACE GRINDER

### Operating and Maintenance Instructions

Machine should be carefully uncrated and cleaned of all packing grease. In case there is no crane for handling available, the machine should be laid on the belt guard side with proper blocking under the side of the base casting to prevent breakage of the weaker castings.

**Special care should be taken not to lift the machine by either the table or cross slide.**

Before mounting the grinder on the legs, be sure that mounting surfaces are cleaned of grit or paint. Bolt legs to base of grinder. Be sure to draw the screws up tightly to insure rigidity of entire unit. After machine is in position, be sure that it rests firmly on all four points of legs and that it is leveled up in this position.

#### GENERAL INSTRUCTIONS

This machine has been carefully assembled at the factory and thoroughly checked for accuracy and ease of operation. The spindle has been "run-in" and the table top ground by a wheel that has been dressed on the machine. The column flange and base are arranged with corresponding marks to indicate when spindle is square with table ways.

It is therefore not necessary to readjust such points as table gibs, spindle bracket pivot and gibs, or the end play of spindle, unless they have been thrown out of adjustment in transit.

After the three hand wheels are assembled, motor and pulleys properly mounted and guarded, and spindle lubricated as specified on instruction plate, the machine should be ready for operation. Before starting the machine, oil all moving parts with machine oil; particular care should be taken that the oil cup on spindle housing is filled with high-grade spindle oil of viscosity 58 to 60, Saybolt at 100° F, such as Socony Vacuum Velocite "E", one-half pint of which is packed in carton with other parts (Cat. No. 24-812). For lubricating details see chart.

Before adjusting the lower slide, be sure that gib lock screw is released.

Check that wheel turns in direction shown by arrow on wheel guard.

#### COLUMN AND SPINDLE BRACKET

The column is fitted into and pivots about a bored hole in the base. The base and the column flange are marked to show position where spindle is square with table ways. To swivel column it is only necessary to

release nut at top. Be sure that this nut is drawn down tightly when machine is in operation. The split column slide should be adjusted so it is free from any looseness. This can easily be done by properly adjusting and locking in position the lower lock bolt and the headless set screw. The Acme screw and handwheel are intended for fast or major adjustment, after which the slide is locked by tightening handle on upper stud. Fine adjustment is made by means of the hand knob above the spindle. This knob is arranged with an adjustable collar that is graduated so that each division is equal to .0005 wheel adjustment. The full range of this fine adjustment screw is about  $\frac{3}{8}$ " and must be "backed up" when limit has been reached. The motor and spindle bracket is attached to the slide by two heavy pivot screws extending into machined centers in the slide to permit pivoting of the spindle bracket and to eliminate all end play. To remove bracket, merely release these screws. When machine is in operation these screws should be tightly pressed into position.

#### ADJUSTING PIVOT SCREWS

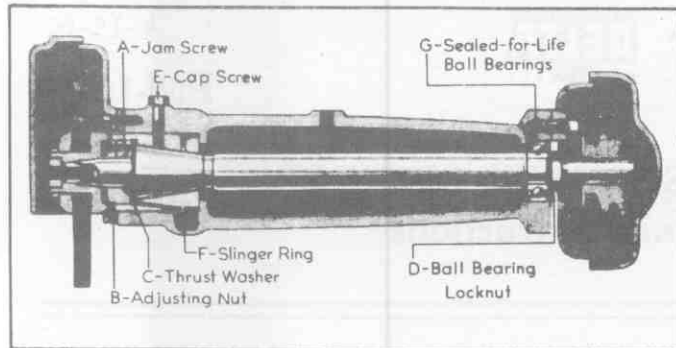
**IMPORTANT:** Before the grinder is placed in service, be sure the pivot screws are adjusted so that there is no play between the SCG-5 Spindle Housing and Motor Bracket Casting and the SCG-10 Bracket Casting that slides up and down on the column. This adjustment is made at the factory, but should be checked because of the possibility of rough handling in transit.

"Play" is removed by tightening the front concentric cone point pivot screw SCG-34, after loosening the SP-1266  $\frac{1}{2}$ "-13 jam nut. The rear eccentric cone point pivot screw SCG-90 should not be disturbed, as this would throw the spindle out of parallel with the surface of the longitudinal slide SCG-3.

The spindle can be adjusted in a vertical plane by turning the rear eccentric pivot screw, always less than 360 degrees. *This is done to purposely tilt the grinding wheel slightly for wheel clearance when grinding a vertical plane surface*, or to adjust the spindle to make it parallel with the table surface, as it should be for normal grinding.

After adjusting the spindle in a vertical plane, always lock the jam nut first on the rear eccentric pivot screw and then remove all play by adjusting and locking the front pivot screw.

## SPINDLE



The spindle is precision ground and balanced. It runs in a high grade tapered bearing, and is lubricated by means of an oil slinger ring. The oil level should be maintained at all times with type of oil specified on instruction plate. The rear bearing consists of a totally enclosed sealed-for-life precision ball bearing. In order to get a high-grade finish, the spindle must first be considered. The spindle must have the proper oil and must be seated correctly in its bearing. In case the spindle has too much END PLAY, this play can be readily taken up by releasing jam screw "A" and by advancing nut "B". This nut must be taken up with great care and must not be wedged too tight against the front face of spindle, otherwise spindle will be locked in its taper bearing. After adjustment is made, spindle should move freely. Be sure to lock jam screw "A" after taking up end play of spindle. If precision spindle bearing must be removed, follow instructions given on plate.

## TABLE UNIT

The last operation on the machine when leaving factory is grinding top of table. This gives us the assurance that the table is square and that the spindle is properly adjusted. The lower slide is arranged with four wicks which can be re-oiled by removing table. Two side feed wick oil cups are connected to reservoir and wicks to lubricate the table ways are conveniently located on the outside of table, all wicks should be removed, cleaned and re-saturated frequently.

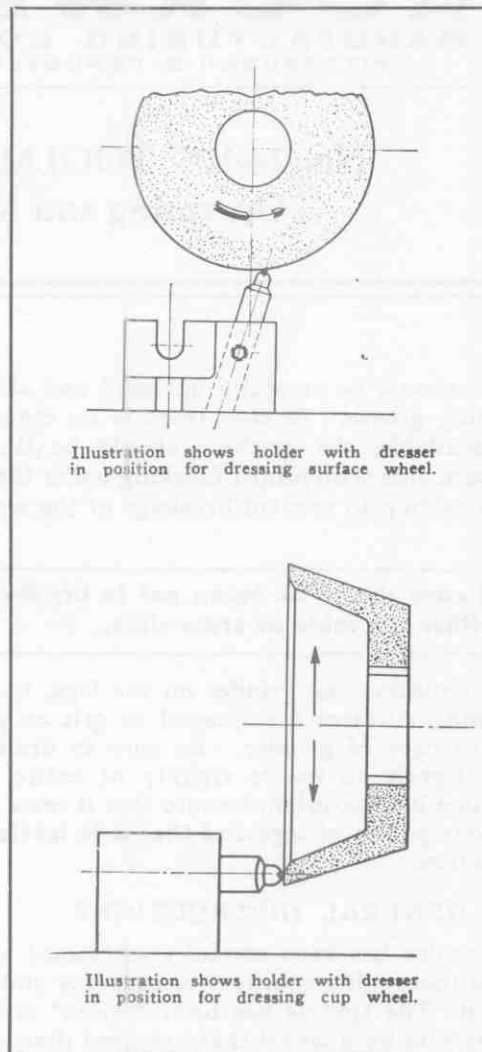
The table and cross slide are lubricated at the factory with high grade light oil.

The spindle oil (catalog No. 24-812) included with machine is also a good oil for the table, but if not available, use SAE No. 10.

The table should also be removed once a week or oftener and the sliding surfaces, also rack and gear, cleaned of gummy oil and abrasive grit. To remove the table, it is merely necessary to remove the stop screw holder and slide table off either side of the machine. Care should be taken that gib is not disturbed. All play can be eliminated by tightening up the gib screws. One revolution of the cross adjustment handwheel moves the slide .100 inch, and each division on dial equals .001 inch movement.

The table is suitable for mounting 5 x 10 inch rectangular magnetic chucks, but these chucks are not supplied by Delta.

## WHEEL DRESSER HOLDER



The wheel dresser holder is made so it can be used for dressing surface wheels and also cup wheels when necessary. When used for surface wheels the table should be locked by bringing both stop collars against the stop screw, and moving the lower slide. When dressing cup wheels, the table should be locked and dresser adjusted into the wheel by moving lower slide until dresser contacts wheel. The wheel is then fed across dresser by means of micro-screw. Particular care should be taken to place the holder in proper position when dressing wheel. The proper position for wheel dresser is in front of the center line of wheel (see illustrations.)

## SURFACE WHEELS

**SAFETY FIRST:** Always place guard in position before starting up grinding wheel. Balanced wheels should always be specified. Always dress a wheel before grinding. We have standardized two types of abrasive wheels which are carried in stock, but in order to obtain the most efficiency from a wheel for production work, we suggest the customer contact the local representative of some reliable abrasive company in order to obtain the proper wheel for his purpose.

## CUP WHEELS

Although this machine is primarily a surface grinder, some limited work can be done on it with cup wheels. Three and one-half inch diameter cup wheels can be used with guard in place. Any other wheel can be used, but front guard must be swung out of position or taken off completely.

**CAUTION:** Do not run wheels faster than recommended speed shown on the wheel.

2 spindle speeds are available,

For 60 cycle, 1725 rpm motor, 3200 and 4200.

For 50 cycle, 1425 rpm motor, 2700 and 3500.

## WHEEL ADAPTERS

The wheel adapters are fitted to a tapered end on the spindle. The wheels can be removed directly with the adapter in position, but many operators will find them useful in removing the adapter with the wheel in place, so that a centered or dressed wheel can be re-fitted to the spindle without resetting or dressing. This is especially useful where diamond wheels are used. When removing the adapter from the spindle, merely loosen the small spindle nut a few turns so it extends beyond the spindle end, and gently tap the nut with a babbitt hammer or other soft material until adapter is free from the taper. Do not try to pry the adapter loose, and take care that taper surfaces are not nicked or dented.

## MOTORS

To insure the maximum efficiency of the Delta Surface Grinder, it is offered complete with a motor. The motor, motor pulley and spindle pulley are each independently dynamically balanced. In addition when the spindle is being "run in" and the table ground, the motor and motor pulley as a unit are balanced, and this unit is then shipped with that machine.

It is **IMPORTANT** therefore that the motor pulley and motor are not separated. If the motor or pulley requires replacement or repairing, **return both items to the factory** so they can again be balanced as a unit.

It is possible that other motors which are properly balanced might give satisfactory results, but because of the importance of good balance between all operating parts of this type machine, we do not recommend using other motors or pulleys and cannot be responsible for results obtained.

## TO GET A HIGH-GRADE FINISH

1. Operate grinder with a well balanced and properly dressed wheel only.
2. Use a good dynamically balanced motor.
3. Check spindle; it must run free and true and all end play must be eliminated.
4. Check, so that pivot screw and lock nut are drawn up tightly.
5. Be sure that upper column clamp is drawn up tightly when grinding.
6. Check up lower column slide clamp. This double lock arrangement is properly set at the time of shipment. Clamp should be adjusted so that it will have a tight sliding fit on column. The setting of this proper sliding fit should be accomplished by loosening up the upper clamp, also the column gib screws. Tighten the gib screws after proper adjustment has been made.
7. Always have nut on top of column drawn down tightly.
8. Check table, see that it is free from grit and other foreign substances.
9. Use proper wheel speed. See chart on belt guard.

## LUBRICATION CHART

Parts To Be Lubricated	Recommended Oil	Method of Filling	Period of Change
Spindle Taper Bearing .....	High Grade Spindle Oil of Viscosity 58 to 60 Saybolt at 100° F.	Oil Cup .....	Daily
Spindle Ball Bearing .....	Pre-Sealed .....	.....	.....
Table .....	SAE #10 { For Very Best Results Use Same Oil as Used for Spindle	Oil Cup .....	Daily
Cross Slide .....		4 Oil Wicks Remove Table .....	Every 30 Days
Cross Slide Screw .....	Alemite Cup Grease .....	Push Back Dust Cover	Every 30 Days
Cross Slide Screw Bearing ..	SAE #10 .....	Oil Cup .....	Daily
Pinion Shaft Bearing .....	Oilite Bushing, Pre-oiled ..	.....	.....
Pinion and Gear Rack .....	Alemite Grease .....	Clean and Grease .....	Every 30 Days
Vertical Screw and Nut ....	SAE #10 .....	Clean and Oil .....	Daily
Column .....	SAE #10 .....	Clean and Oil .....	Daily

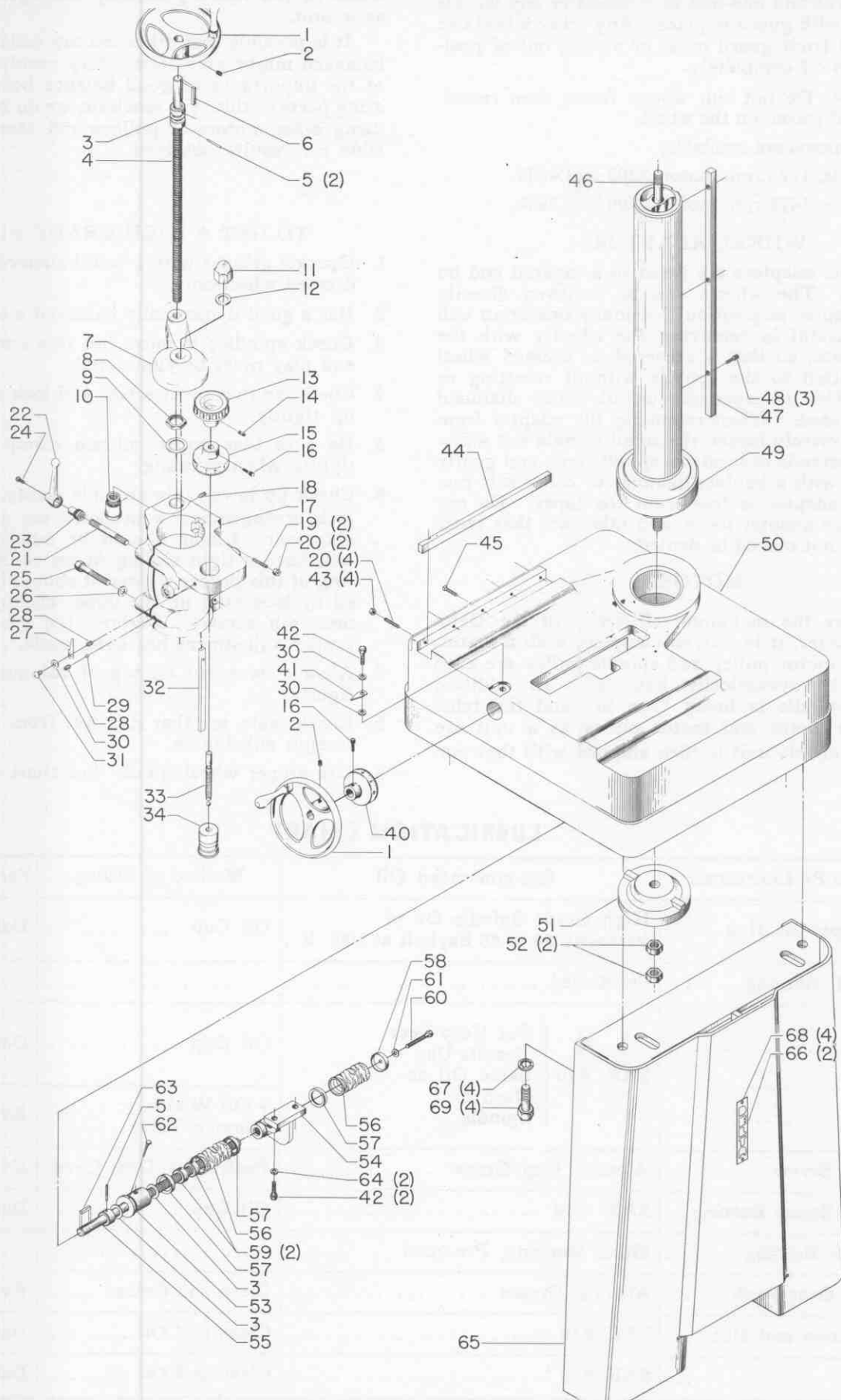


FIGURE 1



## Replacement Parts (Fig.1)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	LTA-420-S	Hand Wheel, Including:	41	TCS-225	Pointer
2	SP-201	5/16-18 x 5/16" Soc. Hd. Set Scr.	42	SP-649	5/16-18 x 1" Hex. Hd. Cap Scr.
3	H-11	Fiber Washer	43	SP-117	1/4-20 x 1 1/4" Headless Set Scr.
4	SCG-35-S	Raising Screw w/ Collar, Including:	44	SCG-29	Cross Slide Gib
5	SP-2420	#2 x 1 1/4" Taper Pin	45	SP-305	1/4-20 x 1" Sq. Hd. Set Screw
6	SP-2655	3/16 x 3/16 x 7/8" Key	46	SCG-14	Column Stud
7	SCG-12	Column Cap	47	SCG-22	Guide
8	TCS-217	Nut	48	SP-755	1/4-20 x 3/4" Hex. Soc. Cap Scr.
9	DDL-107	Steel Washer	49	SCG-4	Column
10	SCG-54	Raising Nut	50	SCG-1	Base
11	SCG-75	3/4"-10 Hex. Nut	51	SCG-11	Flange
12	DP-736	Steel Washer	52	SP-1008	3/4"-10 Hex. Jam Nut
13	SCG-38	Hand Knob	*	SCG-18-S	Cross Feed Scr., Consisting of:
14	SP-104	1/4-20 x 1/2" Headless Set Scr.	3	H-11	Fiber Washer
15	SCG-17	Micrometer Dial	53	SCG-13	Bushing
16	DP-36	Knurled Head Set Screw	54	SCG-15	Bushing
17	SCG-10	Bracket	55	SCG-18-G	Cross Feed Scr. w/ Collar, Incl:
18	SP-213	5/16-18 x 1/2" Soc. Hd. Set Scr.	5	SP-2420	#2 x 1 1/4" Taper Pin
19	SP-109	1/4-20 x 1 1/2" Headless Set Scr.	56	SCG-82-S	Spring w/ Cover
20	SP-1034	1/4"-20 Hex. Nut	57	SCG-83	Cup Washer
21	SCG-27	Stud	58	SCG-84	Cup Washer
22	SR-217	Handle	59	SCG-89	Retainer
23	SR-218	Serrated Nut	60	SP-635	5/16-18 x 2" Hex. Hd. Cap Screw
24	SP-7528	1/4-20 x 1/2" Truss Hd. Screw	61	SP-1620	11/32 x 11/16 x 1/16" Std. Washer
25	SP-3109	1/2-13 x 2 1/2" Hex. Hd. Cap Scr.	62	SCG-74-S	Oiler
26	CBL-447	Steel Washer	63	SP-2650	3/16 x 3/16 x 1 3/8" Key
27	SCG-72	Pointer	64	SP-1703	5/16" Lockwasher
28	SP-231	5/16-18 x 3/8" Soc. Hd. Set Scr.	65	Cat. #50-399	Pair of Legs, Including:
29	SCG-88	Plug	66	DP-741	Nameplate
30	DDL-150	Steel Washer	67	SP-1753	3/4" Internal Teeth Lockwasher
31	SP-520	5/16-18 x 3/8" Rd. Hd. Machine Scr.	68	SP-2824	#4 x 3/16" Drive Screw
32	SCG-23	Gib	69	SP-5479	3/4-10 x 1 1/4" Hex. Hd. Cap Scr.
33	SCG-39-S	Micrometer Screw	*	Cat. #24-812	1/2 Pint Spindle Oil
34	SCG-37	Bushing	*	Cat. #25-857	Lamp Attachment
40	SCG-58	Micrometer Dial	*	Not Shown	

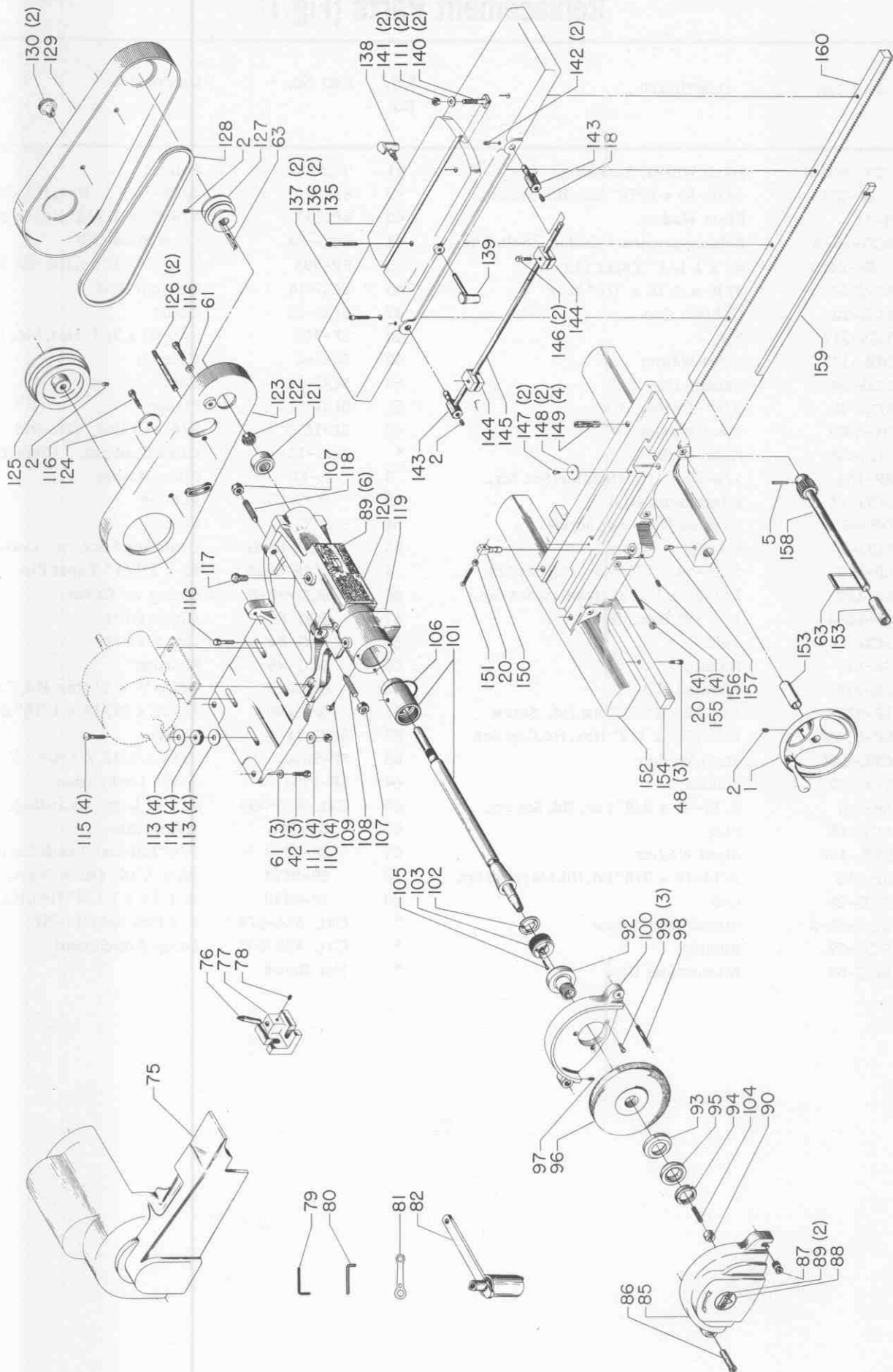


FIGURE 2

## Replacement Parts (Fig.2)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	LTA-420-S	Hand Wheel, Including:	115	SP-806	5/16-18 x 1 1/2" Carriage Bolt
2	SP-201	5/16-18 x 5/16" Soc.Hd.Set Scr.	116	SP-602	5/16-18 x 1 1/4" Hex.Hd.Cap Scr.
18	SP-213	5/16-18 x 1/2" Soc. Hd. Set Scr.	117	SCG-36	Micro Screw Button
20	SP-1034	1/4"-20 Hex. Nut	118	SCG-90	Eccentric Swivel Screw
42	SP-649	5/16-18 x 1" Hex. Hd. Cap Scr.	119	SCG-5	Motor Bracket
48	SP-755	1/4-20 x 3/4" Hex.Soc. Cap Scr.	120	SCG-71	Instruction Plate
61	SP-1620	11/32 x 11/16 x 1/16" Std. Washer	121	SP-5346	Bearing
63	SP-2650	3/16 x 3/16 x 1 3/8" Key	122	SCG-62	Bearing Nut
75	SCG-16	Motor Cover	123	SCG-6	Rear Belt Guard
76	Cat. #24-805	Diamond Wheel Dresser	124	DP-399	Steel Washer
77	SCG-67	Diamond Holder	125	SCG-80-S	Pulley, Including:
78	SP-208	1/4-20 x 1/4" Soc.Hd. Set Scr.	2	SP-201	5/16-18 x 5/16" Soc.Hd.Set Scr.
79	Cat. #194	5/32" Hex. Wrench	126	TCS-305	Stud
80	Cat. #1534	1/8" Hex. Wrench	127	SCG-79-S	Spindle Pulley, Including:
81	Cat. #1526	Double End Hex. Box Wrench	2	SP-201	5/16-18 x 5/16" Soc.Hd.Set Scr.
82	SCG-70-S	Wrench	128	Cat. #49-115	V-Belt
85	SCG-9	Front Wheel Guard	129	SCG-7	Belt Guard Cover
86	SCG-53	Swivel Pin	130	LBS-177	Hand Knob
87	LBS-130	Knurled Nut	** 135	SCG-3	Longitudinal Slide
88	CBL-486	Nameplate	136	SP-221	1/4-20 x 2 1/4" Soc. Hd. Cap Scr.
89	SP-2252	#2 x 3/16" Drive Screw	137	SP-760	1/4-20 x 1 1/4" Hex. Soc. Cap Scr.
90	SCG-51	Retainer	138	SP-2494	Oil Cup
92	Cat. #24-816	Wheel Adapter, Including:	139	SP-2495	Oil Cup
93	SCG-49	Flange	140	SCG-66	"T" Bolt
94	SCG-50	Retainer	141	SP-1207	3/8"-24 Hex. Nut
95	SCG-64	Flange	142	SP-206	5/16-18 x 5/16" Soc. Hd. Set Scr.
96	Cat. #24-807	Wheel for Soft Material	143	SCG-30	Stop Rod Holder
96	Cat. #24-808	Wheel for Hard Material	144	SCG-32	Stop Rod Block
97	SP-102	1/4-20 x 3/8" Headless Set Scr.	145	SCG-31	Stop Rod
98	SCG-24	Stud	146	SP-603	1/4-20 x 7/8" Hex. Hd. Cap Scr.
99	SP-715	1/4-20 x 1/2" Fil. Hd. Screw	147	SP-561	#10-32 x 3/8" Rd. Hd. Screw
100	SCG-8	Rear Wheel Guard	148	SCG-40	Washer
* 101	SCG-43-AR	Spindle & Bearing, Including:	149	VSL-6	Wick
102	SCG-45	Spacer	150	SCG-33	Center Stop
103	SCG-47	Retainer	151	SP-311	1/4-20 x 1 1/2" Sq. Hd. Set Scr.
104	SP-214	3/8-16 x 1 1/4" Soc. Hd. Set Scr.	** 152	SCG-2-X	Cross Slide, Including:
105	SP-759	#8-32 x 5/8" Hex. Soc. Cap Scr.	153	SCG-20	Bushing
106	SCG-44	Slinger Ring	154	SCG-28	Guide
107	SP-1266	1/2"-13 Hex. Jam Nut	155	SP-116	1/4-20 x 1 3/4" Headless Set Scr.
108	SCG-34	Swivel Screw	156	SP-106	5/16-18 x 1/2" Headless Set Scr.
109	SP-6255	Oiler	157	SP-2475	Oiler
110	SP-1300	5/16"-18 Hex. Nut	158	SCG-19-S	Shaft w/ Gear, Including:
111	SP-1605	3/8 x 7/8 x 1/16" Steel Washer	5	SP-2420	#2 x 1 1/4" Taper Pin
113	TCS-291	Special Washer	159	SCG-21-R	Gib
114	SCG-76	Felt Washer	160	SCG-25	Rack

\* Spindle and Spindle Bearing are not sold separately. They are run in at the factory and sold as a unit.

\*\* SCG-3 Longitudinal Slide and SCG-2-X Cross Slide are sold separately. However, if either one requires replacement due to excess wear, we suggest that both be replaced.