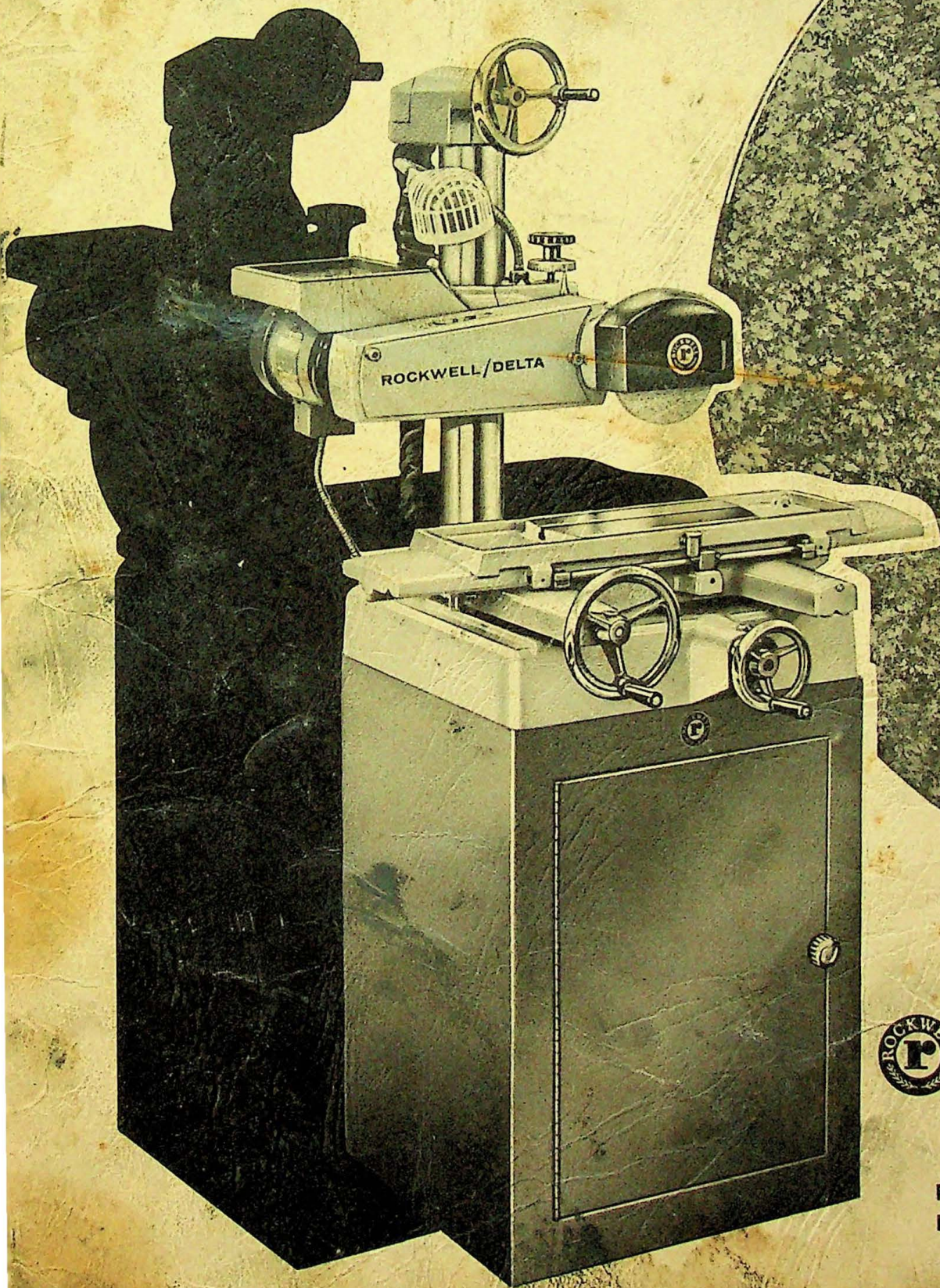


ROCKWELL/DELTA TOOLMAKER GRINDER



Rockwell
MANUFACTURING COMPANY

PM-408-01-651-5003
DATED 1M-11-15-65



Rockwell

MANUFACTURING COMPANY

The Rockwell Building • Pittsburgh, Pa.

PM- 408-01-651-5003

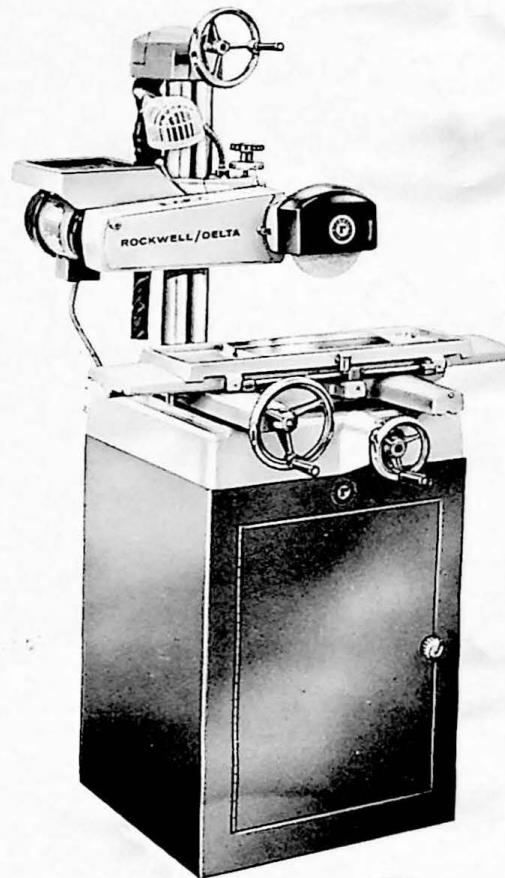
DATED IM-11-15-65

ROCKWELL/DELTA TOOLMAKER GRINDER

TOOLMAKER TOOL AND CUTTER GRINDING MACHINE

TOOLMAKER SURFACE GRINDING MACHINE

TOOLMAKER CHIP BREAKER GRINDING MACHINE



INTRODUCTION

The following instructions will give you an explanation of installation, operating controls, service adjustments, lubrication, and maintenance for the Toolmaker Surface Grinding Machine.

This manual, plus the Rockwell instruction manual covering the 24-822 Tool and Cutter Grinding Attachment will be sufficient for use with the Toolmaker Tool and Cutter Grinding Machine.

This manual, plus the Rockwell instruction manuals covering the 24-902 Univise and the 24-823 Coolant Attachment are sufficient for use with the Toolmaker Chip Breaker Grinding Machine.

It is of the utmost importance, therefore, that you review this entire manual before installing or operating your Toolmaker Grinder so that you may become thoroughly familiar with the adjustments and functions of its various components.

INSTALLATION

Selecting Floor Space — Vibration transmitted through inadequately constructed floors by adjacent machinery or other source can impair the accuracy of your machine. Therefore, it is of the utmost importance that the grinder be mounted to a solid, level foundation, preferably concrete.

Unless substantially constructed, a wood floor should be braced against sagging and transmission of vibration.

Refer to Fig. 1, for floor plan dimensions for your grinder.

CLEANING THE GRINDER

The ways and all other machined and unpainted surfaces of the grinder are protected with a coating of rust preventive. This coating may be removed with a soft cloth moistened with kerosene (do not use acetone, gasoline or lacquer thinner for this purpose.) After cleaning, cover all unpainted surfaces with a light film of good machine oil.

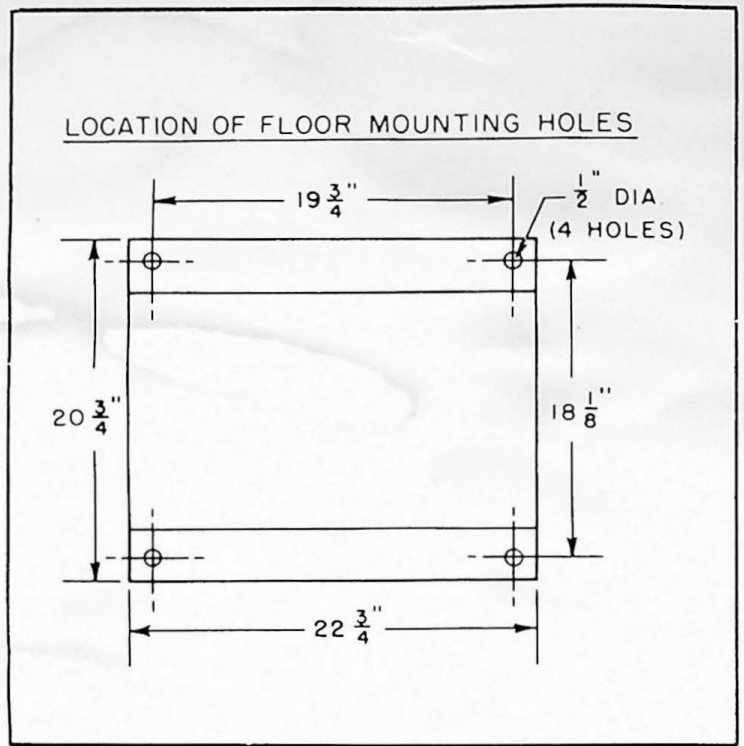


Fig. 1.

OPERATION AND CONTROLS

The following is an explanation of the operating controls of the Rockwell-Delta Toolmaker Grinder. An experienced operator knows that there is always some difference between the location and type of control between different models, even though the purpose of the controls is similar between one Grinder and another. The novice should study these explanations carefully before turning on the power, to avoid damage to the machine or injury to himself.

All operators will profit by a knowledge of how the controls operate, and how they are to be set for standard grinding operations.

NOMENCLATURE CHART

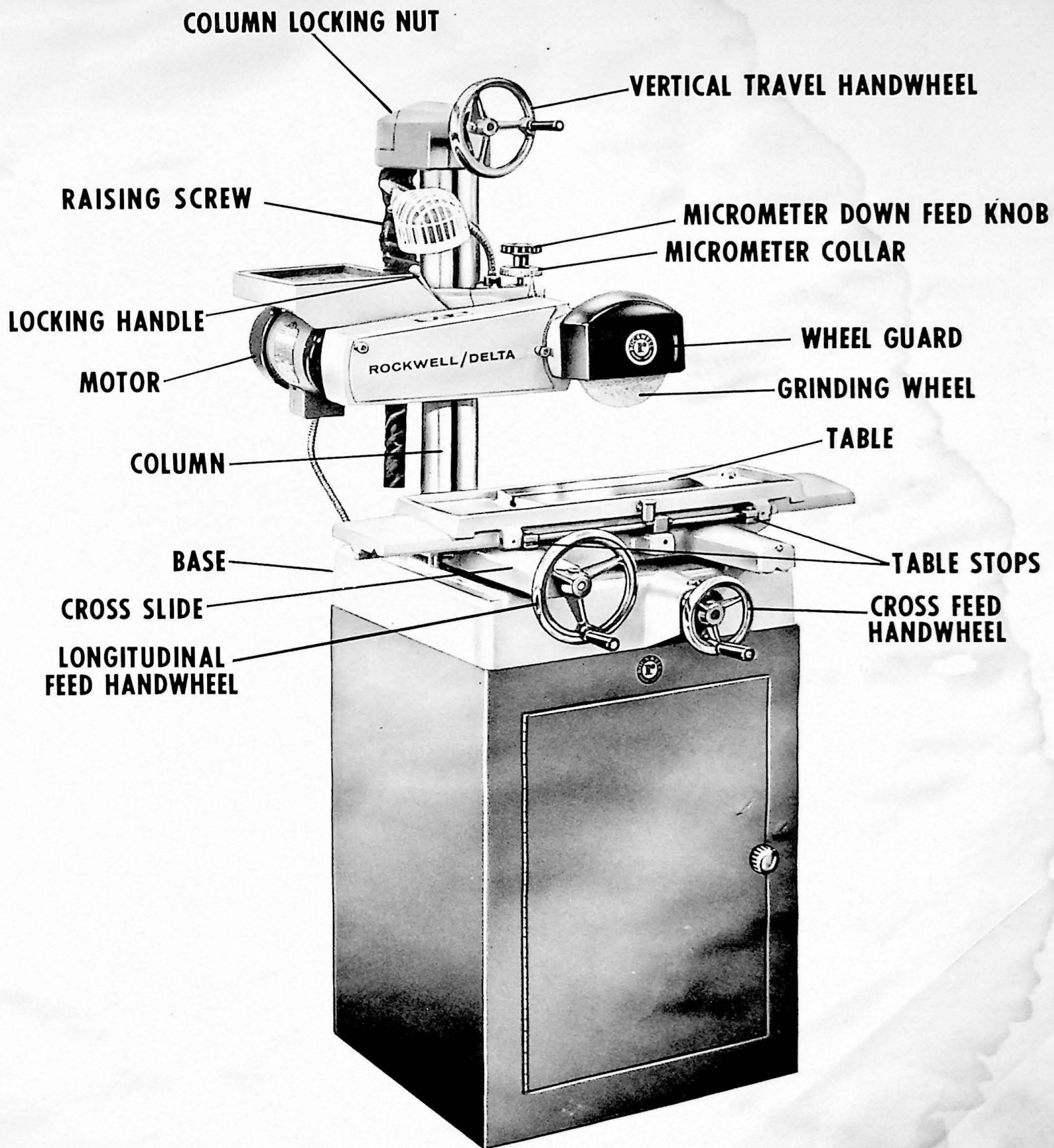


Fig. 2.

COLUMN AND HEAD CONTROLS

The heavy cast iron column is precision ground for accuracy and is capable of rotating through a full 360° , just by loosening the column locking nut at the top end of the column. Match marks are provided on the flange at the base of the column, and on the base, as shown in Fig. 3, to show the proper setting when it is desired to have the spindle square with the table ways. **BE SURE THAT THE COLUMN LOCKING NUT IS DRAWN DOWN TIGHTLY WHEN THE MACHINE IS IN OPERATION.** When doing tool and cutter grinding, it is customary to rotate the column two or three degrees away from the square setting in order to provide wheel clearance.

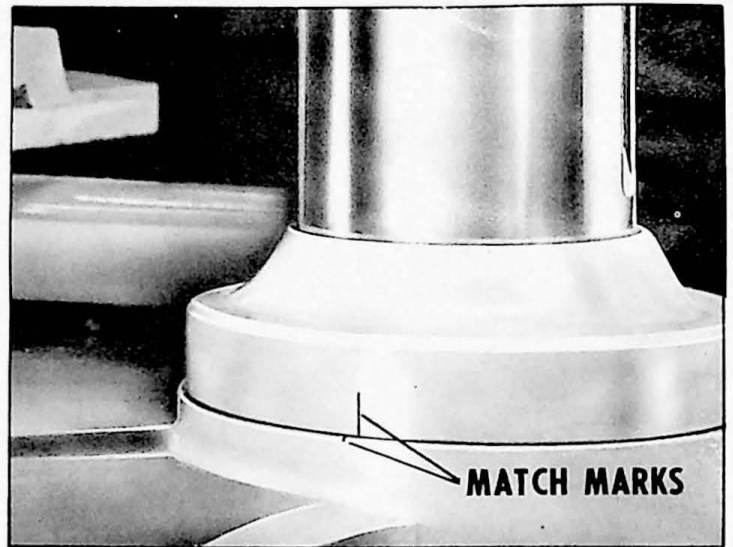


Fig. 3.



Fig. 4.

The micrometer collar on the down feed screw can be adjusted for slip action to provide a zero start e.g., the micrometer collar can be moved without moving the down feed settings. The micrometer collar can also be locked securely, to insure that it will not be moved accidentally. This adjustment is made by tightening or loosening the set screw (under which a nylon drag plug is provided) in the micrometer collar. The full vertical travel with the Micrometer Down Feed Knob is $5/8$ of an inch.

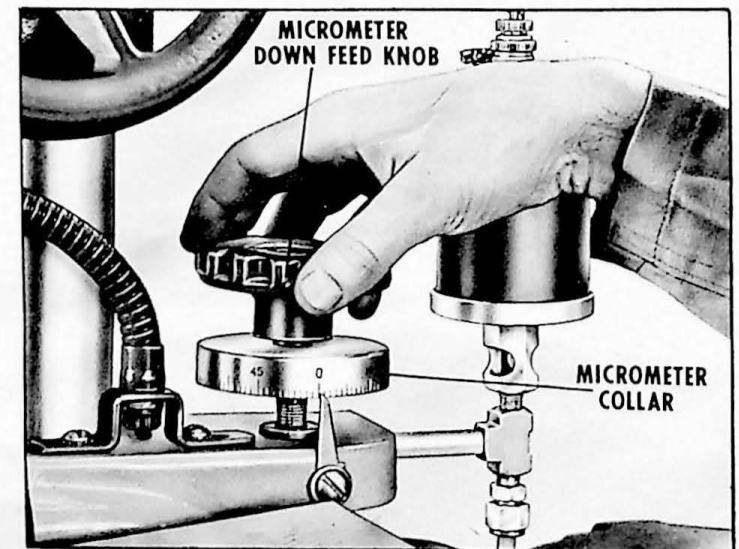


Fig. 5.

The spindle shown in Fig. 6, is precision ground and balanced and is mounted on preloaded precision ball bearings for extreme accuracy.

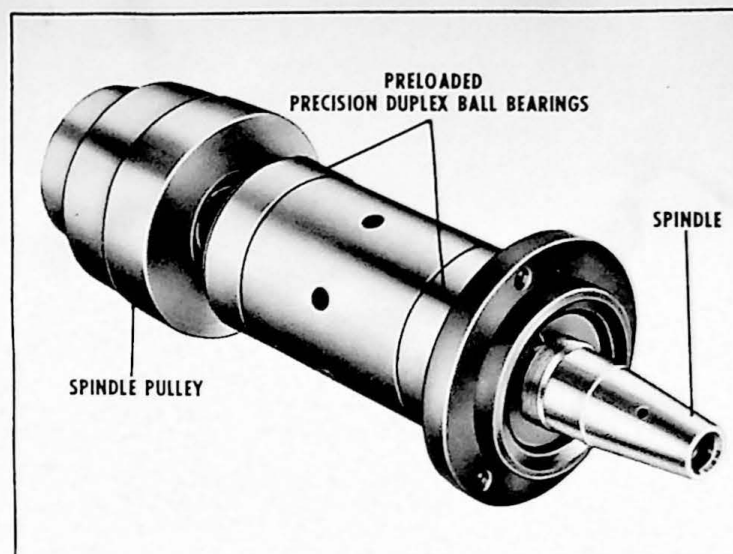


Fig. 6.

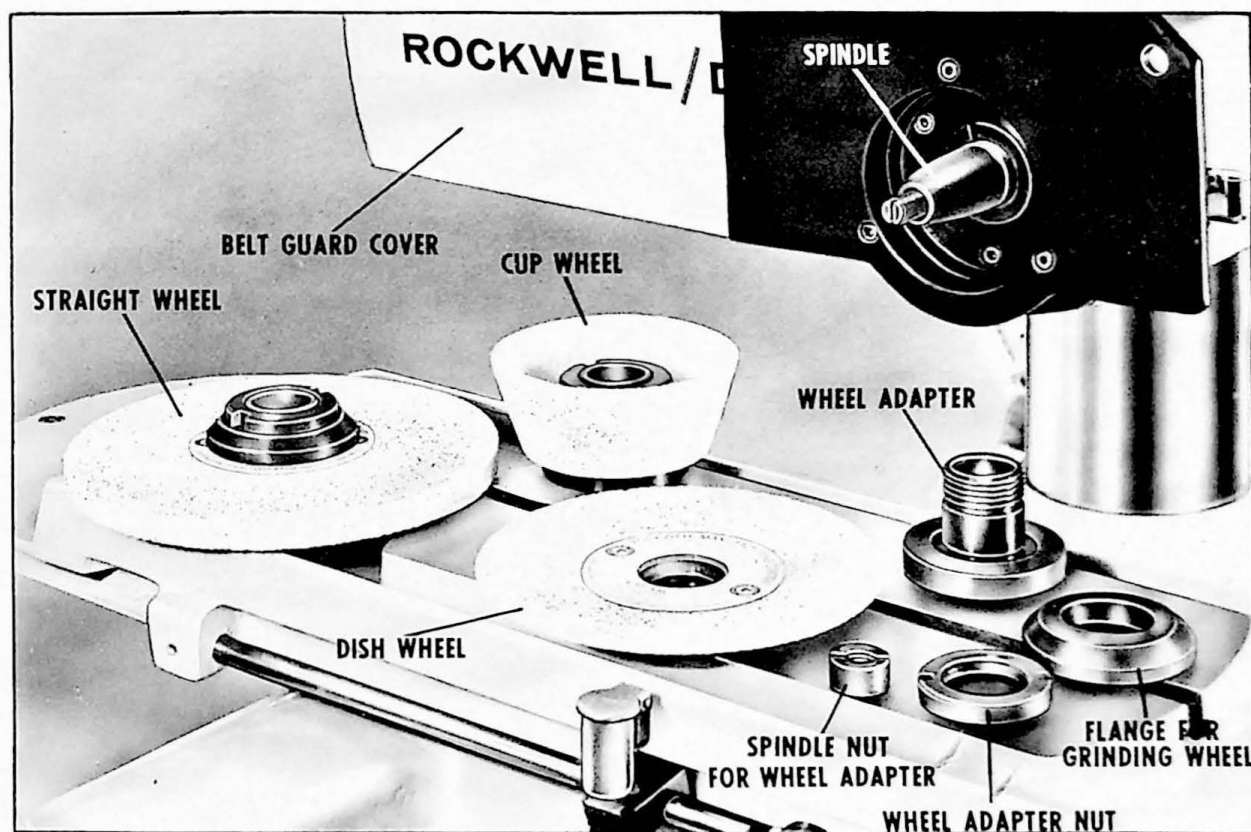


Fig. 7.

The wheel adapter, Fig. 7, is fitted to the tapered spindle nose. Both the spindle nut and wheel adapter nut, as shown in Fig. 7, have left hand threads.

Two flanges, one 2 15/32" O.D. and one 2 7/32" O.D., are provided with the wheel adapter but only one or the other is used depending upon the wheel being mounted. Use the larger flange, (2 15/32" O.D.) whenever possible, however, the smaller flange (2 7/32" O.D.) must be used for cup wheels which do not have enough room for the larger flange.

A wheel can be removed leaving the adapter in position, or it may be more satisfactory to remove the adapter and wheel together, so that a cen-

tered or dressed wheel can be re-fitted to the spindle without resetting or redressing. This is especially useful where diamond wheels are used.

When removing the adapter, shown in Fig. 7, from the spindle, use the special spanner wrench that comes with the unit, and merely loosen the small spindle nut a few turns so it extends beyond the spindle end; then gently, but sharply, tap the nut with a babbitt hammer or other soft material until the adapter is free from the taper. Do not try to pry the adapter loose, and take care that the tapered surfaces are not nicked or dented.

When changing wheels the wheel guard simply flips up out of the way.

TABLE AND CROSS SLIDE CONTROLS

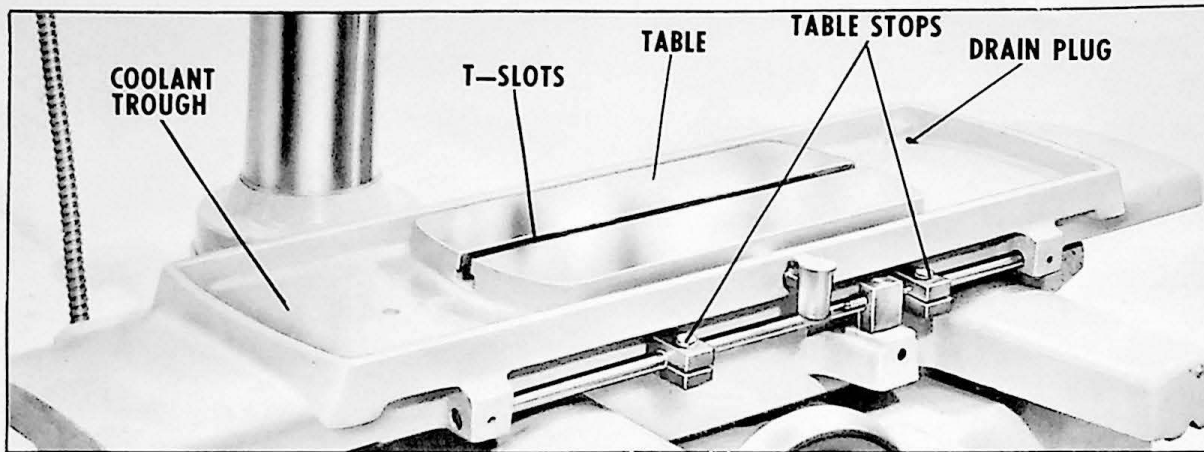


Fig. 8.

The Grinder grinds its own table, Fig. 8, after the final vibration check-run procedure at the factory. This assures that the table is true to the spindle.

The table surface finish so produced is held to a maximum roughness of 16 microinches. The surface area of the table is 5 3/4 x 13" and T-Slots are provided in the table to facilitate clamping of work and to permit easy mounting of work holding fixtures. The table is provided with a coolant trough Fig. 8, all the way around the table and a tapered drain plug.

The table has a 13 1/2" longitudinal travel by means of a rack and pinion, with adjustable table stops to restrict the travel in either direction. These table stops are not intended for use as a positive stop for the grinder table, nor are they used for surface grinding. The table stops are, however, recommended for use in tool and cutter grinding. The purpose of the stops in tool and cutter grinding is to remind the operator that the table has been moved lengthwise far enough to safely index to the next tooth on the cutter. **DO NOT HIT THE TABLE STOPS TOO HARD AT THE END OF TABLE TRAVEL.**

To locate the work in a definite relation with the grinding wheel, it is necessary to move the table longitudinally or transversely. Each of these movements is controlled by a handwheel which can be reached easily from the front of the machine.

Lengthwise or longitudinal movement of the table is accomplished by turning the longitudinal feed handwheel, Fig. 9.

Crosswise or transverse movement of the table is accomplished by turning the cross feed handwheel, Fig. 9, which is mounted on the end of the cross feed screw, and has an adjustable micrometer collar with accurate calibrations of .001". One revolution of the cross feed handwheel moves the slide .100 inch.

The micrometer collar on the cross feed screw can be adjusted for slip action to provide a zero start, e.g., the micrometer collar can be moved without moving the cross feed setting. The micrometer collar can also be locked securely, to insure that it will not be moved accidentally. This adjustment is made by tightening or by loosening the set screw (under which a nylon drag plug is provided) in the micrometer collar.

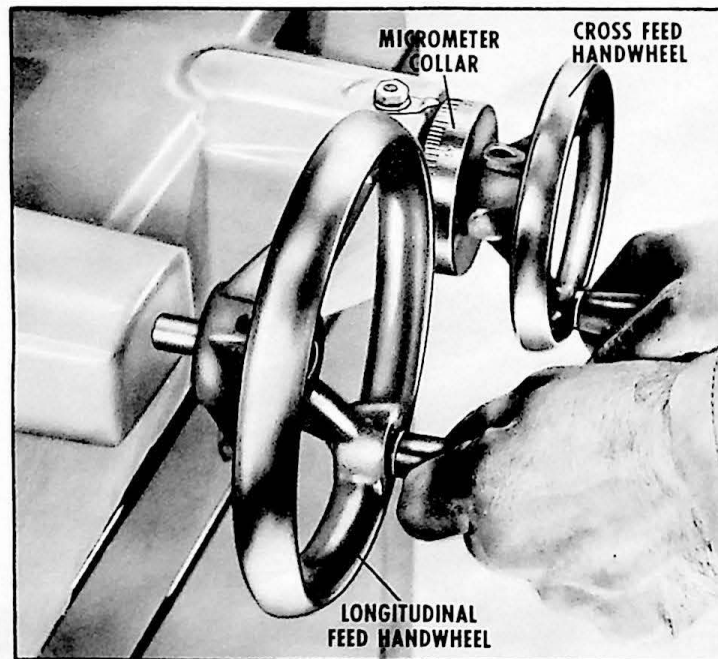


Fig. 9.

When grinding small pieces the position of the handle of the longitudinal feed handwheel can be changed by simply pulling out, rotating, and re-engaging the handwheel for a more convenient position of the handle. Fig. 9 shows the handwheel shaft pulled out during the process of repositioning the handle.

SPINDLE SPEEDS

With a 3450 rpm motor, spindle speeds of 3300, 3900, and 5700 rpm can be obtained. To change spindle speeds, simply remove belt guard cover as shown in Fig. 10, and position the belt on the correct steps of the pulleys. Refer to the spindle speed chart found on top of belt guard. CAUTION: DO NOT RUN WHEELS FASTER THAN RECOMMENDED SPEED SHOWN ON THE WHEEL.

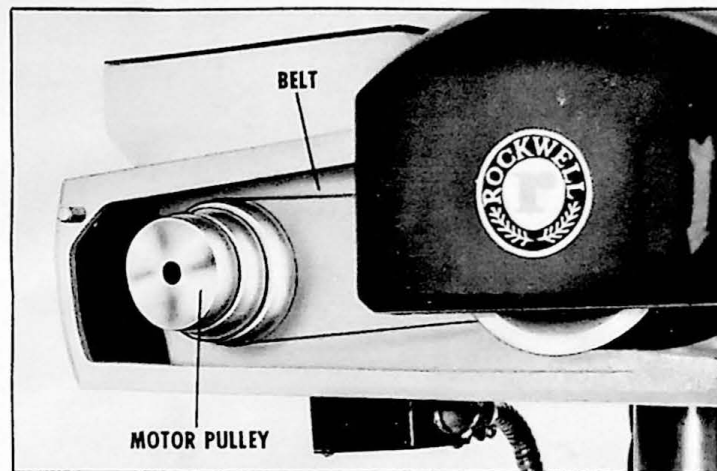


Fig. 10.

GRINDING WHEELS

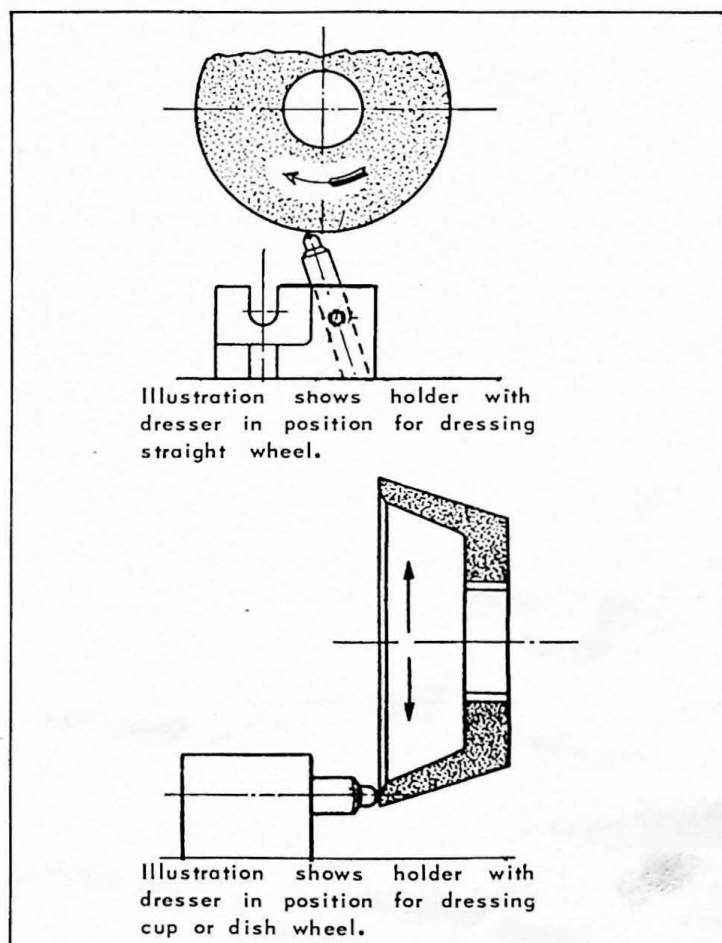


Fig. 11.

Particular care should be taken to place the holder in proper position when dressing wheel. The proper position for the diamond point of the wheel dresser is in front of the center line of the wheel, see Fig. 11.

Only a limited choice of grinding wheels is offered by us. In order to obtain the most efficiency from a wheel for production work, we suggest you contact the local representative of some reliable abrasive company in order to obtain the proper wheel for your purpose.

Always place wheel guard in position before starting up grinding wheel. Balanced wheels should always be specified.

ALWAYS DRESS A WHEEL BEFORE GRINDING using the Diamond Holder, furnished with basic machine, and the Cat. No. 24-805 Diamond Wheel Dresser, available as an accessory. The wheel dresser holder is made so it can be used for dressing straight wheels, cup wheels, and dish wheels. When used for straight wheels, the table should be locked by bringing both table stops against the center spring loaded stop. Move the cross slide and vertical travel handwheel until the diamond just touches the high point of the face of the wheel. Then dress the wheel by moving the cross slide back and forth. Lower the grinding wheel a few thousandths, using the micrometer down feed knob, and dress the wheel back and forth by moving the cross slide. Repeat the above steps until the face of the wheel is clean and the corners are square. Then lower the grinding wheel one thousandth (or two marks) on the micrometer collar of the down feed knob and pass the diamond once rapidly across the face of the wheel.

When dressing cup wheels and dish wheels, the table should be locked and the dresser adjusted to the wheel by moving the cross slide and elevating handwheel until the diamond just touches the high point of the face of the wheel. The wheel is then fed down across the diamond and back by using the micrometer down feed knob. Continue feeding the cross slide "in" and dressing the wheel by lowering and raising the wheel using the micrometer down feed knob until the face of the wheel is clean and completely dressed. Then move the cross slide in one thousandth of an inch and lower the micrometer down feed knob to bring the face of the wheel once across the diamond.

MOTORS AND PULLEYS

To insure the maximum efficiency of the Rockwell-Delta Toolmaker 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 on the grinder, and this unit is then shipped with that machine.

It is important therefore that the motor and motor pulley are not separated.

Available as service accessories for your grinder are the Cat. No. 24-800 1/2 HP Single Phase Motor with motor pulley and 49-085 Belt balanced together for field installation, and the Cat. No. 24-801 1/2 HP Three Phase Motor with motor pulley and 49-085 Belt balanced together for field installation.

SERVICE ADJUSTMENTS

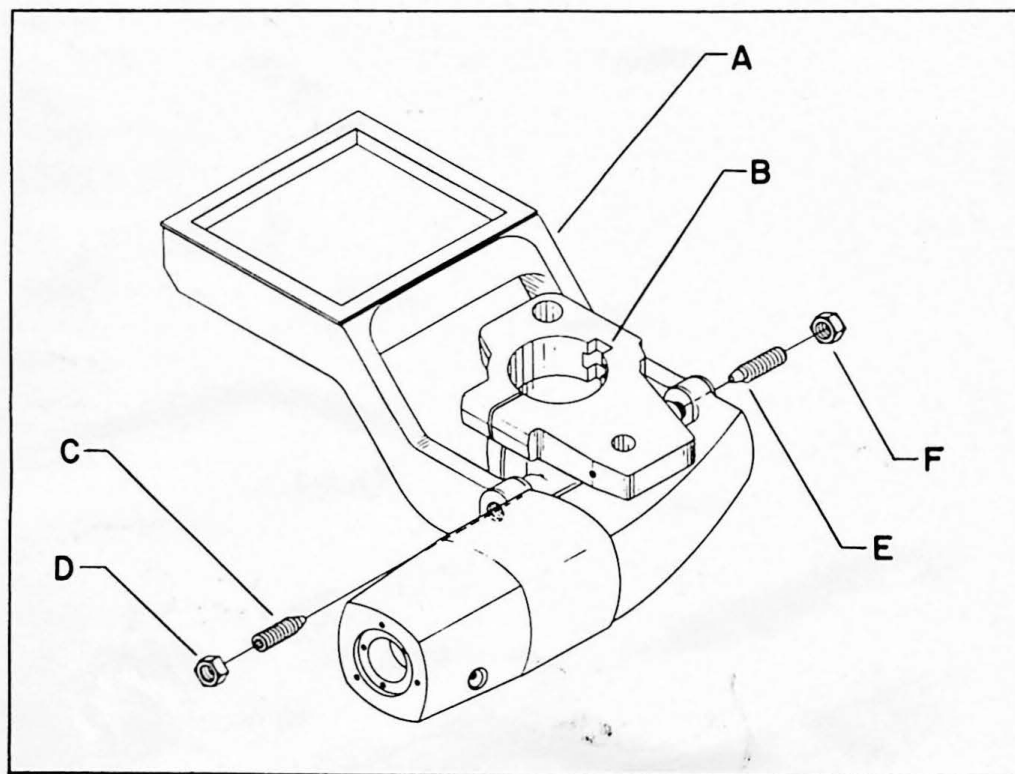


Fig. 12.

ADJUSTING PIVOT SCREWS

Before the grinder is placed into service, be sure the pivot screws are adjusted so that there is no play between the Spindle Housing and Motor Bracket Casting (A) Fig. 12, and the Column Sliding Bracket (B).

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 (C) Fig. 12, after loosening the jam nut (D). The rear eccentric cone point pivot screw (E) should not be disturbed when removing play, as this would throw the spindle out of parallel with the surface of the table.

The spindle can be adjusted in a vertical plane by turning the rear eccentric pivot screw (E) Fig. 12, always less than 360° . 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 (F) Fig. 12, first on the rear eccentric pivot screw (E) and then remove all play by adjusting and locking the front pivot screw (C).

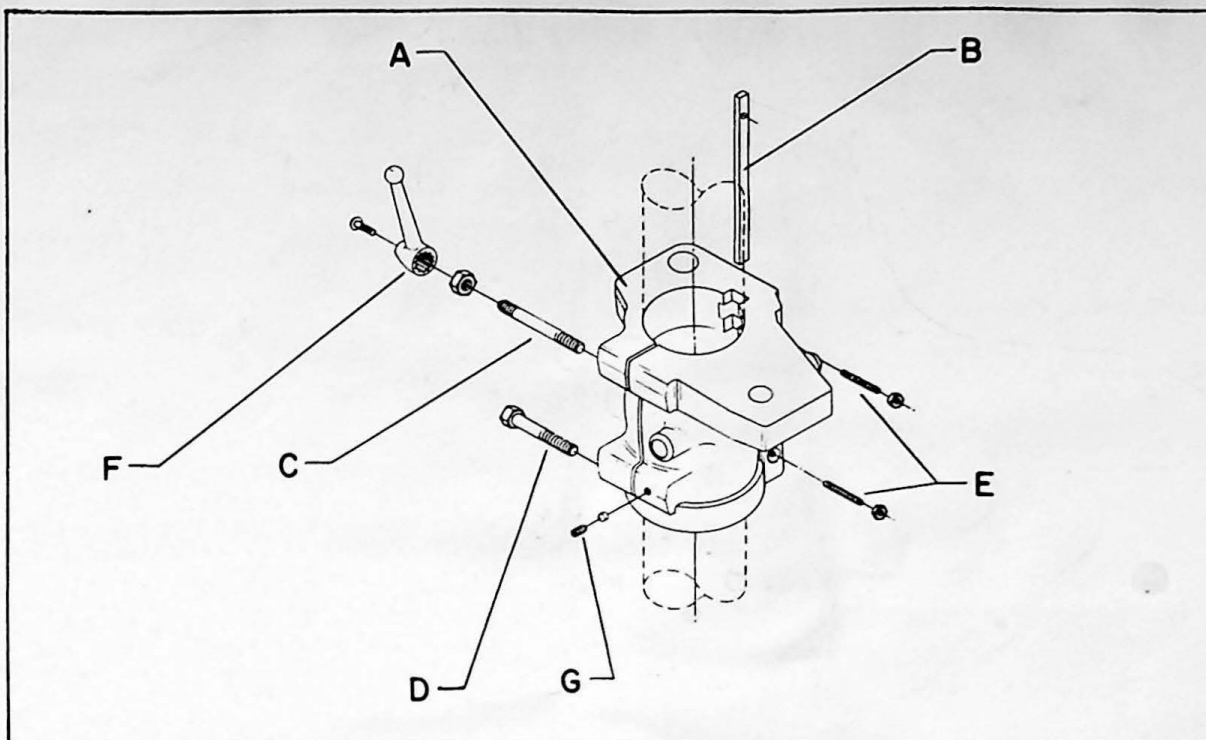


Fig. 13.

ADJUSTING COLUMN SLIDING BRACKET AND COLUMN GIB

Adjustments to the Column Sliding Bracket (A) Fig. 13, and the Column Gib (B) have been made at the factory, however, due to rough handling in transit or after considerable use, the Column Sliding Bracket (A) and Column Gib (B) may have to be adjusted as follows:

1. Loosen both upper and lower bolts (C and D) Fig. 13. NOTE: Before loosening lower bolt (D) make sure set screw (G) is first loosened.

2. Adjust the gib (B) Fig. 13, by adjusting the two gib adjusting screws (E) until a good, snug, sliding fit is obtained.

3. Then adjust the column sliding bracket so it is free from any looseness. This is done by properly adjusting and locking in position the lower locking bolt (D) Fig. 13.

4. Then adjust the upper locking bolt (C) Fig. 13, so that the handle (F) will be in a convenient position when locking the column sliding bracket to the column.

BELT TENSION AND BELT AND PULLEY ALIGNMENT

To increase tension on the belt, loosen the four nuts on the motor mounting bolts and move the motor away from the spindle. Care must be taken to keep the motor shaft in parallel alignment with the spindle. If the motor must be tilted to the front or rear, it is necessary to loosen the four nuts on the motor mounting bolts and adjust the motor until the motor shaft is parallel with the spindle. Then tighten the four motor nuts.

The motor pulley and spindle pulley must also be in alignment with each other in order that the belt rides fully and evenly on the pulley steps. If an adjustment is necessary, merely loosen the four motor mounting nuts and move the motor, with the pulley fastened to the motor shaft, to the front or rear until the steps of the pulleys line up with each other. Then tighten the four motor nuts.

CROSS FEED SCREW END PLAY ADJUSTMENT

1. Remove special screw (A) Fig. 14 and screw (B).

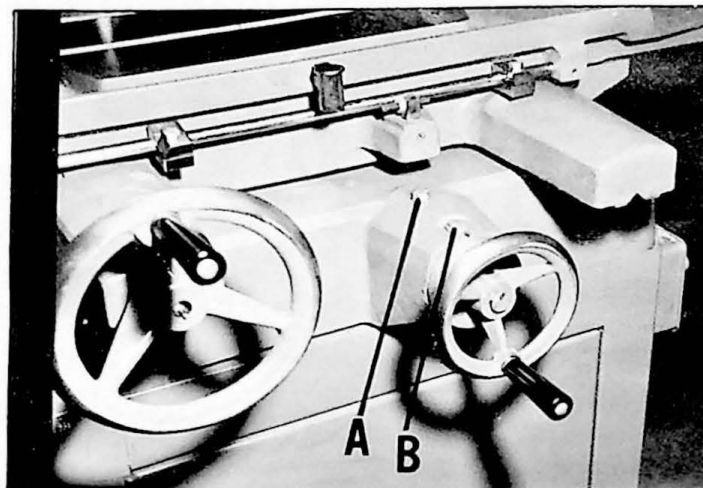


Fig. 14.

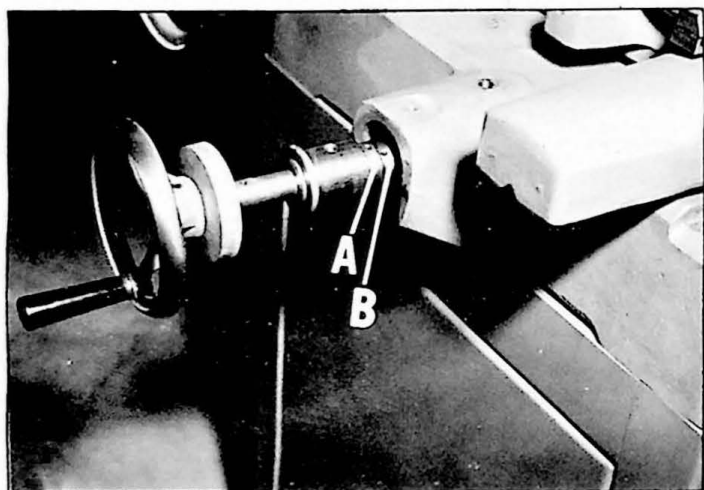


Fig. 15.

2. Turn cross feed handwheel counterclockwise until the two adjusting collars (A) and (B) Fig. 15, are accessible.

3. Adjustment is made by tightening or loosening the adjusting collar (A) Fig. 15, to the desired snugness and locking with the collar (B).

MAINTENANCE AND REPAIRS

REPLACING SPINDLE, SPINDLE BEARINGS, AND SPINDLE PULLEY

The spindle and the spindle bearings are precision made and precision mounted and if it should ever be necessary to replace or repair them, they must be replaced together or returned to the factory where this precision work can be performed. Charges for the work will be based on current parts prices for each part replaced, plus a labor charge. Send the entire spindle assembly prepaid and insured to:

Rockwell Manufacturing Company
Bellefontaine Division
Bellefontaine, Ohio
ATTENTION: Service Department

To remove the spindle, spindle bearings, and spindle pulley, proceed as follows:

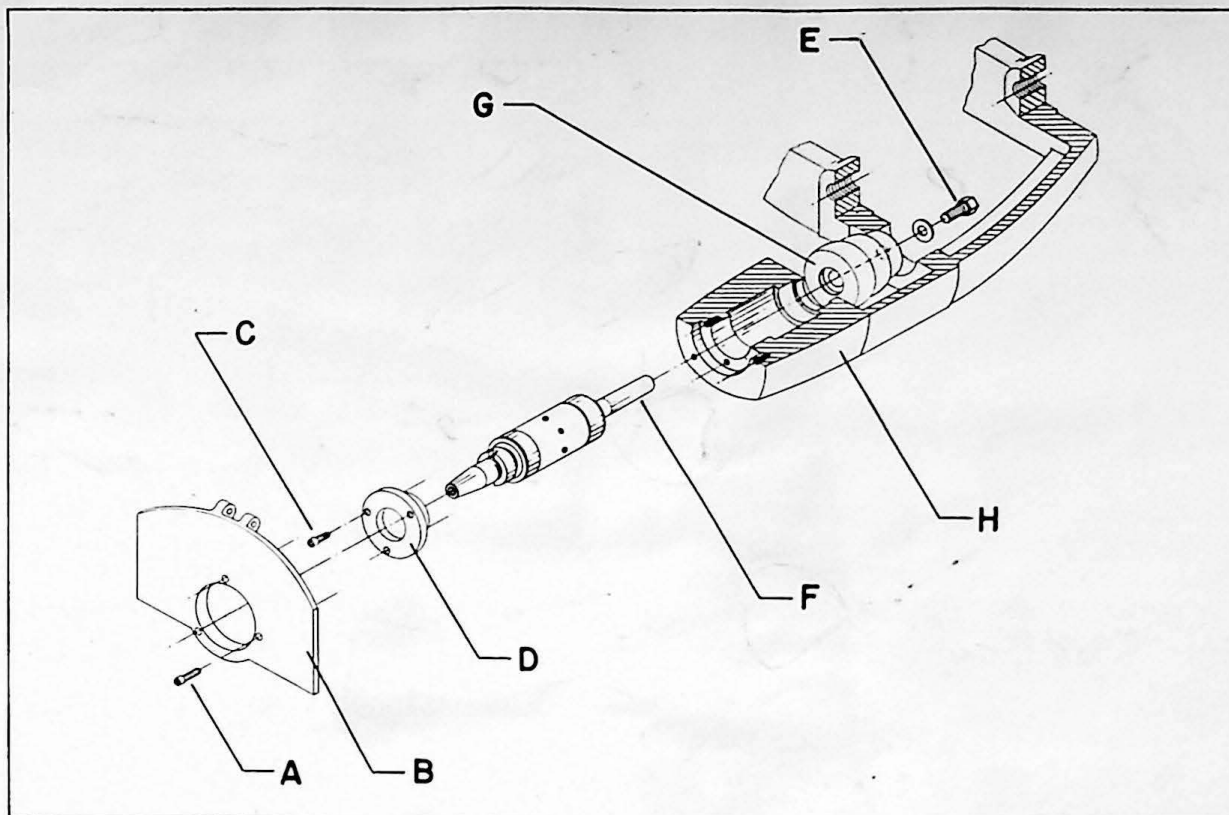


Fig. 16.

1. Remove the belt guard cover and the belt.
2. Raise the grinding wheel guard cover and remove the grinding wheel from the spindle.
3. Remove the three screws (A) Fig. 16, and remove the rear wheel guard (B) from the machine.
4. Remove the three screws (C) Fig. 16, and spindle retainer (D).
5. Loosen screw (E) Fig. 16, three or four turns.
6. Using long brass rod and a hammer, tap the screw (E) Fig. 16, until the spindle is free from the spindle pulley (G). This is necessary because the spindle and spindle pulley are tapered fit.
7. When the taper is broken, remove the screw (E) from the rear of the spindle. The spindle (F) can now be removed from the spindle housing (H) Fig. 16.
8. Remove the spindle pulley (G) from inside the belt guard.

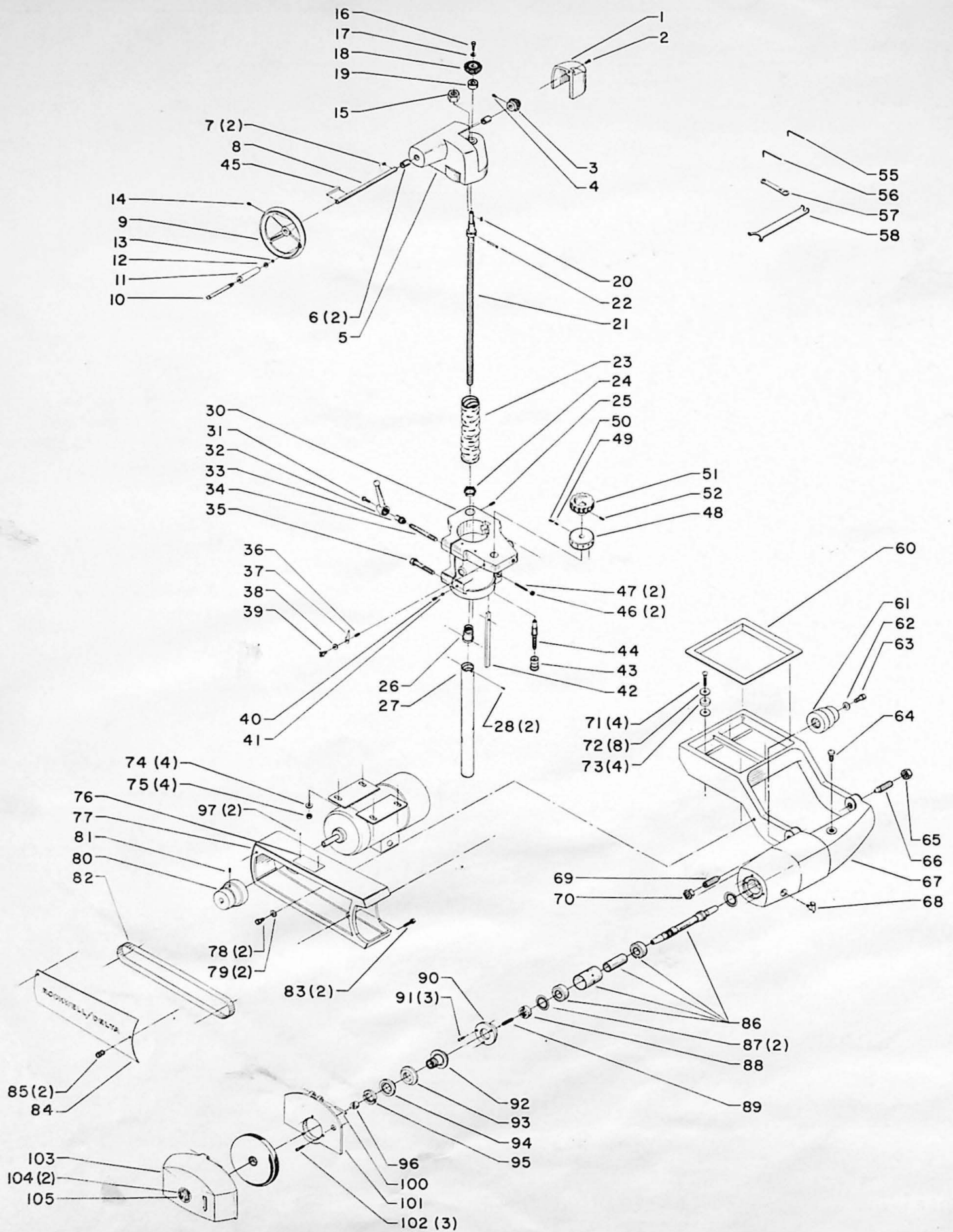
LUBRICATION

LUBRICATION CHART

PARTS TO BE LUBRICATED	RECOMMENDED OIL	METHOD OF FILLING	PERIOD OF CHANGE
SPINDLE BALL BEARINGS	ROCKWELL CAT. NO. 24-812 HIGH GRADE SPINDLE OIL OF VISCOSITY 58 TO 60 SAYBOLT AT 100° F.	*OIL CUP	ADD ONCE A WEEK OR AS NECESSARY - DO NOT OVERFILL
TABLE AND CROSS SLIDE	FOR BEST RESULTS USE ROCKWELL CAT. NO. 24-812 SPINDLE OIL OR ANY GOOD WAY OIL	OIL CUPS	DAILY
CROSS SLIDE SCREW	ALEMITE CUP GREASE	PUSH BACK DUST COVER	EVERY 30 DAYS
CROSS SLIDE SCREW BEARING	SAE #10	OIL FITTING	DAILY
PINION SHAFT BEARING	OILITE BUSHING, PRE- OILED		
VERTICAL SCREW & NUT	SAE #10	CLEAN AND OIL	WEEKLY
COLUMN	SAE #10	CLEAN AND OIL	DAILY
BEVEL GEARS ON TOP OF COLUMN	ALEMITE GREASE	**CLEAN AND GREASE	EVERY 30 DAYS

* WHEN LUBRICATING SPINDLE BALL BEARINGS IT IS NECESSARY THAT THE GRINDER IS NOT RUNNING AND THAT THE SPINDLE IS AT ITS LOWEST POSITION BY TURNING THE MICROMETER DOWN FEED KNOB CLOCKWISE.

** REMOVE CAP ON TOP OF COLUMN.

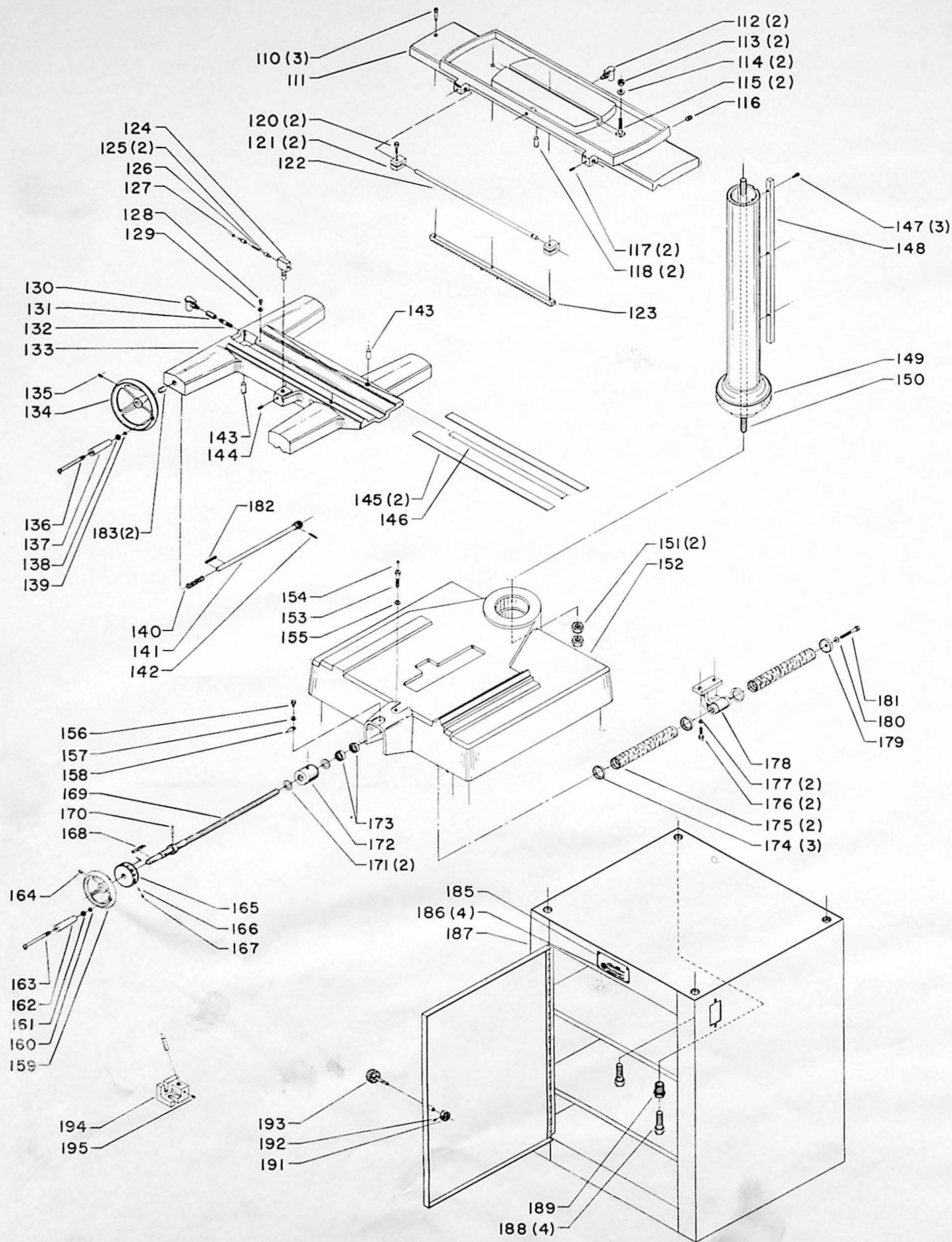


Replacement Parts

Dep Sup 463-9511

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	408-01-031-5002	Cover for Bevel Gears	51	SCG-38	Micrometer Down Feed Knob
2	SP-525	#10-24 x 1/2"Rd. Hd. Scr.	52	SP-104	1/4-20 x 1/2"Headless Set Scr.
3	408-01-051-5005	Bevel Gear	55	Cat. #194	5/32"Hex. Wrench
4	SP-551	#10-32 x 1/4 Rd. Hd. Scr.	56	Cat. #1534	1/8"Hex. Wrench
5	408-01-320-5002	Cap Assembly, Including:	57	Cat. #1526	Double End Hex. Box Wrench
6	MK-6012	Bushing	58	955-02-021-7455	Wrench
7	SP-2665	1/8 x 1/8 x 5/16"Key	60	408-01-069-5001	Pan
8	408-01-106-5008	Shaft for Vertical Feed Handwheel	61	926-13-702-0582	Spindle Pulley
9	930-03-991-0467	Vertical Feed Handwheel Assembly, Including:	62	SP-1638	15/32 x 59/64 x .065"Washer
10	LTA-422	Pin	63	SP-640	3/8-16 x 3/4"Hex. Hd. Scr.
11	931-01-051-6381	Handle for Vertical Feed Handwheel	64	SCG-36	Special Screw
12	PLR-125	Spacer	65	SP-1008	3/4-10 Hex. Jam Nut
13	928-06-011-7701	Spring Washer	66	408-01-042-5003	Eccentric Pivot Screw
14	SP-201	5/16-18 x 5/16"Soc. Set Scr.	67	408-01-058-5003	Spindle Housing & Motor Bracket
15	SP-1027	3/4"-10 Hex. Nut	68	SP-2521	Oiler
16	SP-612	1/4-20 x 5/8"Hex. Hd. Scr.	69	408-01-090-5003	Concentric Pivot Screw
17	SP-1614	9/32 x 5/8 x 1/16"Washer	70	SP-1008	3/4"-10 Hex. Jam Nut
18	408-01-051-5006	Bevel Gear	71	SP-806	5/16-18 x 1 1/2"Carriage Bolt
19	SP-5322	Bearing	72	TCS-291	Special Washer
20	SP-2665	1/8 x 1/8 x 5/16"Key	73	SCG-76	Felt Washer
21	408-01-412-5010	Raising Screw, Including:	74	SP-1620	11/32 x 11/16 x 1/16"Washer
22	SP-2735	1/8 x 1 1/4"Roll Pin	75	SP-1300	5/16"-18 Hex. Nut
23	408-01-405-5004	Cover for Raising Screw	76	960-04-012-0029	Spindle Speed Chart
24	TCS-217	Bearing Nut	77	408-01-054-5007	Belt Guard
25	SP-213	5/16-18 x 1/2"Soc. Set Scr.	78	SP-642	3/8-16 x 1"Hex. Hd. Screw
26	SCG-54	Bushing	79	DDL-175	Special Washer
27	408-01-405-5003	Cover for Raising Screw	80	926-13-992-0581	Motor Pulley, Including:
28	SP-2250	#4 x 5/16"Drive Screw	81	SP-203	1/4-20 x 3/8"Soc. Set Scr.
30	408-01-014-5008	Column Sliding Bracket	82	Cat. #49-085	Belt
31	SP-7510	1/4-20 x 3/4"Truss Hd. Scr.	83	SP-5769	5/16-24 x 1"Hex. Hd. Scr.
32	SR-217	Locking Handle	84	408-01-354-5004	Belt Guard Cover
33	SR-218	Serrated Nut	85	LBS-130	Adjusting Nut
34	901-07-261-8542	Stud	86	408-01-303-5003	Arbor Assembly, Including:
35	SP-3109	1/2-13 x 2 1/2"Hex. Hd. Scr.	87	908-01-010-5267	Seal Ring
36	SP-231	5/16-18 x 3/8"Soc. Set Scr.	88	408-01-079-5009	Retainer
37	SCG-72	Pointer	89	901-04-121-3628	Special Set Screw
38	DDL-150	Special Washer	90	408-01-079-5007	Retainer
39	SP-520	5/16-18 x 3/8"Rd. Hd. Scr.	91	901-03-010-3331	#10-24 x 3/4"Soc. Hd. Scr.
40	SP-231	5/16-18 x 3/8"Soc. Set Scr.	92	Cat. #24-820	Wheel Adapter, Including:
41	SCG-88	Plug	93	SCG-49	Flange for Grinding Wheel
42	SCG-23	Column Gib	94	SCG-64	2 15/32" O. D.
43	408-01-017-5009	Bushing	95	408-01-079-5010	Flange for Grinding Wheel
44	408-01-412-5012	Down Feed Screw	96	408-01-079-5008	2 7/32" O. D.
45	SP-2666	1/8 x 1/8 x 1"Key	97	SP-2252	Wheel Adapter Nut
46	SP-1034	1/4"-20 Hex. Nut	100	SP-5070	Spindle Nut for Wheel Adapter
47	SP-109	1/4-20 x 1 1/2"Headless Set Scr.	101	408-01-054-5009	#2 x 3/16"Drive Screw
48	408-01-037-5006	Micrometer Collar	102	901-03-010-3331	1/4 x 1 1/2"Roll Pin
49	402-04-063-5001	Nylon Drag Plug	103	408-01-054-5010	Wheel Guard (Rear)
50	SP-208	1/4-20 x 1/4"Soc. Set Scr.	104	SP-2252	#10-24 x 3/4"Soc. Hd. Screw
			105	960-02-012-0028	Wheel Guard (Front)
					#2 x 3/16"Drive Screw
					Nameplate

*Arbor, Bearings and Sleeve Assembly are not sold separately. They are run in at the Factory and sold as a unit.



Replacement Parts

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
110	901-03-061-2471	Shoulder Screw	153	408-01-379-5003	Retainer Assembly, Including:
*111	408-01-084-5002	Table	154	SP-7103	Oiler
112	SP-2494	Oiler	155	240-81	Special Washer
113	SP-1207	3/8"-24 Hex. Nut	156	SP-601	1/4-20 x 3/8"Hex. Hd. Scr.
114	SP-1615	13/32 x 13/16 x 1/16" Washer	157	TAM-185	Special Washer
115	SCG-66	T-Bolt	158	TCS-225	Pointer
116	SP-2438	1/8"Soc. Pipe Plug	159	930-01-992-0466	Cross Feed Handwheel Assembly, Including:
117	SP-202	1/4-20 x 1/2"Soc. Set Scr.			
118	HDP-154	Oil Wick	160	928-06-011-7701	Spring Washer
120	SP-603	1/4-20 x 7/8"Hex. Hd. Scr.	161	PLR-125	Spacer
121	SCG-32	Table Stop	162	931-01-051-6381	Handle for Cross Feed Handwheel
122	SCG-31	Table Stop Rod	163	LTA-422	Pin
123	408-01-051-5004	Rack	164	SP-231	5/16-18 x 3/8"Soc. Set Scr.
	408-01-388-5004	Center Stop Assembly, Consisting of:	165	408-01-037-5005	Micrometer Collar
			166	402-04-063-5001	Nylon Drag Plug
124	408-01-088-5008	Stop	167	SP-208	1/4-20 x 1/4"Soc. Set Scr.
125	408-01-016-5001	Bumper	168	SP-2655	3/16 x 3/16 x 7/8"Key
126	928-01-301-8890	Spring	169	408-01-412-5011	Cross Feed Screw, Including:
127	904-15-102-0151	Retaining Ring	170	SP-2735	1/8 x 1 1/4"Roll Pin
128	SP-593	#10-24 x 3/8"Binding Hd. Scr.	171	H-11	Fiber Washer
129	SCG-40	Special Washer	172	SCG-13	Bushing
130	SP-2494	Oiler	173	SCG-89	Retainer
131	SP-2513	1/8"Pipe Coupling	174	SCG-83	Cup Washer
132	SP-3521	1/8 x 1 1/2"Pipe Nipple	175	408-01-405-5003	Cover for Cross Feed Screw
*133	408-01-082-5002	Cross Slide	176	SP-649	5/16-18 x 1"Hex. Hd. Scr.
134	930-03-991-0467	Longitudinal Feed Handwheel, Including:	177	SP-1703	5/16"Split Lockwasher
			178	SCG-15	Bushing
135	SP-201	5/16-18 x 5/16"Soc. Set Scr.	179	SCG-84	Cup Washer
136	LTA-422	Pin	180	SP-1620	11/32 x 11/16 x 1/16"Washer
137	931-01-051-6381	Handle for Longitudinal Feed Handwheel	181	SP-635	5/16-18 x 2"Hex. Hd. Scr.
			182	SP-2666	1/8 x 1/8 x 1"Key
138	PLR-125	Spacer	183	MCL-183	Sleeve Bearing
139	928-06-011-7701	Spring Washer	185	960-02-012-0028	Nameplate
140	PLR-210	Spring	186	SP-2252	#2 x 3/16"Drive Screw
141	408-01-406-5003	Shaft Assembly for Longitudinal Feed Handwheel, Including:	187	408-01-318-5001	Cabinet
			188	SP-9060	3/4-10 x 1 3/4"Hex. Hd. Scr.
142	SP-2721	1/8 x 7/8"Roll Pin	189	408-01-112-5010	Leveling Screw
143	HDP-154	Oil Wick	190	SP-1753	3/4 Internal Tooth Lockwasher
144	SP-106	5/16-18 x 1/2"Headless Set Scr.	191	CBS-80	Cam
145	408-01-031-5005	Teflon Tape	192	SP-208	1/4-20 x 1/4"Soc. Set Scr.
146	408-01-104-5006	Bonding Film	193	MCL-540-S	Knob Assembly
147	SP-715	1/4-20 x 1/2"Fil. Hd. Scr.	194	408-01-360-5002	Diamond Holder, Including:
148	SCG-22	Guide for Column Sliding Bracket	195	SP-208	1/4-20 x 1/4"Soc. Set Scr.
149	408-01-030-5003	Column	**	Cat. #24-812	1/2 Pint Spindle Oil
150	408-01-111-5001	Column Stud	***	Cat. #24-808	7" Straight Wheel
151	SP-1008	3/4"-10 Hex. Jam Nut	***	Cat. #24-973	6"Dish Wheel
152	408-01-005-5008	Base	***	Cat. #24-974	4" Cup Wheel
			***	Cat. #24-805	Diamond Wheel Dresser
			***	Cat. #24-823	Coolant Attachment
			***	Cat. #24-822	Tool & Cutter Grinding Attachment
			***	Cat. #25-857	Lamp Attachment
			****	Cat. #24-800	1/2 HP Single Phase Motor W/Pulley & Belt
			****	Cat. #24-801	1/2 HP Three Phase Motor W/Pulley & Belt

*Part No. 408-01-084-5002, Table, and Part No. 408-01-082-5002, Cross Slide are sold separately. However, if either one requires replacement due to excess wear, we suggest that both be replaced.

** Not Shown

*** Available, but not included with 24-150 Toolmaker Surface Grinder.

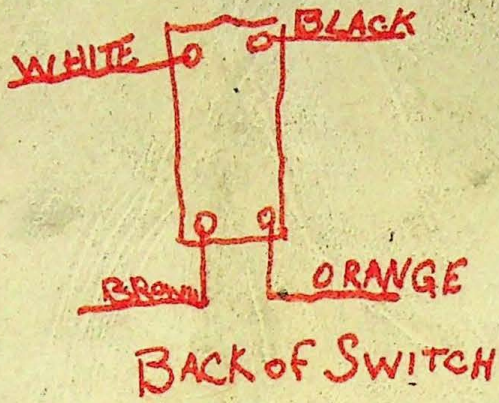
**** Available as Service Accessories

ROCKWELL GUARANTEE

Rockwell is proud of the quality of the power tools which it sells. The component parts of our tools are inspected at various stages of production, and each finished tool is subjected to a final inspection before it is placed in its specially designed carton to await shipment. Because of our confidence in our engineered quality, we agree to repair or replace any part or parts of Rockwell Power Tools or Rockwell Power Tool Accessories which examination proves to be defective in workmanship or material. In order to take advantage of this guarantee, the complete Delta or other Rockwell machinery part or accessory must be returned prepaid to the appropriate Factory, Rockwell Service Center, or Authorized Service Station for our examination. This guarantee, of course, does not include repair or replacement required because of misuse, abuse, or normal wear and tear. Repairs made by other than our Factory, Rockwell Service Center, or Authorized Service Station, relieves Rockwell of further liability under this guarantee. This guarantee is made expressly in place of all other guarantees expressed or implied with respect to fitness, merchantability, or quality.

MOTORS

Motors are built to Rockwell's specifications by only leading motor manufacturers. A service station list is supplied with your motor and all defective motors (both in and out of guarantee) should be taken to the local authorized repair station when service is desired.



FOR

SERVICE,

QUALITY

and PERFORMANCE in
WOODWORKING and METALWORKING
MACHINES
and
POWER TOOLS