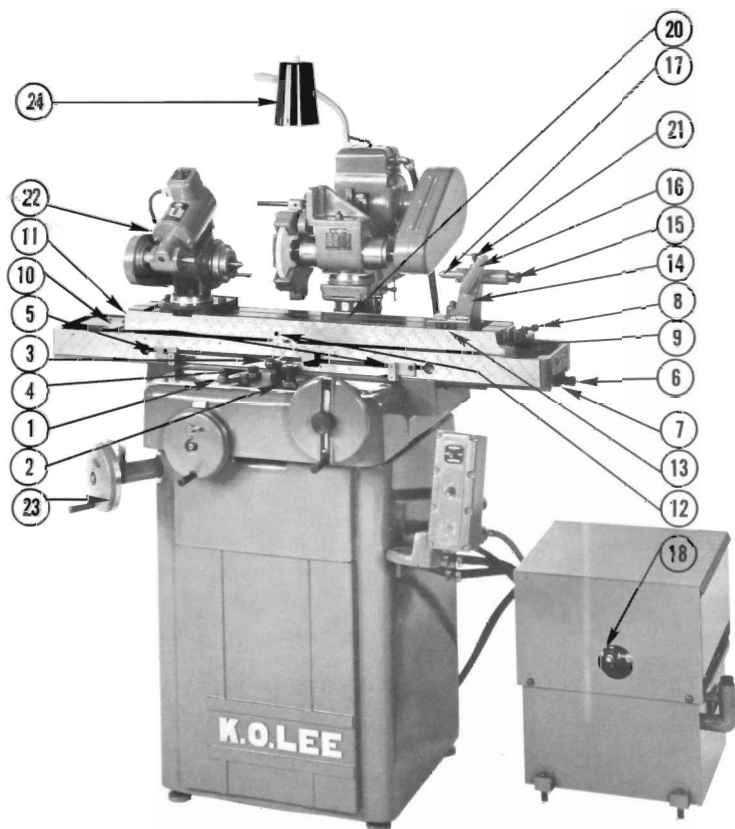


MODEL B6062H WITH B10043M MOTORIZED WORKHEAD

PHOTO 4

- | | |
|---|---|
| 1. Switch on Machine with Toggle Switches | 14. Table Index Plate |
| 2. Belt Guard | 16. Table Adjustment Screws |
| 3. Tilting Degree Dial | 18. Adjustable Stop |
| 4. Cartridge Spindle Locking Screw | 19. Table Stop |
| 5. Wet Wheel Guard | 20. Crossfeed Handwheel |
| 6. B923CL Motor Shaft Guard | 21. Thumb Nut |
| 7. Guard Mounting Bracket | 22. Elevation Handwheel |
| 8. Swivel Socket Screws | 23. Knurled Knob to Engage Drive |
| 9. Tailstock Locking Screw | 24. Table Traverse Handwheel |
| 10. Rear Column Lock Screw | 25. Electrical Control Box |
| 11. Hex Nut | 26. Movable Index Disc |
| 12. Swivel Locking Nut | 27. On-Off Coolant Switch if specified on |
| 13. Dovetail Slide | Coolant Tank |



MODEL B2060H

PHOTO 5

- | | | |
|----------------------------|-----------------------------|--|
| 1. On-Off Valve Control | 9. Clamp Bar Socket Screws | 17. Tailstock Center |
| 2. Speed Control | 10. Index Plate | 18. Oil Flow Valve for Ways
remove cover for adj. |
| 3. Directional Control Arm | 11. Pointer | 20. Swivel Table |
| 4. Dwell Control | 12. Friction Socket Screws | 21. Tailstock Locking Screw |
| 5. Table Stops | 13. Hex Socket Screw | 22. B943 Motorized Head |
| 6. Hyd. Cylinder Thumb Nut | 14. Spring Center Tailstock | 23. Elevation Handwheel |
| 7. Rod Drive Collar | 15. Threaded Plunger | 24. 06183 Light Fixture |
| 8. Swivel Table Adj. Screw | 16. Tailstock Lever | |

GENERAL OPERATION INSTRUCTIONS

I. SAFETY PRECAUTIONS

- A. **ALWAYS WEAR SAFETY GLASSES** or an eye shield when operating a grinding machine.
- B. **ALWAYS USE A WHEEL GUARD AND BELT GUARD.** Machines are provided with wheel guards of the correct size and necessary mounting brackets. Consult Part III of this section and general set-up photos in this manual on how to attach these to the machines.
- C. Mounting Wheels
 1. Check wheel R.P.M. charts on the machine or Part III, pages 14, 15 of this section for the correct or maximum safe speed for the size and type of wheel being used. Do not exceed this speed or the speed marked on the wheel or its blotter. The R.P.M. listed is the maximum safe speed for a given new wheel diameter.
 2. Inspect all grinding wheels prior to mounting. Use the following check for cracks or vitrified bond wheels: Hold the wheel by a small shaft through its hole, and then tap the edge with a non-metallic object. An undamaged wheel will sound a clear metallic ring. Check resinoid bond wheels and other types of wheel bonds by visual inspection.
 3. Never alter the hole in the wheel or force the wheel on the spindle.
 4. Use one clean, smooth blotter on each side of the wheel under each flange.
 5. Tighten the arbor nut only enough to hold the wheel firmly.
 6. Stand back and out of plane of the wheel when first starting the grinding spindle (WHEELHEAD MOTOR). Allow the motor to operate for about a minute prior to grinding.
 7. Special caution is needed when grinding on the side of the wheel. Wheels with flat sides may have sufficient side "run-out" to necessitate truing the side with a dressing stick. A slightly hollow recess to within $\frac{1}{16}$ inch of the periphery of the wheel is recommended to limit the amount of side thrust on the wheel. Use saucer wheels whenever possible for side grinding.
 8. Store wheels in a safe place (FREE FROM EXTREMES OF HUMIDITY AND TEMPERATURE) near the grinding machine.
 9. See Part II in this section for procedures on mounting, truing, and dressing wheels. NOTE: Wheel arbor clamping flanges must be the same diameter inside and outside. The wheel collet or arbor O.D. should vary with the wheel diameter. Safety codes recommend a diameter equal to not less than $\frac{3}{4}$ of the diameter of the wheel.
- D. We recommend a dust collect system for use with dry grinding.
- E. Rings, wrist watches, or loose long-sleeved shirts are hazardous items to wear during grinding operations.

II. ELECTRICAL CONTROLS

Before starting machine, learn the location and function of each electrical switch. (REFER TO NUMBERED POSITIONS IN PHOTO 4.)

- A. Wheelhead and Spindle Motor: Machines with standard toggle switches have the switch located at point (1). This switch, located on the top of the motor

housing, is a "Forward-Off-Reversing" type with the "Off" position in the center. Spindle motors should be completely stopped in one direction prior to reversing. Check the rotation of the spindle for "Forward" switch designation. Rotation should be down at the point of grinding as one faces the wheel periphery, with the spindle parallel to the grinder table. Some machines have a standard push button box on the side of the machine at (25) with three positions, "Start-Stop-Reverse." The function of any other switches at this point is described on the station box. Special electrical controls consisting of push button and other types of switching are located at position (25).

- B. Motorized Workheads: Units with toggle switches have the switch located at top of unit and these are "Forward-Off-Reverse" switches. **WARNING:** Prior to turning on the workhead motor, make sure the spindle is free to turn — that the spindle lock is loose. Workheads may plug into the machine or have a separate wall plug. Some motorized workheads that plug into the machine electrical panel have "Forward-Off-Reverse" switches at position (25).
- C. Hydraulic Machines: These machines have "On-Off" switches, toggle or other type located at (25). **WARNING:** Prior to switching on hydraulic motors, check the hydraulic tank for adequate oil and make sure valves are in the "off" position. See the special instructions on the operation of hydraulic grinders, Part III, A-2 of this section.
- D. Coolant Systems: Coolant pumps may have "On-Off" switches at position (25) or at the pump unit itself at (27). Coolant systems plug into the machine electrical panel or have separate plugs for wall connection.
- E. Special Electrical Controls: Some machines have special starting motor controls which may feature other types of switches than the standard toggle switch. Machines may have "overload-under-voltage" magnetic starters located apart from the motor or its usual switch location. Other machines will have magnetic starters for each motor located in a J.I.C. oil tight junction box at the rear of the machine. These systems may or may not feature power transformers for lower voltage starter circuits. With these controls, special switches are located at (25) for starting and stopping motors.

III. MACHINE OPERATION

- A. (REFER TO PHOTOS 1, 4, 5, 6 and 7) Table Traverse: This main control is located at position (24) Photo 4 on most machines and consists of a two-speed transmission and handwheel. Some machine models also feature one or more rear-operated, single speed table controls consisting of handwheel and friction lock-in or lock-out shaft and pinion. The B6060 and B6062 series grinders have a swing handle adjustment, while all other models have friction-slide extending handles.
 - 1. To effect manual table traverse, engage the transmission as follows:
 - (a) B300 Series — The transmission is shipped with gears in neutral position. To engage direct drive, turn and push in the handwheel (24) Photo 4 until spring loaded ball is felt dropping into a groove on the transmission shaft. To shift to low ratio, pull the handwheel out. As the shaft and handwheel move out of the neutral groove, the low ratio groove will be felt. Handwheel, shaft, and pinion are positioned relative to the gear rack by the ball riding in a groove on the shaft.

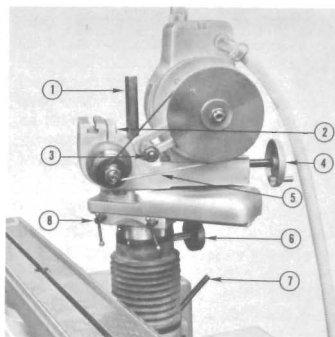


PHOTO 6

1. B855Y Special Nut
2. $\frac{5}{16} \times \frac{3}{4}$ NF Hex Socket Cap Screw
3. B860GN Special Nut
4. Belt Adjustment Handwheel
5. V-Belt
6. Eccentric Shaft Hand Nut
7. Column Lock Lever
8. B955G Lock Screw Assembly

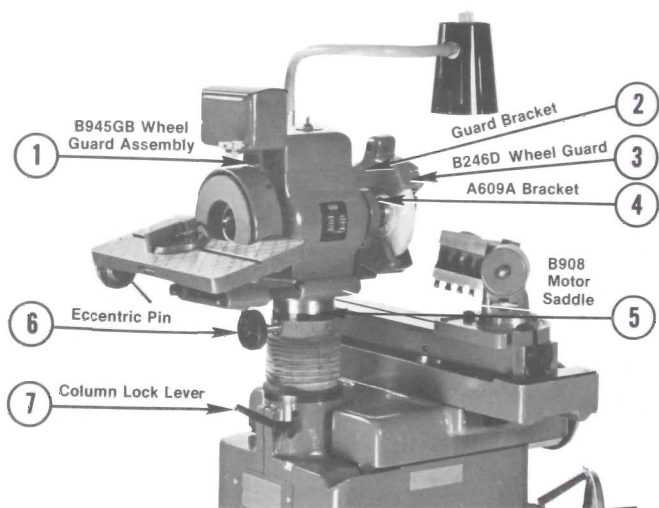


PHOTO 7

- (b) All Other Models: The transmission is shipped with gears in neutral position. The pinion gear is off the rack. To engage the direct drive ratio, turn and pull the knurled knob (23) Photo 4 to start the pinion onto the rack. Continue to pull while oscillating the handwheel until an inner key is felt dropping into the direct drive slot. To engage the low ratio, continue pulling the knob while oscillating the

handwheel until the key in the transmission drops into the low ratio slot. To shift from the low ratio, push in the knurled knob while oscillating the handwheel. Not over $\frac{1}{4}$ turn of the handwheel is necessary to shift into either of the two ratios.

- (c) Use of the hand operated table transmission on machines with hydraulic power: Make sure that the hydraulic motor is turned off. Move control (1) Photo 5 to "Off." It should now be possible to move the table easily when the manual transmission is engaged in the low ratio. If it is desired to avoid the hydraulic oil friction caused by oil being pushed by the cylinder piston, disengage the thumb nut (6) Photo 5 from the piston rod at the right side of the table. Move the table slightly to the right so as to pass the rod end through the yoke; then remove the rod drive collar (7) Photo 5 from the rod. This will enable the table to be moved without moving the piston and rod assembly.

2. Hydraulic Table Traverse: To engage the hydraulic power for traverse of the table, follow these steps:

- (a) Set out to the ends of the table stops number (5) Photo 5 or remove them from the table altogether. Disengage the hand operated table transmission described in 1, (a) and (b) above.
- (b) With "On-Off" valve (1) Photo 5 in the "Off" position and Speed Control (2) Photo 5 at a low setting of about one or two on its dial, turn on the hydraulic pump motor and allow the system to warm up for 15 to 30 minutes.
- (c) Turn valve (1) Photo 5 to "On" and allow the table to traverse to the furthest point in each direction for a few minutes. When the table has stopped traveling in one direction, move the Directional Control Arm (3) Photo 5 to point in the opposite direction, and the table will reverse. This action purges the table cylinder of any air that may be in the system.
- (d) Re-set the table reversing stops relative to the work that is to be ground and tighten with a hex wrench.
- (e) Set the table travel reversal Dwell Control (4) Photo 5 for the amount of dwell desired at the end of each table traverse. The dial for this control allows up to two seconds of dwell (TABLE STOP) before the table starts back in the opposite direction. **NOTE:** The "Instruction Manual . . . HPL-3" which comes with the machine gives basic set-up and maintenance information of the system.

- B. Crossfeed Traverse: The handwheel for actuating the machine saddle either toward or away from the column is located at the same position(s) on all grinders at the left front (20) Photo 4 and on some machines also at the left rear part of the machine. On most machines, this handwheel has a movable index disc (26) Photo 4 graduated in thousandths — one hundred to a revolution. The disc is moved by releasing a thumb nut (21) Photo 4 allowing the operator to set the crossfeed at zero at any saddle position for measurement beyond this point. The B300 and B360 Series grinders have the index dial integral with the handwheel. The feed nut which is a floating type, is split and held together with two screws (2) Photo 2 for backlash adjustment. Screw (1) Photo 2 is an adjustment for the amount of "play" between the

stationary bar which keeps the nut from moving and the nut itself. This latter screw has been factory adjusted for very minimal movement of the nut relative to the bar. Normal backlash in the nut is about .005 inch.

C. Column Elevation:

1. All B300, B360, BA900, BA960, BA962, B2000, B2060, and B2062 series grinders: The elevation handwheel, located at (23) Photo 5 and on some machines also at the center of the machine base just below the column, has an index disc calibrated in thousandths — fifty to a revolution. B300 and B360 series grinders have the index dial integral with the handwheel. The index disc and releasing thumb-nut are the same as on the crossfeed handwheel. These machines with a 4 inch column have a column lock lever at the rear of the machine (7) Photos 6 and 7 which is used to lock the column in at a fixed location for cylindrical grinding and on operations where vertical movement of the column is critical. During surface grinding activity, use the column lock under partial tension before downfeeding onto the work.
2. B6060 and B6062 series grinders: The elevation handwheels are located at (22) Photo 4 and have index discs that are calibrated in thousandths — fifty to a revolution. The index disc and releasing thumb-nut are the same as on the crossfeed handwheel. These machines are provided with a rear column lock screw at (10) Photo 4 for operations that require a fixed column setting.

D. Grinding Heads:

1. **TOOL AND CUTTER GRINDERS:** Models B300, BA900, and B2000 have a motorized dual-wheel grinding spindle and motor saddle (5) Photo 7 attached directly to the top of the column. This entire assembly is held in place by an eccentric pin at (6) Photo 7 which passes through the column wall, through the hold-down cage attached to the motor saddle, and then into the inner wall of the column. When this shaft and handwheel are rotated in either direction sufficiently, the grinding head assembly is held rigidly in place. If only a slight amount of shaft rotation is used, the head can be swiveled in the horizontal plane 360 degrees. The column top is calibrated in degrees and the motor spindle shaft may be positioned to any angle relative to the table and locked in place. Holes in the pin handwheel are provided for use with the handle of the B628 wrench for additional tightening of the grinding head to the column. Wheel guards shown in Photo 7, are mounted to bracket arm A609A (4) or the B945GB bracket (1) (FASTENED TO THE MOTOR HUBS) by means of a wheel guard assembly. Use the B855W open-end wrench, standard T-slot bolts, and the S894 wrench to tighten the hex socket screws and hex nuts.
2. **UNIVERSAL GRINDERS:** Models B360, BA960, BA962, B2060, and B2062. These models use a universal grinding head (**B955 or B955HD**) which features a motor-driven grinding spindle using a V-belt.
 - (a) Spindle Speeds: The R.P.M. is changed by changing the pulleys attached to the spindle and motor. Always use the keyed washers on the outside of the pulley before turning on the locking nut. Remove the belt guard by removing the nut (3) Photo 6 from the T-slot bolt held in the A609A T-slot arm bracket. This bracket slips over the motor hub and is adjustable by a locking hex socket screw. A belt

tightening screw and handwheel (4) Photo 6 is used to move the motor relative to the spindle for installing and tightening the belt. Always leave enough slack in the belt tension so that the belt can be depressed to a depth of $\frac{3}{8}$ to $\frac{1}{2}$ inch between the two pulleys on one side. Use the edge of the wheel guard as a straight edge between the periphery of the two pulleys. Mount the V-groove pulleys with the hub flanges on the same side. Check the alignment of the pulley grooves by running a straight edge between the two pulley sides. To make adjustments, move the spindle relative to the spindle bracket housing by loosening hex socket screws (2) Photo 6. **WARNING:** Do not over tighten these spindle bracket screws, as damage to the spindle bearings may result. Tighten these screws until the spindle cannot be made to slip or rotate in the bracket housing by hand pressure.

- (b) Grinding Head Swivels: The lower swivel adjustment (6) Photo 6 is the same as that described for the models in D-1 above. The upper swivel on the universal head is movable when special nut (1) Photo 6 is loosened with the B855W machine wrench. The upper swivel allows the spindle bracket housing (THUS SPINDLE AND MOTOR) to swivel 360 degrees relative to the dovetail slide in the horizontal plane.
- (c) Dovetail Extension: The universal head is made with a dovetail slide (13) Photo 4 which allows the movement of the spindle relative to the column (IN ANY DIRECTION OF THE WHEELHEAD SWIVEL) up to 6 inches. With the slide all the way to the rear of the machine, the center-line of the spindle is approximately in the vertical plane of the edge of the column. Movement is by hand pressure upon loosening of the two handle lock screws (8) Photo 6.
- (d) Spindles and Wheel Mounting:
 - i. High Speed for Standard Universal Grinders with B955 Head:

The B6055B cartridge spindle (Photo 8) has a normal speed range of 3450 to 18,400 R.P.M. Mount belt pulleys as shown in Photo 8 at the right of the spindle. Mount the spacer washer first, then the pulley, and then the keyed wheel flange and nut. Use the B628 Wrench while holding the pulley by hand or holding the shaft stationary with the B936W Spanner Wrench.

The B855F pulley and wheel arbor shown in Photo 8 attaches to the internal taper lock at the left end of the spindle by means of its inner hex socket screw. Always clean the taper surface prior to mounting arbors. The S894 Hex Wrench is used for tightening this screw while the spindle shaft is held at the right end by an open-end wrench. Using the B628 wrench, the arbor nut, and keyed flange, any $\frac{5}{8}$ inch bore diameter wheel can be mounted on the arbor. Mount straight wheels of no larger diameter than 5 INCHES on this arbor. See Part I of this section for safety precautions when wheels are being mounted. **NOTE:** It is also possible to mount wheels at the right end of this spindle while using the B855F arbor to hold the pulley, so that the motor can drive the spindle from the left end. This makes it possible to mount a wheel further away from the machine column without reversing the spindle in the spindle housing bracket.

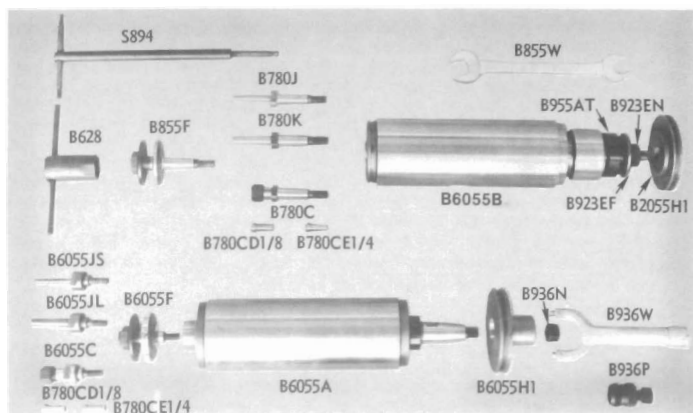


PHOTO 8

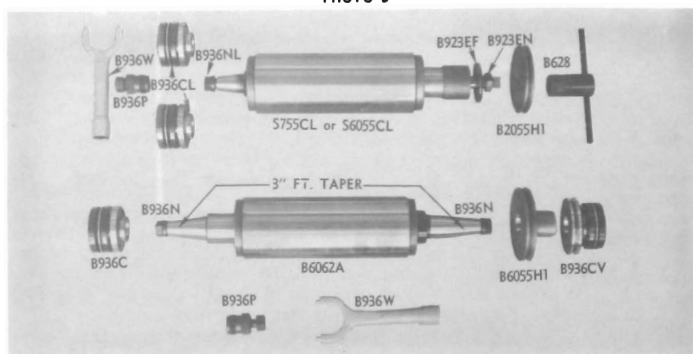


PHOTO 9

B6055B SPEED CHART KO-16				
Diameter of Wheel	Wheel Speed R.P.M.	Pulley on Motor 3450	Pulley on Spindle	Belt Used
6 to 5	3,450	3 3/4	3 3/8	5M615
5 to 4	4,600	4 1/2	3 3/8	5M670
6 to 5	3,450	2 1/2	2 1/2	5M560
4 to 3	5,820	3 3/4	2	5M615
3 to 2	7,760	4 1/2	2	5M710
2 to 1 1/2	10,350	6	2	5M670
1 1/2 to 1	13,800	6	1 1/2	5M670
1 to 3/4	16,560	6	1 1/4	5M670
3/4 to 1/2	18,400	6	1 1/8	5M670

S6055CL SPEED CHART KO-25				
Diameter of Wheel	Wheel Speed R.P.M.	Pulley on Motor 3450	Pulley on Spindle	Belt Used
	1,150	2	6	5M710
	2,580	3 3/8	4 1/2	5M670
7 to 5 1/2	3,450	3 3/8	3 3/8	5M615
7 to 5 1/2	3,450	2 3/8	2 3/8	5M560
5 1/2 to 4	4,600	4 1/2	3 3/8	5M670
4 to 3	6,210	4 1/2	2 1/2	5M615
3 to 2 1/2	7,760	4 1/2	2	5M615

B6055A SPEED CHART KO-48				
Diameter of Wheel	Wheel Speed R.P.M.	Pulley Motor	Pulley on Spindle	Belt Used
6 to 5	3,450	2¾	2¾	5M710
5 to 4	4,390	3½	2¾	5M710
4 to 3	5,330	4¼	2¾	5M750
3 to 2	7,330	4¼	2	5M750
2 to 1½	10,780	6¼	2	5M800
1½ to ¾	14,380	6¼	1½	5M775
¾ to ¼	17,250	6¼	1¼	5M775

B6062A SPEED CHART KO-49				
Diameter of Wheel	Wheel Speed R.P.M.	Pulley Motor	Pulley on Spindle	Belt Used
8 to 6½	2,840	3½	4¼	5M775
6½ to 5½	3,450	2¾	2¾	5M710
5½ to 4½	4,190	4¼	3½	5M775
4½ to 3½	5,330	4¼	2¾	5M750

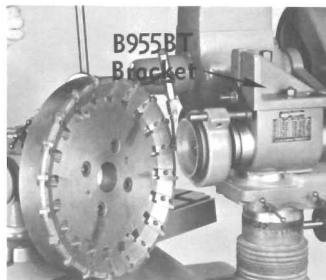
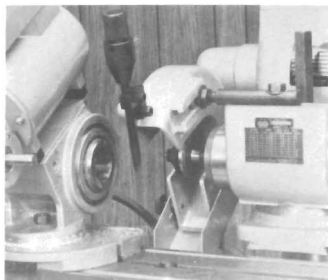
Other arbors shown in Photo 8 are the standard internal grinding arbors (B780J, B780K, and B780C) which are held in the left end of the spindle by an inner taper lock and threaded end. Tighten these arbors in place by using an open-end wrench while holding the spindle shaft with a wrench at the right end. The ½ inch and ¼ inch threaded-shank mounted wheels screw into the B780J and B780K arbors. ½ inch and ¼ inch straight-shank mounted wheels fit into the collet assembly of the B780C arbor. Mount the straight-shank wheels as close as possible to the collet face. The straight shank should be seated into the collet at least ¾ inch.

- ii. Heavy Duty for Universal Grinders with the B955HD Head: The S6055CL heavy duty cartridge spindle (Photo 9) has an operating speed range of 1,150 to 7760 R.P.M. Mount the belt pulleys as shown in Photo 9 at the right side of the spindle. Mount the pulley first, then the keyed wheel flange and nut. Use the B628 wrench to tighten the nut while holding the pulley by hand or holding the shaft stationary with the B936W spanner wrench. The latter wrench holds either the collet itself (BY TWO REAR FACE HOLES) or its locking left-hand nut. The 936P wheel puller is used to extract wheel collets from the taper of the spindle. Remove the locking nut, screw on the puller to the collet, and then with the spindle held still, tighten the inner thrust bolt with the spanner wrench end or other wrench.

Mount wheels to the B936CL wheel collets by first mounting the collet to the spindle tapered shaft. Clean the tapered surfaces, mount the collet, then the nut, and while holding the spindle with an open-end wrench at the spindle's right end, tighten the nut with the B936W wrench. The body of the S894 wrench may be used as a lever in the U-shaped end of the spanner wrench. Once the collet body is locked to the spindle, remove the ring nut, keyed washer, and wheel spacer. Clean these items. Re-mount the wheels spacer which, when removed, allows for the mounting of 8 inch by ¾ inch wide wheels. Mount the wheel, the keyed washer, and the collet ring nut. Holding the spindle at the right end, tighten the collet nut with the B936W spanner wrench. See Part I of this section for safety precautions when wheels are being mounted.

- (e) Wheel Guards: For straight, cup, or saucer wheel grinding, with the

4, 6, or 8 inch dry guard the B955BT vertical T-slot bracket is used. The bracket is mounted to the spindle housing horizontal surface (SEE INSET). The wheel guard is mounted with the use of the accompanying wheel guard bracket (SEE INSET). Photo above shows



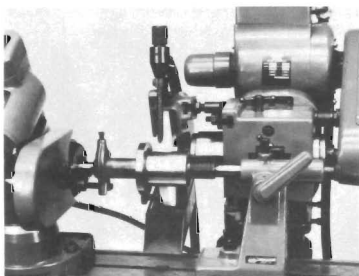
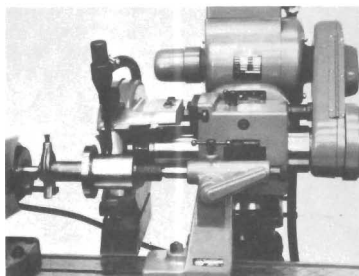
the B935GS wet wheel guard which is used with the B935 and B2035 coolant attachments. This guard handles wheels up to 7 inches in diameter and attaches to B955 or B955HD grinding heads. Always keep B923CL motor shaft guard on unused shaft end as shown.

- (f) Wheelhead Speed Charts: Follow the pulley and wheel size recommendations on the plate on the front of the grinding head. These combinations provide for safe wheel speeds while obtaining sufficient surface feet per minute. **WARNING:** Incorrect wheel speed for the size and type of wheel can cause dangerous wheel destruction. B6055B and S6055CL Speed Charts for these models are listed on page 14.

3. **UNIVERSAL GRINDING HEADS FOR B6060 AND B6062 MODEL SERIES:**

- (a) Tilting Wheelhead: These universal heads differ slightly from those described in D-2(a) and (b), in that the bracket that constitutes the upper swivel in (3) Photo 4 has two other swivel brackets at right angles to its vertical faces, allowing the motor and spindle to "tilt" from the horizontal plane as much as 22 degrees either side of center. Socket screws (8) Photo 4 loosen the swivel, allowing the operator to tilt the spindle to the angle desired, as read from the dial at the top of the upper swivel bracket.
- (b) Spindle speeds, varied by changing V-belts and pulleys on the motor and spindle, are the same as described in D-2. The cartridge spindle locking screw is at (4) Photo 4 and this allows the spindle to be moved relative to its housing for alignment of the pulleys.
- (c) Swivels in the horizontal plane: The lower swivel is the cap for the column and constitutes the lower half of the dovetail slide. The hex socket nut for locking this swivel is located at (12) Photo 4. The upper swivel bracket rests on the dovetail slide and is held in place by hex nut (11) Photo 4 in the center hollow portion of the swivel. Both swivels have 360 degree calibration with an index marking point.
- (d) Dovetail Extension: This slide is the same as described in D-2(c), located at (13) Photo 4.

- (e) Spindles, Pulleys, and Wheel Mounting:
- i. High-Speed for standard Universal Grinders with B6055 Head: The B6055A spindle (Photo 8) has normal speed range of 3,450 to 17,250 R.P.M. The B6055F pulley and wheel arbor has the same function as the one described in D-2(d), with the exception that it uses a face lock rather than a taper lock principle. I.D. arbors B6055JS, B6055JL, and B6055C have the same function as those described in D-2(d). While one of these arbors is being mounted on the spindle, the spindle is held at the right end by the B855W wrench applied to the flat portion of the shaft. Pulleys for this spindle lock on its tapered right end in the manner described in D-2(d) for heavy duty spindles.
 - ii. Heavy Duty for Universal Grinders with B6055HD Head: The B6062A heavy duty cartridge spindle (Photo 9) has an operating speed range of 2,840 to 5330 R.P.M. Mount wheels and pulleys in the same manner described in D-2(d) for heavy duty spindles. Note that the right-hand pulley may be either a plain V-pulley or the B936CV Collet and Pulley, but in either case these pulleys employ a taper lock onto the spindle shaft.

**B6035 Coolant System****B6035HD Heavy Duty Coolant System**

- (f) Wheel Guards: Guards for wheels of 4, 6 or 8 inch diameter are mounted with the use of the accompanying bracket to the left vertical surface of the spindle bracket. A drilled and tapped hole is provided at the right side of the spindle bracket for mounting the same guards when a wheel is mounted on the B936CV wheel collet. The inset shows the B6035 coolant system with B935GS 7 inch wet wheel coolant guard adapted to the B6060 grinder series. The B6035HD heavy duty coolant with B6035G wet wheel guard is used on the B6062 series with 8 inch diameter wheels. Always keep B923CL motor shaft guard on unused shaft end.
- (e) B6055A and B6062A Speed Charts for these models are listed on page 15.

E. Swivel Table Adjustments for Taper and Clearance:

1. All machines have an upper work table known as a swivel table (20) Photo 5. Its primary function is to allow tapers to be ground on a variety of tools and work pieces. The table is freed for adjustment by loosening the two

clamp bar socket screws (9) located at the right end of the table. Use the swivel table adjustment screws (8) to align it with the sub-table. When the pointer (11) mark aligns with the 0 line on the index plate (10), the two tables are aligned. If greater accuracy than a sight scale is needed, use a test arbor between tailstocks in conjunction with a dial indicator to measure exact taper in inches per foot. The index plate is calibrated in inches per foot up to 3 inches either side of center.

2. The swivel table is also used for setting clearance angles on cutters which have been mounted by various means on the table. The index plate is calibrated up to 15 degrees either side of center. For large clearance angles, or when additional distance between the work and the wheel is needed, the swivel table may be pivoted on its central hub so as to cause its ends to leave the bed rests on the sub-table. The center hub is calibrated 360 degrees and utilizes two friction socket screws (12) Photo 5 which may be tightened for additional stability when the clamp bar cannot be used.

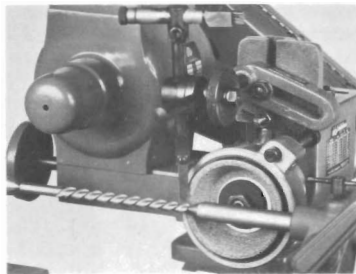
F. Tailstocks and Workheads:

1. Tailstocks are used to hold cutters and other work which must be mounted on straight arbors. With the exception of the B6060 and B6062 series grinders, all machines have tailstocks with centers at a height of 4.130 inches above the swivel table. The former models have a height of 6.130 inches above the swivel table. Tailstock centers (RIGHT AND LEFT) on both of the B922 and B6022 sets are interchangeable. Each center's flat side may be faced in either of four positions — up, down, front, or rear, when the handle locking screw (21) Photo 5 is loosened sufficiently. The right-hand tailstock has a tension adjustment threaded plunger (15) which is adjustable by hand. Lever (16) is used to retract the right-hand center from the work during loading and removal of work between the centers.
2. Before mounting the tailstocks to the table, clean the table and check for any table surface roughness that might affect the bedding of the stocks to the table. The tailstocks are mounted to the grinder table by keeping the special T-slot bolts loose and sliding the head of each bolt into the table T-slot (FROM THE CENTER OR END OF THE TABLE), while still attached to the tailstock. Position the tailstocks to the desired location and align the bases to the table by tightening the clamp bar assembly at the front base of each with the hex socket screw (13). Be sure that the T-slot blocks of each tailstock drop into the grinder table slot. Finally, tighten the nut on each T-slot bolt, thus locking the tailstocks firmly to the work table.
3. Workheads (NOT STANDARD EQUIPMENT) are mounted to the table in the same manner as tailstocks. Their base plates must be aligned with the work table before tightened down with T-slot bolts. Most workheads have swivel elements which allow the spindle axis to be rotated in the horizontal and vertical planes. All swivels are calibrated in degrees with an 0 index mark reading.

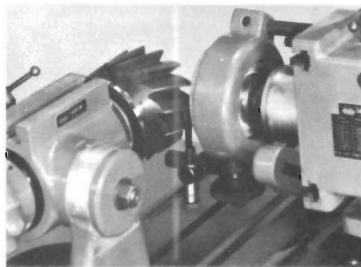
G. Using Diamond and Wheel Dressers to True and Dress the Wheel:

1. The B640K and B6040K diamond dressers (see standard equipment, pages 96, 97, 99) contain a diamond nib which may be rotated periodically in its column mounting. The dresser mounts to the table with a T-slot bolt. Observe the following steps when the dresser is to be used.

- (a) Lower the wheelhead so that the spindle shaft center is slightly above the diamond point.
- (b) Slant the axis of the nib at an angle of about 15 degrees from perpendicular to the wheel to be dressed.
- (c) Using the crossfeed to advance the diamond to the wheel, traverse the diamond across the face of the wheel, using the table handwheel, with transmission in low ratio. Truing the wheel, a process that makes the periphery run concentric to the spindle shaft, is accomplished by taking cuts into the wheel of no more than .001 inch per pass. Truing is usually confined to straight wheels on tool and cutter grinders. Dressing passes are very light, with the table speed varied depending on how "open" the operator wishes to leave the wheel.
- (d) Dressing is a process of restoring the cutting sharpness of the wheel, and, while it may employ the use of the diamond dresser on occasion, this can also be accomplished with a 'dressing stick' or a mechanical rotary truing device such as the K. O. Lee abrasive wheel dresser. When a dresser such as the EI is tilted slightly to one side and allowed to run against a rotating wheel, it will remove slight run-out quickly and restore cutting sharpness by its cleaning action. The EI can also be used to form wheel edges and special shapes.



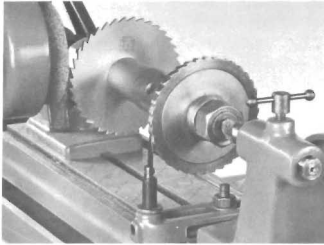
BA940



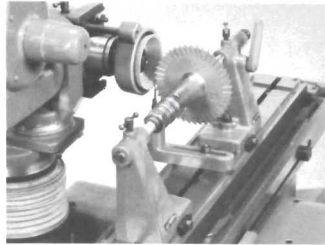
B6040

H Toothrests and Height Gauges:

1. The insets show the BA940 and B6040 Universal Toothrests set at typical locations on tool and cutter grinders and on universal grinders. Note that only the B6040 toothrest used on tilting wheel head grinders can be placed on the wheelhead with blade from below the wheel, for purposes of grinding down at the point of contact with the cutter. Universal toothrests may also be placed on the grinder table or workheads as shown in photos in Section Five. This mechanism, with a spring-loaded rocker, is used to "roll" a cutter about its mounting axis for clearance angle settings when the rest is placed directly on cutter teeth. The short micrometer rigid toothrest (B940H) is used in the same manner where the cutter is moved away from the rest when indexing to the next tooth. Consult Section Five, Chapter 1 for discussion of toothrest positions.
2. The B827 and B6027 plain (MICROMETER) toothrests are placed on the grinder table and usually used in conjunction with an index disc on a



B827 Plain Micrometer Toothrest



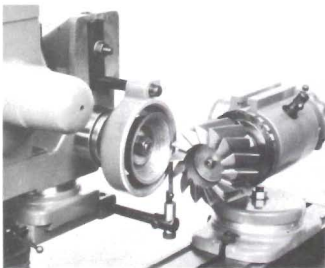
B6027 Plain Micrometer Toothrest

straight arbor, shown in the inset. They may also be used to index cutter teeth directly. They have a micrometer extendable barrel assembly to hold various blades.

3. Height gauges B939 and B6039 are used to set the wheel spindle axis at the same height as the centers of tailstocks or workheads. They are also employed for putting the face of a cutter tooth to be ground at the height above the table as the cutter's center. Use the inside of the 'V' portion of the cast sliding pointer for locating the center of work without center holes.



The diamond shaped pointer plate has two surfaces (ONE ON TOP, ONE ON THE BOTTOM — SEE INSET) which are exactly at the same height in a horizontal plane. This is for the purpose of quickly setting the toothrests relative to a cutter tooth. Consult Section Five, Chapters 1 and 3 for this procedure.



B955PC Dovetail Clamp, standard with all universal models, is shown mounted on Dovetail Slide. Arm and B940H Micrometer Tooth Rest (parts of BA940 Universal Tooth Rest) are extended from the B955PC for this setup, which allows cutters to be ground with wheel rotating downward, by placing teeth faces onto tooth rest in this position.