WARRANTY

BOYAR-SCHULTZ provides a warranty, to the original owner, that all equipment and accessories manufactured by them are to be free from defects in material and workmanship for a period of one year, when properly lubricated and maintained.

A business reply warranty card is shipped with each machine. Fill out and return this card upon delivery to assure your rights under the guarantee.

BOYAR-SCHULTZ, following a policy of continuous improvement of all its products, reserves the right to change specifications or design at any time without notice or obligation.

HANDLING

Remove the machine from its shipping crate.

CABINET BASE: Lift by means of the studs located on either side of the machine bed and the crossfeed handwheel housing.

CAST IRON BASE: Fork lift under the base from the rear of the machine.

Lifting in any other manner may impair the precision to which this machine was manufactured.

INSTALLATION

Set the machine in place and level, adjusting the base leveling screws with the wrenches furnished, to obtain maximum grinding quality and to permit the lubrication system to operate efficiently.

Remove the table from its crate and clean thoroughly. Lubricate the ways and rack as recommended in the lubrication chart. Clean the table carriage ways and pinion carefully; set the table in place, sliding it back and forth until the pinion engages the rack.

SAFETY

Certain federal, state, and local safety regulations must be adhered to in the operation of any machine tool; the importance of operator safety must not be neglected.

The safe operation of this machine will be maximized when these "rules" are followed:

1. Wire the machine according to the local electrical code.
2. Install the machine with adequate "body" clearance beyond the maximum travels.
3. Always wear protective eyeglasses.
4. Check wheel rotation: it must be clockwise.
5. Do not operate the grinding wheel faster than the speed shown on the wheel blottter.
6. Before starting machine, verify that the wheel is secure and the mounting wrenches removed.
7. Do not operate the machine without the wheel guard or end guards.
8. Verify that the work is secure and/or the magnetic chuck energized.
9. Verify that the grinding wheel clears the work.
10. Disengage the longitudinal handwheel before operating the machine vertically.
11. Place all hydraulic controls in the "off" or "neutral" position before starting machine.

ACCURACY

This grinder is manufactured to the highest degree of precision. The following minimum standards have been verified before it was released for shipment.

SPINDLE RUN-OUT: The spindle must run concentric within .0001; checked at two points on the spindle taper.

FLATNESS: The working area of the table or chuck must be flat within .0002.

CROSSFEED TRAVEL: The table must track parallel to the spindle axis within .0003 in 6 inches.

LONGITUDINAL TRAVEL: The table must track square to the spindle axis within .0002 in 12 inches.

SQUARENESS: The spindle axis must be square to the table working area within .0006 in 12 inches of vertical travel.

A quality assurance report, indicating manufactured accuracy, is included with this grinder.

LUBRICATION

The way surfaces, positioning screws and other moving parts are meter lubricated through a sintered bronze filter which assures clean oil distribution. A sight gap indicates oil level and the reservoir is replenished through the conveniently located oil cup.

The lubrication system is non-recirculatory, the used oil collected in a container located on the rear of the machine cabinet base or inside the heavy duty base. Empty the container weekly.

Clean or replace the filter every six months. Follow the procedure outlined on drawing 103443. Use lubricant recommended on lubrication chart 101249.

The automatic lubricator produces one shot of oil per minute. This frequent interval results in less oil required per cycle, reducing the probability of table lift. The volume of oil delivered per cycle is adjustable and has been preset at the factory. Follow the procedure outlined on drawing 103443 to adjust this flow.

GRINDING WHEEL

The grinding wheel is mounted on an adapter with a horn tapered to fit the spindle nose. Wrenches are provided to secure the grinding wheel to the adapter and the adapter to the spindle nose. DO NOT "hammer" the wrenches to tighten or loosen the grinding wheel or adapter, the spindle bearing life will be reduced significantly.

The grinding wheel is readily accessible through the hinged cover and easily changed with the wheel puller and wrenches provided.

Vibration is reduced to a minimum and surface finish potential increased when a balanced grinding wheel is used. Consult your local responsible grinding wheel representative for recommendations to suit your specific requirement.
SPINDLE

The spindle, supported by super-precision ball bearings, permanently lubricated and pre-loaded to take up end thrust, is directly coupled to a dynamically balanced drive motor.

Incorporated into the spindle design are proper mount- ing, lubrication and protection methods. These factors with spindle speed and bearing load determine bearing life.

It is recommended that the spindle be returned to the factory as an integral unit when repair is deemed necessary. Inspection and repair are facilitated in this manner.

Follow the procedure outlined on drawing 102916 for proper spindle disassembly. Follow the procedure outlined on drawing 102916 to check or change motor coupling.

SPINDLE OPTIONS

DUPLEX BEARING MOUNT: The spindle nose is supported by a matched, pre-loaded pair of super precision ball bearings to provide exact radial and axial positioning as well as increased rigidity and radial load capacity. This design should be specified when the primary machine function is slot or face grinding, or when heavier than conventional cuts are anticipated.

BELTED SPINDLE DRIVE: The spindle is driven through a poly-vee pulley system to obtain a speed other than that provided by the motor. Available speed range is 2200 R.P.M. to 6000 R.P.M.

REMOVABLE CARTRIDGE SPINDLE: The housing is designed to accept an integral spindle to expedite dis-assembly when spindle repair is required. Reduce down time by stock- ing a spare cartridge.

TABLE

The grinder table is manufactured from a rugged casting, controlled in hardness and scientifically heat treated to remove all stress. Driven through a rack and pinion system, the table tracks on one flat way and one vee way, precision ground and grooved to permit proper lubricating oil distribution. The table working surface is final ground on the grinder and checked with an electronic gage to assure specified flatness and square- ness tolerances.

Clean and liberally lubricate the way surfaces every three months. Consult the lubrication chart for the recommended lubricant.

TABLE WAY OPTIONS

HARDENED WAY: Hardened tool steel strips are mounted to the table to provide longer life. The accuracy standards and maintenance instructions outlined for the soft way table apply.

The hardened way table, standard equipment on all hydraulic model grinders, is an available option on all handwheel model grinders.

TEFLON WAY: Bronze impregnated teflon strips are mounted to the table to provide longer life and more effortless operation. The accuracy standards and maintenance instructions outlined for the standard table apply.

The teflon way table is an available option on all table carriages.

TABLE CARRIAGE

The table carriage is manufactured from a rugged cast- ing, controlled in hardness and scientifically heat treated to remove all stress. Topside, one flat way and one vee way, precision ground and hand spotted, provide the longitudinal track for the table. Two precision ground bottom ways travel on the precision ground and hand spotted bed ways. The table carriage is motivated by a precision ground Acme threaded screw, housed in a bracket attached to a precision ground rectangular key, which is fixture positioned to insure alignment within specified tolerances and tracks between a stationary gib and a set of adjustable tapered gibs which have been properly adjusted at the factory.

A carriage lock is provided for uses when face or slot grinding. This lock must be released when operating the grind- er conventionally.

Follow the procedure outlined on drawing 102917 to adjust the tapered gibs or the carriage lock.

HANDWHEELS

CROSSFEED: The dull satin chromed crossfeed handwheel, with zero setting slip ring, is black line engraved in easy to read gradations of .001". Each revolution is equivalent to .001" of table crossfeed travel.

TABLE FEED: The table feed handwheel transmits longitudinal motion to the table through a vibration free rack and pinion assembly. Each revolution is equivalent to approximately .001" of table longitudinal travel. For operator convenience, the table feed handwheel may be oriented to the required work stroke. Follow the procedure outlined on drawing 102918 to engage or disengage this handwheel.

ELEVATING: The dull satin chromed elevating handwheel, with zero setting slip ring, is black line engraved in easy to read graduations of .0005". The pointer is graduated in a vernier scale to allow read- ing to .0001". Each revolution is equivalent to .005" of spindle vertical travel.

The rotating "Feel" of the elevating handwheel is factory adjusted. Follow the procedure outlined on drawing 102919 to adjust this "Feel."

HANDWHEEL OPTIONS

CROSSFEED: Accurate crossfeed table positioning is accomplished through a friction lock, which overrides the crossfeed handwheel, engaging the dull satin chromed dial setting crossfeed adjusting knob, which is black line engraved in easy to read graduations of .0005". Each revolution is equivalent to .001" of table crossfeed travel. Handfed grinders equipped with this option are furnished with a backlash free crossfeed screw and nut assem- bly.
ELEVATION: Fine spindle positioning is accomplished through a large dull satin chrome zero setting slip ring which is black line engraved in easy to read graduations of 0.0001". Each revolution is equivalent to 0.25° of spindle vertical travel.

HYDRAULIC RESERVOIR
PORTABLE: Position the hydraulic reservoir along the right side and toward the rear of the machine base. Two hydraulic hoses are located in the top compartment of the reservoir. Connect these hoses as outlined on drawing 103420. Fill the reservoir with hydraulic fluid as recommended on lubrication chart 101245. Insert the pump electrical plug into the receptacle located on the rear of the machine bed.
BUILT IN: The hydraulic reservoir is located inside the machine base. Remove the screws which secure the rear cover exercising caution so as not to damage the cooling fan line cord. Slide the reservoir out for accessibility, remove the top cover and fill the reservoir with hydraulic fluid as recommended on lubrication chart 101245.

The level of hydraulic fluid must not be permitted to fall below the top of the filter screen as air will be taken into the hydraulic system causing erratic operation. This condition may also be encountered in the initial installation or after a prolonged idleness. Completely cycling each cylinder twice will generally eliminate the air accumulation.

To insure long, trouble free operation of the hydraulic system, change the hydraulic fluid and clean the filter screen, line filter and reservoir every 6 months.

The hydraulic system pressure has been set at the factory and requires no further adjustment.

ELECTRICAL CONTROL
HANDFEED: An "across the line" two position starter switch, located on the right side of the machine base, is provided. Verify compliance with all safety rules before operating machine.

HYDRAULIC: A 110 volt motor control with overload protection, located on the right side of the machine base, is provided. Verify compliance with all safety rules before operating machine.

HAND OPERATION
1. Verify compliance with all safety rules.
2. Place all hydraulic controls in the "off" or "neutral" position.
3. Move table reversing dog to outermost position.
4. Engage table feed handwheel.
5. Disengage longitudinal cylinder rod.
7. Positioning operation
   A. Rotate the table feed handwheel clockwise to move the table right approximately 3/16" per revolution.
   B. Rotate the crossfeed handwheel clockwise to move the table in 0.002" per revolution.
   C. Rotate the elevating handwheel counterclockwise to move the wheelhead down 0.050" per revolution.

HYDRAULIC OPERATION
1. Verify compliance with all safety rules.
2. Place all hydraulic controls in the "off" or "neutral" position.
3. Engage table feed handwheel.
4. Disengage longitudinal cylinder rod.
5. Disengage table feed handwheel.
7. Adjust the stop dogs to suit the length of work stroke desired.
8. Positioning operation
   8A. Single axis (longitudinal)
      A1. The longitudinal table speed is variable, the rate set by the table speed control with the main control in the "on" position.
      A2. Rotate the crossfeed handwheel clockwise to move the table in 0.100" per revolution.
      A3. Rotate the elevating handwheel counter clockwise to move the wheelhead down 0.060" per revolution.
   8B. Two axis (longitudinal, crossfeed)
      B1. The longitudinal table speed is variable, the rate set by the table speed control with the main control in the "on" position.
      B2. The table will crossfeed in the direction dictated by the crossfeed directional control. In increments as set by the crossfeed control, with the main control in the "on" position.
      B3. Rotate the elevating handwheel counter clockwise to move the wheelhead down 0.050" per revolution.

WHEEL DRESS (Two axis)
1. Verify compliance with all safety rules.
2. Place all hydraulic controls in the "off" or "neutral" position.
3. Engage table feed handwheel.
4. Position diamond to correct relationship with grinding wheel.
5. Disengage table feed handwheel.
7. Place the main control in the "wheel dress" position.
8. Positioning operation
   A1. The longitudinal travel is disengaged.
   A2. The table will crossfeed in the direction dictated by the crossfeed directional control at the rate governed by the wheel dress speed control.
   A3. Rotate the elevating handwheel counterclockwise to move the wheelhead down 0.050" per revolution.
1. FILL RESERVOIR WITH OIL AS RECOMMENDED ON LUBRICATION CHART.
2. AFTER FILLING, HAND PUMP SEVERAL TIMES UNTIL AN OIL FILL APPEARS ON THE WAY SURFACES.
3. LUBRICATOR OIL FLOW HAS BEEN PRE-SET AT THE FACTORY. TO ADJUST VOLUME, LOOSEN HAND PUMP KNOB AND ROTATE COUNTER-CLOCKWISE TO INCREASE STROKE, SECURE NEW POSITION OF KNOB WITH THE JAM NUT.
4. DO NOT ALLOW OIL LEVEL TO FALL BELOW THE SIGHT GLASS.
5. CLEAN OR REPLACE FILTER EVERY SIX MONTHS.
6. FILTER REMOVAL - REMOVE RESERVOIR RETAINING SCREWS AND RESERVOIR, CLEAN RESERVOIR, REMOVE RETAINING RING AND FILTER, CLEAN FILTER.
OPTIONAL EQUIPMENT AND ACCESSORIES

Magnetic chuck — permanent and electric
Duplex bearing spindle
Removable cartridge spindle
Belt drive spindle — 2200 R.P.M. to 6000 R.P.M.
Hardened ways mounted on table
Bronze impregnated teflon ways mounted on table
Fine 1/10th direct reading dial setting crossfeed adjust-
ment
Riser block for added work height — 2", 3" and 4"
Adjustable table stop — standard anti-chipping
Heavy duty cast iron base
Dust collector — built into base
Dust collector — portable
Mounted work light
Wet coolant system — 5 gallon and 10 gallon capacity
Power spindle elevation
Electric controls — Y10 Volt, NEC or JIC
Over the wheel dresser
Grinding wheel balancer
High speed grinding attachment
Precision wheel former
Diamond hulk/diamond mounted

WHEEL DRESSING AND CHUCK GRINDING PROCEDURE

1. WHEEL:
   8" diameter 60 H

2. COOLANT:
   Always use adequate coolant flow or spray mist.

3. FINISH:
   A commercial finish provides a good non-slip surface for work holding. (It
   is not advantageous to strive for a mirror-like finish.)

4. DRESS:
   Always grind with a free cutting wheel dressed by removing approximately
   .001" per diamond pass using a milder-
   ate to fast crossfeed rate.
   (Grinding with a finely dressed wheel may glaze, heat and/or expand the
   chuck surface resulting in hollow spots directly affecting chuck accuracy).

TO GRIND BOTTOM

1. Loosen chuck in "off" position.
2. Place chuck, top down, on the machine table
   and secure both ends with hold down clamps to
   prevent shifting.
3. Grind, removing .0003" per pass using .001" cross-
   feed increment, until surface is cleared up.
4. Dress wheel, as indicated, after each crossfeed pass.

TO GRIND TOP

1. Place chuck, top up, on the machine table tightening
   hold down clamps just enough to prevent shifting.
   CAUTION: Over tightening may distort chuck base
   and/or machine table.
2. Place chuck in "on" position.
3. Grind, removing .0003" per pass using .001" cross-
   feed increment, until surface is cleared up.
4. Grind one pass removing .0001"
5. Dress wheel, as indicated, after each crossfeed pass.

MAGNETIC CHUCK

GRINDING INSTRUCTIONS

A chuck factory mounted on the machine table has been
ground to established accuracy standards. Further grind-
ing is not required until wear indicates the need.

A chuck furnished unmounted must be ground on the
up and bottom surfaces.
## SPECIFICATIONS

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NOTES:

1. FOR HYDRAULIC OPERATION:
   a. Make all hydraulic connections in the "off" and "unfluid" position.
   b. With the actuator rod, move the table left to the right to the position desired.
   c. The plunger knife must be the table right to the left to the position desired.
   d. The plunger knife before the table right to the left to check the position desired.

2. FOR HYDRAULIC CONNECTION:
   a. Make the actuator rod, move the table left to the right to the position desired.
   b. The plunger knife must be the table right to the left to check the position desired.
   c. The actuator rod, move the table left to the right to check the position desired.

3. FOR HYDRAULIC CONNECTION:
   a. Make the plunger knife before the table right to the left to check the position desired.
   b. The plunger knife before the table right to the left to check the position desired.
   c. The actuator rod, move the table left to the right to check the position desired.

4. FOLLOW OPERATION INSTRUCTION.

NOTE:

PERIODIC TABLE ACTION AFTER INITIAL OPERATION OR AFTER RECONSTRUCTION CHANGING IS DUE TO AIR IN THE HYDRAULIC SYSTEM
CHEMICAL WATER TO VERIFY THE HUMANLY MOUTHED, SPIN THE TABLE, HYDRAULICALLY IF NOT ADJUST TO WORK THE AIR OUT OF THE SYSTEM.