#17720

Care and Use of . . . .
BOYAR SCHULTZ MODEL 6-12
SURFACE GRINDER

CAPACITY-Boyar-Schultz Model 6-12 Surface Grinder, a 6 x 12 machine with actually 7 inch cross feed travel . . . one inch more than the indicated 6 inches. Longitudinal travel is 13 inches and vertical travel of spindle is 11½ inches.

SPINDLE—This is the "working unit," the very heart of the machine, and is designed for very close tolerance, smooth finish grinding; supported at each end by over-size, pre-loaded, radial thrust, super precision ball bearings. Spindle is motivated by a special ½ H.P. motor and connected to motor by precision made pulleys and V Belt. Sturdily built, it will absorb the heavy demands put upon it during a long period of time.

TABLE—Best material, stress and strain relieved. Made with one Vee way and one Flat, ground and scraped for smooth operation.

LONGITUDINAL TABLE ACTION-Obtained by conventional hand wheel and also by Rapid Traverse Table Lever. Either may be disengaged while the other is in use. Large Hand Wheel provides extra leverage.

TABLE CARRIAGE—Table travels on two flat precision and hand scraped ways, mounted on main grinder base. Cross feed travel is actuated by lead screw supported by ball and needle bearings and located between table ways. Neoprene Accordion Sleeve seals lead screw from dirt and abrasive dust. A *Cross feed binding screw* stops transverse motion when desired.

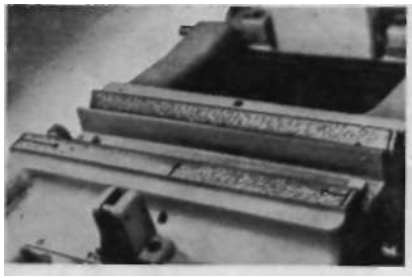
SPINDLE ELEVATING SCREW-Supported by ball thrust bearings and operated by a set of carefully selected bevel gears. Responds instantly to slightest movement of hand wheel because radial thrust bearing provides constant tension between hand wheel shaft and vertical screw.

HAND WHEELS—placed to afford greatest convenience and are fitted with needle bearings for easy operation. Vertical feed graduated in half thousandths; cross feed in thousandths. Working part enclosed for maximum protection from abrasive dust.

NEEDLE BEARINGS—Five sets of needle bearings are used in Model 6-12 Surface Grinder for long wear and easy operation.

OILING OF TABLES-In keeping with Boyar-Schultz progressive designing policy, the oiling system for the longitudinal and cross feed tables, cross feed screw and longitudinal hand wheel has been improved to eliminate 8 of 9 oil cups, and at the same time provide for better, more positive one point lubrication. (see illustration below)

ADJUSTABLE LIGHT-Full visibility is possible with light which is adjustable to any position.



Showing the Improved oiling system developed for Model 6-12 Surface Grinder.

Wheel Capacity. 7 inch diameter, ½ inch thickness. 1¼ inch diameter hole size.

Spindle Elevating Screw. Selected bevel gears, supported in Oilite bearings.

View Showing the new Streamlined stand.

GENERAL INSTRUCTIONS

HANDLING

Remove the top and sides of the machine crate. Take out the screws that secure the machine to the crate base.

Lift the machine by means of the cross feed handwheel housing and the two lifting studs found on the sides. Lifting in any other manner may damage the machine. The lifting studs may be unscrewed when the machine is permanently situated.

INSTALLATION

The rubber pads must be placed at the corners under the grinder and grinder stand. Special wrenches are supplied with each machine to adjust its legs. The machine must be leveled to permit the lubrication system to operate properly.

Remove the grinder table from its crate and clean thoroughly. Oil the table ways and grease the rack with the lubricants recommended in the lubrication chart. Clean the grinder carriage ways and table pinion. Set the grinder table in place gently, moving it back and forth until the table pinion engages the rack.

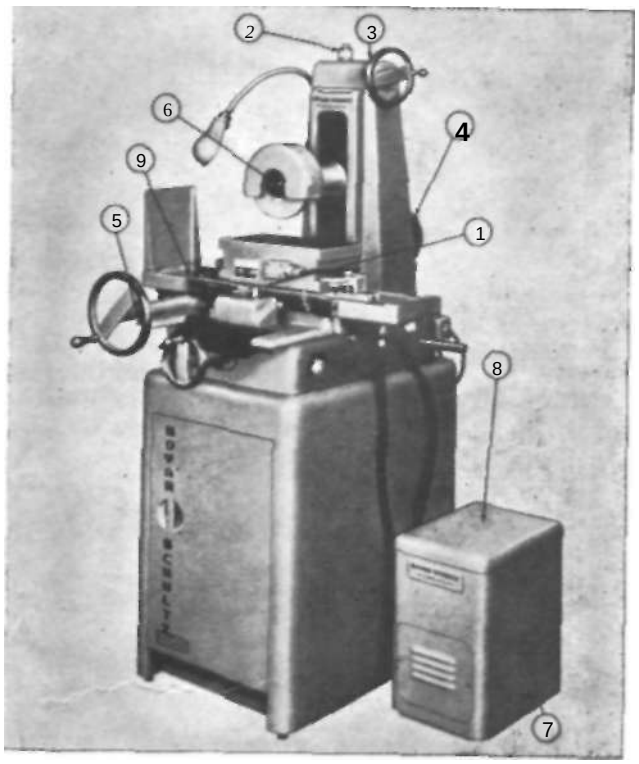
Loosen the two wing nuts that hold the column rear dust cover. Remove the dust cover by sliding it upward. Clean the column ways and lubricate them with the same oil used on the table ways. Replace the column rear dust cover and secure the wing nuts.

LUBRICATION

The table oil cup lubricates the cross feed screw and the table and cross feed ways. The large oil-cup on top of the column cap lubricates the column ways.

The elevating handwheel, rapid traverse handle and spindle motor have their individual oiling points.

Follow the recommendations found in the lubrication chart for the lubrication of the machine.



LUBRICATION CHART

POSITION	OILING PERIOD	LUBRICATING INSTRUCTIONS	LUBRICANT		
			SOCONY VACUUM OIL CO.	SHELL OIL CO.	THE TEXAS OIL CO.
1	DAILY	FILL CUP	VACTRA OIL HEAVY MEDIUM	TONNA OIL #33	CAMOPUS OIL-D
2	TWICE WEEKLY	FILL CUP	"	»	"
3	WEEKLY	10 TO 20 DROPS	"	"	"
4	EVERY 1000 HOURS	30 TO 70 DROPS	"	"	"
5	DAILY WHEN USED	LIBERALLY	"	"	"
6	PERMANENT	AT TIME OF OVERHAUL	B.R.B. LIFETIME GREASE	ALVANIA GREASE # 2	STARFAX GREASE # 2
7	AFTER 6000 OPERATING HOURS	HAND PACK	"	"	"
8	SEMI ANNUALLY	3 GALS.	D.T.E. LIGHT OIL	TELLUS OIL #27	REGAL OIL A-(RSO)
9	SEMI ANNUALLY	HAND PACK	SQUAREX GREASE # 1	ALVANIA E.P. GREASE # 2	NOVA GREASE # 1

SPINDLE

The spindle has been designed and manufactured to maintain long accurate life. It is permanently grease packed and is equipped with preloaded, super precision ball bearings. The spindle is connected to the spindle motor by means of a "V" belt. The tension of the belt has been set at our factory.

To readjust the belt tension, remove the column rear dust cover and loosen the four bolts that hold the motor mounting bracket to the spindle housing. The motor mounting bracket may now be moved up or down to produce the desired belt tension. Tighten the mounting bolts and replace the dust cover.

NOTE: It is recommended that the spindle be sent back to the factory as an assembled unit when repair is deemed necessary. Inspection and repair is facilitated when the spindle is received by us in this manner.

TO REMOVE SPINDLE HOUSING ASSEMBLY

(1) Use elevating handwheel to move spindle vertically to central location on vertical column.

(2) Remove grinding wheel, adapter, and wheel guard from spindle. Remove front dust cover.

(3) Remove rear dust cover.

(4) Remove cover at top of vertical column.

(5) Drive out taper pin securing elevating handwheel pinion gear to elevating handwheel shaft and remove gear.

(6) Remove (4) hex. head cap screws securing motor mounting bracket assembly to spindle. Lift up assembly to release the motor pulley from the belt. Carefully remove motor assembly.

(7) Remove belt from spindle pulley.

(8) Place support blocks between lower edge of spindle and tie brace of spindle column at rear of machine. Also place support blocks between lower edge of spindle housing and table at front of machine.

(9) Inside the vertical column under the bevel gear, on the elevating screw will be found the threaded head elevating screw collar. Remove the set screw that secures the collar to the elevating screw. You can then unscrew collar and allow to pass over elevating screw threads.

(10) At top of column, unscrew hex nut and remove bevel gear. IMPORTANT: Care mast be taken to eliminate all possibility of the spindle housing falling while removing elevating screw.

(11) Remove spindle housing assembly from front of machine. Do not disassemble the spindle unit before shipping, such a procedure will make it difficult to determine the cause of failure.

GRINDING WHEEL

The wheel is mounted on an adapter which, in turn, is mounted on the spindle. A special wheel mounting wrench, furnished with each machine, fits the wheel nut which holds the grinding wheel on the adapter and the nut which holds the adapter on the spindle. One grinding wheel is furnished with your machine. The various responsible manufacturers of grinding wheels will gladly give you information on special wheel needs.

GRINDING WHEEL ADAPTER

A wheel puller has been furnished to remove the grinding wheel adapter from the spindle. To remove the adapter, remove the wheel nut with the spanner wrench provided and screw the puller into the wheel adapter. Tighten the puller a screw until the wheel adapter slips off.

WET GRINDING

All machines may be adapted for wet grinding, but unless otherwise ordered the machine is sent equipped for dry grinding only. Information describing the additional equipment required for wet grinding will be sent on request.

GRINDER TABLE

The grinder table is a rugged, close grained casting, controlled in hardness and scientifically heat treated to relieve all internal stresses. The table slides on hand scraped ways. One "V" and one flat.

The table working surface has been ground and checked on the machine itself to insure flatness and squareness to the spindle. The table ways are grooved to permit proper distribution of the lubricating oil.

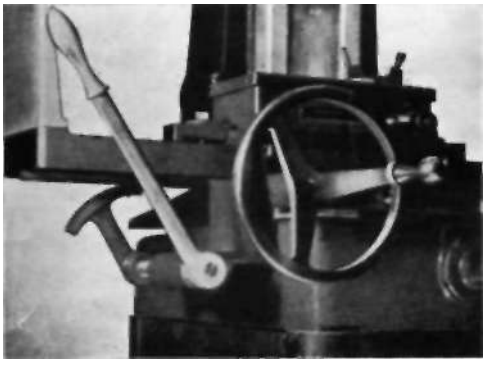
Remove and clean the table ways weekly.

GENERAL INSTRUCTIONS

TABLE FEED HANDWHEEL

The table feed handwheel is the large handwheel on the left front of the machine. One complete revolution of this handwheel moves the table 3-½".

Moving the handwheel transmits motion through the table feed rack pinion to the table rack which is fastened to the underside of the table. To disengage the table feed rack pinion from the table rack, pull handwheel outward. While in this outward position, the handwheel can be turned without moving the table. This will enable you to place the handwheel handle in a convenient position for handling the desired stroke for the work you are grinding.



AUXILIARY TABLE FEED (RAPID TRAVERSE LEVER)

Machines equipped with auxiliary table feed have the auxiliary table feed lever located at the extreme left of the cross feed carriage. When not in use, auxiliary feed lever should be in down position. To move lever to this position, pull outward, swing to the left and down 180°. To utilize this lever, center the part which you intend to grind under grinding wheel, disengage table feed handwheel. To retain handwheel in disengaged position turn handwheel until handle is in up position, pull handwheel outward as far as possible, and turn 180°, placing handle in down position. Move auxiliary table feed lever to a vertical position allowing the gear to engage the rack of the table. The auxiliary table feed is designed for fast and accurate grinding of work up to 6" in length.

CROSS FEED TABLE CARRIAGE

The cross feed table carriage travels on two ground and scraped fiat ways. It is guided and held in perfect alignment by a hardened and ground rectangular shaped key which is mounted in the center on the underside of the carriage. This rectangular shaped key moves between a stationary gib on its left side and a set of tapered adjusting gibs on its right side. The gibs have been properly adjusted for a snug sliding fit at the factory but should the necessity arise for readjustment, they may be adjusted by means of the screw mounted on the base and located just right of the rectangular shaped key.

CROSS FEED TABLE CARRIAGE LOCK

This machine is equipped with a device for locking the table carriage in position when face grinding. You will find the cross feed table lock thumb screw located on the right hand side of the base directly under the table cross feed carriage. Tightening this thumb screw locks the adjusting gibs up against the cross feed table key, preventing transverse movement.

IMPORTANT: This lock must be released when operating the machine under normal conditions.

CROSS FEED HANDWHEEL

The cross feed handwheel is located in the center on the front of the machine. It is graduated to (.001"). One complete turn will move the cross feed table carriage (.100"). This wheel controls the transverse movement of the cross feed table carriage.

ELEVATING HANDWHEEL

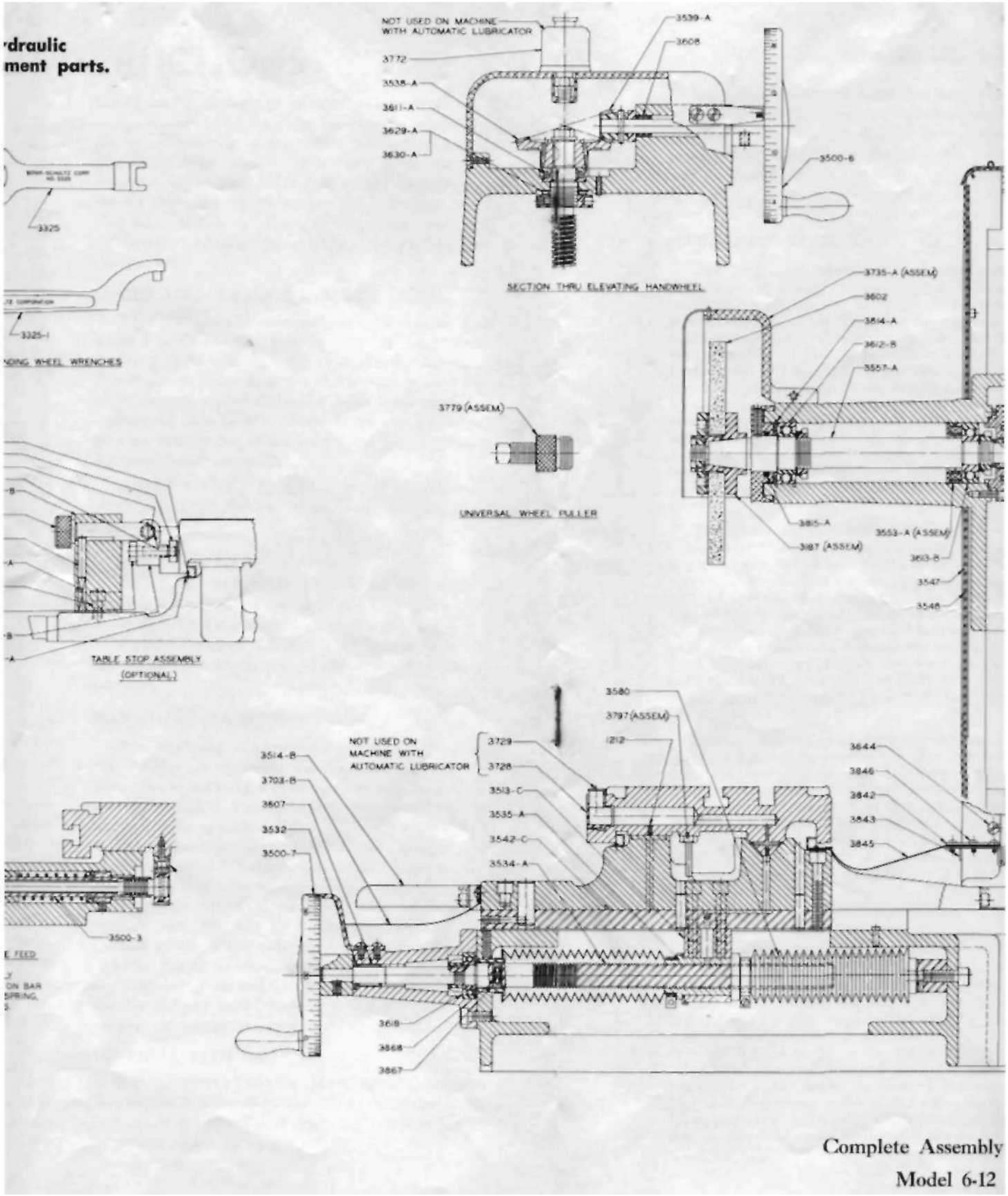
The elevating handwheel located at the top of the column on the right side is used to raise or lower the spindle. It is graduated in one half thousandths (.0005"). One complete revolution raises or lowers the spindle (.050").

If the elevating handwheel rotates too freely, it can be adjusted for the proper rotating tension by means of the tension adjusting device designed for this purpose. To gain access to this adjustment remove the (4) flat head screws securing the column cover to the column. Just to the rear and right of the handwheel, you will find the socket head adjusting screw. To increase the tension on the handwheel turn clockwise. To decrease the tension turn counter clockwise.

VERTICAL FEED GEARS

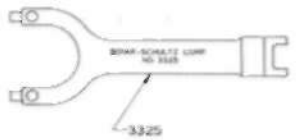
Remove cover from top of the vertical column. The pinion is secured to elevating handwheel shaft just below the bevel gear and backlash is adjusted by means of a locking collar.

'draulic
ment parts.

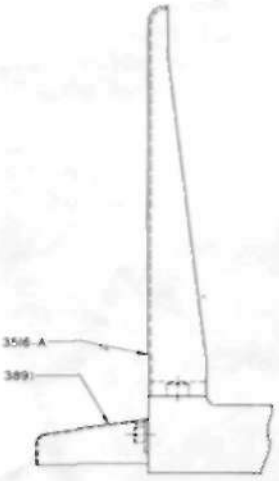


Complete Assembly
Model 6-12

NOTE:
Please specify hand feed or hydraulic machine when ordering replacement parts.



GRINDING WHEEL WRENCHES



DUST DEFLECTOR & WAY COVER ASSEMBLIES

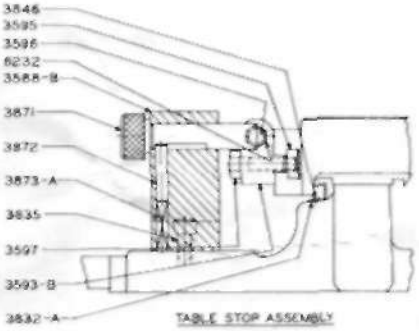
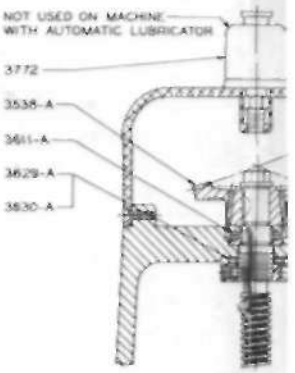
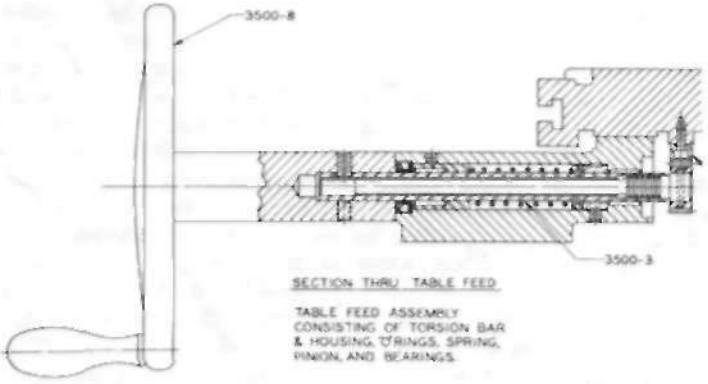


TABLE STOP ASSEMBLY (OPTIONAL)



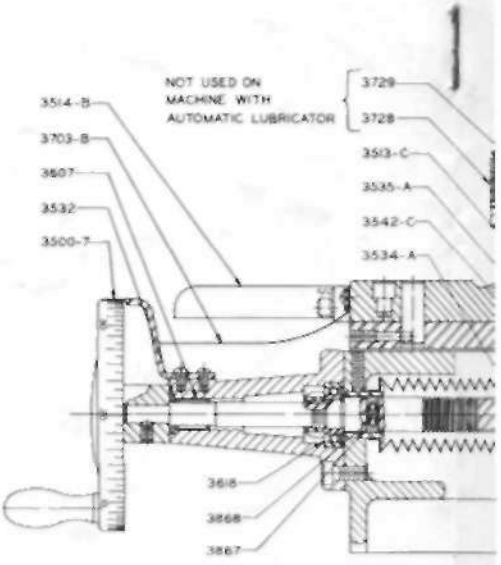
SECTION THRU

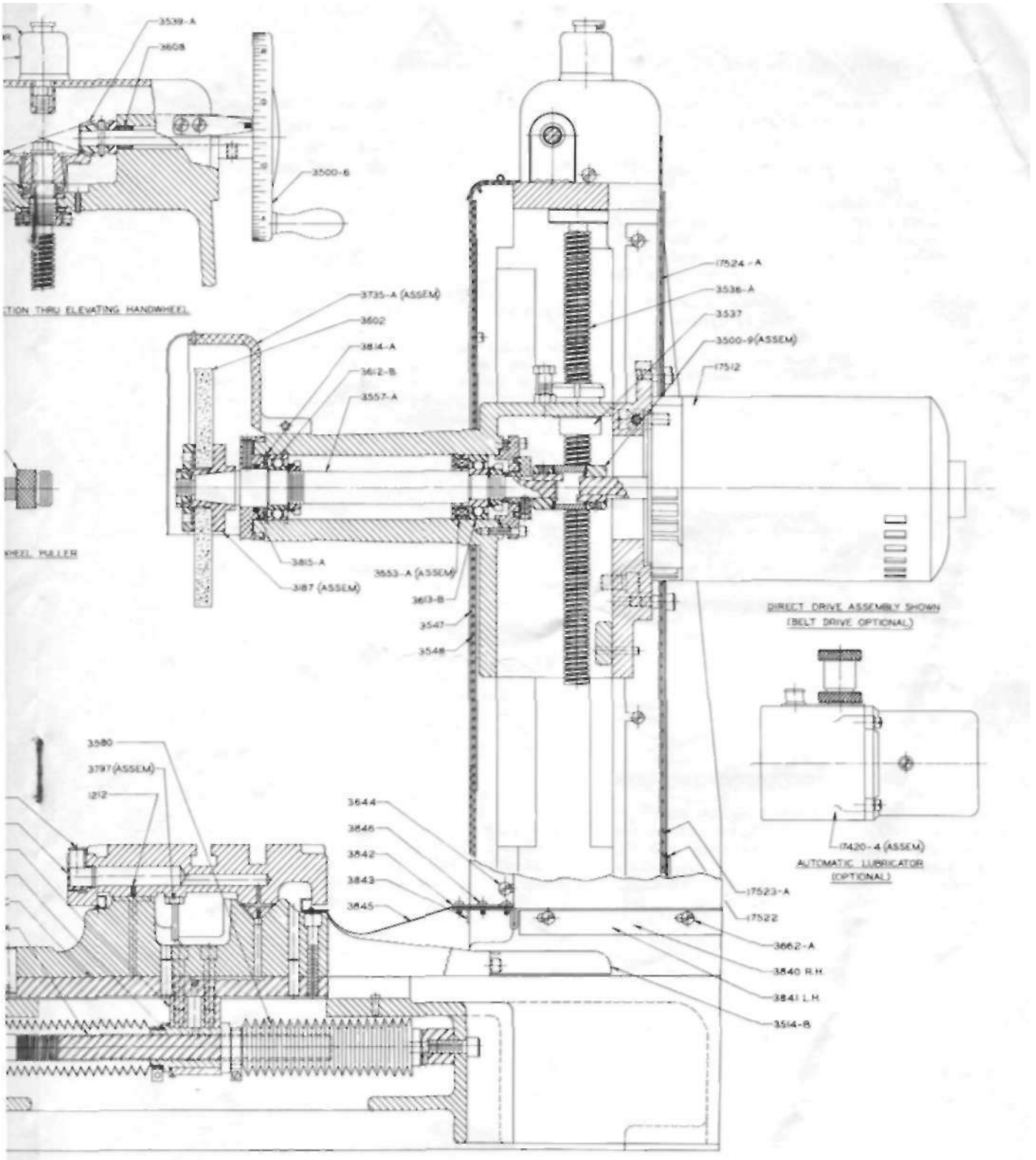
UNIVERSAL WHEEL PULL



SECTION THRU TABLE FEED

TABLE FEED ASSEMBLY CONSISTING OF TORSION BAR & HOUSING, O'RINGS, SPRING, PINION, AND BEARINGS.





Complete Assembly Drawing Showing Details of Boyar-Schultz Model 6-12 Surface Grinder Hand Feed Model.

BOYAR-SCHULTZ 6-12 HYDRAULIC SURFACE GRINDER

See Boyar-Schultz instructions for the handfeed model 6-12 surface grinder before removing the machine from its crate. Follow instructions given in the paragraphs describing handling, installation and lubrication.

HYDRAULIC RESERVOIR

The hydraulic pump and the pump motor are housed in the lower section of the hydraulic reservoir. The pump motor must be connected to the starter switch. This is done by connecting the multi-wired cable that extends from the rear of the reservoir to the junction box located on the back of the grinder. A four wire cable is furnished for three phase installation. Match up loose wires by the color code, secure each, and insulate. The green wire should be fastened to the clamp screw inside the junction box to complete the ground. A three wire cable is furnished for single phase installation. Match up color coded wires and ground the green wires to the junction box clamp screw.

Two hoses are furnished with the machine. The intake hose (long hose) should be connected to the lower of the two elbows that protrude from the reservoir, to the front elbow, located on the right side of the grinder carriage. The exhaust hose (short hose) should be connected to the upper reservoir elbow and to the rear carriage elbow. In both cases, tighten the hose to the carriage elbows first. Station reservoir on the floor as shown in accompanying literature. The back of the reservoir should be approximately flush with the back of the grinder stand.

Remove top cover of the reservoir and add the three gallons of hydraulic oil that are furnished with the machine — see Lubrication Chart for recommended oils. The level of the hydraulic oil should not be permitted to drop below the top of the filter screen. To insure long, trouble-free operation of this hydraulic machine, the hydraulic oil should be changed every six months. The reservoir and the filter screen should be cleaned at the time of the oil change.

AUTOMATIC OPERATION

The stop dog, located on the front edge of the grinder table, control the longitudinal travel of the table. The stop dogs may be adjusted by means of a 5/32" hex wrench to suit the length of stroke desired. The dogs must be set so that the pilot valve head (the two pronged casting located on the top of the valve body) is located between them. The stop dog to the right of the valve must strike the upper arm of the pilot valve head and the stop dog to the left must strike the lower arm. For initial operation of the machine, the stop dogs should be set approximately six inches apart.

Connect cylinder rod to table adapter housing. The table adapter housing is located on the underside of the table at its right end. To engage the cylinder rod, raise the pin that protrudes from the housing and insert the ball end of the cylinder rod. Oscillate the table handwheel while exerting a slight downward pressure on the adapter housing pin until the cylinder rod is locked into place.

Before operating the machine hydraulically, the table handwheel must be disengaged. Pull out the knob of the plunger, located on the left side of the carriage, and pull out the handwheel. Release plunger to lock handwheel in the "OUT" position.

CAUTION!

Check to see that the grinding wheel clears the work and that the magnetic chuck is energized.

The starter switch is located on the right side of the grinder base. The switch has three positions, "MANUAL", "OFF" and "AUTO". To start spindle and hydraulic pump motor, place switch into the "AUTO" position. To set the table in motion, turn the shut-off valve handle (located on top of the valve) in the direction indicated by the arrow.

Erratic action of the table in its initial operation or after prolonged idleness is due to air in the hydraulic system. The air will work out and the action will improve after a short run-in period.

MANUAL OPERATION

Place shut-off valve in the "OFF" position and set starter switch in the "MANUAL" position. Manual operation of the longitudinal table feed is simplified if the cylinder rod is disengaged from the table. To disengage the cylinder rod, raise the pin that protrudes from the adapter housing and move the table to the right, allowing the pin to drop after the cylinder rod is clear of the adapter housing. Cylinder rod disengagement is recommended only when prolonged manual use is anticipated.

TABLE CUSHION ADJUSTMENT

A needle valve adjustment has been provided on the right side of the main valve to cushion the table reversals. To adjust, loosen the lock nut and screw the needle valve in to increase or out to decrease the cushion.

This adjustment has been made at the factory and any re-adjustment should only be made after the rigid mounting of the machine has been checked.

SPECIFICATIONS (6-12) FOR 6 x 12 HAND FEED AND HYDRAULIC SURFACE GRINDERS

	Hydraulic Feed	Hand Feed
Table Travel		
Longitudinal	13"	13"
Cross Feed	7"	7"
Work Height (using 7″ diam. wheel)	0" to 11¼"	0" to 11¼"
Table Working Surface ("T" slot, ″ width)	12" x 5 "	12" x 5 "
Grind Wheel		
Diameter	7"	7"
Thickness	3/16" to ½"	3/16" to ½"
Hole Diam.	1¼"	1¼"
Spindle Speed	3000 rpm	3000 rpm
Handwheel Graduation		
Vertical	.0005"	.0005"
Cross Feed	.001"	.001"
Longitudinal Table Speed	0-50 fpm	
Spindle Motor	½ hp—3450 rpm	½ hp—3450 rpm
Hydraulic Pump Motor	¼ hp-1725 rpm	
Floor Space	44" x 38"	43" x 38"
Height		
(Bench Model)	32"	32"
(Floor Model)	62"	62"
Weight		
Net	485 lb.	415 lb.
Shipping	705 lb.	561 lb.

ELECTRICAL EQUIPMENT

The motor furnished with this machine is a ½ H.P., 220 volt, 3 phase, 60 cycle, 3450 RPM, open round frame, sleeve type bearing motor, precision balanced dynamically for smooth and vibration-free operation. With a minimum amount of care, motor should last the life of the grinder. Follow lubrication chart explicitly for lubricating this unit.

Machines can be wired for 110 V - 60 cycle - 1 phase or 220 V - 60 cycle - 3 phase. They are equipped with 300 Volt wire. Machines wired for 440 V - 60 cycle - 3 phase — have 600 Volt wire.

The machine is wired for 220 volt, 3 phase, 60 cycle operation unless otherwise specified. (See Fig. 2 and Fig. 3}

If the machine is equipped with the adjustable bracket lamp, the lamp is supplied with extension cord for 110 volt circuit.

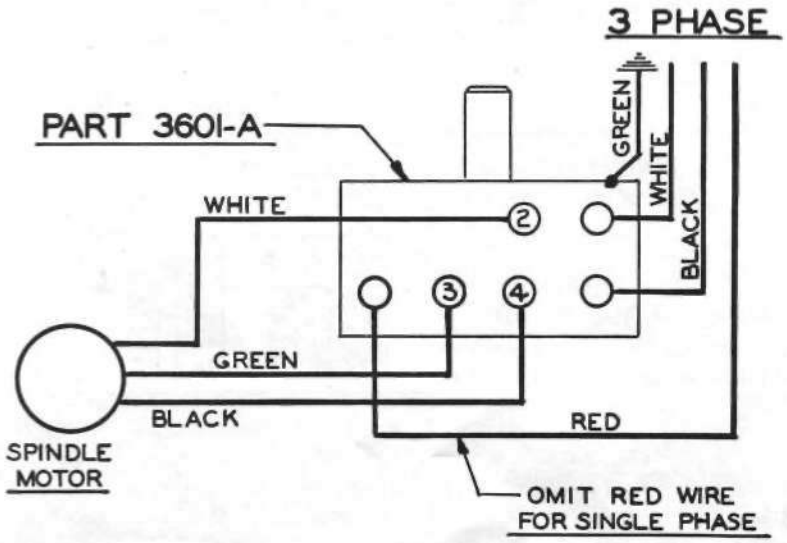
OPTIONAL ACCESSORIES

1. Metal pedestal base.
2. Adjustable longitudinal table stops.
3. Rapid traverse lever arm.
4. Mounted adjustable electric light.
5. 5" x 10" Walker permanent magnetic chuck.
6. 6" x 12" Walker permanent magnetic chuck.
7. Hanchett 5" x 10" Magna-Lock electric magnetic chuck complete with rectifier.
8. Hanchett 6" x 12" electric magnetic chuck complete with rectifier.
9. Diamond holder for wheel dressing.
10. Mounted diamond to fit holder.
11. Wet grinding splash guard.
12. Coolant tank and pump.
13. Motors available:
    110 volt, 60 cycle, single phase (standard)
    220 volt, 60 cycle, three phase (standard)
    440 volt, 60 cycle, three phase (special)
14. Dust collector complete with nozzle.

BOYAR - SCHULTZ CORPORATION

6 x 12

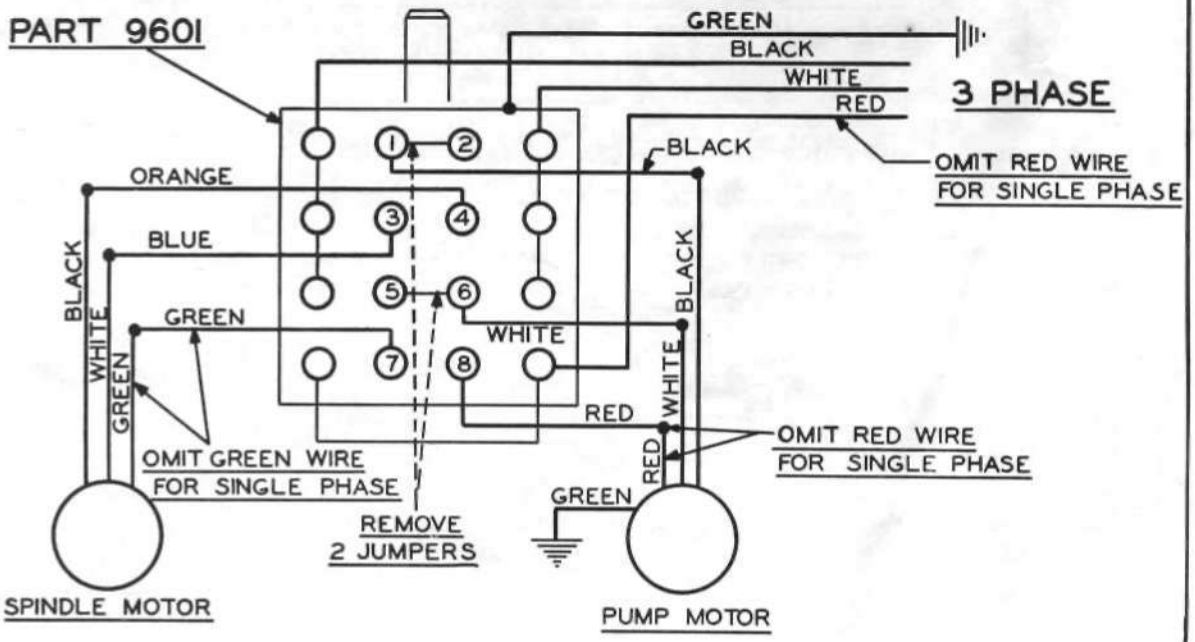
Hand Feed Surface Grinder



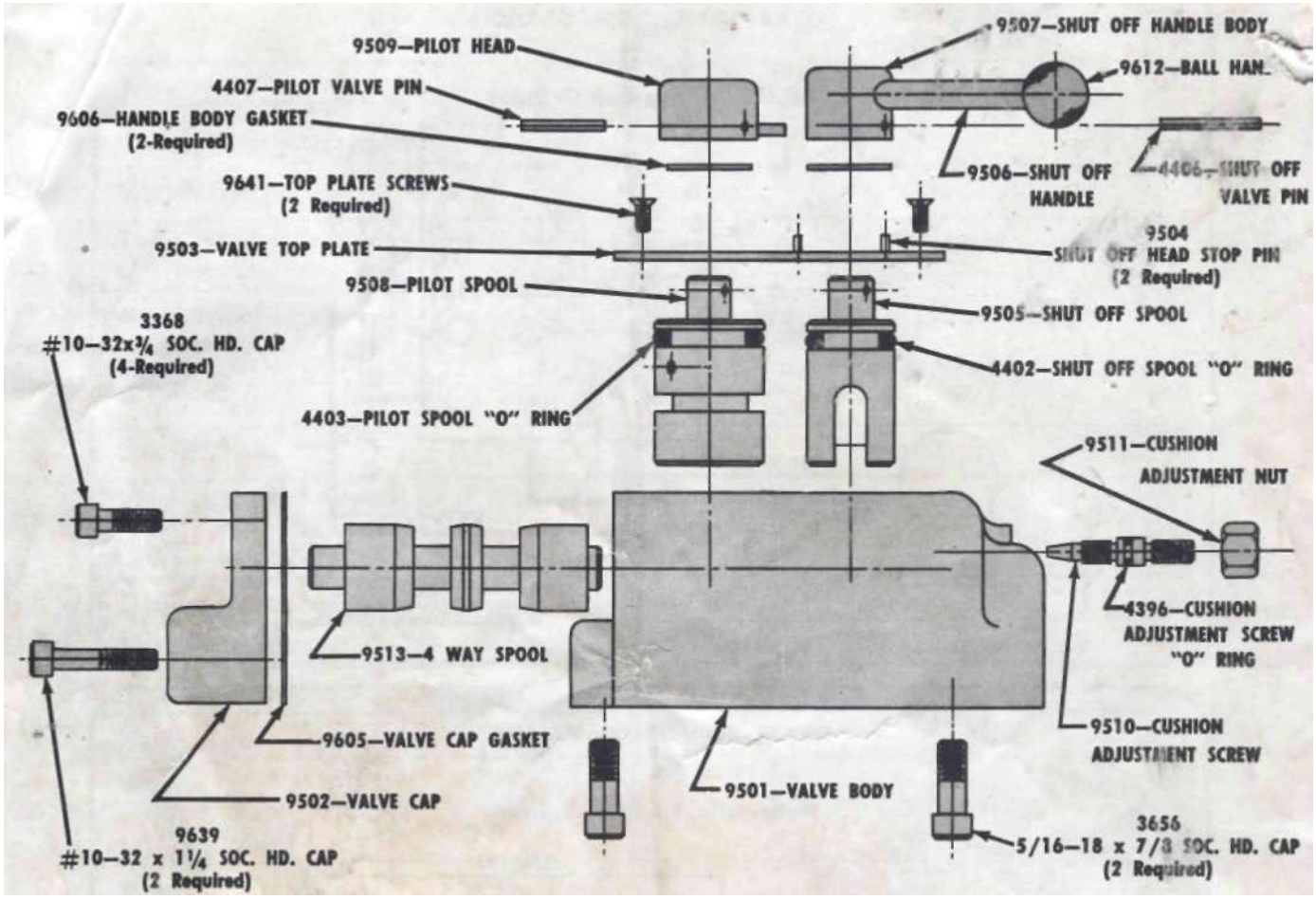
BOYAR - SCHULTZ CORPORATION

6 x 12

Hydraulic Surface Grinder



NOTE: Assemble Parts in Relationship Shown.



REPLACEMENT PARTS LIST

Not Shown on Valve Assembly

9600	Hydraulic Pump and Molar Unit — 3 Phase 220/440 Volt
96O0-A	Hydraulic Pump and Malar Unit—1 Phase 115/230 Vail
9600-X	Hydraulic Pump only
9601	Drum Switch
9603	Hydraulic Cylinder
9603-A	Hydraulic Cylinder Chevron Packing
9604	Hydraulic Reiervoir Filter
9606	Intake Has* (Long Hoiel
9608-A	Intake Hoie (Long Hose) for Math/not w/fft *J.I.C.* EJecfricaf Controls
9609	Exhaust Haie (Short Hose)
9609-A	Exhaust Hot* (Short Hotel for Machine* *with J.I.C.* Electrical Controls
9613	Hose Coupling
9618	Filter line Hose (5" Long)