

PARTS LIST AND INSTRUCTION BOOK FOR S918HGRE Hydraulic Surface Grinders



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See MPL-100 Price List for Prices

K. O. LEE

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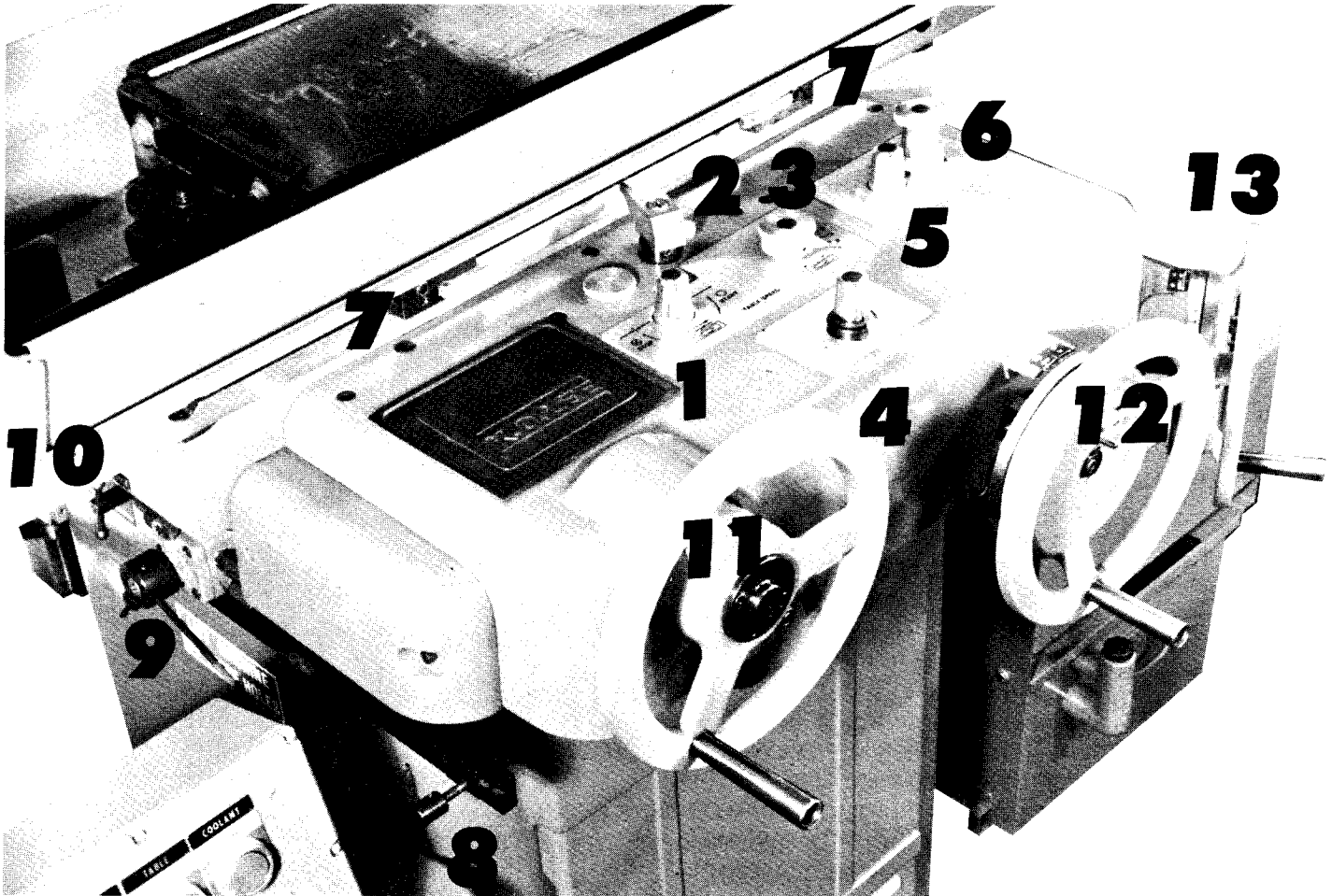
INSTRUCTION INFORMATION

I. Machine set-up instructions

It is essential that the machine be leveled both longitudinally (left to right) and transversely (front to rear). A special foundation is generally not necessary, as any solid floor, reasonably free of vibration, will carry the weight of this machine. Construction of the machine base cabinet includes cast iron leveling pads, with a 4-point leveling system in-

corporating set screw bolts and locking nuts. Consult set-up information instruction cards attached to the machine for further details.

Unless otherwise specified by special instructions, the machine is completely wired, and it is only necessary to connect power source wires to the proper terminals in the junction box, according to the enclosed electrical schematic.



STANDARD SAFETY PRECAUTIONS

Most accidents result from not following proper operating and safety procedures.

1. NEVER operate machine without safety glasses.
2. NEVER operate machine without wheel guard in place.
3. Do NOT wear tie, scarf, ID bracelet, neck chain or other object that could become entangled in the machine or work piece.
4. Always wait for wheel to STOP before bringing your hand to the table or work piece.
5. Make certain piece is SECURELY held in place.
6. NEVER attempt to hand hold or hand feed a work piece.
7. NEVER exceed machine's capacity.
8. Use proper grade grinding wheels and keep them dressed.
9. Stop machine and correct any malfunction IMMEDIATELY. (See trouble-shooting section)
10. Inspect and maintain machine by schedule — not by chance.
11. Keep hands (and clothing) away from table when power feed is operating.
12. If you're not a qualified electrician, do NOT tamper with electrical connections or wiring. Report any suspected electrical malfunction immediately.

INSTRUCTION INFORMATION

II. Start-up and way lubrication of hydraulic machines

1. Do not start pump motor until hydraulic system has been filled with the proper grade of oil, and the start-stop valves turned to OFF. After hydraulic system has been filled with oil, check immediately for correct pump rotation by observing the arrow on the belt guard.
2. Use the correct grade of hydraulic oil required for this machine, as specified on page 20 in this instruction manual. Use of heavier oil than specified or oil with non-lubricating qualities, may result in slower table travel speeds, as well as increased wear on cylinder and valve parts.
3. Most hydraulic machines have table ways lubricated from the hydraulic system. Regulation of the oil flow to the ways is described on page 16 in this manual. Adequate oil to the table ways may be observed by watching oil drip from the small return tubes on the inside of the saddle on the flat ways. If oil does not drop from these return tubes, by observation from either end of the saddle, adjust way oil pressure until some flow is observed. Other way systems on hydraulic machines are lubricated by One-Shot, electric automatic, or spool roller way lube systems, which are described more fully in other instructions accompanying the machine.
4. **BLEEDING OF HYDRAULIC CYLINDERS:** For machines which have just been shipped from the factory, distributor floor, or which have not been used for several days, the following procedures are available for bleeding the cylinders of any air which may have entered them.
 - A. Either remove the reserving stops (No. 7) from the grinder table, or use the hydraulic table reversal control arm (No. 2) which will allow the table to continue traveling to the extreme end of the cylinder travel in each direction. Manually activate the reversal of the table by use of the reversing fork, activating the table slowly so that the cylinder piston touches the end of the cylinder at each end of the grinder several times.
 - B. An alternate method for bleeding the table cylinder is to remove the thumb nut (No. 6, page 13) at the right end of the table, and after removing the collar (No. 4, page 13) from the piston rod, allow the piston to travel the full stroke of cylinder several times in both directions.
 - C. The same procedure should be used when bleeding the machine crossfeed cylinder. Slide the reversing blocks to extreme ends of the slide bar. Activate the continuous crossfeed function slowly in both directions, using the handle of the rotary pilot valve (No. 9).

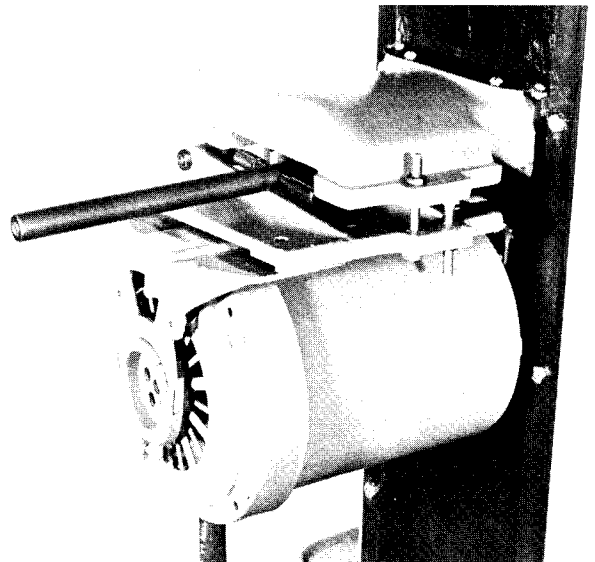
III. Procedures for surface grinding

1. **GRINDING WHEEL MOUNTING PROCEDURE**
Unless the operator intends to premount a wheel to the wheel collet off the machine (e.g. when one wishes to use a special balancing arbor), it



will be done as shown in photo above. Collet locking ring nut and washer are removed from the collet, the wheel placed on the collet and the washer and nut replaced in that order, tightened only with sufficient pressure to keep the wheel from rotating on the collet. Always use a wheel blotter on both sides of the wheel.

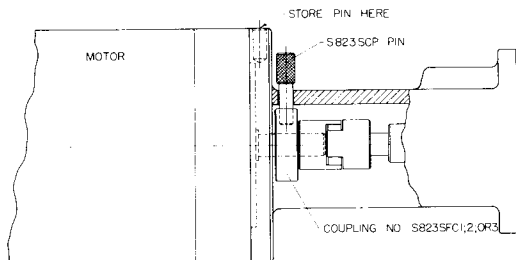
- A. Mounting a premounted wheel and wheel collet on the grinder spindle nose: Clean the tapered surfaces of both the I.D. of the collet and the nose of the spindle. Remove the spindle nut, placing the wheel collet firmly onto the taper of the spindle nose, and replace the spindle nut to hand tight condition. Next, while holding the spindle shaft from rotating with S896 wrench (see photo below) use the



S896 SPINDLE LOCK WRENCH

end of the B936W spanner wrench to tighten spindle nose nut counter clockwise. Remove the S896 wrench or other spindle locking device as shown in the photograph, close the grinding wheel guard cover and proceed to

INSTRUCTION INFORMATION



S823SCP PIN FOR LOCKING SPINDLE ON DIRECT DRIVE SPINDLE

dress the wheel as per the instructions below.

- B. Mounting grinding wheel on the S936CL3 or S936CL wheel collets when either has been placed on the spindle nose without the grinding wheel attached. The collet is locked onto the spindle nose in the same manner as described in 'A' above. Now remove the collet locking ring nut and washer, install the grinding wheel, and replace the washer and ring nut. This time, insure that the S896 spindle lock wrench is in place (or other Spindle Locking device engaged) and proceed to tighten the locking ring nut of the collet in a counter clockwise direction, by use of the S936W special collet wrench. Remove the S896 spindle lock wrench or other locking device, as shown in photograph, close the wheel guard door and lock it securely with a thumb nut provided.
 - C. To remove the S936CL3 from the spindle nose with or without a grinding wheel on the collet, use the S836P wheel puller as follows: With the use of the S896 spindle lock wrench and the B936W spanner wrench, remove the spindle nose nut, and screw on the S836P wheel puller center knurled thumb nut onto the spindle shaft threads until tight. Next, with the B936W spanner wrench hex socket end, turn the wheel puller center bolt clockwise while holding onto the grinder wheel. The collet will pull away from the taper of the spindle nose for easy disassembly.
 - D. Mounting wheels on spindles with Direct Motor Drive: use same procedures as described in A through C above, except be sure to observe any special instructions on wheelguard or at rear of the machine.
2. Set correct spindle speed for O.D. size of abrasive wheel, if machine has standard steppulleys, and not a motorized quill. This is done by removing the Lower Rear Column Guard (Index No. 94B, page 2), lifting the motor upward, and adjusting the two Poly-V belts to the correct pulley diameters. **NOTE: Wheels 8" Diameter and Smaller: Use largest diameter of motor pulley (spindle RPM 2850). Wheels 10" to 8" Diameter Range: Use smallest diameter of motor pulley (spindle RPM 2250).**
 3. **DRESSING THE WHEEL**
Dressing the grinding wheel is accomplished by first lowering the rotating wheel to a position where it just touches the S681 dresser diamond.

The diamond tip should be set a little to the left of the wheel center. It is also advisable to periodically rotate the diamond nib within the dresser for more even wearing of the diamond tip. Next, activate the cross feed motion of the saddle as follows: place the table stop valve (No. 1) to "STOP". Move crossfeed stop valve (No. 4) to "HYDRAULIC". Move crossfeed function valve to "DRESS" and adjust Speed Control Valve (No. 6) to a slow (20-40) rate of dress. The rate of speed of the diamond across the wheel affects how "open" or "closed" the wheel periphery will become. Cross-slide stops (No. 8) may be used to limit travel of saddle, or use the rotary pilot valve (No. 9) manually. Using the elevation handwheel, lower the rotating grinding wheel into the diamond while maintaining crossfeed movement — the diamond moving across the wheel. Downfeed the wheel no more than .001" per dressing pass. When finished with the dressing operation, or if stopping to analyze the results, always use crossfeed stop valve No. 4 by moving it to "MANUAL", thus stopping all crossfeed motion. Be sure to stop the cross motion at a point when the diamond is off from the wheel. **IMPORTANT:** It is not necessary to use coolant during the dressing process. If used, coolant should be continually flowing past the diamond at any time it is contacting the wheel.

4. MACHINE OPERATION

- A. **MANUAL:** All model S918HG grinders produced after August 1981, Serial No. 22700 have a table travel transmission (No. 11) which is always ready for manual movement of the grinder longitudinal table when hydraulic table travel valve lever (No. 1) is in the stop position. This means that rotation of the transmission handwheel (No. 11) will move the table, even when hydraulic motor is running, as the transmission pinion is engaged with the table gear rack. The transmission is always engaged when hydraulic motor is stopped.

NOTE: For any extensive manual operation of the table travel,

- a. Disconnect table from hydraulic cylinder rod as per instruction at table end or described in II, 4-b above.
- b. Run hydraulic unit for table way lubrication. Follow procedure as outlined below: Also follow steps 2, 4, 5, 6, where appropriate.

B. HYDRAULIC:

1. Have the table control start-stop lever (No. 1) in "STOP" position; have Crossfeed Stop (Manual-Hydraulic) valve (No. 4) in "Manual" position; have Crossfeed Function Valve (No. 5) in "Feed" position. Start hydraulic system. Check pump motor for correct rotation; observe arrow on belt guard. Bottom of grinding wheel must clear top of table, chuck or work. Make sure all air is driven out of longitudinal

INSTRUCTION INFORMATION

and crossfeed cylinders. (Check how to bleed cylinders in II.)

2. Load work to magnetic chuck, make sure wheel is dressed properly. (See Dressing procedure in III.) See chuck Dressing procedure, (page 7; consult magnetic chuck manufacture instruction for proper use of any chuck provided with the machine.
 3. Set longitudinal reversing stops (No. 7) for necessary override of work; set crossfeed slide stops (No. 8) (left side of machine) for approximate work width, with enough override space to allow wheel to move partly off work before reversing.
 4. Lower wheel with vertical handwheel (shown at No. 13) to be just above highest part of work. Next, the longitudinal table is started by moving lever No. 1 to "Start". Use a slow speed (control No. 3) and position work with manual crossfeed handwheel (No. 12) so that only a small portion of work will be touched by wheel during the first table pass.
 5. Start spindle before wheel touches the work. After first sign of work touch, turn on coolant. Set the Crossfeed Speed Valve (No. 6) to amount of crossfeed "Jog" or feed increment at each table reversal; then activate crossfeed by turning Crossfeed Stop Valve (No. 4) to "Hydraulic". Saddle will now move in or out (toward column or away) at each reversal of the table. Check which direction the rotary pilot valve handle (No. 9) is pointed to on left side of machine. Lever up is feeding "in" toward the column; lever down is feeding "out" away from column.
 6. After the first cut pass over all of the work, lower the spindle the desired depth of cut with elevation handwheel (No. 13). Downfeed increments should not exceed .001" per pass under wheel where complete wheel width is to contact work depending on hardness of material and finish desired. Typical increments of downfeed for most hardened steels, using standard aluminum oxide wheel is .0002" to .0005". If for any reason the automatic cycle must now be stopped, just turn the longitudinal table start-stop valve (No. 1) to "STOP", as this stops both longitudinal and crossfeed movements. Valve No. 4 stops crossfeed only.
 7. Increase table longitudinal speed if necessary by counter-clockwise rotation of rotary control valve (No. 3).
- C. OTHER GRINDING MODES:
FACE GRINDING: Machine has B2019 Saddle Lock (No. 10). Use of this with hand crossfeed may be desirable.
CRISS-CROSS GRINDING: If, after steps B1 through B7 have been completed and it is desirable to move the work diagonally under the grinding wheel while grinding, simply turn the Crossfeed Function Lever (No. 5) to "DRESS" instead of "JOG". NOTE: Diagonal grinding path

across the work is not predictable as to where it will occur in the longitudinal direction — therefore work surface should be ground flat in all areas by normal crossfeed "JOG" or feed method first.

AUTOMATIC DOWNFEED: If your machine has been provided with an electrically controlled downfeed, consult instructions provided as to integration of the above procedures with the operation of this attachment.

Electrical Controls

- A. Standard switches do not exceed 115 volts at the push button panel, at left side of machine.
- B. Motor starters in JIC Box at rear of grinder may be serviced through door provided. Always have a competent electrician service starters, change hearters, etc.
- C. If power to machine is cut during motor operation, motor starters "kick out" and will not restart when power is restored until push buttons are activated again.
- D. Some machines may be provided with a Red Panic Button. Pressing this will cut all power to all motors. To restore power after problem is solved, by pressing all start buttons.

— SERVICE —

Original factory setting of control knobs and handles on valves

DRAWING SHOW ORIGINAL FACTORY SETTING ON THESE VALVES. SEE LISTING BELOW:

S833-2 Table Speed Valve	Page 6
S837 Crossfeed Valve	Page 8
S839-2 Rotary Pilot Valve	Page 9

Excessive heating-hydraulic unit

OIL TEMPERATURE SHOULD BE BETWEEN 120° TO 130° F.

1. Stuck relief valve. Remove and clean. Reset to 160 lb. See drawing on page 10.
2. Unit is designed to be operated in 70° room temperature. Additional room temperature will cause higher operating temperature.

Column slide - sticking & dropping

1. Oil slide and column; fill oil reservoirs on top of column.
2. Clean and oil feed nut.

Whine or squeal-hydraulic system

1. Pressure relief valve stuck closed. Remove adjustable cap and screw (see Print Page 10). Remove valve, clean and reassemble and adjust to 160 lb. pressure. Piston in valve may have to be polished to remove scratches.
2. Pump running in wrong direction. Check belt direction with arrow on belt guard.
3. Belts loose on pump.

SERVICE INFORMATION

Crossfeed

ERRATIC OR JUMPING ACTION — CROSSFEED:

1. Check hydraulic oil level in tank.
2. Air in crossfeed cylinder. Bleed cylinder. See instructions under heading "To Start Machine".
3. Relief valve may be stuck. Remove pressure relief valve and clean. Reset to 160 lbs. pressure, see drawing on page 10. Check point B.
4. V-Belt slipping or worn pulley. Adjust or replace.
5. No oil in base ways. Must be filled manually.
6. Oil should be at operating temperature.
7. Fine screen in tank should be cleaned.
8. Contamination from coolant system in oil. Change oil.

GRINDING WHEEL GOUGES WORK AT MAXIMUM INFEED OR OUTFEED OF SADDLE

Reason — Positive stops against end of flat way are engaging too soon causing saddle to shift. Back off stops and with piston at extreme end of stroke set screw must just contact end of way. Tighten lock nut on set screw. Check to see that piston and stop are together and no raise of saddle occurs.

FAILURE TO REVERSE:

1. Fork on rotary valve can be forced on shaft on older machines. Reset to original factory markings shown on S839-2 pilot valve on page 9.
2. Thumb nut loose on crossfeed cylinder rod.
3. Feed nut may be binding, not releasing feed screw. Relief valve may be stuck. Remove pressure relief valve and clean, reset to 160 lbs. pressure. See drawing on page 10.
4. Fork on rotary valve not clearing sides of reversing stops.

Table not up to speed-no power Erratic or jumping action of table

1. Check hydraulic oil level in tank.
2. Air in table cylinder. Bleed cylinder. See instructions.
3. Leakage in cylinder due to worn seals on piston or V-packing in end gland. Replace seals. Leakage—Coupling Tube—Damaged O-Rings.
4. Relief valve may be stuck. Remove pressure relief valve and clean. Reset to 160 lb. pressure. See Drawing on page 10. Check point A.
5. Leakage in line. Check and correct.
6. Table ways may require additional lubrication. Adjust screw No. 18 on upper right page 10. Turn clockwise to increase flow.
7. Hydraulic pressure relief valve stuck open. Remove, clean, reset pressure to 160 lbs. See print on page 10.
8. Oil should be at operating temperature.
9. Oil by-passing valve No. 10 upper left, page 6. Check position of star and lever arm No. 17. If lever arm moves too freely, remove and adjust set screw No. 51.
10. Belts slipping. Loose adjustment or worn pulleys.

11. Oil by-passing valve No. 15, page 6. Check position of star. If valve lifts up, adjust set screws No. 51. Remove No. 27, control knob.
12. Oil line or speed valve obstructed by foreign material.
13. Fine screen in tank should be cleaned.
14. Hydraulic oil too heavy, not to specifications.
15. Contamination from coolant system in oil. Oil gets milky color. Change oil.
16. Check In-Line Filter (if used). This filter is located top of pump assembly in pressure line to main control valve.

TABLE HAS ONLY FAST FEED:

1. Oil by-passing valve No. 15, page 6, adjust screw No. 51. Note position of pointer and etched star. This position required when re-assembling No. 2 pointer and No. 27 control knob. Valve should be just free enough to turn with fingers. Use screw driver in slot when setting screw No. 51.

Chatter or vibration marks in finish

1. Too hard and/or too fine a grinding wheel causing bouncing action.
2. Wheel in need of dressing.
3. Wheel out of balance.
4. Wheel loose on collet.
5. Spindle bearings worn.
6. Vibration from some outside source and transmitted through the floor to the grinding machine.
7. Too heavy a feed causing intermittent contact with work.
8. Play or looseness in belts or misalignment of pulleys.
9. Lack of lubrication to column slide.

Longitudinal lines or herringbone pattern in finish

1. Caused by edge of wheel. Break edge.
2. Wheel dressed too finely and not free cutting. Increase speed of dress traverse.
3. Unevenly dressed wheel. Redress wheel.

Inaccurate grinding

1. Magnetic chuck bolts loose.
2. Wheel not dressed evenly.
3. Wheel glazed and not cutting freely.
4. Magnetic Chuck in need of grinding.
5. Particles under work. Clean Chuck.
6. Lack of lubrication to column slide.

Scratchy finish

1. Wheel too soft for material being ground.
2. Grinding grit in coolant. Clean out tank.
3. Lack of lubrication to column slide.

CHUCK DRESSING AND RESURFACING INSTRUCTIONS

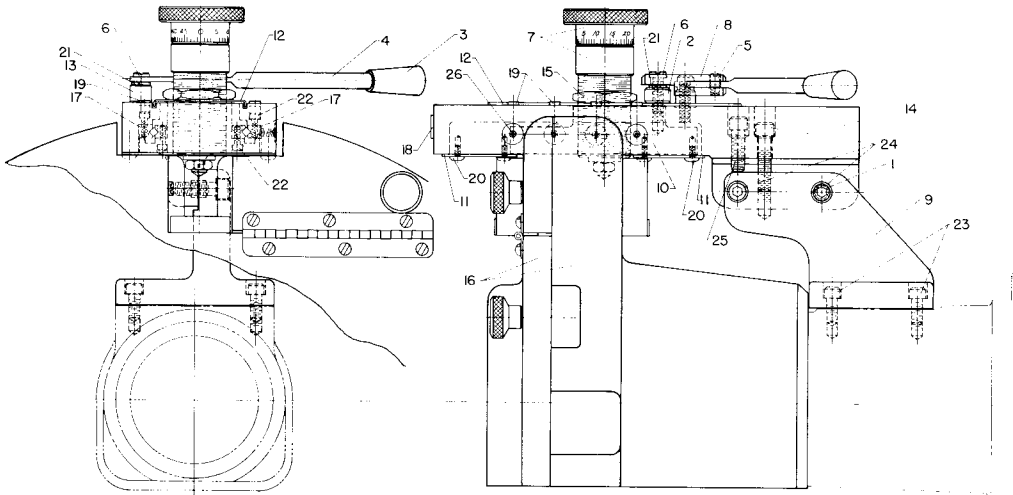
Instructions For Original Dressing and Resurfacing of a Magnetic Chuck.

The bottom of the Chuck should be ground before the chuck is mounted in place, then the top is ground flat and parallel as mounted for use.

1. Place the chuck top down on the surface grinder table and block it to prevent sliding with the Hold Down Clamps bolted to the machine table, snug against the ends of the chuck. Then grind the bottom flat with a wheel that has been made free cutting or "Open" by dressing with a rather rapid and moderately heavy cut taken across the face of the wheel with the diamond. Type of wheel is not critical for grinding either chuck bottom or top, though a wheel with K. O. Lee Designation PV7GM46 for K. O. Lee Surface Grinders using 7" wheels and PV10LS46 for K. O. Lee Surface Grinders using 10" wheels, or equivalent has been found most desirable for exacting requirements.
2. Place chuck top up in final position it is to be mounted on machine table. Clamps should only be tightened sufficiently to keep the chuck from moving on the table.
3. Put chuck in "on" position.

4. Dress top of chuck to clean up, again using "open" wheel. Width of wheel face doing grinding should be limited to about $\frac{1}{2}$ " by dressing excess width away with diamond or stone. Use adequate coolant flow or spray mist if machine is not equipped with coolant. Maximum depth of cut of .0003" and traverse feed of $\frac{3}{8}$ " per stroke are recommended.
5. When the top of the chuck has been cleaned up, take the final pass under the same conditions except that depth of feed should be .00005" to .0001". There should be no effort to "Spark Out" on the top of the chuck after the last pass has been taken. Optimum flatness is best attained by avoiding any polishing or burnishing effect when dressing the top as local hot spots and distortion may result. A "commercial" grind finish is also preferable to a "mirror" finish as it provides the best coefficient of friction for non-slip magnetic holding of critical workpieces.
6. Check results by Five (5) Block Test, in other words, one test block ground at each corner of chuck and one in center with fixed wheel height. Total difference in thickness of block should be within specified limits of the Machine Manufacturer.

S2081-10 OVER WHEEL DRESSER



Index No.	Part No.	Description	Quan. Req.
1	BA910B	Sleeve	1
2	B9043DW	Spacer	1
3	P44B	Knob	1
4	P372HL	Handle	1
5	P372U	Screw	1
6	P372WL	Special Screw	2
7	S881D	Micrometer Head Assembly	1
8	S981EK	Link	1
9	S2081B10	Base (10" Wheel)	1
10	S2081C	Slide	1
11	S2081DGL	Dust Guard — Lower	2
12	S2081DGL	Dust Guard — Upper	1
13	S2081L	Spacer	1
14	S2081S	Saddle	1
15	S2081SN	Special Nut	1

Index No.	Part No.	Description	Quan. Req.
16	S2090G10	Wheel Guard Assembly 10"	1
17	R3100	Precision Roller Ways — Bendix Corp.	1 set
	or		or
	EDP77180	Cross Roller Rail Set	1 set
18	KO-9	Name Plate	1
19	284	Rubber Bumper	8
20	6-32 x $\frac{1}{4}$	Button Hd. Soc. Cap Sc. Dust Guard	8
21	$\frac{1}{4}$ Std.	Lock Washer (Lock Deburred)	2
22	M4 x 10	Socket Hd. Cap Sc.	16
23	$\frac{1}{4}$ x $\frac{3}{8}$ NF	Hex Socket Cap Sc.	4
24	$\frac{3}{16}$ x $1\frac{1}{4}$ NF	Hex Socket Cap Sc.	3
25	$\frac{3}{16}$ x 1 NF	Hex Socket Cap Sc.	1
26	10-32 x $\frac{3}{8}$	Hex Socket Set Sc.	4

OPERATION OF THE OVER WHEEL DRESSER

1. In general, follow the same method as described on page 4 in "Dressing The Wheel", except no movement of saddle crossfeed takes place.
2. Instead, while wheel is rotating, move the Micrometer Head Assembly (which holds the diamond) forward, over the wheel periphery, by motion of Handle Knob toward or away from the column. If wheel has not been dressed before, be sure to have Micrometer Head high enough for diamond nib tip to just touch the rotating wheel. **NOTE:** Adjust larger movements of Micrometer Head by a) loosening locknut (No. 15) counterclockwise, and then turning entire Head clockwise (down) or

- counterclockwise (up), b) tighten lock nut against saddle casting. Range of the micrometer is .750 inches, .050"/Rev.
3. While moving Handle Knob — and thus diamond — back and forth across entire wheel, turn down diamond into the wheel no more than .001" per pass over the wheel. Observe dressing operation through slot in wheel guard — never with guard cover open.

SERVICE: Lubrication is permanent type — factory sealed. Consult special instructions available for unit, as to leveling, and bearings adjustment.

S918HGRE

Series

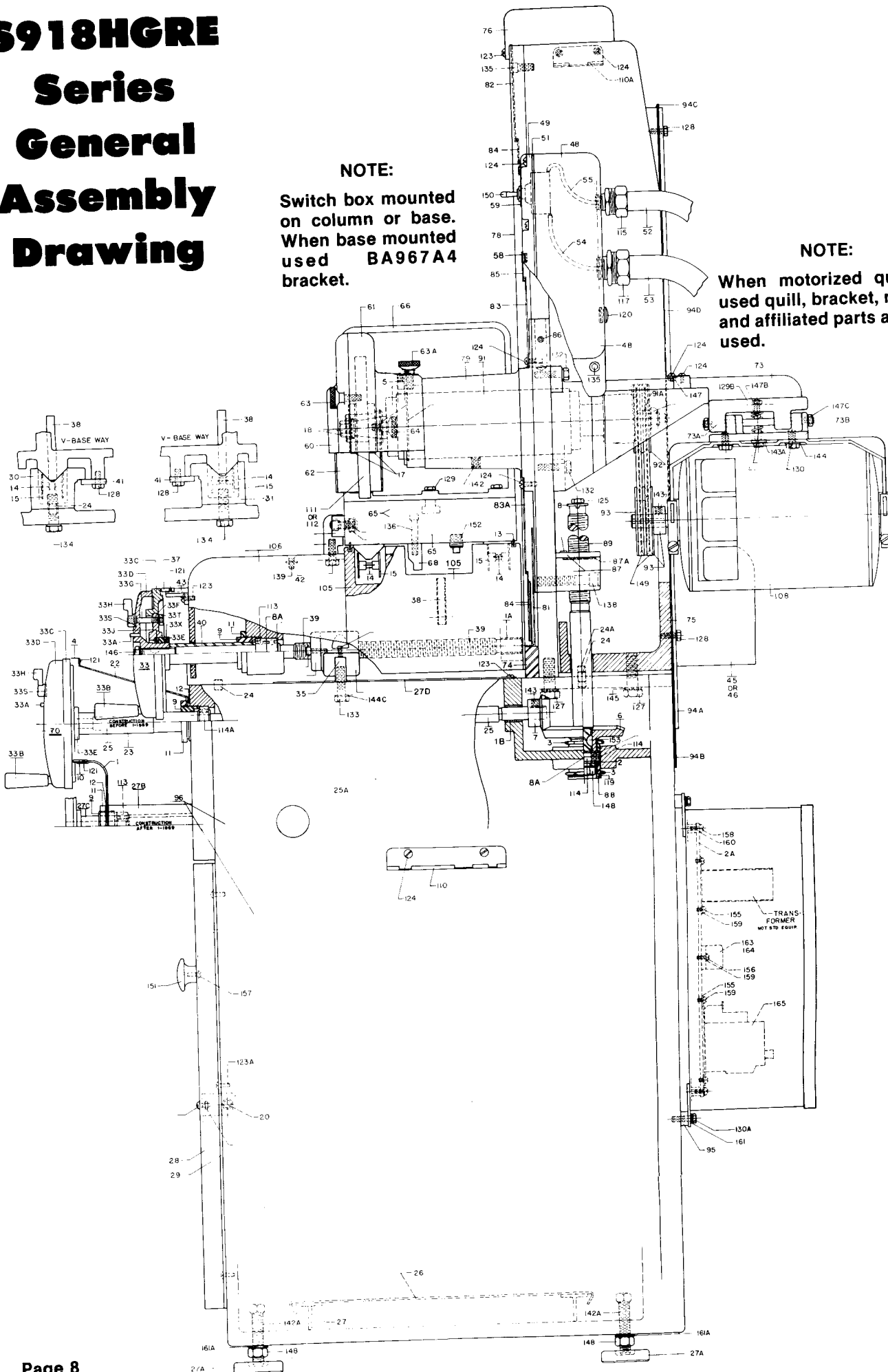
General

Assembly

Drawing

Switch box mounted on column or base. When base mounted used BA967A4 bracket.

When motorized quill is used quill, bracket, motor, and affiliated parts are not used.



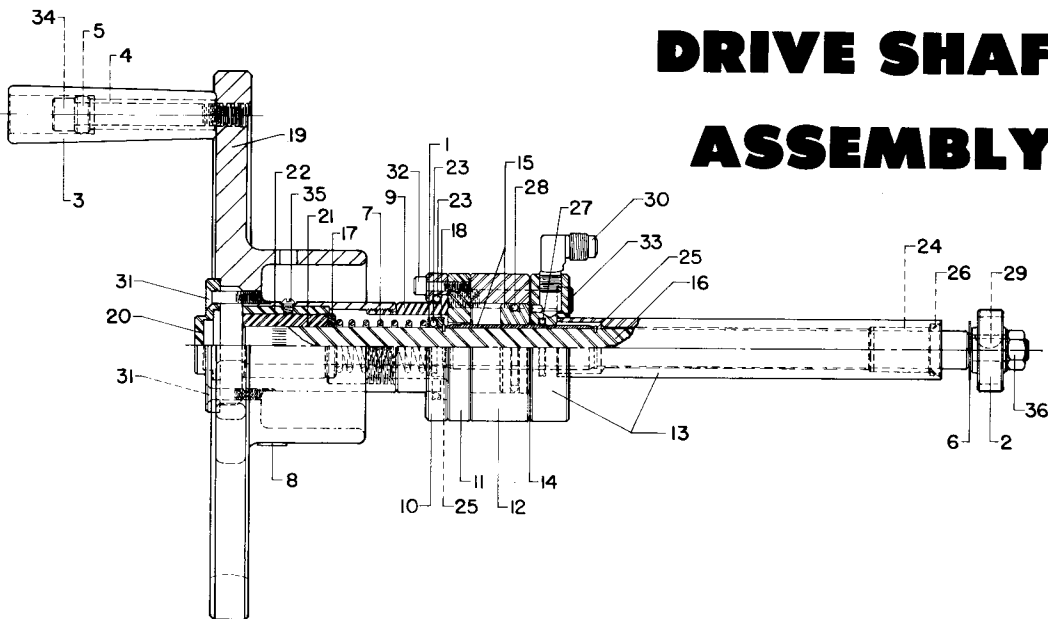
S918HGRE SERIES PARTS LIST

Index No.	Part No.	Description	Quan. Req.	Index No.	Part No.	Description	Quan. Req.
1	B330BP	Pointer Bracket	1	43	BA930WB	Index Bracket	1
1A	M10121	Needle Bearing	1	45	BA930WR	Shroud-Right Rear-(Obsolete)	1
1B	B629M	Bushing	1	46	BA930WT	Shroud-Left Rear-(Obsolete)	1
2	B637W	Thrust Collar (Obsolete)	1		BA931W3	Hose	1
2A	B709P	Panel	1	48	BA967B	Switchbox	1
3	B805M	Adjusting Nut	1	49	BA967D	Cover	1
4	B805P	Indicator Plate (Obsolete)	1	51	BA967G	Gasket	1
6	S626G	Gear	1	52	BA967H34	Flexible Conduit (½ x 34, Sw. box to mtr.)	1
7	S626P	Pinion	1				
	B810P	T-Slot Plate	2	53	BA967J32	Flexible Conduit (¾, outlet box to switch)	1
8	B826W	Stop Washer (Obsolete)	1	54	BA967W52	Power Wire (Outletbox to Switch) (two 1 phase, three 3 phase)	
8A	B830SY5	Preload Washer	2		BA967XL	Jumper Wire (two 1 phase, three 3 phase)	
9	BA805N	Lock Nut	1	55	BA967X46	Power Wire (Switch to Motor) (two 1 phase, three 3 phase)	
10	BA805P	Indicator Plate	1		BA967X87	Power Wire (Switch to pump motor) (two 1 phase, three 3 phase)	
11	BA805R	Lock Ring	1				
12	BA805Y	Vellum Washer	1	58	KO-34	Name Plate — Table	1
	B923LS	Lamp Stud	1	59	KO-37	Name Plate — Spindle	1
13	S930HE	Dust Shield (Back)	1	60	S8009F	Wheel Guard Cover	1
13	B2030HD	Dust Shield (Front)	1	61	S8009G	Wheel Guard	1
14	B930RP	Oil Roller Plate	6	62	S909S	Splash Guard	1
15	B1030RR	Oil Roller	4	63	S9009W	Thumb Screw	3
17	S936CL3	Wheel Collet (10" Dia. Wheels)	1	63A	S632W	Thumb Screw	1
18	B936NL	Spindle Nut	1	64	S609T	Thumb Screw	1
	B933M	Pointer	2	65	S8010	Table	1
	S933RL8	L.H. Rev. Bracket	1	66	S910G	Dust Guard	1
	S933RR8	R.H. Rev. Bracket	1	68	S710R	Rack	1
	B934M	Male Connector	3	70	S812D	Handwheel Assembly (500 Div.)	1
	S936P	Puller	1	73A	S623BA	Axle	1
	B936W	Wrench (S936W Wrench)	1	73B	S623BL	Bracket — Lower	1
20	B965DC	Door Catch	1	73	S823S	Motor Bracket	1
22	S605BP	Pointer Bracket (Obsolete)	1	74	S625AS	Guard Stop	1
23	BA905D	Spacer (Obsolete)	1		S625B	Bracket for Lamp	1
24	BA905DP	Dowel Pin (½" Long)	3	75	S625C	Box Column	1
24A	BA905DPL	Dowel Pin (1" Long)	1	76	S625CP	Column Cap	1
	BA905DPS	Dowel Pin	2	78	S625R	Guide Rail	1
25	BA905E	Handwheel Shaft	1	78	S625RA	Guide Rail	1
25A	BA905HP	Hole Plug	4	79	S625S-1	Column Slide	1
	BA930TN	Hold Down — Notched	1	81	S625TAS	Telescoping Guard	1
26	BA905BB	Plate for Tank	1	82	S625TB	Top Telescoping Guard	1
27	BA905BUS	Tank Rail	2	83	S625TC	Telescoping Guard	1
27A	BA905GR2	Leveling Pad	4	83A	S625TCS	Telescoping Guard	1
27B	S930HH	Housing — Saddle Extension	1	84	S625TD	Telescoping Guard	3
27C	BA909S	Spacer	1	85	S625TE	Telescoping Guard	1
27D	BA905CP	Cover Plate	1	86	S625W	Felt Wick	5
28	BA965DH	Door & Hinge Assembly	1	87	S626B-1	Feed Nut for Slide	1
29	BA966HS	Hinge Strip (Obsolete)	1	87A	S626W	Wavy Spring	1
30	B8005WV	Base Way — Vee	1	88	S626FL	Friction Cap	1
31	B8005WVR	Base Way — Vee	1	89	S626SF	Elevating Screw	1
33	B6012C	Handwheel Assembly (100 Div.)	1	90	S929-8	Transmission Assembly	1
33A	K510PP	Knurled Pin	1	91	S8055CL	Quill (Left hand thread)	1
33B	B6029AB	Grasp Handle	1	91A	S855K	Key	1
33C	S712D500	Index Disc (500) Elevation	1	92	S1055H1S	Pulley (quill)	1
	or		or	93	S1055H2S	Pulley (motor)	1
33C	BA912D100	Index Disc (100) Crossfeed	1	94A	S826TG	Guide Bar	2
33D	B6012H	Handwheel	1	94B	S826TL	Guard — Lower	1
33E	BA912L	Lock Ring	1	94C	S826TR	Guard — Removable	1
33F	BA912P	Lock Plate	1	94D	S826TU	Guard — Upper	1
33G	BA912S	Stud	1		S731DU-9	Hyd. Pump & Tank Assembly	1
33H	BA912T	Thumb Nut	1		S833-2	Valve Assembly	1
33J	BA912W	Wavy Spring	1		S736PW	Pawl Washer	8
33S	#12 SAE	Washer	1		S837	Crossfeed Valve Assembly	1
33T	¼ NC	Hex Jam Nut	1		S839-2	Rotary Pilot Valve	1
33X	10-32 x ¾	Socket Set Screw	1		S839AL	Slide Bar	1
	S629ABI	Valve Guide	1		S839SF	Reversing Block Assembly	1
	S629AW	Thrust Washer	1		S839TR	Reversing Block Assembly	1
	¾ x 3 NF	Hex Socket Cap Screw	1	95	S839W	Spacer	2
35	S924	Feed Nut Assembly	1	96	S805BC	Base	1
37	BA930P	Indicator Plate	1	105	S8030VHG	Saddle (S918HG)	1
38	BA930R	Oil Reservoir Tube (Obsolete)	2		S2030CL	Cover (Rotary Pilot Valve)	1
39	S930SF	Crossfeed Screw	1		S2030CR	Cover (Rotary Pilot Valve)	1
40	S830SS	Spacer for Feed Screw (Obsolete)	1				
41	BA930TT	Hold Down	2				
41	BA930TW	Hold Down	1				
41	BA930TS	Hold Down	1				
42	BA930W	Vellum Washer	5				

S918HGRE SERIES PARTS LIST

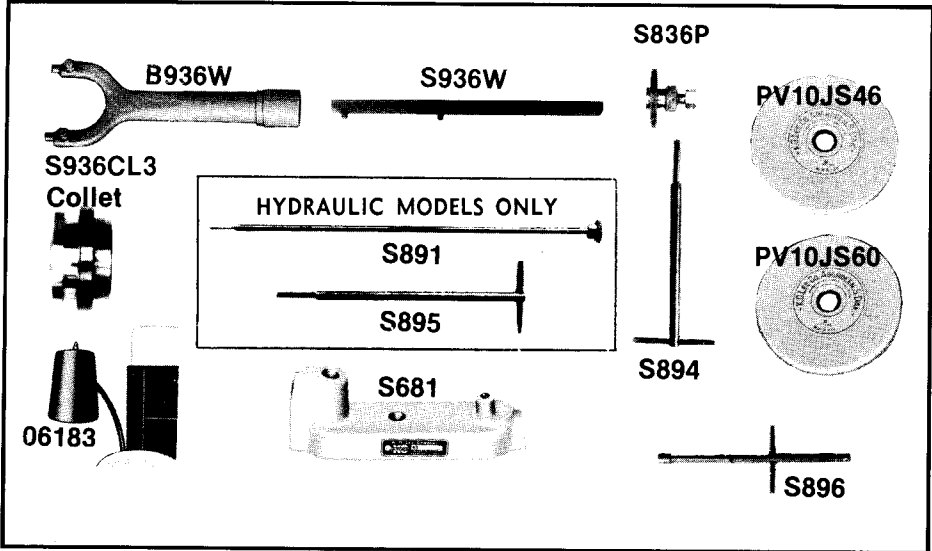
Index No.	Part No.	Description	Quan. Req.	Index No.	Part No.	Description	Quan. Req.
106	S2030WE8	Front Saddle Way Shroud (S918HG)	1	138	5/16 x 2 NF	Hex Socket Cap Screw	4
108	60437300	Motor: 2HP, 230/460V, 3PH, 60CY, 1725RPM	1	139	1/4 x 5/8 NF	Flat Hd. Soc. Cap Screw	6
	or		or		1/4 x 1/4 NF	Hex Socket Set Screw	3
108	5K47UG8046	Motor: 2HP, 230/460V, 3PH, 60CY, 1725RPM	1	142	3/8 x 1/2 NF	Hex Socket Set Screw	1
110	S890B	Wrench Rack	1	142A	1/2 x 2 1/2 NC	Square Hd. Set Screw, Cup pt.	4
110A	S890C	Tool Rack	1	143	1/2 x 5/8 NC	Hex or Bristo Socket Set Sc.	1
111	PV10JS46	Grinding Wheel	1	143A	#12	Washer	1
	or		or	144	5/16 NF	Washer (HB)	4
112	PV10JS60	Grinding Wheel	1	144C	3/8 Std.	Washer	2
113	201KTD	Ball Bearing	1	145	1/2	Shakeproof Washer	4
114	S7K2	Ball Bearing	2	146	7/16 NF	Hex Jam Nut (HB)	2
114A	202KLL3	Ball Bearing (Obsolete)	1	147	10-32	Hex Nut (HB)	1
115	1/2	Connector — Straight	2	147B	1/4 NF	Hex Jam Nut (HB)	2
117	3/4	Connector — Straight	2	147C	5/16 NF	Hex Jam Nut (HB)	2
119	8Z	Wavy Spring Washer	1	148	1/2 NC	Hex Jam Nut	5
120	1/2 Pipe	Cup No. 3	1	149	5M462	V-Belt	2
121	#2 x 1/8	S.T. Round Head Screw NP	2	150	800T	Plate Off-On	2
	#2 x 3/16	S.T. Round Head Screw NP	14	150	800TN1	Closing Button	1
123	10-32 x 1/2	S.T. Round Head Screw NP	5	153	No. 2	Woodruff Key	4
124	10-32 x 1/4	Round Head Machine Screw (HB)		155	8-32 x 1/4	Round Head Machine Screw (NP)	6
	Slides		12	156	8-32 x 3/8	Round Head Machine Screw (NP)	2
127	1/2 x 2 NC	Hex Cap Screw (HT)	4	158	10-32 x 3/8	Round Head Machine Screw	4
128	1/4 x 1/2 NF	Hex Cap Screw	18	159	No. 8	Internal Lock Washer	6
129	1/4 x 3/4 NF	Hex Cap Screw	3	160	No. 10	Internal Lock Washer	4
129B	1/4 x 1 1/4 NF	Hex Cap Screw	1	161	1/4 Std.	Lock Washer	4
130	5/16 x 1/2 NF	Hex Cap Screw (HB)	4	161A	1/2 Std.	Lock Washer	4
	5/16 x 5/8 NF	Hex Cap Screw (HB)	1	163	CR151C10	End Block	1
132	5/16 x 7/8 NF	Hex Cap Screw	4	164	CR151C2200	Box Term. Block	4
133	3/8 x 1 1/2	Hex Socket Hd. Cap Screw	2	165	709A0D103	Relay	1
134	7/16 x 1 3/4 NF	Hex Cap Screw	6		A1412CH	Box JIC	1
135	5/16 x 3/4 NC	Hex Socket Cap Screw	14		B936W	Wrench	1
136	1/4 x 1 1/4 NF	Hex Socket Cap Screw	5		B6034	Cylinder	1
	1/4 x 1 1/2 NF	Hex Socket Cap Screw	3		S434	Cylinder — Crossfeed	1
	1/4 x 2 NF	Hex Socket Cap Screw	2		S681	Diamond Dresser	1
					S840	Valve — Crossfeed Stop	1
					S895	Wrench	1
					S896	Wrench	1

S929-8 HANDWHEEL AND DRIVE SHAFT ASSEMBLY



Index No.	Part No.	Description	Quan. Req.
1	BA930SW4	Washer	1
2	S610RG	Gear	1
3	S629AB	Grasp Handle	1
4	S629ABI	Insert for Grasp Handle	1
5	S629AW	Thrust Washer	1
5	S629AW4	Thrust Washer	1
6	S829W	Washer	1
7	S881YS	Spring	1
8	S929-8N	Name Plate	1
9	S929-10	Spring Cage	1
10	S929-11	Bearing Cage	1
11	S929-12	End Cap	1
12	S929-13	Body	1
13	S929-14	Stationary Shaft Assembly	1
14	S929-17	Gasket	1
15	S929-18	Piston & Bushing Assembly	1
16	S929-21	Drive Shaft	1
17	S929-22	Washer	1
18	S929-23	Bearing Race	1

Index No.	Part No.	Description	Quan. Req.
19	S929CS	Handwheel	1
20	S929FA	Cap	1
21	S929G	Bushing	1
22	S929K	Key	1
23	1/8	Steel Ball	58
24	AA-710-16	Oilite Bearing	1
25	RS62	Spirolox Ring	2
26	B56-40-2	Oil Seal (5/8 x 7/8 x 1/8) Trostel	1
27	8117-366Y	O-Ring (3/32 x 13/16 x 1)	1
28	8218-366Y	O-Ring (1/8 x 1 1/4 x 1 1/2)	1
29	#2	Woodruff Key	1
30	49 x 4	90° Elbow	1
31	10-32 x 3/4	Flat Hd. Soc. Cap Sc. (HB)	2
32	10-32 x 5/8	Hex Socket Cap Sc.	4
33	1/4 x 1 1/4 NF	Hex Socket Cap Sc.	4
34	3/8 x 3 NF	Hex Socket Cap Sc.	1
35	6-32 x 5/16	Slotted Rd. Hd. Mach. Sc.	1
36	3/8 NF	Hex Nut	1



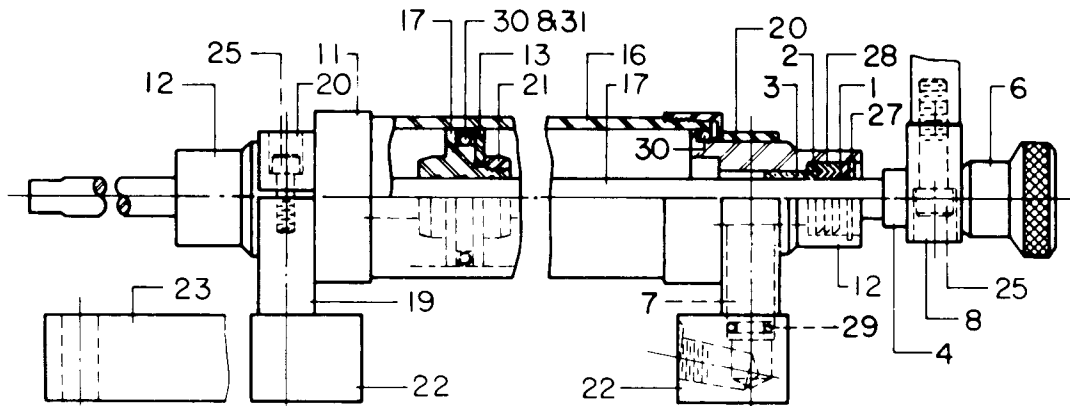
STANDARD EQUIPMENT All Models

B936W Spanner Wrench, B2019 Saddle Lock, 06183 Adjustable Light Fixture, One PV10JS46 Grinding Wheel, One PV10JS60 Grinding Wheel, One PV10JS80 Grinding Wheel (10 x 3/4 x 3) S681 Diamond Dresser, S836P Wheel Puller, S891, S895 and S896 Wrenches, S936CL3 Collet, S936W Wrench, Heavy Cast Iron Base, Table Reversing Stops (page 6) and 2 H.P. Totally Enclosed Special Balanced Ball Bearing Motor. **NOTE:** Automatic Surface Grinders in addition to the standard equipment listed are equipped with S849 One Shot Lube System, S2081-10 Over the Wheel Diamond Dresser and Leematic 20 Downfeed Control.

S833-2 VALVE ASSEMBLY
TABLE CONTROL PLATE AND REVERSING STOPS

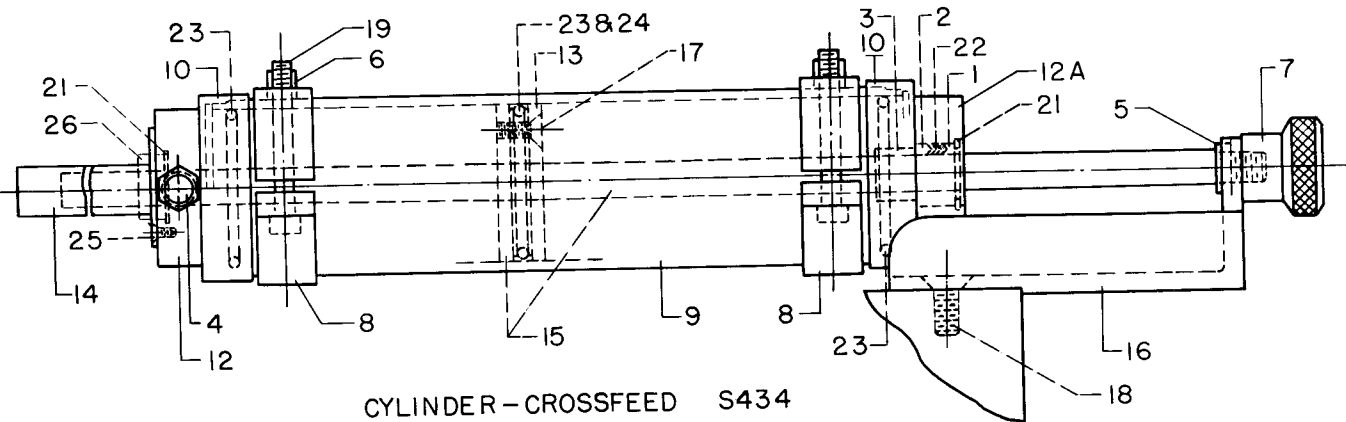
Index No.	Part No.	Description	Quan. Req.	Index No.	Part No.	Description	Quan. Req.
1	B833W-2	Aluminum Washer	2	30	9101K	Ball Bearing	3
2	B933M	Pointer	1	or			or
3	B933R	Valve Thrust Ring	3	30	101KS	Ball Bearing	3
4	B933T	Spool Stop	2	32	H437	Plastic Snap Button	1
5	BA933BC	Bearing Clamp Bar	3	33	¾	Pipe Socket Plug	1
6	BA933BG	Gasket (New Style)	2	34	¾	Pipe Close Nipple	1
7	BA933G	90° Elbow	1	35	¾	Pipe Close Nipple	2
8	BA933G4	Coupling — Pipe ¾	1	36	¾ x ¼	90° Pipe Reducing Elbow	1
9	BA933G5	Coupling — Pipe ¾	1	37	7205 x 4	Male Connector	1
10	BA933L5	Control Valve	1	38	3400 x 4	Street Elbow	1
11	BA933LA	Lever Arm Assembly	1	39	81430-13	Weatherhead Hose	1
12	BA933P2	Bottom Plate	1	40	7205 x 8	Male Connector	1
13	BA933PG	Gasket (New Style)	1	41	7205 x 6	Male Connector	1
14	KO-32A	Table Control Plate	1	42	7405 x 4	90° Male Elbow	3
15	S633J2	Control Valve — Speed	1	43	7405 x 6	90° Male Elbow	2
16	S733AT	Cap	1	44	5822 x 6	Steel Male Elbow	1
17	S733S	Spool	1	45	8011	O-Ring (⅜ x ⅝ x ⅞)	3
18	S833-2N	Name Plate	1	46	8015	O-Ring (⅜ x ⅝ x ⅞)	1
19	S833B	Body & Ring Assembly	1	47	8213	O-Ring (⅜ x 1⅝ x 1⅞)	3
20	S833BN	Nut	1	48	¼ x 2½ NF	Hex Socket Hd. Cap Sc.	14
21	S833BS	Stop Collar	1	49	¼ x ½ NF	Hex Head Cap Screw	5
22	S833D	Rotary Pilot Valve	1	50	¼ x ¾ NF	Hex Head Cap Screw	1
23	S833EH	Control Arm Assembly	1	51	10-32 x ¼	Hex Socket Set Screw	12
24	S833J	Control Valve — Dwell	1	52	10-32 x ½	Hex Socket Set Screw	2
25	S833P2	Oil Channel Plate & Ring	1	53	¼ x ¼	Hex Socket Set Screw	1
26	S833PU2	Oil Channel Plate — Lower	1	54	10-32 x ¾	Hex Socket Set Screw	1
27	S837K2	Control Knob	1	55	⅝ x ¾ NF	Hex Socket Hd. Cap Sc.	2
28	S933RL8	Reversing Bracket Assembly	1	56	#2 x ¾	Self-tap Screw	6
29	S933RR8	Reversing Bracket Assembly	1		KO-32A	KO Data Plate	1

S9034 (1¼x20)
HYDRAULIC CYLINDER ASSEMBLY



Index No.	Part No.	Description	Quan. Req.	Index No.	Part No.	Description	Quan. Req.
1	B834GF	Female Support Ring	2	20	S9034BU	Bracket — Upper	2
2	B834GM	Male Support Ring	2	21	S9034PN	Piston Nut	1
3	B834GR	Gland Bushing	2	22	B7034B3	Coupling Block	1
4	B934R	Rod Drive Collar	1	23	B8034B3	Coupling Block	1
6	BA934N	Thumb Nut	1	25	10-32 x ¾	Socket Head Cap Screw	4
7	S9034CT	Coupling Tube	2	*27	RR81	Spirolox — Internal	2
8	BA934Y	Yoke (Not Part of Cylinder Assembly)	1		¾ x 1½ NC	Hex Cap Screw	2
11	B3034E	End Cap	2	*28	S2-6	Hydraulic V-Packing	4
12	S9034GB	Gland Body	2	*29	8014	O-Ring ⅜ x ⅝ x ⅞	2
13	B3034PC	Cap For Piston	1	*30	8214	O-Ring ⅜ x 1 x 1¼	3
16	S9034C	Cylinder	1	*31	KEX6214	Kapseal — External	1
17	S9034PR	Piston and Rod Assembly	1	<div>S9034RK CYLINDER SEAL REPAIR KIT FOR S9034 CONSISTS OF ITEMS STARRED AND ONE B5034RT THIMBLE</div>			
19	S9034BL	Bracket — Lower	2				

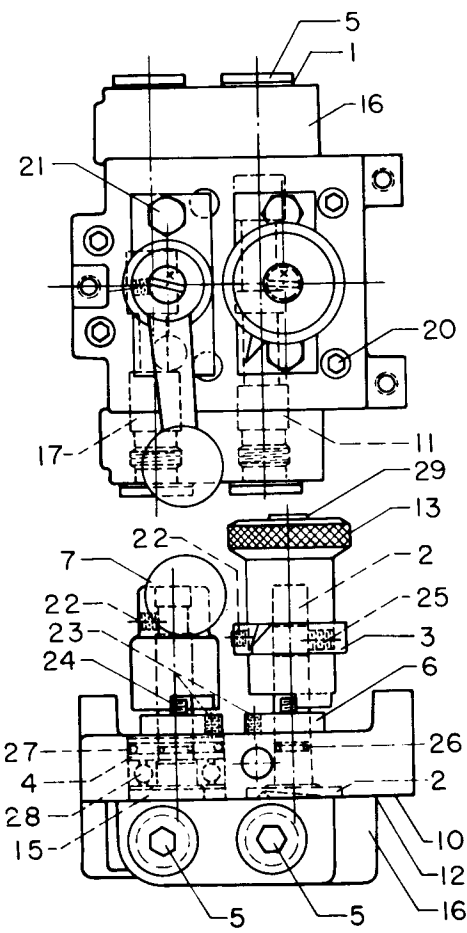
S834 CYLINDER - CROSSFEED



CYLINDER - CROSSFEED S434

Index No.	Part No.	Description	Quan. Req.
1	B834GF	Female Support Ring	2
2	B834GM	Male Support Ring	2
3	B834GR	Gland Bushing	2
4	B934M	Male Connector	1
5	B934R	Rod Drive Collar	1
6	BA905DPS	Dowell Pin	1
7	BA934N	Thumb Nut	1
8	S234B	Bracket	1
9	S834C	Cylinder	1
10	S234E	End Cap	2
12	S834	Gland Body Assembly — Consists of B834GR Gl. Bush & S834GB Gl. Body	1
12A	S834G8	Gland Body Assembly — Consists of B834GR Gl. Bush. & S834GB8 Gl. Body	1

Index No.	Part No.	Description	Quan. Req.
13	S234PC	Cap For Piston	1
14	S834T	Cover Tube (S434)	1
15	S834PR	Piston and Rod Assembly	1
16	S705BD	Bracket	1
17	10-32 x 3/8	Flat Head Socket Cap Screw	4
18	5/16 x 3/4 NF	Flat Head Socket Cap Screw	2
19	1/4 x 2 NF	Hex Socket Cap Screw	2
21	RR-81	Spirolox — Internal	1
22	S2-6	V-Packing	4
23	8224	O-Ring (1/8 x 1 3/4 x 2)	3
24	KEX6224	Kap Seal — External	1
25	5-40 x 1/4	Flat Head Machine Screw (NP)	3
26	01W100-28-4	Seal (S334)	1



S837 CROSSFEED VALVE

DRAWING SHOWS ORIGINAL FACTORY SETTING OF CONTROL KNOB AND HANDLE

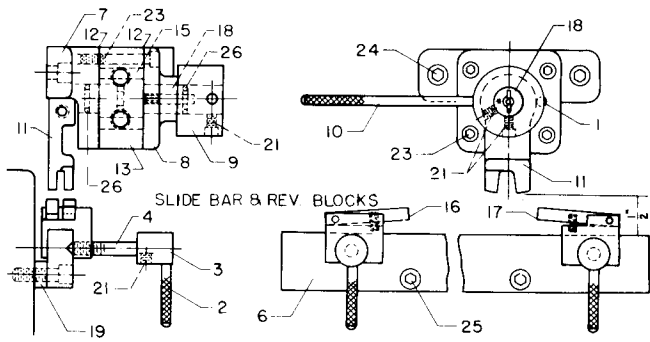
NOTE POSITION OF ETCHED STAR AND SLOT AT END OF SHAFT.

Index No.	Part No.	Description	Quan. Req.
1	B833W	Aluminum Washer	4
2	B9331J	Control Valve	1
3	B933M	Pointer	1
4	B933R	Valve Thrust Ring	2
5	B933T	Spool Stop	4
6	BA933BC	Bearing Clamp Bar	2
7	BA933LA	Lever Arm	1
10	S837B	Valve Body	1
11	S837D	Spool — Cross Feed (Specify Size on Spool)	1
12	S837G	Gasket	1
13	S837K	Control Knob	1
14	S837N	Name Plate	1
15	S837L	Control Valve	1
16	S837P	Valve Plate	1
17	S837S	Spool (Specify Size on Spool)	1
20	1/4 x 1 NF	Hex Socket Cap Screw	6
21	1/4 x 1/2 NF	Hex Cap Screw	4
22	10-32 x 3/16	Socket Set Screw	2
23	10-32 x 1/4	Socket Set Screw	6
24	10-32 x 1/2	Socket Set Screw	2
25	1/4 x 1/4 NF	Socket Set Screw	1
26	No. 8011	O-Ring 1/8 x 3/16 x 7/16	2
27	No. 8213	O-Ring 1/8 x 15/16 x 1 3/16	2
28	9101K	Ball Bearing	2
29	3/8	Chrome Button	1
	KO-45A	Data Plate	1

S839-2
ROTARY PILOT VALVE

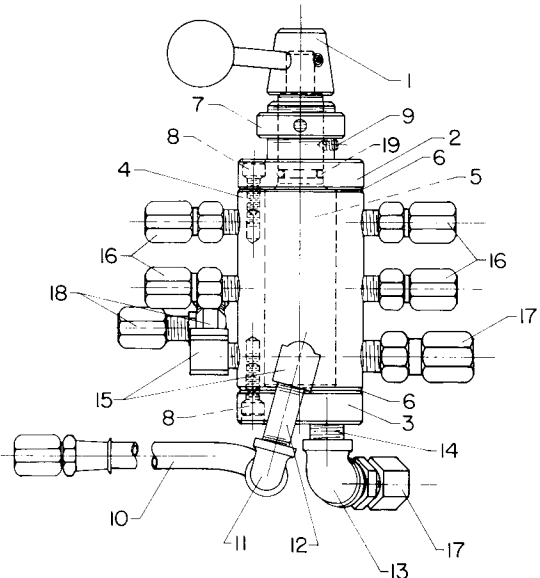
DRAWING SHOWS ORIGINAL FACTORY SETTING
OF CONTROL KNOB & HANDLE ON THIS VALVE.

NOTE POSITION OF ETCHED STAR AND SLOT
AT END OF SHAFT.



Index No.	Part No.	Description	Quan. Req.
1	A629J	Knurled Pin	1
2	BA985XA	Handle	2
3	BA985XH	Head	2
4	S736AS	Screw	2
6	S839AL	Slide Bar	1
7	S839B	Bracket	1
8	S839C	Cover	1
9	S839D	Cap	1
10	S839E	Handle	1
11	S839F	Shifting Fork	1
12	S839G	Gasket	2
13	S839H	Housing	1
14	S839P	Plug	1
15	S839R	Insert Ring	1
16	S839SF	Reversing Block Assembly — Front	1
17	S839TR	Reversing Block Assembly—Rear	1
18	S839V	Rotary Valve	1
19	S839W	Spacer for Bar	2
	S839N	Name Plate	1
21	10-32 x 3/16	Hex Socket Set Screw	2
22	1/4 x 1/4 NF	Socket Set Screw	1
23	10-32 x 1 1/4	Hex Socket Cap Screw	4
24	1/4 x 3/4 NF	Hex Socket Cap Screw	2
25	1/4 x 7/8 NF	Hex Socket Cap Screw	2
26	8110	O-Ring (3/32 x 3/8 x 3/16)	2

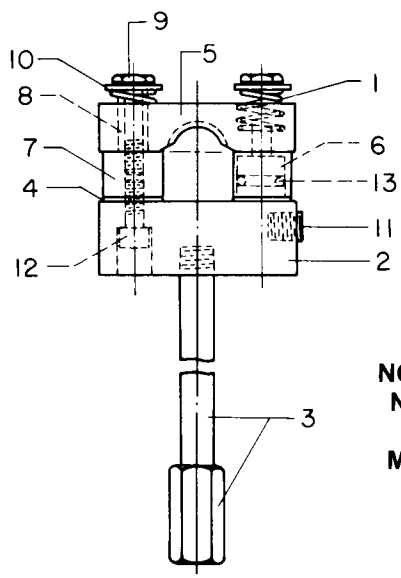
S840-10
VALVE ASSEMBLY
CROSSFEED STOP



Index No.	Part No.	Description	Quan. Req.
1	B933LA	Lever Arm	1
2	S840-11	Threaded Cap	1
3	S840-12	Cap	1
4	S840-13	Body	1
5	S840-14	Spool	1
6	S840-15	Gasket	2
7	K530L	Lock Nut	1
8	10-32 x 1/2	Hex Socket Cap Screw	8
9	10-32 x 1/4	Hex Socket Set Screw Cone Pt.	1
10	81430-24	Hose Assembly	1
11	1/8 Pipe	Elbow 90°	1
12	1/8 x 1 1/2	Pipe Long Nipple	1
13	1/4 Pipe	Elbow 90°	1
14	1/4 Pipe	Close Nipple	1
15	3400 x 2	Street Elbow	2
16	7205 x 4	Male Connector	4
17	7205 x 6	Male Connector	2
18	7755 x 4	Male Run Tee	1
19	8015	O-Ring (1/16 x 3/16 x 11/16) (Old #203)	1
	KO-44A	Data Plate	1

S924 FEED NUT
ASSEMBLY

Index No.	Part No.	Description	Quan. Req.
1	K410S	Spring	4
2	S924BT	Body	1
3	S824C	Tube Assembly	1
4	S824G	Gasket	2
5	S824N	Feed Nut	1
6	S824P	Piston	2
7	S824RT	Rail — Threaded	2
8	S824S	Spacer	4
9	S824T	Special Screw	4
10	S824W	Washer	4
11	1/8	Hex Socket Pipe Plug	1
12	1/4 x 5/8 NF	Hex Socket Cap Screw	4
13	8014	O-Ring (1/16 x 1/2 x 5/8)	2

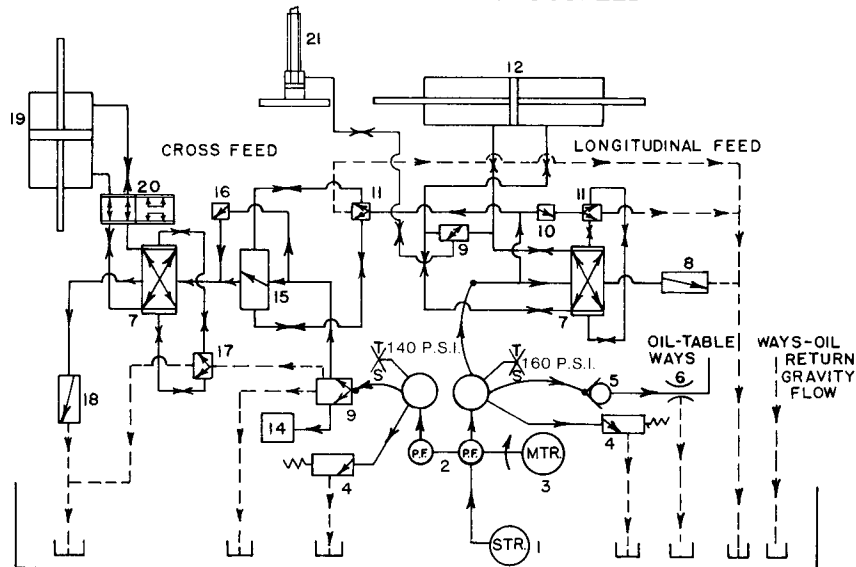


NOTE: NO. 3
NOT USED
ON ALL
MACHINES

S731DU-9

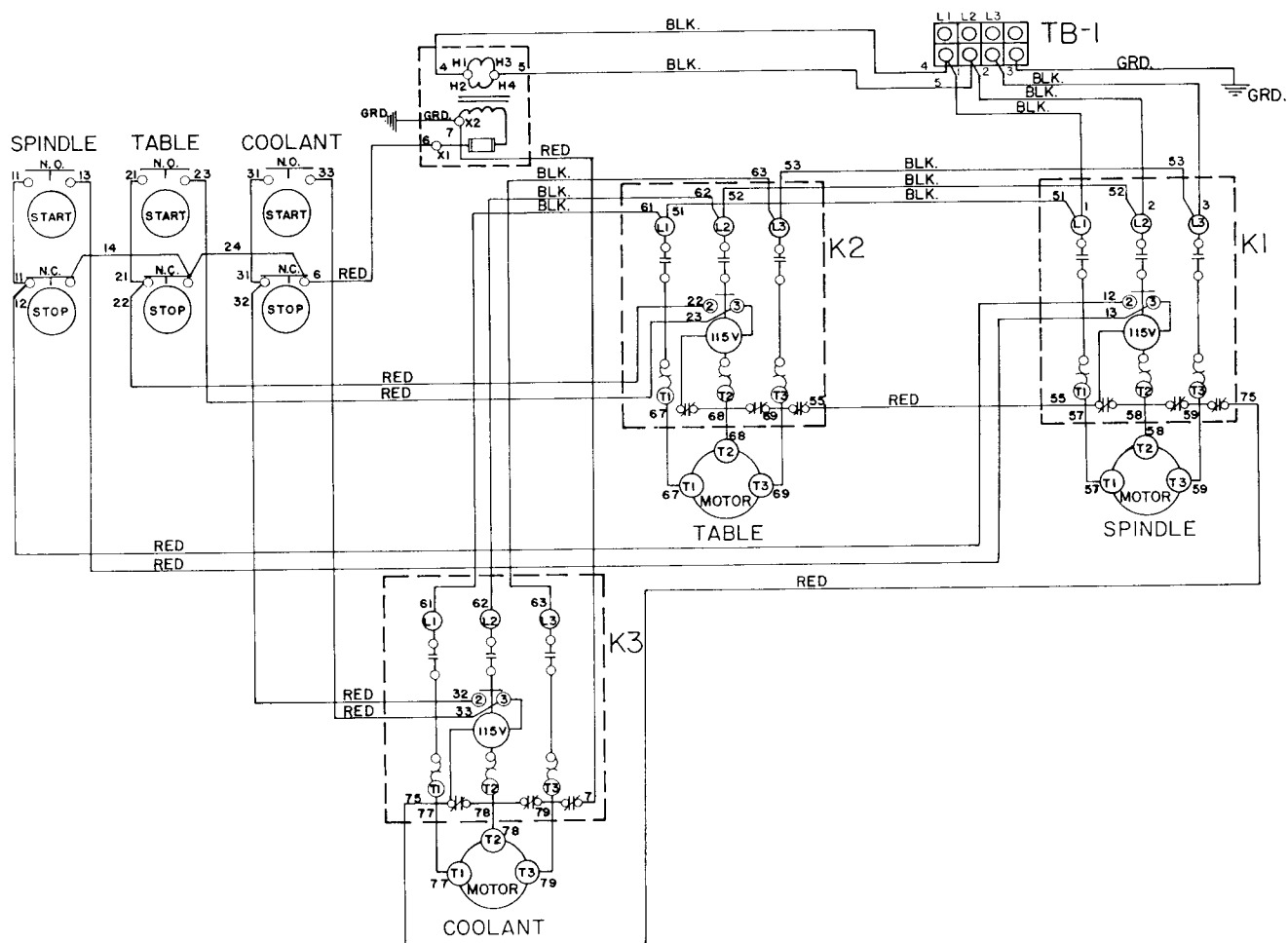
Hydraulic Circuit Drawing, Full Hydraulic Model HG Grinders

LONGITUDINAL AND CROSSFEED



ABERDEEN, SOUTH DAKOTA 57401

S709JIC2P ELECTRICAL CONTROLS



Index No.	Part No.	Description	Quan. Req.
	CR151	End Block	1
	CR151CO200	Box Terminal Block	4
	709TOA	Starter	2
	800T-H2	Selector Switch	2
	800T-XD1	Contact Block N. O.	2
	800T	Plate Off-On	2
	800TN1	Closing Button	1
	N	Heater (select from heater chart)	2
	N	Heater (select from heater chart)	2
	A1412CH	Box J.I.C.	1
	B709P	Panel	1
	BA967D	Cover	1
	KO-34	Name Plate — Table	1
	KO-35	Name Plate — Coolant	1
	KO-37	Name Plate — Spindle	1
	8-32 x 1/4	Round Head Machine Screw—N.P.	6
	8-32 x 3/8	Round Head Machine Screw—N.P.	2
	10-32 x 1/4	Round Head Machine Screw—N.P.	4
	1/4 x 3/8 NC	Hex Cap Screw	4
	1/4 Std.	Lock Washer	4
	No. 8	Internal Lock Washer	6
	No. 10	Internal Lock Washer	4
	B800-12	Wiring Schematic	1

S709JIC2P Electrical Control is standard electrics for all "HG" grinders. Schematic shown is for S709JIC3P and includes magnetic starter for fluid pump. If 110V is required on secondary wiring see control listing for new part numbers. Additional cost for any unit can be obtained by subtracting standard S709JIC2P from required unit.

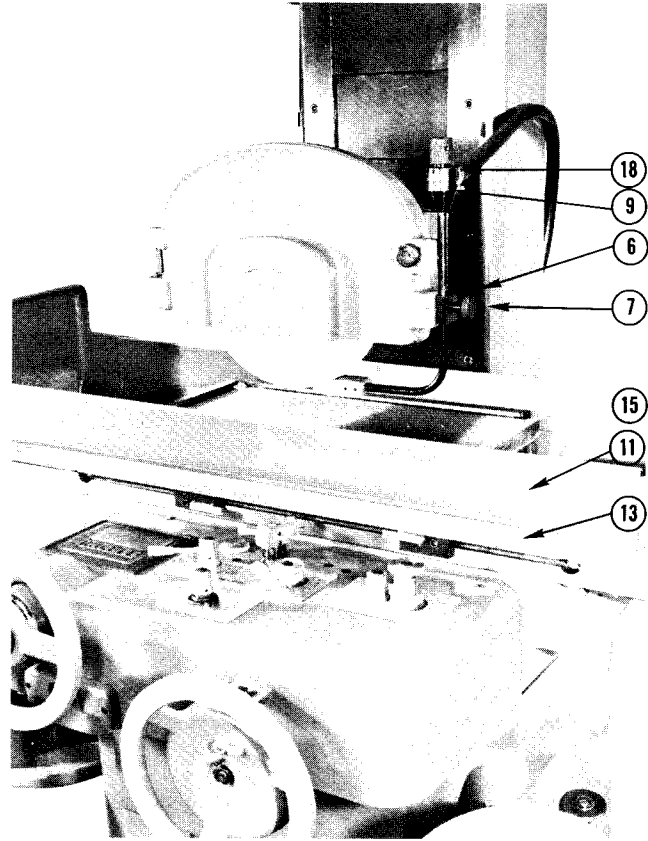
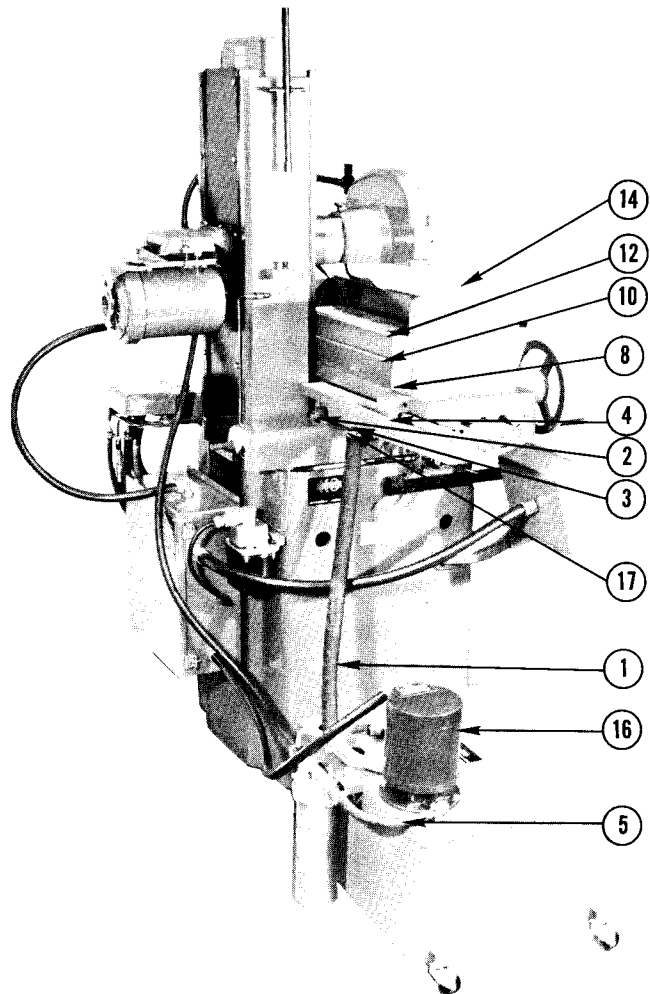
IMPORTANT: When ordering heater elements for this starter always specify the desired heater type number.

General Purpose and Other 40C° Rise Motors — Select the "Heater Type No." with the listed "Full Load Amps" nearest the full load current value shown on the motor nameplate when the ambient temperature at the starter and the motor is the same. If the ambient temperature at the starter is higher than at the motor and the nameplate full load current is between the values listed, select the "Heater Type No." with the higher value. If the ambient temperature at the starter is lower than at the motor and the nameplate full load current is between the values listed, select the "Heater Type No." with the lower value. This will provide protection between 105 and 125% for motors with nameplate full load currents of 0.71 Amperes and above. Motors with full load currents of 0.70 Amperes and below will be protected between 105 and 140%.

Special Purpose Motors — Rated for Continuous Duty 50C°, 55C°, 70C° and 75C° Rise — Select the "Heater Type No." with the next lower listed "Full Load Amps" than determined by the above rules. This will provide a 10% lower value of protection.

Heater Type No.	Full Load Amps.	Heater Type No.	Full Load Amps.	Heater Type No.	Full Load Amps.	Heater Type No.	Full Load Amps.
W10	0.19	W26	0.92	W35	2.22	W44	5.22
W12	0.23	W27	1.03	W36	2.45	W45	5.74
W14	0.27	W28	1.16	W37	2.68	W46	6.30
W16	0.34	W29	1.26	W38	2.97	W47	6.94
W18	0.42	W30	1.38	W39	3.26	W48	7.63
W20	0.50	W31	1.52	W40	3.58	W49	8.45
W22	0.61	W32	1.67	W41	3.95	W50	9.35
W24	0.77	W33	1.84	W42	4.33		
W25	0.83	W34	2.03	W43	4.77		

S932-15 COOLANT ATTACHMENT



Index No.	Part No.	Description	Quan. Req.
1	B2035DH	Drain Hose (1 1/8 x 29)	1
2	B6035DE	Bracket	1
3	B6035DS	Drain Spout	1
4	B6035DT	Drain Trough	1
	BA930W	Vellum Washer	3
	K510PP	Knurled Pin	1
5	S612-233	Tank Assembly & Filter	1
	BA931H10	Hose, 10"	1
	BA931H84	Hose, 84"	1
	BA933GS	Elbow	1
	S612-44	Hose Coupling	1
	S832TA	Tank, Assembly, 15 gal.	1
	S612-232C	Cover Assembly	1
	CT101	Cuno Filter	1
	1-2251-51-2	Caster	4
	S612-232F	Flushing Attachment	1
	C3109x12x6	Reducer Bushing	2
	1/4 x 1/2 NC	Hex Cap Sc. H.B.	4
	1/4 STD.	Lock Washer	4
	8H	Hose Clamp	4
	2278-L1	Replacement 50 Micron Filter Cartridge Available	
6	S632B	Bracket	1
7	S632W	Thumb Screw	1
8	S732DC	Drain Cap	1

Index No.	Part No.	Description	Quan. Req.
9	S832N12	Nozzle Assembly	1
	S832NA2	Body and Tube Assembly	1
	S632NT	Tube	1
	S832NP	Nozzle Assembly	1
	K518S	Valve Shaft	1
	K518K	Control Knob	1
	10-32 x 3/16	Hex Socket Set Screw	1
	10-32 x 3/8	Hex Socket Set Screw	2
	8011	O-Ring 1/8 x 3/16 x 7/16 #6	1
10	S932GA	Splash Guard	1
11	S932GB	Splash Guard	1
12	S932GC	Splash Guard	1
13	S932GD	Splash Guard	1
14	S932GL	Left Splash Guard	1
15	S932GR	Right Splash Guard	1
16	S1635A	Pump Assembly 115V, 1PH	1
	or		or
	S1635E	Pump Assembly 208/220/440V	1
	#200	1/2" Clamps	1
	73-B	Bryant Wire Connector	6
	or		or
	B2-1	Bryant Wire Connector	4
17	16H	Hose Clamp	1
18	8H	Hose Clamp	2
	1/4 x 3/8 NF	Hex Head Cap Screw	7
	1/4 x 3/4 NF	Hex Head Cap Screw	3
	1/4 x 1/2 NF	Hex Socket Cap Screw	2
	3/16 x 3/4 NF	Hex Socket Cap Screw	2
	1/4 NF	Hex Jam Nut	4
	#12 NF	Washer H	3
	1/4 Std.	Lock Washer	4

CHART OF INTERCHANGEABLE LUBRICANTS

K. O. LEE WAY LUBE

No. 2689 Quart and No. 2690 Gallon Available from Factory

Light Hydraulic Oil & Lubricant	
SUPPLIER	PRODUCT NAME
Kendall Refining	Hyken Golden
Pennzoil Co.	AW Hyd. Oil 32
Phillips Petroleum Co.	Magnus Oil 32
Southwestern Petroleum Stewart-Warner Corp.	Swepeco Ind. 702-1 Hyd. Hd Oil #0
Amoco Oil Co. (Standard Oil Co. Division of American Oil Co.)	American Industrial No. 32
Ashland Oil Co.	ETC (R & O) #15
Atlantic Richfield Co.	Duro 32
BP Trading Ltd. and its Affiliated Companies	BP Energol HL-32
Chaplin Petroleum Co.	Hydrol R & O 150
Chevron U.S.A. Inc.	Chevron O.C. Turbine Oil 32
Cities Service Co.	Citgo Pacemaker 32
Conoco Inc.	Dectol R & O Oil 32
Exxon Co. U.S.A. Esso-Affiliated Companies	Teresstic 32, Nuto 32 Teresso 32, Nuto 32
Getty Oil Co.	Veedol Aturbrio 50
Gulf Oil Canada Ltd.	Gulf Harmony 32
Gulf Oil Corp. & Subsidiaries	Gulf Harmony 32
Imperial Oil & Grease Co.	Moluballoy 601
Mobil Oil Corp.	Mobil D.T.E. Oil Light
Petrofina Group	Fina Cirkan 31
Shell Oil Co.	Turbo 32
Standard Oil Co. (Ohio)/ Boron Oil Co.	Industron 44
Sun Petroleum Products Co.	Sunvis 916
Texaco Inc.	Regal R & O 32
Union Oil Co.	Union Unax RX 32 and Turbine Oil 32
United Refining Co.	Emblem R & O 150
World Wide Lubricants	Moly Hyd. 150

Viscosity System (ASTM D 2422) No. 150
(SUS at 100° F) (ASTM D 2161) 135 to 165
(Centistokes at 100° F) (ASTM D 445) 28.8 — 35.2
No inference should be made that all products are of the same quality. This lubricant must have all of the general qualities and properties required to insure its satisfactory performance as a machine tool lubricant and hydraulic medium. It is recommended to be changed at a semi-annual frequency (or after 1000 hours of operation) and to be used under conditions consistent with good machine tool practice.

Heavy - Medium Way Oil	
SUPPLIER	PRODUCT NAME
Kendall Refining	Kenoil 965 EP
Pennzoil Co.	Penreco Way Oil Med.
Southwestern Petroleum	Swepeco Gear Lube 201-80/90
Stewart-Warner Corp.	Hyd. HD Oil #2
Amoco Oil Co. (Standard Oil Co. Division of American Oil Co.)	Waytac Oil 68
Ashland Oil Co.	Waylube W-30
Atlantic Richfield Co.	Truslide 68
BP Trading Ltd. and Affiliated Companies	BP Energol HP 20-C
Chaplin Petroleum Co.	Hydrol AW 315
Chevron U.S.A. Inc.	Chevron Vistac Oil 68 X
Cities Service Oil Co.	Citgo Sliderite 68
Continental Oil Co.	HD Way Lubricant 31
Exxon Co. USA	Febis K-68
Getty Oil Co.	Veedol Aturbrio 61
Gulf Oil Canada Ltd.	Gulfway 68
Gulf Oil Corp. and Subsidiaries	Gulfway 68
Imperial Oil and Grease Co.	Moluballoy M.W.O. 20
Mobil Oil Corp.	Mobil Vactra Oil No. 2
Petrofina Group	Fina Artac EP 37
Shell Canada Ltd.	Tonna 68
Shell International	Tonna 68
Shell Oil Co.	Tonna 68
Standard Oil Co. (Ohio)/ Boron Oil Co. BP Oil Corp.	Factoway 50 Factoway 50 BP Energol HP C68C
Sun Petroleum Products Co.	Sunoco Waylube 1180
Texaco Inc.	Way Lubricant 68
Total Compagnie Francaise De Raffinage	Total Drosera 40
Union Oil Co.	Union Way Oil HD-68
United Refining Co.	Emblem Powerway 350
World Wide Lubricants	Moly-Way 3

Viscosity System (ASTM D 2422) No. 315
(SUS at 100° F) (ASTM D 2161) 284—346
(Centistokes at 100° F) (ASTM D 445) 61.2—74.8
No inference should be made that all products are of the same quality. This lubricant must have all the general qualities and properties required to insure its satisfactory performance as a machine tool slideway lubricant. It is recommended to be changed every 3 months and to be used under conditions consistent with good machine tool practice.