

NORTON
10" Hydraulic
Surface Grinding Machine

Instruction and Parts Manual

Manufactured in the USA by:
Chas. G. Allen Co., Inc.
25 Williamsville Road
Barre, MA 01005

Telephone: (978) 355-2911 Fax: (978) 355-2917

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INDEX

of

Instruction Divisions, Drawings and Photographs

SPECIFICATIONS

UNCRATING, ERECTING AND STARTING MACHINE

Removing Container	5
Inspection	5
Check List	5
Allowing Clearance	5
Leveling	5
Wiring	7
Filling Tanks.	7
Hydraulic Supply	7
Hydraulic Capacity	7
Keeping Supply Ample	7
Pressures	7
Lubrication	11
Greasing.	11
Coolant	11
Non-Soda Compounds	11
Quantity.	11

OPERATION

Interferences	11
Wheel Feed Index	14
Starting the Table	14
Control Valve	14
Table Speeds	14
Cross Traverse Controls	14
Belt Drive Caution	16
Bleeding	16
Truing Preparation	16
Finish Truing.	16
Holding Diamond	16
Wheel Guard Truing	16
Wheel Balance	18
Balancing Sleeve	18
Table Facing	18
Locating Dogs	18
Hand Operation	18

SERVICING

Care of Machine	18
Lubrication.	22
Hydraulic Supply	22
Reverse Dashpot	22
Reverse Valve Action	22
Dirt in Needle Valve	22

SERVICING (Cont.)

Reverse Valve	23
Valve Gear Adjustment	23
Uneven Cross Feed	23
Cross Feed Pressure Adjustment.	23
Table Creep	23
Erratic Wheel Slide Movement.	25
Air in System	25
Hydraulic Pressure.	25
Recommended Hydraulic Oil	25
Other Oils.	27
Spindle Oil	27
Grease.	27
Grinding Compound	27
Machine Adjustment.	27
Adjusting Spindle Bearings.	27
Preparation	29
Adjustment Sequence	29
Caution	29
End Thrust Adjustment	29
Lubrication	29
Belt Length Adjustment.	31
Reassembly Caution.	31
Gib Adjustment.	31
Prospective Life of Gibs.	31
Piston Rod Nuts Adjustment.	31
NORTON Service.	32
Office Information.	32
Customer Assistance	32
Ordering Parts.	32
Address	32

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Index of Photographs

Figure 1 - Front View of Machine	6
Figure 9 - Rear View of Machine.	19
Figure 10 - Detail of Pumps, etc.	20

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Index of Drawings

Figure 2 - Schematic Hydraulic Diagram	8
Figure 3 - Wheel Head Cross Traverse	10
Figure 4 - Reverse Valve Drainage System	11
Figure 5 - Piping to Wheel Slide	12
Figure 6 - Start-Stop Control Lever.	13
Figure 7 - Wheel Feed and Index Mechanism.	15
Figure 8 - Belting and Pulley Speed Diagram.	17
Figure 11 - Table Control Apron Assembly.	21
Figure 12 - Table Cylinder and Reverse Valve.	24
Figure 13 - Pump Unit Assembly.	26
Figure 14 - Grinding Wheel Spindle Assembly	28
Figure 15 - Automatic Cross Feed Control.	30

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Erecting, Operating and Servicing Instructions

for the

Norton 10" Surface Grinding Machine

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UNCRATING, ERECTING AND STARTING MACHINE

- Removing Container Care should be exercised in removing the machine from the box or crate in which it is shipped. Boards should be removed piecemeal from the container rather than attempt to take off a whole side or end at one time. In this way the machine is spared the shocks liable to occur when a heavy sledge and bar are used to strip off the container. While the machine is sturdily constructed, there are parts which are liable to damage or breakage if given rough treatment.
- Inspection Inspect the machine thoroughly after the container has been removed to be sure that no damage has occurred during transit. Past experience has shown that the Norton method of packing is adequate and keeps all parts with the machine in a single container.
- Check List Check the entire shipment against the shipping list. Frequently small parts, listed on the packing list, are missing after the machine has been set up. Too often this loss is caused by the smaller parts being thrown away in the packing materials. It is also recommended that all such small parts, especially wrenches and gages, be segregated or given to the foreman in charge of the job to prevent possible loss or theft.
- Allow Clearance In setting up the machine the millwright must allow ample room around the machine for possible servicing. A space at the right end of the machine for removal of the coolant tank is necessary and, of course, room must be allowed at each end of the machine for the overrun of the table.
- Leveling The machine, resting on three pads cast into the base, does not require the use of wedges or other leveling devices. It is recommended that the floor, which should be as solid as possible, be nearly level. It is not necessary to place any special foundation for this machine and, should it be located on a concrete floor, which is beneficial, it should under no circumstances be grouted into place.

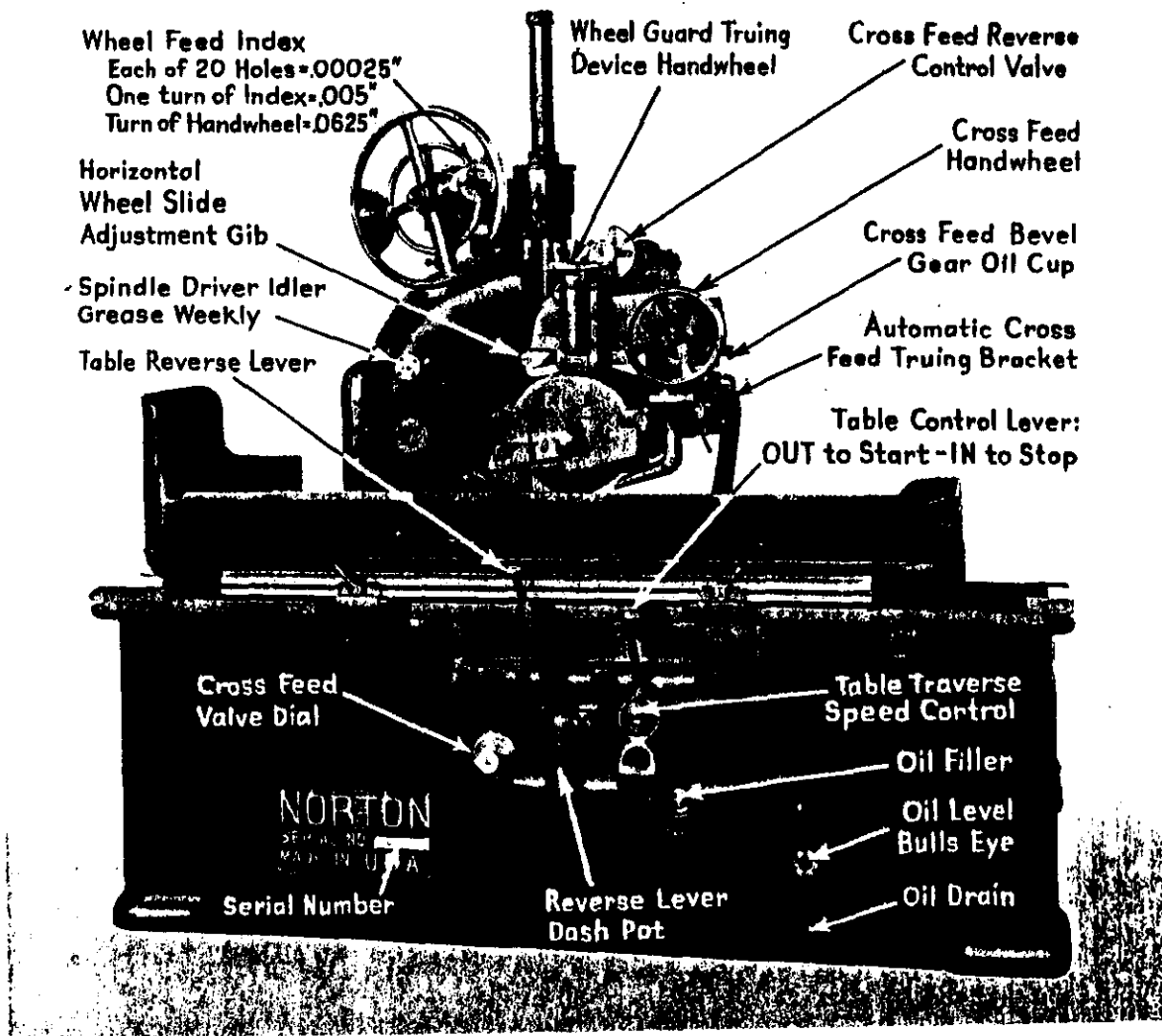


FIGURE 1 - Photo N-3882

10" x 36" Hydraulic Surface Grinder, front, showing nomenclature and various servicing points.

Wiring

Any electrical wiring necessary to the installation of the machine should be done by a competent electrician who should be guided by information derived from plates on the motor and switch boxes. There is no interior wiring to be done as Norton Company makes it a practice to install complete, lead-lined, leakproof cables inside the machine base before shipment.

Filling Tanks

With the machine in place and leveled if necessary; the motors and switches connected, the tank for hydraulic oil within the base may be filled and the coolant tank placed in position at the rear of the machine and filled.

Hydraulic Supply

To fill the hydraulic tank remove the oil filler cover indicated in Fig. 1 on Page 6 and pour the oil directly into the base. It is recommended that a highly refined light turbine oil be used in the hydraulic system of these machines. Norton Company will not be responsible for damages and shut-downs caused by using inferior oil. The most desirable product is especially made for high-speed, high-pressure circulating hydraulic systems and has a S.U.V. rating of 150 at 100° F.

The capacities of the hydraulic reservoirs are:

Hydraulic Capacity

- 24" machine - 15 gallons
- 36" machine - 20 gallons
- 48" machine - 20 gallons
- 60" machine - 20 gallons

Keep Supply Ample

In filling the reservoir be sure that an ample supply is used for nothing is to be gained by skimping. Oil should reach midway on the sight glass on the front of the machine at all times. Too little oil means that the reduced quantity has to pass through the pump and valves more frequently with a consequent heating action.

Pressures

The relief valves on this machine have been set at the factory and should require no adjustment previous to running the machines. However, if after the machine has been running some time and the operator is sure that all other functions are operating satisfactorily, he still finds that apparently there is a lack of, or even too great, hydraulic pressure, adjustment may be made on the main relief valve shown in Fig. 9 on Page 18. Pressures between 100 and 130 pounds comprise the range in which the 10" Surface Grinder performs with the greatest efficiency. See page 25 for adjustments.

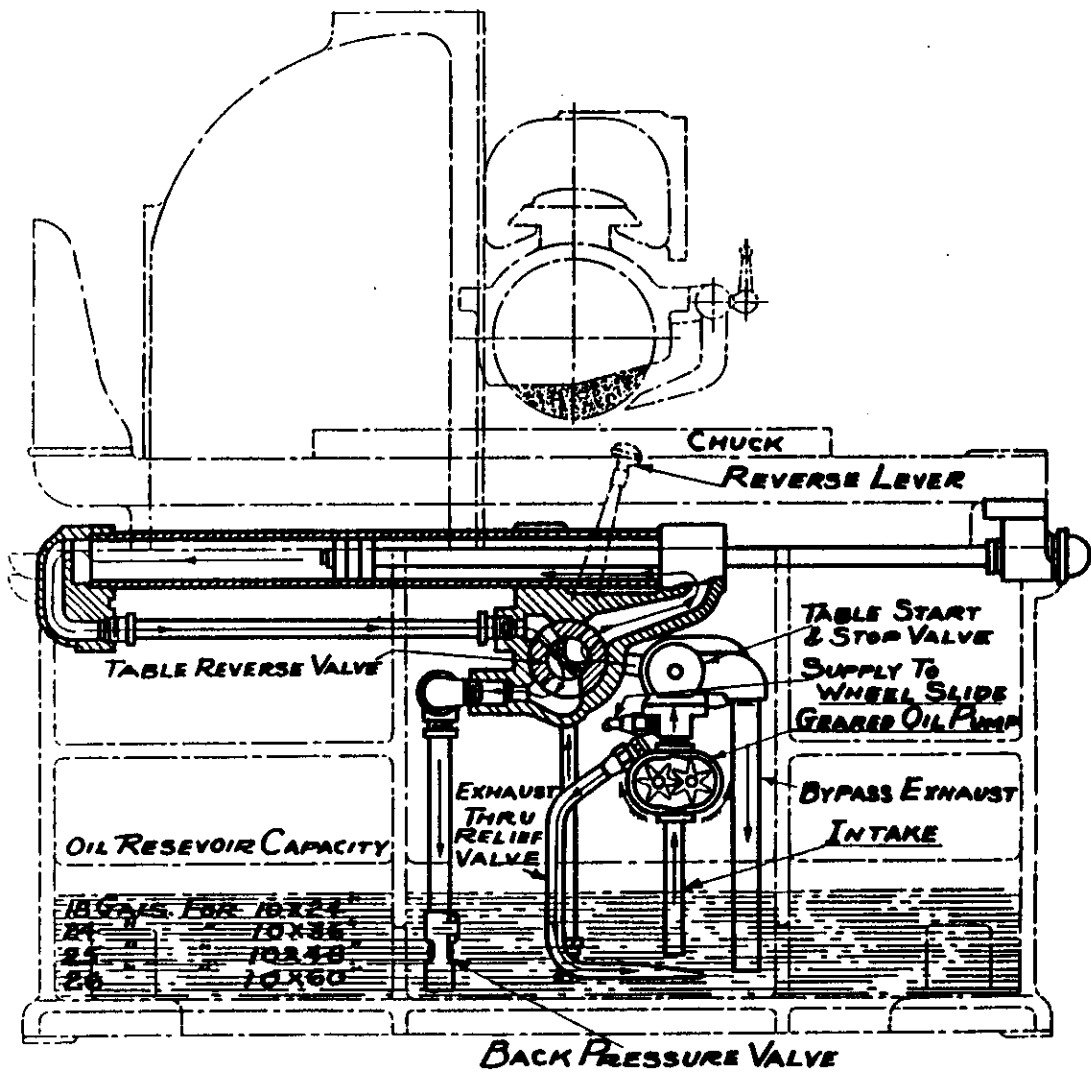


FIGURE 2 - (SE-220)

Schematic Diagram of Hydraulic Table Traverse.

Lubrication The machine should be thoroughly lubricated before being placed in operation. The wheel spindle should obtain special attention, the oil cups indicated in Fig. 9, Page 19 being filled until the bullseyes show that the reservoir is approximately $\frac{3}{4}$ full. Spindle oil with an S.U.V. of 50 to 60 at 100° F. should be used to lubricate the wheel spindle. Due to the importance of perfect spindle operations, it is recommended that no inferior oil be used in this unit.

Greasing Other lubrication points will be found on the machine. The oil pockets under the sliding table should be kept full of a good grade of machine (red engine) oil. The spindle belt idlers must be greased, there being grease-gun connections on the back and two at the front of the column. Three spots will be found just over the coolant tank at the rear of the machine for lubricating the pumps. A good grade of non-graphitic grease should be used in replenishing all of these fittings.

Coolant Fill the coolant tank. This tank, with its sediment and settling chamber has a capacity of 70 gallons. Put in about 60 gallons of clean water, which should be as soft as possible, and add a sufficient supply of grinding compound mixed well into the water. Follow the recommendations of the compound manufacturer for correct proportions, or the operator may have some preference in the consistency of the fluid.

Non-Soda Compound It is recommended that the grinding compound be of a non-soda type since it has been found that compounds containing soda have a tendency to curdle and cake with the hydraulic oil, which may lead to sticky valves and faulty machine action.

Quantity It has been found beneficial at all times to have a flood of coolant flowing onto the work. This stream should be directed as nearly as possible at the spot where the wheel touches the work. No advantage is to be gained by reducing this flow, as some cooling and lubricating effect is lost and added back pressure must be absorbed by the pump.

OPERATION

Interferences With the foregoing preparations completed the machine should be ready to run. Before actually starting the machine, be sure that there are no interferences. The operator should see that the table, in traversing, will not strike other parts of the machine and also that the wheel is raised high enough to clear the magnetic chuck and table.

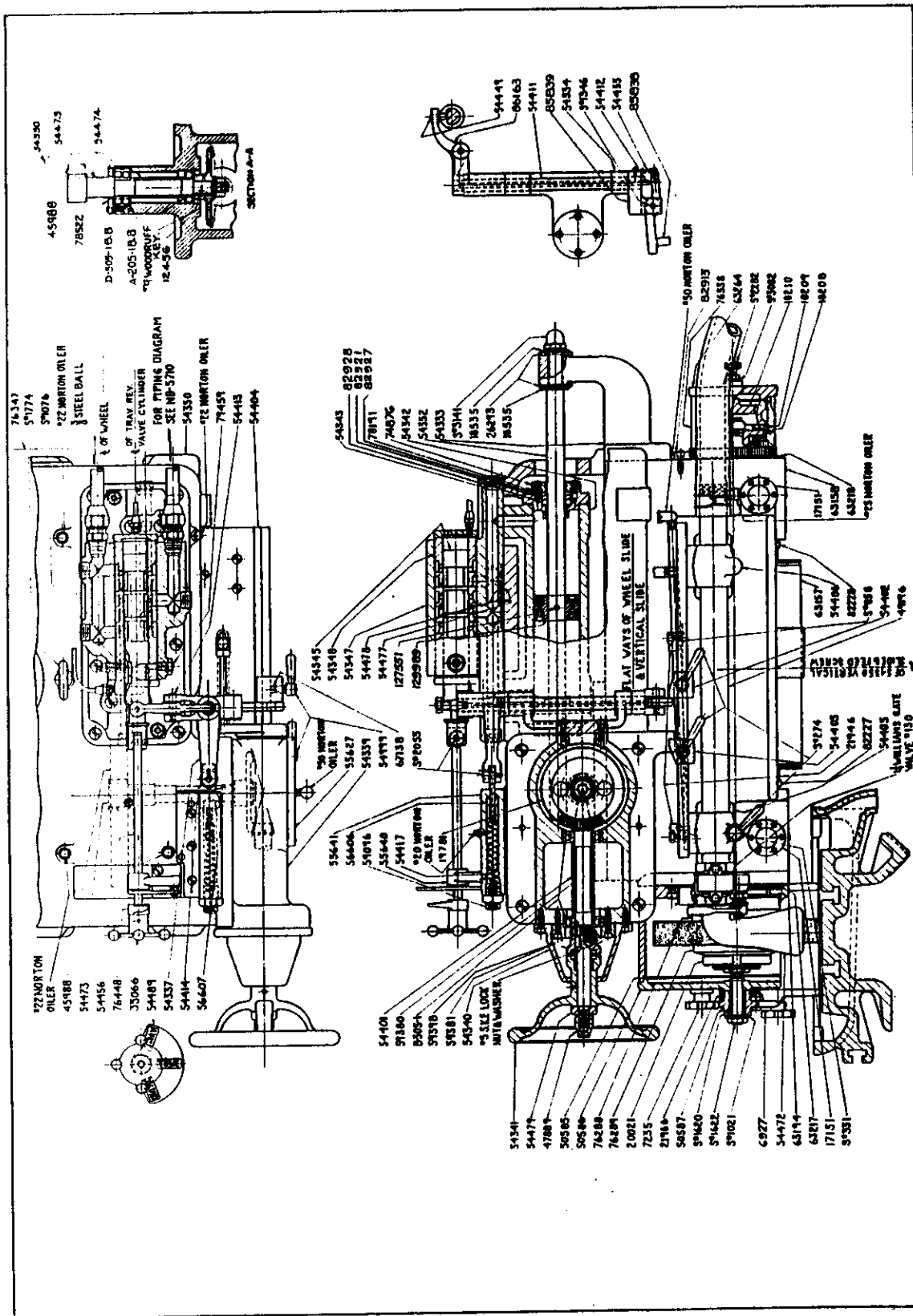


FIGURE 3 - (SE-223-A)

Wheel Head Cross Traverse Mechanism.

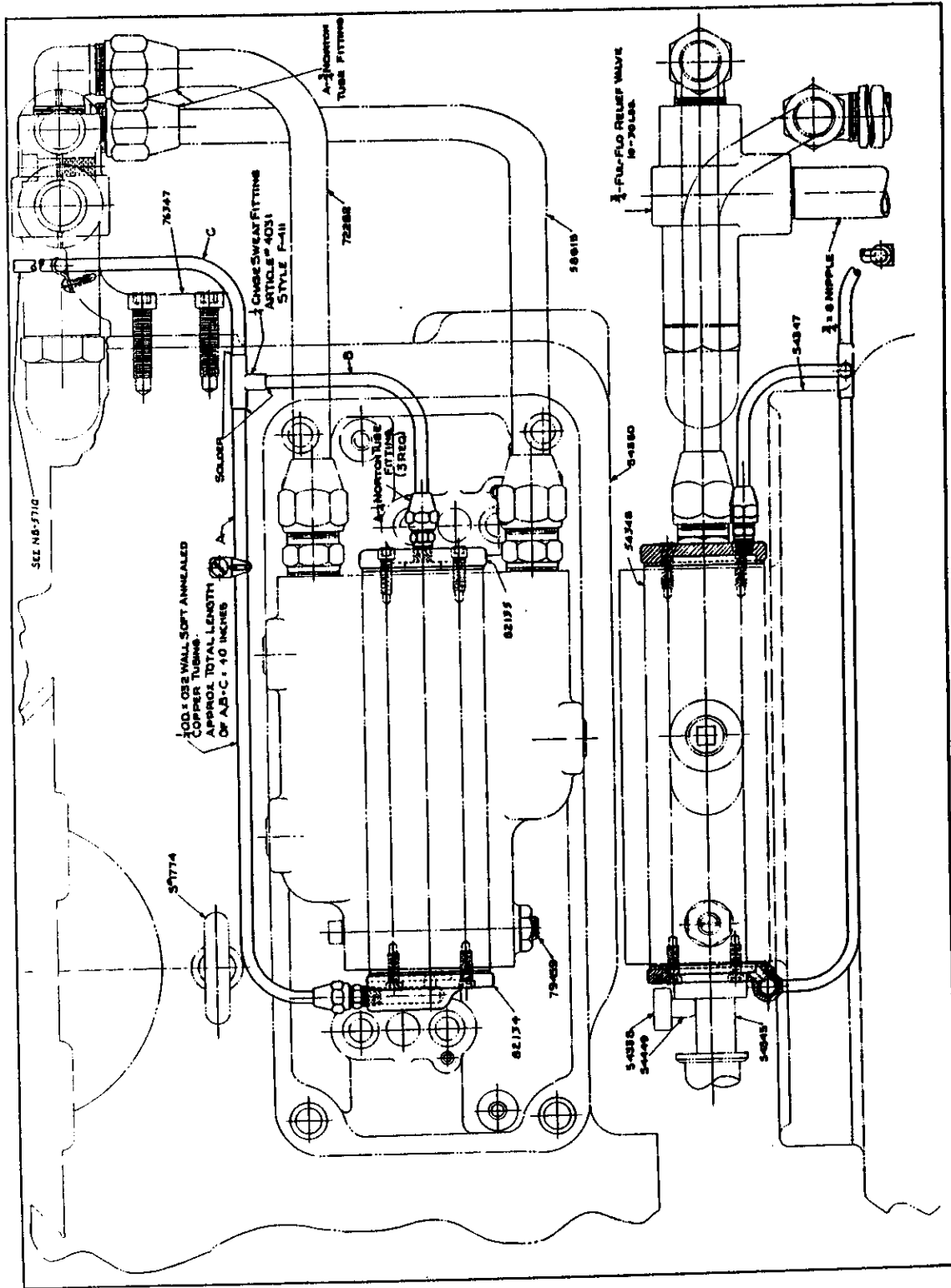


FIGURE 4 - (NB-6309)

Wheel Traverse Reverse Valve Drainage System.

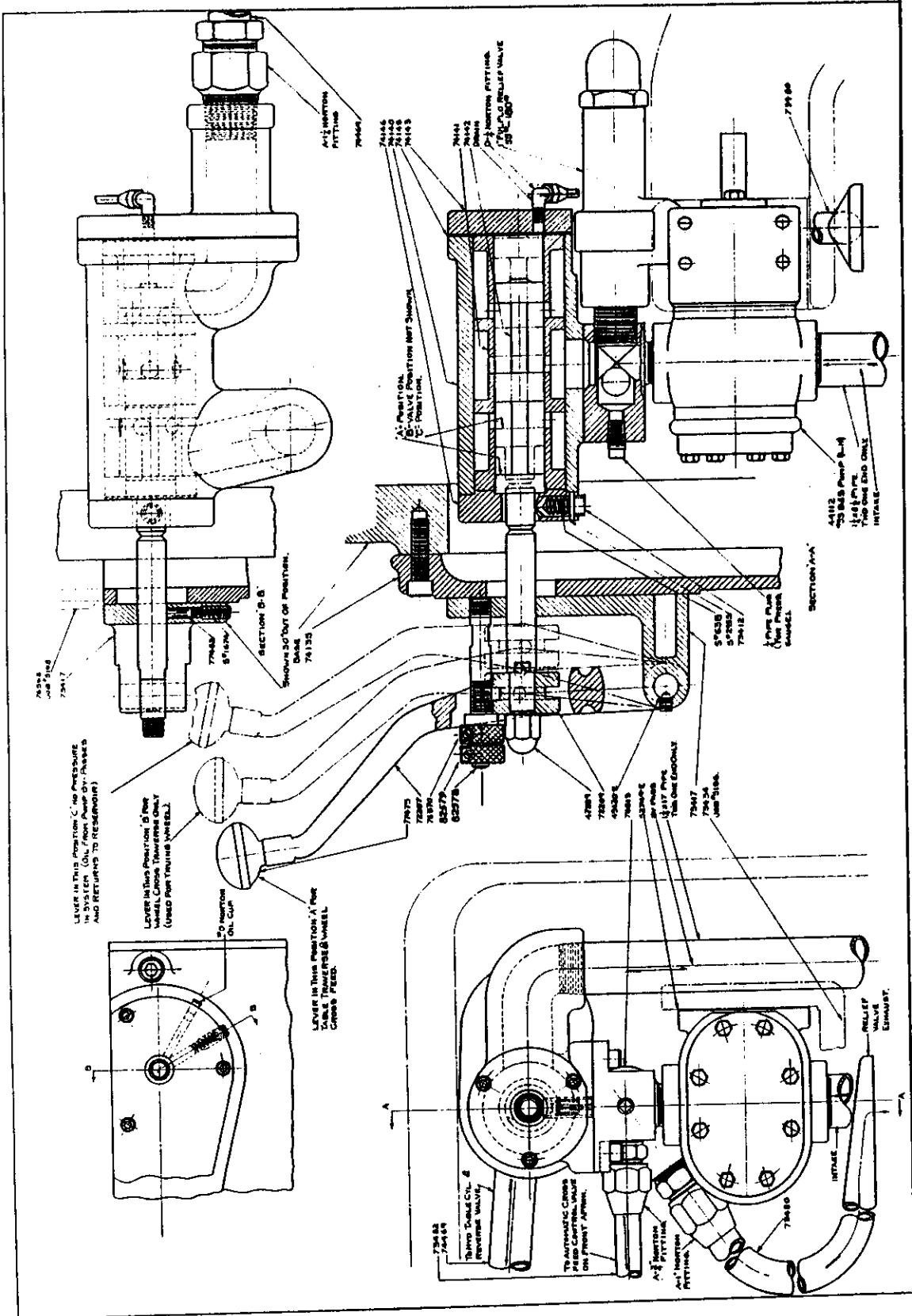


FIGURE 6 - (SE-353A)

Start-Stop Control Lever and Related Mechanisms.

Wheel Feed
Index

Movement of the index crank pin 16262 (see Fig. 7, Page 15) from one hole to the next in the perforated index plate is used to get fine feeds and represent a definite vertical movement of the wheel. The Norton standard index has 20 holes. Feed increments and other data on the index are given below:

Holes in Index	Part No.	Feed per Hole	Standard of Measure
20	73005	.00025"	English (Norton standard)
25	111211	.00020"	English
26	103100	1/200 m/m approx.*	Metric

* This metric index is not exact, the English equivalent for each hole in the 26-hole plate being actually .000192307".

One complete turn of index crank pinion 16261, which has 20 teeth, equals wheel movement of .005".

One complete turn of handwheel 73006, which has 250 teeth, equals wheel movement of .0625", or 1/16".

Starting
the Table

To start the table traverse, pull the table control lever (See Fig. 1, Page 6) outward as far as possible. This lever controls both the power table traverse and the power cross feed of the wheel. These functions are stopped when the lever is thrust toward the base as far as possible. Pulled outward to a mid-way position, indicated by a locating notch, the wheel can be power traversed without table movement and excess oil is bypassed through the pressure relief valve. This power cross feed is used when wheel truing. When the table stop lever is pulled all the way outward, both the table and the wheel will traverse under power.

Control
Valve

The table stop lever operates the valve controlling the flow of hydraulic oil to the table reverse valve. When the stop lever is thrust fully in toward the base, table traverse is stopped and the hydraulic oil is bypassed from the hydraulic pump to the reservoir directly.

Table
Speeds

Table traverse speeds are determined by the adjustment of the small hand-nuts on the stud passing through the table control lever. These nuts control the throw of the lever and hence the metering of the hydraulic fluid to the table cylinder.

Cross
Traverse
Controls

As stated in a previous paragraph, the cross traverse of the wheel slide is controlled by the table control lever which, when in mid-position, allows the wheel to traverse without table traverse and, when pulled fully outward, allows the wheel and table to traverse simultaneously. Speed of the wheel traverse is regulated by the cross feed control valve shown in Figure 1, Page 6 and Figure 15, Page 30.

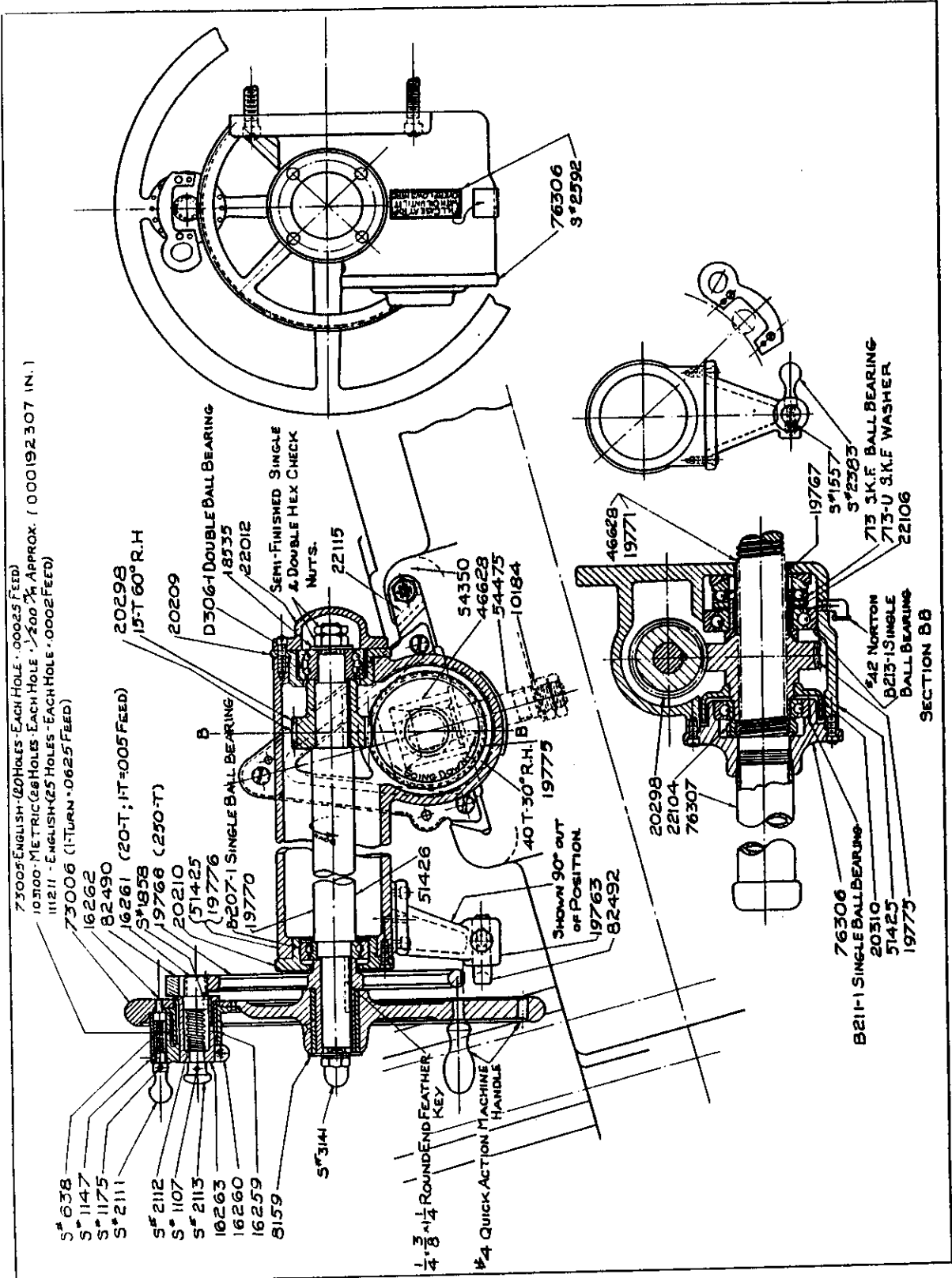


FIGURE 7 - (SE-219-B)

Wheel Feed and Indexing Mechanism.

Drive Belt Caution Do not attempt to cross traverse the wheel slide without the wheel rotating. The wheel drive belt must move laterally on the spindle pulley when the slide is traversed and this is accomplished easily only when the wheel is turning. Neglect of this elementary precaution may ruin the belt through stretching, warping or cracking.

Bleeding On starting the machine, set the two spring dogs on the front of the table so the table may traverse through its maximum stroke without striking the piston against the ends of the hydraulic cylinder. With the cross feed control dial set at TRUE and the reverse control valve at TRAV, allow the table to traverse back and forth at its maximum possible speed for several minutes. The purpose of this is to get the hydraulic oil circulating and remove from this system any air which may have been trapped. The procedure, known as "bleeding", forces air from the hydraulic piston cylinder and assures smooth action.

Truing Preparation To true the grinding wheel, with the table control lever set at mid position, the automatic cross feed control valve dial should be at TRUE and the automatic cross feed reverse valve control also on TRUE. A knurled thumb screw tapped into the first dial regulates the amount of oil which is delivered at the truing speed range to the cross feed reverse valve and the cross feed cylinder and thus regulates the speed at which the grinding wheel traverses the diamond. Clockwise rotation of the dial increases the wheel slide speed and vice versa.

Finish Truing For fine finishes a slow speed obtainable by means of the knurled screw (See Fig. 15) should be used. Feed the wheel down onto the diamond by hand about .002" at each pass until the grinding wheel is absolutely round and then, without any further down feed, give the wheel several passes across the diamond. The speed and care with which the wheel is dressed will be reflected in the quality of the work. Fine, careful truing is required for fine finishes while rough grinding needs but casual wheel truing.

Holding Diamond The above described method of truing is applicable when the diamond, in its holder, is held in place either by a bracket on the magnetic chuck or a bolt in the T-slot of the table. A second method of truing is found in the wheel-guard type truing device, the method of use being described below.

Wheel Guard Truing The diamond, attached in its holder to the vertical wheel slide, is fed onto the wheel through an opening in the top of the wheel guard. See Figure 1, Page 6. Regulation of the diamond feed is by a special handwheel. To true, the diamond is fed down onto the wheel, and the wheel is fed backward and forward by means of the regular cross feed, the automatic cross feed bracket shown in Figure 1 being swung up into position to prevent the diamond from running into the side of the wheel guard, the adjusting screws on the bracket being set to allow just the proper amount of cross feed. Due to this construction, if a certain amount of material is trued from the wheel, the operator is able to again set his wheel for a definite depth of grind by matching the amount removed with a downward movement of the wheel head with the wheel feed index.

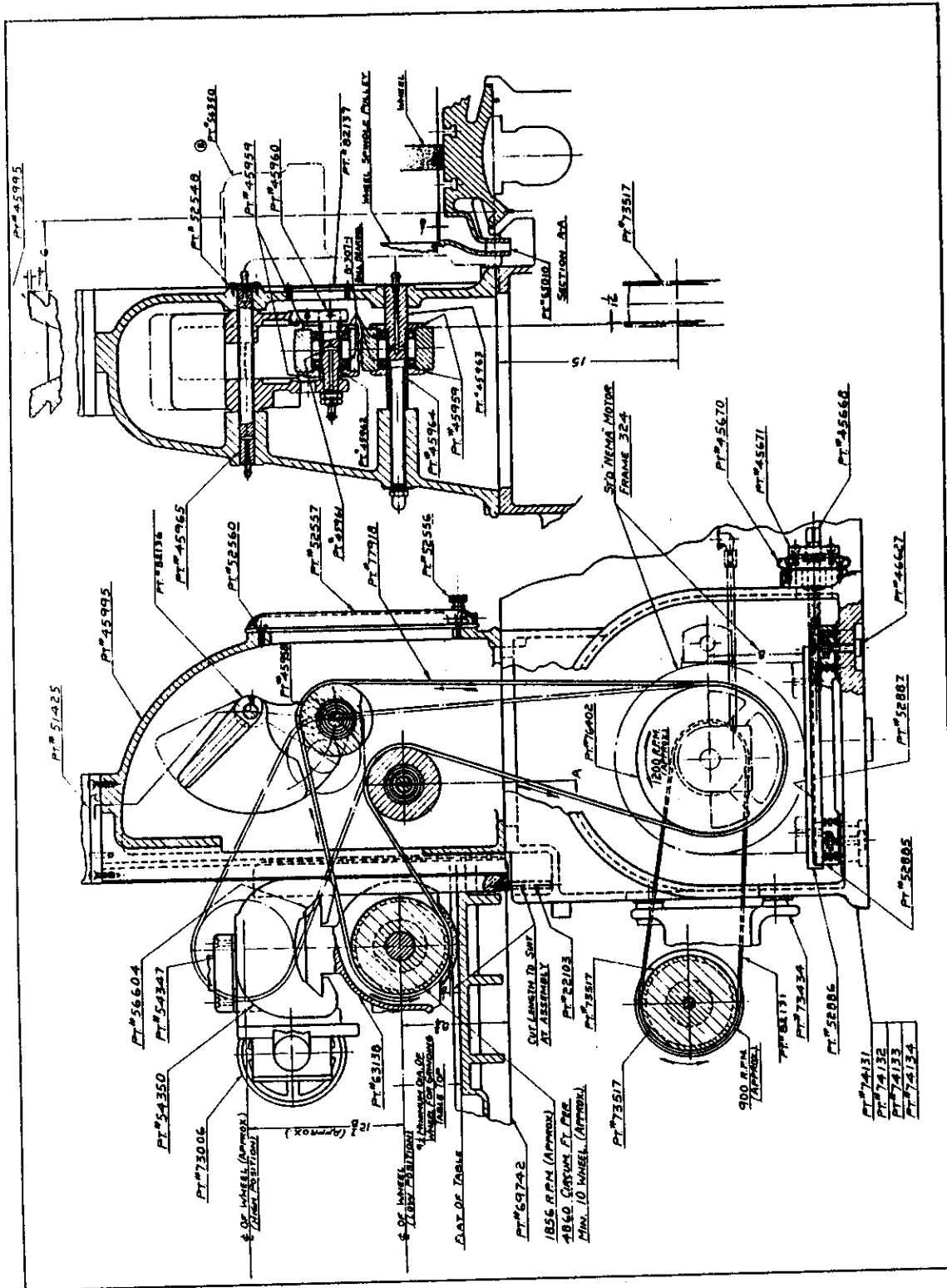


FIGURE 8 - (SB-222)

Belting and Pulley Speed Diagram.

Wheel
Balance

It is important that the wheel be balanced. It is customary and approved Norton Company practice to true the wheel while mounted on the spindle before balancing the wheel and then, following a careful balancing on well constructed ways, to true the wheel again previous to grinding. Some grinder hands eliminate the first truing operation previous to the balancing but the time thus saved will not compensate in the long run for possible out-of-balance conditions to be found and which are best eliminated by truing the wheel before balancing.

Balancing
Sleeve

A balancing type wheel sleeve, by which wheel balance may be adjusted quickly and easily by moving rim weights, is available for this machine as extra equipment.

Table
Facing

With the machine operating smoothly and the wheel properly balanced it is advisable to take a light cut over the top of the table, or the magnetic chuck if one is supplied with the machine. While the table is ground true at the factory the later grind is considered good practice and gives the assurance that the table surface is in alignment with the rest of the machine. If it is found, however, that such a cut indicates that something has seriously affected the alignment, the source of the trouble should be ascertained before progressing further with the operation of the machine. True the wheel as fine as possible before grinding the table or the chuck.

Locating
Dogs

After the piece to be ground has been located on the table and fastened down with bolts in the T-slots, or placed on the magnetic chuck if this attachment is to be used, the cross feed and table traverse dogs should be set. The table dogs should allow the wheel to clear the ends of the work before reversing. In other words the wheel should be off the end of the work at the moment of operation of the cross feed. The cross feed dogs should be set so that the wheel is not permitted to move wholly off the work in cross feeding. When setting cross feed on initial operation, see that the acorn nut on the cross feed piston rod is only finger tight.

Hand
Operation

With the automatic cross feed control valve and the reverse valve control both set at TRAV the machine is arranged to feed the grinding wheel across the work by predetermined increments at each reversal of the table. When it is desired to move the wheel slide by the hand wheel, the reverse valve control should be set on HAND, this disengaging the dog lever and neutralizing the reverse valve so as to bypass the oil in the wheel slide cylinder. (Fig. 1 & 15).

SERVICING

Care of
Machine

A frequent cause of repairs to machine tools is lack of attention. While any such machine may be subject to occasional trouble, the necessity for repair and shut-down may be drastically reduced by continued care of the

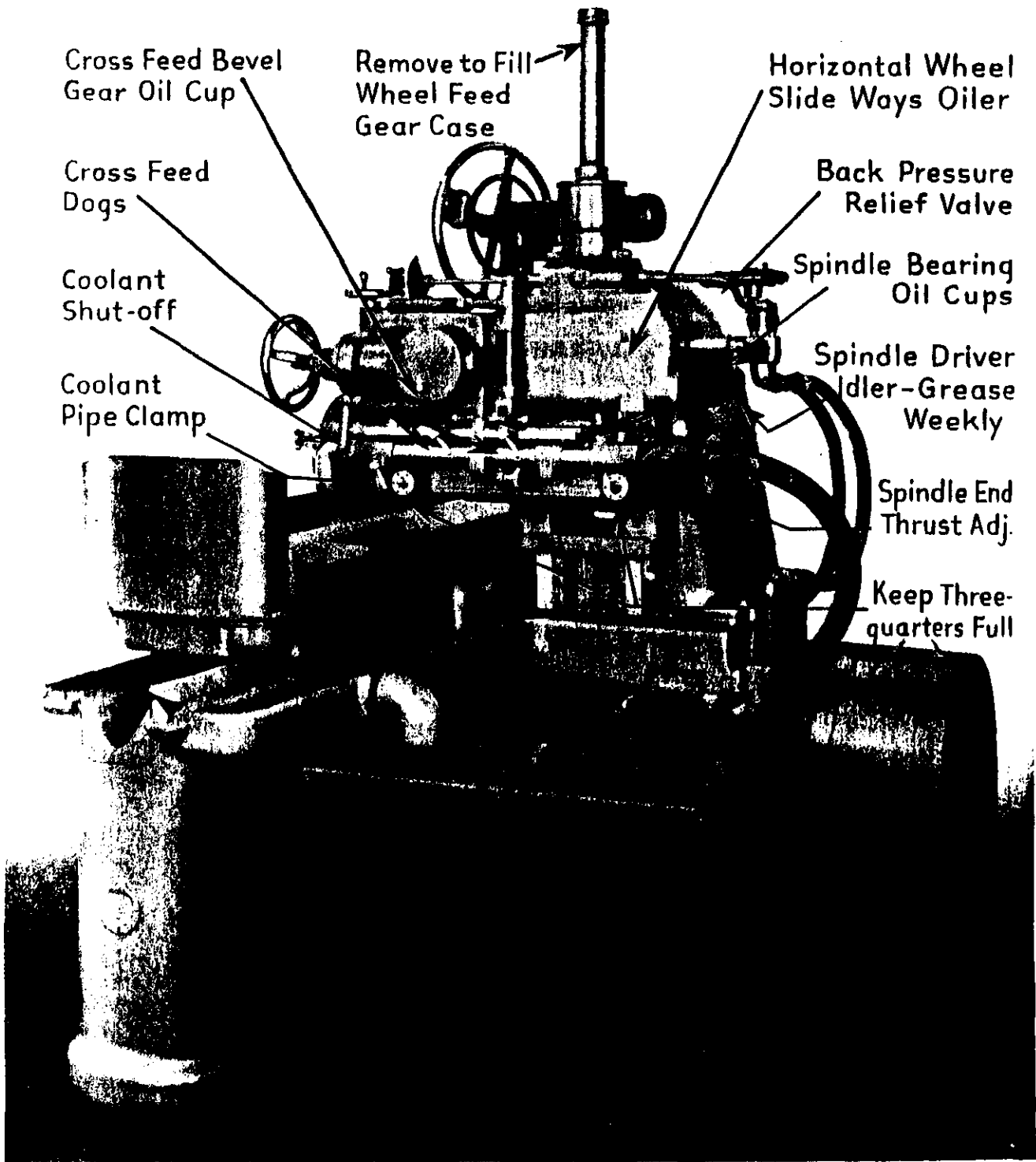


FIGURE 9 - Photo N-3883

Rear view of 10" x 36" Hydraulic Surface Grinder, showing nomenclature of parts and various servicing points.

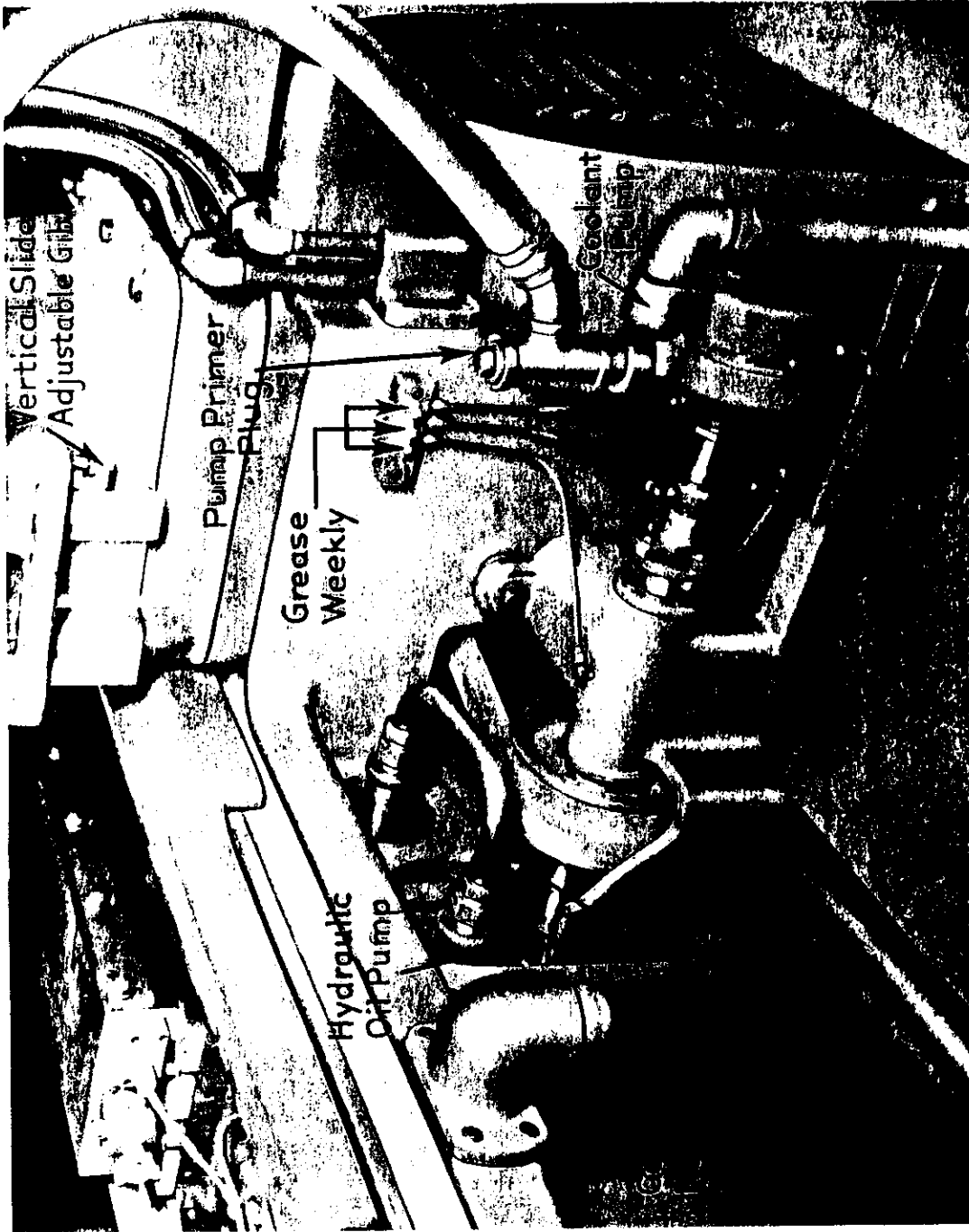


FIGURE 10 - Photo N-3963

Rear view of lower portion of 10" Hydraulic Surface Grinder showing nomenclature of parts and various servicing points.

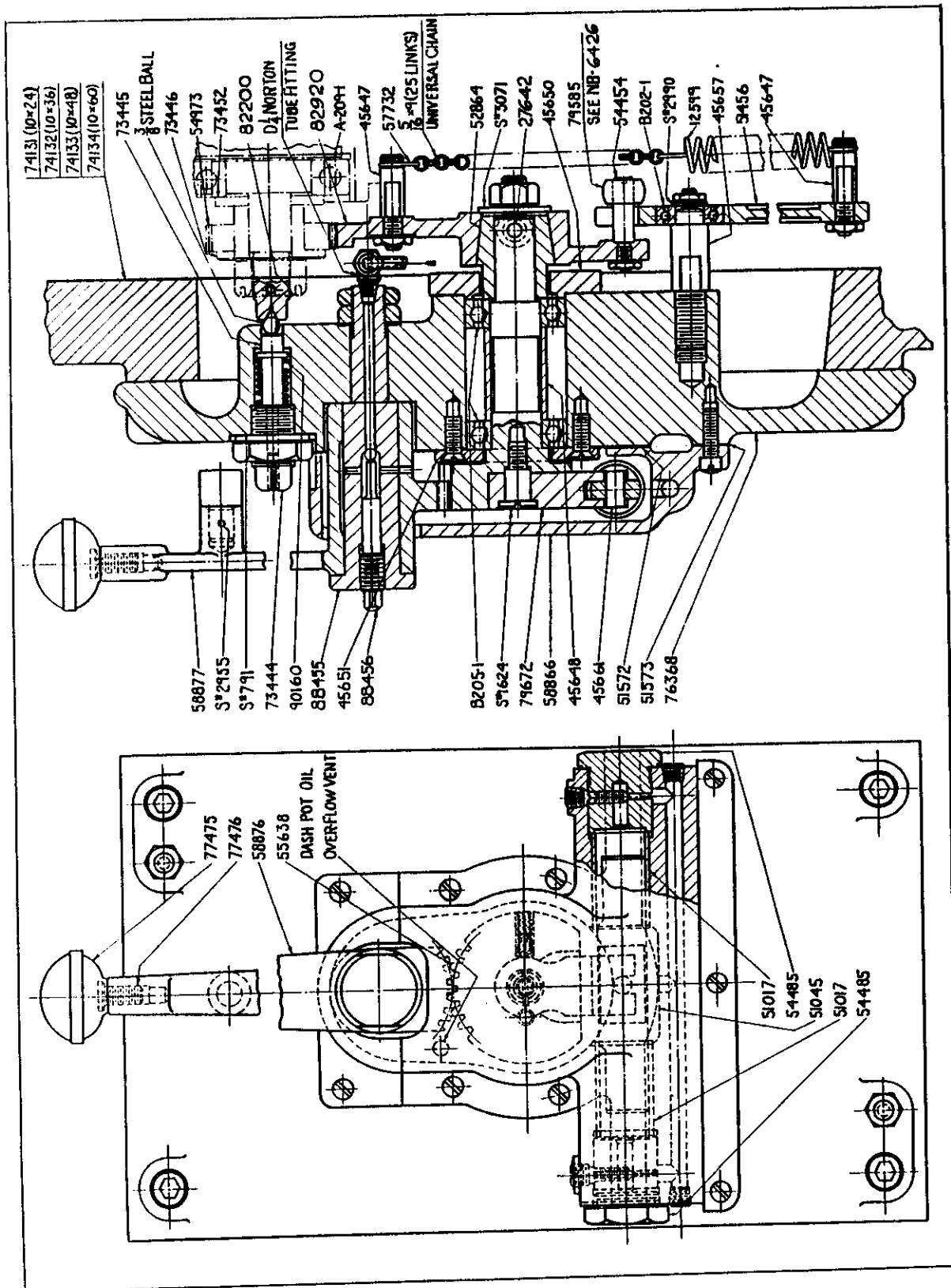


FIGURE 11 - (SE-224-B)

Table Control Apron Assembly

machine. It is not anticipated that the operator will have to spend more than a few minutes a day in seeing to the well-being of his machine, but such a brief interval will pay dividends.

Lubrication
The operator must see that all points requiring lubrication are kept supplied. This applies especially to fast moving parts, notable of which is the wheel spindle, the oil supply for which should be ample at all times to insure a smooth running wheel. Important also are the fast running motor and idler parts.

Hydraulic Supply
Naturally an ample supply of oil must be kept in the hydraulic system at all times. It is not sufficient to have the intake pipe barely under the surface of the oil previous to starting since, with the machine running, oil is taken from the reservoir and the intake may be allowed to suck air. Keep the intake well under the surface of the oil at all times. Keep sight glass half covered.

Reverse Dashpot
Oil must be kept in the table reverse dashpot (See Figure 1) to assure a smooth table reversal. A "slamming" of the table reverse lever indicates the need of dashpot filling. However, this should be done daily. To do this, open dashpot valve spindle #88456-E (Fig. 11) slightly and allow the table to reverse a few times. Watch beneath pivot point of the reverse lever for amount of fill. Do not open the spindle too wide, or permit table to reverse too long. A normal amount of overflow of the dashpot is drained off by the vent shown in Figure 11, but excessive overflow should be avoided. The spring, 12599, shown in Figure 11, must build up sufficient tension to throw the reverse lever over dead center.

Reverse Valve Action
To check the table reverse action, set the table dogs to give the shortest practical stroke (approximately 12" to 15"). The table reverse lever should operate freely and uniformly through its arc, completing its sweep before the table reverses. If the lever action is slow on one or both ends of the stroke, remove plug 54485 at the end of the dashpot toward which the slow lever action occurs and open the needle valve in the plug slightly. This will allow a more rapid escape of fluid from the dashpot. Caution should be exercised in making this adjustment. The needle valve should never be opened more than 1/2 a turn from its seated position.

Dirt In Needle Valve
Should an unexplained change in the reverse lever action occur during machine operation, remove plugs 54485 and look for dirt in the dashpot which may have clogged up the needle valve seat. Clean carefully, readjust valve and replace plug, refilling the dashpot by opening the dashpot cock.

Reverse
Valve

If the lever action is merely stiff instead of slow, adjust the screw 73444 in Figure 11, turning outward to obtain a freer action. This allows the taper valve plug 82200 (see Figure 12) to slip forward slightly out of its seat. This plug should fit loosely enough in the valve housing 82199 so that, under hydraulic pressure, there will be a slight leak of fluid from the front of the valve at all times. This may be observed by removing the right-hand apron cover. Spring 90160 seats the valve when hydraulic pressure is shut off.

Valve
Gear
Adjust-
ment

It is sometimes found when the table control apron 76368 has been replaced after removal for maintenance work that the table action is erratic when the reverse lever is thrown over. The table may move very slowly; may jump ahead as the lever passes its center position; or the table may refuse to move at all. After it is proved that other hydraulic or mechanical units are not responsible, inspect the meshing of gear 54973 with segment 52863. It is probable that valve plug 82200 has been rotated out of its centralized position with relation to the reverse lever 58877 and that, on reassembly, the gear and segment, while in mesh, do not bring the valve ports into proper position before the outlet and intake ports of the valve body 82199.

To correct, loosen the castellated nut on the valve stem 82200, slipping the gear 54973 and its bushing 73446 forward on the valve stem until the gear teeth are out of mesh but without disengaging the keyway. Rotate the gear unit to the desired position and re-mesh the gear and segment. Punch marks on the gear face indicate the proper location of the valve and gear in relation to the reverse lever. Tighten and pin the castle nut after adjustment is made.

Uneven
Cross
Feed

Sometimes the cross traverse of the wheel is greater at one end of the table reverse stroke than at the other. If the long stroke is at the right end, lengthen the eye bolt 79585 and clevis 79584 arrangement by loosening the 3/8" checknut and turning the entire clevis and piston 54421 clockwise. (See Figure 15). Shorten the take-up arrangement to correct for long stroke at the left, and then set up the checknut. Do not make this adjustment unless the reverse lever and dashpot are functioning properly. (See opposite page).

Cross
Feed
Pressure
Adjustment

An adjustment sometimes necessary, is that for back pressure in the main exhaust from the cross feed control valve. Improper adjustment is evidenced by failure of the cross traverse to make a full stroke even when the cross feed metering valve is fully opened. To correct, open the back pressure relief valve (See Figure 9) on the cross feed exhaust line until the wheel cross traverse shows a tendency to "bounce", or a double action. Then close the valve gradually until the double movement disappears.

Table
Creep

Trouble is sometimes experienced from the table creeping despite the fact the control lever is in the

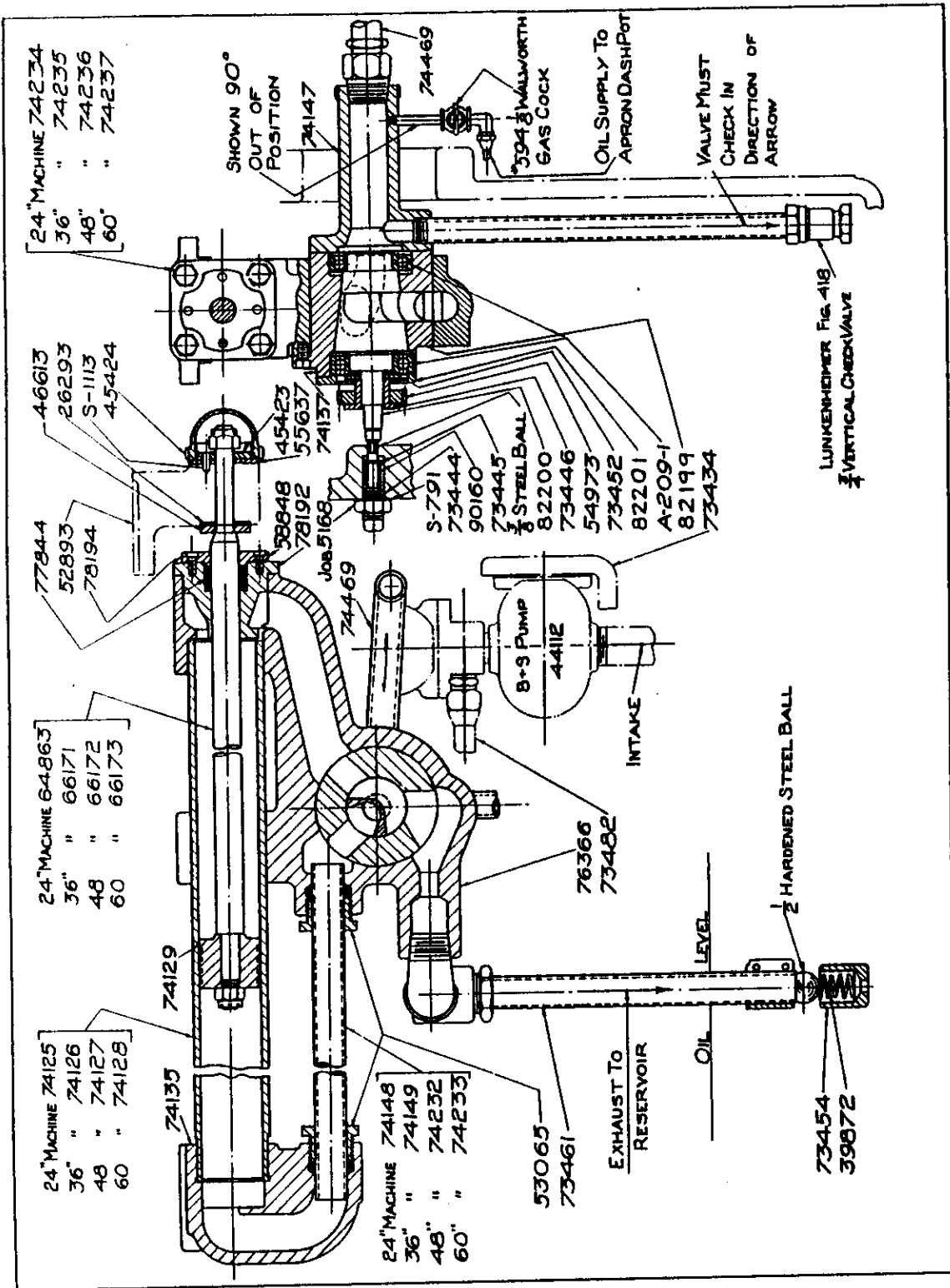


FIGURE 12 - (SE-225)

Table Cylinder and Reverse Valve Assembly.

STOP position. The difficulty can usually be laid to air in the hydraulic system. First determine whether there is ample oil in the hydraulic reservoir as has been mentioned previously. This point satisfactory, examine all fittings to be sure there is no leakage. Worn packings in the stuffing boxes and glands may be responsible as may be joints in pipes.

Erratic
Wheel
Slide
Movement

Should the wheel slide seem to move sluggishly, or move the correct distance and then back away slightly, it may be due to a leakage in the line from the control valve to the automatic cross feed reverse valve. To correct the difficulty, tighten up all of the fittings and if the trouble still persists replace the old fittings with new. The small relief valve regulating the back-pressure in the cross feed line may also be used to rectify this condition. As the machine wears it is found that parts move easier and increased back-pressure may be necessary to control the slide movement. Remove cap and turn screw underneath clockwise to increase pressure.

Air in
System

As may be implied from the various foregoing references to air in the hydraulic system and the improper action which such a condition may cause it will be seen that it is imperative to keep the system free of air. The entrance of air may cause halting or erratic action and in some cases may cause certain functions to cease completely. The operator and service man are urged to be sure that the system is air-free, (See note on "Bleeding", Page 16) at the first indication of trouble and, with this assured, to then look elsewhere for difficulty.

Hydraulic
Pressure

The hydraulic system operates best at a pre-determined pressure of 100 to 130 pounds depending on the size of the machine, the weight of the magnetic chuck, etc. This pressure has been set at the factory at the time the machine was given its test run and no adjustment of the pressure should be necessary in the ordinary course of events. The rule of thumb is that the pressure should be maintained as low as possible consistent with smooth action. If, however, it is deemed necessary to change the pressure in the system the cap is removed from the relief valve at the back of the machine (See Figure 10) and adjustment is made by moving the screw therein. A clockwise rotation of the screw increases the pressure and vice versa. Increased pressure will give higher table speeds and greater wheel feeds.

Recommended
Hydraulic
Oil

In selecting the oil for the hydraulic system use a highly refined light turbine oil with a S.U.V. rating of 150 at 100 degrees F. especially made for high-pressure high-speed circulating systems. Other oils may be suitable and fill the rigid requirements of the exacting hydraulic system but Norton Company will not

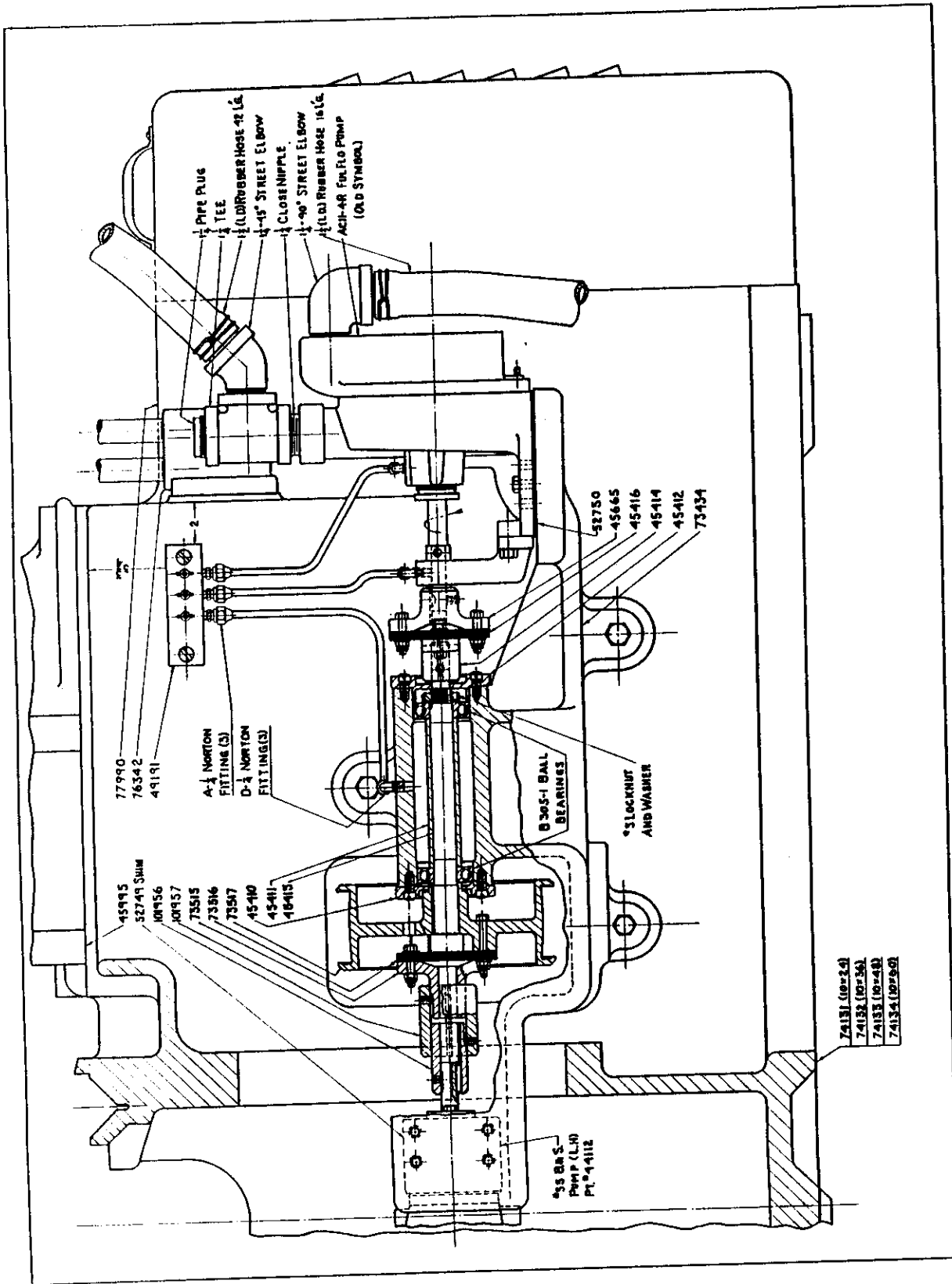


FIGURE 13 - (SE-217-B)

Pump Unit Assembly.

accept responsibility for difficulties if other and inferior oils are used.

Other Oils Care should also be used in the selection of other lubricants. A good grade of machine oil (red engine oil) should be used in all general oiling spots not otherwise lubricated. This oil should have a rating approximating 300 S.U.V. at 100 degrees F. and should be used freely.

Spindle Oil For oiling the grinding wheel spindle a spindle oil rated from 50 to 60 S.U.V. at 100 degrees F. should be kept supplied to the spindle at all times, the operator seeing that the reservoir is kept filled. Bulls-eyes on the side of the spindle housing are provided and the oil should cover $\frac{3}{4}$ of the circle at all times.

Grease In the selection of a grease for other lubrication in the machine a good grade of light non-graphite ball bearing grease is recommended. Greases which have a tendency to gumminess should be avoided.

Grinding Compound As has been stated before, a non-soda coolant or grinding compound should be used. Every care should be used to guard against dilution of the oil in the hydraulic system by the grinding coolant. It is not always possible, however, in all cases to prevent some splash or spray from entering the hydraulic supply tank and hence it is imperative that the coolant on hydraulic machines be free of soda. With the use of soda compounds, should the oil become contaminated, a gummy, soapy residue may form and cause the valves to stick, leading to faulty operation.

Machine Adjustment Any adjustment on this machine, if necessary, should be made with caution and discretion. The machine is so constructed that repairs and alterations in setting may be easily effected. While it is not advised that the operator tinker with the machine, it is not difficult, once he becomes familiar with the mechanisms, to make various adjustments with the aid of this Instruction Book. Assembly drawings are included to cover practically every mechanism in the machine.

Adjusting Spindle Bearings The most important adjustment to be made on the entire machine, of course, is that of the wheel spindle bearings. These bearings have been carefully set when the machine was run-in at the factory and should not require adjustment for some time. In fact some machines run for years without any adjustment but frequently it is found that individual machines, due either to an inherent peculiarity or exacting grinding demands must have bearing adjustments made on occasion.

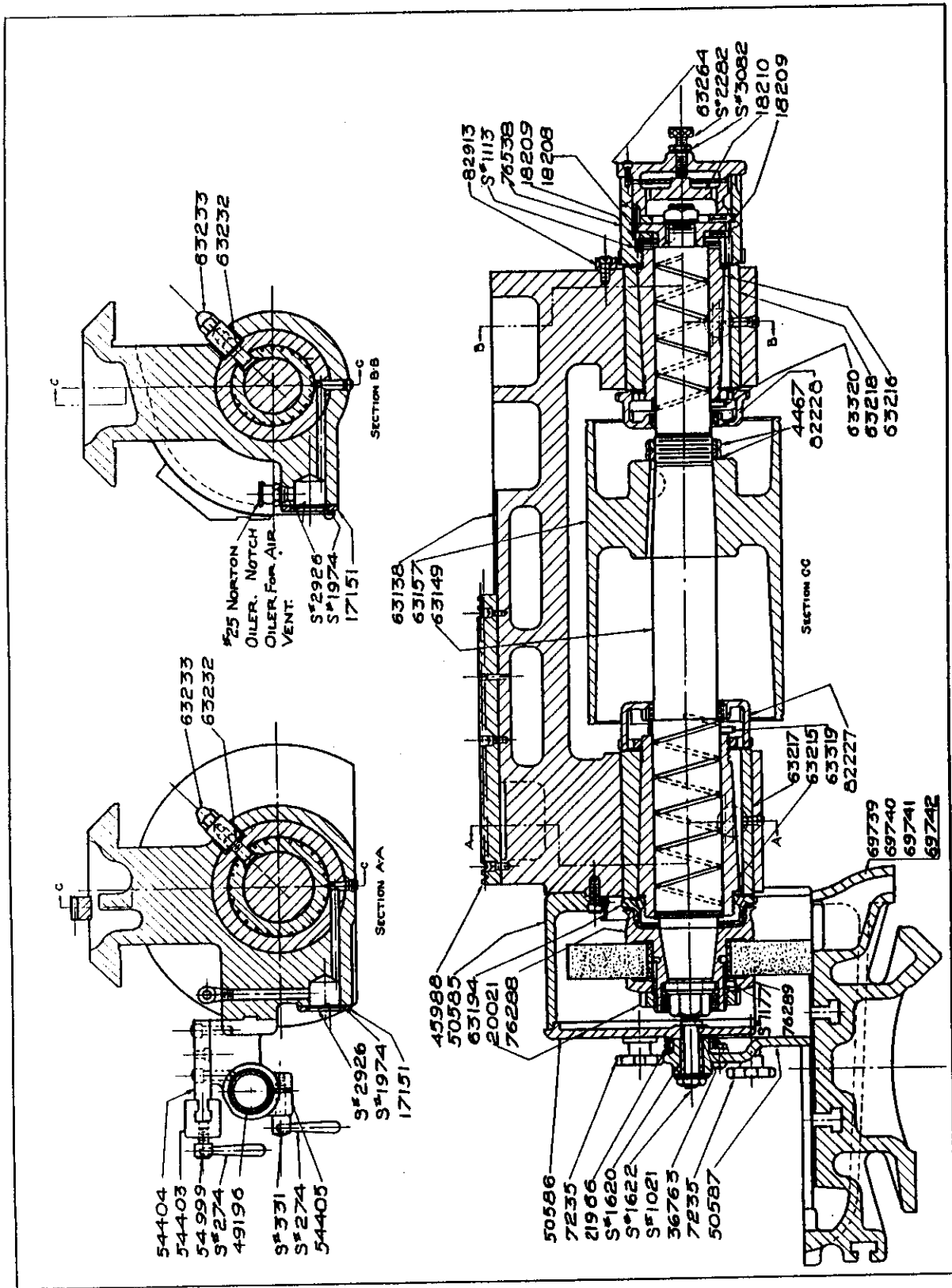


FIGURE 14 - (SE-213B)

Grinding Wheel Spindle Assembly.

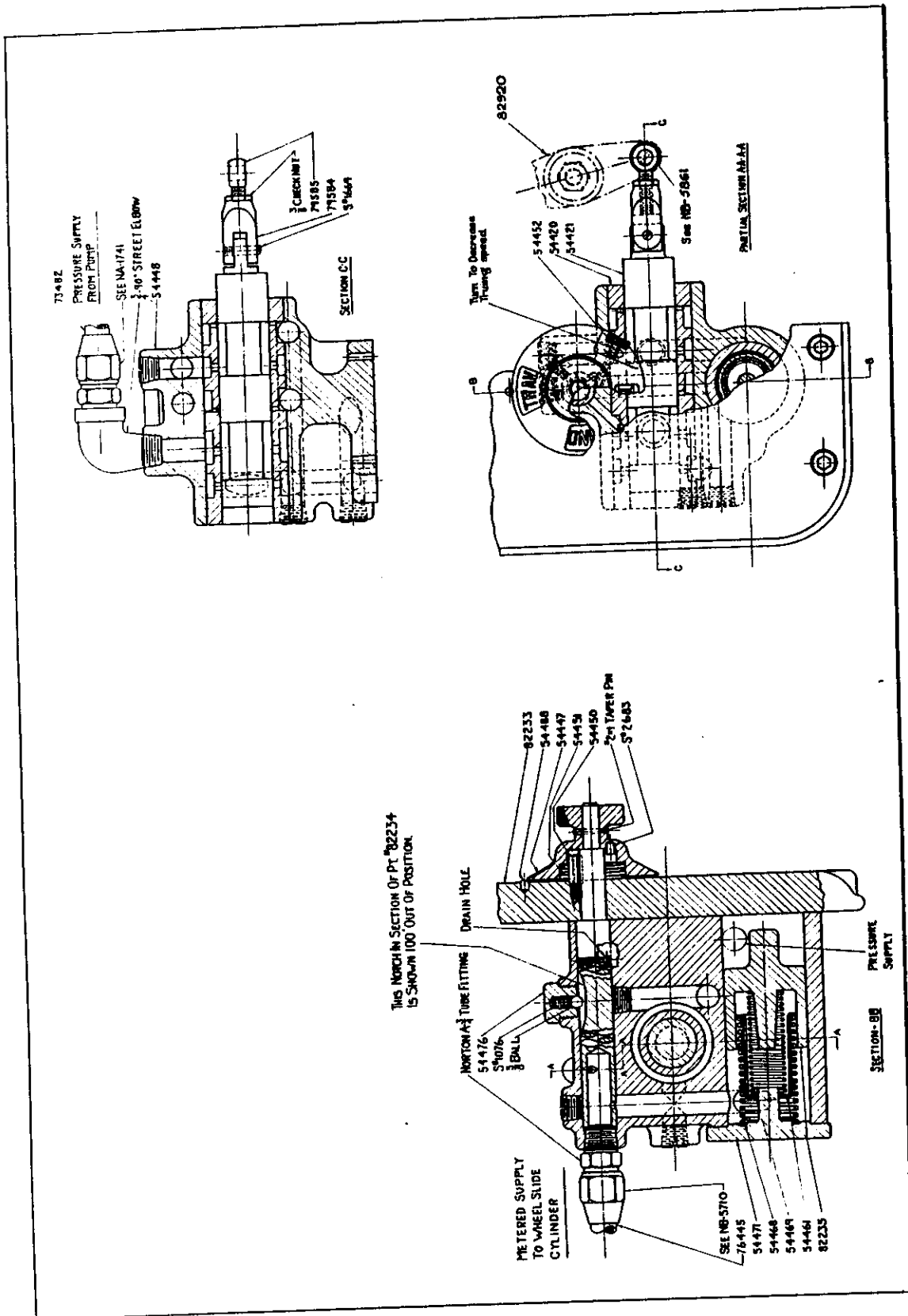
Preparation
In adjusting the wheel spindle bearings it is advisable to adjust one bearing at a time, preferably the front first. This bearing should be allowed to run for several hours. The rear bearing then may be taken up slightly if it appears necessary. As a preliminary, remove the wheel guard cover 50586, (See Drawing SE-213B, Figure 14), the wheel with its sleeve 76288, and the wheel guard body 50585. If the rear bearing is to be adjusted also remove the locking dog 66046.

Adjustment Sequence
In making adjustment, first loosen the wedge bolt nuts 63233 several turns and tap the nuts inward until they loosen their grip on the bearing. Loosen the nuts 63194 or 76538 as the case may require and take up, using the wrench provided for the purpose, on the nuts 82227 or 82228. The bearing has been taken up sufficiently when the spindle may be just turned by hand. Now loosen nuts 82228 and 82227 again and tighten up on the spindle wedge nuts. This operation, often overlooked or neglected, is important to straighten up the bearing which may have taken a twist during the adjustment. The spindle bearing nuts may now be tightened, the inner ones first, after which the parts removed in the preliminaries may be replaced. Be sure the locking dog 66046 is replaced.

Caution
In making this adjustment, the operator or repair man is warned against setting the bearings up too tightly. It should be remembered that a bearing tends to warm up under operating conditions and expand slightly, which may have a binding action on the spindle, causing it to seize. Hence it is better to have the bearing too loose than too tight.

End Thrust Adjustment
The same caution applies to taking up the end thrust. This adjustment is made by turning the screw S#2282 at the back end of the wheel spindle housing inward. This screw, after the check-nut has been slacked off, should be turned inward as far as possible with the fingers and then slacked off about one-eighth turn to allow freedom of action. This adjustment will need attention infrequently as in the majority of cases a small amount of end play in the spindle is desirable rather than harmful.

Lubrication
In order that both the end-thrust and the wheel spindle may receive ample lubrication and to forestall any possibility of excessive wear or possible seizing, the bulls-eyes on the spindle body casting should be kept three-quarters full of recommended oil at all times. These bearing surfaces are oiled by slingers which will take up oil from a lower level, but an ample supply gives the best cooling and lubricating action.



THIS MONKTON SECTION OF PT. 702234 IS SHOWN 100 OUT OF POSITION.

FIGURE 15 - (SE-216-A)

Automatic Cross Feed Control Valve.

Belt Length Adjustment

Notice the method developed on this machine for taking up belt stretch. The upper idler can be located in two positions. This idler takes up a certain amount of slack by simple adjustment. After the point is reached where the idler no longer controls the slack, the idler should be moved to its second and upper position. This arrangement gives full grinding capacity for the machine regardless of belt length variation.

Reassembly Caution

Care should be exercised in making any adjustment or repair that a certain knowledge is retained as to the manner in which the assembly is made. Too often it is found that a mechanism has been disassembled and put back together again incorrectly. Naturally it will not work. One customer, for example, removed the table control apron from the machine and in replacing it neglected to attach the connecting link 79584 shown in Figure 15. Consequently the wheel slide would function only when the controls were in the TRUE position since no pressure was being admitted to the metering cylinder (See Figure 15) at the table reversals. Should this condition develop and the connecting link found to be intact, the repair man must then examine the springs 54468 and 54469 in the metering cylinder for possible breakage or fatigue, in either case replacement being necessary.

Gib Adjustment

Improper adjustment or undue wear of the wheel slide vertical ways will cause the wheel to grind out of parallel. Adjustment of the gib in the ways should be made cautiously, it being remembered at all times that too much adjustment of the gib will merely lock the slide in its ways and that no amount of pressure or adjustment of the gib can correct any out-of-true condition. If taking up the gib does not correct the condition, examine the underside of the wheel slide ways, testing them with a straight edge and rescraping them if they are worn.

Prospective Life of Gibs

Neither the horizontal or vertical gibs indicated in Figures 1, 9 and 10 should require any adjustment for some time after the machine is installed and then only if that particular area has been subjected to unusually severe usage. In fact, it is perfectly probable that neither adjustment need be made for years, if ever, provided, of course, the machine has been given reasonable care and intelligent treatment. If, however, any adjustment is made on either gib, always grind the table or magnetic chuck surface before attempting to grind work.

Piston Rod Nuts Adjustment

Under no circumstances should the acorn nut at the end of the cross slide piston rod (See Figure 3) or the castle nut on the outside end of the table piston rod (See Figure 12) be made wrench tight. If so set up, accurate grinding will be impossible. These nuts should only be set up very lightly with the fingers, or, better still, set up so as to allow a little end play. The nut on the cross slide rod is held in position by friction, but on the table piston rod it is necessary to use a cotter pin to lock.

Norton
Service

It is believed these Instructions will enable the average operator to run and service this machine. If any doubt arises as to operation, grinding procedure or mechanical difficulty which does not respond to suggested treatment, communicate at once with the nearest Norton Company office.

Office
Informa-
tion

In making any inquiry, however, please supply as much information as possible. Give the serial number of the machine, which will be found stamped on the base, together with information concerning its purchase. It is also important that we be informed whether attachments or mechanisms have been added to the machine since it left our factory.

Customer
Assistance

In seeking assistance on problems please give all information possible. This should include such data as the type of material to be ground, the production desired and the quantities required, as this latter point may determine how much might economically be expended on additional equipment if such should be required. In jobs which are unusual, state the nature of the difficulty which you have encountered or anticipate. Often it is helpful if a sample part is sent to us in order that we may use it in reaching a decision.

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IMPORTANT

WHEN ORDERING PARTS

Be Sure To Give: —

1. Number of part as shown in drawing or photograph, or both
2. Serial number, type and size of machine

This information will avoid misunderstandings and delays in obtaining desired parts.

ADDRESS: —

CHAS. G. ALLEN CO., INC.

25 WILLIAMSVILLE ROAD
BARRE, MASS. 01005-9502