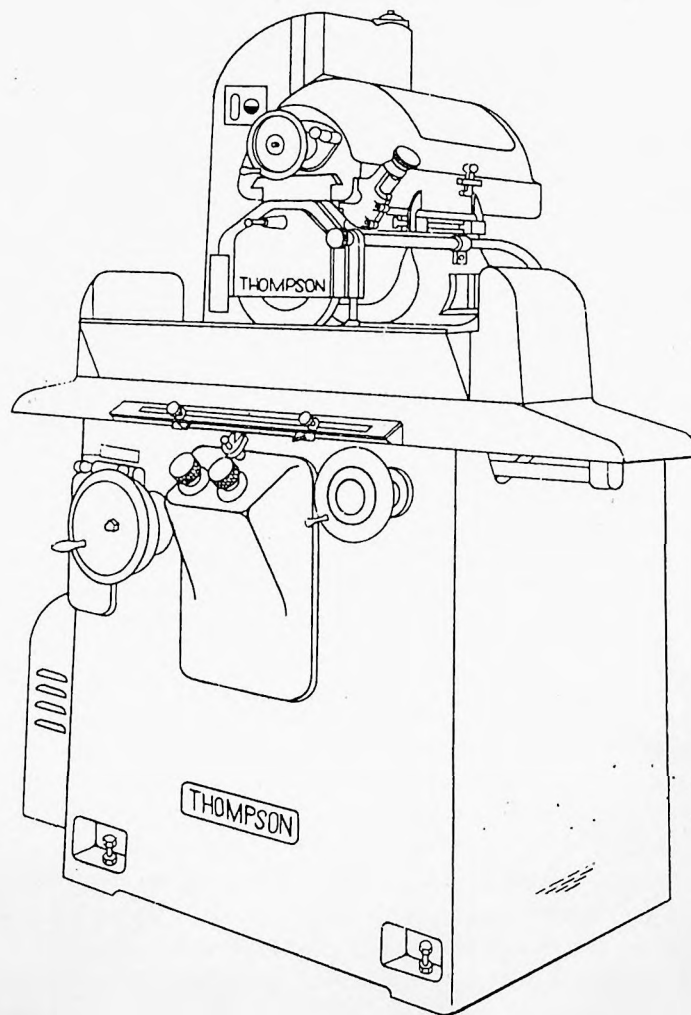


OPERATING INSTRUCTIONS FOR MODELS **F** AND 2F HYDRAULIC SURFACE GRINDING MACHINE



THE THOMPSON GRINDER COMPANY
CHESHIRE, CONNECTICUT

THE THOMPSON GRINDER COMPANY
CHESHIRE, CONNECTICUT

OPERATING INSTRUCTIONS FOR
THOMPSON HYDRAULIC SURFACE GRINDING MACHINE

This grinding machine has been carefully packed and properly covered with rust resisting material. Any damage to the case or machine parts must be promptly reported to the carrier in order to present a proper damage claim.

This machine has been tested under power and has passed inspection. If the following instructions are carefully followed, complete satisfaction is assured.

The machine should be placed in operation in the following manner:

GENERAL INSTRUCTIONS

- 1 - After crating and paper have been removed, wash all finished surfaces with kerosene or naphtha (do not use lacquer thinner or lacquer cleaner). Remove table and wash ways, as ways are slushed. To remove table place throttle in NEUTRAL position.
- 2 - Immediately oil all bearing surfaces being sure to wash out the bed drain pockets at the end of the machine ways.
- 3 - Remove cinders and other foreign matter from oil reservoir in base of machine. Clean coolant tank before filling.
- 4 - Fill oil reservoir to indicated level with recommended oil. Remember that the use of inferior oils will carbon the valves and cylinders of this machine and that periodic cleaning of these parts is costly. Since it is necessary to clean out the oil reservoir at intervals of two (2) to three (3) years the use of high grade oil is economical. Always use inhibited oil.
- 5 - It is recommended that a dis-connect switch be placed in the electric circuit between the machine and power source. This item is not provided due to variable rulings regarding its position and type. It is recommended the machine be mounted on a substantial concrete base isolated from surrounding machinery if possible. Leveling screws are provided in base flanges for the purpose of correctly setting the machine. Either the machine base or table should be checked with an accurate spirit level at regular intervals to prevent sagging of the foundation and resultant inaccuracies. We do not recommend bolting the machine to the floor. It is recommended that 3" diameter x 3/4" thick steel plates be used under leveling screws.

LUBRICATION

- 6 - Before remounting the table, set table throttle to HAND FEED and lubrication flow control needle valve wide open. Flow control valves are close by the relief valve. Now turn on the hydraulic pump motor to clean out any grit that may have gotten into the lubrication lines. Close the flow control valves and then open each one one-quarter turn. If oil is carried out on the table ways, reduce flow.

Lubrication is of vital importance on a grinding machine where accuracy is a prime requisite. The table ways are lubricated automatically and need only be checked for volume at intervals. Turning the screw clockwise will reduce the flow, and an anti-clockwise rotation will increase the flow. If the flow should decrease, look for an obstruction at outlet to ways. The wheel slide is lubricated from a Bijur one-shot oiler located on face of column.

The upper bearing on elevation screw is grease packed. The lower bearing is oiled automatically by flow lubrication. Both handwheel shaft bearings are pregreased sealed type. The saddle is supported by ball bearings which are grease packed and require no care. The spindle bearings are grease packed and should not require repacking in less than one year.

- 7 - The machine is ready for running after the power has been connected and rotation of the wheel is checked with the arrow on the wheel shield. Before starting the hydraulic system, be sure that the control levers are in position as shown in Fig. 4. *Neutral - Neutral*

Adjust table dogs to a short stroke and slowly open table throttle until table operates at slow speed. Operate at reduced speed for (5) minutes before opening wheel head control valve. Operate wheel head to extreme stroke (hand reverse position). Table may now be operated at high speeds. Note that the work table of this machine has been ground in place and should not require regrinding. A light cut should be taken on the top surface of the magnetic chuck.

HYDRAULIC SYSTEM

- 8 - The hydraulic system supply tank is cast integral with the base and is accessible through the door located centrally on the rear of the base. The tank should be filled to within one inch of this door, approximately 25 gallons on model F, and 30 gallons on model 2F. The oil should be 150 ssu @ 100 degrees F.

The hydraulic system is protected by a filter as shown in Fig. 3, which should be removed and washed at intervals of from four to six months, depending on the continuity of service.

The master valve is shown in Fig. 1. This unit is mounted inside the bulged panel directly below the operating controls.

The wheel head reversing valve is mounted inside the saddle, a view of which is shown in Fig. 8. This valve is directional.

The relief valve is accessible through the door that is centrally located on the rear of the base. The relief valve should be set at 130 lbs. pressure, on Model F (6 x 18) and 150 lbs. on Model 2F (8 x 24). Adjustment of the relief valve can be made as follows: Remove the acorn nut and loosen the lock-nut. By turning the screw clockwise, the pressure will be increased, and, by turning the screw counter-clockwise, the pressure will be decreased.

A hydraulic pressure gage should be attached to the elbow extending below the relief valve. When the table does not reach top speed the fault is low pressure or a fatigued relief valve spring or a dirty filter.

OPERATING CONTROLS

9 - Controls are shown in Fig. 4.

Complete control of the table is obtained through the knob "T". By turning the knob clockwise, the table will begin to move; the farther it is turned, the faster the table moves. Hand feed of the table can be obtained by revolving the knob "T" to the position "Hand Feed", which automatically engages the feeding mechanism. The hand wheel for the table feed is readily accessible on the front of the base near the right end.

The wheelhead hydraulic cross feed is controlled by the knob "N" (Fig. 4), which is shown in the neutral position. By moving the knob to the right, a continuous movement is obtained which increases in speed as the knob is moved farther to the right. When moved to the left, an intermittent feed is obtained, at each reversal of the table.

Vertical feed of the wheel head is obtained through the hand wheel "B", (Fig. 2). By turning clockwise, the wheel head moves up. The hand wheel is graduated to .0005" on the periphery.

The micrometer stop is shown in Fig. 2.

Fine adjustment of the down feed to within .0001 limits can be obtained by turning the knurled thimble "D", which positions the hardened nose "C". One revolution of the thimble represents .001" down feed. One tenth revolution of the thimble as shown by the graduations will enable the operator to work within these close limits. The micrometer stop can be used to an advantage when two or more parts are to be ground to duplicate dimensions.

The nose "C" can be pivoted out of the path of the dog "E" any time the operator desires.

The drag of the thimble "D" is controlled by the tapered bushing "A". If at any time adjustment is required, place a small piece of tubing over the plunger "C" and tap bushing "A" farther into the housing.

Hand control of the wheel head traverse is obtained by means of the hand-wheel "44" (Fig. 8), mounted on a threaded shaft which engages a roller directly connected to the wheel head. When hand feed is used, control knob "N" (Fig. 4) must always be in neutral position. Knob "4" (Fig. 8) is the hand reverse lever when using the hydraulic feed. The lever may be used when the quantity of work does not justify setting dogs "33" to the proper stroke, or, in reversing the wheel head at any time during its travel.

When the pointer on knob "4" is set at AUTOMATIC REVERSE position, the head will operate automatically or reverse by hand as previously explained. When set at position HAND REVERSE, the dogs "33" will not contact lever "29". On this position, the head must be reversed by hand. Pull lever forward to move forward. When set at hand feed position, the cross feed pilot valve "12" (Fig. 13) is centered and "29" (Fig. 8) should be nested centrally in "30", cam "17" should lay horizontal, pushing fork "16" toward right. The piston rod bracket, "14", is located at the factory and must not be moved.

To facilitate loading of work upon the table surface, turn lever "4", as the head starts back, to the HAND REVERSE position, and the head will continue on until the wheel reaches its extreme rear position. Control knob "N" (Fig. 4) should then be placed in the neutral position. It will then be necessary to pull out knob "4" and reset to AUTOMATIC REVERSE to get the wheel head slide in motion again.

Position HAND FEED permits a short circuiting of the oil in the wheel head valve. For this reason, the HAND FEED should never be used when pointer "5" is not in the HAND FEED position.

When the hand feed fails to function it means a fatigued spring (Fig. 9) or the oil is blocked in the line by the blocking spool "P" (Fig. 1). This spool should shift to the extreme right to engage the hand feed. When

spring "S" (Fig. 1) becomes fatigued the spool will not shift. If the hand feed fails to release the fault is either the piston "28" (Fig. 9) is loose on the rod or spool "P" (Fig. 1) is stuck.

The cross feed cylinder is shown in Fig. 13. The reciprocation of "12" across the ports causes the reversal. As shown the wheel travels toward the rear. Ball "9" and spring "10" hold the cylinder full of oil. Should "10" fatigue an uneven movement of cross feed would result.

WHEEL HEAD

- 10 - The wheel head is shown in Fig. 5.* The wheel head is constructed with the motor on the spindle. Super-precision wheels which have been dynamically and statically balanced should always be used. Ventilation of the motor parts is obtained by a fan mounted on the spindle at the rear of the motor. The air is drawn into the head through ports, which reach the front end of the motor, and is expelled radially through holes provided in the head casting. The front and rear bearings are super-precision ball bearings, size 209, preloaded to 250 lbs. and are non-adjustable. If over a period of time it becomes necessary to replace the above named bearings, follow the description shown on Fig. 5.*

POWER UNIT

- 11 - The pump motor and hydraulic pump are housed in a recess at the left end of the machine, and can be inspected by removing the louvred shield. The hydraulic pump is driven by a Vee belt that can be tightened by loosening the hold down bolts of the motor and moving it along the slots until the required belt tension is obtained. The belt should have about one-half inch deflection after adjustment.

ADJUSTING GIBS

- 12 - The taper gib on the saddle should permit the saddle to follow the screw downward by its own weight. This adjustment may be determined by freeing the front gib and tightening until the slide just barely follows the screw. The movement should be checked against wheel graduation by an indicator.

ELEVATION BRAKE

- 13 - The elevation nut and screw being anti-friction, it is necessary to have a brake on the screw. The elevation brake is shown in Fig. 7. Adjustment of the brake should be made when the saddle does not maintain its

*or Blueprint of Wheel Head Assembly - as indicated on contents page.

position; that is, wear of the brake lining will eventually allow the heavy saddle to drift, turn the screw by its own weight. By turning the brake adjusting screw clockwise, the pressure on the shoe will be increased. The brake should never be tight enough to keep the saddle from following the screw.

OVER-RUN

- 14 - Momentum will force the table to move a slight distance farther after the reverse lever has been shifted. This is called over-run. Normal over-run is approximately one and one-half inches on each side of the reverse lever with the table operating at 70 FPM. By turning the choke screw "B", (Fig. 1), counter-clockwise, it is lengthened. By turning the choke screw "Q", (Fig. 1), counter-clockwise, a faster intermittent feed on the wheel head is obtained. This choke should be adjusted to just accomplish feeding of the head while the table is reversing.

FINISH

- 15 - High degrees of finish can be obtained on all Thompson Hydraulic Surface Grinding Machines by the use of the correct grade wheel and coolant. When grinding for mirror finish, it is necessary to prepare the work with a 46 grain wheel and remove these marks with a 220 grain wheel before proceeding with the final 500 grain wheel. Various materials will react differently to the fine grain wheels and a stock removal of more than .0006" cannot be expected with the 500 grain wheel. Unless a filter having a spacing of .0005" is used, it becomes necessary to pass water directly from the city supply through the coolant nozzle. Care must be used, in this case, to prevent rusting of the machine parts.

Unsatisfactory finish on a surface grinding machine may be the result of the following factors:

1. Grinding wheel is too hard (will cause chatter marks).
2. Work not properly supported.
3. Failure of current to magnetic Chuck, or failure of magnetic Chuck coils.
4. Foreign matter between wheel arbor and spindle.
5. Loose wheel arbor.
6. Vibration from surrounding machinery.
7. Machine improperly supported.
8. Vibrating foundation.
9. Grinding wheel out of balance.
10. Coolant too rich (too much oil).

11. Improper wheel dressing (too fast truing speed causes grain or diamond marks).
12. Worn truing tool (a diamond worn too flat will produce a glazed wheel and result in hot cutting and burned work).

So called "Chatter-marks" can be reduced to a minimum by normal care of the machine and good judgment in operation. Since there is no accepted standard of finishes, it is difficult to classify grinding machine finishes. Machine tool ways are now being ground with very satisfactory results and acceptable finishes. On careful examination, waves in the finished surfaces will be discovered. Since the irregularities are probably less than that found on good surface plates, these waves are not considered serious. The causes of the irregularities are attributed to variations in oil film, wheel structure and material being ground. Elimination of the high spots would result in substantially 100% bearing surface which is as elusive as perpetual motion.

COOLANT

- 16 - The oil coolant tank should be kept filled to capacity with a mixture of soluble oil and water with a ratio of eighty to one. Too rich a mixture (i. e. less than eighty parts water will produce heat and distortion in grinding, while too lean a mixture permits the polished parts of the machine to rust). The sediment should be removed from the tank when an accumulation of from one to two inches has collected in the bottom of large chamber into which the coolant trough exhausts.

ROD PACKING

- 17 - The wheel head piston rod (Fig. 1) is packed with an oil resisting packing requiring replacement periodically, depending on service. A high grade "Chevron", or Sea Ring packing should be used. The packing dimensions are as follows:

Head Rod - $3/4$ ID x $1-1/4$ OD x $1-1/4$ long

Adequate installation instructions are attached to each packing.

LUBRICATION

PULL BIJUR PUMP HANDLE
AT LEAST FOUR TIMES DAILY
FILL BIJUR SUMP THRU
COLUMN DOOR WITH
SUN TABLE WAY
LUBRICANT 300 SSU

HYDRAULIC PUMP
DRIVE MOTOR BEARINGS
GREASE PACKED

COOLANT PUMP
GREASE PACKED
ANDOK "C"

WHEEL SPINDLE BRG.
LUBRICATED WITH
GREASE ANDOK "C"
STANDARD OIL CO
NEW JERSEY

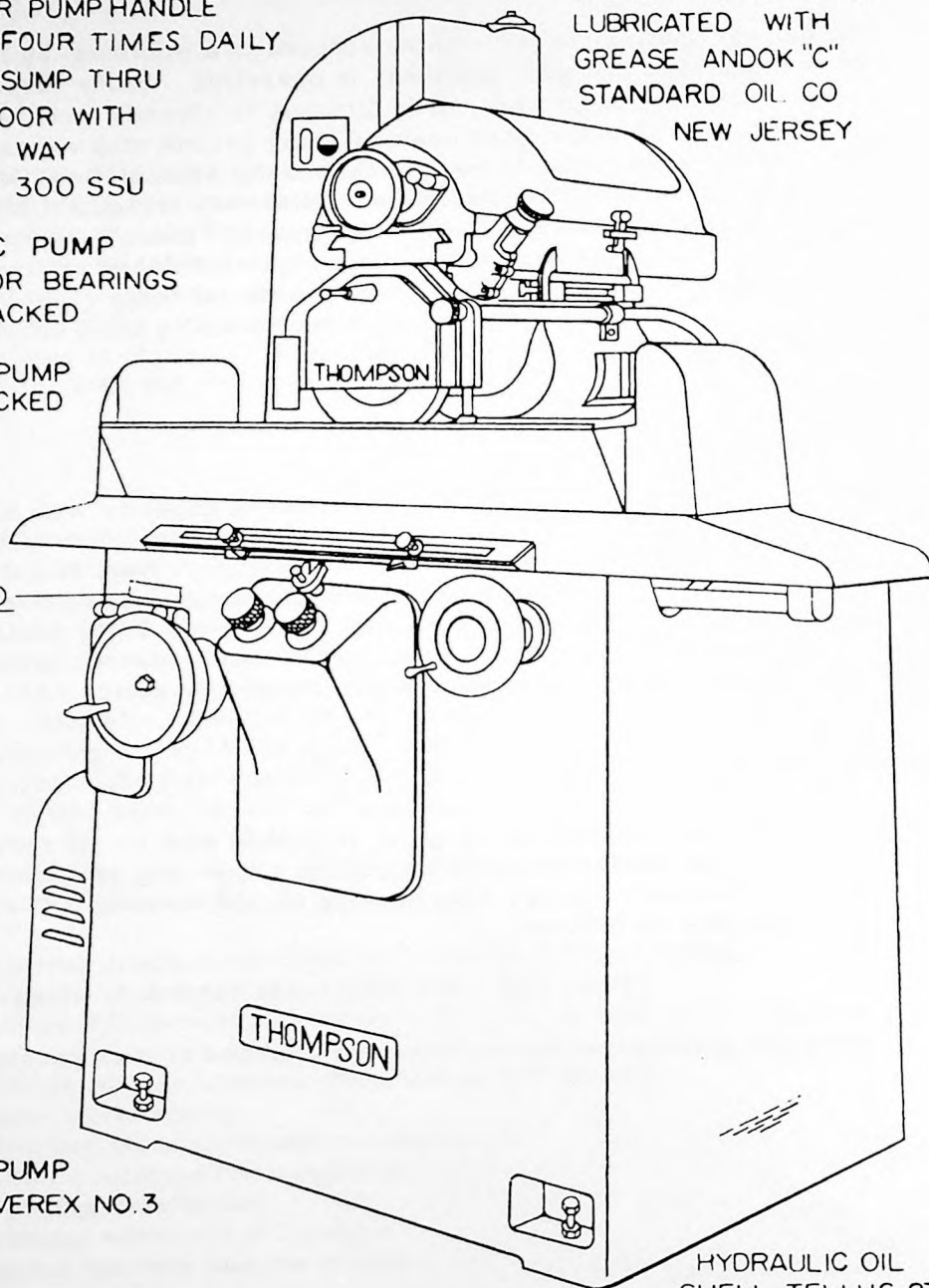
SERIAL NO

HYDRAULIC PUMP
SOC. VAC. SOVEREX NO.3

HYDRAULIC OIL
SHELL TELLUS 27
OR SOCONY VACUUM

THE THOMPSON GRINDER CO.
SPRINGFIELD OHIO U.S.A.

FIG. NO. 12



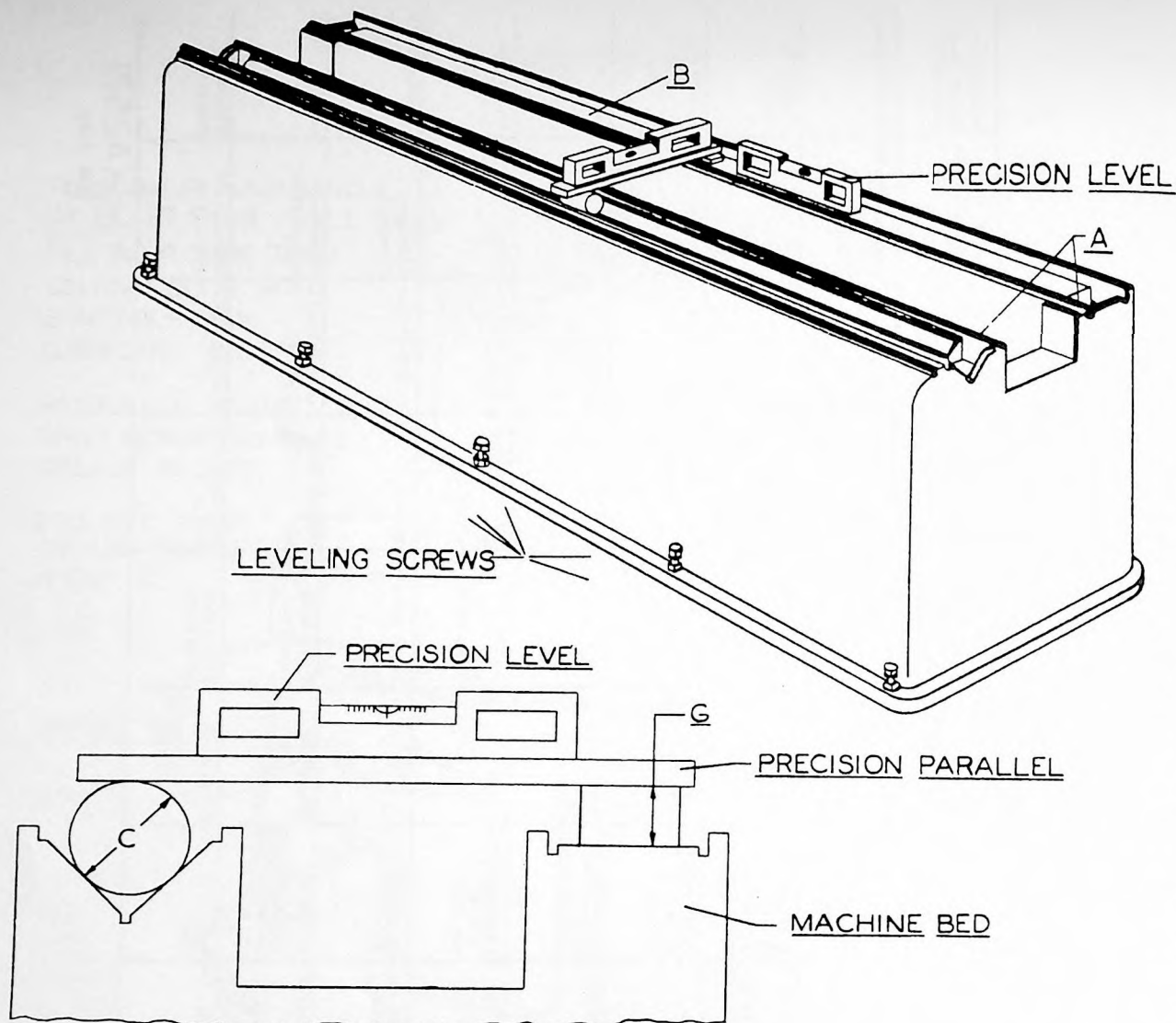
RECOMMENDED LUBRICANTS FOR THOMPSON GRINDERS

Thompson Grinder Specification and Application.	SHELL OIL COMPANY	EXXON COMPANY	SUNOCO (Sun Oil Co.)	SOHIO/BORON (Std. Oil of Ohio/Boron Oil Co.)	MOBIL OIL CORPORATION	CHEVRON OIL COMPANY	TEXACO INC.	AMOCO OIL COMPANY	GULF OIL CORPORATION	ATLANTIC RICHFIELD COMPANY
#TH15: Std. Table Way & Hydraulic Oil, Table Speed 10 FPM or faster; 150 SUS*	Tellus #25 or Hyd. Oil #25	Teressitic #EP44 or Nuto #H44	Sunvis #916, Sunvis #816WK, R&O #150 Oil	Factovis #43 Industron #44 Energol HL-C32 or HLP-C32	DTE Light	OC Turbine Oil #32 or EP Hyd. Oil #32	Regal A (R&O) or Rando HD 32	American Industrial Oil #15	Harmony 43 AW or Harmony 44	Duro Oil #S-150
#THW15: Table Way & Hydraulic Oil, Slow Table Speed, Table Hand Feed & Truform, 150 SUS*	Tonna Oil #25	75% - Teressitic #43 25% - Febis #K-53	Lubeway #150 or Lubeway #1706	Factoway #43 Energol HP-C32-C	Vacuoline #1405	Vistac Oil #32X	Rando HD 32	Waytac Oil #15	75% - Gulfway 52 25% - Gulfspin 35	Truslide Oil #S-150
#TS55: Spindle Oil, Bronze Sleeve Wheel-Head Spindle Bearings, 55 SUS*	Tellus Oil #15	Spinesstic #34	Solnus #55	Industron #34 Energol HLP-C10	Velocite #6	EP Machine Oil #10 or Spindle Oil #10	Spindura 10	Spindle Oil A	Gulfspin 35	Duro Oil #55
#TS35: Spindle Oil, Super-Precision Silver-Sleeve Wheel-Head Spindle Bearings, 33-38 SUS*	none	none	Spindle Oil #35	Industron #32 none	Velocite #3	none	none	none	none	none
#TW35: Way Oil, Column/Saddle & Saddle/Wheel-Head Ways, 350 SUS*	Tonna Oil #33	Febis #K-53	Way Lubricant #80	Factoway #50 Energol HP-C68-C	Vactra #2	Way Oil #68 or Vistac Oil #68	Way Lubricant D	Waytac Oil #31	Gulfway 52	Truslide Oil #S-115
#TSG2: Spindle Grease, Radial Ball Wheel-Head Spindle Bearings, NLGI-2, 600 SUS*	Alvania Grease #2	Andok "C"	Multipurpose #2 EP Grease	Factron #2 Energol M-P	Mobilux EP 2	SRI Grease #2	Multifax #2	Amolith Grease #2	Gulfcrown Grease #2	Litholine HEP 2
#TRG1: Recip'g Ball or Roller Way Brg. Grease, TR's, D's, etc. NLGI-1, 600 SUS.*	Alvania Grease #EP-1	Lidok #EP1	Prostique #741 EP Grease	Factron #1 Bearing Card M-K Energol LS-1 or LS-EP #1	Mobilux EP1	Polyurea EP Grease	Multifax EP #1	Amolith Grease #1 EP	Gulfcrown Grease EP #1	Litholine HEP 1
#THC15: Hydraulic System Cleaner, 150 SUS*	Cassiss Fluid "A"	HDX Plus 10W	Sunvis #706	none none	Delvac #1210	Special Motor Oil SAE 10W	Ursa Extra Duty SAE 10	Dexron II ATF	Hydraulic Oil #141 or #151	ARCOfleet XHD 10W

*at 100° F.

SKA2521

TLW 1-76



BED WAY LEVELING INSTRUCTIONS
(fig No. 1)

2F Machine - ref FD46A Base: Cylinder "C" - 1-1/2" dia
Gage Block "G" - .7481" high

LEVELING INSTRUCTIONS

Leveling is a very important function in the proper installation of a precision machine tool. For such work a sensitive, graduated tube spirit level reading to .0005" per graduation (.0005" per ft.) is required. The ordinary machinist combination square with level is not good enough for this type of work. A short level with a long tube is best.

The table should be removed from the bed and the ways should be absolutely clean and free of burrs in order to obtain accurate results.

The handling of the level is important and a correct method is to handle the level by the ends rather than by the center portion. During a long leveling operation, heat of the operator's hand grasping the center section can definitely affect the bulb's accuracy.

The machine should be setting on the foundation utilizing the leveling plates shown in Fig. 2, Page LP 2. With all leveling screws in contact with the leveling plates proceed as follows:

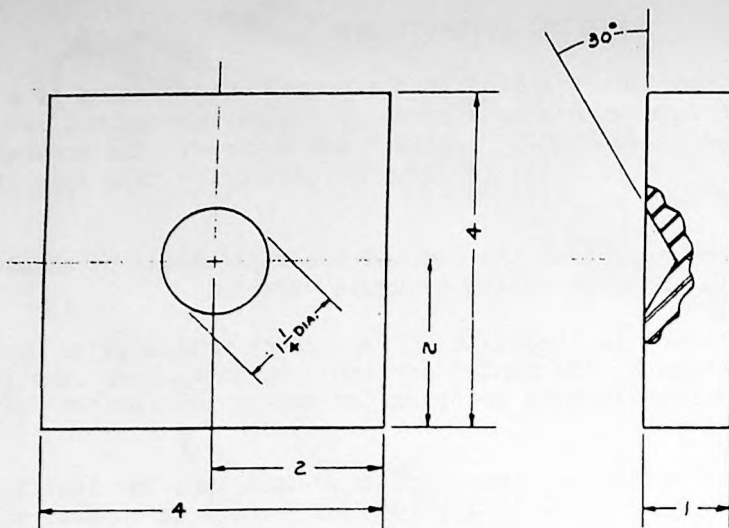
Place a precision cylinder, of the diameter indicated in the chart, in the vee way. A gauge block of the size noted in the chart should be placed on the flat way as shown. A precision parallel should be placed from the cylinder C to the gauge block G. The precision level should then be placed on top of the precision parallel.

The bed should be leveled by alternately placing the precision level transversely on the precision parallel, and then longitudinally on the flat way B. The starting position should be opposite the column and moving alternately toward the ends. This procedure should be repeated until the bed is level within .0005", being preferably low at the center of the bed, leaving the ends no more than .0005" high. To raise the bed, the leveling screws should be turned clockwise. At the conclusion of this leveling procedure all leveling screws should be tight in contact with the leveling screw plates. We do not recommend bolting the machine to the foundation.

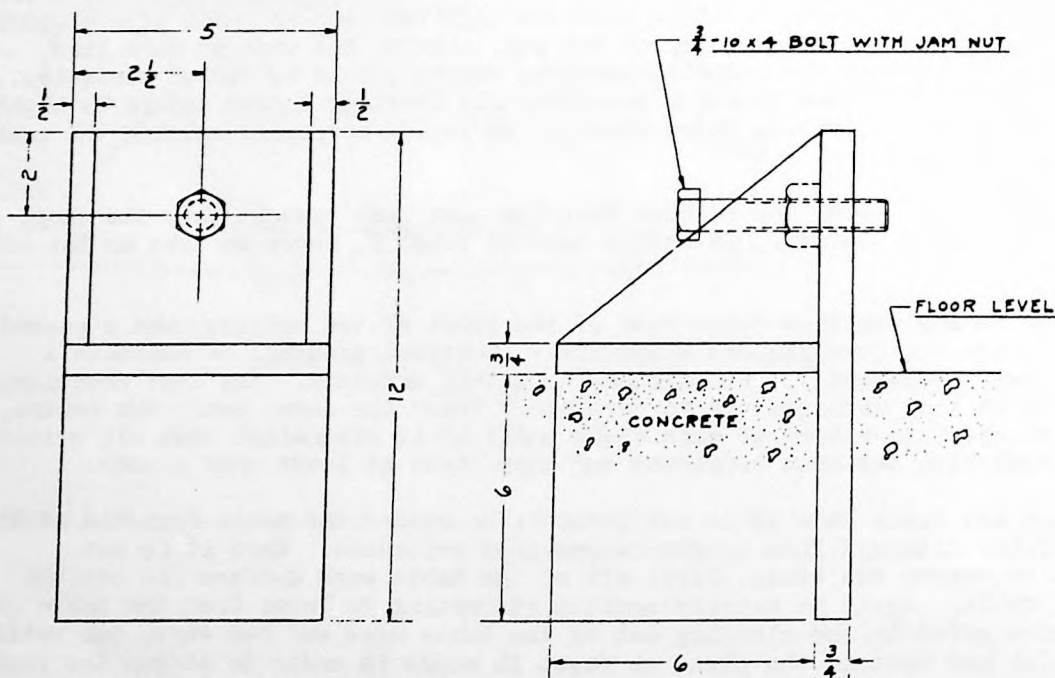
Do not try to level the machine that has just been brought into the shop, especially in cold weather. It should have at least 24 hours to take on the room temperature.

We recommend periodic inspection of the level of the machine, and a record kept each time the leveling check is made. It is not possible to maintain a perfect level permanently. Foundations do settle unevenly. The best procedure, especially on long machines, is to completely check the level every two months, keeping an absolute record of each check until it is determined that all settling of the foundation has been completed and then check at least once a year.

There are times when it is not possible to remove the table from the machine for leveling, although this is the recommended procedure. When it is not possible to remove the table, level off of the table work surface and not the magnetic chuck. Again we caution against attempting to level from the table of the machine prior to the cleaning out of the table ways and bed ways, nor until the machine has been in the plant at least 24 hours in order to attain the room temperature.



LEVELING PLATE
FIG. NO. 2



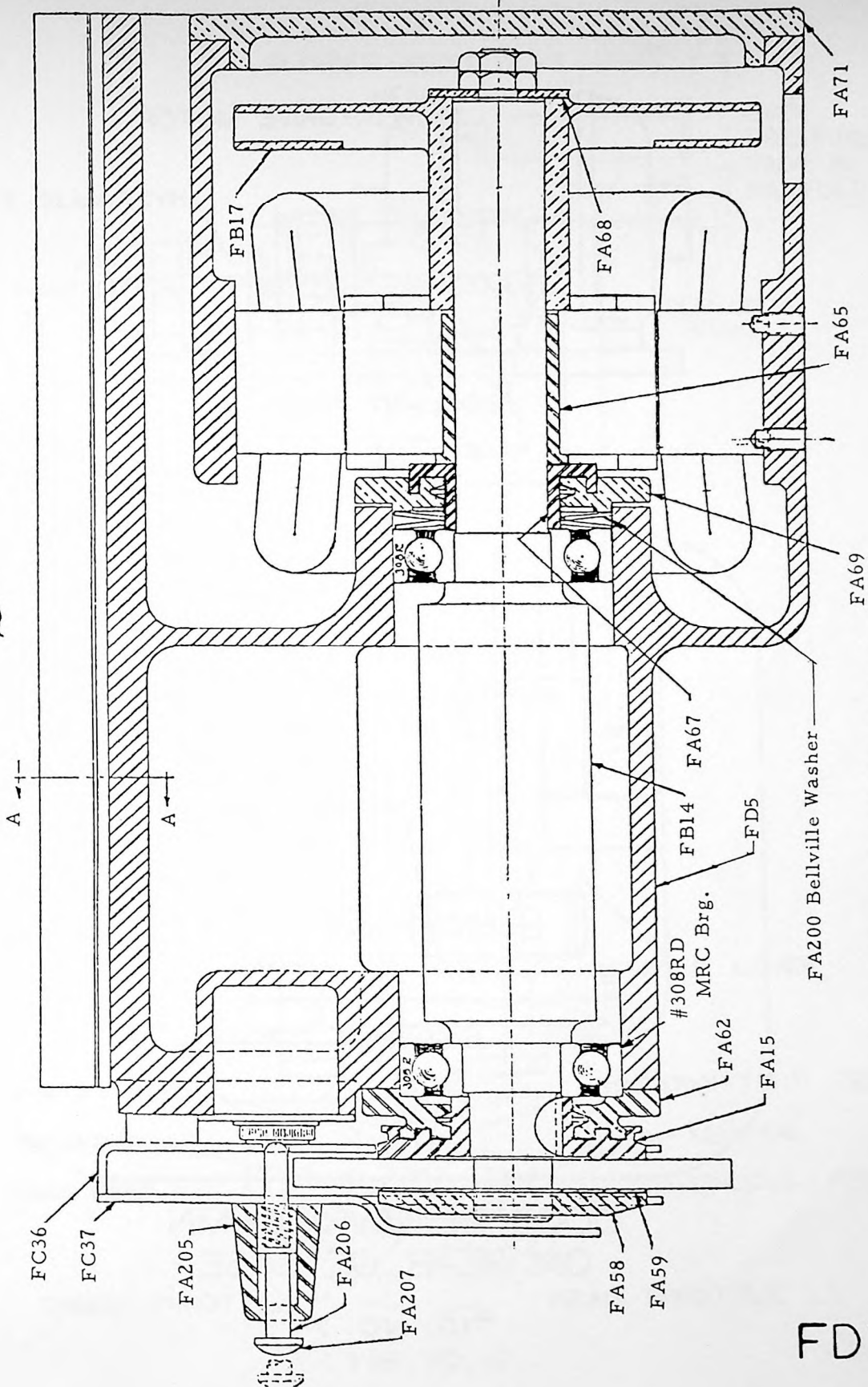
WELDED STEEL CONSTRUCTION

BED STOP
FIG. NO. 3

Head Slide cast into Wheel Head

Ref 10°

Section AA



FD7 WHEEL HEAD ASSEMBLY (fig 5)
(for F machine until 1946)

FD7

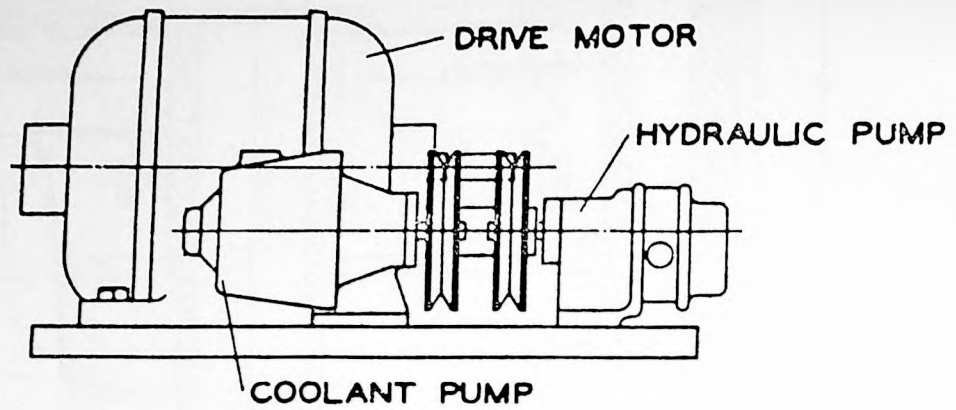
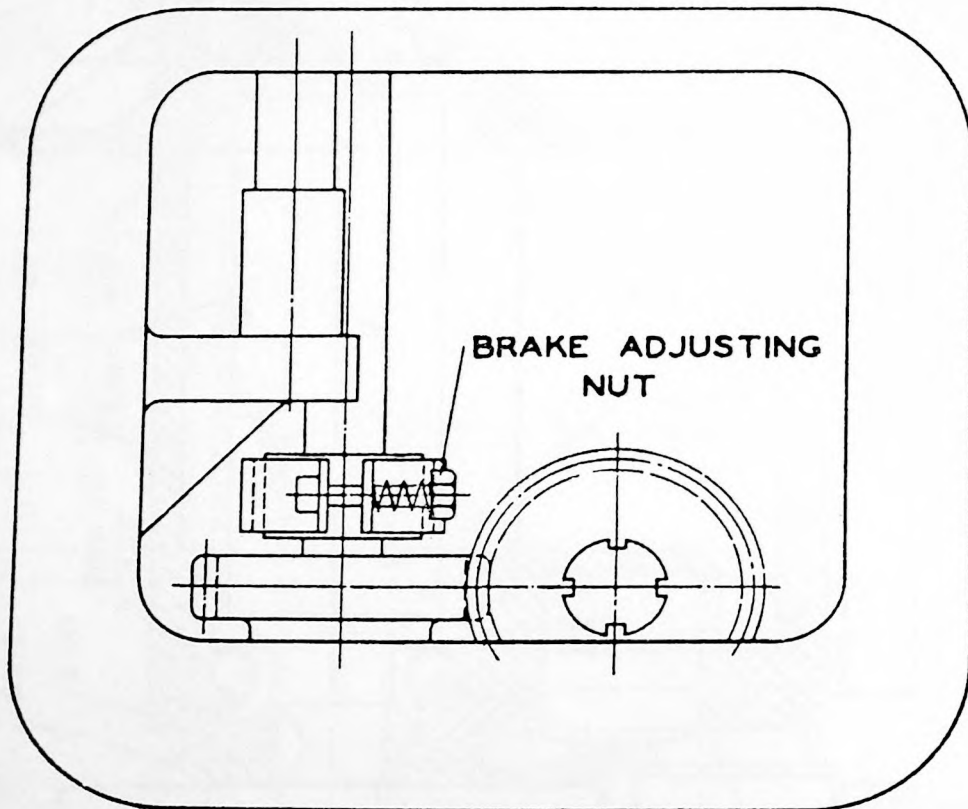


FIG. NO. 6



DOOR BELOW COLUMN
ON REAR OF BASE

FIG. NO. 7

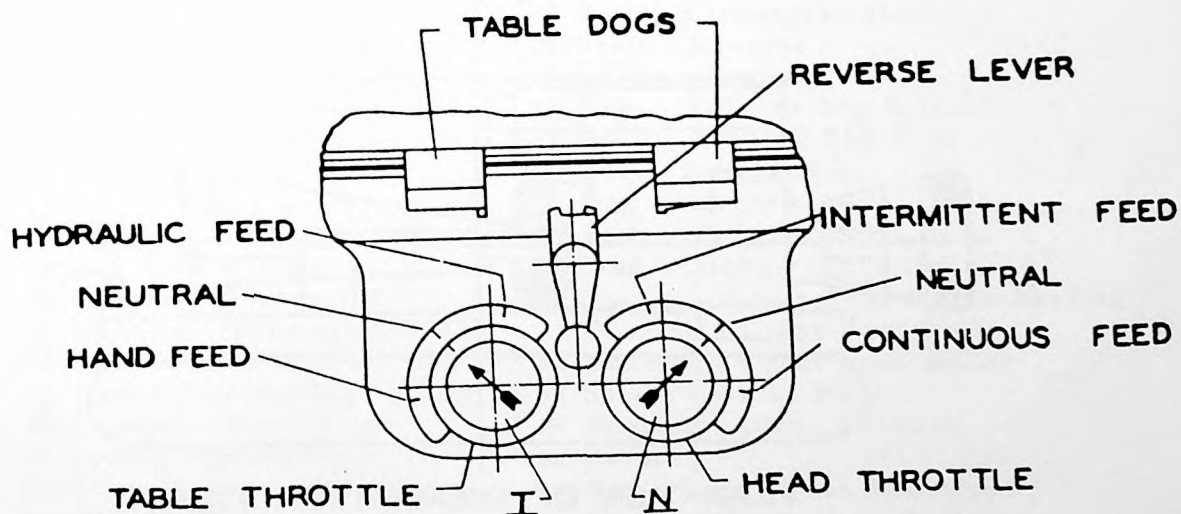
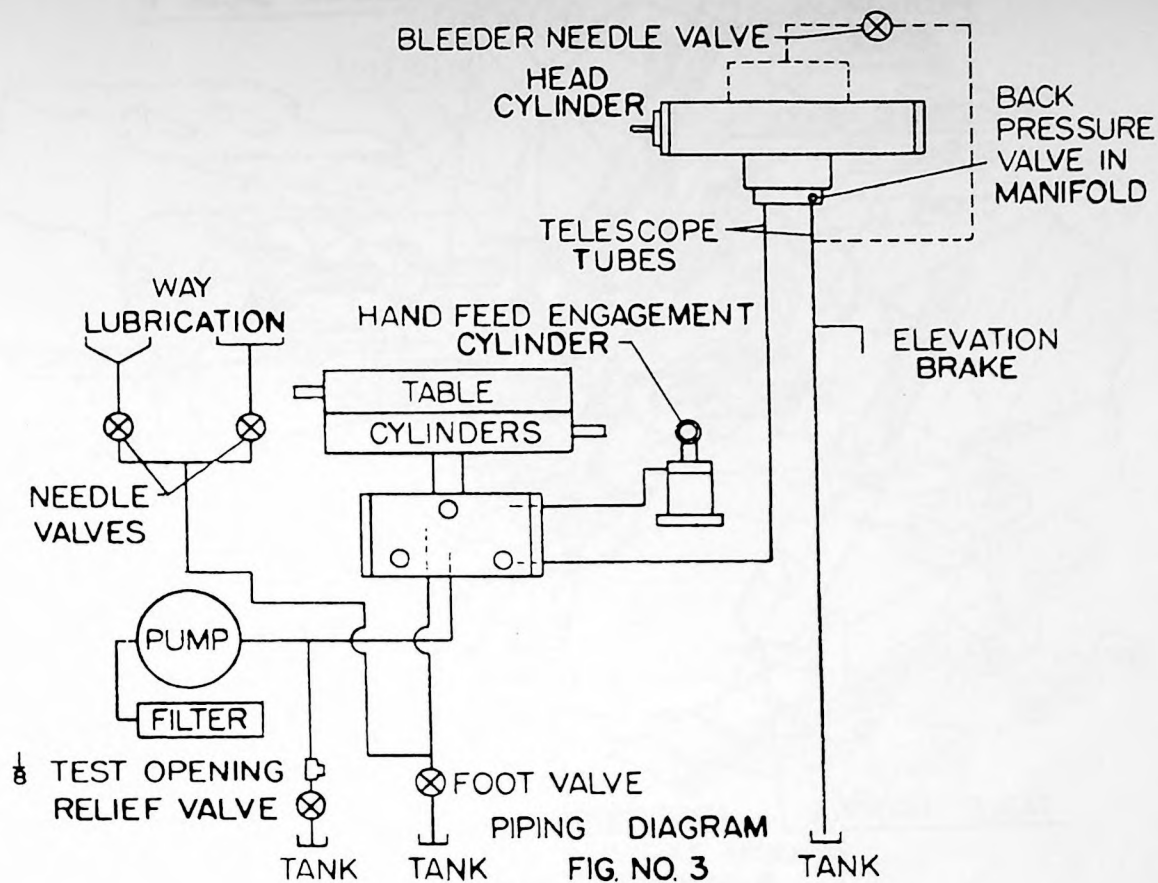
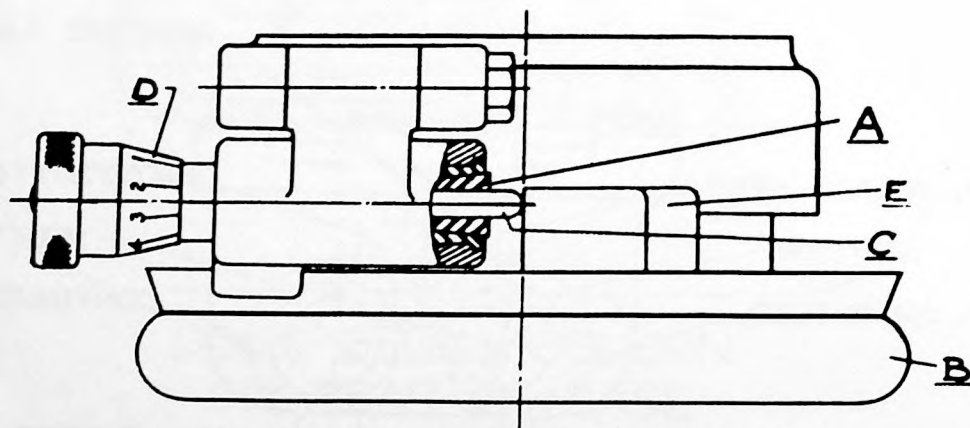
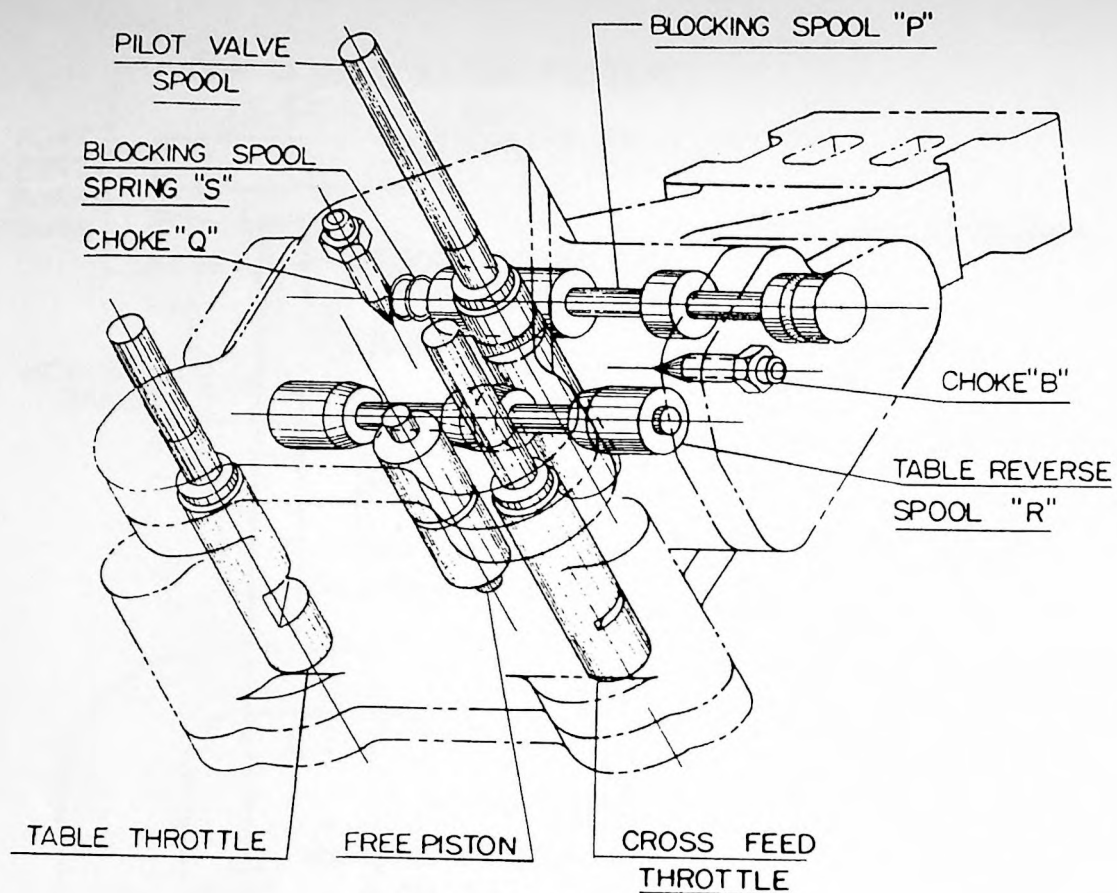
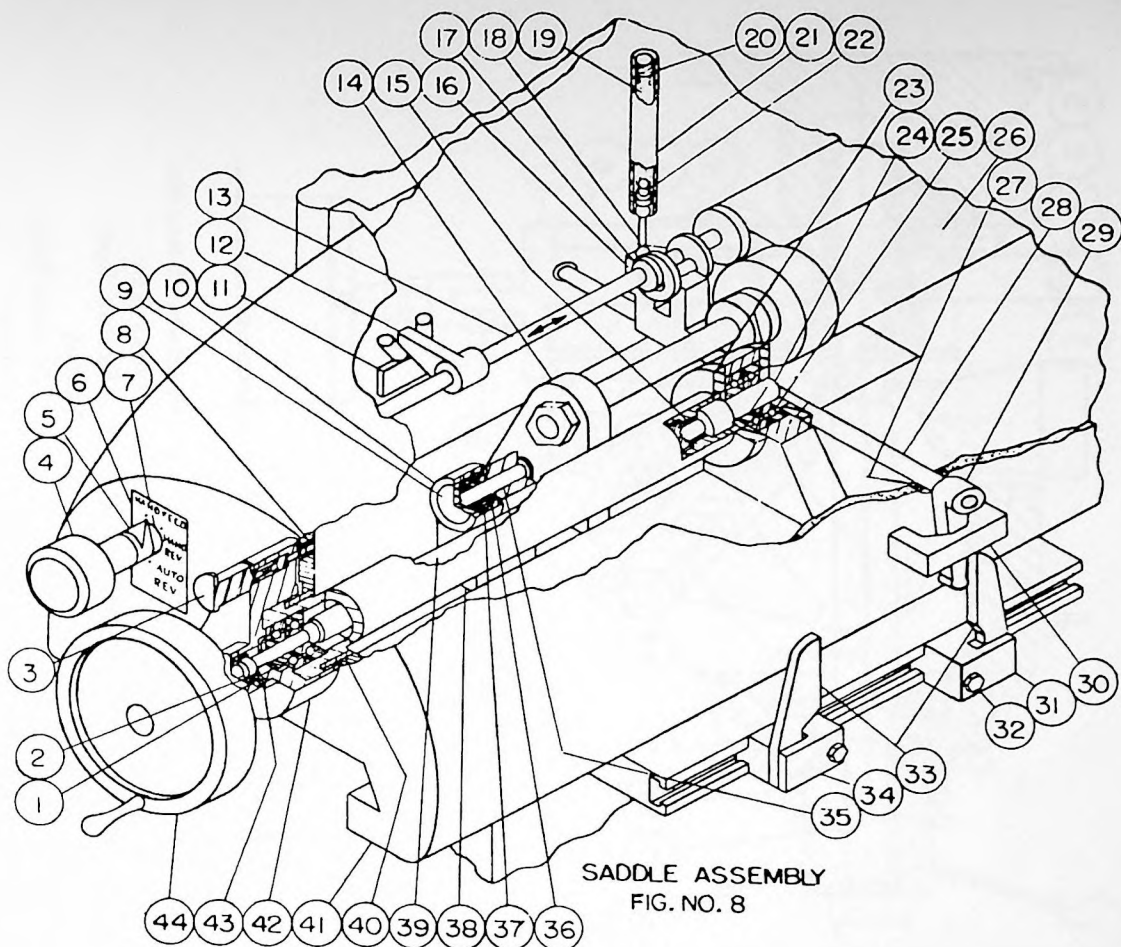


FIG. NO. 4

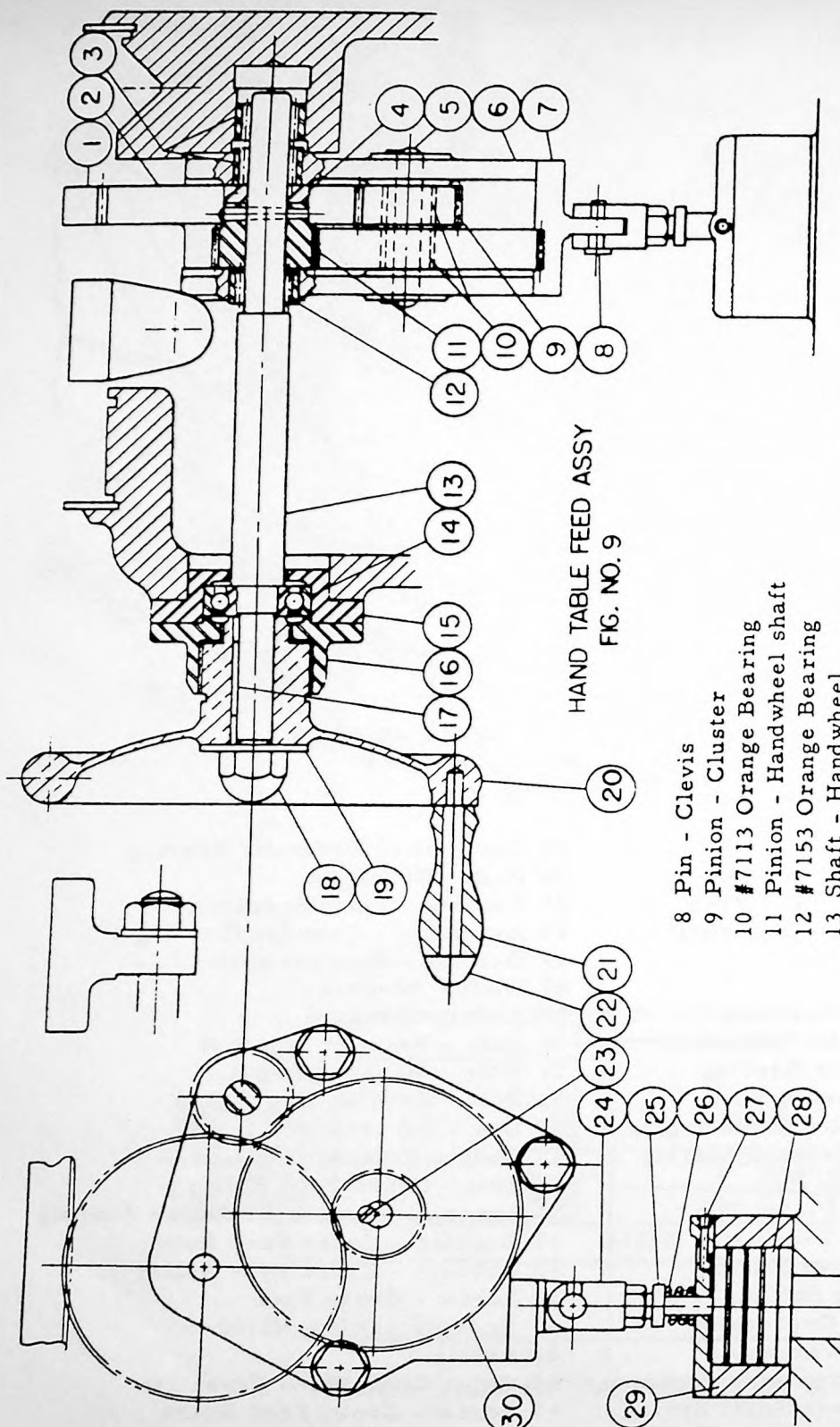


PLAN VIEW OF MICROMETER STOP

FIG. NO. 2

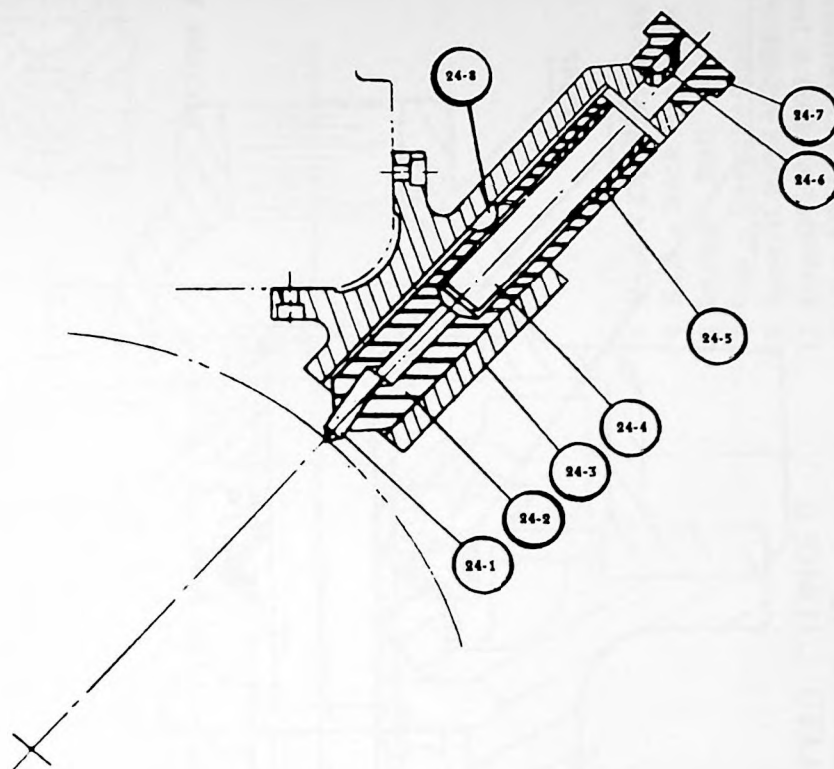


- | | |
|-------------------------------|---------------------------------------|
| 1 Spring - C. F. Brake | 23 Cap - Inner Eccentric Bearing |
| 2 Shoe - C. F. Brake | 24 Plug - Eccentric |
| 3 Shot Bolt - Hand Feed | 25 Bearing - Inner Eccentric |
| 4 Knob - Valve Pull Shaft | 26 Assembly - Cylinder (See Fig.) |
| 5 Pointer - Dial | 27 Bearing - Reverse Shaft |
| 6 Dial | 28 Shaft - Reverse |
| 7 Bushing - Pull Rod | 29 Lever - Reverse |
| 8 Bushing - C. F. Locator | 30 Cam - Reverse Dog R. H. |
| 9 Nut - Roller Bearing | 31 Body - Reverse Dog R. H. |
| 10 Roller - Cross Feed | 32 Bolt - Reverse Dog |
| 11 Fork - Valve Centering | 33 Dog - Reverse |
| 12 Finger - Valve Centering | 34 Body - Reverse Dog L. H. |
| 13 Rod - Valve Pull | 35 Stud - Cross Feed Roller |
| 14 Bracket - Piston Rod | 36 Spacer - Cross Feed Roller Bearing |
| 15 Bearing - Torrington B1212 | 37 Bearing - Cross Feed Roller |
| 16 Yoke - Valve Shifting | 38 Bracket - Cross Feed Roller |
| 17 Cam - Dog Shifting | 39 Screw - Cross Feed |
| 18 Plunger - Overcenter | 40 Bushing - Oilite A3100-6 |
| 19 Spring - Overcenter | 41 Saddle |
| 20 Screw - Overcenter Spring | 42 Cap - Cross Feed Eccentric |
| 21 Guide - Overcenter Spring | 43 Screw - Cross Feed Brake |
| 22 Plug - Overcenter Plunger | 44 Hand Wheel |



HAND TABLE FEED ASSY
FIG. NO. 9

- | | | | |
|------------------------|-----------------------------------|-----------------------------------|----------------------------|
| 1 Rack - Hand Feed | 8 Pin - Clevis | 14 #304 Double Seal Bearing | 22 Stud - Handwheel handle |
| 2 Gear - Rack | 9 Pinion - Cluster | 15 Cage - Bearing | 23 Screw - Gear Pin |
| 3 #7153 Orange Bearing | 10 #7113 Orange Bearing | 16 Seal - Handwheel Shaft Bearing | 24 Clevis - Piston Rod |
| 4 Spacer - Drive Gear | 11 Pinion - Handwheel shaft | 17 Key - Handwheel | 25 Rod - Piston |
| 5 Pin - Gear (2 req.) | 12 #7153 Orange Bearing | 18 Nut - Handwheel Acorn | 26 Spring - Piston Rod |
| 6 Plate - Gear Box | 13 Shaft - Handwheel | 19 Washer - Handwheel | 27 Cap - Cylinder |
| 7 Bracket - Piston Rod | 14 #304 Double Seal Bearing | 20 Handwheel | 28 Piston |
| | 15 Cage - Bearing | 21 Handle - Handwheel | 29 Cylinder |
| | 16 Seal - Handwheel Shaft Bearing | | |
| | 17 Key - Handwheel | | |
| | 18 Nut - Handwheel Acorn | | |
| | 19 Washer - Handwheel | | |
| | 20 Handwheel | | |
| | 21 Handle - Handwheel | | |

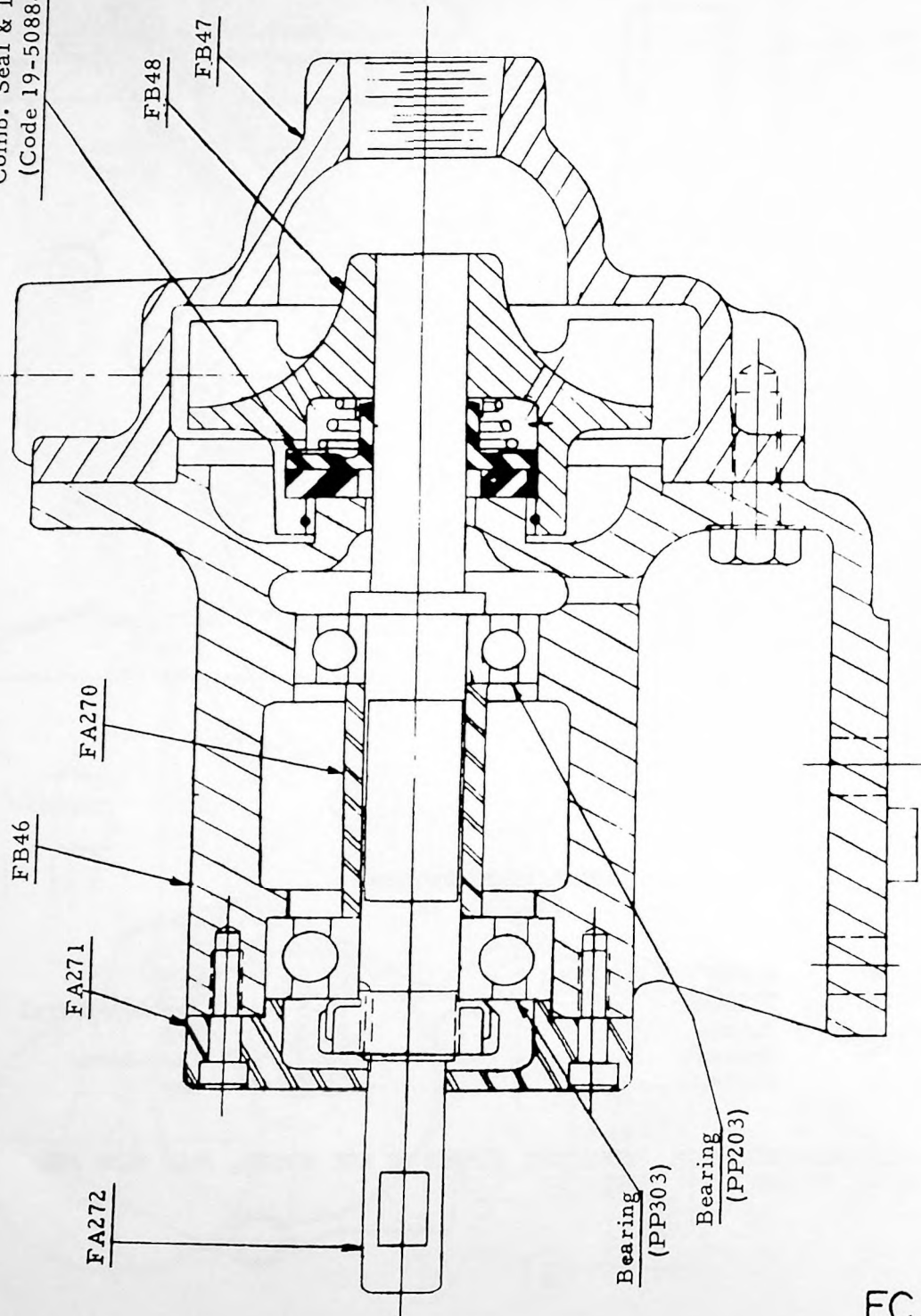


WHEEL TRUER ASSEMBLY
FIG. NO. 24

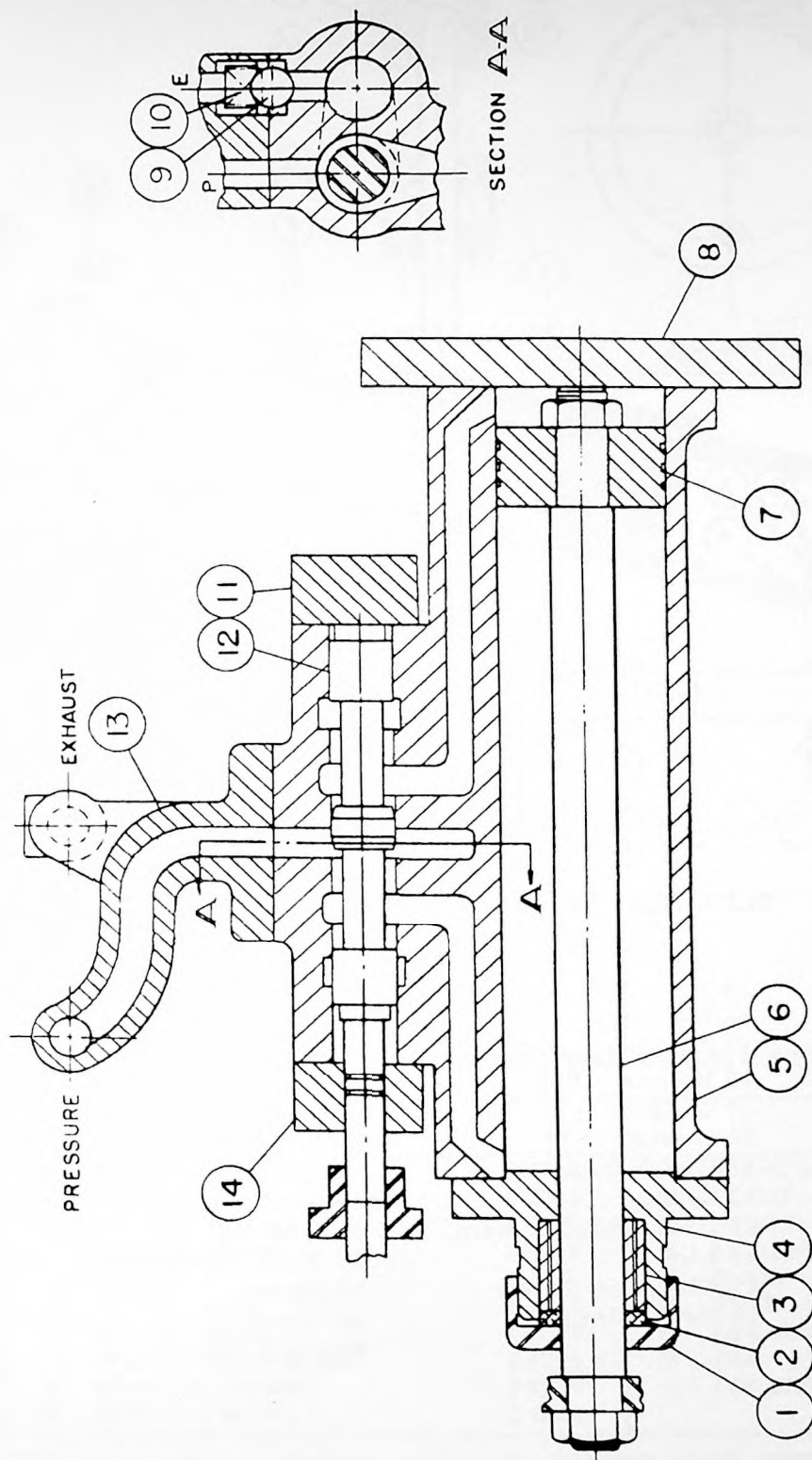
KEY NO.	NAME	KEY NO.	NAME
24-1	Diamond	24-5	Bushing-Barrel
24-2	Barrel	24-6	Key
24-3	Bracket	24-7	Knob-Screw
24-4	Screw	24-8	Key

WHEN ORDERING PARTS, GIVE PART NUMBER OR KEY NUMBER, PART NAME AND SERIAL NUMBER OF MACHINE.

#B112433 Switzer Cummins
Comb. Seal & Impeller
(Code 19-5088-01)

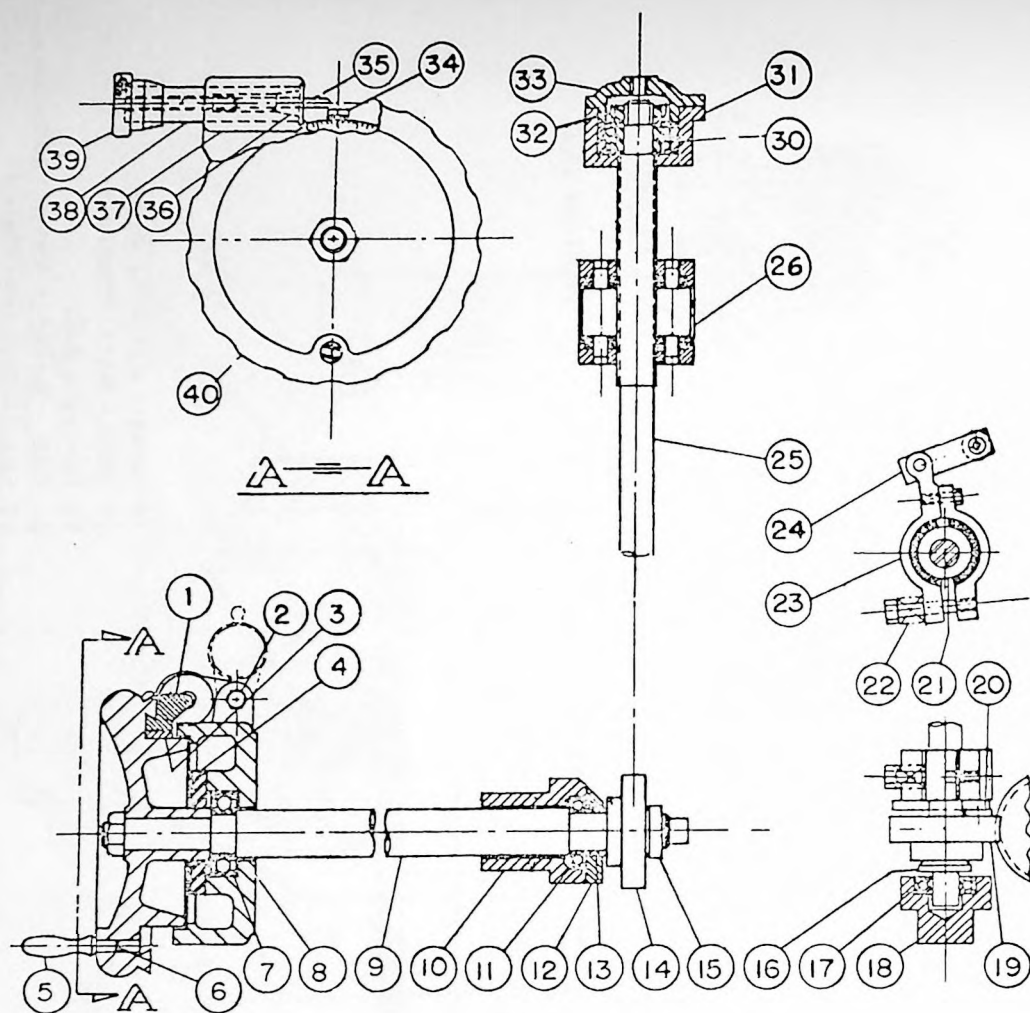


COOLANT PUMP - Thompson Grinder



- 1 Cap Packing Gland
- 2 Gland - Packing
- 3 Packing #431 Garlock Chevron
- 4 Head - Cylinder Front
- 5 Cylinder
- 6 Rod - Piston
- 7 Piston
- 8 Head - Cylinder Rear
- 9 Ball - Back Pressure
- 10 Spring - Ball
- 11 Cap - Reverse Valve rear
- 12 Spool - Reverse Valve
- 13 Manifold - Pipe
- 14 Cap - Reverse Valve Front

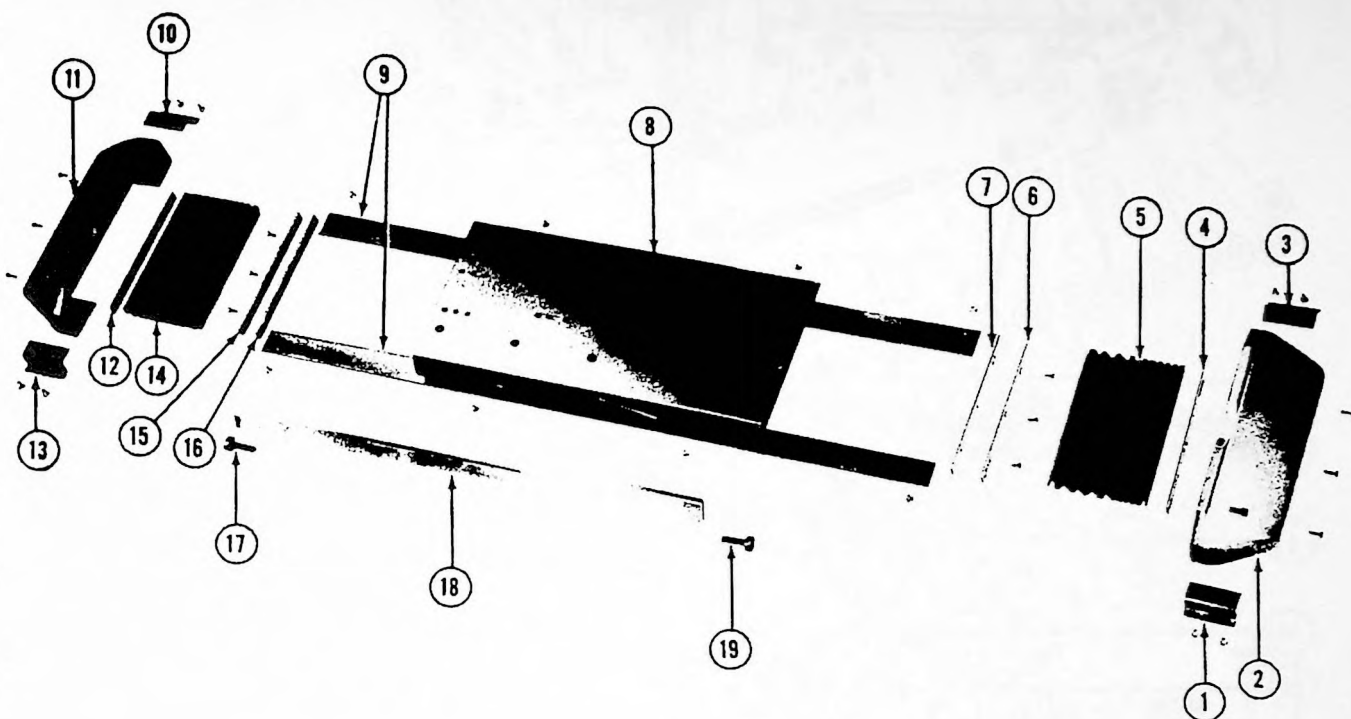
CROSS FEED CYLINDER
FIG. NO. 13



ELEVATION ASSEMBLY FIG.#14

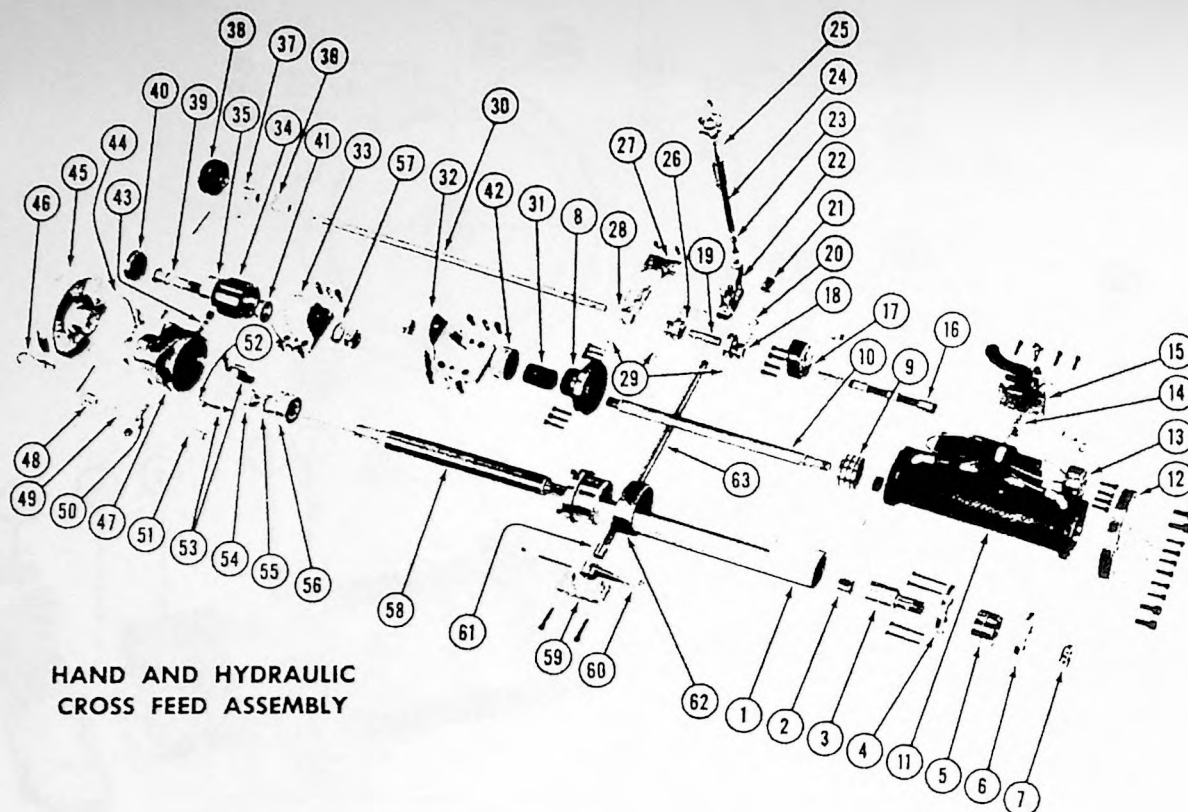
- | | | |
|-------------------------|------------------------|---------------------------|
| 1 Striker | 15 Nut - N4 | 30 Bearing N.D. 5504 |
| 2 Stripper Bolt | 16 Nut - N3 | 31 Cage - Bearing |
| 3 Shoe | 17 Bearing - N.D. 3303 | 32 Nut - N4 |
| 4 Cap - Brg. | 18 Holder - Brg. | 33 Cap - Upper Brg. |
| 5 Handle | 19 Gear | 34 Pointer |
| 6 Stud - Handle | 20 Washer | 35 Spindle |
| 7 Bearing FAF. PP206 | 21 Brake Drum | 36 Bushing |
| 8 Housing | 22 Spring | 37 Body - Micrometer Stop |
| 9 Elevation Shaft | 23 Brake Band Assem. | 38 Sleeve |
| 10 Holder Brg. | 24 Link | 39 Thimble |
| 11 Bearing - N.D. 99604 | 25 Elevation Screw | 40 Hand Wheel |
| 12 Cap Brg. | 26 Nut - Elevation | |
| 13 Spacer Brg. | 27 | |
| 14 Gear | | |

WHEN ORDERING, GIVE FIGURE NUMBER, DESCRIPTION,
ITEM NUMBER AND SERIAL NUMBER OF MACHINE



CROSS FEED WAY COVERS — F-CW

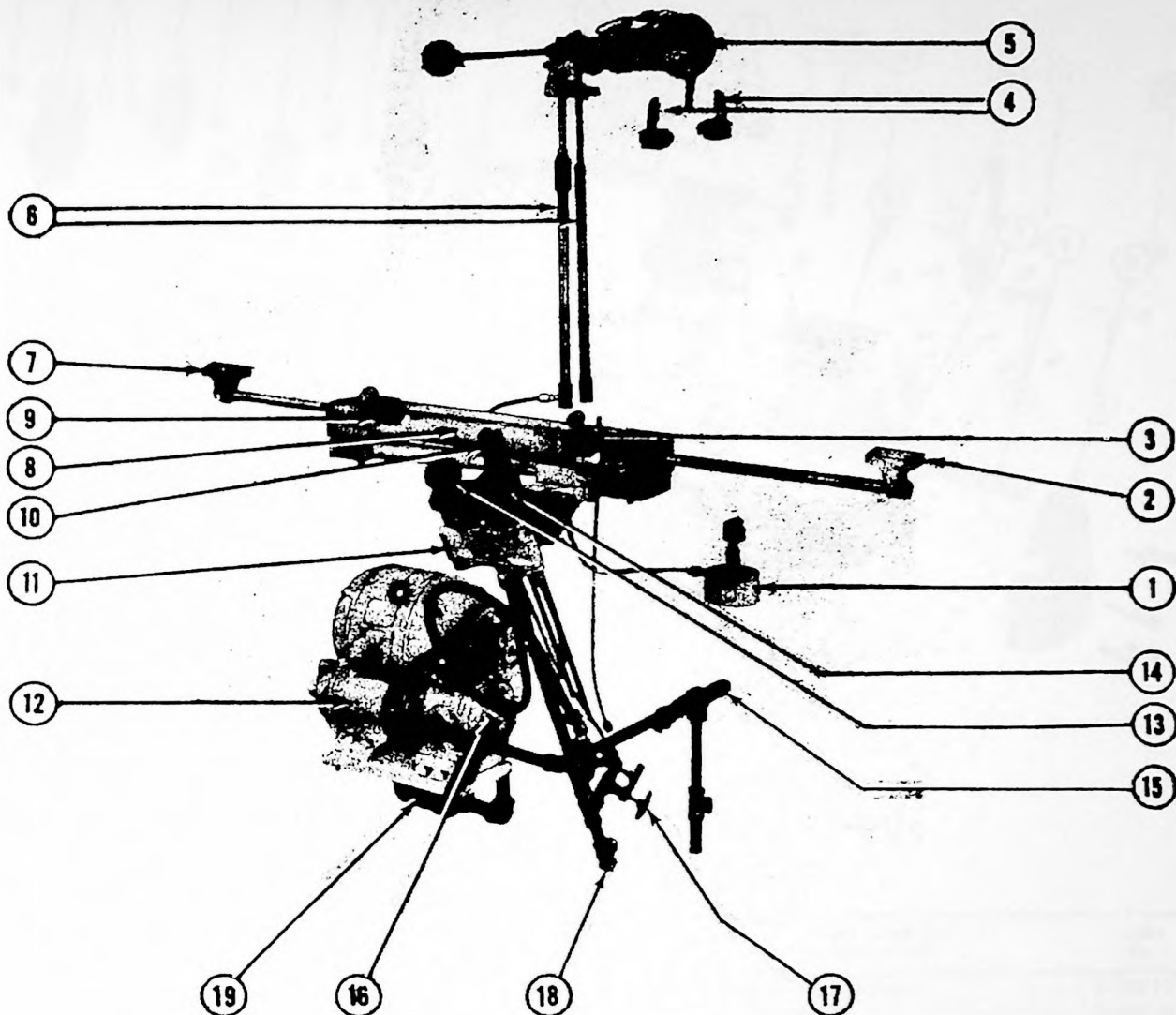
ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	SHIELD — bellows	F-CW1	11	HOUSING — with cover, front	F-CW11
2	HOUSING — with cover, rear	F-CW2	12	CLAMP — bellows	F-CW12
3	SHIELD — bellows	F-CW3	13	SHIELD — bellows	F-CW13
4	CLAMP — bellows	F-CW4	14	BELLOWS	F-CW14
5	BELLOWS	F-CW5	15	PLATE — clamp	F-CW15
6	PLATE — clamp	F-CW6	16	PLATE — anchor	F-CW16
7	PLATE — anchor	F-CW7	17	GIB SCREW	F-CW17
8	WHEEL HEAD SLIDE	F-CW8	18	GIB	F-CW18
9	RUNNER — bellows	F-CW9	19	GIB SCREW	F-CW19
10	SHIELD — bellows	F-CW10			



**HAND AND HYDRAULIC
CROSS FEED ASSEMBLY**

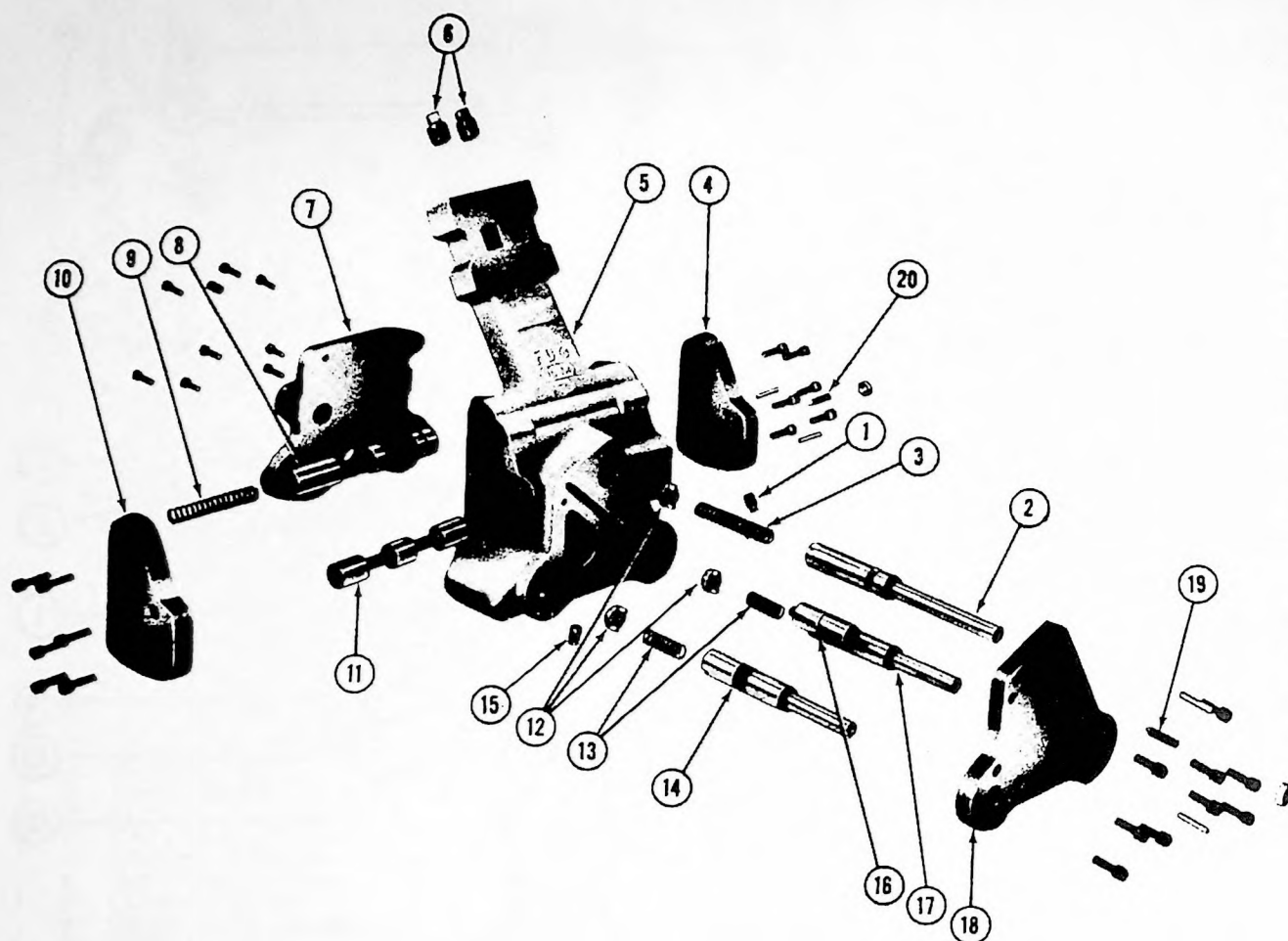
F-CF

ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	SLEEVE - H.C.F.	F-CF1	33	HOLDER	F-CF33
2	B1212 - TORRINGTON	F-CF2	34	ROLLER	F-CF34
3	PLUG	F-CF3	35	5204 BEARING	F-CF35
4	CAP - bearing retainer	F-CF4	36	BUSHING - rod	F-CF36
5	MM204 - WIDBDF	F-CF5	37	POINTER - A.C.F. valve lever	F-CF37
6	CAP - bearing retainer	F-CF6	38	KNOB - pilot valve control - top	F-CF38
7	LOCKNUT No. 4	F-CF7	39	STUD	F-CF39
8	HEAD - A.C.F. cylinder rod	F-CF8	40	CAP - holder	F-CF40
9	PISTON - A.C.F.	F-CF9	41	SPACER - roller	F-CF41
10	ROD - piston	F-CF10	42	CAP - cylinder head gland	F-CF42
11	CYLINDER AND VALVE - A.C.F.	F-CF11	43	SPRING - C.F. brake	F-CF43
12	HEAD - A.C.F. cylinder - dead	F-CF12	44	POINTER	F-CF44
13	CAP - A.C.F. valve reverse	F-CF13	45	HAND WHEEL - H.C.F.	F-CF45
14	SPRING - foot valve master exhaust	F-CF14	46	H29425 MACHINE HANDLE	F-CF46
15	MANIFOLD - A.C.F. cylinder	F-CF15	47	CAP - H.C.F. sleeve	F-CF47
16	SPOOL VALVE	F-CF16	48	KNOB - H.C.F. sleeve	F-CF48
17	CAP - A.C.F. valve reverse	F-CF17	49	SPRING - shot bolt	F-CF49
18	COLLAR - C.F. shaft	F-CF18	50	SPRING - C.F. brake	F-CF50
19	ROD - A.C.F. shaft	F-CF19	51	SHOT BOLT - H.C.F.	F-CF51
20	5100-100 RINGS	F-CF20	52	BUSHING - H.C.F. locator	F-CF52
21	B812X NEEDLE BEARING	F-CF21	53	SHOE - C.F. brake	F-CF53
22	FORK - A.C.F. shifter	F-CF22	54	LOCKNUT No. 4	F-CF54
23	PIVOT PIN - spring	F-CF23	55	LOCK WASHER No. 4	F-CF55
24	SPRING - rocker	F-CF24	56	MM204 WIDBDF	F-CF56
25	GUIDE - spring A.C.F.	F-CF25	57	WASHER	F-CF57
26	COLLAR - C.F. shaft	F-CF26	58	SHAFT - H.C.F.	F-CF58
27	FORK - valve centering	F-CF27	59	CAM - A.C.F. dog lever	F-CF59
28	FINGER - A.C.F. lock	F-CF28	60	LEVER - A.C.F. dog lever	F-CF60
29	5100-100 RINGS	F-CF29	61	B812X NEEDLE BEARING	F-CF61
30	ROD - valve connection - front	F-CF30	62	A1036 OILITE BEARING	F-CF62
31	GARLOCK PACKING	F-CF31	63	SHAFT - A.C.F. fork	F-CF63
32	BRACKET - cross feed rod	F-CF32			



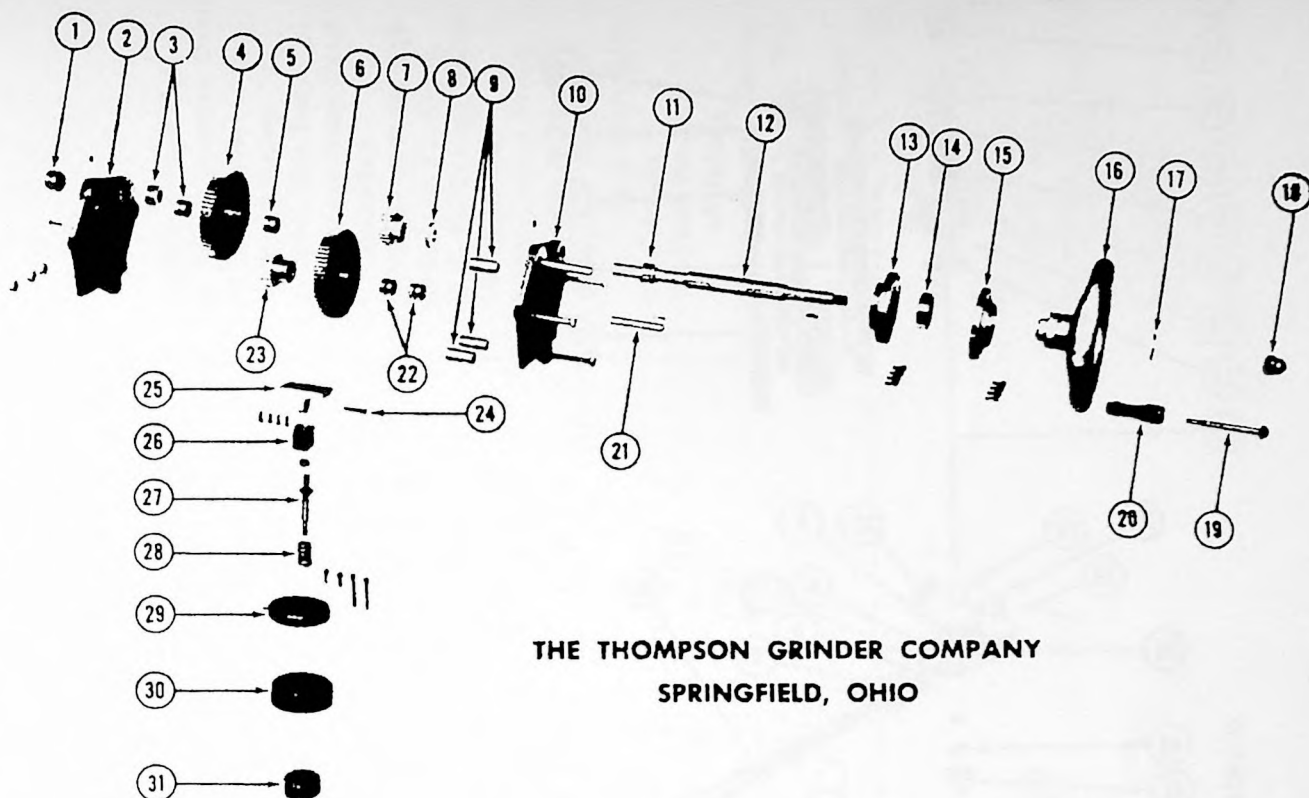
HYDRAULIC ASSEMBLY — F-H

ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	CYLINDER ASSEMBLY	F-H1	11	MASTER VALVE ASSEMBLY	F-H11
2	BRACKET — piston rod	F-H2	12	POWER UNIT ASSEMBLY	F-H12
3	TABLE REVERSE DOG RIGHT HAND	F-H3	13	DIAL — table control	F-H13
4	CROSS FEED DOG ASSEMBLY	F-H4	14	DIAL — head control	F-H14
5	CROSS FEED CYLINDER ASSEMBLY	F-H5	15	RELIEF VALVE	F-H15
6	TELESCOPING PIPE ASSEMBLY	F-H6	16	HYDRAULIC PUMP	F-H16
7	BRACKET — piston rod	F-H7	17	NEEDLE VALVE	F-H17
8	TABLE CYLINDER ASSEMBLY	F-H8	18	FOOT VALVE	F-H18
9	TABLE REVERSE DOG LEFT HAND	F-H9	19	FILTER	F-H19
10	TABLE REVERSE LEVER ASSEMBLY	F-H10			



MASTER VALVE ASSEMBLY -- F-MV

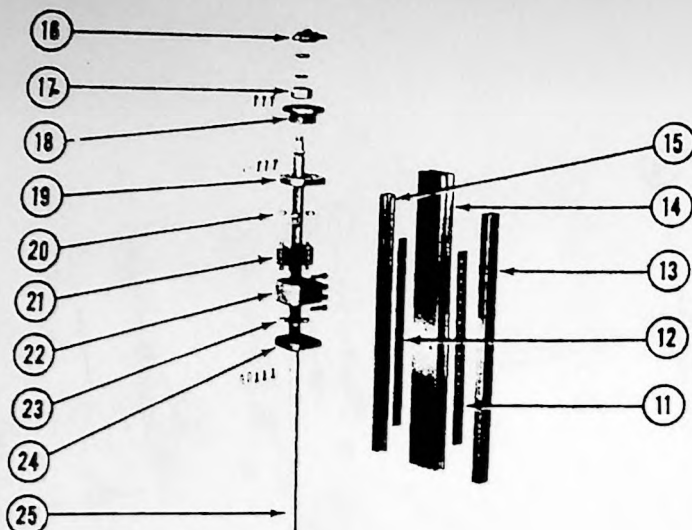
ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	1/8" PIPE PLUG	F-MV1	11	SPOOL -- master valve	F-MV11
2	PLUG -- pilot valve	F-MV2	12	CAP -- throttle	F-MV12
3	SPRING -- throttle	F-MV3	13	SPRING -- throttle	F-MV13
4	CAP -- master valve -- right hand	F-MV4	14	THROTTLE -- master valve table	F-MV14
5	BODY -- master valve	F-MV5	15	1/8" PIPE PLUG	F-MV15
6	3/4" PIPE PLUG	F-MV6	16	PISTON FREE	F-MV16
7	CAP -- master valve bottom	F-MV7	17	THROTTLE HEAD	F-MV17
8	SPOOL BLOCKING VALVE	F-MV8	18	CAP -- master valve top	F-MV18
9	SPRING BLOCKING VALVE	F-MV9	19	CHOKE SCREW -- 1/4" cone pt. set screw 1 1/2" long	F-MV19
10	CAP -- master valve -- left hand	F-MV10	20	CHOKE SCREW -- 1/4" cone pt. set screw 1 1/2" long	F-MV20



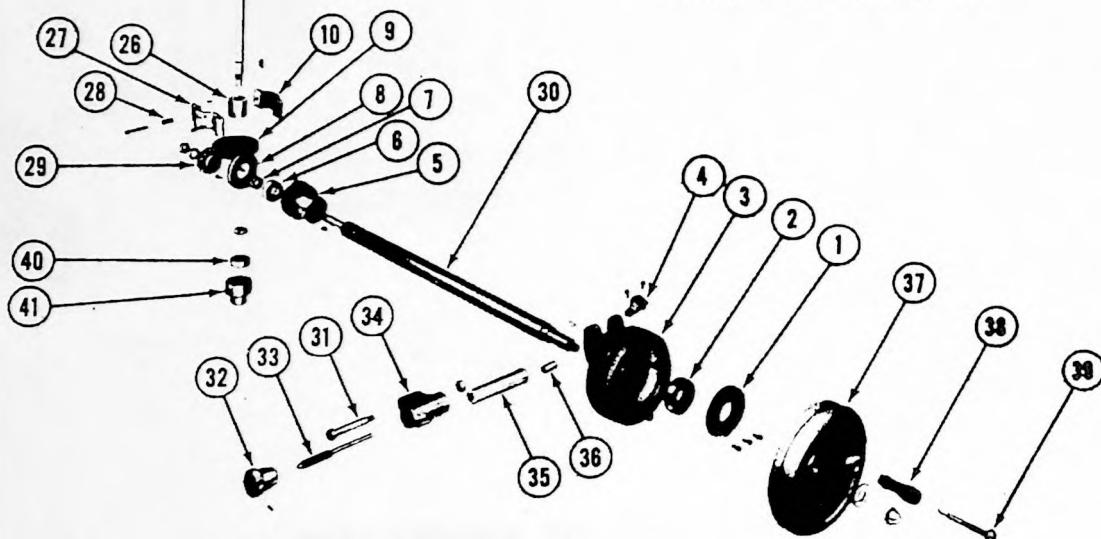
**THE THOMPSON GRINDER COMPANY
SPRINGFIELD, OHIO**

TABLE HAND FEED ASSEMBLY — F-HF

ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	ORANGE 7113 BEARING	F-HF1	17	WASHER — handwheel	F-HF17
2	PLATE — side	F-HF2	18	$\frac{3}{4}$ " 18 CAPNUT	F-HF18
3	ORANGE 7113 BEARING	F-HF3	19	HANDLE — stud	F-HF19
4	GEAR — rack	F-HF4	20	HANDLE	F-HF20
5	ORANGE 7113 BEARING	F-HF5	21	GEAR — pin	F-HF21
6	GEAR — cluster	F-HF6	22	ORANGE 7153 BEARING	F-HF22
7	GEAR — hand shaft	F-HF7	23	CLUSTER — pinion	F-HF23
8	SPACER — hand shaft gear	F-HF8	24	CLEVIS — pin	F-HF24
9	SPACERS	F-HF9	25	BRACKET — rod	F-HF25
10	PLATE — side	F-HF10	26	CLEVIS — table hand feed cylinder	F-HF26
11	ORANGE 7153 BEARING	F-HF11	27	PISTON — rod	F-HF27
12	SHAFT	F-HF12	28	SPRING — rod	F-HF28
13	CAGE	F-HF13	29	CAP — table hand feed cylinder	F-HF29
14	ND7604 BEARING	F-HF14	30	CYLINDER — table hand feed	F-HF30
15	CAP — bearing	F-HF15	31	PISTON — table hand feed	F-HF31
16	WHEEL — hand	F-HF16			

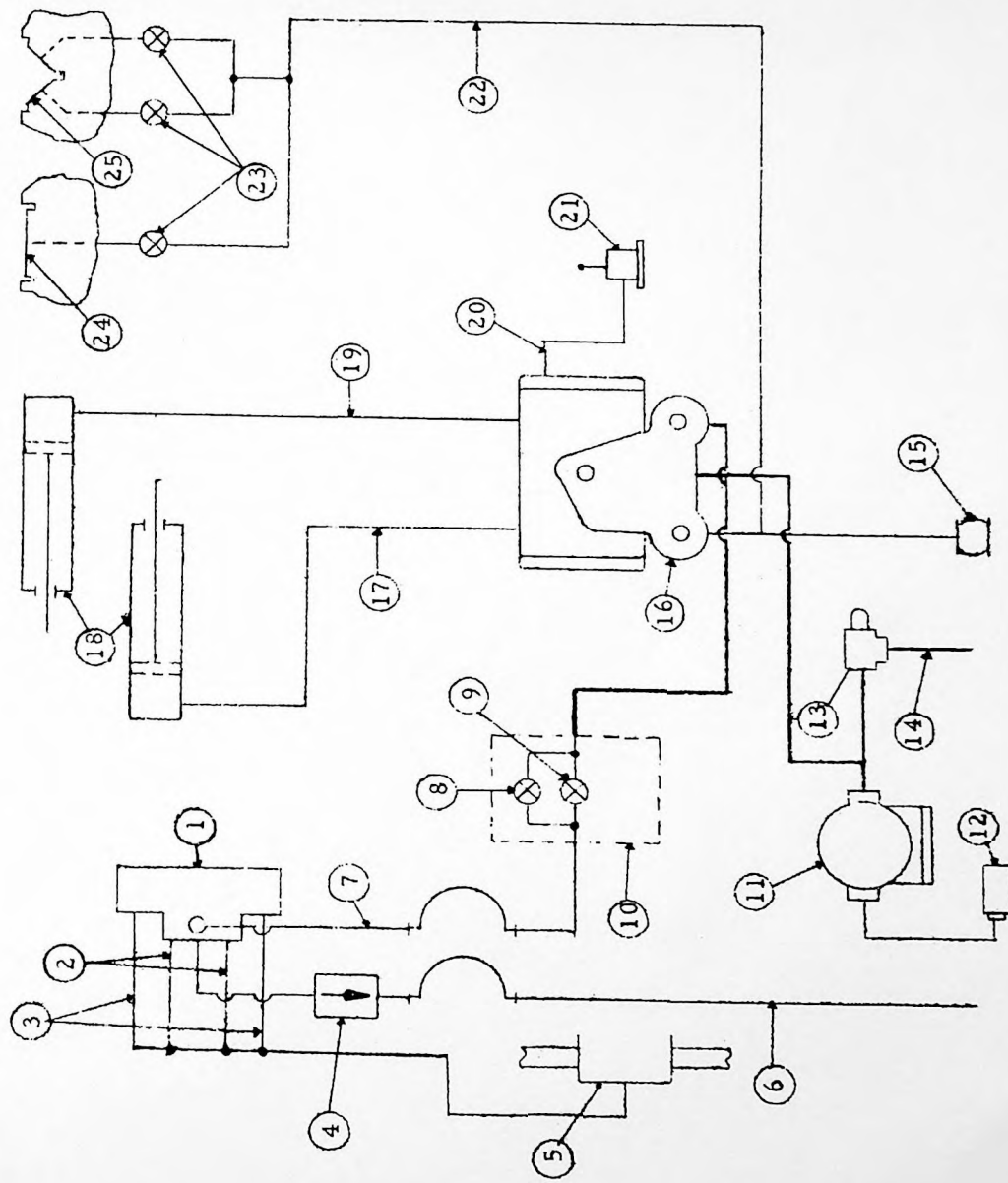


WHEEL HEAD ELEVATION



F-E

ITEM No.	PART NAME OR DESCRIPTION	CODE No.	ITEM No.	PART NAME OR DESCRIPTION	CODE No.
1	CAP - elevation hand wheel bearing	F-E1	22	BODY - anti-friction nut	F-E22
2	77506 N.D. BEARING	F-E2	23	No. 38 N.D. BEARING	F-E23
3	HOUSING - vernier	F-E3	24	CAP - anti-friction nut	F-E24
4	POINTER - micro stop	F-E4	25	SCREW - elevating	F-E25
5	HOLDER - cross shaft bearing	F-E5	26	BRAKE DRUM	F-E26
6	BEARING - 77604 N.D.	F-E6	27	BAND CLAMP	F-E27
7	SPACER - elevation C.S. bearing	F-E7	28	SPRING - brake	F-E28
8	CAP - C.S. bearing	F-E8	29	HB816 GEAR	F-E29
9	GEAR - HB832 bronze spiral	F-E9	30	SHAFT - elevation C.S. bearing	F-E30
10	BAND - anchor	F-E10	31	STRIPPER BOLT	F-E31
11	SEPARATOR	F-E11	32	THIMBLE	F-E32
12	SEPARATOR	F-E12	33	SPINDLE	F-E33
13	GIB - taper column	F-E13	34	BODY	F-E34
14	RACE - stationary column	F-E14	35	SLEEVE	F-E35
15	GIB - straight column	F-E15	36	BUSHING	F-E36
16	CAP - elevation screw upper bearing	F-E16	37	HAND WHEEL - elevation	F-E37
17	5204 BEARING	F-E17	38	HANDLE - loose handle	F-E38
18	CAGE - elevation screw bearing	F-E18	39	STUD - loose handle	F-E39
19	CAP - anti-friction nut	F-E19	40	7504 N.D. BEARING	F-E40
20	No. 38 N.D. BEARING	F-E20	41	HOLDER - elevation screw shaft bearing	F-E41
21	ROLLER - anti-friction nut	F-E21			



- 1-Wheel Head Cyl.
- 2-Valve Chamber Drain
- 3-Air Bleeder Line
- 4-Check Valve
- 5-Elev. Nut Lube
- 6-Exhaust from Head Cylinder
- 7-Power to Head Cyl.
- 8-Fine C.F. Valve
- 9-C.F. Cut-off Valve
- 10-Manifold
- 11-Hydraulic Pump
- 12-Intake Strainer
- 13-Relief Valve 175-200 P.S.I.
- 14-Exhaust
- 15-Foot Valve 6# Spring
- 16-TG Master Valve
- 17-Power to Left End of Cylinder
- 18-Table Cylinder
- 19-Power to Right End of Cylinder
- 20-Power to Hand Feed Cylinder
- 21-Hand Feed Cylinder
- 22-Oil to Ways
- 23-Needle Valves - Way Lube Control
- 24-Flat Way
- 25-Vee Way

F MACHINE STANDARD HYDRAULIC DIAGRAM