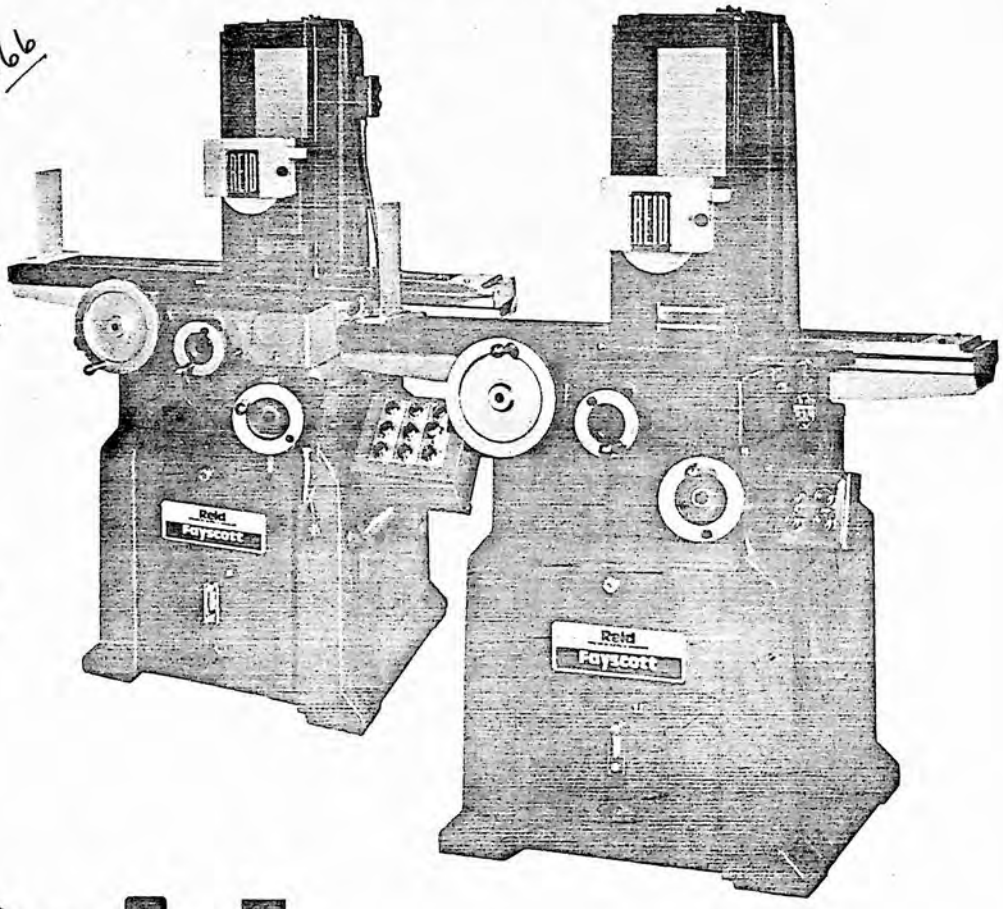
Bayscott

Division of White Consolidated Industries, Inc.

#366



Reid

HYD and HYD/DF HYDRAULIC SURFACE GRINDERS

Lees-Bradner gear hobbing machines **Leland-Gifford** drilling machines **Reid** precision surface grinders

INSTALLATION & START-UP INSTRUCTIONS

REID-O-MATIC
618 HYT, HYD and HYD/DF

INSTALLATION & START UP INSTRUCTIONS

GENERAL

Your REID grinder was given a thorough inspection prior to shipment. All machine elements were correctly aligned and adjusted. After inspection, the hydraulic oil was removed from the reservoir. All critical components were properly blocked and a protective coating was applied to all finished surfaces. The machine was skidded, completely covered and then crated for shipment.

INSTALLATION PROCEDURE

1. Remove the protective crating and covers from the machine.

2. Examine the machine to insure that no damage has occurred during shipment. Notify both your carrier and your local REID representative immediately upon discovery of any damages.

3. Remove all boxes and extra material from the skid. Check the contents against the shipping list enclosed. Notify your local REID representative if any discrepancies exist.

4. Place the machine on a firm foundation.

   NOTE: We advise the use of vibration isolators for the following conditions:

   a. The surface finish must be accurate.
   b. Unevenness of floor where accurate shimming is impossible.
   c. Where neighboring machines might yield a tremendous amount of vibration or shock.

5. Remove the wooden blocks used to brace the moving components.

6. Using a clean pertroleum solvent and clean, lint-free rags, remove all protective coating from the finished surfaces. Apply a light coat of machine oil to the cleaned surfaces.

7. Fill the hydraulic reservoir with clean oil. We recommend MOBIL DTE LIGHT or an equivalent.

8. Check the lubrication reservoir, if required add clean oil. We recommend MOBIL VACTRA NO. 2 or an equivalent. Pull plunger upward for immediate distribution of oil. This system is designed to automatically distribute a metered amount of oil every 27.7 minutes. Consult the Lubrication Section of this manual for more detailed information.

START UP PROCEDURE

1. Connect the main power lines. Refer to the electrical diagram provided with your machine.

2. With all functions in the manual (hand) mode, check for proper rotation of the motors. (NOTE: All motors were phased before shipment. Only the main power line should be adjusted to correct motor rotation.)

   A. Press HYDRAULIC START.

   B. Compare the rotation of the hydraulic pump motor with the arrow located on the top.

   C. Press SPINDLE START.

   D. Check to see that the grinding wheel is rotating in a clockwise motion.

   E. If improper rotation is observed, STOP IMMEDIATELY, reverse two phases of the three phase connection at the main disconnect.

   F. Repeat above procedure.

3. Due to settling of the lubricant in the Spindle during transportation or extended idle periods, the following start up procedure must be adhered to:

   A. JOG three (3) or four (4) times for one (1) minute.

   B. Run for ten (10) minutes, shut down and allow to cool for one (1) hour.

   C. Run again for ten (10) minutes and check with pyrometer. If temperatures exceed 120^{o} F shut down and allow to cool for one (1) hour.

   D. Repeat Step C.

   E. If Spindle continues to operate at elevated temperatures after several cycles, stop running and refer to the Spindle Section of your manual. Notify your local REID representative immediately if operating temperature exceeds acceptable level.

START UP PROCEDURE

4. Your new REID-O-MATIC was adjusted prior to shipment to assure the proper operation of the various hydraulic components. Before operation of the power modes, follow the procedure below:

A. TABLE

1. Rotate the TABLE SPEED CONTROL KNOB to the OFF position by turning clockwise.

2. Manually traverse the Table to the center position.

3. Position the TABLE LIMIT DOGS three (3) to four (4) inches either side of the TABLE REVERSING SWITCH.

4. Press HYDRAULIC START button.

5. Position TABLE MODE LEVER to POWER.

6. Slowly turn TABLE SPEED CONTROL KNOB counterclockwise until the table begins to move.

7. Increase table speed gradually for 15 minutes of operation.

8. After 15 minutes, the dogs can be set for 20 inches of stroke. Overtravel in table will increase slightly as oil in the system warms up. If, at this period, maximum recommended length is used, overtravel will increase to full limit of the cylinder stroke and a thumping may occur. CAUTION: If so, relocate TABLE LIMIT DOGS closer together to avoid damage to the cylinder.

NOTE: Do not reset end play on cylinder rods, thermal expansion must be considered. End play is set for approximately .010" to 015" after oil in system has become thoroughly heated.

9. STOP Table by repositioning TABLE MODE LEVER to HAND.

B. CROSS SLIDE (MODELS HYD & HYD/DF)

1. Position CROSS SLIDE LIMIT DOGS three (3) to four (4) inches apart.

START UP PROCEDURE

2. Start Table by moving TABLE MODE LEVER to POWER.

3. Adjust Table speed to a moderate rate.

4. Rotate INCREMENT KNOB to the middle range.

5. Place the CROSS SLIDE TRAVERSE LEVER in FEED (Increment).

6. Shift CROSS SLIDE MODE LEVER to POWER.

7. Note that the cross feed increment will be at each reversal of the table.

8. Cycle for five (5) minutes and observe cross feed reversals.

   NOTE: A small amount of end play on the nut which fastens piston rod to Cross Slide is necessary. This avoids deflection in rod which, if excessive, could cause damage to seals and bearings.

9. Stop Table.

10. Slowly rotate CROSS SLIDE TRAVERSE LEVER clockwise to observe increasing rate of Cross Slide speed through DRESS and RAPID positions.

11. Return the CROSS SLIDE TRAVERSE LEVER back to the FEED (Increment) position. Check to make sure it is firmly in this position.

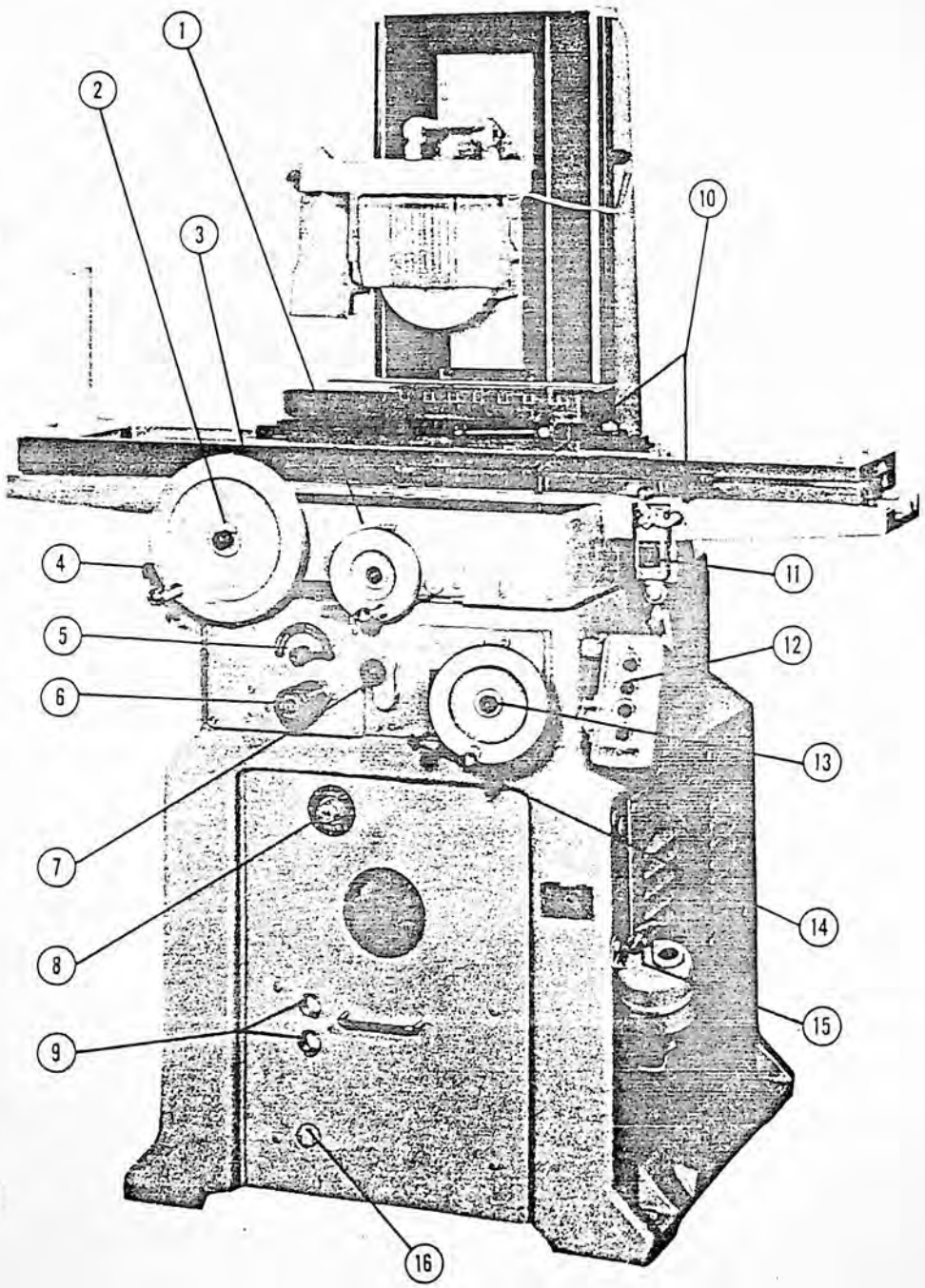
C. AUTOMATIC DOWNFEED

1. It is not necessary to test cycle the Automatic Downfeed mode on your REID grinder. However, before using this feature, the operator should become familiar with the controls. Refer to the "Explanation of Controls" and "Operating Instruction" sections of this manual.

EXPLANATION OF CONTROLS

REID-O-MATIC
ALL HYDRAULIC

1. CROSS FEED HANDWHEEL
2. TABLE HANDWHEEL
3. TABLE LEVER HAND-POWER
4. CROSS FEED LIMIT DOGS
5. RAPID TRAVERSE, WHEELDRESS LEVER
6. CROSS FEED INCREMENT KNOB
7. CROSS SLIDE HAND, POWER LEVER
8. TABLE SPEED CONTROL
9. OIL LEVEL SIGHT GAUGES
10. TABLE LIMIT DOGS (HAND)
11. TABLE LIMIT & REVERSING SWITCH (POWER)
12. SPINDLE, HYDRAULIC, ON-OFF
13. HEAD ELEVATING HANDWHEEL
14. HEAD ELEVATING HANDWHEEL FRICTION BRAKE
15. ONE SHOT LUBRICATING, (HAND)
16. HYDRAULIC TANK DRAIN



REID-O-MATIC
618 HYT, HYD and HYD/DF

EXPLANATION OF CONTROLS

TABLE CONTROLS

TABLE HANDWHEEL

Located in the front, left side of the machine and used for manual operation of the Table. Clockwise rotation will traverse the Table to the right.

TABLE SPEED CONTROL KNOB

Located on the front of the machine below the Cross Slide Mode Lever. Table speed is adjustable from approximately 10 to 140 surface feet per minute.

TABLE MODE LEVER

Located on the top of the Cross Slide above the Table Handwheel. Shifting the lever into the MANUAL position mechanically engages the handwheel assembly and electrically disconnects the Table Reversing Switch for manual operation. Shifting the lever to the POWER position reverses the procedure for power operation.

TABLE LIMIT DOGS

Located on the front face of the Table and used only in the power mode for infinite adjustment of the table stroke (20 inch maximum). In the manual mode, the reversing switch has been de-energized and the table dogs are insignificant.

CROSS SLIDE CONTROLS

CROSS SLIDE HANDWHEEL

Located on the front of the machine between the table and elevating handwheels and used for manual operation. Turn clockwise for inward motion, i.e., away from the operator.

CROSS SLIDE MODE LEVER

Located on the front of the machine below the Cross Slide Handwheel. Shifting the lever into the MANUAL position mechanically engages the Cross Slide Half Nut and electrically disconnects the Increment Valve for manual operation. Shifting the lever in the NEUTRAL or POWER position reverses this procedure for power operation. The lever should be shifted to

CROSS SLIDE CONTROLS

CROSS SLIDE MODE LEVER (Cont'd)

the NEUTRAL position when the Cross Slide is locked down.

SPECIAL NOTE: WHEN ENGAGING THE HANDWHEEL FOR MANUAL OPERATION, USE CAUTION IN THE ENGAGEMENT OF HALF NUT AND SCREW. SLIGHT ROTATION OF THE HANDWHEEL MAY BE NECESSARY.

CROSS SLIDE TRAVERSE LEVER

Located on the Feed Panel to the left of the Cross Slide Mode Lever and allows operation of the Cross Slide in either the FEED, DRESS or RAPID modes. In the FEED mode the cross slide will increment at each table reversal. The DRESS mode allows the operator to true the grinding wheel from the table. (This mode is usually not used in conjunction with table travel.) The RAPID mode allows quick positioning and set-up.

INCREMENT KNOB

Located below the Cross Slide Mode Lever and allows adjustment the magnitude of increment. Smaller increments are realized by turning the Knob in a clockwise rotation. The typical incremen range is .005" to .250" per Table reversal.

CROSS SLIDE LIMIT DOGS

Located on the left side of the machine on the base and used only in the power mode for infinite adjustment of the cross slide stroke (7 inches maximum). In the manual mode, the Cross Slide Reversing Switch has been de-energized and the Cross Slide Dogs are insignificant.

SPECIAL NOTE: Model HYT, having hydraulic power only to the Table, is n equipped with the Cross Slide Mode Lever, Cross Slide Tra Lever, Increment Adjustment nor Cross Slide Limit Dogs.

VERTICAL CONTROLS

DOWNFEED (ELEVATING) HANDWHEEL

Located on the front, right side of the machine and used for manual operation of the vertical traverse. Clockwise rotatio will traverse Head (Grinding Wheel) downwards.

AUTOMATIC DOWNFEED HANDWHEEL CONTROLS

DOWNFEED INCREMENT ADJUSTMENT

Located on the Auto Downfeed Unit, refer to Item 40 on the exploded view drawing in this manual. By loosening the Knob and raising or lowering it, the downfeed increment is reduced or enlarged. A Pointer and Scale are provided for this adjustment. Tighten at desired scale reading.

DOWNFEED RANGE ADJUSTMENT

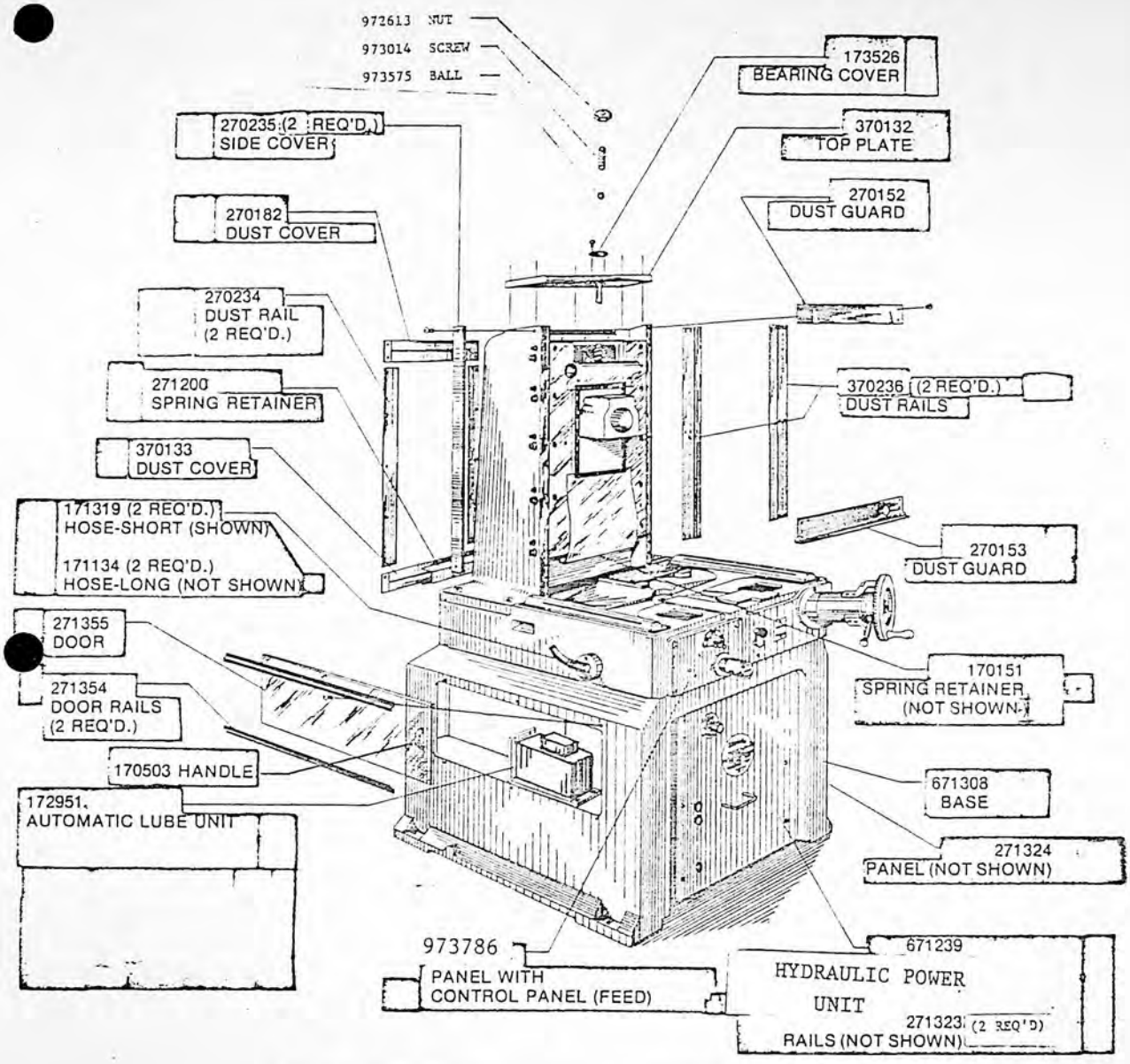
The range of downfeed is adjusted by rotating the Graduated Rim, Reference No. 27 on the exploded view drawing of the Auto Downfeed Unit, clockwise a direct reading amount from the shut-off point (zero).

ENGAGEMENT KNOB

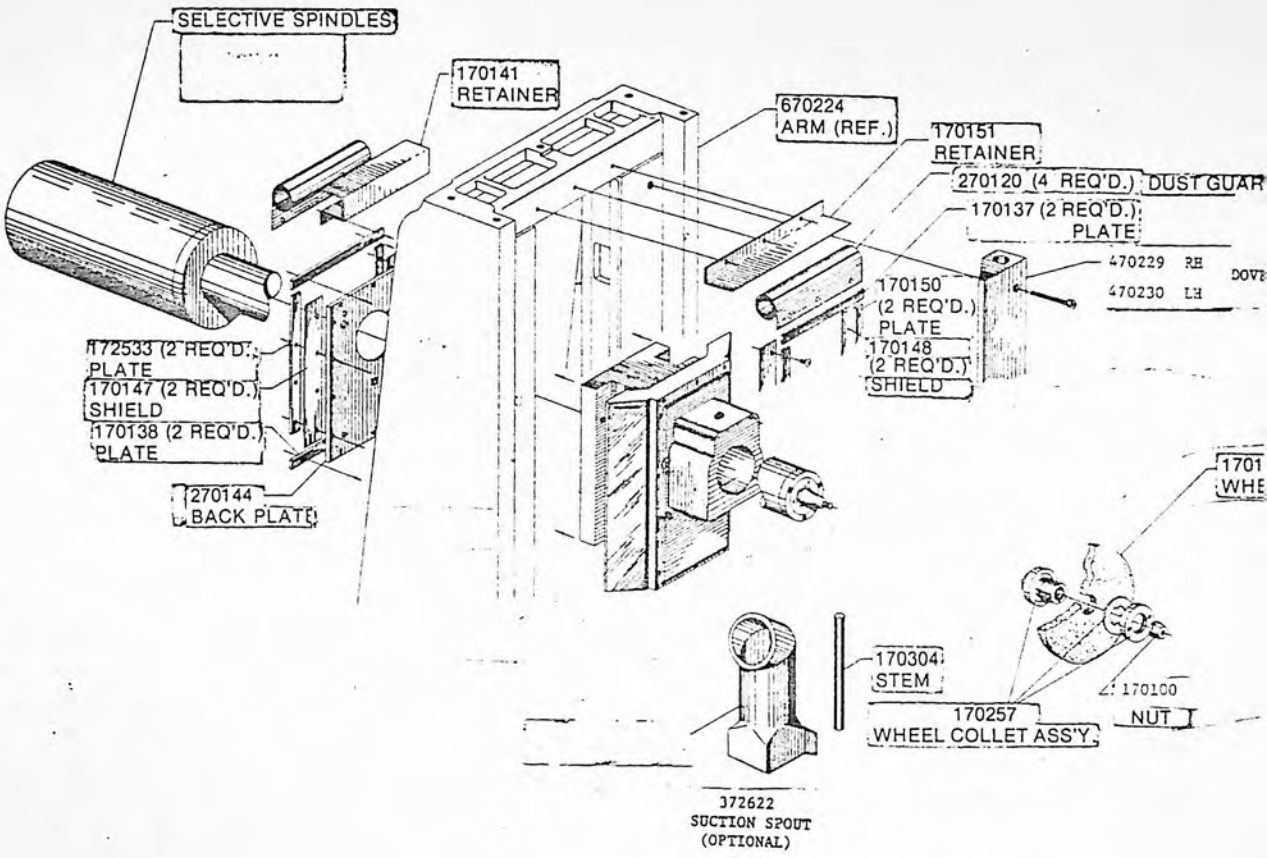
Reference No. 33 on the exploded view drawing of the Auto Downfeed Unit. Loosening this knob disengages the downfeed mechanism from the Handwheel. This permits observation of the mechanism without actual downfeed and also permits manual feeding without changing other controls or switches. Tightening this Knob mechanically engages the downfeed.

HANDWHEEL DRAG ADJUSTMENT

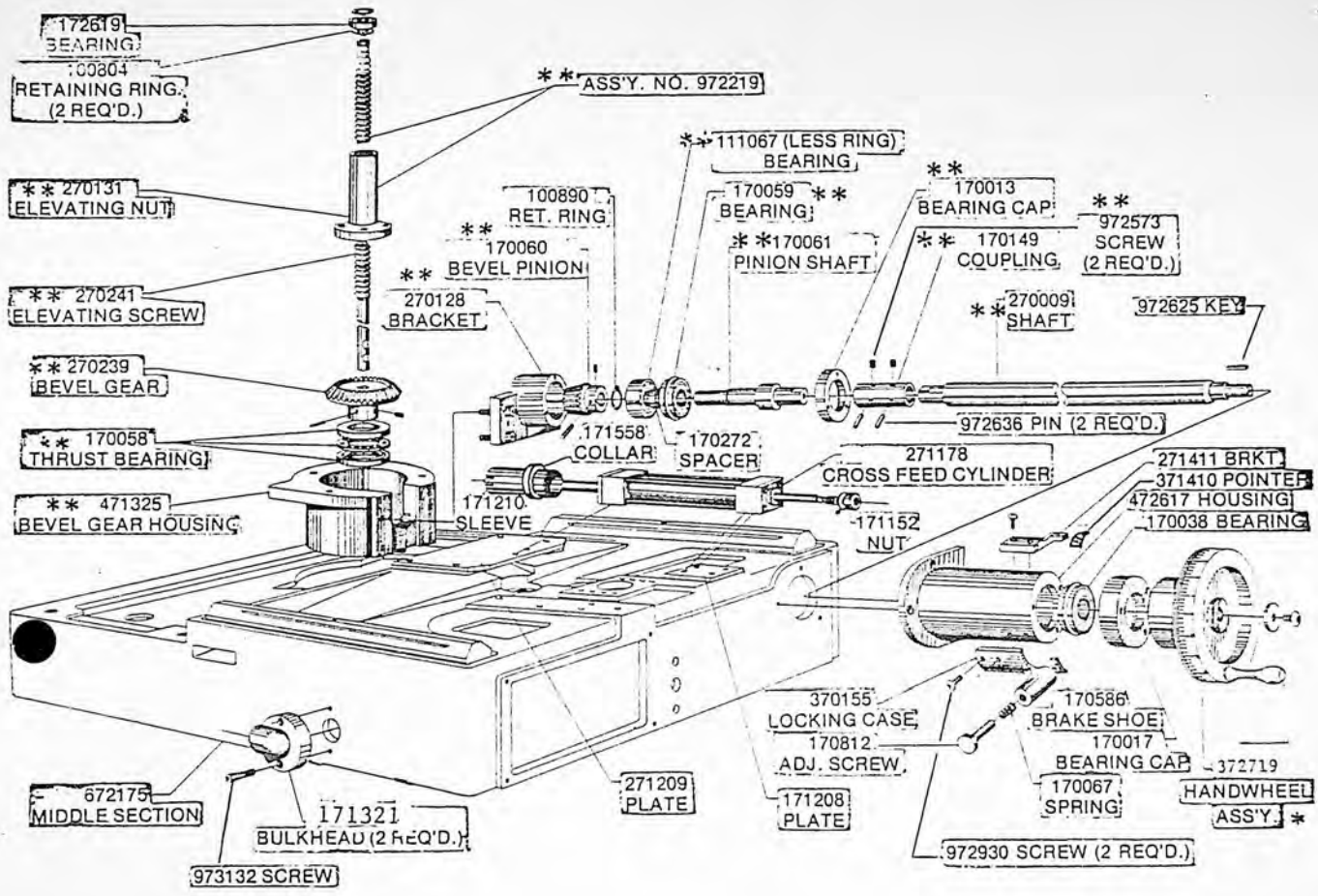
Reference No. 20 on the exploded view drawing of the Auto Downfeed Unit. This Knob provides control of the handwheel rotation, "feel" or "torque" and is used with the Auto Downfeed mechanism to prevent over-spin of the handwheen when incrementing.



BASIC MACHINE ARRANGEMENT



COLUMN SHOWING HEAD AND MOTORIZED SPINDLE ARRANGEMENT



MIDDLE SECTION...SHOWING HEAD ELEVATING ARRANGEMENT & HYDRAULIC CROSS FEED

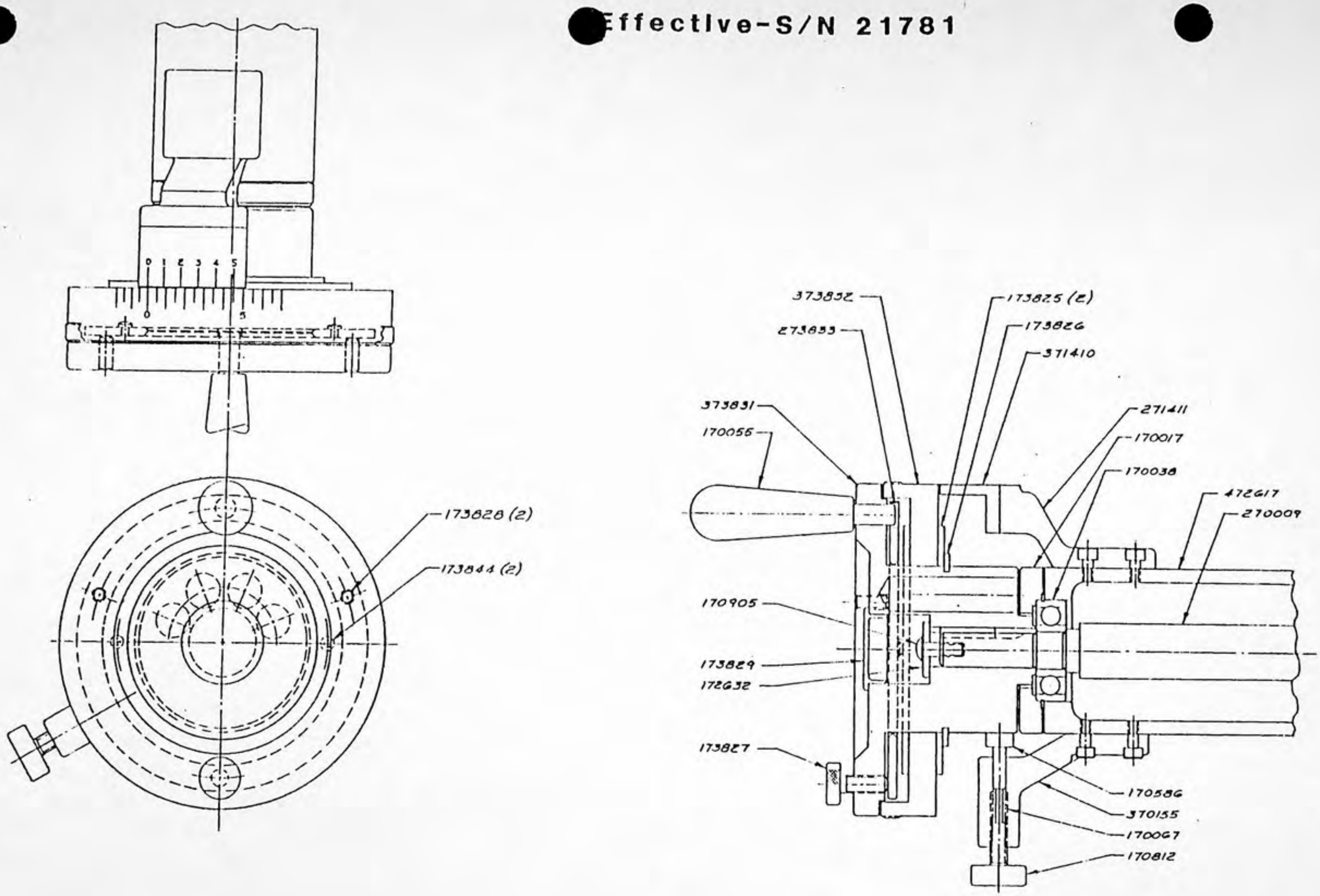
*See Drawing No. 473830 effective Machine S/N 21781. For machines with Micrometer Fine Elevating Feed, refer to separate section.

** See Drawing No. 373934 for Model HYD/DF machines S/N 21960, 21981 and 22069 and after. Drawing No. 373934 also applies for Model HYD with Power Vertical Traverse.

ELEVATING HANDWHEEL ASSEMBLY
DRAWING NO. 473830
EFFECTIVE MACHINE S/N 21781

Part No.	Description	Quantity
170017	Bearing Cap	1
170038	Bearing	1
170055	Handle	1
170067	Spring	1
170586	Lock for Cross Shaft Crank	1
170812	Adjusting Screw for Elevating Brake	1
170905	Nylok Round HD 1/4 - 20P x 3/4	1
172632	Washer 1/4 x 1 x 1/8	1
173825	Clamp Washer	2
173826	Truarc Ret. Ring 5108-300	1
173827	Thumb Screw	1
173828	Nyloc Set Screw 1/4 - 20 x 5/8 Oval Point	2
173829	Hole Plug	1
173844	Clamp Button	2
270009	Shaft	1
271411	Bracket Elevating Vernier	1
273833	Ring Clamp	1
370155	Locking Case for Head Elevation Shaft	1
371410	Elevating Vernier	1
373831	Handwheel - Vertical Travel	1
373832	Graduated Rim .050	1
472617	Housing	1

Effective-S/N 21781



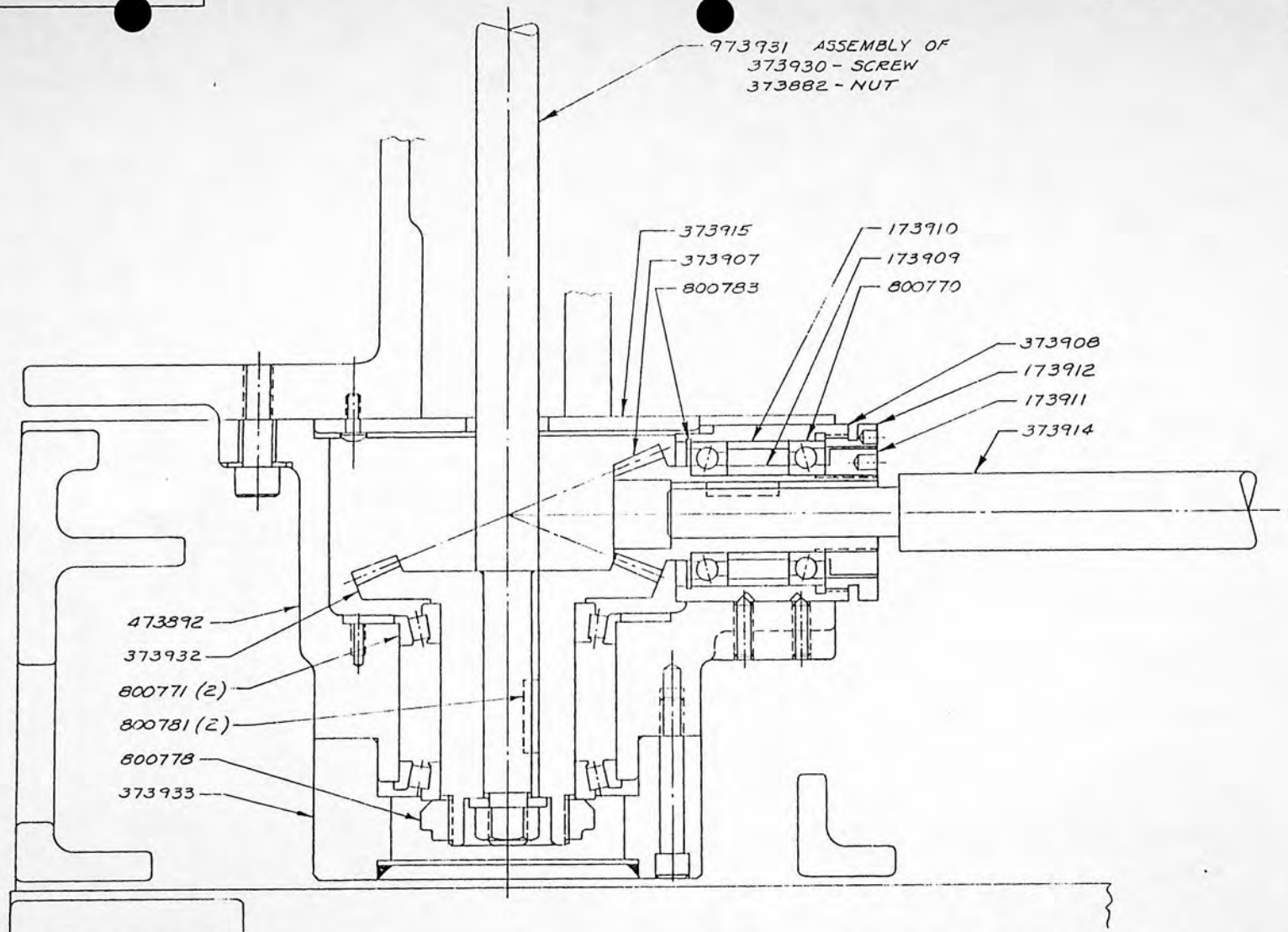
DATE	BY	WAS	DRAWN TH	CHECKED TH	MATERIAL	HARDNESS	TITLE HANDWHEEL ASSEM. VERTICAL TRAVER
CHANGES			DATE 7-21-70	DATE 10-24-70	PATT NO		
TOLERANCE COMMON FRACTIONS ± 1/64			LIST NO / SCALE FULL	COMPANY DEXTER MAINE		SHEET / OF	473830

GEAR HOUSING ASSEMBLY
FOR MODEL HYD/DF SERIAL NOS. 21960, 21981 and 22069 and after.
AND FOR ALL OTHER MODELS WITH POWER VERTICAL TRAVERSE
DRAWING NO. 373934 - ASSEMBLY NO. 973946

PART NO.	DESCRIPTION	QUANTITY
173909	Bearing Spacer - Inner	1
173910	Bearing Spacer - Outer	1
173911	Locknut	1
173912	Bearing Cup	1
373907	Bevel Gear - 16 Tooth	1
373908	Bearing Cartridge	1
373914	Elevating Shaft	1
373915	Pivot Plate (974040 & 973945)	1
373932	Bevel Gear - 40 Tooth	1
373933	Oil Pan	1
473892	Bevel Gear Housing	1
800770	Ball Bearing	1 Pair
800771	Roller Bearing	2
800778	Locknut	1
800781	Key 3/16 x 15/16	2
800783	Retaining Ring	1
973931	Elevating Screw & Nut	1

373934

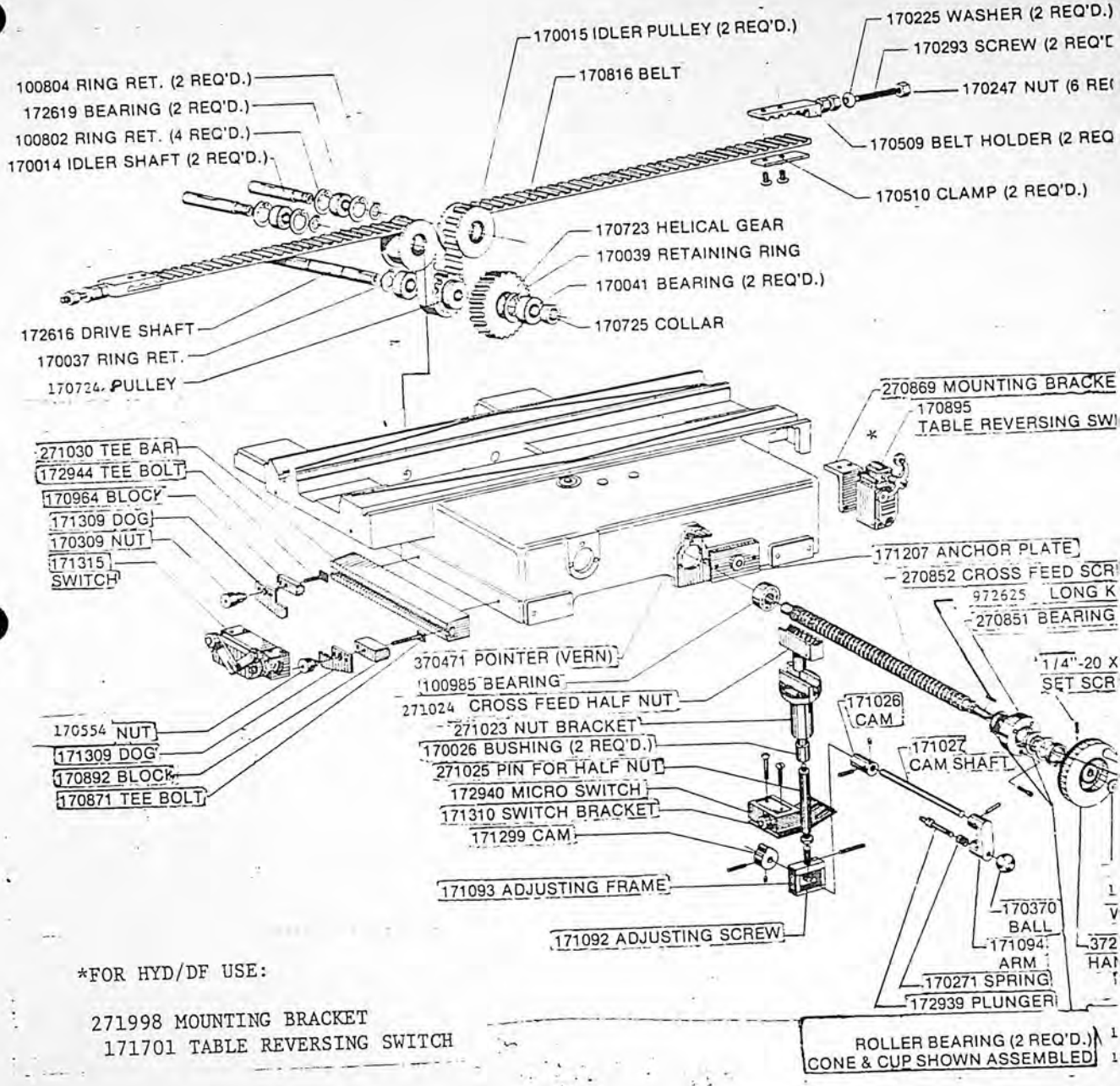
ITEM	REQ'D	MAT	DESCRIPTION



NOV 25 1980

			DRAWN TH	CHECKED TH	MATERIAL	HARDNESS	TITLE GEAR HOUSING ASSEMBLY
DATE	BY	WAS	DATE 9-24-79	DATE 1-8-80	PATT. NO.		
CHANGES			LIST NO.	REID BROS. COMPANY One of the White Consolidated Industries		SHEET	373934
TOLERANCE COMMON FRACTIONS ± 1/64			SCALE FULL	DEXTER WCI MAINE		OF	

DRAWING 40-120 21267

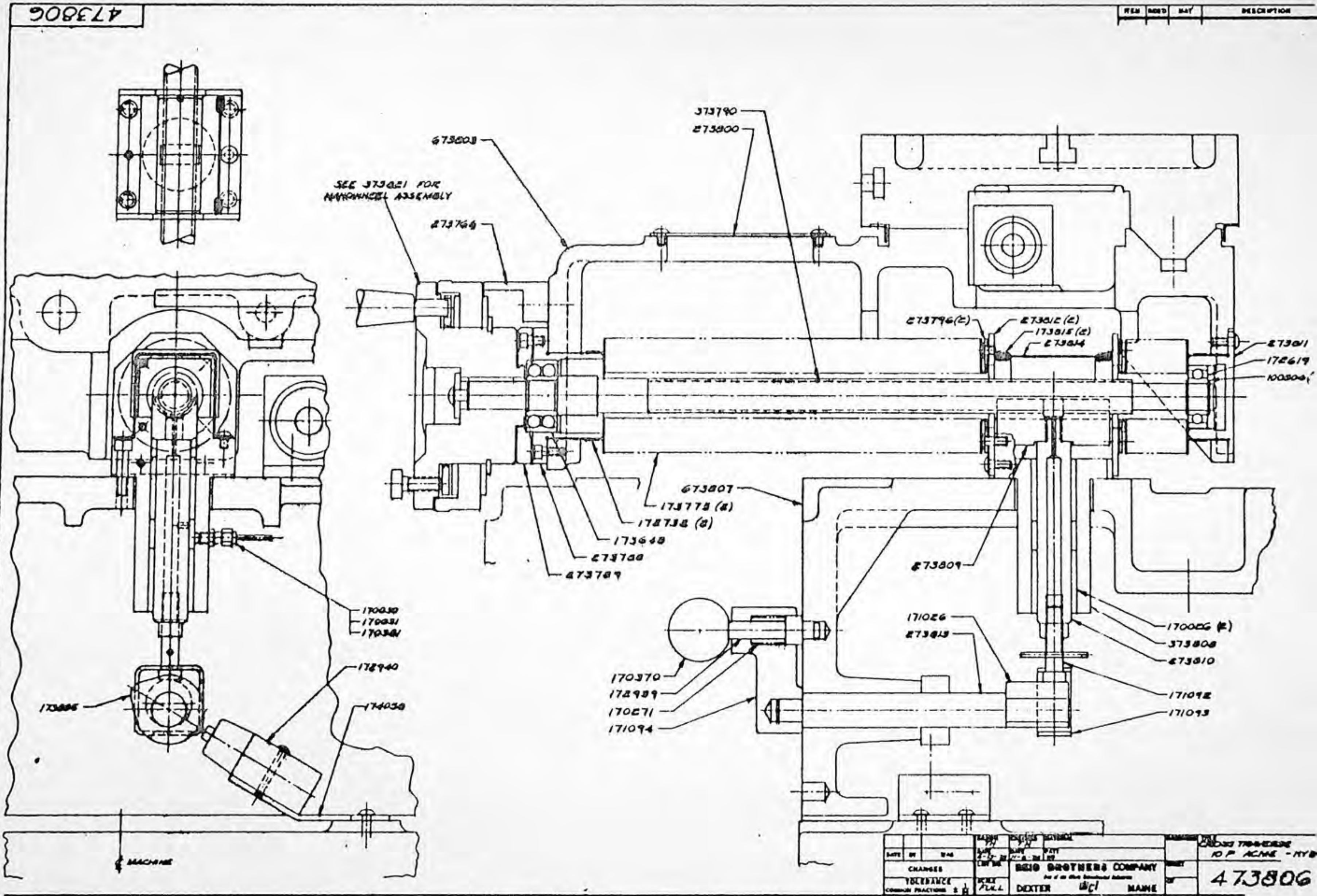


*FOR HYD/DF USE:

271998 MOUNTING BRACKET
171701 TABLE REVERSING SWITCH

CROSS SLIDE...SHOWING CROSS FEED TABLE DRIVE, AND CROSS SLIDE LIMIT SWITCH ARRANGEMENT

Effective S/N 21781 Refer
Drawing No. 473806, Cross
Traverse Assembly, 10 P A
HYD/DF, HYD when ordering
parts.



473806
SEE 373821 FOR HANDWHEEL ASSEMBLY
673803
273766
373790
273800
273796 (2)
273812 (2)
173815 (2)
273814
273811
172619
100506
673807
173778 (2)
172738 (2)
173648
273788
273789
273809
170030
170031
170381
172940
173885
174058
171026
273813
170370
172989
170271
171094
170026 (2)
373808
273810
171092
171093
℄ MACHINE
CHANGES
TOLERANCE
COMMON FRACTIONS
SCALE FULL
DEXTER MAINE
CROSS TRAVERSE 10 P ACME
473806

CROSS TRAVERSE ASSEMBLY
DRAWING NO. 473806
MODELS HYD & HYD/DF
EFFECTIVE SERIAL NO. 21781

Part No.	Description	Quantity
100804 (800235)	Retaining Ring	2
170026	Bushing	2
170030	Compression Sleeve	1
170031	Compression Nut	1
170271	Spring	1
170370	Ball Handle	1
170381	Str. Adapter	1
171026	Cam	1
171092	Adjusting Screw	1
171093	Adjusting Frame	1
171094	Arm	1
172619 (801903)	Bearing	1
172732	Hose Clamp	2
172939	Plunger	1
172940	Micrometer Switch	1
173648 (801985)	Bearing	1
173775	Boot	2
173815	Rubber Channel	2
173885	Switch Cam	1
174058	Bracket (Replaces 171310)	1
*273766	Vernier	1
*273788	Bearing Adapter	1
*273789	Bearing Cap	1
273796	Boot Ring	2
273800	Cover	1
273809	Half Nut	1
273810	Half Nut Pin	1
273811	Bearing Adapter	1
273812	Boot Flange	2
273813	Shaft - Cam	1
273814	Cover	1
373790	Cross Feed - Screw	1
373808	Nut Bracket	1
*373821	Cross Feed Handwheel	1
673803	Cross Slide	1
673807	Mid-Section	1

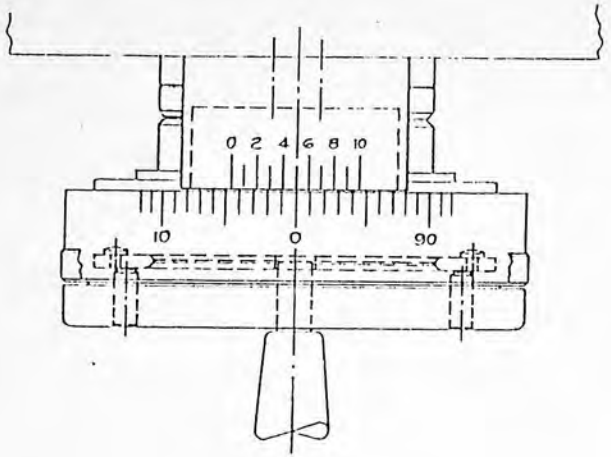
*For machines with Micrometer Find Cross Feed refer to Drawing No. 473682.

CROSS FEED HANDWHEEL ASSEMBLY
DRAWING NO. 373821
EFFECTIVE MACHINE S/N 21781

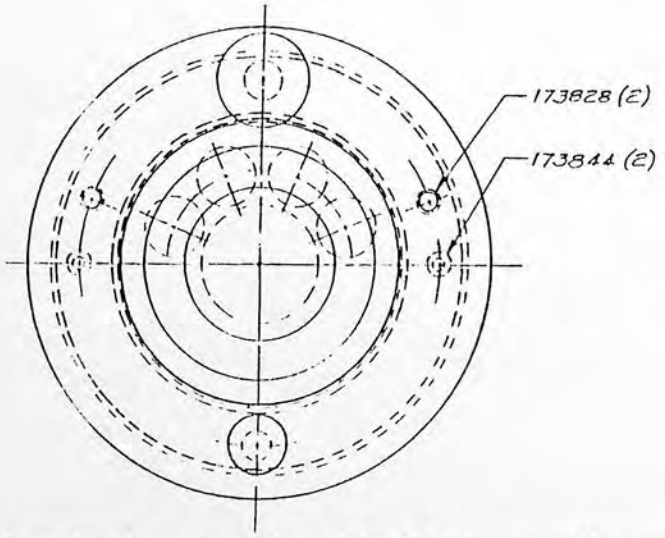
Part No.	Description	Quantity
170055	Handle	1
170905	Nylok Round HD 1/4 - 20P x 3/4	1
172632	Washer 1/4 x 1 x 1/8	1
173648	Ball Bearing N.D.H. 455503X1C	1
173825	Clamp Washer	1
173826	Truarc Ret. Ring 5108-300	1
173827	Thumb Screw	1
173828	Nyloc Set Screw 1/4 - 20 x 5/8 Oval Point	2
173829	Hole Plug	1
173844	Clamp Button	2
273766	Cross Feed Vernier	1
273788	Bearing Adapter	1
273789	Bearing Cap	1
273824	Clamp Ring	1
373822	Handwheel - Cross Traverse	1
373823	Graduated Rim - .100	1
972557	Soc. HD Screw 10-32 x 1/2	3
972625	Key 3/16 x 3/16 x 11/16	1
972849	Soc. HD Screw 10-32 x 3/8	3

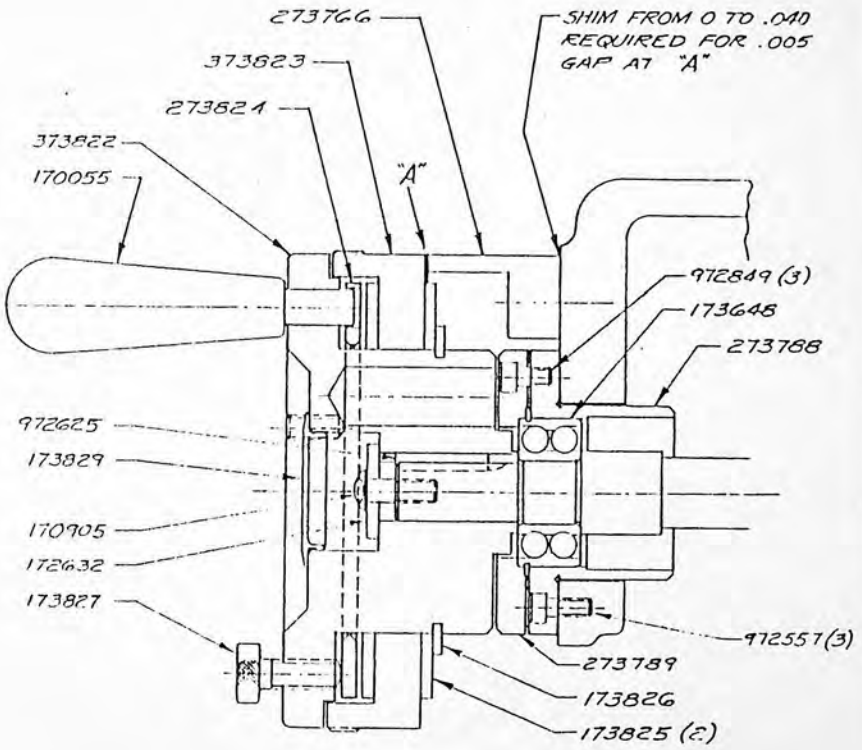
373821

ITEM	REQ'D	MAT	DESCRIPTION



Effective-S/N 21781

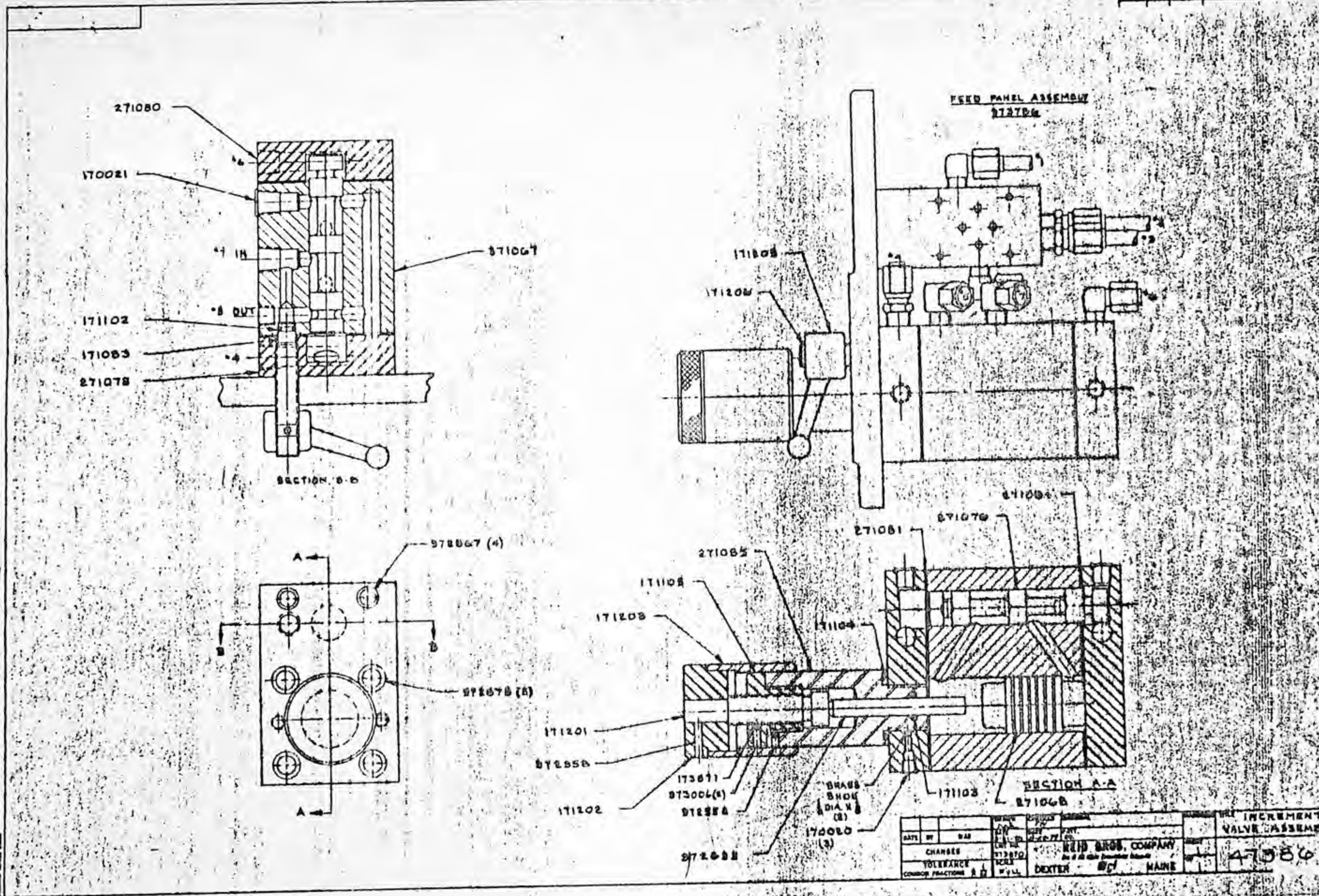




NOTE: Refer to Drawing No. 473682 for machines equipped with MICROMETER FINE CROSS FEED.

DATE	BY	WAS	CHANGES	TOLERANCE COMMON FRACTIONS ± 1/64

DRAWN	CHECKED	MATERIAL	HARDNESS	TITLE
TH	TH			HANDWHEEL ASSEMBLY CROSS TRAVERSE
DATE 7-14-78	DATE 10-24-78	PART NO.		
LIST NO.		COMPANY	SHEET	373821
SCALE FULL		One of the White Consolidated Industries DEXTER WCI MAINE	OF	



271080
170021
#1 IN
271067
#3 OUT
171102
171083
271078
SECTION B-B
A
B
A
FEED PANEL ASSEMBLY
171203
171201
171202
171103
SECTION A-A
BRASS
SHOE
CHANGES
TOLERANCE
REID BROS. COMPANY
DEXTER MAINE
INCREMENT
VALVE ASSEMB

INCREMENT VALVE ASSEMBLY
REID MODEL: HYD HYD/DF
ASSEMBLY LIST NO. 973870
DRAWING NO. 473869

Part No.	Quantity	Description
170020	3	1/8 NPT Pipe Plug
170021	1	1/4 NPT Pipe Plug
171083	1	Adjusting Needle
171102	1	"O" Ring
171103	1	"O" Ring
171104	1	"O" Ring
171105	1	Plug
171201	1	Adjusting Screw
171202	1	Knob
171203	1	Barrel
171205	1	Lever
171206	1	Screw
173088	1	Straight Fitting - 5/16 Tube to 1/4 NPT
173089	1	Elbow Fitting - 5/16 Tube to 1/8 NPT
173090	2	Elbow Fitting - 5/16 Tube to 1/4 NPT
173871	1	Nylon Shoe - 1/8 Diameter x 1/8 Long
271068	1	Piston - Fitted to Body 371067 used as an assembly.
271076	1	Spool - Fitted to Body 371067 used as an assembly.
271079	1	Front
271080	1	Rear Plate
271081	2	Gasket
271085	1	Stem
371067	1	Body
801177	2	Brass Shoe - 1/8 Diameter x 1/8 Long
972552	1	#10-32 x 1/4 Soc. Set Screw - Cup Point
972633	1	Dowel Pin - 3/8 x 3
972867	4	5/16-18 x 7/8 Soc. Cap Screw
972878	8	3/8-16 x 7/8 Soc. Cap Screw
972958	1	#10-32 x 3/4 Soc. Set Screw - Cup Point
973006	2	#10-32 x 3/8 Soc. Set Screw - Cup Point

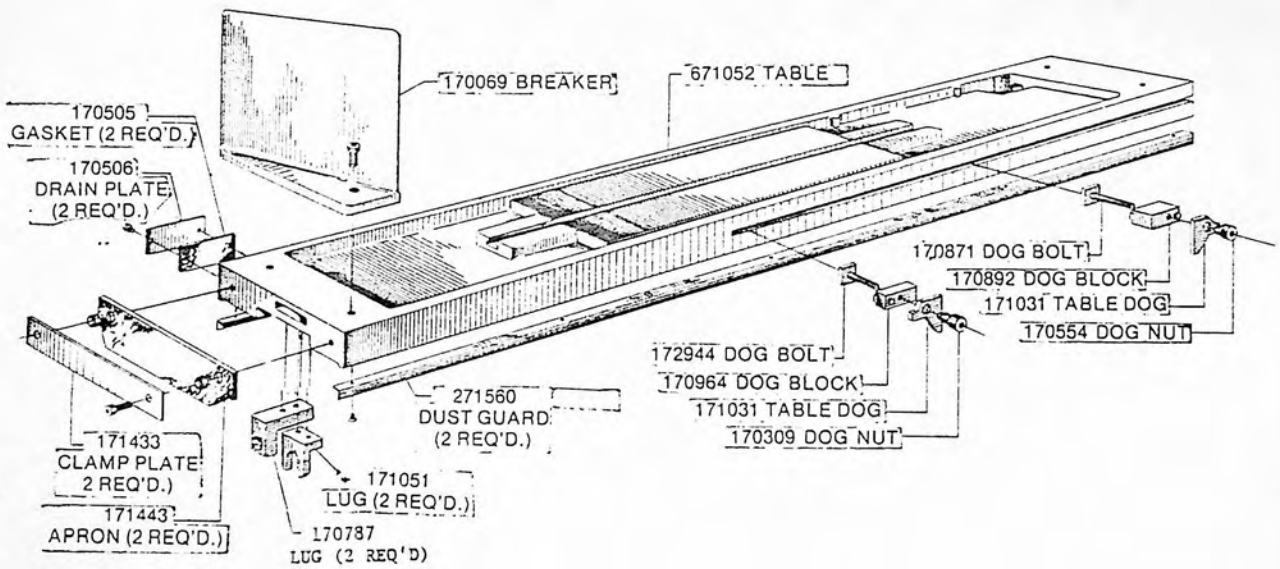
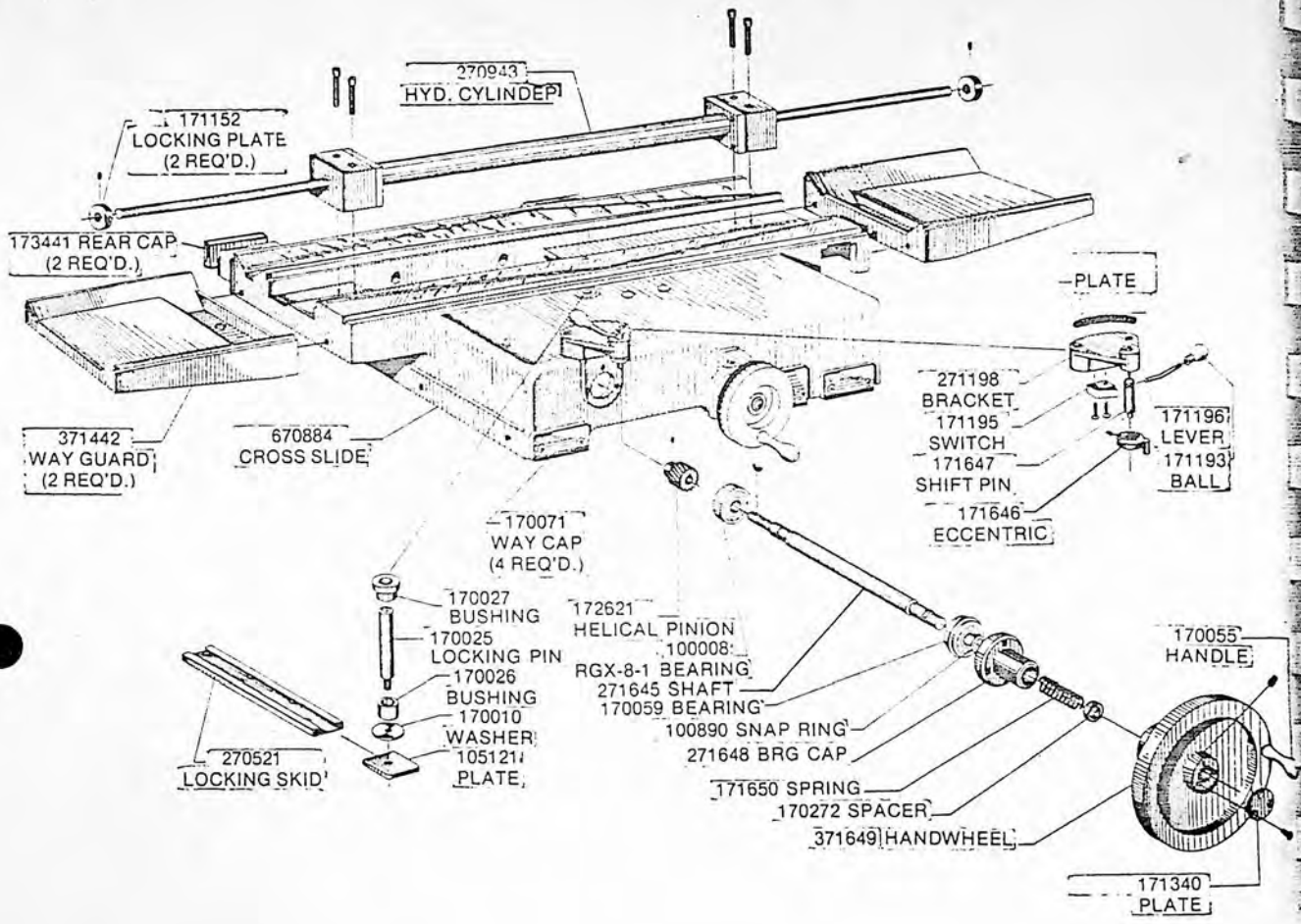


TABLE ARRANGEMENT



CROSS SLIDE...
SHOWING TABLE HANDWHEEL ASSY...
CROSS SLIDE LOCK ASSY...
TABLE HYDRAULIC DRIVE CYLINDER

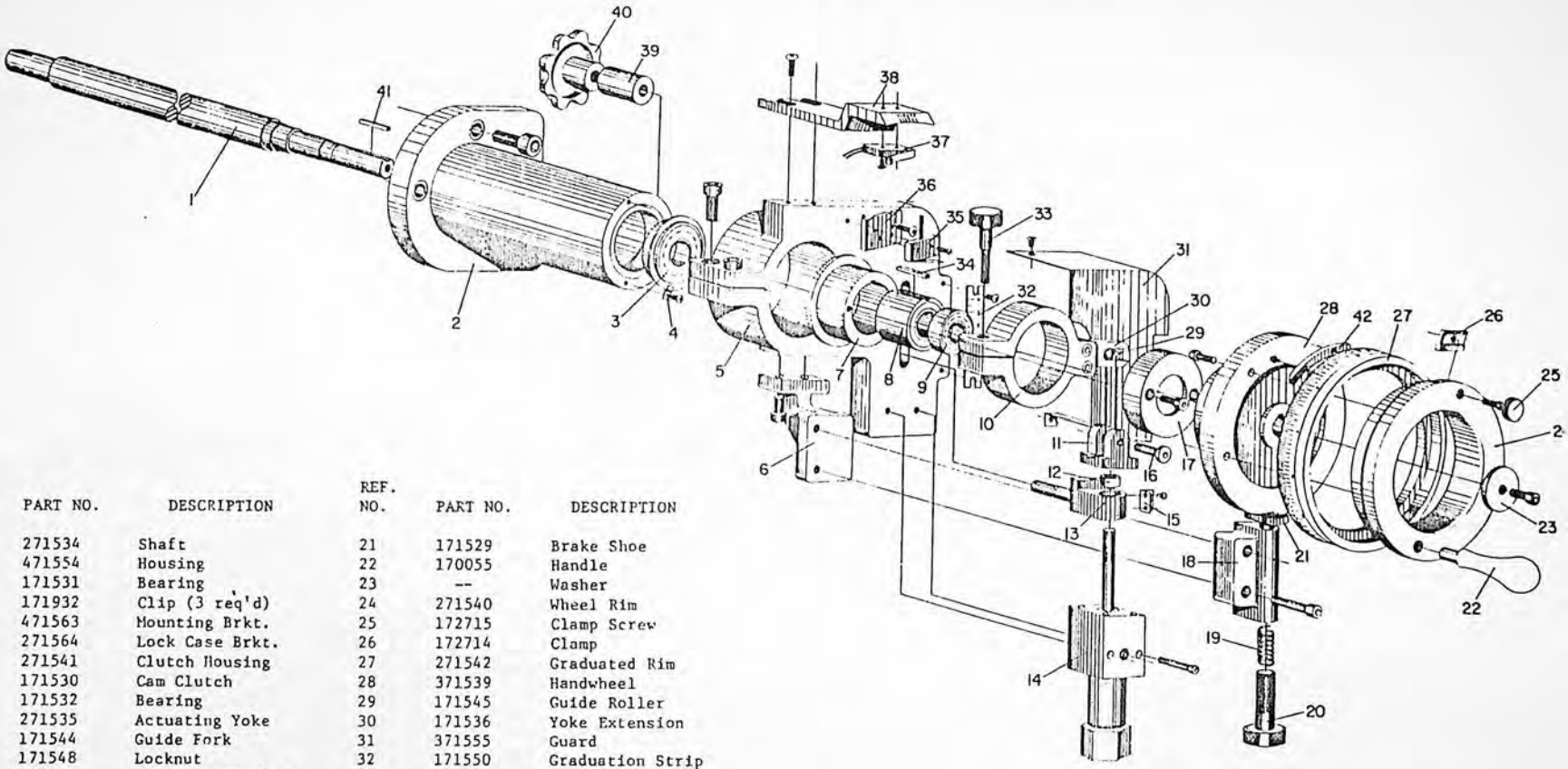
EFFECTIVE ON SERIAL NO. 16744

AUTO DOWNFEED UNIT ASSEMBLY

AUTO DOWNFEED UNIT ASSEMBLY

For Machine S/N's Up To 22068 but

Excluding S/N's 21960 and 21981



REF. NO.	PART NO.	DESCRIPTION
1	271534	Shaft
2	471554	Housing
3	171531	Bearing
4	171932	Clip (3 req'd)
5	471563	Mounting Brkt.
6	271564	Lock Case Brkt.
7	271541	Clutch Housing
8	171530	Cam Clutch
9	171532	Bearing
10	271535	Actuating Yoke
11	171544	Guide Fork
12	171548	Locknut
13	171547	Stop for Downfeed
14	171533	Hydraulic Cylinder
15	171549	Pointer
16	171546	Roller Shaft Screw
17	271537	Yoke Retainer
18	170283	Lock Case
19	170125	Spring
20	170285	Thumb Screw
21	171529	Brake Shoe
22	170055	Handle
23	--	Washer
24	271540	Wheel Rim
25	172715	Clamp Screw
26	172714	Clamp
27	271542	Graduated Rim
28	371539	Handwheel
29	171545	Guide Roller
30	171536	Yoke Extension
31	371555	Guard
32	171550	Graduation Strip
33	171552	Thumb Screw
34	--	Key
35	171272	Switch
36	171551	Switch Mounting Plate
37	171273	Switch
38	371543	Vernier Pointer
39	100116	Sleeve
40	100122	Knob
41		Key
42	171700	Stop Cam

Assembly No. 971695

AUTO DOWNFEED MECHANISM
EFFECTIVE MACHINE S/N 21960
DRAWING NO. 474001
ASSEMBLY NO. 974022

Part No.	Description	Quantity
170038 (801947)	Bearing	1
170067	Spring	1
170159	Hose Clamp	2
170161	Air Cock	1
170586	Drag Shoe	1
170812	Knob	1
171195	Miniature Microswitch N.O.	1
171701	Table Reversing Switch	1
171272	Miniature Microswitch N.O.	1
171273	Miniature Microswitch N.C.	1
171530	Cam Clutch	1
171532	Bearing	1
171533	Hydraulic Cylinder	1
171545	Guide Roll	1
171546	Roller Shaft Screw	1
171548	Locknut	1
173520	Protection Spring	2
173783	Female Plug	1
173871	Nylon Shoe	1
174005	Bearing Housing	1
174006	Clutch Housing	1
174007	Bearing Cap	1
174008	Switch Mount	1
174009	Lever	1
174010	Rod Clevis	1
174011	Knob	1
174012	Cord Bracket	1
174013	Adjusting Rod	1
174014	Adjusting Screw	1
174015	Stop Block	1
174016	Lower Guide	1
174017	Actuator	1
174021	Graduated Plate	1
174052	Cam	1
174108	Clamp Knob	1
271998	Switch Bracket	1
273523	Bracket	1
273524	Bracket	1
274107	Actuating Yoke	1
371410	Vernier Pointer	1
374003	Vernier Bracket	1
374004	Switch Bracket	1

AUTO DOWNFEED MECHANISM
EFFECTIVE MACHINE S/N 21960
DRAWING NO. 474001
ASSEMBLY NO. 974022

Part No.	Description	Quantit
374018	Upper Guide	1
374019	Elevating Shaft	1
374020	Cover	1
472617	Housing	1
474002	Mounting Bracket	1
773081	5/16 Nyla Flow Tubing	11 fe
800784	Retaining Ring	1
801348	Retaining Ring	1
801349	Roll pin (3/32 x 1/2)	1
801350	Drive Screw (P-K #4 x 3/16"U")	1
801351	Spring Plunger	1
801352	Retaining Ring	1
801353	Spring	1
801716	Red. Bushing 3/8 x 1/4	1
802011	Bearing	1
802762	Cable Clamp	1
973428	1/4 Tube Elbow	2
973429	1/8 Tube Elbow	4
973430	1/4 Tee F-M-F	1
973431	1/8 Str. Connector	2
974117	Solenoid Valve Assy.	1
83-S-1835	Spring	*
83-S-1897	Miniature Microswitch N.C.	2

*Part of 83-S-1897

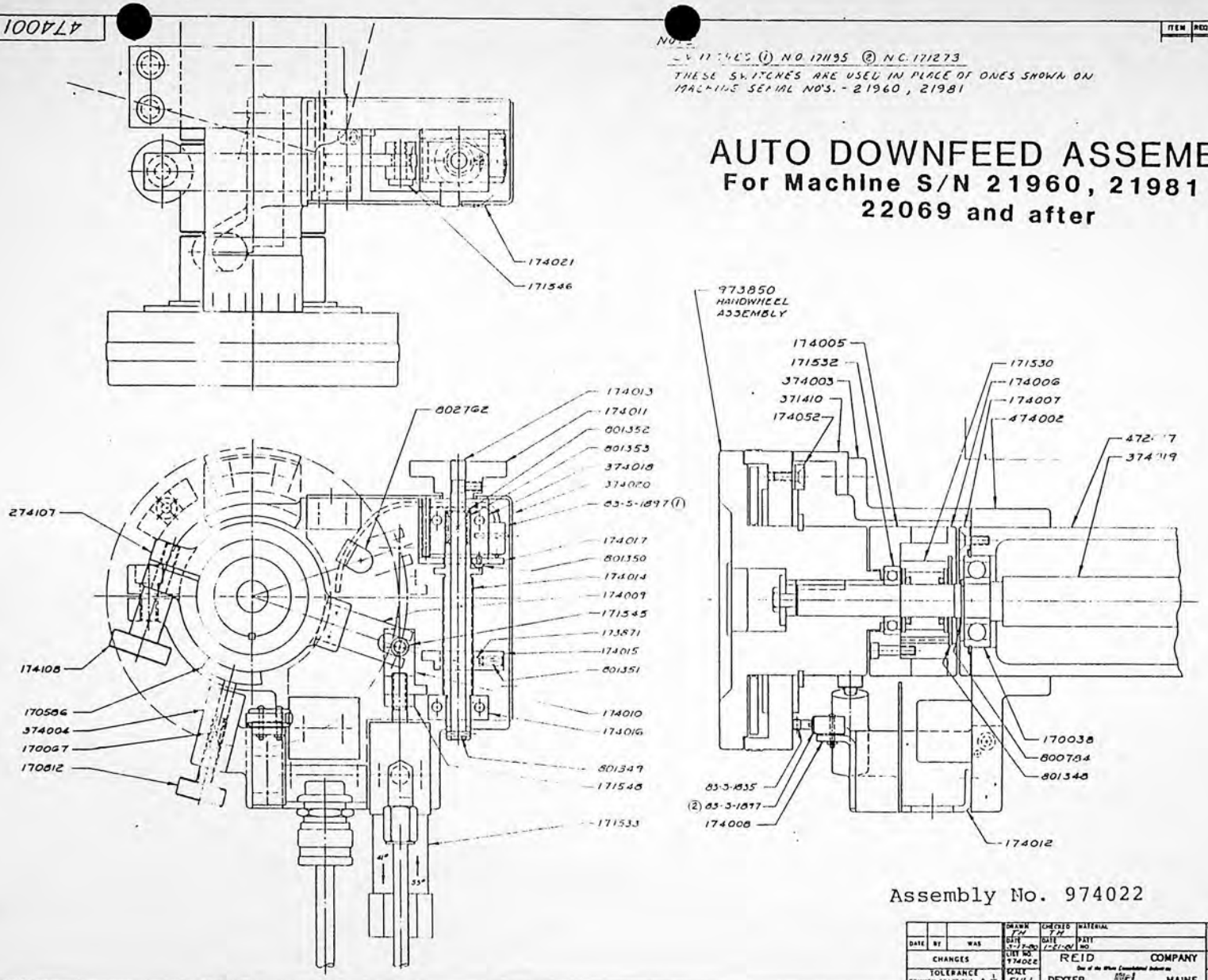
474001

ITEM	REQD		DESCRIPTION

NOTE
SWITCHES (1) NO. 171195 (2) NO. 171273
THESE SWITCHES ARE USED IN PLACE OF ONES SHOWN ON MACHINE SERIAL NO'S. - 21960, 21981

AUTO DOWNFEED ASSEMBLY

For Machine S/N 21960, 21981 and 22069 and after



Assembly No. 974022

DATE	BY	WAS	DRAWN TW	CHECKED TW	MATERIAL	HARDNESS	TITLE AUTOMATIC DOWNFEED MECHANISM - HYD/DF
CHANGES			DATE 5-1-80	DATE 12-21-80	PATE NO		
			LIST NO 774026	REID COMPANY		SHEET	474001
TOLERANCE COMMON FRACTIONS ± 1/8			SCALE FULL	DEXTER MAINE		OF	

JAN 23 1981

HYDRAULICS

373769

ITEM	REQ'D	MAT	SCRIPTION

HYDRAULIC SEQUENCE OF OPERATIONS

1. HYDRAULIC START PUSHBUTTON STARTS DUAL HYDRAULIC PUMP (8) WHICH PRODUCES 4 GPM AND 1 GPM. WITH TABLE STOPPED, 4 GPM OUTPUT DOES NOT DEVELOP ADJUSTED PRESSURE DUE TO ORIFICE (24) CONTROL OF VENT OF RELIEF VALVE (12).

2. HAND TABLE TRAVERSE. WITH TABLE LEVER IN HAND POSITION, PRESSURE IS REMOVED FROM BOTH SIDES OF TABLE CYLINDER DUE TO SPRING CENTERING OF PILOT VALVE (14) AND TABLE REVERSING VALVE (14).

3. HAND CROSS TRAVERSE. WITH CROSS FEED SELECTOR LEVER IN HAND POSITION, PRESSURE IS REMOVED FROM BOTH SIDES OF CROSS TRAVERSE CYLINDER DUE TO SPRING CENTERING OF CROSS TRAVERSE DIRECTION VALVE (18).

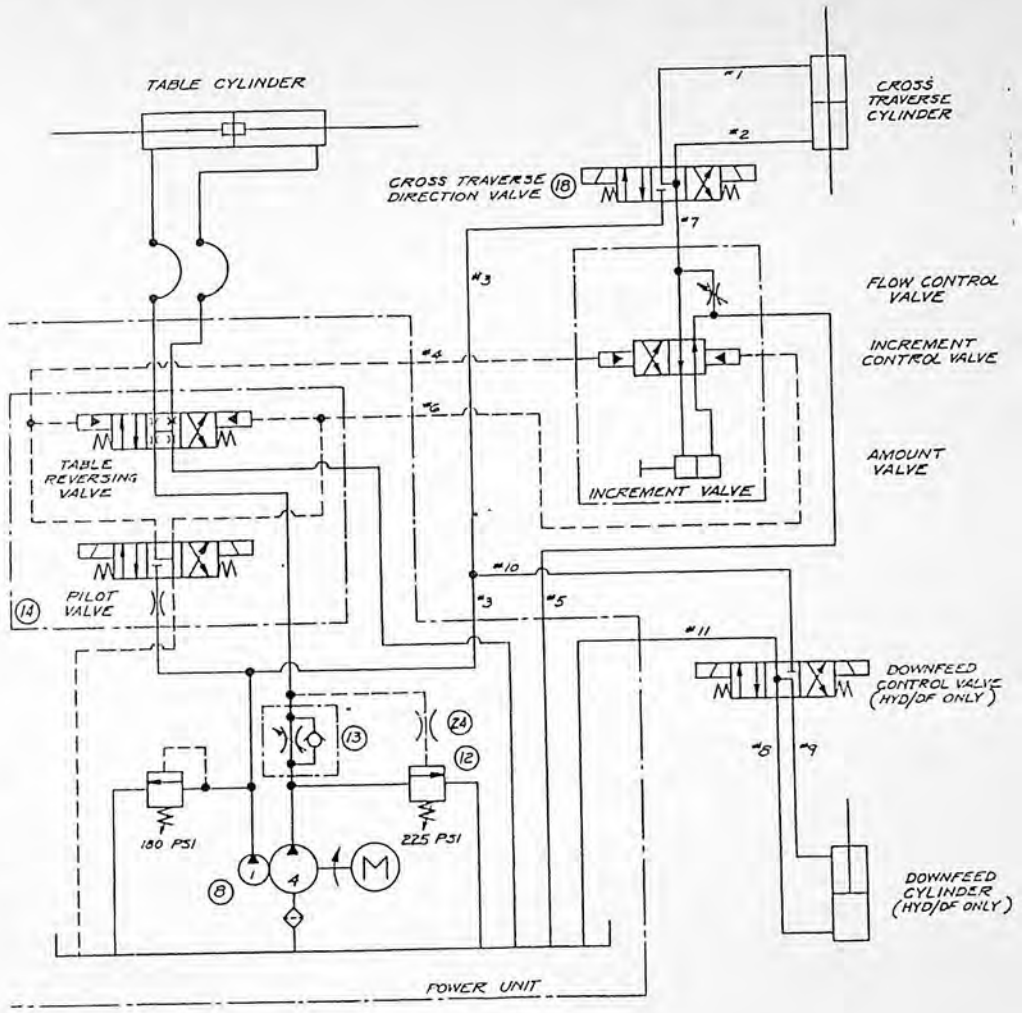
4. HYDRAULIC TABLE TRAVERSE. WITH TABLE LEVER IN POWER POSITION, PILOT PRESSURE FROM 1GPM PUMP ACTUATES TABLE REVERSING VALVE DIRECTING OUTPUT OF 4 GPM PUMP TO TABLE TRAVERSE CYLINDER. ORIFICE (24) CUASES RELIEF VALVE (12) TO INCREASE PRESSURE AND TRAVERSE TABLE EITHER LEFT OR RIGHT UNTIL SWITCH IS TRIPPED TO REVERSE DIRECTION. TABLE SPEED IS CONTROLLED BY THE FLOW CONTROL VALVE (13).

5. HYDRAULIC CROSS TRAVERSE.

   A. INCREMENT FEED. USED WITH TABLE TRAVERSE. OUTPUT FROM THE 1 GPM PUMP IS DIRECTED THRU THE CROSS TRAVERSE DIRECTION VALVE (18) TO THE CROSS TRAVERSE CYLINDER. EXHAUST FLOW IS DIRECTED TO THE INCREMENT CONTROL VALVE WHICH IS ACTUATED SIMULTANEOUSLY WITH THE TABLE REVERSING VALVE PERMITTING FLOW TO THE AMOUNT VALVE WHICH DETERMINES THE VOLUME EXHAUSTED. ADJUSTMENT OF THIS VALVE CONTROLS THE SIZE OF INCREMENT. INCREMENT FEED CONTINUES IN ONE DIRECTION UNTIL FLOW TO THE CYLINDER IS REVERSED.

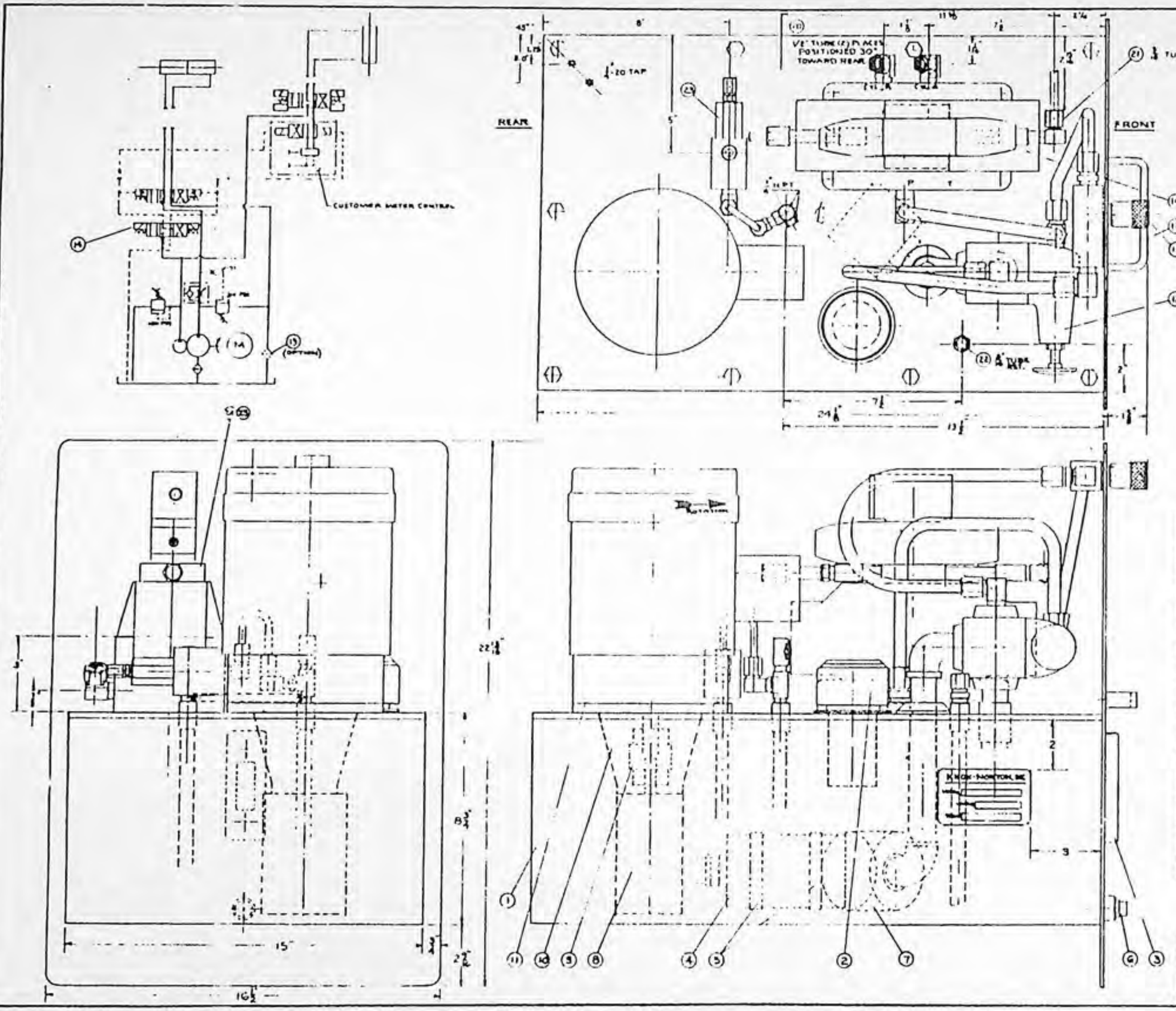
   B. WHEEL DRESS AND RAPID POSITIONING. NORMALLY USED WITH TABLE STOPPED. ROTATION OF CROSS TRAVERSE MODE LEVER TOWARD WHEEL DRESS GOVERNS EXHAUST FLOW FROM CROSS TRAVERSE CYLINDER THRU ADJUSTABLE FLOW CONTROL VALVE. FURTHER ROTATION INCREASES FLOW UNTIL MAXIMUM POSITIONING SPEED IS REACHED. CROSS SLIDE TRAVELS EITHER IN OR OUT UNTIL SWITCH IS TRIPPED TO REVERSE DIRECTION.

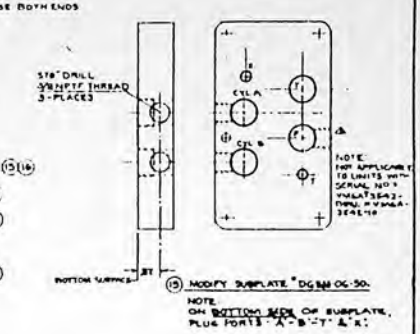
6. AUTOMATIC DOWNFEED - HYD/DF ONLY. USED WITH TABLE TRAVERSE. OUTPUT FROM 1 GPM PUMP IS DIRECTED TO DOWNFEED CONTROL VALVE WHICH IS ACTUATED SIMULTANEOUSLY WITH EITHER THE TABLE PILOT VALVE (14) OR THE CROSS TRAVERSE DIRECTION VALVE (18) PERMITTING FLOW TO DOWNFEED CYLINDER. CYLINDER COMPLETES STROKE CAUSING DOWNFEED CONTROL VALVE TO REVERSE FLOW TO DOWNFEED CYLINDER. AN ADJUSTABLE POSITIVE STOP DETERMINES RESET POSITION OF CYLINDER FOR SIZE OF DOWNFEED INCREMENT.



			DRAWN TH	CHECKED TH	MATERIAL	HARDNESS	TITLE HYDRAULIC DIAGRAM 618 HYD & HYD/DF
DATE	BY	WAS	DATE 12-23-77	DATE 1-3-78	PATT. NO.		
CHANGES			LIST NO.	REID BROS. COMPANY One of the White Consolidated Industries		SHEET	373769
TOLERANCE COMMON FRACTIONS ± 1/64			SCALE —	DEXTER WCI MAINE		OF	

BRUNING 40-135 21267





ITEM	QTY	DESCRIPTION
25	1	BOLT KIT # BKDG3-57B
24	1	ADAPTER PLATE DWG # A-1054-1
23	1	RELIEF VALVE # B5005060
22	1	TUBE FITTING MFR # 1393-5-4
21	2	TUBE FITTING MFR # 1405-5-4
20	2	TUBE FITTING # 3405-6-6
19	1	RETURN LINE FILTER VICKERS # F85-F-10P - OPTION
18		
17	1	HANDLE # 1901
16	1	BOLT KIT # BKDG06-G38
15	1	SUBPLATE # DGSM-06-50 (MODIFIED AS SHOWN ABOVE)
14	1	DIRECTIONAL VALVE # D4B3-8-NC-E-W-B-10
13	1	FLOW CONTROL VALVE # F-800-S-
12	1	PRESS. RELIEF VALVE # CT-06-BV-40
11	1	MOTOR - 1HP/1800/230/460/3/60 3PH ODP # YWM3116T
10	1	ADAPTER - MOTOR/PUMP
9	1	COUPLING # Q100 BORE 5/8" - 3/16" KY & 7/16" - 1/8" KY.
8	1	PUMP - DUAL # PDC 3838 A-1-RA-C
7	1	DEFUSER # D-33
6	1	MAGNET - PIPE PLUG
5	2	MAGNET - FLEX-WRAP SIZE 3" O.D. (SUMP)
4	1	SUMP STRAINER # 10-1-100
3	1	OIL LEVEL GAUGE # FLT-1N4
2	1	FILLER BREATHER ASSY. # AB-1000-3
1	1	RESERVOIR 10 GAL. # D-1015-1

KNOX ● NORTON

TITLE: ASSEMBLY

SCALE: 1/2" = 1'

DATE: 7-12-74

DRAWING NO.: D-1014-1-2

HYDRAULIC POWER UNITS

ITEM NO.	PART NO.	QTY.	NAME	DESCRIPTION
1	173862	1	Tank	Knox-Norton #D-1015-1
2	800165	1	Filler-Breather	Flow-Ezy #AB-1000-3 (includes 40 Micron Mesh)
3	803053	1	Oil Sight Gage	Hydro-Craft #HC-FLT-1314
4	800167	1	Intake Strainer	Flow-Ezy #10-1-100 (100 Micron Mesh)
5	800168	1	Strainer Magnet	Flow-Ezy Flex-Wrap for 3" OD
6	800685	1	Pipe Plug	Pipe Plug
7	800169	1	Exhaust Diffuser	Flow-Ezy #D-33
8	800170	1	Pump	John S. Barnes #GC-5235-A-1-RA-C Duplex Fluid Pump)
9	800171	1	Coupling	Gerbing #G100 (7/8 dia. x 3/16 key & 7/16 dia. x 1/8 key)
10	800172	1	Adapter pump/motor	Chicago HYD Adapter - 56C Frame
11	800173	1	Motor	Baldor Motor, 1 HP (VWM-3116T) 1800 - 3 - 60-230/460
12	171833	1	Table Relief Valve	Vickers #CT06-BV-40 (modified by Knox-Norton)
13	173602	1	Table Speed Control	Manatrol #F-800-S
14	974117	1	Pilot Valve	Vickers #DG4V3-6C-WB10 with Male Receptacle
14	800175	1	Bolt Kit for 974117	Vickers #BKDG3-698
14	800176	1	Table Reversing Valve	Vickers #DG3S4-069C-E-51 (Note 1)
14	802694	1	Table Reversing Valve	Vickers #DG3S-8-9C-E-10 (Note 2)
16	800177	1	Bolt Kit for 800176	Vickers #BKDG06-635
16	173863	1	Adapter for 800174	Knox-Norton PHD #A-01 (Note 3)

ITEM NO.	PART NO.	QTY.	NAME	DESCRIPTION
15	173864	1	Sub-Plate for 800176	Vickers #DGSM-06-50 (modified by Knox-Norton)
17	800178	1	Tank Handle	Guden Handle #1901
23	800179	1	Cross Traverse Relief Valve	Delta #8500-5059

NOTE 1: For units built prior to S/N 800596

NOTE 2: For all units beginning with S/N 800596

NOTE 3: Adapter not required when Note 2 applies.

THE FOLLOWING ITEMS ARE FOR THE REID MODEL HYD/DF ONLY - NOT SHOWN ON DRAWING:

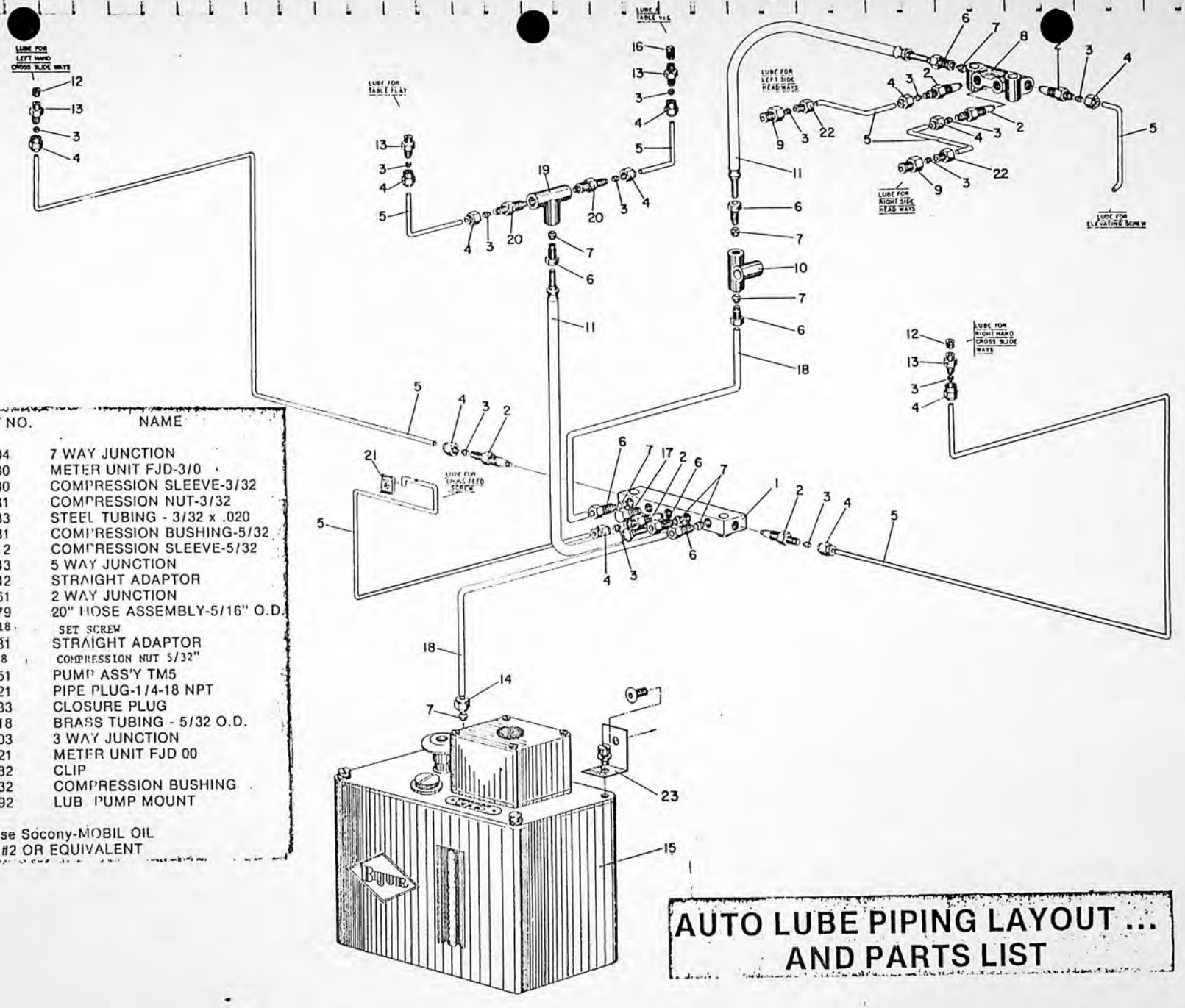
-	270832	1	Sub Plate	
-	*973785	1	Valve Assembly	Vickers #MOD-6C-30

*First used on Machine Serial No. 21137. For machines built prior to S/N 21137 use Part No. 973091, Valve Assembly.

10/23/79
Rev. 2/6/81

LUBRICATION

PIPING LAYOUT, PARTS LIST AND MAINTENANCE INSTRUCTIONS



NO.	PART NO.	NAME
1	170004	7 WAY JUNCTION
2	172580	METER UNIT FJD-3/0
3	170030	COMPRESSION SLEEVE-3/32
4	170031	COMPRESSION NUT-3/32
5	170033	STEEL TUBING - 3/32 x .020
6	172581	COMPRESSION BUSHING-5/32
7	170012	COMPRESSION SLEEVE-5/32
8	170043	5 WAY JUNCTION
9	170042	STRAIGHT ADAPTOR
10	170261	2 WAY JUNCTION
11	170379	20" HOSE ASSEMBLY-5/16" O.D.
12	972618	SET SCREW
13	170381	STRAIGHT ADAPTOR
14	173578	COMPRESSION NUT 5/32"
15	172951	PUMP ASS'Y TM5
16	170021	PIPE PLUG-1/4-18 NPT
17	172583	CLOSURE PLUG
18	170018	BRASS TUBING - 5/32 O.D.
19	170003	3 WAY JUNCTION
20	172721	METER UNIT FJD 00
21	172582	CLIP
22	170032	COMPRESSION BUSHING
23	171992	LUB PUMP MOUNT

NOTE: Use Socony-MOBIL OIL VACTRA #2 OR EQUIVALENT

AUTO LUBE PIPING LAYOUT ... AND PARTS LIST

Service Instructions

For systems with lubricator type TM-5

BIJUR

Your machine is well protected by a built-in Bijur central lubricating system - by CORRECT lubrication of all bearings served. It assures smooth operation of your machine for years, if properly maintained.

The Bijur system consists of three basic elements; (1) A LUBRICATOR which periodically forces a measured volume of oil into (2) a single line of DISTRIBUTION TUBING branched to supply oil to the bearing surfaces through (3) METER-UNITS which proportion the correct oil film to each bearing.

OIL: Use only a clean mineral oil of type and viscosity recommended by machine manufacturer.

OPERATION: The Lubricator is a piston pump of the spring discharge type and driven by a timing motor. The motor drives the pump through a gear train and cam at a predetermined rate. Oil volume is determined by the stroke setting and discharge frequency by the timing motor.

Descent of the piston will be faster as the temperature rises and slower as the temperature decreases. This variation in discharge time compensates for changes in oil viscosity thereby assuring a constant volume of oil pumped to the bearings.

LIQUID LEVEL SWITCH: Some models of this lubricator (see below) are equipped with a Liquid Level Switch. The standard Liquid Level Switch closes at high oil level. When switch is connected to light or other indicating device liquid level is monitored. Switch contact rating is 15 Watt maximum. Indicating device is not supplied by Bijur.

STARTING A NEW MACHINE: Fill reservoir. Pull and release "Instant Feed Button" several times until oil shows freely at all bearings.

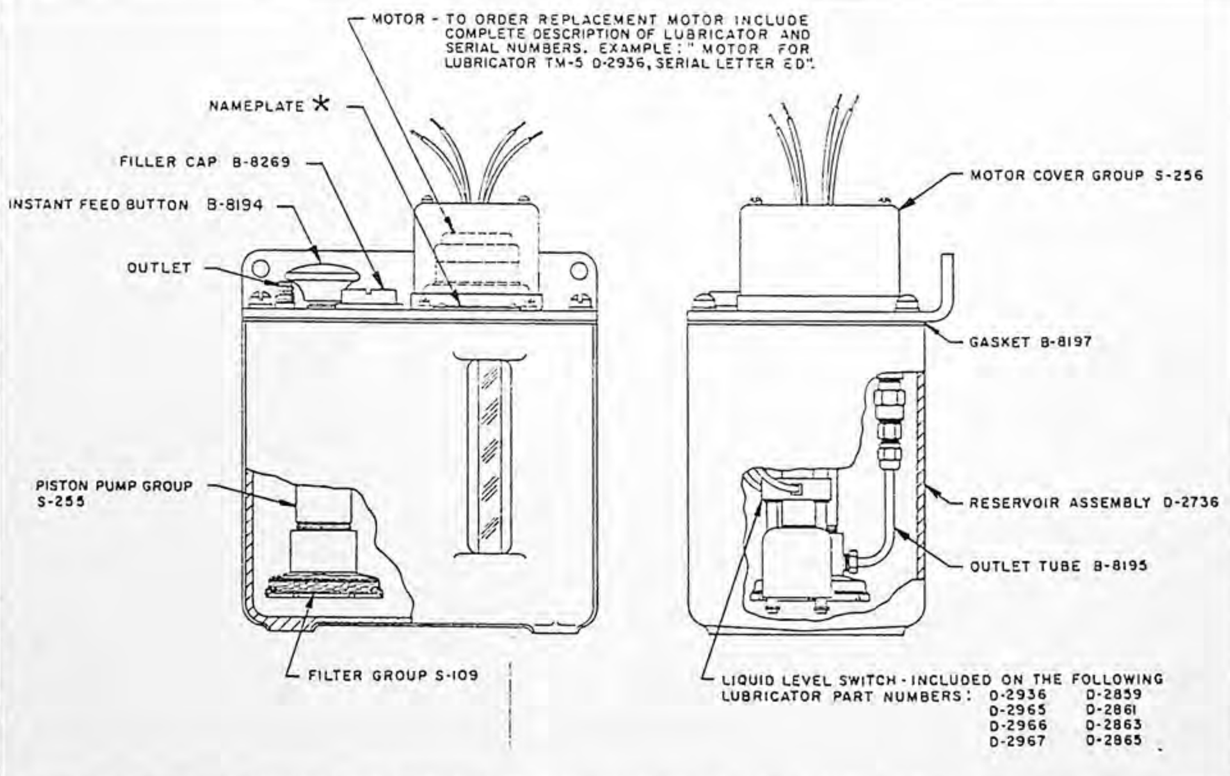
MAINTENANCE: Check oil level daily and refill reservoir when required. Check the system periodically for loose or broken tubing, worn hoses, loose fittings and connections. Replace filter group annually.

SERVICE: Too little oil at all bearings - check for low oil level, broken or cracked tubes, loose connections, flattened lubricator outlet tube, or clogged filter. If one bearing receives too much oil, remove Meter-Unit and replace with one of the same type but next lower Flow Rate Number. For too little oil at one bearing, replace the Meter-Unit with one of the same type but next higher Flow Rate Number. Each increase in Flow Rate Number doubles oil feed. Don't attempt to adjust, disassemble, blow through or drill out Meter-Units.

FILTER REPLACEMENT: A filter at pump inlet protects the lubricating system. The filter disc should be inspected every six months. If not clean, replace. To replace filter remove snap ring which releases clamp ring, filter disc and screens. Insert new screens, coarse screen first, and filter disc. Reassemble clamp and snap ring.

MOTOR REPLACEMENT: Remove motor cover and the two screws holding motor. To reassemble be sure slot in motor shaft engages with pin in drive shaft, before replacing screws.

SERVICE PARTS: Order by Part Number and Name shown below. You must also specify COMPLETE Lubricator Part Number and Serial Letters shown on the Name Plate*. Example: "S-109 Filter Group for Lubricator D-2936, serial ED". For major repairs requiring parts not identified in illustration return lubricator for factory rebuilding and adjustment. If a new lubricator is required for replacement, order by Part Number and Serial Letters shown on the Name Plate.

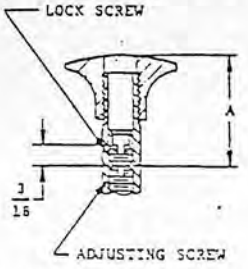


IMPORTANT REPLACE FILTER GROUP ONCE A YEAR

OPERATION:
Lubricator Type TM-S is a motor driven piston pump of spring - discharge type. The motor incorporates a gear reduction which determines the operating cycle of the pump piston. The cycle times available are shown in the table below.

DISCHARGE VOLUME PER STROKE:
Adjustable - 2.5 cu cm minimum
5.0 cu cm maximum

Lubricator supplied set at maximum stroke, 5.0 cu cm discharge. For less delivery remove the lock screw, measure A, turn adjusting screw clockwise increasing A by 5 dimension.



B	DISCHARGE
.400	2.5 cc
.320	3.0 cc
.240	3.5 cc
.160	4.0 cc
.080	4.5 cc
0	5.0 cc

DISCHARGE PRESSURE RANGE: 30 - 60 psi
Discharge pressure will decrease as the number of Meter-Units in the system increases.

MOTOR:
Type: Continuous duty, single phase, synchronous induction timing motor for 50 and/or 60 cps.
Voltage: 115/220 Volt
Wiring: For 110 Volt service connect Blue and White, insulate Red.
For 220 Volt service connect Blue and Red, insulate White.
Power Consumption: 3 Watts.

BIJUR reserves the right to change motor size, mounting dimensions and manufacturer.

Liquid Level Switch:
Models of this lubricator equipped with a Liquid Level Switch are listed below. For fail safe operation, they are supplied so the switch will close an electrical circuit whenever the oil in the reservoir is above the minimum operating level. Thus, when connected to a light or other indicating device, the liquid level can be monitored.

Customers may reverse the operation when desired by inverting the float. When the float is reversed, the switch will close an electrical circuit whenever the oil level is below the minimum operating level.

NOTE: Switch Contact Rating: 15 Watt Max.
Light or indicating device not supplied by Bijur

LUBRICATOR INLET FILTER:
40 micron particle separation. It should be inspected periodically and cleaned or replaced as required.

RESERVOIR: 1 Litre (1000 cu cm) refill capacity, (1 quart).

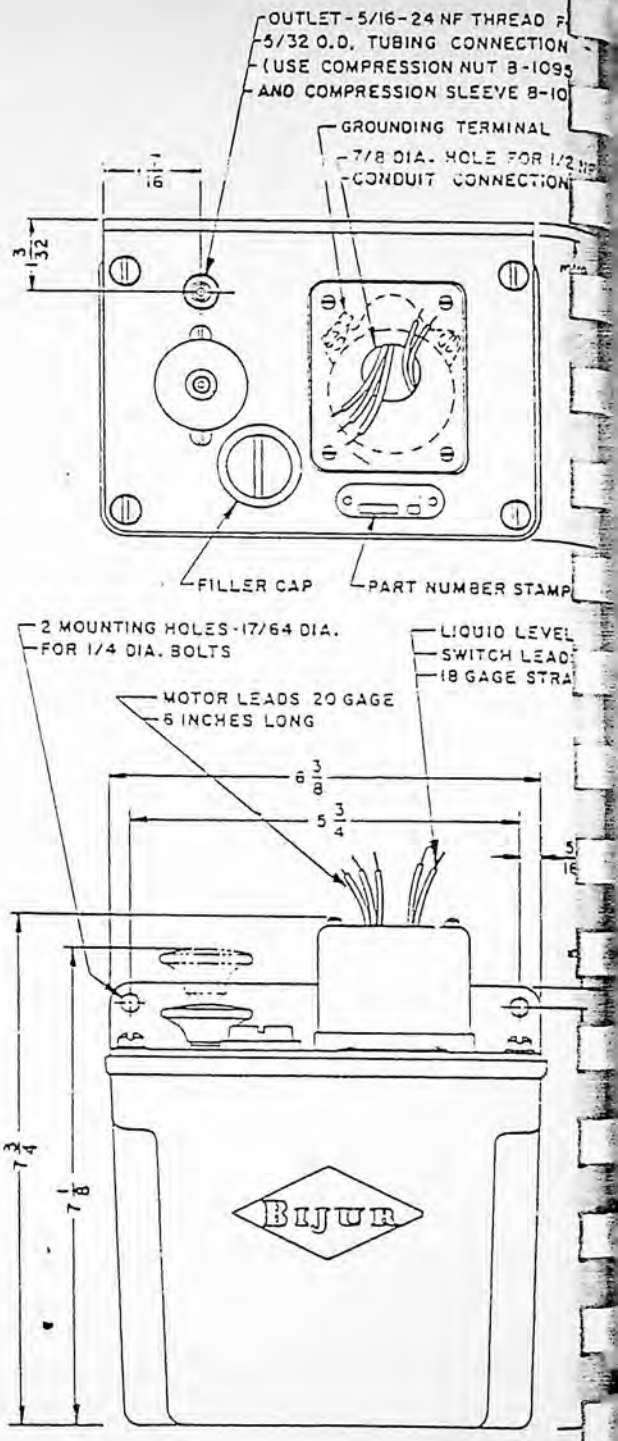
SYSTEM: Use Meter-Units Type F

SYSTEM LIMITATION:
For System & Limitation see "Engineering Manual".

Viscosity range 150 to 8000 SSU at operating temperature.

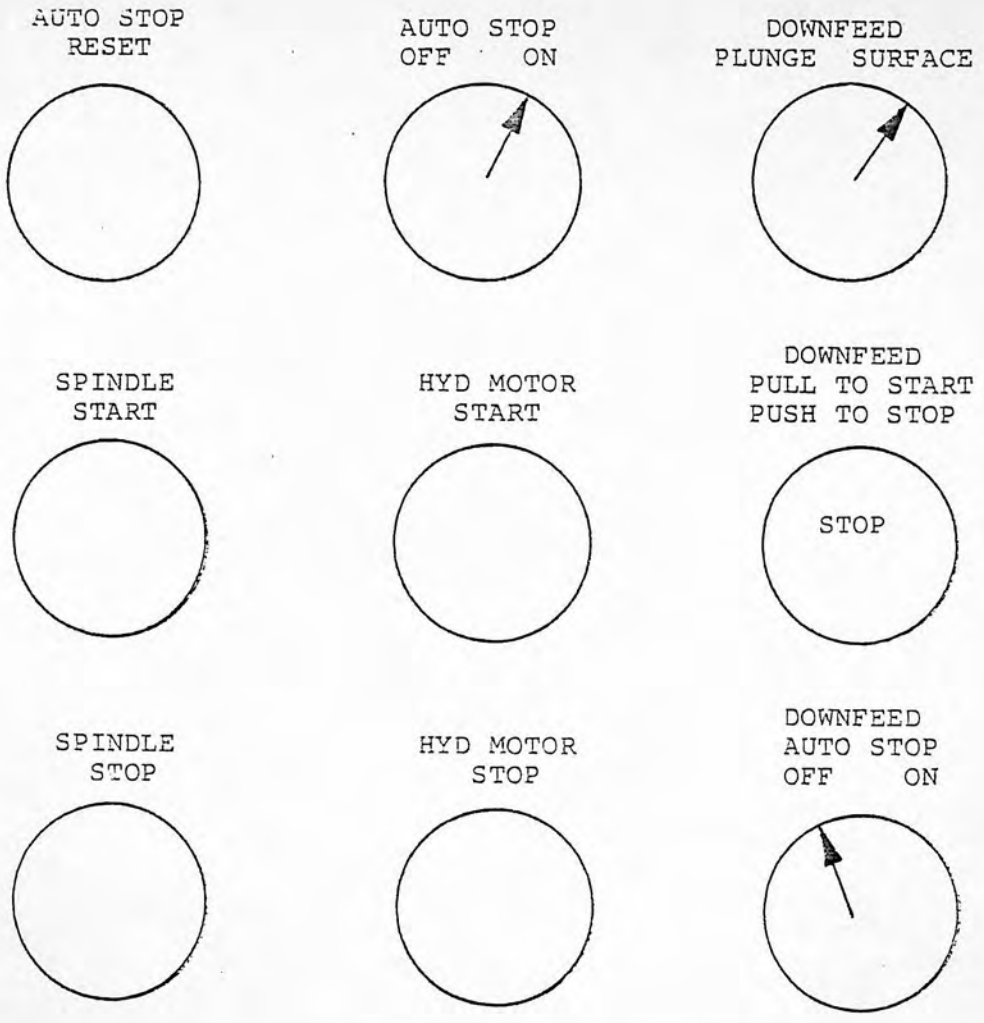
WHEN ORDERING SPECIFY:
Name, Symbol and Part Number such as:
LUBRICATOR TM-S 0-2994

LUBRICATOR CYCLE TIME IN MINUTES		PART NUMBER			
		WITHOUT LIQUID LEVEL SWITCH		WITH LIQUID LEVEL SWITCH	
50 cps	60 cps	BIJUR		BIJUR	
6.4	5.3	0-2994		0-2986	
10.6	8.8	0-2996		0-2988	
32	27.7	0-2998		0-2990	
64.0	53.5	0-3189		0-3187	
128	107	0-3000		0-2992	



OPERATING INSTRUCTIONS - REID MODEL HYD/DF

OPERATING INSTRUCTION - REID MODEL HYD/DF
MANUAL OPERATION OF AUTOMATIC DOWNFEED
WITH AUTO TABLE STOP IN THE ON POSITION

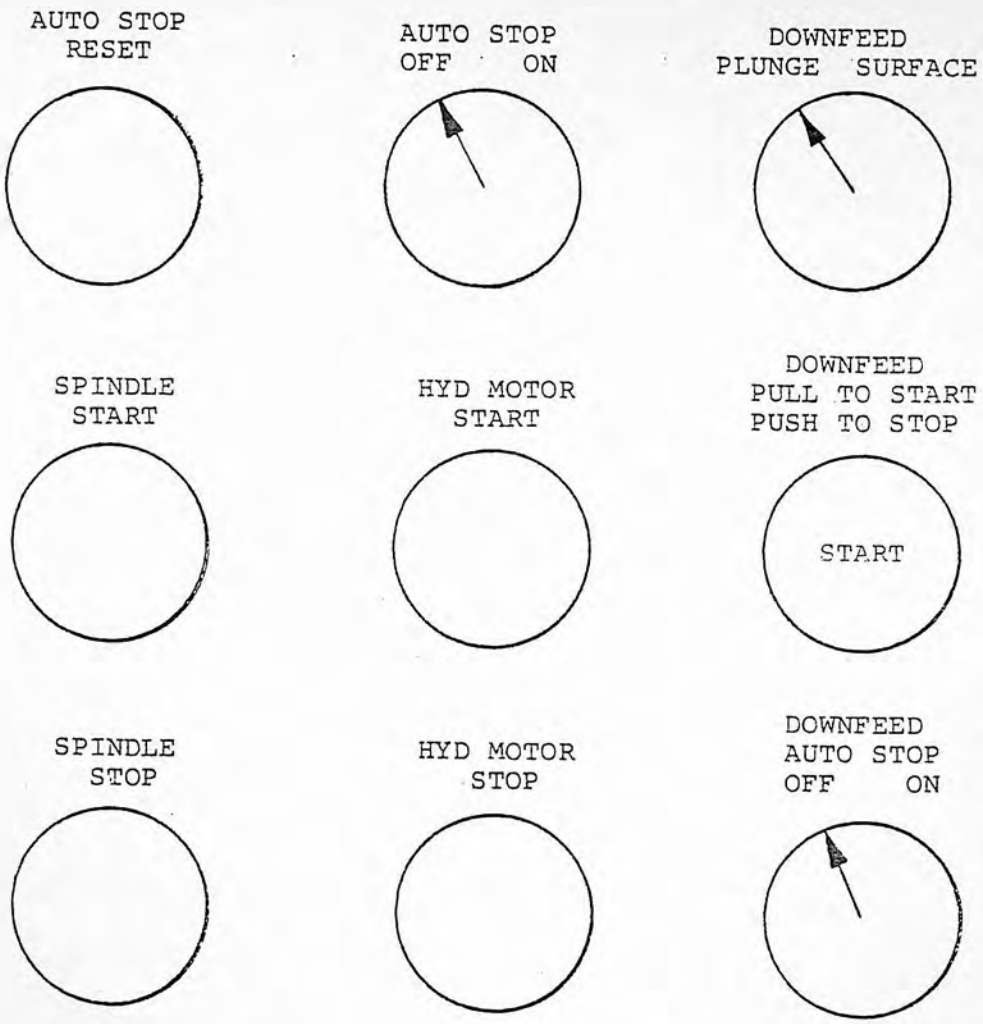


When it is desirable to surface grind without automatic downfeeding, yet have the table stop at the end of a cross slide traverse (IN or OUT), the operator controls must be set as shown above.

In this mode, the table will stop in the extreme right hand position when the cross slide limit switch is tripped. The machine can be started again by pushing the AUTO STOP RESET button.

10/24/79

OPERATING INSTRUCTIONS - REID MODEL HYD/DF
PLUNGE GRINDING



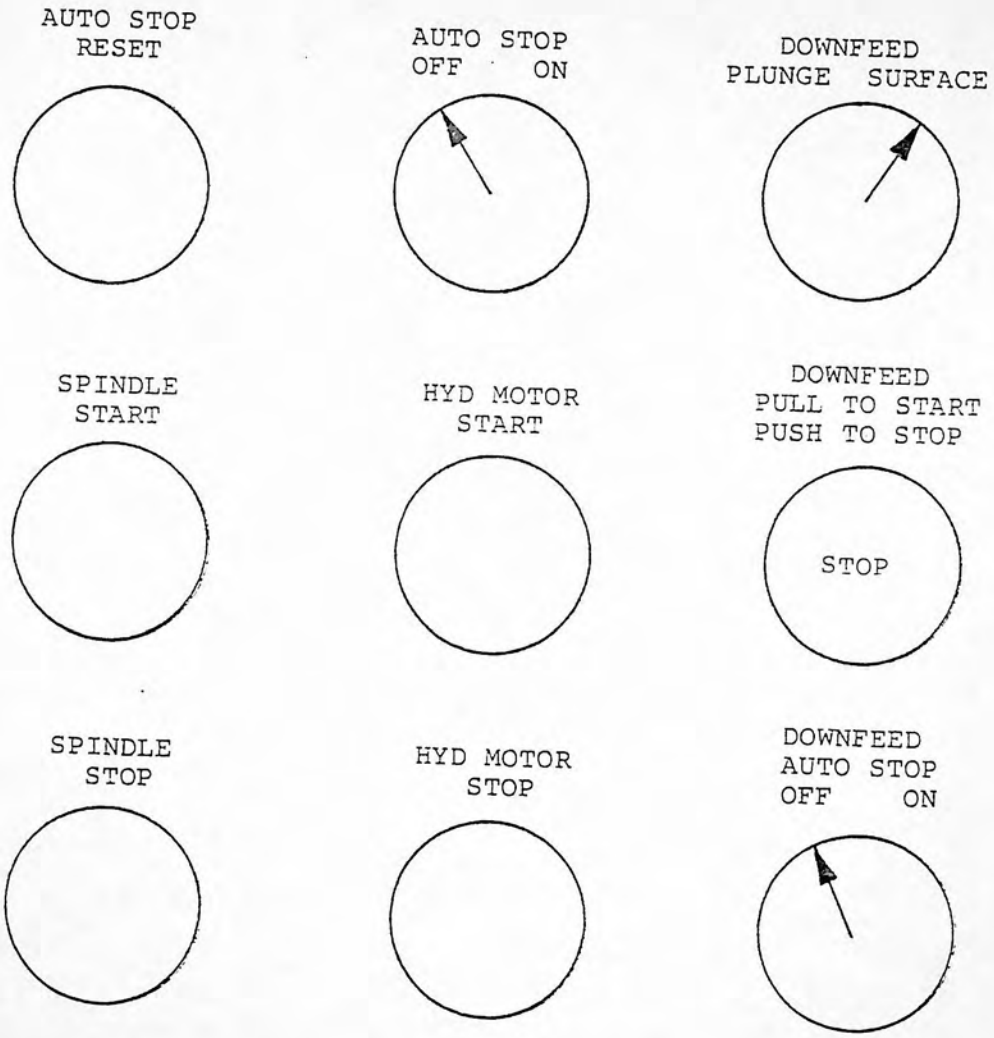
For plunge (downfeeding on table reversal with the cross slide inactivated) grinding, the DOWNFEED selector switch is turned to the PLUNGE position. With the DOWNFEED AUTO STOP selector switch turned to the OFF position, the table will continue to operate when the total incremental downfeed is completed, but the downfeed will stop feeding. The table must be stopped by the table hand controls.

If desired, the table may be stopped automatically in the right hand position on completion of the total incremental downfeed, with the DOWNFEED AUTO STOP selector switch in the ON position.

10/24/79

OPERATING INSTRUCTIONS - REID MODEL HYD/DF

MANUAL OPERATION OF AUTOMATIC DOWNFEED
WITH AUTO TABLE STOP IN THE OFF POSITION



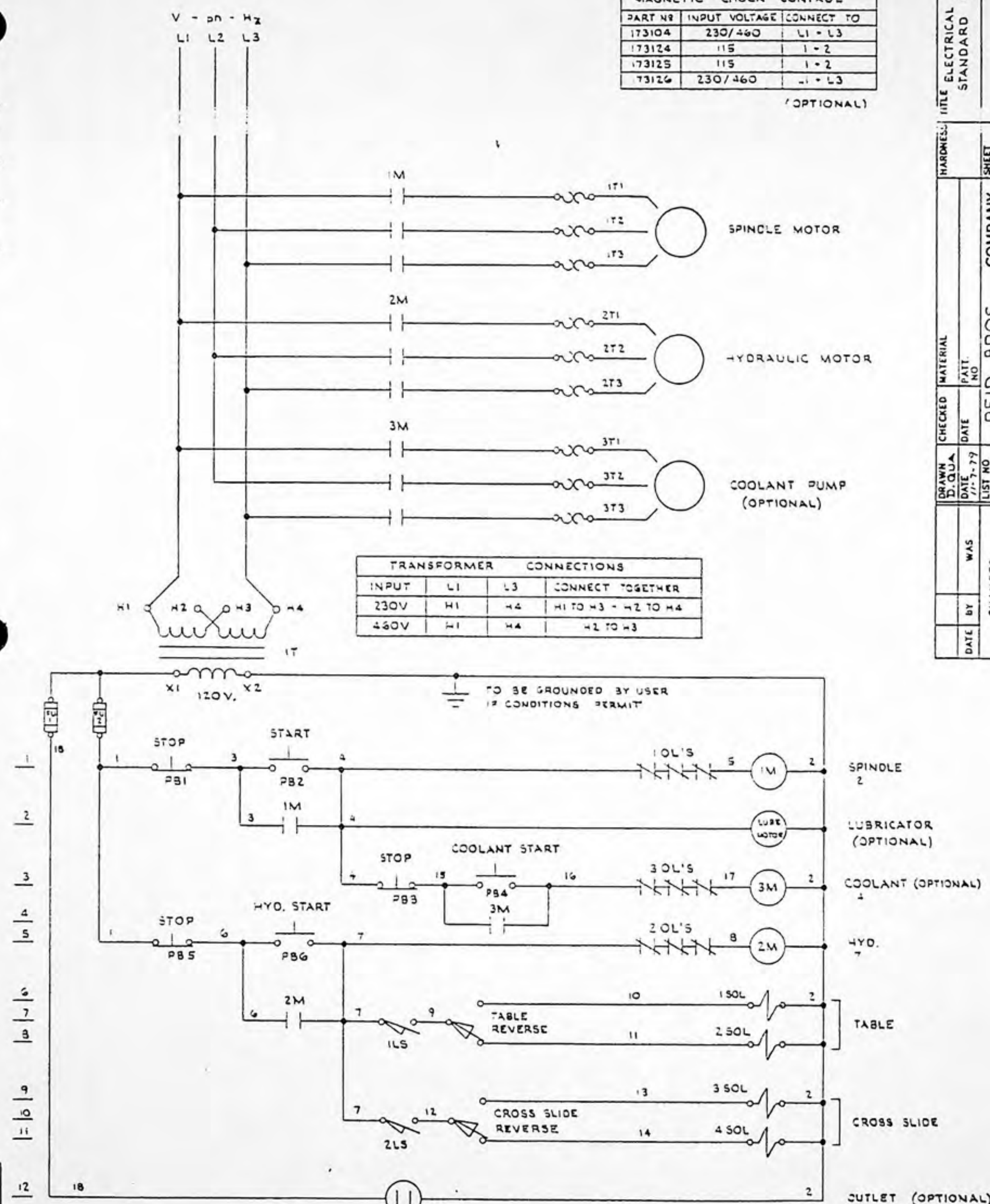
For typical surface grinding, power table and cross slide traverse and manual downfeed, hand controls must be used to stop the table.

10/24/79

ELECTRICAL

MAGNETIC CHUCK CONTROL		
PART Nº	INPUT VOLTAGE	CONNECT TO
173104	230/460	L1 - L3
173124	115	1 - 2
173125	115	1 - 2
173126	230/460	L1 - L3

(OPTIONAL)



TRANSFORMER CONNECTIONS			
INPUT	L1	L3	CONNECT TOGETHER
230V	H1	H4	H1 TO H3 - H2 TO H4
460V	H1	H4	H2 TO H3

TITLE ELECTRICAL SCHEMATIC STANDARD HYD

W -B- 903-E1

JUN 2 1980

REID BROS. COMPANY
One of the White Consolidated Industries
DEXTER MAINE

DRAWN D. QUA DATE 11-7-79 | CHECKED | DATE | MATERIAL | PATT. NO | HARDNESS | SHEET 1 OF 1

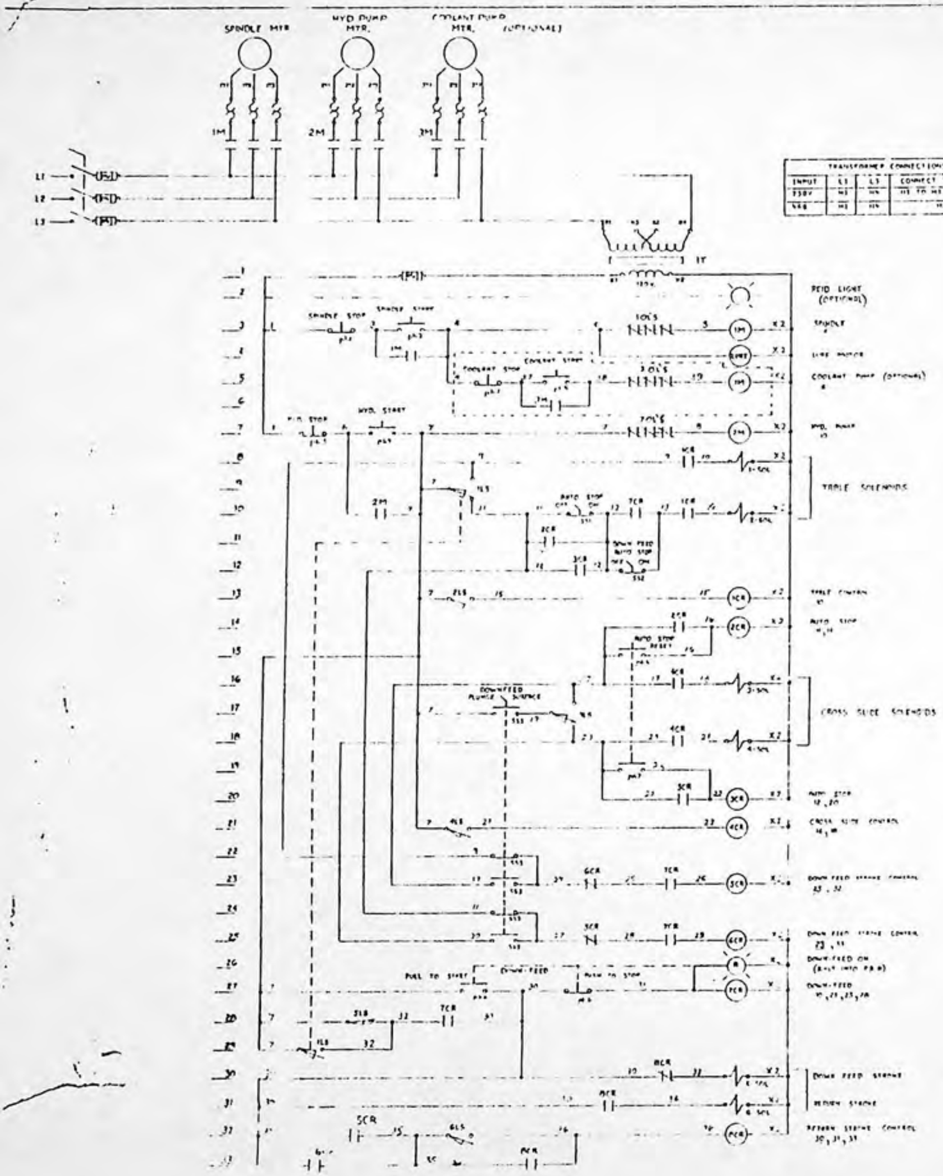
LIST NO | SCALE ~

DATE | BY | WAS | CHANGES

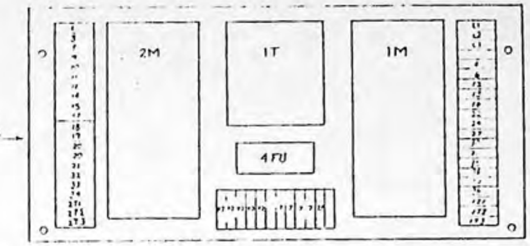
TOLERANCE COMMON FRACTIONS ± 1/64

ITEM | REQD | MAT | DESCRIPTION

W-B-903-E1

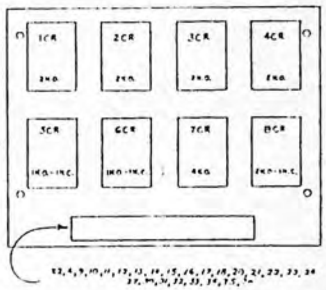


TRANSFORMER CONNECTIONS			
INPUT	L1	L3	CONNECT TOGETHER
230V	H1	H4	H1 TO H3 - H2 TO H4
460	H1	H4	H2 TO H3

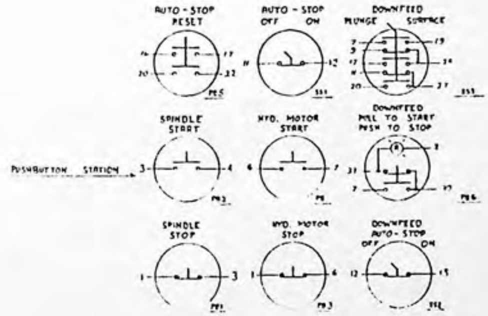


MAGNETIC CHUCK CONTROL		
PART NO.	INPUT VOLTAGE	CONNECT TO
173134	230/460	L1 & L3
173124	115	1 & 2
173125	115	1 & 2
173136	230/460	L1 & L3

(OPTIONAL)



1LS - TABLE REVERSE
2LS - LOCATED IN TABLE CONTROL KNOB, HELD CLOSED IN OPERATION
3LS - CROSS SLIDE REVERSE
4LS - LOCATED IN CROSS SLIDE CONTROL KNOB, HELD CLOSED IN OPERATION
5LS - LOCATED IN VERTICAL TRAVERSE CONTROL KNOB, OPENS WHEN HANDWHEEL COMPLETES ONE REVOLUTION
6LS - LOCATED AT DOWNFEED STROKE CYLINDER, CLOSED WHEN DOWNFEED STROKE COMPLETE



REID BROS. COMPANY

ELECTRICAL SCHEMATIC For a Standard ... Downfeed

W-A-864-E1

SPINDLE MAINTENANCE

'ITNON

HELPFUL HINTS FOR MAINTENANCE

OF

WHITNON SURFACE GRINDER SPINDLES

Whitnon surface grinder spindles, as well as all of the other products in the Whitnon line, are ideally designed for the application for which they are intended. Great care is taken to select the materials durable enough to stand up for years of dependable operation. Considerations for strength and rigidity are always made part of the design.

Our manufacturing people are craftsmen who take pride in the work they do, knowing that the finished product is one of the finest available. They take no shortcuts for the sake of compromising quality, precision and rigidity.

While the Whitnon spindle is built with precision and rigidity, proper care must be exercised to maintain this precision and prolong spindle life just as is true of any other precision instrument. The intention here is to convey some helpful hints which will help extend the long life already built into your Whitnon spindle.

1. All Whitnon spindles are test run under no load conditions at our plant. During this test run, vibration and temperature rise are monitored. No spindle is shipped without first passing the rigid specifications established and enforced by our Engineering Department.

2. All good spindles will develop heat during operation. In the case of a surface grinder spindle, there are three sources of heat. The first is the motor, the second is the front seal, and the third is the bearing system. Operating temperatures over the motor may get as high as 150°F or 80°F above ambient, and temperatures of 125°F or 65°F above ambient over the spindle barrel are possible. These temperatures are hot to the touch so a pyrometer or some other temperature recording instrument should be used if a question of temperature arises.

3. During the initial run, it is possible to experience temperatures exceeding those previously stated over the spindle barrel. This may be caused by the excess grease in the bearing grease pockets migrating back to the bearings from vibration during transit. In effect, the bearings may be overlubricated which will cause an increase in operating temperature. If this occurs, shut off the spindle, let it cool and restart the unit. This cycle may have to be repeated 2 or 3 times, but usually once is enough.

    A. If the heat problem persists, call the Whitnon factory for further advice.

    B. While you may feel the motor is too hot, it is not too hot unless the sealing wax begins to melt and becomes visible over two set screws which secure the motor stator in the motor housing. When this occurs, call the Whitnon factory for further advice.

4. The amplitude of vibration reading on a Whitnon surface grinder spindle is less than .000050 peak to peak. If you feel you have a vibration problem, remove the grinding wheel and wheel holder, and shut off all pumps and machinery close by. In this way you will have excluded other sources and you can now run the spindle alone. In just about every case, you will find that the vibration is being transmitted from some other source. The other source can easily be found by starting or adding one possible source at a time. Make sure the wheel holder runs true and the wheel is dressed before a vibration check is made.

5. Never bang on a spindle. This can cause flat spots on the balls and in the races of the bearings (brinelling) which will cause noise and premature failure. Banging can also increase runout on the spindle nose.

6. Always remove the wheel holder with a puller.

7. If the combination wrench normally supplied with a surface grinder is bent at 90° half way between the socket and pin end, you will obtain better leverage for tightening and loosening the wheel nut and flanged hex nut. At least, if tapping the wrench is required, it will be transmitted to the bearings as a rotational force rather than a shock load.

8. Surface finish problems should be referred back to the original machine tool builder. These are almost always related to the wheel and dressing of the wheel unless the spindle and machine are old.

9. If you notice that the front end of the spindle seems to be throwing out grease, do not panic. The bearings are permanently lubricated for life with a grease that is the finest available. It will not flow or break down under 400°F. What is probably seen is some of the rust preventative solution which leaked into the labyrinth clearances prior to shipment. This will eventually disappear.

10. Never spray coolant directly on the spindle nose. The coolant belongs between the wheel and the workpiece. While the spindle is sealed, no seal lasts forever. In fact, the bearings will last a lot longer than the seal, so if you wish to take advantage of maximum bearing life, do not make the seal work by directing the coolant on the spindle nose.

11. When the day comes that your Whitnon spindle requires repair, send it back to our plant for restoration back to first class condition. This expert service will add more years to the life of the spindle and result in the best performance of your machine.

12. If you use on your surface grinder, a high speed attachment which is clamped over the spindle barrel, tighten the clamp only enough to secure in place. Do not over tighten as this will take out the clearances in the bearing bores, which can result in excessive heat and shortened bearing life. Also, do not over tension the belt to the high speed spindle.

13. The bearings in your Whitnon spindle are grease sealed and require no further maintenance.

We hope this information is useful and if these hints are used you will find that you will obtain many years of dependable service from your Whitnon spindle.

Whitnon Spindle, Div. of Mite Corp.
Rt 6 & New Britain Avenue
Farmington, Conn. 06032
Tel: 203-677-2607

MAINTENANCE AND TROUBLE SHOOTING GUIDE

H Y D R A U L I C P O W E R U N I T

TROUBLE SHOOTING GUIDE

Hydraulic mechanisms are precision units and their continued smooth operation depends on proper care. Therefore, do not neglect hydraulic systems. Keep them clean. Change the oil and oil filter (if present) at established intervals.

If, in spite of these precautions, improper operation does occur, the cause can generally be traced to one of the following:

1. Use of the wrong viscosity or type of oil.
2. Insufficient fluid in the system.
3. Presence of air in the system.
4. Mechanical damage or structural failure.
5. Internal or external leakage.
6. Dirt, decomposed packing, water sludge, rust, etc., in the system.
7. Improper adjustments.
8. Oil cooler plugged, dirty or leaking.

Some possible causes of specific troubles which may be encountered and their remedy are indicated in the succeeding pages.

HYDRAULIC POWER UNIT

MAINTENANCE

1. Make frequent inspections of reservoir oil level sight gauge to insure proper amount of oil in system.

2. Immersed suction line strainers and filters should be inspected every six months for excessive contamination or clogging. Clean or replace as required.

3. The frequency with which used oil should be drained and replaced depends on the nature of the oil and the operating conditions to which it is subjected.

   Visual inspection of the oil to note any change in appearance, such as darkening or thickening, may serve as a rough guide to indicate the need for a change. However, periodic testing of the oil, by submitting samples to your bulk supplier, is the safest way to determine when the oil needs changing.

4. Periodically check all mounting bolts of the pump and motor assembly to guard against possible loosening due to vibration and use. Also check motor/pump coupling, if applicable.

5. Always check to see that cover plate is properly bolted down, all filter/breather caps are in place and that the integrity of reservoir is preserved against the incursion of dirt and moisture.

6. Make certain the oil operating temperatures do not exceed prescribed limits and do not allow line or component leaks to go unattended.

IMPROPER OPERATION OF PUMPS

A. Failure of pump to deliver fluid.

Possible Causes	Remedy
1. Low fluid level in reservoir.	1. Add recommended oil, and check level on both sides of tank baffle to be certain pump suction line is submerged.
2. Oil intake pipe or suction filter plugged.	2. Clean filter or otherwise remove obstruction.
3. Air leak in suction line, preventing priming or causing noise and irregular action of control circuit.	3. Repair leaks.
4. Pump shaft turning too slowly to prime itself (vane type pumps only).	4. Check minimum speed recommendations in manufacturers' descriptive literature.
5. Oil viscosity too heavy to pick up prime.	5. Use lighter viscosity oil. Follow manufacturers' recommendations for given temperature and service.
6. Wrong direction of shaft rotation.	6. Must be reversed immediately to prevent seizure and breakage of parts due to lack of oil.
7. Broken pump shaft or parts broken inside pump. Shear pin or shear linkage broken.	7. Refer to manufacturers' literature for replacement instructions.
8. Dirt in pump.	8. Dismantle and clean.
9. On variable delivery pumps the stroke is not right.	9. Check pump manufacturers' instructions.

B. No pressure in the system.

Possible Causes	Remedy
1. Pump not delivering oil for any of the above reasons.	1. Follow remedies given above.
2. Relief valve not functioning properly. (a) Valve setting not high enough. (b) Valve leaking. (c) Spring in relief valve broken.	2. See below (a) Increase pressure setting of valves. (b) Check seat for score mark and reseat. (c) Replace spring and readjust valve.
3. Vane or vanes stuck in rotor slots (vane type pumps only).	3. Inspect for wedged chips or sticky oil.
4. Head too loose (very infrequent).	4. Must not be tightened too tightly. See manufacturers' instructions before tightening.
5. Free re-circulation of oil to tank being allowed through system.	5. Directional valve may be in open-center neutral, or other return line open unintentionally.
6. Internal leakage in control valves or cylinders.	6. To determine location progressively, block off various parts of circuit. When trouble is located repair.

C. Pump making noise.

Possible Causes	Remedy
1. Partially clogged intake line, intake filter or restricted intake pipe.	1. Clean out intake, strainer or eliminate restriction. Be sure suction line is completely open.
2. Air leaks (a) At pump intake piping joints. (b) At pump shaft packing (if present). (c) Air drawn in through inlet pipe opening.	2. See below. (a) Test by pouring oil on joints while listening for change in sound of operation. Tighten as required. (b) Pour oil around shaft while listening for change in sound of operation. Follow manufacturers' recommendations when changing packing. (c) Check to be certain suction and return lines are well below oil level in reservoir. Add oil to reservoir if necessary.
3. Air bubbles in intake oil.	3. Use hydraulic oil containing a foam depressant.
4. Reservoir air vent plugged.	4. Air must be allowed to breath in the reservoir. Clean or replace breather.
5. Pump running too fast.	5. Check recommended maximum speeds from manufacturers' descriptive bulletins.
6. Too high oil viscosity.	6. Use lower viscosity oil. Follow manufacturers' recommendations for given temperature and service.
7. Filter too small.	7. Capacity may be adequate only when just cleaned, and should have added capacity.
8. Rag, paper, etc., pulled into suction line or pump.	8. Remove.
9. Coupling misalignment.	9. Re-align.
10. Pump head too loose, or a faulty head gasket.	10. Test by pouring oil over head, replacing gasket or tighten head as is necessary.
11. Stuck pump vane (vane type pump).	11. Inspect for wedged chips or sticky oil, and reassemble.
12. Worn or broken parts.	12. Replace.

D. External oil leakage around pump.

Possible Causes	Remedy
1. Shaft packing worn.	1. Replace.
2. Head of oil on suction pipe connection.	2. Sometimes necessary, but will usually cause slight leakage. Keep all joints tight.
3. Damaged head packing.	3. Replace.

E. Excessive wear.

Possible Causes	Remedy
1. Abrasive matter in the hydraulic oil being circulated through the pump.	1. Install adequate filter or replace oil more often.
2. Viscosity of oil too low at working conditions.	2. Check pump manufacturers' recommendations or consult your lubrication engineer.
3. Sustained high pressure above maximum pump rating.	3. Check relief or regulator valve maximum setting.
4. Drive misalignment or tight belt drive.	4. Check and correct.
5. Air recirculation causing chatter in system.	5. Remove air from system.

F. Breakage of parts inside pump housing.

Possible Causes	Remedy
1. Excessive pressure above maximum pump rating.	1. Check relief or regulator valve maximum setting.
2. Seizure due to lack of oil.	2. Check reservoir level, oil filter and possibility of restriction in suction line more often.
3. Solid matter being wedged in pump.	3. Install filter on suction line.
4. Excessive tightening of head screws.	4. Follow pump manufacturers' recommendations.

IMPROPER OPERATION OF ACTUATING MECHANISMS

A. System inoperative.

Possible Causes	Remedy
1. Any of the reasons listed above.	1. Follow remedies given above.

B. Mechanisms creep when stopped in intermediate position.

Possible Causes	Remedy
1. Internal leakage in actuating cylinders or operating valves.	1. Replace piston packing or replace cylinder if walls are scored. Replace or repair valve.
2. Poppet in selector valve not seating.	2. Clean unit to remove foreign matter, then check cam clearance.

C. Times of operation longer than specified.

Possible Causes	Remedy
1. Air in system.	1. Bleed the system.
2. Internal leak in actuating cylinder or selector valve.	2. See remedy for B: 1 and 2 (page 76).
3. Worn pump.	3. Repair or replace.
4. If action is sluggish on starting up, but somewhat less sluggish after operating temperatures have increased, or if action slows down after warm up (depending on equipment and circuit design), it is probable that viscosity of the oil is too high.	4. Consult pump manufacturers' recommendations, or your oil supplier for correct oil viscosity.
5. Low auxiliary control pressure.	5. Control lines may be too small, particularly if they are long.

D. External oil leakage.

Possible Causes	Remedy
1. End caps.	1. Tighten if possible or replace gasket if necessary.
2. Packing gland.	2. Tighten, or replace packing if necessary.

E. Abnormal packing gland wear.

Possible Causes	Remedy
1. Cylinder not securely fastened to frame, causing vibration.	1. Tighten. This should be checked periodically.
2. Misalignment of cylinder and piston rod extension.	2. Check and correct.
3. Side load on piston rod.	3. Revise construction to eliminate side loads.

IMPROPER OPERATION OF ACCUMULATOR

A. Pressure from accumulator drops suddenly when position of selector valve is changed.

Possible Causes	Remedy
1. Internal or external leak in accumulator.	1. Repair leak or replace accumulator valve core (if present).

B. When pump is running pressure is normal, but when pump is stopped no pressure is available.

Possible Causes	Remedy
1. Leaking gas valve or leaking check valve in hydraulic line.	1. Replace valve.

C. Sluggish response from accumulator.

Possible Causes	Remedy
1. Stoppage of oil screen in accumulator (if present).	1. Dismantle accumulator and clean screen.
2. Gas precharge not sufficient.	2. Precharge according to manufacturers' instructions, also check for gas leaks.

Be sure all internal pressure is released before repairs are made on accumulators.

EXCESSIVE HEATING OF OIL IN SYSTEM

A. Heating caused by power unit (reservoir, pump, relief valve and coolers).

Possible Causes	Remedy
1. Relief valve set at a higher pressure than necessary, excess oil dissipated through increased slippage in various parts, or through relief valve or through throttle valve.	1. Reset relief valve to slightly above maximum pressure required for work stroke. Check manufacturers' recommendations for maximum pressure settings.
2. Internal oil leakage due to wear.	2. Repair or replace pump.
3. Viscosity of oil too high.	3. Follow manufacturers' recommendations for correct viscosity grade to be used at various temperatures.
4. Pumps assembled after overhaul may be assembled too tightly. This reduces clearances and increases rubbing friction.	4. Follow manufacturers' instructions when reassembling.
5. Leaking check valves or relief valves in pump.	5. Repair.
6. Improper functioning of oil cooler or coolant is cut off.	6. Inspect cooler and see that it is working properly.
7. Automatic unloading control inoperative.	7. Repair valve.

ating because of conditions in system.

	Remedy
1. Air	1. If lines are crimped, replace; if partially plugged for any reason, remove obstruction.
2. I- va' properly.	2. Make certain that open-center valves are neutralized, and that any pressure-relieving valves are in the correct position. Only small pump volumes should be allowed to remain at high pressures when clamping or running idle for long periods of time.
on.	3. Use artificial cooling.
as.	4. Locate leaks then replace packing.
voir too small to provide adequate cooling.	5. Replace with larger reservoir, or install cooler.
Undersize valves or piping.	6. Check flow velocity through lines and valves and compare with manufacturers' recommendations. If excessive, replace by installing larger equipment.

Note: *If system operates continually at high operating temperatures, consideration should be given to the installation of an oil cooler.*

IMPROPER OPERATION OF FLUID MOTORS

A. Motor turning in wrong direction.

Possible Causes	Remedy
1. Incorrect piping between control valve and motor.	1. Check circuit to determine correct piping.

B. Motor not turning over or not developing proper speed or torque.

Possible Causes	Remedy
1. System overload relief valve adjustment not set high enough.	1. Check system pressure and reset relief valve.
2. Relief valve sticking open.	2. Remove dirt under pressure adjustment ball or piston.
3. Free recirculation of oil to reservoir being allowed through system.	3. Directional control valve may be in open center neutral or other return line unintentionally open. Repair or replace valve.

4. Driven mechanism binding because of misalignment.	4. Remove motor and check torque requirement of driven shaft.
5. Pump not delivering sufficient pressure or volume.	5. Check pump delivery and pressure.
6. Motor yoke not set at proper angle (on adjustable motors).	6. Adjust pump yoke angle by means of hand wheel.

C. External oil leakage from motor.

Possible Causes	Remedy
1. Gaskets leaking (may be due to reservoir drain not being connected if this is required).	1. Replace. (If drain line required it must be piped directly to reservoir.)

REPAIR PARTS ORDERING PROCEDURE

PARTS ORDERING INFORMATION

TO ORDER REPAIR PARTS:

1. State the machine SERIAL NUMBER.

2. State the MODEL of your machine.

3. State the QUANTITY of each part required.

4. State the PART NUMBER and NAME from the parts manual.

5. State exact SHIPPING INSTRUCTIONS:

   (a) Specify where to ship.
   (b) Specify the type of shipping agency.
   (c) Specify regular delivery, special delivery or special handling.

6. Forward all requests for repair parts to our authorized representative in your area or the the attention of CUSTOMER SERVICE DEPARTMENT at the Home Office of Fayscott, Dexter, Maine.

NOTE: The serial number for the machine for which the repairs parts are needed is necessary so that the Service Department can check and furnish the proper parts to fit your machine. This will avoid unnecessary delays and possiblities of errors.

The serial number is shown on the nameplate attached to the front of the hydraulic power unit and is also stamped on front of machine base under the cross feed handwheel.

MISCELLANEOUS INSTRUCTIONS

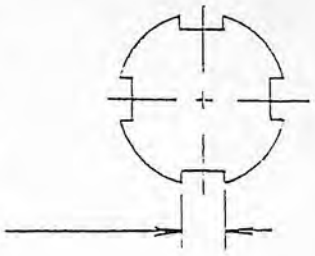
INSTRUCTIONS FOR GRINDING CHUCK

Grinding in a chuck to the table of its grinder is extremely important to the flatness and finish which will be obtained. Grinding the chuck is easy, but must be done with care. The following procedures should be followed carefully.

GENERAL INSTRUCTIONS

-- Use the proper grinding wheels -- 32A46-G12VBEP or equivalent for a new Walker chuck -- 384H or equivalent for others.

-- Due to the different materials on the top of the chuck, there is a tendency for uneven heat build up during grinding which can cause distortion. To avoid, use wet grinder for top if available. If not, it is suggested that the grinding wheel be opened by grinding slots as illustrated, using a pedestal or snagging grinder. Then rebalance the slotted wheel.



Grinding The BOTTOM Of The Chuck

1. Diamond (rough) dress wheel using fast cross feed. Remove 2 to 3 thousandths (.002 to .003) from the wheel dresser.
2. Mount chuck bottom side up, and hold down with chuck clamps in reversed position. Do not over-tighten the clamps!
3. Start grinding from the high point of the chuck. Use top speed if the grinder is a power model. Use normal speed if grinder is a hand feed -- but not slow.
4. Cross feed at approximately 150 thousands (.150).
5. Make one pass only across the chuck.
6. Rough re-dress wheel as in Step 1. Then repeat steps 3, 4 and 5, until surface is flat.

Grinding In The TOP Of The Chuck

1. Remove the chuck from its bottom up position, and thoroughly clean the table top and bottom of chuck.
2. Place the chuck face up in its normal position, and clamp to the table. Then magnetize the chuck. Remember -- don't over-tighten the clamps.
3. Re-dress the wheel, as in Step 1, above.
4. Grind the top of the chuck exactly as you ground the bottom (Steps 3, 4, 5 and 6 above).

RWC/mk
7/26/75

REID-O-MATIC
MISCELLANEOUS INSTRUCTIONS

Please contact our local sales representative in your area or our CUSTOMER SERVICE DEPARTMENT for any instructions not included in this manual.

When ordering additional instructions:

1. State the machine SERIAL NUMBER.
2. State the MODEL of your machine.
3. State the type of INSTRUCTIONS required.
4. State exact MAILING INSTRUCTIONS:
   (a) Specify where and to whom to mail.
   (b) Specify regular delivery or special handling.

NOTE: The serial number is shown on the nameplate attached to the front of the hydraulic power unit and is also stamped on the front of the machine base under the cross feed handwheel.