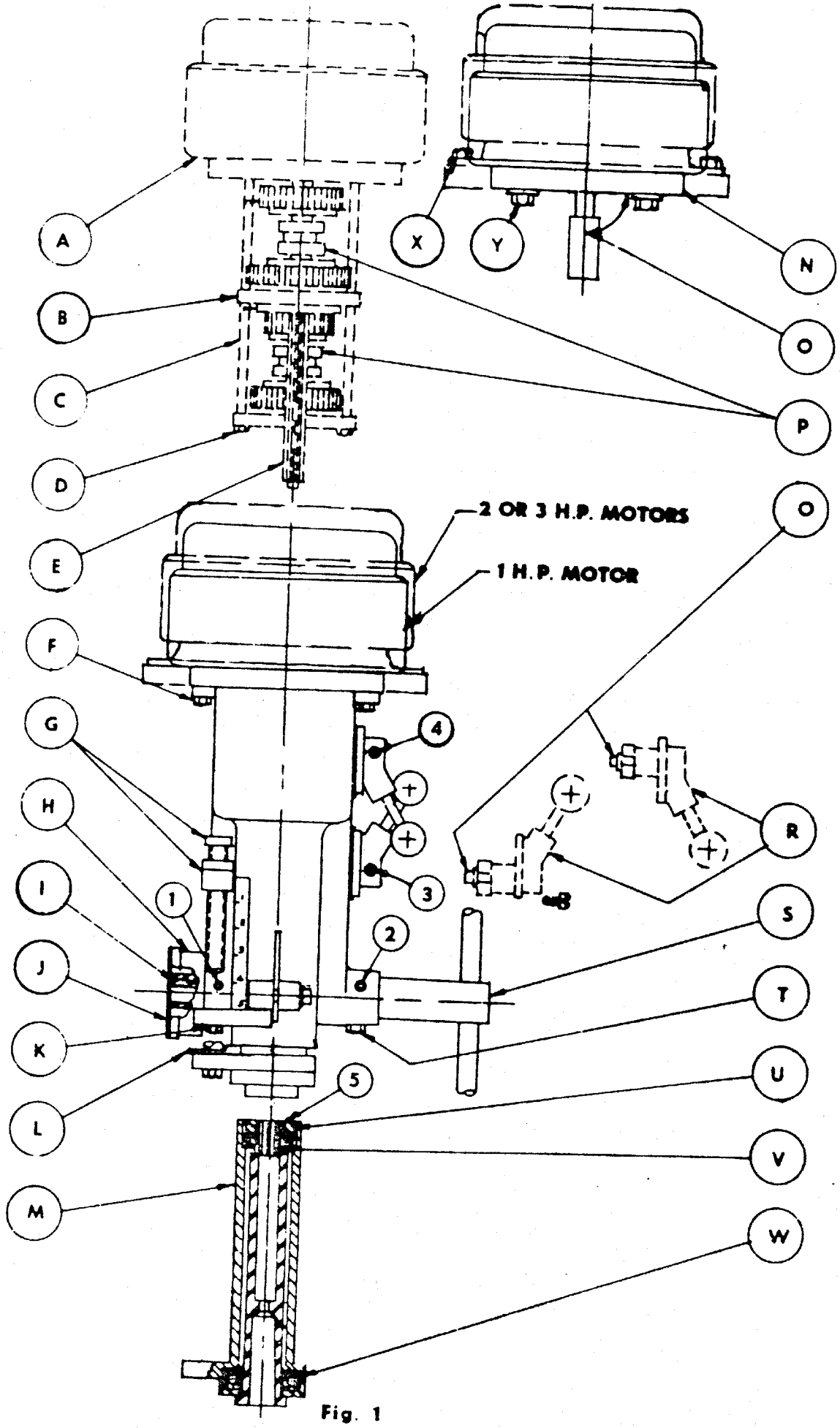

A
B
C
D
E
F
G
H
I
J
K
L
M
X
Y
N
O
P
2 OR 3 H.P. MOTORS
1 H.P. MOTOR
O
R
S
T
U
V
W
1
2
3
4
5

Fig. 1

DRILLING HEAD

(Figure 1)

OPERATING INSTRUCTIONS

General Information:

The gear train on this drill head is equipped with high grade shaved gears throughout. There may seem to be an excess of noise from these gears when the machine is new, but this noise will diminish as the gears wear in, or seat themselves. After a few months operation only the normal hum expected from a gear train will be noticed.

Change spindle speeds while the machine is running but not under load

All gears are constantly in mesh, so there is no danger of any gears being stripped. Any noise you may hear is clutches being engaged and no damage will result.

Until the head wears in, slight difficulty may be experienced in shifting into top speeds. This difficulty can be overcome by:

1) Turn to "Off"
2) Shifting gear levers, and
3) Turn to "On"

DRILL EJECTOR:

To eject drill or chuck from spindle, move stop lever L out of position and and come up hard with quill. Tool will fall out. Do not hesitate to come up with enough force to crack taper shank loose.

MAINTENANCE

OILING AND LUBRICATION INSTRUCTIONS:

The grade and type of oil used throughout the machine should be SAE 30 machine oil of any brand name.

The drilling head and its gear train are equipped with a centrifugal type, re-circulating oil pump. Fill with oil thru filler cap until oil level shows in the sight window on the right side of the drill head.

Check oil level only with spindle and motor turned OFF.

Under normal operating conditions, drain and change the oil every three months. Remove the pipe plug which is located under the head to drain.

The power feed housing oil should be filled until the proper level is established as shown in oil sight window of the power feed housing. Do not fill with oil above the sight window as the oil will just run out.

To drain the oil out, remove the pipe plug located on the underside of the housing.

All other places such as cup-type or ball-type oilers, add a few drops of machine oil once a week.

SERVICE AND ADJUSTMENT

TO DISASSEMBLE FOR SERVICE:

To disassemble this unit for service or inspection, follow these few simple rules:

1. Loosen screw K slightly and allow quill return spring housing H to rotate slightly forward (clockwise) until all tension on this spring has been eliminated.

CAUTION: If screw K is loosened and quill spring housing H is allowed to rotate rapidly the back lash on the quill return spring will invariably cause the spring to break.

2. Remove stop nut and dials G from depth screw. Rotate feed handle or pinion forward until quill drops out from housing.

3. Remove the two gear shift lever assemblies R from housing.

4. Motor A and gear train B are built into one unit. Remove the four bolts F and lift straight up on motor. The complete assembly will come out.

5. By removing four nuts D and four tie-rods C, the complete gear train is disassembled.

TO REMOVE QUILL SPRING HOUSING:

1. Release tension on quill spring, as in step #1 above.

2. Remove housing cover J.

3. Remove screw K. The housing will then slip out.

TO REMOVE QUILL PINION S:

1. Remove screw T.

2. Remove quill spring housing. Pinion will then slide out from housing.

TO REMOVE OR REPLACE MOTOR:

Remove the four screws X and lift motor out.

1. Motor shaft O must be square to motor mount within .005" T.R.I. on its outer rim. If this is not observed, serious damage may result in the gear train.

2. Before replacing gear train in housing, run-out on spindle shaft E. Should run within .003" T.I.R.

After gear train is in place, before bolts F are tightened insert quill assembly M and make sure that spline shaft E and spline bushing V are running concentric.

3. In replacing gear shift lever assemblies R in housing, caution must be

4. In replacing quill M. make sure that splines in bushing V are lined up with splines on spindle drive shaft E. NEVER TRY TO FORCE QUILL INTO HOUSING!

TO REMOVE SPINDLE PLAY:

1. First remove quill M from housing.
2. Tighten up on ball bearing locknut U and re-lock with lockwasher.
3. Rap a quick blow with a piece of hardwood (never use a steel or lead hammer) on top of spindle so that bearings may be seated properly. Spindle should turn freely without any looseness, but not so tight as to cause damage to angular contact bearing W.

SAFETY FACTOR

SPLINE BUSHING V IS FASTENED TO SPINDLE WITH TWO SMALL SCREWS AT 5 THAT SERVE AS SHEAR PINS. SHOULD SUDDEN SHOCK LOAD BE IMPOSED AND IT IS FOUND THAT MOTOR AND GEAR TRAIN ARE RUNNING BUT SPINDLE IS NOT TURNING, REMOVE QUILL ASSEMBLY M AND INSTALL NEW SHEAR PINS.

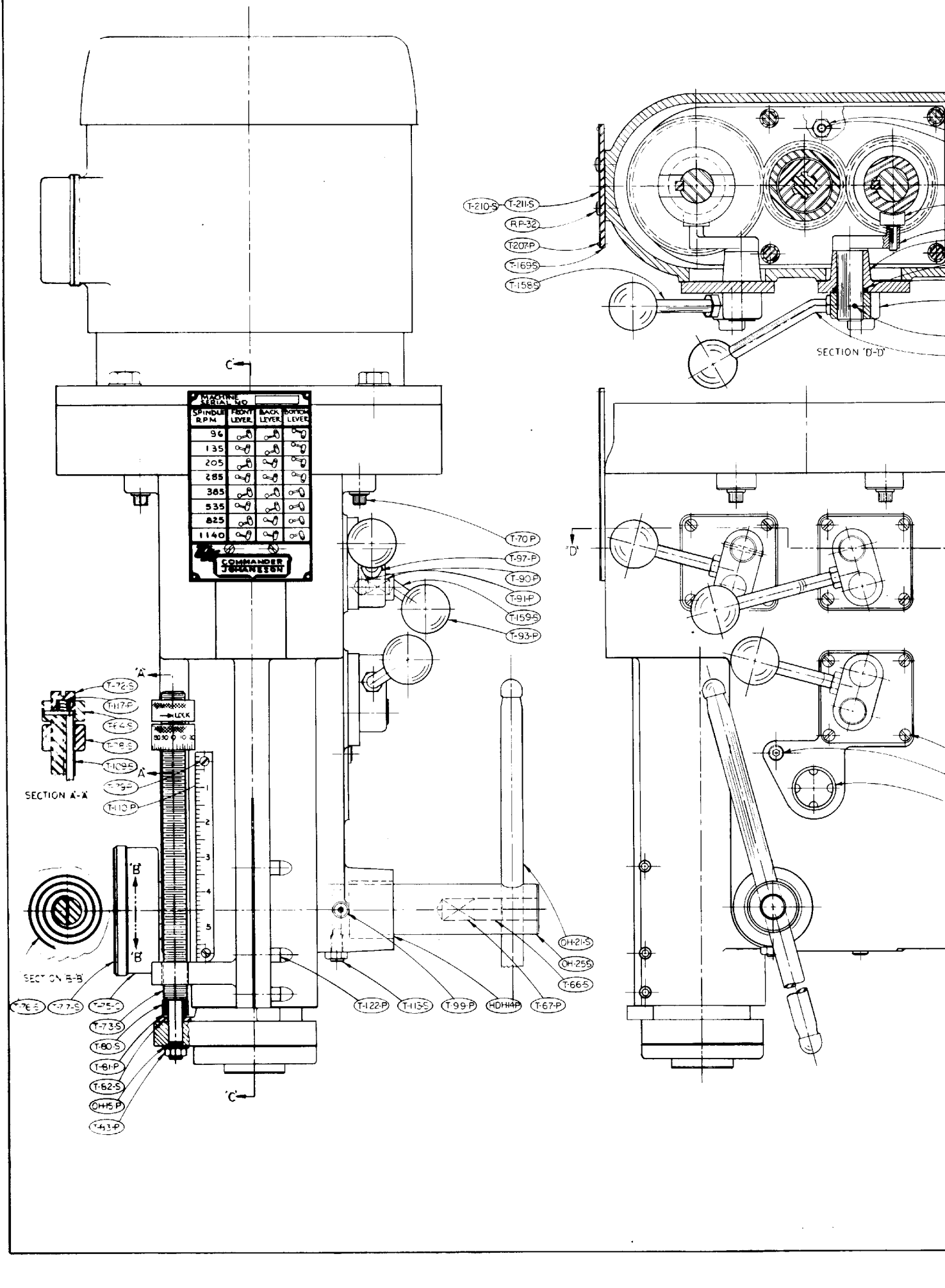
STANDARD DUTY DRILLING HEAD

Part No.	Description
T-2-SC-3	Quill, #3 MT
T-2-SC-4	Quill, #4 MT
T-3-S-3	Spindle, #3 MT
T-3-S-4	Spindle, #4 MT
T-4-S	Retainer
T-6-S	Ejector, #4 MT
T-8-S	Ejector, #3 MT
T-9-S	Gear Rack
T-12-C	Bearing Support
T-17-S	Spline Shaft
T-55-C	Bearing Support
T-64-S	Nut, Lock
T-66-S	Plug, Friction
T-72-S	Retainer, Spring
T-73-S	Screw, Depth
T-75-C	Housing, Spring
T-76-S	Helical Spring
T-77-S	Cover, Housing
T-78-S	Nut, Depth Stop
T-80-S	Housing, Spring
T-82-S	Stop, Drill Ejector
T-84-S	Finger, Clutch
T-85-C	Shaft, Speed Changing
T-94-S	Spacer
T-95-S	Spacer
T-96-S	Tie Rod
T-106-B	Bushing, Spline
T-107-R	Housing, Main
T-109-S	Rod, Locking
T-110-C	Housing, Pump
T-113-S	Screw, Dog Point
T-135-S	Key
T-136-S	Key
T-139-S	Coupling, Motor
T-140-S	Coupling, Motor
T-146-C	Motor Mount
T-158-S	Handle, Speed Control
T-159-S	Handle, Speed Control
T-160-C	Lever, Speed Change
T-169-S	Bracket
T-201-S	Key
T-202-S	Spacer
T-203-S	Key
T-204-S	Clutch
T-205-S	Spacer
T-206-S	Key
T-207-S	Retainer
T-208-S	Shaft, Driven
T-209-C	Bracket, Speed Changing
T-210-S	Legend Plate
T-211-S	Legend Plate
100-S-31	Spur Gear
100-S-32	Spur Gear
100-S-33	Spur Gear
100-S-34	Spur Gear
100-S-35	Spur Gear
100-S-36	Spur Gear
100-S-37	Spur Gear
100-S-38	Spur Gear
100-S-39	Pinion
100-S-40	Spur Gear
HDH-68	Gasket
HDH-97	Impeller, Oil Pump
OH-21-S	Hand Lever
OH-25-S	Pinion

1/14/75

STANDARD DUTY DRILLING HEAD
STANDARD COMMERCIAL PARTS

Part No.	Part Name	Manufacturer Stock No.
T-4-P	Male Connector	Weath. 68 x 4
T-5-P	Ann. Copper Tube	Std.
T-6-P	Bearing, Ball	Q 30203 GR 3
T-8-P	Binder Head Screw	Std. 1/4-20 x 1/2
T-10-P	Bearing, Ball	477604
T-44-P	Bearing, Ball	2499505
T-50-P	Oil Seal	CR 15532
T-57-P	Locknut	N-07
T-58-P	Lockwasher	W-08
T-59-P	Bearing, Ball	773L07
T-67-P	Spring, Compression	Dan. 9100611
T-70-P	Ferry Cap Screw	Std. 3/8 x 24 x 1
T-79-P	Binder Head Screw	Std. 6-32 x 1/4
T-81-P	Spring Commpression	Special
T-83-P	Jam Nut	Std. 3/8-16
T-87-P	Fillister Head Screw	10-24 x 3/8
T-90-P	Ball, Steel	Std.
T-91-P	Spring, Compression	Special
T-93-P	Ball, Control	Reid #R-15
T-97-P	Jam Nut	Std. J 3/8-24
T-99-P	Oiler	Gits #522
T-110-P	Aluminum Scale	
T-113-P	Round Head Screw	Std. 8-32 x 3/4
T-117-P	Spring,Compression	Special
T-119-P	O-Ring	Natl. #622741
T-121-P	O-Ring	Natl. #622715
T-122-P	Socket Cap Screw	Nylok Std. 1/4-20 x 1
T-131-P	Bearing, Ball	ND 4773L09
T-133-P	Spindle Motor	NEMA Std.
T-137-P	Bearing, Ball	ND 477602
T-201-P	Retaining Ring	Truarc 5100-200
T-202-P	Retaining Ring	Truarc 5100-59
T-203-P	Ball Bearing	ND 4773L02
T-204-P	Retaining Ring	Truarc 5100-98
T-205-P	Ball Bearing	ND 73L05
T-206-P	Retaining Ring	Truarc 5000-185
T-207-P	Drive Screw	McMast. #90-081A
BP-17	Cap Screw	Std. 1/2 x 13 x 1-1/4
BP-31	Lockwasher	Std. 1/2
HDH-14-P	Bearing, Br. Cycl.	Bost. M2326-14
HDH-15-P	Bearing, Ball	477504
HDH-48-P	Roll Pin	Std. 1/8 x 1
HDH-59-P	Oil Sight Gauge	Std. Bijur
LST-4-P	Cap Screw	Std. 10-24 x 3/8
OH-15-P	Lockwasher	Std. 3/8
PFP-58	Pipe Plug	Std. 1/8 N.P.T.
RP-32	Binder Head Screw	Std. 10-24 x 1/2


MACHINE SERIAL NO.
SPINDLE R.P.M.
FRONT LEVER
BACK LEVER
BOTTOM LEVER
96
135
205
285
385
535
825
1140
COMMANDER JOHANSSON
T-210-S
T-211-S
R.P-32
T207-P
T-169-S
T-158-S
SECTION 'D-D'
T-70-P
T-97-P
T-90-P
T-91-P
T-159-S
T-93-P
'A'
'A'
T-72-S
T-117-P
T-74-S
T-108-S
T-109-S
T-73-S
T-110-P
SECTION A-A
'B'
'B'
SECTION B-B
T-76-S
T-77-S
T-75-S
T-73-S
T-80-S
T-81-P
T-82-S
OH-15-P
T-43-P
T-122-P
T-113-S
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HDH14P
T-67-P
OH-21-S
OH-25-S
T-66-S
'C'
'C'
'D'

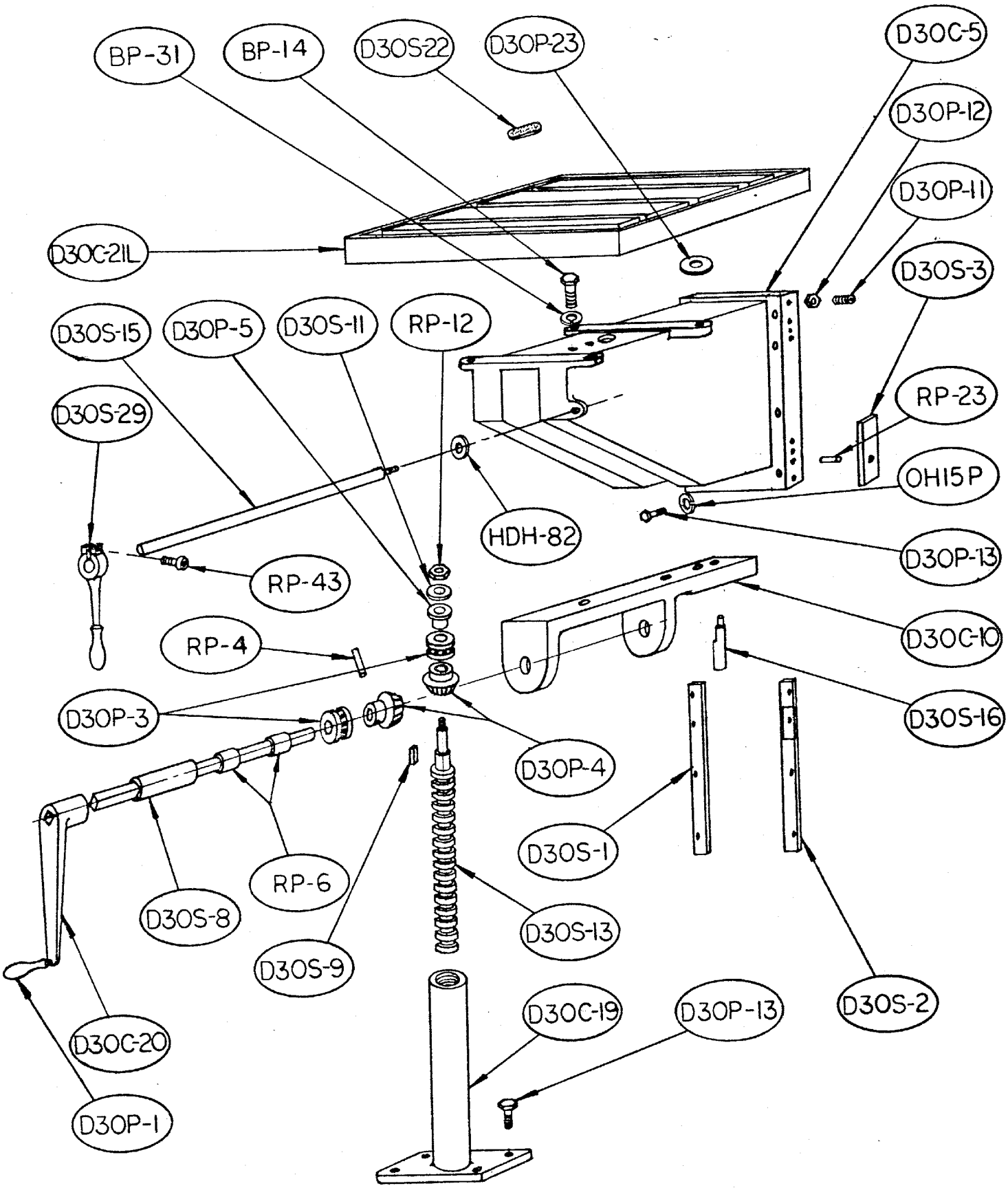


TABLE ELEVATION

STANDARD TABLE ELEVATION

Part Number	Description	Part Number	Description
D30S-1	Gib, L.H.	D30S-15	Lock Screw, Table
D30S-2	Gib, R.H.	D30S-16	Stop, Table Depth
D30S-3	Gib, Adjustable	D30C-19	Nut, Elev. Screw
D30C-5	Knee	D30C-20	Crank
D30S-8	Shaft, Table Elevating	D30C-21L	Table
D30S-9	Key	D30S-22	Strainer, Coolant
D30C-10	Bracket, Miter Gear	D30S-29	Handle, Machine
D30S-11	Washer	HDH-82	Washer
D30S-13	Feed Screw, Table Elev.		

STANDARD COMMERCIAL PARTS

D30P-1	Balcrank H3309	BP-14	1/2-13 x 1-1/2 Hx.Hd.Sc.
D30P-3	Nice 607	BP-31	Lock Washer,1/2
D30P-4	Boston L103-Y	OH-15-P	Lockwasher, 3/8
D30P-5	Boston FB-1216-6	RP-4	#2 x 1-1/2 Taper Pin
D30P-11	3/4-16-x 1 Sock.Set Screw	RP-6	Boston B-1216-6
D30P-12	3/8-16 Jam Nut	RP-12	1/2-20 Jam Nut
D30P-13	3/8-16 x 2 Hex Hd. Screw	RP-23	1/4 x 1 Dowel Pin
D30P-23	Washer	RP-43	1/4-20 x 3/4 Socket Cap

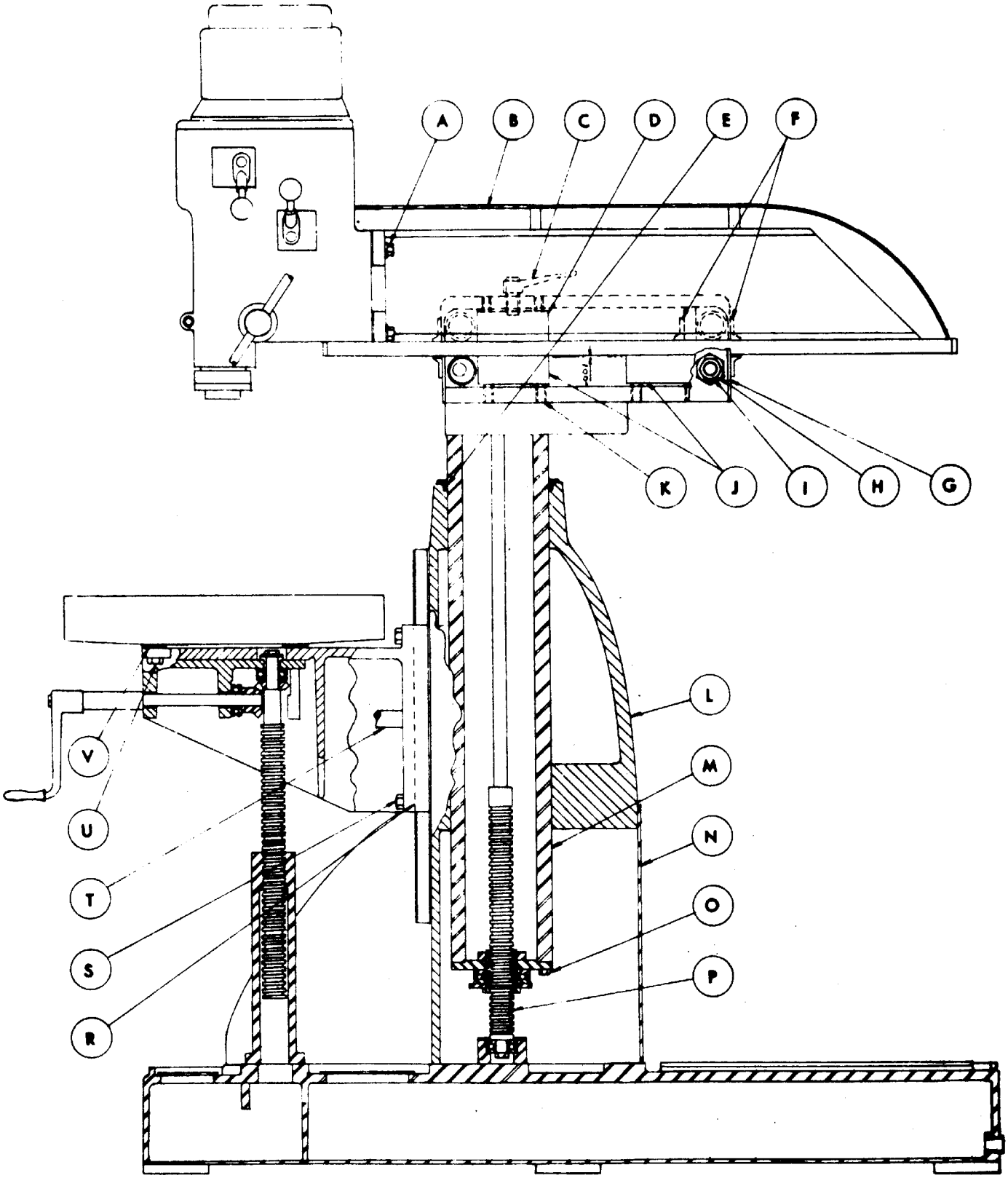


FIG. 2

RADIAL DRILL
(Figure 2)

OPERATING INSTRUCTIONS

Ram Movements:

Ram is moved up and down by crank which fits on square hub at right side of machine as you face it.

Ram is moved back and forth and rotated directly by hand.

Locks:

1. Locks for ram are at C. CAUTION: Very little force is required on lock lever C to lock ram securely. An excess of pressure on these levers might eventually cause damage to machine.
2. Column is locked against rotation by actuating lock handles at right side of column housing as you face machine.
3. Table is locked in position by lock handle to right of elevating crank, as you face machine.

MAINTENANCE

Oiling Instructions:

Ways of ram should at all times be covered with a fine film of oil (to prevent corrosion, not for lubrication purposes).

Once every six months the rear cover N should be removed and some light oil placed on elevating screw P and post M.

Post M should always have a light film of oil for ease of operation and to prevent corrosion.

By saturating felt wiper E with oil, post M will keep clean and covered with a film of oil at all times.

Way Wipers:

If the neoprene way wipers F fail to keep the ways completely clean at all times, the wipers should be adjusted for extra pressure or, if need be, replaced with new ones.

When adjusting or replacing wipers, position wipers so neoprene touches the ways, then force them down another 1/32" and hold until wiper is secured.

SERVICE AND ADJUSTMENT

If, after some use, it should be found that the spindle in the drill press head is not square to table surface, and/or that the ram does not travel parallel to the table surface and the rear work pad surface, the whole machine can be re-adjusted quickly and easily to the desired accuracy.

To Adjust Ram Parallel to Rear Work Pad:

1. Remove ram cover B.
2. Remove way wipers F and front and rear covers G.
3. Unscrew the set screws K for the four bottom support blocks J and the two top blocks D.
4. Put one wrench on eccentric shaft H and one wrench on nut I, and loosen the two top cam rollers.
5. Rotate the eccentric shaft H to move the cam rollers up from the ways.
6. Rotate ram 180° so that head is over rear platform. Secure an indicator in spindle.
7. Slide ram back and forth.
8. Turn bottom eccentric shaft H until ram is parallel to bottom pad surface. CAUTION: All four cam rollers must be touching ram.

After the desired accuracy is obtained,

1. Secure the four bottom eccentric shafts H securely.
2. Bring the top cam rollers down against the ram ways leaving only .001" clearance.
3. Bring support blocks J and D up against ram ways using .001" feeler gauge to maintain proper clearance. CAUTION: This adjustment must be performed properly or the machine will not function.

To Adjust Table Top Surface Parallel to Ram:

1. Place indicator on drill press head and slide forward and back and also rate on post M.
2. By removing the four screws U, the spacers V can then be removed. Grind off from spacers V whatever material is necessary to bring table surface parallel to ram.

CAUTON: When replacing table, make sure table rests on all four pads or an intensive twist will be imposed on the table when screws are replaced.

To Adjust Spindle Square with Table Surface:

1. Place an indicator holder in spindle, setting the indicator to any desired circle diameter deemed necessary.
2. Rotate spindle.
3. By loosening screws A and removing dowel pins either the top or bottom spacers can be removed to grind off required material.
4. When indicator shows spindle to be square to table surface, tighten these screws securely, re-dowel and re-check with indicator.

The machine should now be square and parallel with all work surfaces.

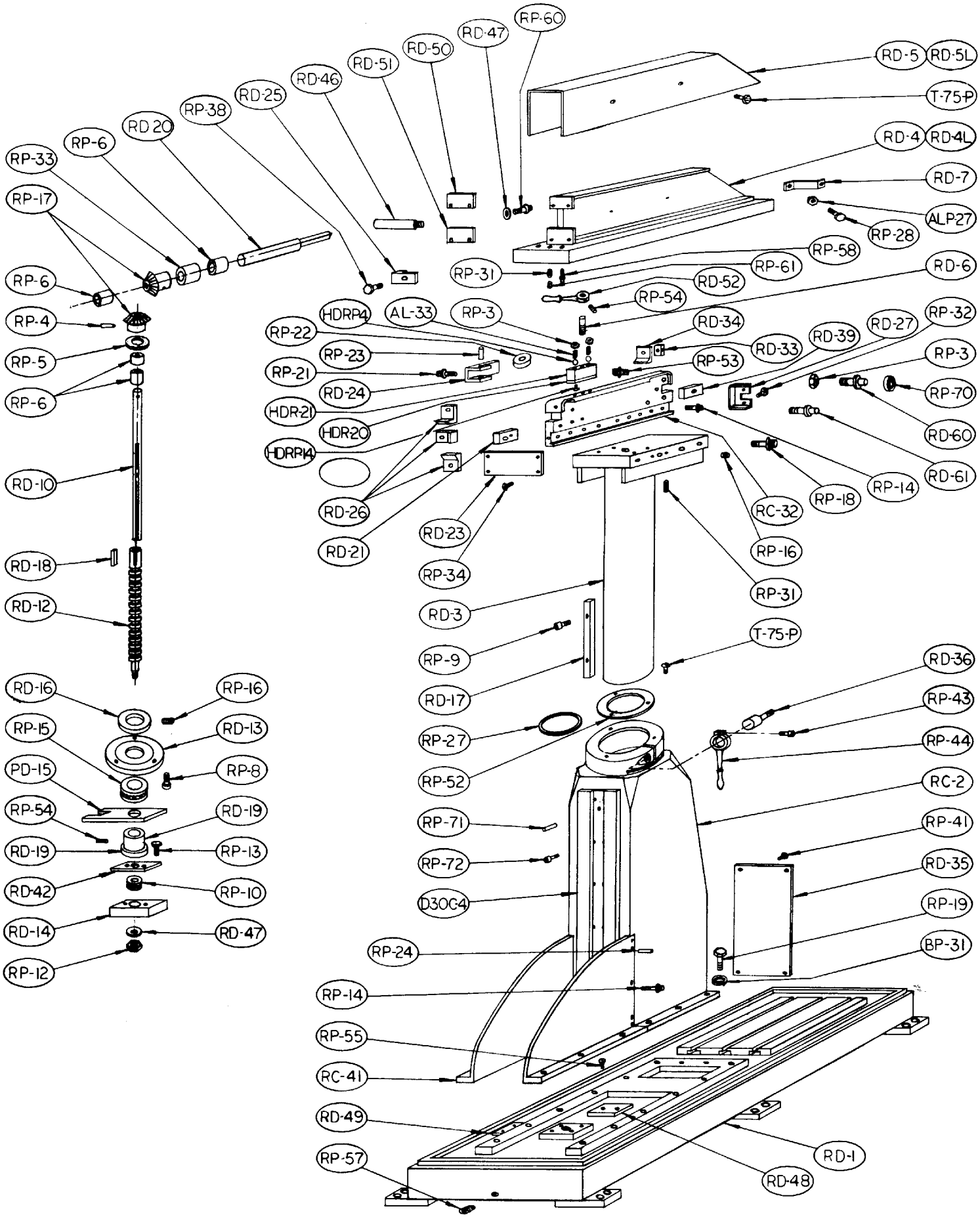
To Adjust Knee Lock:

1. Remove bolts S and lock stud T. Gib R will then drop out.
2. Place gib on surface grinder and remove .0002" - .003" maximum on the front, or narrow, portion of the gib.
3. Replace gib and tighten bolts securely.
4. If lock still does not operate satisfactorily, repeat this procedure.

Knee should slide on dovetail without binding, but should be tight without any play at all times.

To Remove Post M from Housing L:

Remove three screws at O and the post will then slide out of housing quite readily.



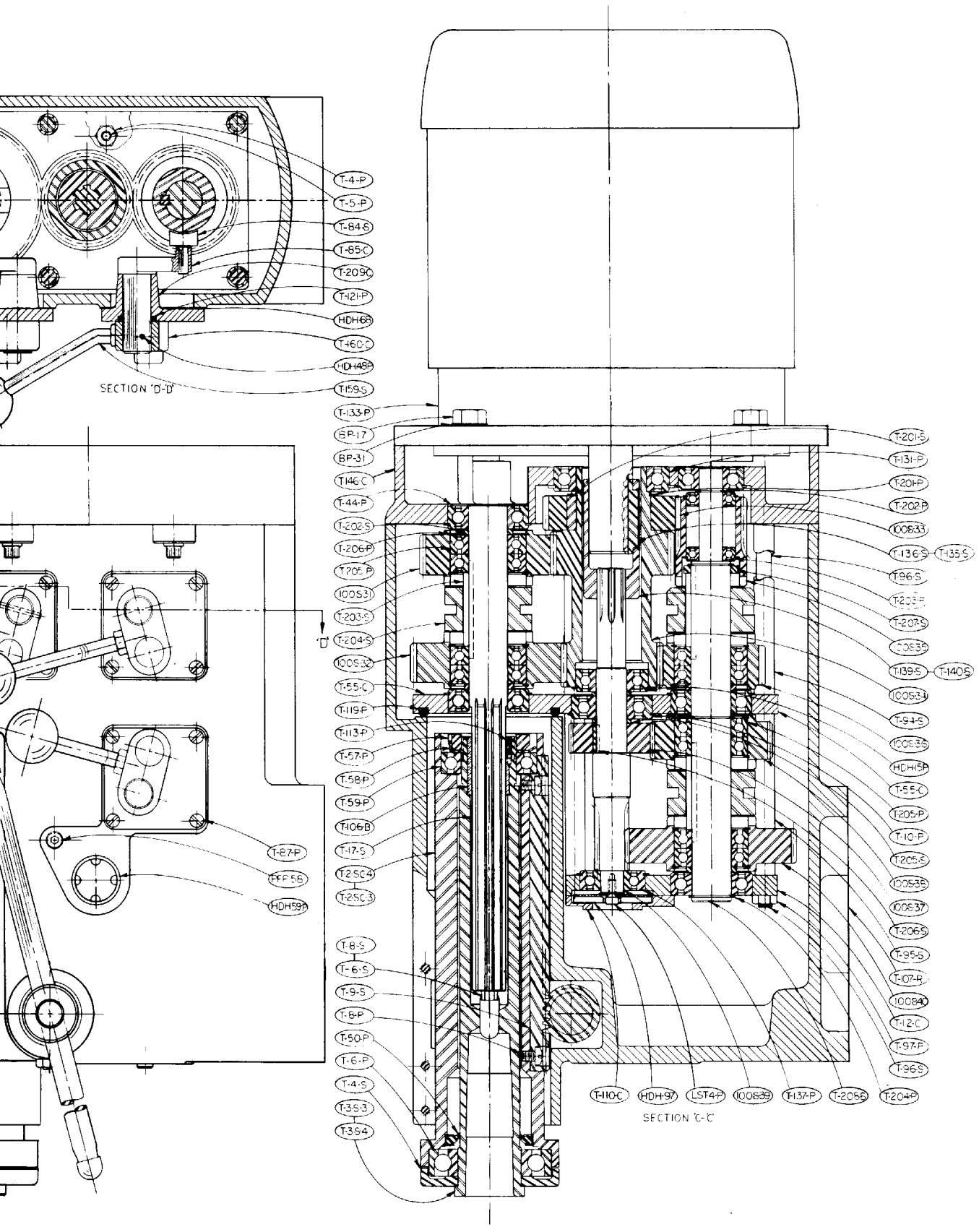
STANDARD DUTY RADIAL DRILLING MACHINE

RADIAL DRILLING MACHINE

Part Number	Description	Part Number	Description
RD-1	Base	RD-26	Way Wiper
RC-2	Housing, Column	RD-27	Housing, Way Wiper
RD-3	Column	RC-32	Ram Housing
RD-4	Ram, Standard	RD-33	Inside Wiper Housing
RD-4L	Ram, Long	RD-34	Inside Wiper
RD-5	Cover, Ram, Standard	RD-35	Cover, Rear
RD-5L	Cover, Ram, Long	RD-36	Lock, Stud
RD-6	Lock Stud, Ram	RD-39	Rear Support Block
RD-7	Support Bracket, Ram Cover	RC-41	Side Support
RD-10	Shaft, Elevating	RD-42	Retainer, Bearing
RD-12	Screw, Elevating	RD-46	Handle
RD-13	Bottom Cap, Column	RD-47	Washer
RD-14	Housing, Thrust Bearing	RD-48	Cover, Coolant
RD-15	Guide Plate	RD-49	Cover, Cleanout Hole
RD-16	Nut, Retainer	RD-50	Plate Filler
RD-17	Guide Bar	RD-51	Plate Filler
RD-18	Drive Key	RD-52	Handle, Machine
RD-19	Nut, Ram Elevating	RD-60	Eccentric Shaft
RD-20	Shaft, Crank	RD-61	Bearing Shaft
RD-21	Support, Front	HDR-20	Wear Strip
RD-23	Cover, Roller	HDR-21	Block, Ram Support
RD-24	Housing, Roller	AL-33	Stud, Ram Locking
RD-25	Stop, Ram	D30C-4	Way, Knee

STANDARD COMMERCIAL PARTS

RP-3	3/4-16 Jam Nut	RP-33	Boston 1220-8
RP-4	#2 x 1-1/2 Taper Pin	RP-34	10-24 x 3/8 Round Head
RP-5	Boston TB-1225	RP-38	3/8-16 x 1" Hex Screw
RP-6	Boston B-1216-6	RP-41	10-24 x 1/4 Round Head
RP-8	1/4-20 x 3/4 Hex Screw	RP-43	1/4-20 x 3/4 Socket Cap
RP-9	1/4-20 x 1 Socket Cap	RP-44	8" Machine Handle
RP-10	Nice 1200-36	RP-52	Washer, Special
RP-12	1/2-20 Jam Nut	RP-53	5/16-18 x 3/4 Countr Bor.
RP-13	5/16-18 x 2" Hex Screw	RP-54	1/4-20 x 3/8 Socket Set
RP-14	3/8-16 x 1 Countr.Bor.	RP-55	1/4-20 x 1/2 Round Hd.
RP-15	Nice 626	RP-57	1/2" Pipe Plug
RP-16	10-24 x 3/8 Socket Set	RP-58	3/8 x 1-1/2 Dowel Pin
RP-17	Boston L-103-Y	RP-60	1/2-13 x 1-3/4 Ctr.Br.Sc.
RP-18	1/2-13 x 1 Countr-Bor	RP-61	1/2-13 x 1/2 Sock.Set Sc.
RP-19	1/2-13 x 1-3/4 Hex Screw	RP-70	N.D. #Z9504B
RP-21	3/8-16 x 3/4 Countr-Bor	RP-71	3/4 x 2" Dowel Pin
RP-22	McGill CYR 3/4	RP-72	5/16-18 x 1½ SDC Cap Screw
RP-23	1/4 x 1 Dowel Pin	ALP-27	1/4 - 20 Hex Nut
RP-24	1/2 x 1 Dowel Pin	BP-31	1/2 Lock Washer
RP-27	Wiper, Felt	HDRP-4	5/8 dia. Steel Ball
RP-28	1/4-20 x 1-1/2 Hex Screw	HDRP-14	1/4-20 x 1/2 Flat Hd.Screw
RP-31	1/2-13 x 1-1/4 Soc.Set Sc.	T-75-P	10-24 x 1/4 Binder Hd.Scr.
RP-32	10-24 x 1/2 Binder Hd.		



COMMANDER JOHANSSON
DIVISION OF TRANSFER MACHINES, INC.
CHICAGO, ILLINOIS

STANDARD DUTY DRILL HEAD

DRAWN	MS	DATE	5-19-75
CHECKED		T-200	
SCALE	FULL		

POWER FEED

General Information:

The power feed is a self-contained unit that can be removed for maintenance from any Johansson Drilling Machine in the field without any problem.

Its main components are as follows: Motor, PFP-59; Zero-Max torque converter, PFP-62; torque converter housing, PFC-35 and main housing, PFC-1, which contains the spur gearing, worm gearing and clutch arrangement. The depth stop shut-off is located underneath the drill head behind the quill.

HOW THE UNIT FUNCTIONS:

Torque from the motor is transmitted through the torque converter, fromthe torque converter to worm PFP-13, and worm gear PFP-12 which is fastened to clutch drum PFC-24.

When levers PFS-5 are moved out or to the right, cone or taper cam PFS-6 is moved forward, allowing levers PFS-2 to release rollers RP-24 and clutch is engaged. The rotation of clutch housing is transmitted through clutch PFS-3 to pinion shaft PFS-22.

OPERATING INSTRUCTIONS

To start motor, "ON-OFF" switch is located in the control panel to left of drill head. Engage clutch by moving levers PFS-5 out or to the right. The output of torque converter is infinitely variable. When the red control lever is moved all the way to the right, quill will not feed down, even though clutch is engaged and motor running. When lever is pushed all the way to the left, quill will feed at its maximum rate of 6" per minute.

A plate is graduated for intermediate feed rate settings.

Depth of hole to be drilled is controlled by setting dials on depth stop to the left of drill head. When pre-set depth is reached, down feed of quill will stop. Quill will not return automatically, the clutch must be disengaged manually and the quill will then return through quill return spring and a new sequence can be started.

MAINTENANCE

Oiling Instructions:

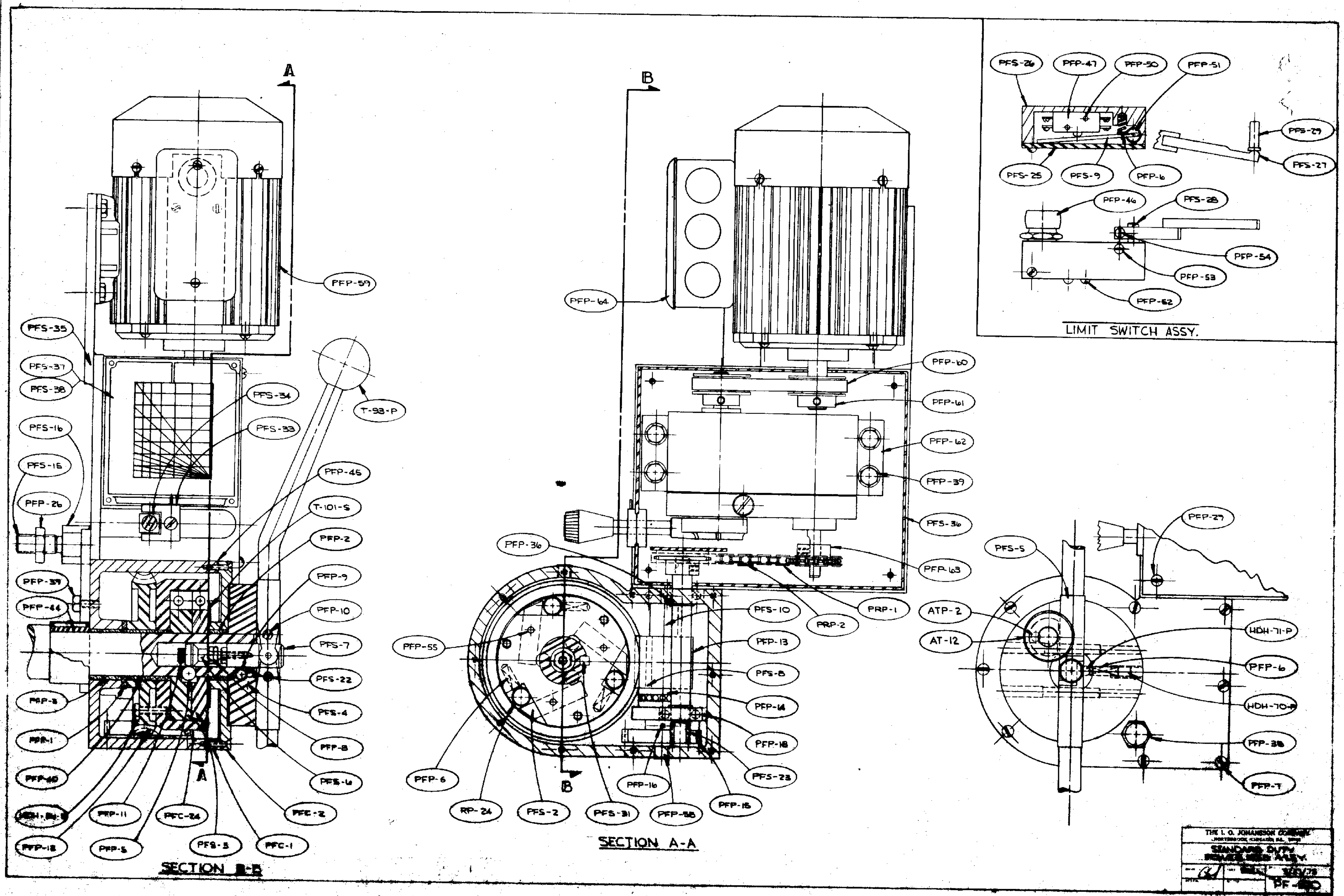
The torque converter PFP-62 is a permanently sealed unit and, therefore, needs no further attention.

The clutch housing PFC-1 has a reservoir with an oil level gauge, part #PFP-38. Check this oil level once a month and add, if necessary only, by removing the small pipe plug on top of the housing. Use S.A.E 30 or equivalent.

SERVICE AND ADJUSTMENTS

Should clutch appear to be slipping under normal loads, remove pins PFP-10 and levers PFS-5; pull out plunger PFS-7. Loosen jam nut PFP-8 and turn screw PFP-11 out about a quarter of a turn. This moves taper cam PFS-6 forward. Tighten jam nut securely and reassemble.

This power feed has built in safety device. If the unit functions but the quill does not feed down, the first thing to look for is sheared HDH-36-P screws. To replace these screws remove pins PFP-10, levers PFS-5, taper pin PFP-9, hub PFS-4 and housing cover PFC-2. Slip assembly off shaft PFS-22, remove clutch housing and worm gear from housing. Replace safety screws and reassemble the unit.



LIMIT SWITCH ASSY.
PFS-26
PFP-47
PFP-50
PFP-51
PFS-29
PFS-27
PFS-25
PFS-9
PFP-6
PFP-46
PFS-28
PFP-54
PFP-53
PFP-62
PFP-59
PFS-35
PFS-37
PFS-38
PFS-34
PFS-33
T-93-P
PFS-16
PFS-15
PFP-26
PFP-45
T-101-S
PFP-2
PFP-9
PFP-10
PFS-7
PFS-22
PFS-4
PFP-8
PFS-6
PFP-39
PFP-44
PFC-2
PFC-1
PFC-24
PFS-3
PFP-11
PFP-5
PFP-18
PFP-40
SECTION B-B
PFP-64
PFP-60
PFP-61
PFP-62
PFP-39
PFS-36
PFP-36
PFP-63
PRP-1
PRP-2
PFS-10
PFP-13
PFS-8
PFP-14
PFP-18
PFS-23
PFP-15
PFP-58
PFP-16
PFS-31
PFS-2
RP-24
PFP-6
PFP-55
SECTION A-A
PFP-27
PFS-5
ATP-2
AT-12
HDH-71-P
PFP-6
HDH-70-P
PFP-38
PFP-T
THE I. O. JOHANSSON COMPANY
STANDARD DUTY
PF-4

POWER FEED

Part Number	Description	Part Number	Description
PFC-1	Housing	PFS-22-2	Pinion
PFC-2	Cover	PFS-23	Pinion
PFS-2	Lever	PFC-24	Drum
PFS-3	Clutch	PFS-25	Cover
PFS-4	Hub	PFS-26	Housing
PFS-5	Lever	PFS-27	Lever
PFS-6	Cam	PFS-28	Shaft
PFS-7	Plunger	PFS-29	Pin
PFS-8	Key	PFS-31	Key
PFS-9	Rod	PFS-33	Insert
PFS-10	Shaft	PFS-34	Follower
PFS-15	Stud	PFS-35	Bracket
PFS-16	Block	PFS-36	Cover

Standard Commercial Parts

PFP-1	Boston TB-1228	PFP-46	Cord Connector
PFP-2	Boston B-1821-16	PFP-47	Micro Switch ITBI
PFP-3	Boston B-1821-16	PFP-50	3-48 x 3/4 Round Head
PFP-5	3/8 dia Ball	PFP-51	Boston B-56-3
PFP-6	1/4 x 7/8 Comp. Spring	PFP-52	1/4-20 x 1/4 Round Head
PFP-7	8-32 x 5/8 Flat Head	PFP-53	10-24 x 1-1/2 Round Head
PFP-8	1/4-20 Jam Nut	PFP-54	10-24 x 1/2 Round Head
PFP-9	#5 x 3" Taper Pin	PFP-55	3/16 x 5/8 Dowel Pin
PFP-10	1/4 x 1-1/2 Dowel Pin	PFP-58	1/8 Pipe Plug
PFP-11	1/4-20 x 1-1/2 Socket Cap	PFP-59	Motor
PFP-12	Worm Gear (Special)	PFP-60	Woods 90 XL
PFP-13	Boston H-1066	PFP-61	Woods 20 XL037
PFP-14	Nice 2602	PFP-62	Zero-Max
PFP-15	Boston HA-40	PFP-63	Boston HK-2517-1
PFP-16	1/3 x 3/4 Roll Pin		
PFP-18	Nice 1616 NS	BP-15	1/4-20 x 1/2 Socket Cap Sc
PFP-26	1/2-13 Jam Nut	HDH-36P	10-24 x 3/4 Socket Cap Sc.
PFP-29	1/4 Burr	HDH-70P	5/16-18 x 3/8 Socket Set
PFP-36	Truarc 5100-50	HDH-71P	1/4 dia Ball
PFP-38	Gits 4040	PRP-1	Boston 25 Chain
PFP-39	1/4-20 x 1/2 Hex Head	PRP-2	Boston SP CL Link
PFP-40	Boston B-1821-16	T-93P	Reid R-15
PFP-44	Torrington B-2220	T-101S	1-1/2 Washer
PFP-45	Gasket (Special)	RP-24	1/2 x 1 Dowel Pin

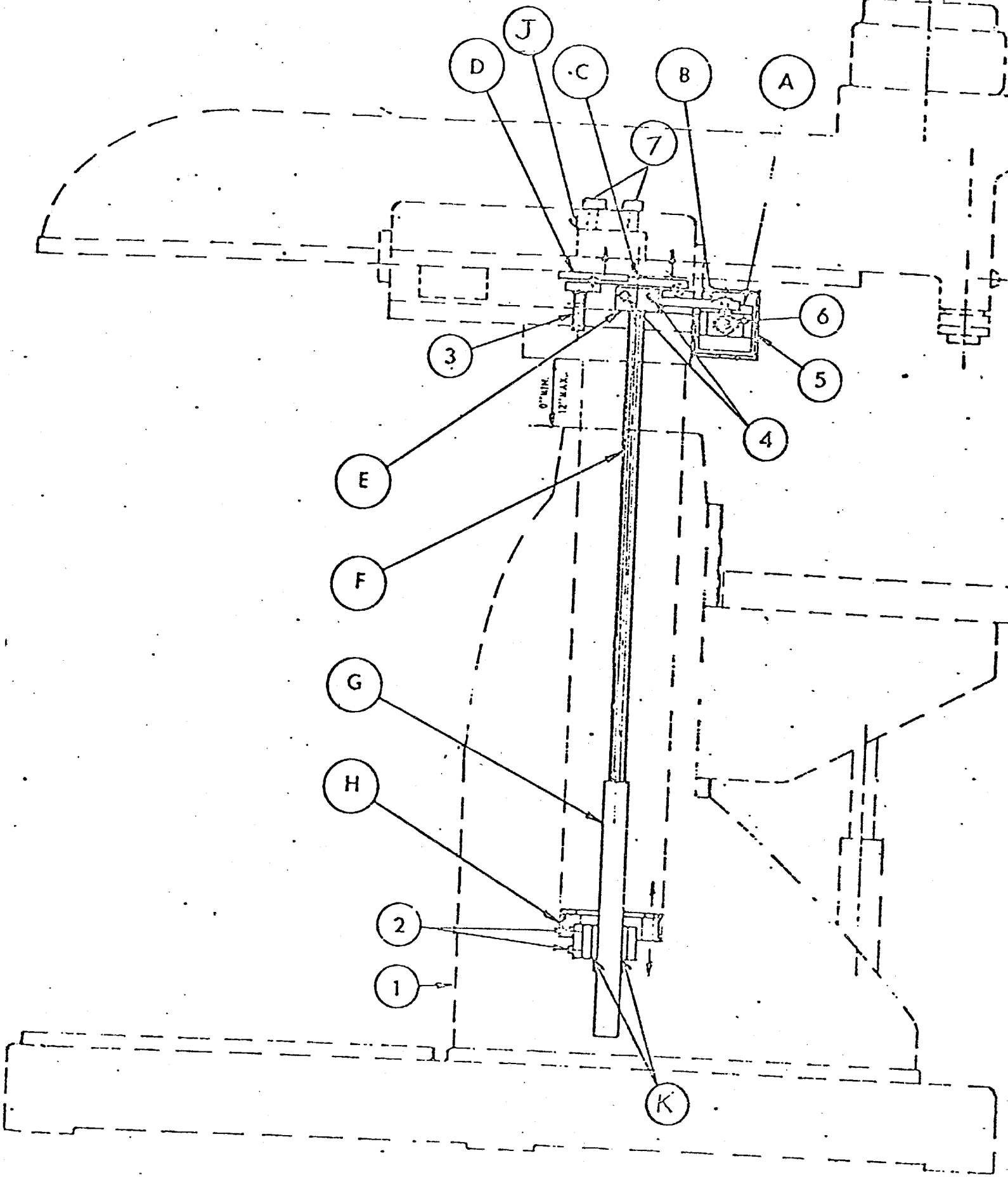


FIG. 1

Operating Instructions

After locating drill or tool at desired position, turn switch marked "Lock" on control panel. Drill head will be locked against ram cross movement and head and ram assembly also will be locked from rotating horizontally. NOTE: After machine is locked it is still possible to move ram assembly up or down in its 12 inch vertical travel either with hand crank or by power elevation without disturbing spindle location. Spindle will stay square to table surface within .002" in the entire 12 inch travel.

Maintenance

This unit should require no oiling or maintenance as all sliding or rotating members are either of oilite or anti-friction construction.

Service and Adjustments

This unit should be adjusted on a new machine for proper locking action after the machine has been used for a few weeks so that the locking members have seated. If the main components are recognized and their functions understood, it is easy to adjust for proper locking in a few minutes. The main components are as follows:

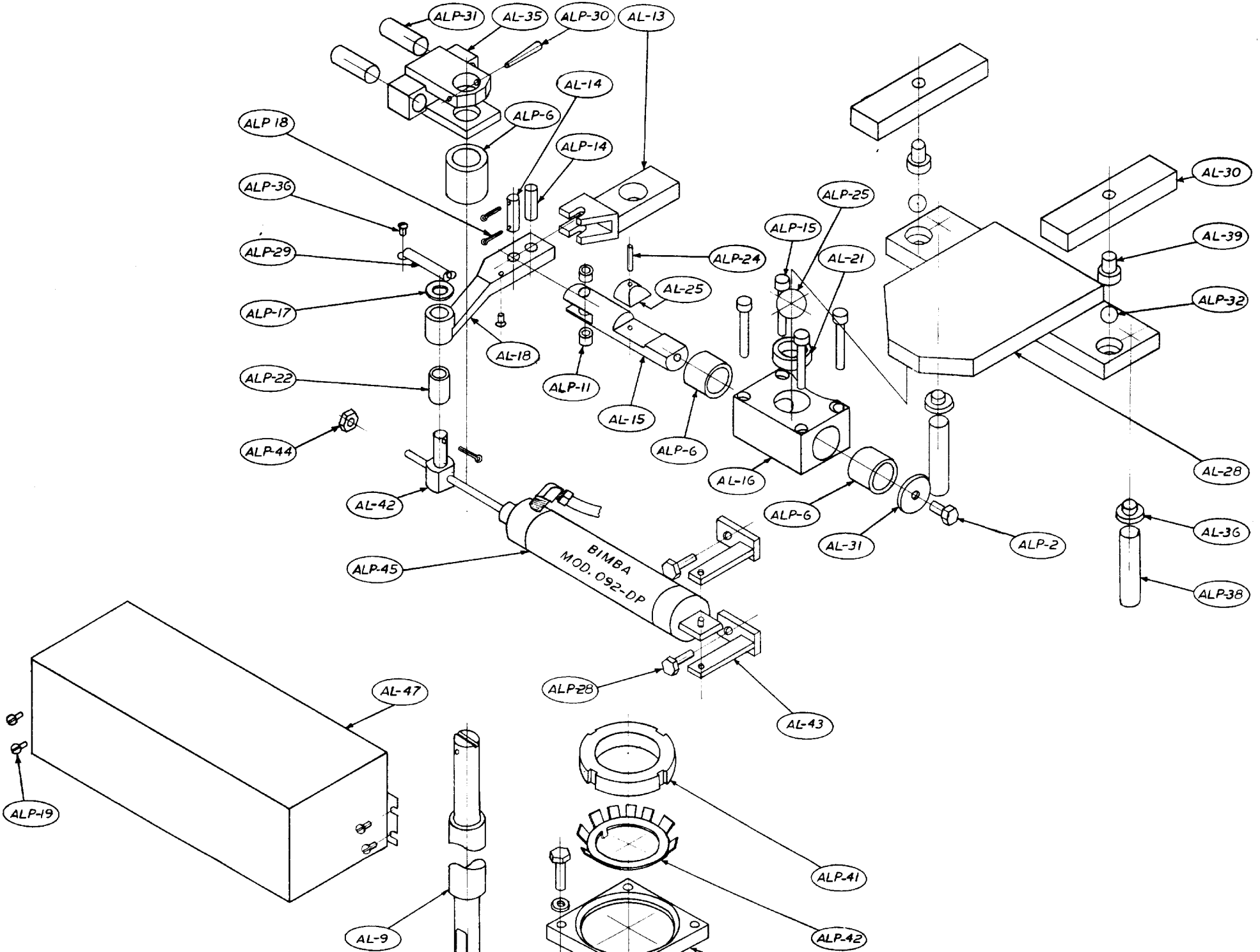
A - Air Cylinder
B - Locking Arm
C - Rocker Block
D - Ram Locking Blocks
E - Torsion Adjusting Block
F - Torsion Bar
G - Guide Bars
H - Column Lock
J - Wear Locks
K - Guide Blocks

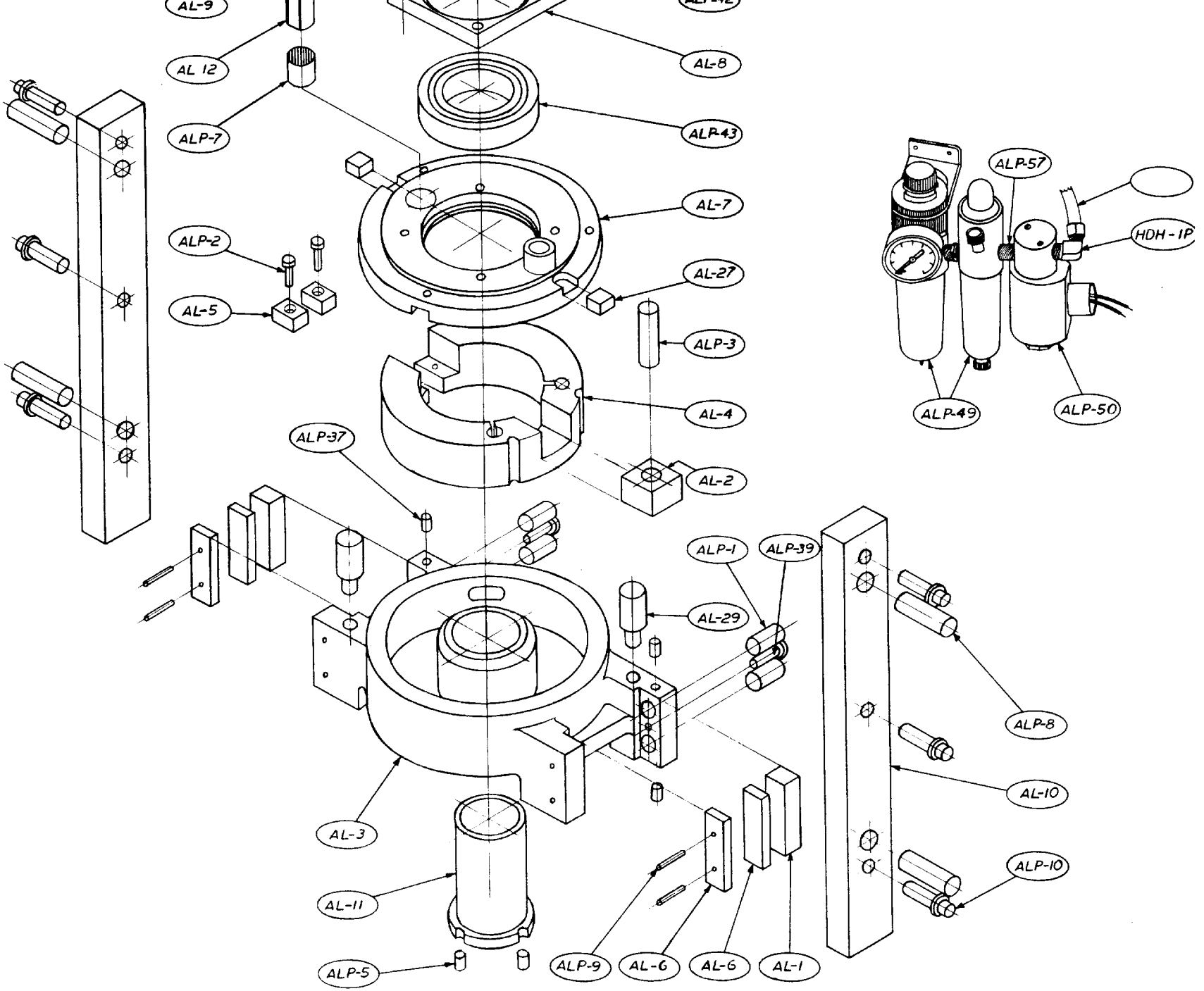
To Adjust for Locking:

1. Release lock nuts 7 and adjust locking screws to allow for .001" clearance between wear block and ram.
2. Adjust screws 3 (one on each side of ram) for .001" clearance between ram and blocks D.
3. Remove cover 1, check to make sure there is no play between guide blocks K and guide bars G. Adjust screws 2, if necessary.
4. Remove cover 5.
5. Engage lock by energizing air cylinder through locking switch.
6. Maintain air pressure at 80 to 85 P.S.I. Adjust screws 4 for locking rotation of column. Tightening right screw increases locking action; tightening left decreases locking action. One screw must be loosened in order to tighten opposite screw.
7. Pull rod of air cylinder in locked position 6 should not be closed completely (approximately, 1/4" open).

CAUTION:

For proper performance, locking arm B should be parallel to ram when the unit is engaged and properly adjusted.


ALP-31
AL-35
ALP-30
AL-13
AL-14
ALP-6
ALP 18
ALP-14
ALP-36
ALP-29
ALP-17
ALP-24
AL-25
AL-18
ALP-11
AL-15
ALP-6
ALP-22
ALP-44
AL-42
ALP-45
BIMBA
MOD. 092-DP
ALP-28
AL-43
ALP-25
ALP-15
AL-21
AL-30
AL-39
ALP-32
AL-28
AL-16
ALP-6
AL-31
ALP-2
AL-36
ALP-38
AL-47
ALP-19
AL-9
ALP-41
ALP-42


AL-9
AL 12
ALP-7
AL-8
ALP-43
AL-7
ALP-2
AL-5
AL-27
ALP-3
AL-4
ALP-37
AL-2
ALP-1
ALP-39
AL-29
ALP-8
AL-10
AL-3
ALP-10
AL-11
ALP-5
ALP-9
AL-6
AL-6
AL-1
ALP-57
HDH-1P
ALP-49
ALP-50

POWER LOCKING SYSTEM

1 to 3 Horsepower Machines

Part No.	Part Name	Manufacturer Name & Stock No.
AL-1	Block	
ALP-1	Socket Cap Screw	1/2-13 x 1/2
AL-2	Block	
ALP-2	Socket Cap Screw	1/4-20 x 1/2
AL-3	Housing	
ALP-3	Dowel	5/8 x 1-3/4
AL-4	Brake Shoe	
AL-5	Block	
ALP-5	Socket Set Screw	1/4-20 x 1/4
AL-6	Bearing Block	
ALP-6	Bushing	Boston P-78-6
AL-7	Cap	
ALP-7	Needle Bearing	Torrington GB-1012
AL-8	Retainer	
ALP-8	Dowel	1/2 x 1-1/2
AL-9	Rod	
ALP-9	Dowel	3/16 x 5/8
AL-10	Beam	
ALP-10	Counter Bore Screw	3/8-16 x 1
AL-11	Nut	
ALP-11	Bushing	Boston B-56-3
AL-12	Stud	
AL-13	Block	
AL-14	Pin	
ALP-14	Dowel	3/8 x 1
AL-15	Plunger	
ALP-15	Socket Cap Screw	1/4-20 x 1-1/4
AL-16	Block	
ALP-17	Thrust Bearing	Boston TB-612
AL-18	Lever	
ALP-18	Cotter Pin	1/16 x 3/4
ALP-19	Binder Head Screw	6-32 x 1/4
AL-21	Ring	
ALP-22	Bushing	Boston B-68-6
ALP-24	Rivet	1/8 x 1
AL-25	Block	
ALP-25	Steel Ball	3/4" Dia.
AL-27	Key	
AL-28	Rocker	
ALP-28	Hex Head Screw	1/4-20 x 3/4
AL-29	Stud	
ALP-29	Spring	
AL-30	Block	
ALP-30	Taper Pin	#2 x 1-1/2"
AL-31	Washer	
ALP-31	Socket Set Screw	1/2-13 x 1-1/4
ALP-32	Steel Ball	7/16" Dia.
AL-35	Block	
AL-36	Stud	
ALP-36	Round Head Screw	10-24 x 3/4

POWER LOCKING SYSTEM

ALP-37	Socket Set Screw	10-24 x 3/8
ALP-38	Socket Set Screw	1/2-13 x 2-1/4
AL-39	Ball Socket	
ALP-39	Socket Cap Screw	1/4- 20 x 1
ALP-41	Locknut	N-09
AL-42	Stud	
ALP-42	Lockwasher	W-09
AL-43	Bracket	
ALP-43	Ball Bearing	New Departure ND 773L09
ALP-45	Hex Nut	3/8 - 24
ALP-44	Air Cylinder	Bimba 092-DP
AL-47	Cover	
ALP-49	Regulator Lubricator	Norgren
ALP-50	Solenoid Valve	Schrader 20462-1115
ALP-57	Close Nipple	1/8 Pipe
HDH-1-P	Elbow	90°

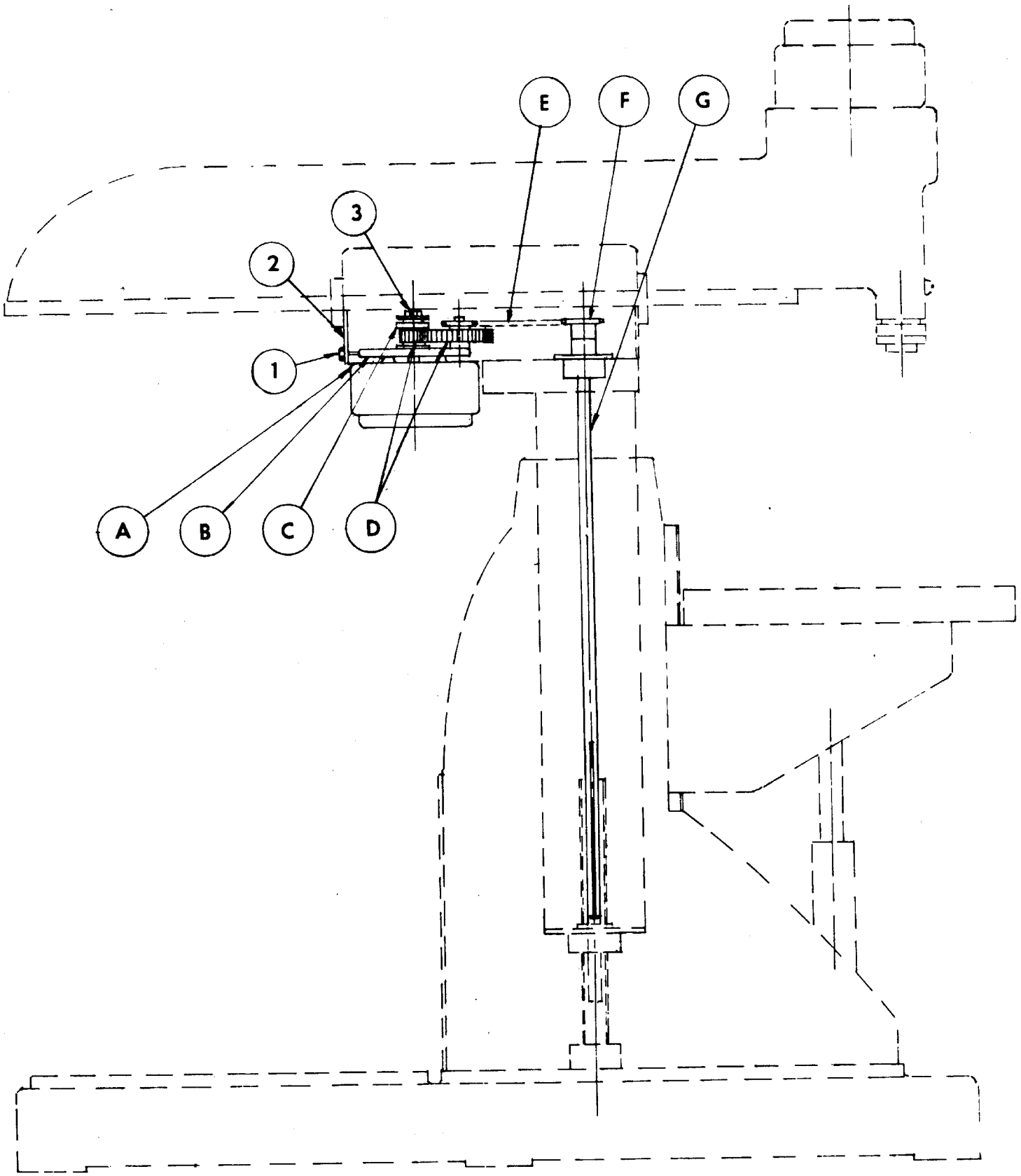


Fig. 1

Operating Instructions

General Information:

Fig. 1. Shows the location of the automatic elevating mechanism in the Radial Drilling Machine. The major components are Motor A, Motor Mount B, Slip Clutch C, Spur Gears D, Chain E, Sprocket F, and Drive Shaft G. Power from motor is transferred through gears, chain and sprockets and drive shaft to the elevating screws in base of machine.

Elevation switch on control panel is held at "Raise" or "Lower" until desired vertical location is obtained. When switch is released motor stops and top portion of machine will stay at height selected. If moved to either maximum top or bottom position, motor will keep on running as long as switch is engaged - the torque being dissipated through slip clutch.

Maintenance:

No oiling is required as all bearings are of anti-friction construction or oilite.

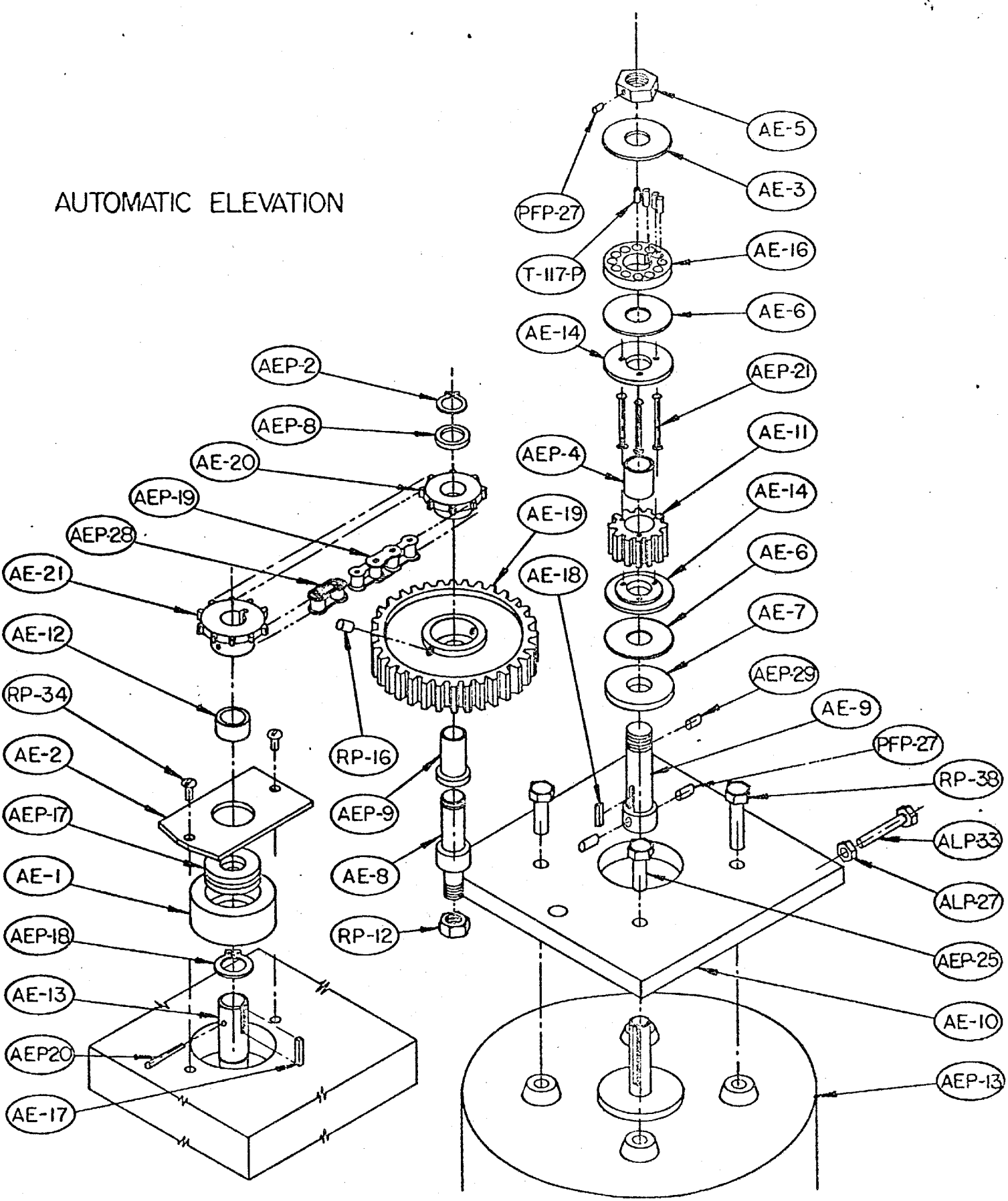
Service & Adjustment:

For inspection or adjustment, remove screw 1 and cover plate 2. If motor is running but top section of machine will not elevate tighten up on pressure nut 3 to obtain necessary friction but so that clutch C will slip when top section of machine is brought to either its maximum top or bottom position. If chain E is slipped off the sprocket the complete gear and motor assembly will slide out.

Caution:

When reassembling, only take up slack on chain E. Do not impose unnecessary tension-this will only damage the bearings.

AUTOMATIC ELEVATION



AUTOMATIC ELEVATING

Part Number	Description	Part Number	Description
AE-1	Plug, Bearing	AE-12	Spacer
AE-2	Plate, Retainer Bearing	AE-13	Shaft, Elevating
AE-3	Washer	AE-14	Plate, Friction
AE-5	Nut, Pressure	AE-16	Plate, Friction
AE-6	Disc, Friction	AE-17	Key
AE-7	Plate, Friction	AE-18	Key
AE-8	Stud, Gear	AE-11	Pinion
AE-9	Shaft	AE-19	Gear
AE-10	Plate, Motor Mount	AE-20	Sprocket, Hub Type
		AE-21	Sprocket, Hub Type

STANDARD COMMERCIAL PARTS

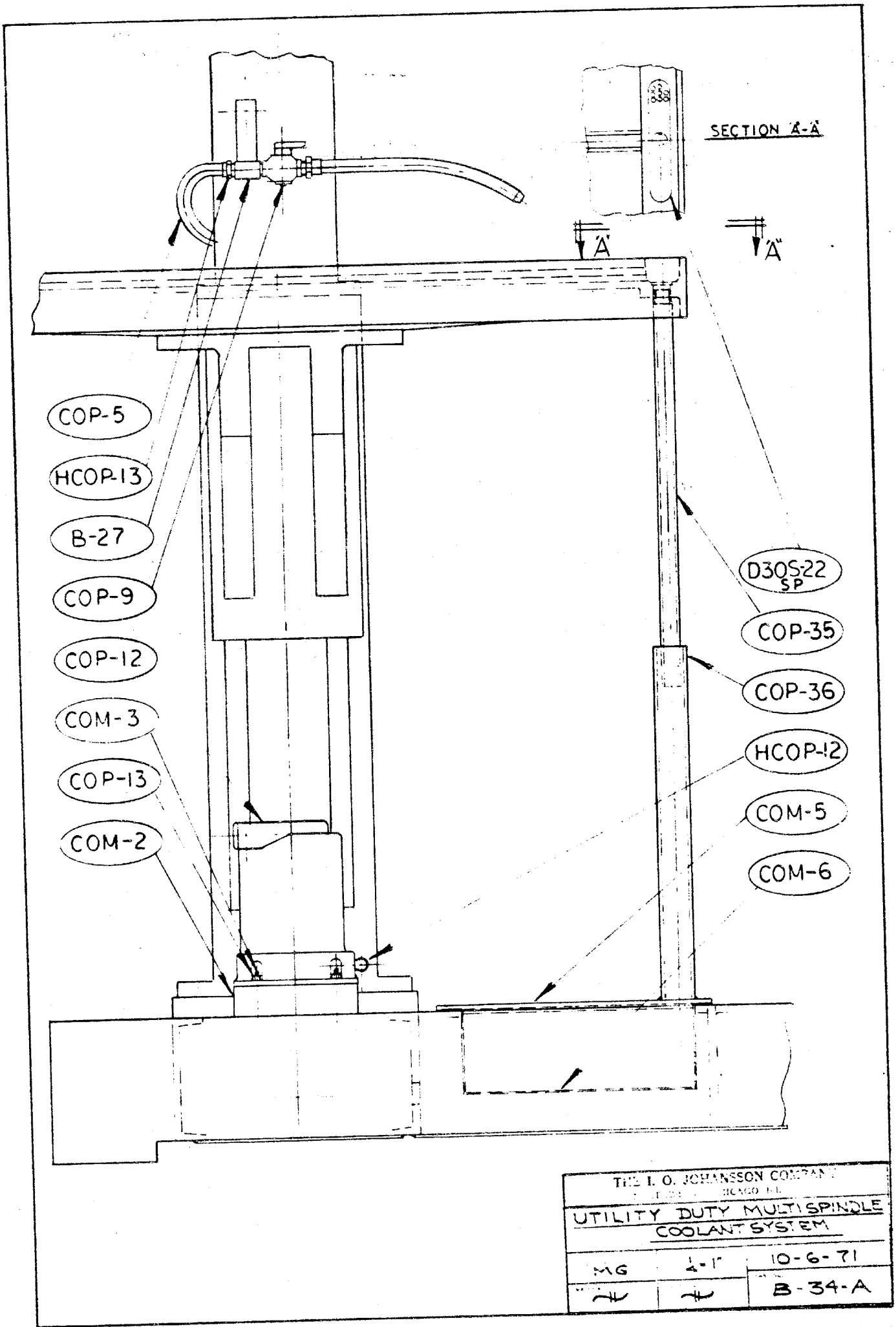
AEP-21	1/8 x 1-1/4 Rivet	AEP-26	Hose Clamp for ½" conduit
AEP-4	Boston M1214-20	AEP-27	1/2" to 3/8" Reducing Bus
AEP-8	Boston TB-1016	AEP-28	Diamond Master Link
AEP-9	Boston FB-1012-10	AEP-29	3/16 dia.x 3/8 Dowel Pin
AEP-13	Motor, 1/2 H.P.	ALP-27	1/4-20 Hex Nut
AEP-17	Nice 1630 DS, Bearing	ALP-33	1/4-20 x 1 Hex Hd. Screw
AEP-18	Truarc 5100-75 Retainer	RP-12	1/2-20 Jam Nut
AEP-19	Diamond 82 Chain	RP-16	10-24 x 3/8 Soc.Set Screw
AEP-20	#2 x 1-1/4 Taper Pin	RP-34	10-24 x 3/8 Rd. Head Scre
AEP-21	.070 x 1-1/4 Rivet	RP-38	3/8-16 x 1 Hex Head Screw
AEP-25	3/8-16 x 3/4 Hex Hd. Sc.	PFP-27	10-24 x 1/4 Sock. Set Scr
AEP-7	Truarc 5100-62 Retainer	T-117-P	Spring, Compression

Johansson Manufactured Parts Only

Part No.	Part Name
COM-2	Spacer
COM-3	Stud
COM-5	Cover
COM-6	Chip Basket, Optional
B-27	Bracket
D30S-22	Strainer

Standard Commercial Purchased Parts

Part No.	Part Name	Manufacturer Stock No.
COP-5	Hose	3/8 I.D. x 11/16 O.D.
COP-9	Nozzle	Graymills A12371
COP-12	Pump	Ruthman 7P3-0929 1/10 HP, 115 Volt, 3450 RPM
COP-13	Hex Nut	1/4-20
COP-35	Pipe	1/2"
COP-36	Pipe	1-1/4"
HCOP-12	Elbow	
HCOP-13	Fitting	



THE I. O. JOHANSSON COMPANY
CHICAGO ILL.

UTILITY DUTY MULTISPINDLE
COOLANT SYSTEM

MG	1-1"	10-6-71
		B-34-A

JOHANSSON AUTOMATIC TAPPING ATTACHMENT FOR DRILLING MACHINES

Components:

AT-6 - Mounting Plate

AT-7 - Fixed Reversing Cam

AT-4 - Graduated Rod

AT-3 - Adjustable Depth Stop Cam

ATP-10 - Limit Switches

Operation:

The operation of this unit is more or less self-explanatory.

Depth Stop "AT-3" is set on Rod "AT-4" at desired depth to be tapped.

Selector Switch on the conrtol panel is turned on to engage tapping attachment.

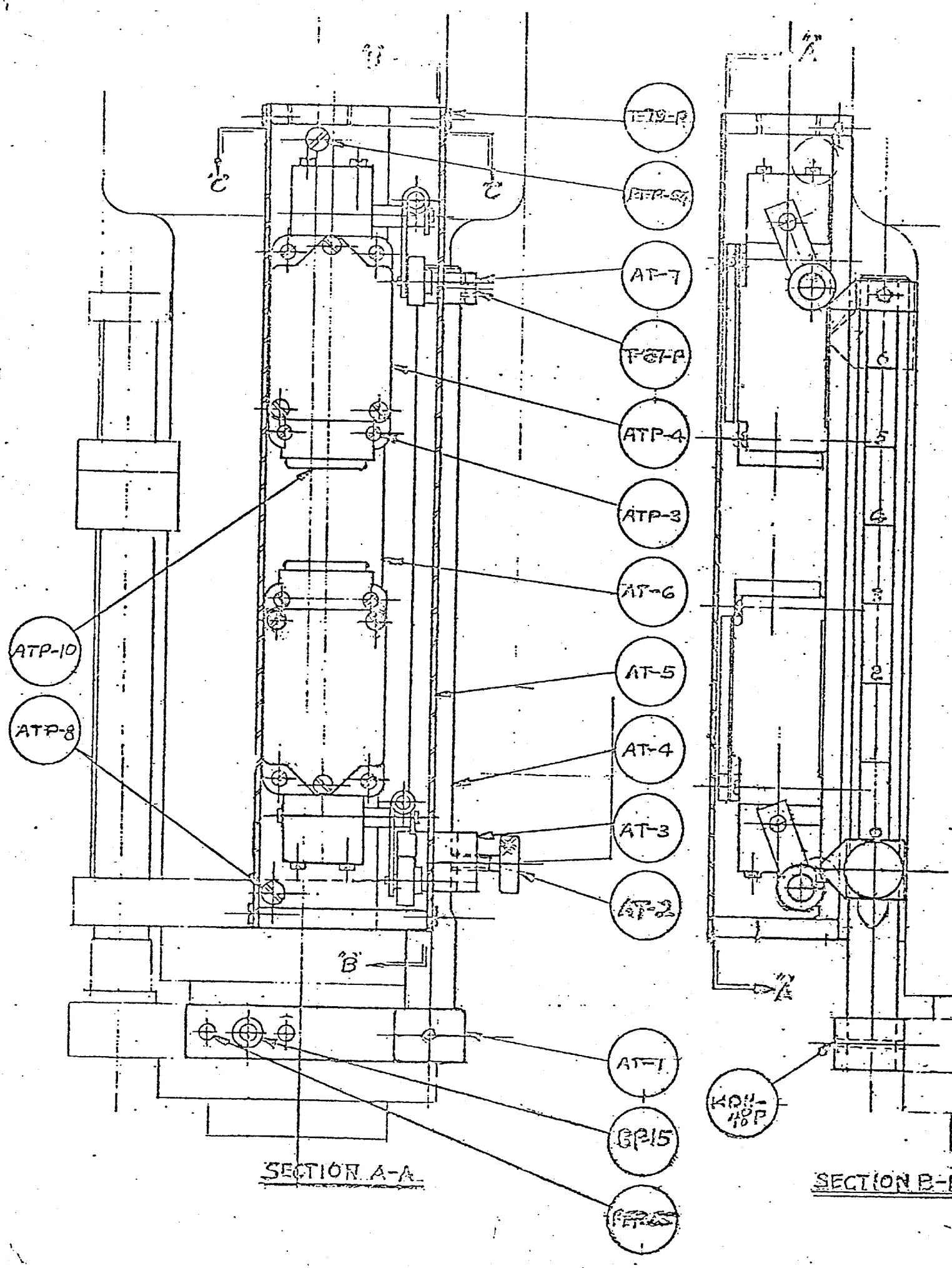
When pre-determined depth is reached, depth stop "AT-3" makes contact with the lower limit switch. This contact energizes a solenoid (not shown) which reverses the field of the motor, causing the tap to come up out of the hole.

The quill return spring brings the quill to the full up position Thus the top limit switch is contacted by fixed reversing cam "AT-7", which again energizes the solenoid, reversing the field of the motor so that it once more runs in forward direction.

A new cycle of tapping can now commence.

Note: When this tapping attachment is turned off, the machine can be used for standard drilling operations. There is nothing to unbolt or add - the machine will function as though the tapping attachment weren't there.

THE I. O. JOHANSSON COMPANY
Northbrook, Illinois


ATP-10
ATP-8
AT-7
ATP-4
ATP-3
AT-6
AT-5
AT-4
AT-3
AT-2
AT-1
BP-15
"B"
"A"
"C"
SECTION A-A
SECTION B-B