

# Wadkin

## OPERATING AND MAINTENANCE INSTRUCTIONS

**36" and 48" Knife Grinders, Type N.Q.**

INSTRUCTION BOOK No. 729

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MODIFICATIONS ARE MADE TO THESE BOOKS FROM TIME TO TIME  
AND IT IS IMPORTANT THEREFORE THAT ONLY THE BOOK SENT  
WITH THE MACHINE SHOULD BE USED AS A WORKING MANUAL.

# Wadkin

## 36" and 48" Knife Grinders, Type N.Q.

### PRINCIPAL DIMENSIONS AND CAPACITIES

Maximum length of knife	.. .. .	36" or 48"
Maximum knife section (Normal)	.. .. .	4 1/8" x 3/8"
Maximum knife section (Slotted knives)	.. .. .	6 1/8" x 3/8"
Minimum knife section	.. .. .	3/8" x 1/8"
Bevel angle	.. .. .	0 to 45°
Hollow grinding	.. .. .	0 to 25° spindle cant
Speed of carriage traverse	.. .. .	27 ft. 7 min.
H.P. of traverse motor	.. .. .	1/6
H.P. of wheel head motor	.. .. .	2
Wheel size	.. .. .	6 1/2" dia.
Wheel speed	.. .. .	2,800 r.p.m.
Down feed of wheel head	.. .. .	.0002", .0004", .0006" and .0008"
		at each end of stroke
Floor space 36" machine	.. .. .	6' 6" x 2' 6"
Floor space 48" machine	.. .. .	7' 6" x 2' 6"

#### Details included with the machine

Set of spanners.  
 Knife setting blocks.  
 Grease gun, No. 2.

One lb. tin of grease L.6. and one pint tin of soluble oil.  
 6 1/2" cup grinding wheel, No. UGW128.  
 Clamp plates : Clamp bolts, nuts and washers.

## INSTALLATION

The machine is despatched from our works with all bright surfaces greased to prevent rusting. This must be removed by applying a cloth damped with paraffin.

### FOUNDATIONS

$\frac{3}{4}$ " dia. foundation bolts should be used to bolt machine down to the floor. If mill floor consists of 6" solid concrete no special foundation is necessary. Rag type holding down bolts may be used, and working from foundation plan 6" to 8" square holes should be cut in concrete for these bolts. After the machine has been carefully levelled it should be grouted in position with liquid cement.

### WIRING

See page 12 for wiring diagram.

### GRINDING COOLANT

The tank should be filled with a coolant consisting of soluble oil and water. The recommended mixture is 1 pint of soluble oil, Wadkin Grade L.10, to 70 pints of water. Add the oil to the water and thoroughly mix. The old coolant should be drained off the tank and replaced by fresh coolant every 2-4 weeks. A drain plug is provided to empty the tank.

If it is desired to use other than Wadkin Soluble Oil, Grade L.10, the following equivalents may be used:

Shell-Mex and B.P. Ltd.	..	Shell Dromus "D."
Vacuum Oil Co. Ltd.	..	Solvac Clear.

### 36" MACHINE

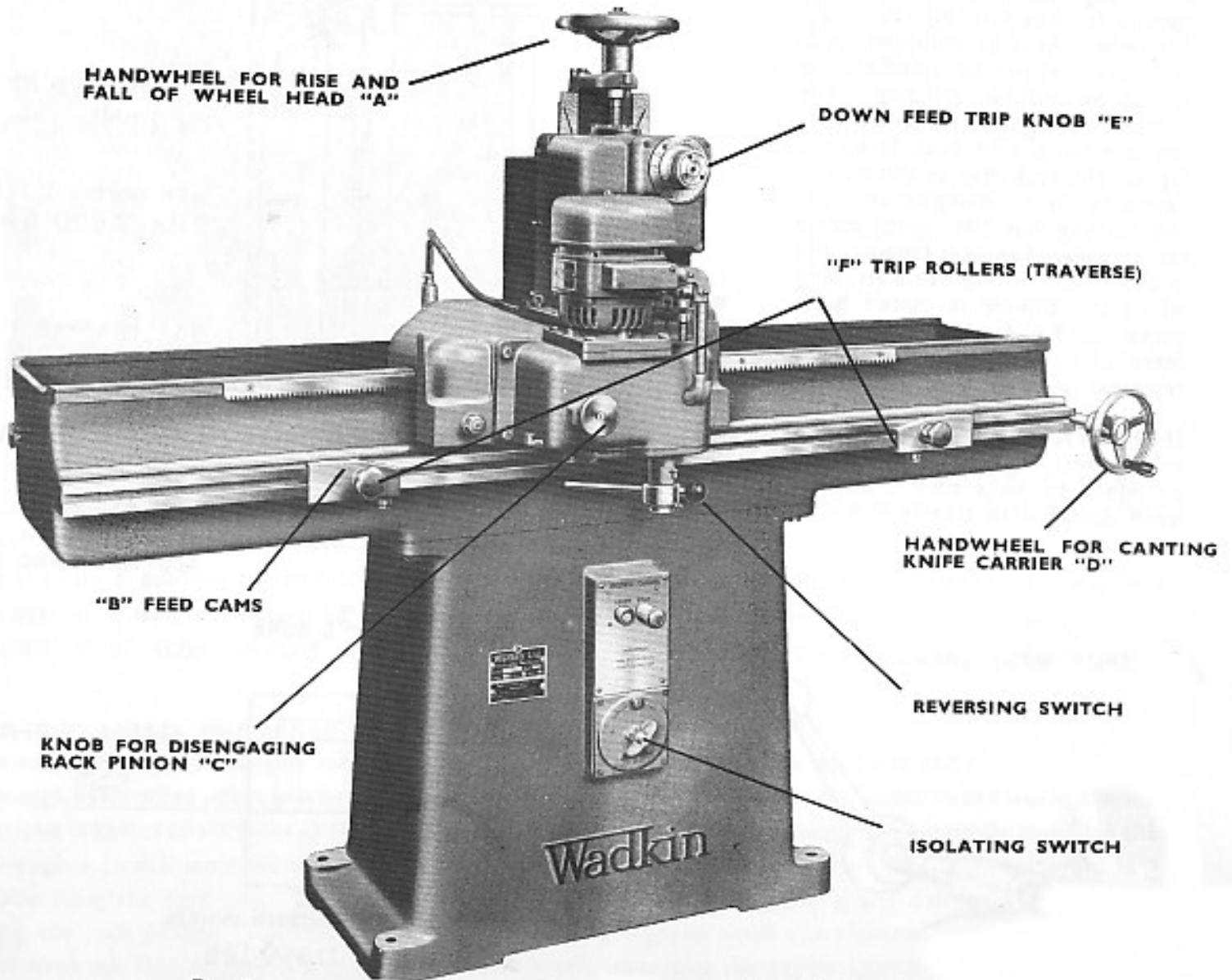


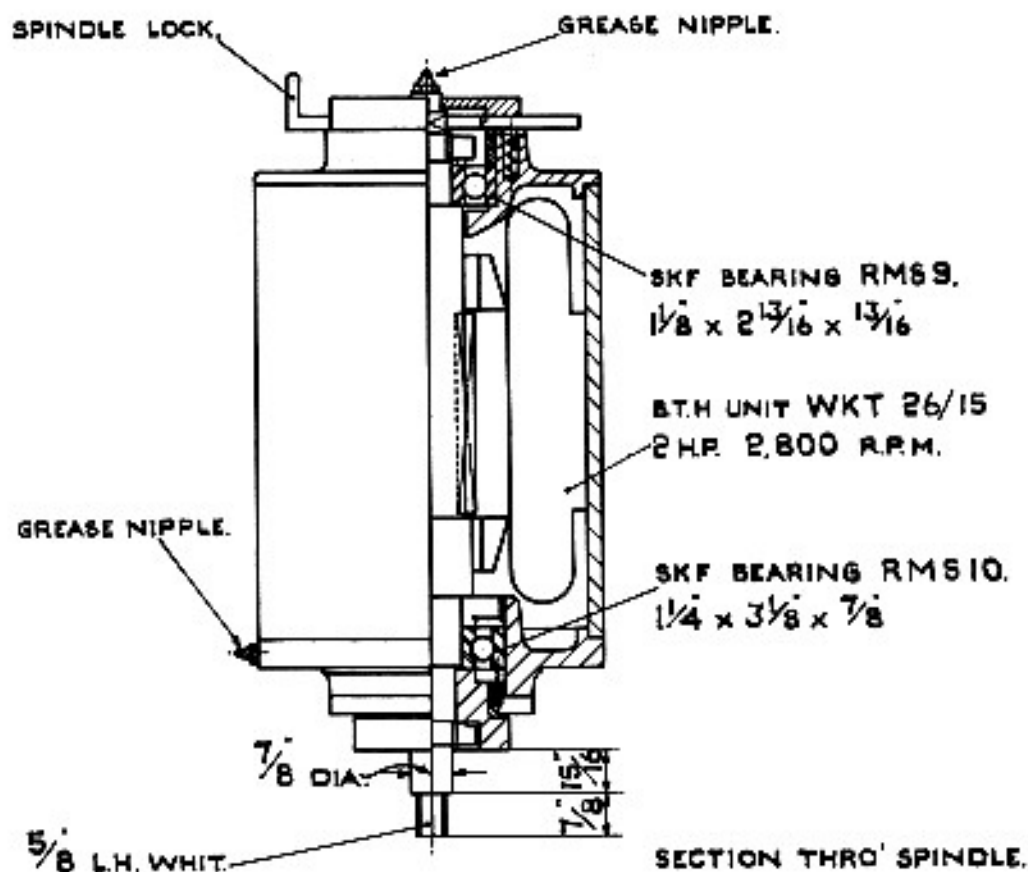
Fig. 1

### THE WHEEL HEAD

An arrangement of the wheel head spindle is shown in Fig. 3.

The wheel head is mounted on a trunnion to enable the spindle to be canted for hollow grinding. The outside dia. of the trunnion forms the face for a split bush lock, see Fig. 2. This lock may be adjusted, if necessary, by removing screw "G" and turning nut "H" until screw can be engaged in next tapping hole in bush "J." To remove a grinding wheel the spindle is canted horizontal, see Fig. 4. A spindle lock is fitted to hold spindle while nut is removed, see Fig. 3.

**IMPORTANT.** Before using a new wheel it must be carefully examined to make sure it has not been damaged in transit.



SPLIT BUSH LOCK.

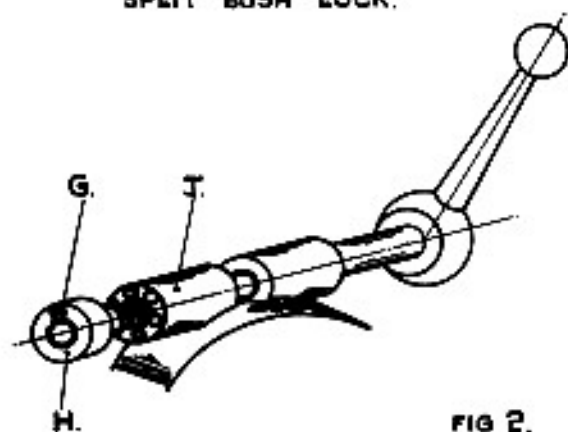
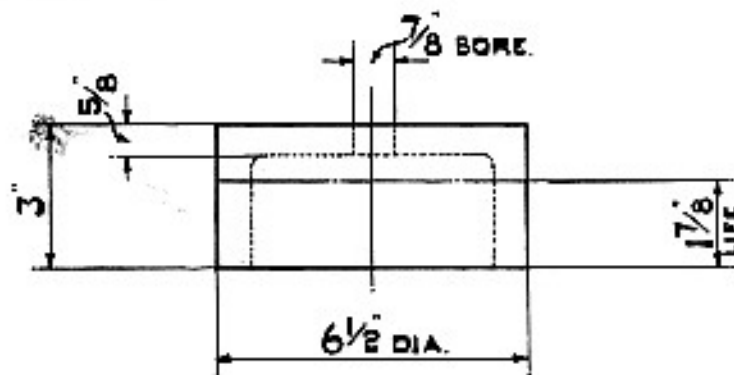


FIG 2.



DETAILS OF GRINDING WHEEL  
WADKIN N<sup>o</sup> UGW 128.  
SPECIFICATION WA 30 HB.

FIG.3.



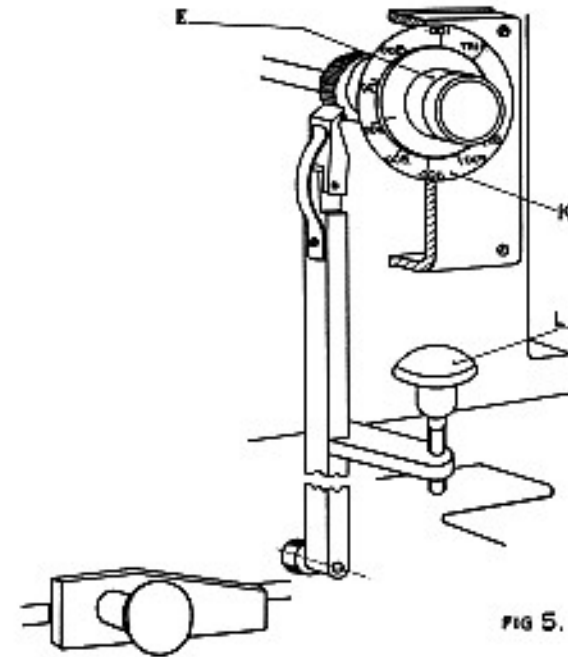


FIG 5.

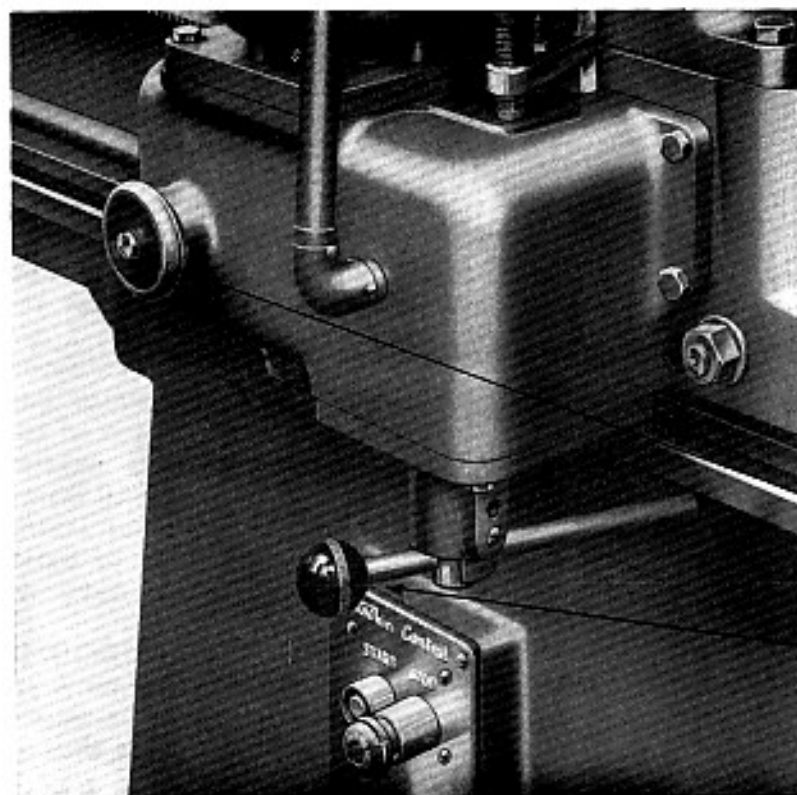
### THE WHEEL HEAD DOWN FEED

Initial setting of the grinding wheel is by handwheel "A", see Fig. 1. The zero line on trip knob "E" is then set on scale "K" to required amount to be removed, see Fig. 5, e.g., if trip knob is set at .004" down feed will be automatically tripped after .004" has been removed.

To select the rate of automatic downfeed the machine should be set in motion and the screw knob "L" adjusted until the amount of feed is indicated by the movement of trip knob "E" against scale "K." The four rates of feed are .0002", .0004", .0006" and .0008" at each end of stroke, i.e., each time the carriage contacts the feed cams "B."

### THE WHEEL HEAD TRAVERSE

The traverse of the wheel head is by rack and pinion, the rack is mounted on the tank side and the rack pinion is driven through a worm reduction unit by a  $\frac{1}{8}$  h.p. motor. The traverse motor is mounted direct on the worm box and the whole unit is bolted to the front of the wheel head carriage, the carriage is reversed by electrically reversing the motor through a switch mounted in the worm box. This switch is tripped by rollers "F," Fig. 1, carried in a dovetail slot along the tank side. The traverse of the wheel head can be stopped at any point of the stroke by disengaging the rack pinion. The rack pinion must only be re-engaged while the traverse motor is stationary. The wheel head can also be reversed at any point by manually operating the reversing switch.



### THE KNIFE CARRIER

The knife carrier is canted through a worm and wheel by the handwheel "D," Fig. 1.

The outside dia. of the wormwheel forms the face for a split bush lock, this lock can be adjusted in the same way as the wheelhead lock, see Fig. 2.

The carrier cants from 0° (horizontal) to 45°, and a graduated scale is fitted for setting to required angle.

KNOB FOR DISENGAGING  
RACK PINION

REVERSING SWITCH

Fig. 6

### HOLLOW GRINDING (Instruction Plate)

It will be seen from Fig. 7 (showing grinding wheel canted for hollow grinding) that the angle at which the knife carrier must be set when hollow grinding is NOT the same as the knife angle. An instruction plate (as illustrated at Fig. 8) is provided, giving angles at which carrier must be set for various angles of head cant and knife angles required, e.g., if a knife angle of 30° is required when head is canted at say 25°, the angle at which the carrier must be set is (from table) 16°.

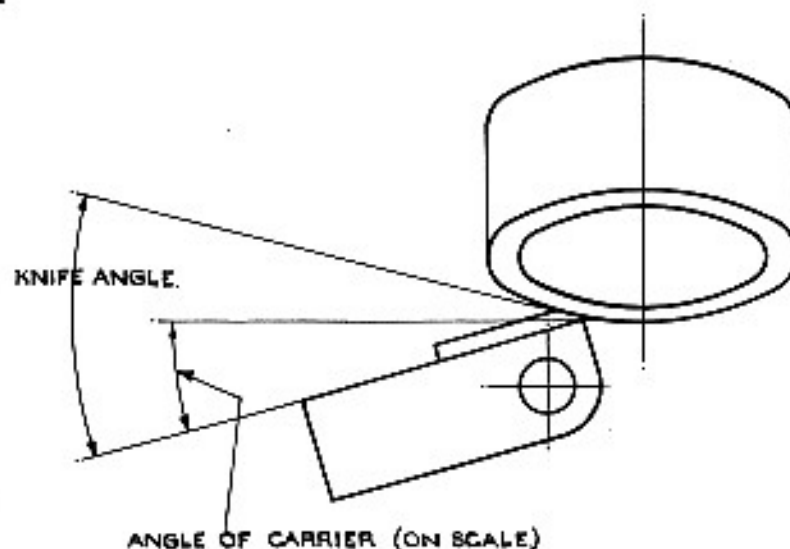


FIG 7.

## KNIFE GRINDING

HOLLOW GRINDING.						
SET ANGLE ON KNIFE CARRIER SCALE TO ANGLE GIVEN IN TABLE, FOR APPROPRIATE HEAD CANT AND KNIFE ANGLE REQUIRED						
REQUIRED KNIFE ANGLE	HEAD CANT.					
	5°	10°	15°	20°	25°	
15	11	8	5	4	2	
20	16	13	10	9	7	
25	21	18	15	13	11	
30	26	23	20	18	16	
35	31	28	25	22	20	
40	36	33	30	26	24	
45	41	38	35	31	28	

FIG. 8.

**SETTING.** A set of blocks is provided for setting knives, Fig. 11. These blocks set to the back edge of the knives, ensuring that after grinding all knives are parallel. In order to set up a number of small knives, a steel strip should be used in front of the blocks, see Fig. 11. All knives should be flat before bolting to knife carrier, if this is not so and knife is of heavy cross section, the carrier may be damaged.

**STRAIGHT GRINDING,** i.e., with grinding spindle vertical. When knife is bolted down and carrier set to required angle the grinding wheel should be adjusted down almost on to the knife while the carriage is being traversed by hand. The machine should then be started and the stroke set by adjusting the trip rollers "F", Fig. 1. The wheel is then brought down on to the knife and the trip knob set to put on feed. The amount to be removed from a knife is governed by:

1. Ground face being totally cleaned up.
2. Balance of knife.

**HOLLOW GRINDING.** The head should be canted over to give the required amount of hollow grind. The knife is then bolted down and carrier set to angle given in instruction plate (see previous note on Page 6). The stroke is then set, etc. as for straight grinding.

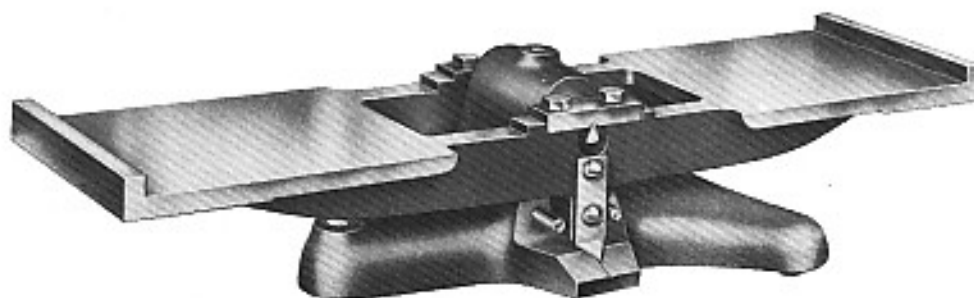


Fig. 9



## GENERAL POINTS ABOUT GRINDING

### BALANCING

Each pair of knives from one block should be in perfect balance. Knives under 18" in length should be ground in pairs to ensure balance. The Wadkin cutter balance, Type K.S., which has been specially produced for balancing planer knives, etc., is illustrated at Fig. 9.

### FINISH

To obtain a good finish the grinding wheel should be allowed to traverse over the knife until cut is completely finished.

### WHEEL DRESSING

The grinding wheels supplied by Wadkin have been chosen as the result of long experience on knife grinders; due to the free cutting action and ability to retain cutting edge throughout the life of the wheel, dressing is not necessary. And it is recommended that only the wheels supplied by Wadkin are used.

### WIRE ON GRINDING WHEEL

Each wheel is bound with two or three groups, of 3 strands of wire, see Fig. 10, to guard against bursting at high speed, and therefore the wire must be left in place while grinding. It is important that each group of wires is removed only when the wheel has worn down to within  $\frac{1}{8}$ " of the wire.

### WHEEL BALANCE

Part of the outside dia. of a grinding wheel may be found to be painted. This is lead paint and is the makers' method of balancing the wheel.

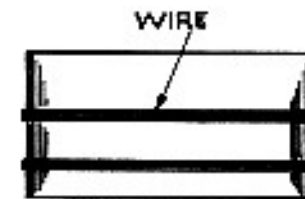
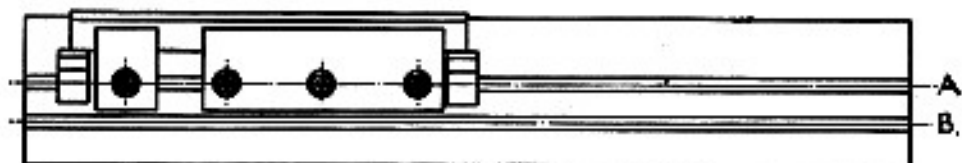


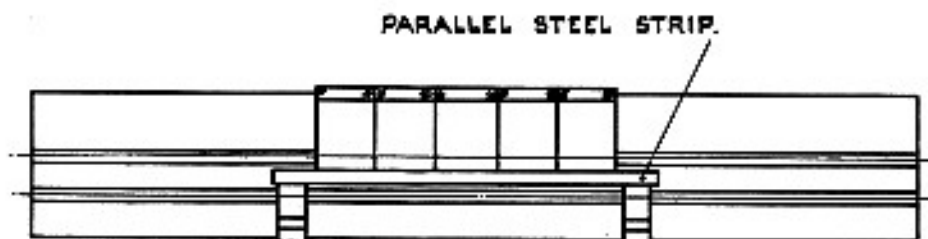
FIG. 10



PLAN VIEW OF KNIFE CARRIER SHOWING NORMAL METHOD OF SETTING KNIVES.



USING SETTING BLOCKS IN SLOT A, KNIVES CAN BE SET UP VARYING IN  $\frac{1}{8}$  THS. FROM  $\frac{3}{4}$  TO  $2\frac{5}{8}$  WIDE. USING SETTING BLOCKS IN SLOT B, KNIVES CAN BE SET UP VARYING IN  $\frac{1}{8}$  THS. FROM  $2\frac{5}{8}$  TO  $4\frac{1}{8}$  WIDE. I.E.  $4\frac{1}{8}$  IS MAX. KNIFE WHICH CAN BE SET WITH BLOCKS SUPPLIED.



PLAN VIEW OF KNIFE CARRIER SHOWING METHOD OF SETTING A NUMBER OF SMALL KNIVES.

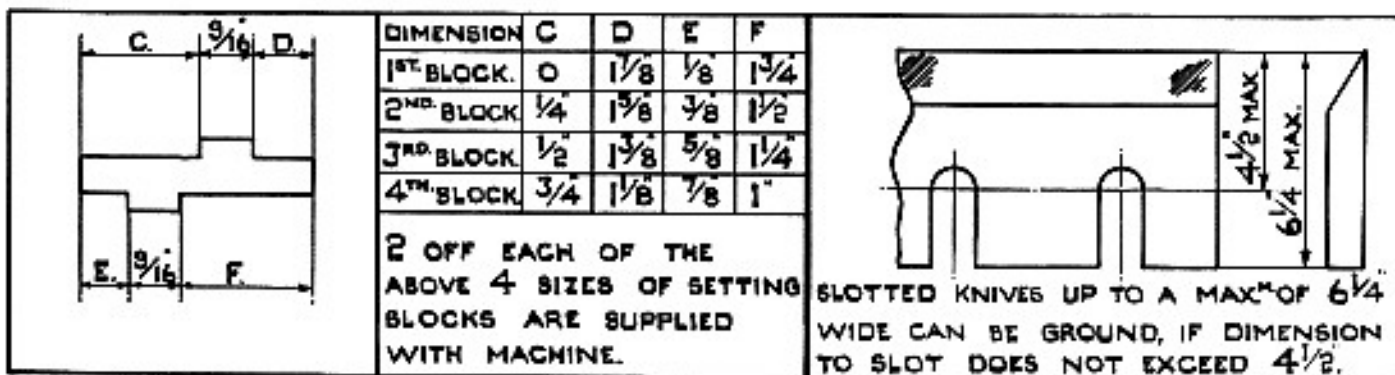


Fig. 11.

- 1 - NQ104/M
- 2 - NQ105/M
- 3 - NQ106/M
- 4 - NQ107/M

## LUBRICATION CHART

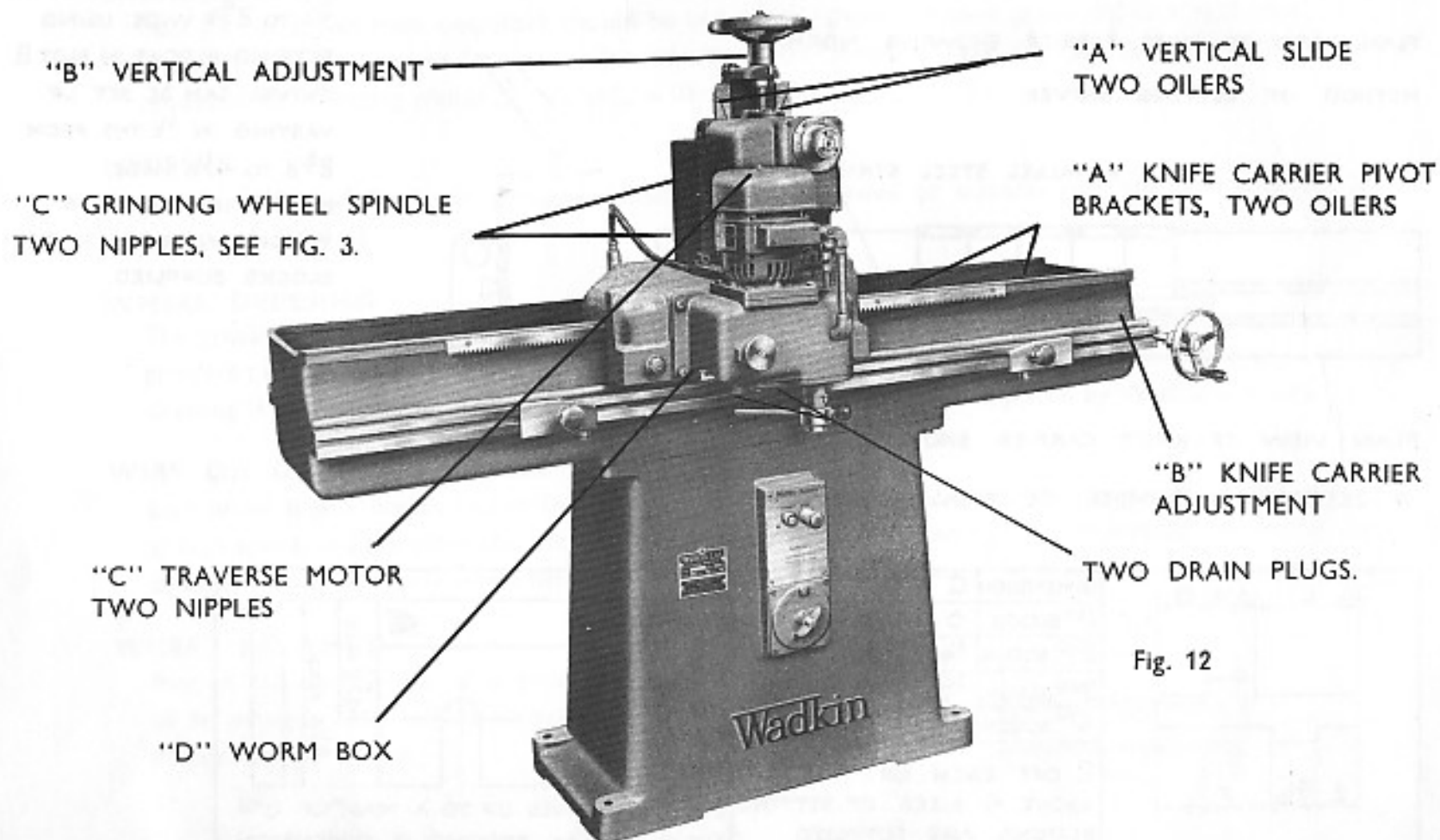


Fig. 12

POINTS "A." Oil daily, 3 to 4 drops Wadkin oil, Grade L.4.

POINTS "B." Fill oiler up weekly using Wadkin oil, Grade L.4.

POINTS "C." Give 3 to 6 charges of grease gun every three months, using Wadkin Grease, Grade L.6.

POINT "D." Check oil level weekly and fill up with Wadkin oil, Grade L.2.

## LUBRICATION (Continued)

As will be seen from the lubricating instructions Wadkin oils and greases are recommended but if it is desired to use lubricants other than Wadkin the following equivalents are listed below :

### WADKIN GRADE AND TYPE

Grease Grade L.6.  
Machine oil Grade L.4.  
Gear oil. Grade L.2.

### EQUIVALENTS

Shell Nerita Grease 3 or Vacuum Gargoyle Grease BRB 3.  
Shell Vitrea Oil 33, or Vacuum, Vactra Oil (Heavy Medium).  
Shell Vitrea Oil 69 or Vacuum Gargoyle DTE/BB Oil.

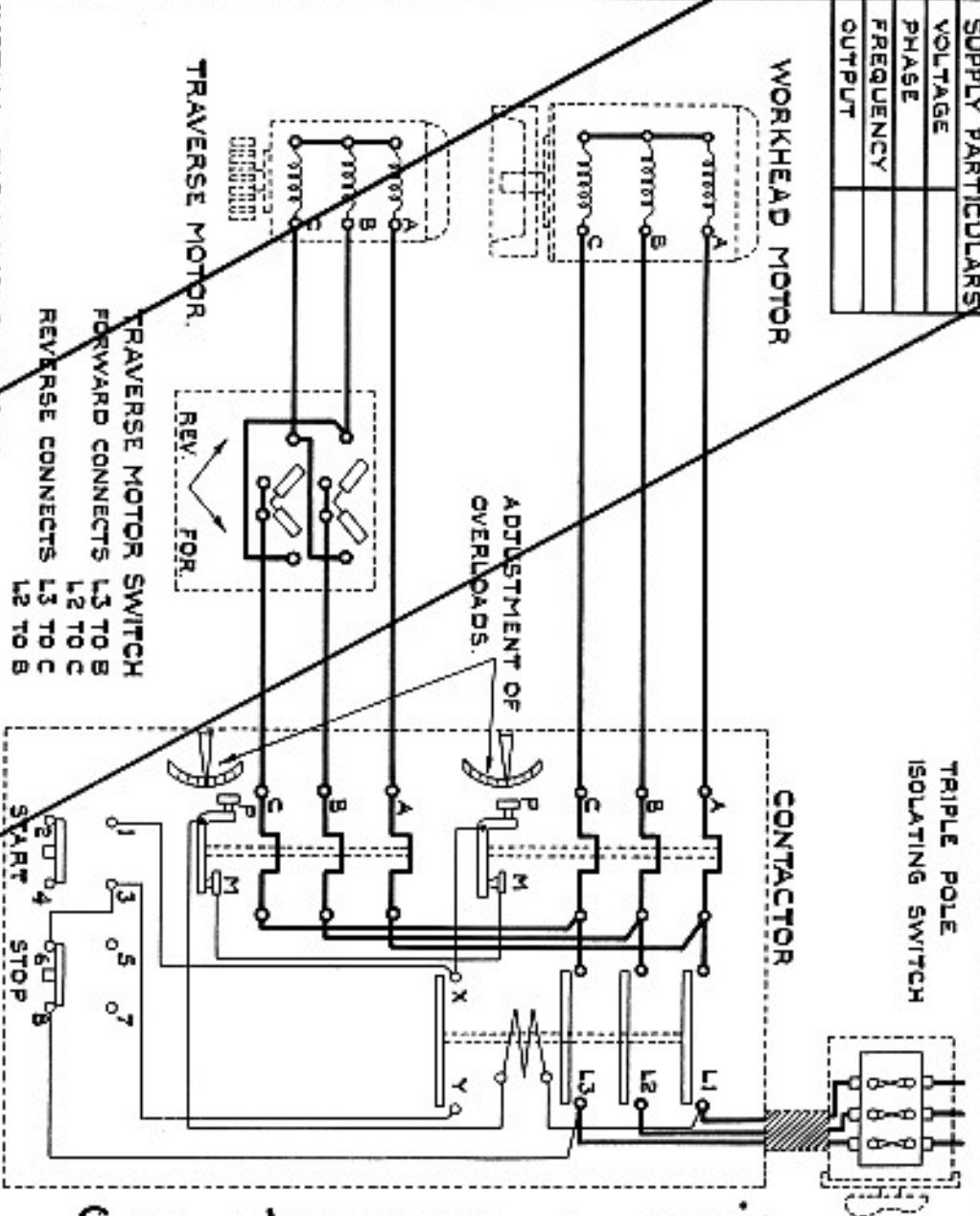
## BALL BEARING LIST

Position on Machine	Makers' No.	Quantity	Bore dia.	Outside dia.	Thickness
Bottom end grinding spindle ..	S.K.F., R.M.S. 10	1	1½"	3½"	¾"
Top end grinding spindle .. ..	S.K.F., R.M.S. 9	1	1½"	2½"	¾"
Driving end traverse motor .. ..	Hoff. 117	1	17 mm.	40 mm.	12 mm.
Tail end traverse motor .. ..	Hoff. 117	1	17 mm.	40 mm.	12 mm.
Raising screw .. .. .	S.K.F. 0-6	1	¾"	1½"	¾"
Carriage rollers .. .. .	Fischer F.G. 409	3			
Worm shaft, top .. .. .	Hoff. X.L.S. 1½"	1	1½"	3"	¾"
Worm shaft, bottom .. .. .	S.K.F., R.L.S. 6	1	¾"	1½"	¾"

RETAIN THIS DIAGRAM FOR FUTURE REFERENCE

FOR PARTICULARS OF WADKIN PORTABLE ELECTRIC BLOWER FOR CLEANING DOWN M/C. & ELECTRICAL GEAR SEE LEAFLET NO687

SUPPLY PARTICULARS	
VOLTAGE	
PHASE	
FREQUENCY	
OUTPUT	



*See diagram opposite page*

**INSTALLATION INSTRUCTIONS.**

FIT TRIPPLE POLE ISOLATING SWITCH NEAR MACHINE UNLESS SUPPLIED BY WADKIN LTD. TO SPECIAL ORDER, SO THAT THE ELECTRICAL GEAR MAY BE RELIABLY ISOLATED FOR INSPECTION PURPOSES. BRING LINE CABLES TO ISOLATING SWITCH AND TO L1, L2 AND L3 AT CONTACTOR. ENSURE THAT THE WORKHEAD MOTOR SPINDLE ROTATES IN A COUNTER CLOCKWISE DIRECTION WHEN THE LOOKING FROM THE NON DRIVING END. TO REVERSE ROTATION INTER-CHANGE L1 AND L2.

**OPERATION.**

TO START MOTORS PRESS 'START' BUTTON. TO STOP, PRESS 'STOP' BUTTON. TO LOCK OFF STOP BUTTON, PRESS AND TURN. THIS MUST BE RELEASED BEFORE A START CAN BE MADE. THE SWITCH CONTROLLING THE TRAVERSE MOTOR IS BUILT INTO THE MACHINE AND IS OPERATED BY THE ADJUSTABLE TRIP DOG MOUNTED ON THE SIDE OF THE TANK.

**OVERLOAD**

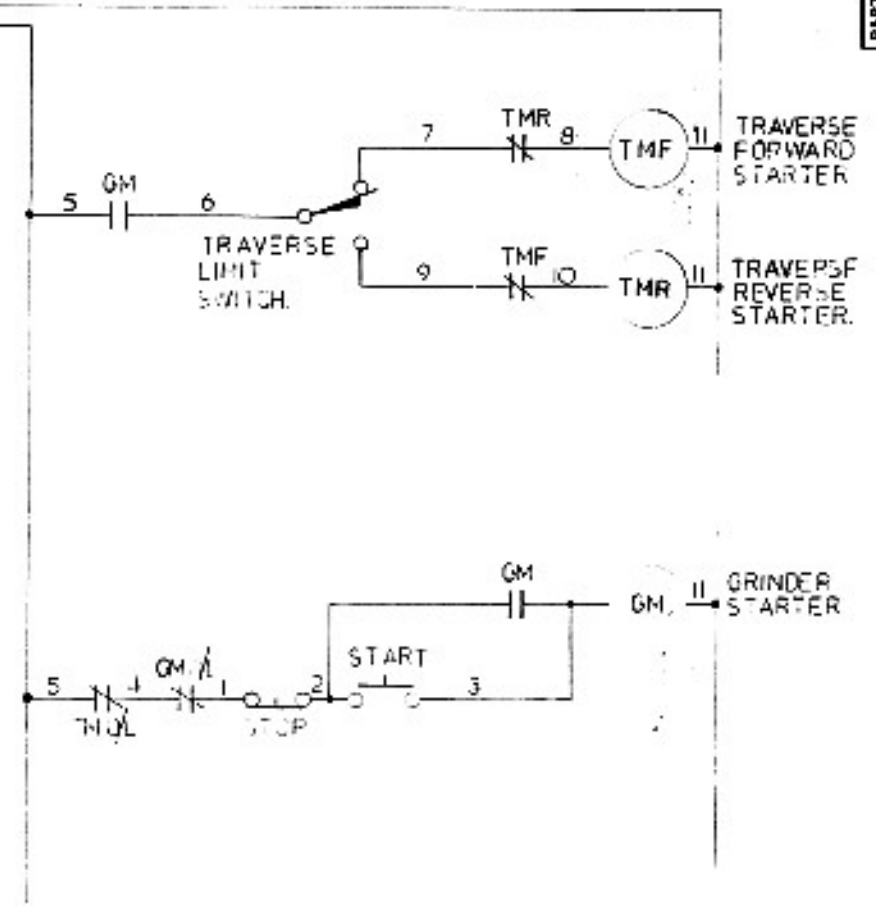
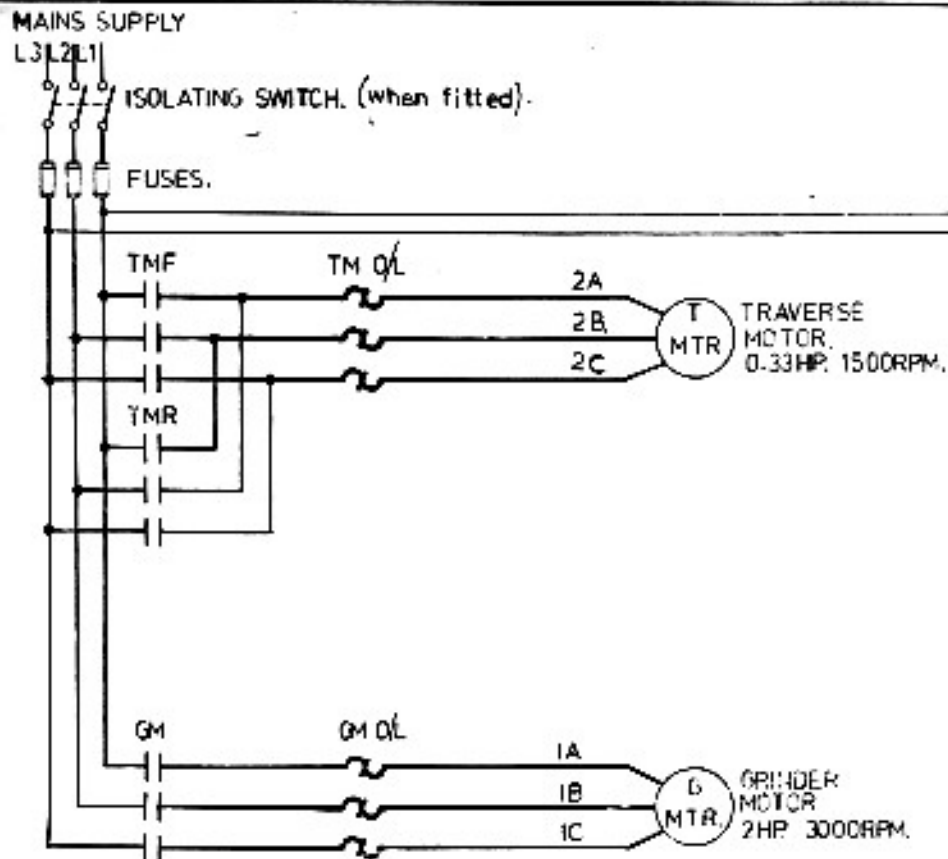
SHOULD THE MACHINE STOP DUE TO OVERLOAD, WAIT FOR A SHORT TIME TO ALLOW THE RELAYS TO COOL THEN START IN THE USUAL MANNER. THE SETTING OF THE OVERLOAD UNITS MAY BE VARIED BY MEANS OF THE ADJUSTMENT POINTERS. NORMAL SETTING IS TO THE MARKS CORRESPONDING TO THE FULL LOAD CURRENT OF THE MOTOR.

WADKIN LTD.  
LEICESTER.

DIAGRAM OF CONNECTIONS. D.475.



PART No.



**OPERATING INSTRUCTIONS**

TO START: PRESS START PUSHBUTTON, GRINDER MOTOR AND TRAVERSE MOTOR WILL START TOGETHER.  
 TO STOP: PRESS STOP BUTTON.  
 TRAVERSE SWITCH: ACTUATED BY DOGS ON SIDE OF TANK.

SIMILAR TO

SURFACE FINISH	
∇	- ROUGH M/C.
∇∇	- FINISH M/C.
∇∇∇	- ROUGH GRIND
∇∇∇∇	- FINISH GRIND

IMPERIAL LIMITS	
FRACTIONS	± 1/16"
DECIMALS	± .005"
METRIC LIMITS	
WHOLE NUMBERS	± 0.1 MM
DECIMALS	± 0.1 MM
BALL BEARING LIMITS - SEE LIST	

<b>THIRD ANGLE PROJECTION</b>	
DATE	SIG.
ALT No.	D
	C
	B

<b>WADKIN LTD. LEICESTER</b>	
DATE	DESCRIPTION
5.12.75	NQ KNIFE GRINDER
DRN. BY	
CHKD. BY	

QTY.	MATERIAL
PART No.	
<b>D.2237</b>	

SAMPLE TYPE ORDER

MACHINE: NQ

MACHINE NO: 1407

TEST NO: 68975

PARTS REQUIRED

1 - NQ201/1/NQ44 TRIP KNOB

1 - NQ201/2/NQ6 WORM BOX

1 - NQ202/NQ16 WORMWHEEL

NQ203/NQ66 RACK

NQ203/NQ131 CARRIER SHAFT

See the next page for sample detail of how to order.

### SPARE PARTS

Should spare parts be required due to breakage or wear full particulars including the machine and test number must be given. This information is on the nameplate attached to the machine and will be similar to the picture below.

<b>Wadkin Ltd.</b>		
<b>LECESTER ENGLAND</b>		
MACHINE SERIAL NO.	FD 5134	
MACHINE TEST NO.	72601	
PATENT NO.		
VOLTAAGE	PHASE	CYCLES
400	3	60
SEE MAINTENANCE INSTRUCTION BOOK FOR LUBRICATION DETAILS		

Please see the next page for sample detail of how to order spare parts.



SPARE PARTS BOOKLET

CONTENTS

1. Basic ordering requirements.
2. Sample type order.
3. List of item numbers and description of item.
4. Drawing showing item numbers.

36" & 48" NQ

KNIFE GRINDER

36" & 48" NQ SPARE PARTS LIST

NQ201/1/NQ1	TANK
NQ201/1/NQ4	COLUMN
NQ201/1/NQ5	VERTICAL SLIDE
NQ201/1/NQ11	GRINDING WHEEL HOOD
NQ201/1/NQ13	MOTOR TRUNNION
NQ201/1/NQ17	BRACKET FOR RAISING SCREW
NQ201/1/NQ22/A	KNIFE CARRIER
NQ201/1/NQ23	COVER FOR COLUMN
NQ201/1/NQ24	BRACKET FOR KNIFE CARRIER
NQ201/1/NQ40	SUDS SCREW
NQ201/1/NQ44	TRIP KNOB
NQ201/1/NQ46	REAR BEARING END CAP
NQ201/1/NQ47	REAR BEARING HOUSING
NQ201/1/NQ48	FRONT BEARING HOUSING
NQ201/1/NQ52	REAR COLLAR
NQ201/1/NQ54	END CAP FOR MOTOR TRUNNION
NQ201/1/NQ56	REAR BEARING LOCKNUT
NQ201/1/NQ57	FRONT COLLAR
NQ201/1/NQ58	HANDLE FOR SPINDLE LOCK
NQ201/1/NQ59	GRINDING WHEEL LOCKNUT
NQ201/1/NQ73	SLEEVE FOR WORMWHEEL
NQ201/1/NQ74	WORMWHEEL FOR FEED
NQ201/1/NQ90	TRIP DIAL
NQ201/1/NQ91	RAISING SCREW
NQ201/1/NQ92	WORM FOR FEED
NQ201/1/NQ95	BUSH FOR COLUMN
NQ201/1/NQ102	CHECK FOR CARRIER BRACKET
NQ201/1/NQ109	POINTER FOR WHEEL ADJUSTMENT
NQ201/1/NQ110	SCALE FOR WHEEL ADJUSTMENT
NQ201/1/NQ126	SPACING SLEEVE
NQ201/1/NQ127	SPRING FOR SPINDLE

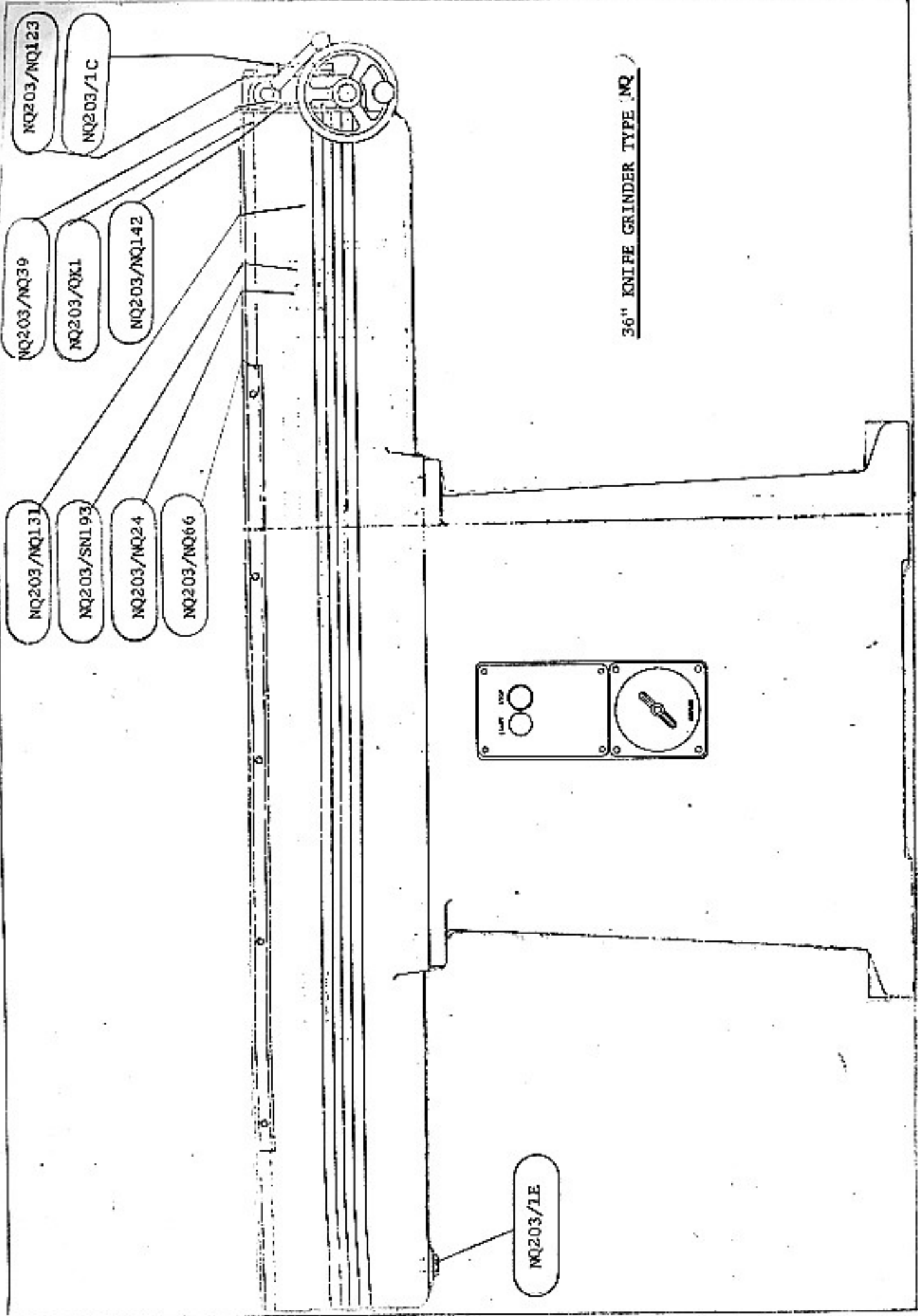


NQ201/2/NQ94	ROD FOR FEED PAWL
NQ201/2/NQ96	FEED PAWL
NQ201/2/NQ97	SPRING FOR FEED PAWL
NQ201/2/NQ98	STUD FOR FEED ADJUSTMENT
NQ201/2/NQ117	BEARING HOUSING
NQ201/2/NQ133	WORM SHAFT
NQ201/2/NQ146	WORMSHAFT LOCKNUT
NQ201/2/NQ165	DOWN FEED CAM
NQ201/2/LS1 $\frac{3}{4}$	HOFFMAN BALL BEARING
NQ201/2/NP179	SHAFT FOR REVERSING SWITCH
NQ201/2/SKFRLS6	BALL BEARING
NQ201/2/4C	TWO BALL HANDLE
NQ201/2/5B	STAR HANDWHEEL
NQ201/2/5F	STAR HANDWHEEL
NQ201/2/00D	BALL BEARING LOCKNUT
NQ202/NQ15	BRACKET FOR RACK PINION
NQ202/NQ16	WORMWHEEL
NQ202/NQ28	HANDWHEEL FOR RAISING AND LOWERING
NQ202/NQ43	KNOB FOR RACK PINION
NQ202/NQ72	BUSH FOR RACK PINION SLEEVE
NQ202/NQ88	SLEEVE FOR RACK PINION
NQ202/NQ89	RACK PINION
NQ202/NQ99	ROLLER STUD
NQ202/NQ100	SLEEVE FOR ROLLER STUD
NQ202/NQ101	VEE STRIP FOR COLUMN
NQ202/NQ103	LOCKNUT FOR RACK PINION SLEEVE
NQ202/NQ110	SCALE FOR WHEEL ADJUSTMENT
NQ202/NQ111	SPRING FOR TRIP KNOB
NQ202/FG409	FISCHER BEARING

NQ201/1/NQ145	SPINDLE LOCKING PLATE
NQ201/1/NQ148	FEED RATCHET
NQ201/1/NQ150	FRONT BEARING END CAP
NQ201/1/NQ155	ROTOR SPINDLE
NQ201/1/NQ177	ADAPTOR BUSH FOR 1" BORE WHEEL
NQ201/1/NQ178	COVER FOR TANK
NQ201/1/ME136	SPRING
NQ201/1/NP168	HANDLE FOR REVERSING SWITCH
NQ201/1/NP169	LEVER FOR REVERSING SWITCH
NQ201/1/QAF 33	DOVETAIL BOLT
NQ201/1/SKP06	THRUST BEARING
NQ201/1/SKFRMS9	BALL BEARING
NQ201/1/SKFRMS10	BALL BEARING
NQ201/1/OD	BALL BEARING LOCKNUT
NQ201/1/1D	BALL BEARING LOCKNUT
NQ201/1/3	COLLAR
NQ201/1/37	GREASE RETAINER
NQ201/2/NQ3	CARRIAGE
NQ201/2/NQ6	WORM BOX
NQ201/2/NQ18	ADAPTOR PLATE
NQ201/2/NQ20	END CAP
NQ201/2/NQ55	LOCKING SCREW FOR CANTING
NQ201/2/NQ74	WORMWHEEL FOR FEED
NQ201/2/NQ75	LOCK BUSH
NQ201/2/NQ76	LOCK BUSH
NQ201/2/NQ83	DOWN FEED CAM
NQ201/2/NQ85	STUD FOR TRIP ROLLER
NQ201/2/NQ86	TRIP ROLLER

NQ203/NQ1	TANK
NQ203/NQ2	TANK LEG
NQ203/NQ24	BRACKET FOR KNIFE CARRIER
NQ203/NQ37	WORMWHEEL HOUSING
NQ203/NQ39	WORMWHEEL FOR KNIFE CARRIER
NQ203/NQ66	RACK
NQ203/NQ67	SLIDE ROD
NQ203/NQ75	LOCK BUSH
NQ203/NQ121	BUSH FOR WORMWHEEL HOUSING
NQ203/NQ122	SCALE FOR KNIFE CARRIER
NQ203/NQ123	POINTER FOR CARRIER ADJUSTMENT
NQ203/NQ124	NUT FOR CANTING LOCK
NQ203/NQ125	LOCK BUSH
NQ203/NQ130	LOCKING SCREW FOR CANTING
NQ203/NQ131	CARRIER SHAFT
NQ203/NQ132	WORM FOR ADJUSTING KNIFE CARRIER
NQ203/NQ142	PLATE FOR WORMWHEEL HOUSING
NQ203/QK1	RUBBER MUSHROOM
NQ203/SM193	COMPO BUSH
NQ203/1C	TWO BALL HANDLE
NQ203/2B	HANDWHEEL
NQ203/3	COLLAR
NQ203/4	TWO BALL HANDLE
NQ203/1E	PLUG

36" KNIFE GRINDER TYPE 'NQ'



NQ203/NQ123

NQ203/1C

NQ203/NQ39

NQ203/QX1

NQ203/NQ142

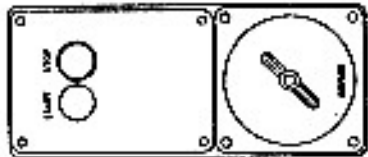
NQ203/NQ131

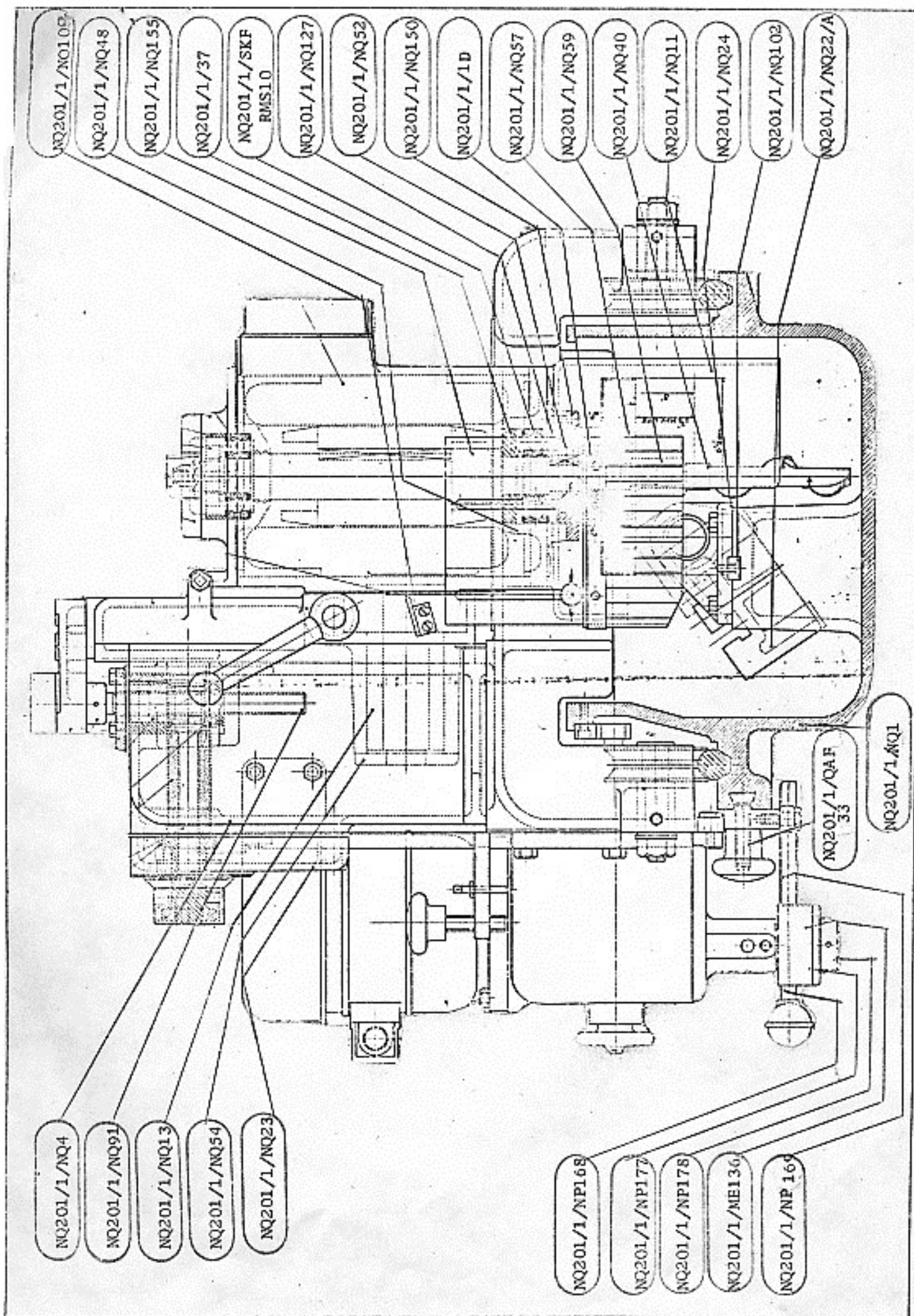
NQ203/SN193

NQ203/NQ24

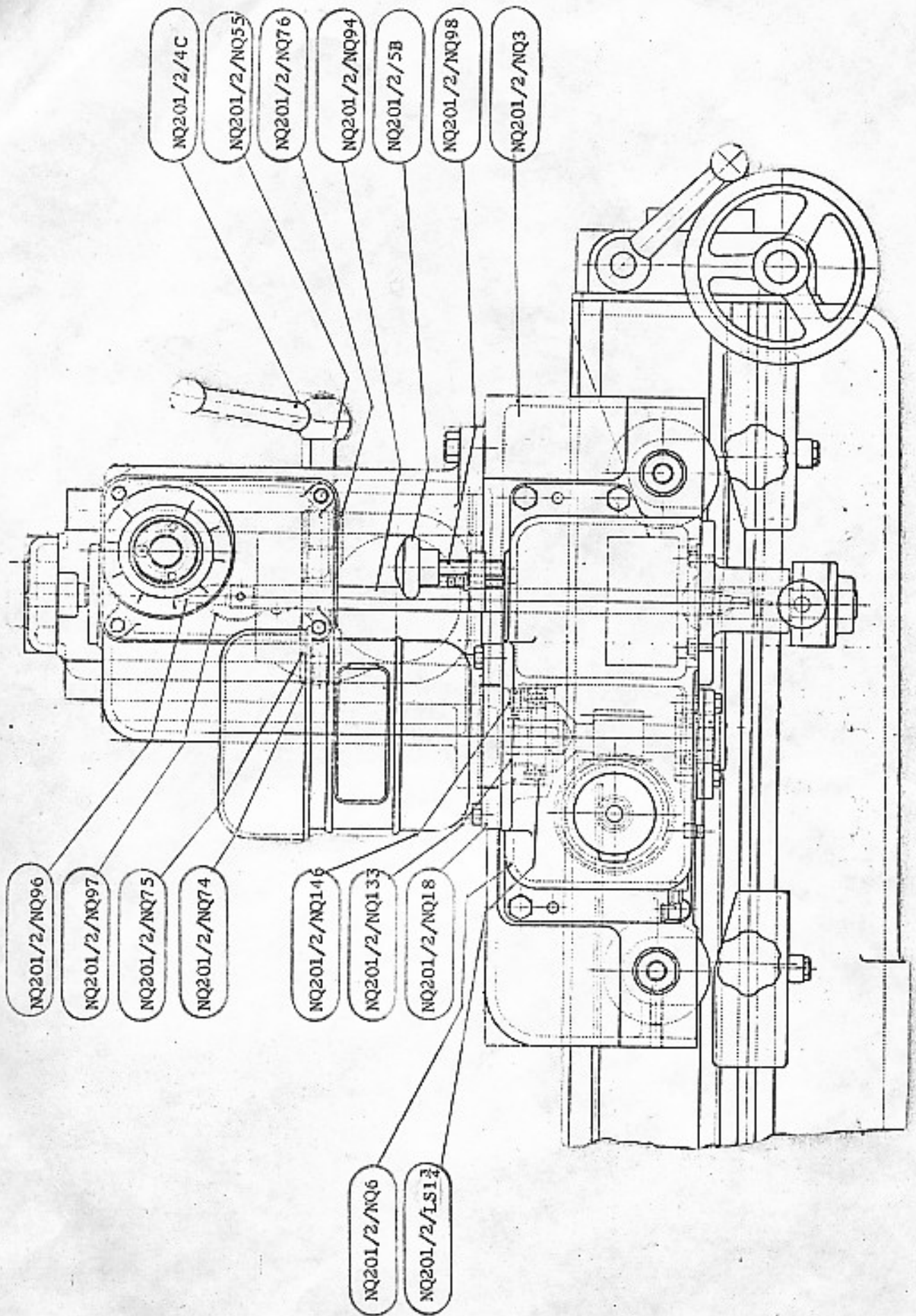
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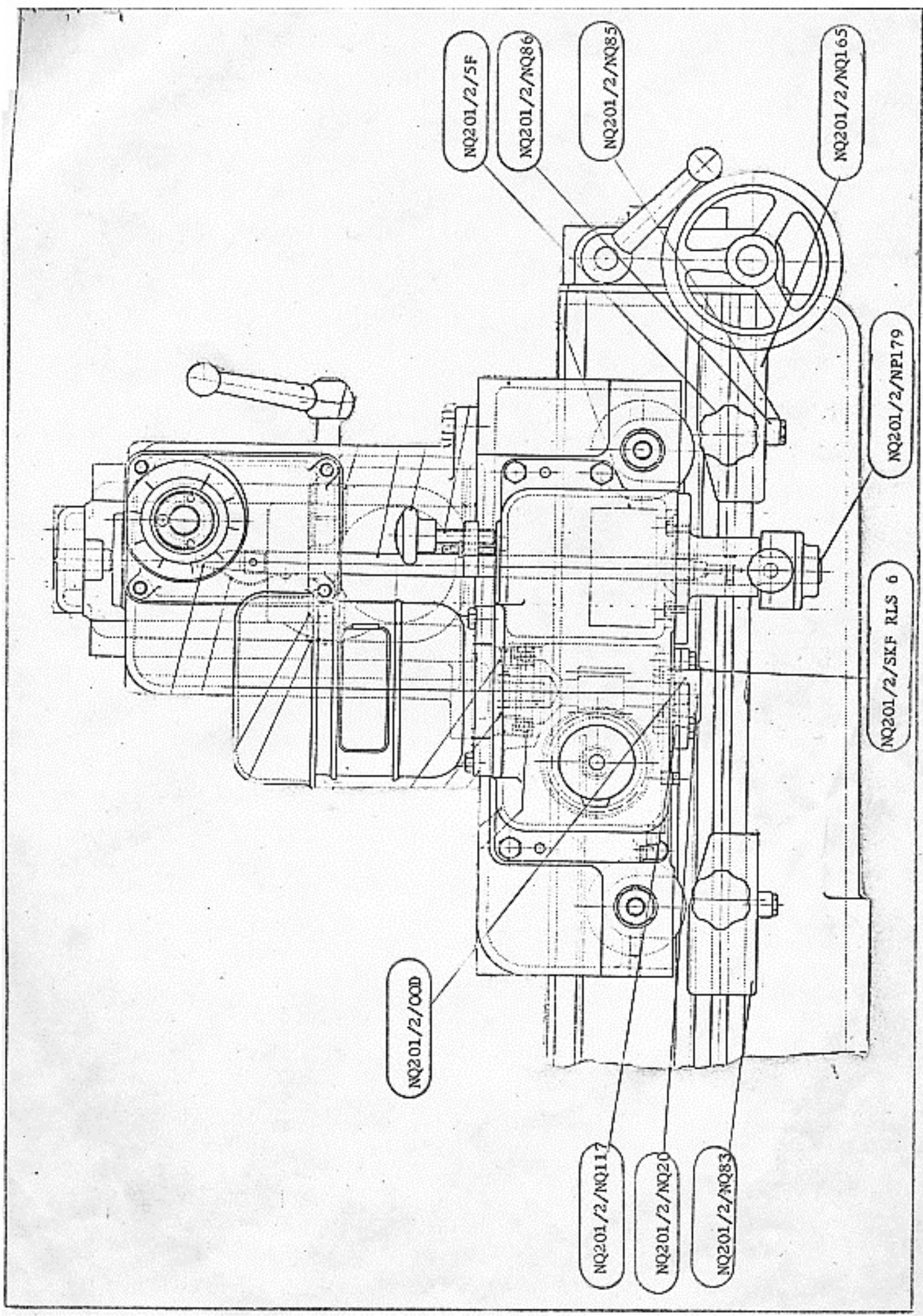
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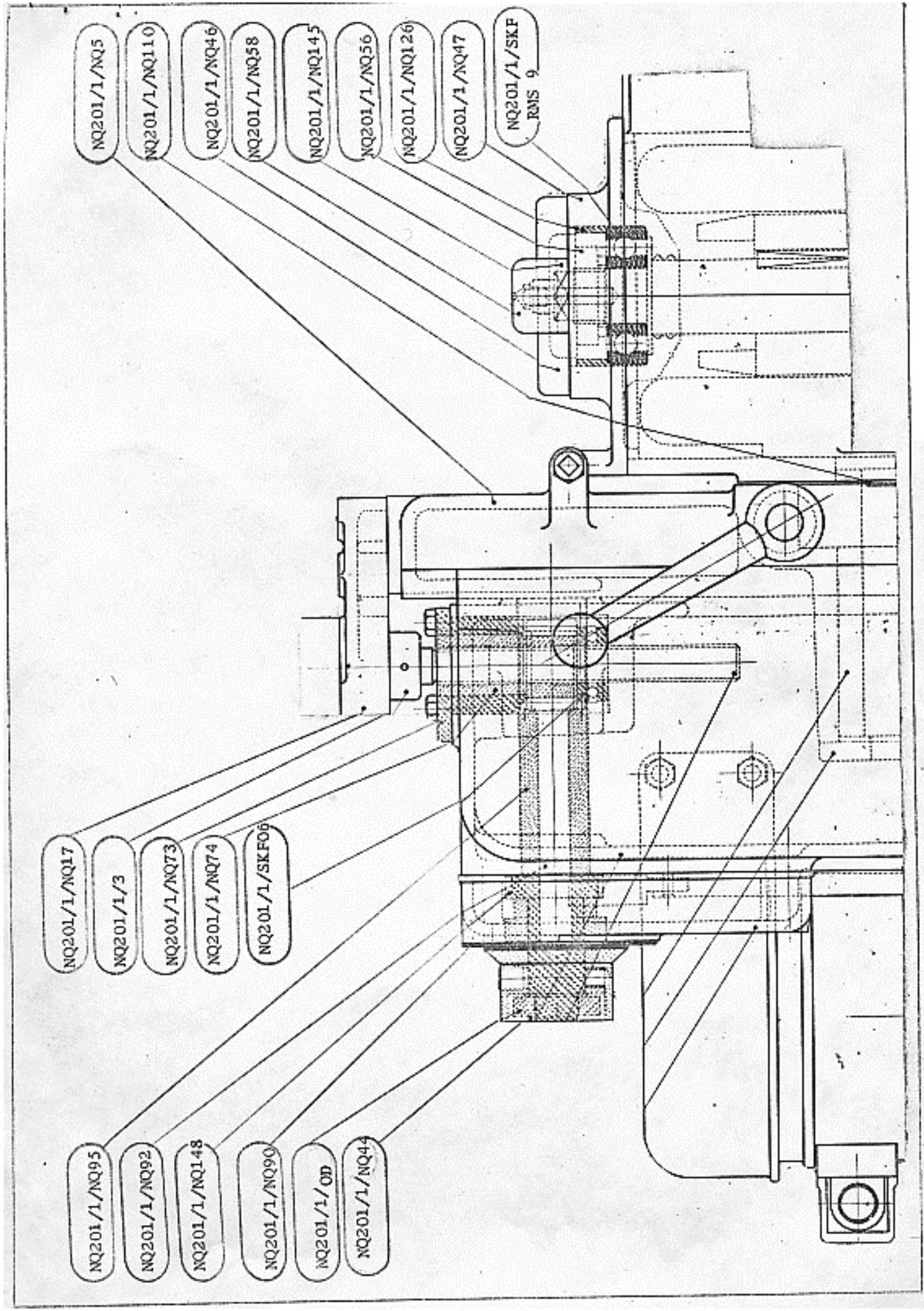
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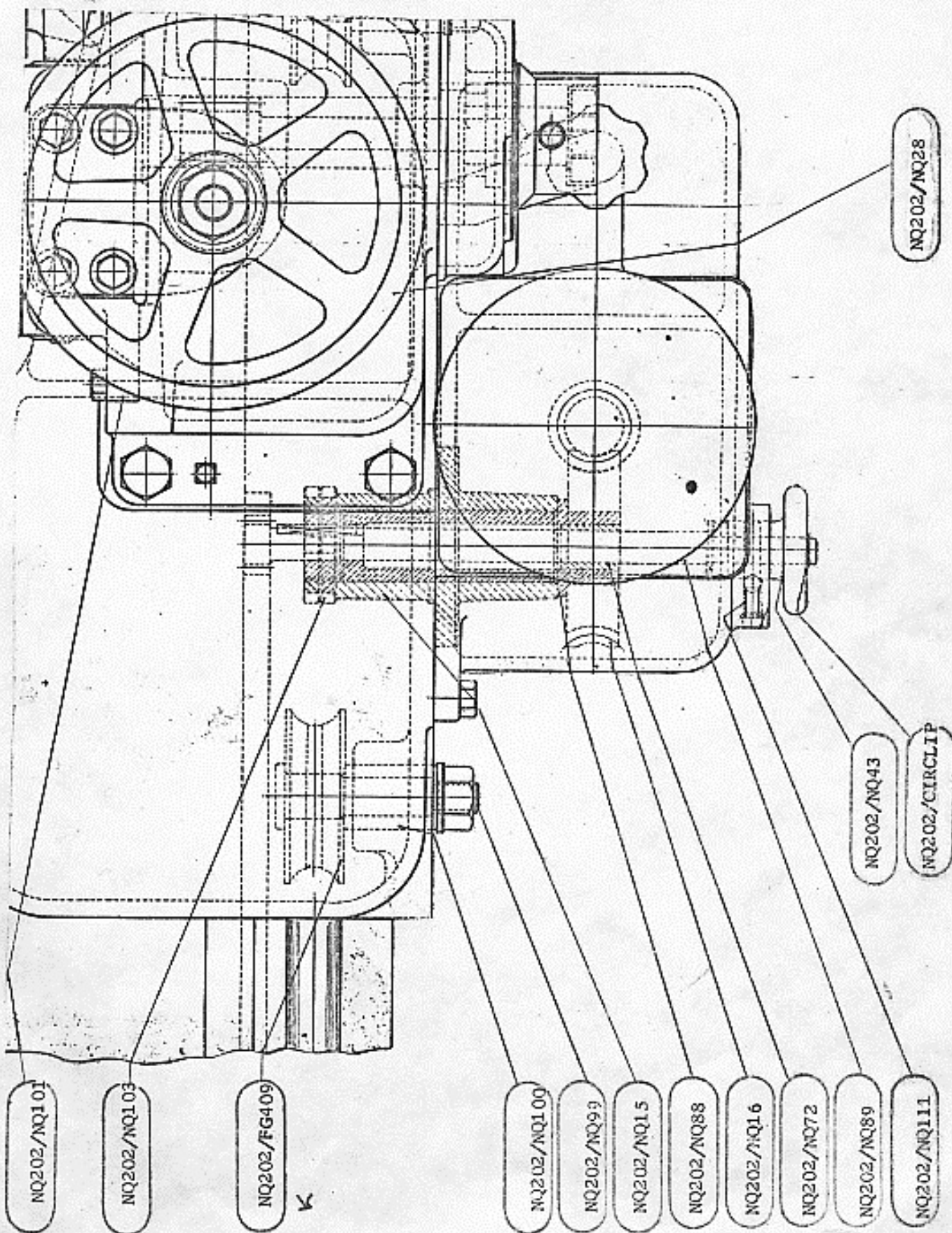
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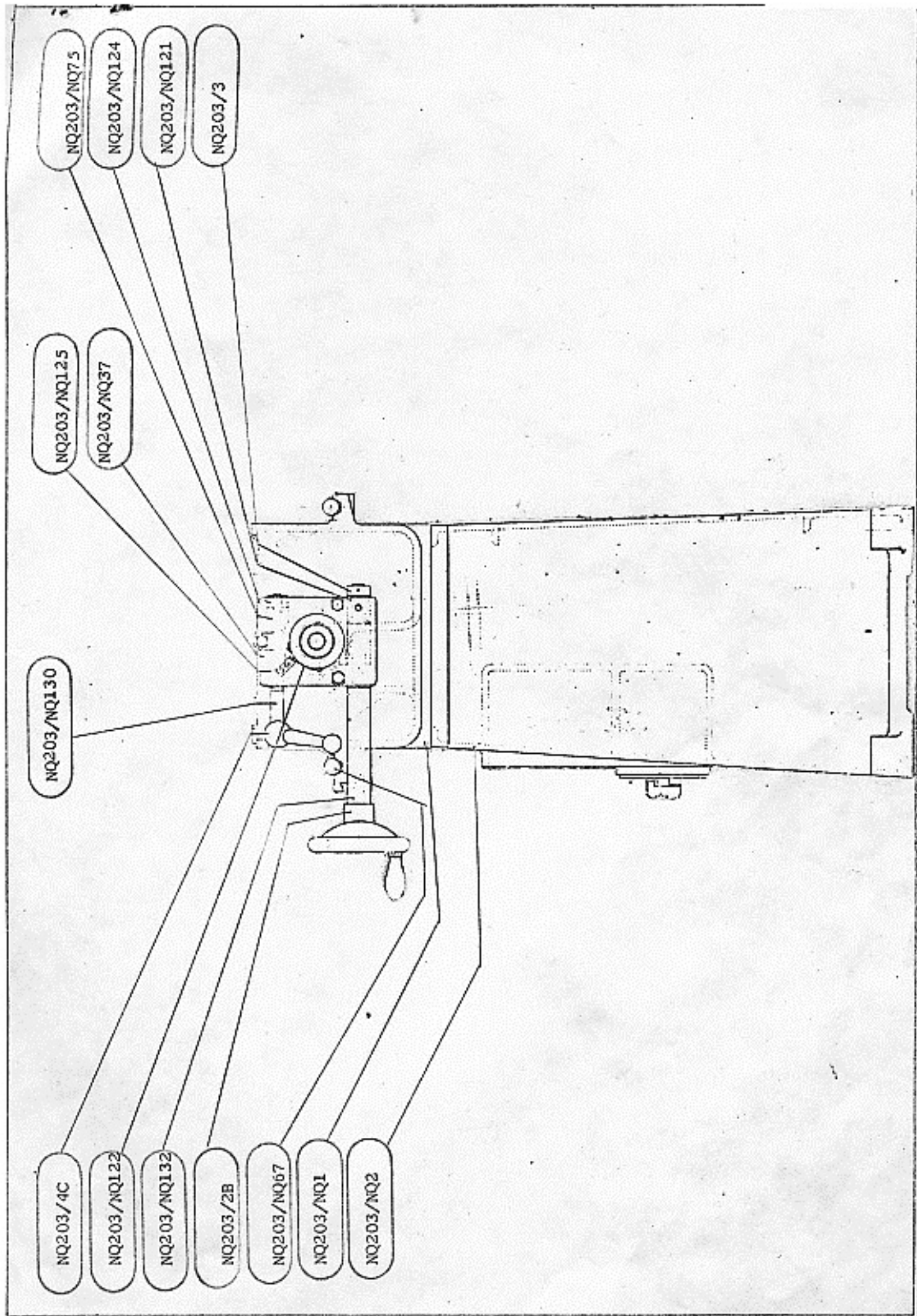
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NQ203/3

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NQ203/NQ132

NQ203/2B

NQ203/NQ67

NQ203/NQ1

NQ203/NQ2

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