

OPERATOR'S HANDBOOK

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SPECIFICATION

20 INCH LATHE		September 1986
MACHINE	Swing over bed & saddle	20 in. (500 mm)
	Swing over cross slide	13 in. (300 mm)
	Distance between centers	30 in. or 60 in. or 80 in. or 120 in.
	MAIN drive motor	15 H.P. (5.6 kw)
	Bar capacity	3.0 in. (76 mm)
HEADSTOCK	Spindle speeds	18
	Geometric speed range	27-1600 RPM
	Spindle nose - camlock	D1-8 in.
	Spindle hole	3.06 in. (77 mm)
	Spindle center	#5MT
FEED BOX	Inch feed range	.0015 - .108 in./rev.
	Inch thread range	2 to 127 TPI
	Metric feed range	.04 to 2.75 mm/rev.
	Metric thread range	.2 to 14 mm pitch.
APRON	Handwheel-one revolution	1.000 in. (25.4 mm)
	Half-nuts	Double
	High speed threading	(See Page 16)
	Repeatability of auto carriage stop	+ .005 in. (+.13 mm)
	Feed torque control	Variable
CARRIAGE CROSS SLIDE	Carriage length on bed	21 in. (533 mm)
	Carriage bridge width	10 in. (254 mm)
	Cross slide length	24 in. (610 mm)
	Cross slide travel	11.5 in. (292 mm)
	Compound travel	5 in.
	Direct reading dial graduation	.001 in. (.02 mm)
TAILSTOCK	Quill diameter	3 in. (76 mm)
	Quill travel	7 in. (178 mm)
	Morse taper with tang	#5 MT
	Offset	+ .75 in. (+ 19 mm)

1. LIFTING AND INSTALLATION INSTRUCTIONS, contd.

1.2 Inspection

Check your delivery slip against the accessories that were ordered with the machine. If there is a shortage or error, report it to Standard-Modern Technologies immediately, giving the serial number of the machine which is stamped in the recessed face on top of the bed at the tailstock end.

1.3 Cleaning

All unpainted parts of the machine have been coated with an anti-rust compound. This should be thoroughly removed after the machine is installed and before moving the carriage, compound rest or tailstock.

To remove the anti-rust compound use a wiper dipped in Varsol or Kerosene.

All unpainted surfaces should be coated immediately with a film of light machine oil to prevent rust.

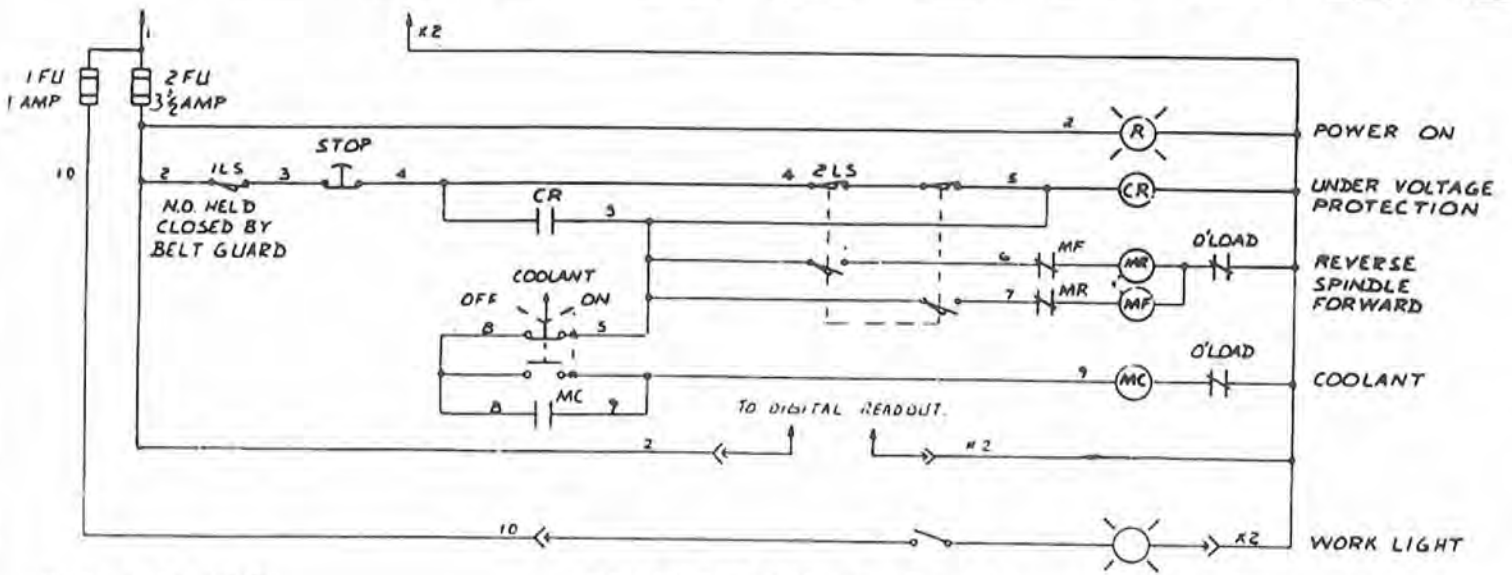
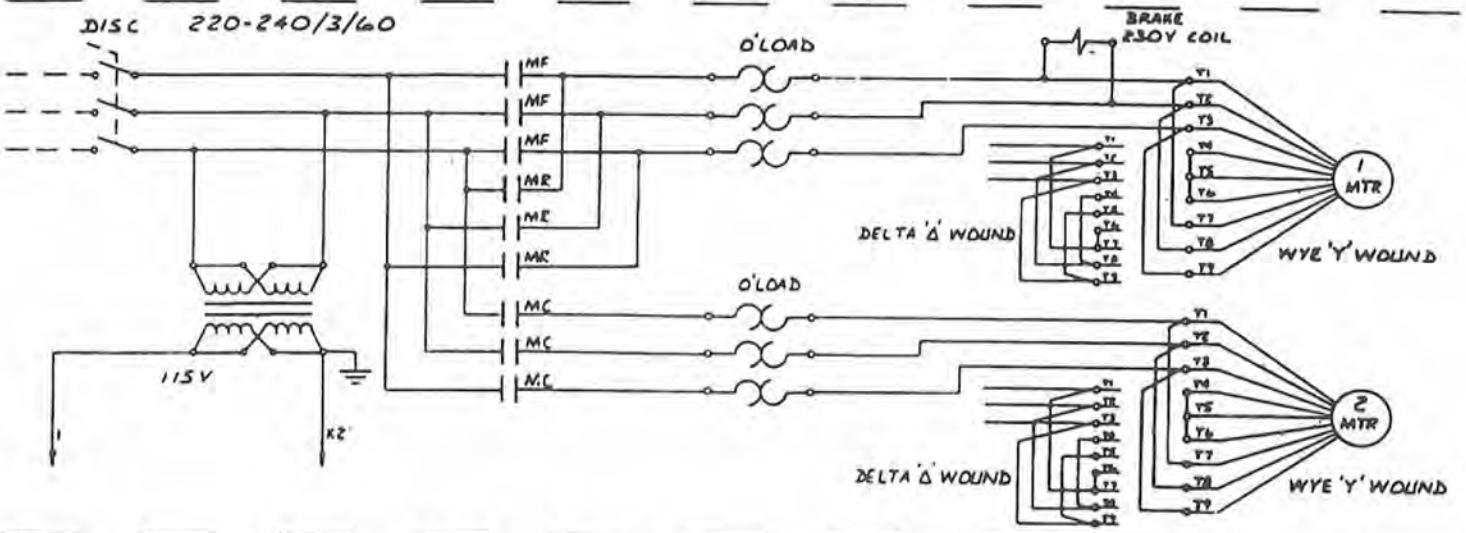
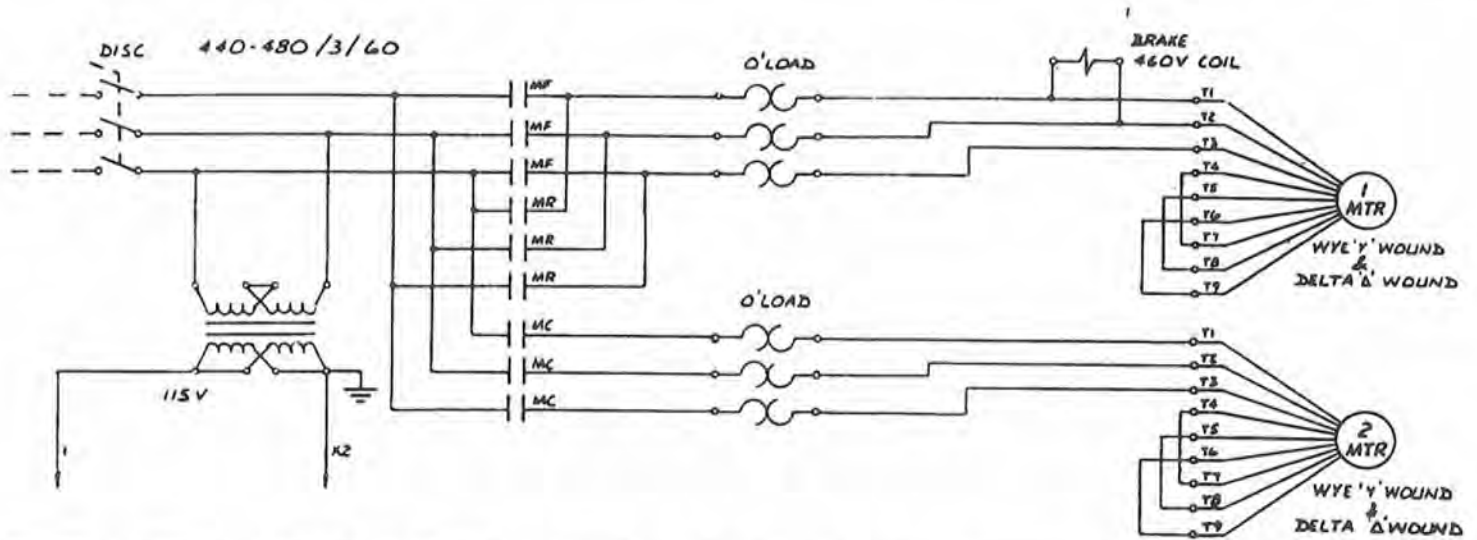
1.4 Installation

For proper operation, the machine should be set on a substantial floor capable of supporting a uniform pressure of 30 P.S.I. To secure the machine on its foundation use anchor bolts or lag screws as shown on Floor Plan.

After the machine is in position, it must be levelled by the use of the square head set screws provided, before tightening the lag screws. It will be necessary to use 4-inch square steel plates, about 3/4" thick, under the levelling screws to prevent the ends of the screws from sinking into the floor.

Use a precision level placed lengthwise, and crosswise on the bed. To take a reading of the level for the crosswise levelling of the bed, use parallel bars placed on the flats of the bed.

After levelling within 0.0005 in/ft, the pedestals should be lagged to the floor, and the levelling re-checked. Re-check the level of the machine at regular intervals



DRAWN BY: A.S. HOWLETT
DATE: JAN 16 1982

ELEMENTARY DIAGRAM

20" LATHE 1/4" 3-PHASE COOLANT & D.R.D.

A-110708

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2. LUBRICATION

OIL: SUNOCO Way Lube 80 or equivalent.

Refer to Lubrication Chart attached to lathe.

Grease: Lithium Base with or without E.P. additives.

EVERY SIX MONTHSCHANGE OIL

Headstock	-	14.2	litres	or	15	U.S.	quarts
Feedbox	-	2.8	"	"	3	"	"
Apron	-	1	"	"	1	"	"

EVERY MONTHLIGHTLY OIL

Leadscrew Reverse Linkage Pivot.

Grease

Apron Controls	-	2	Fittings
Leadscrew Reverse Cam	-	1	Fitting and Cam Track

EVERY 8 WORKING HOURSTOP UP WITH OIL

Apron	-	Oil Sump
Compound	-	1 Pipe Plug, 1 Oiler
Cross slide nut and bearing		2 Oilers
Taper attachment	-	1 cup, 4 Oilers
Tailstock		2 Oilers

GREASE END BRACKET - 3 FITTINGS

2.1 All machines are shipped with the lubricant oil drained from the oil sumps in the Headstock, Feedbox and Apron and must be serviced before being put into use.

Before filling reservoirs or oil cups, always wipe off any accumulation of old oil, grease or dirt that might get into a part being lubricated.

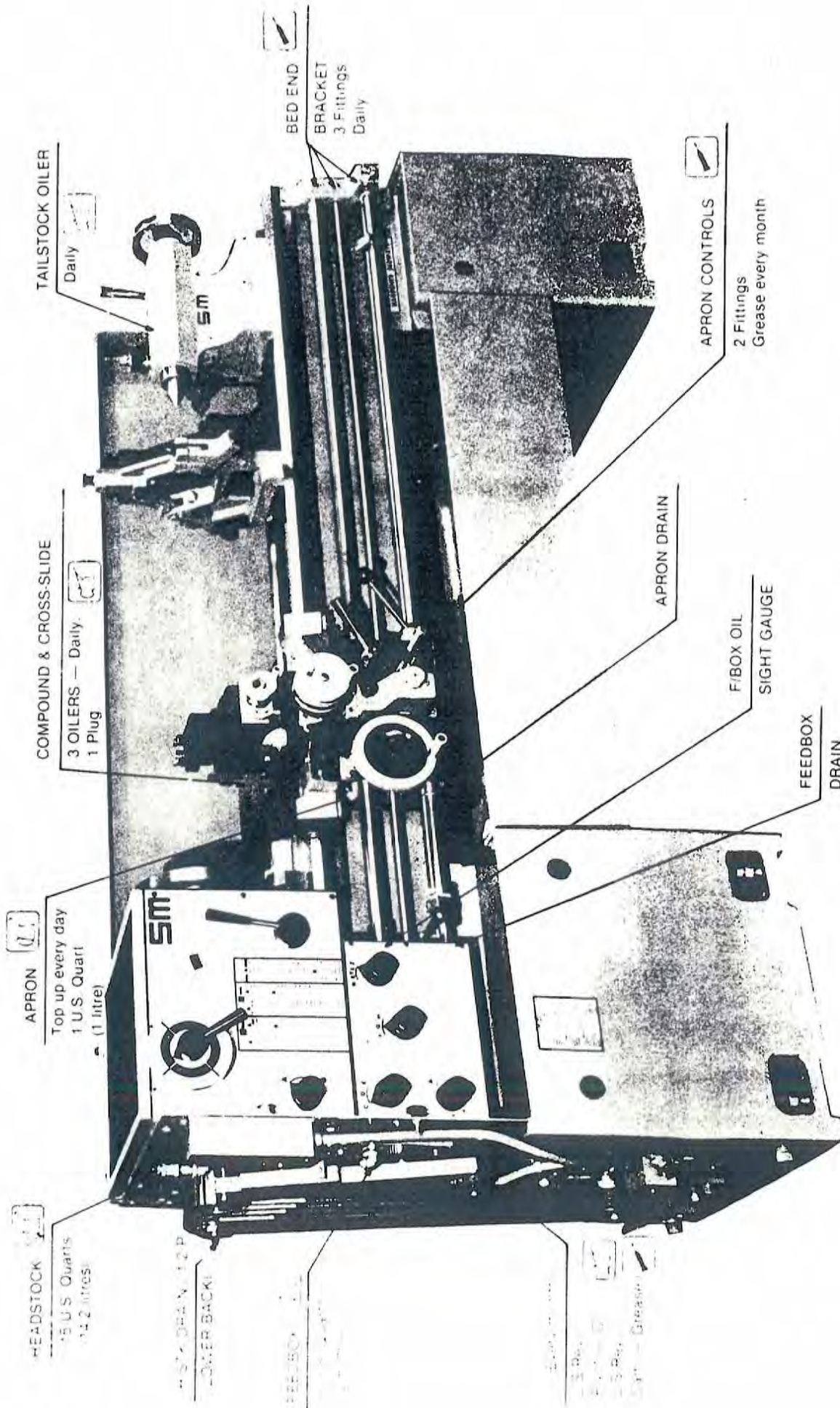
Depending on operating conditions, usually about every six months, the Headstock, Feedbox and Apron should be drained and thoroughly flushed out, before adding new oil.

Because most solvents tend to soften paints, they are not recommended as flushing mediums. A light mineral oil, to which a small percentage of kerosene has been added, may be used to flush out any dirt or sediment. Run the machine for several minutes without load so that the flushing oil can circulate through the reservoir. The flushing oil should then be drained and new oil added.

2.2 END GEAR TRAIN

Oil idler gear teeth daily.

(See page 33).



HEADSTOCK
5 U.S. Quarts
(1.2 litres)

APRON
Top up every day
1 U.S. Quart
(1 litre)

COMPOUND & CROSS-SLIDE
3 OILERS — Daily
1 Plug

TAILSTOCK OILER
Daily

FEEDBOX
LOWER BACK

BED END
BRACKET
3 Fittings
Daily

APRON DRAIN

FIBOX OIL
SIGHT GAUGE

FEEDBOX
DRAIN

APRON CONTROLS
2 Fittings
Grease every month

LUBRICATION —
OIL: SUNOCO WAY LUBE 80 OR EQUIVALENT.
GREASE: Lithium Base with or without E.P. Additives.
CAUTIONS: DO NOT USE DETERGENT OIL
CHECK LEVELS DAILY

LUBRICATION, contd.

2.3 Apron

The oil level should be checked and replenished daily as the "one-shot" lubricating pump draws its oil from this reservoir in order to lubricate the saddle and cross slide ways.

The "one-shot" lubrication system plunger is located on the front face of the apron close to the handwheel and should be used once every 2-6 working hours, depending on operating conditions.

The apron oil reservoir should be drained, flushed and refilled with fresh clean oil at least once every six months.

One grease nipple located on the right hand end face of the apron lubricates the half-nut control shaft. A second grease nipple lubricates the leadscrew reverse control hub.

2.4 Tailstock

The spindle and screw are lubricated by an oiler located on top of the spindle housing. The bedways on which the tailstock slides should be cleaned and oiled frequently.

Dry red lead mixed with machine oil to a creamy consistency is an excellent lubricant for the tailstock center when a revolving center is not available.

2.5 Compound

On the compound rest, remove the pipe plug in the top face to lubricate the ways and the screw. Replace the pipe plug after applying oil. A ball type oiler lubricates the screw bearing.

2.6 Cross Slide

The cross slide dovetails and bearing surfaces are lubricated by the "one-shot" lubricator pump located in the apron. One oiler, at the center on top of the cross slide lubricates the Cross Feed Nut and the threaded portion of the Cross Feed Screw. The cross feed screw bearing is lubricated through an oiler behind the cross feed dial.

2.7 Saddle

The saddle ways are lubricated by means of the "one-shot" lubricating system through oil passages and oil grooves.

The oil is retained at the bearing surfaces by felt seals located at either end of the saddle wings which also provide an even distribution of the lubricant over the ways.

LUBRICATION, contd.2.8 Bed End Bracket and Leadscrew

Three grease fittings, located on the front face of the Bed End Bracket lubricate the ends of the Leadscrew, Feed Shaft, Control Shaft and Leadscrew Reverse Shaft and Trip Cam.

Grease the ends of the Leadscrew and Feedshaft every 8 working hours. The end of the Control Shaft and Leadscrew Reverse Shaft require grease once a month, as indicated on Lubrication Plate.

Before cutting a thread, clean and oil the Leadscrew thoroughly.

2.9 Leadscrew Reverse Linkage

The leadscrew reverse linkage and cam are serviced after opening/removal of the belt guard.

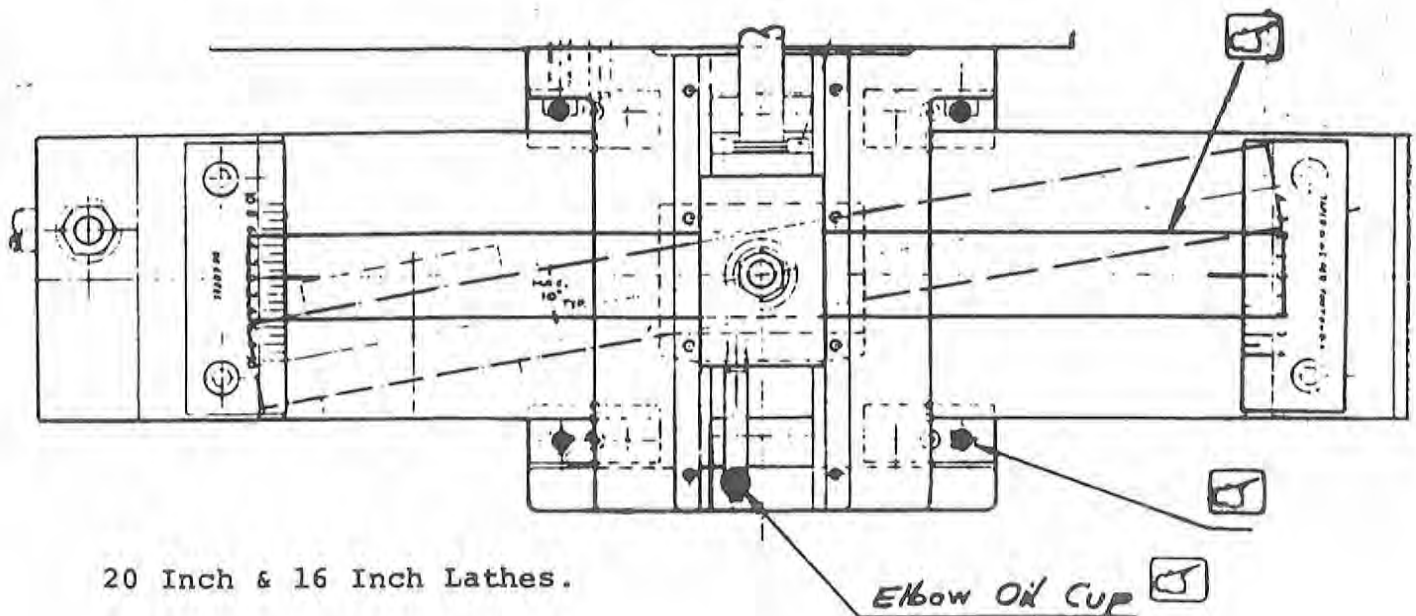
Once per month, grease should be applied to the top of the operating bar, the cam track and the grease nipple in the operating cam body. The pivot should also be lightly oiled at this time.

2.10 Taper Attachment

Clean and oil the pivoted Slide Bar before using

Four oilers lubricate the slide plate.

The elbow oil cup located at the back of the sliding block lubricates the cross-feed shaft bearings, sliding block and pivot bolts.



20 Inch & 16 Inch Lathes.

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3. LATHE SAFETY

Every effort has been made in the design and production of the lathe to comply with statutory safety requirements and to provide a fundamentally safe machine tool.

In the further interests of safety, attention should be given to the following notes:

3.1 Machine Capacity

The dimensions of a component which can be accommodated on the lathe are limited only by the physical restrictions of the machine itself but responsibility for the following points with respect to machining a component must inevitably rest with the user.

- (1) Ensuring that the operator has had suitable training and possesses the required degree of skill and experience to undertake the work.
- (2) Providing suitable work holding and/or supporting equipment, i.e. chucks, steadies, revolving centers, etc.
- (3) Ensuring that suitable tooling is provided and correctly mounted.
- (4) Ensuring that suitable feeds and speeds are selected (if in doubt select the lowest).
- (5) Providing suitable workpiece guards and ensuring that these are consistently used.

3.2 Lathe Safety Rules

- (1) Read and understand operation notes before attempting to use the machine.
- (2) Keep lathe work areas clean.
- (3) Keep area surrounding machine tidy.
- (4) ENSURE YOU KNOW HOW TO STOP THE MACHINE BEFORE STARTING IT.
- (5) DO NOT interchange chucks or other spindle mounting items between lathes without checking for correct locking (see operational notes).
- (6) We recommend only high speed chucks.
- (7) Before operating the lathe, note the maximum rated speed for chucks and faceplates as supplied by the manufacturer.
- (8) Remove chuck key immediately after use.
- (9) Check load capacity of revolving centers.

3. LATHE SAFETY, contd.

3.2 contd.

- (10) Ensure workpiece guards are in position before starting machine.
- (11) DO NOT use cracked or chipped tools.
- (12) CHECK before starting motor:
 - Spindle speed selected
 - Feed rate selected
 - Feed and thread cutting levers are disengaged
- (13) STOP MACHINE IMMEDIATELY IF ANYTHING UNEXPECTED HAPPENS.
- (14) DO NOT use coarse feed range on high spindle speeds.
- (15) DO NOT change spindle speeds when spindle is rotating.
- (16) DO NOT touch revolving chuck, spindle or workpiece.
- (17) DO NOT remove work from the machine without retracting the tool to a safe position.
- (18) Stop motors and push in red safety stop switch when leaving machine unattended.
- (19) Use safety stop switch when changing workpieces, tightening or loosening chuck, etc.

3.3 Personal Safety Rules

- (1) Report any accident, however small, immediately it happens.
- (2) Wear safety glasses.
- (3) Wear safety shoes.
- (4) Use barrier creams provided.
- (5) Wear your overalls buttoned up.
- (6) Roll sleeves up, or button the cuffs.
- (7) Keep hair short or wear a cap.
- (8) Use the correct size wrench at all times.
- (9) Be careful of, and remove if possible, burrs and sharp edges.
- (10) When lifting workpiece use the correct type of sling, ensuring it is not worn or damaged, and the correct safe working load.

20 Inch & 16 Inch Lathes.

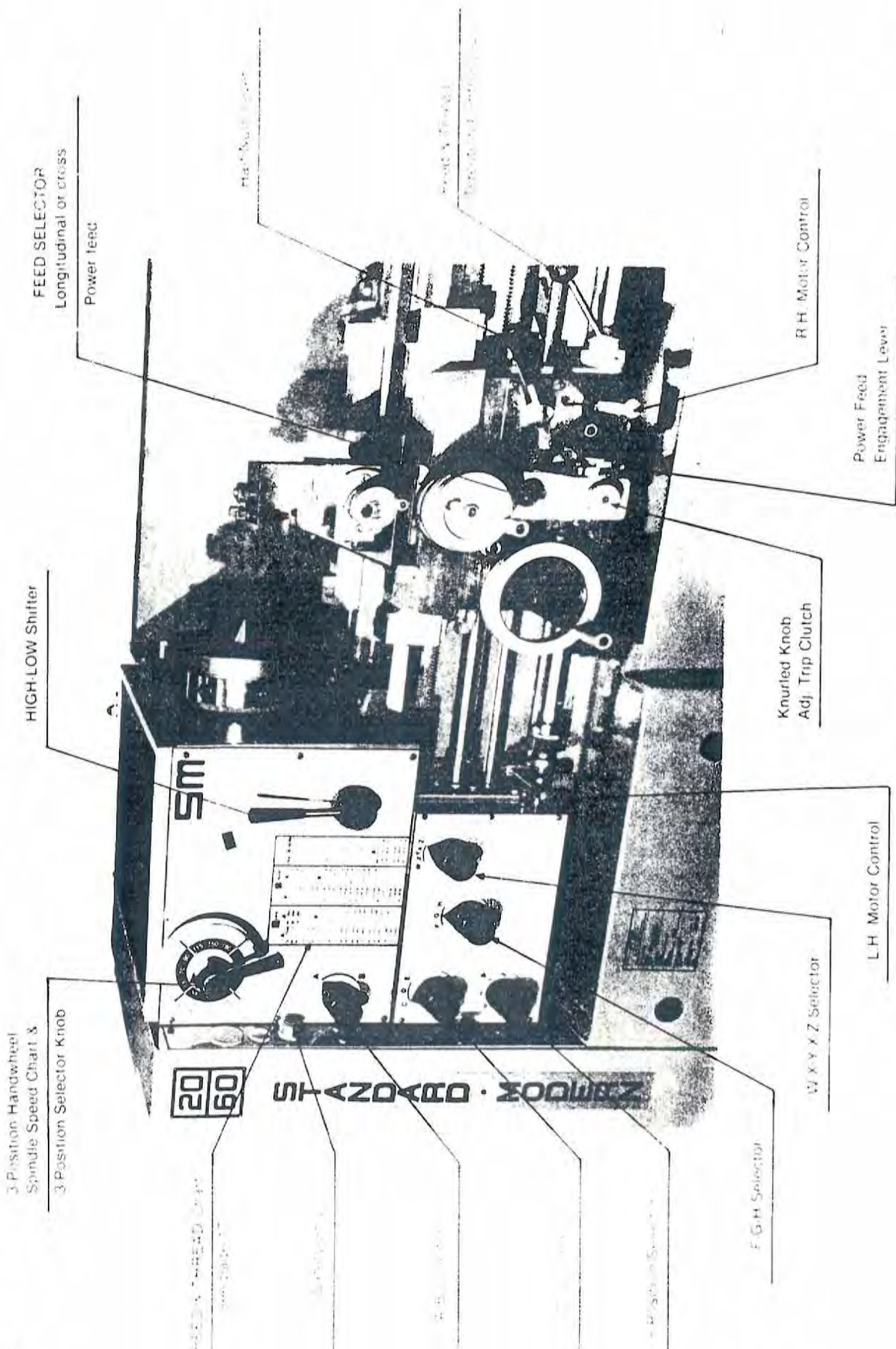
3. LATHE SAFETY, contd.

3.3 Personal Safety Rules, contd.

- (11) Stand clear when lifting workpieces or equipment by crane.
- (12) Obtain assistance when mounting heavy or awkwardly shaped workpieces.
- (13) DO NOT wear rings, watches, ties, etc.
- (14) DO NOT keep tools (scribers, etc.) in overall pockets.
- (15) DO NOT remove guards unless machine is stationary.
- (16) DO NOT wash hands in coolant.
- (17) DO NOT remove swarf with bare hands, use a rake or brush.
- (18) DO NOT manually lift heavy equipment.
- (19) DO NOT use files, scrapers, etc., on machine tools.
- (20) DO NOT lean on the machine.
- (21) DO NOT tamper with electrical equipment.

20 Inch & 16 Inch Lathes.

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3-Position Handwheel
Spindle Speed Chart &
3-Position Selector Knob

HIGH-LOW Shifter

FEED SELECTOR
Longitudinal or cross
Power feed

20 60

SM - 2000 - 2000

F.G.H Selector

W X Y x Z Selector

L.H. Motor Control

Knurled Knob
Adj. Trip Clutch

Power Feed
Engagement Lever

R.H. Motor Control

4. OPERATING INSTRUCTIONS

4.1 Motor and Spindle Control

The spindle motor is controlled by means of two control levers. The L.H. motor control causes forward rotation and stop. It is intended primarily for jogging when changing gear. The R.H. motor control, mounted on the apron is lifted up for FORWARD rotation, centralized for STOP and pushed down for REVERSE rotation. In the CENTRAL or STOP position, a fail-safe brake is engaged.

4.2 Spindle Speed Selection

LOW:	27	35	45	55	70	90	115	150	190
HIGH:	240	300	380	480	600	775	1000	1250	1600

The desired spindle speed range is obtained by moving the 3-POSITION HANDWHEEL. Any spindle speed within that range can be obtained by moving the 3-POSITION SELECTOR KNOB and the High-Low shifter.

For free hand rotation of the spindle, move the HIGH-LOW shifter lever to its vertical position.

- WARNING - STOP the motor before operating any speed selectors.
- Do not exceed spindle speed recommended by chuck manufacturer.
 - Operate machine with the large faceplate at 480 rpm maximum.

4.3 Power Feeds

The automatic trip clutch pre-load may be adjusted using the knurled knob next to the power feed engagement lever. Turn clockwise to increase feed torque.

A safety interlock is fitted so that it is impossible to engage the POWER FEED ENGAGEMENT LEVER and the HALF-NUTS LEVER at the same time.

To select the power longitudinal feed or the power cross feed, arrange the "A-B" selector knob on the headstock and the "C-D-E", "F-G-H", "W-X-Y-X-Z" and "8-POSITION" knob on the feedbox to correspond with the desired feed rate indicated on the FEEDS and THREADS CHART. (Shown on Pages 17 and 18).

- CAUTION: AVOID THE COARSE RANGE OF FEEDS WHEN SPINDLE SPEEDS ARE ABOVE 480 RPM.

4.3 Power Feeds, cont'd.

Push the black ball handle located on front of apron in for longitudinal feed or pull out for cross feed.

Select "L.H." longitudinal feed and "OUT" cross feed or "R.H." longitudinal feed and "IN" cross feed using the FEED & THREAD DIRECTION CONTROL LEVER, situated at the right hand side of the apron.

To engage power feed, lift the POWER FEED ENGAGEMENT LEVER. Power feed may be engaged when the spindle is running.

For automatic feed kickout in power feed longitudinal operations, set the TRIP DOGS as required.

CAUTION: TRIP DOGS MUST NOT BE USED WHEN SPINDLE IS OPERATED IN THE REVERSE DIRECTION.

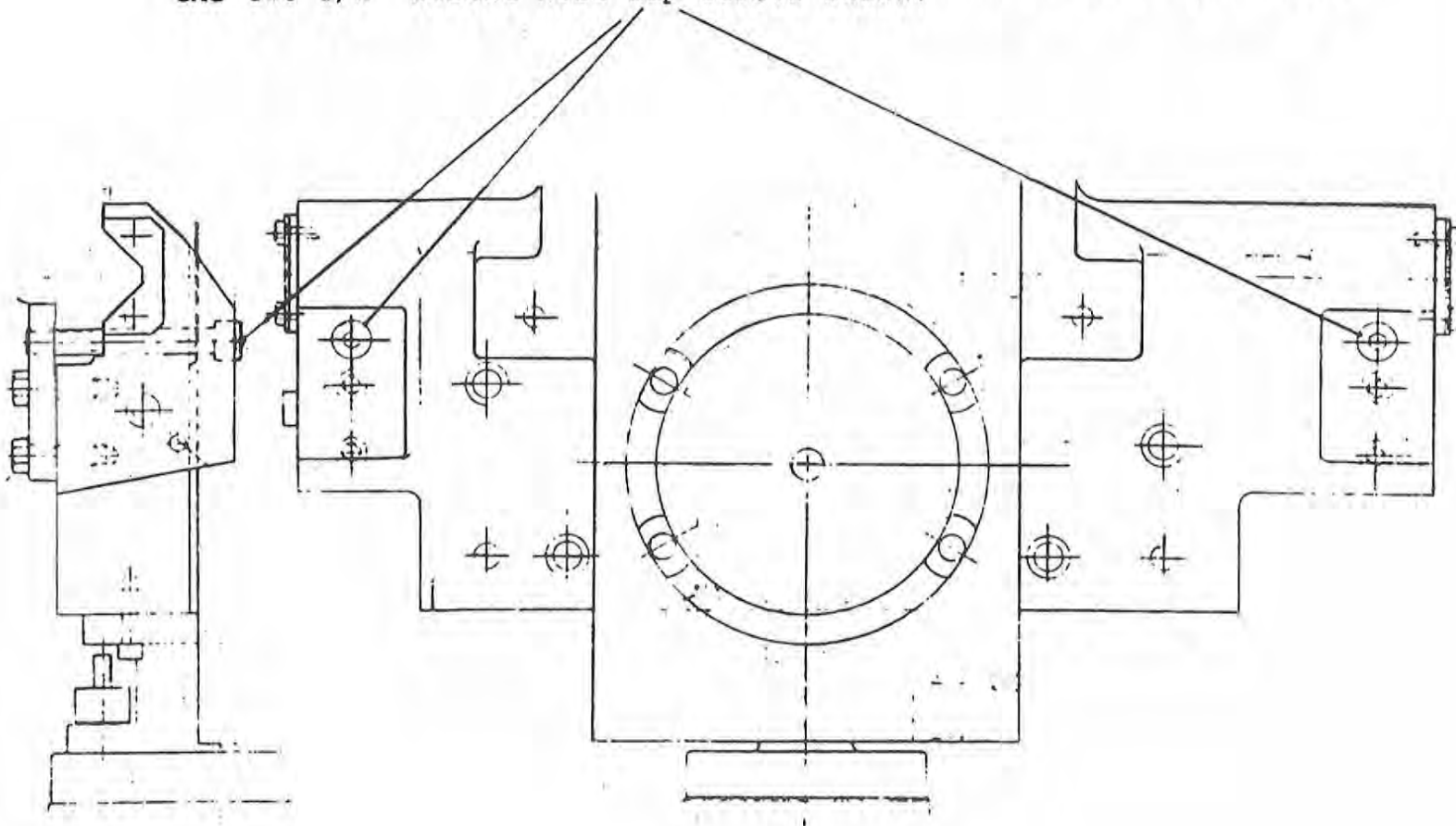
CAUTION: Do not use this procedure for spindle speeds above 800 RPM.

THREADS PER INCH				m.m. PITCH			
A		B		A		B	
127	EH1W	7½	CF3Z	.2	EH1W	4.0	DF1W
84	CG7Z	7 1/8	DH1Z	.225	EH2W	4.4	EG8W
78	CG6Z	7	CF7Y	.25	EH3W	4.5	DF2W
72	CG5Z	6½	CF6Y	.275	EH8W	4.6	EG4W
69	CG4Z	6	CF5Y	.2875	EH4W	4.75	CG7W
66	CG8Z	5½	CF4Y	.3	EH5W	4.8	EG5W
60	CG3Z	5½	CF8Y	.325	EH6W	5.0	DF3W
56	CG7Y	5½	CH7Z	.35	EH7W	5.5	DF8W
54	CG2Z	5	CF3Y	.4	EF1W	5.75	DF4W
52	CG6Y	4¾	DH1Y	.45	EF2W	6.0	DF5W
48	CG5Y	4½	CF2Y	.5	EF3W	6.5	DF6W
46	CG4Y	4 1/8	CH8Z	.55	EF8W	7.0	DF7W
44	CG8Y	4	CF1Y	.575	EF4W	8.0	DG1W
42	CF7Z	3¾	CH3Z	.6	EF5W	9.0	DG2W
40	CG3Y	3½	CH7Y	.625	DH3W	10.0	DG3W
39	CF6Z	3 3/8	CH2Z	.65	EF6W	11.0	DG8W
36	CG2Y	3¼	CH6Y	.6875	DH8W	11.5	DG4W
33	CF8Z	3	CH5Y	.7	EF7W	12.0	DG5W
32	CG1Y	2 7/8	CH4Y	.71875	DH4W	12.7	CH1Y
34½	CF4Z	2¾	CH8Y	.75	DH5W	13.0	DG6W
30	CF3Z	2½	CH3Y	.8	EG1W	14.0	DG7W
28	CF7Y	2¼	CH2Y	.8125	DH6W		
27	CF2Z	2	CH1Y	.875	DH7W		
26	CF6Y			.9	EG2W		
24	CF5Y			1.0	DF1W		
23	CF4Y			1.1	EG8W		
22	CF8Y			1.125	DF2W		
21	CH7Z			1.1875	CG7W		
20	CF3Y			1.2	EG5W		
19	DF8Y			1.25	DF3W		
18	CF2Y			1.3	EG6W		
16½	CH8Z			1.375	DF8W		
16	CF1Y			1.4	EG7W		
15	CH3Z			1.4375	DF4W		
14	CH7Y			1.5	DF5W		
13½	CH2Z			1.625	DF6W		
13	CH6Y			1.75	DF7W		
12	CH5Y			2.0	DG1W		
11½	CH4Y			2.25	DG2W		
11	CH8Y			2.5	DG3W		
10	CH3Y			2.75	DG8W		
9	CH2Y			2.875	DG4W		
8	CH1Y			3.0	DG5W		
				3.25	DG6W		
				3.5	DG7W		

FEED PER REV.					
Inch			m.m.		
A (Fine)			B (Coarse)		
.0015	EH1X	.04	.027	EG2X	.69
.0017	EH2X	.045	.030	DF1X	.76
.002	EH3X	.05	.033	EG8X	.84
.0021	EH8X	.053	.034	DF2X	.86
.0022	EH4X	.055	.035	EG4X	.89
.0023	EH5X	.058	.037	EG5X	.93
.0025	EH6X	.06	.038	DF3X	.97
.0027	EH7X	.07	.039	EG6X	1.00
.003	EF1X	.08	.042	DF8X	1.07
.0034	EF2X	.085	.043	EG7X	1.09
.0038	DH1X	.095	.044	DF4X	1.12
.004	EF3X	.10	.046	DF5X	1.15
.0041	EF8X	.104	.049	DF6X	1.24
.0042	DH2X	.107	.053	DF7X	1.35
.0044	EF4X	.110	.060	DG1X	1.55
.0046	EF5X	.115	.068	DG2X	1.73
.005	EF6X	.125	.076	DG3X	1.91
.0052	DH8X	.13	.083	DG8X	2.10
.0053	EF7X	.135	.087	DG4X	2.20
.0055	DH4X	.14	.091	DG5X	2.30
.0057	DH5X	.145	.098	DG6X	2.48
.006	EG1X	.15	.105	DG7X	2.67
.0062	DH6X	.155			
.007	EG2X	.17			
.007	EG2X	.17			
.0075	DF1X	.19			
.0084	EG8X	.20			
.0087	EG4X	.21			
.009	EG5X	.23			
.009	EG5X	.23			
.0095	DF3X	.24			
.0099	EG6X	.25			
.0106	EG7X	.26			
.011	DF8X	.27			
.0114	DF5X	.29			
.0124	DF6X	.31			
.013	DF7X	.34			
.015	DG1X	.38			
.017	DG2X	.43			
.019	DG3X	.48			
.021	DG8X	.53			
.0228	DG5X	.57			
.025	DG6X	.63			
.027	DG7X	.67			

4. OPERATING INSTRUCTIONS, contd.

Provision is made for locking saddle when facing, tightening the two 1/2" Socket Head Cap Screws shown.

4.4 Thread Cutting

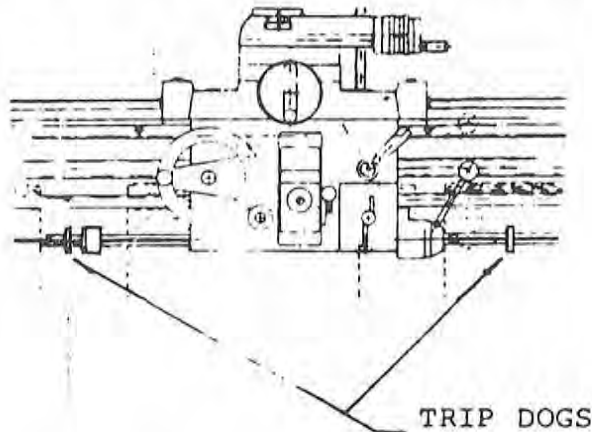
- 4.4.1 When cutting screw threads, begin by selecting the desired mm pitch or T.P.I., in a manner similar to feed selection (4.3).
- 4.4.2 The FEED & THREAD DIRECTION CONTROL LEVER mounted on the extreme righthand side of the Apron must be moved:
- UP for R.H. threads.
 - DOWN for L.H. threads.
 - In the CENTRAL position the entire feed and thread gear train is disengaged.

This lathe is equipped with a leadscrew reversing mechanism which allows half-nuts to remain engaged during the entire threading operation.

4. OPERATING INSTRUCTIONS, contd.

- 4.4.3 For automatic thread kickout set the TRIP DOGS as required.

CAUTION: TRIP DOGS MUST NOT BE USED WHEN SPINDLE IS OPERATED IN THE REVERSE DIRECTION.



- 4.4.4 CAUTION: THE THREADING SPINDLE SPEED LIMIT IS 800 RPM. THE TRIP DOGS OR THE FEED & THREAD DIRECTION CONTROL LEVER MUST NOT BE USED ABOVE THIS SPEED.

Approximate safe thread cutting speeds can be determined by using the following formulae:

$$(1) \text{ T.P.I.} \times 25 = \text{SAFE R.P.M.}$$

e.g. 20 T.P.I. \times 25 = 500 R.P.M.

$$(2) \frac{625}{\text{mm pitch}} = \text{SAFE R.P.M.}$$

e.g. $\frac{625}{.9 \text{ mm pitch}} = 695 \text{ R.P.M.}$

CAUTION: DO NOT USE ANY SPINDLE SPEED ABOVE 800 RPM FOR CUTTING THREADS.

4. OPERATING INSTRUCTIONS, contd.

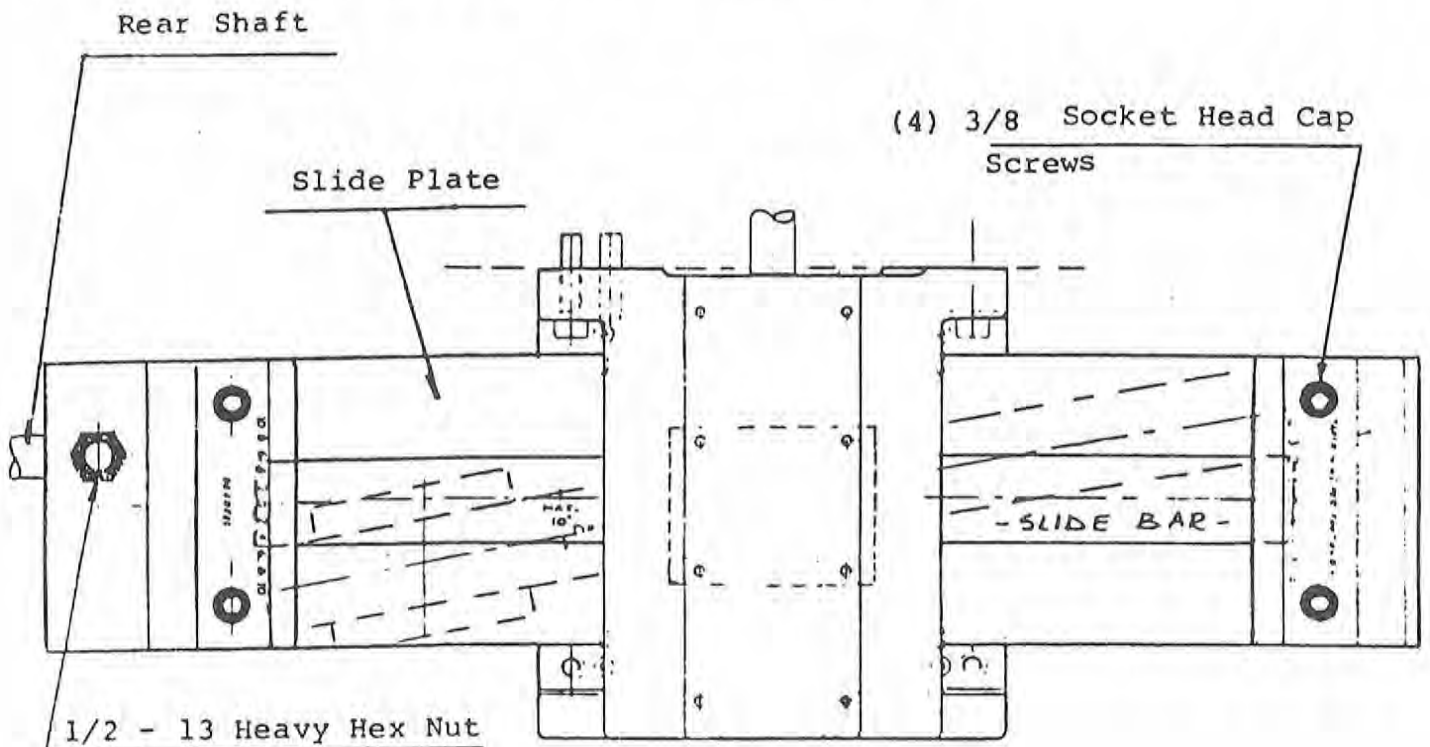
4.5 Telescopic Taper Turning Attachment

For taper turning:

- (1) Loosen HEAVY HEX. NUT on rear shaft.
- (2) Locate saddle on bed in relation to workpiece.
- (3) Locate SLIDE PLATE in relation to workpiece.
- (4) Tighten HEAVY HEX. NUT on rear shaft.
- (5) Adjust SLIDE BAR to desired taper and lock securely by means of the 4 - 3/8 SOC. HD. SCREWS located towards each end.

For straight turning:

Loosen HEAVY HEX. NUT on rear shaft.



For clamping the Slide Plate

20 Inch & 16 Inch Lathes.

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OPERATING INSTRUCTIONS, Cont'd.4.6 Coolant Unit

The coolant fluid is contained within a tank built into the tailstock pedestal. The tank is equipped with 2 oil windows to indicate "FULL" and "EMPTY" fluid levels. Coolant is pumped by means of a "GUSHER-RUMACO" centrifugal pump #5-K21C (with impeller #6172F), to a flexible nozzle, which permits the flow to be regulated or shut-off. From the chip tray, the coolant drains back into the tank, through a perforated metal filter.

The tank capacity is approximately 9 U.S. Gallons, and should be cleaned and refilled every 6 months or more often, depending on usage. Access to the tank is through a cover plate at the right end of tailstock pedestal. The pump motor is equipped with pre-lubricated bearings, and no lubrication is required for either pump or motor. The control switch for the pump is in the electrical control station at the left end of the headstock.

4.7 Face Plate Attachment

The face plate as shipped from the factory is rough turned on the part mounting surface, and must be machined using a skim cut prior to first usage.

Note maximum safe operating speed for large face plates is 480 RPM.

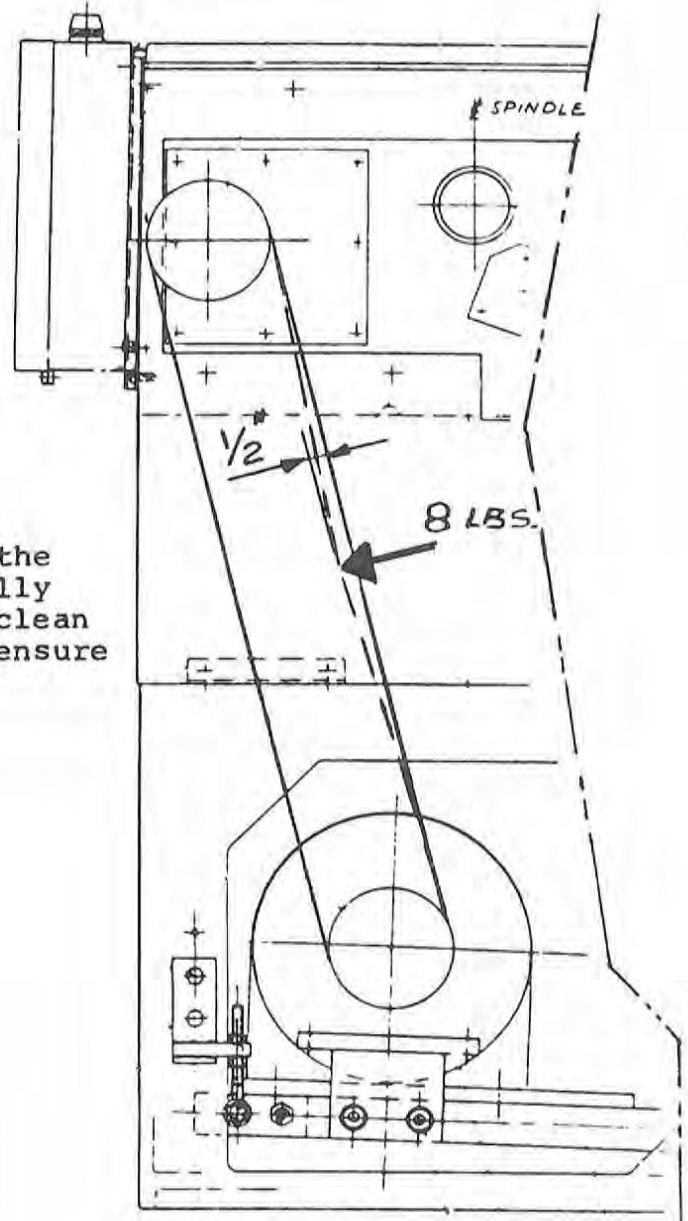
5.1 Drive Belts Tension Control

When changing pulleys and/or belts, loosen the motor plate clamp and lift the motor plate by means of the adjusting screw provided. With the new pulleys and/or belts in position, adjust for correct belt tension (see below) and tighten the nut on the motor plate clamp.

For correct belt tension, use the following method:

At the center of the span apply a force of 8 lbs., with a spring scale to deflect the belt $\frac{1}{2}$ ".

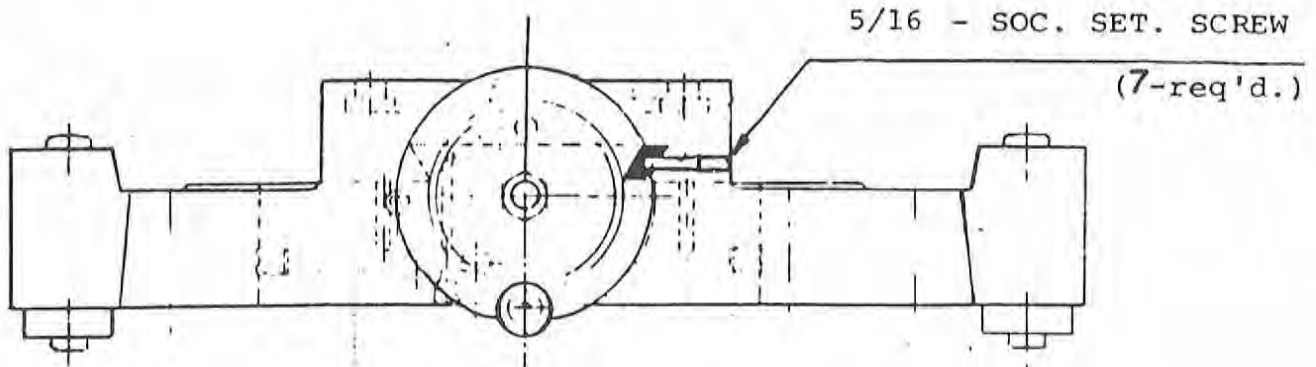
Check the tension frequently during the first day of operation and periodically thereafter. Keep pulleys and belts clean and free of any foreign material to ensure long life and better traction.



5.2 Cross Slide Ways

Wear in the Cross Slide Ways may be adjusted as follows:-

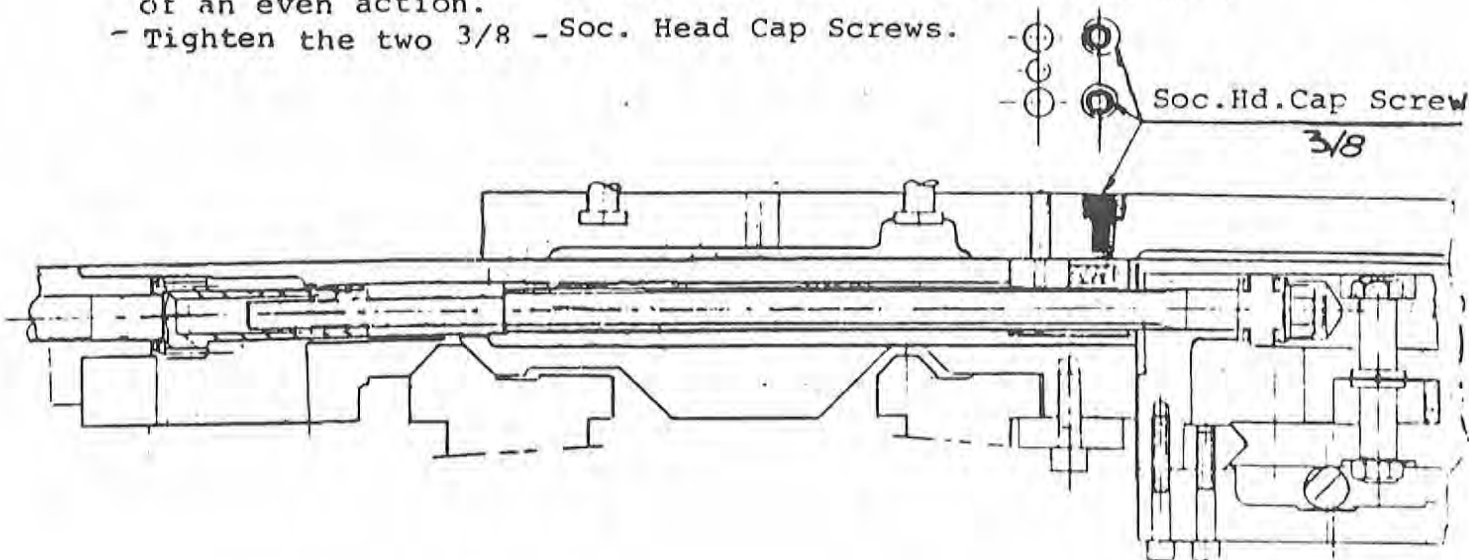
Turn ALL Seven - 5/16 Socket Set Screws located on R.H. side of the Cross Slide in a clockwise direction to tighten the "Gib".



5.3 Cross Slide Nut

Provision is made for the elimination of backlash in the Cross Slide Nut, as follows:-

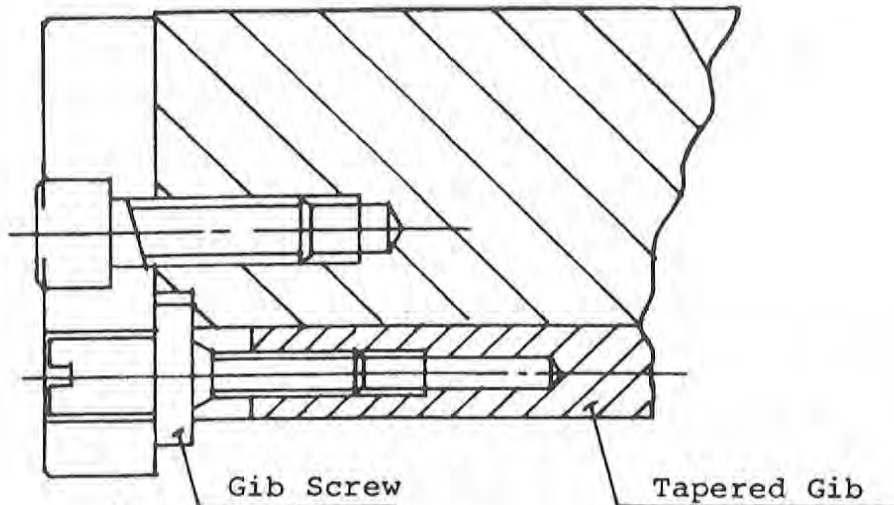
- Position the Cross Slide close to the center line of the lathe.
- Slacken only the two 3/8 Soc. Head Cap Screws shown. The Captive Spring will take up the backlash automatically.
- Move the Cross Slide by hand over full travel to be sure of an even action.
- Tighten the two 3/8 - Soc. Head Cap Screws.



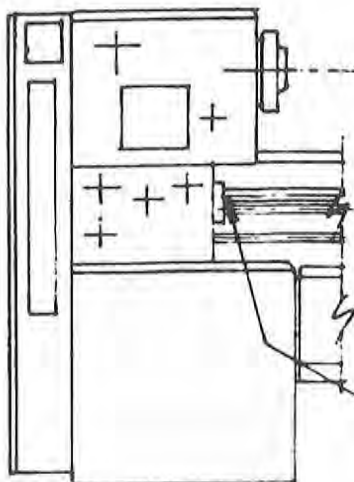
5. MAINTENANCE INSTRUCTIONS, contd.5.4 Compound Slide Ways

Wear in the Compound Slide Ways may be adjusted by means of the Tapered-Gib as follows:

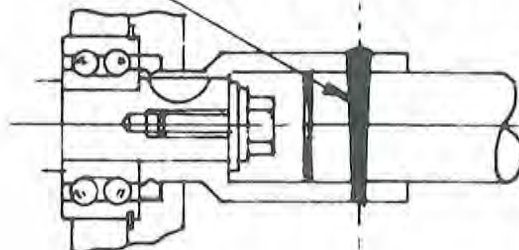
Turn the slotted Head Gib Screw at the handle end in a clockwise direction to tighten.

5.5 Leadscrew Shear Pin

This brass shear pin is provided to prevent damage to the leadscrew should the carriage be allowed to come in contact with the headstock or some other obstruction which acts as a positive stop. When the stoppage takes place, the leadscrew continues to turn in the half nuts and will begin to move endwise thus shearing the pin.



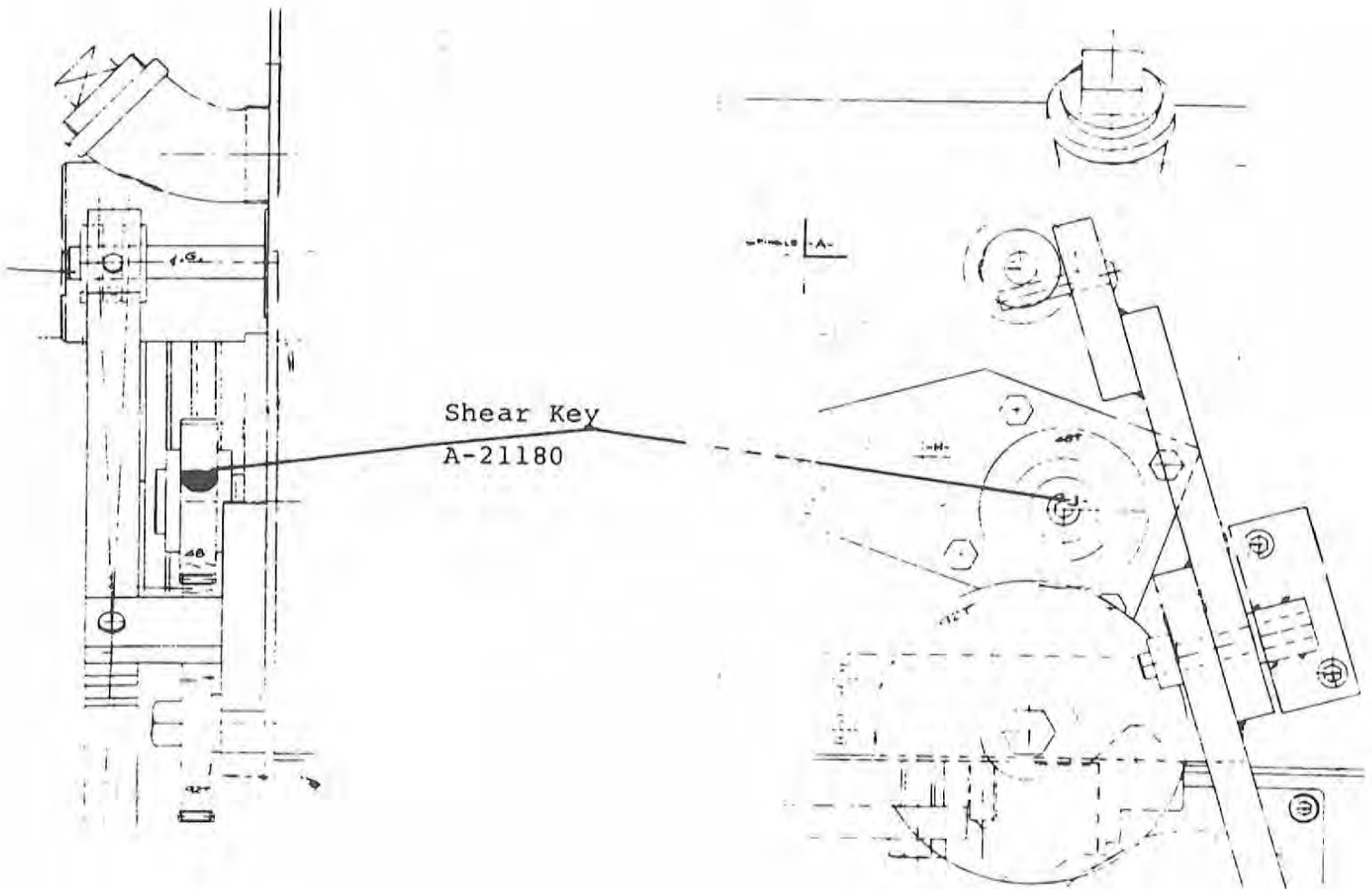
The shear pin can be readily replaced by first withdrawing the leadscrew from the coupling to remove the three portions of broken pin. It is then returned to the coupling and rotated by hand until the zero line on the screw coincides with that on the coupling. A new shear pin (4 spare are provided with the machine) is then driven into place.



MAINTENANCE INSTRUCTIONS, contd.5.6 End Gear Train Shear Key

This brass shear key # A-21180 drives the top gear of the end gear train (see below on shaft-J). It is provided to prevent damage to the feed gears if abnormally excessive loads are encountered.

A Spare Shear Key, which is provided with the machine, can be readily fitted. First remove the 48T gear, then remove the broken portion of the key from the shaft with a small square nose chisel. The new key is then fitted to the shaft and the gear assembled. It is important, of course, to locate and remedy the cause of the excessive load.



5. MAINTENANCE INSTRUCTIONS, contd.5.7 Trouble Shooting Chart

TROUBLE	PROBABLY CAUSE	CORRECTION
Vibration	<p>Loose leveling screws</p> <p>Torn or mismatched vee belts</p> <p>Work or chuck out of balance operating at high spindle speeds</p> <p>Motor out of balance</p>	<p>Set all screws so they bear evenly on leveling plates.</p> <p>Replace vee belts with matched set.</p> <p>Balance chuck or reduce spindle-speed.</p> <p>Contact local representative of motor manufacturer.</p>
Chatter	<p>Tool bit improperly ground or not on center</p> <p>Tool overhang too great</p> <p>Using improper surface</p> <p>Feed rate too high or too low.</p> <p>Gibs of cross slide or compound rest loose.</p> <p>Spindle bearings worn or loose.</p> <p>Work improperly supported.</p> <p>Vibration</p>	<p>Regrind tool bit or adjust tool holder so that area of contact between tool bit and work is decreased. Avoid extreme negative rake angle.</p> <p>Keep point of tool bit as close as possible to tool holder.</p> <p>Reduce or increase spindle speed.</p> <p>Reduce or increase feed.</p> <p>Adjust gibs.</p> <p>Adjust spindle bearings.</p> <p>Adjust tailstock center. Use steady rest or follow rest for long slender shafts. Minimize tailstock barrel extension.</p> <p>See "Vibration" trouble above.</p>

5. MAINTENANCE INSTRUCTIONS, contd.5.7 Trouble Shooting Chart, contd.

TROUBLE	PROBABLE CAUSE	CORRECTION
Work not turned straight.	Headstock & tailstock not aligned. Work improperly supported. Bed not level. Tool not on center when using taper attachment.	Align tailstock center. Use steady rest or follow rest. Reduce overhang from chuck. Re-level bed, using precision level. Put tool on center.
Work out of round.	Work loose between centers or centers are excessively worn - work centers out of round. Loose headstock spindle bearings.	Adjust tailstock center. Regrind centers. Lap work centers. Adjust headstock spindle bearings.
Cross slide or compound rest movement does not coincide with dial movement of respective adjusting screw.	Gib setting too tight or too loose. Work is too long and slender.	Adjust gibs. Use steady rest or follow rest.

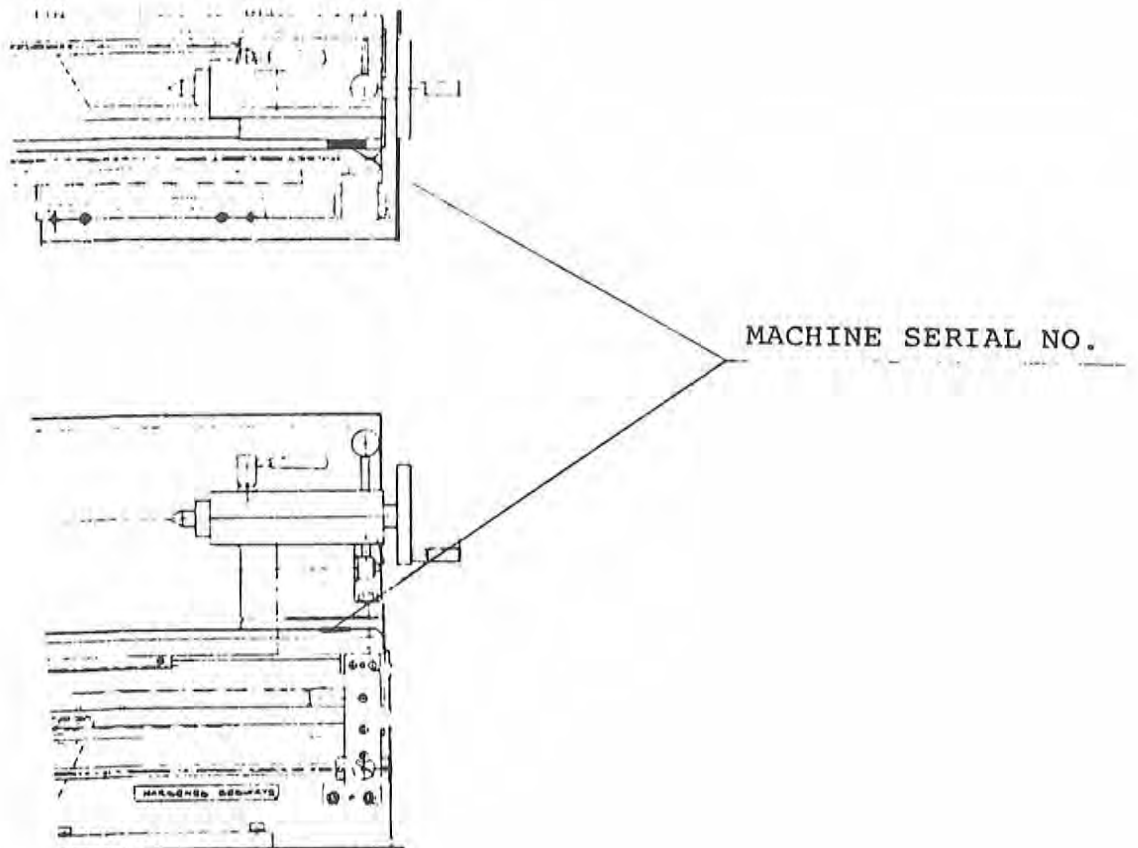
20 Inch & 16 Inch Lathes.

9/79.

PARTS ORDERING PROCEDURE

- (1) Always quote the Machine Serial Number which will be found stamped in the recessed face on top of the bed at the tailstock end.
- (2) Refer to the appropriate assembly and INDIVIDUAL PART NUMBERS taken direct from the illustrations.

NOTE: Quantity required (when other than one) is given following the Part Number itself.



20 Inch & 16 Inch Lathes.

9/79.

ELECTRICAL PARTS LIST : 15 H.P.
208-230-460-575/3/60

S-M Ref. 96652, 96653, 96654, 96655.

QTY.	DESCRIPTION	OPTION
1	Drive Motor, 15 HP 1800 RPM Drip Proof Frame 254T.	Std.
1	Full Voltage Rev. Starter Allen-Bradley 705X-COD (230, 460, 575) -DOD (208)	Std.
3	Heater Elements Allen-Bradley Type N.	Std.
1	O'load Reset, Allen-Bradley 1493-N1	Std.
1	Oiltight Limit Switch Allen-Bradley 802T-NPTP c/w Actuator 802T-W1A or: Denison 'Loxswitch' C3-JK04-A3N.	Std.
1	Oiltight Limit Switch Allen-Bradley 802T-A c/w Actuator 802T-W1A	JIC
1	Oiltight Push-Button Unit Allen-Bradley 800T-FX6D4	Std.
1	Legend Plate "STOP" Allen-Bradley 800T-X550	Std.
1	Oiltight Pilot Light Unit Allen-Bradley 800T-P16R	Std.
1	Disconnect Switch Allen-Bradley 1494R-N60	JIC
2	Connector Kit Allen-Bradley 1494R-N1	JIC
1	Fuse Block Allen-Bradley 1491-N266	JIC Fusible only
1	Terminal Block, Channel Mounted Allen-Bradley 1492 series	Std.
3	Fuse Puller Allen-Bradley 1492-N12	Std.

ELECTRICAL PARTS LIST, contd.

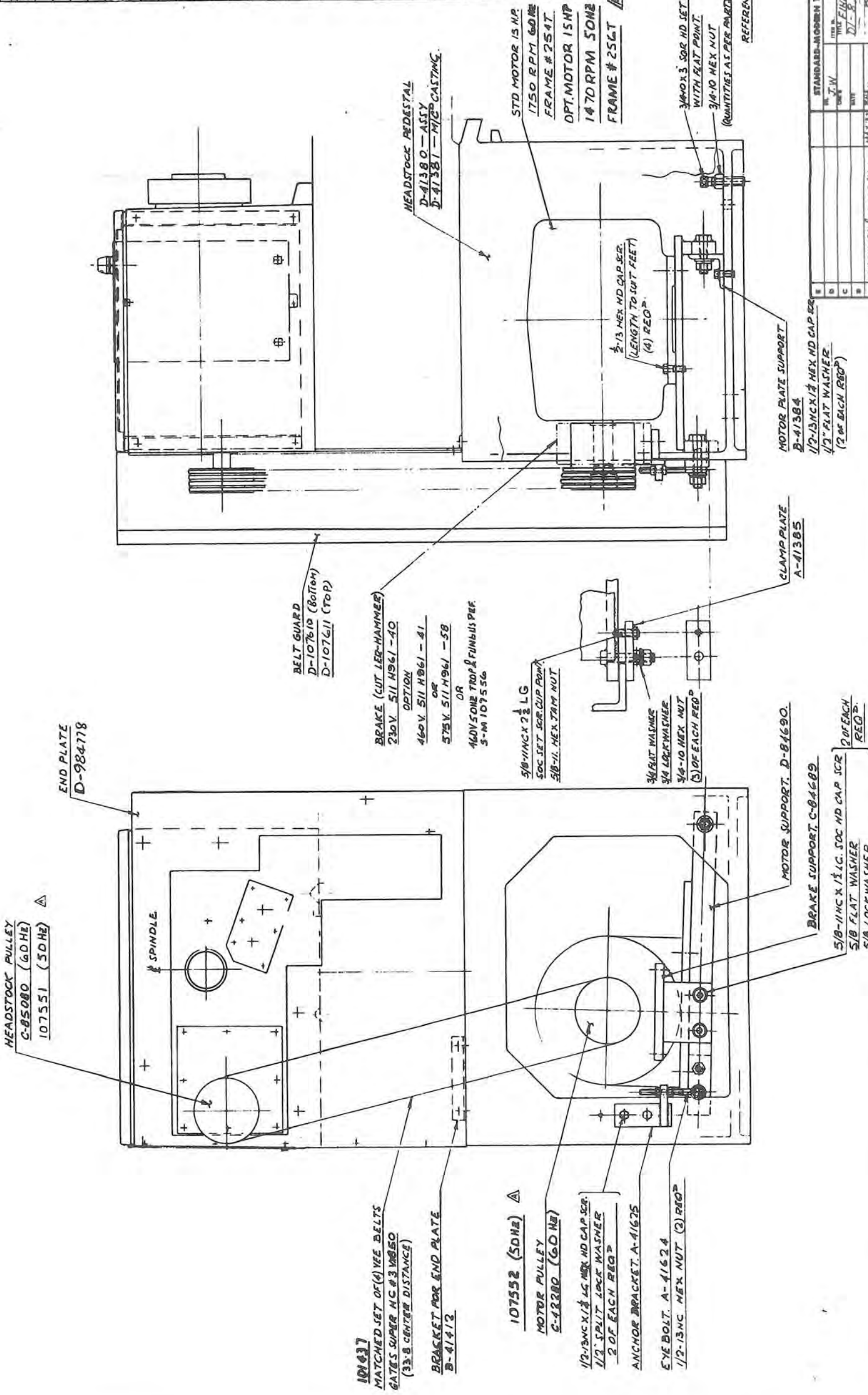
QTY.	DESCRIPTION	OPTION
1	Transformer 350VA 120V Secondary Pri 208V Hammond HK3J Pri 240V Hammond HK6P Pri 460V Hammond HK6P Pri 575V Hammond HK9J	Std.
1	Relay 1 - N.O. GE CR120EC010-02 (115V coil).	Std.
1	Fail Safe Brake Cutler Hammer 208V 511 H961-45 240V 511 H961-40 460V 511 H961-41 600V 511 H961-58	Std.
1	Enclosure 16" x 16" x 7 1/2" Standard-Modern D-96658	Std. & Non-Fusible JIC
	Enclosure 16" x 32" x 7 1/2" Standard-Modern D-96660	208V only
1	Enclosure 16" x 22" x 7 1/2" Standard-Modern D-96659	Fusible JIC
1	Nameplate 'STOP/ARRETER' Standard-Modern B-96734	Std.
1	Nameplate 'COOLANT' Standard-Modern A-96691	Std.
1	Nameplate 'WORKLIGHT' Standard-Modern A-96692	Std.
1	Angle Bracket Standard-Modern A-85176	JIC
1	FS Box Crouse Hinds FS1, or equal.	Std.
1	Cover Crouse Hinds DS70G, or equal.	Std.
1	Receptacle 115V U-ground Slater 3030 Brown, or equal.	Non-JIC Std.
1	Receptacle "Twistlock" Hubbell 4702 (or 4703)	JIC

ELECTRICAL PARTS LIST, contd.

<u>QTY.</u>	<u>DESCRIPTION</u>	<u>OPTION</u>
2	Cap "Twistlock" (for Coolant and/or Worklight) Hubbell 4723VY	JIC
3	Fuses (Line 50 Amp. Form I, Class J.	JIC
2	Fuse, 1 Amp Slo-Blo Fusetron FNM 1, or equal.	Std.
1	Fuse, 2 Amp Slo-Blo Fusetron FNM 2, or equal.	Std.
	# 6 AWG C.S.A. Certified THHN-U.L.MTW Black (Motor Line Volts)	
	#14 AWG C.S.A. Certified THHN-U.L.MTW White (Control X2)	
	#14 AWG C.S.A. Certified THHN-U.L.MTW Red (115V AC)	

20 Inch Lathe
6/81

ITEMS NOT SHOWN:	PART NO.
	C-41355
	B-41318
	B-10699
	B-85087
	A-43074
	A-43076
	A-42404
	A-107317

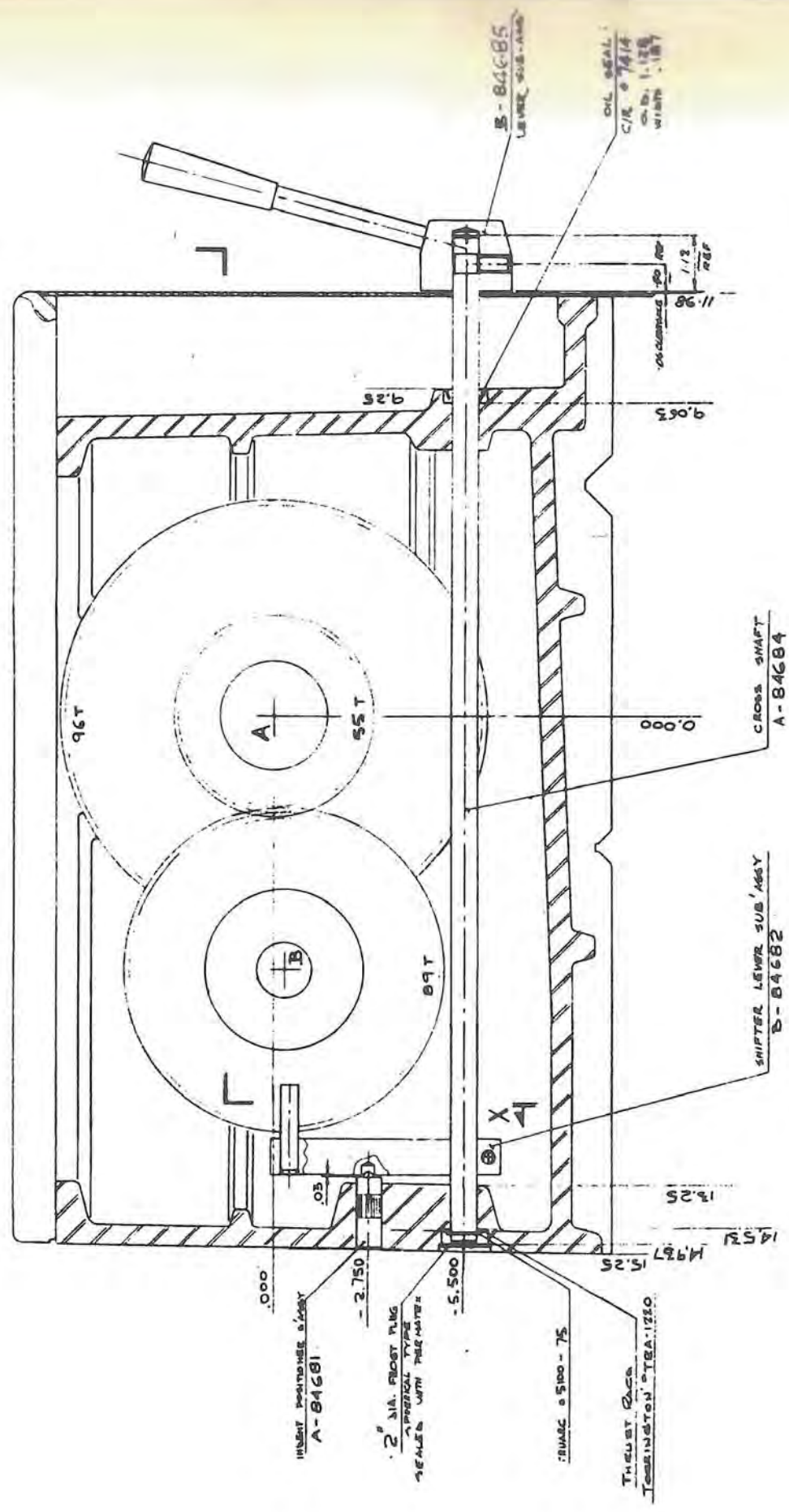
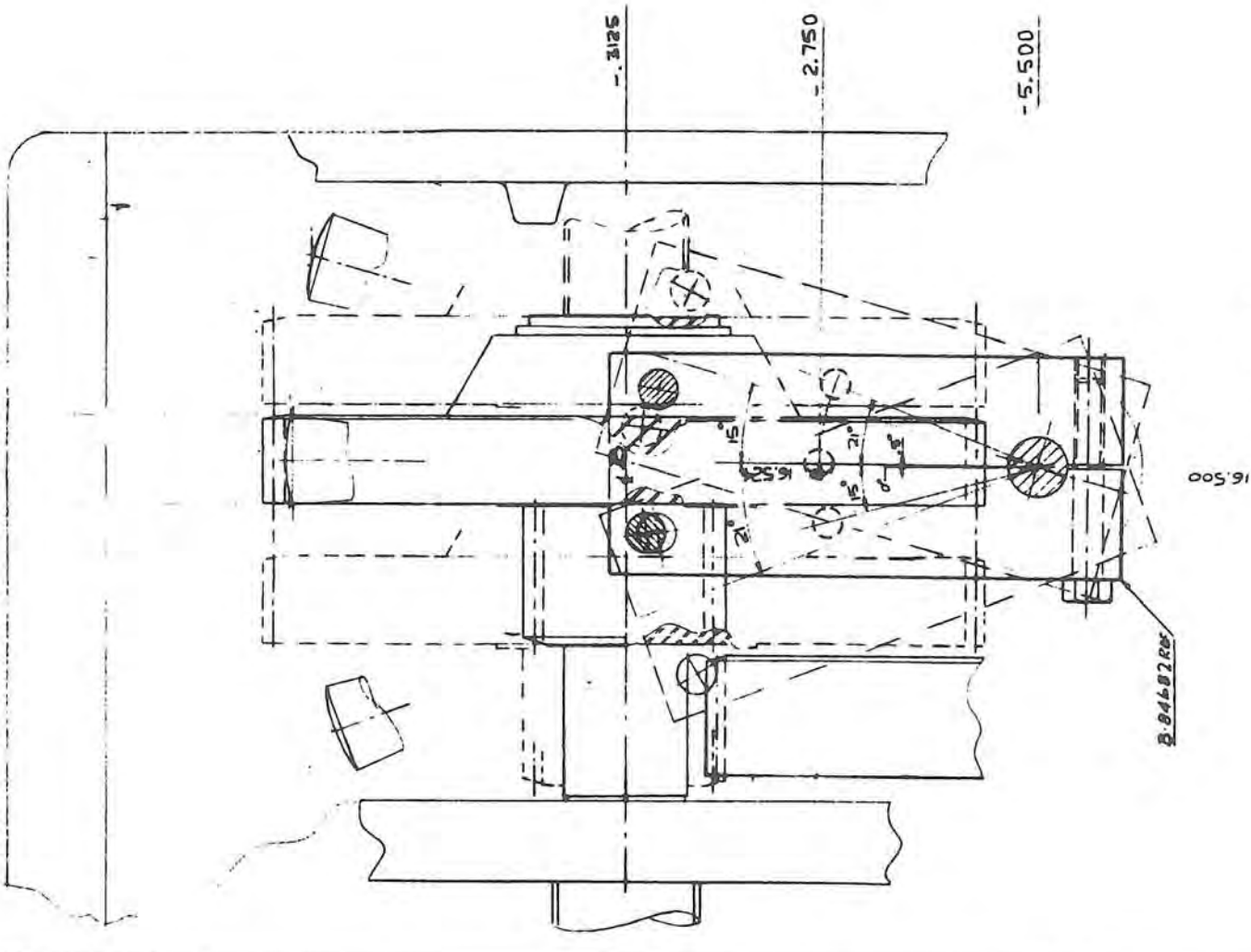


REFERENCE DWG. END GEAR TRAIN E-85083

STANDARD-MORRIS TOOL COMPANY LIMITED		TORONTO, CANADA	
NO.	REV.	DATE	BY
1			
TITLE: FINAL ASSY-HEADSTOCK END		DATE: 10/1/58	BY: J.S.P.
DRAWN BY: J.S.P.		SCALE: 1" = 1"	UNIT: INCHES
SHEET NO. 1		OF 1	
D-85192		D-85192	

SECTION W W
(ON ANG E-85068)

X 4



SECTION XX
SCALE: FULL SIZE

ITEMS REQUIRED BUT NOT SHOWN		REMARKS
3	BUTTON HEAD SCREW	FOR PART NO B-84734
	CAP SCREW 5/16-18 X 3/4	
2	OIL SUPPLY TRAY	DWG # C-84713
1	HEX. CAP SCREW 5/16-18 X 3/4 LG	FOR PART NO C-84713
1	ROD	

STANDARD TOOL COMPANY LIMITED TORONTO, CANADA	
NO.	DESCRIPTION
B	
C	
D	
E	

WASHER SPRING
 1/2" DIA. X 1/8" THK
 S.M.T. # 101847

PAD 384489 2 KLGD

SOCKET HD CAP SCREW
 3/16" DIA. X 1/4" LG
 S.M.T. # 10438

HALF NUT SET
 384488 2 DIA. 1/2" SCREW
 385063 20 LATHE 1/2" DIA. 1/2" SCREW

GUIDE 384487 2 RECD

EXSCREW SUPPORT
 385291 1/2" LATHE
 385563 20 LATHE

SOCKET HD CAP SCREW
 3/16" DIA. X 1/4" LG
 S.M.T. # 104138 2 RECD

GREASE FITTING 2 RECD
 ALL WHITE #1728
 S.M.T. # 101942

SOCKET HD CAP SCREW
 1/2" DIA. X 1/4" LG
 S.M.T. # 104234

LEVER (REF)
 384508

ROUND KNOB (MAROON)
 REID'S # 33 (REF)
 7/16" DIA. X 1/2" LG
 S.M.T. # 101673

PLASTIC HANDLE (BLACK)
 REID'S # PTH 202
 S.M.T. # 101652

LEVER 384493

SOCKET SET SCREW (60° PT)
 3/16" DIA. X 3/8" LG
 S.M.T. # 105240

LEVER 384473

PLASTIC BALL KNOB (BLACK)
 REID'S # OA-1
 S.M.T. # 101667

HALF NUT COVER
 384490

HEXAGON HD CAP SCR.
 5/16" DIA. X 3/4" LG
 S.M.T. # 104459

DOWEL
 3/16" DIA. X 3/4" LG
 S.M.T. # 105436

FLOATING COUPLING
 384486

LOCKING BAR
 384484

HALF NUT CONTROL SMART
 384485

DOWEL
 3/16" DIA. X 1" LG
 S.M.T. # 103508

FLOATING COUPLING (REF)
 384486

SWITCHING HUB WELDMENT (REF)
 384502

SPRING STEEL CONNECTOR
 385205

SOCKET HD CAP SCREW (REF)
 3/16" DIA. X 3/8" LG
 S.M.T. # 104134

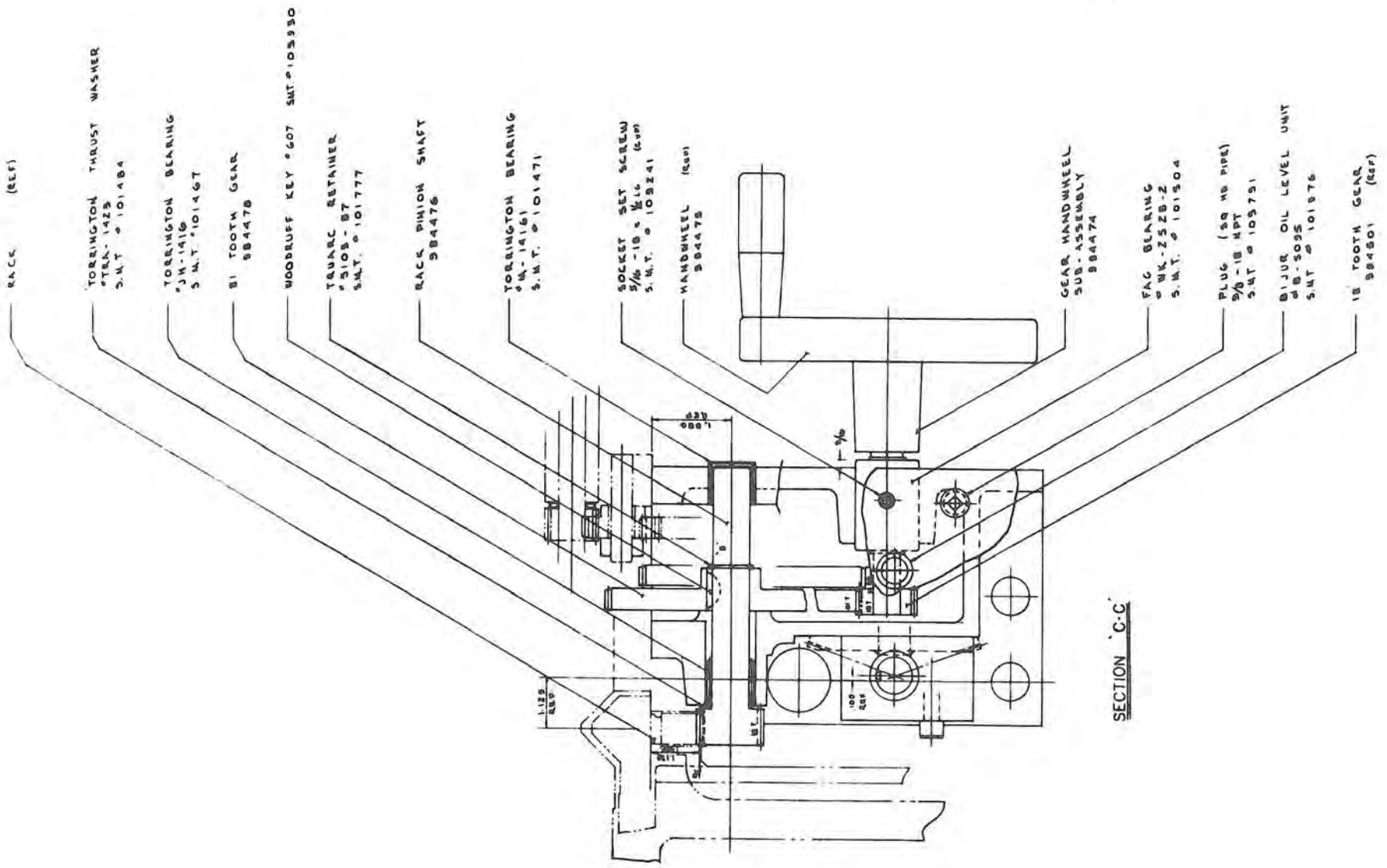
SHANK (REF)
 385204

PLASTIC HANDLE (RED)
 REID'S # 190 (REF)
 S.M.T. # 101653

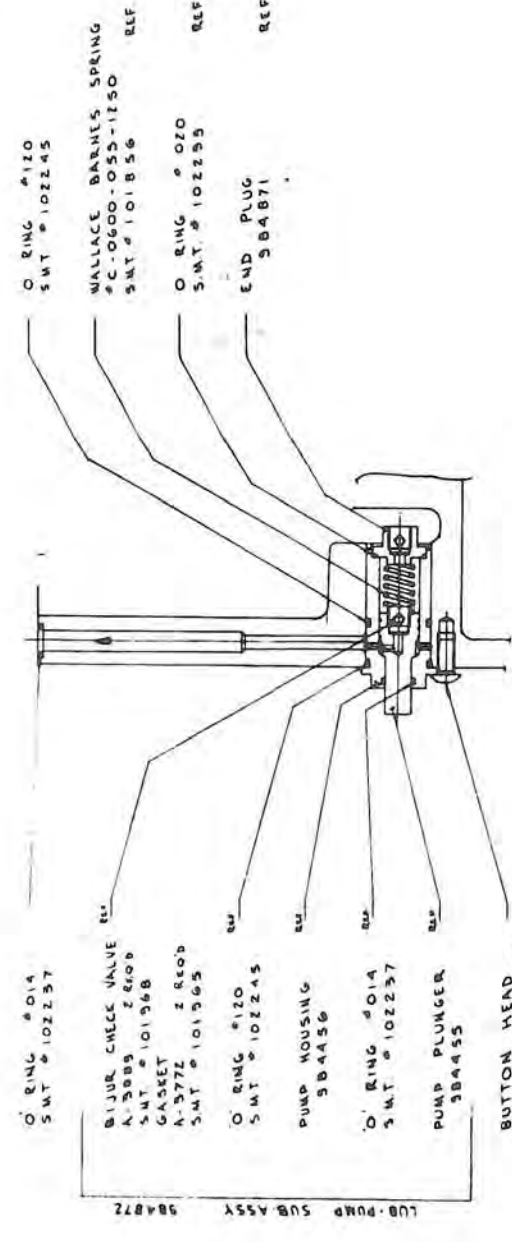
APPLY LOCKTITE TO THE HEAD
 OF HANDLES
 101652 AND 101653

SECTION E-E

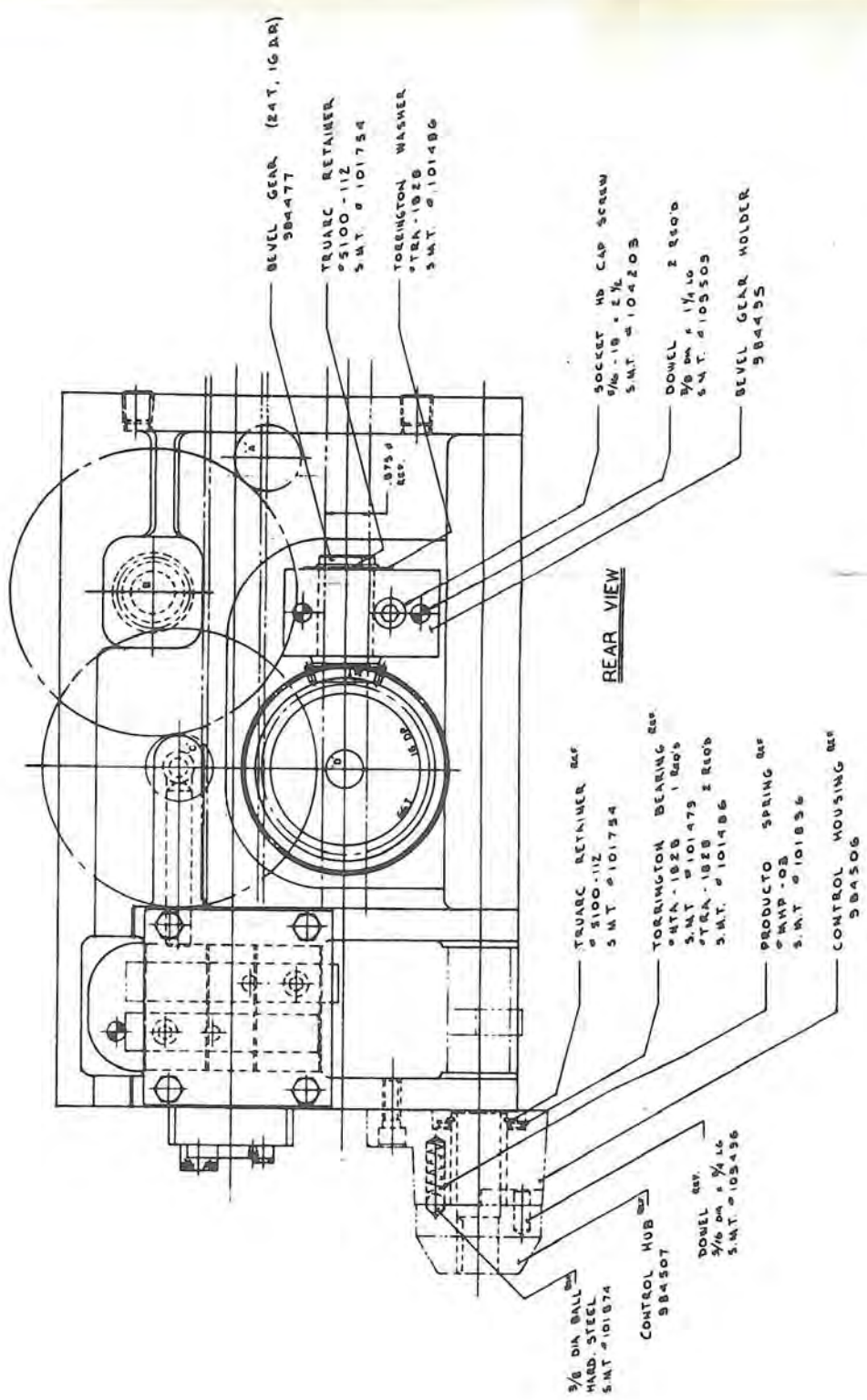
NO.	DESCRIPTION	QTY	UNIT	REVISION
1
2
3
4
5



SECTION 'C-C'

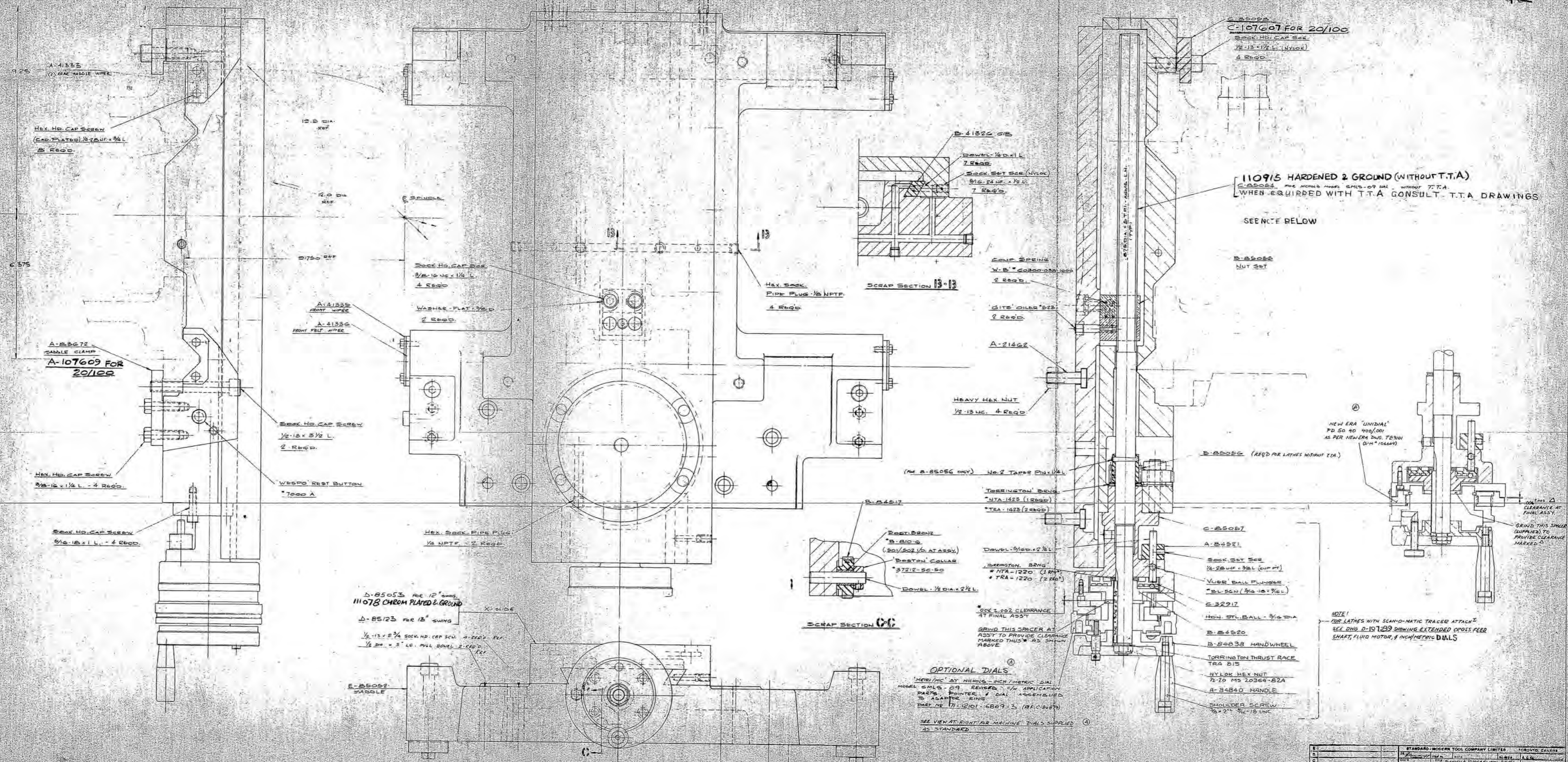


SCRAP SECTION 'D-D' (S.M.T. # 104964)



REAR VIEW

NO.	REV.	DATE	BY	CHKD.	DESCRIPTION
1					ISSUED FOR FABRICATION
2					ISSUED FOR FABRICATION
3					ISSUED FOR FABRICATION
4					ISSUED FOR FABRICATION
5					ISSUED FOR FABRICATION
6					ISSUED FOR FABRICATION
7					ISSUED FOR FABRICATION
8					ISSUED FOR FABRICATION
9					ISSUED FOR FABRICATION
10					ISSUED FOR FABRICATION



110915 HARDENED & GROUND (WITHOUT T.T.A.)
 C-25002 FOR 20/100
 SOCK. HD. CAP SCW
 1/2-13 x 1 1/2 L. (NYLON)
 4 REQD.
 WHEN EQUIPPED WITH T.T.A CONSULT T.T.A. DRAWINGS

SEE NOTE BELOW

B-25056
 NUT SET

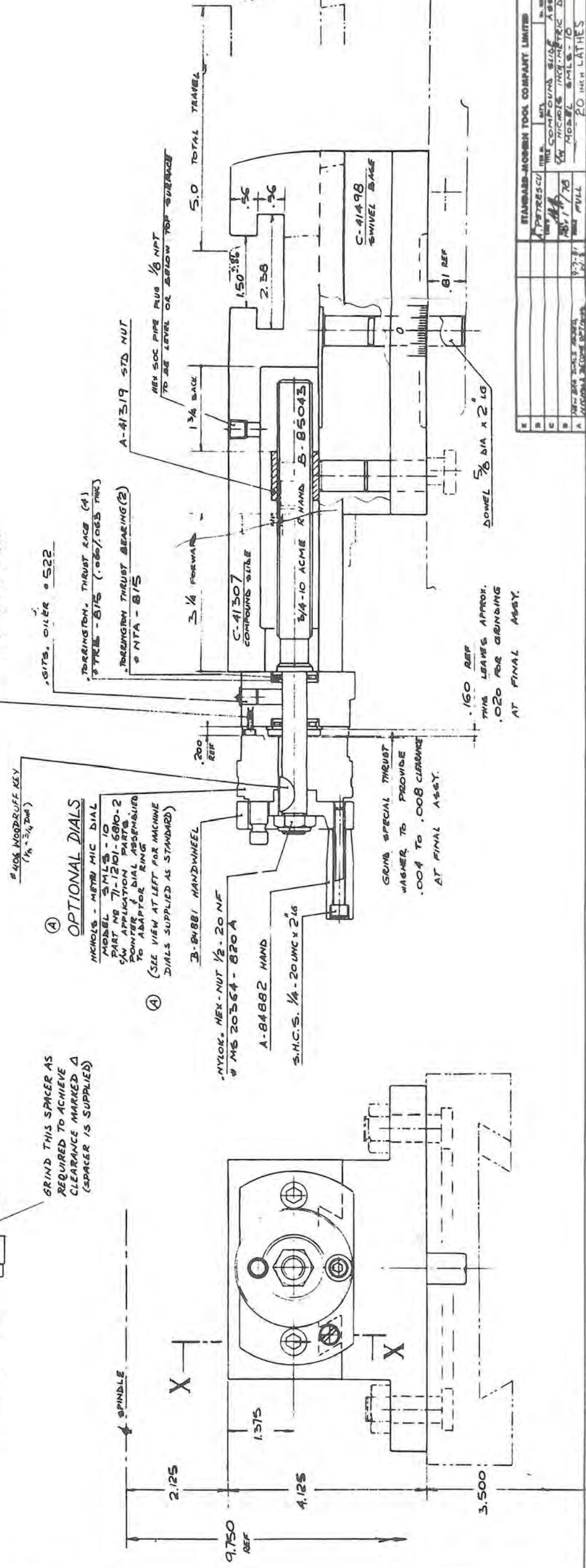
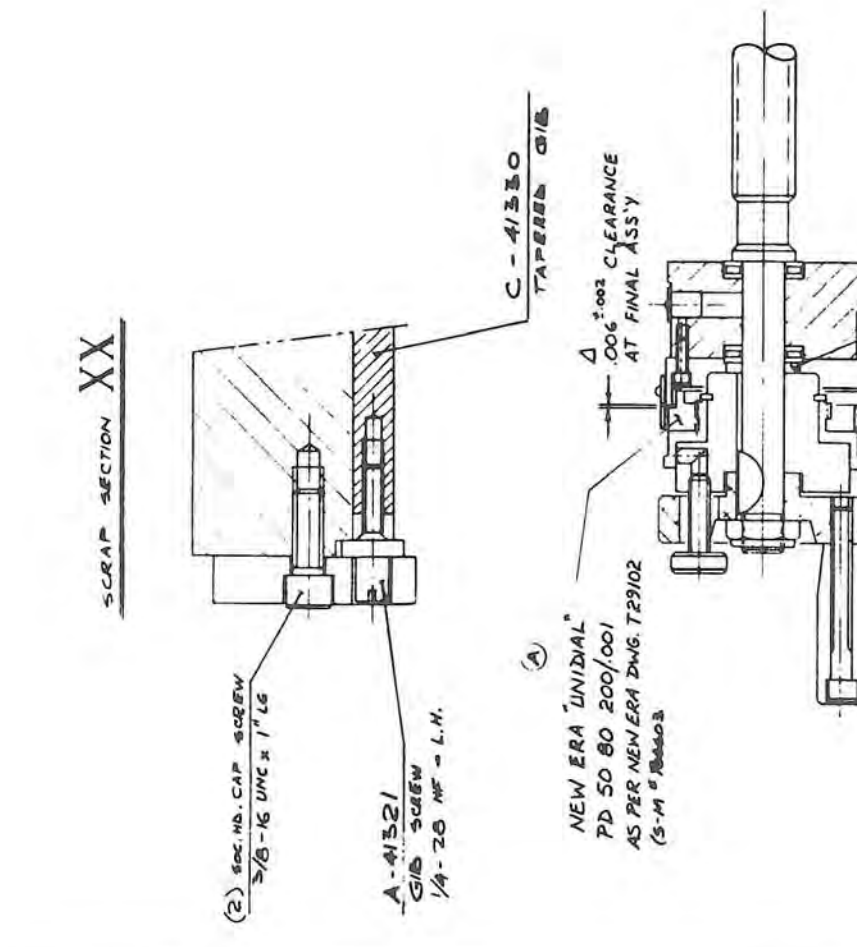
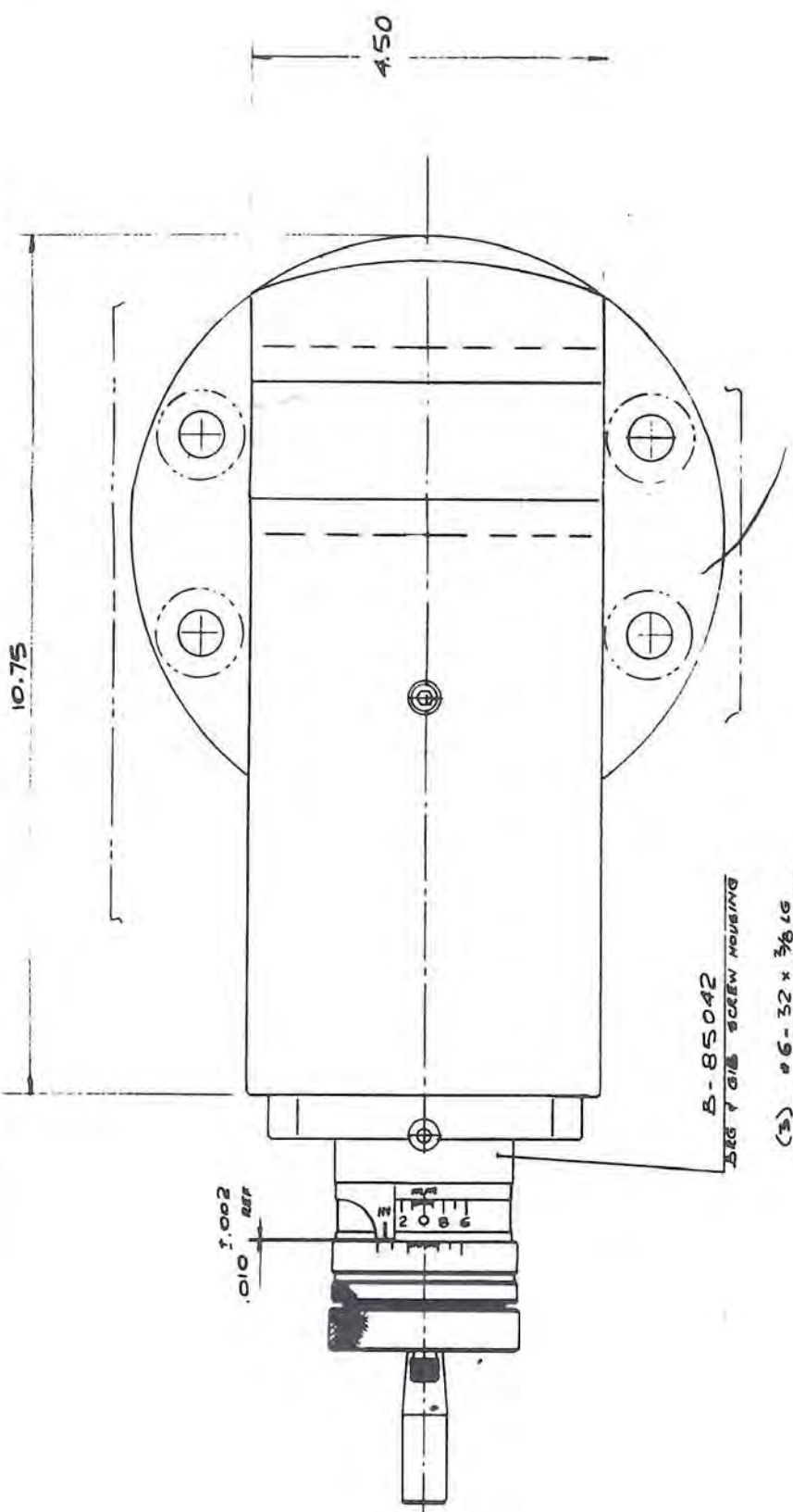
NEW ERA "UNIDIAL"
 PD 50 40 400/001
 AS PER NEW ERA Dwg. T29101
 (D.M. 106669)

GRIND THIS SPACER
 (SUPPLIED) TO
 PROVIDE CLEARANCE
 MARKED

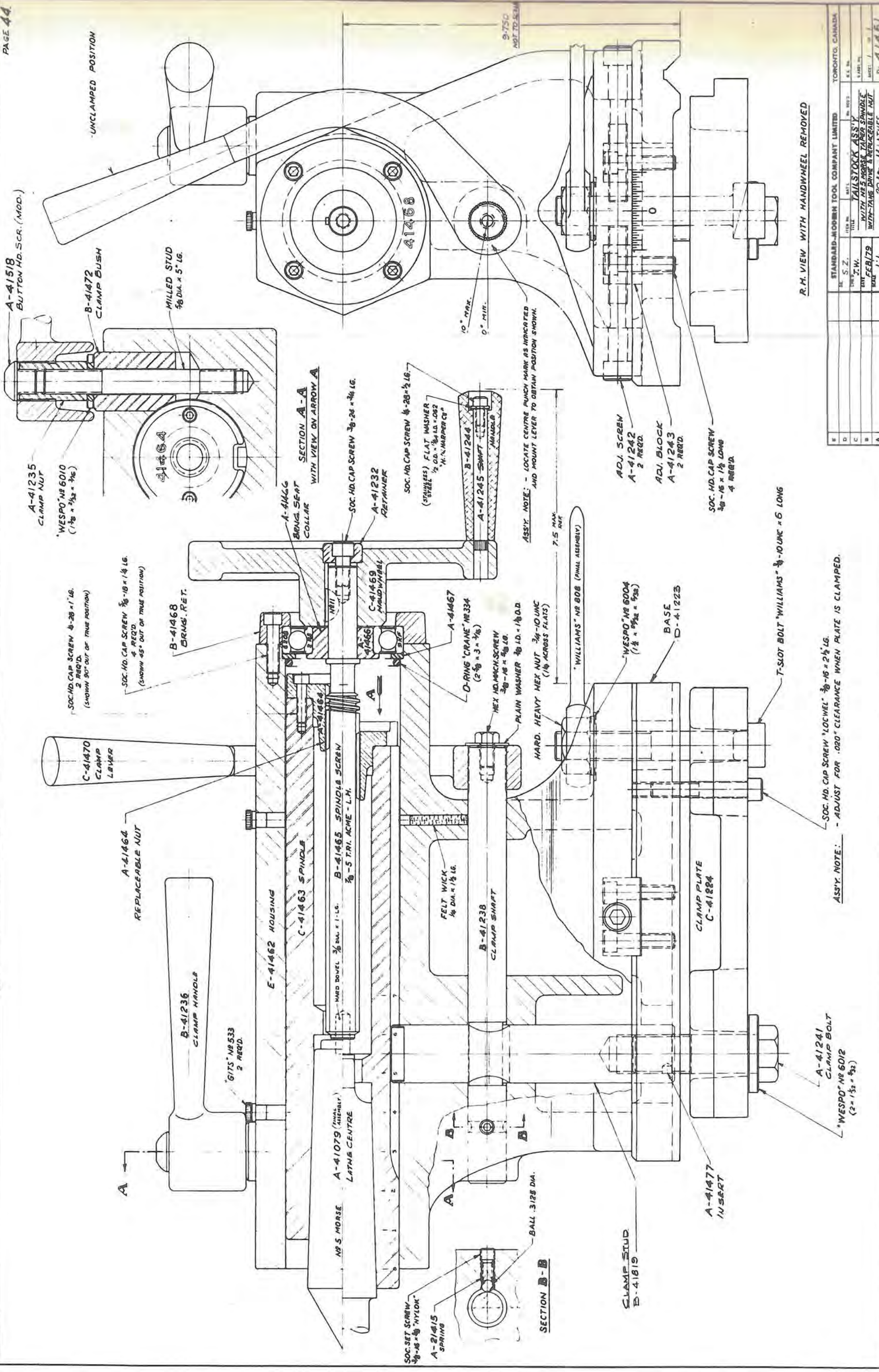
NOTE!
 FOR LATHES WITH SCAND-MATIC TRACER ATTACH
 SEE Dwg. D-197839 SHOWING EXTENDED CROSS FEED
 SMART, FLUID MOTOR, & INCH/METRIC DIALS

OPTIONAL DIALS
 METRIC BY NICHOLS - INCH / METRIC DIAL
 MODEL SMLS OR REVISED C/W APPLICATION
 PARTS POINTER & DIAL ASSEMBLED
 TO ADAPT RING
 PART NO. 71-1201-6809-3 (REF. C-24679)
 SEE VIEW AT RIGHT FOR MACHINE DIALS SUPPLIED
 AS STANDARD

REV.	DATE	BY	CHKD.	DESCRIPTION
1				STANDARD MODERN TOOL COMPANY LIMITED TORONTO, CANADA
2				70 INCH LATHES E-25052



STAMBAUGH-HOBEN TOOL COMPANY LIMITED		TORONTO, CANADA	
DESIGNED BY	W. J. HOBEN	DATE	11/1/75
DRAWN BY	W. J. HOBEN	SCALE	AS SHOWN
CHECKED BY	W. J. HOBEN	PROJECT NO.	D-85006
APPROVED BY	W. J. HOBEN	WORKING DRAWING NO.	D-85006



UNCLAMPED POSITION

SECTION A-A
WITH VIEW ON ARROW A

SECTION B-B

R.H. VIEW WITH HANDWHEEL REMOVED

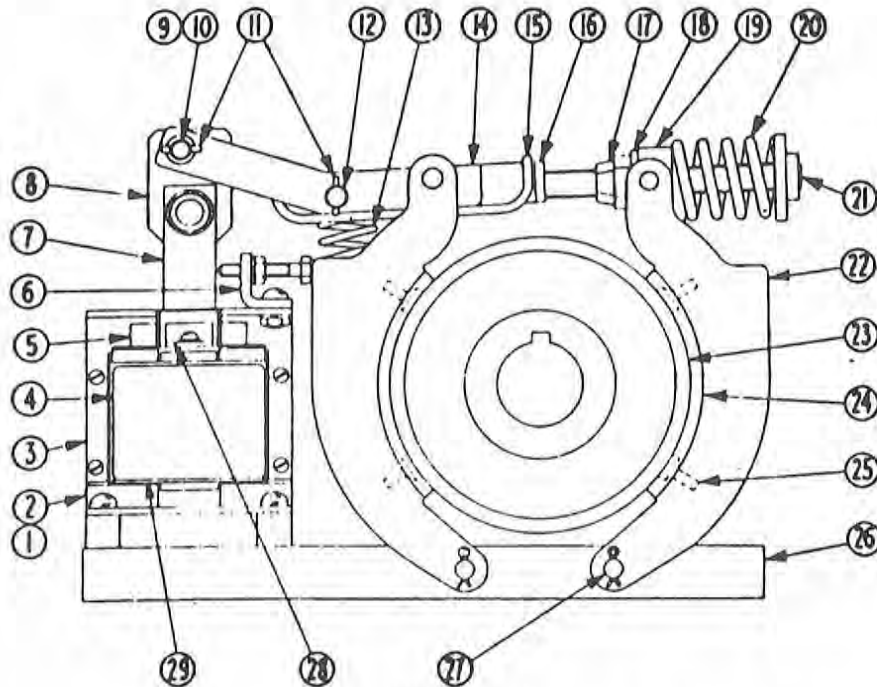
ASSY. NOTE: - LOCATE CENTRE PUNCH MARK AS INDICATED AND MOUNT LEVER TO OBTAIN POSITION SHOWN.

ASSY. NOTE: - ADJUST FOR .020" CLEARANCE WHEN PLATE IS CLAMPED.

STANDARD-MORRIS TOOL COMPANY LIMITED	TORONTO, CANADA
ITEM NO.	REV.
TITLE	DATE
DESIGNED BY	DRAWN BY
CHECKED BY	SCALE
APPROVED BY	PROJECT NO.
DATE	FIG.
20/11/1945	D-41461

INSTRUCTION SHEET

For Bulletin 511 Type "S" 5½" A-c Brake



88-1332-2, -3, -4, -6

INSTRUCTIONS (See Figure 1)

1. MOUNTING — Clamp the brake on the wheel by compressing torque spring "D" by tightening the adjusting nut "E". Insert shims between the mounting stand and the base of the brake until the brake is setting solid on base

2. Adjustment — a. Compress the torque spring "D" until the desired torque is obtained. The approximate compressed length of this spring, to obtain rated torque, is given in the table below and on some brakes this length is given on a small plate mounted on the pivot block, item 19. It is an approximate dimension and further adjustment may be necessary.

While making this adjustment maintain a clearance of

.015 inch at "C" when the brake is applied. When the desired torque is obtained be sure that the clearance "C" is .015 inch. The lock nut "B" will secure itself in this position.

b. Equalize the clearance between the shoes and wheel when the brake is released by setting screw "A".

3. Re-Adjustment — When the lining wears, the clearance "C" decreases. Never permit this clearance to become zero since complete loss of braking torque will result. When the clearance "C" becomes low, again adjust to .015 inch by turning screw "E". No change in torque will result from this adjustment if nut "B" is not changed.

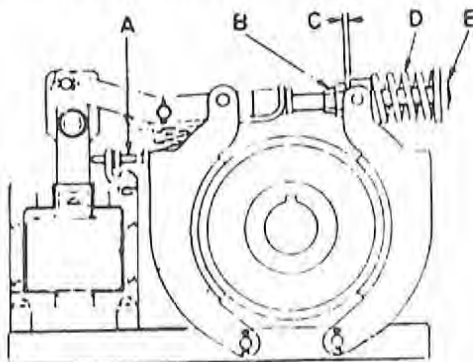


Fig 1

Size of Brake	Torque Rating	Compressed Length of Spring "D"
5½"	35 Lbs. Ft.	1¾"

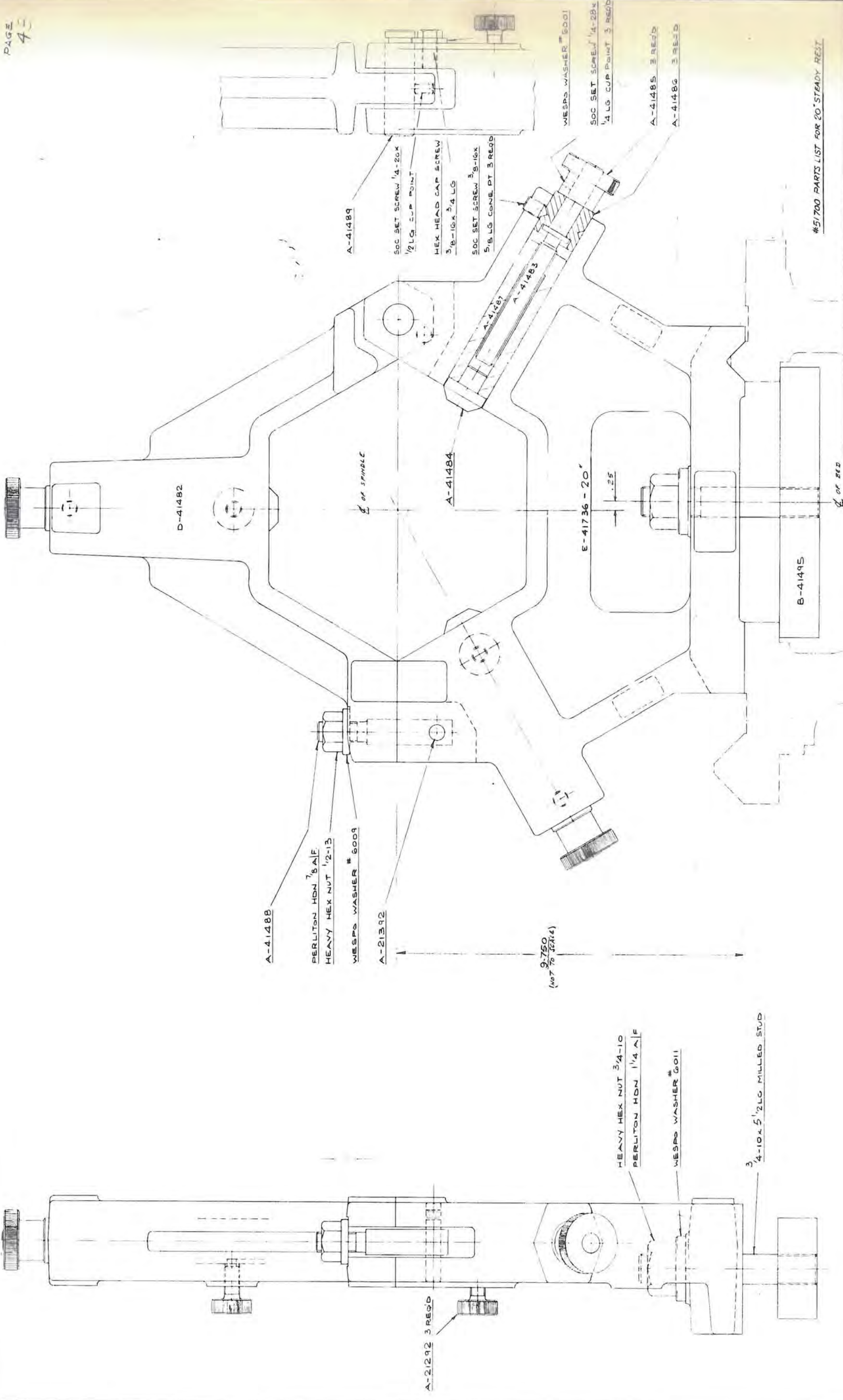
RENEWAL PARTS — Information Required

Parts CANNOT be sent promptly unless you include the FOLLOWING with your order: PUBLICATION NO. 10824, ITEM NO., DESCRIPTION, PART NUMBER AND NO. STAMPED ON THE BRAKE NAMEPLATE

Item No.	Description of Part	No. Req.	Part No. 25 Lb. Ft. Torque 88-1332-2, -3 35 Lb. Ft. Torque 88-1332-4, -6
1	Case (when used).....	1	39-18564
2	Cover (when used).....	1	47-828
3	Magnet frame.....	1	17-476
▲ 4	Coil (Give No. on Coil).....	1	
5	Spring.....	2	69-273
6	Bracket.....	1	79-415
▲ 7	Plunger (includes item 8).....	1	51-93-4
	1/2-13 screw.....	1	11-709-2
	1/2-13 hexagon nut.....	1	915-1401Z
	1/2 lockwasher.....	1	916-1161Z
8	Link.....	1	51-116-2
9	Pin.....	1	13-3527
10	Spacer.....	2	56-2561-4
11	Spring pin.....	4	13-3187-2
12	Pin.....	1	13-317 0
▲ 13	Solenoid spring		
	25 lb. ft. torque.....	1	69-336
	35 lb. ft. torque.....	1	69-1584
14	Lever.....	2	24-4026
15	Spring gland.....	1	49-3025
16	Adjusting stud nut.....	1	15-774
17	Locknut -- 1/2-20.....	1	15-209
18	Washer.....	1	916-1121Z
19	Pivot block.....	1	17-241
▲ 20	Torque spring		
	25 lb. ft. torque.....	1	69-287
	35 lb. ft. torque.....	1	69-303
21	Adjusting stud assembly.....	1	14-141-2
22	Brake shoe (includes items 24 and 25).....	2	48-98-3
▲ 23	Brake wheel (see below).....	1	
24	Lining.....	2	48-338-2
25	Groov pin.....	8	13-4762
26	Base.....	1	17-242
27	Base pin.....	2	13-474
▲ 28	Plunger guide.....	2	54-300-2
29	Washer.....	2	16-254
▲ 30	Set of lining for repairs (includes items 24 and 25).....	1	6-166-2

*Give Catalog "H" No. when stamped on the wheel or, if this Number does not appear on the wheel, give complete brake nameplate data and bore and keyway dimensions.

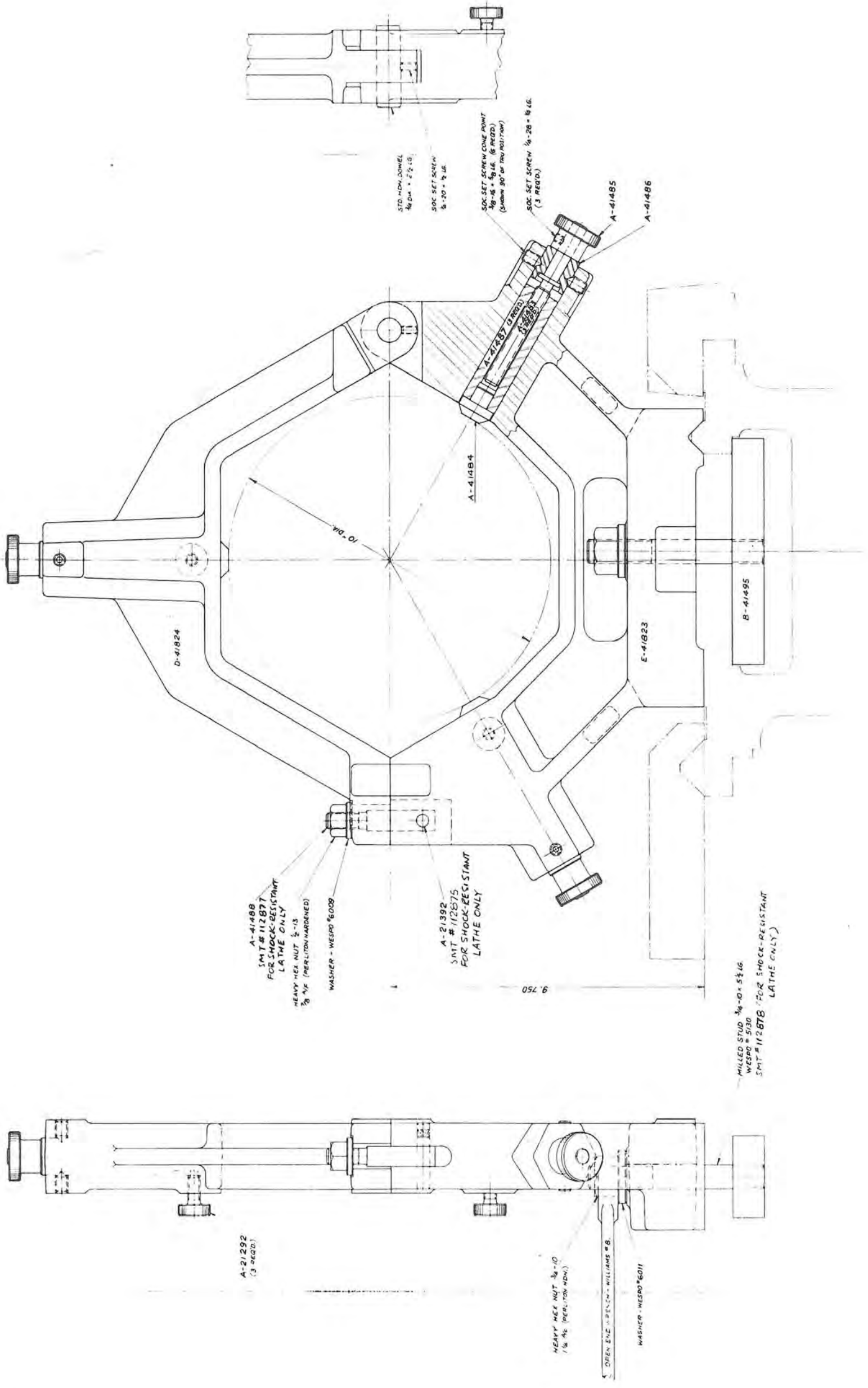
▲ We recommend that these items be stocked. The quantity to be stocked will depend upon the total number in use.



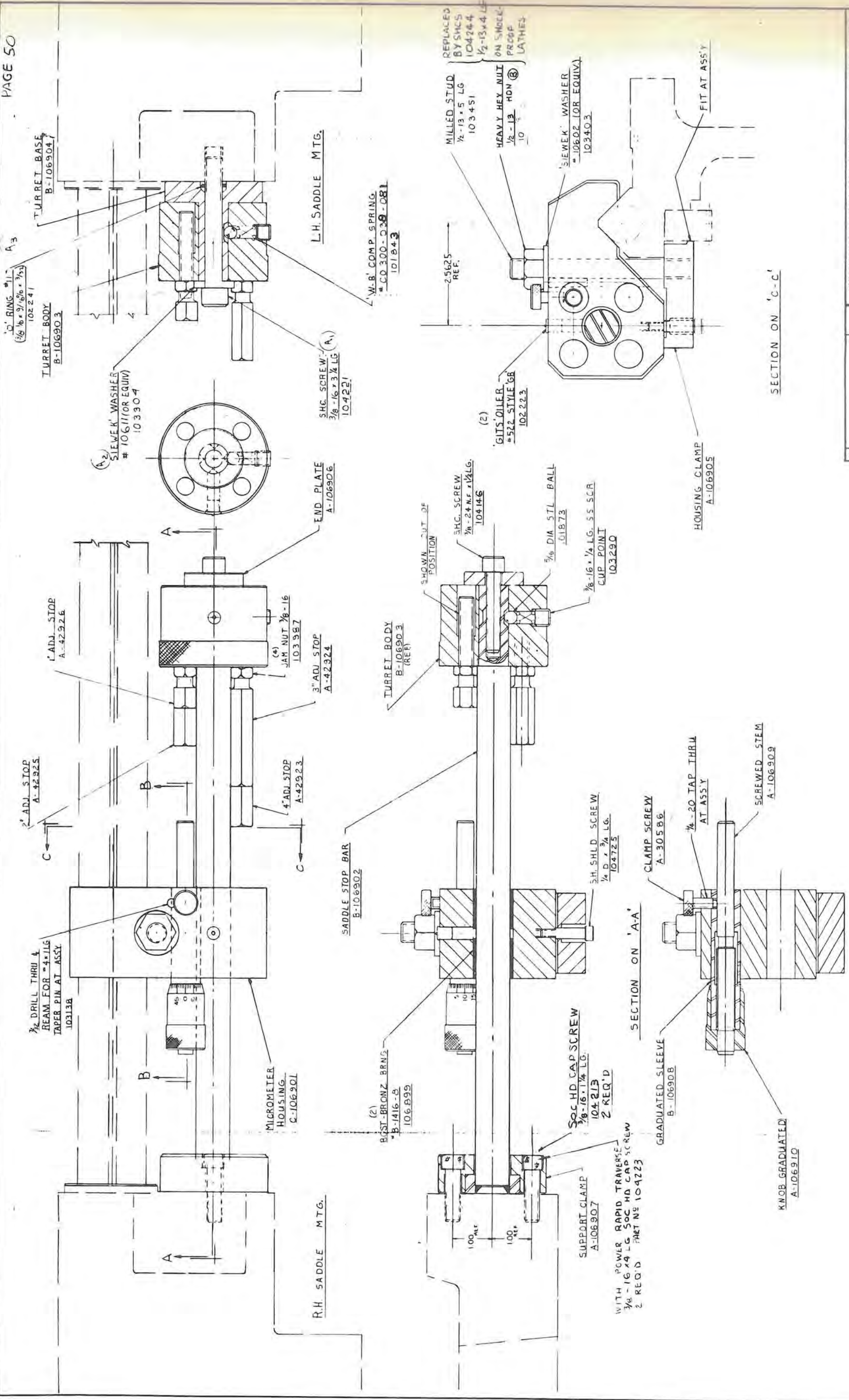
#51700 PARTS LIST FOR 20" STEADY REST

STANDARD-MODERN TOOL COMPANY LIMITED		TORONTO, CANADA	
REV.	DATE	BY	CHKD.
1			
TITLE		PART NO.	
ABSY OF STEADY REST		41482	
1/2 TO G. CAPACITY		MATERIAL	
BUTTON TYPE		UNIT	
20 INCH LATHES		P-41440	
FULL			

(MYPAC)

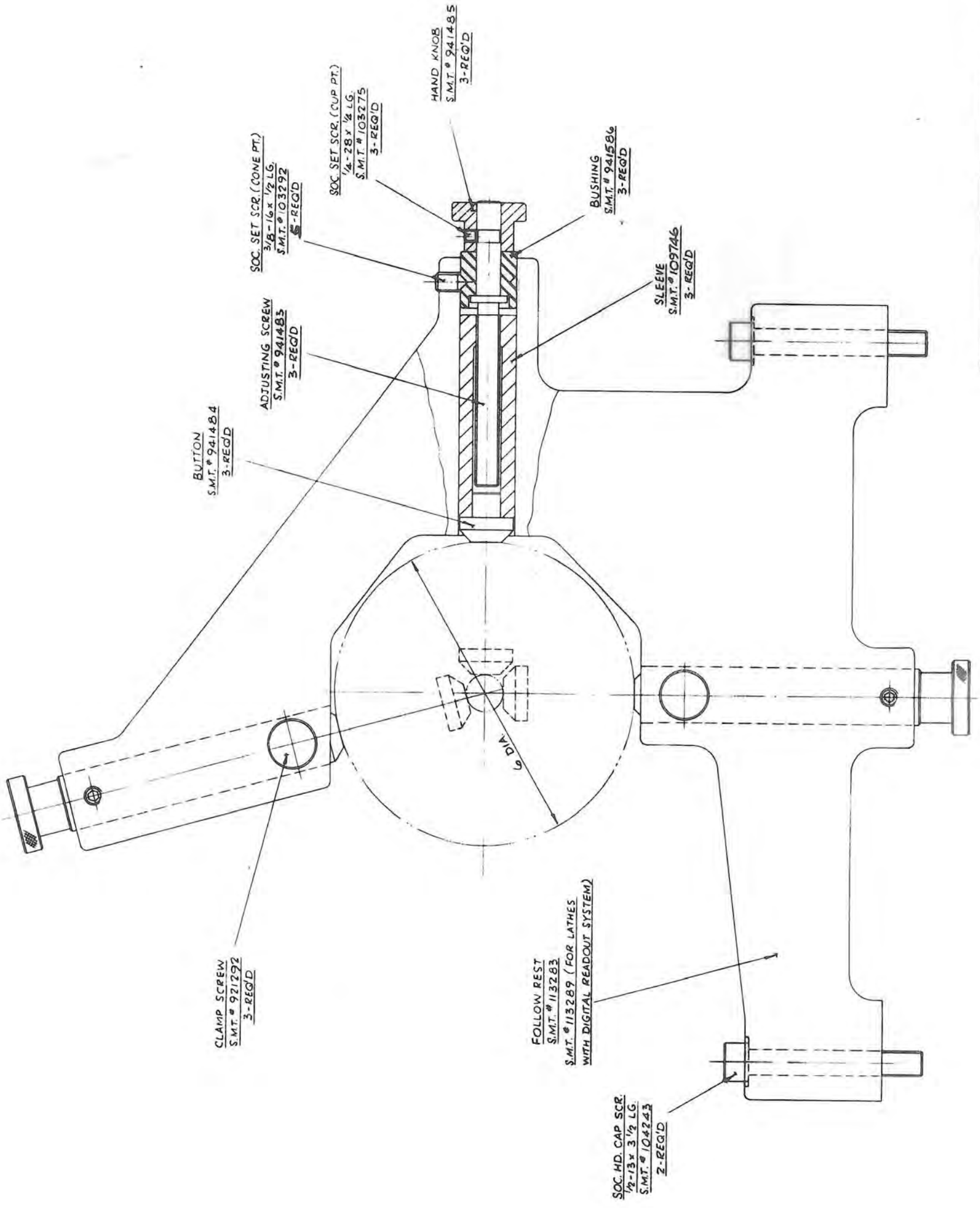


BRANDS - ROOSTER TOOL COMPANY LIMITED	
1	1/2" DIA.
2	1/4" DIA.
3	3/16" DIA.
4	1/8" DIA.
5	3/32" DIA.
6	1/16" DIA.
7	3/64" DIA.
8	1/32" DIA.
9	1/64" DIA.
10	1/128" DIA.
11	1/256" DIA.
12	1/512" DIA.
13	1/1024" DIA.
14	1/2048" DIA.
15	1/4096" DIA.
16	1/8192" DIA.
17	1/16384" DIA.
18	1/32768" DIA.
19	1/65536" DIA.
20	1/131072" DIA.
21	1/262144" DIA.
22	1/524288" DIA.
23	1/1048576" DIA.
24	1/2097152" DIA.
25	1/4194304" DIA.
26	1/8388608" DIA.
27	1/16777216" DIA.
28	1/33554432" DIA.
29	1/67108864" DIA.
30	1/134217728" DIA.
31	1/268435456" DIA.
32	1/536870912" DIA.
33	1/1073741824" DIA.
34	1/2147483648" DIA.
35	1/4294967296" DIA.
36	1/8589934592" DIA.
37	1/17179869184" DIA.
38	1/34359738368" DIA.
39	1/68719476736" DIA.
40	1/137438953472" DIA.
41	1/274877906944" DIA.
42	1/549755813888" DIA.
43	1/1099511627776" DIA.
44	1/2199023255552" DIA.
45	1/4398046511104" DIA.
46	1/8796093022208" DIA.
47	1/17592186044416" DIA.
48	1/35184372088832" DIA.
49	1/70368744177664" DIA.
50	1/140737488355296" DIA.
51	1/281474976710592" DIA.
52	1/562949953421184" DIA.
53	1/1125899906842368" DIA.
54	1/2251799813684736" DIA.
55	1/4503599627369472" DIA.
56	1/9007199254738944" DIA.
57	1/18014398509477888" DIA.
58	1/36028797018955776" DIA.
59	1/72057594037911552" DIA.
60	1/14411518807582304" DIA.
61	1/28823037615164608" DIA.
62	1/57646075230329216" DIA.
63	1/115292150460658432" DIA.
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81	1/30223145490358843998208" DIA.
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94	1/24758800785701965003319936" DIA.
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96	1/99035203142807860013279744" DIA.
97	1/198070406285615720026559488" DIA.
98	1/396140812571231440053118976" DIA.
99	1/792281625142462880106237952" DIA.
100	1/1584563250284925760212475904" DIA.



STANDARD-MODERN TOOL COMPANY LIMITED		TORONTO, CANADA	
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SECTION ON 'B-B'

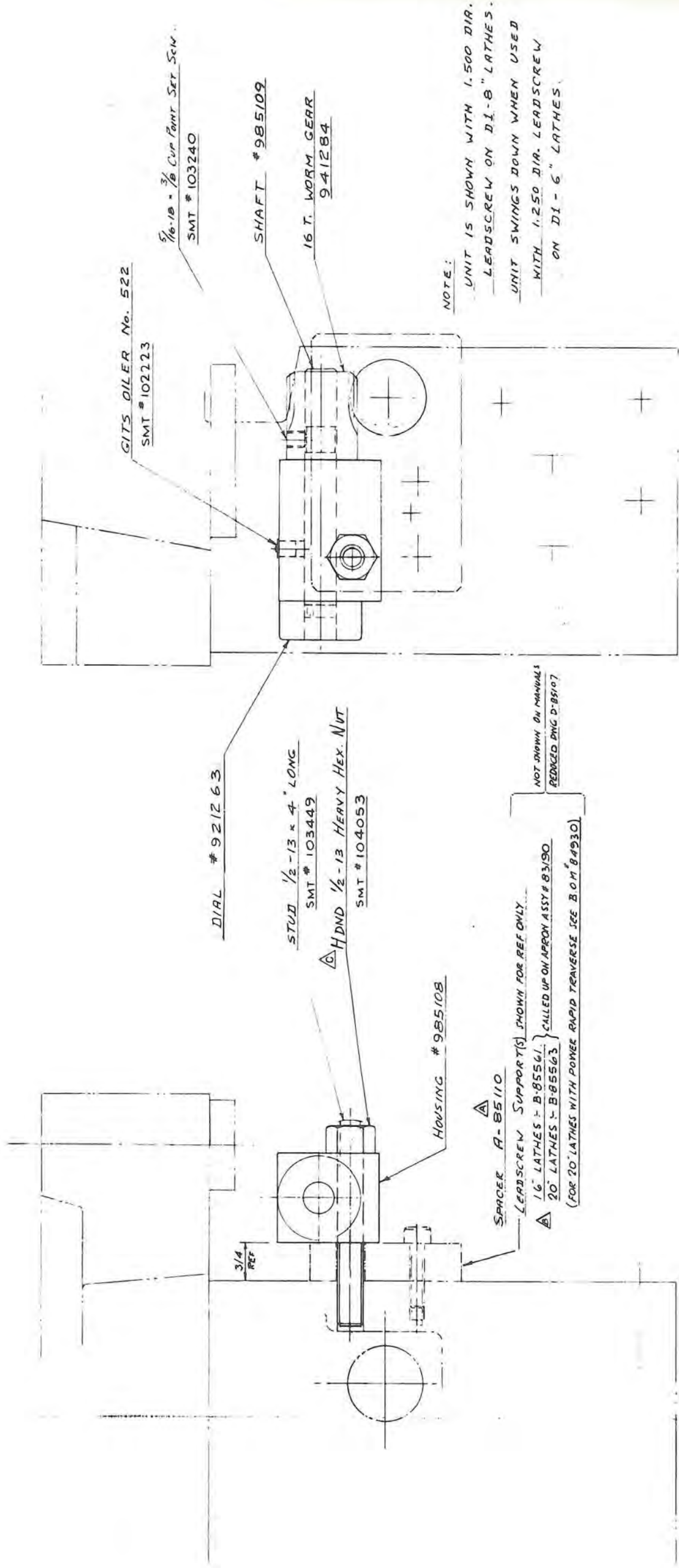


25-47613 TORONTO, CANADA

DR	S. LIU	REV NO	REV 1	NO. REQ'D	
CHK'D		TITLE	FOLLOW REST ASSY		
DATE	APR 30, 1986	SCALE	5/4" TO 6" CAPACITY		
POST	FULL	REVISION TYPE	BUTTON TYPE		
			20 INCH LATHES		
E					
D					
C					
B					
A					

SIN Standard-Modem
Microfilm Corporation

DRAWING NO. 25-47613
REV. 1
DATE: APR 30, 1986
BY: S. LIU
CHECKED: [blank]
SCALE: 5/4" TO 6" CAPACITY
REVISION TYPE: BUTTON TYPE
LATHES: 20 INCH LATHES



NOTE:

UNIT IS SHOWN WITH 1.500 DIA. LEADSCREW ON DI-B LATHES. UNIT SWINGS DOWN WHEN USED WITH 1.250 DIA. LEADSCREW ON DI-6" LATHES.

NOT SHOWN ON MANUALS REDUCED PNG D-85107

STANDARD-MODERN TOOL COMPANY LIMITED										TORONTO, CANADA	
REV.	DATE	BY	CHKD.	APP'D.	QTY.	UNIT	PRICE	REMARKS	DATE	BY	CHKD.
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