

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS LIST
FOR**

**LATHE, ENGINE TOOLROOM
MODEL 1530
(3416-00-517-1051)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1983

WARNING

DO NOT OPERATE THE SPEED SELECTORS WHEN THE MOTOR IS RUNNING.

TECHNICAL MANUAL

No. 9-3416-230-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 14 March 1983

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MODEL 1530
(NSN 3416-00-517-1051)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this equipment is issued.

Manufactured by: Standard-Modern Tool Co. Ltd.
69 Montcalm, Ave.
Toronto, Ontario M6E4N9
Procured under Contract No. DAAA-75-C-7017

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

- 1 - Manufacturer's Federal Supply Code Number. 36195
- 2 - Manufacturer's Part Number exactly as listed herein.
- 3 - Nomenclature exactly as listed herein, including dimensions, if necessary.
- 4 - Manufacturer's Model Number. 1530
- 5 - Manufacturer's Serial Number (End Item).
- 6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
- 7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

- (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number - 36195 followed by a colon and manufacturer's Part Number for the repair part.
- (b) Complete Remarks field as follows:

Noun: (nomenclature or repair part)
 For: NSN: 3416-00-517-1051
 Manufacturer: Standard-Modern Tool Co. Ltd.
 69 Montcalm, Ave.
 Model: 1530 Toronto, Ontario M6E4N9
 Serial: (of end item)

Any other pertinent information such as Frame Number, Type, Dimensions, etc.

OPERATOR'S HANDBOOK

Index	Page No.
General View	1
Lifting and Installation Instructions	2-3
Floor Plan	4
Electrical Diagram	5
Lubrication	6-9
Leadscrew Reverse	10
Operating Instructions	11-17
Headstock Parts	18-21
2-Speed Headstock Drive and End Gear Training Parts	22-23
Feedbox Parts	24-26
Apron Parts	27-28
Cross Slide and Saddle Parts	29-30
Tool Post and Compound Parts	31
Tailstock Parts	32
General Assembly Parts	33
End Gear Train Parts for Cutting Metric and Special Threads	34
Taper Attachment Parts	35
Coolant Parts	36
Steady Rest, Follow Rest and Micrometer Carriage Stop Parts	37
Dial Indicator Carriage Stop and Depth Threading Stop Parts	38
Automatic Carriage Stop Parts	39
One-shot Lubricator	40

LIST OF ILLUSTRATIONS

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
1	General View	1
2	Lifting the Machine	2
3	Floor Plan	4
4	Electrical Schematic Diagram	5
5	Belt Tension	11
6	Motor & Spindle Rotation Control	12
7	Thread Cutting (Pitches)	14
8	Taper Turning	15
9	Location of Shear Pin & Shear Key	16
10	Headstock Parts	18
11	Headstock Feedtrain for Leadscrew Reverse	20
12	Headstock Parts	21
13	2-Speed Headstock Drive & End Gear Train Parts	22
14	Totally Enclosed Feedbox Parts	24
15	Control Linkage L. H. for Leadscrew Reverse Diagram	26
16	Apron Parts	27
17	Apron Control R. H. for Leadscrew Reverse Diagram	28
18	Cross Slide & Saddle Parts	29
19	Details of Cross Feed Dial with Ball Type Threading Stop	30

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
20	Compound Slide Assembly Diagram	31
21	Tailstock Parts	32
22	General Assembly Parts	33
23	End Gear Train Parts For Cutting Metric and Special Threads	34
24	Telescopic Taper Attachment Parts	35
25	Coolant Parts	36
26	Steady Rest, Follow Rest and Micrometer Carriage Stop Parts	37
27	Dial Indicator Carriage Stop and Depth Threading Stop Parts	38
28	Automatic Carriage Stop Parts	39
29	One Shot Lubrication Assembly Diagram	40

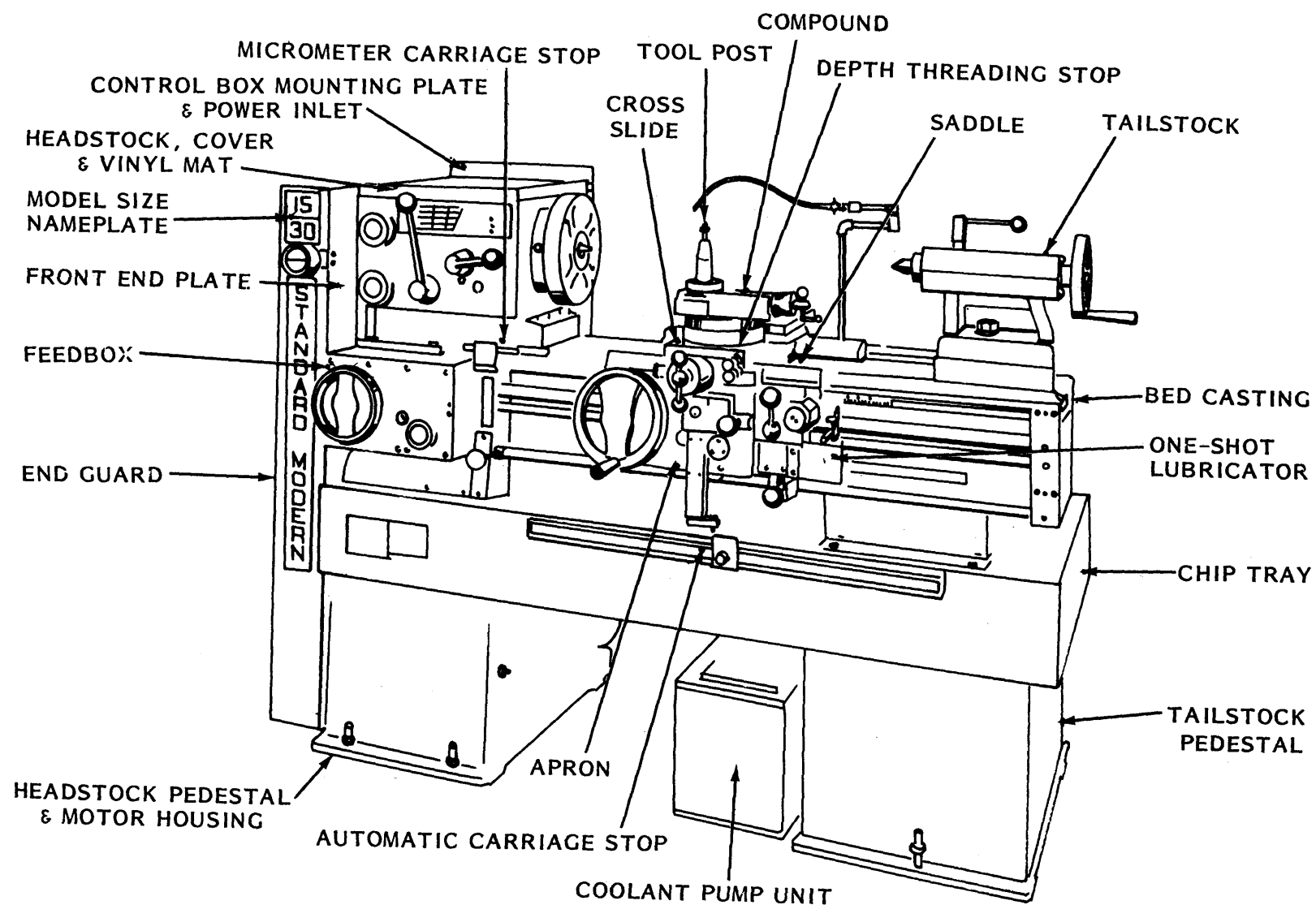


Figure 1 General View

1. LIFTING AND INSTALLATION INSTRUCTIONS

1.1 Lifting the Machine

To lift the machine by the use of chain slings, run the carriage down to the tailstock and place the slings around the center bed cross ribs.

Protect painted surfaces with thick pads.

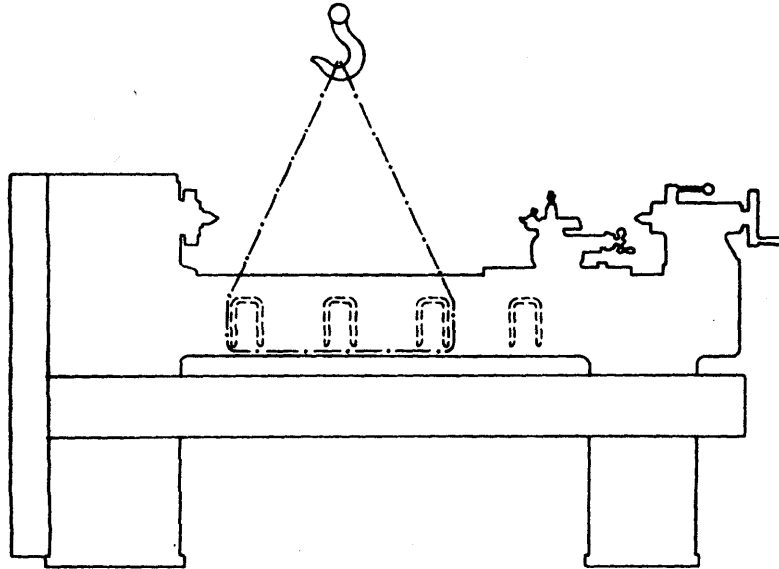


Figure 2 Lifting the Machine

Lifting equipment should have a capacity of approximately 4000 lbs.

Do not remove skids from the machine until it is brought to its final position.

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.

The serial number of the machine is stamped on the recessed face, on top of the bed, at the tailstock end.

LIFTING AND INSTALLATION

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 on their respective slides.

To remove the anti-rust compound use a wiper dipped in kerosene.

All unpainted surfaces should immediately be coated with a film of light machine oil to prevent rust. If the finished surfaces are kept clean and well coated with oil, the lathe will retain its new appearance indefinitely.

1.4 Installation

For proper operation, the machine should be set on a substantial floor capable of supporting the weight safely. To secure the machine on its foundation use anchor bolts or lag screws. For the size of the lathe and the location of the bolt holes see the floor plan.

After the machine is in position, it must be leveled 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 3/8" thick, under the leveling screws to prevent the ends of the screws from sinking into the floor.

It is important that the lathe be level in order to produce accurate work.

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

After all the strain and twist has been removed from the lathe bed, and it checks perfectly level, the pedestals should be lagged to the floor, and the leveling re-checked. Re-check the level of the machine at regular intervals.

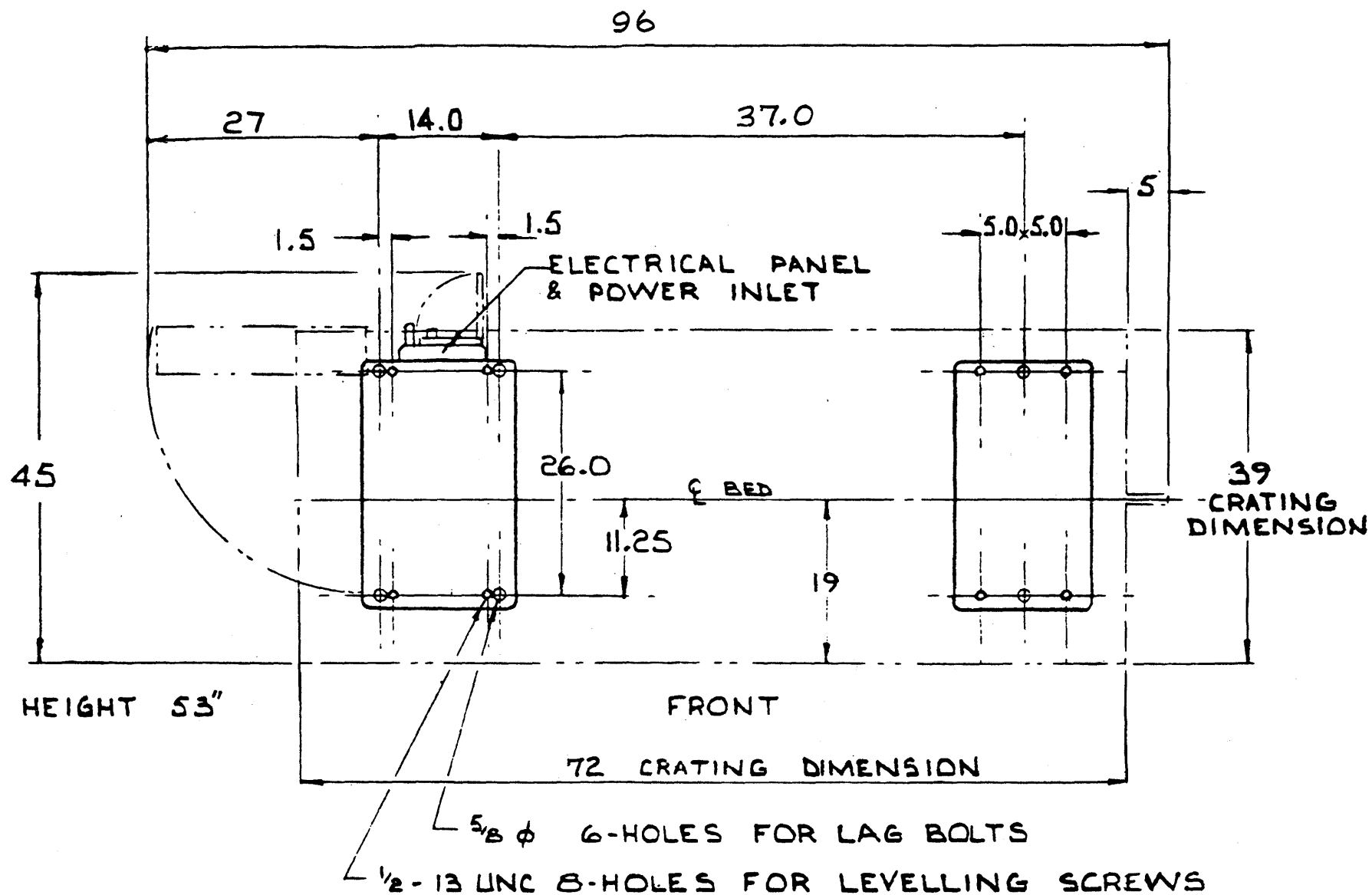


Figure 3 Floor Plan

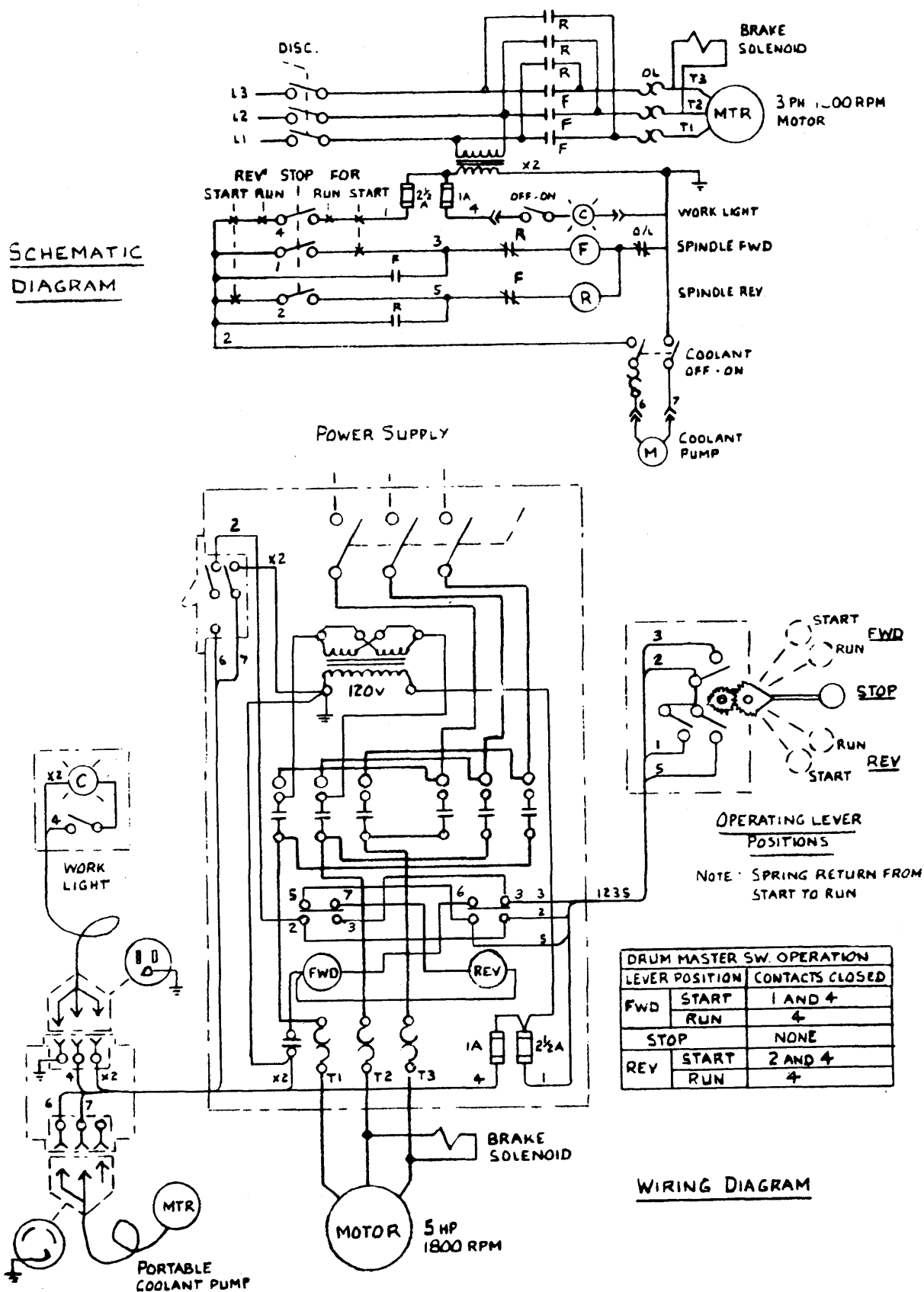


Figure 4 Electrical Schematic Diagram

2. LUBRICATION

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.

A high grade S.A.E. No. 30, Mineral Oil should be used. (Viscosity 500-530 SUS at 100 Deg. F.)

CAUTION:

Do not mix detergent type, automotive oil or multipurpose oils with the type of oil specified.

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.

2.1 Headstock

The lubrication of the headstock is automatic, so that an even distribution throughout the headstock is assured.

To service the headstock, fill the reservoir to the center of the oil sight gauge through the oil pipe at the left end of the headstock inside the end guard.

The reservoir capacity of the headstock is approximately 9 British Imperial Quarts or 11 U.S. Quarts.

Depending on operating conditions, usually about every six months, the headstock should be drained and thoroughly flushed out, before adding new oil. The drain pipe is located at rear bottom of headstock.

Because most solvents tend to soften paints, they are not recommended as flushing mediums. A light blending 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.

LUBRICATION

2.2 2-Speed Headstock Drive.

Four grease fittings, located inside the end guard, lubricate the shaft bearings of the 2-Speed Drive.

On the 2-Speed Drive, between the large "Slow Range" Pulley and the smaller "Fast Range" Pulley, a CLUTCH BOBBIN slides on a multi-tooth sleeve which requires the application of grease at regular intervals, to assure free shifting.

In order to apply grease to the sleeve, move the bobbin first to the "Fast" position and then to the "Slow" position. (The "SLOW RANGE-FAST RANGE" SELECTOR KNOB actuates the Clutch Bobbin).

Use a small rod to insert the grease on either side of the bobbin.

Also apply grease to the groove in the clutch bobbin to prevent noise from the actuating pin.

2.3 Feedbox

The lubrication of the Totally Enclosed Feedbox is automatic so that an even distribution throughout is assured. To service the feedbox, fill reservoir to the center of the oil sight gauge through filler elbow at left end of feedbox. The reservoir capacity of the Feedbox is approximately 2 British Imperial Quarts or 2 1/2 U.S. Quarts.

Feedbox should be drained and flushed, using same procedure as outlined for headstock, approximately every 6 months. The drain hole is located on front face of Feedbox at left hand end.

2.4 Compound

On the compound rest, one oil hole lubricates both the ways and the screw,

2.5 Cross Slide

Of the three ball type oilers on top of the cross slide the two outer ones lubricate the cross slide dovetails and bearing surfaces on the saddle.

These two oilers are not used when the One-Shot Lubricator provides lubrication to the bearing surfaces through internal passages in the saddle. This lubricating system with One-Shot Lubricator, located on the apron, is optional equipment.

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 by an oiler behind the cross feed dial.

LUBRICATION

2.6 Saddle

On the right top side of the saddle wings two oilers lubricate the bearing surfaces of the saddle on bedways.

These two oilers are not used when the oil is supplied by the One-Shot Lubricator.

The oil flows down through the oilers, or flows through the inside oil passages when using One-Shot Lubricating System, out onto the ways and along the length of the saddle through oil grooves.

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

2.7 Apron

The box construction of the apron completely encloses all moving parts. The lower half forms a large oil reservoir in which all the gears run, providing an even distribution of lubricant.

Service the apron reservoir through the oil cup at the back of the apron handwheel. Fill with oil to the center of the oil sight gauge. The reservoir capacity of the apron is approximately 1 British Imperial Quart or 1 1/4 U.S. Quarts.

The apron oil reservoir should be drained, flushed and re-filled with fresh, clean oil at least once every 6 months.

Two oil cups, located on the right hand front of the apron, lubricate individually the half-nuts control shaft and the thread chasing dial shaft.

2.8 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.

LUBRICATION

2.9 Bed End Bracket and Leadscrew

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

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

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

2.10 Taper Attachment

Clean and oil the pivoted Slide Bar before use.

Three oilers lubricate the cross guide bar and two oilers provide lubrication to the slide plate dovetails.

2.11 Control Shaft for Leadscrew Reverse

NOTE: This lathe has two extra grease fittings on the Control Shaft for Leadscrew Reverse - one on the Bed End Bracket (3rd down) and one on the Support Block at R.H. end of Apron. Grease once a week.

Apply a few drops of oil to the Coupling and Pivot Roller at left end of Control Shaft.

LEADSCREW REVERSE

This lathe is equipped with an apron-mounted control lever (MAROON KNOB) for selecting both leadscrew and feed reverse.

Push "DOWN" for R.H. threads & L.H. Feed.
 Pull "UP" for L.H. Threads & R.H. Feed.
 Horizontal position is neutral.

Avoid engagement at spindle speeds above 100 R.P.M. when cutting very coarse threads - OR - 800 R.P.M. when cutting fine threads and when using normal feed rates.

A good general rule for determining the approximate safe spindle speed when cutting a specific T.P.I. is to multiply the T.P.I. by 25.

Example	2	T.P.I.	x 25 =	50	R.P.M.
	8	T.P.I.	x 25 =	200	R.P.M.
	16	T.P.I.	x 25 =	400	R.P.M.
	32	T.P.I.	x 25 =	800	R.P.M.

There should be little difficulty in engaging the half nuts when following this rule and undue strain on the feed gear train is avoided.

The main feature of the Leadscrew Reversing Mechanism is the ability to disengage, reverse and re-engage the drive to the leadscrew without losing the relationship between the spindle and the leadscrew.

A further asset is the precise stopping of the carriage movement in either direction (via the trip dogs) when cutting threads or doing normal turning operations.

This is invaluable when:

1. Cutting a thread up to a shoulder.
2. Cutting an internal thread in a blind hole.

NOTE:

The threading tool will cut its own internal undercut, prior to retraction.

3. Cutting threads which cannot be handled with the threading dial such as metric leads and other odd pitches where the half nuts must be kept in engagement until the thread is completed.

CAUTION

**Do not use "Reverse Spindle Rotation" in conjunction with the Trip Dogs for Leadscrew Reverse.
 A stop block has been fitted below the L.H. Motor Control Handle to guard against this.**

If "Reverse Spindle Rotation" is ever required for a special job, simply loosen the screw in the stop block and swing it out of the way. Be sure to re-position it after the job is done.

3. OPERATING INSTRUCTIONS

3.1 Motor Drive and Belt Tension Control

The Electrical Motor, located in the pedestal below the headstock, drives the machine through a 2-speed Drive Arrangement with Super H.C. V-Belts.

All belts are the same length and are interchangeable with one another.

When replacing belts, loosen the motor plate clamps and lift the motor plate.

The belts on the Slow Range Pulley can be readily removed, simply by rolling them off the pulley. However, replacement of the Fast Range Belts, requires the removal of the Shifting Arm which drops down between the two pulleys.

When replacing the shifting arm, place the Clutch Bobbin in its central position between the pulleys and clamp the shifting arm by tightening the 3/8 Soc. Hd. Cap Screw.

Be sure the clutch actuating pin does not touch the bottom of the Bobbin groove. Leave 1/32" clearance to prevent rubbing.

With the shifting arm in position adjust the new belts for proper tension (see below) and tighten motor plate clamps.

For the correct belt tension, use the following simple method:

At the center of the span apply a force of 5 lbs. using a spring scale (at right angles to the span) to deflect the belt 1/2 inch.

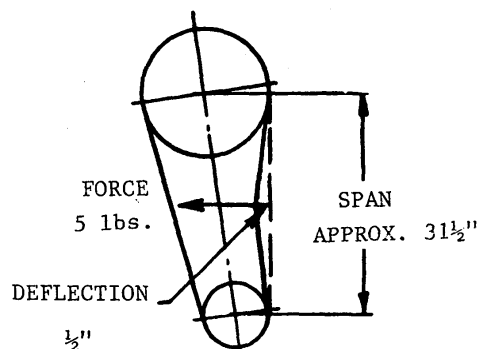


Figure 5 Belt Tension

Check the tension frequently during the first day of operation, and periodically thereafter.

Keep the pulleys and belts clean and free of any foreign material to ensure long life and better traction.

3.2 Motor and Spindle Rotation Control

Spindle rotation is controlled by means of the dual Control Levers mounted on a common Control Shaft. This control shaft in turn actuates a 3-position Rotary Pilot Switch which selects FORWARD, STOP and REVERSE rotation of the motor and spindle.

OPERATING INSTRUCTIONS

Motor and Spindle Rotation Control

The switch box and the L.H. CONTROL LEVER are located just below the headstock at the right lower side of the feedbox.

The R.H. CONTROL LEVER is mounted at the right lower side of the apron and moves with the apron along the bed.

Lifting the levers up gives FORWARD rotation of spindle in the normal direction for turning, drilling, boring, etc.

Pushing the levers down gives REVERSE spindle rotation.

The central or STOP position stops the spindle.

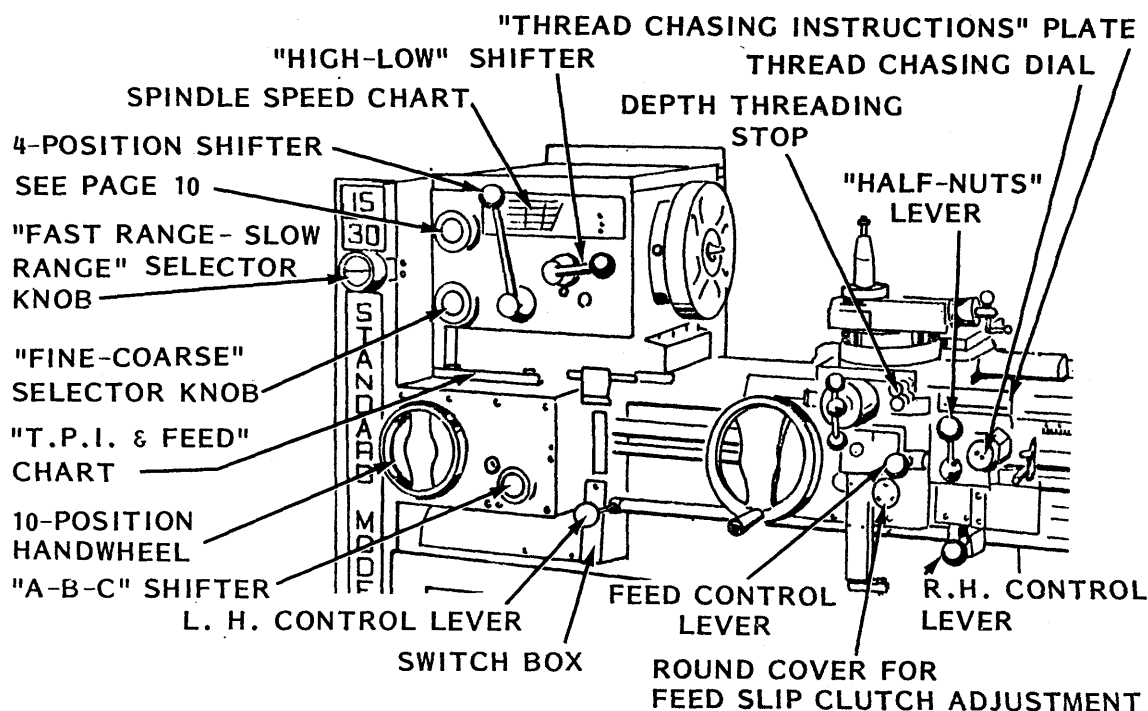


Figure 6. Motor & Spindle Rotation Control

3.3 Spindle Speed Selection

The direct reading SPINDLE SPEED CHART is located on the upper front face of the Headstock.

Immediately below are two speed selectors:

THE 4-POSITION SHIFTER and the "HIGH-LOW" SHIFTER.

The third speed selector: The "FAST RANGE - SLOW RANGE." SELECTOR KNOB is located at the left hand end of headstock.

The desired spindle speed is obtained by placing the three Speed Selectors in positions corresponding to the selected spindle R.P.M. number noted directly on the SPINDLE SPEED CHART.

For free hand rotation of the spindle move the "HIGH-LOW" SHIFTER to its NEUTRAL position.

WARNING

DO NOT OPERATE THE SPEED SELECTORS WHEN THE MOTOR IS RUNNING.

OPERATING INSTRUCTIONS

3.4 Power Feeds

To select the power longitudinal feed or the power cross feed arrange the "R.H. - L.H." and "FINE-COARSE" SELECTOR KNOBS on the headstock and also the "A-B-C" SHIFTER and the 10-POSITION HANDWHEEL on the feedbox, to correspond to the desired feed rate indicated on the "T.P.I. and FEED" CHART.

As an added feature all feed rates are exactly as shown on the chart. This makes it possible to cut scrolls on faceplate work when using the power cross feed.

CAUTION

AVOID THE COARSE RANGE OF FEEDS WHEN SPINDLE SPEEDS ARE ABOVE 500 R.P.M.

For longitudinal power feed move the FEED CONTROL LEVER up to the "LONG FEED" POSITION and the tool will move along the bed parallel to the spindle.

For cross power feed move the FEED CONTROL LEVER down to the "CROSS FEED" position, and the tool will move across the bed, at right angle to the spindle.

NOTE:

A short side shift is required before shifting from LONG FEED to CROSS FEED or vice-versa. This prevents accidental through-shifting.

A safety interlock is also fitted so that it is impossible to engage the FEED CONTROL LEVER and the HALFNUTS at the same time.

3.5 Automatic Carriage Stop.

As an additional feature, lathes can be equipped with automatic feed trip to provide accurate carriage stopping at any point on the bed and in either direction of longitudinal feed.

Simply clamp the moveable TRIP DOG to the rail at the desired stopping position.

3.6 Thread Cutting and Thread Chasing Dial

When cutting screw threads select the desired T.P.I. setting, and proceed in the normal manner.

To engage Apron for threading, the HALF-NUTS are brought into mesh with the Leadscrew by pushing the "HALF-NUTS" LEVER down.

To disengage, lift the same lever up.

The THREAD CHASING DIAL is conveniently located in relation to the lever and the "THREAD CHASING INSTRUCTIONS" PLATE is attached to the saddle wing just above it.

OPERATING INSTRUCTIONS

Thread Cutting

For cutting metric or special threads an ADJUSTABLE BRACKET with CHANGE GEARS for desired pitches is available as optional equipment together with a nameplate with TABLES of THREADS and PARTICULARS of CHANGE GEARS and FEEDBOX SETTINGS (as shown below).

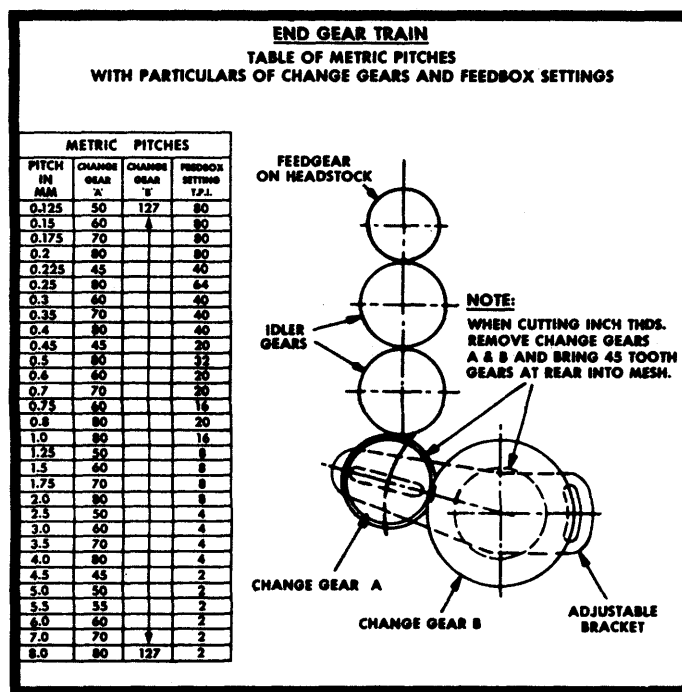


Figure 7 Thread Cutting (Pitches)

- For cutting the METRIC PITCHES as per chart a set of seven change gears is required.
- Virtually ANY DESIRED PITCH can be cut via the use of special change gears.

The Thread Chasing Dial cannot be used when cutting metric threads. The half nuts must be closed during the entire threading operation. Use the reversing motor to return carriage at the end of each cut - after retracting the cutting tool.

NOTE

It is not necessary to remove the ADJUSTABLE BRACKET when cutting Standard Inch Pitches. Simply remove the outer change gears and bring the 45T gears at rear into mesh.

OPERATING INSTRUCTIONS

3.7 Taper Turning Attachment:

Telescopic Type - Saddle Mounted

Taper: 4" per foot on dia. or 20 deg. included angle

Stroke: 12" - Standard, or 15" stroke - special

For Taper Turning:

- (1) Loosen HEX HEAD LOCK SCREW on the bracket;
- (2) Locate saddle on bed in relation to work piece;
- (3) Tighten the two - HEAVY HEX NUTS on the bed clamp;
- (4) Adjust the PIVOTED SLIDE BAR to desired taper and lock securely.

For Straight Turning:

- (1) Loosen HEAVY HEX NUTS on the bed clamp;
- (2) Tighten the HEX HEAD LOCK SCREW on the bracket;
- (3) Leave the PIVOTED SLIDE BAR locked at its angular setting, so that taper attachment will move with the saddle.

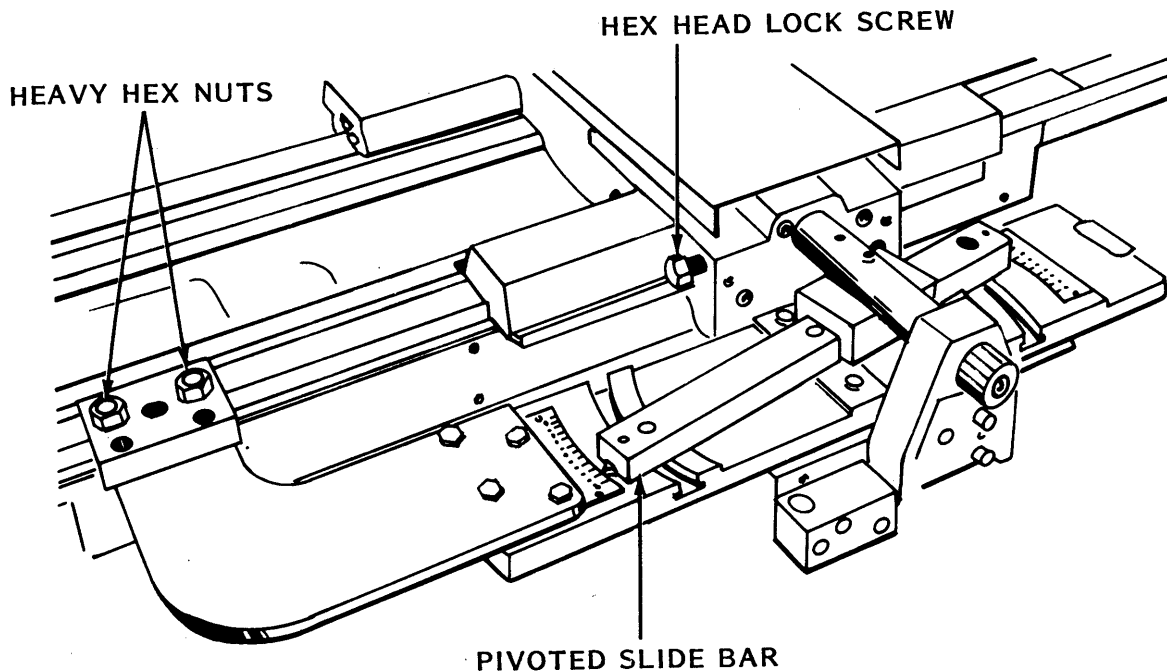


Figure 8 Taper Turning

OPERATING INSTRUCTIONS

3.8 Lead Screw Shear Pin

This brass shear pin is located at the left-hand end of the leadscrew (see below) and 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 longitudinally.

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.

3.9 Gear Train Shear Key

This brass shear key, is located in the feed compound shaft and drives the top gear of the end gear train (see below). It is provided to prevent damage to the feed compound gears in the headstock due to a possible seizure in the feed box.

A Spare Shear Key, which is provided with the machine, can be readily fitted by first removing the gear and knocking the broken portions of key out of the shaft with a small square nosed 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 seizure.

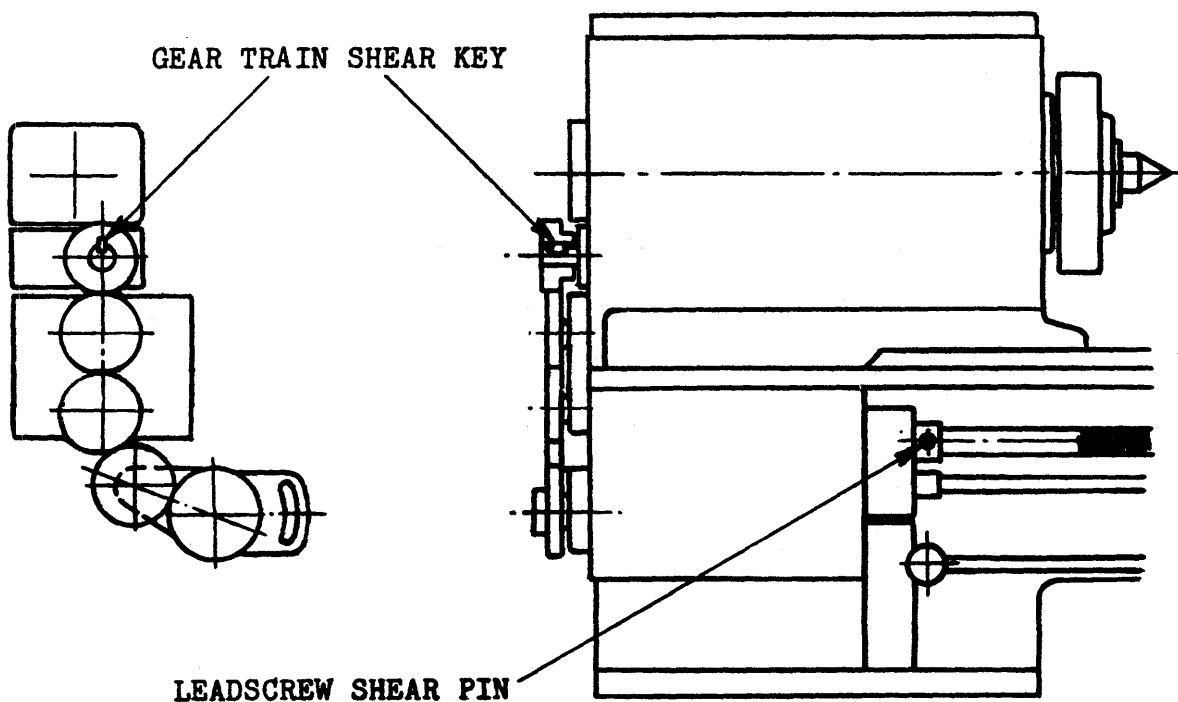


Figure 9 Location of Shear Pin & Shear Key

OPERATING INSTRUCTIONS

3.10 Feed Slip Clutch Adjustment

A feed slip clutch is provided in the apron to prevent damage to the feed mechanism in case of accidental overload. The clutch is pre-adjusted at the factory for all normal cutting loads.

If further adjustment is required, proceed as follows:-

- (1) Remove the round cover from the front of the apron just below and to the left of the feed control lever

NOTE

Oil will drain out through the screw holes and should be retained in a clean container for refilling the apron oil sump.

- (2) To adjust the feed slip clutch, simply tighten the socket set screw in the exposed end of the clutch shaft until the desired drive is obtained.

CAUTION

Do not lock the screw up solid as this will make the slip clutch inoperative.

- (3) Test the drive via a very heavy cut or by grasping the apron handwheel with two hands while the carriage is in motion. You should be able to make the clutch "click" otherwise it is too tight and could shear the brass key in the end gear train.
- (4) Replace the round cover and the oil.

3.11 Coolant Attachment

Available with centrifugal pump unit which delivers a copious volume of liquid at relatively low pressure.

The flow may be throttled or shut off completely without overloading the motor.

The motor has permanently lubricated oilite bearings and no lubrication is required for either pump or motor.

This unit has a 10 gal. tank supplied with removable chip and sludge collecting tray with a baffle and deflector for settling out sediment. Easily removed for cleaning.

Coolant tank should be cleaned and re-filled every 6 months or more frequently depending on usage.

The pump motor as standard is supplied with a 6 feet cord complete with "U" ground plug for use with a 115 volt wall outlet.

On special applications the coolant pump is supplied with a twist-lock plug, and the lathe-mounted receptacle is connected to the Control Panel 115 Volt Supply via a coolant On-Off switch.

HEADSTOCK PARTS

ITEM	NAME	PART NO.
1	SOC. HD. CAP SCREW 1/2-13 X 1 1/4	
2	SPECIAL WASHER	A-33264
3	SPECIAL WASHER	A-33265
4	REAR COVER	B-33159
5	GASKET	A-33218
6	OIL SEAL (1 3/8 I.D. X 2 O.D. X 2 1/64)	
	CHICAGO RAWHIDE #13560	
7	INNER RACE-TORRINGTON #IR-1812	
8	DOUBLE ROW BALL BEARING-S.K.F. #3206/C4	
9	KEY 1/4 X 1/4 X 2 3/4 SQUARE ENDS	
10	PULLEY SHAFT	C-33161
11	TRIPLE SHIFTING GEAR	C-33089
12	38 TOOTH SPLINED GEAR	B-33090
13	BALL BEARING-S.K.F. #6205	

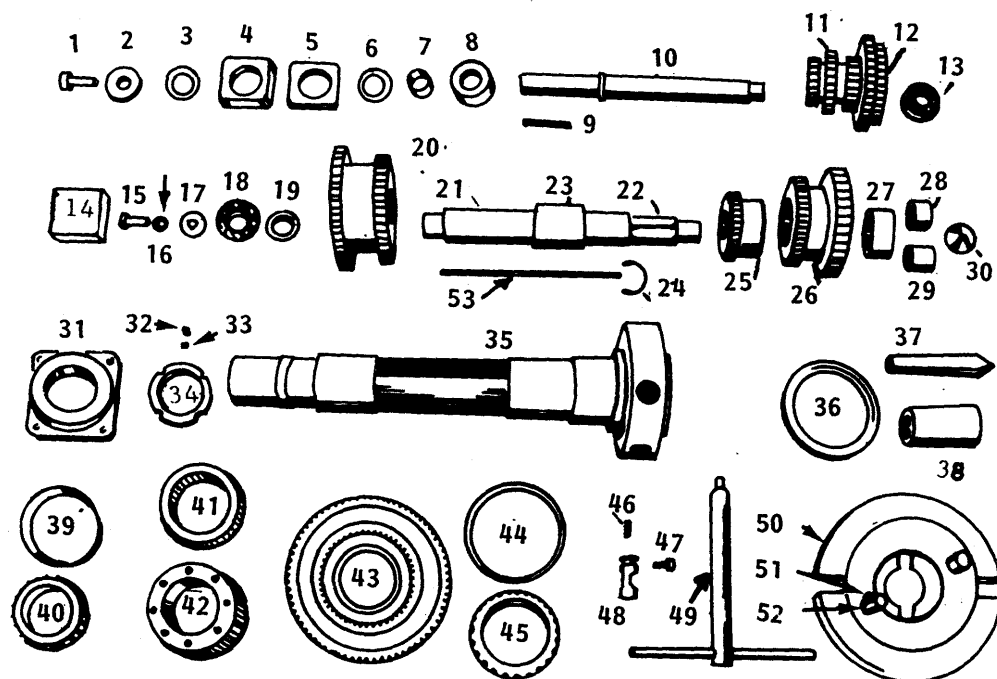


Figure 10 Headstock Parts

HEADSTOCK PARTS LIST (continued)

ITEM	NAME	PART NO.
14	REAR COVER	B-33157
15	HEX. HD. CAP SCREW 1/2-13 X 1 1/4	
16	SPLIT LOCKWASHER #1/2	
17	WASHER	A-33175
18	BALL BEARING-S.K.F. #6206	
19	SPACER	B-33167
20	60T. & 52T. GEAR	B-33163
21	INTERMEDIATE SHAFT	C-33169
22	ROLL PIN 3/16 DIA. X 1/2 LG.	
23	SPACER	B-33156
24	CRESCENT RETAINING RING-TRUARC #5103-175	
25	33T. GEAR	B-33166
26	42T. & 53T. GEAR	B-33160
27	RETAINER	B-33168
28	NEEDLE BEARING-TORRINGTON #JH-2016	
29	INNER RACE-TORRINGTON #IR-1616	
30	FROST PLUG 2" DIA.	
31	REAR COVER	B-32673
32	SOC. SET SCREW 1/4-28 X 1/4 LG.	
33	BRASS PAD	A-30564
34	LOCKNUT #N13	B-33155
35	D1-6" CAMLOCK SPINDLE	C-32671
36	BEARING SHIELD	B-32891
37	LATHE CENTER No. 4 MORSE:	
	-FOR ENGINE LATHE	A-22639
	-FOR TOOLROOM LATHE	A-41591
38	SLEEVE	
	-FOR ENGINE LATHE	A-41064
	-FOR TOOLROOM LATHE	A-41590
39	CUP #29520 TIMKEN	
40	CONE #29588 ROLLER BEARING	
	(No. 3 PRECISION FOR ENGINE LATHE)	
	(No. 0 PRECISION FOR TOOLROOM LATHE)	
41	54T. FEED TAKE OFF GEAR	C-33173
42	HIGH-LOW SHIFTER GEAR	C-33188
43	69T. BULL GEAR	C-33172
44	CUP #492A TIMKEN	
45	CONE #497 ROLLER BEARING	
	(No. 3 PRECISION FOR ENGINE LATHE)	
	(No. 0 PRECISION FOR TOOLROOM LATHE)	
46	CAM SPRING (6 REQ'D.)	A-41131
47	CAM SCREW (6 REQ'D.)	A-41123
48	CAM FOR D1-6" CAMLOCK (6 REQ'D.)	
49	CAM WRENCH	B-41210
50	10" DIA. DOG PLATE #D-41216	
51	SOC. HD. CAP SCREW 5/16-18 X 5/8	SUB-ASS'Y.
	(4 REQ'D.)	#51634
52	D1-6" CAMLOCK STUD "MAC-IT" (4 REQ'D.)	
53	Key 1/4 x 1/4 x 2 3/4 Square Ends	

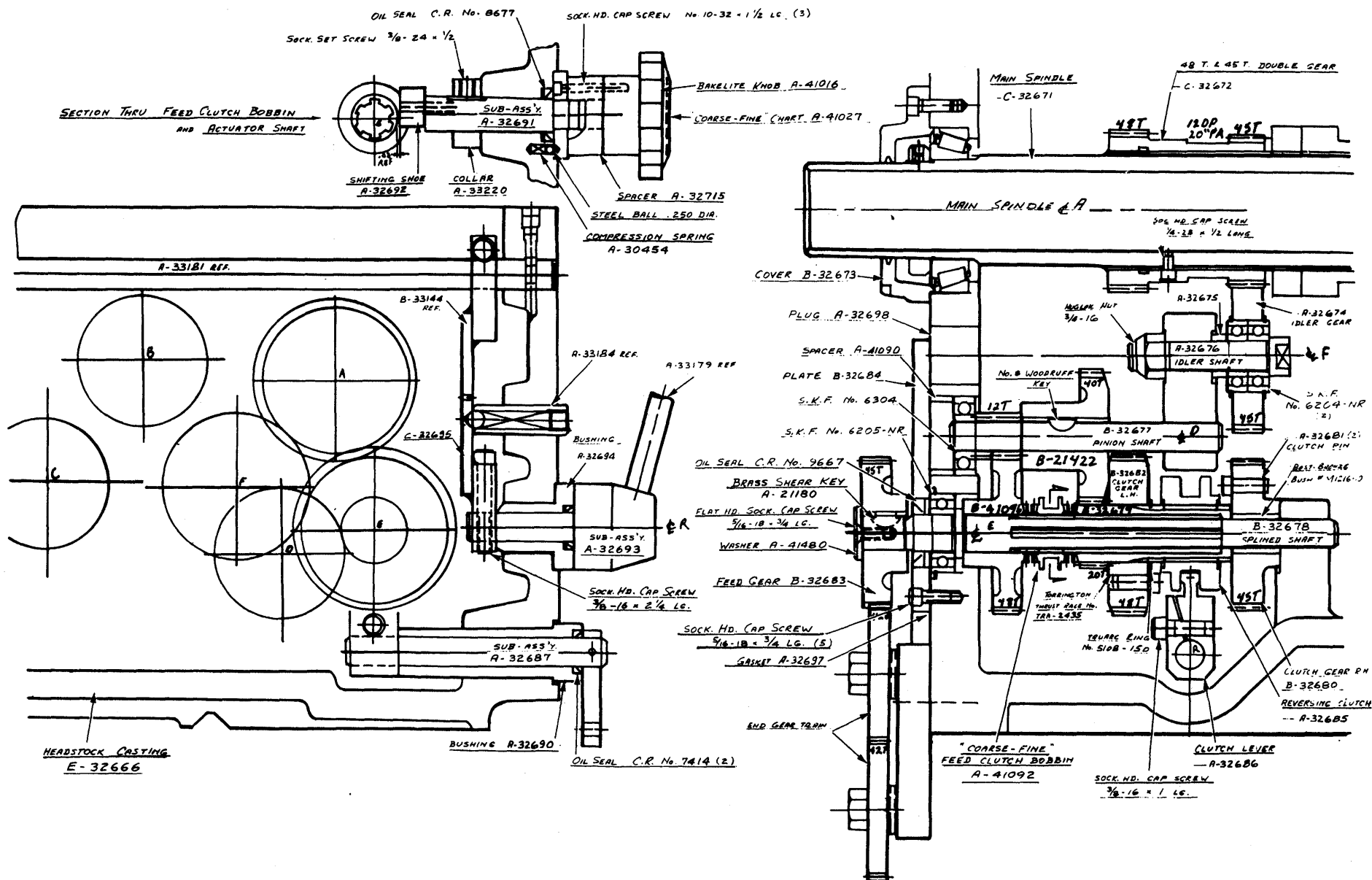


Figure 11 Headstock Feedtrain for Leadscrew Reverse

HEADSTOCK PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
90	CROSS SHAFT	A-33181	112	GALVANIZED PIPE COUPLING 1/2 NPTF	
91	4-POSITION GEAR SHIFT SUB-ASS'Y.	B-33182	113	STANDARD GALVANIZED LONG NIPPLE	
92	ROLL PIN 1/4 DIA. x 1 1/2 LG.		114	GALVANIZED 90° ELBOW 1/2 NPTF	
95	RETAINING SCREW	A-33291	115	OIL WINDOUW-BIJUR #B.5093	
96	SOC. SET SCREW 1/2-13 x 3/8 LG.		116	STANDARD GALVANIZED LONG NIPPLE	
97	INDENT POSITIONER	A-33184		1/2 NPTF x 12" LG. or	B-32987
98	SPRING- #1			OIL DRAIN PIPE -13 1/2 LG.	
99	STEEL BALL .4375 DIA.		117	STYANIDAPD GALVANIZED LONG NIPPLE	
100	SOC. HD. CAP SCREW 3/8 16 x 1 1/4 LG			1/2 NPTF x 8" LG.	
101	GEAR SHIFTER SECTOR	B-33144	118	GAIVANIZED 45° ELBOW 1/2 NPTF	
106	BLACK PLASTIC BALL KNOB- DIMCO #230 (3/8-24 x 1/2 INSERT)		119	SQUARE HD PIPE PLUG 1/2 NPTF	
107	HAND LEVER	A-33179	120	HEX HD. CAP SCREW 1/2 13 x 1" LG.	
108	HAND LEVER	A-33180	121	HEX JAM NUT 1/2 13	
109	SOC. HD. CAP SCREW 3/8-16 x 2 1/2 LG		122	HEX HD CAP SCREW 5/8 11 x 2 1/4 LG.	
110	HI-LO GEAR SHIFTER SUB-ASS'Y	B-33143	123	HEADSTOCK CLAMP (REAR)	A-33203
111	FILLER BREATHER PLUG	A-41712	124	HEADSTOCK CLAMP	A-21447
			125	SOC. HD. CAP SCREW 5/8 11 x 4 LG	
				NOT SHOWN	
				HEADSIOCK COVER	C-33134
				MAT FOR HEADSTOCK COVER	B-33133

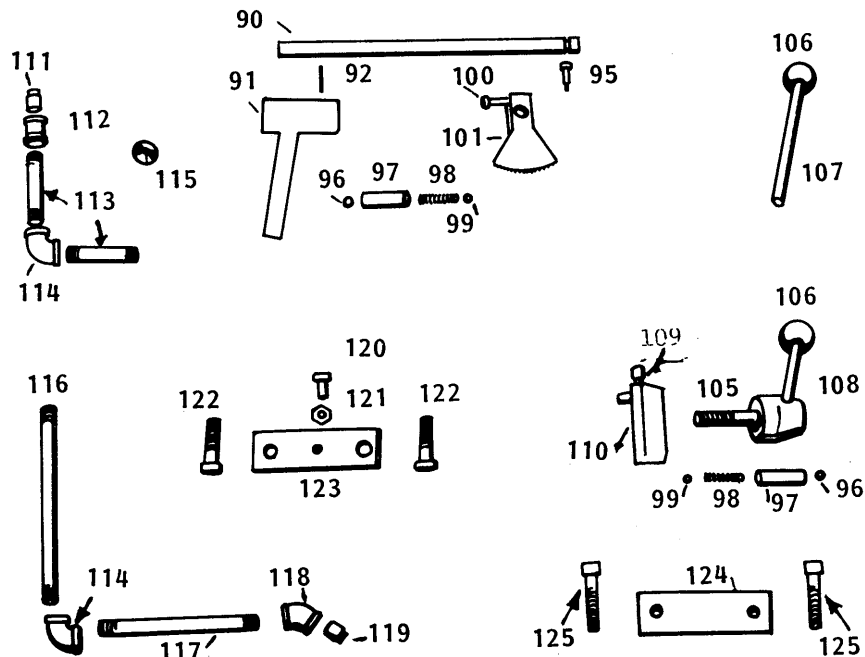


Figure 12 Headstock Parts

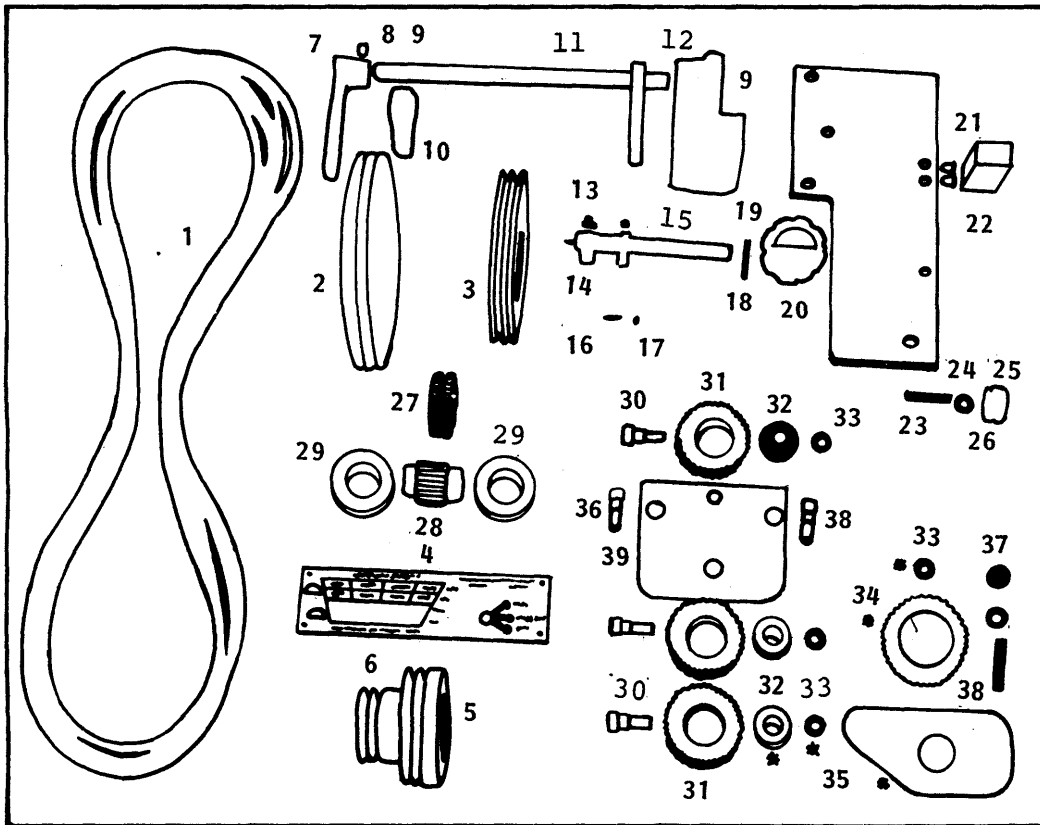


Figure 13

2-SPEED HEADSTOCK DRIVE AND END GEAR TRAIN PARTS

2-SPEED HEADSTOCK DRIVE AND END GEAR TRAIN PARTS

ITEM	NAME	PART NO.
1	V-BELTS 85" LG. GATES SUPER H.C. #3V850	
2	LOW SPEED PULLEY	C-33966
3	HIGH SPEED PULLEY	C-33967
4	SPEED CHART (30-1800 R.P.M.)	B-33986
5	MOTOR PULLEY	C-33245
6	SOC. SET SCREW 3/8-16 X 3/4 LG.	
7	OFFSET LEVER	B-33259
8	SOC. HD. CAP SCREW 3/8-16 X 1 1/4 LG.	
9	GREASE FITTING LINCOLN #5042 STRAIGHT THREAD	
10	PIVOT	B-33255
11	SHAFT & LEVER	B-33256
12	MOUNTING CASTING	C-33084
13	SOC. SET SCREW 3/8-24 X 1/2 LG.	
14	COLLAR	A-41018
15	ECCENTRIC SHAFT SUB-ASS'Y.	B-33974
16	COMPRESSION SPRING	A-30454
17	STEEL BALL .250 DIA.	
18	ROLL PIN 1/4 DIA. X 2" LG.	
19	"SLOW RANGE-FAST RANGE" PLATE	A-33263
20	KNOB	A-33092
21	BUTTON HD. SOC. CAP SCREW 5/16-18 X 5/8 LG.	
22	SHAFT SUPPORT BLOCK	A-33019
23	BELT GUARD LATCH SPINDLE	A-41415
24	WASHER-WESPO #6001	
25	SOC. SET SCREW 1/4-28 X 1/4 LG.	
26	KNOB FOR GUARD	A-21120
27	SPLINED CLUTCH	B-33110
28	SPLINED SLEEVE	B-33266
29	BALL BEARING-S.K.F. #6208-2RS	
30	IDLER BOLT	A-41526
31	42 T. IDLER GEAR	A-41363
32	BALL BEARING-S.K.F. #6303-2RS	
33	WASHER-WESPO #6009	
34	45 T. FEED GEAR	B-41364
35	ADJUSTABLE IDLER BRACKET	B-33038
36	SOC. HD. CAP SCREW 1/2-13 X 1 1/2 LG.	
37	HEAVY HEX. NUT 1/2-13	
38	MILLED STUD 1/2-13 X 2 1/4 LG.	
39	FIXED IDLER BRACKET	B-33368

Note: PARTS MARKED THUS * ARE NOT REQUIRED FOR CUTTING METRIC OR SPECIAL THREADS AND PITCHES - SEE PAGE 28 FOR REPLACEMENT PARTS.

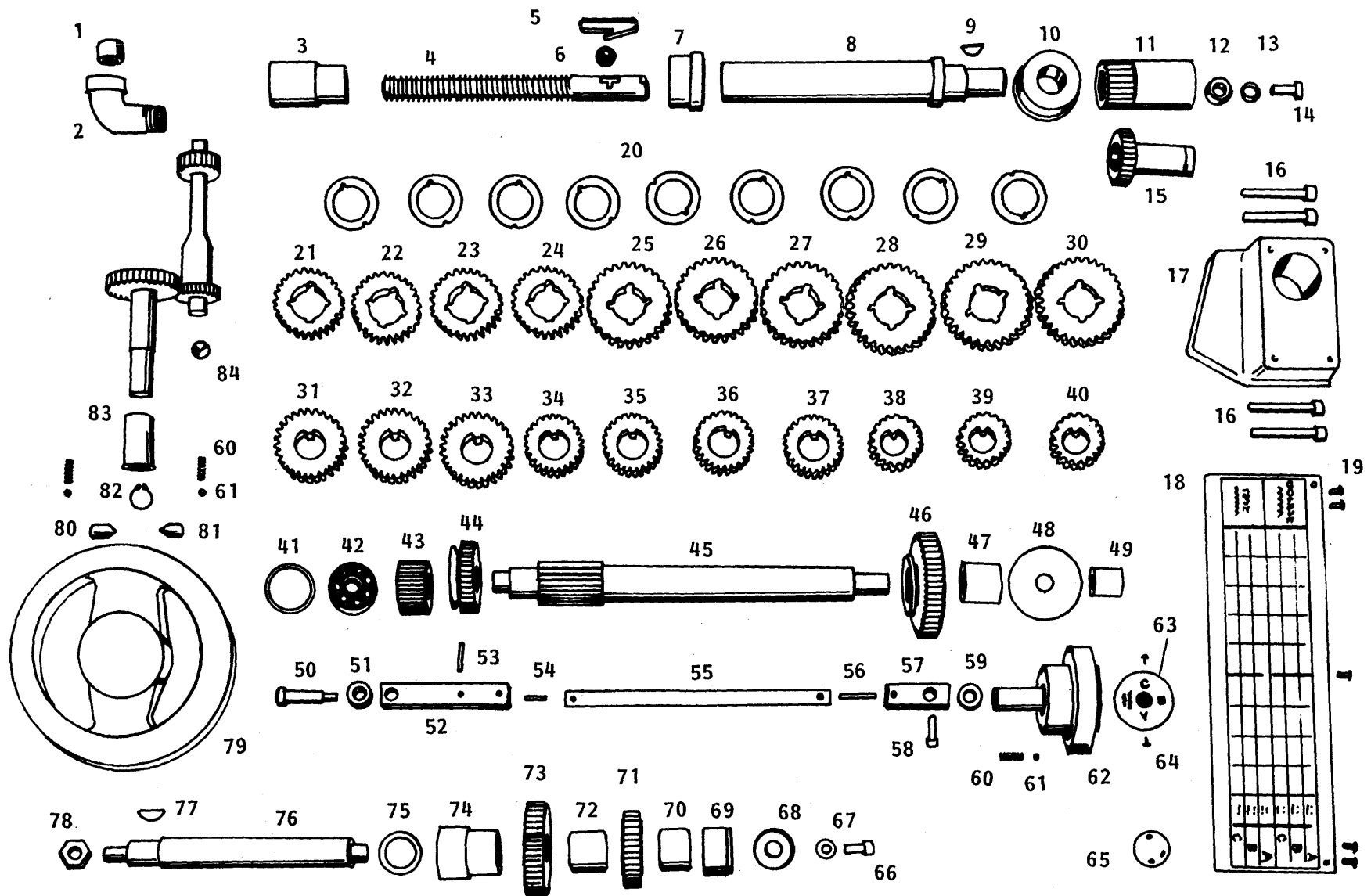


Figure 14 Totally Enclosed Feed Box Parts

TOTALLY ENCLOSED FEED BOX PARTS

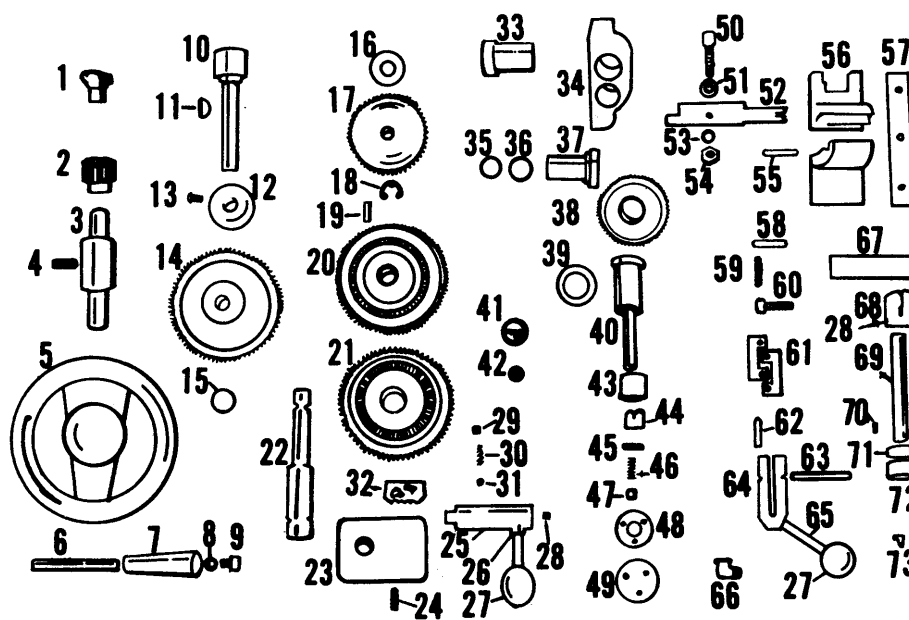
ITEM	NAME	PART NO.	ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	SQ. HD. PIPE PLUG 1/2, NPTF		39	20 TOOTH GEAR	A-33450	76	POWER INPUT SHAFT	
2	STREET ELBOW 1/2, NPTF x 90°		40	16 TOOTH GEAR	A-33451	77	WOODRUFF KEY #11	B-33470
3	RACK COVER	A-33467	41	BEARING RETAINER	A-33475		(AMER. STD. #607) 3/16 x 7/8	
4	ROTATING RACK	C-33458	42	BALL BEARING - S.K.F. #6302		78	HEAVY HEX. NUT 1/2-13 NC	
5	LEAF SPRING	A-41156	43	24 TOOTH CLUTCH GEAR	A-33466	79	HANDWHEEL	C-33459
6	ROLLER KEY	A-33469	44	36 TOOTH SLIDING GEAR	B-33474	80	SOC. SET SCREW FLAT POINT	
7	FLANGE BUSHING	A-33468	45	INTERMEDIATE SHAFT	B-33471		1/2-13 x 3/4 LG.	
8	ROLLER KEY SHAFT	B-33472	46	CLUTCH GEAR	B-33473	81	SOC SET SCREW CONE POINT	
9	WOODRUFF KEY #9		47	BUSHING (1 x 1 1/4 x 1 1/4) --			1/2-13 x 3/4 LG.	
	3/16x 3/4			OILITE #AA-1212-16		82	RETAINING RING-TRUARC #5100-75	
10	DOUBLE ROW BALL BEARING- NEW DEPARTURE #45205		48	WASHER-INTERMEDIATE SHAFT	A-33476	83	BEAR-N-BRONZ BEARING- BOSTON CAT. NO. M1216-14	
11	LEADSCREW COUPLING GEAR	B-33985	49	BUSHING (5/8 x 7/8 x 1)--			FROST PLUG 5/8 DIA.	
12	WASHER 3/8 I.D.-WESPO #6008		50	SHOULDER SCREW 3/8 x 1 1/4 LG.		84	HANDWHEEL GEAR & SHAFT SUB-ASS'Y.	A-33452
13	SPLIT LOCKWASHER # 3/8		51	SPACER	A-33428	85	RACK PINION SHAFT	B-33455
14	HEX. HD. CAP SCREW 3/8,-24 x 2 1/4 LG.		52	SHIFTER BLOCK	B-33427			
15	FEED SHAFT COUPLING GEAR	B-33071	53	H'DN. DOWEL PIN 3/16 DIA. x 1" LG.				
16	SOC. HD. CAP SCREW 5/16-18 x 2 1/4 LG.		54	H'DN. DOWEL PIN 3/16 DIA. x 3/4 LG.				
17	END CASTING	C-3266	55	SHIFTER LINK	B-33426			
18	T.P.I. & FEEDS NAMEPLATE	B-33456	56	H'DN. DOWEL PIN 3/16 DIA. x 1 1/4 LG.				
19	BUTTON HD. SOC. CAP SCREW #10-24 x 3/8 LG.		57	SHIFTER BLOCK	A-33425			
20	THRUST RACE-TORRINGTON #TRB-2031		58	SOC. HD. CAP SCREW 1/4-28 x 2/4 LG.				
21	27 TOOTH FEED DRIVE GEAR	A-33432	59	OIL SEAL (7/8 O.D. x 1/2 I.D. x 1/4)- #4938				
22	27 " " " "	A-33433	60	COMPRESSION SPRING	A-30454		NOT SHOWN	
23	30 " " " "	A-33434	61	STEEL BALL.250 DIA.				
24	33 " " " "	A-33435	62	A-B-C SHIFTER KNOB SUB-ASS'Y.	B-33429			
25	23 " " " "	A-33436	63	A-B-C NAMEPLATE	A-33457			
26	27 " " " "	A-33437	64	DRIVE SCREW TYPE "U" #4 x 1/4 LG.			GASKET	C-33424
27	39 " " " "	A-33438	65	OIL WINDOW-BIJUR B 5093			FEEDBOX CASTING	E-33421
28	27 " " " "	A-33439	66	SOC. HD. CAP SCREW 5/16-24 x 3/8 LG.			WITH: (2) PULL DOWEL	
29	35 " " " "	A-33440	67	FLAT WASHER-S.A.E. # 5/16			(2) HEX. HD. CAP SCREW	
30	30 " " " "	A-33441	68	BALL BEARING-S.K.F. #6202	A-33463		1/2-13 x 1 1/4 LG.	
31	27 TOOTH GEAR	A-33442	69	24 TOOTH GEAR	A-33465		(2) SOC. 3D. CAP SCREW	
32	24 " "	A-33443	70	SPACER	A-33462		3/8-16 x 2" LG.	
33	24 " "	A-33444	71	36 TOOTH GEAR	A-33464		FRONT COVER	C-33422
34	24 " "	A-33445	72	SPACER	A-33461		WITH: (2) DOWEL PIN 1/4, DIA. x 3/4 LG.	
35	16 " "	A-33446	73	48 TOOTH GEAR	A-33460		(10) SOC. HD. CAP SCREW	
36	18 " "	A-33447	74	BEARING BUSH			5/16-18 x 1 1/4 LG.	
37	24 " "	A-33448	75	OIL SEAL (1 1/2 O.D. x 1" I.D. x 5/16) #9840			DRAIN PLUG-HEX. SOC. PIPE PLUG	
38	16 " "	A-33449					1/4 NPTF	

26

APRON PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	OILER-GITS #307		35	RETAINING RING-TRUARC #5100-100	
2	16 TOOTH GEAR	B-33059	36	THRUST WASHER	A-21250
3	FAN & PUMP BEARING-POLLARD #FPS 137		37	BEVEL PINION	B-21245
4	SOC. SET SCREW 3/8-16 x 1" LG.		38	66 T. BEVEL GEAR	B-21756
5	HANDWHEEL	C-33060	39	OIL SEAL (1 3/8 x 2 x 21/64) #13560	
6	SHAFT	A-41245	40	SHAFT FOR BEVEL GEAR	B-21757
7	HANDLE	B-41244	41	OIL WINDOW -- BIJUR #B-5093	
8	WASHER 1/2 O.D. x 17/64 I.D. x .062		42	HEX. SOC. PIPE PLUG 3/8-18 NPTF	
9	STAINLESS STEEL-H. M. HARPER CO.		43	18 T. SLIP CLUTCH PINION	A-21246
10	SOC HD. CP SCREW 1/4-28 x 1/2		44	FEED SLIP CLUTCH	A-21247
11	RACK PINION SHAFT	B-21238	45	PIN	A-50507
12	WOODRUFF KEY #11 (3/16 x 7/8 DIA.)		46	COMPRESSION SPRING	A-21267
13	BALL BEARING-S.K.F. #6304-2RS-NR		47	SOC. SET SCREW 1/2-13 x 1/2 "NYLOK"	
14	BUTTON HD. SOC. CAP SCREW 1/4-20 x 1/2 LG.		48	GASKET	A-20985
15	67 TOOTH GEAR	B-33053	49	COVER	A-21249
16	CLOSED END NEEDLE BEARING-TORRINGTON #M.12121		50	SOC. HD. CAP SCREW 3/8-16 x 1 x 3/4	
17	SPACER	A-41285	51	WASHER-WESPO #6001	
18	16 T. CLUTCH GEAR	B-41266	52	FEED INTERLOCK BAR	B-33054
19	RETAINING RING-TRUARC #5133-75		53	SPLIT LOCKWASHER #3/8	
20	SPACER PIN	A-41263	54	HEX. NUT 3/8-16	
21	90 T. DOUBLE CLUTCH GEAR	C-33051	55	DOWEL 5/16 DIA. X 1 3/4 LG.	
22	90 T. SINGLE CLUTCH GEAR	B-33052	56	HALF NUTS	C-33056
23	CLUTCH SHAFT		57	GIB	B-33057
	--STANDARD	B-41262	58	DOWEL 5/16 DIA. x 1 1/2 LG.	
	--FOR AUTO. CARRIAGE STOP	C-41669	59	TENSION SPRING	A-21257
24	FEED CONTROL BOX		60	SOC. HD. CAP SCREW 1/4-20 x 1 1/2 LG.	
	--STANDARD	C-41259	61	HALF NUT LINK	A-33068
	--OR AUTO. CARRIAGE STOP	C-41668	62	LINK PIN	A-21252
25	SOC. SET SCREW 3/8-16 x 3/4 LG.		63	RETAINER PIN	A-21258
26	"NYLOK" FULL DOG POINT		64	CONTROL SHAFT	A-33058
27	CLUTCH CONTROL SHAFT	B-41260	65	HANDLE FOR HALF NUTS	A-21266
28	FEED CONTROL LEVER	A-33061	66	ELBOW OILER-GITS #1207	
29	SLACK PLASTIC BALL KNOB-DIMCO #230 3/8-24 INSERT)		67	THREAD CHASING INSTRUCTIONS CHART	A-41203
30	SOC. SET SCREW 5/16-18 x 3/8 G.		68	16 T. WORM GEAR	A-33077
31	SOC. SET SCREW 5/16-18 x 1/4 LG.		69	DIAL SHAFT	A-21265
32	COMPRESSION SPRING	A-21268	70	DOWEL 1/8 DIA. x 1/2 LG.	
33	STEEL BALL .250 DIA.		71	ZERO WASHER	A-41276
34	FEED INDICATING CHART	A-41202	72	THREAD CHASING DIAL	A-21263
	BUSH FOR BEVEL BRACKET	A-33076	73	OILER-GITS #521	
	BEVEL GEAR BRACKET	A-32701		NOT SHOWN	
				APRON HOUSING	D-32700

Figure 16 Apron Parts



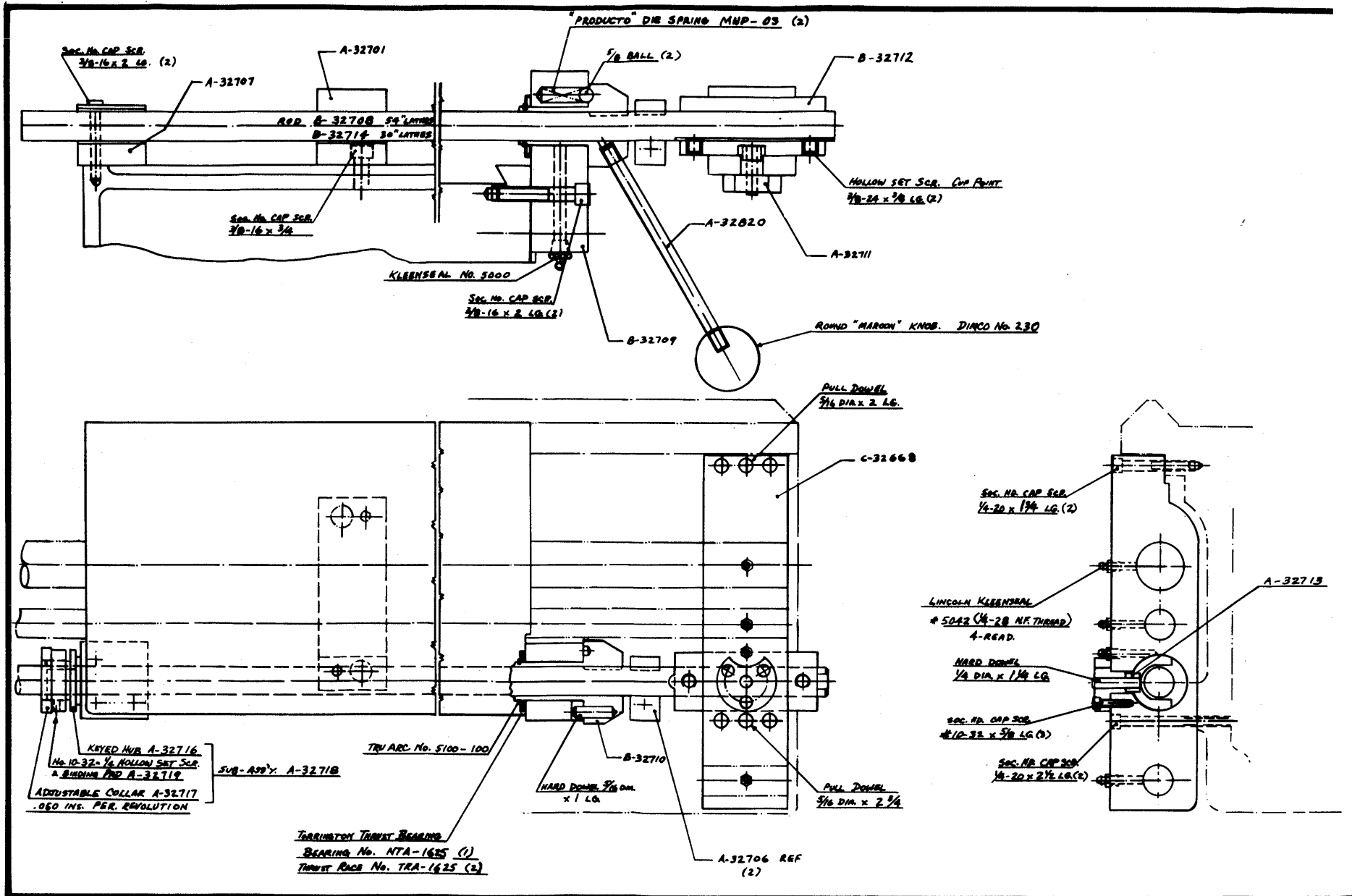
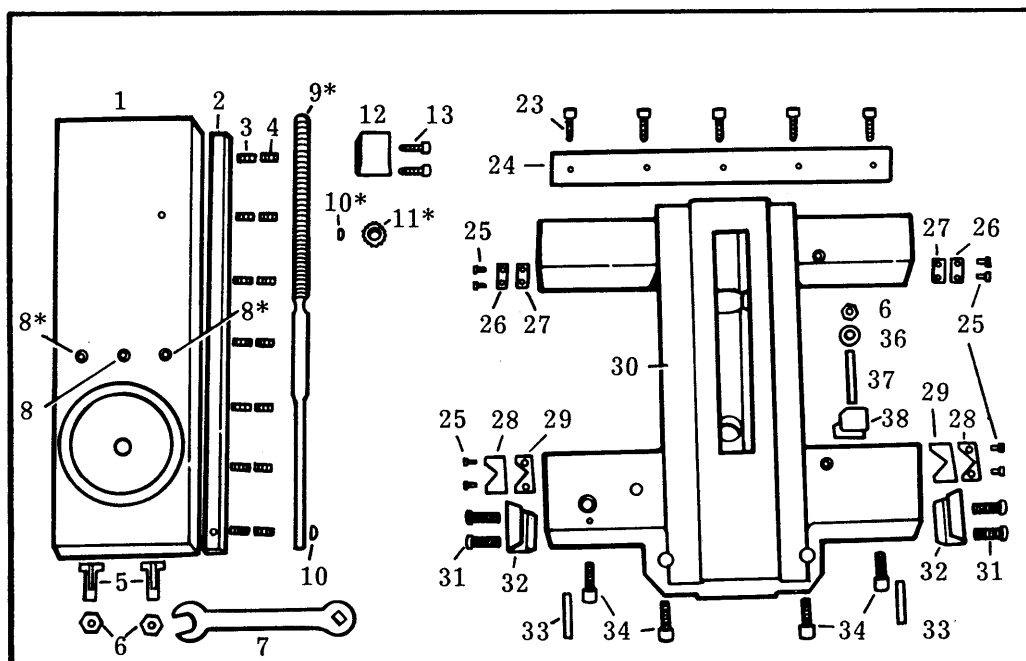


Figure 17 Apron Control R. H. for Leadscrew Reverse Diagram

CROSS SLIDE AND SADDLE PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	EXTENDED CROSS SLIDE: --STANDARD --FOR DEPTH THREADING STOP AND ONE-SHOT LUBRICATION --FOR DEPTH THREADING STOP ONLY --FOR ONE-SHOT LUBRICATION ONLY	D-32925 D-32936 D-32965 D-32966 B-33480			
2	GIB FOR EXTENDED CROSS SLIDE		23	"LOC WELL" SOC HD. CAP SCRE[W 3/8-16x 1 1/4 LG	
3	HARDENED DOWEL 1/4 DIA. x 1 LG.		24	REAR SADDLE GIB	B-33126
4	"NYLOK" SOC. SET SCREW 5/16-24 x 1/2 LG.	A-21462	25	ROUND HD MACHINE SCREW #10 32 x 1/2 LG	
5	TEE-HEAD BOLT		26	REAR SADDLE WIPER PLATE	A-21186
6	HEAVY HEX. NUT 1/2-13 UNC		27	REAR SADDLE WIPER	A-21188
7	TOOL POST WRENCH - ARMSTRONG #5630 OR WILLIAMS #5630		28	FRONT SADDLE WIPER PLATE	A-21185
8	OILER GILS #523 (4 OILERS MARKED THUS * IN PICTURE ARE NOT REQUIRED FOR ONE SHOT LUBRICATION)		29	FRONT SADDLE WIPER	A-21187
*9	CROSS FEED SCREW	B-21202	30	SADDLE CASTING - STANDARD - FOR ONE SHOT LUBRICATION	E-33086 E-33087
*10	WOODRUFF KEY #6 (5/32 x 5/8 DIA				
*11	GEAR FOR CROSS FEED SCREW	A-21203	31	HEX. HD CAP SCREW 3/8-16 x 1 1/2 LG.	
12	NUT FOR CROSS FEED SCREW	A-32926	32	FRONT SADDLE GIB	A-21219
13	SOC HD. CAP SCREW 5/16-24 x 1 1/4 LG		33	PULL DOWEL 5/16 DIA x 2" LG.	
			34	SOC. HD. CAP SCREW 1/2-13 1 1/2 LG.	
			36	WASHER - WESPO #6002	
			37	MILLED STUD 1/2-13 x 2 3/4 LG.	
			38	SADDLE CLAMP BLOCK	A-21218
			Note: - ITEM 8 WHERE MARKED THUS * IN PICTURE BELOW IS NOT REQ'D. WITH ONE-SHOT LUBRICATION. - ITEMS 9, 10 AND 11 MARKED THUS * ARE NOT REQ'D WITH TELESCOPIC TAPER ATTACHMENT, 4 FOR REPLACEMENT PARTS SEE PAGE 29		

Figure 18 Cross Slide & Saddle Parts



SEE PAGE 30
FOR DETAILS OF CROSS FEED DIAL WITH
BALL TYPE THREADING STOP

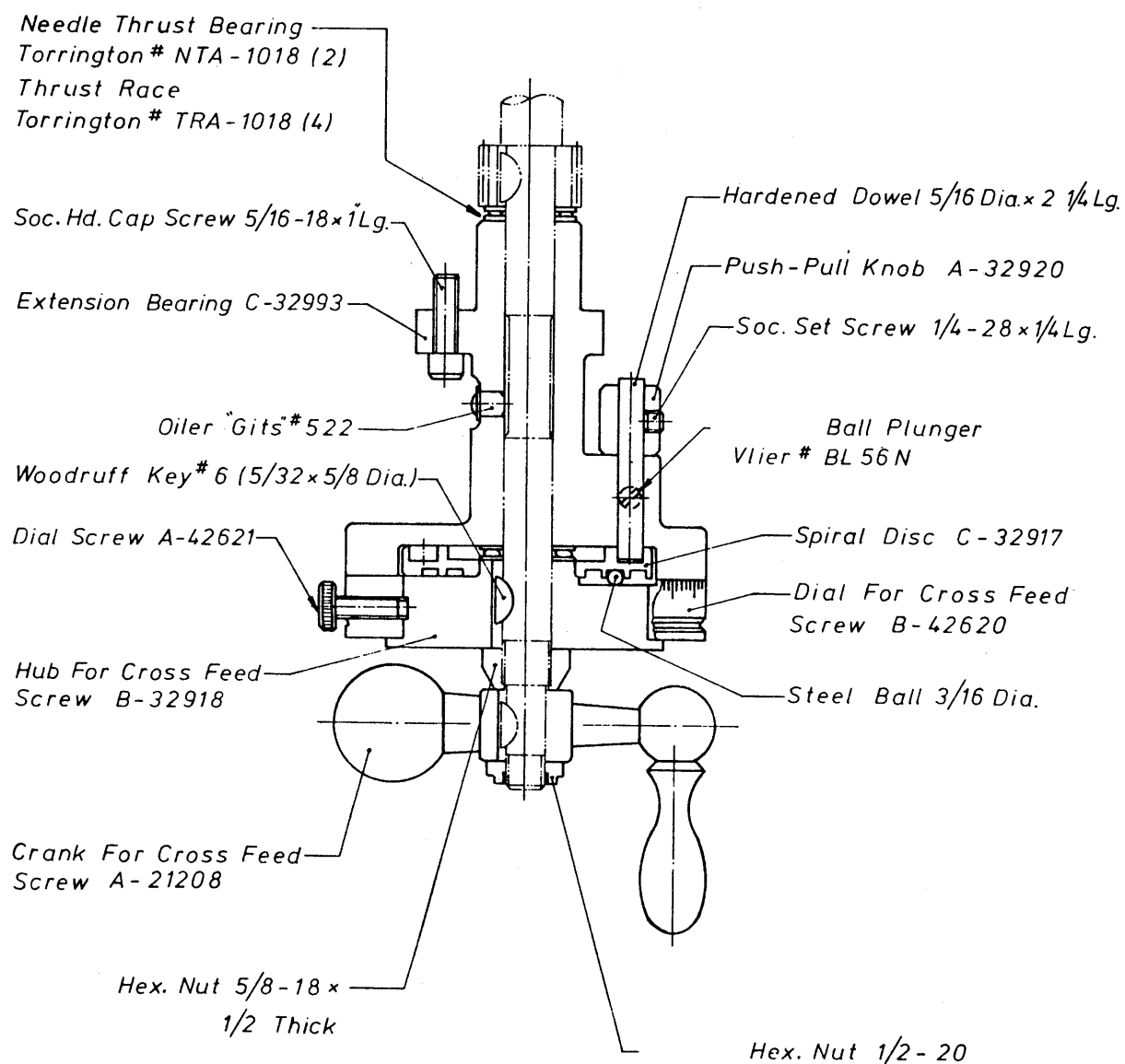


Figure 19

**DETAILS OF CROSS FEED DIAL
WITH BALL TYPE THREADING STOP**

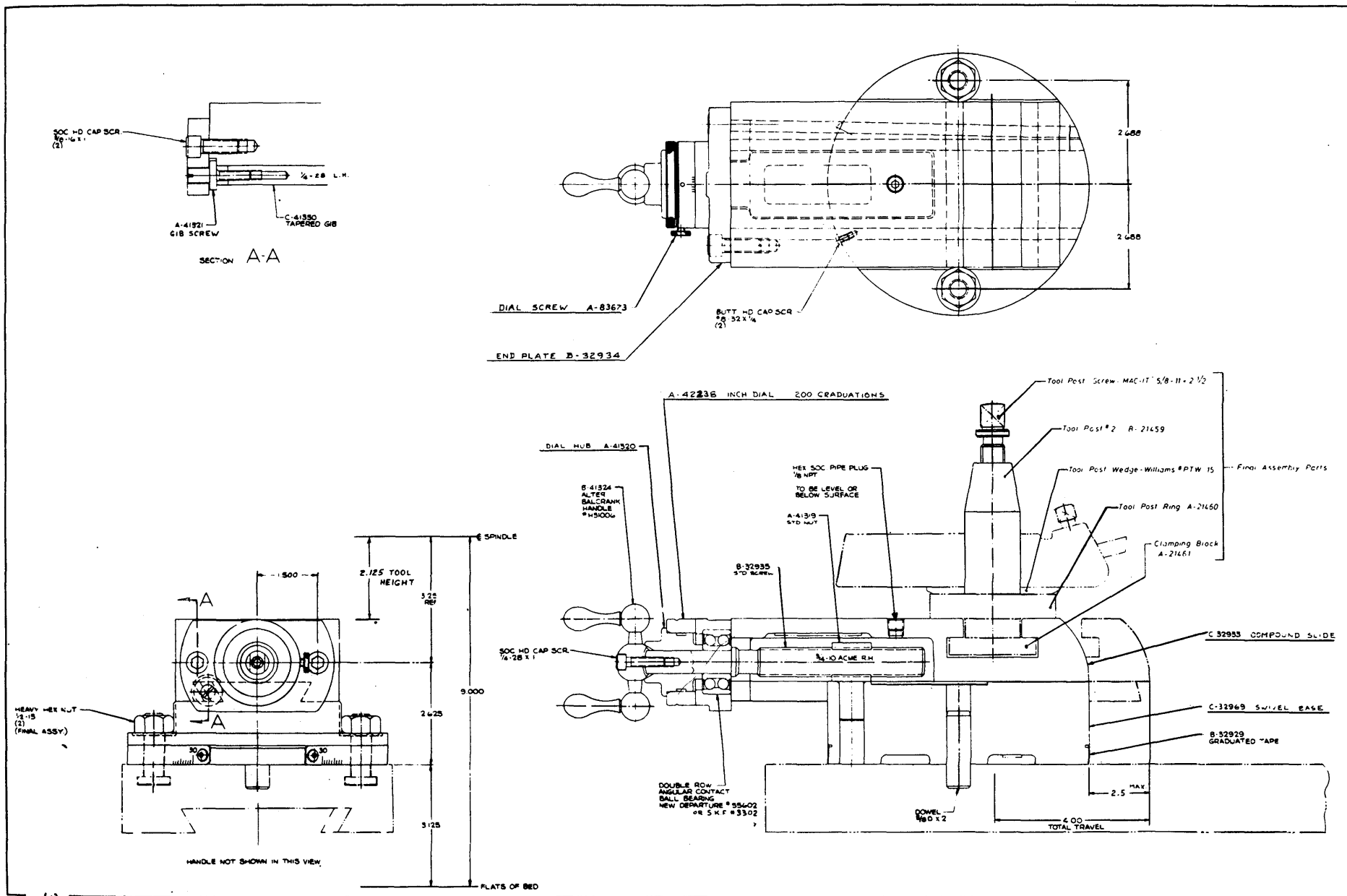
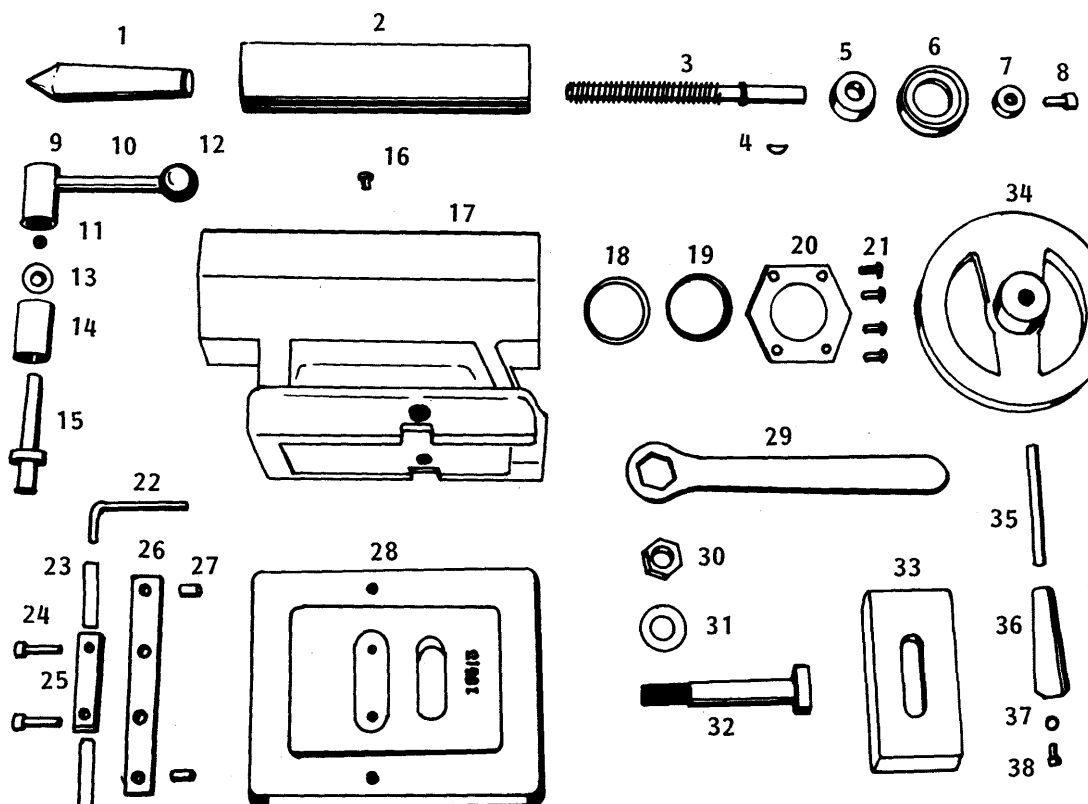


Figure 20 Compound Slide Assembly Diagram

TAILSTOCK PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	LATHE CENTER NO. 4 MORSE: -FOR ENGINE LATHE -FOR TOOLROOM LATHE	A-22639 A-41591	21	BUTTON HD. SOC. CAP SCREW 5/16-18 x 3/4 LG. (4 REQ'D.)	
2	SPINDLE	C-33016	22	ALLEN KEY #1/4	
3	WITH SPINDLE NUT	A-33018	23	SOC. SET SCREW, FLAT POINT 1/2-13 x 2 1/4 LG. (2 REQ'D.)	
4	AND SOC. HD. CAP SCREWS #10-32 x 3/4		24	SOC. HD. CAP SCREW 5/16-18 x 1 1/4 LG. (2 REQ'D.)	
5	SPINDLE SCREW	B-33017	25	THRUST BLOCK	A-33033
6	WOODRUFF KEY #8(5/32 x 3/4 DIA.)		26	TENON STRIP	A-33025
7	BEARING SEAT COLLAR	A-33026	27	DOWEL 3/8 DIA. x 3/4 LG. (2 REQ'D.)	
8	BALL BEARING-.K.F. #6008.2RS	A-41232	28	BASE CASTING	C-33366
9	HANDWHEEL RETAINER		29	BOX WRENCH WILLIAMS #808 (1 1/4 ACROSS FLATS)	
10	SOC. HD. CAP SCREW 3/8-24 x 3/4	A-33027	30	HARDENED HEAVY HEX NUT 3/4-10 (1 1/4 ACROSS FLATS)	
11	BOSS FOR HANDLE	A-33028	31	WASHER-WESPO #6011	
12	SHAFT FOR HANDLE		32	CLAMP STUD	A-33363
13	SOC. SET. SCREW 1/2-13 x 3/8 LG.		33	CLAMP PLATE	B-21098
14	BLACK PLASTIC BALL KNOB		34	HANDWHEEL	C-33023
15	DIMCO #95 (3/8-24 INSERT)		35	SHAFT	A-41245
16	WASHER-WESPO #6009	B-21466	36	HANDLE	B-41244
17	CLAMP BUSHING	A-22813	37	WASHER 1/2 O.D. x 17/64 I.D. x .062	
18	SPINDLE CLAMPING STUD	D-33012	38	STAINLESS STEEL-H.M. HARPER CO. SOC. HD. CAP SCREW 1/4-28 x 1/2	
19	OILER-GITS #533				
20	SPINDLE HOUSING				
21	O-RING #330 (2 1/8 x 2 1/2 x 3/16)	A-33031			
22	SPACER	A-33030			
23	RETAINING PLATE				

Figure 21 Tailstock Parts



GENERAL ASSEMBLY PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	MODEL SIZE NAMEPLATE	A-33994	24	HUB	A-33202
2	SERIAL NAMEPLATE	B-60275	25	CONTROL BRACKET	B-33067
3	LUBRICATION NAMEPLATE: -STANDARD LATHE	A-32923	26	HUB	A-21092
	-WITH ONE SHOT LUBRICATOR	A-32906	27	STEM FOR CONTROL LEVER	A-21093
4	"HARDENED BEDWAYS" NAMEPLATE	B-41519	28	BLACK OVAL KNOB OA-5	
5	VERTICAL NAMEPLATE	D-41413	29	HEX HD. CAP SCREW 3/4-10 x 1 1/2" LG	
6	RACK	B-21278	30	WASHER	B-33252
7	BED END BRACKET	C-32668	31	MOTOR PLATE	D-33124
8	GREASE FITTING-KLEENSEAL #5042		32	HEX NUT 3/8-11	
9	LEADSCREW SHEARPIN	A-21142	33	PIVOT SCREW	A-31231
10	TAPER PIN #1 x 1" LG.		34	HEX JAM-NUT 1/2-13	
11	LEADSCREW 1 3/16 DIA.	B-33980	35	PLAIN WASHER # 1/2	
12	FEEDSHAFT	B-33483	36	HEX NUT 1/2-13	
13	CONTROL SHAFT	B-33485	37	SPLIT LOCKWASHER # 1/2	
14	FROST PLUG 2" DIA.		38	ANCHOR FOR MOTOR PLATE	A-33221
15	"FWD-STOP-REV" NAMEPLATE	B-33196	39	HEX HD BOLT 1/2-13 x 2 LG	
16	SWITCH BOX	D-32669		NOT SHOWN	
17	GASKET FOR SWITCH BOX	B-33195		BED CASTING	E-33118
18	COVER PLATE FOR SWITCH BOX	B-33487		CHIP TRAY	D-33995
19	ROTARY PILOT SWITCH - ALLEN-BRADLEY #804-A3 (WITHOUT ENCLOSURE. HAND LEVER AND LEGEND PLATE)			HEADSTOCK PEDESTAL	D-33116
20	CONTROL SHAFT SECTOR	B-33197		TAILSTOCK PEDESTAL	D-32892
21	PINION	B-33199		END GUARD	E-33083
22	SOC. SET SCREW 5/16-24 x 5/16 LG.			HINGE END PLATE	D-33996
23	SOC. SET SCREW 3/8-24 x 3/8 LG.			CONTROL BOX MOUNTING PLATE:	D-33132

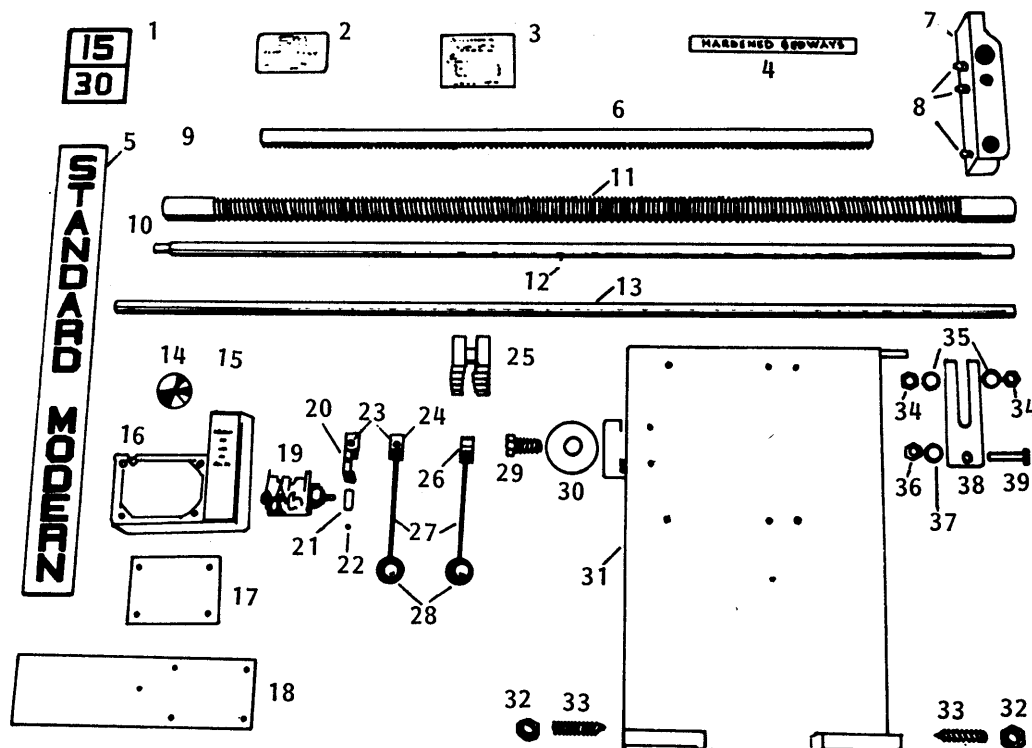


Figure 22 General Assembly Parts

END GEAR TRAIN PARTS FOR CUTTING METRIC AND SPECIAL THREADS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	ADJUSTABLE BRACKET	C-21353	12	70 T. CHANGE GEAR	22656
2	FIXED GEAR HUB	A-21361		74 T. " "	22657
3	KEY 1/4 x 1/4 x 1 3/8 LG.			75 T. " "	22658
4	45 TOOTH SPUR GEAR	B-41407		79 T. " "	22659
5	SPECIAL WASHER	A-21359		80 T. " "	22660
6	SPECIAL BOLT	A-21360		84 T. " "	22661
7	HARDENED SLEEVE	A-21358		85 T. " "	22662
8	BUSHING (.751 x .878 x 3/8 LG) -- OILITE #AA-838-25			86 T. " "	22663
9	IDLER GEAR HUB	A-21357		88 T. " "	22664
10	HEAVY HEX NUT 1/2-13			89 T. " "	22665
11	NAMEPLATE: - METRIC THREADS ONLY - METRIC DIAMETRAL, MODULE AND SPECIAL THREADS	B-33990		91 T. " "	22666
	CHANGE GEARS (TWO ONLY SHOWN FOR ILLUSTRATION)	B-33039		92 T. " "	22667
	45 T. CHANGE GEAR	C-21362		93 T. " "	22668
	50 T. " "			95 T. " "	22681
	55 T. " "	22650		97 T. " "	22669
	60 T. " "	22651		98 T. " "	22670
	64 T. " "	22652		100 T. " "	22682
	65 T. " "	22653		107 T. " "	22671
	67 T. " "	22677		108 T. " "	22672
		22654		110 T. " "	22673
		22265		117 T. " "	22674
				124 T. " "	22675
				127 T. " "	22676

NOTE: CHANGE GEARS ARE SUPPLIED WHEN REQUIRED.

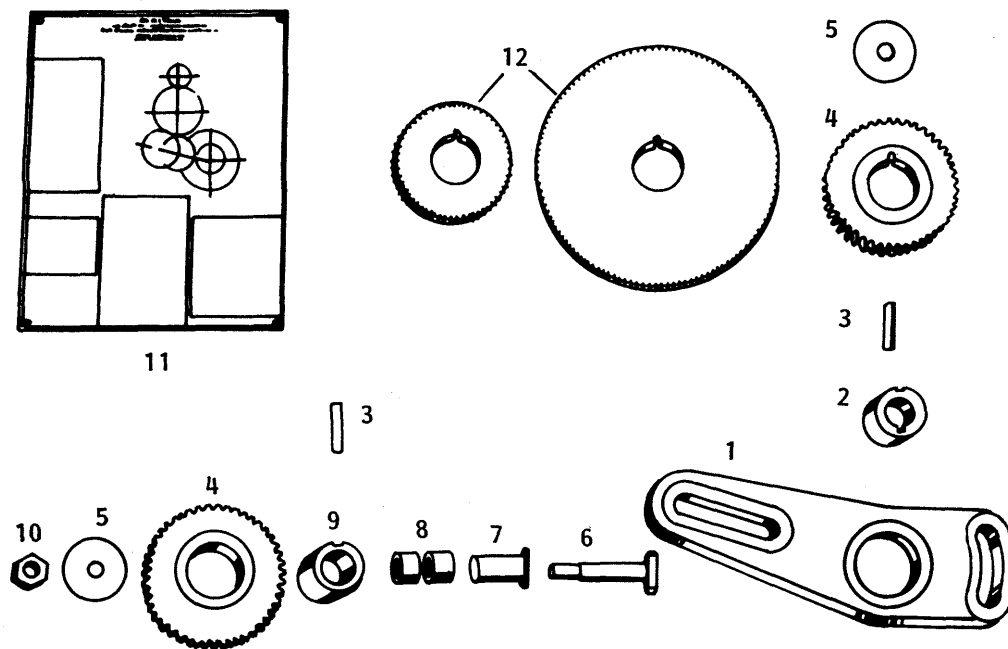
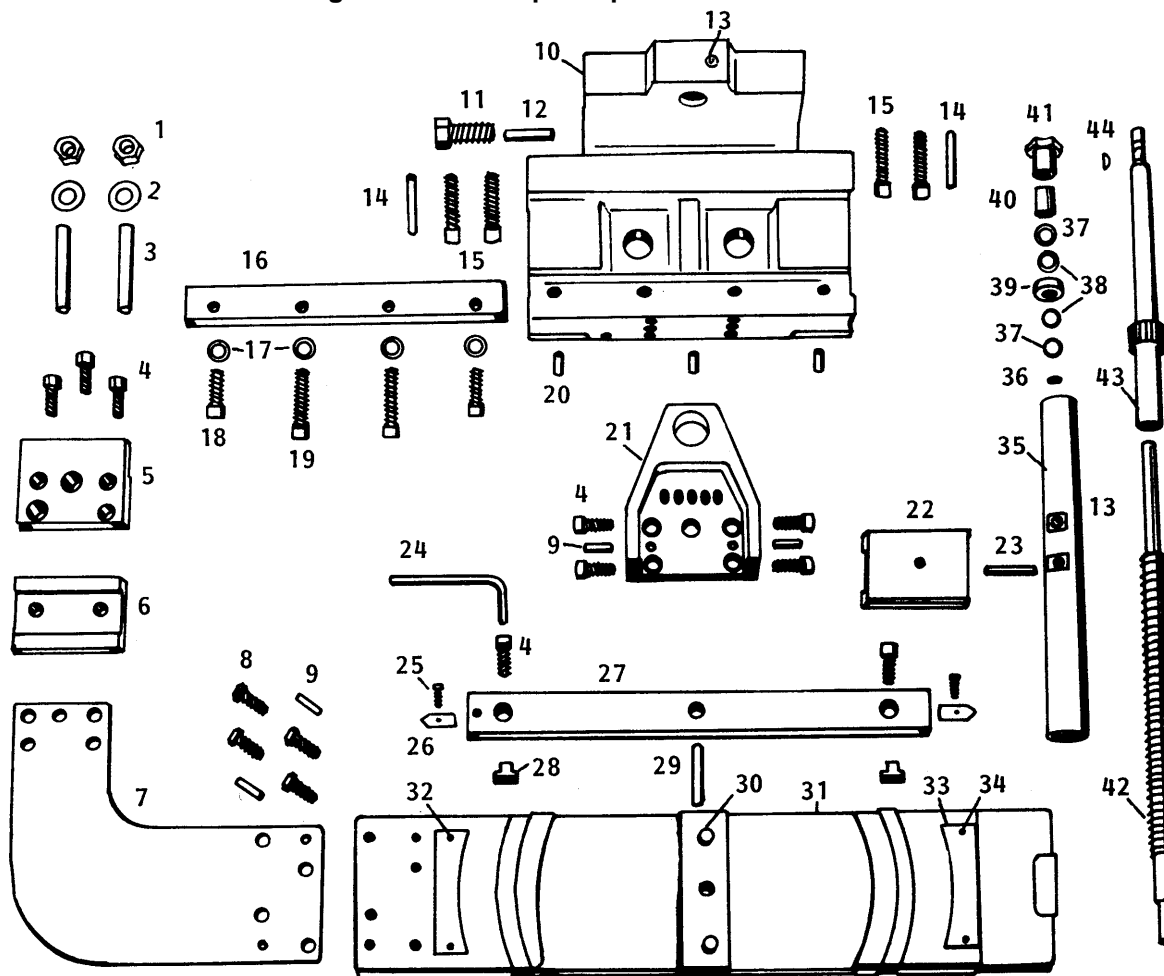


Figure 23 End Gear Train Parts

TELESCOPIC TAPER ATTACHMENT PARTS PAGE 33

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	HEAVY HEX NUT 1/2-13		27	SLIDE BAR: - FOR 12" STROKE	C-33306
2	WASHER - WESPO #6002			- FOR 15" STROKE	C-32911
3	MILLED STUD 1/2-13 x 3" LG.		28	T-SLOT NUT	A-41353
4	SOC. HD. CAP SCREW 3/8-16 x 1" LG.		29	DOWEL 1/2 DIA. x 2" LG.	
5	BED CLAMP - UPPER	A-33308	30	OILER-GITS #533	
6	BED CLAMP - LOWER	A-33309	31	SLIDE PLATE: - FOR 12" STROKE	D-33302
7	BED ANCHOR ARM,	C-33307		- FOR 15" STROKE	D-32912
8	HEX HD. CAP SCREW 3/8 - 16 x 1" LG.		32	GRADUATED PLATE-DEGREES - FOR 12" STROKE	B-33318
9	DOWEL 5/16 DIA. x 1" LG.			- FOR 15" STROKE	B-32910
10	MAIN BRACKET	D-33301	33	GRADUATED PLATE-TAPER/FOOT: - FOR 12" STROKE	B-33317
11	HEX. HEAD LOCK SCREW	A-33320		- FOR 15" STROKE	B-32909
12	LOCKING PIN	A-33321	34	DRIVE SCREW "U" TYPE #4 x 1/4 LG.	
13	OILER - GITS #521		35	CROSS GUIDE BAR	C-33310
14	PULL DOWEL 3/8 DIA. x 2" LG.		36	HEAVY HUGLOCK NUT 3/8 - 24	
15	SOC. HD. CAP SCREW 3/8 - 16 x 2" LG.	B-33305	37	THRUST RACE- TORRINGTON #TRC - 613	
16	GIB		38	! NEEDLE THRUST BEARING TORRINGTON #NTA - 613	
17	PLAIN WASHER - S.A.E. # 3/8		39	BEARING RING	A-33312
18	SOC. HD. CAP SCREW 3/8 - 24 x 1 1/4 LG.		40	BOST-BRONZ BEARING #B911-6 (.565 I.D. x .691 O.D. x 3/4)	
19	SOC. HD. CAP SCREW 3/8 - 24 x 2" LG.		41	BEARING LOCKNUT	B-33311
20	SOC SET SCREW "NYLOK" 3/8 - 16 x 3/4 LG.		42	CROSS FEED SCREW	B-33313
21	OUTER SUPPORT	C-33303	43	CROSS FEED SHAFT	B-33314
22	SHOE	C-33304	44	WOODRUFF KEY #6 (5/32 x 3/8)	
23	PULL DOWEL 3/8 DIA. 1 x 3/4 LG.				
24	ALLEN KEY #5/16				
25	SOC. HD. CAP SCREW #10 - 32 x 3/8 LG.	A-33319			
26	POINTER				

Figure 24 Telescopic Taper Attachment Parts



COOLANT PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	PUMP UNIT-GRAY MILLS #X11 - HR35 - A		9	ELBOW # 3/8 x 90°	
2	NOZZLE WITH SHUT-OFF COCK & REDUCING BUSHING # 3/8 x 1/4 (SUPPLIED WITH PUMP UNIT)		10	PIPE NIPPLE 3/8 x 18" LG.	
3	FLEXIBLE HOSE (SUPPLIED WITH PUMP UNIT)		11	SOC. SET SCREW 1/2 - 13 x 3/4 LG.	C-33360
4	STREET ELBOW # 1/2 x 90°		12	PIPE SUPPORT BRACKET	
5	PIPE COUPLING # 3/8		13	SOC. HD. CAP SCREW 3/8 - 16 x 1 1/4 LG.	
6	PIPE NIPPLE 3/8 x 3" LG.		14	SEALTITE RUBBER COVER- HUBBELL #7574 (WITH "TWIST-LOCK" PLUG ONLY)	
7	SWING JOINT # 3/8 - CRANE #300		15	"TWIST-LOCK" ARMORED CAP- HUBBELL #4726 WITH CORD GRIP FOR CORD DIA. .296 - .562 (SPECIAL APPLICATION ONLY)	
8	PIPE NIPPLE 3/8 x 4" LG.				

NOTE: ITEM 12 - PIPE SUPPORT BRACKET PART #C - 33360 NOT USED ON LATHE
WITH TELESCOPIC TAPER ATTACHMENT.
- USE PIPE SUPPORT BLOCK PART #B - 41475 INSTEAD.

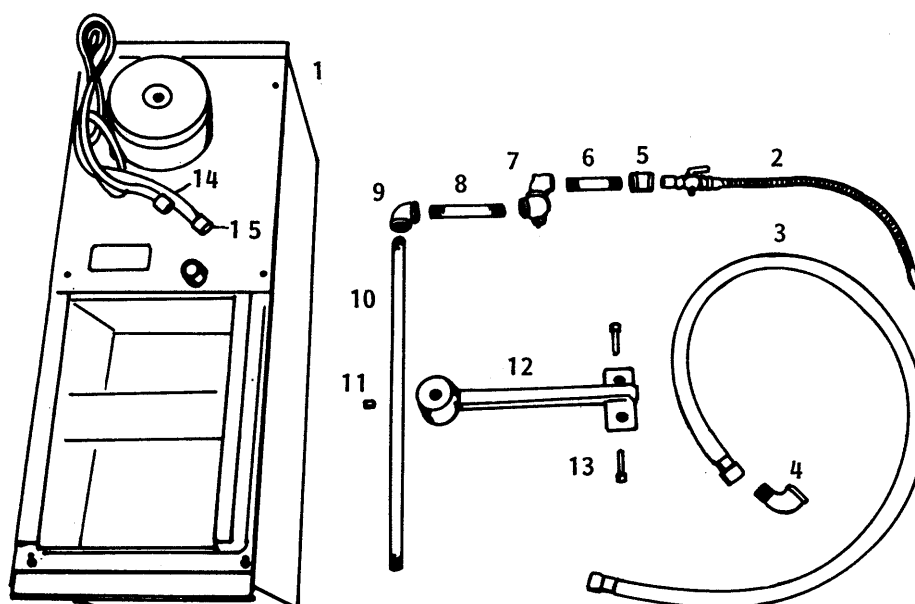


Figure 25 Coolant Parts

STEADY REST, FOLLOW REST AND MICROMETER CARRIAGE STOP PARTS

STEADY REST - 33125			FOLLOW REST 33325		
ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	UPPER CASTING	D-41482	15	SOC. SET SCREW 3/8 - 16 x 3/8, LG.	
2	LOWER CASTING	E-33097		CONE POINT (6 REQ'D.)	
3	HARDENED HEAVY HEX. NUT 1/2 - 13, 3/8 ACROSS FLATS (2 REQ'D.)		16	SOC. SET SCREW 1/4 - 28 x 1/4 (3 REQ'D.)	
4	% ACROSS FLATS (2 REQ'D.)		17	BUSHING (3 REQ'D.)	A-33095
5	WASHER WESPO #6009 (2 REQ'D.)		18	KNOB (3 REQ'D.)	A-21120
6	EYE BOLT	A-41488	19	BUTTON FOR SLEEVE (3 REQ'D.)	A-33096
7	PIVOT PIN	A-21392	20	CLAMP SCREW (3 REQ'D.)	A-21292
8	SOC. SET SCREW 3/8 - 20 x 3/4 LG.	A-41489	21	FOLLOW REST CASTING	D-33326
9	HINGE PIN		22	SOC. HD. CAP SCREW 1/2 - 13 x 3 1/4 LG.	
10	HEX. HD. CAP SCREW 3/8 - 16 x 3/4 LG.		23	SLEEVE (3 REQ'D.)	A-21301
11	WASHER-WESPO #6001		24	ADJUSTING SCREW-LONG	A-33098
12	MILLED STUD 1/2 - 13 x 4 LG.	A-21288	25	ADJUSTING SCREW (2 REQ'D.)	A-21302
13	CLAMP BAR	A-41487		MICROMETER CARRIAGE STOP-22187	
14	SLEEVE (3 REQ'D.)	A-41483	3	HARDENED HEAVY HEX. NUT 1/2 , 13	
15	ADJUSTING SCREW		29	WASHER-WESPO #6002	
16	SOC. SET SCREW 3/8 - 16 x 3/8 LG.		30	COLLAR	A-22819
17	CONE POINT (3 REQ'D.)		31	MILLED STUD 1/2 - 13 x 3 1/2 LG.	
18	SOC. SET SCREW 1/4 - 28 x 1/4 (3 REQ'D.)	A-41486	32	KNOB	A-21396
19	BUSHING (3 REQ'D.)	A-41485	33	GRADUATED SLEEVE	B-41373
20	KNOB (3 REQ'D.)	A-41484	34	SCREWED STEM	A-21397
21	BUTTON FOR SLEEVE (3 REQ'D.)	A-21292	35	BODY	B-22818
22	CLAMP SCREW (3 REQ'D.)		36	DOWEL 1/4 DIA. x 3/4 LG.	
			37	CLAMP SCREW	A-30586
			38	TAPER PIN #4 x 1 1/2 LG.	
			39	CLAMP	A-41372

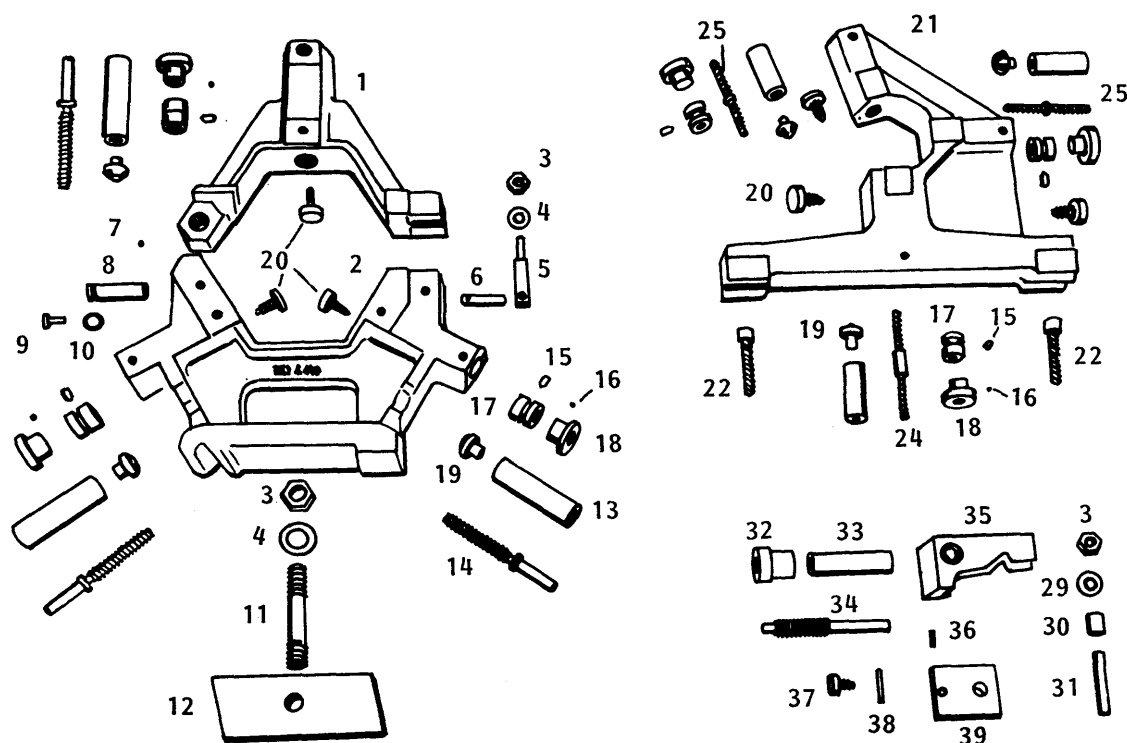


Figure 26 Steady Rest, Follow Rest & Micrometer Carriage Stop Parts

DIAL INDICATOR CARRIAGE STOP AND DEPTH THREADING STOP PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	FILLISTER HD. MACH. SCREW #10 - 32 x 1/2 LG.		8	CLAMPING STUD	A-23256
2	CHIP GUARD	A-21347	9	CLAMPING NUT	A-23254
3	CLAMPING BRACKET	B-21348	10	HARDENED HEAVY HEX NUT 3/8- 16	
4	LONG RANGE DIAL INDICATOR AMES #282 WITH SCREW TYPE BACK, SHOCK- LESS. HUNDRED SERIES-GRADUATED .001		11	WASHER-WESPO #6001	A-41547
5	HARD STD. DOWEL 3/16 DIA. x 3/4 LG.		12	CLAMP BOLT	A-22708
6	SOC. HD. CAP SCREW 1/4-20 x 3/4 LG.		13	STOP ROD	
7	CLAMPING PLATE	A-21346	14	MILLED STUD 3/8- 16 x 1 1/2 LG.	A-22710
			15	LATCH PLATE	A-22711
			16	GRADUATED NUT	A-22712
			17	KNURLED LOCKNUT	

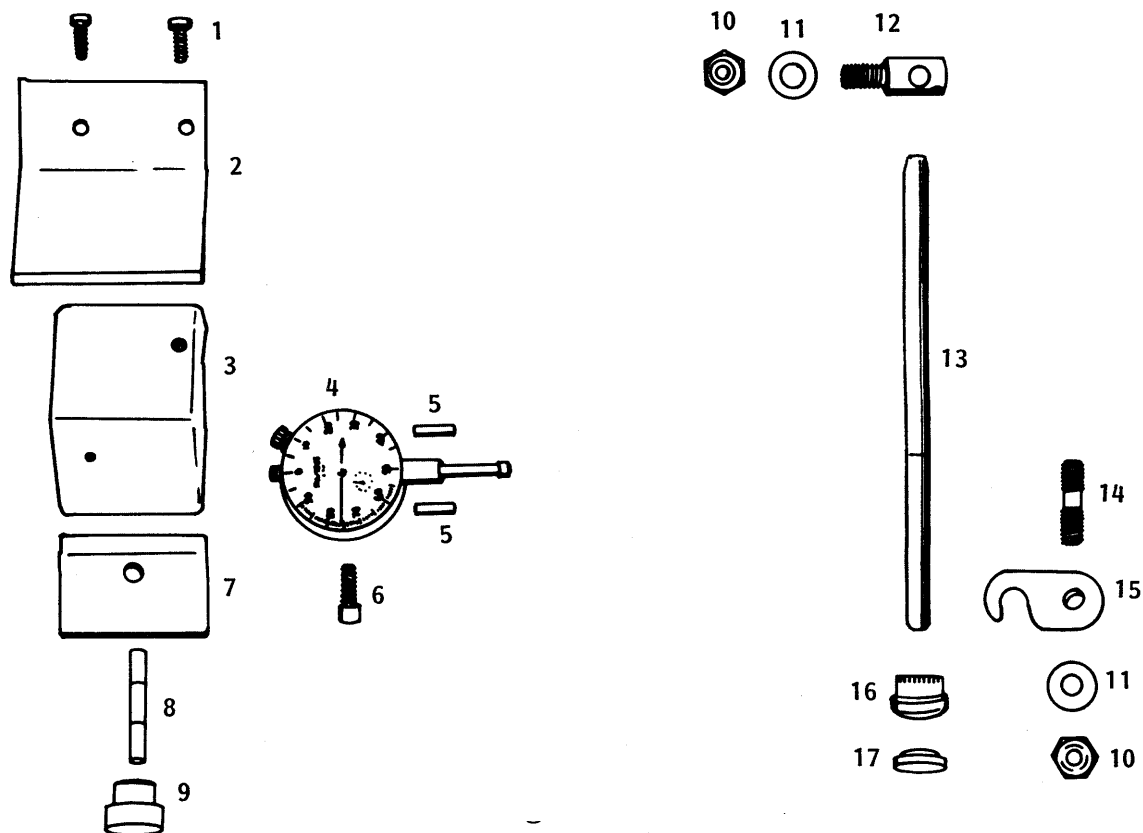


Figure 27

Dial Indicator Carriage Stop and Dept Threading Stop Parts

AUTOMATIC CARRIAGE STOP PARTS

ITEM	NAME	PART NO.	ITEM	NAME	PART NO.
1	SOC. HD. CAP SCREW 1/4 - 20 x 1 3/4 LG. (4 REQ'D.)	B-33351	11	CAM FOLLOWER-TORRINGTON #CRS- 12	A-33356
2	STOP CONTROL BLOCK		12	CLAMP NUT	
3	HARDENED DOWEL 3/16 DIA. x 3/4 LG. (2 REQ'D.)		13	TRIP DOG	
4	ROLLER BEARING -- TORRINGTON #HJ - 101812 12 REQ'D.)		14	HEAVY HEX BOLT	
5	OIL SEAL (3/8 I.D. x 1 1/4 x O.D. x 1/4) CHICAGO RAWHIDE STOCK NO. 6225	B-33352	15	END CAP-CANTRUSS #RR2E (2 REQ'D.)	C-33353
6	ECCENTRIC SHAFT		16	HEX. NUT 3/8 - 16 (5 REQ'D. FOR 30" BED - 8 FOR 54")	
7	WOODRUFF KEY #3 (1/8 x 1/2 DIA.)	B-41672	17	RAIL FOR 30" BED	C-33347
8	SOC. HD. CAP SCREW 1/4 - 20 x 3/4		18	RAIL FOR 54" BED	
9	TRIM ARM		19	SPLIT LOCK WASHER # 3/8 (5 REQ'D. FOR 30" BED-8 FOR 54")	A-32949
10	HUGLOCK NUT 3/8 - 24 (5/16 THICK)		20	SOC. HD. CAP SCREW 3/8 - 16 x 3/4 LG. (5 REQ'D. FOR 30" BED 8 FOR 54")	
				SLEEVE FOR CAM FOLLOWER	

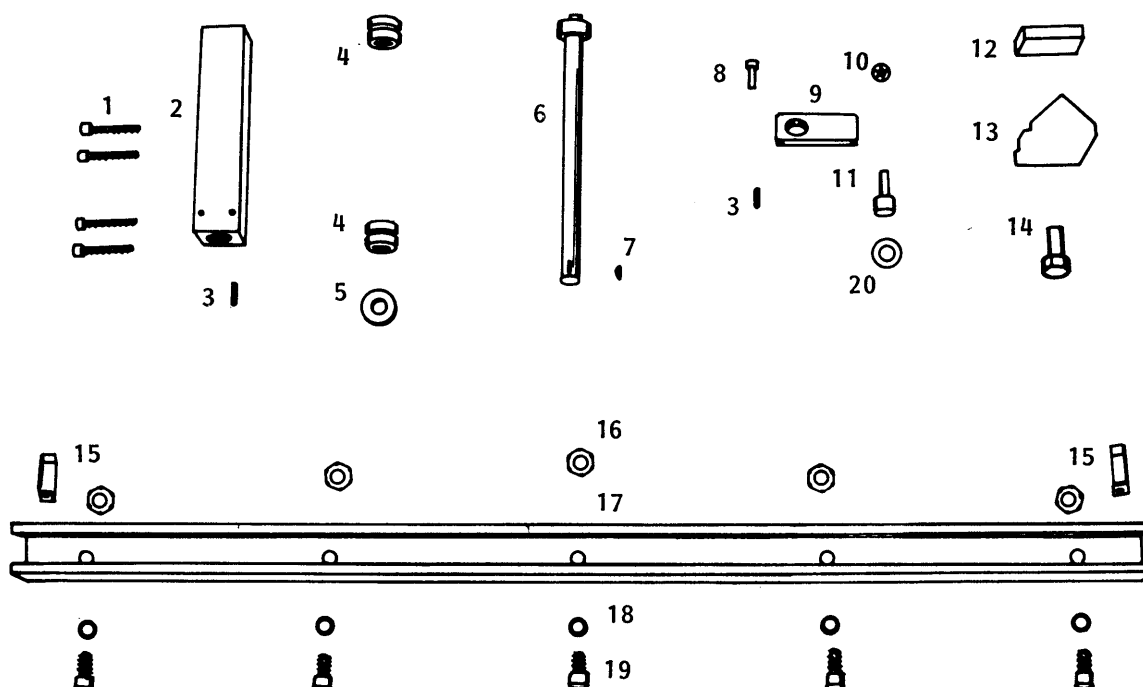


Figure 28 Automatic Carriage Stop Parts

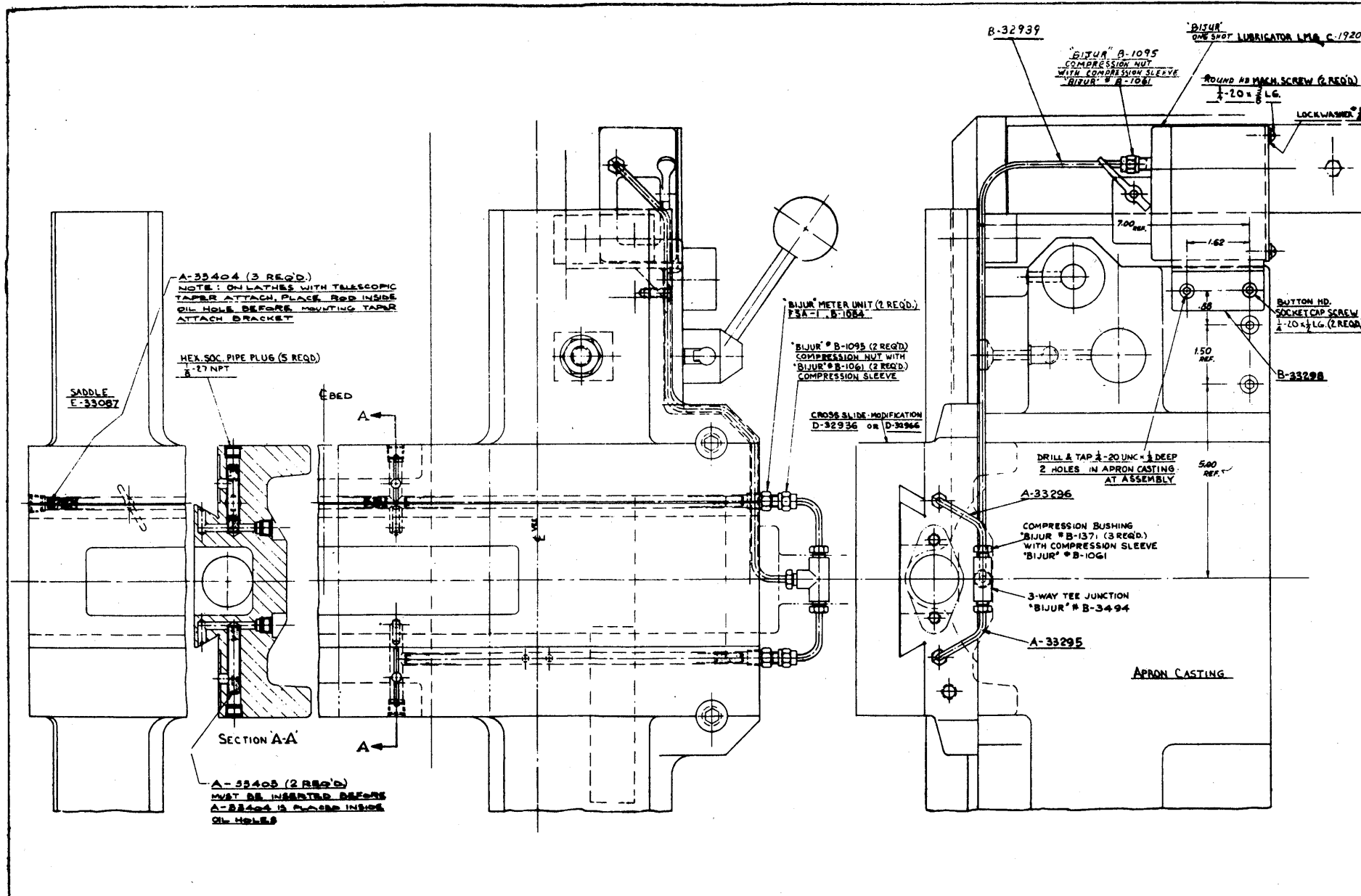


Figure 29 One Shot Lubricator Assembly Diagram

By Order of the Secretary of the Army:

Official:

E. C. MEYER
General, United States Army
Chief of Staff

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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