TECHNICAL MANUAL

# OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT

# AND GENERAL SUPPORT MAINTENANCE

# MANUAL INCLUDING REPAIR PARTS LIST

FOR

## LATHE, ENGINE
## MODEL 1754
## (NSN) 3416-00-250-6550)

STANDARD-MODERN TOOL COMPANY, LIMITED

HEADQUARTERS, DEPARTMENT OF THE ARMY

JANUARY 1983

Technical Manual

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HEADQUARTERS
DEPARTMENT OF THE ARMY
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# OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS LIST FOR LATHE, ENGINE MODEL 1754 STANDARD-MODERN TOOL COMPANY, LIMITED

**REPORTING OF ERRORS**

**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 the 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 Company, Limited
69 Montcalm Avenue
Toronto, Canada M6E4N9

Procured under Contract No. DAAA09-77-C-6014

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.

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## 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. 1754
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:

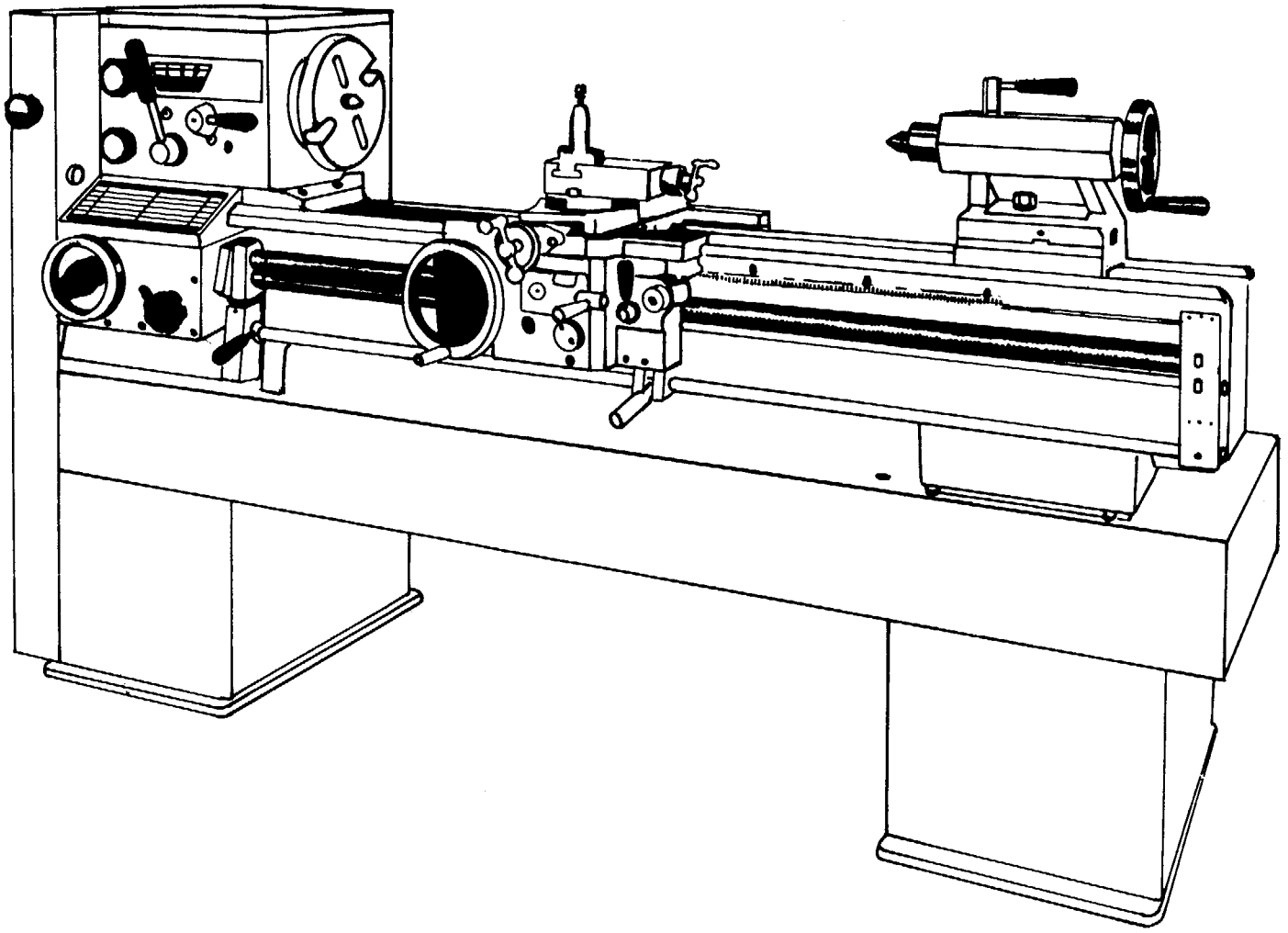
   (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number - 36195 followed by a colon and manufacturer's Part Number for the repair part.

   (b) Complete Remarks field as follows:

   Noun: (nomenclature or repair part)
   For: NSN: 3416-00-250-6550.
   Manufacturer: Standard-Modern Tool Company, Limited
   69 Montcalm Avenue, Toronto, Ontario M6E4N9

   Model: 36195
   Serial: (of end item)

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

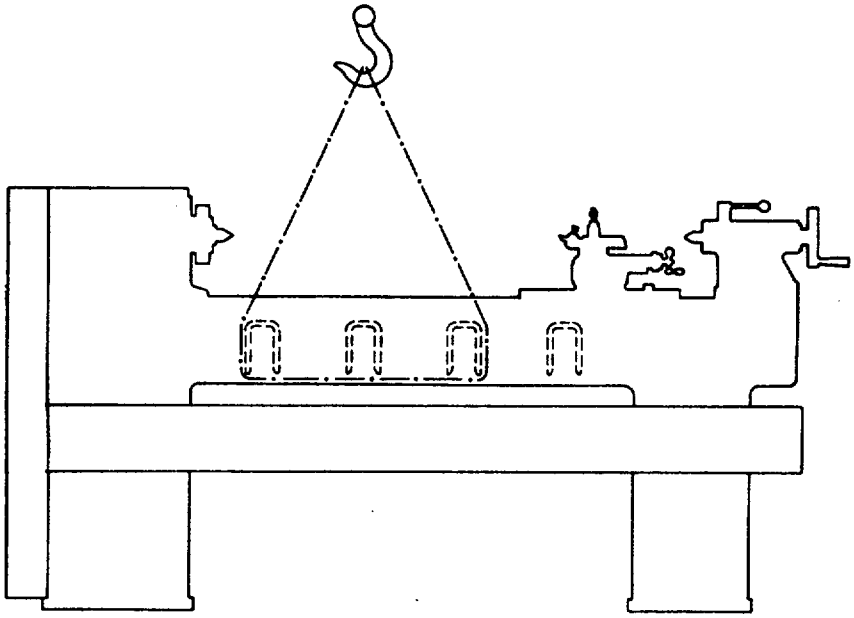


*GENERAL VIEW*

## SECTION I. 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. Lifting equipment should have the capacity of approximately 4000 lbs. Do not remove skids from the machine until it is brought to its final position.



*Lifting the Machine*

### 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 immediately, giving the serial number of the machine which is stamped on 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 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

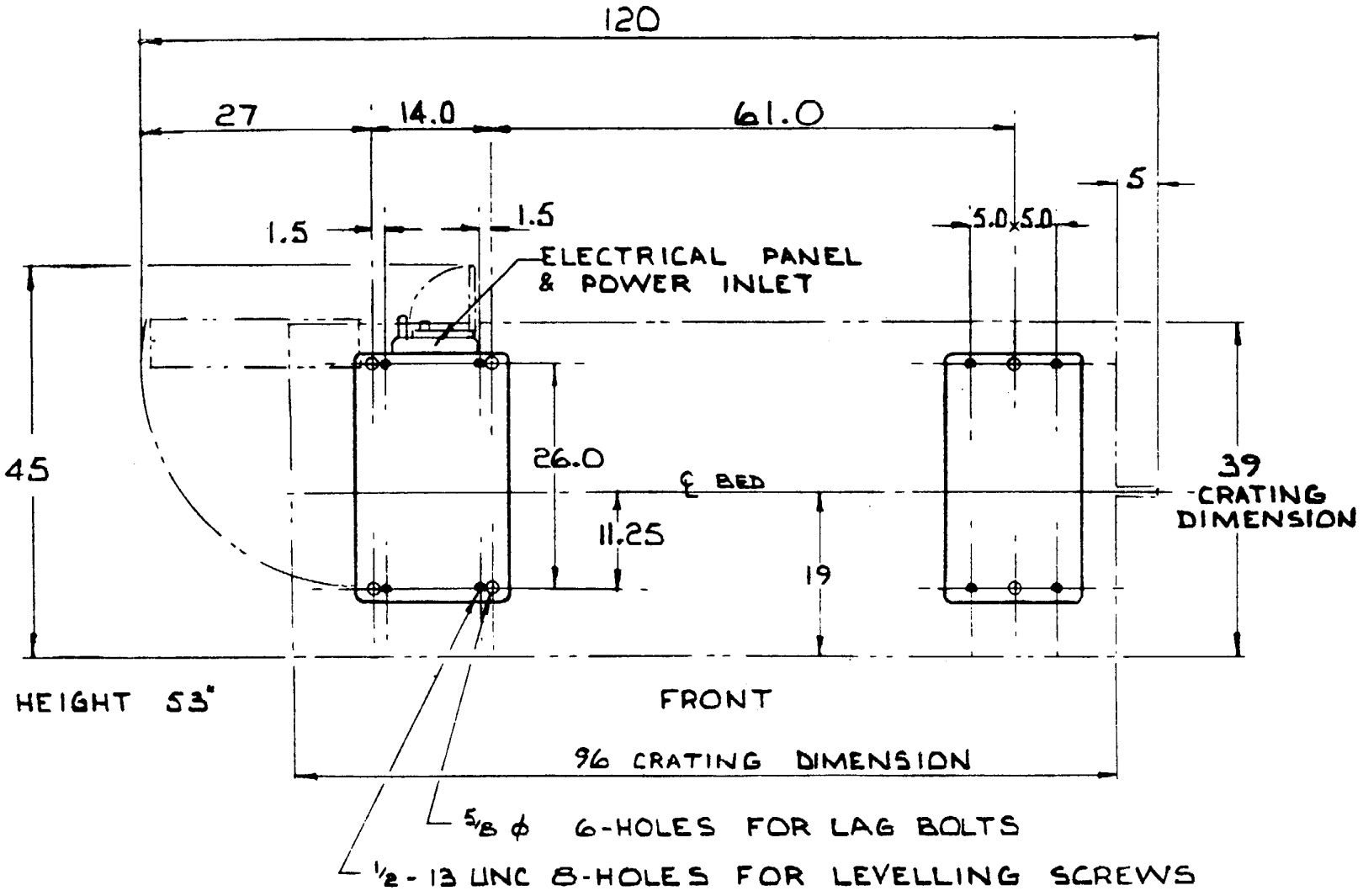
*a.* For proper operation, the machine should be set on a substantial floor capable of supporting the weight safely. To secure the machine on its foundation use anchor bolts or lag screws. For the size of the lathe and the location of the bolt holes see the floor plan.

*b.* 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.

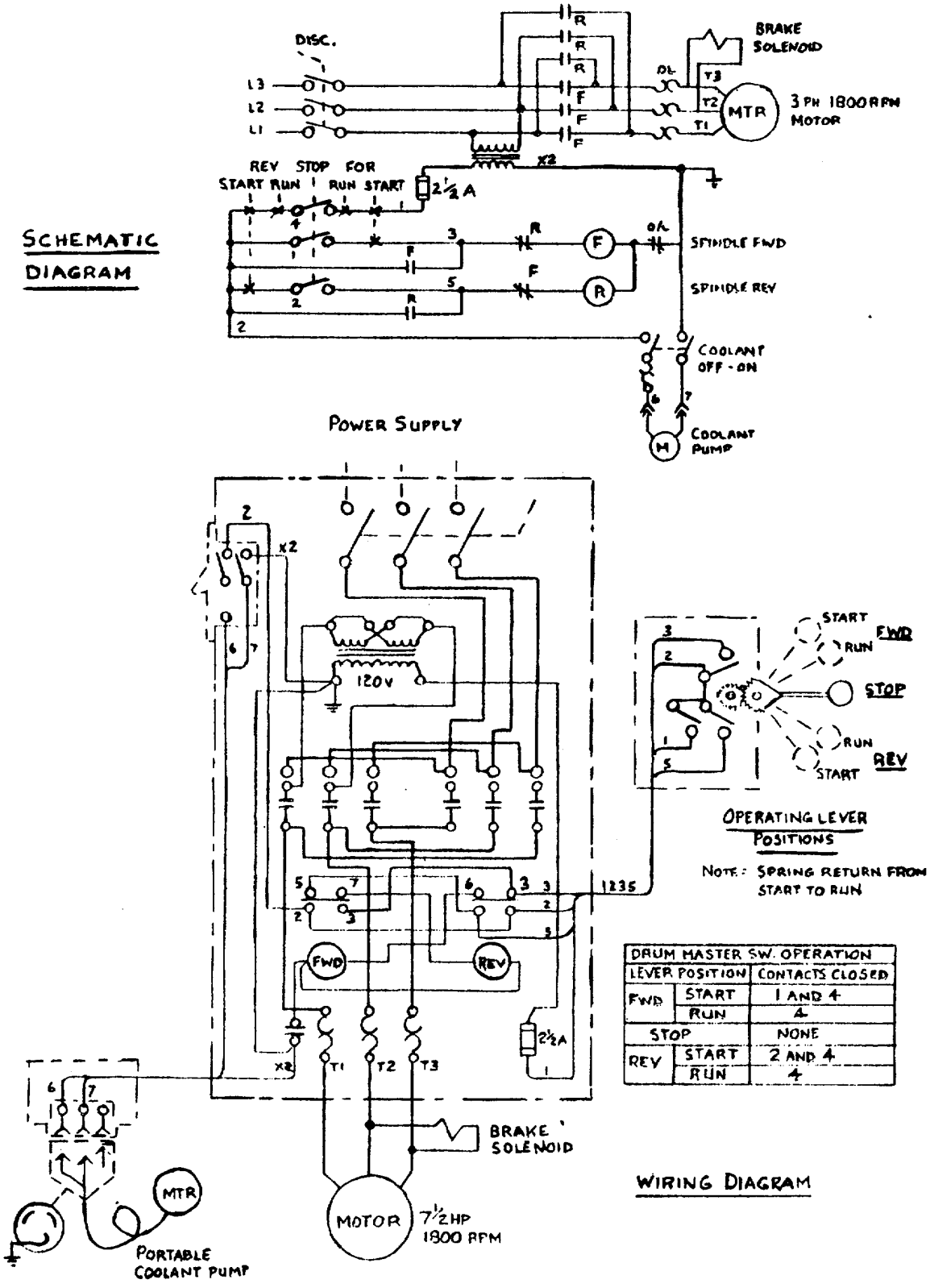
*c.* It is important that the lathe be level in order to produce accurate work.

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

*e.* 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 rechecked. Re-check the level of the machine at regular intervals.


120
27
14.0
61.0
5
1.5
1.5
5.0
5.0
ELECTRICAL PANEL
& POWER INLET
45
26.0
℄ BED
11.25
19
39
CRATING
DIMENSION
HEIGHT 53"
FRONT
96 CRATING DIMENSION
5/8 ϕ 6-HOLES FOR LAG BOLTS
1/2 - 13 UNC 8-HOLES FOR LEVELLING SCREWS

FLOOR PLAN




*ELECTRICAL DIAGRAM MODEL 1754 LATHE*

## SECTION II. LUBRICATION

### 2.1 General

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.

### 2.2 Headstock

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

*b.* To service the headstock, fill the reservoir to the centre of the oil sight guage 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.

c. 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.

*d.* 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.

### 2.3 2-Speed Headstock Drive

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

*b.* 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.

c. 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).

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

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

### 2.4 Feedbox

a. 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 centre of the oil sight guage through filler elbow at left end of feedbox. The reservoir capacity of the Feedbox is approximately 2 British Imperial Quarts or 2 /2 U.S. Quarts.

*b.* 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.

### 2.5 Compound

On the compound rest, one oil hole lubricates both the ways and the screw, while an oiler lubricates the screw bearing.

### 2.6 Cross Slide

*a.* Off 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.

*b.* 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 option equipment.

*c.* 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.

*d.* The cross feed screw bearing is lubricated by an oiler behind the cross feed dial.

### 2.7 Saddle

*a.* 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.

*b.* 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.

*c.* 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.

### 2.8 Apron

*a.* 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, so providing an even distribution of lubricant.

*b.* Service the apron reservoir through the oil cup at the back of the apron handwheel. Fill with oil to the centre of the oil sight guage. The reservoir capacity of the apron is approx. 1I British Imperial Quart or 1 ¼ U.S.
Quarts.

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

*d.* 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.

**2.9 Tailstock**

*a.* The spindle and screw are lubricated by an oiler located on top of the spindle housing.

*b.* The bedways on which the tailstock slides should be cleaned and oiled frequently.

*c.* 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.

**2.10 Bed End Bracket and Leadscrew**

*a.* 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.

*b.* 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.

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

**2.11 Taper Attachment**

*a.* Clean and oil the pivoted Slide Bar before using.

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

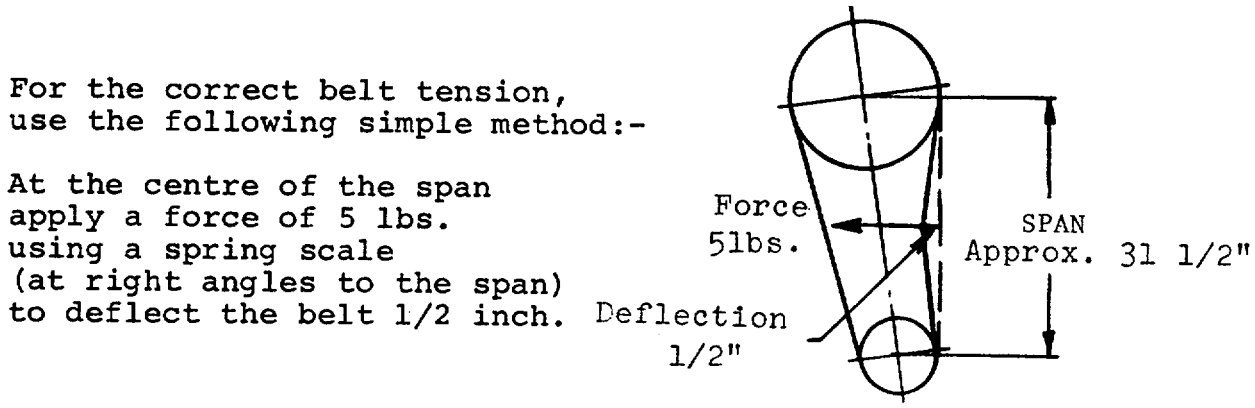
## SECTION III. OPERATING INSTRUCTIONS

### 3.1 Motor Drive and Belt Tension Control

*a.* 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.

*b.* 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.

*c.* 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.




*Motor Drive and Belt Tension Control*

*d.* 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 Spindle and Rotation Control

*a.* 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.

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

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

*d.* 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.

### 3.3 Spindle Speed Selection

*a.* 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.

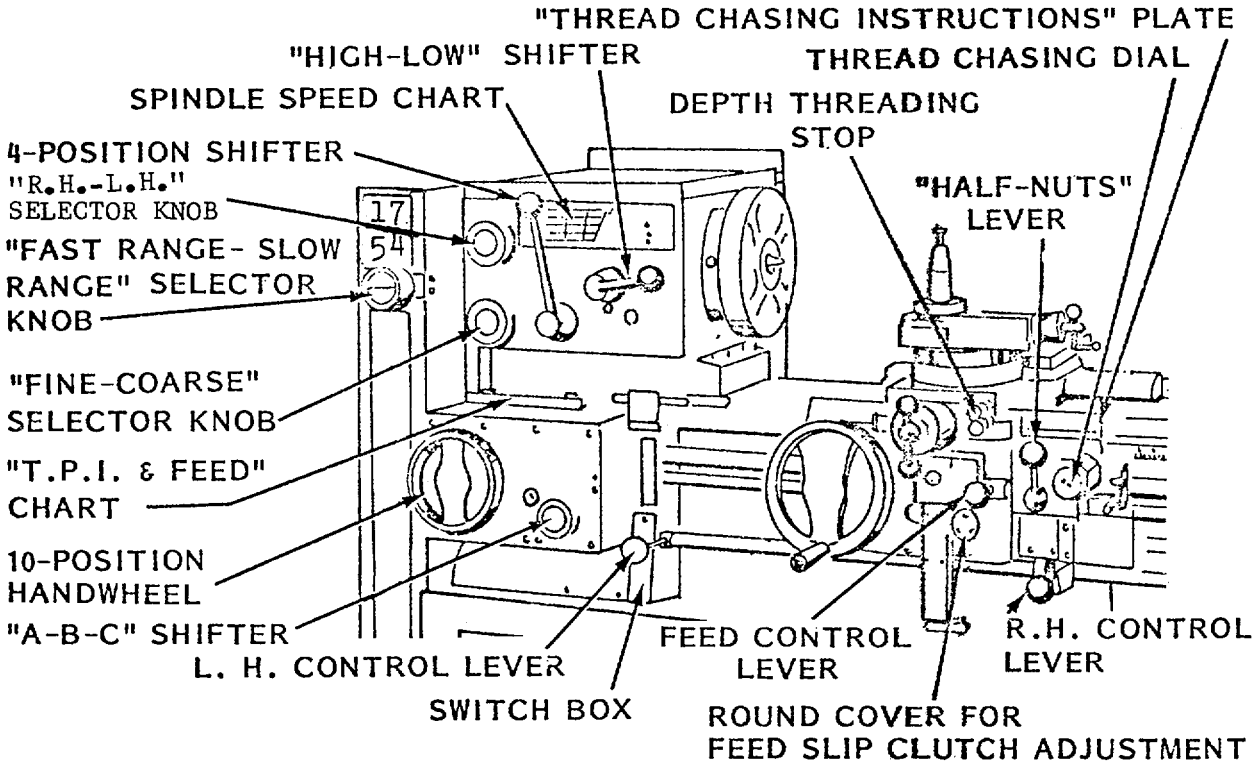
*b.* The desired spindle speed is obtained by placing the three Speed Selectors in positions corresponding to the selected spindle R.P.M. number noted directly on the SPINDLE SPEED CHART. For free hand rotation of the spindle move the "HIGH-LOW" SHIFTER to its NEUTRAL Position.

**CAUTION**

**Do not operate the speed selectors when the motor is running.**

### 3.4 Power Feeds

*a.* 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.




*Motor and Spindle Rotation Control*

*b.* 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 rpm.**

*c.* 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.

*d.* 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.**

*e.* A safety interlock is also fitted so that it is impossible to engage the FEED CONTROL LEVER and the HALF-NUTS at the same time.

**3.5 Automatic Carriage Stop**

*a.* 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.

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

**3.6 Thread Cutting and Thread Chasing Dial**

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

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

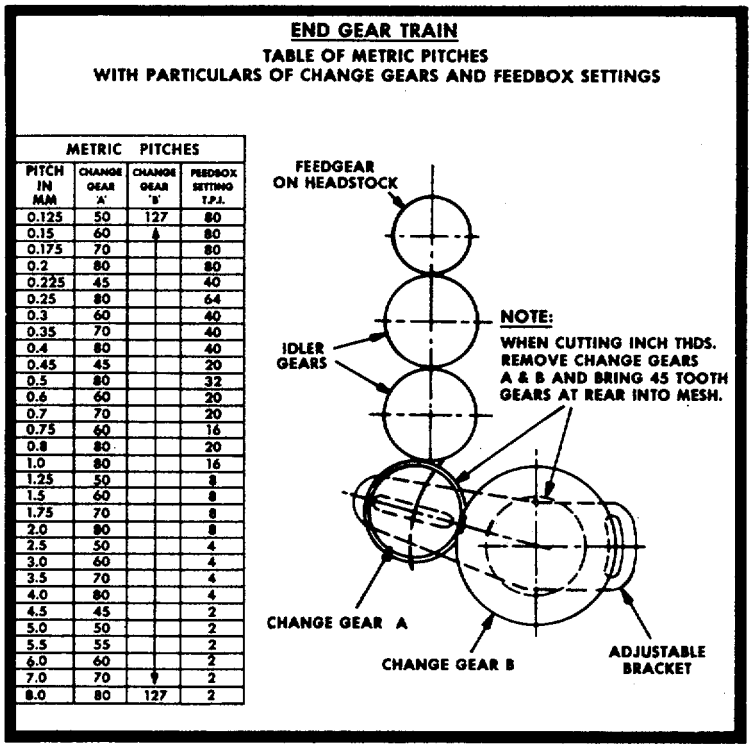
*c.* To disengage, lift the same lever up.

*d.* 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.

*e.* 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).

(1) For cutting the METRIC PITCHES as per chart a set of seven change gears is required.

(2) Virtually ANY DESIRED PITCH can be cut via the use of special change gears. Consult manufacturer for particulars.



**END GEAR TRAIN**
**TABLE OF METRIC PITCHES**
**WITH PARTICULARS OF CHANGE GEARS AND FEEDBOX SETTINGS**

| METRIC PITCHES | | | |
|---|---|---|---|
| PITCH IN MM | CHANGE GEAR 'A' | CHANGE GEAR 'B' | FEEDBOX SETTING T.P.I. |
| 0.125 | 50 | 127 | 80 |
| 0.15 | 60 | ↑ | 80 |
| 0.175 | 70 | | 80 |
| 0.2 | 80 | | 80 |
| 0.225 | 45 | | 40 |
| 0.25 | 80 | | 64 |
| 0.3 | 60 | | 40 |
| 0.35 | 70 | | 40 |
| 0.4 | 80 | | 40 |
| 0.45 | 45 | | 20 |
| 0.5 | 80 | | 32 |
| 0.6 | 60 | | 20 |
| 0.7 | 70 | | 20 |
| 0.75 | 60 | | 16 |
| 0.8 | 80 | | 20 |
| 1.0 | 80 | | 16 |
| 1.25 | 50 | | 8 |
| 1.5 | 60 | | 8 |
| 1.75 | 70 | | 8 |
| 2.0 | 80 | | 8 |
| 2.5 | 50 | | 4 |
| 3.0 | 60 | | 4 |
| 3.5 | 70 | | 4 |
| 4.0 | 80 | | 4 |
| 4.5 | 45 | | 2 |
| 5.0 | 50 | | 2 |
| 5.5 | 55 | | 2 |
| 6.0 | 60 | | 2 |
| 7.0 | 70 | ↓ | 2 |
| 8.0 | 80 | 127 | 2 |



*Table of Metric Pitches*

*f:* 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.**

### 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

*a. 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.

*b. For Straight Turning:*

(1) Loosen HEAVY HEX NUTS on the bed clamp;

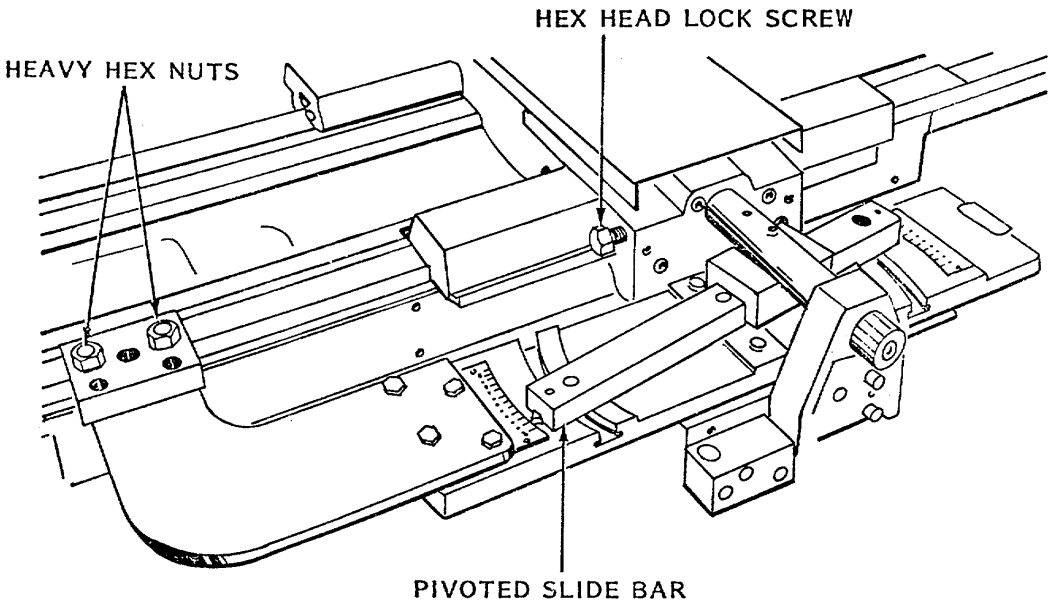
(2) Tighten the HEX HEAD LOCK SCREW on bracket;

(3) Leave the PIVOTED SLIDE BAR locked at its angular setting, so that taper attachment will move with the saddle. 4

### 3.8 Lead Screw Shear Pin

*a.* 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.

*b.* 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.

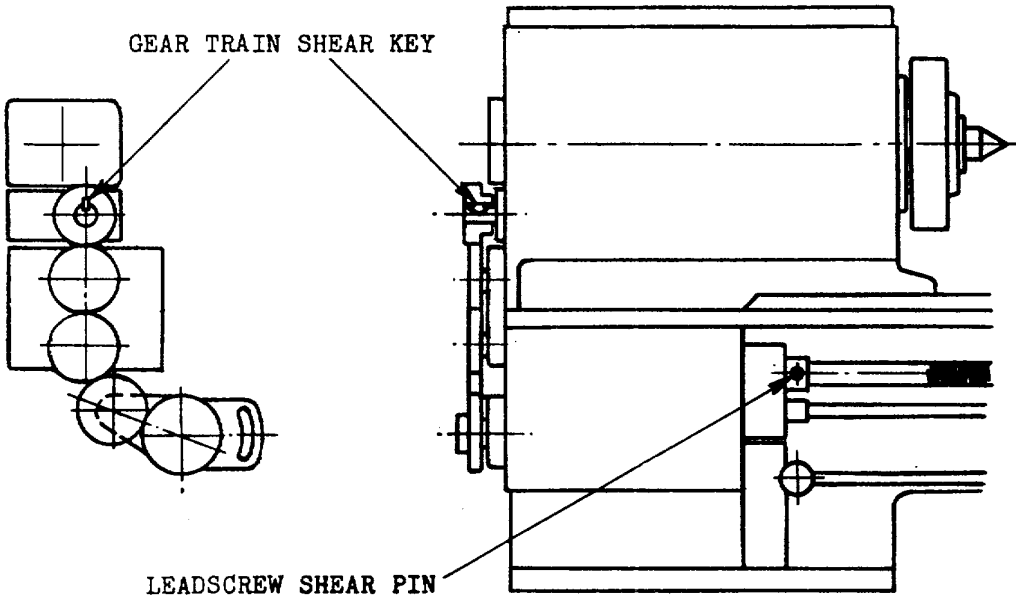



*Taper Turning Attachment*

**3.9 Gear Train Shear Key**

*a.* 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.

*b.* 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.




*Gear Train Shear Key and Leadscrew Shear Pin*

**3.10 Feed Slip Clutch Adjustment**

*a.* 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.

*b.* 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**

*a.* Available with centrifugal pump unit, GRAYMILLS MODEL NO. X11-HR35-A which delivers a copious volume of liquid at relatively Low pressure.

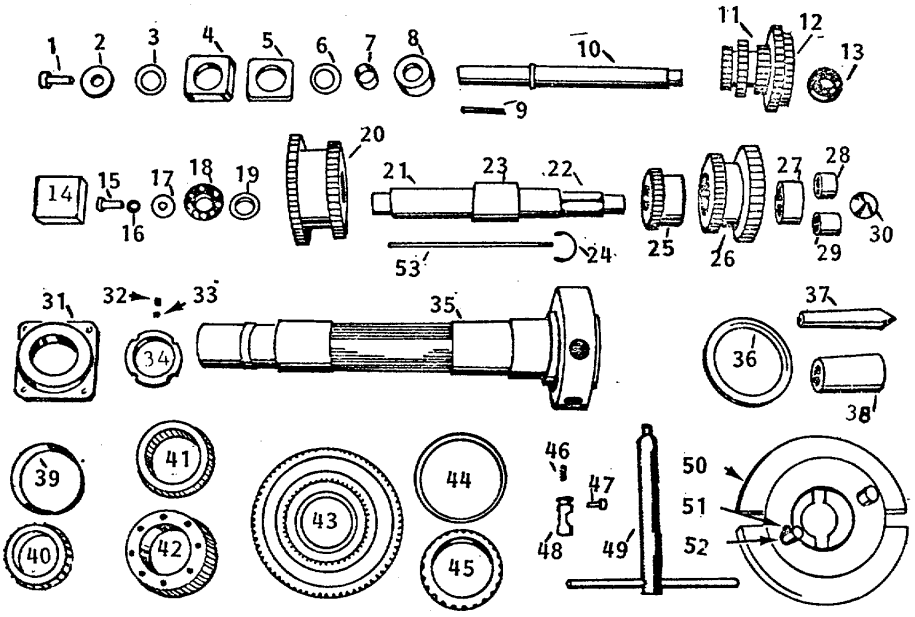
*b.* The flow may be throttled or shut off completely without overloading the motor. The motor has permanently lubricated oilite bearings and no lubrication is required for either pump or motor. This unit has a 10 gal. tank supplied with removable chip and sludge collecting tray with a baffle and deflector for setting out sediment. Easily removed for cleaning. Coolant tank should be cleaned and re-filled every 6 months or more frequently depending on usage.

*c.* 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.

*d.* 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.

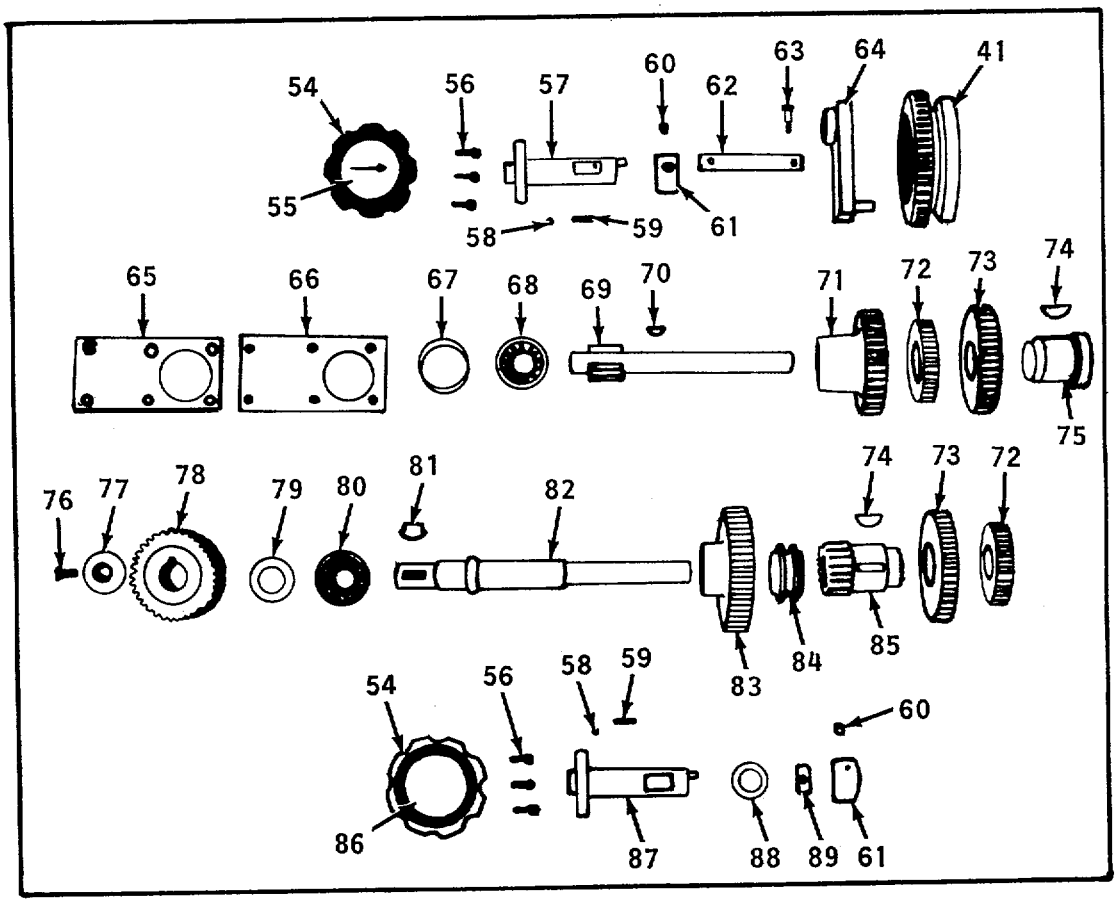
## Section IV. REPAIR PARTS LIST
## HEADSTOCK PARTS

| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | SOC. HD. CAP SCREW 1/2-13 x 1 1/4 | | 31 | REAR COVER | B833158 |
| 2 | SPECIAL WASHER | A-33264 | 32 | SOC. SET SCREW 1/4-28 x 1/4 LG. | |
| 3 | SPECIAL WASHER | A-33265 | 33 | BRASS PAD | A-30564 |
| 4 | REAR COVER | B-33159 | 34 | LOCKNUT #N13 | B-33155 |
| 5 | GASKET | A-33218 | 35 | D1-6" CAMLOCK SPINDLE | D-32888 |
| 6 | OIL SEAL (1 3/8 I.D. x 2 O.D. x 21/64) | | 36 | BEARING SHIELD | B-32891 |
| | CHICAGO RAWHIDE #13560 | | 37 | LATHE CENTER No. 4 MORSE: | |
| 7 | INNER RACE-TORRINGTON #1R-1812 | | | FOR ENGINE LATHE | A-22639 |
| 8 | DOUBLE ROW BALL BEARING | | | FOR TOOLROOM LATHE | A-41591 |
| | S.K.F. #3206/C4 | | 38 | SLEEVE: | |
| 9 | KEY 1/4 x 1/4 x 2/4 SQUARE ENDS | | | FOR ENGINE LATHE | A-41064 |
| 10 | PULLEY SHAFT | C-33161 | | FOR TOOLROOM LATHE | A-41590 |
| 11 | TRIPLE SHIFTING GEAR | C-33089 | 39 | CUP 429520 | TIMKEN |
| 12 | 38 TOOTH SPLINED GEAR | 8-33090 | 40 | CONE -29588 ROLLER BEARING | |
| 13 | BALL BEARING S.K.F. #6205 | | | (No. 3 PRECISION FOR ENGINE LATHE) | |
| 14 | REAR COVER B-33157 | | | (No. 0 PRECISION FOR TOOLROOM LATHE) | |
| 15 | HEX. HD. CAP SCREW 1/2-13 x 1 1/4 | | 41 | 54T. FEED TAKE OFF GEAR | C-33173 |
| 16 | SPLIT LOCKWASHER #5V | | 42 | HIGH-LOW SHIFTER GEAR | C-3318B |
| 17 | WASHER | A-33175 | 43 | 69T. BULL GEAR | C-33172 |
| 18 | BALL BEARING-S.K.F. #6206 | | 44 | CUP #492A TIMKEN | |
| 19 | SPACER | B-33167 | 45 | CONE #497 ROLLER BEARING | |
| 20 | 60T. & 52T. GEAR | B-33163 | | (No. 3 PRECISION FOR ENGINE LATHE) | |
| 21 | INTERMEDIATE SHAFT | C-33169 | | (No. 0 PRECISION FOR TOOLROOM LATHE) | |
| 22 | ROLL PIN 3/16 DIA. X 1/2 LG. | | 46 | CAM SPRING (16 REQ'D.) | A-41131 |
| 23 | SPACER | B-33156 | 47 | CAM SCREW (6 REQ'D.) | A-41123 |
| 24 | CRESCENT RETAINING RING- | | 48 | CAM FOR D1-6" CAMLOCK 16 REQ'D.) | |
| | TRUARC #5103-175 | | 49 | CAM WRENCH B.41210 | |
| 25 | 33T. GEAR | B-33166 | 50 | 10" DIA. DOG PLATE #D-41216 | |
| 26 | 42T. & 53T. GEAR | B-33160 | 51 | SOC. HD. CAP SCREW 5/16-18 | #SUBASS'Y |
| 27 | RETAINER | B-33168 | | (4 REQ'D.) | |
| 28 | NEEDLE BEARING | | 52 | D1-6" CAMLOCK STUD "MAC-IT" | #51634 |
| | TORRINGTON #JH-2016 | | | (4 REQ'D.) | |
| 29 | INNER RACE--TORRINGTON #IR-1616 | | | KEY ¼ X 1/16 2 1/4 SQUARE ENDS | |
| 30 | FROST PLUG 2" DIA. | | 53 | | |



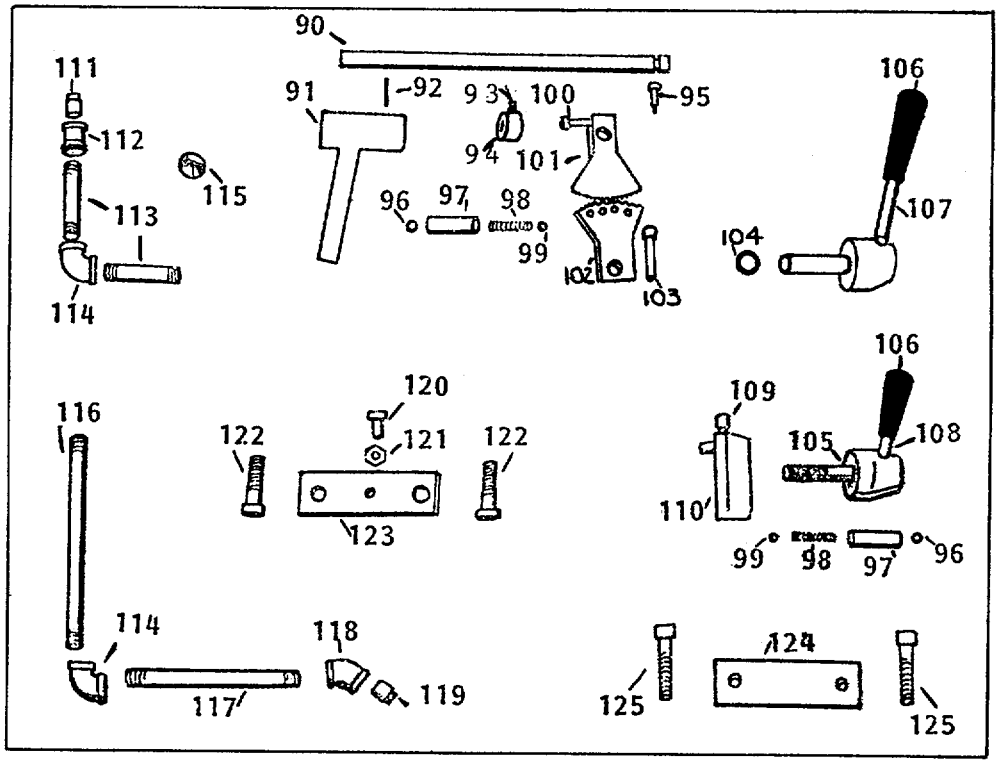
## HEADSTOCK PARTS

| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 41 | 54 T. FEED TAKE-OFF GEAR | C-33173 | 73 | 42 T. FEED IDLER | A-41093 |
| 54 | KNOB | A-41016 | 74 | WOODRUFF KEY # 15 (4 x 1" DIA.) | |
| 55 | R.H. & L.H. CHART | A-41026 | 75 | IDLER SLEEVE | A-41091 |
| 56 | SOC. HD. CAP SCREW #10-32 x 5/8 | | 76 | FLAT HEAD SOCKET CAP SCREW | |
| 57 | UPPER ECCENTRIC SHAFT | B-33139 | | 5/16-18 x 3/4 LG. | |
| 58 | STEEL BALL .250 DIA. | | 77 | WASHER | A-41480 |
| 59 | COMPRESSION SPRING | A-30454 | 78 | 35 T. FEED GEAR | B-41394 |
| 60 | SOC SET SCREW 3/8-24 x 3/8 LG. | | 79 | OIL SEAL 121/32 .D. x 1 3/4 0 D. x 5/16) | |
| 61 | COLLAR | A-33220 | | CHICAGO RAWHIDE #9667 | |
| 62 | GEAR SHIFT LINK | B-33151 | 80 | BALL BEARING-S.K.F. #6205 | |
| 63 | SHOULDER SCREW 1/4 DIA. x 1/2 LG. | | 81 | SHEAR KEY FOR FEED TRAIN | A-21180 |
| 64 | FWD.-REV. GEAR SHIFTER | B-33142 | 82 | FEED COMPOUND SHAFT | 8-21429 |
| 65 | COVER PLATE | B-33154 | 83 | 48 T. FEED CLUTCH GEAR | 8-41096 |
| 66 | GASKET | A-33217 | 84 | FEED CLUTCH BOBBIN | A-41092 |
| 67 | SPACER | A-41090 | 85 | 20 T. FEED CLUTCH IDLER | B-41095 |
| 68 | BALL BEARING -S.K.F. #6304 | | 86 | COARSE & FINE CHART | A-41027 |
| 69 | PINION SHAFT | 8-41089 | 87 | LOWER ECCENTRIC SHAFT | B 33138 |
| 70 | WOODRUFF KEY #8 15/32 x 3/4 DIA.) | | 88 | OIL SEAL (7/8 I. D. x 1 3/8 0.D. x 1/4 | |
| 71 | 40 T. FEED COMPOUND GEAR | 8-21422 | | CHICAGO RAWHIDE #8677 | |
| 72 | 30 T. FEED IDLER | A-41094 | 89 | SHIFTER SHOE | A-30468 |



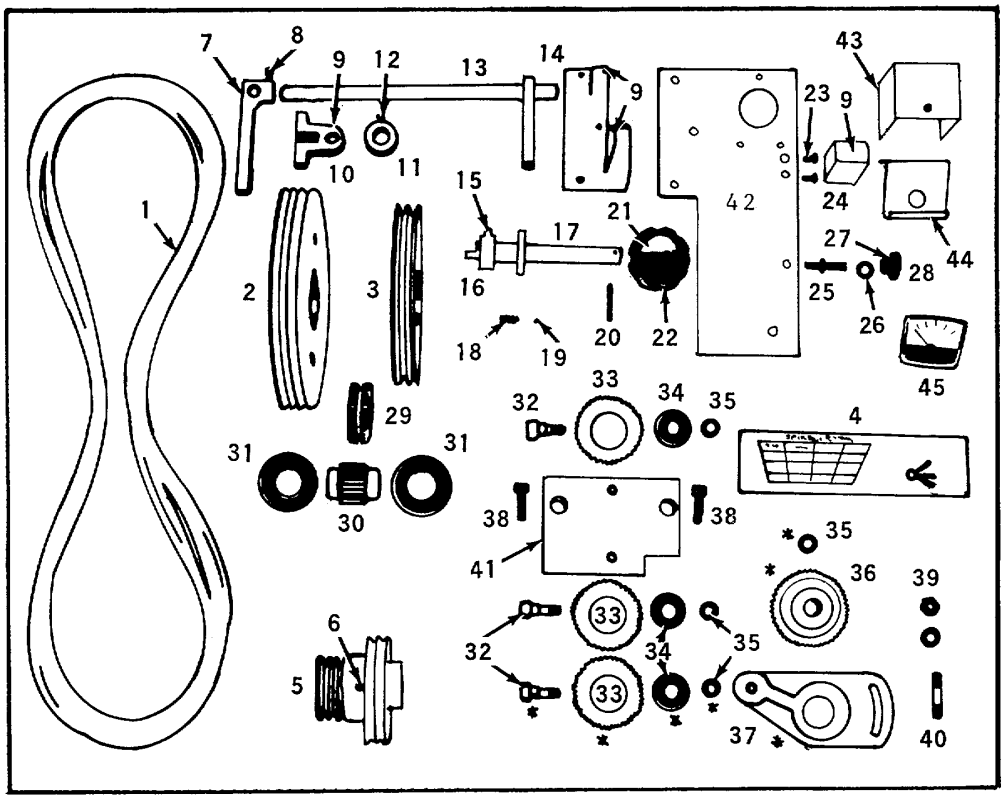
## HEADSTOCK PARTS

| 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-ASSY. | B-33182 | 113 | STANDARD GALVANIZED LONG NIPPLE 72 NPTF x 3/,2" LG. | |
| 92 | ROLL PIN 1/4 DIA. x 1/2 LG. | | 114 | GALVANIZED 900 ELBOW '1/ NPTF | |
| 93 | SOC. SET SCREW 1/4 -20 x 1/3 LG. | | 115 | OIL WINDOW-BIJUR #B-5093 | |
| 94 | COLLAR | A-33185 | 116 | STANDARD GALVANIZED LONG NIPPLE 1/2, NPTF x 12" LG. or | |
| 95 | RETAINING SCREW | A-33291 | | OIL DRAIN PIPE—13 1/2" LG. (FOR LATHE WITH COMBINATION STARTER) | B-329B7 |
| 96 | SOC. SET SCREW 1/32-13 x 1/3 LG. | | 117 | STANDARD GALVANIZED LONG NIPPLE 1/2 NPTF x 8" LG. | |
| 97 | INDENT POSITIONER | A-33184 | 118 | GALVANIZED 45° ELBOW 1/2 NPTF | |
| 98 | SPRING-WALLACE BARNES #1 | | 119 | SQUARE HD. PIPE PLUG 1/2 NPTF | |
| 99 | STEEL BALL .4375 DIA. | | 120 | HEX. HD. CAP SCREW 1/213 x 13 LG. | |
| 100 | SOC. HD. CAP SCREW 3/8 x-16 x 1/4 LG. | | 121 | HEX. JAM NUT 1/27-13 | |
| 101 | GEAR SHIFTER SECTOR | 8-33144 | 122 | HEX. HD. CAP SCREW 5/8 x 11 x 2 1/4 LG. | |
| 102 | GEAR SHIFTER SECTOR | C-33145 | 123 | HEADSTOCK CLAMP REAR | A-33203 |
| 103 | SOC. HD. CAP SCREW 3/8-16 x 2 1/4 LG. | | 124 | HEADSTOCK CLAMP | A-21447 |
| 104 | OIL SEAL (3/4, I.D. x 1 1/8 O.D. x 3/16)- CHICAGO RAWHIDE #7414 | | 125 | SOC. HD. CAP SCREW 5/8-11 x 4" LG. | |
| 105 | 2 & 4-POSITION SHIFTER SUB-ASSY. | B-33176 | | NOT SHOWN | |
| 106 | BLACK PLASTIC TAPERED HANDLE-- BALCRANK #PTH-202 | | | | |
| | 107 HAND LEVER A-33975 | | | | |
| 108 | HAND LEVER A-33976 | | | | |
| 109 | SOC. HD. CAP SCREW 3/8-16 x 2 1/2 LG. | | | | |
| | | | | HEADSTOCK CASTING | E-33123 |
| 110 | HI-LO GEAR SHIFTER SUB-ASS'Y. | 8-33143 | | HEADSTOCK COVER | C-33134 |
| 111 | FILLER BREATHER PLUG | A-41712 | | MAT FOR HEADSTOCK COVER | B-33133 |



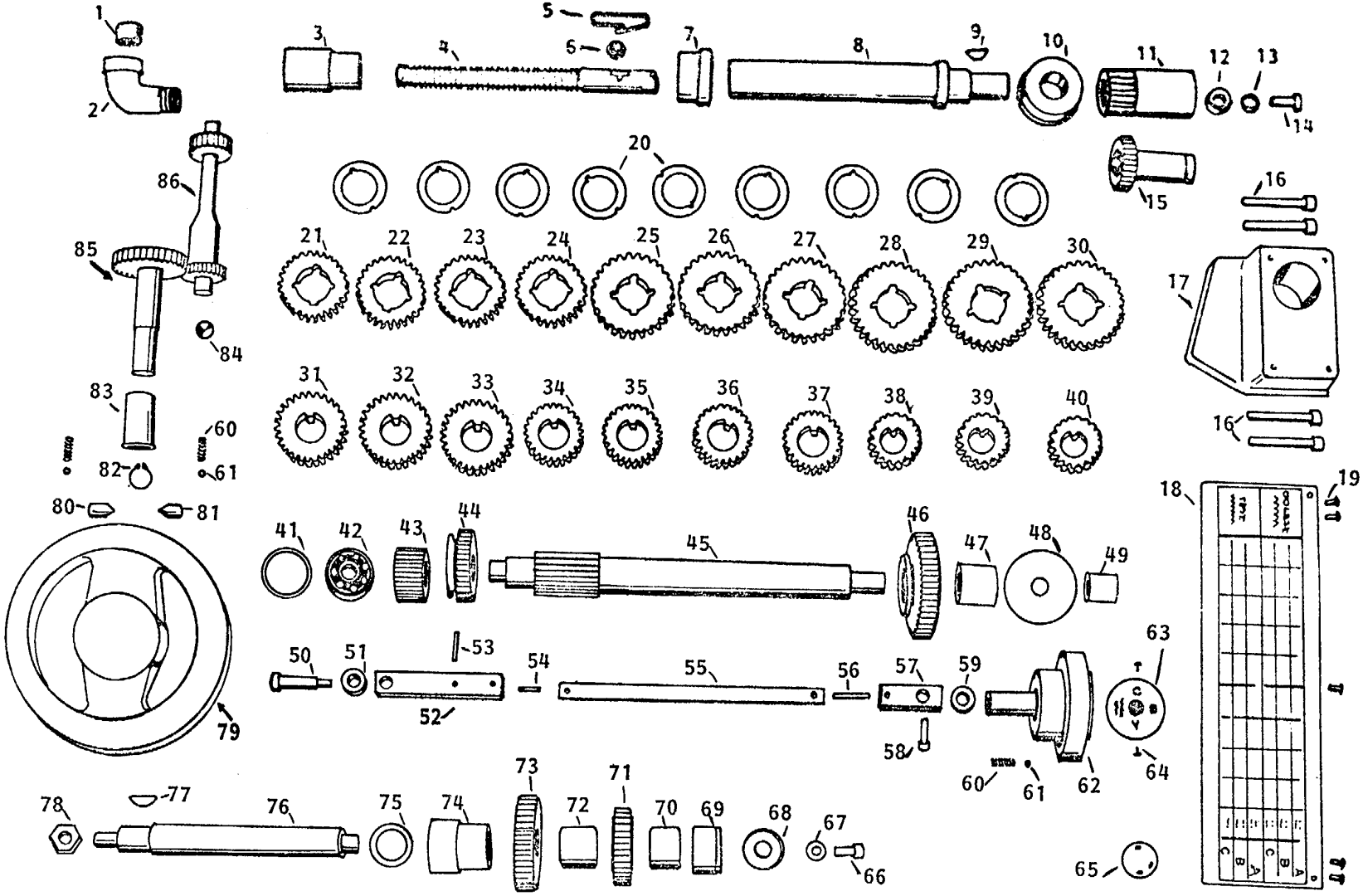
## 2-SPEED HEADSTOCK DRIVE AND END GEAR TRAIN PARTS

| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | V-BELTS 85" LG. GATES SUPER H.C. #3V850 | | 25 | BELT GUARD LATCH SPINDLE | A-41415 |
| | | | 26 | WASHER-WESPO #6001 | |
| 2 | LOW SPEED PULLEY | C-33081 | 27 | SOC. SET SCREW 1/4-28 x 1/4 LG. | |
| 3 | HIGH SPEED PULLEY | C-33080 | 28 | KNOB FOR GUARD | A-21120 |
| 4 | SPEED CHART (26-1600 R.P.M.) | 8-33987 | 29 | SPLINED CLUTCH | 8-33110 |
| 5 | MOTOR PULLEY | C-33014 | 30 | SPLINED SLEEVE | B-33266 |
| 6 | SOC. SET SCREW 3/8-16 x 3/4 LG. | | 31 | BALL BEARING-S.K.F. #6208-2RS | |
| 7 | OFFSET LEVER | B-33259 | 32 | IDLER BOLT | A-41526 |
| 8 | SOC. HD. CAP SCREW 3/8 16 x 1 1/4 LG. | | 33 | 42 T. IDLER GEAR | A-41363 |
| 9 | GREASE FITTING-"KLEENSEAL" LINCOLN #5042 STRAIGHT THREAD | | 34 | BALL BEARING- S.K.F. #6303-2RS | |
| | | | 35 | WASHER-WESPO #6009 | |
| 10 | PIVOT | B-33255 | 36 | 45 T. FEED GEAR | 8-41364 |
| 11 | COLLAR | A-33185 | 37 | ADJUSTABLE IDLER BRACKET | 8-33038 |
| 12 | SOC SET SCREW 1/4-20 x '1/4 LG. | | 38 | SOC. HD. CAP SCREW 1/2-13 x 1 1/2 LG. | |
| 13 | SHAFT & LEVER | 8-33256 | 39 | HEAVY HEX. NUT 1/2-13 | |
| 14 | MOUNTING CASTING | C-33084 | 40 | MILLED STUD 1/2-13 x 2 1/4 LG. | |
| 15 | SOC. SET SCREW 3/8-24 x 1/2 LG. | | 41 | FIXED IDLER BRACKET | 8-32950 |
| 16 | COLLAR | A-41018 | 42 | FRONT END PLATE | C-32946 |
| 17 | ECCENTRIC SHAFT SUB-ASS'Y. | B-33974 | 43 | AMMETER COVER | C-32947 |
| 18 | COMPRESSION SPRING | A-30454 | 44 | SWITCH COVER BRACKET | 8-41437 |
| 19 | STEEL BALL .250 DIA. | | 45 | AMMETER 25 AMPS.--"CANEX" CR-52 | |
| 20 | ROLL PIN 1/4 DIA. x 2" LG. | | | | |
| 21 | "SLOW RANGE-FAST RANGE" PLATE | A-33263 | | **Note: PARTS MARKED THUS * ARE NOT REQUIRED FOR CUTTING METRIC OR SPECIAL THREADS AND PITCHES- SEE PAGE 28 FOR REPLACEMENT PARTS** | |
| 22 | KNOB | A-33092 | | | |
| 23 | BUTTON HD. SOC. CAP SCREW 5/16-18 x 5/8 LG. | | | | |
| 24 | SHAFT SUPPORT BLOC | A-33019 | | | |



# TOTALLY ENCLOSED FEED BOX PARTS

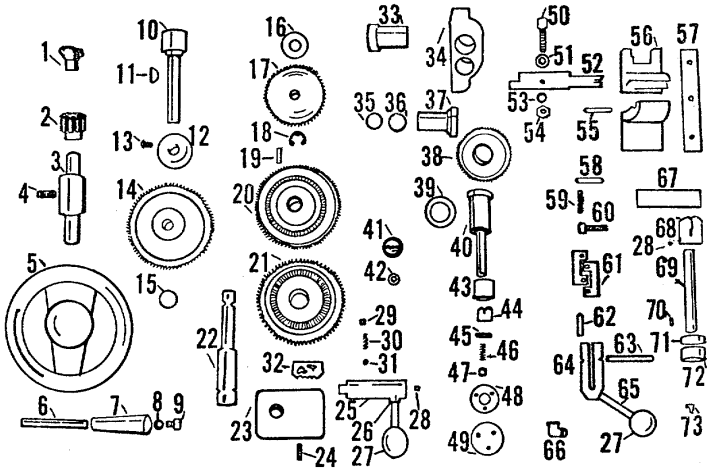
| ITEM | NAME | PART NO. | ITEM | NAME | PART NO | ITEM | NAME | PART NO |
|---|---|---|---|---|---|---|---|---|
| 1 | SQ. HD. PIPE PLUG 1/2 NPTF | | 39 | 20 TOOTH GEAR | A-33450 | 76 | POWER INPUT SHAFT | B-33470 |
| 2 | STREET ELBOW )/, NPTF x 900 | | 40 | 16 " " | A-33451 | 77 | WOODRUFF KEY #11 | |
| 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 | C33459 |
| 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 | 8-33472 | 46 | CLUTCH GEAR | B-33473 | 81 | SOC. SET SCREW CONE POINT | |
| 9 | WOODRUFF KEY #9 | | 47 | BUSHING (1 x 1 1/4 x 1 X 1 1/4)-- | | | 1/2-13 x 3/4 LG. | |
| | (AMER. STD. #6061 3/16 x 3/4 | | | OILITE #AA-1212-16 | | 82 | RETAINING RING-TRUARC #5100-75 | |
| 10 | DOUBLE ROW BALL BEARING | | 43 | WASHR-INTERMEDIATE SHAFT | A-33476 | 83 | BEAR-N-BRONZ BEARING- | |
| | NEW DEPARTURE #45205 | | 49 | BUSHING (5/8 x 7/8 x 1)-- | | | BOSTON CAT. NO. M1216-14 | |
| 11 | LEADSCREW COUPLING GEAR | 8-33985 | | OILITE #AA.832-1 | | 84 | FROST PLUG 5/8 DIA. | |
| 12 | WASHER 3/ I.D.-WESPO #6008 | | 50 | SHOULDER SCREW 3/8 x 1 1/4 LG. | | 85 | HANDWHEEL GEAR & SHAFT SUB-ASS'Y. | A-33452 |
| 13 | SPLIT LOCKWASHER #3/8 | | 51 | SPACER | A-33428 | 86 | RACK PINION SHAFT | B-33455 |
| 14 | HEX. HD. CAP SCREW 3/8-24 x 7/8 LG. | | 52 | SHIFTER BLOCK | 8-33427 | | | |
| 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 1/4LG. | | 54 | H'DN. DOWEL PIN 3/16 DIA. x 3/4 LG. | | | | |
| 17 | END CASTING | C-33423 | 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 | | 57 | SHIFTER BLOCK | A-33425 | | | |
| | #10-24 x 3/8 LG. | | 58 | SOC. HD. CAP SCREW 1/4-28 x 3/4 LG . | | | | |
| 20 | THRUST RACE-TORRINGTON #TRB-2031 | | 59 | OIL SEAL (7/8 O.D. x 1/2.D. X 1/4 | | | | |
| 21 | 27 TOOTH FEED DRIVE GEAR | A-33432 | | CHICAGO RAWHIDE #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. | 8-33429 | | GASKET | C33424 |
| 25 | 23 " " " " | A-33437 | 63 | A-B-C NAMEPLATE | A-33457 | | FEEDBOX CASTING | E-33421 |
| 26 | " " " " | | 64 | DRIVE SCREW TYPE "U" #4 x 1/4 LG. | | | | |
| 27 | 39 " " " " | A-33438 | 65 | OIL WINDOW-BIJUR #B5093 | | | WITH: (2) PULL DOWEL | |
| 28 | 27 " " " " | A-33439 | 66 | SOC. HD. CAP SCREW 5/16.24 x 5/8 LG. | | | 5/16 DIA. x 112 LG. | |
| 29 | 35 " " " " | A-33440 | 67 | FLAT WASHER-S.A.E. #5/16 | | | 1(2) HEX. HD. CAP SCREW | |
| 30 | 30 " " " " | A-33441 | 68 | BALL BEARING-S.K.F. #6202 | A-3346 | | 3 13 LG. | |
| 31 | 27 TOOTH GEAR | A-33442 | 69 | 24 TOOTH GEAR | A33465 | | (2) SOC. HD. 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 | C33422 |
| 34 | 24 " " " " | A-33445 | 72 | SPACER | A-33461 | | WITH: (2) DOWEL PIN 1/, DIA. x % 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 11/4 LG. | |
| 37 | 24 " " " " | A-33448 | 75 | OIL SEAL (1 1/2 O.D. x 1" I.D. x 5/16) | | | DRAIN PLUG-HEX. SOC PIPE PLUG | |
| 38 | 16 " " " | A-33449 | | CHICAGO RAWHIDE #9840 | | | 1/4 NPTF | |




*FEEDBOX PARTS*

## APRON PARTS

| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | OILER-GITS #307 | | 35 | RETAINING RINCGTRUARC #5100-100 | |
| 2 | 16 TOOTH GEAR | B-33059 | 36 | THRUST WASHER | A-21250 |
| 3 | FAN & PUMP BEARING-POLLARD | | 37 | BEVEL PINION | B-21245 |
| | #FPS 137 | | 38 | 66 T. BEVEL GEAR | B-21756 |
| 4 | SOC. SET SCREW 3/8-16 x 1" LG. | | 39 | OIL SEAL (13/8 x 2 x 21/64) | |
| 5 | HANDWHEEL | C-33060 | | CHICAGO RAWHIDE #13560 | |
| 6 | SHAFT | A-41245 | 40 | SHAFT FOR BEVEL GEAR 8-21757 | |
| 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 2/,-18 NPTF | |
| | STAINLESS STEEL-H. M. HARPER CO. | | 43 | 18 T. SLIP CLUTCH PINION | A-21246 |
| 9 | SOC. HD. CAP SCREW 1/4-28 x 1/2 | | 44 | FEED SLIP CLUTCH | A-21247 |
| 10 | RACK PINION SHAFT | B-21238 | 45 | PIN | A-50507 |
| 11 | WOODRUFF KEY # 11 (3/16 x 7/8 DIA.) | | 46 | COMPRESSION SPRING | A-21267 |
| 12 | BALL BEARING-S.K.F. #6304-2RS-NR | | 47 | SOC. SET SCREW 1/2-13 x 1/2 NYLOK" | |
| 13 | BUTTON HD. SOC. CAP SCREW | | 48 | GASKET | A-20985 |
| | 1/4-20 x 1/2 LG. | | 49 | COVER | A-21249 |
| 14 | 67 TOOTH GEAR 8 | B-33053 | 50 | SOC. HD. CAP SCREW 3/8-16 x 1 3/4, | |
| 15 | CLOSED END NEEDLE BEARING- | | 51 | WASHER-WESPO #6001 | |
| | TORRINGTON #M-12121 | | 52 | FEED INTERLOCK BAR B-33054 | |
| 16 | SPACER | A-41285 | 53 | SPLIT LOCKWASHER #3/8 | |
| 17 | 16 T. CLUTCH GEAR | B-41266 | 54 | HEX. NUT 3/8-16 | |
| 18 | RETAINING RING-TRUARC #5133-75 | | 55 | DOWEL 5/16 DIA. x 1 3/4 LG. | |
| 19 | SPACER PIN | A-41263 | 56 | HALF NUTS | C-33056 |
| 20 | 90 T. DOUBLE CLUTCH GEAR | C-33051 | 57 | GIB | B-33057 |
| 21 | 90 T. SINGLE CLUTCH GEAR | B-33052 | 58 | DOWEL 5/16 DIA. x 1 1/2 LG. | |
| 22 | CLUTCH SHAFT: | | 59 | TENSION SPRING | A-21257 |
| | -STANDARD | B-41262 | 60 | SOC. HD. CAP SCREW 1/4-20 x 1 1/4 LG. | |
| | -FOR AUTO. CARRIAGE STOP | C-41669 | 61 | HALF NUT LINK | A-33068 |
| 23 | FEED CONTROL BOX: | | 6:2 | LINK PIN | A-21252 |
| | -STANDARD | C-41259 | 63 | RETAINER PIN | A-21258 |
| | -FOR AUTO. CARRIAGE STOP | C-41668 | 64 | CONTROL SHAFT | A-33058 |
| 24 | SOC. SET SCREW 3/4-16 x 3/4 LG. | | 65 | HALF NUTS LEVER | A-33979 |
| | "NYLOK" FULL DOG POINT | | 66 | ELBOW OILER-GITS #1207 | |
| 25 | CLUTCH CONTROL SHAFT | B-41260 | 67 | THREAD CHASING INSTRUCTIONS | |
| 26 | FEED CONTROL LEVER | A-41337 | | CHART | A-41203 |
| 27 | BLACK PLASTIC TAPERED HANDLE- | | 68 | 16 T. WORM GEAR | A-33077 |
| | BALCRANK #PTH-202 | | 69 | DIAL SHAFT | A-21265 |
| 28 | SOC. SET SCREW 5/16-18 x 3/4 LG. | | 70 | DOWEL 1/8 DIA. x 1/2 LG. | |
| 29 | SOC. SET SCREW 5/16-18 x 1/4 LG. | | 71 | ZERO WASHER | A-41276 |
| 30 | COMPRESSION SPRING | A-21268 | 72 | THREAD CHASING DIAL | A-21263 |
| 31 | STEEL BALL .250 DIA. | | 73 | OILER-GITS #521 | |
| 32 | FEED INDICATING CHART | A-41202 | | NOT SHOWN | |
| 33 | BUSH FOR BEVEL BRACKET | A-33076 | | | |
| 34 | BEVEL GEAR BRACKET | B-21235 | | APRON HOUSING | E-33989 |



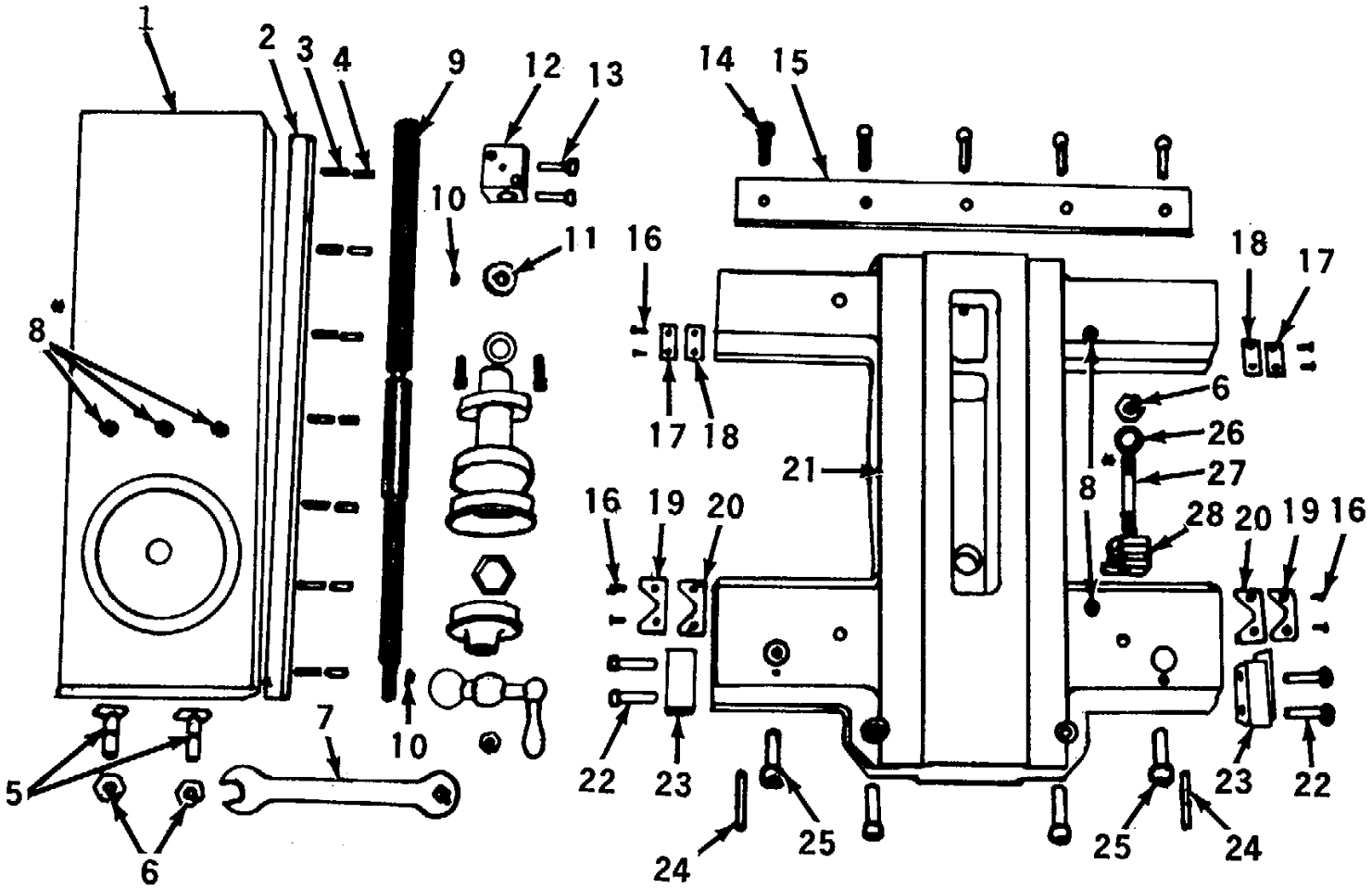
## CROSS SLIDE AND SADDLE PARTS

| ITEM | NAME | PART NO |
|---|---|---|
| 1 | EXTENDED CROSS SLIDE: | |
| | -STANDARD | D-32925 |
| | -FOR DEPTH THREADING STOP AND ONE-SHOT LUBRICATION | D-32936 |
| | -FOR DEPTH THREADING STOP ONLY | D32965 |
| | -FOR ONE-SHOT LUBRICATION ONLY | D-32966 |
| 2 | GIB FOR EXTENDED CROSS SLIDE | B-33480 |
| 3 | HARDENED DOWEL ¼ DIA x 1"LG | |
| 4 | "NYLOK" SOC. SET SCREW 5/16-24 x 1/2" LG | |
| 5 | TEE-HEAD BOLT A-2 1462 | |
| 6 | HEAVY HEX. NUT ½-13 UNC | |
| 7 | TOOL POST WRENCH-ARMSTRONG #563D OR WILLIAMS #563D | |
| 8 | OILER-GITS #523 (4 OILERS MARKED THUS * IN PICTURE ARE NOT REQUIRED FOR ONE-SHOT LUBRICATION) | |
| *9 | CROSS FEED SCREW B-21202 | |
| *10 | WOODRUFF KEY #6 (5/32 x 5/8 DIA.) | |
| *11 | GEAR FOR CROSS FEED SCREW | A-21203 |
| 12 | NUT FOR CROSS FEED SCREW | A-32926 |
| 13 | SOC. HD. CAP SCREW 5/16-24 x 1 1/4LG | |
| 14 | "LOCK-WELL" SOC HD CAP SCREW 3/8-16 x 1/4 LG | |
| 15 | REAR SADDLE GIB B-33126 | |
| 16 | ROUND HD. MACHINE SCREW # 10-32 x 1/2 LG. | |
| 17 | REAR SADDLE WIPER PLATE | A-21186 |
| 18 | REAR SADDLE WIPER | A-21186 |
| 19 | FRONT SADDLE WIPER PLATE | A-21185 |
| 20 | FRONT SADDLE WIPER | A-21187 |
| 21 | SADDLE CASTING: | |
| | - STANDARD | E-33086 |
| | -STANDARD | E-33086 |
| | FOR ONE-SHOT LUBRICATION | E-33087 |
| 22 | HEX. HD. CAP SCREW 3/8-16 x 1 1/2 LG. | |
| 23 | FRONT SADDLE WIPER | A-21219 |
| 24 | PULL DOWEL 5/16 DIA. x 2" LG. | |
| 25 | SOC. HD. CAP SCREW 1/2-13 x 1 1/2 LG. | |
| 26 | WASHER-WESPO #6002 | |
| 27 | MILLED STUD 1/2-13 x 2 3/4 LG. | |
| 28 | SADDLE CLAMP BLOCK | A-21218 |

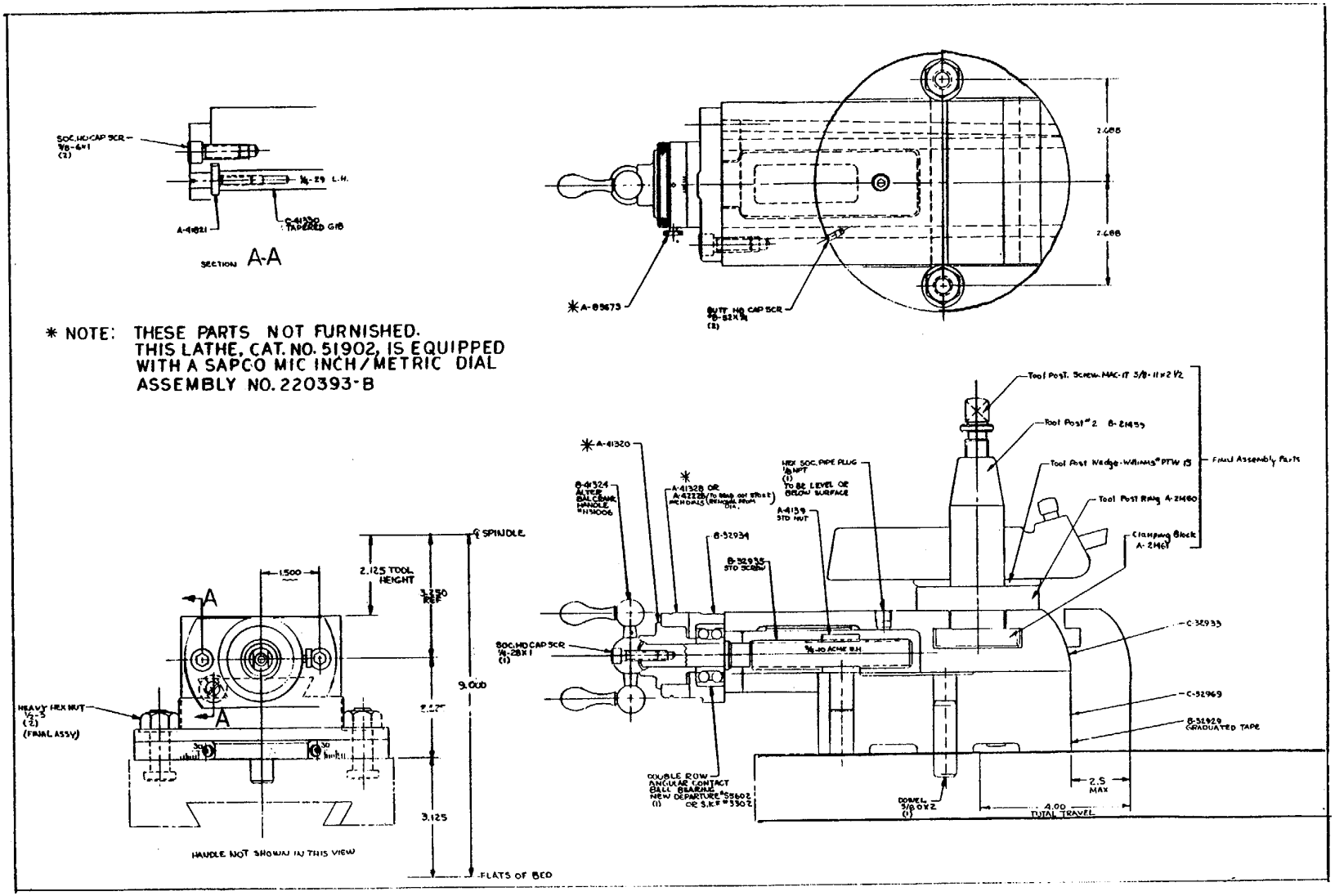
**NOTES:**

**-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; FOR RE-PLACEMENT PARTS SEE PAGE 29.**

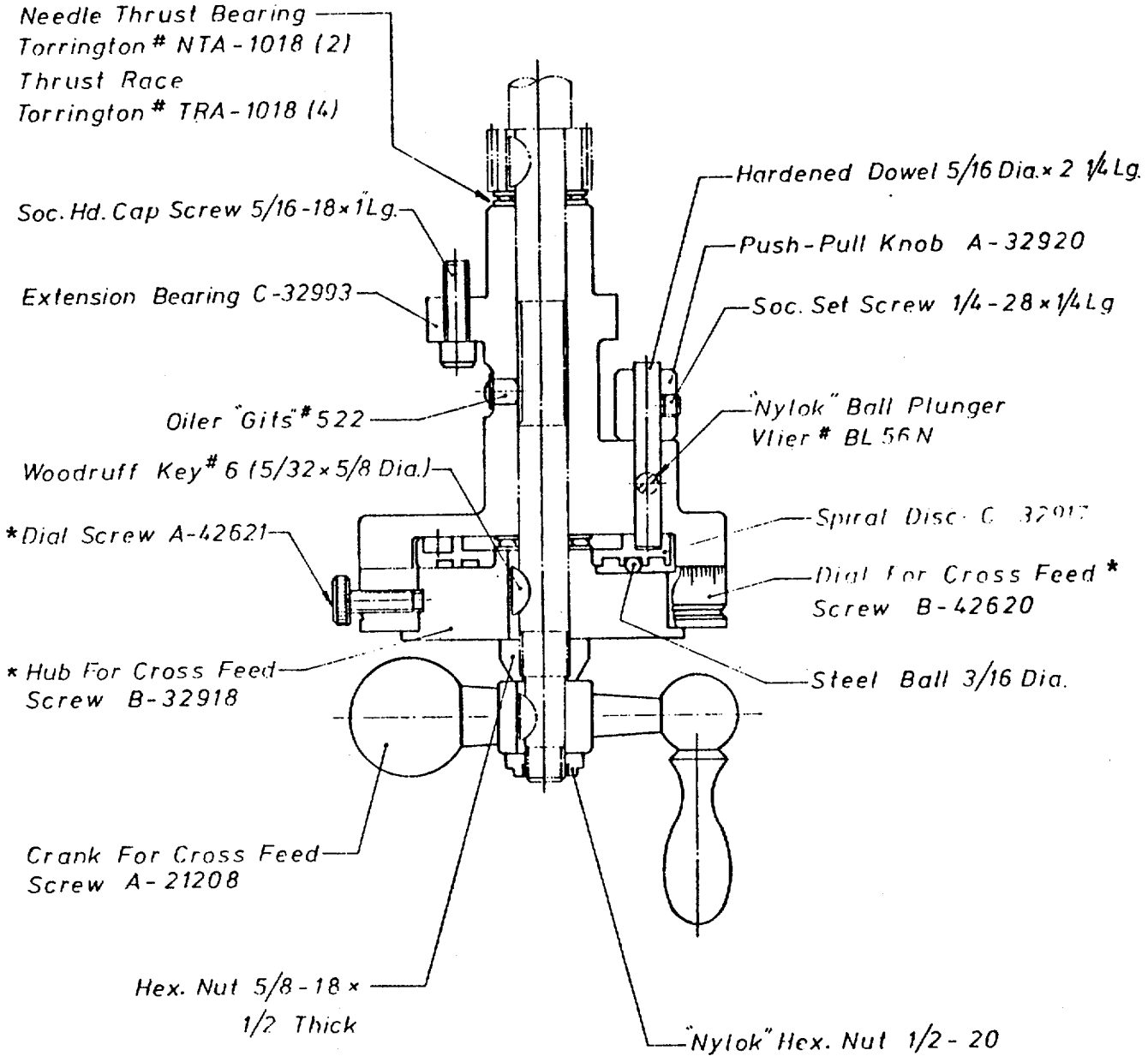



*CROSS SLIDE AND SADDLE PARTS*




*Cross-Section for Parts Not Furnished*

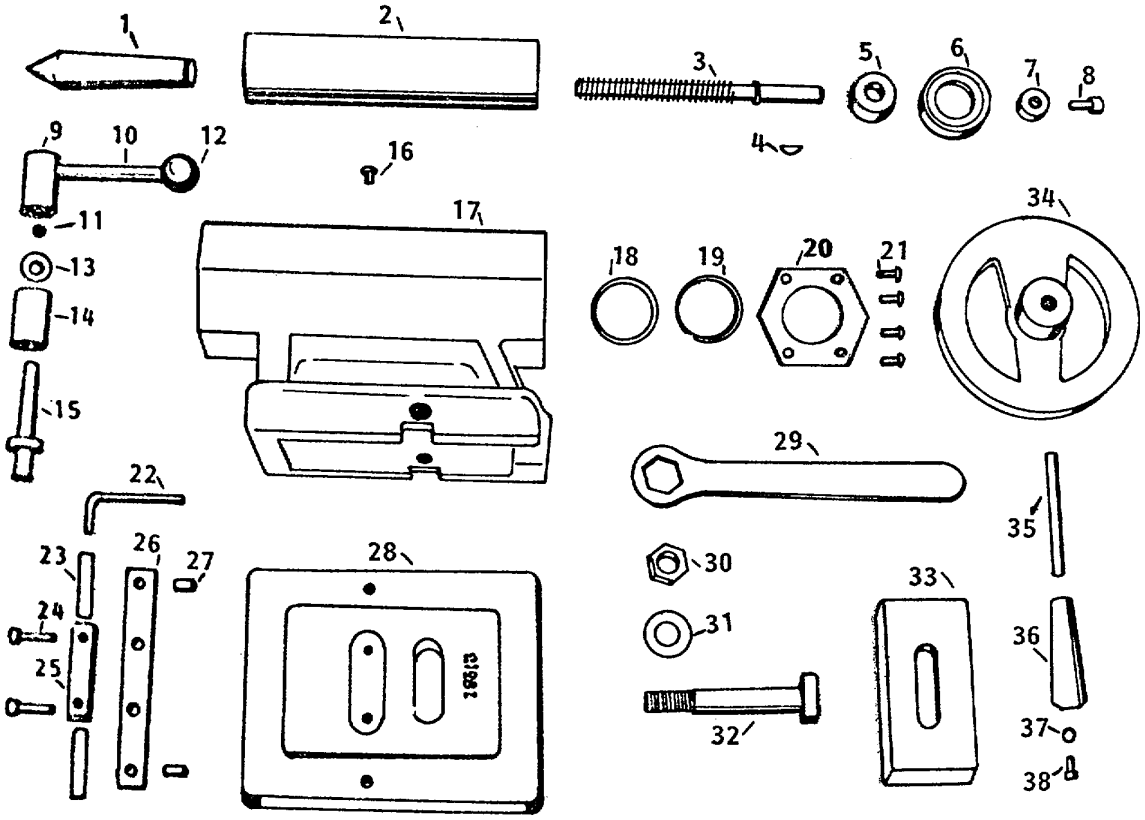
*NOTE: THESE PARTS NOT FURNISHED.
THIS LATHE, CAT. No. 51902, IS EQUIPPED WITH A 'SIPCO MIC' INCH/METRIC DIAL ASSEMBLY No. 220392 - B




Ball Type Threading Stop

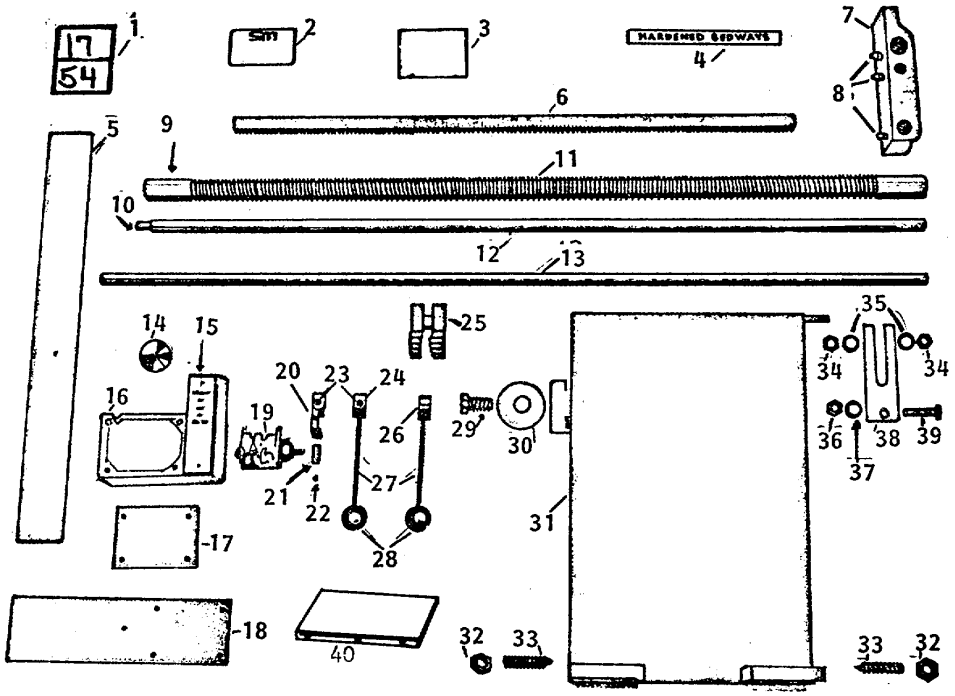
## TAILSTOCK PARTS

| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | LATHE CENTER NO. 4 MORSE: | | 21 | BUTTON HD. SOC. CAP SCREW | |
| | -FOR ENGINE LATHE | A-22639 | | 5/16-18 x 3/4 LG. (4 REQ'D.] | |
| | FOR TOOLROOM LATHE | A-41591 | 22 | ALLEN KEY # 1/ | |
| 2 | SPINDLE | C-33016 | 23 | SOC. SET SCREW, FLAT POINT | |
| | WITH SPINDLE NUT | A-33018 | | 1/2-13 x 2 1/4 LG. (2 REQ'D.) | |
| | AND SOC. HD. CAP SCREWS # 10-32 x 3/4 | | 24 | SOC. HD. CAP SCREW | |
| 3 | SPINDLE SCREW | B-33017 | | 5/16-18 x 1 1/4 LG. (2 REQ'D.I | |
| 4 | WOODRUFF KEY #8 15/32 x 3/4 DIA.) | | 25 | THRUST BLOCK | A-33033 |
| 5 | BEARING SEAT COLLAR | A-33026 | 26 | TENON STRIP | A-33025 |
| 6 | BALL BEARING-S.K.F. #6008-2RS | | 27 | DOWEL 3/4 DIA. x 3/4 LG. | |
| 7 | HANDWHEEL RETAINER | A-41232 | | (2 REQ'D.) | |
| 8 | SOC. HD. CAP SCREW 3/4.-24 x 3/4 | | 28 | BASE CASTING | C-33366 |
| 9 | BOSS FOR HANDLE | A-33027 | 29 | BOX WRENCH WILLIAMS #808 | |
| 10 | CLAMP LEVER | A-33971 | | (1 1/4 ACROSS FLATS) | |
| 11 | SOC SET SCREW 1/2-13 x 3/8 LG. | | 30 | HARDENED HEAVY HEX NUT | |
| 12 | BLACK PLASTIC TAPERED HANDLE-- | | | 3/4-10 11 / ACROSS FLATS) | |
| | BALCRANK #PTH-202 | | 31 | WASHER-WESPO #6011 | |
| 13 | WASHER-WESPO #6009 | | 32 | CLAMP STUD | A-33363 |
| 14 | CLAMP BUSHING | B-21466 | 33 | CLAMP PLATE | B-21098 |
| 15 | SPINDLE CLAMPING STUD | A-22813 | 34 | HANDWHEEL | C-33023 |
| 16 | OILER-GITS #533 | | 35 | SHAFT | A-41245 |
| 17 | SPINDLE HOUSING | D-33012 | 36 | HANDLE | 8-41244 |
| 18 | O-RING #330 (21/8 x 21/2 x 3/16) | | 37 | WASHER 1/2 O.D. x 17/64 I.D. x .062 | |
| 19 | SPACER | A-33031 | | STAINLESS STEEL-H.M. HARPER CO. | |
| 20 | RETAINING PLATE | A-33030 | 38 | SOC. HD. CAP SCREW 1/4-28 x 1/2 | |



## GENERAL ASSEMBLY PARTS

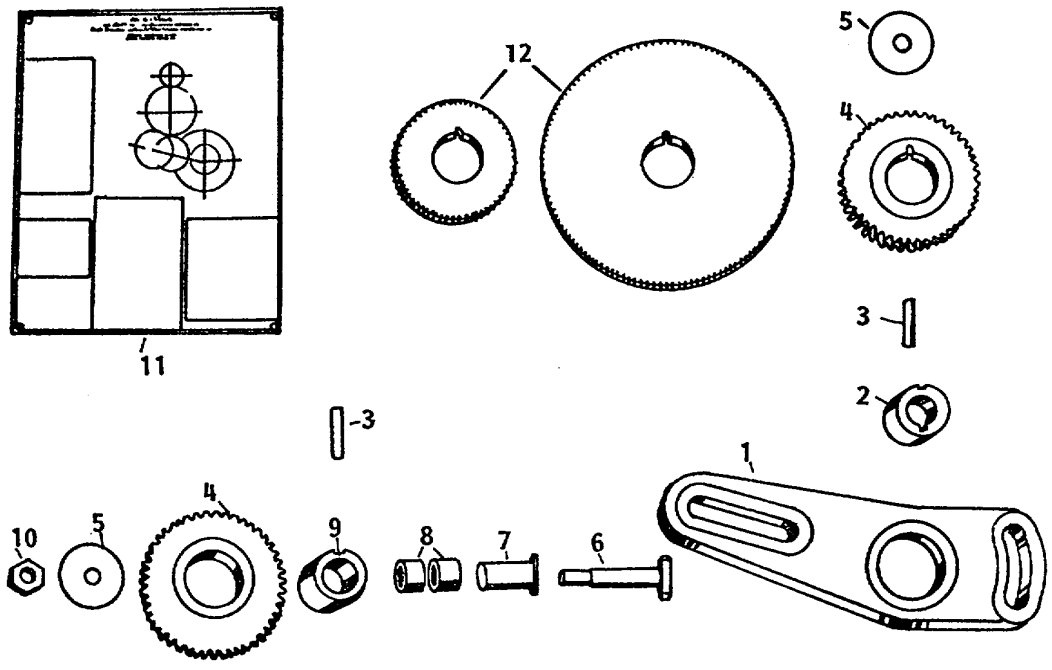
| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | MODEL SIZE NAMEPLATE | A-33993 | 25 | CONTROL BRACKET | B-33067 |
| 2 | SERIAL NAMEPLATE | B-60275 | 26 | HUB | A-21092 |
| 3 | LUBRICATION NAMEPLATE | | 27 | HAND LEVER FOR CONTROL SHAFT | A-33977 |
| | STANDARD LATHE | A-32923 | 28 | BLACK PLASTIC TAPERED HANDLE | |
| | -WITH ONE-SHOT LUBRICATOR | A-32906 | | BALCRANK #PTH - 202 | |
| 4 | "HARDENED BEDWAYS" NAMEPLATE | B-41519 | 29 | HEX. HD. CAP SCREW ¾ - 10 X 1 ½" LG. | |
| 5 | VERTICAL NAMEPLATE | D-41413 | 30 | WASHER | B-33252 |
| 6 | RACK | B-21279 | 31 | MOTOR PLATE | D-33124 |
| 7 | BED END BRACKET | C-33984 | 32 | HEX NUT 5 - 11 | |
| B | GREASE FITTING-KLEENSEAL #5000 | | 33 | PIVOT SCREW | A-31231 |
| 9 | LEADSCREW SHEARPIN | A-21142 | 34 | HEX JAM NUT 1/2 - 13 | |
| 10 | TAPER PIN #1 x 1" LG. | | 35 | PLAIN WASHER #1/2 | |
| 11 | LEADSCREW 1 3/16 DIA. | B-33983 | 36 | HEX NUT 1/2 - 13 | |
| 12 | FEEDSHAFT | B-33484 | 37 | SPLIT LOCKWASHER #1/2 | |
| 13 | CONTROL SHAFT | B-33486 | 38 | ANCHOR FOR MOTOR PLATE | A-33221 |
| 14 | FROST PLUG 2" DIA. | | 39 | HEX HD. BOLT ½ 13 X 2" LG. | |
| 15 | FWD-STOP-REV NAMEPLATE | B-33196 | 40 | FEED BOX TOP COVER | D-33982 |
| 16 | SWITCH BOX | D-33193 | | | |
| 17 | GASKET FOR SWITCH BOX | B-33195 | | NOT SHOWN | |
| 18 | COVER PLATE FOR SWITCH BOX | B-33487 | | BED CASTING | E-33119 |
| 19 | ROTARY PILOT SWITCH-- | | | CHIP TRAY | D-33078 |
| | ALLEN-BRADLEY #804-A3 | | | HEADSTOCK PEDESTAL | D-33116 |
| | (WITHOUT ENCLOSURE, HAND LEVER | | | TAILSTOCK PEDESTAL | D-33135 |
| | AND LEGEND PLATE) | | | | |
| 20 | CONTROL SHAFT SECTOR | B-33197 | | END GUARD | E-33083 |
| 21 | PINION | B-33199 | | HINGE END PLATE | D-33996 |
| 22 | SOC. SET SCREW 5/16-24 x 5/16 LG. | | | CONTROL BOX MOUNTING PLATE: | |
| 23 | SOC. SET SCREW 3/8-24 x 3/8 LG. | | | -STANDARD LATHE | D-33998 |
| 24 | HUB | A-33202 | | -FOR COMBINATION STARTER | D-33132 |



## END GEAR TRAIN PARTS
## FOR CUTTNG METRIC AND SPECIAL THREADS

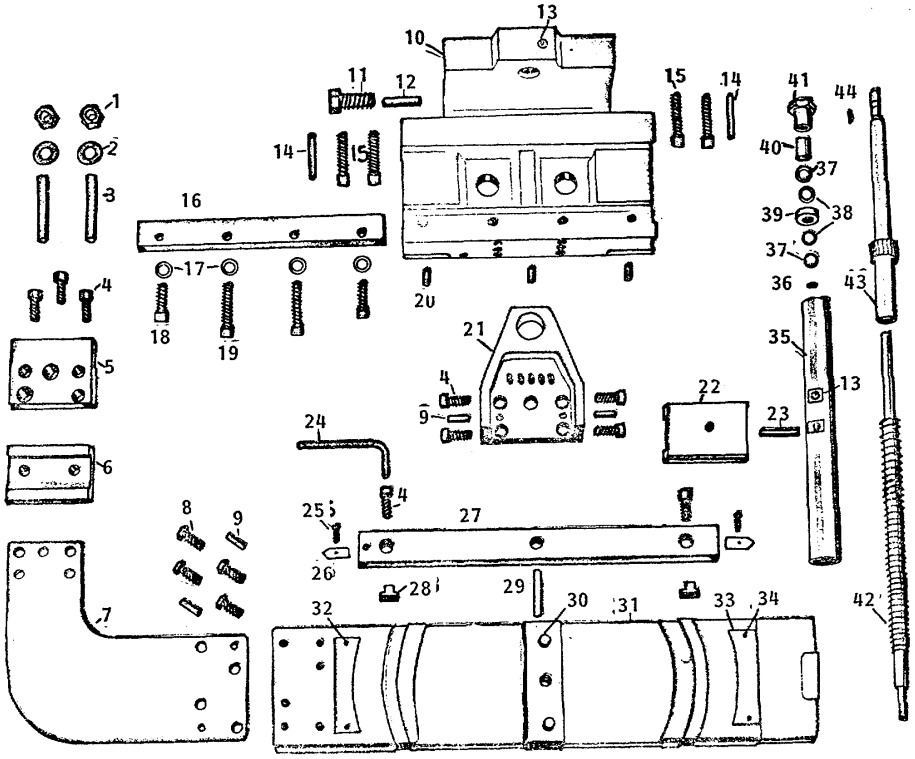
| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | ADJUSTABLE BRACKET | C-21353 | 12 | 70 T. CHANGE GEAR | 22656 |
| 2 | FIXED GEAR HUB | A-21361 | | 74 T. " " | 22657 |
| 3 | KEY 1/4 x 1/4 x 3/8 LG. | | | 75 T. " " | 22658 |
| 4 | 45 TOOTH SPUR GEAR | B-41407 | | 79 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 5/8 LG.)-- | | | 86 T. " " | 22663 |
| | OILITE #AA-83B-25 | | | 88 T. " " | 22664 |
| 9 | IDLER GEAR HUB | A-21357 | | 89 T. " " | 22665 |
| 10 | HEAVY HEX NUT 1/2-13 | | | 91 T. " " | 22666 |
| 11 | NAMEPLATE: | | | 92 T. " " | 22667 |
| | -METRIC THREADS ONLY | B-33990 | | 93 T. " " | 22668 |
| | -METRIC, DIAMETRAL, MODULE AND | | | 95 T. " " | 22681 |
| | SPECIAL THREADS | B-33039 | | 97 T. " " | 22669 |
| 12 | CHANGE GEARS | C-21362 | | 98 T. " " | 22670 |
| | (TWO ONLY SHOWN FOR | | | | |
| | ILLUSTRATION) | | | 100 T. " " | 22682 |
| | 45 T. CHANGE GEAR | 22650 | | 107 T. " " | 22671 |
| | 50 T. " " | 22651 | | 108 T. " " | 22672 |
| | 55 T. " " | 22652 | | 110 T. " " | 22673 |
| | 60 T. " " | 22653 | | 117 T. " " | 22674 |
| | 64 T. " " | 22677 | | 124 T. " " | 22675 |
| | 65 T. " " | 22654 | | 127 T. " " | 22676 |
| | 67 T. " " | 22655 | | | |

NOTE: CHANGE GEARS ARE SUPPLIED WHEN REQUIRED.



## TELESCOPIC TAPER ATTACHMENT PARTS

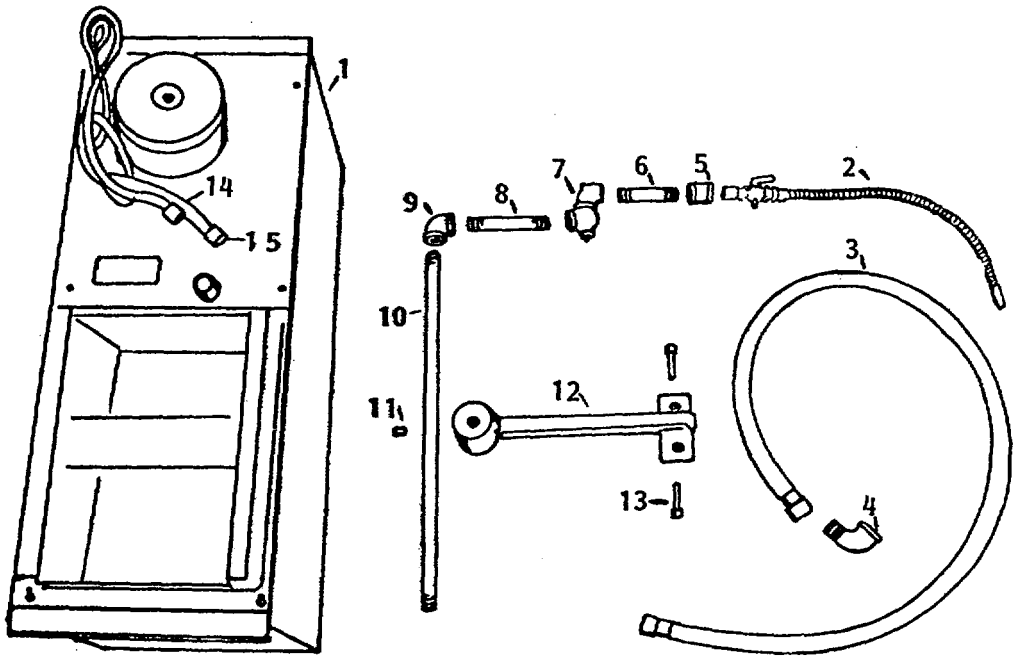
| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | HEAVY HEX NUT 1/2, - 13 | | 27 | SLIDE BAR: | |
| 2 | WASHER - WESPO #6002 | | | -FOR 12" STROKE | C-33306 |
| 3 | MILLED STUD 1/2 - 13 x 3" LG. | | | -FOR 15" STROKE | C-32911 |
| 4 | SOC. HD. CAP SCREW 3/8 - 16 x 1" LG. | | 28 | T-SLOT NUT | A-41353 |
| 5 | BED CLAMP - UPPER | A-33308 | 29 | DOWEL 1/2 DIA. x 2" LG. | |
| 6 | BED CLAMP - LOWER | A-33309 | 30 | OILER-GITS #533 | |
| 7 | BED ANCHOR ARM | C-33307 | 31 | SLIDE PLATE: | |
| 8 | HEX HD. CAP SCREW 3/4 - 16 x 1" LG. | | | -FOR 12" STROKE | D-33302 |
| 9 | DOWEL 5/16 DIA. x 1" LG. | | | -FOR 15" STROKE | D-32912 |
| 10 | MAIN BRACKET | D-33301 | 32 | GRADUATED PLATE-DEGREES | |
| 11 | HEX. HEAD LOCK SCREW | A-33320 | | -FOR 12" STROKE | B-33318 |
| 12 | LOCKING PIN | A-33321 | | -FOR 15" STROKE | B-32910 |
| 13 | OILER - GITS #521 | | 33 | GRADUATED PLATE-TAPER/FOOT: | |
| 14 | PULL DOWEL 3/8 DIA. x 2" LG. | | | -FOR 12" STROKE | B-33317 |
| 15 | SOC. HD. CAP SCREW 3/8- 16 x 2" LG. | | | -FOR 15" STROKE | B-32909 |
| 16 | GIB | B-33305 | 34 | DRIVE SCREW "U" TYPE #4 x 1/4, LG. | |
| 17 | PLAIN WASHER - S.A.E. #3/8 | | 35 | CROSS GUIDE BAR C-33310 | |
| 18 | SOC. HD. CAP SCREW 3/8-24 x 1 ¼" LG. | | 36 | HEAVY HUGLOCK NUT 3/8 - 24 | |
| 19 | SOC. HD. CAP SCREW 3/8-24 x 2" LG. | | 37 | THRUST RACE- | |
| 20 | SOC SET SCREW "NYLOK" | | | TORRINGTON #TRC - 613 | |
| | 3/8 - 16 x 3/4 LG. | | 38 | NEEDLE THRUST BEARING- | |
| 21 | OUTER SUPPORT | C-33303 | | TORRINGTON #NTA - 613 | |
| 22 | SHOE | C-33304 | 39 | BEARING RING A-33312 | |
| 23 | PULL DOWEL 3/8 DIA. x 1 3/4 LG. | | 40 | BOST-BRONZ BEARING #B911-6 | |
| 24 | ALLEN KEY #5/16 | | | (.565 I.D. x .691 O.D. x 3/4) | |
| 25 | SOC. HD. CAP SCREW #10 - 32 x 3/8 LG. | | 41 | BEARING LOCKNUT | B-33311 |
| 26 | POINTER | A-33319 | 42 | CROSS FEED SCREW | B-33313 |
| | | | 43 | CROSS FEED SHAFT | B-33314 |
| | | | 44 | WOODRUFF KEY #6 (5/32 x 3/8) | |



## COOLANT PARTS

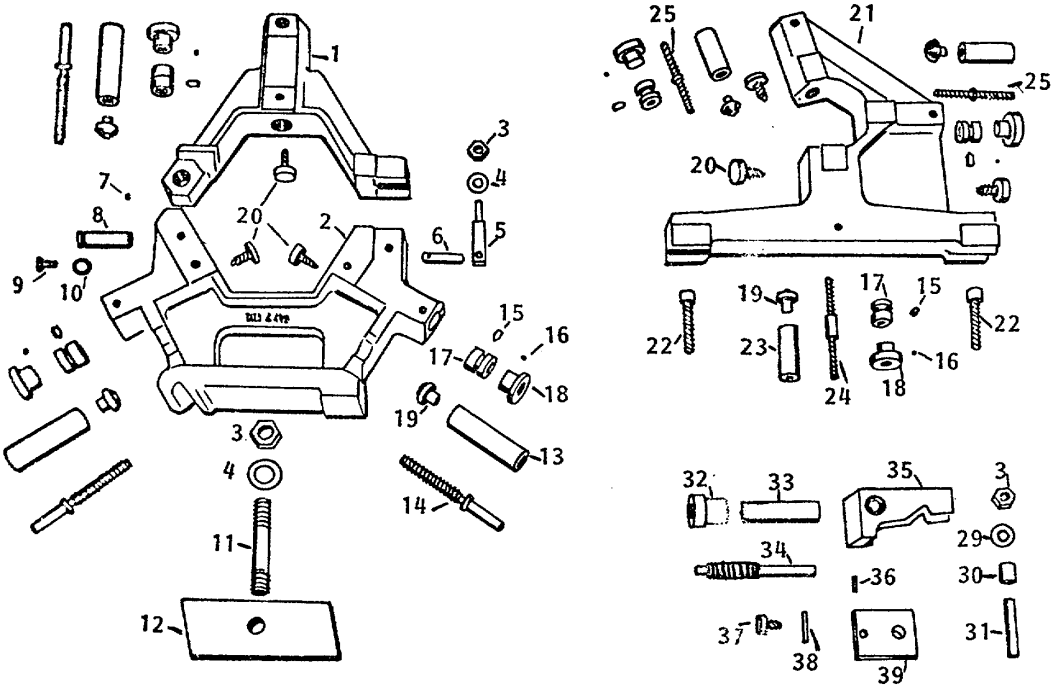
| ITEM | NAME | PART NO. | ITEM | NAME | PART NO. |
|---|---|---|---|---|---|
| 1 | PUMP UNIT--GRAY MILLS #X11 - HR35 - A | | 9 | ELBOW #3/8 x 90° | |
| | | | 10 | PIPE NIPPLE 3/8 x 18" LG. | |
| 2 | NOZZLE WITH SHUT-OFF COCK & REDUCING BUSHING #3/8 x 1/4 (SUPPLIED WITH PUMP UNIT) | | 11 | SOC. SET SCREW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



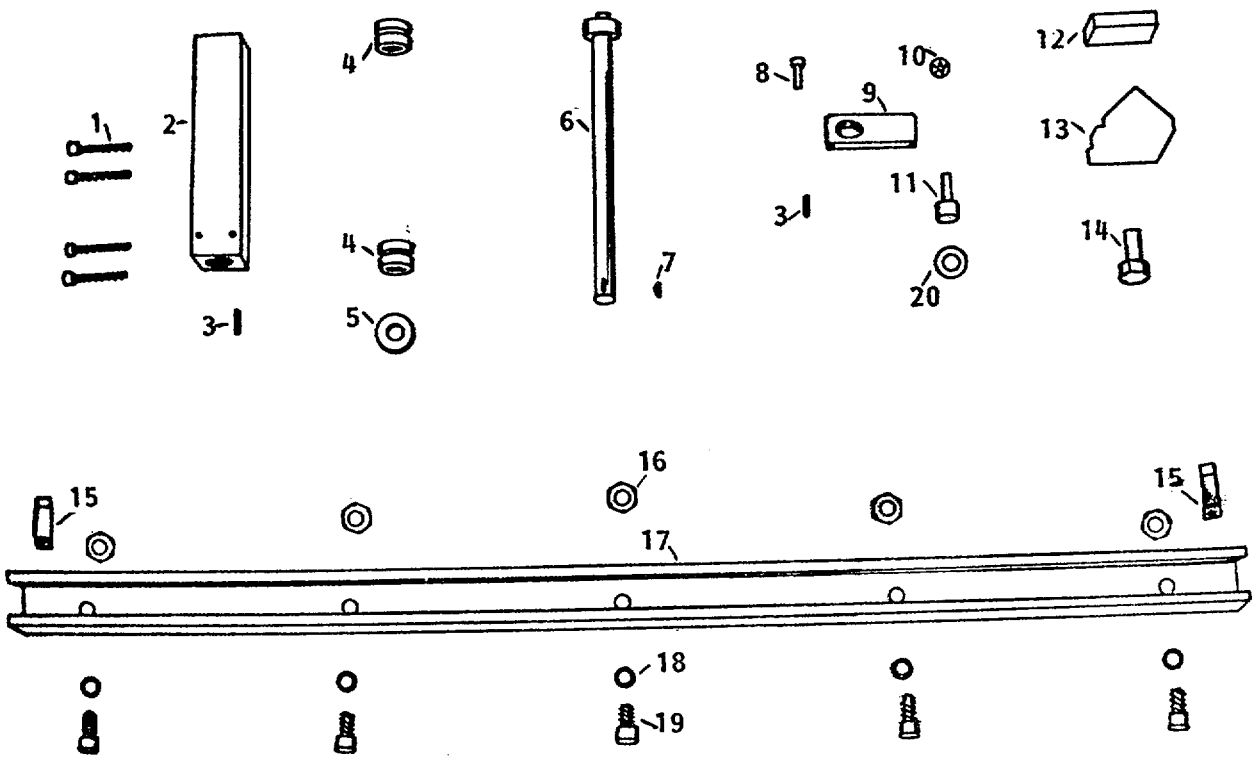
## STEADY REST, FOLLOW REST AND MICROMETER CARRIAGE STOP PARTS

| 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 5/8 LG. | |
| 2 | LOWER CASTING | E-33097 | | CONE POINT (6 REQ'D.} | |
| 3 | HARDENED HEAVY HEX. NUT 1/2 - 13, | | 16 | SOC. SET SCREW 1/4 -28 x {3 REQ'D} | |
| | 7/8 ACROSS FLATS (2 REQ'D) | | 17 | BUSHING (3 REQ'D.) A-33095 | |
| 4 | WASHER-WESPO #6009 (2 REQ'D. | | 18 | KNOB (3 REQ'D.) | A-21120 |
| 5 | EYE BOLT | A-41488 | 19 | BUTTON FOR SLEEVE (3 REQ'D.) | A-33096 |
| 6 | PIVOT PIN | A-21392 | 20 | CLAMP SCREW (3 REQ'D.) | A-21292 |
| 7 | SOC. SET SCREW 1/4 - 20 x 3/8 LG. | | 21 | FOLLOW REST CASTING | D-33326 |
| 8 | HINGE PIN A-41489 | | 22 | SOC. HD. CAP SCREW 1/2 -13 x 3 1/4 LG. | |
| 9 | HEX. HD. CAP SCREW 3/8 -16 x 3/4 LG. | | 23 | SLEEVE (3 REQ'D.) | A-21301 |
| 10 | WASHER-WESPO #6001 | | 24 | ADJUSTING SCREW-LONG | A-33098 |
| 11 | MILLED STUD 1/2 -13 x 4 LG, | | 25 | ADJUSTING SCREW (2 REQ'D.) | A-21302 |
| | | | **MICROMETER CARRIAGE STOP-22187** | | |
| 12 | CLAMP BAR | A-21288 | 3 | HARDENED HEAVY HEX. NUT 1/2-13 | |
| 13 | SLEEVE (3 REQ'D.) | A-41487 | 29 | WASHER-WESPO #6002 | |
| 14 | ADJUSTING SCREW | A-41483 | 30 | COLLAR | A-22819 |
| 15 | SOC. SET SCREW 3/8 - 16 x 5/8 LG | | 31 | MILLED STUD 1/2 - 13 x 3 1/2 LG. | |
| | CONE POINT (3 REQ'D.) | | 32 | KNOB | A-21396 |
| 16 | SOC. SET SCREW 1/4 - 28 x 1/4 (3 REQ'D.) | | 33 | GRADUATED SLEEVE | B-41373 |
| 17 | BUSHING (3 REQ'D.) | A-41486 | 34 | SCREWED STEM | A-21397 |
| 18 | KNOB (3 REQ'D.) | A-41485 | 35 | BODY | B-22818 |
| 19 | BUTTON FOR SLEEVE 13 REQ'D.I | A-41484 | 36 | DOWEL 1/4 DIA. x 3/4 LG. | |
| 20 | CLAMP SCREW {3 REQ'D.} | A-21292 | 37 | CLAMP SCREW | A-30586 |
| | | | 38 | TAPER PIN #4 1 1/2 LG | |
| | | | 39 | CLAMP | A-41372 |



## 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.) | 11CAM FO | LLOWER-TORRINGTON #CRS- 12 | | |
| | | | 12 | CLAMP NUT | A-33356 |
| 2 | STOP CONTROL BLOCK | B-33351 | 13 | TRIP DOG | B-33354 |
| 3 | HARDENED DOWEL 3/16 DIA. x 3/4LG. (2 REQ'D.) | | 14 | HEAVY HEX BOLT | A-21217 |
| | | | 15 | END CAP-CANTRUSS #RR2E (2 REQ'D.) | |
| 4 | ROLLER BEARING-TORRINGTON #HJ - 101812 (2 REQ'D.) | | 16 | HEX. NUT % -16 (5 REQ'D. FOR 30" BED-8 FOR 54") | |
| 5 | OIL SEAL (5/8 I.D. x 1 1/8 O.D. x ¼) CHICAGO RAWHIDE STOCK NO. 6225 | | 17 | PAIL FOR 30" BED | C-33353 |
| | | | | RAIL FOR 54" BED | C-33347 |
| 6 | ECCENTRIC SHAFT B-33352 | | 18 | SPLIT LOCK WASHER #3/8 (5 REQ'D. FOR 30" BED-8 FOR 54") | |
| 7 | WOODRUFF KEY #3 (1/8 x 1/2 DIA.) | | | | |
| 8 | SOC. HD. CAP SCREW 1/4 - 20 x 1/4 | | 19 | SOC. HD. CAP SCREW 3/8 - 16 x 3/4 LG. (5 REQ'D. FOR 30" BED-8 FOR 54") | |
| 9 | TRIM ARM B-41672 | | | | |
| 10 | HUGLOCK NUT 3/8 - 24 15/16 THICK) | | 20 | SLEEVE FOR CAM FOLLOWER | A-32949 |



**By Order of the Secretary of the Army:**

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

**Official:**

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

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## THE METRIC SYSTEM AND EQUIVALENTS

### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

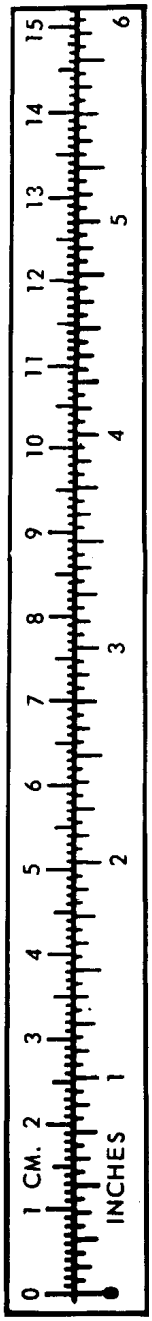
### TEMPERATURE

5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 (°C + 32) = F°

### APPROXIMATE CONVERSION FACTORS

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Inches | Centimeters | 2.540 |
| Feet | Meters | 0.305 |
| Yards | Meters | 0.914 |
| Miles | Kilometers | 1.609 |
| Square Inches | Square Centimeters | 6.451 |
| Square Feet | Square Meters | 0.093 |
| Square Yards | Square Meters | 0.836 |
| Square Miles | Square Kilometers | 2.590 |
| Acres | Square Hectometers | 0.405 |
| Cubic Feet | Cubic Meters | 0.028 |
| Cubic Yards | Cubic Meters | 0.765 |
| Fluid Ounces | Milliliters | 29.573 |
| Pints | Liters | 0.473 |
| Quarts | Liters | 0.946 |
| Gallons | Liters | 3.785 |
| Ounces | Grams | 28.349 |
| Pounds | Kilograms | 0.454 |
| Short Tons | Metric Tons | 0.907 |
| Pound-Feet | Newton-Meters | 1.356 |
| Pounds per Square Inch | Kilopascals | 6.895 |
| Miles per Gallon | Kilometers per Liter | 0.425 |
| Miles per Hour | Kilometers per Hour | 1.609 |

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Centimeters | Inches | 0.394 |
| Meters | Feet | 3.280 |
| Meters | Yards | 1.094 |
| Kilometers | Miles | 0.621 |
| Square Centimeters | Square Inches | 0.155 |
| Square Meters | Square Feet | 10.764 |
| Square Meters | Square Yards | 1.196 |
| Square Kilometers | Square Miles | 0.386 |
| Square Hectometers | Acres | 2.471 |
| Cubic Meters | Cubic Feet | 35.315 |
| Cubic Meters | Cubic Yards | 1.308 |
| Milliliters | Fluid Ounces | 0.034 |
| Liters | Pints | 2.113 |
| Liters | Quarts | 1.057 |
| Liters | Gallons | 0.264 |
| Grams | Ounces | 0.035 |
| Kilograms | Pounds | 2.205 |
| Metric Tons | Short Tons | 1.102 |
| Newton-Meters | Pound-Feet | 0.738 |
| Kilopascals | Pounds per Square Inch | 0.145 |
| Kilometers per Liter | Miles per Gallon | 2.354 |
| Kilometers per Hour | Miles per Hour | 0.621 |



**TM 9-3416-236-14&P LATHE ENGINE (NSN 3416-00-250-6550) 1982**

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