OPERATOR'S MANUAL

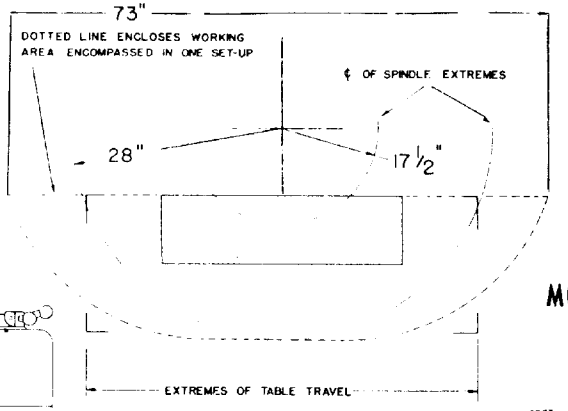
Bridgeport MACHINES, A Textron company

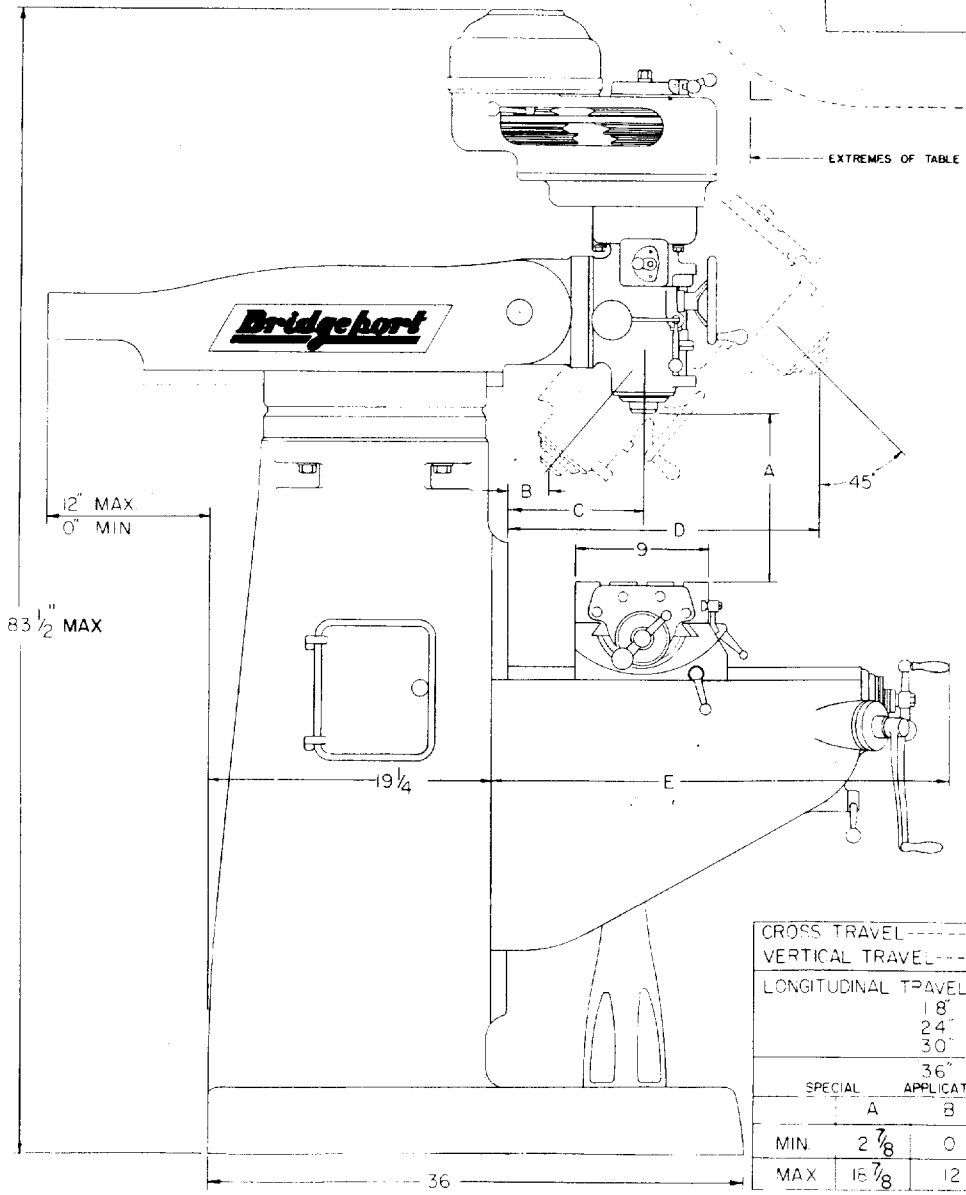
BRIDGEPORT, CONNECTICUT, U.S.A.

INDEX

	Page
Dimensional Drawing	1
Floor Plan	2
Long and Cross Feed Assembly	3
Uncrating	4
Shortages	4
Cleaning	4
Placing on Solid Foundation	4
Leveling Machines	4
Mounting Head on Overarm Adapter	5
Handles	5
Inspection	5
Alignment of Head	5
Lubrication	6
Lubrication Drawing	6
Adjustment of Table Gib	7
Adjustment of Saddle and Knee Gibs	7
Clamping Table, Saddle and Knee	8
Removing of Table	8
Removing of Saddle	8
Power Feed Attachment	9
Instructions for Installing Power Feed	9 & 10
Installation and Use of Measuring Attachment	11 & 12
Descriptive Photograph of Model "J" Attachment	13
Mounting Motor on Attachment	14
Placing and Adjusting Belts	14
Operating Instruction of "J" Attachment	14
Operating Instruction of "J" Attachment	15
Operating Instruction of "J" Attachment	16
Operating Instruction of "J" Attachment	17
General Speed Recommendations	18
Table of Cutting Speeds and Feeds	18
Parts List and Drawing on BR Turret Milling Machine	19 & 19A
Drawing and Parts list on "J" Attachment	20 & 20A
Parts Drawing and List on Power Feed Attachments	21
Parts Drawing and List on Model "M" Attachments	22
Parts Drawing and List on Shaping Attachment	23 & 24
Parts Drawing and List on Cherrying Attachment	25 & 26
Parts Drawing and List on Model "R" Attachment	27
Parts List and Drawing on Model "C" Attachment	28
Optical Measuring System	29
Optical Parts Drawing	30
Optical Parts List	31
Assembly Instructions For Mounting Varidrive Attachment to Ram Adapter	32
Lubrication	32
Operating Instructions	32
Spindle Brake	32
High-Low Range Switch	32
Hi-Neutral-Lo Lever	33
Hi Position	33
Power Feed Transmission Engagement Crank	33
Quill Feed Selector	33
Feed Reversing Knob	33
Manual Feed	33
Feed Control Lever	34
Quill Feed Handle	34
Quill Stop	34
Micrometer Adjusting Nut	34
Quill Lock	34
Indicator Mounting Rod	34
Position of Ram	34
Operating Instructions	35
Removing the Motor	35
Changing Vari-Drive Belt	36
Changing Timing Belt	37
Parts List	38
2J — 200 Drawing	39

Dimensional





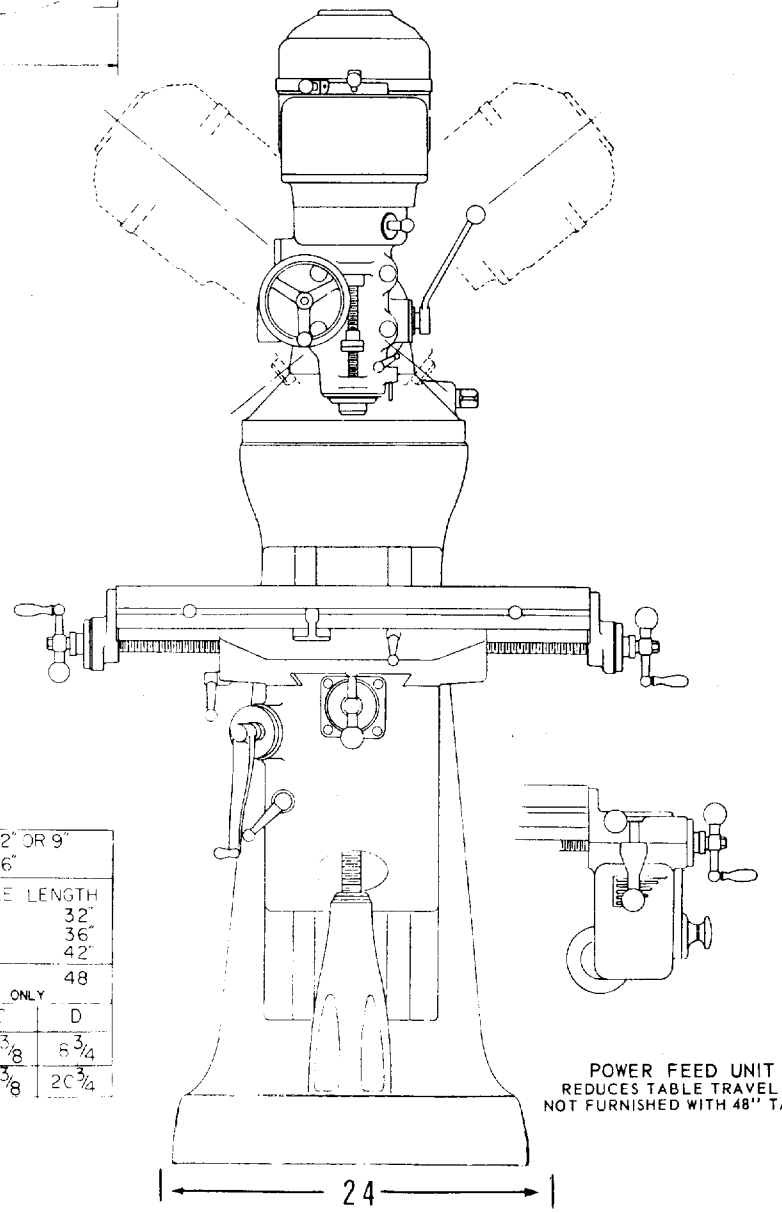
CROSS TRAVEL	12" OR 9"
VERTICAL TRAVEL	16"
LONGITUDINAL TRAVEL	TABLE LENGTH
18"	32"
24"	36"
30"	42"
36"	48

SPECIAL APPLICATIONS ONLY

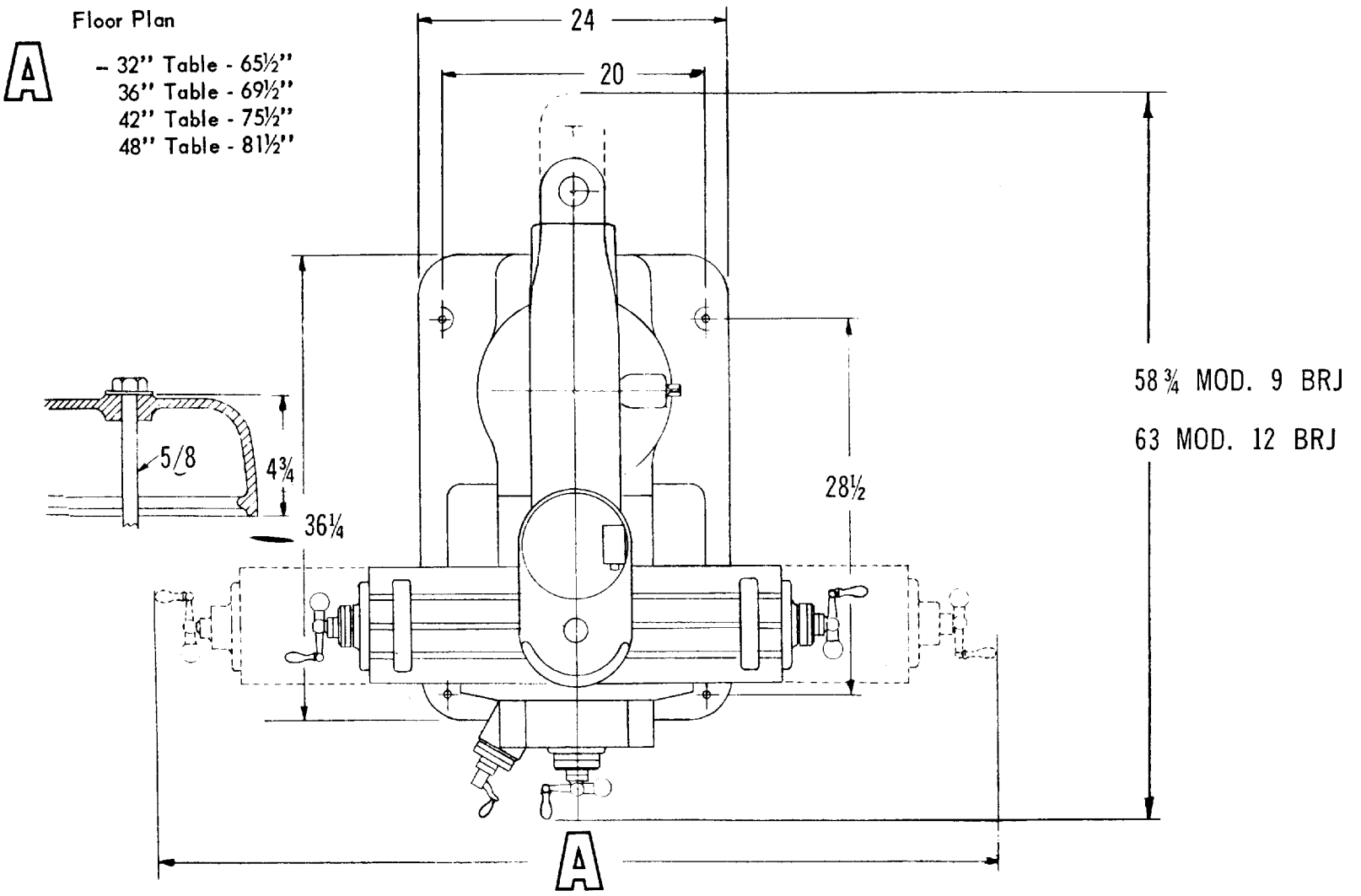
	A	B	C	D
MIN.	2 7/8	0	6 3/8	6 3/4
MAX	16 7/8	12	13 3/8	20 3/4

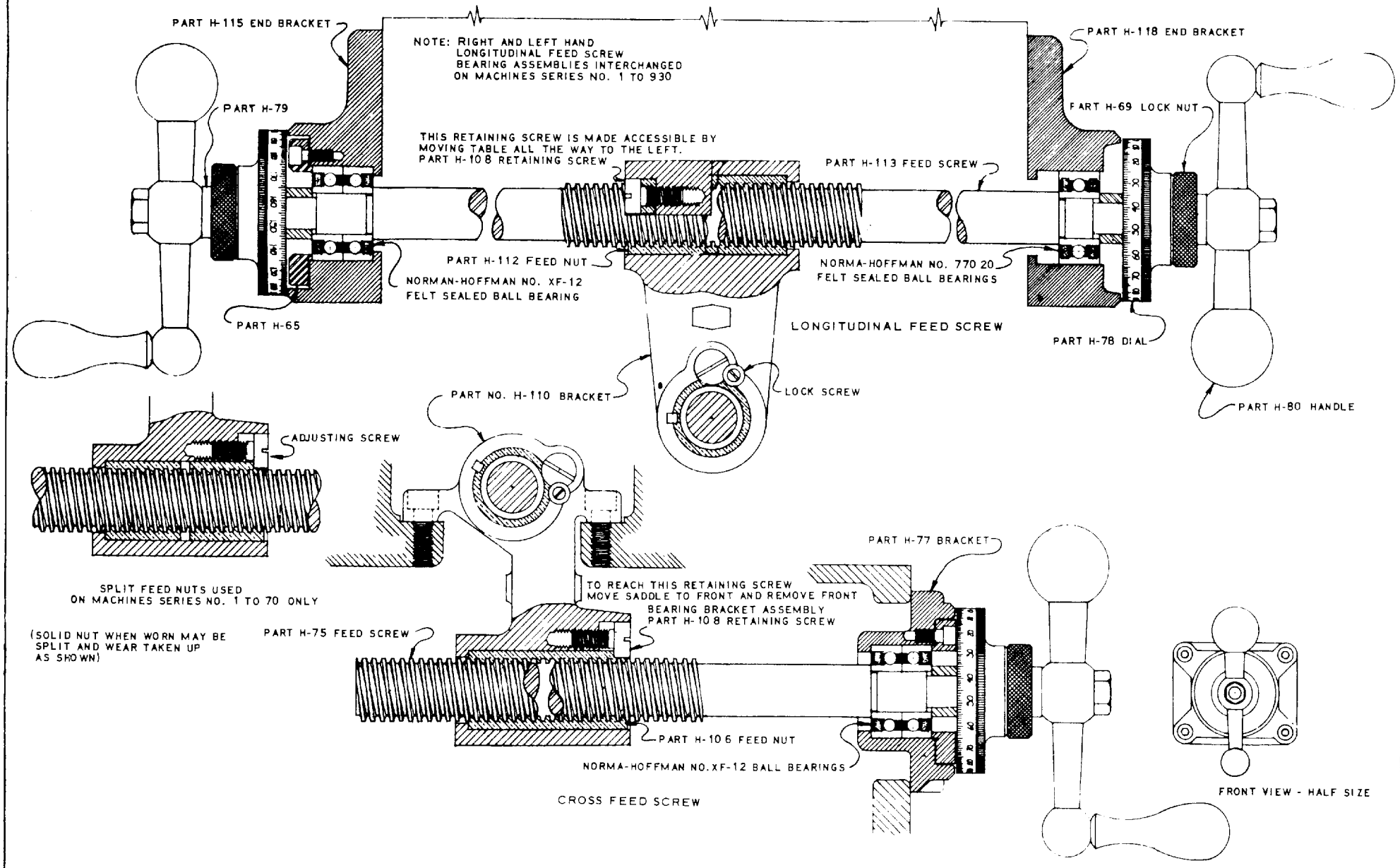
	E
9" KNEE	27 1/2
12" KNEE	31 1/2

TURRET MILLER
with
MODEL "J" MILLING ATTACHMENT



POWER FEED UNIT
REDUCES TABLE TRAVEL 3½
NOT FURNISHED WITH 48" TABLE


Floor Plan
A
– 32" Table - 65½"
36" Table - 69½"
42" Table - 75½"
48" Table - 81½"
24
20
5/8
4¾
36¼
28½
58¾ MOD. 9 BRJ
63 MOD. 12 BRJ
A



LONGITUDINAL AND CROSS FEED ASSEMBLY
BRIDGEPORT TURRET MILLING MACHINE

UNCRATING

Carefully remove protective crating and skids so that the machine and parts are not marred, scratched or impaired. In the event of damage in transit, communicate at once with our representative and the transportation company making delivery.

Machine should be lifted by placing a sling under overarm or by putting an eye bolt in tapped hole on top of overarm.

SHORTAGES

Check shipment carefully, against the itemized packing list which is included in the parts box. In case of shortages, report them immediately to the representative from whom the machine was purchased, indicating parts not received which have been checked on the packing list.

CLEANING

Thoroughly clean slush from machine with gasoline or kerosene. Do not move the table, saddle, knee or any movable part until all ways have been well cleaned and lubricated. Then, by hand, move table, saddle and knee to limit stop in one direction. Clean and lubricate exposed ways and then move each unit to the opposite limit stop and similarily clean and lubricate the exposed ways. Loosen bolts to unlock overarm, and move it forward and backward to the full length in order to clean and lubricate.

PLACING ON SOLID FOUNDATION

The column and base are cast in one piece. When setting machine on a concrete foundation, it is advisable to use a little grout (thin mortar) to take care of any unevenness in the concrete as well as to provide a solid foundation at all points.

When setting machine on a floor that has any surface irregularities, shims should be used to correct this condition to the greatest extent possible.

LEVELING MACHINES

Set machines by leveling the work table lengthwise and crosswise with a precision instrument.

MOUNTING HEAD ON OVERARM ADAPTER

The face on flange or adapter should be thoroughly cleaned as this aligns milling head square with table working surface. Then clean mounting surface of head carefully. When bolting the head to the adapter or overarm, tighten nuts evenly, using normal pressure. Care should be taken to avoid excessive pressure since this will cause distortion in the quill.

HANDLES

When crating, the three ball crank handles are turned facing each other. The handles should be reversed.

LUBRICATION

Do not operate machine until properly lubricated. Follow the instructions given in Dwg. 4, page 6.

INSPECTION

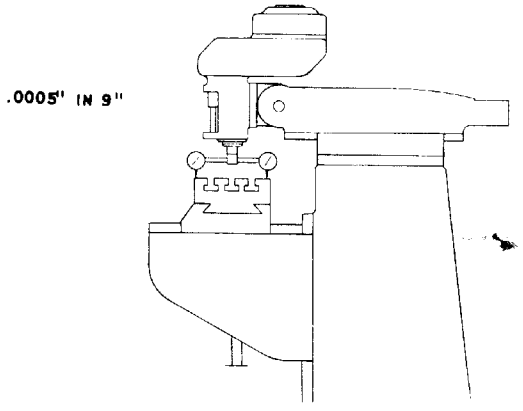
Machine is carefully inspected and lined up before it leaves our factory. Sketch # 1 and 2 shows the way your machine is lined up.

ALIGNMENT OF HEAD

In case of precision boring or work of that nature, where it is necessary to have head perfectly square with the table, use method prescribed below. For normal milling, graduations on turret and head are close enough. To set head perfectly square with table, Sketch #1. This may be done with head and adapter on overarm, by adjusting adapter through worm gear on adapter. Loosen three binding bolts but leave drag on same for fine adjustment. Mount indicator in spindle nose as shown in Sketch #2 and 2, and indicate parallel.

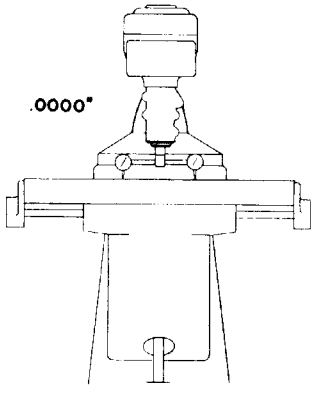
Note: When indicating as in Sketch 1, it should be noted that the table is fitted to be slightly high in front, usually about .0005.

TABLE SQUARE WITH SPINDLE THRU TRANSVERSE AXIS



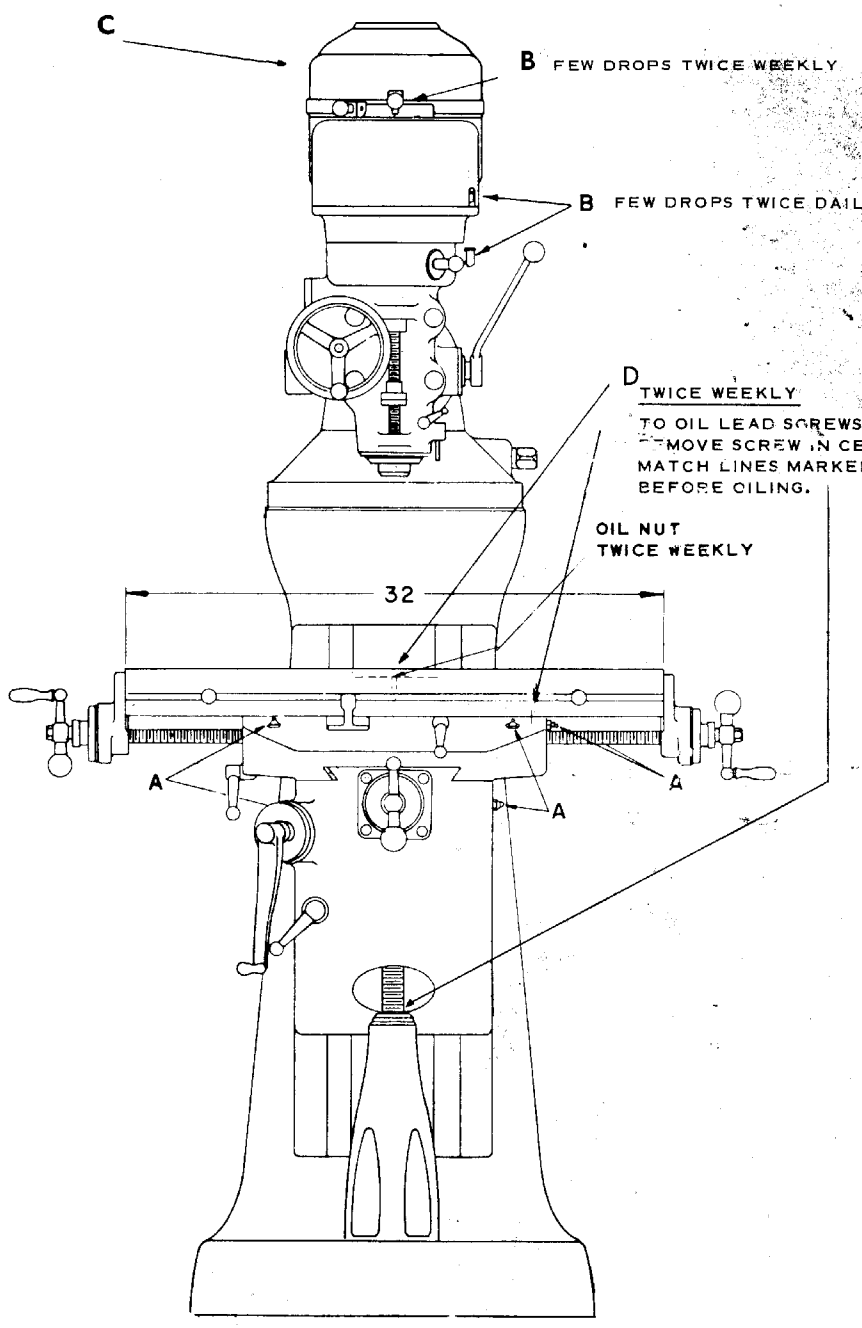
Sketch #1

TABLE SQUARE WITH SPINDLE THRU LONGITUDINAL AXIS



Sketch #2

RECOMMENDED LUBRICATION FOR THE BRIDGEPORT TURRET MILLING MACHINE



A. Way Surfaces
"Sunoco" Waylube #80 or equivalent
} WEEKLY

B. Milling Heads (Spindle Bearings)
S.A.E. 10 or 10W Light Oil

C. Motors are greased for life of bearings
For further instructions refer to motor manufacturer's instruction book

D. Lead Screws
Shell Carnea Oil 41
Socony Gargoyle Vactra Oil No. 2

ATTACHMENTS: POWER FEED
Shell Carnea Oil 33
Socony Gargoyle Vactra Oil (Heavy Medium)

SHAPING ATTACHMENT
Shell Nassa Oil J78 or K79
Socony Gargoyle Vactra Oil (Heavy Medium)

SHAPING ATTACHMENT (Worm drive)
Shell Nassa Oil J78 or K79
Socony Cylinder Oil 600W

ADJUSTMENT OF TABLE GIB

The table is provided with a full length tapered gib in the saddle, with an adjusting screw on the left side. To take up gib, tighten large screw slightly and repeat until a slight drag is felt when moving the table by hand. (Sketch 3)

Sketch #3

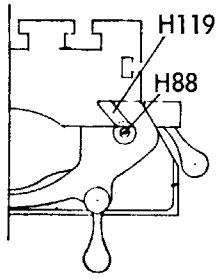
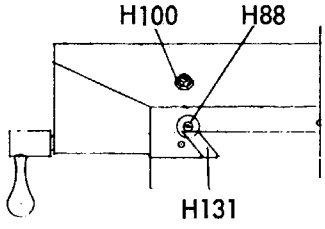


Table-saddle gib

ADJUSTMENT OF SADDLE AND KNEE GIBS.

A tapered gib is used for adjusting the saddle bearing on the knee. This forms a guide for the saddle. To tighten gib same principal as described above is used; however, chip wiper has to be removed first. (Sketch 4)

Sketch #4

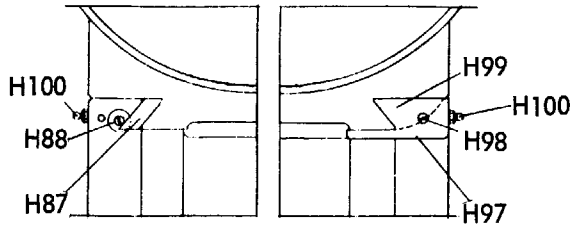


Saddle-knee gib

ADJUSTMENT OF KNEE GIB

Remove chip wiper and adjust screw until smooth movement is attained. (Sketch 5)

Sketch #5

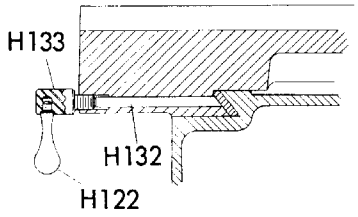


Knee-Column gib

CLAMPING TABLE, SADDLE AND KNEE

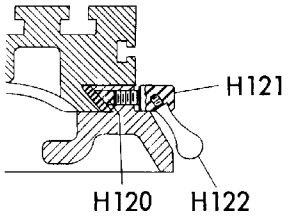
When milling with longitudinal table feed only, it is advisable to clamp the knee to the column and the saddle to the knee to add rigidity to these members and provide for heavier cuts with a minimum of vibration. The saddle locking lever is located on the left-hand side of saddle. (Sketch 6) Excessive pressure can cause slight table bind. Use moderate clamping pressure, as this will hold saddle sufficently.

Sketch #6



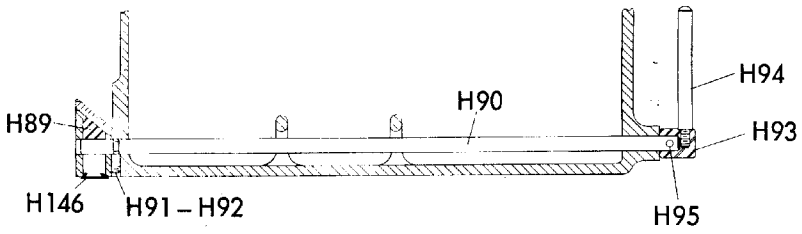
The table clamping lever is located on front of saddle and should always be clamped when longitudinal movement is not required. (Sketch 7)

Skerch #7



The knee clamping lever is at the left side of the knee and should be drawn upward to clamp the knee. (Sketch 8) This is only a tension brake and will not lock the knee completely. Leave clamped at all times unless using knee in operation.

Sketch #8



REMOVING OF TABLE

Remove as follows: Ball crank handles, dial holders, bearing brackets. Screw will then turn all the way so that it can be removed. When this is accomplished, the table can easily be taken off merely by sliding from saddle.

REMOVING OF SADDLE

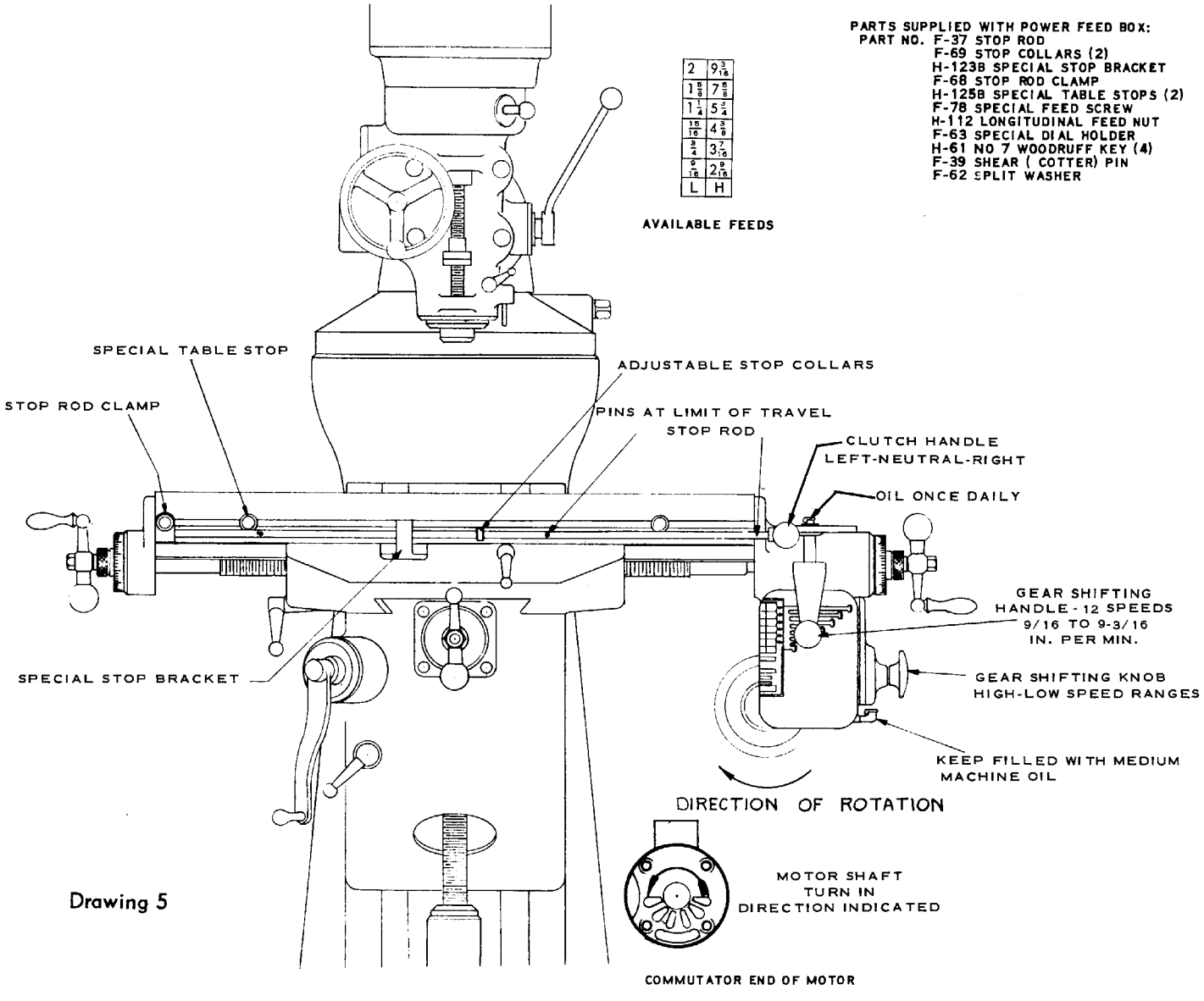
Follows along the same lines as removing table; however, it is necessary to remove entire front bracket assembly completely. Then remove nut bracket which has become accessible after table has been removed. See pages 9 and 10, Drawing 5 and 6.

POWER FEED ATTACHMENT

The feed box is equipped with an overload release. If the table stops during operation and a series of clicks is heard, feed is overloaded. When load is relieved, power feed will resume operation. If the overload clutch jams, the 1/8" shearing pin (Drawing 5) will break. This will prevent damage to the power feed box.

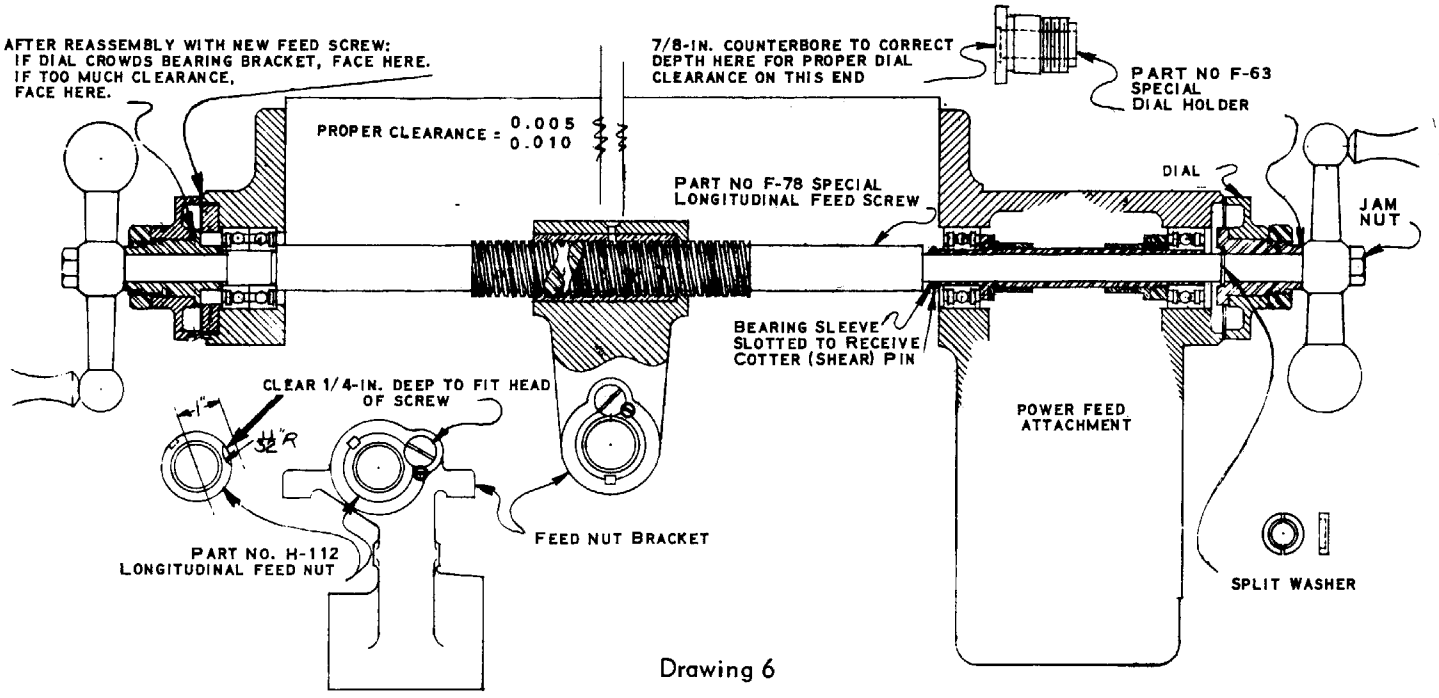
INSTRUCTIONS FOR INSTALLING POWER FEED IN FIELD

First remove left handle, lock nut, dial, and end bracket. Then remove right handle and also right bearing and bracket. The next step is to remove retaining screw (see Drawing 6) after lock screw has been taken out. The screw and nut will then slide out. This procedure is reversed for installing power feed screw and nut. Power feed unit is easily installed and needs little explanation. Do not neglect to put Shear Pin in Place. (Drawing #5).



Drawing 5

LONGITUDINAL FEED SCREW ASSEMBLY WITH POWER FEED



Drawing 6

REMOVING REGULAR SCREW

Remove (left side) bracket - (the 1/2" 20 nut, dial holder and nut, (4) 3/8 16 x 1" cap screws, and H-115 bracket and bearing by tapping with plastic hammer). Remove (right side) bracket - using same procedure. Remove 8/32" locking screw from feed nut bracket. Also remove 5/16" 18 binding screw. Pull, to remove lead screw and lead nut from lead screw bracket.

INSTALLING POWER FEED

Move table to right side, half way. Insert power feed lead screw and nut into bracket from left side; long end of screw should be on right side.

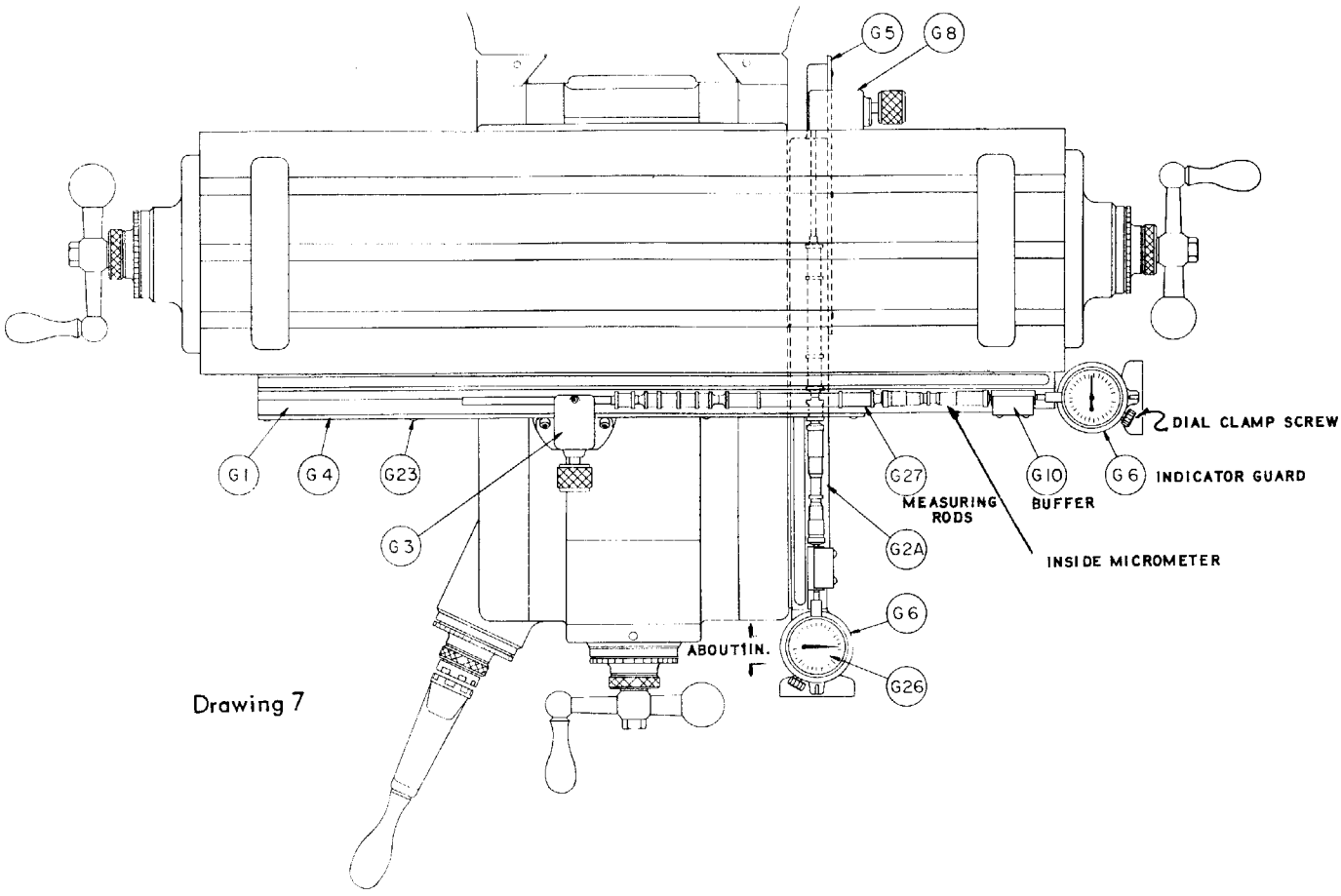
Mark with scriber on bushing where binding screw goes; remove screw and nut from bracket. Remove the screw from the nut. File relief flat on nut to receive bidning screw. (Make certain flat is not filed too deep.) Insert screw and nut into bracket with binding screw and locking screw. Reassemble left hand bracket and dial holder complete. Mount power feed box on right with dowel pins and 3/8" cap screws (3). Insert split washer into groove in lead screw. Insert Woodruff keys. Push power feed dial holder onto screw. (Make sure split washer does not fall out.)

Assemble dial and nut onto dial holder. Insert cotter pin through hole in lead screw at back of power feed box. If dials drag, remove some stock from outside rib. If too much clearance, remove stock from inside rib. Remove door and fill with oil to height of oiler.

Assemble stop rod as illustrated. Drill 3/32" hole into stop rod to receive 3/32" pins which limit the travel of the power feed. Locate these by cranking table to each extreme travel and locate pin to kick off feed rod about 1/4" before extreme travel.

INSTALLING MEASURING ATTACHMENT

For locating holes to greater accuracy on the Bridgeport Turret Milling Machine.



Drawing 7

INSTALLING MEASURING SYSTEM

I

Install knee trough in counterbored holes on right hand side of knee. Indicate from dovetail on knee for parallelism within .003 using 5/8 rod in trough – Indicate top and side. Bring saddle as far front as possible. Mount saddle bracket into trough with rolls on spindle of bracket Center rolls in trough and scribe holes in saddle. Drill 5/16 hole 1/2" deep (Caution on depth; do not drill into dovetail) Use 3/8-16 Tap. Mount Bracket with 3/8-16 x 1 1/2 Cap screw. Caution: Saddle and table bracket alignment with trough is essential for good operation.

II

TABLE TROUGH

Remove table stops and stop bracket from front of table. Remove table lock bolt and handle. (Reposition handle after trough is installed by facing end of lock bolt.

Mount table trough with tee nuts into tee slot on front of table. Indicate from top of table for parallelism - within .003 - same as cross feed trough.

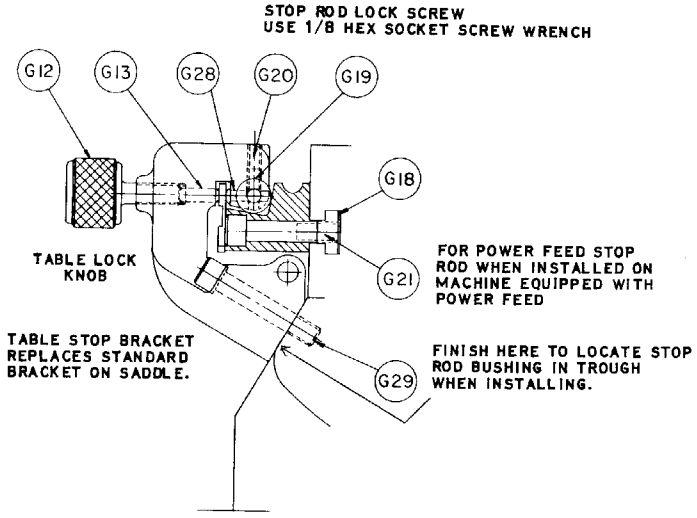
With rolls on spindle of table stop bracket, center rolls into trough and secure with 3/8-16 x 2" cap screw. Adjustment may be made by filing bottom of bracket or shimming if necessary.

Locking table on saddle with table lock knobs (Reed clamp on troughs) shouldn't disturb indicator needle more than .0001 if brackets are aligned properly.

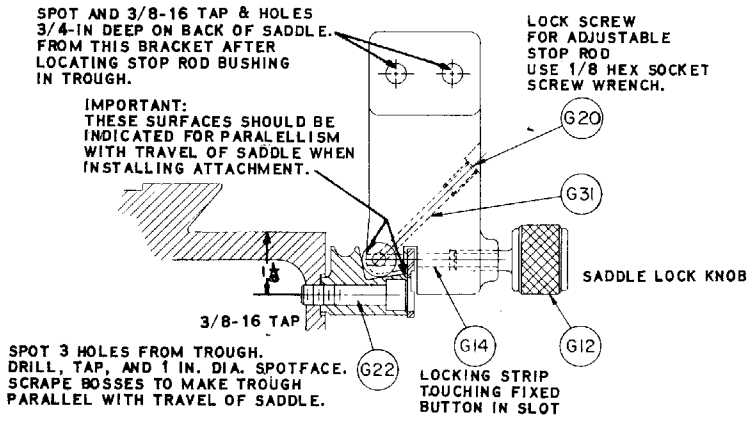
USING MEASURING ATTACHMENT

Any hole may be located by two dimensions at right angles. The table and saddle are located separately by combinations of positive measuring instruments consisting of measuring rods for even inches, an inside micrometer for fractions, and a dial indicator reading to one ten-thousandth. The "zero" point from which other dimensions are taken is established for each slide after locating the first hole and is not changed until the job is finished. Other holes to be bored are located from these two "zero" points by measurements at right angles. The measuring rods required are added, and the inside micrometers set and locked at the proper readings. The table and saddle are then carefully positioned with the dial indicators and clamped in place. After checking indicator readings, the hole is ready to be bored.

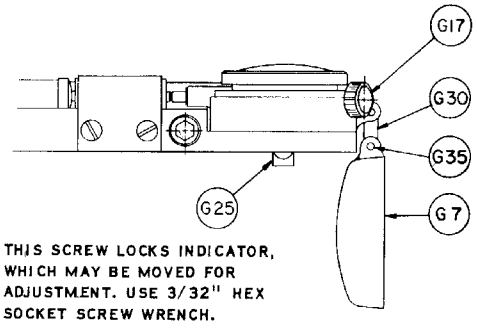
CAUTION: Make certain that the head is indicated properly so that the head is absolutely square with the table.



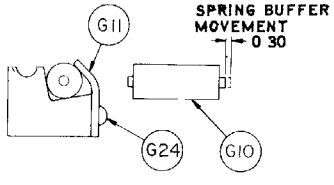
Sketch #9



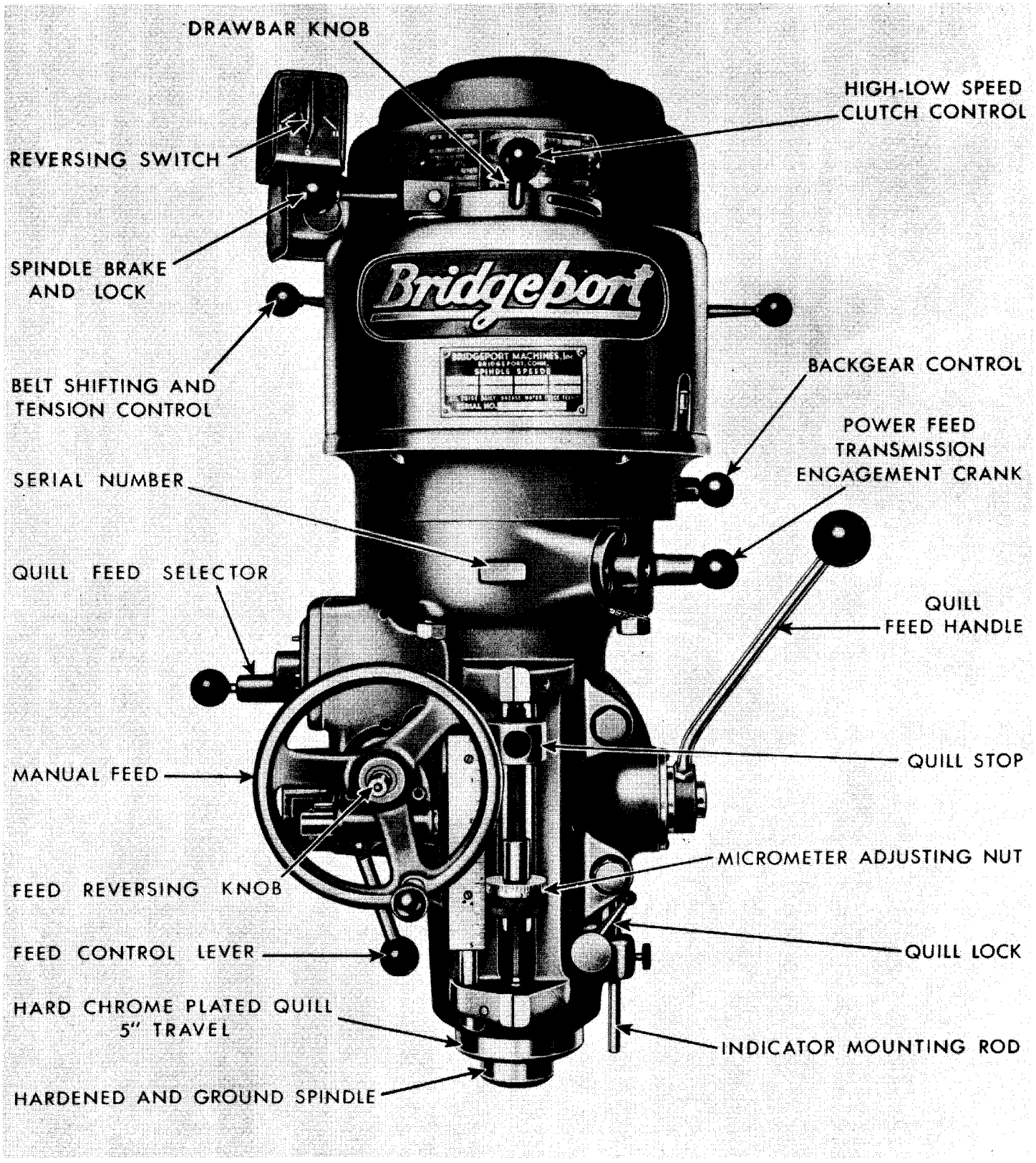
Sketch # 10



Sketch # 11



Sketch # 12


DRAWBAR KNOB
HIGH-LOW SPEED CLUTCH CONTROL
REVERSING SWITCH
SPINDLE BRAKE AND LOCK
BELT SHIFTING AND TENSION CONTROL
BACKGEAR CONTROL
POWER FEED TRANSMISSION ENGAGEMENT CRANK
SERIAL NUMBER
QUILL FEED SELECTOR
QUILL FEED HANDLE
QUILL STOP
MANUAL FEED
MICROMETER ADJUSTING NUT
FEED REVERSING KNOB
FEED CONTROL LEVER
QUILL LOCK
HARD CHROME PLATED QUILL 5" TRAVEL
INDICATOR MOUNTING ROD
HARDENED AND GROUND SPINDLE
Bridgeport

MOUNTING MOTOR ON ATTACHMENT

Place belt over bottom step of spindle pulley, then place motor in housing and lower to place, switch being on left hand side.

PLACING AND ADJUSTING BELTS

Release lock nut handle which is the handle on right of belt housing and also handle on left side and adjust V belts to proper driving tension, then tighten both motor clamping handles.

MACHINE IS READY TO OPERATE

If quill and head are to be used in stationary position, quill lock should be applied. Micrometer depth stop scale is graduated in 20ths of an inch, pitch is .050 and nut is graduated in thousands. By utilizing these graduations it is possible to work very accurately as far as different depths are concerned. Micrometer nut when in position is locked securely by tightening micrometer lock nut.

OPERATING INSTRUCTIONS

When tightening or loosening the draw bar it is necessary to lock the spindle. To accomplish this, use spindle brake and lock which is located at top of belt housing, turning it either to the right or left until it binds, then raise handle.

Drawbar has 7/16-20 right hand thread and should be tightened with normal amount of pressure using wrench furnished with machine. To loosen collet back off drawbar and if collet does not open immediately give knob on top of drawbar a slight tap. Spindle has non sticking taper and collets should release readily.

SPINDLE BRAKE

Lever can be moved in either direction to stop spindle; however, when locking spindle, lever should be moved to right or left and then raised.

CAUTION: Be certain that the spindle brake is released before starting the motor. This is important as the motor can be damaged if switch is left on with brake in locked position.

REVERSING SWITCH is used to obtain clockwise or counter clockwise rotation of spindle.

Note: Due to back gear construction, when machine is running in low speed range, spindle rotation is opposite to that of high speed range. Therefore forward on your reversing switch becomes reverse switch in low speed range.

HIGH LOW SPEED CLUTCH CONTROL is directly in front of motor. When knob is in position, as shown on picture, clutch is in high speed position. To put clutch into low speed position turn lever to the extreme right. It is necessary to rotate spindle while engaging high speed clutch. This can be accomplished by either turning spindle nose by hand or by turning drawbar knob using wrench, providing drawbar is pulled up tightly.

CAUTION: Do not shift clutch while motor is running.

Back gear control is used in conjunction with the high low speed clutch control above back gear control handle is stamped IN and OUT. When back gear control handle is in OUT position, which is the position furthest from face of machine, then HIGH LOW speed clutch control should be located as illustrated in photograph. With these controls in position as explained, head is set for operation in high speed range (660-2720 RPM). When back gear control lever moved to IN position and HIGH LOW speed clutch control moved to extreme right then the head is ready for operation in the low speed range (80-325 RPM).

POWER FEED TRANSMISSION ENGAGEMENT CRANK engages power feed worm gear. When lever is in position as indicated in photograph, the power feed worm gear is engaged. To disengage worm gear, pull knob out and crank handle in clockwise or down direction and move to opposite position.

Note: Crank cannot be swung around in counter clockwise direction; however no damage will occur if moved in this direction. To engage the worm a counter clockwise movement is required.

CAUTION: Power feed worm gear may be engaged when spindle is rotating, however it should be engaged gently to avoid damage to worm gear. The worm gear may be disengaged at any time.

IMPORTANT: It is recommended that the Power Feed worm gear be disengaged whenever the power feed is not required. This will avoid unnecessary wear on power feed worm gear.

QUILL FEED SELECTOR

This crank is used for selecting the three feeds; 1.5, 3 and 6 thousandths per revolution. It is shifted by pulling knob out and turning from one position to the other. Feeds are stamped on cover below indentation hole. Feed is more readily engaged when spindle is running.

FEED REVERSING KNOB

Position of this handle depends upon direction of spindle rotation. If boring with right hand cutting tools, pull feed handle towards operator until clutch becomes engaged.

Neutral position is between forward and reverse position. It is recommended that the handle be left in neutral position when not in use.

MANUAL FEED

Reversing clutch knob should be in neutral position and feed control lever engaged. Clockwise rotation of handwheel moves quill down. The Manual Feed Handwheel and the quill feed handle may be disengaged by moving outward about 1/8".

Note: Feed control lever must be engaged in order to use manual feed controls. Manual Feed Handle and Handwheel may be taken off when not in use.

FEED CONTROL LEVER

Engages over-load clutch on pinion shaft when thrown to left and will stay engaged until either quill stop comes in contact with micrometer nut, forcing feed control lever to drop out automatically, or released manually by throwing lever to right.

Note: Feed Control Lever is carefully set at plant to throw out automatically when quill stop goes against micrometer nut or against safety pin in top. However, if this should go out of adjustment it may easily be brought back by regulating the screw located at bottom of tripping rod.

CAUTION: When adjusting the screw, check automatic throw off in both directions; that is with micrometer nut against the quill stop for down position and quill stop against throw out pin for up position.

QUILL FEED HANDLE

May be removed by simply pulling handle off end of shaft. It is recommended that handle be disengaged when using power feed.

QUILL STOP is used to disengage automatic feed in either direction as well as the setting point for working to given depths.

MICROMETER ADJUSTING NUT is used for setting of depths. Each graduation on nut indicates one thousand of depth, it reads directly to scale mounted along side of it. Depths may be obtained by setting micrometer nut in conjunction with quill stop.

QUILL LOCK

This is a positive quill lock to be used when quill is in stationary position such as milling operations. It is recommended that this lock be used whenever quill movement is not desired.

INDICATOR MOUNTING ROD is used for the fastening of an indicator.

LUBRICATION

Do not operate machine until properly lubricated. Lubrication of head is obtained by use of the drip feed method through two oil cups located at right side of belt housing, with lighi machine oil such as Socony D.T.E. light or equivalent.

POSITION OF OVERARM can be regulated by loosening two bolts on turret and pulling arm in or out to desired position.

CAUTION: Care should be taken to lock overarm securely after setting.

Note: It is recommended that on heavy milling work, head should be kept as close to face of turret as possible, as maximum rigidity is then obtained.

OPERATION

To operate in high speed range, move high low speed clutch control handle to extreme left then put back gear control in OUT position.

Then, if power feed is desired, crank power feed transmission engagement to IN position, (refer back to explanation of controls) and feed reversing knob should be pushed in for down feed and pulled out for up feed.

The next step is to throw feed control lever to left. Power feed is now in operation in high speed range. Feeds can be selected by cranking quill feed selector to desired feeds.

BACK GEAR OR LOW SPEED RANGE

Stop spindle, then move high low speed clutch control to extreme right and also back gear control handle over to IN position.

RECOMMENDATIONS

Use 2, 3, or 4 flute end mills. 8 flute end mills are usually not as satisfactory. When using shell or face mills standard cutter practice should be observed.

Power feed can be used for drilling up to 3/8'' diameter drills. Use manual feed for drills larger than 3/8".

Overload clutch is set at factory to hold up to 200 lbs. DOWN pressure on quill, which will accommodate drills up to 3/8'' diameter in mild tool steel.

CAUTION: This clutch should not be tampered with in the field.

GENERAL SPEED RECOMMENDATIONS

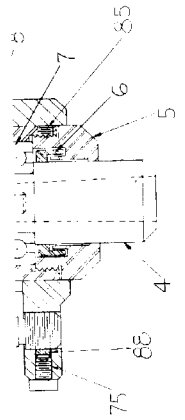
Material to be Cut	Feet Per Minute		
	Rough Cut	Rough and Finish	Light and Finish Cut
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(Over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (Low Carbon)	80	90	140
Steel (High Carbon)	40	50	70
Bronze (Medium)	90	120	150
Bronze (Hard)	65	90	130
Brass (Hard)	100	150	200
Copper	150	200	300
Duraluminum	400	----	600
Aluminum	600	----	1000

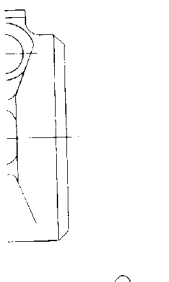
TABLE OF CUTTING SPEEDS AND FEEDS

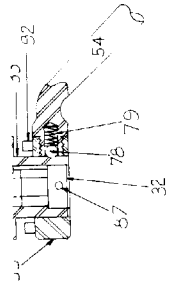
Feet Per Minute	15	20	25	30	40	50	60	70	80	90	100
Diameter, Inches	Revolutions Per Minute										
1/16"	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6112
1/8"	458	611	764	917	1222	1528	1833	2139	2445	2750	3056
3/16"	306	407	509	611	815	1019	1222	1426	1630	1833	2037
1/4"	229	306	382	458	611	764	917	1070	1375	1375	1528
5/16"	183	244	306	367	489	611	733	856	978	1100	1222
3/8"	153	204	255	306	407	509	611	713	815	917	1019
7/16"	131	175	218	262	349	437	524	611	698	786	873
1/2"	115	153	191	229	306	382	458	535	611	688	764
5/8"	91	122	153	183	244	306	367	428	489	550	611
3/4"	76	102	127	153	204	255	306	357	407	458	509
7/8"	65	87	109	131	175	218	262	306	349	393	437
1"	57	76	95	115	153	191	229	267	306	344	382
1 1/8"	50	67	84	102	136	170	204	238	272	306	340
1 1/4"	45	61	76	91	122	153	183	214	244	275	306
1 3/8"	41	55	69	83	111	139	167	194	222	250	278
1 1/2"	38	50	63	76	102	127	153	178	204	229	255
1 5/8"	35	47	58	70	94	118	141	165	188	212	235
1 3/4"	32	43	54	65	87	109	131	153	175	196	218
1 7/8"	30	40	50	61	81	102	122	143	163	183	204
2"	28	38	47	57	76	95	115	134	153	172	191

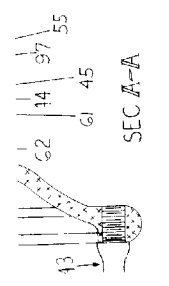
NO. 7 BROWN & SHARPE
NO. 2 MORSE
BRIDGEPORT B3

SPECIFY SPINDLE TAPER WHEN ORDERING COLLETS



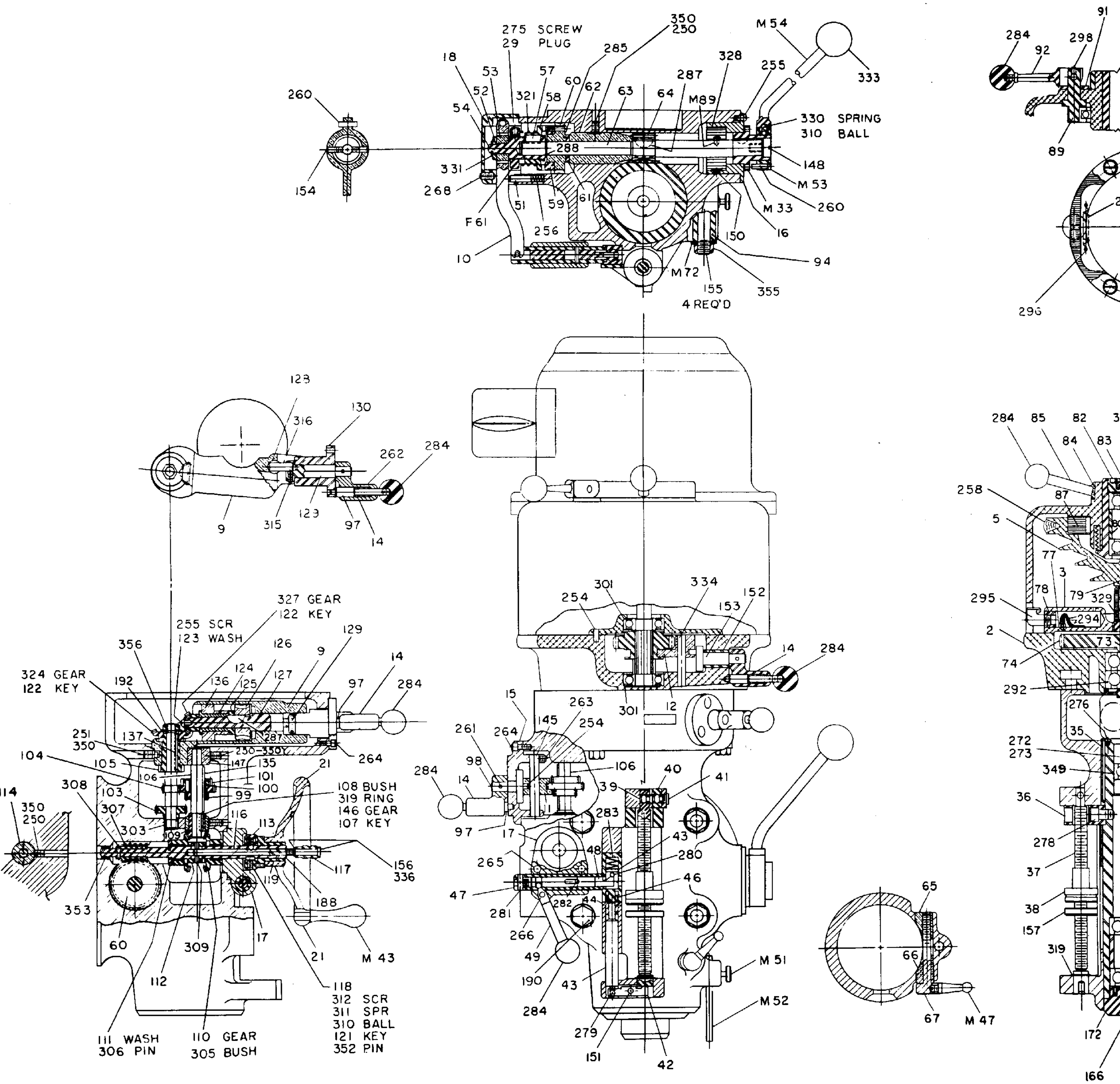


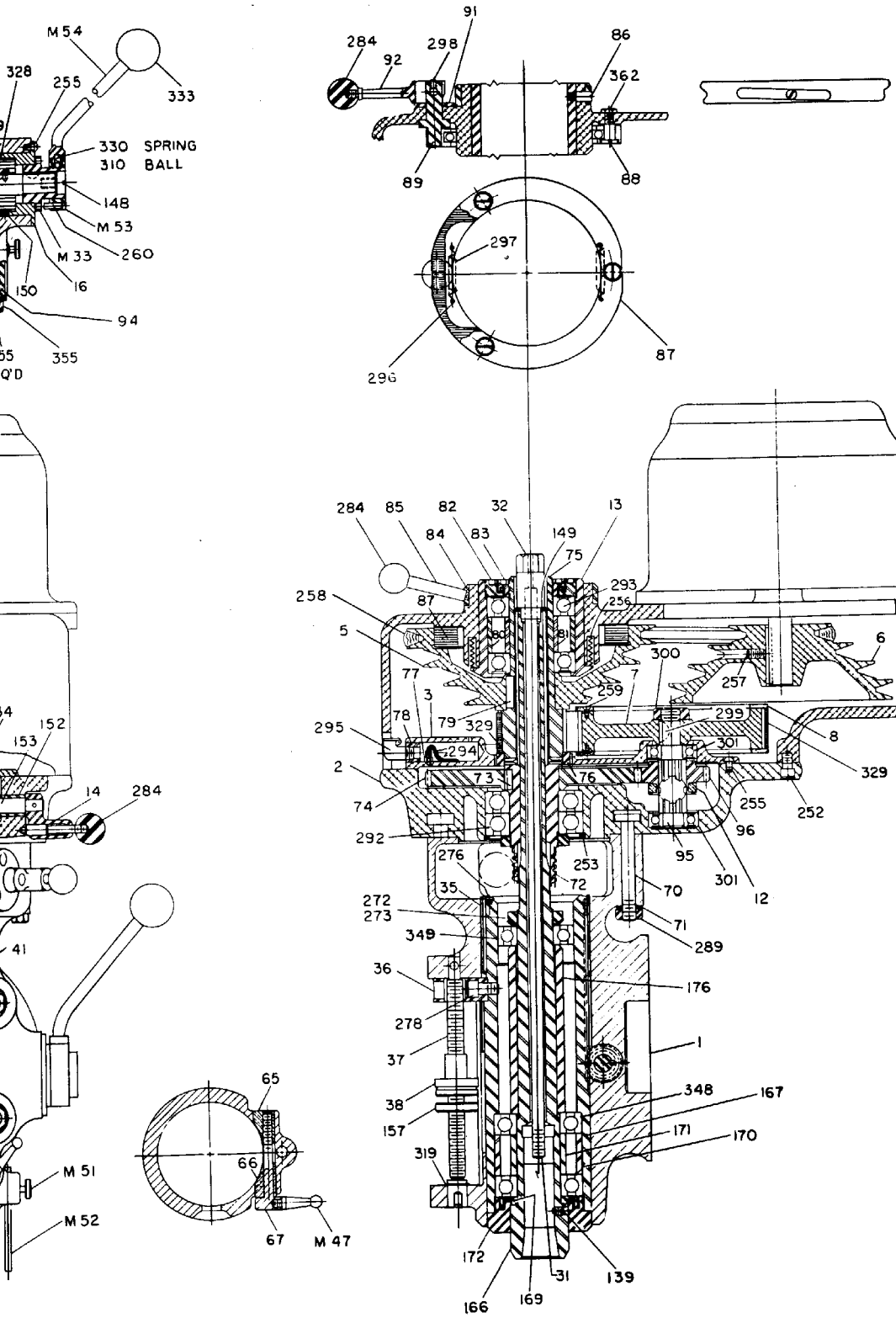




PART LIST — THE BRIDGEPORT TURRET MILLING MACHINE

H-2 ELEVATING SCREW HOUSING
H-3 ELEVATING SCREW NUT
H-4 3/8 - 16 x 1 HOLLOW HEAD CAP SCREW (2 REQUIRED)
H-5 1/4 – 20 x 3/4 HOLLOW HEAD CAP SCREW (3 REQUIRED)
H-6 DOOR
H-7 DOORKNOB
H-8 DOOR LOCKING CAM
H-9 1/4 - 20 x 1/4 SET SCREW
H-10 17/32 x 1 SPACER
H-11 3/16 x 1-1/2 HINGE PIN (2 REQUIRED)
H-12 WOODEN SHELF (2 HALVES)
H-28 HANDLE
H-50 KNEE (9")
H-263 KNEE (12")
H-51 ELEVATING SCREW
H-52 NO. 3606 – J GREASE-SEALED BALL BEARING
H-53 BEARING RETAINER RING
H-54 1/4 x 20 x 1/2 HOLLOW HEAD CAP SCREW (3 REQUIRED)
H-56 3/16 x 3/16 x 7/8 KEY
H-57 33/64 x 1 x 0.100 WASHER
H-58 1/2 – 20 JAM NUT (2 REQUIRED)
H-59 BEVEL GEAR
H-60 BEVEL PINION
H-61 NO. 7 WOODRUFF KEY
H-62 NO. 77020 GREASE-SEALED BALL BEARINGS (3 REQUIRED)
H-63 GEAR SHAFT FOR 9" KNEE
H-265 GEAR SHAFT FOR 12" KNEE
H-64 BEARING CUP
H-65 BEARING RETAINER RING (3 REQUIRED)
H-66 1/4 – 20 x 1/2 HOLLOW HEAD CAP SCREW (9 REQUIRED)
H-67 DIAL WITH 100 GRADUATIONS
H-68 DIAL HOLDER
H-69 DIAL LOCK NUT (4 REQUIRED)
H-70 GEARSHAFT CLUTCH INSERT
H-71 ELEVATING CRANK
H-75 CROSS FEED SCREW FOR 9" KNEE
H-267 CROSS FEED SCREW FOR 12" KNEE
H-76 NO. XF-12 GREASE-SEALED BALL BEARINGS (2 PAIRS REQUIRED)
H-77 CROSS FEED BEARING BRACKET
H-78 DIAL WITH 200 GRADUATIONS (3 REQUIRED)
H-79 DIAL HOLDER (3 REQUIRED)
H-80 BALL CRANK HANDLE (3 REQUIRED)
H-81 1/2 – 20 JAM NUT (3 REQUIRED)
H-82 3/8 – 16 x 1 HOLLOW HEAD CAP SCREW (4 REQUIRED)
H-83 CHIP GUARD
H-84 STOP SCREW
H-86 3/8 – 16 HEXAGON NUT
H-87 KNEE COLUMN GIB FOR 9" KNEE
H-264 KNEE COLUMN GIB FOR 12" KNEE
H-88 GIB SCREW (3 REQUIRED)
H-89 KNEE LOCKING PLUNGER
H-90 KNEE LOCKING CAMSHAFT
H-91 5/16 – 18 x 5/16 DOG POINT SET SCREW
H-92 5/16 – 18 x 5/16 SET SCREW
H-93 CAM SHAFT HUB
H-94 CAM SHAFT HANDLE
H-95 NO. 1 x 1" TAPER PIN
H-96 LEFT HAND KNEE-COLUMN WIPER HOLDER
H-97 RIGHT HAND KNEE-COLUMN WIPER HOLDER
H-98 1/4 – 20 x 1 HOLLOW HEAD CAP SCREW (2 REQUIRED)
H-99 FELT WIPER (2 REQUIRED)
H-100 NO. 1610 ALEMITE FITTING (4 REQUIRED)
H-103 STOP SCREW
H-104 KEY PIN
H-105 SADDLE
H-106 CROSS FEED NUT
H-107 3/16 x 3/16 x 2-1/2 KEY (2 REQUIRED)
H-108 CROSS FEED NUT RETAINING SCREW (2 REQUIRED)
H-109 NO. 8 – 32 x 3/8 WASHER HEAD SCREW (2 REQUIRED)
H-110 FEED NUT BRACKET
H-111 HOLLOW HEAD CAP SCREW (12 REQUIRED)
H-112 LONGITUDINAL FEED NUT
H-113 LONGITUDINAL FEED SCREW
H-114 TABLE
H-115 LEFT BEARING BRACKET
H-117 3/16 x 1 DOWEL PINS (6 REQUIRED)
H-118 RIGHT BEARING BRACKET
H-119 SADDLE-TABLE GIB
H-120 TABLE LOCK PLUNGER
H-121 TABLE LOCK BOLT
H-122 TABLE LOCK BOLT HANDLE (2 REQUIRED)
H-123 TABLE STOP BRACKET
H-124 3/8 – 16 x 1/2 HOLLOW HEAD CAP SCREW (2 REQUIRED
H-125 TABLE STOP PIECE (2 REQUIRED)
H-126 STOP PIECE T-BOLT (2 REQUIRED)
H-127 WASHER (2 REQUIRED)
H-128 3/8 – 16 HEXAGON NUT (2 REQUIRED)
H-129 SADDLE-KNEE WIPER PLATE (2 REQUIRED)
H-130 FELT WIPER (4 REQUIRED)
H-131 SADDLE-KNEE GIB
H-132 SADDLE LOCK PLUNGER
H-133 SADDLE LOCK BOLT
H-134 NO. 1611 ALEMITE FITTING (2 REQUIRED)
H-135 5/16 – 18 x 5/16 SET SCREW
H-136 NO. 10 – 32 x 1/2 OVAL HEAD SCREW (6 REQUIRED)
H-140 1-1/4 OPEN END AND 1-1/16 BOX END WRENCH
H-141 GREASE GUN
H-146 PLUG
H-223 TURRET
H-224 RAM
H-225 RAM ADAPTER
H-226 VERTICAL ADJUSTING WORM
H-227 VERTICAL ADJUSTING WORM SHAFT
H-228 ADAPTER PIVOT STUD
H-229 ADAPTER PIVOT STUD LOCKNUT
H-230 RAM LOCK STUD
H-231 RAM PINION
H-232 WORM THRUST WASHER
H-233 RAM CLAMP
H-234 RAM CLAMP BAR
H-235 WORM KEY
H-236 ANGLE PLATE
H-237 RAM PINION HANDLE
H-238 RAM PINION SCREW
H-239 RAM CLAMP
H-240 ADAPTER LOCKING BOLT (2 REQUIRED)
H-243 3/8 x 16 BALL
H-254 TURRET
H-256 SPIDER
M-72 WASHER
H-268, H-269 CHIP GUARD COVER PLATES FOR 12" KNEE
H-270 TURRET CLAMP BOLTS
H-271 COLUMN


275 SCREW
29 PLUG
350
250
M54
333
285
328
255
18
53
57
60
62
63
64
287
M89
52
321
58
260
54
330 SPRING
310 BALL
288
331
148
M53
268
61
M33
260
154
51
59
16
F61
256
150
10
94
M72
155
4 REQ'D
355
284
92
298
91
89
296
128
316
130
262
284
9
315
123
97
14
284
85
82
84
83
258
87
5
77
3
79
329
78
295
294
2
73
74
292
276
35
272
273
349
36
278
37
38
157
319
172
166
301
334
152
254
153
14
284
327 GEAR
122 KEY
255 SCR
123 WASH
129
356
126
9
324 GEAR
122 KEY
192
136
124
125
127
97
14
284
251
350
137
287
250-350Y
264
15
263
301
12
145
254
104
105
147
135
101
100
106
21
261
264
284
98
106
40
41
114
350
250
308
103
307
303
99
108 BUSH
319 RING
146 GEAR
107 KEY
14
39
109
116
113
97
17
283
43
48
280
265
46
117
156
336
47
281
282
44
353
119
188
60
309
17
266
21
M43
65
49
66
190
M51
112
43
118
312 SCR
311 SPR
310 BALL
121 KEY
352 PIN
M52
284
67
M47
111 WASH
306 PIN
110 GEAR
305 BUSH
279
151
42



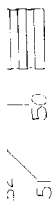
1 H.P. MILLING ATTACHMENT

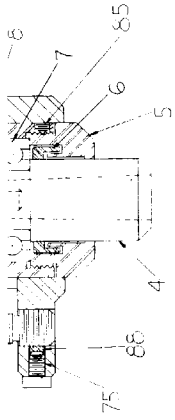
J PARTS LIST

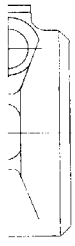
J-1 QUILL HOUSING
J-2 GEAR HOUSING
J-3 GEAR HOUSING COVER
J-4 BELT HOUSING
J-5 SPINDLE PULLEY
J-6 MOTOR PULLEY
J-7 TIMING BELT PULLEY
J-8 TIMING BELT PULLEY FLANGE
J-9 WORM GEAR CRADLE
J-10 OVERLOAD CLUTCH TRIP LEVER
J-11 FEED GEAR SHIFTER FORK
J-12 BACK GEAR SHIFTER FORK
J-13 SPINDLE PULLEY BEARING SLEEVE
J-14 SHIFT CRANK
J-15 CLUSTER GEAR COVER
J-16 SPRING COVER
J-17 FEED TRIP BRACKET
J-18 CLUTCH ARM COVER
J-20 MOTOR SWITCH BRACKET
J-21 HANDWHEEL
J-23 FELT RETAINER RING
M-24 MICRO SCREW JAM NUT
J-27 TIMKEN BEARING SPACER FOR J-100 TO J-1199 ONLY
J-29 SPINDLE LOCKNUT BINDING
J-31 DRAWBAR FOR R-8 COLLET
J-32 DRAWBAR KNOB
M-33 PINION SHAFT HUB SLEEVE
J-34 QUILL NOSEPIECE FOR J-100 TO J-1199 ONLY
J-35 QUILL SKIRT
J-36 QUILL STOP KNOB
J-37 QUILL STOP MICRO SCREW
J-38 MICROMETER NUT
J-39 REVERSE TRIP BALL LEVER
J-40 FEED REVERSE TRIP PLUNGER
J-41 REVERSE TRIP BALL LEVER SCREW
J-42 FEED TRIP LEVER
J-43 FEED TRIP PLUNGER
M-43 HANDWHEEL HANDLE
J-44 TRIP PLUNGER BUSHING
J-45 TRIP PLUNGER
J-46 FEED TRIP PLUNGER BUSHING
J-47 CAM ROD SLEEVE ASSEMBLY
M-47 LOCK HANDLE
J-48 CAM ROD
J-49 TRIP HAND
J-50 LOCKNUT BINDING PLUG FOR J-100 TO J-1199 ONLY
J-51 OVERLOAD CLUTCH LEVER SPRING PLUNGER
M-51 INDICATOR ROD SCREW
J-52 OVERLOAD CLUTCH WASHER
M-52 INDICATOR ROD
J-53 CLUTCH RING
M-53 PINION SHAFT HUB
J-54 OVERLOAD CLUTCH SLEEVE
M-54 PINION SHAFT HUB HANDLE
J-57 OVERLOAD CLUTCH SLEEVE KEY
J-58 OVERLOAD CLUTCH
J-59 OVERLOAD CLUTCH RING
J-60 OVERLOAD CLUTCH WORM GEAR
J-61 PINION SHAFT WORM GEAR SPACER
F-61 OVERLOAD CLUTCH LOCKNUT
J-62 QUILL PINION SHAFT BUSHING
J-63 QUILL PINION SHAFT
J-64 QUILL PINION
J-65 QUILL LOCK SLEEVE
J-66 QUILL LOCK SLEEVE
J-67 QUILL LOCK BOLT
J-70 VERTICAL TEE BOLT
J-71 VERTICAL TEE BOLT WASHER
J-72 SPLINED GEAR HUB
J-73 BULL GEAR KEY
J-74 SPINDLE BULL GEAR
J-75 SPINDLE PULLEY HUB
J-78 PULLEY COLLAR
J-77 OILER TUBE
J-78 OIL PLUG
J-79 SPINDLE PULLEY KEY
J-80 UPPER BEARING SPACER (LARGE)
J-81 UPPER BEARING SPACER (SMALL)
J-82 BEARING SLEEVE LOCKNUT
J-83 UPPER BEARING LOCKNUT
J-84 CAM RING
J-85 SPINDLE CLUTCH LEVER
J-86 SPINDLE CLUTCH CAM RING PIN
J-87 BRAKE BLOCK
J-88 BRAKE RING SCREW
J-89 BRAKE LOCK STUD
M-89 CLOCKSPRING STUD
J-91 BRAKE LOCK WASHER
J-92 BRAKE LOCK & HANDLE
J-93 BRAKE LOCK PIN
J-94 LOWER CLAMPING BOLT SPACER
J-95 COUNTERSHAFT
J-96 COUNTERSHAFT GEAR
J-97 GEARSHIFT PLUNGER
J-98 CLUSTER GEAR SHIFT CRANK
J-99 FEED DRIVE CLUSTER GEAR
J-100 FEED DRIVE CLUSTER GEAR (CENTER)
J-101 FEED DRIVE CLUSTER GEAR (UPPER)
J-103 FEED DRIVE GEAR
J-104 CLUSTER GEAR INPUT SHAFT
J-105 FEED DRIVING GEAR
J-106 CLUSTER GEAR SHAFT
J-107 CLUSTER GEAR KEY
J-108 BEVEL GEAR BEARING
J-109 BEVEL GEAR THRUST SPACER
J-110 FEED REVERSE BEVEL GEAR
J-111 FEED WORM SHAFT THRUST WASHER
J-112 FEED REVERSE CLUTCH
J-113 HANDWHEEL CLUTCH SPRING SCREW
J-114 FEED WORM SHAFT BUSHING
J-116 REVERSE CLUTCH ROD
J-117 REVERSE KNOB
J-118 HANDWHEEL CLUTCH
J-119 HANDWHEEL BUSHING
J-121 WORM SHAFT KEY
J-122 FEED DRIVING GEAR KEY
J-123 BEVEL PINION WASHER
J-124 FEED WORM GEAR SHAFT SLEEVE
J-125 WORM GEAR SPACER
J-126 FEED DRIVE WORM GEAR
J-127 FEED DRIVE WORM GEAR SHAFT
J-128 FEED ENGAGE PIN
J-129 WORM GEAR CRADLE THROW-OUT
J-130 SHIFT SLEEVE
J-131 MOTOR LOCKNUT
J-132 MOTOR LOCKNUT HANDLE
J-133 MOTOR MOUNTING STUDS
J-134 MOTOR MOUNTING STUD WASHERS
J-135 CLUSTER GEAR KEY
J-136 WORM CRADLE BUSHING
J-137 CLUSTER GEAR KEY
J-139-S COLLET ALIGNING SCREW
J-140 WORM GEAR
J-141 NUT
J-142 KEY
J-143 1/4 20 x 3/8 SOCKET SET SCREW
J-144 GEAR
J-145 FEED SHIFT ROD
J-146 FEED REVERSE BEVEL PINION
J-147 CLUSTER GEAR SHAFT UPPER BEARING
J-148 PINION SHAFT HUB SCREW
J-149 DRAWBAR WASHER
J-150 OUTSIDE CLOCKSPRING PIN
J-151 TRIP LEVER PIN
J-152 BACKGEAR SHIFT BUSHING
J-153 BACKGEAR SHIFT CRANK
J-154 CLUTCH RING PIN
J-155 1/2" T-BOLT
J-156 FEED REVERSE KNOB STUD
J-157 QUILL MICRO STOP NUT
J-159 KEY FOR #30 STD TAPER SPINDLE
J-166 SPINDLE (SERIAL J-1200 AND UP)
J-167 QUILL (SERIAL J-1200 AND UP)
J-169 SPINDLE DIRT SHIELD
J-170 BEARING SPACER - LARGE FROM J-1750
J-171 BEARING SPACER - SMALL
J-172 NOSEPIECE
J-176 SLEEVE FROM SER. J-1750
J-188 FEED WORM SHAFT STARTED WITH SERIAL NO. 5500
J-190 1/2 - 13 SPECIAL HEX NUT OPTIONAL EQUIP.
J-192 WASHER
J-193 PLUG FOR 5/8 HOLE
J-250 1/4 - 20 1/2 LG. SOCKET SET SCREW KP
J-251 5/16 - 18 x 5/16 SOCKET SET SCREW
J-252 5/16 - 18 x 5/8 LG. SOCKET CAP SCREWS
J-253 KOHINOOR #5000 - 315 SNAP RING
J-254 3/16 x 1/2 LG. DOWEL PINS
J-255 #10-24 x 3/8 LG. R. HEAD SCREW
J-256 COMPRESSION SPRING
J-257 5/16 - 18 x 1/2 LG. K.P. SOCKET SET SCREWS
J-258 V BELT
J-259 #6 - 32 x 3/8 LG. FLAT HEAD SCREWS
J-260 3/16 x 3/4 LG. DOWEL PIN
J-261 1/8 x 7/8 LG. ROLL PIN
J-262 COMPRESSION SPRING
J-263 10-32 x 1/4 LG. K.P. SET SCREW
J-264 #10-24 x 1/2 LG. CAP SCREW
J-265 1/4 - 20 x 1 LG. CAP SCREW.
J-267 #10 - 24 x 1-1/2 LG. CAP SCREW
J-268 1/4 - 20 x 1/2 SOCKET SET SCREWS
J-269 1/4 - 20 x 3/8 LG. SOCKET HEAD CAP SCREW
J-272 N-08 LOCK NUT
J-273 W-08 LOCKWASHER
J-274 5/16 - 18 x 5/16 SOCKET SET SCREW K.P.
J-275 1/4 - 20 x 1/4 LG. SOCKET SET SCREW
J-276 10-32 x 5/16 LG. RD. HD. SCREW
J-278 3/8 - 24 x 5/8 SCREW
J-279 #6 - 32 x 3/8 SOCKET SET SCREW
J-280 1/8 x 7/16 LG. ROLL PIN
J-281 3/16 x 5/8 LG. DOWEL PIN
J-282 1/8 x 9/16 LG. ROLL PIN
J-283 COMPRESSION SPRING
J-284 BLACK PLASTIC BALL HANDLES 1" DIM.
J-285 8-32 x 5/8 LG. HD. SCREW
J-286 #3 WOODRUFF KEY
J-287 #7 WOODRUFF KEY
J-288 #5108 - 59 KOHINOR SNAP RING
J-289 7/16 - 14 HEX NUT HARDENED (AMERICAN STD. REGULAR)
J-290 N-08 SPECIAL 5/16 THICK BEARING LOCKNUT
J-291 W-08 LOCKWASHER
J-292 1 PR. #208 BEARINGS
J-293 1 PR. #207 BEARINGS
J-294 WICK 1/8 O.D.
J-295 GITS OIL CUP #1207
J-296 3/32 x 5/8 LG. ROLL PIN
J-297 W.B. JONES #167 - A EXT. SPRING (LINDQUIST)
J-298 10-32 x 1/4 LG. SOCKET SET SCREWS
J-299 #9 WOODRUFF KEY
J-300 5/8 - 18 HEX JAM NUT
J-301 ND #99503 DOUBLE SEAL BEARING ABEC 3
J-303 B-68 TORRINGTON NEEDLE BEARING
J-304 3/8 - 24 HEX JAM NUT
J-305 A-672-4 OILITE BEARING
J-306 32 - 5/16 LG. PIN
J-307 BOSTON WORM #HLVH
J-308 .110 DIA. x 7/16 LG. PIN
J-309 3/32 x 3/4 LG. ROLL PIN
J-310 3/16 STEEL BALL
J-311 COMPRESSION SPRING
J-312 1/4 - 20 x 5/16 LG. SET SCREW
J-315 #10-24 x 3/8 LG. K.P. SET SCREW
J-316 5/16 x 7/8 LG. DOWEL PIN
J-318 3/8 LOCKWASHER
J-319 5108 - 62 WALDES SNAP RING
J-321 SAFETY CLUTCH SPRING
J-322 MICROMETER SCALE
J-323 6-32 x 1/4 LG. RD. HD. SCREW
J-324 FEED REVERSE BEVEL GEAR
J-326 BILLING #1166 WRENCH
J-327 STEEL PINION
J-328 CLOCK SPRING 1" x .020" x 42"
J-329 TIMING BELTS 1-1/4" WIDE
J-330 COMPRESSION SPRING
J-331 5108 - 37 KOHINOOR SNAP RING
J-333 BLACK PLASTIC BALL HANDLES 13/8 DIM. SAME AS M-54
J-334 5/16 x 2" LG. DOWEL PIN
J-335 #8 SPLIT LOCKWASHER
J-336 SNAP RING 5100-25
J-338 #2002 GITS OIL CUP
J-339 SPINDLE SPEED PLATE
J-340 OPERATING INSTRUCTION PLATE
J-345 10 - 32 x 3/8 SOCKET SET SCREWS
J-348 FAFNIR MM 207 WI-CR-DB. SPEC. E5227. START AT J-1200
J-349 FAFNIR M206 K SPEC. E 6578 OR NORMA HOFFMAN 206 S-685 A START AT SER. #J-1750
J-350 1/4 - 20 MOCK-IT LOCKSCREW
J-351 5/16 - 18 MOCK-IT LOCKSCREW
J-352 1/8 x 3/4 LG. DOWEL PINS
J-353 BUSHING
J-355 1/2" - 13 STD. HEX NUT
J-356 3/8 - 24 FLOPLOC STOP & LOCKNUT
J-358 6-32 x 1/4 SOCKET SET SCREW K.P. STARTED WITH SER. #J-8300
J-359 1/4-20 JAM - NUT
J-362 5/16 - 18 JAM NUT
J-363 5/16 EXTERNAL LOCK WASHER
J-365 1/4 x 3/4 ROLL PINS
J-366 NAME PLAT
J-368 OIL STRAINER FOR QUILL BRG.
J-839 SWITCH BRACKET
M-72 WASHER

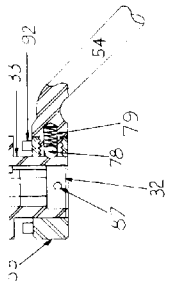
NO. 7 BROWN & SHARPE
NO. 2 MORSE
BRIDGEPORT B3

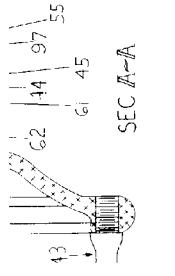
SPECIFY SPINDLE TAPER WHEN ORDERING COLLETS

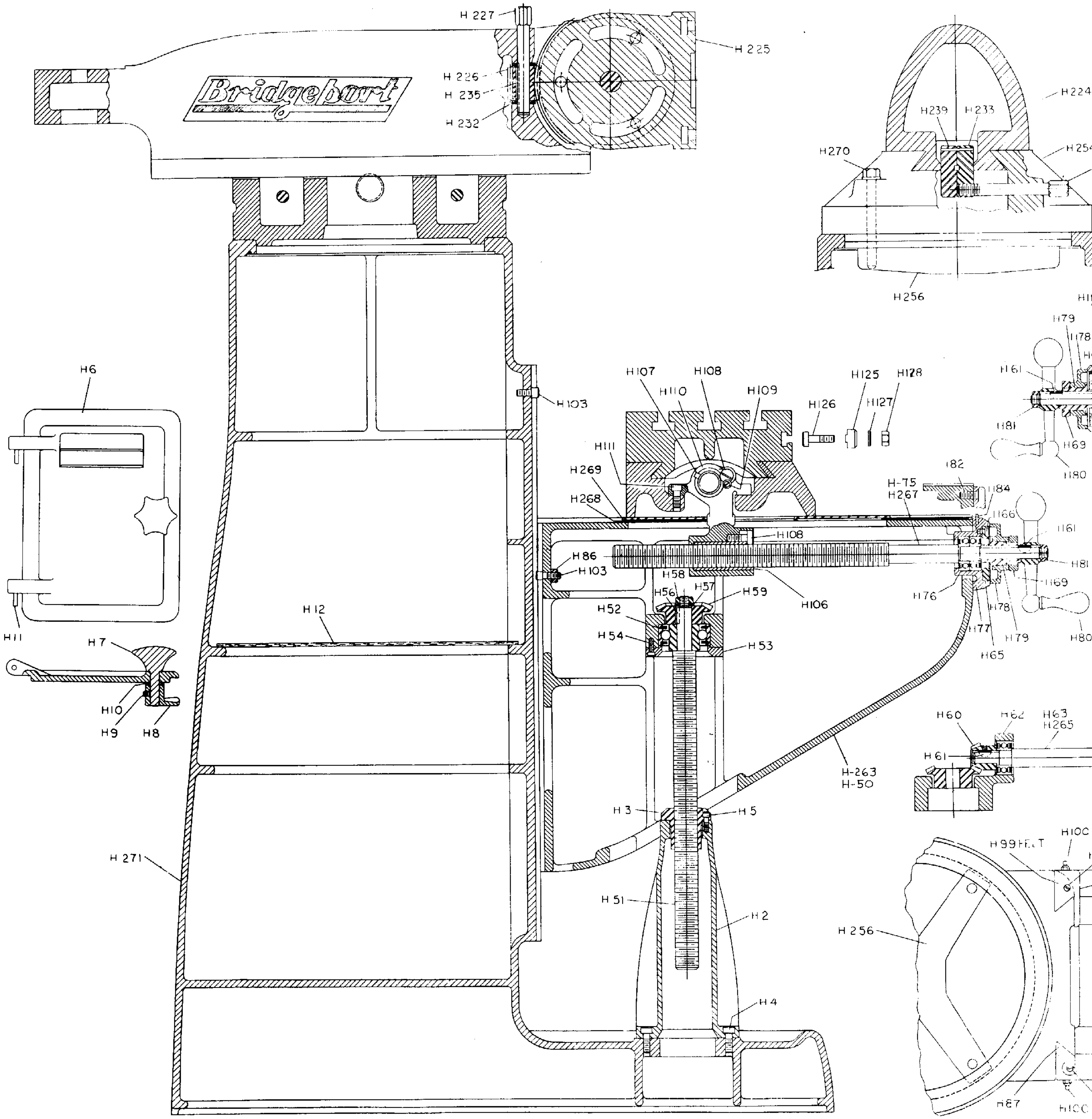


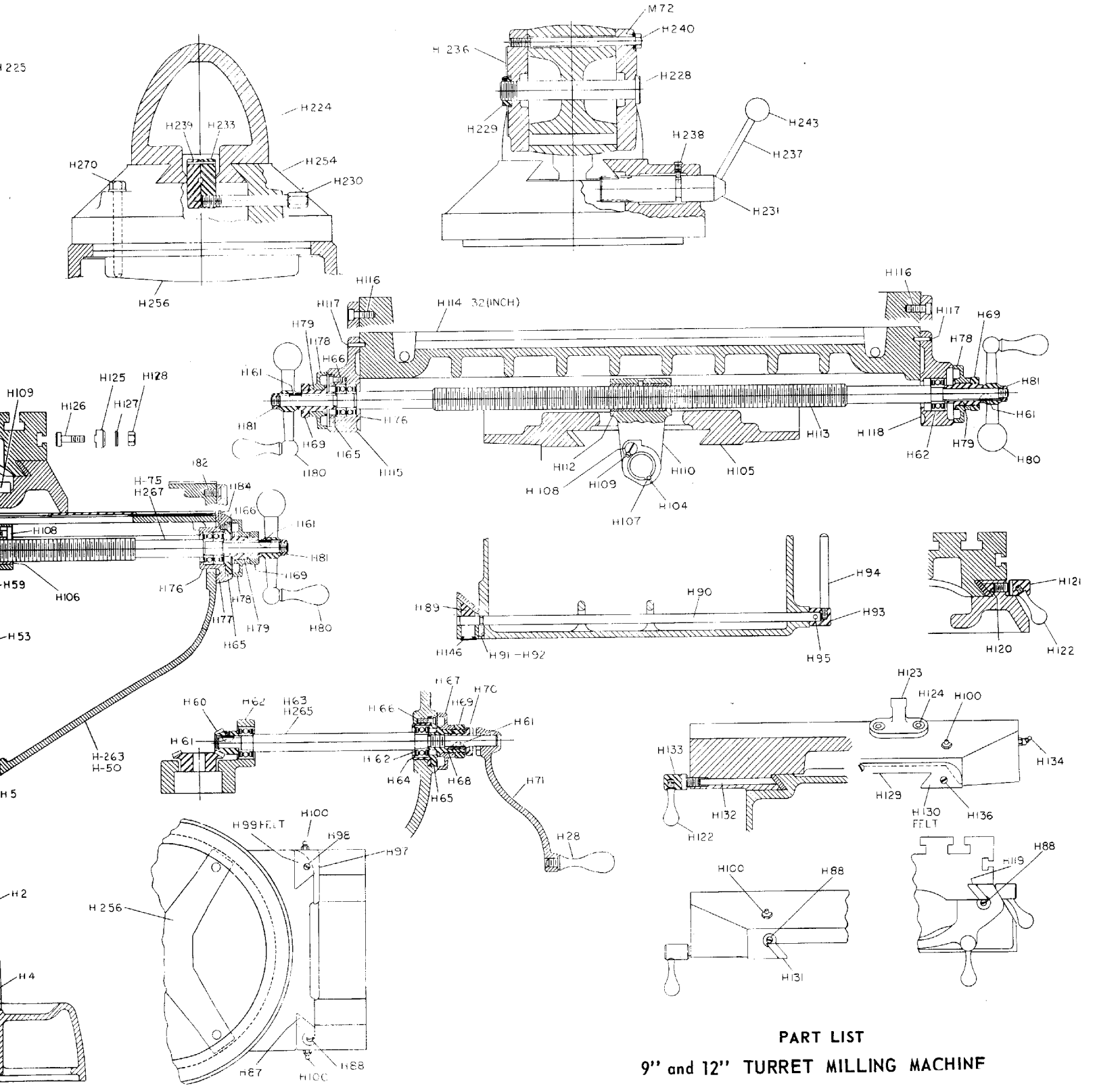






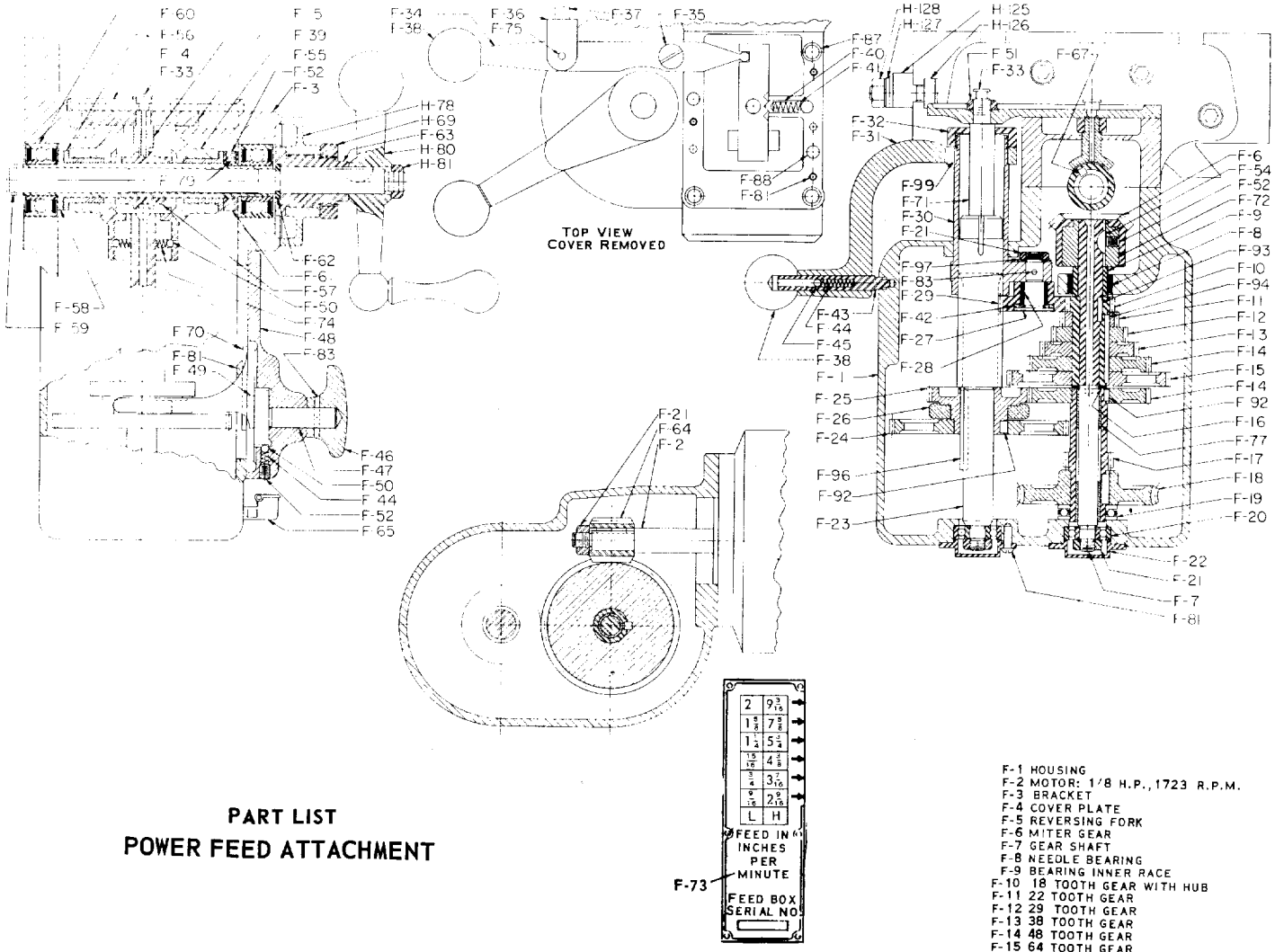



H 227
H 225
H 226
H 235
H 232
Bridgeport
H224
H239
H233
H270
H256
H6
H103
H107
H108
H110
H109
H125
H128
H126
H127
H111
H269
H268
H-75
H267
H61
H81
H69
H80
H66
H108
H86
H103
H58
H57
H56
H59
H106
H76
H78
H79
H77
H65
H12
H11
H7
H52
H54
H53
H10
H9
H8
H60
H63
H265
H-263
H-50
H3
H5
H271
H51
H2
H256
H4
H87



PART LIST

9" and 12" TURRET MILLING MACHINE



PART LIST
POWER FEED ATTACHMENT

F-1 HOUSING
F-2 MOTOR: 1/8 H.P., 1723 R.P.M.
F-3 BRACKET
F-4 COVER PLATE
F-5 REVERSING FORK
F-6 MITER GEAR
F-7 GEAR SHAFT
F-8 NEEDLE BEARING
F-9 BEARING INNER RACE
F-10 18 TOOTH GEAR WITH HUB
F-11 22 TOOTH GEAR
F-12 29 TOOTH GEAR
F-13 38 TOOTH GEAR
F-14 48 TOOTH GEAR
F-15 64 TOOTH GEAR
F-16 FIBER WASHER
F-17 18 TOOTH SLEEVE GEAR
F-18 WORM GEAR
F-19 THRUST BEARING
F-20 S.A.E. NO. 200 BALL BEARING
F-21 HEX. JAM NUT
F-22 BEARING COVER
F-23 16 TOOTH PINION WITH SHAFT
F-24 70 TOOTH GEAR
F-25 40 TOOTH GEAR WITH HUB
F-26 GEAR SHIFTING FORK
F-27 IDLER STUD
F-28 NEEDLE BEARING
F-29 27 TOOTH IDLER GEAR
F-30 GEAR SHIFTING SLEEVE
F-31 GEAR SHIFTING HANDLE
F-32 SHIFTING SLEEVE CAP
F-33 OILER
F-34 REVERSING HANDLE
F-35 PIVOT SCREW
F-36 REVERSING STOP ROD FORK
F-37 REVERSING STOP ROD
F-38 BALL HANDLE
F-39 REVERSING SLIDE
F-40 LOCK PIN
F-41 SPRING 1/4X3/4
F-42 THRUST WASHER
F-43 LOCK PIN
F-44 SPRING
F-45 PIN
F-46 SPEED CHANGE KNOB
F-47 SPEED CHANGE CRANK
F-48 DOOR
F-49 PIN
F-50 BALL
F-51 HEX. JAM NUT
F-52 SET SCREW
F-53 SWITCH
F-54 NO. 7 WOODRUFF KEY
F-55 MITER GEAR WITH CLUTCH FACE
F-56 MOLDED BRONZE BEARING
F-57 CLUTCH
F-58 GEAR SLEEVE
F-59 COTTER (SHEAR) PIN
F-60 GREASE-SEALED BALL BEARING
F-61 GEAR SLEEVE NUT
F-62 SPLIT WASHER
F-63 DIAL HOLDER
F-64 WORM
F-65 OIL CUP
F-66 CORD SET
F-67 KEY
F-68 STOP ROD CLAMP
F-69 STOP ROD COLLAR
F-70 SHIFTING FORK HOLD-DOWN
F-71 SLEEVE GUIDE PIN
F-72 SAFETY RELEASE INSERT
F-73 NAMEPLATE
F-74 SPRING
F-75 STOP ROD FORK PIN
F-76 1/4-20 X3/4 SOCKET HD. CAP SCW.
F-77 MOLDED BRONZE BEARING
F-78 FEED SCREW
F-79 BRASS PLUG 3/16X1/16
F-80 RD. HD. SCREW
F-81 NO. 10-24X1/2 RD. HD. SCREW
F-82 PIN 1/4X1/16
F-83 NO.0 0 X1 TAPER PIN
F-84 TAPER PIN
F-85 COTTER PIN
F-86 5/16-18X13/4 SOCKET HD. CAP SCW.
F-87 5/16-18X2 SOCKET HD. CAP SCW.
F-88 PIN 5/16X1
F-89 NO.10-24X1/2 SOCKET HD. CAP SCW.
F-90 PIN
F-91 NO. 10-24X1/4 SET SCREW
F-92 KEY
F-93 KEY
F-94 KEY
F-95 KEY
F-96 KEY
F-97 LOCWASHER
F-99 KEY
H-69 DIAL LOCK NUT
H-78 DIAL
H-80 BALL CRANK HANDLE
H-81 1/2-20 JAM NUT
H-125 TABLE STOP PIECE
H-126 STOP PIECE T-BOLT
H-127 WASHER
H-128 3/8-16 HEXAGON NUT

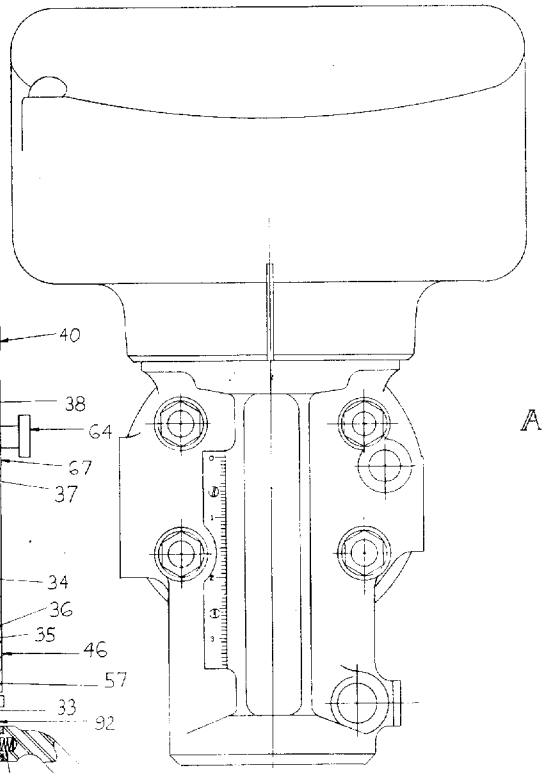
NOTE: GIVE SERIAL NUMBER WHEN ORDERING PARTS

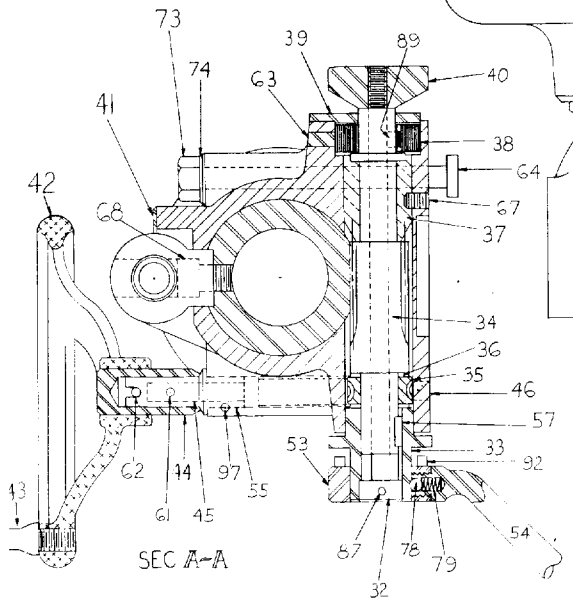
PART LIST

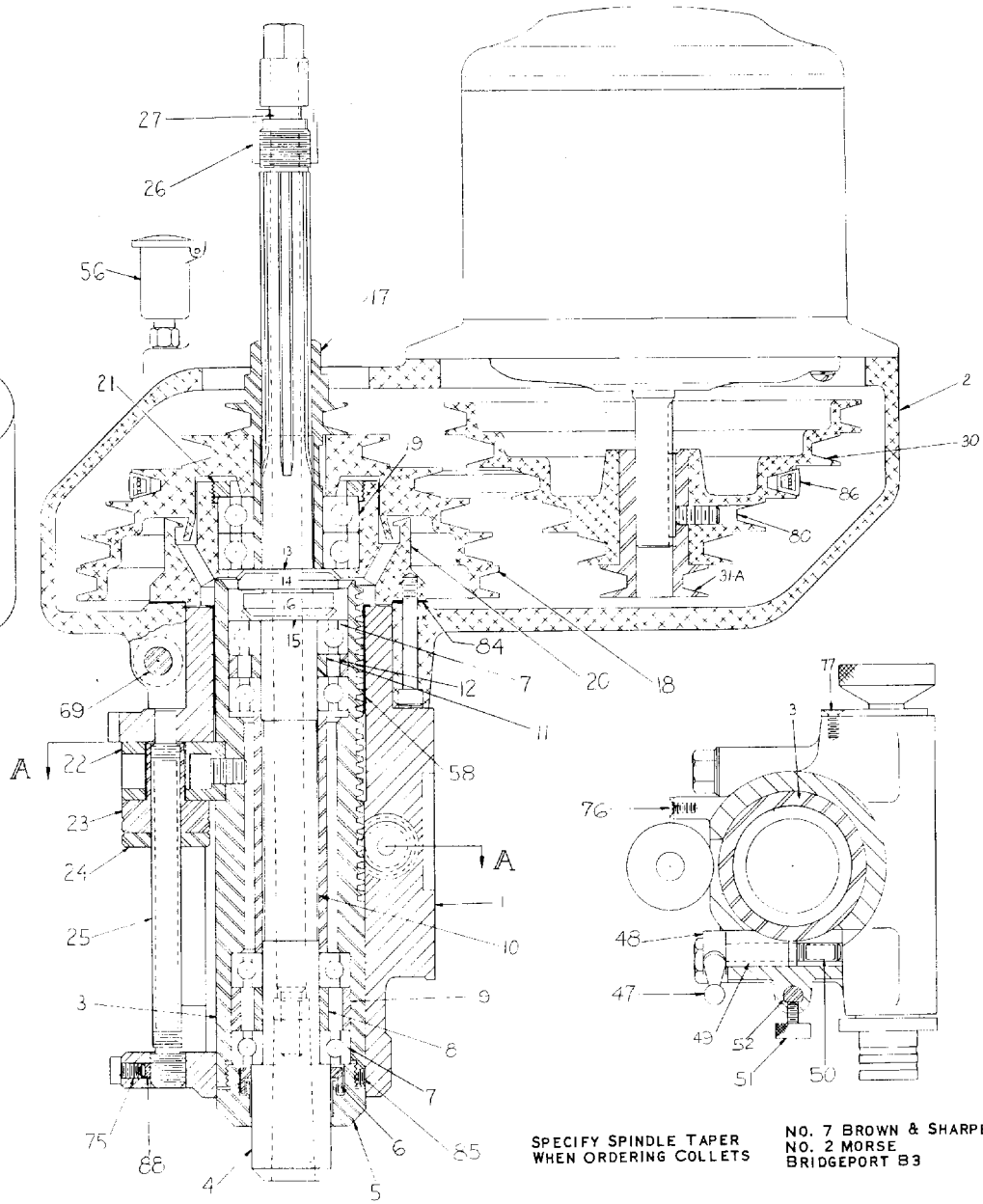
MASTER MILLING ATTACHMENT

M1 QUILL HOUSING
M2A BELT HOUSING, SINGLE BELT DRIVE, 60
M2B BELT HOUSING, DOUBLE BELT DRIVE 60
M2C BELT HOUSING, SINGLE BELT DRIVE, 25
M2D BELT HOUSING, DOUBLE BELT DRIVE, 25
M3 QUILL
M4A SPINDLE, SINGLE BELT NO.2 MORSE TAPER
M4B SPINDLE, SINGLE BELT, NO.7 B&S TAPER
M4C SPINDLE, SINGLE BELT, NO.B3 TAPER
M4D SPINDLE, DOUBLE BELT, NO.2 MORSE TAPER
M4E SPINDLE, DOUBLE BELT, NO7 B&S TAPER
M4F SPINDLE, DOUBLE BELT, NO.B3 TAPER
M5 NOSEPIECE
M6 OIL SLINGER
M7 S.A.E. NO. 205 BALL BEARING, 4 REQ'D.
M8 0.750 INSIDE BEARING SPACER
M9 0.750 OUTSIDE BEARING SPACER
M10 LONG SPACER
M11 0.375 INSIDE BEARING SPACER
M12 0.375 OUTSIDE BEARING SPACER
M13 NO. W-05 BEARING LOCK WASHER
M14 NO. N-05 BEARING LOCK NUT
M15 NO. W-06 BEARING LOCK WASHER
M16 NO. N-06 BEARING LOCK NUT
M17A SPINDLE PULLEY HUB, SINGLE BELT DRIVE
M17B SPINDLE PULLEY HUB, DOUBLE BELT DRIVE
M18A SPINDLE PULLEY, SINGLE BELT DRIVE
M18B SPINDLE PULLEY, DOUBLE BELT DRIVE
M19 S.A.E. NO. 206 BALL BEARING, 2 REQ'D.
M20 BEARING HOUSING
M21 BEARING RETAINER RING
M22 MICROMETER STOP
M23 MICROMETER NUT
M24 MICROMETER LOCK NUT
M25 MICROMETER SCREW
M26 DRAWBAR NUT (LEFT HAND THREAD)
M27A DRAWBAR, DOUBLE BELT, NO.7 OR NO.2 SPINDLE
M27B DRAWBAR, DOUBLE BELT, NO.B3 SPINDLE
M27C DRAWBAR, SINGLE BELT, NO.7 OR NO.2 SPINDLE
M27D DRAWBAR, SINGLE BELT, NO. B3 SPINDLE
*M28 DRAWBAR KNOB
M30 A MOTOR PULLEY, SINGLE BELT DRIVE
M30 B MOTOR PULLEY, DOUBLE BELT DRIVE
*M31 MOTOR PULLEY HUB
M32 QUILL FEED CLUTCH BOLT
M33 QUILL FEED CLUTCH HUB
M34 QUILL FEED PINION
M35 QUILL FEED WORM WHEEL
M36 FIBRE WASHER, 2 REQ'D
M37 SPLIT BUSHING
M38 CLOCK SPRING
M39 SPRING COVER
M40 QUILL FEED CLUTCH KNOB
M41 MICROMETER SCALE
M42 QUILL WORM FEED HAND WHEEL
M43 QUILL WORM FEED HAND WHEEL HANDLE
M44 QUILL WORM FEED HAND WHEEL HUB
M45 QUILL FEED WORM HUB
M46 QUILL FEED WORM
M47 QUILL LOCK BOLT HANDLE
M48 QUILL LOCK BOLT
M49 QUILL LOCK SLEEVE DRILLED
M50 QUILL LOCK SLEEVE, TAPPED
M51 INDICATOR ROD CLAMP SCREW
M52 INDICATOR ROD
M53 RACK FEED HANDLE HUB
M54 RACK FEED HANDLE
M55 BRONZE WORM BUSHING
M56 GITS NO. 2551 OIL CUP
M57 PINION KEY
M58 BRASS QUILL SKIRT
*M59 MOTOR DOME
*M60 MOTOR SWITCH
M61 NO. 00X1/2 TAPER PIN
M61 TAPER PIN
M62 STRAIGHT PIN
M63 OUTSIDE SPRING PIN
M64 T-BOLT, 4 REQ'D.
M67 SET SCREW
M68 CAP SCREW
M69 HEX. HEAD SCREW
M70 MOTOR MOUNTING RING STUD, 2 REQ'D.
M73 3/8 X 16 HEX. NUT, 4 REQ'D.
M74 3/8 X 1/8 X 3/4 CHAMFERED & HARDENED WASHER
M75 SET SCREW
M76 FLAT HEAD SCREW, 2 REQ'D.
M77 FLAT HEAD SCREW, 3 REQ'D.
M78 STEEL BALL
M79 SPRING
M80 SET SCREW
*M83 1/2 H.P. MOTOR
M84 PAPER GASKET
M85 SET SCREW
M86 V-BELT
M87 STRAIGHT PIN
M88 BRASS PLUG
M89 PINION SPRING PIN
M90 MOTOR CORD
M92 STRAIGHT PIN
M97 STRAIGHT PIN
M125 SNAP RING

NOTE: ALWAYS GIVE SERIAL NUMBER OF ATTACHMENT WHEN ORDERING PARTS. SPECIFY MAKE OF MOTOR FOR ITEMS MARKED *

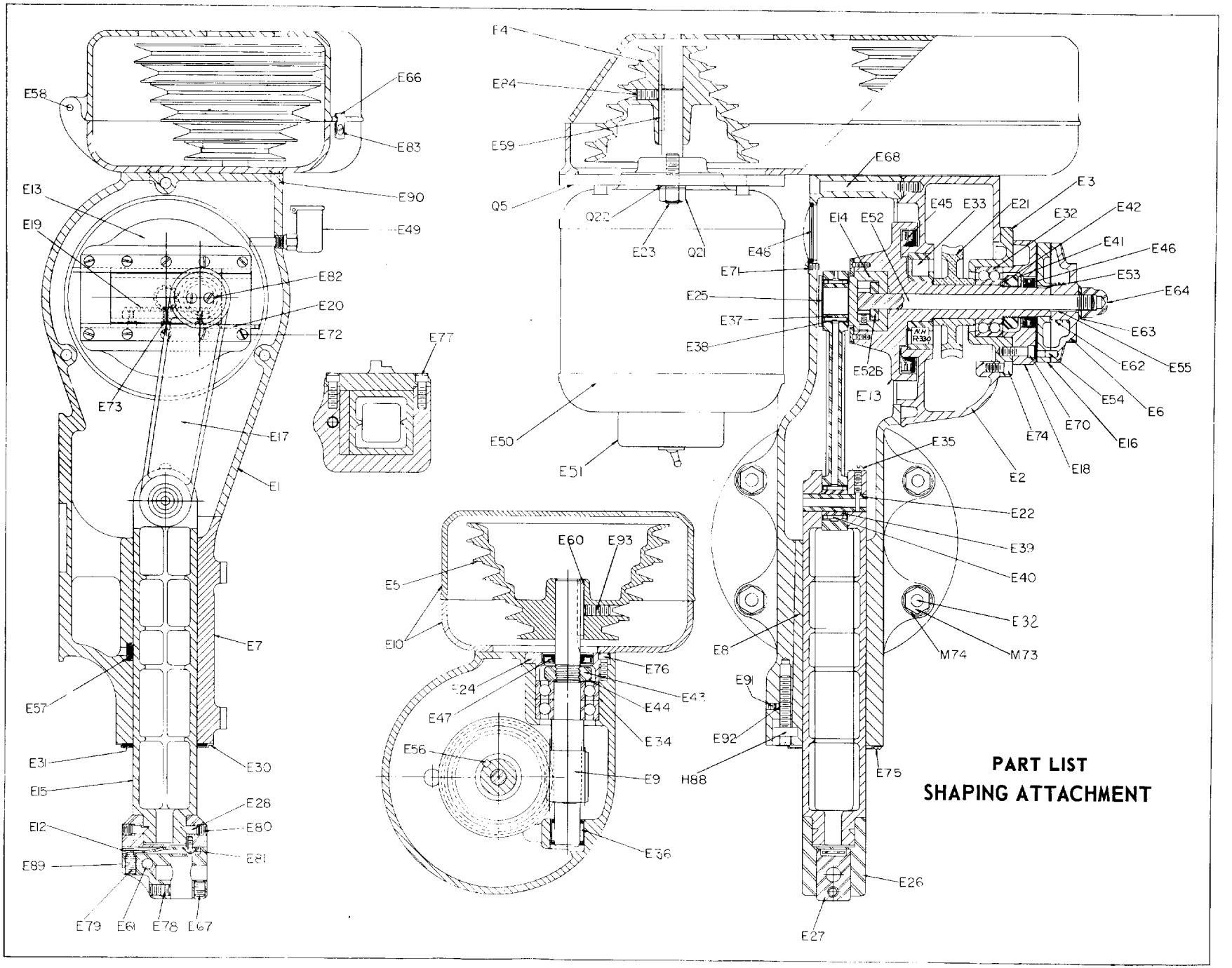






SPECIFY SPINDLE TAPER WHEN ORDERING COLLETS

NO. 7 BROWN & SHARPE
NO. 2 MORSE
BRIDGEPORT B3

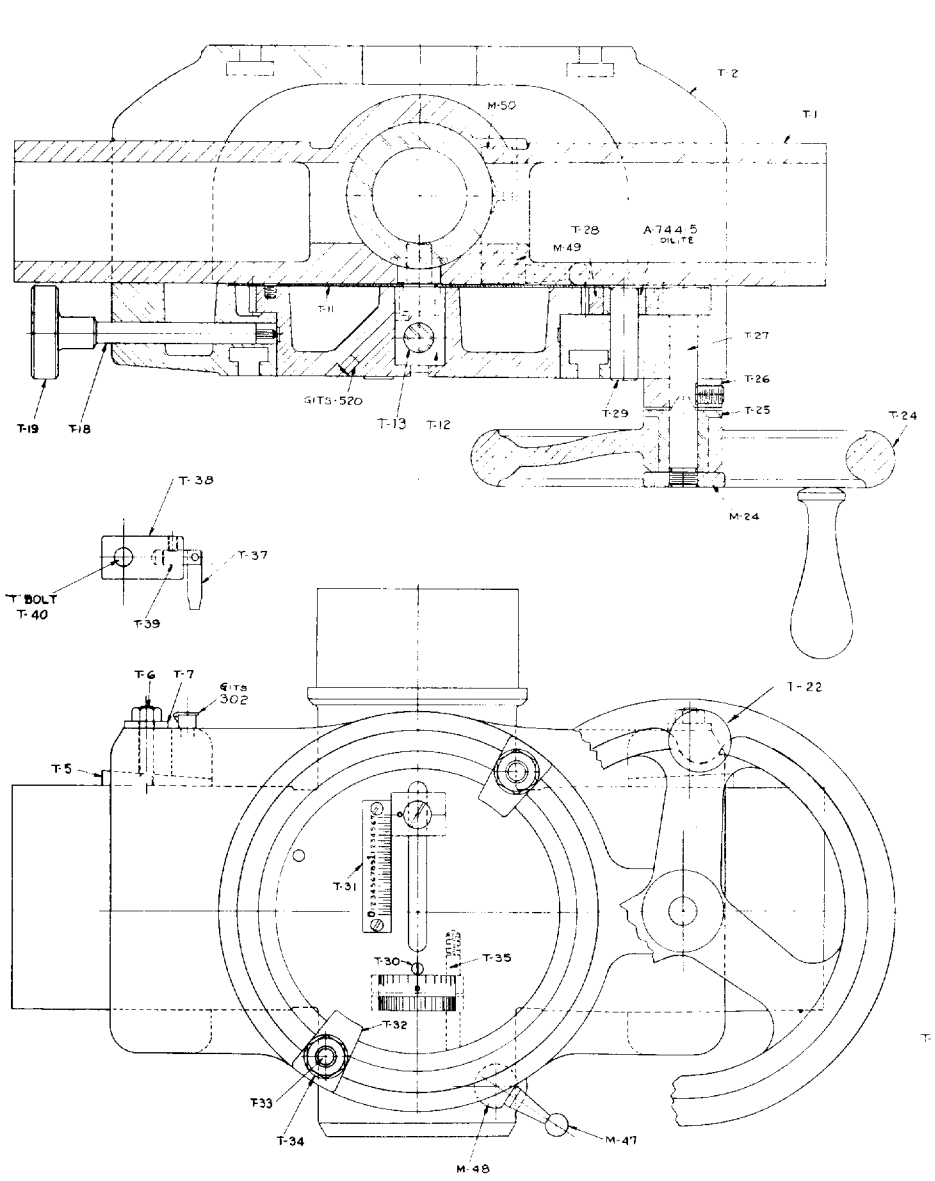


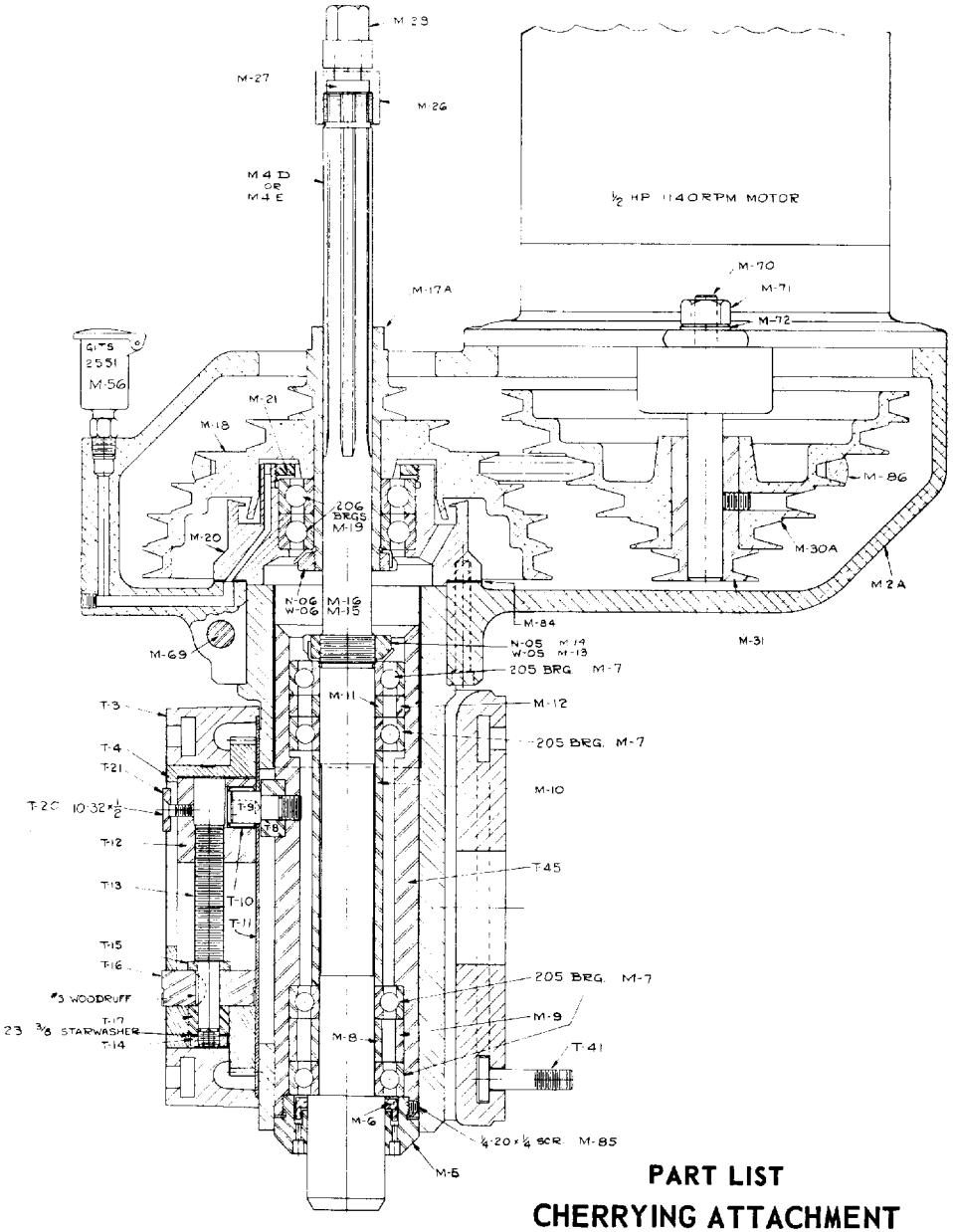
PART LIST
SHAPING ATTACHMENT

PART LIST -- THE BRIDGEPORT SHAPING ATTACHMENT

E-1	RAM HOUSING
E-2	GEAR HOUSING
E-3	GEAR HOUSING COVER
E-4*	MOTOR PULLEY
E-5	WORM SHAFT PULLEY
E-6	STROKE ADJUSTMENT DIAL
E-7	RAM COVER
E-8	GIB
E-9	WORM AND SHAFT
E-10*	BELT HOUSING
E-12	CLAPPER SPRING
E-13	CRANK AND SHAFT
E-14	CRANKPIN BLOCK
E-15	RAM
E-16	STROKE ADJUSTMENT PLATE
E-17	CONNECTING ROD
E-18	CRANK BEARING COVER
E-19	RACK
E-20	CRANKPIN BLOCK HOLD-DOWN–2 REQUIRED
E-21	WORM GEAR
E-22	RAM CRANKPIN
E-23	MOTOR MOUNTING RING STUD – 2 REQUIRED
E-24	WORM BEARING COVER
E-25	BEARING RETAINING WASHER
E-26	CLAPPER BOX
E-27	CLAPPER
E-28	CLAPPER BOX CLAMP SHOE – 2 REQUIRED
E-29*	BELT
E-30	WIPER PLATE
E-31	WIPER–FELT
E-32	NO. 5205 BEARING
E-33	NO. R330 BEARING
E-34	NO. 204 BEARING – 1 PAIR
E-35	RAM CRANKPIN LOCKSCREW
E-36	NO. B-1212X BEARING
E-37	NO. 1S-1312 INNER RACE
E-38	NO. GB-1612X BEARING
E-39	NO. 1S-812 OSC. INNER RACE
E-40	NO. GB-1212X BEARING
E-41	N-05 LOCKNUT
E-42	NO. W-05 LOCKWASHER
E-43	NO. N-04 LOCKNUT
E-44	NO. W-04 LOCKWASHER
E-45	3-1/4 x 4-1/4 x 1/2 OILSEAL
E-46	7/8 x 1-1/2 x 3/8 OILSEAL
E-47	3/4 x 1-1/2 x 5/16 OILSEAL
E-48	AIR VENT COVER
E-49	OIL CUP
E-50*	MOTOR
E-51*	SWITCH
E-52	LOCKING BOLT AND GEAR
E-52B	LOCKING BOLT COLLAR
E-53	KEY
E-54	3/16 x 3/8 PIN
E-55	KEY
E-56	KEY
E-57	FELT PLUG
E-58	1/8 x 1-1/4 PIN – 2 REQUIRED
E-59	KEY
E-60	3/16 x 3/16 x 1-3/4 KEY
E-61	5/16 x 1-7/8 PIN
E-62	DIAL SPRING
E-63	WASHER
E-64	7/16 – 20 ACORN NUT
E-66	BELT COVER CLIP
E-67	5/16 – 18 x 1/2 SET SCREW
E-68	5/16 – 18 x 2-3/4 CAP SCREW
E-70	1/4 – 20 x 3/4 CAP SCREW – 3 REQUIRED
E-71	NO. 8-32 x 3/8 WASHER HEAD SCREW – 2 REQUIRED
E-72	NO. 10-24 x 3/8 FLAT HEAD SCREW – 10 REQUIRED
E-73	NO. 8-32 x 3/8 ROUND HEAD SCREW – 3 REQUIRED
E-74	1/4 – 20 x 1/2 CAP SCREW – 3 REQUIRED
E-75	NO. 5-40 x 1/4 ROUND HEAD SCREW – 4 REQUIRED
E-76	NO. 10-24 x 3/8 CAP SCREW – 3 REQUIRED
E-77	1/4 – 20 x 1/2 CAP SCREW – 6 REQUIRED
E-78	5/16 – 18 x 5/8 SET SCREW
E-79	5/16 – 18 x 5/8 SET SCREW
E-80	5/16 – 18 x 5/16 SET SCREW – 2 REQUIRED
E-81	NO. 8-32 x 3/8 ROUND HEAD SCREW
E-82	NO. 5-40 x 1/4 FLAT HEAD SCREW – 2 REQUIRED
E-83	NO. 8-32 x 3/8 WASHER HEAD SCREW
E-84	5/16 – 18 x 5/8 SET SCREW
E-85	OVERARM MARKER
E-88	1/8 PIPE PLUG, DRILLED AND TAPPED
E-89	NO. 10-24 x 1/4 SET SCREW
E-90	1/4 – 20 x 1/2 FLAT HEAD SCREW – 4 REQUIRED
E-91	1/4 – 20 x 1/4 SET SCREW
E-92	BRASS PLUG
E-93	5/16 – 18 x 3/4 SET SCREW
E-94	ROTATION NAMEPLATE
E-203	STANDARD NAMEPLATE
M-73	T-BOLT NUT – 4 REQUIRED
M-74	T-BOLT WASHER – 4 REQUIRED
Q-17	T-BOLT – 4 REQUIRED
Q-5	MOTOR MOUNTING RING
Q-21	MOTOR MOUNTING RING STUD NUT – 2 REQUIRED
Q-22	MOTOR MOUNTING RING STUD WASHER – 2 REQUIRED
H-88	GIB SCREW

* GIVE MOTOR SPECIFICATIONS INCLUDING MAKE OF MOTOR WHEN ORDERING THESE PARTS. ALWAYS GIVE SERIAL NUMBER OF ATTACHMENT.

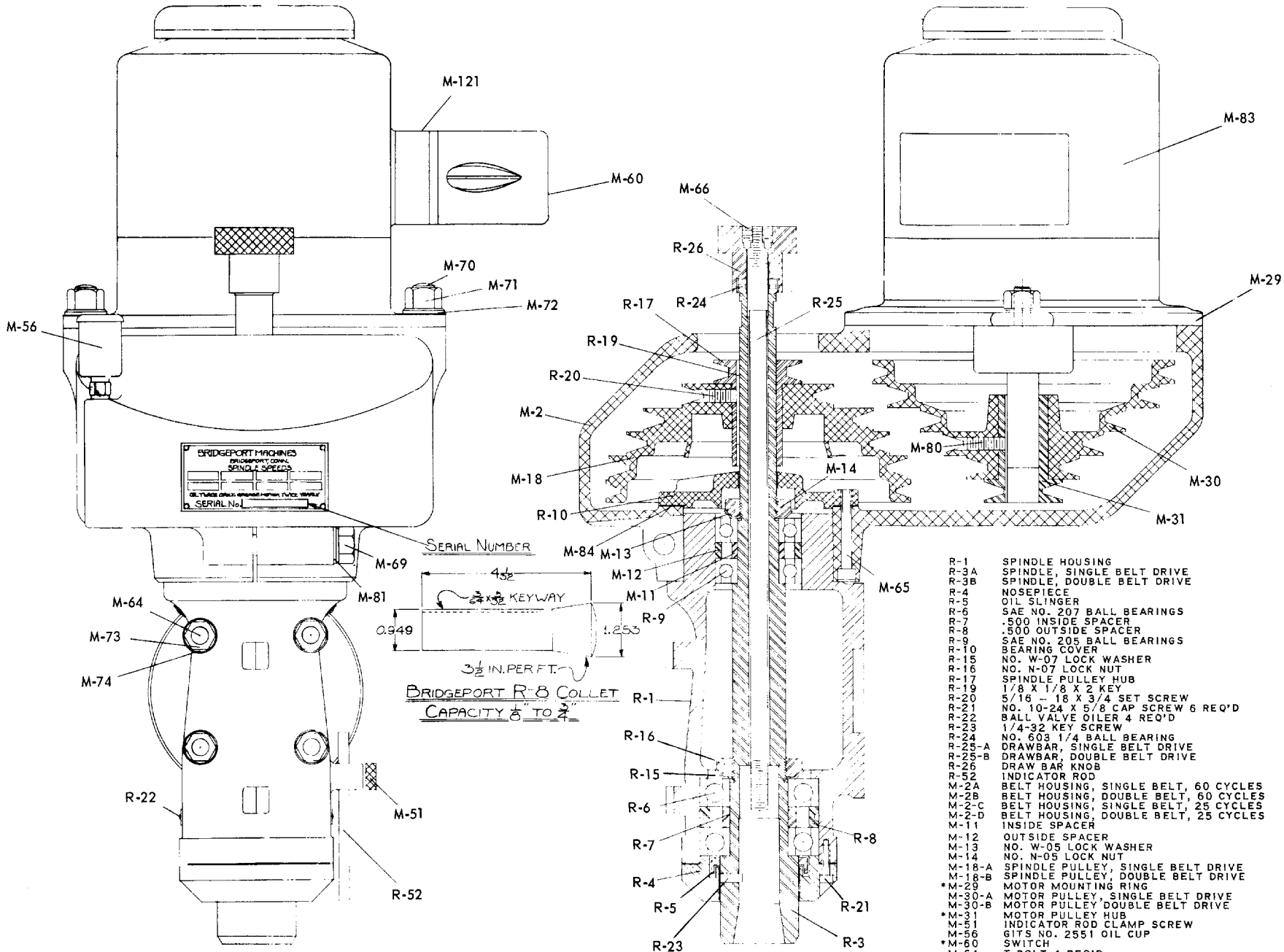




PART LIST
CHERRYING ATTACHMENT

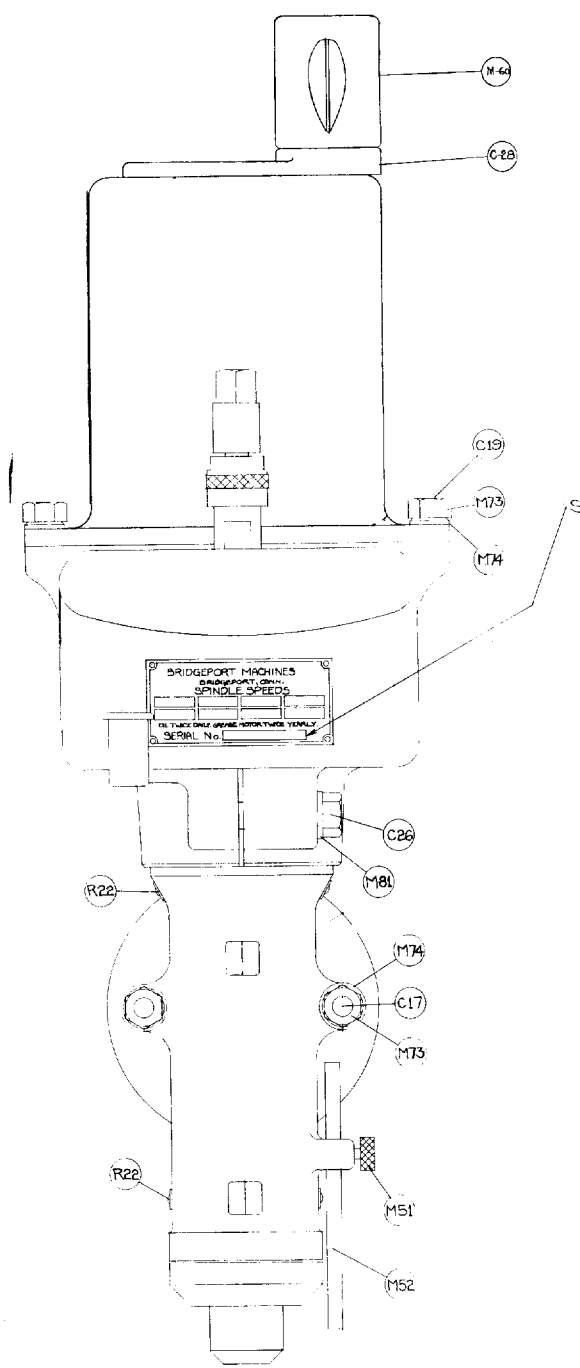
CHERRYING ATTACHMENT PARTS LIST

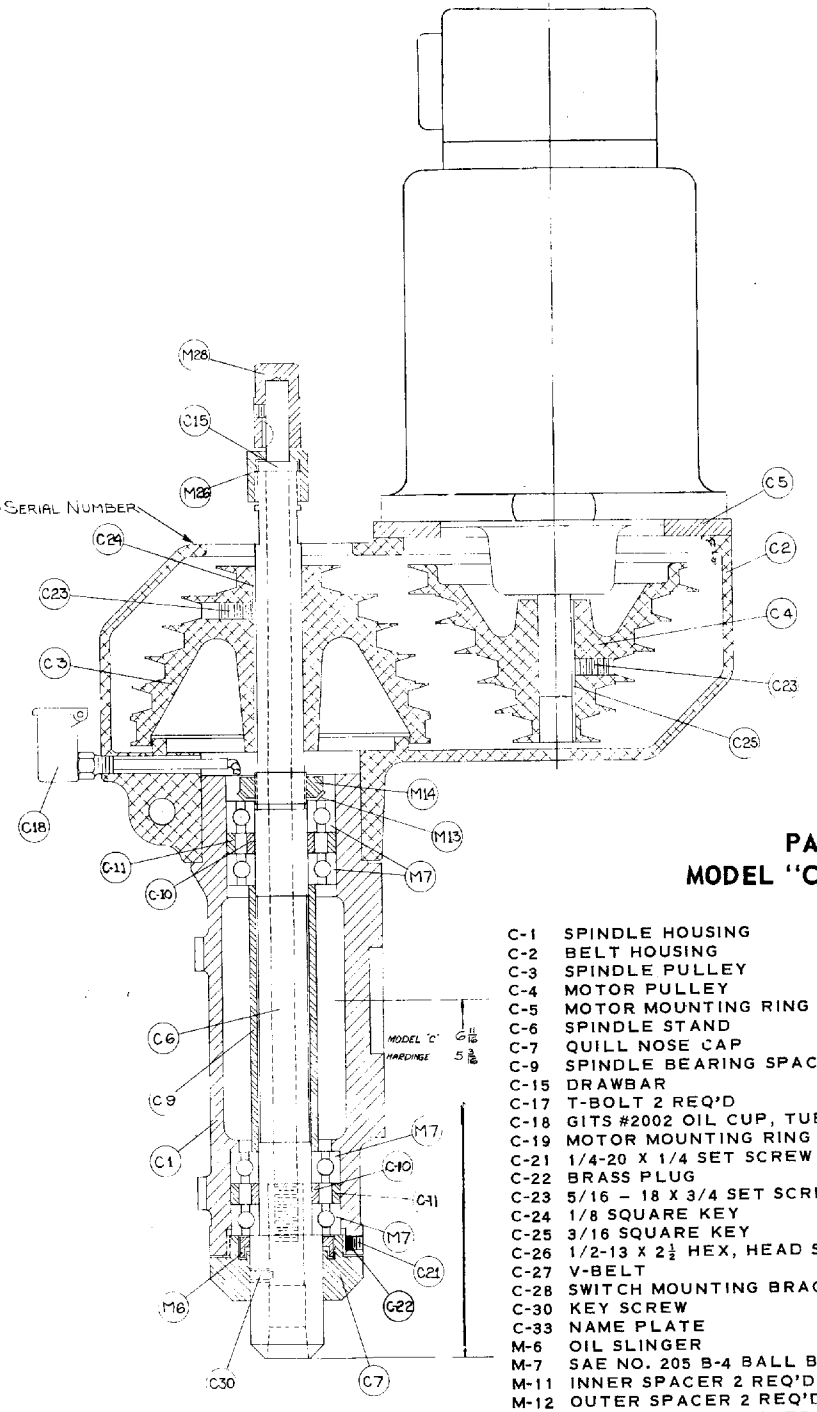
M2A	Belt Housing, single belt drive, 60 cycle
M4D	Spindle, Double belt, #2 Morse Taper
M4E	Spindle, Double belt, #7 B&S Taper
M5	Nosepiece
M6	Oil Slinger
M7	SAE # 205 Ball Bearing (4 Req'd)
M8	0.750 Inside Bearing Spacer
M9	0.750 Outside Bearing Spacer
M10	Long Spacer
M11	0.375 Inside Bearing Spacer
M12	0.375 Outside Bearing Spacer
M13	No. W-05 Bearing Lock Washer
M14	No. N-05 Bearing Lock Nut
M15	No. W-06 Bearing Lock Washer
M16	No. N-06 Bearing Lock Nut
M17A	Spindle Pulley Hub, Single Belt Drive
M18A	Spindle Pulley, Single Belt Drive
M19	SAE #206 Ball Bearings (2 Req'd)
M20	Bearing Housing
M21	Bearing Retainer Ring
M26	Drawbar Nut (Left Hand Thread)
M27A	Drawbar, double drive, #7 or #2 spindle
M28	Drawbar Knob
M29	Motor Mounting Ring
M30A	Motor pulley, single belt drive with Hub Part M31
M31	Motor Pulley Hub
M47	Quill Lock Bolt Handle
M48	Quill Lock Bolt
M49	Quill Lock Sleeve, Drilled
M50	Quill Lock Sleeve, Tapped
M56	Gits No. 2551 Oil Cup
M60	Motor Switch 9441 H31D Cutler Hammer
M64	T Bolts (4 Req'd)
M65	1/4 x 20 x 1-3/4 lg. Cap Screw (6 Req'd)
M69	1/2 x 13 x 3-1/4 Hex. Head Screw
M70	Motor Mounting Ring Stud (2 Req'd)
M71	1/2 x 20 Hex. Nut (2 Req'd)
M72	1/2 x 1/8 x 1 Chamfered & Hardened Washer
M83	1/2 HP Motor
M84	Paper Gasket
M85	1/4 x 20 x 1/4 Set Screw
M86	Gilmer 5607 Belt F.H.P.
M90	Motor Cord
T1	Quill Housing
T2	Quill Housing Saddle
T3	Gear Housing
T4	Drum Gear
T5	Gib (2 Req'd)
T6	Gib Screw (2 Req'd)
T7	Gib Screw Washer (2 Req'd)
T8	Cherry
T9	Pivot Stud
T10	Torr. Brg. GB-98
T11	Drum Gear Plate
T12	Pivot Offset Block
T13	Lead Screw
T14	Lead Screw Locknut
T15	Lead Screw Washer
T16	Lead Screw Dial
T17	Lead Screw Spacer
T18	Allen Wrench Stud
T19	Wrench Knob
T20	10 - 32 x 1/2 lg. Flat Head Screw
T21	Zero Block
T22	Handwheel Handle
T23	3/8" Star Washer
T24	Hand Wheel
T25	Hand Wheel Dog
T26	Hand Wheel Gear Clutch
T27	Hand Wheel Pinion
T28	Idler Gear
T29	Idler Gear Post
T30	Lead Screw Zero Pin
T31	Scale (Purchased)
T32	Stop Dog (2 Req'd)
T33	T Bolt (3 Req'd)
T34	T Bolt Washer (3 Req'd)
T35	Dial Binder Plug
T36	Fork Adapter (See Misc. Price List)
T37	Finger Ratchet Spring
T38	Feed Ratchet Dog
T39	Ratchet Stud
T40	Ratchet Dog Tee Bolt
T41	Adapter Tee Bolt
T45	Quill

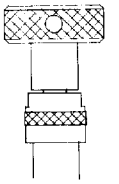


PART LIST
MODEL "R" MILLING ATTACHMENT

R-1	SPINDLE HOUSING
R-3A	SPINDLE, SINGLE BELT DRIVE
R-3B	SPINDLE, DOUBLE BELT DRIVE
R-4	NOSEPIECE
R-5	OIL SLINGER
R-6	SAE NO. 207 BALL BEARINGS
R-7	.500 INSIDE SPACER
R-8	.500 OUTSIDE SPACER
R-9	SAE NO. 205 BALL BEARINGS
R-10	BEARING COVER
R-15	NO. W-07 LOCK WASHER
R-16	NO. N-07 LOCK NUT
R-17	SPINDLE PULLEY HUB
R-19	1/8 X 1/8 X 2 KEY
R-20	5/16 – 18 X 3/4 SET SCREW
R-21	NO. 10-24 X 5/8 CAP SCREW 6 REQ'D
R-22	BALL VALVE OILER 4 REQ'D
R-23	1/4-32 KEY SCREW
R-24	NO. 603 1/4 BALL BEARING
R-25-A	DRAWBAR, SINGLE BELT DRIVE
R-25-B	DRAWBAR, DOUBLE BELT DRIVE
R-26	DRAW BAR KNOB
R-52	INDICATOR ROD
M-2A	BELT HOUSING, SINGLE BELT, 60 CYCLES
M-2B	BELT HOUSING, DOUBLE BELT, 60 CYCLES
M-2-C	BELT HOUSING, SINGLE BELT, 25 CYCLES
M-2-D	BELT HOUSING, DOUBLE BELT, 25 CYCLES
M-11	INSIDE SPACER
M-12	OUTSIDE SPACER
M-13	NO. W-05 LOCK WASHER
M-14	NO. N-05 LOCK NUT
M-18-A	SPINDLE PULLEY, SINGLE BELT DRIVE
M-18-B	SPINDLE PULLEY, DOUBLE BELT DRIVE
*M-29	MOTOR MOUNTING RING
M-30-A	MOTOR PULLEY, SINGLE BELT DRIVE
M-30-B	MOTOR PULLEY DOUBLE BELT DRIVE
*M-31	MOTOR PULLEY HUB
M-51	INDICATOR ROD CLAMP SCREW
M-56	GITS NO. 2551 OIL CUP
*M-60	SWITCH
M-64	T-BOLT 4 REQ'D
M-65	1/4-20 X 5/8 CAP SCREW 3 REQ'D
M-66	1/4-20 X 3/8 SET SCREW 4 REQ'D
M-69	1/2-13 X 3-1/4 HEX HEAD SCREW
M-70	MOTOR MOUNTING RING STUD 2 REQ'D
M-71	1/2-20 HEX. HD. NUT 2 REQ'D
M-72	1/2 X 1/8 X 1 HARDENED, CHAMFERED WASHER
M-73	3/8-16 HEX NO. 7 4 REQ'D
M-74	3/8 X 1/8 X 3/4 HARDENED, CHAMFERED WASHER
M-80	5/16 – 18 X 3/4 SET SCREW
M-81	1/2 X 1/8 X 7/8 HARDENED, CHAMFERED WASHER







NOTE: KNURLED TYPE DRAW KNURLED KNOB TYPE DRAWBA COMPLETE DRAWBAR ASSEMB AND M28) WILL BE REPLACED KNOB DRAWBAR ASSEMBLY.

PARTS LIST
MODEL "C" ATTACHMENT

C-1 SPINDLE HOUSING
C-2 BELT HOUSING
C-3 SPINDLE PULLEY
C-4 MOTOR PULLEY
C-5 MOTOR MOUNTING RING
C-6 SPINDLE STAND
C-7 QUILL NOSE CAP
C-9 SPINDLE BEARING SPACER
C-15 DRAWBAR
C-17 T-BOLT 2 REQ'D
C-18 GITS #2002 OIL CUP, TUBING, WICK
C-19 MOTOR MOUNTING RING STUD 2 REQ'D
C-21 1/4-20 X 1/4 SET SCREW
C-22 BRASS PLUG
C-23 5/16 – 18 X 3/4 SET SCREW 2 REQ'D
C-24 1/8 SQUARE KEY
C-25 3/16 SQUARE KEY
C-26 1/2-13 X 2½ HEX, HEAD SCREW
C-27 V-BELT
C-28 SWITCH MOUNTING BRACKET
C-30 KEY SCREW
C-33 NAME PLATE
M-6 OIL SLINGER
M-7 SAE NO. 205 B-4 BALL BEARINGS 4 REQ'D
M-11 INNER SPACER 2 REQ'D
M-12 OUTER SPACER 2 REQ'D
M-13 NO. W-05 LOCK WASHER
M-14 NO. N-05 LOCK NUT
M-26 DRAWBAR NUT
M-28 DRAWBAR KNOB
M-51 INDICATOR ROD CLAMP SCREW
M-52 INDICATOR ROD
M-60 MOTOR SWITCH
M-73 3/8 – 16 HEX. NUT 4 REQ'D
M-74 3/8 X 1/8 X 3/4 WASHER 4 REQ'D
M-81 1/2 X 1/8 X 7/8 WASHER
R-22 BALL VALVE OILER 4 REQ'D

OPTICAL MEASURING SYSTEM

Alignment of Scales.

Table Scale

1. Install scale holder (0-7) on scale holder bracket (0-21) using (2) washers (0-60) and (2) round head screws (0-41 Snug up screws (0-41).
2. Loosen (4) screws (0-40) located in base of scope housing (0-2). Move scope unit (0-2) in or out to bring image in focu on window of scope unit (0-2). Snug up (2) screws (0-40) (top left and lower right) in base of scope unit (0-2).
3. Crank table to read 5.000 inch in scope unit window. At this point lower or raise scale holder (0-7) by using adjustmer screw (0-48) to bring scale image into view of scope unit window so that the top of the short graduations lines ar parallel to top of catch fork.

   (Note: Illustration.)

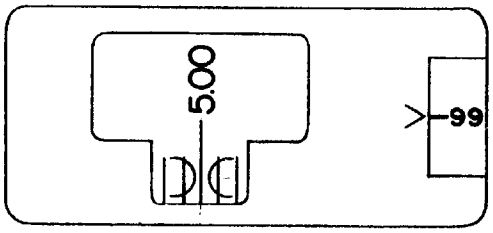


FIG. 3

4. Follow same procedure at point 15 inch on scale image viewed in scope unit window. This adjustment is repeated until scale graduations are parallel to catch fork. Re-adjust scope housing for sharpness and lock scope housing tight by using (4) screws (0-40). Re-check scale image in scope unit window and make final adjustment on scale holder (0-7) if necessary. Lock (2) screws (0-41) tight. Check tenth reading dial to scale graduations. (This reading will determine proper focus of scope — i.e. scope must be adjusted in or out for proper focus.) Dial reading should be set at 99 and catch fork lined central with a given line by moving the machine lead screw. See Fig. 3. Rotate dial to line below 0 line — catch fork should now fall centrally over adjacent line. If it doesn't, then the focus of the scope must be adjusted.

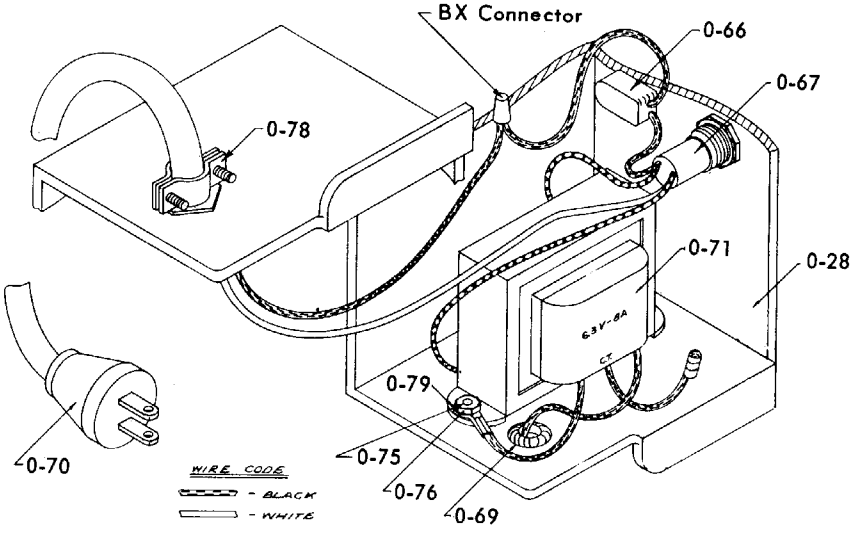
   Note: This is most important as unit is *only* in focus when lines are in center of catch and fork as described above.

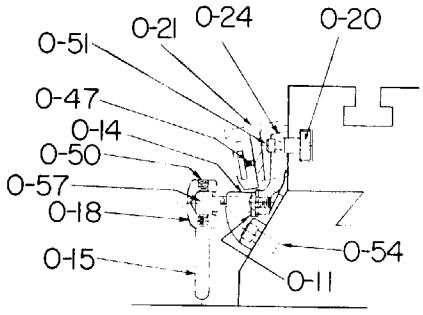
Cross Travel Scale

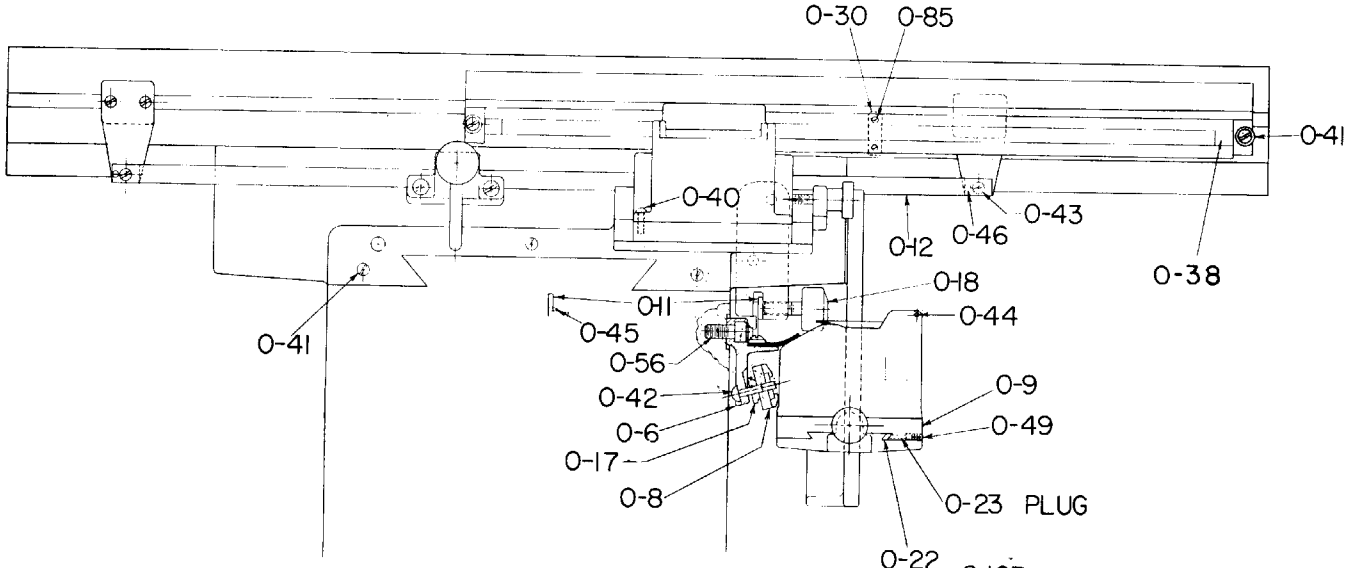
1. Crank saddle to front position.
2. Loosen (4) screws (0-40) located in base of scope unit (0-2). Position scope unit (0-2) so location of screws (0-40) are in center of elongated slots. Snug up (2) screws (0-40) in scope unit.
3. Bring scale into focus by using adjusting nut (0-17). Align short graduations to top of catch fork.
4. Crank table to 9" or 12" point on scale. Bring scale to focus by adjusting nut (0-17) and set top of catch fork to top of short graduations using adjusting set screw (0-48). Proceed to focus following same procedure in setting table scale holder (0-7).

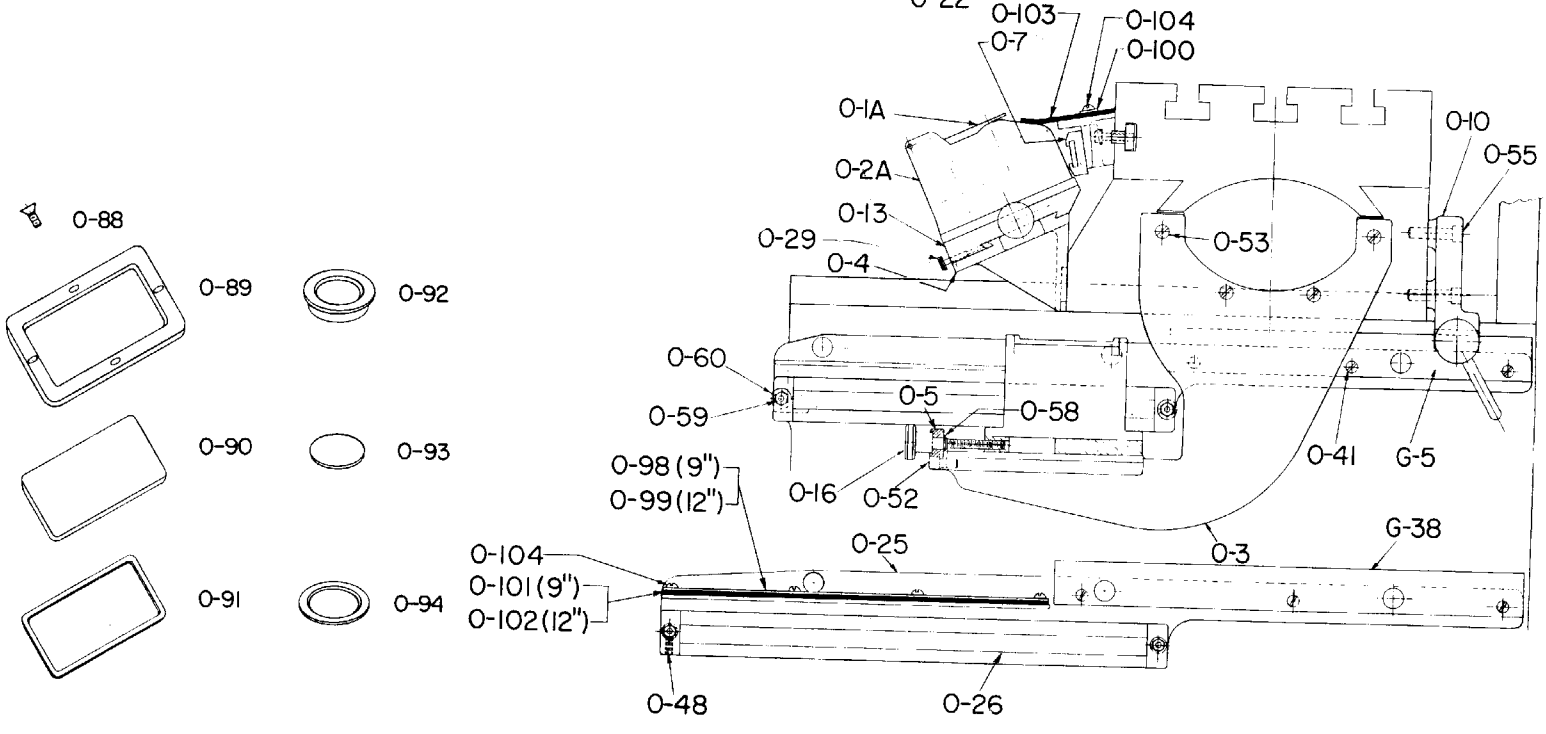
   Note: Check 1" slide adjustment for parallelism. If top of catch fork does not run parallel to top of short graduations. It is necessary to loosen (4) cap screws (0-53) holding cross bracket-lens assembly (0-3) and make proper adjustment.

OPTICAL PARTS DRAWING









OPTICAL PARTS LIST

PART NUMBER	AMOUNT	NAME
O-1A		Lens Cover
O-2A		Scope Housing
O-3	1	Cross Bracket
O-4	1	Table Bracket
O-5	2	Adj. Screw Bracket
O-6	1	9" Cross Travel Bracket
O-7	1	Table Scale Bracket
O-8	1	9" Cross Travel Scale Bracket
O-9	1	Cross Travel Dovetail Slide
O-10	1	Cross Travel Binder Bracket
O-11	2	Binding Bracket Plate
O-12	1	Table Binder Strip
O-13	1	Table Dovetail Slide
O-14	1	Table Binder Bracket
O-15	2	Binder Handle
O-16	2	Housing Adjusting Screw
O-17	2	Scale Adj. Nut
O-18	2	Binder Hub
O-20	7	Tee Slot Shoe
O-21	1	Table Scale Bracket
O-22	2	Straight Dovetail Gib
O-23	6	Gib Binding Plugs
O-24	2	Binding Strip Dogs
O-25	1	12" Cross Travel Bracket
O-26	1	12" Cross Travel Scale Bracket
O-27		Assembly Dwgs.
O-28	1	Transformer Box
O-29	2	Slide Lock Screw
O-30	1	Scale Holder Clamp
O-31	1	Cam Shaft (Not Shown)
O-32	1	Scale Dial Knob (Not Shown)
O-33	1	Dial Knob Shaft (Not Shown)
O-34	1	Dial Knob Washer (Not Shown)
O-35	1	Lamp Cover Gasket (Not Shown)
O-36	1	Lens Cover Gasket (Not Shown)
O-37	1	Dial Knob Shaft Diaphragm (Not Shown)
O-38	4	Scale Holder Cap (Replaces O-19)
O-39	2	Scope Units Complete
O-40	8	8-32 x 1/2 Round Head Screws
O-41	8	10-32 x 1/2 Round Head Screws
O-42	2	Round Head Screws
O-43	2	1/4-20 x 3/8 Round Head Screws
O-44	4	.078" x 3/8 Roll Pins
O-45	4	1/8 x 1/4 Roll Pins
O-46	2	1/8 x 3/8 Roll Pins
O-47	4	5-40 x 1/8 Socket Set Screws
O-48	4	5-40 x 1/2 Socket Set Screws
O-49	4	6-40 x 3/8 Socket Set Screws
O-50	2	1/4-28 x 1/4 Socket Set Screws
O-51	7	10-32 x 3/4 Socket Cap Screws
O-52	4	1/4-20 x 1/2 Socket Cap Screws
O-53	4	1/4-20 x 3/4 Socket Cap Screws
O-54	2	5/16-18 x 5/8 Socket Cap Screws
O-55	2	5/16-18 x 1" Socket Cap Screws
O-56	3	3/8-16 x 3/4 Socket Cap Screws
O-57	2	3/8-16 x 1 Socket Cap Screws
O-58	2	#5100-31 Snap Ring
O-59	2	10-32 Hex Nut
O-60	4	#6 Flat Washer
O-61	1	9" Scale
O-62	1	12" Scale
O-63	1	20" Scale
O-64	2	Bycor Cord Seal (Specify Scale Length)
O-65	2	Scale Glass (Specify Scale Length)
O-66	1	Toggle Switch (117/110 Volt)
O-67	1	Signal Lamp Complete (117/110 Volt)
O-68	1	Signal Lamp Bulb GE NE 51H (117/110 Volt)
O-69	1	Rubber Cromet 3/8 I.D.
O-70	1	Cord Set (18-2 117/110 Volt)
O-71	1	Transformer (117/110 Volt Primary – 6.3 Volt Secondary)
O-72	1	Harness Cord Set (6.3 Volt)
O-73	1	Transformer Box Name Plate
O-74	2	Decal (Optical Housing)
O-75	2	6-32 x 1/2 Round Head Screws
O-76	2	6-32 Hex Nuts
O-77	2	1/4-20 x 1/2 Round Head Screws
O-78	1	3/8" Cable Connector
O-79	1	#B65 Spade Terminal
O-80	1	#2B-14 Wire Terminal
O-81	2	Bulb #81 Automotive (6 Volt)
O-82	1	1/2-13 x 3/8 Socket Set Screws
O-83	1	67-1/2° Angle Alemite Fitting
O-84	1	Starr Lenn Gauze
O-85	2	5-40 x 1" Oval Head Screw
O-86	2	No. 4 x 1/4 R Sheet Metal Screws
O-87	2	Rubber Cap
O-88		#1-72 x 3/16 Flat Head Screw for Window Frame
O-89	2	Window Frame
O-90	2	Window
O-91	2	Window Gasket
O-92	2	Lens Frame
O-93	2	Lens
O-94	2	Lens Gasket
O-98		Guard Securing Strip (9" Knee)
O-99		Guard Securing Strip (12" Knee)
O-100		Guard Securing Strip (Table)
O-101		Cross Travel Scale Guard (9" Knee)
O-102		Cross Travel Scale Guard (12" Knee)
O-103		Table Scale Guard
O-104		6-32 x 1/4 LG. RD. HD. Mach. Screw
OF-79	1	Table Stop Bracket (P.F.)
OF-80	1	Power Feed Stop Rod (Give Table Size)
OF-81	1	Power Feed Reversing Stop Rod Guide
OF-82	1	Table Binder Strip (With Power Feed)
OF-107		Power Feed Binder & Rod Bracket
OF-108		Power Feed Control Lever for Offset Stud
OF-109		Power Feed Offset Stud
G-5	1	9" Saddle Locking Strip
G-38	1	12" Saddle Locking Strip

ASSEMBLY INSTRUCTIONS
FOR MOUNTING VARIDRIVE ATTACHMENT TO RAM ADAPTER

Lift the attachment by the lifting strap, fastened to the cap on the top of the belt housing.

Insert the four tee bolts #J-155 into the ram adapter and position them to match the bolt holes in the attachment.

Slide the attachment onto the bolts, insert the spacers #J-94 and washers #M-72 and secure with the nuts #J-355 as shown on the assembly drawing #2J-200.

Tighten all the nuts with 25 ft. lbs. of torque, no more - - no less, and then repeat with 50 ft. lbs.

CAUTION: Improper tightening of these could cause a choppy quill movement.

Remove the lifting strap, replace screws in spindle bearing cap #2J-601.

LUBRICATION:

The useful life of this attachment will be determined to a large extent by proper lubrication. Carefully observe the nameplate recommendations and avoid substitutions. The Varidrive ball-bearings are grease-sealed for the life of the bearings.

OPERATING INSTRUCTIONS:

DO NOT attempt to change spindle RPM unless the motor is running. Dial speeds will only be approximate. Belt wear will cause a slight inaccuracy in speeds as indicated by the dial.

When tightening or loosening the drawbar it is necessary to lock the spindle. To accomplish this, use spindle brake and lock, which is located on the left side of belt housing, turning it either to the right or left until it binds, then raise handle.

Drawbar has 7/16-20 right hand thread and should be tightened with normal amount of pressure using wrench furnished with machine. To loosen collet back off drawbar and if collet does not open immediately give knob on top of drawbar a slight tap. Spindle has non-sticking taper and collet should release readily.

SPINDLE BRAKE:

Brake lever can be moved in either direction to stop spindle; however, when locking spindle, lever should be moved to right or left and then raised. When brake is worn out it has to be replaced. There are no adjustments to be made.

CAUTION: Be certain that the spindle brake is released before starting the motor. This is important as the motor can be damaged if switch is turned on with brake in locked position.

HIGH-LOW RANGE SWITCH:

This is the motor reversing switch. When the attachment is in direct drive (High Speed) the motor and spindle are turning in the same direction. When the attachment is in "Back Gear" (Low Speed) the spindle would run backwards unless the motor direction is reversed.

The back-gear lever is marked Hi-Lo. This will indicate the proper switch position. They should be alike or the spindle will run backwards.

HI-NEUTRAL-LO LEVER:

This lever is used to put the attachment into either backgear or direct drive. Rotate the spindle by hand to facilitate meshing of clutch or gears.

Neutral can also be obtained at mid-way position. After a long period of use, the neutral position may cause noise (in neutral only) by allowing the clutch teeth to rub each other.

This can be corrected by reversing the position of the detent plate #2J-605.

Neutral is provided to permit free spindle rotation for indicating and set-up work.

HI POSITION:

In the high speed position (direct drive) the spindle is driven by tapered clutch teeth. If the clutch is not meshed tightly, clutch rattle will be heard. This can be avoided by moving the detent plate #2J-605 upward as the clutches wear. This is also the reason for possible loss of neutral, requiring the reversal of the detent plate #2J-605.

CAUTION: DO NOT shift while motor is running.

POWER FEED TRANSMISSION ENGAGEMENT CRANK:

Engages power feed worm gear. When lever is in right hand hole, the power feed worm gear is engaged. To disengage worm gear, pull knob out and crank handle in clockwise or down direction and move to opposite position.

NOTE: Crank cannot be swung around in counter clockwise direction; however, no damage will occur if moved in this direction. To engage the worm a counter clockwise movement is required.

CAUTION: Power feed worm gear may be engaged when spindle is rotating, however, it should be engaged gently to avoid damage to worm gear. The worm gear may be disengaged at any time. **DO NOT** use Power Feed at speeds above 3000 RPM.

IMPORTANT: It is recommended that the Power Feed worm gear be disengaged whenever the power feed is not required. This will avoid unnecessary wear on power feed worm gear.

QUILL FEED SELECTOR:

This crank is used for selecting the three feeds; 1.5, 3, and 6 thousandths per revolution. It is shifted by pulling knob out and turning from one position to the other. Feeds are stamped on cover below indentation hole. Feed is more readily engaged when spindle is running.

FEED REVERSING KNOB:

Position of this handle depends upon direction of spindle rotation. If boring with right hand cutting tools, pull feed handle towards operator until clutch becomes engaged.

Neutral position is between forward and reverse position. It is recommended that the handle be left in neutral position when not in use.

MANUAL FEED:

Reversing clutch knob should be in neutral position and feed control lever engaged. Clockwise rotation of handwheel moves quill down. The Manual Feed Handwheel and the quill feed handle may be disengaged by moving outward about 1/8".

NOTE: Feed control lever must be engaged in order to use manual feed controls. Manual Feed Handle and Handwheel may be taken off when not in use.

FEED CONTROL LEVER:

Engages over-load clutch on pinion shaft when thrown to left and will stay engaged until either quill stop comes in contact with micrometer nut, forcing feed control lever to drop out automatically, or released manually by throwing lever to right.

NOTE: Feed Control Lever is carefully set at plant to throw out automatically when quill stop goes against micrometer nut or against safety pin in top. However, if this should go out of adjustment it may easily be brought back by regulating the screw located at bottom of tripping rod.

CAUTION: When adjusting the screw, check automatic throw off in both directions; that is with micrometer nut against the quill stop for down position and quill stop against throw out pin for up position.

QUILL FEED HANDLE:

May be removed by simply pulling handle off end of shaft. It is recommended that handle be disengaged when using power feed.

QUILL STOP:

Is used to disengage automatic feed in either direction as well as the setting point for working to given depths.

MICROMETER ADJUSTING NUT:

Is used for setting of depths. Each graduation on nut indicates one thousand of depth, it reads directly to scale mounted along side of it. Depths may be obtained by setting micrometer nut in conjunction with quill stop.

QUILL LOCK:

This is a positive quill lock to be used when quill is in stationary position such as milling operations. It is recommended that this lock be used whenever quill movement is not desired.

INDICATOR MOUNTING ROD:

Is used for fastening an indicator.

POSITION OF RAM:

Can be regulated by loosening two bolts on turret and pulling arm in or out to desired position.

CAUTION: Care should be taken to lock ram securely after setting.

NOTE: It is recommended that on heavy milling work, head should be kept as close to face of turret as possible, as maximum rigidity is then obtained.

RECOMMENDATIONS:

Use 2, 3, or 4 flute end mills. Eight flute end mills are usually not as satisfactory. When using shell or face mills standard cutter practice should be observed.

Power feed can be used for drilling up to 3/8" diameter drills. Use manual feed for drills larger than 3/8"

Overload clutch is set at factory to hold up to 200 lbs. down pressure on quill, which will accomodate drills up to 3/8" diameter in mild tool steel.

CAUTION: This clutch should not be tampered with in the field.

OPERATING INSTRUCTIONS

CAUTION: DO NOT try to change speed position until motor is running. This could cause breakage of parts.

Spindle Speeds are adjusted by turning the small handwheel on the front of the belt housing. There are two ranges shown; 60 to 500 and 500 to 4200.

60 to 500 is obtained through the back-gear drive and is referred to as the low range. To engage the back-gears, use the lever marked Hi-Neutral-Lo on the right rear side of the attachment. Move this to the "LO" position and use the low range on the drum switch.

When shifting to "Lo", do not force the lever if the back gears do not mesh. Hold the lever so that the gears are clear of one another, then rotate the spindle nose by hand until the gears line up, then put the unit in "Lo" (back gear).

500 to 4200 is obtained through direct drive and is the high range. The same lever and switch as above are used; selecting the "HI" range.

When shifting to "Hi", do not force the lever if the clutch teeth do not mesh. It is a simple matter to engage the brake and rotate the spindle nose by hand until the clutches engage.

Wear on the vari-drive belt will cause a slight change in the speeds as shown on the dial. This can be corrected as follows. Crank the speed control snugly against the high speed stop. (This will be near the 4200 reading on the dial). Use a tachometer to determine the spindle speed, and turn the adjusting screw #2J-526 (after loosening the jam nut) until the spindle speeds registers 4200 on the tachometer; tighten jam nut.

Now reposition the speed dial plate to match the tachometer reading. This is done by loosening the acorn nut in the center of the dial and setting the dial accordingly.

CAUTION: Try to avoid shifting the HI-LO lever when the feed worm is engaged.

DO NOT LOOSEN the 3 Hex Castle nuts #2J-575 that are locked with cotter pins. These are set at the factory and are used only for clutch alignment.

SWIVELING THE VARI-DRIVE attachment on this spindle housing may be done by loosening the 3 hex. nuts #2J-562 and then swiveling the attachment to any desired position.

CAUTION: Care should be taken to secure the nuts when the attachment is in position, before the motor is turned on.

REMOVING THE MOTOR:

Run the attachment to the bottom of either speed range and shut off the motor. This puts the vari-drive belt in the best position for disassembly.

1. DISCONNECT THE POWER AND THEN REMOVE THE SWITCH from the side of the belt housing.

PARTS LIST FOR J VARIDRIVE UNIT

J-1	Quill Housing
J-9	Worm Gear Cradle
J-10	Overload Clutch Trip Lever
J-11	Feed Gear Shifter Fork
J-14	Shift Crank
J-15	Cluster Gear Cover
J-16	Spring Cover
J-17	Feed Trip Bracket
J-18	Clutch Arm Cover
J-21	Handwheel
J-29	Locknut Binding Plug
J-31	Draw Bar
J-35	Quill Skirt
J-36	Quill Stop Knob
J-37	Quill Stop Micro Switch
J-38	Micrometer Nut
J-39	Reverse Trip Ball Lever
J-40	Feed Reverse Trip Plunger
J-41	Reverse Trip Ball Lever Screw
J-42	Feed Trip Lever
J-43	Feed Trip Plunger
J-44	Trip Plunger Bushing
J-46	Feed Trip Plunger Bushing
J-47	Cam Rod Sleeve Assembly
J-48	Cam Rod
J-49	Trip Handle
J-51	Overload Clutch Lever Spring Plunger
J-52	Overload Clutch Washer
J-53	Clutch Ring
J-54	Overload Clutch Sleeve
J-57	Overload Clutch Sleeve Key
J-58	Overload Clutch
J-59	Overload Clutch Ring
J-60	Overload Clutch Worm Gear
J-61	Pinion Shaft Worm Gear Spacer
J-62	Quill Pinion Shaft Bushing
J-63	Quill Pinion Shaft
J-64	Quill Pinion
J-65	Quill Lock Sleeve - Tapped
J-66	Quill Lock Sleeve - Drilled
J-67	Quill Lock Bolt
J-92	Brake Lock Handle
J-93	Brake Lock Pin
J-94	Spacer for J-155
J-97	Gear Shift Plunger
J-98	Cluster Gear Shift Crank
J-99	Feed Drive Cluster Gear
J-100	Feed Drive Cluster Gear (Center)
J-101	Feed Drive Cluster Gear (Upper)
J-103	Feed Drive Gear
J-104	Cluster Gear Input Shaft
J-105	Feed Driving Gear
J-106	Cluster Gear Shaft
J-107	Cluster Gear Key
J-108	Bevel Gear Bearing
J-109	Bevel Gear Thrust Spacer
J-110	Feed Reverse Bevel Gear
J-111	Feed Worm Shaft Thrust Washer
J-112	Feed Reverse Clutch
J-113	Handwheel Clutch Spring Screw
J-114	Feed Worm Shaft Bushing
J-116	Reverse Clutch Rod
J-117	Reverse Knob
J-118	Handwheel Clutch
J-119	Handwheel Bushing
J-121	Worm Shaft Key
J-122	Feed Driving Gear Key
J-123	Bevel Pin Washer
J-124	Feed Worm Gear Shaft Sleeve
J-125	Worm Gear Spacer
J-126	Feed Drive Worm Gear
J-127	Feed Drive Worm Gear Shaft
J-128	Feed Engage Pin
J-129	Worm Gear Cradle Throw Out
J-130	Shift Sleeve
J-135	Cluster Gear Key
J-136	Worm Cradle Bushing
J-137	Cluster Gear Key
J-139	Collet Aligning Screw
J-140	Worm Gear
J-141	Adjusting Worm
J-142	Key
J-144	Quill Housing Adj. Gear
J-145	Feed Shift Rod
J-146	Feed Reverse Bevel Pinion
J-147	Cluster Gear Shaft Upper Bearing
J-148	Pinion Shaft HUB Screw
J-150	Outside Spring Pin
J-151	Trip Lever Pin
J-154	Clutch Ring
J-155	1/2" T-Bolt
J-156	Feed Reverse Knob Stud
J-157	Micro Quill Stop Nut
J-166	Spindle
J-167	Quill
J-169	Spindle Dirt Shield
J-170	Bearing Spacer
J-171	Bearing Spacer
J-172	Quill Nosepiece
J-176	Single Row Bearing Sleeve
J-188	Feed Worm Shaft
J-190	Long Nut
J-192	Washer For J-104 Shaft
J-250	1/4-20 x 1/2 Lg. K.P. Set Screw
J-251	Set Screw
J-254	3/16 x 1/2 Dowel Pin
J-255	10-24 x 3/8 Lg. Round Head Screws
J-256	Compression Spring
J-260	3/16 x 3/4 Lg. Dowel Pin
J-261	1/8 x 7/8 Lg. Roll Pin
J-262	Spring for J-14
J-263	10-32 x 1/4 Lg. K.P. Set Screw
J-264	10-24 x 1/2 Lg. Cap Screws
J-265	1/4-20 x 3/4 Lg. Cap Screws
J-268	1/4-20 x 1/4 Lg. Set Screw
J-272	N-06 Lock Nut
J-273	W-06 Lock Washer
J-275	1/4-20 x 1/4 Lg. Set Screw
J-276	10-32 x 5/16 Lg. Round Head Screw
J-278	3/8-24 x 5/8 Cap Screw
J-279	#6-32 x 3/8 Set Screw
J-280	1/8 x 7/16 Dowel Pin
J-281	3/16 x 5/8 Dowel Pin
J-282	1/8 x 9/16 Dowel Pin
J-283	Compression Spring
J-284	1/4 x 20 Bakelite Ball Handle
J-285	8-32 x 5/8 Lg. Round Head Screw
J-287	#7 Woodruff Key
J-288	#5108 - 59 Snap Ring
J-298	#10-32 x 1/4 Socket Set Screw
J-299	#9 Woodruff Key
J-300	5/8-18NF Jam Nut
J-303	B-66 Torrington Needle Bearing
J-305	A-672-4 Oilite Bearing
J-306	3/32 x 5/16 Lg. Pin
J-307	Boston Worm Gear
J-308	.110 x 7/16 Lg. Pin
J-309	3/52 x 3/4 Lg. Roll Pin
J-310	3/16 Steel Ball
J-311	Compression Spring
J-312	1/4-20 x 5/16 Set Screw
J-315	10-24 x 3/8 K.P. Set Screw
J-316	5/16 x 7/8 Lg. Dowel Pin
J-319	5108-62 Snap Ring
J-321	Safety Clutch Spring
J-324	Feed Reverse Bevel Gear
J-327	Feed Bevel Pinion
J-328	1" x .020 x 42 Clock Spring
J-330	Compression Spring
J-331	5108-37 Snap Ring
J-333	Black Ball for M-54
J-336	5100-25 Snap Ring
J-338	Spindle Brg. Oil Cup
J-348	Ball Bearing #207
J-349	Ball Bearing #206
J-350	1/4-20 Mackit Lock Screw
J-352	1/8 x 3/4 Lg. Dowel Pin
J-353	#B-58-5 Boston Bronze Bearing
J-355	1/2 x 13 Std. Hex Nut
J-356	Flexloc Stop & Locknut
F-50	3/16 Steel Ball
F-61	Gear Sleeve Nut
F-74	Spring
M-33	Quill Feed Clutch Hub
M-43	Handwheel Handle
M-47	Lock Handle
M-51	Indicator Rod Clamp Screw
M-52	Indicator Rod
M-53	Rack Feed Handle Hub
M-54	Rack Feed Handle
M-72	Washer
M-89	Spring Pin
M-123	1/8 Dia. x 3/16 Brass Plug
H-100	Grease Fitting

2. Remove cover #2J-545 (lower end of motor shaft). Use two cover screws #2J-594 to fasten the spring retainer #2J-539, on the lower end of the motor shaft, to the lower motor vari-drive pulley #2J-531. This will reduce the hazard of personal injury that is always present when a heavy spring is under compression. When the pulley, spring retainer, and spring are securely fastened as a single unit, crank the speed dial to top speed position.

3. Now remove the screws that fasten the motor to the belt housing.

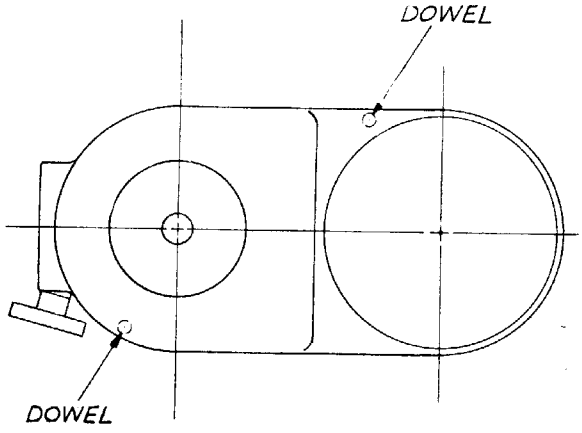
The motor should be lifted slightly and pulled firmly away from the spindle and toward the rear of the belt housing. This will pull the vari-drive belt deeply into the spindle pulley, providing the slack needed to slip the belt over the motor pulley.

4. Now lift the motor high enough to rest the motor base GENTLY on the adjusting screw #2J-526 seen directly in front of the motor flange. The belt can now be slipped over the lower pulley #2J-531, and the motor removed from the housing.

CHANGING VARI-DRIVE BELT:

Complete above operation (for removing motor); then remove top spindle cap #2J-601. Now, looking down inside of the unit you can see a socket head cap screw #2J-566 and a bushing #2J-546, remove these. Also remove two lower screws in speed changer bracket #2J-504 just below the speed dial.

Remove the 5 screws holding the belt housing #2J-500 to its sub-plate #2J-501. The belt housing is now held in place by two dowel pins at positions shown by sketch below.



The belt housing, complete with speed changer bracket, is now removed from its sub-plate #2J-501. A slight blow under the speed changer bracket may be needed to separate the housing from its base.

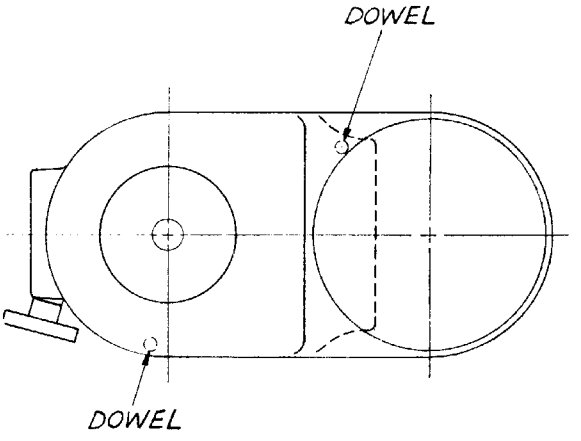
Remove the old belt and replace it with a new belt. **DO NOT** use a substitute belt purchased from other than a Bridgeport Dealer. Vibration and heat could result from the use of the wrong belt.

CHANGING TIMING BELT:

Complete the operation for removing the motor. Then put the (Hi-Neutral-Lo) lever in the Lo position, remove the drawbar #2J-543 and lower the spindle.

Remove screws holding #2J-501 and #2J-502 Housings together, including the two lower screws in speed changer bracket #2J-504 just below the speed dial. Also remove the motor shaft cover plate #2J-545.

There are two dowel pins still holding these parts together at the location shown below.



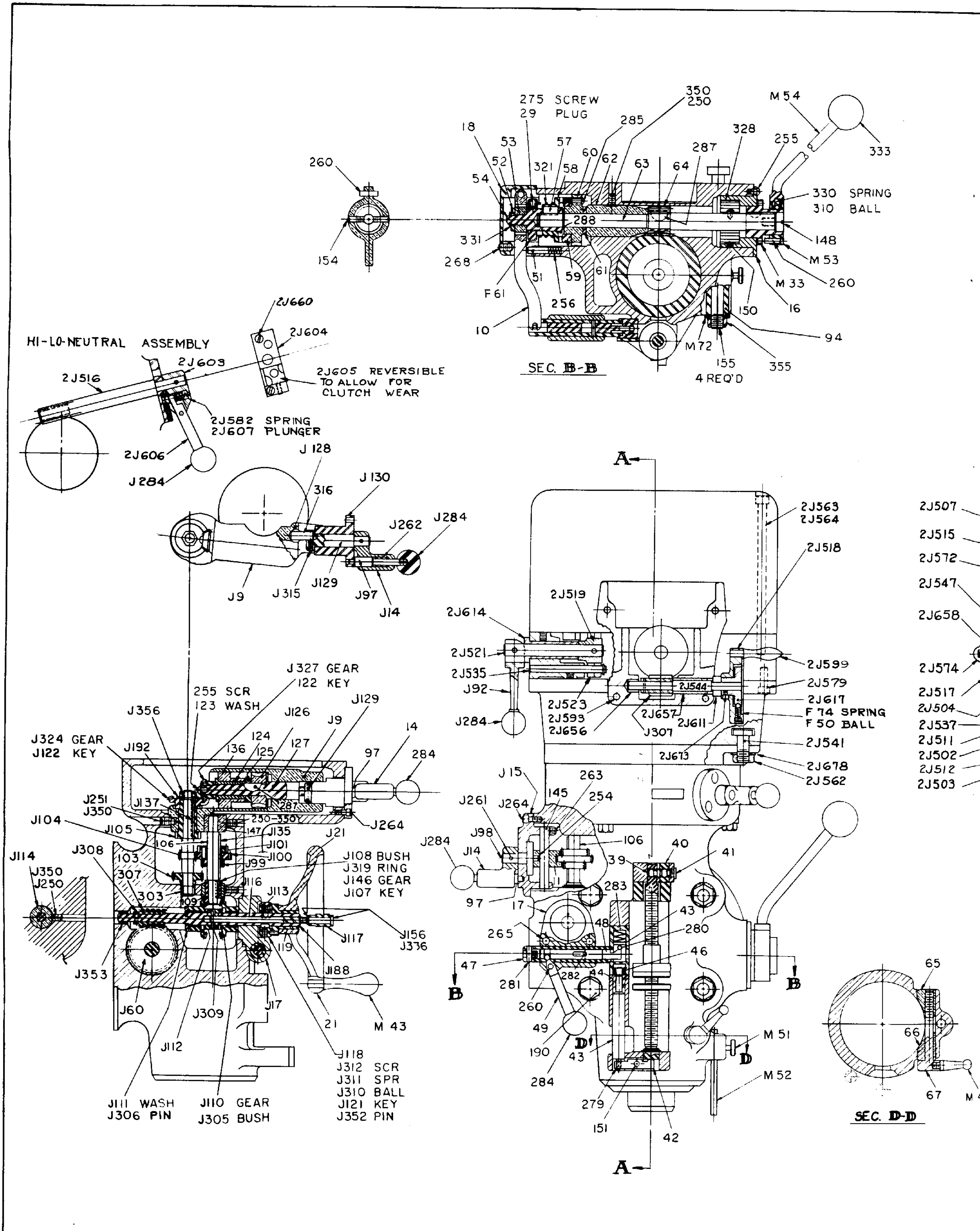
A slight blow under the speed changer bracket may be needed to separate the #2J-501 housing from its base #2J-502. The two upper screws on the speed changer bracket #2J-504 should be loosened now.

As the housings are being separated the timing belt still connects them, resisting the separating movement. The separation can be assisted by gently pushing the timing belt off of the large pulley #2J-548 as the #2J-501 housing is being raised.

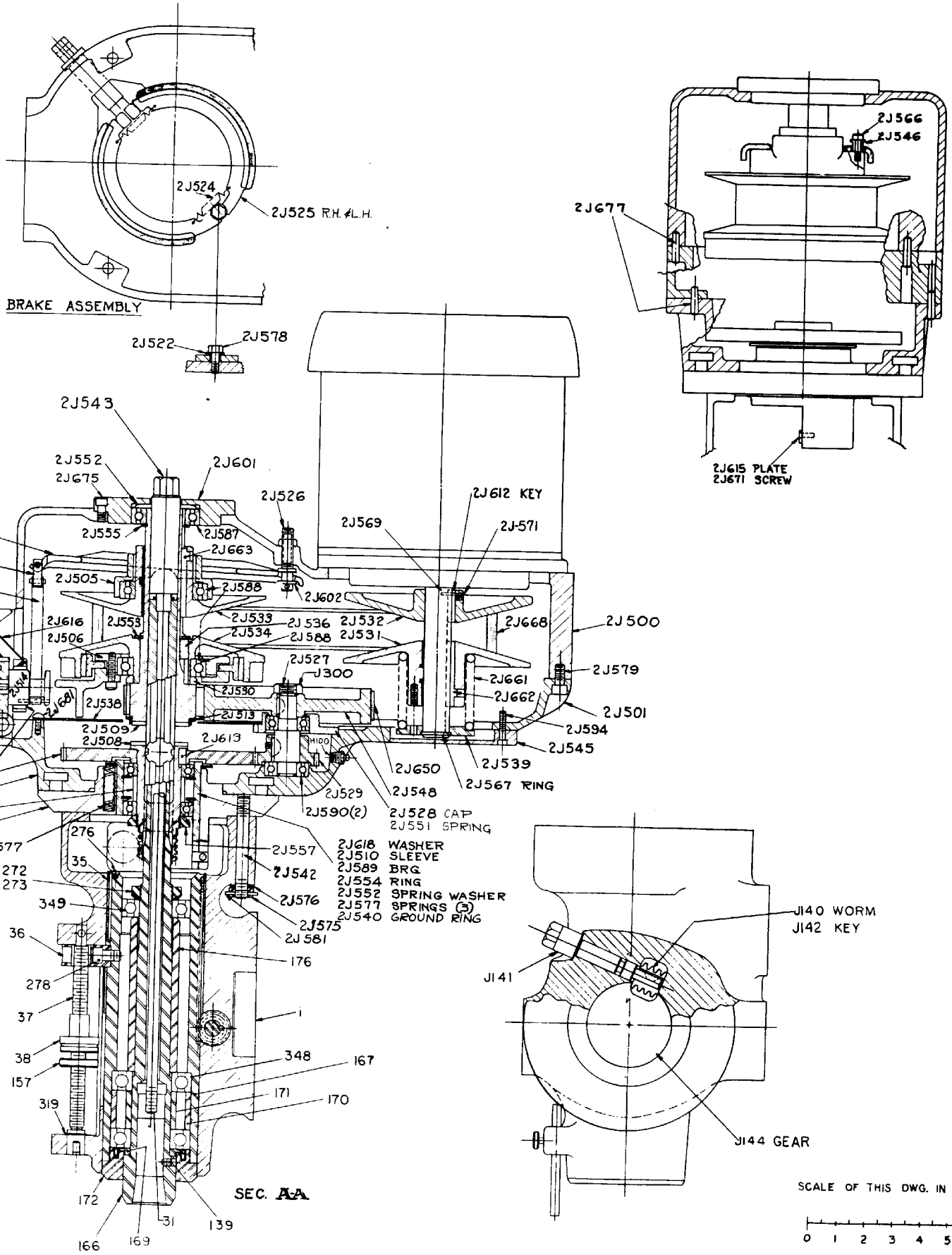
Remove the old belt and replace with a new belt.

PARTS LIST FOR 2J VARIDRIVE UNIT

2J-500	Belt Housing
2J-501	Belt Housing Base
2J-502	Gear Housing
2J-503	Fixed Clutch Bracket for J-1
2J-504	Speed Changer Housing
2J-505	Spin. Pulley Brg. Sliding Housing
2J-506	Brake Brg. Cap
2J-507	Speed Changer Plate
2J-508	Splined Gear Hub
2J-509	Spindle Pulley Hub
2J-510	Bull Gear Brg. Sleeve
2J-511	Spindle Bull Gear
2J-512	Bull Gear Brg. Spacer
2J-513	Timing Pulley Clutch Sleeve
2J-514	Speed Change Chain Drum
2J-515	Speed Change Chain Stud
2J-516	Bull Gear Shifter Pinion
2J-517	Vari-Speed Dial
2J-518	Speed Change Hand Knob
2J-519	Brake Lock Cam
2J-521	Brake Lock Shaft
2J-522	Brake Shoe Pivot Sleeve
2J-523	Brake Operating Finger
2J-524	Brake Spring
2J-525	Brake Shoe
2J-525P	Brake Lining
2J-526	Speed Change Plate Pivot Stud
2J-527	Bull Gear Pinion Counter Shaft
2J-528	Bull Gear Pinion Brg. Cap
2J-529	Bull Gear Pinion
2J-530	Spindle Pulley Spacer
2J-531	Adjustable Motor Varidisc
2J-532	Stationary Motor Varidisc
2J-533	Adjustable Driven Varidisc
2J-534	Stationary Driven Varidisc
2J-535	Brake Finger Pivot Stud
2J-536	Key for 2J-509 — 2J-534
2J-537	Brg for 2J-504
2J-538	Gear Housing Plate
2J-539	Adiustable Varidisc Spring Colar
2J-540	Snap Ring 5000-244
2J-541	Vert. Tee Bolts
2J-542	Studs for J-1 to 2J-503
2J-543	Drawbar Knob (Use with J-31)
2J-544	Speed Control Shaft
2J-545	Motor Pulley Cover
2J-546	Pivot sleeve for 2J-507
2J-547	Speed Changer Spur Gear
2J-548	Timing Belt Pulley
2J-551	Wave Spring Washer
2J-552	Wave Spring Washer
2J-553	Snap Ring #5102-156
2J-554	Snap Ring #N5000-244
2J-555	Snap Ring #5100-137
2J-556	Snap Ring #5100-25
2J-557	N-08 Bearing Locknut - Special 3/16" thick
2J-558	1/4 Dia x 3/8 roll pin
2J-562	7/16-14 Hex Jam Nut-finished, HDN
2J-563	5/16 - 18 x 6" Soc. hd. cap screw
2J-564	5/16 - 18 x 4" Soc. hd. cap screw
2J-566	10-32 x 5/8 Soc. hd. cap Screw-Loc-wel
2J-567	Ret. Ring #5103-93
2J-569	1/8 dia. x 1/4 lg. roll pin
2J-570	1/4 - 20 x 5/8 Soc. hd. cap screw
2J-571	1/4 - 20 x 1/4 Soc. set screw
2J-572	Speed Changer chain
2J-573	"O" Ring Parker #2-14
2J-574	5/16 - Hex. cap nut
2J-575	3/8 - 16 Hex nut
2J-576	3/8 Lockwasher
2J-577	3/8 O.D. x 062 wire x 3" long
2J-578	1/4 - 20 x 3/4 Hex hd. Screw
2J-579	5/16 - 18 x 3/4 Soc. hd. cap screw
2J-580	3/8 - 16 Hex jam nut
2J-581	3/32 x 3/4 Cotter Pin
2J-582	1/4 OD x .032 wire x 9/16 Spring
2J-583	1/8 dia. x 5/8 lg. roll pin
2J-584	5/32 dia. x 7/8 lg. roll pin
2J-585	1/4-20 x 1/2 full dog soc. set scr.
2J-586	1/8 dia. x 1" lg. roll pin
2J-587	Ball Bearing, Fafnir #RM9107NPP-E9147
2J-588	Ball Bearing, Fafnir #PM9110NPP-E9147
2J-589	Ball Bearing, Fafnir #RM9308NPP-E9147
2J-590	Ball Bearing, Fafnir #RM203NPP-E9147
2J-593	1/4 - 20 x 1-1/4" Soc. hd. cap screw
2J-594	#10 - 24 x 1 soc. hd. cap screw
2J-595	3/32 dia. x 5/8 cotter pin
2J-597	Gits Style L #1202 oil cup
2J-598	Gits style GA #7002 grease cup
2J-599	Machine handle #3302
2J-600	Draw Bar Washer
2J-601	Top Bearing Cap
2J-602	Washer for 2J-526
2J-603	Hi-Low Pinion Block
2J-604	Hi-Low Detent Plate
2J-605	Adjustable Plate for 2J-604
2J-606	Hi-Low Shift Crank
2J-607	Hi-Low Detent Plunger
2J-611	Washer for 2J-518, 2J-544
2J-612	Drive Key for 2J-532
2J-613	Key for 2J-508, 2J-511
2J-614	Sleeve for Brake Lock Shaft 2J-521
2J-615	Guide for 2J-503, 2J-510
2J-616	Speed Changer Chip Shield
2J-617	Flanged Sleeve for 2J-518
2J-618	Bull Gear Bearing Sleeve Washer
2J-650	Timing Belt 1-1/8" wide
2J-651	#8 32 x 1/4 lg. machine screws
2J-652	Lubrication data-nameplate
2J-653	Speed Changer-Caution-Nameplate
2J-654	Hi-Lo range, nameplate
2J-655	Quill Feed Nameplate
2J-656	Bronz Brg. Boston #B56-5
2J-657	Bronz Brg. Boston #B79-10
2J-658	Bronz Brg. Boston #B810-4
2J-659	1/16 Dia. x 3/8 roll pin
2J-660	10-32 x 1/2 lg. soc. hd. cap screws
2J-661	Spring for varidisc motor shaft
2J-662	Key for adj. varidisc motor shaft
2J-663	Key for adj. varidisc, driven shaft
2J-664	Bushing for adj. varidisc motor shaft
2J-665	Bushing for adj. varidisc Driven shaft
2J-666	1/8 x 3/4 cotter pin
2J-667	Motor
2J-668	Belt 575997
2J-669	Switch - 9441H292
2J-670	Cord Set
2J-671	10-32 x 3/8 flat hd. soc. cap scr. Loc-wel
2J-672	Drawbar wrench
2J-673	10-32 x 3/16 soc. set scr. Knurled cup point
2J-674	10-32 x 3/8 soc. set scr. cup point
2J-675	1/4 - 20 x 3/4 soc. hd. cap scr.
2J-676	10-24 x 5/8 soc. hd. cap scr.
2J-677	No. 4 x 1 taper pins
2J-678	15/32 ID x 15/16 OD x 1/16 Stl. Washer
2J-679	3/8 - 16 x 1 Hex Hd. Scr's.
2J-680	1/4 - 20 x 3/8 Round hd. mach. scr. blackened
2J-681	#10-24 x 5/16 Round hd. mach. screw



275 SCREW
29 PLUG
350
250
M 54
333
18
53
57
285
328
255
260
52
321
58
60
62
63
287
64
54
330 SPRING
310 BALL
288
148
331
M 53
268
154
51
59
61
M 33
260
F 61
256
150
16
10
94
M 72
155
355
4 REQ'D
SEC. B-B
2J660
2J604
HI-LO-NEUTRAL ASSEMBLY
2J603
2J516
2J605 REVERSIBLE
TO ALLOW FOR
CLUTCH WEAR
2J582 SPRING
2J607 PLUNGER
2J606
J284
J 128
J 130
316
J262
J284
J9
J315
J129
J97
J14
A
2J563
2J564
2J518
2J507
2J515
2J572
2J547
2J658
2J519
2J614
2J521
2J599
2J535
2J544
2J579
J92
2J574
2J517
2J617
2J523
2J593
2J656
2J657
J307
2J611
F 74 SPRING
F 50 BALL
2J504
2J537
2J511
2J541
2J502
2J613
2J678
2J512
2J562
2J503
J 327 GEAR
122 KEY
255 SCR
123 WASH
J356
J126
J129
J9
J324 GEAR
J122 KEY
J192
136
124
125
127
14
97
284
J251
J350
J137
287
230-350
J264
J104
J105
106
147
J135
J101
J100
J21
J114
J308
103
J99
J108 BUSH
J319 RING
J146 GEAR
J107 KEY
J350
J250
307
303
109
J116
J113
J156
J336
J117
119
J188
J353
J17
J60
J309
J112
21
M 43
J118
J312 SCR
J311 SPR
J310 BALL
J121 KEY
J352 PIN
J111 WASH
J306 PIN
J110 GEAR
J305 BUSH
J 15
263
J261
J264
145
254
J284
J98
106
J14
40
41
39
97
17
283
43
48
280
265
46
47
B
B
281
282
44
260
49
190
284
M 51
D
D
43
M 52
279
151
42
65
66
67
SEC. D-D
A



1½ HP MILLING ATTACHMENT

2J-200

OPERATOR'S MANUAL