

MANUAL NO. M-105

BRIDGEPORT SERIES I MILLING MACHINE

INSTALLATION, OPERATION
AND
MAINTENANCE

Bridgeport machines[®]

a **textron** company

500 LINDLEY STREET, BRIDGEPORT, CONN. 06606

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MILLING MACHINE**

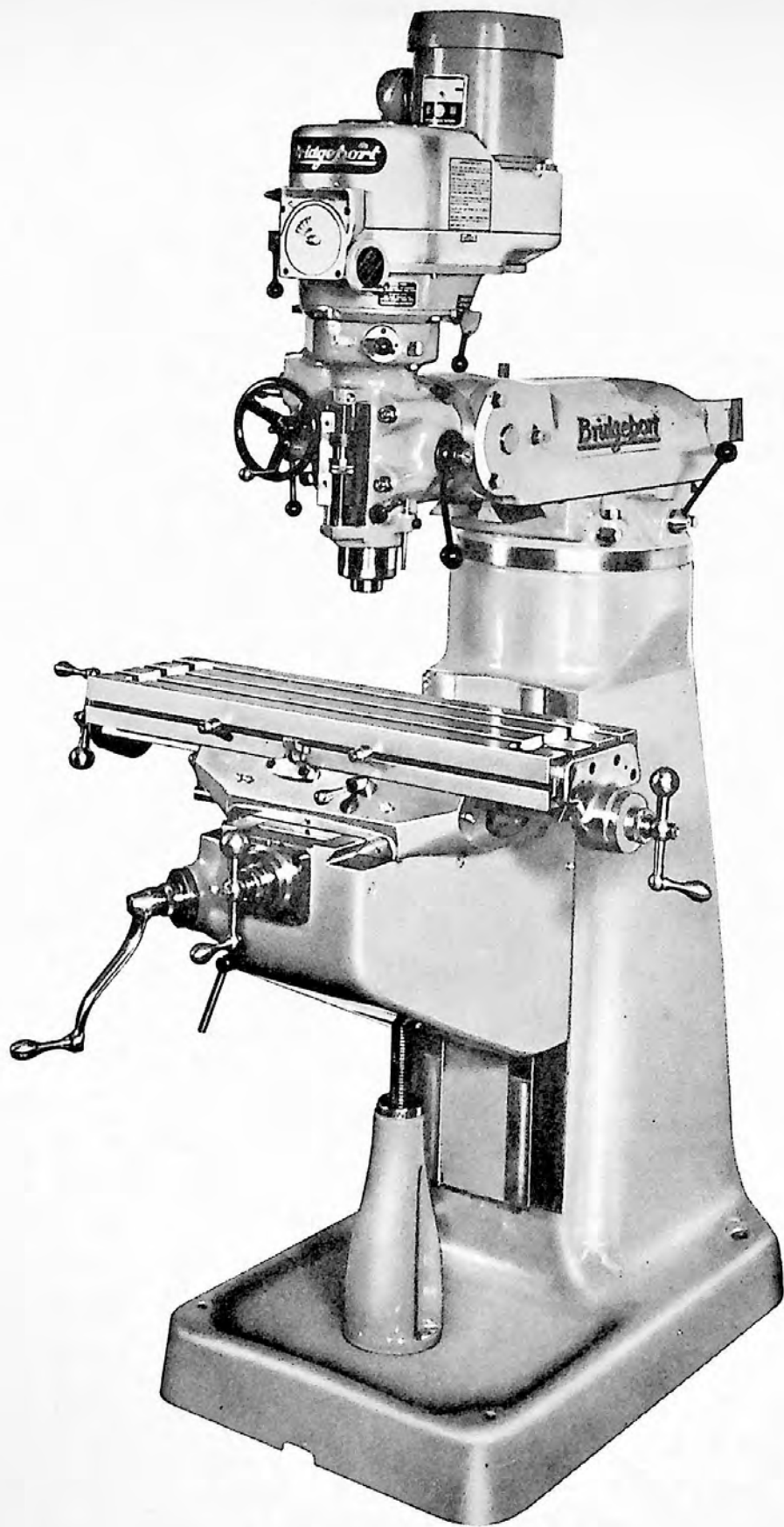
JUNE, 1973

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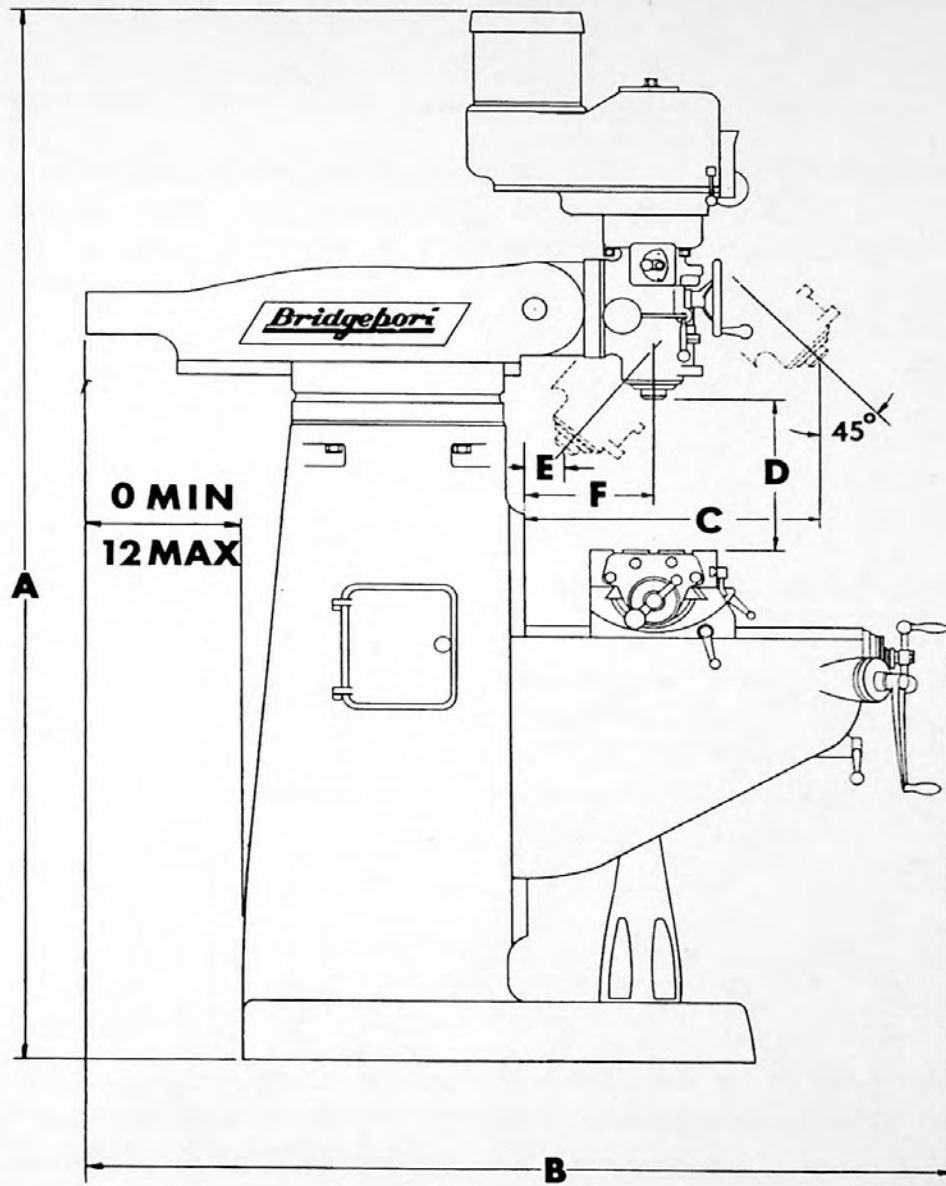
500 LINDLEY STREET, BRIDGEPORT, CONN. 06606



BRIDGEPORT SERIES I TURRET MILLER MODEL BR2J

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	LONGITUDINAL TRAVEL			TABLE LENGTH		
		24"		36"		
		30"		42"		
		36"		48"		
	A	B	C	D	E	F
MIN.	82 1/2	50 3/4	8 3/4	2 7/8	0	6 3/8
MAX	82 1/2	62 3/4	20 3/4	18 7/8	12	18 3/8

Figure 1. Principal Dimensions

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 kerosene.

WARNING: It is not recommended that gasoline or any other highly inflammable cleaning agent be used.

Do not move the table, saddle, knee or any moveable 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 similarly 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.

NOTE: It is recommended that the machine be secured to the floor to prevent movement or tipping due to off-center loading.

LEVELING MACHINE

Set machine 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 sometimes turned to face the machine. In these cases the handles should be reversed before operating.

LUBRICATION

Do not operate machine until properly lubricated. Follow the instructions given in Figure 5.

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, see Figure 3. 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. To square head to table in the longitudinal axis, mount indicator as shown in Figure 4.

NOTE: When indicating as in Figure 3, it should be noted that the table is fitted to be slightly high in front, usually about $.0005''$.

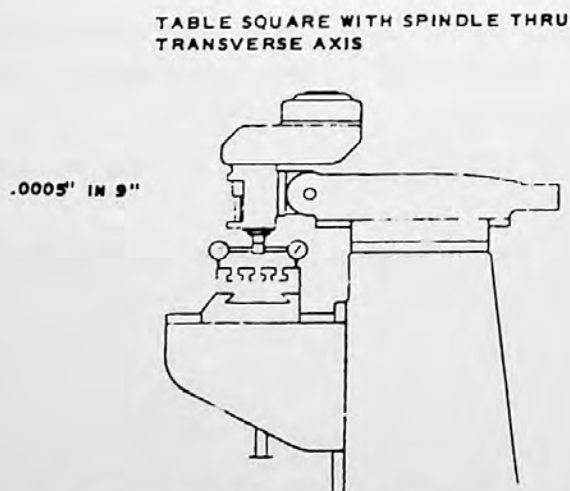


Figure 3. Head Alignment Y Axis

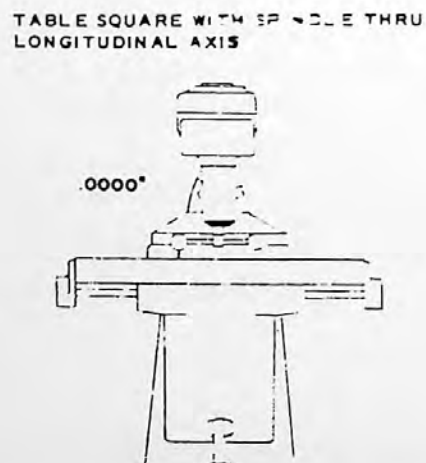


Figure 4. Head Alignment X Axis

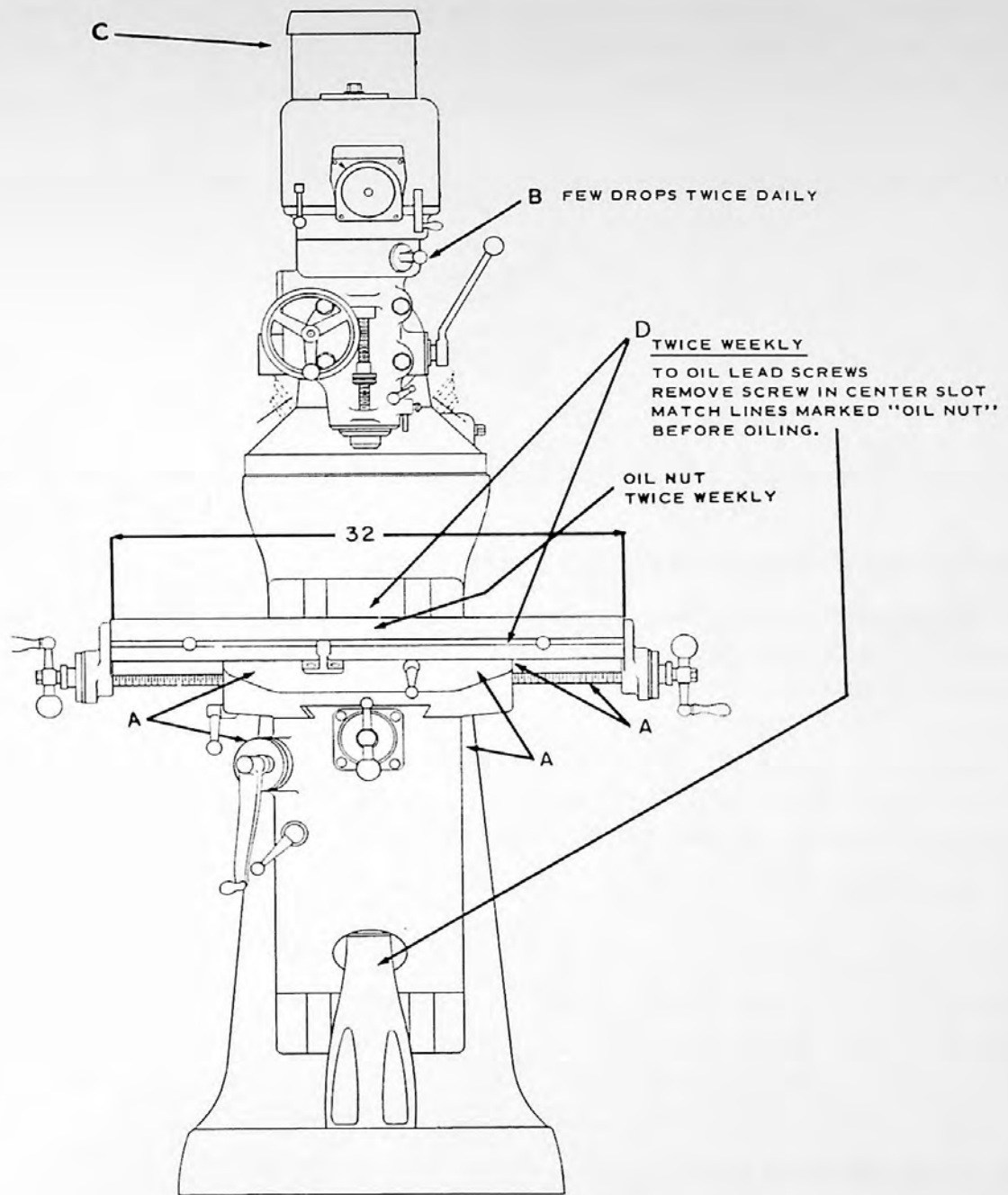


Figure 5. Recommended Lubrication

- A. Way Surfaces**
"Sunoco" Waylube #80
or equivalent
- B. Milling Heads (Spindle Bearings)**
S.A.E. 10 or 10W Light Oil
(none on grease packed heads)
- 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

Oil to sight level with
Mobilube No. 46 S.A.E. 140

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.

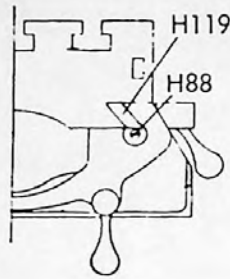
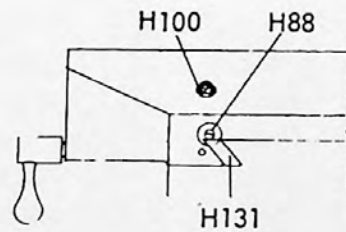


Table-saddle gib

ADJUSTMENT OF SADDLE AND KNEE GIBS

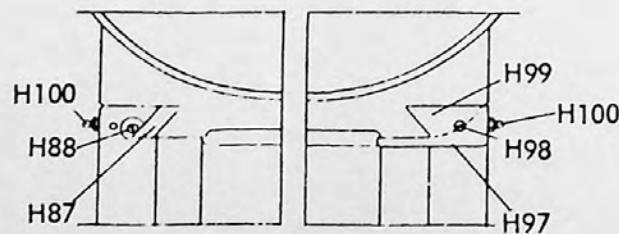
A tapered gib is used for adjusting the saddle bearing on the knee. This forms a guide for the saddle. To tighten gib same principal as described above is used; however, chip wiper has to be removed first.



Saddle-knee gib

ADJUSTMENT OF KNEE GIB

Remove chip wiper and adjust screw until smooth movement is attained.

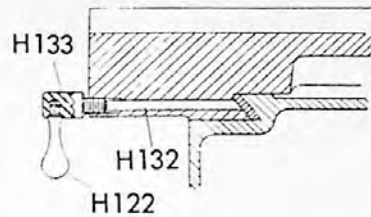


Knee-Column gib

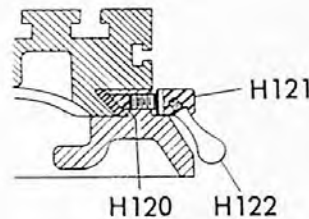
CLAMPING TABLE, SADDLE AND KNEE

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.

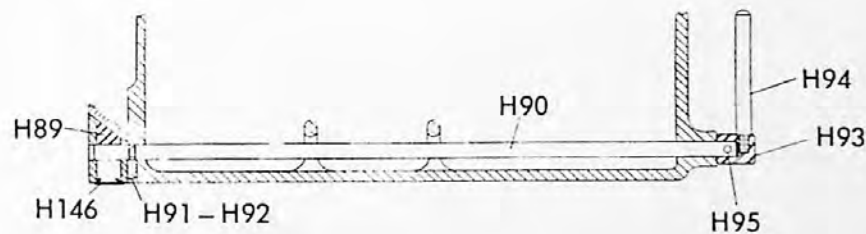
Excessive pressure can cause slight table bind. Use moderate clamping pressure, as this will hold saddle sufficiently.



The table clamp lever is located on front of saddle and should always be clamped when longitudinal movement is not required.



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



REMOVING 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. See Figure 6.

REMOVING SADDLE

Follow 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 Figure 6.

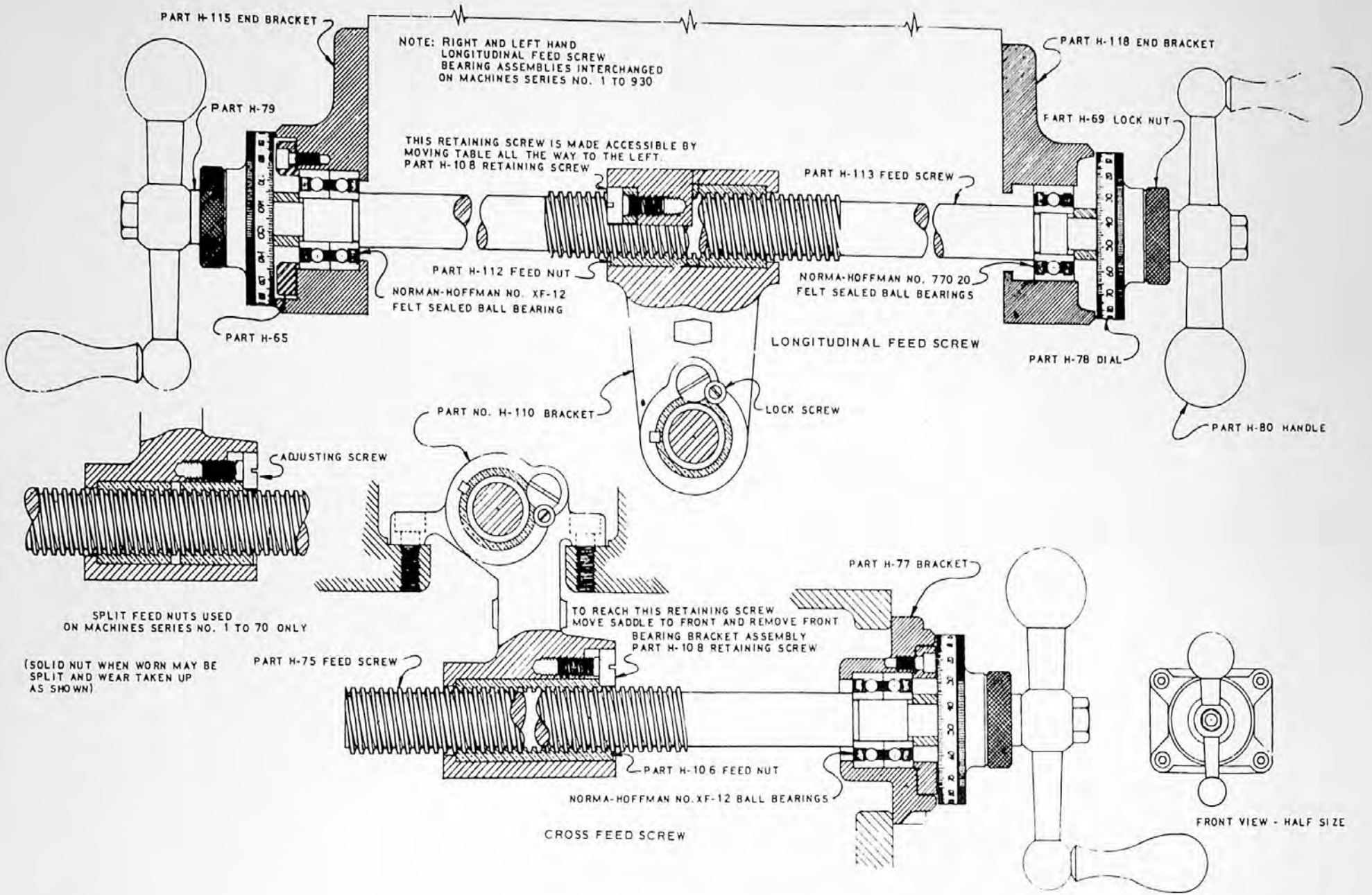


Figure 6. Longitudinal and Cross Feed Assembly

ASSEMBLY INSTRUCTIONS FOR MOUNTING 2-J 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.

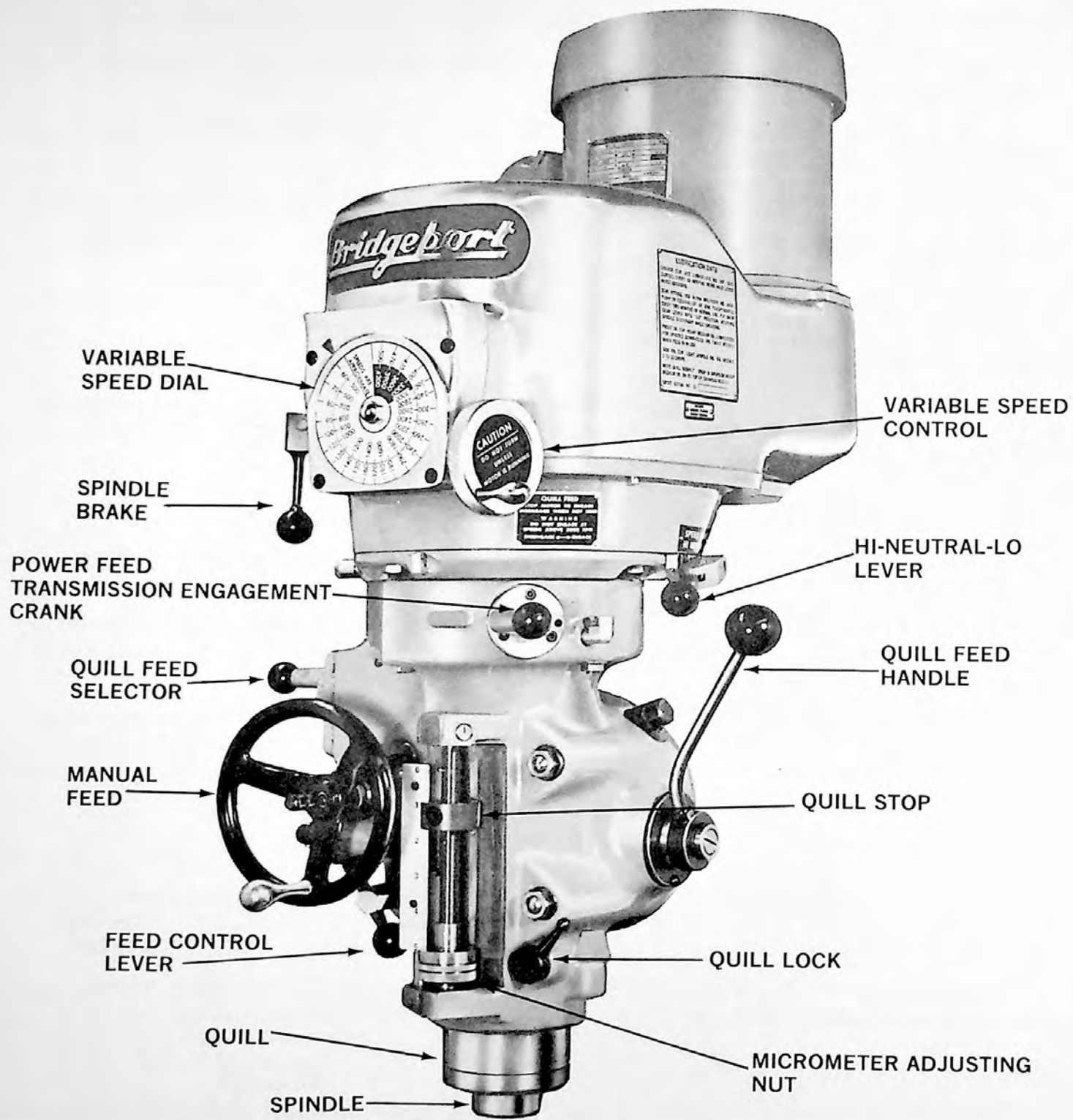


Figure 7. 2J (1½ HP) Milling Attachment

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.

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 accommodate 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.

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.

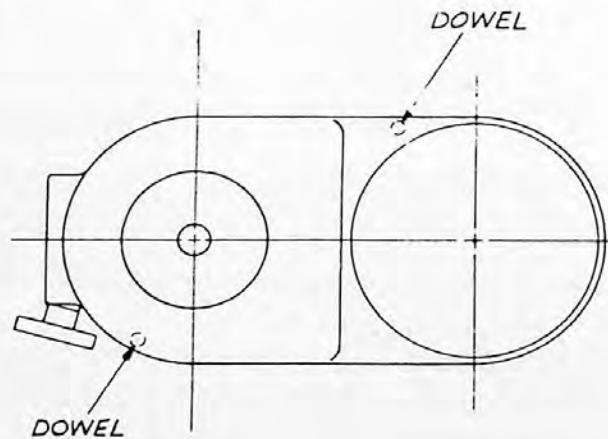
The motor should be lifted slightly and pulled firmly away from the spindle and toward the rear of the belt housing. This will pull the vari-drive belt deeply into the spindle pulley, providing the slack needed to slip the belt over the motor pulley.

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.

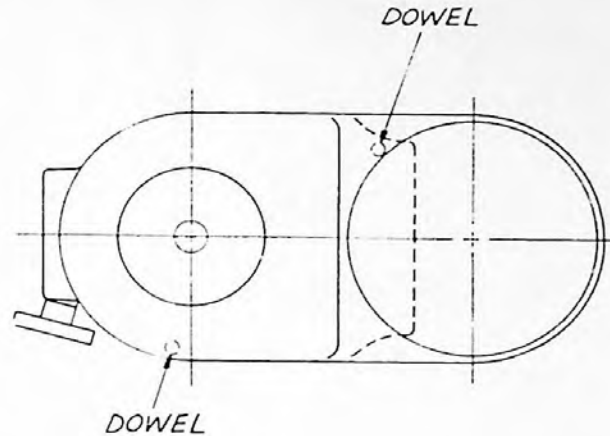
Remove the old belt and replace it with a new belt. **DO NOT** use a substitute belt purchased from other than a Bridgeport Dealer. Vibration and heat could result from the use of the wrong belt.

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.

GENERAL SPEED RECOMMENDATIONS

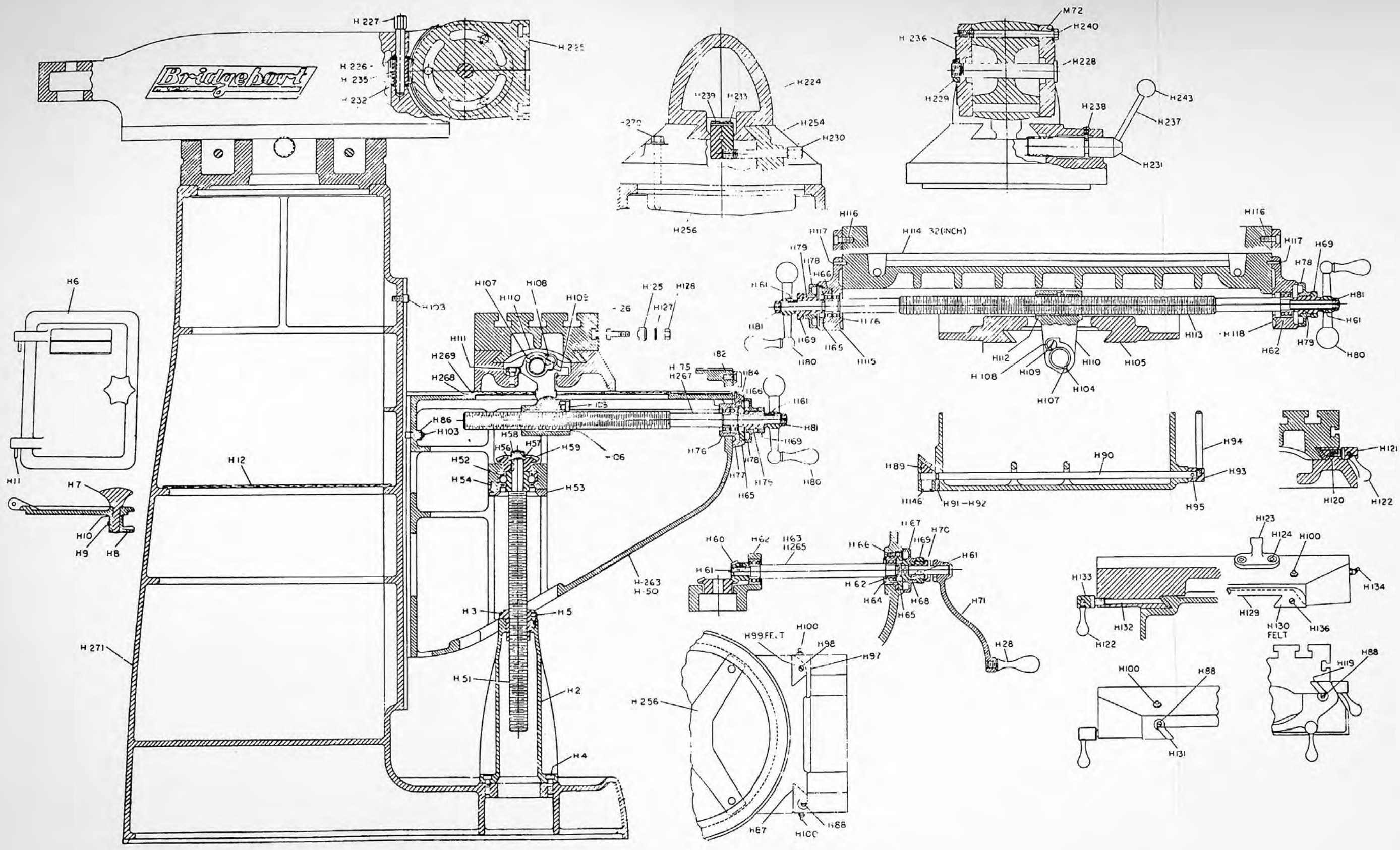
Material to be Cut	Feet Per Minute		
	Rough Cut	Rough and Finish	Light and Finish Cut
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(Over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (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

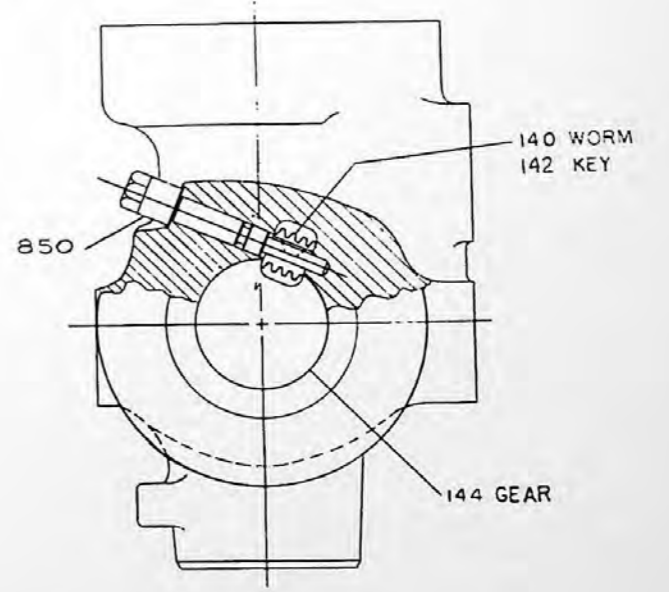
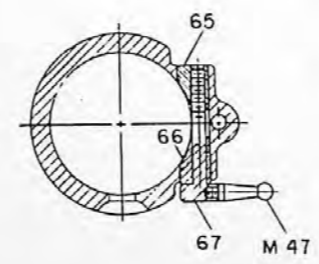
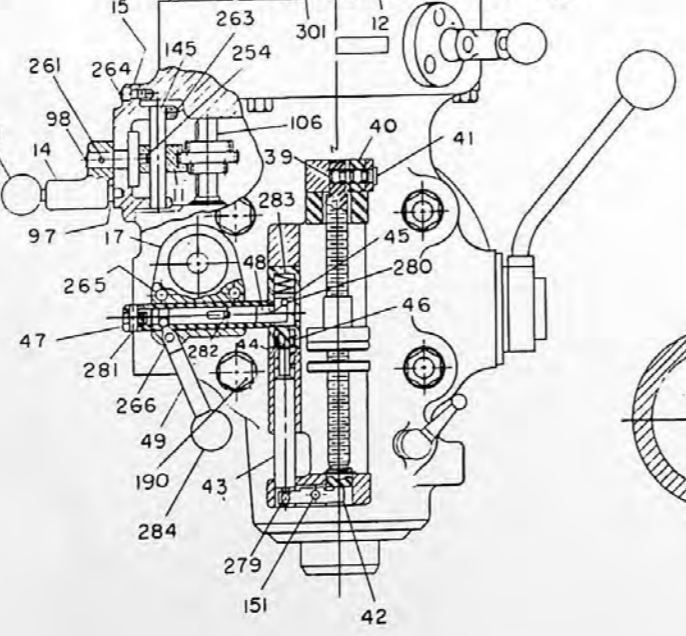
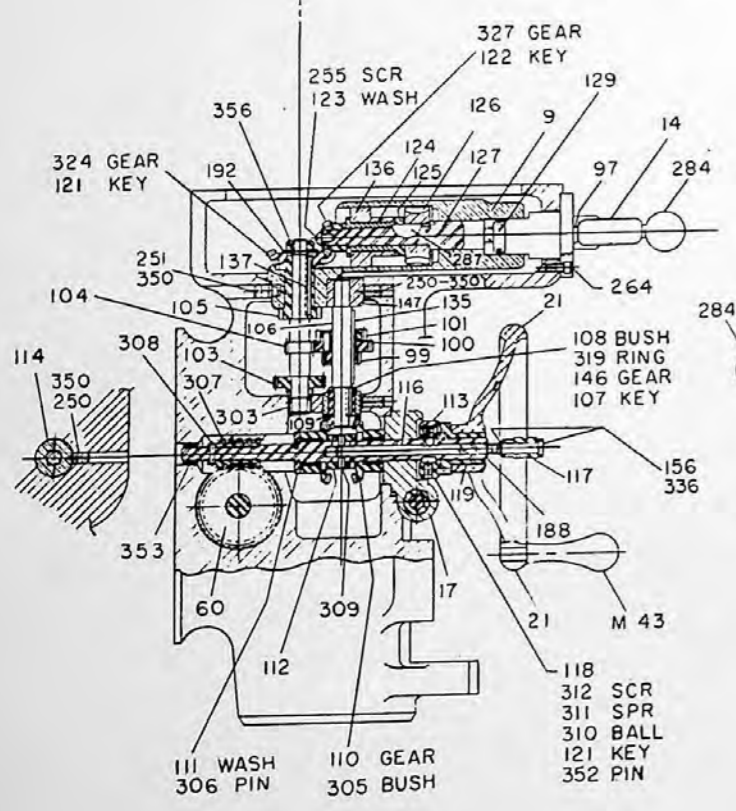
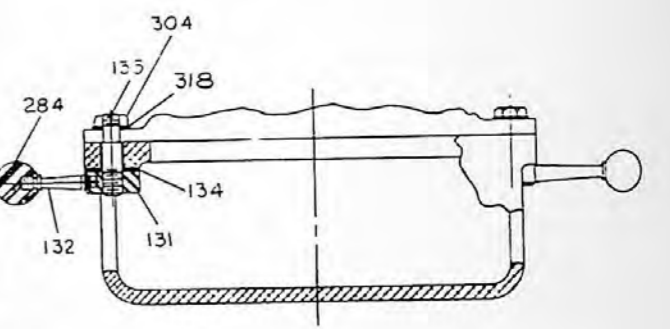
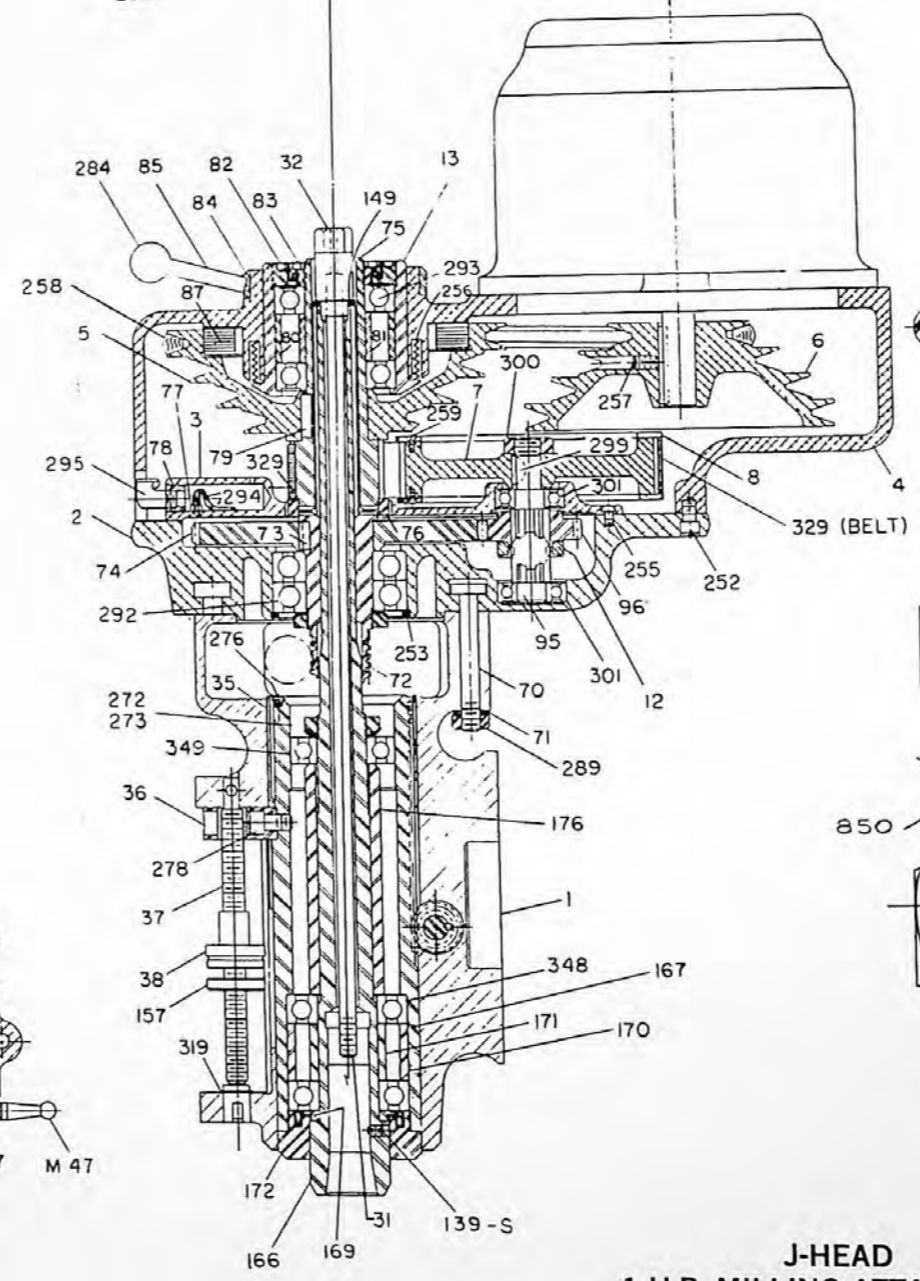
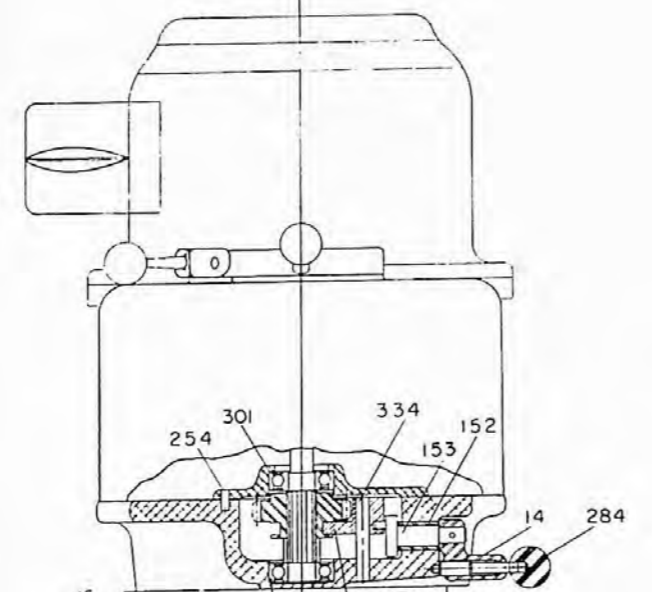
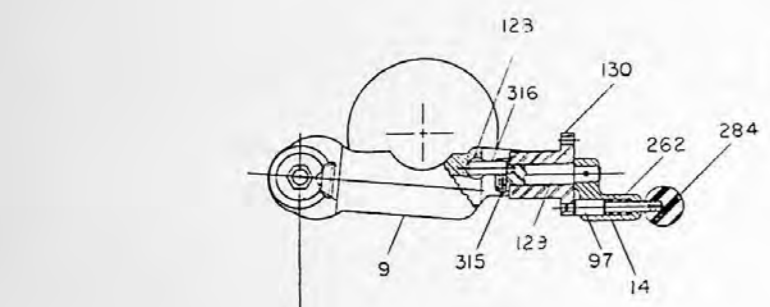
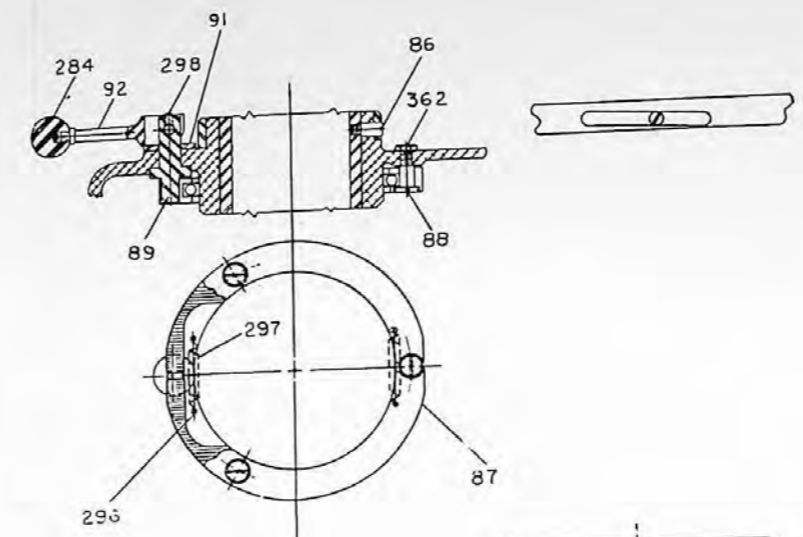
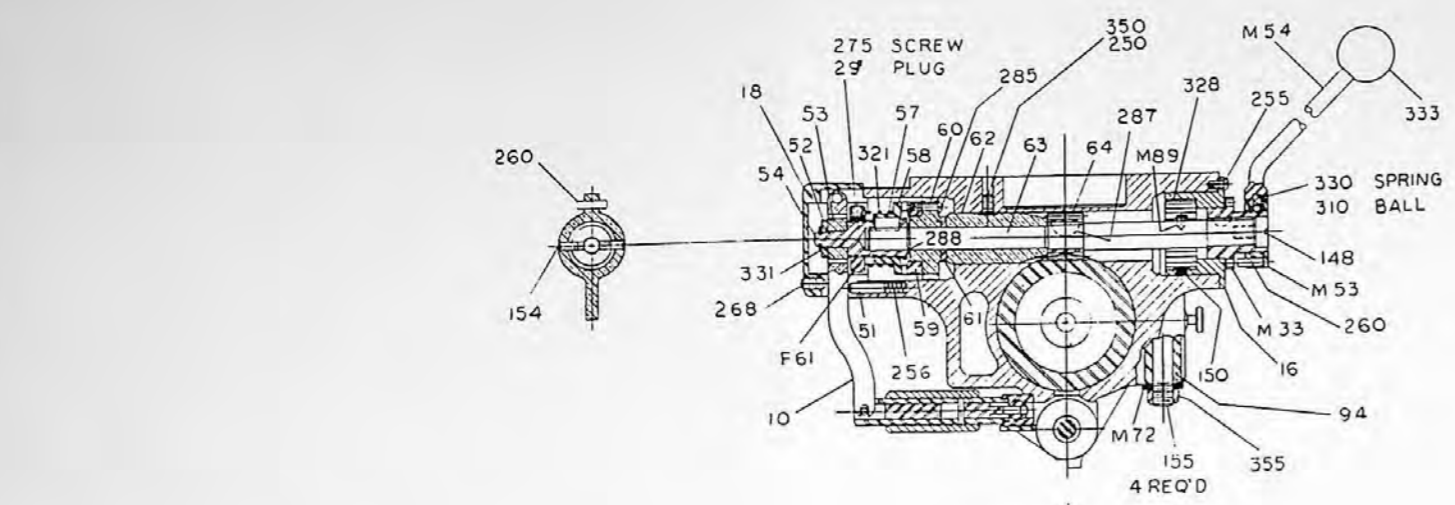
PARTS LIST — THE BRIDGEPORT TURRET MILLING MACHINE

Code No.	Part No.	Code No.	Part No.
2060050	H-2	2060095	H-103
2060051	H-3	2060096	H-104
1011074	H-4	2060097	H-105
1011033	H-5	2060098	H-106
2060052	H-6	2060099	H-107
2060053	H-7	2060100	H-108
2060054	H-8	1011592	H-109
1011220	H-9	2881250	H-110
1010545	H-11	1011033	H-111
1065320	H-12	2060102	H-112
2060060	H-28	(VARIES BY	H-113
2060068	H-50	LENGTH)	H-114
2060145	H-263	2060115	H-115
2060069	H-51	1010543	H-117
1060205	H-52	2060116	H-118
2060070	H-53	2060117	H-119
1011030	H-54	2060118	H-120
		2060119	H-121
2060071	H-56	2060120	H-122
2060072	H-57	2060121	H-123
1011755	H-58	1011071	H-124
1062204	H-59	1062301	H-125
1062205	H-60	1061602	H-126
1013078	H-61	2060122	H-127
1060204	H-62	1011720	H-128
		2060123	H-129
2060073	H-63	1062406	H-130
2060147	H-265	2060124	H-131
2060074	H-64	2060125	H-132
2060075	H-65	2060126	H-133
1011030	H-66	1063172	H-134
		1011270	H-135
2060076	H-67	1011580	H-136
2060077	H-68	1113051	H-140
2060078	H-69	1013170	H-141
2060079	H-70	1010786	H-146
2060080	H-71	2060127	H-223
2060149	H-267	2060128	H-224
1060203	H-76	2060129	H-225
		1062206	H-226
2060082	H-77	2060130	H-227
2060083	H-78	2060131	H-228
2060084	H-79	2060132	H-229
2060085	H-80	2060133	H-230
1011755	H-81	2060134	H-231
1011074	H-82	2060135	H-232
2060086	H-83	2060136	H-233
2190188	H-84	2060137	H-234
1011720	H-86	2060138	H-235
2060087	H-87	1062826	H-236
2060146	H-264	2060139	H-237
2060088	H-88	2060140	H-238
2060089	H-89	2060141	H-239
1011375	H-91	1061180	H-240
1011270	H-92	1192150	H-243
2060091	H-93	2060143	H-254
2060092	H-94	2060144	H-256
1010409	H-95	2200109	M-72
2060093	H-96	2060150	H-268
2060094	H-97	2060151	H-269
1011035	H-98	1061178	H-270
1062405	H-99	2060400	H-271
1063171	H-100		



PARTS LIST FOR 2J VARIDRIVE UNIT

CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION
2883514	J1	Quill Housing Assembly	2190132	J91	Brake Lock Washer	1011010	F-6059	#10.24 x 1/2 lg. Cap Screw	2883923	2J500	Belt Housing Assembly	1183109	2J598	Grease Cup
2883505	J2	Gear Housing Assembly	2190133	J92	Brake Lock & Handle	1011035	H98	1/4.20 x 1 lg. Cap Screw	2180053	2J502	Gear Housing	1182178	2J599	Handle
2883452	J3	Gear Housing Cover Assembly	2190134	J93	Brake Lock Pin	1011014	J267	10.24 x 1-1/2 lg. Cap Screw	2180054	2J503	Fixed Clutch Bracket for J-1	2180093	2J600	Draw Bar Washer
2883507	J4	Belt Housing	2190135	J94	Spacer for J155	1011308	J268	1/4-20 x 1/4 lg. S.L. Set Screw	2180055	2J504	Speed Changer Housing	2180094	2J601	Top Bearing Cap on Belt Housing
2190055	J5	Spindle Pulley	2190136	J95	Countershaft	1190225	J270	Roller Bearing (Cup and Cone) (To Serial J-1200)	2180056	2J505	Spindle Pulley Brg. Sliding Housing	2180095	2J602	Washer
2883508	J6	Motor Pulley	2190138	J97	Gearshift Plunger	1190228	J271	Ball Bearing (To Serial J-1750)	2180057	2J506	Brake Brg. Cap	2180096	2J603	Hi-Low Pinion Block
2883509	J7	Timing Belt Pulley	2883446	J98	Cluster Gear Shift Crank Assembly	1201788	J272	N-06 Lock Nut	2180058	2J507	Speed Changer Plate	2180097	2J604	Hi-Low Detent Plate
2190058	J8	Timing Belt Pulley Flange		J99	Feed Drive Cluster Gear (Machined as a unit)	1191942	J273	W-06 Lock Washer	2180059	2J508	Spindle Gear Hub	2180098	2J605	Adj. Plate - For 2J604
2190059	J9	Worm Gear Cradle	2883504	J100	Feed Drive Cluster Gear (Center) Machined as a Unit	1011270	J274	3/8 16 x 3/8 K.P. Screw	2180060	2J509	Spindle Pulley Hub	2180099	2J606	Hi-Low Shift Crank
2883427	J10	Overload Clutch Trip Lever		J101	Feed Drive Cluster Gear (Upper) Machined as a Unit.	1011265	J275	1/4-20 x 1/4 lg. Set Screw	2180061	2J510	Bull Gear Brg. Sleeve	2180100	2J607	Hi-Low Detent Plunger
2190061	J11	Feed Gear Shifter Fork	2883440	J103	Feed Drive Gear	1011453	J276	10.32 x 5/16 lg. Round Head Screw	2883933	2J511	Spindle Bull Gear Assembly	2883926	2J611	Washer - (For 2J518, 2J544) Incl. 2J659
2190062	J12	Back Gear Shifter Fork	2190146	J105	Feed Driving Gear	1010784	J277	1/8 Allen Pipe Plug	2180063	2J512	Bull Gear Brg. Spacer	2180102	2J612	Drive Key - For 2J532
2883512	J13	Spindle Pulley Bearing Sleeve	2883517	J106	Cluster Gear Shaft	1011090	J278	3/8-24 x 5/8 Cap Screw	2180064	2J513	Timing Pulley Clutch Sleeve	2180103	2J613	Key - For 2J508, 2J511
2883443	J14	Shift Crank Assembly	2190148	J107	Cluster Gear Key	1011302	J279	6-32 x 3/8 Set Screw	2180065	2J514	Speed Change Chain Drum	2180104	2J614	Sleeve for Brake Lock Shaft 2J521
2190065	J15	Cluster Gear Cover	2190149	J108	Bevel Gear Bearing	1010513	J280	1/8 x 7/16 lg. Dowel Pins	2180066	2J515	Speed Change Chain Stud	2180105	2J615	Guide - For 2J503, 2J510 (2 Req'd)
2883436	J16	Spring Cover	2190150	J109	Bevel Gear Thrust Spacer	1010515	J282	1/8 x 9/16 lg. Roll Pin	2180067	2J516	Bull Gear Shifter Pinion	1185325	2J616	Speed Changer Chip Shield
2190067	J17	Feed Trip Bracket	2883432	J110	Feed Reverse Bevel Gear (Boston L-148)	1192053	J283	Compression Spring	1182890	2J517	Vari-Speed Dial	2180106	2J617	Flanged Sleeve - For 2J518
2190068	J18	Clutch Arm Cover	2190152	J111	Feed Worm Shaft Thrust Washer	1192151	J284	1/4-20 Ball Handle	2180068	2J518	Speed Change Hand Knob	1181986	2J618	Bull Gear Bearing Sleeve Washer
2190069	J19	Flanged Heavy Duty Overarm (Specify Serial #)	2190153	J112	Feed Reverse Clutch	1011431	J285	8-32 x 5/8 lg. Round Head Screw	2180069	2J519	Brake Lock Cam	1182895	2J619	Nameplate
2190070	J25	Spindle (Part Used to Serial J1200)	2190154	J113	Handwheel Clutch Spring Screw	1013076	J286	#3 Woodruff Key	2180070	2J521	Brake Lock Shaft	1182106	2J650	Timing Belt
2190071	J26	Spindle Dirt Shield (Part Used to Serial J1200)	2190155	J114	Feed Worm Shaft Thrust Washer	1013078	J287	#7 Woodruff Key	2180071	2J522	Brake Shoe Pivot Sleeve	1011420	2J651	Machine Screw (2 Req'd)
2190072	J28	Spindle Bearing Locknut (Part used to Serial J1200)	2190156	J115	Feed Worm Shaft	1190870	J288	Snap Ring	1182306	2J523	Brake Operating Finger (2 Req'd)	1182891	2J652	Lubrication Data Nameplate
2190073	J29	Spindle Locknut Binding (Part used to Serial J1200)	2190157	J116	Reverse Clutch Rod	1011718	J289	7/16 14 Hex Nut Hardened (American Std. Regular)	1182081	2J524	Brake Spring (2 Req'd)	1182892	2J653	Speed Changer Caution Nameplate
2190074	J30	Bearing Shoulder Ring (Part used to Serial J1200)	2883433	J117	Reverse Knob	1191793	J290	N-08 Special 5/16 Thick Bearing Locknut	2180073	2J525	Brake Shoe (2 halves) (must be ordered	1182893	2J654	Hi-Low Range Nameplate
2883502	J32	Drawbar for R8 Collet with J31	2883518	J118	Handwheel Clutch	1191944	J291	W-08 Lockwasher	1183619	2J525P	Brake Lining (2 halves) (together in pairs	1182894	2J655	Quill Feed Nameplate
2190079	M33	Pinion Shaft Hub Sleeve	2190210	J119	Handwheel Bushing	1190230	J292	Ball Bearings	2180074	2J526	Speed Change Plate Pivot Stud	1183636	2J656	Bronze Bearing
2190080	J34	Quill Nosepiece (Part Used to Serial #J-1200)	2883503	J120	Handwheel	1190232	J293	Ball Bearings (grease sealed)	2180075	2J527	Bull Gear Pinion Counter Shaft	1183646	2J657	Bronze Bearing
2190081	J35	Quill Skirt	2190162	J121	Worm Shaft Key (Replaces J-122)	1195720	J294	Wick 1/8 O.D.	2180076	2J528	Bull Gear Pinion Counter Brg. Cap	1633647	2J658	Bronze Bearing
2190082	J36	Quill Stop Knob	2190163	J123	Bevel Pinion Washer	1013150	J295	Oil Cup	2180077	2J530	Spindle Pulley Spacer	1010501	2J659	Roll Pin (2 Req'd)
2190083	J37	Quill Stop Micro Screw	2190164	J124	Feed Worm Gear Shaft Sleeve	1010507	J296	3/32 x 5/8 lg. Roll Pin	2883931	2J531	Adjustable Motor Vari-Disc Assembly	1011017	2J660	Soc. Hd. Cap Screw (2 Req'd)
2190084	J38	Micrometer Nut	2190165	J125	Worm Gear Spacer	1192084	J297	Ext. Spring	2180080	2J532	Stationary Motor Vari-Disc	1182083	2J661	Washer - For Vari-Disc Motor Shaft also 1012083
2190085	J39	Reverse Trip Ball Lever	2190166	J126	Feed Drive Worm Gear	1011260	J298	10-32 x 1/4 lg. Set Screw	2883932	2J533	Adjustable Driven Vari-Disc Assembly	1182121	2J662	Key - For Adj. Vari-Disc, Motor Shaft
2190086	J40	Feed Reverse Trip Plunger	2190167	J127	Feed Drive Worm Gear Shaft	1013079	J299	#9 Woodruff Key	2180082	2J534	Stationary Driven Vari-Disc	1182122	2J663	Key - For Adj. Vari-Disc, Driven Shaft
2190087	J41	Reverse Trip Ball Lever Screw	2190168	J128	Feed Engage Pin	1191738	J300	5/8-18 Hex Jam Nut	2180083	2J535	Brake Finger Pivot Stud	1182123	2J664	Bushing - For Adj. Vari-Disc, Motor Shaft (2 Req'd)
2883498	J42	Feed Trip Lever	2190169	J129	Worm Gear Cradle Throw-Out	1180235	2J590	Ball Bearing	2180084	2J536	Key for 2J-509 - 2J-534	1182124	2J665	Bushing - For Adj. Vari-Disc, Driven Shaft (2 Req'd)
2190089	J43	Feed Trip Plunger	2190170	J130	Shift Sleeve	1190310	J303	Needle Bearing	1183655	2J537	Brg. - for 2J-504	1010620	2J666	Cotter Pin
2060120	H122	Handwheel Handle	2883541	J131	Motor Locknut	1191796	J304	3/8-24 Hex Jam Nut	2180078	2J538	Gear Housing Plate	1185030	2J668	Belt
2190090	J44	Trip Plunger Bushing	2190172	J132	Motor Locknut Handle	1193635	J305	Bearing	1182305	2J539	Adjustable Vari-Disc Spring Collar	1182655	2J669	Switch
2883456	J45	Trip Plunger	2190173	J133	Motor Mounting Studs	2190200	J306	3/32 x 5/16 lg. Pin	1181650	2J541	Vertical Tee Bolts (3 Req'd)	1182557	2J670	2 Cord. Cord Set
2190092	J46	Feed Trip Plunger Bushing	2190174	J134	Motor Mounting Stud Washer	1192208	J307	Worm Gear	2180085	2J542	Studs - For J-1 to 2J-503 (3 Req'd)	1011135	2J671	Flat Hd. Soc. Cap Screw (2 Req'd)
2190093	J47	Cam Rod Sleeve Assembly	2190175	J135	Cluster Gear Key	2190201	J308	110 Dia. x 7/16 lg. Pin	2883920	2J543	Drawbar Assembly with J-31	1011280	2J672	Soc. Set Screw
2190094	J48	Cam Rod	1192303	J136	Bushing	1010509	J309	3/32 x 3/4 lg. Roll Pin	2180087	2J544	Speed Control Shaft	1011284	2J674	Soc. Set Screw
2200098	M47	Lock Handle	2190176	J137	Cluster Gear Key	1192165	J310	3/16 Steel Ball	2180088	2J545	Motor Pulley Cover	1011033	2J675	Soc. Hd. Cap Screw (3 Req'd)
2190095	J49	Trip Handle	2883540	J139	Collet Aligning Screw Assy	1192054	J311	Compression Spring	2180089	2J546	Pivot Sleeve - For 2J-507	1011011	2J676	Soc. Hd. Cap Screw (2 Req'd)
2190096	J51	Overload Clutch Lever Spring Plunger	1192207	J140	Worm Gear	1011258	J315	10-24 x 3/8 lg. K.P. Set Screw	2180090	2J547	Speed Changer Spur Gear	2180107	2J677	No. 4 Taper Pin (4 Req'd)
2190097	J52	Overload Clutch Washer	2190177	J141	Nut	1010743	J316	5/16 x 7/8 lg. Dowel Pin	2180091	2J548	Timing Belt Pulley	1181906	2J678	Washer (3 Req'd)
2190098	J53	Clutch Ring	1013077	J142	Key	1191922	J318	3/8 Lock Washer	1181975	2J551	Wave Spring Washer (2 Req'd)	1011148	2J679	Hex Hd. Screw (2 Req'd)
2883465	M53	Pinion Shaft Hub	1011370	J143	Screw	1190836	J319	Snap Ring	1181977	2J552	Wave Spring Washer (2 Req'd)	1011473	2J680	Round Hd. Machine Screw (2 Req'd)
2883549	J54	Overload Clutch Sleeve Assembly	2883500	J144	Gear	1192055	J321	Safety Clutch Spring	1180855	2J553	Snap Ring	1011443	2J681	Round Hd. Machine Screw (3 Req'd)
2883466	M54	Pinion Shaft Hub Handle	2190179	J145	Feed Shift Rod	1195306	J322	Micrometer Scale	2180092	2J554	Snap Ring (2 Req'd)	1183615	2J683	Motor Shipping Block
2883468	M54	Pinion Handle Assembly Complete	2883544	J146	Feed Reverse Bevel Pinion	1011411	J323	6-32 x 1/4 lg. Round Head Screw	1180848	2J555	Snap Ring	1185410	2J686	Tag Caution
1192302	J58	Overload Clutch	2190181	J147	Cluster Gear Shaft Upper Bearing	1011409	J323A	6-32 x 1/8 Round Head Screw	1180818	2J556	Snap Ring	1183147	2J688	Lubri Plate
2190102	J59	Overload Clutch Ring	2190182	J148	Pinion Shaft Hub Screw	1192209	J324	Feed Reverse Bevel Gear	1181794	2J557	Bearing Locknut	1182897	2J693	Lube Plate (decal)
2190103	J60	Overload Clutch Worm Gear	2190183	J149	Drawbar Washer	1193054	J326	Wrench (Replaces 2J-672)	1010550	2J558	Roll Pin	2180117	2J694	Grease Container (11 oz.) EP-741
2190104	J61	Pinion Shaft Worm Gear Spacer	2190184	J150	Outside Clockspring Pin	2190203	J327	Pinion Gear	1011750	2J562	Jam Nut (3 Req'd)	1183743	2J695	Grease Gun
2190105	F61	Overload Clutch Locknut	2190185	J151	Trip Lever Pin	1192020	J328	1 x 020 x 42 lg. Clock Spring	1011069	2J563	Soc. Hd. Cap Screw (2 Req'd)	2883921	2J800	Drawbar for Right Angle Attach Assembly
2190106	J62	Quill Pinion Shaft Bushing	2190186	J152	Backgear Shift Bushing	1182106	2J650	E-2 Construction Spec. Timing Belt	1011065	2J564	Soc. Hd. Cap Screw (2 Req'd)	2180109	2J802	Switch Plate
2883420	J63	Quill Pinion Shaft	2883545	J153	Backgear Shift Crank	1192033	J330	Compressing Spring	1011065	2J564	Soc. Hd. Cap Screw	2180114	2J803	Key for Adj. Vari-Disc, Motor Shaft
2190108	J64	Quill Pinion	2190188	J154	Quill (Serial #J-1200 and up)	1190822	J331	Clutch Ring	1011125	2J566	Retainer Ring	1011152	2J995	Hex Head Cap Screw
2190109	J65	Quill Lock Sleeve (Tapped)	2883499	J155	Tee Bolt (adapter locking bolts 1/2 x 13)	1192150	J333	Black Ball for M-54	1180860	2J567	Snap Ring	1182896	2J996	Nameplate
2190110	J66	Quill Lock Sleeve (Drilled)	2883547	J156	Feed Reverse Knob Stud	1010747	J334	5/16 x 2" lg. Dowel Pin	1010511	2J569	Soc. Hd. Cap Screw (2 Req'd)	2883922	2J997	Drawbar Assembly (MOOG)
2190111	J67	Quill Lock Bolt	2190190	J157	Micrometer Jam Nut	1191920	J335	#8 Split Lockwasher	1180915	2J573	Soc. Set Screw (5 Req'd)	2180111	2J998	Hub
2190112	J68	Quill Housing Lockbolt (Mount J Head to Round Overarm)	2883511	J166	Spindle (Serial #J-1200 and up)	1180818	2J556	Snap Ring	1011287	2J571	Soc. Set Screw (5 Req'd)	1011246	2J	Socket Set Screw
2190113	J69	Quill Housing Lockbolt (Long)	2190192	J167	Quill (Serial #J-1200 and up)	1010514	J337	1/8 x 1/2 lg. Roll Pin	1183720	2J572	Speed Changer Chain	1182656	2J	Switch Drum
2883515	J70	Vertical Tee Bolt	2190193	J169	Spindle Dirt Shield	1193111	J338	Oil Cup	1180915	2J573	"O" Ring	2180113	2J	Motor Pulley Assembly
2190114	J71	Vertical Tee Bolt Washer	2883513	J170	Spacer (Machined as a unit)	1190239	J348	Ball Bearing (start at #J-1200)	1011765	2J574	Hex Cap Nut - 5/16	1182556	2J	Cord Set
2190115	J72	Splined Gear Hub	2190196	J172	Nosepiece	1190240	J348A	Ball Bearing (Grease Sealed)	1181732	2J575	Hex Nut - 3/8 (3 Req'd)			



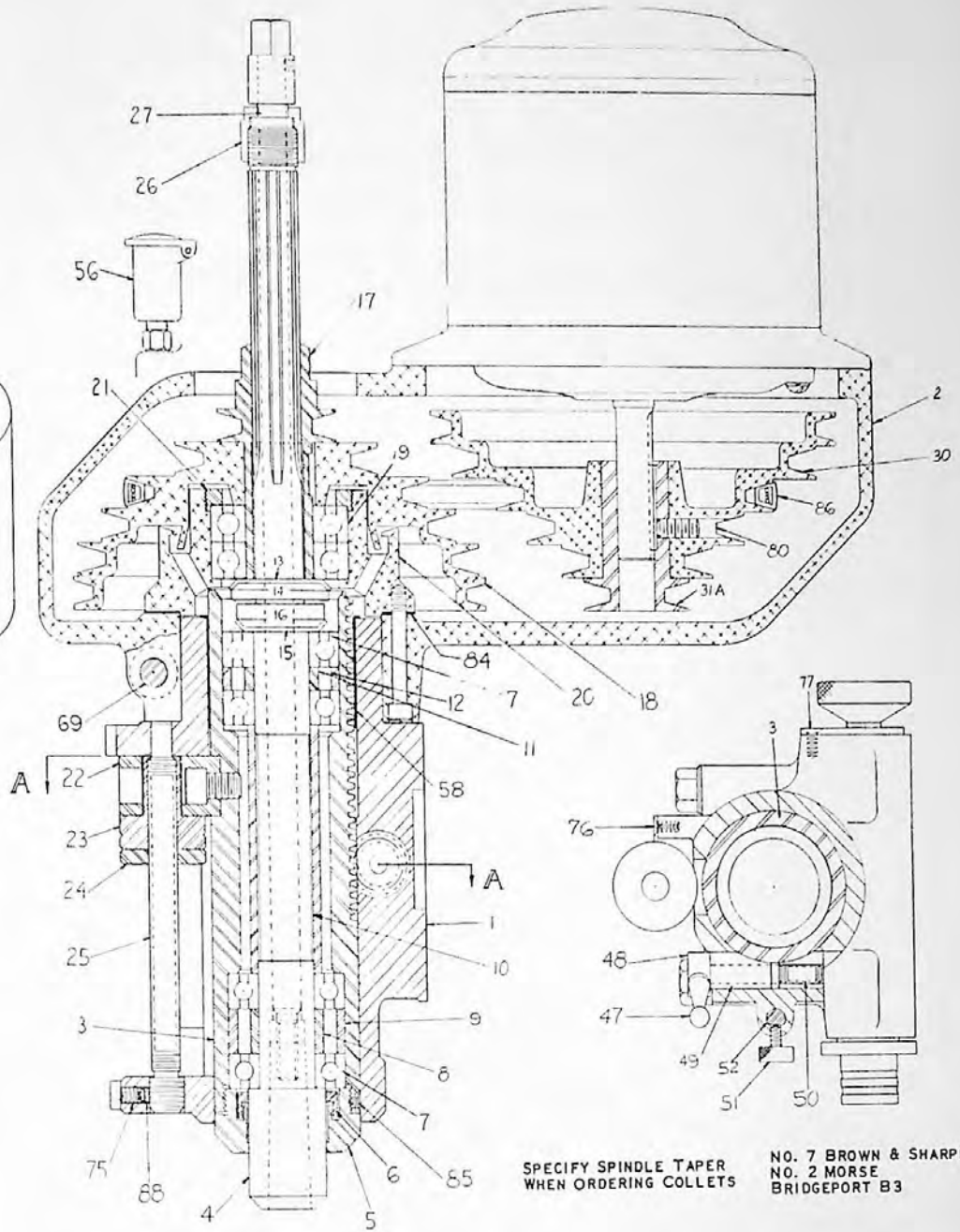
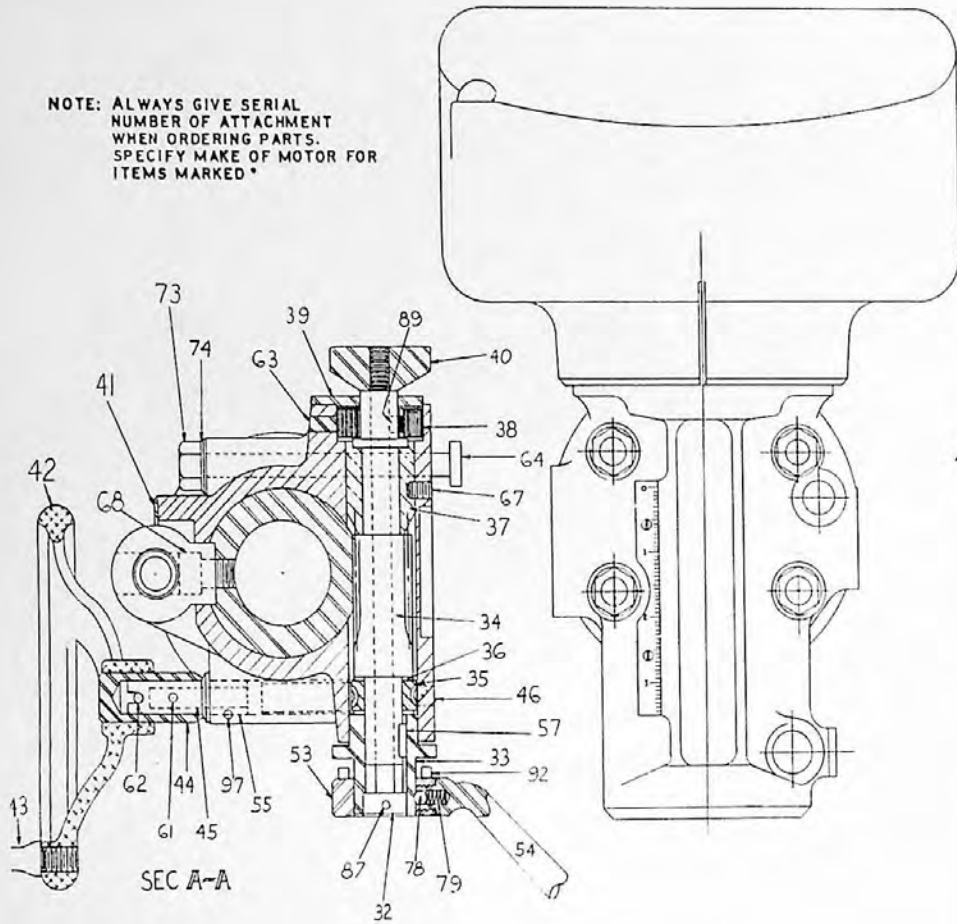
J-HEAD
1 H.P. MILLING ATTACHMENT

J PARTS LIST

CODE NO	PART NO		CODE NO	PART NO		CODE NO	PART NO	
2883514	J-1	QUILL HOUSING	2190134	J-93	BRAKE LOCK PIN	1011014	J-287	#10 - 24 x 1-1/2 LG. CAP SCREW
2883505	J-2	GEAR HOUSING	2190135	J-94	LOWER CLAMPING BOLT SPACER	1011308	J-268	1/4 - 20 x 1/2 SOCKET SET SCREWS
2883452	J-3	GEAR HOUSING COVER	2190136	J-95	COUNTERSHAFT	1011028	J-269	1/4 - 20 x 3/8 LG. SOCKET HEAD CAP SCREW
2883507	J-4	BELT HOUSING	2190137	J-96	COUNTERSHAFT GEAR	1201788	J-272	N-08 LOCK NUT
2190055	J-5	SPINDLE PULLEY	2190138	J-97	GEARSHIFT PLUNGER	1191942	J-273	W-08 LOCKWASHER
2883508	J-6	MOTOR PULLEY	2883446	J-98	CLUSTER GEAR SHIFT CRANK	1011270	J-274	5/16 - 18 x 5/16 SOCKET SET SCREW K.P.
2883509	J-7	TIMING BELT PULLEY		J-99	FEED DRIVE CLUSTER GEAR	1011285	J-275	1/4 - 20 x 1/4 LG. SOCKET SET SCREW
2190058	J-8	TIMING BELT PULLEY FLANGE	2883504	J-100	FEED DRIVE CLUSTER GEAR (CENTER)	1011453	J-278	10-32 x 5/16 LG. RD. HD. SCREW
2190059	J-9	WORM GEAR CRADLE		J-101	FEED DRIVE CLUSTER GEAR (UPPER)	1011090	J-278	3/8 - 24 x 5/8 SCREW
2883427	J-10	OVERLOAD CLUTCH TRIP LEVER	2883440	J-103	FEED DRIVE CLUSTER GEAR (UPPER)	1011302	J-278	#6 - 32 x 3/8 SOCKET SET SCREW
2190061	J-11	FEED GEAR SHIFTER FORK	2190145	J-104	FEED DRIVE GEAR	1010913	J-280	1/8 x 7/16 LG. ROLL PIN
2190062	J-12	BACK GEAR SHIFTER FORK	2190146	J-105	CLUSTER GEAR INPUT SHAFT	1010717	J-281	3/16 x 5/8 LG. DOWEL PIN
2883512	J-13	SPINDLE PULLEY BEARING SLEEVE	2883517	J-106	FEED DRIVING GEAR	1010515	J-282	1/8 x 9/16 LG. ROLL PIN
2883443	J-14	SHIFT CRANK	2190148	J-107	CLUSTER GEAR SHAFT	1192053	J-283	COMPRESSION SPRING
2190065	J-15	CLUSTER GEAR COVER	2190149	J-108	CLUSTER GEAR KEY	1192151	J-284	BLACK PLASTIC BALL HANDLES 1" DIM.
2883436	J-16	SPRING COVER	2190150	J-109	BEVEL GEAR BEARING	1011431	J-285	8-32 x 5/8 LG. HD. SCREW
2190067	J-17	FEED TRIP BRACKET	2883432	J-110	BEVEL GEAR THRUST SPACER	1013076	J-286	#3 WOODRUFF KEY
2190068	J-18	CLUTCH ARM COVER	2190152	J-111	FEED REVERSE BEVEL GEAR	1013078	J-287	#7 WOODRUFF KEY
2200076	M-24	MICRO SCREW JAM NUT	2190153	J-112	FEED WORM SHAFT THRUST WASHER	1190870	J-289	#5108 - 59 KOHNOR SNAP RING
2190073	J-29	SPINDLE LOCKNUT BINDING	2190154	J-113	FEED REVERSE CLUTCH	1011718	J-289	7/16 - 14 HEX NUT HARDENED (AMERICAN STD. REGULAR)
2199000	J-31	DRAWBAR FOR R-B COLLEY	2190155	J-114	HANDWHEEL CLUTCH SPRING SCREW	1191793	J-290	N-08 SPECIAL 5/16 THICK BEARING LOCKNUT
2883502	J-32	DRAWBAR KNOB	2190157	J-116	FEED WORM SHAFT BUSHING	1191944	J-291	W-08 LOCKWASHER
2190079	M-33	PINION SHAFT HUB SLEEVE	2883433	J-117	REVERSE CLUTCH ROD	1190230	J-292	1 PR. #208 BEARINGS
2190080	J-34	QUILL NOSEPIECE FOR J-100 TO J-1199 ONLY	2883518	J-118	REVERSE KNOB	1190232	J-293	1 PR. #207 BEARINGS
2190081	J-35	QUILL SKIRT	2883519	J-119	HANDWHEEL CLUTCH	1195720	J-294	WICK 1/8 O.D.
2190082	J-36	QUILL STOP KNOB	2190210	J-119	HANDWHEEL BUSHING	1013150	J-285	GITS OIL CUP #1207
2190083	J-37	QUILL STOP MICRO SCREW	2190162	J-121	WORM SHAFT KEY	1010507	J-286	3/32 x 5/8 LG. ROLL PIN
2190084	J-38	MICROMETER NUT	2190163	J-123	BEVEL PINION WASHER	1192084	J-297	W.B. JONES #167 - A EXT. SPRING (LINOQUIST)
2190085	J-39	REVERSE TRIP BALL LEVER	2190164	J-124	FEED WORM GEAR SHAFT SLEEVE	1011280	J-298	10-32 x 1/4 LG. SOCKET SET SCREWS
2190086	J-40	FEED REVERSE TRIP PLUNGER	2190165	J-125	WORM GEAR SPACER	1013078	J-299	#9 WOODRUFF KEY
2190087	J-41	REVERSE TRIP BALL LEVER SCREW	2190166	J-126	FEED DRIVE WORM GEAR	1191738	J-300	5/8 - 18 HEX JAM NUT
2883498	J-42	FEED TRIP LEVER	2190167	J-127	FEED DRIVE WORM GEAR SHAFT	1190235	J-301	ND #99503 DOUBLE SEAL BEARING ABEC 3
2190089	J-43	FEED TRIP PLUNGER	2190168	J-128	FEED ENGAGE PIN	1190310	J-303	B-68 TORRINGTON NEEDLE BEARING
2060120	M-43	HANDWHEEL HANDLE	2190169	J-129	WORM GEAR CRADLE THROW-OUT	1191796	J-304	3/8 - 24 HEX JAM NUT
2190090	J-44	TRIP PLUNGER BUSHING	2190170	J-130	SHIFT SLEEVE	1193835	J-305	A-672-4 OILITE BEARING
2883456	J-45	TRIP PLUNGER	2883541	J-131	MOTOR LOCKNUT	2190200	J-308	32 - 5/16 LG. PIN
2190092	J-46	FEED TRIP PLUNGER BUSHING	2190172	J-132	MOTOR LOCKNUT HANDLE	1192208	J-307	BOSTON WORM #HLVH
2190093	J-47	CAM ROD SLEEVE ASSEMBLY	2190173	J-133	MOTOR MOUNTING STUDS	2190201	J-308	.110 DIA. x 7/16 LG. PIN
2200098	M-47	LOCK HANDLE	2190174	J-134	MOTOR MOUNTING STUD WASHERS	1010509	J-309	3/32 x 3/4 LG. ROLL PIN
2190094	J-48	CAM ROD	2190175	J-135	CLUSTER GEAR KEY	1192185	J-310	3/16 STEEL BALL
2190095	J-49	TRIP HAND	1192303	J-136	WORM CRADLE BUSHING	1192054	J-311	COMPRESSION SPRING
2190096	J-51	OVERLOAD CLUTCH LEVER SPRING PLUNGER	2190176	J-137	CLUSTER GEAR KEY	1011258	J-316	#10-24 x 3/8 LG. K.P. SET SCREW
2190097	J-52	OVERLOAD CLUTCH WASHER	2883540	J-138	COLLET ALIGNING SCREW	1010743	J-316	5/16 x 7/8 LG. DOWEL PIN
2190098	J-53	CLUTCH RING	1192207	J-140	WORM GEAR	1191922	J-318	3/8 LOCKWASHER
2883465	M-53	PINION SHAFT HUB	2190177	J-141	NUT	1190838	J-319	5108 - 62 WALDES SNAP RING
2883549	J-54	OVERLOAD CLUTCH SLEEVE	1013077	J-142	KEY	1192055	J-321	SAFETY CLUTCH SPRING
2883466	M-54	PINION SHAFT HUB HANDLE	1011370	J-143	1/4 20 x 3/8 SOCKET SET SCREW	1195306	J-322	MICROMETER SCALE
2190100	J-57	OVERLOAD CLUTCH SLEEVE KEY	2883500	J-144	GEAR	1011411	J-323	8-32 x 1/4 LG. RD. HD. SCREW
1192302	J-58	OVERLOAD CLUTCH	2190179	J-145	FEED SHIFT ROD	1192209	J-324	FEED REVERSE BEVEL GEAR
2190102	J-59	OVERLOAD CLUTCH RING	2883544	J-146	FEED REVERSE BEVEL PINION	1193054	J-326	BILLING #1166 WRENCH
2190103	J-60	OVERLOAD CLUTCH WORM GEAR	2190181	J-147	CLUSTER GEAR SHAFT UPPER BEARING	2190203	J-327	STEEL PINION
2190104	J-61	PINION SHAFT WORM GEAR SPACER	2190182	J-148	PINION SHAFT HUB SCREW	1192020	J-328	CLOCK SPRING 1" x .020" x 42"
2190105	F-61	OVERLOAD CLUTCH LOCKNUT	2190183	J-149	DRAWBAR WASHER	1192033	J-330	COMPRESSION SPRING
2190106	J-62	QUILL PINION SHAFT BUSHING	2190184	J-150	OUTSIDE CLOCKSRING PIN	1190822	J-331	5108 - 37 KOHNOR SNAP RING
2883420	J-63	QUILL PINION SHAFT	2190185	J-151	TRIP LEVER PIN	1192150	J-333	BLACK PLASTIC BALL HANDLES 13/8 DIM. SAME AS M-54
2190108	J-64	QUILL PINION	2190186	J-152	BACKGEAR SHIFT BUSHING	1010747	J-334	5/16 x 2" LG. DOWEL PIN
2190109	J-65	QUILL LOCK SLEEVE	2883545	J-153	BACKGEAR SHIFT CRANK	1191920	J-335	#8 SPLIT LOCKWASHER
2190110	J-66	QUILL LOCK SLEEVE	2190188	J-154	CLUTCH RING PIN	1190818	J-336	SNAP RING 5100-25
2190111	J-67	QUILL LOCK BOLT	2883499	J-155	1/2" T-BOLT	1193111	J-338	#2002 GITS OIL CUP
2883515	J-70	VERTICAL TEE BOLT	2883547	J-157	QUILL MICRO STOP NUT	1192830	J-339	SPINDLE SPEED PLATE
2190114	J-71	VERTICAL TEE BOLT WASHER	2190190	J-159	KEY FOR #30 STD TAPER SPINDLE	1192832	J-340	OPERATING INSTRUCTION PLATE
2190115	J-72	SPLINED GEAR HUB	2883511	J-166	SPINDLE (SERIAL J-1200 AND UP)	1190239	J-348	FAFNIR MM 207 WI-CR-DB. SPEC. E5227 START AT J-1200
2190116	J-73	BULL GEAR KEY	2190192	J-167	QUILL (SERIAL J-1200 AND UP)	1190237	J-349	FAFNIR M208 K SPEC. E 6578 OR NORMA HOFFMAN 208 S-685 A START AT SER. #J-1750
2883548	J-74	SPINDLE BULL GEAR	2190193	J-169	SPINDLE DIRT SHIELD	1011542	J-350	1/4 - 20 MOCK-IT LOCKSCREW
2883478	J-75	SPINDLE PULLEY HUB	2883513	J-170	BEARING SPACER - LARGE FROM J-1750	1011547	J-351	5/16 - 18 MOCK-IT LOCKSCREW
2190119	J-76	PULLEY COLLAR	2190195	J-171	BEARING SPACER - SMALL	1193839	J-363	BUSHING
2190120	J-77	OILER TUBE	2190196	J-172	NOSEPIECE	1011738	J-365	1/2" - 13 STD. HEX NUT
2190121	J-78	OIL PLUG	2190197	J-176	SLEEVE FROM SER. J-1750	1011771	J-358	3/8 - 24 FLOPLOC STOP & LOCKNUT
2190122	J-79	SPINDLE PULLEY KEY	2190198	J-188	FEED WORM SHAFT STARTED WITH SERIAL NO. 5500	1011255	J-358	8-32 x 1/4 SOCKET SET SCREW K.P. STARTED WITH SER. #J-8300
2883506	J-80	UPPER BEARING SPACER (LARGE)	1191736	J-190	1/2 - 13 SPECIAL HEX NUT OPTIONAL EQUIP.	1011740	J-359	1/4-20 JAM - NUT
	J-81	UPPER BEARING SPACER (SMALL)	2190199	J-192	WASHER	1011743	J-362	5/16 - 18 JAM NUT
2190125	J-82	BEARING SLEEVE LOCKNUT	1011268	J-260	1/4 - 20 1/2 LG. SOCKET SET SCREW KP	1191985	J-363	5/16 EXTERNAL LOCK WASHER
2190126	J-83	UPPER BEARING LOCKNUT	1011375	J-261	5/16 - 18 x 5/16 SOCKET SET SCREW	1010555	J-365	1/4 x 3/4 ROLL PINS
2190127	J-84	CAM RING	1011104	J-262	5/16 - 18 x 5/8 LG. SOCKET CAP SCREWS	1192835	J-368	NAME PLAT
2190128	J-85	SPINDLE CLUTCH LEVER	1190806	J-263	KOHINOOR #5000 - 315 SNAP RING	2200108	M-72	WASHER
2190129	J-86	SPINDLE CLUTCH CAM RING PIN	1010712	J-264	3/16 x 1/2 LG. DOWEL PINS			
2883477	J-87	BRAKE BLOCK	1011445	J-265	#10-24 x 3/8 LG. R. HEAD SCREW			
2883516	J-88	BRAKE RING SCREW	1192032	J-266	COMPRESSION SPRING			
2190131	J-89	BRAKE LOCK STUD	1011237	J-267	5/16 - 18 x 1/2 LG. K.P. SOCKET SET SCREWS			
2200111	M-89	CLOCKSRING STUD	1192101	J-268	V BELT			
2190132	J-91	BRAKE LOCK WASHER	1011506	J-269	#8 - 32 x 3/8 LG. FLAT HEAD SCREWS			
2190133	J-92	BRAKE LOCK & HANDLE	1010717	J-280	3/16 x 3/4 LG. DOWEL PIN			
			1010517	J-281	1/8 x 7/8 LG. ROLL PIN			
			1192052	J-282	COMPRESSION SPRING			
			1011260	J-283	10-32 x 1/4 LG. K.P. SET SCREW			
			1011010	J-264	#10-24 x 1/2 LG. CAP SCREW			
			1011035	J-265	1/4 - 20 x 1 LG. CAP SCREW			

MASTER MILLING ATTACHMENT M HEAD

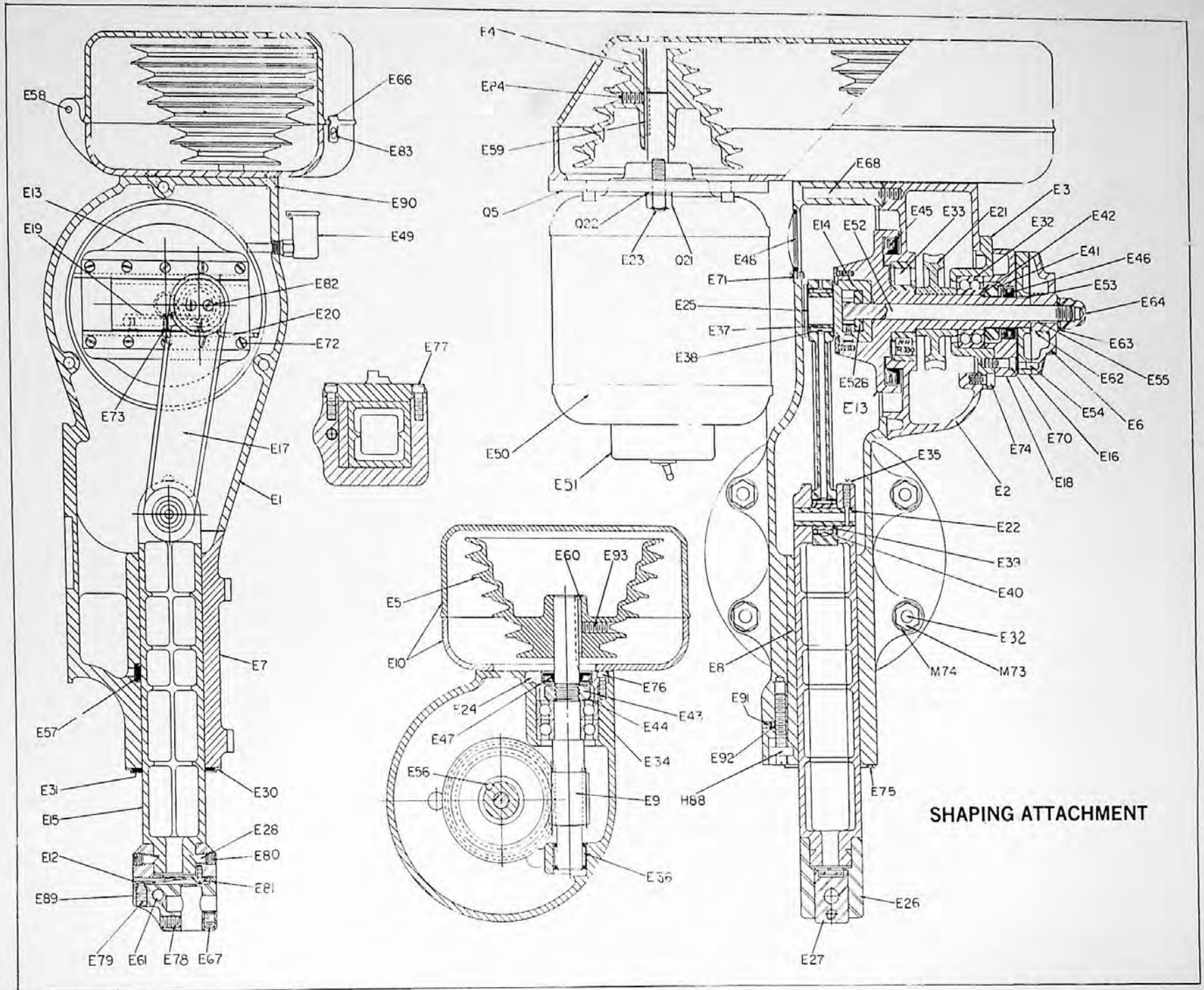
NOTE: ALWAYS GIVE SERIAL NUMBER OF ATTACHMENT WHEN ORDERING PARTS. SPECIFY MAKE OF MOTOR FOR ITEMS MARKED *



SPECIFY SPINDLE TAPER WHEN ORDERING COLLETS
NO. 7 BROWN & SHARPE
NO. 2 MORSE
BRIDGEPORT B3

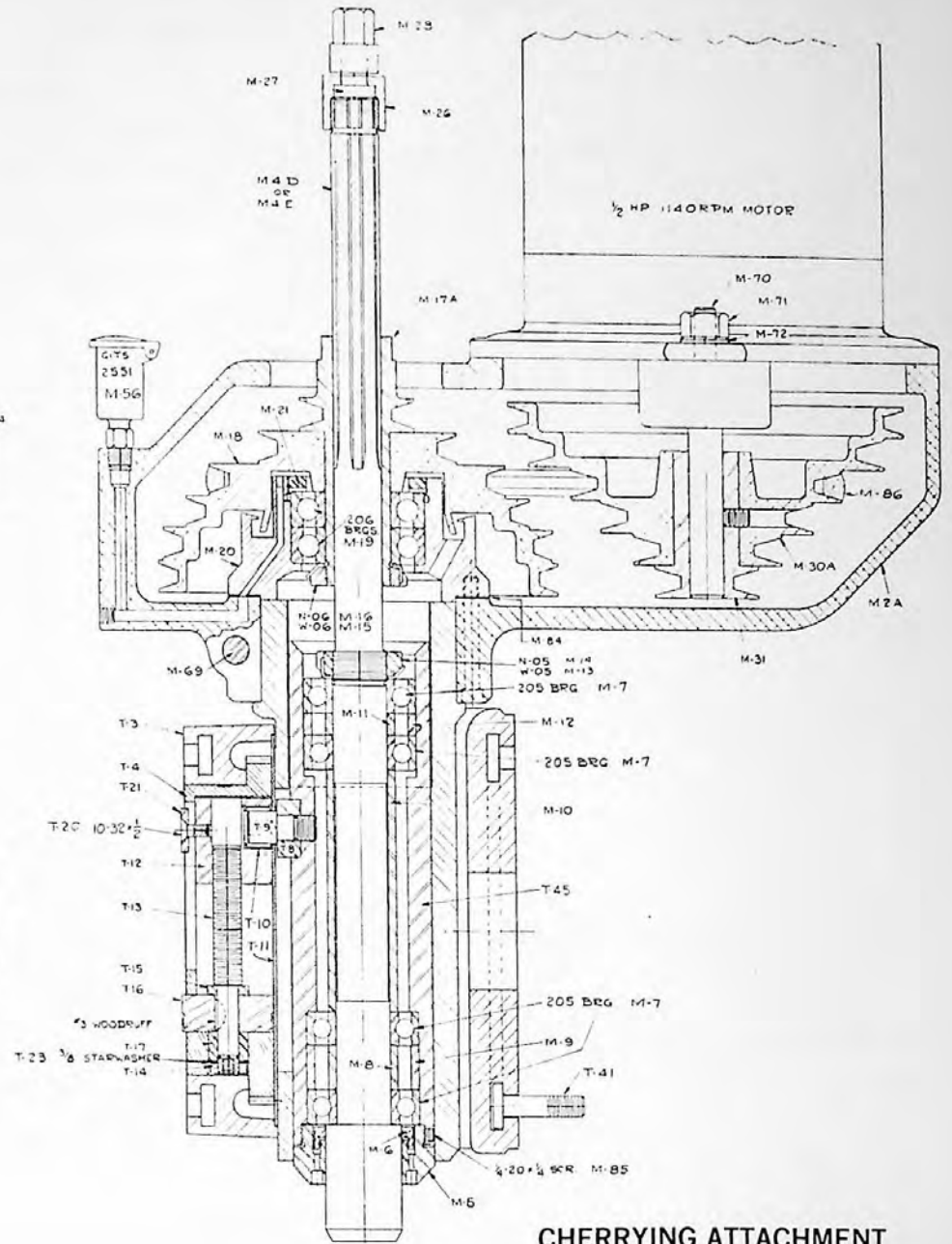
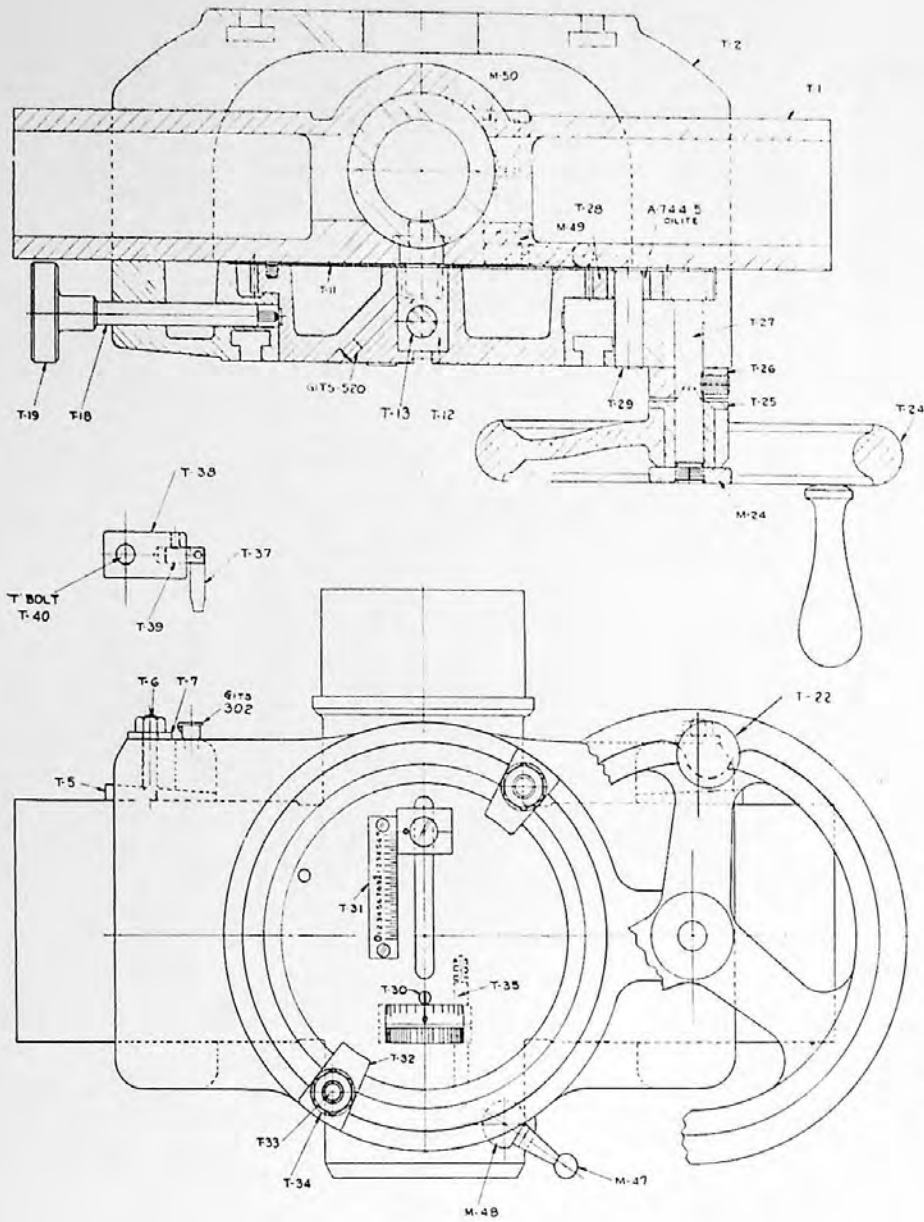
M HEAD — PARTS LIST

CODE NO.	PART NO.		CODE NO.	PART NO.		CODE NO.	PART NO.	
2884832-	M1	Quill Housing	2884838-	M42	Quill Worm Feed Handwheel [®]	A2884854-	M115	M-Head Belt Guard Assy. S.D.
2884833-	M2A	Belt Housing, Single Belt Drive, 60 Cycle	2884849-	M42	Quill Worm Feed Handwheel Assembly	B2884855-	M116	M-Head Belt Guard Assy. D.D.
2200053-	M3	Quill	2060120-	H122	Quill Worm Feed Hand Wheel Handle [®]	2200006-		Double V-Belt - Extra
2884820-	M4A	Spindle, Single Belt #2 MT Taper	2200096-	M45	Quill Feed Worm Hub	2200007-		Grease Packed Bearings - Extra
2884821-	M4B	Spindle, Single Belt #7 B & S Taper	2200097-	M46	Quill Feed Worm	2200008-		Quill Housing Assembly (need taper)
2884822-	M4C	Spindle, Single Belt B-3 Taper	2200098-	M47	Quill Lock Bolt Handle	2200009-		Spindle Assembly (need taper)
2884823-	M4D	Spindle, Double Belt #2 MT Taper	2200099-	M48	Quill Lock Bolt			
2884824-	M4E	Spindle, Double Belt #7 B & S Taper	2200100-	M49	Quill Lock Sleeve, Drilled			
2884825-	M4F	Spindle, Double Belt B-3 Taper	2200101-	M50	Quill Lock Sleeve, Tapped			
2200060-	M5	Nosepiece	2200102-	M51	Indicator Rod Clamp Screw			
2200061-	M6	Oil Slinger	2200103-	M52	Indicator Rod			
1200201-	M7	Ball Bearing (4 req'd)	2883465-	M53	Rack Feed Handle Hub [®] Assembly			
2884840-	M8	0.750 Inside Bearing Spacer	2883468-	M54	Rack Feed Handle Assembly - Complete			
	M9	0.750 Outside Bearing Spacer	2883466-	M54	Rack Feed Handle			
2200064-	M10	Long Spacer [®] aligner spring plunger assembly	1633638-	F6079	Bronze Worm Bushing			
2884842-	M11	0.375 Inside Bearing Spacer	1203108-	M56	Oil Cup			
	M12	0.375 Outside Bearing Spacer	2200106-	M58	Brass Quill Skirt			
1241940-	M13	W-05 Bearing Lock Washer	2884851-	SW	Motor Switch			
1241786-	M14	N-05 Bearing Lock Nut	2200107-	M62	Straight Pin			
1191942-	J273	W-06 Bearing Lock Washer	2200108-	M63	Outside Spring Pin			
1201788-	J272	N-06 Bearing Lock Nut			When ordering Motor Pulley specify make of Motor.			
2884826-	M17A	Spindle Pulley Hub, Single Belt Drive	2884841-	M64	T-Bolt (4 req'd)			
2884827-	M17B	Spindle Pulley Hub, Double Belt Drive	1011040-	M65	1/4 x 20 Cap Screw (6 req'd)			
2200069-	M18A	Spindle Pulley, Single Belt Drive	1011223-	M66	1/4 x 20 x 3/8 Set Screw			
2200070-	M18B	Spindle Pulley, Double Belt Drive	1011236-	M67	Set Screw			
1200202-	M19	Ball Bearings (2 req'd)	1011116-	M68	Cap Screw			
2884834-	M-20	Bearing Housing	1011170-	M69	Hex Head Screw			
2200072-	M-21	Bearing Retainer Ring	1011855-	M70	Motor Mounting Ring Stud (2 req'd)			
2200073-	M22	Micrometer Stop	1011715-	M71	1/2 x 20 Hex Nut (2 req'd)			
2190084-	J38	Micrometer Nut	2200109-	M72	1/2 x 1/8 x 7/8 Chamfered & Hardened Washer			
2200076-	M24	Micrometer Lock Nut	1011720-	H86	3/8 x 16 Hex Nut (4 req'd)			
2200077-	M25	Micrometer Screw	2060122-	H127	3/8 x 1/8 x 3/4 Chamfered & Hardened Washer			
2200078-	M26	Drawbar Nut	1011265-	J275	Set Screw			
2884843-	M27A	Drawbar, Double Drive, #7 B & S, #2 MT Taper	1011502-	M76	Flat Screw (3 req'd)			
2884844-	M27B	Drawbar, Double Drive, B-3 Taper	1011515-	M77	Flat Head Screw (2 req'd)			
2884845-	M27C	Drawbar, Single Drive #7 B & S, #2 MT Taper	1011240-	M80	Set Screw			
2884846-	M27D	Drawbar, Single Drive B-3 Taper	1011073-	M82	3/8 x 16 x 3/4 Mounting Ring Cap Screw (4 req'd)			
2884835-	M28	Drawbar Knob	1202450-	M84	Paper Gasket			
2884847-	M30A	Motor Pulley, Single Drive, with Hub M-31	1011265-	J275	Set Screw			
2884848-	M30B	Motor Pulley, Double Drive, with Hub M-31	1202102-	M86	V Belt			
2200087-	M32	Quill Feed Clutch Belt	2200112-	M87	Straight Pin			
2190079-	M33	Quill Feed Clutch Hub	2200110-	M88	Brass Plug			
2884837-	M34	Quill Feed Pinion	2200111-	M89	Pinion Spring Pin			
2200090-	M35	Quill Feed Worm Wheel	1202560-	M90	Motor Cord			
1202452-	M36	Fibre Washer (2 req'd)	1011392-	J139	Collet Key Screw with B 3 spindle			
2200091-	M37	Splint Bushing	1011427-	M95	#8 x 32 x 3/8 Round Head Screw (4 req'd)			
1202021-	M38	Clock Spring	1010717-	J260	Dowel Pin (Assembly of M-54, M-53)			
2200092-	M39	Spring Cover	1192165-	J310	Steel Ball Assembly of M-54, M-53			
2200093-	M40	Quill Feed Clutch Knob	1192033-	J330	Compression Spring			
1202845-	M41	Micrometer Scale	1192150-	J333	Black Ball for M-54			



PARTS LIST — THE BRIDGEPORT SHAPING ATTACHMENT

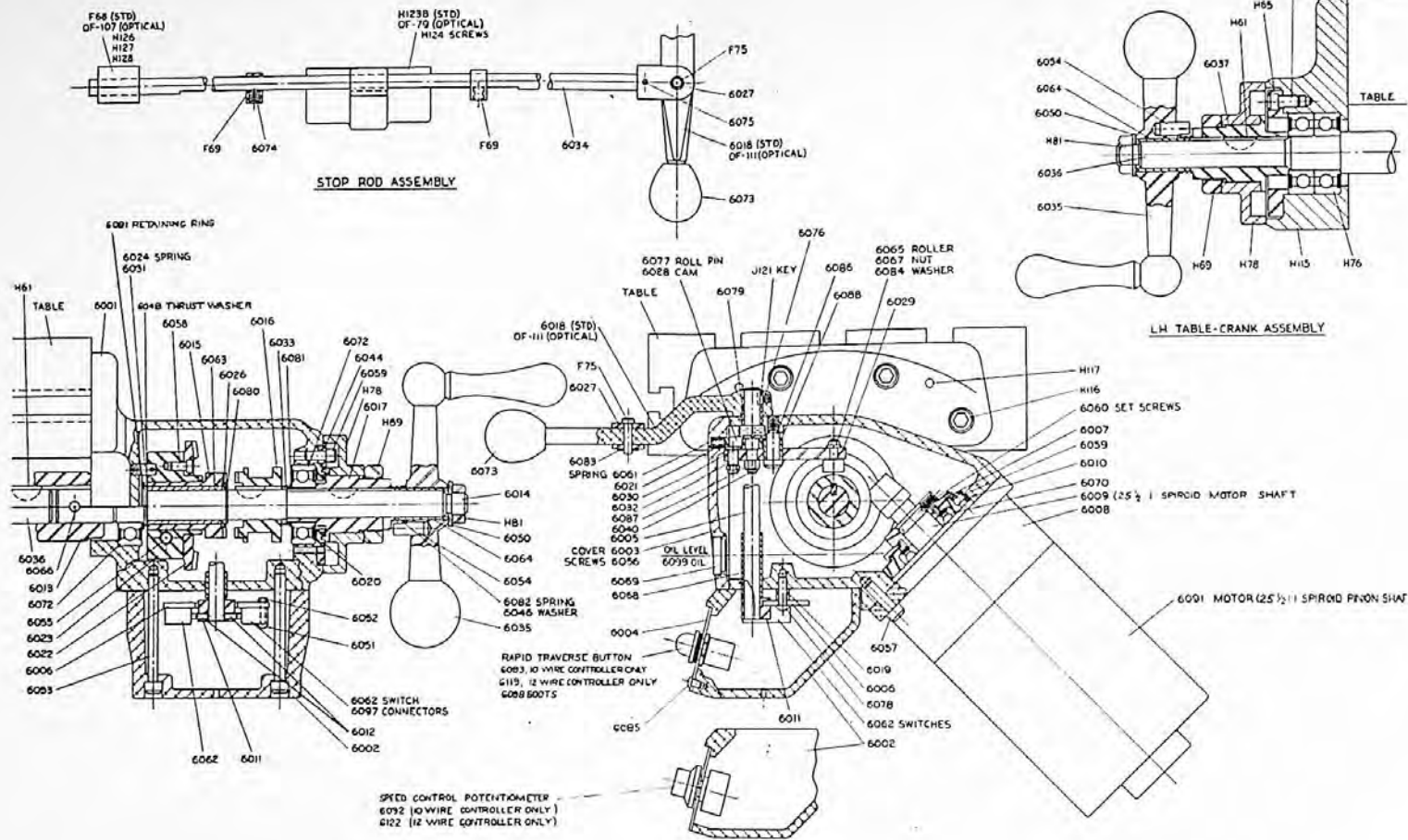
CODE NO	PART NO		CODE NO	PART NO		CODE NO	PART NO	
2880810-	E1	Kam Housing	2240080-	E52	Locking Bolt plus Gear (same as Pinion Gear & Shaft)	2886330-	E	#8 Bar
2240051-	E2	Gear Housing	2240081-	E52B	Locking Bolt Collar only	2886331-	E	#9 Bar
2240106-	E3	Gear Housing Cover	2240082-	E53	1/8 x 1/8 x 3/8 Key	2886332-	E	#10 Shoe
2880811-	E4	Motor Pulley	2240083-	E54	3/16 x 3/8 Pin	2240125-	E	Tools with 3" Overall Length
2880814-	E5	Worm Shaft Pulley	2240084-	E55	1/8 x 1/8 x 3/4 Key	2240126-	E	Tools with 3-1/2" Overall Length
2240055-	E6	Stroke Adjustment Dial	2240085-	E56	3/16 x 3/16 x 1-3/16 Key	2240127-	E	Tools with 4" Overall Length
2240056-	E7	Ram Cover	1242402-	E57	Felt Plug	2240128-	E	High Speed Cutters
2240057-	E8	Gib	2240086-	E58	3/8 x 1-1/4 Pin (2 Req'd)	2240129-	E	Tools with cutting edge unground
2240058-	E9	Worm & Shaft	2240087-	E59	3/16 x 3/16 x 1-3/4 Key	2240094-	E	Complete Shaping Tools
2240059-	E10	Belt Housing	1010748-	E61	5/16 x 1-7/8 Pin	1245440-	T-Bit	Tool Bit 3/16" Sq. x 2" for Shaper
2240061-	E11	Belt Cover	1242050-	E62	Dial Spring			
2240062-	E12	Clapper Spring	2240088-	E63	7/16 x 7/8 Washer			
2240063-	E13	Crank & Shaft	2240089-	E64	7/16-20 Acorn Nut			
2240064-	E14	Crankpin Block	2240090-	E66	Belt Cover Clip			
2240065-	E15	Ram	1011237-	J257	5/16-18 x 1/2 Set Screw			
2240066-	E16	Stroke Adjustment Plate	1011061-	E68	5/16-18 x 2-3/4 Cap Screw			
2240067-	E17	Connecting Rod	1011033-	2J-675	1/4-20 x 3/4 Cap Screw (3 Req'd)			
2240068-	E18	Crank Bearing Cover	1011592-	H109	#8-32 x 3/8 Washer Head Screw (2 Req'd)			
2240069-	E19	Rack	1011515-	M77	#10-24 x 3/8 Flat Head Screw (10 Req'd)			
2240070-	E20	Crankpin Block Hold-Down (1 Req'd)	1011427-	M95	#8-32 x 3/8 Round Head Screw (3 Req'd)			
2240071-	E21	Worm Gear	1011030-	H66	1/4-20 x 1/2 Cap Screw (3 Req'd)			
2240072-	E22	Ram Crankpin	1011407-	E75	#5-40 x 1/4 Round Head Screw (4 Req'd)			
1011850-	E23	Motor Mounting Ring Stud (2 Req'd)	1011009-	E76	#10-24 x 3/8 Cap Screw (3 Req'd)			
2240073-	E24	Worm Bearing Cover	1011270-	J274	5/16-18 x 5/16 Set Screw (2 Req'd)			
2240074-	E25	Bearing Retaining Washer	1011502-	M76	#5-40 x 1/4 Flat Head Screw (2 Req'd)			
2880813-	E26	Clapper Box Assembly	1011590-	E83	#8-32 x 3/8 Washer Head Screw			
2240076-	E27	Clapper	1011239-	E84	5/16-18 x 5/8 Set Screw			
2240077-	E28	Clapper Box Clamp Shoe (2 Req'd)	2240091-	E88	1/8 Pipe Plug, drilled & tapped			
1242104-	E29	Belt	1011214-	E89	#10-24 x 1/4 Set Screw			
2240078-	E30	Wiper Plate	1011530-	E90	1/4-20 x 1/2 Flat screw (4 Req'd)			
1242404-	E31	Wiper Felt	1011265-	J275	1/4-20 x 1/4 Set Screw			
1240216-	E32	Ball Bearing	2240150-	E92	Brass Plug			
1240214-	E33	Ball Bearing	1011240-	M80	5/16-18 x 3/4 Set Screw			
1240217-	E34	Ball Bearing	1242805-	E94	Rotation Name Plate			
1011450-	E35	Ram Crankpin Lockscrew	2240092-	E95	Worm (Slo-Speed)			
1240306-	E36	Bearing	2240093-	E96	Worm Gear (Slo-Speed)			
1240303-	E37	Inner Race	2240105-	E145	Toggle Adapter			
1240302-	E38	Bearing	1011720-	H86	T-Bolt Nut (4 Req'd)			
1240305-	E39	Inner Race	2060122-	H127	T-Bolt Washer (4 Req'd)			
1240304-	E40	Bearing	1241605-	Q17	T-Bolt (4 Req'd)			
1241786-	M14	Locknut	2240151-	E204	Motor Mounting Ring			
1241940-	M13	Lockwasher	1011745-	2J580	Motor Mounting Ring Stud Nut (2 Req'd)			
1241784-	E43	Locknut	2060088-	H88	Gib Screw			
1241932-	E44	Lockwasher	2240095-	E	#1 Shaping Tool			
1243180-	E45	Oilseal 3-1/4 x 4-1/4 x 1/2	2240096-	E	#2 Shaping Tool			
1243181-	E46	Oilseal 7/8 x 1-1/2 x 3/8	2240097-	E	#3 Shaping Tool			
1243182-	E47	Oilseal 3/4 x 1-1/2 x 5/16	2240098-	E	#4 Shaping Tool			
2240079-	E48	Air Vent Cover	2240099-	E	#5 Shaping Tool			
1243107-	E49	Oil Cup	2240100-	E	#6 Shaping Tool			
1432651-	SW	Switch	2240101-	E	#7 Shaping Tool			



CHERRYING ATTACHMENT

CHERRYING ATTACHMENT PARTS LIST

CODE NO	PART NO		CODE NO.	PART NO	
2884833-	M2A	Belt Housing, Single Belt Drive, 60 Cycle	2230054-	T5	Gib (2 Req'd)
2200053-	M3	Quill (T-45 part #)	2230055-	T6	Gib Screw (2 Req'd)
2884823-	M4D	Spindle, Double Belt #2 MT	2230056-	T7	Gib Screw Washer (2 Req'd)
2884824-	M4E	Spindle, Double Belt #7 B & S	2230057-	T8	Cherry
2200060-	M5	Nosepiece	2230058	T9	Pivot Stud
2200061-	M6	Oil Slinger	1230301-	T10	Bearings
1200201-	M7	Ball Bearing (4 Req'd)	2230059-	T11	Brass Gear Plate
2884840-	M8	0.750 Inside Bearing Spacer	2230060-	T12	Pivot Offset Block
2884840-	M9	0.750 Outside Bearing Spacer	2230061-	T13	Lead Screw
2200064-	M10	Long Spacer	2230062-	T14	Lead Screw Locknut
2884842-	M11	0.375 Inside Bearing Spacer	2230063-	T15	Lead Screw Washer
2884842-	M12	0.375 Outside Bearing Spacer	2230064-	T16	Lead Screw Dial
1241940-	M13	W-05 Bearing Lock Washer	2230065-	T17	Lead Screw Spacer
1241786-	M14	N-05 Bearing Lock Nut	2230066-	T18	Allen Wrench Stud
1191942-	J273	W-06 Bearing Lock Washer	2230067-	T19	Wrench Knob
1201788-	J272	N-06 Bearing Lock Nut	1011130-	T20	Flathead screw 10-32 x 1/2
2884826-	M17A	Spindle Pulley Hub, Single Belt drive	2230068-	T21	Zero Block
2200069-	M18A	Spindle Pulley, Single belt drive	2230069-	T24	Hand Wheel
1200202-	M19	Ball Bearing (2 Req'd)	2230070-	T25	Handwheel Dog
2884834-	M20	Bearing Housing	2230071-	T26	Handwheel Gear Clutch
2200072-	M21	Bearing Retainer Ring	2230072-	T27	Handwheel Pinion
2200078-	M26	Drawbar nut (left-hand thread)	2230073-	T28	Idler Gear
2884843-	M27A	Drawbar, Double drive #7 B & S	1010760-	T29	Dowel Pin
2884835-	M28	Drawbar Knob	2230074-	T30	Lead Screw Zero Pin
2884847-	M30A	Motor Pulley, Single belt drive with M-31 Hub.	1232876-	T31	Scale
2200098-	M47	Quill Lock Bolt Handle	2230075-	T32	Stop Dog (2 Req'd)
2200099-	M48	Quill Lock Bolt	2230076-	T33	T Bolt (3 Req'd)
2200100-	M49	Quill Lock Sleeve, drilled	2230077-	T34	T Bolt Washer (3 Req'd)
2200101-	M50	Quill Lock Sleeve, tapped	2230078-	T35	Dial Binder Plug
1203108-	M56	Oil Cup	2230079-	T36	Toggle Adapter
2200106-	M58	Quill Skirt	2230080-	T37	Finger Ratchet Spring
2884851-	SW	Motor Switch	2230081-	T38	Feed Ratchet Dog
2884841-	M64	T Bolts (4 Req'd)	2230082-	T39	Finger Stud (feed ratchet stud)
1011040-	M65	1/4 x 20 Cap Screw (6 Req'd)	2230083-	T40	Ratchet Dog
1011116-	M68	7/16 x 20 x 1/2 Cap Screw	2886370-	T41	T-Bolt (4 Req'd)
1011170-	M69	1/2 x 13 x 3-1/4 Hex Head Screw	1232176-		Handwheel Handle
1011855-	M70	Motor Mounting Ring Stud (2 Req'd)	1232877-	T43M	Nameplate
1011715-	M71	1/2 x 20 Hex Nut (2 Req'd)	1232878-	T31M	Nameplate
2200109-	M72	Chamfered & Hardened Washer	2884851-	SW	Drum Switch
1011720-	H86	3/8 x 16 Hex Nut (4 Req'd)			
2060122-	H127	3/8 x 1/8 x 3/4 Chamfered & Hardened Washer			
1011073-	M82	3/8 x 16 x 3/4 Mounting Ring Cap Screw (4 Req'd)			
1202450-	M84	Paper Gasket			
1011265-	J275	1/4 x 20 x 1/4 Set Screw			
1202102-	M86	V Belt			
1202560-	M90	Motor Cord			
2230050-	T1	Quill Housing			
2230051-	T2	Quill Housing Saddle			
2230052-	T3	Gear Housing			
2230053-	T4	Drum Gear			



CODE NO	PART NO	DESCRIPTION
2630091-	F6048	L.H. Thrush Washer
2630092-	F6049	Drive Shaft
1011404-	F6051	4-40 x 3/4 Rd. Hd. Machine Screw (4 req'd.)
1011701-	F6052	4-40 Hex Nut (4 req'd)
1011046-	F6053	Soc. Hd. Cap Screw 1/4-20 x 2 1/2 (2 req'd.)
1015401-	F6054	Plug for (F-6129)
1011128-	F6055	Soc. Hd. Cap Screw 1/4-20 x 1 1/2 (Loc-well)
1011011-	2J676	Soc. Hd. Cap Screw 10-24 x 5/8 (4 req'd.)
1011033-	2J675	Soc. Hd. Cap Screw 1/4-20 x 3/4 (4 req'd)
1011016-	F6058	Soc. Hd. Cap Screw 10-32 x 3/8 (3 req'd)
1011010-	F6059	Soc. Hd. Cap Screw 10-24 x 1/2 (6 req'd)
1011340-	F6060	Soc. Set Screw 10-32 x 5/16 CP (3 req'd)
1632073-	F6061	Spring For Detent Pin
1632658-	F6062	Limit Switch (Robertshaw XD1000) (2 req'd)
1633647-	F6063	Bronze Bearing B-1114-14
1633653-	F6064	Bronze Bearing M1012-10 (2 req'd)
1630320-	F6065	Bearing
1010411-	F6066	Taper Pin #2 x 1 1/2 long
1011705-	F6067	10-32 Hex Nut
1633650-	F6068	Bronze Bearing M-68-12
1633112-	F6069	Oil Sight B-5095
1630260-	F6070	Front Motor Bearing
1635040-	F6071	1/4 NPT Flush Seating Pipe Plug (2 req'd)
1630261-	F6072	Shaft Bearings (2 req'd)
1632152-	F6073	Knob Roaz (Red)
1011265-	J-275	Soc. Set Screw 1/4-20 x 1/4 K.C. Pt
1010507-	J296	3/32 x 5/8 Roll Pin
1011277-	F6076	Soc. Set Screw 10-24 x 1/4 (Loc-wel)
1010516-	2J583	1/8 x 5/8 roll pin
1011447-	F6078	Rd. Hd. Slotted Screw 10-24 x 5/8 (3 req'd)
1633638-	F6079	Bronze Bearing B-68-3
1630838-	F6080	Ret. Ring 5100-68
1630814-	F6081	Ret. Ring 5100-78 (2 req'd)
1632006-	F6082	Handle Release Spring
1630890-	F6083	Ret. Ring 5115-18
1631925-	F6084	#10 Lockwasher
1011190-	F6085	Button Hd. Soc. Scr. 8-32 x 1/4 (4 req'd)
1011575-	F6086	S. L. Shoulder Screw 5/16 x 5/8 lg. 1/4-20
1011740-	J359	1/4-20 Jam Nut
1633641-	F6088	Bronze Bearing 5/16 ID x 7/16 OD x 1/2 lg. #M57-6
1011138-	F6089	Hex Hd. Screw 1/4-20 x 3/4 (2 req'd) (For mtg. F-6041)
1632542-	F6090	Electronic Control Unit - 10 Wire
1632619-	F6093	Rapid Traverse Button AH#83091P
1632547-	F6096	Cord Grip DB-3 (1 for 10 Wire; 2 for 12 Wire)
1632594-	F6097	Crimp Connectors FR-4B-187 (6 req'd)
1632506-	F6098	N-3030 Boot For Ah & H Rapid Btn
1633149-	F6099	SAE Grade 140 - Spiroid Gear Oil
1632814-	F6100	Lubrication Nameplate
1632153-	F6101	#368-1 Knob for Potentiometer (For F-6092 & F-6122)
1632595-	F6102	Crimp Connectors FR-4B-110 (4 req'd) For 10 wire (2 req'd) for 12 wire
1632536-	F6103	Wire Nut IDEAL - #30-071 Model #71B (4 req'd)
1632544-	F6109	Controller for Nema 12 Panel Mt. (10 Wire 6090)
2630093-	F6111	P.F. Extension for PF 6108
1632620-	F6119	Rapid Traverse Button (For 12 Wire)
1632568-	F6120	12 Wire SCR Controller
1632553-	F6121	Power Cord 8 ft. (For 12 Wire)
1632618-	F6122	500 OHM Potentiometer for 12 Wire CTS Spec. 307286)
1632521-	F6123	12 Conductor Cable (For 10 & 12 Wire)
1632551-	F-6124	Cable Grips (2 for 12 wire, 1 for 10 Wire)
1632659-	F-6125	On-Off Switch (For 12 Wire)
1632593-	F6126	Pilot Light (For 12 Wire)
1632607-	F6127	Fuse Holder (For 12 Wire)
1632606-	F6128	10 Amp. Fuse (For 12 Wire)
1632504-	F6129	Back Plate (For 12 Wire)
1632628-	F6130	Boot for F-6125 (For 12 Wire)
1632854-	F6131	Elec. Connection Insts. (Tag)
1633728-	F6132	Motor End Cap
2881050-	F6090	Control Housing Assembly
2881051-	F6091	Motor Assembly
1011720-	H86	3/8-16 Hex Nut
2200109-	M72	1/2 x 1/8 x 7/8 Chamfered Washer (2 req'd.)
1013078-	J287	#7 Woodruff Key
2060300-	H123B	Spec. Stop Bracket
2430097-	F68	Stop Rod Guide
1632304-	F69	Stop Collar
2430101-	F75	Stop Rod Fork Pin
2190162-	J121	1/8 x 1/8 Key for 3/4 Slot
1061602-	H126	T Bolt
2060122-	H127	Washer

CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION
2630051-	F6001	Main Housing (Table Mtg.)	2630066-	F6019	Switch Mtg. Plate Spacer (3 Req'd) For F-6006
2630052-	F6002	Control Station	2630067-	F6020	Lead Screw Seal
2630053-	F6003	Side Cover	2630068-	F6021	Detent Pin
1632576-	F6004	Cover for Control Station F-6002	1632216-	F6022	25 1/2 - 1 Drive Shaft Gear (Spiroid)
2630054-	F6005	Actuating Shaft	2630069-	F6023	Drive Gear Mounting Hub
1632610-	F6006	Switch Mounting Plate	1632005-	F6024	Spring for Clutch Arm
2630055-	F6007	Motor Oil Slinger	2630094-	F6025	Handle Drive Pin (2 Req'd)
2630056-	F6008	Motor End Bracket	2630070-	F6026	R.H. Thrust Bearing
2630057-	F6010	Motor Bearing Cap	2630071-	F6027	Stop Rod Fork
2630058-	F6011	Switch Actuating Hsg.	2630072-	F6028	Clutch Detent Cam
2630059-	F6012	Switch Actuator Pin (2 Req'd)	2630073-	F6029	Clutch Arm
2630060-	F6013	Coupling	2630074-	F6030	Clutch Arm Detent Roller
2630062-	F6015	Clutch - Driver	2630075-	F6031	Pin for 6024 Spring
2630063-	F6016	Clutch - Driven	2630076-	F6032	Clutch Arm Spring Pin
2630064-	F6017	Hand Crank Shaft	1632074-	F6033	Clutch Spring
2630065-	F6018	Control Lever	2881052-	F6034A	Stop Rod 32" Table - Assembly

CODE NO	PART NO	DESCRIPTION
2881053-	F6034B	Stop Rod 36" Table - Assembly
2881054-	F6034C	Stop Rod 42" Table - Assembly
2881055-	F6034D	Stop Rod 48" Table - Assembly
2630081-	F6035	Handle (2 Req'd)
2630082-	F6036B	Lead Screw 32" Table
2630083-	F6036D	Lead Screw 36" Table
2630084-	F6036F	Lead Screw 42" Table
2630085-	F6036H	Lead Screw 48" Table
2630086-	F6037	Dial Holder L.H.
1632218-	F6038	58:1 Drive Shaft Gear - Spiroid - Spec.
1632219-	F6039	58:1 Spiroid Motor Shaft - Pinoin - Spec.
2630087-	F6040	Detent Roller Pin
2630088-	F6041	SCR Control Housing
2630089-	F6044	Take Up Cap
2630090-	F6046	Washer For F6082
1632577-	F6047	Blank Cover for F6002 (Special)

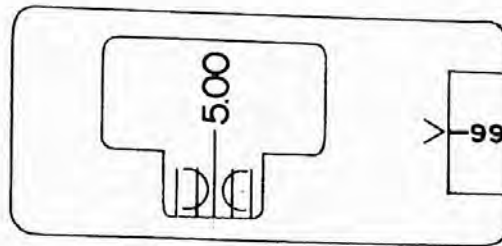
POWER FEED ASSEMBLY

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 focus 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 adjusting screw (0-48) to bring scale into view of scope unit window so that the top of the short graduations lines are parallel to top of catch fork.



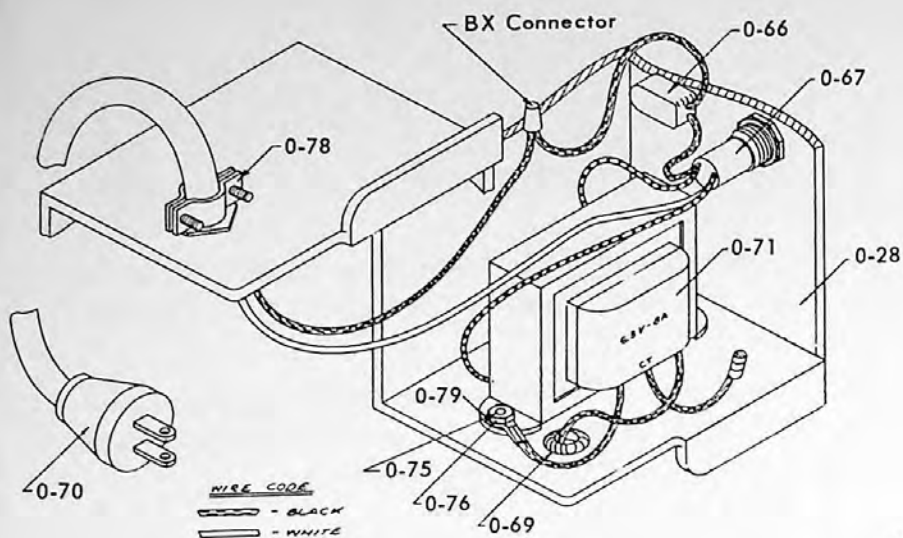
4. Follow same procedure at point 15 inch on scale image viewed in scope unit window. This adjustment is repeated until scale graduations are parallel to catch fork. Re-adjust scope housing for sharpness and lock scope housing tight by using (4) screws (0-40). Re-check scale image in scope unit window and make final adjustment on scale holder (0-7) if necessary. Lock (2) screws (0-41) tight. Check tenth reading dial to scale graduation. (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.

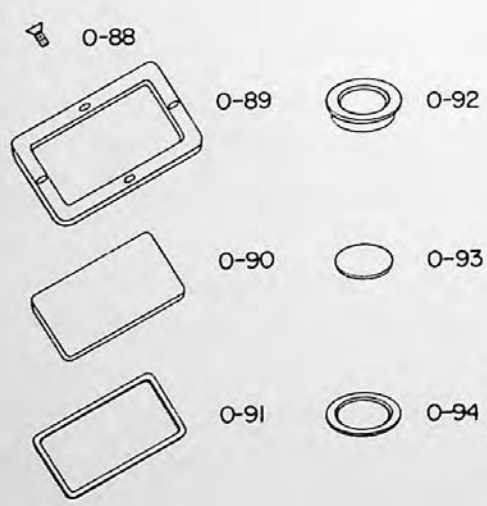
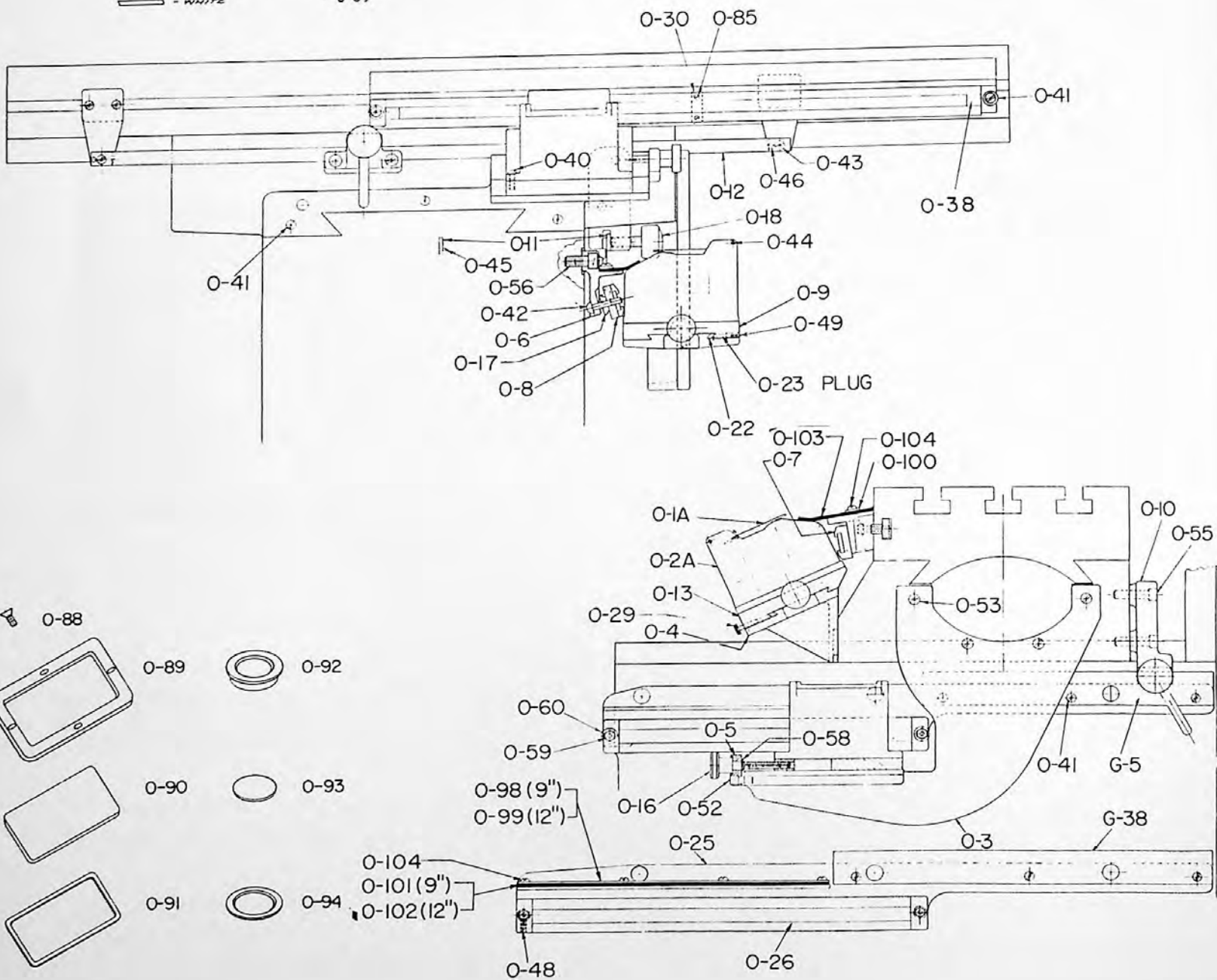
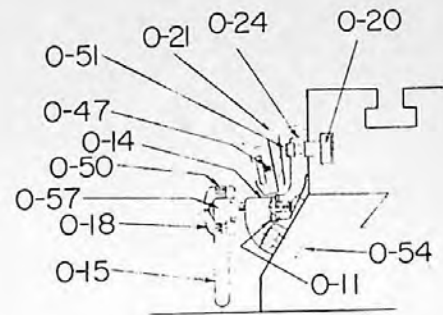
CROSS TRAVEL SCALE

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.



WIRE CODE
 — BLACK
 — WHITE



OPTICAL PARTS LIST

CODE NO	PART NO	DESCRIPTION	CODE NO	PART NO	DESCRIPTION
2270052-	O1A	Scope Housing Cover (2 Req'd)	1011074-	H82	3/8-16 x 1" Socket Cap Screws (2 Req'd)
2270053-	O2A	Scope Housing (2 Req'd)	1270820-	O58	Snap Rings (2 Req'd)
2270054-	O3	Cross Bracket	1011705-	F6067	10-32 Hex Nuts (2 Req'd)
2270055-	O4	Table Bracket	1271994-	O60	#6 Flat Washer (4 Req'd)
2270056-	O5	Adjusting Screw Bracket (2 Req'd)	2885234-	O62	12" Optical Scale Assembly
2270058-	O7	Table Scale Bracket	2885232-	O63	20" Optical Scale Assembly
2270060-	O9	Cross Travel Dovetail Slide	1272550-	O64-A	Cord Seal (2 Req'd) 12"
2270061-	O10	Cross Travel Binder Bracket (2 Req'd)	1272551-	O64B	Cord Seal 20"
2885226-	O11	Binding Bracket Plate (2 Req'd)	1274130-	O65	Scale Glass 20"
2270063-	O12A	Table Binder Strip 32" W/O PF	1274131-	O65	Scale Glass 12"
2270064-	O12B	Table Binder Strip 36" W/O PF	1272650-	O66	Toggle Switch (117/110 Volt)
2270067-	O13	Table Dovetail Slide	1272590-	O67	Signal Lamp Complete (117/110 Volt)
2270068-	O14	Table Binder Bracket	1272511-	O68	Signal Lamp Bulb GE NE 51H
2270069-	O15	Binder Handle (2 Req'd)	1272580-	O69	Rubber Grommet 3/8 I.D.
2270070-	O16	Housing Adjusting Screw (2 Req'd)	1272561-	O70	Cord Set (18-2 117/110 Volt)
2270071-	O17	Scale Adjusting Nut (2 Req'd)	1272670-	O71	Transformer
2270072-	O18	Binder Hub (2 Req'd)	1272583-	O72	Harness Cord Set (6.3 Volt) (Red Connectors)
2270097-	O19	Scale Bracket Cap (4 Req'd)	1272860-	O73	Transformer Box Name Plate
2270073-	O20	Tee Slot Shoe (7 Req'd)	1272861-	O74	Decal (Optical Housing) (2 Req'd)
2270074-	O21	Table Scale Bracket	1011414-	O75	6-32 x 1/2 Round Head Screws (2 Req'd)
2270075-	O22	Straight Dovetail Gib (2 Req'd)	1011703-	O76	6-32 Hex Nuts (2 Req'd)
2270076-	O23	Gib Binding Plugs (6 Req'd)	1011475-	O77	1/4-20 x 1/4 Round Head Screws (2 Req'd)
2270077-	O24	Binding Strip Dogs (2 Req'd)	1272535-	O78	3/8" Cable Connector
2270078-	O25	12" Cross Travel Bracket	1272643-	O79	B-65 Spade Terminal
2270079-	O26	12" Cross Travel Scale Bracket	1272642-	O80	#2B-14 Wire Terminal
1272671-	O28	Transformer Box	1272512-	O81	Bulb #81 Automotive (6 Volt) (2 Req'd)
2270080-	O29	Slide Lock Screw (2 Req'd)	1011250-	O82	1/2-13 x 3/8 Socket Set Screws
2270081-	O30	Scale Holder Clamp	1273190-	O83	67-1/2° Angle lube Fitting
1277511-	O32	Knob	1277514-	O84	Gauze
2270098-	O35	Lamp cover guard	1011585-	O85	Oval Head Machine Screw
2270082-	O38	Scale Holder Cap (4 Req'd)	1272522-	O87	Rubber Cap (2 Req'd)
1011429-	O40	8-32 x 1/2 Round Head Screws (8 Req'd)	2885228-	O90	Window (2 Req'd) W10-91
1011456-	O41	10-32 x 1/2 Round Head Screws (8 Req'd)	1277501-	O92N	Front Window incl. Lens & Gasket
1011462-	O42	10-32 x 1-1/4 Round Head Screws (2 Req'd)	1275311-	O102	Cross Travel Scale Guard - 12"
1011472-	O43	1/4-20 x 3/8 Round Head Screws (2 Req'd)	1275312-	O103	Table Scale Guard
1010575-	O44	078 x 3/8 Roll Pins (4 Req'd)	1277510-	O	Micro switch
1010511-	2J569	1/8 x 1/4 Roll Pins (4 Req'd)	1277517-	O	Optical slide unit complete consisting of, frosted glass, plain glass, red screw and steel mounting springs
1010585-	O46	1/8 x 3/8 Roll Pins (2 Req'd)			
1011202-	O47	5-40 x 1/2 Socket Set Screws			
1011204-	O48	5-40 x 1/2 Socket Set Screws			
1011211-	O49	6-40 x 3/8 Socket Set Screws (4 Req'd)			
1011232-	3D38	1/4 28 x 1/4 Socket Set Screws (2 Req'd)			
1011020-	3D82	10-32 x 3/4" Socket Set Screws (7 Req'd)			
1011268-	J250	1/4 20 x 1/2 Socket Cap Screws (4 Req'd)			
1011033-	2J675	1/4 20 x 3/4" Socket Cap Screws (4 Req'd)			
1011104-	J252	5/16 18 x 5/8 Socket Screws (2 Req'd)			
1011106-	R1134	5/16 18 x 1" Socket Cap Screws (2 Req'd)			
1011073-	M82	3/8 16 x 3/4" Socket Cap Screws (3 Req'd)			

OPTICAL PARTS NEEDED FOR MACHINE WITH POWER FEED

2270088-	OF79	Table Stop Bracket	2270065-	O12C	Table Binder Strip 42" W/O PF
2270093-	OF107	Binder and Rod Bracket	2270066-	O12D	Table Binder Strip 48" W/O PF
2270094-	OF108	Control lever for offset Stud	2270083-	O96	Spacer
2270095-	OF109	Offset Stud	2270084-	O97	Ball Crank Handle
1630890-	F6083	Snap Ring	2270086-	O99	Guard Securing Steel Strip - 12"
2270089-	OF82A	Binder Strip for 32" Table PF	2270087-	O100	Guard Securing Strip (Table)
2270090-	OF82B	Binder Strip for 36" Table - PF	2270085-	O98	Guard Securing Strip
2270091-	OF82C	Binder Strip for 42" Table - PF			
2270092-	OF82D	Binder Strip for 48" Table - PF	2270107		Optical Scale Assembly - 300 mm 12 Metric
1277500-	O-88	Frame with 0-89 screws	2270108		Optical Scale Assembly - 500 mm 20 Metric