



MILLING MACHINE DIVISION

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

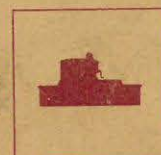
MILLING MACHINES



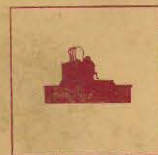
HORIZONTAL
KNEE & COLUMN



VERTICAL
KNEE & COLUMN



HORIZONTAL &
VERTICAL BED TYPE

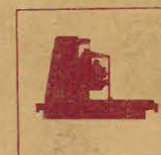


RISE & FALL AND
TRACER CON-
TROLLED BED TYPE

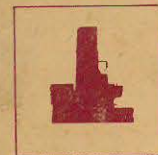
Products of the Milling Machine Division of The Cincinnati Milling Machine Co. are listed and symbolized here.

Products of The Cincinnati Milling Machine Co.'s other divisions include a complete line of centertype grinding machines, centerless grinding machines, roll grinding machines, chucking grinding machines, micro-centric grinding machines, special grinding machines, heating machines, metal forming machines, special broaching machines, special machine tools and complete production lines, special machinery, numerical control systems, tracing systems, gaging systems, hydraulic motors, hydraulic and electro-hydraulic valves and components, cutting fluids and precision grinding wheels.

DIE SINKING MACHINES
AND
BROACHING MACHINES



HORIZONTAL
& VERTICAL

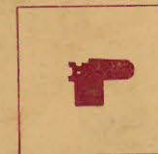


VERTICAL

CUTTER SHARPENING
MACHINES



Nos. 1 & 2.

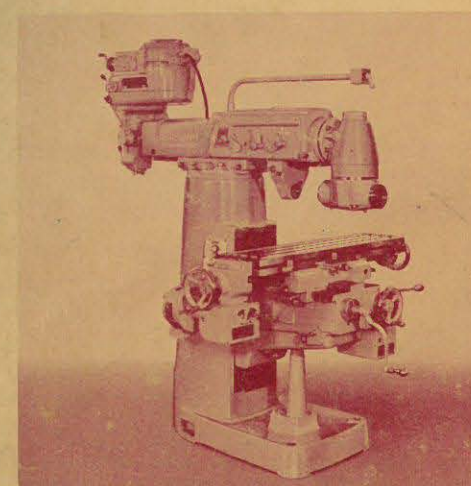


MONOSET
& OPTICAL

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINES (M-2318)

605-129

SERVICE MANUAL AND PARTS LIST CATALOG



**1B, 1C, 1D, 1E and HV
TOOLMASTER
MILLING MACHINES**



Identification No. 6J-DE
Publication No. M-2318

WHEN ORDERING REPAIR PARTS

1. Give complete Serial Number of Machine.
2. Give Part Number and Name.
3. Give Amount Required.

UNLESS THE ABOVE DATA IS INCLUDED WE CANNOT FILL YOUR ORDER

This Booklet should be Filed in Tool Crib and issued by Tool Check only.

THE  **E.S. STEPHENSON & CO. LTD.** **IE CO.**
HALIFAX N.S. SAINT JOHN N.B.

SERVICE MANUAL
AND
PARTS LIST CATALOG
FOR

Cincinnati
TOOLMASTER MILLING MACHINES

1B, 1C Model LO
1D Model LA
1E Model LR
HV Model DK



This catalog has been compiled to expedite the ordering of repair parts for your CINCINNATI TOOLMASTER Milling Machines as well as to present to maintenance personnel the correct methods of servicing the machines.

Due to continual improvements in design, it is possible that some information or the appearance of component parts to be found in this catalog may vary slightly from the machine delivered to you. This merely indicates that the mechanism has been improved to better fulfill your requirements.

MILLING MACHINE DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

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(Machines shipped in 1961 and after)

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The design and specifications of these machines are subject to change without notice.

FUNCTIONAL DIAGRAM

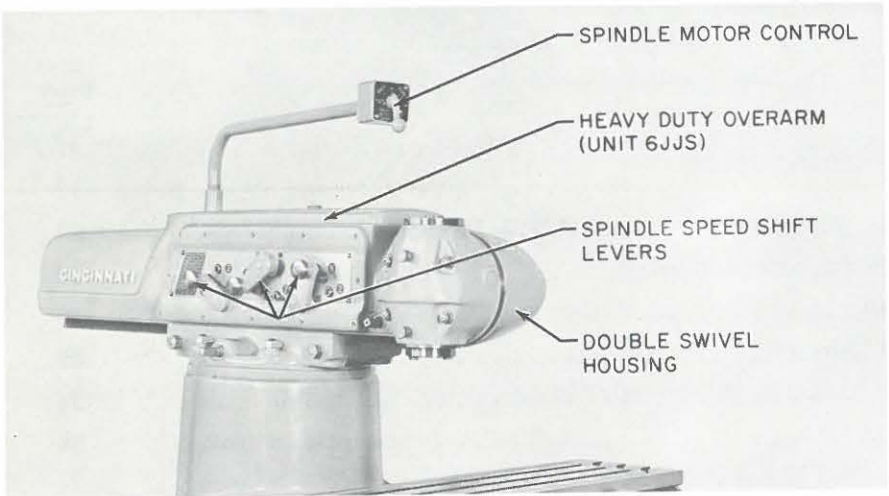


Figure 4A
Style 1C Toolmaster Milling Machine with Heavy Duty Overarm and Double Swivel (Intermediate) Housing

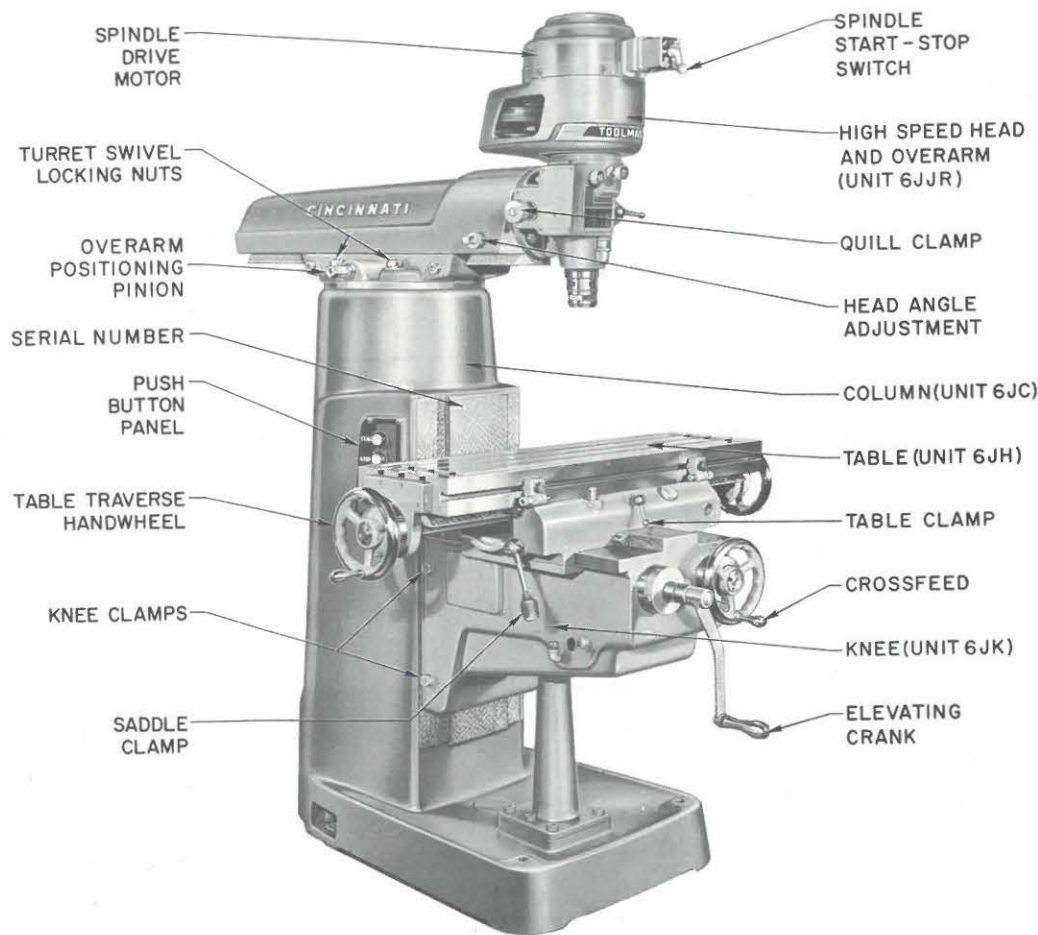


Figure 4B
Style 1B Toolmaster Milling Machine with Power Feed to Quill, Manual Feed to Saddle and Table

FUNCTIONAL DIAGRAM

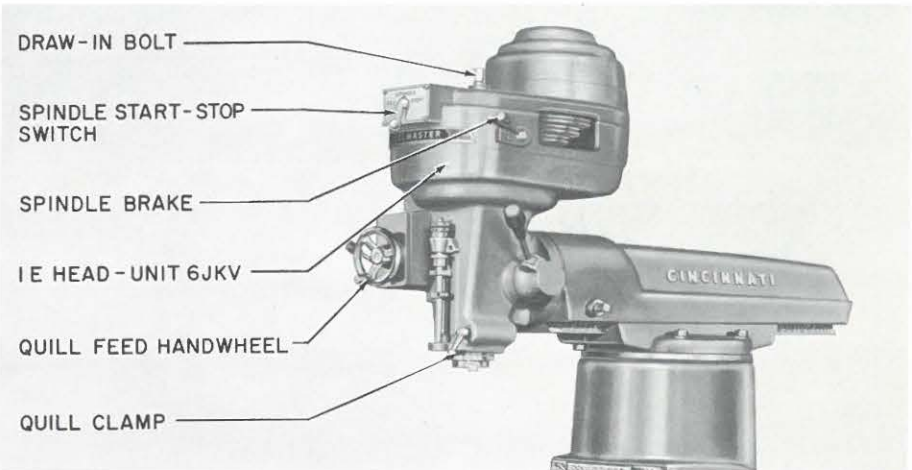


Figure 5A
Style 1E Toolmaster Milling Machine with Power Feed to Quill

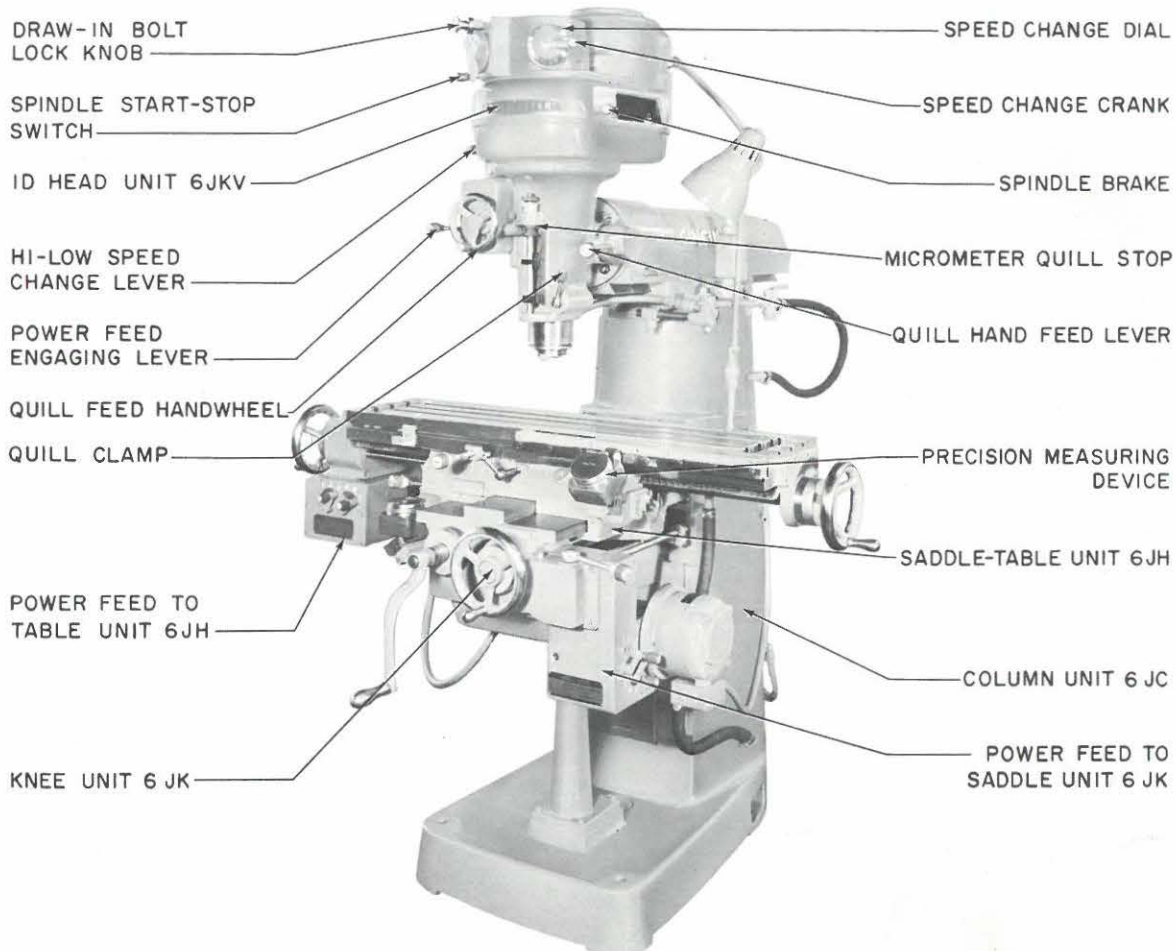


Figure 5B
Style 1D Toolmaster Milling Machine with Power Feed to Quill, Saddle and Table

FUNCTIONAL DIAGRAM

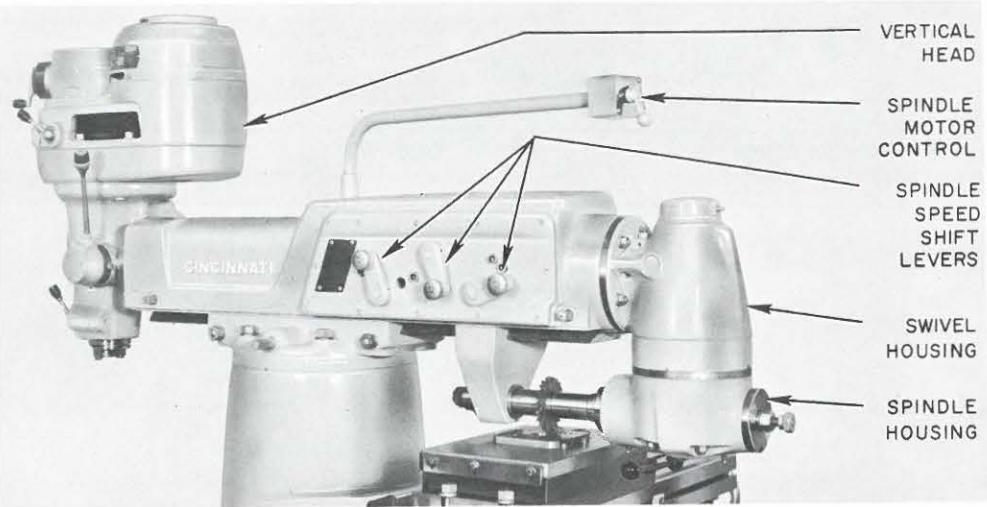
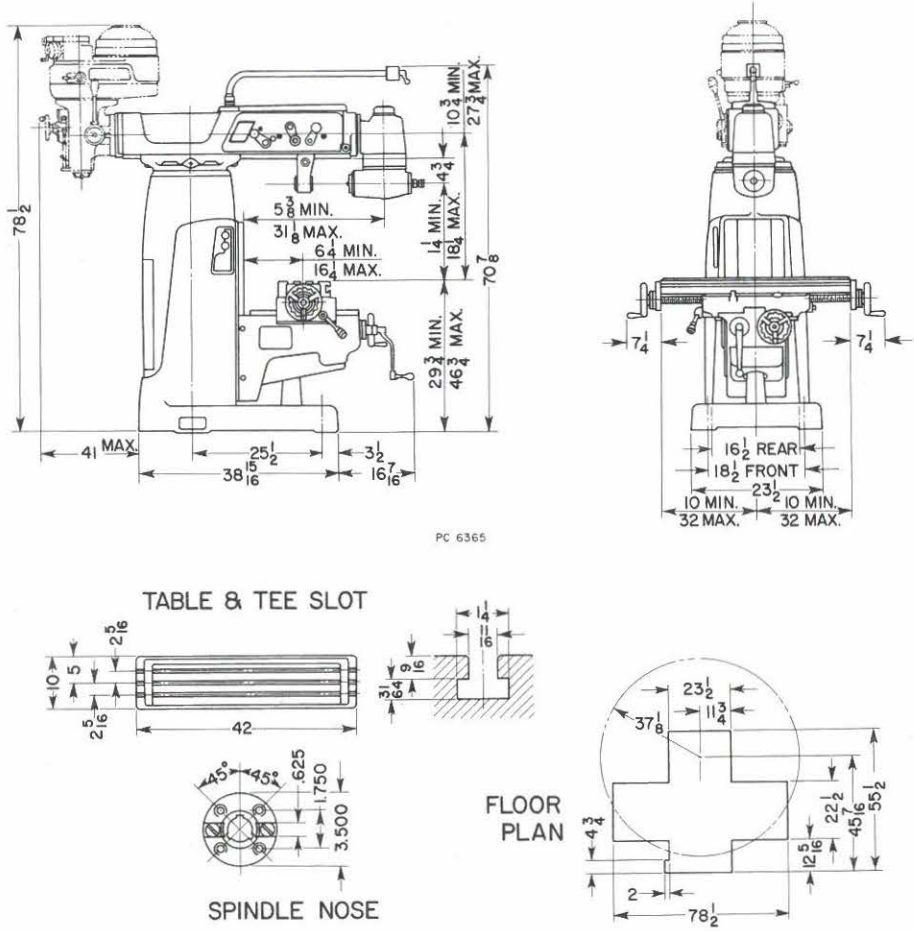


Figure 6A
Style H-V Toolmaster
Milling Machine
Equipped with Style 1-D
Vertical Head at Rear
of Overarm

DIMENSIONAL DRAWING
STYLE H-V TOOLMASTER MILLING MACHINE

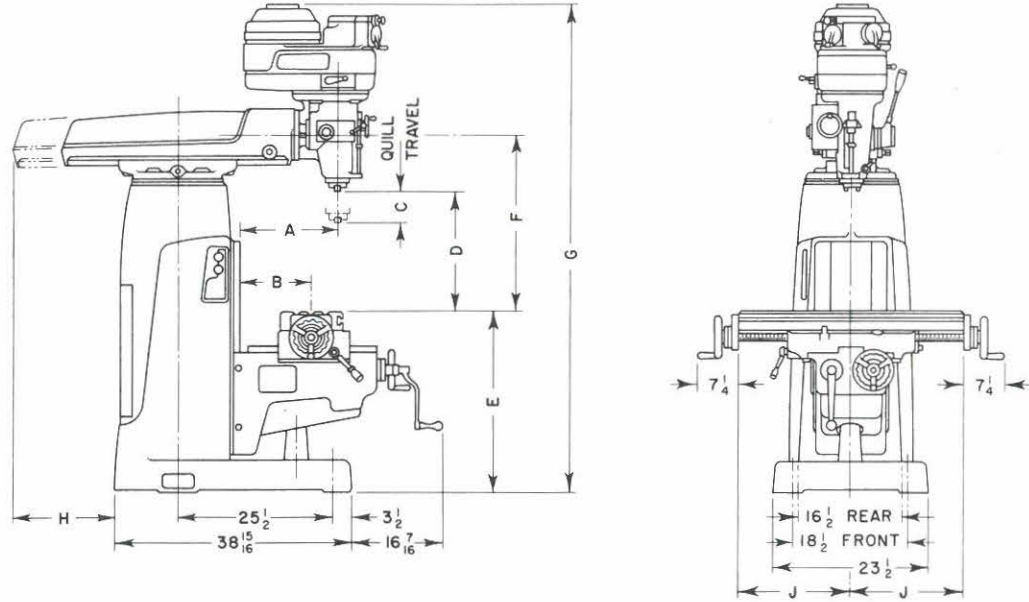


PC 6365

FLOOR
PLAN

SPINDLE NOSE

DIMENSIONAL DRAWING



Machine	Max.	A	Min.	Max.	B	Min.	C	Max.	D	Min.	Max.	E	Min.	Max.	F	Min.	G	H	Max.	J	Min.
1B	22-1/4	4-3/4	16-1/4	6-1/4	3-1/2	20-1/8	3-1/8	46-3/4	29-3/4	27-3/4	10-3/4	74-1/2	17	32	10						
1C	25-3/8	5-3/8	16-1/4	6-1/4	3	22-5/8	5-5/8	46-3/4	29-3/4	27-3/4	10-3/4	73-1/2	20	32	10						
1D	23-3/4	6-1/4	16-1/4	6-1/4	5	19-3/4	2-3/4	46-3/4	29-3/4	27-3/4	10-3/4	78-1/2	17	32	10						
1E	23-3/4	6-1/4	16-1/4	6-1/4	5	19-3/4	2-3/4	46-3/4	29-3/4	27-3/4	10-3/4	78-1/2	17	32	10						

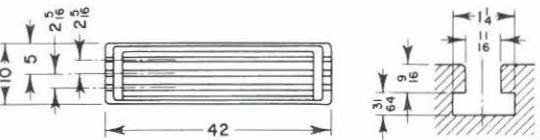
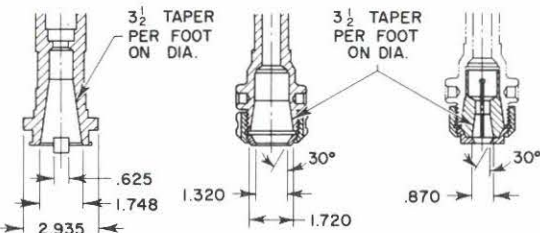
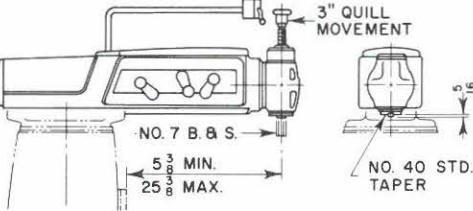


TABLE & TEE SLOT

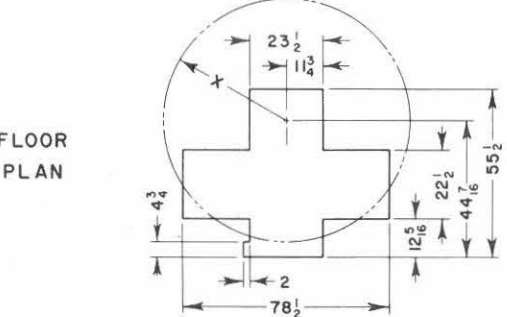


SPINDLE NOSE
NO. 40 STD. TAPER
(10 B 1E MACHINE)

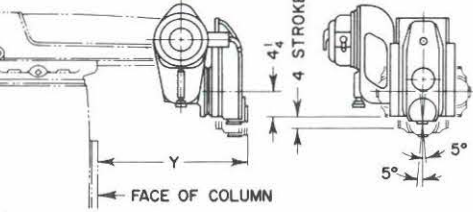
SPINDLE NOSE
ASSEMBLY AND ADAPTER
(1B MACHINE)



HEAVY DUTY
OVERARM
&
SPINDLE NOSE
(1C MACHINE)



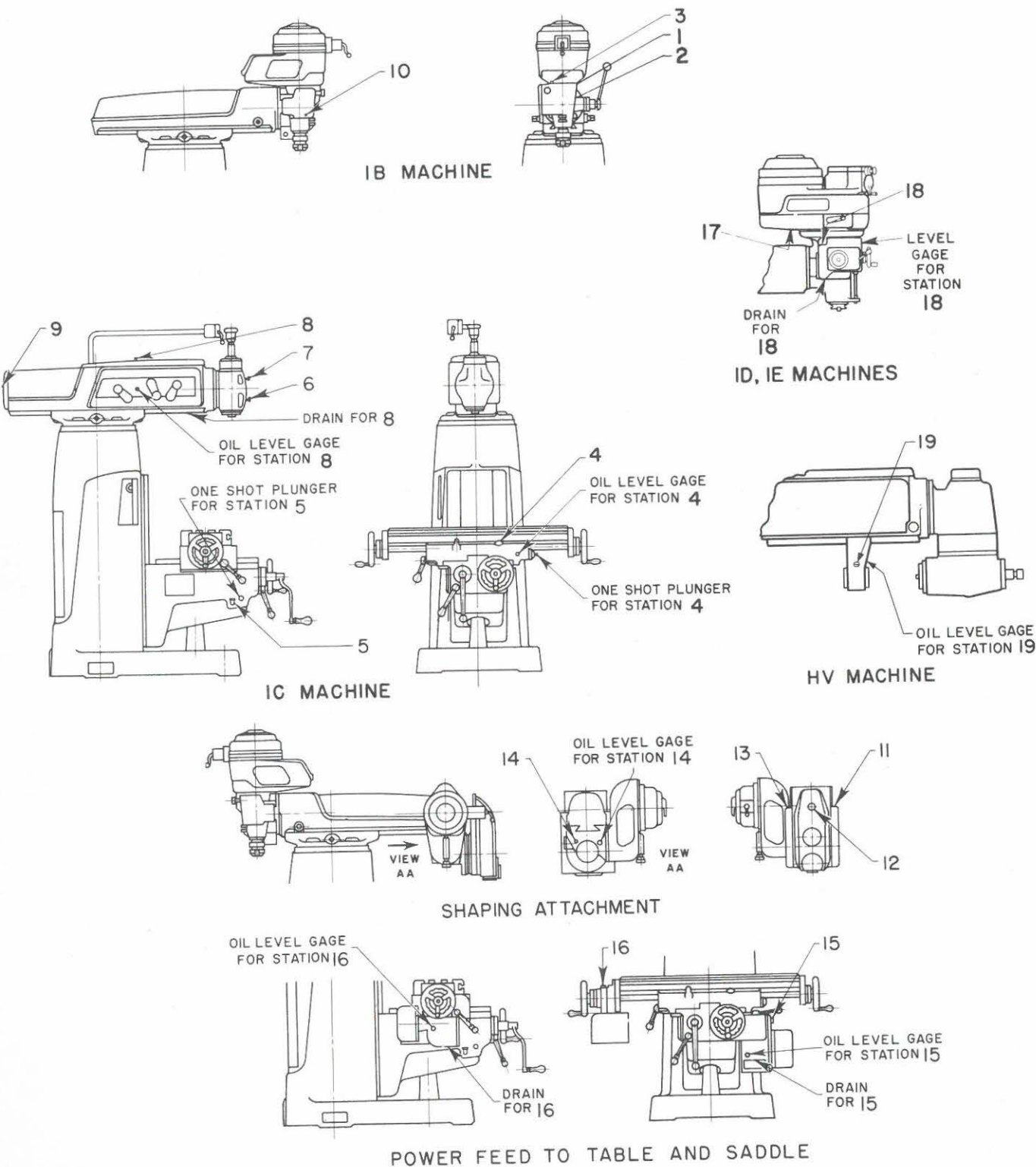
FLOOR
PLAN



SHAPING
ATTACHMENT

Machine	X With Shaping Attach.	X Without Shaping Attach.	Y With Shaping Attach. Max.	Min.
1B	33-1/2	37-1/8	24	15
1C	37-1/8	38-1/4	28-1/2	15
1D	33-1/2	39-3/4	24	15
1E	33-1/2	39-3/4	24	15

LUBRICATION DIAGRAM



LUBRICATION INSTRUCTIONS and SPECIFICATIONS
(See diagrams opposite page)

Thoroughly oil all moving parts as they are installed, then lubricate all principal points as listed below before starting motor. Periodic and thorough lubrication with correct lubricant, as specified, will help to maintain the long life and accuracy built into each machine. The intervals listed are based on a normal eight hour day.

PURCHASE LUBRICANTS FROM RELIABLE DEALERS

Interval	Station No. and Part Lubricated		Lubrication Instructions		Lubricant Specifications
Twice Daily (4 hours) When Used	11, 13	Shaping Attachment Ways	Fill oiler cups or button oilers		CMMCo. No. P-54 Rust and oxidation in- hibited oil. Viscosity 300-320 S. U. S. at 100° F.
Daily (8 hours)	1	Pinion Shaft			
	2	Quill Bearing			
	3	Power Feed Drive Gears			
	4	Saddle-Table and Saddle- Knee Ways, Table and Cross Nut and Lead Screw	Cap. 1 Pt.	Check level daily. Maintain level at height of opening of 4, above low limit of 5.	
			height of opening of 4, above low limit of 5.		
	5	Knee-Column Ways, Ele- vating Screw and Gears. (Some machines-plunger is on right side.)	Cap. 1/4 Gal.	3 TIMES DAILY Pull out each plunger and allow it to return itself.	
			plunger and allow it to return itself.		
	8	Gear Box	Cap. 1-1/2 Gal.	Check level daily. Fill to high limit when oil reaches low limit.	
	14	Shaping Attachment Drive	Cap. 1-3/4 Pts.		
	15	Table Power Feed Gear Housing	Cap. 1/2 Gal.		
16	Saddle Power Feed Gear Housing	Cap. 1/2 Gal.			
17	Vari-Speed Pulley As- sembly, (1-D only)	Grease daily. Grease lightly with spindle speed set to 1400 rpm or less. Run at this speed for one minute.		CMMCo. No. P-64 Lithium base grease having a consistency of N. L. G. I. No. 2.	
18	Power Feed to Quill (1-D, 1-E)	Cap. 1 Pt.	Check oil level daily while machine is running. Add oil as needed.	CMMCo. No. P-54 Rust and oxidation in- hibited oil. Viscosity 300-320 S.U.S. at 100° F.	
		Check oil level daily while machine is running. Add oil as needed.			
6, 7	Spindle Bearings		One-half turn only, of grease cup. Refill as required.		CMMCo. No. P-64 Lithium base grease having a consistency of N. L. G. I. No. 2.

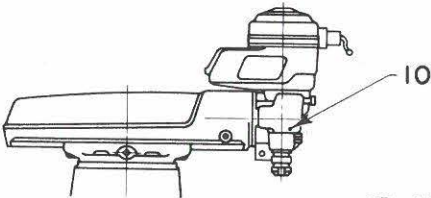
(continued on next page)

Coolant reservoir capacity is approximately 4-1/2 gals. (17 liters).
See M-2258 for various oil company recommended lubricants that comply with CMMCo. specifications.

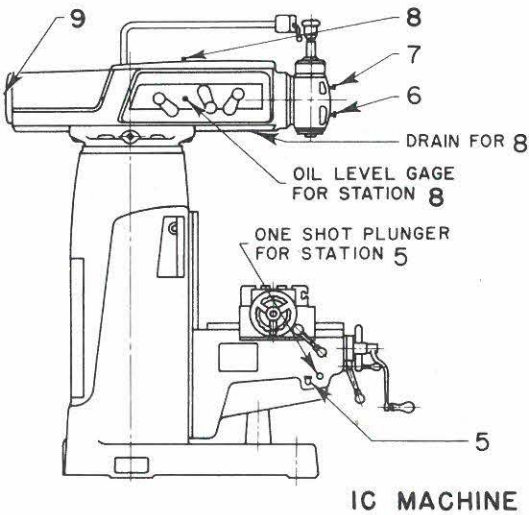
LUBRICATION INSTRUCTIONS and SPECIFICATIONS
(See diagrams, page 8)

Interval	Station No. and Part Lubricated	Lubrication Instructions	Lubricant Specifications
Weekly (48 hours)	12	Shaping Attachment Pitman Arm Bearings	CMMCo. No. P-64. (See page 9.)
	10*	Quill—Power Feed 1B	Cap. 1 Pt. CMMCo. No. P-54. (See page 9.)
	19	Arbor Support Bearings	
Periodically	9	Motor Bearings	Lubricate all motors only according to motor manufacturer's recommendations. DO NOT OVERLUBRICATE.

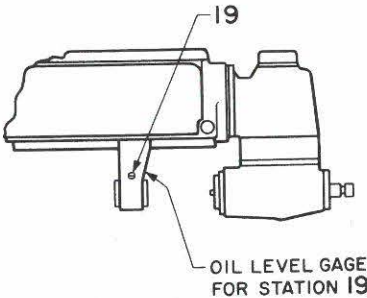
*Tilt spindle housing 30° toward right to fill or check oil level. At 30° angle, the oil level should be even with hole. To drain, rotate housing 70°—80° to left. (1-B)



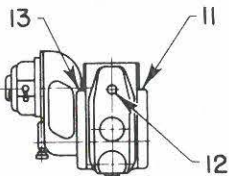
1B MACHINE



1C MACHINE



HV MACHINE



11

INSTALLATION INSTRUCTIONS

Foundations

A special foundation is not required for the No. 1 Toolmaster Milling Machine. Any substantial floor, wood or concrete, fairly flat and sufficiently sturdy to hold machines weight (approximately 2500 pounds) will be satisfactory. If installed on an upper floor place directly over a main beam. Select a zone free from extraneous vibration.

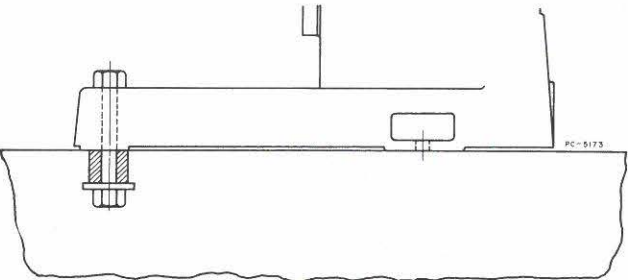


FIGURE 11B
Bolting to Concrete Floor

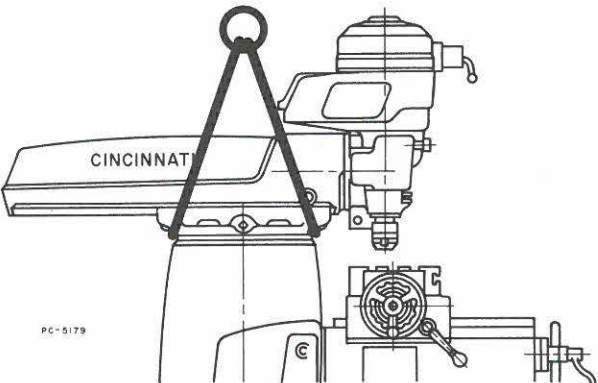


FIGURE 11A
Lifting Machine

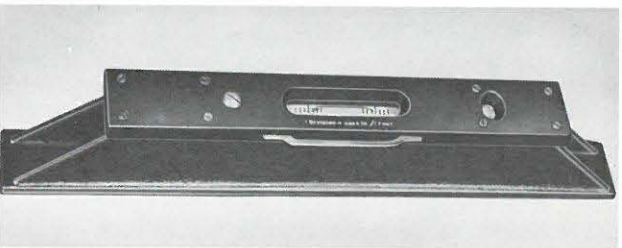


FIGURE 11C
Sensitive Spirit Level

Lifting Machine (Figure 11A)

The machine may be lifted by a crane with a rope or cable sling around the turret. Have saddle in inner position and overarm fully retracted and clamped before lifting. If a wire cable is used to lift machine, protect any surface contacted by cable with a leather belt or wood blocks.

Bolting Machine to Floor (Figure 11B)

If you wish to bolt machine to floor notice that center distances of bolt holes given on "Dimensional Drawing" are approximated. If the floor is concrete, drill the bolt holes about 6" in diameter. Place a large washer on head of hold down bolt, followed by a short length of 1-1/2" pipe, pass bolts up through holes in base and secure with a nut at top. Fill each pipe with dry sand. Lower machine into place but have it resting on two 1" thick boards. (Tops of pipes around hold down bolts should be flush with floor.) Fill holes around pipes with quick drying cement that is thin enough to flow easily. When cement is dry, remove boards, level machine and tighten hold down bolts.

Leveling Machine (Figure 11C)

For leveling machine tools a sensitive, graduated tube spirit level reading to 10 seconds per graduation (.0005" per foot) and provided with a screw adjustment, is required. A carpenter's level or the bulb in a machinists' combination square is not good enough. Table must be clean and free of burrs. Place 6" squares of shim stock under the four bearing pads of base until machine is level in all directions. Check machine level periodically. Always handle a precision level by the ends. If it is grasped at the center, the heat of your hand around the glass may distort it sufficiently to impair the leveling accuracy.

Cleaning

The machine should never be cleaned with the blast from an air hose as it will drive grit and dirt into ways and bearings. Use only lint-free rags for plain surfaces and a stiff bristle brush for corners. Prevent formation of permanent stain by periodic cleaning. If machine will remain idle for a long time, wipe a thin coat of oil over all exposed parts to prevent rusting.

ADJUSTMENTS

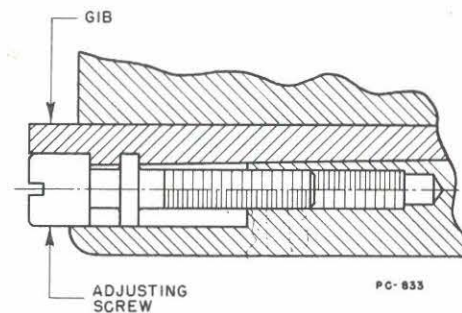


FIGURE 12
Headless Type Gib

To Adjust Gibs (See Figure 12)

Headless type taper gibs are provided to compensate for wear of bearing surfaces between sliding elements at knee and column; knee and saddle; saddle and table. Keep these surfaces clean and lubricated to cut down wear.

Move slide, to be adjusted by hand, turn gib adjusting screw in until movement of slide feels tight then back off screw until movement is just snug with a slight drag.

CAUTION --- Too tight an adjustment of the gibs squeezes out the oil film, causing undue wear and scoring.

To Adjust Drive Belts: Style 1-B (See Page 28.)

Style 1-B machines are driven through a V-belt and step pulleys which transmit motor torque to the drive sleeve through a jack shaft and timing belt. To tighten the V-belt (3B), turn knurled knob (43B). To tighten timing belt (9B), loosen two socket head screws (23B), move V-belt housing (19B) back until belt is tight and retighten the socket head screws. When belt can be depressed 1/2" (midway between shafts), adjustment is correct. (If timing belt is noisy, it is too tight. When properly adjusted, the timing belt runs quietly.)

To Adjust Drive Belt: Style 1-E (See Page 56.)

Drive belt (130B) is tightened or loosened by turning knurled knob (101B). Loosen two hex nuts (133B) before adjusting belt. Tighten hex nuts after adjusting belt. When belt can be depressed 1/2" (midway between shafts), adjustment is correct.

To Adjust Backlash Eliminator (See Page 72)

Lunging table movements while climb milling would indicate that backlash (B/L) eliminator nuts are loose or worn and need adjusting.

1. Run table to extreme left position so lead screw nuts are most accessible.
2. Loosen two socket head screws (82B) and, by hand only, turn B/L eliminator nut (80B) clockwise, then tighten screws (82B) while holding B/L nut. The two screws (82B) can be placed in either set of two holes in nut (79B) that are 90° apart.

To Adjust Quill Powerfeed Clutch: Style 1-B (See Page 32)

If powerfeed to quill should slip during a normal cut, it should be adjusted as follows:

1. Drain oil from vertical head, unscrew knurled knob (175B) at left side of head and remove six screws holding cover plate (123B, page 30) from side of head. Remove cover plate.
2. Loosen set screw in adjusting collar (178B), tap to loosen shoe under it and rotate collar in a clockwise direction until it is within 0.010" of the front face of male friction clutch (181B). [Or, run collar tight against friction clutch and back it off 1/5 of a turn on the 5/8-18 fine threads of pinion shaft.]

As hand clutch knob is turned clockwise, it will push adjusting pins (177B) against friction clutch and force clutch into spiral gear (182B) to produce drive to quill.

To Adjust Shaping Attachment Drive Belt (See Page 98)

Loosen the three cap screws that attach motor mounting plate (39B) to belt housing and tighten knurled knob (48B) until belt (44B) can be sagged between sheaves about one-half its thickness by finger pressure.

To Adjust Shaping Attachment Gib (See Pages 98, 100)

Slightly loosen bottom gib screw and tighten top gib screw (104B) until movement of slide (8B) is felt to be snug as drive belt is pulled over by hand.

DISMANTLING PROCEDURE

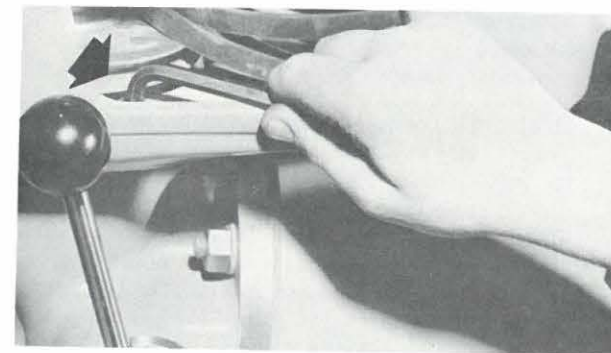


FIGURE 13
Removing V-Belt Housing

To Remove V-Belt Housing: Style 1-B. (See Page 28 and Figure 13.)

1. Loosen timing belt by loosening two socket head screws (33B) and turning knurled knob (43B).
2. Attach a two-point suspension sling (with padded hooks) to the top flanges above side openings in housing (19B). Remove two socket head screws (33B) and two washers (34B). Lift housing straight up, slowly, and be certain timing belt (9B) comes free of driven pulley (22C) as V-belt housing is separated from spindle housing.

NOTE --- If the V-belt housing is to be moved any distance from the machine, it will be necessary to break electrical connections at junction box on motor.

To Remove V-Belt Housing: Style 1-D. (See Page 54.)

1. Loosen four capscrews (66B) and remove two capscrews (99B). Rig a two-point suspension sling with padded hooks and attach hooks to flanges above side openings in V-belt housing (58B). Remove slack from lifting cables.
2. Remove four capscrews (66B) and washers (67B). Lift housing (58B), slowly, until it is clear of drawbar (210B, page 58).

When reassembling, be certain key (93B) does not fall out of keyway in helical gear (98B) or power will not be transmitted to spindle.

NOTE --- If V-belt housing is to be moved any distance from the machine, it will be necessary to break electrical connections at junction box on motor.

To Remove V-Belt Housing: Style 1-E. (See Page 56.)

1. Remove two screws (117B) and remove brake assembly from side of motor housing.
2. Loosen four capscrews (127B) and remove two capscrews (146B). Rig a two-point suspension sling with padded hooks and attach hooks to flanges above side openings in V-belt housing (107B). Remove slack from lifting cables. Remove four capscrews (127B) and washers (128B). Lift housing (107B), slowly, until it is clear of drawbar (210B, page 58).

When reassembling, be certain key (144B) does not fall out of keyway in helical gear (143C) or power will not be transmitted to spindle.

NOTE --- If V-belt housing is to be moved any distance from the machine, it will be necessary to break electrical connections at junction box on motor.

To Remove Splined Spindle Sleeve: Style 1-B. (See Page 28.)

1. Remove V-belt housing per instructions above.
2. Turn driven pulley (22C) until two capscrews (25B) are accessible through holes in pulley. Remove two capscrews (25B). Turn pulley 90° until remaining two capscrews (25B) are accessible and remove capscrews.
3. Lift bearing housing (12B) from top of spindle housing.
4. Remove screw (6B) and loosen screw (7C) in locknut (20B). Loosen and remove locknut (20B). Tap splined spindle sleeve (29B) out of bearing housing (12B).

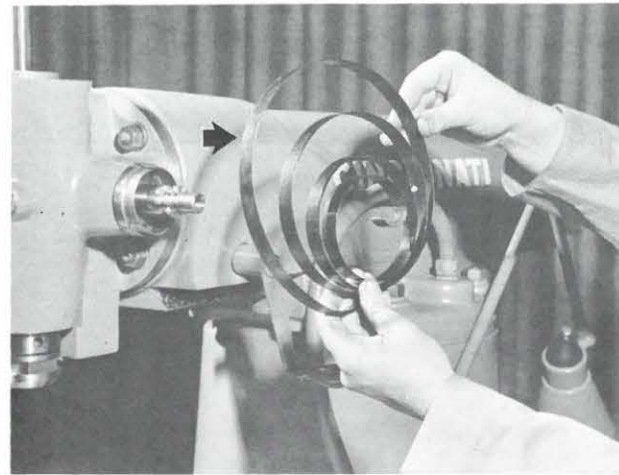


FIGURE 14A
Quill Feed Torsion Spring

**To Remove Drive Spindle Assembly: Style 1-B
(See Pages 30, 32)**

1. Proceed as per instructions above under "To Remove V-Belt Housing" and "To Remove Splined Spindle Sleeve."
2. Unscrew hub retainer (194B) that is attached to spring pin (191B), spring (192B) and spring retainer screw (193B). Lift off handle hub (190C) and dial (189B).
3. Tape a small rag to the exposed end of pinion shaft (183B) to protect shaft when spring unwinds. Grip the tang of spring (187B) with a pliers and place a rag over spring housing. Pull tang of spring free of notch in spring housing (185B) and, at the same time, step back while spring unwinds. The tang at inner end of spring lies in groove of pinion shaft (183B). [See Figure 14A.]

This spring is most easily replaced by two men, each handling spring with a pair of pliers. [Grease spring before replacing.] Have spindle at its bottom position, fully wind spring, back off one notch and hook spring in

housing. [This spring is only strong enough to balance weight of sleeve assembly. It is not intended to return spindle to its upper position.]

4. Drain oil from spindle housing by removing plug (124B) and rotating spindle housing (151B) to left. [See Figure 16B.] Unscrew hand clutch knob (175B, page 32) and remove cover plate (123B, page 30). Loosen lock screw (179B, page 32), unscrew clutch adjusting collar (178B) and remove male friction clutch (181B) [See Figure 15C], key (184B) and spiral gear (182B). Loosen clamp screw (205B).
5. Remove two set screws (163B, 162B, page 30) from side of spindle housing. Replace handle hub (190C, page 32). Rotate handle (196C) to raise sleeve (144B, page 30) and, by knocking it against driven gear (115B), force worm shaft (118B) up out of spindle housing. [See Figure 15A.] Pull out pinion shaft (183B, page 32).
6. Push spindle (132C, page 30) and sleeve up high enough to remove stop key (154B) and lower sleeve assembly down out of head. [See Figure 14B.] Stop key contacts depth adjusting stop (159B).

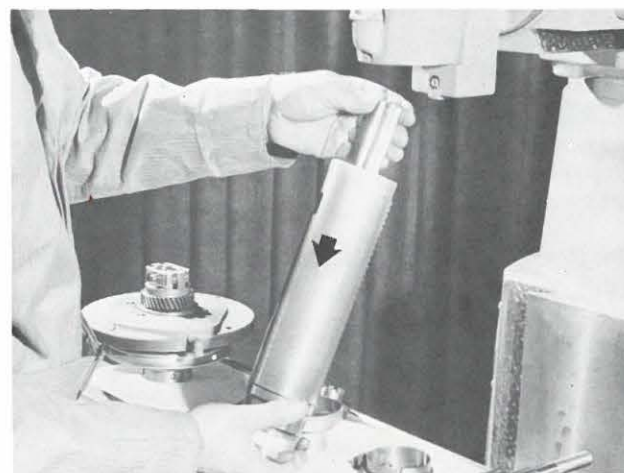


FIGURE 14B
Drive Spindle and Sleeve

**To Remove Drive Spindle Assembly
Styles 1-D, 1-E.
(See Page 64.)**

1. Remove knurled locknut (364B) from top of shaft (386B). Remove screw (377B) and loosen screw (378B) to remove micrometer stop dial (376B). Loosen screw (384B) and slide pointer block (385B) up on shaft (386B). Remove retainer ring (387B) from groove near bottom of shaft (386B) and slide ring up toward center of shaft.

Turn bushing (361B, power feed; 381B, manual feed) counter-clockwise to remove shaft (386B) from bushing. Remove two screws (382B and 383B) holding bracket (369B) and remove bracket from shaft (386B). Removing bracket (369B) allows removal of the quill (200B, page 58) assembly from spindle housing.

2. Raise table to upper limit. Place block of wood between table and bottom of spindle. Loosen quill clamp lever (453B, page 66). Turn hand feed control wheel (347B, page 62) to lower spindle. Lower table as spindle is lowered. Support spindle assembly [near top] before it is clear of spindle housing.

**To Remove Spindle Housing with Spindle:
Style 1-B.
(See Page 30.)**

1. Proceed as per instructions in paragraphs 1 and 2 under "To Remove V-Belt Housing: Style 1-B" (page 13) and lift off housing.
2. Remove four nuts (135C, page 30). Pull spindle housing straight out of overarm. This housing assembly weighs approximately 60 lb. [See Figure 15B.]

When assembling, the tee bolts (133B, page 30) could be held in correct positions, in circular slot at end of overarm, by heavy grease until spindle head is pushed into place in overarm. [See Figure 15B.] Spiral gear (129C, page 30) must mesh with spiral gear shaft (237B, page 34) as housing is pushed into overarm.

If machine is equipped with a double swivel adapter, remove spindle housing before attempting to remove adapter from overarm.

3. After assembling, the spindle alignment with table should be checked. [See Figure 16A.] Tramming readings on a 10" diameter circle should be 0.000" at both sides and rear, but 0.001" at front. If readings are not 0.000" at

sides, it may be necessary to change zero line on overarm. If readings are not 0.000" at rear and 0.001" at front, it may be necessary to rescribe head.

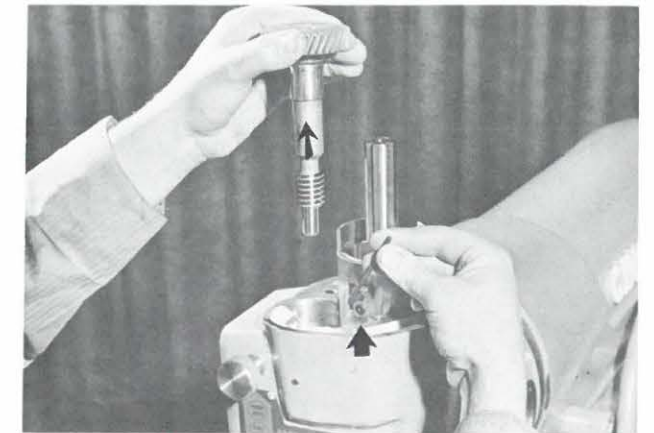


FIGURE 15A
Worm Shaft - 1B Head



FIGURE 15B
Removing Spindle Housing

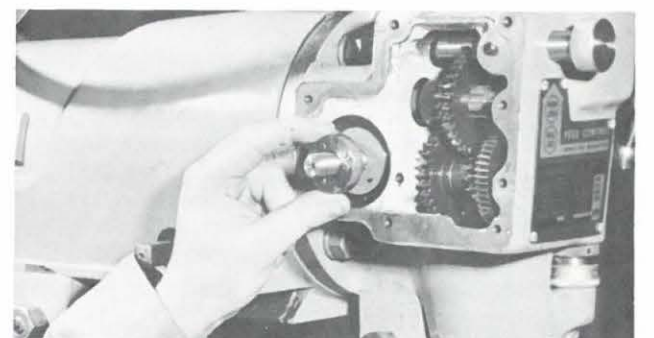


FIGURE 15C
Spindle Drive Friction Clutch

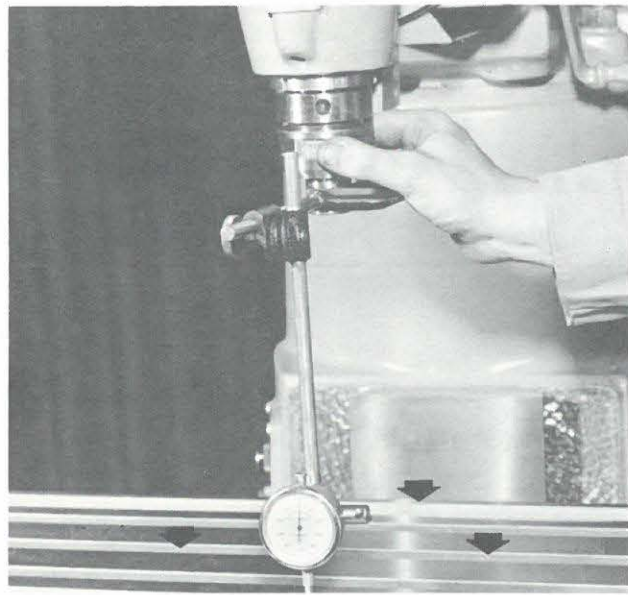


FIGURE 16A
Tramming Spindle To Table

**To Remove Spindle Housing With Spindle:
Styles 1-D, 1-E.
(See Page 66.)**

1. Disconnect electrical leads at junction box on back of motor. Place rope sling through openings in side of V-belt housing and connect sling to crane. Remove slack from rope sling.
2. Remove four nuts (428B) and washers (427B). Pull spindle housing (420B) straight out of overarm.

When assembling, the tee bolts (423B) could be held in correct positions, in circular slot at end of overarm, by heavy grease until spindle head is pushed into place in overarm. [See Figure 15B.] Spiral gear (419B) must mesh with spiral gear shaft (416B) as housing is pushed into overarm.

If machine is equipped with a double swivel adapter, remove spindle housing before attempting to remove adapter from overarm.

**To Remove Spiral Gear Shaft: Style 1-B.
(See Pages 30, 32)**

1. Proceed as per instructions in paragraphs 1 and 2 under "To Remove Drive Spindle Assembly: Style 1-B, page 14.
2. Remove four nuts (135C, page 30) and pull spindle housing straight out of overarm. Drill

a hole in expansion plug (212B, page 32) and remove it. With a brass bar against front end of spiral gear shaft (209B), drive it out rear of housing.

**To Remove Transmission Shaft: Style 1-B
(See Pages 30, 32)**

1. Turn spindle housing 90° to left and remove plug (124B) to drain oil from housing. [See Figure 16B.] Return housing to upright position, unscrew hand clutch knob (175B, page 32) and remove cover plate (123B, page 30).

Loosen set screw (179B, page 32), tap collar to loosen shoe under screw, and remove clutch adjusting collar (178B). Slip off male friction clutch (181B), remove key (184B) and spiral gear (182B) from pinion shaft. [See Figure 15C.]

2. Unscrew hub retainer (194B) that is attached to spring pin (191B). Remove hub handle (190C) and dial (189B). Tape a small rag to the exposed end of pinion shaft (183B) to protect shaft when spring unwinds. Grip the tang of spring (187B) with a pliers and place a rag over spring housing. Pull tang of spring free of notch in spring housing (185B) and, at the same time, step back while spring unwinds. The tang at inner end of spring lies in groove of pinion shaft (183B). Take out three screws (186B), remove housing, and pinion shaft (183B).

The torsion spring is most easily replaced by two men, each handling spring with a pair of pliers. [Grease spring before replacing.] Have spindle at its bottom position, fully wind spring, back off one notch and hook in spring housing.

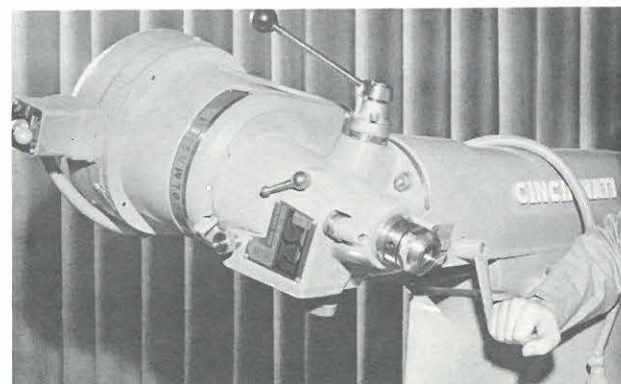


FIGURE 16B
Draining Oil From Head

3. Remove spring wire rings (217B) and set screws (215B, 218B) from gears. Drill a hole through expansion plug (221B) and pull it from housing.

Insert a 1/2" by 1-1/2" brass rod into pinion shaft opening of housing and tap transmission shaft (214B) out front of housing.

**To Remove Speed Change Assembly:
Style 1-D. (See Page 54.)**

1. Proceed as per instructions under "To Remove V-Belt Housing: Style 1-D, page 13."
2. Pry motor pulley open and wedge with small blocks of wood to release pressure on belt. Remove belt (72B). Remove wooden blocks and allow pulley halves to close.
3. Remove lock screw (52B) and loosen set screw (51B). Remove handle (41B) and dial (44B). Remove three screws (47B) from sleeve (46B). Turn gear shaft (48B) counter-clockwise until it is clear of nut (12B). Gear shaft and sleeve assembly can then be removed from housing. [Gear (37B) may be removed, if necessary, by removing lock screw (20B) and loosening set screw (28B). This releases the pressure on gear pin (38B) and permits removal of pin and gear.] Remove lock screw (8) and loosen set screw (10B) until it is clear of recess in shaft pin (9B).

Remove four screws (55B) and work drum switch (59C) out of housing carefully. Do not break or damage wires attached to drum switch. With drum switch out of its recess, tap shaft pin (9B) out back of casting until it is clear of yoke (17B). Lift pin and yoke out of casting.

4. Remove five screws (1B) and cover (14B). [Keep drawbar bolt (6B) in place on underside of cover or plunger (2B) and spring (3C) may fall out and be lost.]

**To Remove and Dismantle Powerfeed Housing:
Styles 1-D, 1-E. (See Pages 60 and 62.)**

1. Attach rope sling through side openings in motor housing (58B, page 54, 1-D machine; or 107B, page 56, 1-E machine). Remove three screws (188B, page 58) and raise motor housing base until it is clear of spindle housing. [It is not necessary to break electrical connections to motor if the housing remains suspended on crane or is lowered onto machine table.] Remove plug (262B, page 60) and screws (263B, 264B) located near top of housing and midway between screws (258B).

Remove bevel gear (234C) assembly; this assembly includes parts (221C, 231B through 234C, 245B and 246B).

Remove plug (272B) and drain oil from gear box. Remove two screws (283B) and two screws (258B). Move housing (247B) straight out from side of spindle housing. Place powerfeed housing on work bench for dismantling.

2. Remove plug (262B) and screws (263B, 264B) that hold sleeve (217B) in place. Through opening in back of powerfeed housing place screwdriver against recess in face of bevel gear (226C) and tap complete shaft (220B) assembly to left (as viewing explode) out of housing. [Do not remove shaft (220B) assembly by tapping against front end of shaft. This action would dislodge Truarc rings (219B, 224B, 240B) and result in bearing damage.]
3. Remove roll pins (301B, 303B, page 62) and pull shaft (315B), with handwheel and dial in place, out of housing. Remove gears (300B, 305B, 307B) as they drop free of shaft.
4. Remove four screws (317B) and cover (326B). Remove spring (298B, page 60). Remove roll pin (277C) from shifting arm. Remove dog point set screw (290B) and tap 1/8" roll pin (481B) out of shifting shaft detent (289C). Remove pin (281B) and lever (293B). Tap shifting shaft (296B) at lever end and move shaft through clutch shifting fork (297B) until key (295C) can be removed. Then tap shaft in the opposite direction and remove from control side of housing.
5. Remove three screws (260B) and remove gear shift knob assembly. This assembly includes the following parts: (255B, 256B, 259B through 261C, 265B through 270B, 279B and 280B).
6. Remove roll pin (308B, page 62) from gear (306B) and remove gear from end of shaft (343B). Remove screw (321B) and loosen screw (320B) that holds sleeve (339B) in housing. Tap sleeve (339B), ring (340B) and plug (341B) out of housing. [Place screwdriver on inner face of sleeve and tap carefully.] Tap shaft (343B) from above and remove shaft, gear (337C), snap ring (338B), bushing (348B) and reversing clutch (336C) through access in bottom of housing. Remove plug (333B), screw (332B) and loosen screw (331B). Remove four screws (309B) and rear cover (310B). Tap shaft (325B) to left until it is clear of bevel gear (342C) and remove bevel gear. Then, tap shaft (325B) to right to remove shaft and bevel gear (324B) from housing. Gears (329B, 330B) may be lifted out of housing after they fall clear of shaft. To

separate cluster gear from driving gear, remove ring (328B).

7. Remove screw (248B, page 60) and loosen screw (249B). Remove roll pin (250B). Tap shaft (253B) from inside housing. As shaft is removed, it will force plug (254B) out of housing.

To Remove Overarm and Turret: Styles 1-B, 1-D and 1-E. (See Pages 34 and 66.)

1. Attach rope sling through side openings in motor housing in head and connect sling to crane. Remove slack from sling. Remove four nuts from T-bolts that hold head to overarm and pull head straight out from overarm.
2. Remove coolant hose (27B, page 92) and bracket (23B) if machine is so equipped. Remove socket head screw from top center of overarm, insert an eyebolt and attach crane hook. Wind overarm forward and slide out of turret (257B, page 34). Make certain overarm is balanced as it is slid off, to prevent damage to ways. Break electrical connections, remove four nuts (255B) from top of turret and lift turret off column.

NOTE --- The overarm is easier to balance while removing if spindle housing is taken off first. However, by using a rope sling around spindle housing and from it to crane, it is possible to remove overarm with housing in place.

To Remove Overarm (Heavy Duty): Styles I-C & H-V (See Page 40)

Before attempting to remove overarm from Style H-V machine, remove high speed vertical head from rear of overarm. (See instructions on page 16 under, "To Remove Styles 1D, 1E Spindle Housing.")

Remove one 1/2" set screw (2C) from top of gear housing (14C) on motor end, insert an eyebolt and attach to a crane. Remove electrical compartment cover (10B) and break electrical connections. Wind overarm forward and slide out of turret. Make certain overarm is balanced as it is slid off, otherwise vee-way in turret may be damaged.

If a swivel housing is being used, turn spindle housing so it is in line with overarm to prevent a twisting action as overarm is removed. It is advisable to use two eyebolts in gear case when lifting overarm with swivel housing in place.

To Remove and Dismantle Overarm Gear Housing: Styles I-C & H-V (See Pages 40, 42, 44)

1. Drain oil from gear housing. Set the center and rear speed shift levers (74C, 68C, page 42) in the number 2 stops and the forward lever (88C) in either its number 1 or its neutral stop. Remove twelve screws (51B) and pull

speed control plate (56B) from overarm. Mark location of gears so they can be more easily set when assembling.

2. Remove two 1/2" set screws (2C, page 40), insert two eyebolts and attach to a crane. Through side opening, set couplings (109B, 112B, page 44) so their sides are vertical, remove fourteen screws (1C, 9B, page 40), and raise gear housing out of overarm.

Overarm can be left on turret while gear housing is removed but gear housing must be in place to remove overarm.

3. Loosen set screw, tap to loosen lock shoe, remove shoe-type lock nut (148B, page 44) and drive spur gear shaft (142B) toward front of housing sufficiently to expose set screw in lock nut (144C). Loosen set screw and tap to loosen lock shoe in nut. Tap shaft (142B) to rear into original place and, using a spanner wrench in the side holes of nut (144C), unscrew it. Tap shaft forward and out of housing.

4. Remove shoe-type lock nut (137B), loosen locknut (134B) until it is clear of shaft threads and tap cluster shaft (131B) forward and out of housing.

When assembling, set spur gear (132B) as far toward rear of housing as possible so change gear (145B) does not have to shift too far forward to engage spur gear (132B). If change gear (145B) moves too far forward, it will rub against end of change gear shaft (119B).

5. Remove coupling halves (109B, 112B) and hydro keys from ends of change gear shafts (105B, 119B). Remove shoe-type locknuts (108B, 115B) and tap shafts out of housing.

The flange of bearing cup (106B) must have a flat ground on one side to miss the adjacent bearing.

To Remove Spindle Housing and Drive — Without Hand Feed: Styles I-C & H-V (See Pages 42, 48)

1. Drain oil from gear housing. Set the two rear speed change levers (74C, 68C, page 42) in the Number 2 stop and the forward lever (88C) in the Number 1 stop. Remove twelve screws (51B) and pull speed control plate (56B) from overarm. It is easier to align couplings when assembling if speed control plate is off.
2. Unscrew four nuts (211B, page 48) and pull spindle housing (213B) from overarm. Remove index head gear (235B) from sleeve ad-

justing housing (227B). Remove four screws (233B) and tap motor driven shaft (224B) and sleeve housing (227B) assembly out of spindle housing.

After assembly, the gear (214B) is correctly aligned and meshed by grinding the spacer (207B) to correct thickness.

3. Remove spindle bearing cap (203C), split type spindle locknut (205B) from top of spindle and spindle cap (220B) from bottom of spindle housing.

Gently tap spindle down out of housing to prevent damage to thrust bearing (219B). It is not necessary to remove spindle housing before removing spindle.

To Remove Spindle Housing and Drive — With Hand Feed: Styles I-C & H-V (See Pages 46, 48)

This spindle housing is the same one used without hand feed but is rotated 180° before mounting on overarm. (See "Ref." at bottom of page 48.)

1. Proceed as per paragraphs 1 and 2 directly above under "To Remove Spindle Housing." When assembling, grind spacer (161B, page 46) to set spiral drive gear (153B) to gear on motor driven shaft (224B, page 48).
2. Remove two screws (171B) and draw bolt cover (191B). Remove bearing nut (193B) and locknut (174B) and remove quill (169B) from spindle. Loosen set screw (154C) and tap to free brass plug (155B) under it. Unscrew quill adjusting cap (199B) from top of spindle housing and remove with dial (198B) and quill adjusting screw (184B).
3. Remove spindle bearing cap (165B) and split type locknut (163B) from bottom of spindle (167B). Turn spindle housing 180° and gently tap spindle (167B) down out of housing to prevent damage to thrust bearing (149B).

To Remove and Dismantle Intermediate Swivel Housing: Styles I-C & H-V (See Page 50)

1. Remove spindle housing (160B, page 46 or 213B, page 48) from intermediate swivel housing (260B, page 50).
2. Remove four nuts (258B) and pull swivel head out of overarm. Remove index head gear (247B). Remove set screw (261B) and pull eccentric (262B) from housing. Remove set screw (250B), loosen set screw (251B) and

pull motor driven shaft (254B) and bearing sleeve (256B) assembly out of overarm.

Remove shoe-type locknut (244B) and gently tap shaft out of sleeve to prevent damaging thrust bearing (255B).

3. Remove end cap (266B), shoe-type locknut (265B) and tap spiral bevel pinion (240B) gently out of housing. If pinion is driven too hard, the thrust bearing (243B) might be damaged.
4. When assembling, gear (240B) and gear on motor shaft (254B) are aligned by grinding spacer (242B) to suit and moving bearing sleeve (256B) with eccentric (262B). Sight gears through opening left by removal of expansion plug (249B). When spindle housing (160B, page 46 or 213B, page 48) is attached to swivel housing, it may be necessary to re-adjust all gears to obtain proper running mesh.

When inserting spindle housing in swivel housing or the latter into overarm, turn housing 90° to one side before slipping it home. Thus, if a slight loop of the O-ring gasket should be squeezed down and cut by edge of opening, the damaged portion will be above lubrication level.

To Remove Table (See Page 70)

1. Unscrew split type locknut (38B) from right end of leadscrew (21B) and remove handwheel with dial. Remove key (22B), four cap screws (24B) and tap right-hand apron (23C) from table.
2. Move table to right so left apron is near saddle. Remove four cap screws (18B) from left apron and tap apron to free it from table. Remove precision measuring equipment from table, if so equipped.
3. Fasten a U-clamp to center of table and attach to a crane with a slight tension. Remove gib (12B), loosen saddle clamping lever (114B, page 72) and slide table (11C) toward right and off saddle.

If table is equipped with powerfeed, it is first necessary to remove gear housing bracket (144B, page 74) and then proceed as above.

It is extremely difficult to replace an apron onto leadscrew without damaging the oil seal. It is better to first remove seal, install apron and then replace seal. Make a roll of thin shim stock, slip inside seal, put shim roll on end of screw, slide seal into place in apron and remove shim roll.

To Remove Table Lead Screw (See Page 70)

1. Unscrew split type lock nut (38B) from right end of table leadscrew (21B) and remove handwheel with dial. Remove key (22B).
2. Move table to right so left apron is near saddle. Remove four cap screws (18B) from left apron, place a tension on leadscrew with handwheel, and tap apron to free it from table.
3. With table clamped and apron in place, turn leadscrew in a clockwise direction out of table nut. Support leadscrew as it emerges. There is less chance of damaging the lead-screw if left apron was removed before lead-screw was taken out.

See last paragraph under "To Remove Table," (page 19) before replacing right-hand apron.

If table is equipped with powerfeed, it is first necessary to remove gear housing bracket (144B, page 74) [see "To Remove Table Powerfeed Housing"] and then proceed as above after handwheel is replaced on left end.

Positive stop dogs (272B, 273B, page 78) should never be removed from table. Their function is to prevent any chance of ramming table aprons against knee with possible damage to mechanism.

To Remove Table Powerfeed Housing (See Pages 74, 76, 78)

1. Unscrew split type lock nut (220B, page 76) from left end of table leadscrew (252B) and remove handwheel with dial [see Figure 20A.] Remove key (250B) and split ring (221B).
2. Remove two cap screws and lift top housing cover (124B, page 74), with cam follower (131B), off gear housing bracket. Drain oil from bracket.

Before replacing cover (124B), unscrew oil filler cap (122B). Set reversing clutch (232B, page 76) so its teeth are about 1/16" into engagement with teeth of clutch spur gear (229C) and set trip lever (305B, page 78) in a neutral position, handle (306B) straight out. Have concave side of cam follower (131B, page 74) facing squarely toward table and while lowering cover into bracket, sight through nipple (123B) to guide pins of cam follower into engagement with reversing clutch (232B, page 76) and drum cam (293B, page 78). [See Figure 20B.]

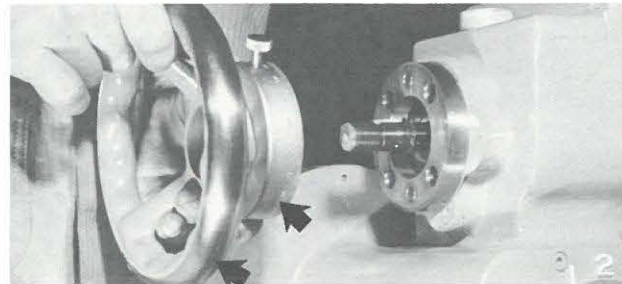


FIGURE 20A
Removing Handwheel

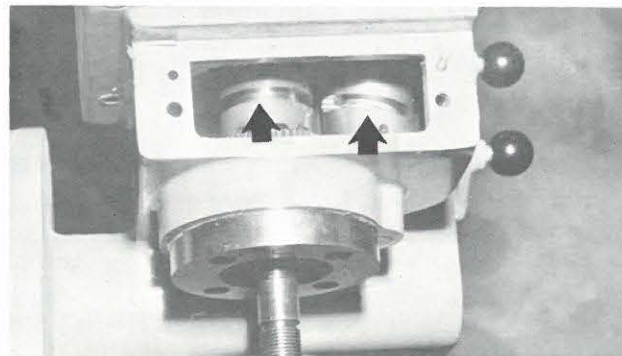


FIGURE 20B
Table Powerfeed Housing with Cover Removed

3. Take out screws (138B, 136B, page 74) and tap gear housing bracket (144B) with bearing retainer (225B, page 76), oil seal (226B) and bushing (227B) off mounting apron (128C, page 74). [See Figure 21A.]
4. Grasp drum cam (293B, page 78) and pull shaft (288B) out of segment gear (290B). Pick gear out of space between saddle and knee.

When inserting this shaft, hold segment gear in place under saddle with key (287B), tight in gear, at top.

Drum cam (293B) should be clamped to shaft with set screw (282B) in line with center of keyway. Slip shaft into place and assemble powerfeed to table. Start machine and move table right and left by actuating trip lever by table dogs while under power. The trip lever should snap over at the same point on each feed dog (271B, 274B). If trip lever (305B) trips sooner off right table dog---table moving to left---than it does off left table dog when moving to right, the cam (293B) should be rotated slightly clockwise on shaft (288B). When cam is correctly located on shaft, swing table lever (306B) to left to rotate cam so hole for lock screw (281B) is vertical and spot drill shaft to take lock screw. Replace top housing cover (124B, page 74).

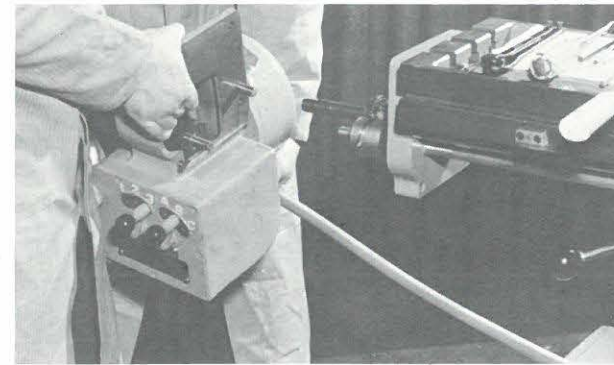


FIGURE 21A
Removing Table Powerfeed Housing

To Dismantle Table Powerfeed Housing (See Pages 74, 76)

1. Proceed as per instructions directly above under "To Remove Table Powerfeed Housing."
2. Loosen slotted round head screws and remove cover from motor (129B, page 74). Remove four cap screws (139B) and, by tapping on round head screws around motor, drive motor (with key) out of bracket.

When installing motor, see "To Install Table or Saddle Powerfeed Motor" on page 24.

3. Remove seven screws (165B) and take off front cover (164B) with feed levers. Remove split rings (176B and 141B) and tap spiral gear (174B) out rear of housing bracket.
4. Either shaft "A" or shaft "C" can be removed any time as described below. It is necessary to remove both "A" and "C" shafts before "B" shaft can be removed. (See Page 76)

To remove "A" shaft, drive plug (184B) out of housing by tapping from inside of housing. Remove screw (149B) and loosen screw (148B) that holds bushing (193B) in housing. [These screws are accessible when cover (164B) is removed from housing.] Remove split ring (185B). Tap shaft (190B) very carefully to the right to loosen and remove drive gear (186B). [Drive gear (186B) is keyed to shaft (190B). Tap shaft lightly to prevent key from damaging bushing.] Remove key (189C). Plug (194B) and bushing (193B) will start out of housing as shaft is moved to right. Hold split ring (188B) open and continue to tap shaft (190B) until it is out of housing.

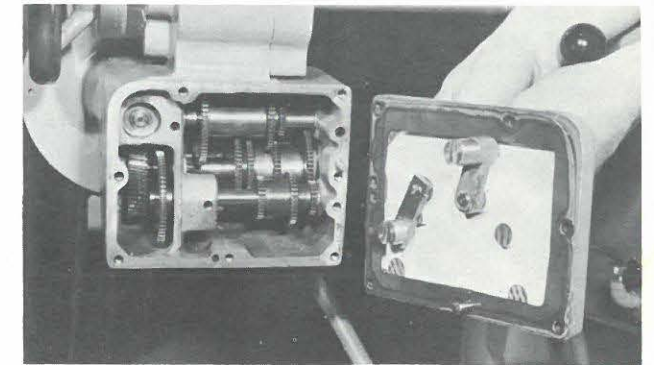


FIGURE 21B
Table Powerfeed Housing - Front Cover Removed

5. To remove "C" shaft, drill and tap plug (218C) for 1/4-20 threads and remove plug. Remove screw (149B) and loosen screw (148B) that holds bushing (217C) by inserting wrench in appropriate drilled passage which is accessible when cover (164B) is removed from housing. Tap outer end of hole in bushing (217C) for 1/2-13 threads and remove bushing from housing. Pull shaft (213C) through right end of housing until split ring (207B) is against cluster "C" gear (215B). Remove split ring and continue to move shaft (213C) to the right until it is out of the housing.
6. Drill and tap plug (195B) for 1/4-20 threads and remove plug. Tap outer end of bushing (196B) for 1/2-13 threads. Remove screw (149B) and loosen screw (148B) that holds bushing (196B) in place. These screws are accessible through bottom of housing. Remove bushing (196B). Remove drive gear shaft (197B) which is tapped 10-24 to make removal easier. Drive reduction gear (199B) and spacer (200B) can be lifted off shaft (197B) as it is removed. Drill and tap plug (206B) for 1/4-20 threads and remove plug. Tap right end of shaft (201B) and move shaft to left; bushing (209B) will be moved to left, also, as shaft advances. When bushing is almost out of housing rib, tap shaft (201B) to right until it is clear of bushing. Tilt right end of shaft and lift it from housing with gears (203B, 204B) on shaft.

To Remove Standard Saddle (See Page 72)

1. Slightly loosen screws through long and short side clamps (102B, 104B, 105B, page 72). These clamps are designed to allow clearance between knee and clamps.

- Remove four screws (50B, page 82). Drill and tap 3/8" straight pin (49B) with 1/4-20 tap, screw 12" long threaded rod, having a nut at outer end and mounted with a slidable weight into pin and hammer it from crossfeed nut (47B). Pry nut out of groove in bottom of saddle.
- Remove saddle gib (107B, page 72). Fasten a U-clamp to center slot of table, attach to a crane and slide saddle off knee. Overarm and turret must be rotated to one side to allow room for crane cable to connect at center of table.

To Remove Crossfeed Screw (See Page 82)

- Unscrew split type lock nut (63B) and remove handwheel with dial. Remove four cap screws and lift off bearing retainer (55B). Clamp saddle to hold it in place.
- Replace handwheel on crossfeed screw (52B) and turn it out of right-hand threaded crossfeed nut (47B).

To Remove and Dismantle Saddle When Table is Equipped with Powerfeed. (See Pages 72, 74, 76, 78)

- Proceed as per paragraphs 1, 2 and 3 under "To Remove Table Powerfeed Housing," page 20. Remove clutch (232B) assembly which includes the following parts: Truarc ring (240B), spacer (228B), bushing (241B), spur clutch gear (229C), spacer (230B), Truarc ring (242B), nylon insert (231B), key (251B), reversing clutch (232B), Truarc ring (233B), spacer (243B), bushing (234B), spur clutch gear (244B), spacer (245B) and Truarc ring (246B). [See page 76.]

Slide shaft (288B) assembly out of saddle. This assembly includes parts (279B) through (288B), (292B) through (294B) and plug (330B). [See page 78.]

Loosen screw (326B, page 76) in bearing retainer (248B). Remove four screws (127B, page 74) and push table away from apron (128C). Remove table gib (87B, page 72) and loosen saddle clamping lever (114B).

- Remove precision measuring equipment from table if so equipped. Fasten a U-clamp to center of table and attach to a crane with a slight tension. Remove table from either end of saddle.
- Proceed as per instructions in paragraphs 1 and 2 under "To Remove Standard Saddle,"

page 21. Rotate turret 90° to swing overarm out of the way, place a rope sling around ends of saddle, attach to a crane and slide saddle off knee.

- Remove detent cover (313C, page 78), screw (325B), loosen set screw (324B) and pull up trip plunger (305B). [Key (310B) is tight in detent (323B)]. Lift out detent (323B) and rack (320B). Push in detent plunger (319B), remove plug (301B), screw (302B), loosen dog point set screw (303B) and ease plunger out of saddle---compression spring (318B) is strong.

These parts could all be removed while saddle is on knee. However, to remove set screw (303B), it is necessary to remove table first.

To Remove and Dismantle Saddle Powerfeed Housing (See Pages 84 thru 90)

- Remove split type lock nut (264B, page 90) and lift off handwheel with feed dial (253B). [Remove key (236B).] Remove six screws (270B) and two pins and lift off front cover (257B).

The drive into gear housing is from motor-driven spiral gear (87C, page 84) through gears (155C, page 86) and (158C) into shaft "A". Cluster shifting gear (168B) on "A" shaft meshes with either of gears (149B) or (150B) on "B" shaft, depending on location of feed lever (118B, page 84). Gear (177B, page 86) on "C" shaft engages with either gear (147B) or large or small gear of (150B) on "B" shaft, depending on how gear (168B) is shifted by feed lever (131B, page 84). Gear (177B, page 86) on "C" shaft is always meshed with gear (184C) on "D" shaft. Clutch spur gear (194B, page 88) on shaft "E" and reversing gear (142B, page 86) on "F" shaft are also always meshed with gear (184C) on "D" shaft. Clutch spur gear (200B, page 88) on shaft "E" in mesh with reversing gear (142B, page 86) rotates in the opposite direction from gear (194B, page 88) also on "E" shaft. Thus, the drive from "E" shaft gear (188C)---in either direction depending on engagement of reversing clutch (197B)---continues through idler gear (261B, page 90) into saddle traversing gear (231B) and crossfeed screw.

- Loosen round head screws around motor (101B, page 84) and lift off motor cover. Remove four screws (93B) and tapping on round head screws, remove motor (101B) from adapter plate (90B). Remove three screws (91B) and adapter plate (90B).

When installing motor, see "To Install Table or Saddle Powerfeed Motor" on page 24.

- Drain oil from bracket through plug hole (115B). Remove eight screws (128B) and lift off gear cover (110B) from side of bracket.

Remove detent cover (225B, page 88), loosen screw (213B), pull detent pivot pin (223B) and drop shaft detent (221B) from engagement with shifting shaft (203B). [The pivot pin is case hardened and it may be necessary to unbolt rear bracket (217B) and rotate it to be able to get behind pivot pin and drive it out.]

Drive taper pins from positive stop blocks (207B and 210B) and loosen clamp screws (215B) to release adjusting stop blocks (209B). Pull shifting shaft (203B) from bracket.

Remove cap screws and lift gear housing bracket (103B, page 84) away from knee.

- Remove split ring (144B, page 86) and drive "F" (140B) shaft out of bracket. Drive shaft "D" (182B), with seal plug (181B), forward out of bracket.

Remove set screws that fasten bronze bushing (190B, page 88) into bracket and drive "E" shaft assembly forward and out of bracket.

- Remove knock out plug (180B, page 86). Remove set screws which hold bushing (165B) in housing. Remove Truarc retainers (283B and 169B). Insert a brass drive rod through hole left by knock out plug (180B) and, using light pressure, drive shaft (167C) from housing. Bushing (165B) will drive plug (164B) out of the housing ahead of it, while gears (158C) and (168B) will fall into the housing as they clear the shaft.

- Drive sealing plug (94B, page 84) into gear housing bracket and force spiral gear shaft (87C) assembly out of bracket toward motor side.

- Drive sealing plug (180B, page 86) into gear housing, remove locking set screws from bushing (174C) and tap shaft "C" (175C) out front of bracket.

Drill and tap sealing plug (157B) for 1/4-20 threads and pull it out of bracket. Tap outer end of bushing (156B) for 1/2-13 threads and, after removing two locking set screws, pull it out of bracket. Pull out cluster gear shaft (152B) and remove drive gear (155C). Remove two locking set screws from bushing (146B), drive "B" shaft toward front of bracket until shaft is free of rear bushing, then angle it with gears (149B, 150B) in place, out of bracket.

To Remove Elevating Crank Shaft (See Page 82)

- Remove 3/8-16 center screw (80B) and remove crank. Drive out taper pin and remove elevating crank clutch (78B). Remove bearing retainer (81B).
- Screw a 3/8-16 threaded rod, mounted with a slidable weight and having a nut at its outer end, into end of elevating shaft (72B) and hammer shaft forward far enough to pull roller bearing (68B) out of support bracket (6B). Remove support bracket from side of knee.
- Remove screw (66B) and inner race of bearing (68B). [Outer race stayed in support bracket.] Loosen set screw, tap to loosen shoe under it; remove locknut (69B) and spiral gear (70B) from inner end of elevating shaft. Pull shaft (72B) out of knee.

To Remove Elevating Screw and Pedestal (See Page 80)

- Proceed as per instructions on page 21, under "To Remove Standard Saddle."
- Run knee up near its topmost position. Remove four cap screws (14B) from base and tap base to loosen two straight 3/8" pins (12B). Clamp knee and place a wood block under it next to column. Turn elevating crank and raise elevating screw pedestal (11B). [Figure 23.]
- Remove steel plug (21B) and shoe type lock nut (22B) from top of elevating screw (32B). Block up to within a few inches of pedestal and tap elevating screw down out of knee.

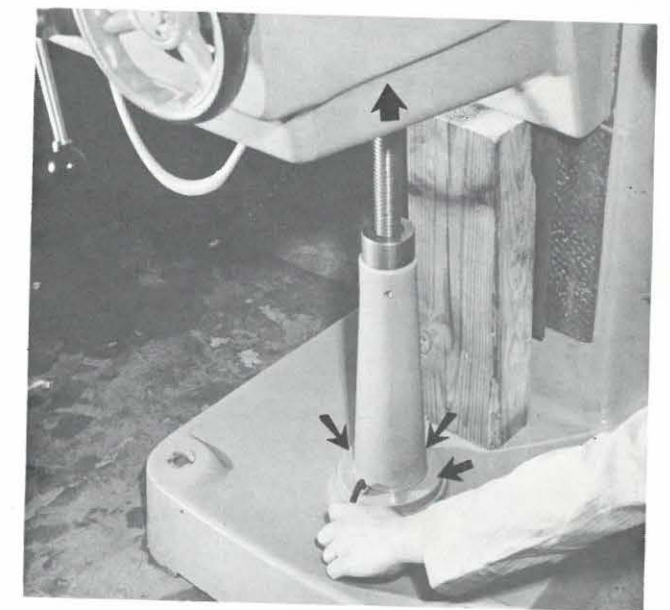


FIGURE 23
Removing Elevating Screw

To Remove Knee (See Page 80)

1. Proceed as per instructions on page 21 under "To Remove Standard Saddle"; as per instructions above under "To Remove Elevating Crank Shaft."
2. Rotate turret (257B, page 34) 90° on column. Remove steel plug (21B, page 80) and shoe type lock nut (22B) from top of elevating screw (32B). Place a rope sling around front and back of knee. Remove knee gib (2B). Lift knee, while tapping the top of elevating screw (32B), straight up off column ways.

To Dismantle Shaping Attachment (See Pages 98, 100)

Although this attachment can be easily removed after clamp screws (80B) are loosened, it is easier to dismantle if left on the overarm.

1. Loosen three screws (37B), drop motor and remove drive belt (44B). Remove screws (37B) and lift motor (34B) off attachment. Remove four screws (45B) and lift off belt housing (40B).
2. Remove hexagon nut (81B). Loosen gib (117B) by unscrewing top gib screw (104B) and tightening bottom gib screw. Rotate crank (109B) so tee slot is horizontal, remove left (101B) and right (118B) clamps and pull slide (8B) with assembled pitman (76B) straight away from slide housing (102B) and off tee bolt (85B).
3. Remove 1/4" pipe plug (89B) from bottom of drive gear housing (62B) and 1/4" set screw (113B) from worm wheel (114B). Remove drive housing cover plate (70B), capstan nut (68B) and pull crank (109B) out of its housing.
4. Remove small oil seal housing (95B) from gear housing. Remove two set screws and pull off driven sheave (50B). Remove large oil seal housing (53B). Loosen locking set

screw in nut (55B), tap screw to loosen lock shoe under it and loosen nut.

Tap worm shaft (61B) slightly to right, remove Truarc ring (93B) and drive worm shaft to left out of housing.

Unscrew three hexagon nuts (88B) and pull slide housing (102B) away from gear housing (62B). When assembling, attach slide to housing while housing is upside down. Thus, any sag that might occur in O-ring (115C), to be cut as slide is pushed onto boss of housing, will be on top when attachment is in place.

To Install Table or Saddle Powerfeed Motor

When installing table or saddle powerfeed motors, always be sure there is clearance between the armature and field laminations as shown in Figure 24. Check the periphery because the fields or the armature shaft (or both) may be slightly out of line. If necessary, the armature, a press fit, can be pulled to obtain the correct clearance. Adjust minimum clearance to 0.015".

Do not bump or press armature while installing motor or the minimum clearance will be changed.

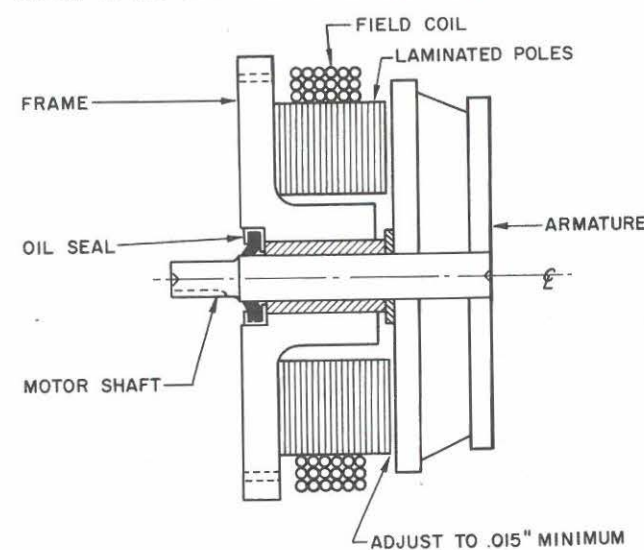


FIGURE 24

KEY NUMBER INDEX

UNIT NAME	DRAWING NAME	KEY NUMBERS	PAGE NO.	KEY NUMBER OF OTHER UNITS
HIGH SPEED HEAD AND OVERARM (Unit 6JJR)	Motor Drive Sleeve - Jack Shaft Style 1-B	1-36, 6-15, 17-26, 28-41, 43-51, 304, 305	29	6JJN-4, 5, 16 6JM-42
	Housing and Spindle - Style 1-B	115-173, 341, 342, 343	31	
	Pinion Shaft - Spiral Gear Shaft - Style 1-B	174-221	33	
	Double Swivel Adapter and Overarm	222-238	35	
	Turret - All Machines	239-264	35	
	Craley Head - Chucks	305-332	37	
HEAVY DUTY HEAD AND OVERARM (Unit 6JJS)	Collets - Chucks	333-344	39	
	Heavy Duty Overarm and Motor Style 1-C & H-V	1-34, 36-48, 305	41	6JM-35
	Heavy Duty Control Mechanism Style 1-C & H-V	49-99	43	
	Heavy Duty Drive Shafts Style 1-C or H-V	100-148	45	
	Spindle Housing-Hand Feed to Quill Style 1-C or H-V	149-199	47	
	Spindle Housing Without Hand Feed to Quill	201-207, 209-236, 269, 272, 306, 307	49	
VARI-SPEED HEAD AND OVERARM (Unit 6JKV)	Swivel Housing, Style 1-C, H-V	237-268, 270-274	51	
	Arbor Support H-V	280-299	53	
	1-D Motor Housing and Vari-Speed Drive	1-34, 37-55, 58, 60-63, 66-99, 482, 484, 485	55	6JNN-59
	1-E Motor Housing and Vee-Belt Drive	100-146, 473, 486	57	
	Motor Housing Base and Spindle	151-213, 472, 474	59	
	Power Feed Housing Style 1-D and 1-E	214-232, 234-299, 475-477, 480, 481	61	6JKY-481
	Power Feed Gearing Style 1-D and 1-E	300-354, 478	63	
	Manual Feed Gear Housing and Micrometer Depth Stop	355-411	65	
	Spindle Housing and Overarm - Style 1-D and 1-E	412-471, 479	67	
	Right Angle Attachment	483-515	69	

KEY NUMBER INDEX (Cont'd)

UNIT NAME	DRAWING NAME	KEY NUMBERS	PAGE NO.	KEY NUMBER OF OTHER UNITS
SADDLE TABLE (Unit 6JH)	Table and Leadscrew - With or Without Powerfeed	11-56, 335	71	6JP-336
	Saddle - With or Without Power-Feed	58-83, 85-115	73	
	Table Powerfeed Gear Housing	116-183, 331-334	75	
	Power Feed - Gearing & Leadscrew - Table	184-209, 211-269, 326-329	77	
	Power Feed Drive Shaft & Saddle	270-325, 330	79	
KNEE (Unit 6JK)	Knee and Elevating Screw	1-44	81	
	Crossfeed Screw and Elevating Shaft	45-86	83	
	Power Feed - Gear Housing Bracket - Knee	87-139	85	
	Power Feed - Gearing - Knee	140-158, 164-170, 173-179, 181-186, 276-279, 282, 283, 287	87	
	Power Feed - "E" & Shifter Shafts - Knee	187-229, 284-286	89	
	Power Feed - Crossfeed Screw and Front Cover - Knee	230-275, 280, 281	91	
COLUMN (Unit 6JC)				
COOLANT PUMP AND PIPING (Unit 6JP)	Column and Coolant Pump	2-5, 12-17, 19-48	93	6JNN-8, 10, 11
PRECISION MEASURING EQUIPMENT (Unit 6JL)	Precision Measuring Attachment Longitudinal Movement	1-27	95	
	Cross Movement	28-53	95	
	Vertical Movement	54-82	97	
SHAPING ATTACHMENT (Unit 6JHF)	Shaping Attachment	1-33, 35-49	99	6JM-34
	Shaping Attachment	50-97, 100-119	101	
PLAIN, SWIVEL & UNIVERSAL VISES (Unit 6JKA)	Plain and Swivel Vise	1-32, 171	103	
	Universal Vise	33-69	103	
INDEX HEAD AND TAILSTOCK (Unit 6JKA)	Tailstock	70-94	105	
	Index Head	95-170, 172	105	
OPTICAL MEASURING (Unit 6JKY)	Optical Measuring	1-50	107	
MACHINE INSTRUCTION PLATES		1-12	109	
		13-19	111	

HOW TO ORDER REPAIR PARTS

You will receive quicker and better service when ordering repair parts if you will adhere to the following instructions when ordering such replacements.

These four requirements are essential:

1. State amount wanted.
2. Give catalog key number, part number and name of part. If ordering parts by part number, please advise where the number was obtained. (See paragraph A, below.)
3. Give complete serial number of machine. (This number will be found stamped at top of column front face between dovetail ways. See Figure 4B).
4. Specify how and where to ship. (See paragraph B, below.)

Paragraph A

When ordering parts by number, kindly advise how the number was obtained, namely:

Number stamped on part.

Prior Invoice.

Parts List Catalog. (Give identification and publication numbers on front cover.)

Paragraph B

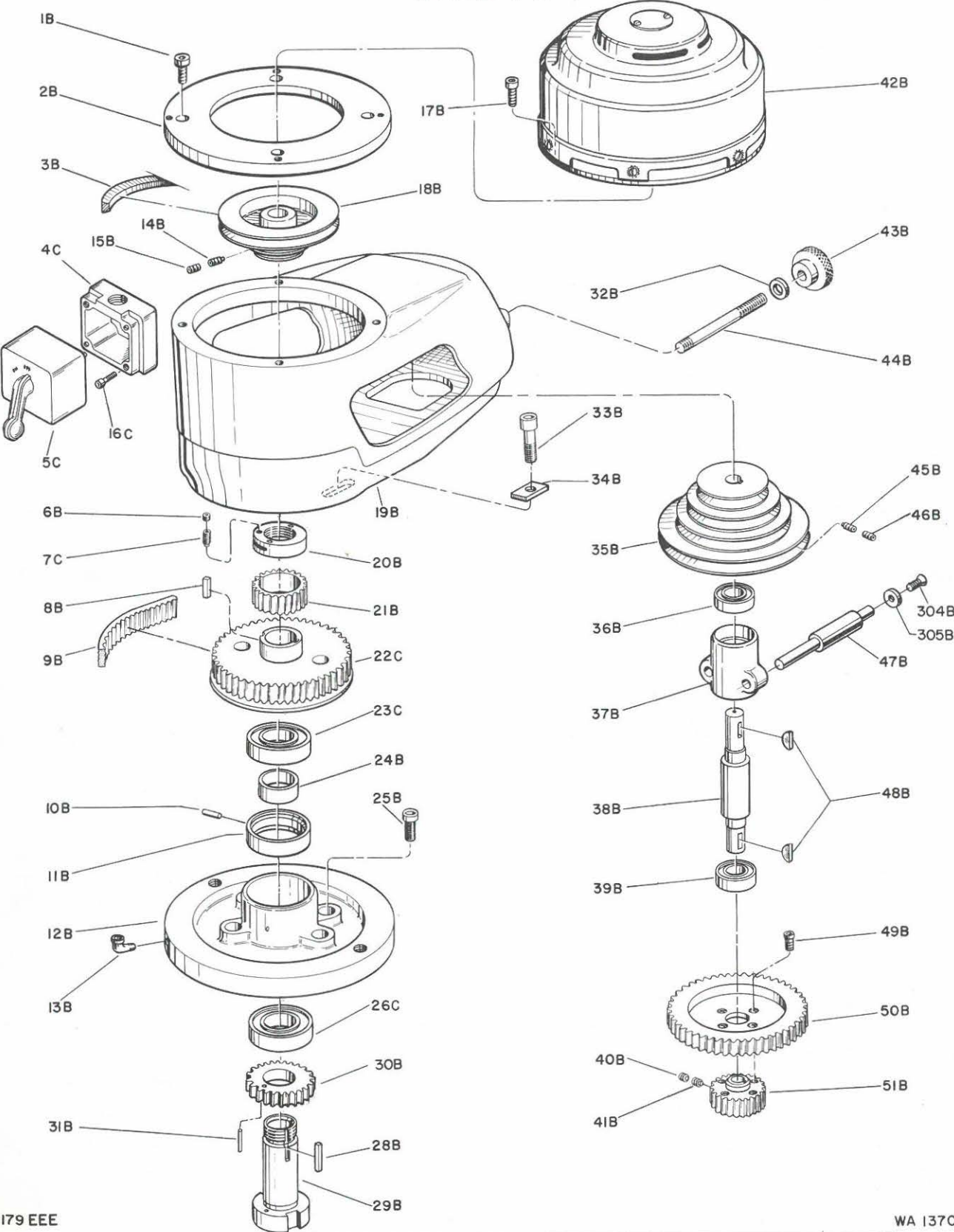
Do not say, "Ship quickest way." Be definite and state agency desired, that is—Air Mail, Parcel Post (Special Delivery), Parcel Post (Regular), Express, Motor Freight, Rail Freight, etc.

Specify each individual piece that is required in the order. If only certain parts of a unit are required, never use the word "complete"; it always raises a question as to how much of a unit to supply.

However, in some cases, due to the nature of the part, it will be necessary, and less costly to you, for us to supply additional related pieces, especially if part wanted is obsolete.

HIGH SPEED HEAD
AND OVERARM

MOTOR-DRIVE SLEEVE-JACK SHAFT
STYLE 1-B



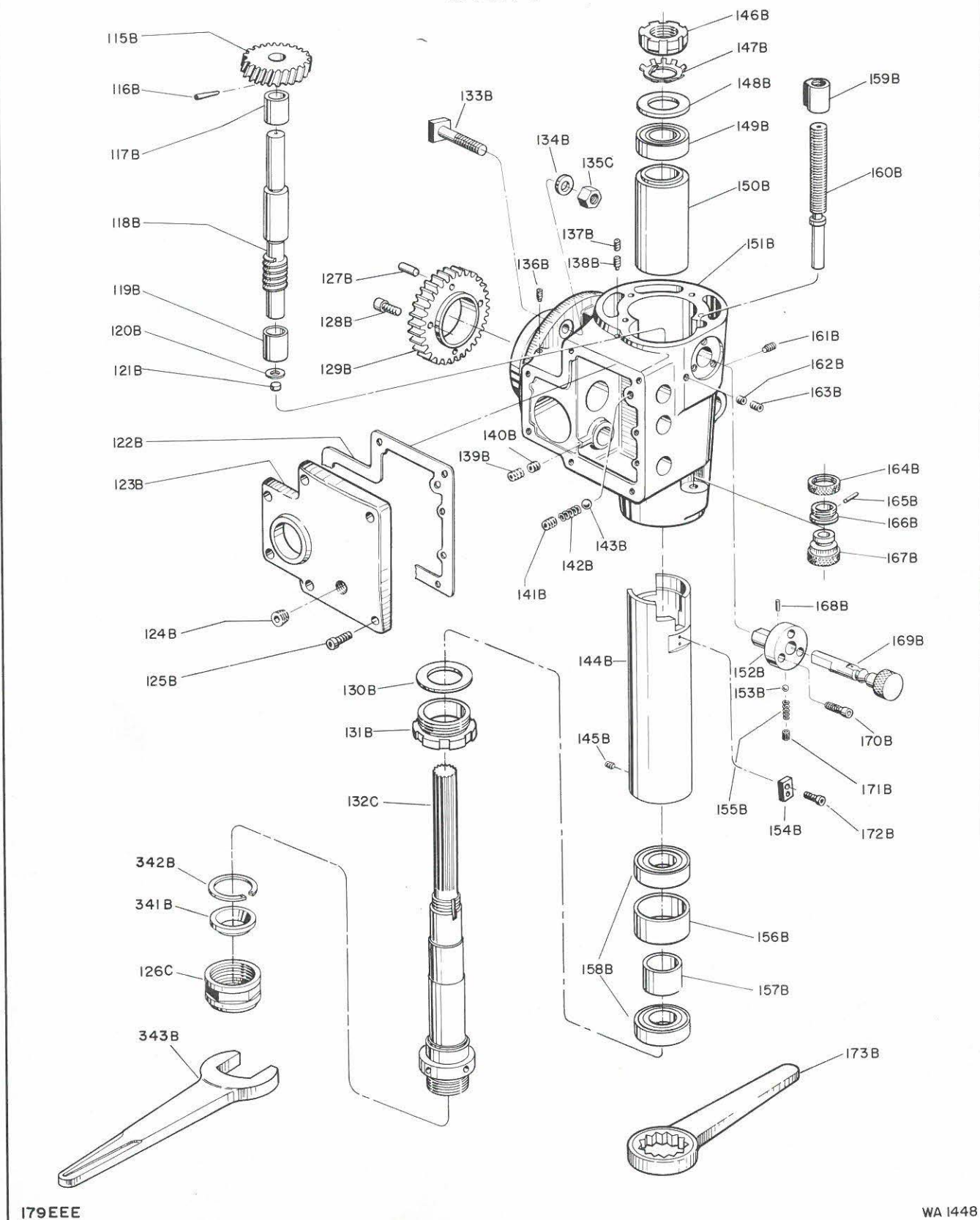
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WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR
STYLE 1-B

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-1B	3210	Screw	4	6JJR-28B	864	Key	1
6JJR-2B	170497	Plate - Adapter, Motor	1	6JJR-29B	166492	Sleeve	1
	143278	750 - 900 RPM	1	6JJR-30B	143211	Gear - Drive,	1
	160028	900 - 1200 RPM	1	6JJR-31B	3540	Pin	1
6JJR-3B	153091	Belt - Vee	1	6JJR-32B	176299	Washer	1
6JNN-4C	148189	Block - Switch Mounting	1	6JJR-33B	3404	Screw	2
6JNN-5C	2354	Switch - Drum	1	6JJR-34B	165707	Washer	2
6JJR-6B	2341	Screw	1	6JJR-35B	143231	Sheave - Jack Shaft	1
6JJR-7C	3371	Screw	1	6JJR-36B	143230	Bearing - Ball	1
6JJR-8B	161369	Key	1	6JJR-37B	169433	Housing - Bearing	1
6JJR-9B	3636	Belt - Spindle Drive	1	6JJR-38B	169434	Shaft - Jack	1
6JJR-10B	153817	Pin	1	6JJR-39B	143230	Bearing - Ball	1
6JJR-11B	161797	Spacer - Bearing	1	6JJR-40B	2354	Screw	1
6JJR-12B	143275	Housing - Bearing	1	6JJR-41B	3228	Screw	1
6JJR-13B	3228	Cup - Oil	1	6JM-42B		Motor - Spindle, High Speed Head Style	1
6JJR-14B	3254	Screw	1			For Spindle Speed:	
6JJR-15B	3218	Screw	2	150733		108 to 2825 RPM, 3/4 H. P., 900 RPM.	1
6JNN-16C	3266	Screw	4	143277		140 to 3800 RPM, 1 H. P., 1200 RPM	1
6JJR-17B	143207	Sheave - Motor Drive	1	143205		215 to 5650 RPM, 1 H. P., 1800 RPM	1
6JJR-18B	169435	Housing - Vee Belt	1	6JJR-43B	143234	Knob - Handle	1
6JJR-19B	161366	Nut - Lock	1	6JJR-44B	143233	Stud - Jack Shaft	1
6JJR-20B	161364	Pulley - Driven	1	6JJR-45B	3229	Screw	1
6JJR-21B	161793	Pulley - Driven, (with Flange)	1	6JJR-46B	2332	Screw	1
6JJR-22C	143209	Bearing	1	6JJR-47B	178273	Pin - Slide	2
6JJR-23C	143210	Spacer	1	6JJR-48B	679	Key	2
6JJR-24B	3266	Screw	4	6JJR-49B	3204	Screw	4
6JJR-25B	143209	Bearing	1	6JJR-50B	161794	Pulley - Intermediate	1
6JJR-26C				6JJR-51B	161795	Pulley - Intermediate	1
				6JJR-304B	171506	Screw	2
				6JJR-305B	171505	Washer	2

HIGH SPEED HEAD
AND OVERARMHOUSING AND SPINDLE
STYLE I-B

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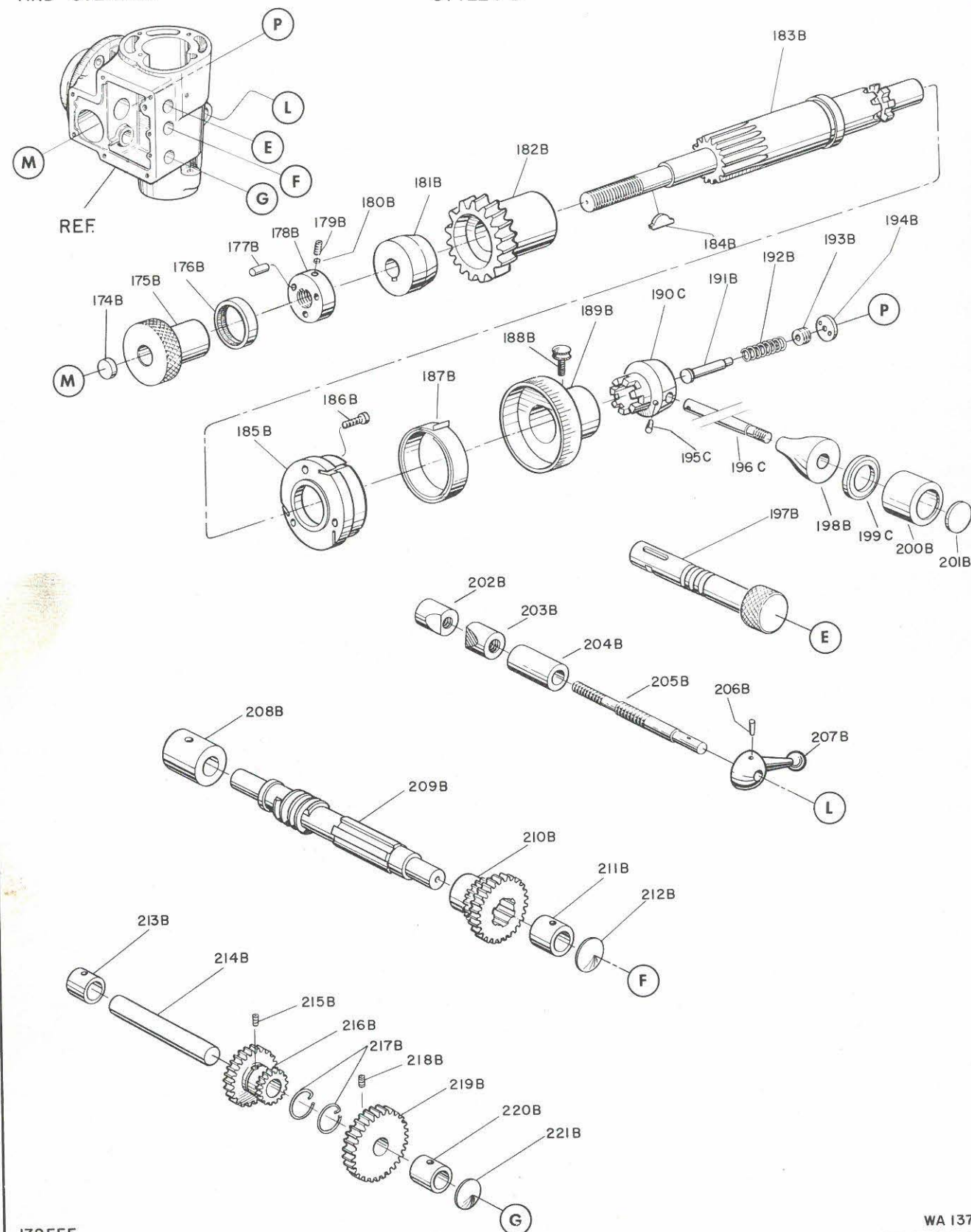
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WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR (Continued)
STYLE I-B

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-115B	143268	Gear - Driven	1	6JJR-149B	153808	Bearing - Ball	1
6JJR-116B	2291	Pin	1	6JJR-150B	153806	Spacer - Quill	1
6JJR-117B	153819	Sleeve - Thrust	1	6JJR-151B	166497	Housing - Spindle	1
6JJR-118B	143269	Shaft - Worm	1	6JJR-152B	166495	Sleeve - Mounting	1
6JJR-119B	143266	Bushing - Sleeve	1	6JJR-153B	30060	Ball - Steel	1
6JJR-120B	143498	Washer	1	6JJR-154B	143213	Key - Stop	1
6JJR-121B	255822	Plug	1	6JJR-155B	100239	Spring	1
6JJR-122B	143281	Gasket	1	6JJR-156B	153805	Spacer - Outer, Lower Bearings	1
6JJR-123B	143271	Plate - Cover	1	6JJR-157B	153802	Spacer - Inner, Lower Bearings	1
6JJR-124B	76645	Plug	1	6JJR-158B	153807	Bearing - Ball, Lower	2
6JJR-125B	3396	Screw	6	6JJR-159B		Stop - Adjusting Depth	
6JJR-126C	183685	Nut - Spindle	1		143217	English	1
6JJR-127B	1383	Pin	1		153081	Metric	1
6JJR-128B	2321	Screw	3	6JJR-160B		Screw - Lead, Depth Stop	
6JJR-129B	143235	Gear - Spiral	1		143216	English	1
6JJR-130B	152362	Seal	1		153080	Metric	1
6JJR-131B	153803	Nut - Lock	1	6JJR-161B	3228	Screw	1
6JJR-132C	181901	Spindle	1	6JJR-162B	3229	Screw	1
6JJR-133B	3311	Bolt - Tee	4	6JJR-163B	2333	Screw	1
6JJR-134B	3442	Washer	4	6JJR-164B	143218	Nut - Locking, Depth Stop	1
6JJR-135C	3479	Nut - Hex	4	6JJR-165B	3270	Pin	1
6JJR-136B	3232	Screw	1	6JJR-166B	143219	Stud - Locking, Depth Stop	1
6JJR-137B	2332	Screw	1	6JJR-167B		Wheel - Thumb, Depth Stop	
6JJR-138B	3230	Screw	1		143220	English	1
6JJR-139B	2332	Screw	1		153082	Metric	1
6JJR-140B	2341	Screw	1	6JJR-168B	166496	Pin	1
6JJR-141B	2316	Screw	1	6JJR-169B	166494	Shaft - Lock	1
6JJR-142B	101732	Spring - Compression	1	6JJR-170B	3396	Screw	3
6JJR-143B	30060	Ball - Steel	1	6JJR-171B	2355	Screw	1
6JJR-144B	166493	Sleeve - Spindle Quill Feed	1	6JJR-172B	3246	Screw	1
6JJR-145B	2339	Screw	1	6JJR-173B	143538	Wrench	1
6JJR-146B	3810	Nut - Lock	1	6JJR-341B	183687	Washer	1
6JJR-147B	3809	Washer - Lock	1	6JJR-342B	184680	Ring	1
6JJR-148B	153804	Cap - Bearing	1	6JJR-343B	153843	Wrench	1

HIGH SPEED HEAD AND OVERARM



179EEE

WA 1370

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

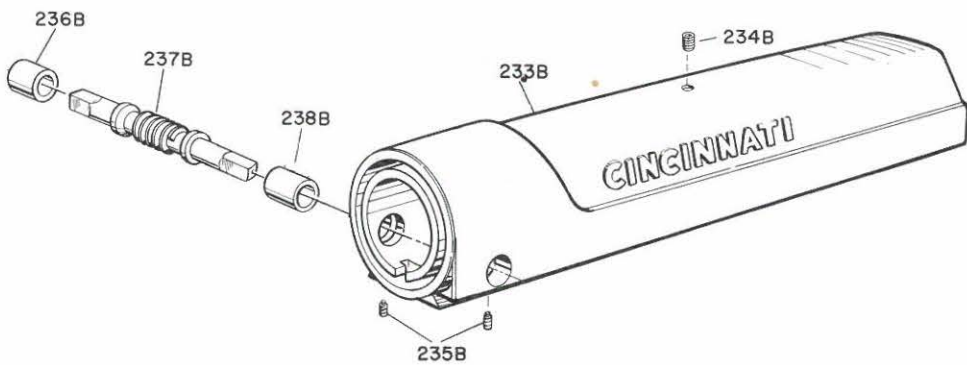
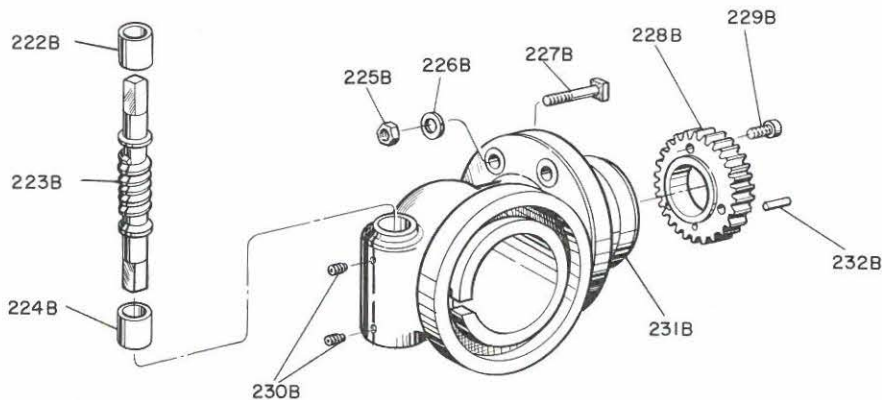
HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR (Continued)

STYLE 1-B

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-174B	3530	Plug	1	6JJR-197B	155655	Shaft - Shifter	1
6JJR-175B	143242	Knob - Hand Clutch	1	6JJR-198B	168055	Knob - Handfeed	1
6JJR-176B	700449	Seal - Oil	1	6JJR-199C	4358	Washer	1
6JJR-177B	143240	Pin - Adjusting	1	6JJR-200B	4356	Knob - Lever	1
6JJR-178B	143241	Collar - Clutch Adjusting	1	6JJR-201B	4341	Plate - Name	1
6JJR-179B	2333	Screw.	1	6JJR-202B	165708	Shoe - Clamp	1
6JJR-180B	143243	Shoe	1	6JJR-203B	165709	Shoe - Clamp	1
6JJR-181B	143239	Clutch - Friction Male	1	6JJR-204B	165711	Spacer - Shoe Clamp.	1
6JJR-182B	143238	Gear - Spiral	1	6JJR-205B	165710	Screw - Clamp.	1
6JJR-183B	152342	Shaft - Pinion	1	6JJR-206B	141	Pin - Taper.	1
6JJR-184B	3280	Key	1	6JJR-207B	78907	Lever.	1
6JJR-185B	143249	Housing - Spring	1	6JJR-208B	143260	Sleeve - Thrust	1
6JJR-186B	3198	Screw.	3	6JJR-209B	143259	Shaft - Spiral Gear	1
6JJR-187B	143247	Spring - Torsion	1	6JJR-210B	143258	Gear - Shifter	1
6JJR-188B	2255	Screw - Thumb	1	6JJR-211B	143266	Bushing - Sleeve	1
6JJR-189B		Dial - Spring Cover		6JJR-212B	143265	Plug - Expansion	1
	159959	English.	1	6JJR-213B	143266	Bushing - Sleeve	1
	153079	Metric	1	6JJR-214B	143264	Shaft - Transmission	1
6JJR-190C	183618	Hub - Handle	1	6JJR-215B	2341	Screw.	1
6JJR-191B	143252	Pin - Spring	1	6JJR-216B	143267	Gear - Transmission	1
6JJR-192B	3942	Spring	1	6JJR-217B	119764	Ring - Spring Wire	2
6JJR-193B	143251	Screw - Spring Retainer	1	6JJR-218B	2341	Screw.	1
6JJR-194B	143250	Retainer - Hub.	1	6JJR-219B	143263	Gear - Spiral	1
6JJR-195C	147898	Pin - Roll	1	6JJR-220B	143266	Bushing - Sleeve	1
6JJR-196C	608675	Lever - Handfeed	1	6JJR-221B	143265	Plug - Expansion	1

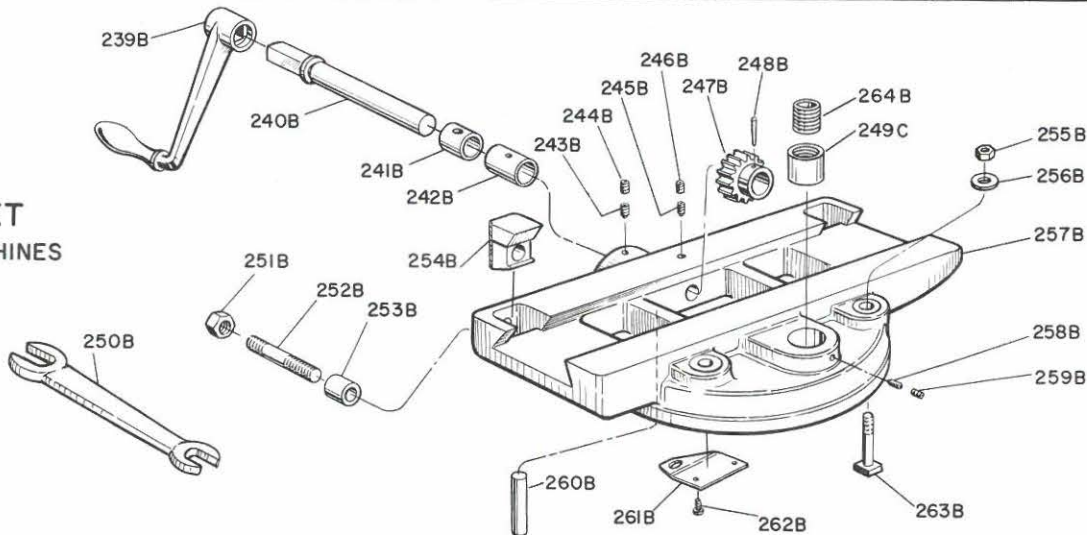
HIGH SPEED HEAD
AND OVERARM

DOUBLE SWIVEL ADAPTER AND OVERARM



15 EEE
76 EEE

TURRET
ALL MACHINES



28 EEE

WA 1370

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR (Continued)

STYLE 1-B

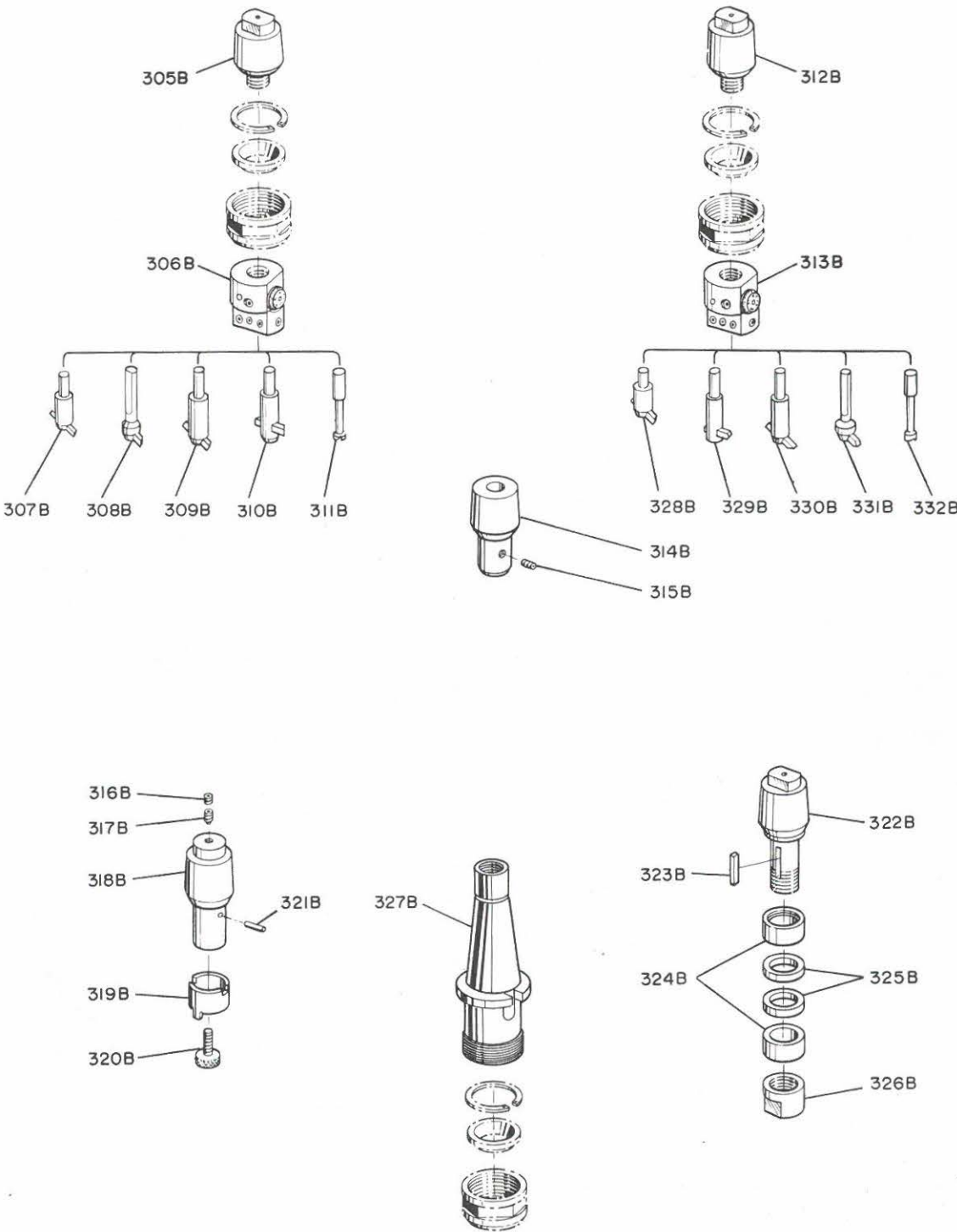
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-222B	153085	Bushing	1	6JJR-231B	143279	Adapter - Overarm	1
6JJR-223B	153084	Shaft - Spiral Gear	1	6JJR-232B	1383	Pin	1
6JJR-224B	153085	Bushing	1	6JJR-233B	161756	Overarm - (1-B, 1-D or 1-E).	1
6JJR-225B	3479	Nut	4	6JJR-234B	2248	Screw - Set	1
6JJR-226B	3442	Washer	4	6JJR-235B	105147	Screw.	2
6JJR-227B	3311	Bolt - Tee	4	6JJR-236B	161755	Bushing	1
6JJR-228B	143235	Gear - Spiral.	1	6JJR-237B	148623	Shaft - Spiral Gear	1
6JJR-229B	2321	Screw.	3	6JJR-238B	148624	Bushing	1
6JJR-230B	3233	Screw.	2				

TURRET

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-239B	150700	Handle - #6 Williams Crank	1	6JJR-253B	161754	Spacer	2
6JJR-240B	151458	Shaft - Pinion	1	6JJR-254B	153491	Clamp - Overarm.	1
6JJR-241B	151461	Bushing - Bronze.	1	6JJR-255B	3480	Nut	4
6JJR-242B	151460	Bushing - Bronze.	1	6JJR-256B	1040	Washer	4
6JJR-243B	2343	Screw.	1	6JJR-257B	151451	Turret (Altered per Drawing 143447 if Coolant Pump is Provided)	1
6JJR-244B	2355	Screw.	1	6JJR-258B	3228	Screw.	1
6JJR-245B	2343	Screw.	1	6JJR-259B	2332	Screw.	1
6JJR-246B	2316	Screw.	1	6JJR-260B	1387	Pin	2
6JJR-247B	151459	Pinion - Overarm.	1	6JNN-261B	150703	Plate - Electrical.	1
6JJR-248B	148717	Roll - Pin	1	6JNN-262B	3199	Screw.	2
6JJR-249C	186582	Bushing	1	6JJR-263B	143424	Bolt - Tee	4
6JJR-250B	3605	Wrench	1	6JJR-264B	24815	Nipple	1
6JJR-251B	3480	Nut	2				
6JJR-252B	161746	Stud - Clamping	2				

HIGH SPEED HEAD
AND OVERARM

CRALEY HEAD-CHUCKS



37EEE
45EEE

WA 1530

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

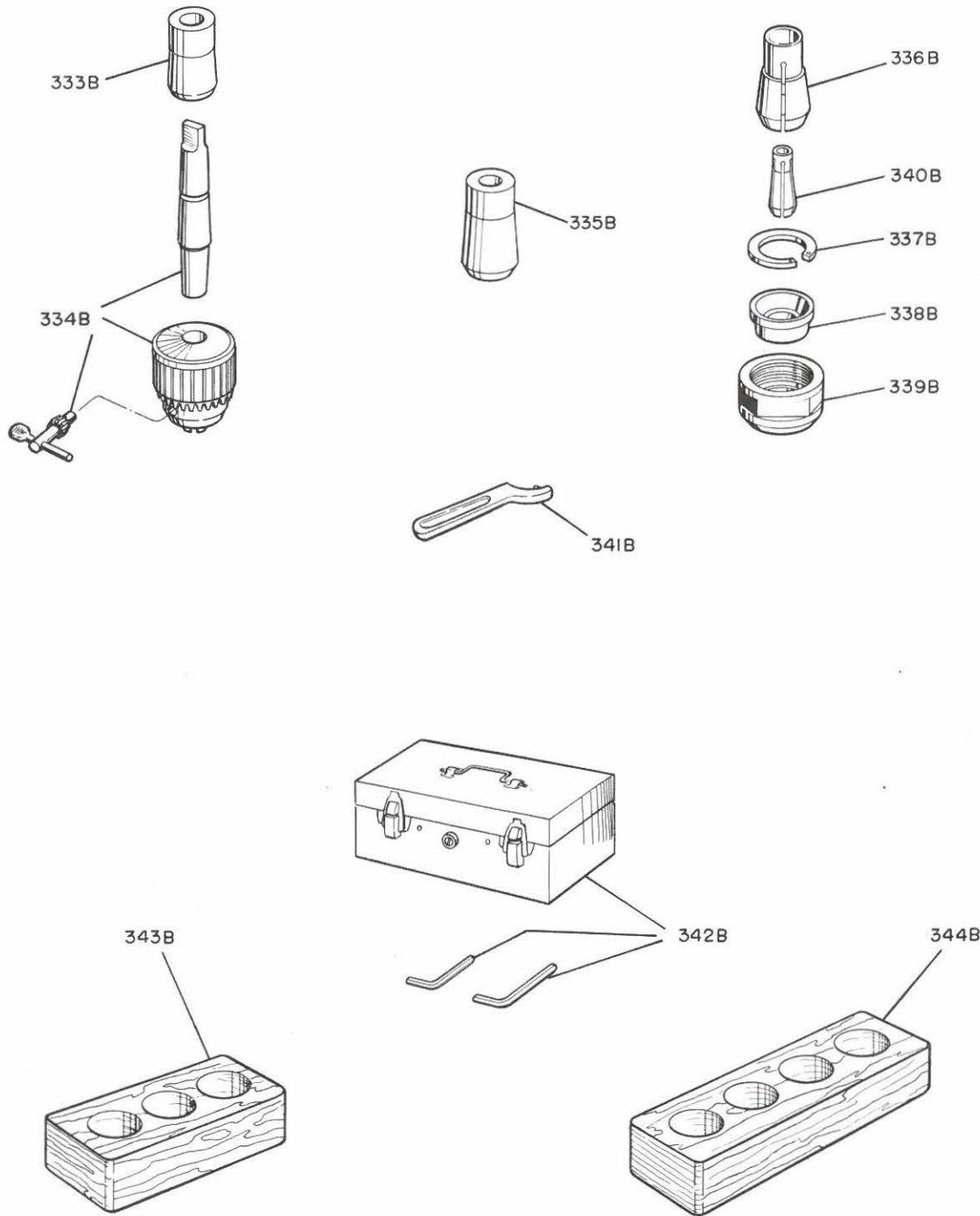
HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-305B	153459	Adapter - No. 3 Craley Head	1	6JJR-321B	152346	Pin - Driving	
*6JJR-306B	157751	Head - Boring Bar #3 Craley	1		152347	1/2" Dia. Hole Shell End Mill	1
*6JJR-307B	153099	Bar - Boring #2 for #3 Head	1		152348	3/4" Dia. Hole Shell End Mill	1
*6JJR-308B	153450	Bar - Boring #3 for #3 Head	1			1" Dia. Hole Shell End Mill	1
*6JJR-309B	153451	Bar - Boring #4 for #3 Head	1	6JJR-322B		Arbor - Stub	
*6JJR-310B	153452	Bar - Boring #5 for #3 Head	1		152357	3/4" Stub Arbor	1
*6JJR-311B		Bar - Boring, Two Lip	1		152358	7/8" Stub Arbor	1
		(For No. 3 Craley Head)			152359	1" Stub Arbor	1
	153098	Bar - Two Lip Boring for #3 Head	1	6JJR-323B		Key	
	153453	Bar - Two Lip Boring for #3 Head	1		864	3/4" Stub Arbor	1
	153454	Bar - Two Lip Boring for #3 Head	1		864	7/8" Stub Arbor	1
	153455	Bar - Two Lip Boring for #3 Head	1		814	1" Stub Arbor	1
	153456	Bar - Two Lip Boring for #3 Head	1	6JJR-324B		Collar - Arbor Spacing 1/2" Wide	
	153457	Bar - Two Lip Boring for #3 Head	1		152365	3/4" Stub Arbor	2
	153458	Bar - Two Lip Boring for #3 Head	1		152367	7/8" Stub Arbor	2
6JJR-312B	153460	Adapter - #10 Special Hd. Unit	1		3647	1" Stub Arbor	2
*6JJR-313B	157750	Head - Boring Bar #0 Craley	1	6JJR-325B		Collar - Arbor Spacing 1/4" Wide	
6JJR-314B		Adapter End Mill			152366	3/4" Stub Arbor	2
	152352	3/8" End Mill	1		152368	7/8" Stub Arbor	2
	152353	1/2" End Mill	1		152369	1" Stub Arbor	2
	152354	5/8" End Mill	1	6JJR-326B		Nut - Arbor	
	152355	3/4" End Mill	1		152364	3/4" Stub Arbor	1
6JJR-315B	2301	Screw.	1		1341	7/8" Stub Arbor	1
6JJR-316B	2354	Screw.	1		3693	1" Stub Arbor	1
6JJR-317B	3228	Screw.	1	6JJR-327B	181149	Adapter 40 Series, 1-C, 1-D, 1-E	
6JJR-318B		Adapter - Shell End Mill				Machines	1
	152344	1/2" Dia. Hole Shell End Mill	1	*6JJR-328B	153462	Bar, Boring #3 Bar for #0 Head	1
	152345	3/4" Dia. Hole Shell End Mill	1	*6JJR-329B	153463	Bar, Boring #4 Bar for #0 Head	1
	152346	1" Dia. Hole Shell End Mill	1	*6JJR-330B	153464	Bar, Boring #1 Bar for #0 Head	1
6JJR-319B		Collar - Arbor		*6JJR-331B	153465	Bar, Boring #5 Bar for #0 Head	1
	152351	1/2" Dia. Hole Shell End Mill	1	*6JJR-332B	153466	Bar - Two Lip Boring for #0 Head	1
	152350	3/4" Dia. Hole Shell End Mill	1		153467	Bar - Two Lip Boring for #0 Head	1
	152349	1" Dia. Hole Shell End Mill	1		153468	Bar - Two Lip Boring for #0 Head	1
6JJR-320B		Screw - Arbor			153469	Bar - Two Lip Boring for #0 Head	1
	4167	1/2" Dia. Hole Shell End Mill	1		153470	Bar - Two Lip Boring for #0 Head	1
	4168	3/4" Dia. Hole Shell End Mill	1		153471	Bar - Two Lip Boring for #0 Head	1
	4169	1" Dia. Hole Shell End Mill	1		153472	Bar - Two Lip Boring for #0 Head	1

* Also used with Vari-Speed Head and Overarm - Unit 6JFV.

HIGH SPEED HEAD
AND OVERARM

COLLETS - CHUCKS



37EEE
45EEE

WA 1530

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

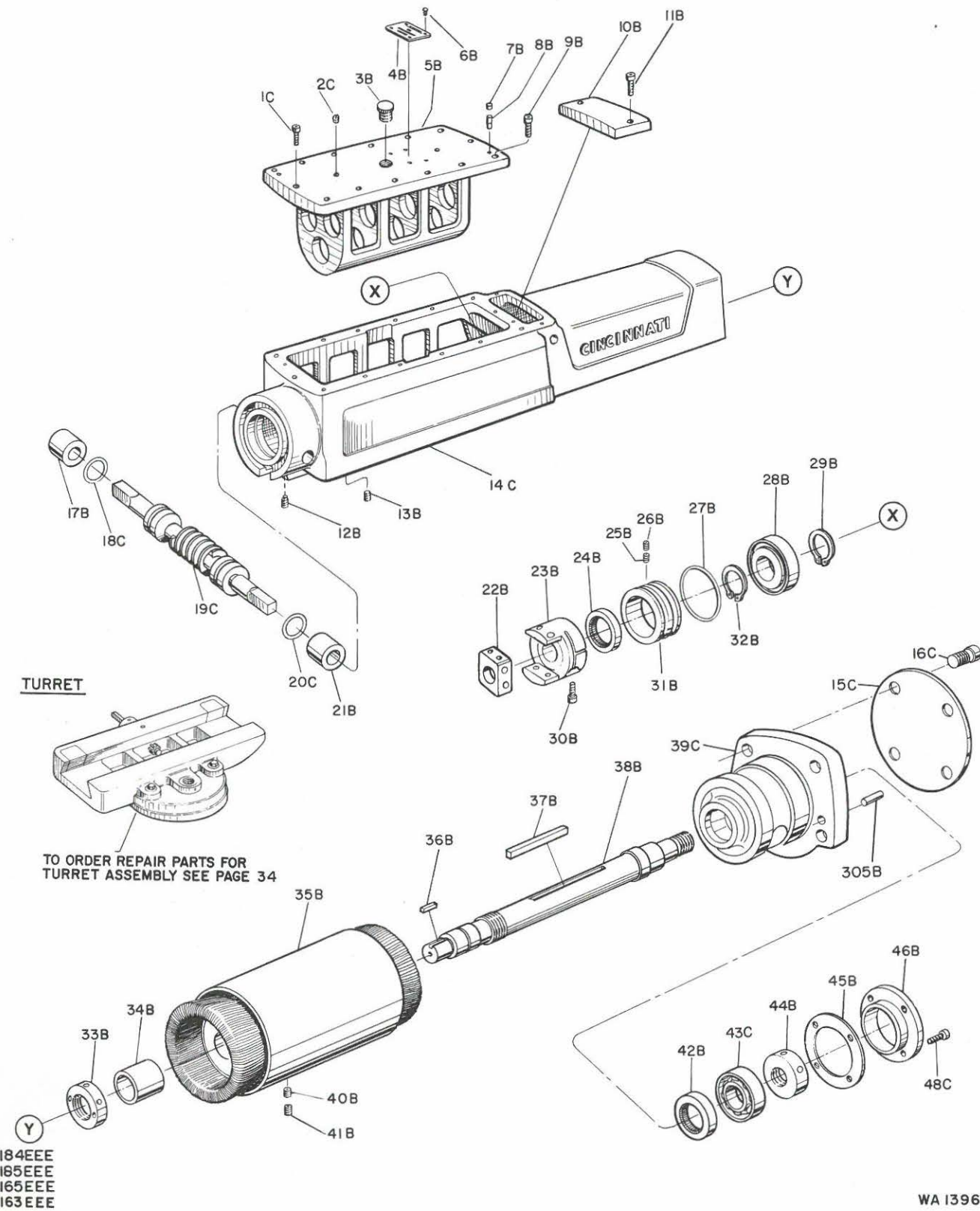
HIGH SPEED HEAD AND OVERARM - UNIT No. 6JJR (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJR-333B	181903	Collet - With Jacobs Chuck			181919-18	18 Millimeter Hole	1
	158151	#1 M. T. C. Series	1		181919-19	19 Millimeter Hole	1
	165670	#2 M. T. C. Series	1		181919-20	20 Millimeter Hole	1
	158153	#3 M. T. C. Series	1		181919-21	21 Millimeter Hole	1
	158152	#5 B & S, "C" Series	1		181919-22	22 Millimeter Hole	1
6JJR-334B		Jacobs Chuck			181919-24	24 Millimeter Hole	1
	603023-1	Chuck - Drill, 0-1/4", #2 M. T.	1		181919-25	25 Millimeter Hole	1
	603023-2	Chuck - Drill, 0-1/4", #3 M. T.	1		181919-26	26 Millimeter Hole	1
	603023-4	Chuck - Drill, 0-3/8", #2 M. T.	1		181919-27	27 Millimeter Hole	1
	603023-5	Chuck - Drill, 0-3/8", #3 M. T.	1		181919-28	28 Millimeter Hole	1
	603023-7	Chuck - Drill, 0-1/2", #2 M. T.	1		181919-29	29 Millimeter Hole	1
	603023-8	Chuck - Drill, 0-1/2", #3 M. T.	1		181919-30	30 Millimeter Hole	1
	603023-11	Chuck - Drill, 1/8"-5/8", #2 M. T.	1		181919-31	31 Millimeter Hole	1
	603023-12	Chuck - Drill, 1/8"-5/8", #3 M. T.	1		181919-32	32 Millimeter Hole	1
	603023-15	Chuck - Drill, 1/8"-3/4", #2 M. T.	1	6JJR-336B	128929	Adapter - Collet, "A" Series	1
	603023-16	Chuck - Drill, 1/8"-3/4", #3 M. T.	1	6JJR-337B	183684	Washer	1
6JJR-335B		Collet - "C" Series		6JJR-338B	181925	Ring	1
	181918-24	3/8" Hole	1	6JJR-339B	183682	Nut - Small Collet	1
	181918-26	13/32" Hole	1	6JJR-340B		Collet - "A" Series	
	181918-28	7/16" Hole	1		181926-8	1/8" Hole	1
	181918-30	15/32" Hole	1		181926-10	5/32" Hole	1
	181918-32	1/2" Hole	1		181926-12	3/16" Hole	1
	181918-34	17/32" Hole	1		181926-14	7/32" Hole	1
	181918-36	9/16" Hole	1		181926-16	1/4" Hole	1
	181918-38	19/32" Hole	1		181926-18	9/32" Hole	1
	181918-40	5/8" Hole	1		181926-20	5/16" Hole	1
	181918-42	21/32" Hole	1		181926-22	11/32" Hole	1
	181918-44	11/16" Hole	1		181926-24	3/8" Hole	1
	181918-46	23/32" Hole	1		181926-26	13/32" Hole	1
	181918-48	3/4" Hole	1		181926-28	7/16" Hole	1
	181918-50	25/32" Hole	1		181926-30	15/32" Hole	1
	181918-52	13/16" Hole	1		181926-32	1/2" Hole	1
	181918-54	27/32" Hole	1			Collet - "A" Series, Metric	
	181918-56	7/8" Hole	1		181927-3	3 Millimeter Hole	1
	181918-58	29/32" Hole	1		181927-4	4 Millimeter Hole	1
	181918-60	15/16" Hole	1		181927-5	5 Millimeter Hole	1
	181918-62	31/32" Hole	1		181927-6	6 Millimeter Hole	1
	181918-64	1" Hole	1		181927-7	7 Millimeter Hole	1
		Collet - "C" Series, Metric			181927-8	8 Millimeter Hole	1
	181919-10	10 Millimeter Hole	1		181927-10	10 Millimeter Hole	1
	181919-11	11 Millimeter Hole	1		181927-11	11 Millimeter Hole	1
	181919-12	12 Millimeter Hole	1		181927-12	12 Millimeter Hole	1
	181919-13	13 Millimeter Hole	1	6JJR-341B	153827	Wrench - "A" Series	1
	181919-14	14 Millimeter Hole	1	*6JJR-342B		Unit - Craley	
	181919-15	15 Millimeter Hole	1		153097	No. 3 Boring Head	1
	181919-16	16 Millimeter Hole	1		153461	No. 0 Boring Head	1
	181919-17	17 Millimeter Hole	1	6JJR-343B	152374	Block - Three Adapter	1
				6JJR-344B	152373	Block - Four Adapter	1

* Also used with Vari-Speed Head and Overarm - Unit 6JKV.

HEAVY DUTY HEAD
AND OVERARM

HEAVY DUTY OVERARM AND MOTOR
STYLES IC & H-V



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS

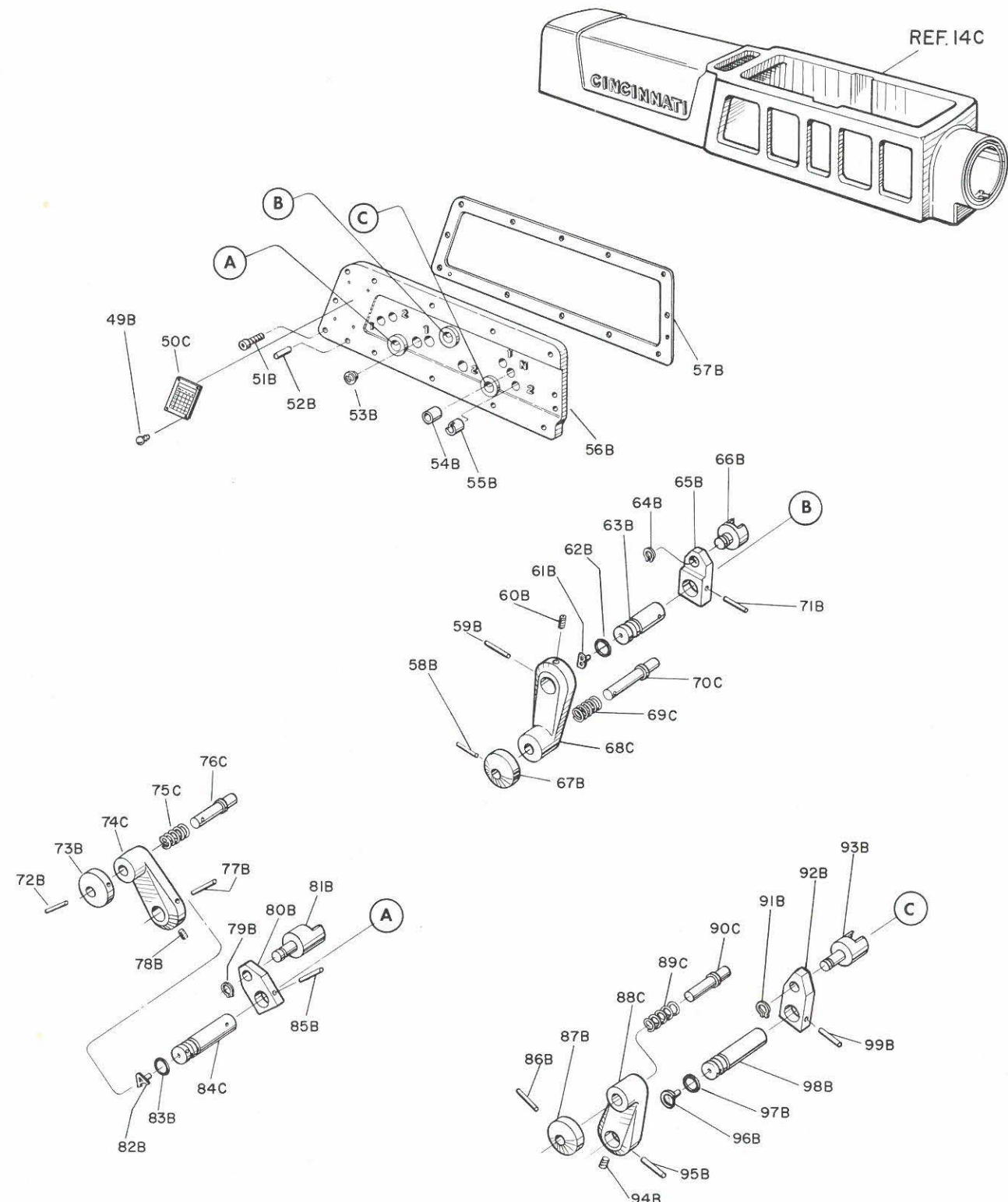
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-1C	3251	Screw.	2	6JJS-26B	2355	Screw.	1
6JJS-2C	2248	Screw.	2	6JJS-27B	139787	Ring - "O"	1
6JJS-3B	3987	Plug	1	6JJS-28B	221123	Bearing	1
6JJS-4B	167039	Plate - Name	1	6JJS-29B	122094	Ring - Retaining	1
6JJS-5B	143317	Housing - Gear	1	6JJS-30B	3400	Screw.	1
6JJS-6B	2209	Screw - Drive	4	6JJS-31B	143298	Retainer - Oil Seal	1
6JJS-7B	23173	Plug	2	6JJS-32B	122094	Ring - Retaining	1
6JJS-8B	1664	Pin	2	6JJS-33B	4247	Nut - Lock	1
6JJS-9B	3266	Screw.	12	6JJS-34B	143299	Spacer - Rotor.	1
6JJS-10B	143301	Cover - Electrical Compartment	1	6JJS-35B	143292	Motor - Heavy Duty, Style 1-C Machine, 2 H. P., 1200 R. P. M.	1
6JJS-11B	3266	Screw.	2	6JJS-36B	3307	Key	1
6JJS-12B	105147	Screw - Set.	2	6JJS-37B	161806	Key	1
6JJS-13B	216607	Plug - Pipe.	1	6JJS-38B	181116	Shaft - Motor 2 H. P. 1200 R. P. M.	1
6JJS-14C	183616	Overarm, 1-C or H-V Machines.	1	6JJS-39C	181993	Bracket - Rear Bearing W/Rear Mounting Vertical Head	1
6JJS-15C	183642	Cover - Plate, Rear (Without Rear Mounted Vertical Head).	1	6JJS-40B	183641	Without Rear Mounting Vertical Head	1
6JJS-16C	2386	Screw (Without Rear Mounted Vertical Head).	4	6JJS-41B	3233	Screw.	1
6JJS-17B	148624	Bushing	1*	6JJS-42B	2356	Screw.	1
6JJS-18C	246308	Ring - "O"	1*	6JJS-43C	93235	Seal - Oil	1
6JJS-19C	148623	Shaft - Spiral Gear	1*	6JJS-44B	181120	Bearing	1
6JJS-20C	246308	Ring - "O"	1*	6JJS-45B	4243	Nut - Lock	1
6JJS-21C	148624	Bushing	1*	6JJS-46C	143537	Shim - Retainer	1
6JJS-22B	97264	Coupling - Center.	1	6JJS-48C	181119	Retainer, Bearing	1
6JJS-23B	227570	Coupling.	1	6JJS-305B	3403	Screw.	4
6JJS-24B	93235	Seal - Oil	1		231132	Pin	1
6JJS-25B	2343	Screw.	1				

*Double quantity if Rear Mounted Vertical Head is used.

HEAVY DUTY HEAD
AND OVERARM

HEAVY DUTY CONTROL MECHANISM

STYLE IC & H-V



191 EEE
185 EEE
165 EEE

WA 1436
WA 1553

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

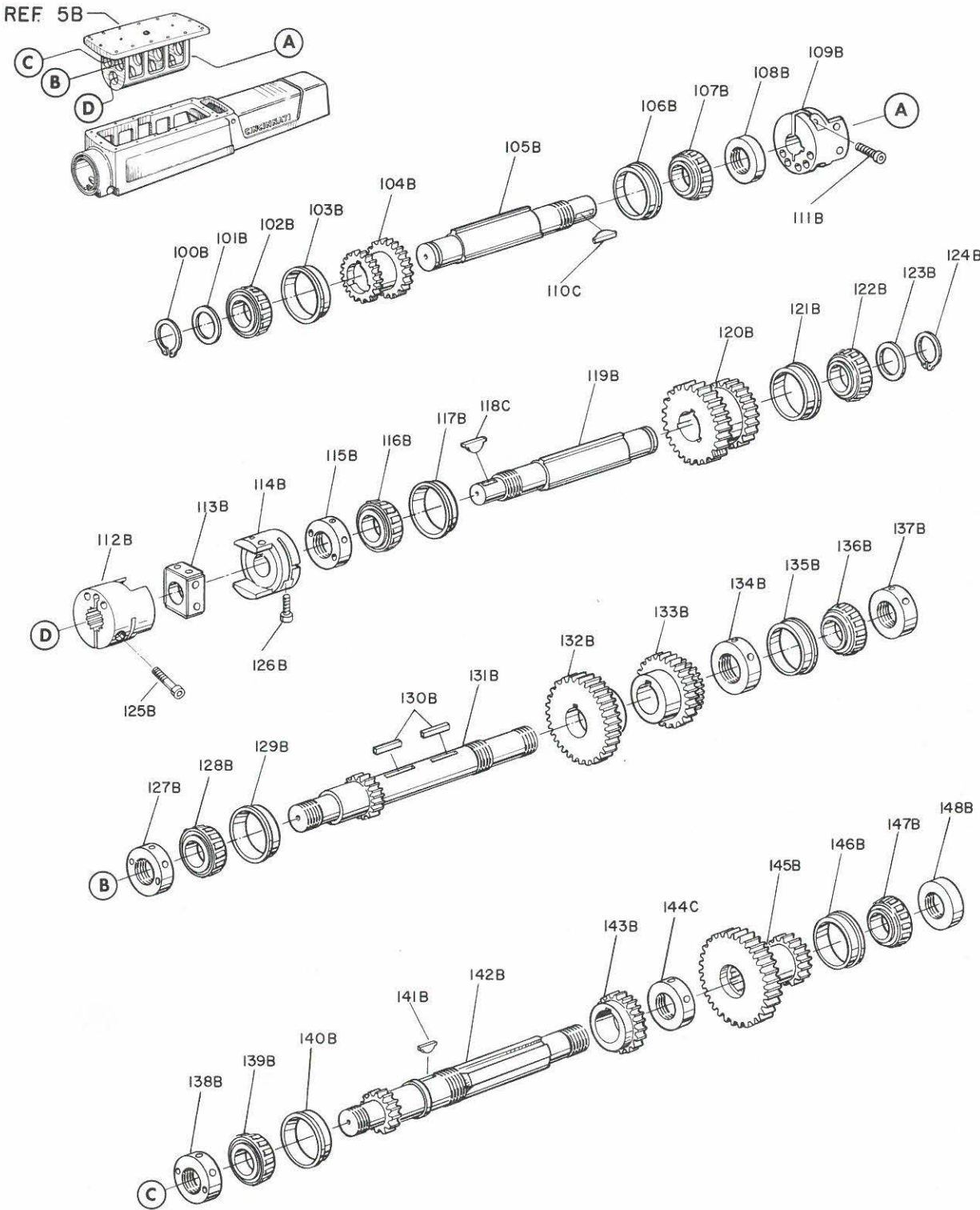
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-49B	2209	Screw - Drive	4	6JJS-73B	151453	Knob - Hand	1
6JJS-50C		Plate - Speed		6JJS-74C	178277	Lever - Speed Selector	1
	178250	100 - 1530 RPM	1	6JJS-75C	134367	Spring	1
	178279	75 - 1130 RPM	1	6JJS-76C	178278	Pin - Index	1
	183699	50 - 750 RPM	1	6JJS-77B	143311	Roll Pin	1
6JJS-51B	2320	Screw	12	6JJS-78B	78600	Screw - Set	1
6JJS-52B	1966	Pin	2	6JJS-79B	236956	Ring - Truarc	1
6JJS-53B	115591	Gage - Sight Bijur	1	6JJS-80B	143310	Arm - Speed Shifter "A"	1
6JJS-54B	143304	Stop - Speed Change	1	6JJS-81B	143309	Fork - Shifter	1
6JJS-55B	143303	Stop - Speed Change	6	6JJS-82B	3334	Letter - "A"	1
6JJS-56B	178251	Plate - Speed Control	1	6JJS-83B	129871	Ring - "O"	1
6JJS-57B	143332	Gasket - Speed Control Plate	1	6JJS-84C	143308	Shaft - Speed Shift "A"	1
6JJS-58B	143329	Roll Pin	1	6JJS-85B	143319	Roll Pin	1
6JJS-59B	143311	Roll Pin	1	6JJS-86B	143329	Roll Pin	1
6JJS-60B	78600	Screw - Set	1	6JJS-87B	151453	Knob - Hand	1
6JJS-61B	3335	Letter - "B"	1	6JJS-88C	178277	Lever - Speed Selector	1
6JJS-62B	129871	Ring - "O"	1	6JJS-89C	134367	Spring	1
6JJS-63B	143313	Shaft - Speed Shift "B"	1	6JJS-90C	178278	Pin - Index	1
6JJS-64B	236956	Ring - Truarc	1	6JJS-91B	236956	Ring - Truarc	1
6JJS-65B	143314	Arm - Speed Shifter "B"	1	6JJS-92B	143310	Arm - Speed Shifter "C"	1
6JJS-66B	143312	Fork - Shifter "B"	1	6JJS-93B	143315	Fork - Shifter "C"	1
6JJS-67B	151453	Knob - Hand	1	6JJS-94B	78600	Screw - Set	1
6JJS-68C	178277	Lever - Speed Selector	1	6JJS-95B	143311	Roll Pin	1
6JJS-69C	134367	Spring	1	6JJS-96B	3336	Letter - "C"	1
6JJS-70C	178278	Pin - Index	1	6JJS-97B	129871	Ring - "O"	1
6JJS-71B	143319	Roll Pin	1	6JJS-98B	143308	Shaft - Speed Shift "C"	1
6JJS-72B	143329	Roll Pin	1	6JJS-99B	143319	Roll Pin	1

HEAVY DUTY HEAD
AND OVERARM

HEAVY DUTY DRIVE SHAFTS
STYLE IC & H-V



23 EEE
165 EEE

WA 1370

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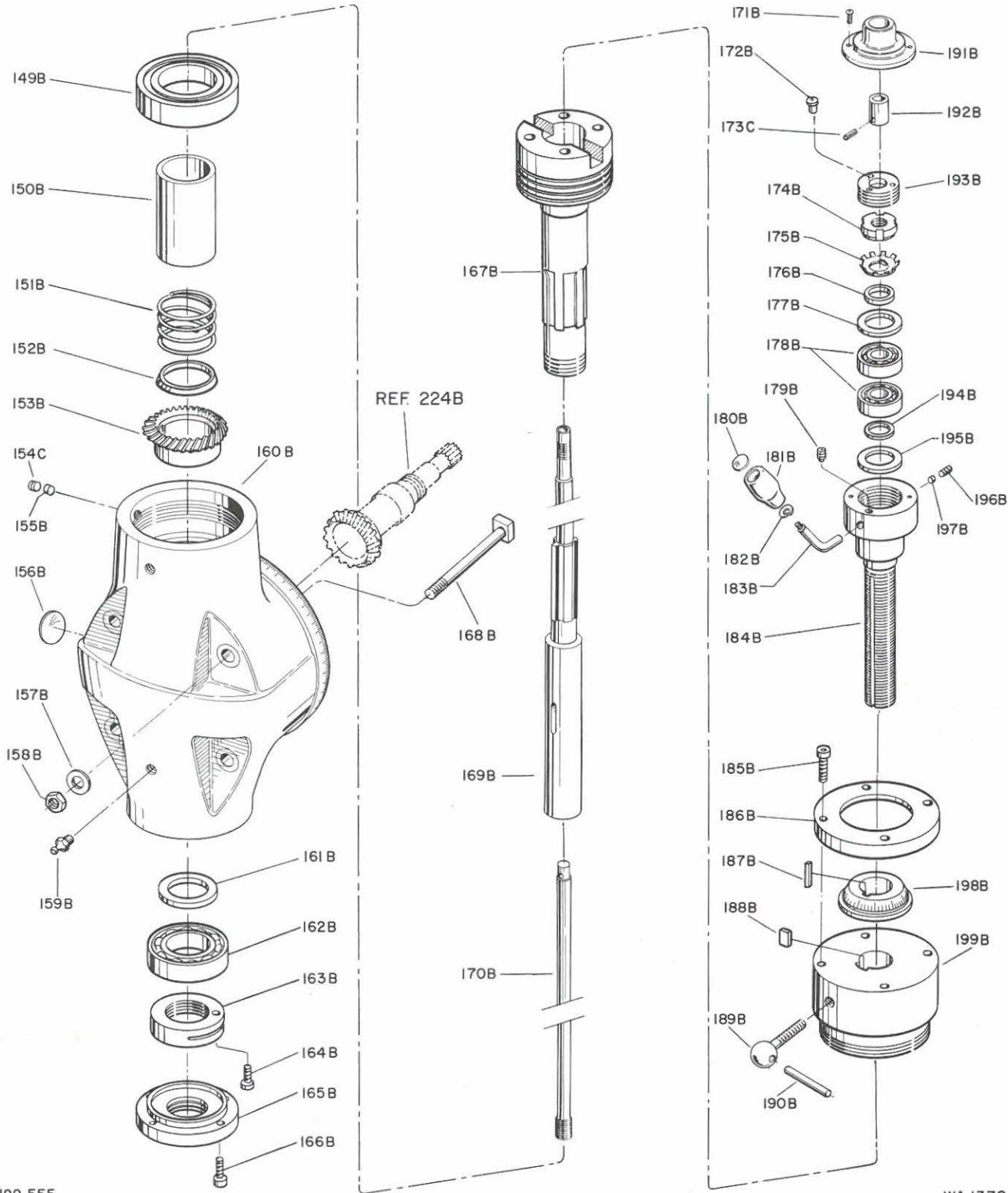
HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-100B	113079	Ring - Retaining	1	6JJS-125B	2322	Screw.	1
6JJS-101B	143330	Washer - Change Gear	1	6JJS-126B	3400	Screw.	1
6JJS-102B	202876	Cone - Bearing	1	6JJS-127B	4243	Nut - Lock	1
6JJS-103B	202877	Cup - Bearing	1	6JJS-128B	108345	Cone - Bearing	1
6JJS-104B		Gear - Change	1	6JJS-129B	202877	Cup - Bearing	1
	143321	With 60 Cycle Motor	1	6JJS-130B	814	Key	2
	158507	With 50 Cycle Motor	1	6JJS-131B	143322	Shaft - Cluster Gear	1
6JJS-105B	143320	Shaft - Change Gear	1	6JJS-132B	143323	Gear - Spur.	1
6JJS-106B	202877	Cup - Bearing	1	6JJS-133B		Gear - Cluster Spur	1
6JJS-107B	202876	Cone - Bearing	1		143324	With 60 Cycle Motor	1
6JJS-108B	4242	Nut - Lock	1		158508	With 50 Cycle Motor	1
6JJS-109B	225482	Flange, Coupling	1	6JJS-134B	221399	Nut - Adjusting	1
6JJS-110C	703074	Key	1	6JJS-135B	202877	Cup - Bearing	1
6JJS-111B	3400	Screw.	1	6JJS-136B	108345	Cone - Bearing	1
6JJS-112B	168146	Flange - Coupling	1	6JJS-137B	4243	Nut - Lock	1
6JJS-113B	97264	Center - Coupling.	1	6JJS-138B	4243	Nut - Lock	1
6JJS-114B	225482	Coupling.	1	6JJS-139B	108345	Cone - Bearing	1
6JJS-115B	4242	Nut - Lock	1	6JJS-140B	202877	Cup - Bearing	1
6JJS-116B	202876	Cone - Bearing	1	6JJS-141B	3281	Key	1
6JJS-117B	202877	Cup - Bearing	1	6JJS-142B	143325	Shaft - Spur Gear.	1
6JJS-118C	703074	Key	1	6JJS-143B	143326	Gear - Spur.	1
6JJS-119B	143320	Shaft - Change Gear	1	6JJS-144C	4188	Nut - Lock	1
6JJS-120B	143328	Gear - Change.	1	6JJS-145B	143327	Gear - Change.	1
6JJS-121B	202877	Cup - Bearing	1	6JJS-146B	202877	Cup - Bearing	1
6JJS-122B	202876	Cone - Bearing	1	6JJS-147B	202876	Cone - Bearing	1
6JJS-123B	143330	Washer - Change Gear	1	6JJS-148B	4242	Nut - Lock	1
6JJS-124B	113079	Ring - Retaining	1				

HEAVY DUTY HEAD
AND OVERARM

SPINDLE AND HOUSING
HAND FEED TO QUILL

STYLE IC & H-V

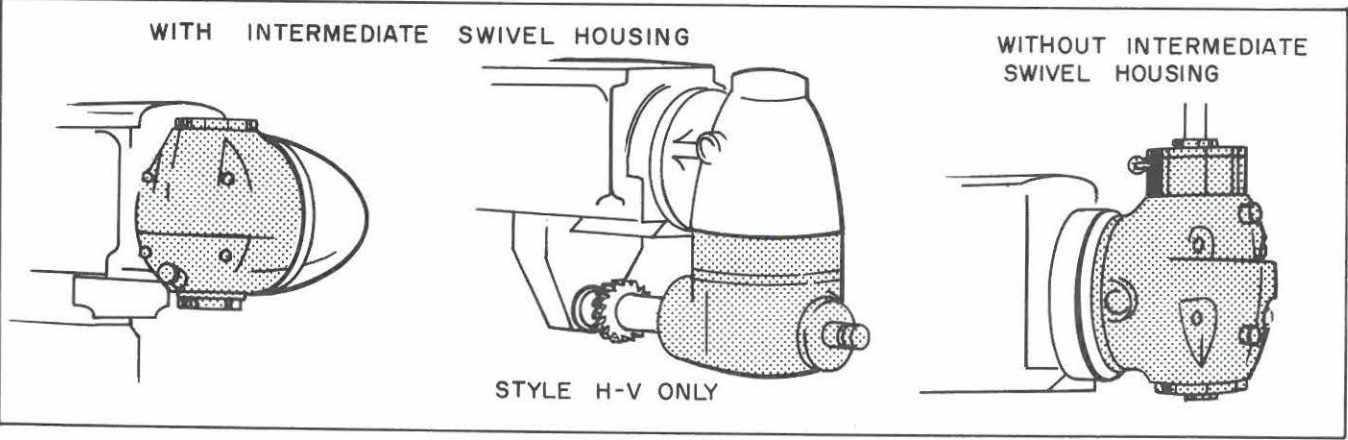


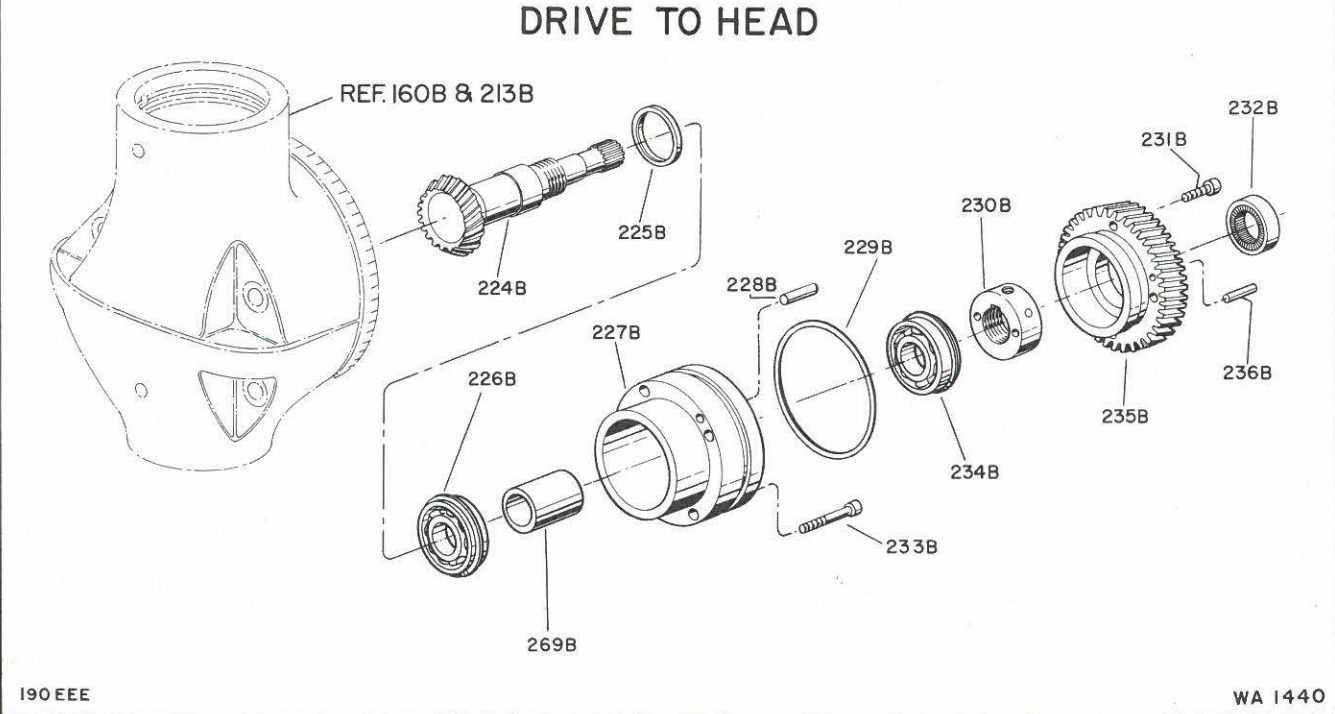
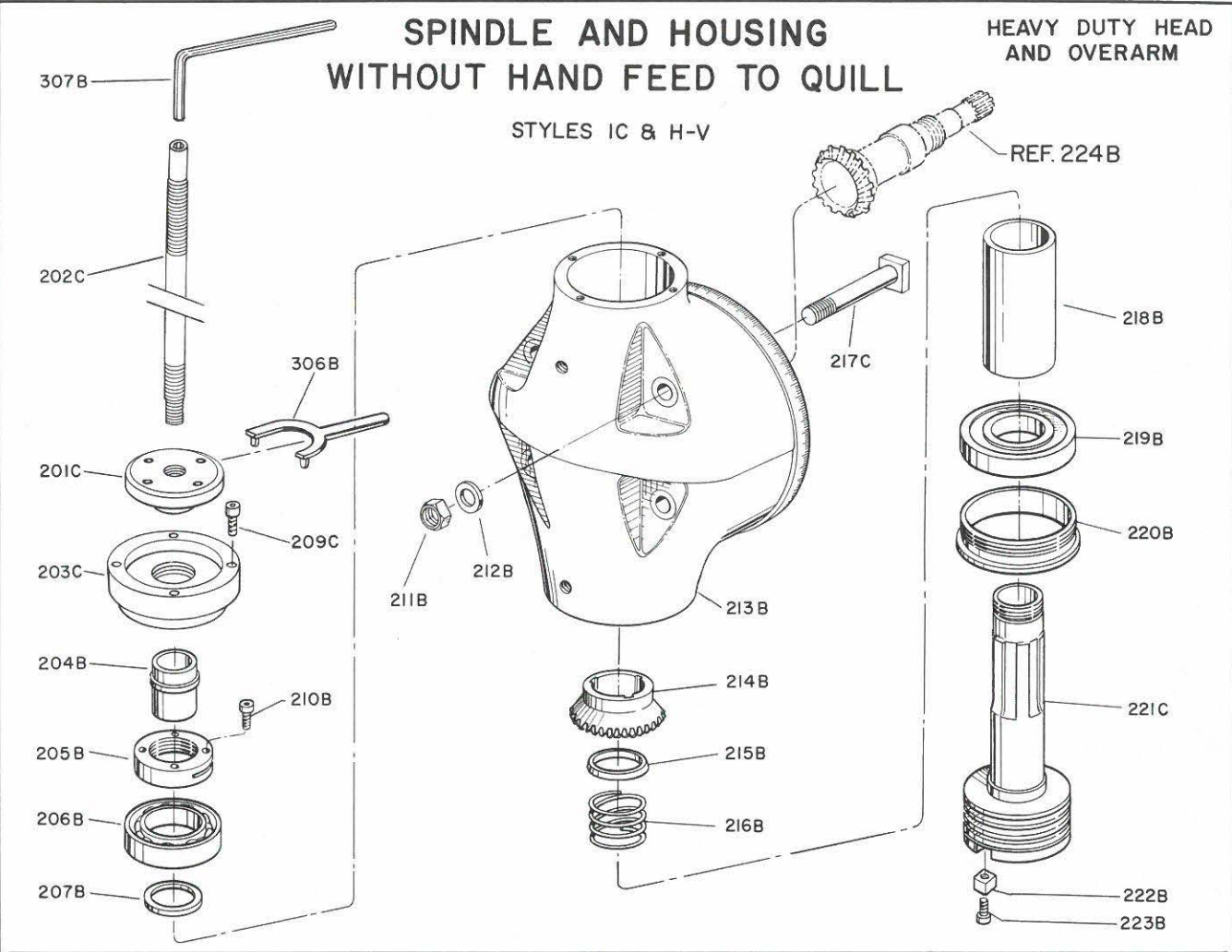
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-149B	217925	Bearing - Ball, Thrust	1	6JJS-174B	76676	Nut - Lock	1
6JJS-150B	168160	Seat - Spring	1	6JJS-175B	76675	Washer - Lock.	1
6JJS-151B	78388	Spring - Spindle	1	6JJS-176B	93167	Spacer - Bearing	1
6JJS-152B	78387	Seat - Spring	1	6JJS-177B	93166	Washer - Thrust	1
6JJS-153B	143342	Gear - Spiral Drive	1	6JJS-178B	168164	Bearing - Ball	2
6JJS-154C	3458	Screw - Set.	1	6JJS-179B	2341	Screw.	1
6JJS-155B	1844	Plug - Brass	1	6JJS-180B	4331	Plate - Name	1
6JJS-156B	69448	Plug - Expansion	1	6JJS-181B	4327	Knob - Small	1
6JJS-157B	143300	Washer	4	6JJS-182B	2123	Washer - Lock.	1
6JJS-158B	2057	Nut - Hex	4	6JJS-183B	150744	Lever - Quill Adjusting.	1
6JJS-159B	3342	Fitting - Alemite	2	6JJS-184B	150743	Screw - Quill Adjusting.	1
6JJS-160B	168151	Housing - Spindle	1	6JJS-185B	3396	Screw.	4
6JJS-161B	102727	Spacer	1	6JJS-186B	78920	Retainer - Dial	1
6JJS-162B	76659	Bearing - Ball	1	6JJS-187B	76667	Key - Square	1
6JJS-163B	103308	Nut - Spindle, Lock	1	6JJS-188B	3858	Shoe	1
6JJS-164B	3218	Screw.	1	6JJS-189B	76664	Screw - Handle	1
6JJS-165B	78925	Cap - Spindle, Bearing	1	6JJS-190B	3537	Pin - Handle	1
6JJS-166B	3396	Screw.	4	6JJS-191B	171355	Cover - Draw Bolt	1
6JJS-167B	186581	Spindle	1	6JJS-192B	171371	Head - Draw Bolt.	1
6JJS-168B	168159	Bolt - Tee	4	6JJS-193B	76677	Nut - Bearing, Lock.	1
6JJS-169B		Quill		6JJS-194B	93168	Spacer - Bearing	1
	168153	#9 B and S O.D.	1	6JJS-195B	93166	Washer - Thrust	1
	168154	#7 B and S Regular	1	6JJS-196B	2333	Screw.	1
6JJS-170B		Bolt - Draw		6JJS-197B	1550	Plug	1
	168156	#9 B and S O.D.	1	6JJS-198B		Dial - Quill Adjusting	
	168157	#7 B and S Regular	1		76666	English.	1
6JJS-171B	2361	Screw.	2		95250	Metric.	1
6JJS-172B	60062	Cup - Oiler.	1	6JJS-199B	168155	Cap - Quill Adjusting	1
6JJS-173C	606072	Pin	1				

POSITIONS OF SPINDLE HOUSING ASSEMBLY





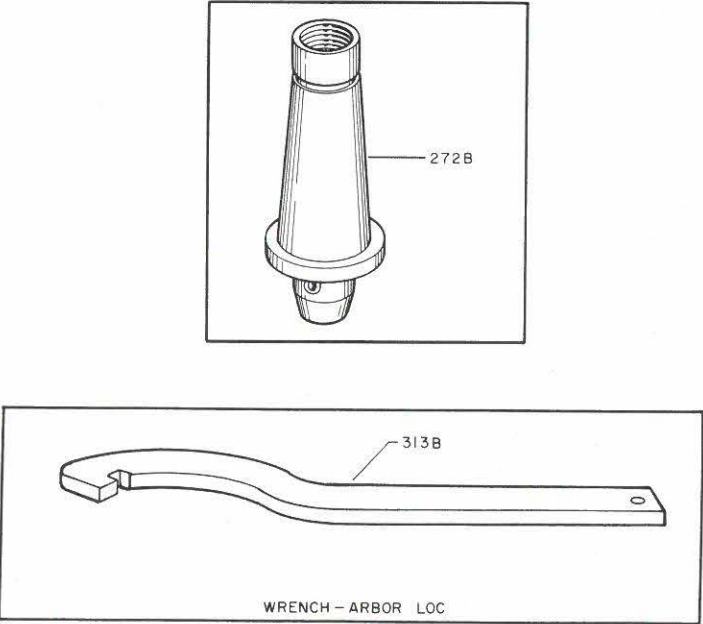
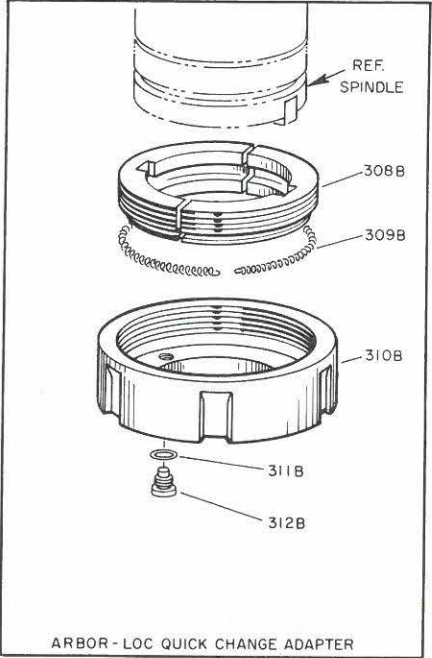
190 EEE

WA 1440

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Continued)

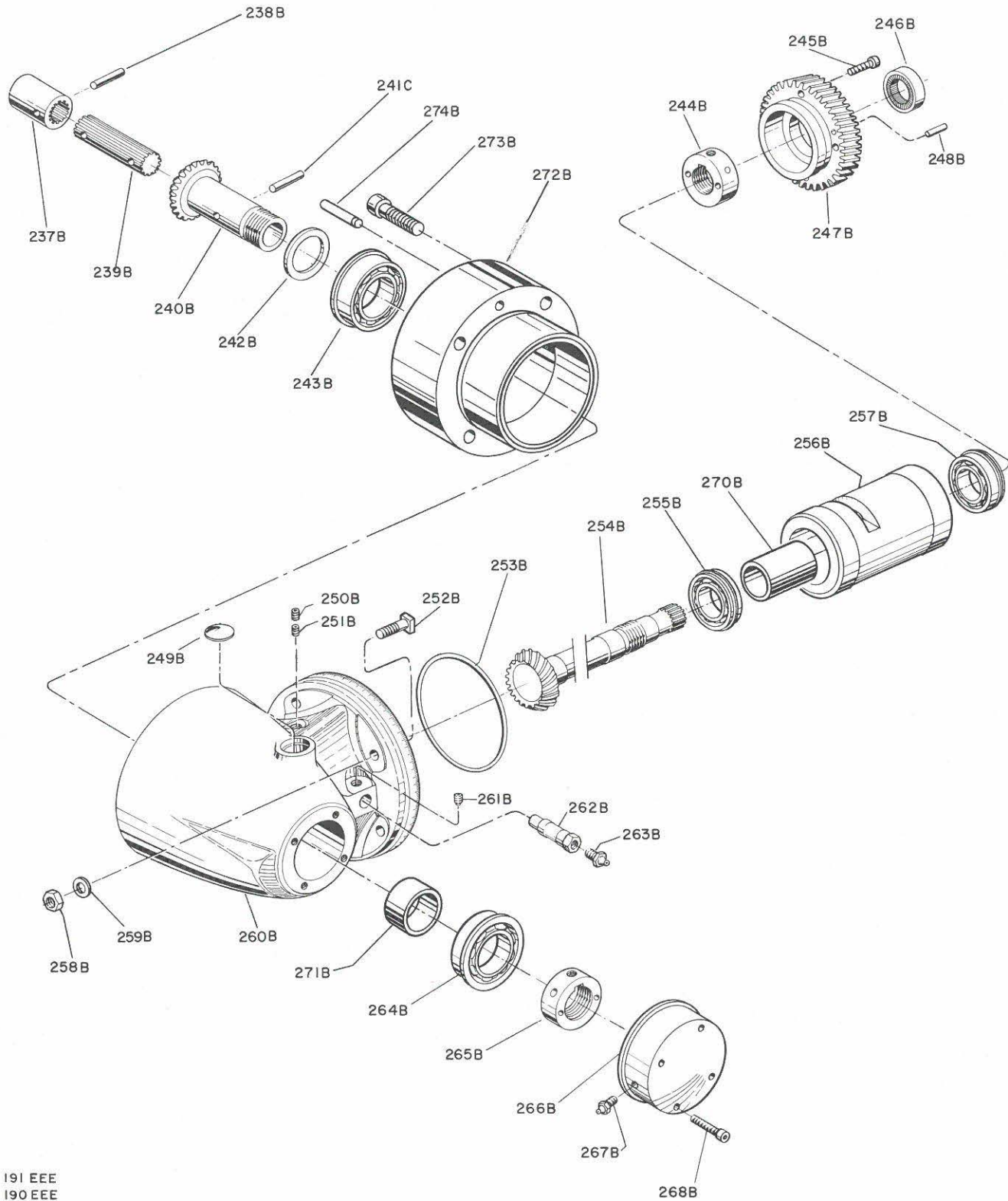
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-201C	184671	Nut, Arbor	1	6JJS-225B	102729	Spacer - Bearing	1
6JJS-202C	184670	Bolt, Draw-In	1	6JJS-226B	78394	Bearing - Ball	1
6JJS-203C	184672	Cap, Spindle Bearing	1	6JJS-227B	168141	Housing - Sleeve Adjusting.	1
6JJS-204B	78986	Plug - Draw In.	1	6JJS-228B	3543	Pin	1
6JJS-205B	103308	Nut - Spindle Lock	1	6JJS-229B	251229	Ring - "O"	1
6JJS-206B	76659	Bearing - Ball.	1	6JJS-230B	4244	Nut - Lock	1
6JJS-207B	102727	Spacer	1	6JJS-231B	3227	Screw.	4
6JJS-209C	3227	Screw.	4	6JJS-232B	93233	Seal - Oil	1
6JJS-210B	3218	Screw.	1	6JJS-233B	3158	Screw.	4
6JJS-211B	2057	Nut	4	6JJS-234B	78394	Bearing - Ball.	1
6JJS-212B	143300	Washer	4	6JJS-235B	168147	Gear - Index Head	1
6JJS-213B	168151	Housing - Spindle without Hand Feed to Quill	1	6JJS-236B	3543	Pin	1
6JJS-214B	143342	Gear - Spiral Drive 100 - 1530 RPM	1	6JJS-269B	178952	Spacer	1
6JJS-215B	181995	75 - 1130 RPM	1	6JJS-272B	179037	Holder - End Mill (No. 40 MM Std. taper) 3/16" Dia. Hole	1
6JJS-216B	78387	Seat - Spring	1		179038	3/8" Dia. Hole	1
6JJS-217C	78388	Spring - Spindle	1		179039	1/2" Dia. Hole	1
6JJS-218B	3311	Bolt - Tee	4		179040	5/8" Dia. Hole	1
6JJS-219B	168160	Seat - Spring	1		179041	3/4" Dia. Hole	1
6JJS-220B	217925	Bearing - Ball.	1		179042	7/8" Dia. Hole	1
6JJS-221C	78982	Cap - Spindle	1		179043	1" Dia. Hole	1
6JJS-222B	186581	Spindle (100 - 1530 RPM & 75 - 1130 RPM)	1		179044	1-1/4" Dia. Hole	1
6JJS-223B	70049	Key - Arbor	2	6JJS-306B	74795	Wrench - Spanner.	1
6JJS-224B	3396	Screw.	2	6JJS-307B	4049	Wrench	1
		Pinion - Motor 100 - 1530 RPM	1	6JJS-308B	175700	Adapter - Quick Change.	1
		75 - 1130 RPM.	1	6JJS-309B	175699	Spring - Tension	1
				6JJS-310B	175701	Nut - Quick Change	1
				6JJS-311B	130145	Ring - "O"	1
				6JJS-312B	175703	Screw - Hex Socket	1
				6JJS-313B	175770	Wrench - Hook Spanner.	1



HEAVY DUTY HEAD
AND OVERARM

INTERMEDIATE SWIVEL HOUSING

STYLES IC & H-V



191 EEE
190 EEE
183 EEE

WA1370

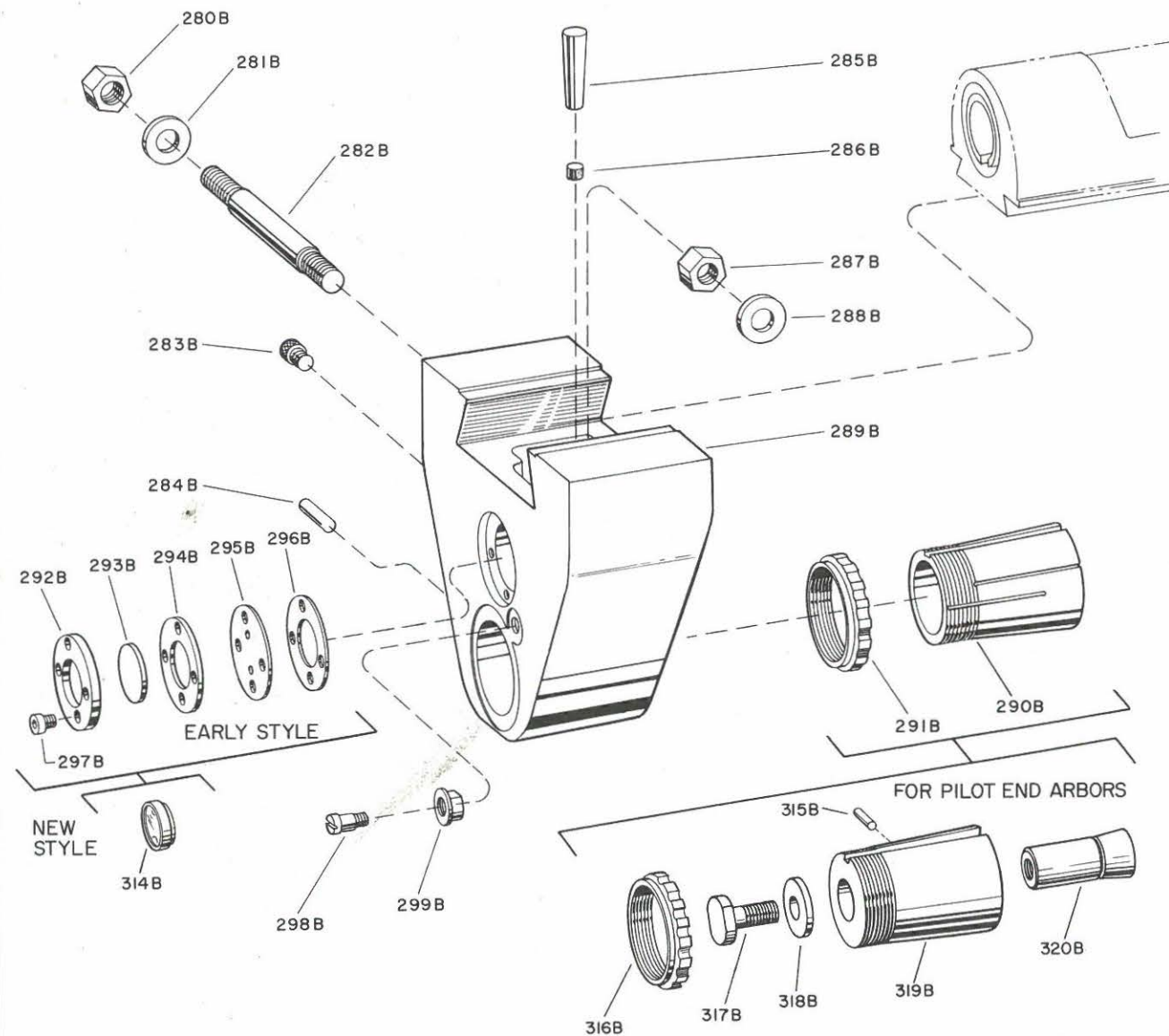
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HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-237B	170764	Coupling	1	6JJS-254B	168145	Shaft - Driven	1
	181998	Without Horizontal Arbor or H-V	1		183697	75 - 1130 RPM	1
6JJS-238B	148045	Pin - Roll	1		252554	50 - 750 RPM	1
6JJS-239B	170765	Shaft	1	6JJS-255B	167900	Bearing - Ball	1
	181997	Without Horizontal Arbor or H-V	1	6JJS-256B	252554	Sleeve - Bearing	1
6JJS-240B	170763	Gear	1	6JJS-257B	252554	Bearing - Ball	1
	183698	75 - 1130 RPM	1	6JJS-258B	2057	Nut	4
	148717	50 - 750 RPM	1	6JJS-259B	143300	Washer	4
6JJS-241C	102729	Pin	1	6JJS-260B	167875	Housing - Swivel	1
6JJS-242B	78394	Spacer - Bearing	1		183615	Without Horizontal Arbor or H-V	1
6JJS-243B	4244	Bearing - Ball	1		3232	With Horizontal Arbor or H-V	1
6JJS-244B	3227	Nut - Lock	1	6JJS-261B	150741	Screw	1
6JJS-245B	93233	Screw	4	6JJS-262B	3342	Eccentric - Stud	1
6JJS-246B	168147	Seal - Oil	1	6JJS-263B	3342	Fitting - Alemite	1
6JJS-247B	3543	Gear - Index Head	1	6JJS-264B	78394	Bearing - Ball	1
6JJS-248B	69448	Pin	1	6JJS-265B	4246	Nut - Lock	1
6JJS-249B	1911	Plug - Expansion	1	6JJS-266B	143337	Cap - End	1
6JJS-250B	3211	Screw	1	6JJS-267B	3342	Fitting - Alemite	1
6JJS-251B	3311	Screw	1	6JJS-268B	3217	Screw	4
6JJS-252B	251229	Bolt - Tee	4	6JJS-270B	178950	Spacer - Bearing	1
6JJS-253B		Ring - "O"	1	6JJS-271B	178951	Spacer - Bearing	1
				6JJS-272B	183614	Block 2" Ext. H-V Unit Only	1
				6JJS-273B	3404	Screw	1
				6JJS-274B	1385	Pin	1

HEAVY DUTY HEAD
AND OVERARM

ARBOR SUPPORT
STYLE H-V



191 EEE

WA-1575
WA-1560

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

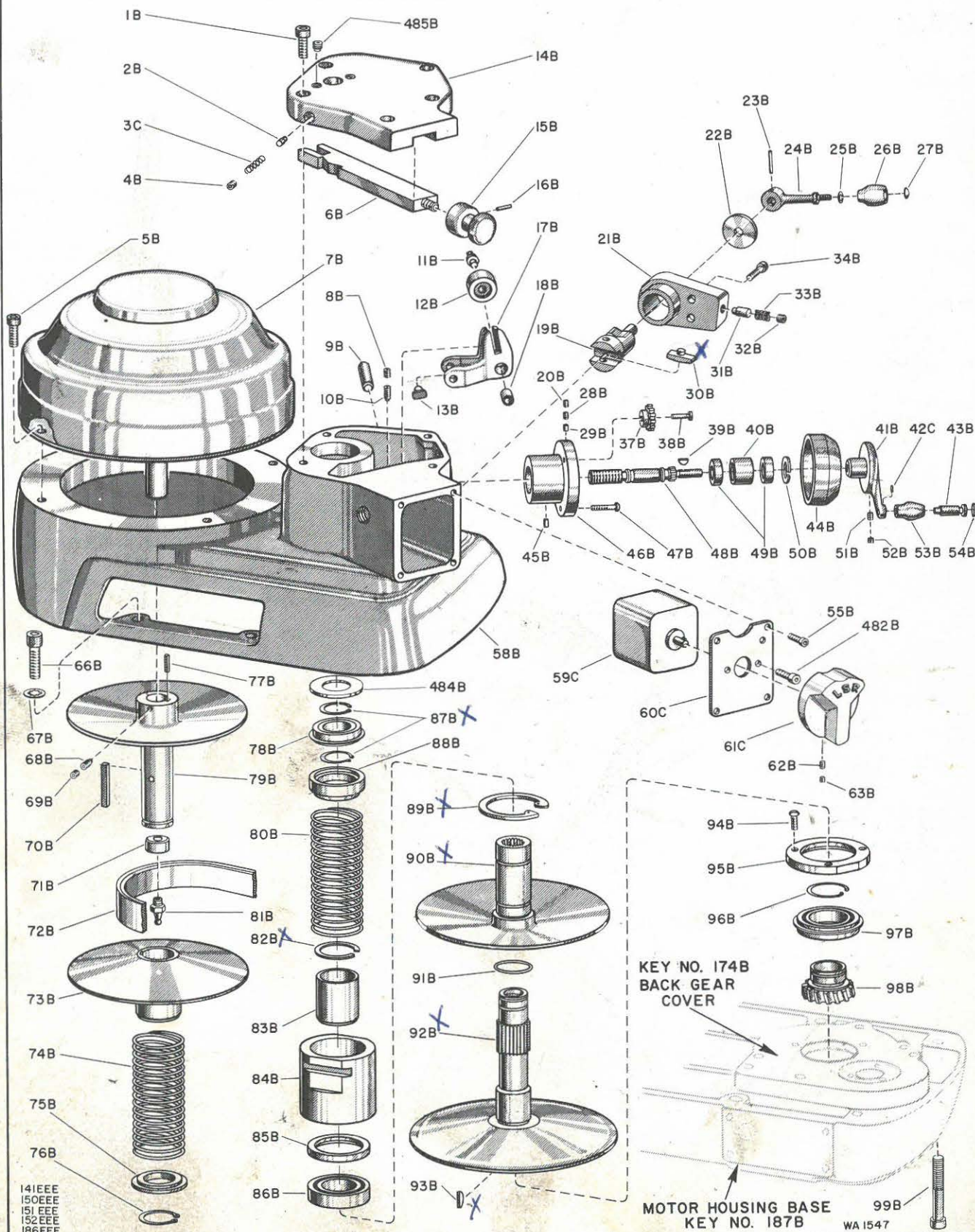
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

HEAVY DUTY HEAD AND OVERARM - UNIT No. 6JJS (Concluded)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JJS-280B	3480	Nut	1	6JJS-294B	4087	Gasket	1
6JJS-281B	1740	Washer	1	6JJS-295B	97388	Dial	1
6JJS-282B	181996	Stud	1	6JJS-296B	4077	Gasket	1
6JJS-283B	3964	Plug	1	6JJS-297B	3197	Screw.	4
6JJS-284B	3543	Pin	1	6JJS-298B	3484	Screw.	1
6JJS-285B	181999	Tube	1	6JJS-299B	3974	Roller	1
6JJS-286B	3306	Plug	1	6JJS-314B	241087	Gage - Oil Sight	1
6JJS-287B	3480	Nut	1	6JJS-315B	3377	Pin	1
6JJS-288B	2118	Washer	1	6JJS-316B	4040	Nut - Adjusting	1
6JJS-289B	181992	Support - Arbor	1	6JJS-317B	4038	Bolt - Arbor	1
6JJS-290B	4039	Bushing	1	6JJS-318B	128	Washer	1
6JJS-291B	4040	Nut - Adjusting	1	6JJS-319B	189850	Adapter - Bushing	1
6JJS-292B	4076	Cover.	1	6JJS-320B	3695	Bushing - Arbor Support	1
6JJS-293B	4078	Disc.	1				

VARI-SPEED HEAD
AND OVERARM

I-D MOTOR HOUSING AND VARI-SPEED DRIVE



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

VARI-SPEED HEAD AND OVERARM - UNIT No. 6JKV

STYLE I-D

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-1B	3266	Screw	4	6JKV-49B	146390	Bearing - Ball	2
6JKV-2B	175395	Plunger	1	6JKV-50B	171364	Ring - Retaining	1
6JKV-3C	262	Spring	1	6JKV-51B	3229	Screw	1
6JKV-4B	2301	Screw	1	6JKV-52B	2332	Screw	1
Example	Example	Screw	4	6JKV-53B	166214	Knob	1
6JKV-6B	167320	Bar - Draw Bolt	1	6JKV-54B	4331	Plate - Knob	1
Example	Example	Motor (*)	1	6JKV-55B	3268	Screw	4
6JKV-8B	2332	Screw	1	6JKV-58B	175501	Housing	1
6JKV-9B	167488	Shaft - Pin	1	6NN-59C	183646	Switch - Drum	1
6JKV-10B	3229	Screw	1	6JKV-60C	183644	Plate - Switch	1
6JKV-11B	171386	Shoe - Lock	2	6JKV-61C	183643	Handle	1
6JKV-12B	167349	Nut	1	6JKV-62B	3228	Screw	1
6JKV-13B	167477	Shoe - Lock	2	6JKV-63B	2332	Screw	1
6JKV-14B	167331	Cover	1	6JKV-66B	3404	Screw	4
6JKV-15B	167321	Knob - Draw Bolt	1	6JKV-67B	3257	Washer	4
6JKV-16B	167492	Pin - Roll	1	6JKV-68B	3228	Screw	1
6JKV-17B	167348	Yoke	1	6JKV-69B	2354	Screw	1
6JKV-18B	259598	Bushing	2	6JKV-70B	1632	Key	1
6JKV-19B	176255	Shaft - Brake	1	6JKV-71B	173873	Plug	1
6JKV-20B	2354	Screw	1	6JKV-72B	158588	Belt - Vari-Speed	1
6JKV-21B	175386	Bracket - Brake	1	6JKV-73B	167336	Pulley	1
6JKV-22B	167471	Washer	1	6JKV-74B	166819	Spring	1
6JKV-23B	152449	Pin - Roll	1	6JKV-75B	167340	Retainer	1
6JKV-24B	158617	Lever	1	6JKV-76B	170496	Ring - Retaining	1
6JKV-25B	2123	Washer	1	Example	Example	Key (Furnished with Motor)	1
6JKV-26B	4327	Knob	1	6JKV-78B	167327	Bearing - Ball	1
6JKV-27B	4331	Plate	1	6JKV-79B	173872	Pulley	1
6JKV-28B	2332	Screw	1	6JKV-80B	166819	Spring	1
6JKV-29B	2008	Plug	1	6JKV-81B	3223	Fitting - Lubrication	1
6JKV-30B	176253	Shoe - Brake	2	6JKV-82B	171363	Ring - Retaining	1
6JKV-31B	175395	Plunger	1	6JKV-83B	167330	Sleeve	1
6JKV-32B	2301	Screw	1	6JKV-84B	167323	Sleeve - Bearing	1
6JKV-33B	173888	Spring	1	6JKV-85B	167326	Retainer	1
6JKV-34B	3399	Screw	2	6JKV-86B	167325	Bearing - Ball	1
6JKV-37B	167344	Gear	1	6JKV-87B	239553	Ring - Retaining	2
	158587	60 Cycle	1	6JKV-88B	167328	Retainer	1
6JKV-38B	167346	Pin - Gear	1	6JKV-89B	260528	Ring - Retaining	1
6JKV-39B	3279	Key	1	6JKV-90B	167315	Pulley	1
6JKV-40B	167343	Sleeve	1	6JKV-91B	141016	Ring - "O"	1
6JKV-41B	167480	Handle	1	6JKV-92B	167316	Pulley	1
6JKV-42C	147822	Pin - Roll	1	6JKV-93B	3280	Key	1
6JKV-43B	167317	Stud - Spinning Knob	1	6JKV-94B	2371	Screw	3
6JKV-44B	175397	Dial - Plastic	1	6JKV-95B	167310	Retainer	1
	175272	60 Cycle	1	6JKV-96B	118579	Ring - Retaining	1
6JKV-45B	167486	Pin - Roll	1	6JKV-97B	158594	Bearing	1
6JKV-46B	167347	Sleeve	1	6JKV-98B	175398	Gear - Helical	1
6JKV-47B	2371	Screw	3	6JKV-99B	3346	Screw	2
6JKV-48B	167345	Shaft - Gear	1	6JKV-482B	154761	Screw	1
				6JKV-484B	188833	Spacer	1
				6JKV-485B	172444	Screw	2

* When ordering specify H. P., frame size, voltage and cycle.

Bearings upper 6006 } July 7/87
lower 6008 }

Serial #

6J4V5M-121

RVS 483-10

Diagram #
B176290

NTN BEARINGS
8006 LLUNR/2A 93-11

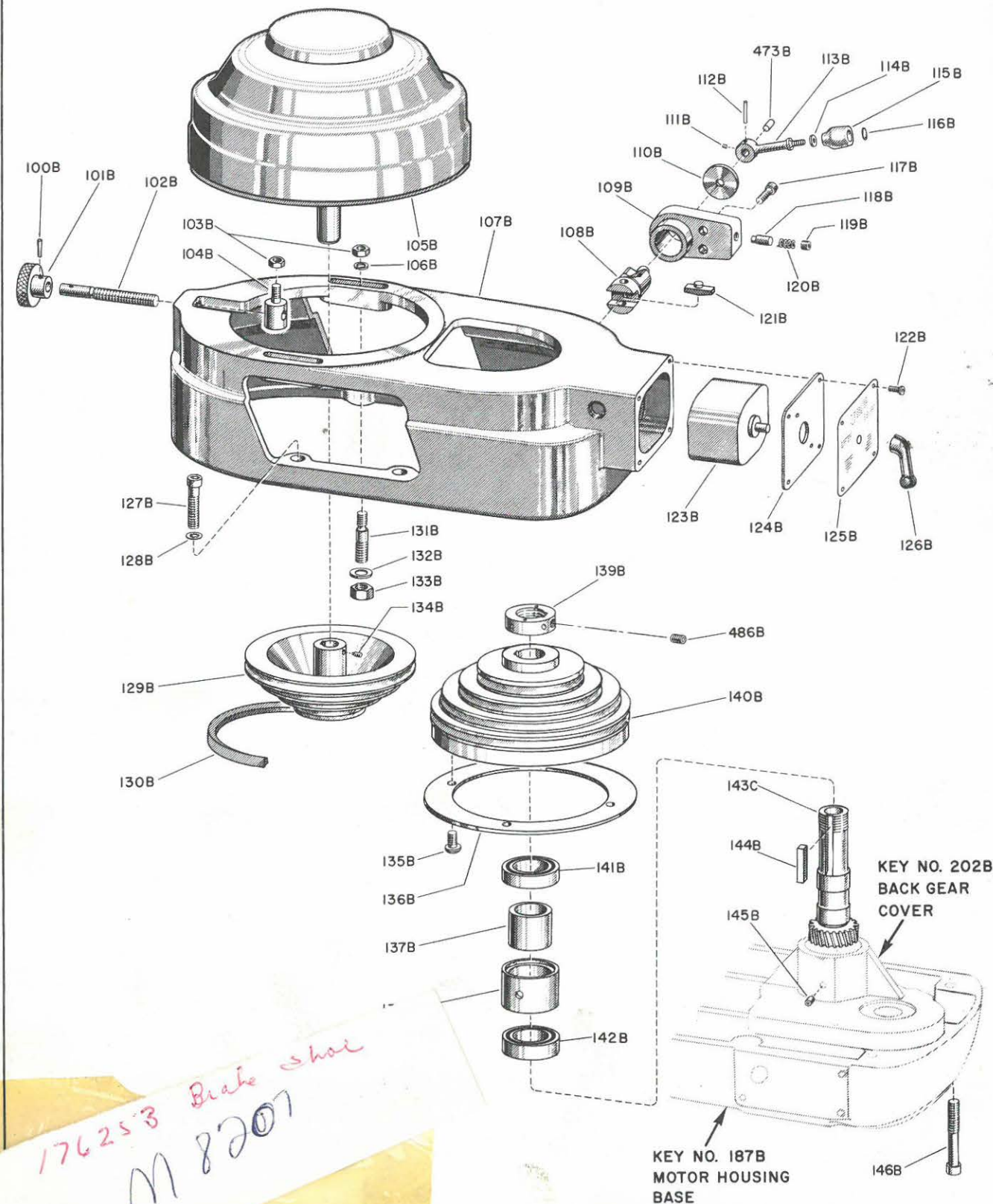
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028

VARI-SPEED HEAD
AND OVERARM

I-E MOTOR HOUSING AND VEE BELT DRIVE



WA1345

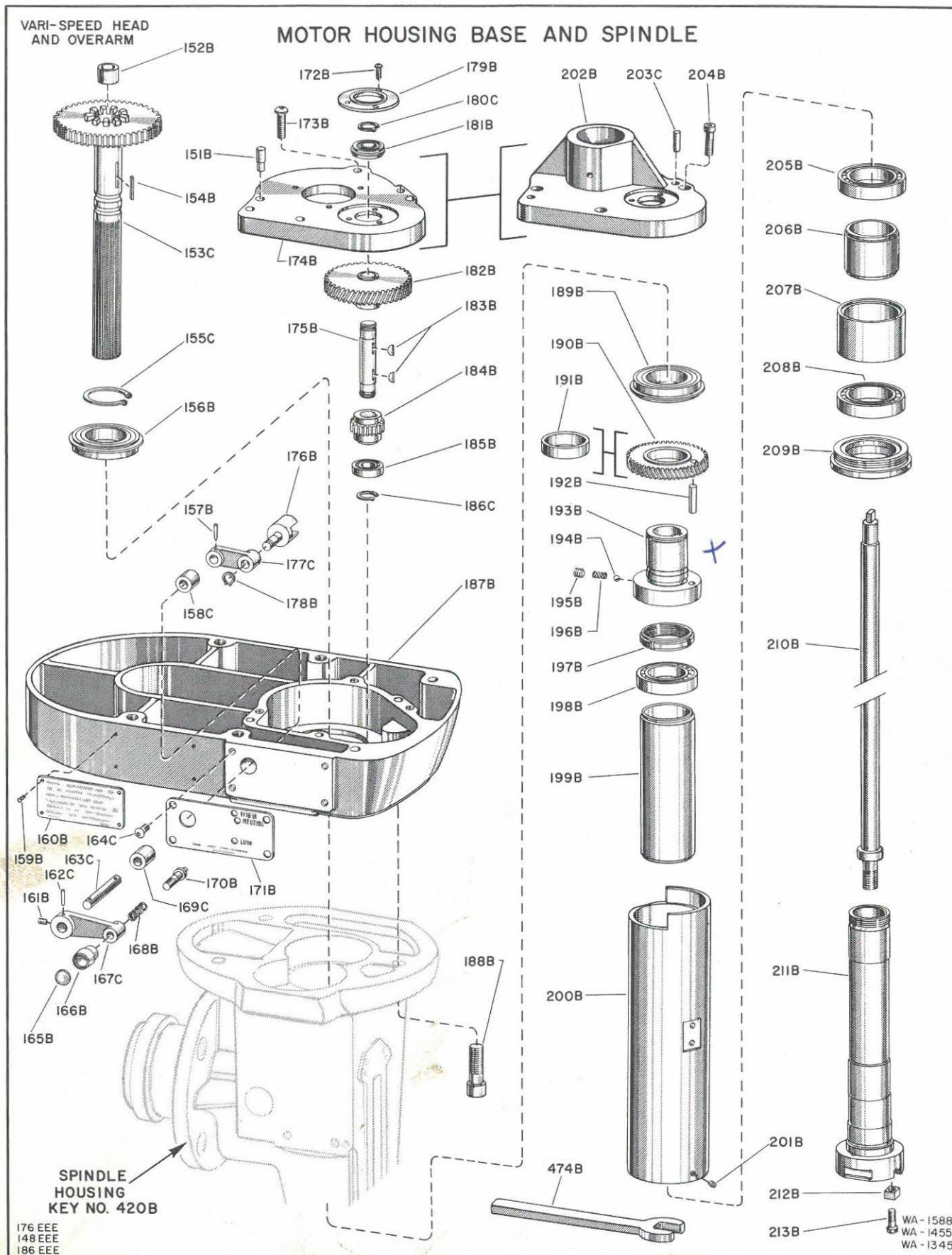
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VARI-SPEED HEAD AND OVERARM - UNIT No. 6JKV (Continued)

STYLE I-E

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-100B	141	Pin - Roll	1	6JKV-126B	148189	Handle - Switch Drum	1
6JKV-101B	240480	Knob - Knurled	1	6JKV-127B	3405	Screw.	4
6JKV-102B	175390	Shaft - Adjustable	1	6JKV-128B	2038	Washer	4
6JKV-103B	3473	Nut	3	6JKV-129B	175385	Pulley	1
6JKV-104B	175387	Nut	1	6JKV-130B	175391	Belt - Vee	1
6JKV-105B	Example	Motor (*)	2	6JKV-131B	175389	Stud - Motor	2
6JKV-106B	2135	Washer	1	6JKV-132B	3442	Washer	2
6JKV-107B	175375	Housing	1	6JKV-133B	3479	Nut	2
6JKV-108B	176254	Shaft - Brake	1	6JKV-134B	2343	Screw.	1
6JKV-109B	175386	Bracket - Brake	1	6JKV-135B	2370	Screw.	4
6JKV-110B	167471	Washer	1	6JKV-136B	175392	Plate - Brake	1
6JKV-111B	2330	Screw.	1	6JKV-137B	175378	Spacer - Inner, Bearing	1
6JKV-112B	152449	Pin - Roll	1	6JKV-138B	175377	Spacer - Outer, Bearing	1
6JKV-113B	158617	Handle	1	6JKV-139B	4245	Nut - Lock	1
6JKV-114B	2123	Washer	1	6JKV-140B	175384	Pulley	1
6JKV-115B	4327	Knob	1	6JKV-141B	152813	Bearing - Ball	1
6JKV-116B	4331	Plate - Knob	1	6JKV-142B	152813	Bearing - Ball	1
6JKV-117B	3399	Screw.	2	6JKV-143C		Gear - Helical	1
6JKV-118B	175395	Plunger	1		175379	60 Cycle	1
6JKV-119B	2301	Screw.	1		175380	60 Cycle	1
6JKV-120B	173888	Spring	1		175522	50 Cycle	1
6JKV-121B	176253	Shoe - Brake	1		167312	50 Cycle	1
6JKV-122B	2369	Screw.	4	6JKV-144B	963	Key	1
6JKV-123B	148189	Switch - Drum	1	6JKV-145B	175388	Pin	1
6JKV-124B	175393	Plate - Switch	1	6JKV-146B	3346	Screw.	2
6JKV-125B	175394	Plate - Direction	1	6JKV-473B	152307	Plug	1
				6JKV-486B	2282	Screw.	1

* When ordering specify H. P., frame size, voltage and cycle.

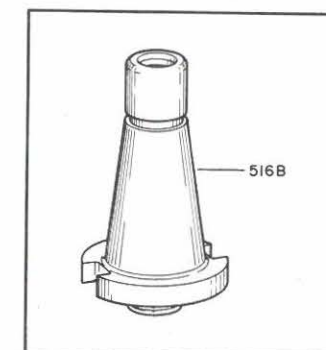


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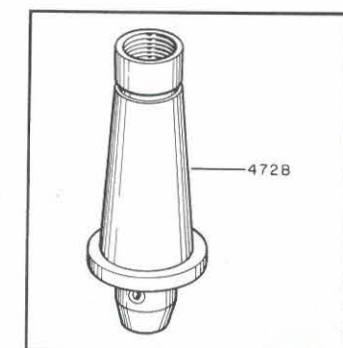
VARI-SPEED HEAD AND OVERARM - UNIT No. 6JKV (Continued)
STYLE 1-D AND 1-E

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-151B	1664	Pin (1-D Head Only)	2	6JKV-188B	1929	Screw	3
6JKV-152B	167454	Bushing - Oilite	1	6JKV-189B	145424	Bearing - Ball	1
6JKV-153C	180271	Shaft	1	6JKV-190B	158572	Gear - Helical (Power Feed Only)	1
6JKV-154B	3447	Key	1	6JKV-191B	172704	Bushing (Manual Feed Only)	1
6JKV-155C	150954	Ring - Retaining	1	6JKV-192B	147821	Pin (Power Feed Only)	1
6JKV-156B	145424	Bearing - Ball	1	6JKV-193B	158573	Sleeve - Detent	1
6JKV-157B	140	Pin	1	6JKV-194B	30060	Ball	1
6JKV-158C	180213	Bushing	1	6JKV-195B	1213	Screw	1
6JKV-159B	2263	Screw - Drive	4	6JKV-196B	100239	Spring	1
6JKV-160B	172730	Plate - Instruction, Grease	1	6JKV-197B	158583	Nut - Lock, Bearing	1
6JKV-161B	2339	Screw	1	6JKV-198B	158592	Bearing - Ball	1
6JKV-162C	140	Pin	1	6JKV-199B	158574	Spacer	1
6JKV-163C	180212	Shaft	1	6JKV-200B	167493	Quill	1
6JKV-164C	2369	Screw	4	6JKV-201B	2339	Screw	1
6JKV-165B	4331	Plate	1	6JKV-202B	175376	Cover - Back Gear (1-E Head Only)	1
6JKV-166B	4327	Knob	1	6JKV-203C	1664	Pin (1-E Head Only)	1
6JKV-167C	180219	Lever - Shifter	1	6JKV-204B	3266	Screw (1-E Head Only)	4
6JKV-168B	151493	Spring	1	6JKV-205B	158590	Bearing - Ball	1
6JKV-169C	180213	Bushing	1	6JKV-206B	158650	Spacer - Inner	1
6JKV-170B	151486	Pin - Detent	1	6JKV-207B	158584	Spacer - Outer	1
6JKV-171B	167457	English	1	6JKV-208B	158590	Bearing - Ball	1
6JKV-172B	2368	Screw	3	6JKV-209B	167509	Nut - Lock	1
6JKV-173B	2378	Screw (1-D Head Only)	4	6JKV-210B	171369	Bar - Draw	1
6JKV-174B	167314	Cover - Back Gear (1-D Head Only)	1		175383	1-D Head	1
6JKV-175B	167309	Shaft - Spur Gear	1		167342	1-E Head	1
6JKV-176B	161745	Shifter - Back Gear	1	6JKV-211B	167342	Spindle	1
6JKV-177C	180225	Arm, Shifter	1	6JKV-212B	94602	Key	2
6JKV-178B	123820	Ring - Truarc	1	6JKV-213B	3484	Screw	2
6JKV-179B	167313	Retainer	1	6JKV-472B		Holder - End Mill (No. 40 Std. Taper)	
6JKV-180C	144894	Ring - Retaining	1		179037	3/16" Dia. Hole	1
6JKV-181B	161748	Bearing - Ball	1		179038	3/8" Dia. Hole	1
6JKV-182B		Gear - Helical			179039	1/2" Dia. Hole	1
	175380	60 Cycle	1		179040	5/8" Dia. Hole	1
	167312	50 Cycle	1		179041	3/4" Dia. Hole	1
6JKV-183B	3280	Key	2		179042	7/8" Dia. Hole	1
6JKV-184B	167311	Gear - Spur	1		179043	1" Dia. Hole	1
6JKV-185B	158593	Bearing - Ball	1		179044	1-1/4" Dia. Hole	1
6JKV-186C	144894	Ring - Retaining	1	6JKV-474B	176268	Wrench	1
6JKV-187B		Base - Motor Housing		6JKV-516B		Adapter	
	167338	1-D Head	1		189886	#3 Craley Head	1
	178254	1-E Head	1		189885	#0 Craley Head	1

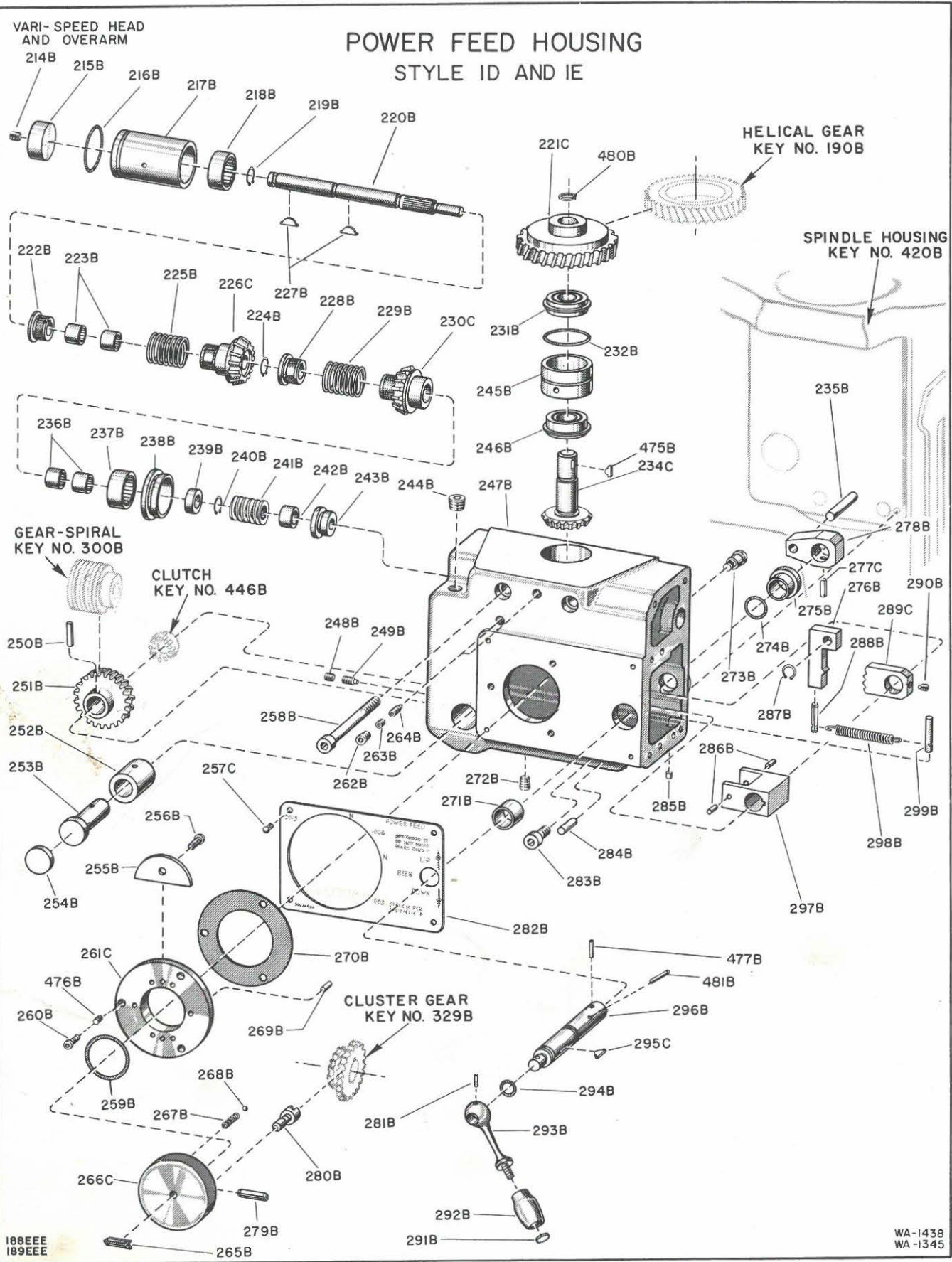
ADAPTER-NO. 3 CRALEY HEAD



END MILL HOLDER



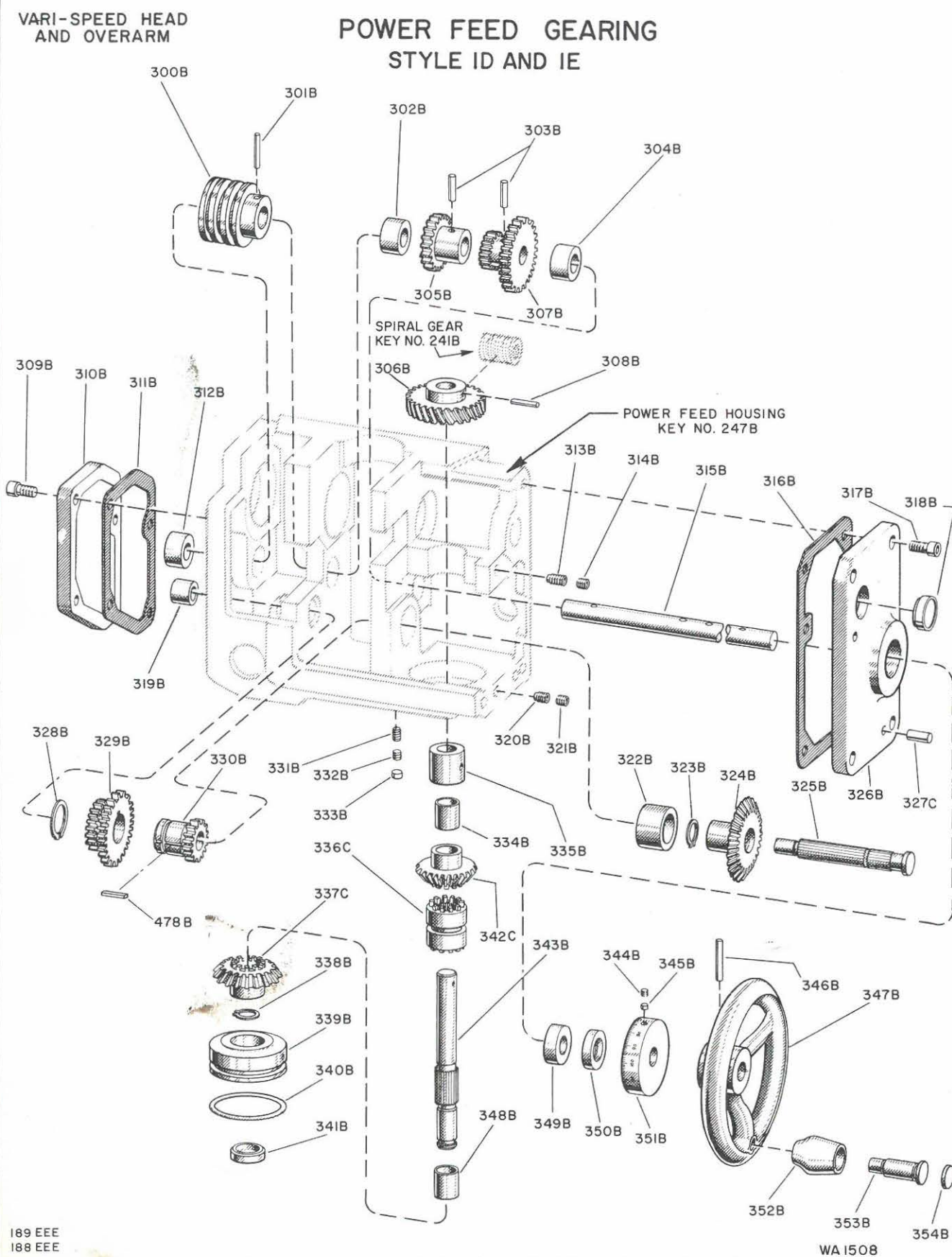
For Collets, Chucks, Boring Bar Heads, Boring Bars, see page 36



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

VARI-SPEED HEAD AND OVERARM - UNIT No. 6JKV (Continued)
STYLE 1-D AND 1-E

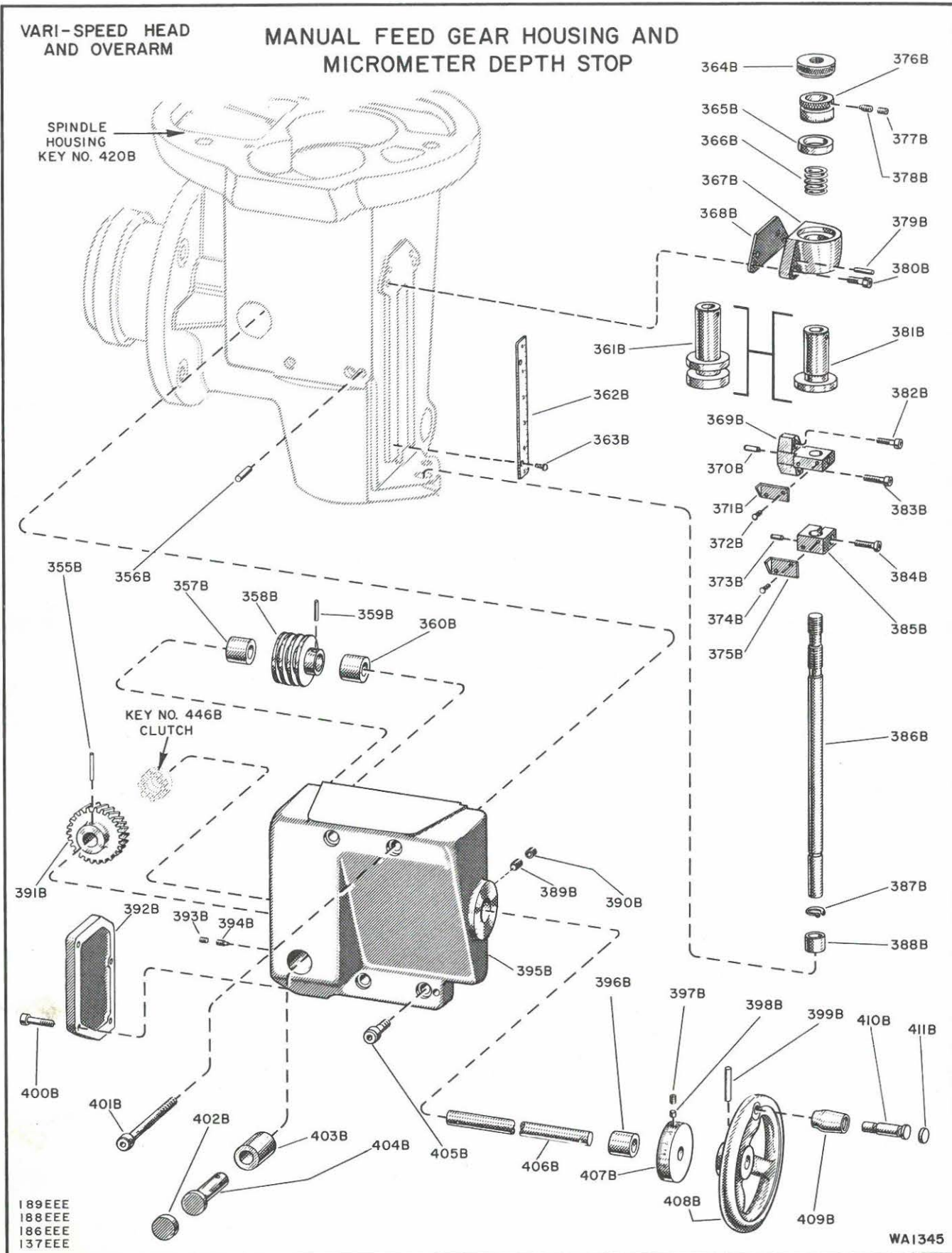
Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-214B	2301	Screw.	1	6JKV-260B	170495	Screw.	3
6JKV-215B	110389	Plug	1	6JKV-261C	178252	Bushing - Pinion	1
6JKV-216B	166229	Ring	1	6JKV-262B	76644	Plug	2
6JKV-217B	166228	Sleeve	1	6JKV-263B	2332	Screw.	2
6JKV-218B	79526	Bearing	1	6JKV-264B	3229	Screw.	2
6JKV-219B	140228	Ring	1	6JKV-265B	3338	Arrow	1
6JKV-220B	170475	Shaft	1	6JKV-266C	178253	Knob - Gear Shift	1
6JKV-221C	184669	Gear - Helical	1	6JKV-267B	237417	Spring	2
6JKV-222B	158697	Hub	1	6JKV-268B	218832	Ball	2
6JKV-223B	116965	Bearing	2	6JKV-269B	3539	Pin	1
6JKV-224B	140228	Ring	1	6JKV-270B	172722	Gasket - Detent	1
6JKV-225B	158696	Spring - Clutch	1	6JKV-271B	166246	Bushing - Pinion	1
6JKV-226C	173333	Gear - Bevel	1	6JKV-272B	76644	Plug	1
6JKV-227B	3279	Key	2	6JKV-273B	166450	Shaft	1
6JKV-228B	158697	Hub	1	6JKV-274B	246308	Ring	1
6JKV-229B	158696	Spring - Clutch	1	6JKV-275B	173341	Bushing - Bronze	1
6JKV-230C	173332	Gear - Bevel	1	6JKV-276B	166451	Arm - Detent	1
6JKV-231B	161748	Bearing - Ball	1	6JKV-277C	163118	Pin - Roll	1
6JKV-232B	166233	Ring	1	6JKV-278B	173339	Arm - Shifting	1
6JKV-234C	184668	Gear - Bevel	1	6JKV-279B	154160	Pin - Roll	1
6JKV-235B	173331	Pin	1	6JKV-280B	173313	Fork - Gear Shift	1
6JKV-236B	116965	Bearing	2	6JKV-281B	152449	Pin - Roll	1
6JKV-237B	79526	Bearing	1	6JKV-282B	169445	Plate - Instruction, English	1
6JKV-238B	166227	Bushing - Pinion	1	6JKV-283B	3399	Screw.	2
6JKV-239B	158601	Spacer	1	6JKV-284B	3543	Pin	1
6JKV-240B	140228	Ring	1	6JKV-285B	1844	Plug	1
6JKV-241B	170477	Gear - Spiral	1	6JKV-286B	158618	Pin	1
6JKV-242B	170476	Bearing	1	6JKV-287B	253007	Ring	1
6JKV-243B	170488	Bushing - Pinion	1	6JKV-288B	166249	Pin	1
6JKV-244B	76645	Plug	1	6JKV-289C	178275	Detent	1
6JKV-245B	166232	Sleeve	1	6JKV-290B	106035	Screw - Dog Point	1
6JKV-246B	161748	Bearing - Ball	1	6JKV-291B	4331	Plate	1
6JKV-247B	166203	Housing	1	6JKV-292B	4327	Knob	1
6JKV-248B	2332	Screw.	1	6JKV-293B	158617	Lever	1
6JKV-249B	3228	Screw.	1	6JKV-294B	247090	Ring	1
6JKV-250B	147865	Pin - Roll	1	6JKV-295	32	Key	1
6JKV-251B	171388	Gear - Spiral	1	6JKV-296B	173342	Shaft - Shifting	1
6JKV-252B	166238	Bushing	1	6JKV-297B	173340	Fork - Clutch Shifting	1
6JKV-253B	166239	Shaft	1	6JKV-298B	166248	Spring	1
6JKV-254B	34387	Plug	1	6JKV-299B	98826	Pin	1
6JKV-255B	172721	Plate - Stop	1	6JKV-475B	3279	Key	1
6JKV-256B	2364	Screw.	1	6JKV-476B	76645	Plug	1
6JKV-257C	149521	Screw.	1	6JKV-477B	163118	Pin	1
6JKV-258B	3175	Screw.	2	6JKV-480B	240852	Ring - Retaining	1
6JKV-259B	169447	Ring	1	6JKV-481B	152449	Pin - Roll	1



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

VARI-SPEED HEAD AND OVERARM - UNIT No. 6JKV (Continued)
STYLE 1-D AND 1-E

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-300B	170487	Gear - Spiral	1	6JKV-329B	170492	Gear - Cluster.	1
6JKV-301B	150577	Pin - Roll	1	6JKV-330B	170491	Gear - Driving.	1
6JKV-302B	170486	Bushing - Pinion	1	6JKV-331B	3229	Screw.	1
6JKV-303B	150577	Pin - Roll	2	6JKV-332B	2332	Screw.	1
6JKV-304B	170483	Bushing - Pinion	1	6JKV-333B	76644	Plug	1
6JKV-305B	170484	Gear - Driven	1	6JKV-334B	259598	Bushing - Pinion	1
6JKV-306B	170478	Gear - Spiral	1	6JKV-335B	166205	Bushing - Pinion	1
6JKV-307B	170485	Gear - Cluster.	1	6JKV-336C	173944	Clutch - Reversing	1
6JKV-308B	152449	Pin - Roll	1	6JKV-337C	173945	Gear - Bevel	1
6JKV-309B	3218	Screw.	4	6JKV-338B	236956	Ring	1
6JKV-310B	166225	Cover - Rear	1	6JKV-339B	166209	Sleeve	1
6JKV-311B	166475	Gasket - Rear	1	6JKV-340B	244178	Ring	1
6JKV-312B	170486	Bushing - Pinion	1	6JKV-341B	166211	Plug	1
6JKV-313B	3229	Screw.	1	6JKV-342C	173943	Gear - Bevel	1
6JKV-314B	2332	Screw.	1	6JKV-343B	166210	Shaft	1
6JKV-315B	170482	Shaft	1	6JKV-344B	2331	Screw.	1
6JKV-316B	166474	Gasket - Front.	1	6JKV-345B	1994	Plug	1
6JKV-317B	3218	Screw.	4	6JKV-346B	143319	Pin - Roll	1
6JKV-318B	143496	Gage - Oil	1	6JKV-347B	150815	Handwheel	1
6JKV-319B	170494	Bushing - Pinion	1	6JKV-348B	259598	Bushing - Pinion	1
6JKV-320B	3228	Screw.	1	6JKV-349B	166220	Bushing - Pinion	1
6JKV-321B	2332	Screw.	1	6JKV-350B	166219	Seal - Oil	1
6JKV-322B	170490	Bushing - Pinion	1	6JKV-351B		Dial - Hand Feed	1
6JKV-323B	236956	Ring	1		171384	English.	1
6JKV-324B	170489	Gear - Bevel	1		171385	Metric	1
6JKV-325B	170493	Shaft	1	6JKV-352B	166214	Knob	1
6JKV-326B	166217	Cover - Front.	1	6JKV-353B	166213	Shaft	1
6JKV-327C	3431	Pin - Roll	2	6JKV-354B	4331	Plate	1
6JKV-328B	248065	Ring	1	6JKV-478B	101327	Key	1



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

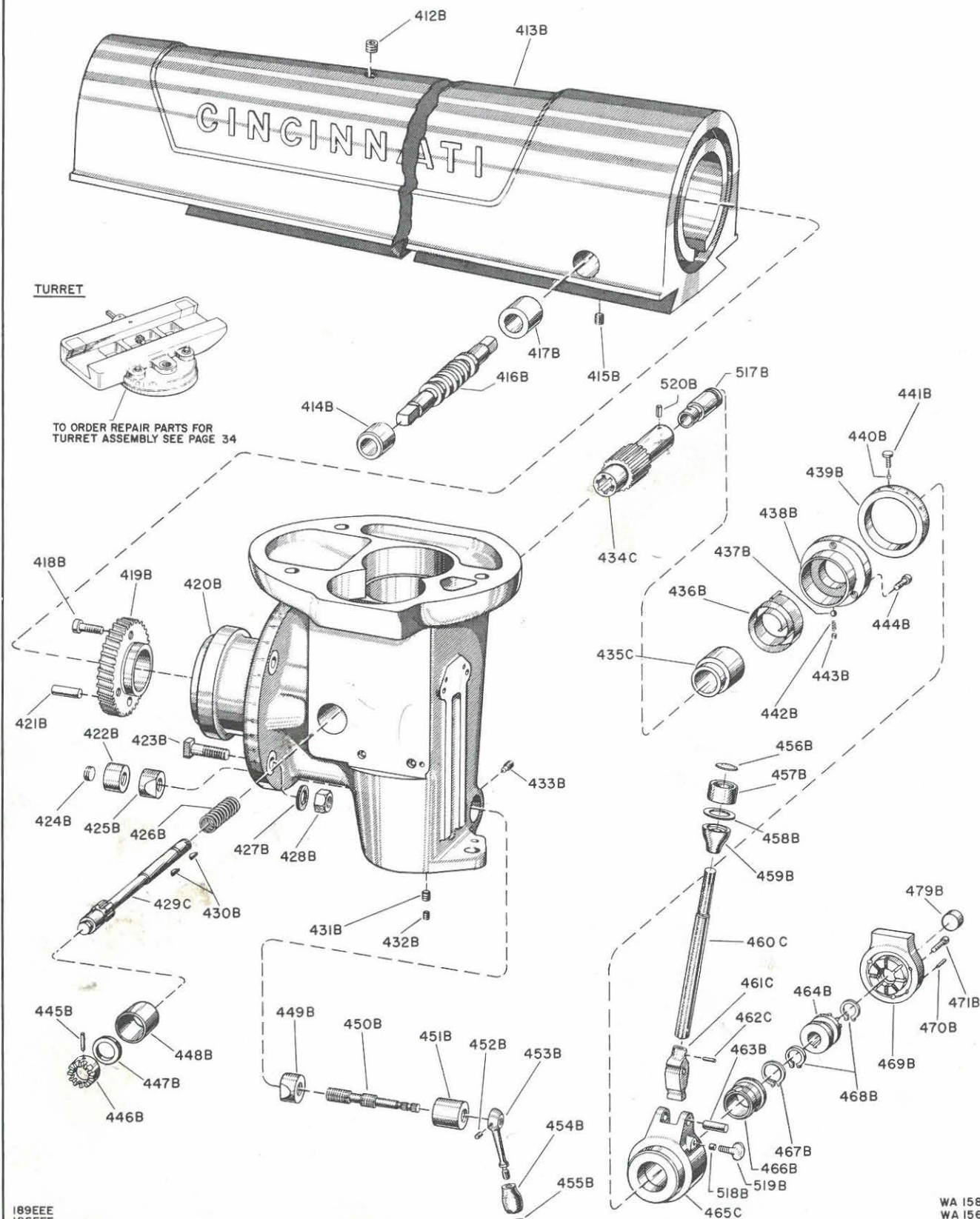
VARI SPEED HEAD AND OVERARM UNIT No. 6JKV (Continued)
STYLE 1-D AND 1-E

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-355B	147865	*Pin - Roll	1	6JKV-382B	124975	Screw.	1
6JKV-356B	3543	*Pin	1	6JKV-383B	3396	Screw.	1
6JKV-357B	170486	*Bushing	1	6JKV-384B	3204	Screw.	1
6JKV-358B	170487	*Gear - Spiral	1	6JKV-385B	165674	Block - Pointer	1
6JKV-359B	150577	*Pin - Roll	1	6JKV-386B	165680	Shaft	1
6JKV-360B	170486	*Bushing	1	6JKV-387B	236956	Ring - Truarc	1
6JKV-361B	171360	Bushing (Power Feed Only)	1	6JKV-388B	165677	Bearing	1
6JKV-362B	173314	Scale - Depth	1	6JKV-389B	3229	*Screw.	3
	173315	English.	1	6JKV-390B	2332	*Screw.	3
6JKV-363B	3178	Metric	1	6JKV-391B	171388	*Gear - Spiral	1
6JKV-364B	165671	Screw.	2	6JKV-392B	166225	*Cover.	1
6JKV-365B	172701	Nut - Lock	1	6JKV-393B	2332	*Screw.	1
6JKV-366B	222029	*Washer	1	6JKV-394B	3228	*Screw.	1
6JKV-367B	171359	Spring	1	6JKV-395B	172700	*Housing - Gear	1
6JKV-368B	166476	Block	1	6JKV-396B	170486	*Bushing	1
6JKV-369B	165673	Shim	1	6JKV-397B	2331	*Screw.	1
6JKV-370B	266693	Bracket - Shaft	1	6JKV-398B	1994	*Plug - Brass	1
6JKV-371B	172717	Pin	1	6JKV-399B	143319	*Pin - Roll	1
6JKV-372B	3178	Pointer	1	6JKV-400B	3218	*Screw.	4
6JKV-373B	1406	Screw.	2	6JKV-401B	3175	*Screw.	2
6JKV-374B	3178	Pin	1	6JKV-402B	34387	*Plug	1
6JKV-375B	3178	Screw.	2	6JKV-403B	166238	*Bushing	1
		Pointer	2	6JKV-404B	166239	*Shaft	1
6JKV-376B	165675	Manual Feed	1	6JKV-405B	3266	*Screw.	2
	172741	Power Feed	1	6JKV-406B	172713	*Shaft	1
		Dial - Micrometer Stop	1	6JKV-407B		Dial - Hand Feed	1
	171361	English.	1		171384	*English	1
	171362	Metric	1		171385	*Metric	1
6JKV-377B	106035	Screw.	1	6JKV-408B	150815	*Handwheel	1
6JKV-378B	2330	Screw.	1	6JKV-409B	166214	*Knob - Spinning	1
6JKV-379B	3541	Pin	2	6JKV-410B	166213	*Shaft	1
6JKV-380B	124975	Screw.	2	6JKV-411B	4331	*Plate	1
6JKV-381B	172703	*Bushing	1				

* Manual Feed Only.

VARI-SPEED HEAD
AND OVERARM

SPINDLE HOUSING AND OVERARM



WA 1587
WA 1561

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

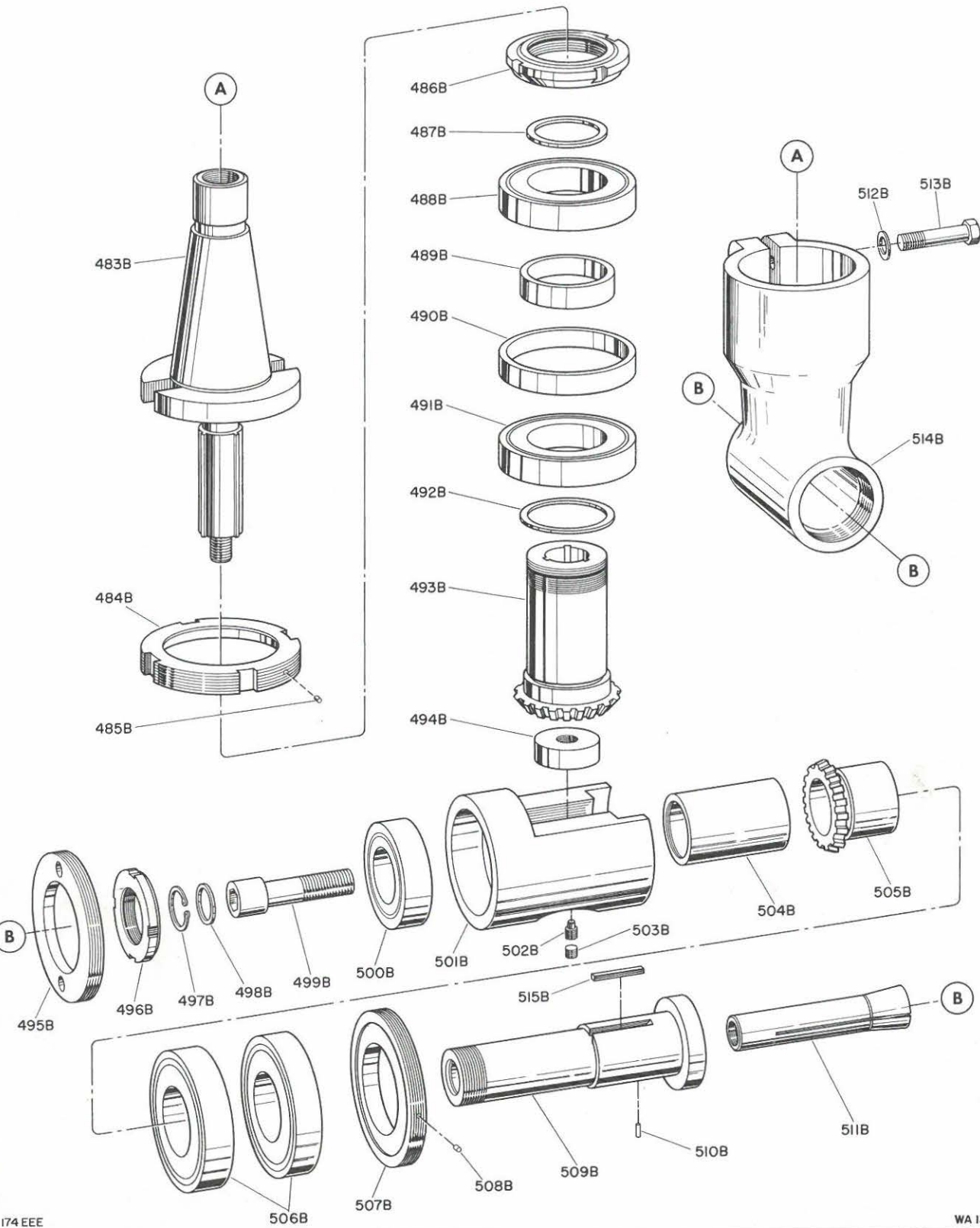
VARI - SPEED HEAD AND OVERARM - UNIT No. 6JKV(Continued)
STYLE 1-D AND 1-E

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKV-412B	2248	Screw	1	6JKV-444B	3246	Screw	3
6JKV-413B	161756	Overarm	1	6JKV-445B	154160	Pin - Roll	1
6JKV-414B	161755	Bushing	1	6JKV-446B	171387	Clutch	1
6JKV-415B	105147	Screw	2	6JKV-447C	239066	Seal - Oil	1
6JKV-416B	148623	Shaft - Spiral	1	6JKV-448B	169418	Bushing - Pinion	1
6JKV-417B	148624	Bushing	1	6JKV-449B	167464	Clamp - Quill, L.H. Thread	1
6JKV-418B	2321	Screw	3	6JKV-450B	167462	Screw - Quill Clamp	1
6JKV-419B	143235	Gear - Spiral	1	6JKV-451B	167461	Bushing - Quill Clamp	1
6JKV-420B	167339	Housing - Spindle	1	6JKV-452B	2339	Screw	1
6JKV-421B	1383	Pin	1	6JKV-453B	167463	Lever - Quill Clamp	1
6JKV-422B	167460	Plug	1	6JKV-454B	4327	Knob	1
6JKV-423B	3311	Bolt - Tee	4	6JKV-455B	4331	Plate	1
6JKV-424B	2301	Screw	1	6JKV-456B	4341	Plate - Name	1
6JKV-425B	167465	Clamp - Quill, R.H. Thread	1	6JKV-457B	4356	Knob - Lever	1
6JKV-426B	169416	Spring	1	6JKV-458B	4357	Washer	1
6JKV-427B	3442	Washer	4	6JKV-459B	168055	Knob - Lever	1
6JKV-428B	3479	Nut	4	6JKV-460C	608675	Lever - Hand Feed	1
6JKV-429C	189612	Shaft	1	6JKV-461C	178286	Shifter	1
6JKV-430B	3280	Key	2	6JKV-462C	163118	Pin - Roll	1
6JKV-431B	2301	Screw	1	6JKV-463B	173307	Pin - Roll	1
6JKV-432B	2332	Screw	1	6JKV-464B	169412	Clutch	1
6JKV-433B	3228	Screw	2	6JKV-465B	171370	Hub	1
6JKV-434C	189613	Pinion	1	6JKV-466B	171375	Bushing - Detent	1
6JKV-435C	189615	Bushing - Pinion	1	6JKV-467B	158682	Ring - Truarc	1
6JKV-436B	158699	Spring	1	6JKV-468B	240852	Ring - Truarc	2
6JKV-437B	2290	Ball	1	6JKV-469B	171380	Cover - Hub	1
6JKV-438B	169415	Housing - Spring	1	6JKV-470B	3541	Pin	1
6JKV-439B	169413	Dial - Hand Feed	1	6JKV-471B	251177	Screw	3
	169414	English	1	6JKV-479B	3530	Plug	1
	1550	Metric	1	6JKV-517B	189614	Shaft - Spring	1
6JKV-440B	109182	Plug	1	6JKV-518B	2008	Plug	1
6JKV-441B	718	Screw	1	6JKV-519B	61	Screw - Thumb	1
6JKV-442B	170510	Spring	1	6JKV-520B	76119	Pin	1
6JKV-443B		Screw	1				

VARI-SPEED HEAD
AND OVERARM

RIGHT ANGLE ATTACHMENT

STYLE I-D



174 EEE

WA 1345

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

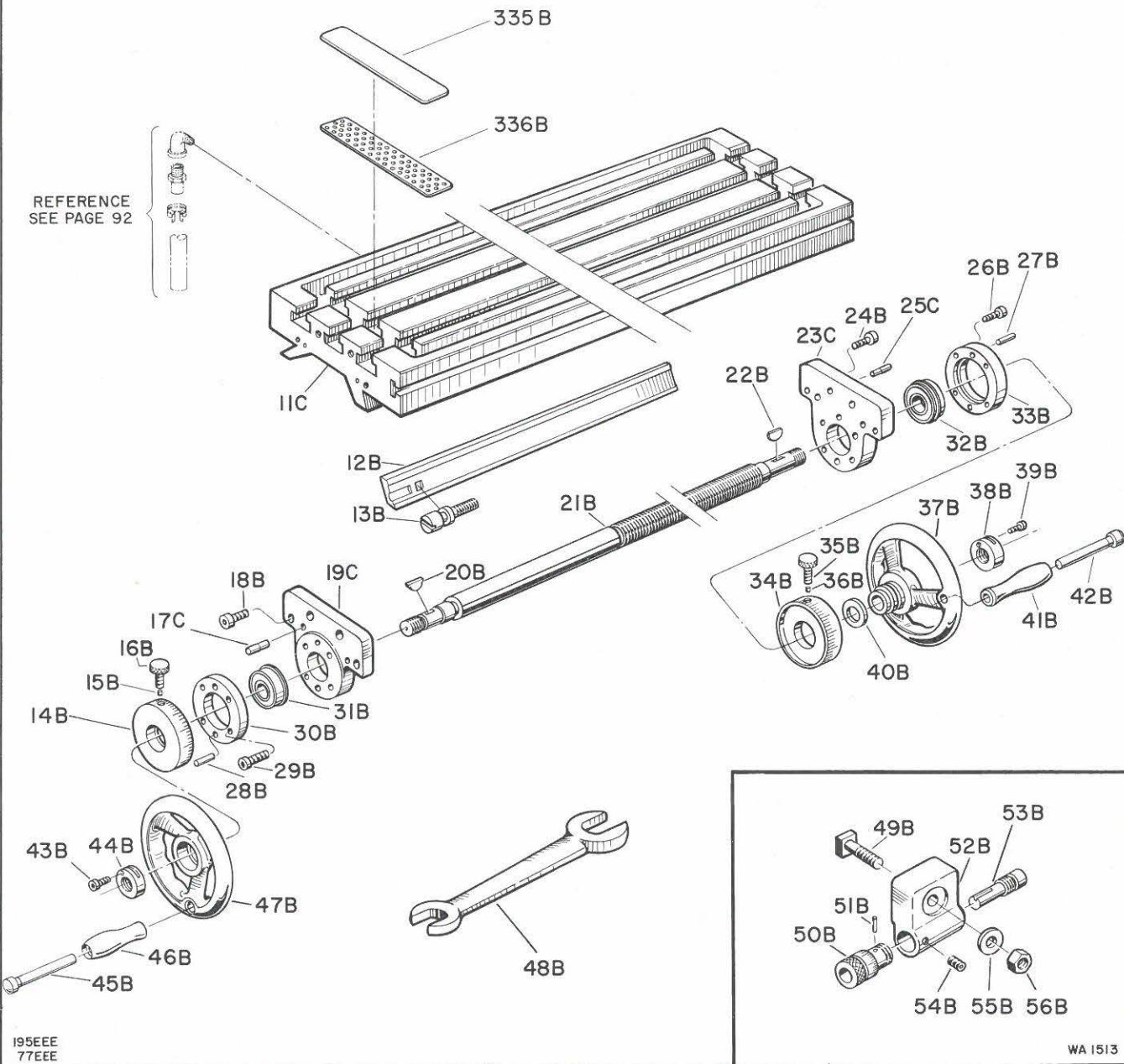
VARI SPEED HEAD AND OVERARM UNIT No. 6JKV(Concluded)

STYLE I-D

KEY NO.	PART NO.	PART NAME	AMT. USED	KEY NO.	PART NO.	PART NAME	AMT. USED
6JKV-483B	179729	Adapter	1	6JKV-500B	158539	Bearing	1
6JKV-484B	179730	Retainer - Bearing	1	6JKV-501B	179740	Sleeve - Bearing Retainer	1
6JKV-485B	282982	Plug - Nylon	1	6JKV-502B	3228	Screw	1
6JKV-486B	177067	Nut - Self Locking	1	6JKV-503B	2354	Screw	1
6JKV-487B	179737	Washer	1	6JKV-504B	179741	Spacer	1
6JKV-488B	153807	Bearing	1	6JKV-505B	181963	Gear - Bevel	1
6JKV-489B	179731	Spacer	1	6JKV-506B	152362	Bearing	2
6JKV-490B	179732	Spacer	1	6JKV-507B	179739	Retainer, Spindle	1
6JKV-491B	153807	Bearing	1	6JKV-508B	282982	Plug, Nylon	1
6JKV-492B	179734	Washer	1	6JKV-509B	179735	Spindle	1
6JKV-493B	181964	Pinion - Bevel	1	6JKV-510B	710699	Pin	1
6JKV-494B	73411	Plug	1	6JKV-511B	179736	Collet	1
6JKV-495B	179739	Retainer, Spindle	1	6JKV-512B	3442	Washer	1
6JKV-496B	606854	Nut - Bearing Lock	1	6JKV-513B	3444	Screw	1
6JKV-497B	125313	Ring - Retaining	1	6JKV-514B	179728	Housing	1
6JKV-498B	186605	Washer	1	6JKV-515B	864	Key	1
6JKV-499B	179378	Screw	1				

SADDLE TABLE

TABLE AND LEADSCREW
WITH OR WITHOUT POWERFEED



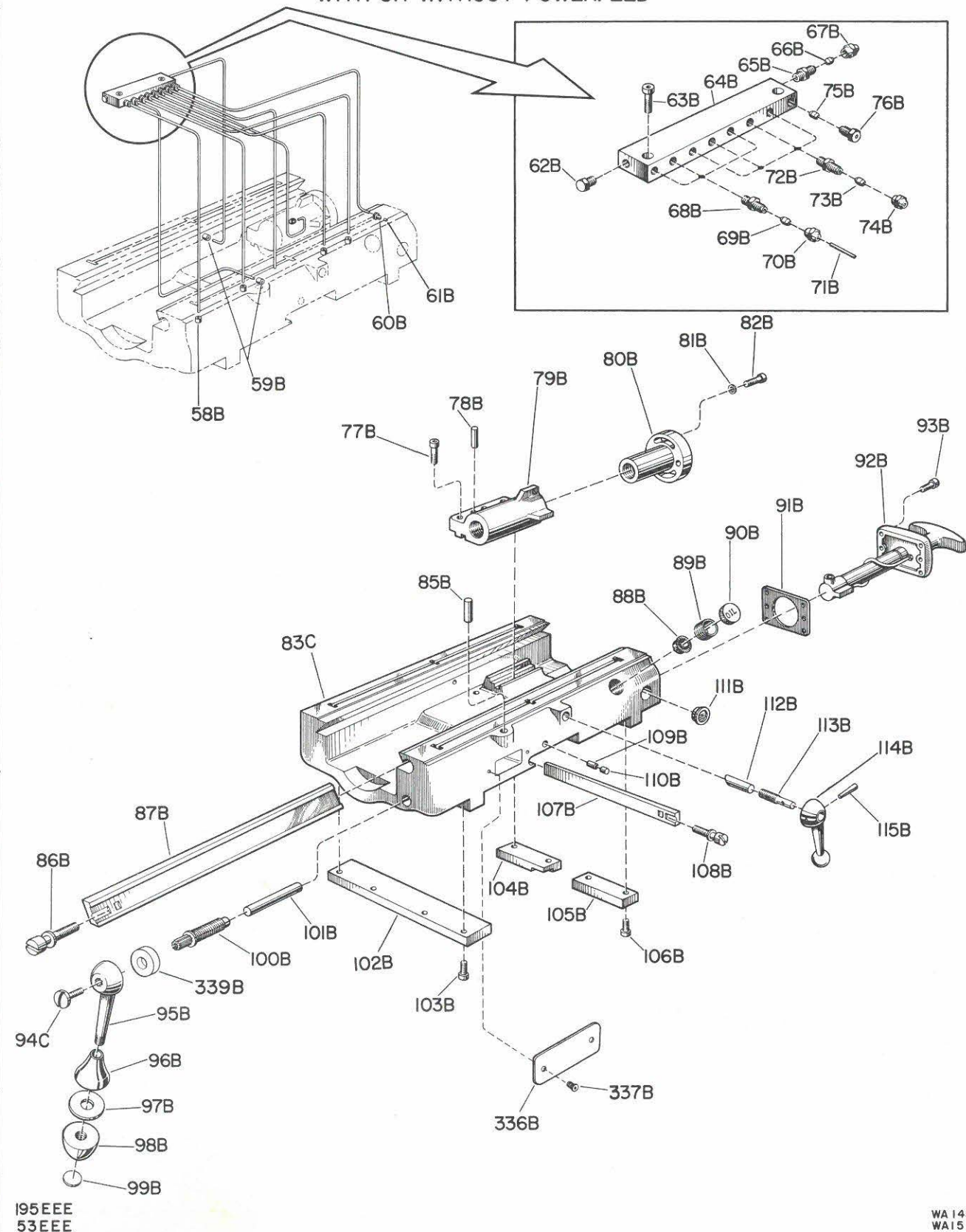
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

SADDLE TABLE - UNIT No. 6JH
WITH OR WITHOUT POWERFEED TO TABLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JH-11C	184681	Table - With or w/o Powerfeed to Table	1	6JH-30B	143374	Retainer - Bearing	1
	184682	22" Travel	1	6JH-31B	143375	Bearing - Ball	1
6JH-12B		Gib - Table	1	6JH-32B	143376	Bearing - Ball	1
	153095	3/4" Counterbore (Standard)	1	6JH-33B	143374	Retainer - Bearing	1
	143356	5/8" Counterbore	1	6JH-34B		Dial - Feed, Long, With or w/o Powerfeed to Table	1
6JH-13B		Screw - Gib, Adjusting	1		143371	22" Table Travel (English)	1
	153092	3/4" Diameter Head (Standard)	1		143372	22" Table Travel (Metric)	1
	143293	5/8" Diameter Head	1	6JH-35B	94710	Screw - Thumb	1
6JH-14B		Dial - Feed, Long With or w/o Powerfeed to Table	1	6JH-36B	2008	Plug	1
	143371	22" Table Travel (English)	1	6JH-37B	157557	Handwheel - 7"	1
	143372	22" Table Travel (Metric)	1	6JH-38B	124501	Nut - Lock	1
6JH-15B	2008	Plug	1	6JH-39B	3202	Screw	1
6JH-16B	94710	Screw - Thumb	1	6JH-40B	143373	Spacer - Handwheel	1
6JH-17C	145428	Pin	2	6JH-41B	163680	Handle - Spool	1
6JH-18B	3400	Screw	4	6JH-42B	163689	Spool - Handle	1
6JH-19C	184683	Apron - Table w/o Powerfeed to Table	1	6JH-43B	3202	Screw	1
6JH-20B	679	Key	1	6JH-44B	124501	Nut - Lock	1
6JH-21B		Leadscrew	1	6JH-45B	163681	Stud - Handle	1
	143359	22" Table w/o Powerfeed, Eng. Soft	1	6JH-46B	163680	Handle - Spool	1
	143360	22" Table w/o Powerfeed, Metric Soft	1	6JH-47B	157557	Handwheel - 7"	1
	181987	22" Table w/o Powerfeed, Eng. Hard	1	6JH-48B	91898	Wrench	1
	157764	22" Table with Powerfeed, Eng. Soft	1	6JH-49B	3328	Bolt - Tee	2
	157763	22" Table with Powerfeed, Metric Soft	1	6JH-50B		Dial - Positive Stop	1
	181988	22" Table with Powerfeed, Eng. Hard	1		106576	English	2
	181990	28" Table w/o Powerfeed, Eng. Soft	1		124181	Metric	2
	181989	28" Table w/o Powerfeed, Eng. Hard	1	6JH-51B	201112	Pin	2
	181984	28" Table with Powerfeed, Eng. Soft	1	6JH-52B		Block - Stop, 22" - 28", w/o powerfeed	1
	181985	28" Table with Powerfeed, Eng. Hard	1		106579	Left Hand (w/o optical measuring)	1
6JH-22B	679	Key	1		173939	Left Hand (with optical measuring)	1
6JH-23C	184683	Apron - Table w/o Powerfeed to Table	1		106582	Right Hand (w/o optical measuring)	1
6JH-24B	3400	Screw	1		173938	Right Hand (with optical measuring)	1
6JH-25C	145428	Pin - Double Diameter	2	6JH-53B	106575	Screw - Stop Block	2
6JH-26B	2321	Screw	4	6JH-54B	103321	Screw - Set	2
6JH-27B	1383	Pin	2	6JH-55B	3441	Washer	2
6JH-28B	1383	Pin	2	6JH-56B	3478	Nut	2
6JH-29B	2321	Screw	4	6JH-335B	184690	Cover - Drain (without Coolant)	1
				6JP-336B	184689	Strainer - Drain, Coolant	1

SADDLE TABLE

SADDLE
WITH OR WITHOUT POWERFEED

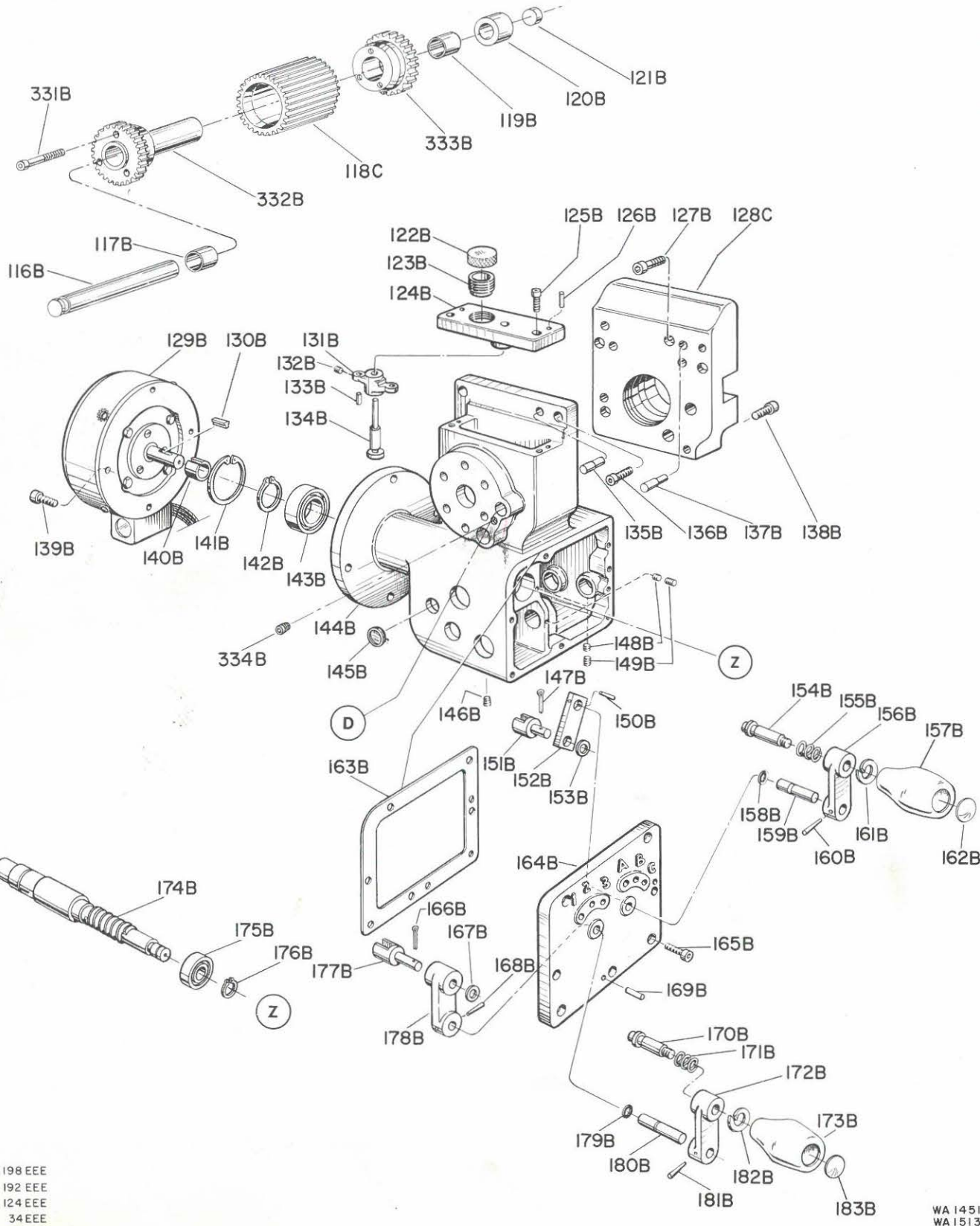


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

SADDLE TABLE - UNIT No. 6JH (Continued)
WITH OR WITHOUT POWERFEED TO TABLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JH-58B	77197	Bushing	6	6JH-88B	111460	Screen - One Shot.	1
6JH-59B	219984	Bushing	2	6JH-89B	3912	Nipple	1
6JH-60B	214300	Bushing - Compression	1	6JH-90B	3986	Cap - Oil Filler	1
6JH-61B	214304	Sleeve - Compression	1	6JH-91B	Example	Gasket (Supplied with Pump)	1
6JH-62B	77411	Plug	1	6JH-92B	96257	Pump - Lubricator	1
6JH-63B	3401	Screw.	2	6JH-93B	3218	Screw.	4
6JH-64B	112300	Block - Junction	1	6JH-94C	168192	Screw.	1
6JH-65B	77196	Plug - Drip	1	6JH-95B	170780	Lever.	1
6JH-66B	214304	Sleeve - Compression	1	6JH-96B	168055	Knob	1
6JH-67B	214294	Nut - Compression	1	6JH-97B	4358	Washer	1
6JH-68B	77196	Plug - Drip	3	6JH-98B	4356	Knob	1
6JH-69B	214304	Sleeve - Compression	3	6JH-99B	4333	Plate	1
6JH-70B	214294	Nut - Compression	3	6JH-100B	111378	Stud - Clamping	1
6JH-71B	158174	Tubing - List	1	6JH-101B	143353	Shoe - Clamping Saddle	1
6JH-72B	220004	Plug - Drip	4	6JH-102B		Clamp - Side, Long	
6JH-73B	214304	Sleeve - Compression	4		143355	(Without Cross Movement Precision Measuring Attachment)	1
6JH-74B	214294	Nut - Compression	4		143457	(With Cross Movement Precision Measuring Attachment)	
6JH-75B	214304	Sleeve - Compression	1	6JH-103B	3266	Screw.	4
6JH-76B	214300	Bushing - Compression	1	6JH-104B	160047	Clamp - R.H. Rear	1
6JH-77B	3401	Screw.	3	6JH-105B	143354	Clamp - Side, Short	1
6JH-78B	1385	Pin	1	6JH-106B	3266	Screw.	4
6JH-79B	143365	Nut - Leadscrew	1	6JH-107B	153094	Gib - Saddle	1
6JH-80B	143368	Nut - Leadscrew, Backlash Eliminator	1	6JH-108B	153092	Screw - Gib Adjusting	1
6JH-81B	3441	Washer	2	6JH-109B	219984	Bushing	2
6JH-82B	3400	Screw.	2	6JH-110B	2245	Plug	2
6JH-83C		Saddle - Table		6JH-111B	237701	Gage - Oil Sight	1
	177546	With or without Powerfeed 22" or 28"		6JH-112B	143352	Shoe - Clamping, Table.	1
		Table Travel (Without precision Longitudinal Measuring)	1	6JH-113B		Screw - Clamping	
	152370	With or without Powerfeed 22" or 28"			125645	Without Precision Long. Meas. Att.	1
		Table Travel (With Precision Longitudinal Measuring)	1		157070	With Precision Long. Meas. Att.	1
6JH-85B	143385	Pin - Positive Stop	1	6JH-114B	78907	Lever - Clamping, Saddle	1
6JH-86B	153092	Screw - Gib Adjusting	1	6JH-115B	141	Pin	1
6JH-87B	153095	Gib - Table	1	6JH-336B	177548	Cover (Without Power Feed)	1
				6JH-337B	3202	Screw (Without Power Feed)	2

SADDLE TABLE
TABLE POWERFEED GEAR HOUSING

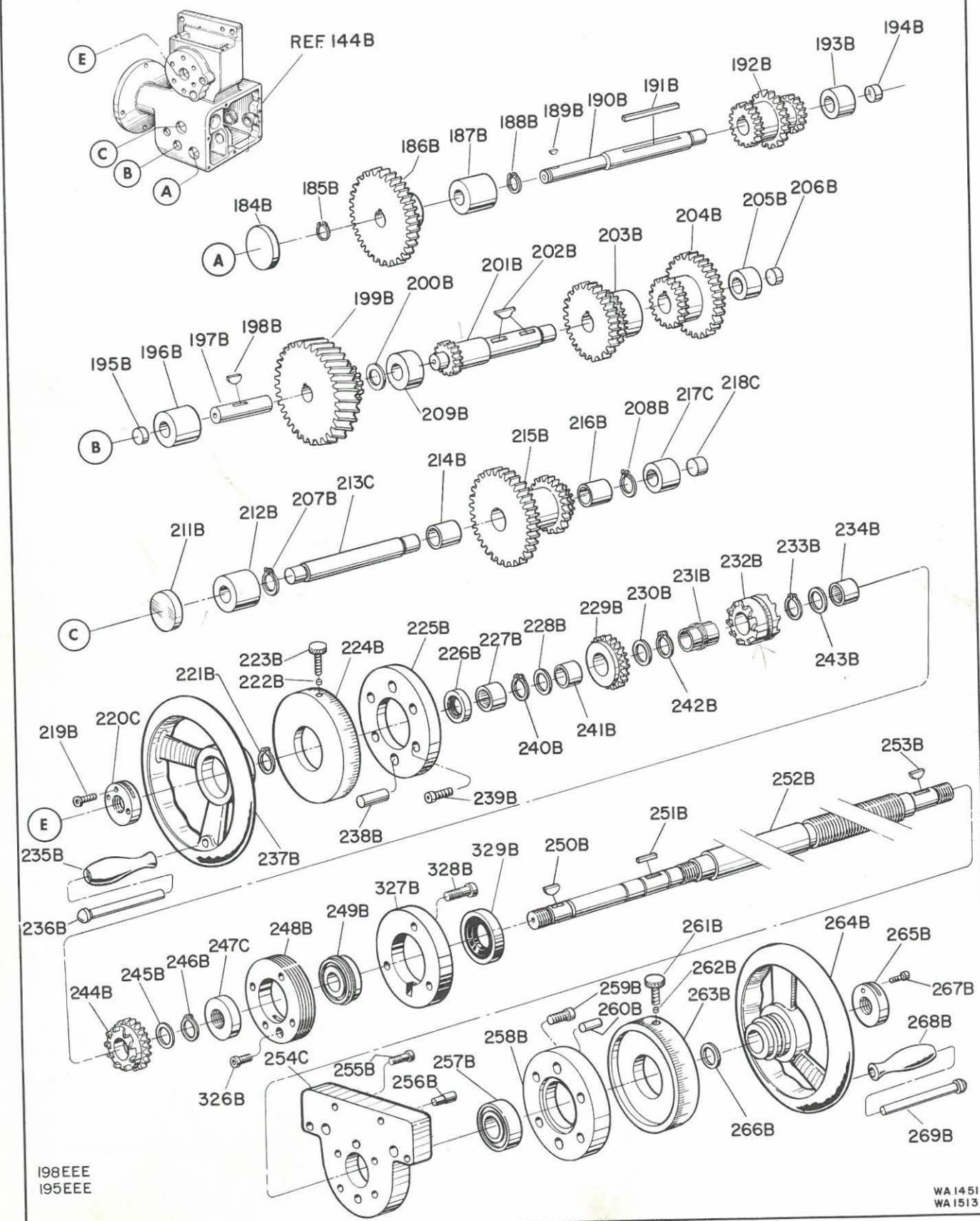


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SADDLE TABLE - UNIT No. 6JH (Continued)
WITH POWERFEED TO TABLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JH-116B	152308	Shaft - Drive Gear	1	6JH-151B	151491	Fork - Shifter Gear	1
6JH-117B	79524	Bearing - Roller	1	6JH-152B	151489	Arm - Shifting	1
6JH-118C	186660	Gear - Slip	1	6JH-153B	151490	Spacer	1
6JH-119B	79524	Bearing - Roller	1	6JH-154B	151486	Pin - Detent	1
6JH-120B	152330	Spacer - Drive Gear	1	6JH-155B	151493	Spring	1
6JH-121B	3529	Plug	1	6JH-156B	151494	Lever - Feed	1
6JH-122B	3986	Cap	1	6JH-157B	4327	Knob - Lever	1
6JH-123B	3912	Nipple	1	6JH-158B	130145	Ring - "O"	1
6JH-124B	163649	Cover - Housing, Top	1	6JH-159B	152303	Pin - Lever	1
6JH-125B	2320	Screw	2	6JH-160B	140	Pin - Taper	1
6JH-126B	3162	Pin	2	6JH-161B	2123	Washer - Lock	1
6JH-127B	3251	Screw	4	6JH-162B	4331	Plate - Name	1
6JH-128C	184684	Apron - Mounting	1	6JH-163B	151470	Gasket - Cover	1
6JH-129B	152543	Motor	1	6JH-164B	151469	Cover	1
6JH-130B	170521	Key	1	6JH-165B	2320	Screw	7
6JH-131B	158459	Follower - Cam	1	6JH-166B	3329	Pin - Cotter	1
6JH-132B	3230	Screw	2	6JH-167B	151490	Spacer	1
6JH-133B	151496	Pin - Cam	2	6JH-168B	140	Pin - Taper	1
6JH-134B	158460	Pin - Follower	1	6JH-169B	3543	Pin	2
6JH-135B	1629	Pin	2	6JH-170B	151486	Pin - Detent	1
6JH-136B	3266	Screw	3	6JH-171B	151493	Spring	1
6JH-137B	223053	Pin	2	6JH-172B	151494	Lever - Feed	1
6JH-138B	3251	Screw	1	6JH-173B	4327	Knob - Lever	1
6JH-139B	124975	Screw (With single phase motors or Standard Electric three phase motor).	4	6JH-174B	176317	Gear - Spiral	1
	3219	Screw (With Fairbanks-Morse three phase motor).	4	6JH-175B	152300	Bearing - Ball	1
6JH-140B	170520	Bushing - Nylon	1	6JH-176B	140228	Ring - Truarc	1
6JH-141B	129835	Ring - Truarc	1	6JH-177B	151492	Fork - Shifting	1
6JH-142B	238349	Ring - Truarc	1	6JH-178B	151488	Arm - Shifter	1
6JH-143B	152305	Bearing - Ball	1	6JH-179B	130145	Ring - "O"	1
6JH-144B	170759	Bracket - Gear Housing	1	6JH-180B	152304	Pin - Lever	1
6JH-145B	143496	Gage - Oil Sight	1	6JH-181B	140	Pin - Taper	1
6JH-146B	76644	Plug - Pipe	1	6JH-182B	2123	Washer - Lock	1
6JH-147B	3329	Pin - Cotter	1	6JH-183B	4331	Plate - Name	1
6JH-148B	2355	Screw	6	6JH-331B	186644	Screw	3
6JH-149B	2343	Screw	6	6JH-332B	186659	Gear	1
6JH-150B	140	Pin - Taper	1	6JH-333B	186661	Gear	1
				6JH-334B	76644	Plug	1

SADDLE TABLE POWER FEED-GEARING & LEADSCREW - TABLE



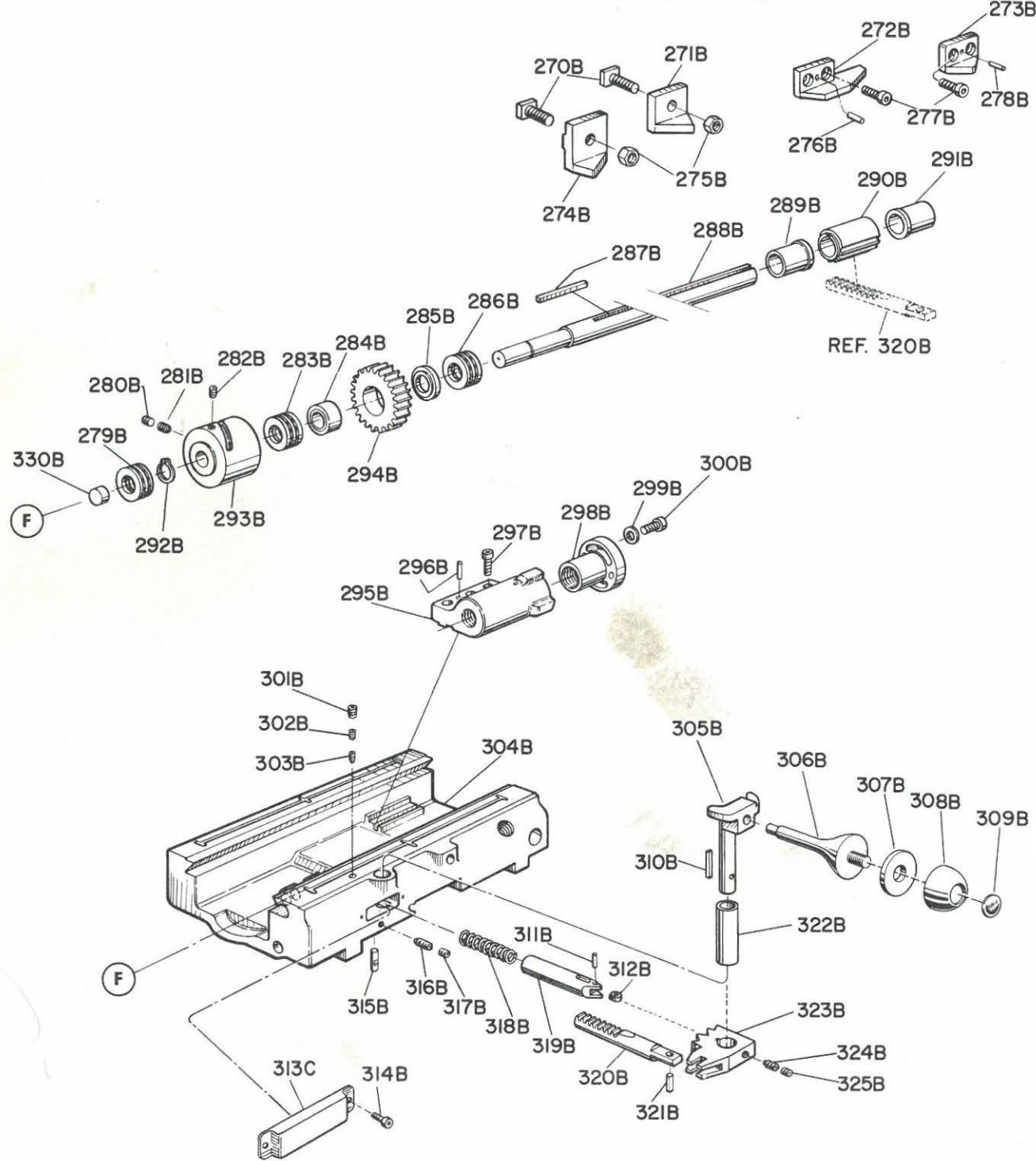
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

SADDLE TABLE - UNIT No. 6JH (Continued)
WITH POWERFEED TO TABLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JH-184B	76680	Plug	1	6JH-228B	152315	Spacer	1
6JH-185B	237219	Ring - Truarc	1	6JH-229C	186658	Gear	1
6JH-186B		Gear - Drive Shaft "A"	1	6JH-230B	152315	Spacer	1
	183673	50 Cycle	1	6JH-231B	158518	Insert - Nylon	2
	156147	60 Cycle	1	6JH-232B	158519	Clutch - Reversing	1
6JH-187B	156146	Bushing	1	6JH-233B	237432	Ring - Truarc	1
6JH-188B	237219	Ring - Truarc	1	6JH-234B	247565	Bushing	1
6JH-189C	156205	Key	1	6JH-235B	163680	Handle - Spool	1
6JH-190B	156138	Shaft - "A"	1	6JH-236B	163681	Stud - Spool Handle	1
6JH-191B	152325	Key	1	6JH-237B	157557	Handwheel	1
6JH-192B	152319	Gear - Cluster, "A"	1	6JH-238B	1383	Pin	2
6JH-193B	152331	Bushing - Bronze	1	6JH-239B	2321	Screw	4
6JH-194B	152307	Plug	1	6JH-240B	237432	Ring - Truarc	1
6JH-195B	152307	Plug	1	6JH-241B	247565	Bushing	1
6JH-196B	152327	Bushing - Bronze	1	6JH-242B	237432	Ring - Truarc	1
6JH-197B	152335	Shaft - Drive Gear	1	6JH-243B	152315	Spacer	1
6JH-198B	156205	Key	1	6JH-244B	158187	Gear - Spur Clutch	1
6JH-199B		Gear - Drive Reduction	1	6JH-245B	152315	Spacer	1
	152333	60 Cycle	1	6JH-246B	237432	Ring - Truarc	1
	183674	50 Cycle	1	6JH-247C	183649	Nut - Lock	1
6JH-200B	152334	Spacer	1	6JH-248B	176276	Retainer - Bearing	1
6JH-201B	152323	Shaft - Gear and "B"	1	6JH-249B	143375	Bearing - Ball	1
6JH-202B	3280	Key	2	6JH-250B	679	Key	1
6JH-203B	152321	Gear - Cluster Intermediate, "B"	1	6JH-251B	157762	Key	1
6JH-204B	152322	Gear - Cluster Intermediate, "B"	1	6JH-252B		Leadscrew	1
6JH-205B	152331	Bushing - Bronze	1		157764	22" Table Travel, English	1
6JH-206B	152307	Plug	2		157763	22" Table Travel, Metric	1
6JH-207B	237219	Ring - Truarc	1	6JH-253B	679	Key	1
6JH-208B	237219	Ring - Truarc	1	6JH-254C	184683	Apron - Table	1
6JH-209B	152327	Bushing	1	6JH-255B	3400	Screw	4
6JH-211B	76680	Plug	1	6JH-256B	145428	Pin	2
6JH-212B	152327	Bushing - Bronze	1	6JH-257B	143376	Bearing - Ball	1
6JH-213C	178268	Shaft	1	6JH-258B	143374	Retainer - Bearing	1
6JH-214B	151495	Bushing - Oilite	1	6JH-259B	2321	Screw	4
6JH-215B	152318	Gear - Cluster, "C"	1	6JH-260B	1383	Pin	2
6JH-216B	151495	Bushing - Oilite	1	6JH-261B	94710	Screw - Thumb	1
6JH-217C	178267	Bushing	1	6JH-262B	2008	Plug	1
6JH-218C	178265	Plug	1	6JH-263B		Dial - Feed, Long	1
6JH-219B	3202	Screw	1		143371	22" Table Travel, English	1
6JH-220B	124501	Nut - Lock	1		143372	22" Table Travel, Metric	1
6JH-221B	237432	Ring - Truarc	1	6JH-264B	157557	Handwheel	1
6JH-222B	2008	Plug	1	6JH-265B	124501	Nut - Lock	1
6JH-223B	94710	Screw - Thumb	1	6JH-266B	3202	Screw	1
6JH-224B		Dial - Feed, Long	1	6JH-267B	143373	Spacer - Handwheel	1
	143371	22" Table Travel, English	1	6JH-268B	163680	Handle - Spool	1
	143372	22" Table Travel, Metric	1	6JH-269B	163681	Stud - Spool Handle	1
6JH-225B	143374	Retainer - Bearing	1	6JH-326B	3202	Screw	1
6JH-226B	239435	Seal	1	6JH-327B	176277	Retainer - Seal	1
6JH-227B	158493	Bushing	1	6JH-328B	122604	Screw	3
				6JH-329B	176278	Seal	1

SADDLE TABLE

POWERFEED DRIVE SHAFT AND SADDLE



192 EEE
124 EEE
53 EEE

WA 1451
WA 1513

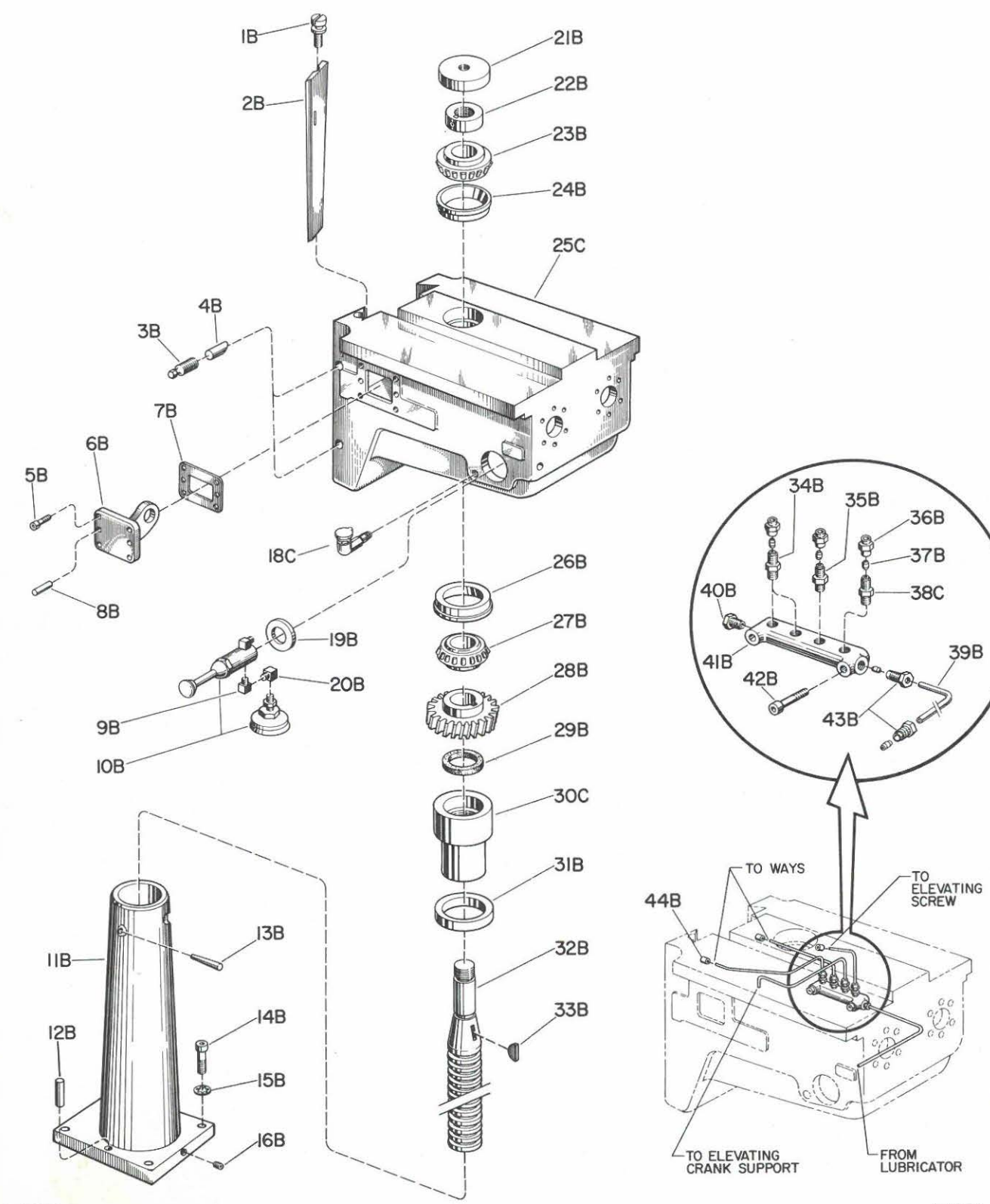
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SADDLE TABLE - UNIT No. 6JH (Concluded)
WITH POWERFEED TO TABLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JH-270B	3220	Bolt - Tee	2	6JH-298B		Nut - Leadscrew, Back Lash Eliminator	
6JH-271B	151482	Dog - Feed, Right Hand.	1	143368		16" or 22" Table Travel, English	1
6JH-272B	151485	Dog - Positive Stop, Left Hand.	1	143369		16" or 22" Table Travel, Metric	1
6JH-273B	176315	Dog - Positive Stop, Right Hand.	1	6JH-299B	3441	Washer	2
6JH-274B	151484	Dog - Feed, Left Hand.	1	6JH-300B	3400	Screw.	2
6JH-275B	664	Nut	2	6JH-301B	76644	Plug - Pipe.	1
6JH-276B	3636	Pin	1	6JH-302B	2332	Screw.	1
6JH-277B	3199	Screw.	4	6JH-303B	3229	Screw.	1
6JH-278B	3636	Pin	1	6JH-304B	157582	Saddle - 16" or 22" Table Travel	1
6JH-279B	101615	Bearing - Thrust	1	6JH-305B	151476	Lever - Trip	1
6JH-280B	2332	Screw.	1	6JH-306B	170777	Lever - Handle	1
6JH-281B	3228	Screw.	1	6JH-307B	4357	Washer	1
6JH-282B	2333	Screw.	1	6JH-308B	4356	Handle	1
6JH-283B	101615	Bearing - Thrust	1	6JH-309B	4336	Plate - Name	1
6JH-284B	152306	Bearing - Needle	1	6JH-310B	77281	Key	1
6JH-285B	158479	Spacer	1	6JH-311B	158455	Pin	1
6JH-286B	101615	Bearing - Thrust	1	6JH-312B	158457	Bearing - Ball	1
6JH-287B	1632	Key	1	6JH-313C	177547	Cover	1
6JH-288B	158176	Shaft (Powerfeed Drive to Table).	1	6JH-314B	3202	Screw.	2
6JH-289B	124255	Bushing - Flange	1	6JH-315B	158452	Pin	1
6JH-290B	152339	Gear - Segment	1	6JH-316B	3235	Screw.	1
6JH-291B	124255	Bushing - Flange	1	6JH-317B	1917	Screw.	1
6JH-292B	236956	Ring - Truarc	1	6JH-318B	213270	Spring - Plunger	1
6JH-293B	152337	Cam - Drum	1	6JH-319B	158456	Plunger - Detent	1
6JH-294B	152310	Gear - Spur.	1	6JH-320B	152338	Rack	1
6JH-295B		Nut - Leadscrew		6JH-321B	151487	Pin - Rack	1
	143365	16" or 22" Table Travel, English	1	6JH-322B	152336	Bushing - Oilite	1
6JH-296B	1385	Pin	1	6JH-323B	156185	Detent	1
6JH-297B	3401	Screw.	1	6JH-324B	3228	Screw.	1
				6JH-325B	2354	Screw.	1
				6JH-330B	3529	Plug	1

KNEE

KNEE AND ELEVATING SCREW



I56EEE

WA 1561

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

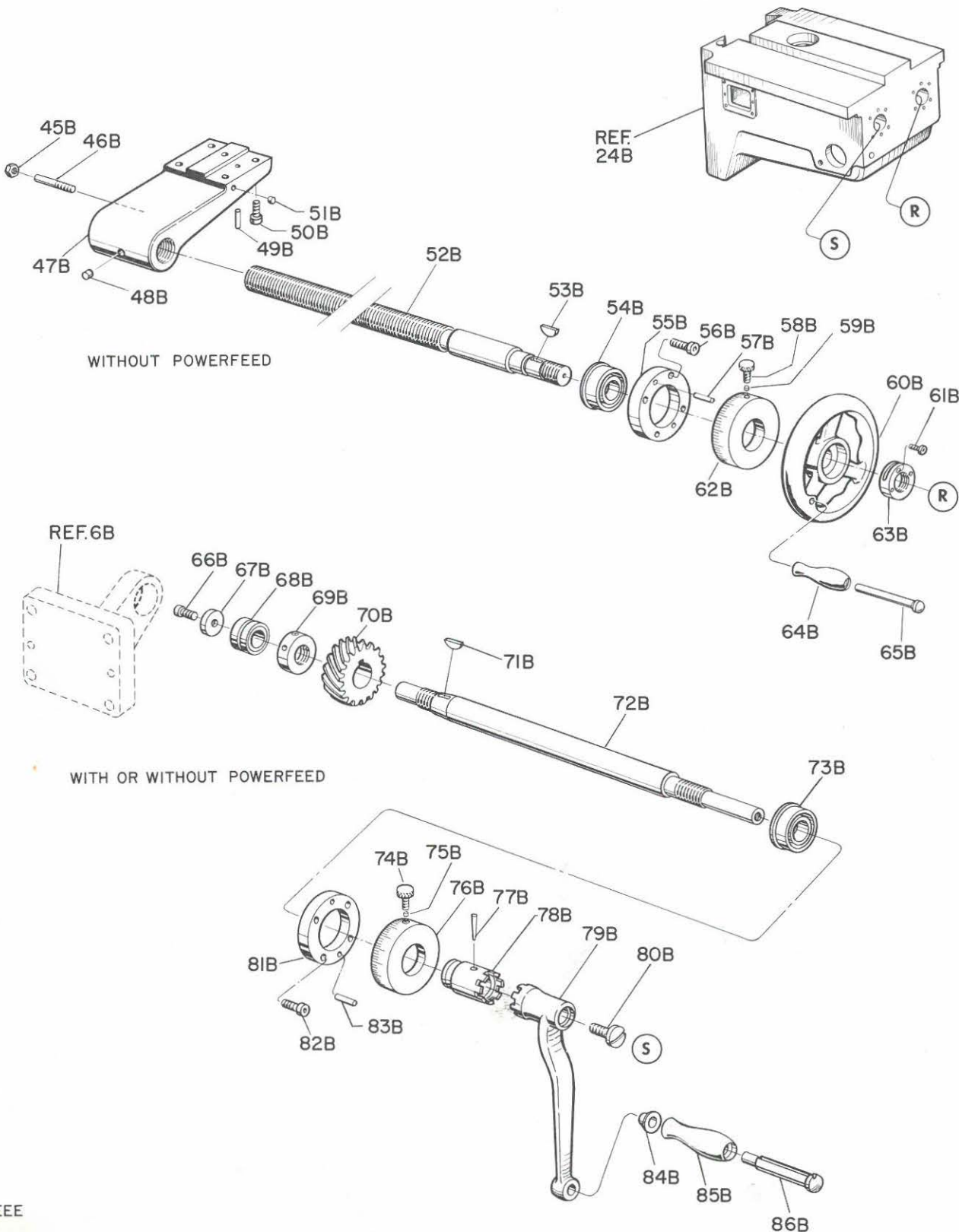
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KNEE - UNIT No. 6JK
WITH OR WITHOUT POWERFEED TO SADDLE

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-1B	153092	Screw - Gib, Adjusting	1	6JK-26B	113516	Cup - Bearing	1
6JK-2B	153093	Gib - Knee	1	6JK-27B	113515	Cone - Bearing	1
6JK-3B	170767	Screw - Clamping	2	6JK-28B	143394	Gear - Spiral, Elevating Crank	1
6JK-4B	170757	Shoe - Clamping	2	6JK-29B	201636	Washer - Felt	1
6JK-5B	3266	Screw	4	6JK-30C		Nut - Elevating Screw	
6JK-6B	143401	Bracket - Support	1		172476	English	1
6JK-7B	143402	Shim - Bracket	1		172475	Metric	1
6JK-8B	88799	Pin	2	6JK-31B	175267	Spacer	1
6JK-9B	96855	Elbow	1	6JK-32B		Screw - Elevating	
6JK-10B	603983	Lubricator - Bijur	1		143389	English	1
6JK-11B	172427	Pedestal - Elevating Screw	1		143390	Metric	1
6JK-12B	3369	Pin	2	6JK-33B	3497	Key	1
6JK-13B	645	Pin	2	6JK-34B	220003	Plug - Drip No. 2	2
6JK-14B	3251	Screw	4	6JK-35B	220004	Plug - Drip No. 0	1
6JK-15B	3267	Washer - Lock	4	6JK-36B	214294	Nut - Compression	4
6JK-16B	3211	Screw	1	6JK-37B	214304	Sleeve - Compression	6
6JK-18C	101344	Oiler	1	6JK-38C	94477	Plug - Drip No. 3	1
6JK-19B	153089	Plug - Bijur	1	6JK-39B	158185	Tubing List	1
6JK-20B	96855	Elbow	1	6JK-40B	115596	Plug - Screw	1
6JK-21B	143396	Plug - Steel	1	6JK-41B	143414	Block - Junction, Bijur	1
6JK-22B	7184	Nut - Lock	1	6JK-42B	3227	Screw	2
6JK-23B	113515	Cone - Bearing	1	6JK-43B	214300	Bushing - Bijur	2
6JK-24B	113516	Cup - Bearing	1	6JK-44B	77197	Bushing	3
6JK-25C		Knee					
	177545	(Without Vertical Precision Measuring Attachment Provision)	1				
	158520	(With Vertical Precision Measuring Attachment Provision)	1				
	158505	(With Cross Precision Measuring Attachment Provision)	1				

KNEE

CROSSFEED SCREW & ELEVATING SHAFT



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

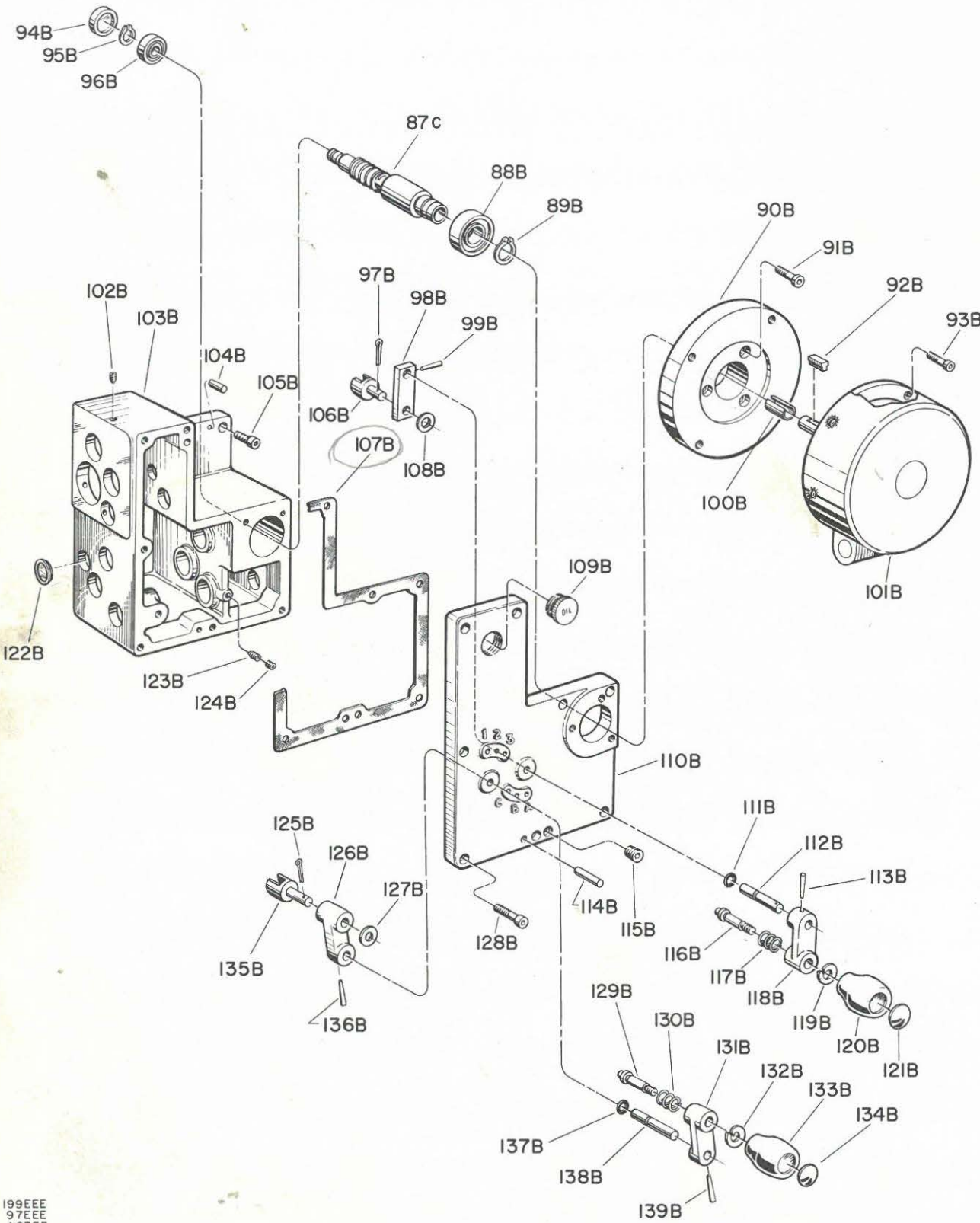
KNEE - UNIT No. 6JK (Continued)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-45B	3478*	Nut	1	6JK-63B	124501*	Nut - Lock	1
6JK-46B	143418*	Stop - Positive	1	6JK-64B	163680*	Handle - Spool	1
6JK-47B		Nut - Crossfeed		6JK-65B	163681*	Stud - Spool Handle.	1
	143408*	English.	1	6JK-66B	3396	Screw	1
	143409*	Metric	1	6JK-67B	239914	Washer.	1
6JK-48B	2245*	Plug	1	6JK-68B	231587	Bearing - Roller	1
6JK-49B	3369*	Pin	1	6JK-69B	4242	Nut - Lock	1
6JK-40B	3251*	Screw	4	6JK-70B	143395	Gear - Spiral, Elevating Crank.	1
6JK-51B	1844*	Plug	1	6JK-71B	679	Key	1
6JK-52B		Screw - Crossfeed		6JK-72B	143397	Shaft - Elevating Crank	1
	143405*	English - Soft	1	6JK-73B	143375	Bearing - Ball	1
	143406*	Metric - Soft	1	6JK-74B	94710	Screw - Thumb	1
	183600*	English - Hard	1	6JK-75B	2008	Plug.	1
	183601	English - Hard (With Power Feed).	1	6JK-76B		Dial - Feed, Elevating	
6JK-53B	679*	Key	1		143399	English.	1
6JK-54B	143375*	Bearing - Ball	1		143400	Metric	1
6JK-55B	143374*	Retainer - Bearing.	1	6JK-77B	642	Pin	1
6JK-56B	2320*	Screw	4	6JK-78B	143417	Clutch - Elevating Crank.	1
6JK-57B	1383*	Pin	2	6JK-79B	153075	Crank - Elevating	1
6JK-58B	94710*	Screw - Thumb	1	6JK-80B	3514	Screw	1
6JK-59B	2008*	Plug.	1	6JK-81B	143374	Retainer - Bearing.	1
6JK-60B	157557*	Handwheel.	1	6JK-82B	2320	Screw	4
6JK-61B	3202*	Screw	1	6JK-83B	1383	Pin	2
6JK-62B		Dial - Feed		6JK-84B	3504	Collar - Spool Handle	1
	143371*	English.	1	6JK-85B	3505	Handle - Spool	1
	143372*	Metric	1	6JK-86B	3503	Stud - Spool Handle.	1

*Without Powerfeed

KNEE

POWER FEED-GEAR HOUSING BRACKET-KNEE



199EEE
97EEE
40EEE
39EEE

WA 1370

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

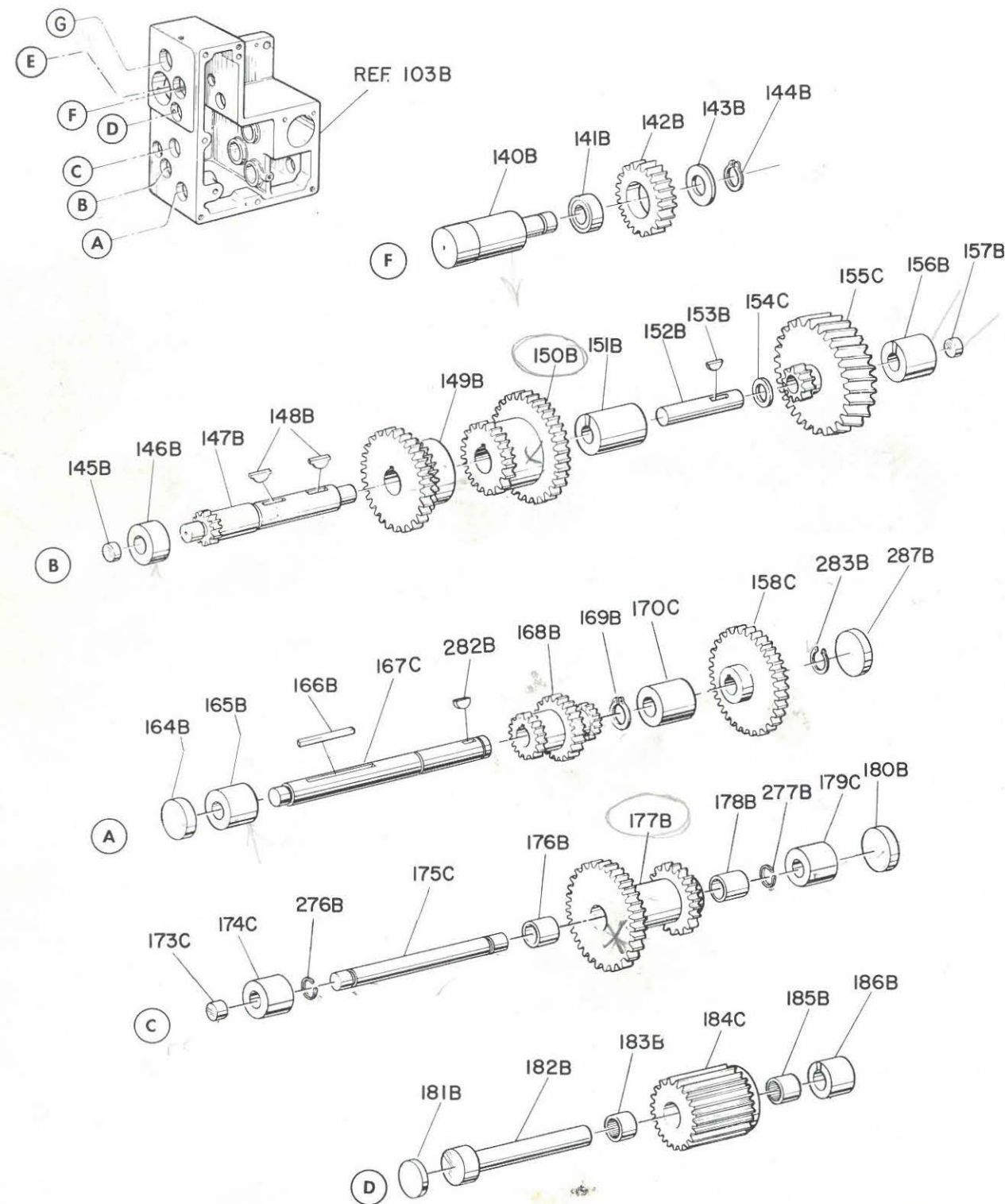
KNEE - UNIT No. 6JK (Continued)

WITH POWERFEED

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-87C	170523	Gear - Spiral	1	6JK-112B	152303	Pin - Lever, Short	1
6JK-88B	152305	Bearing - Ball	1	6JK-113B	140	Pin - Taper.	1
6JK-89B	137926	Retainer - Truarc	1	6JK-114B	3543	Pin	2
6JK-90B	170758	Plate - Adapter	1	6JK-115B	76645	Plug	1
6JK-91B	3210	Screw	3	6JK-116B	151486	Pin - Detent	1
6JK-92B	170521	Key (Supplied with Motor)	1	6JK-117B	151493	Spring	1
6JK-93B	124975	Screw (With Single Phase Motors or Standard Electric Three-Phase Motors).	4	6JK-118B	151494	Lever - Feed	1
	3219	Screw (With Fairbanks-Morse Three-Phase Motors)	4	6JK-119B	2123	Washer - Lock.	1
6JK-94B	153061	Plug	4	6JK-120B	4327	Knob - Lever	1
6JK-95B	140228	Retainer.	1	6JK-121B	4331	Plate - Name	1
6JK-96B	152300	Bearing - Ball	1	6JK-122B	143496	Gage - Oil Sight	1
6JK-97B	3329	Pin - Cotter	1	6JK-123B	2343	Screw - Set	8
6JK-98B	151489	Arm - Gear Shifter	1	6JK-124B	2355	Screw - Set.	8
6JK-99B	140	Pin - Taper.	1	6JK-125B	3329	Pin - Cotter	1
6JK-100B	170520	Bushing - Nylon	1	6JK-126B	151488	Arm - Gear Shifter	1
6JK-101B	152543	Motor.	1	6JK-127B	151490	Spacer	1
6JK-102B	3229	Screw.	1	6JK-128B	2320	Screw.	8
6JK-103B	152396	Bracket - Gear Housing.	1	6JK-129B	151486	Pin - Detent	1
6JK-104B	3369	Pin	2	6JK-130B	151493	Spring	1
6JK-105B	3403	Screw.	4	6JK-131B	151494	Lever - Feed	1
6JK-106B	151491	Fork - Gear Shifter	1	6JK-132B	2123	Washer - Lock.	1
6JK-107B	153064	Gasket	1	6JK-133B	4327	Knob - Lever	1
6JK-108B	151490	Spacer	1	6JK-134B	4331	Plate - Name	1
6JK-109B	3987	Plug - Oil Filler	1	6JK-135B	151492	Fork - Gear Shifter	1
6JK-110B	152397	Cover - Gear Housing	1	6JK-136B	140	Pin - Taper.	1
6JK-111B	130145	Ring - "O"	1	6JK-137B	130145	Ring - "O"	1
				6JK-138B	152304	Pin - Lever, Long	1
				6JK-139B	140	Pin - Taper.	1

KNEE

POWER FEED-GEARING-KNEE



199EEE

WA 1557

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

6J4V5M-121

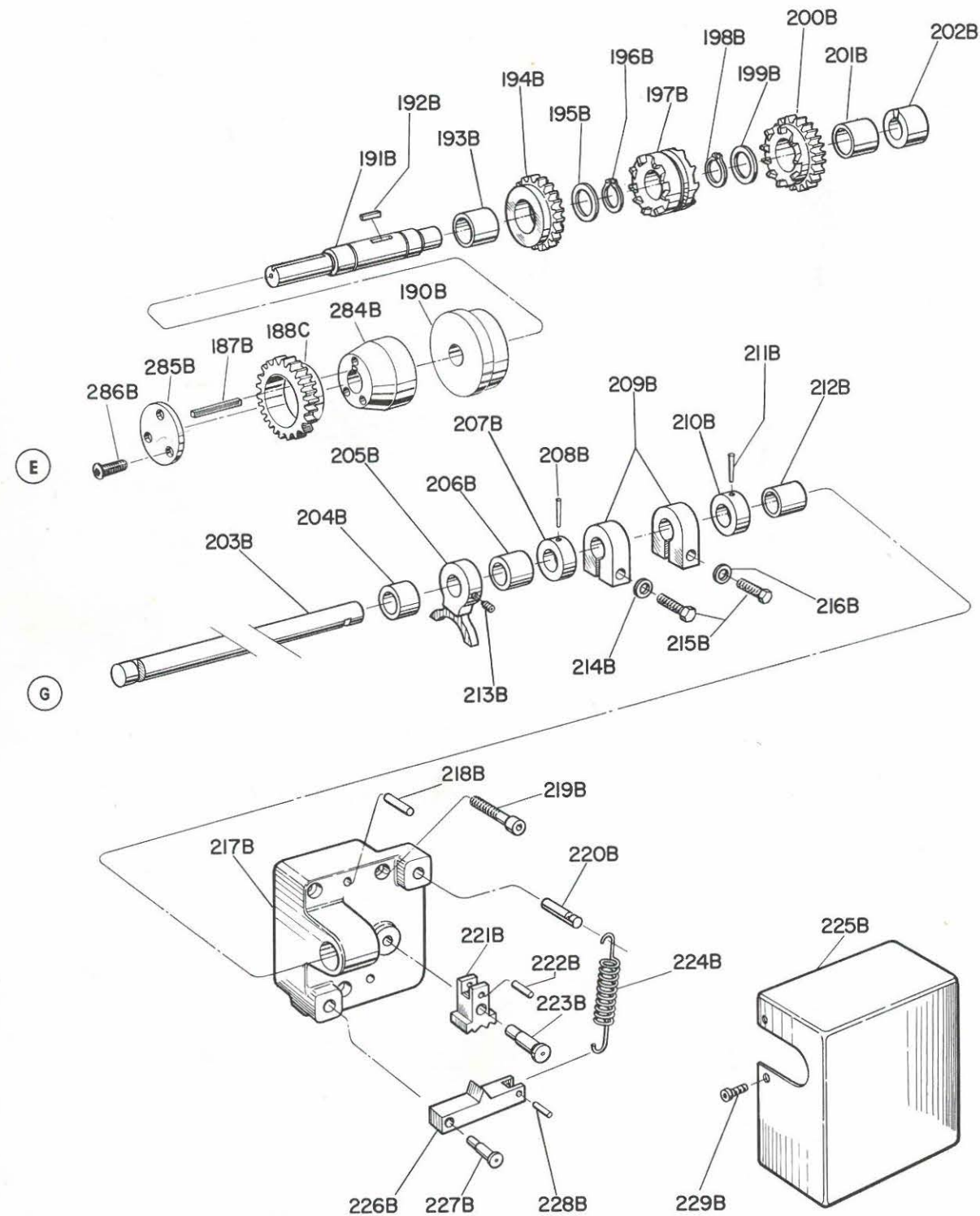
KNEE - UNIT No. 6JK (Continued)

WITH POWERFEED

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-140B	152378	Shaft - "F"	1	6JK-169B	237219	Ring - External Truarc	1
6JK-141B	152306	Bearing - Needle	1	6JK-170C	156146	Bushing	1
6JK-142B	152310	Gear - Reversing	1	6JK-173C	178265	Plug	1
6JK-143B	158479	Spacer	1	6JK-174C	178269	Bushing	1
6JK-144B	236956	Retainer - Truarc	1	6JK-175C	178268	Shaft - "C"	1
6JK-145B	152307	Plug	1	6JK-176B	151495	Bushing - Oilite	1
6JK-146B	152389	Bushing - Bronze	1	6JK-177B	152318	Gear - Cluster "C"	1
6JK-147B	152380	Shaft - Gear and "B"	1	6JK-178B	151495	Bushing - Oilite	1
6JK-148B	3280	Key	2	6JK-179C	178269	Bushing	1
6JK-149B	152321	Gear - Cluster	1	6JK-180B	76680	Plug	1
6JK-150B	152322	Gear - Cluster	1	6JK-181B	158533	Plug - Seal	1
6JK-151B	152387	Bushing - Bronze	1	6JK-182B	152379	Shaft - "D"	1
6JK-152B	152391	Shaft - Cluster Gear	1	6JK-183B	79524	Bearing - Roller	1
6JK-153B	156205	Key	2	6JK-184C	152309	Gear - "D"	1
6JK-154C	152334	Spacer	1	6JK-185B	79524	Bearing - Roller	1
6JK-155C	152333	Gear - Reduction	1	6JK-186B	152383	Bushing - Bronze	1
6JK-156B	152388	Bushing - Bronze	1	6JK-276B	237219	Ring - Retaining	1
6JK-157B	152307	Plug	1	6JK-277B	237219	Ring - Retaining	1
6JK-158C	156147	Gear - Drive	1	6JK-278B	179073	Spacer	1
6JK-164B	3830	Plug	1	6JK-279B	179074	Bushing	1
6JK-165B	152388	Bushing - Bronze	1	6JK-282B	156205	Key	1
6JK-166B	152325	Key	1	6JK-283B	237219	Ring - Retaining	1
6JK-167C	156138	Shaft - "A"	1	6JK-287B	76680	Plug	1
6JK-168B	152319	Gear - Cluster Shifting	1				

KNEE

POWER FEED-"E" & SHIFTER SHAFTS-KNEE



39EEE
199EEE

WA 1557

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

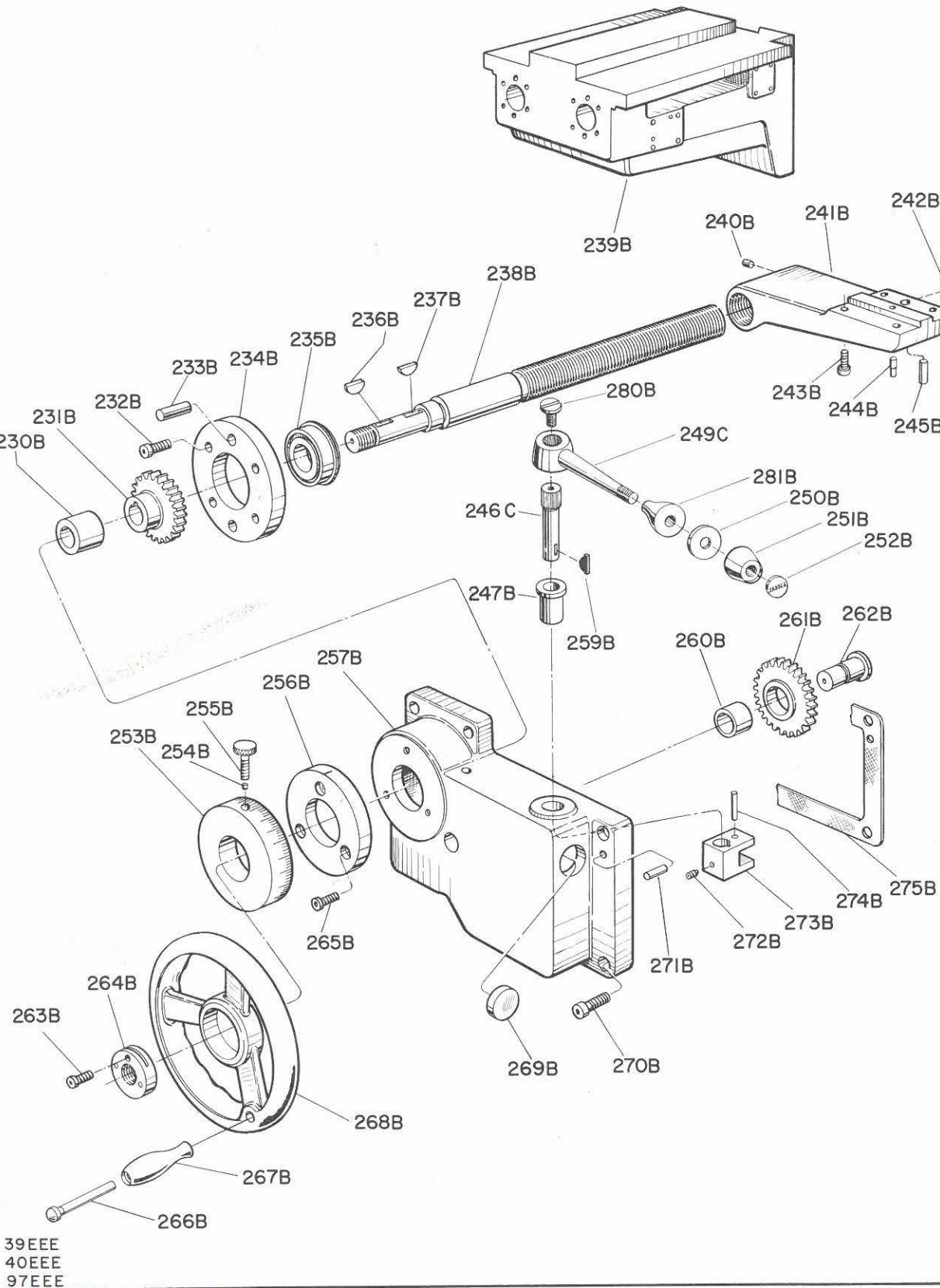
KNEE - UNIT No. 6JK (Continued)

WITH POWERFEED

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-187B	99199	Key	1	6JK-210B	153070	Block - Positive Stop	1
6JK-188C	188836	Gear - Drive	1	6JK-211B	663	Pin - Taper.	1
6JK-189B	3226	Screw.	1	6JK-212B	154418	Bushing - Oilite	1
6JK-190B	157761	Bushing - Bronze.	1	6JK-213B	3229	Screw.	1
6JK-191B	157759	Shaft - "E".	1	6JK-214B	246088	Washer	1
6JK-192B	157762	Key	1	6JK-215B	1062	Screw.	2
6JK-193B	247565	Bushing - Oilite	1	6JK-216B	246088	Washer	1
6JK-194B	158182	Gear - Spur Clutch	1	6JK-217B	150824	Bracket - Rear	1
6JK-195B	152315	Spacer	1	6JK-218B	3543	Pin	2
6JK-196B	237432	Ring - Truarc	1	6JK-219B	2300	Screw.	3
6JK-197B	158183	Clutch - Reversing	1	6JK-220B	3382	Pin - Spring	1
6JK-198B	237432	Ring - Truarc	1	6JK-221B	157040	Detent - Shifting Shaft	1
6JK-199B	152315	Spacer	1	6JK-222B	230058	Pin	1
6JK-200B	158181	Gear - Reversing.	1	6JK-223B	154420	Pin - Pivot, Detent	1
6JK-201B	247565	Bushing - Oilite	1	6JK-224B	93970	Spring	1
6JK-202B	152383	Bushing - Bronze.	1	6JK-225B	154421	Cover - Detent.	1
6JK-203B	154422	Shaft - Shifting.	1	6JK-226B	155656	Arm - Detent	1
6JK-204B	124668	Bushing - Bronze.	1	6JK-227B	155657	Pin - Detent Arm	1
6JK-205B	152382	Fork - Shifter	1	6JK-228B	3431	Pin	1
6JK-206B	124668	Bushing - Bronze.	1	6JK-229B	3194	Screw.	3
6JK-207B	153070	Block - Positive Stop	1	6JK-284B	188837	Hub - Gear	1
6JK-208B	663	Pin - Taper.	1	6JK-285B	188838	Plate - Clamp	1
6JK-209B	153071	Block - Adjusting Stop	2	6JK-286B	188839	Screw.	3

KNEE

POWER FEED-CROSSFEED SCREW & FRONT COVER-KNEE



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

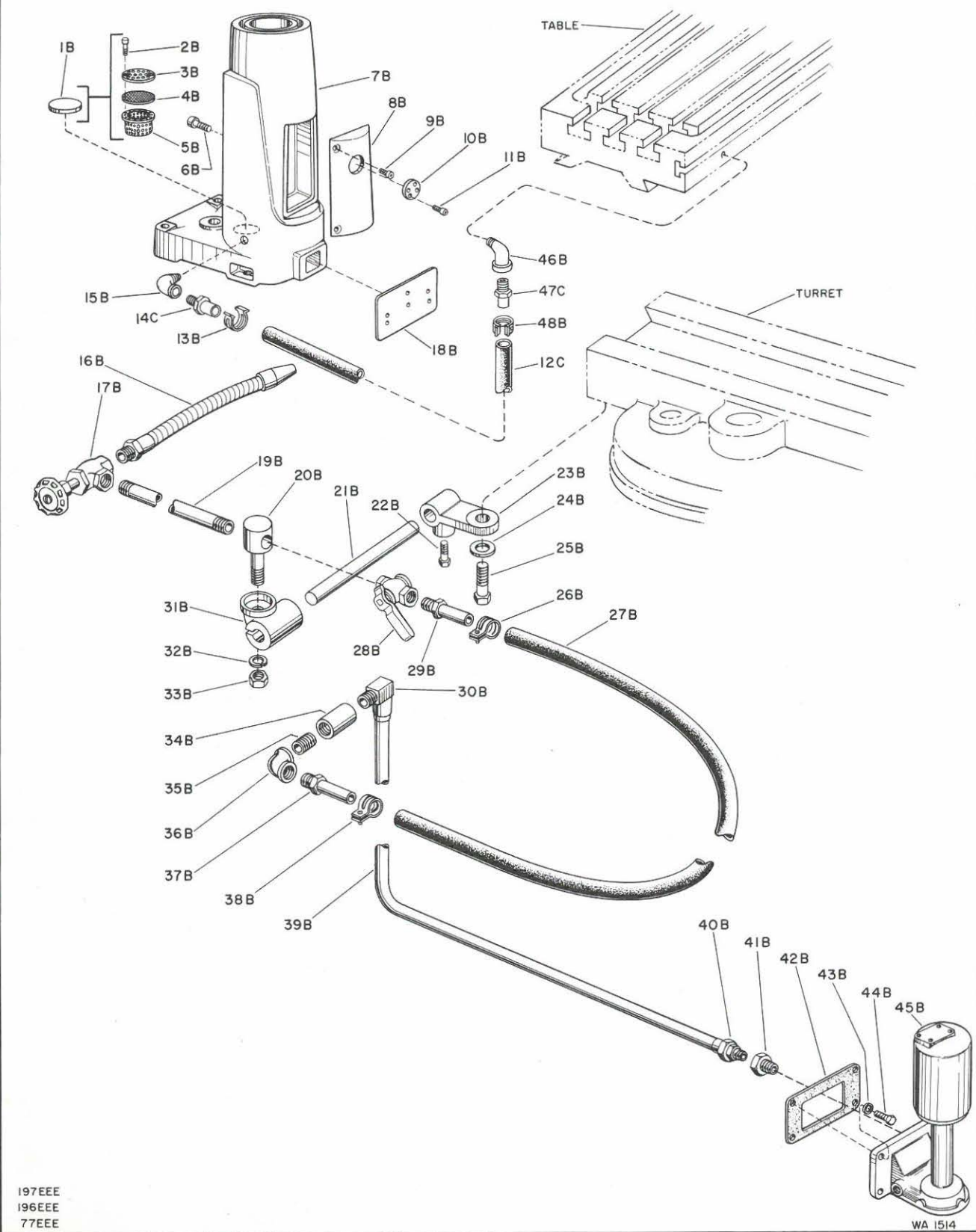
KNEE - UNIT No. 6JK (Concluded)

WITH POWERFEED

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JK-230B	153052	Spacer - Handwheel	1	6JK-253B	143371	Dial - Feed	1
6JK-231B	152398	Gear - Saddle Traversing	1		143372	English	1
6JK-232B	2320	Screw.	4		2008	Metric	1
6JK-233B	1383	Pin	2	6JK-254B	94710	Plug	1
6JK-234B	143374	Retainer - Bearing	1	6JK-255B	153051	Screw - Thumb	1
6JK-235B	143375	Bearing - Ball	1	6JK-256B	152393	Indicator - Cross Movement	1
6JK-236B	679	Key	1	6JK-257B	152393	Cover - Front	1
6JK-237B	679	Key	1	6JK-259B	1266	Key - Hypro	1
6JK-238B		Screw - Crossfeed	1	6JK-260B	143701	Bushing - Oilite	1
	153067	English	1	6JK-261B	152394	Gear - Idler	1
	153068	Metric	1	6JK-262B	153050	Shaft - Idler Gear	1
6JK-239B	170756	Knee (Alter per 158521).	1	6JK-263B	3202	Screw.	1
6JK-240B	247024	Plug	1	6JK-264B	124501	Nut - Lock	1
6JK-241B		Nut - Crossfeed	1	6JK-265B	4093	Screw.	3
	153072	English	1	6JK-266B	163681	Stud - Spool	1
	153476	Metric	1	6JK-267B	163680	Handle - Spool	1
6JK-242B	1844	Plug	1	6JK-268B	143377	Handwheel	1
6JK-243B	3251	Screw.	4	6JK-269B	93985	Plug	1
6JK-244B	3369	Pin	1	6JK-270B	3399	Screw.	6
6JK-245B	1900	Pin	1	6JK-271B	1383	Pin	2
6JK-246C	179010	Shaft - Shifter Arm	1	6JK-272B	3229	Screw.	1
6JK-247B	157563	Bushing - Shifter Shaft	1	6JK-273B	153053	Arm - Shifter	1
6JK-249C	188275-3	Lever.	1	6JK-274B	230058	Pin	1
6JK-250B	4357	Washer	1	6JK-275B	153073	Gasket	1
6JK-251B	4356	Knob	1	6JK-280B	168192	Screw.	1
6JK-252B	4352	Plate - Name	1	6JK-281B	168055	Knob - Lever	1

COLUMN
COOLANT PUMP
AND PIPING

COLUMN AND COOLANT PUMP



197EEE
196EEE
77EEE

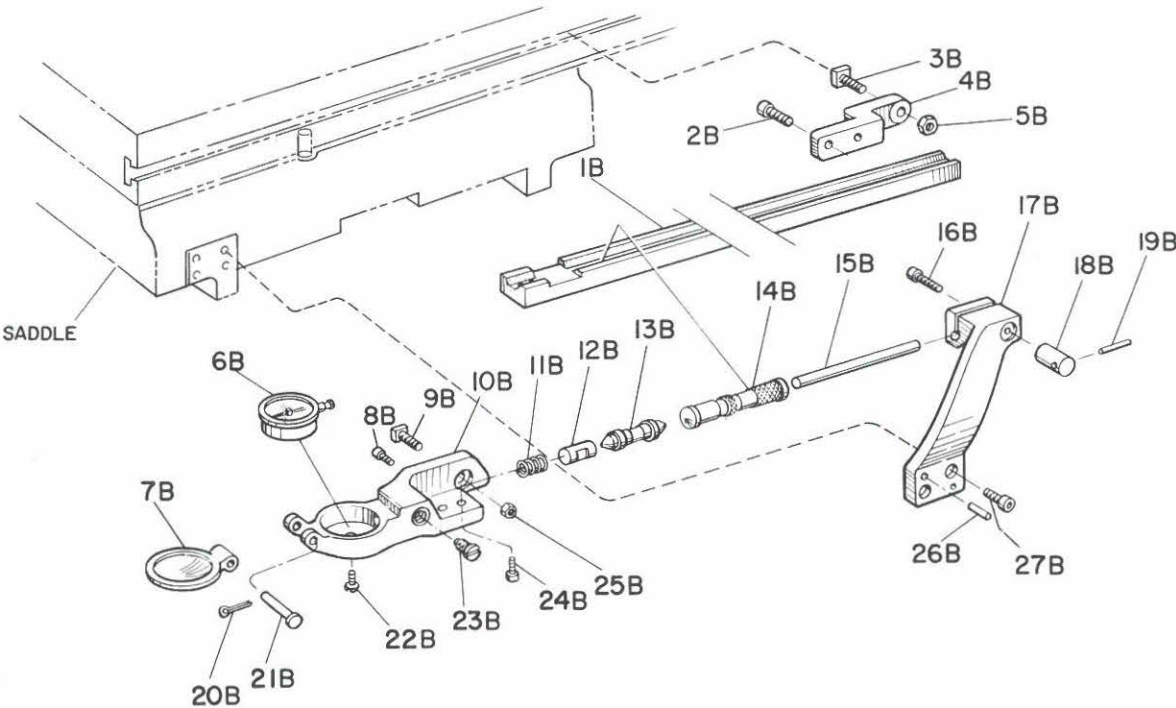
WA 1514

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

COLUMN - UNIT No. 6JC
COOLANT PUMP AND PIPING - UNIT No. 6JP

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JC-1B	143421	Cover - Drain, Without Coolant Pump . .	1	6JP-25B	111	Screw.	1
6JP-2B	3198	Screw.	4	6JP-26B	80486	Clamp - Hose	1
6JP-3B	143440	Screen - Coarse Mesh	1	6JP-27B	143431	Hose - Neoprene	1
6JP-4B	143439	Screen - Fine Mesh	1	6JP-28B	52054	Valve.	1
6JP-5B	176342	Strainer - Drain, Coolant	1	6JP-29B	143536	Connector - Male.	1
6JC-6B	158511	Screw - Stop	1	6JP-30B	130962	Elbow.	1
6JC-7B	175266	Column Without Vertical Precision Movement Attachment Provision	1	6JP-31B	38856	Clamp - Supply Pipe.	1
	175271	Column With Vertical Precision Movement Attachment Provision	1	6JP-32B	855	Washer	1
6JNN-8B	156195	Cover - Electrical	1	6JP-33B	3479	Nut	1
6JC-9B	273171	Screw.	4	6JP-34B	166812	Coupling - Pipe	1
6JNN-10B	163671	Cover (Without Disconnect Switch)	1	6JP-35B	10051	Nipple - Close.	1
6JNN-11B	3198	Screw.	4	6JP-36B	24024	Elbow - 90°.	1
6JP-12C	184691	Hose - Flexible	1	6JP-37B	143536	Connector - Male.	1
6JP-13B	238325	Clamp - Hose	2	6JP-38B	80486	Clamp - Hose	1
6JP-14C	189871	Connector - Male.	1	6JP-39B	143429	Tubing - 1/2"	1
6JP-15B	29810	Elbow.	1	6JP-40B	133089	Fitting - Adapter (1/2" N.P.T. to 1/2" Tubing)	1
6JP-16B	113111	Hose - Flexible, Coolant	1	6JP-41B	89138	Bushing - Shoulder (1/2" to 3/4")	1
6JP-17B	143433	Valve - Crane	1	6JP-42B	143428	Gasket	1
6JC-18B	150704	Cover (Without Coolant Pump)	1	6JP-43B	2118	Washer	4
6JP-19B	143432	Pipe - List	1	6JP-44B	3463	Screw.	4
6JP-20B	143434	Holder - Supply Pipe.	1	6JP-45B		Pump - Coolant	
6JP-21B	143435	Shaft - Pipe Clamp	1		153999	Fairbanks-Morse	1
6JP-22B	2260	Screw.	1		156429	Pioneer	1
6JP-23B	143436	Bracket - Pipe Clamp Shaft	1	6JP-46B	29810	Elbow	1
6JP-24B	1040	Washer	2	6JP-47C	189871	Connector - Male	1
				6JP-48B	238325	Clamp - Hose	1

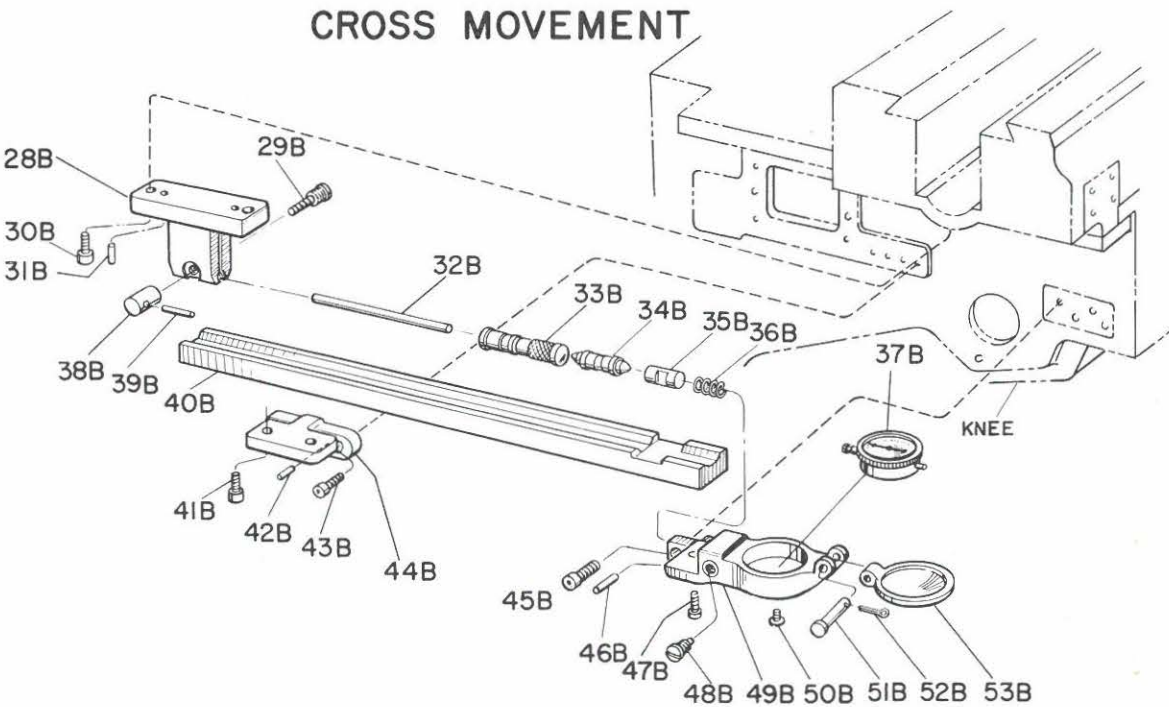
PRECISION MEASURING ATTACHMENT
LONGITUDINAL MOVEMENT



87 EEE

WA 987

CROSS MOVEMENT



89 EEE

WA 987

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

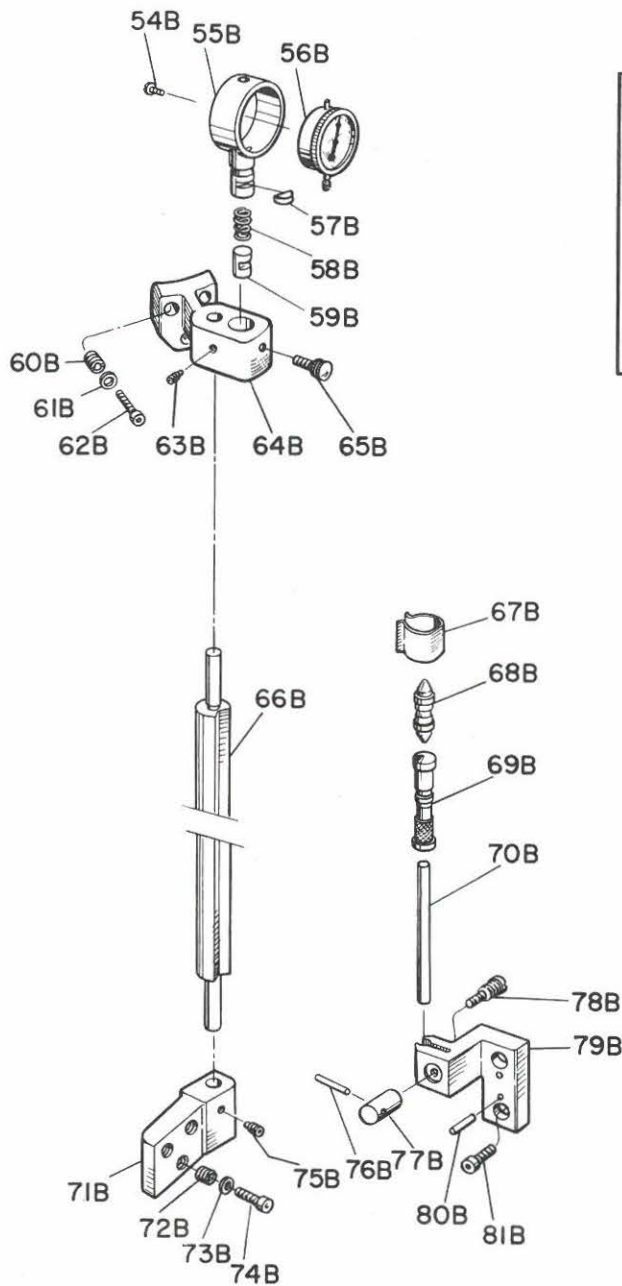
PRECISION MEASURING EQUIPMENT - UNIT No. 6JLJ
LONGITUDINAL MOVEMENT

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JLJ-1B	143463	Trough - On Table	1	6JLJ-14B	162324	50 M/M Metric	1
6JLJ-2B	2320	Screw	2	6JLJ-15B	163640	100 M/M Metric	1
6JLJ-3B	3314	Bolt - Tee	1	6JLJ-16B	163641	200 M/M Metric	1
6JLJ-4B	143448	Bracket - Trough	1	6JLJ-17B	163643	Micrometer	1
6JLJ-5B	664	Nut	1	6JLJ-18B	163644	English	1
6JLJ-6B	152060	Dial - Indicator	1	6JLJ-19B	163644	Metric	1
	152061	English	1	6JLJ-20B	68270	Pin - Stop	1
6JLJ-7B	153975	Lid - Indicator Bracket	1	6JLJ-21B	143460	Bolt - Pin Clamping	1
6JLJ-8B	3486	Screw	1	6JLJ-22B	151499	Bracket - Stop Pin	1
6JLJ-9B	3314	Bolt - Tee	1	6JLJ-23B	68716	Nut - Pin Clamping	1
6JLJ-10B	152301	Bracket - Indicator Dial	1	6JLJ-24B	3277	Pin	1
6JLJ-11B	68266	Spring - Compression	1	6JLJ-25B	3329	Pin	1
6JLJ-12B	68265	Plunger	1	6JLJ-26B	68269	Pin - Lid	1
6JLJ-13B	161846	Rod	1	6JLJ-27B	68271	Screw - Indicator Fastening	1
	161847	1" English	1		68267	Screw - Stop, Indicator Bracket	1
	161848	2" English	1		3399	Screw	2
	161849	4" English	1		664	Nut	1
	162323	8" English	1		1421	Pin	2
		25 M/M Metric	1		3266	Screw	2

CROSS MOVEMENT

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JLJ-28B	158503	Bracket - Stop Pin	1	6JLJ-37B	152060	Dial - Indicator	1
6JLJ-29B	143458	Bolt - Pin Clamping	1		152061	English	1
6JLJ-30B	2320	Screw	2	6JLJ-38B	68716	Metric	1
6JLJ-31B	1421	Pin	2	6JLJ-39B	3277	Nut - Pin Clamping	1
6JLJ-32B	68270	Pin - Stop	1	6JLJ-40B	3277	Pin	1
6JLJ-33B	163643	Micrometer	1	6JLJ-41B	143454	Trough - On Knee	1
	163644	English	1	6JLJ-42B	2320	Screw	2
6JLJ-34B	163644	Metric	1	6JLJ-43B	1421	Pin	2
	161846	Rod	1	6JLJ-44B	3399	Screw	2
	161847	1" English	1	6JLJ-45B	143455	Screw	1
	161848	2" English	1	6JLJ-46B	3399	Bracket - Trough	1
	161849	4" English	1	6JLJ-47B	1421	Screw	2
	162323	8" English	1	6JLJ-48B	3399	Pin	2
	162324	Screw	1	6JLJ-49B	68267	Screw	2
	163640	25 M/M Metric	1	6JLJ-50B	68267	Screw - Stop, Indicator Bracket	1
	163641	50 M/M Metric	1	6JLJ-51B	143453	Bracket - Dial, Indicator	1
6JLJ-35B	163641	100 M/M Metric	1	6JLJ-52B	68271	Screw - Indicator Fastening	1
6JLJ-36B	68265	Pin - Lid	1		68269	Pin - Clamping	1
	68266	Pin - Cotter	1		3329	Pin	1
		Spring	1		153975	Lid - Indicator Bracket	1

PRECISION MEASURING ATTACHMENT
VERTICAL MOVEMENT

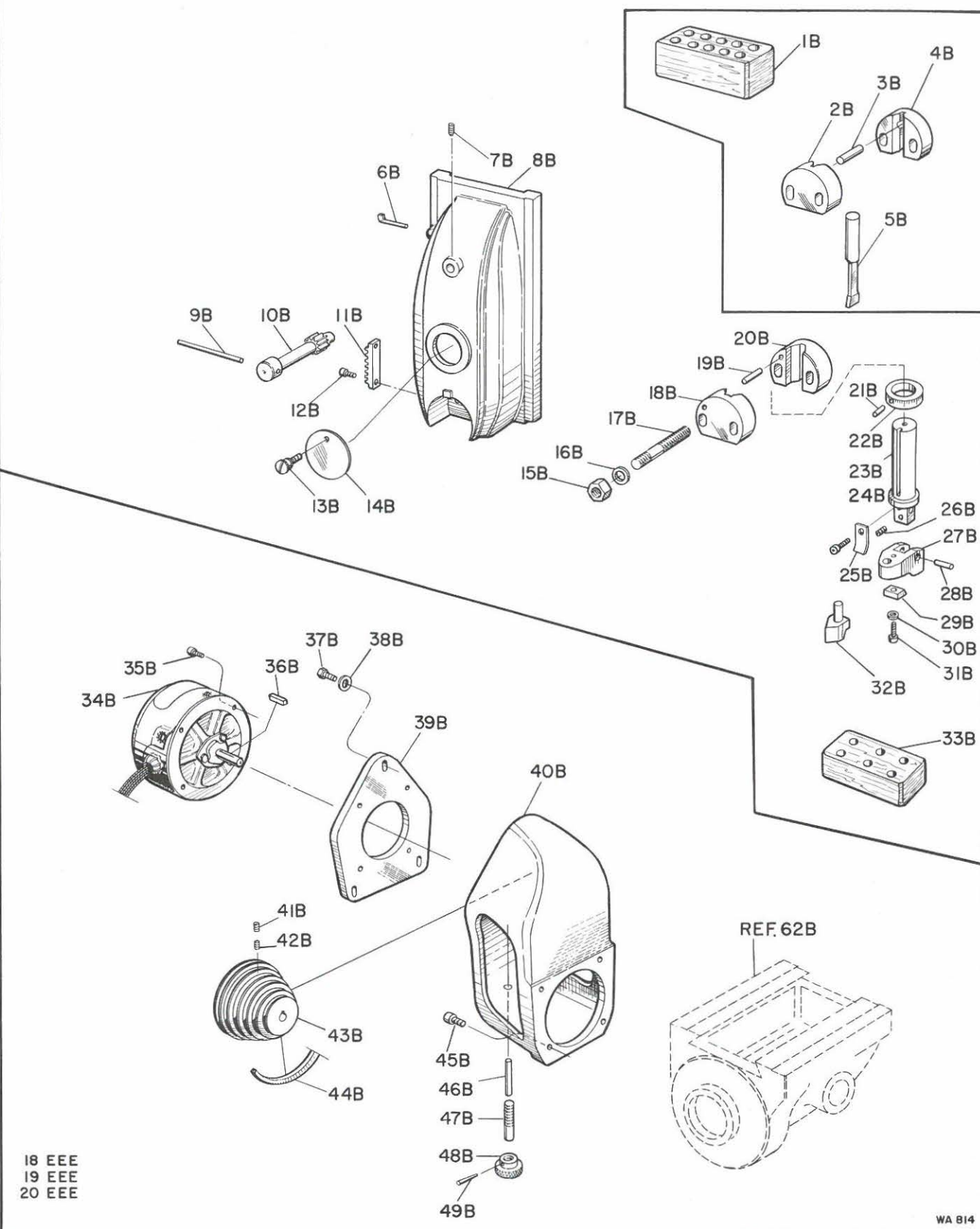


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

PRECISION MEASURING EQUIPMENT - UNIT No. 6JLL (Concluded)
VERTICAL MOVEMENT

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JLL-54B	68271	Screw - Indicator Fastening	1		161849	8" English.	1
6JLL-55B	79004	Case - Indicator	1		162323	25 M/M Metric	1
6JLL-56B		Dial - Indicator	1		162344	Rod, 50 M/M	1
	152060	English.	1		163640	100 M/M Metric	1
	152061	Metric	1		163641	200 M/M Metric	1
6JLL-57B	679	Key	1	6JLL-69B		Micrometer	1
6JLL-58B	68266	Spring - Compression	1		163643	English.	1
6JLL-59B	68265	Plunger - Indicator Bracket	1		163644	Metric	1
6JLL-60B	151467	Screw - Bushing	3	6JLL-70B	68270	Pin - Stop	1
6JLL-61B	122184	Washer	3	6JLL-71B	143450	Bracket - Vertical Shaft	1
6JLL-62B	3206	Screw.	3	6JLL-72B	151467	Screw - Bushing	3
6JLL-63B	3232	Screw.	1	6JLL-73B	122184	Washer	3
6JLL-64B	143452	Bracket - Indicator Dial	1	6JLL-74B	3206	Screw.	3
6JLL-65B	2253	Screw.	1	6JLL-75B	3232	Screw.	1
6JLL-66B	143449	Shaft - Vertical	1	6JLL-76B	3277	Pin	1
6JLL-67B	78456	Clip	8	6JLL-77B	68716	Nut - Pin Clamping	1
6JLL-68B		Rod	1	6JLL-78B	68715	Bolt	1
	161846	1" English.	1	6JLL-79B	158501	Bracket - Stop Pin	1
	161847	2" English.	1	6JLL-80B	1421	Pin	2
	161848	4" English.	1	6JLL-81B	3266	Screw.	2
				6JLL-82C	165719	Case - Rod	1

SHAPING ATTACHMENT



18 EEE
19 EEE
20 EEE

WA 814

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINE

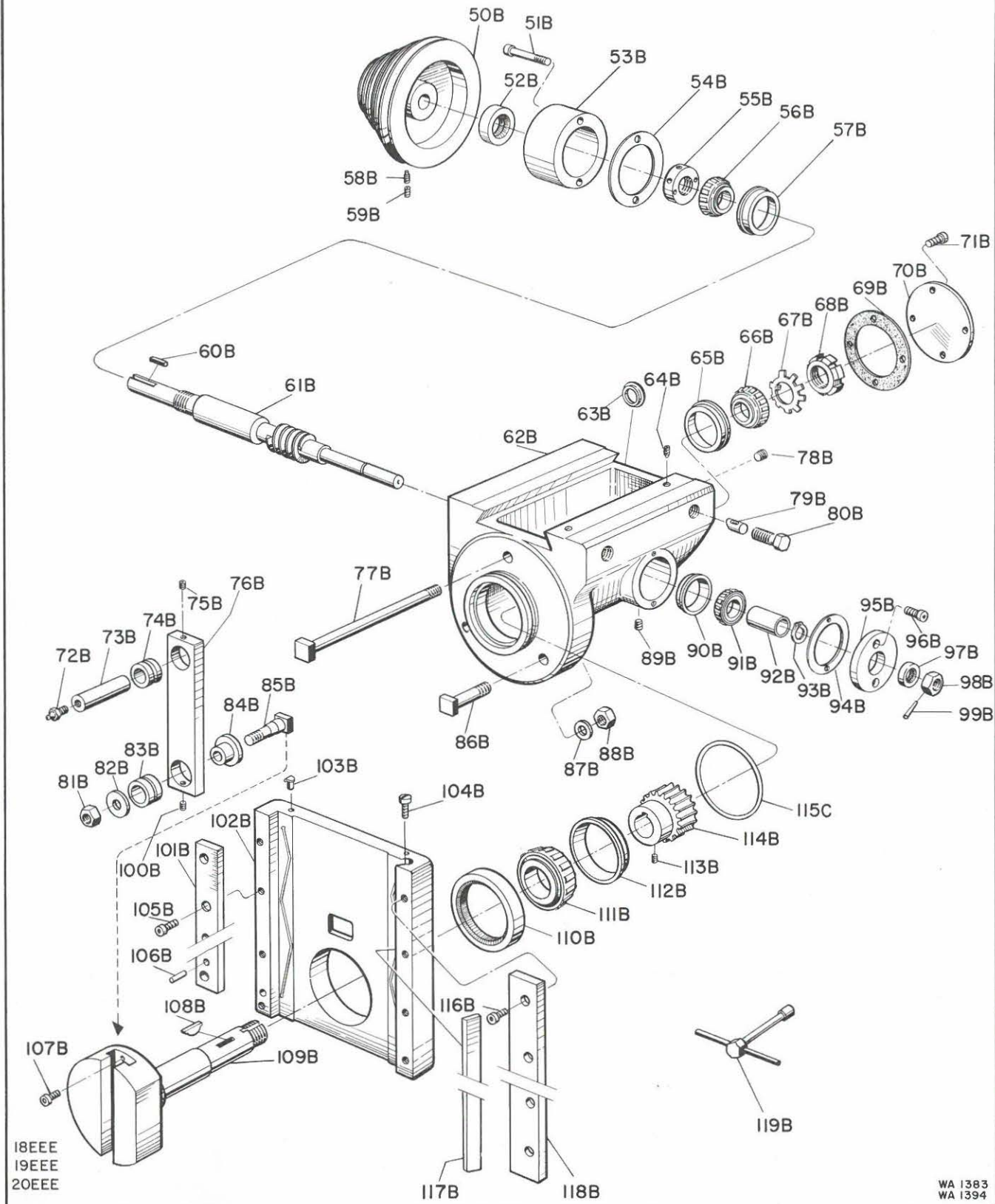
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

SHAPING ATTACHMENT - UNIT No. 6JHF

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JHF-1B	36714	Block - For Shaping Tools	1	6JHF-23B	143509	Bar - Tool Support	1
6JHF-2B	143526	Clamp - Tool, Outer.	1	6JHF-24B	3203	Screw.	1
6JHF-3B	143527	Pin - Tool Stop	1	6JHF-25B	143511	Spring - Clapper	1
6JHF-4B	143525	Clamp - Tool, Inner.	1	6JHF-26B	2333	Screw.	1
6JHF-5B		Tool - Shaping, Solid Tool Holder		6JHF-27B	143510	Block - Clapper	1
	121121	1/8" Parting	1	6JHF-28B	137917	Pin - Pivot	1
	121122	3/16" Parting	1	6JHF-29B	143512	Lug - Tool Clamp.	1
	121123	1/4" Square	1	6JHF-30B	143513	Washer - Tool Clamp	1
	121124	5/16" Square.	1	6JHF-31B	3227	Screw.	1
	121125	3/8" Square	1	6JHF-32B		Tool - Clapper Box Tool Holder	
	121126	1/2" Square	1		150709	Left Diamond Point.	1
	121127	1/4" Round	1		150710	Right Diamond Point	1
	121128	3/8" Round	1		150711	Straight, Round Nose	1
	121129	1/2" Round	1		150712	Round Nose	1
	121130	75° Angle	1		150713	Diamond Point	1
6JHF-6B	3518	Pointer	1		150714	Parting, Straight	1
6JHF-7B	3228	Screw.	1		150715	Block - For Shaping Tools	1
6JHF-8B	143477	Slide	1	6JHF-33B	Example	Motor - Shaping Attachment (*)	1
6JHF-9B	143486	Handle - Wrench	1	6JHF-35B	4093	Screw.	4
6JHF-10B	143485	Wrench - Stroke Adjusting.	1	6JHF-36B	1632	Key	1
6JHF-11B	143483	Rack - Stroke Adjusting.	1	6JHF-37B	49	Screw.	3
6JHF-12B	3218	Screw.	2	6JHF-38B	3441	Washer	3
6JHF-13B	2278	Screw.	1	6JHF-39B	166485	Plate - Motor Mounting.	1
6JHF-14 C		Plate - Instruction		6JHF-40B	143478	Housing - Belt.	1
	158104	60 Cycle Eng.	1	6JHF-41B	2332	Screw.	1
	166810	50 Cycle Eng.	1	6JHF-42B	3230	Screw.	1
6JHF-15B	3480	Nut	2	6JHF-43B	143514	Sheave - Motor Drive	1
6JHF-16B	225188	Washer - Heat.	2	6JHF-44B	166484	Belt - Vee	1
6JHF-17B	240381	Stud	2	6JHF-45B	2321	Screw.	4
6JHF-18B	143489	Clamp - Outer.	1	6JHF-46B	143481	Pin - Belt Adjusting	1
6JHF-19B	3544	Pin	1	6JHF-47B	143484	Screw - Belt Adjusting	1
6JHF-20B	143488	Clamp - Inner.	1	6JHF-48B	125141	Knob - Knurled	1
6JHF-21B	3541	Pin	1	6JHF-49B	140	Pin	1
6JHF-22B	143508	Dial - Tool Index	1				

* When ordering specify H. P., frame size, voltage and cycle.

SHAPING ATTACHMENT



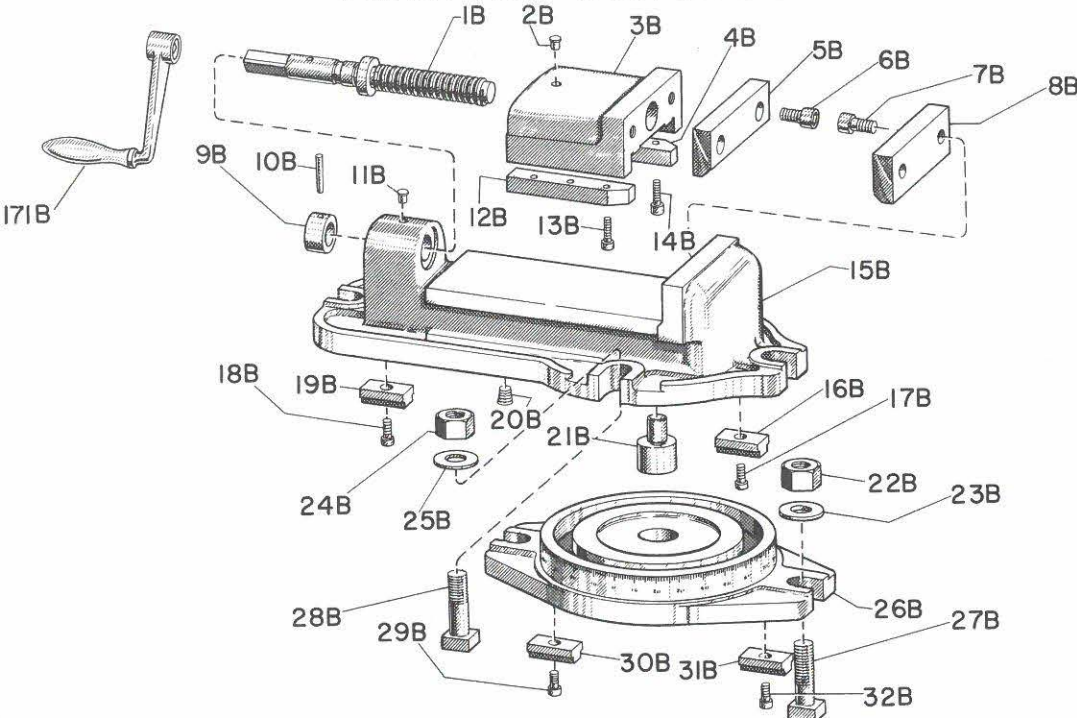
WA 1383
WA 1394

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

SHAPING ATTACHMENT - UNIT No. 6JHF (Concluded)

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JHF-50B	143515	Sheave - Driven	1	6JHF-86B	3274	Bolt - Tee	2
6JHF-51B	3158	Screw	2	6JHF-87B	3442	Washer	3
6JHF-52B	225409	Seal - Oil	1	6JHF-88B	3479	Nut	3
6JHF-53B	143518	Housing - Oil Seal, Large	1	6JHF-89B	76645	Plug	2
6JHF-54B	143517	Gasket - Housing, Large	1	6JHF-90B	97288	Cup - Bearing	1
6JHF-55B	4242	Nut - Lock	1	6JHF-91B	97289	Cone - Bearing	1
6JHF-56B	221593	Cone - Bearing	1	6JHF-92B	143519	Spacer - Worm Shaft.	1
6JHF-57B	108367	Cup - Bearing	1	6JHF-93B	237219	Ring - Retaining	1
6JHF-58B	3230	Screw	1	6JHF-94B	143520	Gasket - Housing, Small	1
6JHF-59B	2332	Screw	1	6JHF-95B	143521	Housing - Oil Seal, Small	1
6JHF-60B	1632	Key	1	6JHF-96B	3218	Screw	2
6JHF-61B	143516	Worm - Shaft	1	6JHF-97B	143522	Seal - Oil, Garlock	1
6JHF-62B	143475	Housing - Gear	1				
6JHF-63B	143496	Gage - Oil Sight	1				
6JHF-64B	3228	Screw	2	6JHF-100B	4236	Screw	1
6JHF-65B	95586	Cup - Bearing	1	6JHF-101B		Clamp - Left, On Housing	
6JHF-66B	95585	Cone - Bearing	1			English	1
6JHF-67B	3809	Washer - Lock	1			Metric	1
6JHF-68B	3810	Nut	1	6JHF-102B	143476	Housing - Slide	1
6JHF-69B	143495	Gasket - Drive Housing	1	6JHF-103B	44980	Oiler	2
6JHF-70B	143494	Plate - Drive Housing, Cover.	1	6JHF-104B	381	Screw	2
6JHF-71B	3203	Screw	4	6JHF-105B	3399	Screw	4
6JHF-72B	3342	Fitting - Alemite	1	6JHF-106B	1383	Pin	1
6JHF-73B	143502	Pin - Pitman Mounting	1	6JHF-107B	3221	Screw	2
6JHF-74B	143501	Bushing - Pitman, Small	1	6JHF-108B	3281	Key	1
6JHF-75B	4236	Screw	1	6JHF-109B	143493	Crank	1
6JHF-76B	143503	Pitman	1	6JHF-110B	143499	Seal - Oil, Garlock	1
6JHF-77B	143492	Bolt - Tee	1	6JHF-111B	108365	Cone - Bearing	1
6JHF-78B	76645	Plug - Pipe (1/4")	1	6JHF-112B	108366	Cup - Bearing	1
6JHF-79B	143524	Clamp - Screw	2	6JHF-113B	2333	Screw	1
6JHF-80B	741	Screw	2	6JHF-114B	143497	Worm - Wheel	1
6JHF-81B	3480	Nut	1	6JHF-115C	165148	Ring - "O"	1
6JHF-82B	143506	Washer - Pitman Bearing	1	6JHF-116B	3399	Screw	4
6JHF-83B	143505	Bushing - Pitman, Large	1	6JHF-117B	143491	Gib - Taper	1
6JHF-84B	143504	Sleeve - Bearing	1	6JHF-118B	143490	Clamp - Right, On Housing	1
6JHF-85B	143507	Bolt - Tee	1	6JHF-119B	3611	Wrench	1

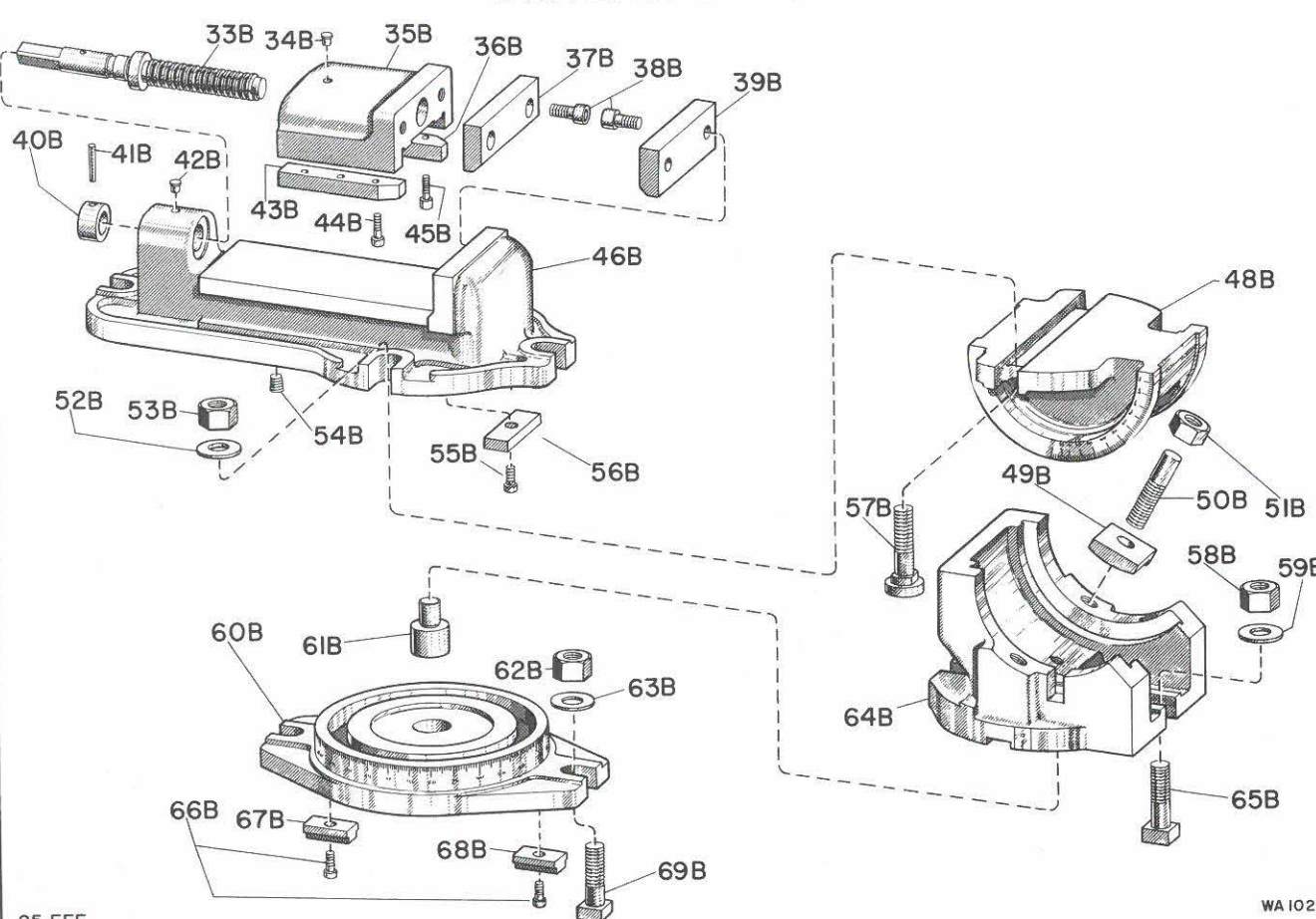
PLAIN AND SWIVEL VISE



WA 1024

50 EEE

UNIVERSAL VISE



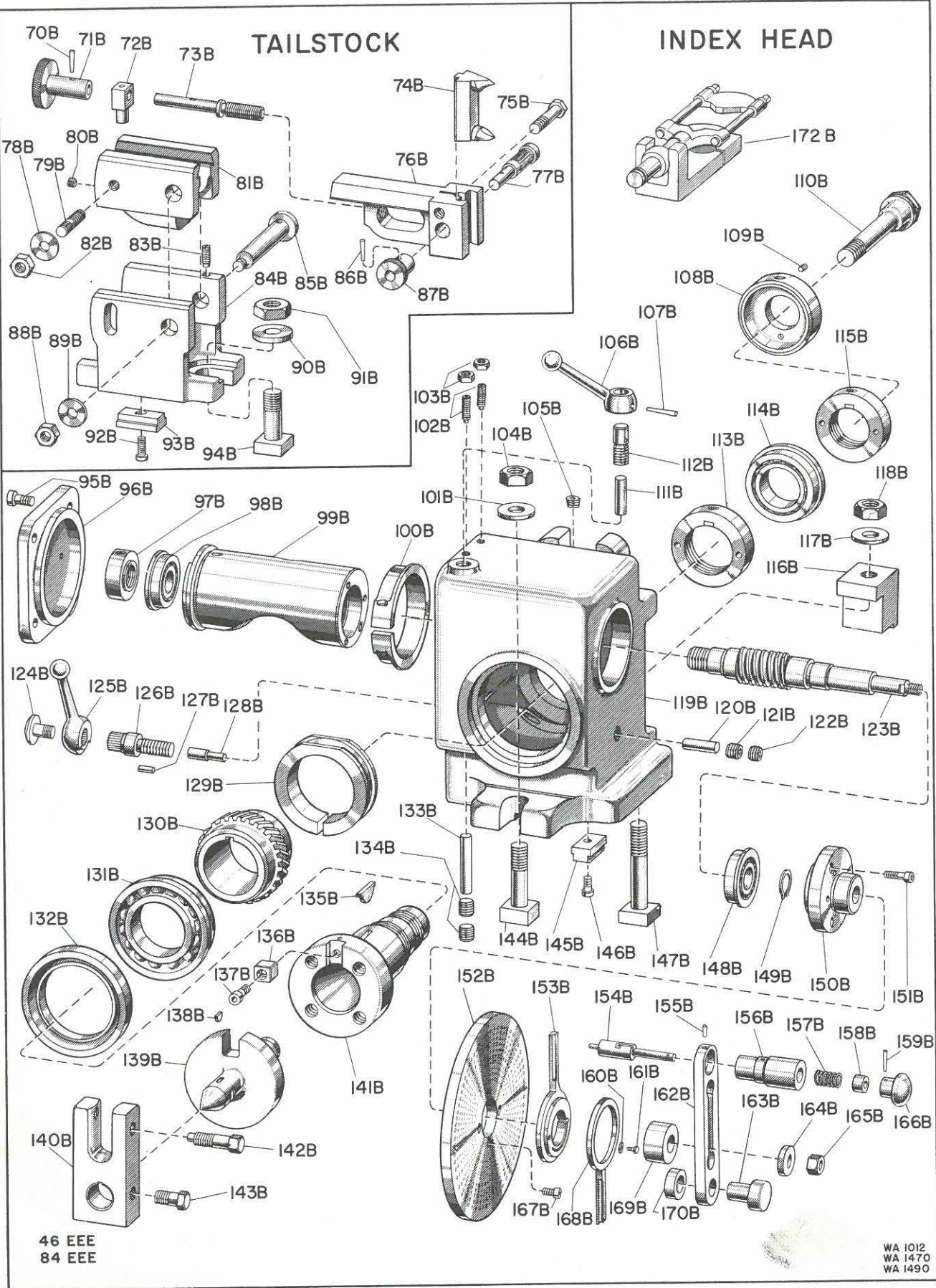
WA 1024

85 EEE

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

PLAIN, SWIVEL AND UNIVERSAL VISES - UNIT No. 6JKA

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKA-1B	153837	Screw - Vise	1	6JKA-35B	153836	Housing - Vise.	1
6JKA-2B	60062	Oiler	1	6JKA-36B	156208	Gib - Housing, Left Hand	1
6JKA-3B	153836	Housing - Vise.	1	6JKA-37B	153840	Jaw - Vise	1
6JKA-4B	156208	Gib - Housing, Left Hand	1	6JKA-38B	3399	Screw.	4
6JKA-5B	153840	Jaw - Vise	1	6JKA-39B	153840	Jaw - Vise	1
6JKA-6B	3399	Screw.	2	6JKA-40B	153839	Collar - On Screw	1
6JKA-7B	3399	Screw.	2	6JKA-41B	663	Pin - Taper.	1
6JKA-8B	153840	Jaw - Vise	1	6JKA-42B	60062	Oiler	1
6JKA-9B	153839	Collar - On Screw	1	6JKA-43B	153838	Gib - Housing, Right Hand.	1
6JKA-10B	663	Pin - Taper.	1	6JKA-44B	3396	Screw.	3
6JKA-11B	60062	Oiler	1	6JKA-45B	3396	Screw.	3
6JKA-12B	153838	Gib - Housing, Right Hand.	1	6JKA-46B	153832	Body - Vise.	1
6JKA-13B	3396	Screw.	3	6JKA-48B	161830	Swivel	1
6JKA-14B	3396	Screw.	3	6JKA-49B	161836	Shoe - Clamp	2
6JKA-15B	153832	Body - Vise.	1	6JKA-50B	224115	Stud	2
6JKA-16B	3357	Tongue	1	6JKA-51B	3480	Nut	2
6JKA-17B	3486	Screw.	1	6JKA-52B	1040	Washer	2
6JKA-18B	3486	Screw.	1	6JKA-53B	3480	Nut	2
6JKA-19B	3357	Tongue	1	6JKA-54B	76645	Plug - Pipe	2
6JKA-20B	76645	Plug - Pipe	2	6JKA-55B	3486	Screw.	2
6JKA-21B	10624	Stud	1	6JKA-56B	1954-T	Tongue	2
6JKA-22B	3480	Nut	2	6JKA-57B	158173	Bolt - Locking Tee	2
6JKA-23B	1040	Washer	2	6JKA-58B	3480	Nut	2
6JKA-24B	3480	Nut	2	6JKA-59B	1040	Washer	2
6JKA-25B	1040	Washer	2	6JKA-60B	153833	Plate - Swivel	2
6JKA-26B	153833	Plate - Swivel	1	6JKA-61B	10624	Stud	1
6JKA-27B	275	Bolt - Tee	2	6JKA-62B	3480	Nut	2
6JKA-28B	222	Bolt - Tee	2	6JKA-63B	1040	Washer	2
6JKA-29B	3486	Screw.	1	6JKA-64B	161835	Base - Swivel	1
6JKA-30B	3357	Tongue	1	6JKA-65B	222	Bolt - Tee	2
6JKA-31B	3357	Tongue	1	6JKA-66B	3486	Screw.	2
6JKA-32B	3486	Screw.	1	6JKA-67B	3357	Tongue	1
6JKA-33B	153837	Screw - Vise	1	6JKA-68B	3357	Tongue	1
6JKA-34B	60062	Oiler	1	6JKA-69B	275	Bolt - Tee	2
				6JKA-171B	150700	Wrench	1

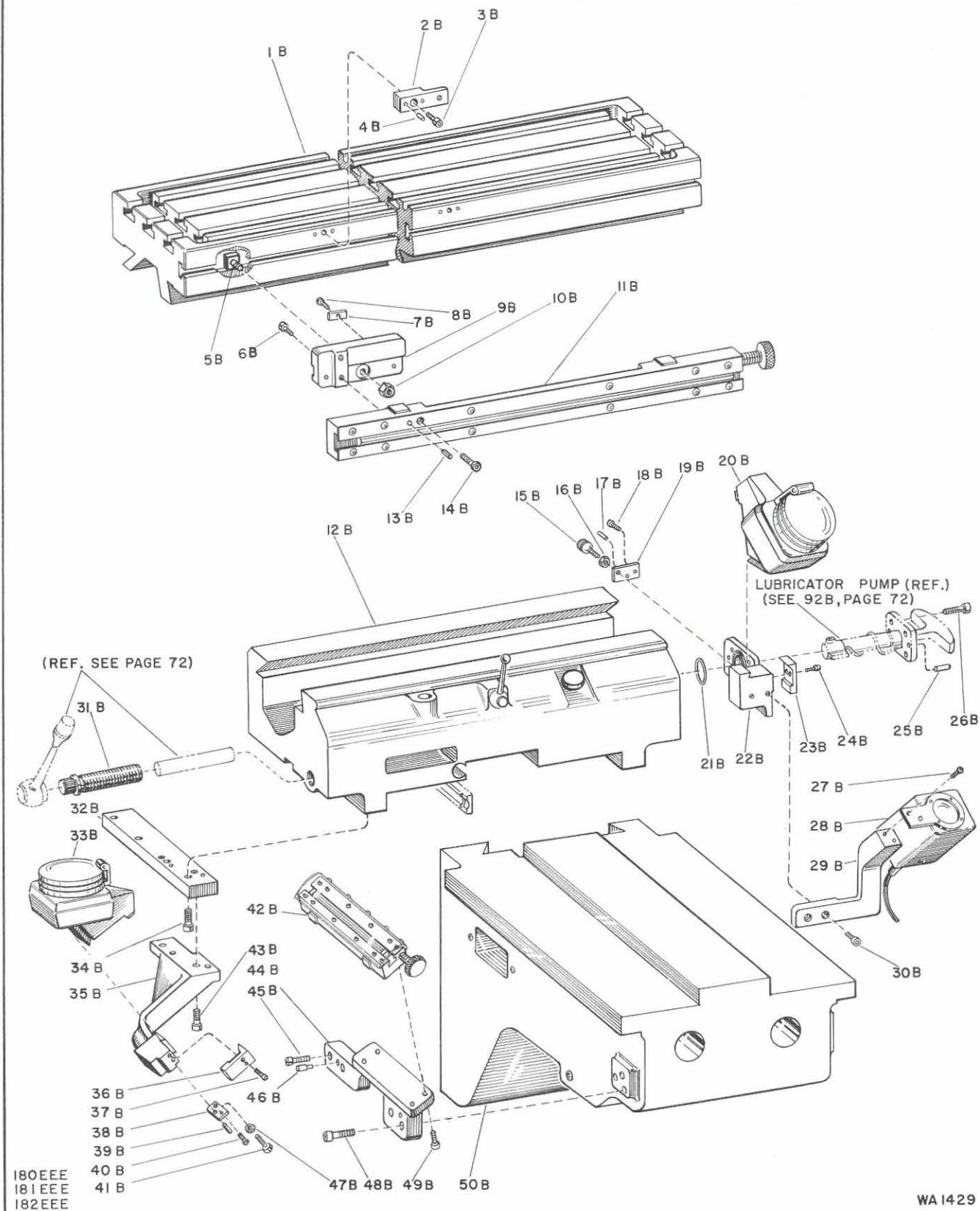


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

INDEX HEAD AND TAILSTOCK - UNIT No. 6JKA

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKA-70B	140	Pin - Taper.	1	6JKA-121B	45668	Screw.	1
6JKA-71B	142918	Knob - On Screw for Tailstock	1	6JKA-122B	2357	Screw.	1
6JKA-72B	142917	Bearing - Adjusting Screw.	1	6JKA-123B	170799	Shaft - Worm	1
6JKA-73B	142916	Screw - Adjustment	1	6JKA-124B	3514	Screw - Retaining.	1
6JKA-74B	142913	Center - Elevating Tailstock	1	6JKA-125B	150430	Lever - Spindle Clamp	1
6JKA-75B	3320	Screw.	1	6JKA-126B	150431	Screw - Spindle Clamp	1
6JKA-76B	142912	Slide - Tailstock	1	6JKA-127B	3636	Pin	1
6JKA-77B	142914	Pinion - Tailstock	1	6JKA-128B	150427	Pin - Spindle Clamp	1
6JKA-78B	82244	Washer	1	6JKA-129B	149779	Clamp - Spindle	1
6JKA-79B	225067	Stud	1	6JKA-130B	171335	Wheel - Worm	1
6JKA-80B	2332	Screw.	1	6JKA-131B	142612	Bearing - Ball	1
6JKA-81B	142911	Block - Swivel	1	6JKA-132B	173802	Baffle - Spindle	1
6JKA-82B	3478	Nut	1	6JKA-133B	153488	Pin - Sleeve Clamp	1
6JKA-83B	3230	Screw.	1	6JKA-134B	2248	Screw.	2
6JKA-84B	142910	Housing - Tailstock	1	6JKA-135B	3281	Key	1
6JKA-85B	142919	Shaft - Trunnion	1	6JKA-136B	94602	Key - Spindle	1
6JKA-86B	140	Pin - Taper	1	6JKA-137B	3396	Screw.	1
6JKA-87B	142915	Knob - Pinion	1	6JKA-138B	1266	Key	1
6JKA-88B	3478	Nut	1	6JKA-139B	151382	Center - Adapter	1
6JKA-89B	82244	Washer	1	6JKA-140B	134972	Holder - Dog	1
6JKA-90B	1040	Washer	2	6JKA-141B	168188	Spindle	1
6JKA-91B	3475	Nut	2	6JKA-142B	51	Screw.	2
6JKA-92B	3203	Screw.	2	6JKA-143B	1453	Screw.	1
6JKA-93B	163935	Tongue	2	6JKA-144B	2227	Bolt - Tee	1
6JKA-94B	3362	Bolt - Tee	1	6JKA-145B	3357	Tongue	2
6JKA-95B	4093	Screw.	4	6JKA-146B	3486	Screw.	2
6JKA-96B	161831	Cap - Worm Dust	1	6JKA-147B	232618	Bolt - Tee	1
6JKA-97B	153483	Nut - Lock	1	6JKA-148B	150429	Bearing - Ball	1
6JKA-98B	150429	Bearing - Ball	1	6JKA-149B	125924	Ring - Retaining	1
6JKA-99B	161833	Sleeve - Eccentric Engagement	1	6JKA-150B	153482	Flange - Eccentric	1
6JKA-100B	161832	Clamp - Eccentric Sleeve	1	6JKA-151B	3396	Screw.	3
6JKA-101B	1040	Washer	1	6JKA-152B	153478	Plate - Index	1
6JKA-102B	3231	Screw - Set.	1	6JKA-153B	157954	Sector - Bottom Part	1
6JKA-103B	3472	Nut - Thin	1	6JKA-154B	70861	Plunger - Index	1
6JKA-104B	3475	Nut	1	6JKA-155B	2160	Pin	1
6JKA-105B	76644	Plug - Pipe	1	6JKA-156B	37750	Holder - Pin Index	1
6JKA-106B	115999	Lever	1	6JKA-157B	253	Spring	1
6JKA-107B	232350	Pin - Taper	1	6JKA-158B	295	Bushing	1
6JKA-108B	150418	Cap - Spindle Dust	1	6JKA-159B	140	Pin - Taper	1
6JKA-109B	2332	Screw.	2	6JKA-160B	294	Washer	1
6JKA-110B	156438	Bolt - Arbor, Draw-In	1	6JKA-161B	2285	Screw.	1
6JKA-111B	153487	Pin - Sleeve Clamp	1	6JKA-162B	149772	Carrier - Index Pin Holder	1
6JKA-112B	153486	Screw - Sleeve Clamp	1	6JKA-163B	76948	Stud - Balancing	1
6JKA-113B	4249	Nut	1	6JKA-164B	661	Washer	1
6JKA-114B	236701	Bearing - Ball	1	6JKA-165B	3478	Nut	1
6JKA-115B	4247	Nut	1	6JKA-166B	149778	Knob - Index	1
6JKA-116B	153490	Clamp - Hold Down	1	6JKA-167B	3197	Screw.	4
6JKA-117B	1040	Washer	1	6JKA-168B	157953	Sector - Top Part	1
6JKA-118B	3475	Nut	1	6JKA-169B	153484	Collar - Sector Retaining	1
6JKA-119B	161834	Body - Index Head	1	6JKA-170B	76949	Collar - Balancing Stud	1
6JKA-120B	153489	Pin - Spindle Clamping	1	6JKA-172B	151383	Dog - Milling Machine	1

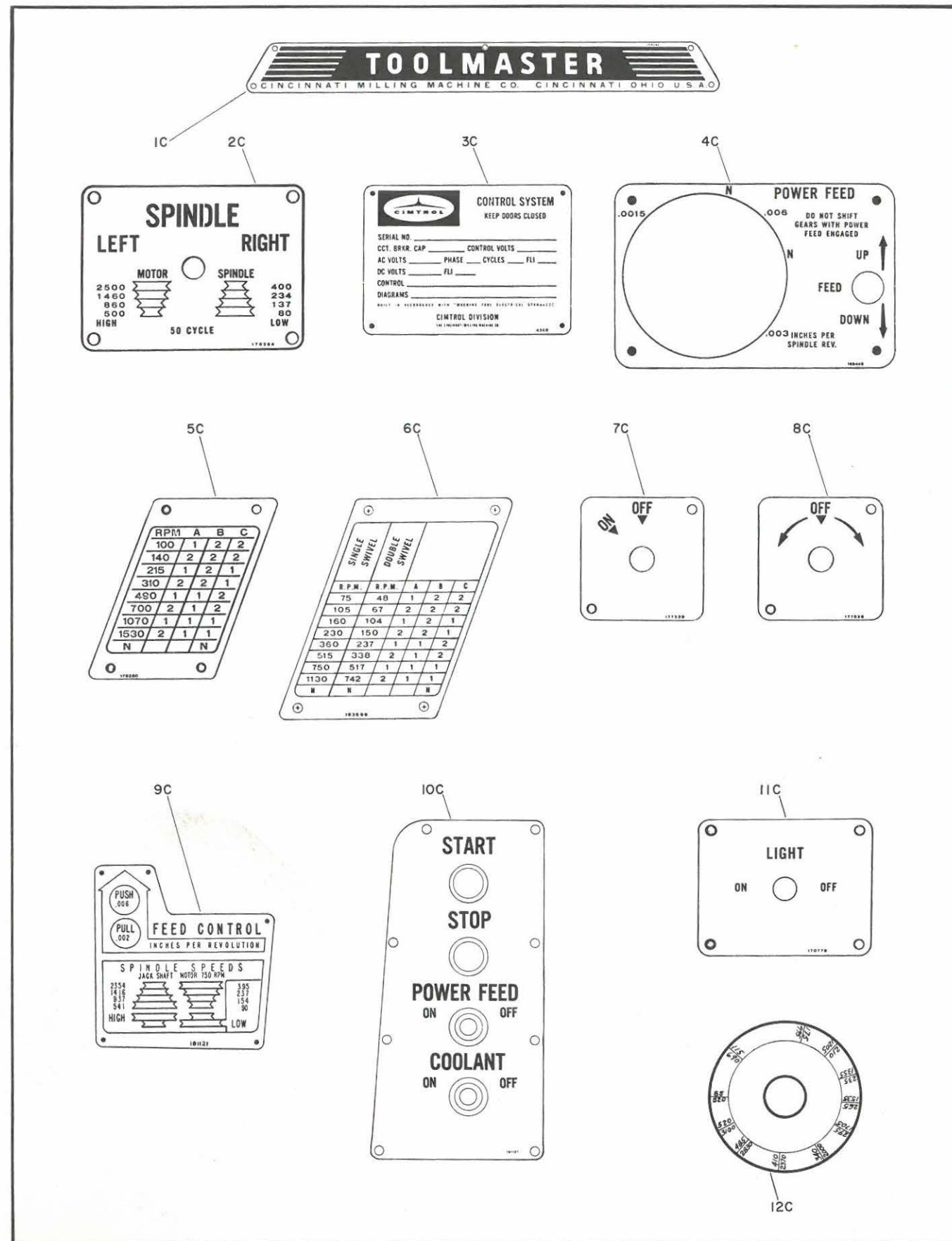
OPTICAL MEASURING EQUIPMENT



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

OPTICAL MEASURING EQUIPMENT - UNIT NO. 6JKY

Key No.	Part No.	Part Name	Amt. Used	Key No.	Part No.	Part Name	Amt. Used
6JKY-1B	181974	22-28 Inch Longitudinal Movement	1	6JKY-26B	3227	Screw.	4
6JKY-2B	181966	Alt. Table 155652	1	6JKY-27B	2369	Screw.	2
6JKY-3B	2321	Bracket - Scale Mounting	1	6JKY-28B	181971	Timer	1
6JKY-4B	3636	Screw.	4	6JKY-29B	181969	Bracket - Timer	1
6JKY-5B	3220	Pin	2	6JKY-30B	3396	Screw.	2
6JKY-6B	2320	"T" Bolt	1			22-28 Inch Cross Movement	
6JKY-7B	176293	Screw.	2	6JKY-31B	173867	Stud - Clamping	1
6JKY-8B	3199	Tongue	2	6JKY-32B	173911	Alt. Clamp 143355	1
6JKY-9B	181967	Screw.	2	6JKY-33B	181939	Vernac	1
6JKY-10B	3478	Bracket - Mounting	1	6JKY-34B	3266	Screw.	4
6JKY-11B		Nut	1	6JKY-35B	181972	Bracket - Vernac.	1
		Scale - Vernac		6JKY-36B	173866	Block - Clamping	1
	181965	22" Adjustable	1	6JKY-37B	251177	Screw.	2
	184647	28" Adjustable	1	6JKY-38B	173865	Plate - Adj.	1
6JKY-12B	173884	Alt. Saddle 156187	1	6JKY-39B	3636	Pin	1
6JKY-13B	150577	Pin - Roll	1	6JKY-40B	3246	Screw.	3
6JKY-14B	3206	Screw.	1	6JKY-41B	77200	Screw.	1
6JKY-15B	2255	Screw.	1	6JKY-42B	181970	Scale	1
6JKY-16B	2280	Nut	1	6JKY-43B	3399	Screw.	2
6JKY-17B	3636	Pin	1	6JKY-44B	184603	Bracket - Scale	1
6JKY-18B	3246	Screw.	1	6JKY-45B	3266	Screw.	2
6JKY-19B	173865	Plate - Adjusting	1	6JKY-46B	1421	Pin	2
6JKY-20B	173859	Vernac	1	6JKY-47B	2280	Nut	1
6JKY-21B	173882	Ring - "O"	1	6JKY-48B	3266	Screw.	2
6JKY-22B	181968	Bracket - Vernac.	1	6JKY-49B	4093	Screw.	4
6JKY-23B	173866	Block - Clamping	1	6JKY-50B	158505	Alt. Knee 173756	1
6JKY-24B	251177	Screw.	2				
6JKY-25B	3541	Pin	2				



WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

MACHINE INSTRUCTION PLATES (Continued)

KEY NO.	PART NO.	PART NAME	AMT. USED	KEY NO.	PART NO.	PART NAME	AMT. USED
1C	158086	Plate - Name	1	8C	177528	Plate - Electrical Direction	1
2C	176264	Plate - Spindle Direction	1	9C	181121	Plate - Feed and Speed	1
	175394	50 Cycle, 80-1500 RPM.	1		181122	750 RPM.	1
	180288	60 Cycle, 1800 RPM.	1		181123	900 RPM.	1
3C	4368	3600 RPM.	1		181124	1000 RPM.	1
4C	169445	Plate - Control, System	1		181125	1200 RPM.	1
5C	178250	Plate - Instruction	1		181126	1500 RPM.	1
	178279	Plate - Spindle Speeds	1		181127	1800 RPM.	1
	183699	100 to 1530	1	10C	181127	Plate - P. B. Cover	1
6C	177529	75 to 1130	1	11C	170778	Plate - On-Off	1
7C	184643	Plate - Speed.	1	12C	175272	Dial - V.S.	1
		Plate - On-Off	1		175397	50 Cycle, 1500 RPM.	1
		English.	1			60 Cycle, 1800 RPM.	1
		Metric	1				

13C

TABLE FEEDS									
POSITION OF LEVERS	1A	1B	1C	2A	2B	2C	3A	3B	3C
INCHES PER MIN	.37	.55	.85	1.2	1.7	2.6	3.3	5.0	7.5

178274

14C

SADDLE FEEDS									
POSITION OF LEVERS	1A	1B	1C	2A	2B	2C	3A	3B	3C
INCHES PER MIN	.75	1.1	1.7	2.4	3.4	5.2	6.6	10	15

180128

15C

IMPORTANT

FILL TO LINE ON GAGE. USE GOOD GRADE MEDIUM MACHINE OIL. VISCOSITY 200 TO 220 SAYBOLT UNIVERSAL SECONDS AT 100° F. SEE LUBRICATION BOOK FOR RECOMMENDED SUPPLIERS. SPECIFICATION CIMA NO. P-55. CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO 45202

16C

GREASE LIGHTLY WITH SPINDLE SPEED SET TO 1400 RPM OR LESS. RUN AT THIS SPEED FOR ONE MINUTE.

180895

17C

HIGH
NEUTRAL

LOW

STOP MOTOR BEFORE SHIFTING

181129

18C

CAUTION
DO NOT OVER GREASE
USE A LIGHT QUALITY GREASE TO LUBRICATE BALL AND ROLLER TYPE BEARINGS.
7 ON 3 SHOTS AT ALL FITTINGS WEEKLY
USE ALUMINUM ZINC GREASE GUN
SEE LUBRICATION BOOK FOR RECOMMENDED SUPPLIERS.
SPECIFICATION CIMA NO. P-43

181129

19C

MOTOR
SHEAVE

STROKES
PER
MINUTE

180128

20C

CINCINNATI
THE CINCINNATI MILLING MACHINE CO.

180128

21C

ARBOR-LOC

180128

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 27, "How to Order Repair Parts."

MACHINE INSTRUCTION PLATES (Concluded)

KEY NO.	PART NO.	PART NAME	AMT. USED	KEY NO.	PART NO.	PART NAME	AMT. USED
13C	181128	Plate - Table Feed		15C	167039	Plate - Oil Specification	1
	184643	1800 RPM, 60 Cycle, English.	1	16C	186595	Plate - Instruction, Lube, Grease.	1
	183636	1800 RPM, 60 Cycle, Metric	1	17C	167457	Plate - Shifting, 50-60 Cycle	1
	178274	1500 RPM, 50 Cycle, (P. F.)	1	18C	167038	Plate - Instruction	1
14C		900 RPM, 0.37 to 7.5 (Table).	1	19C		Plate - Instruction	
	181129	Plate - Saddle Feed (Knee).	1		158104	60 Cycle.	1
	183635	1800 RPM, 60 Cycle.	1		166810	50 Cycle.	1
	183672	1500 RPM, 50 Cycle.	1	20C	185387	Plate - Name (Vises)	1
		900 RPM, 0.37 to 7.5	1	21C	174886	Plate - Name (Arbor-Loc).	1

CONVERSION CHART

(Based on 25.4mm = 1")

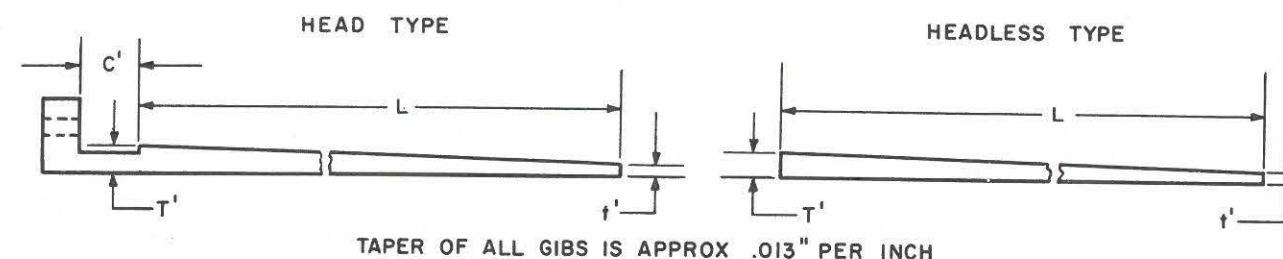
Inches into Millimeters

Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M
1/64	.0156	0.3969	49/64	.7656	19.4469	34	863.600	82	2082.80
1/32	.0313	0.7937	25/32	.7813	19.8437	35	889.000	83	2108.20
3/64	.0469	1.1906	51/64	.7969	20.2406	36	914.400	84	2133.60
1/16	.0625	1.5875	13/16	.8125	20.6375	37	939.800	85	2159.00
5/64	.0781	1.9844	53/64	.8281	21.0344	38	965.200	86	2184.40
3/32	.0938	2.3812	27/32	.8438	21.4312	39	990.600	87	2209.80
7/64	.1094	2.7781	55/64	.8594	21.8281	40	1016.00	88	2235.20
1/8	.1250	3.1750	7/8	.8750	22.2250	41	1041.40	89	2260.60
9/64	.1406	3.5719	57/64	.8906	22.6219	42	1066.80	90	2286.00
5/32	.1563	3.9687	29/32	.9063	23.0187	43	1092.20	91	2311.40
11/64	.1719	4.3656	59/64	.9219	23.4156	44	1117.60	92	2336.80
3/16	.1875	4.7625	15/16	.9375	23.8125	45	1143.00	93	2362.20
13/64	.2031	5.1594	61/64	.9531	24.2094	46	1168.40	94	2387.60
7/32	.2188	5.5562	31/32	.9688	24.6062	47	1193.80	95	2413.00
15/64	.2344	5.9531	63/64	.9844	25.0031	48	1219.20	96	2438.40
1/4	.2500	6.3500	1		25.4000	49	1244.60	97	2463.80
17/64	.2656	6.7469	2		50.800	50	1270.00	98	2489.20
9/32	.2813	7.1437	3		76.200	51	1295.40	99	2514.60
19/64	.2969	7.5406	4		101.600	52	1320.80	100	2540.00
5/16	.3125	7.9375	5		127.000	53	1346.20	101	2565.40
21/64	.3281	8.3344	6		152.400	54	1371.60	102	2590.80
11/32	.3438	8.7312	7		177.800	55	1397.00	103	2616.20
23/64	.3594	9.1281	8		203.200	56	1422.00	104	2641.60
3/8	.3750	9.5250	9		228.600	57	1447.80	105	2667.00
25/64	.3906	9.9219	10		254.000	58	1473.20	106	2692.40
13/32	.4063	10.3187	11		279.400	59	1498.60	107	2717.80
27/64	.4219	10.7156	12		304.800	60	1524.00	108	2743.20
7/16	.4375	11.1125	13		330.200	61	1549.40	109	2768.60
29/64	.4531	11.5094	14		355.600	62	1574.80	110	2794.00
15/32	.4688	11.9062	15		381.000	63	1600.20	111	2819.40
31/64	.4844	12.3031	16		406.400	64	1625.60	112	2844.80
1/2	.5000	12.7000	17		431.800	65	1651.00	113	2870.20
33/64	.5156	13.0969	18		457.200	66	1676.40	114	2895.60
17/32	.5313	13.4937	19		482.600	67	1701.80	115	2921.00
35/64	.5469	13.8906	20		508.000	68	1727.20	116	2946.40
9/16	.5625	14.2875	21		533.400	69	1752.60	117	2971.80
37/64	.5781	14.6844	22		558.800	70	1778.00	118	2997.20
19/32	.5938	15.0812	23		584.200	71	1803.40	119	3022.60
39/64	.6094	15.4781	24		609.600	72	1828.80	120	3048.00
5/8	.6250	15.8750	25		635.000	73	1854.20	121	3073.40
41/64	.6406	16.2719	26		660.400	74	1879.60	122	3098.80
21/32	.6563	16.6687	27		685.800	75	1905.00	123	3124.20
43/64	.6719	17.0656	28		711.200	76	1930.40	124	3149.60
11/16	.6875	17.4625	29		736.600	77	1955.80	125	3175.00
45/64	.7031	17.8594	30		762.000	78	1981.20	126	3200.40
23/32	.7188	18.2562	31		787.400	79	2006.60	127	3225.80
47/64	.7344	18.6531	32		812.800	80	2032.00	128	3251.20
3/4	.7500	19.0500	33		838.200	81	2057.40	129	3276.60

0.001" = .0254 mm

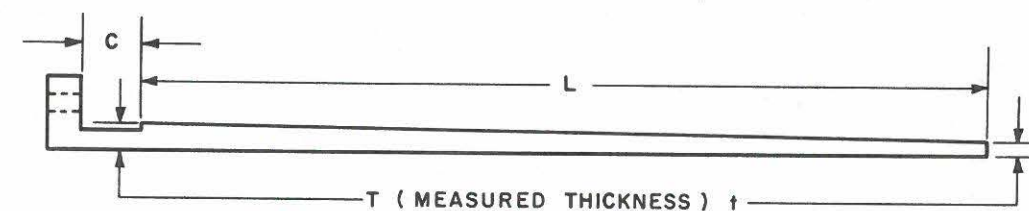
0.01 mm = 0.0004"

ORDERING REPLACEMENT GIBS



Measurements of Old Gib

When ordering replacement gibs, be certain to give length and thickness at both ends of old gib. Also specify the amount of stock you wish left on gib for fitting. (Normally a replacement gib has 0.020" extra stock for planing and scraping to fit.)



Measurements of New Gib

Example:

Assume that the old gib had been readjusted so there was no clearance under head and the ways had been scored so 0.010" had to be removed to clean them. If a clearance under head (C) of 1" is desired, specify a gib of length L having $T = T' + 0.023"$ and $t = t' + 0.023"$. (0.010" is amount of stock removed; 0.013" increased gib thickness that will move gib out approximately 1".)



MILLING MACHINE DIVISION

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.



HORIZONTAL
KNEE & COLUMN



VERTICAL
KNEE & COLUMN

MILLING MACHINES



HORIZONTAL &
VERTICAL BED TYPE



RISE & FALL AND
TRACER CON-
TROLLED BED TYPE

Products of the Milling Machine Division of The Cincinnati Milling Machine Co. are listed and symbolized here.

Products of The Cincinnati Milling Machine Co.'s other divisions include a complete line of centertype grinding machines, centerless grinding machines, roll grinding machines, chucking grinding machines, micro-centric grinding machines, special grinding machines, heating machines, metal forming machines, special broaching machines, special machine tools and complete production lines, special machinery, numerical control systems, tracing systems, gaging systems, hydraulic motors, hydraulic and electro-hydraulic valves and components, cutting fluids and precision grinding wheels.



HORIZONTAL
& VERTICAL

DIE SINKING MACHINES
AND
BROACHING MACHINES



VERTICAL



Nos. 1 & 2

CUTTER SHARPENING
MACHINES

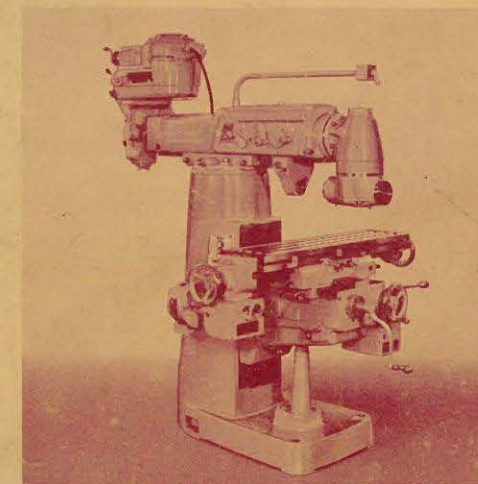


MONOSET
& OPTICAL

CINCINNATI NO. 1 TOOLMASTER MILLING MACHINES (M-2318)

605-129

SERVICE MANUAL AND PARTS LIST CATALOG



**1B, 1C, 1D, 1E and HV
TOOLMASTER
MILLING MACHINES**



Identification No. 6J-DE
Publication No. M-2318

WHEN ORDERING REPAIR PARTS

1. Give complete Serial Number of Machine.
2. Give Part Number and Name.
3. Give Amount Required.

UNLESS THE ABOVE DATA IS INCLUDED WE CANNOT FILL YOUR ORDER

This Booklet should be Filed in Tool Crib and issued by Tool Check only

