

CLEEREMAN
Drilling Machine
Model DV 24
24" Round column

Instruction and Parts Manual

Chas. G. Allen Co., Inc.
25 Williamsville Road
Barre, MA 01005

Telephone: (978) 355-2911 Fax: (978) 355-2917

INTRODUCTION

This manual is designed to assist you in using your Cleereman machine tool.

It is a handbook for the operator, service department, shop foreman, plant engineer, master mechanic, methods and processing department and tool design personnel.

The following pages give details covering installation, lubrication, operation and care of the machine. Instructions, supplemented by drawings and parts lists, are included for your guidance in disassembling the components of the machine and identifying the parts.

Your machine was work-tested and performed actual drilling; it was adjusted for accuracy, alignments and proper operation before being shipped to you. Cleereman design and manufacture assures long, reliable machine life; however, should natural

wear or accidental damage cause a stoppage, the procedures outlined herein will be a definite help in accomplishing quickly and accurately any repair work which may be necessary.

Cleereman Machine Tool Division keeps a record by serial number of each machine built. To insure prompt and efficient service, include the serial number of your machine with any inquiry or parts order. The serial number will be found at the bottom of the sliding head way.

A Cleereman Machine Tool is precision equipment - keep it clean and well lubricated and it will render efficient service for many years.

Study this manual and keep it for future reference. Additional copies are available upon request.

INDEX

Uncrating and Setting Up	2
Lubrication	3
Operating Instructions	4
Maintenance Adjustments	7
Service Instructions	9
Parts Manual	19
How To Identify and Order Replacement Parts	19
Visual Index for Heavy Duty Sliding Head Drilling Machines	21

UNCRATING AND SETTING UP

1. Remove the crating but be careful to save any small boxes which may be attached. They contain important parts of the machine. The skids should remain attached to the machine until it has been moved to its permanent location or under a crane. Lift the machine with a crane using a rope sling as shown in Figure 1. Place a pad or felt between the rope and the machine to prevent marring the painted surface. All loose parts such as a spindle guard and shaft guard, piping and wrenches are packed in a separate wooden box attached to the skids.

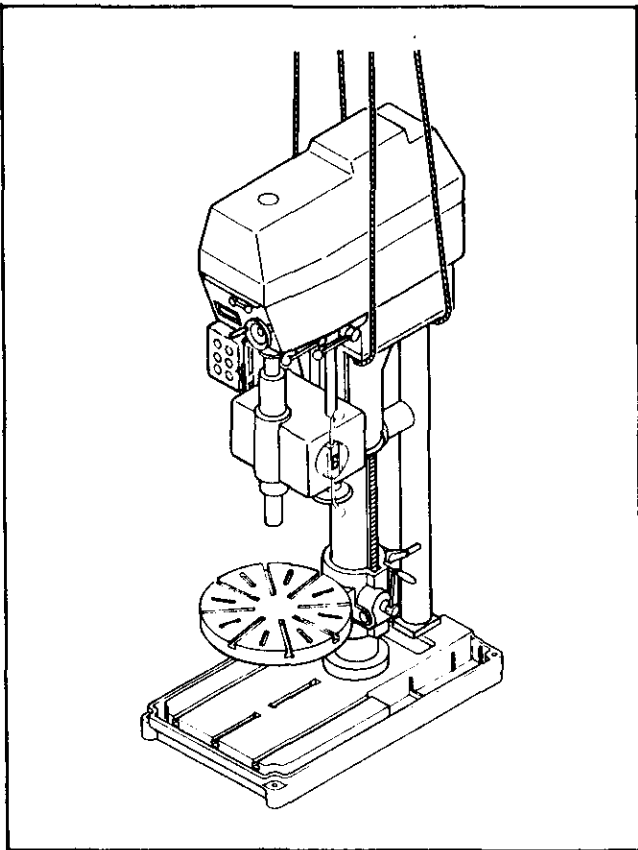


Figure 1. Lifting The Machine
24" Round Column Drill

2. The Cleereman Upright Drill has a large base in proportion to its size and weight, so it may be located on any good floor. However, it is well to remember that the more solid the foundation, the less trouble there will be from vibration and distortion and the more accurate will be the results.

If machines are to be placed on balconies or upper floors, place the machine as near to a pillar or supporting wall as possible.

3. It is recommended that all machines be bolted down but if the machine is placed on a rigid floor with little or no vibration it is not necessary to bolt the machine down.

4. Remove the blocking which holds the counterweight inside the column. It is only necessary to lift the machine off the skid a sufficient height to permit the blocking to fall out.

CAUTION

Do not move the spindle up before removing blocking because of the possibility of getting the counterweight chain off the sheaves.

5. Carefully remove all slushing compound from the spindle, quill, table and ways. Use new clean kerosene and clean rags free from lint. Use a stiff bristle brush to get into corners. Do not use an air hose for cleaning because air pressure will drive grit and dirt into bearing surfaces.

6. All machines are normally shipped completely wired and ready to connect to the line. Connect the line wires to the disconnect switch. Be sure to connect the line ground connection to the ground lug provided near the disconnect switch. The line connections should be such that the spindle will rotate right hand, or ready to drive a drill or right hand tap, when joystick control on control panel is moved to forward.

7. Fill transmission head and sliding head with oil and oil machine at all oil hole covers on sliding head and table before operating machine under power. See instruction plate on machine and lubricating instructions in this book for full details.

8. For leveling use a sensitive spirit level both lengthwise and crosswise of the base. Use either screw adjusting leveling blocks or wooden wedges under the base as may be necessary.

LUBRICATION

Top Head

With motor shut off, fill both reservoirs (speed transmission and feed transmission) to "oil level" mark with high grade mineral oil SAE 30 (MIL-L-2104). Check oil level daily. Keep full. Flush and change annually.

Sliding Head

Fill gear case with SAE 90 worm gear oil (MIL-L-2105 GR 90) to "oil level" mark. Check weekly. Flush and change annually.

Ways

Sliding head ways, counterweight chain, spindle quill, feed shaft and all oil cups must be oiled daily with SAE 10 Mineral Oil (MIL-L-2104A).

Spindle

No lubrication required. Lubricated for life.

Round Column Arm

One zerk fitting on the elevating mechanism. Force 4 oz. of SAE 150 grease (VV-L-751A Type 1 GRA) into the zerk.

OPERATING INSTRUCTIONS

GENERAL

1. In general, it is better to increase the speed and use a lighter feed on all sizes of drills to obtain the maximum drill life (except in cast iron where a heavy load is desirable).

2. In setting up a job, the first consideration is convenience of operation. Raise or lower the table with a work piece in place to a suitable working height. Then position sliding head with a drill in the spindle to suit. Always keep the spindle well up in the sliding head when setting up. Never attempt to do any heavy work with the spindle extended way down out of the sliding head. In other words, keep the sliding head down as close to the work as possible to afford the best support for the spindle. This is especially important where accuracy and good finish are required.

3. Where drills with shanks smaller than No. 4 Morse Taper must be used, always use only one reducing sleeve. Multiple reducing sleeves tend to produce excessive runout.

4. Keep all drills properly ground. It is impossible to drill a clean accurate hole with a drill which is dull or improperly sharpened.

Direction Of Spindle Rotation

The rotation of the spindle is controlled by means of the joystick control (Figure 2) located in the top, left position in the control panel. When the lever is in the "FORWARD" (up) position, the spindle rotates clockwise for driving a drill or tap. When the lever is in the "REVERSE" (down) position, the spindle rotates counterclockwise for backing out drills or taps.

When moving the joystick from one of the spindle directions to the other, move it to "STOP", wait for the spindle to stop rotating, and then move it to the other direction setting.

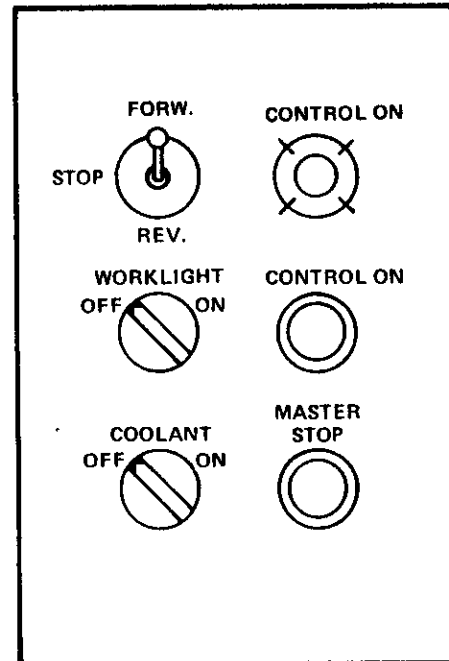


Figure 2. Control Station

Spindle Speed Range

Spindle speed range is controlled by the "HIGH-LOW" spindle speed control (Figure 3). Move the control all the way to the left for "HIGH SPEED" and all the way to the right for "LOW SPEED." Do not operate the machine with the lever at any positions other than at the far left or far right.

Before changing the speed range, stop the machine. Moving the lever from one position to the other changes gears, so this should be done with one, quick, strong motion.

The low speed range is from 0 to 400 rpm.

The high speed range is from 401 to 1200 rpm.

Spindle speed is indicated by the spindle speed dial on the front of the head.

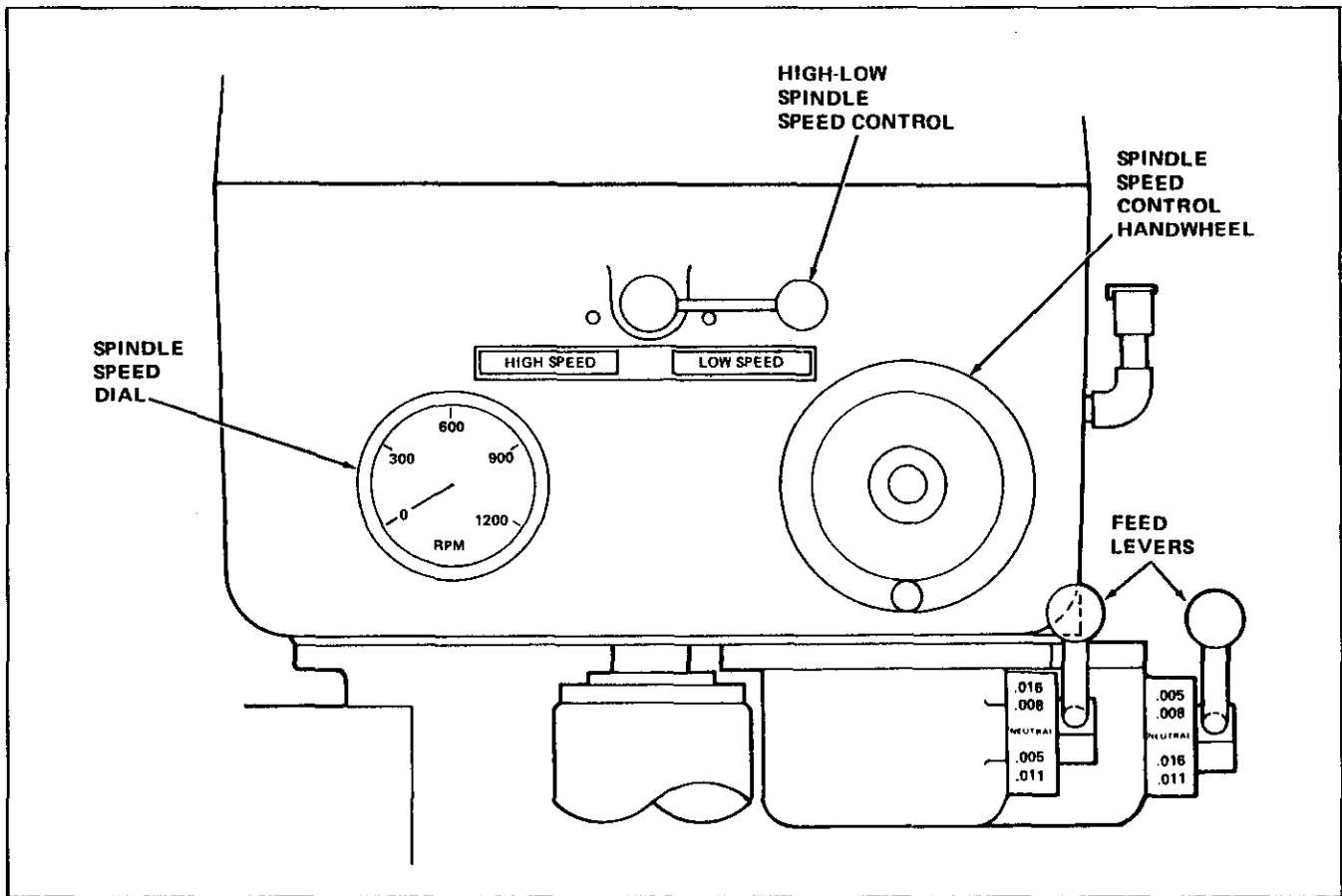


Figure 3. Changing Speeds And Feeds

Spindle Speed

Spindle speed within the high or low speed ranges is controlled by the speed control handwheel on the front of the top head.

NOTE

- The machine must be running to change spindle speed with the speed control handwheel.
- Turn the handwheel to the right to increase spindle speed.
- Turn the handwheel to the left to decrease spindle speed.

Sliding Head

To move the sliding head, loosen the lock lever (Figure 4) and rotate the handwheel on the left side of the head.

When head is positioned, retighten the lock lever.

Feed Changes

1. Stop the machine.
2. Set both feed control levers, located on the right side of the top head (Figure 4), to the feed rate desired. The levers must be at matching rates. For example, if one is set at .016 the other one must be at .016.

NOTE

The spindle may have to be rotated slightly back and forth by hand until the gears in the feed box mesh.

Feeds shown on the dials are in thousandths of an inch per revolution of the spindle, from .005" to .016" I.P.R.

Power Feed

1. To engage the power feed, thrust either of the quick traverse (turnstile) levers outward or to the right (Figure 4). A light thrust inward will disengage the power feed. It is not necessary to hold the power feed engaged, merely thrust out on the lever and then let it go. **DO NOT RIDE YOUR HAND ON THE QUICK TRAVERSE LEVERS.** Holding the power feed engaged will cause the spindle to feed past the desired point.

2. To set the feed depth gauge (Figure 4), run the drill down against the work by means of the quick traverse lever. Loosen the hand knob (Figure 4) on the feed depth scale on the left side of the sliding head and slide the knob up or down until the arrow points at the desired depth. Tighten the hand knob, start the machine and engage the power feed.

Hand Feed

To use the hand feed through the handwheel (Figure 4), shift the feed gears to "Neutral" and thrust the quick traverse levers to the right as when engaging the power feed. The small handwheel on the bottom of the sliding head may then be used to feed the spindle for boring, counter-boring, spot-facing, heavy drilling, etc.

Table And Arm

To raise or lower the arm and table, loosen the binder lever at the rear of the table arm and operate the hand crank on the right side of the arm.

Retighten the clamp lever when the table is positioned.

To rotate the table, loosen the clamp on the front of the table arm, below the table, rotate the table manually and re-clamp.

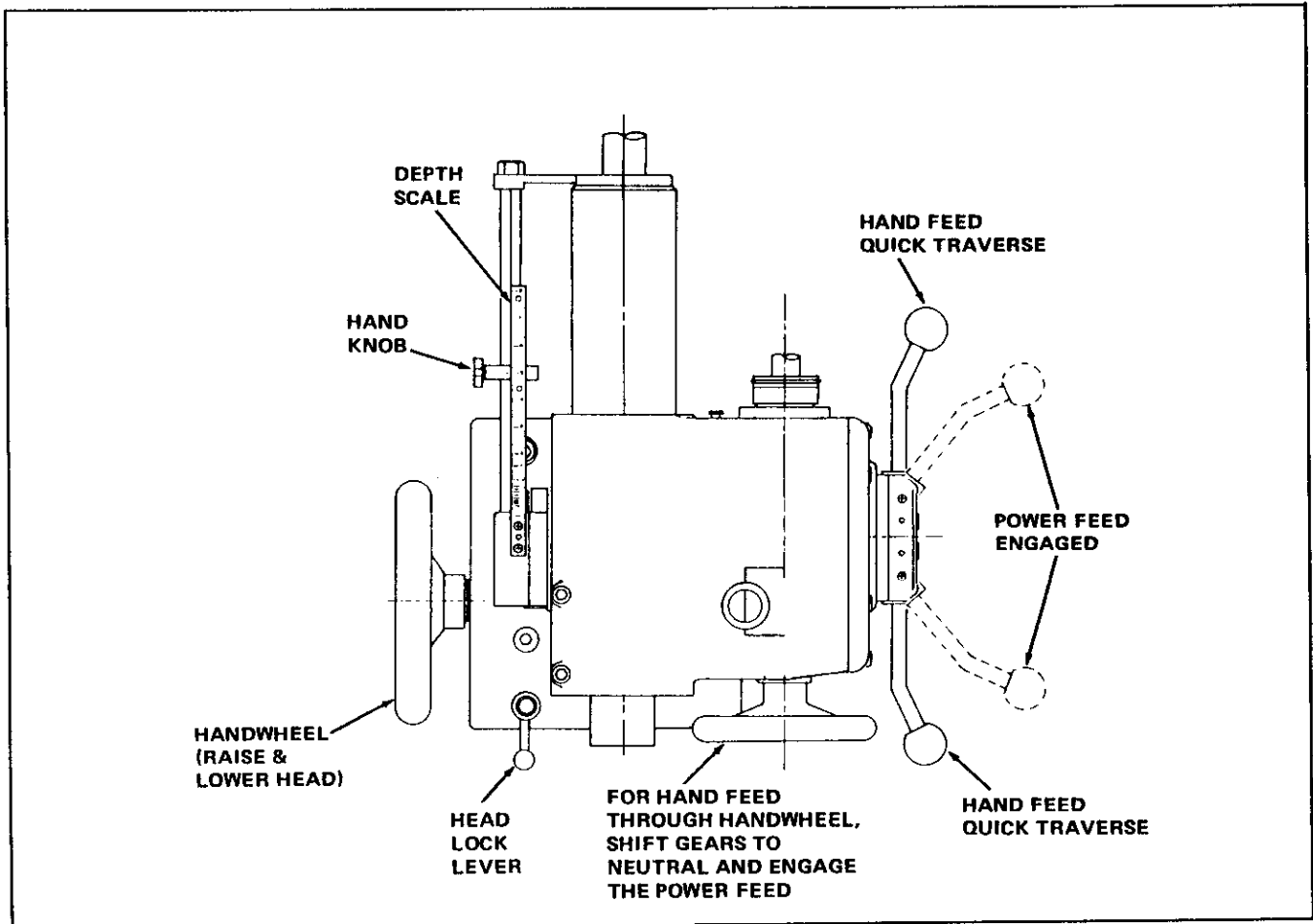


Figure 4. Sliding Head Controls

MAINTENANCE ADJUSTMENTS

Sliding Head Gib (Figure 5)

Loosen set screws (1) behind gib (2) and adjust socket head screws (3) evenly so that the sliding head can be moved up and down freely, with elevating handwheel (4). Then check with a .0015 shim to see if all ways on sliding head are closed to the column ways (5), thus giving you

proper bearing surface between sliding head and column. Retighten set screws (1) against socket head screws.

To compensate for wear of the quill, remove the two capscrews (6) and spacer (7). Grind spacer as necessary and replace spacer. Tighten capscrews (6).

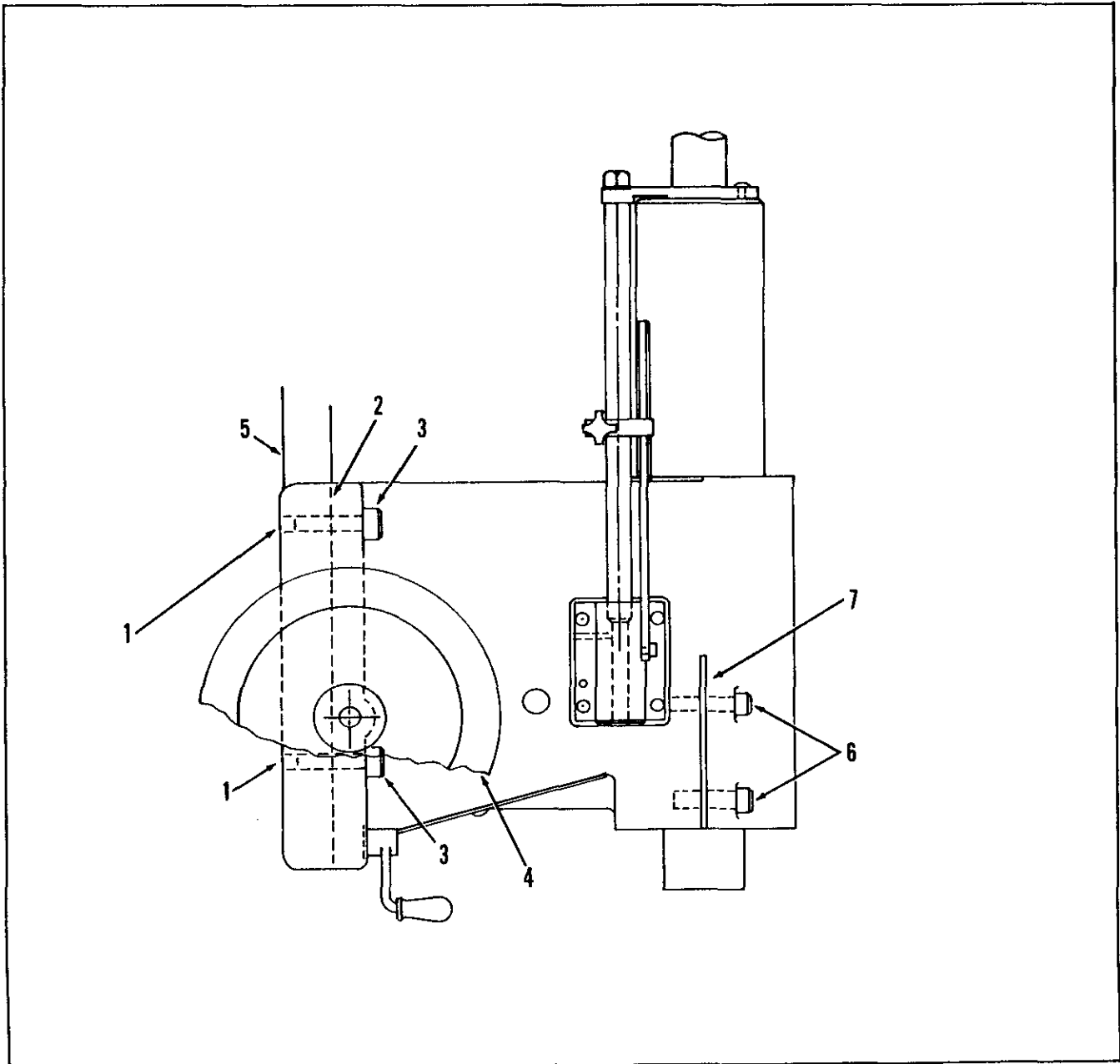


Figure 5. Sliding Head Gib Adjustment

Table And Arm

There are two binder levers on the table arm under the table (Figure 6). The one on the front is for clamping the table, and the one on the back is for clamping the arm to the column. These levers should be about 30° below horizontal when tightly

clamped. To adjust either binder, set the lever in the desired position as above. Loosen the set screw slightly in the clamp screw bearing and tighten the hex bolt until the table (or arm) is locked firmly. Tighten the set screw. The bolt at the lower rear of the arm should be brought up just right enough to permit the arm to be moved easily when unlocked.

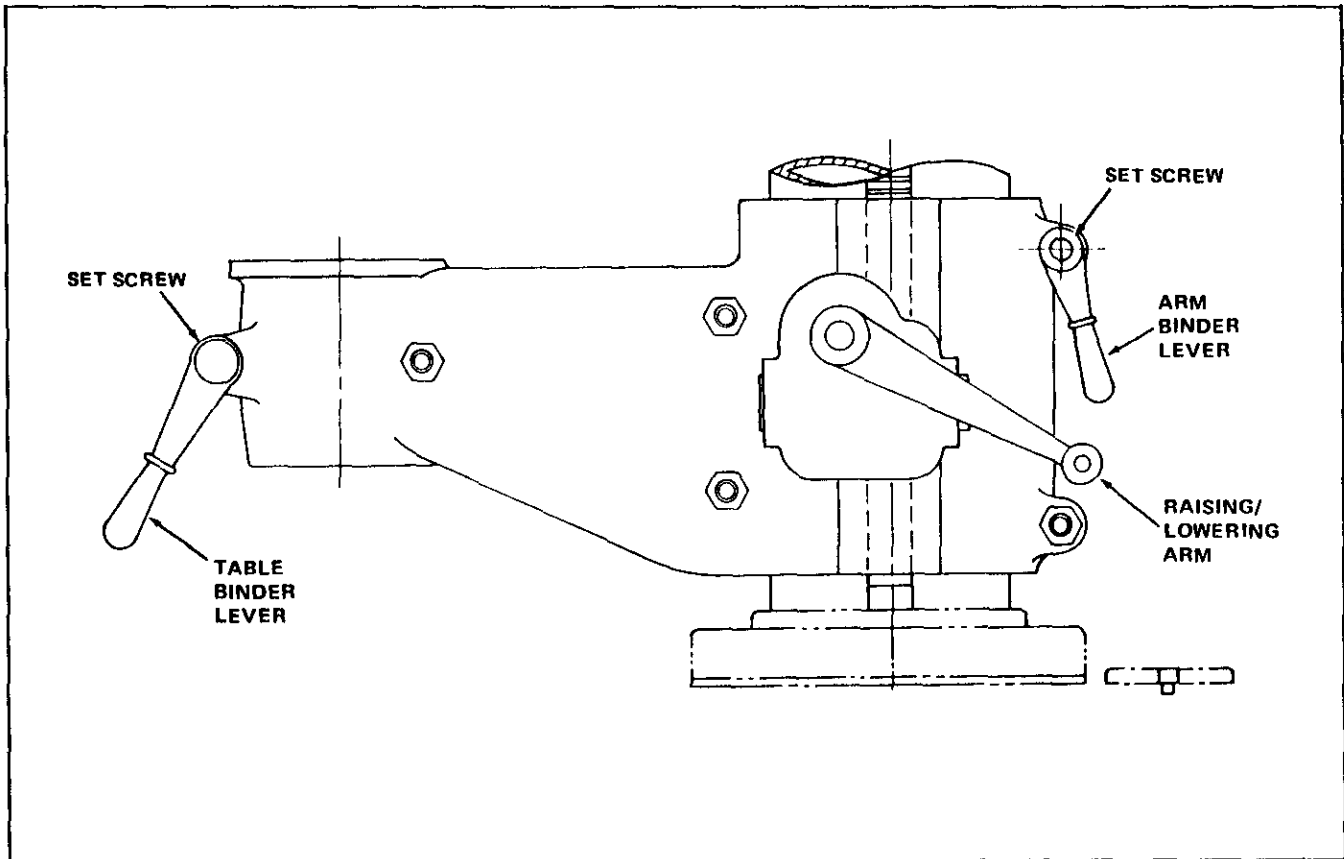


Figure 6. Table And Arm Clamping Levers

SERVICE INSTRUCTIONS

Feed Transmission Removal (Figure M-1)

The feed gear case is a complete unit and may be removed and taken to a bench for disassembly.

1. Position the sliding head near the bottom of its travel.

2. Remove the snap ring (5) from the bearing collar (2) and remove the shear pin (4) holding the feed shaft (3) to the collar (2).

3. Slowly lower the sliding head and raise the feed shaft (3) up high enough to clear the sliding head.

4. Take out the capscrews holding the feed gear case to the top head and remove the feed gear case.

5. The feed shaft can then be removed from the top head.

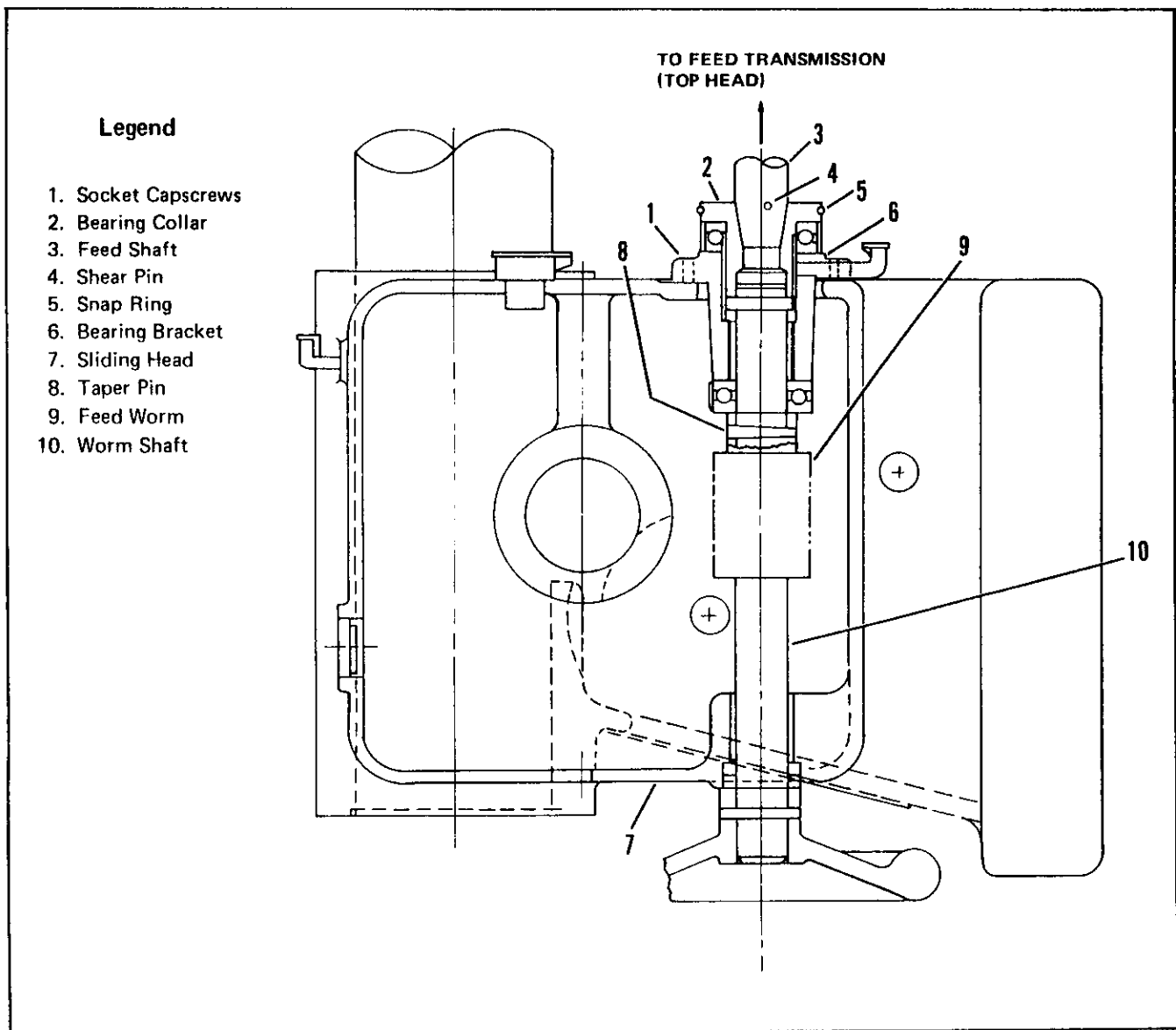


Figure M-1. Cross Spindle Removal

Feed Transmission Disassembly (Figure M-2)

1. Remove the socket head capscrew (3) and retainer (2) and lift off the pick-off gear (1) from the pick-off gear shaft (4).
2. Take out the eleven capscrews (5) and remove the cover plate (6).
3. All other parts can then be removed as necessary.

Gear Shifting Mechanism Removal (Figure M-2)

1. Follow steps 1 and 2 under "Feed Transmission Disassembly" in previous paragraph.
2. Remove the two button head screws (7) and two washers (8) from the two shifter arms.
3. Remove the shifter forks (11 and 12).

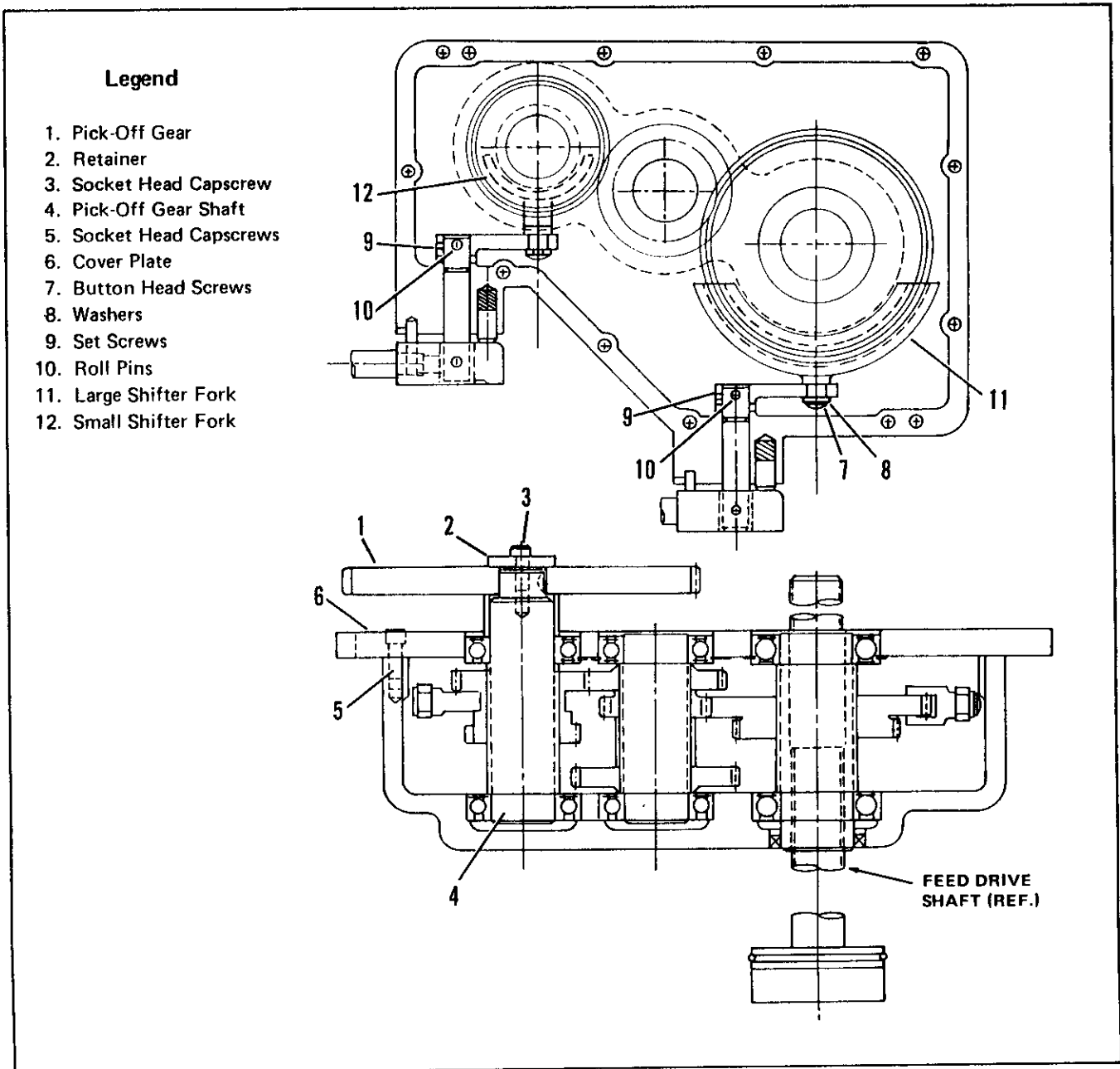
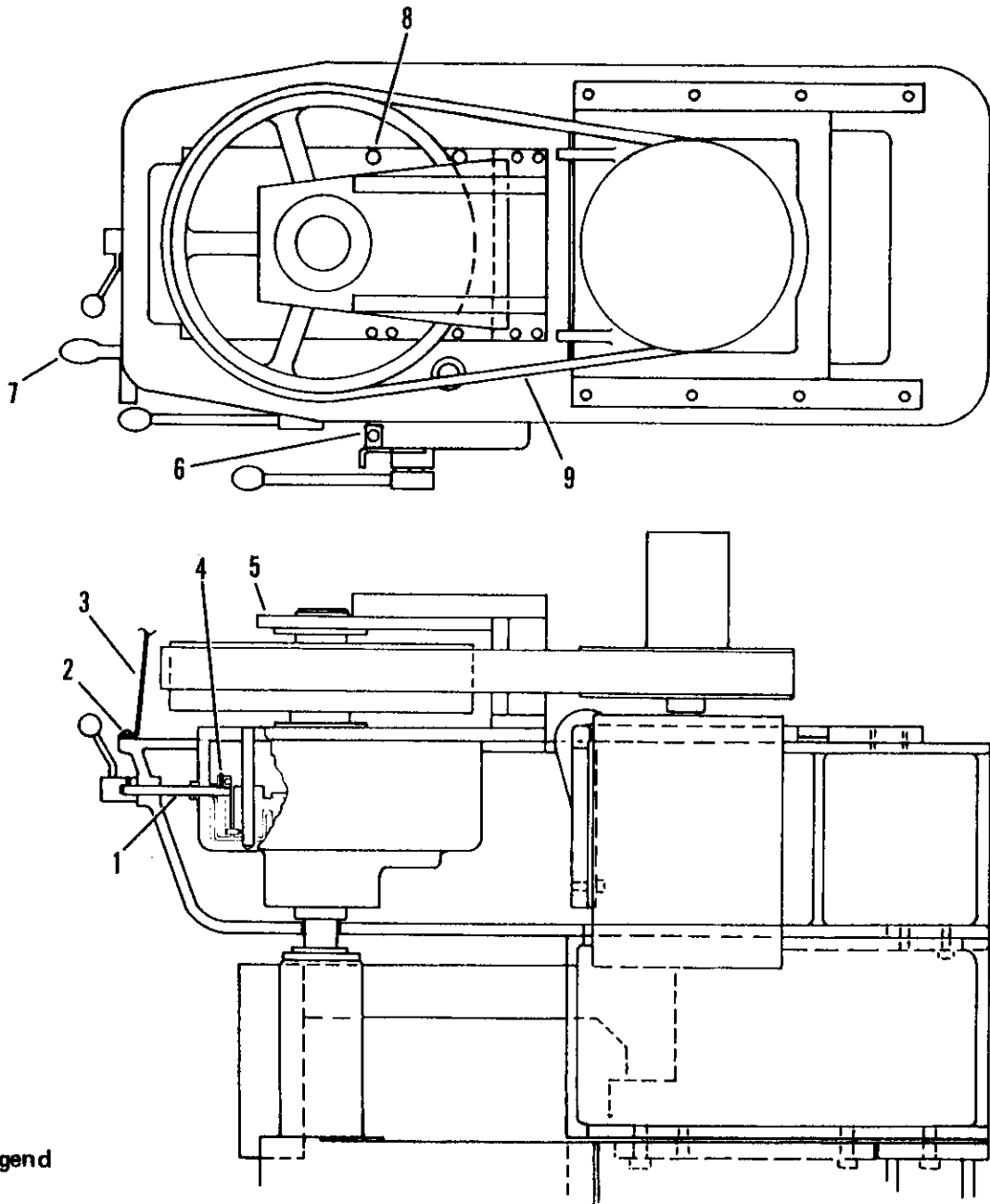


Figure M-2. Feed Transmission Assembly



Legend

- 1. Shaft
- 2. Button Head Screws
- 3. Shroud
- 4. Set Screw
- 5. Gear Case
- 6. Oil Filler Pipe
- 7. Handwheel
- 8. Capscrews
- 9. Drive Belt

Figure M-3. Top Head And Motor Mounting

High-Low Speed Transmission Removal (Figure M-3)

1. Run the sliding head and spindle to its lowest point.
2. Remove six button head screws (2) and remove the fiberglass shroud (3).
3. Rotate the handwheel (7) clockwise so motor moves toward the center of the top head.
4. Lift off the drive belt (9).
5. Turn the oil filler pipe (6), located on the right side of the top head, so oil will drain out and drain the oil into a clean container.
6. After oil has drained out, remove the oil filler pipe.
7. Take out the set screw (4) and slide the shaft (1) away from the housing.
8. Take out the eight capscrews (8) and lift off the complete gear case (5).
9. Remove remaining parts as necessary.

Sliding Head

Most repairs to the sliding head are of a nature that will not require the removal of the sliding head from the column, so we will deal with this phase first. It is to be strongly urged that these steps be followed carefully and no more parts removed than necessary due to the time involved in making adjustments and timing the various functions (see Sliding Head Removal).

Cross Spindle And Spindle Removal (Figures M-4, M-5 and M-6)

1. Drain the oil from the sliding head.
2. Run the spindle and sleeve down as far as it will go in the sliding head. Mark the sleeve so that it may be reassembled at the same point.
3. Note carefully the exact reading on the feed depth scale and tighten the handnut so that this reading will not be changed.

4. Insert a 3/16" hex wrench (the type used for hollow head set screws) through the counter-weight chain directly above the sliding head with the short leg of the wrench pointing down behind the chain and the long leg lying horizontal, pointing at the spindle (Figure M-4).

5. Raise the sliding head on the column until 3/16" hex wrench is up against the face of the column and the chain is just barely slack beneath the wrench.

6. Remove the sheet steel cover (10, Figure M-6) from the underside of the sliding head and note the position of the chain on the chain gear so that this can be placed in the same position at reassembly (Figure M-5).

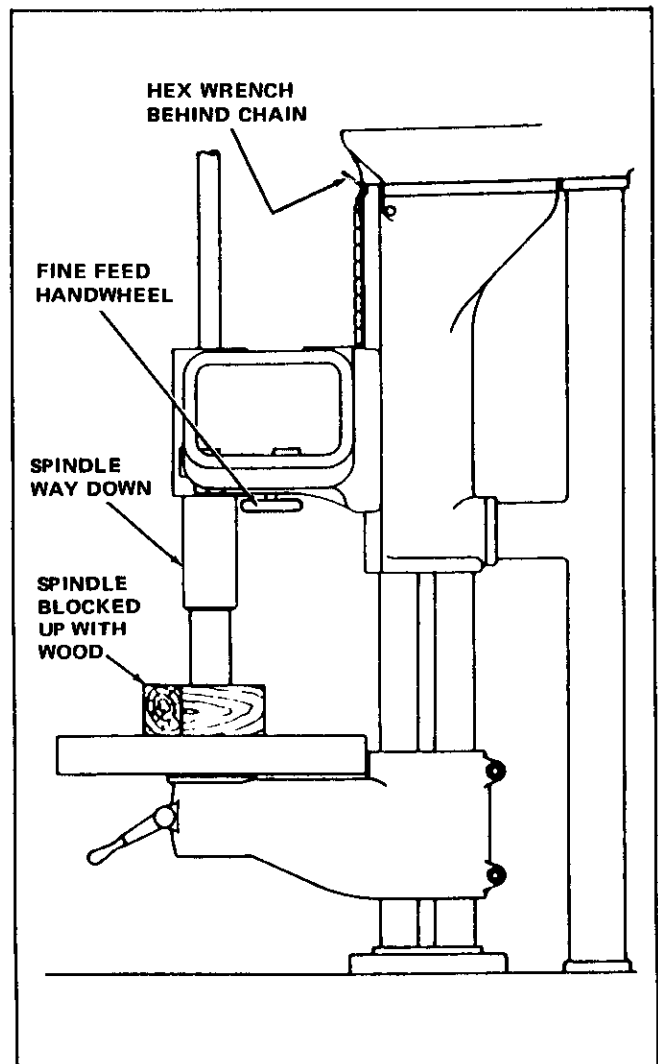


Figure M-4. Blocking Up Sliding Head

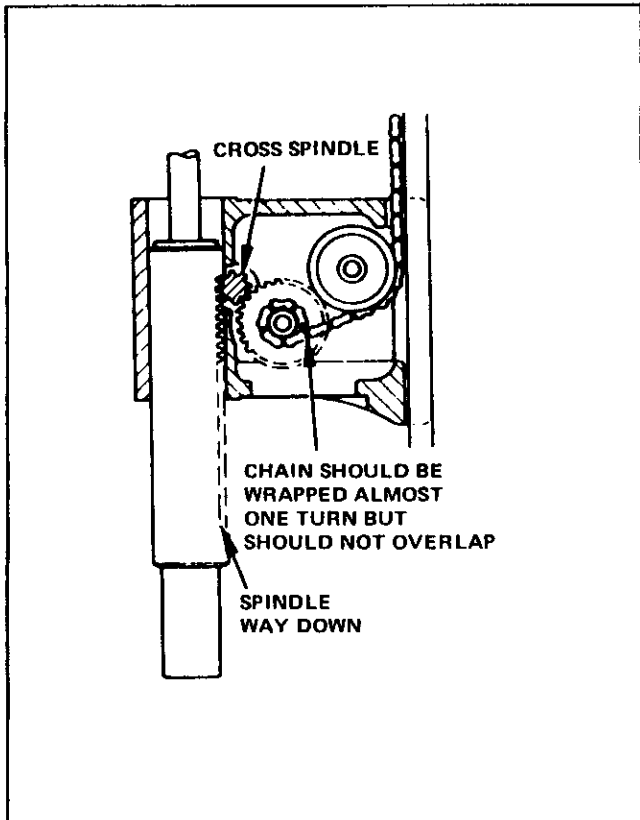


Figure M-5. Chain Position

7. Block up the spindle and sleeve with wooden blocking built up from the table (Figure M-4).

8. Remove one of the turnstile levers (3 and 5, Figure M-6) and remove the screws (2) and the cover (1).

9. Reinstall the turnstile lever.

10. Remove the taper pin (8, Figure M-1) and slide the feed worm (9, Figure M-1) down to the lowest point on the worm shaft (10, Figure M-1).

11. The cross spindle, worm gear and feed clutch assembly may then be removed as a unit.

12. Remove the three screws (6) and nut (7) from the trip rod support (8).

13. The spindle and quill may now easily be removed if desired. Insert a short length of 7/16" diameter rod through the drift slot to facilitate handling, remove the blocking and lower the spindle to the base.

Cross Spindle Disassembly (Figure M-7)

1. Knock out the taper pins (10 and 12) from the turnstile hub (8) and remove the two turnstile levers (6 and 13).

2. Remove the screws (2, Figure M-6) and remove the cover (1, Figure M-6).

3. Remove the taper pin (8, Figure M-1) and slide the feed worm (9, Figure M-1) down to the lowest point on the worm shaft (10, Figure M-1).

4. Slide out rack pin (16, Figure M-7), push rod and cam pin (12 and 11, Figure M-6). Remove capscrews (3, Figure M-7) which hold the feed clutch ring (2) to the worm gear (1) and drive out roll pins (14). Remove "C" spring (5) and the clutch ring (2). Then swing feed clutch shoes (4) out of position for removal of adjusting screws (9) and the bushings through which the pins (19) pass.

5. The turnstile hub (8) together with the worm gear (1) may now be taken off the cross spindle.

6. If necessary, the clutch shoes may be removed from the turnstile hub by slipping off the "O" rings (16) and driving out the shoe pins (17).



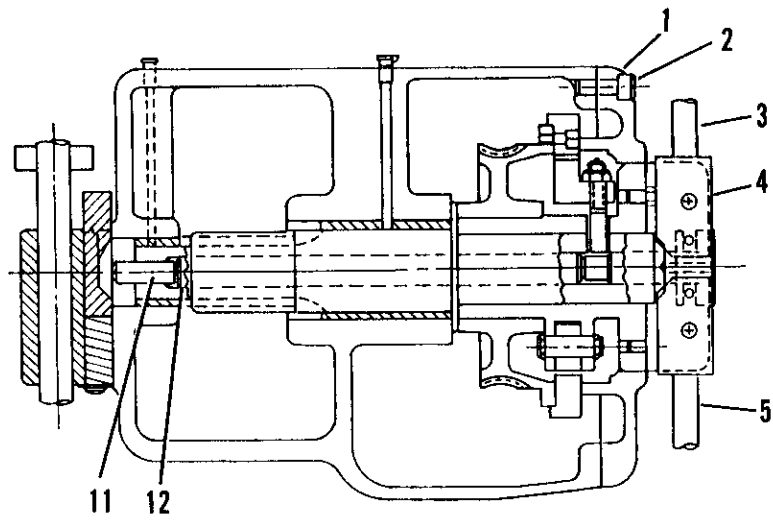
Do not disturb the setting of the adjusting screws (9), unless absolutely necessary.

Cross Spindle Reassembly (Figure M-7)

1. Hold the cross spindle in a vise in a horizontal position and reassemble first the washer (18), then press on the turnstile hub with worm gear in place. Replace the adjusting screws (9), pins (19) and the bushings. With the clutch shoes in position replace the clutch ring on the worm gear.

2. The clutch shoes should not need adjustment, but if necessary proceed as follows:

a. Still holding the cross spindle in the vise, insert the rack pin (14) as far as it will go.



Legend

- 1. Cover
- 2. Socket Capscrews
- 3. Turnstile Lever
- 4. Cross Spindle Worm & Feed Clutch Assembly
- 5. Turnstile Lever
- 6. Screw
- 7. Socket Capscrew
- 8. Trip Rod Support
- 9. Trip Rod
- 10. Cover
- 11. Cam Pin
- 12. Push Rod

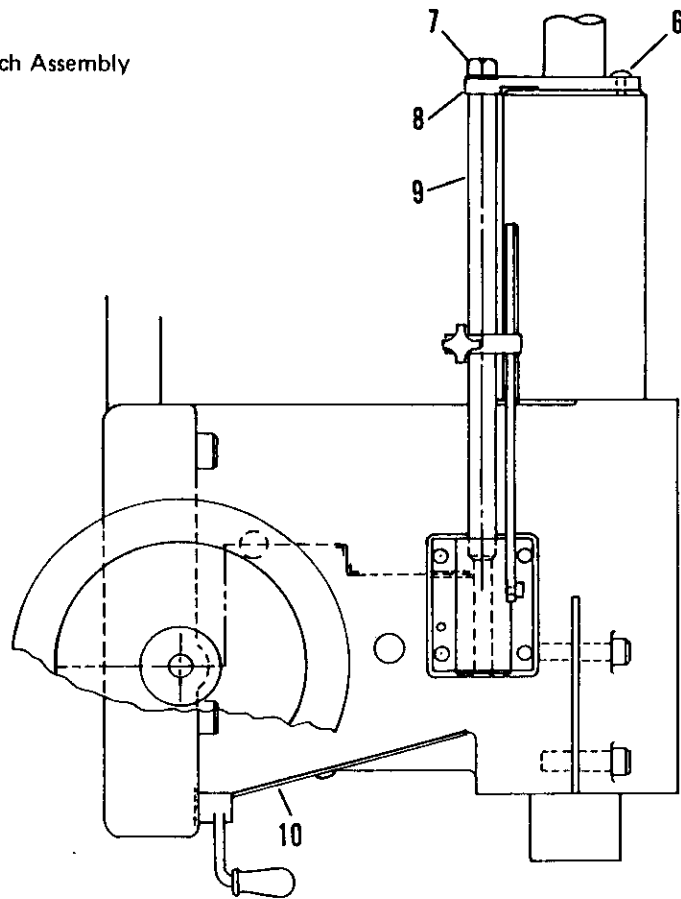


Figure M-6. Cross Spindle And Spindle Removal

b. Engage the clutch shoe teeth of one of the clutch shoes into those of the ring, and then turn the shoe adjusting screw until there is no play.

c. Back off the screw about one-sixth of a turn.

d. Engage the other shoe to the ring and turn the shoe adjusting screw until there is no play.

e. Replace the operating levers to the turnstile hub and test this adjustment in different positions of the clutch ring. Equal pressure should be exerted on each clutch shoe.

f. Lock the adjusting screws in place with jam nuts (7) and insert the "C" spring (5) in the set screw hex holes.

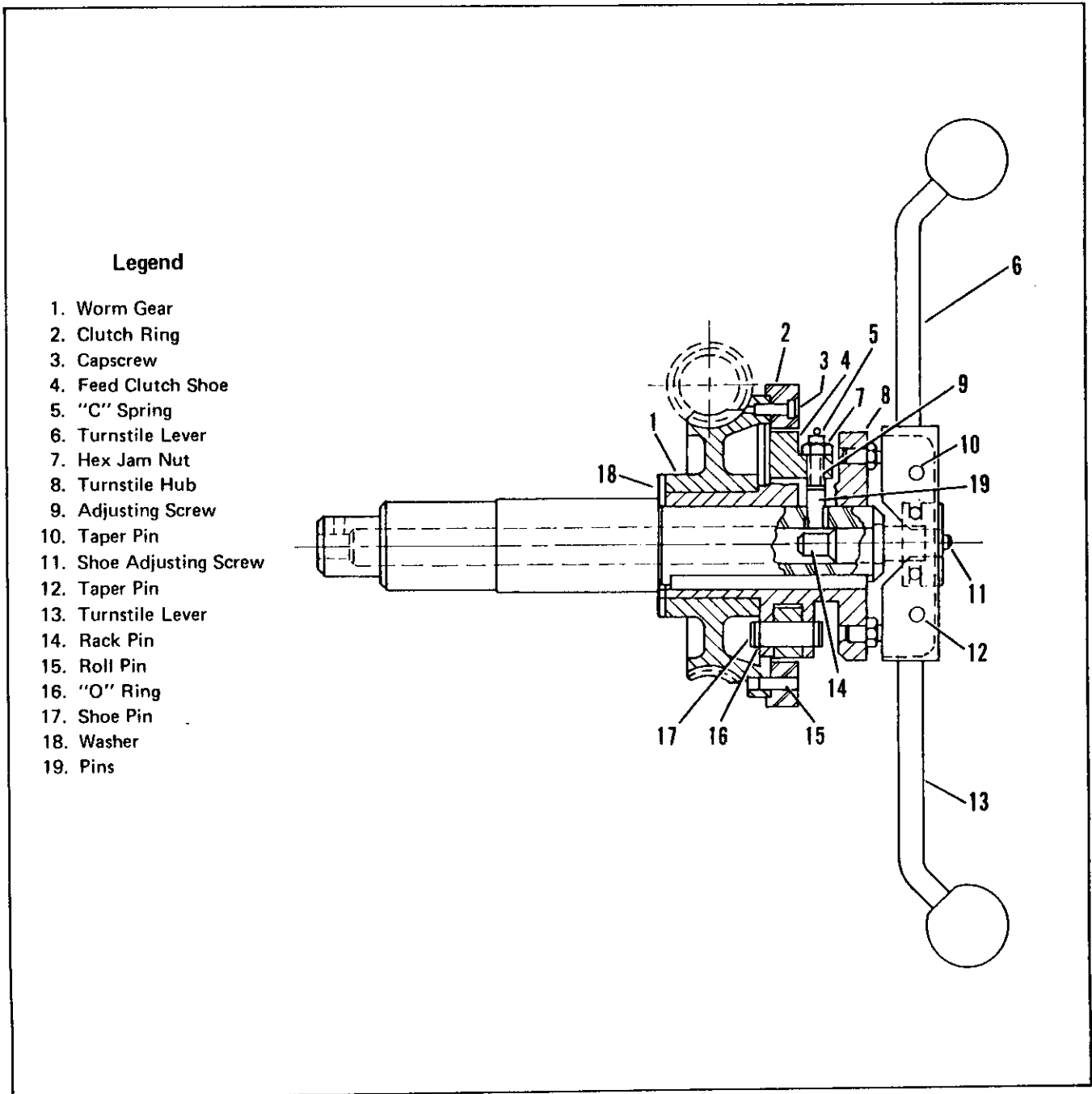


Figure M-7. Cross Spindle Sub-Assembly

Counterweight Chain, Driveshaft and Sheave (Figure M-8)

1. Block up the counterweight by following steps 1 through 7 under "Cross Spindle And Spindle Removal".

2. Loosen the set screws (6) in the collar (8) and drive out the pin (7) thus permitting the balance gear (5) to drop down.

3. The chain may be disconnected at the connecting link which is located about the middle of the chain along the face of the column.

4. Loosen the set screws (2) in the collar (3) which hold the shaft (4) through the chain sheave (1) and drive out the shaft to remove the sheave.

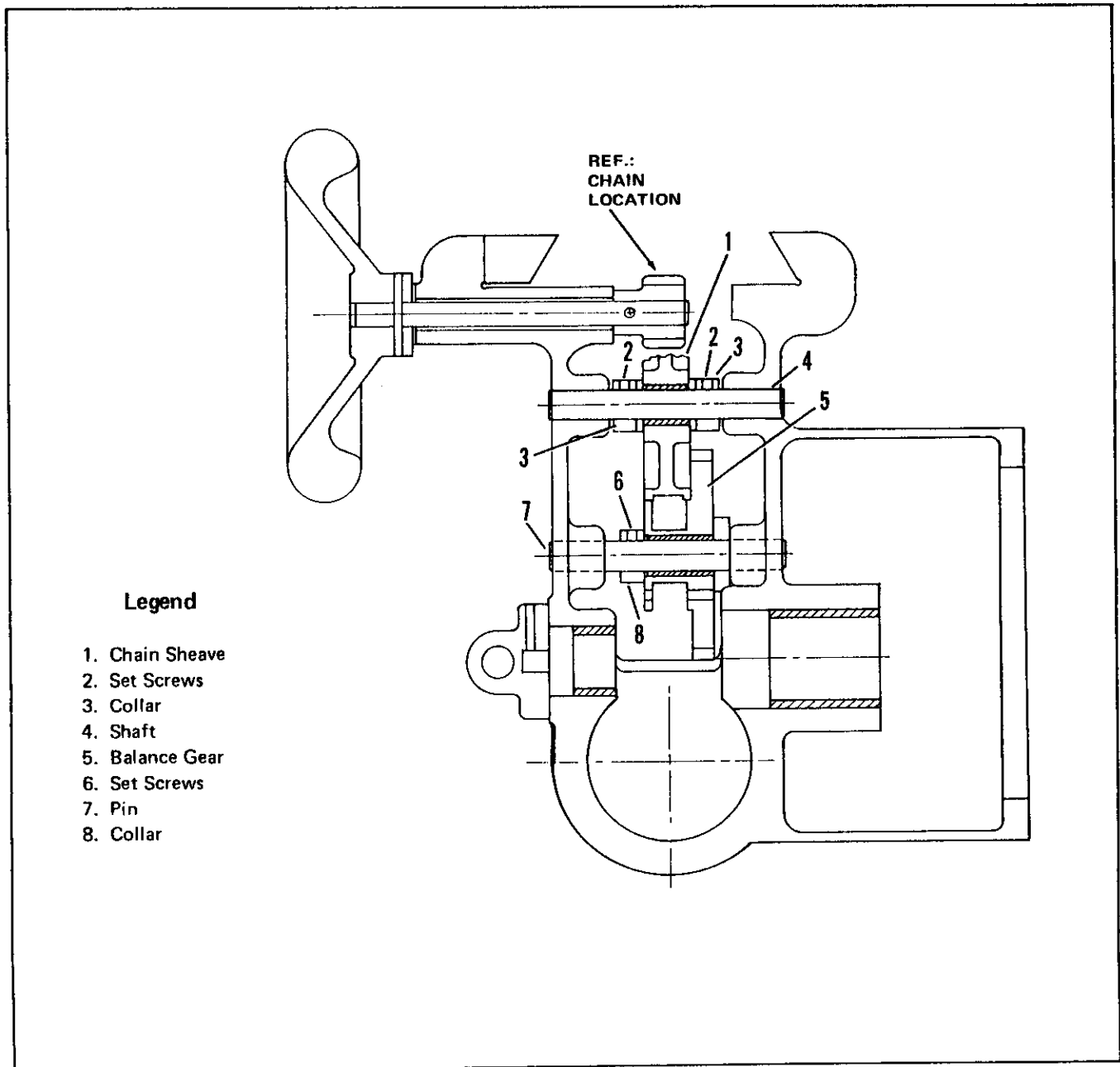


Figure M-8. Removing Counterweight Chain, Sprocket And Gear

Sliding Head Removal (Figure M-9)

Any part on the sliding head which may become damaged or worn may be removed in accordance with the preceding instructions. If for any reason it becomes necessary to remove the sliding head, proceed as follows:

1. Block the counterweight by following steps 1 through 7 under "Cross Spindle And Spindle Removal."

2. Disconnect the chain at the connecting link which is located about the middle of the chain.

3. Lower the sliding head by means of the elevating shaft handwheel until it is near the end of the dovetail where it should be supported on wooden blocking built up from the table.

4. Remove the two socket head bolts (2) and set screws (1) from sliding head. Then the sliding head gib (3) will slide down and out.

5. The sliding head may then be swung away from the column.

Reassembling The Sliding Head (Figure M-5)

1. Block up the spindle and sleeve as described in steps 1 through 7 under "Cross Spindle And Spindle Removal."

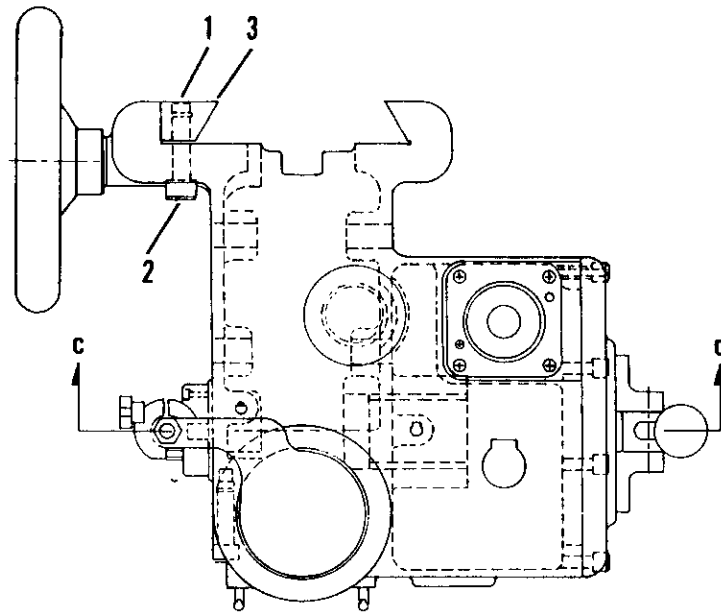
2. Reach through the opening in the underside of the sliding head and turn the chain gear with the chain passing UNDER the gear to take up the slack in the chain or to the same relative position as noted in step 6 under "Cross Spindle And Spindle Removal."

3. Have the ball thrust bearing in place on the worm shaft before replacing the cross spindle assembly. Check also to be sure that the push rod and cam pin are in place in the cross spindle. Insert the cross spindle.

4. Try moving the spindle by hand. There should be little or no movement down since the spindle should be at its lower limit of travel. Movement up should be difficult because with the counterweight parked, it is necessary to lift the weight of the spindle and sleeve. Remove the wrench and try the spindle through its full travel. The chain should be wrapped on the hub of the chain gear almost a full turn (but not overlapping) (Figure M-5) when the spindle is down and tangent to the hub when the spindle is up.

5. Reposition worm shaft and replace taper pin so worm engages worm gear.

6. Replace the cover and fit the turnstile levers.



Legend

- 1. Set screw
- 2. Socket Head Bolts
- 3. Sliding Head Gib

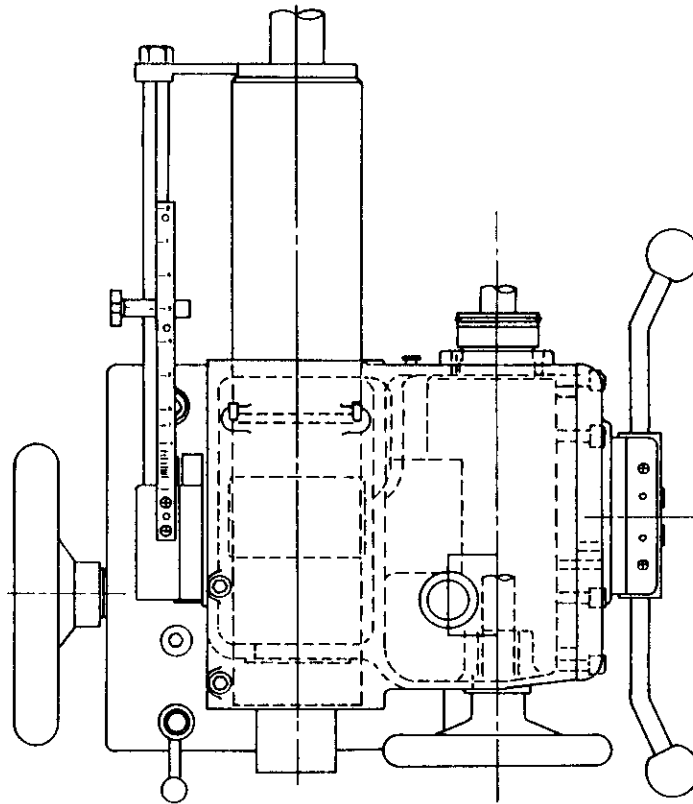


Figure M-9. Sliding Head Assembly

PARTS MANUAL

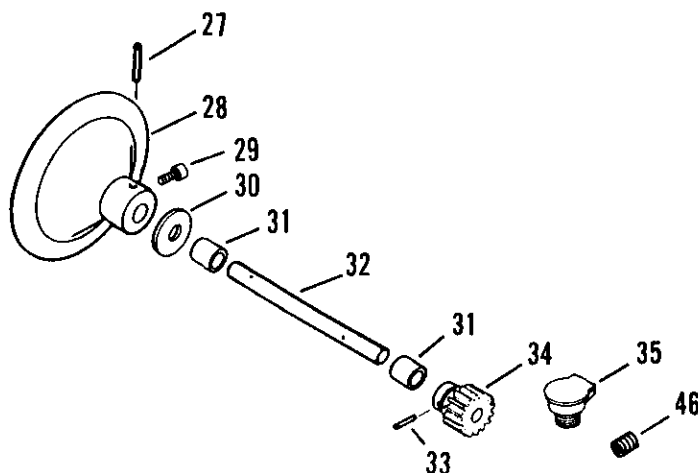
This is a replacement parts manual for your Cleereman - Appleton machine tool. These precision built machines are designed and manufactured so as to assure long life performance. However, over a period of time, natural wear or accidental damage may occur which may require the replacement of parts. This manual is provided to assist you with your machine maintenance and to enable you to order replacement parts quickly and correctly should this become necessary.

Every effort has been made to make this manual accurate, clear, concise and easy to use. The assemblies are arranged in a natural sequence and are indexed visually on the visual index page. However, the design of this machine is subject to change and your machine may have modifications which may differ slightly from that shown on the exploded views in this manual. Cleereman -

Appleton maintains a complete record of every machine we manufacture based on **MACHINE SERIAL NUMBER**. To assure prompt and efficient service, it is imperative to include the **MACHINE MODEL, SIZE and SERIAL NUMBER** with every inquiry or order for replacement parts. Refer to the visual index page for instructions showing the location of the serial number on this machine.

In several instances in this manual it will be noted that certain parts are mated at the factory. Such parts should never be replaced individually and are to be ordered in pairs or sets. By carefully following the instructions for ordering replacement parts given on the next page you will aid us in giving you prompt service. It is our desire to provide you with the best in machine tools and service.

HOW TO IDENTIFY AND ORDER REPLACEMENT PARTS



1. Refer to the Visual Index, to locate the exploded view which contains the desired part.

2. Locate the desired part and its item number in the exploded view.

3. Find the corresponding item number in the parts list on the facing page, to determine the part name, description, code number and quantity.

4. Send the part name, description, quantity and the **SERIAL NUMBER OF THE MACHINE** to:

Parts Department
Cleereman Machine Tool
Division of Appleton Machine Co.
618 S. Oneida Street
Appleton, Wisconsin, U.S.A. 54911

5. For service by telephone:

call 414-733-7361

and give the information in paragraph 4 above.

6. Majority of parts can be furnished individually, except for some critically mated or processed parts which must be purchased as service sub-assemblies.

7. There are many standard commercial articles such as screws, bolts, pipes, fittings and similar items which may be in your stock room, or can be purchased from your local hardware store. Orders for such parts will be supplied upon request but it is recommended that they be purchased locally whenever possible.

8. **FASTER DELIVERY** can be obtained by ordering electrical repair parts directly from the manufacturer or nearest distributor, because many of these parts are not stocked by Cleereman.

NOTE

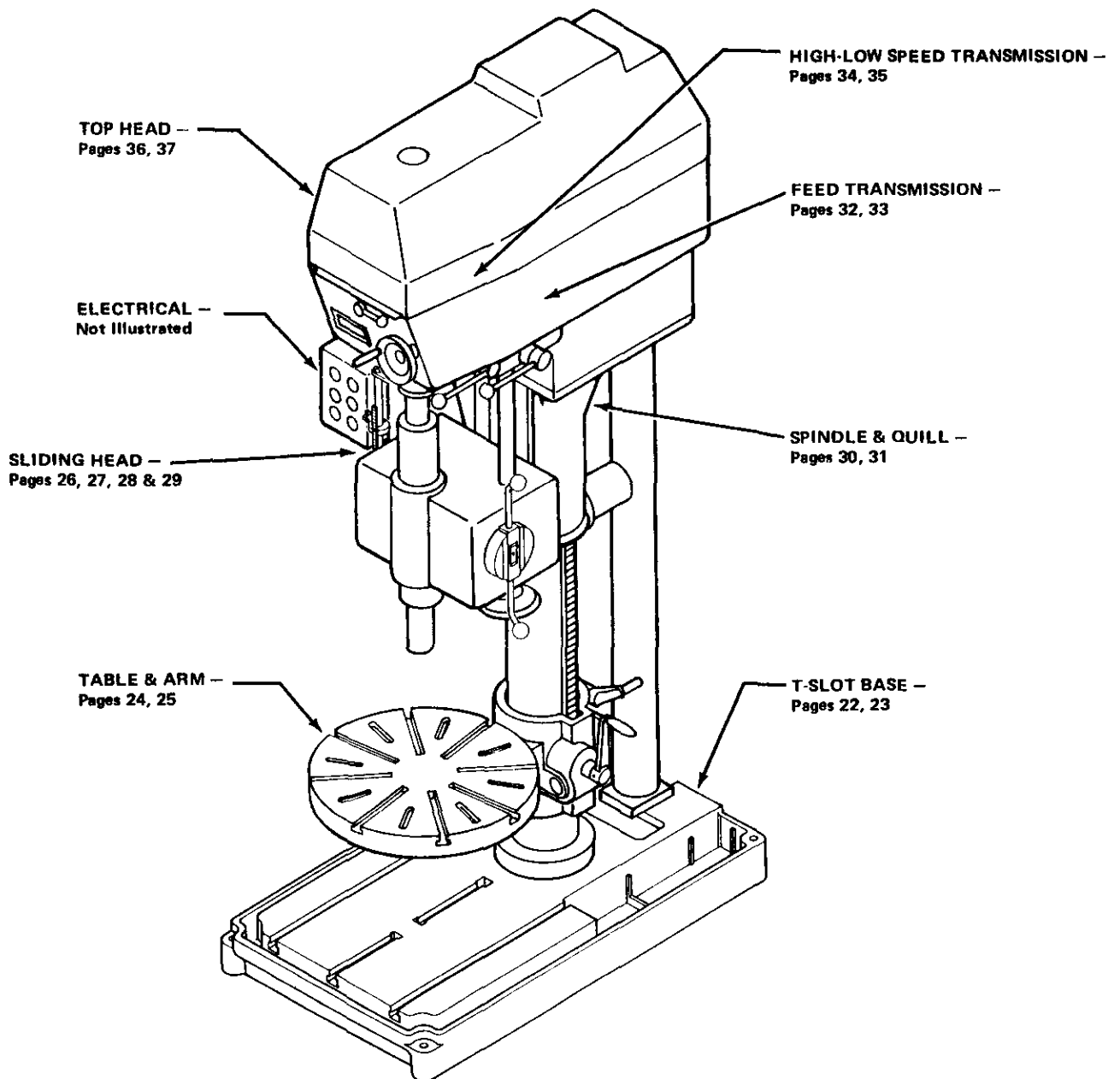
This manual is not intended for use in assembly or disassembly purposes. It is to be used for part identification only.

VISUAL INDEX

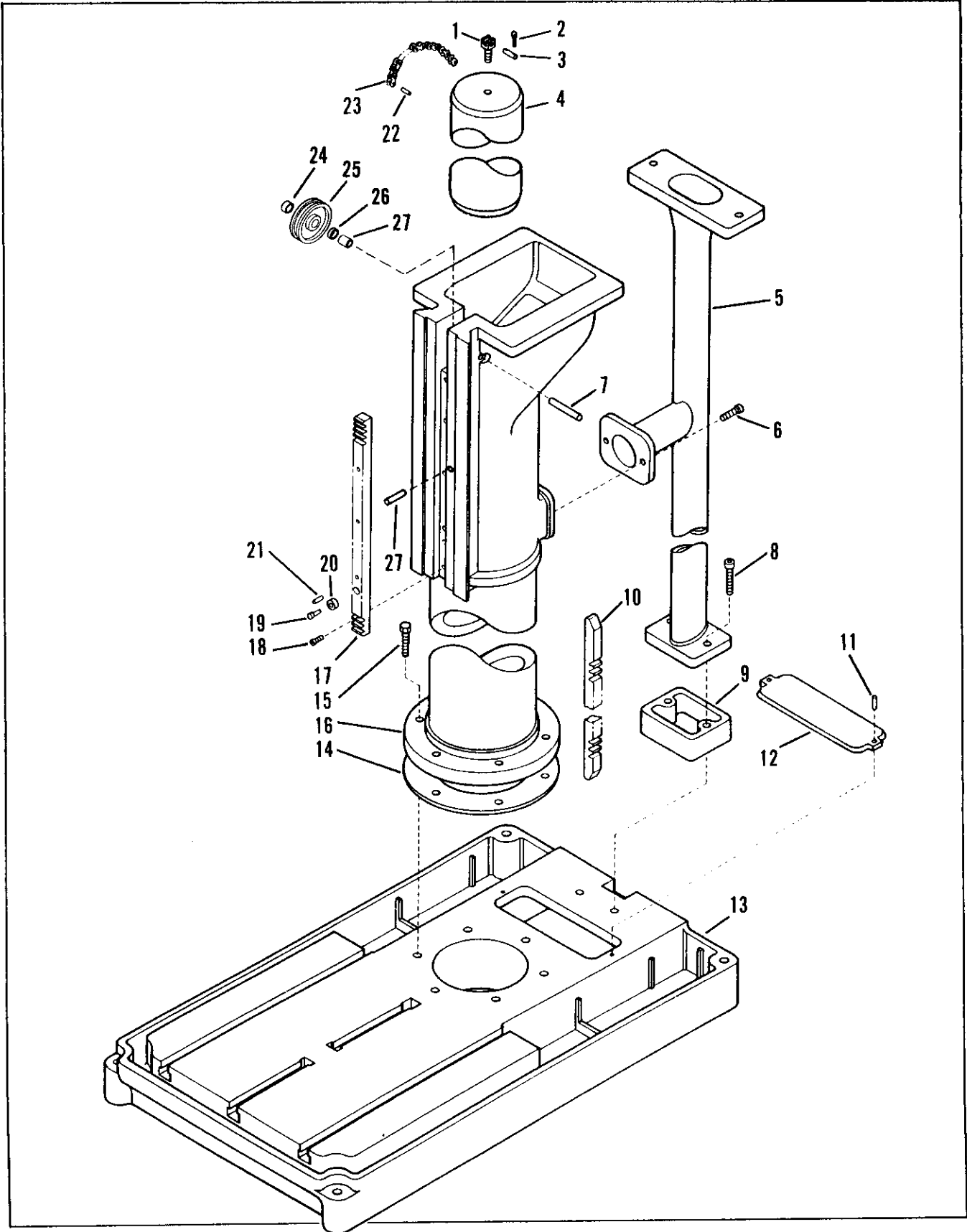
FOR HEAVY DUTY SLIDING HEAD DRILLING MACHINES

MODEL DV 24 ROUND COLUMN

Use This Index to Determine the Title, Figure and Page Number of the Exploded View.



ROUND COLUMN - T - SLOT BASE

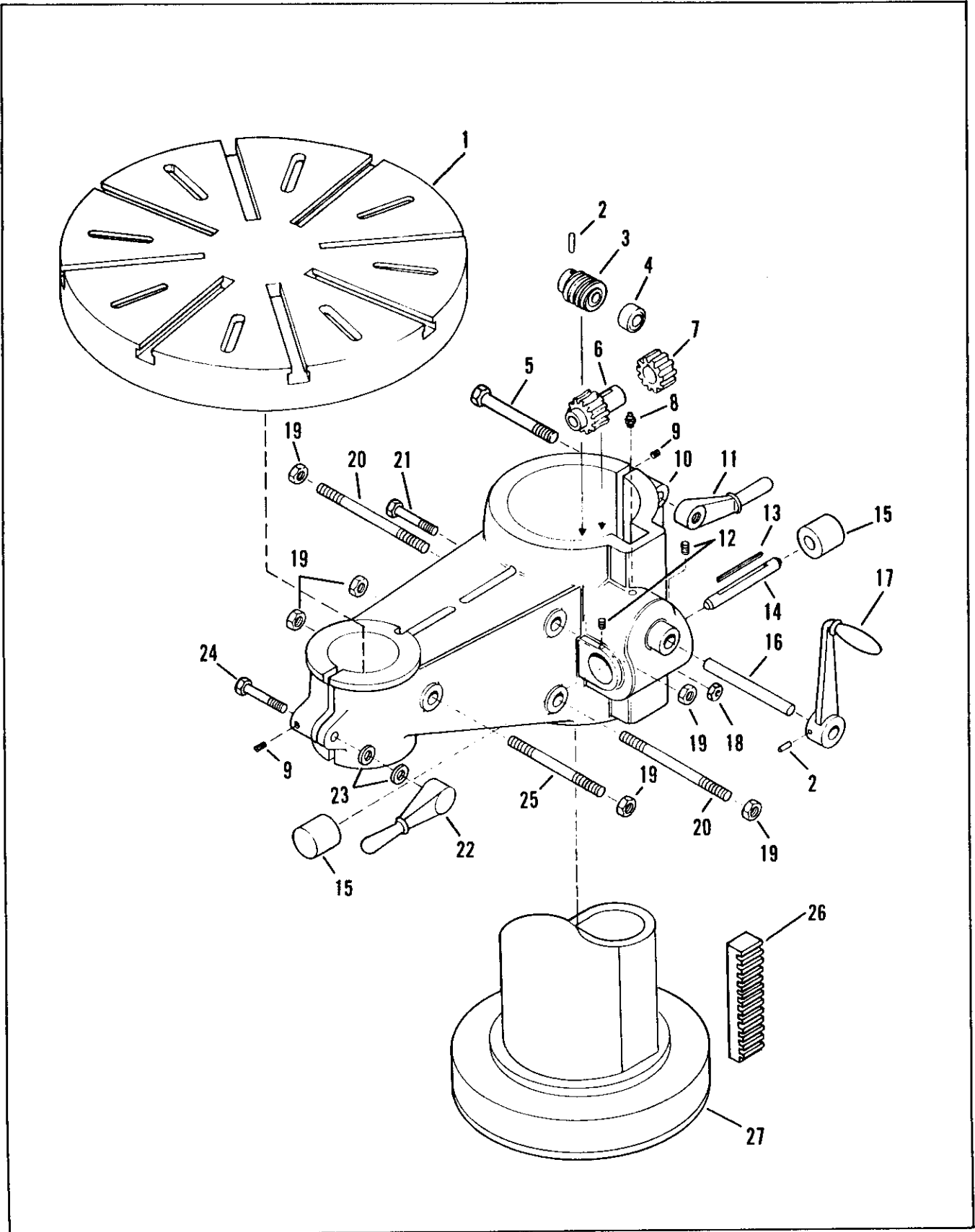


ROUND COLUMN - T - SLOT BASE

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	34184	1	STUD
2	K-3562	2	PIN, Cotter
3	34188	1	PIN
4	35036	1	COUNTERWEIGHT
5	34397	1	BRACE, Back
6	K-2506	2	SCREW
7	34110	1	PIN
8	K-6421	2	SCREW
9	34399	1	SPACER
10	37667	1	RACK
11	K-4545	2	DOWEL
12	34408	1	COVER
13	34086	1	BASE
14	34559	1	SPACER
15	K-2750	6	SCREW
16	35032	1	COLUMN
17	37786	1	RACK
18	K-135	3	SCREW
19	K-3587	1	SCREW
20	34174	1	STOP, Rack
21	K-3808	2	PIN
22	34180	1	PIN
23	K-11427	1	CHAIN
24	K-456	2	WASHER
25	34183	1	SHEAVE
26	K-11230	1	BEARING
27	K-4059	1	PIN, Stop

24" ARM TO COLUMN - BASE ASSEMBLY

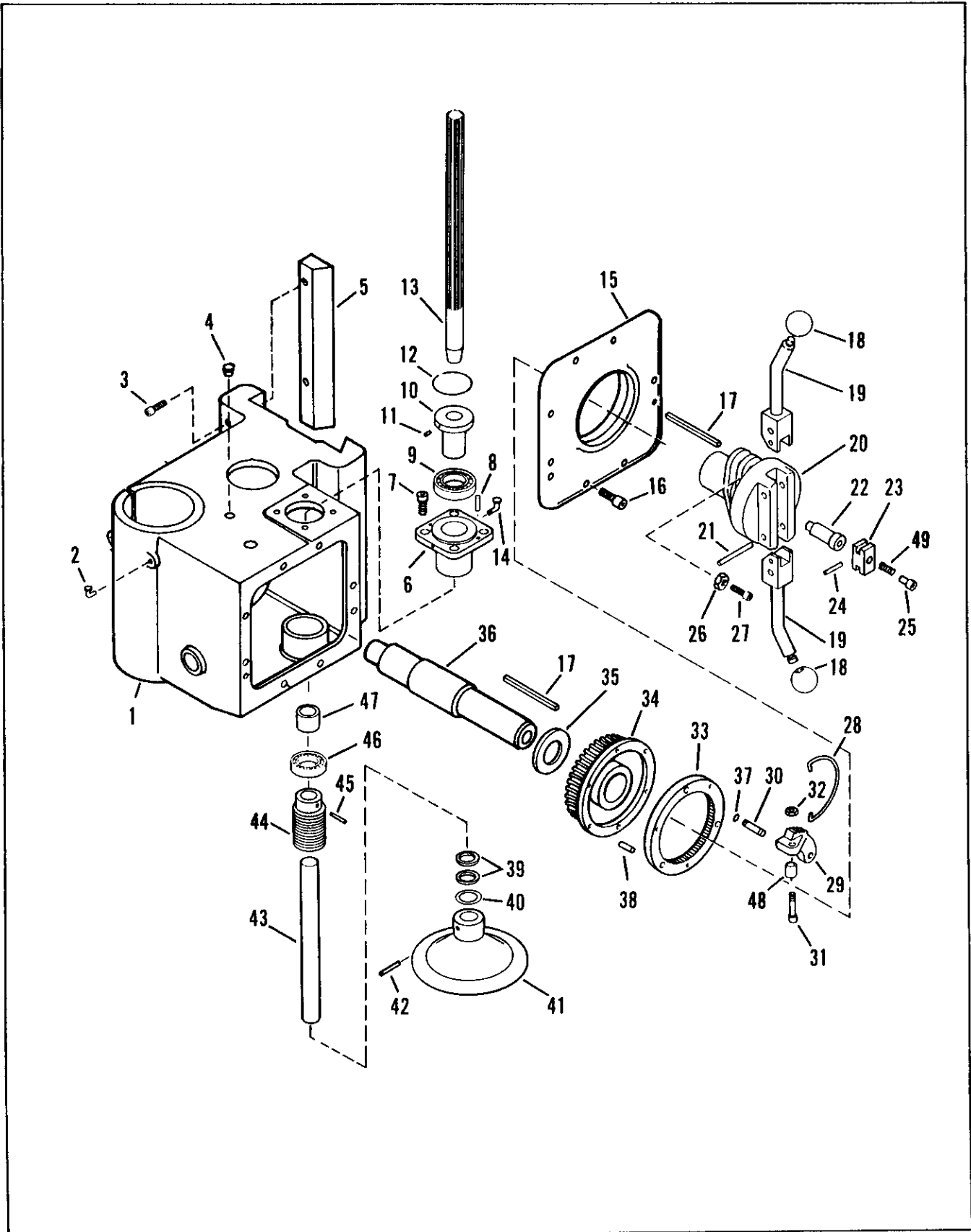


24" ARM TO COLUMN - BASE ASSEMBLY

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	34401	1	TABLE, 24" Plain
	34426	1	TABLE, 24" with Trough
2	K-485	2	PIN, Tape
3	37627	1	WORM
4	KB-11322	1	BEARING, Ball
5	K-14386	1	BOLT, Hex head
6	37625	1	GEAR, Worm
7	37624	1	GEAR, 20T
8	K-2023	1	FITTING, Grease
9	K-4538	1	SCREW, Set, dog point
10	CP-3436	1	ARM, Table, 24"
11	K-14344	1	LEVER, Arm
12	K-190	2	SCREW, Set
13	K-9834	1	KEY
14	37623	1	SHAFT, Pinion
15	37622	2	BUSHING, Shaft
16	37626	1	SHAFT, Elevating worm
17	K-14345	1	HANDLE, Crank
18	K-310	1	NUT, Full
19	K-2137	6	NUT
20	K-14042	2	STUD, Long table
21	K-124-26	1	CAPSCREW, Hex head
22	K-14343	1	LEVER, Table binder
23	K-11654	2	WASHER, Brass
24	K-14385	1	BOLT, Hex head
25	K-14041	1	STUD, Short table
26	37667	1	RACK
27	35032	1	COLUMN, Round

SLIDING HEAD ASSEMBLY (PART 1)

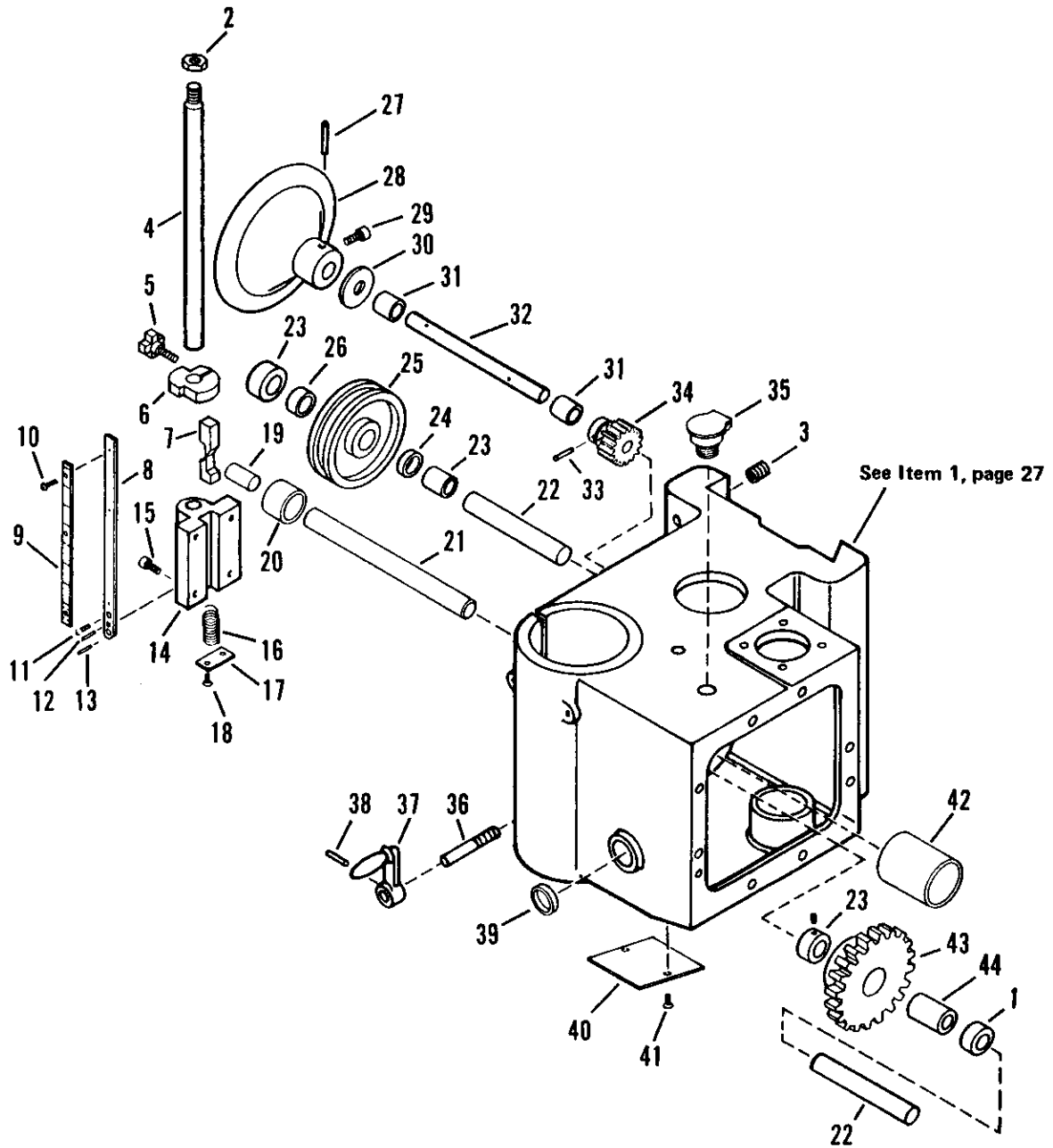


SLIDING HEAD ASSEMBLY (PART 1)

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	CP-3426	1	SLIDING HEAD
2	K-14307	2	OILER, Gits
3	K-170	2	CAPSCREW, Socket head
4	K-9994	2	COVER, Oil hole gits
5	34487	1	GIB
6	37621	1	BRACKET, Bearing
7	K-683	4	CAPSCREW, Socket head
8	K-3808	4	PIN, Dowel hard
9	K-14347	1	BEARING, Thrust
10	37620	1	COLLAR, Shear
11	34824	1	PIN, Shear
12	37603	1	RING, Snap
13	37604	1	SHAFT, Feed
14	K-518	1	CUP, Oil
15	37639	1	COVER, Sliding head
16	K-151	7	CAPSCREW, Socket head
17	K-9835	1	KEY
18	K-12409	2	BALL
19	34277	2	LEVER, Turnstile
20	34271	1	HUB, Quick return
21	34890	2	PIN, Taper
22	34381	1	PIN, Rack
23	34278	1	BLOCK, Equalizer
24	K-5719	2	PIN, Roll
25	K-5439	1	SCREW, Jam, socket
26	K-1354	2	NUT, Jam, hex
27	K-2010	2	SCREW, Set, socket
28	34276	1	C-SPRING
29	34379	2	SHOE, Feed clutch
30	34382	2	PIN, Shoe
31	K-3222	2	SCREW, Set, socket head
32	K-5941	2	NUT, Jam, hex
33	34380	1	RING, Clutch
34	34237	1	GEAR, Worm
35	34275	1	WASHER
36	37485	1	SPINDLE, Cross
37	K-6871	4	"O" RING
38	K-6080	3	PIN, Roll
39	K-9978	2	SEAL, Oil
40	K-3332	1	WASHER, Thrust
41	K-14309	1	HANDWHEEL
42	K-1569	1	SCREW, Set, socket flat point
43	37605	1	SHAFT, Pinion
44	34234	1	WORM, Feed
45	K-482	2	PIN, Taper
46	K-14346	1	BEARING, Thrust
47	K-14129	1	BEARING, Oilite
48	37769	2	BUSHING
49	K-135	1	SCREW, Set

SLIDING HEAD ASSEMBLY (PART 2)

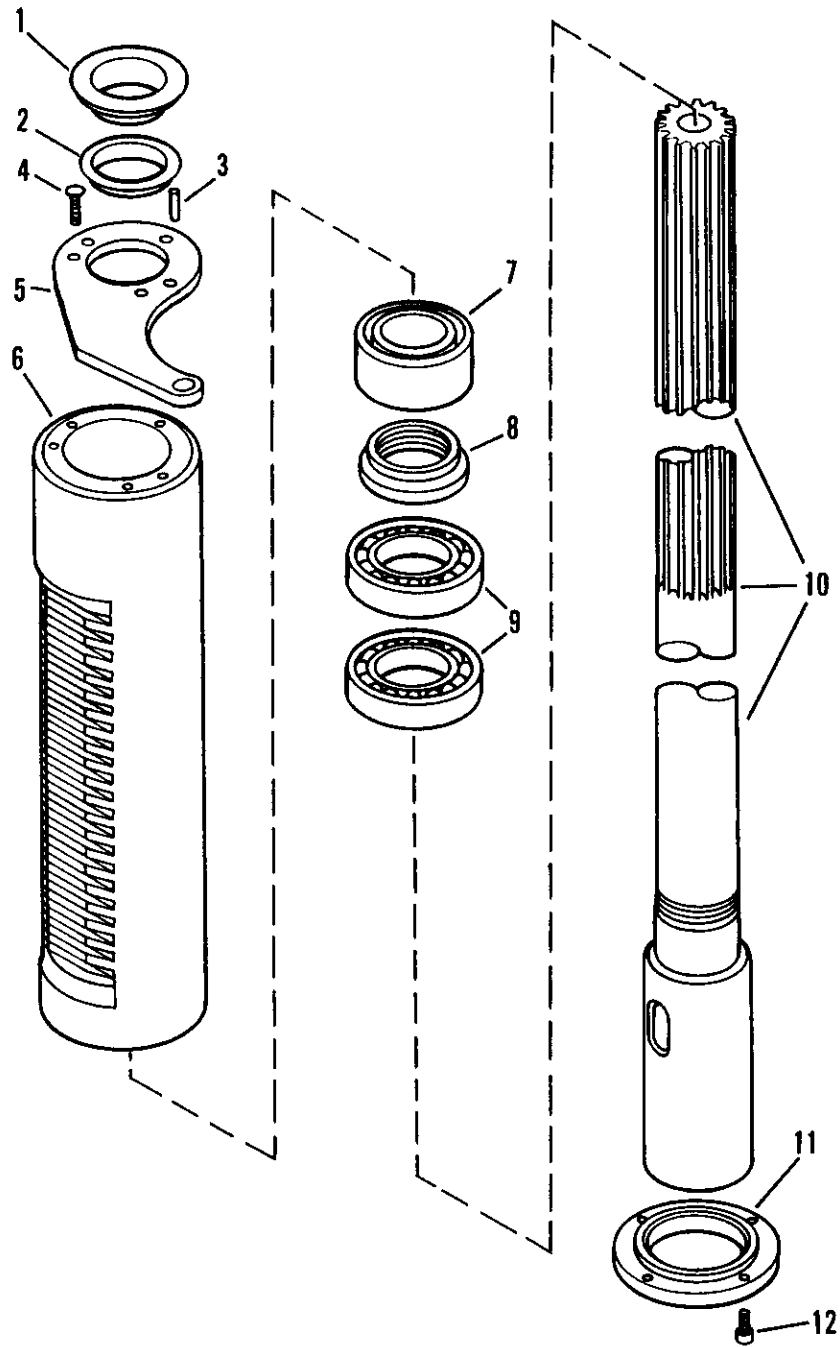


SLIDING HEAD ASSEMBLY (PART 2)

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	34179	1	SPACER
2	K-308	1	NUT, Hex
3	K-11665	1	SCREW, Set, socket cup point
4	37633	1	ROD, Trip
5	K-14317	1	KNOB, Hand
6	37634	1	DOG, Trip
7	37635	1	CAM
8	37636	1	SPACER, Scale
9	37637	1	SCALE
10	K-5306	3	SCREW, Flange head
11	K-133	2	CAPSCREW, Socket head
12	K-7749	1	PIN, Dowel hard
13	K-4624	1	PIN, Dowel hard
14	37632	1	BRACKET, Cam
15	K-136	4	CAPSCREW, Socket head
16	K-14316	1	SPRING, Lee
17	37638	1	HOLDER
18	K-5387	2	CAPSCREW, Button head
19	37631	1	PIN, Cam
20	K-14314	1	BUSHING, Oilite
21	37630	1	ROD, Push
22	34102	2	PIN
23	K-14313	3	COLLAR, Shaft
24	K-14312	2	COLLAR, Thrust
25	34183	1	SHEAVE
26	K-11230	1	BUSHING, Oilite
27	K-488	1	PIN, Taper
28	K-14311	1	HANDWHEEL, Reid
29	K-194	1	SCREW, Set, socket flat point
30	K-11315	1	BEARING, Thrust
31	K-2797	2	BUSHING, Oilite
32	37641	1	SHAFT, Head elevating
33	K-483	1	PIN, Taper
34	34169	1	PINION
35	K-9989	1	COVER, Oil hole gits
36	37642	1	SCREW, Clamp
37	K-14310	1	HANDLE, Crank reid
38	K-12419	1	PIN, Dowel hard
39	K-9921	1	WINDOW, Oil level
40	K-9995	1	COVER
41	K-8215	2	CAPSCREW, Button head
42	K-14315	1	BUSHING, Oilite
43	34331	1	GEAR, Balance
44	K-11231	1	BEARING, Oilite

SPINDLE & QUILL ASSEMBLY

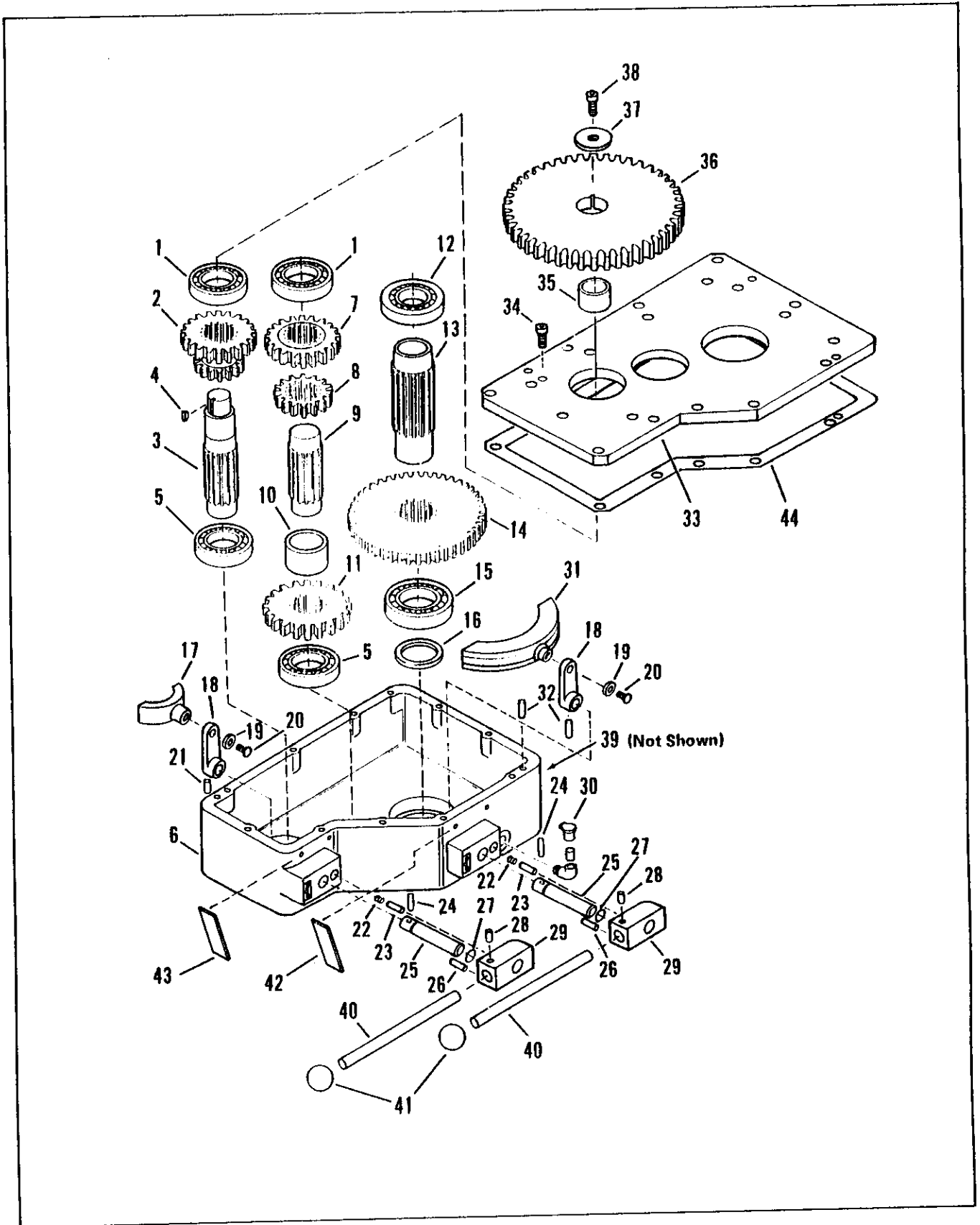


SPINDLE & QUILL ASSEMBLY

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	37606	1	PLUG, Cap
2	37611	1	PLUG, Cap
3	K-6124	2	PIN, Dowel
4	K-5388	3	SCREW, Button head
5	37610	1	SUPPORT, Trip rod
6	37607	1	QUILL
7	K-14294	1	BEARING
8	K-14243	1	NUT, Lock
9	KB-20000	2	BEARING
10	37609	1	SPINDLE
11	37608	1	CAP, End
12	K-3587	4	SCREW, Socket head

FEED TRANSMISSION ASSEMBLY

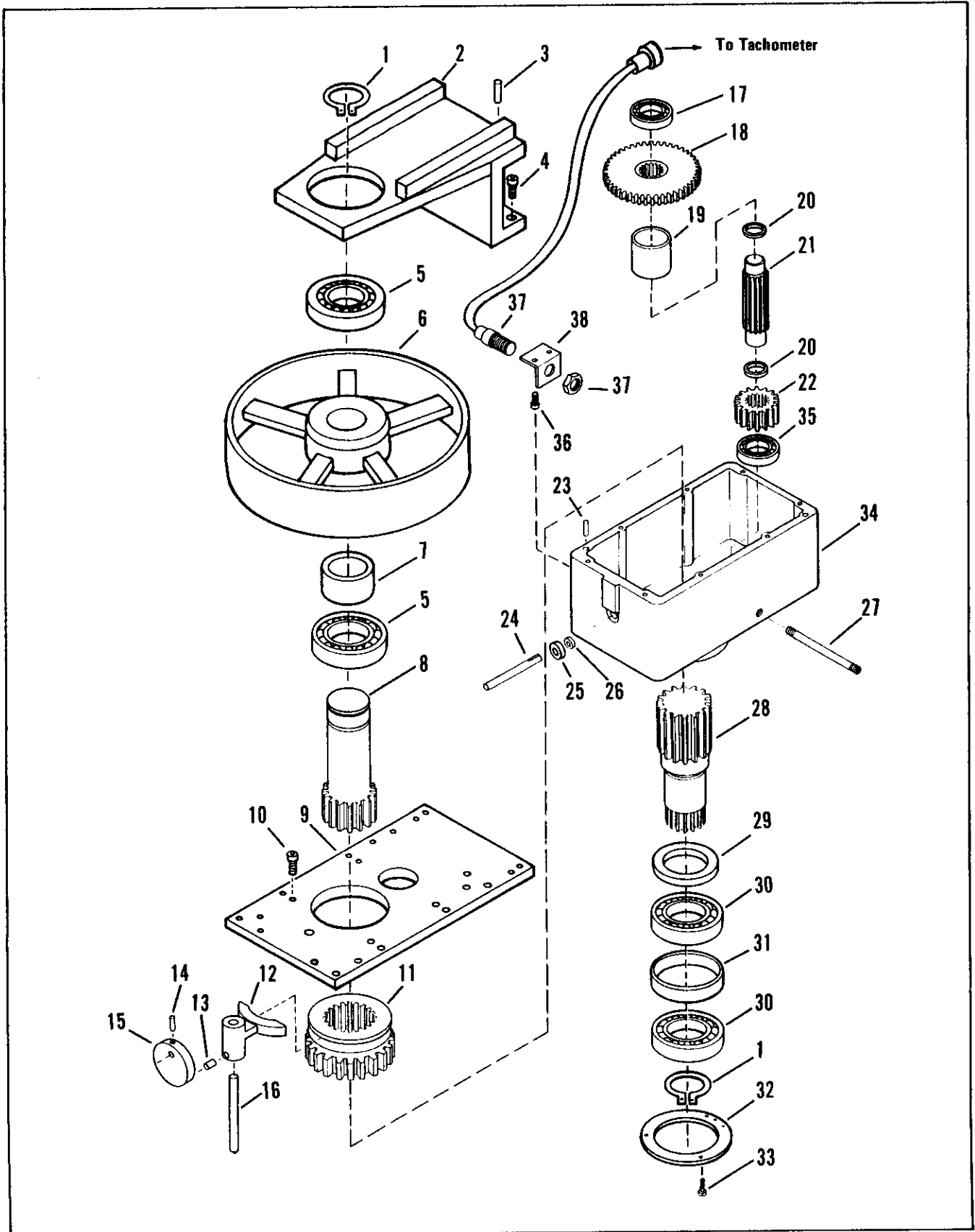


FEED TRANSMISSION ASSEMBLY

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	KB-20006	2	BEARING, Ball
2	37482	1	GEAR, Shifter
3	37481	1	SHAFT, Pick-off gear
4	K-14339	1	KEY
5	KB-20003	2	BEARING, Ball
6	37484	1	CASE, Gear
7	37483	1	GEAR, Idler
8	37474	1	GEAR, Idler
9	37478	1	SHAFT, Idler
10	37468	1	SPACER
11	37474	1	GEAR, Idler
12	KB-20004	1	BEARING, Ball
13	37475	1	QUILL, Transfer
14	37601	1	GEAR, Cluster
15	KB-20005	1	BEARING, Ball
16	K-14340	1	SEAL, Oil
17	37602	1	FORK, Shifter
18	37476	2	ARM, Shifter
19	K-459	2	RETAINER
20	K-12676	2	CAPSCREW, Button head
21	K-3593	2	SCREW, Set, socket cup point
22	K-14338	2	SPRING, Lee
23	K-6004	2	PIN
24	K-5974	2	PIN, Roll
25	37470	2	SHAFT, Shifter
26	K-6124	2	PIN, Dowel hard
27	K-14337	2	"O" RING
28	K-7378	4	PIN, Dowel hard
29	37469	2	HANDLE, Shifter
30	K-14336	1	OILER, Gits
31	37479	1	FORK, Shifter
32	K-12419	2	PIN, Dowel hard
33	37472	1	PLATE, Cover
34	K-1618	11	CAPSCREW, Socket head
35	37471	1	SPACER
36	37480	1	GEAR, Pick-off
37	37473	1	RETAINER
38	K-138	1	CAPSCREW, Socket head
39	K-687	1	PLUG, Pipe
40	37497	2	LEVER, Feed
41	K-14052	2	KNOB, Plastic
42	K-14326	1	PLATE, Feed
43	K-14327	1	PLATE, Feed
44	37695	1	GASKET

HIGH - LOW SPEED TRANSMISSION

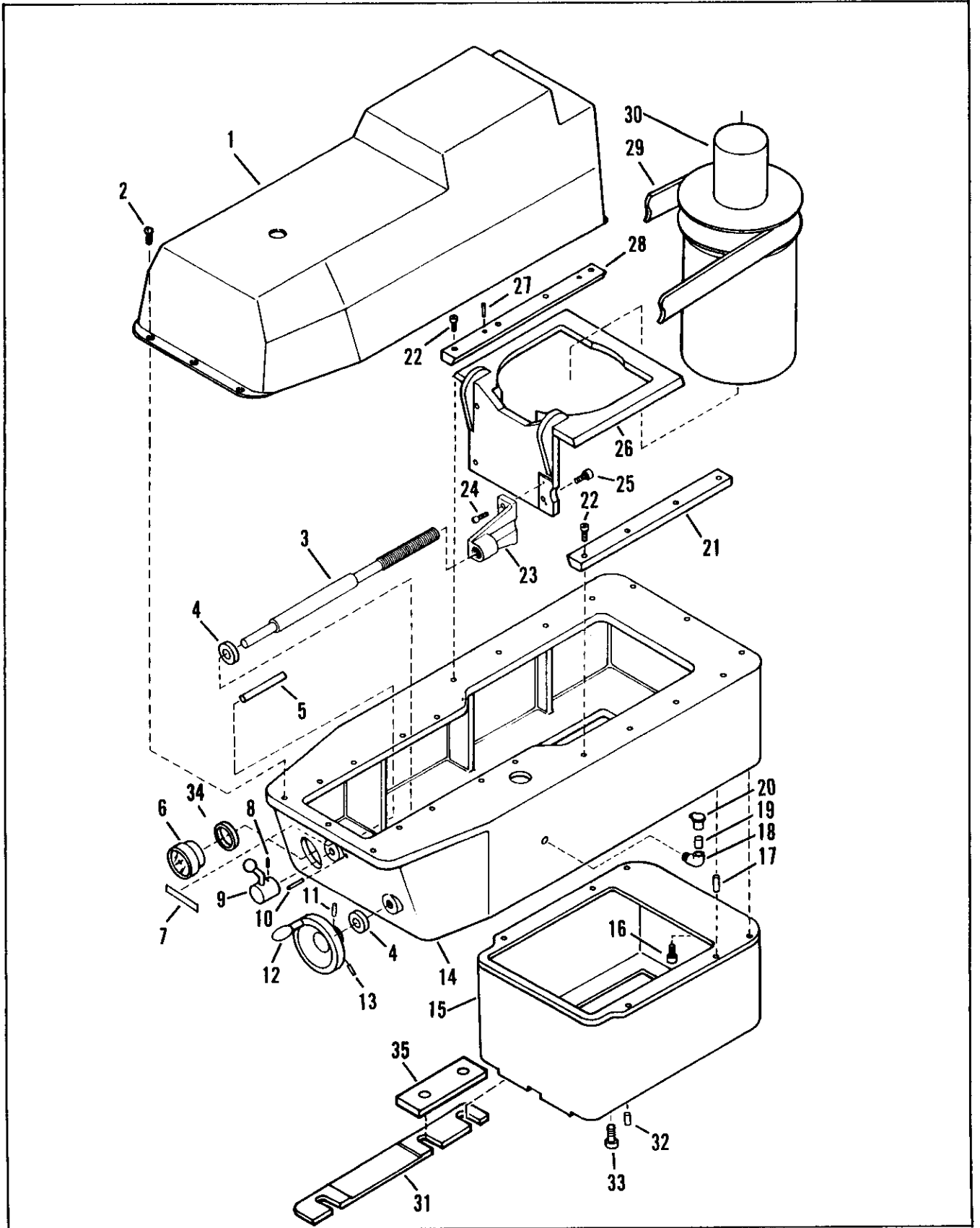


HIGH - LOW SPEED TRANSMISSION

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	K-14352	3	"S" RING
2	37657	1	BRACKET, Bearing
3	K-6071	2	PIN, Dowel
4	K-2029	4	CAPSCREW, Socket head
5	K-20007	2	BEARING, Ball
6	K-14329	1	PULLEY, Companion
7	37649	1	SPACER
8	37653	1	SHAFT, Gear
9	37656	1	COVER
10	K-683	8	CAPSCREW, Socket head
11	37464	1	GEAR, Clutch
12	37648	1	FORK, Shifter
13	K-6348	1	PIN, Dowel
14	K-2502	1	SCREW, Set
15	37647	1	CAM
16	37645	1	SHAFT
17	KB-20009	1	BEARING, Ball
18	37652	1	GEAR
19	37651	1	SPACER
20	37650	2	SPACER
21	37643	1	SHAFT, Idler
22	37644	1	GEAR
23	K-6348	2	PIN, Dowel
24	37646	1	SHAFT
25	K-14354	1	COLLAR, Set
26	K-14353	1	SEAL, Oil
27	K-12415	1	PIPE
28	37654	1	SHAFT, Output
29	K-14325	1	SEAL, Oil
30	K-6348	2	BEARING, Ball
31	CP-3433	1	SPACER, Set
32	37658	1	RETAINER
33	K-12676	3	CAPSCREW, Button head
34	37655	1	CASE, Gear
35	KB-20010	1	BEARING, Ball
36	K-11651	2	CAPSCREW, Socket head
37	E-7797	1	SENSOR, Magnetic
38	37499	1	BRACKET, Mounting

TOP HEAD



TOP HEAD

NOTE: Order by your machine serial number and this parts list.

Item	Part No.	Qty.	Description
1	37496	1	SHROUD
2	K-8087	4	SCREW, Button head
3	37493	1	SCREW, Speed change
4	37498	2	SPACER
5	K-5660	1	PIN, Roll
6	E-7797	1	TACHOMETER
7	K-14335	1	PLATE, High speed-Low speed
8	K-11663	1	SCREW, Set, flat point
9	K-14331	1	HANDLE, Speed shaft
10	K-5990	2	PIN, Dowel
11	K-8777	1	SCREW, Set, socket head
12	K-14332	1	WHEEL, Hand
13	K-5652	1	PIN, Roll
14	37489	1	HEAD, Top
15	37490	1	RISER
16	K-160	6	CAPSCREW
17	K-11077	2	PIN, Taper pull
18	K-6271	1	PIPE, Elbow
19	K-14333	1	NIPPLE
20	K-14334	1	COVER, Oil, gits
21	37495	1	CLAMP, Motor slide
22	K-683	8	CAPSCREW, Socket head
23	37492	1	NUT, Speed change
24	K-136	2	CAPSCREW, Socket head
25	K-151	4	CAPSCREW, Socket head
26	37491	1	BRACKET, Motor slide
27	K-3808	5	PIN, Hard dowel
28	37494	1	CLAMP, Motor slide, L.H.
29	K-14330	1	BELT, Variable
30	K-14328	1	PULLEY, Variable
31	26198	2	SPACER, Fitting
32	K-11078	2	PIN, Taper pull
33	K-170	6	CAPSCREW, Socket head
34	37792	1	SPACER
35	37791	1	SPACER