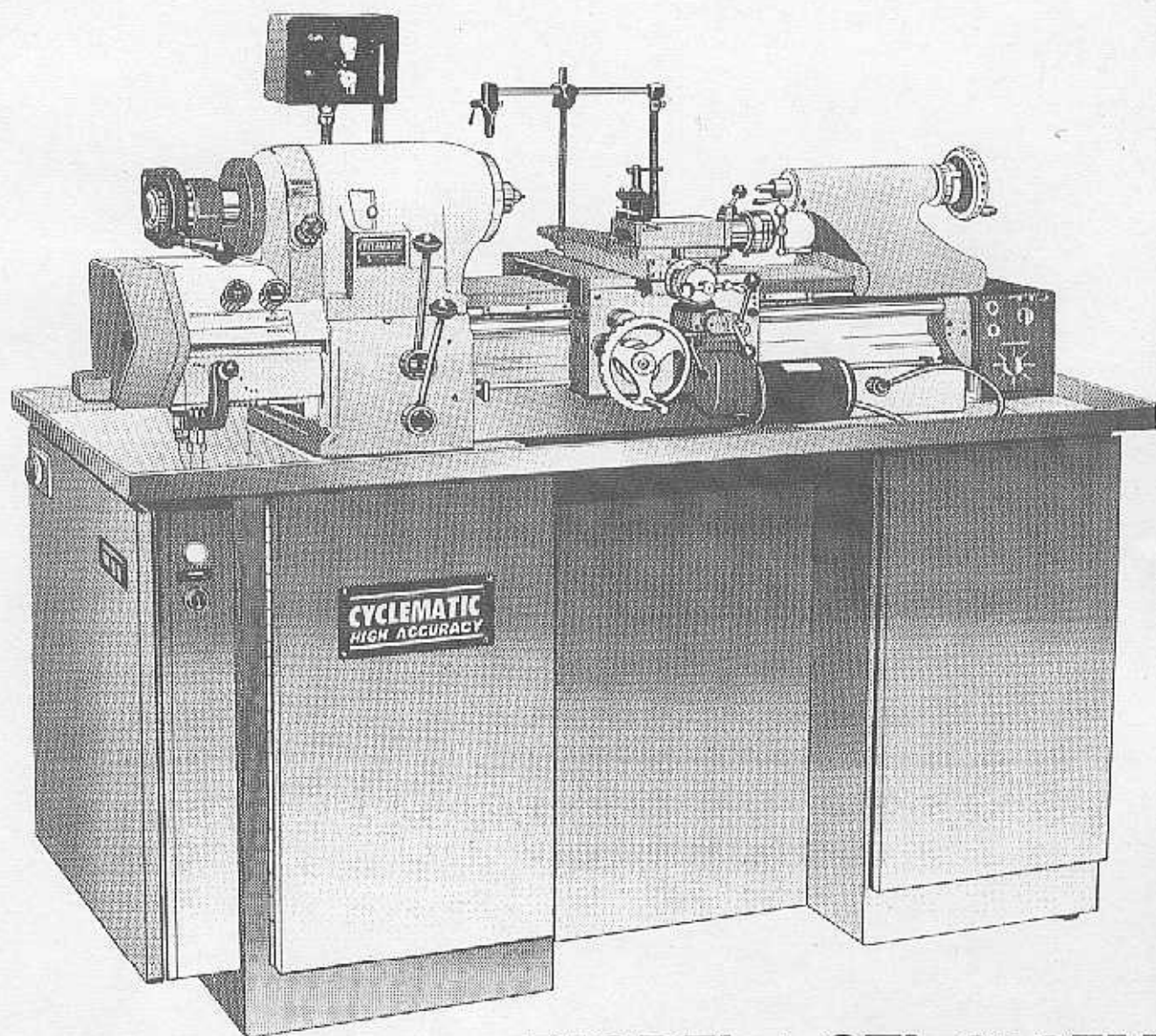


# CYCLEMATIC

## SERVICE MANUAL



**MODEL : CTL-618EM**

**MANUFACTURER:**

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MACHINE

NO.

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## **PUIROSE OF THIS MANUAL**

The model CTL-618 series machine is built for easy and safe operation and excellent manufacturing of work in process. The machine is built with high quality material, and carefully to exacting standards that guarantee the life, economical use, accuracy, and minumum maintenance of the machine.

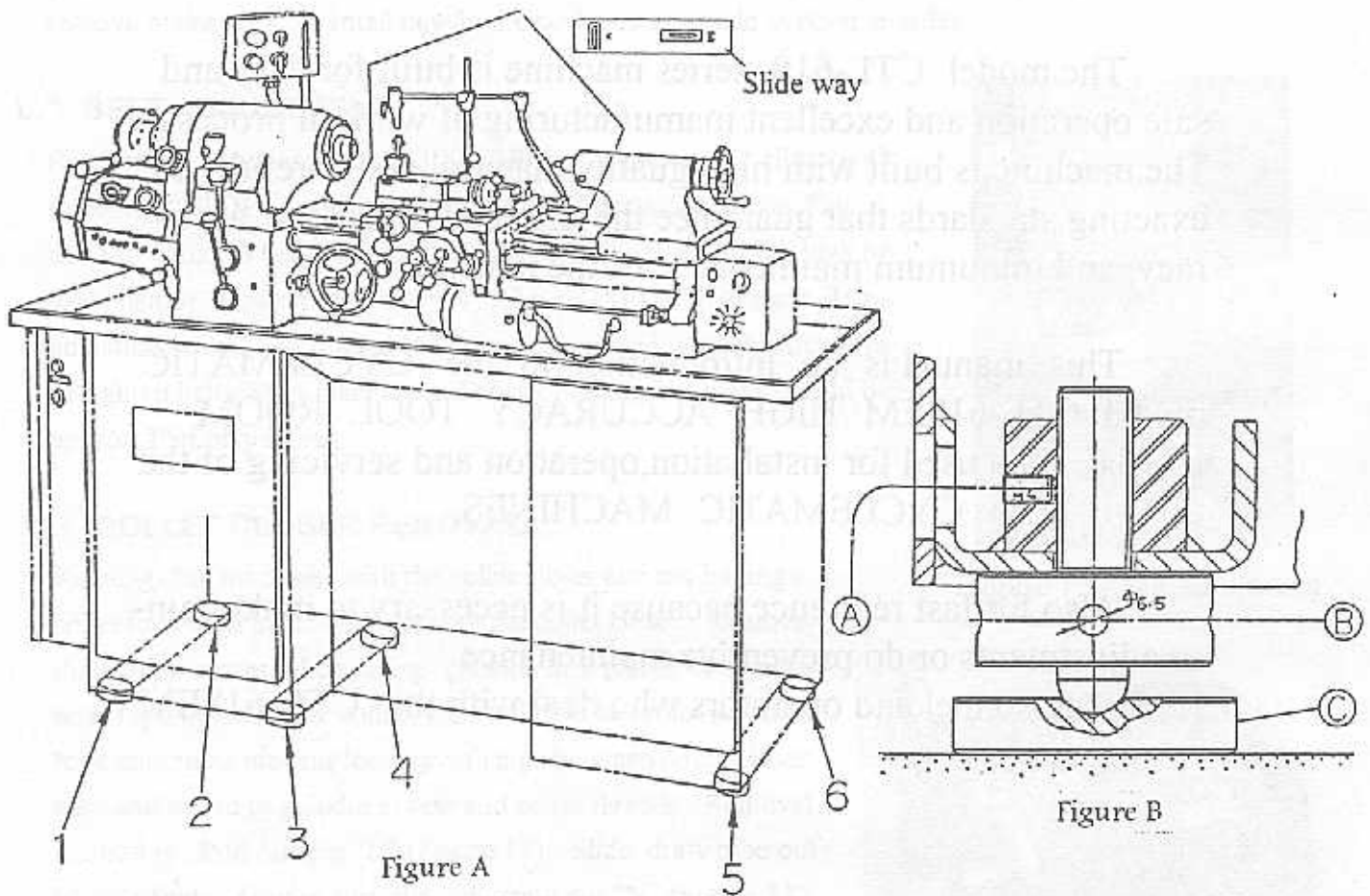
This manual is an introduction to the CYCLEMATIC model CTL-618EM HIGH ACCURACY TOOL ROOM LATHE .It is used for installation, operation and servicing of the CTL-618EM CYCLEMATIC MACHINES.

Also, for fast reference, because it is necessary to make minor adjustments or do preventive maintenance.

( For personnel and operators who deal with the CTL-618EM machine. )



### Place Two Levels ON Slide Way



CTL-618EM

### Adjusting process for leveling machine

1. Put pads C (Fig.B) under each of six points.
2. Loosen set screw A (Fig.B) .
3. Insert a pin wrench into the hole B.  
raise or lower by turning (C.W. or C.C.W)
4. Tighten set screw A (Fig.B) to lock.
5. Be sure every point is touching the ground to support the machine.

## THREAD CUTTING

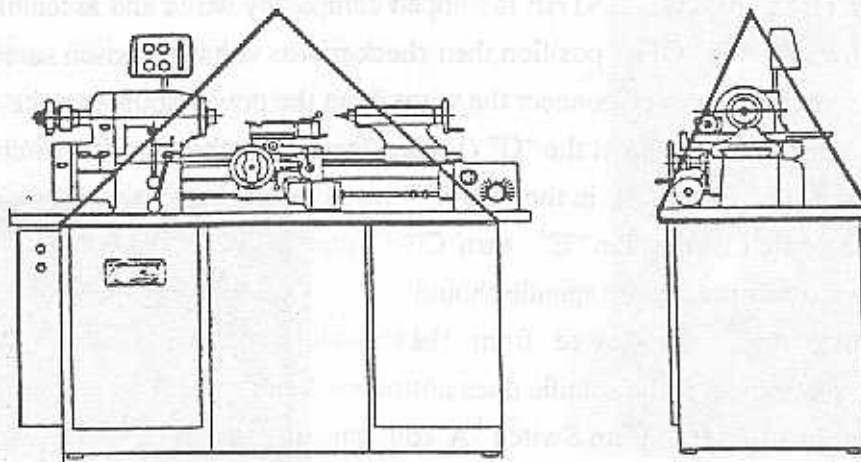


Figure 1 - Lifting machine

Lifting machine, arrange rope or cable as shown in figure 1, and check to see if the correct balance has been obtained. Then insert pads of soft cloth between the edges of the rope and machine. The net weight of this machine is approx 830 kgs (1830 lbs). So the rope or cable must be rated at 3000 lbs capacity.

### A.) INSPECTION AND CLEANING OF MACHINE

An inspection should be made after arrival of the machine in your plant. Look for possible damage caused

by shock or vibration during transportation, also check for any missing parts, standard tools or other equipment.

In shipment, all exposed surfaces of the machine are coated with an antirust liquid. Before moving carriage and cross-slide, leadscrew tailstock...etc, these surfaces should be thoroughly cleaned to remove all

antirust liquid use a soft brush and solvent. This is very important because it can prevent any dirt or grit which may have accumulated on the antirust liquid from working under the sliding members and causing undue wear.

**\* CAUTION : DO NOT USE COMPRESSED AIR TO CLEAN, WHICH WILL REDUCE THE MACHINE'S LIFE.**

### B.) FOUNDATION, INSTALLATION, AND LEVELING

A fairly flat foundation and proper installation will provide the machine long-term high accuracy, so supplying a good solid foundation of proper thickness is important. (Generally, a thickness of 300mm (12") is considered to be enough.) The machine has six adjustable feet on the corners of the pedestal base, used for leveling the machine. Place the pads under the feet of pedestal. To adjust, loosen the set screw and raise or lower the foot with a pin wrench so that all six feet rest firmly on the floor. When the adjustment is done, tighten set screws.

### C.) ELECTRICAL CONNECTIONS

The CTL-618EM TOOL ROOM LATHE is shipped completely wired and assembled. Turn Cam Switch "A" (Figure 2) to the "OFF" position, then check motor voltage. Loosen screws "B" (Figure 2), and open the switch case cover, connect the wires from the power source to the terminals (R, S, T), and ground connection is made at the "G" (Figure 3) which is the electric switch case.

Place Control Lever "G" (Figure 4) in the "LOW" position, pull out Spindle Locking Pin "E", turn "C" (Figure 5) in forward position. The spindle should rotate counterclockwise when viewed from the tailstock end of the machine. If the spindle does not turn in the correct direction, turn Cam Switch "A" to "OFF" position. Disconnect electric power source, and interchanges any two leads until the turning direction is correct. When the spindle is rotating correctly, secure switch case cover, turn Cam Switch "A" to "ON" position.

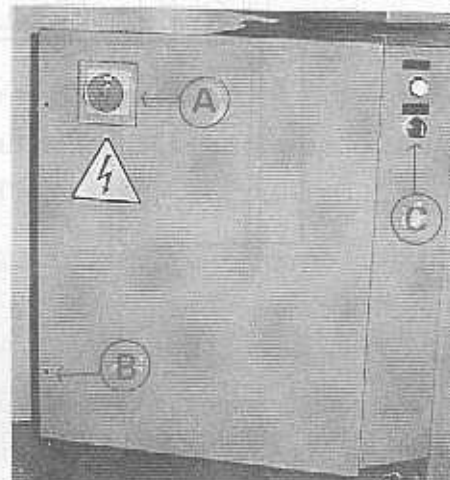


Figure 2 - Control Unit Door

**\* CAUTION : RUNNING THE MACHINE IN THE WRONG DIRECTION WILL RESULT IN DAMAGE TO THE SPINDLE SPEED CHANGE UNIT.**

### D.) LUBRICATION

Proper lubrication supplied carefully, will maintain the life and performance of the machine for a long period. Therefore, lubricate the machine with a high quality lubricant, and check periodically to assure that the lubricant in the oil sight gage is filled to the proper level.

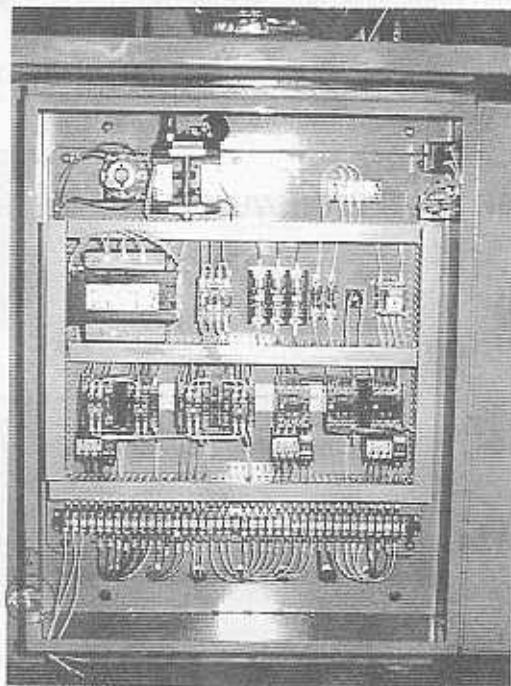


Figure 3 - Control Unit

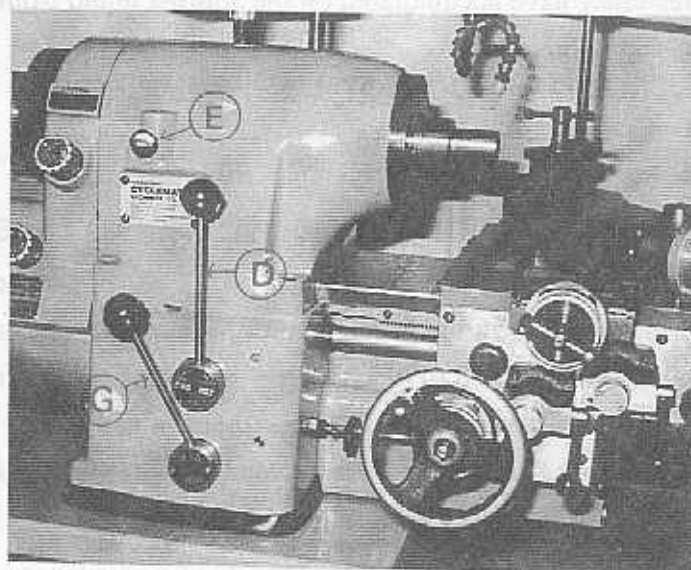


Figure 4 - Control Speed and Direction



## 1.VERTICAL SCREW

Lubricate the vertical screw "V" (Figure 6) with grease in fitting "N" as shown in (Figure 6). There after grease monthly or as necessary. Whenever you start to operate the machine, add a few drops of light oil in the Vertical Screw "V" (Figure 6) and the Brake Cork "C" (Figure 14).

## 2.CARRIAGE LUBRICATION

Fill with Mobil Vactra Oil No.2 or equivalent in oil reservoir. Maintain oil level in Sight window "W" (Figure 7) To lubricate carriage and bed ways, lift plunger on reservoir "R" (Figure 7) hold briefly and release to keep bed ways lubricated.

## 3.GEAR BOX AND CLUTCH LUBRICATION

Maintain oil level in sight windows "W" (Figure 8) .To fill gearbox,remove plug "C" (Figure 8) use Automatic Transmission Fluid Mobil 200 ( Esso ATF or equivalent Change oil every 500 HRS.)

To drain oil,remove the Drain Plug "M" located under the oil gear box (Figure 8).

**\* CAUTION : USE OF ANY OTHER TYPE OF OIL IN THE GEARBOX MAY RESULT IN DAMAGE TO THE CLUTCH SURFACES.**

## 4.HEADSTOCK LUBRICATION

The headstock spindle is mounted on precision preloaded ball bearings. The ball bearings are grease packed for life and require no further lubrication.

## E.) SPINDLE CONTROL LEVERS

To change spindle speeds. Push start button (M) Figure(5). Turn cam switch (C) to the forward or reverse position and move lever (G) Figure ( 4) to the low position. Turn cam switch (I) Figure (5) to the left to increase speed and to the right to decrease speed. Moreover hold the cam switch to left or right until required speed is indicated in the sight window.



Figure 5 - Speed Control box

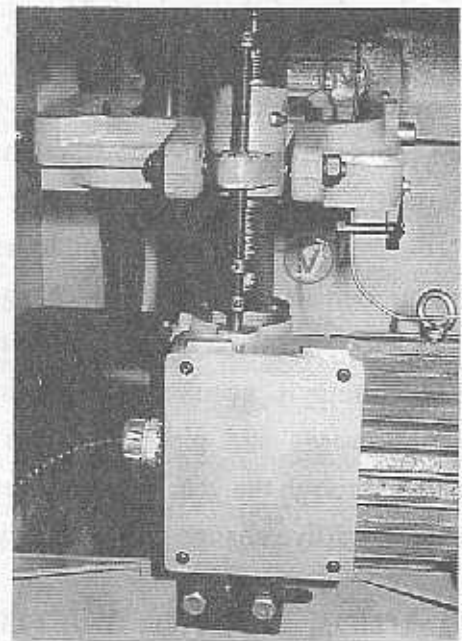


Figure 6 - Speed Change Unit

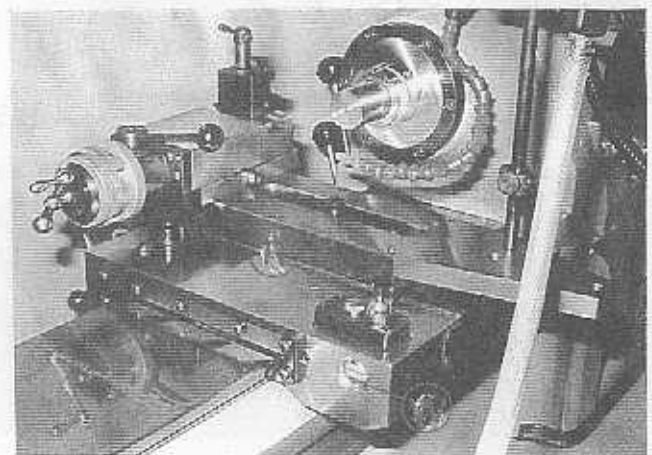


Figure 7 - Carriage Lubrication



Speeds in the right side of sight window are obtained lever (G) Figure (4) in the high position and speeds in the left side of sight window are obtained with lever (G) in the low position. The spindle speeds can be selected to suit each particular job that depends on type of material, work diameters and tooling being used.

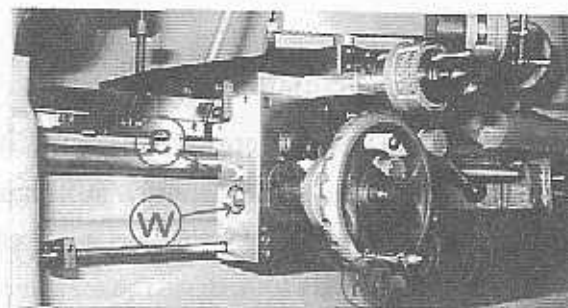


Figure 8 - Gear box Lubrication

## F.) FREE SPINDLE

To obtain a free spindle for turning the spindle by hand move lever (G) Figure (4) to the stop position. Turn cam switch (C) Figure (5) to brake off position and push start button (M). The spindle will rotate by hand easier after machine has been run at a speed of 1100 RPM or over.

## G.) QUICK CHANGE GEAR BOX

The Quick Change Gear Box Unit see (Figure 9 & 11), feed or thread change knob "T", shifted to left is threading, shifted to right is feed only. The range of threads, their selection and the position of the knobs for each thread are shown on the chart "C" (Figure 10). Pull out the ball of gear change arm "A" (Figure 10). Then move arm to left or right, insert in correct position, and change the speed change knob "S" to 1, 2, or 3 position until desired thread cutting is acquired see (Figure 10). The standard threads and pipe threads are immediately available through the gear box by the use of outside change gears (five change gear assembly), pitches of threads can be cut to 250 threads per inch.

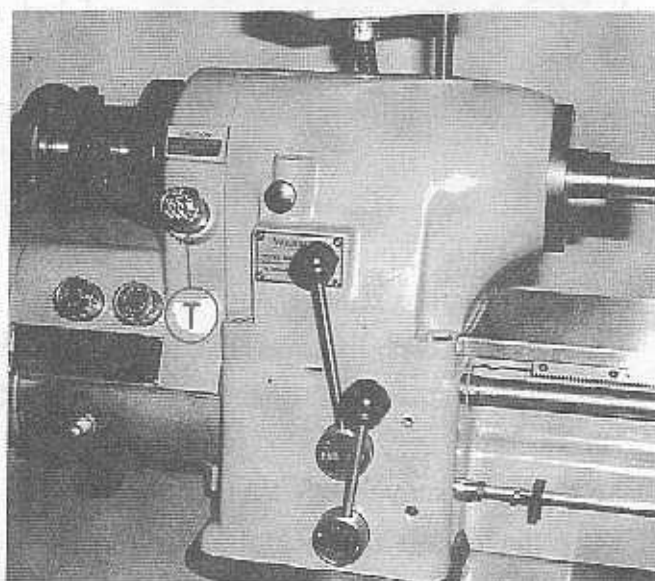


Figure 9 - Feed or Thread Change

**\* CAUTION : DO NOT SHIFT GEARS KNOB "T" WHEN THE SPINDLE IS RUNNING**

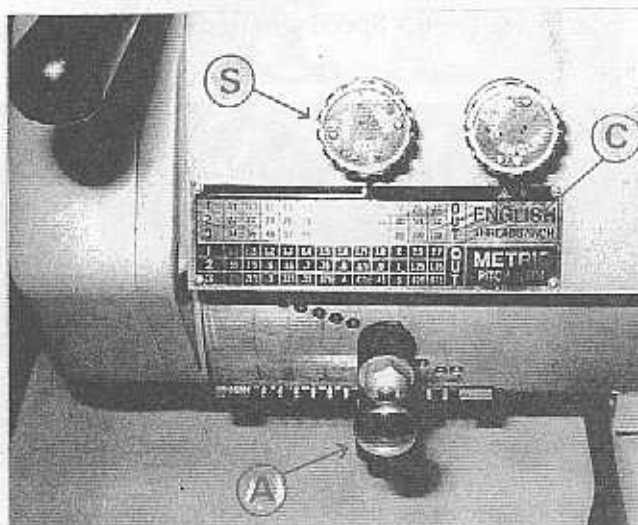


Figure 10 - Tread Chart

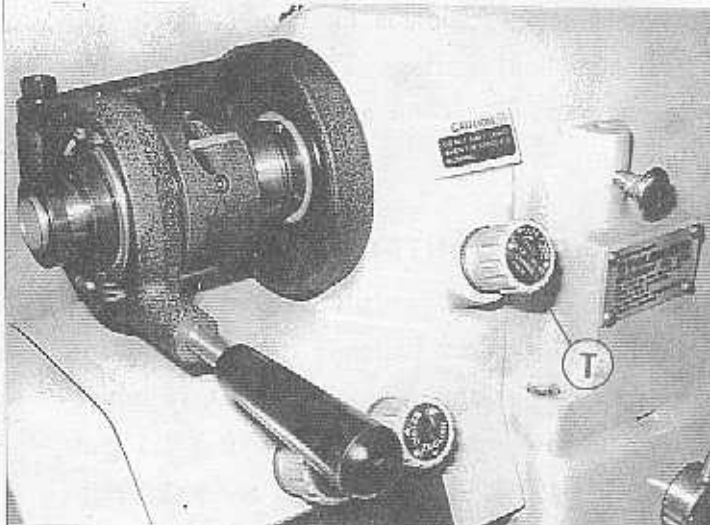


Figure 11 - Feed or Thread Change

## H.) AUTOMATIC THREAD LENGTH CONTROL

When threading into a blind hole or to a shoulder without a thread relief. The lead screw half nut is engaged at the start of the threading and remains engaged until threading work is completed. Left or right hand threads are controlled by Control lever "D" (Figure 4), the lever is joined with the control bar "B" (Figure 12). When the carriage touches the adjusting screw "S" (Figure 12) of the length control bar, it will push the lever "D" to "STOP" position, and make the lead screw stop. For method of threading cut, please see Page 8, QUICK ACTING.

## I.) SPINDLE BRAKE

The Spindle Brake is built for rapid stopping of the headstock spindle. Turn the Control Lever "G" (Figure 4) to "BRAKE" position, the spindle will automatically brake at all speeds within a few seconds. The Brake is actuated when the brake cork "C" (Figure 14) is forced against the brake drum (Figure 14) by spring action and is released by a solenoid. Allowing brake cork to become dry will reduce belt and brake life, so add a few drops of spindle oil to the brake drum as often as necessary.

## J.) BRAKE ADJUSTMENT

To adjust the brake, start the machine. Run it at 1500 RPM. While the machine is running, insert a 5mm allen wrench in the screw head located under the electrical connector on the brake solenoid. (Fig.3) Turn the screw counterclockwise until brake cork contacts drum, then turn clockwise until noise disappears. At 1500 RPM the brake should stop the spindle in approx. 3 sec.

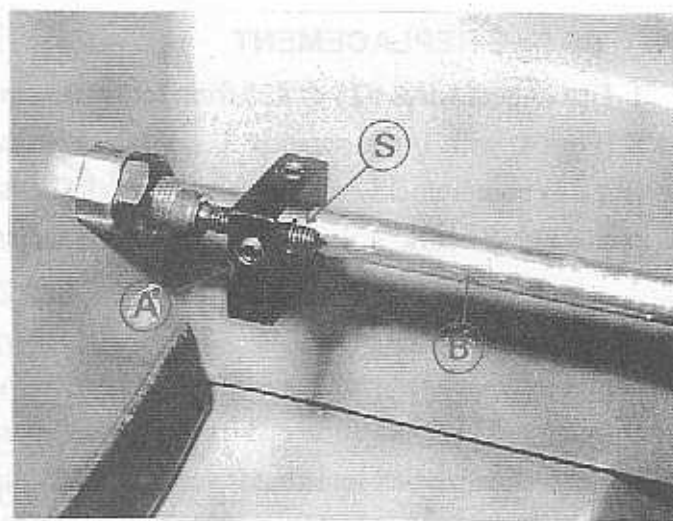


Figure 12 - Thread Length Control

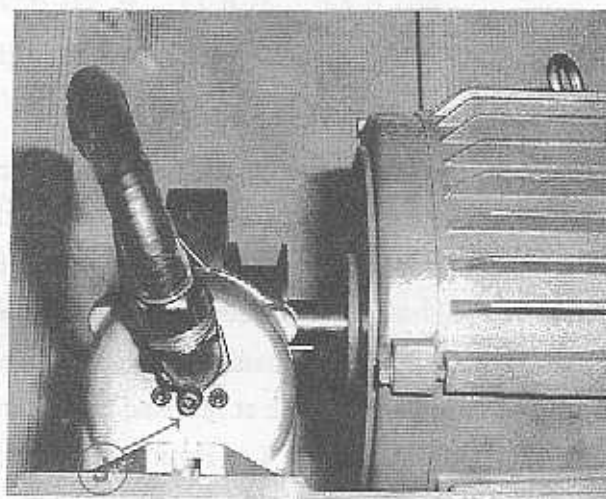


Figure 13 - Brake Adjustment

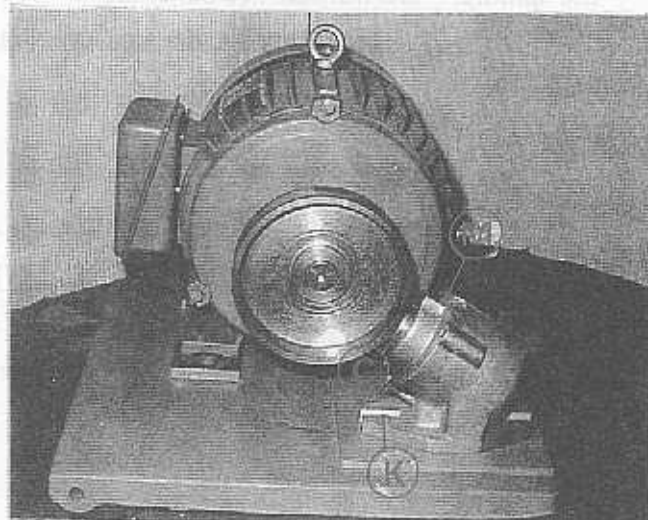


Figure 14 - Brake Cork Replacement

## K.) BRAKE REPLACEMENT

1. Disconnect wires #25 & #25 from terminal, strip and remove conduit.(Fig.3) 2. Remove tow bolts K (Fig.14) with 14mm wrench. 3. Loosen set screw "M" (Fig.14) in keyway, turn adjusting screw "J" (Fig.13) counterclockwise and remove brake housing. Use a pin punch through adjustment hole to remove brake cork. 4. Install new brake cork and assemble in reverse order.

## L.) BELT ADJUSTMENT

Run spindle at approximately 1000 RPM. Move lever "G" (Figure 4) to center "STOP" position and let the spindle coast to a stop. This is done to equalize belt tension. Move lever "G" (Figure 4) to the high or low position. Loosen lock nut "N" (Figure 15) 19mm wrench. Turn adjusting screw "D" (Figure 15) 6mm socket head wrench clockwise to tighten belts. Stop machine and check belt tension, there should be approx. 1" of play in belt.

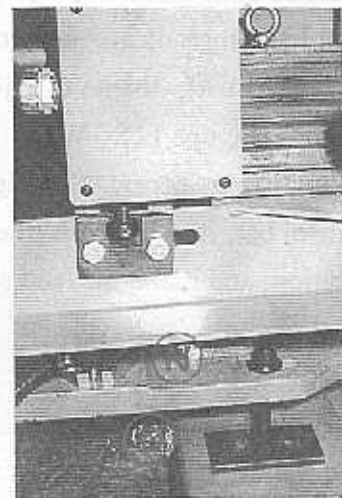


Figure 15 - Belt Adjustment

## M.) COLLET CLOSER REMOVAL

Running the machine with the collet closer and not having a collet locked in place will damage the collet closer. Remove the collet closer when using chucks, face plates, or spindle nose type fixtures. The collet closer should be removed often for cleaning to prevent loading of chips between collet closer tube and inside of spindle at rear and collet threads. Removal method is: Pull out pin "L" (Figure 17). Slide draw tube out of the spindle. Do not turn the adjusting nut "N" (Figure 17). It is keyed to the spindle. To remove slide it off the end of the spindle. Do not remove collet closer by removing screw "S" (Figure 17), this screw has been adjusted at the factory for proper operation of the collet closer.

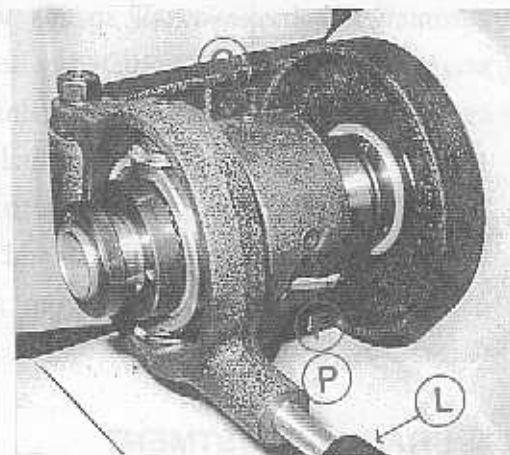


Figure 16 - Collet Closer Adjustment

## N.) COLLET CLOSER REPLACEMENT

Before replacement of the closer, clean inside of the headstock spindle and outside diameter at rear of spindle where Adjusting Nut "N" (Figure 17) is located. Apply a film of light oil on rear of spindle. Do not force Adjusting Nut "N" on spindle. If Adjusting Nut "N" fits to tight, remove and check for burrs or scratches, then replace. Clean collet closer tube inside and out apply a film of light oil on slip surface "T" (Figure 17) of the collet closer tube, replace collet closer and insert Link Pin "L" (Figure 17).



## O.) COLLET CLOSER ADJUSTMENT

1. Before using collet closer, and any collet or step chuck to be used should be thoroughly cleaned. 2. Push the lock Pin "E" (Figure 4) . To engage lock pin, turn spindle by hand till lock pin enters notch to lock. 3. Press the Closer Adjusting Finger "F" (Figure 16) down to the point "P" (Figure 16). 4. Place collet closer tube on collet or step chuck until engaged. Turn both collet closer tube and shell Guard "G" (Figure 15) forward with the left hand, and hold the collet or step chuck with the right hand at the same time. 5. Place a work piece in collet or step chuck. 6. Place lever "L" (Figure 16) to the extreme left fixed position. Turn the Shell Guard "G" (fig. 16) toward operator until the work piece is clamped by the collet. 7. Place lever "L" to the right, the released position. Turn Shell Guard "G" toward operator, move the Adjusting Finger "F" advance two notches on the adjusting nut "N" (Figure 17) and close Adjusting Finger "F". 8. Test collet closer's tension on work piece. If the work piece needs additional gripping pressure, press down on the adjusting finger "F" and turn Shell Guard "G" forward and lock. (see figure 16)

## P.) CARRIAGE INDICATING RING

Dual dials with english and Metric Handwheel dial "W" (Fig. 18) graduations are in 0.01" 0.2mm. It is built for the operator's convenience of operation. (Fig. 16) Spring loaded indicating ring, just turn to required location by loosening lock screw "L" (Fig. 18) Sliding cover cage exposes only the dial in use.

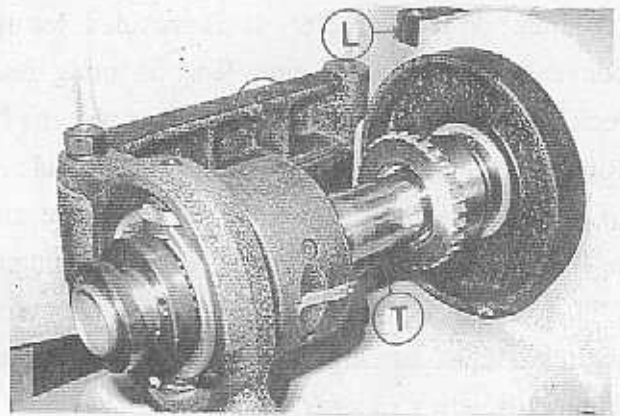


Figure 17 - Collet Closer Removal

## Q.) CARRIAGE LOCK

To hold the carriage in a fixed position on the bed use the Carriage Lock Handle "H" (Figure 19). Move the lock handle "H" clockwise toward the operator, lock the carriage in position. Move the lock handle "H" counterclockwise away from the operator. To unlock the carriage.

## R.) CARRIAGE CLUTCHES

The carriage clutches are made of a friction type material, designed to slip when slide or carriage engages a feed stop. The clutches are a spring-loaded arrangement and can not be adjusted for more pulling power. If clutch slips under a cut, it is a sign of improper tool grinding, dull tool or excessive feed. The friction clutches have sufficient power to handle all work.

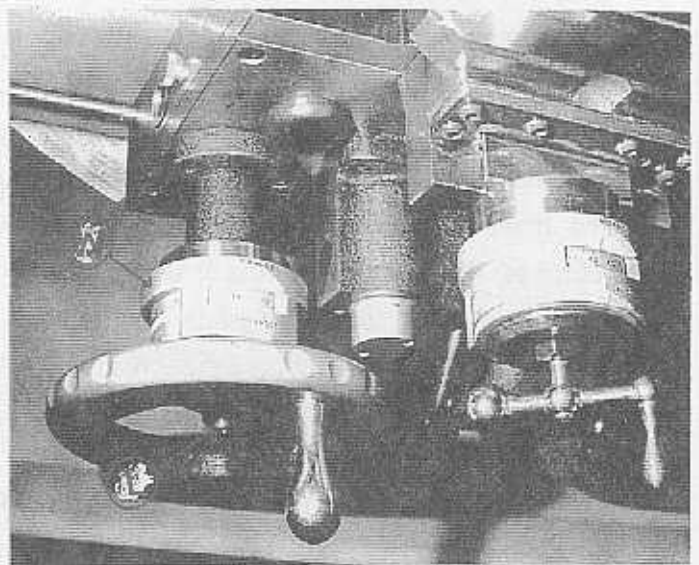


Figure 18 - Carriage Indicating

When the machine contacts a feed "stop", it is intended for the clutch to slip. To operate clutches as shown in (figure 20), raise handle "H" (figure 20) is approx. 20 degrees above horizontal, the clutch will engage. Push down the handle "H", the clutch will release. When the carriage lead screw is engaged for threading the carriage feed clutch is mechanically interlocked (can not be engaged). This is to prevent machine damage. Adjust clutches as shown in Figure 20.

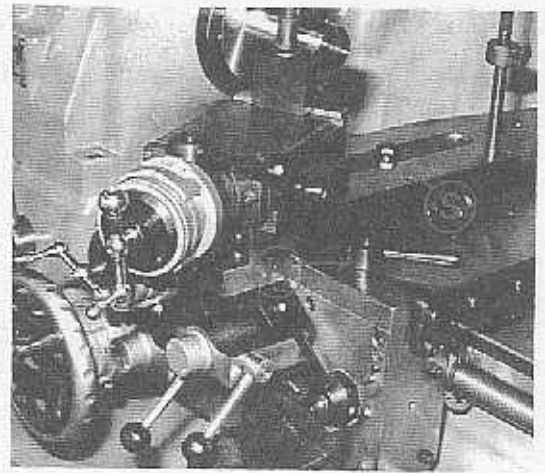


Figure 19 - Carriage Lock

### S.) CROSS SLIDE INDICATING RING

Dual dials with english and metric handwheel dial. Each graduation of the Indicating Ring "C" (figure 21) is 0.001" (0.02mm) on the diameter. It is provided for operator's convenience. The Indicating Ring is spring loaded, so a lock screw is not needed. To use it, just turn the Indicating Ring to required location by hand. Cross Slide operation of feed and adjustment of clutches are identical with the operation and adjustment of carriage clutches. If CTL-618EM TOOL ROOM LATHE needs to be used with the taper turning attachment, loosen the screw "S" (figure 19) with a spanner wrench.

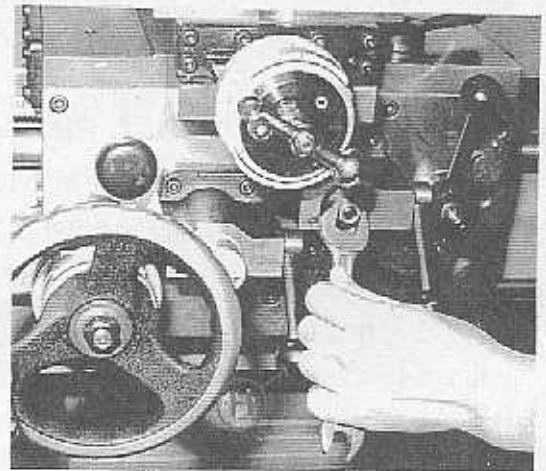


Figure 20 - Carriage Clutches

### T.) QUICK-ACTING TOOL POST COMPOUND SLIDE ASSEMBLY

The compound slide has a quick-acting tool post, at the start of threading cut, place the ball-handle "H" (Figure 21) of the quick-acting tool post toward the workpiece, at the end of the threading cut, the threading tool is instantly cleared from the work by hand operated, handle "H", for the return of the carriage to the next cut, the ball-handle lever actuating the tool post slide feed screw. Operate above procedure repeatedly until the threaded work piece is completed. Each graduation of the indicated ring "C" (Figure 21) is 0.001" (0.02mm) on diameter.

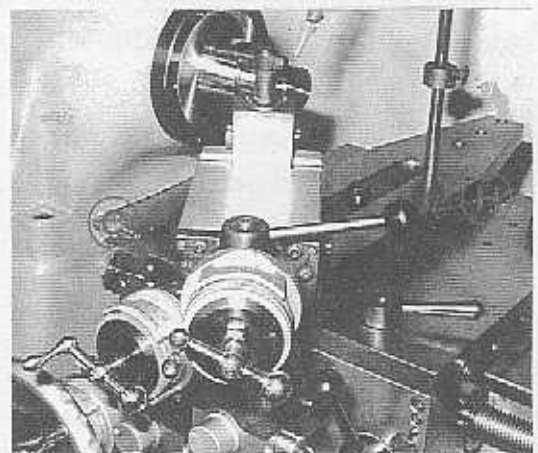


Figure 21 - Cross Slide Indicated Ring and Quick Acting

**\* CAUTION : THE BALL-HANDLE LEVER OF THE QUICK-ACTING TOOL POST MUST BE MOVED TOWARD OPERATOR AT THE END OF THE THREADING CUT.**



## U.) POWER FEED UNIT

The carriage Power Feed unit is mounted on the carriage.

It is powered by a direct current motor (Figure 22).

1. The power feed can be operated only when the machine is running.

Start the power feed by turning Cam Switch "S" (figure 23).

2. The Cam Switch "S" (figure 23) controls the direction of the power feed.
3. The carriage Feed Control "N" (figure 23) controls the rate of feed. When Cam Switch "S" is placed in "RIGHT" position, the carriage will feed toward the right, the cross slide will feed away from the operator.
4. When Cam Switch "S" is placed in "LEFT" position, the carriage will feed toward left, the cross slide will feed toward operator.
5. Turn Cam Switch "S" to "STOP" position, power feed motor is then off.
6. The rate of the carriage feed should be pre-selected to suit each particular job, which depend on material, diameter, type of cut, and tooling used.
7. The numbers on the carriage feed control panel, do not represent either thousandths per revolution or inches per minute. So the operator must test sample pieces for determining the spindle speed and rate of feed which can best suit to the requested surface finish and production rate, then record the proper settings after testing.

**NOTE : WHEN STARTING INTO PRODUCTION. AN OPERATOR CAN SET THE FEED CONTROL "N" TO THE RECORDED REFERENCE SETTING, THEN THE SAME TESTED RESULTS WILL BE OBTAINED.**

## V.) COOLANT FACILITIES

The coolant pump is controlled by Switch "C" (figure 2) . Turn Switch "C" to "ON" position, the pump will run continuously, turn to "AUTO" position, the pump will run only when the machine is running. If pump switch is set at "OFF" position, the coolant pump is off. Sump should be cleaned periodically, depending on the type of material being machined.

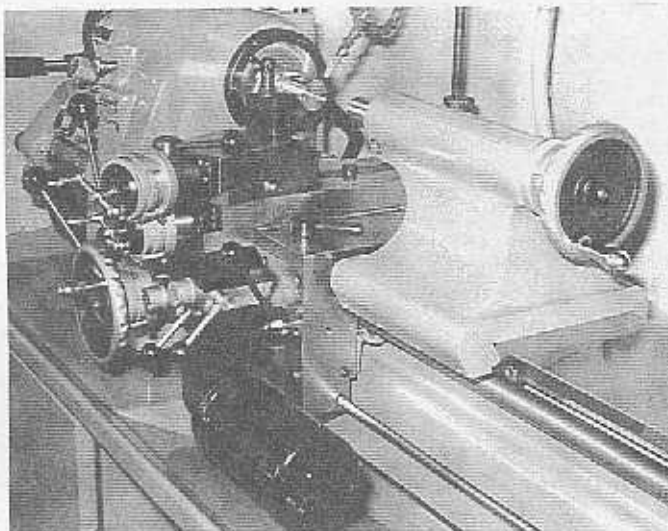


Figure 22 - D.C Motor

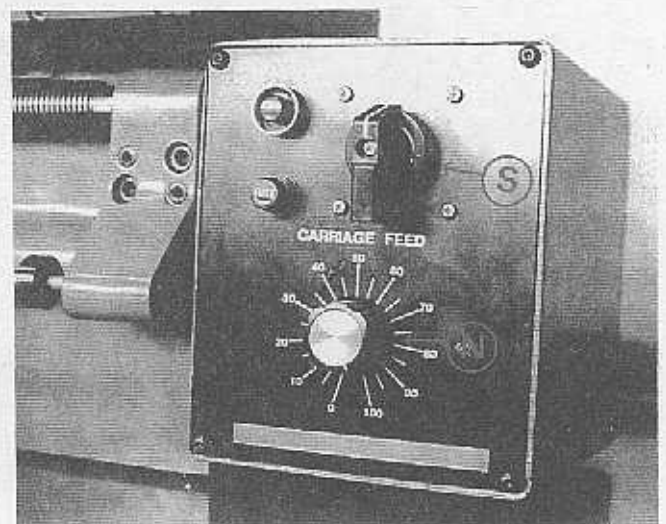


Figure 23 - Power Feed Unit



## W.) TAILSTOCK

The tailstock is mounted on preloaded ball bearings and can support any load to the spindle. It is provided with a fine "feed" for accurate work. The spindle of the tailstock is graduated in eighths of an inch, and 1 mm and has a travel of  $3 \frac{3}{4}$ " (92.25mm). The handwheel is dual dial English and Metric. Graduations are 0.001" (0.02mm). It is built for the operator's convenience of operation just turn the dial ring "D" (Figure 25) to the required location. It is unnecessary to tighten the dial rings. They are spring loaded, so a lock screw is not needed. Sliding cover cage exposes only the dial in use.

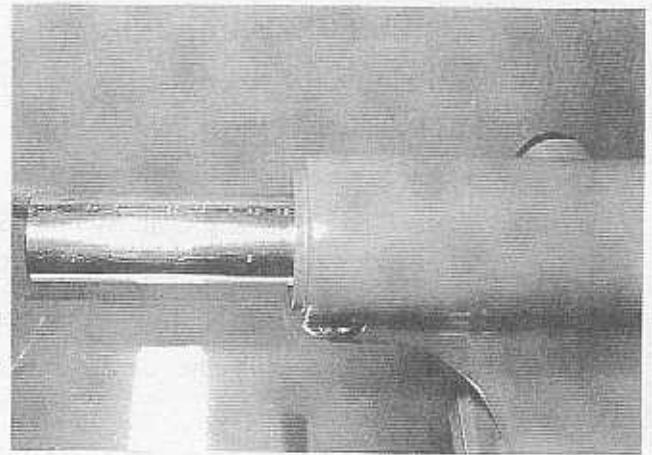


Figure 24 - Tailstock Spindle Travel

## X.) TAILSTOCK SPINDLE LOCK

The tailstock spindle lock holds the spindle securely in any travel position. Move lever "L" (Figure 25) toward the headstock lock position and backward to the released position.

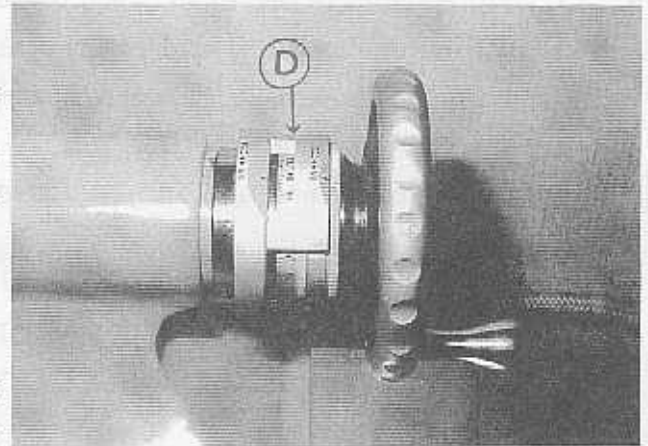


Figure 25 - Handwheel Dial Ring

## Y.) TAILSTOCK BODY LOCK

The tailstock can be clamped in any position along the bed way by operating Lever "M" (Figure 26). The Lever "M" should be adjusted to a clamp position between the two stop pins "A" and "B". When tailstock is fully clamped, lever "M" should not contact stop pin "A".

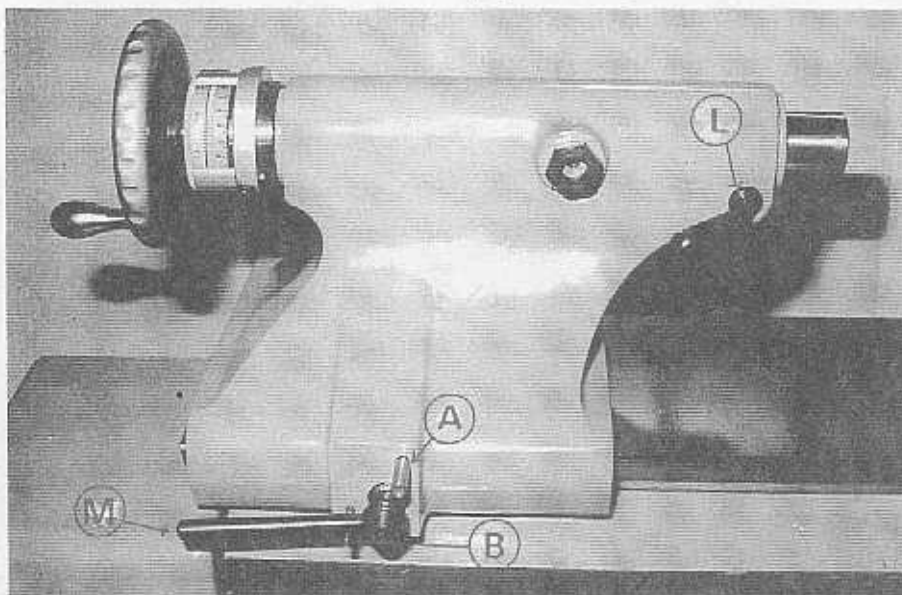


Figure 26 - Tailstock Spindle and Body Lock

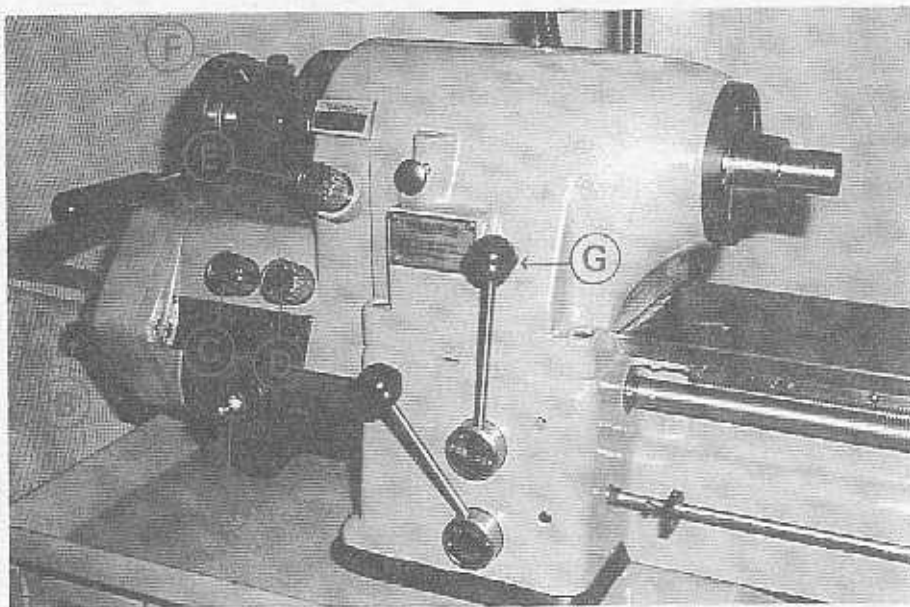


Figure 1 - Headstock and Gearbox

## THREAD CUTTING

**CAUTION : Do not run spindle in reverse when threading.**

The CYCLEMATIC CTL-618EM is designed for rapid and accurate thread cutting. The quick-change gearbox permits instant selection of 36 different English and metric threads. Threads can be cut to a shoulder without running into the shoulder since the automatic stop will limit carriage travel at a predetermined point in either direction. Before starting to cut a thread, select the proper cutting speed for the size of thread to be cut and to give the best finish for the particular material being used. Maximum recommended threading speed is 1000 RPM.

Set the quick-change gearbox for desired pitch. To make a selection on the gearbox thread chart, pull the spring-pressured knob "A", Figure 1, out as far as it will go and lower it until it will move sideways to the desired notch directly under the thread required. Raise the handle and let plunger drop into hole. If tumbler handle will not raise for enough to position plunger into hole, loosen knob "S", open gear box door and rotate gear "T", Figure 4, until gears mesh and handle raises, permitting plunger to seat.

**DO NOT SHIFT GEARS OR OPEN GEARBOX DOOR WHILE MACHINE IS RUNNING.**

Set three-change knob "C", Figure 1, for number corresponding to left side of gearbox thread chart. Set knob "C" so desired number is in bottom position in line with arrow. If the sliding gear cluster does not engage the other gears in gearbox properly to bring the desired number on three-change knob "C" in line with arrow, loosen knob "B", open gearbox door and rotate gear "T", Figure 4, until gear mesh.

Set English /Metric knob "D", Figure 1, so thread system to be cut reads at top of knob, If the sliding gear does not engage properly to bring desired system to read at top, loosen knob "B", open gearbox door and rotate gear "T", Figure 4, until gears mesh and knob is felt to engage detent.

Engage gearbox by turning knob "E", Figure 1, counterclockwise in the direction of arrow marked "THREAD". When turning knob "E", the teeth of the sliding gear within the gearbox may not mesh with the headstock spindle gear teeth. If this is the case, turn headstock spindle with handwheel "F" while turning knob "E" to left until definite click is heard.

Set compound slide at  $61^\circ$  and position cutting tool in compound slide tool post. Position carriage with handwheel so threading tool is in the center of the part to be threaded.

Carriage control lever "G", Figure 1, when moved to the left, will cause carriage to move to the left. When the carriage control lever is moved to the right, the carriage will move to the right. Carriage travel can be stopped at any time by placing control lever "G" in center position.

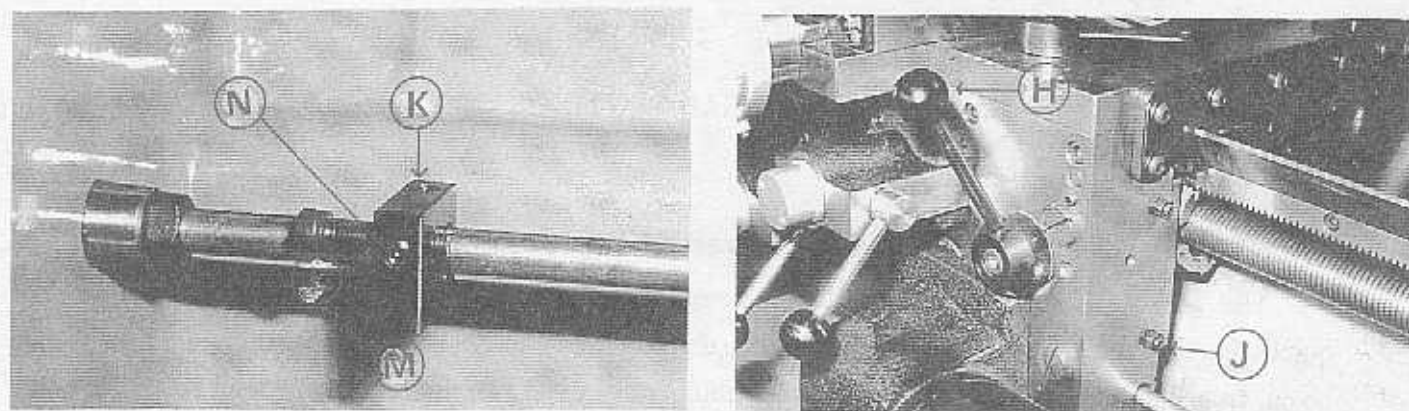


Figure 2 - Thread Length Control

**NOTE : Carriage power feed unit is not used threading operation.**

Place lever "G" in center position and engage lead screw nut "J", Figure 2, by moving ball handled lever "H" clockwise. Set two carriage stops "M" approximately  $1/2$ " from both ends of carriage. Loosen screw "K" to make area location of stops. Loosen lock screw "N" and turn stop screw "L" to make fine adjustment. With threading tool away from work toward operator, make a trial run with carriage. Pick up the exact relation between the tool and the shoulder or end of the thread by using tool post slide. Run carriage to right, checking stop. Make adjustments so tool will clear end of work by  $1/4$ ".



**CAUTION : Lock carriage stops securely before starting to cut the threads. Do not release carriage nut "J" until threading operation is completed.**

With carriage at rest and quick-acting handle "P" Figure 3, forward in cutting position, feed the desired amount for each threading pass using cross slide handwheel "R".

Move lever "G", Figure 1, to the left and carriage will travel until it contacts stop at headstock end of machine. The headstock spindle will continue to run. Carriage stops cause only the gearbox, lead98 screw and carriage to stop.

After each pass, withdraw threading tool from work with quick-acting handle "P", Figure 3, and return carriage to starting position by moving carriage control lever "G", Figure 1, to the right.

LEFT- HAND THREADS can be cut the same as right - hand with the spindle running "FORWA-RD" except that cutting pass is made from the headstock toward the tailstock. Carriage control stops are used for left-hand threads as well as right -hand threads.

## **OUTSIDE CHANGE GEARS**

The outside change gears are used to cut threads not provided in the quick-change gearbox. A set of five gears and a bracket are supplied as standard equipment with each machine. These gears, when set up to the gear chart, Page 8 will cut 10 threads per inch or 0.25 mm pitch according to set up. Three of the gears are shipped on the bracket and the other two are in place on the shafts as shown at "U" and "W", Figure 5.

### **BEFORE SETTING UP CHANGE GEARS, PLACE KNOB "A", FIGURE 1, IN THE "OUT" POSITION**

Fastened to the tumbler handle bracket within the gear box is a round safety bar "X", Figure 5, that extends out through a slot in the gearbox plate. This bar is to prevent applying change gears outside the gearbox until the tumbler handle is placed in the "OUT" position.

Additional gears are available to cut other threads which are not available through gearbox.

Lubricate bushings and shafts on change gear bracket with spindle oil each time a setup is made. If long run threading is involved, lubricate daily.

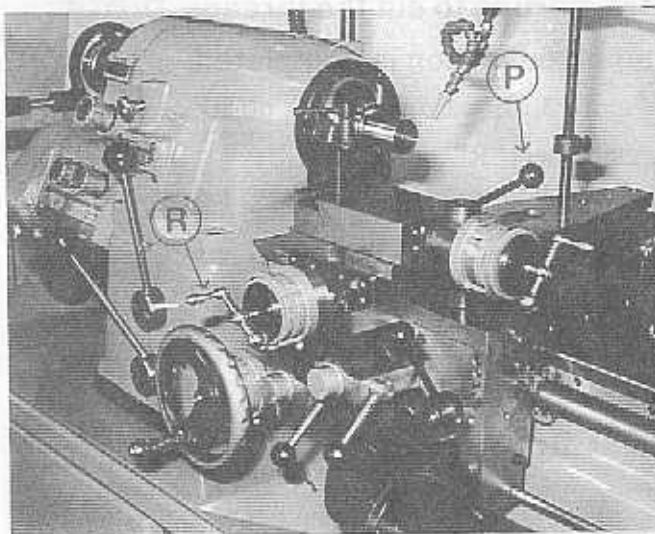


Figure 3 - Carriage and Compound Slide

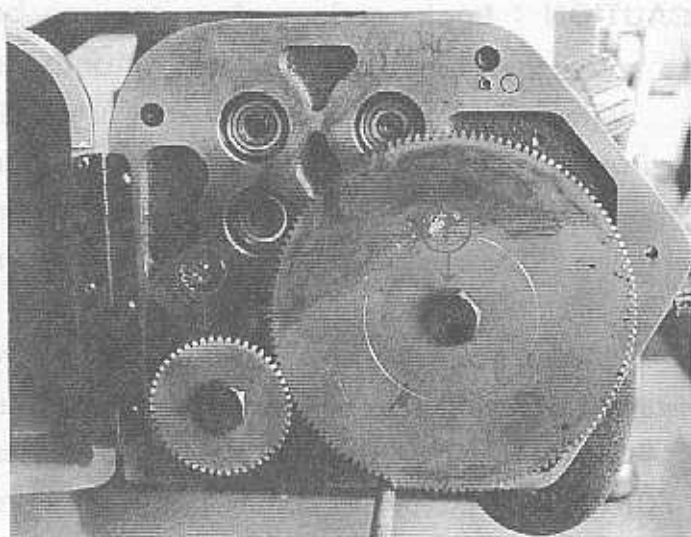


Figure 4 - Threading Gearbox

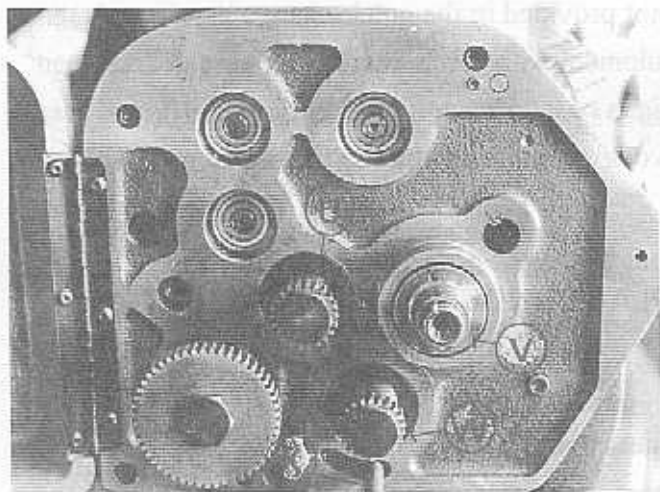


Figure 5 - Threading Gearbox

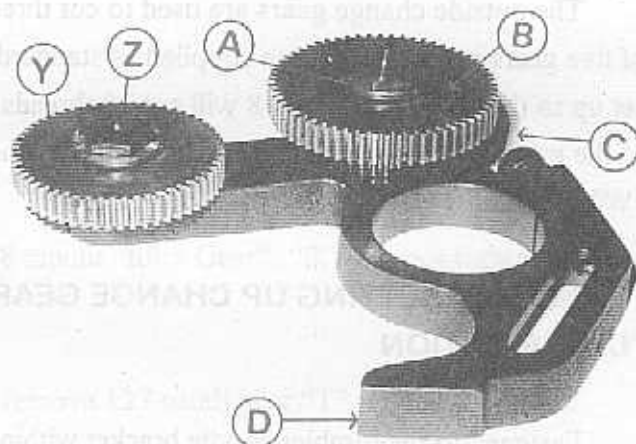


Figure 6 - Change gear Bracket

### English Threads Using Outside Change Gear

1. Turn disconnect switch "OFF".
2. On English side of change gear bracket "D", Figure 6, mount "First Gear on stud" "C" with spacer between gears. Do not tighten bolt "A" fully.
3. Mount "Idler Gear" "Y" but do not mesh with "First Gear on Stud" "C", or tighten bolt "Z" fully.
4. Loosen knob "S", Figure 1, open gearbox door and remove 50 tooth gear "S", Figure 4, and 127 tooth gear "T". Do not misplace key under 50 tooth gear.

5. If thread chart specifies number of teeth in "First Gear" to be other than 22 teeth, remove gear "U" Figure 5, and replace with specified gear.
6. Remove tumbler gear "W".
7. Mount Change gear bracket assembly, Figure 6, on pivot post "V", Figure 5. Do not tighten bracket bolt "H", Figure 7, fully.
8. Make certain key is in place and mount "Screw Gear" "J", Figure 7. Replace bolts "K" and "M".
9. Adjust "Second Gear on Stud" "G", Figure 7, with 0.003-0.004 backlash between it and "Screw Gear" "J". Use plastic shim stock to help determine backlash. Tighten bolt "F".
10. Adjust "Idler Gear" "E" with 0.003-0.004 backlash between it and "First Gear on Stud" (behind "Second Gear on Stud" in picture). Tighten bolt "N".
11. Pivot bracket to obtain 0.003-0.004 backlash between "First Gear" "L" and "Idler Gear" "E". Tighten bracket bolt "H".
12. Make certain all gears are properly meshed and all bolts tightened.
13. Close gearbox door, tighten knob "B", Figure 1, and turn three-change knob "C" to position specified on chart.
14. Turn english/Metric knob "D" to "English".
15. Turn Feed /Thread knob "E" to "Thread".
16. Follow same procedures for setting carriage stops lead screw nut and compound slide as when cutting threads from the gearbox. Use of carriage control level "G", Figure 1, and quick-acting handle "P", Figure 3, will also be the same as when cutting threads from the gearbox.

**NOTE :** (a) 50 tooth gear "S", Figure 4, and 127 tooth gear "T" must be remounted (without bracket) to obtain metric thread pitches through gearbox.

(b) When disassembling setup, remount 22 tooth gears "U" and "W", Figure 5.



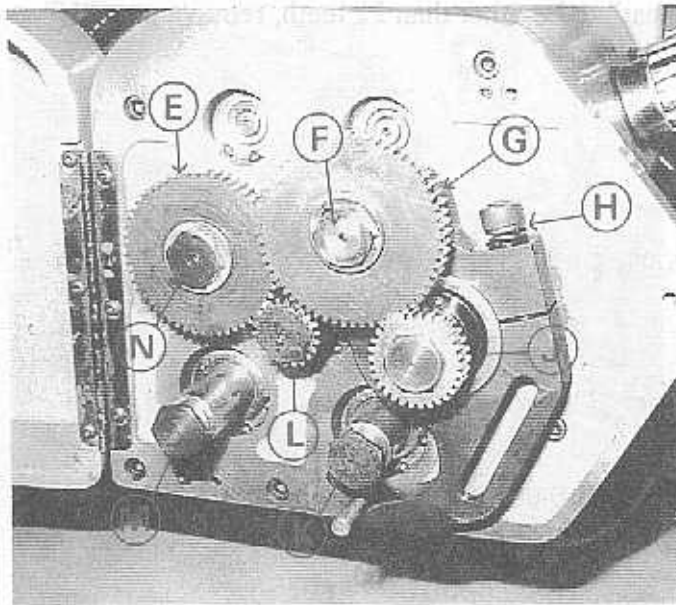


Figure 7 - Mounting Change Gear Bracket

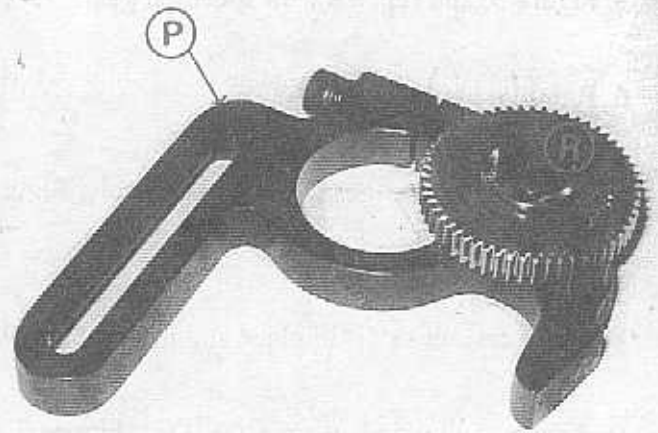


Figure 8 - Change Gear Bracket

### Metric Threads Using Outside Change Gears

1. Turn disconnect switch "OFF"
2. On metric side of change gear bracket "P" Figure 8 mount "Idler Gear" "R". Do not tighten bolt "S" fully.
3. Loosen knob "B", Figure 1, open gearbox door and remove 127 tooth gear "T", Figure 4.
4. Mount change gear bracket assembly, Figure 8, on pivot post "V", Figure 9, Do not tighten bracket bolt "U" fully.
5. Remove "First Gear" "U", Figure 5, and replace bolt. Do not misplace key.
6. Mount "First Gear on Screw" "T", Figure 9.
7. If thread chart specifies number of teeth in "Tumbler Gear" to be other than 22 teeth, remove gear "Y" and replace with specified gear.
8. Adjust "Idler Gear" "X" with 0.003-0.004 backlash between it and "First Gear on Screw" "T". Use plastic shim stock to help determine backlash. Tighten bolt "W".
9. Pivot bracket to obtain 0.003-0.004 backlash between "Idler gear" "X" and "Tumbler Gear" "Y". Tighten bracket bolt "J".

10. Make certain key is in place and remount 127 tooth gear "A". Figure 10. Tighten bolt "Z".
11. Make certain all gears are properly meshed and all bolts tightened.
12. Close gearbox door, tighten knob "B" Figure 1, and turn three-change knob "C" to position specified on chart.
13. Turn English/Metric knob "D" to "Metric".
14. Turn Feed/Thread knob "E" to "Thread".
15. Follow same procedures for setting carriage stop, lead screw nut and compound slide as when cutting threads from the gearbox. Use of carriage control lever "G", Figure 1, and quick-acting handle "P", Figure 3, will also be the same as when cutting threads from the gearbox.
16. Observe same operational cautions as when cutting threads from gearbox.

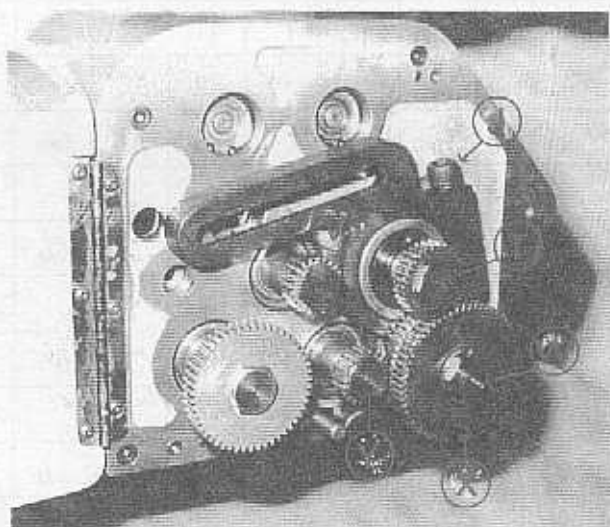


Figure 9 - Mounting Change Gear Bracket

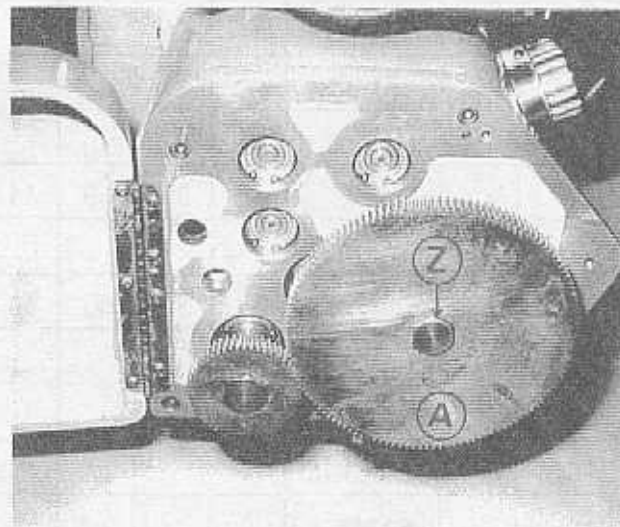
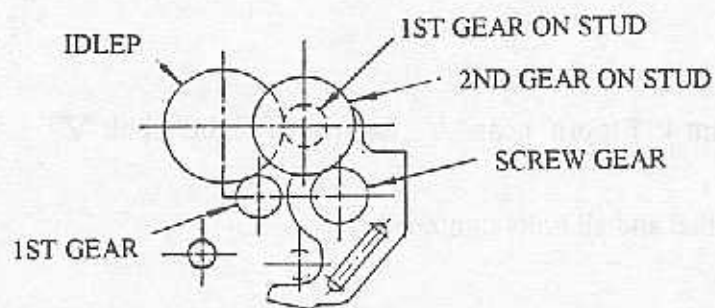


Figure 10 - Mounting 127 Tooth Gear

- NOTE :** (a) 50 tooth gear "S", Figure 4, and 127 tooth gear "T" must be remounted without bracket to obtain metric thread pitches through gearbox.
- (b) When disassembling setup, remount 22 tooth "Tumbler Gear" "W", Figure 5, and 22 tooth "First Gear" "U".

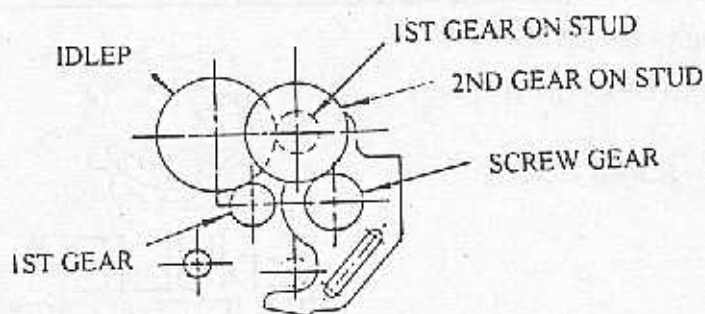


# ENGLISH THREADS

THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER	THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER
10	2	22*	22*	60*	30*	55*	33	1	30*	33	22*	66	44
11		GEARBOX					34	2	40	34	30*	60*	44
11.5		GEARBOX					35		GEARBOX				
12		GEARBOX					36		GEARBOX				
13		GEARBOX					37	1	30*	37	22*	66	44
14		GEARBOX					38	2	40	38	30*	60*	44
15		GEARBOX					39	1	30*	39	22*	66	44
16		GEARBOX					40		GEARBOX				
17	1	40	34	30*	60*	44	41	1	30*	41	22*	66	44
17.5		GEARBOX					42	2	40	42	30*	60*	44
18		GEARBOX					43	1	30*	43	22*	66	44
19	1	40	38	30*	60*	44	44		GEARBOX				
20		GEARBOX					45	1	30*	45	22*	66	44
21	1	40	42	30*	60*	44	46		GEARBOX				
22		GEARBOX					47	1	30*	47	22*	66	44
23		GEARBOX					48		GEARBOX				
24		GEARBOX					49	1	30*	49	22*	66	44
25		GEARBOX					50		GEARBOX				
26		GEARBOX					51	1	30*	51	22*	66	44
27		GEARBOX					52		GEARBOX				
28		GEARBOX					53	1	30*	53	22*	66	44
29	1	30*	29	22*	66	44	54		GEARBOX				
30		GEARBOX					55	1	30*	55*	22*	66	44
31	1	30*	31	22*	66	44	56		GEARBOX				
32		GEARBOX					57	1	30*	57	22*	66	44

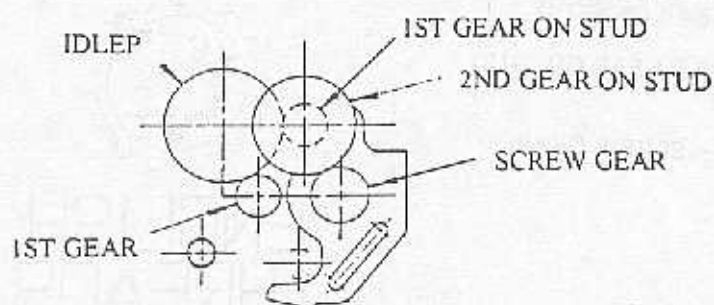
**Gear\*** means "standard equipment" which supplied with machine.





# ENGLISH THREADS

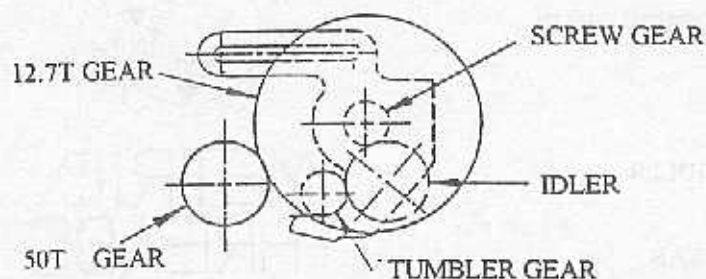
THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER	THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER
58	2	30*	29	22*	66	44	83	2	30*	33	22*	83	55*
59	1	30*	59	22*	66	44	84	3	40	42	30*	60*	44
60		GEARBOX					85	2	24	34	22*	66	44
61	1	30*	61	22*	66	44	86	2	30*	43	22*	66	44
62	2	30*	31	22*	66	44	87	3	40	29	22*	66	44
63	2	40	42	22*	66	44	88	2	30*	44	22*	66	44
64		GEARBOX					89	3	40	22	22*	89	44
65	2	48	52	22*	66	30	90	2	30*	45	22*	66	44
66	2	30*	33	22*	66	44	91	3	40	26	22*	77	44
67	2	30*	33	22*	67	44	92	2	30*	46	22*	66	44
68	3	40	34	30*	60*	44	93	3	40	31	22*	66	44
69	2	40	46	22*	66	44	94	2	30*	47	22*	66	44
70		GEARBOX					95	2	24	38	22*	66	44
71	2	30*	33	22*	71	44	96	2	30*	48	22*	66	44
72		GEARBOX					97	3	40	22*	22*	97	55*
73	2	30*	33	22*	73	44	98	2	30*	49	22*	66	44
74	2	30*	37	22*	66	44	99	3	40	33	22*	66	44
75	2	40	50	22*	66	44	100		GEARBOX				
76	3	40	38	30*	60*	44	102	2	30*	51	22*	66	44
77	2	30*	33	22*	77	44	104	2	30*	52	22*	66	44
78	2	30*	39	22*	66	44	105	2	24	42	22*	66	44
79	3	40	22*	22*	79	44	106	2	30	53	22*	66	44
80		GEARBOX					108		GEARBOX				
81	3	40	27	22*	66	44	110	2	30*	55*	22*	66	44
82	2	30*	41	22*	66	44	112	2	30*	56	22*	66	40



# ENGLISH THREADS

THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER	THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	IDLER
114	2	30°	57	22°	66	44	160	3	24	32	22°	66	44
115	2	24	46	22°	66	44	164	3	30°	41	22°	66	44
116	3	30°	29	22°	66	44	166	3	30°	33	22°	83	55°
118	2	30°	59	22°	66	44	170	3	24	34	22°	66	44
120	2	30°	60°	22°	66	40	172	3	30°	43	22°	66	44
122	2	30°	61	22°	66	44	176	3	30°	44	22°	66	44
124	3	30°	31	22°	66	44	180	3	30°	45	22°	66	44
125	2	24	50	22°	66	44	184	3	30°	46	22°	66	44
126	3	40	42	22°	66	44	188	3	30°	47	22°	66	44
128	3	30°	32	22°	66	44	190	3	24	38	22°	66	44
130	3	48	52	22°	66	30°	192	3	30°	48	22°	66	44
132	3	30°	33	22°	66	44	196	3	30°	49	22°	66	44
134	3	30°	33	22°	67	44	200	3	24	40	22°	66	44
135	3	40	45	22°	66	44	204	3	30°	51	22°	66	44
136	3	30°	34	22°	66	44	208	3	30°	52	22°	66	44
138	3	40	46	22°	66	44	210	3	24	42	22°	66	44
140	3	30°	35	22°	66	44	212	3	30°	53	22°	66	44
142	3	30°	33	22°	71	44	220	3	30°	55°	22°	66	44
144	3	40	48	22°	66	44	224	3	30°	56	22°	66	40
145	3	24	29	22°	66	44	228	3	30°	57	22°	66	44
146	3	30°	33	22°	73	44	230	3	24	46	22°	66	44
148	3	30°	37	22°	66	44	236	3	30°	59	22°	66	44
150	3	40	50	22°	66	44	240	3	30°	60°	22°	66	40
154	3	30°	33	22°	77	44	244	3	30°	61	22°	66	44
156	3	30°	39	22°	66	44	250	3	24	50	22°	66	44

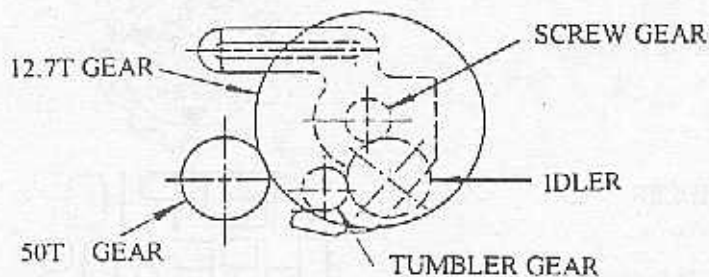
※ 50 TEETH AND 127 TEETH GEARS MUST BE REMOUNTED (WITHOUT BRACKET) TO  
OBTAIN METRIC THREAD PITCHES THROUGH THE GEARBOX.



# METRIC THREADS

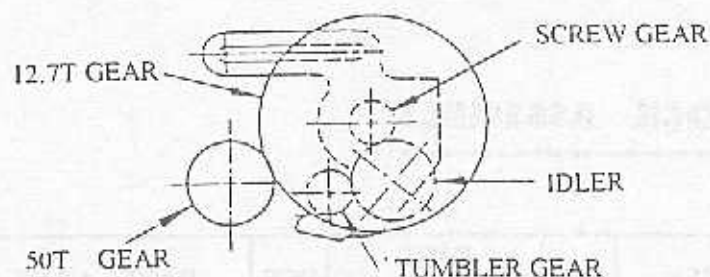
PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	IDLER	PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	IDLER
.10	3	22°	55°	44	.325		Gearbox		
.11	3	22°	50	45	.33	3	33	25	50
.12	3	24	50	44	.34	2	34	50	40
.13	3	26	50	44	.35		Gearbox		
.14	3	28	50	40	.36	2	36	50	33
.15	3	30°	50	42	.37	3	37	25	44
.16	3	32	50	40	.375		Gearbox		
.17	3	34	50	40	.38	2	38	50	33
.18	3	36	50	33	.39	3	39	25	44
.19	3	38	50	33	.40		Gearbox		
.20	2	22°	55°	44	.41	3	41	25	44
.21	3	21	25	55°	.42	2	21	25	55°
.22	2	22°	50	45	.425	3	51	30°	33
.23	3	23	25	55°	.43	3	43	25	44
.24	2	24	50	44	.4375		Gearbox		
.25	3	22°	22°	55°	.44	3	44	25	44
.26	2	26	50	44	.44	1	22°	50	45
.27	3	27	25	50	.45		Gearbox		
.275		Gearbox			.46	2	23	25	55°
.28	2	28	50	40	.47	3	47	25	44
.2875		Gearbox			.475	3	57	30°	33
.29	3	29	25	50	.48	1	24	50	44
.30		Gearbox			.49	3	49	25	44
.31	3	31	25	50	.50		Gearbox		
.32	2	32	50	40	.51	3	51	25	40





# METRIC THREADS

PITCH IN MM	NOB	SCREW GEAR	TUMBLER GEAR	IDLER	PITCH IN MM	NOB	SCREW GEAR	TUMBLER GEAR	IDLER
.52	1	26	50	44	.76	1	38	50	33
.53	3	53	25	40	.78	2	39	25	44
.54	2	27	25	50	.80		Gearbox		
.55		Gearbox			.82	2	41	25	44
.56	1	28	50	40	.84	1	21	25	55*
.5625	3	54	24	33	.85	2	51	30*	33
.57	3	57	25	33	.86	2	43	25	44
.575		Gearbox			.875		Gearbox		
.58	2	29	25	50	.88	2	44	25	44
.59	3	59	25	33	.90		Gearbox		
.60		Gearbox			.92	1	23	25	55*
.61	3	61	25	33	.94	2	47	25	44
.62	2	31	25	50	.95	2	57	30*	33
.625		Gearbox			.98	2	49	25	44
.63	3	63	25	33	1.0		Gearbox		
.64	1	32	50	40	1.02	2	51	25	40
.65		Gearbox			1.06	2	53	25	40
.66	2	33	25	50	1.08	1	27	25	50
.675		Gearbox			1.1		Gearbox		
.68	1	34	50	40	1.125	2	54	24	33
.6875	3	66	24	33	1.14	2	57	25	33
.70		Gearbox			1.15		Gearbox		
.72	1	36	50	33	1.16	1	29	25	50
.74	2	37	25	44	1.18	2	59	25	33
.75		Gearbox			1.2		Gearbox		



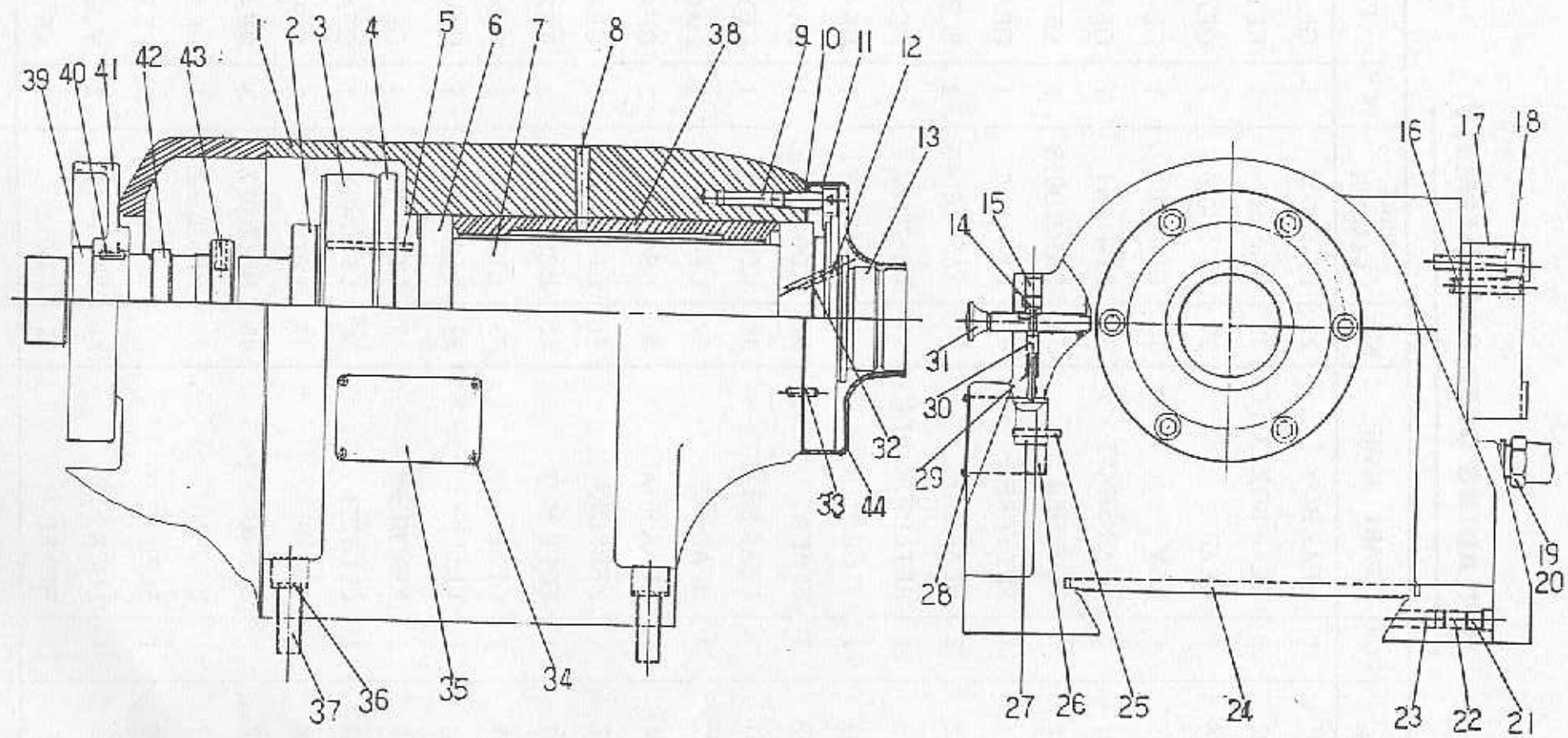
# METRIC THREADS

PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	IDLER	PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	IDLER
1.22	2	61	25	33	2.2	1	55*	25	33
1.24	1	31	25	50	2.25	1	54	24	33
1.25		Gearbox			2.28	1	57	25	33
1.26	2	63	25	33	2.36	1	59	25	33
1.3		Gearbox			2.4	1	60*	25	33
1.32	1	33	25	50	2.44	1	61	25	33
1.35		Gearbox			2.5		Gearbox		
1.375	2	66	24	33	2.52	1	63	25	33
1.4		Gearbox			2.6	1	65	25	33
1.48	1	37	25	44	2.7		Gearbox		
1.5		Gearbox			2.75	1	66	24	33
1.56	1	39	25	44	3.0	1	66	22*	33
1.6		Gearbox							
1.64	1	41	25	44					
1.7	1	51	30*	33					
1.72	1	43	25	44					
1.75		Gearbox							
1.76	1	44	25	44					
1.8		Gearbox							
1.88	1	47	25	44					
1.9	1	57	30*	33					
1.96	1	49	25	44					
2.0		Gearbox							
2.04	1	51	25	40					
2.12	1	53	25	40					

## **HEADSTOCK ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-01-101	1	HEADSTOCK	26	L-1027	1	INSULATOR
2	LB-01-102	1	SPINDLE NUT	27		1	MICRO SWITCH
3	1626V604	1	BELT	28	L-1029	1	SEAL
4	LB-01-102	1	SPINDLE PULLEY	29	L-1031	1	SPRING
5	KP02N42	1	KEY	30	L-1030	1	PLUNGER
6	BA7013	1pr	prBEARING	31	L-1032	1	LOCK PIN
7	LT-01-103	1	BEARING SPACER	32	L-1033	1	KEY SCREW
8	PT5#50	1	TAPER PIN	33	PD02B012B	1	PIN
9	LB-01-113	6	SCREW	34	SN5/32B05B	1	SCREW
10	LB-01-107	1	GASKET	35	L-1036	4	NAME PLATE
11	LB-01-108	1	FRONT CAP	36	L-1037	4	LOCKWASHER
12	SL04B007B	1	LOCK SCREW	37	SA06B108B	1	SCREW
13	LT-01-104	1	SPINDLE	38	LT-01-105	1	BEARING SPACER
14	L-1014	1	LOCK SCREW	39	LT-01-101	1	NUT
15	SL06B08B	1	LOCK SCREW	40	KD02B14	1	KEY
16	PD05B112B	1	PIN	41	LT-01-106	1	HANDWHELL
17	L-1017	1	COLLET CLOSER	42	LT-01-107	1	DRIVER GEAR
			BRACKET	43	PS04B010B	1	SPRING PIN
18	SA05B108B	3	SCREW	43A	P35/32B010B	1	SPRING PIN
19			1/2" CONNECTOR	44	LB-01-003	1	COOLANT SHEILD
	EC-08B-15A	1					
20			90° AND CONDUIT				
21	SL08B006B	1	LOCK SCREW				
22	SL08B012B	1	LOCKSCREW				
23	L-1023	1	LOCKING PLUG				
24	LT-01-114	1	SEAL				
25	SC5/32B16B	2	SCREW				





## **THREADING GEAR BOX ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-11-001	1	GEAR BOX	27	LT-11-008	1	GEAR SHAFT
2	LT-11-002	1	GEAR BOX COVER	28	KD0465	1	KEY
3	LT-01-206	1	GEAR	29	LT-11-009	1	GEAR
4	KD04015	1	KEY	30	LT-11-010	1	GEAR
5	LT-01-207	1	GEAR SHAFT	31	LT-11-011	1	GEAR
6	LT-01-208	1	PLUNGER	32	SA5/32B03B	2	SET SCREW
7	SL06010	1	SET SCREW	33	LT-11-012	1	GEAR
8	BB6200ZZ	2	BEARING	34	SA5/32B04B	2	SCREW
9	RCR30	11	RETAINING RING	35	BB6200ZZ	2	BEARING
10	LT-01-209	1	STOP BLOCK	36	LT-11-013	1	GEAR SHAFT
11	SA03B06B	2	SCREW	37	KD04094	1	KEY
12	LT-11-003	1	GEAR SHAFT	38	KD04100	1	KEY
13	BB6200ZZ	2	BEARING	39	LT-11-014	1	E.M.CONVERSION FORK
14	LT-11-004	1	GEAR SHAFT	40	BB61850	2	BEARING
15	BP5202ZZ	1	BEARING	41	LT-11-015	1	GEAR
16	LT-01-213	1	LOCK NUT	42	RCS25	2	RETAINING RING
17	LT-11-005	1	GEAR	43	LT-11-016	1	GEAR
18	KD03045	1	KEY	44	KD0414	1	KEY
19	LT-01-219	1	KEY BUSH	45	LT-11-017	1	GEAR
20	LT-01-218	1	CLUTCH	46	LT-11-018	1	GEAR
21	LT-01-006	1	GEAR	47	PS03014	2	SPRING PIN
22	BP5201ZZ	1	BEARING	48	BB6200ZZ	1	BEARING
23	LT-01-217	1	LOCKNUT	49	BB6203ZZ	1	BEARING
24	LT-11-007	1	SLEEVE	50	RCR40	5	RETAINING RING
25	LT-01-220	1	LOCK NUT	51	LT-11-019	2	SLEEVE
26	BB6200ZZ	2	BEARING	52	KD0325	2	KEY

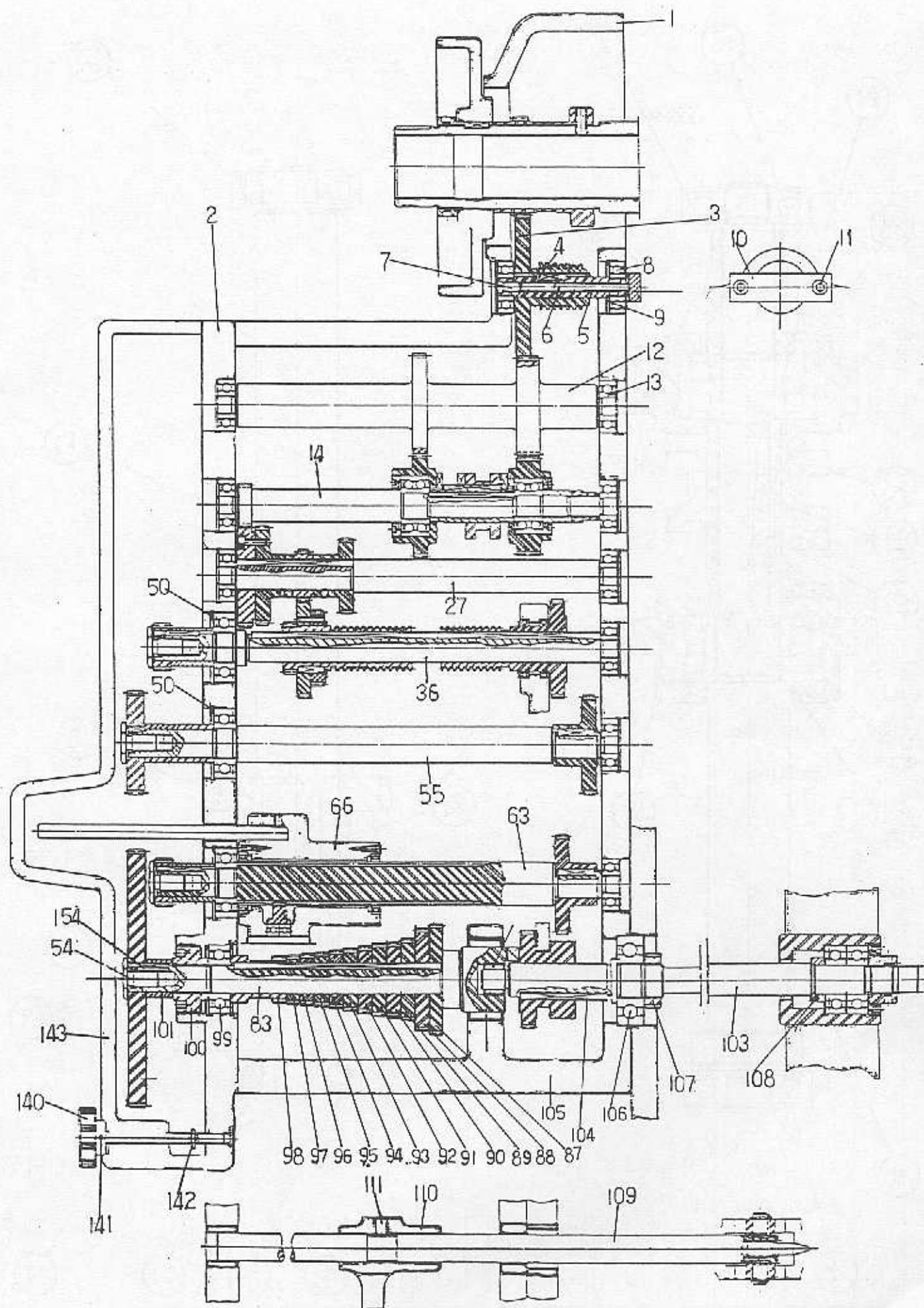
## **THREADING GEAR BOX ASSEMBLY**

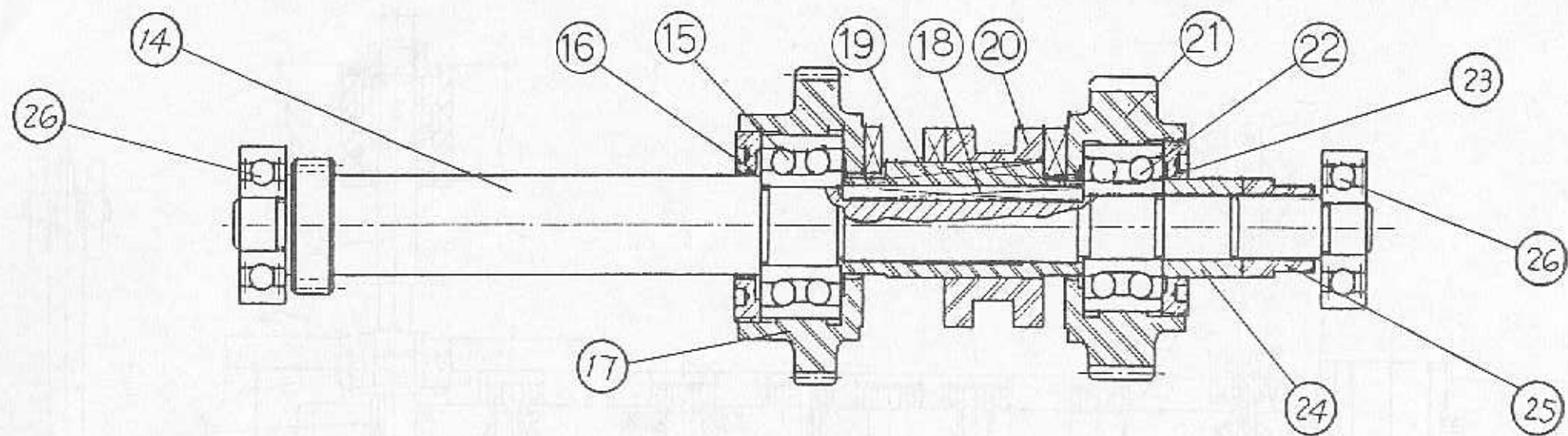
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
53	LT-01-266	2	GEAR	79	LT-01-248	1	LOCK PIN
54	LT-01-267	4	BOLT	80	LT-01-250A	1	HANDLE HEAD
55	LT-11-020	1	GEAR SHAFT	81	LT-01-250B	1	SPRING
56	KD0420	2	KEY	82	BB6203ZZ	1	BEARING
57	LT-11-021	1	GEAR	83	LT-11-031	1	GEAR SHAFT
58	BB6200ZZ	2	BEARING	84	BNTA1212	1	NEEDLE BEARING
59	BB6203ZZ	1	BEARING	85	BNTA3820	1	NEEDLE BEARING
60	LT-11-022	1	SLEEVE	86	KD04116	1	KEY
61	KD03010	1	KEY	87	LT-01-253	1	GEAR
62	LT-11-023	1	GEAR	88	LT-11-032	1	GEAR
63	LT-11-024	1	GEAR SHAFT	89	LT-01-254	1	GEAR
64	LT-11-025	1	GEAR	90	LT-01-255	1	GEAR
65	RCS15	2	RETAINING RING	91	LT-11-033	1	GEAR
66	LT-11-026	1	THREAD CHANGE ARM	92	LT-01-256	1	GEAR
67	BB61805	2	BEARING	93	LT-11-034	1	GEAR
68	SF02B05B	2	CROSS RECESSES SCREW	94	LT-01-257	1	GEAR
69	LT-11-027	1	GEAR	95	LT-01-258	1	GEAR
70	BB608Z	2	BEARING	96	LT-01-259	1	GEAR
71	LT-11-028	1	SHAFT	97	LT-01-260	1	GEAR
72	SL03B04B	2	SET SCREW	98	LT-01-261	1	GEAR
73	LT-11-029	1	STOP ROD	99	BB6203ZZ	1	BEARING
74	LT-11-030	1	SPACE PLATE	100	LT-11-035	1	LOCK NUT
75	SA5/32B04B	2	SCREW	101	LT-11-036	1	SLEEVE
76	PD03B12B	2	DOWEL PIN	102	LT-11-037	1	GEAR
77	LT-01-246	1	SLEEVE	103	LT-11-038	1	SHAFT
78	LT-01-247	1	NUT	104	KD0445	1	KEY



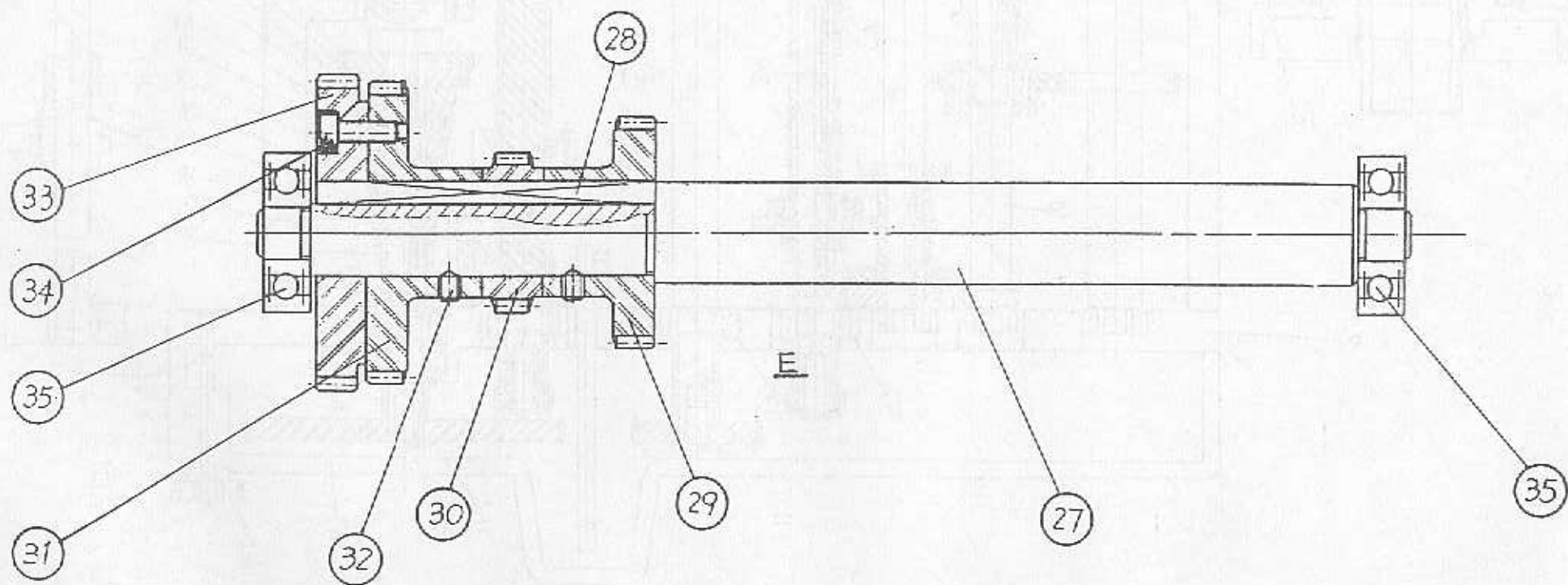
## **THREADING GEAR BOX ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
105	LT-11-039	1	GEAR	129	LT-01-274	1	SPACER
106	BB63042RS	1	BEARING	130	LT-01-275	1	BOLT
107	LT-11-040	1	LOCK NUT	131	LT-01-278	1	SPACER
108	LT-11-041	1	SLEEVE	132	LT-01-279	1	KEY BUSH
109	LT-11-042	1	SHAFT	133	LT-01-280	1	BUSH
110	LT-11-043	1	CLUTCH ARM	134	LT-01-281	1	BOLT
111	SL04B03B	2	SET SCREW	135	LT-01-268	1	GEAR
112	SA05B100B	4	SCREW	136	LT-01-277	1	GEAR
113	LT-01-290	1	TAPER PIN	137	LT-01-272	1	GEAR
114	NH06	1	NUT	138	LT-11-048	1	SETDOOR LINK SET
115	SA04B100B	1	SCREW	139	SN5/32B05B	6	SCREW
116	SA04B103B	4	SCREW	140	LT-11-049	1	LOCK BOLT
117	PD05B16B	2	DOWEL PIN	141	PS02018	1	SPRING PIN
118	LT-11-044	1	BUSH	142	PS02012	1	SPRING PIN
119	LT-11-045	2	BUSH	143	LT-11-050	1	COVER
120	LT-11-046	3	KNOB	144	LT-11-051	1	COVER
120A	LT-11-283	3	GEAR SHAFT	145	LT-11-292	1	COVER
120B	RCS19	3	RETAINING RING	146	SN03B08B	8	SCREW
121	L-2016	3	SPRING	147	LT-01-294	1	INDICATED PLATE
122	LT-11-286	3	PIN	148	LT-11-052	1	INDICATED PLATE
123	SL06B03B	3	SET SCREW	149	LT-01-295	1	INDICATED PLATE
124	SL04B05B	3	SET SCREW	150	LT-01-293	1	WARNING PLATE
125	LT-11-047	1	GEAR BASE	151	LT-11-053	1	INDICATED PLATE
126	SA05B109B	1	SCREW	152	MF1	8	RIVER
127	LT-01-276	2	NUT	153	LB-05-610	1	PLUG
128	LT-0-273	1	KEY BUSH	154	KD0322	1	KEY



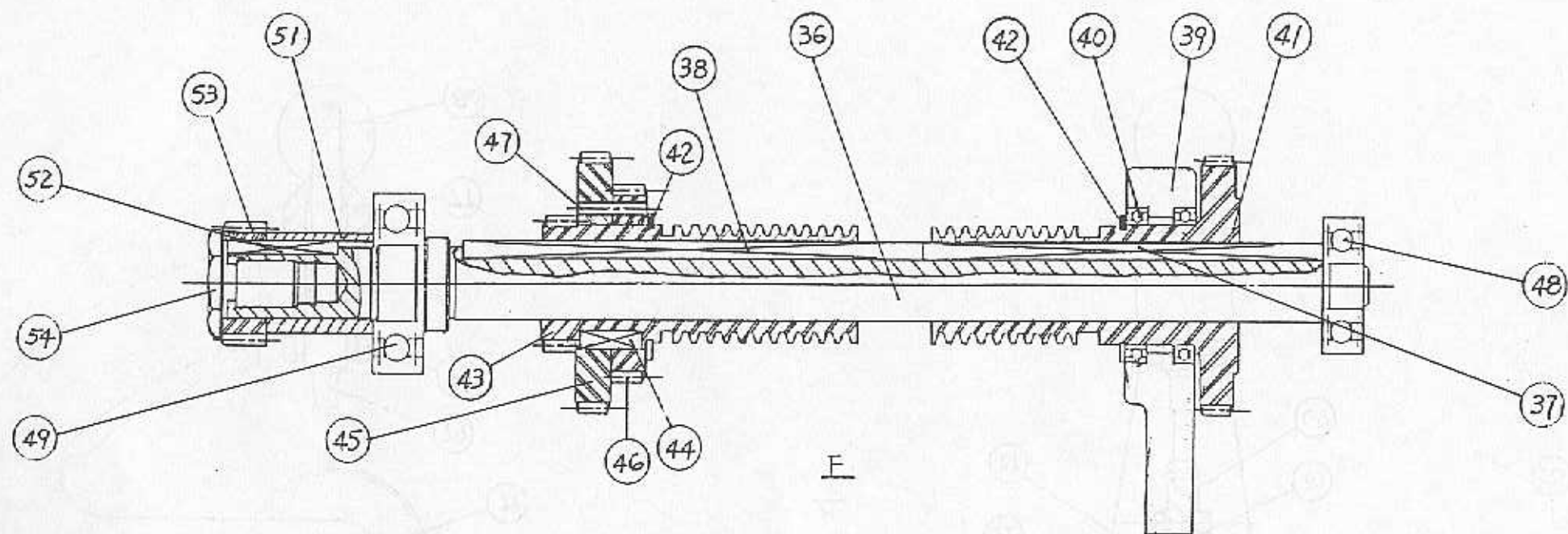


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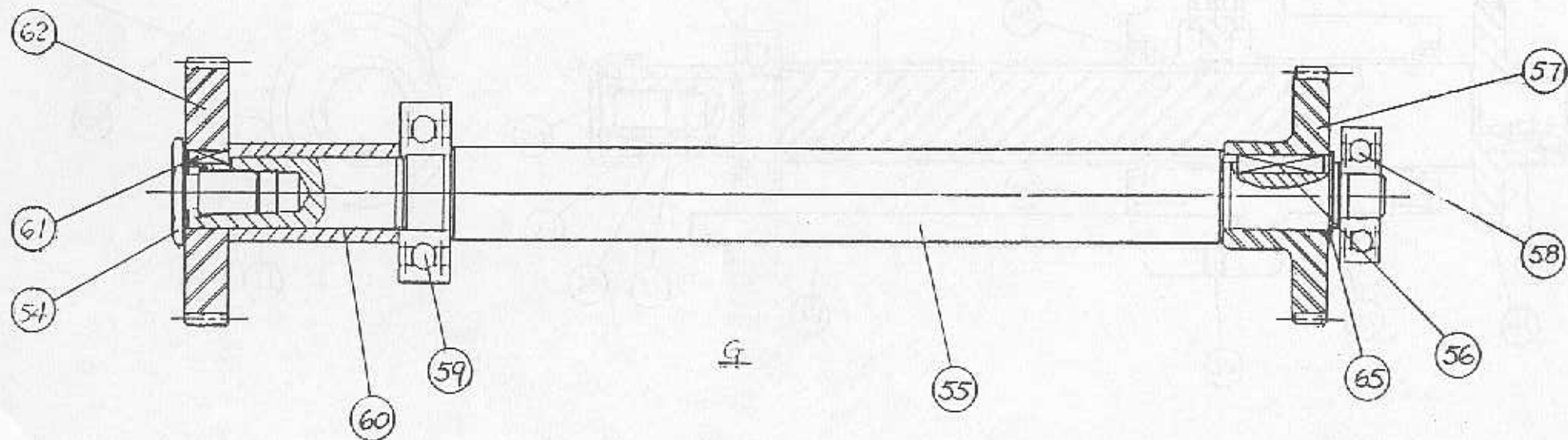


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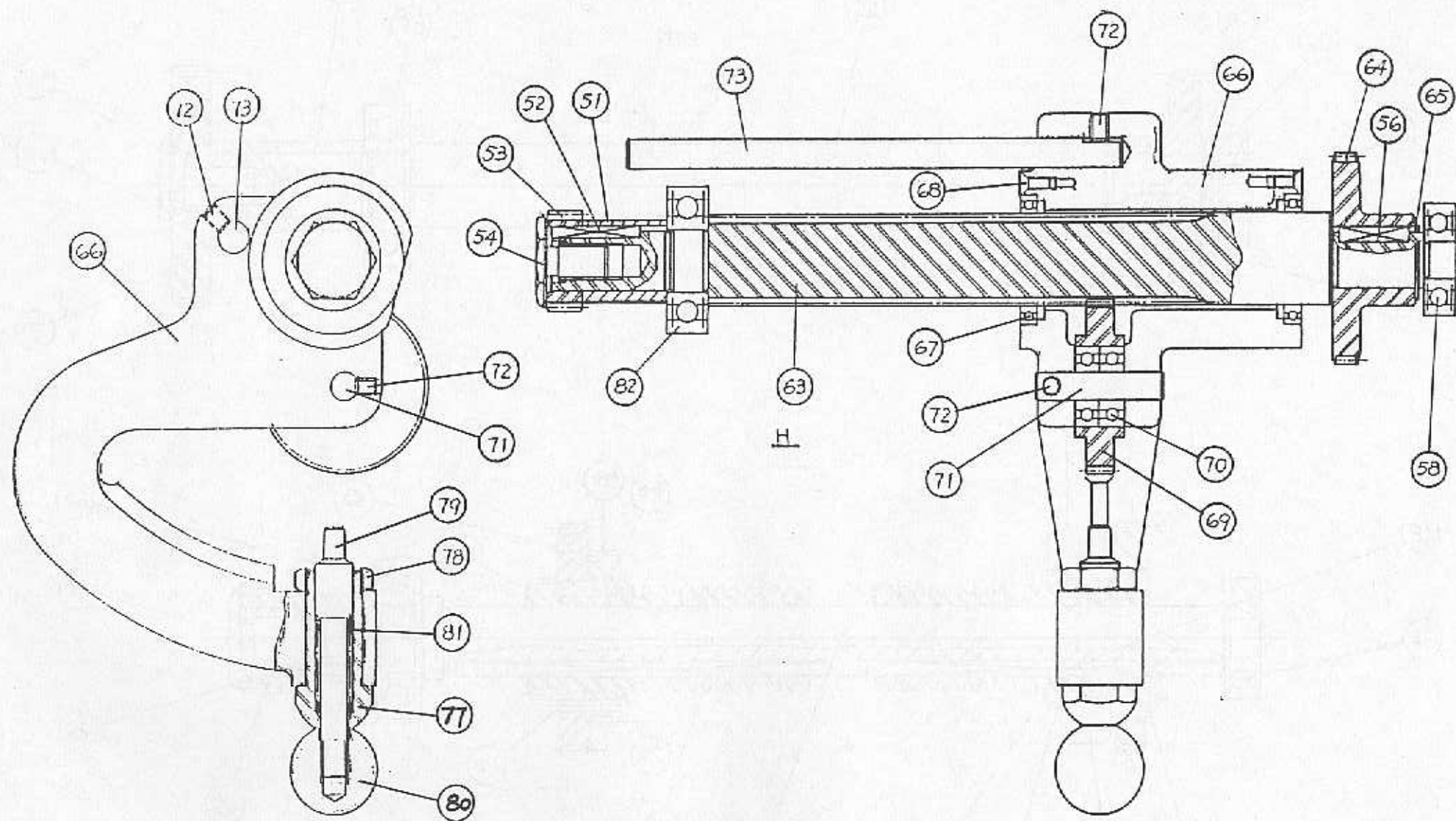


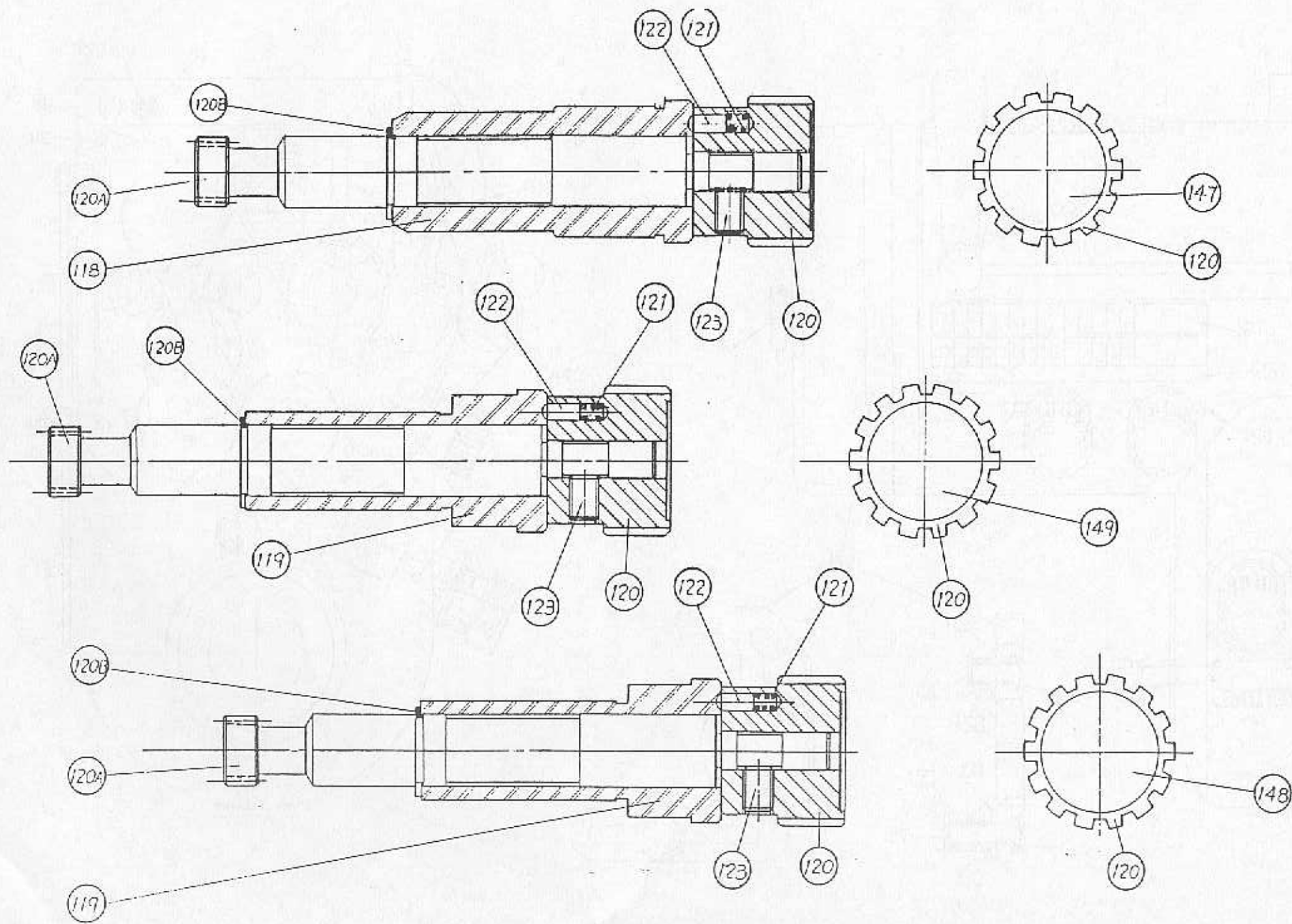


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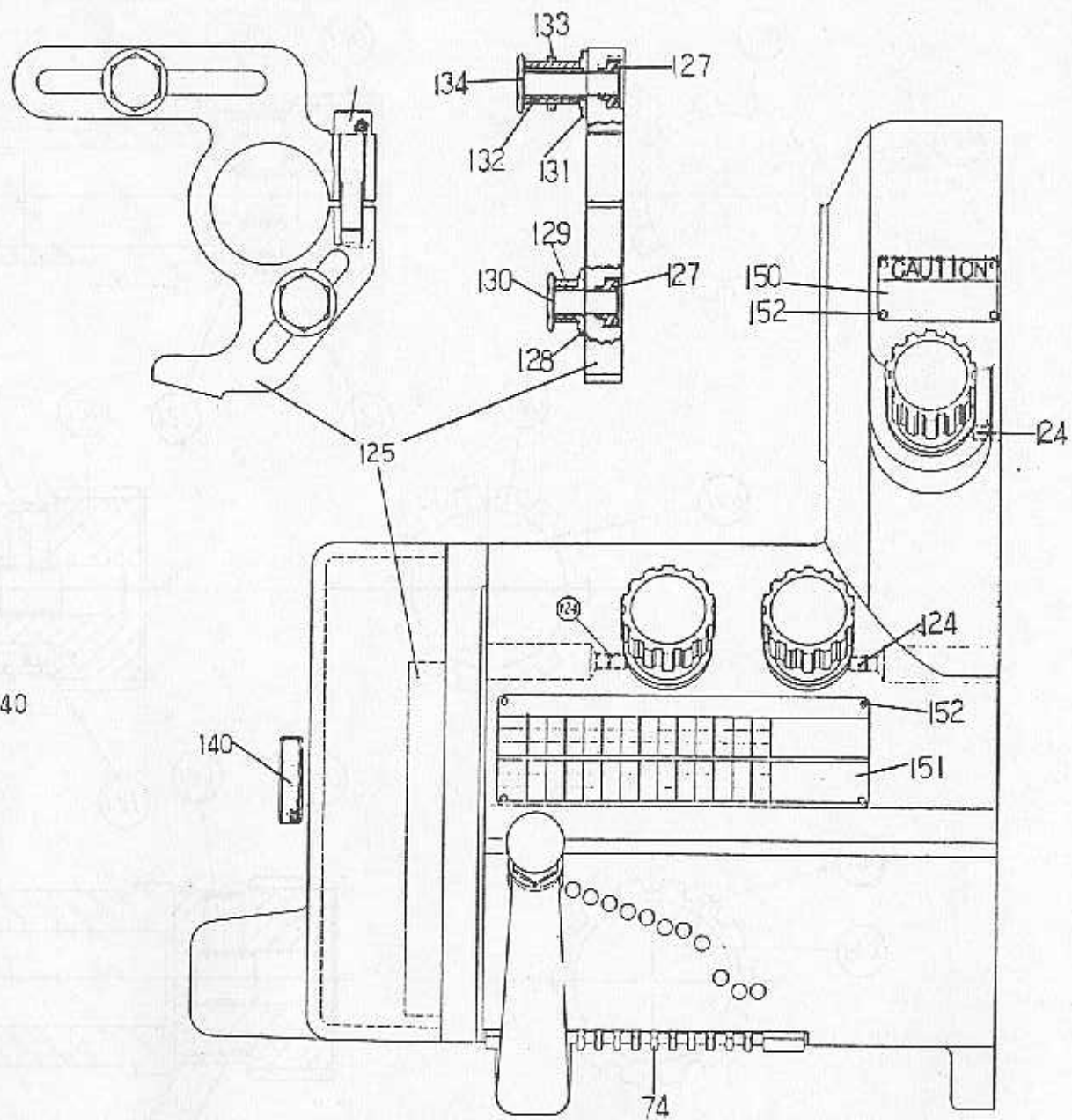
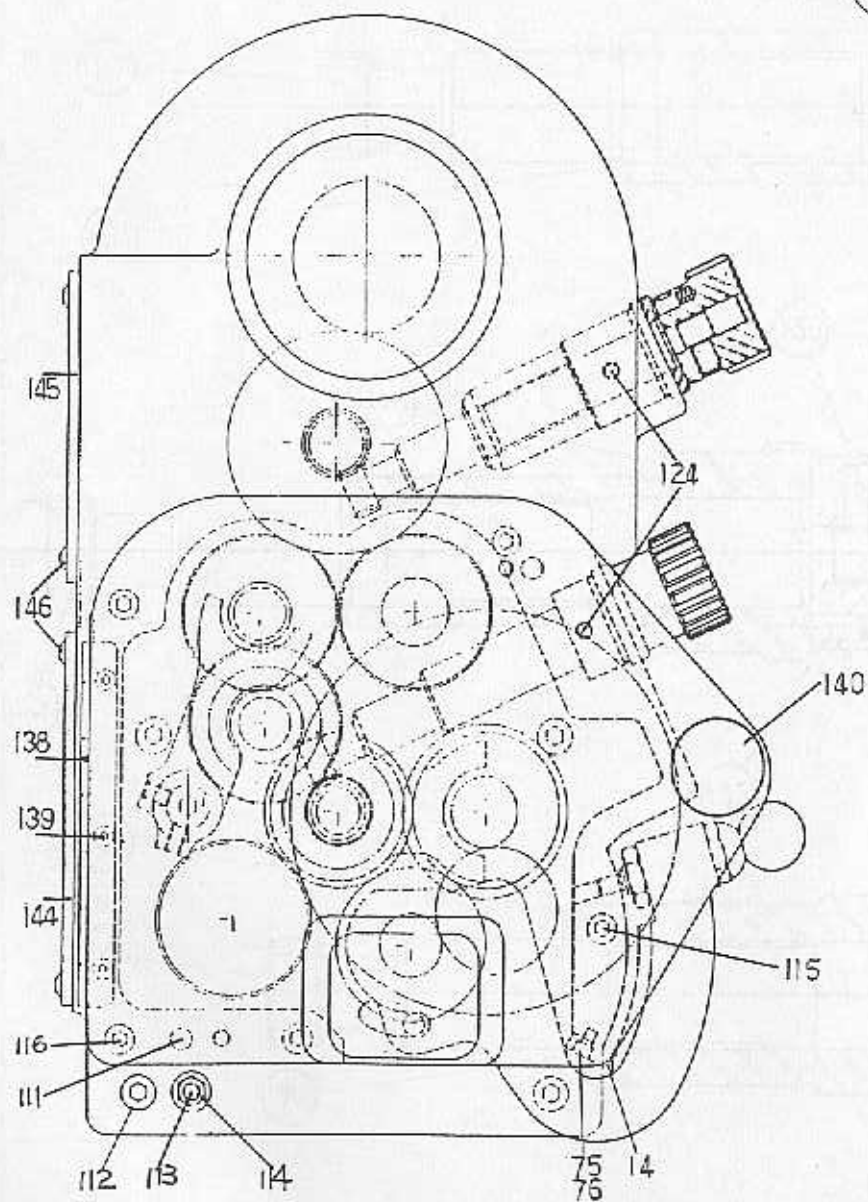


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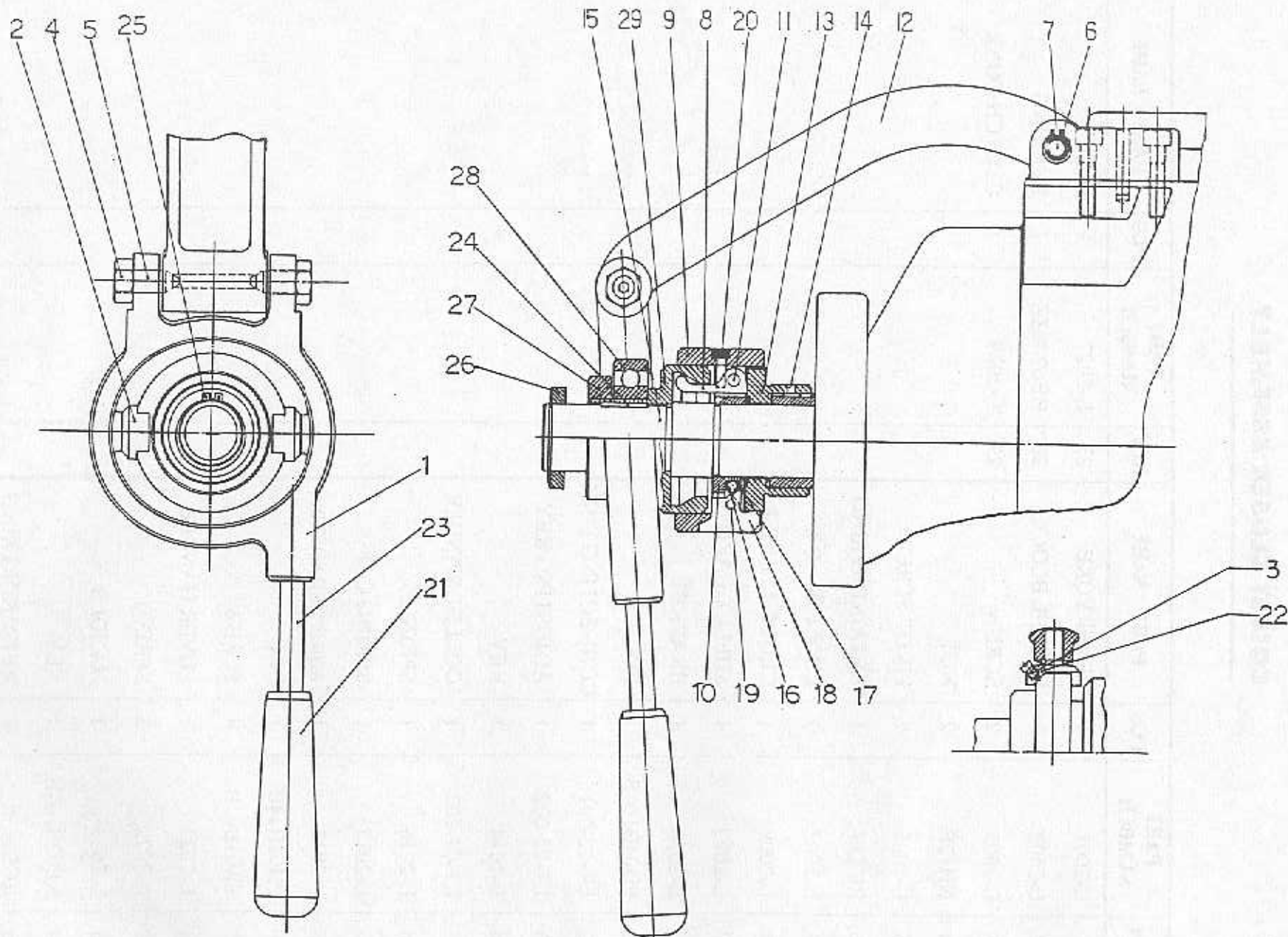






### **COLLET CLOSER ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	L-2001	1	LEVER YOKE	27	L-2027	1	NUT
2	L-2002	2	SWIVEL BLOCK	28	BB6208ZZ	1	BEARING
3	L-2003	2	SCREW	29	L-2029	1	CLUTCH CONE
4	NH12F	2	NUT				
5	L-2005	2	PIVOT SCREW				
6	RCS13	1	RETAINING RING				
7	L-2007	1	LINK PIN				
8	L-2008	1	CLUTCH FINGER				
9	L-2009	1	SHELL GUARD				
10	L-2010	1	BRACKET				
11	PD04B104B	3	PIN				
12	LT-02-001	1	CONNECTING LINK				
13	LT-02-002	1	ADJUSTING KEY				
14	L-2014	1	KEY				
15	LT-02-003	1	COLLET SPINDLE				
16	L-2016	1	SPRING				
17	L-2017	1	SPRING CAP				
18	L-2018	1	ADJUSTING FINGER				
19	PD03B14B	1	PIN				
20	SA03B07B	4	SCREW				
21	L-2021	1	LEVER HANDLE				
22	L-2022	2	SPRING				
23	L-2023	1	HANDLE				
24	KP02B104B	1	KEY				
25	RCS34	1	RETAINING RING				
26	L-2026	1	STOP RING				

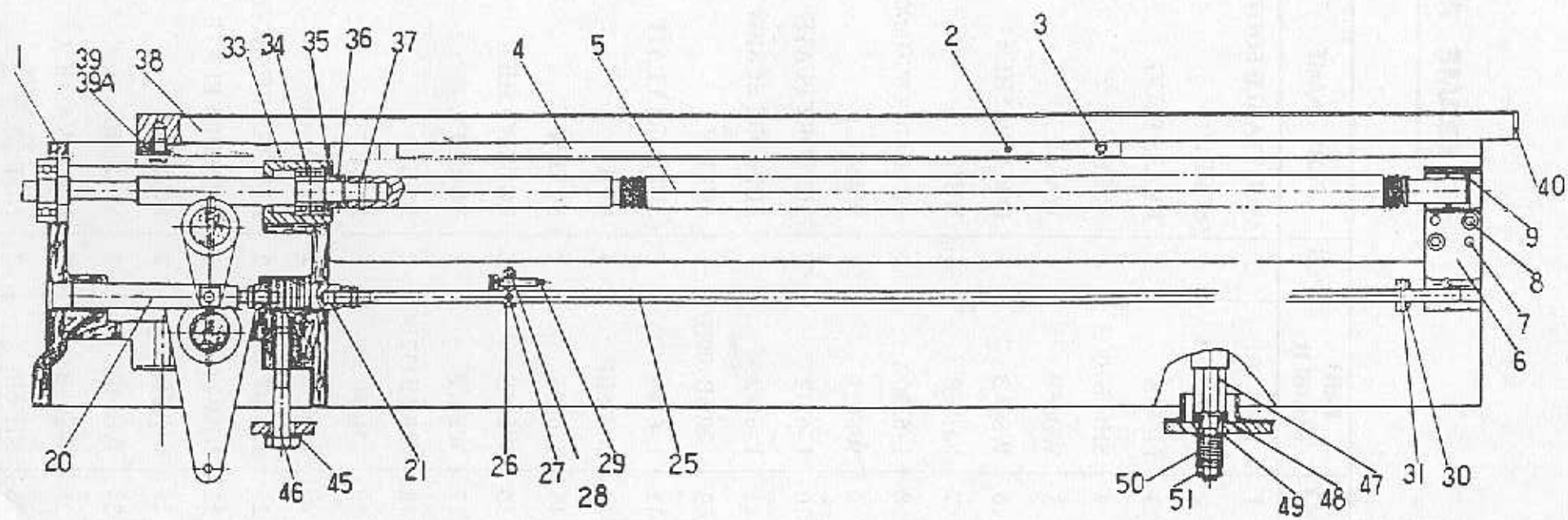




## **BED ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-03-101	1	BED BODY	26	LT-03-119	2	DOMPER
2	PD03B16B	2	PIN	27	SL04B04B	2	LOCK SCREW
3	SA03B012B	8	SCREW	28	SL03B04B	2	LOCK SCREW
4	LT-03-102	1	RACK	29	SA04B112B	2	SCREW
5	LT-03-103	1	LEAD SCREW	30	LT-03-120	1	FIXED BLOCK
6	LT-03-104	1	LEAD SCREW SUPPORT	31	PS03025	1	TAPER PIN
7	PD04B104B	2	PIN	32	LT-03-121	1	LENGTH CONTROL LEVER
8	SA05B112B	2	SCREW	33	LT-03-122	1	BEARING SPACER
9	BN-RNA6902	1	NEDDLE BEARING	34	BB6203Z	2	BEARING
10	LT-03-105	1	SPEED LEVER	35	LT-03-123	1	LOCK NUT
11	LT-03-106	1	SPEED ARM	36	LT-03-124	1	LOCK NUT
12	LT-03-107	1	REVERSE ARM	37	PT3#25	1	TAPER PIN
13	LT-03-108	2	FIXED BLOCK	38	LB-03-013	1	BED PLATE
14	LT-03-109	1	SWIVEL SHAFT	39	SA05B12B	28	SCREW
15	RCS0B	2	RETAINING RING	39A	WS05B	17	LOCKWASHER
16	PT03045	3	TAPER PIN	04	LT-03-125	1	BUMPER
16A	LT-03-110	1	REVERSE ARM	41	DRP25	4	O RING
17	LT-03-111	4	NUT	42	L-5008	2	WASHER
18	LT-03-112	1	SCREW	43	L-5010	2	SPRING WASHER
19	LT-03-113	1	GUIDE BLOCK	44	NH08BF	2	NUT
20	LT-03-114	1	GUIDE BAR	45	SH08B300B	1	HEX. SCREW
21	LT-03-115	1	LOCATING LINK	46	WS08B	1	LOCKWASHER
22	LT-03-116	1	DOWEL	46A	L-5015	3	WASHER
23	LT-03-117	1	SPRING	47	L-5016	3	HOLD DOWN STUD
24	SL08B12B	1	LOCK SCREW	48	L-5017	3	WASHER
25	LT-03-118	1	LENGHT CONTROL BAR	49	L-5020	6	WASHER





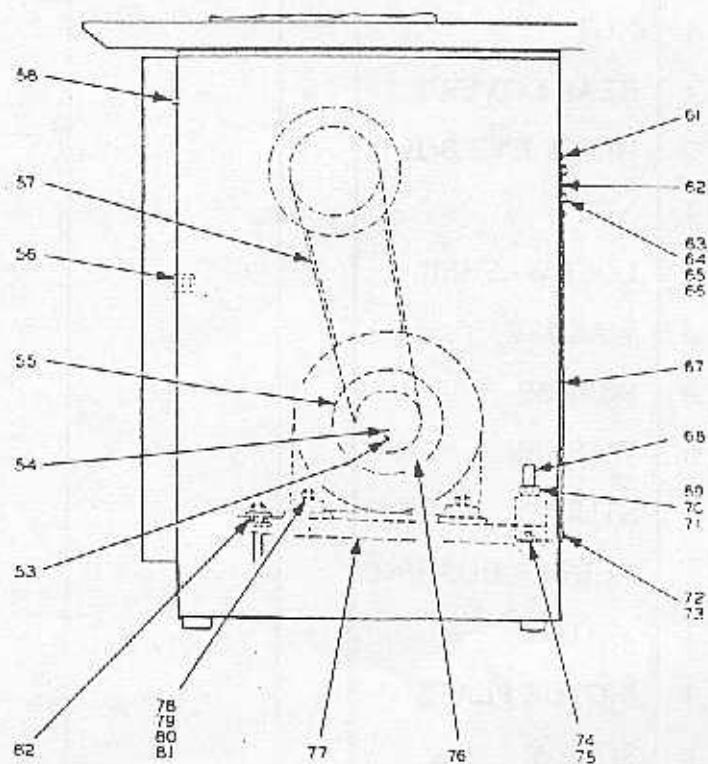
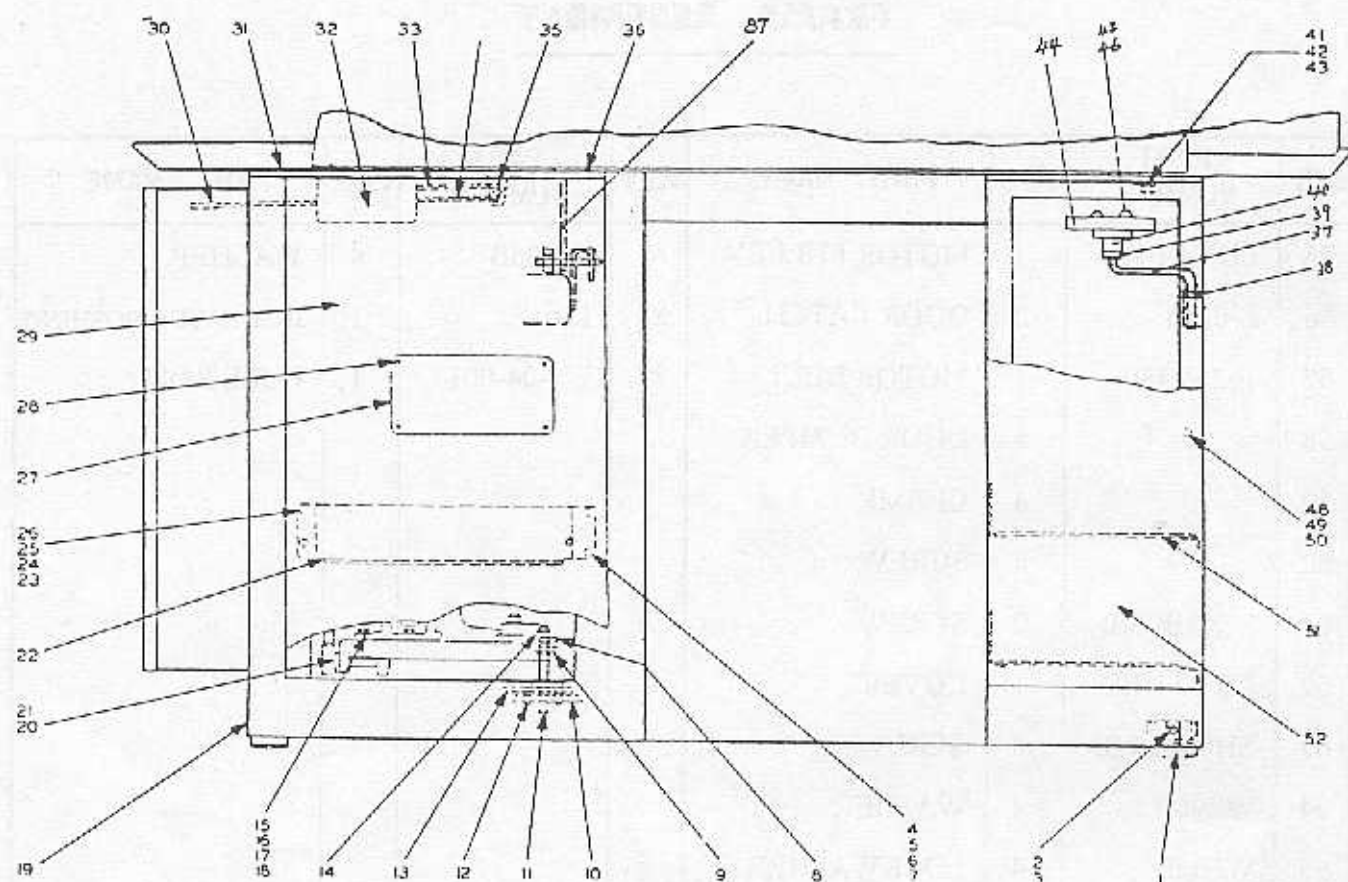


## **FRAME ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LB-04-001	3	ADJUSTABLE FOOT	27	L-6102	1	NAME PLATE
2	SA04B06B	3	SCREW	28	SN5/32B05B	4	SCREW
3	L-6618	3	BRASS PLUG	29	LB-04-011	1	MOTOR DOOR
4	SH06B100B	4	SCREW	30	BDJAF5	1	PULL ROD LINK
5	WB06B	4	WASHER	31	L-6107	6	CORK PAD
6	WS06B	4	LOCKWASHER	32	L-8308	1	BRAKE PLATE
7	NH06B	4	NUT	33	L-6106	1	SPEED PULL ROD
8	L-6320A	2	INSULATOR BUSHING	35	PC01B12B	2	COTTER PIN
9	WE08B	2	WASHER	36	L-G107	1	CORK PAD
10	L-6142	1	SUPPORT PLATE	37	LB-04-006	1	SHAFT
11	L-6143	1	SUPPORT SCREW	38	L-5020	1	WASHER
12	SH05B100B	2	SCREW	39	LB-04-007	1	WASHER
13	L-6145	1	SUPPORT PLATE	40	LB-04-008	1	COLLET BOARD
14	NH08BF	4	NUT	41	L-6119	6	WASHER
15	L-6135	2	SCREW	42	WS06B	6	LOCKWASHER
16	WS05B	2	LOCKWASHER	43	NH06B	6	NUT
17	WE05B	2	WASHER	44	LB-04-009	1	COLLET PLATE
18	SH05B112B	2	BOLT	45	SN04B07B	3	SCREW
19	LB-04-002	1	BASE	46	WS04B	3	LOCKWASHER
20	L-6146	2	STUD	48	SN04B08B	10	SCREW
21	L-6147	2	RUBBER BUSHING	49	WS04B	10	LOCKWASHER
22	LT-04-002	1	SUPPORT PLATE	50	NH04B	10	NUT
23	SH06B100B	2	SCREW	51	LB-04-010	2	SHELF
24	WE06B	2	WASHER	52	LB-04-004	1	COLLET DOOR
25	WS06B	2	LOCKWASHER	53	SL04B05B	8	LOCKSCREW
26	NH06B	2	NUT	54	SL04B05B	4	SCREW

## **FRAME ASSEMBLY**

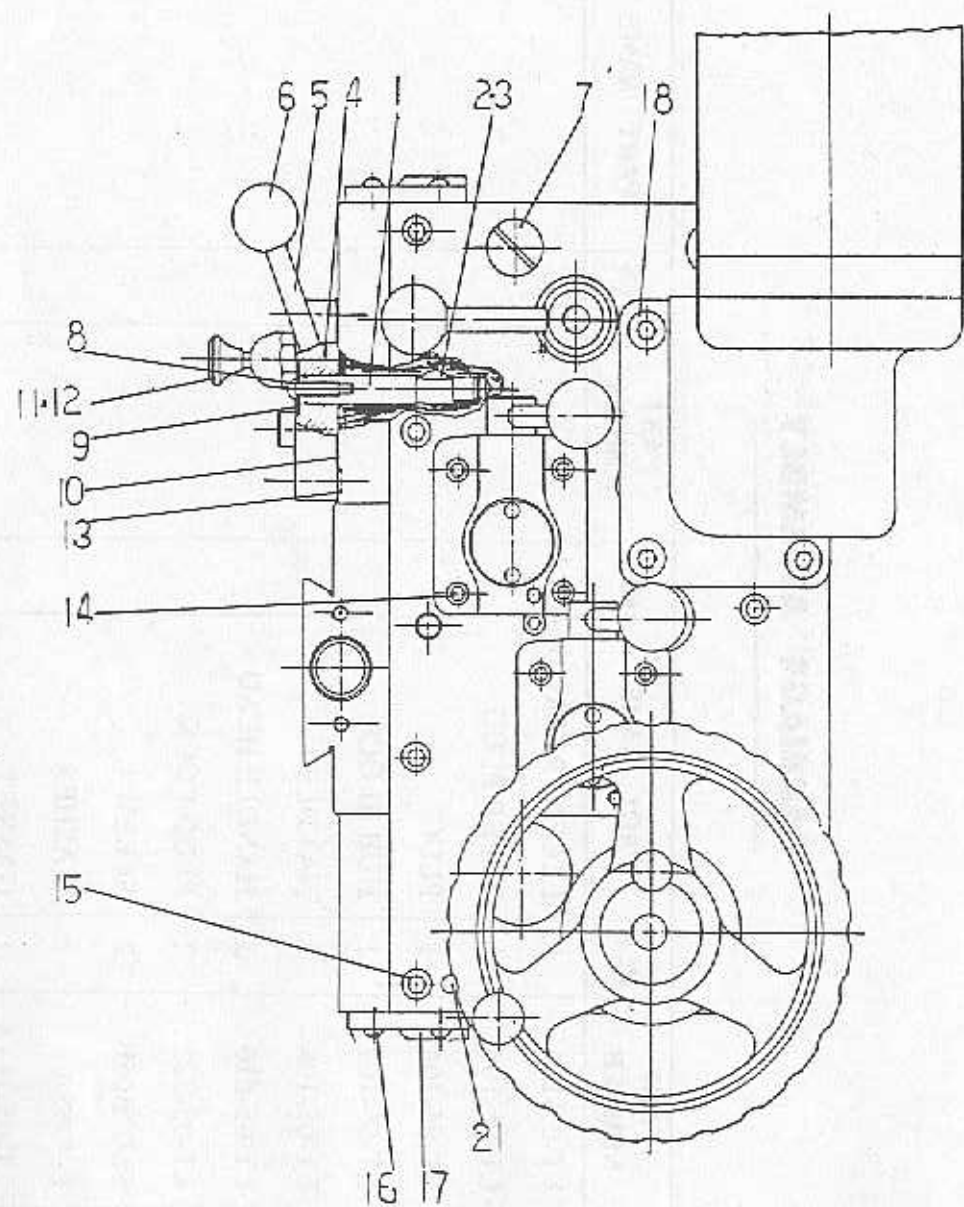
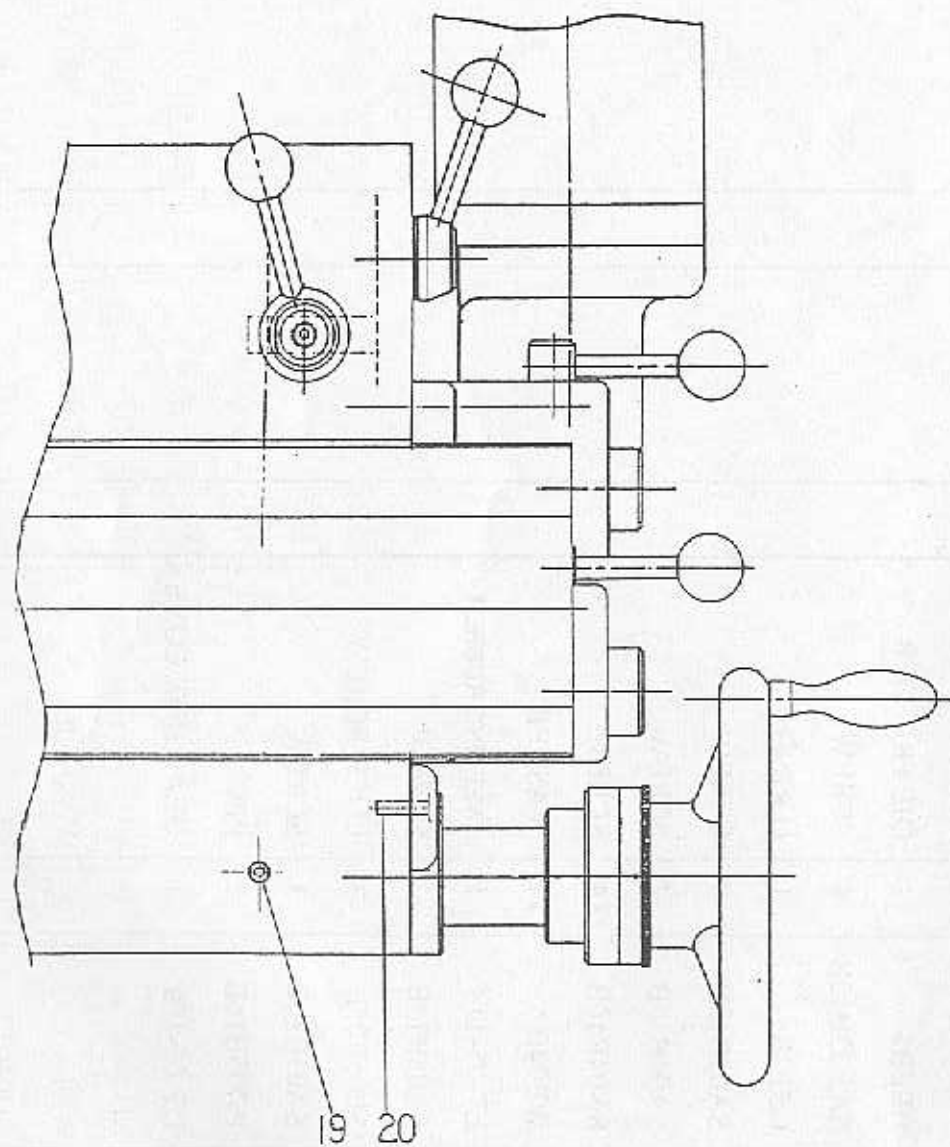
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
55	LB-04-012	1	MOTOR PULLEY	81	WE06B	4	WASHER
56	L-6148	2	DOOR CATCH	82	L-6152	1	INSULATOR BOSHING
57	1626V380	1	MOTOR BELT	87	LY-04-001	1	PULL ROD
58		5	DOOR BUMPER				
59		3	CLAMP				
60		3	SCREW				
61	SN03B05B	2	SCREW				
62	LB-04-013	1	COVER				
63	SH06B103B	4	SCREW				
64	WE06B	4	WASHER				
65	WS06B	4	LOCKWASHER				
66	NH06B	4	NUT				
67	L-6165	1	REAR COVER				
68	L-6164	2	HINGE EYE BOLT				
69	NH10BF	4	NUT				
70	WS10B	4	LOCKWASHER				
71	WE10B	4	WASHER				
72	SN04B07B	4	SCREW				
73	WE04B	4	WASHER				
74	L-6146	1	STUD				
75	L-6147	1	RUBBER BUSHING				
76	LB-04-014	1	MOTOR				
77	LB-04-015	1	MOTOR PLATE				
78	SH06B204B	4	SCREW				
79	NH10N	4	NUT				
80	WE06B	4	WASHER				





## **CARRIAGE ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-05-104	1	ECCENTRIC ROD				
2	LT-05-105	1	TAPER PLUG				
3	LT-05-106	1	PLUG				
4	LT-05-107	1	HUB BLOCK				
5	LT-05-108	2	NANDLE				
6	LT-05-616	3	HANDLE HEAD				
7	LT-05-321	2	PLUG COCK				
8	SN03B05B	2	SCREW				
9	L-4065A	2	WASHER				
10	LT-05-111A	1	GASKET				
11	HEEB8	1	OIL FREEDER				
12	SA5/32B12B	4	SCREW				
13	DRP10	1	O RING				
14	SA03B12B	8	SCREW				
15	SA04B10B	7	SCREW				
16	SN04B10B	14	SCREW				
16A	WE04B	14	WASHER				
17	LT-05-114	1	SWEEPING RUBBER				
18	SA05B12B	3	SCREW				
19	SL05B05B	3	LOCK SCREW				
20	SA03B10B	3	SCREW				
21	PD05B16B	2	PIN				
22	LT-05-109	1	GEAR BOX COVER				



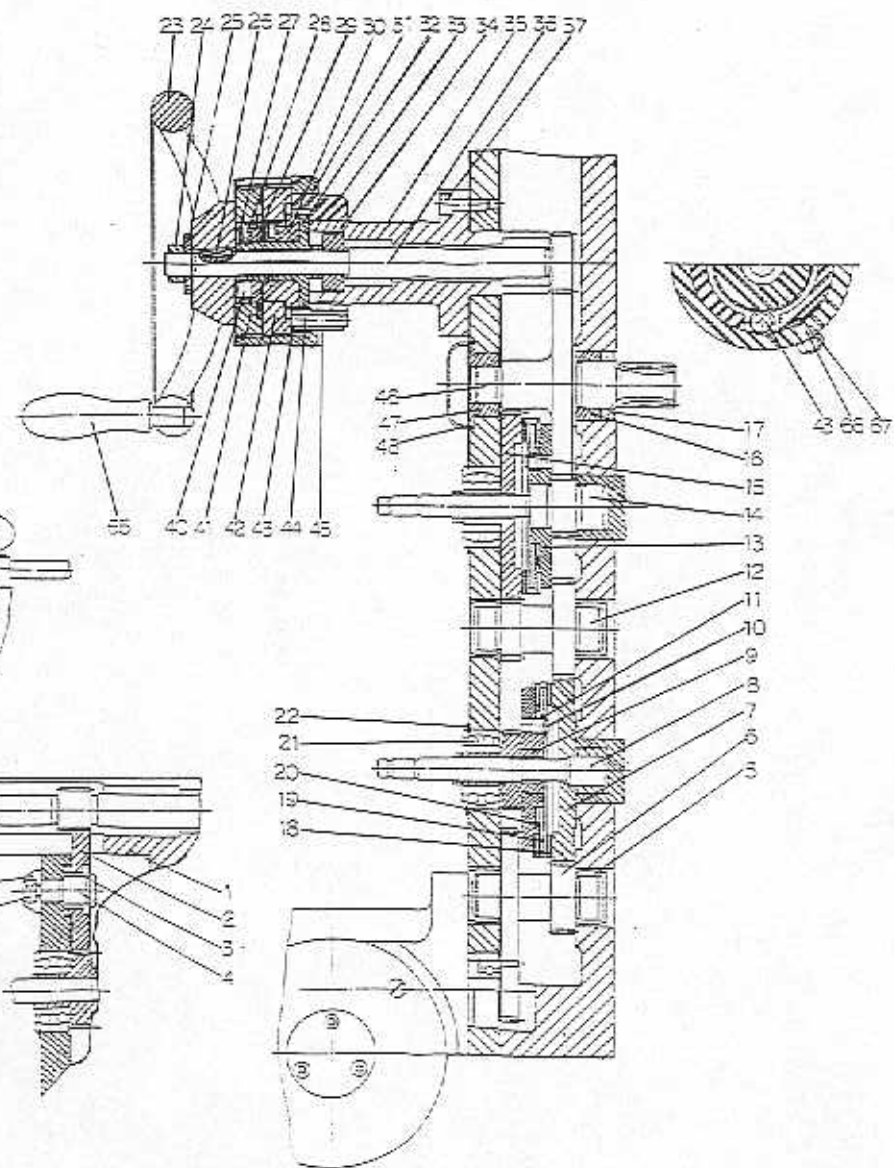
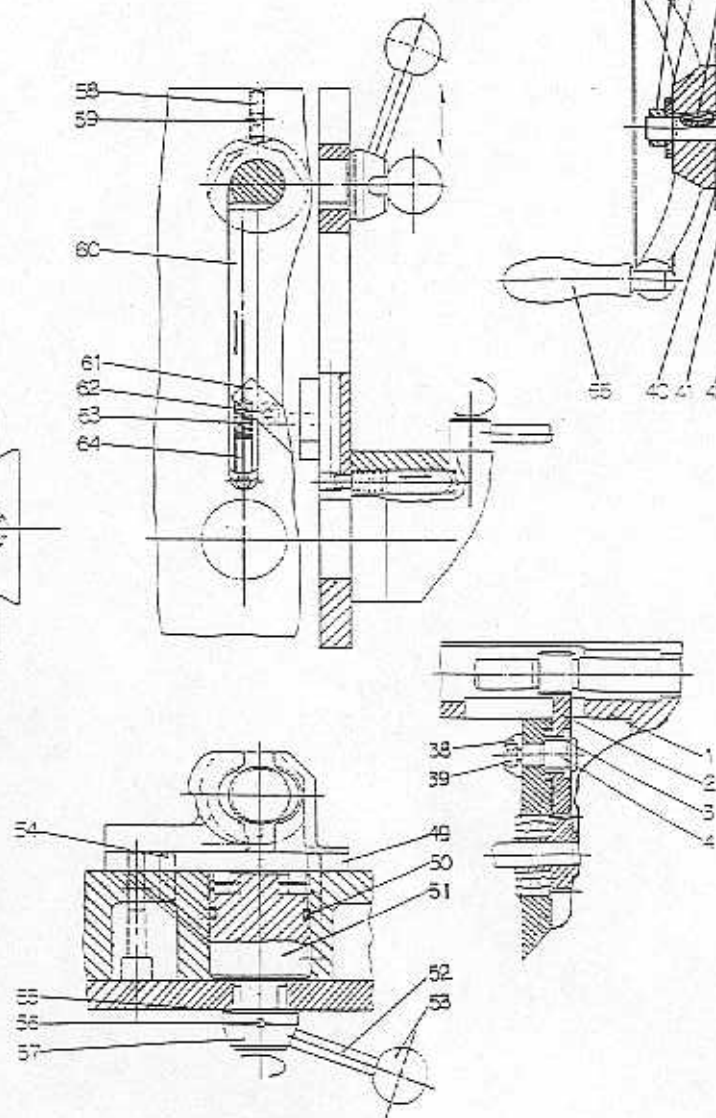
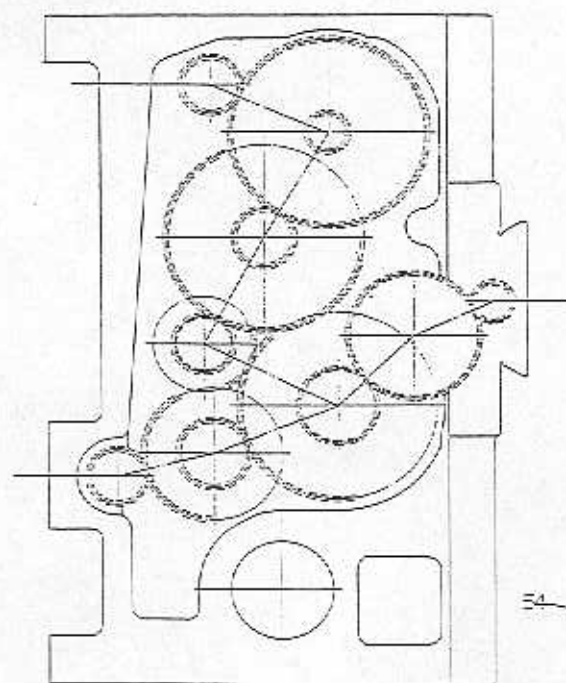
## **GEAR BOX OF CARRIAGE ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-05-301	1	CARRIAGE	27	LT-09-121	2	SPRING
2	LT-05-302A	1	GEAR	28	LT-05-432	2	KEY
3	LT-05-302B	1	OILY BEARING	29	LT-05-431	1	COLLAR
4	LT-05-303	1	STUD	30	LT-05-428	1	GEAR
5	BN-BAM128	4	NEDDLE BEARING	31	LT-05-207C EM99	1	ZERO RING
6	LT-05-304	1	GEAR	32	LT-05-427	1	GEAR
7	LB-05-306	1	CLUTCH BUSHING	33	LT-05-307 EM99	1	ZERO RING
8	LB-05-307	1	CLUTCH SHAFT	34	LT-05-312 EM	1	SLEEVE
9	LB-05-308	1	PINION	35	LT-05-311 EM99	1	SUPPORT
10	LB-05-330	6	CLUTCH PIN	36	LT-05-310	1	GEAR SHAFT
11	RCS06	6	RETAINING RING	37	SA05016	3	SCREW
12	LT-05-305 A B	1	GEAR	38	LT-05-303A	1	BUSHING
13	LB-05-308A	2	CLUTCH FIXED PLATE	39	SA05010	1	SCREW
14	LB-05-32B	1	CLUTCH SHAFT	40	SL06008	1	LOCK SCREW
15	LB-05-329	1	CLUTCH BUSHING	41	LT-05-206EC	1	DIAL RING
16	LT-05-318	1	BEARING BRASS	42	LT-05-206MC	1	DIAL RING
17	OS20305	1	SEAL	43	LT-05-430	1	GEAR
18	LB-05-305	4	BRAKE PLATE	44	LT-05-429	1	SHAFT
19	LB-05-310	2	CLUTCH DISC	45	SL06010	1	LOCK SCREW
20	LB-05-301	2	BOWED WASHER	46	LT-05-306	1	GEAR SHAFT
21	BP-5202NR	2	BEARING	47	LT-05-320	1	BEARING BRASS
22	RCS35	2	RETAINING RING	48	LT-05-319	1	PLUG
23	LT-05-322 EM99	1	HANDWHEEL	49	LT-05-308	2	GIB BLOCK
24	NH10	1	NUT	50	OSP36	1	"O" RING
25	WB10	1	WASHER	51	LT-05-309	1	SHIFT SHAFT
26	KD04012	1	KEY	52	L-7011	1	HANDLE LEVER



## **GEAR BOX OF CARRIAGE ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
53	LB-05-616	1	KNOB				
54	PD0412B	2	PIN				
55	LT-05-313	1	SHIM				
56	PT2#038	1	TAPER PIN				
57	LT-05-314	1	HUB				
58	SL06020	1	LOCK SCREW				
59	SL05012	1	LOCK SCREW				
60	LT-05-315	1	SLIDE BLOCK				
61	LT-05-317	1	FIXED BLOCK				
62	SA05012	1	SCREW				
63	LB-03-004	1	SPRING				
64	LT-05-316	1	PLUG				
65	LT-05-324	1	HANDLE				
66	LT-09-219	1	LOCK SCREW				
67	NH06	1	NUT				



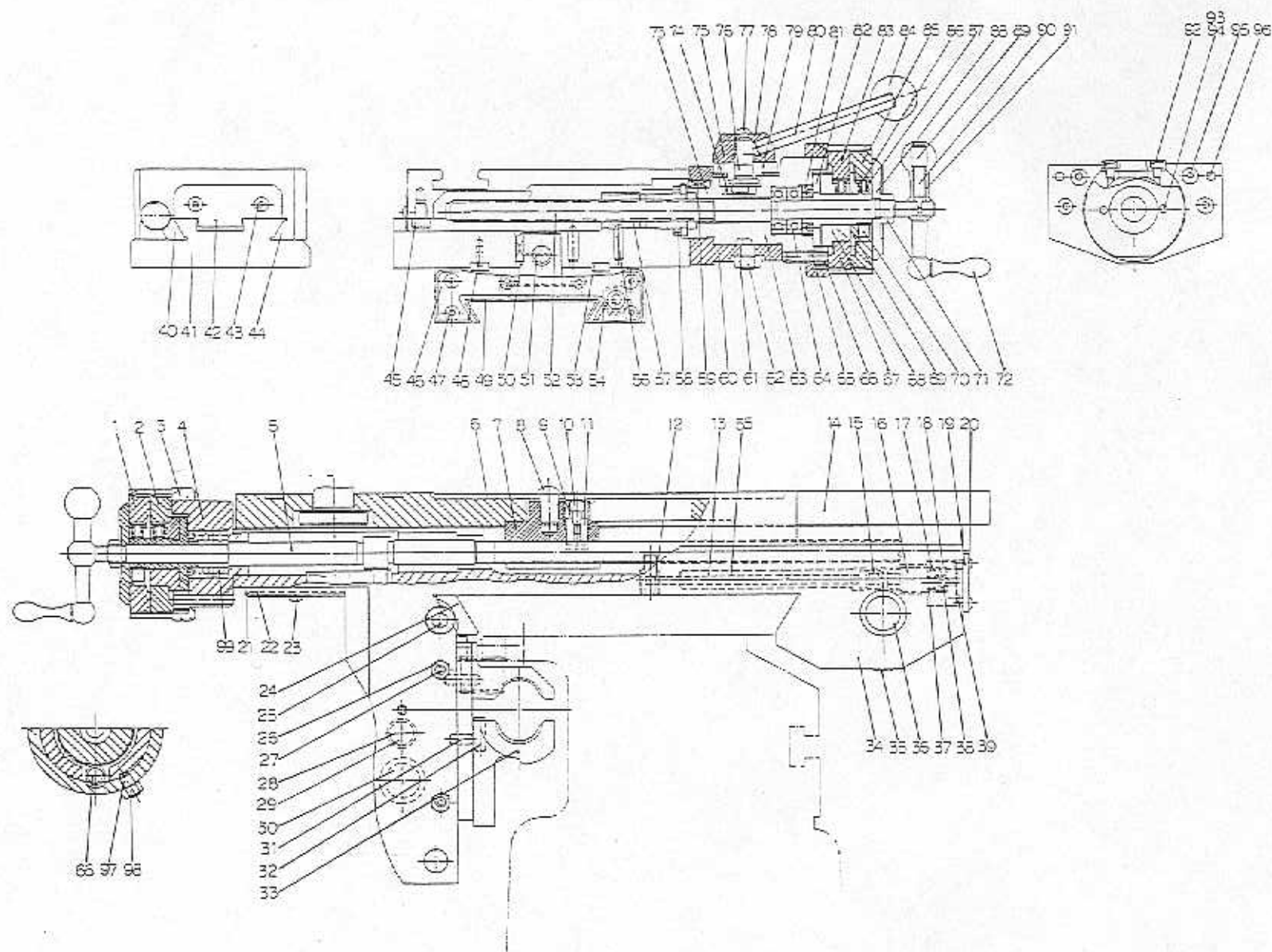
## **CROSS AND COMPOUND SLIDE ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-05-206EA	1	DIAL RING	27	SL06020	2	LOCK SCREW
2	LT-05-206MA	1	DIAL RING	28	HE-OC	1	OIL CUP
3	LT-05-207EMA	1	ZERO RING	29	LB-05-206	1	INSTRUCTION NAME PLATE
4	LT-05-205EM99	1	SUPPORT	30	OW21	1	OIL WINDOW
5	LT-05-214EM99	1	CROSS-FREED SCREW	31	PD04008B	1	PIN
6	LT-05-403	1	COVER	32	PD04012B	2	PIN
7	LT-05-215	1	BRASS NUT	33	LT-05-218	1	LEAD SCREW NUT
8	SH10012	1	HEX SCREW	34	LT-05-301	1	CARRIAGE
9	LT-05-217	1	LOCK SCREW	35	SP06PT	1	OIL PLUG
10	SA04008	1	SCREW	36	OW 21	1	OIL WINDOW
11	LT-05-216	1	SCREW PLUG	37	ORP8	1	"O" RING
12	LB-05-213	1	OIL TUBE	38	SP-02PT	1	OIL PLUG
13	LB-05-212A	3	TUBING	39	SN05025	4	SCREW
14	LT-05-401	1	CROSS SLIDE	40	LT-05-414	1	COMPOUND SLIDE GIB
15	HE-MV	3	METER UNIT	41	LT-05-410	1	COMPOUND SLIDE BASE
16	LB-05-207	3	CONNECTOR	42	LT-05-412	1	WIPPER
17	ORP10	3	"O" RING	43	SN05008	2	SCREW
18	LT-05-208	1	JUNCTING BLOCK	44	LT-05-415	1	COMPOUND SLIDE
19	LT-05-209	1	COVER	45	SA06010	1	SCREW
20	SN05010	4	SCREW	46	LT-01-112A	1	COVER
21	LB-05-217	1	COVER	47	SN05008	6	LOCK SCREW
22	LB-05-201	1	"O" RING	48	SB04008	2	SCREW
23	SN06012	2	SCREW	49	LT-01-112N	1	COVER
24	LT-05-210	1	CARRIAGE GIB	50	LT-05-406	1	LOCK BLOCK
25	LB-05-216	6	LOCK SCREW	51	LT-05-407	1	ECCENTRIC SHAFT
26	NH06	2	NUT	52	LT-05-408	1	COMPOUND SLIDE SCREW



## **CROSS AND COMPOUND SLIDE ASSEMBLY**

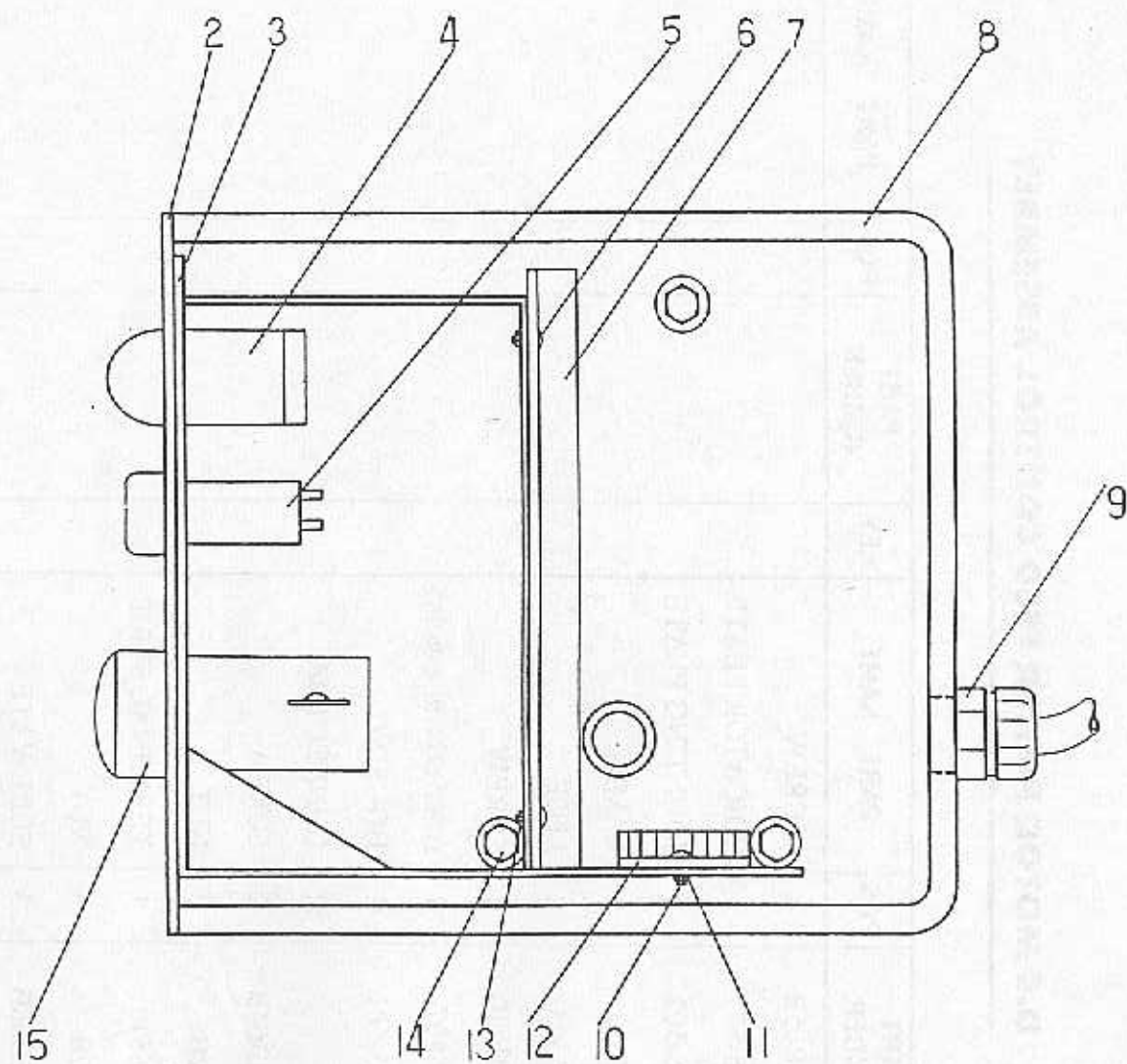
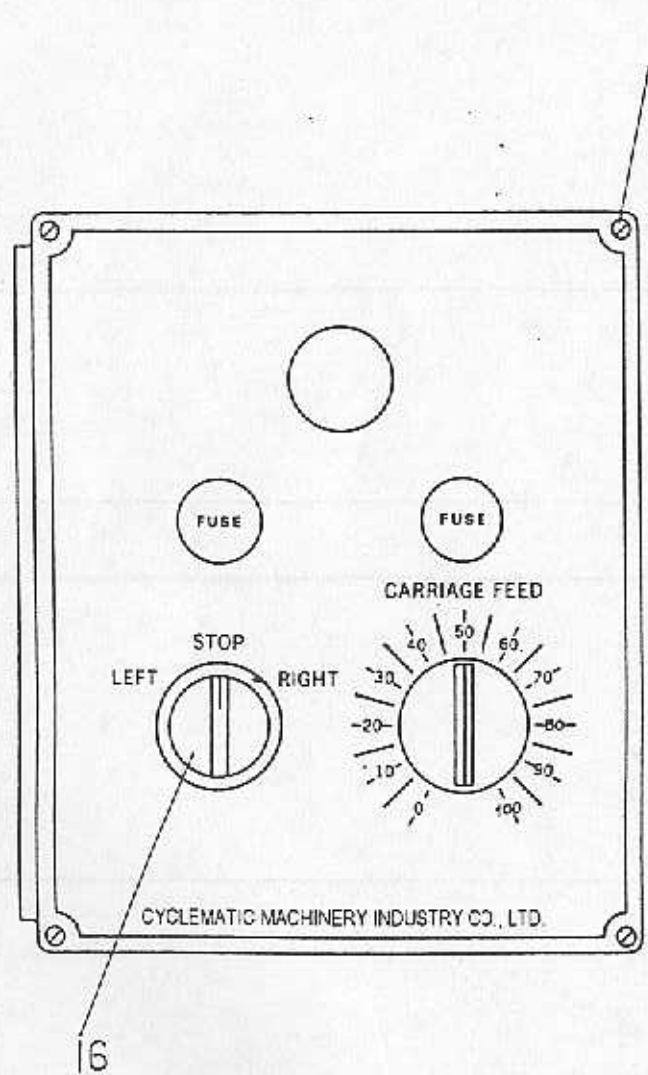
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
53	LT-05-404	1	LOCATING RING	79	LT-05-420	1	SUPPORT
54	LT-05-402	1	CROSS SLIDE GIB	80	L-7011	1	LEVER
55	HE-PB4	3	COMPRESSION SLEEVE	81	LT-05-204	2	LOCK NUT
56	LB-03-003	2	LOCK SCREW	82	LT-05-427	2	GEAR
57	LT-05-409	1	NUT	83	LT-05-206MC	1	DIAL RING
58	LT-05-411	1	LOCK SCREW	84	LB-05-616	1	KNOB
59	KD 04012	1	KEY	85	LT-05-206EC	1	DIAL RING
60	LT-05-416	1	QUICK-ACTING BASE	86	LT-05-432	4	KEY
61	NH-08	1	NUT	87	LT-09-121	4	SPRING
62	LT-05-413	1	ECCENTRIC SCREW	88	LT-05-203	2	COVER PLATE
63	LT-05-417EM99	1	QUICK-ACTING SHAFT	89	SL08012	2	SCREW
64	BB6000	2	BEARING	90	LT-05-101	2	LOCK PIN
65	LT-05-429	2	SHAFT	91	LT-05-102	2	CRANK
66	LT-05-430	2	GEAR	92	SA04006	2	SCREW
67	LT-05-207BEM99	1	ZERO RING	93	LT-05-421	2	SPRING
68	LT-05-428	1	GEAR	94	LT-05-422	2	PIN
69	LT-05-431	2	COLLAR	95	SN06020	4	SCREW
70	SL06008	2	SCREW	96	PD03016B	2	PIN
71	LT-03-111	2	NUT	97	LT-05-219	1	LOCK SCREW
72	LT-05-103	2	HANDLE	98	NH06	1	NUT
73	LT-05-408EM99	1	COMPOUND SLIDE SCREW	99	BB6000Z	2	BEARING
74	LT-05-419	1	GUIDE BLOCK				
75	LT-05-107	1	HUB BLOCK				
76	LT-05-418	1	ECCENTRIC ROD				
77	SN05008	1	SCREW				
78	L-4065A	1	WASHER				



## **D.C MOTOR POWER FEED CONTROL ASSEMBLY**

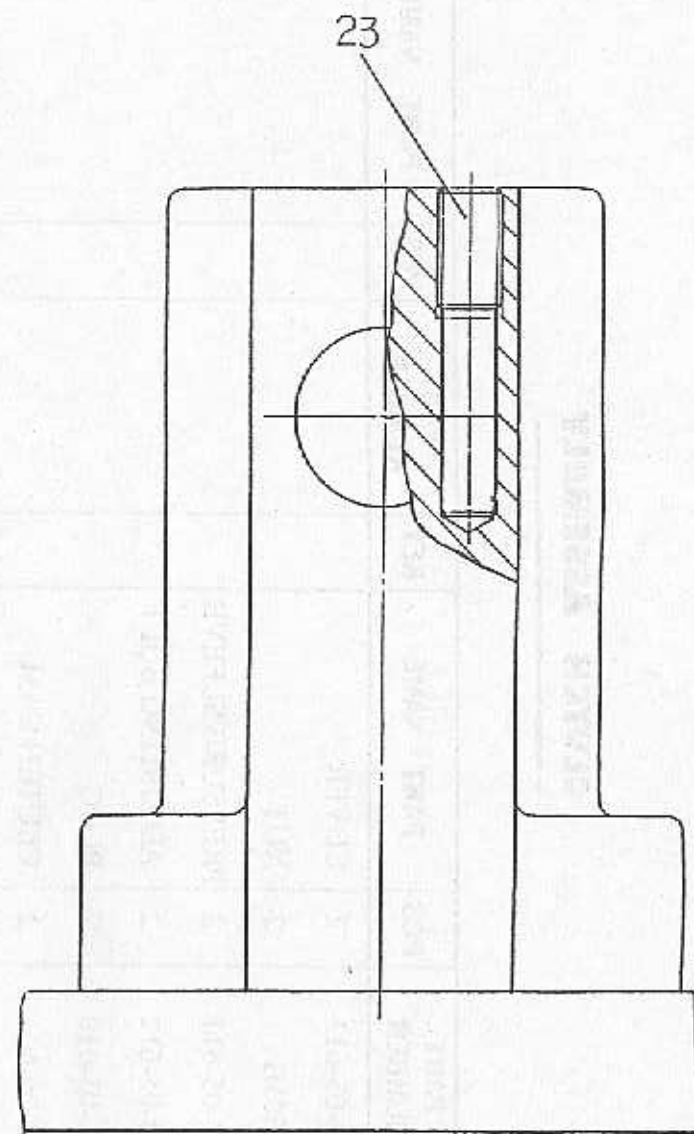
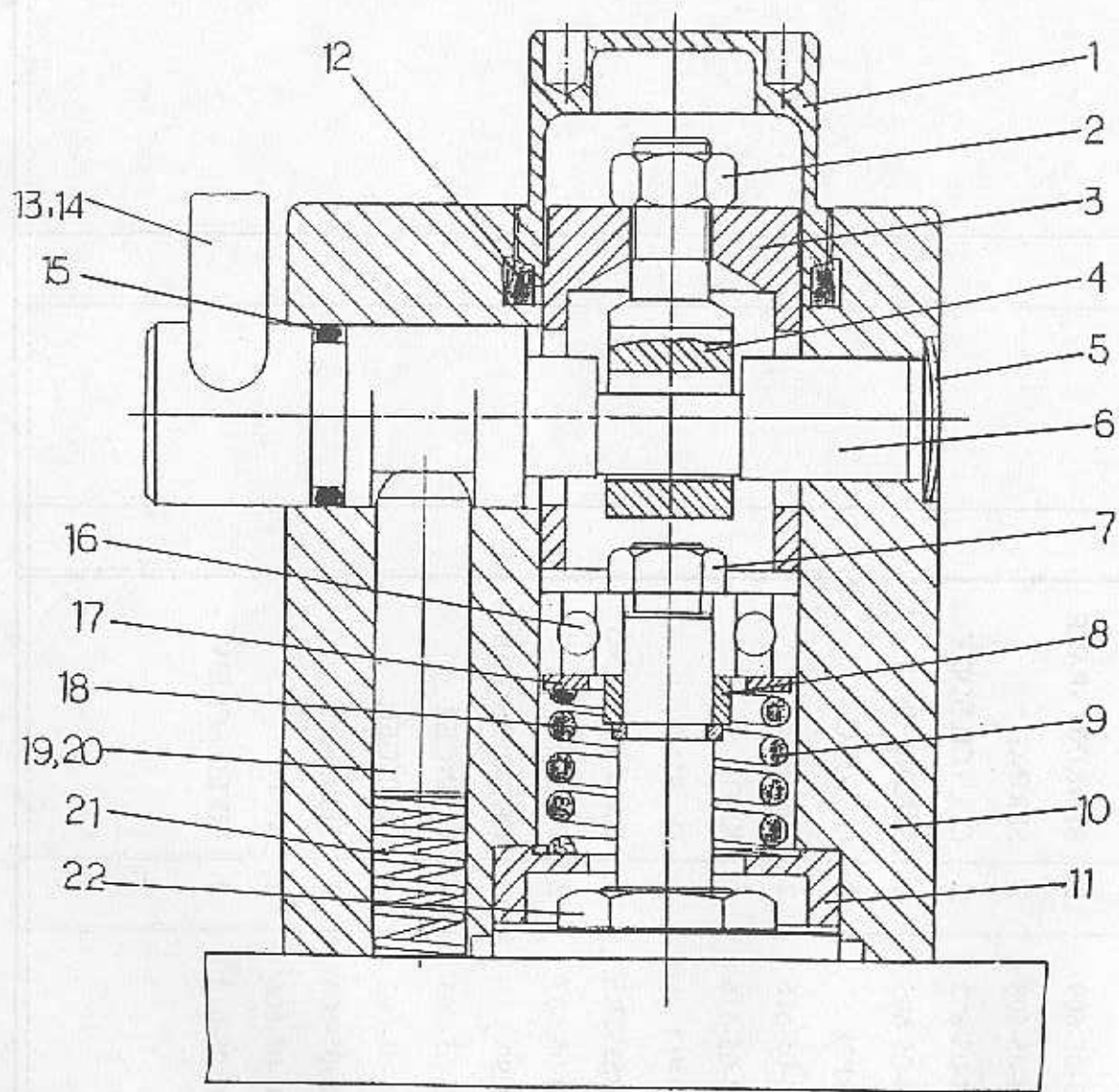
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	SN04B05B	4	SCREW				
2	LB-05-503	1	INDICATOR PLATE				
3	LB-05-502	1	MOUNTING PLATE				
4	EP-6752	1	LAMP				
5	EP-05505	2	FUSE				
6	SL02B04B	4	SCREW				
7	EP-05507	1	SPEED CONTRL CIRCUIT				
8	LB-05-501	1	HOUSING				
9	EC1	2	CONNECTOR				
10	SC02B04B	2	SCREW				
11	NH02B	2	NUT				
12	EP-05512	1	TERMINAL STRIP				
13	NH02B	4	NUT				
14	SA05B06B	3	SCREWATE				
15	DP-05515	1	SELECT SWITCH				
16	EP-05516	1	SELECT SWITCH				





## **CLUTCH ASSEMBLY**

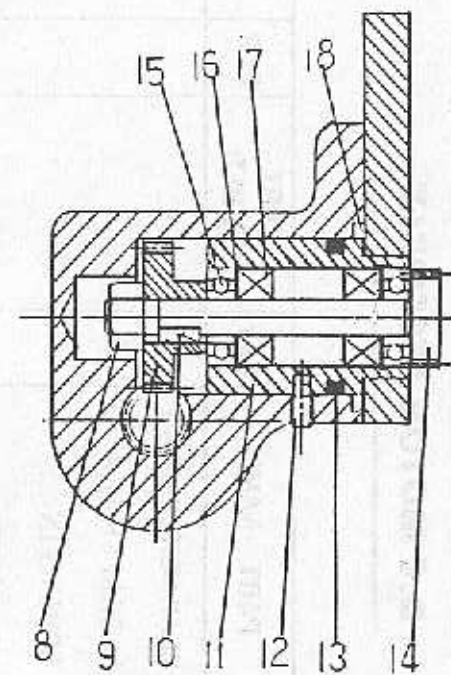
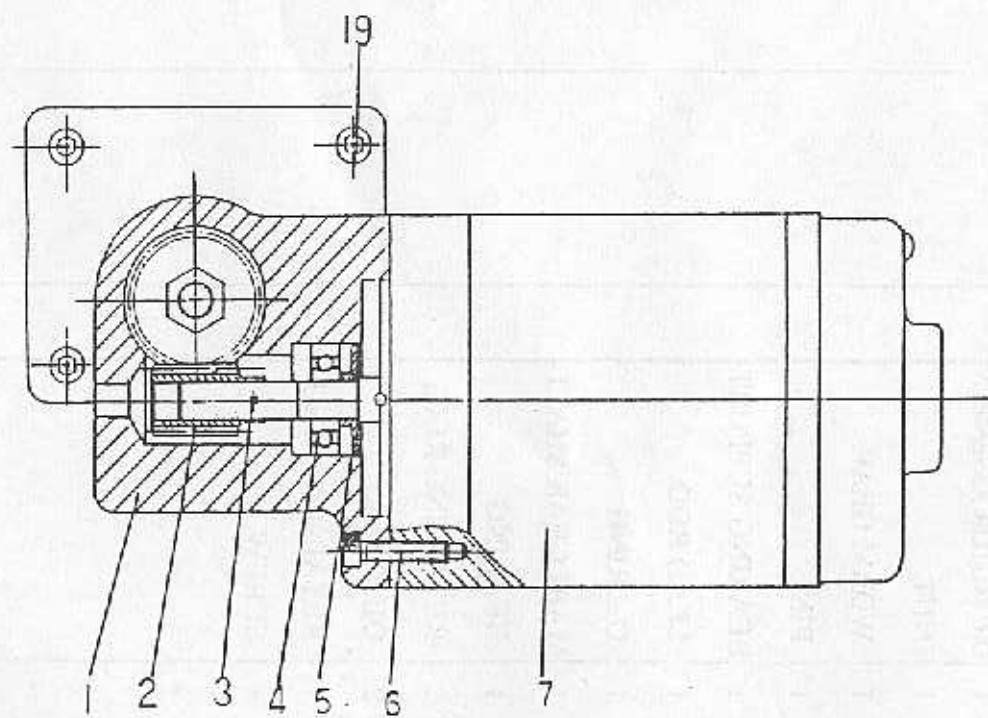
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LB-05-613	2	COVER				
2	NH05B	2	NUT				
3	LB-05-611	2	PRESSURE SLEEVE				
4	LB-05-612	2	ADJUSTING BOLT				
5	LB-05-610	2	PLUG				
6	LT-05-601	2	CLUTCH CAM				
7	NH08	2	HUT				
8	LB-05-609	2	BEARING SPACE				
9	LB-05-608	2	SPRING				
10	LB-05-602	2	CLUTCH BODY				
11	LB-05-605	2	SPRING SEAT				
12	ORP28	2	O RING				
13	LB-05-615	2	HANDLE				
14	LB-05-616	2	KNOB				
15	ORP14	2	O RING				
16	BB6292RS	2	BALL BEARING				
17	LB-05-607	2	WASHER				
18	RCS9	2	RETAINING RING				
19	LB-05-603	1	PLUNGER				
20	LT-05-602	1	PLUNGER				
21	LB-05-604	2	SPRING				
22	LB-05-606	2	NUT				
23	LB-05-614	2	FIXED SCREW				





### **D.C MOTOR ASSEMBLY**

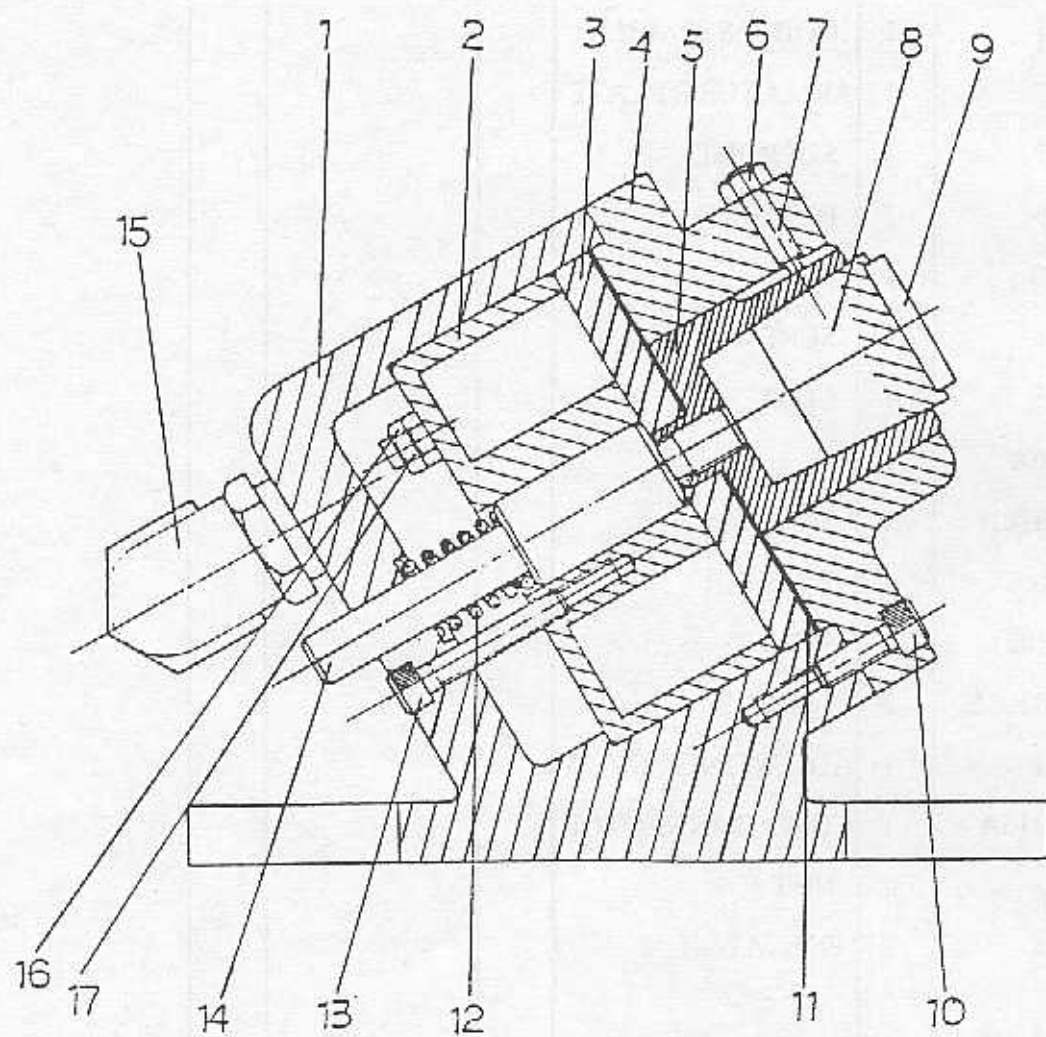
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-05-701B	1	GEAR BOX HOUSING				
2	LT-05-702	1	WORM SHAFT				
3	PS03012	1	SPRING IN				
4	BB6200ZZ	1	BEARING				
5	LB-05-705	1	BEARING SPACER				
6	SA05020	2	SCREW				
7	LB-05-700	1	D.C MOTOR ASSEMBLY				
8	NH10NF	1	NUT				
9	LT-05-703	1	WORM GEAR				
10	KD04012	1	PIN				
11	LT-05-705	1	BEARING SUPPORT				
12	L-8006	1	LEAD ROD				
13	ORP16	1	O RING				
14	LT-05-704	1	MAIN GEAR SHAFT				
15	BB-6000ZZ	1	BEARING				
16	RCR26	2	RETAINING RING				
17	OS102610	2	OIL SEAL				
18	ORP36	1	RETAINING RING				
19	SA04B10B	3	SCREW				



## **ELECTRIC BRAKE PARTS LIST**

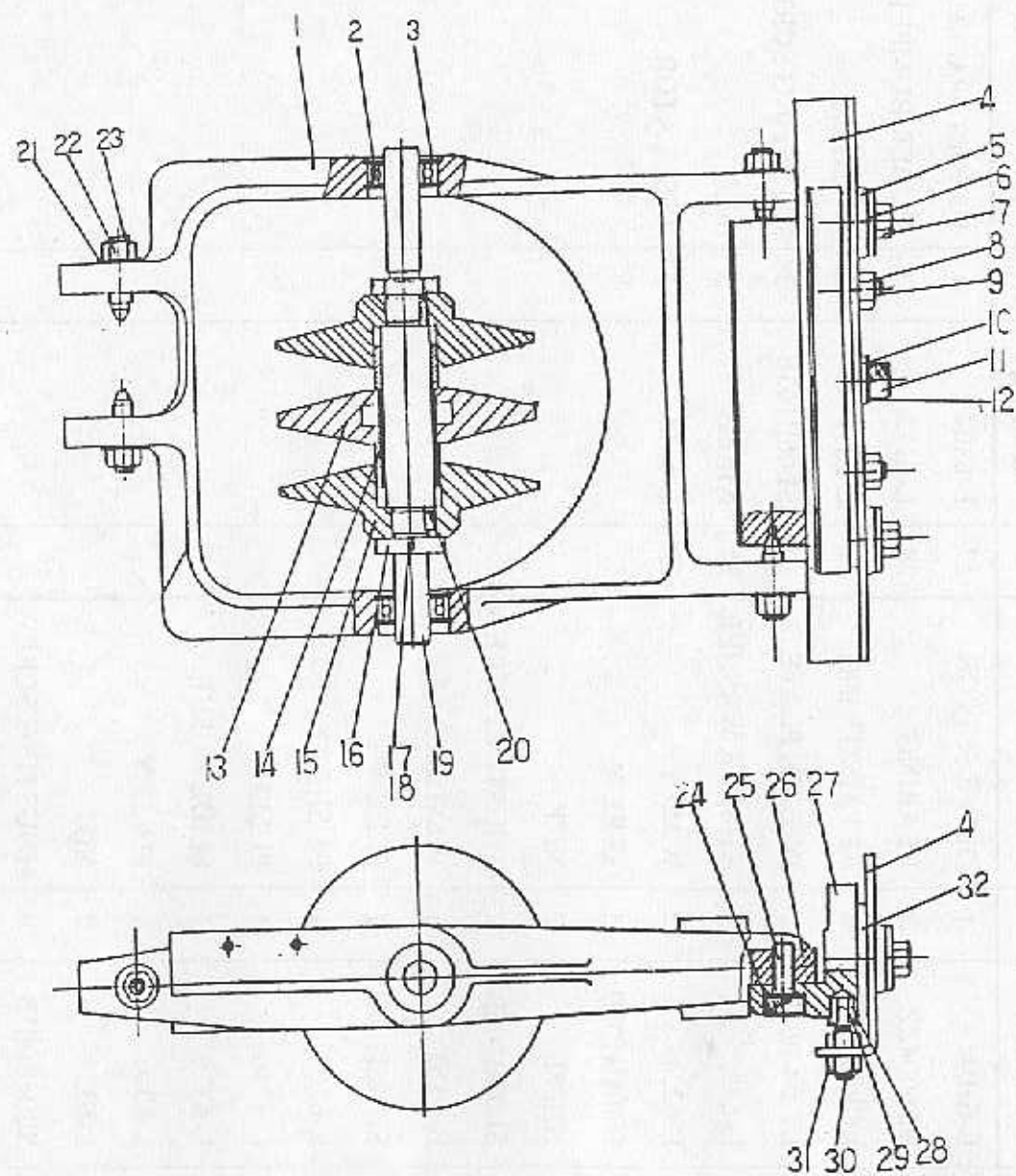
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	L-6214	1	HOUSING				
2	L-6201	1	COIL ASSEMBLY				
3	L-6202	1	ARMATURE PLATE				
4	L-6207	1	SUPPORT				
5	L-6205	1	BUSHING				
6	NH04B	1	NUT				
7	L-6204	1	SCREW				
8	L-6205	1	CORK				
9	L-6206A	1					
10	SA04B10B	3	SCREW				
11	L-6016	1	WASHER				
12	C-01-102	1	SPRING				
13	SA04B103B	2	SCREW				
14	L-6211	1	ADJUSTING SCREW				
15	EC08B15A	1	CORD CONNECTOR				
16	NH04	2	NUT				
17	L-6215	2	INSLATOR				





## **VARIABLE SPEED PULLERY ASSEMBLY**

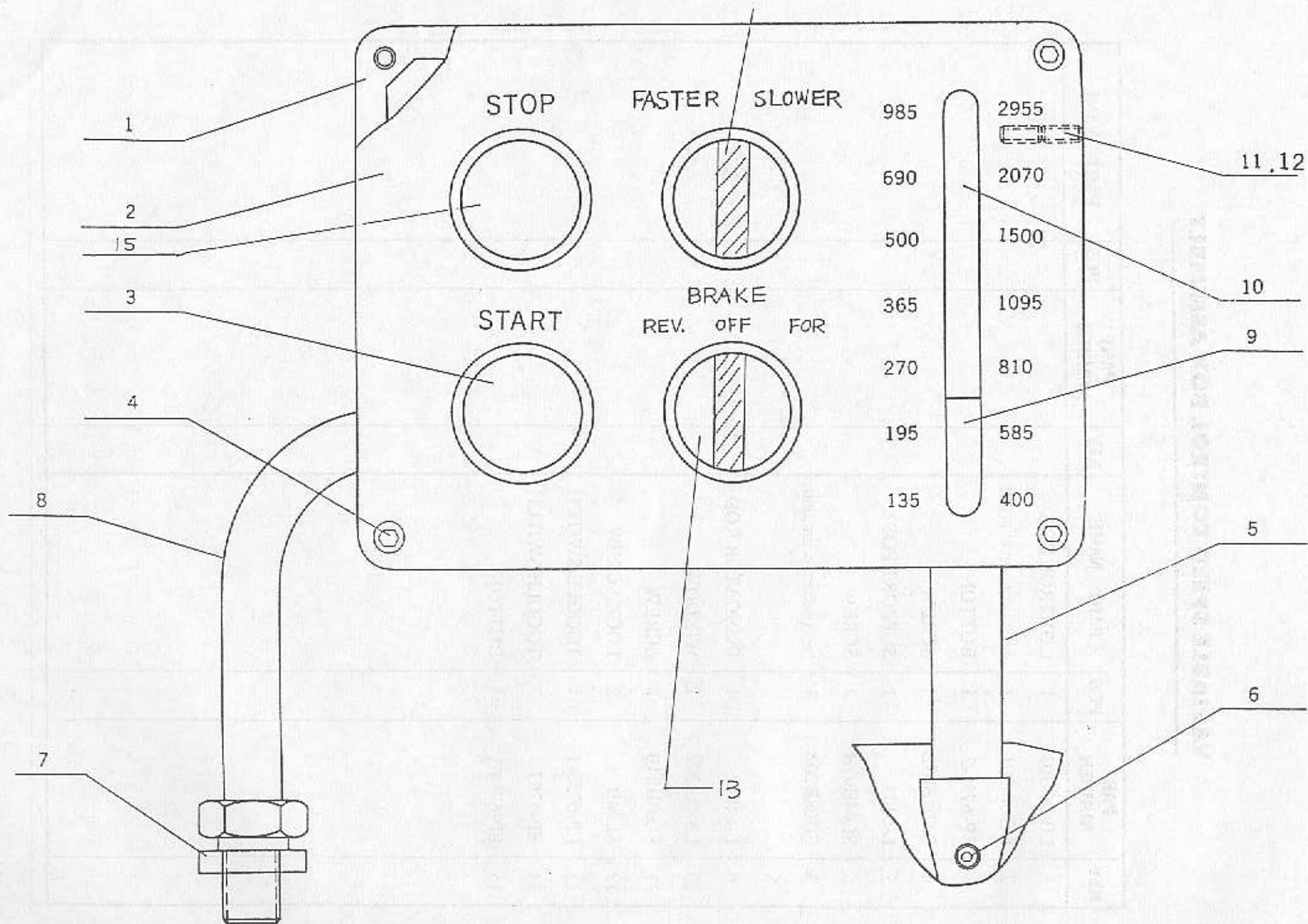
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	L-6304	1	DRIVE SUPPORT	27	L-6307	1	SUPPORT BRACKET
2	BB6004ZZ	2	BEARING	28	L-6312	2	RUBER BUMPER
3	RCR42	4	RETAING RING	29	L-6313	2	BUSHING
4	LT-04-002	1	DRIVEN PLATE	30	SL06B103B	2	ADJUSTING SCREW
5	L-6322	2	RUBBER WASHER	31	NH08B	2	NUT
6	L-6321	2	WASHER	32	L-6314	1	INSULATOR
7	SH08B103B	2	SCREW				
8	NH08B	2	NUT				
9	SL08B106B	2	ADJUSTING SCREW				
10	L-5020	1	WASHER				
11	SA08B103B	1	SCREW				
12	L-6317	1	BUSHING				
13	L-6330	1	PULLEY				
14	L-6329	1	SLIDE BUSHING				
15	L-6305	2	PULLEY				
16	L-6328	2	NUT				
17	SL04B003B	4	ADJUSTING SCREW				
18	L-6618	4	PLUNGER				
19	L-6327	1	SHAFT				
20	KD05010	2	KEY				
21	WS08B	4	SPRING WASHER				
22	NH08B	4	NUT				
23	L-6325	4	PIVOT SCREW				
24	WS08B	4	SPRING WASHER				
25	SA08B103B	1	SCREW				
26	L-6306	1	PIVOT BLOCK				





## **VARIABLE SPEED CONTROL BOX ASSEMBLY**

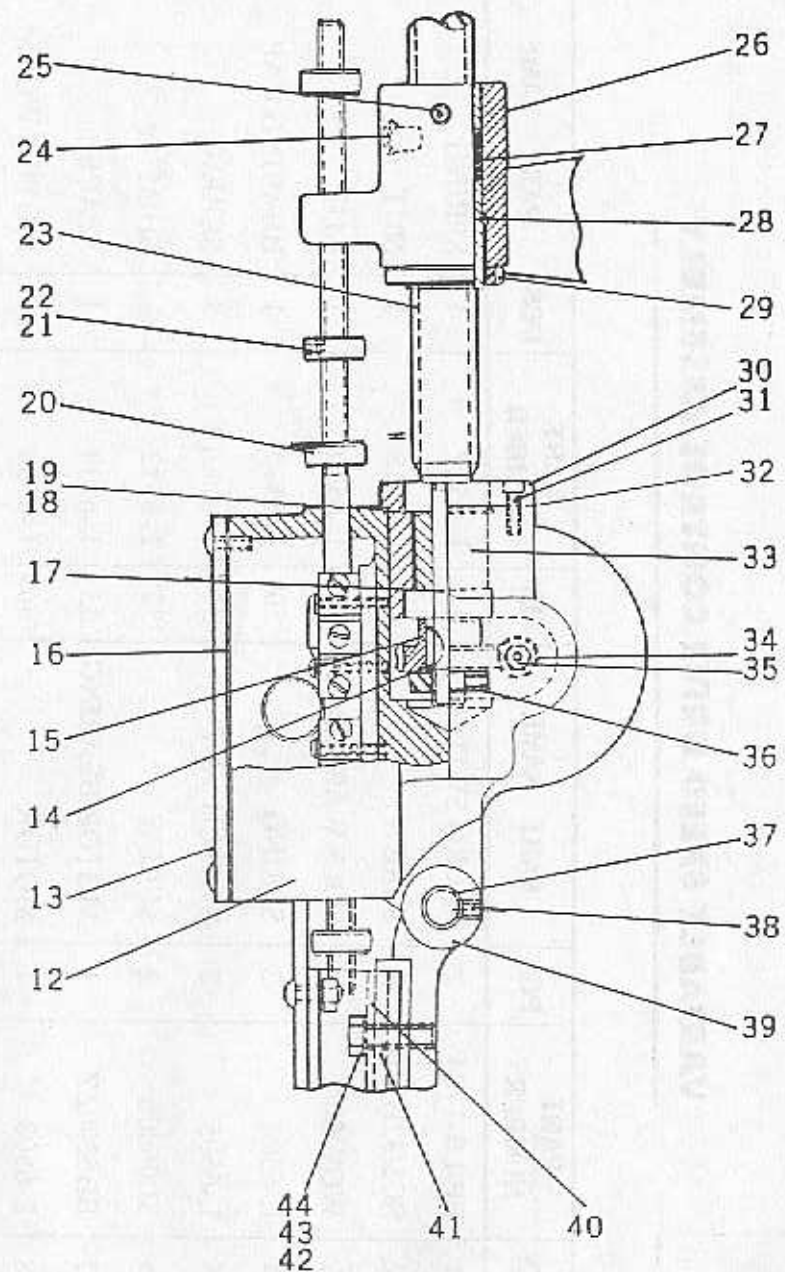
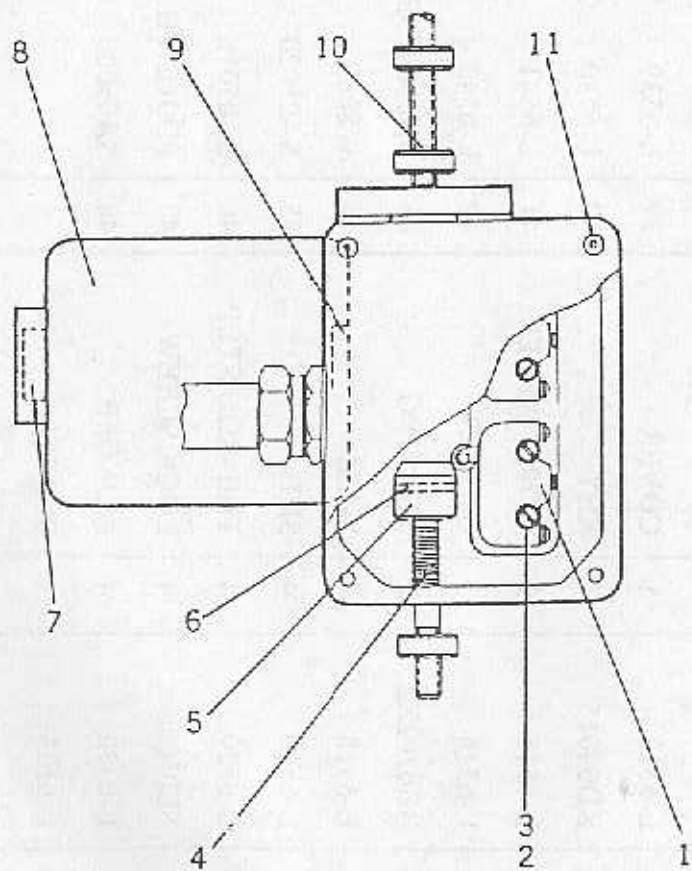
KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LB-06-303	1	CONTROL BOX				
2	LT-06-301	1	SPEED INDICATOR PLATE				
3	EP-6752-2	1	BUTTON				
4	SN04B05B	4	SCREW				
5	L-6405	1	SUPPORT POST				
6	SL04B07B	2	SCREW				
7	EC08B20A-1	1	1/2" CONNECTOR STRAIGHT				
8							
9	L-6409	1	INDICATOR ROD				
10	LB-06-302	1	WINDOW				
11	SL04B04B	2	SCREW				
12	SL04B	2	LOCK SCREW				
13	EP-6755-1	1	TOGGLE SWITCH				
14	EP-6767	1	TOGGLE SWITCH				
15	EP-6754-1	1	BUTTON				



## **VARIABLE SPEED DRIVE CONTROL ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	EP-LS-1704	2	MICRO SWITCH	27	L-6527	1	SPRING
2	SC5/32B16B	4	SCREW	28	L-6528	1	NUT
3	WGWS04	4	LOCKWASHER	29	L-6529	1	NUT
4	L-6504	2	SPRING	30	L-6530	1	BEARING CAP
5	L-6505	2	SWITCH TRIP	31	SA05012	3	SCREW
6	SL06006	2	SCREW	32	L-6532		SHIM
7	BB6200ZZ	1	MOTOR BEARING	33	L-6533	1	SPACER
8	L-6508	1	MOTOR	34	L-6534	1	MOTOR WORM
9	BB6001ZZ	1	MOTOR BEAR	35	NH05BFN	1	NUT
10	L-6510	1	TRIP ROD	36	L-6536	1	NUT
11	SN03B05B	4	SCREW	37	L-6537	1	SWIVEL PIN
12	L-6512	2	CONTROL HOUSING	38	SL05010	1	SCREW
13	L-6513	1	COVER	39	L-6539	1	FIXED BLOCK
14	KD04015	1	KEY	40	L-6540	1	BACKING PLATE
15	L-6515	1	WORM WHEEL	41	L-6541	1	INSULATOR
16	L-6516	1	GASKET	42	L-6542	1	BUSHING
17	BB6202ZZ	2	GEARING	43	SH08B103B	2	WASHER
18	L-6518		SHIM	44	WS08B	2	SPRING WASHER
19	L-6519	4	SHIM	45	SA05020	3	SCREW
20	L-6520	4	TRIP ROD STOP	46	SA05016	3	SCREW
21	SL05006	4	LOCK SCREW	47	PD01B10B	1	PIN
22	L-6332	4	PIUNGER	48	SA05008	1	SCREW
23	L-6523	1	SCREW				
24	OH02PT	1	GREASE FITTING				
25	L-6525	1	SCREW				
26	L-6526	1	NUT HOUSTING				

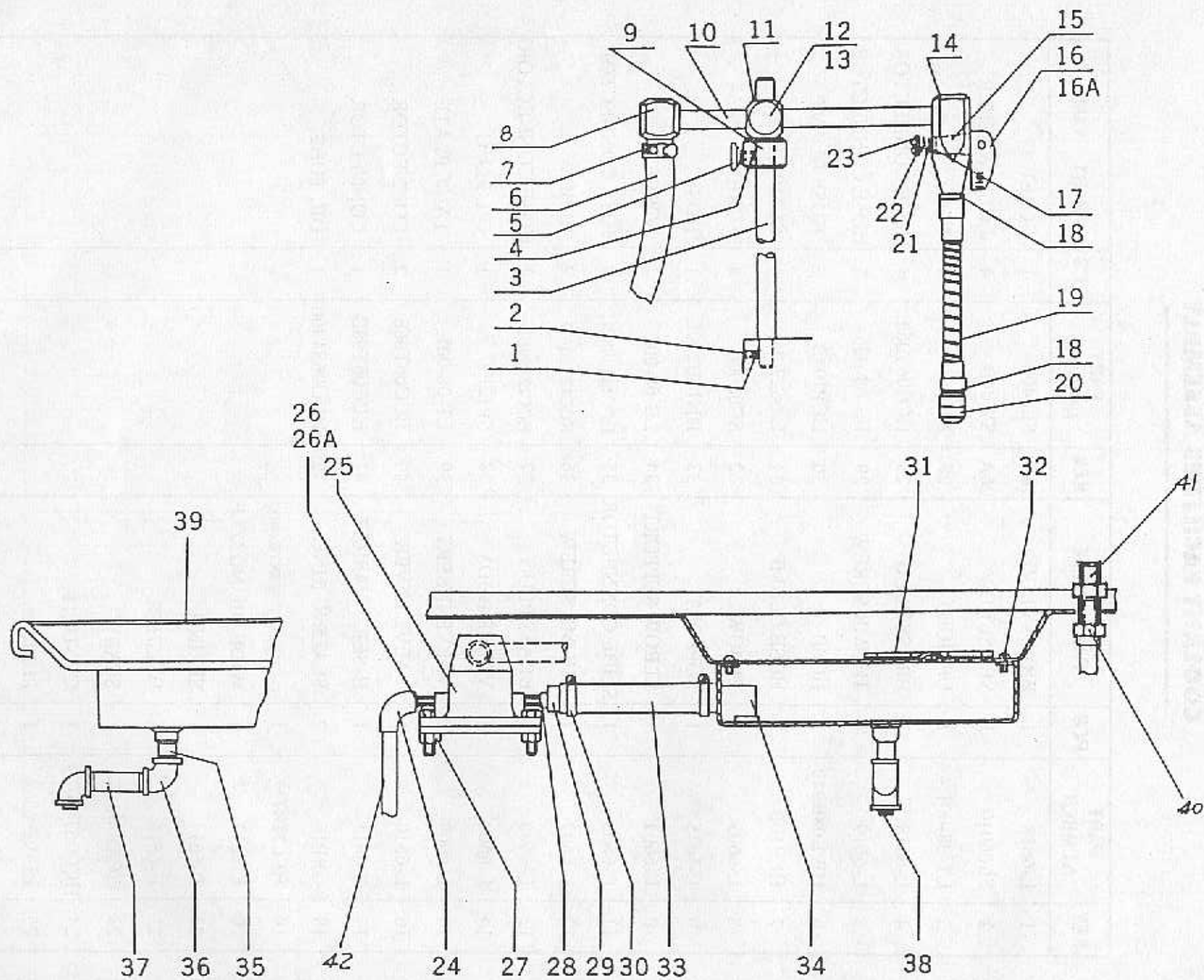
**CYCLEMATIC MACHINERY INDUSTRY CO., LTD.**





## **COOLANT FACILITIES ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	L-6618	1	BRASS PLUG	16A	SL04004	1	SCREW
2	SL06010	1	SET SCREW	26A	SW04B	4	LOCK WASHER
3	LT-08-001	1	UPRIGHT	27	NH06	4	NUT
4	L-6618	1	BRASS PLUG	28	HCC06T06T	1	HOSE CONNECTOR
5	L-6619	1	THUMB SCREW	29	LB-08-005	1	HOSE CONNECTOR
6	HWB08B940	1	HOSE	30	HCP104B	2	HOSE CLAMP
7	HCP10B	2	HOSE CLAMP	31	L-6629-2	1	SUMP CLAMP
8	L-6603	1	ELBOW	32	SC06006	4	SCREW
9	L-6615	1	SUPPORT	33	HN16B200L	1	HOSE
10	L-6604	1	ELBOW SUPPORT	34	LB-08-002	1	SCREEN
11	L-6605	1	SLIDE CONNECTOR	35	HCC12T308BL	1	HOSE CONNECTOR
12	L-6607	1	THUMB SCREW	36	HCC12T90AD	2	ELBOW
13	L-6606	1	BRASS PLUG	37	HCC12T90BL	1	HOSE CONNECTOR
14	L-6608	1	VALVE BODY	38	SP12PT	1	OIL PLUG
15	L-6609	1	VALVE INSERT	39	LT-08-001	1	TANK PLATE
16	L-6610	1	VALVE LEVER	40	HCC06T06S	2	CONNECTOR
17	L-6611	1	INSERT WASHER	41	HCC06T08D	1	CONNECTOR
18	ORP10	2	SEALING RING	42	HNO06S1400	1	OIL TUBE
19	HE02T8TE	1	FLEXIBLE TUBE EXTENSION				
20	L-6613	1	WIDE OIL NOZZLE				
21	L-6614	1	SPRING				
22	L-6616	1	WASHER				
23	SC05008	1	SCREW				
24	HCC06T90AD	1	CONDUIT				
25	LB-08-006	1	PUMP				
26	SH06020	4	SCREW				

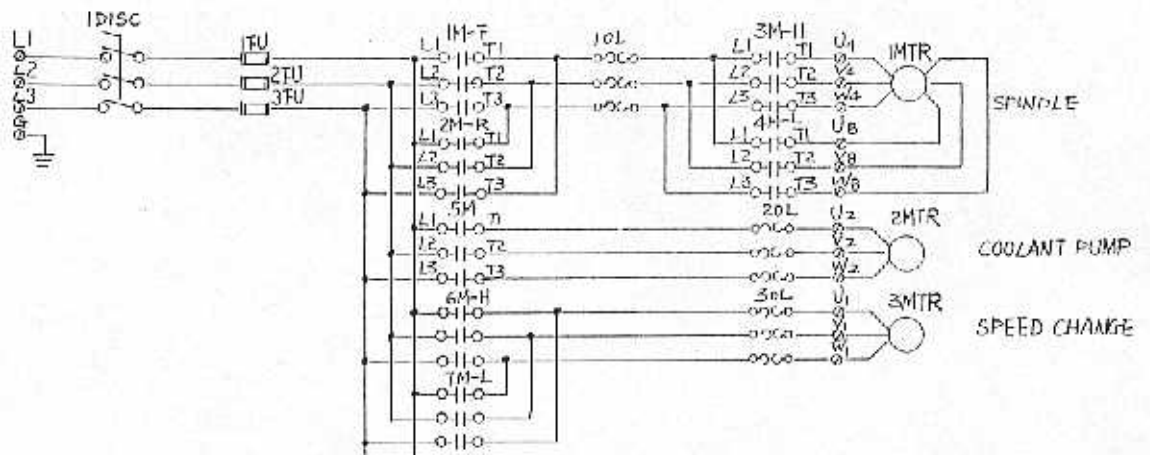


1DISC	Disconnect Switch	EP-CS-18B	2CS	Select Switch	EP-TS-303B
1.2.3.FU	Fuse	EP-FT-25A	3CS	Select Switch	EP-TS-52A
4.6FU	Fuse	EP-FT-5A	1LS	Limite Switch	EP-LS-1300
5FU	Fuse	EP-FT-10A	2.3LS	Limite Switch	EP-LS-1306
10FU	Overload Realy	EP-OR-15A	4.5LS	Limite Switch	EP-LS-1704
2.30.L	Overload Realy	EP-OR-1.7A	1.2.3 Rec	Rectifier	EP-OP-25A600V
1MF	Contactor	EP-MC-25G	2T	Autotransfomer	EP-TFM-3A110V
2MR	Contactor	EP-MC-25G	IL	Inductor	EP-TFM-065
3MH	Contactor	EP-MC-25G	1R	Resistance	EP-OP-5K30W
4ML	Contactor	EP-MC-25G	4CS	Select Switch	EP-TS-303D
5M	Contactor	EP-MC-16G			
6MH	Contactor	EP-MC-11G (3A1b)			
7ML	Contactor	EP-MC-11G (3A-b)			
8M	Contactor	EP-MC-11G (3A1a)			
1T	Transfomer	EP-TFM-114			
1CR	Power Realy	EP-PR-2P			
1IL	Indicate Light	EP-PL-30W			
2IL	Indicate Light	EP-PL-18V			
G	Indicate Light (DS)	EP-PL-114G			
1PB	Push Botton	EP-BS-30RL			
2PB	Push Botton	EP-PS-30PLW			
1CS	Select Switch	EP-TS-303C			

FTL-618EM

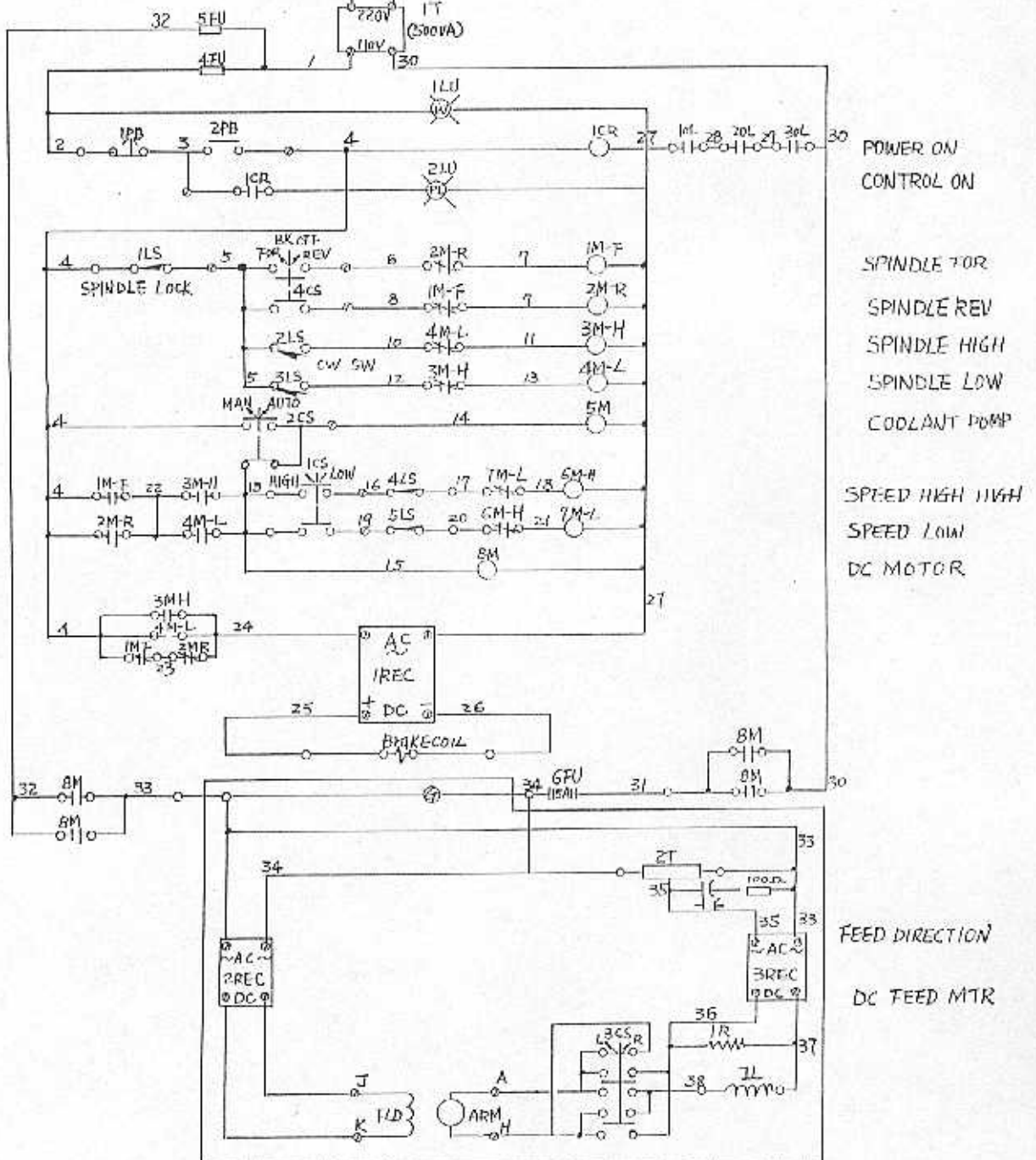
E

220V 3PH 60HZ



COOLANT PUMP

SPEED CHANGE



POWER ON  
CONTROL ON

SPINDLE FOR  
SPINDLE REV  
SPINDLE HIGH  
SPINDLE LOW  
COOLANT PUMP

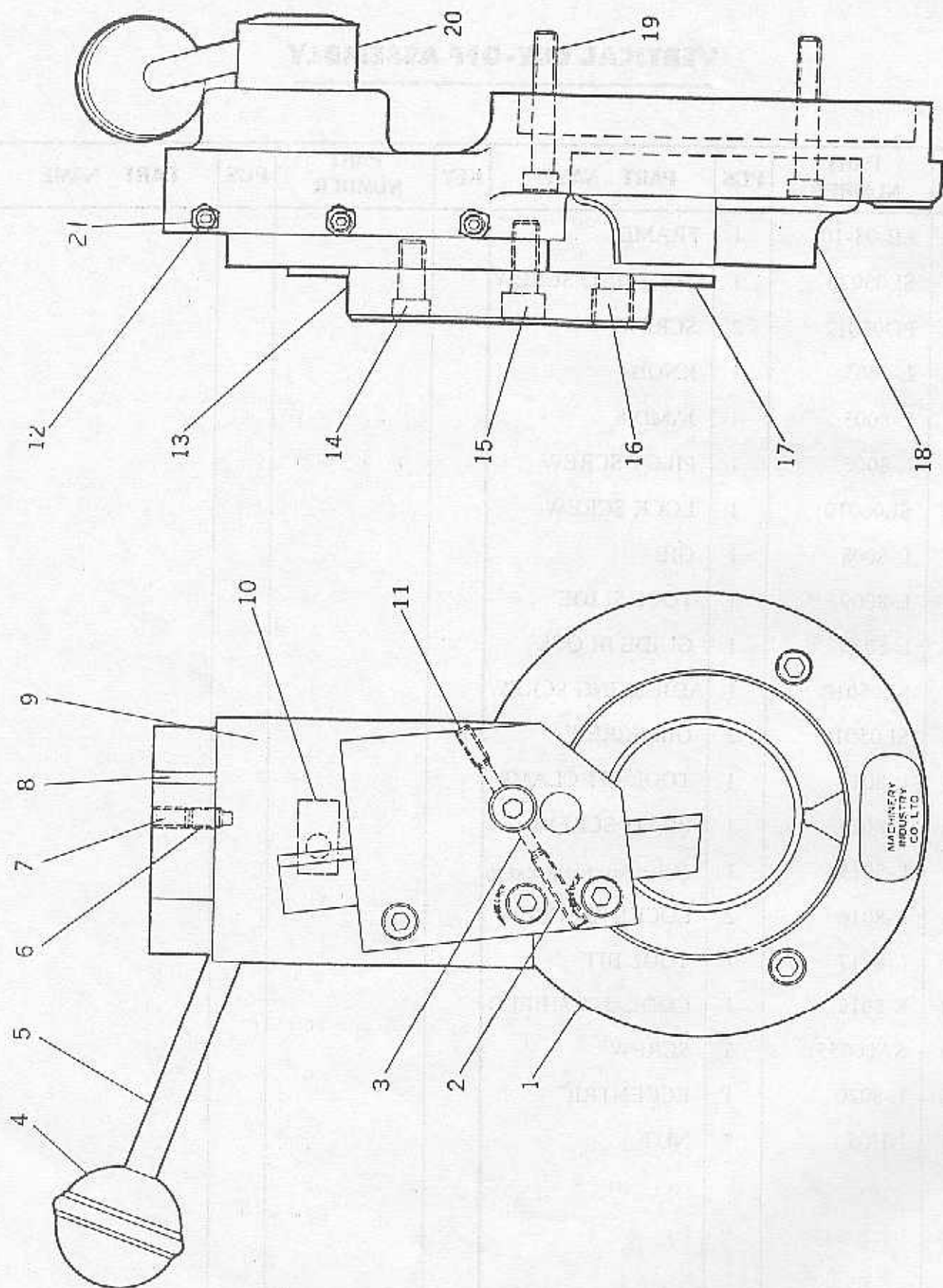
SPEED HIGH HIGH  
SPEED LOW  
DC MOTOR

FEED DIRECTION  
DC FEED MTR



## **VERTICAL CUT-OFF ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LB-08-101	1	FRAME				
2	SL05020	1	ADJUSTING SCREW				
3	PD03012	2	SCREW				
4	L-5005	1	KNOB				
5	L-8005	1	JAMD,E				
6	L-8006	1	PILOT SCREW				
7	SL06010	1	LOCK SCREW				
8	L-8008	1	GIB				
9	L-8009	1	TOOL SLIDE				
10	L-8010	1	GUIDE BLOCK				
11	SL05010	1	ADJUSTING SCREW				
12	SL05010	3	GIB SCREW				
13	L-8013	1	TOOL BIT CLAMP				
14	L-8014	1	PIVOT SCREW				
15	L-8015	1	ADJUSTING CLAMP SCREW				
16	L-8016	2	LOCKING SCREW				
17	L-8017	1	TOOL BIT				
18	L-8018	1	COOLANT SHIELD				
19	SA06055	3	SCREW				
20	L-8020	1	ECCENTRIC				
21	NH05	3	NUT				



**CYCLEMATIC MACHINERY INDUSTRY CO., LTD.**

## **TAILSTOCK ASSEMBLY**

KEY	PART NUMBER	PCS	PART NAME	KEY	PART NUMBER	PCS	PART NAME
1	LT-09-101	1	TAILSTOCK BODY	27	LB-05-442	1	LOCK SCREW
2	PD03104B	1	PIN	28	LT-09-106	1	TAILSTOCK SPINDLE
3	NH10	1	NUT	29	LT-09-112	1	HANDLE
4	WB10	1	WASHER	30	C-03-401	1	LOCK PLUG
5	KD04012	1	KEY	31	LT-09-111	1	KEY
6	LT-09-102EM99	1	HANDLE WHEEL	32	LT-09-114	1	WASHER
7	LT-05-203	1	COVER PLATE	33	LT-09-113	1	LOCK PLUG
8	LT-09-121	2	SPRING	34	PD05112B	1	PIN
9	LT-05-432	2	KEY	35	SA05016	1	SCREW
10	LT-05-431	1	COLLAR	36	LT-09-116	1	PLUG
11	LT-05-428	1	GEAR	37	LT-09-115	1	HANDLE
12	LT-05-207EMC99	1	ZERO RING	38	LT-09-117	1	BUSHING
13	LT-05-427	1	GEAR	39	LT-09-109	1	LOCK BOLT
14	SA05016	4	LOCK SCREW	40	L-9010	1	LOCK BLOCK
15	LT-09-105EM99	1	BEARING SPACER	41	LT-09-103	1	GIB
16	LT-09-119	1	SPACER	42	SA06025	4	SCREW
17	BP-5202NR	1	BEARING	43	LT-05-219	1	SCREW
18	LT-09-107EM99	1	SCREW SHAFT	44	NH06	1	NUT
19	LT-05-324	1	HANDLE				
20	SL06008	1	SCREW				
21	LT-05-206EC	1	DIAL RING				
22	LT-05-206MC	1	DIAL RING				
23	LT-05-430	1	GEAR				
24	LT-05-429	1	SHAFT				
25	LT-09-110	1	LOCK NUT				
26	LT-09-108	1PR	NUT				

