

## CONTENTS

	<b>PAGE</b>
PURPOSE OF THIS MANUAL.....	1
LEVEL ADJUSTMENT PROCES.....	2
LIFTING MACHINE.....	3
A.) INSPECTION AND CLEANING OF MACHINE.....	3
B.) FOUNDATION, INSTALLATION, AND LEVELING.....	3
C.) ELECTRICAL CONNECTIONS.....	4
D.) LUBRICATION.....	5
E.) SPINDLE CONTROL LEVER.....	6
F.) QUICK CHANGE GEAR BOX.....	7
G.) AUTOMATIC THREAD LENGTH CONTROL.....	8
H.) SPINDLE BRAKE.....	8
I.) BELT ADJUSTMENT.....	9
J.) COLLET CLOSER-REMOVAL.....	9
K.) COLLET CLOSER-REPLACEMENT.....	9
L.) COLLET CLOSER-ADJUSTMENT.....	10
M.) CARRIAGE INDICATED RING.....	10
N.) CARRIAGE LOCK.....	11
O.) CARRIAGE CLUTCHES.....	11
P.) CROSS SLIDE INDICATING RING.....	11
Q.) QUICK-ACTING TOOL POST COMPOUND SLIDE ASSEMBLY...	12
R.) POWER FEED UNIT.....	13
S.) COOLANT FACILITIES.....	14
T.) TAILSTOCK.....	14
U.) TAILSTOCK-SPINDLE LOCK.....	14
V.) TAILSTOCK BODY LOCK.....	14
THREAD CUTTING.....	15
OUTSIDE CHANGE GEARS.....	19
METRIC THREADS USING OUTSIDE CHANGE GEARS.....	22
PARTS ASSEMBLY NUMBER.....	30
ELECTRIC CONTROL PARTS&RD.....	64

## **PURPOSE OF THIS MANUAL**

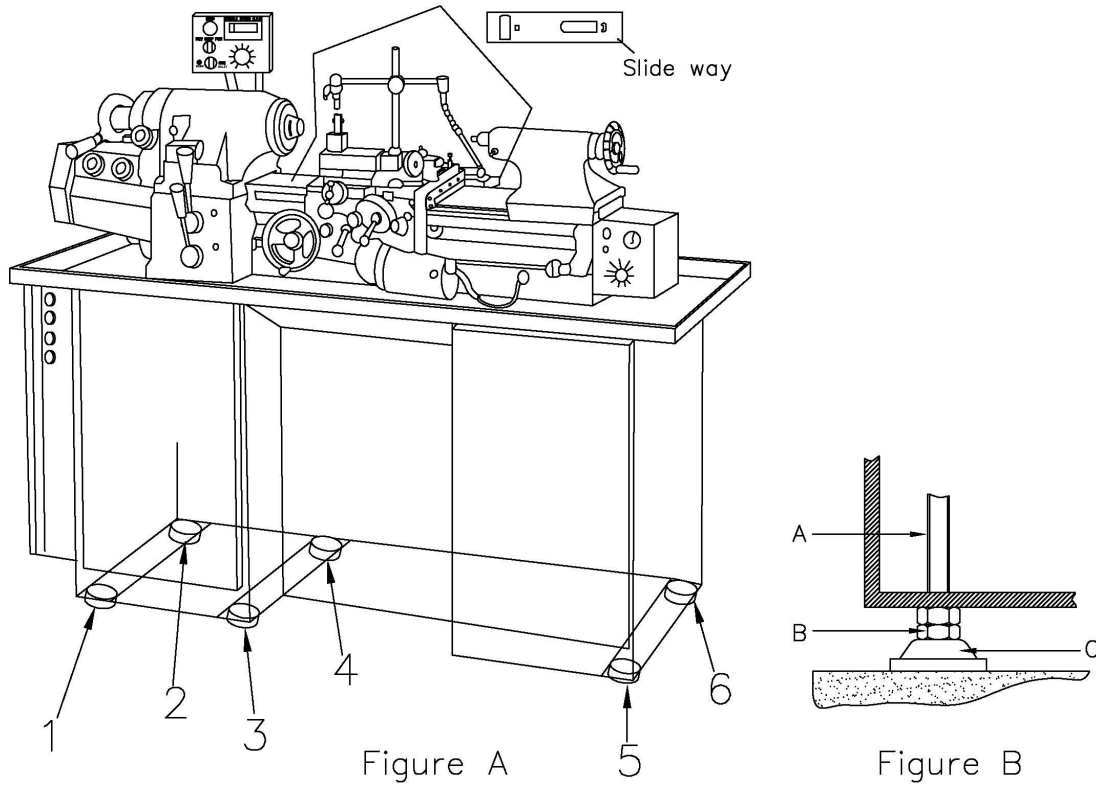
The model ATL-618EVS series machine is built for easy and safe operation and excellent manufacturing of work in process. The machine is built with high quality material, and carefully to exacting standards that guarantee the life, economical use, accuracy, and minimum maintenance of the machine.

This manual is an introduction to the ACRA model ATL-618EVS HIGH ACCURACY TOOL ROOM LATHE. It is used for installation, operation and maintenance of the ATL-618EVS ACRA 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 ATL-618EVS machine.)

**FOR MODEL ATL-618EVS EQUIPPED WITH ELECTRONIC  
VARI-SPEED SYSTEM**

Place one spirit level in Z direction and one in X direction on slide way



ATL-618EVS

## Level adjustment process

1. Put pads C (Figure B) under each of six points.
2. Insert the pillar A into the pedestal hole and adjust the nut B to the location according to machine level need.
3. Make sure every point is touching the ground to support the machine.

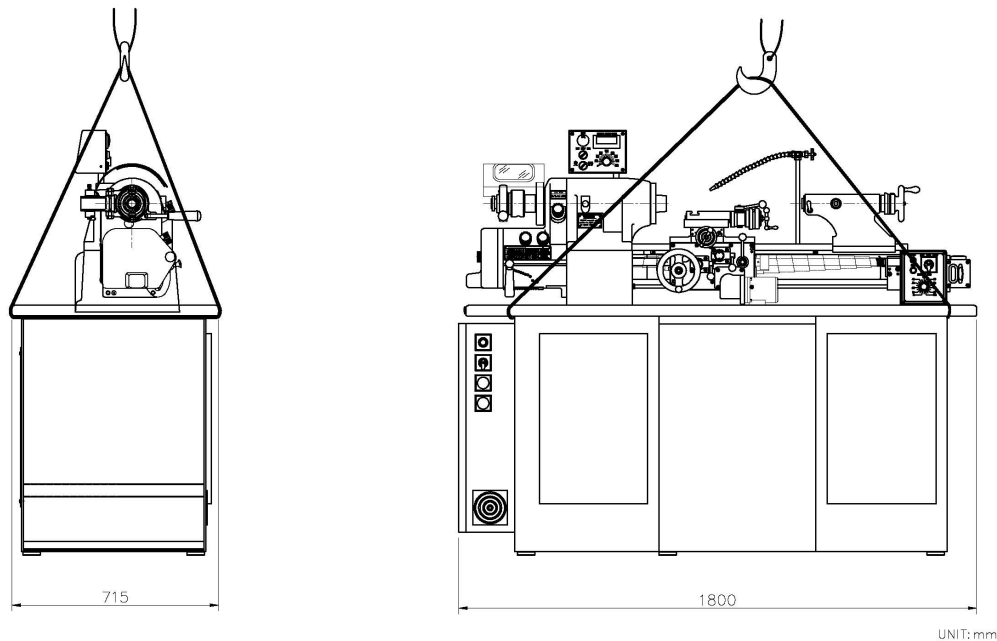


Figure 1 – Lifting machine

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 1050kgs (2300 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 a 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 MACHINES 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 coners 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 ATL-618EVS TOOLROOM 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. Pull out Spindle locking Pin “E” (Figure 4), turn “C” (Figure 5) in forward position. The spindle should rotate counterclockwise when viewed from the tailstock end of the machine. If the spindle dose not turn in the correct direction, turn Cam Switch “A” (Figure 2) to “OFF” position. Disconnect electric power source, and interchanges any two leads until the turning direction is correct. When the spindle is rotation correctly, secure switch case cover, turn Cam Switch “A” (Figure 2) to “ON” position. Please check the coolant direction when first time power up the machine.

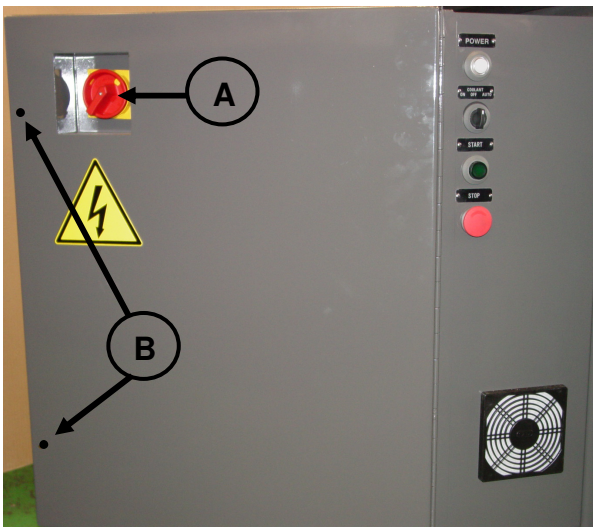


Figure 2-Control Unit Door

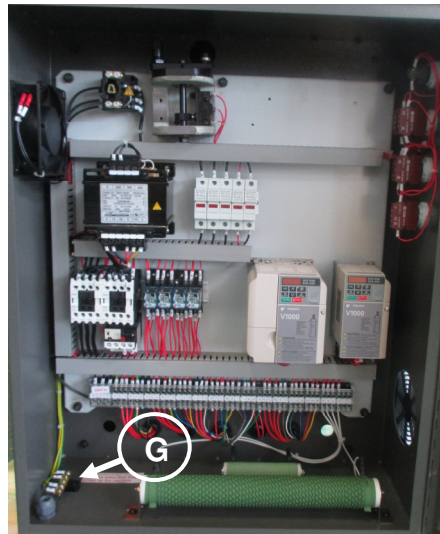


Figure 3-Control Unit

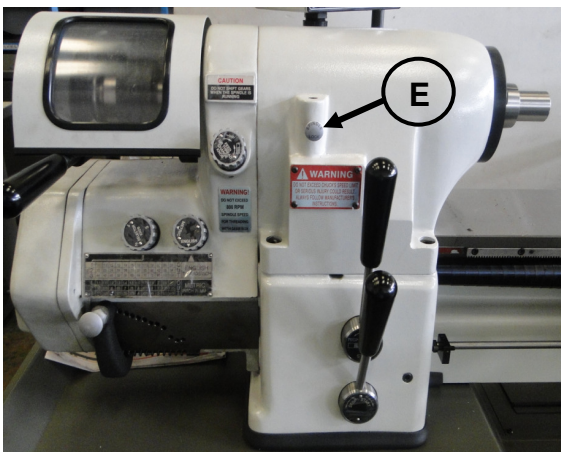


Figure 4-Control Speed and Direction



Figure 5-Speed Control Box

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

## 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.

### 1. CARRIAGE LUBRICATION

Fill with Mobil Vactra Oil No.2 or equivalent in oil reservoir. Lift plunger on reservoir "R" (Figure 6) hold briefly and release to keep bed ways lubricated.

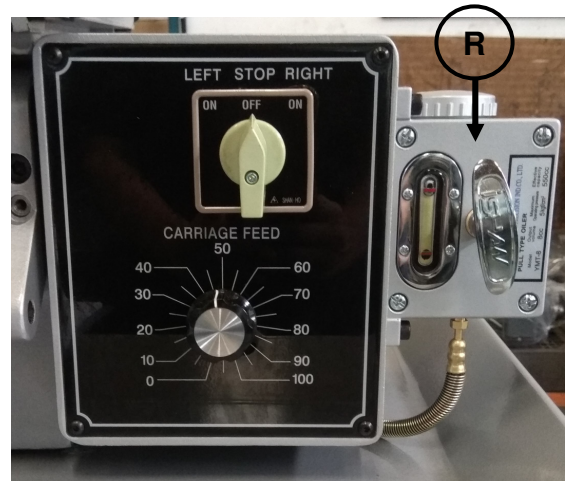


Figure 6-Speed Change Unit

### 2. 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 220 (Esso ATF or equivalent Change oil every 500 hours.)

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

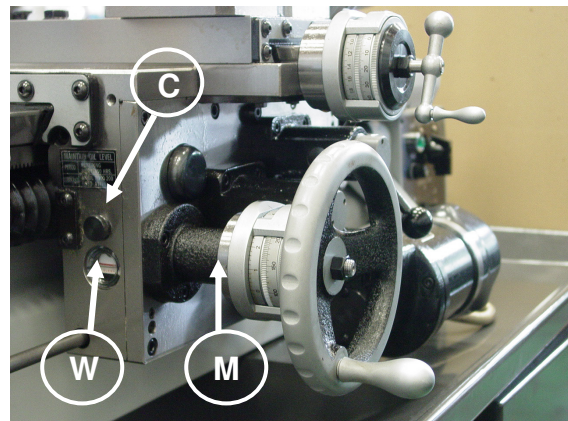


Figure 8-Gear Box Lubrication

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

### 3. 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 “D” (Figure 9). Turn cam switch “C” (Figure 11) to the forward or reverse position and move lever “G” (Figure 10) to the start position. Turn cam switch “I” (Figure 11) to the right to increase speed and to the left to decrease speed.

When use “collet”, speed of spindle can reach max. 4000 R.P.M.; when use “chuck”, speed can reach max. 3000 R.P.M.

Please stop running main spindle before change function. To change function, turn cam switch “Z” to right side to activate function of COLLET. Turn cam switch “Z” (Figure 11) to left side to activate function of CHUCK.

\* **Note:** Please do not change function when spindle is running. The function will not be successfully changed if disobey and may cause heavy vibration.



Figure 9-Control Unit Door



Figure 10-Control Speed and Direction



Figure 11-Speed Control Box

## F.) QUICK CHANGE GEAR BOX

The Quick Change Gear Box Unit see (Figure 12 & 14), 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 13). Pull out the ball of gear change arm “A” (Figure 13). Then move arm to left or right, insert in correct position, and change the selector knob “S” (Figure 13) to 1,2 or 3 position until desired thread cutting is acquired see (Figure 13). 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.

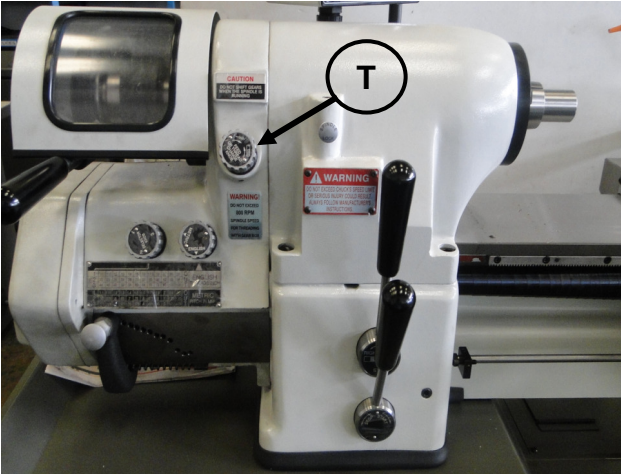


Figure 12-Feed of Thread Change

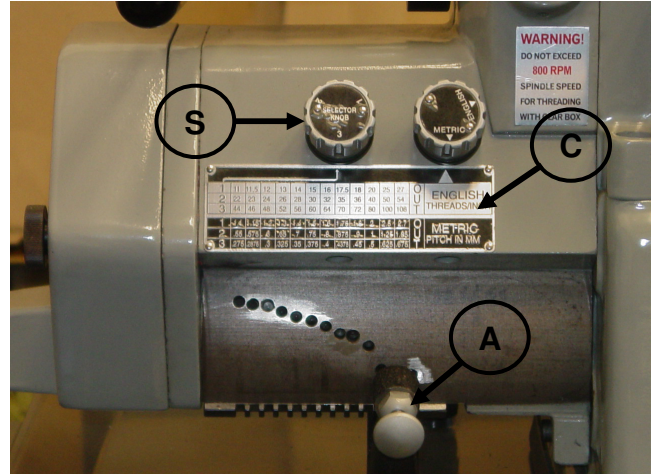


Figure 13-Thread Chart

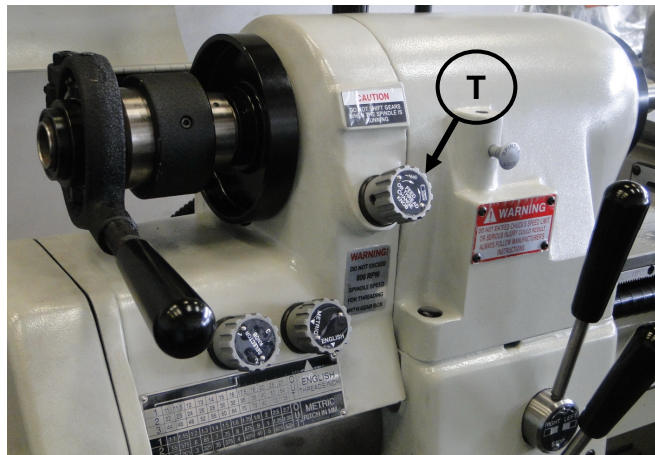


Figure 14-Feed of Thread Change

**※ CAUTION : DO NOT SHIFT GEARS KNOB “T” WHEN THE SPINDLE IS RUNNING.**



## G.) AUTOMATIC THREAD LENGTH CONTROL

When threading into a blind hole or to a shoulder without a thread relief. The lead screw half nut if engaged at the start of the threading work is completed. Left or right hand threads are controlled by Control lever "D" (Figure 15), the lever is joined with the control bar "B" (Figure 16). When the carriage touches the adjusting screw "S" (Figure 16) of the length control bar, it will push the lever "D" (Figure 15) to "STOP" position, and make the lead screw stop. For method of threading cut, please see Page 10, QUICK ACTING.

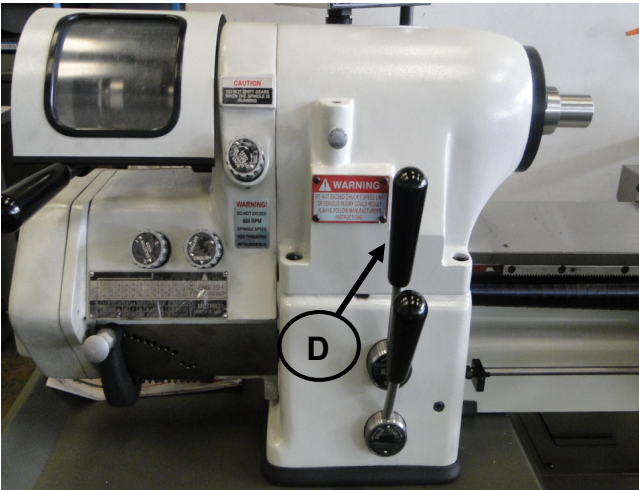


Figure 15-Control speed and Direction

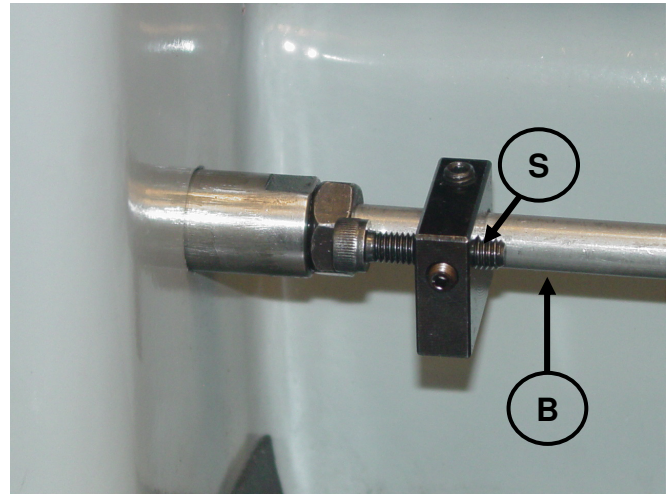


Figure 16-Thread Length Control

## H.) SPINDLE BRAKE

Inverter unit "E" is used to perform dynamic braking. In addition, discharge resistor "C" shortens braking time (Figure 17).

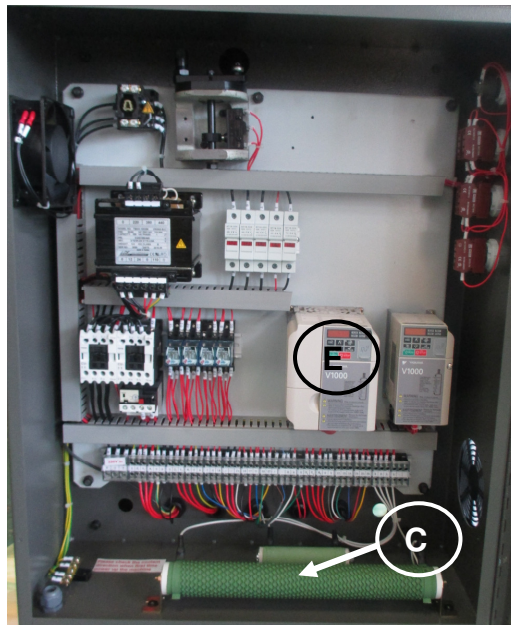


Figure 17-Control Unit

## I.) BELT ADJUSTMENT

Run spindle at approximately 1000 rpm. Move lever "G" (Figure 18) to center "STOP" position and let the spindle coast to a stop. This is done to equalize belt tension. Loosen lock nut "N" (Figure 19) 19mm wrench. Turn adjusting screw "P" (Figure 19) 6mm socket head wrench clockwise to tighten belts. Stop machine and check belt tension, there should be approx. 25.4mm (1") of play in belt.

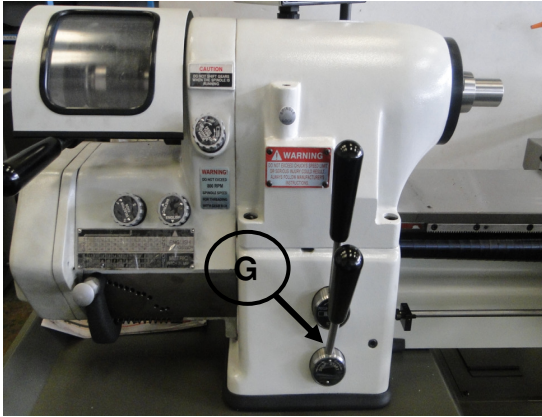


Figure 18-Control Speed and Direction

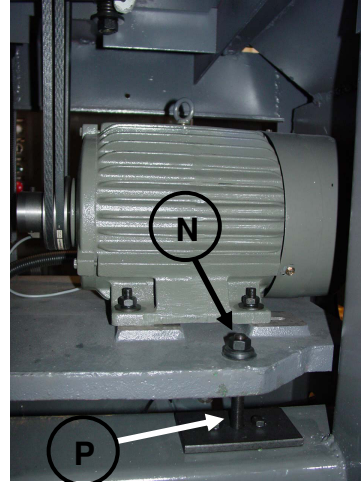


Figure 19-Belt Adjustment

## J.) 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 collect closer should be removed often for cleaning to prevent loading of chips between collet tube and inside of spindle at rear and collet threads. Removal method is : Pull out pin "L" (Figure 20). Slide draw tube out of the spindle. Do not turn the adjusting nut "N" (Figure 20). 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 20), this screw has been adjusted at the factory for proper operation of the collet closer.

## K.) 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 20) is located. Apply a film of light oil on rear of spindle Do not force Adjusting Nut "N" (Figure 20) on spindle. If Adjusting Nut "N" (Figure 20) 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 20) of the collet closer tube, replace collet closer and insert Link Pin "L" (Figure 20).

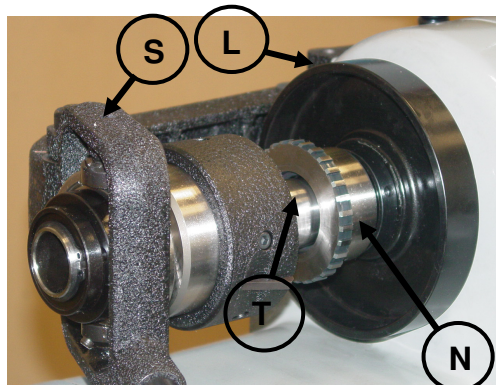


Figure 20-Collet Closer Removal

## L.) 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 21). To engage lock pin, turn spindle by hand till lock pin enters notch to lock.
3. Press the Closer Adjusting Finger "F" (Figure 22) down to the point "P" (Figure 22).
4. Guard "G" (Figure 22) forward with the left hand, and hold the collet or stop chuck with the right hand at the same time.
5. Place a work piece in collet or step chuck.
6. Place lever "L" (Figure 22) to the extreme left fixed position. Turn the Shell Guard "G" (Figure 22) toward operator until the work piece is clamped by the collet.
7. Place lever "L" (Figure 22) to the right, the released position. Turn Shell Guard "G" (Figure 22) toward operator, move the Adjusting Finger "F" (Figure 22).
8. Test collet closer's tension on work piece. If the work piece needs additional gripping pressure, press down on the adjusting finger "F" (Figure 22) and turn Shell Guard "G" (Figure 22) forward and lock. (see Figure 22).

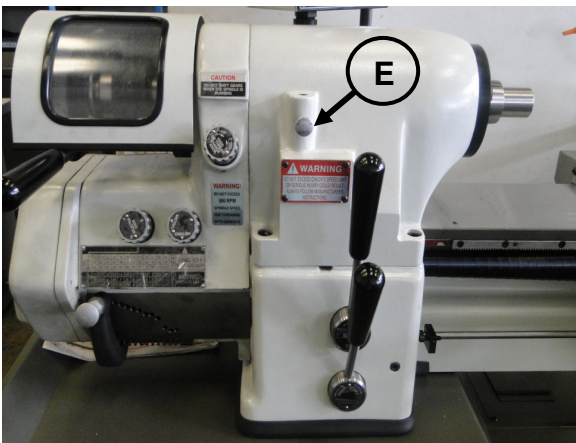


Figure 21-Control Speed and Direction

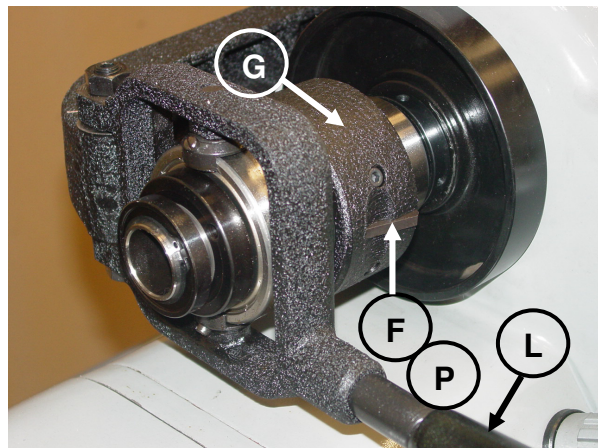


Figure 22-Collet Closer Adjustment

## M.) CARRIAGE INDICATING RING

Dual dials with Inch and Metric Handwheel dial "W" (Figure 23) graduations are in 0.01" 0.2mm. It is built for the operator's convenience of operation. (Figure 22) Spring loaded indicating ring, just turn to required location by loosening lock screw "L" (Figure 23) Sliding cover cage exposes only the dial in use.

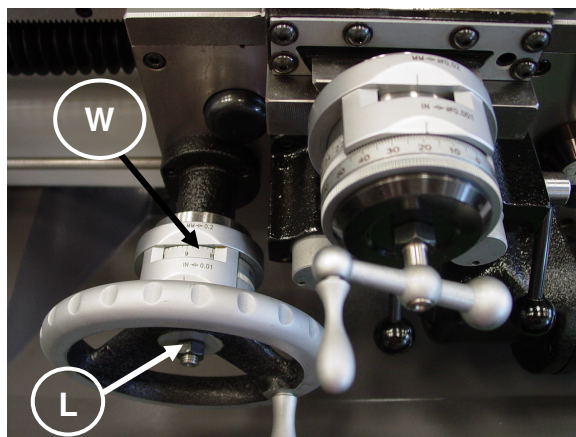


Figure 23-Carriage Indicating

## N.) CARRIAGE LOCK

To hold the carriage in a fixed position on the bed use the Carriage Lock Handle "H" (Figure 24). Move the lock handle "H" (Figure 24) clockwise toward the operator, lock the carriage in position. Move the lock handle "H" (Figure 24) counterclockwise away from the operator. To unlock the carriage.

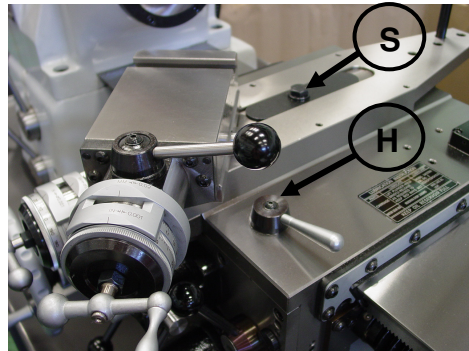


Figure 24-Carriage Lock

## O.) 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. When the machine contacts a feed "stop", it is intended for the clutch to slip, To operate clutches as shown in (Figure 25), raise handle "H" (Figure 25) is approx. 20degrees above horizontal, the clutch will engage, Push down the handle "H" (Figure 25), 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 25.

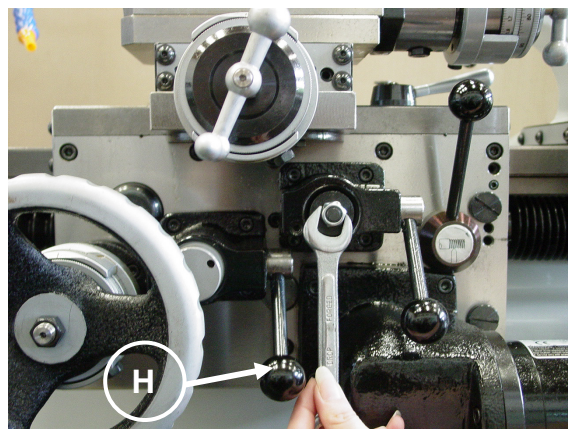


Figure 25-Carriage Clutches

## P.) CROSS SLIDE INDICATING RING

Dualdials with inch and metric handwheel dial. Each graduation of the Indicating Ring "C" (Figure 26) is 0.02mm (0.001") 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 freed and adjustment of clutches are identical with the operation and adjustment of carriage clutches. If ATL-618EVS TOOLROOM LATHE needs to be used with the taper turning attachment, loosen the screw "S" (Figure 26) with a spanner wrench.

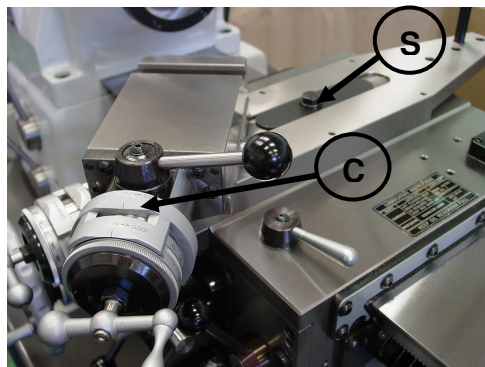


Figure 26-Carriage Look

### **Q.) 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 27) 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 27) is 0.02mm (0.001") on diameter.

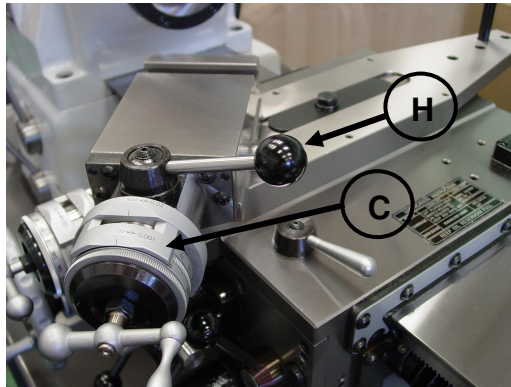


Figure 27-Cross Slide Indicated Ring and Quick Acting

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

## R.) POWER FEED UNIT

The carriage Power Feed unit is mounted on the carriage.

It is powered by a AC motor "M" (Figure 28).

1. The power feed can be operated only when the machine is running. Start the power feed by turning Cam Switch "S" (Figure 29).
2. The Cam Switch "S" (Figure 29) controls the direction of the power feed.
3. The carriage Feed Control "N" (Figure 29) controls the rate of feed. When Cam Switch "S" (Figure 29) 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" (Figure 29) is placed in "LEFT" position, the carriage will feed toward the left, the cross slide will feed toward operator.
5. Turn Cam Switch "S" (Figure 29) to "STOP" position, power feed motor is turned 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.**

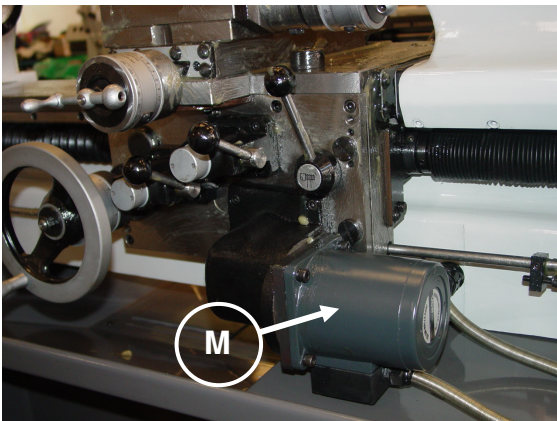


Figure 28-AC Motor

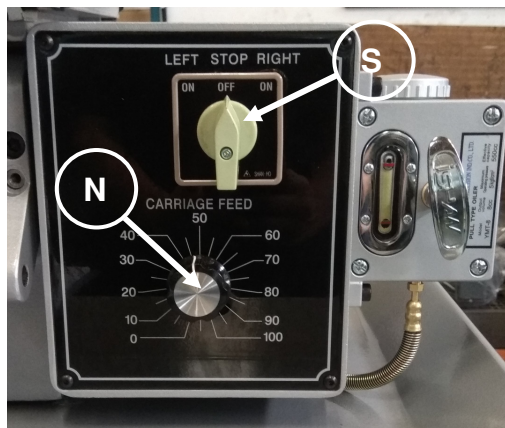


Figure 29-Power Feed Unit

## S.) COOLANT FACILITIES

The coolant pump is controlled by Switch "C" (Figure 30). Turn Switch "C" (Figure 30) 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 30-Control Unit Door

## T.) 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 1mm and has a travel of 3 95mm (3-3/4") The handwheel is dual dial Inch and Metric. Graduations are 0.02mm (0.001"). It is built for the operator's convenience of operation just turn the dial ring "D" (Figure 32) 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 31-Tailstock Spindle Travel

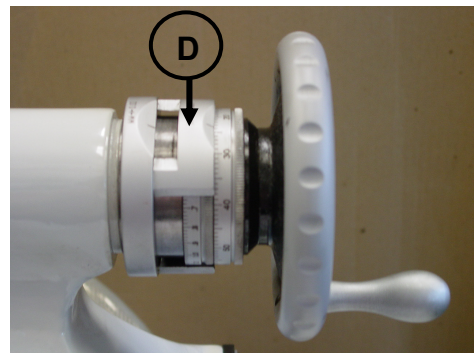


Figure 32-Handwheel Dial Ring

## U.) TAILSTOCK SPINDLE LOCK

The tailstock spindle lock holds the spindle securely in any travel position. Move lever "L" (Figure 33) toward the headstock lock position and backward to the released position.

## V.) TAILSTOCK BODY LOCK

The tailstock can be clamped in any position along the bed way by operating Lever "M" (Figure 33). The Lever "M" (Figure 33) should be adjusted to a clamp position between the two stop pins "A" (Figure 33) and "B" (Figure 33). When tailstock is fully clamped, lever "M" (Figure 33) should not contact stop pin "A" (Figure 33).

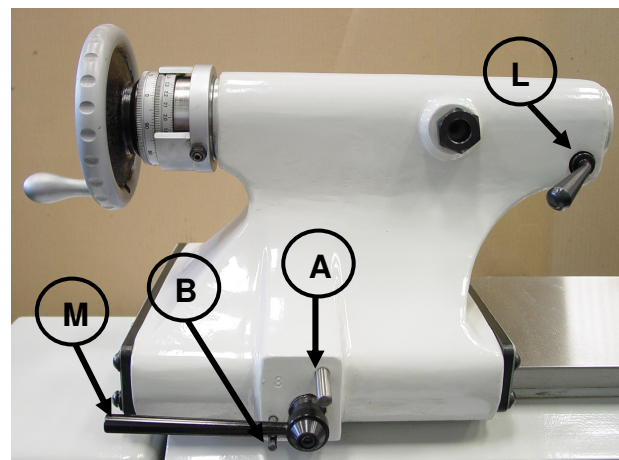


Figure 33-Tailstock Spindle and Body Lock

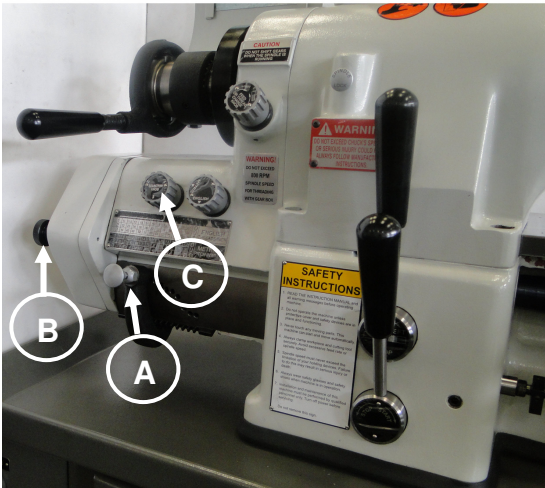


Figure 34-Headstock and Gearbox

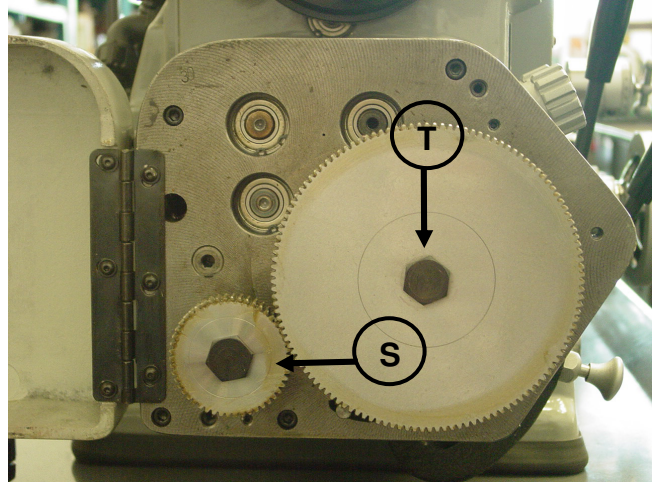


Figure 35-Thread Gearbox

## THREAD CUTTING

### **CAUTION : DO NOT RUN SPINDLE IN REVERSE WHEN THREADING.**

The ACRA ATL-618EVS is designed for rapid and accurate thread cutting. The quick-change gearbox permits instant selection of 36 different inch 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 800R.P.M.

Set the quick-change gearbox for desired pitch. To make a selection on the gearbox thread chart, pull the spring-pressured knob "A" (Figure 34), 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 far enough to position plunger into hole, loosen knob "S" (Figure 35), open gear box door and rotate gear "T" (Figure 35), until gears mesh and handle raises, permitting plunger to seat.

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

Set selector knob "C" (Figure 34), for number corresponding to left side of gearbox thread chart. Set knob "C" (Figure 34) 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 selector knob "C" (Figure 34) in line with arrow, loosen knob "B" (Figure 34) open gearbox door and rotate gear "T" (Figure 35), until gear mesh.



Set Inch/Metric knob “D” (Figure 36), 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” (Figure 36), OPEN GEARBOX DOOR AND ROATE GEAR “T” (Figure 37), until gears mesh and knob is felt to engage detent.

Engage gearbox by turning knob “E” (Figure 36), counterclockwise in the direction of arrow marked “THREAD” When turning knob “E” (Figure 36) <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” (Figure 36) while turning knob “E” (Figure 36) to left until definite click is heard.

Set compound slide at 61° 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 36), when moved to the left, will cause carriage to move to the left. When the carriage control level 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” (Figure 36) in center position.

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

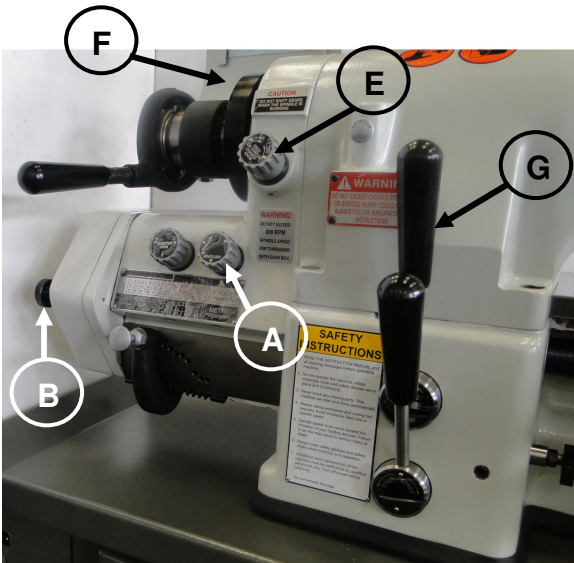


Figure 36-Headstock and Gearbox

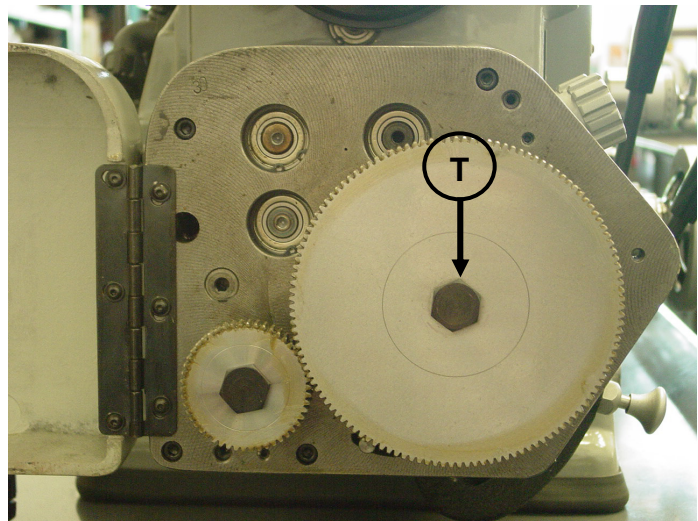


Figure 37-Thread Gearbox

Place lever "G" (Figure 38) in center position and engage lead screw nut "J" (Figure 40), by moving ball handled lever "H" (Figure 40) clockwise. Set two carriage stops "M" (Figure 39) approximately 1/2" from both ends of carriage. Loosen screw "K" (Figure 39) to make area location of stops. Loosen lock screw "N" (Figure 39) and turn stop screw "L" (Figure 39) to make fine adjustment. With threading tool away from work toward operator, make a trial run with the carriage. Pick up the exact relation between the tool and the shoulder or end of the thread by using the tool post slide. Run carriage to the right, checking the stop. Make adjustments so tool will clear end of work by 1/4".



Figure 38-Headstock and Gearbox

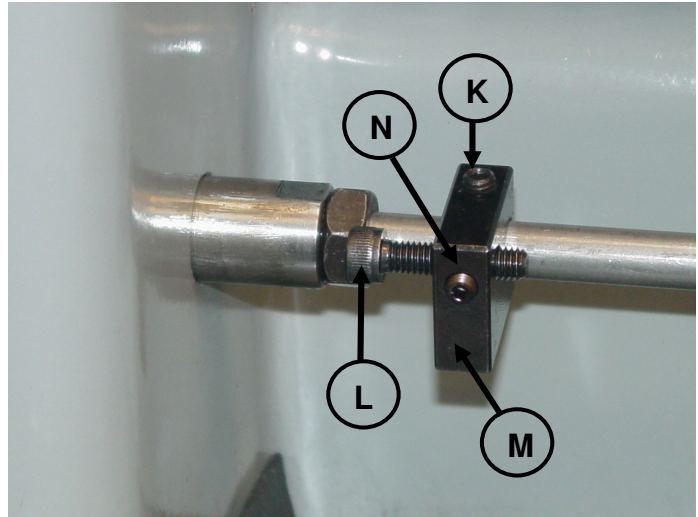


Figure 39-Thread Length Control

※ **CAUTION : LOCK CARRIAGE STOPS SECURELY BEFORE STARTING TO CUT THE THREADS. DO NOT RELEASE CARRIAGE NUT "J" UNTIL THREADING OPERATION IS COMPLETED.**

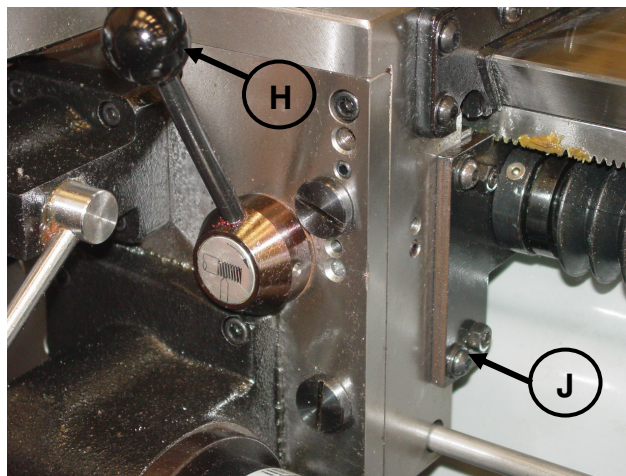


Figure 40-Thread Length Control

With carriage at rest and quick-acting handle “P” (Figure 42), forward in cutting position, feed the desired amount for each threading pass using cross slide handwheel “R” (Figure 42).

Move lever “G” (Figure 41), 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, lead screw and carriage to stop.

After each pass, withdraw threading tool from work with quick-acting handle “P” (Figure 42), and return carriage to starting position by moving carriage control lever “G” (Figure 41), to the right.

LEFT-HAND THREADS can be cut the same as right-hand with the spindle running “FORWARD” 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.

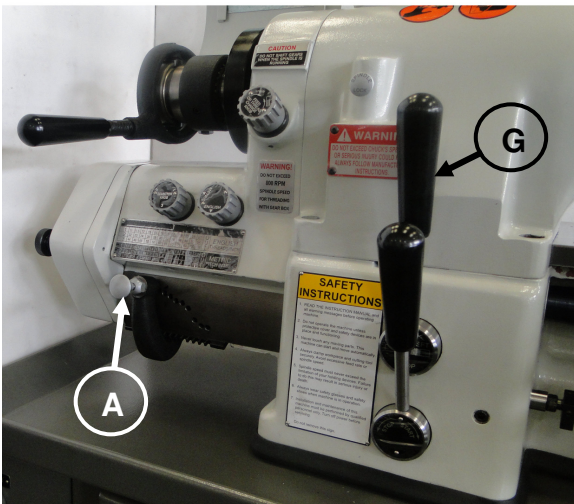


Figure 41-Headstock and Gearbox

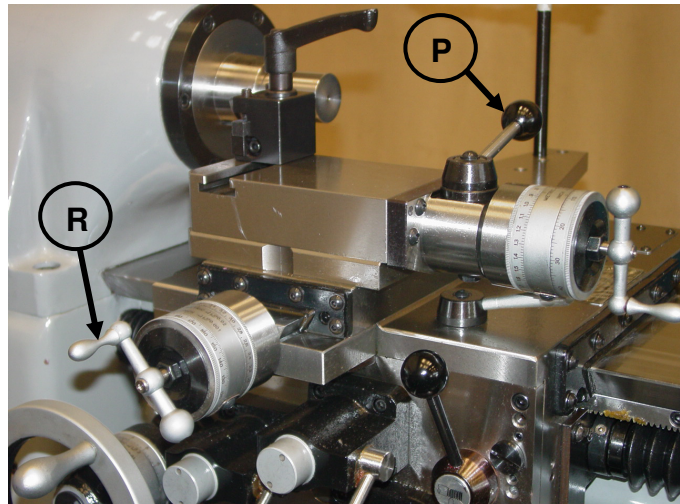


Figure 42-Carriage and Compound Slide

## 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 optional equipment. These gears, when set up to the gear chart, Figure 45 will cut 10 threads per inch or 0.25mm pitch according to set up. If ordered, three of the gears are shipped on the bracket and the other two are in place on the shafts as shown at “U” (Figure 44) and “W” (Figure 44).

**BEFORE SETTING UP CHANGE GEARS, PLACE KNOB “A” (FIGURE 43), IN THE “OUT” POSITION.**

Fastened to the tumbler handle bracket within the gear box is round safety bar “X” (Figure 44), 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.

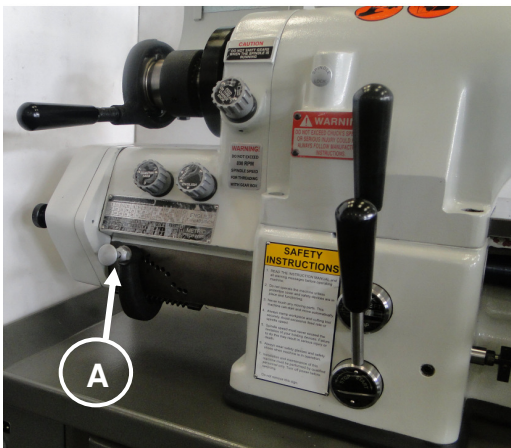


Figure 43-Headstock and Gearbox

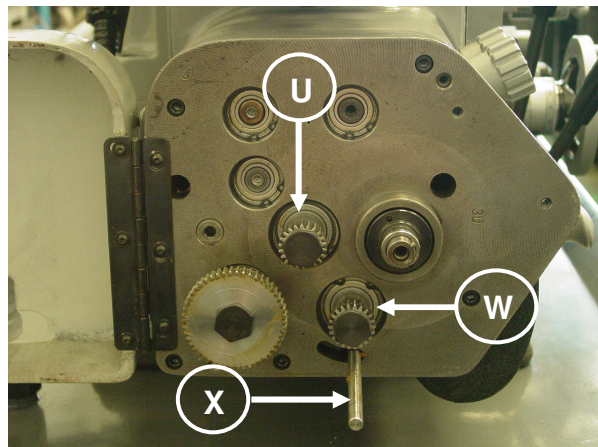


Figure 44-Threading Gearbox

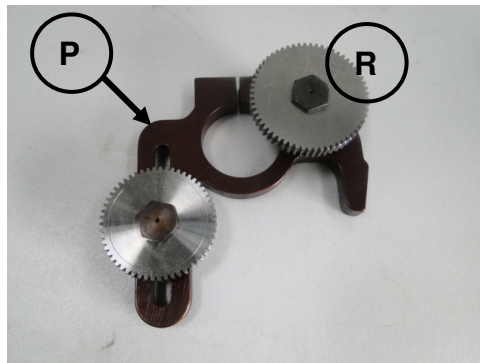


Figure 45-Change Gear Bracket “Optional”

## Inch Threads Using Outside Chang Gear

1. Turn disconnect switch "OFF".
2. On inch side of change gear bracket "D" (Figure 50), mount "First Gear on Stud" "C" (Figure 50) with spacer between gears. Do not tighten bolt "A" (Figure 50) fully.
3. Mount "Idler Gear" "Y" (Figure 50) but do not mesh with "First Gear on Stud" "C" (Figure 50), or tighten bolt "Z" (Figure 50) fully.
4. Loosen knob "S" (Figure 48), open gearbox door and remove 50 tooth gear "S" (Figure 48), and 127 tooth gear "T" (Figure 48). 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 49), and replace with specified gear.
6. Remove tumbler gear "W" (Figure 49).
7. Mount Change gear bracket assembly, Figure 48, on pivot post "V" (Figure 49). Do not tighten bracket bolt "H" (Figure 51), fully.
8. Make certain key is in place and mount "Screw Gear" "J" (Figure 51). Replace bolts "K" (Figure 51) and "M" (Figure 51).
9. Adjust "Second Gear on Stud" "G" (Figure 51), with 0.08"-0.010" backlash between it and "Screw Gear" "J" (Figure 51). Use plastic shim stock to help determine backlash. Tighten bolt "F" (Figure 51).
10. Adjust "Idler Gear" "E" (Figure 51) with 0.003"-0.004" backlash between it and "First Gear on Stud" (behind "Second Gear on Stud" in picture). Tighten bolt "N" (Figure 51).
11. Pivot bracket to obtain 0.003"-0.004" backlash between "First Gear" "L" (Figure 51) and "Idler Gear" "E" (Figure 51). Tighten bracket bolt "H" (Figure 51).
12. Make certain all gears are properly meshed and all bolts tightened.
13. Close gearbox door, tighten knob "B" (Figure 46), and turn selector knob "C" (Figure 46) to position specified on chart.
14. Turn Inch/Metric knob "D" (Figure 46) to Inch.
15. Turn Feed/Thread knob "E" (Figure 46) 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 46), and quick-acting handle "P" (Figure 47), will also be the same as when cutting threads from the gearbox.

**NOTE : (a) 50 tooth gear "S" (Figure 48), and 127 tooth gear "T" (Figure 48) must be remounted (without bracket) to obtain metric thread pitches through gearbox.**

**(b) When disassembling setup, remount 22 tooth gears "U" (Figure 49) and "W" (Figure 49).**

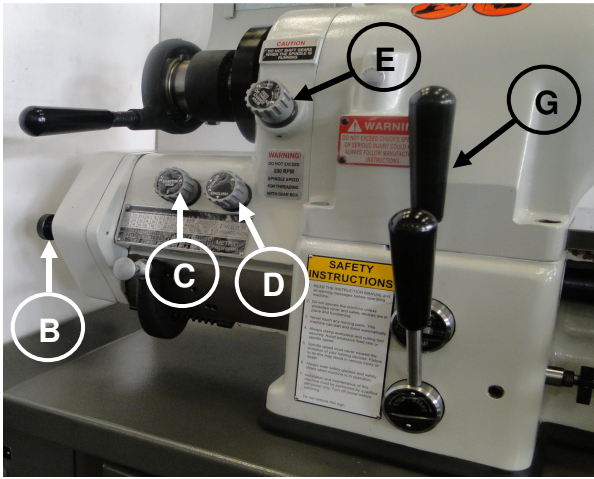


Figure 46-Headstock and Gearbox

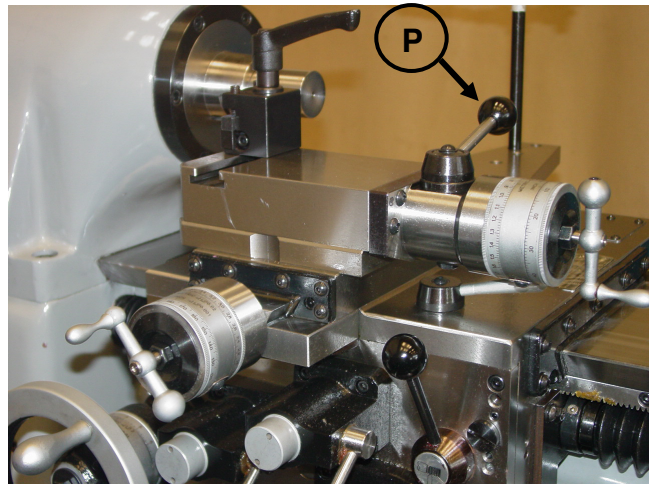


Figure 47-Carriage and Compound Slide

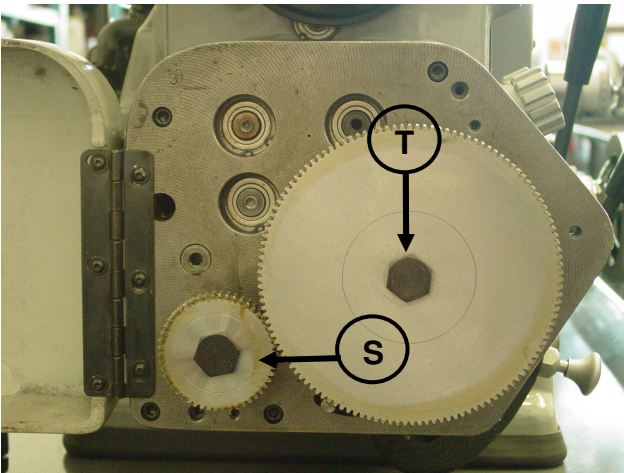


Figure 48-Thread Gearbox

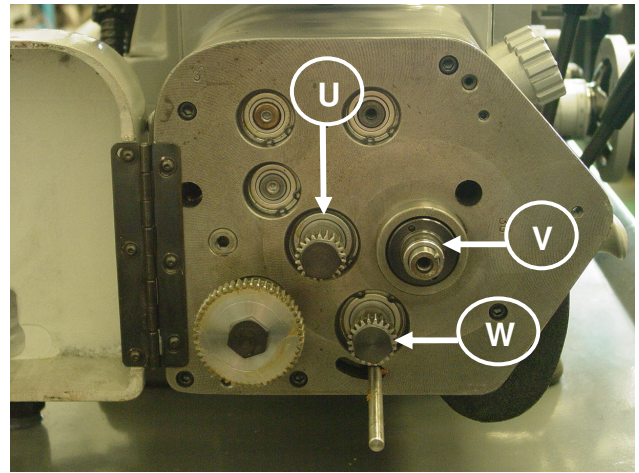


Figure 49-Threading Gearbox

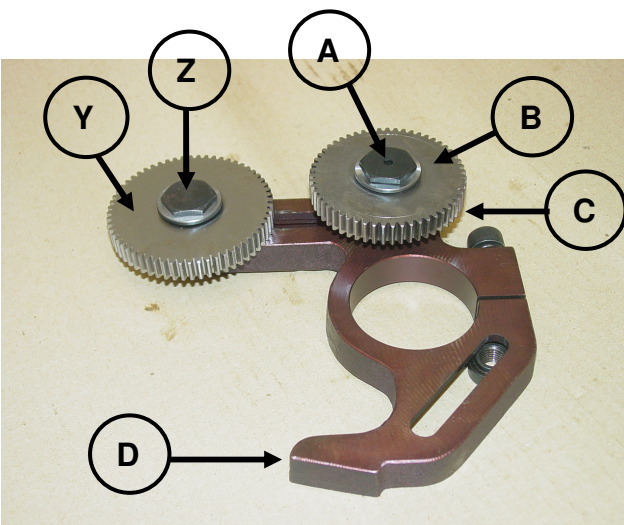


Figure 50-Change Gear Bracket

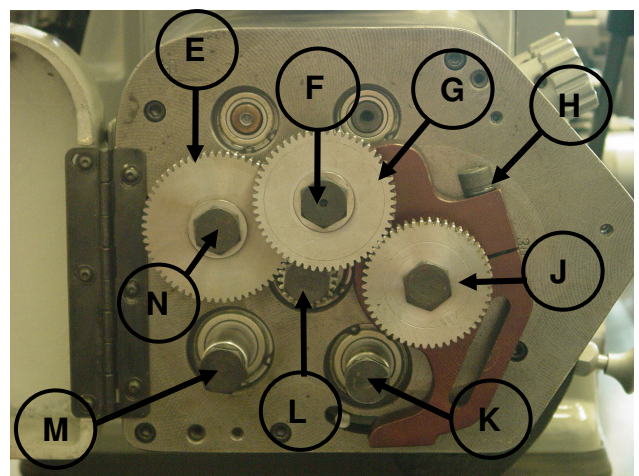


Figure 51-Mounting Change Gear Bracket

## **Metric Threads Using Outside Chang Gears**

1. Turn disconnect switch "OFF".
2. On metric side of change gear bracket "P" (Figure 56) mount "Idler Gear" "R" (Figure 56). Do not tighten bolt "S" fully.
3. Loosen knob "B" (Figure 52), open gearbox door and remove 127 tooth gear "T" (Figure 54).
4. Mount change gear bracket assembly, Figure 56, on pivot post "V" (Figure 57), Do not tighten bracket bolt "U" (Figure 55) fully.
5. Remove "First Gear" "U" (Figure 55), and replace bolt. Do not misplace key.
6. Mount "First Gear on Screw" "T" (Figure 57).
7. If thread chart specifies number of teeth in "Tumbler Gear" to be other than 22 teeth, remove gear "Y" (Figure 57) and replace with specified gear.
8. Adjust "Idler Gear" "X" (Figure 57) with 0.003"-0.004" backlash between it and "First Gear on Screw" "T" (Figure 57). Use plastic shim stock to help determine backlash. Tighten bolt "W" (Figure 57).
9. Pivot bracket to obtain 0.003"-0.004" backlash between "Idler gear" "X" (Figure 57) and "Tumbler Gear" "Y" (Figure 57). Tighten bracket bolt "J" (Figure 57).
10. Make certain key is in place and remount 127 tooth gear "A" (Figure 58). Tighten bolt "Z" (Figure 58).
11. Make certain all gears are properly meshed and all bolts tightened.
12. Close gearbox door, tighten knob "B" (Figure 52), and turn selector knob "C" (Figure 52) to position specified on chart.
13. Turn Inch/Metric knob "D" (Figure 52) to "Metric".
14. Turn Feed/Thread knob "E" (Figure 52) 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 52), and quick-acting handle "P" (Figure 53), will also be the same as when cutting threads from the gearbox.
16. Observe same operational cautions as when cutting threads from gearbox.

**NOTE : (a) 50 tooth gear "S" (Figure 54), and 127 tooth gear "T" (Figure 54) must be remounted without bracket to obtain metric thread pitches through gearbox.**

**(b) When disassembling setup, remount 22 tooth "Tumbler Gear" "W" (Figure 55), and 22 tooth "First Gear" "U" (Figure 55).**

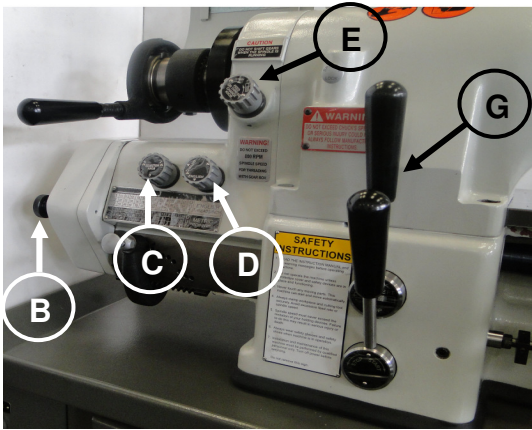


Figure 52-Headstock and Gearbox

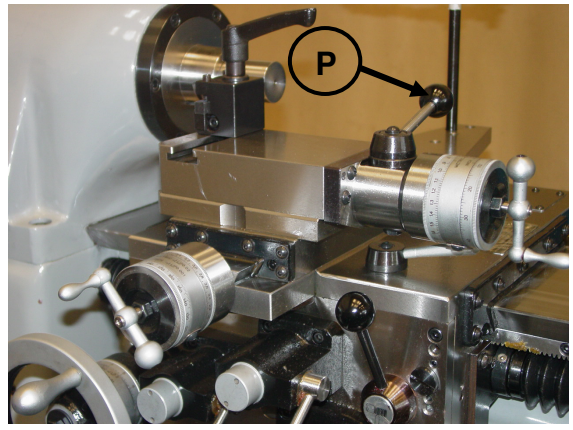


Figure 53-Carriage and Compound Slide

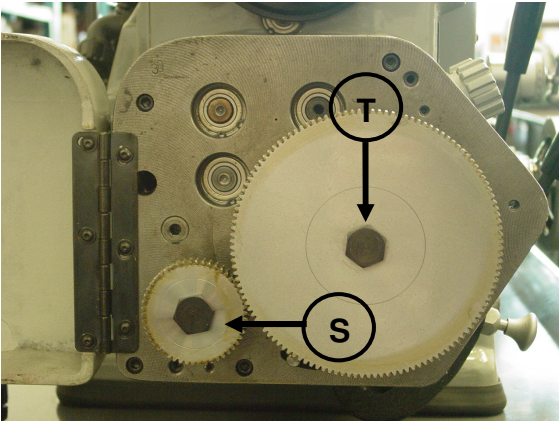


Figure 54-Thread Gearbox

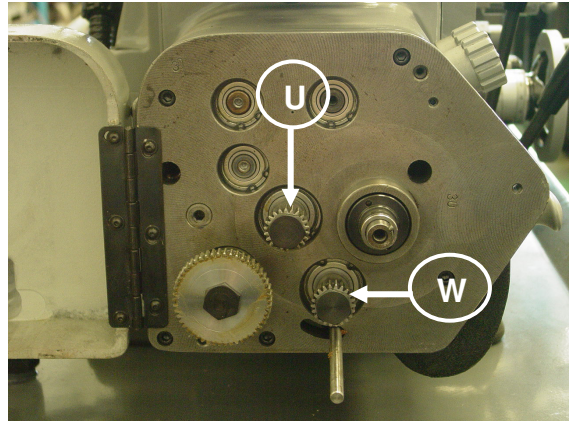


Figure 55-Threading Gearbox

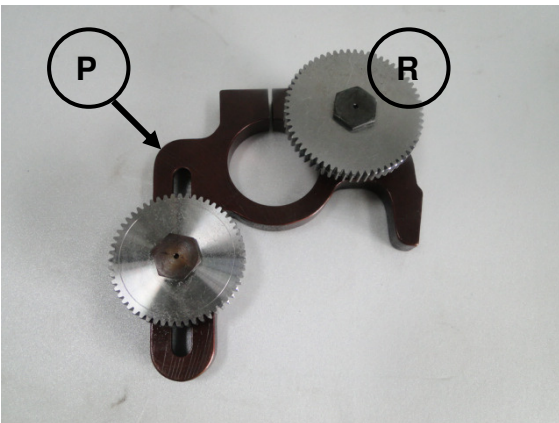


Figure 56-Change Gear Bracket

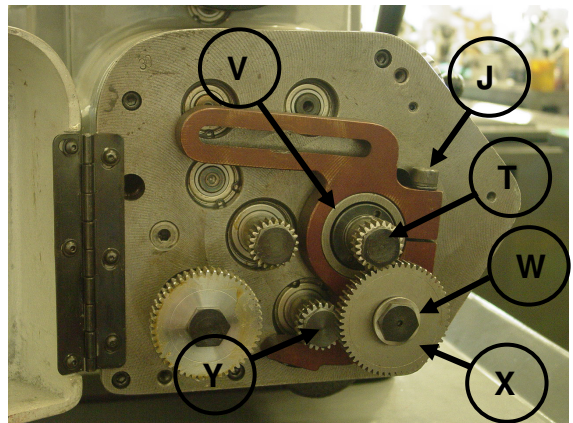


Figure 57- Mounting Change Gear Bracket

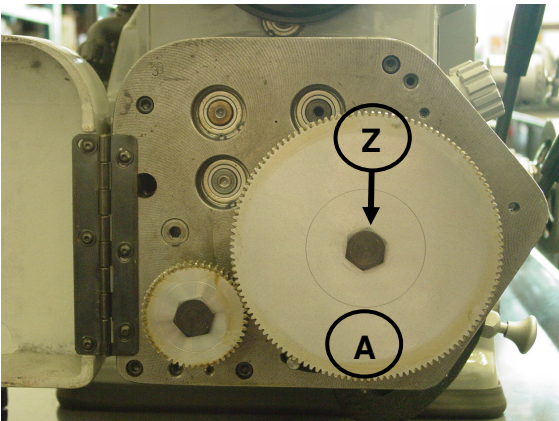


Figure 58-Mounting 127 Tooth Gear



## HOW TO APPLY AND REMOVE SPINDLE NOSE TOOLING

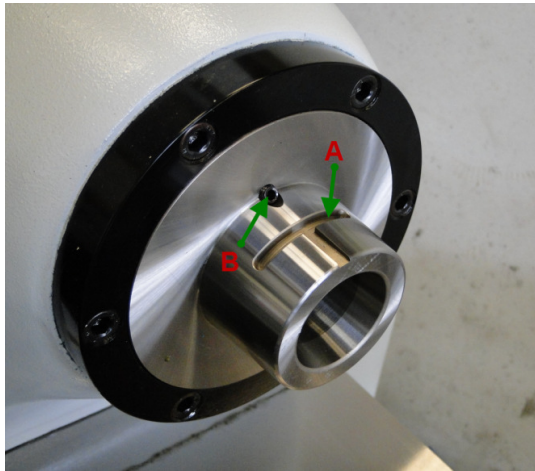


Fig 59

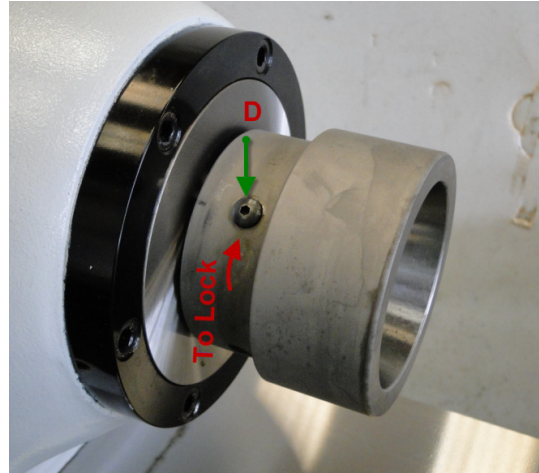


Fig60

The taper nose spindle construction is time-proven for accuracy, durability and fast, easy application and removal of spindle nose tooling. The taper holds and aligns the tooling with extreme accuracy. The precision ground slow taper holds and aligns all Tooling. The pin in all headstock spindle nose tooling engages the bayonet slot "A" To draw the attachment securely on the taper. Once securely drawn up, the Spindle nose attachment is actually driven by the locking action of the tapered surface.

Note: Before applying any item of tooling to the spindle nose wipe the spindle nose and attachment mating section clean.

To apply the step chuck closer, for example, align key "D", Fig 60, with bayonet slot and slide drive plate on spindle nose. When it is back as far as it will go turn the chuck closer clockwise to lock in place. Final tightening should be done with a standard pin type spanner wrench.

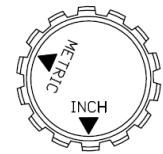
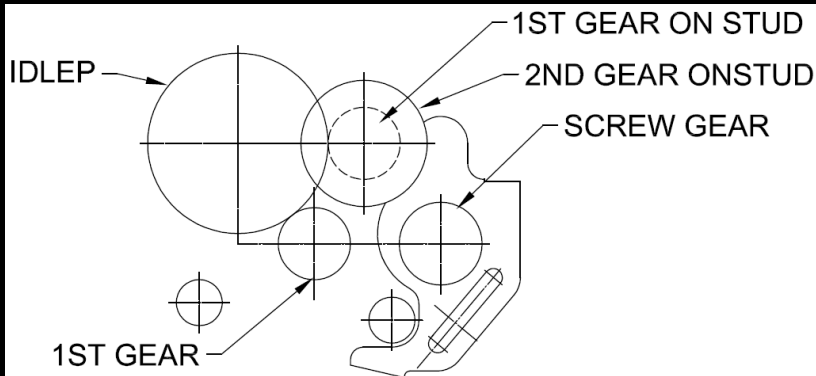
To remove the step chuck closer, turn counterclockwise with spanner wrench to loosen. Continue to turn unit key "D" then remove from spindle by sliding to right off end of spindle.

### CAUTION :

1. To obtain accurate results from precision spindle nose attachment always be sure the spindle nose and mating section in attachment are clean before they are assembled together and make certain both spindle nose and tooling tapers are absolutely clean.
2. Don't remove key "D" to remove spindle nose tooling. It's the slow way and will interfere with future accurate operation of the attachment.
3. Rotate tooling in opposite direction of intended spindle rotation.
  - a. Spindle forward--rotate tooling clockwise to lock.
  - b. Spindle reverse—rotate tooling counterclockwise to lock.

### Spindle collet Key

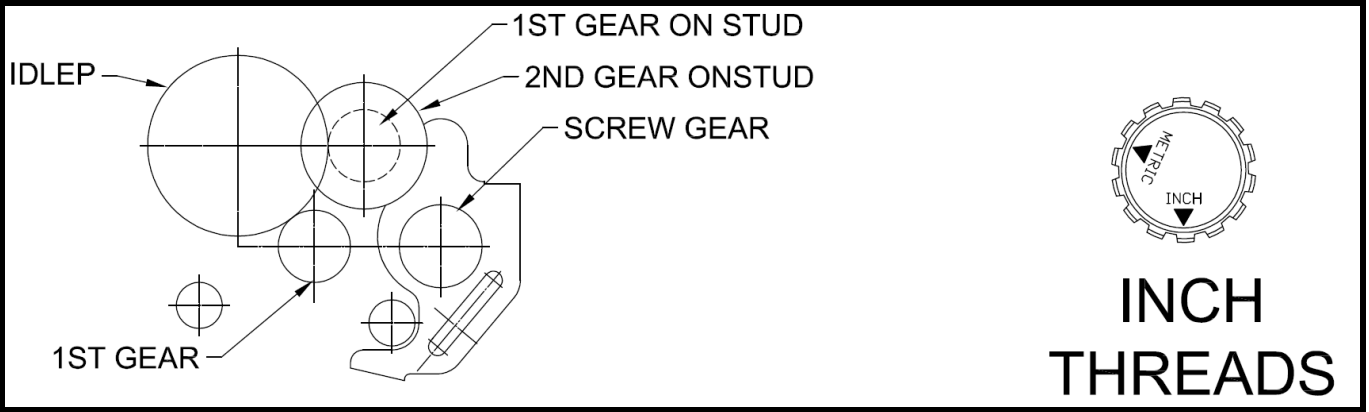
The spindle collet Key "B", Fig 59, is threaded into the spindle and can removed and Replaced, in the event of wear or damage, without removing the headstock, spindle or spindle bearings. Use hexagon pin wrench to remove lock screw; then remove collet key screw with same hexagon pin wrench.



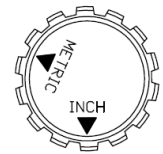
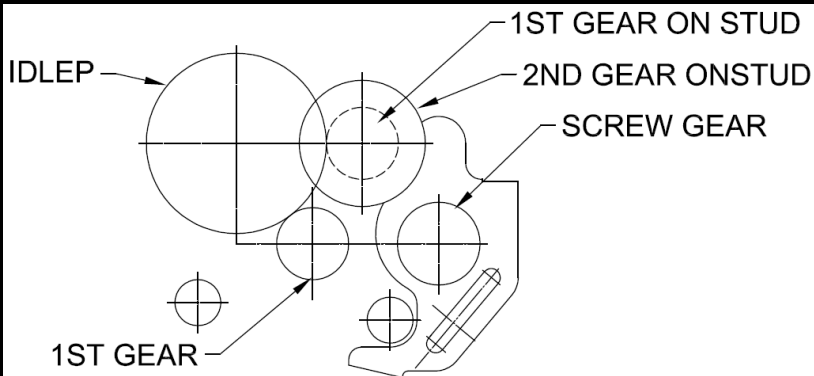
# INCH THREADS

THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER	THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER
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	4

**Gear\* means "Optional equipment (part no: LT-11-047T)".**



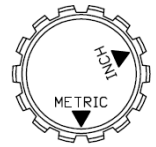
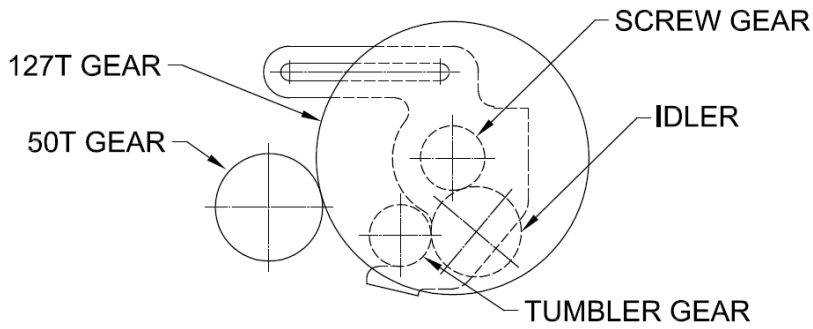
THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER	THREADS PER INCH	KNOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER
58	2	30*	29	22*	66	44	83	2	30*	33	22*	83	55*
59	1	30*	59	22*	66	44	84	3	40	42	30*	60*	44
60		GEARBOX					85	2	24	34	22*	66	44
61	1	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



# INCH THREADS

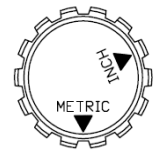
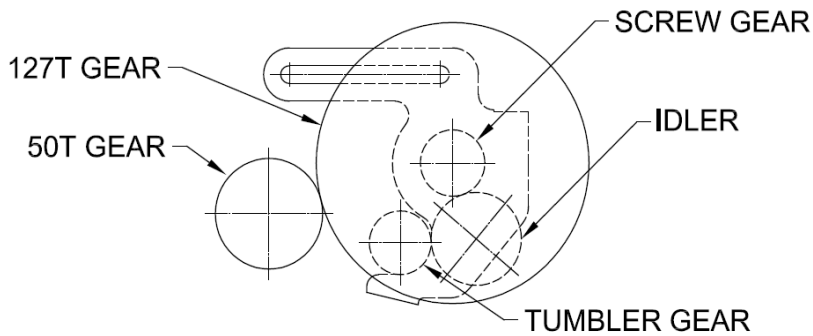
THREADS PER INCH	NOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER	THREADS PER INCH	NOB	FIRST GEAR	1ST GEAR ON STUD	2ND GEAR ON STUD	SCREW GEAR	1 DLER
114	2	30*	57	22*	66	44	160	3	24	32	22*	66	44
115	2	24	46	22*	66	44	164	3	30*	41	22*	66	44
116	3	30*	29	22*	66	44	166	3	30*	33	22*	83	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.



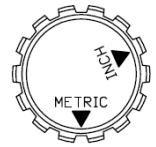
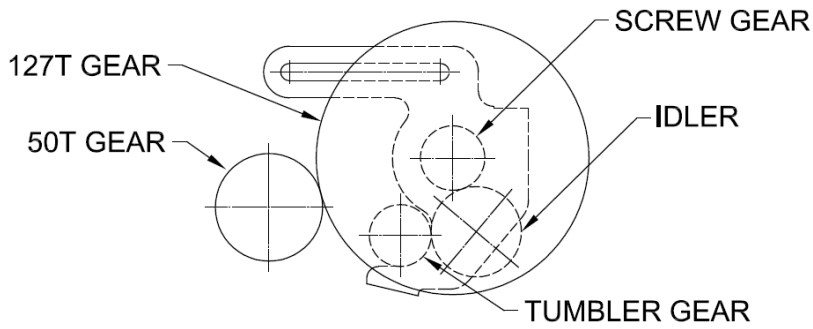
# METRIC THREADS

PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	1 DLER	PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	1 DLER
.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 X			.46	2	23	25	55*
.28	2	28	50	40	.47	3	47	25	44
.2875		GEARBOX X			.475	3	57	30*	33
.29	3	29	25	50	.48	1	24	50	44
.30		GEARBOX X			.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	1 DLER	PITCH IN MM	NOB	SCREW GEAR	TUMBLER GEAR	1 DLER
.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		



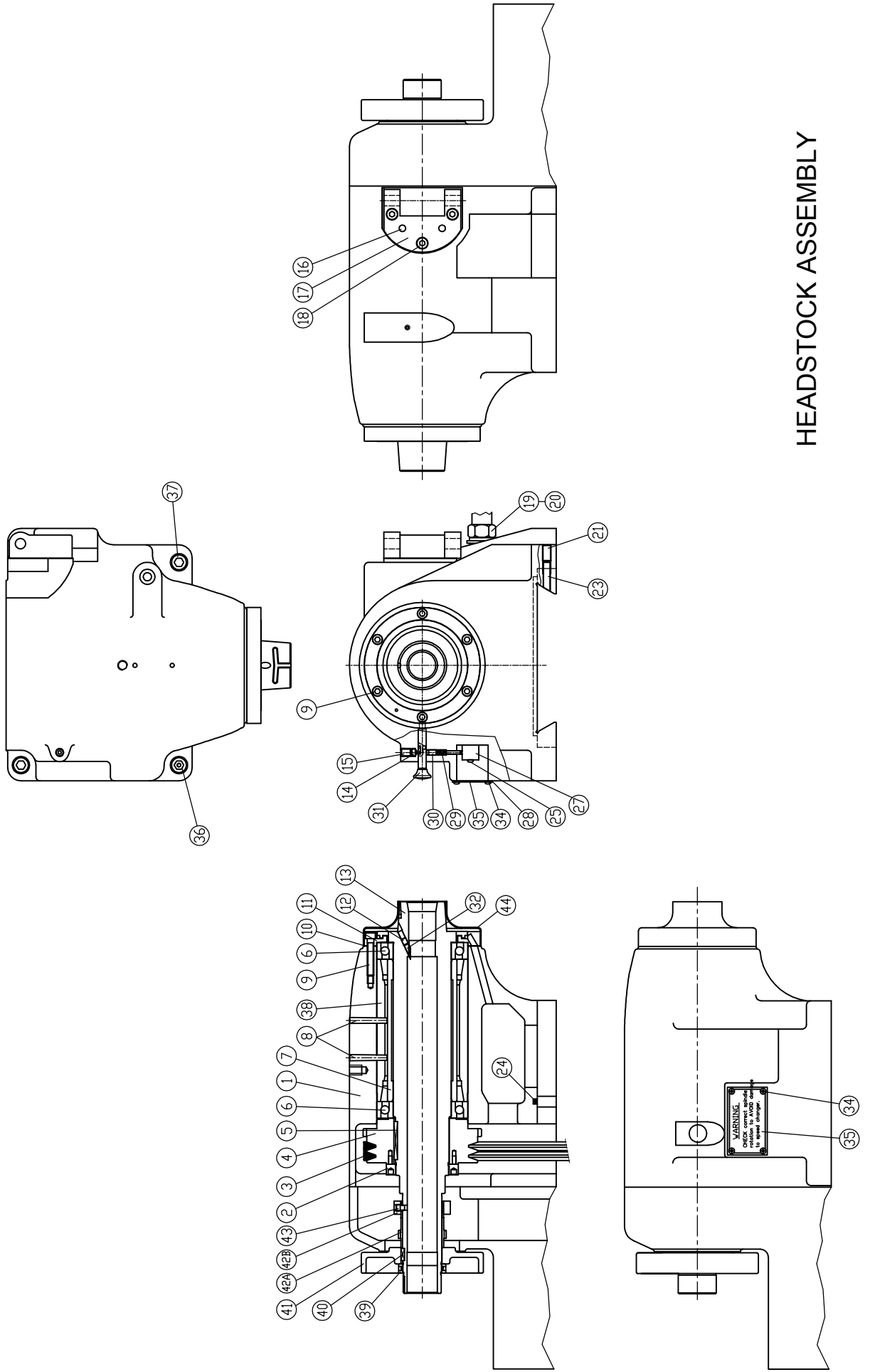
# METRIC THREADS

PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	1 DLER	PITCH IN MM	KNOB	SCREW GEAR	TUMBLER GEAR	1 DLER
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	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-01-101	1	HEADSTOCK	39	LB-01-101	1	NUT
2	LB-01-102	1	SPINDLE NUT	40	KD02B14	1	KEY
3	2-3V0670	1	BELT	41	LT-01-106	1	HANDWHELL
4	LT-01-102F	1	SPINDLE PULLEY	42A	LT-01-107A	1	DRIVER GEAR
5	KD02B042	1	KEY	42B	LT-01-107S	1	GEAR COVER
6	BB7014CP4	2	BEARING	43	SL08005	1	SCREW
7	LT-01-103	1	BEARING SPACER	44	LB-01-115	1	COOLANT SHIELD
8	PT5#50	1	TAPER PIN				
9	LB-01-113	6	SCREW				
10	LB-01-107	1	GASKET				
11	LB-01-108	1	FRONT CAP				
12	SL06008	1	LOCK SCREW				
13	LT-01-104	1	SPINDLE				
14	L-1014	1	LOCK SCREW				
15	SL06B08B	1	SCREW				
16	PD05B112B	2	PIN				
17	L-1017	1	COLLET CLOSER BRACKET				
18	SA08035	3	SCREW				
19	PCL-04B 1/2"	1	CONNECTOR QUEKER				
20	PCB-04B 1/2"	1	CONNECTOR STRAIGHT				
21	SL10020	1	LOCK SCREW				
23	L-1023	1	LOCKING PLUG				
24	L-1024	1	SEAL				
25	SC04025	2	SCREW				
27	Z-15G-B	1	MICRO SWITCH				
28	L-1029	1	SEAL				
29	L-1031	1	SPRING				
30	LT-01-116	1	PLUNGER				
31	L-1032	1	LOCK PIN				
32	L-1033	1	KEY SCREW				
34	SN04008	4	SCREW				
35	L-1036	1	NAME PLATE				
36	LT-01-117	4	SCREW				
37	SA12040	3	SCREW				
38	LT-01-105	1	BEARING SPACER				





HEADSTOCK ASSEMBLY

## THREADING GEAR BOX ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-11-001	1	GEAR BOX	39	LT-11-014	1	E.M.CONVERSION FORK
2	LT-11-002	1	GEAR BOX COVER	40	BB61805	2	BEARING
3	LT-01-206	1	GEAR	41	LT-11-015	1	GEAR
4	KD04015	1	KEY	42	RCS25	2	SNAP RING
5	LT-01-207	1	GEAR SHAFT	43	LT-11-016	1	GEAR
6	LT-01-208	1	PLUNGER	44	KD04014	1	KEY
7	SL06010	1	SET SCREW	45	LT-11-017	1	GEAR
8	BB6002ZZ	2	BEARING	46	LT-11-018	1	GEAR
9	RCR32	11	RETAINING RING	47	SA04010	2	SCREW
10	LT-01-209	1	STOP BLOCK	48	BB6002ZZ	1	BEARING
11	SA05010	2	SCREW	49	BB6203ZZ	1	BEARING
12	LT-11-003	1	GEAR SHAFT	50	RCR40	5	RETAINING RING
13	BB6002ZZ	2	BEARING	51	LT-11-019	2	SLEEVE
14	LT-11-004	1	GEAR SHAFT	52	KD03025	2	KEY
15	LB-05-337	1	BEARING	53	LT-01-266	2	GEAR
16	LT-01-213	1	LOCK NUT	54	LT-01-267	4	BOLT
17	LT-11-005	1	GEAR	55	LT-11-020	1	GEAR SHAFT
18	KD03045	1	KEY	56	KD0420	2	KEY
19	LT-01-219	1	KEY BUSH	57	LT-11-021	1	GEAR
20	LT-01-218	1	CLUTCH	58	BB6002ZZ	2	BEARING
21	LT-11-006	1	GEAR	59	BB6203ZZ	1	BEARING
22	BB5201ZZ	1	BEARING	60	LT-11-022	1	SLEEVE
23	LT-01-217	1	LOCKNUT	61	KD03010	1	KEY
24	LT-11-007	1	SLEEVE	62	LT-11-023	1	GEAR
25	LT-01-220	1	LOCK NUT	63	LT-11-024	1	GEAR SHAFT
26	BB6002ZZ	2	BEARING	64	LT-11-025	1	GEAR
27	LT-11-008	1	GEAR SHAFT	65	RCS15	2	SNAP RING
28	KD04065	1	KEY	66	LT-11-026	1	THREAD CHANG ARM
30	LT-11-010	1	GEAR	67	BB61805	2	BEARING
33	LT-11-012	1	GEAR	68	SF02B05B	2	CROSS RECESSES SCREW
34	SA04005	2	SCREW	69	LT-11-027	1	GEAR
35	BB6002ZZ	2	BEARING	70	BB608Z	2	BEARING
36	LT-11-013	1	GEAR SHAFT	71	LT-11-028	1	SHAFT
37	KD04094	1	KEY	72	SL05006	2	SET SCREW
38	KD04100	1	KEY	73	LT-11-029	1	STOP ROD

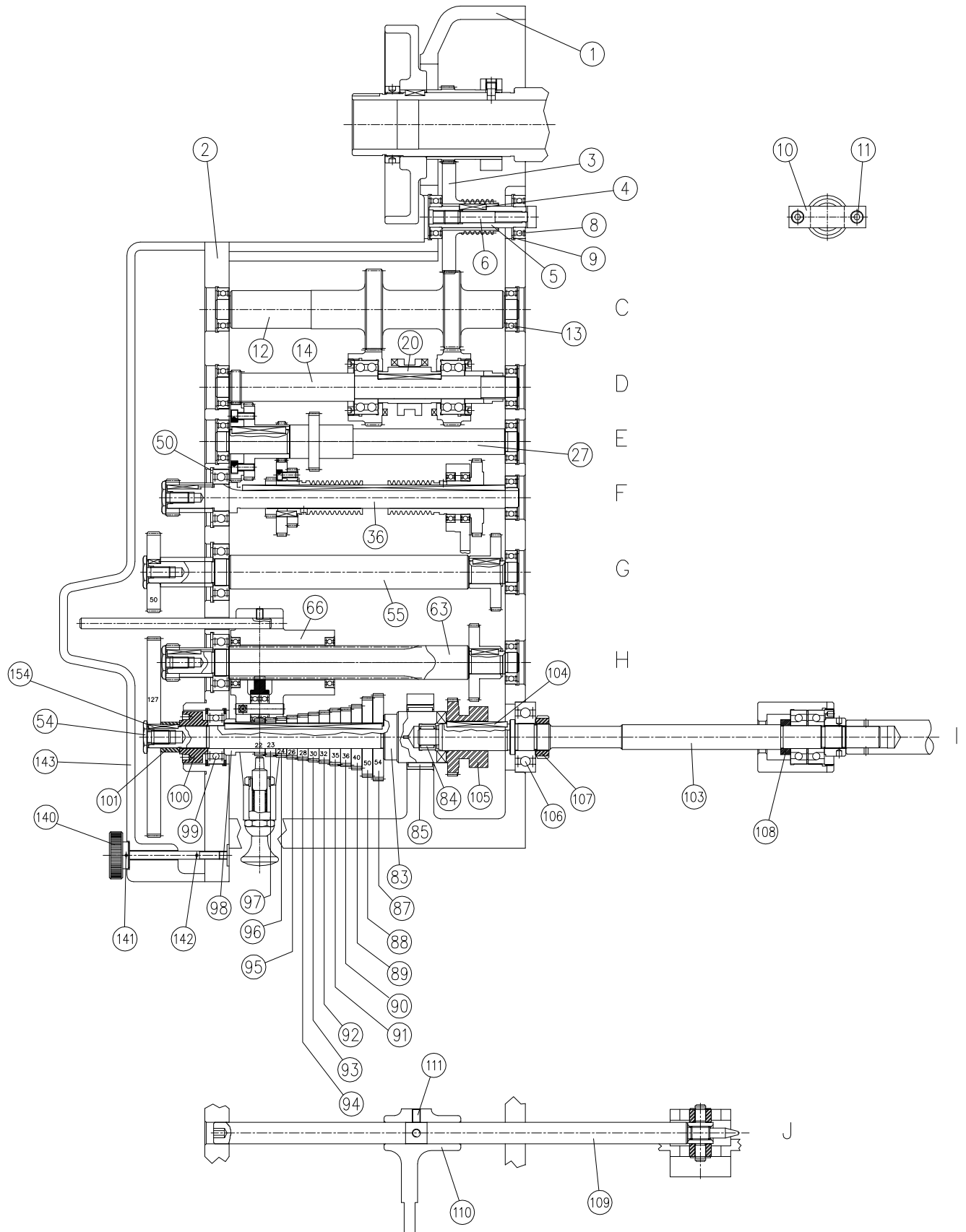
## THREADING GEAR BOX ASSEMBLY

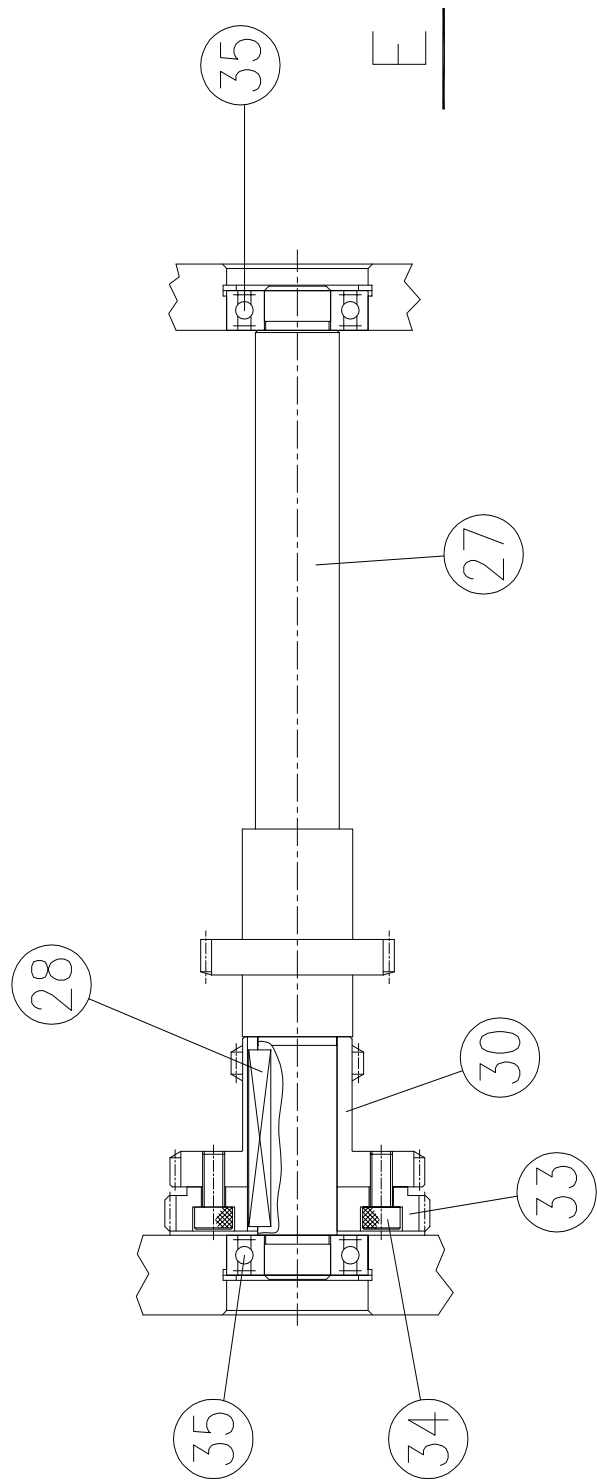
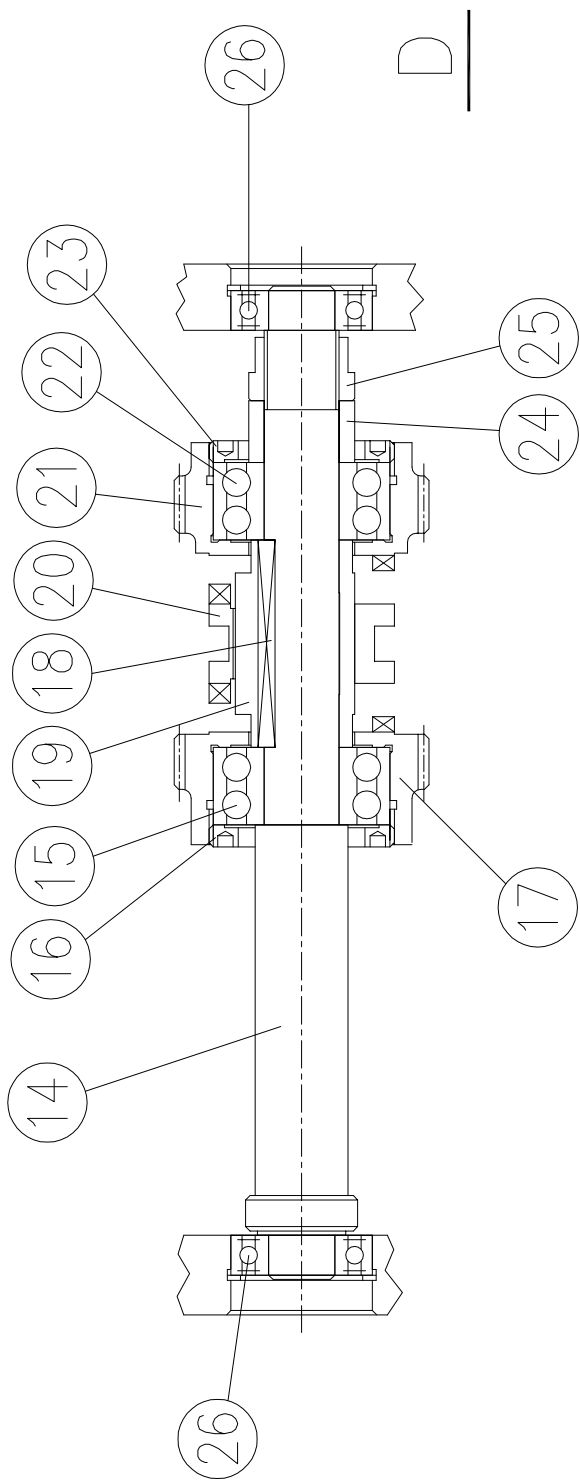
KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
74	LT-11-030	1	SPACE PLATE	109	LT-11-042	1	SHAFT
75	SA04006	2	SCREW	110	LT-11-043	1	CLUTCH ARM
76	PD05012	2	DOWEL PIN	111	SL04B03B	2	SCREW
77	LT-01-246	1	SLEEVE	112	SA05B100B	4	SCREW
78	LT-01-247	1	NUT	113	LT-01-290	1	TAPER PIN
79	LT-01-248	1	LOCK PIN	114	NH06	1	NUT
80	LT-01-250A	1	HANDLE HEAD	115	SA04B100B	1	SCREW
81	LT-01-250B	1	SPRING	116	SA04B103B	4	SCREW
82	BB6203ZZ	1	BEARING	117	PD05B16B	2	DOWEL PIN
83	LT-11-031	1	GEAR SHAFT	118	LT-11-044	1	BUSH
84	BNTA1212	1	NEEDLE BEARING	119	LT-11-045	2	BUSH
85	BNTA3820	1	NEEDLE BEARING	120	LT-11-046	3	KNOB
86	KD04116	1	KEY	120A	LT-01-283	3	GEAR SHAFT
87	LT-01-253	1	GEAR	120B	RCS19	3	SNAP RING
88	LT-11-032	1	GEAR	121	L-2016	3	SPRING
89	LT-01-254	1	GEAR	122	LT-01-286	3	PIN
90	LT-01-255	1	GEAR	123	SL06B03B	3	SCREW
91	LT-11-033	1	GEAR	124	SL04B05B	3	SCREW
92	LT-01-256	1	GEAR	125	LT-11-047	1	GEAR BASE
93	LT-11-034	1	GEAR	126	SA05B109B	1	SCREW
94	LT-01-257	1	GEAR	127	LT-01-276	2	NUT
95	LT-01-258	1	GEAR	128	LT-01-273	1	KEY BUSH
96	LT-01-259	1	GEAR	129	LT-01-274	1	SPACER
97	LT-01-260	1	GEAR	130	LT-01-275	1	BOLT
98	LT-01-261	1	GEAR	131	LT-01-278	1	SPACER
99	BB6203ZZ	1	BEARING	132	LT-01-279	1	KEY BUSH
100	LT-11-035	1	LOCK NUT	133	LT-01-280	1	BUSH
101	LT-11-036	1	SLEEVE	134	LT-01-281	1	BOLT
102	LT-11-037	1	GEAR	135	LT-01-268	1	GEAR
103	LT-11-038	1	SHAFT	136	LT-01-277	1	GEAR
104	KD0445	1	KEY	137	LT-01-272	1	GEAR
105	LT-11-039	1	GEAR	138	LT-11-048	1	SETDOOR LINK SET
106	BB63042RS	1	BEARING	139	SN0205B	6	SCREW
107	LT-11-040	1	LOCK NUT	140	LT-11-049	1	LOCK BOLT
108	LT-11-041	1	SLEEVE	141	SP02018	1	SPRING PIN

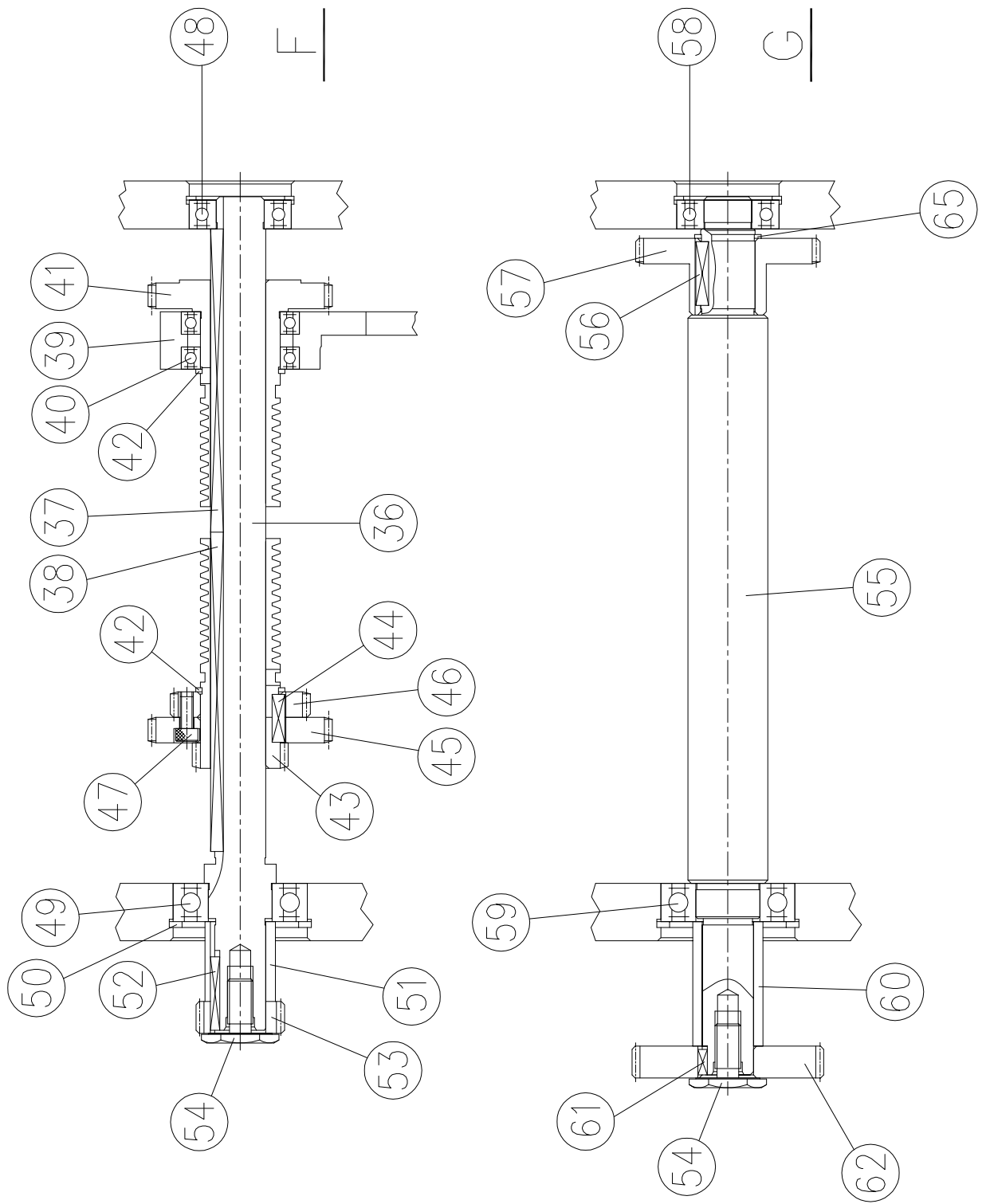
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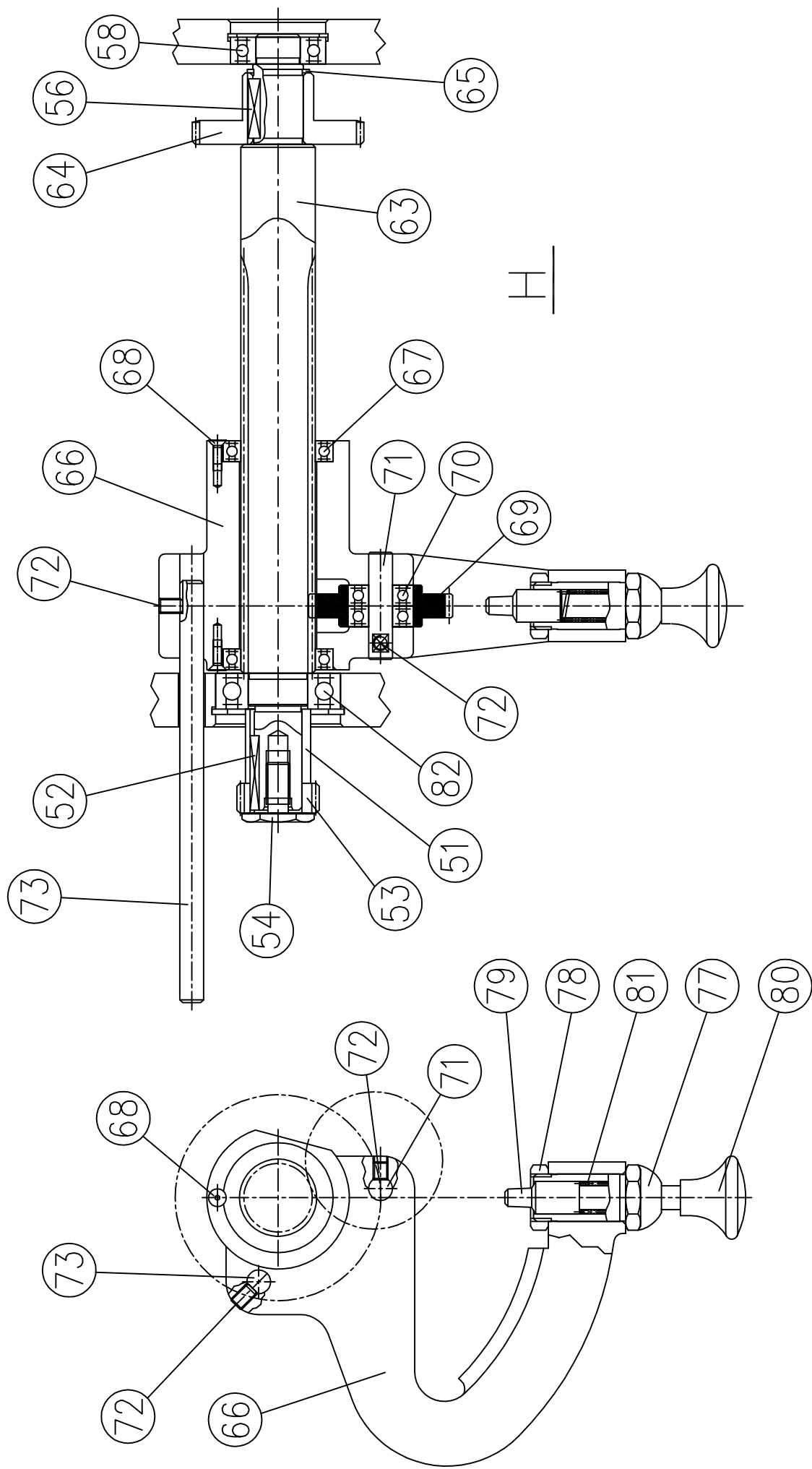
KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
142	SP02012	1	SPRING PIN				
143	LT-11-050	1	COVER				
144	LT-11-051	1	COVER				
145	LT-01-292	1	COVER				
146	SN03B08B	8	SCREW				
147	LT-01-294	1	INDICATED PLATE				
148	LT-11-052	1	INDICATED PLATE				
149	LT-01-295	1	INDICATED PLATE				
150	LT-01-293	1	WARNING PLATE				
151	LT-11-053	1	INDICATED PLATE				
152	MF1	8	RIVER				
154	KD03022	1	KEY				

# THREADING GEAR BOX ASSEMBLY

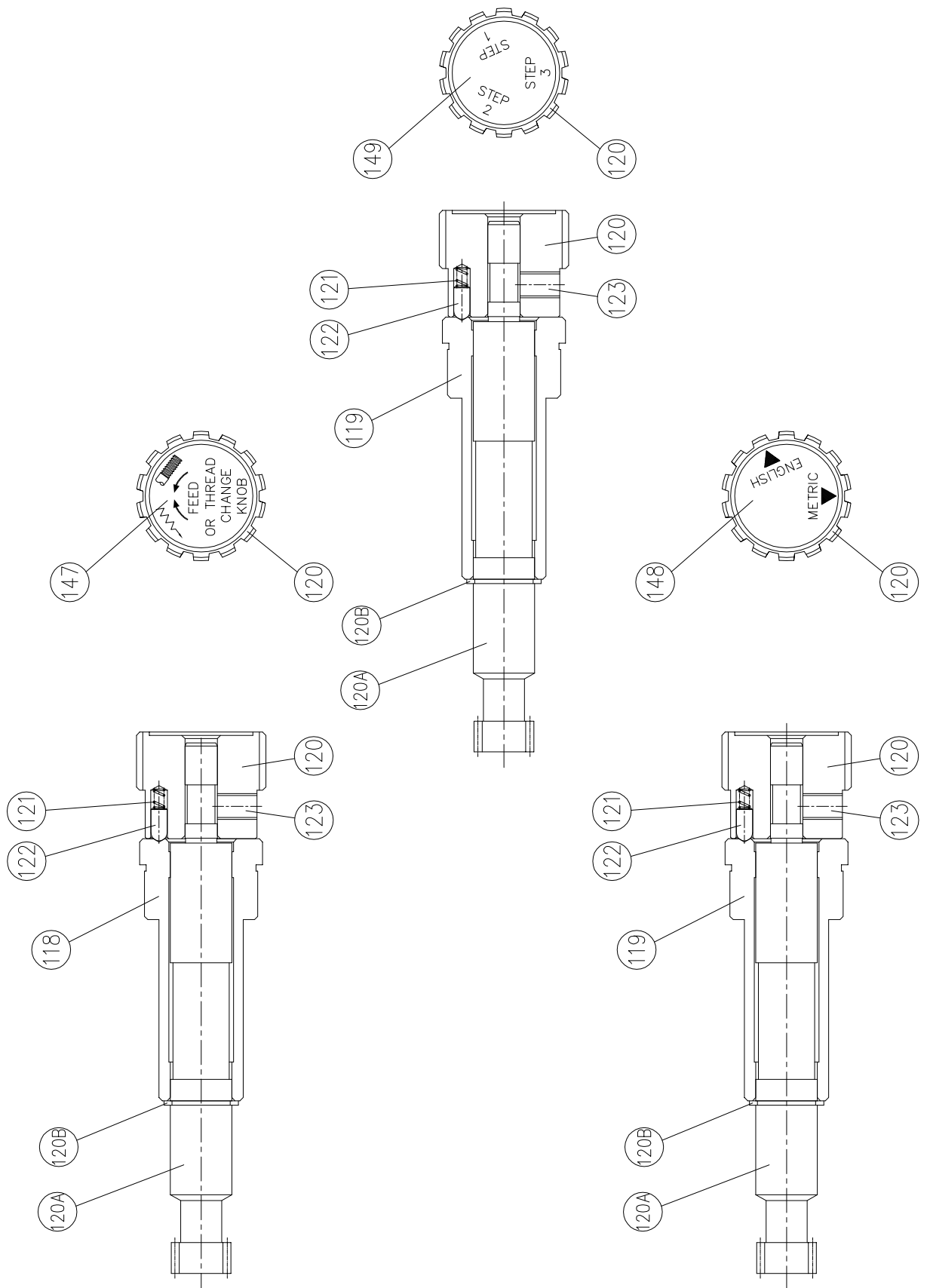


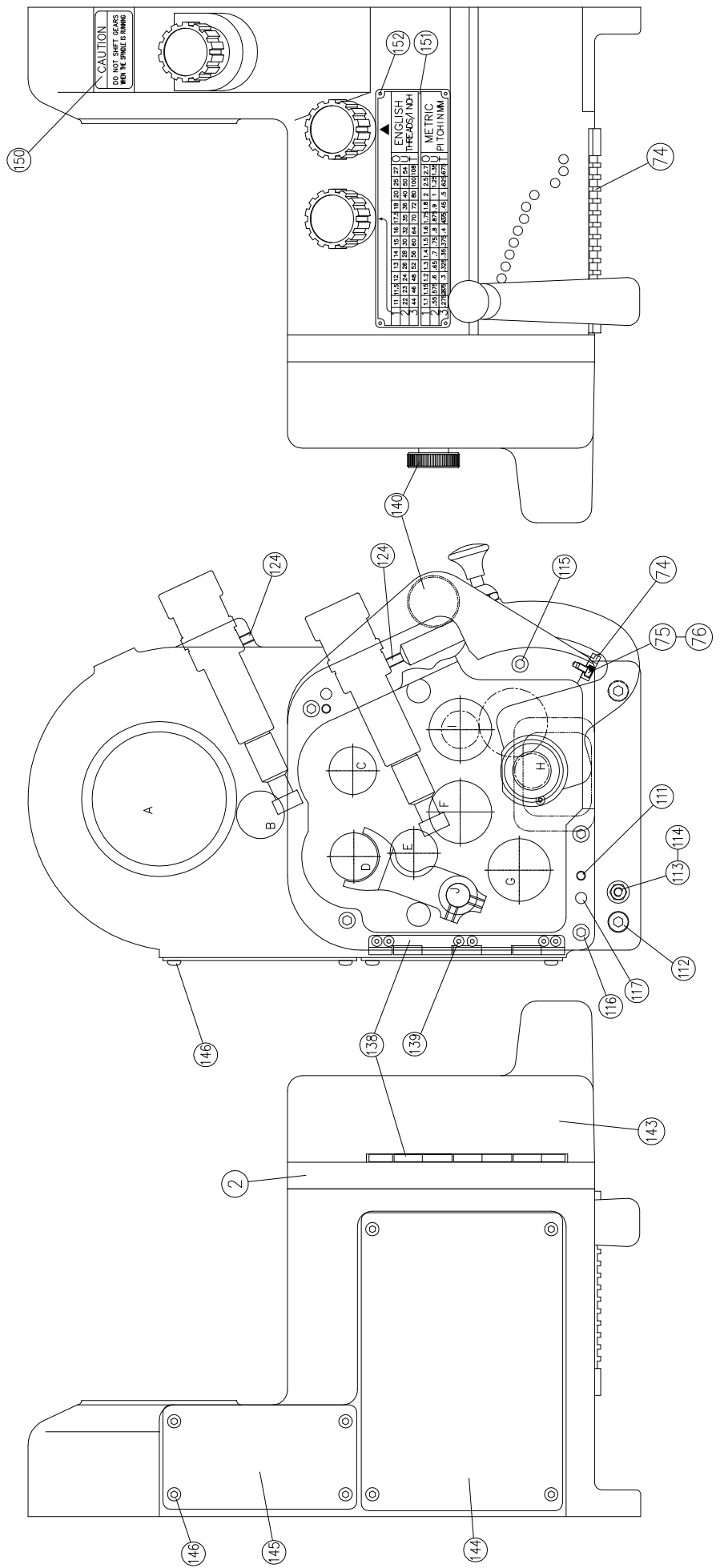
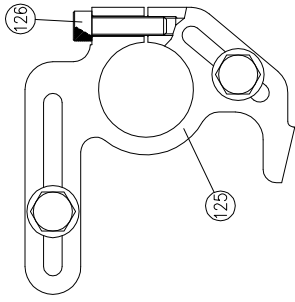
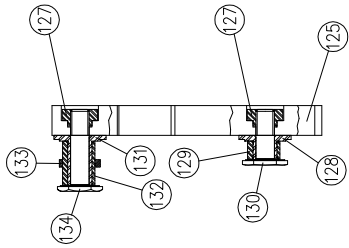






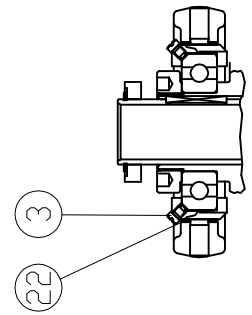
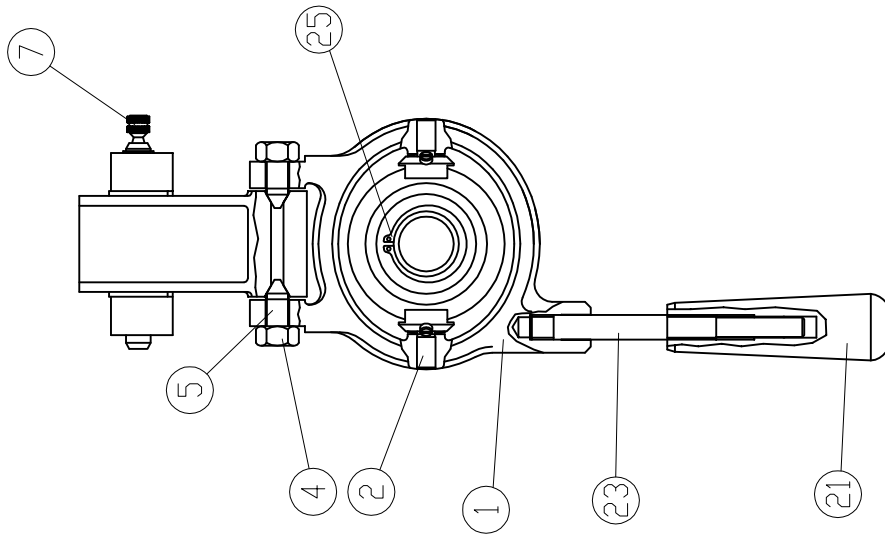
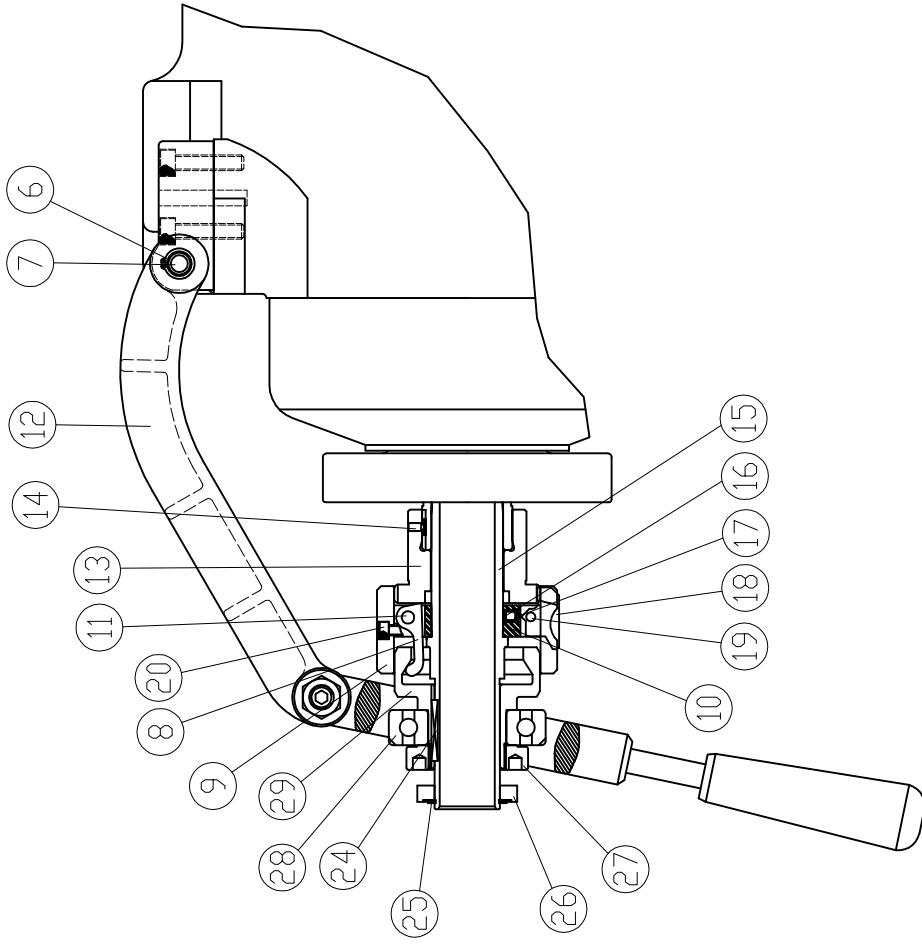






## COLLET CLOSER ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	L-2001	1	LEVER YOKE				
2	L-2002	2	SWIVEL BLOCK				
3	L-2003	2	SCREW				
4	NH12F	2	NUT				
5	L-2005	2	PIVOT SCREW				
6	RCS13	1	SNAP RING				
7	L-2007	1	LINK PIN				
8	L-2008	3	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	SA05010	4	SCREW				
21	L-4001	1	LEVER HANDLE				
22	L-2022	2	SPRING				
23	L-2023	1	HANDLE				
24	KD02B104B	1	KEY				
25	RCS34	1	SNAP RING				
26	L-2026	1	STOP RING				
27	L-2027	1	NUT				
28	L-2028	1	BEARING				
29	L-2029	1	CLUTCH CONE				

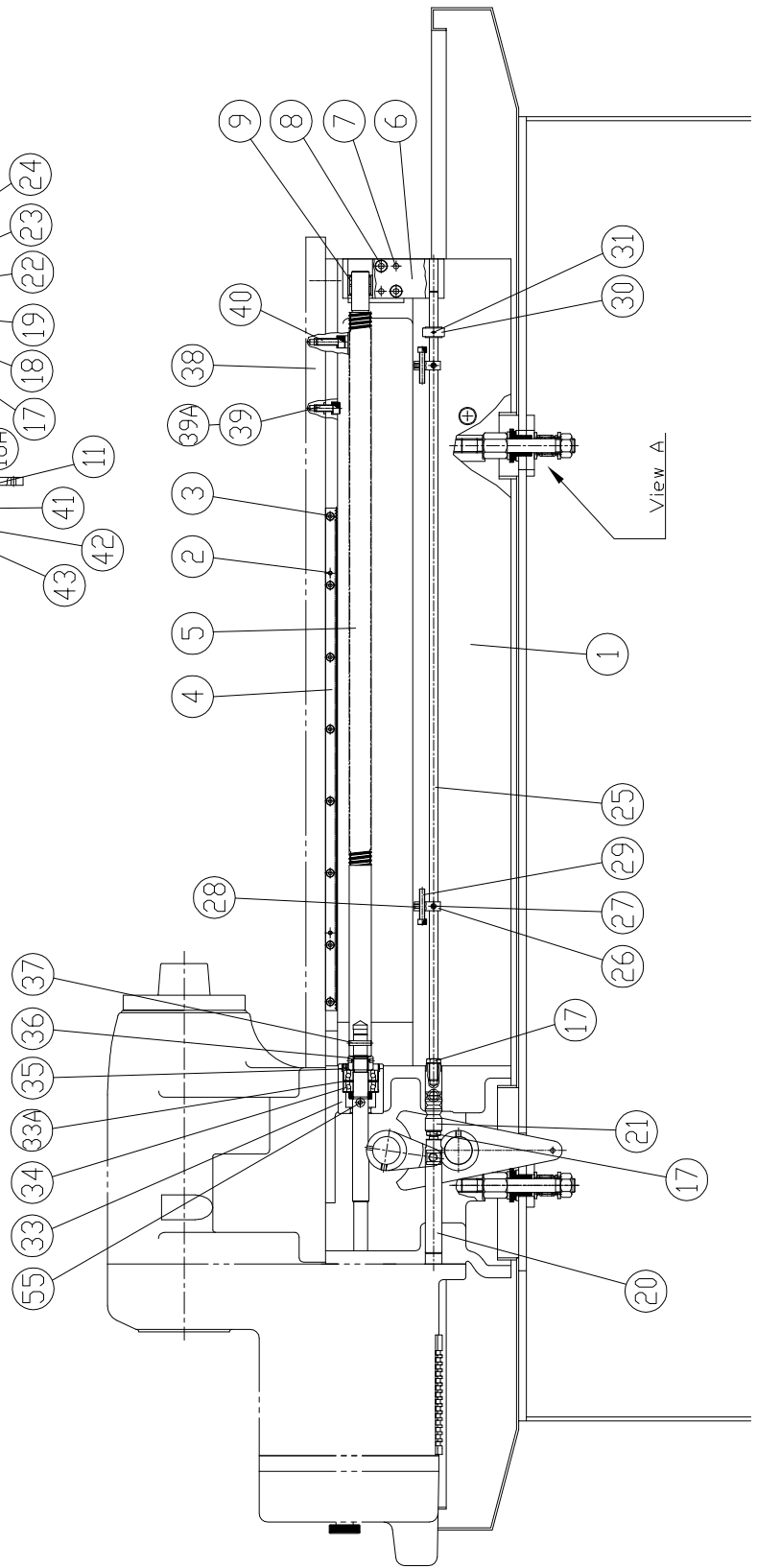
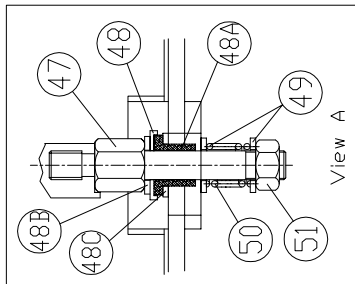
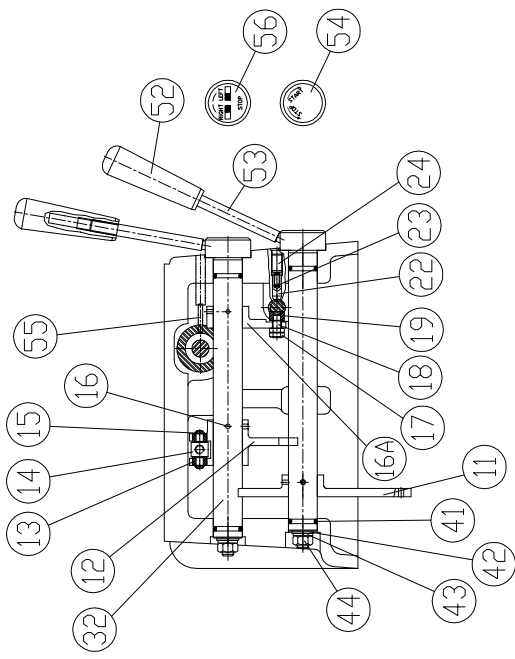


# COLLET CLOSER

## BED ASSEMBLY

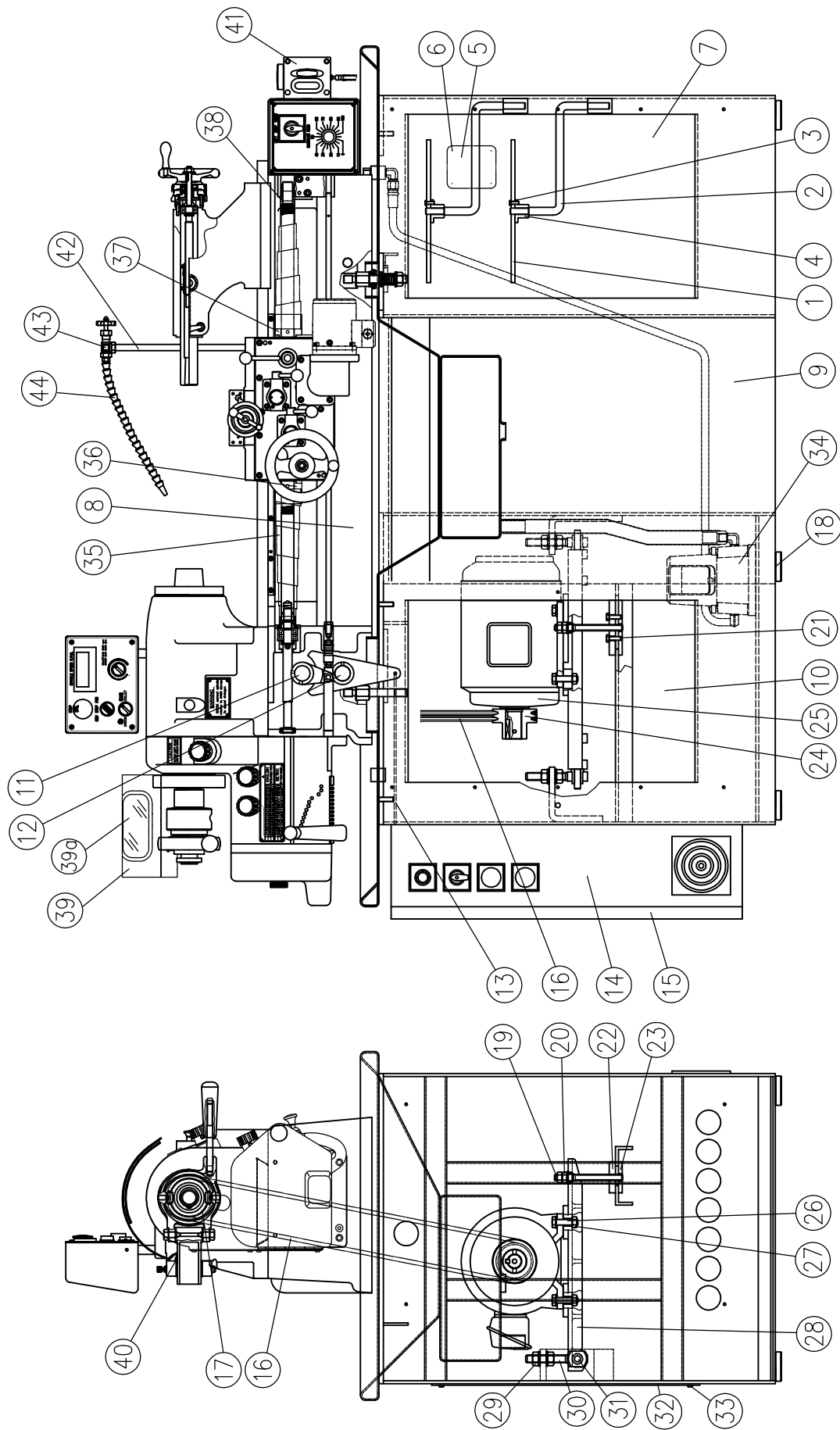
KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-03-101	1	BED BODY	33B	LT-03-122B	1	BEARING SPACER
2	PD03B16B	2	PIN	34	BB72032Z	2	BEARING
3	SA05012	8	SCREW	35	LT-03-123A	1	LOCK NUT
4	LT-03-102	1	RACK	36	LT-03-124	1	LOCK NUT
5	LT-03-103	1	LEAD SCREW	37	PT3#25	1	TAPER PIN
6	LT-03-104	1	LEAD SCREW SUPPORT	38	LB-03-013	1	BED PLATE
7	PT7#64	2	TAPER PIN	39	SA08020	28	SCREW
8	SA08045	2	SCREW	39A	WS08B	17	LOCK WASHER
9	RNA6902	1	NEDDLE BEARING	40	SA08025	14	SCREW
10	LT-03-105	1	SPEED LEVER	41	ORP25	4	O RING
11	LT-03-106	1	SPEED ARM	42	L-5008	2	WASHER
12	LT-03-107	1	REVERSE ARM	43	L-5010	2	SPRING WASHER
13	LT-03-108	2	FIXED BLOCK	44	NH08BF	2	NUT
14	LT-03-109	1	SWIVEL SHAFT	47	LB-03-021	3	HOLD DOWN STUD
15	RCS08	2	SNAP RING	48	LB-03-025	3	WASHER
16	PT03045	3	TAPER PIN	48A	LB-03-026	3	SPACER
16A	LT-03-110	1	REVERSE ARM	48B	LB-03-022	10	WASHER
17	LT-03-111	4	NUT	48C	LB-03-027	3	WASHER
18	LT-03-112	1	SCREW	49	WB10B	6	WASHER
19	LT-03-113	1	GUIDE BLOCK	50	LB-03-024	3	SPRING
20	LT-03-114	1	GUIDE BAR	51	NH10BF	3	NUT
21	LT-03-115	1	LOCATING LINK	52	L-4001	2	BALL HANDLE
22	LT-03-116	1	DOWEL	53	L-5004A	2	LEVER
23	LT-03-117	1	SPRING	54	LT-03-126	1	SPEED PLATE
24	SL12020	1	LOCK SCREW	55	PD03B104B	1	PIN
25	LT-03-118	1	LENGTH CONTROL BAR	56	L-5006	1	REVERSE FORWAR PLATE
26	LT-03-119	2	DOMPER				
27	SL06006	2	LOCK SCREW				
28	SL05006	2	LOCK SCREW				
29	SA06035	2	SCREW				
30	LT-03-120	1	FIXED BLOCK				
31	PT03025	1	TAPER PIN				
32	LT-03-121	1	LENGTH CONTROL LEVER				
33	LT-03-122	1	BEARING SPACER				
33A	LT-03-122A	1	BEARING SPACER				

# BED ASSEMBLY



## PADESTAL ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LB-04-009	1	COLET HOLDER PLATE	36	LT-03-103A	1	SCREW
2	LB-04-006	1	PULL ROD	37	LT-03-103B	1	SCREW
3	SN06015	3	SCREW	38	LT-03-103C	1	SCREW
4	LB-04-008	1	BUSHING	39	LT-04-004	1	COVER
5		1	NAMEPLATE	40	SN05008	2	SCREW
6	MP 02	4	NAMEPLATE PIN	41	YMT-8	1	MANUAL LUBRICATORS
7		1	RIGHT SIDE DOOR	42	L-6604A	1	ELBOW SUPPORT
8	LB-03-009	1	BED BODY	43	CS-5001	1	NEEDLE VALVE
9	LB-04-002	1	PEDESTAS	44	1/4"x1'L	1	NOZZLE
10		1	LEFT SIDE DOOR				
11	LT-03-121	1	CONTROL LEVER				
12	LT-03-105	1	HI-LOW CONTROL LEVER				
13	LB-04-005	1	PULL ROD				
14		1	PANEL				
15		1	PANEL COVER				
16	2-3V0670	1	BELT				
17	LT-01-102F	1	PULLEY				
18	LB-04-001A	6	ADJUSTING SCREW				
19	L-6143	1	SUPPORT STUD				
20	HN08BF	2	HEX NUT				
21	SH08025	2	HEX HEAD SCREW				
22	L-6145	1	UPPER SUPPORT PLATE				
23	L-6142	1	LOWER SUPPORT PLATE				
24	LT-04-012F	1	PULLEY				
25		1	SPINDLE MOTOR				
26	SH12035	4	HEX HEAD SCREW				
27	HN012	4	HEX NUT				
28	LB-04-015F	1	MOTOR PLATE				
29	HN10BF	2	HEX NUT				
30	L-6164	2	HINGE EYE BOLT				
31	L-6146	2	ROD				
32	L-6165	1	REAR COVER				
33	SH06012	4	SCREW				
34	LB-08-006	1	PUMP				
35	118143	2	COVER				



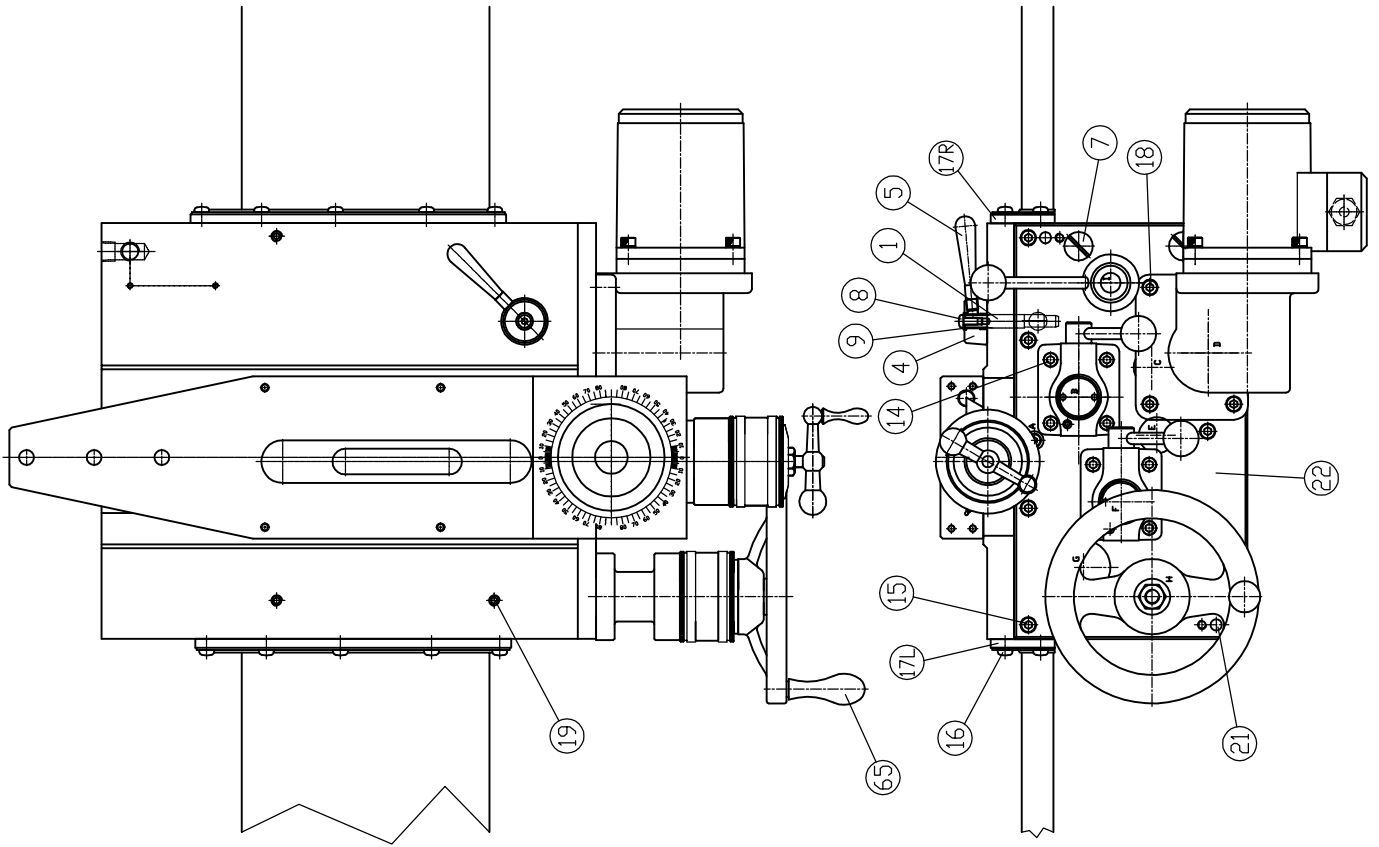
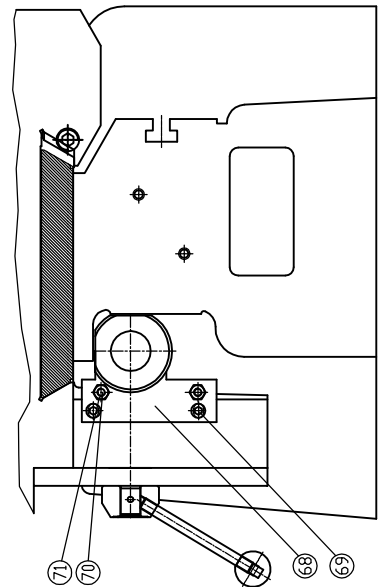
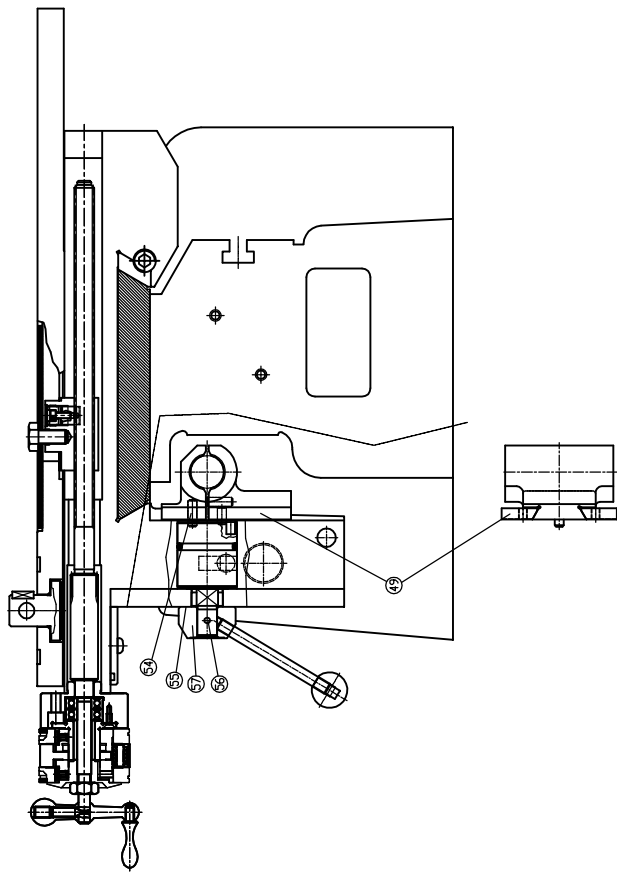
PADESTAL ASSEMBLY



## CARRIAGE ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-05-104	1	ECCENTRIC ROD				
2	LT-05-105	1	TAPER PLUG				
3	LT-05-106	1	PLUG				
4	LT-05-107A	1	HUB BLOCK				
5	LT-05-108	2	NANDLE				
7	LT-05-321	2	PLUG COCK				
8	SN03B05B	2	SCREW				
9	L-4065A	2	WASHER				
14	SA03B12B	8	SCREW				
15	SA04B10B	7	SCREW				
16	SN06016	14	SCREW				
16A	WE04B	14	WASHER				
17L	LB-05-114B	1	LEFT WIPPER				
	LB-05-114C	1	LEFT COVER				
17R	LB-05-114A	1	RIGHT WIPPER				
	LB-05-114C	1	RIGHT COVER				
18	SA05B12B	3	SCREW				
19	SL05B05B	3	SCREW				
20	SA05B05B	3	SCREW				
21	PD05B16B	2	PIN				
22	LT-05-109	1	GEAR BOX COVER				

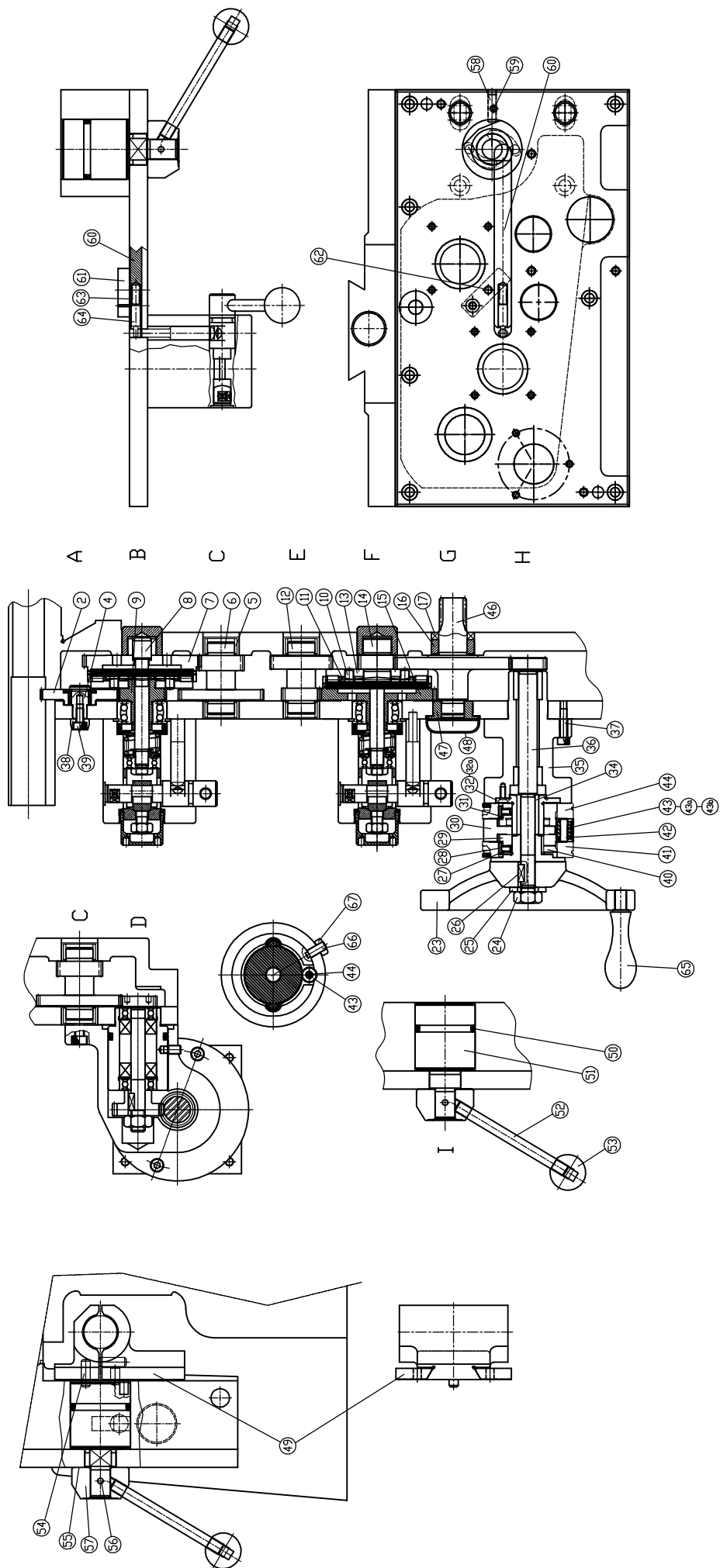
CARRIAGE ASSEMBLY



## GEAR BOX OF CARRIAGE ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-05-301	1	CARRIAGE	37	SA05016	3	SCREW
2	LT-05-302	1	GEAR ASS'Y	38	LT-05-303A	1	BUSHING
4	LT-05-303	1	STUD	39	SA05010	1	SCREW
5	BAM128	4	NEDDLE BEARING	40	SL05008	1	LOCK SCREW
6	LT-05-304	1	GEAR	41	18-20206EB	1	DIAL RING
7	LB-05-306	1	CLUTCH BUSHING	42	18-20212	1	GEAR SHAFT
8	LB-05-307	1	CLUTCH SHAFT	43	18-20210	1	GEAR
9	LB-05-308	1	PINION	43a	18-20207	1	ANTI-CHIP SET
10	LB-05-330	6	CLUTCH PIN	43b	SN05008	2	SCREW
11	RCS06	6	SNAP RING	44	18-20206MB	1	SHAFT
12	LT-05-305	1	GEAR	46	LT-05-306	1	GEAR SHAFT
13	LB-05-308A	2	CLUTCH FIXED PLATE	47	LT-05-320	1	BEARING BRASS
14	LB-05-328	1	CLUTCH SHAFT	48	LT-05-319	1	PLUG
15	LB-05-329	1	CLUTCH BUSHING	49	LT-05-308	2	GIB BLOCK
16	LT-05-318	1	BEARING BRASS	50	ORP36	1	O RING
17	OS20307	1	OIL SEAL	51	LT-05-309	1	SHIFT SHAFT
18	LB-05-305	4	BRAKE PLATE	52	L-7011	1	HANDLE LEVER
19	LB-05-310	2	CLUTCH DISC	53	LB-05-616	1	KNOB
20	LB-05-301	2	BOWED WASHER	54	PD06020	2	PIN
21	LB-05-337	2	BEARING	55	LT-05-313	1	SHIM
22	RCS35	2	SNAP RING	56	PT2#038	1	TAPER PIN
23	LT-05-322EM99	1	HANDWHEEL	57	LT-05-314	1	HUB
24	NH10	1	NUT	58	SL06020	1	LOCK SCREW
25	WB10	1	WASHER	59	SL05012	1	LOCK SCREW
26	KD04012	1	KEY	60	LT-05-315	1	SLIDE BLOCK
27	LT-09-121	2	SPRING	61	LT-05-317	1	FIXED BLOCK
28	LT-05-432	2	KEY	62	SA05012	1	SCREW
29	18-20203	1	COLLAR	63	LB-03-004	1	SPRING
30	18-20211B	1	ZERO RING	64	LT-05-316	1	PLUG
31	18-20209	1	GEAR	65	LT-05-324	1	HANDLE
32	18-20263	1	SHAFT	66	LT-09-219	1	LOCK SCREW
33	LT-05-307EM99	1	ZERO RING	67	NH06	1	NUT
34	18-20213	1	SLEEVE				
35	18-20127	1	SUPPORT				
36	LT-05-310EM	1	GEAR SHAFT				

GEAR BOX OF CARRIAGE ASSEMBLY



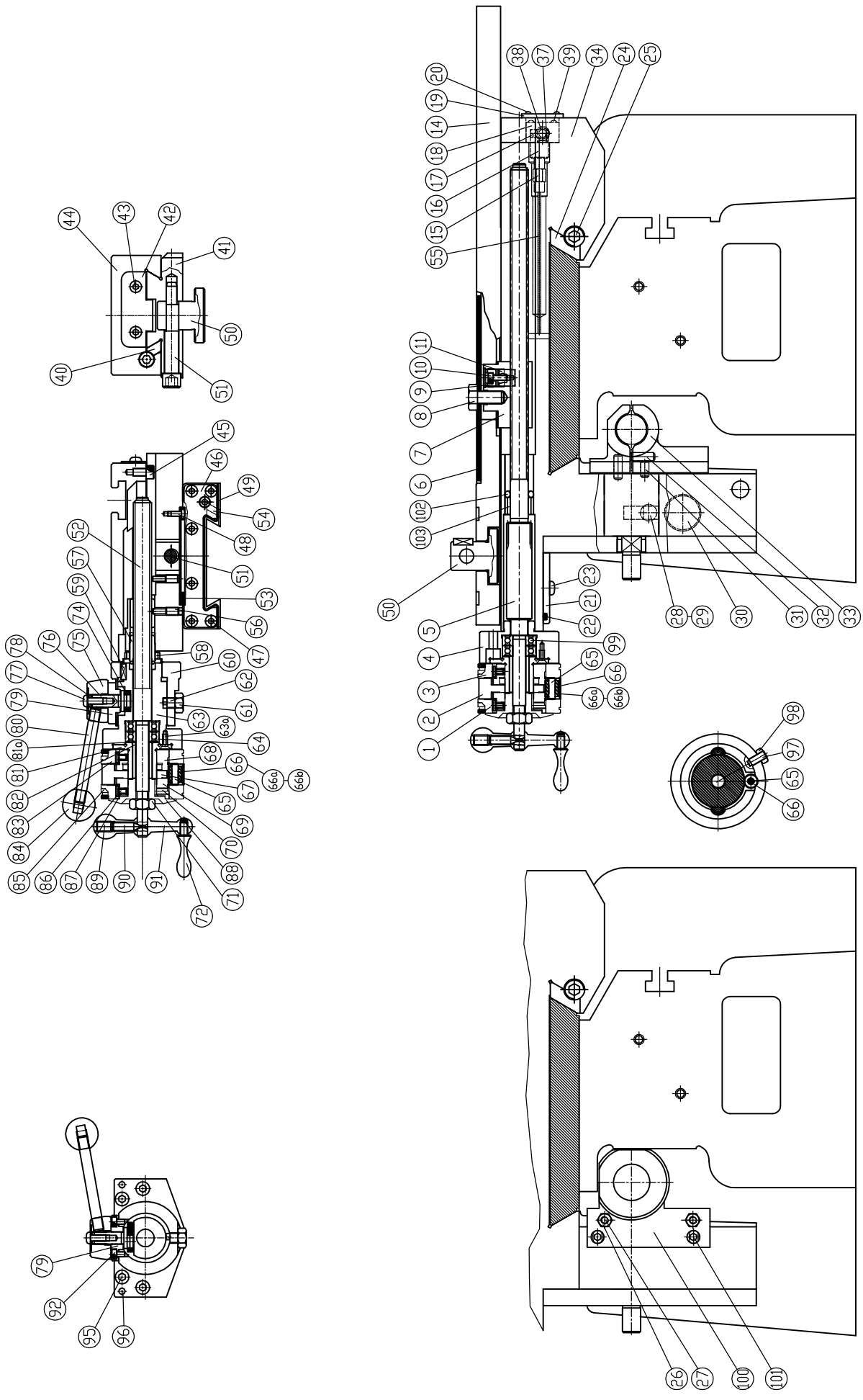
## CROSS AND COMPOUND SLIDE ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	18-20206EA	1	DIAL RING	39	SN05025	4	SCREW
2	18-20211A	1	DIAL RING	40	LT-05-414	1	COMPOUND SLIDE GIB
3	18-20206MA	1	ZERO RING	41	LT-05-410	1	COMPOUND SLIDE BASE
4	18-20204	1	SUPPORT	42	LT-05-412	1	WIPPER
4a	SA06020	2	SCREW	43	SN05008	2	SCREW
5	LT-05-214EM99	1	CROSS-FEED SCREW	44	LT-05-415	1	COMPOUND SLIDE
6	LT-05-403	1	COVER	45	SA06010	1	SCREW
7	LT-05-215	1	BRASS NUT	46	LT-05-112A	1	COVER
8	SH10012	1	HEX SCREW	47	SN05008	6	LOCK SCREW
9	LT-05-217	1	LOCK SCREW	48	SB04008	2	SCREW
10	SA04008	1	SCREW	49	LT-05-112N	1	WIPPER
11	LT-05-216	1	SCREW PLUG	50	LT-05-406	1	LOCK BLOCK
14	LT-05-401	1	CROSS SLIDE	51	LT-05-407	1	ECCENTRIC SHAFT
15	HE-MV	3	METER UNIT	52	LT-05-408EM99	1	COMPOUND SLIDE SCREW
16	LB-05-207	3	CONNECTOR	53	LT-05-404	1	LOCATING RING
17	ORP10	3	O RING	54	LT-05-402	1	CROSS SLIDE GIB
18	LT-05-208	1	JUNCTING BLOCK	55	HE-PB4	3	COMPRESSION SLEEVE
19	LT-05-209	1	COVER	56	LB-03-003	2	LOCK SCREW
20	SN05010	4	SCREW	57	LT-05-409	1	NUT
21	LB-05-217	1	COVER	58	LT-05-411	1	LOCK SCREW
22	LB-05-201	1	O RING	59	KD04012	1	KEY
23	SN06012	2	SCREW	60	LT-05-416	1	QUICK-ACTING BASE
24	LT-05-210	1	CARRIAGE GIB	61	NH08	1	NUT
25	LB-05-216	6	LOCK SCREW	62	LT-05-413	1	ECCENTRIC SCREW
26	NH06	2	NUT	63	18-20243	1	QUICK-ACTING SHAFT
27	SL06020	2	LOCK SCREW	63a	SB04008	3	SCREW
28	OC04B	1	OIL CUP	64	BB6000	2	BEARING
29	LB-05-206	1	INSTRUCTION NAME PLATE	65	18-20212	2	SHAFT
30	OW21	1	OIL WINDOW	66	18-20210	2	GEAR
31	PD04B008B	1	PIN	66a	18-20207	2	COVER
32	PD04B012B	2	PIN	66b	SN05008	2	SCREW
33	LT-05-218	1	LEAD SCREW NUT	67	18-20211C	1	ZERO RING
34	LT-05-301	1	CARRIAGE	68	18-20209	1	GEAR
37	ORP8	1	O RING	69	18-20203	2	GEAR
38	SP-02PT	1	OIL PLUG	70	SL05008	2	SCREW

## CROSS AND COMPOUND SLIDE ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
71	LT-03-111	2	NUT				
72	LT-05-103	2	HANDLE				
74	LT-05-419	1	GUIDE BLOCK				
75	LT-05-107	1	HUB BLOCK				
76	LT-05-418	1	ECCENTRIC ROD				
77	SN05012	1	SCREW				
78	L-4065A	1	WASHER				
79	LT-05-420	1	SUPPORT				
80	L-7011	1	LEVER				
81	18-20263	2	SUPPORT SHAFT				
81a	LT-05-205A	1	COPPER SPACER				
82	18-20213	2	BUSHING				
83	18-20206MC	1	DIAL RING				
84	LB-05-616	1	KNOB				
85	18-20206EC	1	DIAL RING				
86	LT-05-432	4	KEY				
87	LT-09-121	4	SPRING				
88	18-20265	2	GEAR SHAFT				
89	SL08012	2	SCREW				
90	LT-05-101	2	LOCK PIN				
91	LT-05-102	2	CRANK				
92	SA04006	2	SCREW				
95	SN06020	4	SCREW				
96	PD03016B	2	PIN				
97	LT-05-219	1	LOCK SCREW				
98	NH06	1	NUT				
99	BB6000Z	2	BEARING				
100	LT-03-103B	1	COVER				
101	SA06016	2	SCREW				
102	OS14227	1	OIL SEAL				
103	4900UU	1	BEARING				

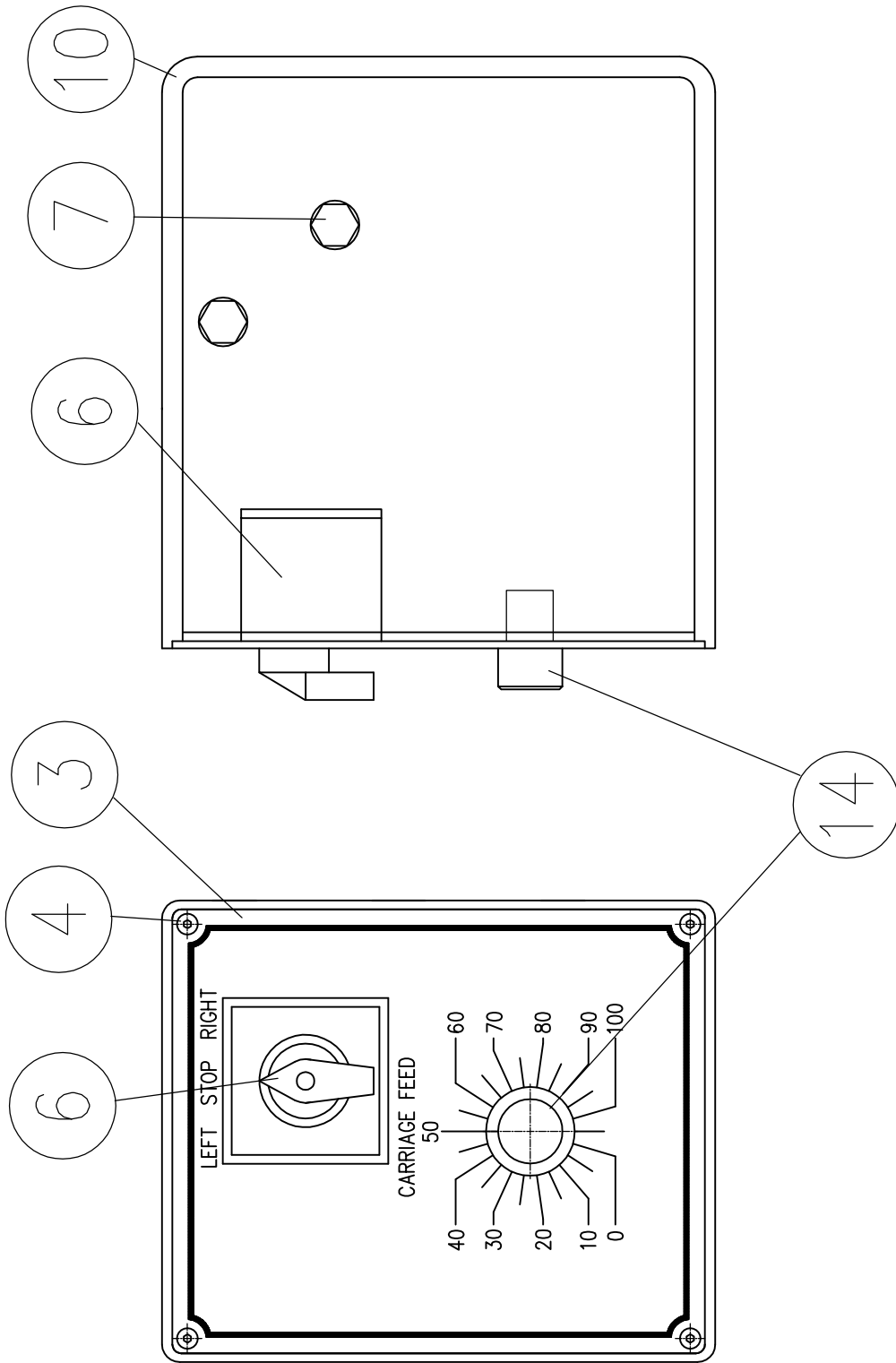
# CROSS AND COMPOUND SLIDE ASSEMBLY



## A.C MOTOR POWER FEED CONTROL ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
3	LB-05-501F	1	INDICATOR PLATE				
4	SN04008	4	SCREW				
6	SC68-36 1a 0 1a	1	SELECT SWITCH				
7	SA08020	2	SCREW				
10	LB-05-501	1	HOUSING				
14	VR-2K 202	1	SPEED CONTROL				

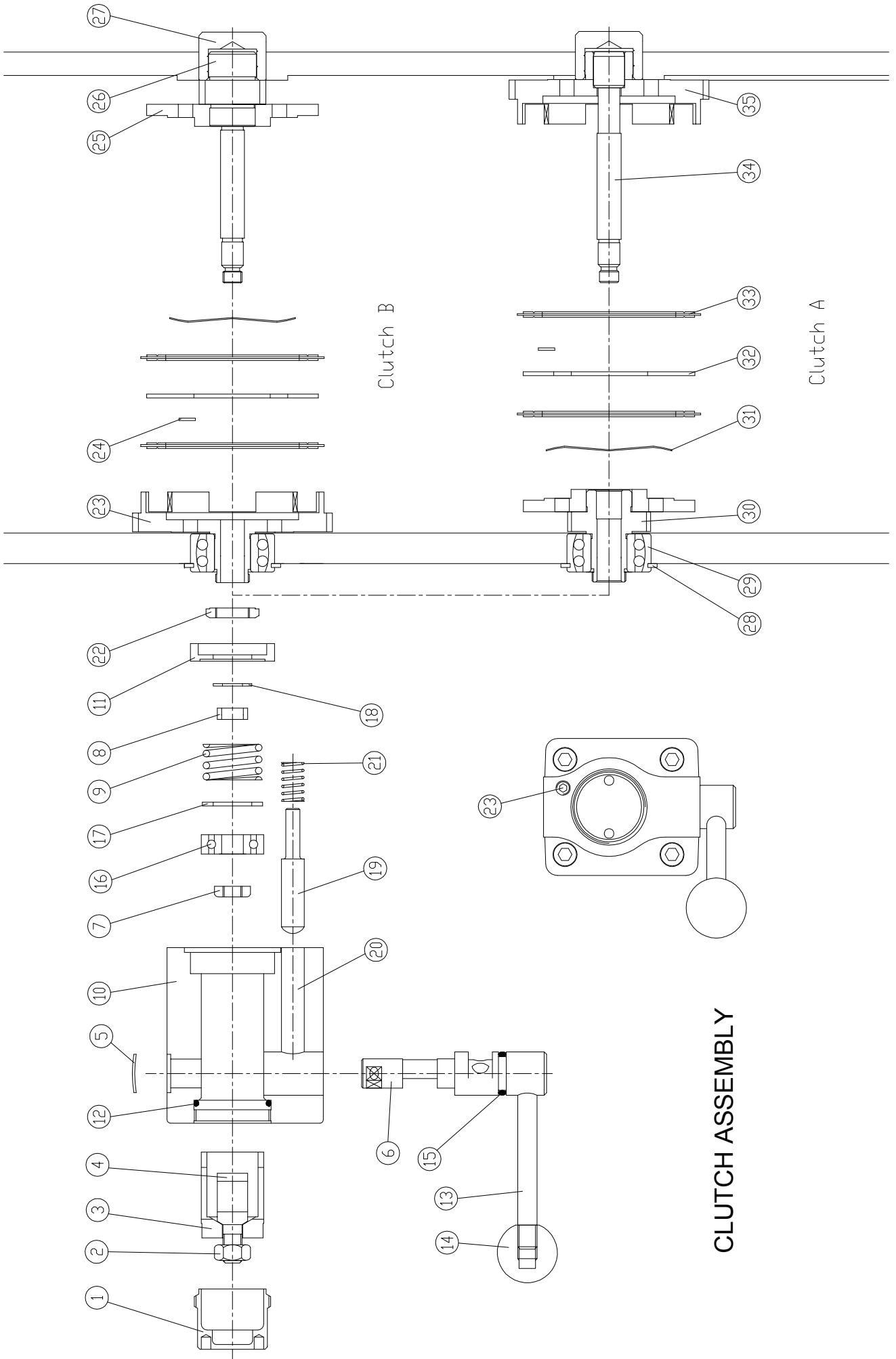




A.C MOTOR POWER FEED CONTROL ASSEMBLY

## CLUTCH ASSEMBLY

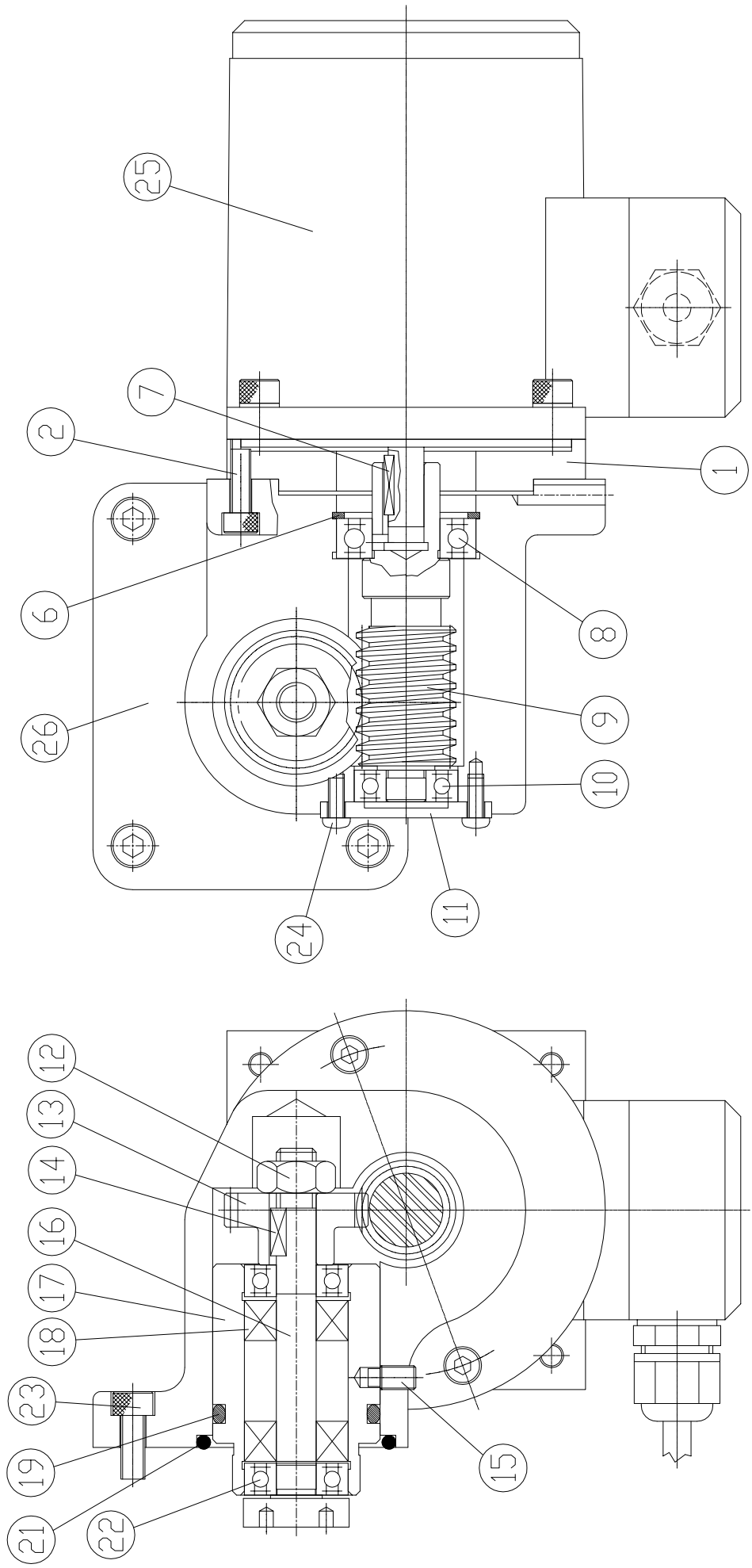
KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LB-05-613	2	COVER				
2	NH08NF	2	NUT				
3	LB-05-611	2	PRESSURE SLEEVE				
4	LB-05-612	2	ADJUSTING BOLT				
5	LB-05-610	2	PLUG				
6	LT-05-601	2	CLUTCH CAM				
7	NH08NF	2	NUT				
8	LB-05-609	2	BEARING SPACER				
9	LB-05-608	2	SPRING				
10	LB-05-602	1	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	RCS09	2	SNAP RING				
19	LB-05-603	1	PLUNGER				
20	LB-05-604	2	SPRING				
21	LB-05-606	2	NUT				
22	LB-05-614	2	STOP SCREW				
23	LB-05-306	1	CLUTCH BUSHING				
24	RCS06	6	SNAP RING				
25	LB-05-308A	2	CLUTCH FIXED PLATE				
26	LB-05-328	1	CLUTCH SHAFT				
27	LB-05-308B	2	OILITE BEARING				
28	RCS35	2	SNAP RING				
29	LB-05-337	2	BEARING				
30	LB-05-308	1	PINION				
31	LB-05-301	2	BOWED WASHER				
32	LB-05-310	2	CLUTCH DISC				
33	LB-05-305	4	BRAKE PLATE				
34	LB-05-307	1	CLUTCH SHAFT				
35	LB-05-329	1	CLUTCH BUSHING				



**CLUTCH ASSEMBLY**

## A.C MOTOR ASSEMBLY

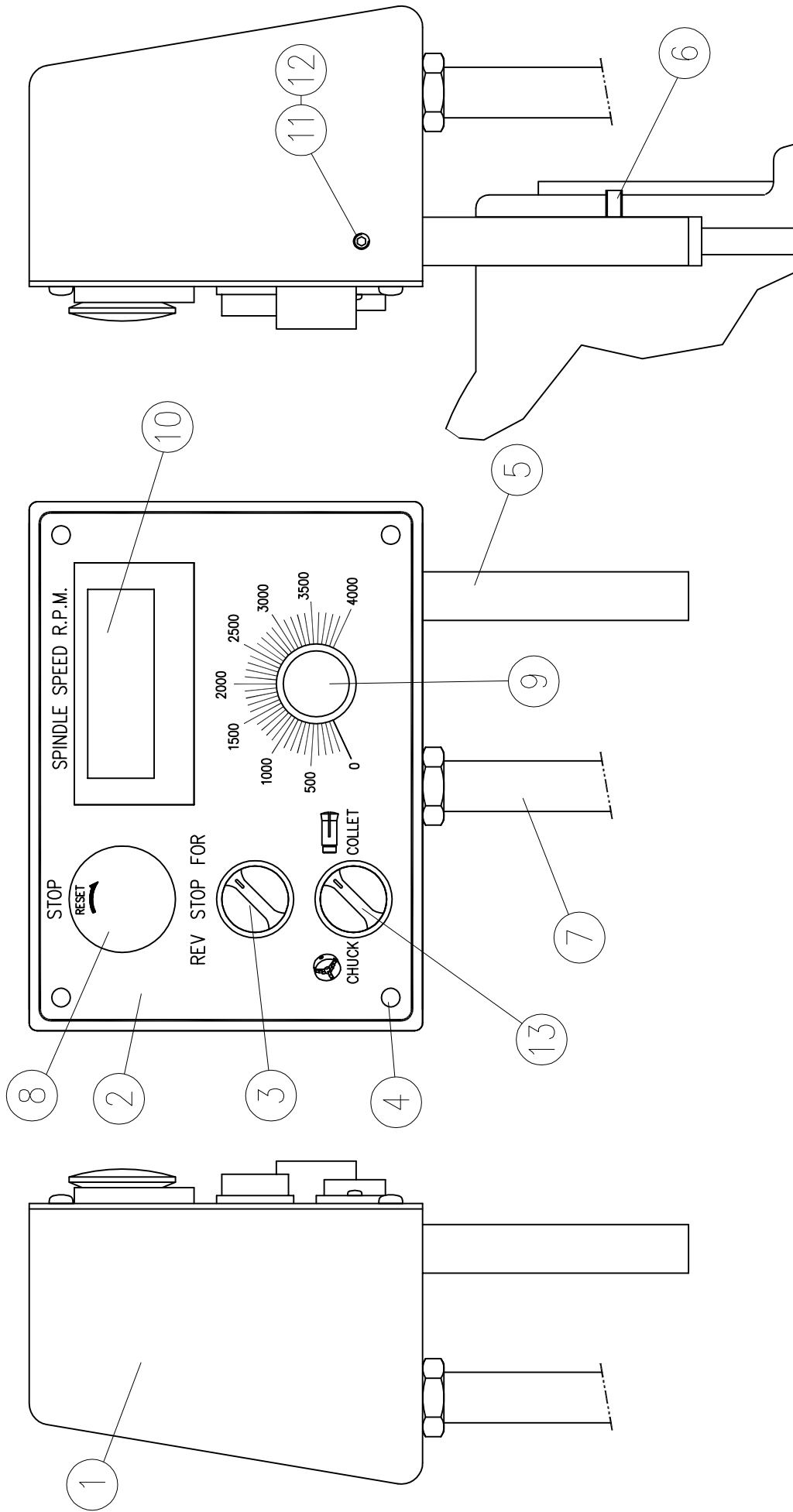
KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LB-05-721-A	1	CONNECTING ADAPTER				
2	SH05015	2	SCREW				
3	SA06020	4	SCREW				
6	RCR35	1	RETAINING RING				
7	KD03015	2	KEY				
8	BB6003ZZ	1	BEARING				
9	LT-05-708-1	1	WORM SHAFT				
10	BB6000ZZ	1	BEARING				
11	LT-05-710	1	BEARING CAP				
12	NH10NF	1	NUT				
13	LT-05-703-1	1	WORM GEAR				
14	KD04012	1	KEY				
15	L-8006	1	FIXED SCREW				
16	LT-05-704	1	MAIN GEEAR SHAFT				
17	LT-05-705	1	BEARING BRACKET				
18	OS10267	2	SEAL				
19	ORP042	1	O RING				
20	RCR35	1	RETAINING RING				
21	ORP45	1	O RING				
22	BB6000ZZ	2	BEARING				
23	SA05015	1	SCREW				
24	SN04010	4	SCREW				
25	LB-05-700AC	1	A.C MOTOR				
26	LT-05-707	1	SPEED BOX				



A.C MOTOR ASSEMBLY

## VARIABLE SPEED CONTROL BOX ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LB-06-303F	1	CONTROL BOX				
2	LT-06-301F	1	SPEED INDICATOR PLATE				
3	22mm 2A 3 B	1	TOGGLE SWITCH				
4	SN05008	4	SCREW				
5	L-6405F	1	SUPPORT POST				
6	SL06010	2	SCREW				
7	PCB-04B 1/2"	1	CONNECTOR STRAIGHT				
8	22mm 1B R	1	BUTTON				
9	VR-2K 202	1	SPEED CONTROL				
10	PF-L(R) NR-D1S	1	DIGITAL READOUT				
11	SL06006	1	SCREW				
12	SL06006	1	LOCK SCREW				
13	22mm XB-ND21 1a 2 B	1	SELECT SWITCH				

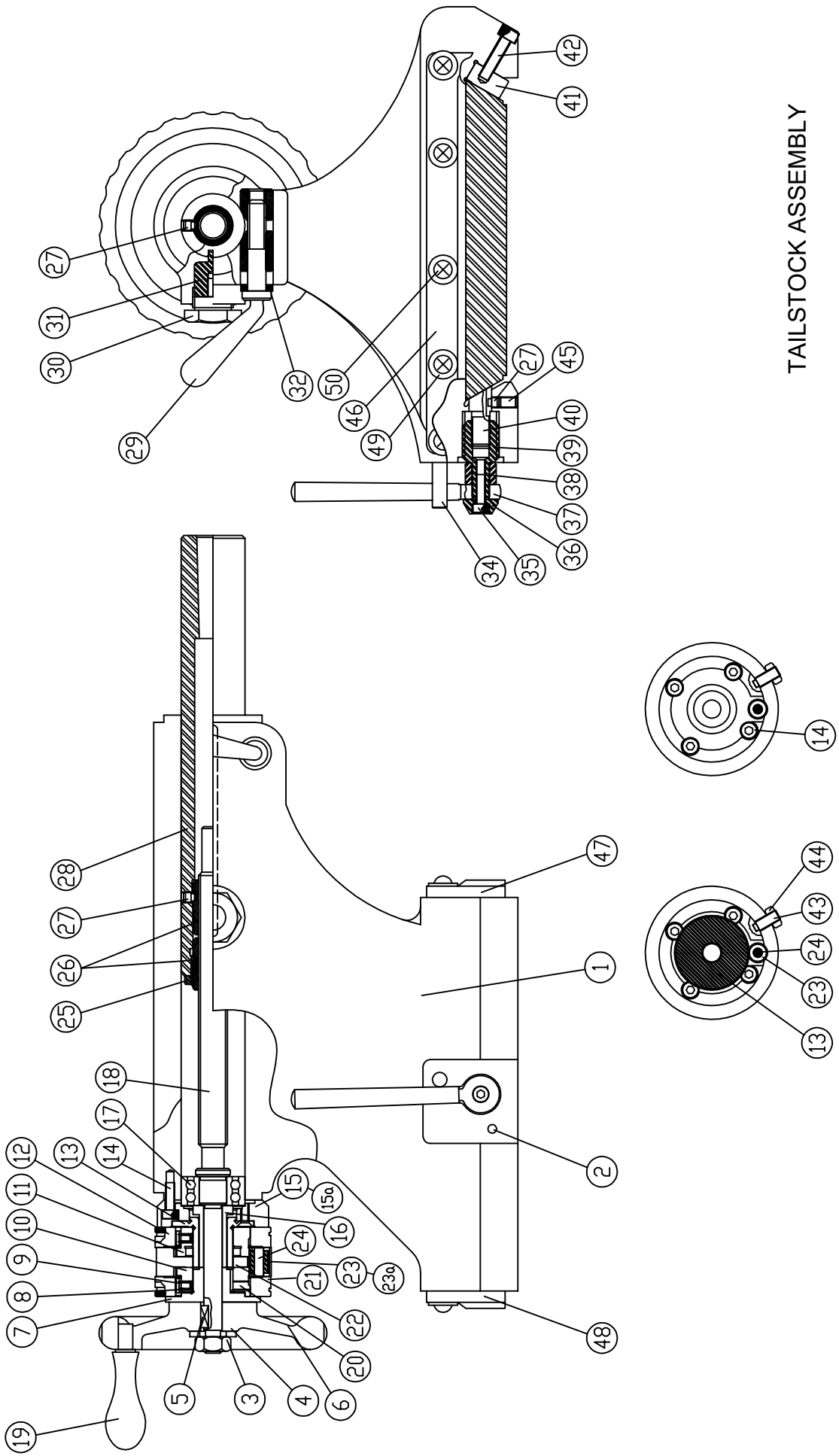


VARIABLE SPEED CONTROL BOX ASSEMBLY

## TAILSTOCK ASSEMBLY

KEY	PARTS NUMBER	PCS	PARTS NAME	KEY	PARTS NUMBER	PCS	PARTS NAME
1	LT-09-101	1	TAILSTOCK BODY	34	PD08040	1	PIN
2	PD05040	1	PIN	35	SA05016	1	SCREW
3	NH10	1	NUT	36	LT-09-116	1	PLUG
4	WB10	1	WASHER	37	LT-09-115	1	HANDLE
5	KD04012	1	KEY	38	LT-09-117	1	BUSHING
6	LT-09-102EM99	1	HANDLE WHEEL	39	LT-09-109	1	LOCK BOLT
7	18-85024	1	COVER PLATE	40	LT-09-109A	1	LOCK BLOCK
8	LT-09-121	2	SPRING	41	LT-09-103	1	GIB
9	LT-05-432	2	KEY	42	SA06025	4	SCREW
10	18-20203	1	GEAR	43	LT-05-219	1	SCREW
11	18-20209	1	GEAR	44	NH06	1	NUT
12	18-20206MC	1	DIAL RING	45	SL06010	1	SCREW
13	18-20263	1	SUPPORT SHAFT	46	LT-09-123	2	WIPPER
14	SA05016	4	SCREW	47	LT-09-123A	1	LEFT WIPPER
15	18-85005	1	BEARING SPACER	48	LT-09-123B	1	RIGHT WIPPE
15a	SB04010	1	SCREW	49	WB06	7	WASHER
16	18-85025	1	SPACER	50	SN06014	7	SCREW
17	LB-05-337	1	BEARING				
18	LT-09-107EM99	1	SCREW SHAFT				
19	LT-05-324	1	HANDLE WHEEL				
20	SL06008	1	SCREW				
21	18-20206EC	1	DIAL RING				
22	18-20211C	1	ZERO RING				
23	18-20210	1	GEAR				
23a	18-20207	1	COVER				
24	18-20212	1	SHAFT				
25	LT-09-110	1	LOCK NUT				
26	LT-09-108	1pr	NUT				
27	LB-05-442	1	LOCK SCREW				
28	LT-09-106	1	TAILSTOCK SPINDLE				
29	LT-09-112	1	HANDLE				
30	LT-09-122	1	LOCK PLUG				
31	LT-09-111	1	KEY				
32	LT-09-114	1	WASHER				
33	LT-09-113	1	LOCK PLUG				

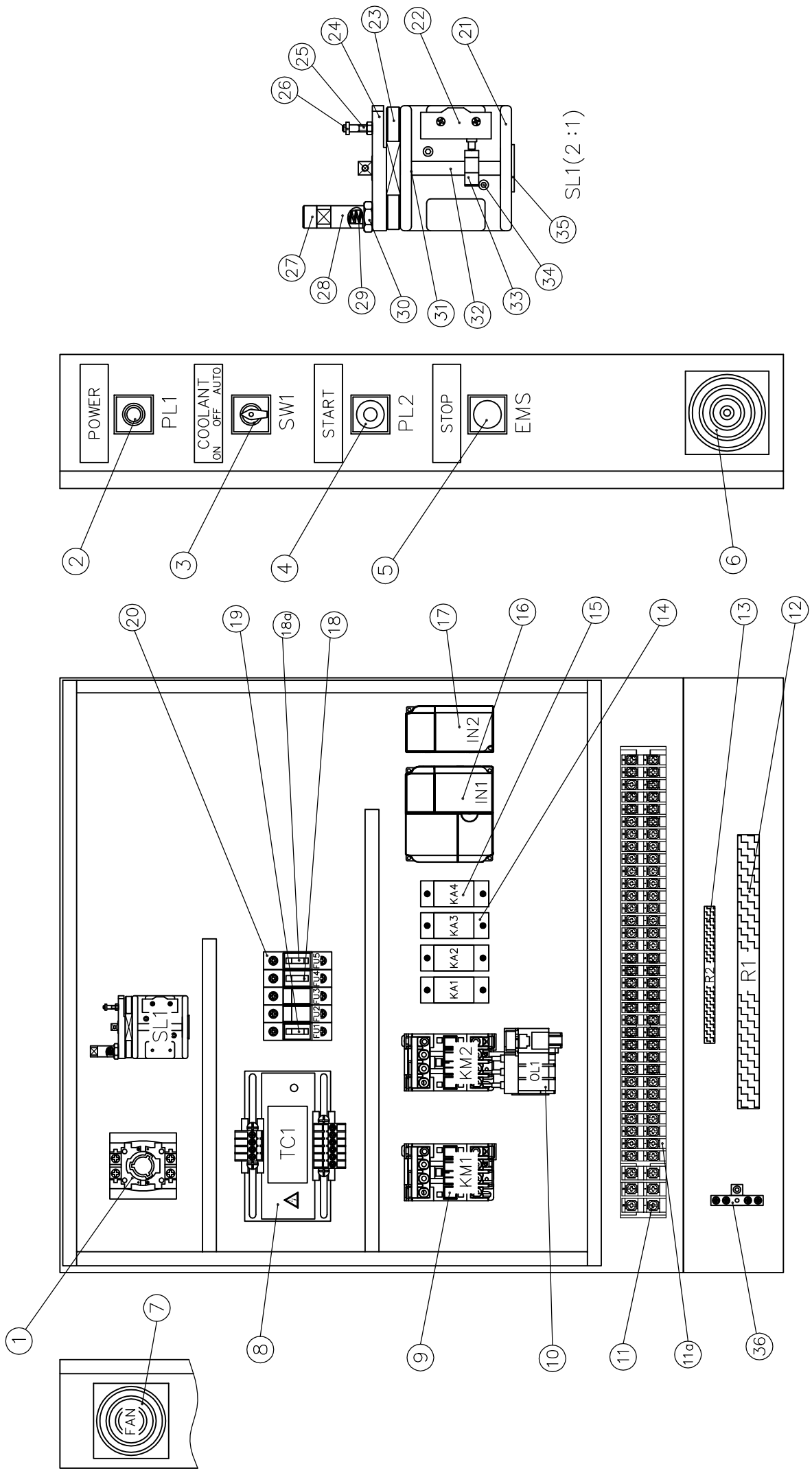




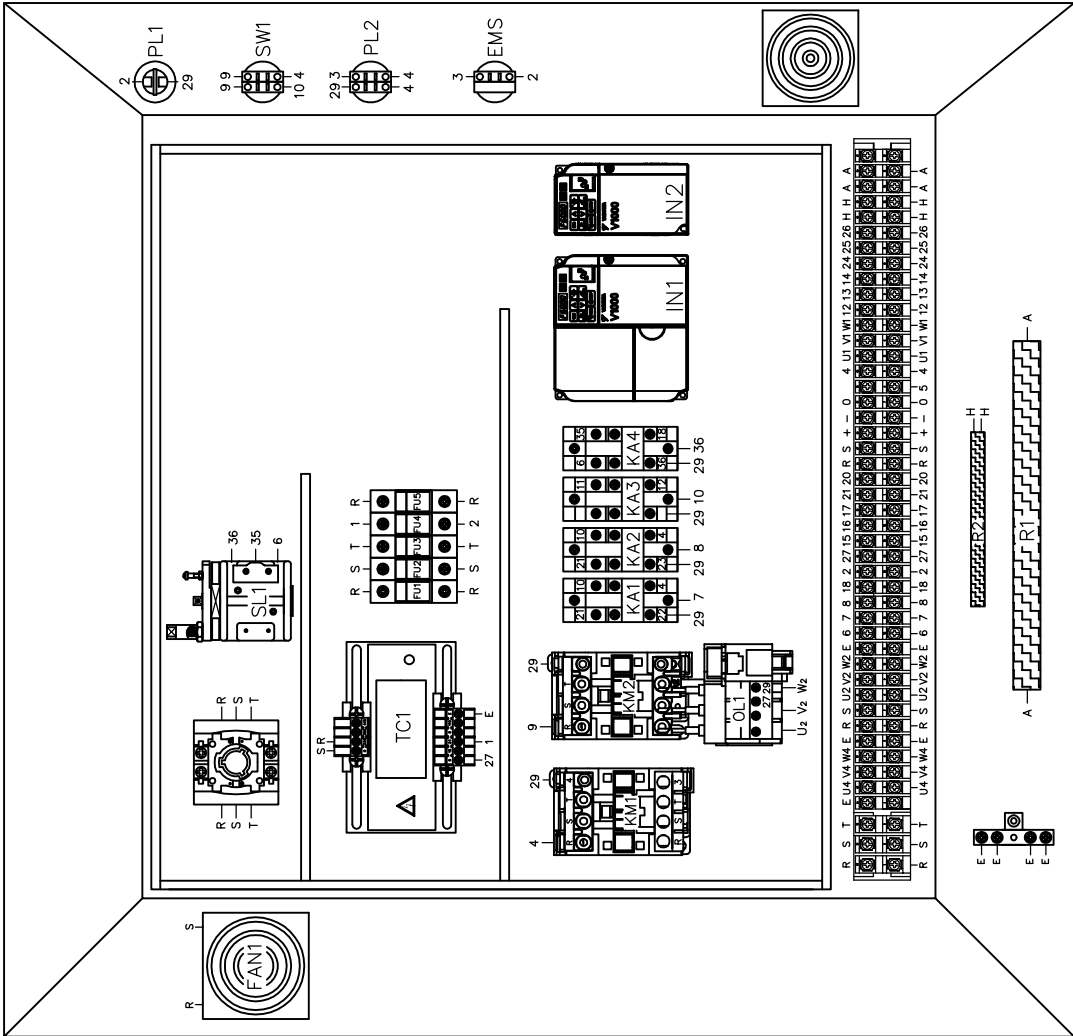
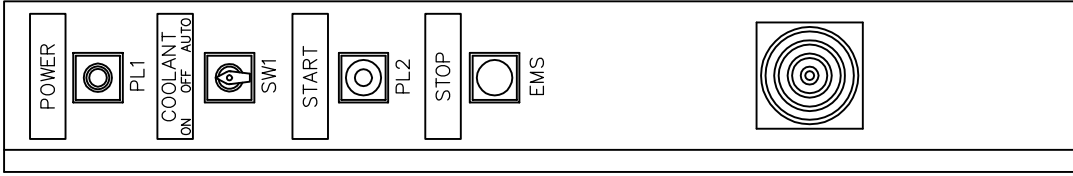
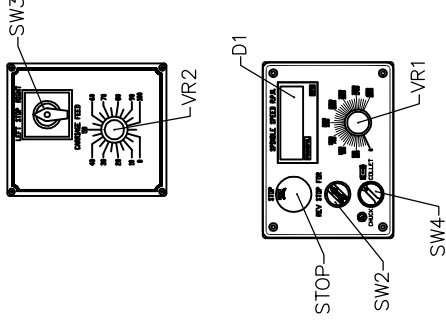
TAILSTOCK ASSEMBLY

## ELECTRIC CONTROL PANEL

KEY	PARTS NUMBER	PCS	PARTS NAME
1	TO-2-1/V/SVB	1	DISCONNECT SWITCH
2	30mm 24V W	1	INDICATE LIGHT
3	30mm 2a 3 B	1	SELECT SWITCH
4	30mm 1a 24V G	1	PUSH BOTTON
5	30mm 1b R	1	PUSH BOTTON
6	4"	1	PLASTIC COVER FILTER
7	4" 220V	1	FAN
8	260VA 220V	1	TRANSFOMER
9	CU-11 3A1a 24V	2	CONTACTOR
10	RHU-10K1 0.75-1A	1	OVERLOAD RELAY
11	IN20BK 3P	1	TERMINAL STRIP
11a	IN13SBKN 3P	14	TERMINAL STRIP
12	600W40Ω	1	BRAKE
13	70W200Ω	1	BRAKE
14	PYF08A-E	4	RELAY BASE
15	MY2N-GS AC24V	4	POWER RELAY
16	V1000 3HP 220V	1	INVERTER
17	V1000 0.5HP 220V	1	INVERTER
18	10*38 4A	1	FUSE
18a	10*38 6A	1	FUSE
19	10*38 20A	3	FUSE
20	10*38 1P	5	FUSE BASE
21	L-6701	1	SWITCH BASE
22	Z-15GD-B	1	LIMITE SWITCH
23	L-6706	1	SLEEVE
24	L-6702N	1	SWIVEL ARM
25	L-6703	1	RETAINING BOLT
26	BB/PHS5	1	BEARING
27	SA10008	2	SCREW
28	L-6707	1	SPRING SEAT
29	L-6708	1	SPRING
30	LT-01-247	1	NUT
31	BD10	1	BALL
32	L-6704	4	GEAR SHAFT
33	L-6705	1	ECCENTRIC RING
34	SA04012	2	SCREW
35	L-6710	2	BUSHING
36	4P	1	GROUND TERMINAL



M1	Spindle motor
M2	Feed motor
M3	Coolant pump
V1	Yaskawa V1000 2.2kw
V2	Yaskawa V1000 0.4kw
SW1	Coolant pump switch
SW2	Motor forward and Reverse switch
SW3	Feed motor switch
EMS1	Emergency stop switch
STOP	stop switch
VR1	Spindle speed select knob
VR2	Feed speed select knob
PL1	Power light
PL2	Start light
S1	Start button
FU1	Fuse
FU2	Fuse
FU3	Fuse
FU4	Fuse
FU5	Fuse
KM1	Spindle motor contactor
KM2	Coolant pump contactor
KA1	Forward/Reverse power relay
KA2	Forward/Reverse power relay
KA3	Feed motor power relay
KA4	Power relay
R1	Spindle motor brake resistor
R2	Feed motor brake resistor
SL1	limit switch
SL2	limit switch
Fan1	Fan
D1	Digital readout
IN1	Yaskwa 2.2kw inverter
IN2	Yaskwa 0.4kw inverter
OL1	Coolant pump over relay



M1	Spindle motor
M2	Feed motor
M3	Coolant pump
V1	Yaskawa V1000 2.2kw
V2	Yaskawa V1000 0.4kw
SW1	Coolant pump switch
SW2	Motor forward and Reverse switch
SW3	Feed motor switch
EMS1	Emergency stop switch
STOP	stop switch
VR1	Spindle speed select knob
VR2	Feed speed select knob
PL1	Power light
PL2	Start light
S1	Start button
FU1	Fuse
FU2	Fuse
FU3	Fuse
FU4	Fuse
FU5	Fuse
KM1	Spindle motor contactor
KM2	Coolant pump contactor
KA1	Forward/Reverse power relay
KA2	Forward/Reverse power relay
KA3	Feed motor power relay
KA4	Power relay
R1	Spindle motor brake resistor
R2	Feed motor brake resistor
SL1	limit switch
SL2	limit switch
Fan1	Fan
D1	Digital readout
IN1	Yaskwa 2.2kw inverter
IN2	Yaskwa 0.4kw inverter
OL1	Coolant pump over relay

