

# OPERATING MANUAL

HEALTH AND SAFETY  
GUIDANCE NOTES  
MODEL: K3FLC



DATE : 2004/08/12

VERSION : 1

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# 1. OPERATING SAFETY GUIDELINES

## 1.1 OPERATING SAFETY PRECAUTIONS

- a. The operator must be a technician who is trained in the operation and familiar with the manual.
- b. Never lay anything on the working surfaces of the machine, where it may foul with rotating or moving parts.
- c. Do not touch or reach over moving or rotating machine parts.
- d. Ensure you know how to stop the machine before starting it.
- e. Do not operate the machine in excess of its rated capacity.
- f. Do not wear rings, watches, ties or loose sleeved clothing.
- g. Stop machine immediately anything unexpected happens.
- h. Do not cutting Mg metal.
- i. Always select the correct tool for the job.
- j. Do not run the machine unattended.
- k. Do not place hand or body in path of moving objects.
  - l. Know the function of each and every control.
- m. Make sure power has been turned off when machine is unused for sometime.
- n. Be sure spindle is not running when using gauges on the machine.
- o. Never take depth of cuts beyond machine's capability.

## 1.2 MACHINE OPERATORS PRECAUTIONS

- a. The machine is to be started or operated by an authorized operator only.
- b. Immediate stop and repair are needed in case of troubles in operations.
- c. In installation, the machine shall be connected to earth.
- d. In stop motion, the feed lever shall be placed in the neutral position.
- e. The machine should be stopped during the inspection on the workpieces.
- f. In clamping, check and ensure if the workpieces are firmly vised.
- g. The spindle must be kept clean and lubricated all the time.
- h. Do not place any tools on the work table to maintain its surface preciseness and smoothness.
- i. Prior to cutting, wait until the spindle is running steadily after the motor is started.
- j. Use brush to clean off the iron fragments.

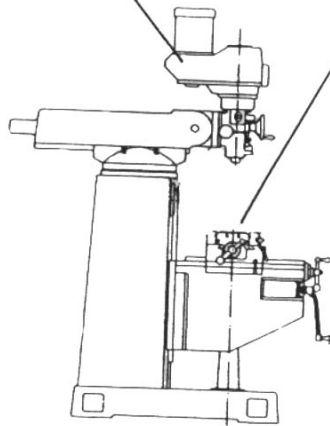
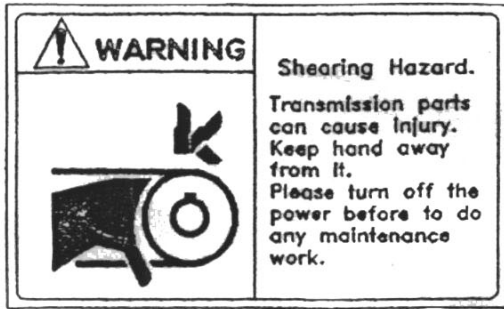


FIG1-1



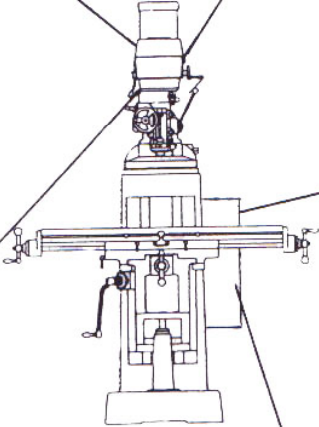
**WARNING**

IMPROPER INSTALLATION OR OPERATION OF THIS MOTOR MAY CAUSE INJURY TO PERSONNEL OR MOTOR FAILURE. READ OPERATION INSTRUCTION.


MOTOR MUST BE INSTALLED AND GROUNDED PER LOCAL AND NATIONAL ELECTRICAL CODES. TO REDUCE POTENTIAL OF ELECTRIC SHOCKS. DISCONNECT ALL POWER SOURCES BEFORE INITIATING AND MAINTENANCE OR REPAIRS.

KEEP FINGERS AND FOREIGN OBJECTS AWAY FROM VENTILATION AND OTHER OPENINGS. KEEP AIR PASSAGES CLEAR.

EYEBOLTS OR LIFTING HOOKS WHEN SUPPLIED ARE INTENDED FOR LIFTING THE PRODUCTS ONLY. DON'T LIFT ADDITIONAL WEIGHT.



**⚠ DANGER**



1. High voltage inside. it may make people being killed.
2. Please turn off the power before to do any service work.
3. The cabinet can be opened only by qualified personnel.

**⚠ DANGER**



Entanglement Hazard  
Keep your hands away from the running tooling.



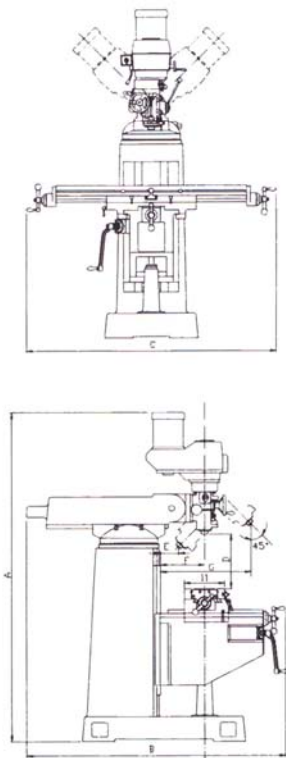
FIG1-2

## 2. MACHINE SPECIFICATIONS

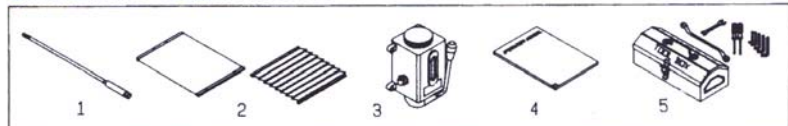
### 2.1 SPECIFICATION

SPECIFICATIONS	K3FLC
WORK TABLE	254 x1270mm (10x50")
X AXIS TRAVEL	800 mm (31-1/2")
Y AXIS TRAVEL	380mm (15")
Z AXIS TRAVEL	406mm (16")
QUILL DIAMETER	Ø86mm (3-3/8")
QUILL TRAVEL	127mm (5")
QUILL FEED	2.5M/min (100ipm)
CUTTING FEED	3 M/min (120ipm)
RAPID FEED	4 M/min (160ipm)
SPINDLE TAPER	N.S.T. #30
SPINDLE MOTOR	AC 3HP
SPINDLE SPEED	70-4200R.P.M
SPINDLE NOSE TO TABLE	20-426mm(3/4"-16-3/4")
3 AXES DRIVE MOTOR	DC or AC servo motor
COOLANT PUMP MOTOR	1/8HP
TABLE T-SLOTS(WxN)	16mm(0.63")x3
TABLE LOAD MAX.(CENTER)	320kgs(700lbs)
NET WEIGHT	1500kgs (3300lbs)
FLOOR SPACE(LxWxH)	280 x 145 x 216cm
PACKED SIZE(LxWxH)	165 x 145 x 180cm

### OVERALL DIMENSION

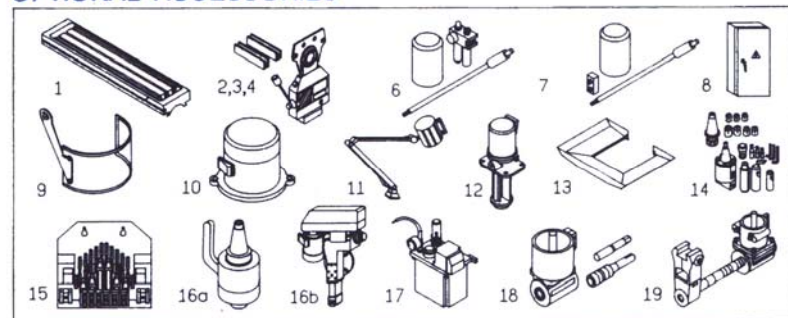


### STANDARD EQUIPMENTS



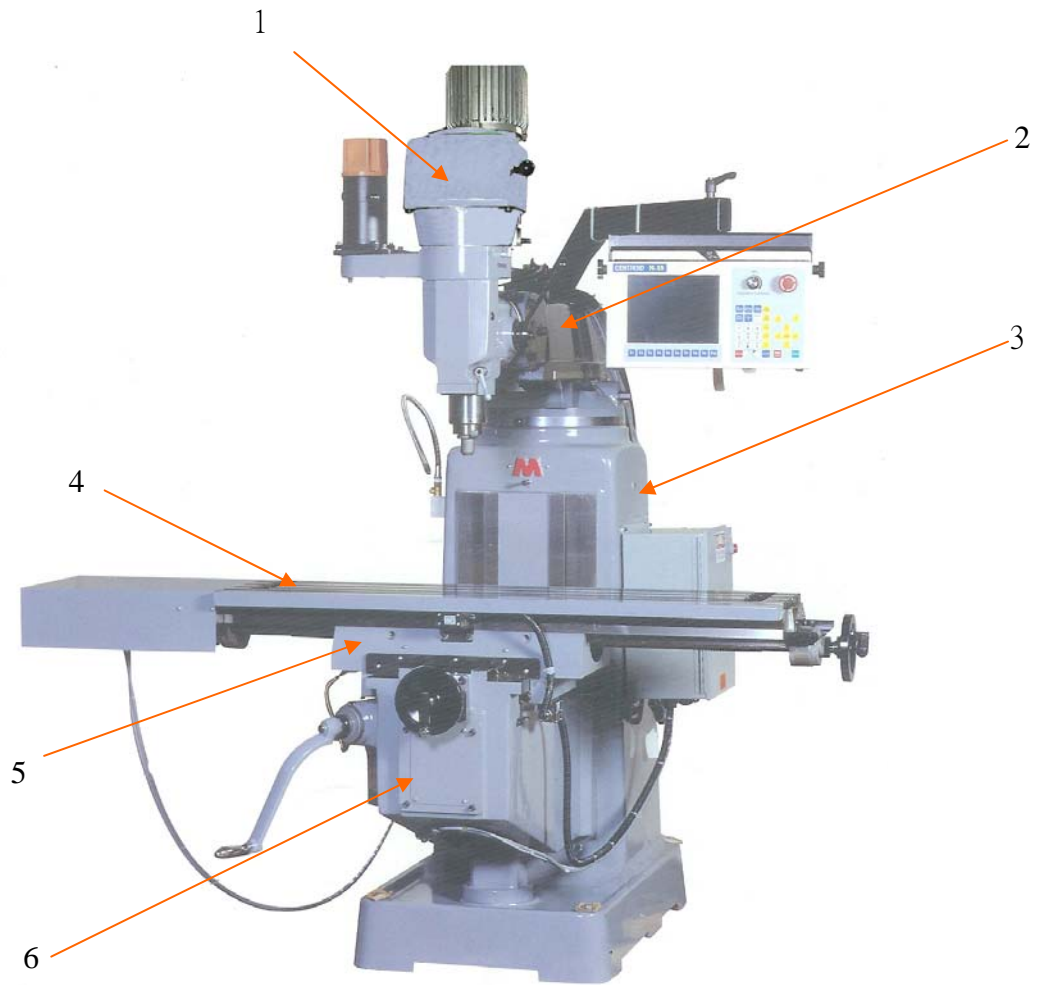
1. DRAW BAR
2. SLIDWAYS COVER
3. ONE SHOT LUBRICATION
4. OPERATION MANUAL
5. TOOLS & TOOL BOX

### OPTIONAL ACCESSORIES



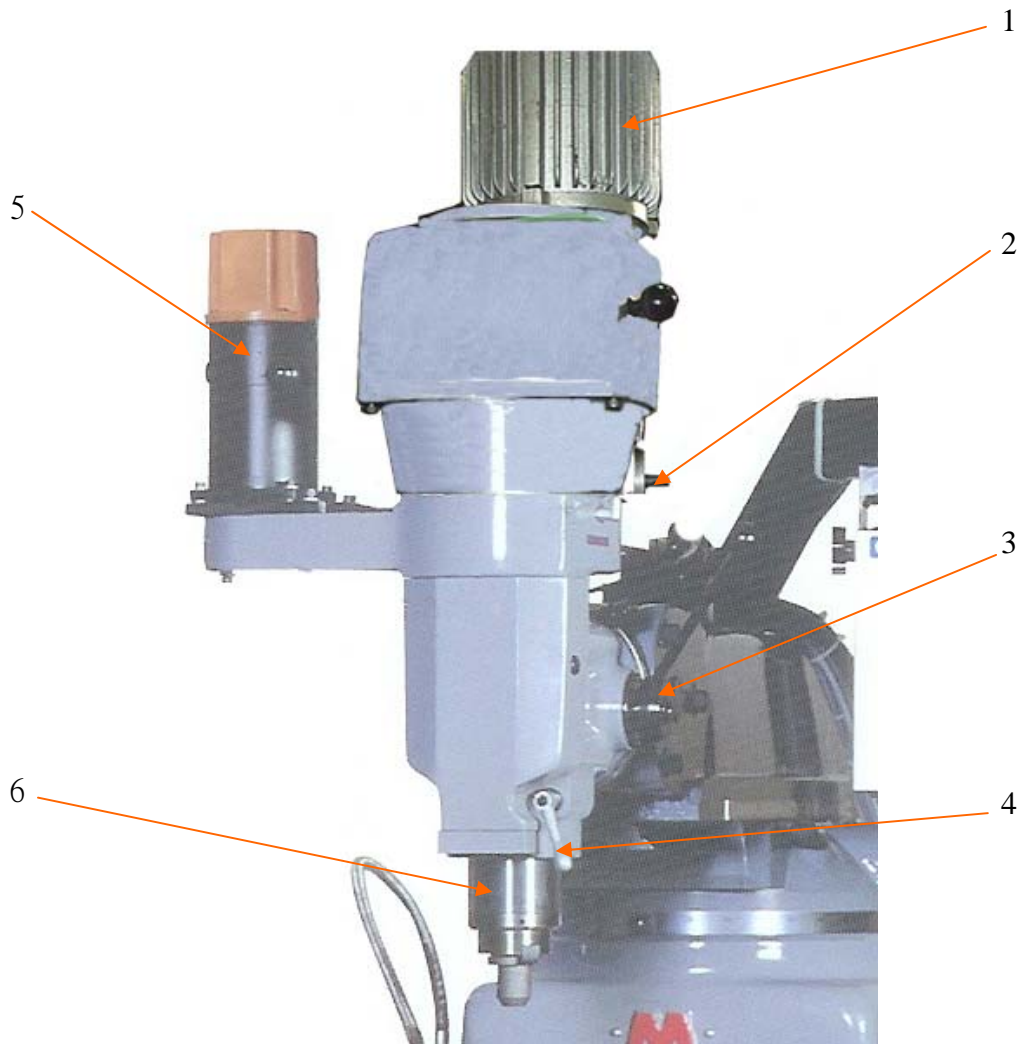
1. LARGER WORK TABLE
2. X AXIS POWER FEED
3. Y AXIS POWER FEED
4. Z AXIS POWER FEED
5. PNEUMATIC POWER DRAW BAR
6. ELECTRIC POWER DRAW BAR
7. ELECTRIC BOX
- 8a. CE ELECTRIC BOX
9. CHIP GUARD
10. 2P/4P 2-SPEED MOTOR (K3SL)
11. HALOGEN WORK LIGHT
12. COOLANT SYSTEM
13. CHIP TRAY
14. MILLING CHUCK W/-COLLETS
15. CLAMPING KITS
16. a. QUICK CHANGE SLOTING UNIT  
b. SLOTING UNIT
17. AUTO LUBRICATION SYSTEM
18. RIGHT ANGLE ATTACHMENT
19. HORIZONTAL MILLING ATTACHMENT

### 3. NAMES OF MACHINE PARTS



1	Milling Head
2	Ram
3	Column
4	Table
5	Saddle
6	Knee

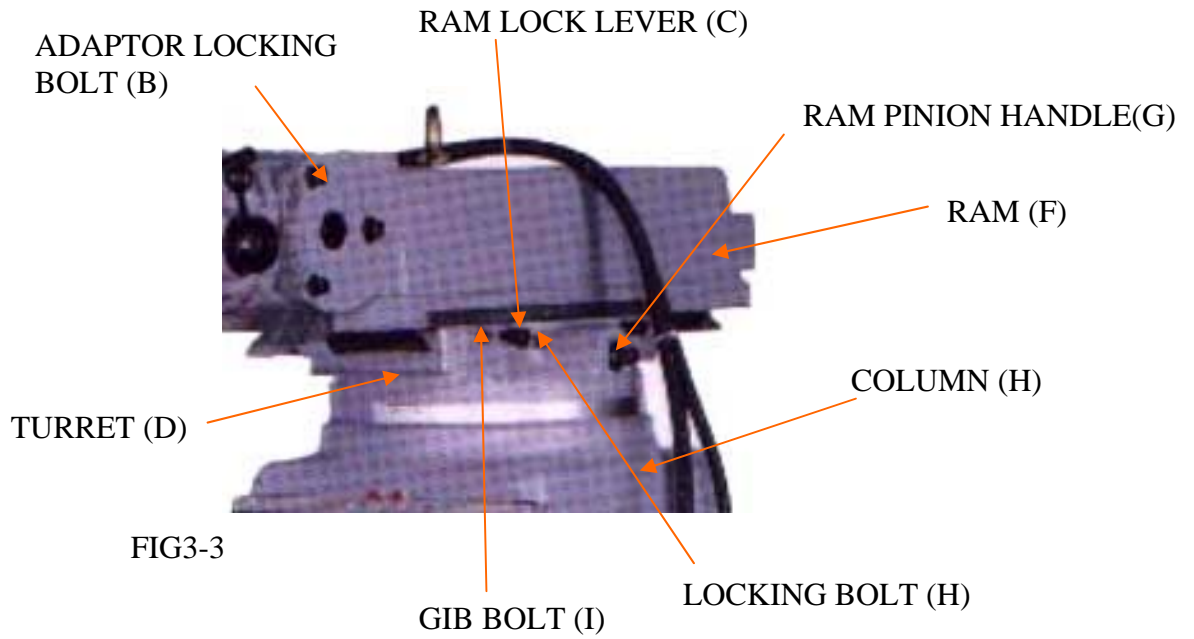
### 3.1 HEADSTOCK



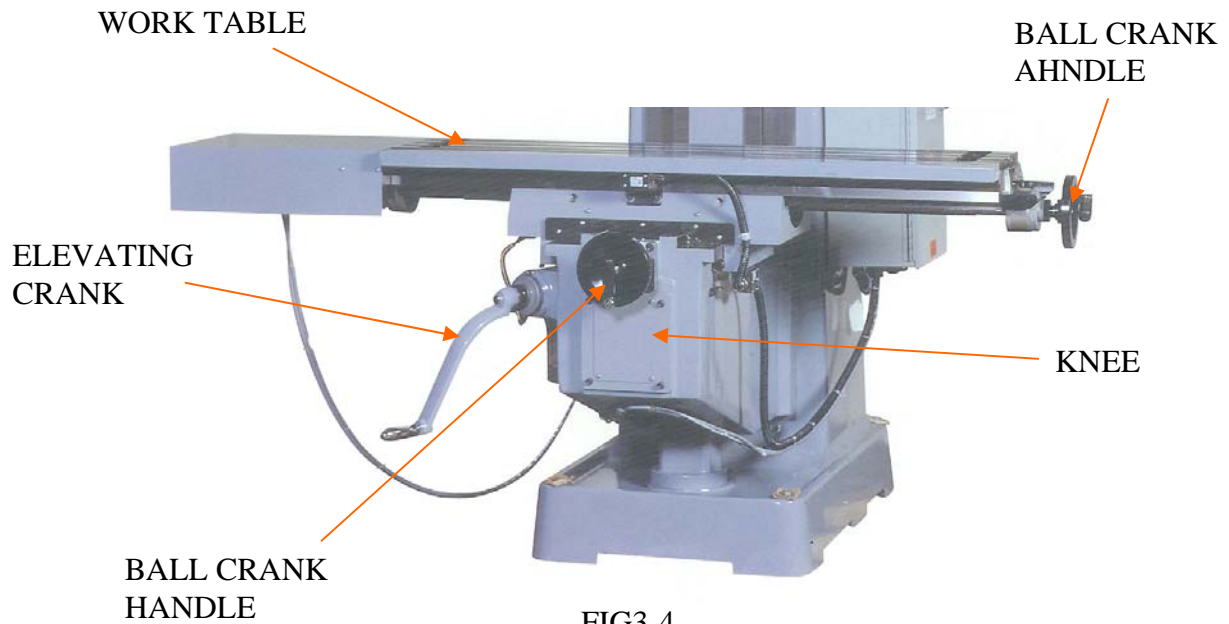
1	Spindle motor
2	Hi-low speed change lever
3	Quill feed lever
4	Quill lock
5	SERVE MOTOR
6	SPINDLE

### 3.2 MACHINE BODY

(1) COLUMN, TURRET AND RAM



(2) WORK TABLE,SADDLE AND KNEE



#### 4.1 OPERATOR POSITION AND NOISE LEVEL

Noise Level:  
Less Than 82 dB

At a distance of 1 meter from the surface of the machinery and at a height of 1.6 meter from floor.

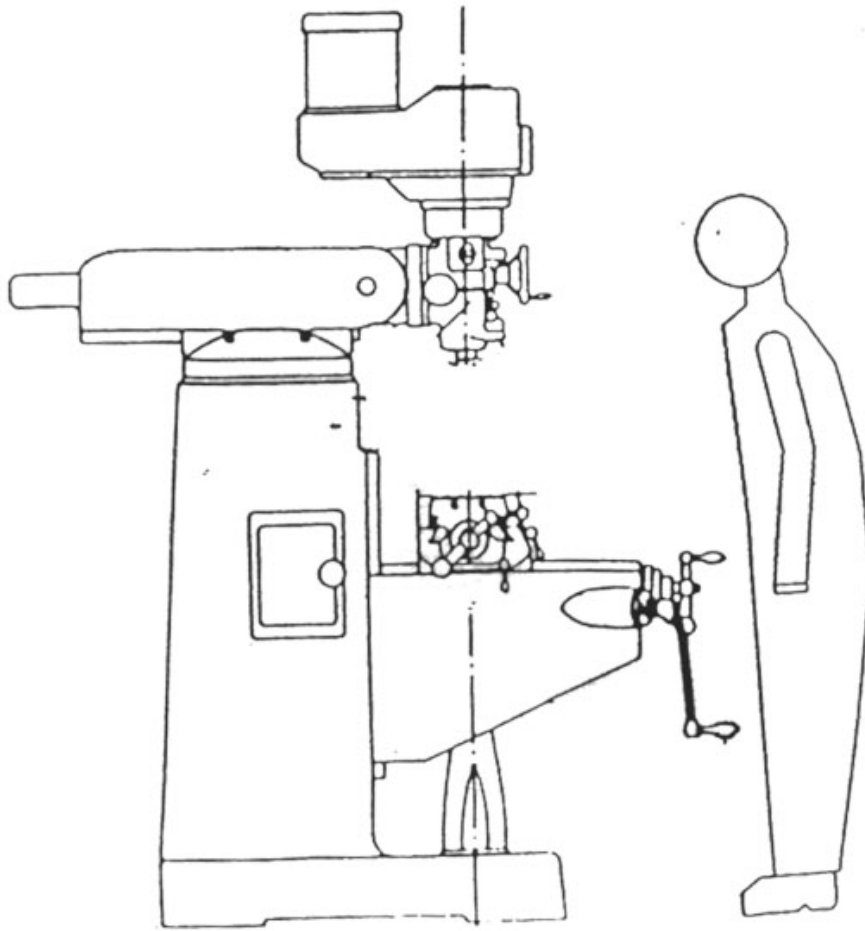


FIG4-1

## 4.2 SPINDLE NOISE DETAIL

### Spindle Nose Detail

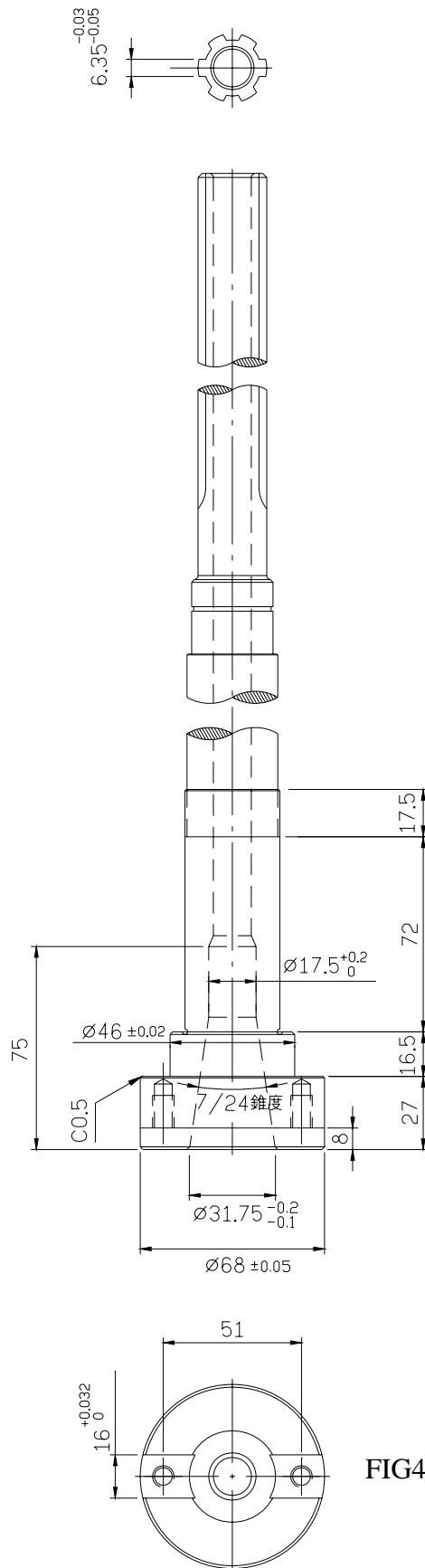


FIG4-2

## 5. LUBRICATION

### 5.1 MACHINE TABLE LUBRICATION

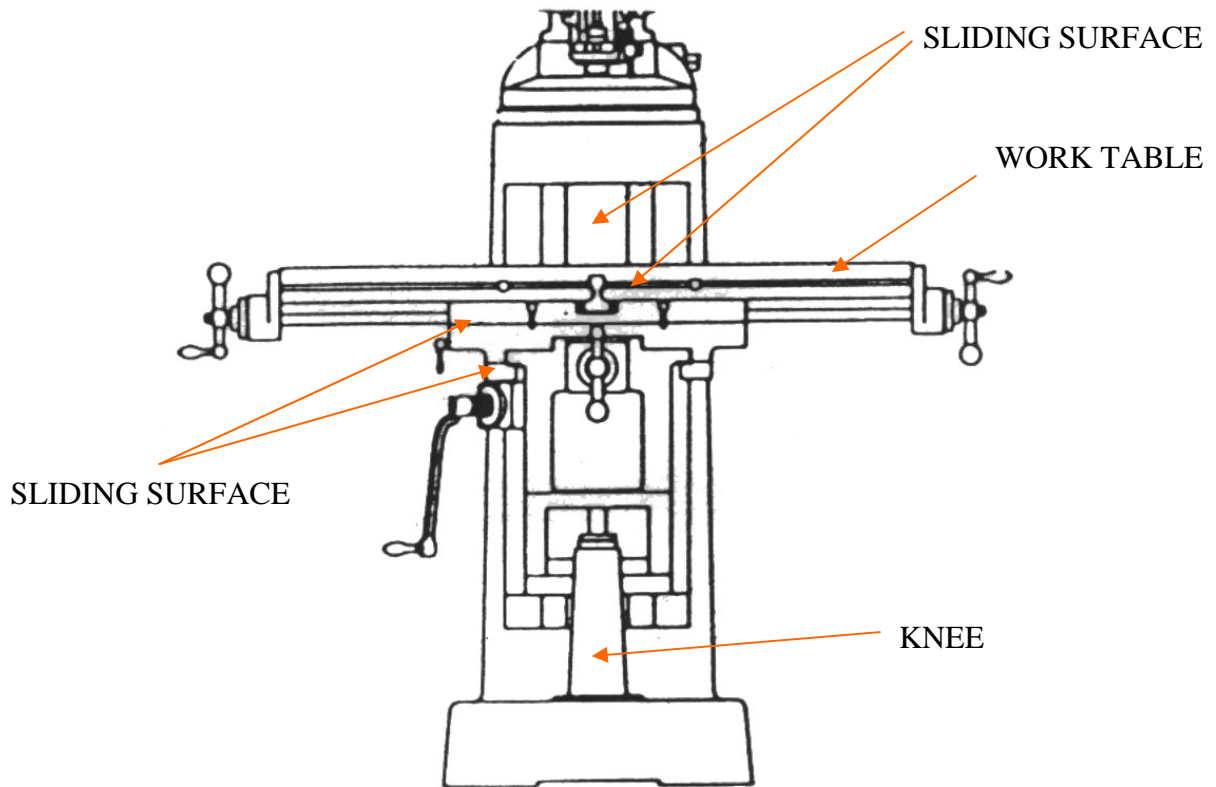


FIG5-1

POSITION:	LUBRICATION OF WORK TABLE, KNEE, SLIDING SURFACE AND LEADSCREWS MAY BE EFFECTUATED BY MEANS OF THE HAND CRANK PUMP ON THE LEFT SIDE OF KNEE.
METHOD:	3 TO 5 TIME DAILY BY PULLING TWICE EACH TIME.
LUBRICANT:	KUO KUANG R-68 GULFWAY 52 VACTRA 2 ESSO FBIS K-53 SHELL TONNA 33

## 6. INSTRUCTIONS IN OPERATIONS

### 6.1 HEADSTOCK

#### 6.1.1 SPINDLE BRAKE:

Before braking, the power source must be switched off, and waiting until the spindle speed is lower than 200 rpm before the brake lever (as shown in the figure on the left) is pushed to the left rear or left from to stop the turning and effectuate the braking. Push the brake lever upward and the quill is braked to full stop for easy cutter tool change.

**NOTE:** Be sure that the brake lever in neutral before starting moto

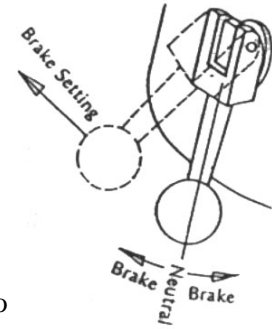


FIG6-1

#### 6.1.2 CHUCKING OF TOOLING SHANK AND DISMANTLING

First the spindle must be raised up to its maximum height. The screw of draw bar is right turn. When the screw is turned clockwise, is for locking of tooling shank, and vice versa. To take out the tooling shank, the drawbar to allow the tooling shank to separate from the spindle. Turn the drawbar, until the tooling shank comes off totally.

**NOTE :** According to spindle braking, brake the spindle to a stop and the tooling shank may easily come off or chuck on.

#### 6.1.3 MANUAL FEED:

The manual feed lever is installed on the right side of head stock . The spindle will vertically when the lever is turned. There are 12 positions to be closed. An operator can freely take out the lever and install it again at the position deemed proper and fit.

**NOTE :** In manual feed, the feed control handle (F) must be placed at position (F) as shown in (Figure 6-2).

#### 6.1.4 MANUAL MICRO MOTION FEED:

To effectuate the manual micro motion feed, the power feed transmission engagement crank (J) (figure 6-2) shall be placed at "OUT" position, and feed reverse knob (d), at the neutral position.

Feed control lever (F) must be pulled from (F1) to (F2). This is to engage the overload clutch. Turn the feed hand wheel (E) clockwise for quill downward feed, and vice-versa.

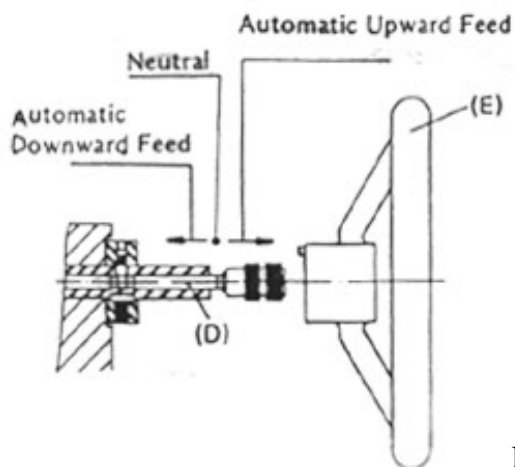
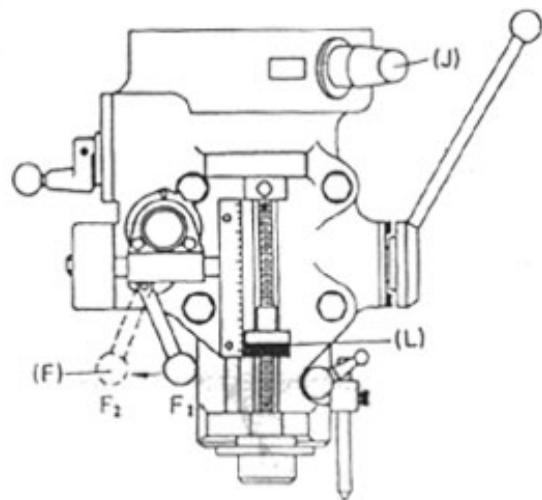


FIG6-2



#### 6.1.5 AUTOMATIC FEED:

For automatic feeding, please take the following steps

- a. Loosen the quill lock (L) .
- b. Turn the power feed transmission engagement crank.
- c. Feed speed is in three stages. H, L and M. selection may be made by quill feed elector.
- d. Pull the feed control lever (F) from (F1) to (F2) position to engage the overload
- e. When the feed control lever knob (D) pressed inward (FIGURE 6-2), it is for downward feed, and vice-versa. The middle position is neutral.
- f. As shown in (FIGURE 6-3), the working depth may be set by micrometer adjustments nuts (K) (each graduation is 0.001" or 0.02 mm). When the quill stop block (I)

clutch

for automatic feed mechanism.

contacts

the micrometer nut (K), the feed control lever (F) may simply jump from (F2) back to (F1) position owing to the connecting motion between the feed trip lever and feed trip plunger. This will disengage the overload clutch and stop the spindle feed.

NOTE : 1. Maximum drilling capacity in automatic feed is 3/8" or 10 mm.

2. The power feed transmission engagement crank shall be placed at "out" position when the automatic feed is not in operation. do not move the power feed transmission engagement crank when the spindle is in revolution.

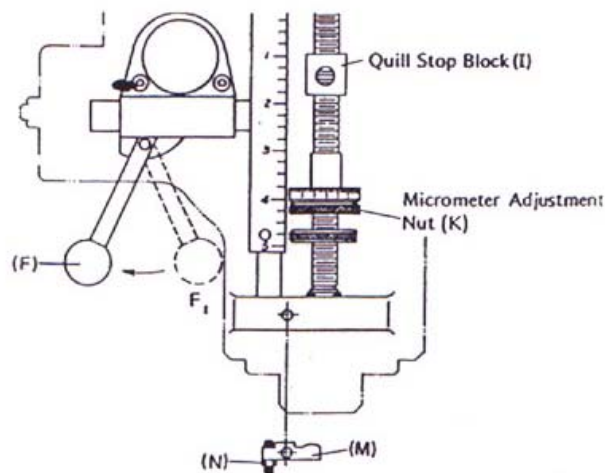


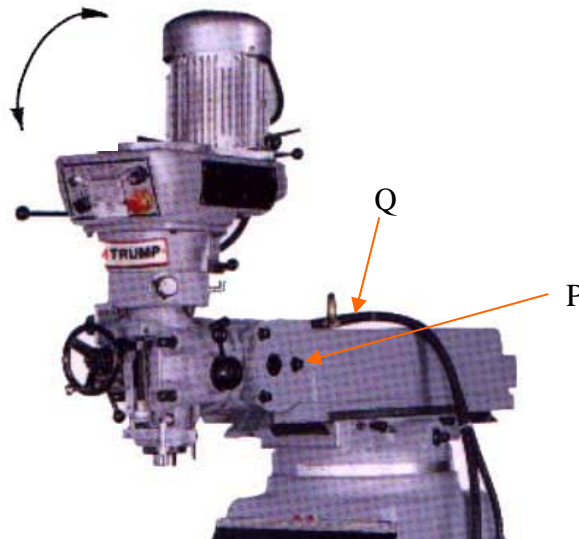
FIG6-3

## 6.1.6 HEADSTOCK TILTING

### In and Out tilting

Turn loose evenly the three adapter locking bolt (P) and turn the vertical adjusting worm shaft (Q) until the angle desired is obtained. Lock up the bolts (P) tightly.

**NOTE:** Do not loosen all the headstock bolts totally.

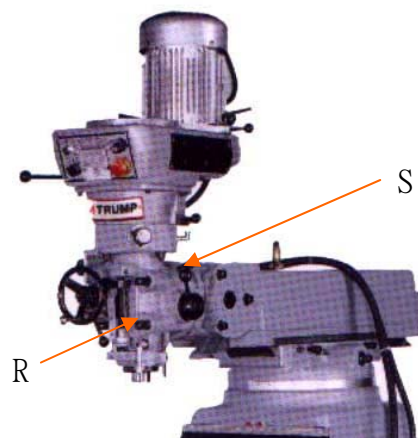
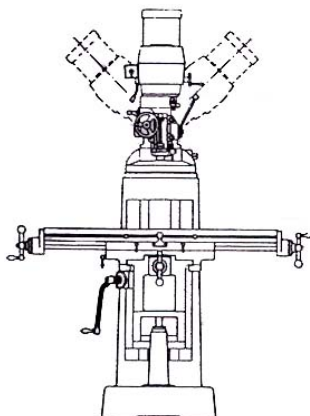


### Cross tilting

Loosen evenly the four lock nuts (R) and turn the worm shaft (S) until the desired angle is secured. Then lock up the lock nuts (R) evenly.

**NOTE:** a. If the adjustment angle is larger than 30 degrees, the safety pin (T) must be drawn out.

b. Do not loosen the lock nuts (R) totally during the adjustment.



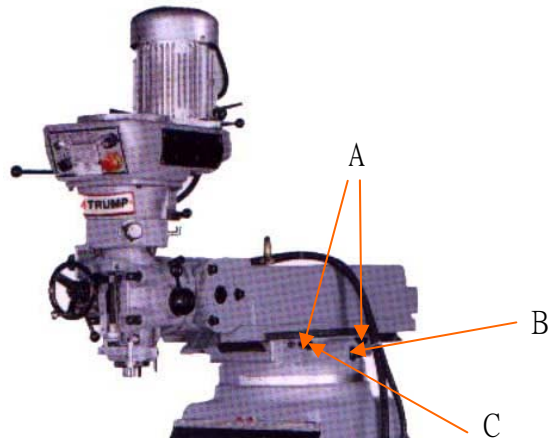
### 6.2.1 Ram movement and swiveling

(1). Ram movement:

- a. Loosen the two ram lock levers (A).
- b. Swivel the ram pinion handle (B), and the ram can be moved.
- c. When it moves to the desired position, lock up (A).

(2). Ram swiveling:

Loosen the four locking bolts (C). And force the cross srm to turn until the desired angle is obtained. lock up (C).



### 7.1 METHODS OF TRANSPORT:

- (1) Machine net weight: approx. 1500KGS
- (2) Prior to unpacking, transport may be using a forklift (fig. 7-1) and a reinforced cable (fig. 7-2)
- (3) After packing, transport may be made by hoisting with a reinforced cable (fig. 7-3) and the eye bolt.

#### REMARKS:

- (1) Always ensure capacity of equipment is adequate before attempting to lift.
- (2) When the machine is being hoisted, keep the personnel afar.
- (3) Hoisting by eye bolt should be used as less as possible.
- (4) To hoist the unpacked case by reinforced cable, the motion shall observe strictly the instruction appeared on the side of the wooden case.
- (5) Keep the work table and saddle in the proper positions so as to keep the machine balance.
- (6) Do not hoist the machine too high. the best position is to keep the machine base approximately 10 cm from the ground.
- (7) Do not allow the machine to wobble in hoisting.
- (8) Only an authorized forklift or crane operator is allowed to transport the machine.

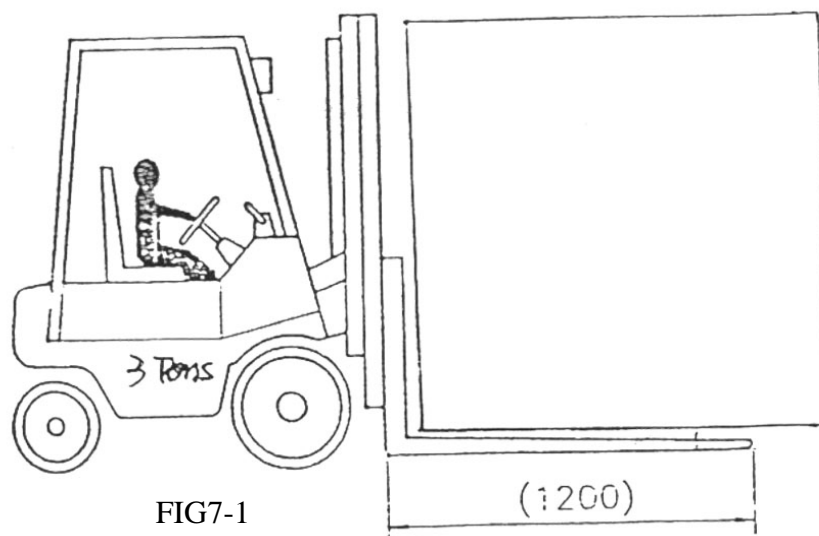


FIG7-1



FIG7-2

## 7.2 CAUTIONS FOR UNPACKING:

- a. To transport the machine, it is necessary to support the machine with the rated case or pallet to avoid moisture. In case of damage by moistening, please contact our agent or the transporter.
- b. After unpacking, check and see if all tools and accessories are intact, otherwise, please contact our agent.
- c. Restore the headstock to its normal position after unpacking.
- d. After unpacking, do not move the sliding surfaces and work table as long as the rustproof oil on them are not cleaned off and followed with the lubrication.
- e. Before the cleaning starts, the sliding protective pieces must be dismantled, and all sliding surface setting levers, loosened. When the rustproof oil is removed, proper amount of lubricant should be injected onto various sliding surfaces. Then move the sliding surfaces for final cleansing and lubrication.
- f. Do not remove the oil brushes in the process of cleaning.
- g. Do not use gasoline or any other inflammable oil cleaner.

## 8. PRECISION ALIGNMENT

Precision of a machine dominates the processing quality. To produce the quality workpiece, precision of each and every components is a top priority.

In order to maintain the primary machine precision following a long-term operation, regular precision alignment is indispensable to the upgrading of work quality. Beside, it may extend the machine service life. For details of components to be aligned and precision requirements, please vide the table of precision inspection.

NOTE: To align the vertically of spindle to the table surface, is necessary to loosen the three machine head bolts (vide figure 6-6(P) ) and the four machine head nuts (vide figure 6-7(R)). however, the bolts and nuts can not be loosened totally to prevent the components from a sudden tilting. lock up (P) and (R) as soon as the alignment is performed.

## **9. MAINTENANCE:**

"Maintenance is more important than repair; and repair is better than purchase".

Under long-term operations, if the machine has not been properly maintained and operated, its service life shall be greatly reduced. The workpiece quality is therefore affected, and the efficiency, decreased. It is essential for an operator to know how to handle the machine and the concept of its maintenance and keep correctly.

#### 9.1 DAILY MAINTENANCE:

- (1) Check and see if the oil level of hand crank pump is on the designated line.
- (2) The designated positions must be lubricated prior to operations .
- (3) Keep the machine idling for three to five minutes daily prior to operations.
- (4) At the close of each day, work table shall be cleaned and the unfinished workpiece must be removed. a little bit of lubricant is recommended.
- (5) At the close of each day, all setting levers shall be loosened, and all sliding parts shall be move to the proper position. The cutter must be dismantled.
- (6) At the close of each day, the headstock must be restored to its normal position if it is tilted.

#### 9.2 MONTHLY MAINTENANCE

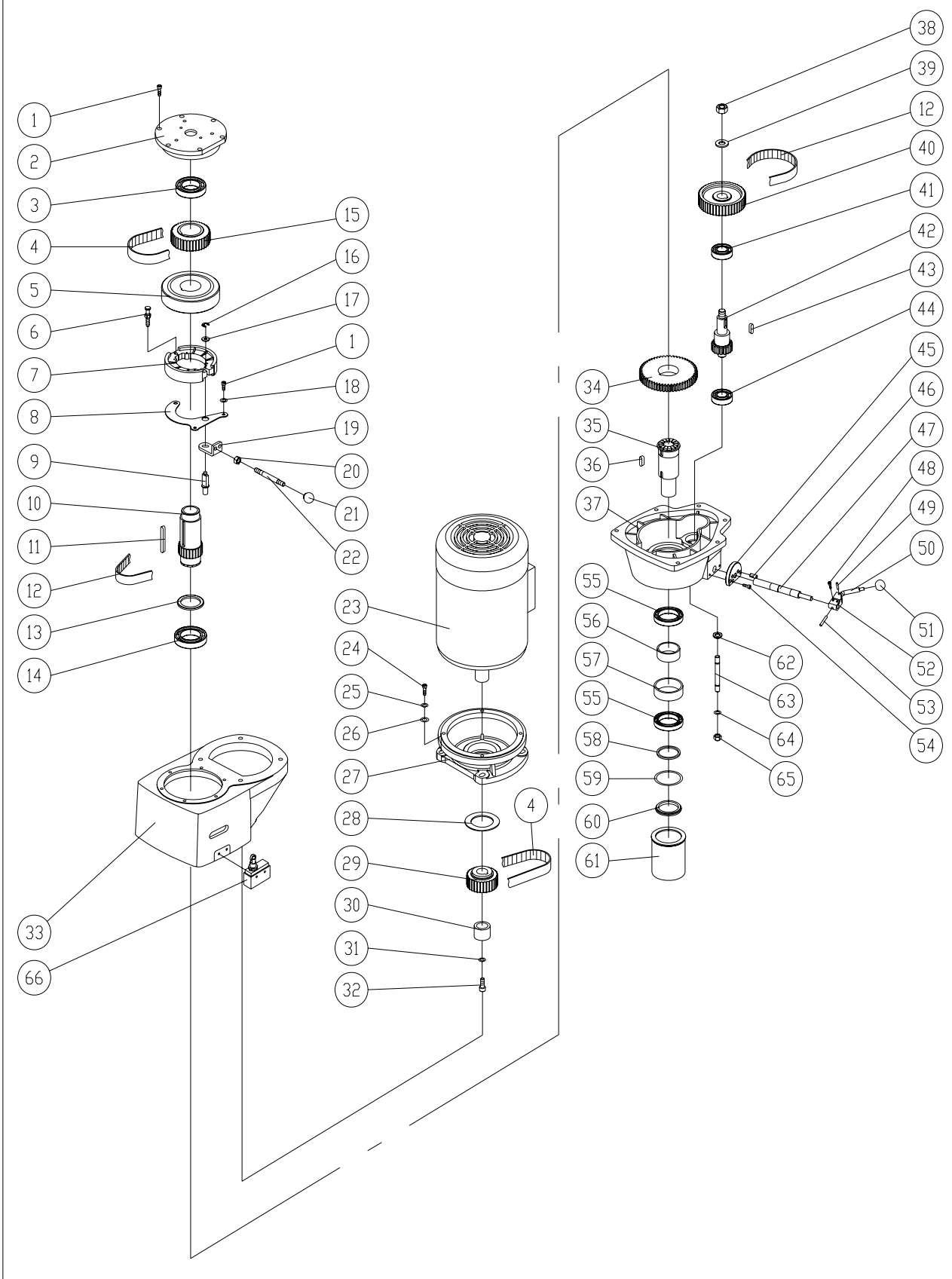
- (1) Check and see if all clamping rails of various sliding surfaces are normal.
- (2) Check and see if the backlash between leadscrew and its nut is normal.
- (3) Check and see if the quill lock and that of each and every sliding surface is normal.

#### 9.3 QUARTERLY MAINTENANCE:

- (1) Check and see if the brake functions and belt are normal.
- (2) Inspect the level of work table and erection status of headstock.
- (3) Test the machine again by the chart of test specs.
- (4) Replace whatever parts worn-out.

# 10. PARTS LIST

## 10.1 HEAD STOCK UPSIDE



## HEAD STOCK UPSIDE PARTS LIST

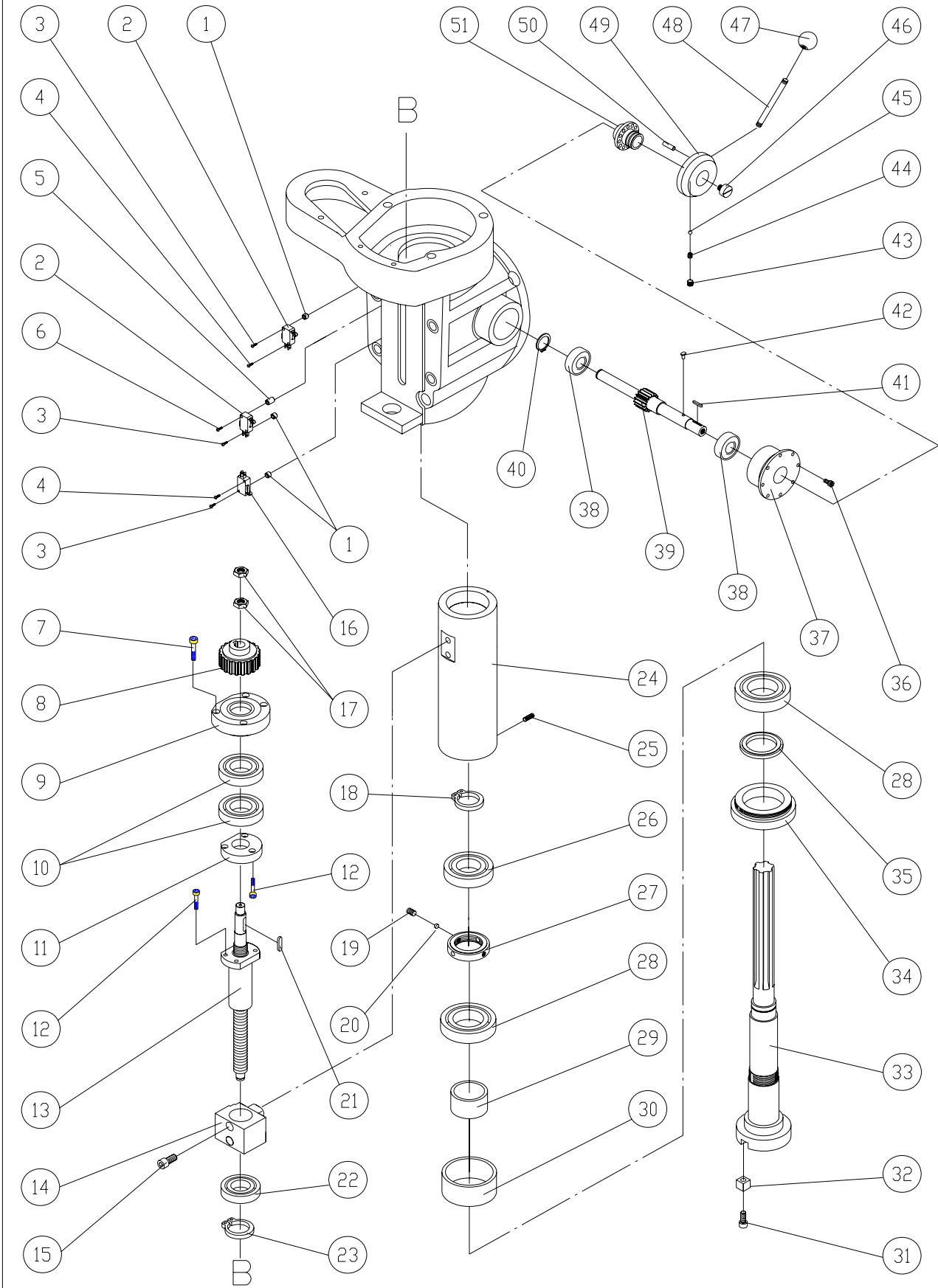
NO.	PART NO.	DESCRIPTION	QTY
1.	SC-M6x16L	SOCKET CAP SCREW	8
2.	F3-K042-02	TOP BEARING CAP	1
3.	6009ZZ	BEARING	1
4.	8YU-616x25	HTD GEAR	1
5.	F3-K052-11	HTD GEAR	1
6.	F3-V097-00	BRAKE SHOE PIVOT SLEEVE	1
7.	F3-V095-00	BRAKE SHOE ASSEMBLY	1
8.	F3-V015-01	SLICING RAIL	1
9.	F3-V128-00	BRAKE LOCK SHAFT	1
10.	F3-K045-00	24T SPINDLE PULLEY HUB	1
11.	KY-8x8x70L	KEY	1
12.	8YU-480x25	HTD GEAR	1
13.	K6-K047-00	SIDE RING	1
14.	6010ZZ	BEARING	1
15.	F3-K054-00	8YU-39T HTD GEAR	1
16.	E-6	SNAP RING	1
17.	WF-Ø8	FLAT WASHER	1
18.	WS-Ø6	SPRING WASHER	2
19.	F3-V126-01	BRAKE HANDLE	1
20.	HN-M10	NUT	2
21.	K2-A164-00	BALL GRIP	1
22.	F3-K125-00	BRAKE HANDLE	1
23.	3HP (2.2KW)	SPINDLE MOTOR (CHERHG CHANG)	1
24.	SC-M10x40L	SOCKET CAP SCREW	4
25.	WS-Ø10	SPRING WASHER	4
26.	WF-Ø10	FLAT WASHER	4
27.	F3-K007-B0	MOTOR BASE	1
28.	F3-K034-00	SIDE RING	1
29.	F3-K033-00	BELT HOUSING ASSEMBLY	1
30.	F3-K038-00	WASHER	1
31.	SC-M8x25L	SOCKET CAP SCREW	1
32.	WS-Ø8	SPRING WASHER	1
33.	F3-K001-03	BELT HOUSING ASSEMBLY	1
34.	K6-K100-00	HI-LOW GEAR	1
35.	F3-K101-00	SPINDLE GEAR HUB	1
36.	KY-8x8x18L	KEY	1
37.	F3-K003-00	GEAR HOUSING	1
38.	HN-M16	NUT	1
39.	WF-Ø16	FLAT WASHER	1
40.	F3-K119-00	8YU 47T HTD GEAR	1
41.	6205ZZ	BEARING	1
42.	K6-K114-00	BULL GEAR PINION COUNTER SHAFT	1
43.	KY-8x10x25L	KEY	1
44.	6204	BEARING	1
45.	F3-K137-00	HI-LOW DETENT PLATE	1
46.	K2-K144-00	HI-LOW DETENT PLUNGER	1
47.	K2-V136-00	HI-LOW GEAR HUB	1
48.	SC-M4x20L	SOCKET CAP SCREW	2
49.	Ø4x15L	SPRING PIN	1
50.	K2-K145-00	GEARSHIFT HANDLE	1
51.	Ø1/4"	BALL GRIP	1
52.	K2-K141-00	HI-LOW PINION BLOCK	1
53.	SS-M5x6L	SOCKET SET SCREW	1
54.	SC-M5x25L	SOCKET CAP SCREW	2
55.	6910VV	BEARING	2
56.	K4-K111-00	WASHER	1
57.	K4-K110-00	WASHER	1
58.	K4-K103-10	WASHER	1
59.	AW-10	WASHER	1
60.	K4-K104-00	SPINDLE NUT	1
61.	K4-K105-00	BEARING SLEEVE	1
62.	K2-A266-00	WASHER	3
63.	K2-A019-00	FIX SCREW	3
64.	WS-Ø7/16"	SPRING WASHER	3
65.	K2-A157-00	NUT	3
66.	KSS-CB1	LIMIT SWITCH	1



## HEAD STOCK INFRASTRUCTURE (1) PARTS LIST

NO.	PART NO.	DESCRIPTION	QTY
1.	SC-M6x20L	SOCKET CAP SCREW	4
2.		KEY	1
3.	SS-M6x6L	SOCKET SET SCREW	1
4.	240Lx20	L TYPE BELT	1
5.	C3-A032-00	MOTOR BASE	1
6.	WS-Ø6	SPRING WASHER	1
7.	WF-Ø6	FLAT WASHER	1
8.	SC-M6x70L	SOCKET CAP SCREW	1
9.	K2-A247-00	QUILL LOCK SLEEVE	1
10.	K2-A246-00	QUILL LOCKB BOLT	1
11.	C3-A040-00	QUILL HOUSING FRONT COVER	1
12.	DF-6028-00	SEAL CAP	1
13.	C3-A012-00	QUILL HOUSING	1
14.	SC-M5x20L	SOCKET CAP SCREW	2
15.	K2-A154-00	WORM GEAR	1
16.	KY-3x3x10L	KEY	1
17.	K2-A156-00	WORM GEAR SHAFT	1
18.	K2-A156-A0	WORM GEAR SHAFT SCREW	1
19.	K2-A070-00	HEX.NUT	4
20.	K2-A266-00	SPACER	4
21.	K2-A069-00	BUSHING	2
22.	K2-A071-00	1/2"-T-BOLT	4
23.	C3-A019-00	FIXED BOLT	1
24.	HN-7/16"-14NC	HEX.NUT	1
25.	C3-A025-00	PROTECTION PLATE	1
26.	SF-M4x8L	SOCKET FLAT COUNTERSUNK, HEAD SCREW	2
27.	C3-A046-00	SHEET RUBBER	1
28.	SC-M5x10L	SOCKET CAP SCREW	2
29.	C3-A045-00	QUILL CHIP GUARD	1
30.	SR-M5x6L	ROUND HEAD SCREW	2
31.		SERVO MOTOR	1
32.	C3-A031-00	GEAR 10T	1
33.	SC-M8x25L	SOCKET CAP SCREW	2
34.	WS-Ø8	SPRING WASHER	2
35.	WF-Ø8	FLAT WASHER	2
36.	C3-A033-00	SHEET RUBBER	1

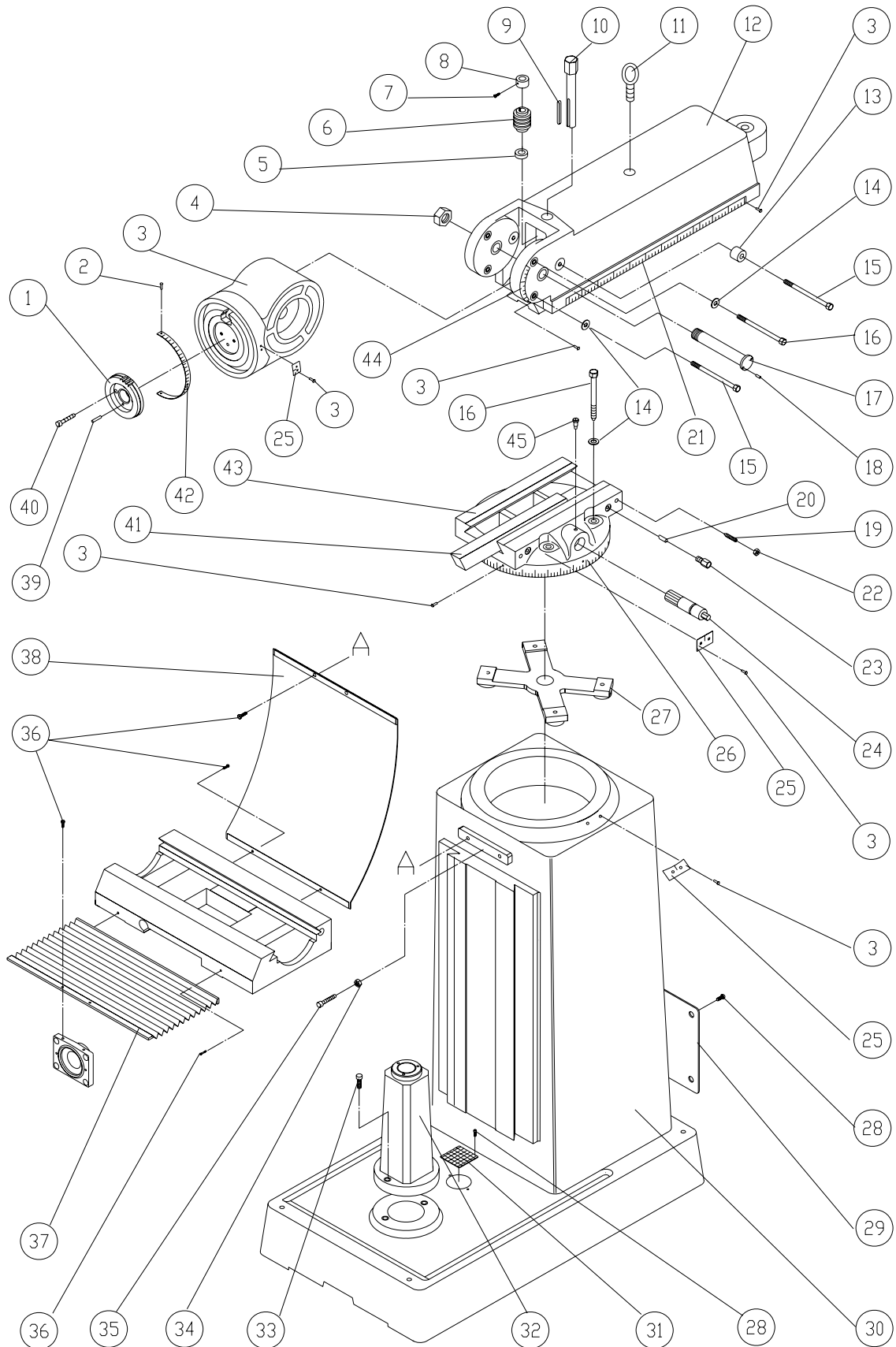
### 10.3 HEAD STOCK INFRASTRUCTURE (2)



## HEAD STOCK INFRASTRUCTURE (2) PARTS LIST

NO.	PART NO.	DESCRIPTION	QTY
1.	C3-A035-00	SCREW BUSHING	3
2.	V-105-1A5	LIMIT SWITCH	2
3.	SR-M3x20L	ROUND HEAD SCREW	3
4.	SR-M3x15L	ROUND HEAD SCREW	2
5.	C3-A036-00	SCREW BUSHING	1
6.	SR-M3x25L	ROUND HEAD SCREW	1
7.	SC-M6x25L	SOCKET CAP SCREW	4
8.	C3-A021-00	20T BELT GEAR	1
9.	C3-A015-00	BEARING HOUSING	1
10.	7203B	BALL BEARING	2
11.	C3-A017-00	BEARING CAP	1
12.	SC-M5x16L	SOCKET CAP SCREW	7
13.	C3-A068-I0	BALL SCREW (INCH)	1
	C3-A068-M0	BALL SCREW (METRIC)	1
14.	C3-A065-00	BRACKET	1
15.	SC-3/8"x3/4"24UNF	SOCKET CAP SCREW	2
16.	V-106-1A5	LIMIT SWITCH	1
17.	C3-A014-00	HEX.NUT	2
18.	SR-30	SNAP RING	1
19.	SS-M8x8L	SOCKET SET SCREW	1
20.	K2-A114-H2	PRESSURE WASHER	1
21.	KY-6x6x25L	KEY	1
22.	6301ZZ	BALL BEARING	1
23.	SR-12	SNAP RING	1
24.	C3-A109-00	QUILL	1
25.	SS-M5x6L	SOCKET SET SCREW	1
26.	6206ZZ	BALL BEARING	1
27.	K2-A114-00	LOCK NUT	1
28.	7207B	BALL BEARING	2
29.	K2-A107-00	BUSHING	1
30.	K2-A106-00	BUSHING	1
31.	SC-5/16"x5/8"	SOCKET CAP SCREW	2
32.	K2-A110-A0	LOCK BLOCK	2
33.	C3-A110-00	SPINDLE 30#	1
34.	K2-A102-00	#7207 NOSE-PIECE	1
35.	K2-A103-00	LOCK WASHER	1
36.	SC-M5x12L	SOCKET CAP SCREW	2
37.	C3-A174-00	BEARING CAP	1
38.	6203ZZ	BALL BEARING	2
39.	C3-A182-01	QUILL PINION SHAFT	1
40.	SR-17	SNAP RING	1
41.	KY-3x3x18L	KEY	1
42.	K2-A182-A0	PIN	1
43.	SS-5/16"x5/16"L	SOCKET SET SCREW	1
44.	K2-A170-A0	SPRING	1
45.	BS-Ø5	STEEL BALL	1
46.	K2-A167-00	PINION SHAFT HUB SCREW	1
47.	BB-3/8"	BLACK PLASTIC BALL HANDLE	1
48.	K2-A165-00	PINION SHAFT HUB HANDLE	1
49.	K2-A166-00	PINION SHAFT HUB	1
50.	K2-A171-00	POLL PIN	1
51.	K2-A168-00	PINION SHAFT HUB SLEEVE	1

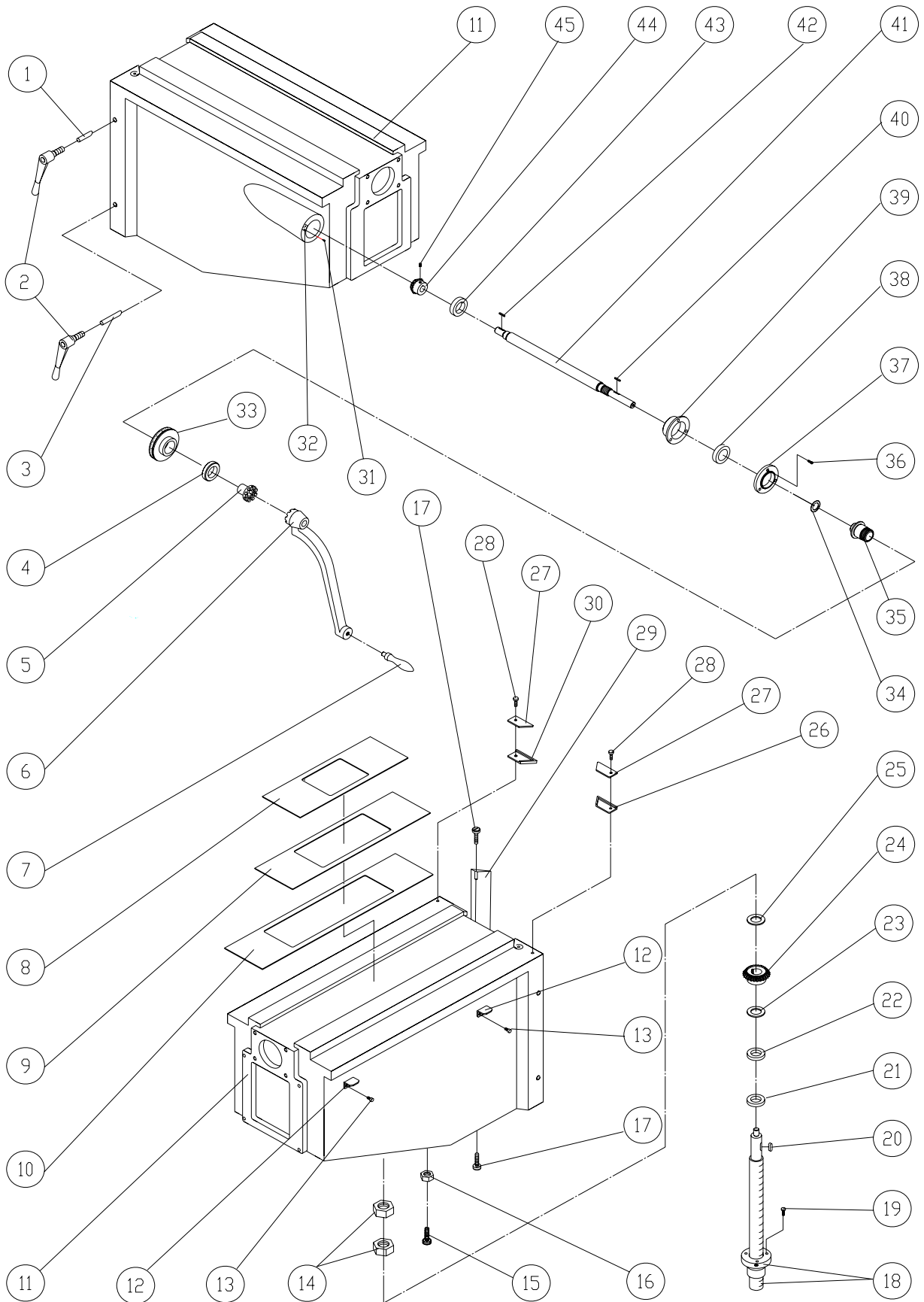
# 10.4 COLUMN ASSEMBLY



## COLUMN ASSEMBLY PARTS LIST

NO	PART NO.	DESCRIPTION	QTY
1.	K2-C001-00	QUILL HOUSING ADJUSTING GEAR	1
2.	RT-Ø2x5L	RIVET	18
3.	K2-C002-00	RAM ADAPTOR	1
4.	K2-C004-10	ADAPTOR PIVOT LOCK NUT	1
5.	K2-C012-00	WORM WASHER	1
6.	K2-C006-00	VERTICAL ADJUSTING WORM	1
7.	SS-M6x8L	SOCKET SET SCREW	1
8.	K2-C007-00	SPACING RING	1
9.	KY-5x5x50L	KEY	1
10.	K3-C008-00	VERTICAL ADJUSTING WORM SHAFT	1
11.	HB-M10	HOOK BOLT	1
12.	K3-C010-00	RAM	1
13.	K3-C010-10	SPACING RING	1
14.	K2-C018-00	WASHER	6
15.	K3-C019-00	ADAPTOR LOCK BOLT	2
16.	K2-C019-00	ADAPTOR LOCK BOLT	5
17.	K2-C017-00	ADAPTOR PIVOT STUD	1
18.	SP-Ø5x14	SPRING PIN	2
19.	K5-C110-00	SCREW	2
20.	K2-C046-70	LOCK PLUNGER	2
21.	PM-DE05-00	RAM PLATE	1
22.	HN-3/8"NC	NUT	2
23.	K2-C107-00	RAM LOCKING BOLT	2
24.	K2-C120-00	RAM PINION	1
25.	PM-DE12-00	ZERO PLATE	3
26.	PM-DE07-00	TURRET SCALE	1
27.	K2-C118-00	SLIDER	1
28.	SR-M5x6L	ROUND HEAD SCREW	6
29.	K5-C135-00	COOLANT PUMP COVER	1
30.	L3-C098-A0	COLUMN	1
31.	K2-C130-00	STRANER NET	1
32.	L3-C103-00	PEDESTAL	1
33.	SC-M10x30L	SOCKET CAP SCREW	2
34.	HN-M8	NUT	1
35.	SC-M8x50L	SOCKET CAP SCREW	1
36.	SR-M5x12L	ROUND HEAD SCREW	8
37.	L3-C100-00	WAVE WAY COVER	1
38.	L3-C101-00	FLAT WAY COVER	1
39.	SP-Ø6x24	SPRING PIN	1
40.	SC-M8x25L	SOCKET CAP SCREW	2
41.	L3-C111-00	RAM / TURRET GIB	1
42.	PM-DE08-00	ADAPTOR SCALE	1
43.	L3-C124-00	TURRET	1
44.	PM-DE15-00	ADAPTOR SCALE	1
45.	K2-C128-00	RAM PINION SET SCREW	1

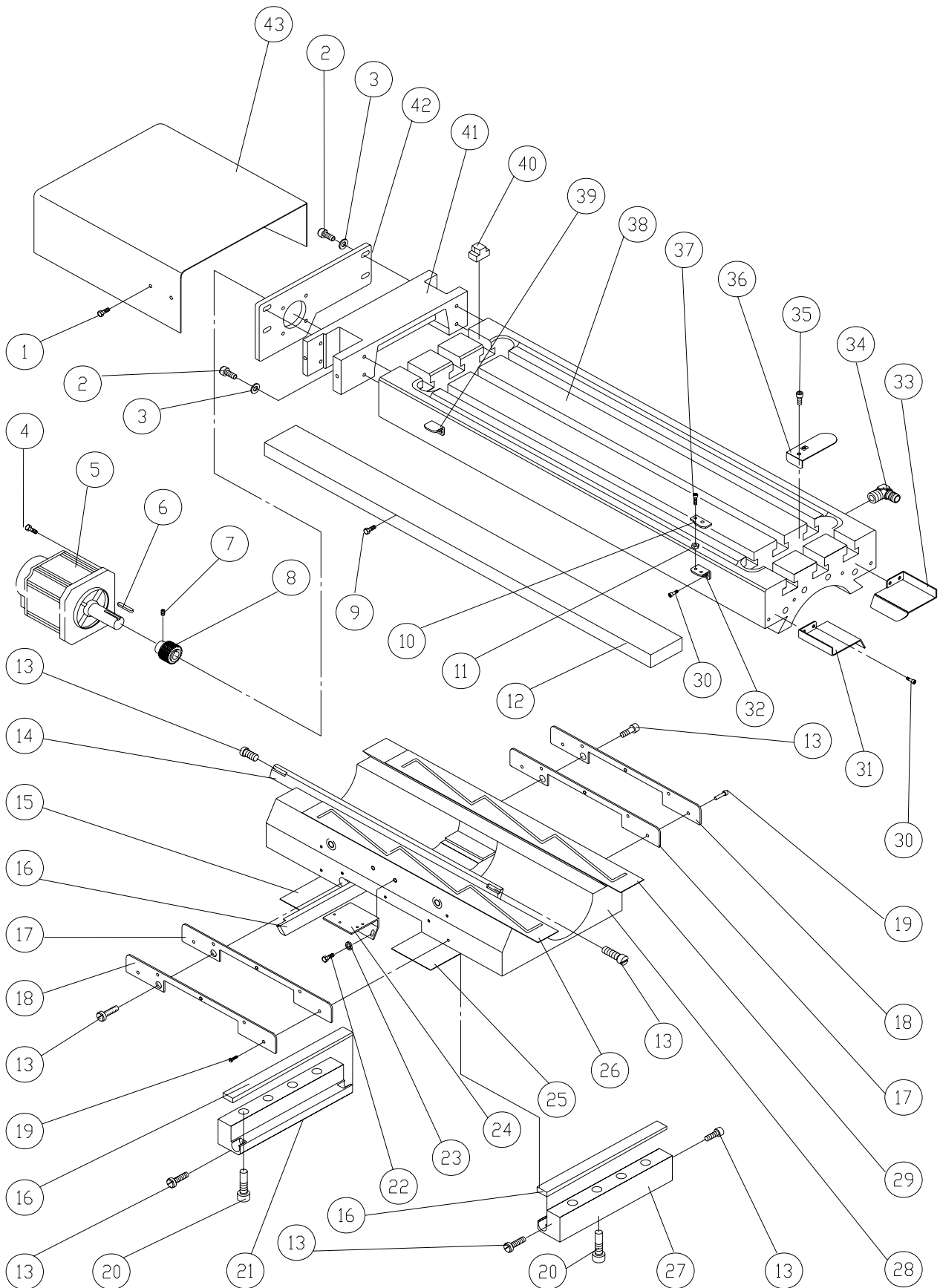
# 10.5 KNEE ASSEMBLY



## KNEE ASSEMBLY PARTS LIST

NO	PART NO.	DESCRIPTION	QTY
1.	L3-C065-00	LOCK PLUNGER	1
2.	K5-C040-00	LOCK BOLT	2
3.	L3-C065-10	LOCK PLUNGER	1
4.	K2-C088-00	DIAL HOLDER	1
5.	K2-C085-00	GEAR SHAFT CLUTH INSERT	1
6.	K5-C084-00	ELEVATING CRANK	1
7.	K5-C083-00	HANDLE	1
8.	L3-C059-00	CHIP GUARD-UP	1
9.	L3-C060-00	CHIP GUARD-MIDDLE	1
10.	L3-C061-00	CHIP GUARD-LOWER	1
11.	L3-C062-B0	KNEE	1
12.	B6-X016-00	DOG	2
13.	SC-M5x8L	SOCKET CAP SCREW	4
14.	HN-1/2"NF	NUT	2
15.	SC-M8x16L	SOCKET CAP SCREW	1
16.	HN-M8	NUT	1
17.	K2-C041-A0	GIB ADJUSTING SCREW	2
18.	K2-C106-I0	ELEVATING SCREW ASSEMBLY (INCH)	1
	K2-C106-M0	ELEVATING SCREW ASSEMBLY (METRIC)	1
19.	SC-M6x16L	SOCKET CAP SCREW	3
20.	KY-5x5x22L	KEY	1
21.	51205	THRUST BALL BEARING	1
22.	6005Z	BALL BEARING	1
23.	K2-C079-00	SPACING WASHER	1
24.	K2-C077-00	BEVEL GEAR	1
25.	K2-C076-00	WASHER	1
26.	L3-C054-10	FLET WIPERS	1
27.	L3-C057-10	SADDLE WIPER PLATE	2
28.	SR-M5x10L	ROUND HEAD SCREW	4
29.	K2-C055-00	KNEE COLUMN GIB	1
30.	L3-C053-10	FELT WIPERS	1
31.	RT-Ø2x5L	RIVET	2
32.	PM-GE29	ZERO PLATE	1
33.	K2-C087-I0	DIAL (INCH)	1
	K2-C087-M0	DIAL (METRIC)	1
34.	K2-C089-00	WASHER	1
35.	K2-C086-00	DIAL NUT	1
36.	SC-M6x12L	SOCKET CAP SCREW	3
37.	K2-C090-00	BEARING CAP	1
38.	6204Z	BALL BEARING	1
39.	K2-C092-00	BEARING RETAINER RING	1
40.	KY-3x3x18L	KEY	1
41.	L3-C094-00	ELEVATION SHAFT	1
42.	KY-4x4x18L	KEY	1
43.	6204ZZ	BALL BEARING	1
44.	K2-C096-00	BEVEL PINION	1
45.	SS-M6x8L	SOCKET SET SCREW	2

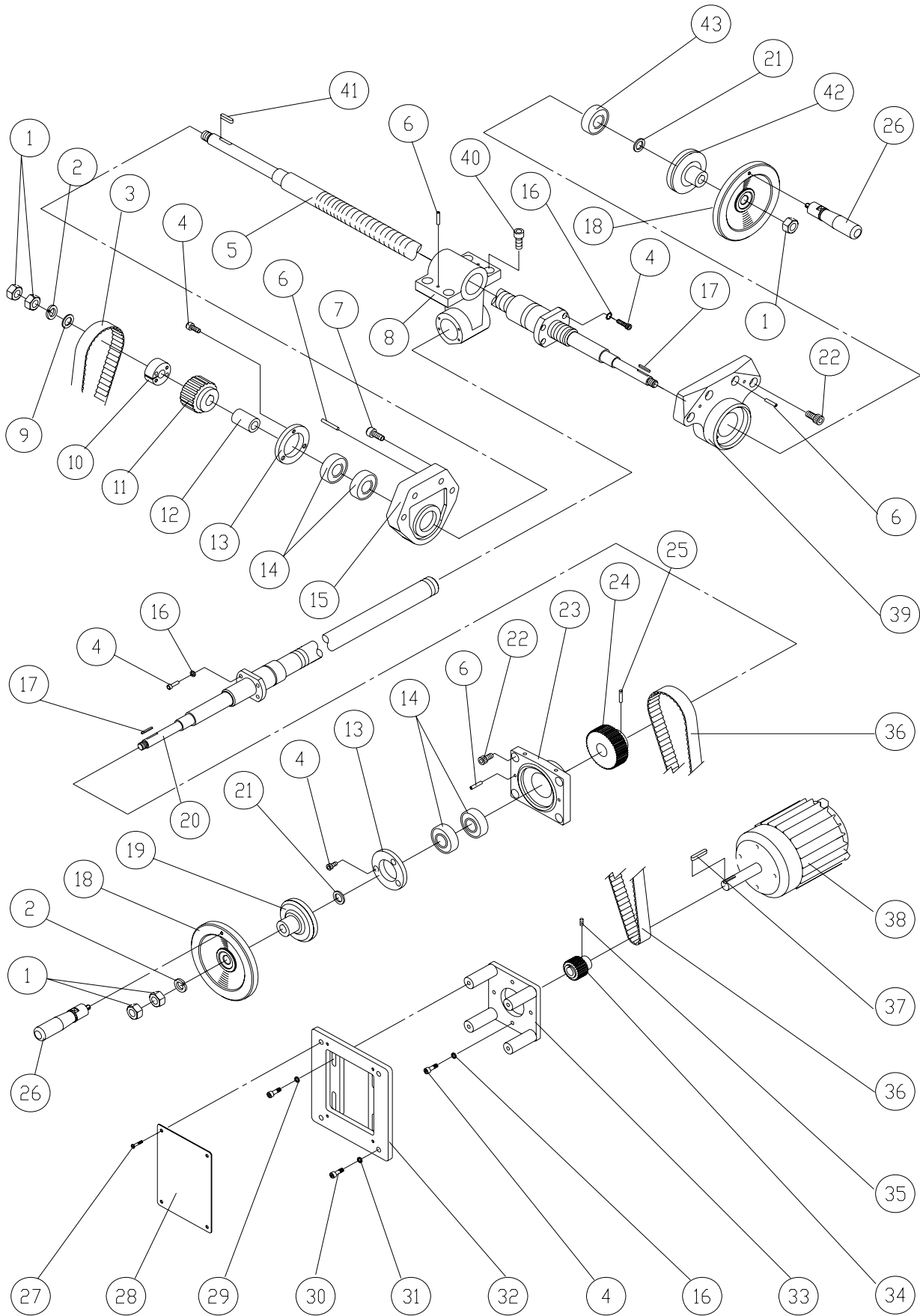
# 10.6 TABLE, SADDLE ASSEMBLY



TABLE, SADDLY ASSEMBLY PARTS LIST

NO	PART NO.	DESCRIPTION	QTY
1.	SR-M5x6L	ROUND HEAD SCREW	4
2.	SC-M8x50L	SOCKET CAP SCREW	8
3.	WS-Ø8	SPRING WASHER	8
4.	SC-M8x25L	SOCKET CAP SCREW	4
5.		SERVO MOTOR	1
6.		KEY	1
7.	SS-M6x6L	SOCKET SET SCREW	1
8.	B3-X008-S0	HTD GEAR 24T	1
9.	SC-M6x10L	SOCKET CAP SCREW	6
10.	B6-X019-00	DOG	1
11.	HN-M6	NUT	2
12.	C3-X020-00	LIMIT SEITCH COVER	1
13.	K2-C041-00	GIB ADJ-SCREW	8
14.	L3-C043-00	TABLE / SADDLE GIB	1
15.	L3-C139-B0	TURCITE	1
16.	L3-C049-B0	GIB	3
17.	L3-C044-B0	WIPER	2
18.	L3-C050-B0	WIPER HOLDER	2
19.	SR-M6x12L	ROUND HEAD SCREW	10
20.	SC-M10x55L	SOCKET CAP SCREW	8
21.	L3-C115-00	SLIDING RAIL	1
22.	SC-M8x12L	SOCKET CAP SCREW	2
23.	WF-Ø8	FLAT WASHER	2
24.	B3-X015-00	LIMIT SWITCH BASE	1
25.	L3-C138-B0	TURCITE	1
26.	L3-C136-40	TURCITE	1
27.	L3-C116-00	SLIDING RAIL	1
28.	L3-C052-B4	SADDLE	1
29.	L3-C137-40	TURCITE	1
30.	SC-M5x8L	SOCKET CAP SCREW	8
31.	C3-X037-00	COVER	1
32.	B6-X016-A0	DOG	1
33.	C3-X038-00	COVER	1
34.	EC-1/2"x5/8"	90°ELBOR MALE STUD HOSE CONNECTOR	2
35.	SC-M6x25L	SOCKET CAP SCREW	2
36.	B3-X040-01	STRAINER	2
37.	SC-M5x12L	SOCKET CAP SCREW	2
38.	L3-X023-00	TABLE	1
39.	B6-X016-00	DOG	1
40.	K2-D029-00	CHOCK PLUG	6
41.	B3-X004-00	MOTOR BASE	1
42.	B3-X025-00	MOTOR PLATE	1
43.	B3-X007-01	MOTOR COVER	1

# 10.7 X,Y AXIS ASSEMBLY



## X,Y AXIS ASSEMBLY PARTS LIST

NO	PART NO.	DESCRIPTION	QTY
1.	HN-5/8"-UNF	NUT	5
2.	WS-Ø5/8"	SPRING WASHER	2
3.	375-5Mx22	HTD BELT	1
4.	SC-M6x20L	SOCKET CAP SCREW	18
5.	B3-X017-M0	X AXIS BALL SCREW	1
6.	TP-#4x38L	TAPER PIN	8
7.	SC-M10x35L	SOCKET CAP SCREW	4
8.	K2-D022-A0	FEED NUT BRACKET	1
9.	WF-Ø5/8"	FLAT WASHER	1
10.	B3-X031-00	LOCK BLOCK	1
11.	B3-X030-01	HTD GEAR 48T	1
12.	B3-X026-00	SPACER	1
13.	C3-C090-00	BEARING CAP	2
14.	20TAA04DB	BALL BEARING	4
15.	B4-X005-00	BRACKET	1
16.	WS-Ø6	SPRING WASHER	12
17.	KY-3x3x25L	KEY	2
18.	B6-X042-00	HANDLE WHEEL	2
19.	B3-Y041-00	BUSHING	1
20.	B3-Y000-M1	Y AXIS BALL BEARING	1
21.	K2-D018-00	WASHER	2
22.	SC-M10x20L	SOCKET CAP SCREW	8
23.	K2-D028-00	BRACKET	1
24.	B3-Y030-00	HTD GEAR 48T	1
25.	TP-#4x45L	TAPER [IN	1
26.	B6-X043-00	HANDLE	2
27.	SR-M5x6L	ROUND HEAD SCREW	4
28.	C3-Y022-00	PROTECTION PLATE	1
29.	SC-M8x20L	SOCKET CAP SCREW	8
30.	WF-Ø8	FLAT WASHER	1
31.	WS-Ø6	SPRING WASHER	4
32.	C3-Y013-00	MOTOR BASE FIXED PLATE	4
33.	C3-Y015-00	MOTOR BASE	1
34.	B3-X008-S0	HTD GEAR 24T	1
35.	SS-M6x6L	SOCKET SET SCREW	1
36.	475-5Mx22	HTD BELT	1
37.		KEY	1
38.		SERVO MOTOR	1
39.	K2-D011-00	BRACKET	1
40.	SC-M10x25L	SOCKET CAP SCREW	4
41.	KY-6x6x20L	KEY	1
42.	B3-X041-00	BUSHING	1
43.	6204ZZ	BALL BEARING	1

