

ACRA

INSTRUCTION MANUAL AND PARTS LIST
FOR MODEL
VERTICAL MILLING MACHINE



Machine Serial No: _____

EC MACHINERY DIRECTIVE 89/392/EEC***OPERATION MANUAL***

Machine name: Vertical turret milling machine

Brand: JIH FONG

Model: JF-15, JF-16, JF-18

Type: JF-153VCE, JF-163VCE, JF-183VCE, JF-185VCE

Manufacture: JIH FONG MACHINERY CO., LTD.

Address: NO. 48 Lane 450, Peiyang Road, Fengyuan 42022,
Taichung hsien, Taiwan, R.O.C P.O BOX 85 Fengyuan

Telephone: 886-4-526-2274

FAX: 886-4-526-8634

VERSION: 2.0

DATE OF ISSUE: 1996,1,23

5.2.2 JF-185V	29
5.3 Legends of the machine head	30
5.4 Operating the machine	31
Chapter 6 : Daily service	
6.1 Daily service for operators	38
6.2 Positions of lubrication	39
6.3 Lubrication system	41
6.4 Coolant system	42
Chapter 7 : Maintenance and adjustment	
7.1 Level	43
7.2 Maintenance items	43
Chapter 8 Electrical parts list and circuit	
8.1 Electrical parts list	
8.1.1 JF-153V, JF-163V, JF-183V	57
8.1.2 JF-185V	58
8.2 Electrical circuit	59
Chapter 9 Parts lists and drawings	
9.1 Quill	61
9.2 Head assembly (for JF-153V, JF-163V, JF-183V)	63
9.3 Head assembly (for JF-185V)	66
9.4 Gear box and belt housing (for JF-153V, JF-163V, JF-183V)	69
9.5 Gear box and belt housing (for JF-185V)	72
9.6 Work table	75
9.7 Basic assembly (for JF-153V)	78
9.8 Basic assembly (for JF-163V)	80
9.9 Basic assembly (for JF-183V, JF-185V)	83
9.10 Adjustable guard	86

INDEX**Chapter 1 : Operating safety guidelines**

1.1 Operating safety precautions and personal protective equipment	1
1.2 Operating potential hazard zone	2
1.3 General safety rules	3
1.4 Warning signs and marks on the machine	
1.4.1 JF-153V, JF-163V, JF-183V	5
1.4.2 JF-185V	7
1.5 Safety features and how to stop of the machine	
1.5.1 JF-153V, JF-163V, JF-183V	9
1.5.2 JF-185V	10

Chapter 2 : Overall description of the machine

2.1 Basic description of the machine	11
2.2 Operator position and noise level	12
2.3 Specifications	
2.3.1 Specifications of JF-153V	13
2.3.2 Specifications of JF-163V	14
2.3.3 Specifications of JF-183V	15
2.3.4 Specifications of JF-185V	16
2.4 The capacity of the infinitely head	
2.4.1 JF-153V, JF-163V, JF-183V	17
2.4.2 JF-185V	18
2.5 Spindle nose drawing	19
2.6 Standard accessories	19
2.6.1 Optional accessories	19

Chapter 3 : Requirement of the machine

3.1 Space requirement	20
3.2 Foundation requirement	22
3.3 Power requirement	23
3.4 Environment	23

Chapter 4 : Transport and installation

4.1 Transport	
4.1.1 Machine weight	24
4.1.2 Safety checks	24
4.1.3 Note	24
4.2 Installation	
4.2.1 Cleaning	25
4.2.2 Level adjustment	25
4.2.3 Electric connected	26
4.2.4 Dismantling procedure of the machine	26

Chapter 5 : Operation

5.1 Safety inspection before operation	27
5.2 Legends of the machine	
5.2.1 JF-153V, JF-163V, JF-183V	28

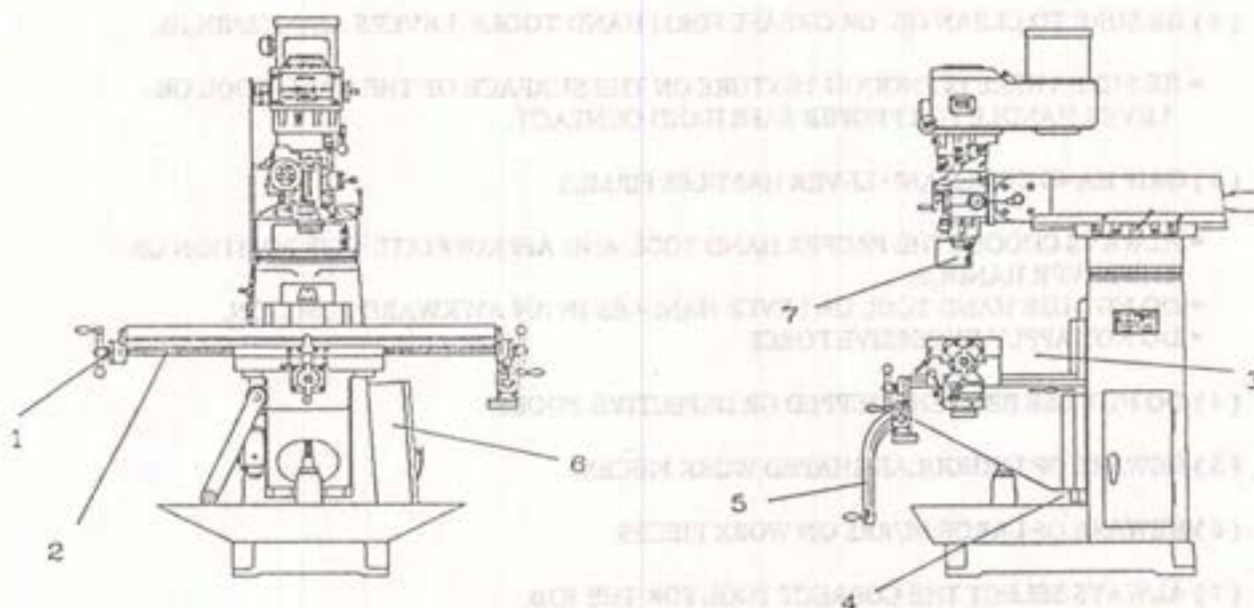
CHAPTER 1**OPERATING SAFETY GUIDELINES****1.1 OPERATING SAFETY PRECAUTIONS AND PERSONAL PROTECTIVE EQUIPMENT (P.P.E)**

- (1) DO NOT LAY ANYTHING ON THE WORKING SURFACES OF THE MACHINE, WHERE IT MAY FOUL WITH ROTATING OR MOVING PARTS.
- (2) DO NOT TOUCH OR REACH OVER MOVING OR ROTATING MACHINE PARTS.
- (3) DO NOT OPERATE THE MACHINE IN EXCESS OF ITS RATED CAPACITY.
- (4) DO NOT WEAR RINGS, WATCHES, TIES OR LOOSE SLEEVED CLOTHING.
- (5) DO NOT INTERCHANGE COLLECT OR OTHER SPINDLE MOUNTING ITEMS WITHOUT CHECKING FOR CORRECT LOCKING.
- (6) DO NOT CUTTING Mg METAL OR Mg ALLOY.
- (7) THE USING IS PROHIBITED IF THE FLUID CAUSES POISONING OR CORROSION OR BURN WHILE CUTTING.
- (8) ISOLATE MACHINE WHEN LEAVING IT UNATTENDED.
- (9) STOP MACHINE IMMEDIATELY ANYTHING UNEXPECTED HAPPENS.
- (10) ENSURE YOU KNOW HOW TO STOP THE MACHINE BEFORE STARTING IT.
- (11) KEEP ALL GUARDS AND COVER PLATES IN PLACE AND ALL MACHINE CABINET DOORS CLOSED.
- (12) KEEP THE MACHINE AND WORK AREA NEAT, CLEAN AND ORDERLY.
- (13) THE OPERATOR MUST BE THE TECHNICIAN WHO IS TRAINED IN OPERATION OF CONVENTIONAL MILLING MACHINE & FAMILIAR WITH MANUAL.
- (14) DO NOT USE THE COOLANT SUCH AS GASOLINE, COAL OIL WHICH IS FRAMMABLE AND SMOKY IS PROWIBITED.
- (15) BEWARE FOR LIFT-HANOED OPERATOR WHEN OPERATING THE MACHINE.

PERSONAL PROTECTIVE EQUIPMENT

- (1) DO OPERATE WITH EYE PROTECTION.
- (2) DO OPERATE WITH SAFETY SHOES.

1.2 OPERATING POTENTIAL HAZARDS ZONE



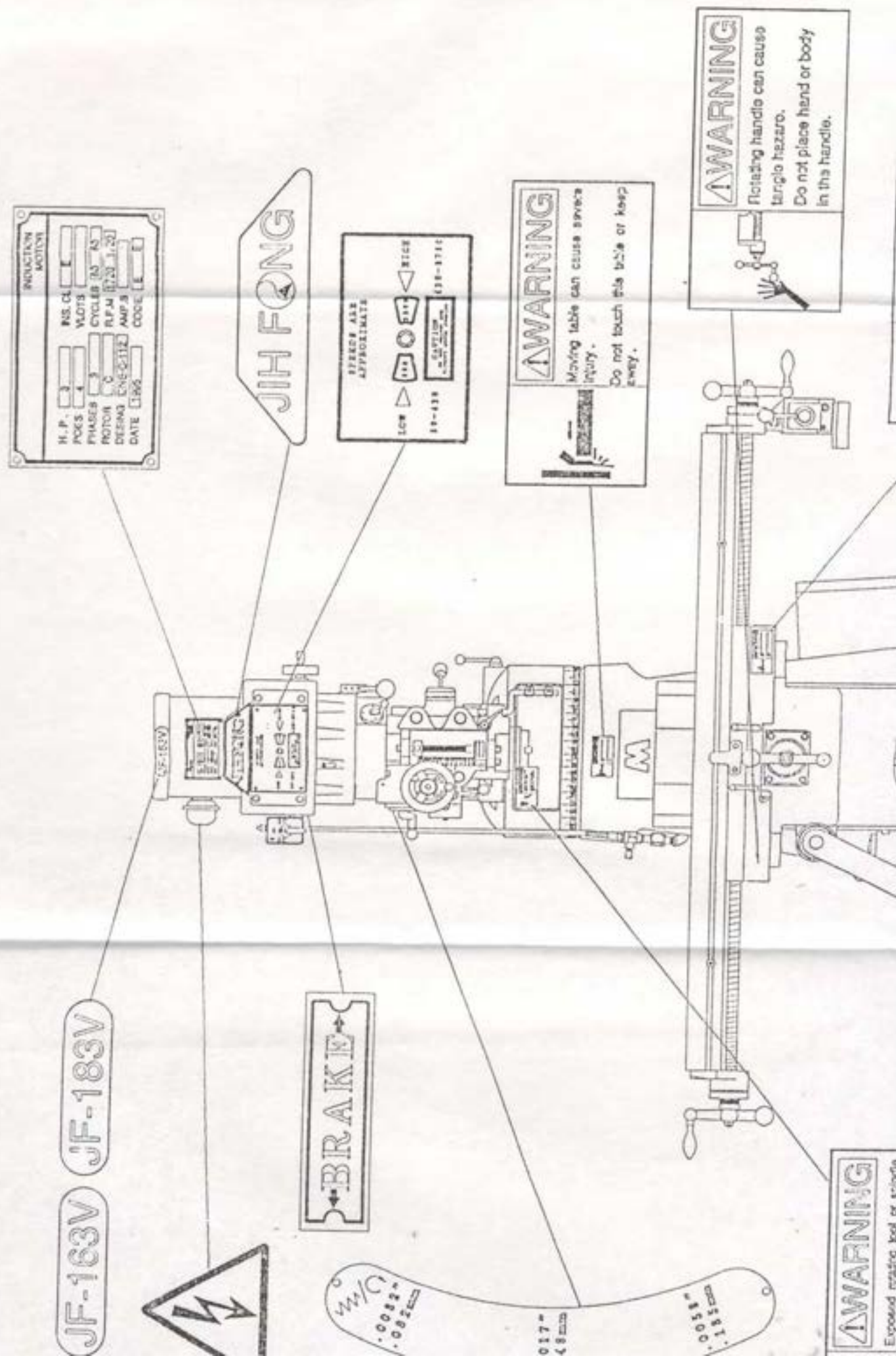
NO.	WARNING
1	The movement of the table causes the potential impact danger.
2	The rotation of the screws causes the potential drawing in danger.
3	The movement of the saddle causes the potential crushing danger.
4	The movement of the elevating housing causes the potential crushing danger.
5	The rotation of the elevating feed hand causes the impacting danger.
6	The high voltage causes the potential electric danger.
7	The rotation of the spindle (or tools) causes the potential cutting danger.

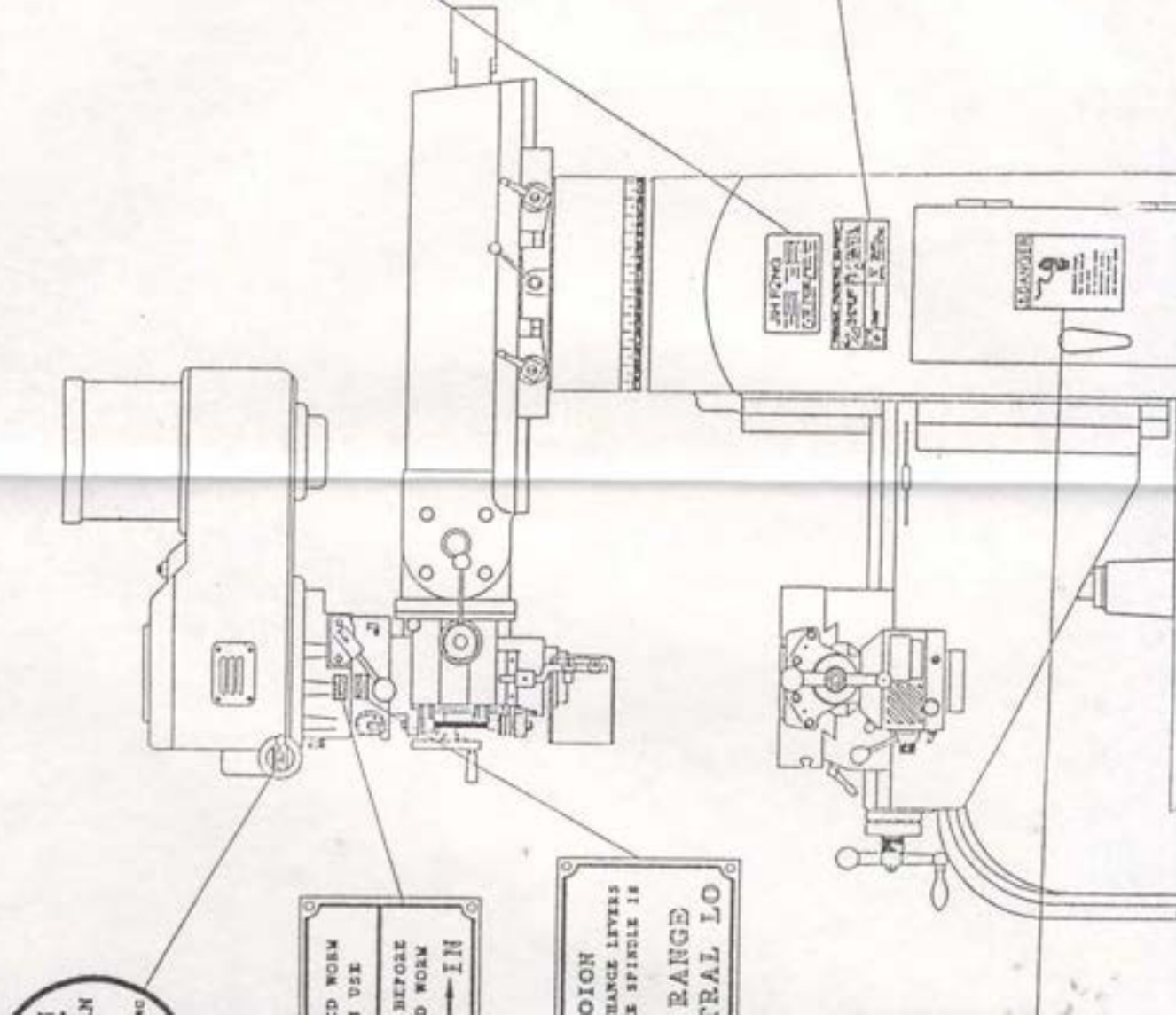
1.3 GENERAL SAFETY RULES

- (1) DO NOT GRIP A COMPONENT WITH GREASE OR OIL ON IT.
- GRIP ALL COMPONENTS FIRMLY.
 - DO NOT ATTEMPT TO HOLD COMPONENTS THAT ARE TOO AWKWARD OR TOO DIFFICULT TO HOLD.
 - DO NOT HOLD COMPONENTS THAT ARE TOO HEAVY FOR THE MACHINE.
 - KNOW HOW TO HOLD COMPONENTS PROPERLY WHEN LIFTING.
- (2) BE SURE TO CLEAN OIL OR GREASE FROM HAND TOOLS, LEVERS AND HANDLES.
- BE SURE THERE IS ENOUGH TEXTURE ON THE SURFACE OF THE HAND TOOL OR LEVER HANDLE FOR PROPER SAFE HAND CONTACT.
- (3) GRIP HAND TOOLS AND LEVER HANDLES FIRMLY.
- ALWAYS CHOOSE THE PROPER HAND TOOL AND APPROPRIATE GRIP POSITION ON THE LEVER HANDLE.
 - DO NOT USE HAND TOOL OR LEVER HANDLES IN AN AWKWARD POSITION.
 - DO NOT APPLY EXCESSIVE FORCE.
- (4) DO NOT USE BROKEN, CHIPPED OR DEFECTIVE TOOLS.
- (5) BEWARE OF IRREGULAR SHAPED WORK PIECES.
- (6) BEWARE OF LARGE BURRS ON WORK PIECES.
- (7) ALWAYS SELECT THE CORRECT TOOL FOR THE JOB.
- (8) DO NOT RUN THE MACHINE UNATTENDED.
- (9) DO NOT USE TOOLS WITHOUT HANDLES.
- (10) CORRECTLY LOCATE TOOL IN SOCKET HANDS AND SCREW SLOTS.
- (11) BEWARE OF OBSTRUCTIONS THAT PREVENT COMPLETE TIGHTENING SCREWS. ENSURE THE SCREW IS TIGHT.
- (12) DO NOT RUSH WORK.
- (13) NEVER SUBSTITUTE THE WRONG SIZE TOOLS IF THE CORRECT SIZED TOOL IS NOT AVAILABLE OR CANNOT BE LOCATED IN THE SHOP.
- (14) DO NOT PLACE HAND OR BODY IN PATH OF MOVING OBJECTS.
- BEWARE OF WHERE YOU ARE MOVING YOUR HAND OR BODY IN RELATIONSHIP TO THE MILLING MACHINE.
 - BEWARE OF HOLDING A TOOL OR OTHER PARTS INSERTED IN OR ATTACHED TO THE WORK PIECE.
- (15) KNOW THE FUNCTION OF EACH AND EVERY CONTROL.
- (16) MAKE SURE POWER HAS BEEN TURNED OFF WHEN MACHINE IS UNUSED FOR SOMETIME.
- (17) ALLOW SPINDLE TO STOP BEFORE OPERATING IT.
- (18) DO NOT ALLOW DISTRACTIONS TO INTERFERE WITH MACHINE OPERATIONS.
- DO NOT OPERATE MACHINE WHILE TALKING.

- (19) BEWARE OF LOOSE CLOTHING NEAR THE ROTATING PARTS OF THE MACHINE.
 - (20) BEWARE OF LOOSE HAIR NEAR THE ROTATING PARTS OF THE MACHINE.
 - (21) BE SURE MOTOR IS NOT RUNNING WHEN USING GAUGES ON THE MACHINE.
 - (22) ALWAYS WEAR THE APPROPRIATE PROTECTION BEFORE OPERATING THE MACHINE.
 - ALWAYS WEAR THE CORRECT PROTECTION BEFORE OPERATING THE MACHINE.
 - NEVER REMOVE PROTECTION FOR EVEN SHORT TIME WHEN OPERATING THE MILLING MACHINE.
 - WEAR PROTECTIVE DEVICES CORRECTLY.
 - KNOW THE CORRECT WAY TO WEAR PROTECTIVE DEVICES
 - (23) KEEP PROTECTIVE GUARDS AT THE POINT OF OPERATION.
 - KNOW HOW TO SET OR ATTACH PROTECTIVE GUARDS PROPERLY.
 - (24) NEVER MOUNT A WORK PIECE TOO LARGE FOR THE MACHINE.
 - (25) USE THE CORRECT LIFTING EQUIPMENT NECESSARY FOR HANDLING WORK PIECES.
 - (26) SECURE ALL WORK PIECES.
 - (27) SECURE ALL JAWS, NUTS , BOLTS AND LOCKS.
 - (28) ALWAYS USE THE CORRECT EQUIPMENT.
 - (29) NEVER TAKE DEPTH OF CUTS BEYOND THE MACHINE'S CAPABILITY.
 - NEVER USE EXCESSIVE FEED RATES.
 - (30) ALWAYS USE THE PROPER HAND TOOL TO REMOVE SWarf.
 - NEVER HURRY WHEN REMOVING SWarf.
 - (31) CHECK THE RUNNING DIRECTION OF THE SPINDLE BEFORE OPERATION.
 - (32) DO NOT TEAR THE WARNING SIGN ON THE MACHINE . IF IT IS NOT CLEAR, PLEASE CONTACT OUR AGENTS FOR REPLACEMENT.
 - (32) PLEASE WAIT UNTIL MACHINE STOPPED TO CLEAN OR SET-UP.
 - (33) OBEY PRECAUTIONS OF OTHER CHAPTER DESCRIBED.
 - (34) CONFIRM THE POSITION OF EMERGENCY-STOP AND OTHER STOP BOTTOM OPERATION.
-

E-183V7



**JIH FONG**

MODEL: _____
 DATE: _____
 WEIGHT: _____
 SERIAL NO.: _____
 POWER: _____
 VOLTAGE: _____
 JIH FONG MACHINERY COMPANY LIMITED
 P.O. BOX 85 FENGYUAN TAIWAN R.O.C.
 TEL: (04) 526-2274 FAX: (04) 526-8834

PERSONAL PROTECTIVE EQUIPMENT

	Do not operate without wearing safety glasses and safety shoes.		Keep hands out of moving parts of the machine. Do not wear gloves or loose clothing.
	Disconnect power before servicing.		Stop spindle completely before change or adjusting workpiece feature or

WARNING**WARNING**



JF-185V

BRAKE

JIH FONG

INDUCTION MOTOR	
N.P.	PHASE
POLE	WEL CL
RATING	VOLTS
DESIGN	CONSTR
MOTOR	AMP S
DATE	COOP



SPEEDS ARE APPROXIMATE

LOW Δ $\square$ $\circ$ $\square$ Δ HIGH

50-650 438-871

CAUTION
DO NOT TOUCH THE SPINDLE
WHEN THE MOTOR IS RUNNING

WARNING

Exposed rotating tool or spindle can cause serious injury.
Pull down this cover before operation and do not touch the spindle.

INDUCTION MOTOR
1/2 HP
4 POLES

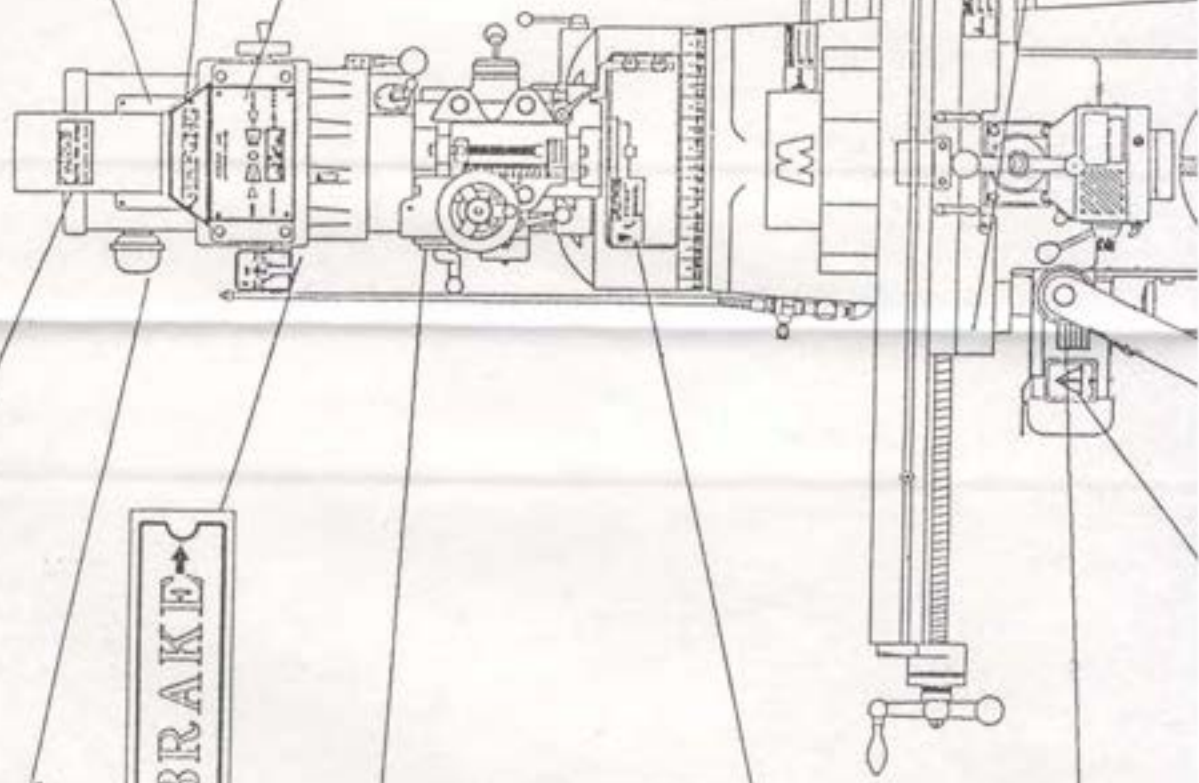
VOLT
HERTZ 50 / 60
AMP S
R.P.M. 1410 / 1720
DATE
SER. NO.

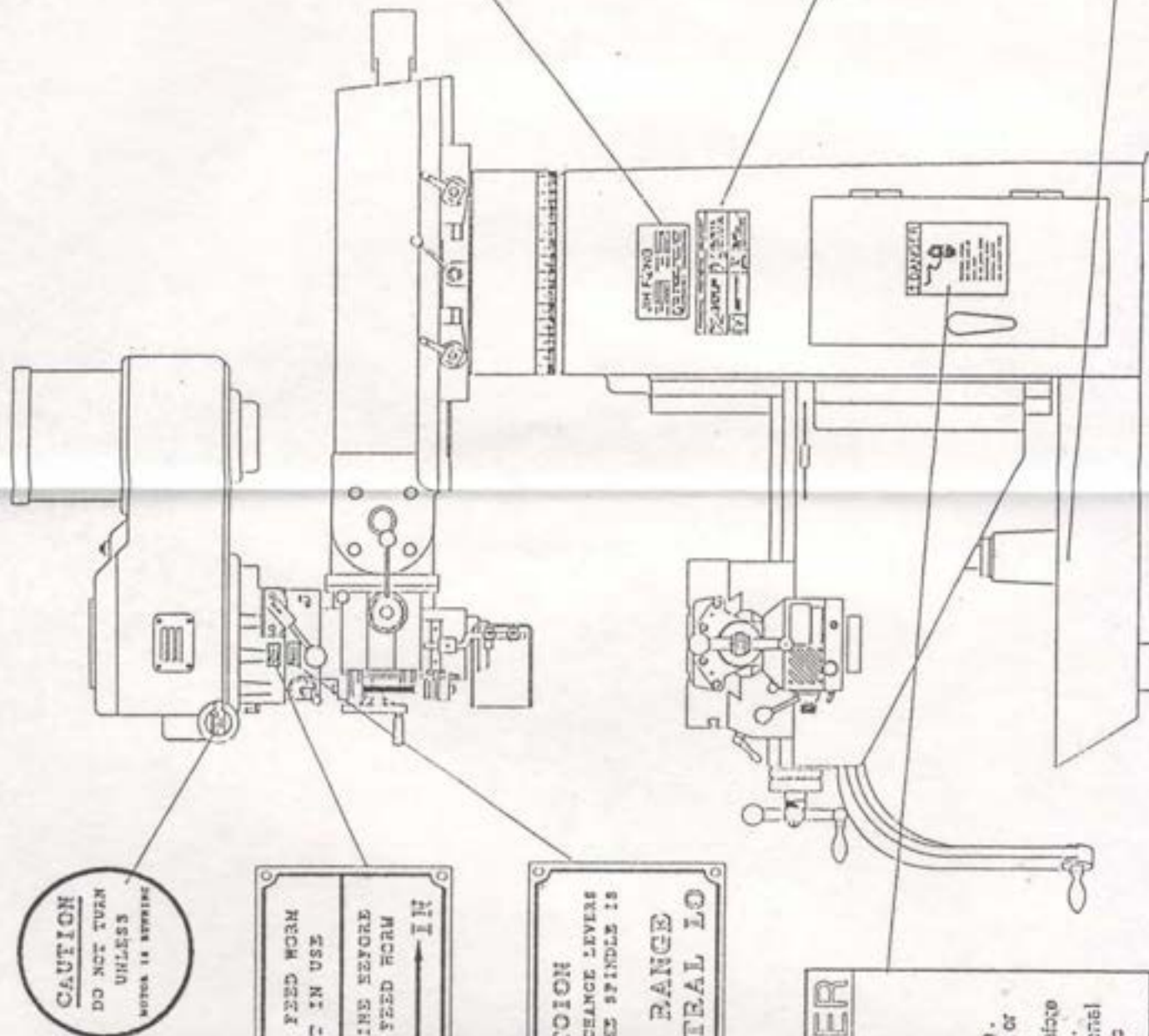
WARNING

Moving table can cause serious injury.
Do not touch the table or keep away.

WARNING

Rotating handle can cause tangled hair, etc.
Do not place hand or body in the handle.





CAUTION
DO NOT TURN
UNLESS
MOTOR IS STOPPED

FEED WORM
IN USE
FEED WORM
IN

CAUTION
CHANGE LEVERS
FEED SPINDLE IS
RANGE
TRIAL LO

JIH FONG
MODEL: _____
SERIAL NO.: _____
POWER: _____
VOLTAGE: _____
WEIGHT: _____
JIH FONG MACHINERY COMPANY LIMITED
P. O. BOX 85 FENGYUAN TAIWAN R.O.C.
TEL: (04) 523-2274 FAX: (04) 523-5346

PERSONAL PROTECTIVE EQUIPMENT			
	Do not operate without wearing safety glasses and safety shoes.		Keep hands away from moving parts machine. Do not wear gloves or loose clothing.
	Disconnect power before servicing.		Stop spindle completely before change or adjustment.



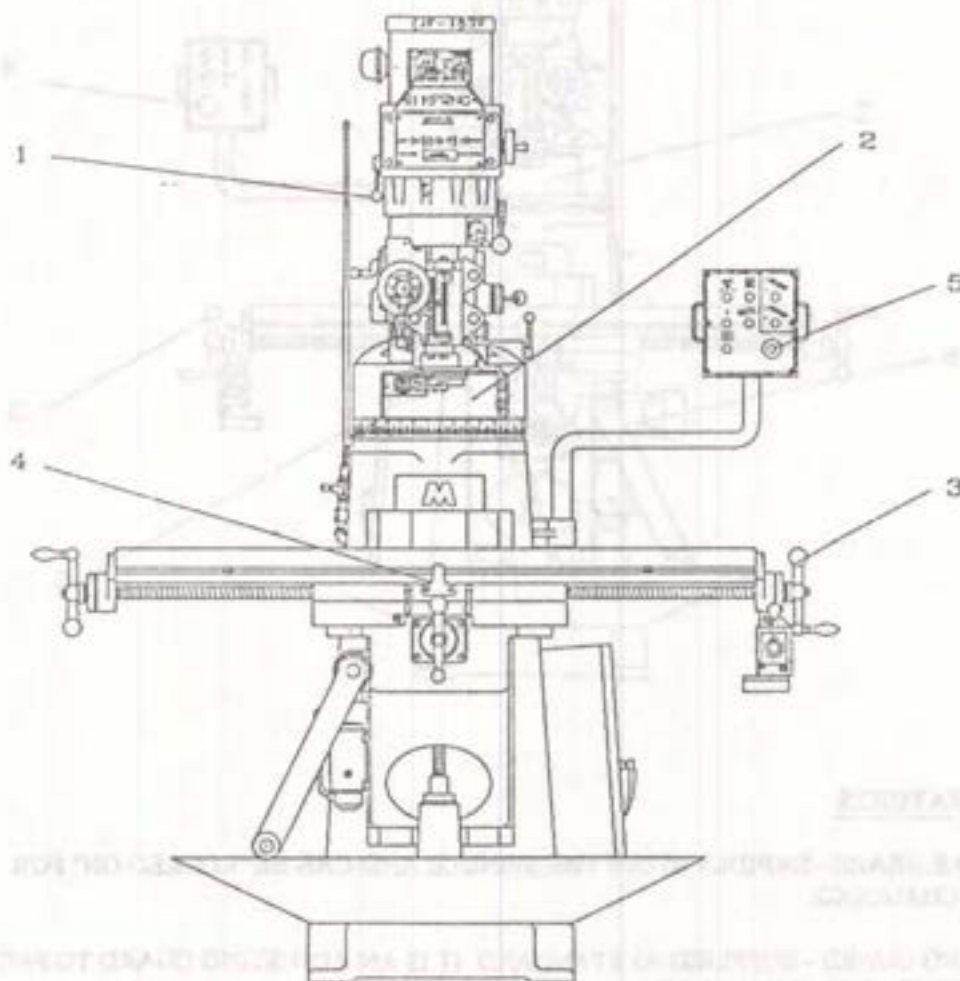
WARNING
Slip hazard.

WARNING
Biological hazard.

1.5 SAFETY FEATURES AND HOW TO STOP OF THE MACHINE

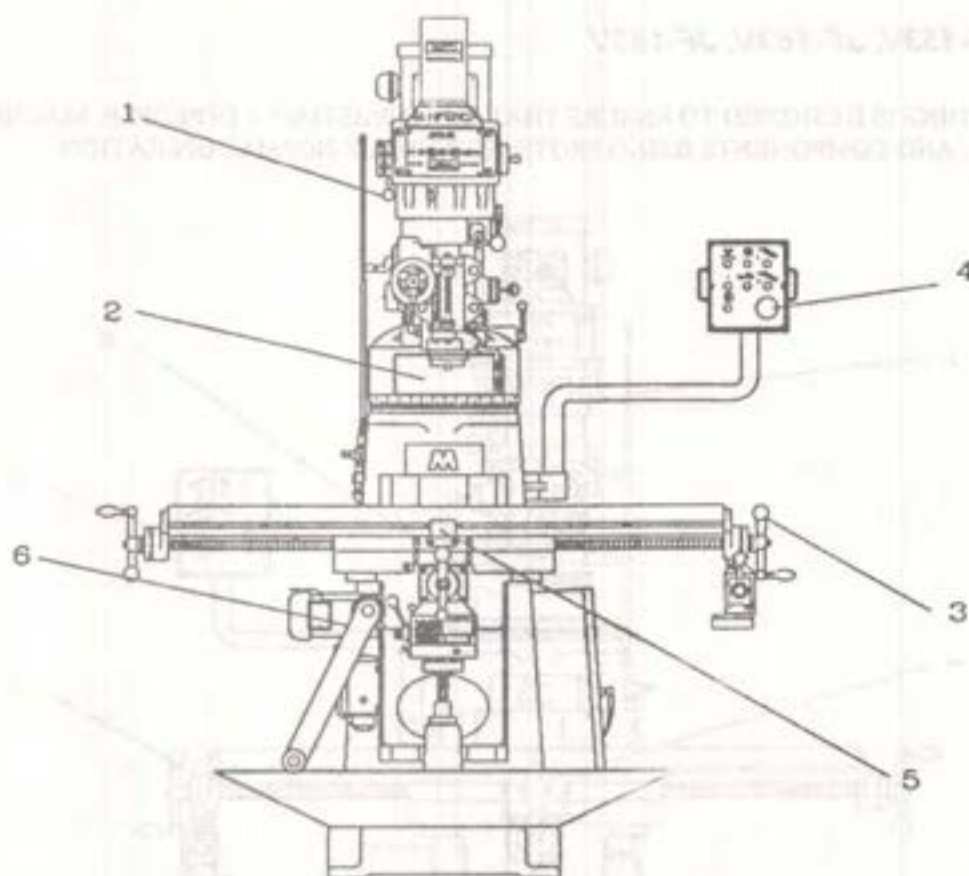
1.5.1 JF-153V, JF-163V, JF-183V

THE MACHINE IS DESIGNED TO ENSURE THAT THE INVESTMENT IN PEOPLE, MACHINE, TOOLING, AND COMPONENTS BEING PROTECTED UNDER NORMAL OPERATION.



SAFETY FEATURES

- (1) SPINDLE BRAKE - RAPIDLY STOPS THE SPINDLE AND CAN BE "LOCKED ON" FOR TOOL CHANGING.
- (2) CUTTER GUARD - SUPPLIED AS STANDARD. IT IS A ADJUSTING GUARD TO PREVENT THE CUTTING CHIP TO SPLASH.
- (3) TRAVERSE HANDLES - AUTOMATICALLY DISENGAGE WHEN TRAVERSING.
- (4) TABLE LIMIT SWITCH- PROTECT THE TABLE FROM POSSIBLE DAMAGE OWING TO OVER TRAVERSING BY POWER FEED (OPTIONAL ACCESSORY).
- (5) E-STOP BUTTON - A RED HEADED EMERGENCY BUTTON IS INCORPORATED INTO THE CONTROL PANEL.

1.5.2 JF-185V**SAFETY FEATURES**

- (1) SPINDLE BRAKE - RAPIDLY STOPS THE SPINDLE AND CAN BE "LOCKED ON" FOR TOOL CHANGING.
- (2) CUTTING GUARD - SUPPLIED AS STANDARD. IT IS AN ADJUSTING GUARD TO PREVENT THE CUTTING CHIP TO SPLASH
- (3) TRAVERSE HANDLES - AUTOMATICALLY DISENGAGE WHEN TRAVERSING.
- (4) E-STOP BUTTON- A RED HEADED EMERGENCY STOP BUTTON IS INCORPORATED INTO THE CONTROL PANEL.
- (5) TABLE LIMIT SWITCH- PROTECT THE TABLE FROM POSSIBLE DAMAGE OWING TO OVER TRAVERSING BY POWER FEED (OPTIONAL ACCESSORY).
- (6) KNEE ELEVATION HANDLE SWITCH- PROTECT THE HANDLE FROM ROTATION WHEN RAPID TRAVERSE BY ELEVATING MOTOR.

TO STOP THE MACHINE

- (1) PRESS EMERGENCY STOP BUTTON.
- (2) PRESS STOP BUTTON ON THE CONTROL PANEL.

CHAPTER 2**OVERALL DESCRIPTION OF THE MACHINE****2.1 BASIC DESCRIPTION OF THE MACHINE**

The JF-153V, JF-163V, JF-183V, JF-185V are milling and drilling machines that, with the combination of head, ram, turret and table movements, can machine a workpiece longer and wider than its own table and form any angle. It is designed for metal cutting as cast iron, carbon stwvl, brass, bronze, or aluminum. Do not cut Mg or Mg alloy, and do not use to grind procedure.

The versatility of the machines allowed the milling head to be moved into practically any position relative to the table and workpiece. Not only could it machine an area larger than the table, but by rotation the head trough 180°, this permitted the milling and boring operations to be followed by shaping and slotting etc., without disturbing the original set-up.

The machines can be used for drilling and milling, but not cutting the Mg or Mg alloy. They are designed handle mode. Any adjustment only can be done under handle mode or shut off the power source. They are designed mainly using a collector for manually holding the tools.

According to the machine's design, only a skilled person is allowed to operate this machine. Otherwise one must be trained until one knows competely how to operate the machine safely. According to the machine's design, this machine can not be used in the potential explosive envirimnt.

OPERATOR CONVENIENCE**(1) Grouping of Control**

All the main controls can be easily operated in the front of the machine, including the slide clamps for all three axes.

(2) Feed Selection

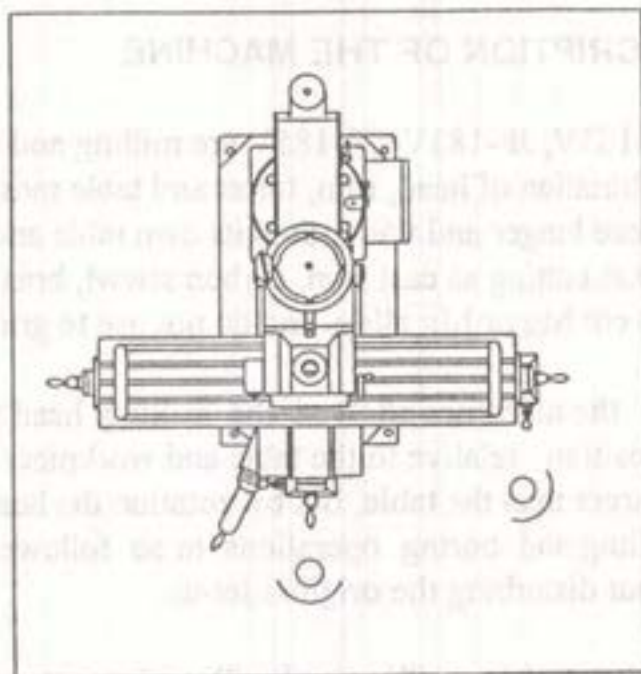
Quick and simple selection of cross and longitudinal traverse is controlled by graduated dial. Rapid traverse is operated by push-button.

(3) Single Spanner Operation

The spanner fits all the movement controls and locking bolts on the milling head, ram, turret and ram adaptor.

2.2 OPERATOR POSITION AND NOISE LEVEL

When operate the power feeder, please stand by the location of the

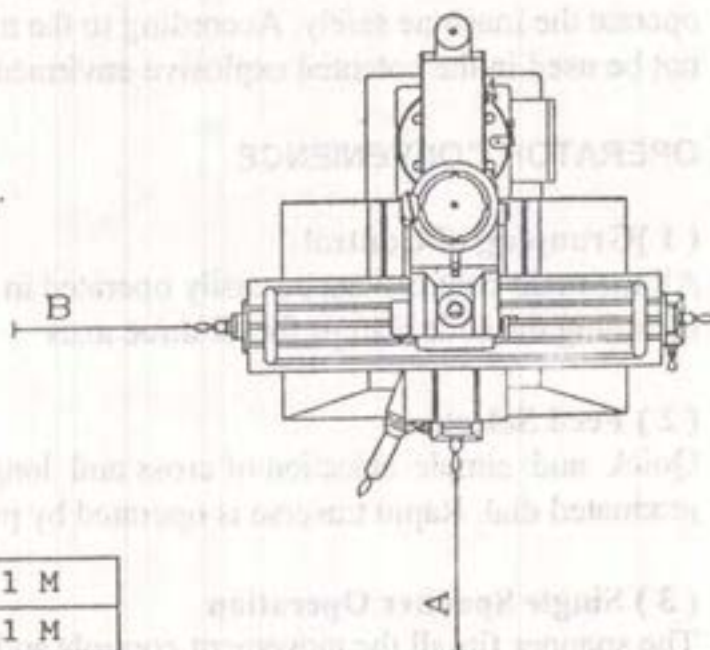


NOISE LEVEL : Less than 83dB

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

Cutting condition :

- (1) Spindle speed : 325 rpm.
- (2) Feed : 0.25 mm/teeth.
- (3) Depth : 2 mm.
- (4) Tool : diameter 50 mm, 4 teeth.
- (5) Material : S45C.

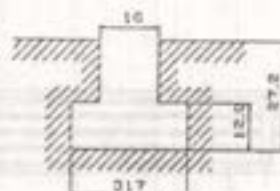
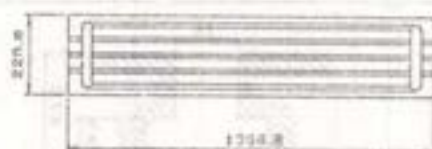
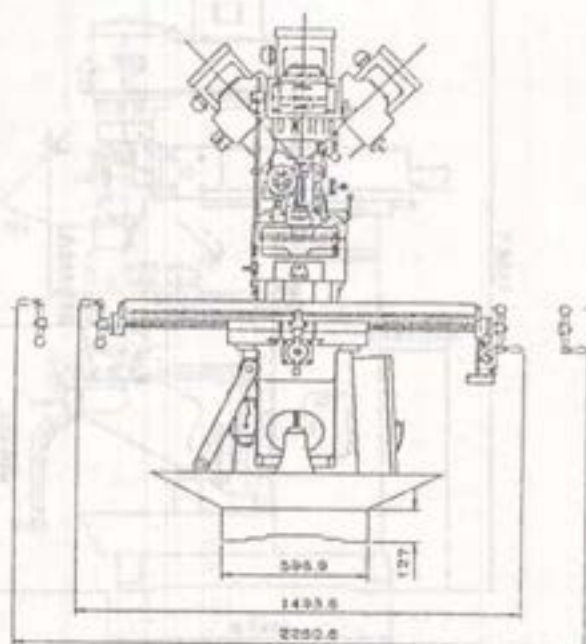


A	1 M
B	1 M

2.3 SPECIFICATIONS

Maximum workpiece weight : 200 Kg. Place the center position of the table.

2.3.1 SPECIFICATIONS OF JF-153V

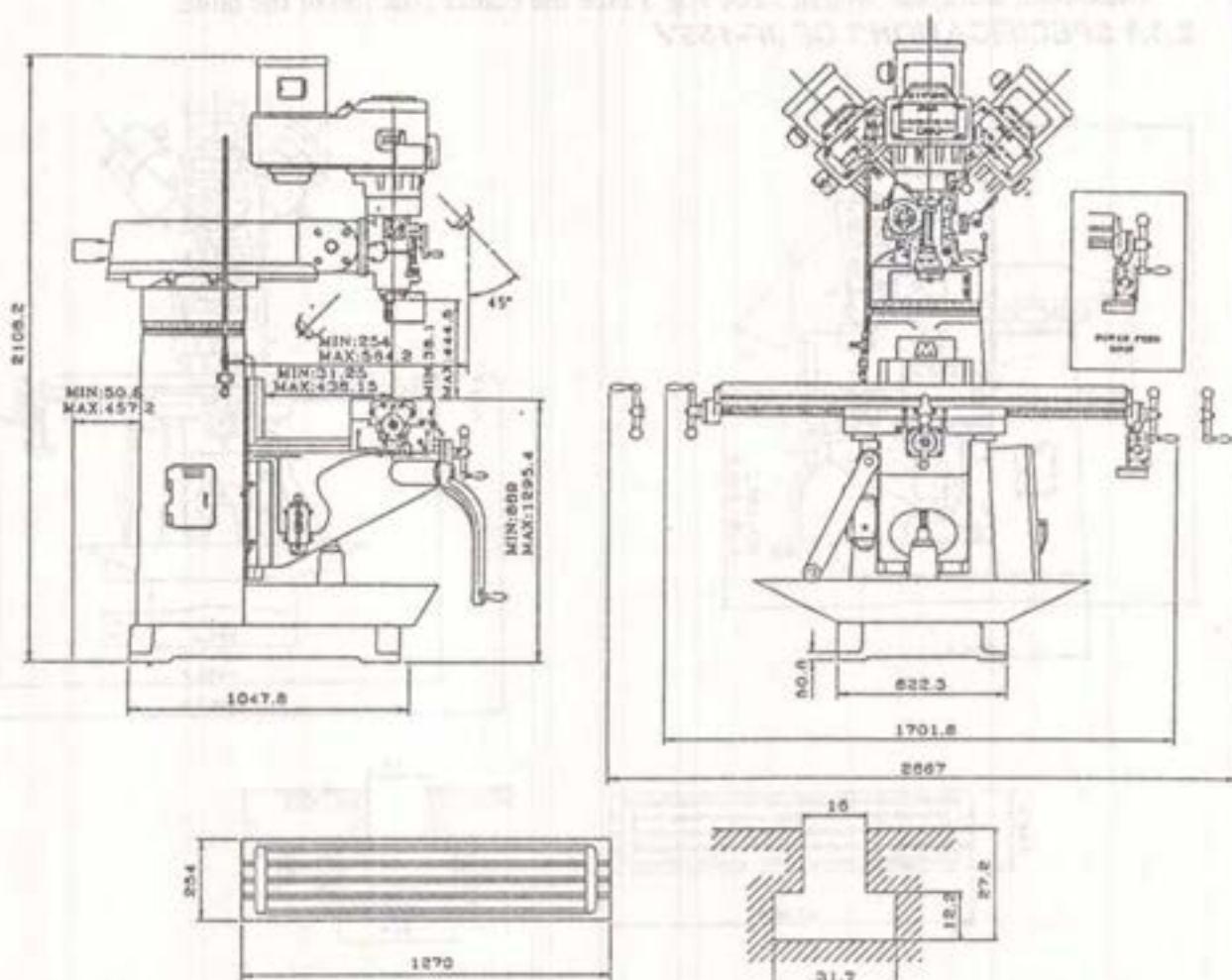


SPECIFICATIONS OF BASIC MACHINE

ITEM	INCHES (")	METRIC (mm)
Table Length	9' x 42"	228.6 x 1066.8
Longitudinal travel (manual)	30"	762
Longitudinal travel (power feed, optional)	26"	660.4
Cross travel	12"	304.8
Vertical travel	16"	406.4
T slots	5/8" x 2.5" x 3	15.875x63.5x3
Ram movement	12"	304.8
Spindle speeds range R.P.M	Low: 60-500, High: 500-4200	
Quill power feed	0.0034", 0.0018", 0.0056"	0.0863, 0.0457, 0.1422
Main horse power	3HP	
Overall height	84"	2,133.6
Overall depth	60"	1,517
Overall width	89"	2,260.6
Distance between spindle nose to table surface	11 1/2"	38.1-444.5
Distance between spindle center to column surface	7"-19"	177.8-482.6
Machine weight	2050lbs	930kgs
Wooden case dimension	63"x62"x76"	1600x1574x1930

All specifications and designs are subject to change without notice.

2.3.2 SPECIFICATIONS OF JF-163V

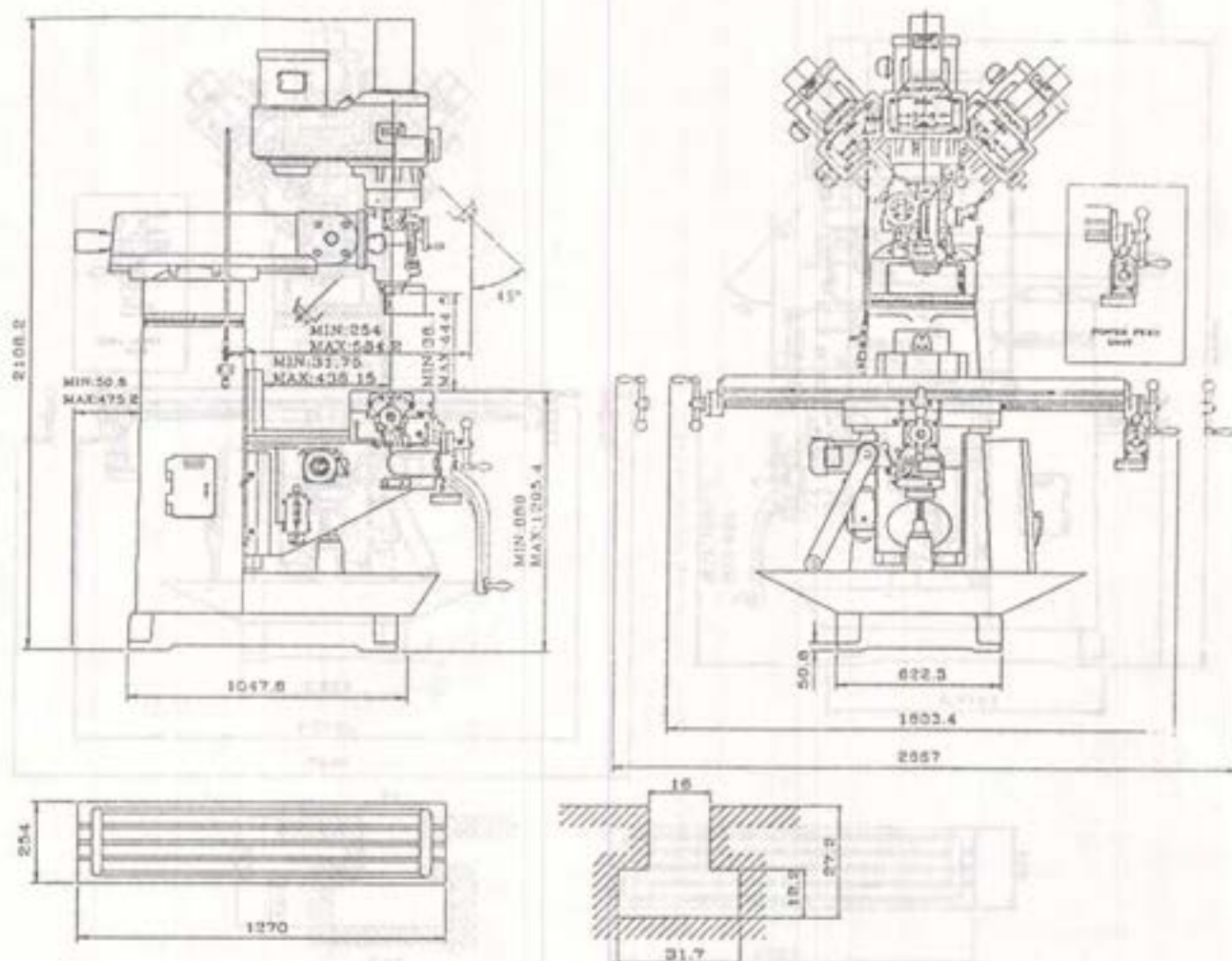


SPECIFICATION OF BASIC MACHINE

ITEM	INCHES (")	METRIC (mm)
Table Length	10"x50"	254x1270
Longitudinal travel (manual)	37 1/2"	952.5
Longitudinal travel (power feed, optional)	35"	889
Cross travel	16"	406
Vertical travel	16"	406
T slots	5/8"x2.5"x3	15.89x63.5x3
Ram movement	16"	406
Spindle speeds range R.P.M	Low: 60-500, High: 500-4200	
Quill power feed	0.0034", 0.0018", 0.0036"	0.0863, 0.04572, 0.1422
Main horse power	3HP	
Overall height	83"	2,109.2
Overall depth	81.5"	2,070.1
Overall width	101"	2,565.4
Distance between spindle nose to table surface	1 1/2"-17 1/2"	38.1-444.5
Distance between spindle center to column surface	10"-23"	254-594.2
Machine weight	2646lbs	1200kgs
Wooden case dimension	163"x62"x76"	1600x1570x1930

All specifications and designs are subject to change without notice.

2.3.3 SPECIFICATIONS OF JF-183V

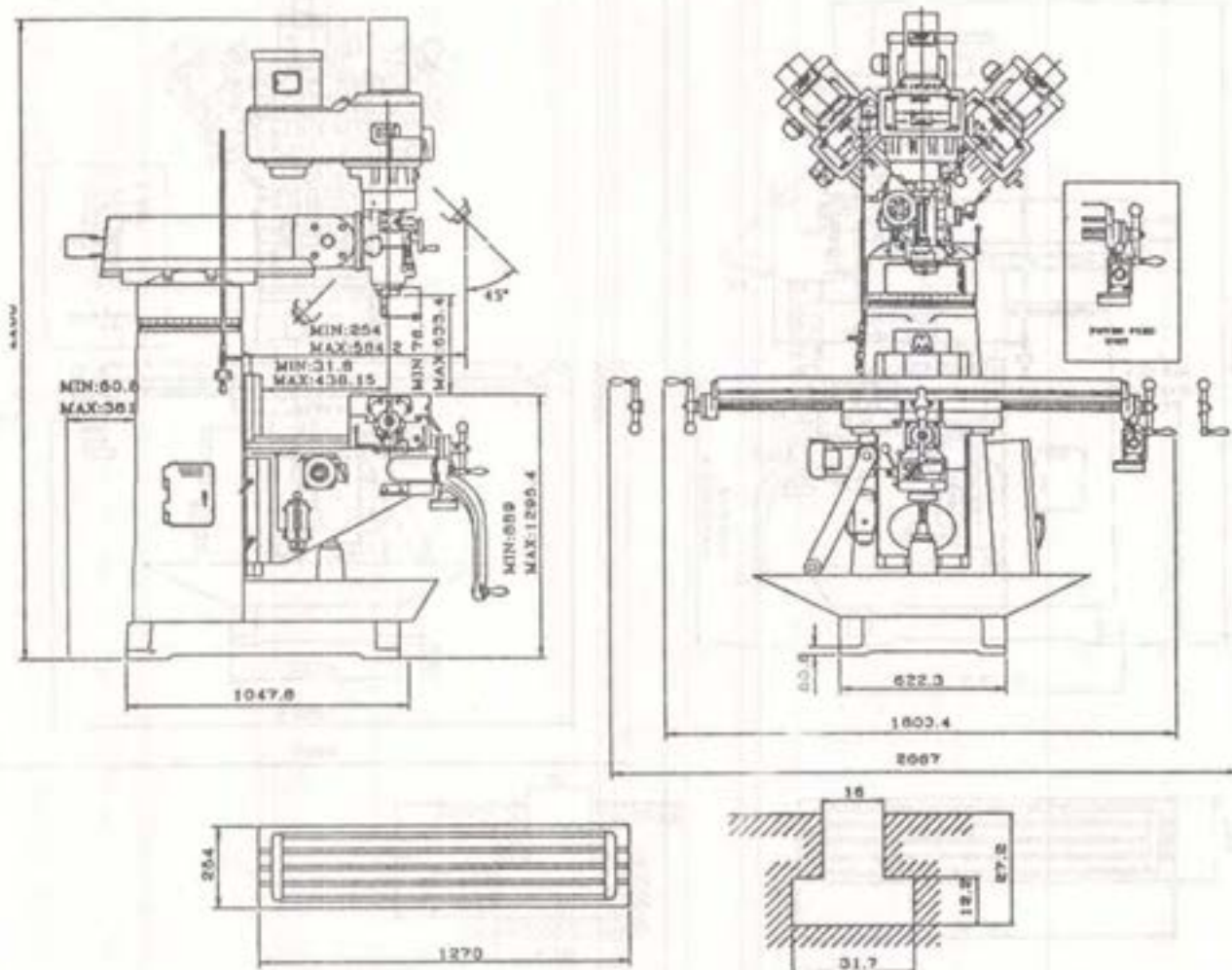


SPECIFICATIONS OF BASIC MACHINE

ITEM	INCHES (")	METRIC (mm)
Table Length	10"x50"	254x1270
Longitudinal travel (manual)	37 1/2"	952.5
Longitudinal travel (power feed, optional)	35"	889
Cross travel	16"	406
Vertical travel	16"	406
T slots	5/8"x2.5"x3	15.88x63.5x3
Ram movement	12"	304.8
Spindle speeds range R.P.M.	Low: 60-500, High: 500-4200	
Quill power feed	0.0034", 0.0016", 0.0056"	0.0363, 0.04572, 0.1422
Main horse power	3HP	
Overall height	93"	2,108.2
Overall depth	80"	2,018.2
Overall width	105"	2,572.5
Distance between spindle nose to table surface	11 1/2"-17 1/2"	38.1-444.5
Distance between spindle center to column surface	15"-26"	391-609.6
Machine weight	2976lbs	1350kgs
Wooden case dimension	163"x62"x76"	1600x1570x1930

All specifications and designs are subject to change without notice.

2.3.4 SPECIFICATIONS OF JF-185V



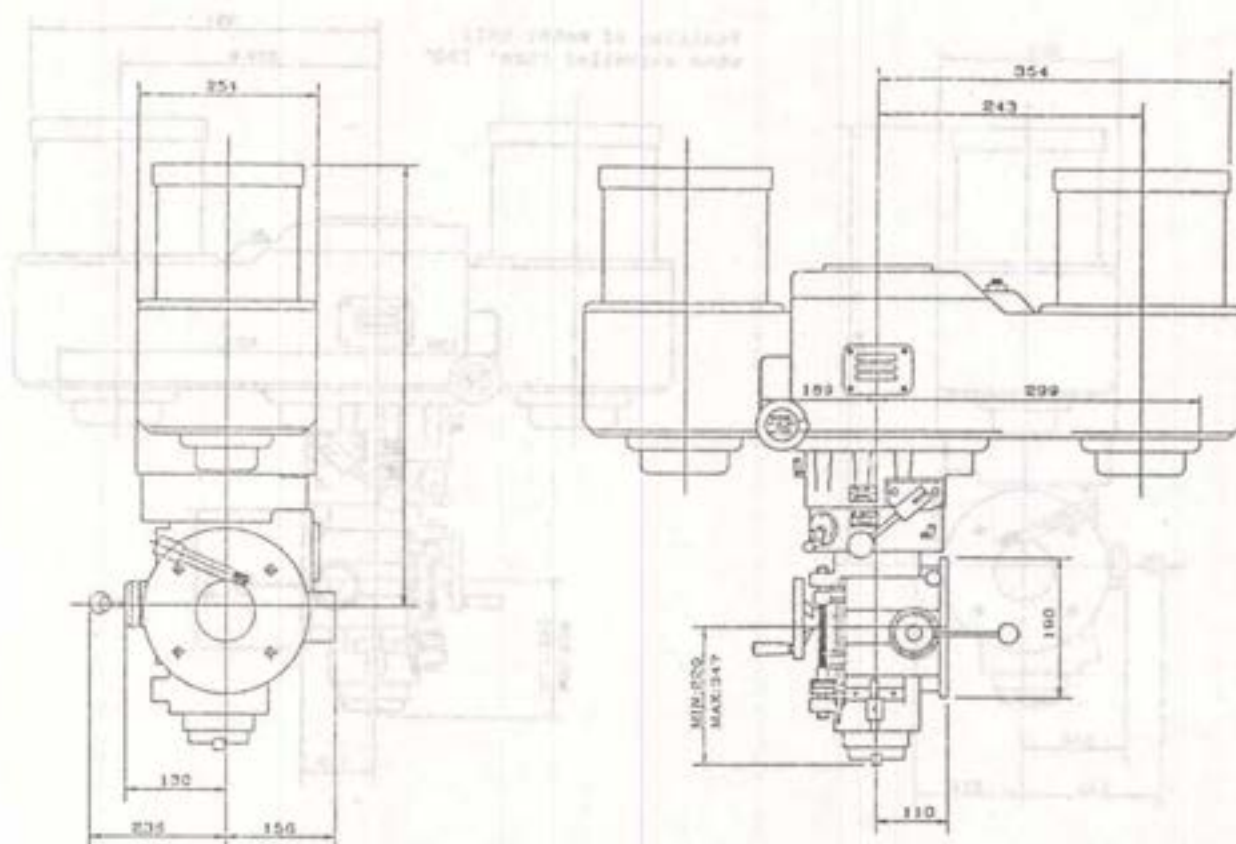
SPECIFICATIONS OF BASIC MACHINE

ITEM	INCHES (")	METRIC (mm)
Table Length	10"x50"	254x1270
Longitudinal travel (manual)	37 1/2"	952.5
Longitudinal travel (power feed, optional)	35"	889
Cross travel	16"	406
Vertical travel	16"	406
T slots	5/8"x2.5"x3	15.88x63.5x3
Ram movement	12"	304.8
Spindle speeds range R.P.M	Low: 60-500, High: 500-4200	
Quill power feed	0.0034", 0.0018", 0.0056"	0.0863, 0.04572, 0.1422
Main horse power	3HP	
Overall height	83"	2,108.2
Overall depth	80"	2,018.1
Overall width	105"	2,572.5
Distance between spindle nose to table surface	1"-17"	25.4-431.8
Distance between spindle center to column surface	15"-24"	381-609.6
Machine weight	3086lbs	1400kgs
Wooden case dimension	163"x62"x76"	1600x1570x1930

All specifications and designs are subject to change without notice.

2.4 THE CAPACITY OF THE INFINITELY HEAD

2.4.1 JF-153V, JF-163V, JF-183V



Spindle speeds(R.P.M)- Low: 60-500

High: 500-4200

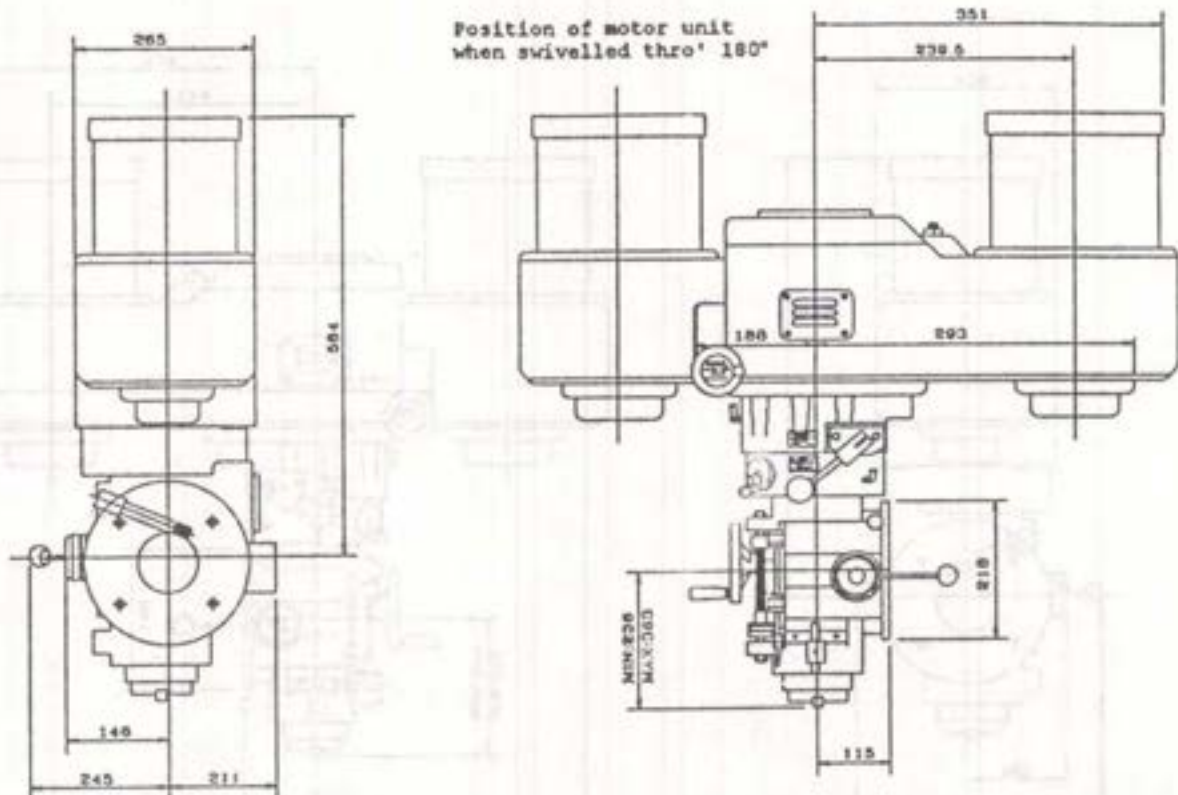
Quill power feed- 0.0863mm, 0.0457mm, 0.1422mm

Spindle taper- N.S.T. #30 or R-8

Quill travel- 127mm

H.P. of Motor- 3

2.4.2 JF-185V



Spindle speeds (R.P.M) - Low: 50-420, High: 420-3750
Quill power feed- 0.0863mm, 0.0457mm, 0.1422mm
Spindle taper- N.S.T. #40
Quill travel- 127mm
H.P. of Motor- 5

- (1) Digital readout system.
- (2) Clamping kit.
- (3) Quartz work light.
- (4) Riser blocks.
- (5) Power feed (x, y axis).
- (6) Safety handle.
- (7) Ball screw.
- (8) Flood coolant system.
- (9) Milling vise.
- (10) R-8 collet set.
- (11) Air power drawbar.
- (12) 9"x49" working table (for JF-153V)
- (13) 10"x54" working table (for JF-163V, JF-183V, JF-185V)
- (14) 12.5"x58 working table (for JF-183V, JF-185V)

CHAPTER 3

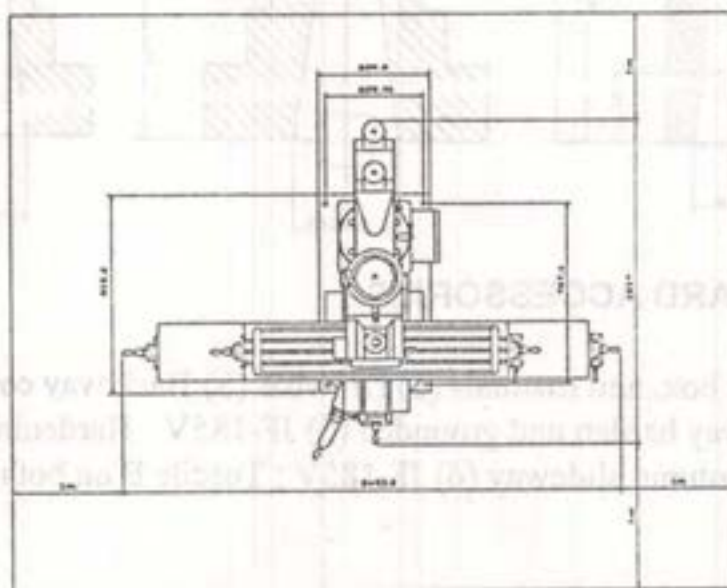
REQUIREMENT OF MACHINE

3.1 : SPACE REQUIREMENT

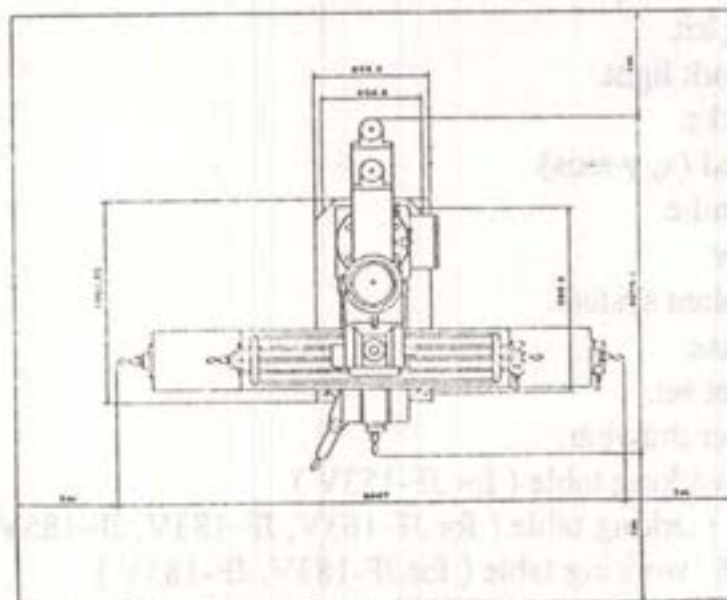
THE MINIMUM SPACE FOR MACHINE:

For your convenience to operate, please take the walkway into consideration. Therefore, the ideal space for machine should be plused 1000mm.

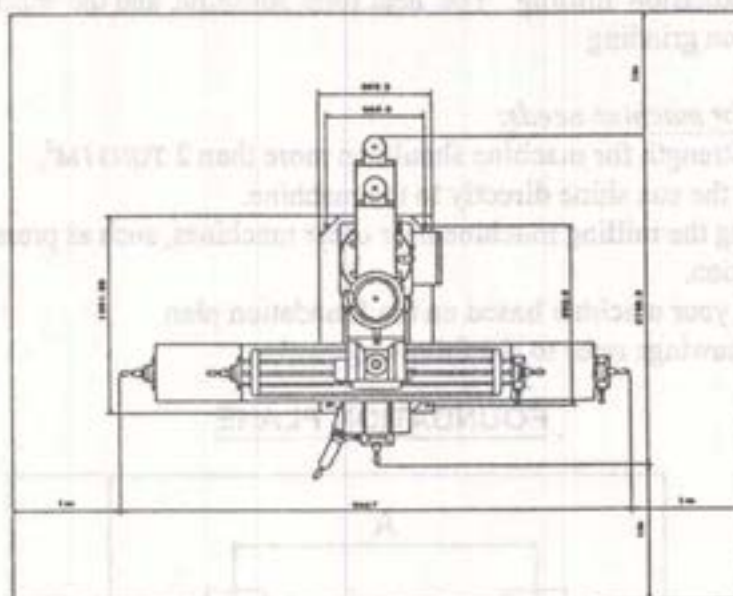
JF-153V



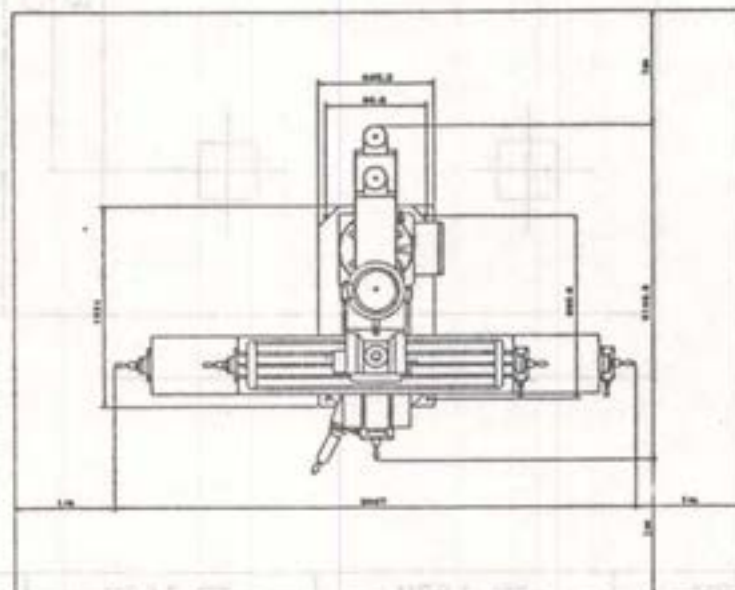
JF-163V



JF-183V



JF-185V



DANGER:

To keep the machine from the environment which might cause any explosion.

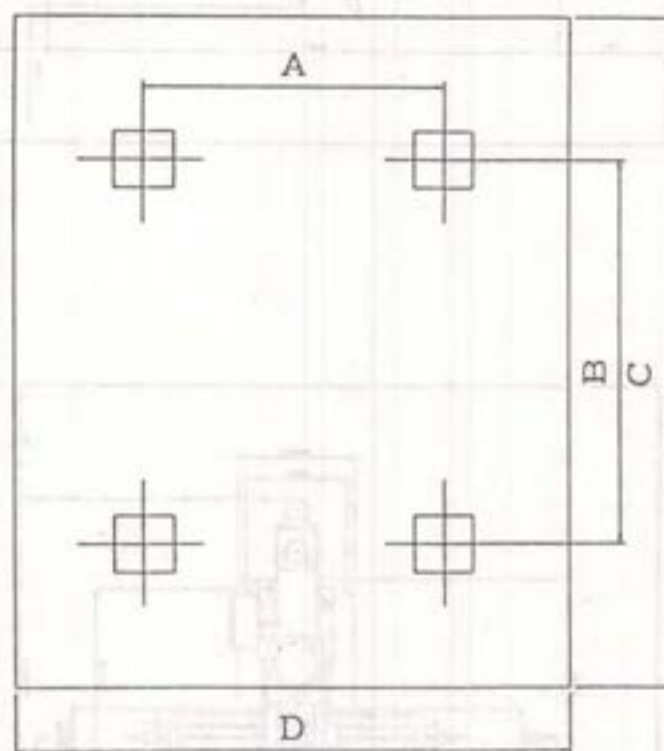
3.2 FOUNDATION REQUIREMENT

Firm, steady, good constructed ground, and well level of machine are the essential conditions for precision milling. The heat from sunshine, and the vibration might also influence precision grinding.

The foundation for machine needs:

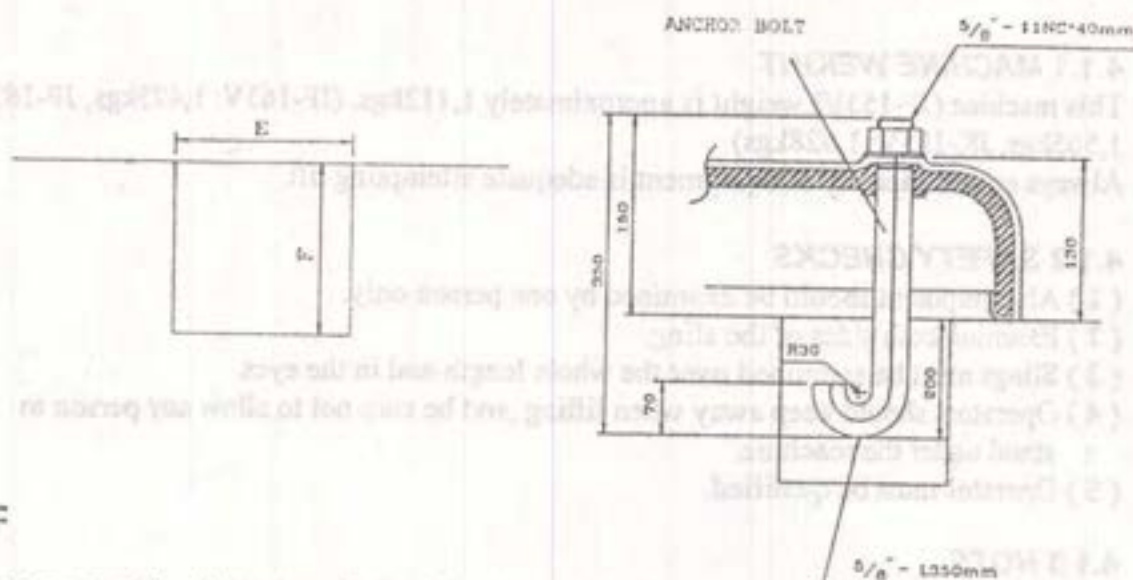
- (1) The bearing strength for machine should be more than 2 TONS / M².
- (2) Avoid letting the sun shine directly to the machine.
- (3) Avoid locating the milling machine near other machines, such as press.
- (4) Good ventilation.
- (5) Please install your machine based on the foundation plan.
- (6) Foundation drawings refer to the following:

FOUNDATION PLANE



	JF-153V	JF-163V	JF-183V	JF-185V
A	502.65mm	558.8mm	558.8mm	558.8mm
B	787.4mm	990.6mm	990.6mm	990.6mm
C	2025mm	2616.2mm	2616mm	2616mm
D	2971.8mm	3175mm	3175mm	3175mm
E	302.8mm	302.8mm	302.8mm	302.8mm
F	302.8mm	302.8mm	302.8mm	302.8mm

FOUNDATION STRUCTURE



3.3 F

- (1) **VOLTAGE:** Steady state voltage, 0.9 ... 1.1 of nominal voltage.
- (2) **FREQUENCY:** 0.99 ... 1.01 of normal frequency continuously, 0.98 ... 1.02 short time.
- (3) **HARMONICS:** Harmonic distortion not to exceed 10% of the total r.m.s. Voltage between the live conductors for the sum of the 2nd through 5th harmonic.
- (4) **VOLTAGE UNBALANCE IN 3-PHASE SUPPLIES:** Neither the voltage of the negative sequence component nor the voltage of the zero sequence component shall exceed 2% of the positive sequence component.
- (5) **VOLTAGE IMPULSES:** Not to exceed 1,5 ms in duration with a rise/fall time between 500 ns and 500 μ s and a peak value not more than 200% of the rated r.m.s. supply voltage.
- (6) **VOLTAGE INTERRUPTION:** Supply interrupted or at zero voltage for not more than 3ms at any random time in the supply cycle, there shall be more than 1 s between successive interruptions.
- (7) **VOLTAGE DIPS:** Voltage dips shall not exceed 20% of the peak voltage of the supply for more than one cycle, there shall be more than 1 s between successive dips.

3.4 ENVIRONMENT

- (1) **Temperature :** Normal temperature within 10°C to 38°C.
- (2) **Humidity :** 30% to 95%.
- (3) **Keep away from gas, chemical, or explosive environment.**
- (4) **Keep away from electrical magnetic interference.**
- (5) **Others :** Keep away from ashes, acid or salty area.
- (6) **Environment lux :** More than 300 lux.

CHAPTER 4

TRANSPORTATION AND INSTALLATION

4.1 TRANSPORTATION

4.1.1 MACHINE WEIGHT

This machine (JF-153V) weight is approximately 1,112kgs. (JF-163V: 1,475kgs, JF-183V: 1,565kgs, JK-185V: 1,628kgs)

Always ensure capacity of equipment is adequate attempting lift.

4.1.2 SAFETY CHECKS

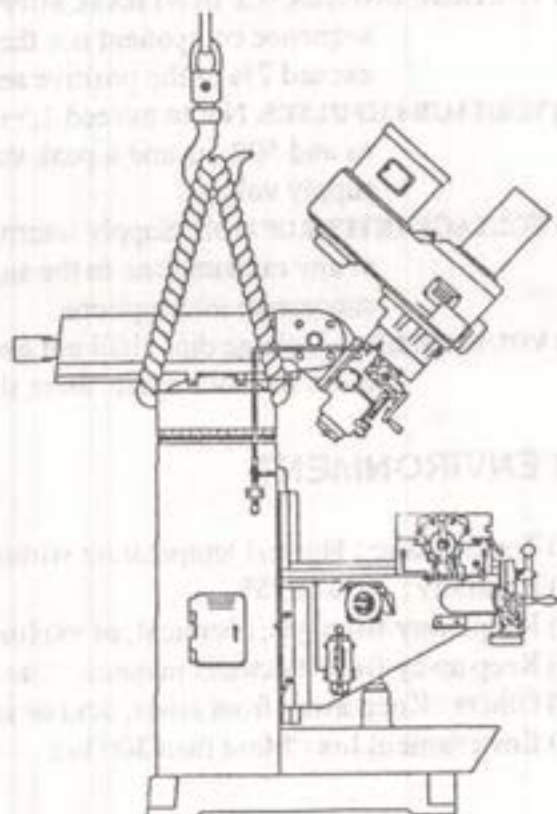
- (1) All equipment should be examined by one person only.
- (2) Examine both sides of the sling.
- (3) Slings must be examined over the whole length and in the eyes.
- (4) Operators should keep away when lifting, and be sure not to allow any person to stand under the machine.
- (5) Operator must be qualified.

4.1.3 NOTE

Move the ram in order to get proper balance and relock the ram before moving the machine. Carefully, lower the machine to its foundation leveling pads or wedges.

LIFT PROCEDURE

Use rope sling as illustrated. Insert soft cloth between rope and machine edges. It is advisable to tilt the head before lift machine.



4.2 INSTALLATION

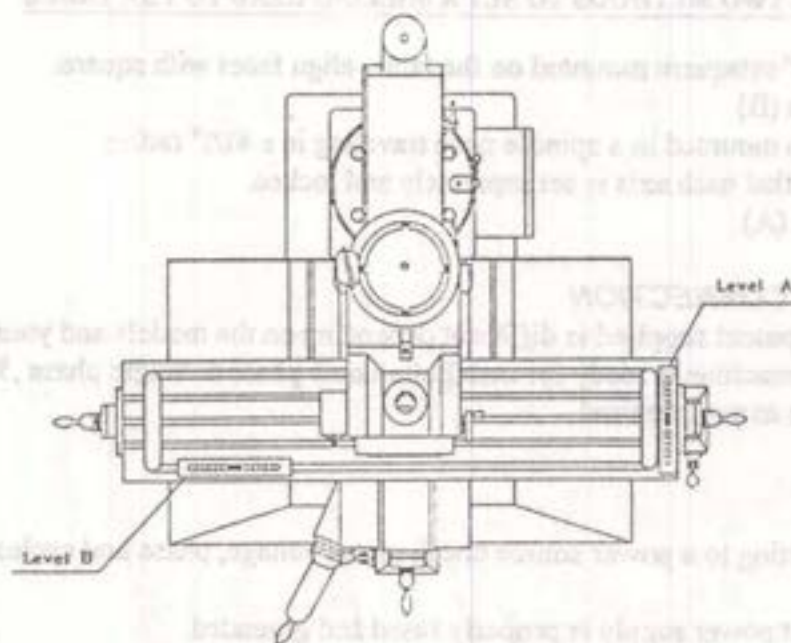
4.2.1 CLEANING

All machine surfaces are covered with a rust preservative which must be thoroughly cleaned before moving any parts of the machine. Only mild solvent and soft rags must be used for clearing.

- (1) Remove rust preventative before moving any slideways.
- (2) The coating is best removed by using paraffin applied with a clean brush. When the coating has softened, remove with clean rags.
- (3) Oil or grease all lubrication points. refer to the lubrication section of this manual.

4.2.2 LEVEL ADJUSTMENT

- (1) It is most important to set the machine level and firm in order to perform accurately. For a best result, it is suggested to mount the machine on a concrete floor with anchor bolt. Please refer to CHAPTER 3.2 FOUNDATION REQUIREMENT.
- (2) If the machine can not be anchored to a concrete floor, it is commended to install the machine on a heavy concrete floor.



- Put levels on the table as illustrated.
- Check the level A and B. The allowance approximate 0.06mm/M.
- Put pads under the base if necessary, and, TIGHTEN the anchor bolt.

FIGURE (A)

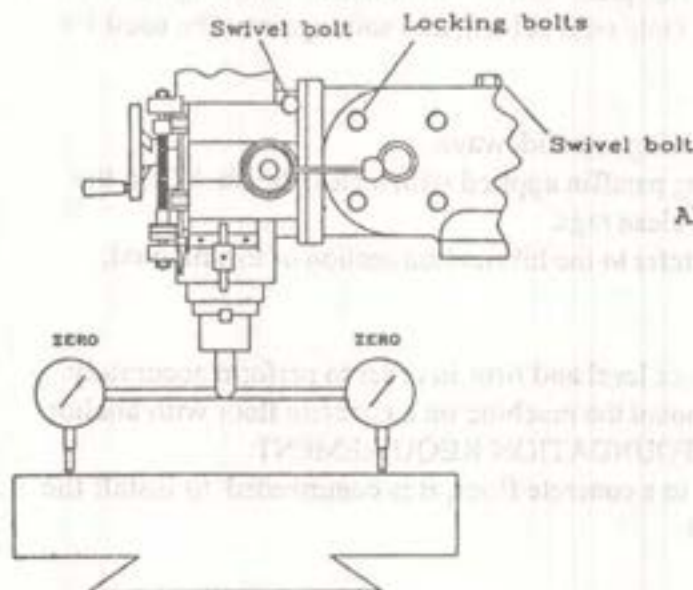
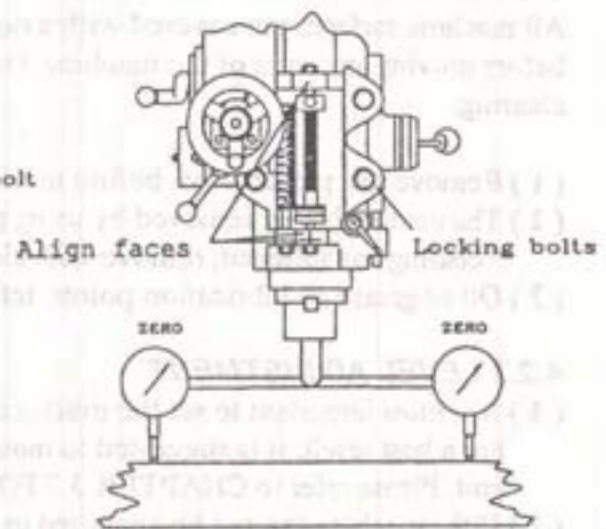


FIGURE (B)



FOLLOWINGS ARE TWO METHODS TO SET A MILLING HEAD TO THE TABLE

- (1) Use a large 90° setsquare mounted on the table, align faces with square.
Refer to figure (B)
- (2) An indicator is mounted in a spindle nose traveling in a 4 1/2" radius.
It is important that each axis is set separately and locked.
Refer to figure (A)

4.2.3 ELECTRIC CONNECTION

The electrical equipment supplied is different depending on the models and your requirements. The machine is ready for installation on 3 phase or single phase, 50 or 60 cycles, AC. voltage as you required.

NOTE:

- (1) Before connecting to a power source check motor voltage, phase and cycles.
- (2) Make sure that power supply is properly fused and grounded.
- (3) Motor rotation must be clockwise when viewed from the spindle end. If the motor turns in the wrong direction, interchange the phases for correction.

4.2.4 DISMANTLING PROCEDURE OF THE MACHINE

The dismantling procedure is the reverse procedure of the installation.

CHAPTER 5**OPERATION****5.1 SAFETY INSPECTION BEFORE OPERATION**

Before attempting to start the machine read carefully the machine operating instructions in this operation manual.

MILLING MACHINE SAFETY

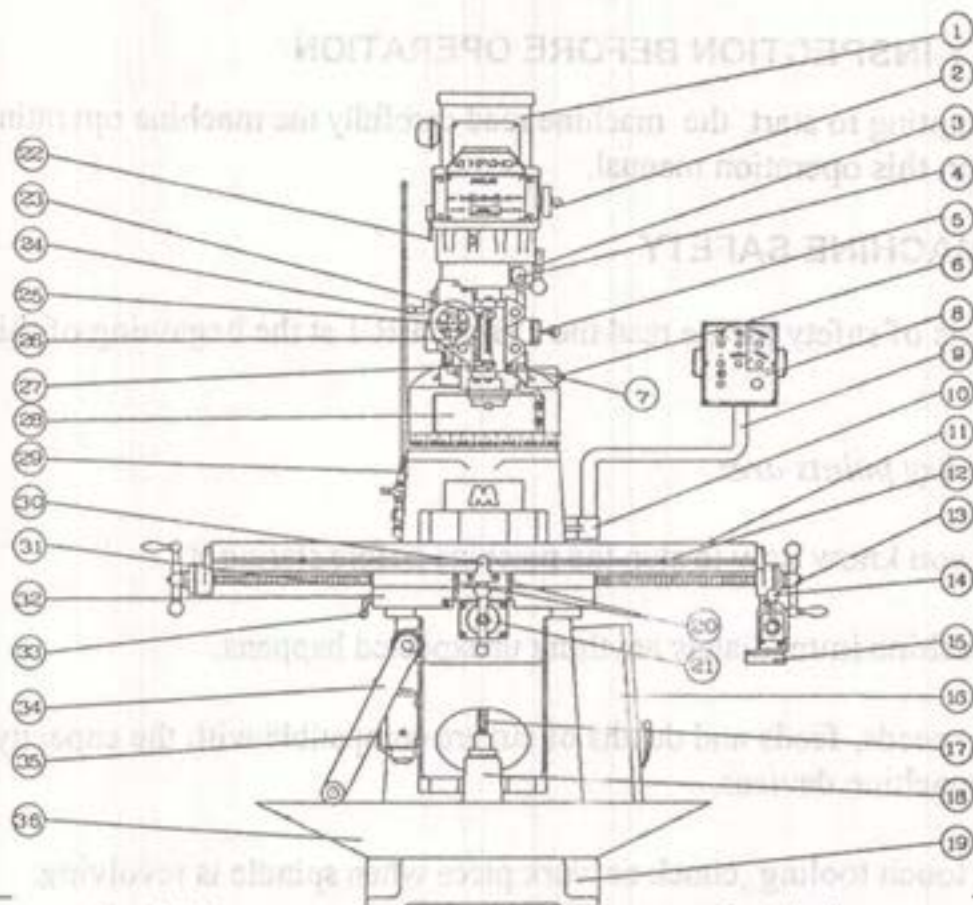
In the interests of safety please read the CHAPTER 1 at the beginning of this manual.

Some of the key points are:

- (1) Ensure you know how to stop the machine before starting it.
- (2) Stop machine immediately anything unexpected happens.
- (3) Ensure speeds, feeds and depths of cut are compatible with the capacity of the machine devices.
- (4) Do not touch tooling ,chuck or work piece when spindle is revolving.
- (5) Wear and utilize suitable protective equipment.
- (6) SAFE HANDLING OF TOOLS TO SPINDEL:
 - (a) Turn off the power and wear gloves.
 - (b) Put the tool with arbor (or chuck holder) to the spindle and screw the arbor (or holder) by the draw bar.
 - (c) Break the spindle and screw again it.

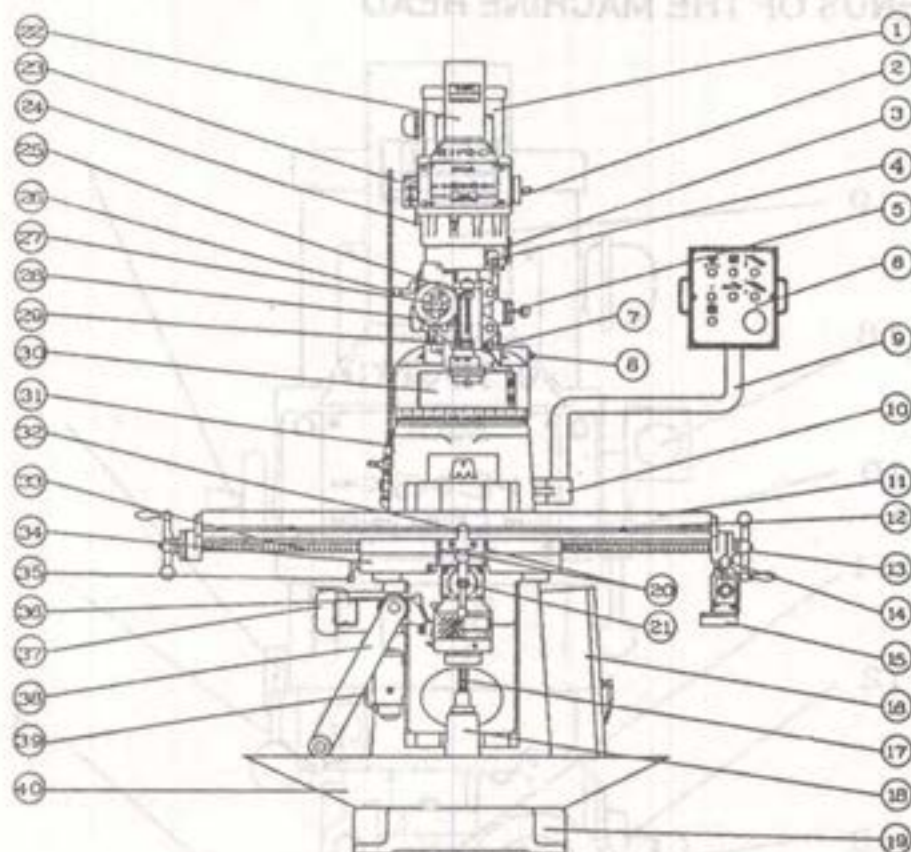
5.2 LEGENDS OF THE MACHINE

5.2.1 JF-153V, JF-163V, JF-183V



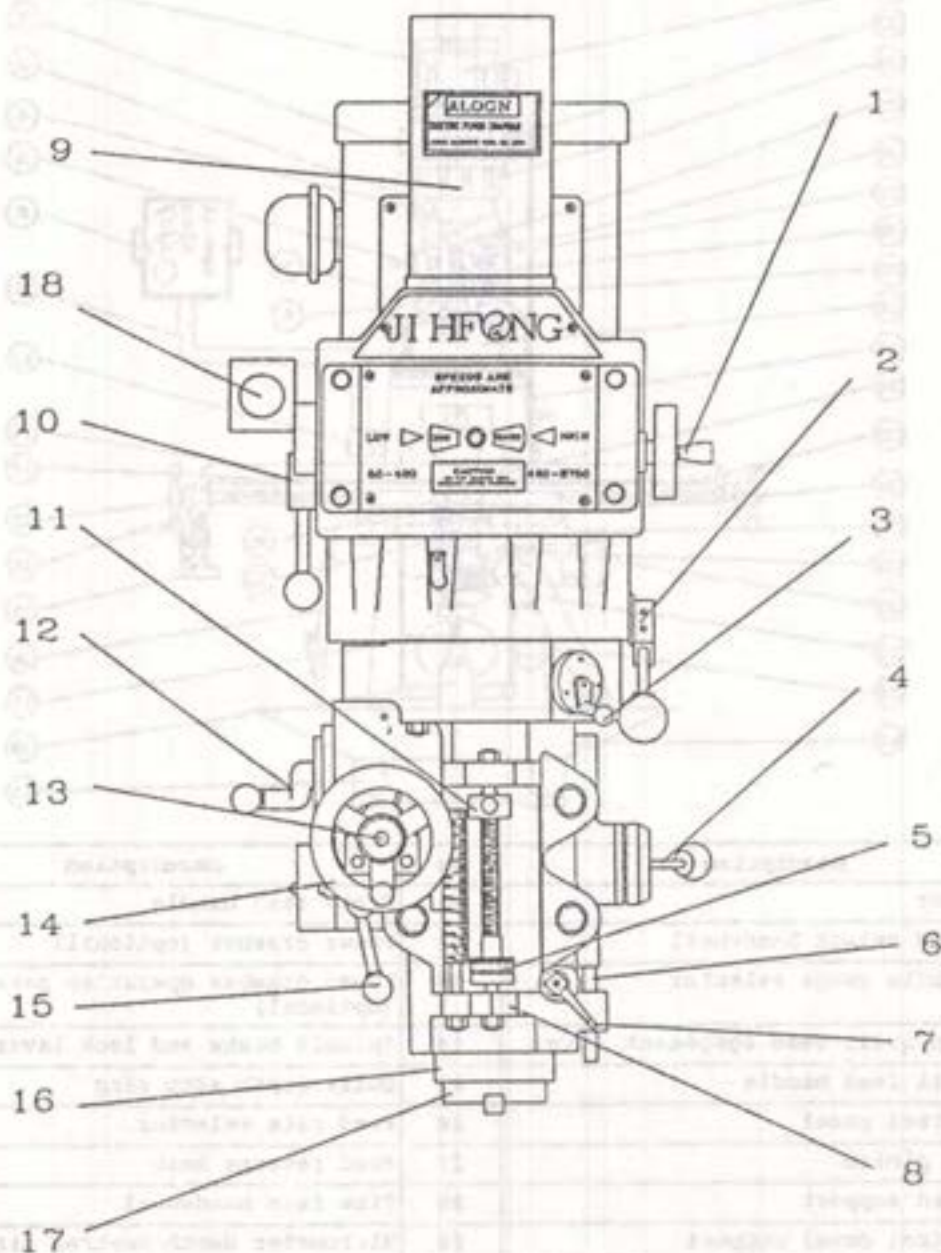
No	Description	No	Description
1	Motor	19	Column
2	Speed select handwheel	20	Table lock lever
3	Spindle range selector	21	Longitudinal feed handle
4	Auto quill feed engagement lever	22	Spindle brake
5	Quill feed handle	23	Micrometer depth stop ring
6	Ram pinion	24	Feed rate selector
7	Guard support	25	Feed reverse knob
8	Control panel	26	Fine feed handwheel
9	Control panel support	27	Micrometer depth control dial
10	Fixed housing	28	Adjustable guard
11	Work table	29	Coolant pipe valve
12	Table stop dog	30	Table stop bracket
13	Long. feed handle	31	Long. feed screw
14	Power table feed lever	32	Saddle
15	Power table feed unit	33	Saddle lock lever
16	Electrical box	34	Elevating feed handle
17	Elevating screw	35	Lubrication oil pump
18	Elevating screw housing	36	Clip tray

5.2.2 JF-185V



No	Description	No	Description
1	Motor	21	Cross feed handle
2	Speed select handwheel	22	Power drawbar (optional)
3	Spindle range selector	23	Power drawbar operation panel (optional)
4	Auto quill feed engagement lever	24	Spindle brake and lock lever
5	Quill feed handle	25	Quill depth stop ring
6	Control panel	26	Feed rate selector
7	Ram pinion	27	Feed reverse knob
8	Guard support	28	Fine feed handwheel
9	Control panel support	29	Micrometer depth control dial
10	Fix housing	30	Adjustable guard
11	Work table	31	Coolant pipe valve
12	Table stop dog	32	Table stop bracket
13	Longitudinal feed handle	33	Long. feed screw
14	Power table feed lever (optional)	34	Saddle
15	Power table feed unit (optional)	35	Saddle clamp lever
16	Electrical box	36	Cross traverse power feed (optional)
17	Elevating screw	37	Elevating motor
18	Elevating screw housing	38	Elevating feed handle
19	Column	39	Lubrication oil pump
20	Table clamp lever	40	Clip tray (optional)

5.3 LEGENDS OF THE MACHINE HEAD



No	Description	No	Description
1	Speed select handwheel	10	Spindle brake and lock lever
2	Spindle range selector	11	Quill depth stop ring
3	Auto quill feed engagement lever	12	Feed rate selector
4	Quill feed handle	13	Feed reverse knob
5	Micrometer depth control dial	14	Fine feed handwheel
6	Micrometer depth control dial	15	Feed engagement lever
7	Quill clamp lever	16	Quill
8	Alignment reference face	17	Spindle
9	Power drawbar	18	E-Stop

5.4 OPERATING THE MACHINE

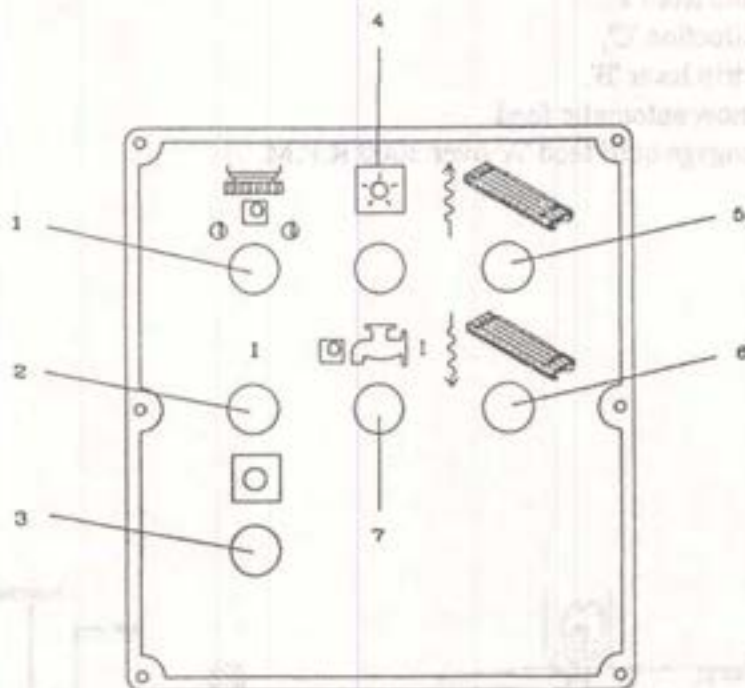
1. STARTING, STOPPING

STARTING

- 1) Connect the power.
- 2) Push the POWER ON BUTTON (2).

STOPPING

- 1) Stop feed.
- 2) Push the POWER OFF BUTTON (3).



LEGENDS OF THE CONTROL PANEL

No.	Description	No.	Description
1	Power ON push button	5	Coolant ON-OFF selection switch
2	Power OFF push button	6	Table rapid-up push button
3	Spindle revolution selection switch	7	Table rapid-down push button
4	Power indicating light		

2. QUILL FEED

FINE HAND FEED

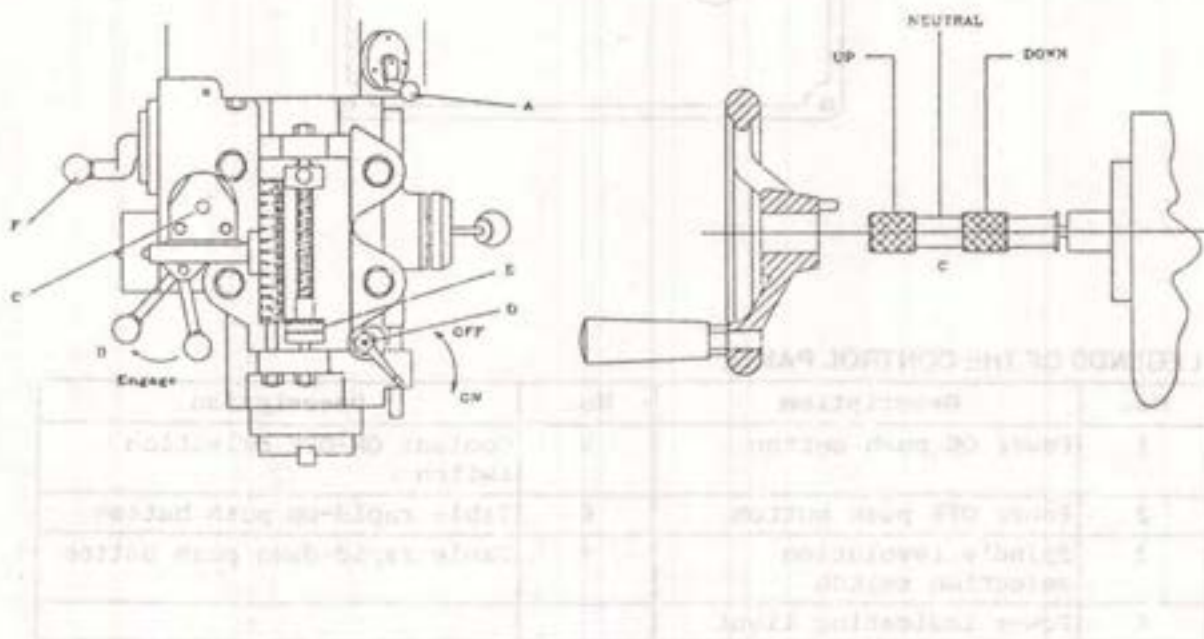
- 1) Disengage Auto Quill Feed 'A'.
- 2) Locate 'C' in mid (neutral) position.
- 3) Engage Feed Trip Lever 'B'.
- 4) The Quill is now under handwheel control.

AUTOMATIC FEED

Maximum loading 3/8" (9.5mm) dia. drill in steel.

- 1) Ensure quill lock 'D' is off.
- 2) Set micrometer dial 'E' to required depth.
- 3) Engage auto quill feed 'A'. (when motor has stopped)
- 4) Select feed rate from 'F'.
- 5) Select feed direction 'C',
- 6) Engage feed trip lever 'B'.
- 7) The Quill is now automatic feed.

NOTE: Do not engage quill feed 'A' over 3000 R.P.M.

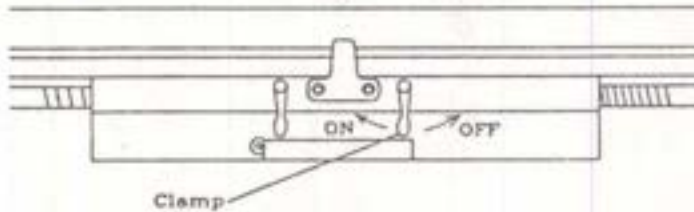
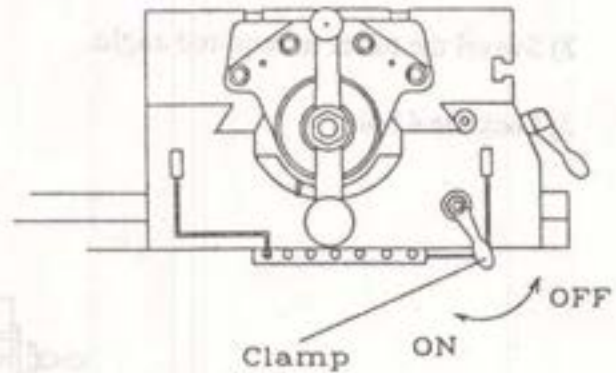


3. TABLE

- 1) Clamping the lever to prevent the slide between the knee and the saddle

Moderate pressure is sufficient.

Excess pressure will cause distortion and make the table stiff to wind.

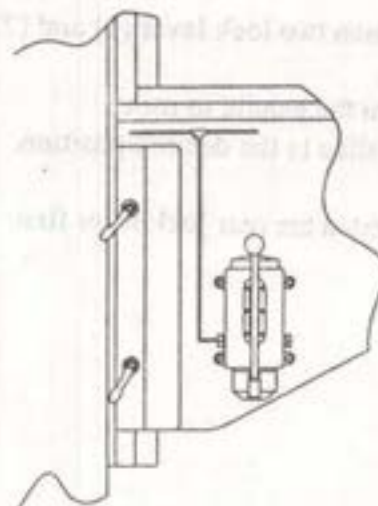


- 2) Clamping the lever to prevent the slide between the table and the saddle.

Moderate pressure is sufficient.

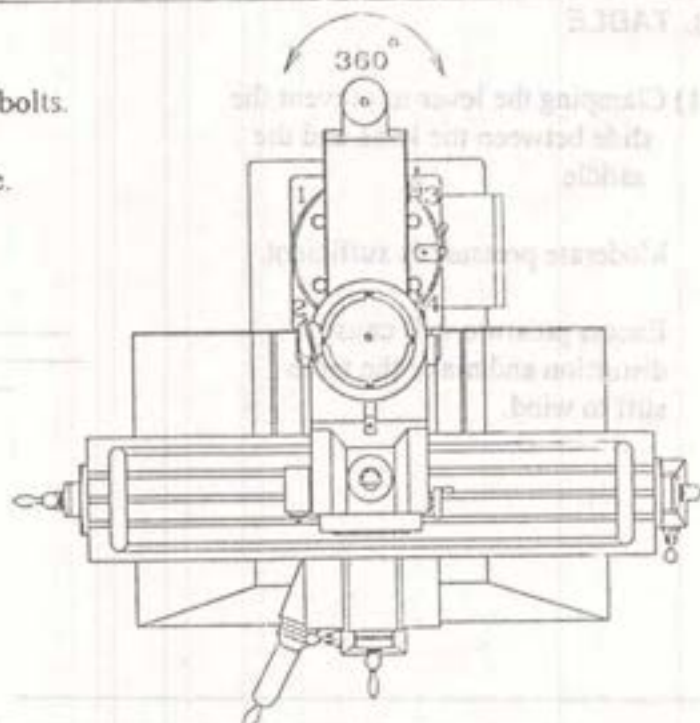
- 3) Clamping the lever to prevent the slide between the knee and the column.

Moderate pressure is sufficient.



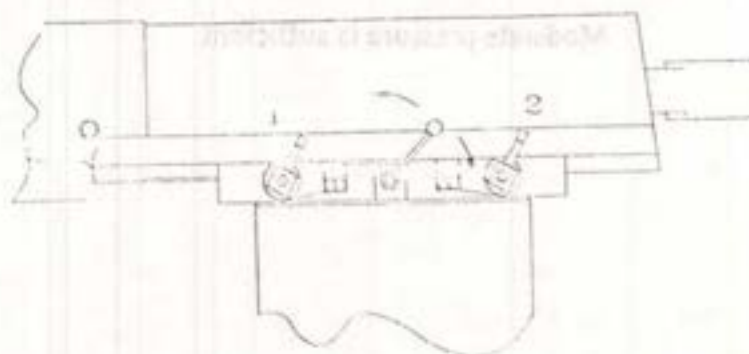
4. SWIVEL TURRET

- 1) Use the spanner and unlock the 4 bolts.
- 2) Swivel the turret to required angle.
- 3) Lock the 4 bolts.



5. MOVE RAM SLIDE

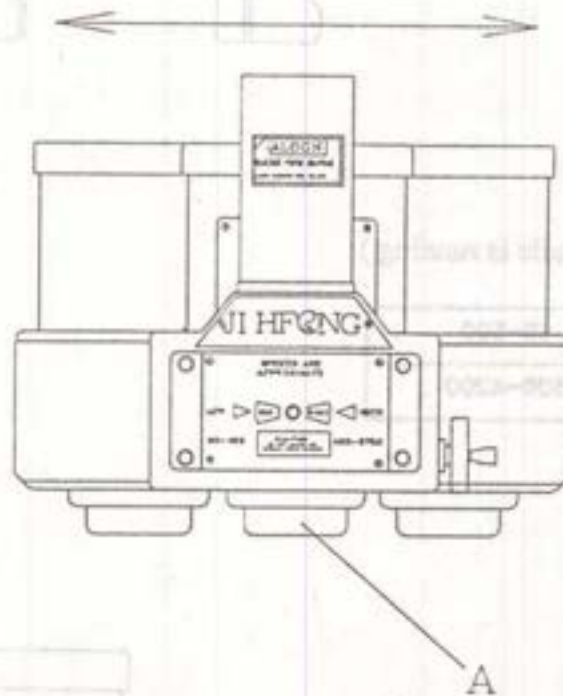
- 1) Loosen two lock lever (1) and (2).
- 2) Turn the handle to move the slide to the desired position.
- 3) Tighten the rear lock lever first.



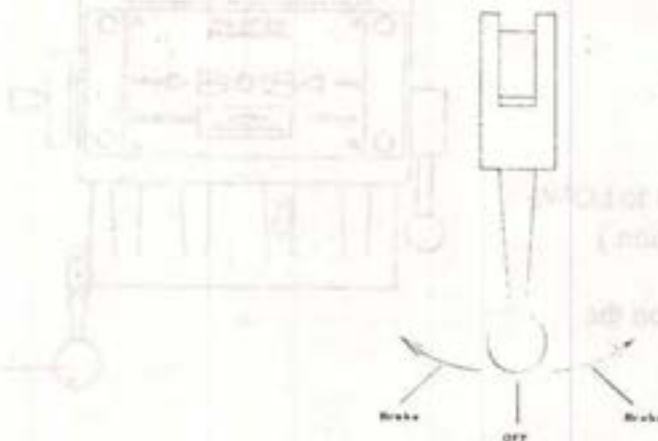
6. SWIVEL BELT HOUSING

- 1) Loosen three Locking Nuts 'A'. (Loose sufficiently to stop setting.)
- 2) Swivel to required angular setting.
- 3) Tighten three Locking Nuts Before finally tightening, run the spindle to give the correct spindle alignment.

NOTE: Unequal tightening three locking nuts will cause incorrect spline alignment which effects the quill feed. This condition can be felt when operating the quill feed handle.

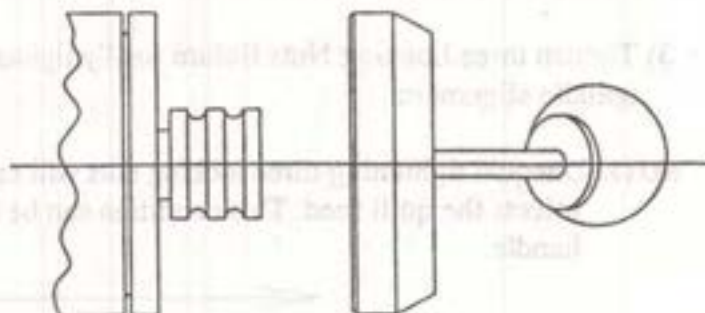


7. SPINDLE BRAKE



8. QUILL SENSITIVE HAND FEED

- 1) Place the handle on the boss.
- 2) Select the most suitable position.
- 3) Push home until the locating pin engages.



9. SPINDLE SPEED

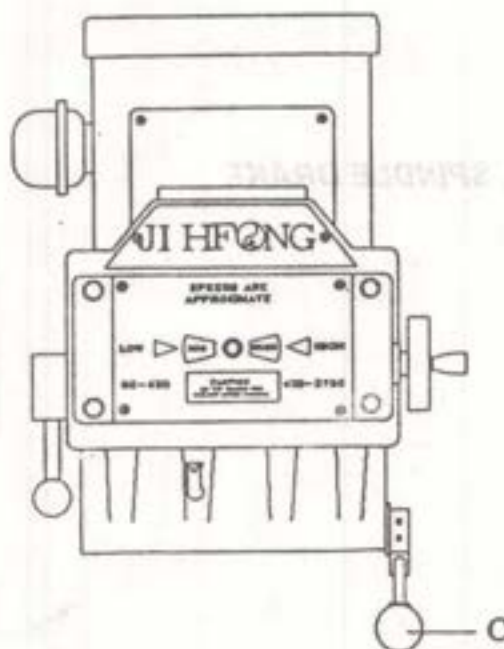
(Change only when spindle is running)

Low	60-500
High	500-4200

10. CHANGE SPEED

CHANGE RANGE

- 1) From direct drive to back gear drive
 - (a) Push the POWER OFF button on the control panel..
 - (b) Move lever 'C' through neutral to LOW.
(This reverse the spindle rotation)
 - (c) Push the POWER ON button on the control to start the spindle.



DAILY SERVICE

6.1 DAILY SERVICE FOR OPERATORS

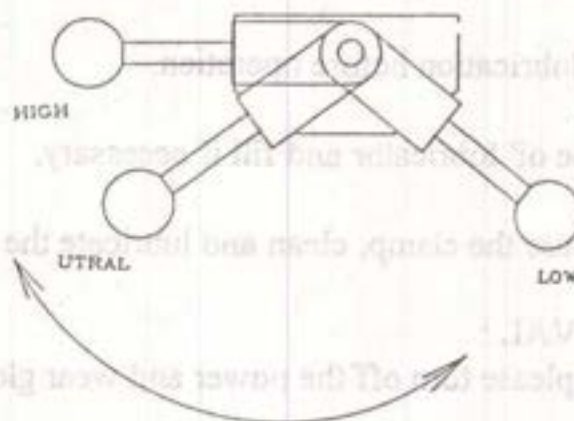
ALWAYS KEEP IN MIND THAT THE ACCURACY AND LONG LIFE OF THE MACHINE DEPENDS ON PROPER CARE AND LUBRICATION.

2) From back gear

(a) Push the stop

(b) Move lever

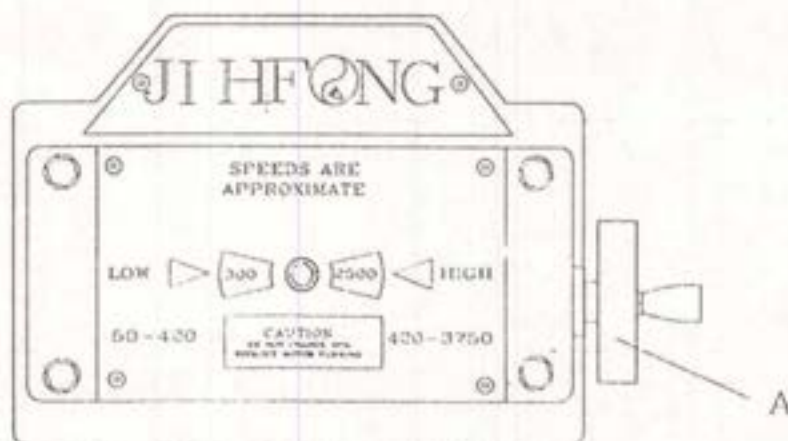
(c) Rotate the



CHANGE SPEED

1) Start the spinc

2) Turn the hand
Change the sp



CHAPTER 6

DAILY SERVICE

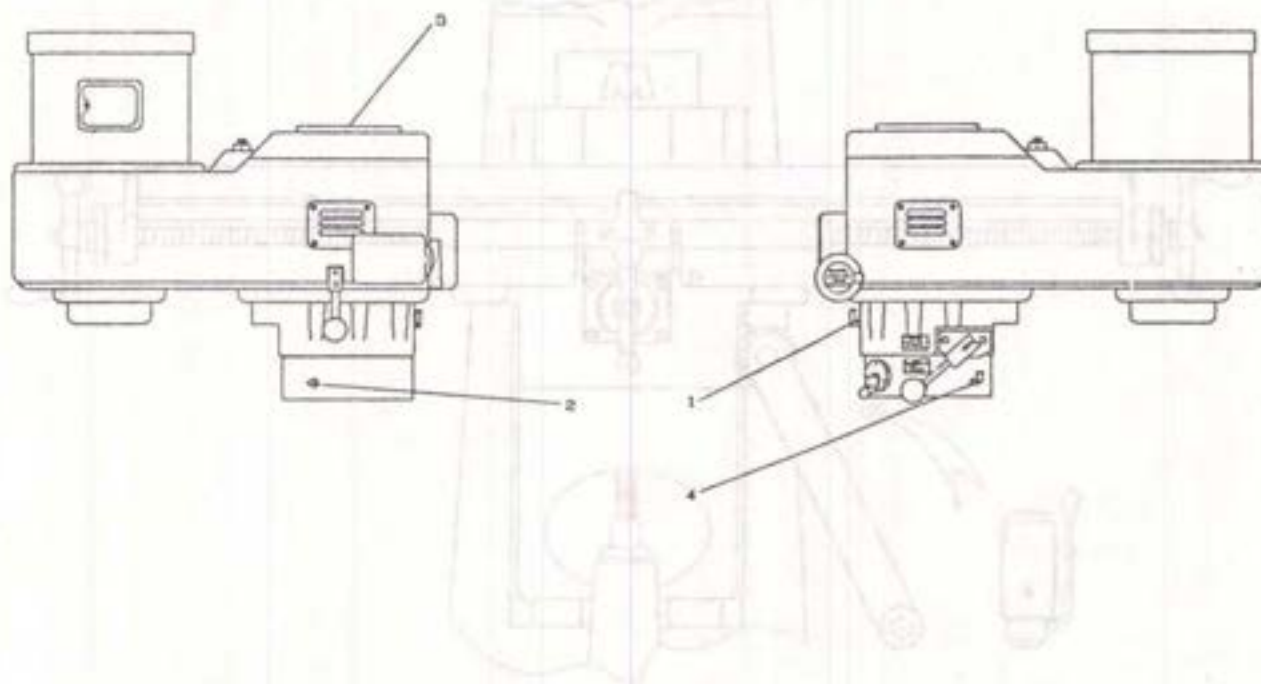
6.1 DAILY SERVICE FOR OPERATORS

ALWAYS KEEP IN MIND THAT THE ACCURACY AND LONG LIFE OF THE MACHINE DEPENDS ON PROPER CARE AND LUBRICATION.

- 1) It is necessary to oil lubrication before operation.
- 2) Check the level of the oil lubricator and fill if necessary.
- 3) It is necessary to release the clamp, clean and lubricate the table after operation.
- 4) **SAFE CHIP REMOVAL :**
When remove chip, please turn off the power and wear gloves to prevent cutting hazard.



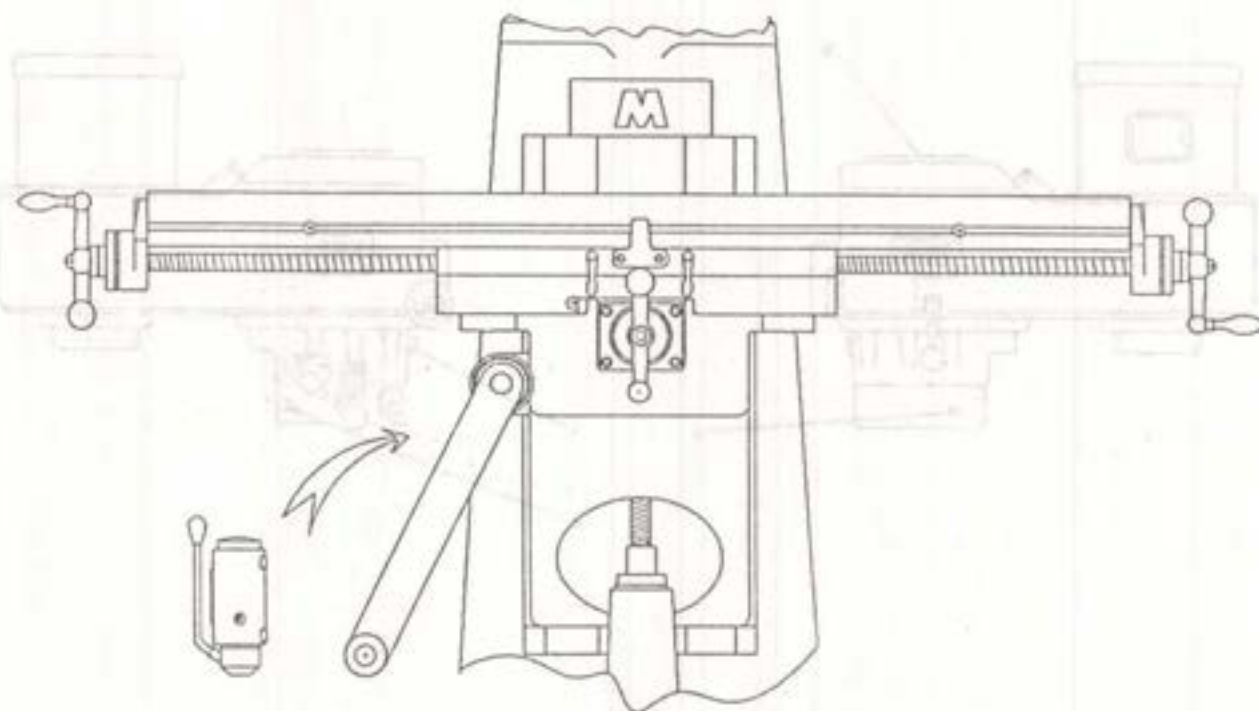
6.2 POSITIONS OF LUBRICATION



FREQUENCY	LUBRICATE	LUBRICANT	QUANTITY	No.
Twice Daily	Quill bearings	Vactra Heavy Medium S.A.E 10 or 10W light	5-10 drops	1 NOTE 1.
Twice Daily (When feed is in use)	Spindle Down Feed	Vactra Heavy Medium S.A.E 10 or 10W light	Fill-up	2
Weekly	Drawbar splines (move quill down 2")	Vactra Heavy Medium S.A.E 10 or 10W Light	5 drops	3
Every 2 months (of normal use)	Back gear	Grease	5 shots by oil gun	4. NOTE 2.

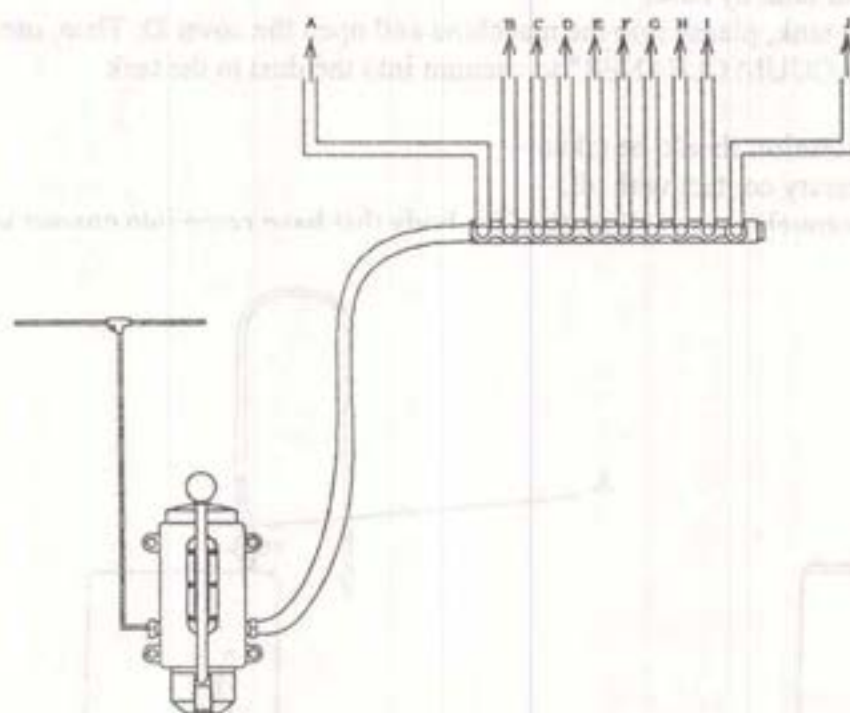
NOTE 1 : Failure to lubricate "Quill bearings" at 1 can result in tight quills and partials seizure of quill in housing.

NOTE 2: Before grease put gear lever back to 'LO' and keep spindle stationary.



FREQUENCY	LUBRICATE	LUBRICANT	QUANTITY
Centralized Lub.	Lead Screw	Shell cornea Oil 41 Mobil Vactra, 2 Socony Gargoyle Vactra No.2	One Pump
Pump Daily	Saddle-Table Ways	"Sunoco" Waylube #80 Mobil Vactra, 2	One Pump
Check Level Weekly	Saddle-Knee Ways	"Sunoco" Waylube #80 Mobil Vactra, 2	One Pump
	Knee Column Ways	"Sunoco" Waylube #80 Mobil Vactra, 2	One Pump
Twice Weekly	Elevating Screw	Shell cornea Oil 41 Mobil Vactra, 2 Socony Gargoyle Vactra No.2	5 Shots (Oil Gun)

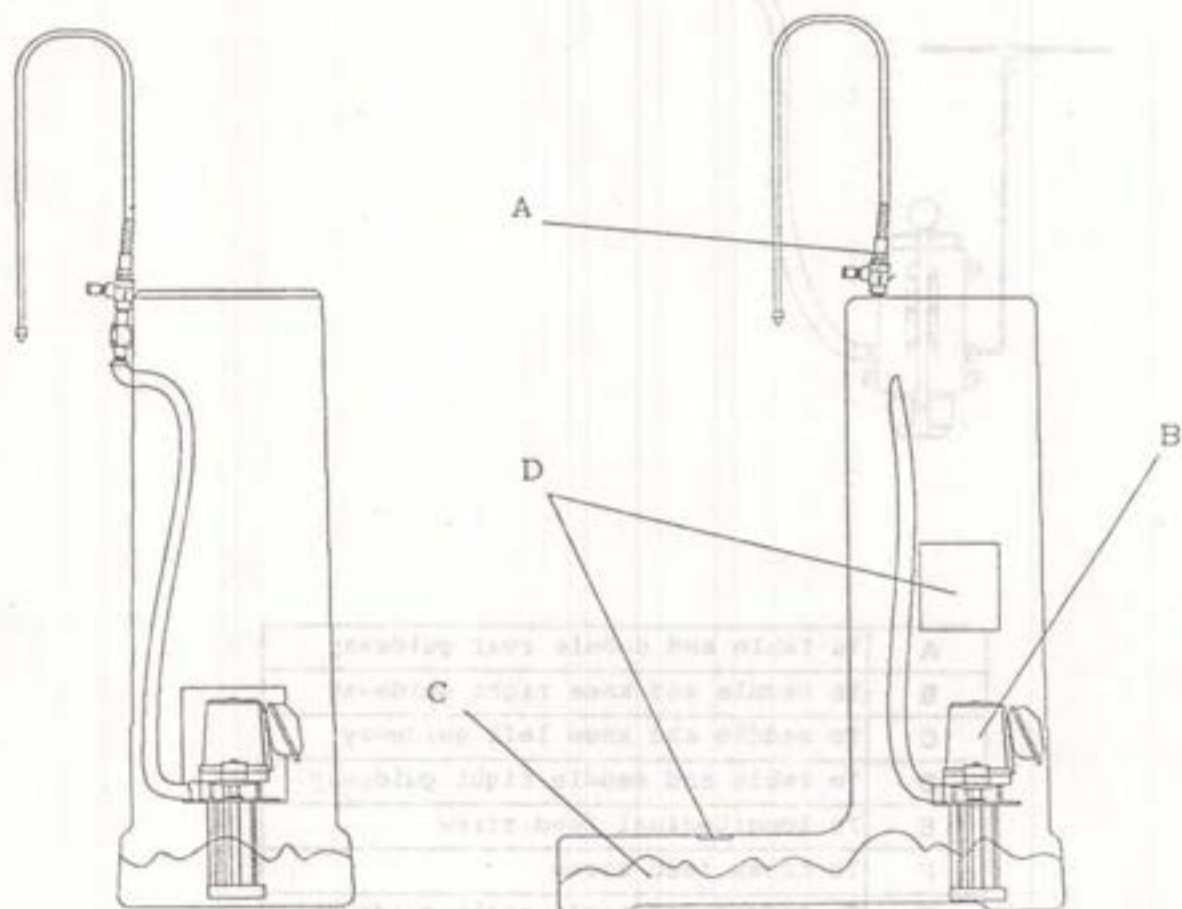
6.3 LUBRICATION SYSTEM



A	To table and saddle rear guideway
B	To saddle and knee right guideway
C	To saddle and knee left guideway
D	To table and saddle right guideway
E	To longitudinal feed screw
F	To cross feed screw
G	To saddle and table right guideway
H	To saddle and knee left guideway
I	To saddle and knee right guideway
J	To table and saddle front guideway

6.4 COOLANT SYSTEM

- (1) Recommended coolant : Such as CASTROL SYNTILO R COOLANT or MOBIL SOLVAC 1535 for ferrous metal.
- (2) (a) When you replace old coolant on the coolant tank, please start the coolant pump and drain to the other tank by hose.
(b) When clean the tank, please stop the machine and open the cover D; Then, use the "WET/DRY VACUUM CLEANER" to vacuum into the dust in the tank.
- (3) The following precaution should be taken:
 - Avoid unnecessary contact with oil.
 - After work thoroughly wash all parts of the body that have come into contact with oil.



A	Valve
B	Coolant pump
C	Coolant tank
D	Cover

FG CHAPTER 7MAINTENANCE AND ADJUSTMENT

EACH ASSEMBLY WAS ADJUSTED AND SUBJECTED TO QUALITY AND ACCURACY TESTS PRIOR TO LEAVING THE FACTORY, HOWEVER RE-ADJUSTMENT MAY BE REQUIRED AFTER SOMETIMES AND THE FOLLOWING PROCEDURE SHOULD FOLLOWED AND ISOLATE THE MACHINE.

7.1 LEVEL

The level of the machine is major factor which will influence the accuracy of the machine. Since the foundation and other components will alter the machine level, regular check is essential.

7.2 MAINTENANCE ITEMS

Monthly	1. Check all the gibs and adjust if necessary. 2. Check all the backlash between screws and nuts, and adjust if necessary.
Quarterly	1. Check and adjust the machine accuracy.

1. MAY WE SUGGEST THE FOLLOWING

Before attempting any maintenance in the interests of safety to you, isolate the machine electrically and in the interest of efficiency to you, read the relevant section of this manual.

When order replacement parts please quote:

•THE MACHINE SERIAL No.

Situated above the door on the left hand side of the column.

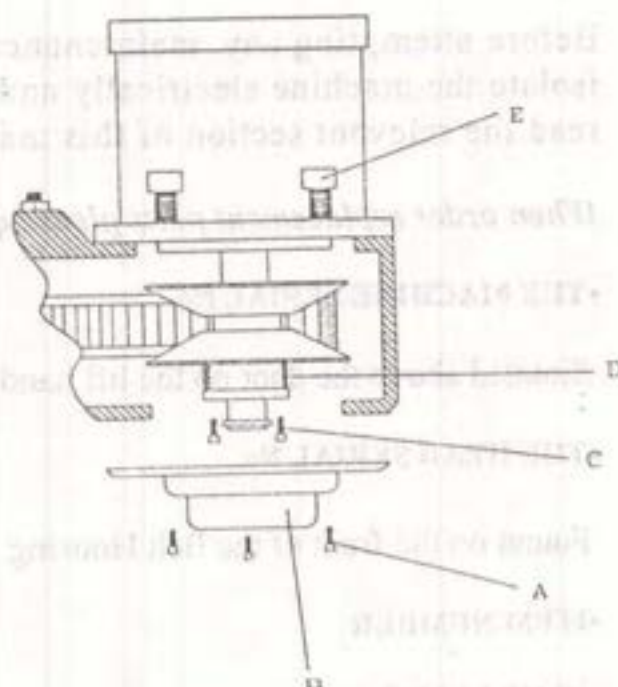
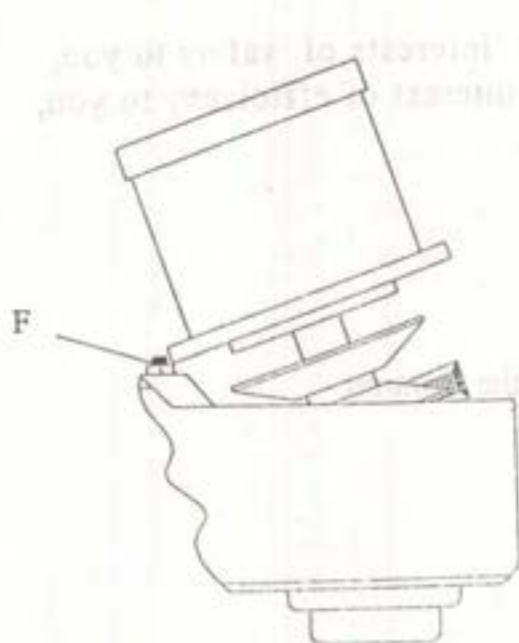
•THE HEAD SERIAL No.

Found on the front of the Belt Housing.

•ITEM NUMBER**•PART NUMBER****•QUANTITY****•DESCRIPTION.**

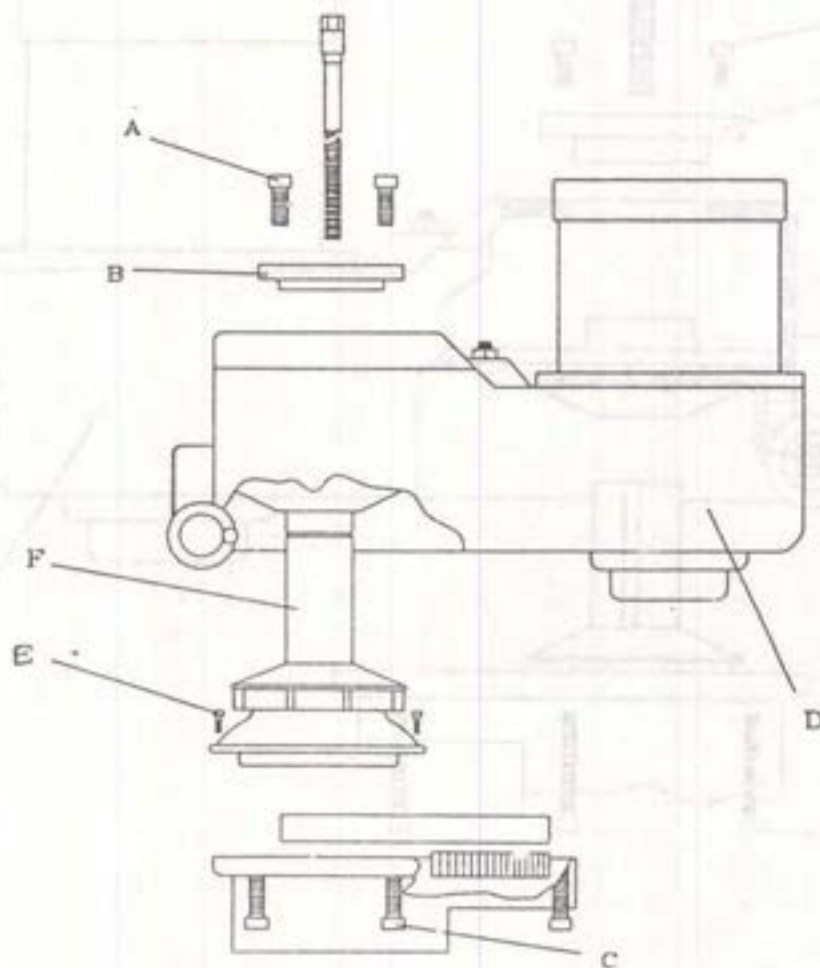
2. MOTOR REMOVAL

- 1) Rotate and adjust the head to the lowest speed.
- 2) Isolate machine (ELECTRICALLY).
- 3) Remove the 4 screws 'A' and cover 'B'.
- 4) Use the two screws 'C' to compress spring 'D'.
- 5) Rotate the speed selector handwheel to the highest speed.
- 6) Remove the reversing switch from the belt housing.
- 7) Remove two locking nuts 'E'.
- 8) Lift the motor and the rest case on stud 'F'.
- 9) Loose the belt over the lower drive disc and remove the motor.
- 10) Assemble procedure of the motor is the reverse of removal.



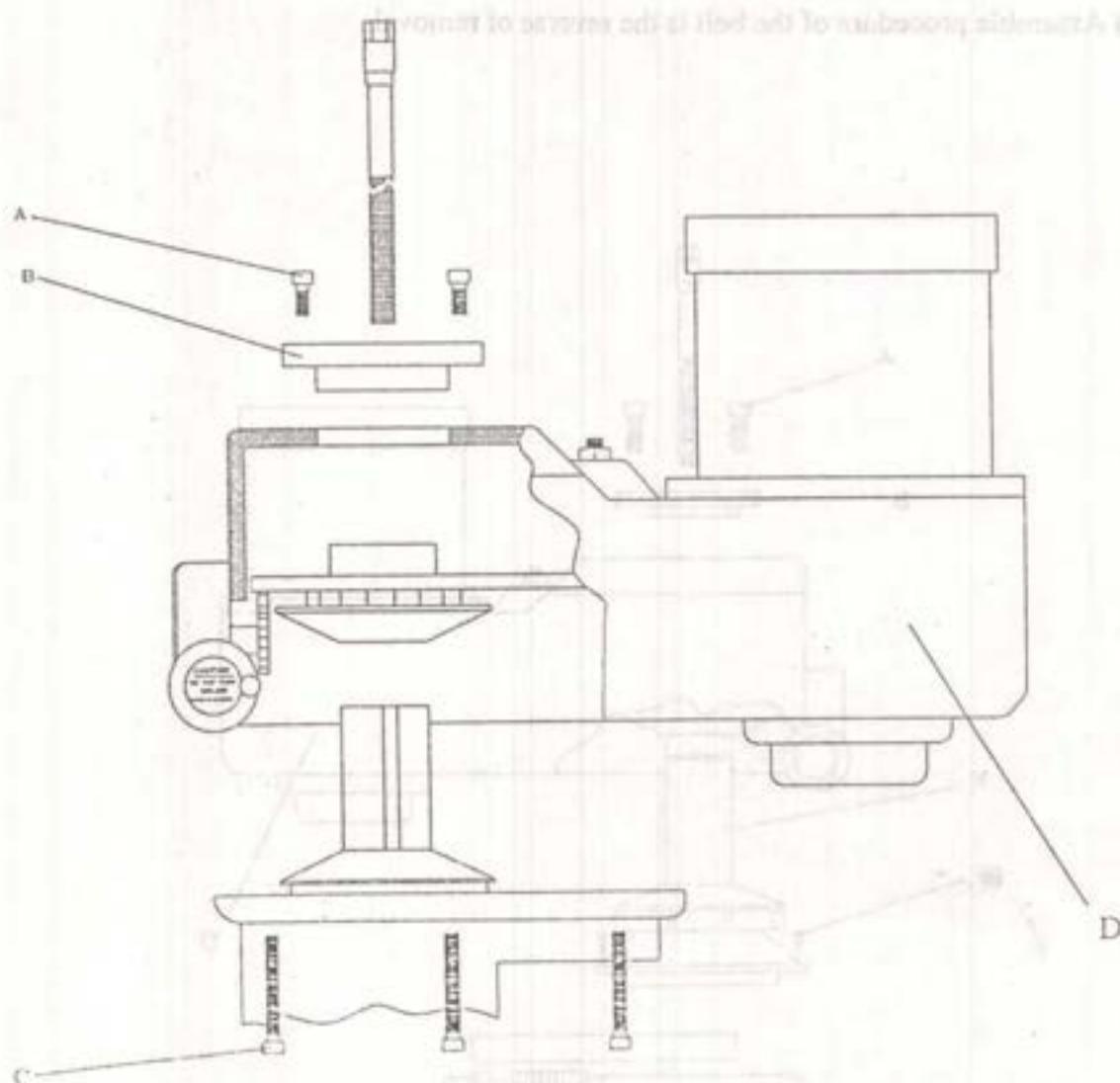
3. TIMING BELT REPLACEMENT

- 1) Lower the quill to full extent.
- 2) Remove the four capscrews 'A' and remove top cover 'B'.
- 3) Remove the six capscrews 'C' than remove the top assembly 'D'.
- 4) Remove the five capscrews (for JF-153V, JF-163V, JF-183V) (six capscrews for JF-185V) and remove the clutch hub assembly 'F'.
- 5) Replace the belt.
- 6) Assemble procedure of the belt is the reverse of removal.



4. DRIVE BELT REPLACEMENT

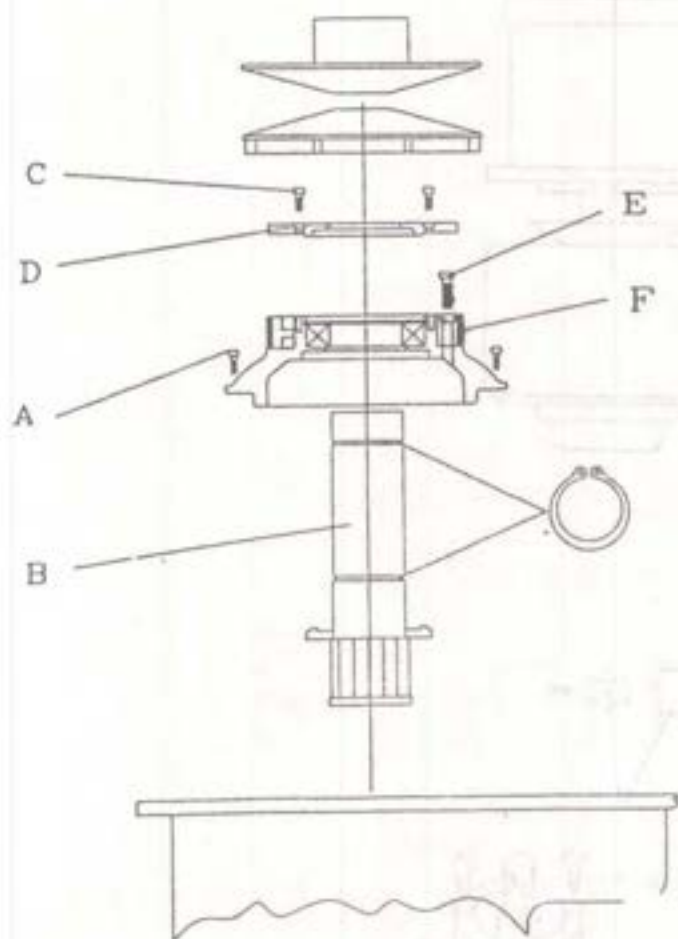
- 1) Remove the four screws 'A', and remove the bearing housing 'B'.
- 2) Remove the six screws 'C'.
- 3) Remove the top assembly 'D'.
- 4) Replace the belt.
- 5) Assemble procedure of the drive belt is the reverse of removal.



5. BRAKE SHOE REPLACEMENT

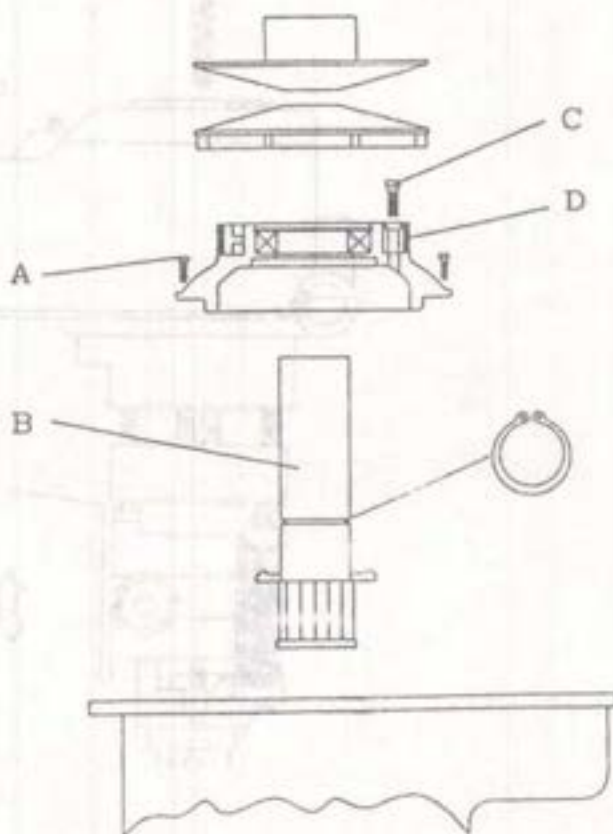
FOR JF-153V, JF-163V, JF-183V

- 1) Remove the five screws 'A', and remove the clutch hub assembly 'B'.
- 2) Remove the four screws 'C', and remove the top cover 'D'.
- 3) Remove three screws 'E'.
- 4) Replace the brake shoes 'F'.
- 5) Assemble procedure of the brake shoe is the reverse of removal.



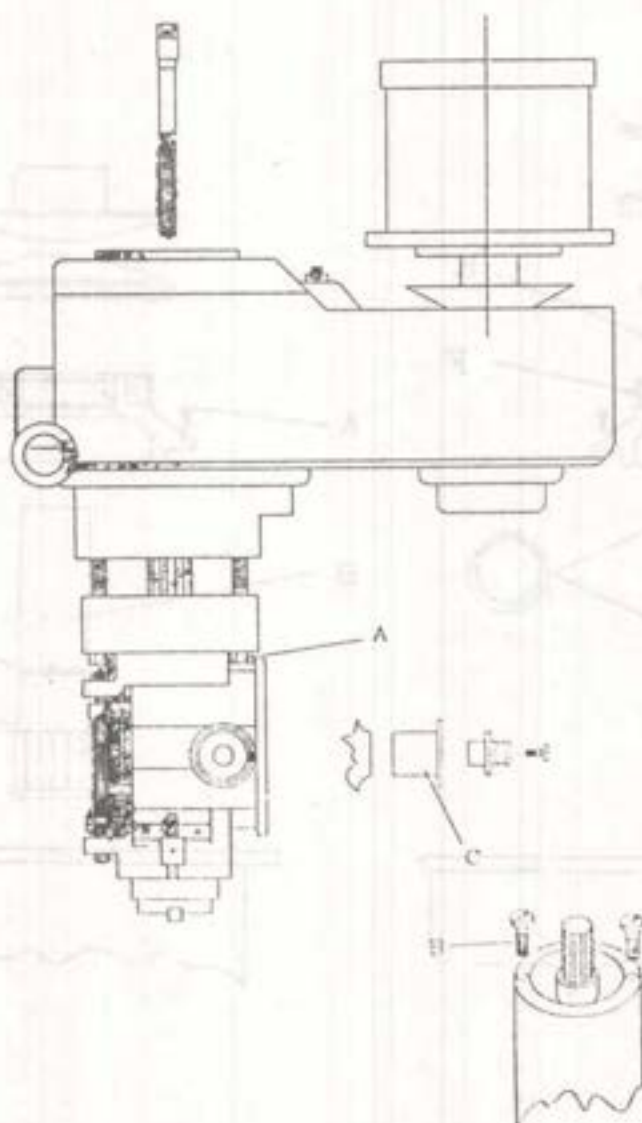
FOR JF-185V

- 1) Remove the six screws 'A', and remove the clutch hub assembly 'B'.
- 2) Remove the 4 screws 'C'.
- 3) Replace the brake shoes 'E'.
- 4) Assemble procedure of the brake shoe is the reverse of removal.

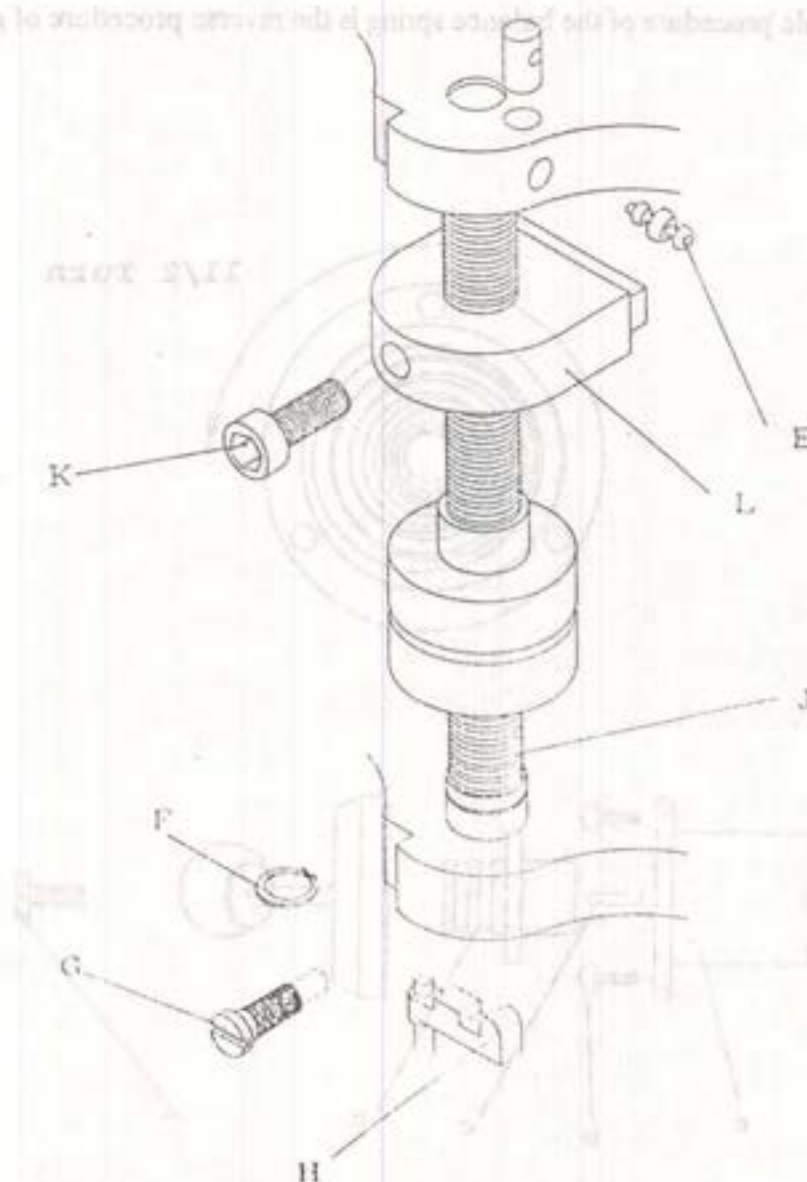


6. QUILL REMOVAL

- 1) Isolate machine. (ELECTRICALLY)
- 2) Remove motor.
- 3) Remove drawbar.
- 4) Fully extent quill.
- 5) Remove 3 nuts 'A'.
- 6) Remove top section completely.
- 7) Remove 2 screws from top of quill.
- 8) Remove stick quill using 'C'.

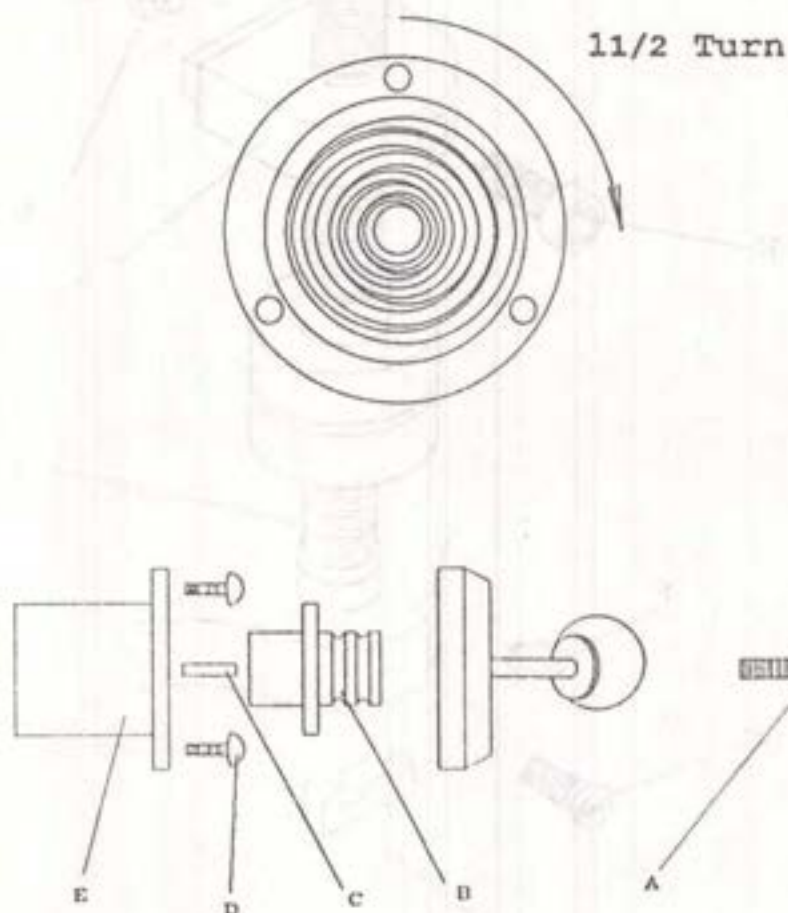


- 9) Remove screws 'D' and ball reverse level 'E'.
- 10) Remove circlip 'F', screws 'G' and arm 'H'.
- 11) Thread shaft 'J' through micro nuts and remove.
- 12) Remove screws 'K' and stop 'L'.
- 13) Remove quill.
- 14) Clean all areas, oil liberally and reassemble.
- 15) Check correct operation of feed trip linkage.
- 16) Assemble procedure of the quill is the reverse of removal.



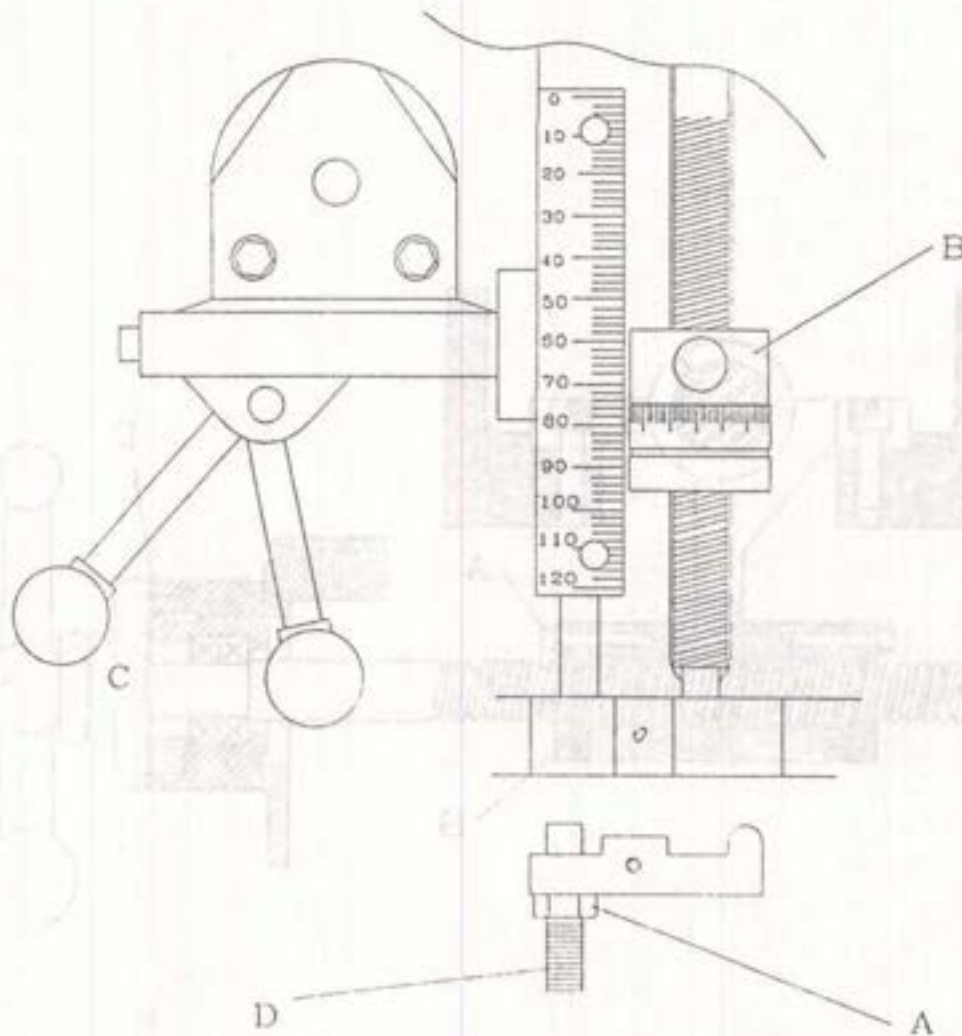
7. BALANCE SPRING REPLACEMENT

- 1) With quill, at top of movement apply quill lock.
- 2) Remove screws 'A', hub 'B', and key 'C'.
- 3) Remove screws 'D', allowing housing to rotate slowly releasing spring tension.
- 4) Lift end of spring from peg on the pinion shaft.
- 5) Rotate housing 'E' anti-clockwise from head casting.
- 6) Remove spring from housing and replace.
- 7) Refit spring to main housing casting turning housing clockwise until spring locate on peg in pinion shaft.
- 8) Assemble procedure of the balance spring is the reverse procedure of removal.



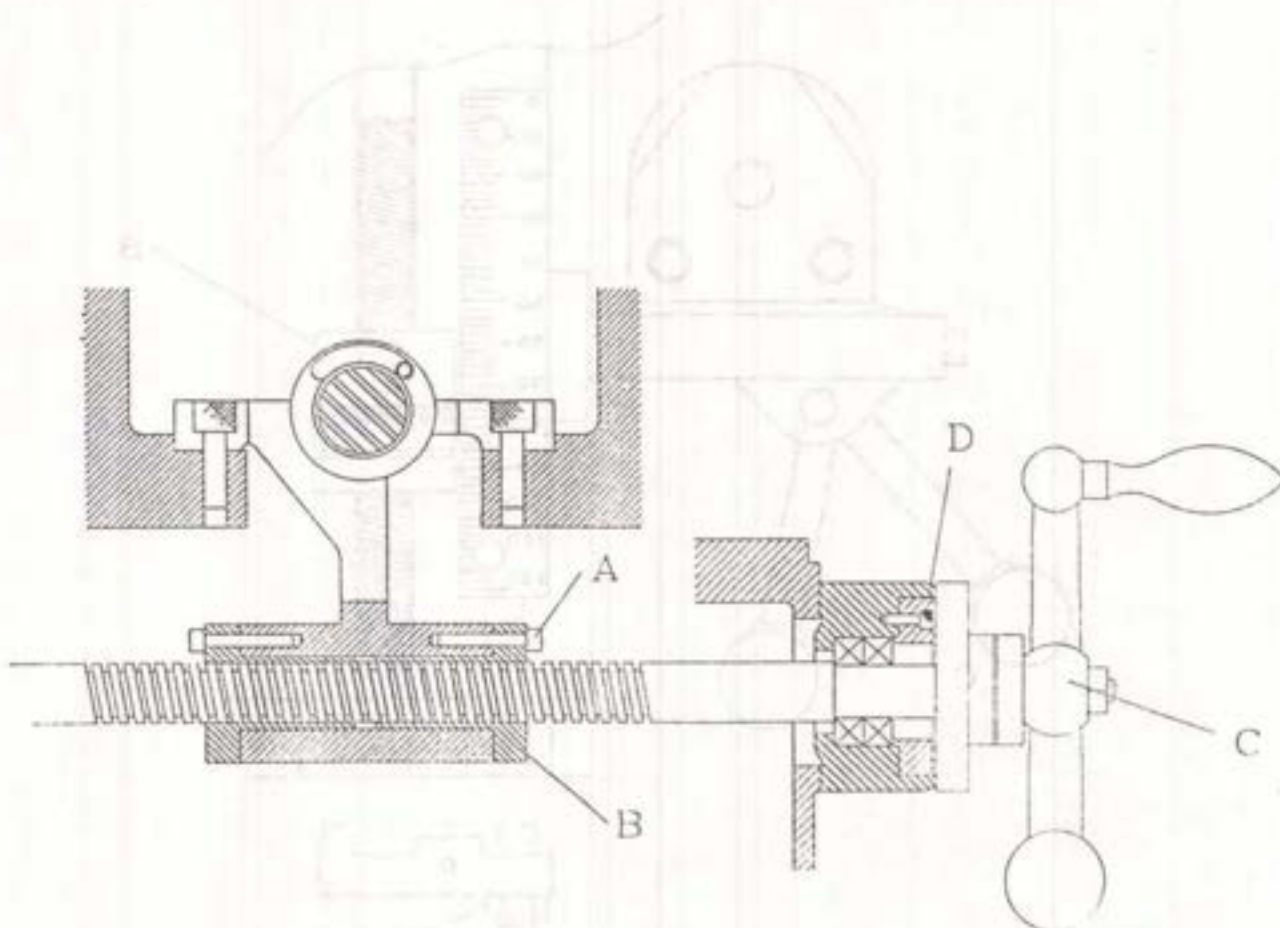
8. FEED TRIP ADJUSTMENT

- 1) Release locknut 'A'.
- 2) Engage trip handle 'C'.
- 3) Adjust micro nuts against quill stop 'B'.
- 4) Slowly turn adjusting screws 'D' until level 'C' trips.
- 5) At this point secure locknut 'A'.
- 6) Check that the trip action is correct.



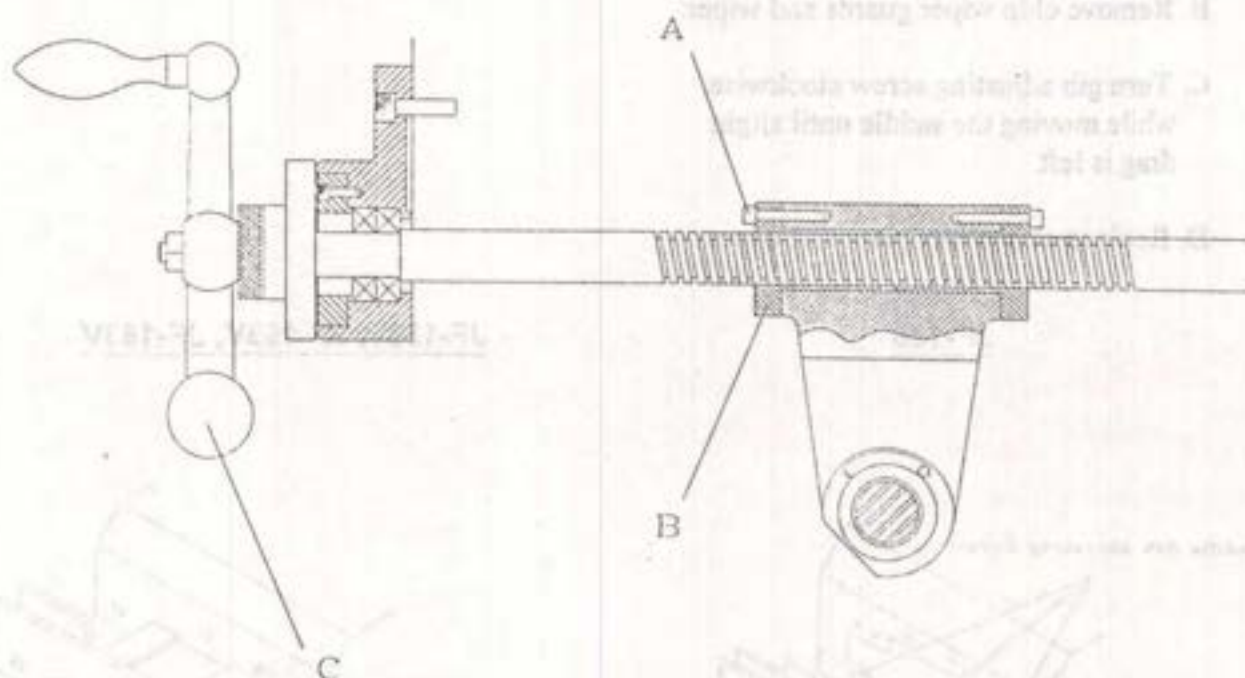
9. CROSS SCREW BACKLASH ADJUSTMENT

- 1) Turn the front handle to set the saddle in the middle of the cross traverse.
- 2) Withdraw 4 screws 'D'.
- 3) Pull the saddle forward to expose screws 'A' & 'B'.
- 4) Withdraw screw 'A' a half turn.
- 5) While slowly turning handle 'C', tighten screw 'B' until a 0.010mm or 0.015" gap is obtained.
- 6) Lock screws 'A' onto 'B'.
- 7) Finally move the saddle to the front of the cross traverse and reassemble 4 screws 'D'.



10. TABLE SCREW BACKLASH ADJUSTMENT

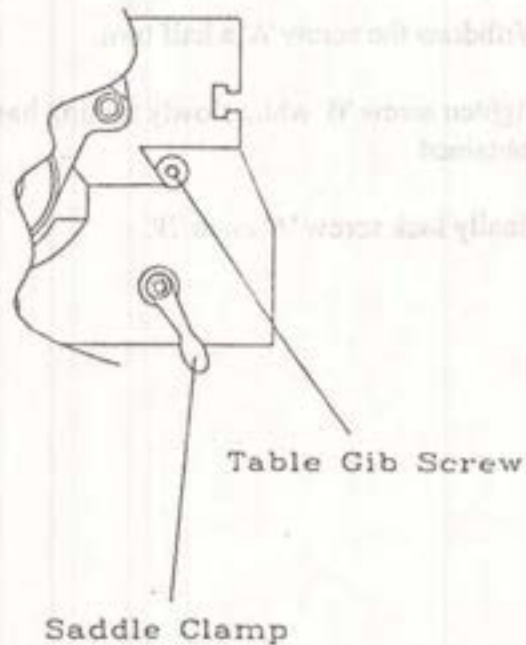
- 1) Turn the handle to move the table to the left.
- 2) Withdraw the screw 'A' a half turn.
- 3) Tighten screw 'B' while slowly turning handle 'C' until a 0.010mm or 0.015mm gap is obtained.
- 4) Finally lock screw 'A' on to 'B'.



11. GIB STRIP ADJUSTMENT

1) Table Saddle Ways

- A. Remove all dirt (from area).
- B. Turn the table gib screw clockwise while moving the table until slight drag is felt.

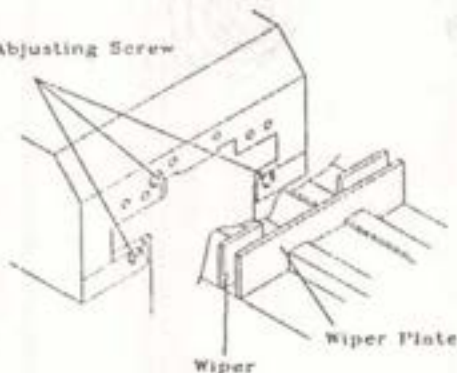


2) Saddle Knee Ways

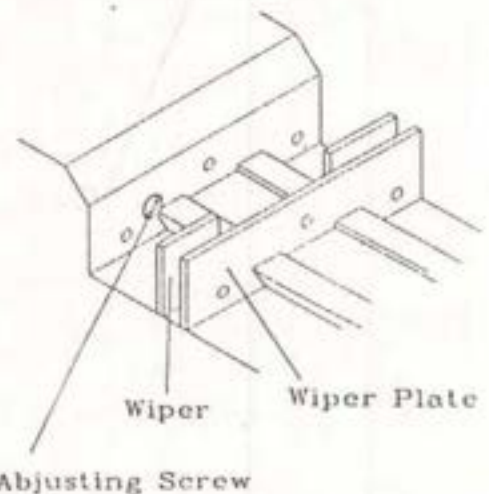
- A. Remove all dirt (from area).
- B. Remove chip wiper guards and wiper.
- C. Turn gib adjusting screw clockwise while moving the saddle until slight drag is left.
- D. Replace chip wiper plate and wiper.

JF-185

Saddle Gib Adjusting Screw



JF-153V, JF-163V, JF-183V

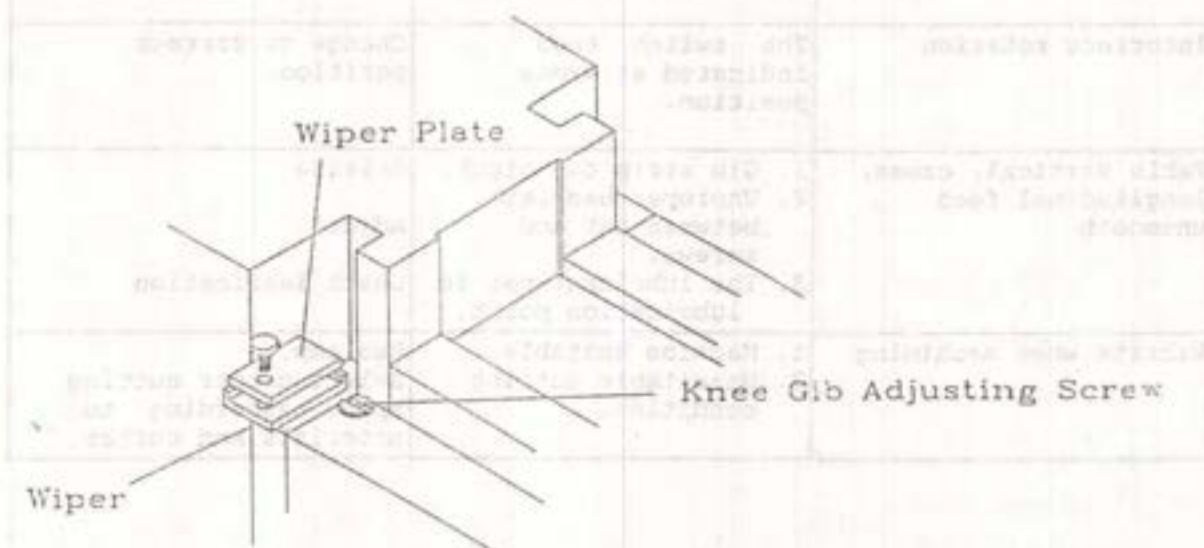


Saddle Gib Adjusting Screw

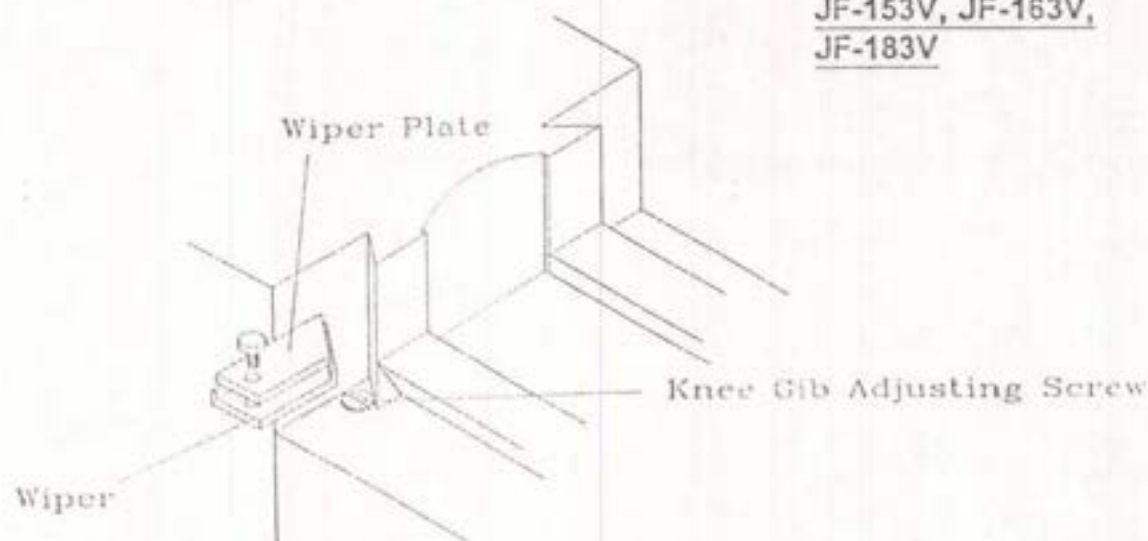
3) Knee Column Ways

- Remove all dirt (from area).
- Remove chip wiper plate.
- Remove wiper.
- Turn gib adjusting screw clockwise while moving knee until slight drag is felt.
- Replace wiper plate and wiper.

JF-185V



JF-153V, JF-163V, JF-183V



12. TROUBLE-SHOOTING

The following chart contains some typical probable trouble of operation, along with possible cause(s) and remedies for each.

TROUBLE	POSSIBLE CAUSES	REMEDY
Spindle feed un-normal	Quill clamp lever unlease.	Release clamp lever.
Spindle brake brake-down	Brake shoe worn out.	Replace.
Spindle unrotate	1. Poor contact on the switch. 2. Drive belt too slack. 3. Poor motor.	1. Check the switch. 2. Adjust or replace. 3. Repair or renew.
Incorrect rotation	The switch knob indicated at wrong position.	Change to correct position.
Table vertical, cross, longitudinal feed unsmooth	1. Gib strip too tight. 2. Unproper backlash between nut and screws. 3. The lubricant not to lubrication point.	Release Adjust Check lubrication.
Vibrate when machining	1. Machine unstable. 2. Unsuitable cutting condition.	Reclamp. Select proper cutting speed according to materials and cutter.

CHAPTER 8ELECTRICAL PARTS LIST AND CIRCUIT**8.1 ELECTRICAL PARTS LIST****8.1.1 ELECTRICAL PARTS LIST OF JF-153V, JF-163V, JF-183V**

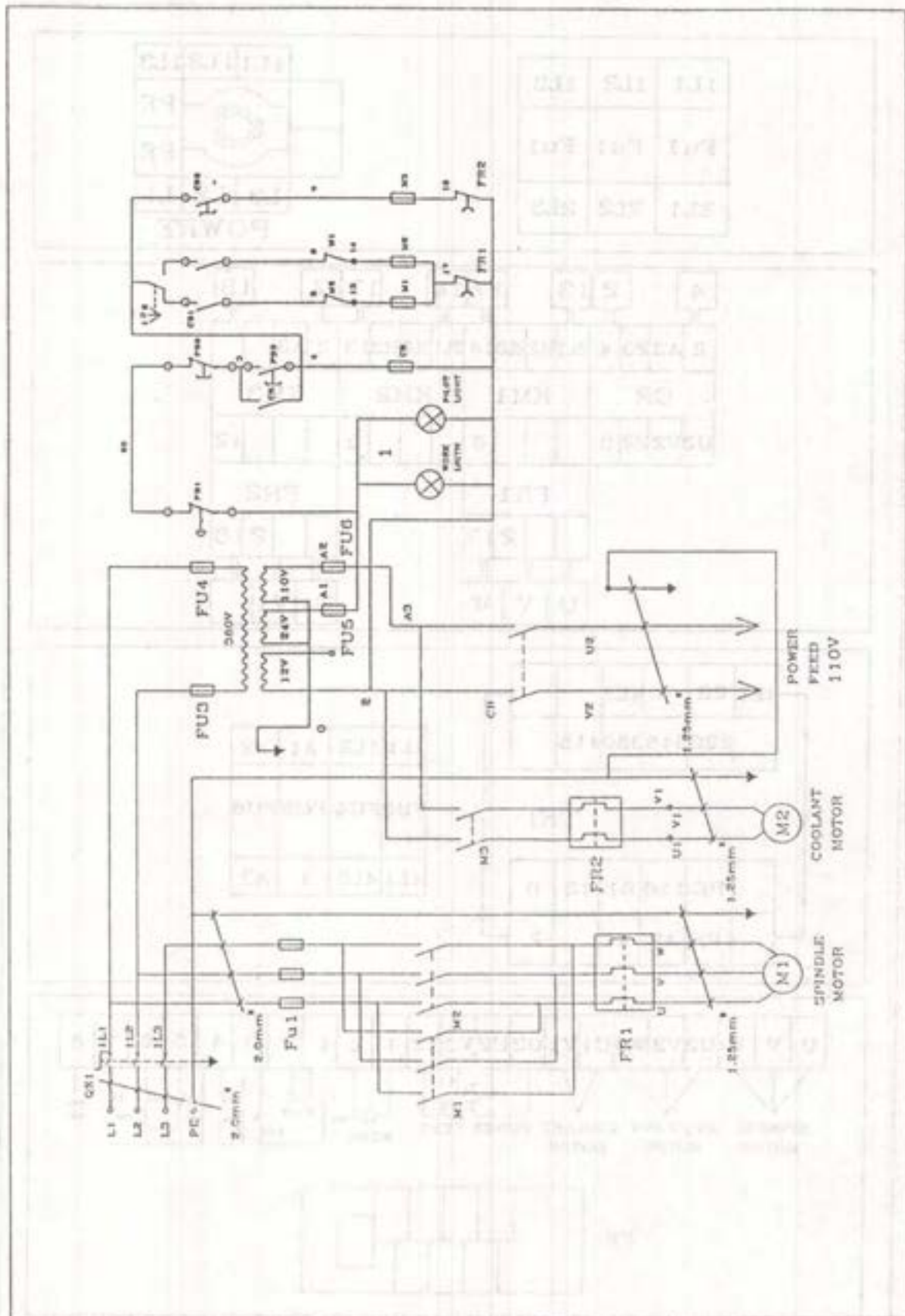
ITEM DESIGNATION	DESCRIPTION AND FUNCTION	TECHNICAL DATA	QUIN-TITY	SUPPLIES	REMARKS
Tr1	Transformer	AC 380V AC 24V 500VA	1		
SQ1	Main power switch	380V 16A	1	MOELLER	IEC-947 VDE 0660
Fu1	Fuse blocks	20A / 500V 25A / 400V 32A / 380V	3	SHAN-HO	
Fu3, Fu4 Fu5, Fu6	Fuse blocks	10A / 250V	4	TEND	
Fu1	Fuse	16A	3	SHAN-HO	
Fu3, Fu4 Fu5, Fu6	Fuse	2A 5A	2 2	TEND	
M1, M2 CR, M3	Magnetic contactors	100-A9 380V 4KW	4	TE	IEC 947 VDE0660
FR1 FR2	Spindle Coolant	0.63-10A	1 1	TE	IEC 947 VDE 0660
	Terminal blocks	20A / 600V	20P	SHAN-HO	
Pilot light	Display lamp		1	SHAN-HO	UL CSA
PB3	Power start		1	SHAN-HO	UL
CS2	Coolant start		1		CSA
CS1	Spindle R/F		2	SHAN-HO	UL
PB2	Power stop		1		CSA
PB1	Emergency stop	4A / 400V	1	MOELLER	IEC 947 VDE 0660

8.1.2 ELECTRICAL PARTS LIST OF JF-185V

ITEM DESIGNATION	DESCRIPTION AND FUNCTION	TECHNICAL DATA	QUANTITY	SUPPLIES	REMARKS
Tr	Transformer	AC 380V AC 24V 500VA	1		
SQ1	Main power switch	16A / 380V	1	MOELLER	IEC-947 VDE 0660
Fu1 Fu3	Fuse blocks	20A / 500V 25A / 400V 32A / 380V	6	SHAN-HO	
Fu4, Fu5 Fu6, Fu7	Fuse blocks	10A / 250V	4	TEND	
Fu1 Fu3	Fuse	16A 6A	3 3	SHAN-HO	
Fu4, Fu5 Fu6, Fu7	Fuse	2A 5A	2 2	TEND	
M1, M2		100-A12 380V5.5KW	2	TE	IEC 947 VDE 0660
CR M3,M4,M5	Magnetic contactors	100-A9 380V4KW	4	TE	
FR1 FR2 FR3	Spindle Coolant Up/Down	6.0-10A 0.6-1.0A 0.63-10A	1 1 1	TE	IEC 947 VDE 0660
	Terminal blocks	20A / 600V 10A / 600V	20P 10P	SHAN-HO	UL CSA
Pilot light	Display lamp		1	SHAN-HO	UL CSA
CS1 CS2 FR3	Spindle start R/F Coolant start Power off		1 1	SHAN-HO	UL CSA
PB4, PB5 PB3	Up/Down start Power start		2 1	SHAN-HO	UL CSA
PB1	Emergency stop	4A / 400V	1	MOELLER	IEC 947 VDE 0660
LS3, LS4	Limit switch	10A / 250VAC	2	NATIONAL 7311	UL E35901 CSA LR23413
LS2		AC15 240V 3A	1	TE	IEC 947.5.1

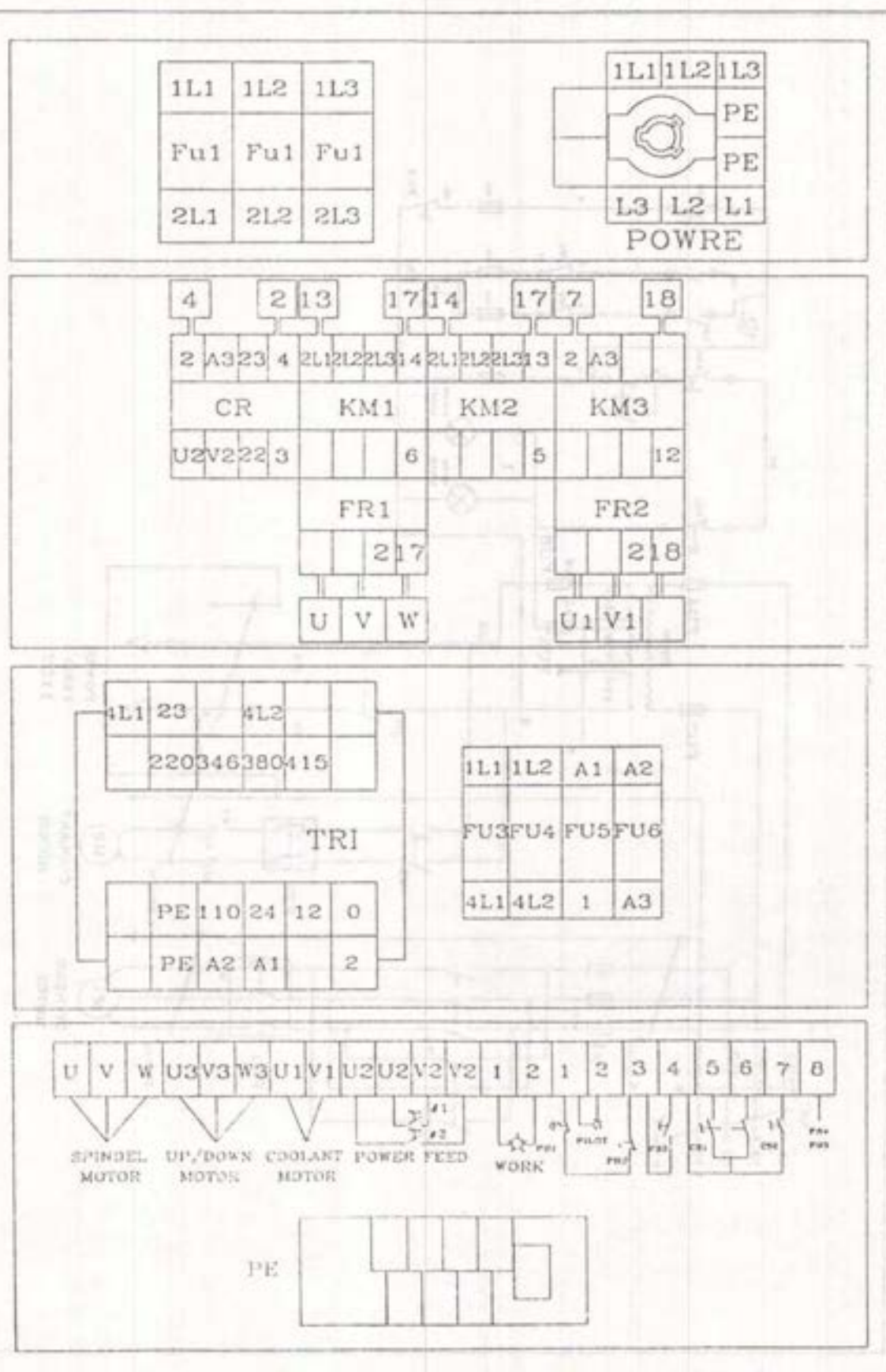
8.2 ELECTRICAL CIRCUIT

8.2.1 JF-153V, JF-163V, JF-183V

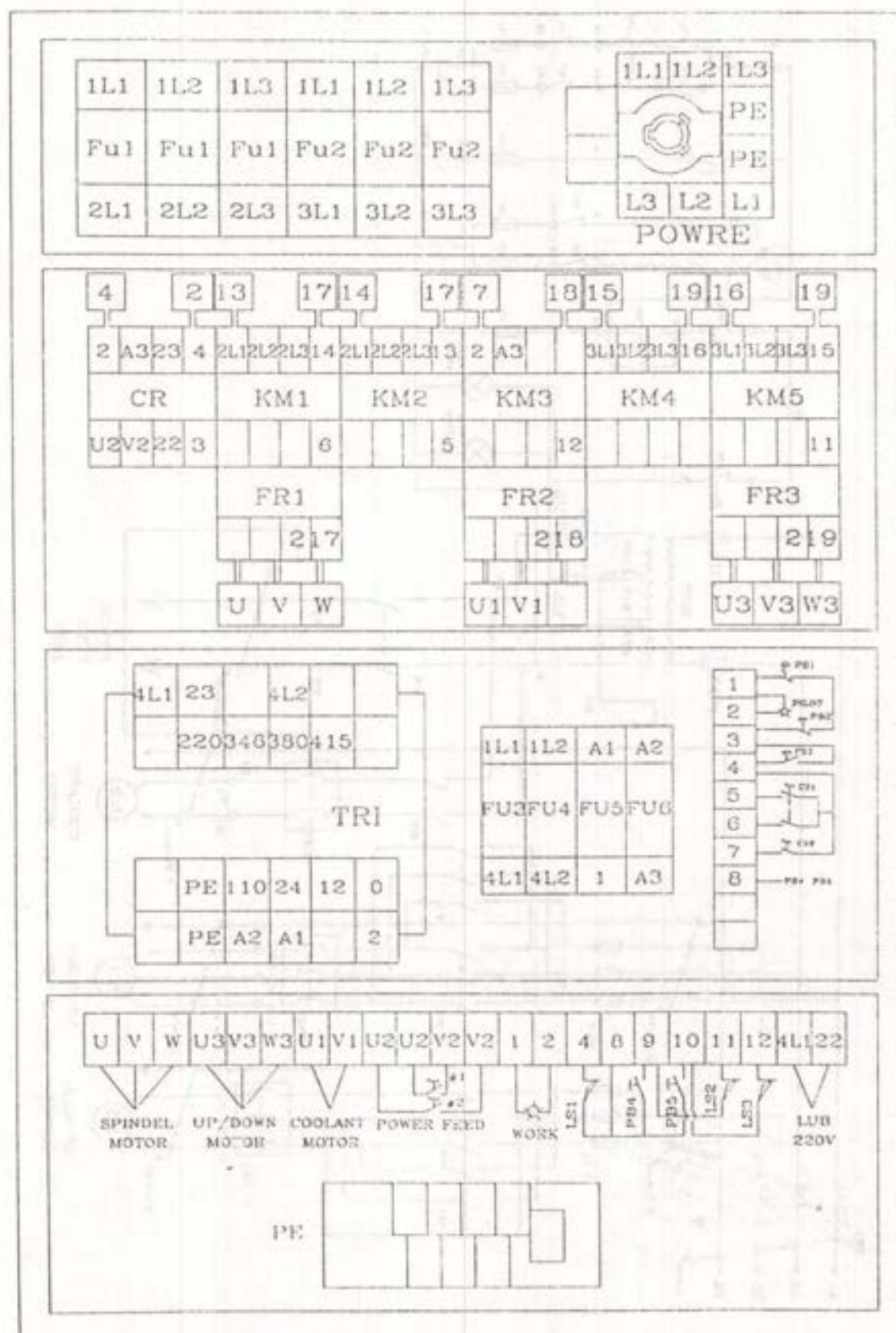


8.2 ELECTRICAL CIRCUIT

8.2.1 JF-153V, JF-163V, JF-133V



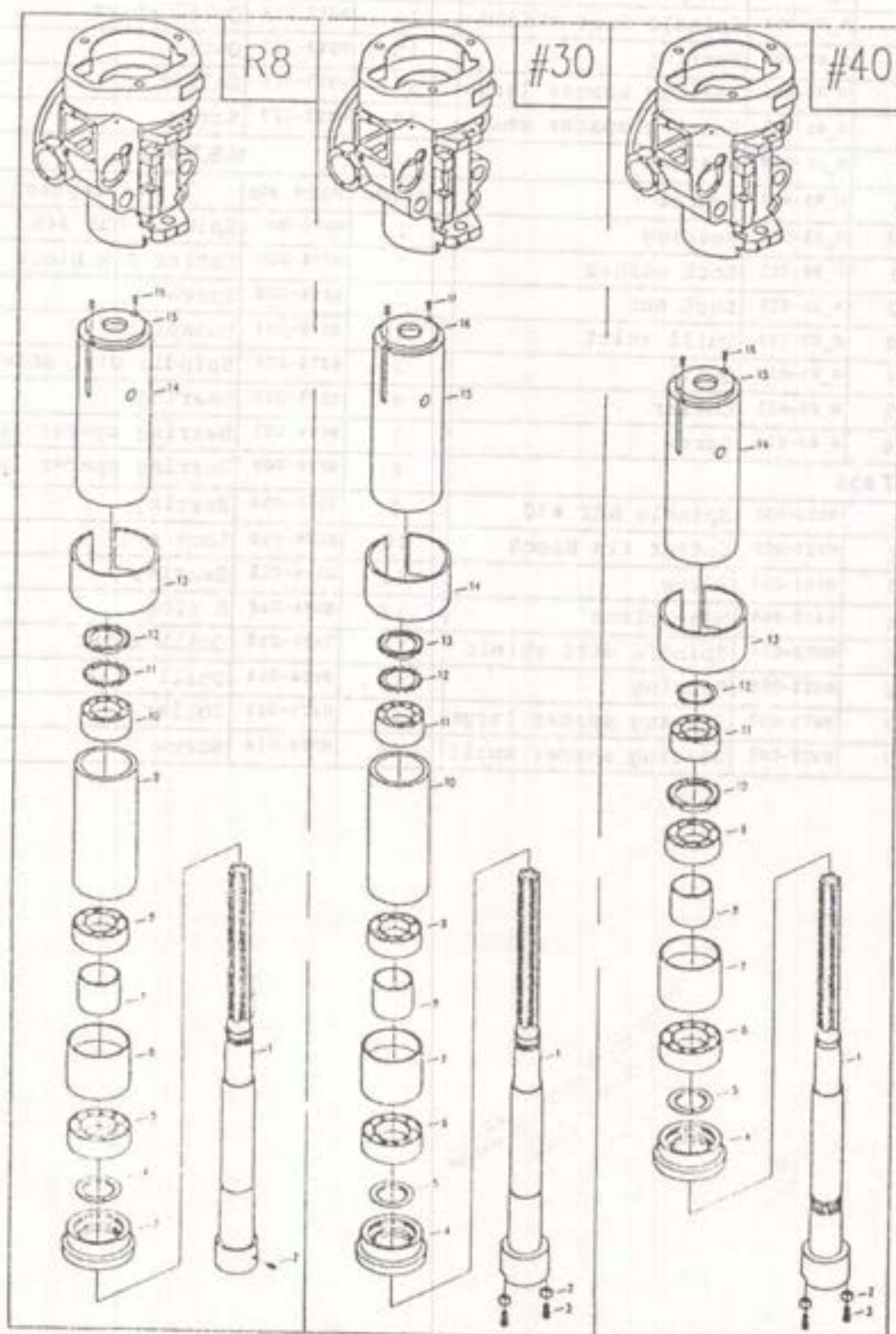
8.2.2 JF-185V



CHAPTER 9

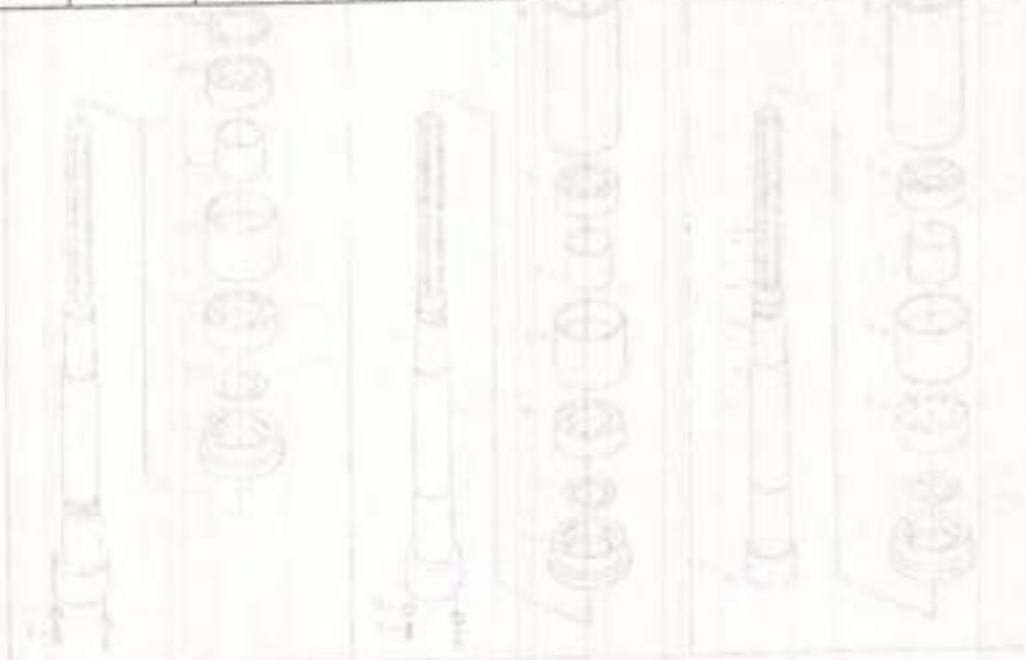
PART LISTS AND SPARE DRAWINGS

9.1 QUILL

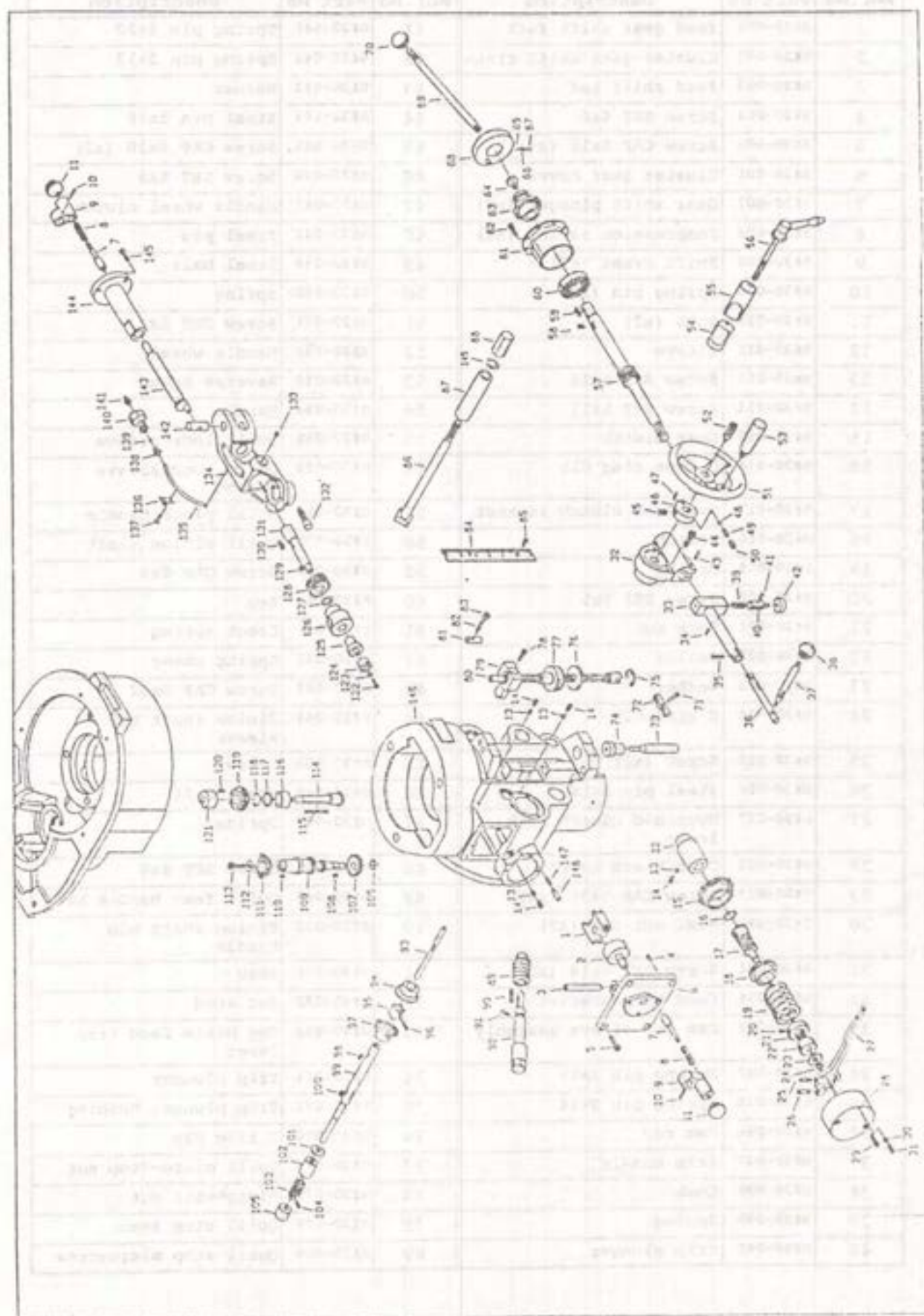


PART LIST OF THE QUILL

R-8			9	NST3-009	Bearing
Ref.No	Part No	Description	10	NST3-010	Spacer
1	R_8S-001	Spindle R-8	11	NST3-011	Bearing
2	R_8S-002	SET screw	12	NST3-012	Lock washer
3	R_8S-003	Nosepiece	13	NST3-013	Lock nut
4	R_8S-004	Spindle dirt shield	14	NST3-014	Quill shirt
5	R_8S-005	Bearing	15	NST3-015	Quill
6	R_8S-006	Bearing spacer large	16	NST3-016	Collar
7	R_8S-007	Bearing spacer small	17	NST3-017	Screw
8	R_8S-008	Bearing	N.S.T #40		
9	R_8S-009	Spacer	Ref.No	Part No	Description
10	R_8S-010	Bearing	1	NST4-001	Spindle NST #40
11	R_8S-011	Lock washer	2	NST4-002	Cutter fix block
12	R_8S-012	Lock nut	3	NST4-003	Screw
13	R_8S-013	Quill shirt	4	NST4-004	Nosepiece
14	R_8S-014	Quill	5	NST4-005	Spindle dirt shield
15	R_8S-015	Collar	6	NST4-006	Bearing
16	R_8S-016	Screw	7	NST4-007	Bearing spacer (large)
N.S.T #30			8	NST4-008	Bearing spacer (small)
1	NST3-001	Spindle NST #30	9	NST4-009	Bearing
2	NST3-002	Cutter fix block	10	NST4-010	Lock nut
3	NST3-003	Screw	11	NST4-011	Bearing
4	NST3-004	Nose piece	12	NST4-012	R ring
5	NST3-005	Spindle dirt shield	13	NST4-013	Quill shirt
6	NST3-006	Bearing	14	NST4-014	Quill
7	NST3-007	Bearing spacer large	15	NST4-015	Collar
8	NST3-008	Bearing spacer small	16	NST4-016	Screw



9.2 GEAR BOX AND BELT HOUSING OF JF-153V, JF-163V, JF-183V



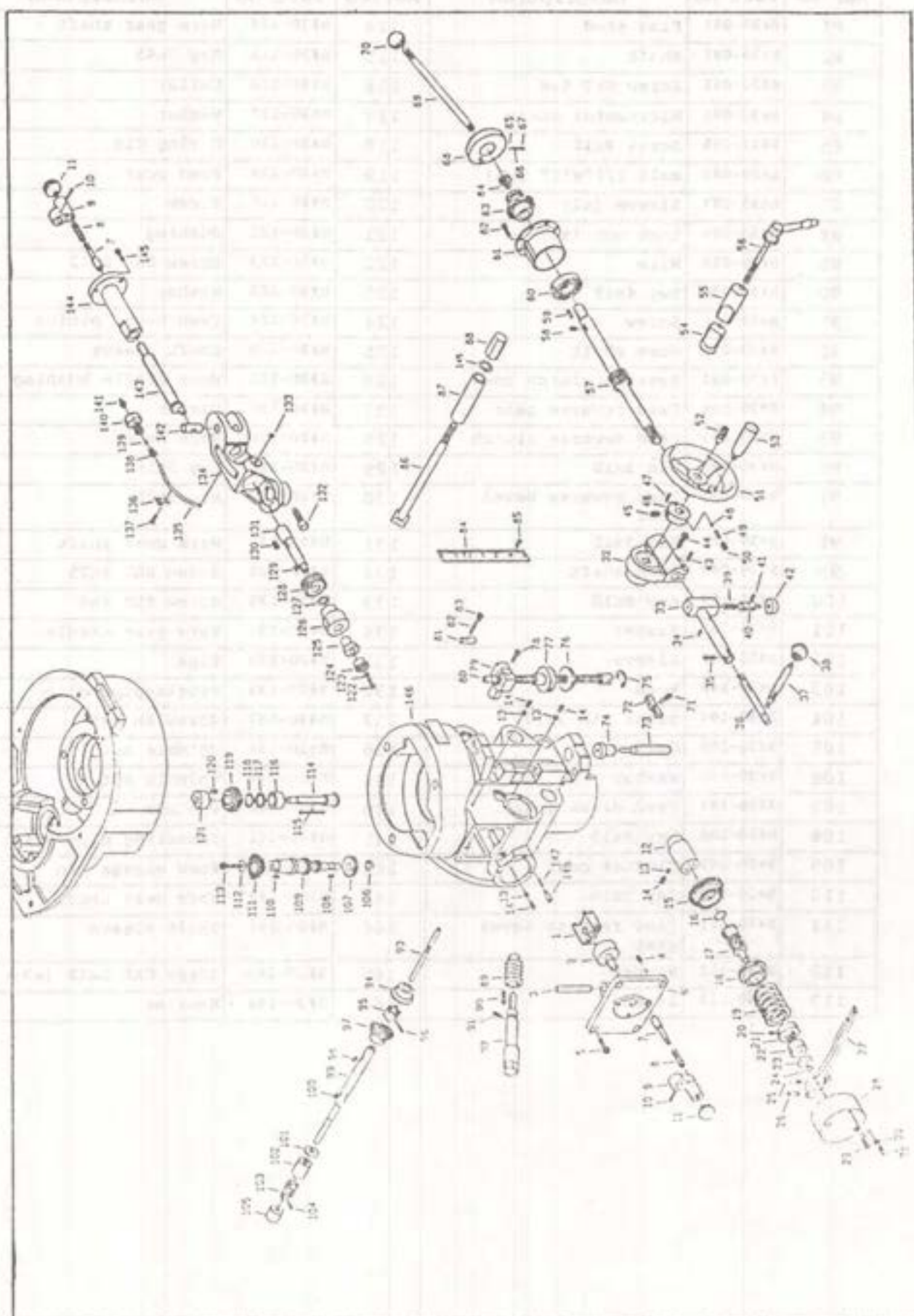
PART LIST OF THE HEAD ASSEMBLY (2-1)

Ref.No	Part No	Description	Ref.No	Part No	Description
1	B#30-001	Feed gear shift fork	41	B#30-041	Spring pin 3x20
2	B#30-002	Cluster gear shift crank	42	B#30-042	Spring pin 3x12
3	B#30-003	Feed shift rod	43	B#30-043	Washer
4	B#30-004	Screw SET 6x6	44	B#30-044	Steel pin 5x18
5	B#30-005	Screw CAP 5x12 (x4)	45	B#30-045	Screw CAP 6x20 (x2)
6	B#30-006	Cluster gear cover	46	B#30-046	Screw SET 8x8
7	B#30-007	Gear shift plunger (x2)	47	B#30-047	Handle wheel clutch
8	B#30-008	Compression spring (x2)	48	B#30-048	Steel pin
9	B#30-009	Shift crank (x2)	49	B#30-049	Steel ball
10	B#30-010	Spring pin (x2)	50	B#30-050	Spring
11	B#30-011	Knob (x2)	51	B#30-051	Screw SET 6x6
12	B#30-012	Sleeve	52	B#30-052	Handle wheel
13	B#30-013	Screw SET 5x12	53	B#30-053	Reverse knob
14	B#30-014	Screw SET 5x17	54	B#30-054	Handle
15	B#30-015	Gear clutch	55	B#30-055	Quill lock sleeve
16	B#30-016	C type ring C15	56	B#30-056	Quill lock sleeve tapped
17	B#30-017	Overload clutch locknut	57	B#30-057	Quill plock handle
18	B#30-018	Clutch	58	B#30-058	Quill pinion shaft
19	B#30-019	Spring	59	B#30-059	Screw CAP 5x8
20	B#30-020	Screw SET 5x5	60	B#30-060	Key
21	B#30-021	Lock nut	61	B#30-061	Clock spring
22	B#30-022	Collar	62	B#30-062	Spring cover
23	B#30-023	Washer	63	B#30-063	Screw CAP 5x12
24	B#30-024	C ring C24	64	B#30-064	Pinion shaft hub sleeve
25	B#30-025	Screw (x2)	65	B#30-065	Screw
26	B#30-026	Steel pin 5x18	66	B#30-066	Steel ball
27	B#30-027	Overload clutch trip lever	67	B#30-067	Spring
28	B#30-028	Clutch arm cover	68	B#30-068	Screw SET 8x8
29	B#30-029	Screw CAP 5x35 (x2)	69	B#30-069	Quill feed handle hub
30	B#30-030	Hex. nut 6mm (x2)	70	B#30-070	Pinion shaft hub handle
31	B#30-031	Screw SET 6x18 (x2)	71	B#30-071	Knob
32	B#30-032	Feed trip bracket	72	B#30-072	Set stud
33	B#30-033	Cam rod sleeve assembly	73	B#30-073	Dog plate feed trip lever
34	B#30-034	Spring pin 3x16	74	B#30-074	Trip plunger
35	B#30-035	Spring pin 5x16	75	B#30-075	Trip plunger bushing
36	B#30-036	Cam rod	76	B#30-076	C ring C16
37	B#30-037	Trip handle	77	B#30-077	Quill micro-stop nut
38	B#30-038	Knob	78	B#30-078	Micrometer nut
39	B#30-039	Spring	79	B#30-079	Quill stop knob
40	B#30-040	Trip plunger	80	B#30-080	Quill stop micro-screw

PART LIST OF THE HEAD ASSEMBLY (2-2)

Ref.No	Part No	Description	Ref.No	Part No	Description
81	B#30-081	Plug stud	114	B#30-114	Worm gear shaft
82	B#30-082	Shaft	115	B#30-115	Key 3x45
83	B#30-083	Screw SET 8x8	116	B#30-116	Collar
84	B#30-084	Micrometer scale	117	B#30-117	Washer
85	B#30-085	Screw 4x10	118	B#30-118	C ring C16
86	B#30-086	Bolt 1/2"x12" (x4)	119	B#30-119	Feed gear
87	B#30-087	Sleeve (x2)	120	B#30-120	Screw
88	B#30-088	Lock nut (x4)	121	B#30-121	Bushing
89	B#30-089	Worm	122	B#30-122	Screw CAP 5x12
90	B#30-090	Key 4x18	123	B#30-123	Washer
91	B#30-091	Screw	124	B#30-124	Feed bevel pinion
92	B#30-092	Worm shaft	125	B#30-125	Shaft sleeve
93	B#30-093	Reverse clutch rod	126	B#30-126	Worm cradle bushing
94	B#30-094	Feed reverse gear	127	B#30-127	Washer
95	B#30-095	Feed reverse clutch	128	B#30-128	Worm gear
96	B#30-096	Pin 3x15	129	B#30-129	Key 3x10
97	B#30-097	Feed reverse bevel gear	130	B#30-130	Key 3x25
98	B#30-098	Key 3x12	131	B#30-131	Worm gear shaft
99	B#30-099	Feed shaft	132	B#30-132	Screw SET 8x25
100	B#30-100	Key 3x10	133	B#30-133	Screw SET 6x6
101	B#30-101	Washer	134	B#30-134	Worm gear cradle
102	B#30-102	Sleeve	135	B#30-135	Pipe
103	B#30-103	Worm	136	B#30-136	Single-pipe clip
104	B#30-104	Steel pin 3x12	137	B#30-137	Screw BH 5x8
105	B#30-105	Collar	138	B#30-138	Thimble nut
106	B#30-106	Washer	139	B#30-139	Thimble nut
107	B#30-107	Feed drive gear	140	B#30-140	Pipe nut
108	B#30-108	Key 3x12	141	B#30-141	Inserting pipe joint
109	B#30-109	Cluster gear	142	B#30-142	Feed engage pin
110	B#30-110	Key 3x10	143	B#30-143	Worm gear cradle
111	B#30-111	Feed reverse bevel gear	144	B#30-144	Shift sleeve
112	B#30-112	Washer	145	B#30-145	Screw CAP 5x12 (x3)
113	B#30-113	Screw	146	B#30-146	Housing

9.3 GEAR BOX AND BELT HOUSING OF JF-185V



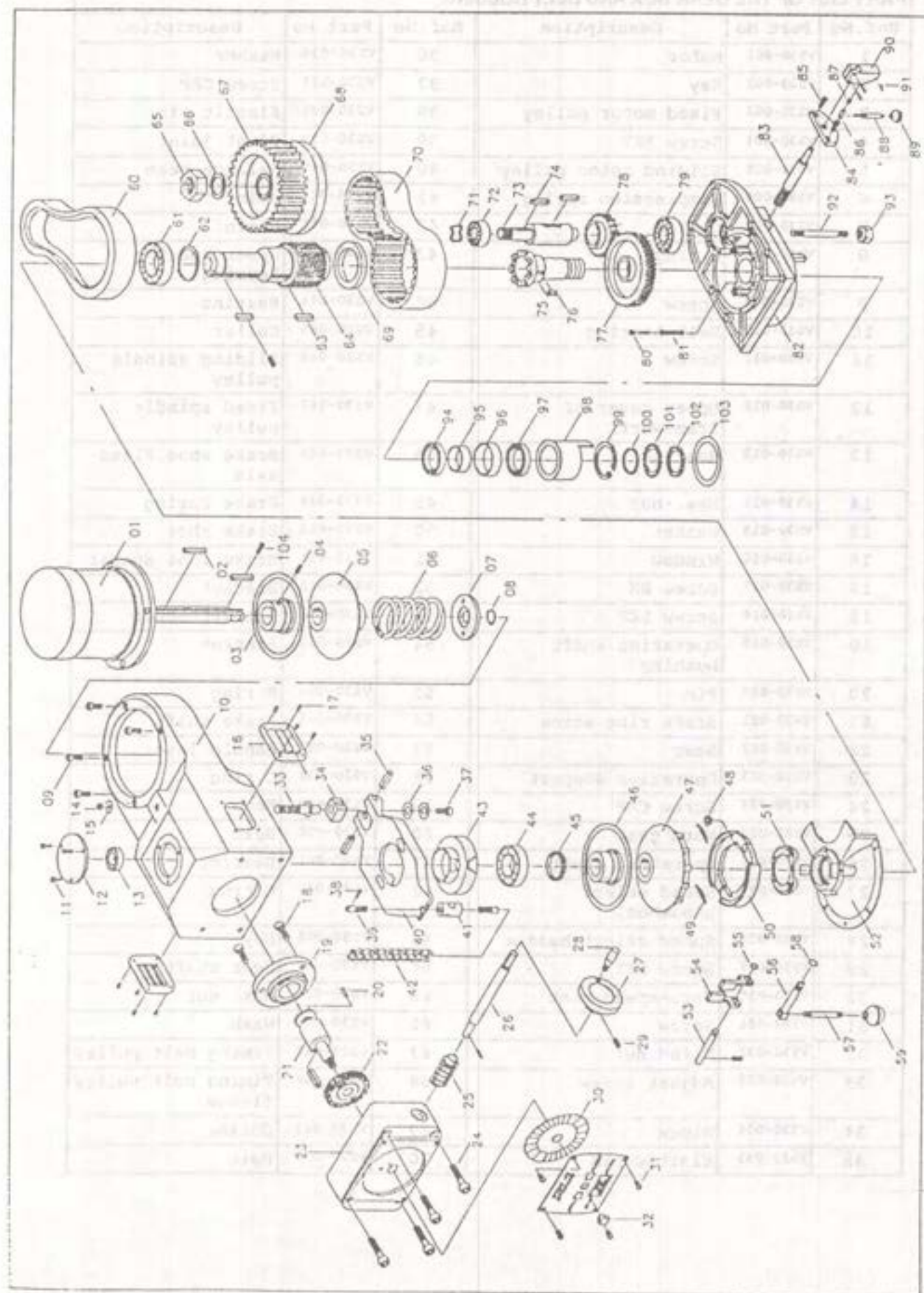
PART LIST OF THE HEAD ASSEMBLY (2-1) (JF-185V)

Ref.No	Part No	Description	Ref.No	Part No	Description
1	B#40-001	Feed gear shift fork	41	B#40-041	Spring pin
2	B#40-002	Cluster gear shift crank	42	B#40-042	Spring pin
3	B#40-003	Feed shift rod	43	B#40-043	Washer
4	B#40-004	Screw SET	44	B#40-044	Steel pin
5	B#40-005	Screw CAP	45	B#40-045	Screw CAP
6	B#40-006	Cluster gear cover	46	B#40-046	Screw SET
7	B#40-007	Gear shift plunger (x2)	47	B#40-047	Handle wheel clutch
8	B#40-008	Compression spring (x2)	48	B#40-048	Steel pin
9	B#40-009	Shift crank (x2)	49	B#40-049	Steel ball
10	B#40-010	Spring pin (x2)	50	B#40-050	Spring
11	B#40-011	Knob (x2)	51	B#40-051	Screw SET
12	B#40-012	Sleeve	52	B#40-052	Handle wheel
13	B#40-013	Screw SET	53	B#40-053	Reverse knob
14	B#40-014	Screw SET	54	B#40-054	Handle
15	B#40-015	Gear clutch	55	B#40-055	Quill lock sleeve
16	B#40-016	C type ring	56	B#40-056	Quill lock sleeve tapped
17	B#40-017	Overload clutch locknut	57	B#40-057	Quill plock handle
18	B#40-018	Clutch	58	B#40-058	Quill pinion shaft
19	B#40-019	Spring	59	B#40-059	Screw CAP
20	B#40-020	Screw SET 5x5	60	B#40-060	Key
21	B#40-021	Lock nut	61	B#40-061	Clock spring
22	B#40-022	Collar	62	B#40-062	Spring cover
23	B#40-023	Washer	63	B#40-063	Screw CAP
24	B#40-024	C ring	64	B#40-064	Pinion shaft hub sleeve
25	B#40-025	Screw (x2)	65	B#40-065	Screw
26	B#40-026	Steel pin	66	B#40-066	Steel ball
27	B#40-027	Overload clutch trip lever	67	B#40-067	Spring
28	B#40-028	Clutch arm cover	68	B#40-068	Screw SET
29	B#40-029	Screw CAP	69	B#40-069	Quill feed handle hub
30	B#40-030	Hex. nut	70	B#40-070	Pinion shaft hub handle
31	B#40-031	Screw SET	71	B#40-071	Knob
32	B#40-032	Feed trip bracket	72	B#40-072	Set stud
33	B#40-033	Cam rod sleeve assembly	73	B#40-073	Dog plate feed trip lever
34	B#40-034	Spring pin	74	B#40-074	Trip plunger
35	B#40-035	Spring pin	75	B#40-075	Trip plunger bushing
36	B#40-036	Cam rod	76	B#40-076	C ring
37	B#40-037	Trip handle	77	B#40-077	Quill micro-stop nut
38	B#40-038	Knob	78	B#40-078	Micrometer nut
39	B#40-039	Spring	79	B#40-079	Quill stop knob
40	B#40-040	Trip plunger	80	B#40-080	Quill stop micro-screw

PART LIST OF THE HEAD ASSEMBLY (2-2) (JF-185V)

Ref.No	Part No	Description	Ref.No	Part No	Description
81	B#40-081	Plug stud	114	B#40-114	Worm gear shaft
82	B#40-082	Shaft	115	B#40-115	Key
83	B#40-083	Screw SET	116	B#40-116	Collar
84	B#40-084	Micrometer scale	117	B#40-117	Washer
85	B#40-085	Screw	118	B#40-118	C ring
86	B#40-086	Bolt	119	B#40-119	Feed gear
87	B#40-087	Sleeve (x2)	120	B#40-120	Screw
88	B#40-088	Lock nut (x4)	121	B#40-121	Bushing
89	B#40-089	Worm	122	B#40-122	Screw CAP
90	B#40-090	Key	123	B#40-123	Washer
91	B#40-091	Screw	124	B#40-124	Feed bevel pinion
92	B#40-092	Worm shaft	125	B#40-125	Shaft sleeve
93	B#40-093	Reverse clutch rod	126	B#40-126	Worm cradle bushing
94	B#40-094	Feed reverse gear	127	B#40-127	Washer
95	B#40-095	Feed reverse clutch	128	B#40-128	Worm gear
96	B#40-096	Pin 3x15	129	B#40-129	Key
97	B#40-097	Feed reverse bevel gear	130	B#40-130	Key
98	B#40-098	Key	131	B#40-131	Worm gear shaft
99	B#40-099	Feed shaft	132	B#40-132	Screw SET
100	B#40-100	Key	133	B#40-133	Screw SET
101	B#40-101	Washer	134	B#40-134	Worm gear cradle
102	B#40-102	Sleeve	135	B#40-135	Pipe
103	B#40-103	Worm	136	B#40-136	Single-pipe clip
104	B#40-104	Steel pin	137	B#40-137	Screw BH
105	B#40-105	Collar	138	B#40-138	Thimble nut
106	B#40-106	Washer	139	B#40-139	Thimble nut
107	B#40-107	Feed drive gear	140	B#40-140	Ppe nut
108	B#40-108	Key	141	B#40-141	Inserting pipe joint
109	B#40-109	Cluster gear	142	B#40-142	Feed engage pin
110	B#40-110	Key	143	B#40-143	Worm gear cradle
111	B#40-111	Feed reverse bevel gear	144	B#40-144	Shift sleeve
112	B#40-112	Washer	145	B#40-145	Screw CAP
113	B#40-113	Screw	146	B#40-146	Housing

9.4 HEAD ASSEMBLY FOR JF-153V, JF-163V, JF-183V

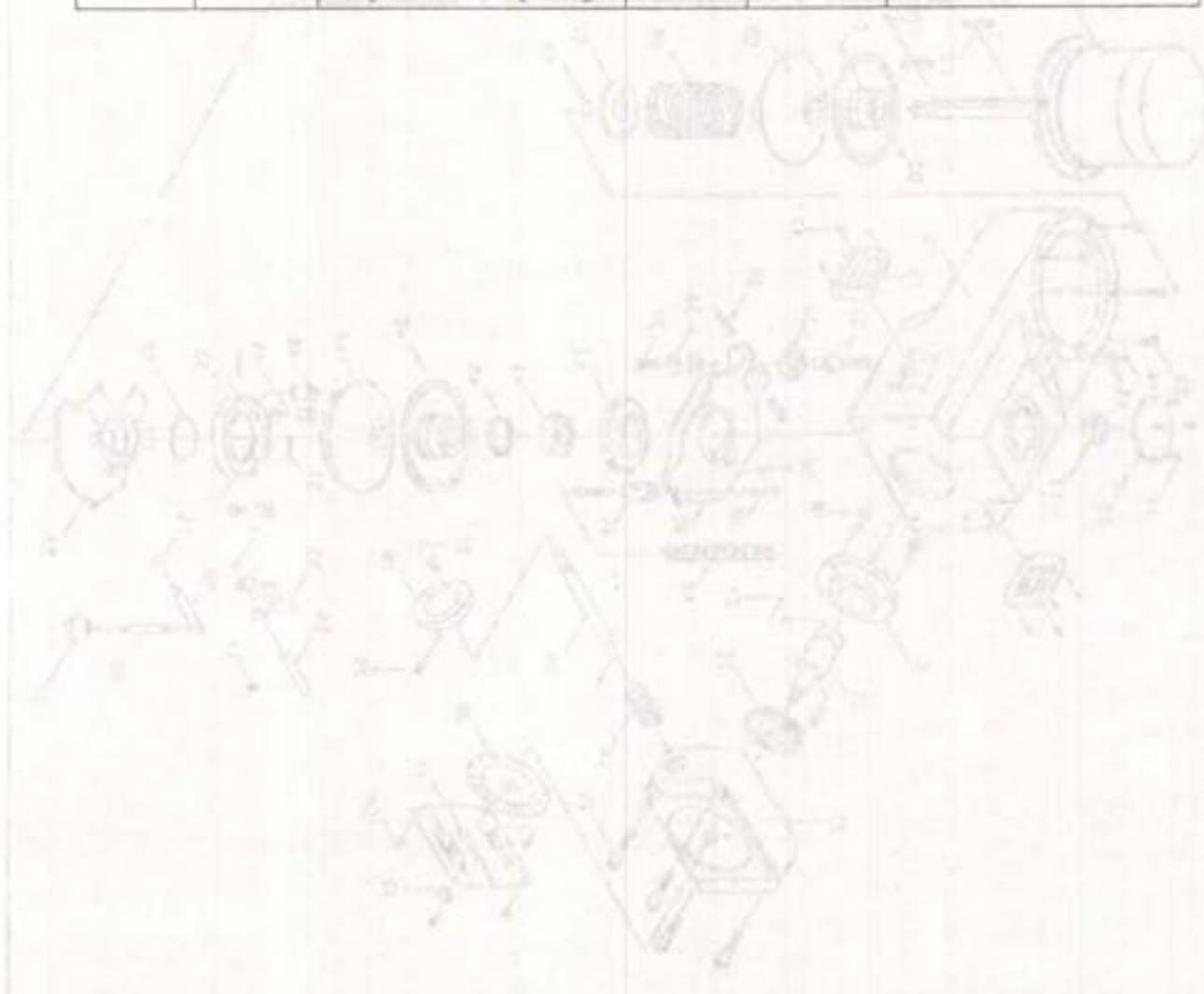


PART LIST OF THE GEAR BOX AND BELT HOUSING

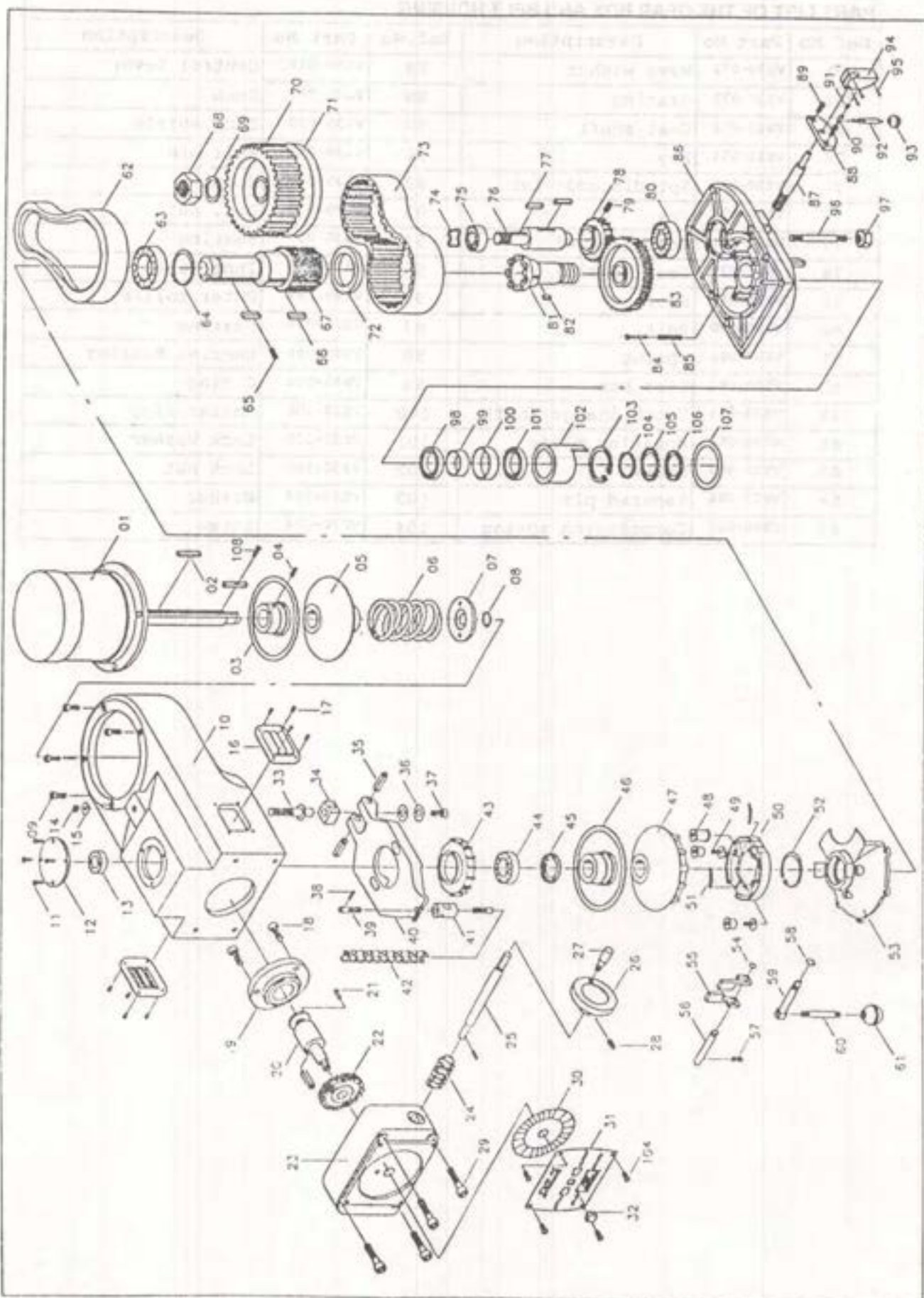
Ref.No	Part No	Description	Ref.No	Part No	Description
1	VS30-001	Motor	36	VS30-036	Washer
2	VS30-002	Key	37	VS30-037	Screw CAP
3	VS30-003	Fixed motor pulley	38	VS30-038	Elastic pin
4	VS30-004	Screw SET	39	VS30-039	Pivot joint
5	VS30-005	Sliding motor pulley	40	VS30-040	Balance beam
6	VS30-006	Compression spring	41	VS30-041	Joint
7	VS30-007	Collar	42	VS30-042	Chain
8	VS30-008	C ring	43	VS30-043	Upper bearing housing
9	VS30-009	Screw	44	VS30-044	Bearing
10	VS30-010	Belt housing	45	VS30-045	Collar
11	VS30-011	Screw	46	VS30-046	Sliding spindle pulley
12	VS30-012	Upper cover of framework	47	VS30-047	Fixed spindle pulley
13	VS30-013	Bearing	48	VS30-048	Brake shoe fixed axis
14	VS30-014	Hex. nut	49	VS30-049	Brake spring
15	VS30-015	Washer	50	VS30-050	Brake shoe
16	VS30-016	Window	51	VS30-051	Brake shoe spacer
17	VS30-017	Screw BH	52	VS30-052	Bracket
18	VS30-018	Screw SET	53	VS30-053	Support shaft
19	VS30-019	Operating shaft bushing	54	VS30-054	Bracket
20	VS30-020	Pin	55	VS30-055	R ring
21	VS30-021	Brake ring screw	56	VS30-056	Brake shaft
22	VS30-022	Gear	57	VS30-057	Handle lever
23	VS30-023	Operation support	58	VS30-058	C ring
24	VS30-024	Screw CAP	59	VS30-059	Knob
25	VS30-025	Worm gear	60	VS30-060	Belt
26	VS30-026	Operating shaft	61	VS30-061	Bearing
27	VS30-027	Speed select handwheel	62	VS30-062	C ring
28	VS30-028	Speed select handle	63	VS30-063	Key
29	VS30-029	Screw SET	64	VS30-064	Gear shaft
30	VS30-030	Vari-speed disk	65	VS30-065	Hex. nut
31	VS30-031	Screw	66	VS30-066	Wash
32	VS30-032	Blind nut	67	VS30-067	Timing belt pulley
33	VS30-033	Adjust screw	68	VS30-068	Timing belt pulley flange
34	VS30-034	Block	69	VS30-069	Collar
35	VS30-035	Elastic pin	70	VS30-070	Belt

PART LIST OF THE GEAR BOX AND BELT HOUSING

Ref.No	Part No	Description	Ref.No	Part No	Description
71	VS30-071	Wave washer	88	VS30-088	Control lever
72	VS30-072	Bearing	89	VS30-089	Knob
73	VS30-073	Gear shaft	90	VS30-090	Lock nozzle
74	VS30-074	Key	91	VS30-091	Roll pin
75	VS30-075	Spindle gear hub	92	VS30-092	Stud
76	VS30-076	Key	93	VS30-093	Hex. nut
77	VS30-077	Gear (large)	94	VS30-094	Bearing
78	VS30-078	Gear (small)	95	VS30-095	Inner collar
79	VS30-079	Bearing	96	VS30-096	Outer collar
80	VS30-080	Bolt	97	VS30-097	Bearing
81	VS30-081	Spring	98	VS30-098	Bearing housing
82	VS30-082	Gear box	99	VS30-099	C ring
83	VS30-083	Tooth change shaft	100	VS30-100	Collar ring
84	VS30-084	Rotation plate	101	VS30-101	Lock washer
85	VS30-085	Screw	102	VS30-102	Lock nut
86	VS30-086	Tapered pin	103	VS30-103	Washer
87	VS30-087	Compression spring	104	VS30-104	Screw



9.5 HEAD ASSEMBLY FOR JF-185V



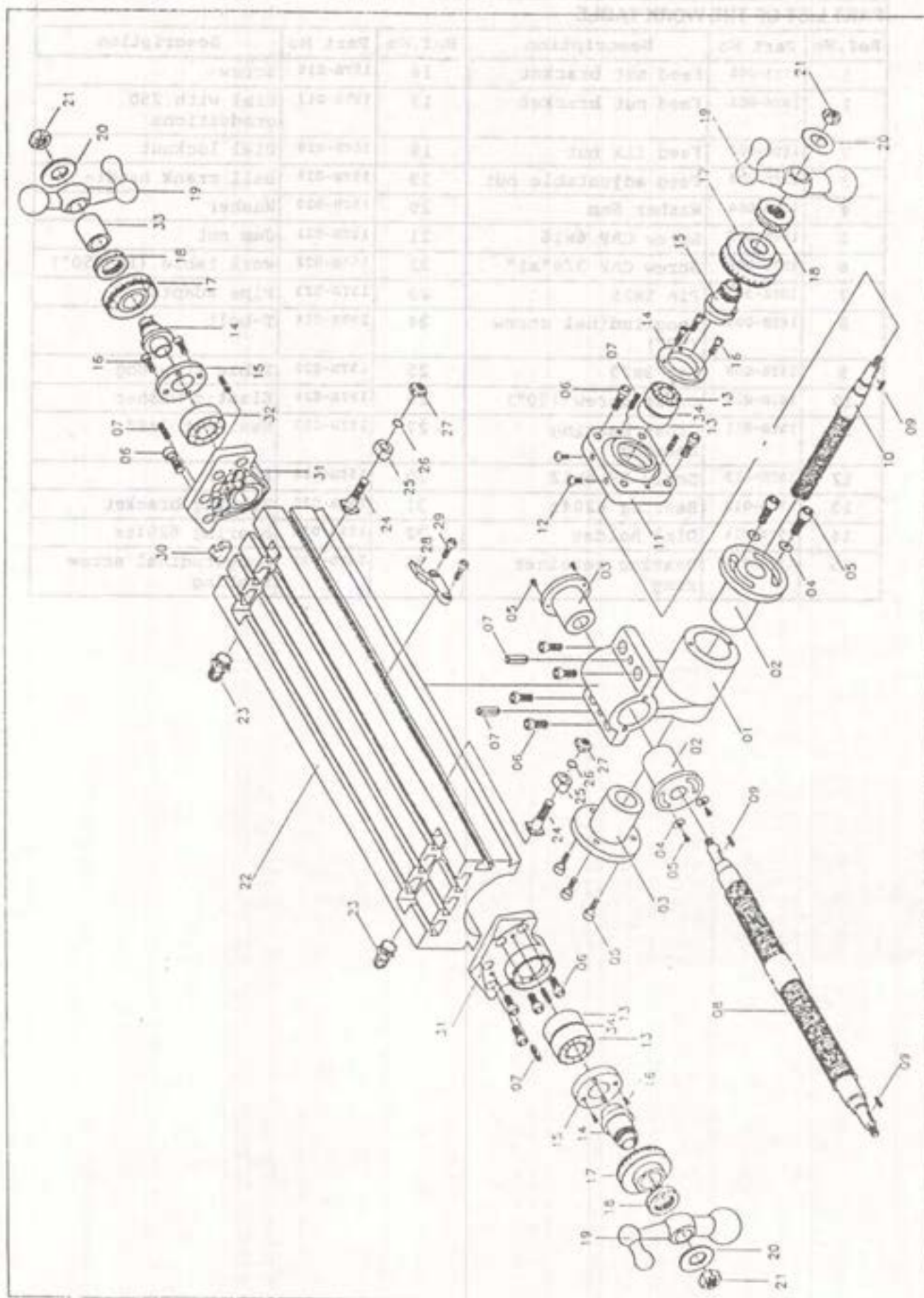
PART LIST OF THE GEAR BOX AND BELT HOUSING

Ref.No	Part No	Description	Ref.No	Part No	Description
1	VS40-001	Motor (5HP)	36	VS40-036	Washer
2	VS40-002	Key	37	VS40-037	Screw CAP
3	VS40-003	Fixed motor pulley	38	VS40-038	Elastic pin
4	VS40-004	Screw SET	39	VS40-039	Pivot joint
5	VS40-005	Sliding motor pulley	40	VS40-040	Balance beam
6	VS40-006	Compression spring	41	VS40-041	Joint
7	VS40-007	Collar	42	VS40-042	Chain
8	VS40-008	C ring	43	VS40-043	Upper bearing housing
9	VS40-009	Screw	44	VS40-044	Bearing
10	VS40-010	Belt housing	45	VS40-045	Bearing spacer
11	VS40-011	Screw	46	VS40-046	Sliding spindle pulley
12	VS40-012	Upper cover of framework	47	VS40-047	Fixed spindle pulley
13	VS40-013	Bearing	48	VS40-048	Brake shoe fixed axis
14	VS40-014	Hex. nut	49	VS40-049	Brake screw
15	VS40-015	Washer	50	VS40-050	Brake shoe
16	VS40-016	Window	51	VS40-051	Brake spring
17	VS40-017	Screw BH	52	VS40-052	R ring
18	VS40-018	Screw SET	53	VS40-053	Bracket
19	VS40-019	Operating shaft bushing	54	VS40-054	Bracket
20	VS40-020	Brake ring screw	55	VS40-055	Brake shaft
21	VS40-021	Pin	56	VS40-056	Support shaft
22	VS40-022	Gear	57	VS40-057	Screw SET
23	VS40-023	Operation support	58	VS40-058	C ring
24	VS40-024	Worm gear	59	VS40-059	Handle lever
25	VS40-025	Operating shaft	60	VS40-060	Stud
26	VS40-026	Speed select handwheel	61	VS40-061	Knob
27	VS40-027	Speed select handle	62	VS40-062	Belt
28	VS40-028	Screw SET	63	VS40-063	Bearing
29	VS40-029	Screw CAP	64	VS40-064	R ring
30	VS40-030	Vari-speed disk	65	VS40-065	Screw SET
31	VS40-031	Vari-speed plate	66	VS40-066	Key
32	VS40-032	Blind nut	67	VS40-067	Gear shaft
33	VS40-033	Adjust screw	68	VS40-068	Hex. nut
34	VS40-034	Block	69	VS40-069	Collar
35	VS40-035	Elastic pin	70	VS40-070	Timing belt pulley

PART LIST OF THE GEAR BOX AND BELT HOUSING

Ref.No	Part No	Description	Ref.No	Part No	Description
71	VS40-071	Timing pulley flange	90	VS40-090	Tapered pin
72	VS40-072	Collar	91	VS40-091	Compression spring
73	VS40-073	Belt	92	VS40-092	Control lever
74	VS40-074	Wave washer	93	VS40-093	Knob
75	VS40-075	Bearing	94	VS40-094	Lock nozzle
76	VS40-076	Gear shaft	95	VS40-095	Roll pin
77	VS40-077	Key	96	VS40-096	Stud
78	VS40-078	Gear (small)	97	VS40-097	Hex. nut
79	VS40-079	Screw SET	98	VS40-098	Bearing
80	VS40-080	Bearing	99	VS40-099	Inner collar
81	VS40-081	Spindle gear hub.	100	VS40-100	Outer collar
82	VS40-082	Key	101	VS40-101	Bearing
83	VS40-083	Gear (large)	102	VS40-102	Bearing housing
84	VS40-084	Bolt	103	VS40-103	C ring
85	VS40-085	Spring	104	VS40-104	Collar ring
86	VS40-086	Gear box	105	VS40-105	Lock washer
87	VS40-087	Tooth change shaft	106	VS40-106	Lock nut
88	VS40-088	Rotation plate	107	VS40-107	Washer
89	VS40-089	Screw	108	VS40-108	Screw
			109	VS40-109	Screw BH

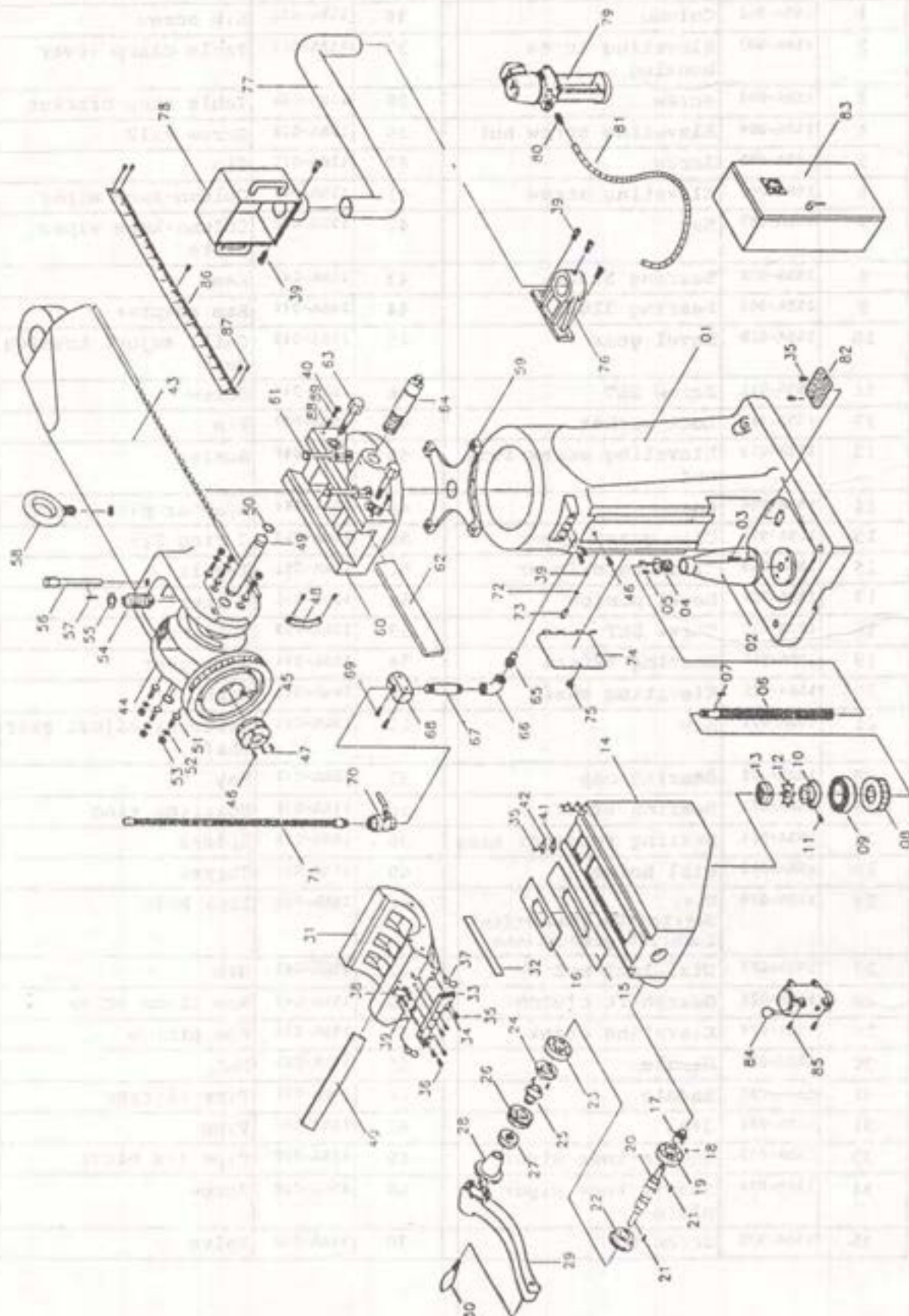
9.6 WORK TABLE



PART LIST OF THE WORK TABLE

Ref.No	Part No	Description	Ref.No	Part No	Description
1	15TB-001	Feed nut bracket	16	15TB-016	Screw
1	16TB-001	Feed nut bracket	17	15TB-017	Dial with 250 graduations
2	15TB-002	Feed fix nut	18	15TB-018	Dial locknut
3	15TB-003	Feed adjustable nut	19	15TB-019	Ball crank handle
4	15TB-004	Washer 6mm	20	15TB-020	Washer
5	15TB-005	Screw CAP 6x16	21	15TB-021	Jam nut
6	15TB-006	Screw CAP 3/8"x1"	22	16TB-022	Work table (10"x50")
7	15TB-007	Pin 5x25	23	15TB-023	Pipe adapter
8	16TB-008	Longitudinal screw (50")	24	15TB-024	T-bolt
9	15TB-009	Key 3x20	25	15TB-025	Table stop dog
10	16TB-010	Cross screw (50")	26	15TB-026	Elastic washer
11	15TB-011	Cross bearing housing	27	15TB-027	Hex. nut 3/8"
12	15TB-012	Screw BH 5x12	30	15TB-028	Filler
13	15TB-013	Bearing 6204z	31	15TB-029	Bearing bracket
14	15TB-014	Dial holder	32	15TB-030	Bearing 6204zz
15	15TB-015	Bearing retainer ring	33	15TB-031	Longitudinal screw bushing

9.7 BASIC ASSEMBLY FOR JF-153V

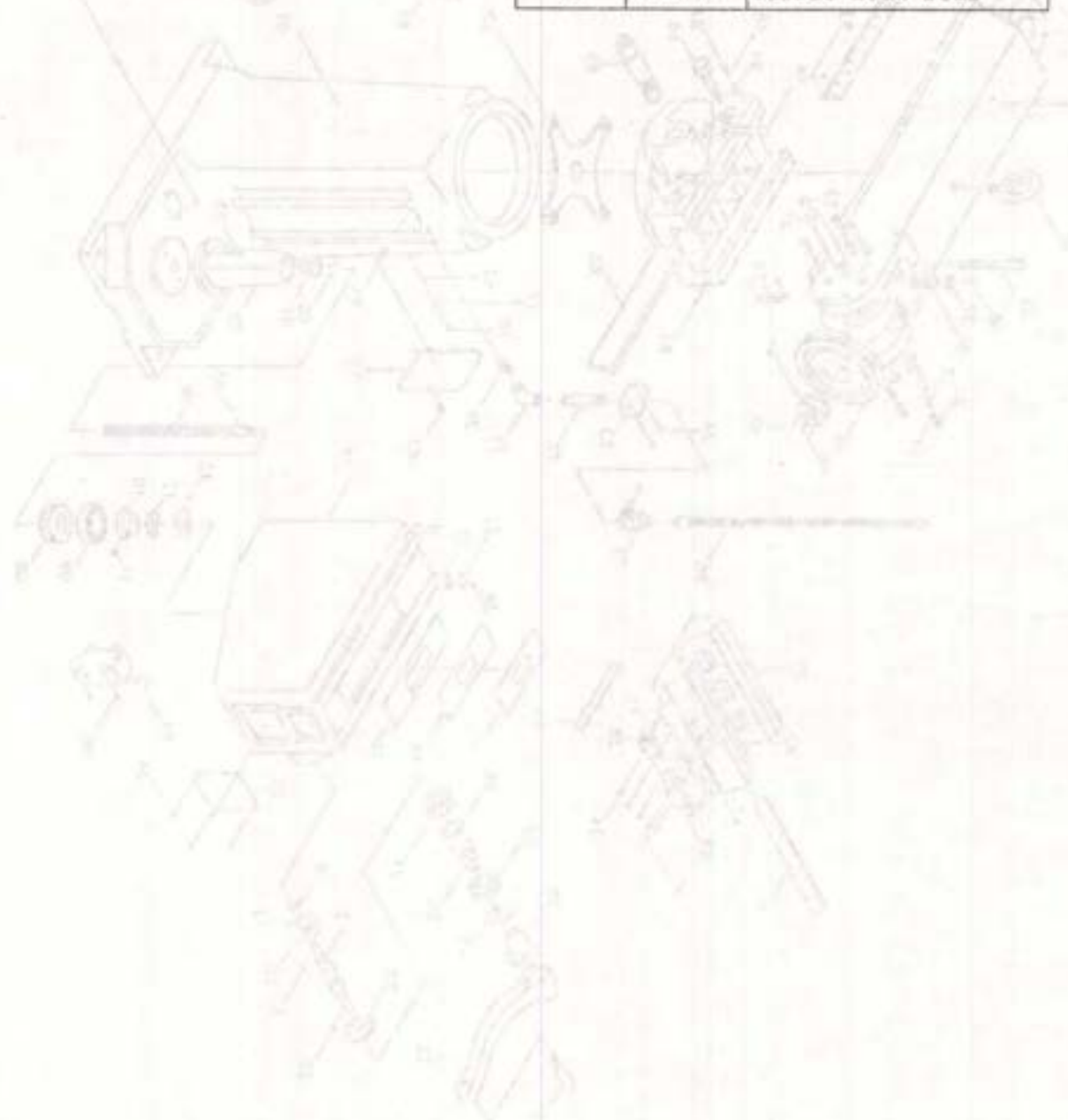


PART LIST OF THE JF-153V BASIC ASSEMBLY

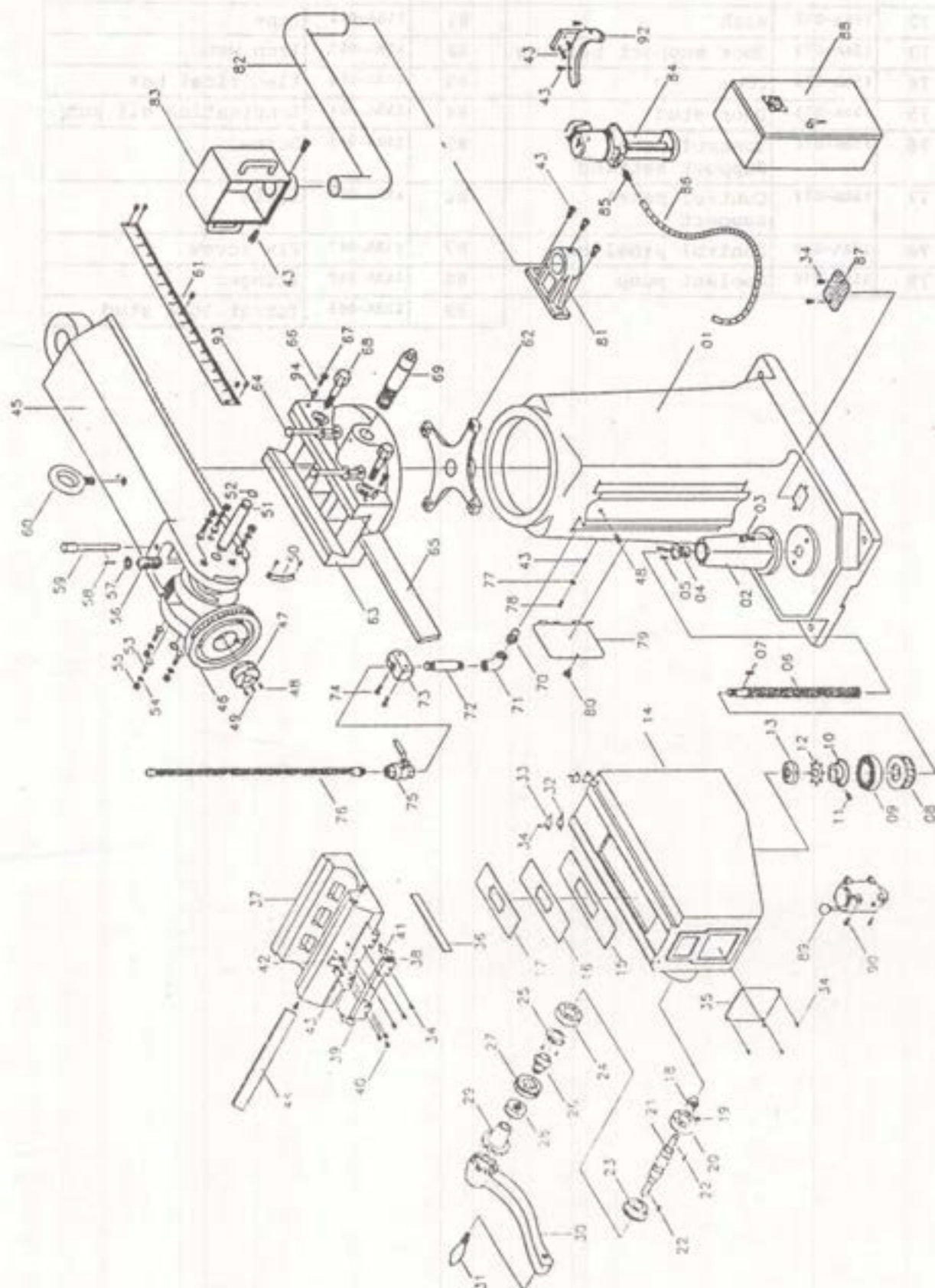
Ref.No	Part No	Description	Ref.No	Part No	Description
1	15BA-001	Column	36	15BA-036	Gib screw
2	15BA-002	Elevating screw housing	37	15BA-037	Table clamp lever
3	15BA-003	Screw	38	15BA-038	Table stop bracket
4	15BA-004	Elevating screw nut	39	15BA-039	Screw 8x12
5	15BA-005	Screw	40	15BA-040	Gib
6	15BA-006	Elevating screw	41	15BA-041	Column-knee wiper
7	15BA-007	Key	42	15BA-042	Column-knee wiper plate
8	15BA-008	Bearing 51305	43	15BA-043	Ram
9	15BA-009	Bearing 32005	44	15BA-044	Ram adapter
10	15BA-010	Bevel gear	45	15BA-045	Quill adjust housing gear
11	15BA-011	Screw SET	46	15BA-046	Screw
12	15BA-012	Lock washer	47	15BA-047	Pin
13	15BA-013	Elevating screw lock nut	48	15BA-048	Scale
14	15BA-014	Knee	49	15BA-049	Adapter pivot stud
15	15BA-015	Clip guard-upper	50	15BA-050	C ring S28
16	15BA-016	Clip guard-lower	51	15BA-051	T-bolt
17	15BA-017	Bevel pinion	52	15BA-052	Washer
18	15BA-018	Screw SET	53	15BA-053	Hex. nut
19	15BA-018	Bearing 6204zz	54	15BA-054	Worm gear
20	15BA-020	Elevating shaft	55	15BA-055	Wash
21	15BA-021	Key	56	15BA-056	Vertical adjust gear shaft
22	15BA-022	Bearing cap	57	15BA-057	Key
23	15BA-023	Bearing 6204zz	58	15BA-058	Hoisting ring
24	15BA-024	Bearing retainer ring	59	15BA-059	Spider
25	15BA-025	Dial holder	60	15BA-060	Turret
26	15BA-026	Dial Metric:100 graduations Inch:125 graduations	61	15BA-061	Lock bolt
27	15BA-027	Dial lock nut	62	15BA-062	Gib
28	15BA-028	Gearshaft clutch	63	15BA-063	Ram clamp screw
29	15BA-029	Elevating crank	64	15BA-064	Ram pinion
30	15BA-030	Handle	65	15BA-065	Nut
31	15BA-031	Saddle	66	15BA-066	Pipe fitting
32	15BA-032	Gib	67	15BA-067	Pipe
33	15BA-033	Saddle-knee wiper	68	15BA-068	Pipe fix block
34	15BA-034	Saddle-knee wiper plate	69	15BA-069	Screw
35	15BA-035	Screw BH	70	15BA-070	Valve

PART LIST OF THE JF-152V BASIC ASSEMBLY

Ref.No	Part No	Description	Ref.No	Part No	Description
71	15BA-071	Nose	80	15BA-080	Pump adapter
72	15BA-072	Wash	81	15BA-081	Pipe
73	15BA-073	Door support bushing	82	15BA-082	Iron web
74	15BA-074	Door	83	15BA-083	Electrical box
75	15BA-075	Door stud	84	15BA-084	Lubrication oil pump
76	15BA-076	Control panel Support setting	85	15BA-085	Screw
77	15BA-077	Control panel support	86	15BA-086	Scale
78	15BA-078	Control panel box	87	15BA-087	Fix screw
79	15BA-079	Coolant pump	88	15BA-088	Plunger
			89	15BA-089	Turret lock stud



9.8 BASIC ASSEMBLY FOR JF-163V



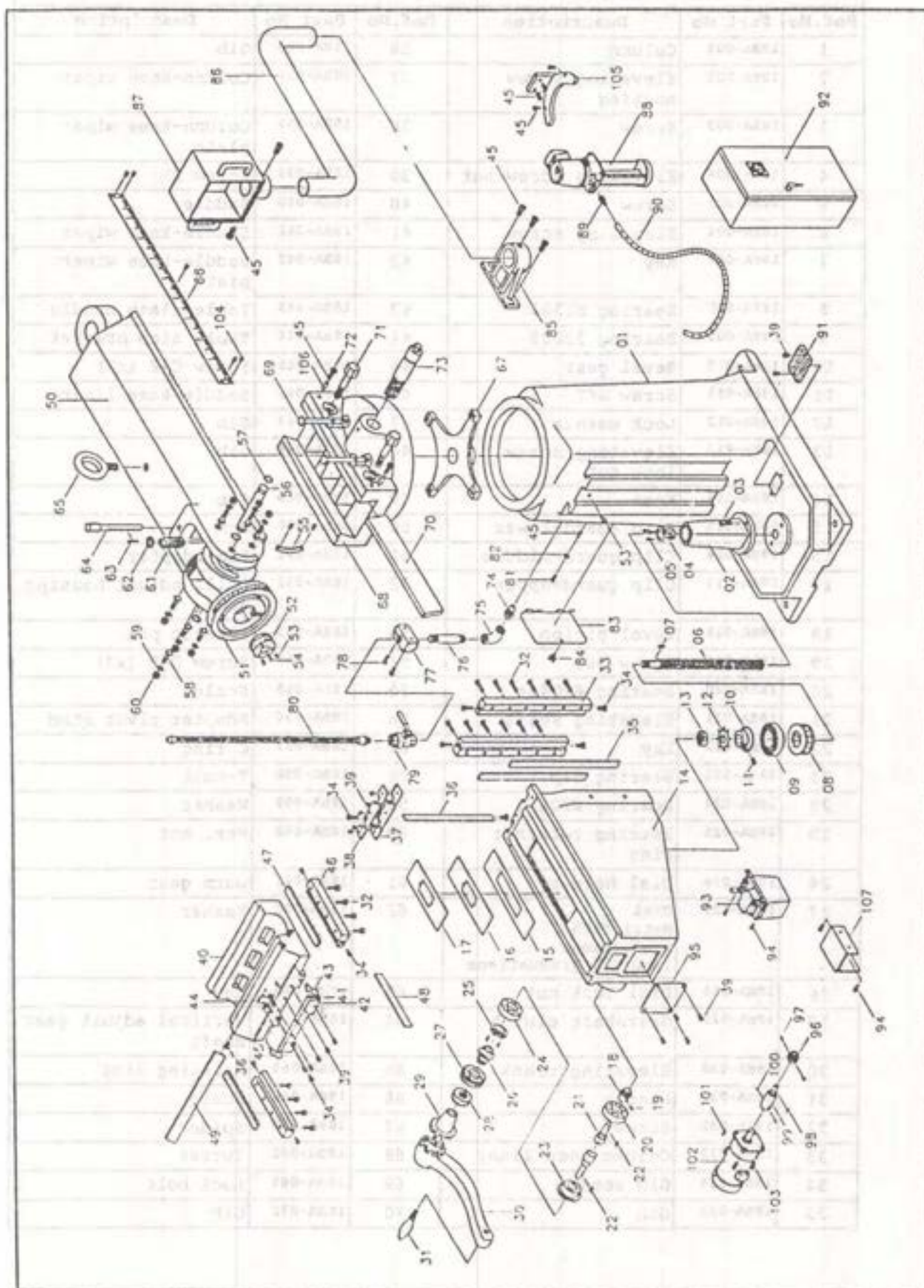
PART LIST OF THE JF-163V BASIC ASSEMBLY

Ref.No	Part No	Description	Ref.No	Part No	Description
1	163A-001	Column	36	168A-036	Gib
2	163A-002	Elevating screw housing	37	168A-037	Saddle
3	163A-003	Screw CAP	38	168A-038	Saddle-knee wiper
4	163A-004	Elevating screw nut	39	168A-039	Saddle-knee wiper plate
5	163A-005	Screw	40	168A-040	Gib screw
6	163A-006	Elevating screw	41	168A-041	Table clamp handle
7	163A-007	Key	42	168A-042	Table stop bracket
8	163A-008	Bearing 51305	43	168A-043	Screw CAP
9	163A-009	Bearing 32005	44	168A-044	Gib
10	163A-010	Bevel gear	45	168A-045	Ram
11	163A-011	Screw SET	46	168A-046	Ram adapter
12	163A-012	Lock washer	47	168A-047	Quill adjust housing gear
13	163A-013	Elevating screw lock nut	48	168A-078	Pin
14	163A-014	Knee	49	168A-049	Screw
15	163A-015	Clip guard-upper	50	168A-050	Scale
16	163A-016	Clip guard-middle	51	168A-051	Adapter pivot stud
17	163A-017	Clip guard-lower	52	168A-052	C ring S28
18	163A-018	Bevel pinion	53	168A-053	T-bolt
19	163A-019	Screw SET	54	168A-054	Washer
20	163A-020	Bearing 6204z	55	168A-055	Hex. nut
21	163A-021	Elevating shaft	56	168A-056	Worm gear
22	163A-022	Key	57	168A-057	Washer
23	163A-023	Bearing cap	58	168A-058	Key
24	163A-024	Bearing 6204zz	59	168A-059	Vertical adjust gear shaft
25	163A-025	Bearing retainer ring	60	168A-060	Hoisting ring
26	163A-026	Dial holder	61	168A-061	Scale
27	163A-027	Dial Metric:125 graduations Inch:100 graduations	62	168A-062	Spider
28	163A-028	Dial lock nut	63	168A-063	Turret
29	163A-029	Gearshaft clutch	64	168A-064	Lock bolt
30	163A-030	Elevating crank	65	168A-065	Gib
31	163A-031	Handle	66	168A-066	Turret lock stud
32	163A-032	Column-knee wiper	67	168A-067	Hex. nut
33	163A-033	Column-knee wiper cover	68	168A-068	Turret clamp screw
34	163A-034	Screw RH	69	168A-069	Ram pinion
35	163A-035	Knee front cover	70	168A-070	Nut

PART LIST OF THE JF-163V BASIC ASSEMBLY

Ref.No	Part No	Description	Ref.No	Part No	Description
71	16BA-071	Pipe fitting	82	16BA-082	Control panel support
72	16BA-072	Pipe	83	16BA-083	Control panel box
73	16BA-073	Pipe fix block	84	16BA-084	Coolant pump
74	16BA-074	Screw	85	16BA-085	Pipe adapter
75	16BA-075	Valve	86	16BA-086	Pipe
76	16BA-076	Nose	87	16BA-087	Iron web
77	16BA-077	Washer	88	16BA-088	Electrical box
78	16BA-078	Door support bushing	89	16BA-089	Lubrication oil pump
79	16BA-079	Door	90	16BA-090	Screw
80	16BA-080	Door stud	91	16BA-091	Pump fixed setting
81	16BA-081	Control panel support setting	92	16BA-092	Fix screw
			93	16BA-093	Plunger

9.9 BASIC ASSEMBLY FOR JF-183V, JF-185V



PART LIST OF THE JF-183V, JF-185V BASIC ASSEMBLY

Ref.No	Part No	Description	Ref.No	Part No	Description
1	18BA-001	Column	36	18BA-036	Gib
2	18BA-002	Elevating screw housing	37	18BA-037	Column-knee wiper
3	18BA-003	Screw	38	18BA-038	Column-knee wiper plate
4	18BA-004	Elevating screw nut	39	18BA-039	Screw BH
5	18BA-005	Screw	40	18BA-040	Saddle
6	18BA-006	Elevating screw	41	18BA-041	Saddle-knee wiper
7	18BA-007	Key	42	18BA-042	Saddle-knee wiper plate
8	18BA-008	Bearing 51305	43	18BA-043	Table clamp handle
9	18BA-009	Bearing 32005	44	18BA-044	Table stop bracket
10	18BA-010	Bevel gear	45	18BA-045	Screw CAP (x2)
11	18BA-011	Screw SET	46	18BA-046	Saddle-knee liner
12	18BA-012	Lock washer	47	18BA-047	Gib
13	18BA-013	Elevating screw lock nut	48	18BA-048	Gib
14	18BA-014	Knee	49	18BA-049	Gib
15	18BA-015	Clip guard-lower	50	18BA-050	Ram
16	18BA-016	Clip guard-middle	51	18BA-051	Ram adapter
17	18BA-017	Clip guard-upper	52	18BA-052	Quill adjust housing gear
18	18BA-018	Bevel pinion	53	18BA-053	Elastic pin
19	18BA-019	Screw SET	54	18BA-054	Screw CAP (x2)
20	18BA-020	Bearing 6204zz	55	18BA-055	Scale
21	18BA-021	Elevating shaft	56	18BA-056	Adapter pivot stud
22	18BA-022	Key	57	18BA-057	C ring
23	18BA-023	Bearing cap	58	18BA-058	T-bolt
24	18BA-024	Bearing 6204zz	59	18BA-059	Washer
25	18BA-025	Bearing retainer ring	60	18BA-060	Hex. nut
26	18BA-026	Dial holder	61	18BA-061	worm gear
27	18BA-027	Dial Metric:125 graduations Inch:100 graduations	62	18BA-062	Washer
28	18BA-028	Dial lock nut	63	18BA-063	Key
29	18BA-029	Gearshaft clutch	64	18BA-064	Vertical adjust gear shaft
30	18BA-030	Elevating crank	65	18BA-065	Hoisting ring
31	18BA-031	Handle	66	18BA-066	Scale
32	18BA-032	Screw	67	18BA-067	Spider
33	18BA-033	Column-knee liner	68	18BA-068	Turret
34	18BA-034	Gib screw	69	18BA-069	Lock bolt
35	18BA-035	Gib	70	18BA-070	Gib

PART LIST OF THE JF-183V, JF-185V BASIC ASSEMBLY

Ref.No	Part No	Description	Ref.No	Part No	Description
71	18BA-071	Turret clamp screw	89	18BA-089	Pipe adaptor
72	18BA-072	Hex. nut	90	18BA-090	Pipe
73	18BA-073	Ram pinion	91	18BA-091	Iron web
74	18BA-074	Nut	92	18BA-092	Electrical box
75	18BA-075	Pipe fitter	93	18BA-093	Electrical oil pump
76	18BA-076	Pipe	94	18BA-094	Screw CAP
77	18BA-077	Pipe fixed block	95	18BA-095	Knee front cover
78	18BA-078	Screw	96	18BA-096	Bevel pinion
79	18BA-079	Valve	97	18BA-097	Screw SET
80	18BA-080	Nose	98	18BA-098	Key
81	18BA-081	Door support bushing	99	18BA-099	Elevating motor shaft
82	18BA-082	Washer	100	18BA-100	Screw SET
83	18BA-083	Door	101	18BA-101	Key
84	18BA-084	Door stud	102	18BA-102	Elevating motor
85	18BA-085	Control panel support setting	103	18BA-103	Screw
86	18BA-086	Control panel support	104	18BA-104	Fixed screw
87	18BA-087	Control panel box	105	18BA-105	Coolant pump setting
88	18BA-088	Coolant pump	106	18BA-106	Plunger
			107	18BA-107	Limit switch setting