

OPERATIONS MANUAL

Mechanical Drawings and Instructions
for

PARTNER ML17 and ML20 CNC LATHE

Milltronics Manufacturing Company
1400 Mill Lane
Waconia, Minnesota 55387 USA

Phone: 952-442-1410□

Fax: 952-442-6457

Parts start on page 55

Version F - AC armature cable 8852-7

If Sigma 1:Axis drive AM-43
and Motor w/o brake is
MO-94

Front window
MPL-640

Coolant Pump
MA-201

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SPECIFICATIONS

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SPEC	MODEL	(17")	(21")
Width of bed	mm	300(11.8")	
Swing over bed	mm	430(17")	530(21")
Swing over cross slide	mm	230(9")	300(11.8")
Swing in gap	mm	610(24")	710(28")
Gap width in front of face plate	mm	150(6")	
Height of center from leg bottom	mm	1080(42.5")	1180(46.5")
Distance between centers	mm	1100/1700/2000(43"/67"/80")	
Spindle bore	mm	58(2 1/4")	
Spindle nose	ASA	A1-6 or (D1-6)	
Quill taper	M.T	No.6	
Chuck type	mm	3 Jaw 250(9") or 4 Jaw 300(12")	
Range of spindle speeds	R.P.M	H: 2600 M: 600 or 12 Steps L: 140 Infinitely variable	
X-Travel	mm	270(11")	
Z-Travel	mm	850/1450/1750(33"/57"/69")	
X-Ball screw	mm	ø25XP5	
Z-Ball screw	mm	ø40XP10	
Rapid traverse rate x-axis	mm	8000 mm/min	
Rapid traverse rate z-axis	mm	10000 mm/min	
Spindle drive motor	HP	7.5 or 10	
X feed motor (AC)	HP(kw)	1(0.75)	
Z feed motor (AC)	HP(kw)	1(0.75)	
Auto lube pump	W	40	
Coolant pump motor	HP	1/8	
Tailstock spindle diameter	mm	60(2 3/8")	
Tailstock spindle travel	mm	150(6")	
Taper hole of tailstock spindle	M.T	No.4	
Floor space	mm		
Mass of machine	kg(lb)	1743: 1600(3520) 1767: 1800(3960) 1780: 2000(4400)	2143: 1750(3850) 2167: 1950(4290) 2180: 2150(4730)

HANDLING

CAUTION: When handling, observe symbols painted on crate for
"safe lifting" either by sling or fork lift!

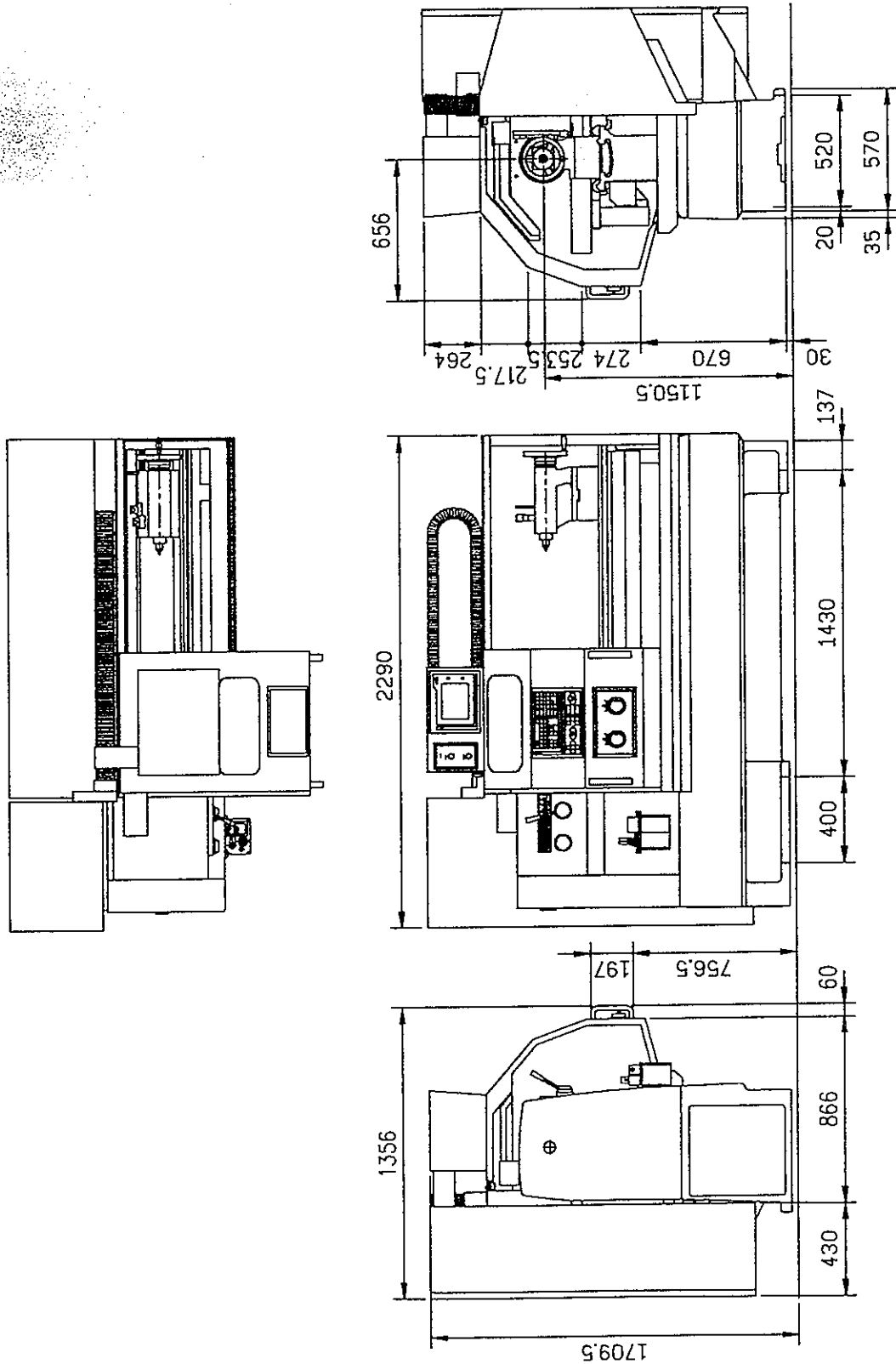
When crate has been removed, the machine can be
handled either on or off the skid.

UNPACKING

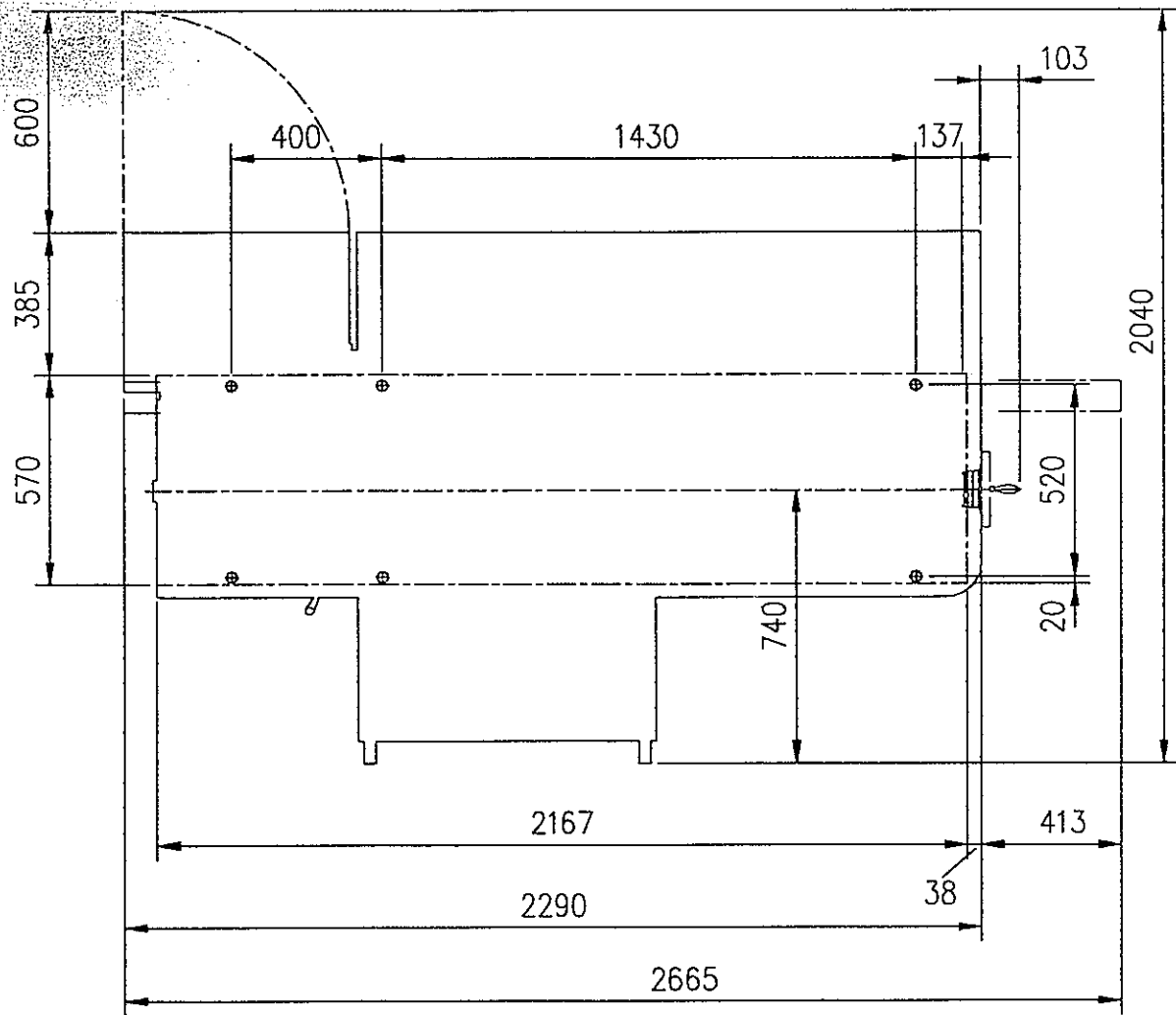
Carefully unpack and remove all items from crate. Examine for
freight damage & check against packing slip to verify receipt
of complete shipment. Freight damage claims must be filed
immediately with the carrier — NOT WITH THE FACTORY
Shortage should be reported to the distributor immediately.

INSTALLATION

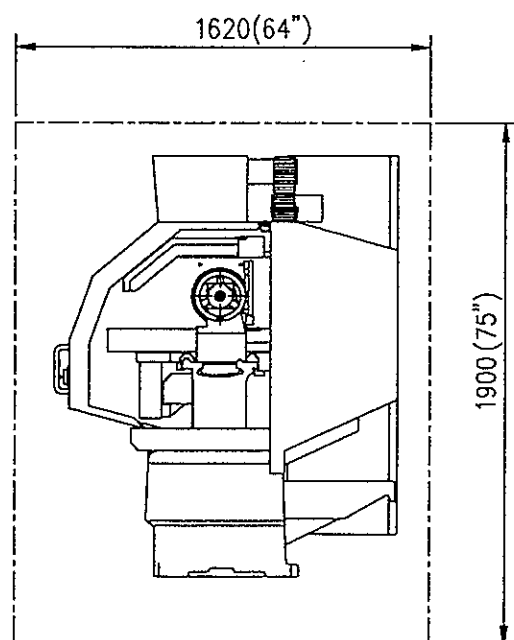
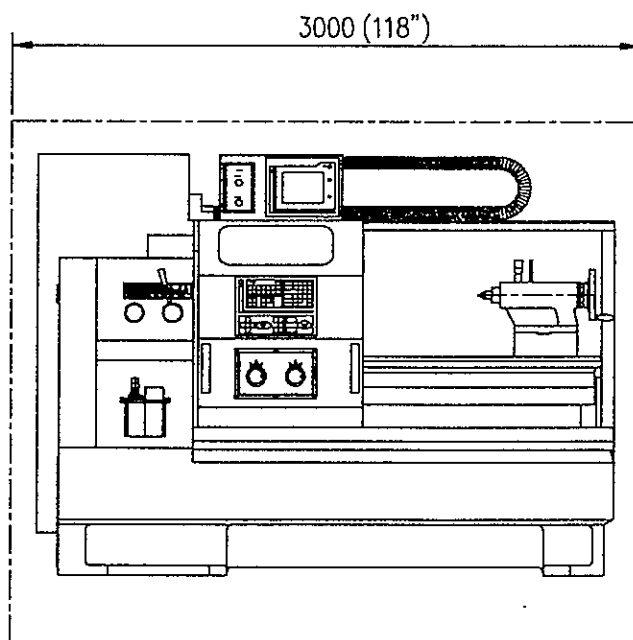
DIMENSIONAL DRAWING



LEVELLINE

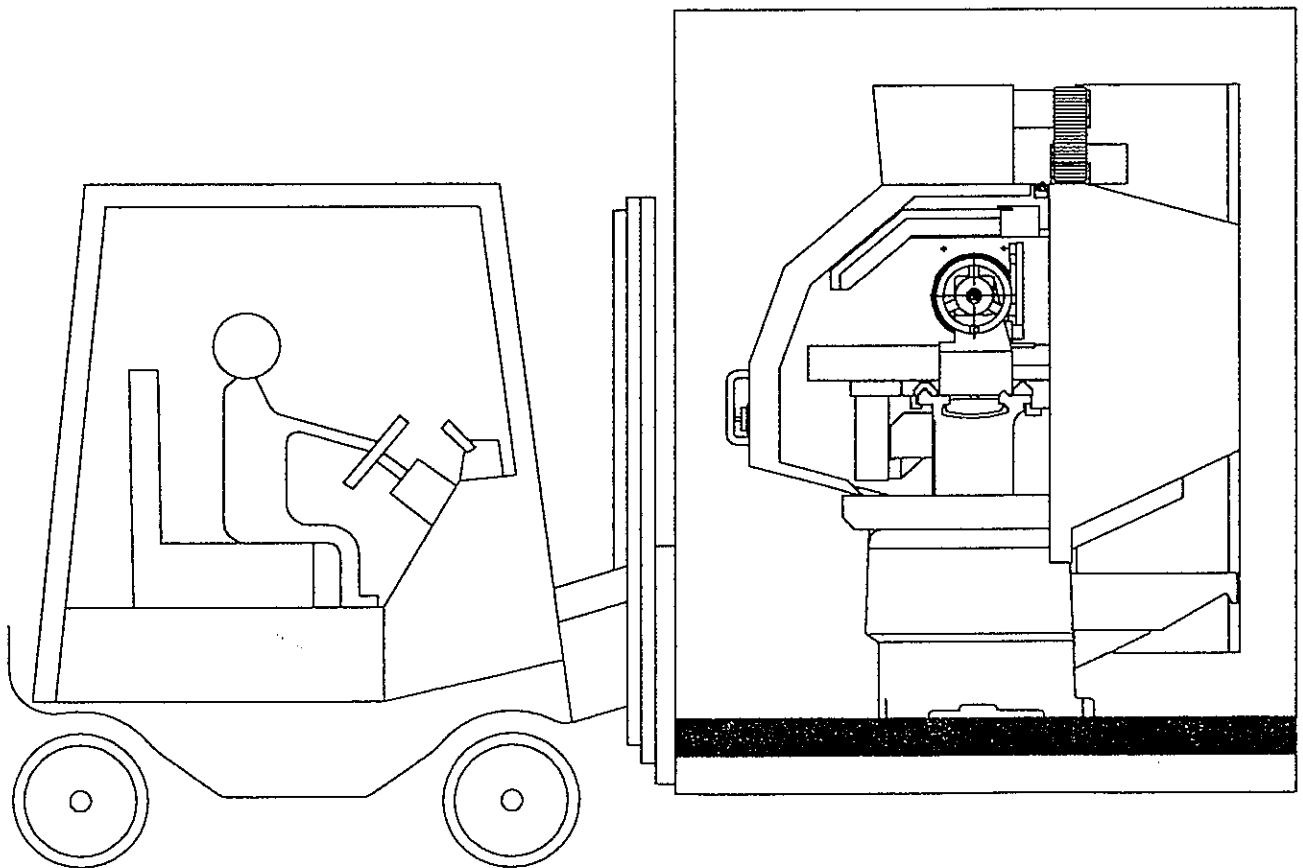


FLOOR SPACE REQUIREMENT



REMOVE MACHINE IN WOODEN BOX

1. Machine net weight: approx. 2000 KGS
gross weight: approx. 2200 KGS (in wooden box)
2. Lifting truck or gantry crane provided. Any lifting equipment should edequate capacity to carry this machine.
3. The sling of the crane should be strong enough to carry the machine. when hanging machine up, the hanging angle should not extend 120 degree or the sling might be break and cause machine crashed.



LIFING MACHING

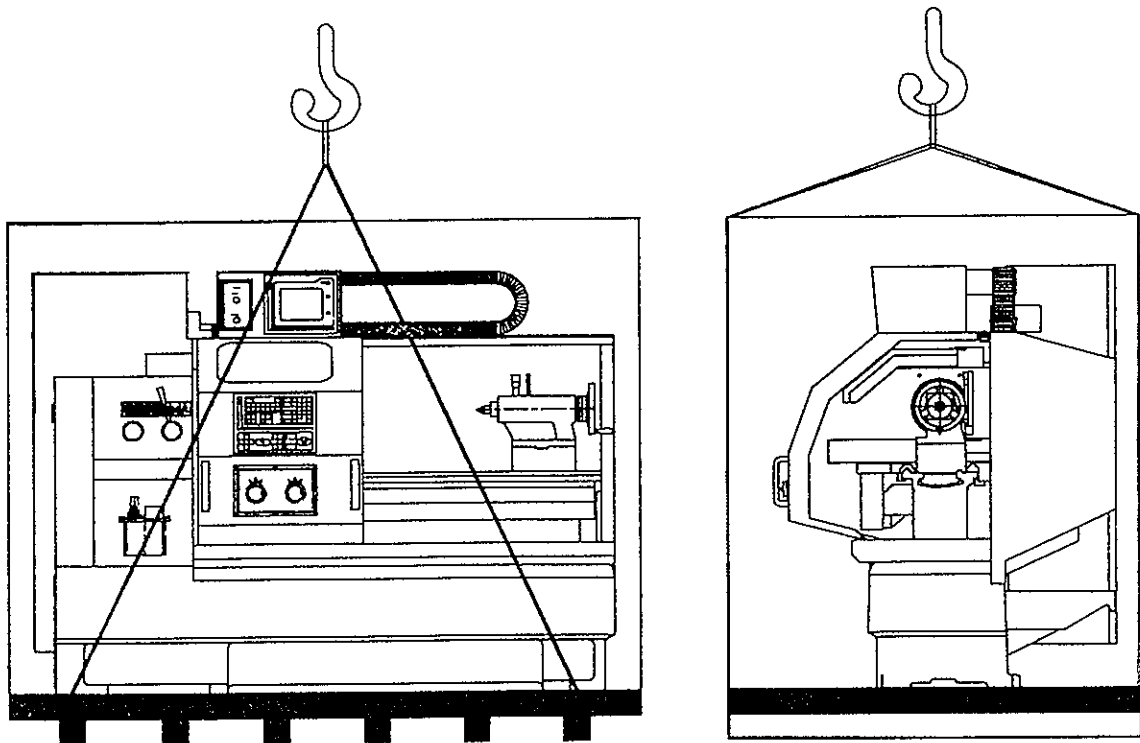
SLNG:LONG OVER 10 M

N.W.:2000 KGS

C.W.:2200 KGS

CRANE:OVER 3 TONS

MEASUREMENT:3000X1620X1900(mm)

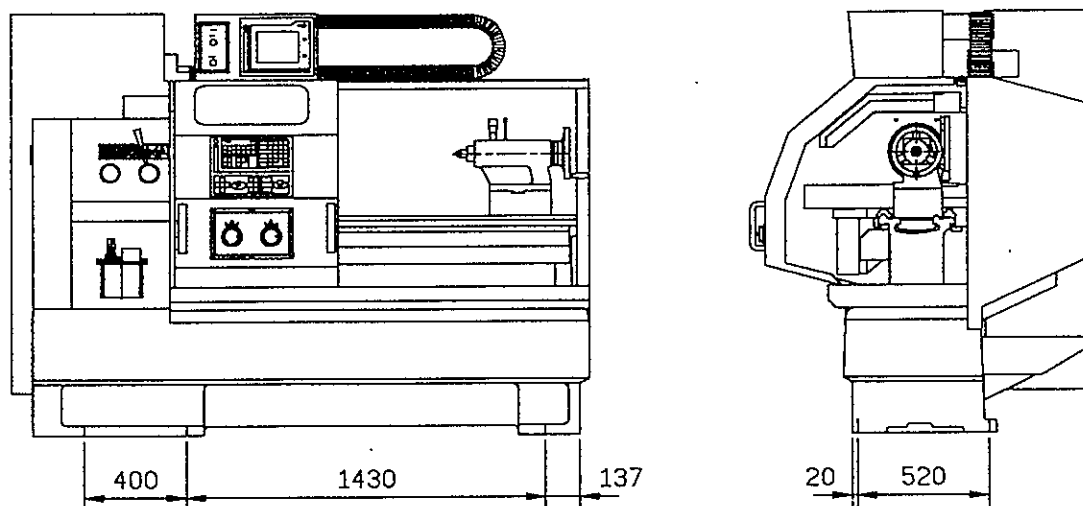


LIFING METHOD OF WOOD WITH CRANE

FOUNDATION REQUIREMENT

Leveling :

After the machine has been moved to its proper location, it must be accurately leveled. Use two spirit levels for the operation. The machine has six adjustable feet under the corners of the pedestal base. Place the pads under the feet of pedestal, loosen the NUT^N and raise or lower the foot with a pin wrench so that all six feet rest firmly on the floor. When the adjustment is done, tighten NUT^N (see figure 3).



CAUTION :

IT MUST BE SURE EVERY POINT IS TOUCHING THE GROUND TO SUPPORT THE MACHINE.

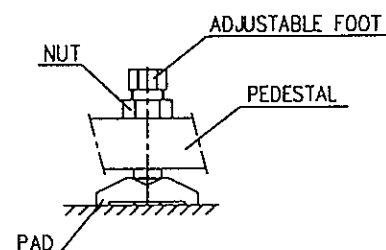
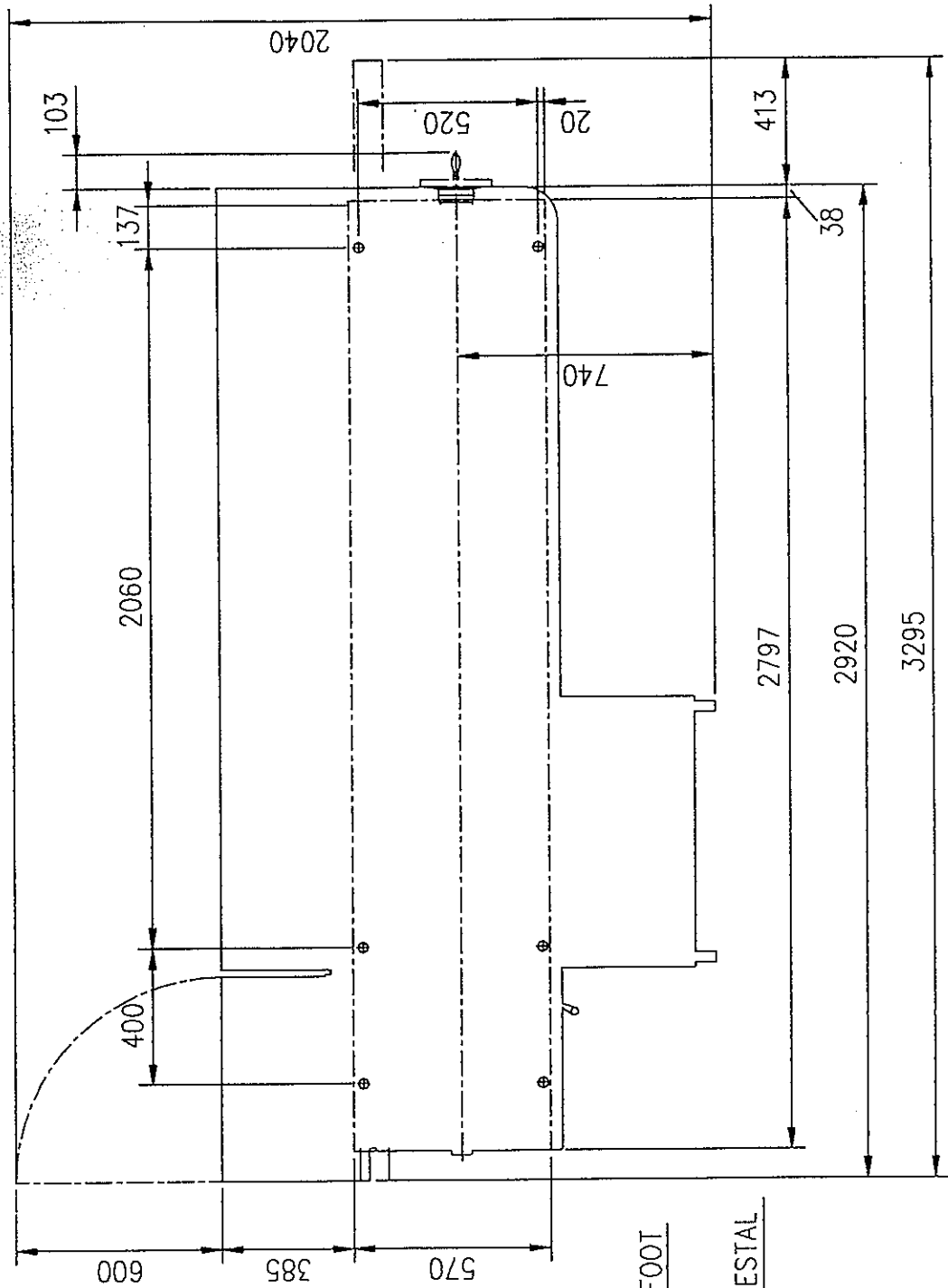


FIG 3

LEVELLINE



CLEANING

This machine is protected with a special anti-rust agent.

Before operating the machine, clean all parts especially the lead screw, rack, and all bright surfaces with soft brush cloth soaked with cleaning solvent or kerosene. DON'T USE GASOLINE OR CELLULOSE SOLVENT! (to avoid danger or fire or explosion.) After the removal of anti-agent, Keep the machine properly lubricated. Press the hand-push (on shot) pump several times to make sure ways are lubricated.

LEVEL ADJUSTMENT

Once the machine is located on the bolts, a machinists level should be used alternately on the cross slide and slideways of the lathe as illustrated (fig. 3 & 3A.) Minute adjustments of adjusting bolts should be made until the machine is

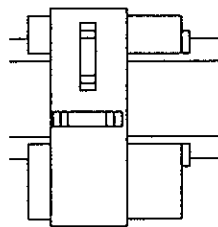
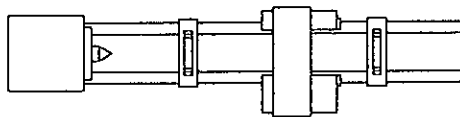
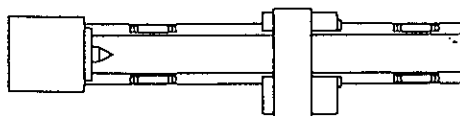


FIG 3



1. BED LEVEL TRANSVERSE DIRECTION

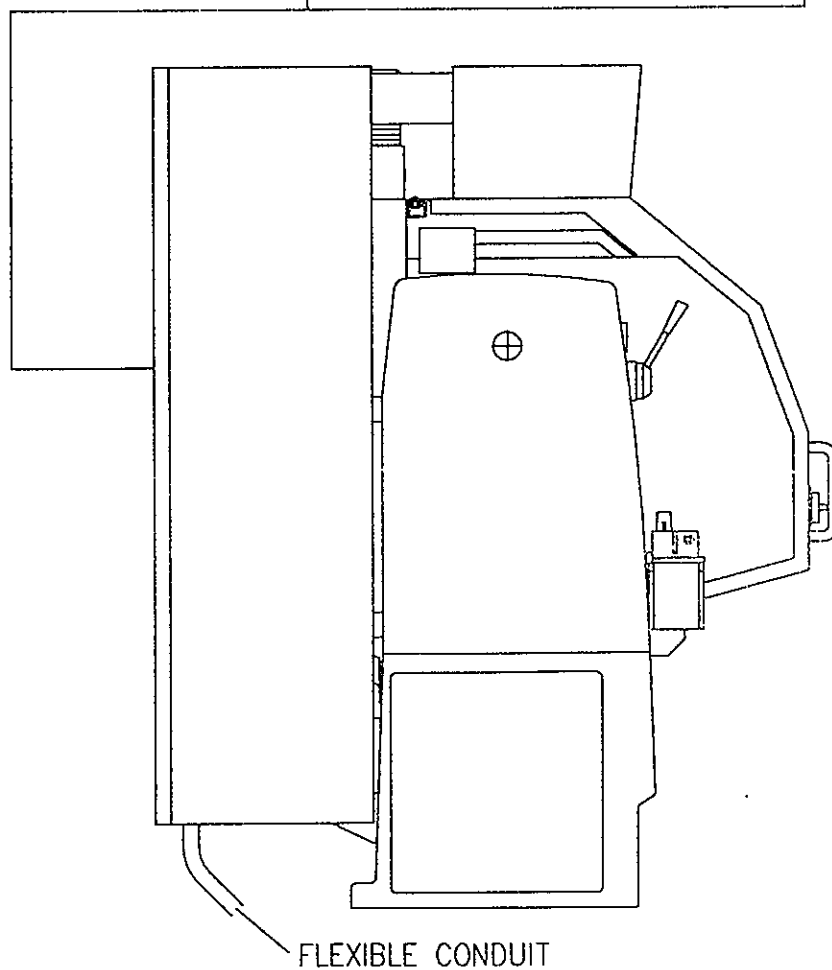
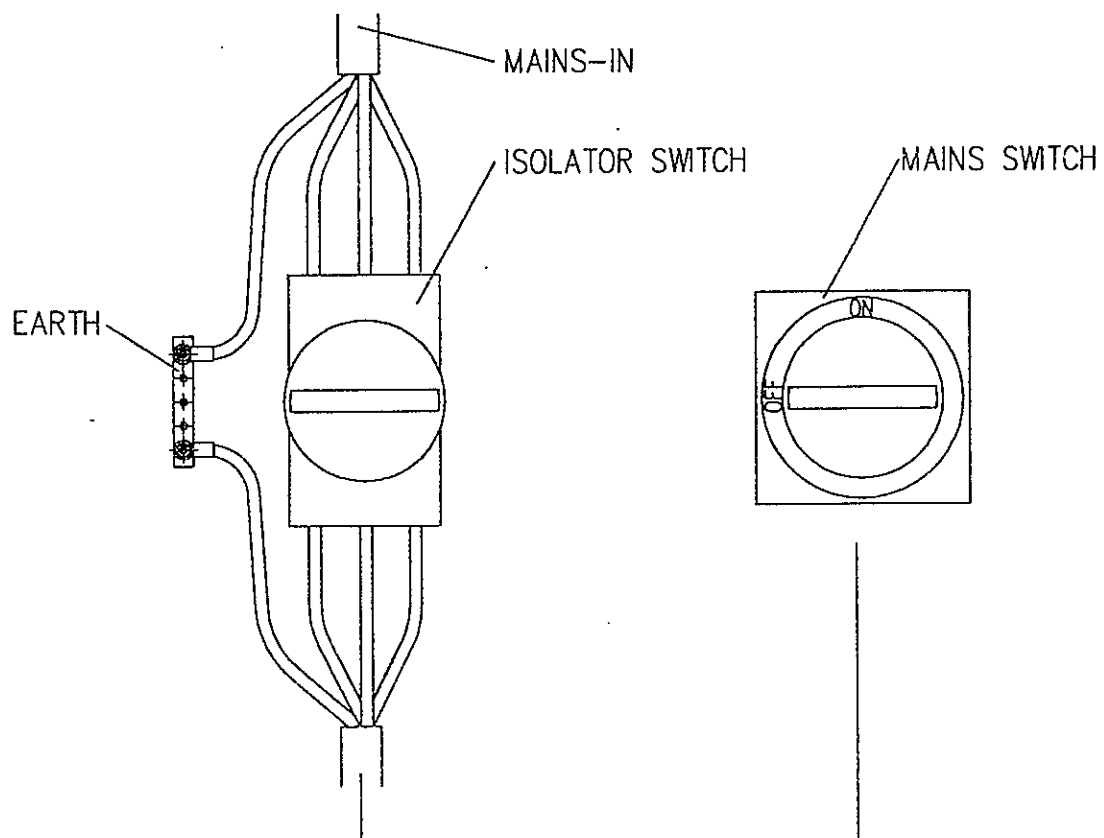


2. BED LEVEL LONGITUDINAL DIRECTION

WHEN USING PRECISION
LEVEL ALL READINGS TO
BE WITHIN 0.0003"
(0.008mm) IN 12" (305mm)

WHEN USING PRECISION
LEVEL ALONG BED MAXIMUM
READING TO BE WITHIN
0.0008" (0.02mm) IN 12" (305mm)

CONNECTING THE MAINS SUPPLY

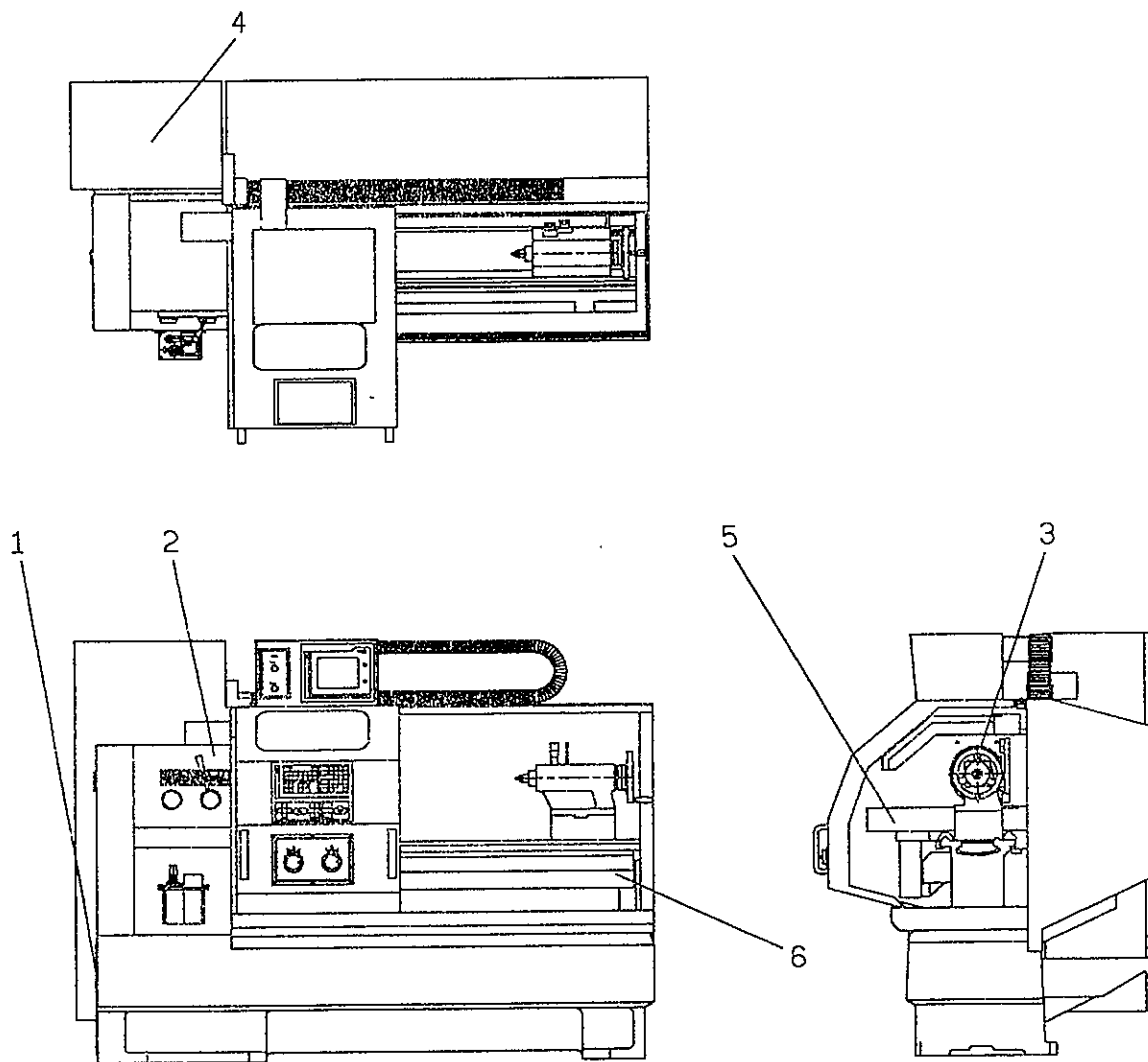


OPERATOR SAFETY

GENERAL SAFETY RULES

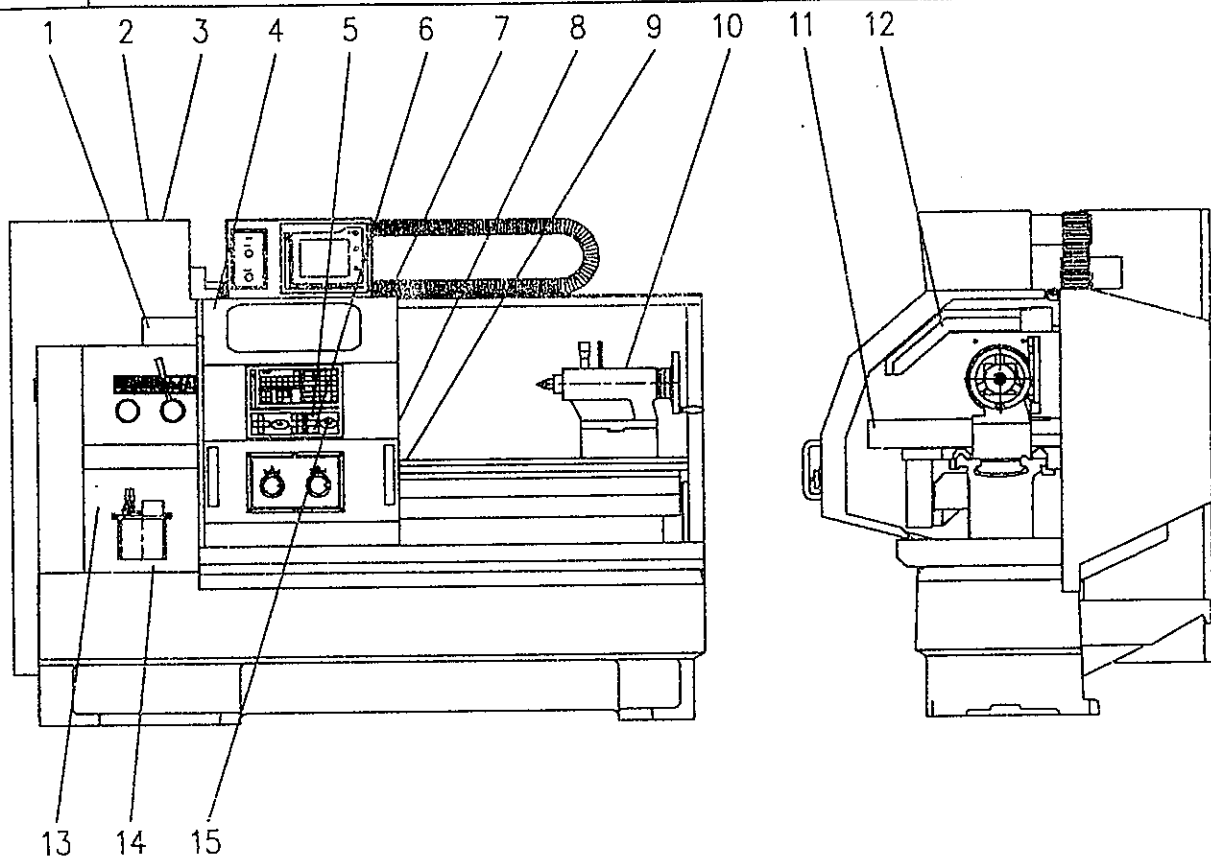
1. Prevent loose clothing, hair or jewelry from contacting spindle or other moving parts.
2. Never change tools, handle spindle, change workpiece or perform any work on the lathe unless the CNC is in EMERGENCY STOP or TOOL CHANGE modes.
3. Always wear eye protection when operating the lathe.
4. Do not operate the lathe without spindle cover or axis way covers in place.
5. Do not place hands or objects between spindle and carriage and lathe bed unless the CNC is in EMERGENCY STOP mode.
6. Do not modify this equipment without prior approval from Milltronics Manufacturing Company. Doing so may create a hazard and void your warranty.
7. Do not operate the lathe if the CNC does not display EMERGENCY STOP on power-up.
8. Electrical enclosures contain high voltage devices, disconnect equipment from main power source before opening electrical enclosures.
9. Always check oil levels before operating machine.
10. Do not operate power chuck/collet unit while spindle is in motion.
11. Place CNC in EMERGENCY STOP mode when not in use.
12. Turn off main power if;
 - Power problems develop
 - Power outages occur
 - Ambient temperatures exceeding 105° F.
13. If using an indexer, be sure tools in the turret will clear the lathe bed before operating.
14. When operating lathe, keep chip guards in place to contain flying chips. Do not allow hot chips to contact flammable objects or materials.

HAZARD ZONES



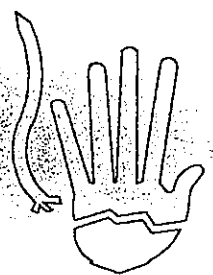
No.	Zone
1	Motor cap
2	Headstock
3	Hydraulic chuck
4	Cabinet
5	Gang tooling system
6	Ball screw cap

MACHINE AND OPERATOR SAFETY



1. Chuck guard switch
2. Mains isolator switch
3. Electrical cabinet key locks
4. Safety door
5. Control on-push-button
6. Control off-push-button
7. Machine work light
8. X-axis ac servo motor
9. Z-axis limit switch
10. Taistock limit switch
11. X-axis limit switch
12. Chuck guard-Interlocked guard
13. Spindle encoder
14. Z-axis ac servo motor
15. Emergency stop push-button

WARNING LABEL




WARNING

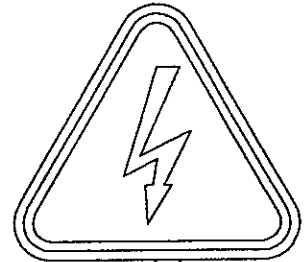
Hazardous voltage
will cause severe
injury or death

Turn off power
before servicing

PLEASE CONNECT

V

POWER SUPPLY FOR
THIS MACHINE

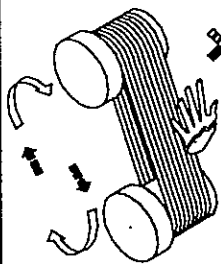


Conforme au code du travail CE

CONSTRUCTEUR

ANNÉE DE FABRICATION

IMMATRICULATION

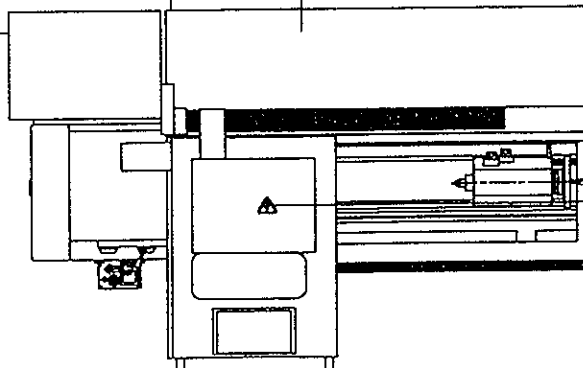



WARNING

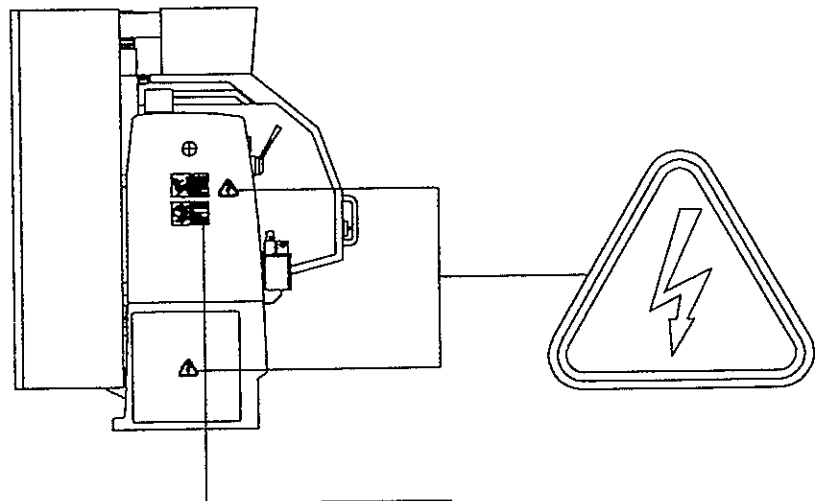
High speed belt and pulley
inside.
Before take off the cover,
turn off the power.

Do not touch belt or pulley
wheel whilst machine running.

Failure to follow the warning
can result in severe injury.



WARNING LABEL



! WARNING

High speed belt and pulley inside.
Before take off the cover, turn off the power.

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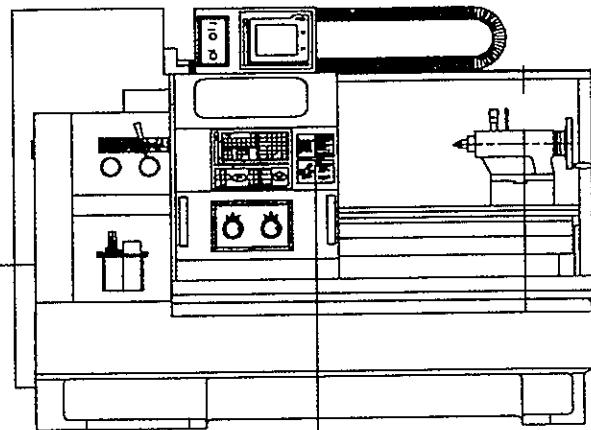
! WARNING

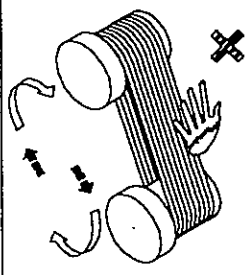
Do not extend or expose bar stock from rear of spindle without use of proper bar feeder.

The extended bar stock from rear of spindle will be swung to a broadish range.

Failure to follow the warning may result in severe injury.

WARNING LABEL



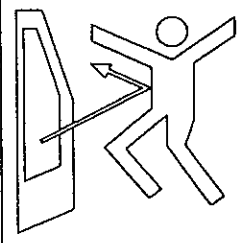


! WARNING

High speed belt and pulley inside.
Before take off the cover, turn off the power.

Do not touch belt or pulley wheel whilst machine running.

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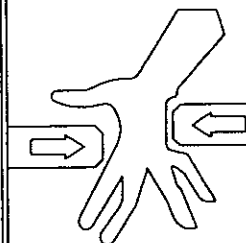
! WARNING

Work piece, chuck jaw or chip may fly out.

KEEP DOOR CLOSE during Automatic Operation Or Spindle Running.

Ensure Door Interlock On.

Failure to follow warning can result in severe injury or death.



! WARNING

Do not approach moving parts during operation.

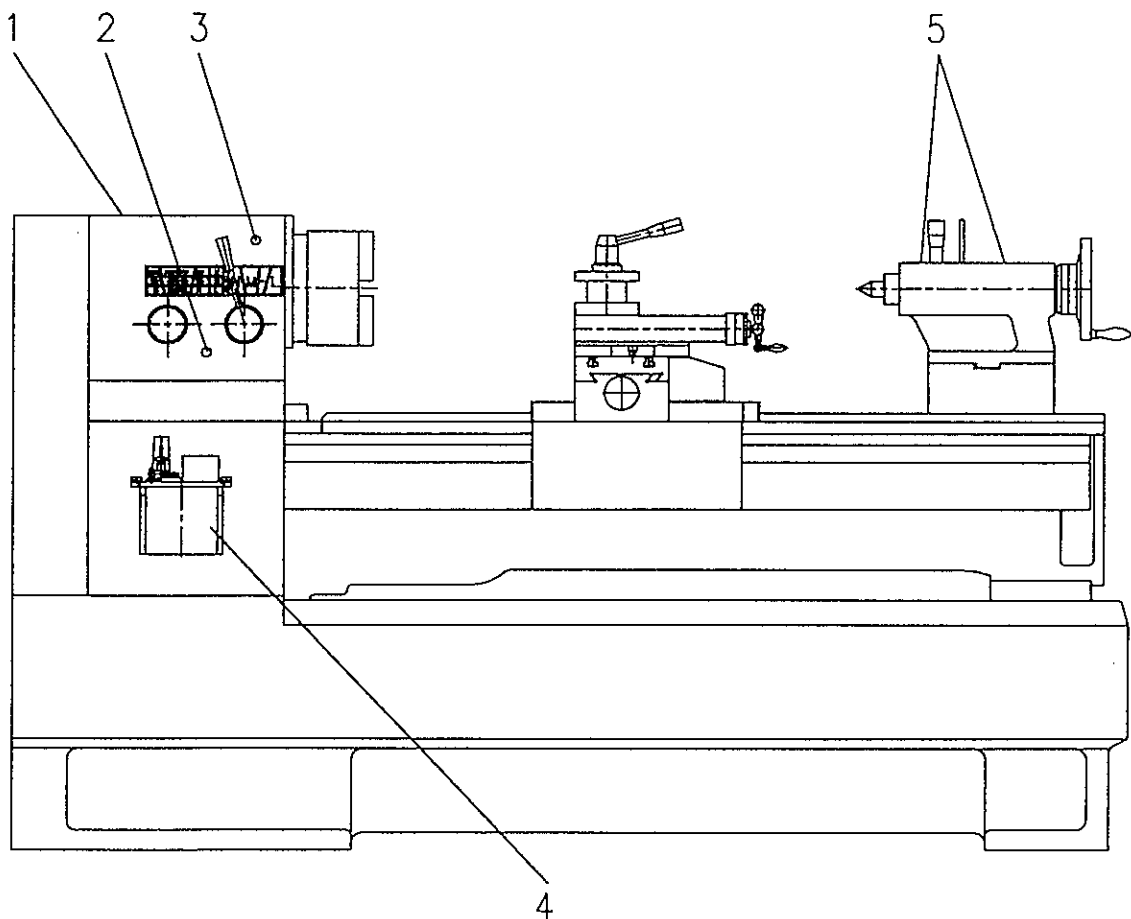
Failure to follow a warning can result in severe injury.

LUBRICATION

LUBRICATION

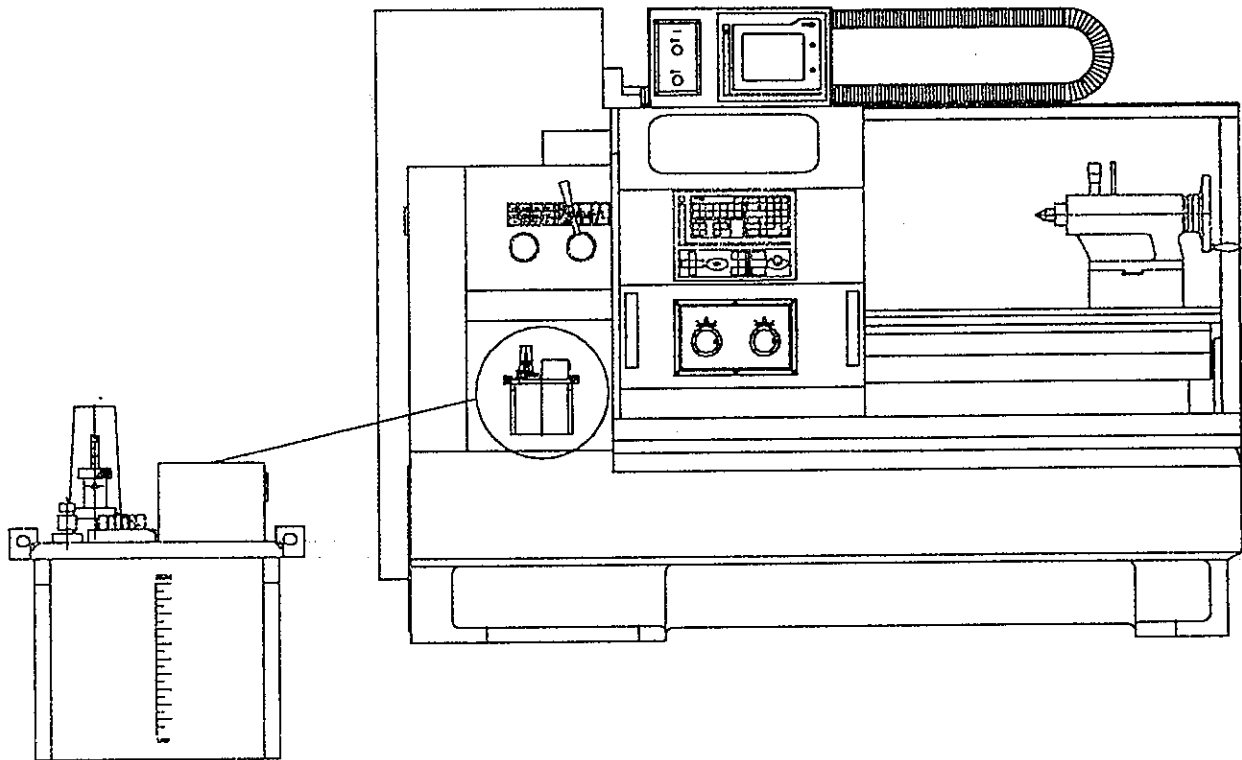
CAUTION: BEFORE OPERATING, LUBRICATE MACHINE AS INDICATED!

FOR LONG LIFE AND PRECISE OPERATION OF THE LATHE, ALL MOVING PARTS SHOULD BE KEPT PROPERLY LUBRICATED. TO KEEP THE MACHINE PROPERLY LUBRICATED, FOLLOW THE INSTRUCTIONS GIVEN ON THE FOLLOWING CHART: FIG'S 4 & 4A



1. HEADSTOCK COVER
2. HEADSTOCK OIL SIGHT GLASS
3. OIL "FLOW" SIGHT GLASS
4. CENTRAL LUBRICATING OIL-FEEDING EQUIPMENT
5. OIL INLETS TAILSTOCK

LUBRICATION PUMP



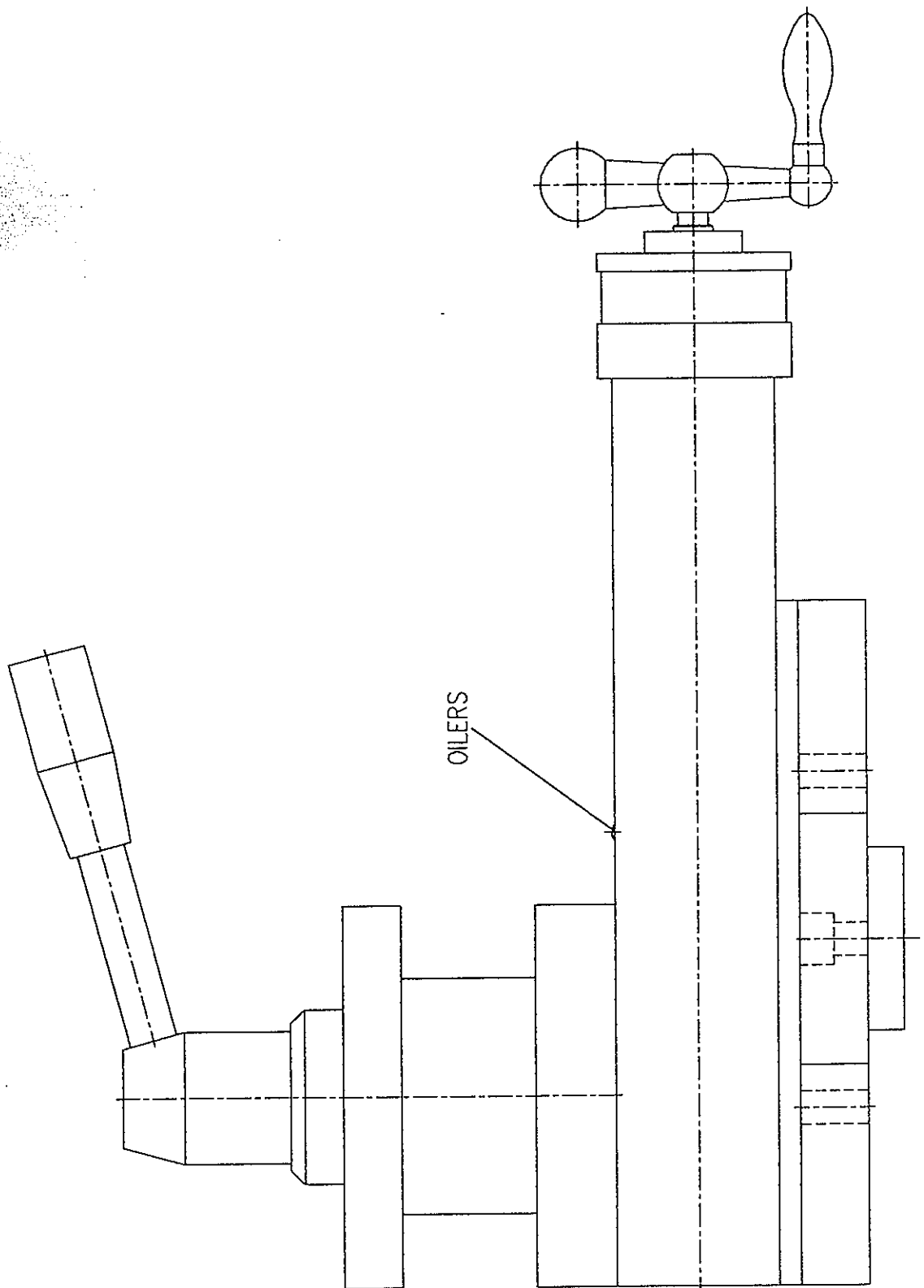
DIRECTIONS

*Note the quantity will reduce gradually under normal application.

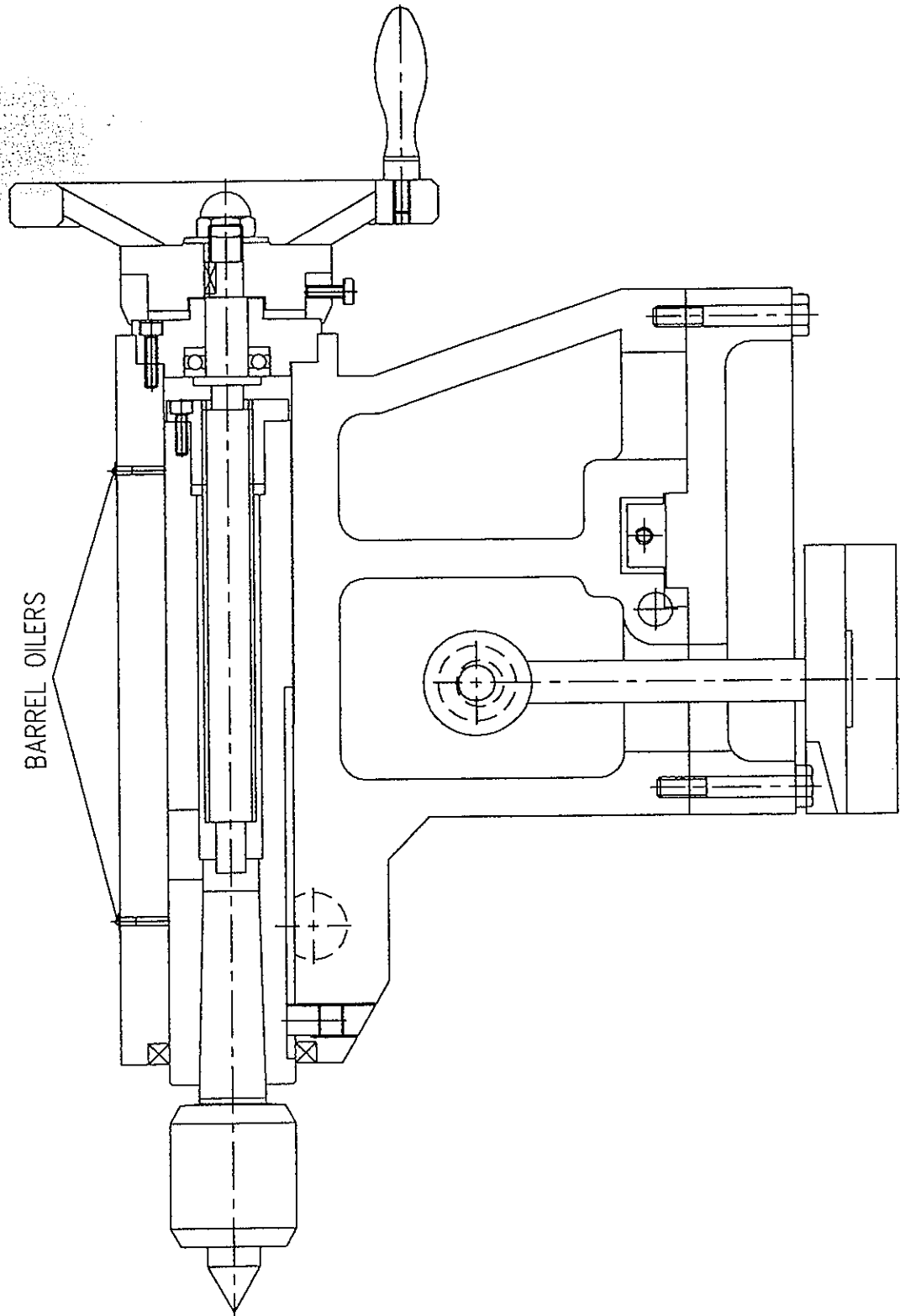
*Note whether the motor is running or not?

1. Fill clean lubricant into the oil tank up to the top red line.
2. The oil tank preserves clean lubricant.
3. In case impurity remains in the oil tank so as to fail the oil feed,
please cleanse the oil absorbing net immediately.
4. First use the oil feeding dutton to fill up the empty pipes for normal application.
5. After pulling open the oil feeding button, never force it.
6. The adjustment of discharge is to release the fixing bolt and adjust it at desired
figure displayed on the scale, so the figure is to show the discharge C cc/cy.
7. Oil surface below the red line. it is necessary to refill oil.

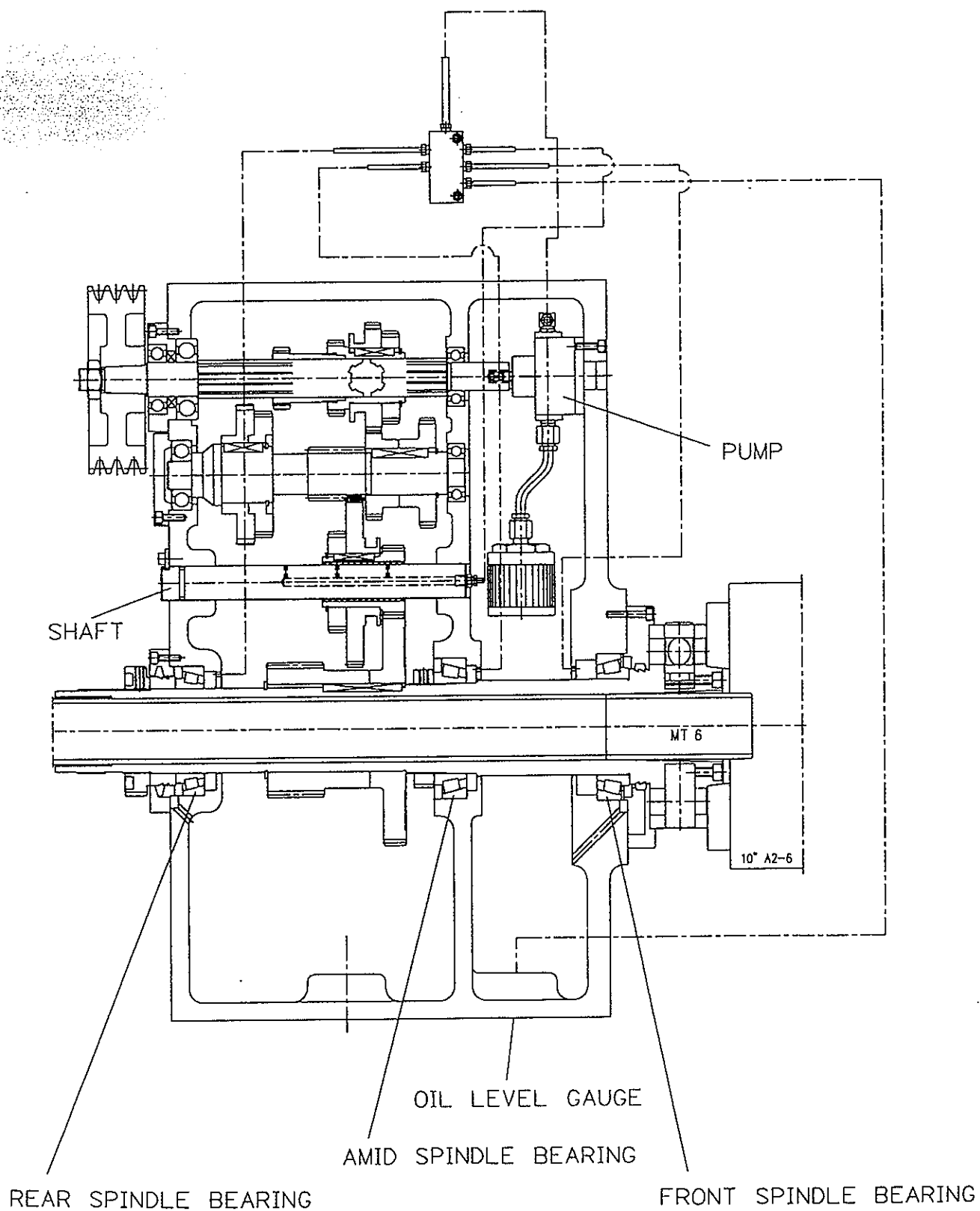
TOPSLIDE LUBRICATION



TAILSTOCK LUBRICATION



HEADSTOCK LUBRICATION SYSTEM



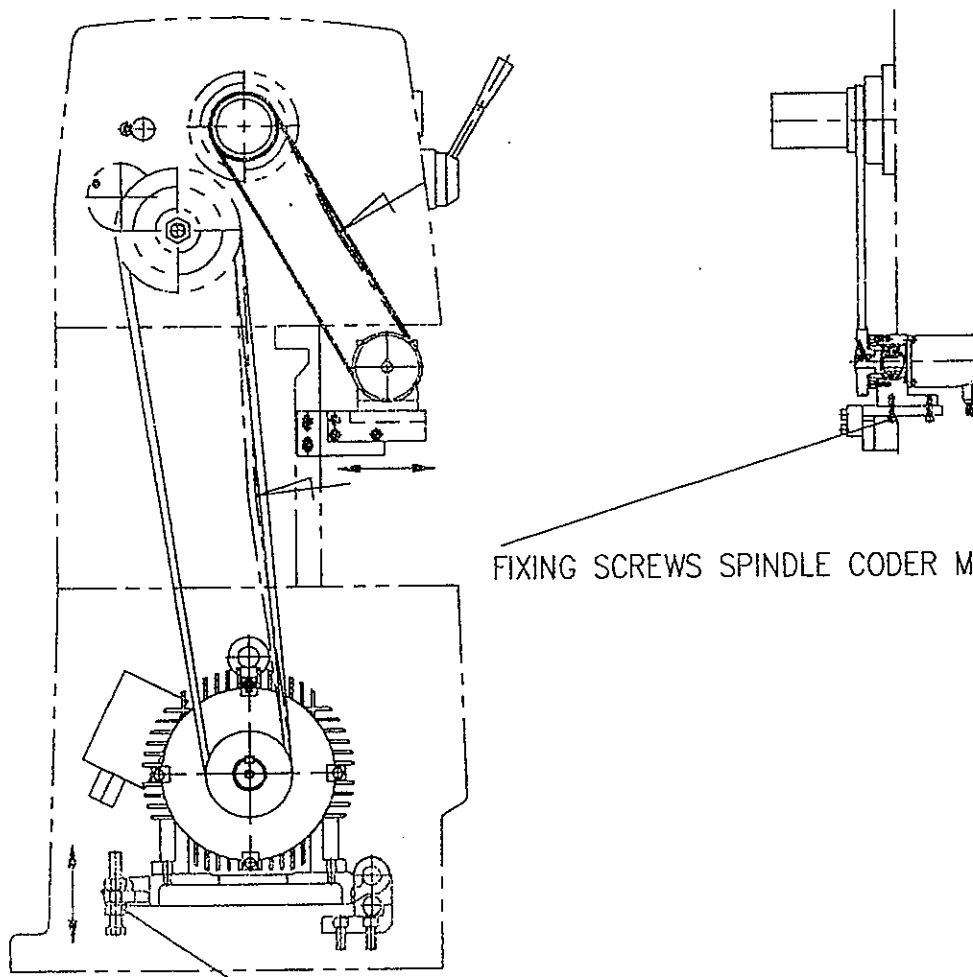
LOCATION	METHOD	FREQUENCY	QUANTITY	OIL RECOMMENDED	REMARKS
HEADSTOCK	Fill: Remove head cover fill to "sight Glass Full Mark" Drain: Remove plug (Lower-center outboard end headstock)	1st Change: After approx. 200 hours Thereafter: Every 6 months	11.36 liters (3 Cd.)	Shell Telus #68	Oil is distributed by automatic pressure system

LUBRICATION SYSTEM

Put electrical power and air in the OFF position and fill lubrication reservoir with mobil vactra oil NO. 2 or equivalent. This unit is preset at the factory to feed 3cc into the system every 10 minutes, the amount may be increased if desired. Remove and clean tank and change or clean suction filter every 6 months. Concerning lubrication of the feed screws, all axes ball screws and way surfaces are lubricated automatically. Maximum capacity is 2 liters, fill with Mobil vactra oil NO. 2 or equivalent.

SPINDLE MOTOR AND
SPINDLE CODER
BELT TENSION ADJUSTMENT

SML-530



FIXING SCREWS SPINDLE CODER MOUNTING PLATE

BELT TENSION ADJUSTER

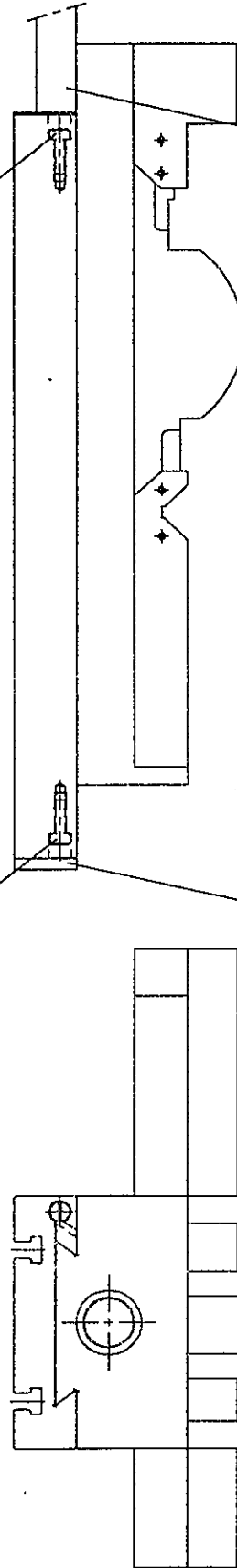
CROSSLIDE TAPER GIBS ADJUSTMENT

REAR GIB SCREW

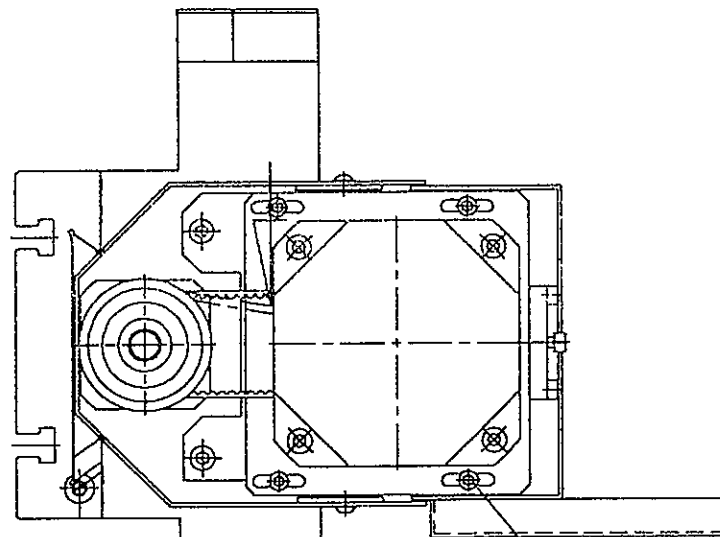
REAR COVER

FRONT GIB SCREW
SCREW IN TO TAKE
UP BACKLASH

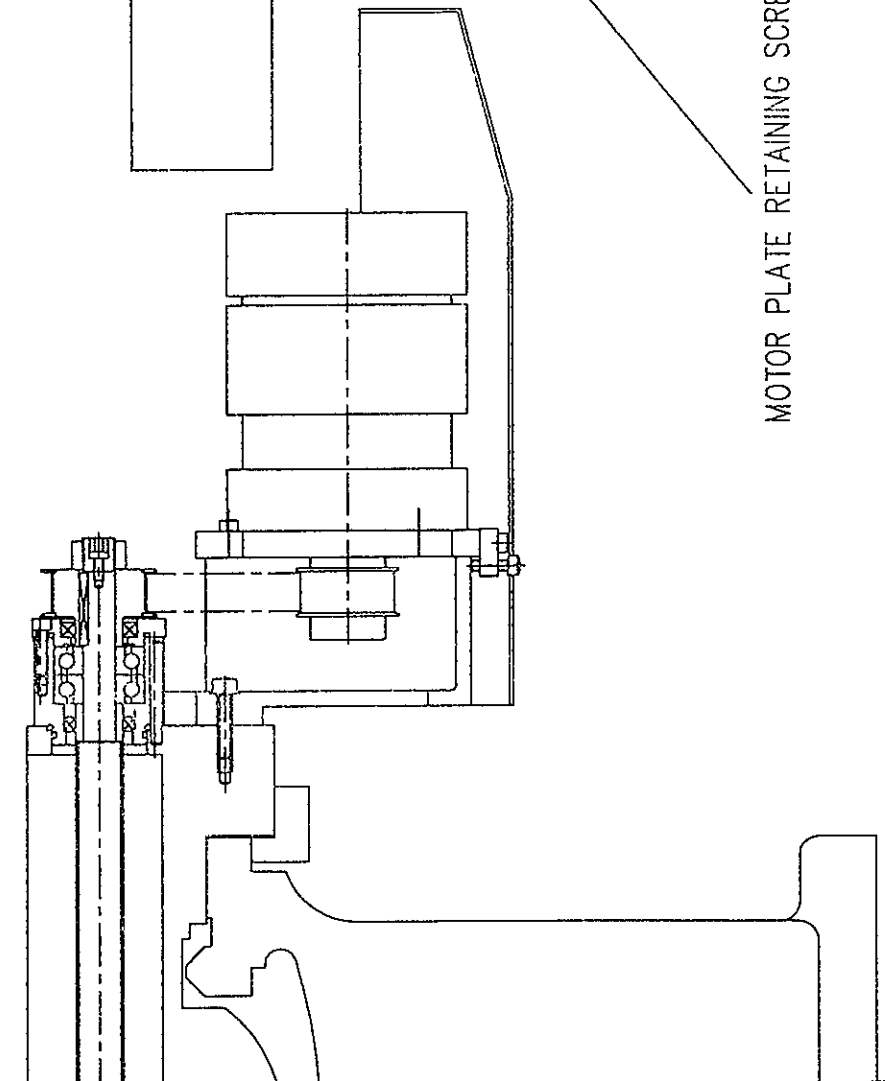
FRONT WIPER



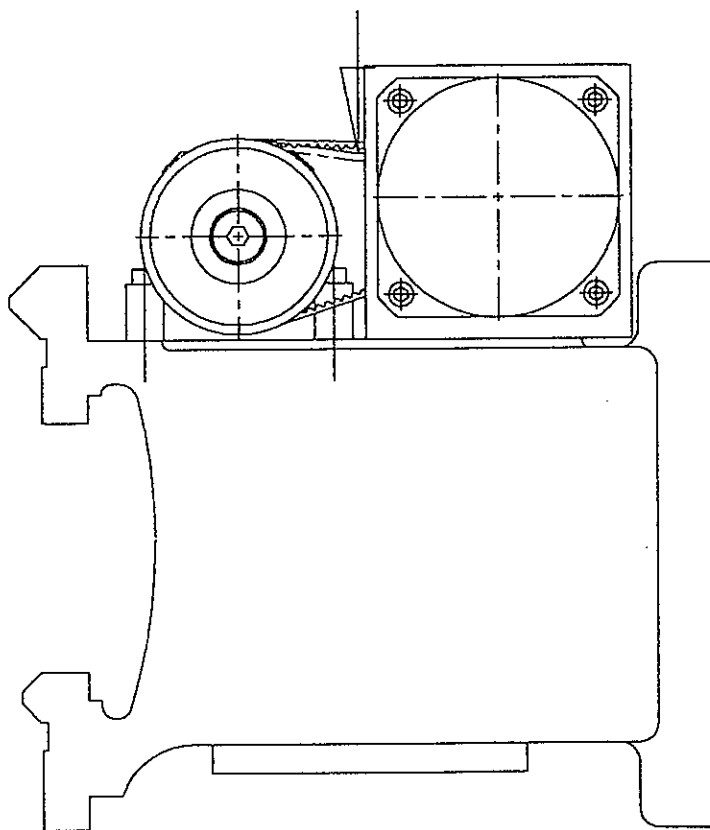
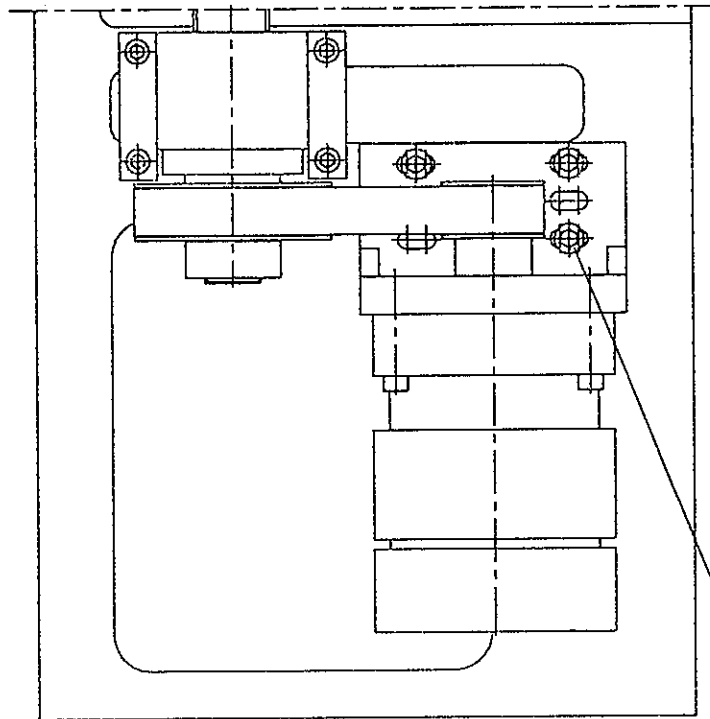
X-AXIS DRIVE BELT TENSION ADJUSTMENT



MOTOR PLATE RETAINING SCREWS



Z-AXIS DRIVE BELT TENSION ADJUSTMENT



MOTOR SUPPORT RETAINING SCREWS

TAILSTOCK

COMPOUND SLIDE:

THE COMPOUND SLIDE CAN ONLY BE OPERATED MANUALLY. IT IS MOUNTED ON A SWIVEL BASE WHICH ENABLES IT TO BE POSITIONED AT ANY DESIRED ANGLE.

CAUTION: DO NOT OPERATE COMPOUND SLIDE FEED UNLESS COMPOUND SLIDE LOCKING SCREW HAS BEEN RELEASED.

OPERATION:

(A) SWIVEL BASE:

3 BOLTS LOCK THE SWIVEL BASE AT ANY SET ANGLE ON THE CROSS SLIDE. ONE IS AT THE FRONT (UNDER THE SLIDE) AND THE OTHER TWO ARE ON EITHER SIDE.

TO REPOSITION (CHANGE ANGLE SETTING)

1. RETRACT THE SLIDE TO EXPOSE THE CENTER HOLD DOWN BOLT.
2. LOOSEN ALL THREE HOLD DOWN BOLTS.
3. SWIVEL THE SLIDE TO NEW DESIRED POSITION.
4. RETIGHTEN ALL THREE HOLD DOWN BOLTS.
5. RETURN SLIDE TO NORMAL OPERATING POSITION.

* CAUTION:

IT IS DANGEROUS AND PHYSICAL HARM COULD OCCUR IF HEAVY CUTS ARE ATTEMPTED WHEN THE COMPOUND SLIDE IS EXTENDED BEYOND THE END OF THE BASE SLIDE WAYS!

TAILSTOCK

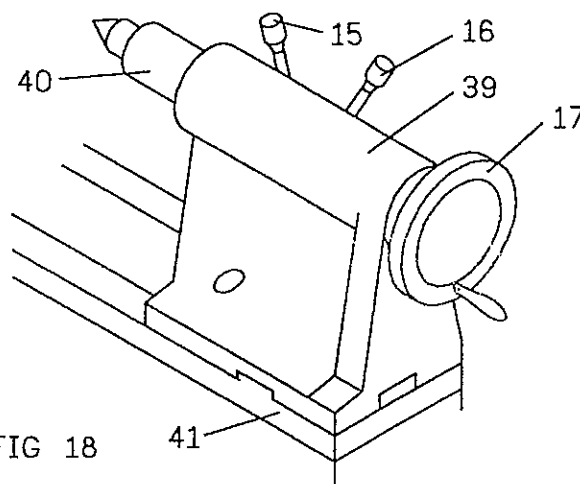
DESCRIPTION:

THE HEAVY, SOLID TAILSTOCK PROVIDES RIGID SUPPORT FOR TURNING BETWEEN CENTERS, AS WELL AS FOR TAILSTOCK DRILLING AND BORING OPERATIONS. THE LARGE SPINDLE IS EQUIPPED WITH A TANG SLOT AND AUTOMATIC CENTER EJECTOR. DUAL INCH/METRIC CALIBRATIONS ARE PROVIDED ON THE SPINDLE. A QUICK ACTING LEVER TYPE CLAMP IS PROVIDED. THE HAND WHEEL IS EQUIPPED WITH A MICROMETER DIAL WITH INCH CALIBRATIONS. CROSS ADJUSTMENT PROVIDES FOR EASY ALIGNMENT AND FOR TURNING SMALL TAPERS.

IT IS EQUIPPED WITH A CAM ACTION CLAMP FOR LOCKING IN POSITION ON THE BED.

PARTS IDENTIFICATION:

- 40 TAILSTOCK SLEEVE
- 41 ADJUSTING SCREW
- 15 SLEEVE LOCK LEVER
- 17 HAND WHEEL
- 16 CLAMP LEVER
- 39 TAILSTOCK BODY



ADJUSTMENT:

ALIGNMENT; TO CORRECT MISALIGNMENT OFF THE HEADSTOCK.

1. POSITION TEST BAR BETWEEN DEAD CENTERS - (ONE IN MAIN SPINDLE TAPER AND ONE IN THE TAILSTOCK TAPER)
2. DETERMINE DIRECTION AND AMOUNT OF MISALIGNMENT (WITH DIAL INDICATOR MOUNTED ON THE SADDLE INDICATOR POINTER AGAINST THE SIDE OF THE TEST BAR, TRAVERSE FROM END TO END OF TEST BAR).
3. LOOSEN THE TWO HEX HEAD BOLTS (FROM BOTTOM SIDE OF TAILSTOCK BASE) THAT LOCK THE BASE AND TAILSTOCK BODY TOGETHER.
4. LOOSEN BOTH FRONT AND REAR AGJUSTING SCREWS (#41 FIG 18).
5. TURN ADJUSTING SCREW (FRONT OR REAR) TO CORRECT. MISALIGNMENT (RUN INDICATOR ALONG TEST BAR TO CHECK). WHEN ALIGNMENT IS CORRECT, CAREFULLY RETIGHTEN ADJUSTING SCREWS AGAINST EACH OTHER AND RECHECK ALIGNMENT.
6. RETIGHTEN THE TWO HEX HEAD BOLTS SECURELY (FROM STEP 3 ABOVE).

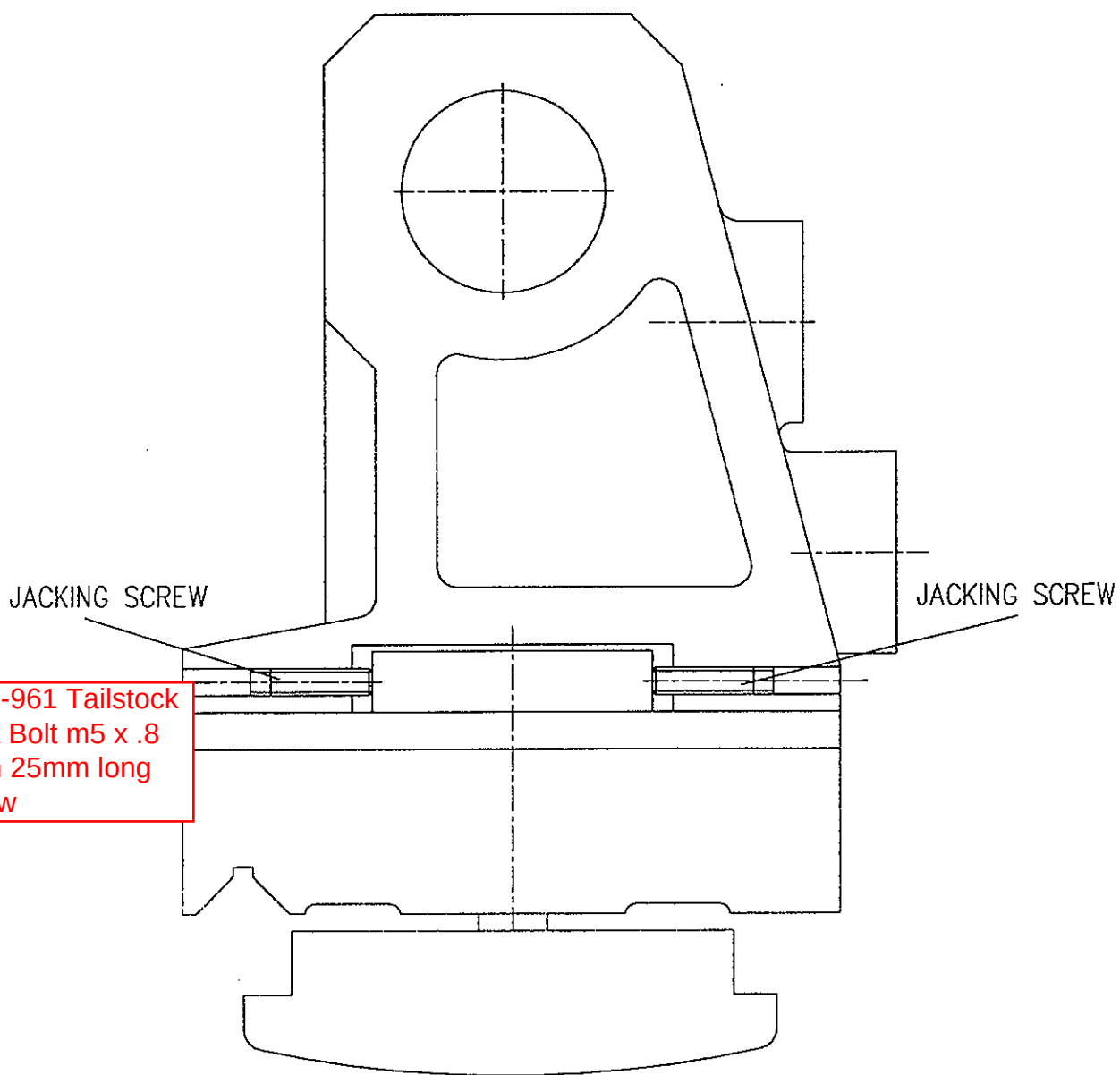
TAPER TURNING/SET OVER;

FOLLOW THE SAME PROCEDURES AS FOR CORRECTING MISALIGNMENT. ESTABLISH AMOUNT OF SET OVER (TAPER) BY MEASURING WITH A SCALE AT THE BASE OR MORE ACCURATELY USING AN INDICATOR MOUNTED ON THE CROSS SLIDE WITH THE CONTACT AGAINST THE SIDE OF THE SPINDLE.

CAUTION:

1. DO NOT USE EXCESSIVE PRESSURE ON A CENTER POINT.
2. DO NOT USE TAPER SHANK TOOLS OR CENTERS THAT ARE SCORED OR DAMAGED.

TAILSTOCK SETOVER ADJUSTMENT



MPL-961 Tailstock
Jack Bolt m5 x .8
pitch 25mm long
screw

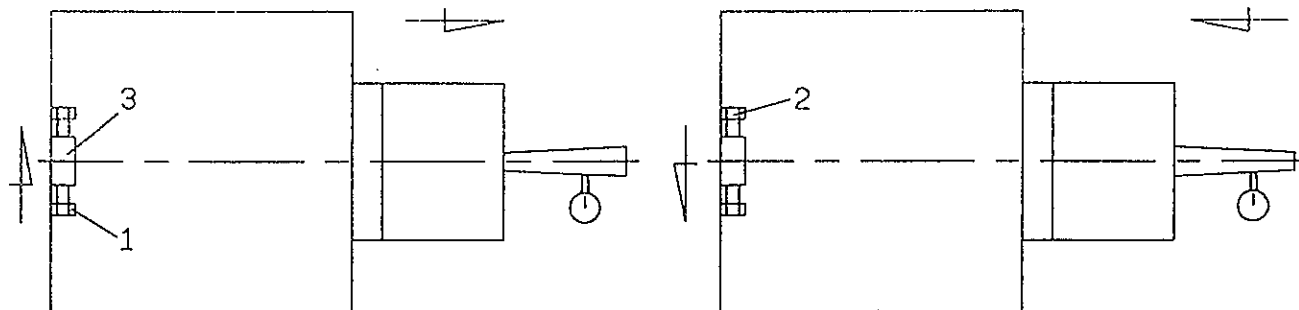
HEADSTOCK

HEADSTOCK REALIGNMENT:

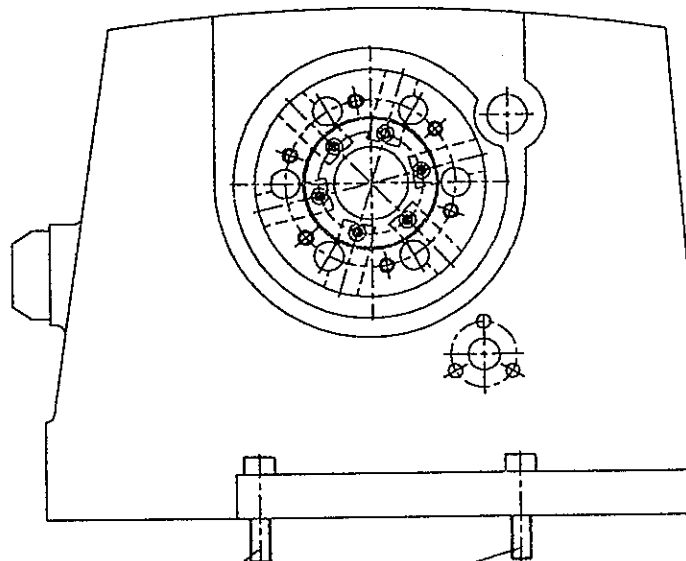
(WHEN MACHINE CUTS TAPER THAT CANNOT BE CORRECTED BY LEVELLING)
WITH THE LATHE BED LEVELLED VERY ACCURATELY, CAREFULLY MAKE
TEST CUTS TO DETERMINE THE DIRECTION AND AMOUNT THE HEADSTOCK
MUST BE SHIFTED TO CORRECT THE TAPER TURNING CONDITION.

TO ADJUST: TURN POWER OFF AT CIRCUIT BREAKER!

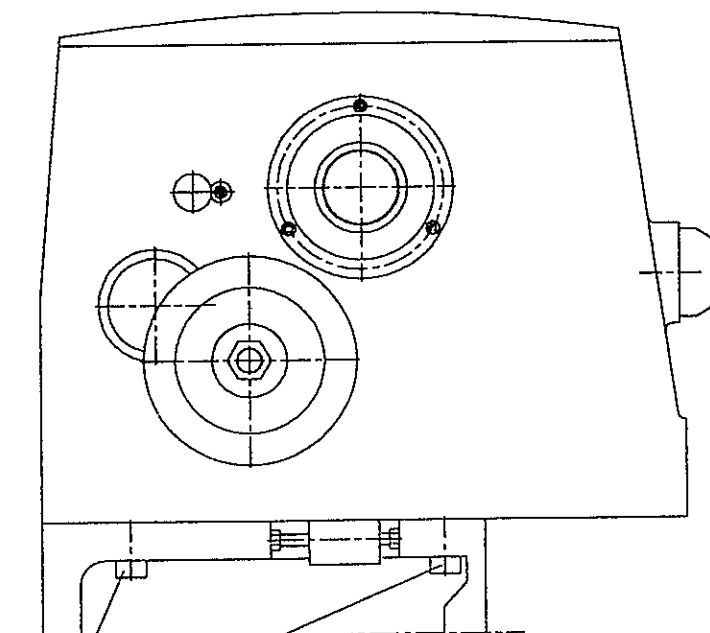
1. REMOVE THE COVER OF THE ELECTRICAL CABINET ON THE BACK
SIDE OF THE HEADSTOCK.
2. REACH THROUGH THE ELECTRICAL CABINET AND JUST CRACK LOOSE
TWO "TIE DOWN BOLTS" BENEATH THE HEADSTOCK HOLDING THE
HEAD TIGHT ON THE BED. (THE TWO BOLTS AT THE OUTBOARD
END-ONE AT THE FRONT WAY AND ONE AT THE REAR WAY).
3. SWING OPEN THE END GEAR GUARD/COVER
4. FIND (2) "HEAD ALIGNMENT BOLTS & BLOCK" (WEDGE BETWEEN THE
FRONT AND BACK BED WAY UNDER THE OUTBOARD END OF THE HEAD
STOCK). USE THE SKETCHES FIG #21 AS A GUIDE. CORRECT THE
MISALIGNMENT BY SHIFTING THE HEAD WITH THE ADJUSTING BOLTS AS
INDICATED SLIGHTLY LOOSEN ONE BOLT THEN TIGHTEN THE OTHER
AGAINST IT TO SHIFT THE HEAD IN THE DESIRED DIRECTION.
5. RETIGHTEN ALL BOLTS.
6. CAREFULLY AND WITH VERY LIGHT CUTS MAKE TESTS AND CHECK
FOR TAPER.
7. READJUST & RECHECK AN REQUIRED TIL CONDITION IS CORRECTED.



HEADSTOCK ALIGNMENT ADJUSTMENT



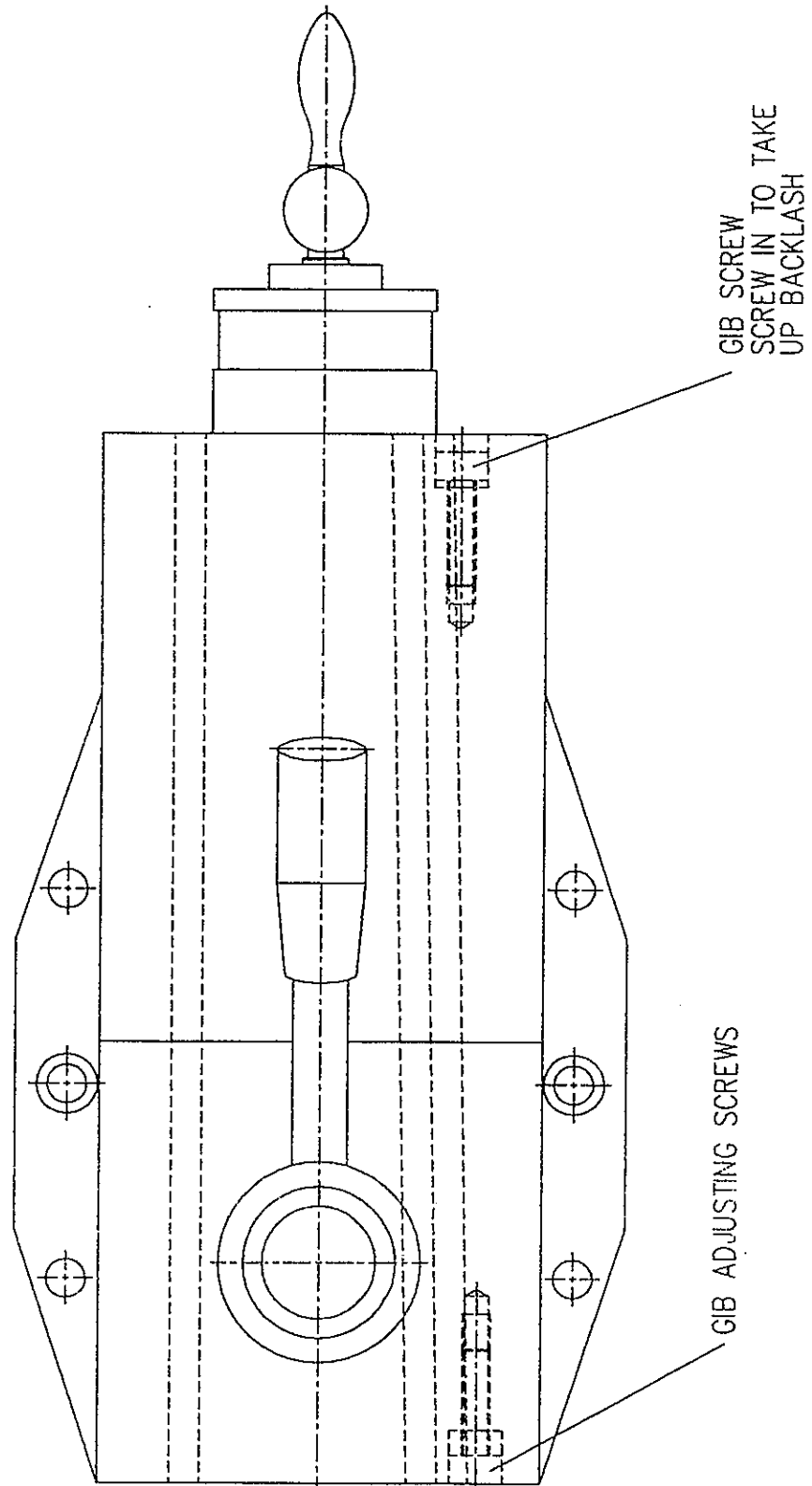
FIXING BOLTS IN FRONT FACE OF HEADSTOCK



FIXING BOLTS AT THE REAR OF HEADSTOCK

TAPERED GIBS

TOPSLIDE TAPER GIBS ADJUSTMENT



TAPERED GIBS:

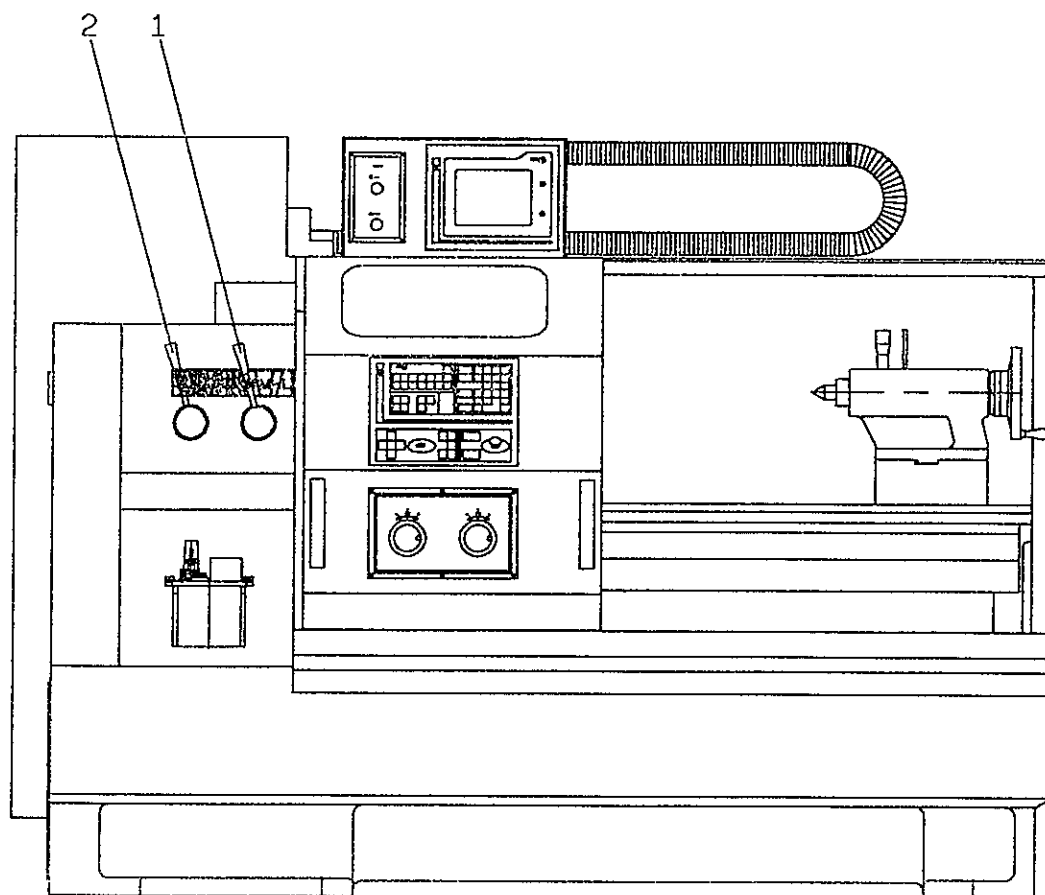
BOTH CROSS SLIDE AND COMPOUND SLIDE ARE EQUIPPED WITH TAPERED-FULLY ADJUSTABLE GIBS.

GIB ADJUSTMENT:

1. POSITION THE SLIDE (LENGTHWISE) ON THE DOVETAIL WAY SO THAT THERE IS NO "OVERHANG" OF THE WAY.
2. BACK OFF THE GIBE LOCKING SCREW AT THE BACK END OF THE SLIDE.
3. ADJUST THE FRONT GIBE SCREW UNTIL THE SLIDE IS SNUG.
RETIGHTEN THE GIB LOCKING SCREW AT THE BACK OF THE SLIDE.
*DO NOT OVER TIGHTEN.
4. RECHECK THE FIT OR FEEL OF THE SLIDE AND READJUST IF NECESSARY.

OPERATION

CAUTION: DO NOT SHIFT GEARS WHILE SPINDLE IS RUNNING TO ASSIST SHIFTING, ROTATE SPINDLE BY HAND. THE CHART ON THE FRONT FACE OF THE HEADSTOCK INDICATES THE SPINDLE SPEEDS AVAILABLE AND THE APPROPRIATE LEVER POSITIONS TO OBTAIN THE SPEED SELECTED. SPINDLE SPEEDS ARE SELECTED BY POSITIONING THE TWO LEVERS (#1 & #2 FIG. 9) AS INDICATED ON THE CHART.



HOUSTING

THIS HEAVY RIGID CASTING IS PRECISION-BORED TO PROVIDE THE MOST ACCURATE SOLID SUPPORT POSSIBLE FOR THE FULLY HARDENED AND PRECISION GROUND SPINDLE, GEARS AND SHAFTS. THE FULL RANGE OF SPINDLE SPEEDS ARE OBTAINED THROUGH PRECISION GEARING. SPINDLE

THE MASSIVE ALLOY STEEL SPINDLE IS SUPPORTED ON THREE HIGH PRECISION BEARINGS. TWO CLOSELY COUPLED TAPER ROLLER BEARINGS OFFER MAXIMUM AXIAL AND RADIAL LOAD CAPABILITIES AND A PRECISION DEEP GROOVE BALL BEARING SUPPORTS THE OUTBOARD END SPINDLE BEARING ADJUSTMENT

1. REMOVE HEADSTOCK COVER
2. POSITION "HIGH/LOW GEAR SHIFT LEVER TO "NEUTRAL"
3. LOOSEN LOCKING BOLT IN "GEAR POSITIONING NUT" (#1 FIG 8)
4. LOOSEN "GEAR POSITIONING NUT" ONE FULL TURN
5. TIGHTEN "BEARING ADJUSTMENT NUT" (#2 FIG 8) (ROTATE SPINDLE BY HAND TO CHECK FOR CORRECT ADJUSTMENT)
6. RETIGHTEN "GEAR POSITIONING NUT" (1) FULLY THEN LOOSEN (BACK OFF) $1/3$ TURN.
7. RETIGHTEN: LOCKING BOLT IN "GEAR POSITIONING NUT" (1) AND SET SCREW IN "BEARING ADJUSTMENT NUT" (2)
8. REPLACE HEADSTOCK COVER

METHOD OF SPINDLE BALANCE ADJUSTMENT

AFTER ADJUSTED BEARING LOCK NUT (3) ON GAP GROOVE OF BEARING LOCK NUT (3) OF SPINDLE BALANCE PICES ABOUT 2-5 PCS.

ADJUSTING TO SUITABLE POSITION, ROTATION EACH TEST RUNNING BY 1800 RPM AND 1125 RPM UNTIL SPINDLE KEEP IN BALANCE AND NO VIBRATION. (REFER TO FIG 8)

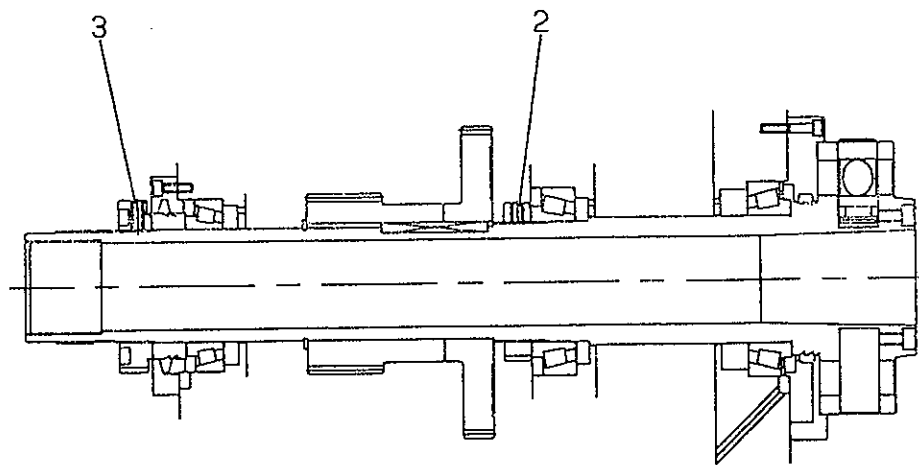


FIG 8(12-SPEED)

ASSEMBLY DRAWINGS

ML 17,20

Mechanical
Drawings

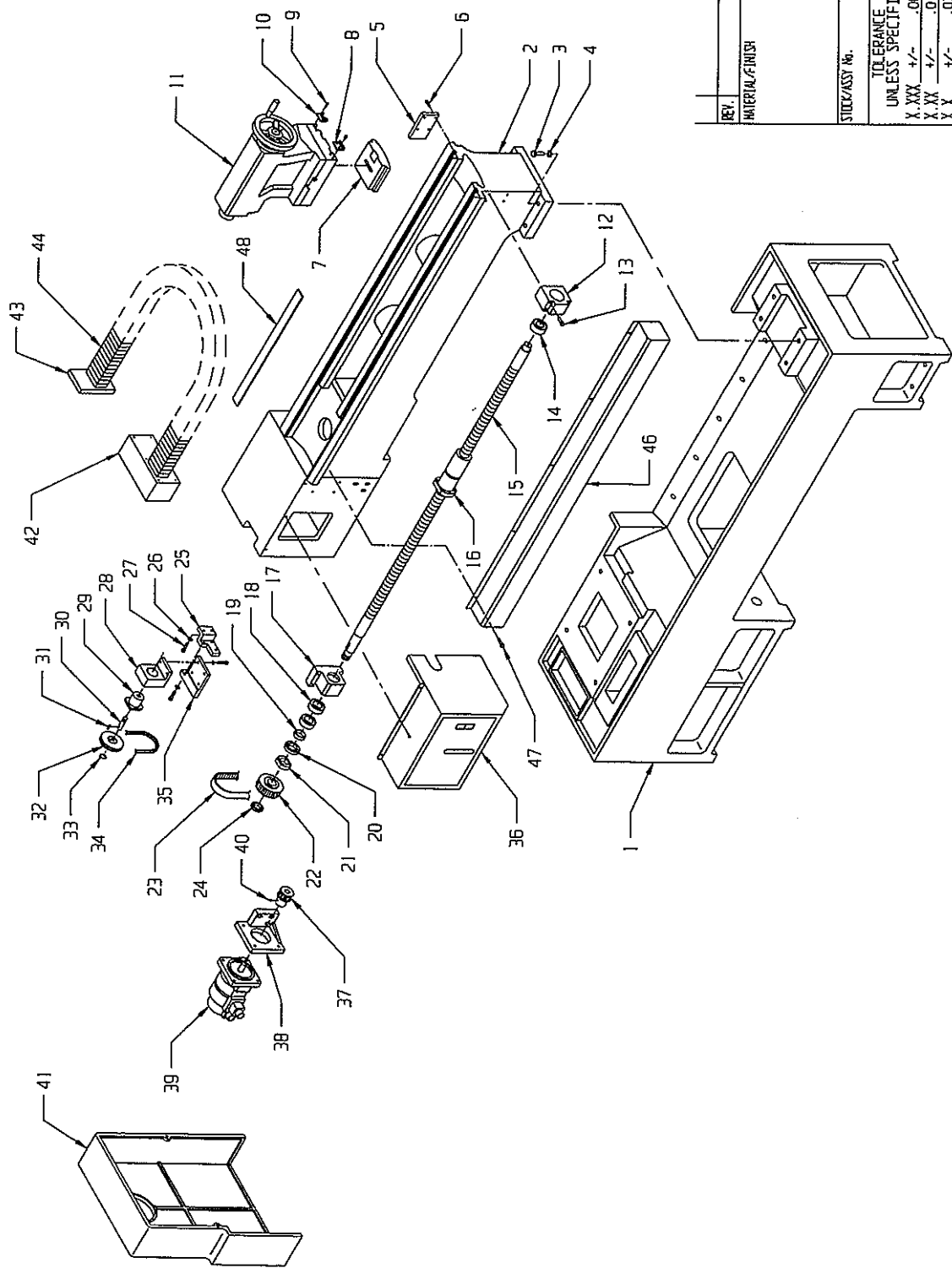
1. Lathe Base Assembly
2. Lathe Carriage Assembly
3. Lathe Enclosures
4. Lathe Headstock Assembly

ML 17/20 Lathe Base Assembly

Drawing No. 6-11-030-010

Item	Part Description	Milltronics #	Quantity
1	Base		1
2	Bed		1
3	Screw		8
4	Washer		8
5	Bracket-Dog		1
6	M6 Metric Screw		4
7	Tailstock Clamping Block	MLA-18	1
8	Z-Axis Way Surface Wiper	MLB-08	2
9	Screw		8
10	Z-Axis Way Surface Wiper	MLB-08	2
11	Tailstock		1
12	Bearing Seat		1
13	Screw		4
14	Bearing, type 6206 22	BG-14- Radial	1
15	Z-Axis Ball Screw	40" MPL-22 60" MPL-21	1
16	Ball Screw Nut		1
17	Bearing Seat		1
18	Bearing, type 30TAC62B	BG-47 Thrust	2
19	Spacer		2
20	Oil Seal, G38		1
21	Bearing Cap		1
22	Z-Axis Timing Pulley	Ballscrew PY-121	1
23	Z-Axis Timing Belt	BT-10	1
24	Lock Nut		1
25	Bracket		1
26	Washer		2
27	Screw		2
28	Encoder Bracket		1
29	Encoder	DC - EO-04	1
30	Shaft		1
31	Key		1
32	Pulley		1
33	C-Snapping		1
34	Belt		1
35	Bracket		1
36	Lube Pump Cover		1
37	Motor Pulley	PY-08	1
38	Motor Bracket		1
39	Z-Axis Servo Motor	9800-225 Assv 9671	1
40	Set Screw		1
41	Cover		1
42	Cable Conduit Bracket		1
43	Bracket		1
44	Flexible Metal Conduit		1
45	Guide Plate		1
46	Ball Screw Cover		1
47	Screw		1

Z axis home/limit
switch SW-340



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/AST No.			
	TOLERANCE UNLESS SPECIFIED			
	X.XXX +/- .005			
	X.XX +/- .010			
	X.X +/- .030			
	ANGLE +/- 1.0°			
	TITLE			
	ML17/20 LATHE BASE			
	APPLICATION			
	PARTNER II-L			
	SCALE			
	1:1			
	DWG No			
	6-11-030-010			
	SIZE			
	B			
	DATE			
	20 MAR 98			
	DRAWN BY			
	REUTER			
	SHEET NO.			
	1 OF 1			



MILLTRONICS MANUFACTURING
 1400 MILL LANE 612.442.1410
 WACONIA, MN 55387 USA

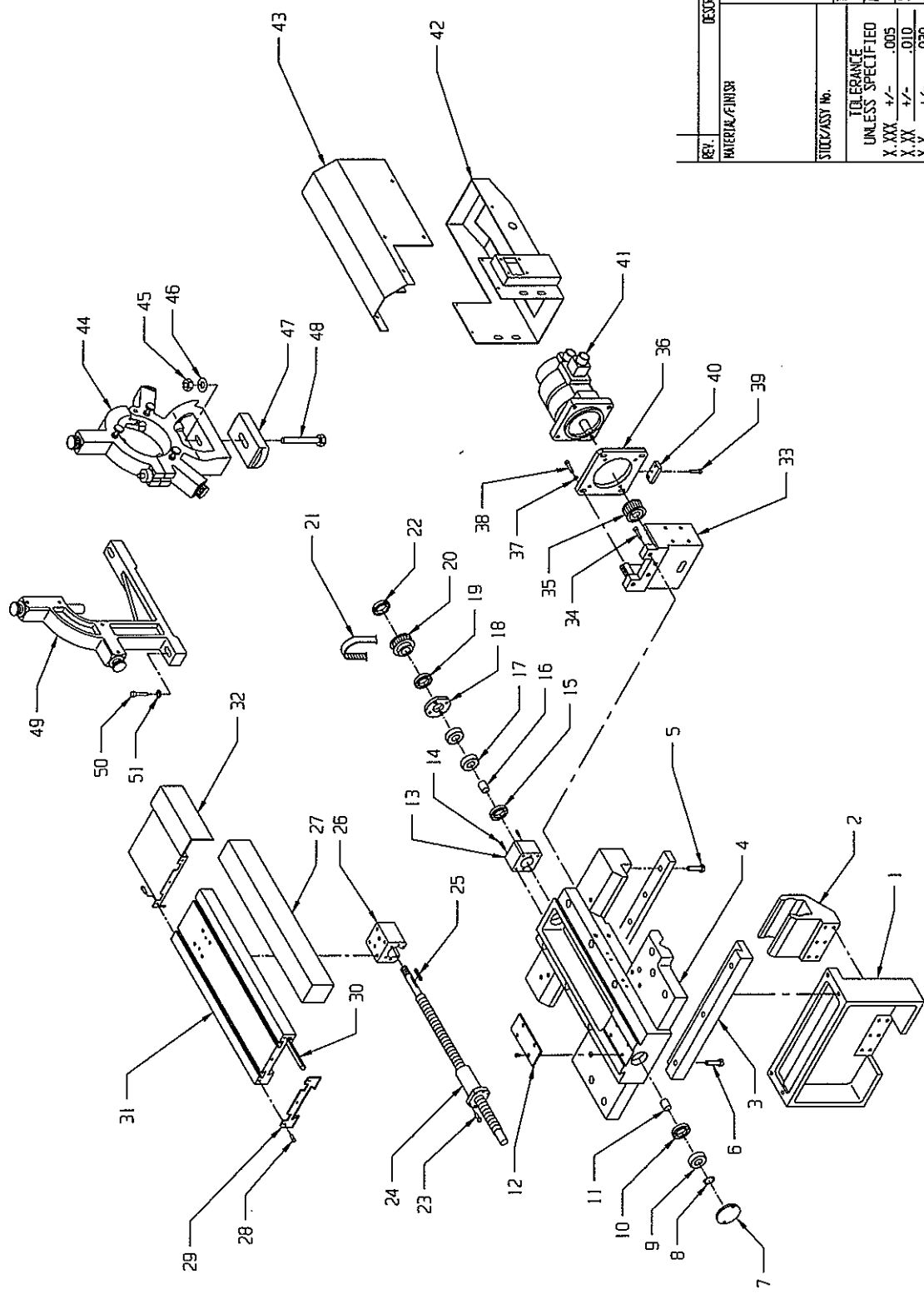
ML 17/20 Lathe Carriage Assembly

Drawing No. 6-11-030-012

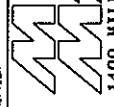
X axis

Item	Part Description	Milltronics #	Quantity
1	Support		1
2	Nut Bracket		1
3	Clamp Plate		1
4	Saddle		1
5	Screw		3
6	Screw		3
7	Bearing Cap		1
8	C-Snapping, S20		1
9	Bearing, type 6004ZZ	BG-115 Radial	1
10	Oil Seal		1
11	Spacer		1
12	Cover		1
13	Bearing Seat		1
14	Screw, M6 metric		4
15	Oil Seal		1
16	Spacer		1
17	Bearing, type 17TAC47B	BG-88 Thrust Duplex Set	2
18	Bearing Cap		1
19	Retainer Washer		1
20	Pulley		1
21	Timing Belt	BT-23	1
22	Nut		
23	Screw		6
24	X Axis Ball Screw	MPL-23	1
25	Key, 5 x 5 x38 mm		1
26	Nut Bracket		1
27	Fixed Block		1
28	Screw		6
29	Wiper		1
30	Cross Slide Gib		1
31	Cross Slider		1
32	Rear Cover		1
33	Motor Bracket		1
34	Screw, M8 metric		4
35	Pulley		1
36	Motor Mounting Plate		1
37	Washer, M8 metric		4
38	Screw, M8 metric		4
39	Fixed Block		1
40	Screw, M8 metric		2
41	X Axis Servo Motor		1
42	Axis Motor Cover - Lower		1
43	Axis Motor Cover - Upper		1
44	Steady Rest	ML17 MPL-49 / ML20 MPL-20	1
45	Nut, M16 metric		1
46	Washer, M16 metric		1
47	Steady Rest Clamping Block		1
48	Screw, M16 x 100 metric		1
49	Follow Rest	ML17 MPL-48 / ML20 MPL-24	1
50	Screw		2
51	Washer		2

X axis limit switch
SW-204



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/CAST No.			
	TOLERANCE UNLESS SPECIFIED			
	X.XXX +/- .005			
	X.XX +/- .010			
	X.X +/- .030			
	ANGLE +/- 1.0°			
	TITLE			
	APPLICATION			
	SCALE			
	DATE			
	DRAWN BY			
	REVIEWER			
	SHEET NO.			
	OF			



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 1400 HILL LANE
 WACONIA, MN 55387 USA

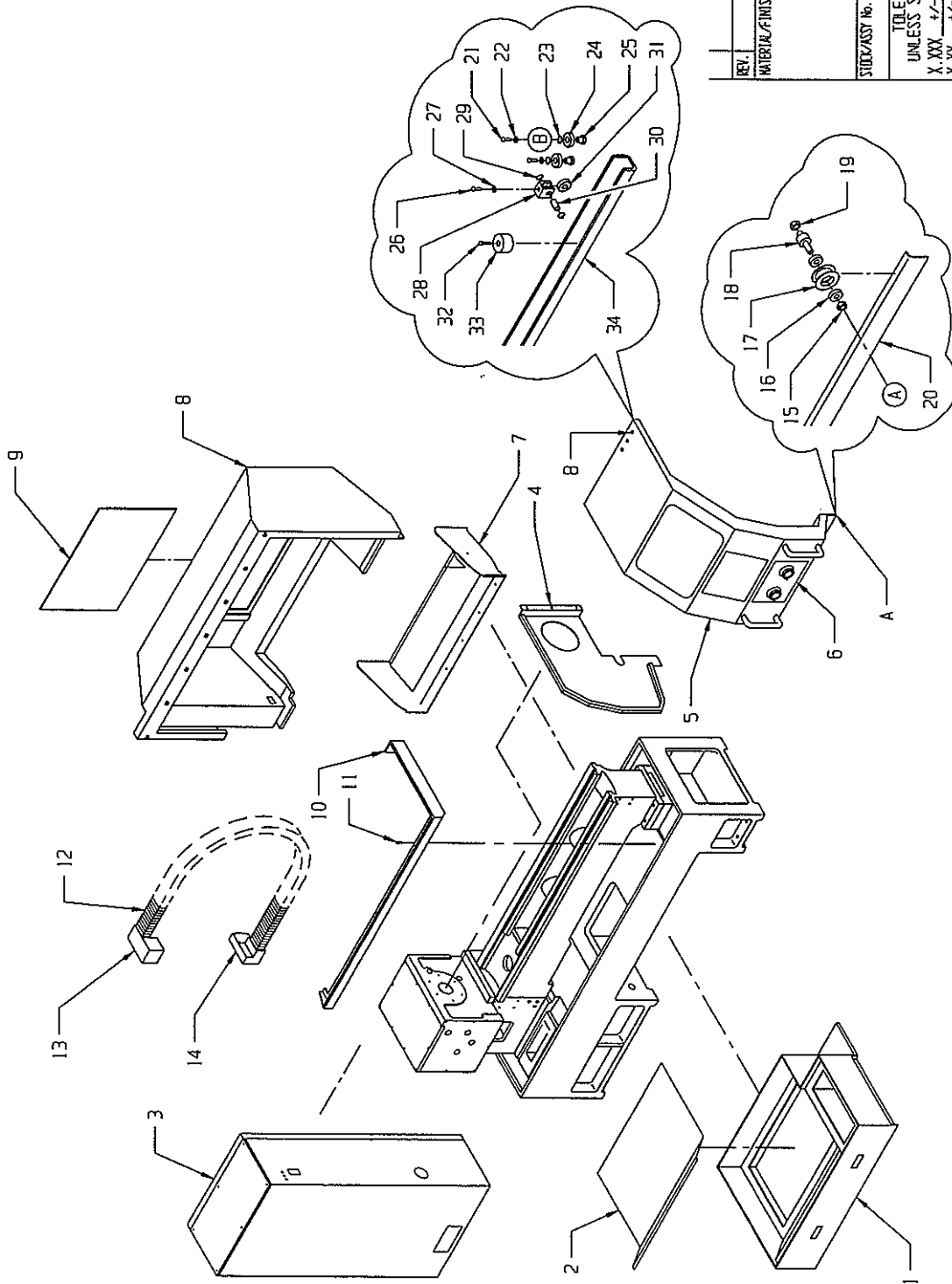
TITLE: ML17/20 LATHE CARRIAGE
 APPLICATION: PARTNER II-L
 SCALE: 1:1
 DATE: 20 MAR 98
 DRAWN BY: REUTER
 SHEET NO.: 1 OF 1

ML17/20 Lathe Enclosures

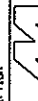
Drawing No. 6-11-030-013

Item	Part Description	Milltronics #	Quantity
1	Oil Tank		1
2	Chip Tray		1
3	Electric Cabinet		1
4	Splash Guard		1
5	Front Door		1
6	Monitor Case		1
7	Chip Pan		1
8	Rear Splash Guard		1
9	Cover		1
10	Screw		8
11	Chip Guard		1
12	Flexible Metal Tube		1
13	Bracket		1
14	Bracket		1
15	Nut, M8 metric		2
16	Bearing, type 608ZZ	BG-37	4
17	Roller	MPL-467	2
18	Shaft		2
19	Nut, M8 metric		2
20	Cover		1
21	Screw, M6 metric		4
22	Washer, 6 mm		4
23	C-Snapring, S10		4
24	Bearing	BG-174 or BG-117	4
25	Shaft		4
26	Screw, M6 metric		4
27	Washer, 6 mm		4
28	Support		2
29	C-Snapring		2
30	Shaft		4
31	Bearing	BG-174 or BG-117	2
32	Screw, M6 metric		2
33	Rubber		2
34	Rail Way		

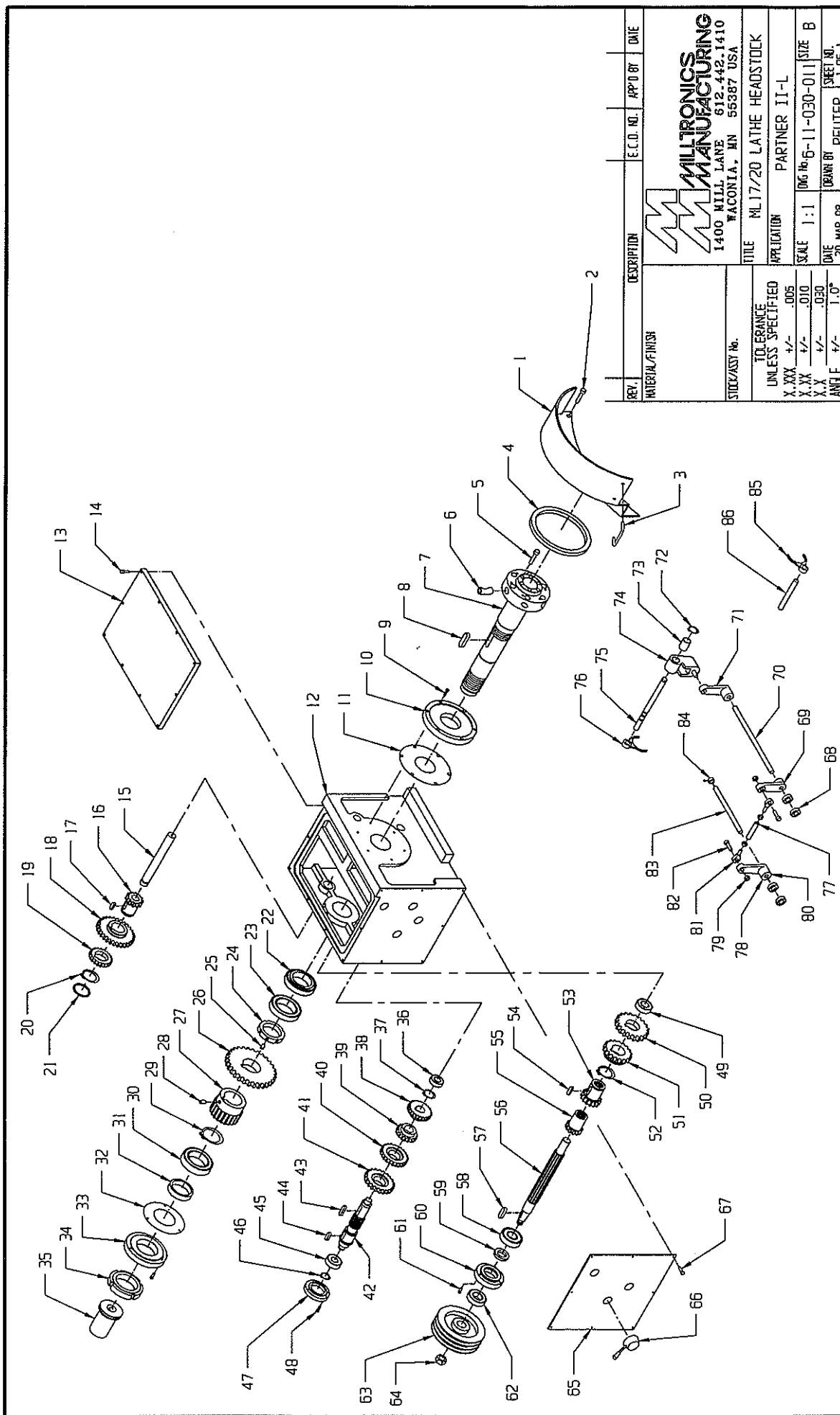
Z axis belt BT-23



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	SUBCASSY No.			
	TOLERANCE UNLESS SPECIFIED			
	X.XXX +/- .005			
	X.XX +/- .010			
	X.X +/- .030			
	ANGLE +/- 1.0°			
	TITLE	ML 17/20 LATHE ENCLOSURES		
	APPLICATION	PARTNER 11-L		
	SCALE	1:1		
	DATE	20 MAR 98		
	DRAWN BY	REITER		
	SHEET NO.	1 OF 1		



MILTRONICS MANUFACTURING
1400 MILL LANE 612.442.1410
WACONIA, MN 55387 USA



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
	MATERIAL/FINISH			
	STOCK/ASSY No.			
	TOLERANCE UNLESS SPECIFIED			
	X.XXX +/- .005			
	X.XX +/- .010			
	X.X +/- .030			
	ANGLE +/- 1.0°			
	TITLE ML17/20 LATHE HEADSTOCK			
	APPLICATION PARTNER II-L			
	SCALE 1:1			
	DATE 20 MAR 98			
	DESIGN BY REUTER			
	SHEET NO. 1 OF 1			

MILITRONICS MANUFACTURING
 1400 MILL LANE
 WACONIA, MN 55387 USA
 612-442-1410

Sight gauge
MPL-650

ML 17/20 Lathe Headstock Assembly

Drawing No. 6-11-030-011

Item	Part Description	Milltronics #	Quantity
1	Chuck Guard	MLH-01	1
2	Screw		3
3	Handle		1
4	Collar		1
5	Screw, M8 metric (D1-6)		6
6	Cam (D1-6)		6
7	Main Spindle		1
8	Key, 12 x 8 x 701 mm		1
9	Screw, M6 x 351		6
10	Bearing Cap		1
11	Packing		1
12	Headstock		1
13	Headstock Cover		1
14	Screw		10
15	Shaft B		1
16	Gear, 35T		1
17	Key, 10 x 8 x 361 mm		1
18	Gear, 59T		1
19	Gear, 24T		1
20	C-Snapping 45 mm		1
21	O-Ring, P24		1
22	Bearing, type 32017	BG-138	1
23	Bearing, type 32016	BG-137	1
24	Nut		1
25	Set Screw		1
26	Gear, 84T		1
27	Gear, 46T		1
28	Set Screw		1
29	C-Snapping, 75 mm		1
30	Bearing, type 32015	BG-136	1
31	Spacer		1
32	Packing		1
33	Bearing Cap		1
34	Nut		1
35	Unused		1
36	Bearing Cap, type 6205	BG-24	1
37	C-Snapping, 38 mm		1
38	Gear, 37T		1
39	Gear, 31T		1
40	Gear, 43T		1
41	Gear, 48T		1
42	Shaft C		1
43	Key, 10 x 8 x 501 mm		1
44	Key, 10 x 8 321 mm		1
45	Bearing, type 6305	BG-149	1
46	C-Snapping, 25 mm		1
47	Bearing Cap		1
48	Screw, M6 x 201		3
49	Bearing, type 3205		1
50	Gear, 31T		1
51	Gear, 38T		1
52	C-Snapping, 45mm		1
53	Gear, 25T		1
54	Key, 8 x 7 x 251 mm		1
55	Gear, 19T		1
56	Shaft A		1

Item	Part Description	Milltronics #	Quantity
57	Key, 6 x 6 x 301 mm		1
58	Bearing, type 6306 BG-43		1
59	Oil Seal, TC 30 x 50 x 7 mm		1
60	Bearing Cap		1
61	Screw, M6 x 201		3
62	Bearing, type 6206 BG-14		1
63	Pulley		1
64	Nut, M20 metric		1
65	Spindle Speed Panel		1
66	Knob		1
67	Screw		8
68	Bearing		4
69	Link		1
70	Shaft		1
71	Link		1
72	C-Snap		1
73	Sleeve		1
74	Block		1
75	Rod		1
76	Shift Fork		1
77	Rod		1
78	Link		1
79	Nut		4
80			
81	Eyebolt		2
82	Screw		1
83	Rod		1
84	Nut		
85	Shift Fork		1
86	Rod		1

MLH-654 Headstock bearing

Flex Oil line NU-151

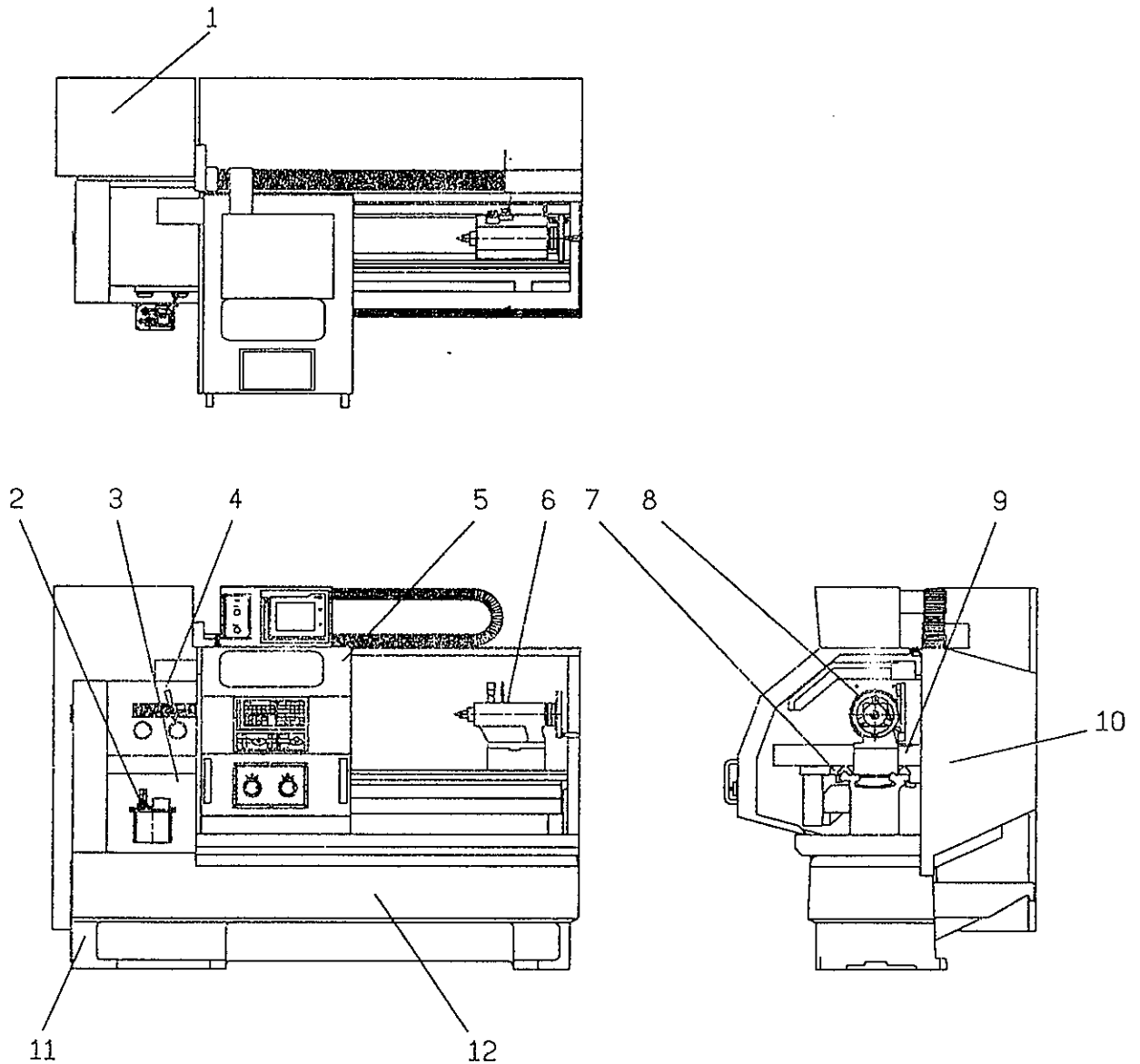
MLH-692 Headstock Bearing

Ferrule for NU-151 NU-38

Spindle encoder
belt BT-75(Rev.D),
BT-71 or BT-84

Spindle belt
BT-114, BT-96,
BT-87 or BT-156

MAIN PARTS OF MACHINE



NO.	CONTANT	NO.	CONTANT
1	CABINET	9	X-AXIS
2	LUBE TANK	10	X-AXIS MOTOR
3	Z-AXIS MOTOR	11	SPINDLE MOTOR
4	HEADSTOCK	12	BASE
5	SAFETY DOOR		
6	TAILSTOCK		
7	Z-AXIS		
8	CHUCK		

Tailstock Parts
MPL-646 #28 Seal
Limit Switch SW-200
or SW-181
Bearing MLTS-35
Wiper MLTS-23
Handwheel MLT-08

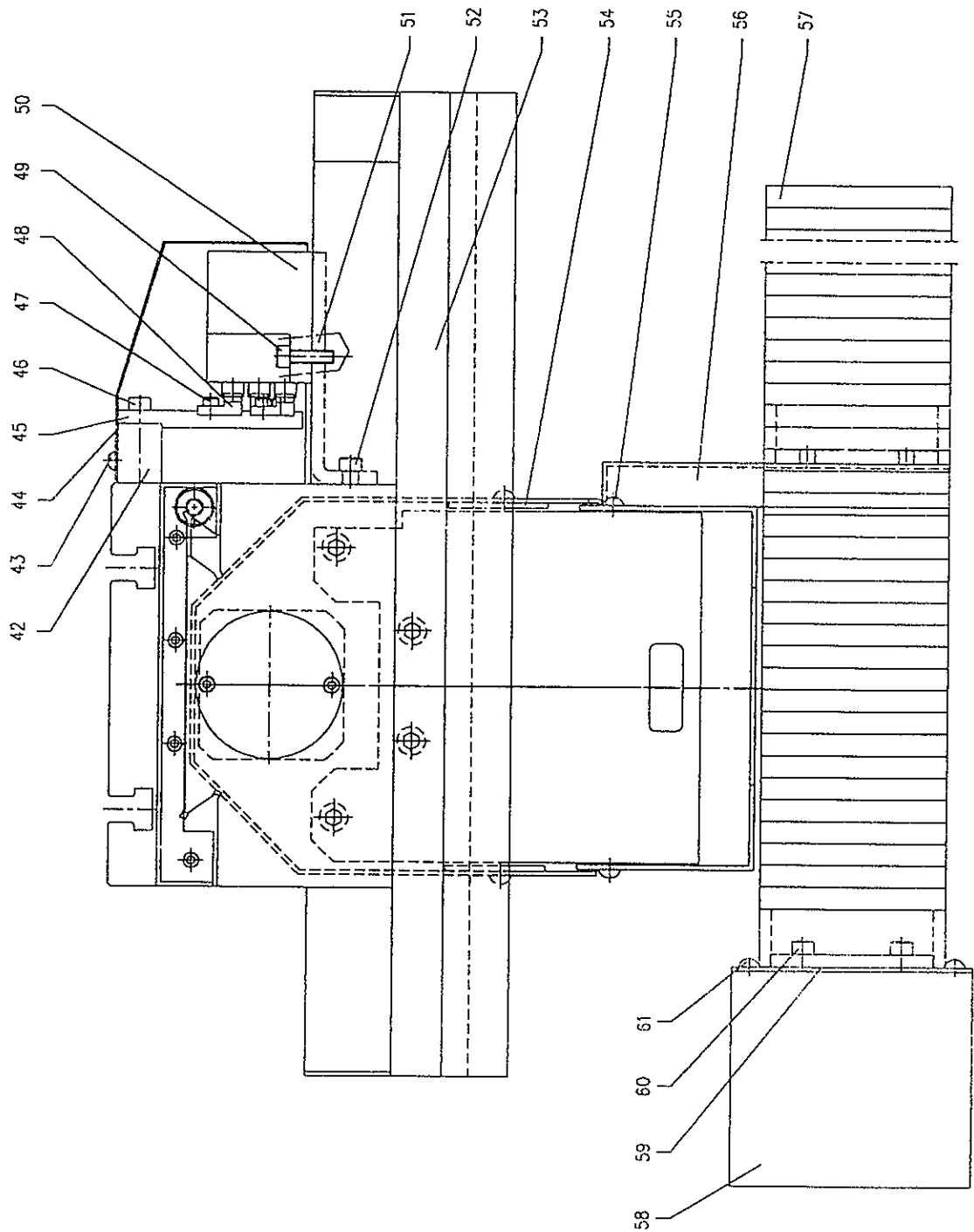
Chuck guard
switch SW-74

Light assy MA-220

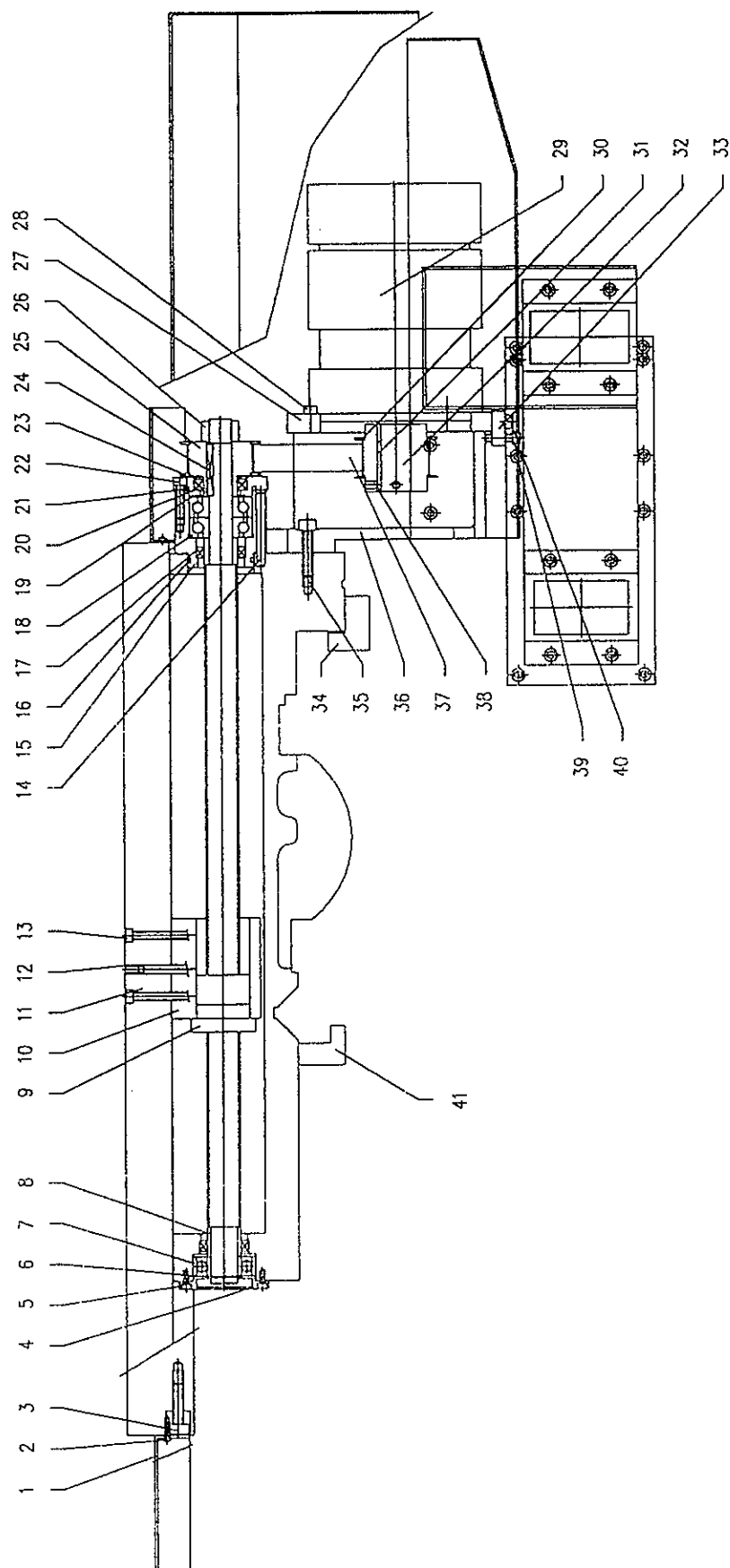
MLTS-04 Tailstock
leadscrew and nut

X AXIS FEED UNIT

X AXIS FEED ASSEMBLY



X AXIS FEED ASSEMBLY



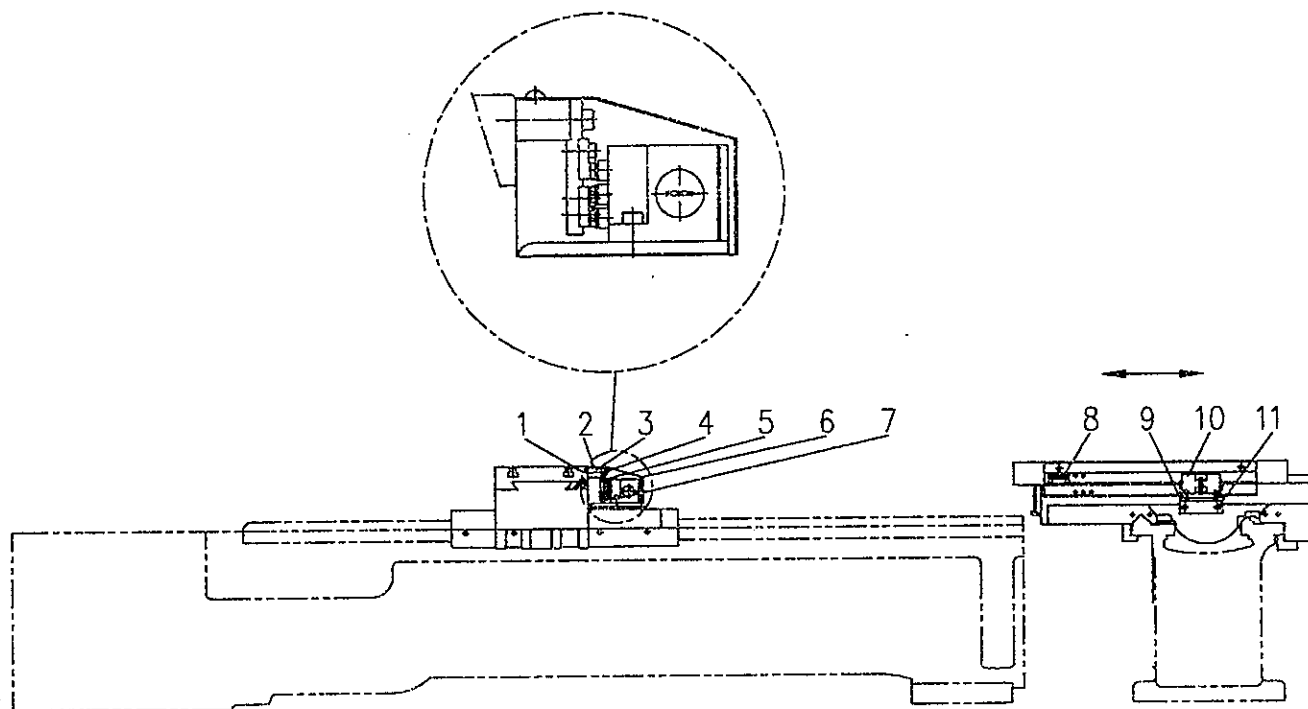
X AXIX RIGHT VIEW

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
001	45-30023	CAP	1	
002		SCREW	4	M4XP0.7
003	MPL-961	JACK BOLT	2	M8XP1.25
004	45-51025	BEARING CAP	1	
005		SCREW	2	M4XP0.7
006		SNAP RING	1	S20
007	BG-115	BEARING	1	6004ZZ
008	45-51038	SPACER	1	
009	45-51023	BALL SCREW	1	MPL-23 505
010	45-51024	BALL SCREW BRACKET	1	
011	45-30001	CROSS SLIDE	1	
012	25-51018	TAPER PIN	2	
013		SCREW	4	M6XP1.0
014	25-51017	TAPER PIN	2	
015	25-51009	BEARING HOUSING	1	
016		'O' OIL RING	1	G45
017	Verify size	SEAL S25x37x8(ML17)	2	S25(ø25Xø38X8)
018	BG-88	BEARING	1	17TAC 47B
019	25-51008	FRANGE	1	
020	Verify size	SEAL S25x37x8(ML17)	1	S25(ø25Xø40X8)
021		'O' OIL RING	1	G50
022		SCREW	4	M6XP1.0
023	45-51009	RETAINING WASHER	2	
024		KEY	1	5X5X38
025	25-51006	TIMING PULLEY	1	PY-61/PY-34
026		LOCKING NUT	1	M17XP1.0
027	25-51003	MOTOR ADAPTER	1	
028		SCREW	4	M8XP1.25
029		AC SERVO MOTOR	1	

X AXIX RIGHT VIEW

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
030	45-53043	RETAINING WASHER	2	
031		KEY	1	
032	45-51027	TIMING PULLEY	1	PY-120
033	25-51004	FIXED BLOCK	1	
034		REAR GIB SUPPORT BLOCK	1	
035		SCREW	4	M8XP1.25
036	25-51002	MOTOR BRACKET	1	
037	BT-23	TIMING BELT	1	5M-425-20
038		SCREW	2	M4XP0.7
039		SCREW	1	M8XP1.25
040		SCREW	2	M8XP1.25
041		REAR GIB SUPPORT BLOCK	1	
042	25-20004	FIXED BLOCK	2	
043		SCREW	4	M4XP0.7
044	45-51030	SWITCH GUARD	1	
045	45-51029	DOG FIXED PLATE	1	
046		SCREW	4	M6XP1.0
047		SCREW	3	M4XP0.7
048	25-20052	DOG	3	
049		SCREW	2	M6XP1.0
050	25-20045	LIMITED SWITCH	1	SW-204
051	45-51028	FIXED PLATE	1	
052		SCREW	2	M6XP1.0
053	45-20001	CARRIAGE	1	
054	25-51014	TOP GUARD	1	
055		SCREW	4	M4XP0.7
056	45-51050	BOTTOM GUARD	1	
057	45-51034	CHAIN	1	
058	45-51032	FIXED BOX	1	

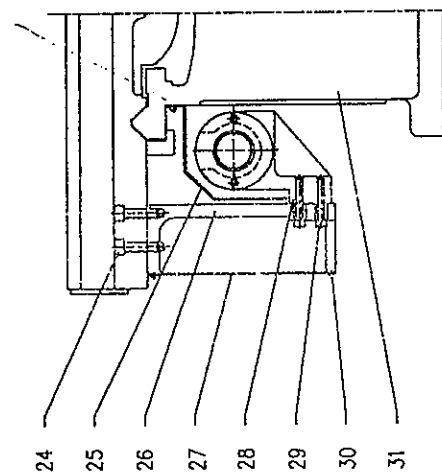
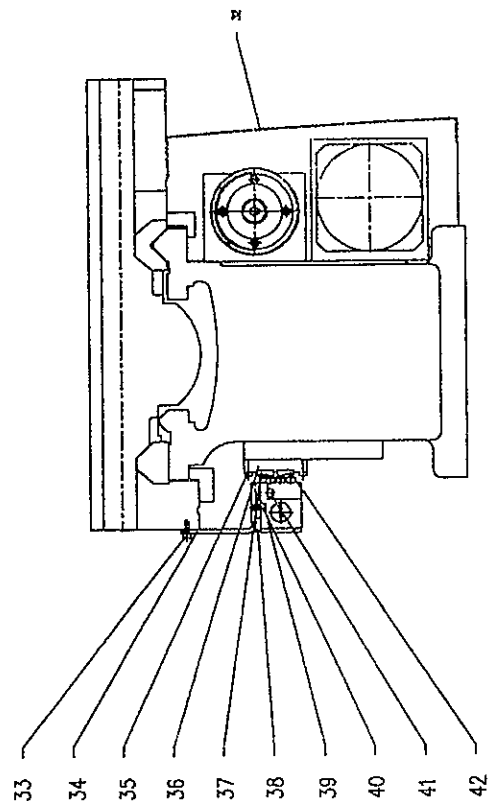
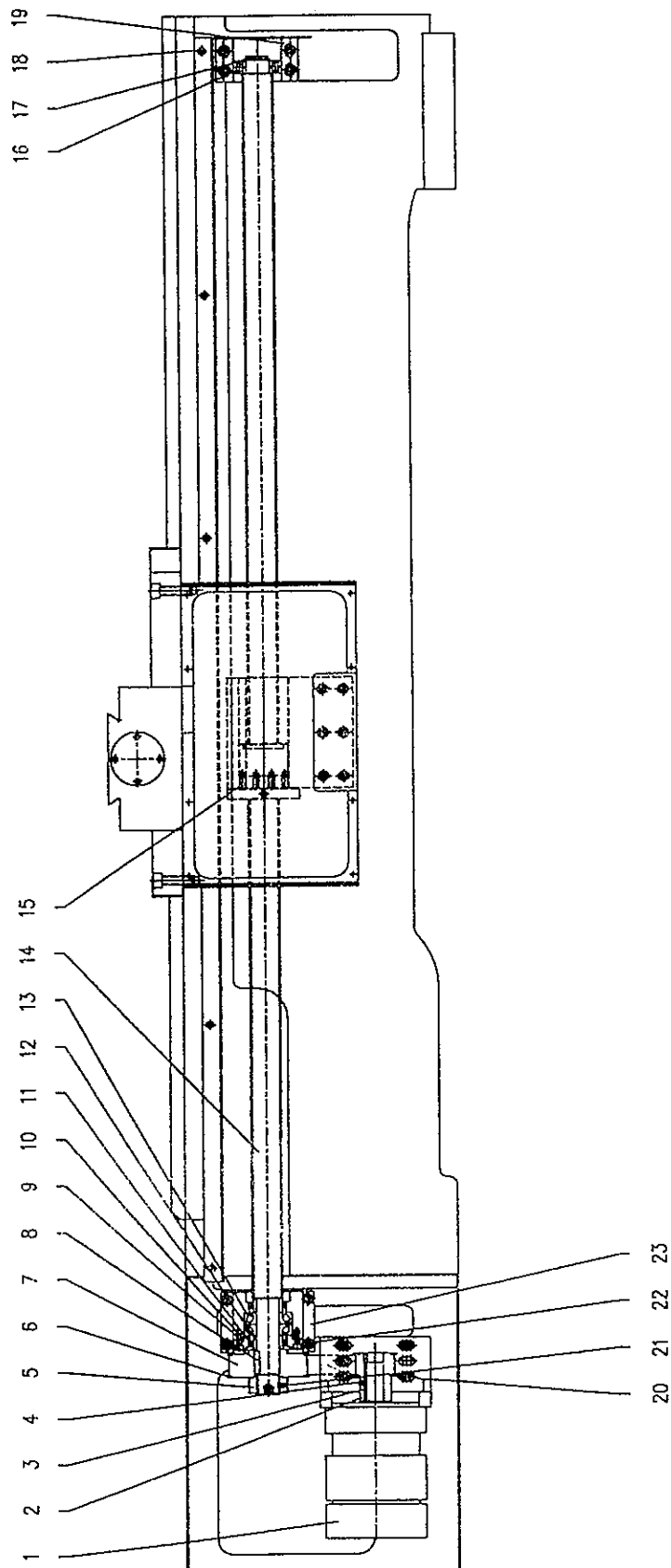
DRAWING OF X-AXIS LIMIT SWITCHES



NO.	Description	Specification	Qty.	Part No.
1	Cross		1	45-30001
2	Screw	M4XP0.7X10L	4	
3	Fixed block		2	25-20004
4	Screw	M6XP1.0X15L	4	
5	Screw	M4XP0.7X15L	3	
6	Switch guard		1	45-51030
7	Screw	M6XP1.0X15L	2	
8	Dog		3	25-20052
9	Fixed plate		1	45-51028
10	Limited switch		1	25-20045
11	Screw	M6XP1.0X15L	2	

Z AXIS FEED UNIT

Z AXIS FEED ASSEMBLY



Z AZIZ RIGHT VIEW

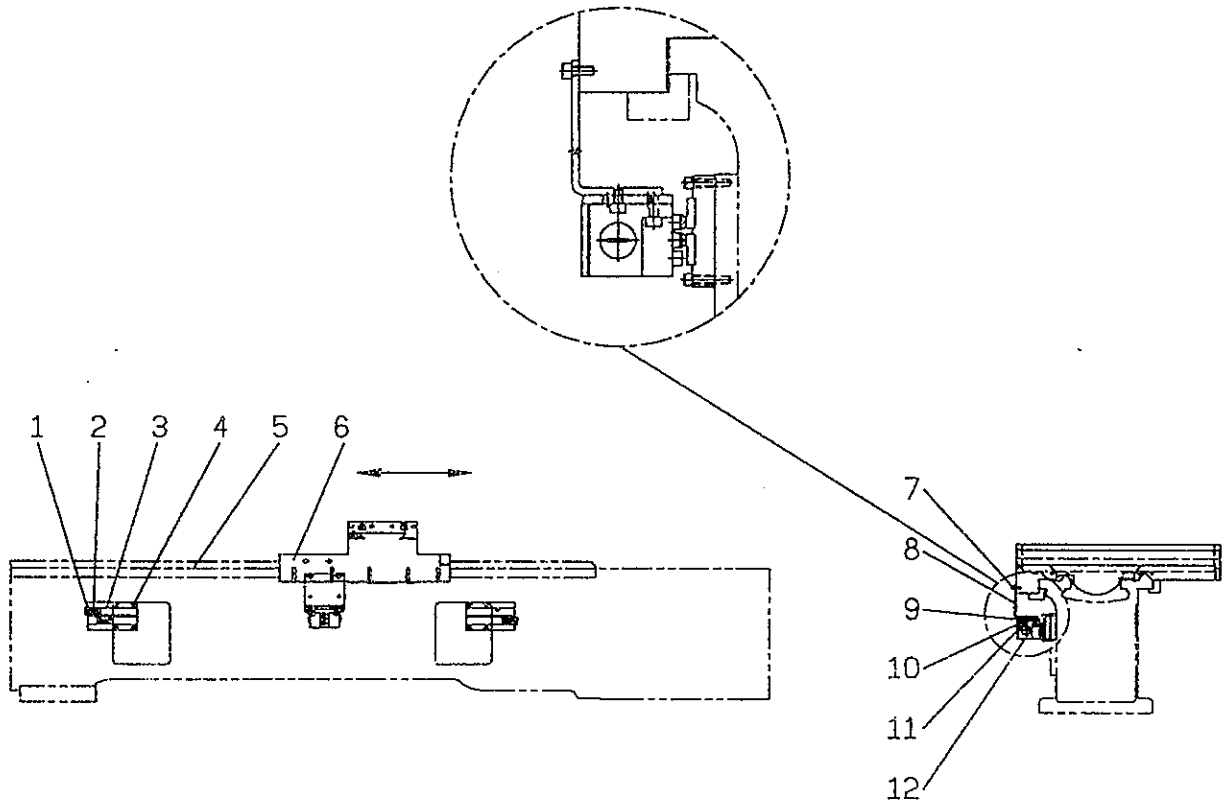
ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
001		CAP	1	
002	45-53041	TIMING PULLEY	1	PY-08
003		KEY	1	6X6X35
004		SCREW	2	M4XP0.7
005		LOCKING NUT	1	M30XP1.5
006	45-53044	RETAINING WASHER	2	
007	45-53042	TIMING PULLEY	1	PY-121
008		KEY	1	8X7X28
009	45-53035	FRANGE	1	
010		SCREW	4	M6XP1.0
011		SEAL	2	G38
012		SPACER	2	
013	BG-47	BEARING	2	30TAC 62B
014	45-53019	BALL SCREW	1	KGF-D 4010
015		SCREW	8	M8XP1.25
016	BG-14	BEARING	1	6206ZZ
017		SNAP RING	1	S30
018		SCREW	6	M6XP1.0
019	45-53034	BEARING HOUSING	1	
020		SCREW	4	M8XP1.25
021		SCREW	1	M6XP1.0
022		SCREW	4	M8XP1.25
023	45-53033	BEARING HOUSING	1	
024		SCREW	4	M12XP1.75
025	45-53039	BALL SCREW CAP	1	
026	45-53031	SUPPORT	1	
027	45-53032	CAP	1	
028	45-53030	BALL SCREW BRACKET	1	
029		SCREW	6	M8XP1.25

BT-10

Z AZIZ RIGHT VIEW

[illegible]

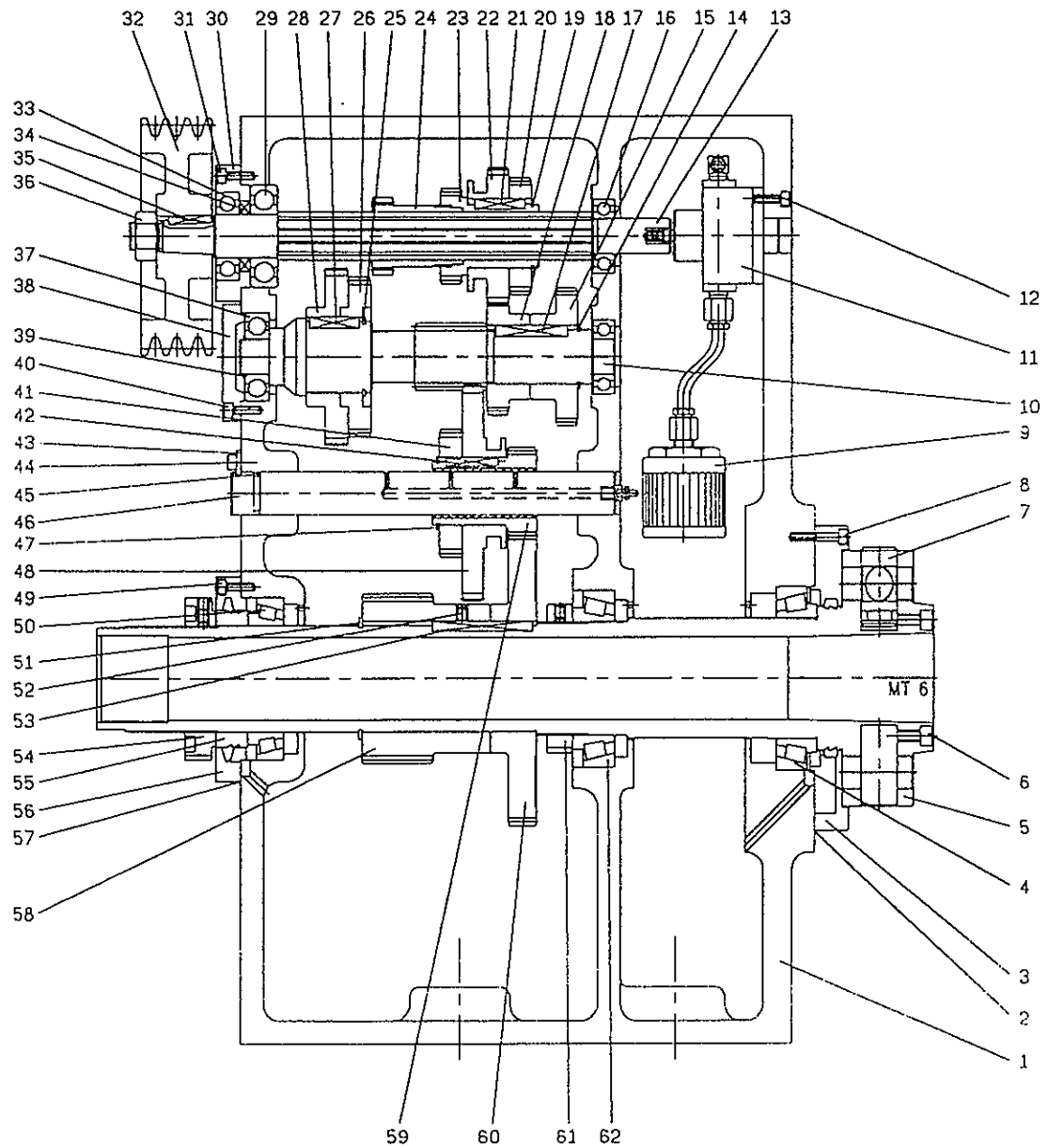
DRAWING OF Z-AXIS LIMIT SWITCHES



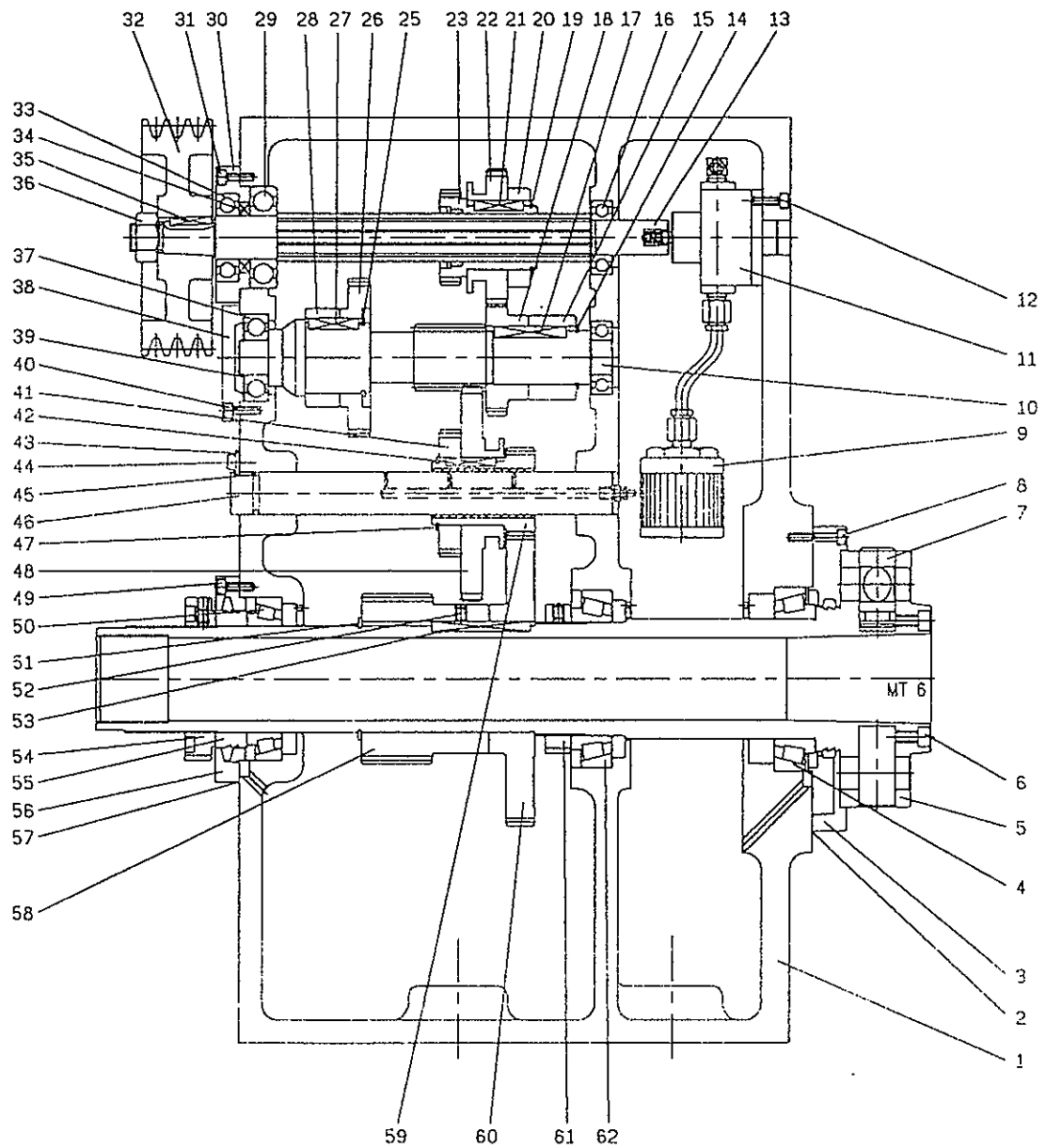
No.	Description	Specification	Qty.	Part No.
1	Dog		3	25-20052
2	Screw	M4XP0.7X10L	3	
3	Dog fixed plate		2	45-53038
4	Screw	M5XP0.8X25L	8	
5	Carriage		1	45-20001
6	Screw	M4XP0.7X15L	2	
7	Fixed plate		1	45-53049
8	Fixed plate		1	45-53050
9	Limited switch		1	25-20045
10	Screw	M6XP1.0X10L	2	
11	Screw	M6XP1.0X15L	1	

HEADSTOCK

HEADSTOCK ASSEMBLY



HEADSTOCK ASSEMBLY



HEADSTOCK ASSEMBLY

ASSEMBLY NUMBER:45A03-01

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
001	45-00001	HEADSTOCK	1	
002	45-03003	PACKING	1	
003	45-03002	COVER	1	
004		BEARING	1	32017# BG-138
005	45-03001	SPINDLE	1	
006		SCREW	6	M8XP1.25X15.8
007		CAM	6	
008		SCREW	6	M6XP1X35
009		PUMP FILTER	1	
010	45-03030	SHAFT C	1	
011		PUMP	1	
012		SCREW	3	M6XP1X20
013	45-03040	SHAFT C	1	MPL-818
014		C SNAP RING	1	ø38
015	45-03031	GEAR	1	37T
016	BG-24	BEARING	2	6205
017		SUNK KEY	1	10X8X50
018	45-03032	GEAR	1	31T
019		C SNAP RING	1	ø45
020	45-03042	GEAR	1	31T
021		SUNK KEY	1	8X7X35
022	45-03043	GEAR	1	38T
023	45-03044	GEAR	1	25T
024	45-03045	GEAR	1	19T
025		C SNAP RING	1	ø50
026	45-03033	GEAR	1	43T
027		SUNK RING	1	10X8X32
028	45-03034	GEAR	1	48T
029	BG-43	BEARING	1	6306

HEADSTOCK ASSEMBLY

ASSEMBLY NUMBER:45A03-02

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
030	45-03047	COVER	1	
031		SCREW	3	M6XP1X20
032	45-03048	PULLEY	1	
033	BG-14	BEARING	1	6206
034		SAEL	1	TC305007
035		SUNK KEY	1	6X6X30
036		NUT	1	M20
037	BG-149	BEARING	1	6305
038	45-03035	COVER	1	
039		C SNAP RING	1	ø25
040		SCREW	3	M6XP1X20
041	45-03023	GEAR	1	34T
042		SUNK RING	1	10X8X36
043		FIXED WASHER	1	M6
044		SCREW	1	M6XP1X20
045		'O' OIL RING	1	P24
046	45-03020	SHAFT B	1	
047		C SNAP RING	1	ø45
048	45-03022	GEAR	1	59T
049		SCREW	3	M6XP1X20
050	BG-136	BEARING	1	32015
051		C SNAP RING	1	ø75
052		LOCK SCREW	1	M10XP1.5X10
053		SUNK KEY	1	12X8X70
054	45-03010	NUT	1	
055	45-03008	COLLAR	1	
056	45-03009	RAER COVER	1	
057	45-03011	PACKING	1	
058	45-03007	GEAR	1	46T



HEADSTOCK ASSEMBLY

[illegible]

HEADSTOCK ASSEMBLY

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
001	45-00001	HEADSTOCK	1	
002	45-03003	PACKING	1	
003	45-03002	COVER	1	
004		BEARING	1	32017#
005	45-03001	SPINDLE	1	
006		SCREW	6	M8XP1.25X15.8
007		CAM	6	
008		SCREW	6	M6XP1X35
009		PUMP FILTER	1	
010	45-03030	SHAFT C	1	
011		PUMP	1	
012		SCREW	3	M6XP1X20
013	45-03040	SHAFT C	1	
014		C SNAP RING	1	ø38
015	45-03036	COLLAR	1	
016		BEARING	2	6205
017		SUNK KEY	1	10X8X50
018	45-03032	GEAR	1	31T
019		C SNAP RING	1	ø45
020	45-03046	COLLAR	1	
021		SUNK KEY	1	8X7X35
022	45-03043	GEAR	1	38T
023	45-03044	GEAR	1	25T
025		C SNAP RING	1	ø50
026	45-03033	GEAR	1	43T
027		SUNK RING	1	10X8X32
028	45-03037	COLLAR	1	
029		BEARING	1	6306

HEADSTOCK ASSEMBLY

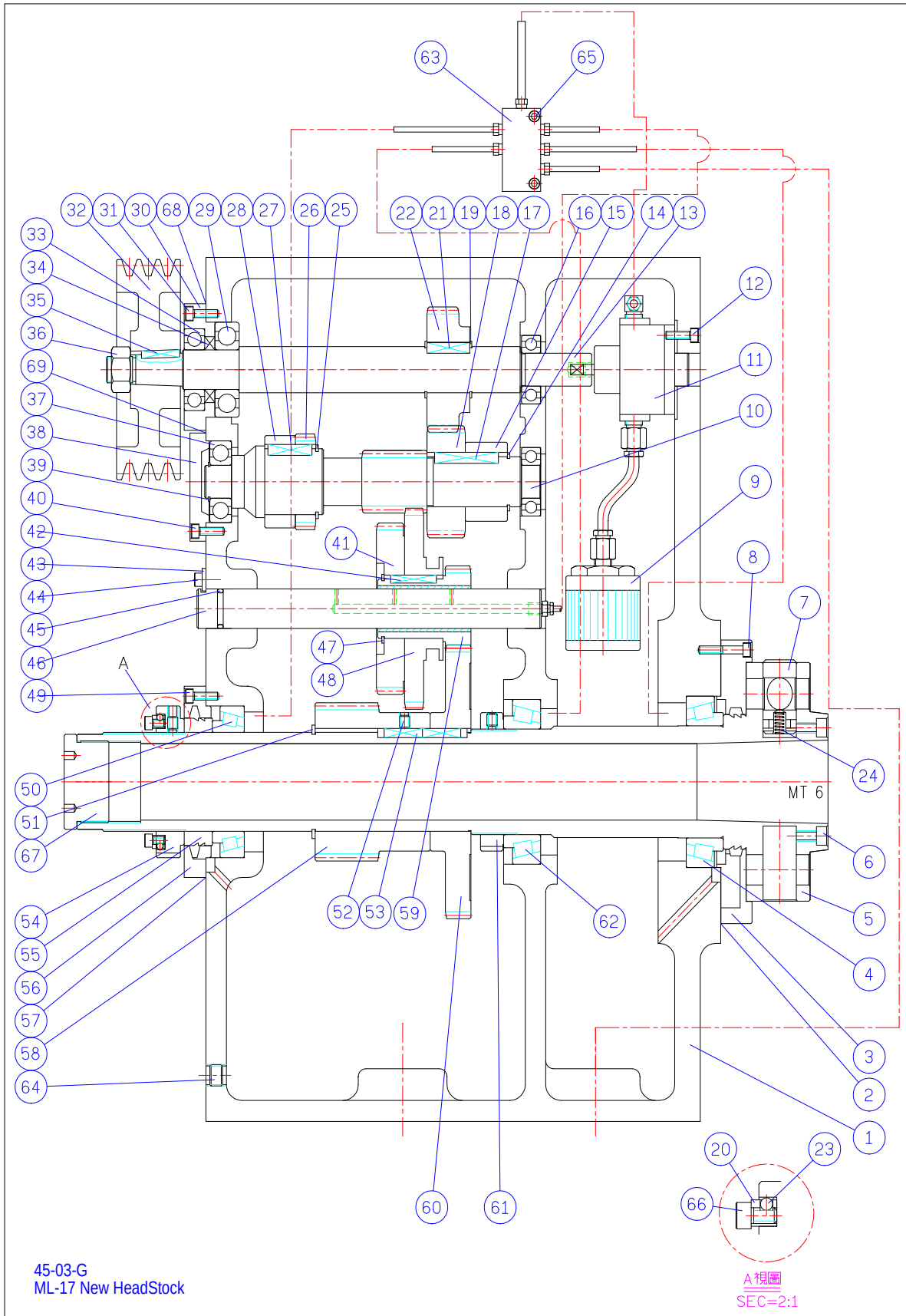
ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
030	45-03047	COVER	1	
031		SCREW	3	M6XP1X20
032	45-03048	PULLEY	1	
033		BEARING	1	6206
034		SAEL	1	TC305007
035		SUNK KEY	1	6X6X30
036		NUT	1	M20
037		BEARING	1	6305
038	45-03035	COVER	1	
039		C SNAP RING	1	ø25
040		SCREW	3	M6XP1X20
041	45-03023	GEAR	1	34T
042		SUNK RING	1	10X8X36
043		FIXED WASHER	1	M6
044		SCREW	1	M6XP1X20
045		"O" OIL RING	1	P24
046	45-03020	SHAFT B	1	
047		C SNAP RING	1	ø45
048	45-03022	GEAR	1	59T
049		SCREW	3	M6XP1X20
050		BEARING	1	32015
051		C SNAP RING	1	ø75
052		LOCK SCREW	1	M10XP1.5X10
053		SUNK KEY	1	12X8X70
054	45-03010	NUT	1	
055	45-03008	COLLAR	1	
056	45-03009	RAER COVER	1	
057	45-03011	PACKING	1	
058	45-03007	GEAR	1	46T

Headstock Assembly
Model : ML17 (new type)

DWG #45-03-G

Item No.	Parts No.	Description	Q'ty	Remarks
1	45-00005	Headstock	1	
2	45-03003	Packing	1	
3	45-03002	Cover	1	
4		Bearing	1	32017#
5	45-03001	Spindle	1	
6	45-03093	Screw	6	D1 type
7	45-04009	Cam	6	D1 type
8	101006035	Screw	6	M6xP1x35
9		Pump filter	1	
10	45-03030	Shaft C	1	
11	45-03041	Pump	1	
12	101006020	Screw	3	M6xP1x20
13	45-03020	Shaft D	1	Straight type
14	113000038	C snap ring	1	ø38
15	45-03036	Spacer	1	
16	30306205	Bearing	2	6205#
17	111010050	Key	1	10x8x50
18	45-03202	Gear	1	32T
19	113000035	C snap ring	2	ø35
20	45-03091	Balance piece	3	
21	111010033	Key	1	10x8x33L
22	45-03201	Gear	1	36T
23	45-03092	Steel ball	3	
24	45-03094	Spring	6	
25	113000050	C snap ring	1	ø50
26	45-03203	Gear	1	27T
27	111010032	Key	1	10x8x32
28	45-03037	Spacer	1	
29	30306306	Bearing	1	6306
30	45-03047	Cover	1	
31	101006020	Screw	3	M6xP1x20
32	45-03048	Pulley	1	
33	30306206	Bearing	1	6206
34		Seal	1	TC305007
35	111006030	Key	1	6x6x30
36	104000020	Nut	1	M20
37	30306305	Bearing	1	6305
38	45-03035	Cover	1	
39	113000025	C snap ring	1	ø25
40	101006020	Screw	3	M6xP1x20
41	45-03204	Gear	1	50T

Item No.	Parts No.	Description	Q'ty	Remarks
42	1111010036	Key	1	10x8x36
43	45-03024	Fixed washer	1	
44	101006020	Screw	1	M6xP1x20
45	50750024	O-ring	1	P24
46	45-03020	Shaft B	1	
47	113000045	C snap ring	1	ø45
48	45-03022	Gear	1	59T
49	101006020	Screw	3	M6xP1x20
50		Bearing	1	32015
51	113000075	C snap ring	1	ø75
52	101010010	Screw	1	M10xP1.5x10
53	111012030	Key	2	12x8x30
54	45-03010	Nut	1	
55	45-03008	Collar	1	
56	45-03009	Rear cover	1	
57	45-03011	Packing	1	
58	45-03007	Gear	1	46T
59	45-03021	Gear	1	24T
60	45-03006	Gear	1	81T
61	45-03005	Nut	1	
62		Bearing	1	32016
63	45-03090	Distributor	1	
64		Screw	1	PT3/8"-19x10
65	101005020	Screw	2	M5xP0.8x20
66	101006010	Screw	3	M6xP1x10
67	45-03088	Block	1	
68	45-03082	Gasket	1	
69	45-03081	Gasket	1	

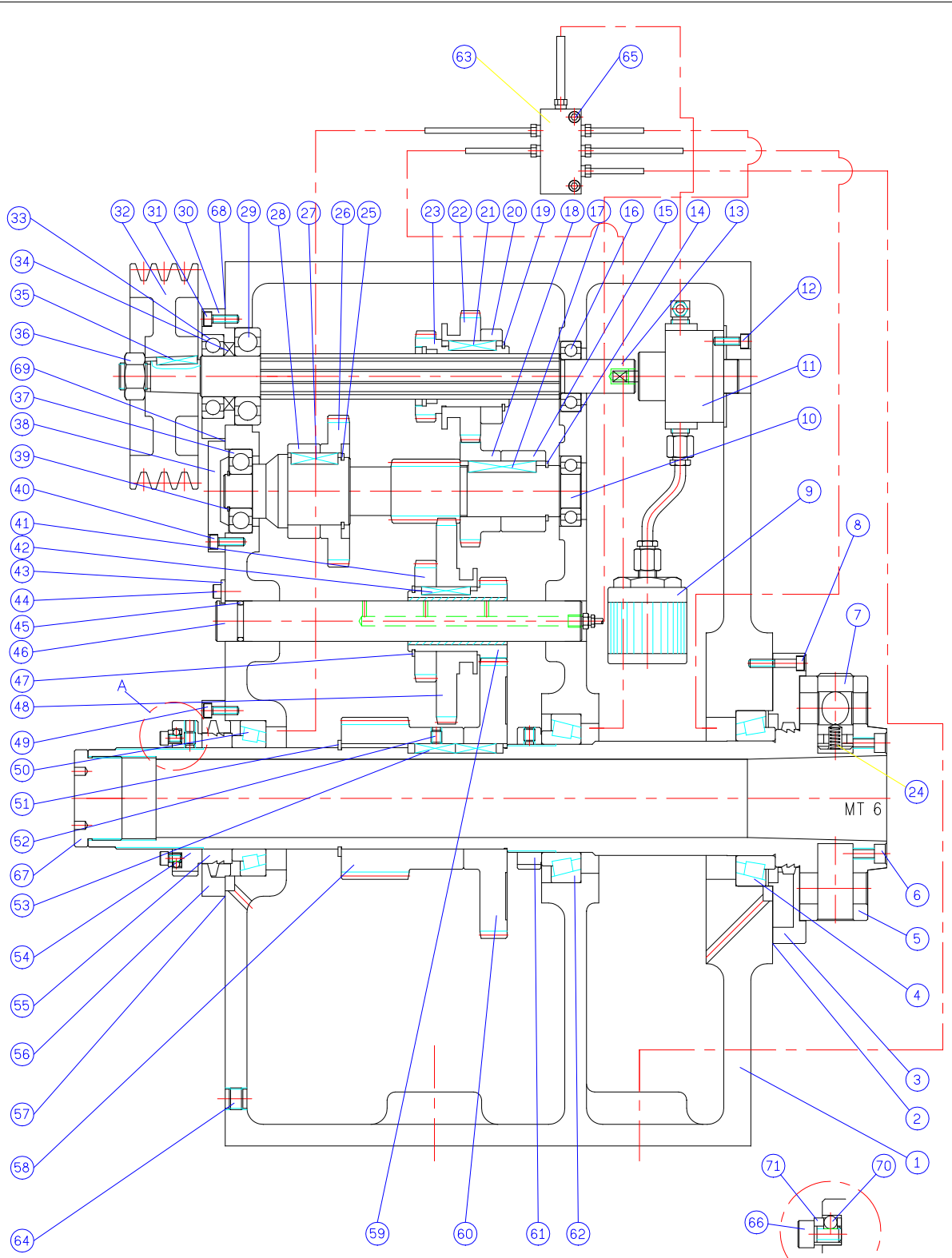


Headstock Assembly
Model : ML17 (old type)

DWG #45-03-C

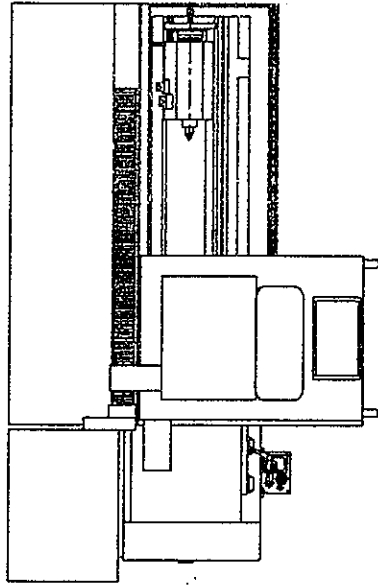
Item No.	Parts No.	Description	Q'ty	Remarks
1	45-00005	Headstock	1	
2	45-03003	Packing	1	
3	45-03002	Cover	1	
4		Bearing	1	32017#
5	45-03001	Spindle	1	
6	45-03093	Screw	6	D1 type
7	45-04009	Cam	6	D1 type
8	101006035	Screw	6	M6xP1x35
9		Pump filter	1	
10	45-03030	Shaft C	1	
11	45-03041	Pump	1	
12	101006020	Screw	3	M6xP1x20
13	45-03040	Shaft D	1	Spline type
14	113000038	C snap ring	1	38 Dia
15	45-03036	Spacer	1	
16	30306205	Bearing	2	6205#
17		Key	1	10x8x50
18	45-03032	Gear	1	
19	113000045	C snap ring	1	45 Dia
20	45-03046	Spacer	1	
21		Key	1	8x7x35
22	45-03043	Gear	1	38T
23	45-03044	Gear	1	25T
24	45-03094	Spring	6	
25	113000050	C snap ring	1	50 Dia
26	45-03033	Gear	1	
27		Key	1	10x8x32
28	45-03037	Spacer	1	
29	30306306	Bearing	1	6306
30	45-03047	Cover	1	
31	101006020	Screw	3	M6xP1x20
32	45-03048	Pulley	1	
33	30306206	Bearing	1	6206
34		Seal	1	TC305007
35		Key	1	6x6x30
36	104000020	Nut	1	M20
37	30306305	Bearing	1	6305
38	45-03035	Cover	1	
39	113000025	C snap ring	1	25 Dia
40	101006020	Screw	3	M6xP1x20

Item No.	Parts No.	Description	Q'ty	Remarks
41	45-03023	Gear	1	
42		Key	1	10x8x36
43	45-03024	Fixed washer	1	
44	101006020	Screw	1	M6xP1x20
45	50750024	O-ring	1	P24
46	45-03020	Shaft B	1	
47	113000045	C snap ring	1	45 Dia
48	45-03022	Gear	1	59T
49	101006020	Screw	3	M6xP1x20
50		Bearing	1	32015
51	113000075	C snap ring	1	75 Dia
52	101010010	Screw	1	M10xP1.5x10
53		Key	2	12x8x30
54	45-03010	Nut	1	
55	45-03008	Collar	1	
56	45-03009	Rear cover	1	
57	45-03011	Packing	1	
58	45-03007	Gear	1	46T
59	45-03021	Gear	1	24T
60	45-03006	Gear	1	81T
61	45-03005	Nut	1	
62		Bearing	1	32016
63	45-03090	Distributor	1	
64		Screw	1	PT3/8"-19x10
65	101005020	Screw	2	M5xP0.8x20
66	101006010	Screw	3	M6xP1x10
67	45-03088	Block	1	
68	45-03082	Gasket	1	
69	45-03081	Gasket	1	
70	45-03092	Steel ball	3	
71	45-03091	Balance piece	3	

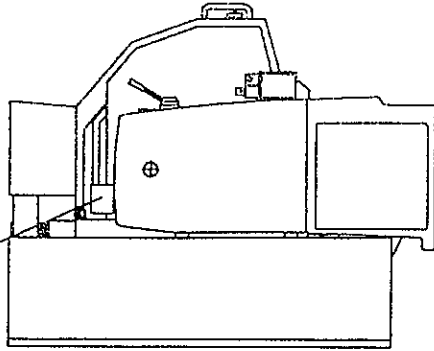


45-03-C
ML-17 Old HeadStock

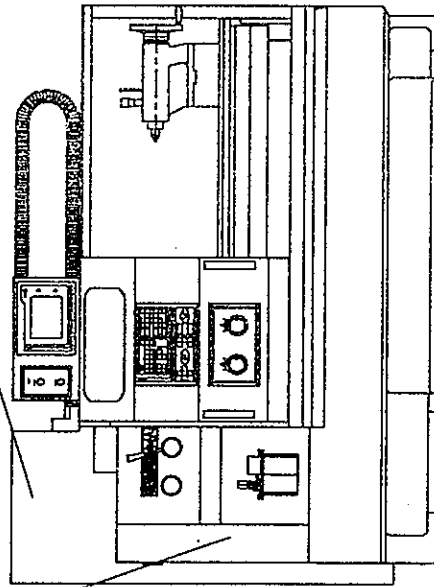
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COVER LIMIT SWITCH

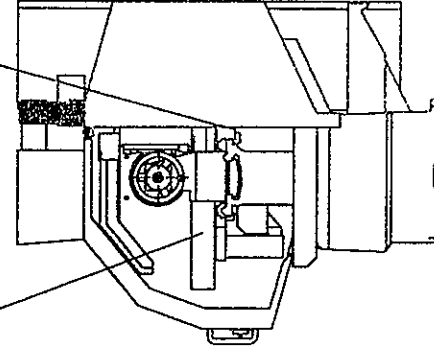


SPINDLE ENCODER



FAN

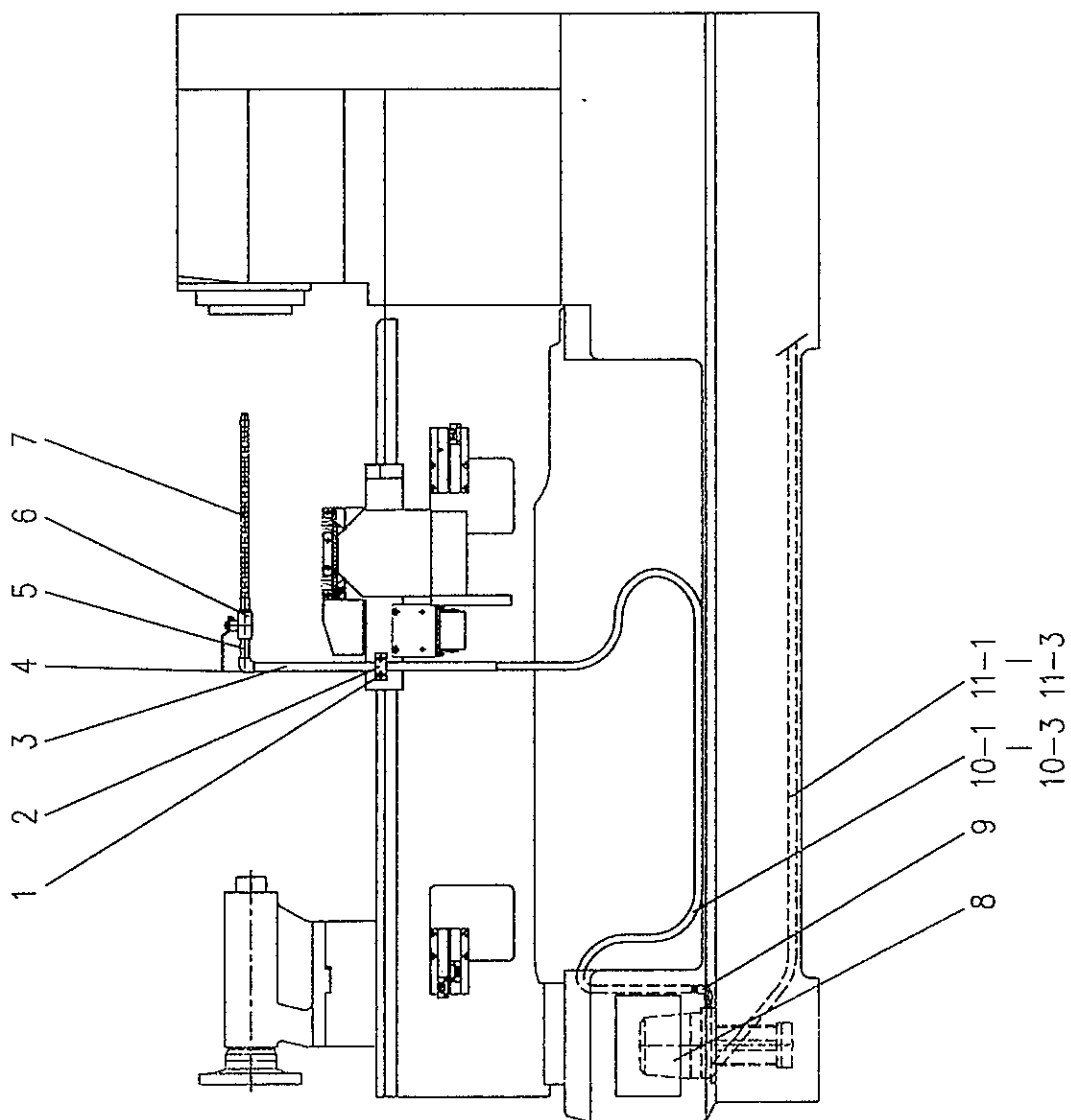
X-AXIS LIMITER



Z-AXIS LIMITER

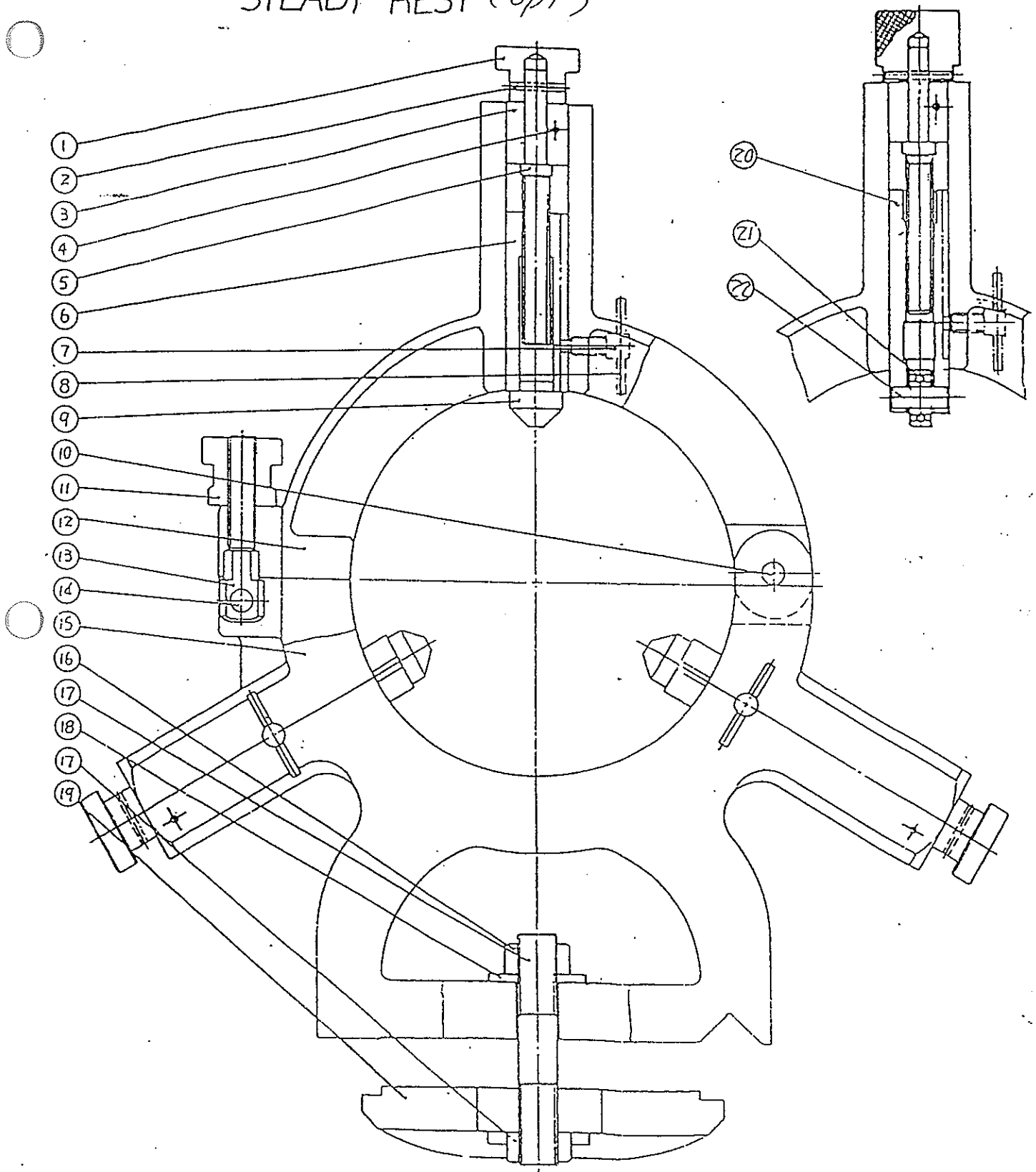
Armored spring hose for
waylube to carriage
110" (6mm)MPL-971

COOLANT SYSTEM



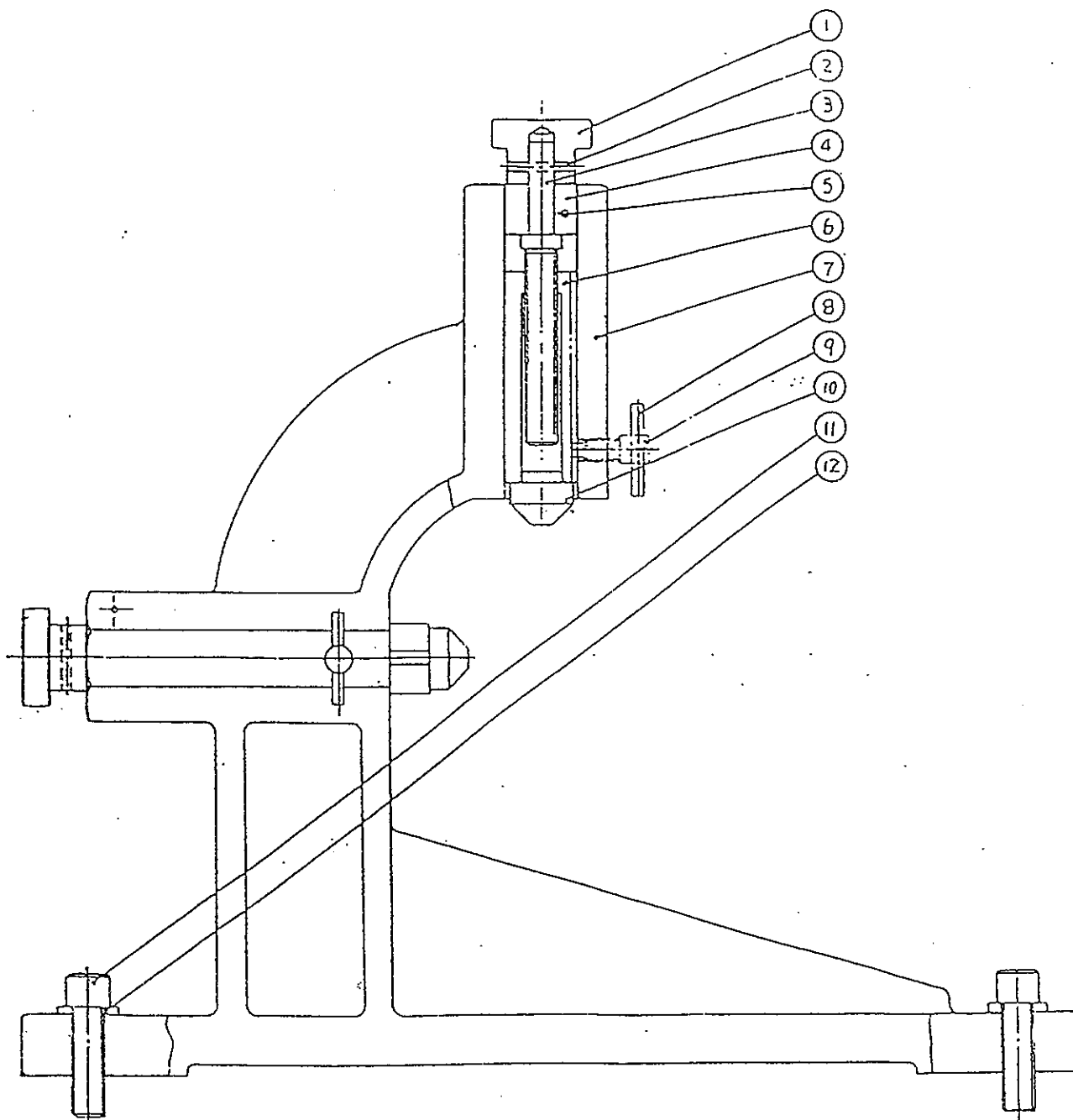


STEADY REST (opt)



ATTACHMENT

FOLLOW REST (OPT)



ATTACHMENTS PARTS LIST

Steady Rest

Item	Part No.	Description	Dimension	Qty.
1	29206	Grip		
2	29206-A	Spring Pin	3 x 23	3
3	29207	Bushing		3
4	29207-A	Spring Pin	3 x 46	3
5	29205	Screw Shaft		3
6	29208	Sleeve		3
7	29210	Special Screw		3
8	29210-A	Spring Pin	4 x 32	3
9	29209	Jaw		3
10	29202	Pin	10 x 46	1
11	29204	Grip for Lock		1
12	29201	Steady Rest Body, Upper		1
13	29203	Special Bolt		1
14	29202-B	Pin	10 x 46	1
15	29202	Steady Rest Body, Lower		1
16	29202-C	Hex Nut	M16	2
17	29202-D	Stud Bolt	M16 x 100	1
18	29202-E	Washer	M16	1
19	29211	Set Boss of Steady Rest		1
20	29208-1	Sleeve		3
21	29208-1-A	Deep Groove Ball Bearing		
22		Pin		

Follow Rest

Item	Part No.	Description	Dimension	Qty.
1	29103	Grip		2
2	29103-A	Spring Pin	3 x 23	2
3	29102	Screw Shaft		2
4	29104	Bushing		2
5	29104-A	Spring Pin	3 x 40	2
6	29105	Sleeve		2
7	29101	Follow Rest Body		1
8	29107-A	Spring Pin	4 x 32	2
9	29107	Special Screw		2
10	29106	Jaw		2
11	29101-A	Socket Head Cap Screw	M12 x 35	2
12	29101-B	Spring Washer	M12	2

SPLASH GUARD

ASSEMBLY NUMBER: 45870-01

ITEM	PARTS NO.	PARTS NAME	Q'TY	REMARKS
001	45-70253	COLLECTOR	1	
002		SCREW	24	M6XP1.0
003		WASHWR	24	Ø12.5XØ6.6X1.6T
004	45-70046	TRACK	2	
005	45-70255	TRACK PLATE	24	
006		SCREW	48	M6XP1.0
007		WASHER	48	Ø12.5XØ6.6X1.6T
008		NUT	12	M8XP1.25
009		WASHER	24	Ø17XØ9X1.6T
010	BG-37	BEARING	12	608ZZ
011	43-70024	SHAFT	12	
012		WASHER	6	Ø12.5XØ6.6X1.6T
013		SCREW	6	M6XP1.0
014	45-70251	DOOR	1	
015		RUBBER	2	
016	45-70257	GLASS WINDOW	1	
017	45-70252	DOOR	1	
018		HANDLE	2	
019	45-70250	DOOR	1	
020		RUBBER	1	
021	45-70057	GLASS WINDOW	1	
022	45-70256	TRACK	2	
023	45-70078	SHAFT	2	
024		C SNAP RING	4	S10
025	45-70077	SUPPORT	2	
026		WASHER	4	Ø12.5XØ6.6X1.6T
027		SCREW	4	M6XP1.0
028	BG-127	BEARING	2	6000ZZ

SPLASH GUARD

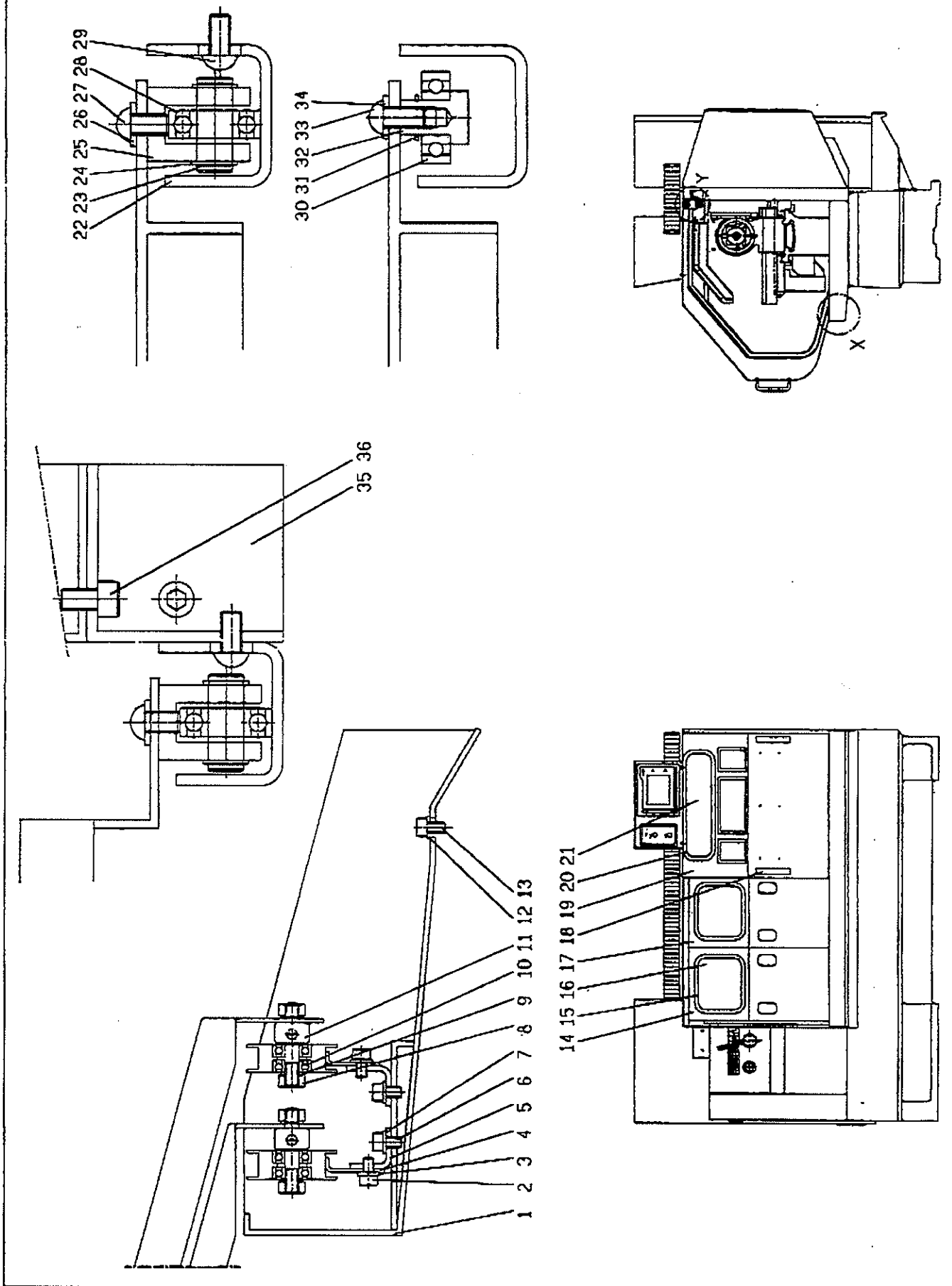
3

ASSEMBLY NUMBER: 15870--02

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TOTAL P.04

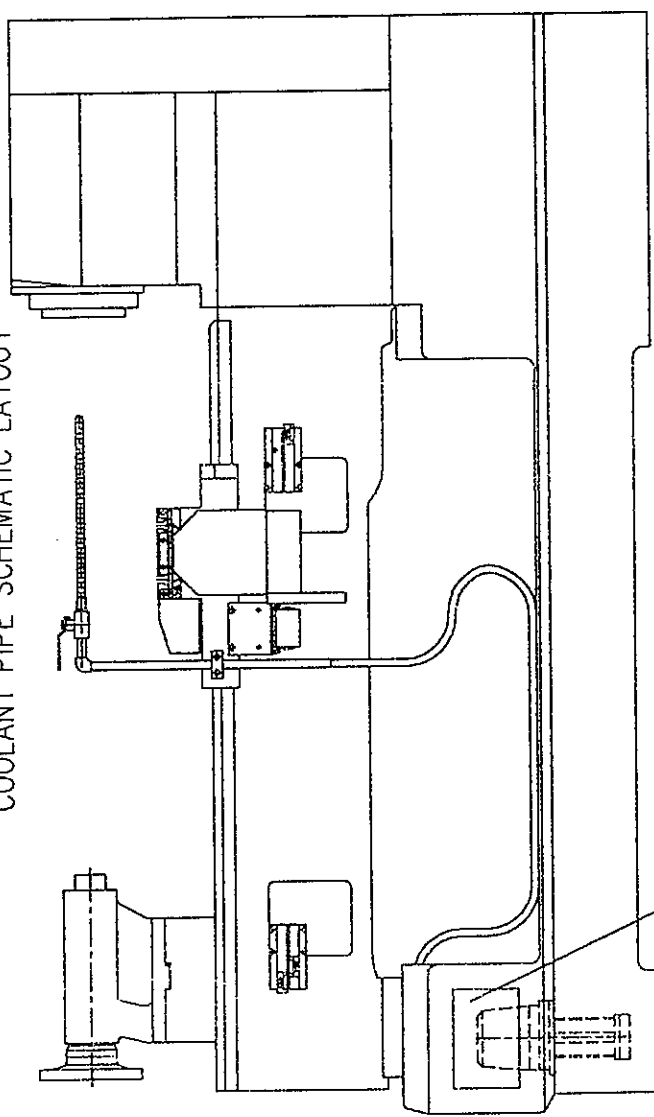
SPLASH GUARD



COOLANT SYSTEM

COOLANT SYSTEM

COOLANT PIPE SCHEMATIC LAYOUT



ACCESS PANEL TO COOLANT PUMP AND TANK

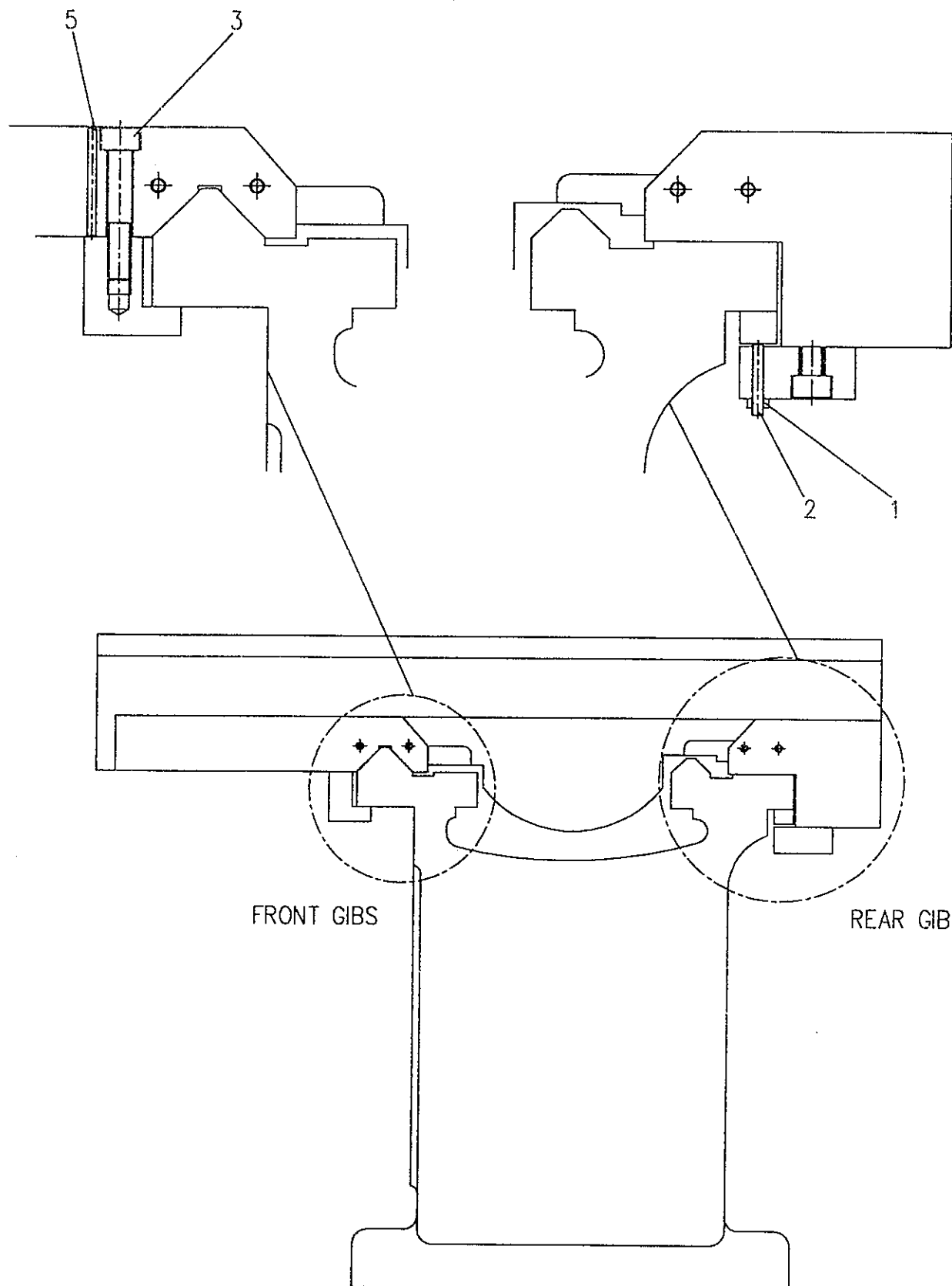
J		

MAINTENANCE

&

ADJUSTMENTS

SADDLE TAPER GIBS ADJUSTMENT



CARRIAGE BIG ADJUSTMENT:

PROLONGED/EXTENSIVE USE MAY REQUIRE THAT THE CARRIAGE (SADDLE) GIBS BE READJUSTED IN ORDER TO RESTORE ORIGINAL REGIDITY AND ACCURACY.

FRONT:

ADJUSTMENTS ARE MADE FROM THE TOP AT BOTH LEFT AND RIGHT WINGS.

1. LOOSEN LOCKING BOLT #3 FIG 24 SLIGHTLY.
 2. REMOVE (TOP) JAMB NUT #4 FIG 24.
 3. TIGHTEN ADJUSTMENT SCREW #5 FIG 24.
 4. RETIGHTEN LOCKING BOLT #5 (OVERTIGHTENING WILL CHANGE ORIGINAL ADJUSTMENT ON #5).
- REPEAT ON OPPOSITE FRONT SADDLE WING.
CHECK FOR PROPER ADJUSTMENT BY TRAVERSING SADDLE BACK AND FORTH WITH THE APRON HAND WHEEL. IF TOO TIGHT OR TOO LOOSE REPEAT PROCEDURE 1,2,3 & 4 TIL CORRECT.

REAR:

ADJUSTMENTS ARE MADE FROM THE UNDER SIDE BOTH LEFT AND RIGHT REAR SADDLE WING.

1. LOOSEN JAMB NUT #1 FIG 24 (BOTH SIDES).
2. TIGHTEN ADJUSTING BOLT #2 (BOLT SIDES) UNTIL THE CORRECT ADJUSTMENT IS ACHIEVED.
3. RETIGHTEN JAMB NUT #1 (BOTH SIDES).

NOTE: TIGHTENING THE JAMB NUT WILL TEND TO LOOSEN ADJUSTING BOLT #2 SLIGHTLY. REPEAT OPERATION; 2 & 3 IF REQUIRED.

CONTINUE

1. ADJUSTING BOLT
2. ADJUSTING BOLT
3. WEDGE BLOCK

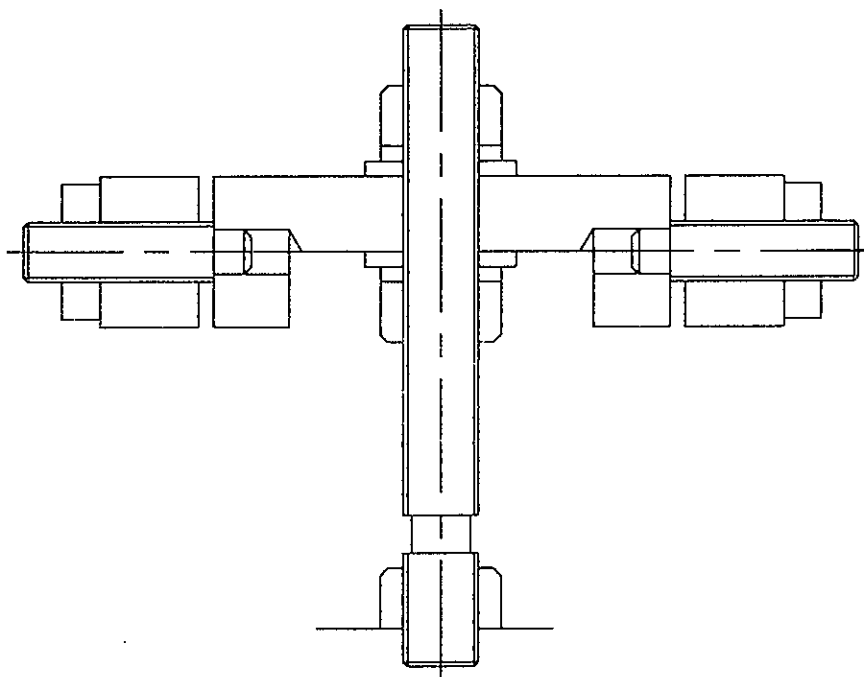
NOTE: TO CORRECT CINDITION A OR B; SHIFT HEAD AAS INDICATED BY APPROPRIATE ARROW.

DRIVE BELTS:

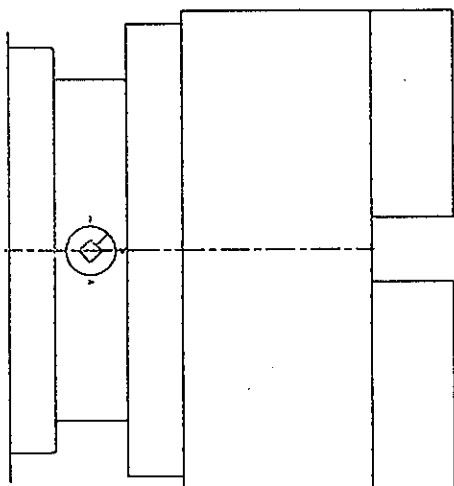
IN NONMAL USE V-BELTS WILL STRETCH THAS REQUIRING PERIODIC TENSION ADJUSTMENT.

1. REMOVE MOTOR ACCESS COVER (SNAP-OUT COVER AT LOWER REAR OF HEADSTOCK PEDESTAL LEG).
2. LOOSEN ADJUSTING NUT TIL DESIRED TENSION IS ACHIEVED.
3. TIGHTEN JAMB NUT.

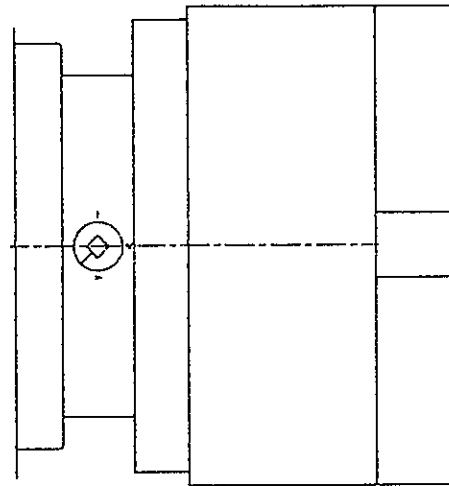
NOTE: CHANGING THE POSITION OF THE MOTOR MOUNTING PLATE WILL AFFECT THE ADJUSTMENT OF THE BRAKE ASSEMBLY & THE MICRO LIMIT SWITCH. IT MAY BE NECESSARY TO READJUST BOTH.



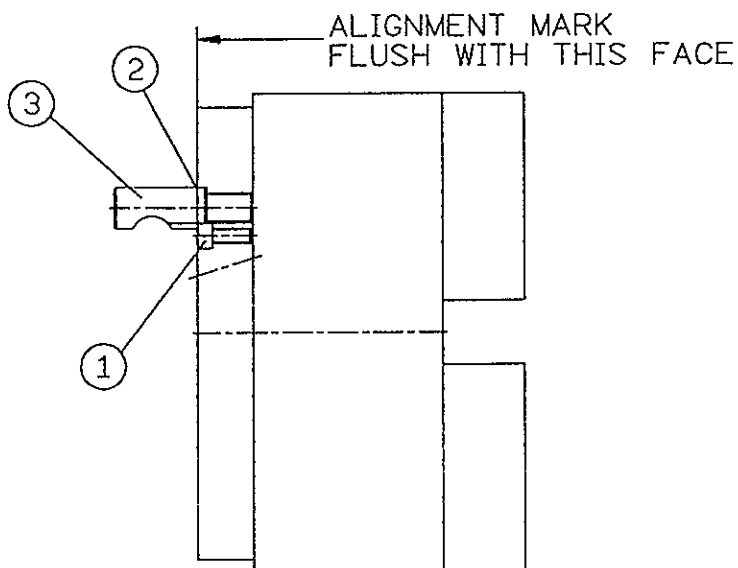
CORRECT CAMLOCK MOUNTING AND ADJUSTMENT



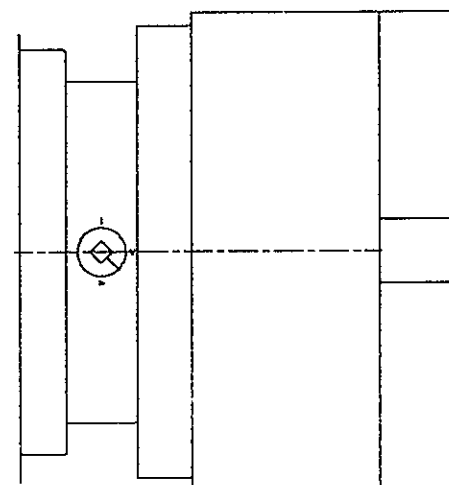
INCORRECT
TURN CAMLOCK STUD
OUT ONE TURN



INCORRECT
TURN CAMLOCK STUD
OUT ONE TURN



- ① LOCKING SCREW
- ② ALIGNMENT MARK
- ③ CAMLOCK STUD



CORRECT
CAMLOCK MARKER LINE
BETWEEN "V" MARKS ON
ON SPINDLE NOSE

