

ISO702/ II-1975)

when mounting, put the three pull pin of chuck or face plate into the three holes (See Fig. 19) on the spindle face end. Then turn the three cams (See, Fig. 19) with the help of square head wrench when turning the cams clockwise the chuck or face plate will be locked. when turning the cams counter-clockwise to certain point, the chuck or face plate can be detached.

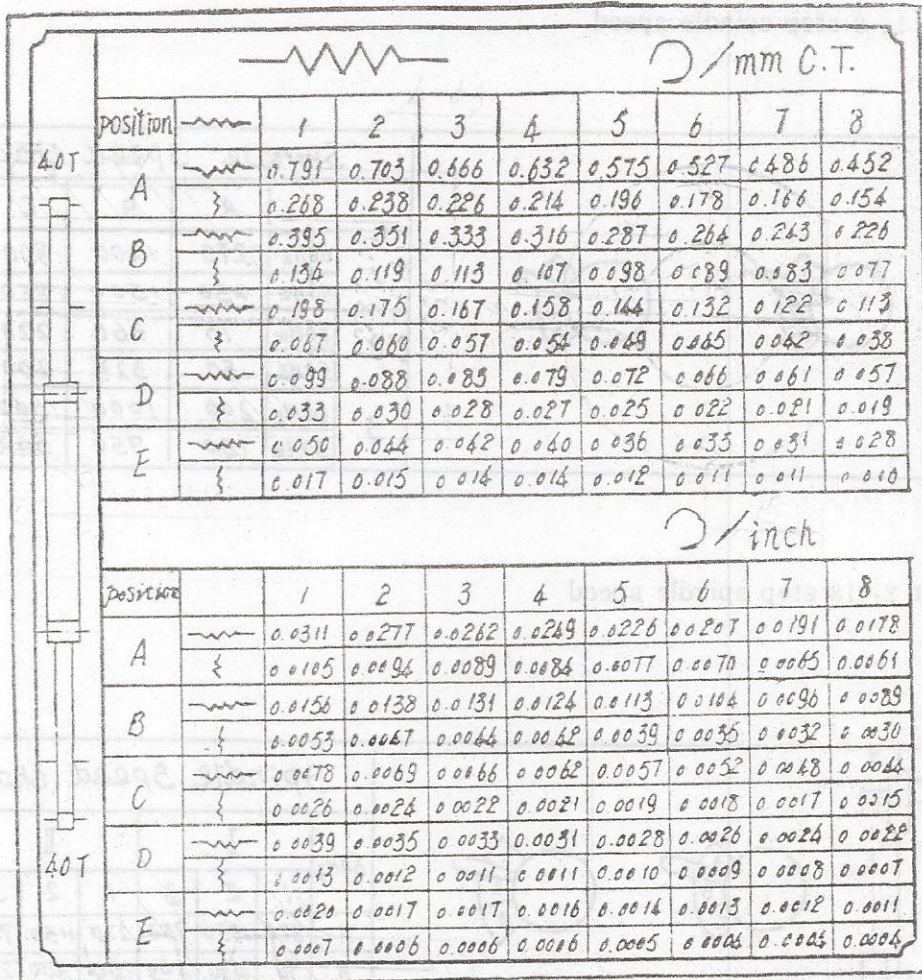
LATHE MAINTENANCE

1. Before operating the machine, check the oil level and lubricate all sliding and rotating parts according to "Lubricate Chart" (Fig. 6)
2. Always clean every sliding surfaces to prevent the chips. Often check the felt element on each end of the saddle. If being damaged, wash or change it. After operating, clean every parts of the machine and oil each slide surfaces, leadscrew, feed rod etc. to avoid rusting.
3. Periodically wash headstock, gear box, apron and change oil.
4. Keep oil from falling on the motor and v-belt. Periodically check and adjust v-belt.
5. Don't change every gear levers when the spindle is running to prevent damaging gears. If unable to change, you can turn the spindle with hand.
6. When changing spindle rotating direction, it can be accomplished with the help of forward and reverse rotation of motor. It is necessary first to stop spindle. Don't directly change the motor rotating direction before spindle stopped.
7. When using steady rest or follower rest, frequently oil the touching positions between slide pieces and workpiece.
8. Protect the spindle nose, short taper, taper bore of spindle from roughing and impacting on the working accuracy.
9. Finding the machine damaged, repair it immediately.

- * Handwheel (7) is used for manually moving the carriage along the bedway.
 - * crossfeed crank (19) is used to manually move the cross slide in or out.
 - * Compound slide crank (16) is used to manually move the tool post. The compound is fully adjustable to any angle and is also used for threading or machining an angle on the workpiece.
 - * Starting/stopping lever (11) is used to control the spindle direction of rotating, either forward or reverse.
 - * Thread lever (9) is used to engage the half nuts when threading.
 - * Feed lever (8) is used to engage either the longitudinal or cross feed. This lever has a safety interlock to prevent accidental engagement of the half nuts when the lathe is in feed mode. There are three positions: Center or disengaged position. Upper position engages the power longitudinal feed. Lower position engages the power cross feed.
 - * The lead/feed lever (3) is used to change the direction of either longitudinal or cross feed in remaining the same spindle rotation.
 - * Thread cutting dial (10) is used to engage the half nuts with the leadscrew in the same thread that has been previously cut. Please note: Use any line of the dial for even pitches of threads; but you must use the same starting line for odd pitches of threads, i.e. when cutting a shaft with 10 T.P.I., engage the half nuts at any number on the thread dial; when cutting an odd pitches, if you start the cut using a 1 or a 3, continue to use the 1 or the 3 until the thread is finished.
 - * The clamp lever (18) is used to secured tool post against loosing. Loosing the lever, the tool post can rotate counter-clockwise to change cutting tools.
 - * Saddle lock screw (17) is used to firmly clamp saddle to bed way.
 - * Compound slide screw (20) is used to clamp compound silde to saddle.
- Tailstock
- * The handwheel (12) is used to feed or retreat the quill. Turning the handwheel in counter-clockwise until a full stop is reached will automatically eject the tool being used.
 - * The tailstock clamp lever (13) locks the tailstock to the bedway. To lock, put the lever up. To release, put it down.
 - * The quill lock lever (15) prevent the quill from moving. Before operating the handwheel (12), release the lever. Feeding the quill to desired position, lock it.
 - * Two set screws (14) on either side of the base is used to offset the tailstock. After taper adjustment is made, retighten both screws.
5. See the Fig. 18, Adjust the clearance of cross feed nuts on the saddle as

COMBINATION OF GEARS		CHANGE GEAR CHART FOR mm SIZE								
		PITCH mm								
		1	2	3	4	5	6			
F G	26	ANY	60	POSITION						
				A				2.0		
				B				1.0	0.9	
				C	0.7			0.5	0.45	
				D	0.35			0.25		
				E						
F G	27		60	A						
				B		1.2				
				C		0.6				
				D		0.3				
				E						
F G	35		60	A	3.5					
				B	1.75					
				C	0.875	0.8				
				D		0.4				
				E		0.2				
F G	45		60	A	4.5	4				3
				B	2.25					1.5
				C	1.25					0.75
				D						
				E						
F G	50		60	A	5					
				B	2.5	2.2				
				C	1.25	1.1				
				D		0.55				
				E						

Fig.17 Metric Thread pitch list(Imperial leadscrew)



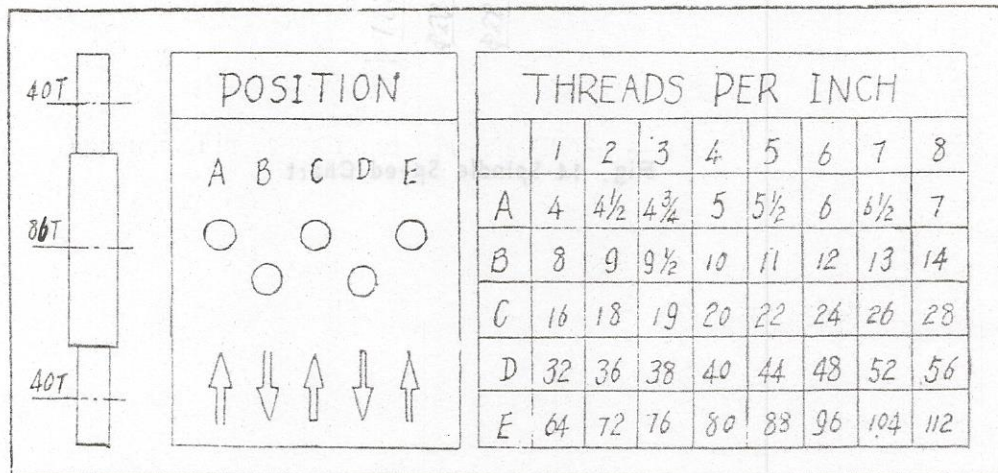
mm C.T.

Position		1	2	3	4	5	6	7	8
A	~	0.791	0.703	0.666	0.632	0.575	0.527	0.486	0.452
	}	0.268	0.238	0.226	0.214	0.196	0.178	0.166	0.154
B	~	0.395	0.351	0.333	0.316	0.287	0.264	0.243	0.226
	}	0.134	0.119	0.113	0.107	0.098	0.089	0.083	0.077
C	~	0.198	0.175	0.167	0.158	0.144	0.132	0.122	0.113
	}	0.067	0.060	0.057	0.054	0.049	0.045	0.042	0.038
D	~	0.099	0.088	0.085	0.079	0.072	0.066	0.061	0.057
	}	0.033	0.030	0.028	0.027	0.025	0.022	0.021	0.019
E	~	0.050	0.044	0.042	0.040	0.036	0.035	0.031	0.028
	}	0.017	0.015	0.014	0.014	0.012	0.011	0.011	0.010

inch

Position		1	2	3	4	5	6	7	8
A	~	0.0311	0.0277	0.0262	0.0249	0.0226	0.0207	0.0191	0.0178
	}	0.0105	0.0094	0.0089	0.0084	0.0077	0.0070	0.0065	0.0061
B	~	0.0156	0.0138	0.0131	0.0124	0.0113	0.0104	0.0096	0.0089
	}	0.0053	0.0047	0.0044	0.0042	0.0039	0.0035	0.0032	0.0030
C	~	0.0078	0.0069	0.0066	0.0062	0.0057	0.0052	0.0048	0.0044
	}	0.0026	0.0024	0.0022	0.0021	0.0019	0.0018	0.0017	0.0015
D	~	0.0039	0.0035	0.0033	0.0031	0.0028	0.0026	0.0024	0.0022
	}	0.0013	0.0012	0.0011	0.0011	0.0010	0.0009	0.0008	0.0007
E	~	0.0020	0.0017	0.0017	0.0016	0.0014	0.0013	0.0012	0.0011
	}	0.0007	0.0006	0.0006	0.0006	0.0005	0.0004	0.0004	0.0004

Fig.15 Feed Rate list



POSITION	THREADS PER INCH							
	1	2	3	4	5	6	7	8
A	4	4½	4¾	5	5½	6	6½	7
B	8	9	9½	10	11	12	13	14
C	16	18	19	20	22	24	26	28
D	32	36	38	40	44	48	52	56
E	64	72	76	80	88	96	104	112

Fig.16 Inch Thread Pitch list (Imperial leadscrew)

PARTS LIST

Symbol	Name	Type
M1	IPH Motor	YC90L2-4
FR1	Heat device relay	T16
FU1	Fuse	RDD-1 110V 2A
SB0	Button	LAY3-01ZS / 1
SB1	Button	LAY3-10DN / 32J
SB2	Button	LAY3-10 / 3
SA1	Selector Switch	HZ5B-10 / 2D009
HL1	Indicator Lamp	AD1-22 / 212 110V
HL2	Indicator Lamp	In SB1
TC	Transformer	JBK-63
KA0	Relay	CA2-DN140 110V
KM1	AC Cotactor	LC1-D259 110V
KM2	AC Contactor	LC1-D259 110V

FOR 1 PHASE

PARTS LIST

Symbol	Name	Type
M1	Motor	Y90S-4
FR1	Heat device relay	T16
FU1	Fuse	RDD-1 110V 2A
SB0	Button	LAY3-01ZS / 1
SB1	Button	LAY3-10DN / 32J
SB2	Button	LAY3-10 / 3
SA1	Selector Switch	HZ5B-10 / 2D009
HL1	Indicator Lamp	AD1-22 / 212 110V
HL2	Indicator Lamp	In SB1
TC	Transformer	JBK-63
KA0	Relay	CA2-DN140 110V
KM1	AC Contactor	LC1-D129 110V
KM2	AC Contactor	LC1-D129 110V

FOR 3 PHASE

ELECTRICAL DOCUMENT CATALOGUE

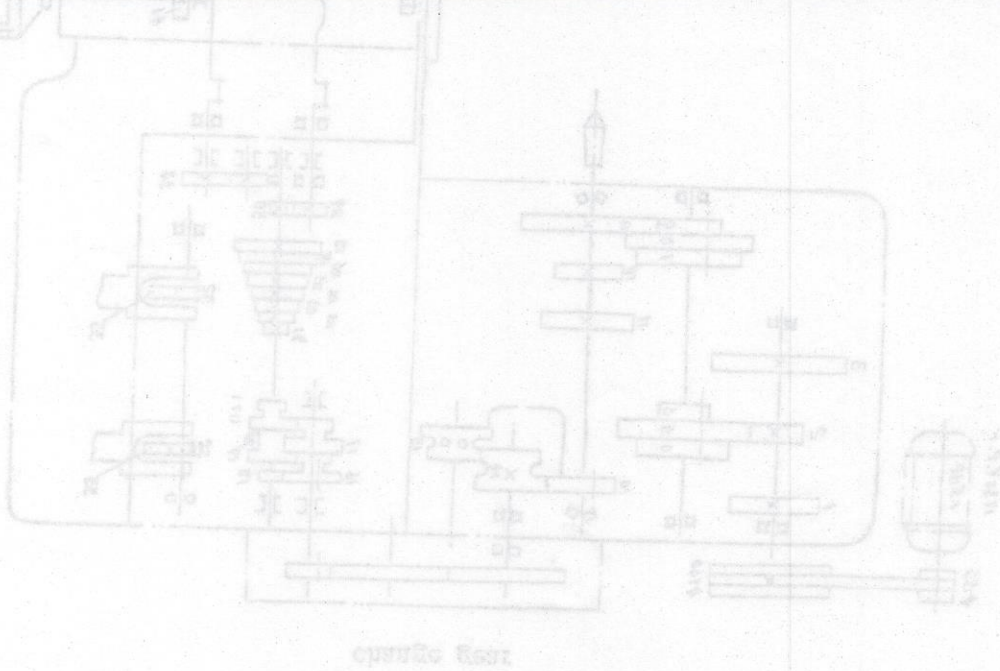
No.	Name	Page
1	electrical system explanation	14
2	Fig.7 Wiring diagram for 3 phase	15
3	electrical element list	16
4	Fig.8 Wiring diagram for 1 phase	17
5	electrical element list	18

ELECTRICAL SYSTEM EXPLANATION

- * The standard lathe are wired for 220V/380 V3 phase 60 & 50 Cycle(See Fig. 7) or for 110 V/220 V 1 phase 60 & 50 cycle (See Fig.8) according to order. For connection to other volts, check the wiring diagram for the changeover shown in the motor terminal cover.
For electrical connections, merely connect your supply lines to the leads provided on the lathe, Before connecting, make sure the motor specification and the machine wiring correspond with power supply and connect 15/30 A fuse into power line.
- * Electrical control box is located behind the headstock.
- * Put the cs handle in the middle position and push the "power start" to close the electrical circuit. The cs switch is wired for counter-clockwise spindle rotation in the forward position and clockwise spindle rotation in the reverse position. If not, turn off the power and interchange the leads according to the motor wiring diagram.
- * Putting cs-handle in the middle position can stop the machine. Pushing the knob "reset" will open the circuit.
- * The machine must be connected to ground or ground wire.

BEARING LIST(See Fig 5)

Type	Name	Specification	Q'TY	Installation
60104	single row ball bearing with shield	20 × 42 × 12	2	headstock
60304	"	20 × 52 × 15	1	
104	single row ball bearing	20 × 42 × 12	3	
204	"	20 × 47 × 14	1	
D7211	single row taper roller bearing	55 × 100 × 23	1	
D7212	"	60 × 110 × 24	1	
7000102	single row ball bearing	15 × 32 × 8	2	gear box
8103	single row pillow-block bearing	17 × 30 × 9	3	
8101	"	12 × 26 × 9	2	carriage
8102	"	15 × 28 × 9	2	
8101	"	12 × 26 × 9	1	tailstock
80202	single row ball bearing with two end shield	15 × 35 × 11	1	change gear



续表

parts	part No	description	No of teeth or thread	modulus or pitch	pressure angle	material	notes
	39	worm	single thread	m2	20 deg	45	
	40	worm gear	24	m2	20 deg	ZQSn 6-6-3	
	41	gear	12	m2	20 deg	45	
	42	gear	50	m2	20 deg	45	
	43	pinion	25	m2	20 deg	45	
	44	nut	single thread	8 teeth per inch		ZQSn 6-6-3	lefthand thread
	45	screw	single thread	8 teeth per inch		45	
apron	46	gear	14	m2	20 deg	45	
	47	gear	51	m2	20 deg	45	
	48	gear	13	m2	20 deg	45	
	49	gear	25	m2	20 deg	45	
	50	gear	48	m2	20 deg	45	
	51	screw	single thread	8 teeth per inch		45	
	52	screw nut	single thread	8 teeth per inch		ZQSn 6-6-3	
tail-stock	53	screw	single thread	10 teeth per inch		45	lefthand thread
	54	nut	single thread	10 teeth per inch		ZQSn 6-6-3	lefthand thread
		gear	40	m1.5	20 deg	45	2 pieces
		gear	25	m1.5	20 deg	45	
		gear	26	m1.5	20 deg	45	
change gear		gear	43	m1.5	20 deg	45	
		gear	46	m1.5	20 deg	45	
		gear	47	m1.5	20 deg	45	
		gear	60	m1.5	20 deg	45	
		gear	80	m1.5	20 deg	45	

the bedway are level (the longitudinal tolerance is 0.02/1000 and the cross one is 0.04/1000).

6. During transport and unpacking, it is likely that debris will be present on top of the lathe. Do not move the carriage or tailstock until the bed way has been thoroughly cleaned.

LATHE DRIVING SYSTEM AND THE LIST OF MAIN GEARS, SCREWS, NUTS

Machine driving system, see Fig. 4

The list of main gears, screws and nuts in the machine driving system

parts	part No	description	No. of gear teeth or screw thread	modulus or pitch	pressure angle	material	notes
head-stock	1	gear	42	m 2	20 deg	45	
	2	gear	23	m 2	20 deg	45	
	3	gear	51(47)	m 2	20 deg	45	47 teeth gear is used to 18 chang speed lathe.
	4	gear	36	m 2	20 deg	45	
	5	gear	55	m 2	20 deg	45	
	6	gear	27(31)	m 2	20 deg	45	"
	7	gear	50(45)	m 2	20 deg	45	"
	8	gear	65(58)	m 2	20 deg	45	
	9	gear	21	m 2	20 deg	45	
	10	gear	45	m 2	20 deg	45	"
	11	gear	54(59)	m 2	20 deg	45	"
	12	gear	39(46)	m 2	20 deg	45	
	13	gear	83	m 2	20 deg	45	
	14	paired gear	45	m 2	20 deg	45	
		gear	40	m 2	20 deg	45	
15	paired gear	40	m 2	20 deg	45		
	gear	45	m 2	20 deg	45		

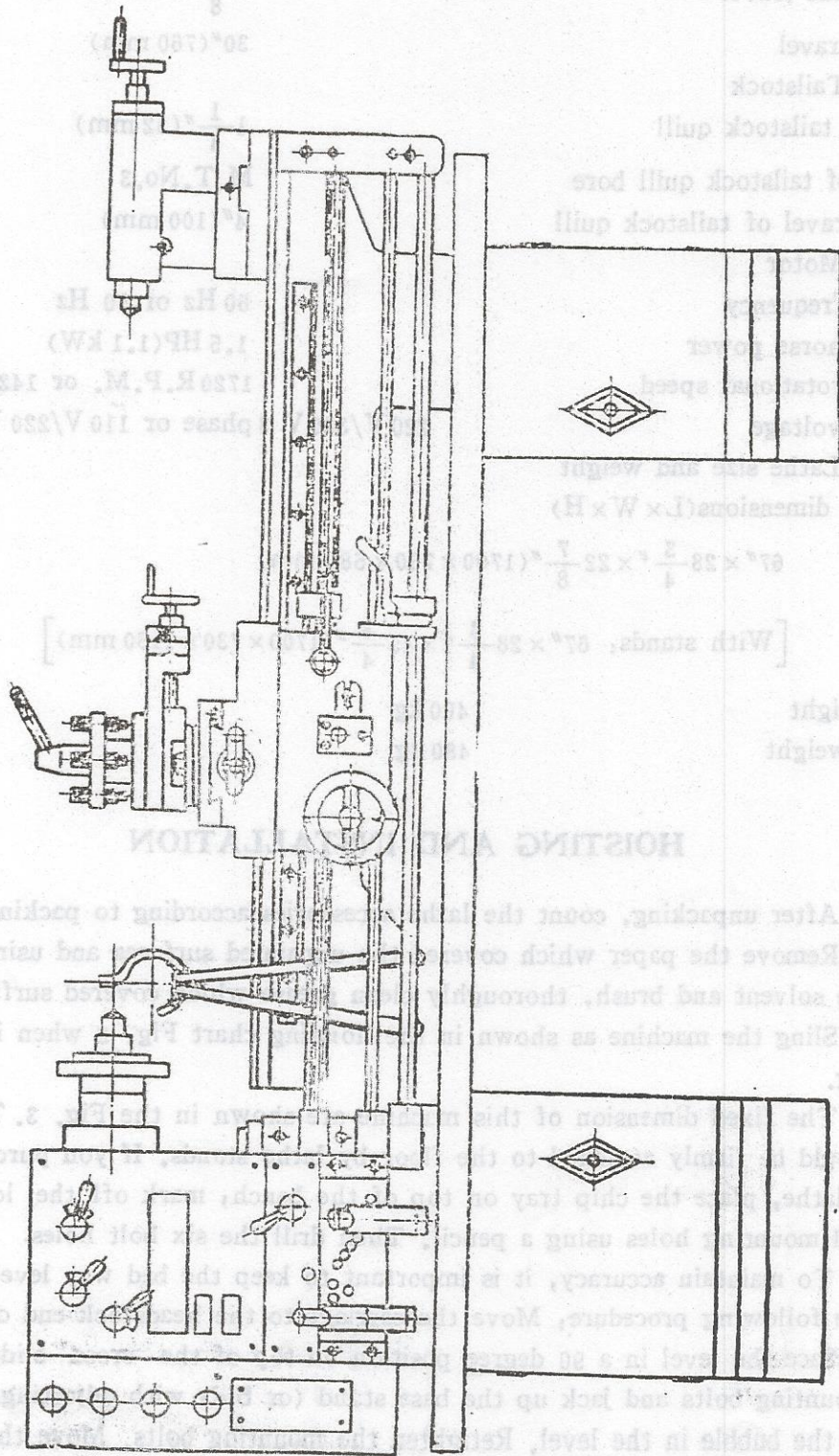


Fig. 2 Hoisting Chart

APPLICATION

The machine is a small-scale universal engine lathe. It can perform various turning operation, as well as boring, drilling, grooving and other operations. It can also be used for turning metric threads and inch threads.

The machine is characterized by simple construction, easy operation, large hole in spindle and small floor space. It is used in the instrument industry and repairing workshops and is suitable for metal manufacture in single piece, small and medium batch production.

MAIN TECHNICAL SPECIFICATION

1. Main Specification

Max. swing dia. of workpiece over bed	12" (300 mm)
Max. swing dia. of workpiece over saddle gap	17" (430 mm)
Max. swing over cross slide	7" (178 mm)
Max. length of workpiece	36" (900 mm)

2. Headstock

(dia. of) spindle bore	1 $\frac{1}{2}$ " (38 mm)
Taper of spindle bore	M.T. No. 5
Range of spindle speeds (9 or 18 changes)	50—1500 r.p.m.

3. Change Gears And Gear Box

Threads which can be cut	Metric: 29 kinds, 0.2—4.5 mm Inch: 40 kinds, 4—112 T.P.I.
--------------------------	--

Saddle feed range per spindle revolution:

40 kinds, 0.028—0.791 mm/rev.

Cross feed range per spindle revolution:

40 kinds, 0.010—0.268 mm/rev.

Threads per inch lead screw 8 T.P.I.

Threads per inch cross screw 8 T.P.I.

Cross Feed per division on its dial 0.001" (0.025 mm)

Threads per inch tool post screw 8 T.P.I.

Tool Post feed per division on its dial 0.001" (0.03 mm)

4. Tool Post And Saddle

Max. turn angle of tool post ±90°

Tool slide travel 3" (76 mm)

CAUTION
CONTENTS

OUTSIDE DIAGRAM.....	1
APPLICATION.....	2
MAIN TECHNICAL SPECIFICATION.....	2
HOISTING AND INSTALLATION.....	3
LATHE DRIVING SYSTEM DIAGRAM AND THE LIST OF MAIN GEARS, SCREWS, AND NUTS.....	6
BEARING LIST.....	10
LUBRICATION.....	12
ELECTRICAL SYSTEM EXPLANATION.....	14
TRIAL DRIVE, ADJUSTMENT AND OPERATION.....	19
MAINTENANCE.....	26
DAMAGEABLE PARTS.....	27