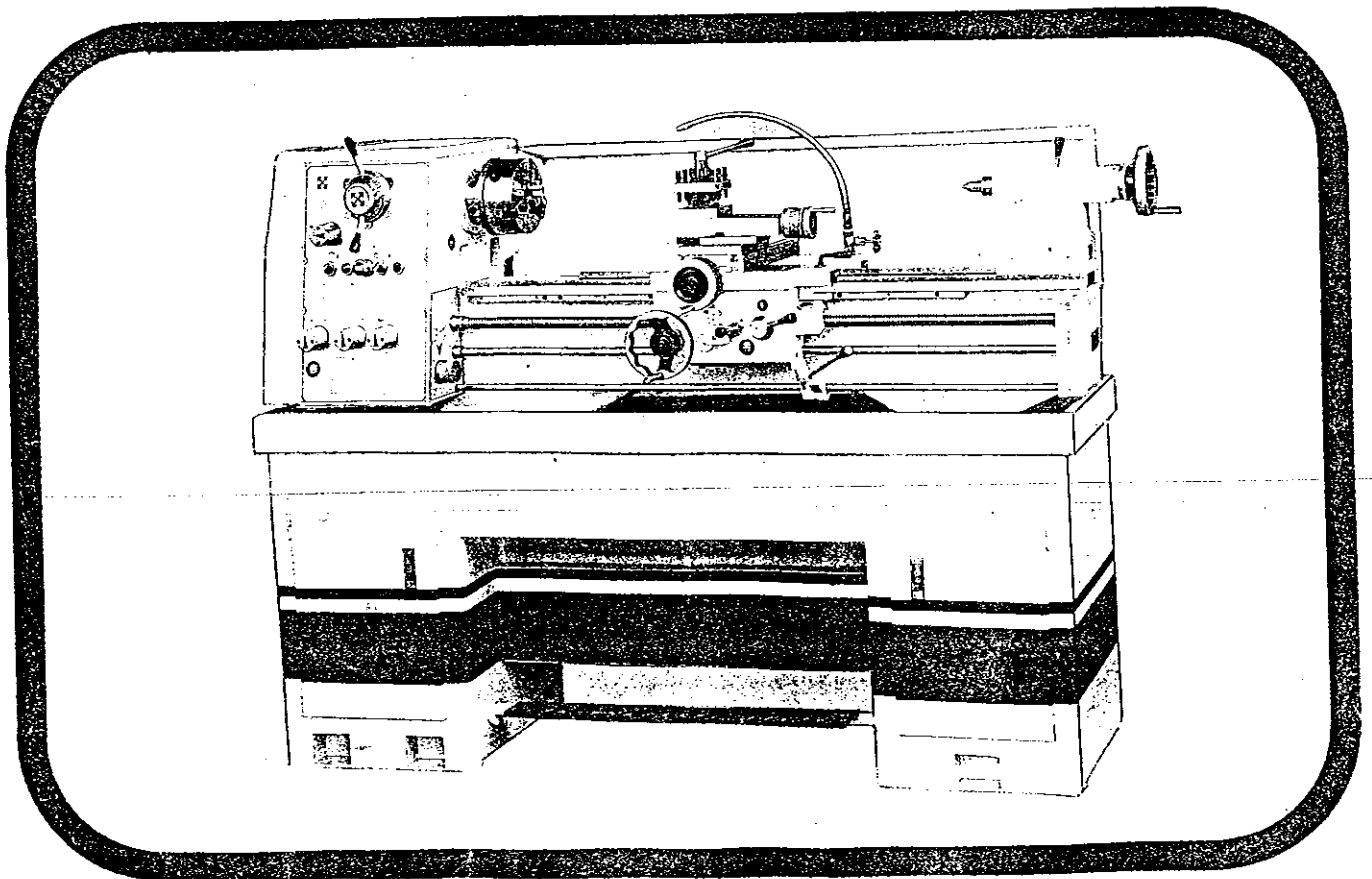


*PRECISION BENCH LATHE
OPERATING MANUAL
AND PARTS LIST*

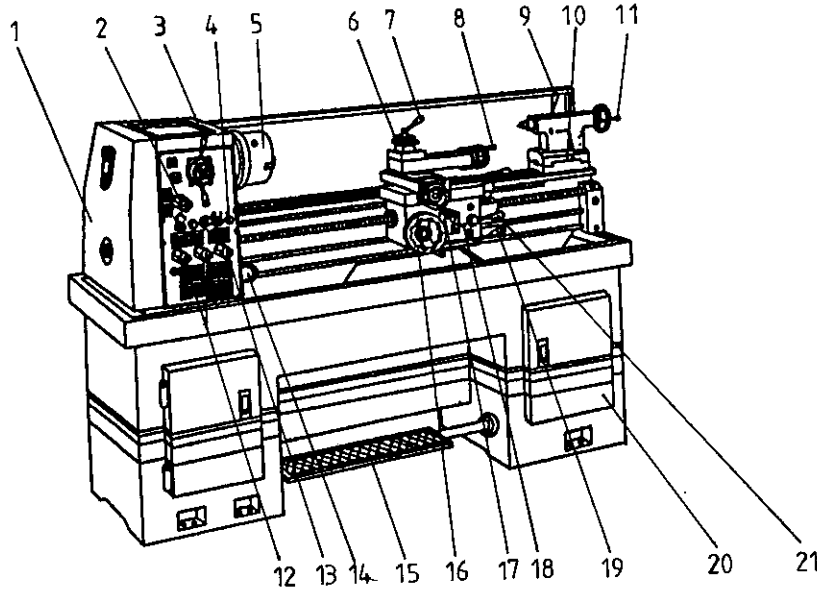
MODEL: 17 E F



1 . LENGEND

- 01.END COVER
- 02.POSITIVE-REVERSE SELECTIVE
- 03.HIGH/LOW SPEEDS CHANGE KNOB
- 04.ELECTRIC CONTROL PANEL
- 05.BACKING PLATE
- 06.LOCKING BOLT
- 07.CLAMPING LEVER FOR SQUARE TURRET TOOL POST
- 08.TOOL SLIDE HANDE
- 09.TAILSTOCK CLAMPING LEVER
- 10.TAILSTOCK ADJUSTED SCREW

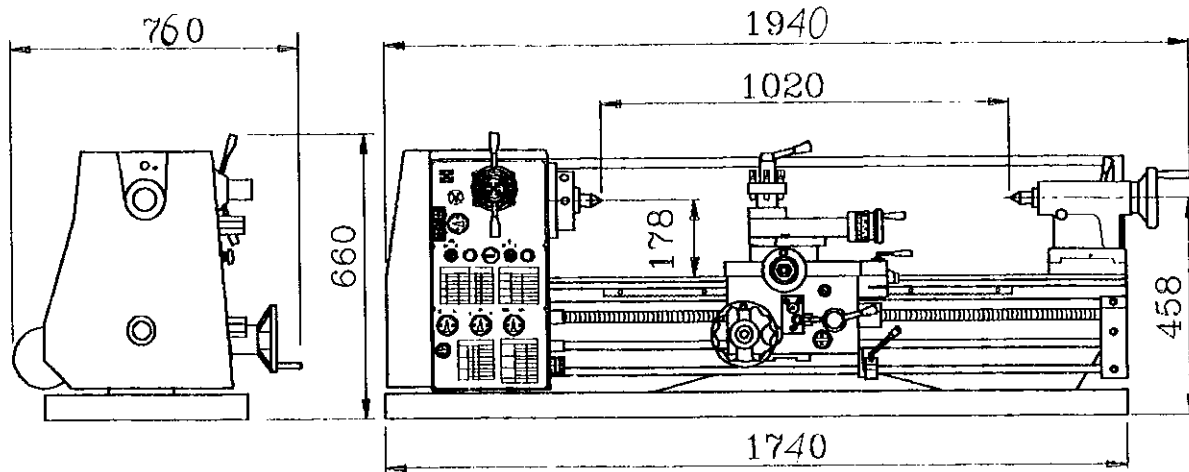
- 11.HAND WHEEL FOR TAILSTOCK QUILL MOVEMENT
- 12.GEAR BOX SPEEDS CHANGE KNOB
- 13.FEEDS AND THREADS SELECTIVE KNOB
- 14.GEAR BOX SPEEDS SELECTIVE DISH
- 15.BRAKE PEDAL
- 16.HANDLE WHEEL FOR LONGITUDINAL
- 17.CROSS SLIDE HAND WHEEL
- 18.LONGITUDINAL/CROSS FEED LEVER
- 19.FORWARD & REVERSE CONTROLLER
- 20.FLOOR STAND



2 . TECHNICAL DATA

SWING OVER BED	356mm (14")
SWING OVER SADDLE	218mm (8-9/16")
SWING OVER GAP	555mm (21-7/8")
DISTANCE BETWEEN CENTER	1020mm (40")
BED WIDTH	220mm (8-21/32")
SPINDLE BORE	41mm (1-5/8")
SPINDLE NOSE TAPER	M.T. #5
TAILSTOCK TAPER	M.T. #3
SPINDLE SPEED	12
RANGE OF SPINDLE SPEED	32-2500 RPM
TOP SLIDE TRAVEL	110mm (4-11/32")
CROSS SLIDE TRAVEL	187mm (7-3/8")
TAILSTOCK TRAVEL	127mm (5")
METRIC PITCHES	27
RANGE OF METRIC PITCHES	0.2 - 7.5 mm
IMPERIAL THREAD	40
NUMBER OF IMPERIAL	4 - 112 TPI
LEADSCREW DIAMETER & PITCHES	1" (25.4mm) X4 TPI OR PITCH 6mm
RANGE OF LONGITUDINAL FEED	0.33mm-0.924mm (0.0013"-0.0364")
RANGE OF CROSS FEED	0.06mm-0.157mm (0.0002"-0.0063")
MOTOR	3HP
NET WEIGHT	700 KG
MEASUREMENT	188X76X150 CM

3 . GENERAL DIMENSION



3.1 STANDARD ACCESSORIES

01.THREAD CUTTING INDICATOR	1 PC.
02.CENTER SLEEVE (M.T.#5)	1 PC.
03.CENTER (M.T.#3)	2 PCS.
04.TOOL POST WRENCH	1 PC.
05.METRIC CHANGE GEAR	1 SET.
06.4-WAYS TOOL POST	1 PC.
07.TOOL BOX & TOOL KITS	1 SET.
08.STEADY REST	1 PC.
09.3-JAW SCROLL CHUCK 6"	1 PC.
10.4-JAW INDEPENDENT CHUCK 8"	1 PC.
11.ELECTRIC MOTOR 3HP (3HP)	1 PC.
12.ROLLING CENTER M.T.#3	1 PC.
13.COLLANT PUMP & FITTINGS	1 SET.
14.FULL LENGTH SPLASH GUARD	1 PC.
15.FLOOR STAND	1 PC.

3.2 SPECIAL ACCESSORIES

01.FOLLOW REST	1 PC.
02.CAMLOCK FACE 12"	1 PC.
03.DRILL CHUCK 1/2"	1 PC.
04.SINGLE TOOL POST	1 PC.
05.MICROMETER TYPE CARRIAGE STOP	1 PC.
06.4-POSITION CROSS SLIDE STOP	1 PC.
07.MACHINE LIGHT	1 PC.
08.QUICK CHANGE TOOL POST 2	1 SET.
09.CAMLOCK BACK PLATE	1 PC.
10.5C HAND WHEEL COLLET CLOSER	1 SET.
11.5C LEVER COLLET CLOSER	1 SET.
12.CHUCK GUARD	1 PC.
13.MILLING ATTACHMENT	1 SET.
14.TAPER ATTACHMENT	1 SET.

4 . UNCRATION

ON RECEIPT OF SHIPMENT INSPECT THE CRATE FOR DAMAGES IN TRANSIT AND ADVISE THE SHIPPING COMPANY IF DAMAGES TO THE MACHINE ARE FOUND.

CAREFULLY REMOVE THE CRATE AND THE SKID TAKING CARE NOT STO SCRATCH OR DAMAGE THE MACHINE AND THE ACCESSORIES.

IMPORTANT:

1. WHEN HANDLING, MAKE SURE THAT THE SLINGS DO NOT CONTACT THEi@LEAD SCREW, THE FEED SHAFT, THE SPINDLE OR ANY HANDWHEEL.
2. CAREFULLY, LOWER THE MACHINE SO NOT TO BUMP THE FLOOR.

5. INSTALLATION

5.1 HANDLING

LIFT THE MACHINE AS SHOWN IN FIG.1 MAKING SURE THAT THE BEDWAYS ARE ADEQUATELY PROTECTED SO NOT TO BE DAMAGED.

MOVE THE CARRIAGE IN ORDER TO GET PROPER BALANCE AND RELOCK THE CARRIAGE BEFORE MOVING THE MACHINE.

CAREFULLY, LOWER THE MACHINE TO ITS FOUNDATION LEVELING PADS, WEDGES OR SHIMS.

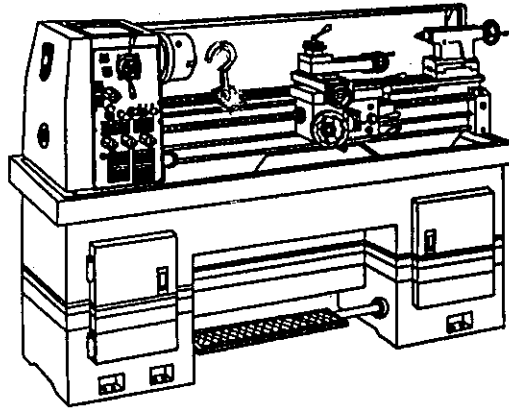


FIG.1

5.2 CLEANING

ALL MACHINE SURFACES ARE COVERED WITH A RUST PRESERVATIVE WHICH MUST BE THOROUGHLY CLEANED BEFORE MOVING ANY PARTS OF THE LATHE. ONLY MILD SOLVENT AND SOFT RAGS MUST BE USED FOR CLEANING.

- NOTE: 1. SPECIAL CARE MUST BE TAKEN TO COMPLETELY CLEAN THE LEAD SCREW, FEED SHAFT, RACK AND PINION.
2. NEVER USE LACQUER, THINNER, GASOLINE OR OTHE INFLAMMABLE AS A CLEANING FLUID.

5.3 LEVELLING

1. IT IS MOST IMPORTANT TO SET THE LATHE LEVEL AND FIRM IN ORDER TO PERFORM ACCURATELY. FOR A BEST RESULT, IT IS SUGGESTED TO MOUNT THE LATHE ON A CONCRETE FLOOR.
2. IF THE MACHINE CAN NOT BE ANCHORED TO A CONCRETE FLOOR IT IS RECOMMENDED TO INSTALL THE LATHE ON A HEAVY STEEL PLATE FITTED WITH LEVELLING SCREWS SO TO PROPERLY ALIGN AND LEVEL THE MACHINE.
3. IF THE LATHE IS TO BE MOUNTED ONTO A BENCH, FIRST MAKE SURE THAT THE BENCH, IS PROPERLY LEVELLED TO THE REQUIRED TOLERANCE.

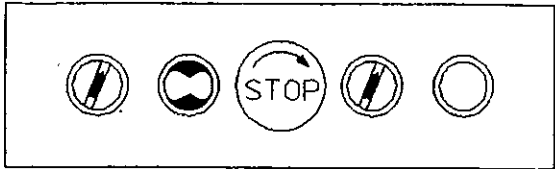
5.4 ELECTRICAL CONTROLS

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, A.C. VOLTAGE AS YOU REQUIRED.

- NOTE: 1. BEFORE CONNECTING TO A POWER SOURCE ESTABLISH MOTOR VOLTAGE, PHASE AND CYCLES.

2. MADE SURE THAT POWER SUPPLY IS PROPERLY FUSED AND GROUNDED.
3. MOTOR ROTATION MUST BE CLOCKWISE WHEN VIEWED FROM THE PULLY END. IF THE MOTOR TURNS IN THE WRONG DIRECTION INTERCHANGE THE PHASES FOR CORRECTION.

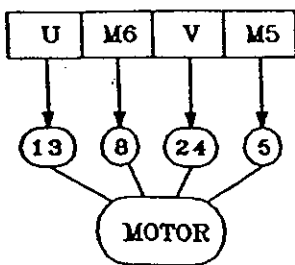
5.5 MOTOR CONTROLS



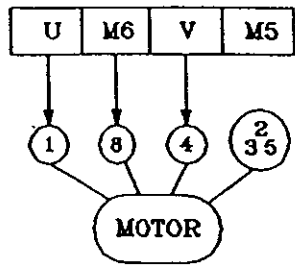
1. PUMP SWITCH
2. PILOT LAMP
3. STOP SWITCH
4. POWER SWITCH
5. JOGGING SWITCH

1 2 3 4 5

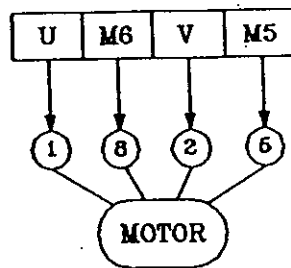
5.6 ELECTRIC WIRING DIAGRAM



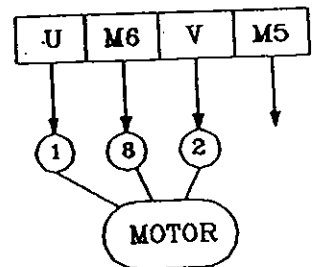
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(LINE OUT 6 TYPE)

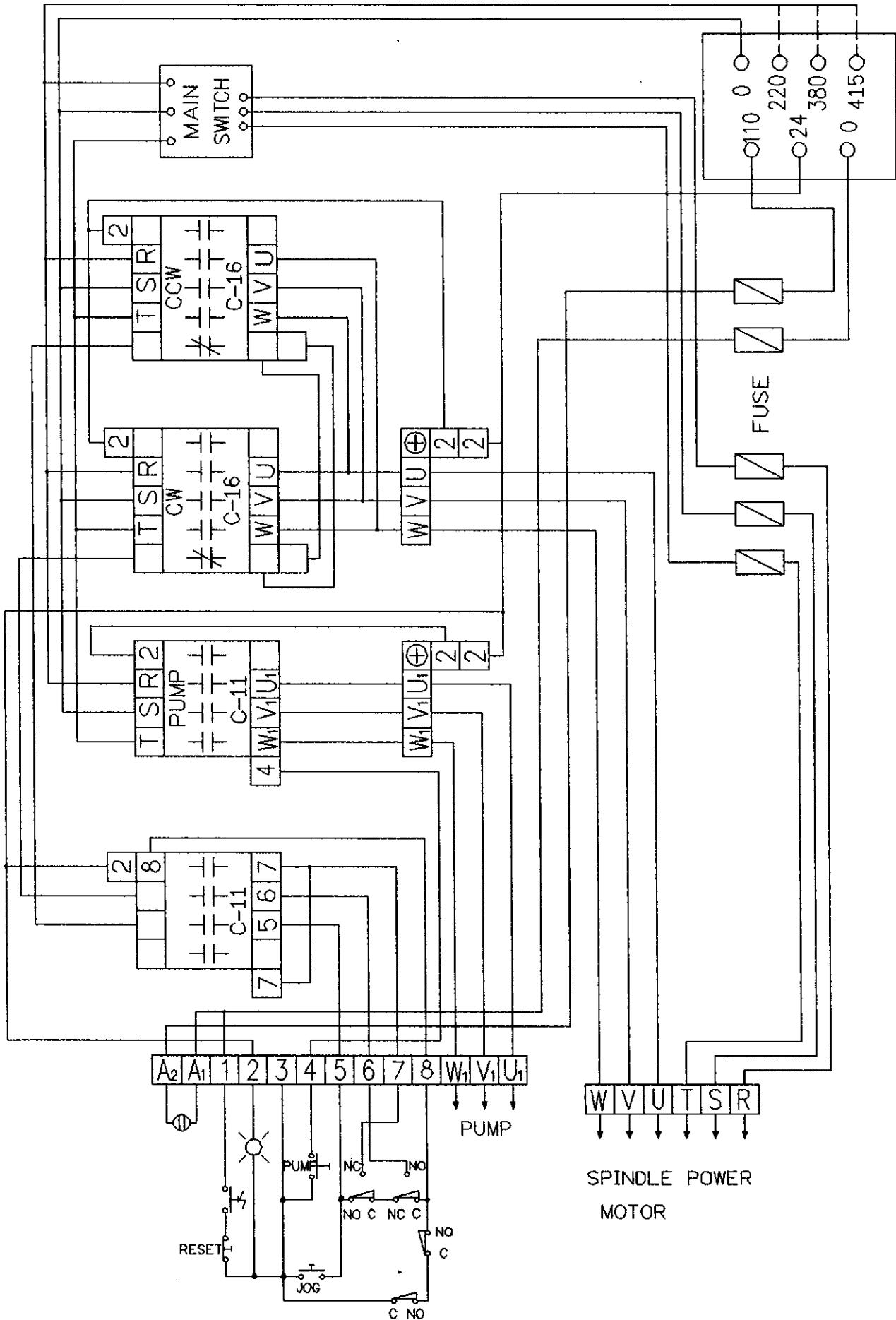


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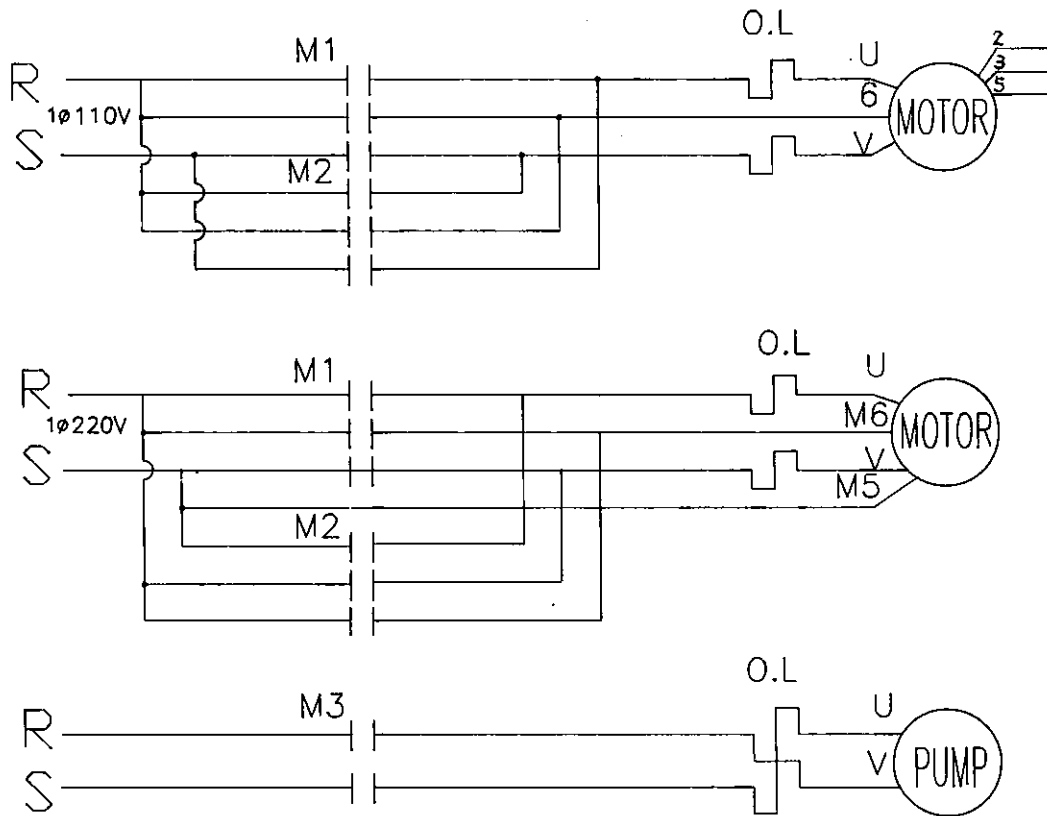


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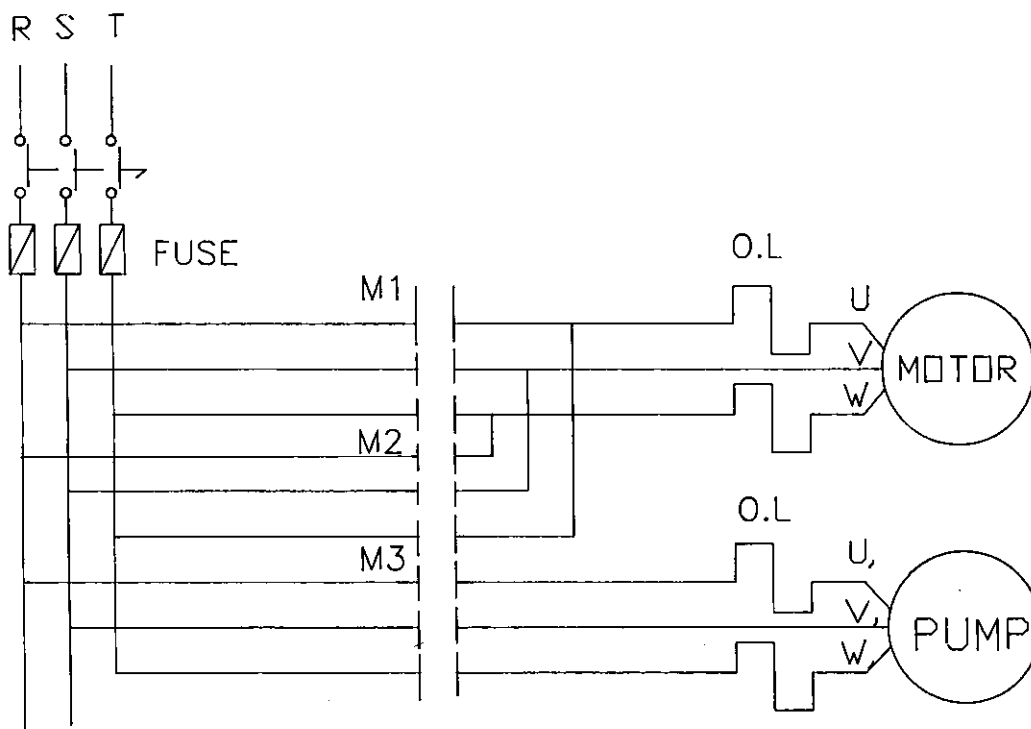
5.7 ELECTRIC WIRING DIAGRAM(EF) THREE PHASE



5-8 ELECTRIC WIRING DIAGRAM - MODEL: THREE PHASE



5-9 ELECTRIC WIRING DIAGRAM - MODEL: THREE PHASE



6. LUBRICATION

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

BEFORE START-UP, MAKE SURE THAT THE FOLLOWING ARE PROPERLY LUBRICATED: HEAD STOCK, GEAR BOX, CROSS SLIDE, TOOL SLIDE, TOOL POST, SADDLE, APRON, TAIL STOCK, LEAD SCREW, FEED SHAFT AND SCREW BRACKET AND THE BEDWAYS.

NOTE: USE ONLY TOP QUALITY INDUSTRIAL LUBRICANTS. (USE LUBRICANT OIL SHELL TELLUS #32 ON HEAD STOCK AND SHELL TONNA #68 ON OTHER PARTS).

6.1 HEAD STOCK LUBRICATION

FILL AND MAINTAIN OIL LEVEL AS INDICATED IN SIGHT GLASS. DRAIN AND CHANGE OIL TWICE YEARLY.

6.2 QUICK CHANGE BOX LUBRICATION - FOUR TIMES DAILY

INSIDE GEARS OF GEARBOX ARE LUBRICATED BY OIL GOT INTO THROUGH THE LUBRICATING POINT COVERED BY OIL CAP TO THE CAVITY ON TOP OF THE GEARBOX WHERE HAS A SPONGE TO RETAIN LUBRICATING OIL FOR CONSTANT DRIPPING INTO THE 14 HOLES.

6.3 CHANGE GEAR LUBRICATION - TWICE DAILY

OPEN SIDE COVER OF HEAD STOCK AND FEED OIL ON THE GEARS DIRECTLY.

6.4 SLIDEWAYS

THE GUIDES OF SADDLE, CROSS SLIDE, COMPOUND SLIDE, TAILSTOCK AND BEDWAYS SHOULD RECEIVE A LIGHT FILM OF OIL.

MAKE SURE THAT THE COMPOUND SCREW AND NUT, CROSS FEED SCREW AND NUT AS WELL AS THE LEAD SCREW AND HALF NUT ARE PROPERLY LUBRICATED.

6.5 TAIL STOCK - ONCE DAILY

OIL THROUGH OILER FITTED ON TOP OF TAILSTOCK.

6.6 LEADSCREW AND FEED ROD LUBRICATION - AT LEAST ONCE OR TWICE DAILY

FEED OIL INTO THE LEAD SCREW DIRECTLY WITH OIL CAN. ALSO FEED OIL INTO LEADSCREW BRACKET.

6.7 BEARINGS

ALL BALL AND ROLLER BEARINGS HAVE BEEN PROPERLY LUBRICATED AT THE FACTORY AND SPECIAL CARE MUST BE TAKEN NOT TO OVERGREASE AS IT WILL CAUSE OVERHEATING.

LUBRICATION CHART (FIG.2)

1. HEAD STOCK OILING INLET
2. GEAR BOX OILING INLET
3. CHANGE GEAR OILING INLET
4. SADDLE OILING INLET
5. TAILSTOCK OILING INLET
6. FEED ROD BRACKET OILING INLET
7. APRON OILING INLET

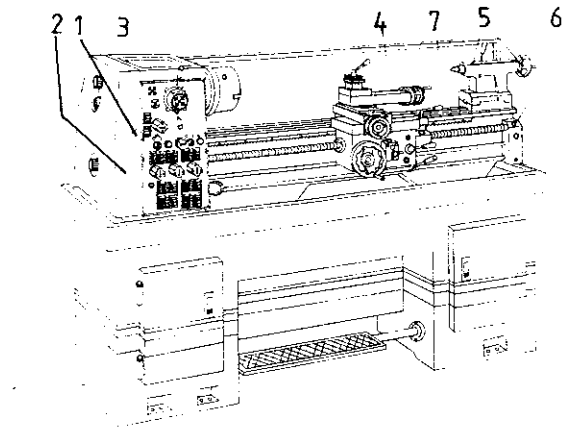


FIG.2

7. CONSTRUCTION

7.1 HEADSTOCK

THE HEADSTOCK IS A ONE-PIECE SPECIAL (FC-25) CAST IRON CASTING FITTED WITH ADJUSTING SCREWS FOR PROPER ALIGNMENT TO THE BEDWAYS AND FASTENED TO THE BED WITH SIX SCREWS. THE SPINDLE IS SUPPORTED ON TWO TAPER ROLLER BEARINGS FOR MAXIMUM RIGIDITY AND PRECISION, AND THE OTHER GEARS SHAFTS OPERATE ON BALL BEARINGS. THE COMPLETE GEAR TRAIN THE SELF LUBRICATED BY SPLASH SYSTEM.

7.2 BED AND FLOOR STAND

THE BED IS MADE OF SPECIAL CAST IRON (FC-25) IN ONE-PIECE CASTING AND HAS A BOX-SECTION MEMBER. THE BEDWAYS IS PRECISION GROUND AND HAS BEEN SUBJECTED TO HIGH FREQUENCY HEAT-TREATMENT (HRC 55).

THE FLOOR STAND IS SEPARATED FROM THE BED. THE FLOOR STAND IS READY TO REMOVE, DISENGAGE AND REFIT, THERE ARE 6 SETS OF SCREW TO ADJUST THE MACHINE LEVEL.

7.3 SADDLE

THE WIDE SADDLE INSURES MAXIMUM RIGIDITY AGAINST STRESSES OF HEAVY CUTTING LOADS. THE CROSS-SLIDE AND COMPOUND SLIDES ARE FITTED TO THE SADDLE.

WHEN FITTED WITH INCH SCREW, THE CROSS SLIDE MOVES .200" ON DIAMETER FOR EACH REVOLUTION OF THE HANDWHEEL AND THE DIAL IS GRANDUATED IN .001". THE TRAVEL OF THE CROSS SLIDE IS 162MM (6-3/8"). THE COMPOUND SLIDE TRAVEL IS 92MM (3-5/8").

7.4 APRON

THE APRON IS A HEAVY DUTY DOUBLE WALL CASTING AND ALL THE SHAFTS AND GEARS ARE SUPPORTED AT BOTH ENDS. IT CONTAINS ALL THE NECESSARY GEARING AND CONTROLS TO TRANSMIT POWER FEED FOR LONGITUDINAL AND CROSS MOVEMENTS AS WELL AS FOR THREAD CUTTING. THE CONTROLS ARE INTERLOCKED TO PREVENT SIMULTANEOUS ENGAGEMENT OF THE FEEDS AND THREADING.

7.5 GEAR BOX

THIS GEAR BOX ALLOWS SELECTION OF METRIC AND INCH THREADS AS WELL AS FEEDS.

7.6 TAILSTOCK

THE TAILSTOCK IS ALSO MADE OF CAST IRON (FC 25) RUGGED AND COMPACT. IT IS EASY TO MOVE AND ADJUST. IT CAN BE KEPT CLOSE TO THE HEAD STOCK WITHOUT THE INTERFERENCE FOR THE OPERATION OF TOOL POST.

THE LATHE IS MANUFACTURED TO JIS STANDARDS AND ALL SLIDING SURFACES ARE PRECISION GROUND.

8. OPERATING INSTRUCTION

8.1 START AND STOP

FOR YOUR SAFETY, MAKE SURE THAT THE FEED ENGAGEMENT LEVER IS IN NEUTRAL BEFORE STARTING SPINDLE ROTATION.

THE ELECTROMAGNETIC COMPONENTS, TRANSFORMER, OVERLOADS AND CONTROL FUSES ARE MOUNTED IN AN ENCLOSURE AT THE BACK OF THE HEADSTOCK.

SPINDLE REVERSAL SHOULD BE MADE ONLY AFTER THE SPINDLE HAS COME TO A COMPLETE STOP.

8.2 FORWARD-REVERSE SELECTION KNOB

PULL THE SELECTIVE KNOB (1 IN FIG. 4) UP, THE MOTOR WILL BE START AND THE SPINDLE WILL GET A FORWARD ROTATION WHILE OPERATING. ON THE CONTRARY, PUSH DOWN THE SELECTIVE KNOB THE MOTOR WILL BE START AND THE SPINDLE WILL GET A REVERSE ROTATION WHILE OPERATING.

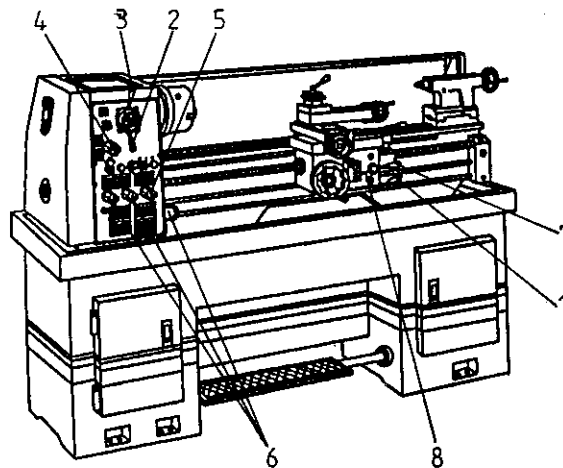


FIG. 4

8.3 SPINDLE SPEED CHANGE

12 SPINDLE SPEEDS ARE POSSIBLE BY THE PROPER THREE GEAR SELECTIONS (2 IN FIG. 4) AND THE HIGH-LOW LEVER (3 IN FIG. 4) IN TWO MOTOR PULLEY RANGES.

8.4 FORWARD-REVERSE SELECTION KNOB

TURN THE SELECTIVE KNOB (4 IN FIG. 4) TO RIGHT POSITION, THE LEAD SCREW WILL GET A COUNTERCLOCKWISE ROTATION OR THE FEED ROD WILL GET A CLOCKWISE ROTATION WHILE OPERATING. ON THE CONTRARY, TURN THE SELECTIVE KNOB TO LEFT POSITION, THE LEADSCREW WILL GET A CLOCKWISE ROTATION OR FEED ROD WILL GET A COUNTERCLOCKWISE ROTATION WHILE OPERATING.

FEEDS/THREADS CHANGE KNOB (5 IN FIG. 4) IS FITTED WITH THE COVER OF GEAR BOX. TURN THE CHANGE KNOB TO RIGHT POSITION, FEED ROD WILL TURN FOR FEEDING AUTOMATICALLY. TURN THE CHANGE KNOB TO LEFT POSITION, THE LEAD SCREW WILL TURN, THREADS IS READY.

8.5 THREADING

BY PROPER LOCATION OF THE GEAR BOX SPEEDS CHANGE KNOB AND GEAR BOX SPEEDS SELECTIVE DISH (6 IN FIG. 4), INCH AND METRIC THREADS AND CORRESPONDING FEEDS ARE POSSIBLE. THE THREAD CUTTING CHARTS GIVE FULL DETAILS OF THE INCH AND METRIC THREAD AVAILABLE.

8.6 HALF NUT CONTROL LEVER

PUSH THE HALF NUT LEVER (7 IN FIG. 4) DOWN WHEN THE LEAD SCREW IS REVOLVING TO ANGE THE HALF NUT FOR THREADING. PULLING THIS LEVER UP WILL DISENGAGE THE HALF NUT.

8.7 LONGITUDINAL AND CROSS FEED ENGAGEMENT LEVER

THIS IS A THREE POSITION CONTROL WITH THE MIDDLE POSITION AS NEUTRAL. PUSH THE LEVER (8 IN FIG.4) DOWN TO ENGAGE THE CROSS FEEDS AND LIFT UP TO ENGAGE THE LONGITUDINAL FEEDS.

FEED AND THREAD TABLE FOR INCH SPECIFICATION

FOR CUTTING METRIC THREAD

METRIC THREAD PITCH		mm					
		1	2	3	6	8	
40	AC	6			4		
	AD	3			2		
	AE	1.5			1		
	BD	0.75		0.6	0.5		
	BE			0.3	0.25		
32	AC	7.5		6	5		
	AD			3	2.5		
	AE			1.5	1.25		
	BD			0.75			
	BE						
30	AC	4.5	4		3		
	AD		2		1.5		
	AE		1	0.9	0.75		
	BD		0.5	0.45			
	BE		0.25	0.225			
32	AE				0.8		
	BD	0.6			0.4		
	BE	0.3			0.2		
	42	AC	7				4
		AD	3.5				2
AE		1.75				1	
BD				0.7	0.5		
BE				0.35	0.25		

FOR CUTTING INCH THREAD

THREAD PER INCH		IN							
		1	2	3	4	5	6	7	8
40	AC	4	4½	5	5½	5¾	6	6½	7
	AD	8	9	10	11	11½	12	13	14
	AE	16	18	20	22	23	24	26	28
	BD	32	36	40	44	46	48	52	56
	BE	64	72	80	88	92	96	104	112

RANGE OF FEED		IN							
		1	2	3	4	5	6	7	8
40	AC	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
	AD	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
	AE	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
	BD	0.128	0.128	0.128	0.128	0.128	0.128	0.128	0.128
	BE	0.256	0.256	0.256	0.256	0.256	0.256	0.256	0.256
30	AC	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
	AD	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
	AE	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
	BD	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096
	BE	0.192	0.192	0.192	0.192	0.192	0.192	0.192	0.192
32	AC	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
	AD	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	AE	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
	BD	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
	BE	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240

FEEDS AND THREAD TABLE FOR METRIC SPECIFICATION

FOR CUTTING METRIC THREAD

FOR CUTTING INCH THREAD

		METRIC THREAD PITCH																				
		mm																				
		1	2	3	6	8			1	2	3	6	8			1	2	3	6	8		
120	40	AC	6			4	120	40	AC	7.5		6	5	120	40	AC	7				4	
	127	AD	3			2		127	AD			3	2.5		127	AD	3.5				2	
	40	AE BC	1.5			1		32	AE BC			1.5	1.25		32	AE BC	1.75				1	
		BD	0.75		0.6	0.5			BD			0.75				36	BD			0.7	0.5	
120	30	AC	4.5	4		3	120	32	AC						120	32	AC					
	127	AD		2		1.5		127	AD							127	AD					
	40	AE BC		1	0.9	0.75		40	AE BC							40	AE BC					
		BD		0.5	0.45				BD			0.35		0.25			BD			0.6		0.4
		BE		0.25	0.25			BE			0.3		0.2		BE			0.3		0.2		

		THREAD PER INCH								
		1	2	3	4	5	6	7	8	
120	40	AC	4	4½	5	5½	5¾	6	6½	7
	127	AD	8	9	10	11	11½	12	13	14
	40	AE BC	16	18	20	22	23	24	26	28
		BD	32	36	40	44	46	48	52	56
		BE	64	72	80	88	92	96	104	112

		RANGE OF FEED								
		1	2	3	4	5	6	7	8	
120	30	AC	1.188	1.056	0.950	0.864	0.826	0.792	0.761	0.679
	127	AD	0.594	0.528	0.475	0.432	0.413	0.396	0.385	0.339
	40	AE BC	0.297	0.264	0.238	0.216	0.207	0.198	0.183	0.170
		BD	0.148	0.132	0.119	0.108	0.103	0.099	0.091	0.085
		BE	0.074	0.066	0.059	0.054	0.052	0.050	0.045	0.042
120	40	AC	0.202	0.180	0.162	0.147	0.141	0.135	0.124	0.115
	127	AD	0.101	0.090	0.081	0.074	0.070	0.067	0.062	0.058
	40	AE BC	0.051	0.045	0.040	0.037	0.035	0.034	0.031	0.029
		BD	0.025	0.022	0.020	0.018	0.018	0.017	0.016	0.014
		BE	0.013	0.011	0.010	0.009	0.009	0.008	0.008	0.007

8.7 THREAD INDICATOR

THE THREAD INDICATOR IS MOUNTED ON THE RIGHT HAND SIDE OF THE CARRIAGE AND IS ENGAGED WITH THE LEADSCREW. THE INDICATOR DIAL HAS 8 LINES, 4 OF WHICH ARE NUMBERED 1, 2, 3 AND 4. WHEN THE CARRIAGE IS STATIONARY AND THE LEAD SCREW IS REVOLVING, THE THREADING DIAL IS TURNING. A REFERENCE LINE IS IN THE HOUSING AND IS USED FOR REFERENCE ENGAGEMENT OF THE HALF NUT THERE IS AN INDICATOR TABLE IN THE THREADING CHART WHICH GIVES THE SELECTION OR SEQUENCE OF REVOLVING LINES WHICH CAN BE USED FOR A GIVEN INCH THREAD PITCH.

WHEN 1-4 IS INDICATED IT MEANS THAT THE HALF NUT CAN BE ENGAGED ON THE LINES ENGRAVED 1, 2, 3, OR 4.

WHEN 1-3 IS INDICATED, THE HALF NUT IS ENGAGED ON LINES ENGRAVED 1 AND 3.

THE SAME APPLIES WHEN THE INDICATOR CALL FOR 2-4

THE INDICATOR CHART WILL ALSO REFER TO 1-8 WHICH MEANS THAT THE HALF NUT CAN BE ENGAGED ON ANY OF THE 8 LINES ON THE THREADING DIAL INDICATOR FOR SUCCESSIVE CUTS.

IMPORTANT

1. IF THE LATHE IS EQUIPTED WITH AN INCH LEAD SCREW, THE DIAL INDICATOR CAN ONLY BY USED FOR CUTTING INCH THRCADES.

When cutting metric threads the half nut is never disengaged. At completion of a threading cut, the cutting tool is retracted and the spindle stopped. the spindle rotation is reversed which brings the carriage back to the beginning position. by going back and forth successive cuts are taken to the required thread depth.

2. Make sure that the appropriate indicator line always coincides with the fixed line on each cut.

FOR INCH SPECIFICATION

THREAD INDICATOR METHOD	
AGREEMENT	A SORT OF INCH THREAD
ANYWHERE	8 16 24 32 40 48 56
	64 72 80 88 96 104 112
⊗	4 6 10 12 14 18 20 22
	26 28 36 44 46 52 92
⊕	5 7 9 11 13 23
⊖	4½ 5½ 6½ 11½
⊙	5¾

FOR METRIC SPECIFICATION

THREAD INDICATOR METHOD		
GEAR	AGREEMENT	A SORT OF METRIC THREAD
28T	ANYWHERE	0.2 0.25 0.3 0.5 0.6 0.75 1 1.5 3
	⊕	0.35 0.7 1.75 3.5 7
	⊖	2 6
24T	ANYWHERE	0.2 0.25 0.3 0.5 0.6 0.75 1 1.5 3
	⊗	0.225 0.45 0.9 4.5
	⊕	0.4 2 6
20T	⊖	0.8 4
	ANYWHERE	0.2 0.25 0.3 0.5 0.6 0.75 1 1.5 3
	⊕	1.25 2.5 5 7.5
	⊖	0.4 2 6

TREAD INDICATOR PLATE (FIG. 5)

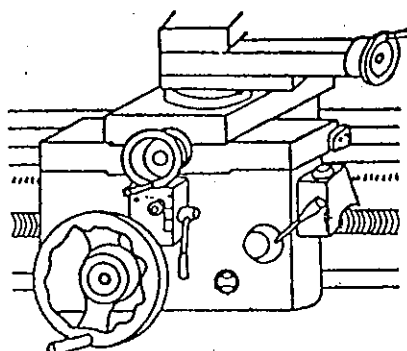


FIG. 6

SPEED	RPM
H	2500
	1720
	810
	1180
M	520
	360
	170
	245
L	116
	80
	38
	55

FIG. 7

NOTE: When mesh the intermediate gear with spindle gear, operating under "D" "d" condition.

8.8 AUTOMATIC FEEDING

1. PUT THE POSITIVE-REVERSE SELECTIVE KNOB TO THE POSITION WHICH IS NEEDED.
2. TURN THE TWO GEAR BOX SPEEDS CHANGE KNOB AND GEAR BOX SPEEDS SELECTIVE DISH.
3. TURN THE FEEDS AND THREADS SELECTIVE KNOB TO THE LEFT, THE FEED ROD (5 IN FIG. 8) WILL TURN.
4. PUSH DOWN THE AUTO-FEEDING SELECTOR (5 IN FIG. 8), THE MACHINE WILL HAVE A CROSS AUTOMATICAL FEEDING. PULL THE LEVER (5 IN FIG. 8) UP, THE MACHINE WILL HAVE A LONGITUDINAL AUTOMATICAL FEEDING.

IF YOU WANT TO FEED BY HAND, JUST PUT ALL THE LEVER BACK TO THE ORIGINAL POSITION, THE MACHINE IS NOW UNDER HAND WHEEL CONTROL. TURN THE HAND WHEEL (4 IN FIG. 8) AND MACHINE CAN MAKE THE LONGITUDINAL FEEDING.

8.9 TOOL POST AND SADDLE

1. MOVE SADDLE BY HANDLE WHEEL (9 IN FIG. 8).
2. CROSS MOVEMENT OF THE TOOL POST IS ACCOMPLISHED BY TURNING THE HANDLE (3 IN FIG. 8). THE TOOL POST WILL MOVE TOWARDS THE CENTER WHEN TURNING THE HANDLE CLOCKWISE.
3. BOTH THE CROSS-SLIDE AND COMPUND SLIDE CAN BE LOCKED.

8.10 TAILSTOCK

THE ALIGNMENT OF THE TAILSTOCK WITH THE HEAD STOCK IS INSURED BY A "VEE" AND A "FLAT" IN THE MACHINE BED. ONCE POSITIONED IT IS LOCKED TO THE BED BY THE LEVER (2 IN FIG. 9) LOCATED AT THE BACK OF THE TAILSTOCK.

THE TAILSTOCK BODY (5 IN FIG. 9) MOUNTED ON A FIRM BASE (6 IN FIG. 9) AND MAY BE ADJUSTED BY MEANS OF AN ADJUSTING SCREW (7 IN FIG. 9) ON THE SIDE OF THE BODY FOR OFF-SETTING THE CENTER, CARRIED IN THE TAIL STOCK QUILL TO PERMIT TAPERS TO BE TURNED FOR LINING UP THIS CENTER WITH THAT IS IN THE HEAD STOCK SPINDLE. THE TAIL STOCK QUILL IS LOCKED BY MEANS OF A QUILL CLAMPING LEVER (1 IN FIG. 9).

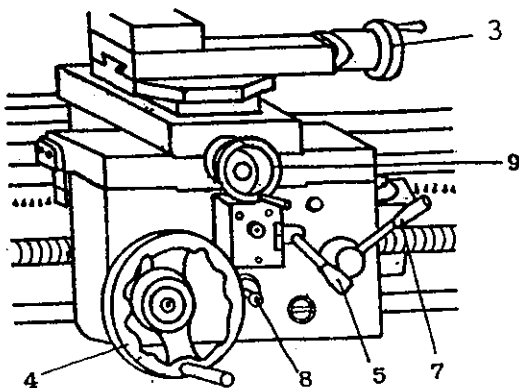


FIG. 8

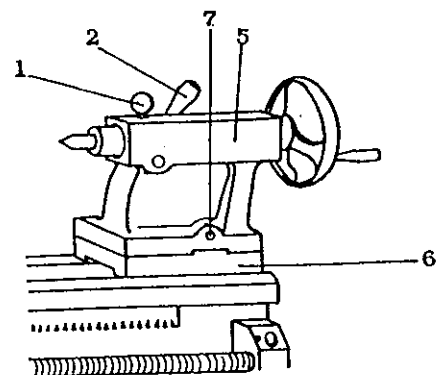


FIG. 9

9. 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 PROCEDURES SHOULD BE FOLLOWED.

9.1 LEVEL

THE LEVEL OF THE MACHINE IS A MAJOR FACTOR WHICH WILL INFLUENCE THE ACCURACY OF THE LATHE. SINCE THE FOUNDATION AND OTHER COMPONENTS WILL ALTER THE MACHINE LEVEL, REGULAR CHECK IS ESSENTIAL.

9.2 MAIN SPINDLE BEARING ADJUSTMENT

THE FRONT ROLLER BEARING IS A #30213 AND THE REAR ROLLER BEARING IS A #30211.

THESE BEARINGS HAVE BEEN PROPERLY ADJUSTED BEFORE LEAVING THE FACTORY. IF THEY BECOME LOOSE AFTER SOMETIMES, ADJUSTMENT CAN BE MADE BY FIRST RE- MOVING THE REAR BEARING CAP #EF-1105 AND RETIGHTENING THE SPINDLE LOCK-NUT #EF-1110 SO TO HAVE THE MINIMUM RADIAL AND AXIAL PLAY. DO NOT ADJUST THE BEARINGS TOO TIGHT AS IT WILL CAUSE SPINDLE OVERHEATING AT HIGH SPEED.

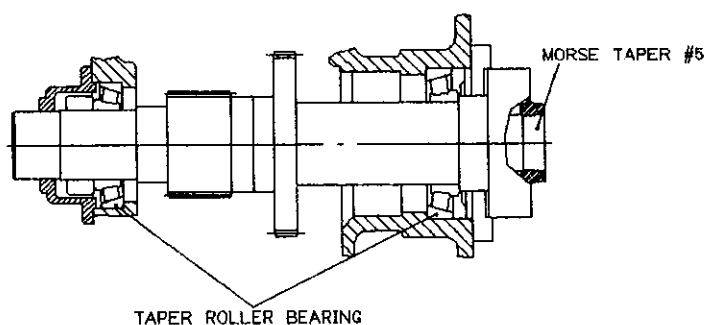


FIG. 10

9.3 ADJUSTMENT OF SADDLE AND CROSS-SLIDE FEED OVERLOAD

THERE IS A FEED OVERLOAD CLUTCH IN THE APRON WHICH IS ADJUSTED BY TURNING THE ADJUSTMENT SCREW (8 IN FIG. 8) CLOCKWISE IF THE SADDLE OR CROSS-SLIDE STOPS WHILE TAKING A CUT. CARE MUST BE TAKEN NOT TO OVERTIGHTEN THIS SAFETY DEVICE AS YOU WILL NOT HAVE AN OVERLOAD PROTECTION.

9.4 ADJUSTMENT OF TAPER GIB

THERE IS A TAPER GIB ON THE CROSS SLIDE AND TOOL SLIDE RESPECTIVELY. ADJUST A TAPER GIB IN A SUCCESSIVE ORDER AS FOLLOWS:

ADJUSTMENT OF A CROSS SLIDE GIB: (FIG. 11)

1. LOOSEN AN ADJUSTING SCREW (2) AT THE REAR AND TIGHTEN AN ADJUSTING SCREW (3) IN THE FRONT.
2. TURN CROSS SLIDE HANDLE AND MAKE SURE WHETHER A TAPER GIB HAS BEEN ADJUSTED. IF IT IS WELL ADJUSTED THEN TIGHTEN AN ADJUSTING SCREW (3)

ADJUSTMENT OF A TOOL SLIDE GIB:

TIGHTEN AN ADJUSTING SCREW (1), AND THEN TURN THE HANDLE OF TOOL SLIDE TO MAKE SURE WHETHER A TAPER GIB HAS BEEN ADJUSTED.

ADJUSTMENT OF SADDLE GIB (FIG.12)

SADDLE IS MOUNTED ON BEDWAY. IN ORDER TO KEEP LEVELLING ACCURACY, THERE IS PLANE GIB TO BE ADJUSTED AS SHOWN IN FIGURE. IF THERE EXIST EXCESS CLEARANCE BETWEEN SADDLE AND BEDWAY, LOOSE THE FIXING NUT THEN FASTEN THE ADJUSTING BOLT IN RIGHT-HAND ROTATION. THE PLANE GIB WILL BE PUSHED TO PROPER POSITION AND THEN FASTEN THE FIXING NUT AGAIN.

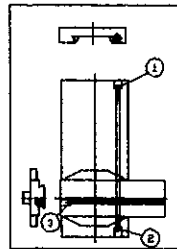


FIG. 11

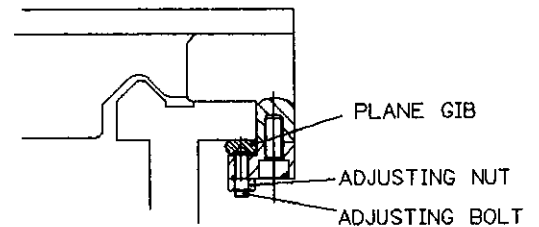


FIG.12

9.5 CROSS SLIDE NUT

THE CROSS SLIDE NUT CAN BE ADJUSTED TO MINIMISE THE BACK-LASH ON THE CROSS SLIDE SCREW. THIS ADJUSTMENT IS CARRIED OUT BY TIGHTENING THE CAP SCREW WHICH IS FITTED TO THE NUT AND WHICH CAN BE REACHED FROM THE REAR OF THE LATHE AFTER MOVING THE CROSS SLIDE TOWARDS THE BACK OF THE MACHINE.

9.6 ALIGNMENT OF THE TAILSTOCK

THE TAILSTOCK ASSEMBLY IS COMPRISED OF A BASE AND THE QUILL CASTING AND CAN BE ADJUSTED TO PERFECTLY LINE UP WITH THE HEADSTOCK SPINDLE AXIS OR CAN BE OFF-SET IN ORDER TO PRODUCE SHALLOW TAPERS.

9.7 TAILSTOCK LOCKING BOLT ADJUSTMENT

IF THE TAILSTOCK DOES NOT CLAMP POSITIVELY THE BED WHEN ACTUATING LEVER (2 IN FIG. 9) READJUST THE CLAMPING BOLT NUT (FIG. 13)

9.8 BACKLASH ADJUSTMENT OF SADDLE LEADSCREW (FIG. 14)

THERE IS A FRICTION BETWEEN LEADSCREW AND SCREW NUT OF SADDLE AFTER LONG USE OF THE PARTS SO IT WILL BE WEAR PRODUCED. IN ORDER TO ELIMINATE THE EXCESS CLEARANCE, THE ADJUSTING BOLT SHOULD BE ADJUSTED. ITS ADJUSTING METHOD: AT FIRST, ROTATE THE LEADSCREW TO BACK END, FASTEN THE ADJUSTING BOLT TO PROPER POSITION THAT THE CLEARANCE BETWEEN LEADSCREW AND LEADSCREW NUT IS ADEQUATE.

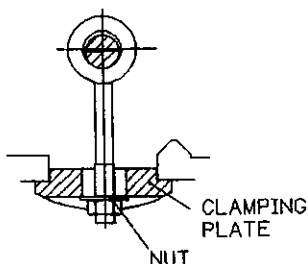


FIG.13

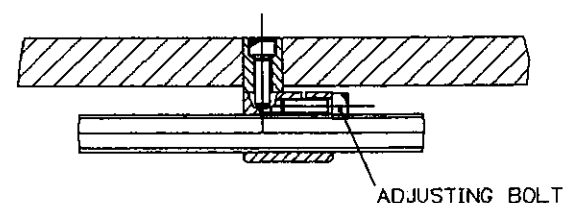
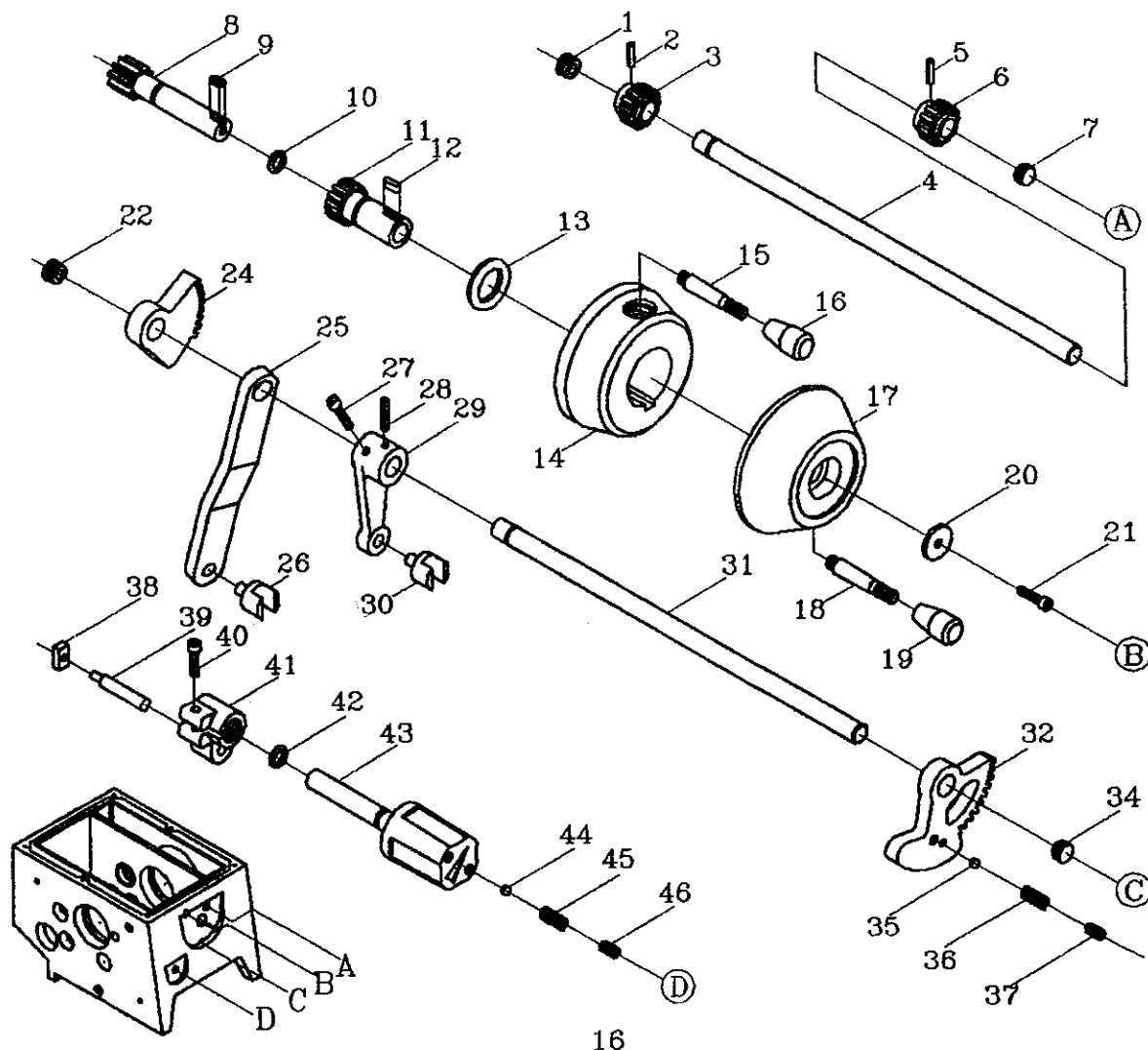


FIG.14

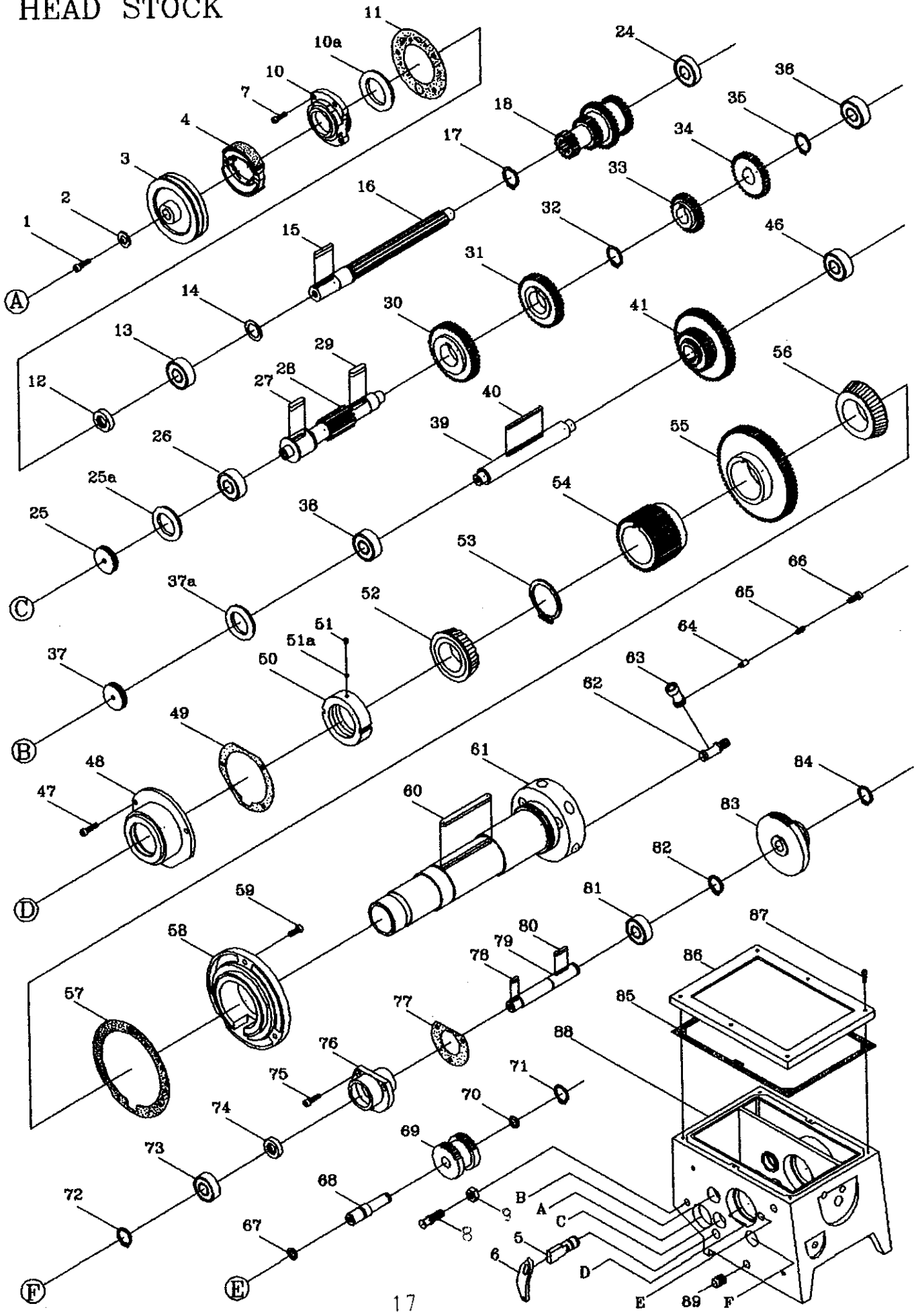
PARTS LIST

HEAD STOCK

01. SEAL CAP	CF-6026-00	24. HALF GEAR	EF-1040-L0
02. SPRING PIN	ø5X24	25. OPERATING LEVEL	EF-1036-00
03. GEAR	CF-1044-00	26. SHAFT FORK	EF-1034-00
04. SHAFT	CF-1037-01	27. SOCKET CAP SCREW	M6X30
05. SPRING PIN	ø5X24	28. SPRING PIN	ø5X24
06. GEAR	CF-1044-00	29. OPERATING LEVEL	CF-1035-00
07. SEAL CAP	CF-6026-00	30. SHAFT FORK	EF-1034-00
08. GEAR SHAFT	EF-1043-00	31. SHAFT	CF-1037-01
09. KEY	DA-5212-00	32. HALF GEAR	EF-1039-L0
10. O RING	P12		
11. GEAR SHAFT	CF-1041-00	34. SEAL CAP	CF-6028-00
12. KEY	CF-1218-00	35. STEEL BALL	ø5/16"
13. O RING	P22	36. SPRING	
14. HUB	EF-1046-00	37. SET SCREW	M8X12
15. CONTROL LEVEL	CF-6047-00	38. SLIDING BLOCK	EK-1129-00
16. GRIP		39. SHAFT	CF-1130-00
17. HUB	EF-1045-00	40. SOCKET CAP SCREW	M6X30
18. HANDLE	EF-6047-00	41. OPERATING LEVEL	CF-1128-01
19. GRIP		42. O RING	P12
20. WASHER	CF-6068-00	43. HANDLE KNOB	CF-1042-00
21. SOCKET CAP SCREW	M6X16	44. STEEL BALL	ø5/16"
22. SEAL CAP	CF-6028-00	45. SPRING	
23. SPRING PIN	ø5X30	46. SET SCREW	M8X10



HEAD STOCK

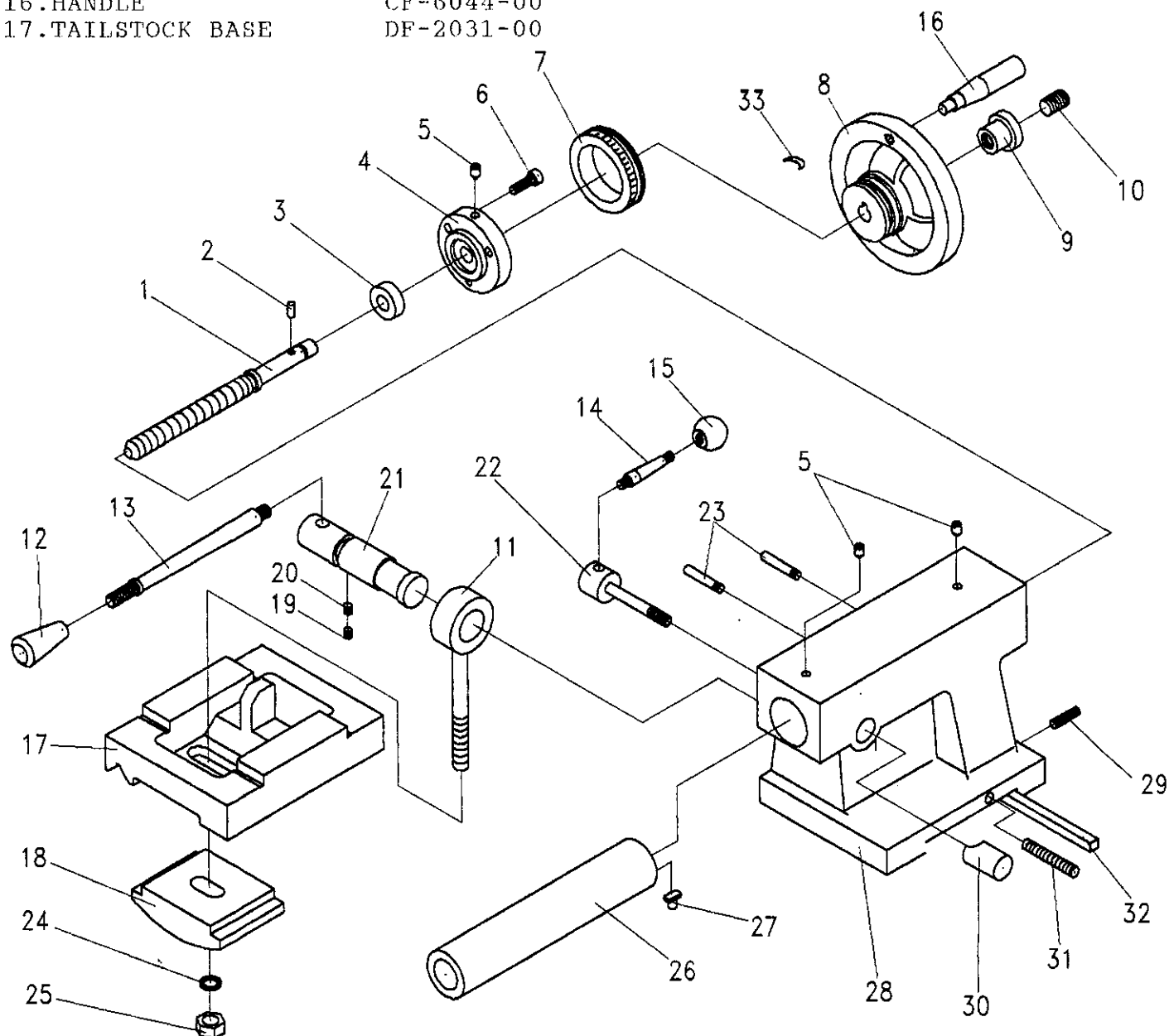


H E A D S T O C K

01. SOCKET CAP SCREW	M6X16	50. SPINDLE LOCK NUT	EF-1110-00
02. WASHER	EK-6044-00	51. SET SCREW	M6X6
03. PULLEY	EF-1017-01	51a. PRESSURE WASHER	EF-1109-00
04. BRAKE SHOE		52. TAPER ROLLER BEARING	ER-3021-10
05. BRAKE LEVEL	EF-7042-00	53. RETAINING RING	S-60
06. BRAKE CAM	CF-7041-00	54. GEAR 40T	EF-1083-G0
07. SOCKET CAP SCREW	M6X16	55. GEAR 71T	EF-1084-G0
08. BRAKE BAR	CF-7040-00	56. TAPER ROLLER BEARING	BR-3021-30
09. NUT	M10	57. PACKING	EF-1177-00
10. BEARING CAP	EF-1019-01	58. FRONT BEARING CAP	EF-1077-00
11. PACKING	EF-1119-00	59. SOCKET CAP SCREW	M6X20
12. OIL SEAL	TC 25 38 8	60. KEY	
13. BALL BEARING	BR-6205-00	61. SPINDLE	EF-1076-A0
14. WASHER	EF-1018-00	62. CAMLOCK STUD	CF-7073-00
15. KEY	6X6X35	63. CAM	CF-1071-00
16. A SHAFT	EF-1012-G0	64. STOP BOLT FOR CAMS	CF-1072-00
17. RETAINING RING	S-25	65. SPRING	
18. GEAR	EF-1011-G0	66. SOCKET CAP SCREW	M6X16
24. BALL BEARING	BR-6203-00	67. O RING	P16
25. BEARING CAP	EF-1062-00	68. SHAFT	CF-1111-00
25a. O RING	P-34	69. GEAR	CF-1114-G0
26. BALL BEARING	BR-6203-00	70. WASHER	EK-1112-A0
27. KEY	8X8X30	71. RETAINING RING	S-16
28. B SHAFT	EF-1022-G0	72. RETAINING RING	S-19
29. KEY	8X8X30	73. BALL BEARING	BR-6004-L0
30. GEAR 43T	EF-1023-G0	74. OIL SEAL	TC 20 35 8
31. GEAR 38T	EF-1024-G0	75. SOCKET CAP SCREW	M6X16
32. RETAINING RING	S-35	76. BEARING CAP	CF-1122-01
33. GEAR 27T	EF-1025-G0	77. PACKING	CF-1123-00
34. GEAR 32T	EF-1026-G0	78. KEY	CF-1218-00
35. RETAINING RING	S-24	79. SHAFT	CF-1118-00
36. BALL BARING	BR-6203-00	80. KEY	CF-1218-00
37. BEARING CAP	EF-1062-00	81. BALL BEARING	BR-6004-L0
37a. O RING	P-34	82. RETAINING RING	S-20
38. BALL BEARING	BR-6203-00	83. GEAR 56T	EF-1125-G0
39. C SHAFT	EF-1052-G0	84. RETAINING RING	S-20
40. KEY	5X5X73	85. PACKING	EF-1008-00
41. GEAR 30T 53T 21T	EF-1060-G0	86. HEAD STOCK COVER	EF-1009-00
46. BALL BEARING	BR-6203-L0	87. SOCKET CAP SCREW	M6X25
47. SOCKET CAP SCREW	M6X16	88. HEAD STOCK CASTING	EF-1001-00
48. REAR BEARING CAP	EF-1105-00	89. GP SCREW	Ø1/2"-UNC
49. PACKING	EF-1106-00		

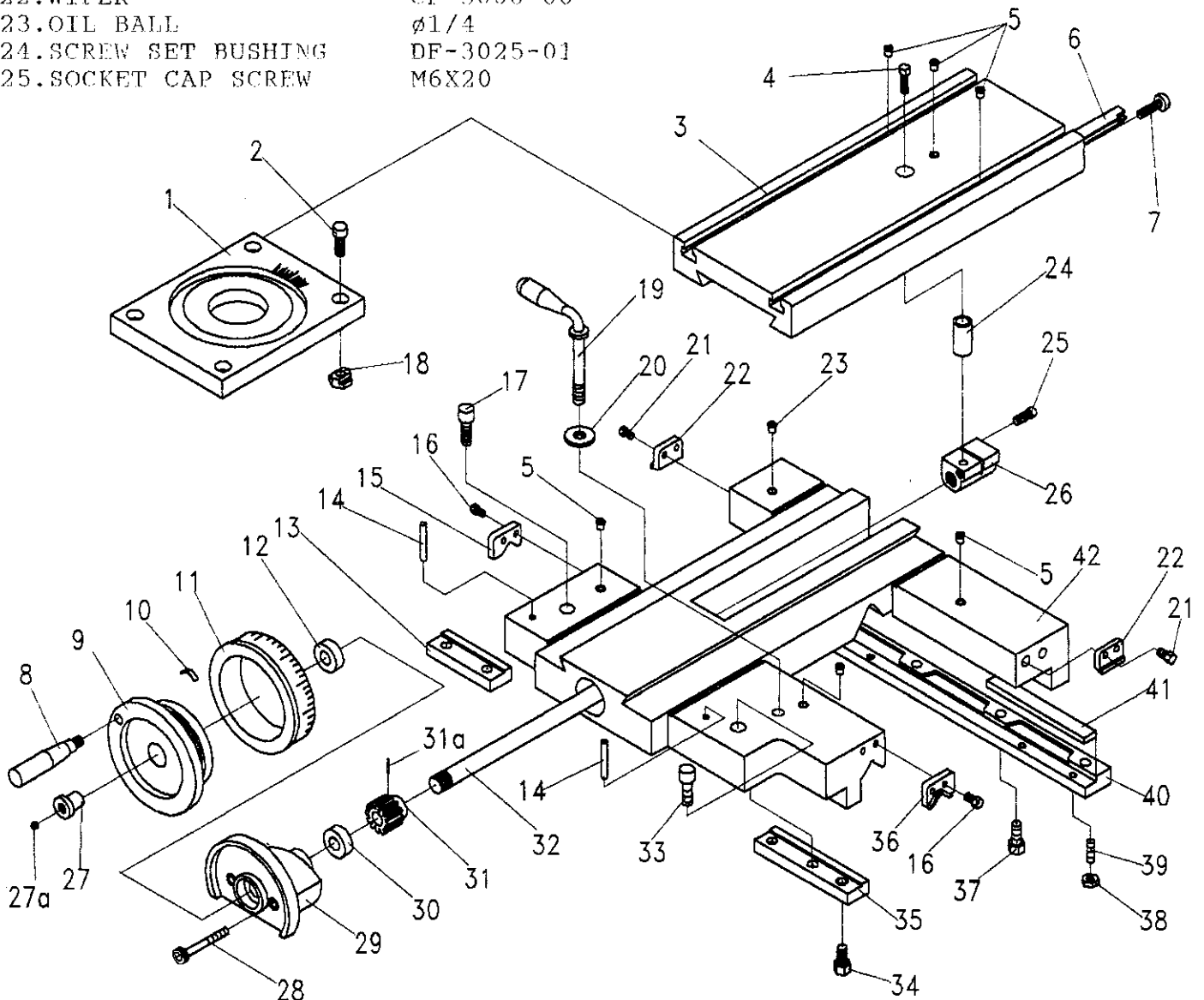
TAIL STOCK

01.FEED SCREW	DF-2008-00	18.CLAMPING PLATE	DF-2033-00
02.KEY	5X5X12	19.SET SCREW	M6X6
03.THRUST BALL BEARING	BR-5110-10	20.SET SCREW	CF-2027-00
04.OIL BALL	ø1/4	21.CLAMPING SHAFT	DF-2028-00
05.FEED SCREW HOLDER	DF-2011-00	22.CLAMPING SHAFT BOLT	DF-2021-00
06.SOCKET CAP SCREW	M6X20	23.LEVER STUD	CF-2018-00
07.HANDLE WHEEL DIAL		24.HEX. NUT	1/2"-UNC
(IMPERIAL)	DF-2005-I0	25.WASHER	ø1/2"
(METRIC)	DF-2005-M0	26.TAILSTOCK QUILL	DF-2015-00
08.HANDLE WHEEL	DF-2004-00	27.GUIDE PIN	CF-2017-00
09.LOCKING SCREW	DF-2006-00	28.TAILSTOCK CASTING	DF-2001-00
10.SET SCREW	M12X10	29.SET SCREW	M6X20
11.CLAMPING BOLT	DF-2030-00	30.CLAMP NUT	DF-3023-00
12.CYLINDRICAL KNOB		31.ADJUSTING SCREW	M8X50
13.HANDLE KNOB	CF-2026-00	32.GIB	CF-2131-00
14.HANDLE KNOB	CF-2020-00	33.FEED SPRING	CF-3035-00
15.GRIP			
16.HANDLE	CF-6044-00		
17.TAILSTOCK BASE	DF-2031-00		



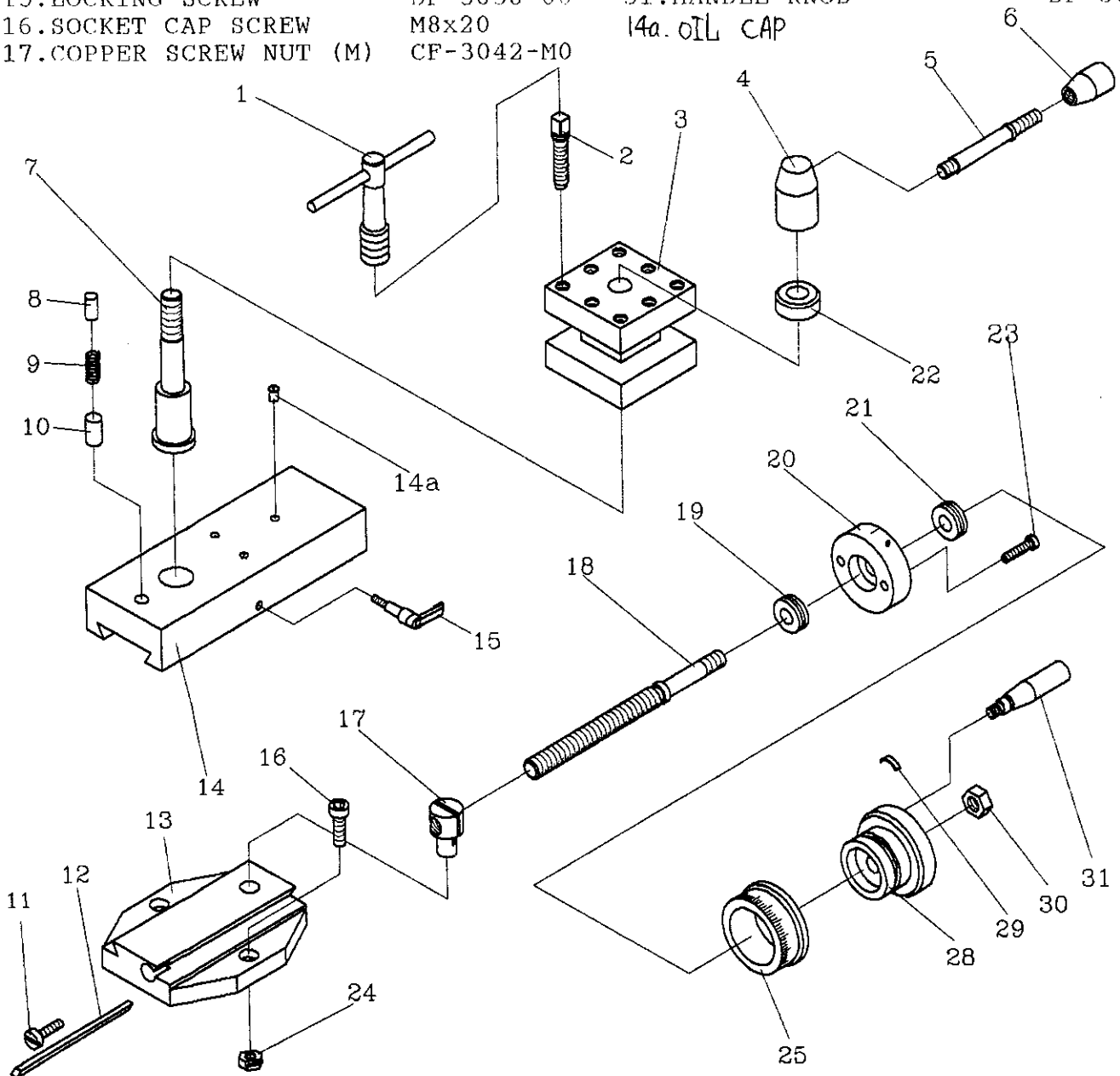
CARRIAGE

01.SWIVEL	DF-3138-00	26.FEMALE SCREW NUT (I)	EF-3023-I0
02.SOCKET CAP SCREW	M8X20	FEMALE SCREW NUT (M)	EF-3023-M0
03.CROSS SLIDE	DF-3016-00	27.LOCKING SHAFT	DF-2006-00
04.SOCKET CAP SCREW	M6X20	27a.SET SCREW	M12X12
05.OIL BALL	ø1/4	28.SOCKET CAP SCREW	M6X50
06.TAPER GIB	DF-3017-00	29.FEED SCREW BUSHING	EF-3029-00
07.GIB ADJUSTING SCREW	CF-3057-00	30.THRUST BALL BEARING	BR-5110-10
08.HANDLE	CF-6044-00	31.GEAR	CF-3027-01
09.HANDLE WHEEL	EF-3036-00	31a.SPRING PIN	ø4X18
10.FEED SPRING	CF-3035-00	32.CROSSFEED SCREW (M)	EF-3024-M0
11.CROSS FEED DIAL (I)	EF-3032-I0	CROSSFEED SCREW (I)	EF-3024-I0
12.THRUST BALL BEARING	BR-5110-10	33.SOCKET CAP SCREW	M8X30
13.CLAMPING PLATE	CF-3012-00	34.SOCKET CAP SCREW	M8X16
14.SPRING PIN	ø5X35	35.CLAMPING PLATE	CF-3112-01
16.ROUND HEAD SCREW	M5X10	36.WIPER	CF-3009-00
17.SOCKET CAP SCREW	M8X30	37.SOCKET CAP SCREW	M8X20
18.T CLOT SCREW NUT	CF-3039-00	38.NUT	M6
19.SADDLE LOCKING HANDLE	DF-3021-00	39.SET SCREW	M6X20
20.WAHSER	CF-3020-00	40.CIAMPING PLATE	DF-3013-00
21.ROUND HEAD SCREW	M6X10	41.LOCK METAL PIECE	CF-3113-00
22.WIPER	CF-3008-00	42.SADDLE	DF-3001-00
23.OIL BALL	ø1/4		
24.SCREW SET BUSHING	DF-3025-01		
25.SOCKET CAP SCREW	M6X20		



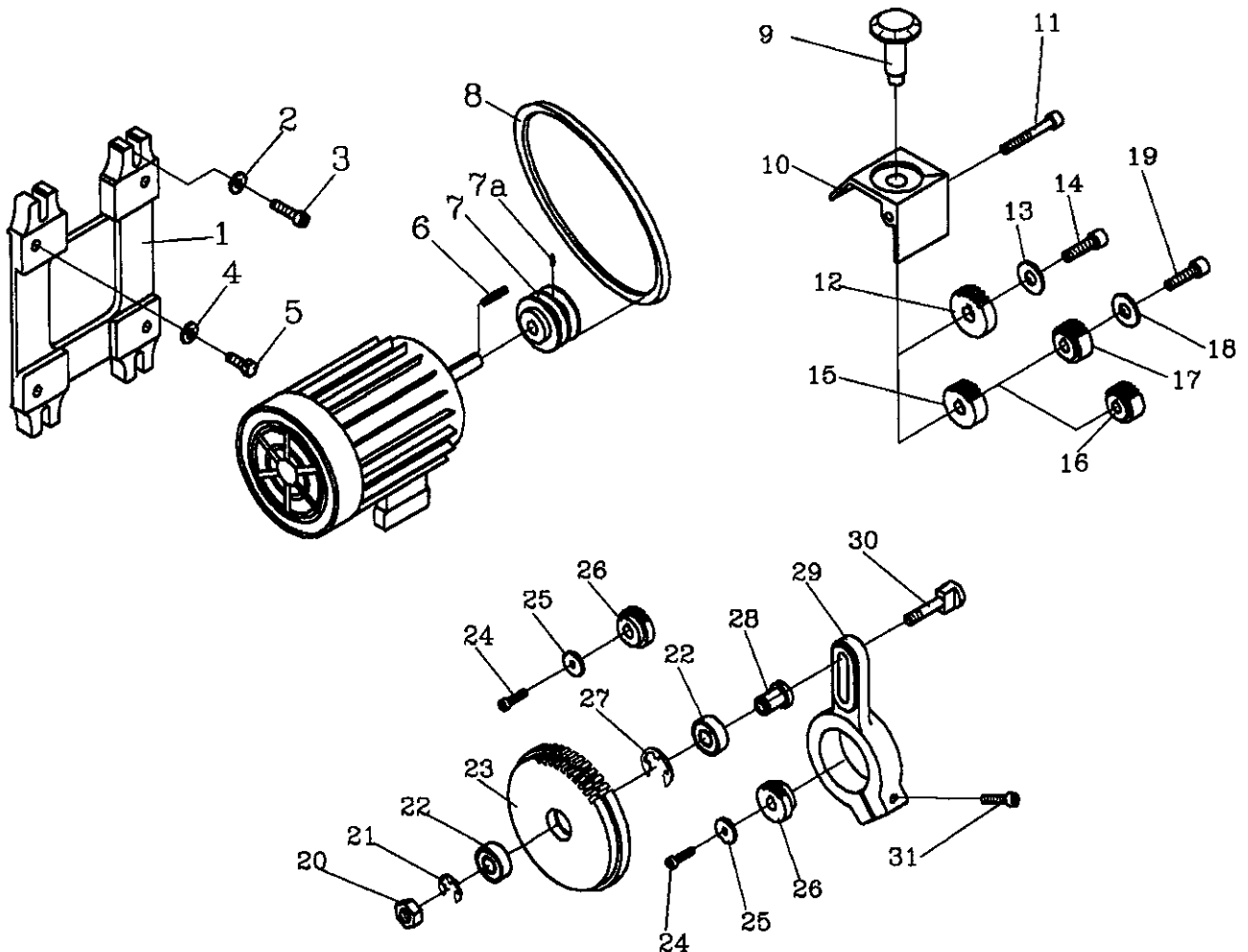
TOOL SLIDE

01.TOOL POST WRENCH	CF-3068-00	COPPER SCREW NUT (I)	CF-3042-I0
02.SQUARE HEADED BOLT	DF-3064-00	18.COMPOUND SLIDE	
03.4 WAYS TOOLPOST	DF-3063-00	LEADSCREW (METRIC)	DF-3043-M0
04.TOOL POST LOCKING NUT	CF-3066-00	(IMPERIAL)	DF-3043-I0
05.HANNDLE	CF-3067-00	19.THRUST BALL BEARING	BR-5110-10
06.GRIP		20.COMPOUND SCREW BUSHING	DF-3046-00
07.SQUARE TURRET SHAFT	CF-3061-00	21.THRUST BALL BEARING	BR-5110-10
(T SLOT)	CF-3061-T0	22.SPACER	CF-3065-00
08.BUSHING	DF-3060-00	23.SOCKET CAP SCREW	M6x20
09.SPRING		24.LOCK NUT FOR SWIVAL	CF-3039-00
10.BUSHING	DF-3059-00	25.COMPOUND SLIDE DIAL	
11.GIB ADJUSTING SCREW	CF-3057-00	(INCH)	DF-3048-I0
12.TAPER GIB	DF-3056-00	(METRIC)	DF-3048-M0
13.SWIVEL	DF-3038-00	28.HANDLE WHEEL	DF-3052-00
14.COMPOUND SLIDE	DF-3055-00	29.FEED SPRING	CF-3035-00
(T SLOT)	DF-3055-T0	30.NUT	M12
15.LOCKING SCREW	DF-3058-00	31.HANDLE KNOB	DF-3053-00
16.SOCKET CAP SCREW	M8x20	14a.OIL CAP	
17.COPPER SCREW NUT (M)	CF-3042-M0		

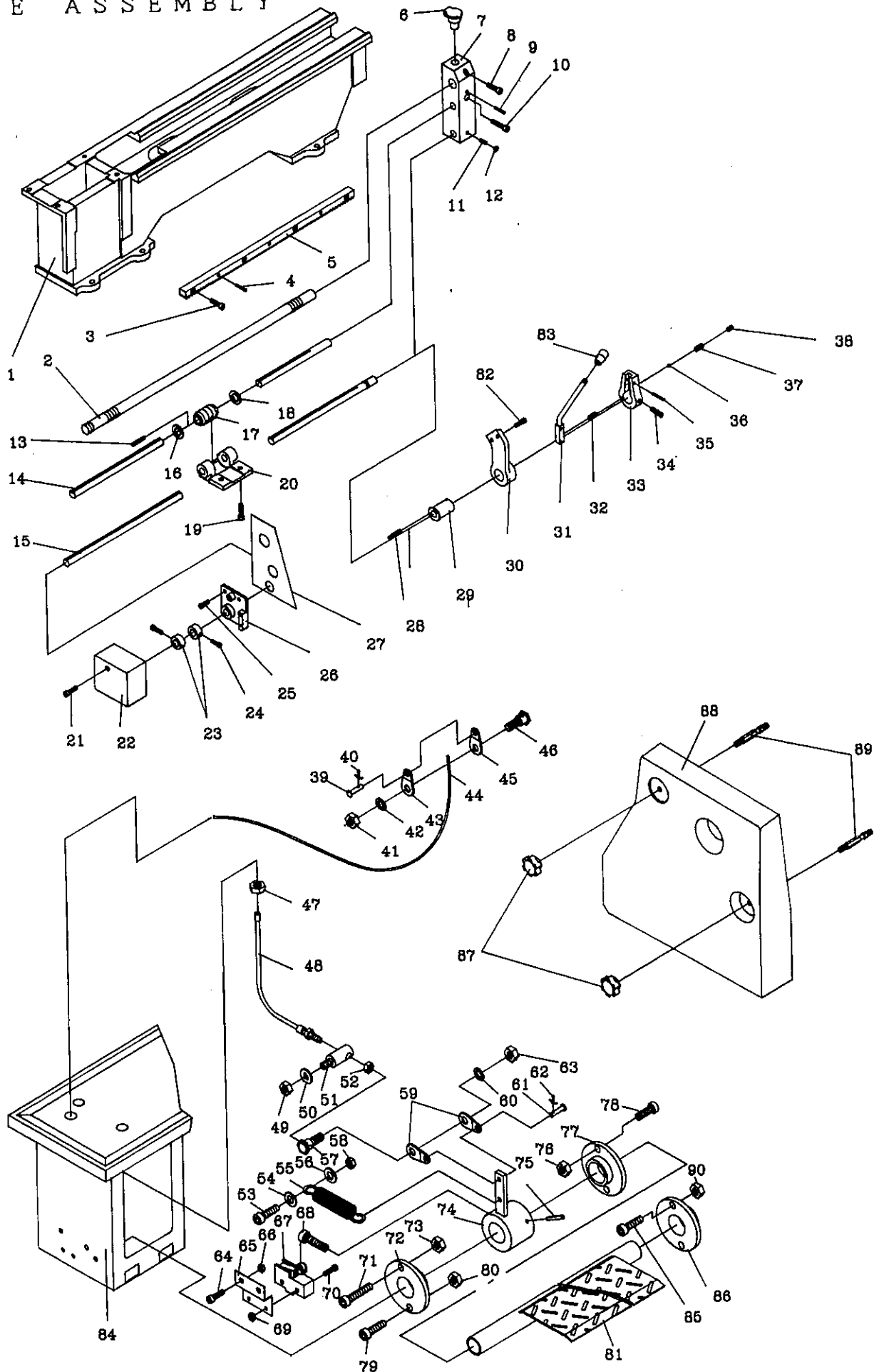


MOTOR, THREAD INDICATOR AND CHANGE GEAR ASSEMBLY

01.MOTOR BASE	EF-6042-00	17.GEAR 24T (METRIC)	EF-4065-M2
02.WASHER	EK-6044-00	18.WASHER	1/4
03.SOCKET CAP SCREW	M8X35	19.SOCKET CAP SCREW	M6X25
04.SPRING WASHER	5/16	20.HEX. NUT	M10
05.	M8X25	21.CIRCLET	S-15
06.KEY	6X6X30	22.BALL BEARING	BR-6003-Z0
07.MOTOR PULLEY 50C	EF-6055-00	23.IDLE GEAR	CF-6065-00
MOTOR PULLEY 60C	EF-6056-00	24.SOCKET CAP SCREW	M6X16
08.BELT 50C	A67	25.WASHER	CF-6068-00
BELT 60C	A66	26.CHANGE GEAR 40T	CF-6070-00
09.THREAD INDICATOR	CA-4064-00	CHANGE GEAR 30T	CF-6069-00
10.THREAD INDICATOR		CHANGE GEAR 32T	CF-6072-00
BRACKET	CA-4062-00	CHANGE GEAR 42T	CF-6073-00
11.SOCKET CAP SCREW	M6X50	27.CIRCLET	R-35
12.GEAR 32T (IMPERIAL)	EF-4065-I0	28.IDLE GEAR SHAFT	CF-6063-00
13.WASHER	1/4	29.IDLE GEAR HOLDER	CF-6058-00
14.SOCKET CAP SCREW	M6X12	30.LOCKING SCREW	CF-6062-00
15.GEAR 28T (METRIC)	EF-4065-M1	31.SOCKET CAP SCREW	M8X45
16.GEAR 20T (METRIC)	EF-4065-M3	7a.SET SCREW	



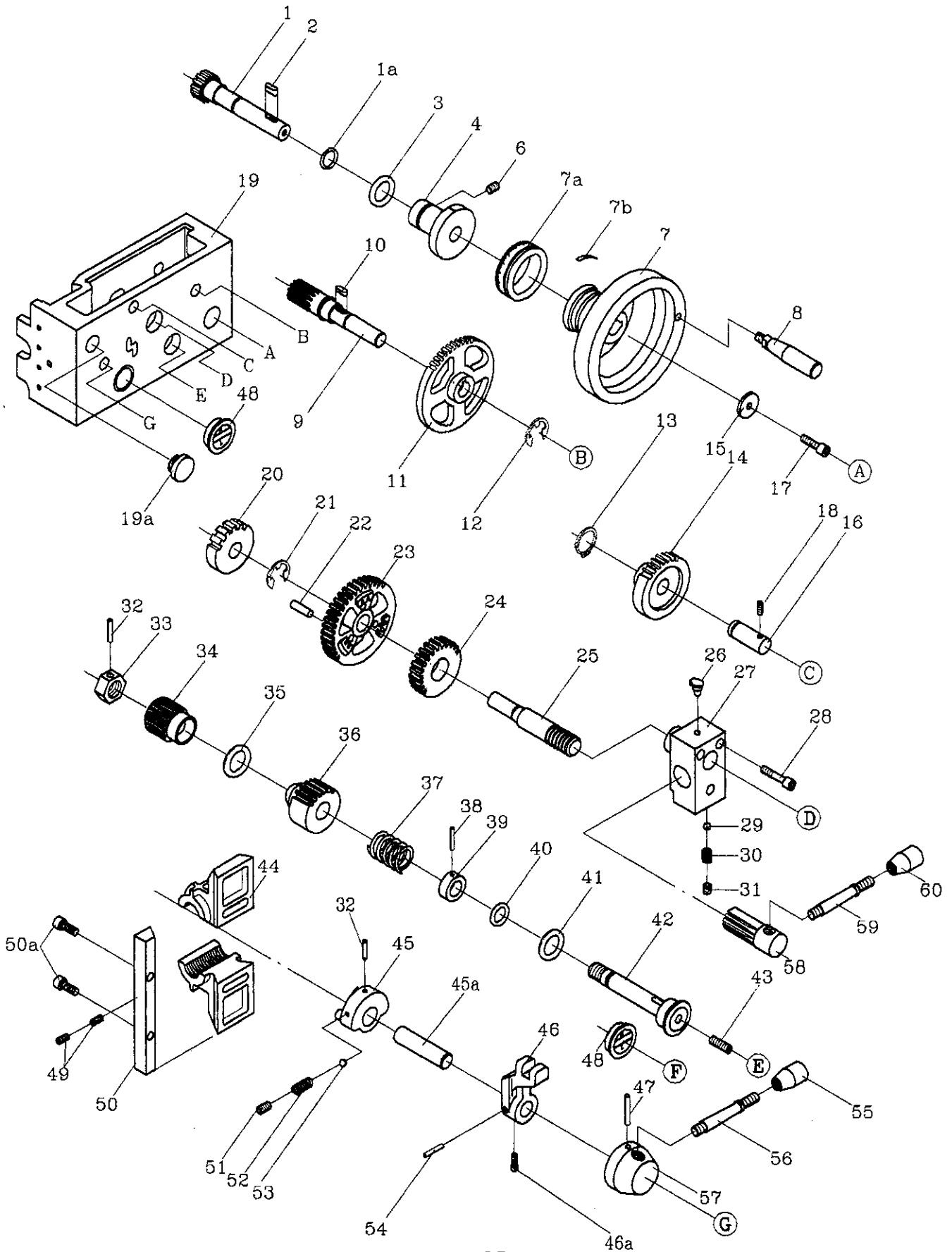
BED, LEADSCREW AND BRAKE ASSEMBLY



BED, LEADSCREW AND BRAKE ASSEMBLY

01. BED	DF-6702-00	44. BRAKE CABLE	
02. LEADSCREW (IMPERIAL) (METRIC)	EF-6716-10 EF-6716-M0	45. BRAKE LINING	
03. SOCKET CAP SCREW	M6X16	46. HEX. BOLTS	
04. SPRING PIN	ø5X24	47. NUT	
05. RACK (HANDLE WHEEL ON APRON LEFT)	DF-6706-L0	48. BRAKE CABLE	
RACK (HANDLE WHEEL ON APRON RIGHT)	CF-6407-G0	49. NUT	M8
06. OIL CAP	DF-6707-R0	50. WASHER	
07. BRACKET	ø1/4"	51. BRAKE BRANCH	CF-7044-00
08. SOCKET CAP SCREW	DF-6010-30	52. NUT	M6
09. SPRING PIN	M8X20	53. SOCKET CAP SCREW	M8X40
10. SOCKET CAP SCREW	5X45	54. WASHER	
11. SET SCREW	M8X45	55. SPRING	
12. NUT	M6X20	56. WASHER	
13. KEY	M6	57. HEX. BOLTS	
14. FEED ROD	CF-6239-00	58. NUT	M8
15. FORWARD-REVERSE CONTROL LEVEL	EF-6725-00	59. BRAKE LINING	
16. WASHER	DF-6792-00	60. SPRING PIN	
17. WORM	CF-6740-00	61. AXLE	
18. WASHER	CF-6739-R0	62. OPEN PIN	
19. SOCKET CAP SCREW	CF-6740-00	63. NUT	M8
20. WORM CASTING	M8X25	64. SOCKET CAP SCREW	M6X16
21. SOCKET CAP SCREW	CF-6741-00	65. LIMITED SWITCH PLATE	CF-7047-00
22. LIMITED SWITCH COVER	CF-6109-00	66. NUT	M6
23. SPACER	CF-6107-00	67. LIMITED SWITCH	
24. SOCKET CAP SCREW	M6X16	68. SOCKET CAP SCREW	M6X40
25. SOCKET CAP SCREW	M6X16	69. NUT	M3
26. LOCKING BRACKET	CF-6101-01	70. ROUND SCREW	M3X25
27. GEAR BOX SIDE COVER		71. SOCKET CAP SCREW	M8X40
28. KEY	CF-6239-00	72. BRAKE BUSHING	CF-7046-00
29. BUSHING	CF-6104-01	73. NUT	M8
30. BRACKET	CF-6103-01	74. BRAKE PEDAL PULL ROD	CF-7045-00
31. OPERATING HANDLE	CF-6106-01	75. SPRING PIN	ø5X40
32. SPRING		76. NUT	M8
33. BRACKET	CF-6105-01	77. BRAKE BUSHING	CF-7046-00
34. SET SCREW	M8X8	78. SOCKET CAP SCREW	M8X20
35. SPRING PIN	ø5X30	79. SOCKET CAP SCREW	M8X40
36. STEEL BALL	ø1/4"	80. NUT	M8
37. SPRING		81. BRAKE PEDAL	DF-7748-00
38. SET SCREW	M8X6	82. SOCKET CAP SCREW	M6X16
39. AXLE		83. GRIP	
40. OPEN PIN		84. FLOOR STAND	EF-7732-00
41. NUT	M10	85. SOCKET CAP SCREW	M8X20
42. SPRING WASHER		86. BRAKE BUSHING	CF-7046-00
43. BRAKE LINING		87. PLASTIC LOCKING CLIP	
		88. SIDE COVER	EF-6080-00
		89. SIDE COVER LOCKING SCREW	CF-6081-00
		90. NUT	M8

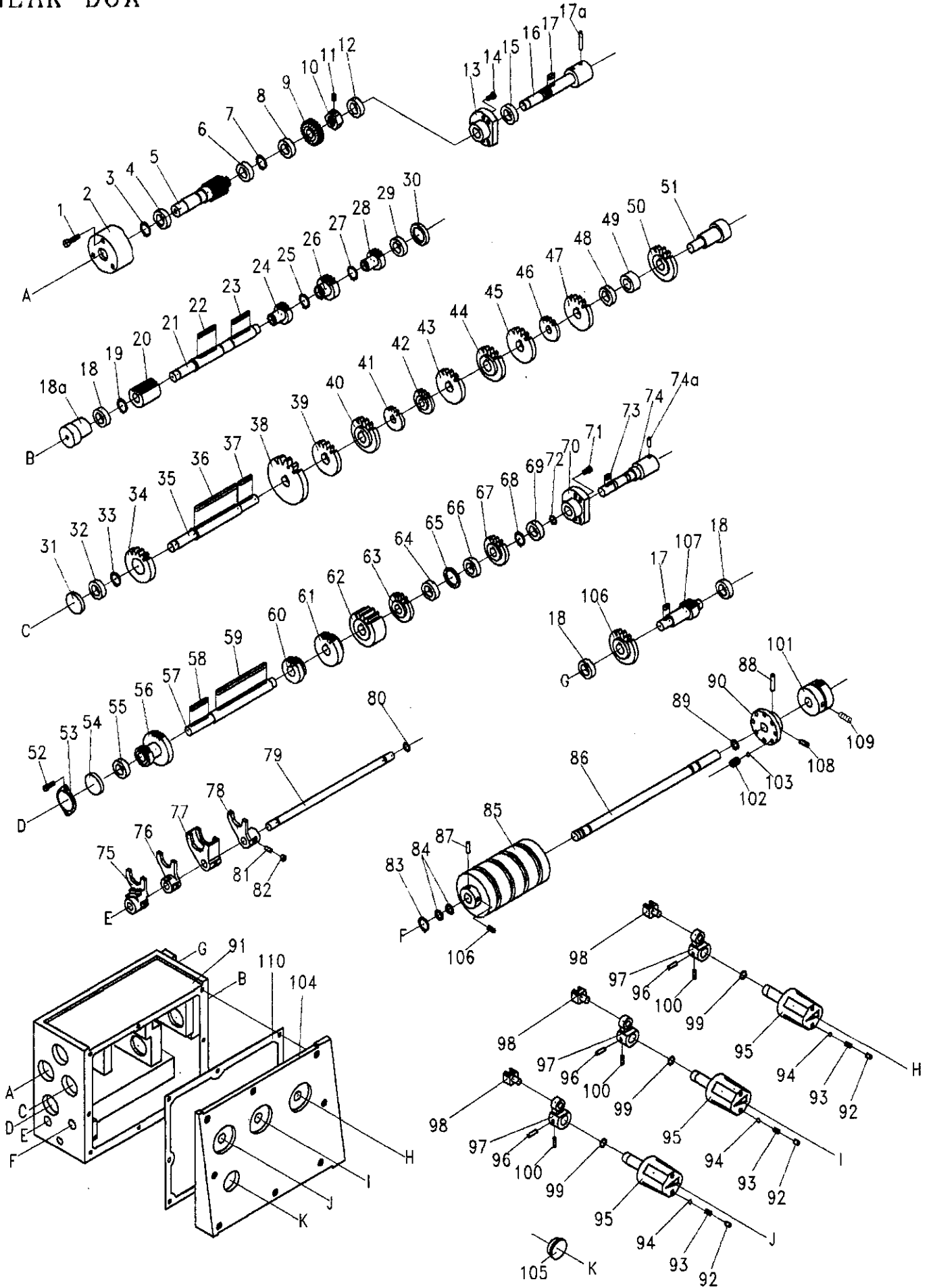
APRON



APRON

01.GEAR SHAFT	CA-4010-00	31.SET SCREW	M8X6
1a.O RING	P12	32.SPRING PIN	5X24
02.KEY	5X5X14	33.NUT	5/8"-UNF
04.BUSHING	CA-4007-A0	34.WORM GEAR	CA-4037-R0
06.SET SCREW	M6X8	35.O RING	P22
07.HANDLE WHEEL	CA-4003-A1	36.GEAR 21T	CA-4036-00
7a.DIAL FOR IMPERIAL	CA-4004-I0	37.SPRING	CF-4035-00
DIAL FOR METRIC	CA-4004-M0	38.SPRING PIN	5X24
7b.FEED SPRING	CF-3035-00	39.BUSHING	CA-4033-00
08.HANDLE	CF-6044-00	40.O RING	P12
09.GEAR SHAFT 13T	CA-4013-00	41.O RING	P22
10.KEY	5X5X14	42.SHAFT	CA-4031-00
11.GEAR 50T	CA-4011-01	43.SET SCREW	M8X20
12.RETAINING RING	E-12	44.HALF NUT BRACKET	
13.RETAINING RING	S-16	(IMPERIAL)	EF-4442-I0
14.GEAR 30T	CA-4023-01	(METRIC)	EF-4442-M0
15.WASHER	CF-6068-00	45.OPERATING LEVEL	EF-4049-A0
16.SHAFT	CA-4022-01	45a.SHAFT	EF-4049-B0
17.SOCKET CAP SCREW	M6X16	46.SAFETY BRACKET	CA-4050-02
18.SET SCREW	M6X6	46a.SOCKET CAP SCREW	M6X16
19.APRON CASTING		47.SPRING PIN	5X45
(WHEEL ON LEFT)	EF-4001-L0	48.OIL GLASS	
(WHEEL ON RIGHT)	EF-4001-R0	49.SET SCREW	M6X6
19a.OIL CAP		50.GIB FOR HALF NUT	CA-4046-00
20.GEAR 24T	CA-4015-00	50a.SOCKET CAP SCREW	M6X20
21.RETAINING RING	E-12	51.SET SCREW	M8X6
22.AXLE	CA-4019-00	52.SPRING	
23.GEAR 39T	CA-4017-01	53.STEEL BALL	1/4
24.GEAR 24T	CA-4020-00	54.SPRING PIN	5X30
25.SHAFT	CA-4016-00	55.GRIP	
26.OIL CAP	1/4"	56.HANDLE	CF-6047-00
27.BRACKET	CA-4021-01	57.HANDLE BOSS	CA-4045-00
28.SOCKET CAP SCREW	M6X35	58.GEAR SHAFT	CA-4028-00
29.STEEL BALL	1/4"	59.HANDLE	CA-4029-00
30.SPRING		60.GRIP	

GEAR BOX



GEAR BOX

01.SOCKET CAP SCREW	M6X25	55.BEARING	BR-6202-00
02.BEARING CAP	DA-5010-00	56.GEAR 15-30T	DA-5151-00
03.RETAINING RING	S-20	57.SHAFT	DA-5150-00
04.BEARING	BR-6004-00	58.KEY	DA-5220-00
05.SHAFT	DA-5111-00	59.KEY	CA-5220-00
06.BEARING	BR-6202-00	60.GEAR 24T	DA-5152-00
07.RETAINING RING	S-15	61.GEAR 24T	DA-5153-00
08.BEARING	BR-6002-00	62.GEAR 24T	DA-5154-00
09.GEAR 21T	DA-5113-00	63.GEAR 24T	DA-5155-00
10.ADJUSTING NUT	EK-5075-00	64.BALL BEARING	BR-6202-00
11.HEADLESS SCREW	M6X6	65.WAVE SPRING WASHER	DA-5156-00
12.THRUST BALL BEARING	BR-5110-30	66.BALL BEARING	BR-6202-00
13.BEARING CAP	DA-5014-01	67.GEAR	DA-5158-00
14.SOCKET CAP SCREW	M6X12	68.RETAINING RING	S-17
15.THRUST BALL BEARING	BR-5110-30	69.BEARING	BR-6202-00
16.SHAFT	EF-5112-00	70.BEARING CAP	DA-5059-01
17.KEY	DA-5212-00	71.SOCKET CAP SCREW	M6X12
17a.TAPER PIN	#4X32	72.OIL RING	P12
18.BEARING	BR-6202-00	73.KEY	EF-5212-00
18a.BEARING CAP	EF-5025-00	74.SHAFT	DA-5157-00
19.RETAINING RING	S-16	74a.SPRING PIN	ø5X24
20.GEAR 16T	DA-5121-00	75.SHIFTER	DA-5261-00
21.SHAFT	DA-5120-00	76.SHIFTER	DA-5262-00
22.KEY	DA-5220-00	77.SHIFTER	DA-5263-00
23.KEY	DA-5220-00	78.SHIFTER	DA-5264-00
24.GEAR 24T	DA-5122-00	79.SHAFT	EF-5260-00
25.RETAINING RING	S-16	80.O RING	P9
26.GEAR 32T	DA-5123-00	81.SHAFT	DA-5265-00
27.RETAINING RING	S-16	82.BUSHING	DA-5266-00
28.GEAR 21T	DA-5124-00	83.RETAINING RING	S15
29.BALL BEARING	BR-6202-00	84.O RING	P12
30.BEARING CAP	CA-5021-00	85.CAM	DA-5271-00
31.BEARING CAP	CA-5021-00	86.SHAFT	EF-5770-00
32.BEARING	BR-6202-00	87.SPRING PIN	ø5X24
33.RETAINING RING	S-16	88.SPRING PIN	ø5X24
34.GEAR 30T-15T	DA-5131-00	89.O RING	P12
35.SHAFT	DA-5130-00	90.SELECTIVE DISC	DA-5773-00
36.KEY	DA-5231-00	91.GEAR BOX CASTING	EF-5001-00
37.KEY	DA-5230-00	92.HEADLESS SCREW	M8X6
38.GEAR 32T	DA-5132-00	93.SPRING	
39.GEAR 28T	DA-5133-00	94.STEEL BALL	ø1/4"
40.GEAR 26T	DA-5134-00	95.HANDLE KNOB	DA-5057-00
41.GEAR 18T	DA-5135-00	96.SPRING PIN	ø5X24
42.GEAR 16T	DA-5136-00	97.OPERATING LEVER	CA-5064-01
43.GEAR 24T	DA-5137-00	98.SHAFT FORK	CA-5066-01
44.GEAR 23T	DA-5138-00	99.O RING	P12
45.GEAR 22T	DA-5139-00	100.SET SCREW	M6X6
46.GEAR 16T	DA-5140-00	101.HANDLE KNOB	DA-5772-00
47.GEAR 20T	DA-5141-00	102.SPRING	
48.BALL BEARING	BR-6002-00	103.STEEL BALL	ø1/4"
49.BUSHING	DA-5142-01	104.GEAR BOX COVER	EF-5002-00
50.GEAR 27T	DA-5143-00	105.OIL GLASS	
51.SHAFT	EF-5144-00	106.GEAR SHAFT	EF-5115-00
52.ROUND HEAD SCREW	M5X16	107.GEAR 28T	EF-5116-00
53.BEARING CAP	EK-5038-00	108.SET SCREW	M6X8
54.BEARING CAP	CA-5021-00	109.SET SCREW	M6X8
		110.PACKING	EF-5003-00