OPERATING MANUAL
AND
PART LIST

CHU SHING

HR

SHING CHU MACHINERY CO.,LTD.

9-14-01

ACRA MACHINERY, INC.

Bill LaRue

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HAWTHORNE MACHINERY CO. CAT®

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PURCHASE ORDER NO:

S ~~3546~~ W 1148-15W

THIS NUMBER MUST APPEAR ON ALL INVOICES AND PACKING LISTS

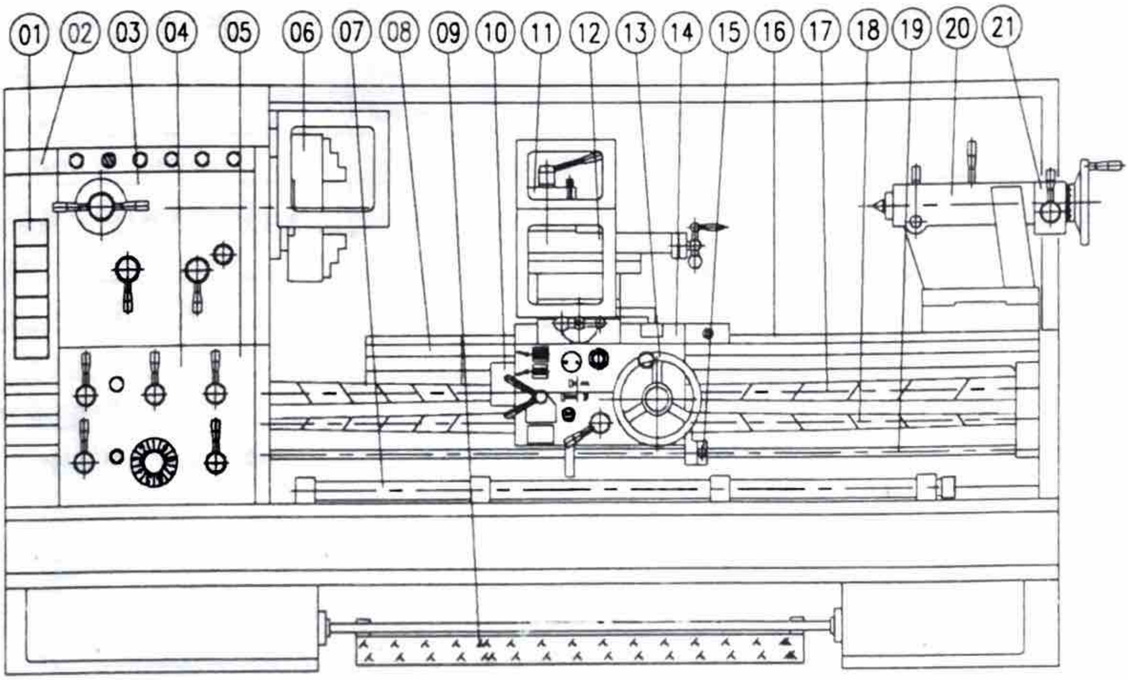
VENDOR NAME: ACRA MACHINERY
ATTENTION: BILL LARUE
ADDRESS:
CITY, STATE, ZIP:
TELEPHONE: (800) 225 - 4651

CONTACT: DAN ARGUIN
DATE REQUIRED: BY 10-14-01
DATE ORDERED:
~~DATE PROMISED~~: (858) 674-7159
FAX
~~DATE RECEIVED~~: (858) 674-7190

ITEM	QUANTITY	DESCRIPTION	PRICE	UNIT	AMOUNT
1		FEL - 2600 LATHE			$40,000.00
2					
3		26 X 160 WITH 480 VOLTS			PLUS
4		6" HOLE			
5		ALL TOOLS AS PER BROCHURE			TAX
6		INCLUDES SHIPPING TO OUR			
7		LOCATION, INSTALLATION AND			
8		2 YEARS PARTS + LABOR			
9		WARRANTY			
10					
11		REC. 9-14-01			
12					
13					

INDEX

GENERAL LAYOUT



01 THREADS AND FEEDS CHART	11 SQUARE TURRET TOOL POST
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08 GAP	18 FEED ROD
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10 THREAD CHANSING DIAL	20 TAIL STOCK
	21 GEAR BOX

SPECIFICATIONS:

MODELS	HR-680	HR-780	HR-880
MODEL	1100G 1600G 2000G 2500G 3000G 3500G 4000G		
SWING			
Height of center (over bed)	340mm(13-3/8")	390mm(13-3/8")	440mm(17-3/8")
Over bed	680mm(26-7/8")	780mm(13-7/8")	880mm(34-3/4")
Over cross slide	440mm(17-3/8")	540mm(21-1/4")	640mm(25-1/4")
Distance between centers	110mm 1600mm 2000mm 2500mm 3000mm 3500mm 4000mm		
Over gap & width in front chuck	1000mm(39-3/8")x482(19")	1100mm(43-3/8")x482(19")	1200mm(47-1/4")x482(19")
Bed width	420mm(16-1/2")		
HEADSTOOK			
Spindle bore	80mm(3-1/8") 105mm(4-1/8")		
Number of spindle speed	12		
Range of spindle speed(r.p.m)	12,20,29,40,55,85,120,175, 300,445,650,1000	10,17,25,36,47,70,100,150,245,370,540,800	
Spindle nose	ASA-A1-8(D1-8) ASA-A1-11(D1-11)		
FEEDS-THREAD			
Lead screw	44.5mm(1-3/4")		
Number of feed changes	28		
Longitudinal feed range	01.-2.1		
Cross feed range	0.035-0.7		
Inch threads	2-28(32)		
Metric threads	1-14(32)		
TOOL SUDE			
Cross slide travel	340mm(13-3/8")	390mm(15-3/8")	440mm(17-3/8")
Compound rest travel	240mm(9-1/2")		
TAIL STOOK			
Spindle travel	210mm(8-1/4")		
Spindle diameter	75mm(2-15/16")		
Taper of center	M.T.#5		
MOTOR			
Main motor	7.5 HP/4P		
Rapid feed motor Coolant Pump	1/8HP		
BED			
Length	1100Gx2630mm 1600Gx3130mm 2000Gx3630mm 2500Gx4210mm 3000Gx4790mm 3500Gx5370mm 4000Gx5950mm		
Width	1100mm		

MODELS	HR-680	HR-780	HR-880
Height	1340mm	1390mm	1440mm
N.W.	1100Gx2900kg 1600Gx3200kg 2000Gx3500kg 2500Gx3800kg 3000Gx4100kg 3500Gx4400kg 4000Gx4700kg		
G.w.	1100Gx3050kg 1600Gx3400kg 2000Gx3750kg 2500Gx4100kg 3000Gx4450kg 3500Gx4800kg 4000Gx5200kg		
Packing size (L)	1100Gx2800mm 1600Gx3300mm 2000Gx3800mm 2500Gx4390mm 3000Gx4970mm 3500Gx5500mm 4000Gx6110mmx1280mmx1500mm		
Packing size (W)	1280mm		
Packing size (H)	1450mm	1500mm	1550mm

STANDARD ACCESSORIES:

1 Chuck back................................1pc

2 Center sleeve..............................1pc

3 Center M.T. No. 5.....................2pcs

4 Tool post wrench........................1pc

5 Change gear................................1sec

SPECIAL ACCESSORIES:

1 3-Jaw scroll chuck.............10“ 1pc

2 4-Jaw independent chuck...20“ 1pc

3 Center rest.................................1pc

4 7.5hp 50 or 60 HZ motor...........1pc

5 Face plate............................24“1pc

6 Follow rest................................1pc

7 Rapid feed motor.......................1pc

INSTALLATION

CLEANING

Protective layers of grease and corrosion-preventing paint have been liberally applied to all external parts of the machine to guard it against the elements during storage and shipping. Before installing the lathe in its final position, these protective coatings should be thoroughly removed.

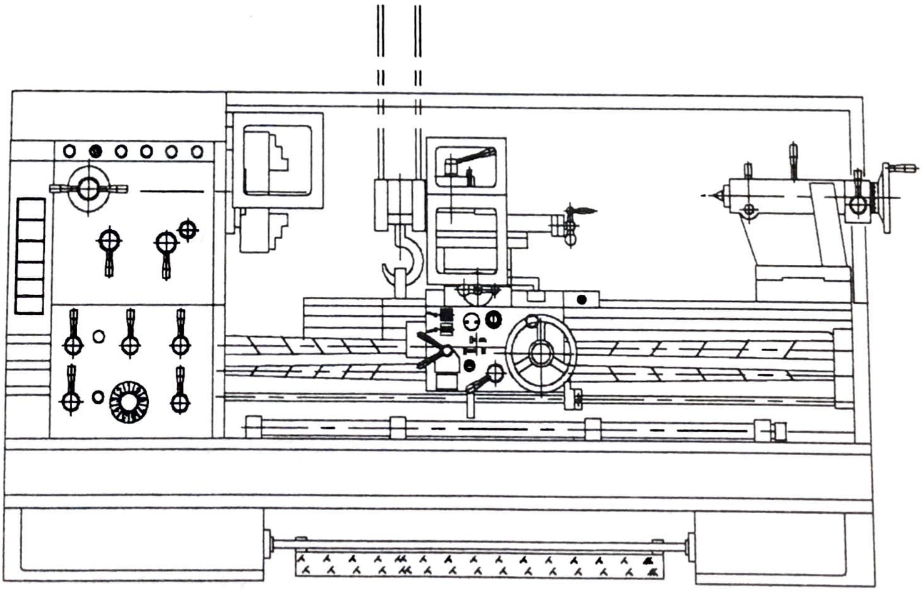
Cleaning should be done immediately after removeing the machine from its packaging . Special care should be given to cleaning the slideways.

LIFTING

In order to have the machine properly balanced before hoisting, it is advisable to move Tailstock and Carriage to the extreme righthand position; clamp both assemblies firmly in place so they will not accidentally slide to the left when lifting.

Hemp rope should be used in lifting, which should be at least 1-3/8"(30 mm) in diameter, or steel cable of equivalent strength.

Place wooden blocks between the hoisting cable and the body of the machine at points where damage would occur if excessive pressure resulted from lifting. Other parts of the machine should be protected by cloth to prevent scratching or other disfiguring marks. When hoist rope becomes taunt, check the position of the inserted blocks and the cable itself. As the lathe lifts from the ground, check the blocks and cables once more, and determine if the balance of the machine is proper. Again, just before lowering the machine into position, check all cable and blocks.



POSITIONING AND LEVELLING

The production accuracy of all precision machinery depends on the accuracy with which the machine is aistalled. Manufacturing tolerance of the machine can only be guaranteed if the machine is firmly and accurately installed. The foundation for all C.H lathes should be of the highest quality concrete and at least 22-1/2" in depths. The foundation should support the entire weight bearing surfaces of the lathe base.

Once the machine is lowered on the prepared foundation, machinists levels should be used alternarely on the cross slide and slideways of the lathe. Reading of the level should be taken on the extreme ends of the slideways as well as in the center. Minute adjustments of adjusting blots should be made until the machine is perfectly leveled.

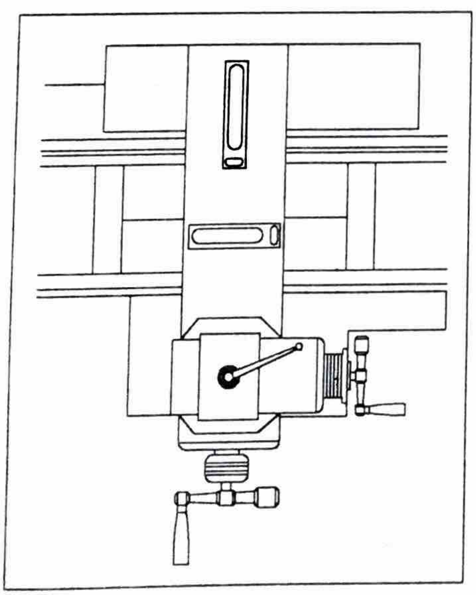
When the level of the lathe has been established, immediately grout the machine base to the foundation with the highest quality, shock-vibration-resistant mortar.

Care must be tacken not to jar the machine or the foundation after grouting until the mortar is completely set; usually 48 hours are required. The anchoring bolts should be securely tightened after the grouting mortar is set; and spirit levels should again be used to assure absolute levelling of the lathe.

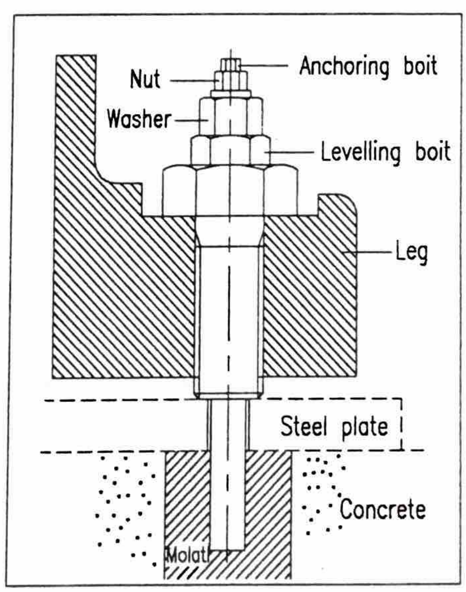
Positioning of Spirit levels.

Detailed view of foundation.

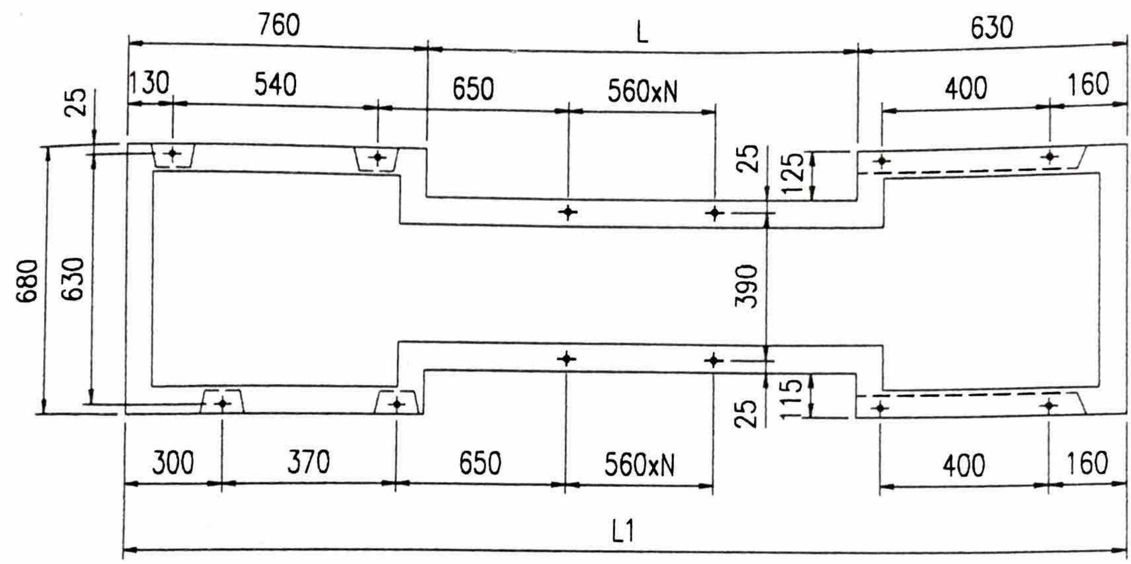
Positioning of Spirit Levels



Detailed view foundation



FOUNDATION PLAN



ITEMS\MODELS	1100G	1600G	2000G	2500G	3000G	3500G	4000G
L	1250	1750	2250	2750	3250	3750	4250
L1	2640	3140	3640	4140	4640	5140	5640
N	0	1	2	3	4	5	6

ELECTRICAL WIRING

This machine is equipped with 15HP main motor and 150W coolant pump. If an electric wire is used a cap-tired code, use size over AWG #12. The use of extremely fine wires causes the fall of the voltage which often brings the trouble on a magnetic contactor.

In case the voltage is dropped down less than 70% of the required voltages, the magnetic contactor dose not work properly, so that the main motor may stop running, lowering the life of magnetic contactor.

Protect carefully the electric wires exposed to the outside, which will be liable to be damaged by chips. This will induce a layer-short accident and will lower an efficiency to a considerable extent. The respective wirings should be connected with terminals R.S.T. at the control boss. In this instance check the revolving direction of main motor.

LUBRICATION

LUBRICATION AND LUBRICANT

The operator should be responsible for the proper lubrication of the lathe. The grade and quality of lubricants are given on the lubrication specification plate attached to the machine and also on the follwing chart of oil recommended. The instructions on this plate are essential to the proper oiling of the internal parts of
the lathe. Oil levels should be strictly observed, for the it is of primary importance
for proper operation and long life that the oil baths for the internal parts of the
lathe;Headstock,Feed Gear Box and Apron, Always be completely filled.

To keep the machine properly lubricated, follow the instructions given on the chart.

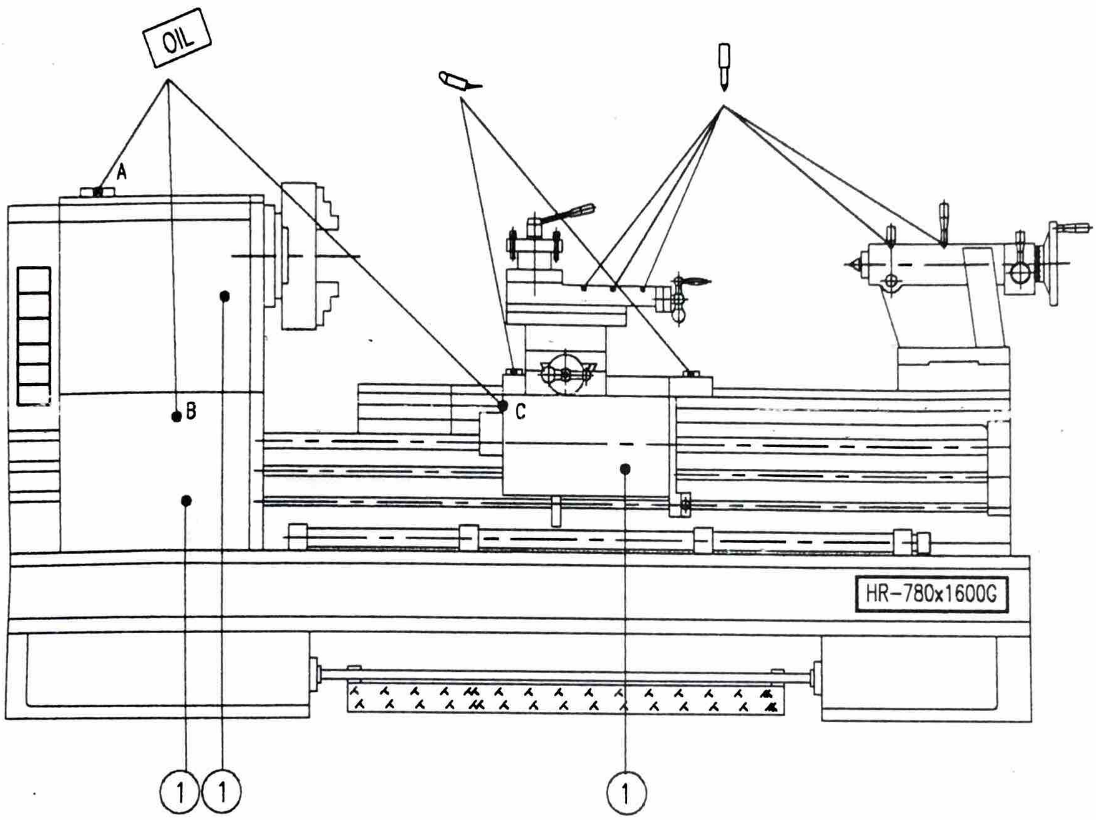
OIL LUBRICATION CHART

Lubricating Point	Oil exchange and/or replenishment	Quantity	Viscosity S.U.S 100°F
Headstock	Twice a year	12 litres	160
Feed Gear box	Twice a year	1.5 litres	160
Cioss slide	Once a day		320
Apron & Carriage	Twice a month	6.5 litres	320
End bracket	Once a day		320
Tail stock	Once a day		320
Quadrant & tool slid	Twice a year		320
Qther parts			

OIL RECOMMEND

	HEAD STOCK 12 litres	FEED BOX 1.5 litres	APRON 6.5 litres
SHELL	TELLUS 27	TELLUS 27	TONNA 33
ESSO	TERESSO 43	TERESSO 43	TERSSO 52
CALTEX	REGAL AR & O	REGAL AR & O	WAYLUBRICA
MOBIL	D.T.E. LIGHT	D.T.E. LIGHT	VACTORA NO.2

LUBRICATION CHART



1. OIL GAUGE
A. HEAD STOCK
B. GEAR BOX
C. APRON

LUBRICATION OF HEADSTOCK AND FEED GEAR BOX

Oil windows are provided to check the proper functioning of the lubrication system.

The lubrication of headstock and feed gear box is forcedly provided by trochoid pumps(discharge quantity 2.4 L/min,pressure 2Kgs/cm2 per 1000 r.p.m. through filters from oil tank incorporated into the machine leg.

Lubrication of end bar support is done by a pump fitted into the support itself and this pump should be oiled periodically on a regular scheduled basis.

Particular attention and study has been done into manufacturing of lubrication system in all C.H lathes. In most instances, trochoid pumps are fitted into Feed Gear Box and Headstock, and provides forced lubrication to Spindle bearings and spray oiling of all other running parts. The inlet side of all pumps are fitted with fine filters to offer further protection.

Remove the cover of headstock and next pour the recommended oil into the headstock, and oil is stocked in the tank through the feed box. After long term use, dirt and spoiled oil should be replenished with fresh lubrication oil.

The oil tank can be easily dismantled from the machine by loosening the bolts tightened to the machine.

Cleaned oil by the filter flows regularly to the said points.

Oil filter should be cleaned at regular intervals and wire screws should be kept clean.

LUBRICATION FOR CARRING & APRON

Allgears, shafts, bearings and all other running parts are automatically lubricated by a plunger pump.

Push the manual plunger pump several times which located on the left side of the apron when start to operate the machine or the machine stop running for a long time.

Particular attention should be given to the lubrication of the slideways during mechanical traversing.

Although the slideways are oiled autmatically, during heavy duty work, close visual checks are strongly recommended.

LUBRICATION OF LEADSCREW AND FEED ROD

Leadscrews and feed rod should be lubricated at least once or twice a day by an oil gun.

Be sure that the grade of oil should be used according to the recommended oil chart attached. Likewise lubricate to the starting rod.

LUBRICATION OF TAILSTOCK

The oil inlets are equipped at the slideways of tailstock spindle, supporting part for leadscrew and feed rod, and gear wheel. The daily lubrication should be done before operating the machine every mornings.

OPERATION AND USE

STARTING AND STOPPING

Before starting up machine, make sure if the proper lubrication to all running parts has been done as per lubrication chart on page. And switch on after ensuring the starting lever at apom, which should be placed in the neutral position.

Upon switching on, the pilot lamp is on. The starting-up of main spindle is accomplished by the starting lever which incorporates a safety device, which prevents an abrupt accidend from operators. Move this starting lever horizontally to diaengage a safety pin. When this lever is moved. Thermal overload relay protects motor from overheating or excessive voltage coming in with the stop of motor drive. In the case of motor stop with reason, please reset the thermal relay by the pushing the button to reste. The main spindle gets a reverse revolution, and when the lever is moved downwards, the main spindle gets a forward revolution.

When this lever comes back to the neutral position, it engages a safety pin, and the main spindle stops revolving.

SELECTION OF SPINDLE SPEEDS

Main spindle is supported by bearing in three places. Taper roller bearing is placed both at front and middle respectively to avoid the rise of temperature, and ball bearing is placed at the rear end to eliminate the expansion of main spindle. In addition to this, taper roller bearing at the middle is pressed by a saucer spring, due to which the adjustment of bearings is not needed at the position of lower speed range and higher speed range.

Note: Torque constant range is up to 52 r.p.m.

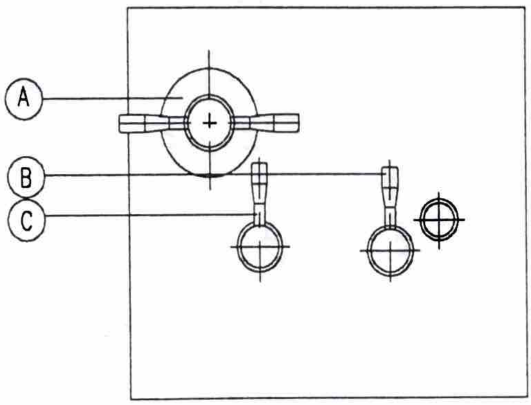
Operation

Range of spindle speeds: 10-800, r.p.m.(12 spindle speeds) 12-1000 for HR-680

The selection of spindle speeds carried out by three levers(A),(B)

Lever(A)selects name plates(A)or (B)and lever(B)selects(H) or(L).

Knob(C) carries out the change of the forward and reverse revolution for feeds and threads. Check out the oil sight gage to make sure of the proper lubrication.



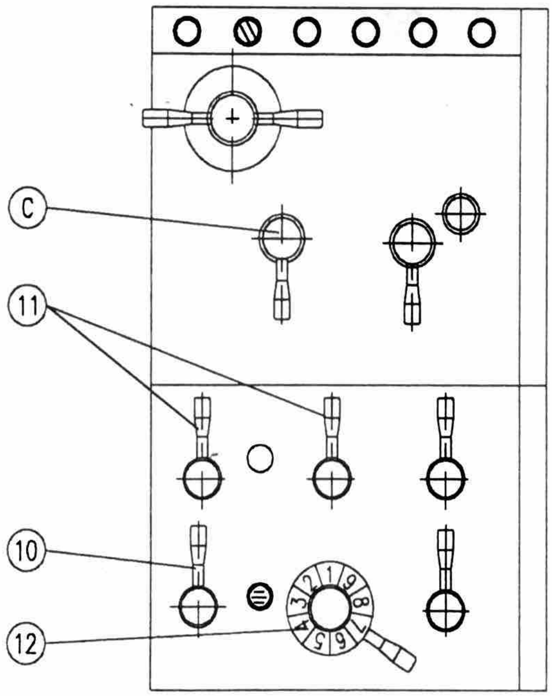
FEEDS:

First, turn the lever(10) to Feed, and turn a dial selector(12) to get feeds table plate at the upper side. Check out the desired feed according to the feeds table plate and turn the lever(11) up to the position where the indicated figure comes to the upper side.

Turn the clamping lever(C) anti-clockwise and the engaged gears of Norton system disengages. Turn the lever(11) up to the position of arrow which indicates the disired feed, and then the desired operation of feed is ready by turning the clamping lever(C) clockwise.

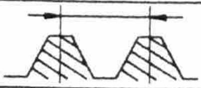
THREADS:

First, select change gears to meet the desired threads according to the threads according to the threads chart. Trun the lever(10) to threads side and then a dial selector to get a threads table plate at the upper side. The further preparatory procedure is exactly same as in feed selection.



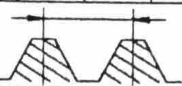
FEEDS AND THREADS TABLE

1 in



	1	2	3	4	5	6	7	8	9
ADWF	2	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$
BDWF	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{2}$	7
ACWF	8	9	$9\frac{1}{2}$	10	11	$11\frac{1}{2}$	12	13	14
BCWF	16	18	19	20	22	23	24	26	28

mm



	1	2	3	4	5	6	7	8	9
ACME	8	9	9.5	10	11	11.5	12	13	14
BCME	4	4.5	4.75	5	5.5	5.75	6	6.5	7
ADME	2	2.25	/	2.5	2.75	/	3	3.25	3.5
BDME	1	/	/	1.25	/	/	1.5	/	1.75
ACMH	6.4	7.2	7.6	8	8.8	9.2	9.6	10.4	11.2
BCMH	3.2	3.6	3.8	4	4.4	4.6	4.8	5.2	5.6
ADMH	1.6	1.8	1.9	2	2.2	2.3	2.4	2.6	2.8
BDMH	0.8	0.9	0.95	1	1.1	1.15	1.2	1.3	1.1

DP

	1	2	3	4	5	6	7	8	9
ADWF	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	$5\frac{3}{4}$	6	$6\frac{1}{2}$	7
BDWF	8	9	$9\frac{1}{2}$	10	11	$11\frac{1}{2}$	12	13	14
ACWF	16	18	19	20	22	23	24	26	28
BCWF	32	36	38	40	44	46	48	52	56

MP

	1	2	3	4	5	6	7	8	9
ACME	4	4.5	4.75	5	5.5	5.75	6	6.5	7
BCME	2	2.25	/	2.5	2.75	/	3	3.25	3.5
ADME	1	/	/	1.25	/	/	1.5	/	1.75
BDME	0.5	/	/	/	/	/	0.75	/	/

MM ( = $\frac{1}{2}$)

	1	2	3	4	5	6	7	8	9
ACMG	0.40	0.44	0.46	0.48	0.52	0.56	0.60	0.62	0.70
BCMG	0.20	0.22	0.23	0.24	0.26	0.28	0.30	0.31	0.35
ADMG	0.10	0.11	0.11	0.12	0.13	0.14	0.15	0.16	0.17
BDMG	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09

THREAD INDICATOR

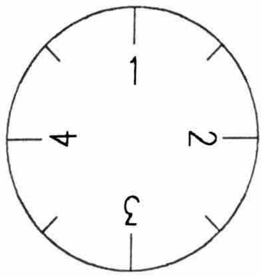
Thread outting indicator is installed on the left side of APRON, it is used for cutting inch thread.

To cut threads of an even number per inch, close the half nut as any line on the dial passe datum mark.

To out threads of odd numbers per inch close the half nut as any one long number on the dial passes datum mark.

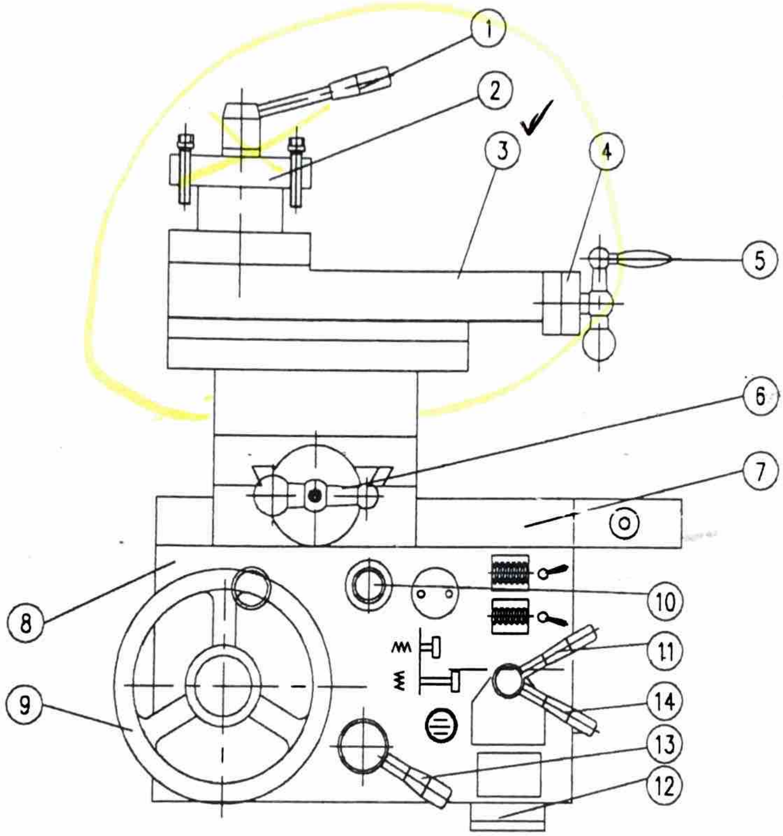
Fractional threads of 1/2 or 3/4 T.P.I may be by closing the half nut at the same line on each pass of the tool.

This dial indicator can't be used with an inch leadsorew to cut metrio threads, D.P.,module pitches. For that will cut the metric threads, the half nut of APRON must be kept closed,can only be cut by the spindle reverse-For ward rotation lever in PRON and carriage return is driven by half nut and leadscrew.



CARRIAGE AND APRON

The engaging and disengaging of longitudinal and cross feeds is accomplished by lever(10) drop worm; system). The interlocking device is equipped so that the longitudinal feeds and the half-nut engagement or disengagement can not work together. There is an overload safety device by means of cone clutch.



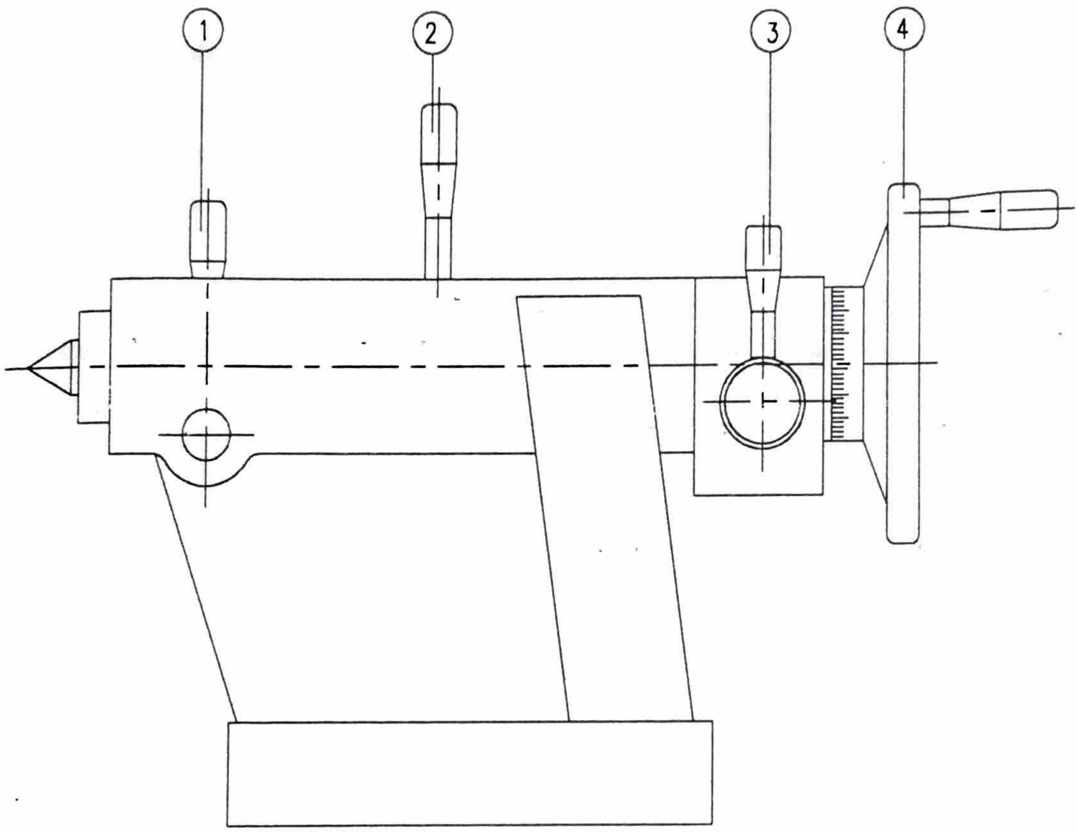
1. CLAMPING LEVER
2. SQUARE TURRET TOOL POST/AMERICAN TOOL POST
3. TOP SLIDE
4. MICRO METER COLLAR
5. TOP SLIDE HANDLE FOR CROSS FEEDS
6. OPERATING HANDLE FOR CROSS FEEDS
7. CARRIAGE
8. APRON
9. HAND WHEEL FOR LONGITUDINAL
10. CHANG LEVER FOR AUTOMATIC LONGITUDINAL AND CROSS FEEDS
11. HALF-NUT LEVER
12. MOTOR
13. FEEDS STARTING LEVER
14. RAPID FEED LEVER

TAILSTOCK

Tow step of spindle speed:

A 1 to 1/4 reduction gein gives a fast range quick positioning and slow one principally for drilling operation .(Special order)

Normal speed	5mm/rev.
Reduction speed	1.25 mm/rev.



1. CLAMPING LEVER FOR QUILL
2. CLAMPING LEVER FOR TAILSTOCK BODY
3. TAILSTOCK TRAVEL REDUCTION LEVER
4. HANDWHEEL FOR TAILSTOCK QUILL MOVEMENT

BED AND LEVELLING

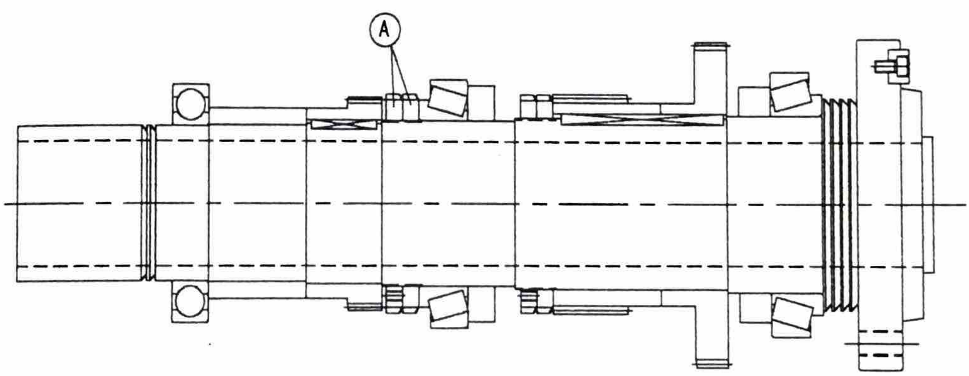
Levelling of machine itself is very important so that cutting accuracy can be maintained. So occassional levelling check is required very carefully. And for levelling adjustment, please refer to the levelling instruction shown in page No.5 and chart of accuracy.

SPINDLE BEARING ADJUSTMENT

Spindle bearings are already adjusted correotly at our plant befor delivery. So please avoid the unnecessary adjustment except the particular case. When adjustment is needed by the reason of chattering or bearing noise or over temperature etc, adjust only front and middle bearings by loosing or tightening the nut(A)properly, not too tight.

Rear bearing is specially comdined and free from adjustment.

It is recommended that when main spindle is rotated slowly, continuously, to ensure the bearings are not overtighed. Do not over adjust flat spring as this is a eguard against over-heating of bearings.



ADJUSTMENT OF TAPER GIB

There is a taper gib on the cross slide and tool slide respectively. Adjust a taper gib in a sucessive order as follows:

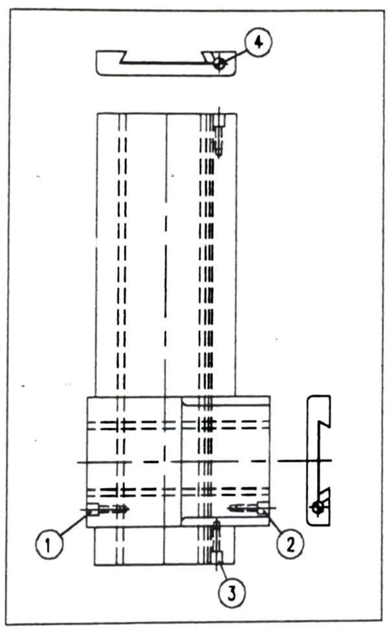
Adjustment of a tool slide gib.

1) Loosen an adjusting screw (1) at the rear and tighten an adjusting screw(2) at the front.

2) Turn a tool slide handle and make sure whether a taper gib has been adjusted. If it is well adjusted, then tighten an adjusting screw (1).

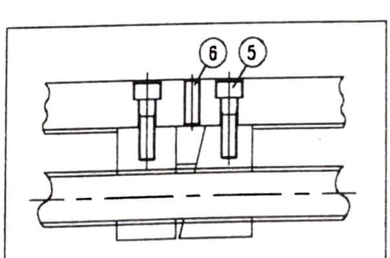
Adjustment of a cross slide gib.

Remove a felt cover at the front and loosen an adjusting screw(3) at the front and then tighten an adjusting screw (4) at the rear. The following procedure is same as for tool slide gib.

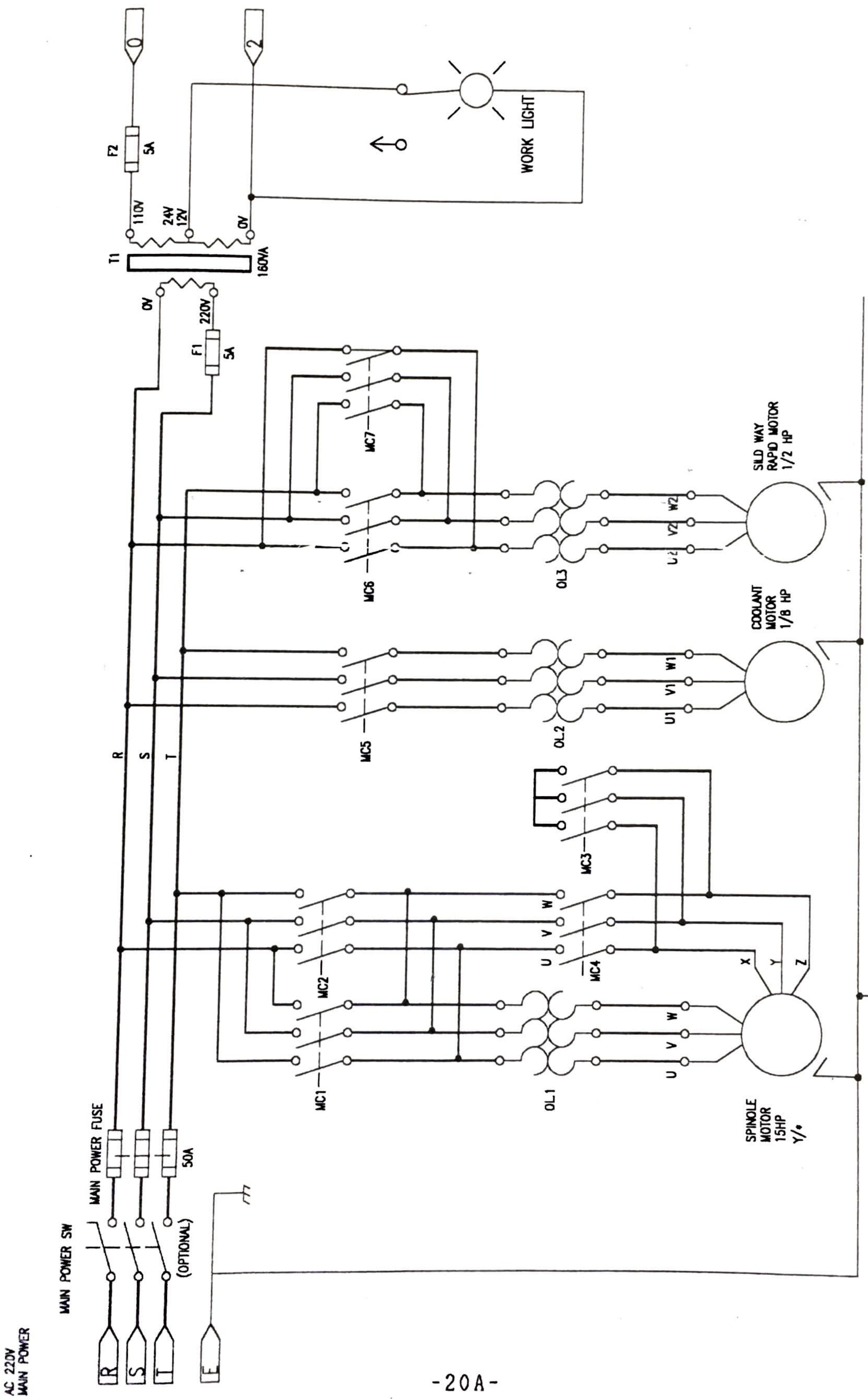


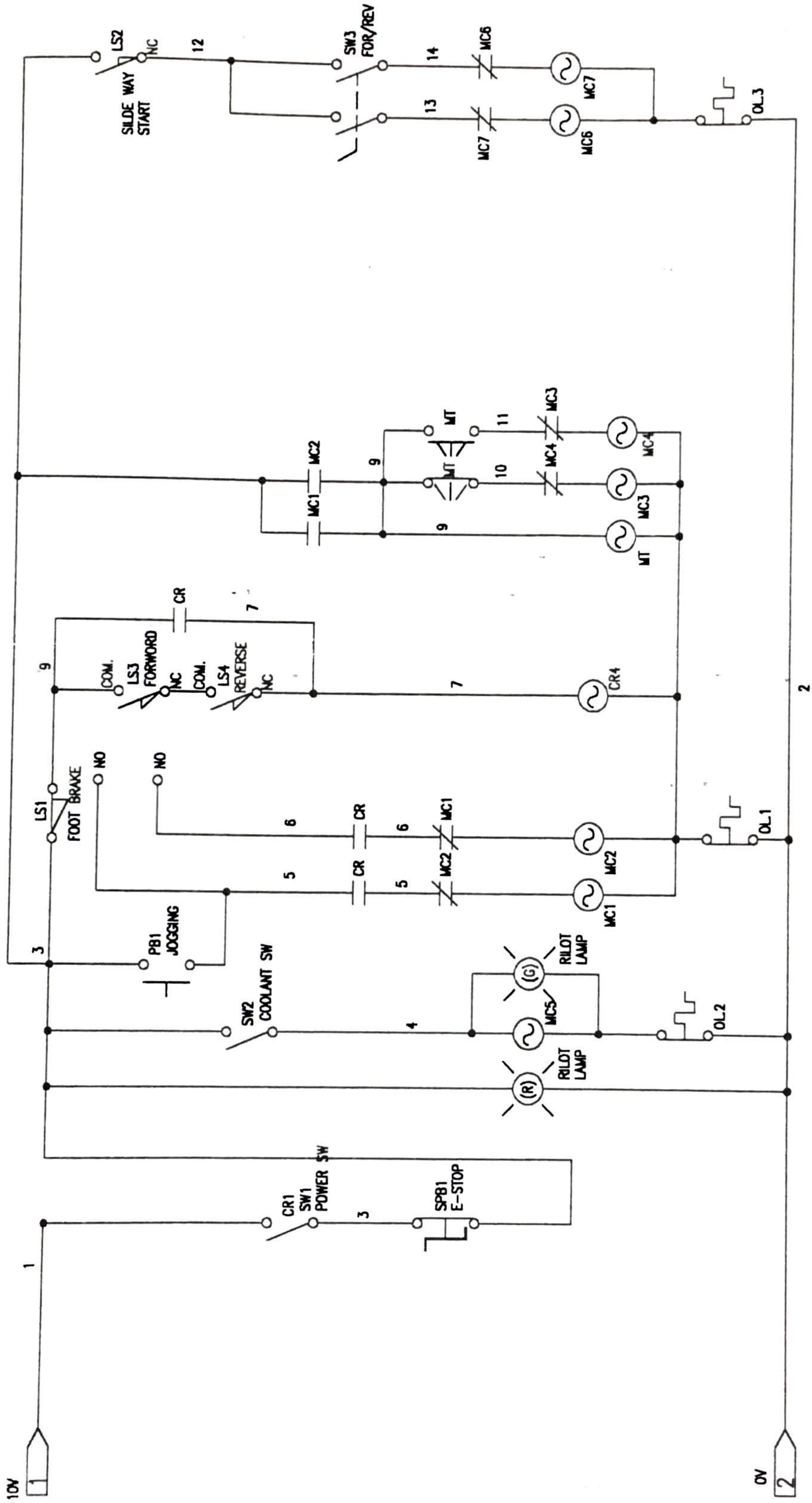
FEMALE SCREW OF CROSS SLIDE

A female screw can be adjusted to minimize a backlash for a cross slide screw. Lossen Bolt (5) to some extent and tighten Screw(6) by a driver. Then the said backlash can be minimized.



ELECTRICAL CIRCUIT DIAGRAM





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CR1
SW1
POWER SW
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SPB1
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LS1
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CR4
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MC3
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SW3
FOR/REV
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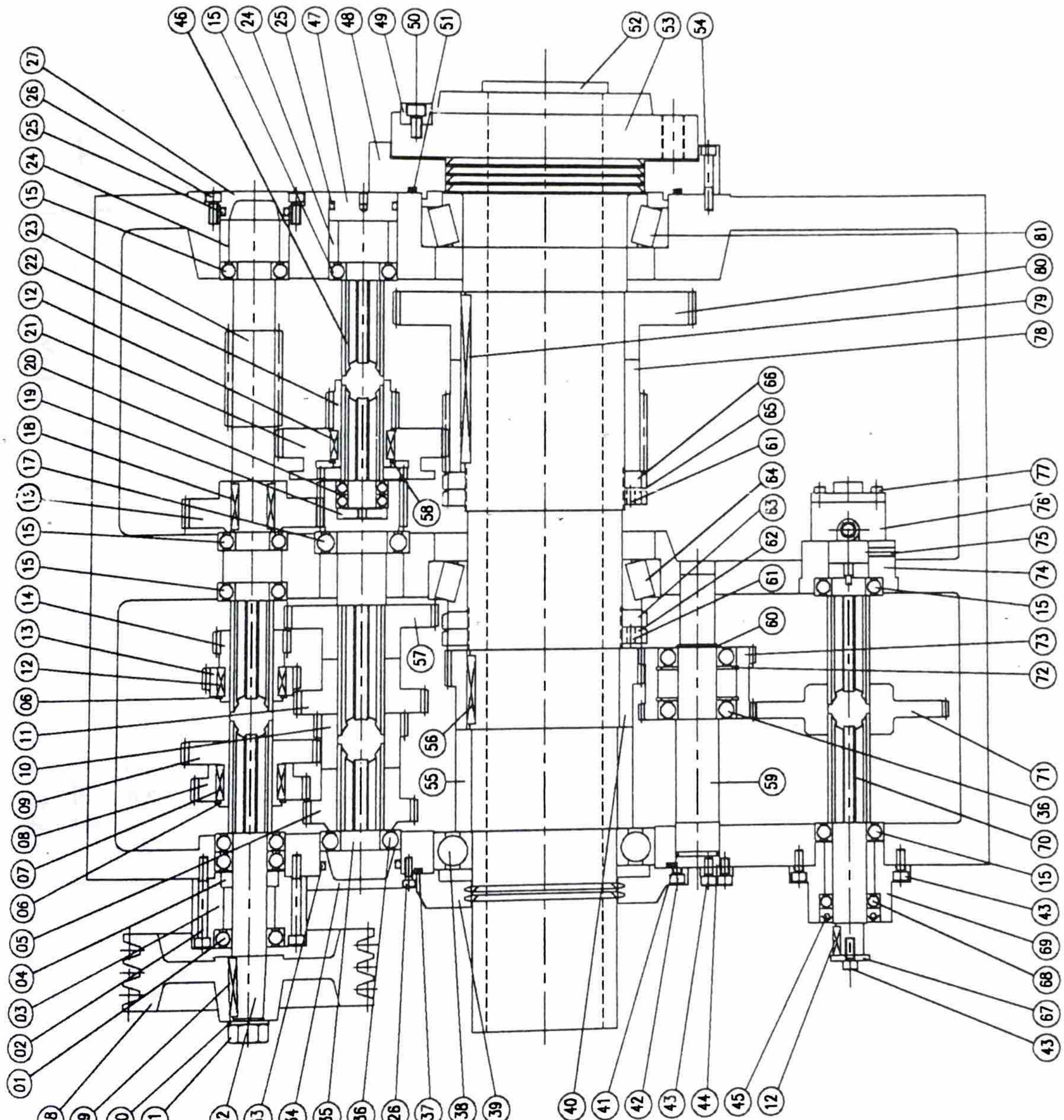
MC6
MC7
OL3



主 軸 箱
HEADSTOCK

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01		BEARING	6206RS	1
02		SCREW	M8x65L	4
03	HR-2005	FLANGED BEARING		1
04		OIL SEAL	TC-305011	1
05	HR-2619	GEAR		1
06		SNAP RING	STW-55	2
07		KEY	7x7x30L	2
08	HR-2608	GEAR		1
09	HR-2007	GEAR		1
10	HR-2018	GEAR		1
11	HR-2017	GEAR		1
12		KEY	7x7x25L	5
13	HR-2010	GEAR		1
14	HR-2009	GEAR		1
15		BEARING	6206	8
16	HR-2012	GEAR		1
17		BEARING	6209	1
18		KEY	7x7x40L	2
19	HR-2615-1	COLLAR		1
20		BEARING	NJ-205	2
21	HR-2623	GEAR		1
22	HR-2622	GEAR		1
23	HR-2011	SHAFT		1
24	HR-2113	COLLAR		2
25		O-RING	P52	2
26		SCREW	M8x16L	4

主 軸 箱
HEADSTOCK

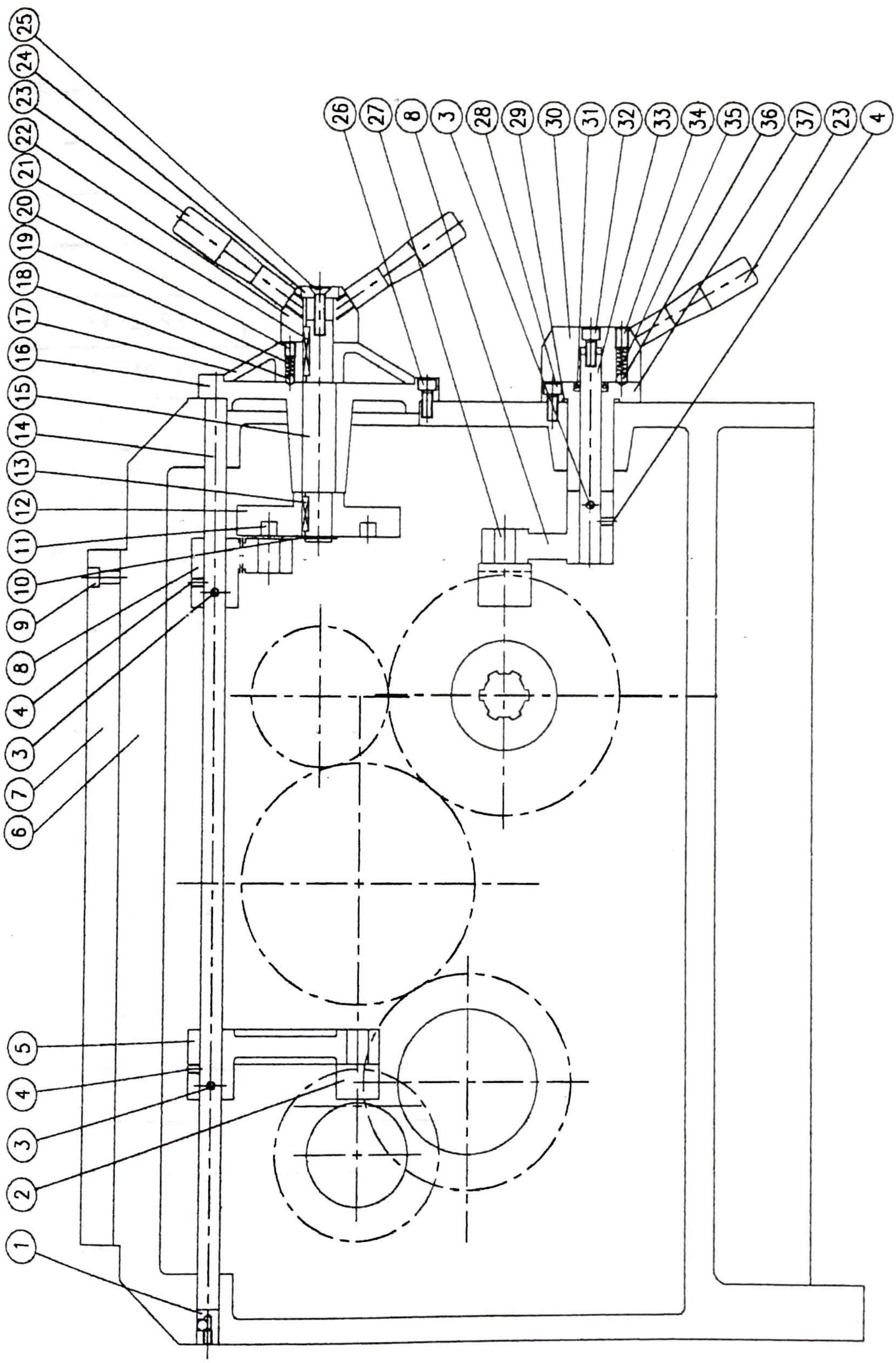
REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27	HR-2014	COVER		1
28	HR-2004	PULLEY		1
29		KEY	7x7x45L	1
30		SPRING WASHER	7/8"	1
31		NUT	7/8"-14UNF	1
32	HR-2006	SHAFT		1
33		O-RING	P62	1
34	HR-2024	COVER		1
35	HR-2015	SHAFT		1
36		BEARING	6207	3
37		O-RING	G220	1
38		BEARING	6026	1
39	HR-2135	COVER		1
40	HR-2132	GEAR		1
41		O-RING	G35	1
42		SCREW	M6x18L	6
43		SCREW	M8x20L	2
44	HR-2038	STOPPER		1
45		OIL SEAL	TC-305511	1
46	HR-2621	SHAFT		1
47	HR-2025	PLUG		1
48	HR-2134A	COVER		1
49	HR-2066	DRIVE KEY		1
50		SCREW	M10x20L	1
51		O-RING	G250	1
52	HR-2068	SLEEVE		1

主 軸 箱
HEADSTOCK

REF NO.	件 號 PART NO.	零 件 名 稱 DESCRIPTION	規 格 PARTS NAME	數 量 Q'TY
53	HR-2103A	SPINDLE		1
54		SCREW	M8x50L	5
55	HR-2133	COLLAR		1
56		KEY	10x8x65L	1
57	HR-2016	GEAR		1
58		SNAP RING	STW-52	1
59	HR-2036	SHAFT		1
60		SNAP RING	STW-35	1
61		SCREW	M8x16	4
62	HR-2131	NUT		1
63	HR-2130	NUT		1
64		BEARING	32028X	1
65	HR-2129	NUT		1
66	HR-2128	NUT		1
67	HR-2067	WASHER		1
68		BEARING	6006	1
69	HR-2042	FLANGED BEARING		1
70	HR-2039	SHAFT		1
71	HR-2040	GEAR		1
72		SNAP RING	RTW-72	1
73	HR-2037	GEAR		1
74	HR-2641	FLANGED BEARING		1
75		SCREW	M8x25L	1
76		PUMP	AM-2	1
77		SCREW	M6x45L	3
78	HR-2127	GEAR		1

主　軸　箱
HEADSTOCK

REF NO.	件　號 PART NO.	零　件　名　稱 DESCRIPTION	規　格 PARTS NAME	數　量 Q'TY
79		KEY	14x9x150L	1
80	HR-2126	GEAR		1
81		BEARING	32030X	1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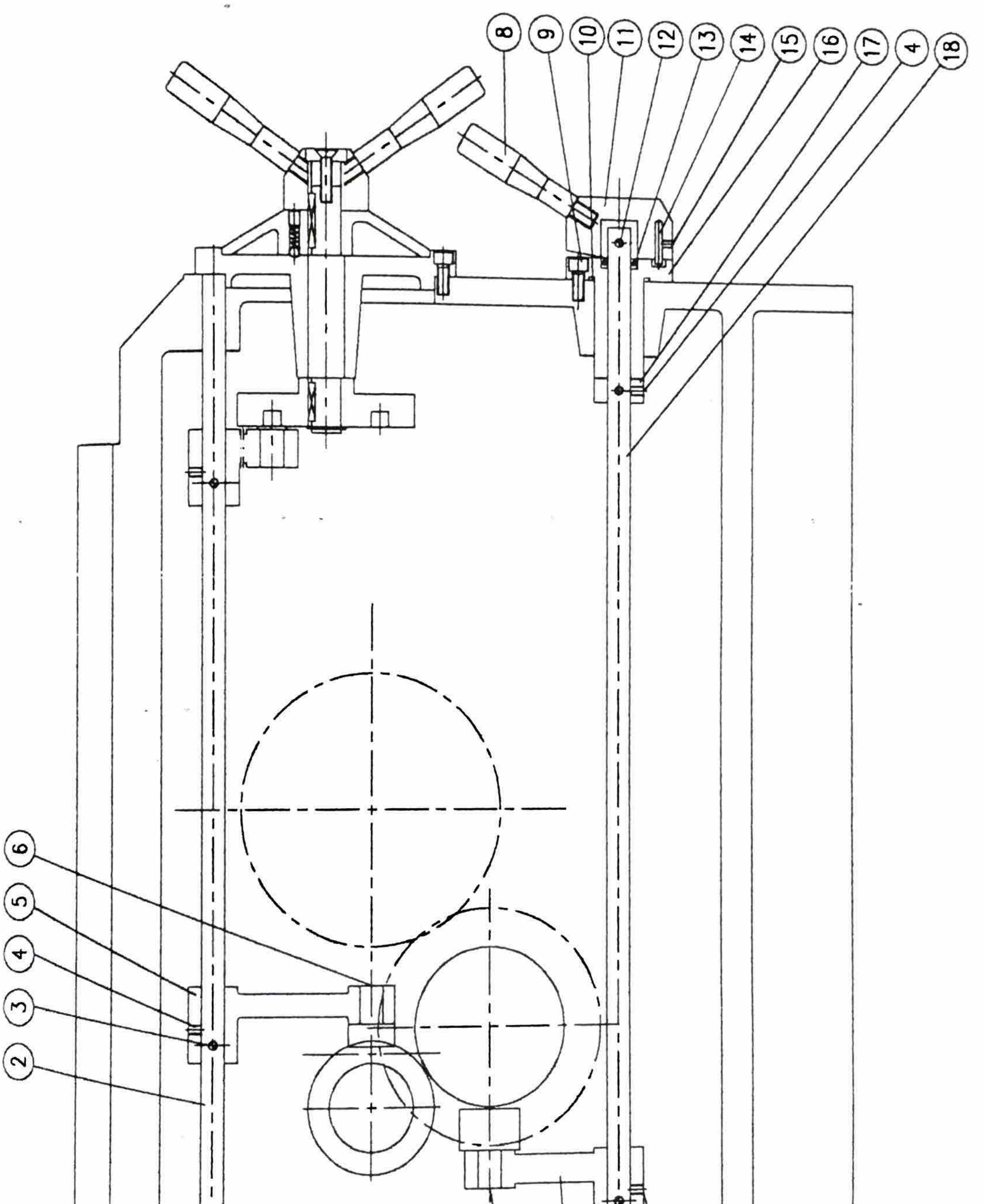
主軸箱變速(一)
HEADSTOCK：CONTROL FRAME ASSY(一)

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01	HR-2056	PLUG		1
02	HR-2055-1	PAD		1
03		TAPER PIN	#4x38L	3
04		SCREW	M6x10L	3
05	HR-2653	LEVER		1
06	HR-2601	HEADSTOCK		1
07	HR-2002	COVER		1
08	HR-2661	LEVER		2
09		SCREW	M8x30L	7
10		SNAP RING	STW-20	1
11	HR-2651	PIN		2
12	HR-2649	CAM		1
13		KEY	5x5x25L	1
14	HR-2052	SHAFT		1
15	HR-2048	SHAFT		1
16	HR-2647	CAM COVER		1
17	HR-2046	SPEED SELECTOR		1
18		STEEL BALL	1/4"	1
19		SPRING	1/4"x3/4"L	1
20		SCREW	M8x10L	1
21		KEY	5x5x35L	1
22	HR-2043	LEVER BOSS		1
23	HR-2045	HANDLE		3
24	HR-2044	WASHER		1
25		SCREW	M8x30L	1
26		SCREW	M6x20L	6

主 軸 箱 變 速 (一)
HEADSTOCK：CONTROL FRAME ASSY(一)

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27	HR-2065	FORK		1
28	HR-2661	LEVER		1
29		O-RING	G35	1
30	HR-2657	LEVER BOSS		1
31		OIL SEAL	TC-162607	1
32		SCREW	M8x20L	1
33	HR-2659-1	SHAFT		1
34		SCREW	M10x12L	1
35		SPRING	5/16"x1"L	1
36		STEEL BALL	5/16"	1
37	HR-2658	BUSH		1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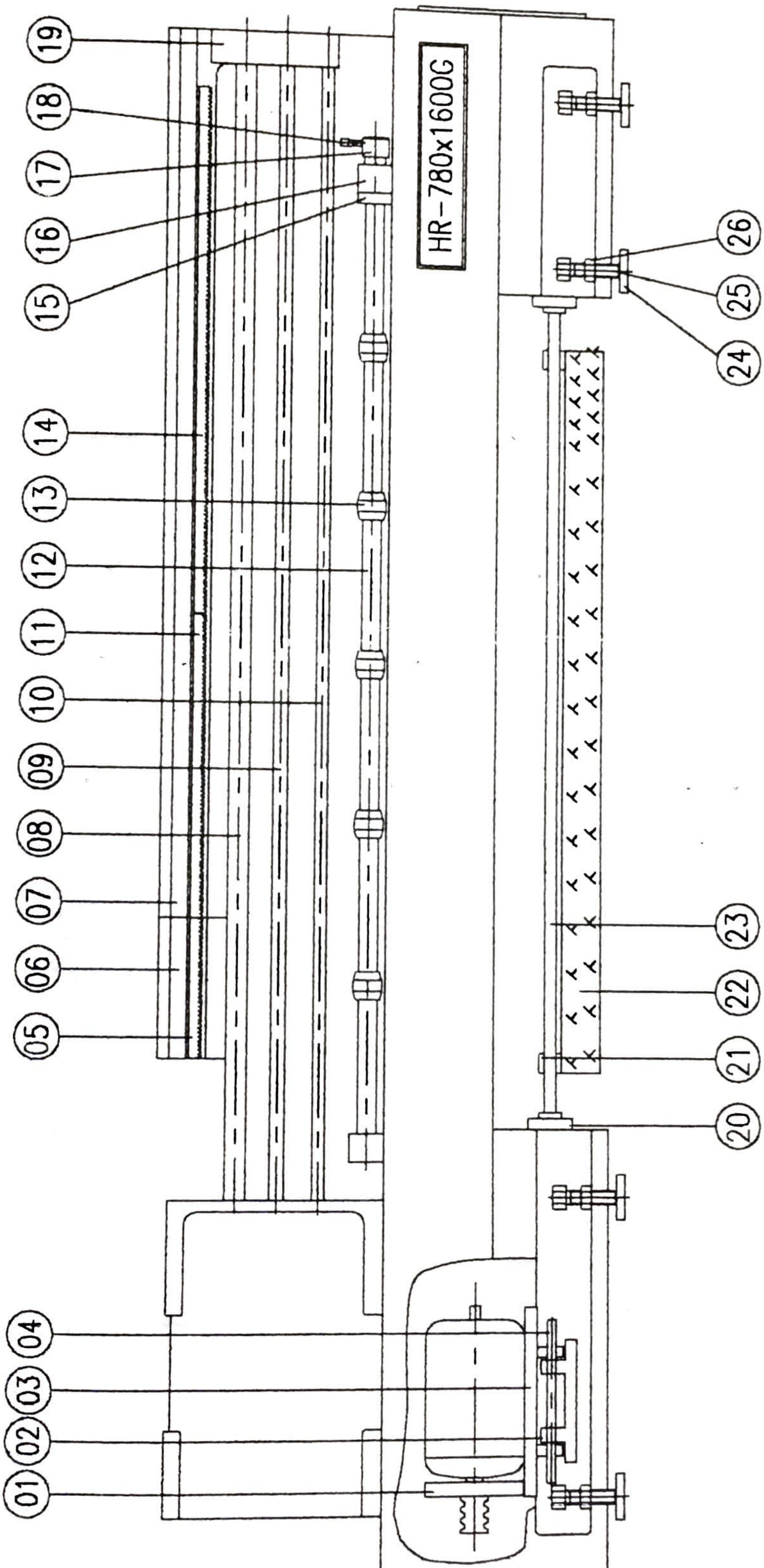
主 軸 箱 變 速 (二)
HEADSTOCK : CONTROL FRAME ASSY (二)

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01	HR-2056	PLUG		2
02	HR-2052	SHAFT		1
03		TAPER PIN	#4x38L	2
04		SCREW	M6x10L	4
05	HR-2653	LEVER		2
06	HR-2055	PAD		1
07	HR-2054	PAD		1
08	HR-2045	HANDLE		1
09		SCREW	M8x16L	2
10		O-RING	G35	1
11	HR-2662	LEVER BOSS		1
12		TAPER PIN	#5x75L	1
13		OIL SEAL	TC-162607	1
14		PIN	ϕ 5x25L	1
15		SCREW	M5x12L	1
16	HR-2663	BUSH		1
17	HR-2060	COLLAR		1
18	HR-2064	SHAFT		1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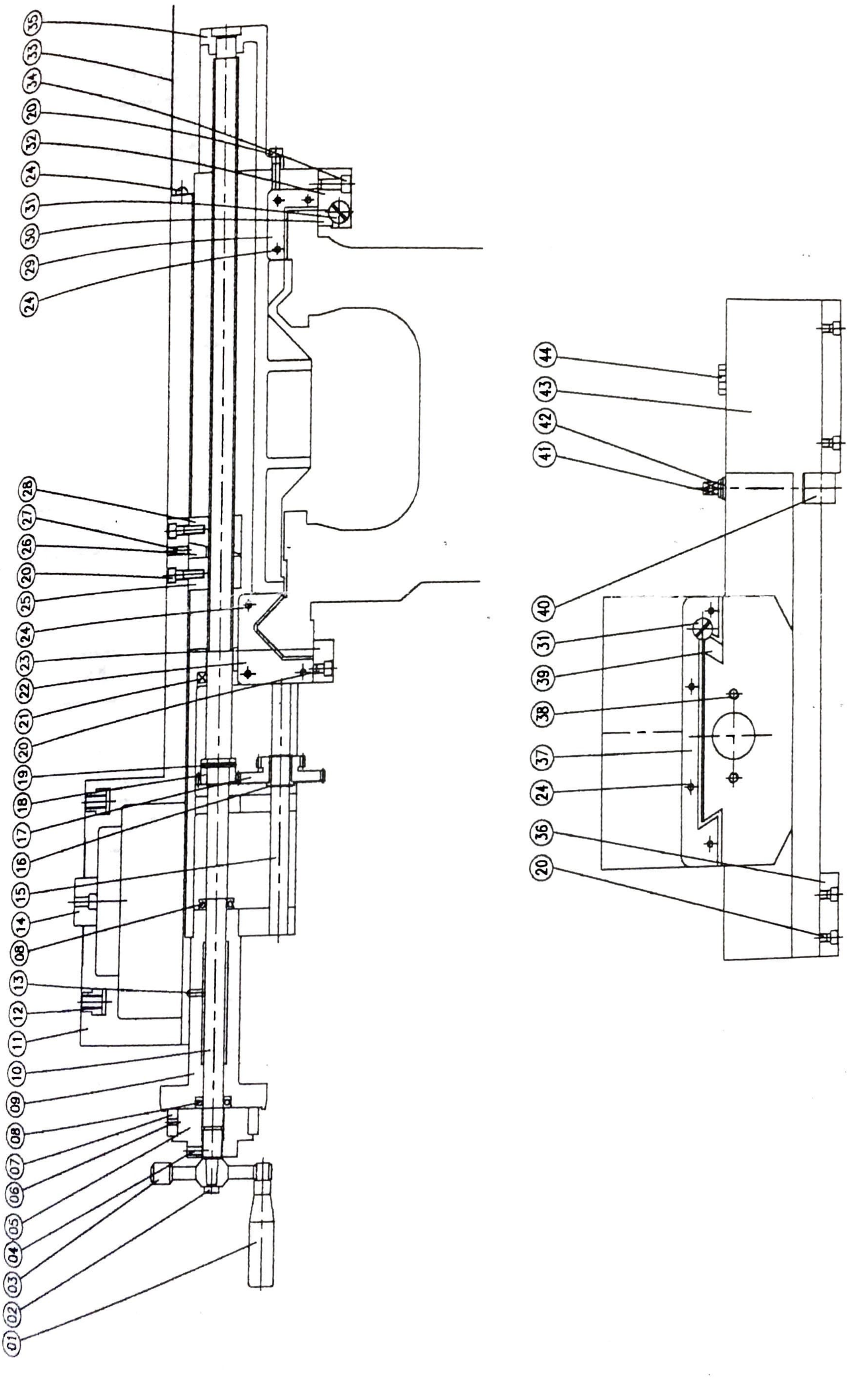
床身
BED

REF NO.	件號 PART NO.	零件名稱 TYPE-RATING	規格 PARTS NAME	數量 Q'TY
01	HR-1007	PULLEY		1
02	HR-1003	BRACKET		1
03	HR-1004	MOTOR BASE		1
04	HR-1005	SHAFT		1
05	HR-1010	RACK		1
06	HR-1002	GAP		1
07	HR-1001	BED		1
08	HR-1011	LEADSCREW		1
09	HR-1012	FEED ROD		1
10	HR-1013	THIRD ROD		1
11	HR-1009	RACK		1
12	HR-1014	STOPING ROD		1
13	HR-1019	STOPING RING		4
14	HR-1008	RACK		1
15	HR-1017	COLLAR		1
16	HR-1018	BRACKET		2
17	HR-1020	HANDLE BOSS		1
18	HR-1021	HANDLE		3
19	HR-1015	BRACKET		1
20	HR-1016	COVER		2
21	HR-1022	LEVER		2
22	HR-1023	BRAKE FOOT PLATE		1
23	HR-1024	BRAKE ROD		1
24	HR-1025	PLATE		8
25	HR-1026	NUT		8
26		BOLT		8



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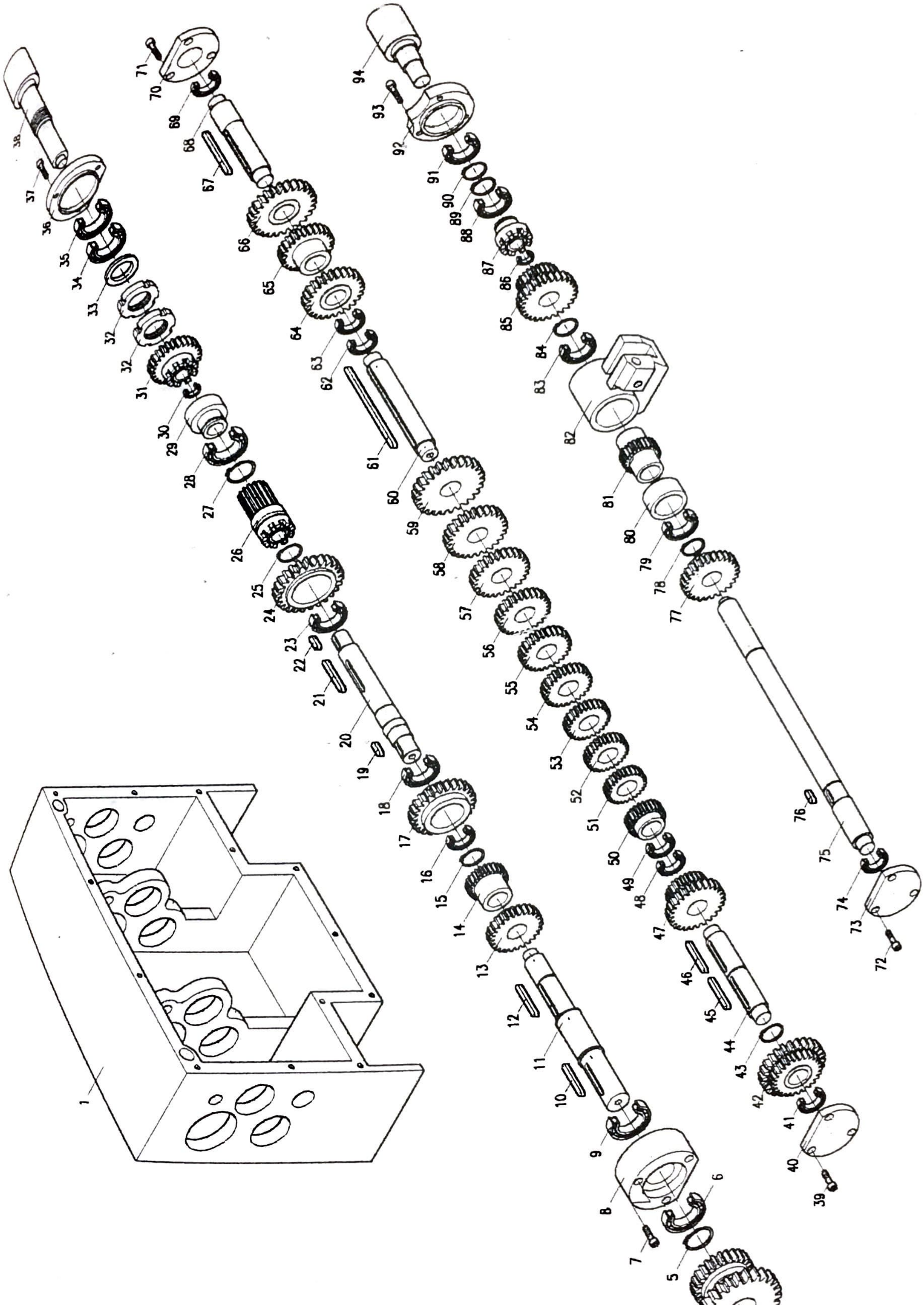
床鞍
CARRIAGE

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01		HANDLE	3/8"	1
02		SCREW		1
03		HANDLE WHEEL		1
04		SET SCREW	M8x15L	1
05	HL-5008	NUT		1
06		SET SCREW	M6x12L	1
07	HL-5007	INDEX RING		1
08		BEARING	51104	2
09	HR-3010	BRACKET		1
10	HR-3004	LEAD SCREW		1
11	HR-3002	CROSS SLIDE		1
12	HR-3018	T-NUT		4
13		OILER	1/4"	1
14	HR-3021	PIVOT		1
15	HR-3016	SHAFT		1
16		SNAP RING	STW-18	2
17	HR-3017	GEAR		1
18	HR-3008	GEAR		1
19		TAPER PIN	#2x35L	1
20		SCREW	M8x25L	9
21		OIL SEAL	TC-254511	1
22	HR-3028	WIPER		1
23	HR-3022	PLATE		1
24		SCREW	M5x12L	19
25	HR-3005R	NUT		1
26	HR-3007	GIB		1

床鞍
CARRIAGE

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27		SET SCREW	M8x20L	1
28	HR-3006R	NUT		1
29	HR-3030	WIPER		1
30	HR-3025	GIB		1
31		SCREW	M8	1
32	HR-3024	PLATE		1
33	HR-3027	COVER		1
34		SCREW	M10x40L	4
35	HR-3014	BRACKET		1
36	HR-3023	PLATE		1
37	HR-3015	WIPER SLIDE		
38		SCREW	M10x35L	2
39	HR-3003	GIB		1
40	HR-3019	CLAMP NUT		1
41	HR-3017	SCREW		1
42	HR-3020	WASHER		1
43	HR-3001	CARRIAGE		1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零 件 表
PARTS LIST

REF NO.	件 號 PART NO.	零 件 名 稱 DESCRIPTION	規 格 PARTS NAME	數 量 Q'TY
01	HR-7001	GEAR BOX		1
02		BOLT	M8x25L	1
03		WASHER		1
04	HR-7007	GEAR		1
05		SNAP RING		1
06		BEARING	6006	1
07		BOLT	M6x50L	3
08	HR-7040	COVER		1
09		BEARING	6206	1
10		KEY	6x6x55L	1
11	HR-7030	SHAFT		1
12		KEY	6x6x50L	1
13	HR-7008	GEAR		1
14	HR-7009	GEAR		1
15		SNAP RING		1
16		BEARING	6203	1
17	HR-7010	GEAR		1
18		BEARING	6205	1
19		KEY	6x6x20L	1
20	HR-7031	SHAFT		1
21		KEY	6x6x50L	1
22		KEY	6x6x20L	1
23		BEARING	6005	1
24	HR-7011	GEAR		1
25		SNAP RING		1
26	HR-7012	GEAR		1

零件表 PARTS LIST

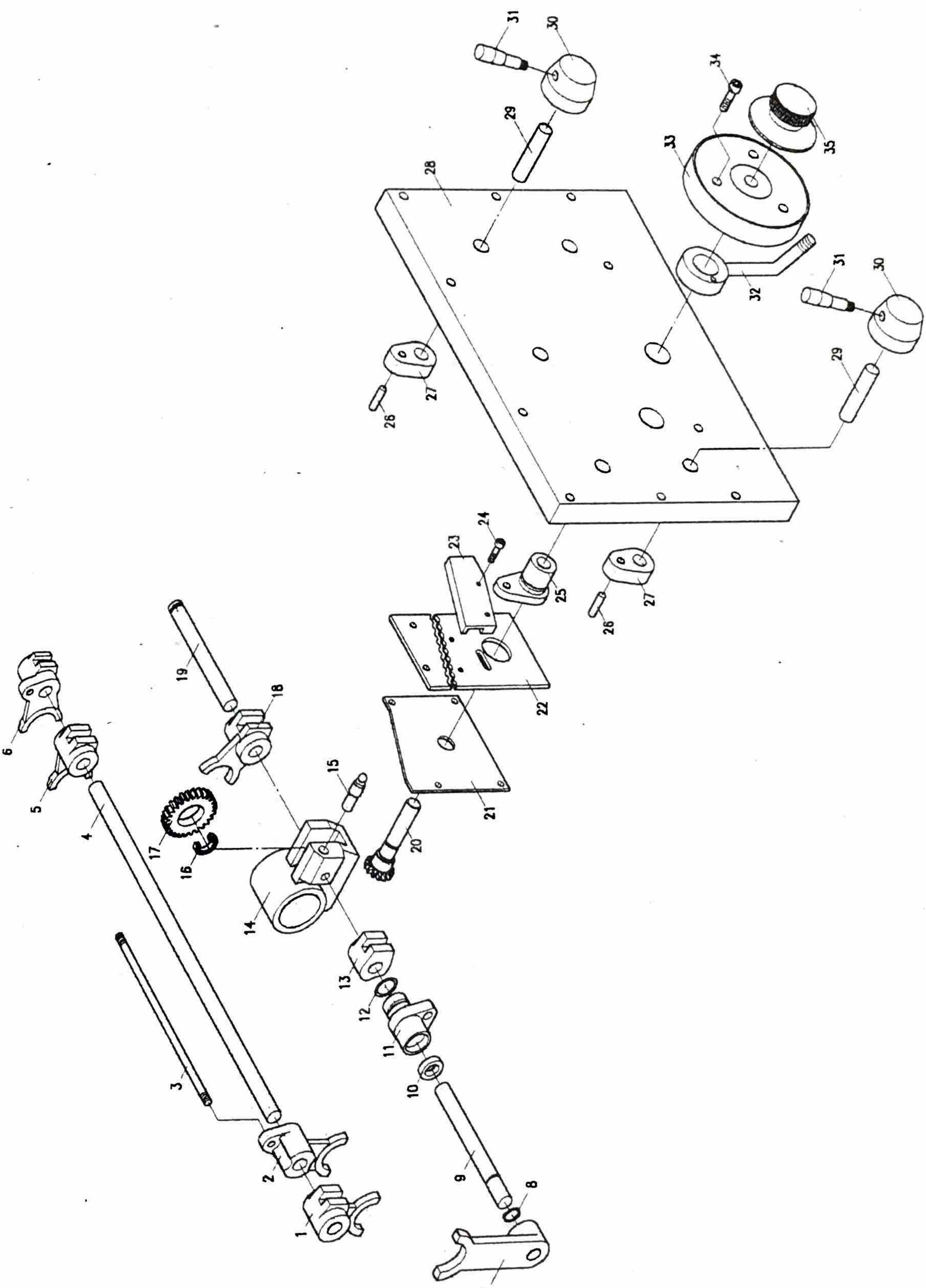
REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27		SNAP RING		1
28		BEARING	6006	1
29	HR-7014	CLUTEH		1
30		BEARING	6002	1
31	HR-7015	GEAR		1
32		NUT		2
33		WASHER		1
34		BEARING	30206	1
35		BEARING	30206	1
36	HR-7041	COVER		1
37		BOLT	M6x25L	1
38	HR-7032	SHAFT		1
39		BOLT	M6x16L	3
40	HR-7042	COVER		1
41		BEARING	6204	1
42	HR-7016	GEAR		1
43		SNAP RING		1
44	HR-7033	SHAFT		1
45		KEY	6x6x55L	1
46		KEY	6x6x55L	1
47	HR-7017	GEAR		1
48		BEARING	6204	1
49		BEARING	6204	3
50	HR-7018	GEAR		1
51	HR-7019-1	GEAR		1
52	HR-7019-2	GEAR		1

零 件 表
PARTS LIST

REF NO.	件 號 PART NO.	零 件 名 稱 DESCRIPTION	規 格 PARTS NAME	數 量 Q'TY
53	HR-7019-3	GEAR		1
54	HR-7019-4	GEAR		1
55	HR-7019-5	GEAR		1
56	HR-7019-6	GEAR		1
57	HR-7019-7	GEAR		1
58	HR-7019-8	GEAR		1
59	HR-7020	GEAR		1
60	HR-7034	SHAFT		1
61		KEY	6x6x130L	1
62		BEARING	6204	1
63		BEARING	6204	1
64	HR-7021	GEAR		1
65	HR-7022	GEAR		1
66	HR-7023	GEAR		1
67		KEY	6x6x70L	1
68	HR-7035	SHAFT		1
69		BEARING	6204	1
70	HR-7042	COVER		1
71		BOLT	M6x16L	3
72		BOLT	M6x16L	3
73	HR-7042	COVER		1
74		BEARING	6204	1
75	HR-7036	SHAFT		1
76		KEY	6x6x20L	1
77	HR-7024	GEAR		1
78		SNAP RING		1

零件表
PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
79		BEARING	6205	1
80	HR-7054	WASHER		1
81	HR-7025	GEAR		1
82	HR-7053	GEAR BOD		1
83		BEARING	6205	1
84		SNAP RING		1
85	HR-7027	GEAR		1
86		BEARING	6002	1
87	HR-7014	CLUTEH		1
88		BEARING	6006	1
89		SNAP RING		1
90		SNAP RING		1
91		BEARING	6005	1
92	HR-7043	COVER		1
93		BOLT	M6x16L	3
94	HR-7037	SHAFT		1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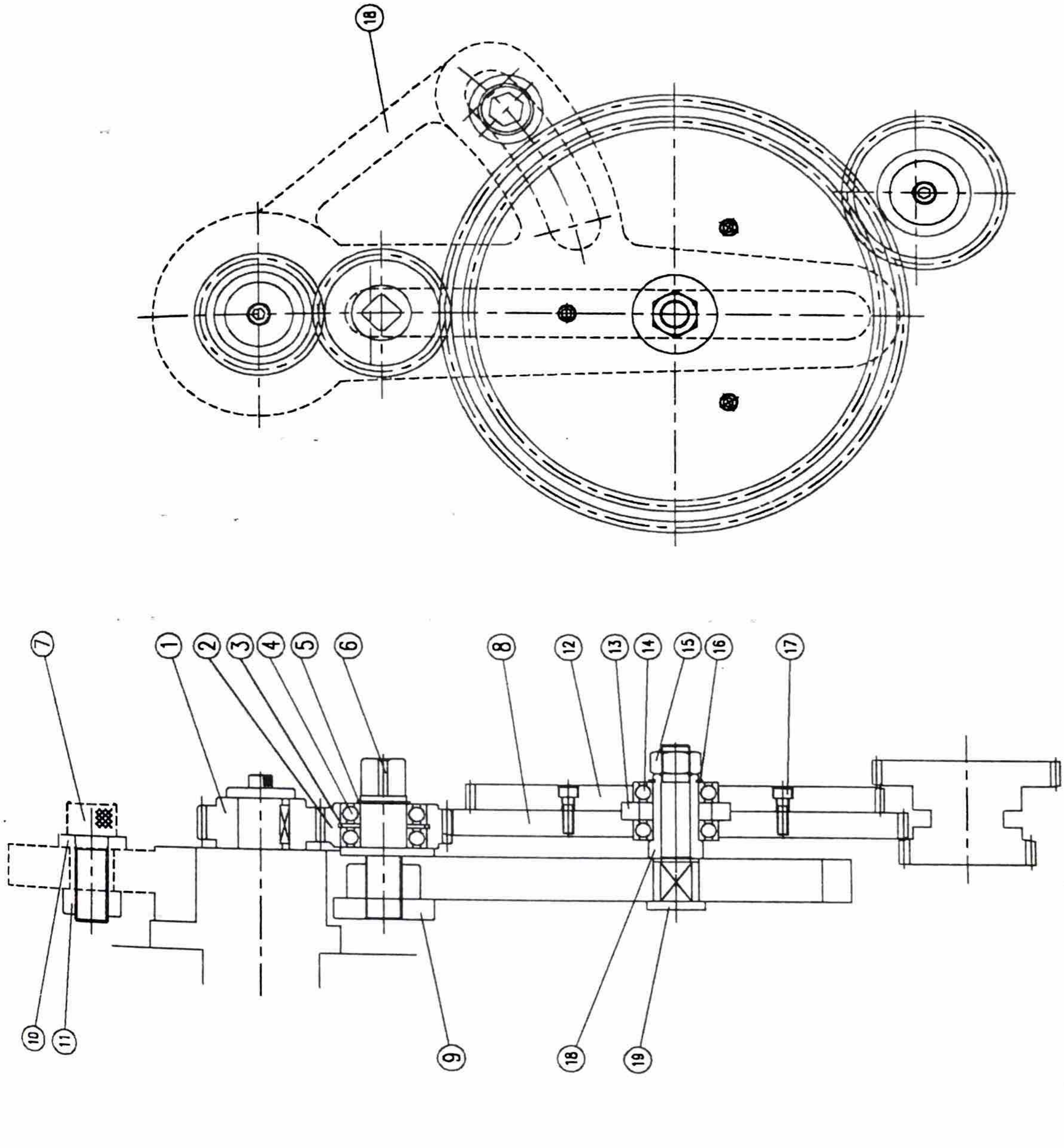
零件表 PARTS LIST				
REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01	HR-7045	REGULATOR		1
02	HR-7046	REGULATOR		1
03	HR-7076	SHAFT		1
04	HR-7029	SHAFT		1
05	HR-7047	REGULATOR		1
06	HR-7048	REGULATOR		1
07	HR-7049	REGULATOR		1
08		SNAP RING		1
09	HR-7038	SHAFT		1
10		O-RING	TC16267	1
11	HR-7044	COVER		1
12		O-RING		1
13	HR-7050	REGULATOR		1
14	HR-7053	GEAR BOD		1
15	HR-7052	SHAFT		1
16		BEARING	6200	1
17	HR-7026	GEAR		1
18	HR-7051	REGULATOR		1
19	HR-7039	SHAFT		1
20	HR-7061	GEAR SHAFT		1
21	HR-7059	SLIDE PLATE		1
22	HR-7057	SETTING PLATE		1
23	HR-7058	COVER		1
24		BOLT		1
25	HR-7055	RACK		1
26	HR-7064	SAFT		5

零 件 表
PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27	HR-7065	RACK		5
28	HR-7002	GEAR COVER		1
29	HR-7067	SHAFT		5
30		HUB		5
31	HR-7077	HANDLE		5
32	HR-7056	HANDLE		1
33	HR-7068	COVER		1
34		BOLT	M8x35L	3
35		CHANGE SPEED DISK		1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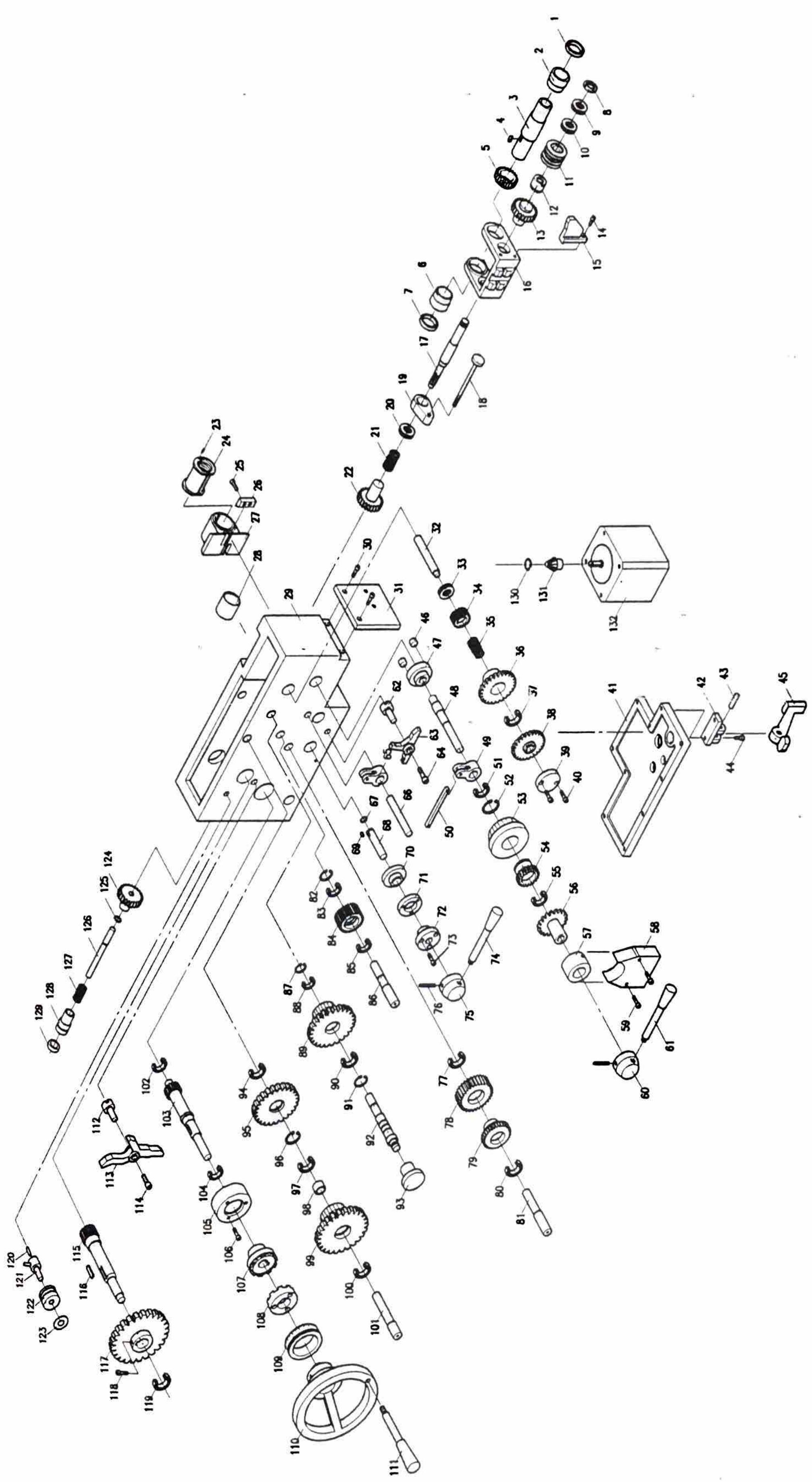
配換齒輪
CHANGE GEAR

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01	HR-7067	GEAR		1
02	HR-7070	GEAR		2
03		SNAP RING	RTW-47	2
04		BEARING	6005RS	4
05		SNAP RING	STW-25	2
06	HR-7068	BOLT		2
07		SCREW	M20x75L	1
08	HR-7067-1	GEAR		1
09	HR-7069	NUT		2
10		WASHER	M20	1
11	HR-7072	NUT		1
12	HR-7064	GEAR		1
13	HR-7073	COLLAR		1
14		BEARING	6005RS	2
15		NUT	M16	1
16		SNAP RING	STW-25	1
17		SCREW	M6xP1.0	3
18	HR-7066	SWING FRAME		1



零件表
PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01		OIL SEAL	40528	1
02	HR-5005	BUSHING		1
03	HR-5004	SHAFT		1
04		KEY	6x6x20L	1
05	HR-5006	GEAR		1
06	HR-5005	BUSHING		1
07		OIL SEAL	40528	1
08		NUT	AN03	1
09		BEARING	51103	1
10		BEARING	51103	1
11	HR-5009	WORM		1
12	HR-5008	BUSHING		1
13	HR-5007	GEAR		1
14		SCREW	M6x16L	2
15	HR-5037	RACK		1
16	HR-5003	BRACKET		1
17	HR-5032	SHAFT		1
18	HR-5049	SHAFT		1
19	HR-5048	BRACKET		1
20		BEARING	51103	1
21		SPRING		1
22	HR-5025	GEAR		1
23		PIN	∮3x8L	1
24	HR-5086	SLEEVE		1
25		SCREW	M6x20L	2
26	HR-5060	REGULATOR		1

零件表 PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27	HR-5067	BRACKET		1
28	HR-5066	SLEEVE		1
29	HR-5001	APRON BOX		1
30		SCREW	M6x16L	2
31	HR-5044	COVER		1
32	HR-5031	SHAFT		1
33		BEARING	51103	1
34	HR-5074	GEAR		1
35		SPRING		1
36	HR-5012	GEAR		1
37		BEARING	6003	1
38	HR-5076	GEAR		1
39	HR-5079	COVER		1
40		SCREW	M6x16L	2
41	HR-5002	COVER		1
42	HR-5065	BRACKET		1
43		SHAFT		1
44		SCREW	M6x16L	2
45	HR-5045	RACK		1
46		PIN		1
47	HR-5020	SHAFT		1
48	HR-5021	SHAFT		1
49	HR-5042	BRACKET		1
50	HR-5038	SHAFT		1
51		BEARING	6003	1
52		SNAP RING	S40	1

零件表
PARTS LIST

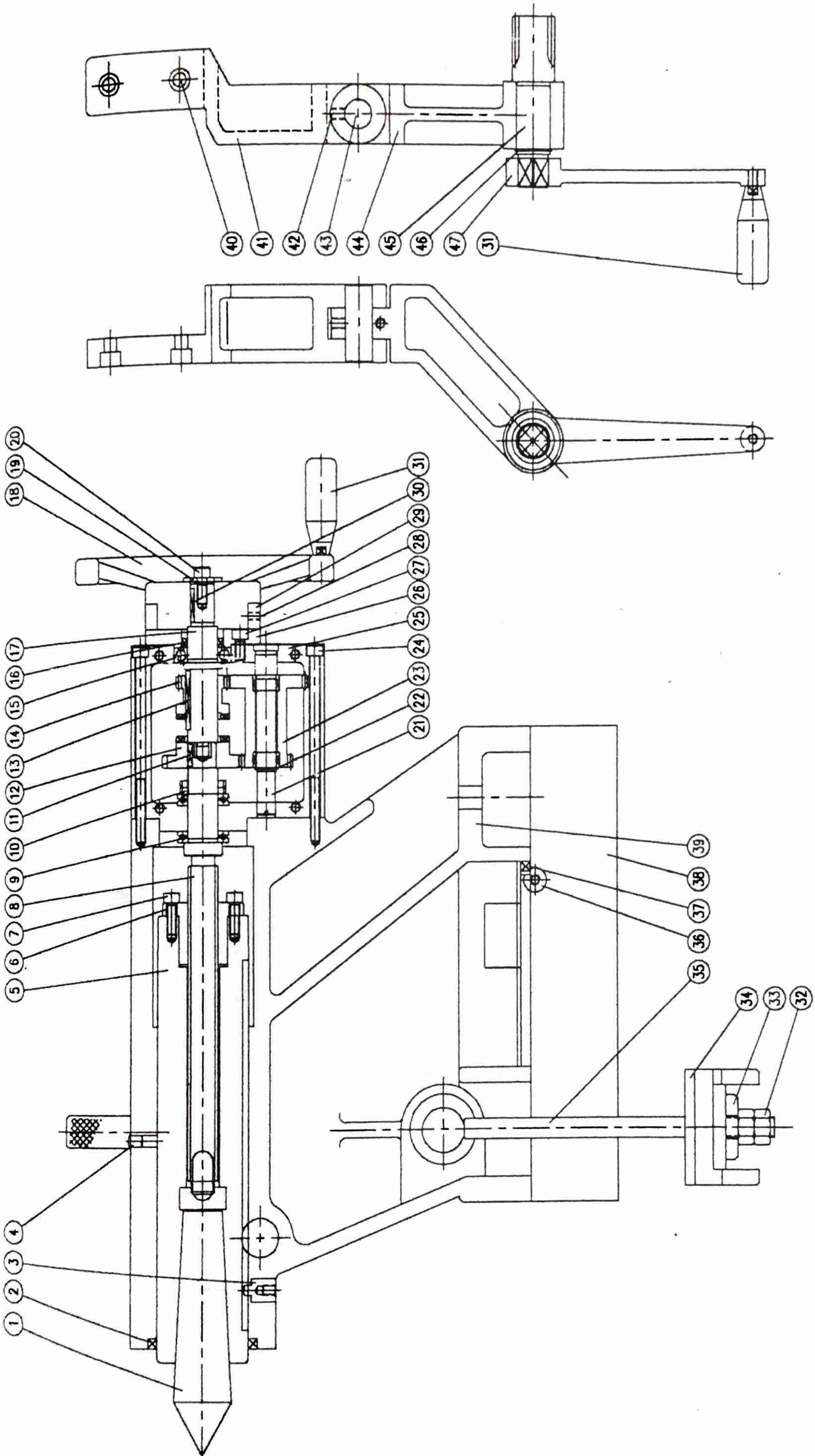
REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
53	HR-5024	GEAR		1
54	HR-5022	GEAR		1
55		BEARING	6003	1
56	HR-5046	GEAR		1
57	HR-5080	COVER		1
58	HR-5071	COVER		1
59		SCREW	M6x35L	2
60	HR-5075	HUB		1
61		HANDLE		1
62	HR-5053	SHAFT		1
63	HR-5050	BRACKET		1
64		SCREW	M12x35L	1
65	HR-5043	BRACKET		1
66	HR-5077	SHAFT		1
67		SNAP RANG	S16	1
68	HR-5041	SHAFT		1
69		KEY	5x5x10L	1
70	HR-5061	LEVER		1
71	HR-5062	LEVER		1
72	HR-5040	COVER		1
73		SSCREW	M6x16L	3
74		HANDLE		1
75	HR-5075	HUB		1
76		PIN		1
77		BEARING	6203	1
78	HR-5010	GEAR		1

零件表
PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
79	HR-5011	GEAR		1
80		BEARING	6203	1
81	HR-5035	SHAFT		1
82		SNAP RING	S17	1
83		BEARING	6003	1
84	HR-5013	GEAR		1
85		GEARING	6203	1
86	HR-5034	SHAFT		1
87		SNAP RING	S17	1
88		BEARING	6003	1
89	HR-5014	GEAR		1
90		BEARING	6003	1
91		SNAP RING	S20	1
92	HR-5036	SHAFT		1
93	HR-5047	HANDLE		1
94		BEARING	6003	1
95	HR-5016	GEAR		1
96		SNAP RING	R35	1
97		BEARING	6003	1
98	HR-5030	WASHER		1
99	HR-5015	GEAR		1
100		BEARING	6003	1
101	HR-5033	SHAFT		1
102		BEARING	6203	1
103	HR-5019	GEAR SHAFT		1
104		BEARING	6005	1

零件表
PARTS LIST

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
105	HR-5015	COVER		1
106		SCREW	M6x16L	3
107	HR-5028	CLUTCH		1
108	HR-5027	CLUTCH		1
109	HR-5052	INDEX RING		1
110	HR-5069	HAND WHEEL		1
111		HANDLE		1
112	HR-5053	SHAFT		1
113	HR-5054	BRACKET		1
114		SCREW	M12x30L	1
115	HR-5018	GEAR SHAFT		1
116		KEY	8x8x30L	1
117	HR-5017	GEAR		1
118		SCREW	M6x12L	1
119		BEARING	6203	1
120		PIN		1
121	HR-5059	SHAFT		1
122	HR-5072	HANDLE		1
123	HR-5039	COVER		1
124	HR-5025	GEAR		1
125		SNAP RING	S12	1
126	HR-5026	GEAR		1
127		SPRING		1
128	HR-5029	SHAFT		1
129		OIL SEAL	13246	1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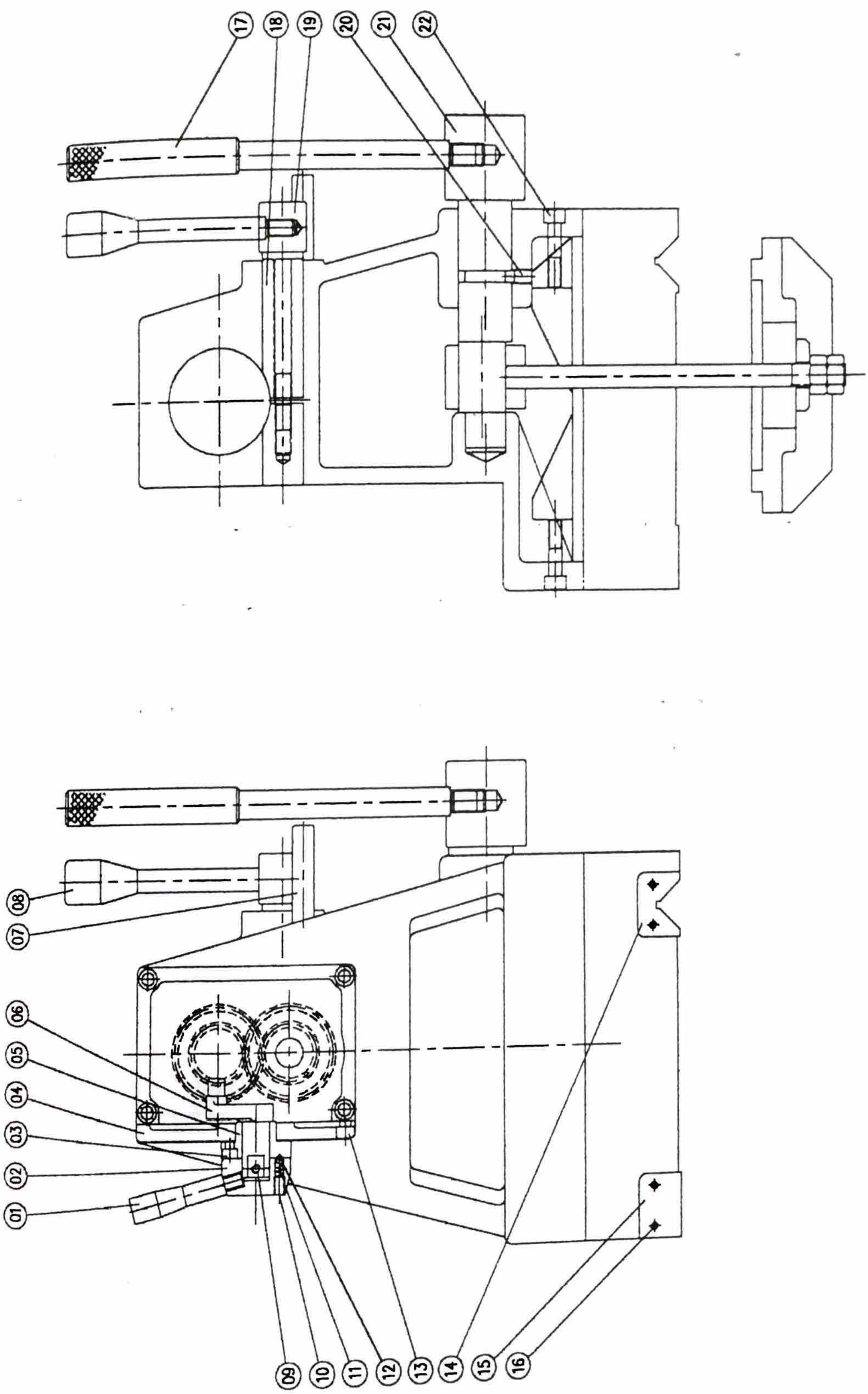
尾座
TAIL STOCK

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
01		CENTER	M.T.#5	1
02		OIL SEAL	SC 759008	1
03	HR-4020	T-KEY		1
04		OILER		1
05	HR-4006	BARREL		1
06	HR-4008	NUT		1
07		SCREW	M8x20L	4
08	HR-4007	LEAD SCREW		1
09		BEARING	51105	2
10		NUT	AN-05	2
11		KEY	4x4x16L	1
12	HR-4013	GEAR		1
13		KEY	4x4x45L	1
14	HR-4014	GEAR		1
15		BEARING	6005	1
16		OIL SEAL	TC 253507	1
17	HR-4012	SHAFT		1
18	HL-7013	HANDLEWHEEL		1
19	HR-4032	WASHER		1
20		SCREW	M8x25L	1
21	HR-4015	SHAFT		1
22		SNAP RING	STW-16	1
23	HR-4016	GEAR		1
24		SCREW	M8x140L	4
25	HR-4004	GEAR BOX		1
26	HR-4009	BRACKET		1

尾座
TAIL STOCK

REF NO.	件號 PART NO.	零件名稱 DESCRIPTION	規格 PARTS NAME	數量 Q'TY
27		SCREW	M8x16L	2
28		SET SCREW	M6x10L	1
29	HR-4010	INDEX RING		1
30		KEY	6x6x25L	1
31		HANDLE	3/8"	1
32		NUT	5/8"	2
33		WASHER		1
34	HR-4028	CLAMP		1
35	HR-4027	BOLT		1
36		ADJUSTMENT SCREW	M8	2
37	HR-4003	GIB		1
38	HR-4002	BASE		1
39	HR-4001	CASTING		1
40		SCREW	M10x25L	2
41	HR-4035	BRACKET		1
42		SET SCREW	M8x10L	1
43	HR-4038	PIN		1
44	HR-4036	BRACKET		1
45	HR-4037	GEAR		1
46		SNAP RING	STW-28	1
47	HR-4039	LEVER		1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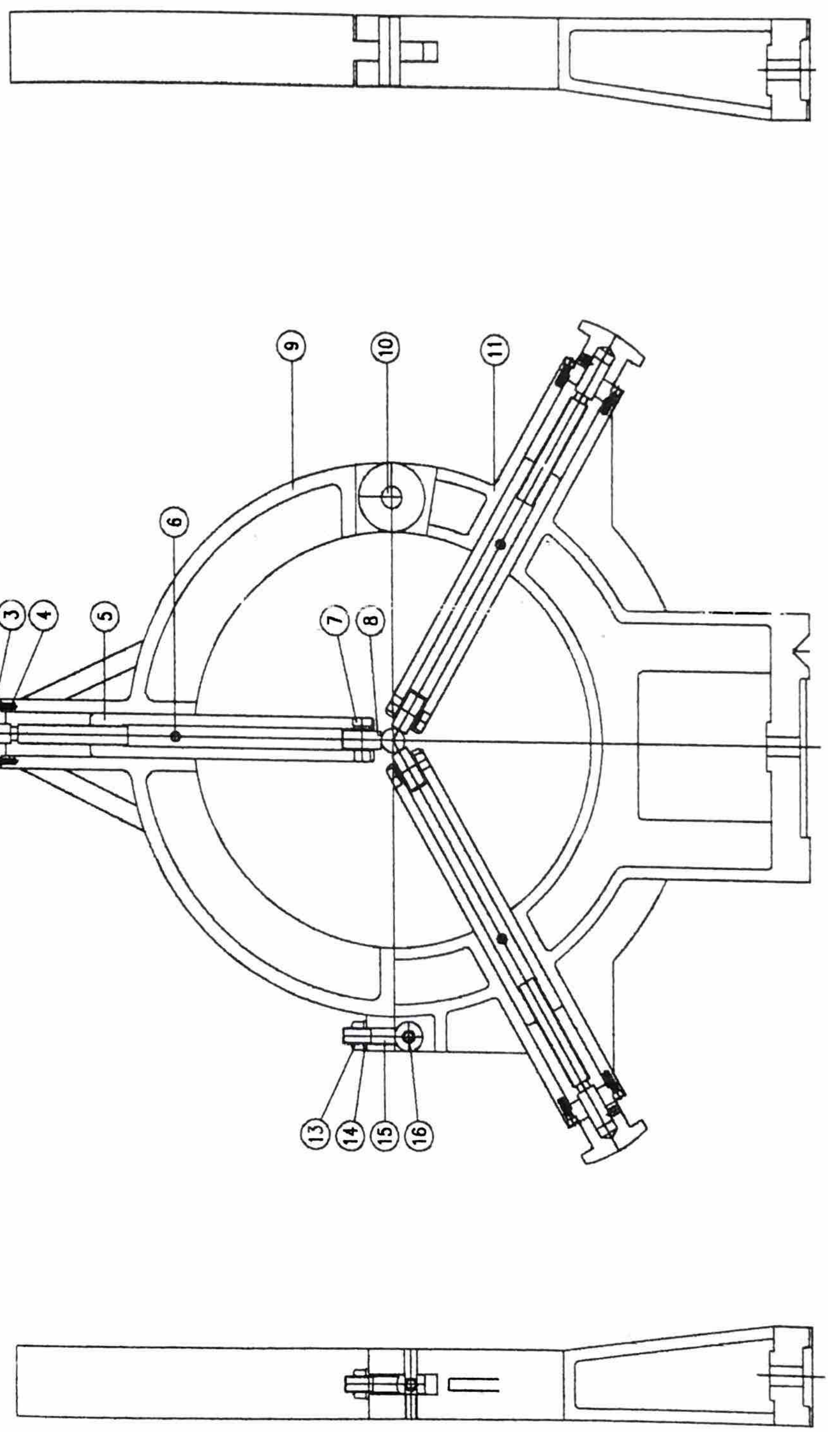
尾 座
TAILSTOCK ; CONTROLS

REF NO.	件 號 PART NO.	零 件 名 稱 DESCRIPTION	規 格 PARTS NAME	數 量 Q'TY
01	HR-7047-1	HANDLE		1
02	HR-4017	LEVER BOSS		1
03		SCREW	M6x16L	2
04	HR-4005	COVER		1
05	HR-4018	BUSH		1
06	HR-4019	LEVER		1
07	HR-4030	PIN		2
08	HR-4024	HANDLE		1
09		SPRING PIN	ϕ 5x50L	1
10		SET SCREW	M8x10L	1
11		SPRING	1/4"x3/4"L	1
12		STEEL BALL	1/4"	1
13		SCREW	M8x16L	4
14	HR-4034	WIPER		1
15	HR-4033	WIPER		1
16		SCREW	M5x12L	8
17	HR-4025	HANDLE		1
18	HR-4022	BUSH & NUT		1
19	HR-4023	STUD		1
20	HR-4031	SCREW		1
21	HR-4026	SHAFT		1
22		SCREW	M10x45L	2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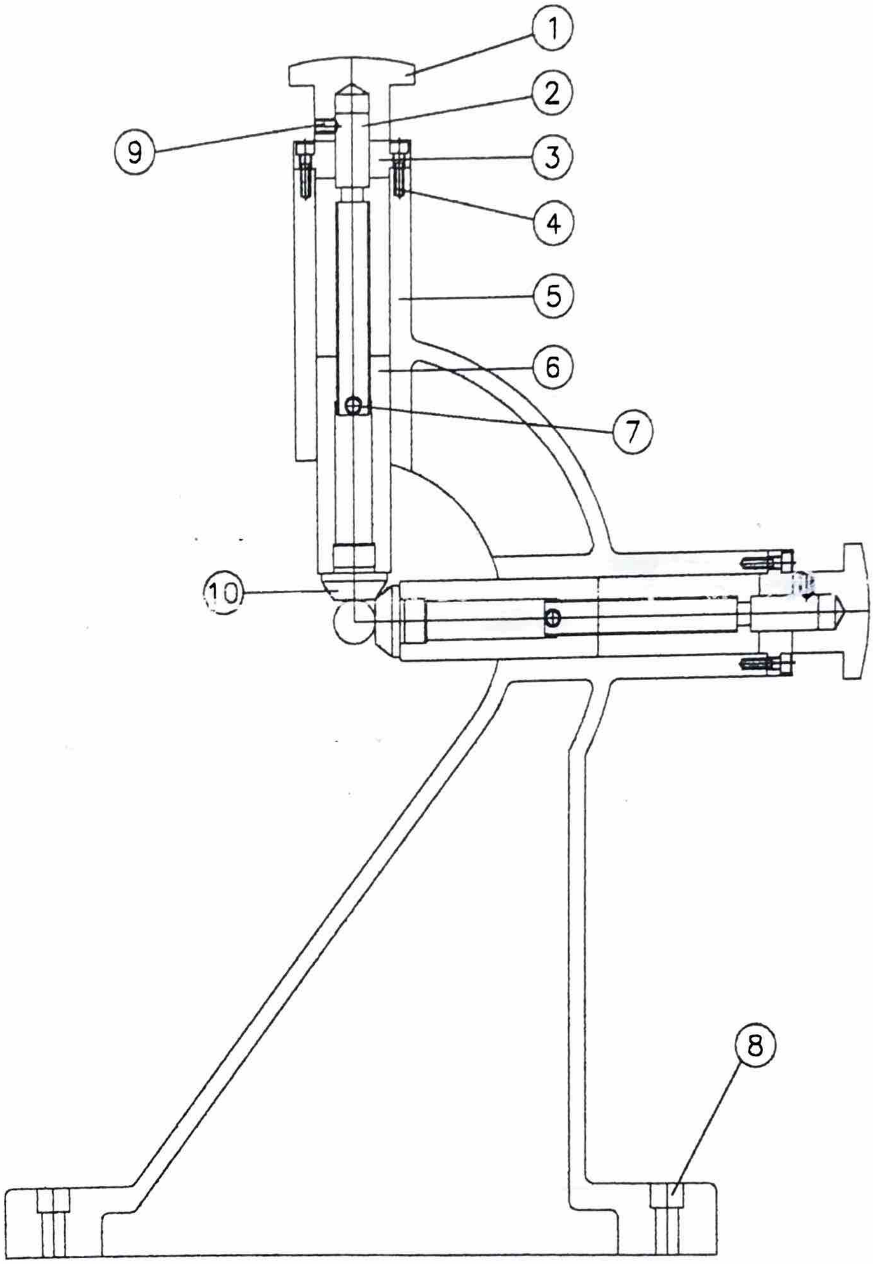
中心架
STEADY REST

REF NO.	件號 PART NO.	零件名稱 TYPE-RATING	規格 PARTS NAME	數量 Q'TY
01	HR-8006	HANDLE		3
02	HR-8004	ADJUSTMENT SCREW		3
03	HR-8005	COVER		3
04		SCREW	M6x16L	9
05	HR-8003-1A	SHAFT		3
06	HR-8008	SCREW	M10x15L	3
07	HR-8010	PIN		3
08		BEARING	5203ZZ	3
09	HR-8002-1B	CASTING		1
10	HR-8011	PIN		1
11	HR-8001-1A	CASTING		1
12		SET SCREW	M8x12L	3
13		NUT	M16	1
14		WASHER	M16	1
15	HR-8009	BOLT		1
16		SCREW	M12x70L	1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FOLLOW REST

REF NO.	件號 PART NO.	零件名稱 TYPE-RATING	規格 PARTS NAME	數量 Q'TY
01	HR-8006	HANDLE		2
02	HR-8004	ADJUSTMENT SCREW		2
03	HR-8005	COVER		2
04		SCREW	M6x16L	6
05	HR-8101-A	BODY OF FOLLOW REST		1
06	HR-8003-2C	SHAFT		2
07	HR-8008	SCREW		2
08		SCREW	M12x45L	2
09		SET SCREW	M8x12L	2
10	HR-8007	PAD		2