



Operation Manual
&
Parts List
For
ML45 C
Versions

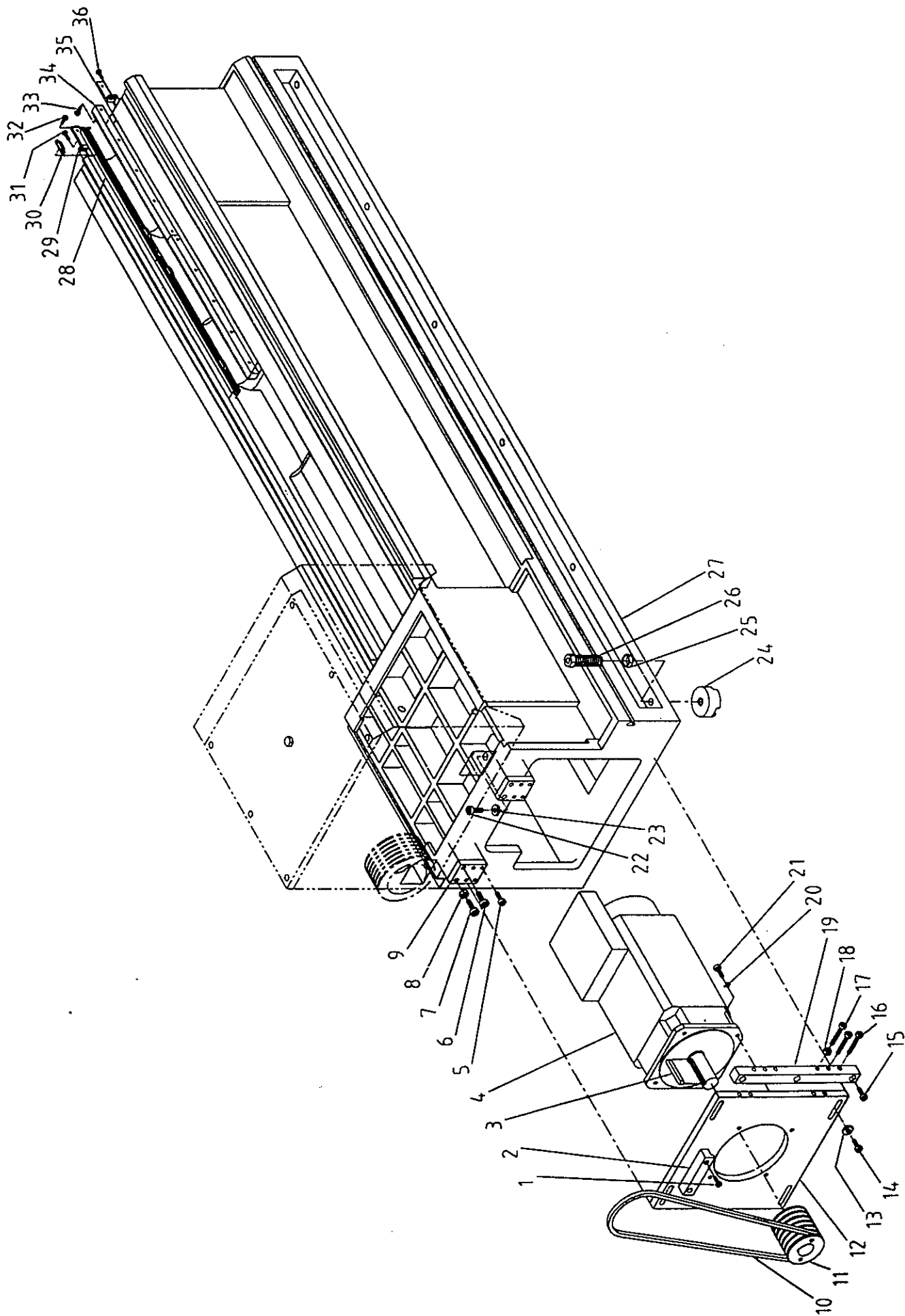
Milltronics Manufacturing Company
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www.milltronics.net

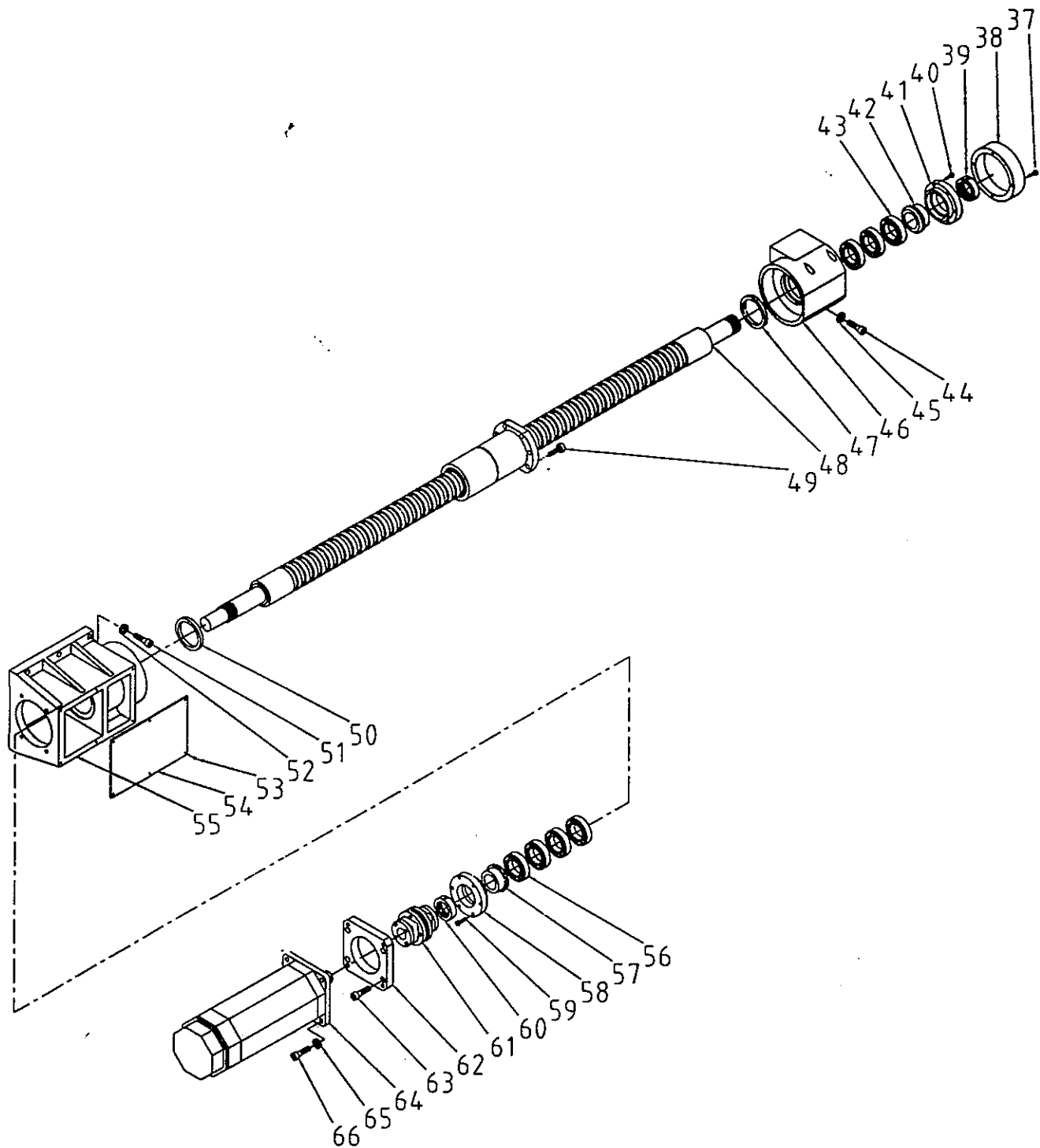
Item	No Part No.	Description	Remark
1		HEX. SOC. HD. SCREW	
2	1008	STOP PLATE	
3		KEY	
4		MOTOR	
5		HEX. SOC. HD. SCREW	
6		HEX. SOC. HD. SCREW	
7		HEX. SOC. HD. SCREW	
8		NUT	
9	1013	LOCK PLATE	
10		BELT	
11	1008-8	V-PULLEY	PY-225
12	1004-1	MOTOR BASE	
13		WASHER	
14		HEX. SOC. HD. SCREW	
15		HEX. SOC. HD. SCREW	
16		HEX. SOC. HD. SCREW	
17		HEX. SOC. HD. SCREW	
18		NUT	
19	1003-1	LOCK PLATE	
20		SPRING WASHER	
21		HEX. SOC. HD. SCREW	
22		HEX. SOC. HD. SCREW	
23	1022	WASHER	
24	1027	BRACKET	
25	1026-1	NUT	
26	1026	FOUNDATION BOLT	
27	1001	BED	
28		BLOCKS' SEAT	
29		BRACKET	
30		Limit Switch	SW-259 & WX-306
31		HEX. SOC. HD. SCREW	
32		HEX. SOC. HD. SCREW	
33		HEX. SOC. HD. SCREW	
34	4019	RACK GEAR	
35		BRACKET	
36		HEX. SOC. HD. SCREW	
37		HEX. SOC. HD. SCREW	
38	1010	COVER	
39		LOCKING NUT	
40		HEX. SOC. HD. SCREW	

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Item	No Part No.	Description	Remark
1		PLUG	
2	2002	TOP COVER	
3		HEX. SOC. HD. SCREW	
4		PLUG	
5		OIL GLASS	
6		OIL GUAGE	
7	2001	HOUSING	
8		PLUG	
9		LOCK NUT	
10		LOCK WASHER	
11	2009	WASHER	
12		V-PULLEY	
13		SPACER	
14		SNAP RING	
15		OIL SEAL	
16		HEX. SOC. HD. SCREW	
17	2009-A	COVER	
18		O RING	
19		BWW 6210	
20		BALL BEARING	
21		KEY	
22	2003-A-1	SHAFT A	
23		KEY	
24	2015	SPUR GEAR	
25	2016	SPUR GEAR	
26		SNAP RING	
27		BALL BEARING	
28	2007	PUMP BASE	
29		OIL PUMP	
30		HEX. SOC. HD. SCREW	
31		HEX. SOC. HD. SCREW	
32	2018	STOP PLATE	
33	2017-B	COVER	
34		O RING	
35		BWW	
36		BALL BEAGING	
37	2019-B	SHAFT	
38		KEY	
39		KEY	
40		SNAP RING	

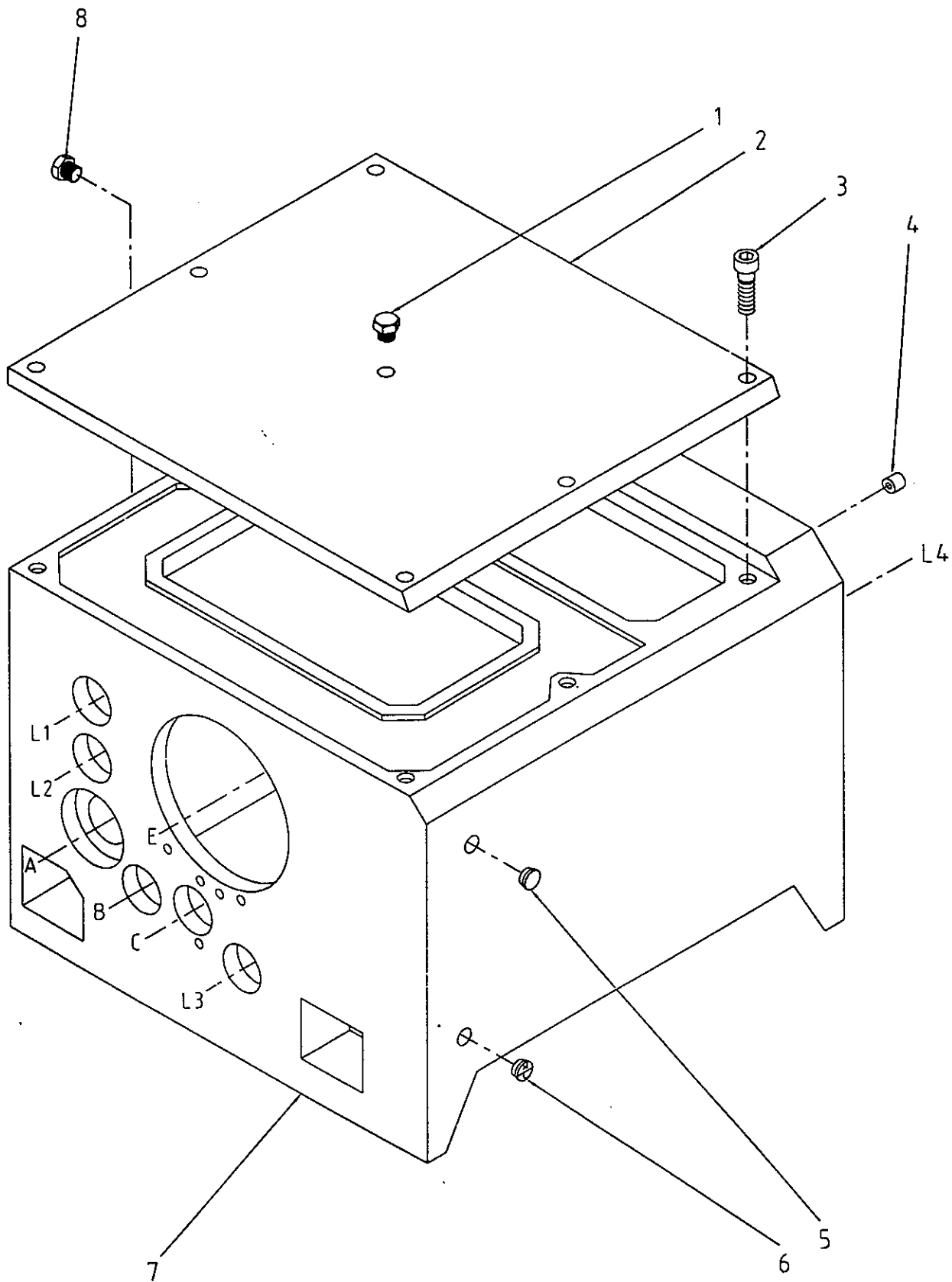
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41	2020-B	SPUR GEAR	
42	2021-B	SPUR GEAR	
43	2319	SPUR GEAR	
44		SNAP RING	
45		BALL BEARING	
46		PLUG	
47	2044-A	SHAFT	
48		SNAP RING	
49	7051	WASHER	
50		HEX. SOC. HD. SCREW	
51	2067-A	FORK	
52	2083-A	CYLINDER	
53		LOCK WASHER	
54		LOCK NUT	
55	2082	CYLINDER	
56		LOCK NUT	
57		LOCK WASHER	
58	2045-B	FORK	
59		HEX. SOC. HD. SCREW	
60		HEX. SOC. HD. SCREW	
61	2047	STOP PLATE	
62	2081	COVER	
63		O RING	
64	2044	SHAFT	
65		HEX. SOC. HD. SCREW	
66	2018	STOP PLATE	
67	2017-B	COVER	
68		O RING	
69		BWW 6209	
70	BG-20	BALL BEARING	
71	2011-B	SPLINE SHAFT	
72	2024-A	SPUR GEAR	
73		SNAP RING	
74	2023-B	SPUR GEAR	
75		KEY	
76	2022-C	BUSHING	
77		SNAP RING	
78	2084	SPUR GEAR	
79	2085	SPACER	
80		BALL BEARING	

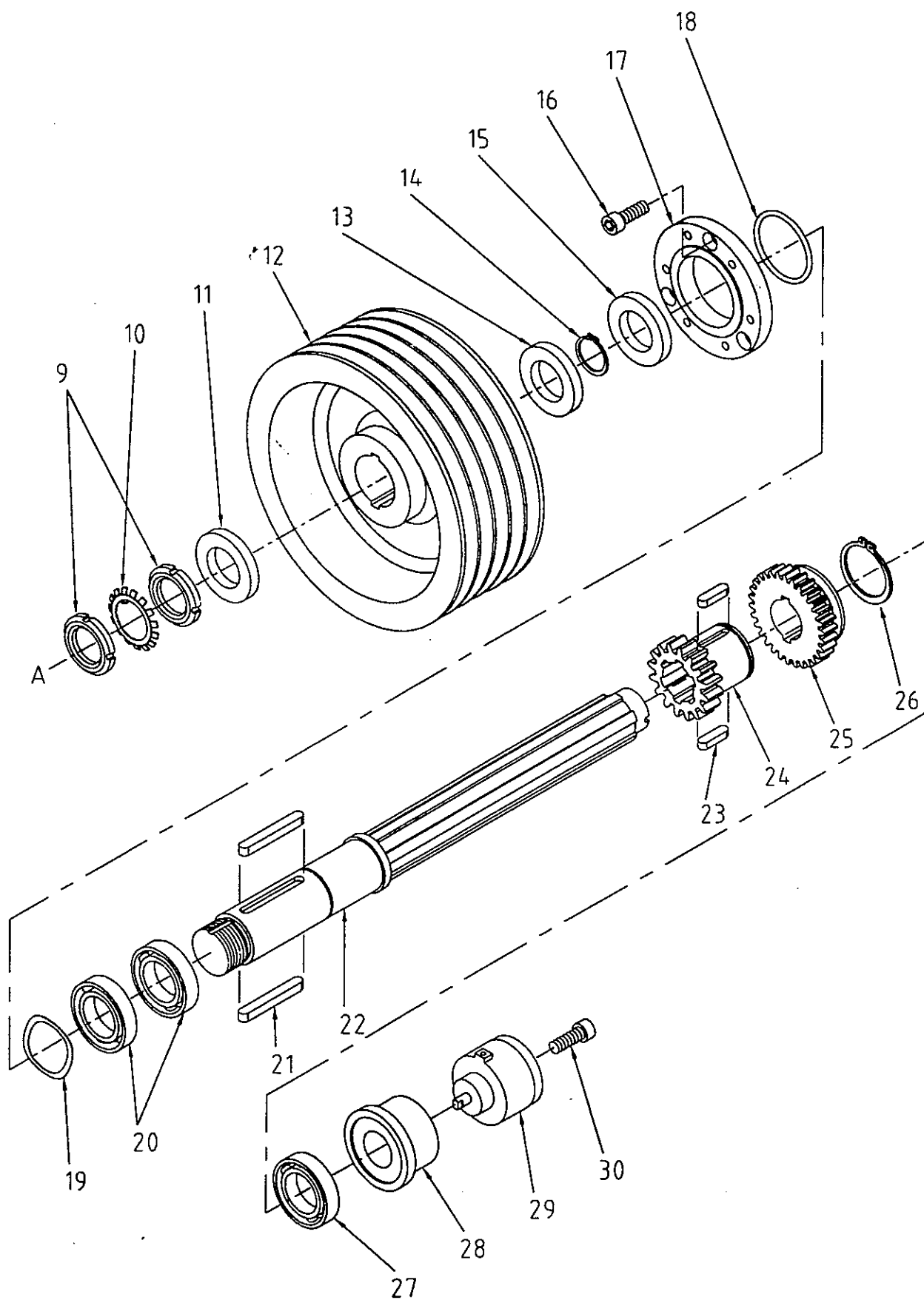
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81	2022-B	SPUR GEAR	
82		HEX. SOC. HD. SCREW	
83		NUT	
84		HEX. SOC. HD. SCREW	
85	2031	REAR COVER	6" SPINDLE BORE
86	BG-160	BALL BEARING	
87	2030	SPACER	
88	2028-A	SPUR GEAR	6" SPINDLE BORE
89	2027	LOCK NUT	6" SPINDLE BORE
90		BRASS	
91		SET SCREW	
92	BG-161	TAPER ROLLER BEARING	
93	BG-161	TAPER ROLLER BEARING	
94	2026-A	FRONT COVER	6" SPINDLE BORE
95		HEX. SOC. HD. SCREW	
96	2025-D	SPINDLE	6" SPINDLE BORE
97		KEY	
98		HEX. SOC. HD. SCREW	
99	2908	REAR COVER	9", 10" SPINDLE BORE
99	2308-2	REAR COVER	12" SPINDLE BORE
99	214008	REAR COVER	14" SPINDLE BORE
99	216009-A	REAR COVER	16" SPINDLE BORE
99	221009	REAR COVER	21" SPINDLE BORE
99	224009	REAR COVER	24" SPINDLE BORE
100	2907	LOCK NUT	9", 10" SPINDLE BORE
100	212007	LOCK NUT	12" SPINDLE BORE
100	214007	LOCK NUT	14" SPINDLE BORE
100	216007	LOCK NUT	16" SPINDLE BORE
100	221007	LOCK NUT	21" SPINDLE BORE
100	224007	LOCK NUT	24" SPINDLE BORE
101		BRASS	
102		SET SCREW	
103		TAPER ROLLER BEARING	
104	2906	LOCK NUT	9", 10" SPINDLE BORE
104	212006	LOCK NUT	12" SPINDLE BORE
104	214006	LOCK NUT	14" SPINDLE BORE
104	216006	LOCK NUT	16" SPINDLE BORE
104	221006	LOCK NUT	21" SPINDLE BORE
104	224006	LOCK NUT	24" SPINDLE BORE
105		BRASS	

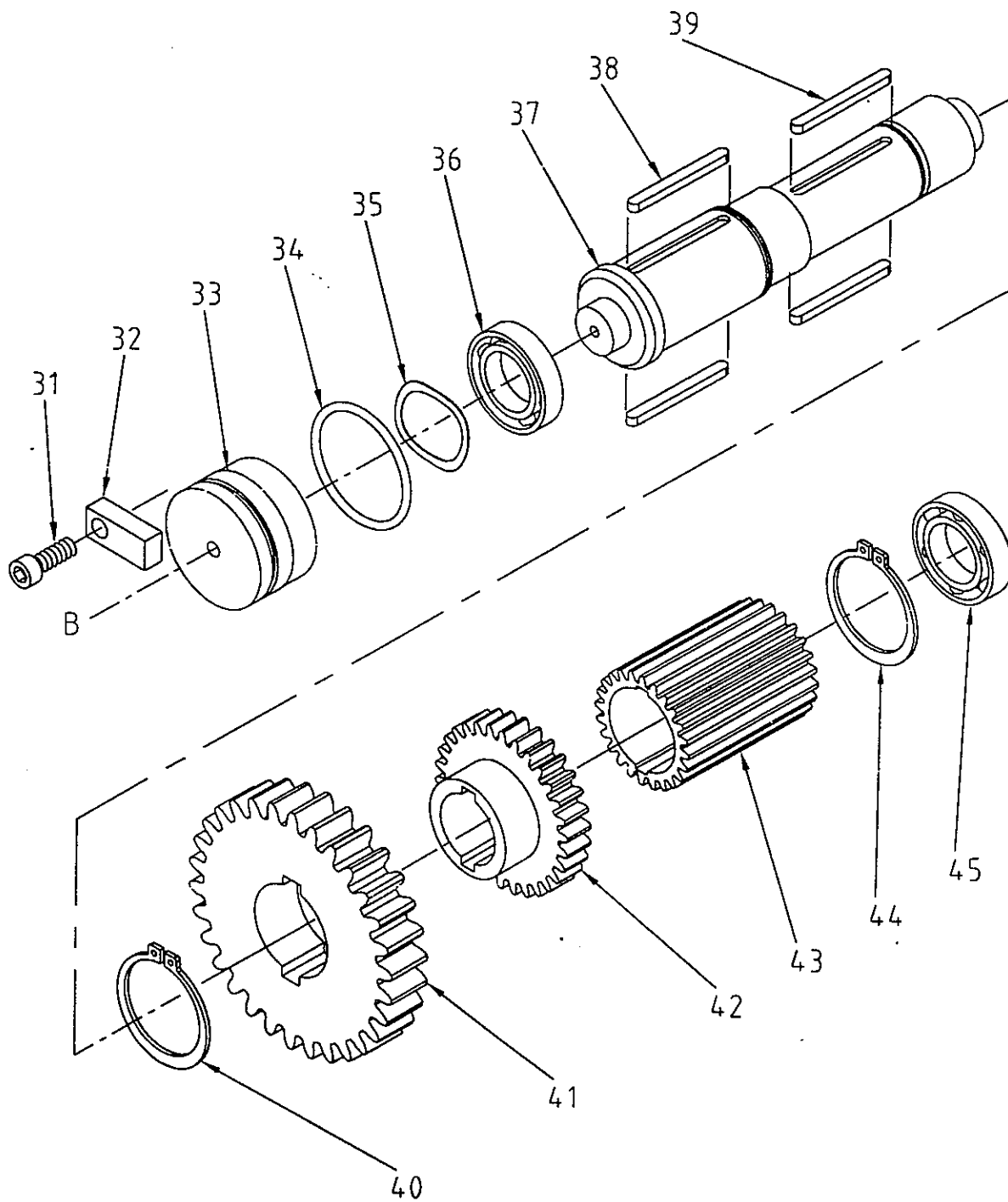
HEADSTOCK ASSY.

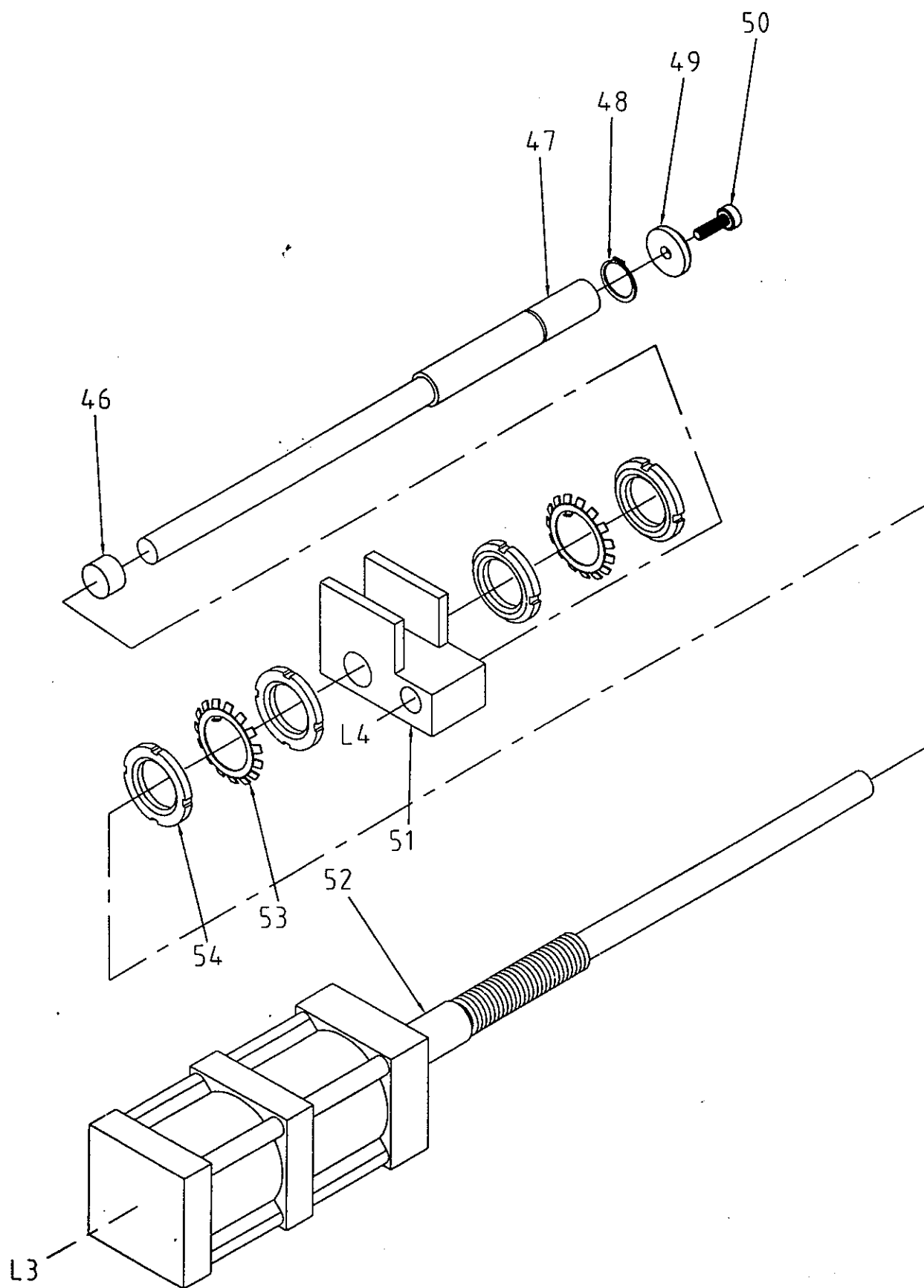
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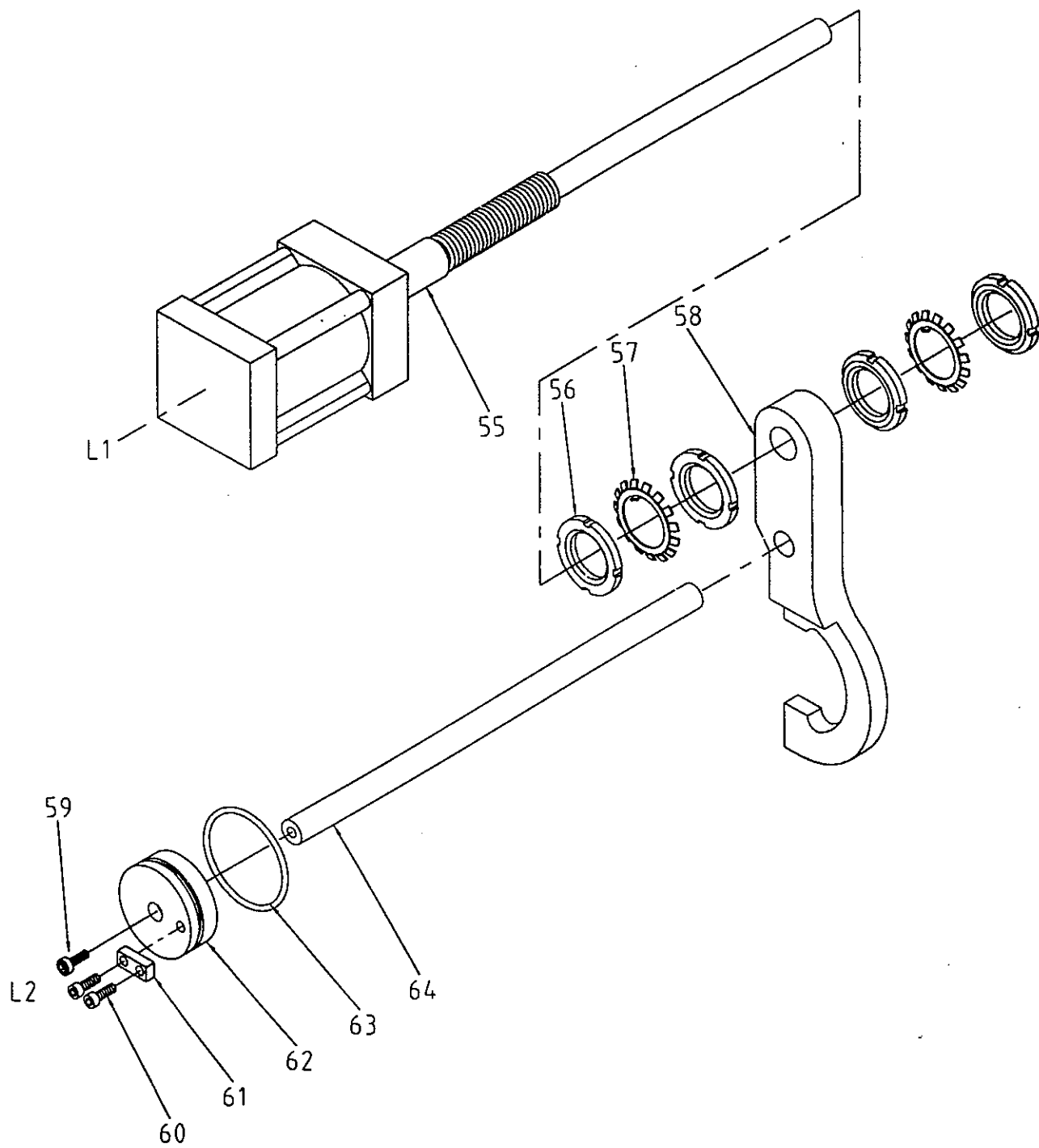
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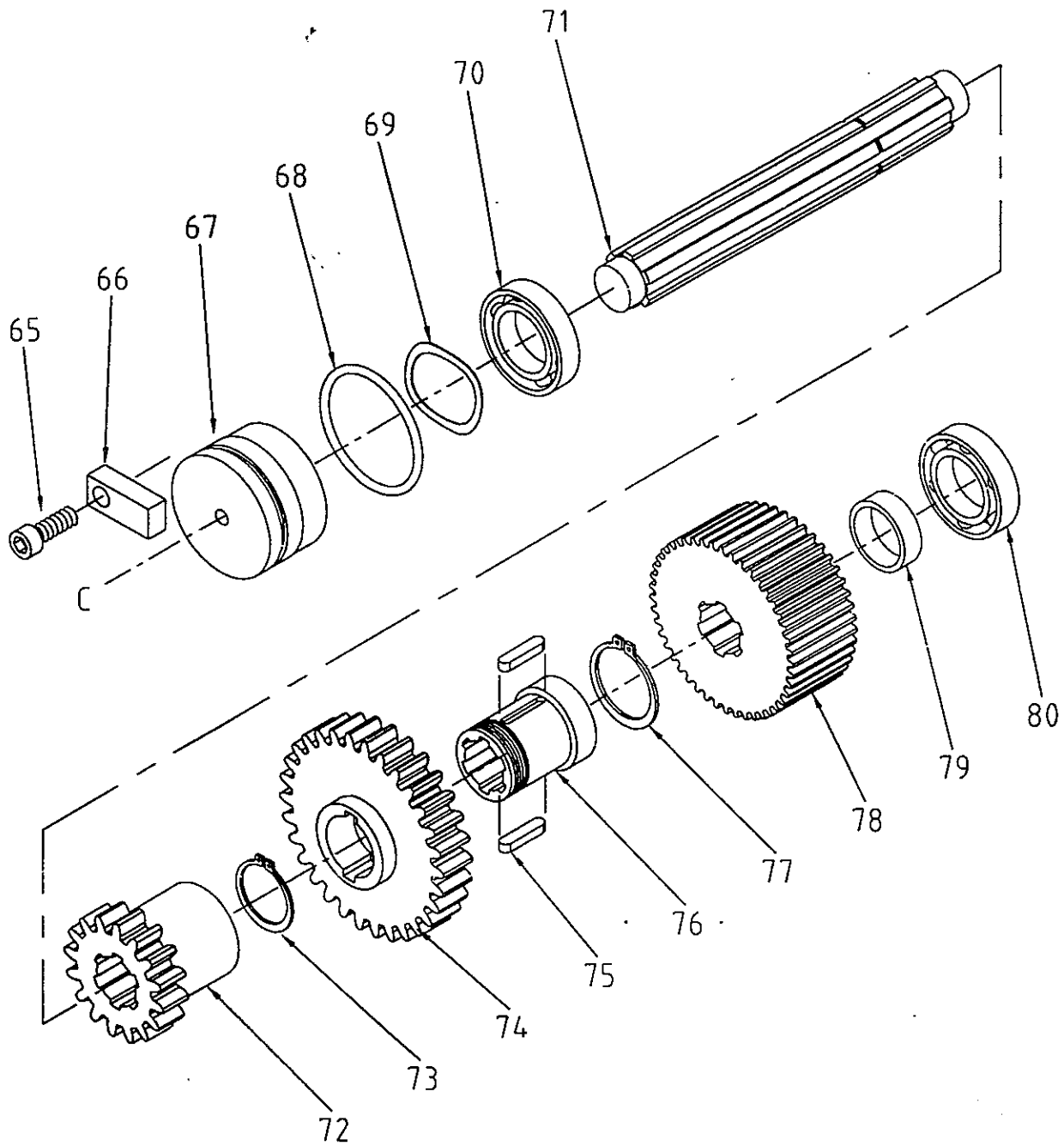


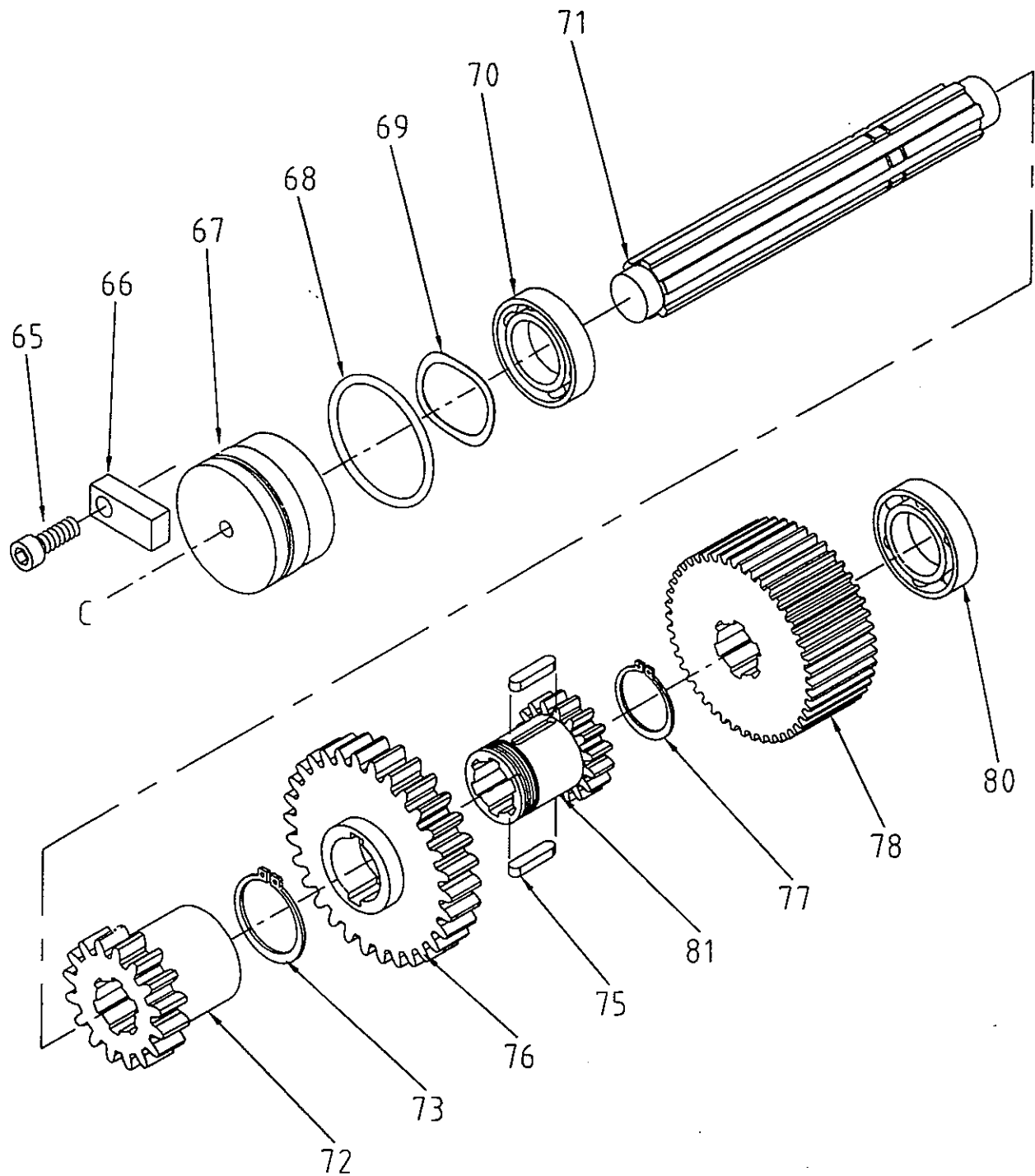


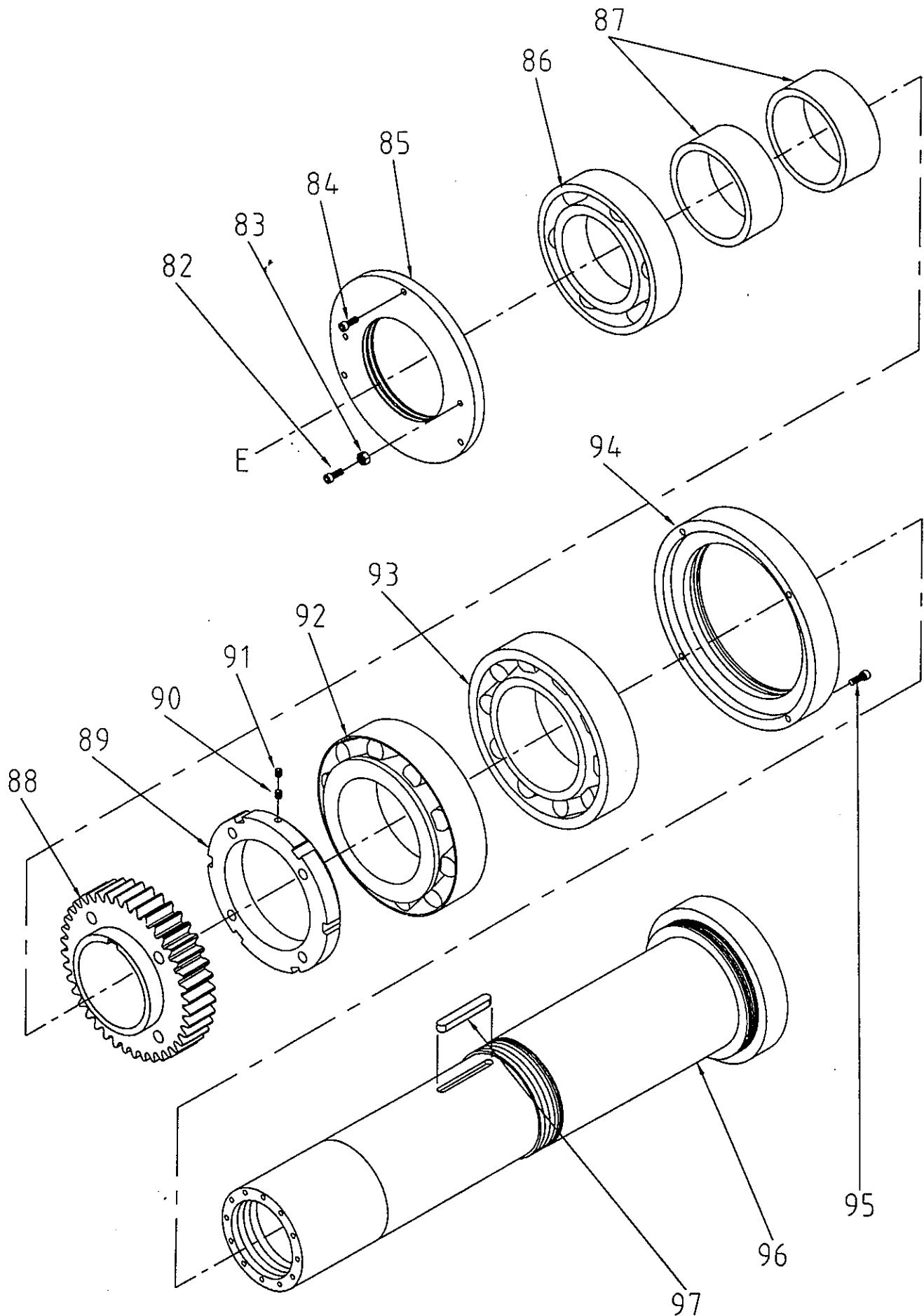


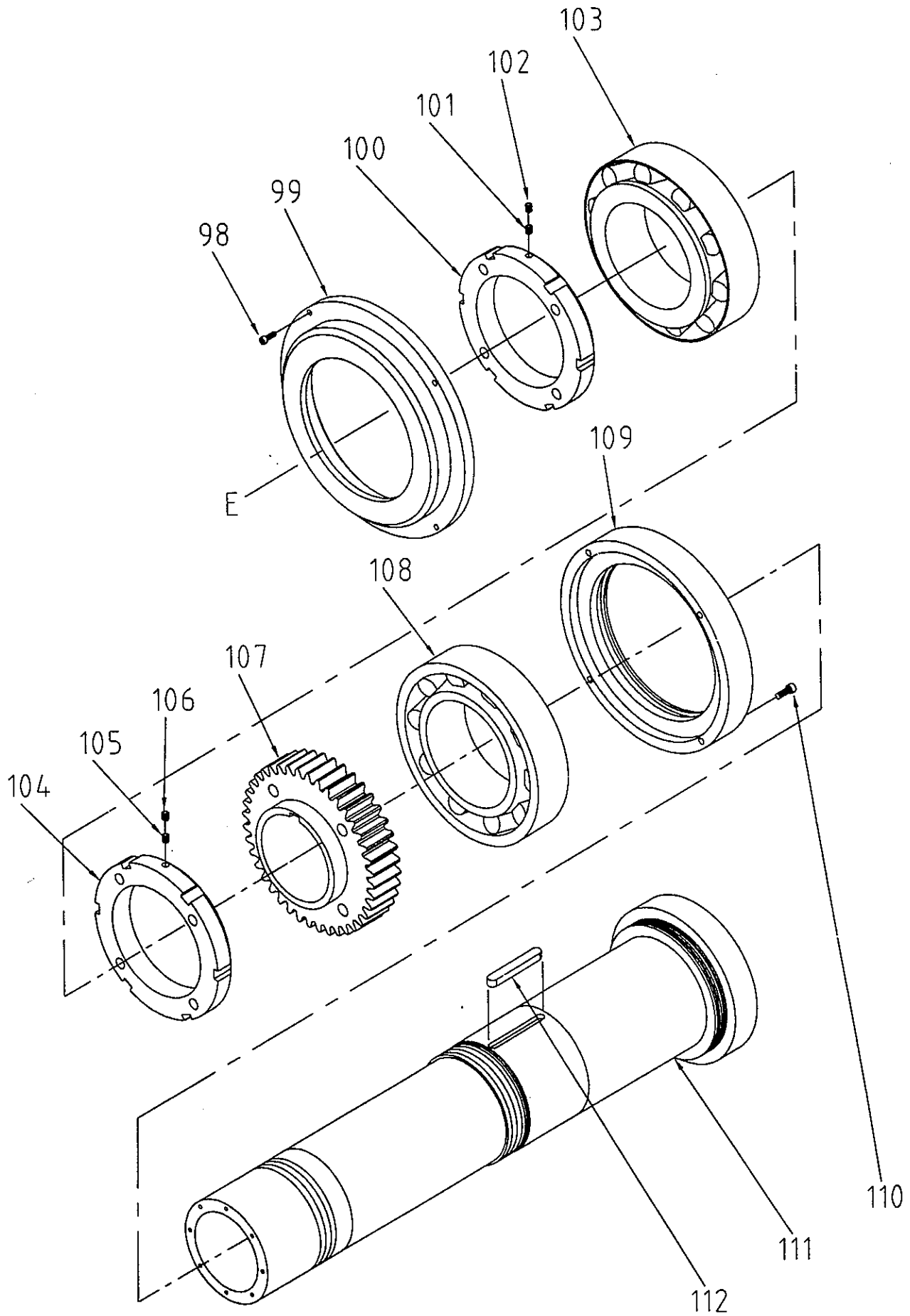


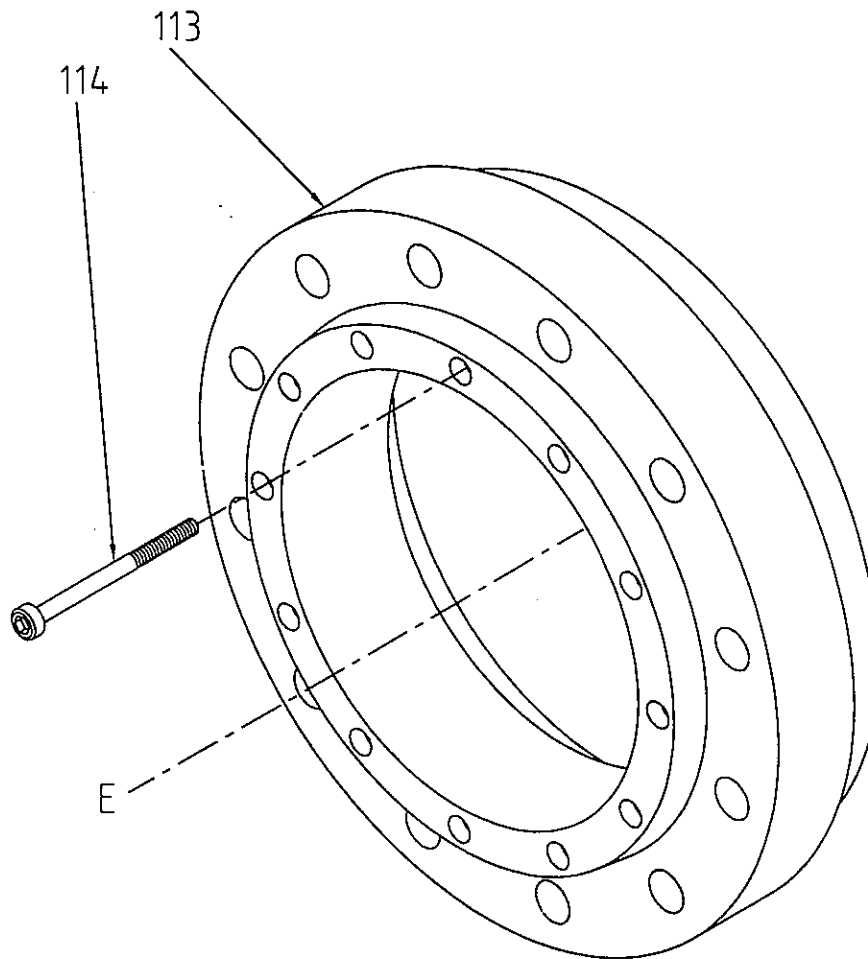




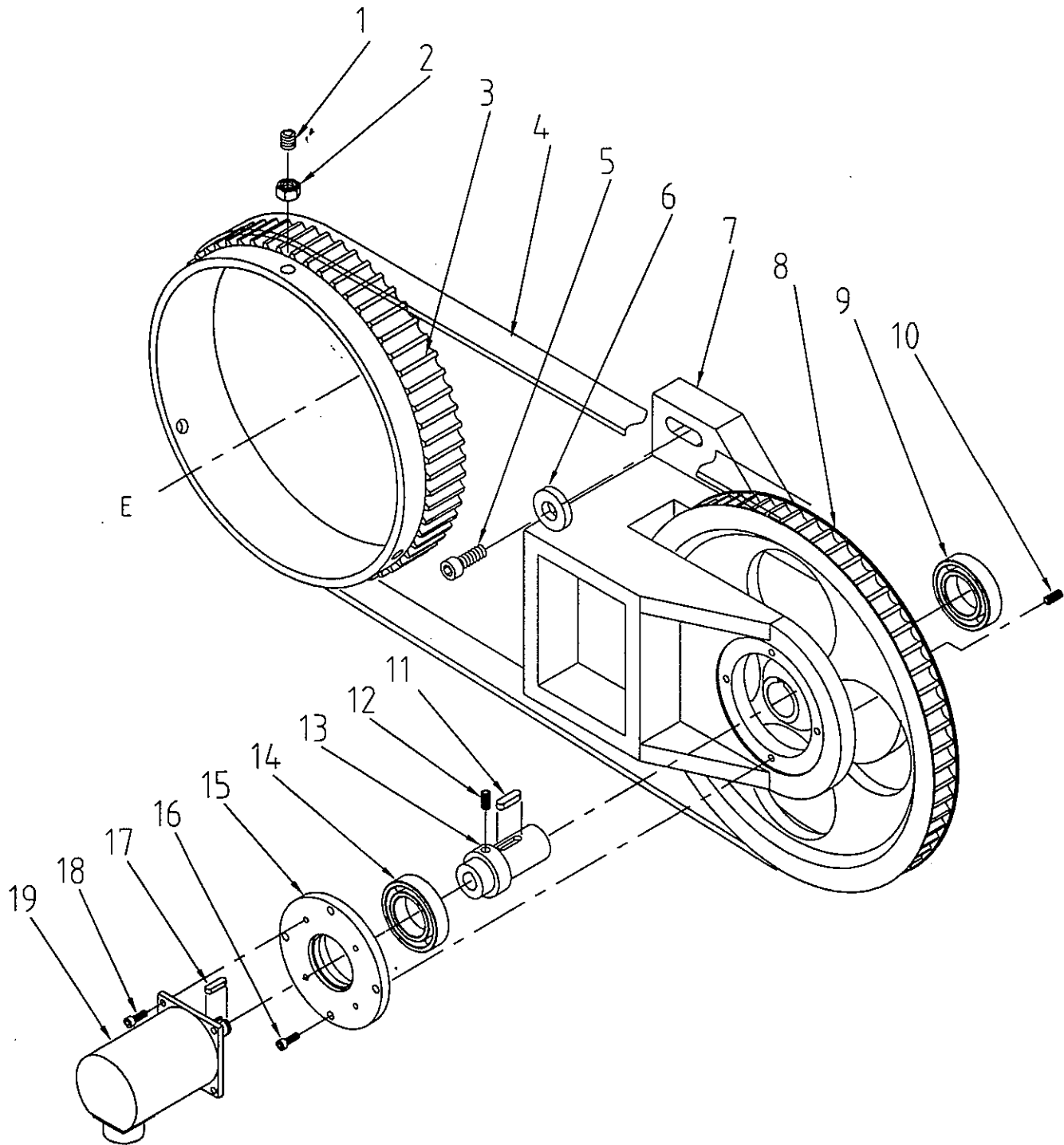


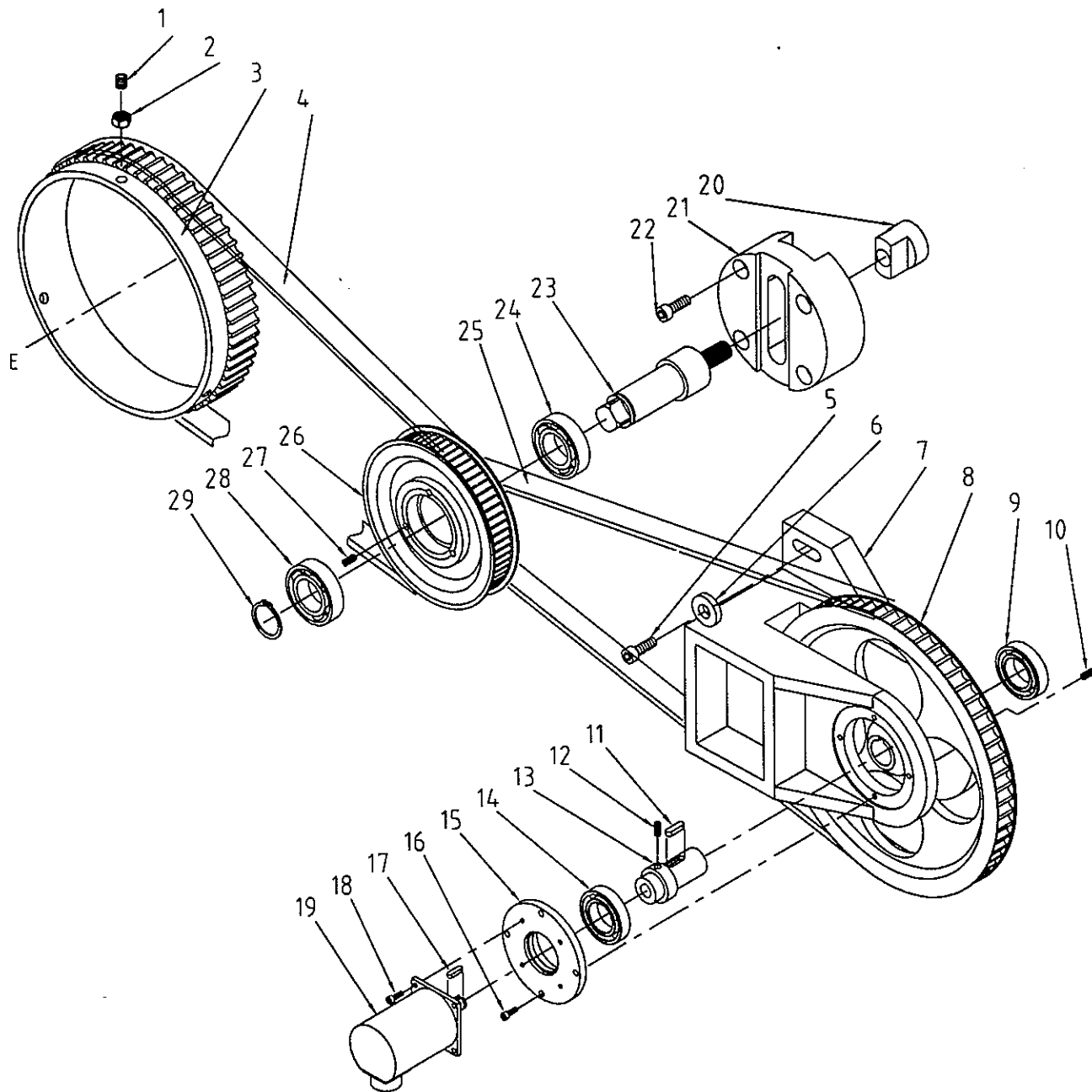






Item	No Part No.	Description	Remark
1		SET SCREW	
2		NUT	
3	206005-CO	PULLEY	6" SPINDLE BORE
3	209005-CO	PULLEY	9", 10" SPINDLE BORE
3	212005-CO	PULLEY	12" SPINDLE BORE
3	214005-CO	PULLEY	14" SPINDLE BORE
3	216005-CO	PULLEY	16" SPINDLE BORE
3	221005-CO	PULLEY	21" SPINDLE BORE
3	224005-CO	PULLEY	24" SPINDLE BORE
4		TIMING BELT	
5		HEX. SOC. HD. SCREW	
6		WASHER	
7	2001-CO	BRACKET	
8	2003-CO	PULLEY	9", 10", 14", 16", 21", 24" SPINDLE BORE
8	2003A-CO	PULLEY	6", 12" SPINDLE BORE
9		BALL BEARING	
10		SET SCREW	
11		KEY	
12		SET SCREW	
13	2002-CO	SHAFT	
14		BALL BEARING	
15	2004-CO	BUSHING	
16		HEX. SOC. HD. SCREW	
17		KEY	
18		HEX. SOC. HD. SCREW	
19		ENCODER	
20	1020	NUT	
21	2008-CO	FIXER	
22		HEX. SOC. HD. SCREW	
23	2006-CO	SHAFT	
24		BALL BEARING	
25	PY-138	TIMING BELT	
26	2007-CO	PULLEY	12", 21" SPINDLE BORE
26	214007-CO	PULLEY	14" SPINDLE BORE
26	216007-CO	PULLEY	16" SPINDLE BORE
26	224007-CO	PULLEY	24" SPINDLE BORE
27		SET SCREW	
28		BALL BEARING	
29		SNAP RING	





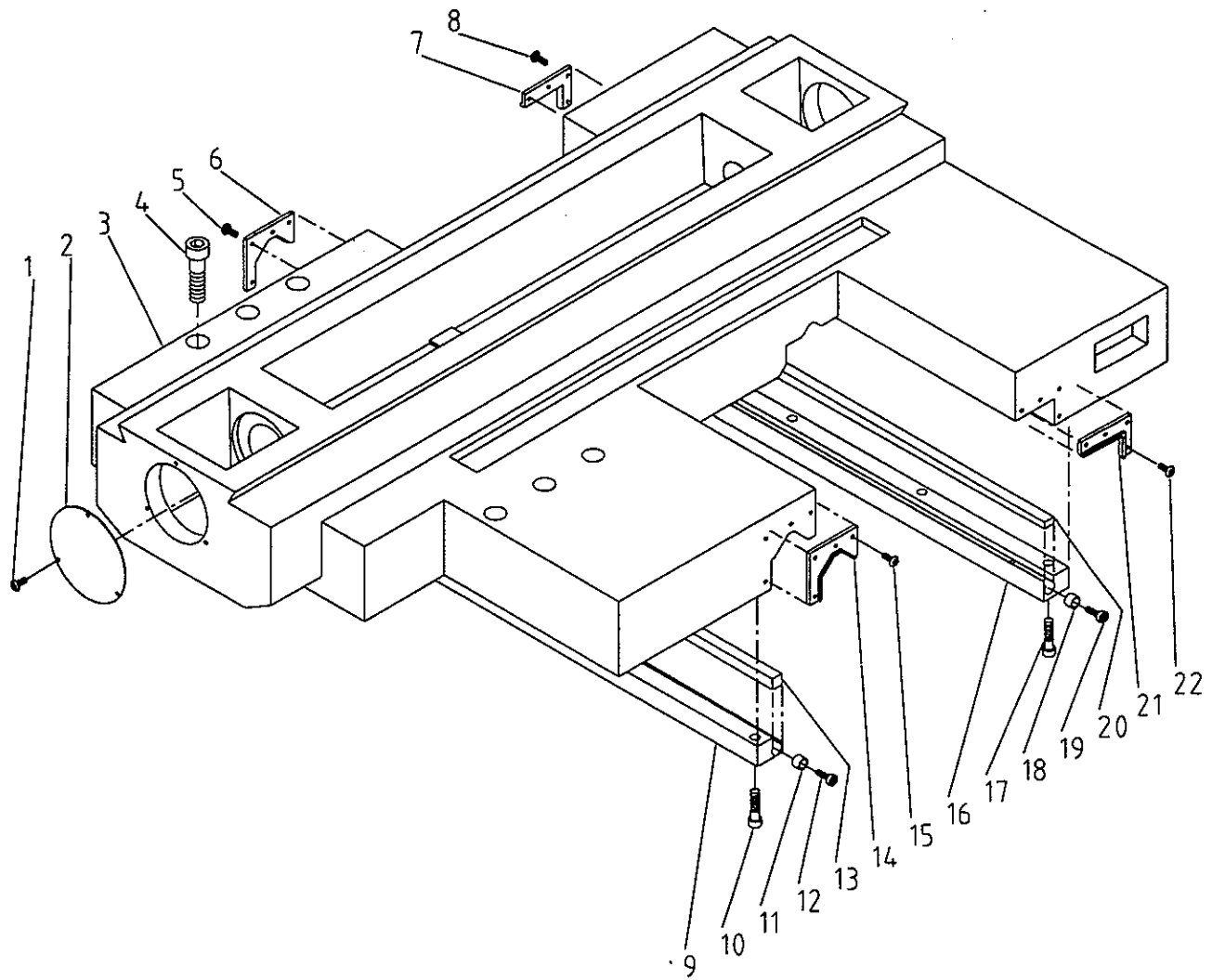
Item	No Part No.	Description	Remark
1		HEX. SOC. RD. SCREW	
2	3011	COVER	
3	3001	CARRIAGE	
4		HEX. SOC. HD. SCREW	
5		HEX. SOC. RD. SCREW	
6	3038	WIPER	MPL-933
7	3040	WIPER	MPL-934
8		HEX. SOC. RD. SCREW	
9	3028	PLATE	
10		HEX. SOC. HD. SCREW	
11		BUSHING	
12		HEX. SOC. HD. SCREW	
13	3029	GIB	
14	3039	WIPER	MPL-935
15		HEX. SOC. RD. SCREW	
16	3028	PLATE	
17		HEX. SOC. HD. SCREW	
18		BUSHING	
19		HEX. SOC. HD. SCREW	
20	3029	GIB	
21	3041	WIPER	MPL-936
22		HEX. SOC. RD. SCREW	
23		HEX. SOC. HD. SCREW	
24	3031	COVER	
25		HEX. SOC. RD. SCREW	
26		HEX. SOC. RD. SCREW	
27		WIPER	MPL-939
28		HEX. SOC. HD. SCREW	
29		BUSHING	
30	3010	GIB	
31		BRASS	
32		SET SCREW	
33	3002	CROSS SLIDE	
34		WIPER	MPL-940
35		HEX. SOC. RD. SCREW	
36		BUSHING	
37		HEX. SOC. HD. SCREW	
38	BG-47	ANGULARCONTACT BALL BEARING	
39	3008-A	COLLAR	
40		LOCKING NUT	

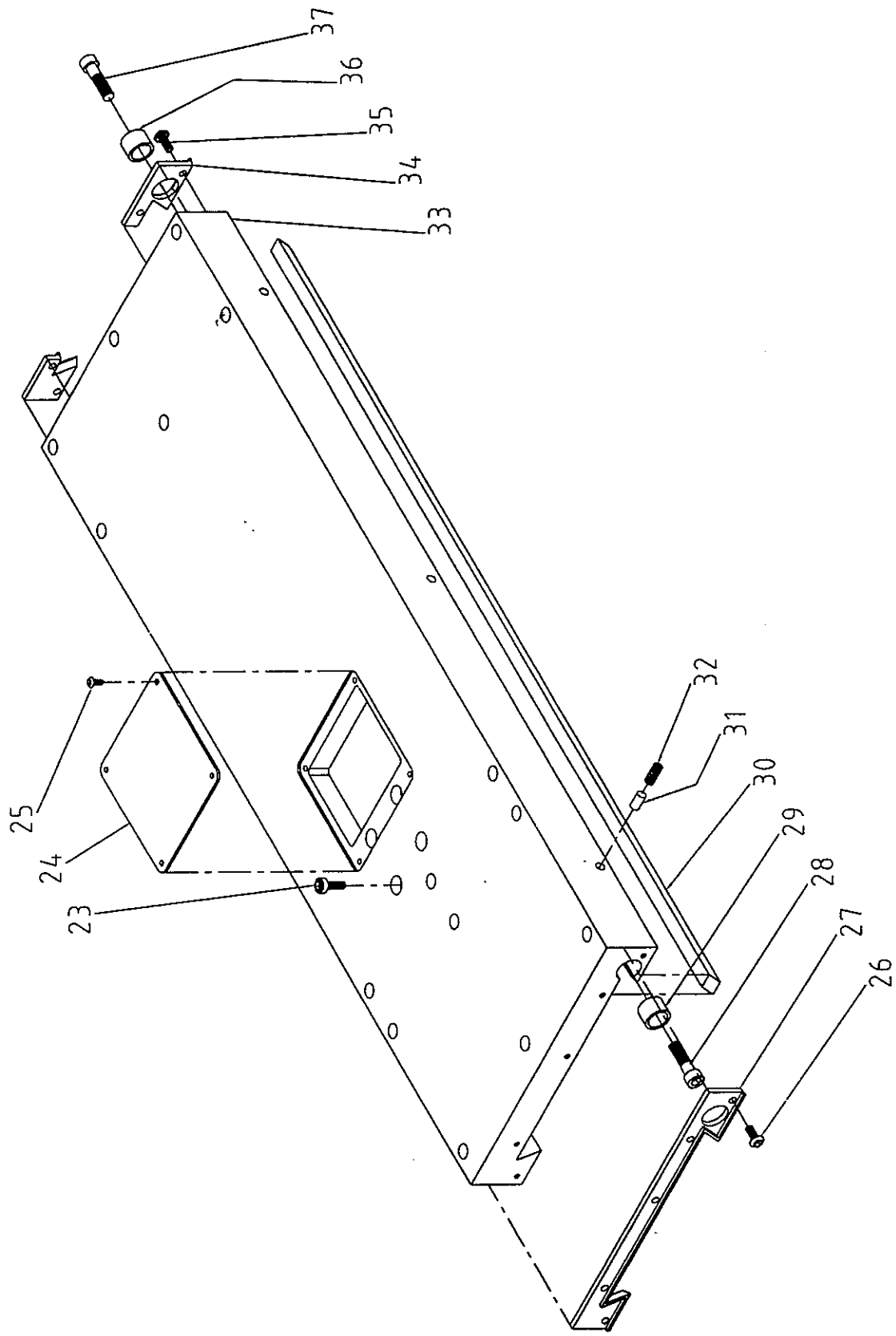
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41		HEX. SOC. HD. SCREW	
42		HEX. SOC. HD. SCREW	
43	MA-253	COUPLER	
44	3013	MOTOR BASE PLATE	
45		HEX. SOC. HD. SCREW	
46		MOTOR	
47		SPRING WASHER	
48		HEX. SOC. HD. SCREW	
49		HEX. SOC. HD. SCREW	
50	3009-1	PACKING COVER	
51		LOCKING NUT	
52	3008-1	COLLAR	
53	BG-47	ANGULARCONTACT BALL BEARING	
54		HEX. SOC. HD. SCREW	
55	3012	BEARING SEAT	
56	3109	SCREW SEAT	
57	3007	SHIM	
58	3005	BALL SCREW	80" w/nut MPL-710
59		HEX. SOC. HD. SCREW	
60		HEX. SOC. HD. SCREW	
61		PLATE	
62	3103	TOOLHOLDER	
63		O RING	
64		HEX. SOC. RD. SCREW	
65	3102	COVER	
66		HEX. SOC. HD. SCREW	
67	3105	GIB	
68		SET SCREW	
69	3106	GIB	
70		HEX. SOC. HD. SCREW	
71		HEX. SOC. HD. SCREW	
72	3104	TOOLHOLDER	
73		O RING	
74	3101	TOOL POST	
75		TURRET	
76		HEX. SOC. HD. SCREW	
77		WASHER	
78	3004	SHIM BLOCK	
79		HEX. SOC. HD. SCREW	
80	3003	FIXING SEAT	

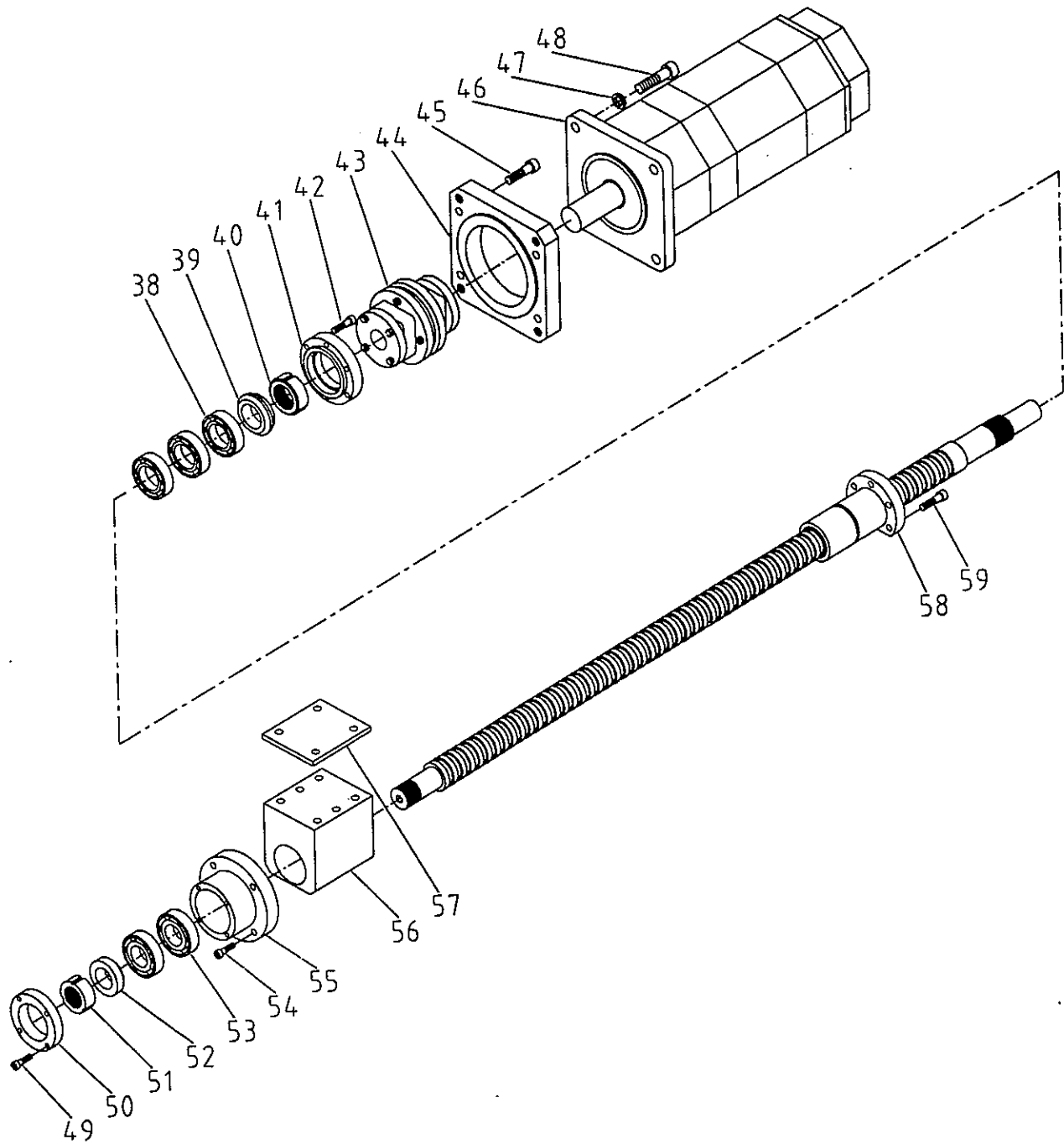
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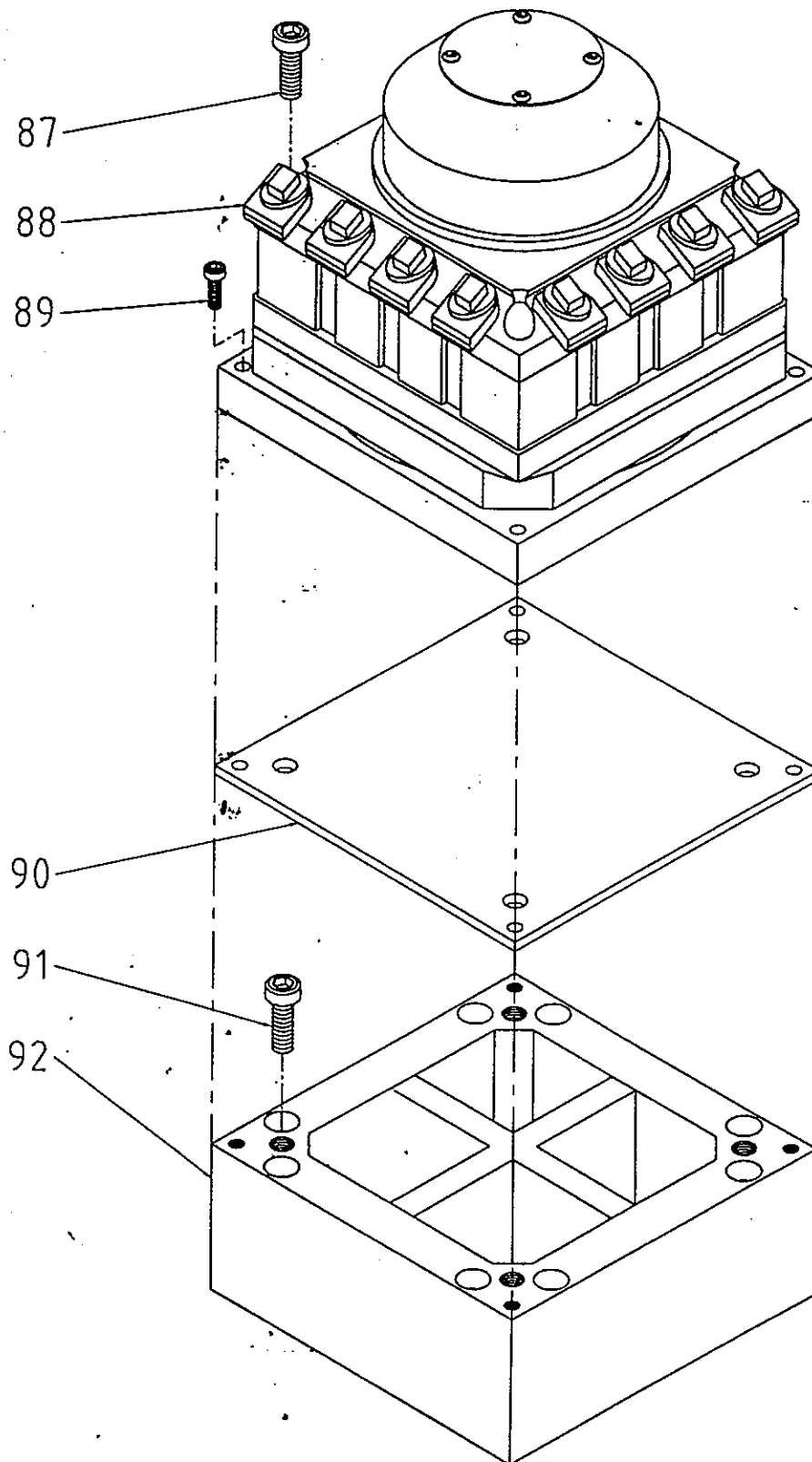
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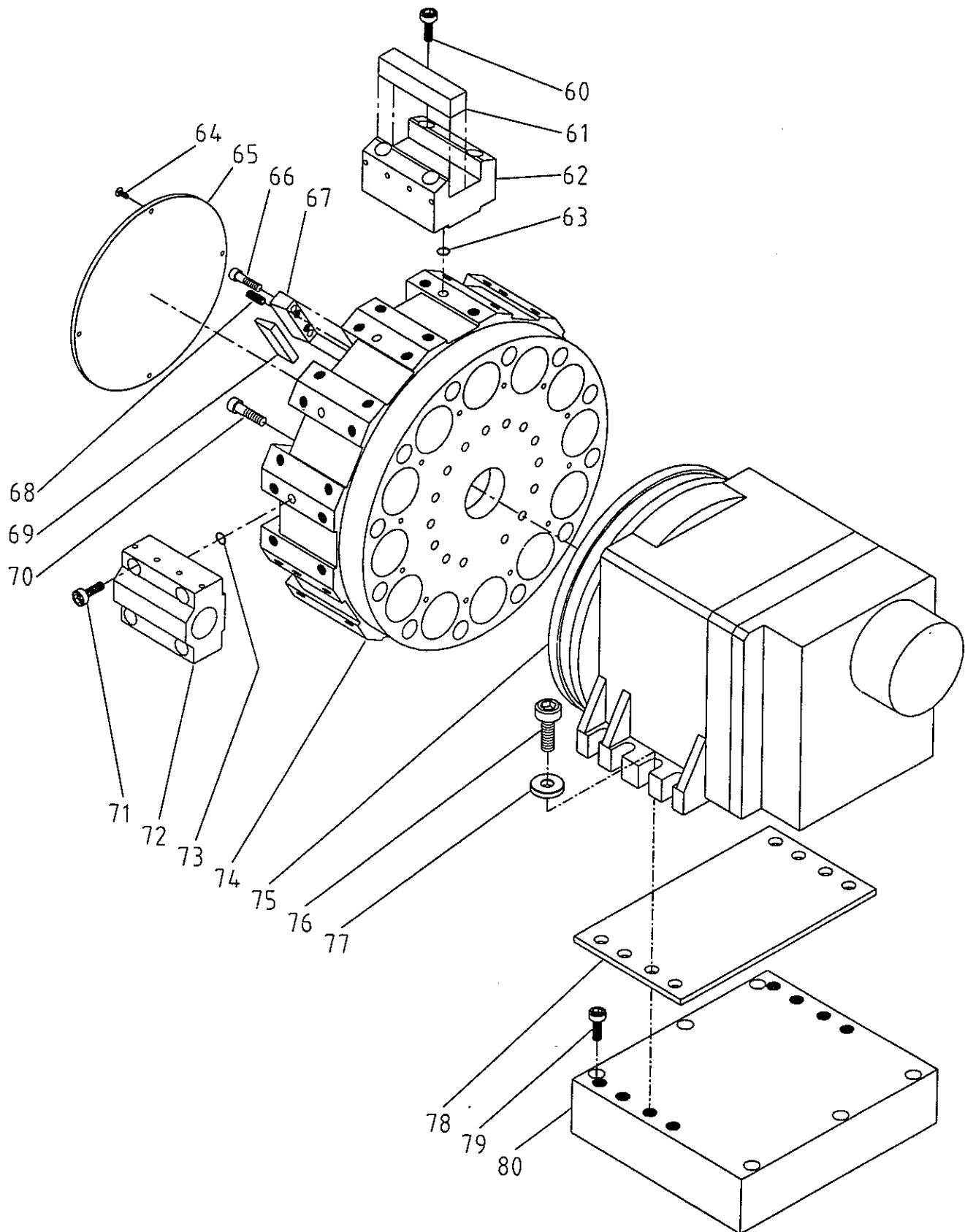
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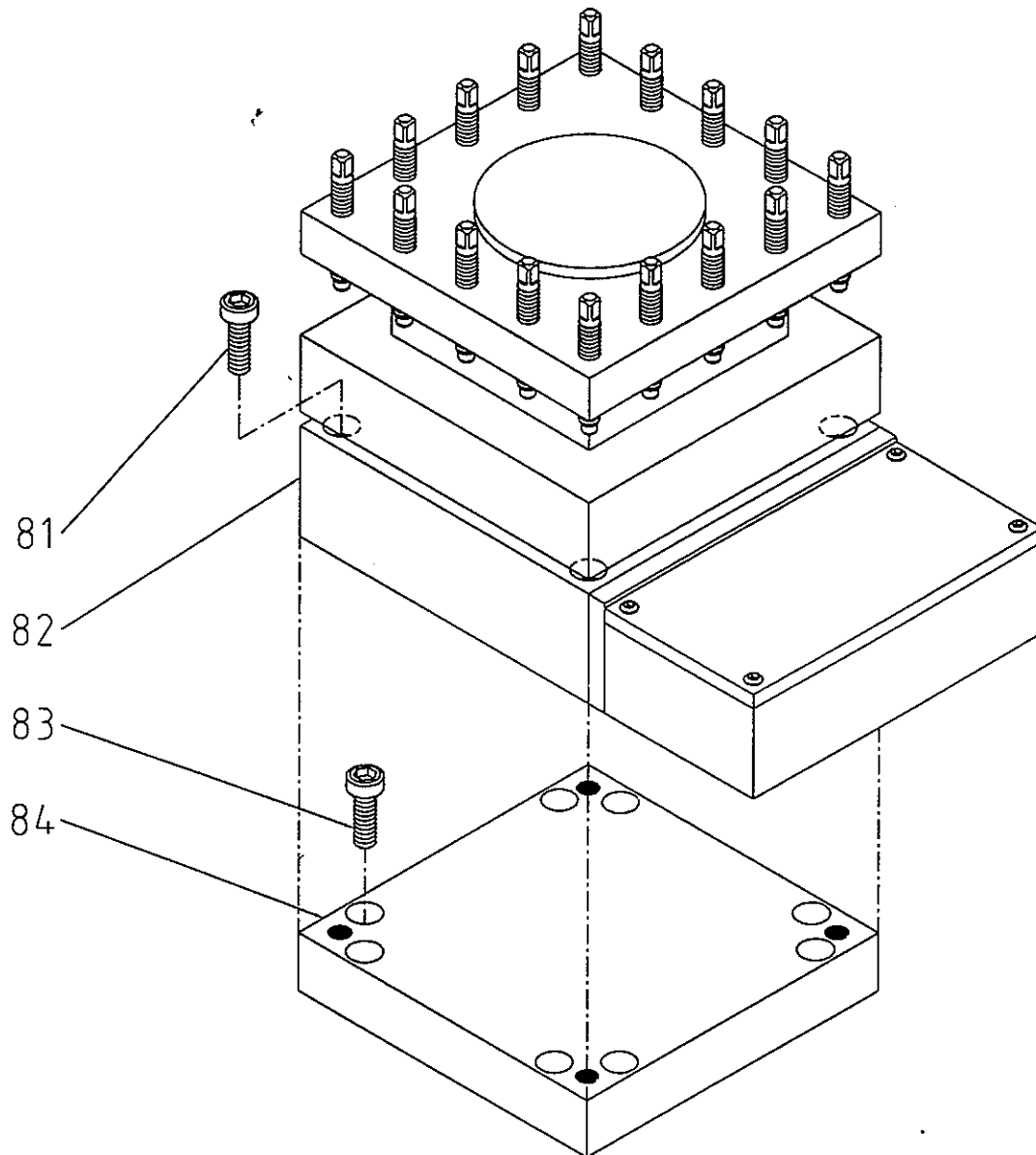










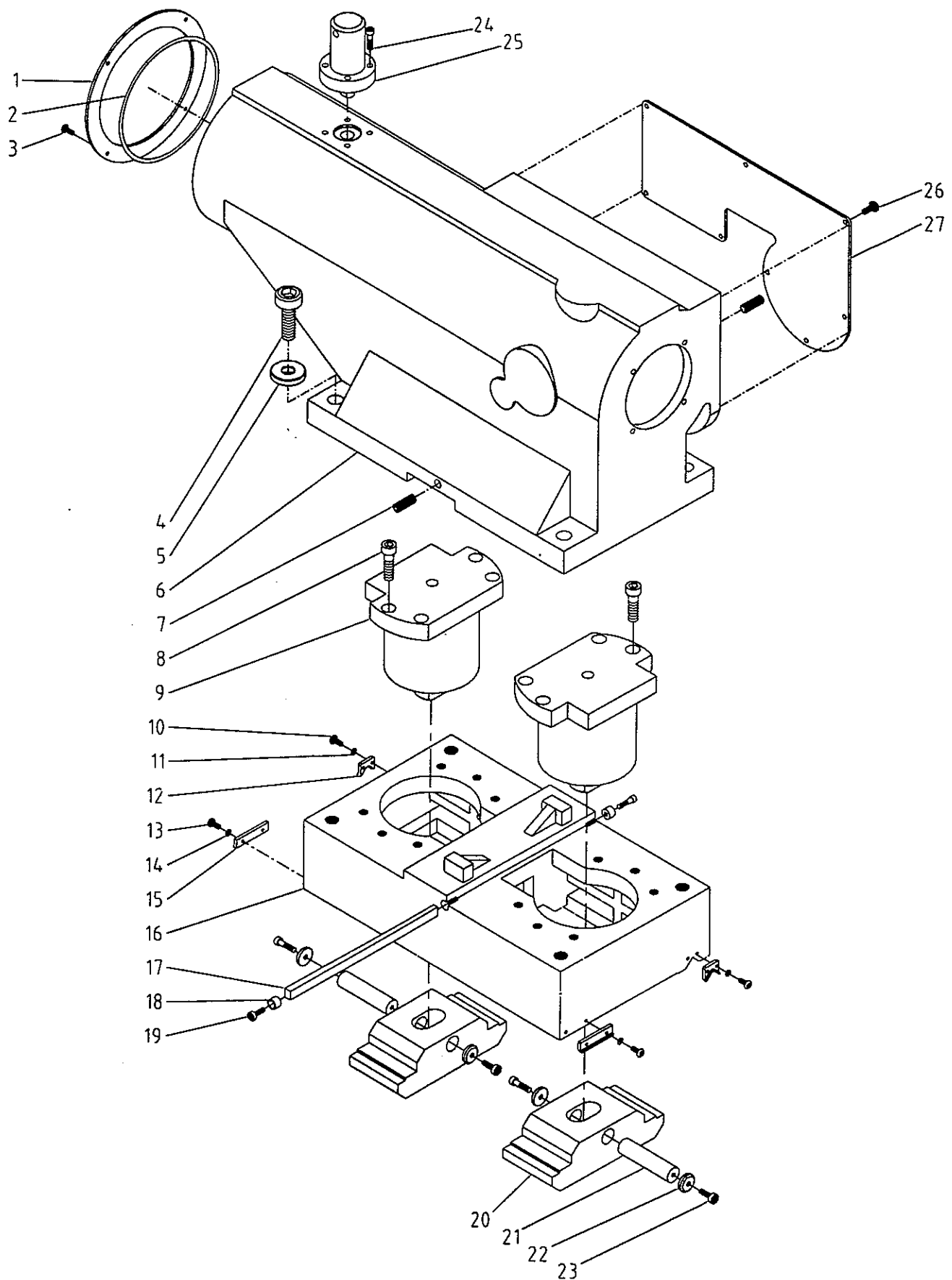


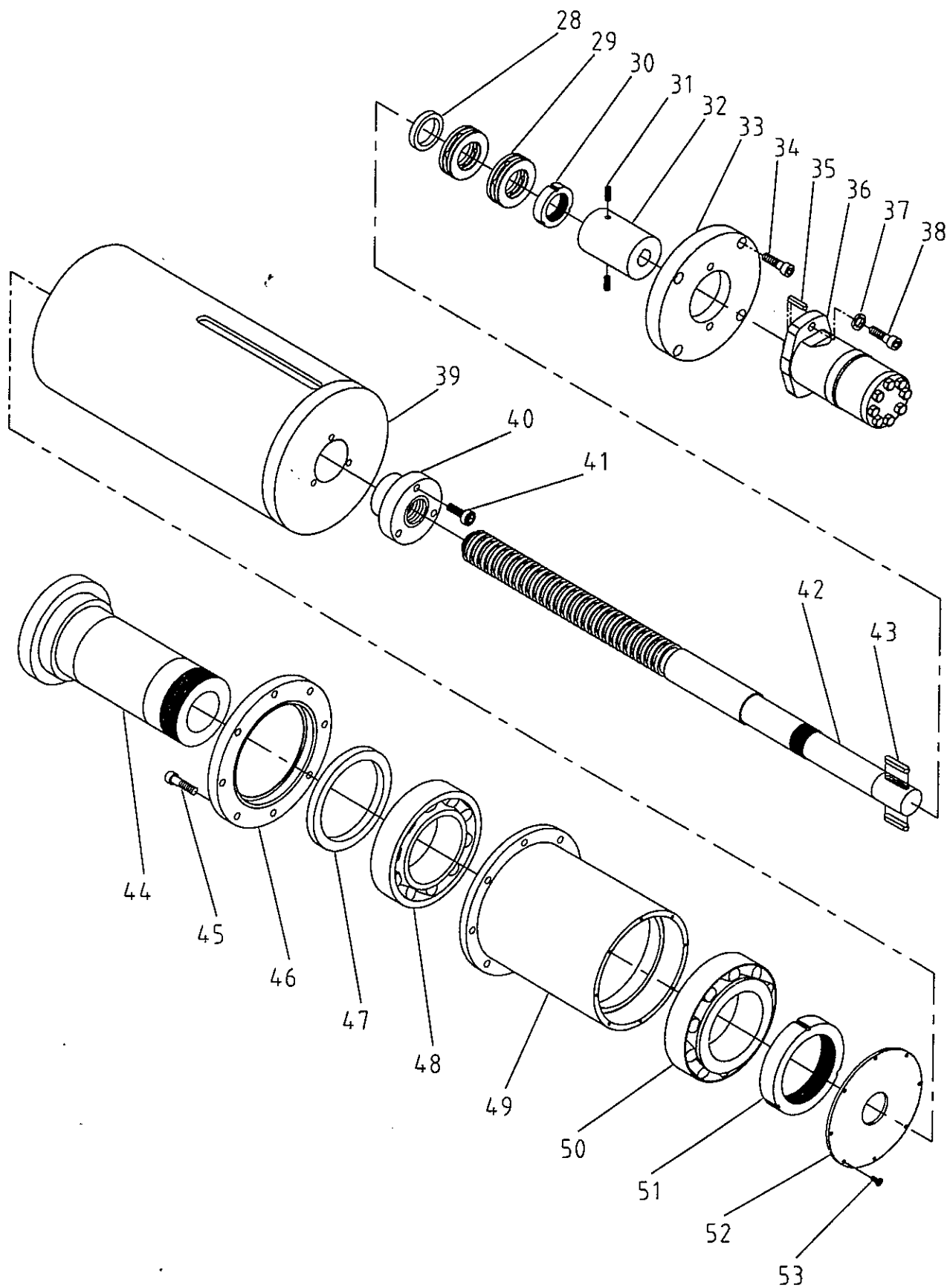
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1	4017	COVER	
2		O RING	
3		HEX. SOC. RD. SCREW	
4		HEX. SOC. HD. SCREW	
5	1022	WASHER	
6	4001	TAILSTOCK BODY	
7		SET SCREW	
8		HEX. SOC. HD. SCREW	
9	4012	HYDRAULIC CYLINDER	
10		HEX. SOC. RD. SCREW	
11		WASHER	
12	4031	WIPER	MPL-937
13		HEX. SOC. RD. SCREW	
14		WASHER	
15	4030	WIPER	MPL-938
16	4002	TAILSTOCK BASE	
17	4003	GIB	
18		BUSHING	
19		HEX. SOC. HD. SCREW	
20	4013	CLAMPING PLATE	
21	4020	SHAFT	
22	7051	WASHER	
23		HEX. SOC. HD. SCREW	
24		HEX. SOC. HD. SCREW	
25	4011	HYDRAULIC CYLINDER	
26		HEX. SOC. RD. SCREW	
27	4014	COVER	
28	4009	SPACER	
29	MPL-535	THRUST BALL BEARING	
30		LOCKING NUT	
31		SET SCREW	
32	4018-2	COUPING	
33	4010	MOTER BASE	
34		HEX. SOC. HD. SCREW	
35		KEY	
36		OIL MOTOR	
37		SPRING WASHER	
38		HEX. SOC. HD. SCREW	
39	4003-1	QUILL	
40	4007	NUT	

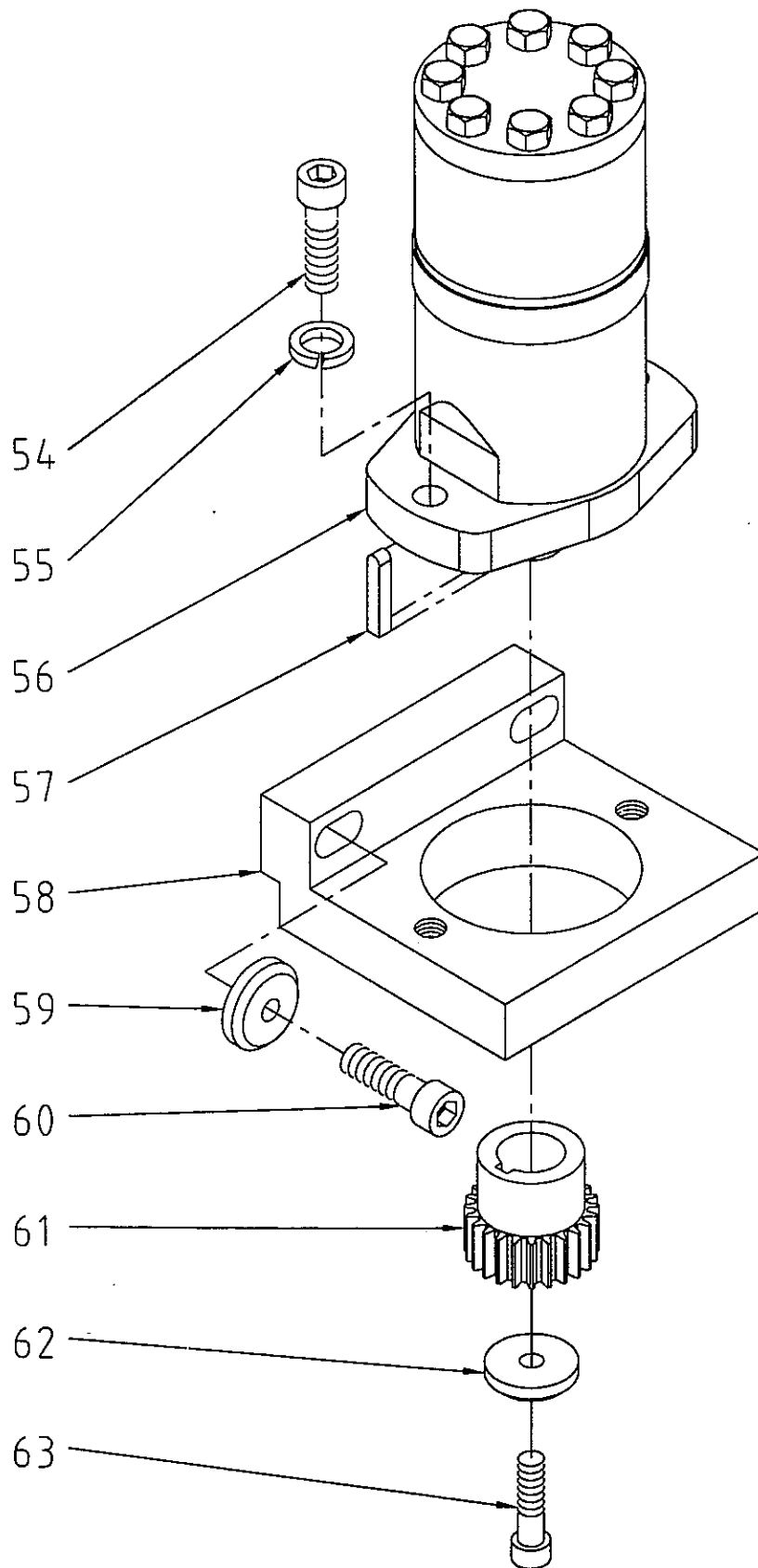
TAILSTOCK ASSY.

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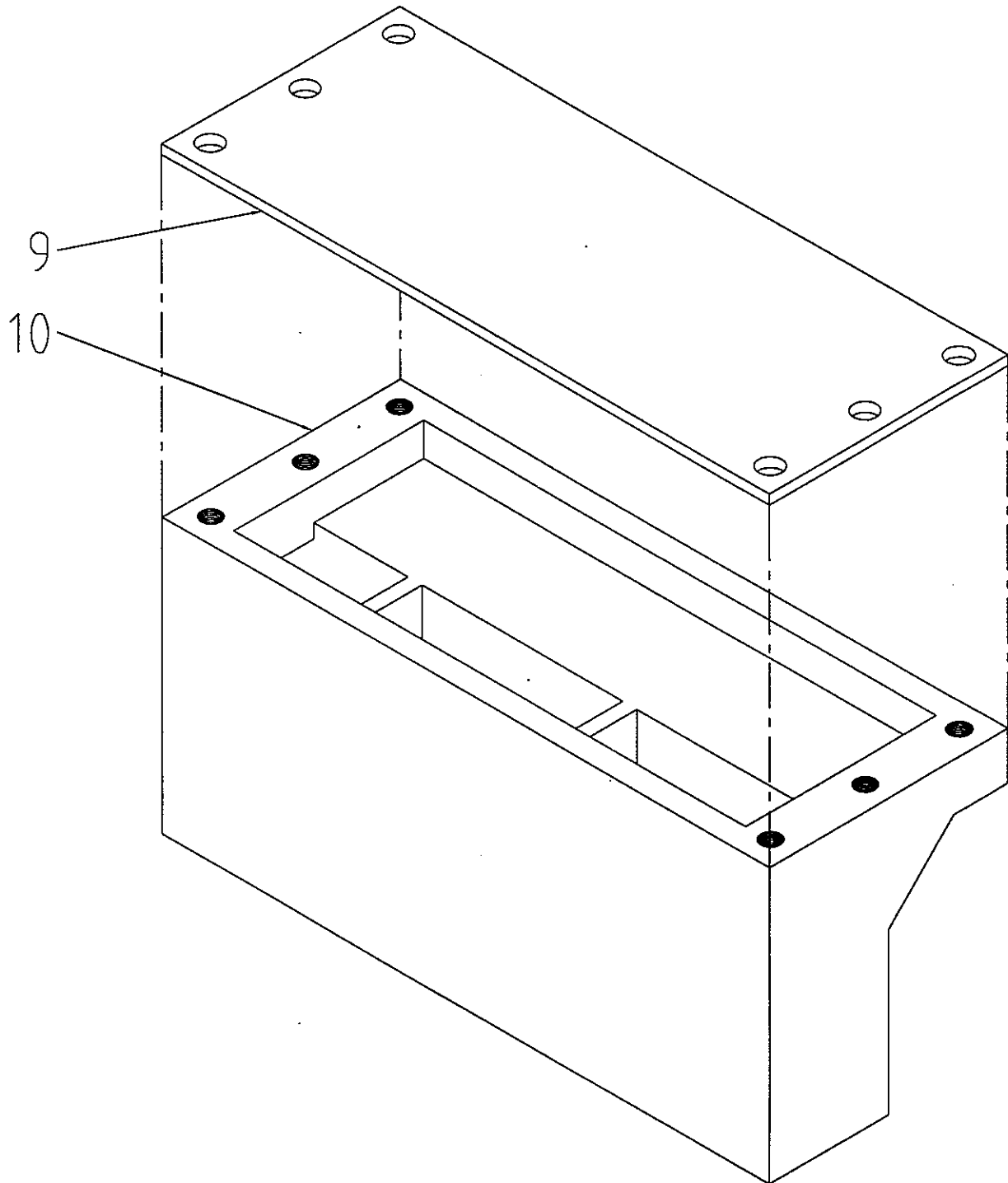




APRON ASSY.

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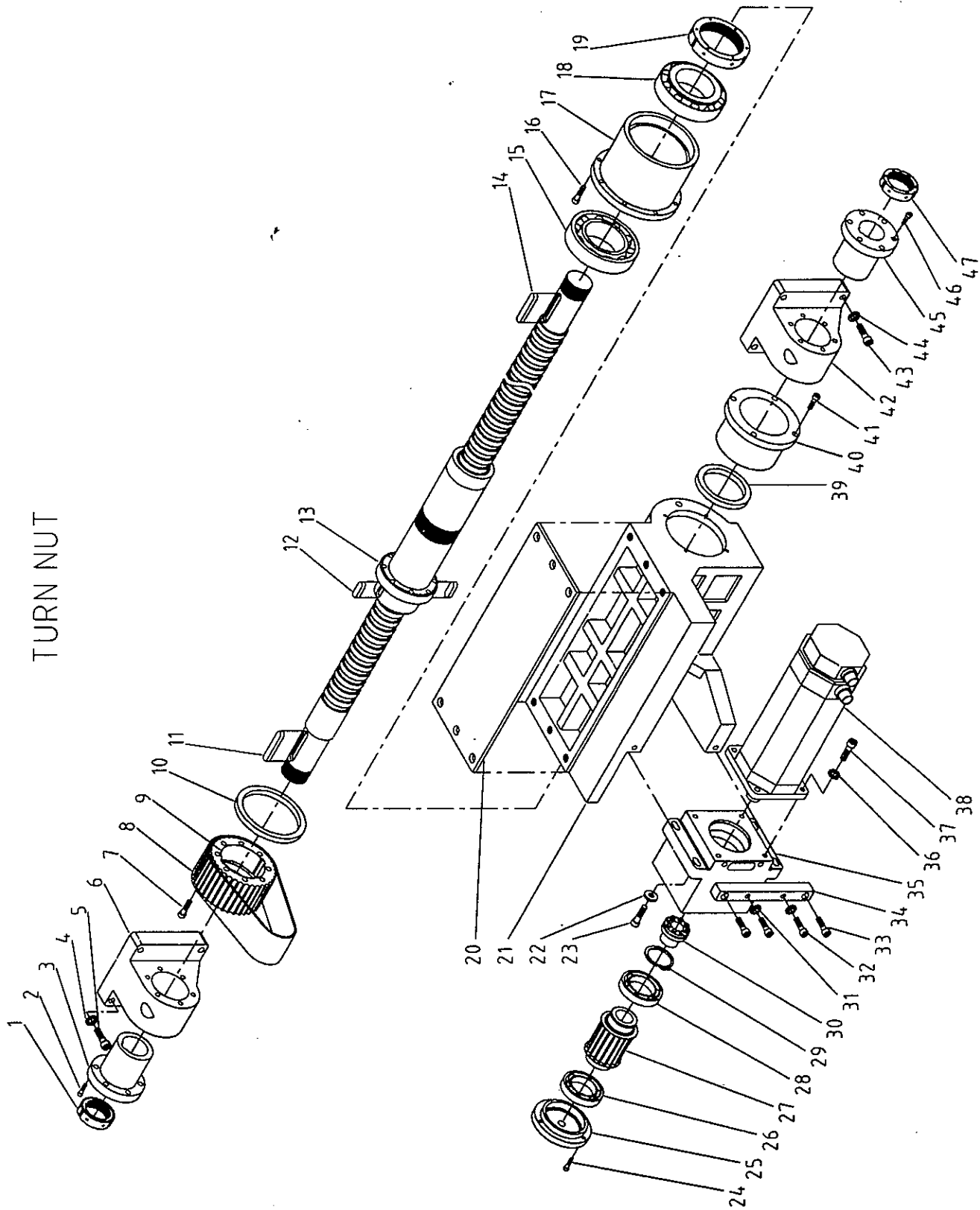
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1		LOCKING NUT	
2		HEX. SOC. HD. SCREW	
3	5210	BUSHING	
4		SPRING WASHER	
5		HEX. SOC. HD. SCREW	
6	5209-A	BRACKET	
7		HEX. SOC. HD. SCREW	
8		TIMING BELT	
9	5205-A	PULLEY	
10		OIL SEAL	
11		KEY	
12		KEY	
13		BALL SCREW	
14		KEY	
15		TAPER ROLLER BEARING	
16		HEX. SOC. HD. SCREW	
17	5211	MANDREL	
18		TAPER ROLLER BEARING	
19		LOCKING NUT	
20	5102	SHIM BLOCK	
21	5201-A	APRON	
22		WASHER	
23		HEX. SOC. HD. SCREW	
24		HEX. SOC. HD. SCREW	
25	5207-A	COVER	
26		BEARING	
27	5204-A	PULLEY	
28		BEARING	
29		SNAP RING	
30		COUPLING	
31		WASHER	
32		HEX. SOC. HD. SCREW	
33		HEX. SOC. HD. SCREW	
34	5213	PLATE	
35	5203	MOTOR BASE	
36		SPRING WASHER	
37		HEX. SOC. HD. SCREW	
38		MOTOR	
39		OIL SEAL	
40	5212	BUSHING	

APRON ASSY.

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TURN NUT





Operation Manual

For

ML45 160 Spindle Chiller

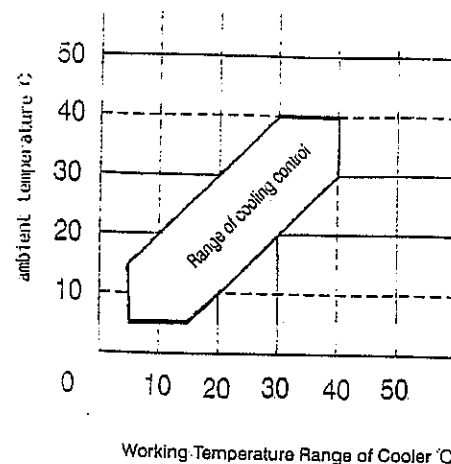
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1.GENERAL

This unit is designed to cool any of the oil of CNC can provide high-precision control of oil temperature. But its working temperature range is limited. Please refer to Fig.1



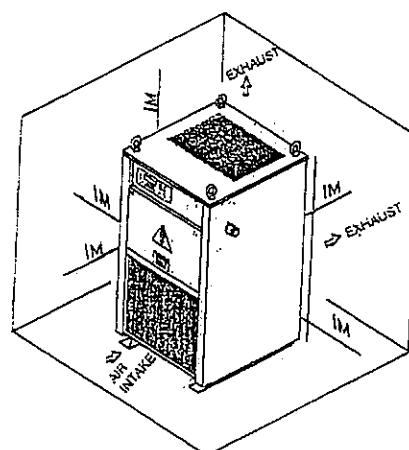
(Fig.1)

2.INSTALLATION

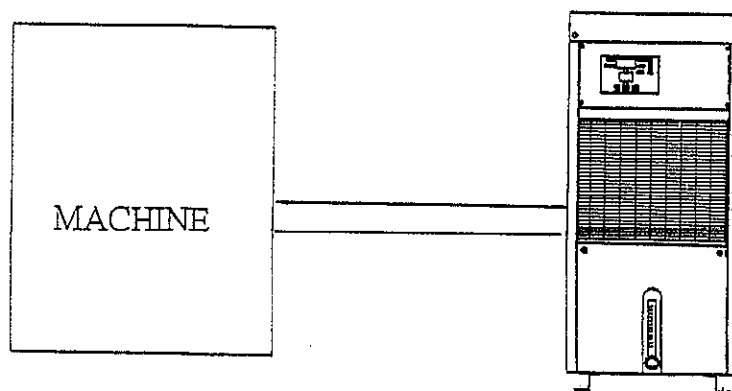
- 2-1 Keep the slant of this unit within 45°C and avoid vibration during transportation. (Vibration may cause unit failure and Freon leakage.)
- 2-2 Install the unit at a level, horizontal position. Free of exposure to direct sunshine or heat sources such a heating apparatus.
- 2-3 Since the cooler is an air-cooled type, install it at a well-ventilated place and free of dust. The ambient temperature should be from 5 to 40°C.(Fig 2)
- 2-4 Choose a place being convenient for discharging oil-pan drain.

3.PIPING

- 3-1 Use the piping materials completely free of rust or dirt. It causes poor cooling function and failure of compressor if there is filth on the inside of cooler. It is, therefore, essential to fit a suction strainer at the suction end of the oil pipe. The suction strainer for the purpose is of 100-150 mesh.
- 3-2 The size of the pipe connected with this unit should be bigger than the inlet and the outlet of this unit, please use the seal tape to against air infiltration or oil leakage, reduce the valve gate number to the minimum and shorten the length of pipe. Because it is liable to oil pressure loss.
- 3-3 The best oil piping method of the oil passage between machine tool, this unit and the oil tank should be compliance with Fig.3.



(Fig.2)



(Fig.3)

- 3-4 In generally, the oil tank is three or five times the capacity of outflow of pump. Oil strainer is 2 times the capacity of outflow of pump. And please use clean oil.
- 3-5 Oil suction pipe has to keep over 5 centimeters of distance from the bottom of oil tank and oil return pipe has to be gone deep into oil tank.
- 3-6 After pump works correctly, set the thermostat in order to make cooler working (prevent unload working of pump). If this unit equips flow switch, (or oil pressure switch) it needs pump to make the dielectric fluid circulating all of the system. And the function of flow switch (or oil pressure switch) is to prevent the pump working in unload.
- 3-7 Because the air cotained in the hydraulic system may result in irregular operation or noise, remove it completely before starting operation. For this purpose, lower the set pressure of the hydraulic pump until the air between the hydraulic pump and oil pipes is removed or slightly loosening the joint at the highest position of the hydraulic piping until any bubbles can not be observed in the hydraulic oil.
- 3-8 In case the oil viscosity is high or the pressure loss in the piping outside of oil cooler is extremely large, the oil pump will make unusual noise. In this case, trim short the piping outside the machine and change to low viscosity oil.

4.ELECTRICAL WIRING

- 4-1 Connect electrical wires according to the electrical circuit diagram.
- 4-2 Install this unit near the power source and ground exactly the earth wire. Be sure to turn OFF the power source before changing the electrical wiring.
- 4-3 Open the control box and restore it as original after completing wiring.
- 4-4 Do not operate the magnetic switch in the control box by your hand.
- 4-5 Since there is no electric leakage breaker in this unit, please assemble it by yourself.
- 4-6 Do not repeat power ON/OFF frequently, it is one of the resons of failure. Restore this unit ON one minutes later after turning this unit OFF.

5.USING OIL

This unit is manufacture for dielectric fluid, do not use the following oil:

- 5-1 Foods stuff, medicine and strongly corrosive liquid.
- 5-2 Coolant, grinding oil, water-soluble liquid.
- 5-3 Phosphate, chlorinated hydrocarbon, and fireresistant hydraulic oils such as water/glycol oil and w/o, o/w emulsion type hydraulic oils.
- 5-4 Gasoline, and organic solvent.

6.ITEMS CHECK BEFORE OPERATION

6-1 Inspection of oil capacity:

Fill oil a little over than oil level gauge.

6-2 Inspection of oil leakage:

Check oil tank, piping and valves for oil leakage.

6-3 Check connection items:

- a. Check that if the piping between the hydraulic pressure unit and the actuator is properly connected.
- b. Check that if electric wiring is properly connected.

7.MAINTENANCE AND INSPECTION

7-1 Clean the dirt on the face of this unit using neutral detergents or quality soap. Do not brush or use solvent such as benzine, polishing power, hot water and etc., which affect the painting coat.

7-2 Check the condenser whether it is clogged with contaminants. Use the compressed air or the brush with long hair to remove dust from the condenser.

7-3 Cleaning the air filter of condenser:

Turn the dirty face of filter downward and tap it lightly or wash the heavy dust with water containing detergent. Rock the filter to make it dry after washing then restore it. Clean it every two weeks.(Fig.4)

7-4 Periodic removal of water

If this unit is operated in an area with much moisture, water is liable to deposit naturally in the tank.

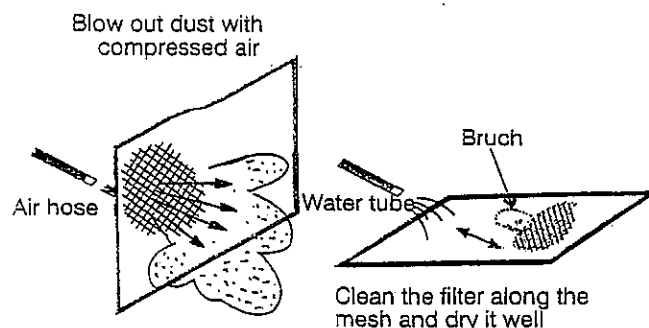
Discharge this water from the oil drain plug on the bottom of the tank every month.

7-5 The air filter should not be removed during operation. It is highly dangerous to remove filter during operation because the hot refrigerant piping and running fan are exposed. When the oil cooler or serviced, be sure to turn OFF the main power.

7-6 When any trouble happen with oil cooler, especially pay attention to the following items for repair:

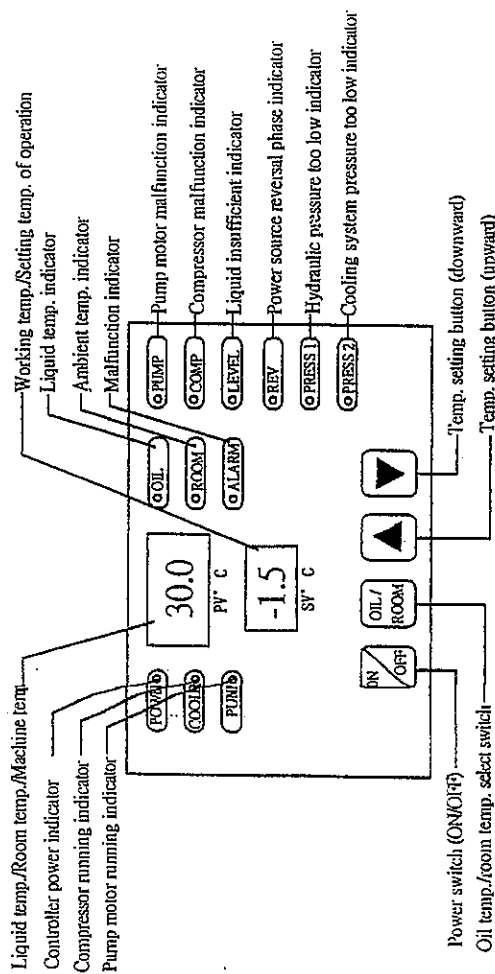
- a. If the welding tools are necessary for repair, demount the oil cooler from machine body and be sure to extract oil from the system completely before the repair work.
- b. Choice the place where free from fire hazard and is well ventilated to avoid suffocation caused by refrigerant.

7-7 When the unit will be not operated for a long time, turn the main power OFF and protect the inside of this unit and condenser against dust or moisture.



(Fig.4)

OPERATION PANEL:



CONTROL PANEL INSTRUCTION

- 1-1. If power indicator lit, it means power source connected OK, please next step "2".
- 1-2. If power indicator not lit, it means power source or connected break.

Machine equip with remote-control start function, should be switched "ON".

2. Press the ON/OFF button once. (Press on the "ON" button for 1 second to activate, press on the "OFF" button for 2 seconds to shut down.

2-1. If function normally, PV and SV would be shown on the control panel.

PV: liquid (oil or water) temperature; SV: setting temperature.

2-2. After 3 seconds, the pump motor will be running and indicator lit.

3. Setting the value of PV at the ideal temp. (20-35°C), press "▲" and "▼" button to adjust SV value.

3-1. Fixed-temp. control mode: the SV setting range is 5-40°C (room temp. won't be detected)

3-2. Differential-temp. control mode: the SV setting range is -15-+15°C. Press "OIL/ROOM" button to choose PV liquid temperature, room temperature or machine temperature shown on the panel. Press "▲" and "▼" button to adjust SV value to control liquid temperature is the same as the room temperature.

3-3. The range of the PV temperature down is 0-50°C.

4. Every turn on the power, after "PUMP" indicator is lit for 60 seconds the "COOLER" indicator will be lit to reflect compressor running. (It means compressor protect time is 60 seconds)

5. The compressor would be stop when the liquid temperature is below 5°C, but the pump will keep running. (While applied in the water-cooling, there will be alarm when the temp is below 0°C)

6. When power incoming first time, the hydraulic pressure malfunction detected time is 30 seconds. Other time, the detected time only 3 seconds to signal output.

7. Any malfunction, the compressor and pump will stop, and the ALARM indicator will show the malfunction location. After trouble shooting, press "ON/OFF" once or reset power source to normal operation. (Please restoration power ON at least 3-5 seconds)

8. Description and remedy method for the "ALARM" system:

Signal	Description	Remedy method
PV blinking SV H/L	1. Liquid temp. is above 50°C 2. Overload	1. Keeping the liquid temp. below 50°C. 2. Select suitable type.
PV blinking SV L/H	1. Liquid temp. is below 0°C 2. The magnetic contactor couldn't shut off	1. Keeping the liquid temp. above 0°C. 2. Replace the magnetic contactor.
PV blinking SV A/L	1. Room temp. sensor is broken 2. Poor connecting of the room temp. sensor	1. Reconnect the room sensor. 2. Replace the room sensor.
PV blinking SV O/H	1. Liquid temp. sensor is broken 2. Poor connecting of the liquid temp. sensor	1. Reconnect the liquid sensor. 2. Replace the liquid sensor.
PV A/H SV O/H	1. Room and liquid temp. sensor break	1. Reconnect or replace room/ liquid sensor.
PV blinking SV --	See below	See below
PUMP Pump motor overload	1. Pump is jammed by objects 2. Pump shaft bearing is jammed 3. Pump coil is broken	1. Clear the jam objects 2. Replace the pump 3. Replace the motor
COMP Compressor overload	1. The incoming voltage is unstable 2. The cooling fan loosen, or motor broken 3. Load capacity of the cooling system not suitable 4. Bad cooling effects of the surrounding 5. Motor break	1. Check the voltage 2. Reinstall the fan, or replace the motor 3. Replace higher cooling capacity cooler 4. Improve the ventilation surround 5. Replace the motor
LEVEL Liquid insufficient	1. Oil/water insufficient 2. The quality of the oil/water is becoming worse and viscosity too high 3. Liquid level switch is broken	1. Add oil/water to ideal level 2. Replace the oil/water 3. Replace the liquid switch
REV. Power source reversal phase	1. Power is reversal phase 2. Power is lack of one phase	1. Check the power source 2. Mutually exchange any 2 wires of the power source
PRESS1 Hydraulic pressure too low	1. Shortage of the oil/water 2. Pump motor is broken 3. The oil suction is jammed 4. Coupling between pump and motor is worn out 5. The setting value of the oil switch too high	1. Add oil/water to ideal level 2. Replace the motor 3. Clear the objects in the pipes 4. Replace the pump motor 5. Adjust the value to the normal setting, or replace it
PRESS2 Cooling pressure overload	1. The cooling fan loosen, or motor broken 2. Air filter or condenser is clogged by dust 3. The flowing in the pump is too few, or abnormal 4. Overload or insufficient pressure 5. Ambient temp. too high or too low 6. Cooling chemical loss, or coil is broken 7. The magnetic contactor of cooling system couldn't shut off	1. Reinstall the fan, or replace the motor 2. Clear the dust 3. Check the flowing, or replace the motor 4. Replace higher cooling capacity cooler 5. Improve the ventilation surround 6. Check the cooling system 7. Replace the magnetic contactor

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Date

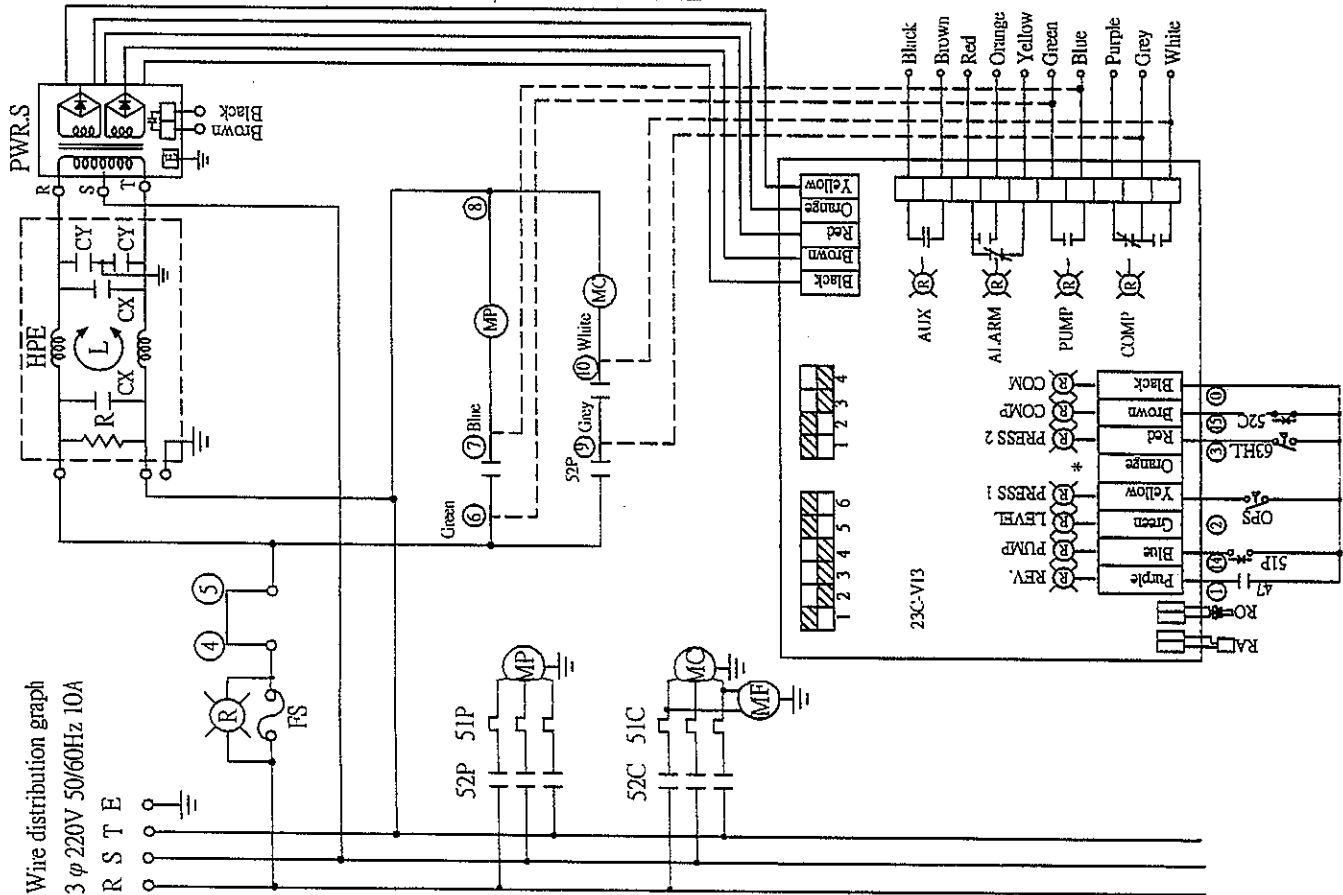
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Graph

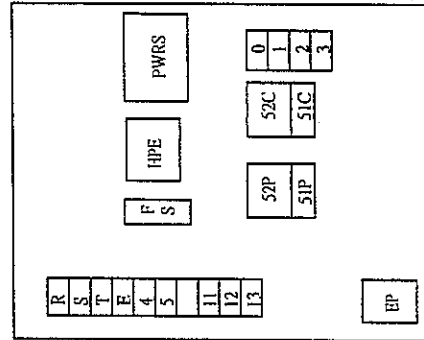
CONTROL PANEL INSTRUCTION

Drafting

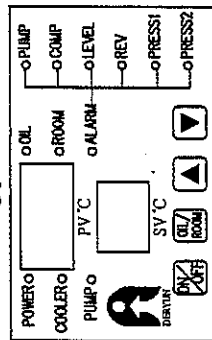
Wire distribution graph
3 φ 220V 50/60Hz 10A
R S T E



Wire distribution graph



23C controlling panel



※ Function of the external connection point.

- ④ ⑤ Jump Pin, Cooling machine remote controlled by working machine.
- ① ② The connection points remotely detected by the working machine for malfunction.
- ① ③ The functioning connection point of the cooling machine constantly close.
- ① ④ The functioning connection point of the cooling machine constantly open.

The meaning of symbol

MP	Motor Pump	HPE	Power signal filter
52P	Electrical magnetic switch on the Motor Pump	PWR.S	Power Supplier
51P	Overload device for the Motor Pump	63HL	High and Low Voltage Switch
MC	Motor Compressor	OPS	Oil Pressure Switch
52C	Electrical magnetic switch on the Compressor	23C	Temperature Controller
51C	Overload device for the Compressor Pump	RO	Oil Temperature Sensor
MF	The motor of the cooling fan	RA	Chamber Temperature Sensor
47	The reverse power	EP	Grounding Board
FS	Fuse		

- ※ Function of the 23C Controller.
- 1. Action Precision: $\pm 1^{\circ}\text{C}$
- 2. SV Δ : differential temperature setting range $\pm 15^{\circ}\text{C}$, Fixed temperature setting range $5\sim 40^{\circ}\text{C}$
- 3. PV: Temperature displaying range $0\sim 50^{\circ}\text{C}$
- 4. ON/OFF power button of the controller
- ON : confirmed by pressing 1 second.
- OFF : confirmed by pressing 2 seconds.
- 5. The pump of the compressor will be activated and function after it has been warmed up for 1 minute whenever the ON/OFF button is pressed.
- 6. When there's the output of the malfunction detection, the compressor will be automatically stopped. And it will become normal through the switching of the ON/OFF button or the Main Power button (3-5 seconds for each switching)
- 7. The malfunction situation is solved and the light of the Alarm is off after the temperature of the oil, or the internal chamber (the temperature of the engine) is displayed on the panel through selecting of the OIL/ROOM switch.
- 8. The Comp won't function when the temperature of the oil is below 5°C But the pump will keep on functioning

- ※ The meaning of the symbol displayed on the malfunction panel:
- SV Δ : 1. Power supplied after the detection of the liquid pressure (PRESS 1). It will be delayed for 30 seconds for the 1st detecting. Then, each signal of the malfunction detected will be output after 3 seconds.
- 2. The compressor overload, the pump overload, the overload of the system pressure (high and low), the insufficiency of the oil quantity and the reverse output of the power.

- SV HL : Malfunction alarm for the overheating of the oil temperature above 50°C .
- SV LT : Malfunction alarm for the insufficient heat of the oil temperature below 0°C .
- SV AL : Alarm for the disconnecting of the chamber temperature sensor.
- SV OL : Alarm for the disconnecting of the oil temperature sensor.

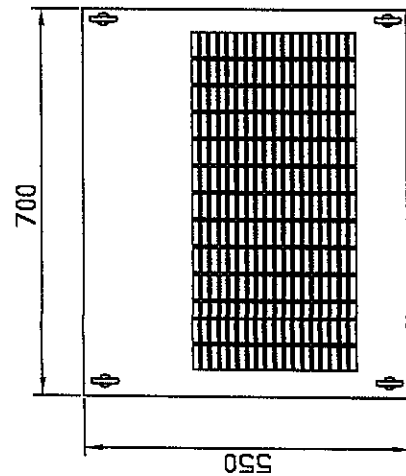
- PV AL : Alarm for the disconnecting of both the chamber temperature sensor and the oil temperature sensor.

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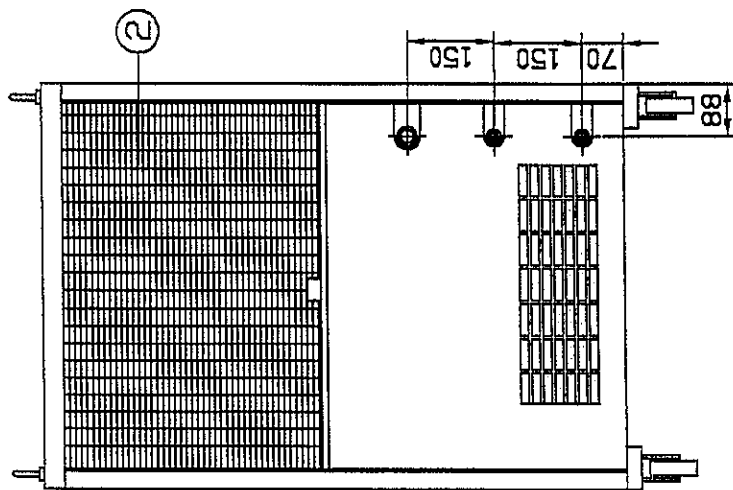
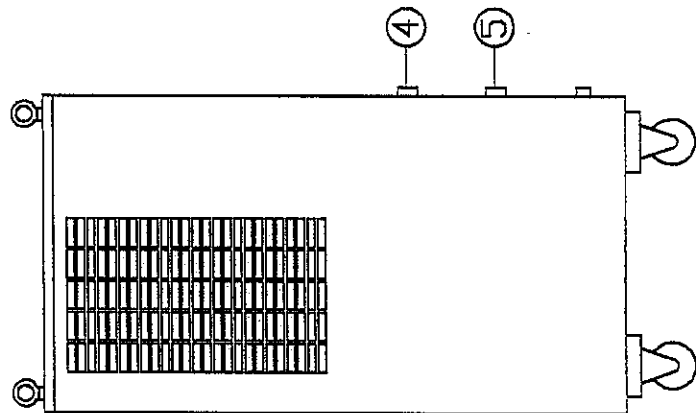
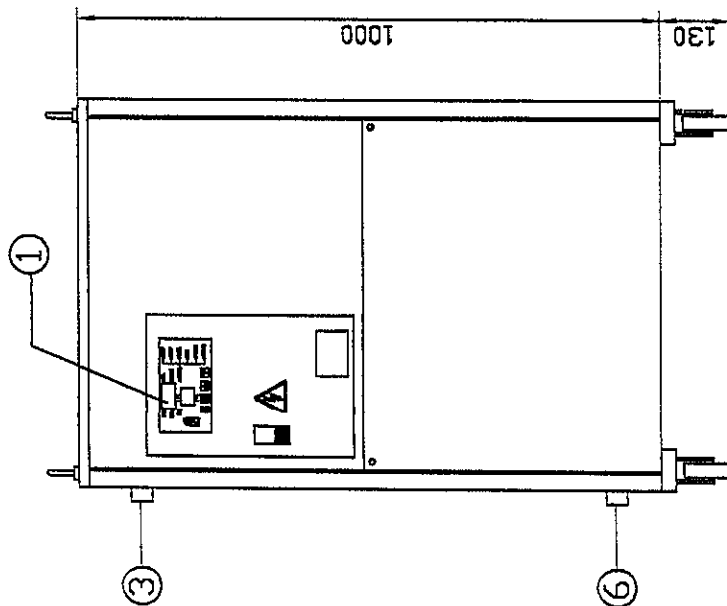
Graph

DO-1.5RPSA Wire Distribution

3.7.2W3



1	控制面板 CONTROL PANEL
2	散熱空氣過濾網 COOLER AIR FILTER
3	電源入口 POWER SUPPLY ENTRANCE
4	出油口 OUTLET PTI"
5	入油口 INLET PTI"
6	排油口 DRAIN PTI/2"



得雲精密工業有限公司 DERYUN PRECISE INDUSTRIES CO., LTD.		單位 Unit	mm
圖名 Graph	DO-1.5RPS 外觀圖 Wire Distribution	比例 Ratio	1:13

3.7.2003