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<R42-101-0>

Service Manual

STEREO TURNTABLE

PL-15/PV

<70L02Y31U>

PIONEER®

1. SPECIFICATIONS

PL-15/PV

1. Motor and turntable

Motor:	4-pole synchronous
Turntable drive:	Belt-driven
Speed:	Two speeds, 33 1/3, 45 rpm
Wow and flutter:	0.1% (WRMS) or less
S/N:	47 dB or more
Turntable platter:	12" (30cm) diameter aluminum alloy die-cast

2. Tonearm

Tonearm:	Static balance type, pipe arm
Effective arm length:	22.1 cm
Furnished cartridge:	PIONEER PC-11 (Moving Magnet Type)

3. Subfunctions

- Automatic tonearm return system.
- Anti-skating device.
- Hydraulic cueing device.
- Light aluminum arm head plug-in type
- Dust cover with free stop hinge.
- Wooden base with anti-acoustic feedback suspension.
- Counterweight with tracking force adjustment gauge.

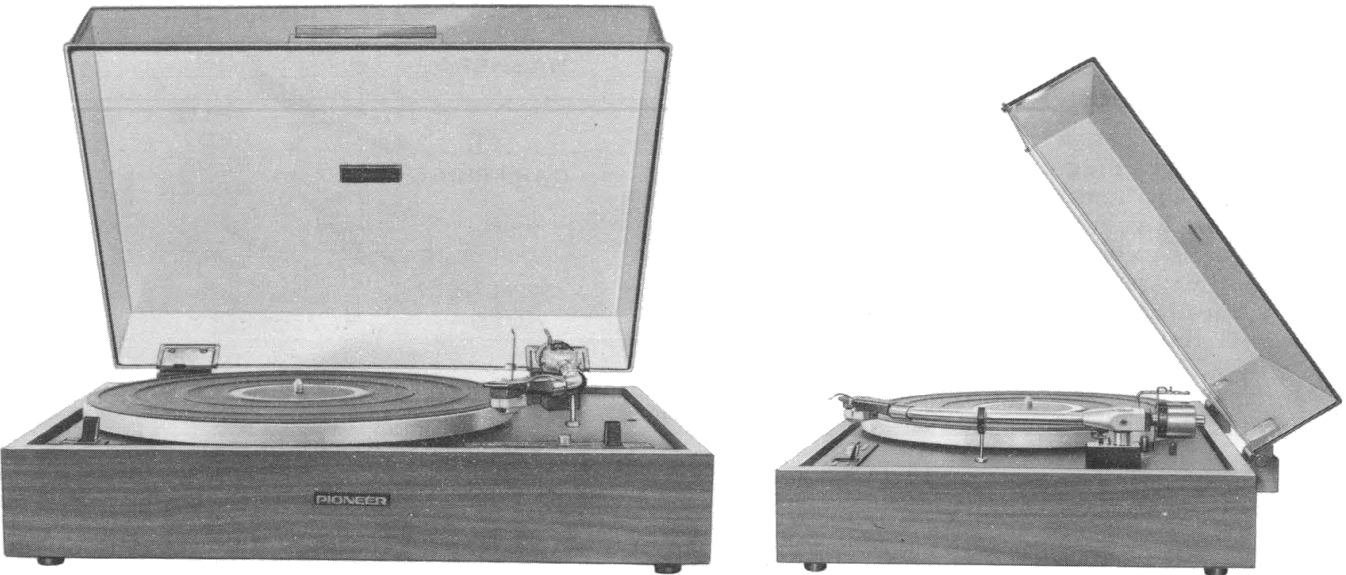
4. Miscellaneous

Power requirement:	AC 220~240V, 110~130V, 60Hz or 50Hz
Power consumption:	18.5VA (12W) MAX
Dimensions:	6 7/16"(H)x16 15/16"(W)x13 3/8"(D) 163(H) x 430(W) x 340(D) mm
Weight:	16lb (7.3kg)

PC-11

Cartridge type:	Moving magnet type
Stylus:	0.6 mil diamond tip
Frequency response:	15 to 20,000Hz
Output voltage:	5mV (1,000Hz, 50mm/sec.)
Channel separation:	More than 25 dB at 1,000Hz
Dynamic compliance:	10x10 ⁻⁶ cm/dyne, 100Hz (Vertical and Lateral)
Optimum tracking force:	2.5~3.5g
Recommended load impedance:	50~100k Ω
Weight:	6.8g
Replacement stylus:	PIONEER PN-11

NOTE: Specifications and the design subject to possible modification without notice due to improvements.



2. CHECKING ASSEMBLY

REMOVING SCREWS

Unscrew and remove the 4 screws with an accessory screwdriver, which clamp the baseplate to the wooden base (to prevent vibration during shipment). The baseplate now floats freely on shock absorbing springs. (Fig. 1)

SETTING THE BELT ON THE CAPSTAN

Set the speed selector lever to the 33-1/3 rpm position. Pulling the ribbon attached to the drive belt, put the belt through the shift lever (belt guide) and set it on the smaller diameter portion (the upper portion) of the capstan. After the belt is properly set on the capstan, remove the ribbon. (Fig. 2)

ASSEMBLY OF ANTI-SKATING DEVICE

The anti-skating device consists of two angle bars: "A" and "B". The bar "B" has a thread tied to an anti-skating bias weight. *Mount the bar "A" on the baseplate with the attached screw. In this instance, the horizontal arm of the bar should be parallel with the tonearm and point toward the tail of the tonearm. (Fig. 3)

LUBRICATION

Mechanical noises, and wow and flutter usually result from lack of lubricant in rotating parts. Be sure that you lubricate the spot specified in Fig. 4 at least once every two months if the PL-15 is used for home entertainment, and two to three times a month if used for professional purposes. When lubricating, care must be taken not to let oil adhere to other parts such as the capstan, belt, or inside wall of the platter rim. Should oil adhere to these parts, wipe clean with a cloth moistened with pure alcohol.

USING A DIFFERENT CARTRIDGE

If you wish to use a cartridge of a different type, disengage plug-in arm head from the tonearm socket and change the cartridge as illustrated in Fig. 5. In this instance, be sure that the leads extending from the neck of the arm head are properly connected to the respective terminals of the newly mounted cartridge referring to lead designations indicated in Fig. 5. The overhang can be adjusted by loosening the setscrews and sliding the cartridge back and forth. (Fig. 6)

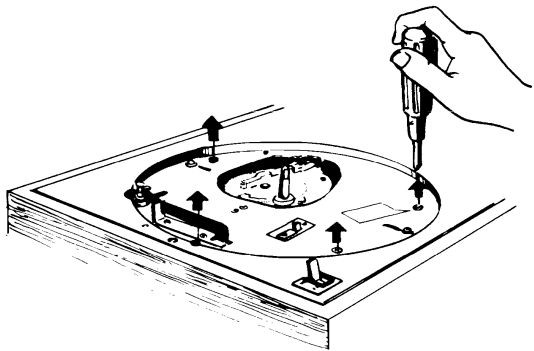


Fig. 1

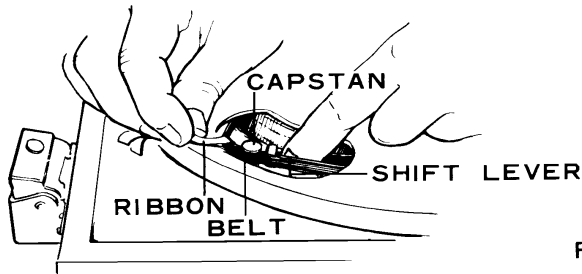


Fig. 2

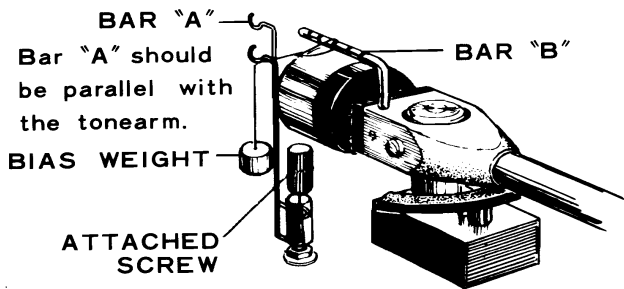


Fig. 3

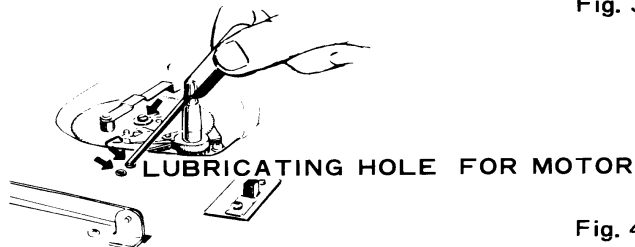


Fig. 4

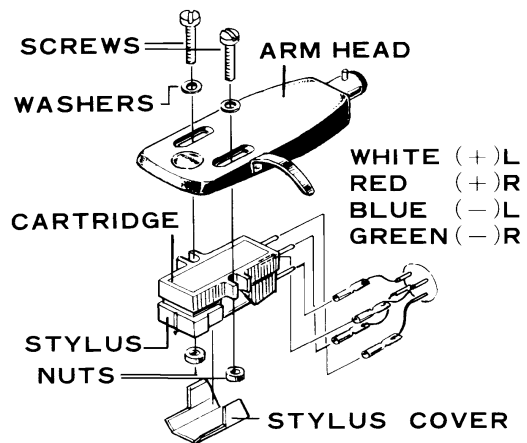


Fig. 5

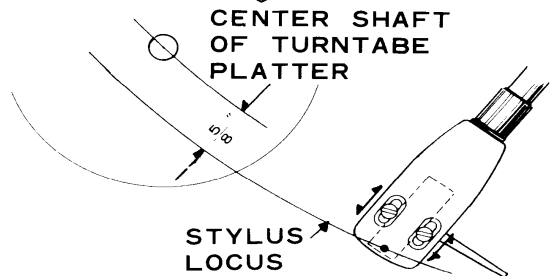


Fig. 6

LINE VOLTAGE

*Fig. 7 shows the location of the line voltage selector switch and lock plate. Remove the screw in the lock plate with a philips screwdriver to free the lock plate. *Set the selector switch to the proper line voltage marking, hold the switch in position with the lock plate, and tighten the screw.

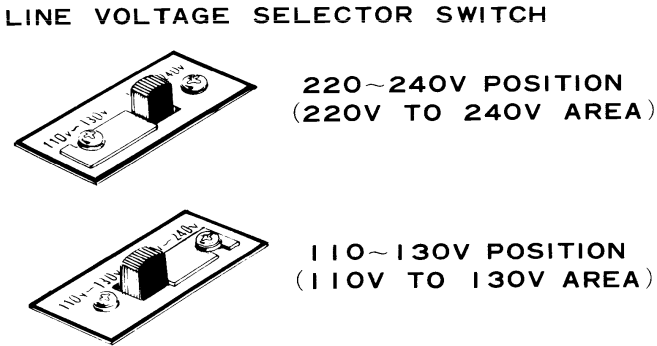


Fig. 7

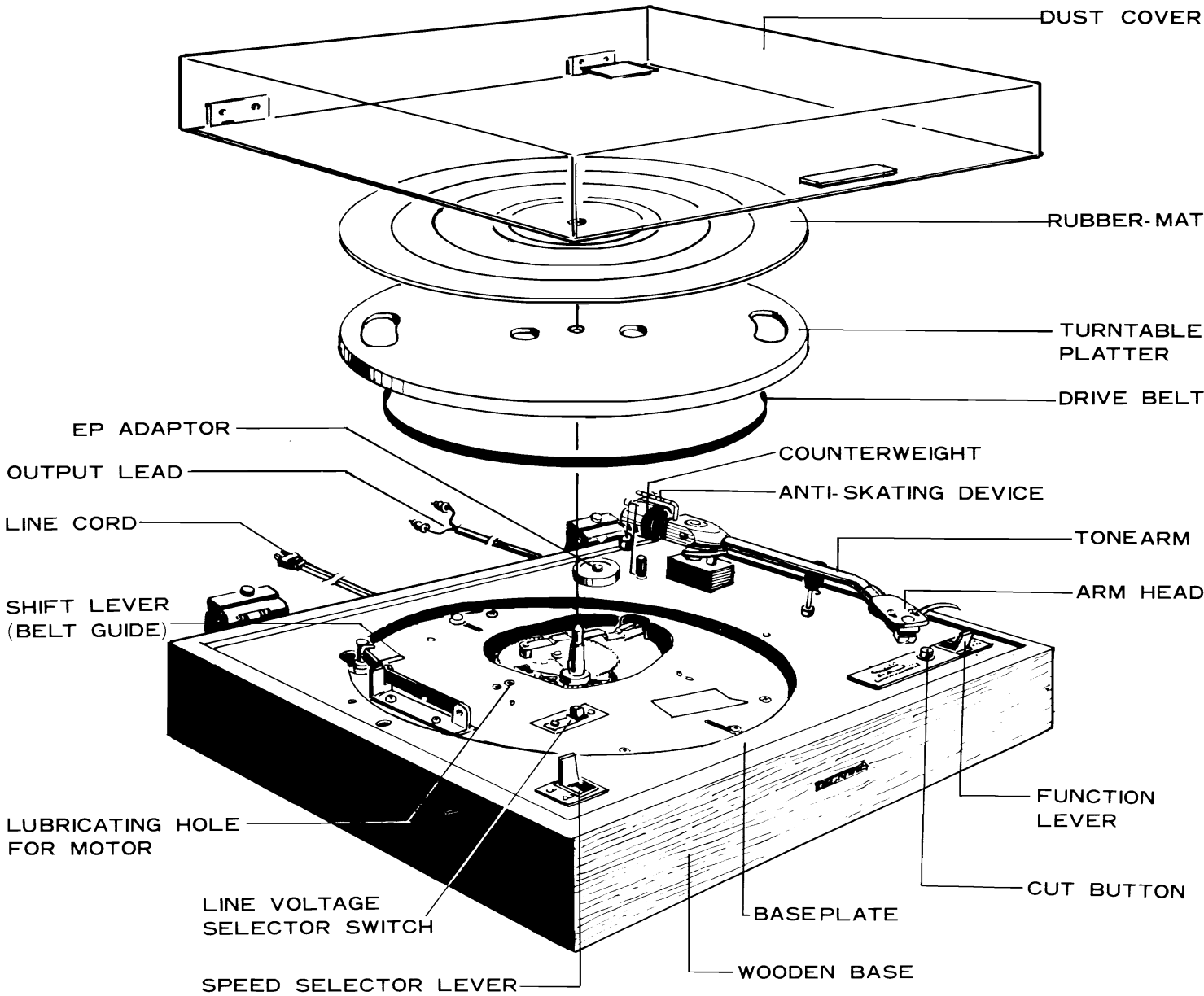
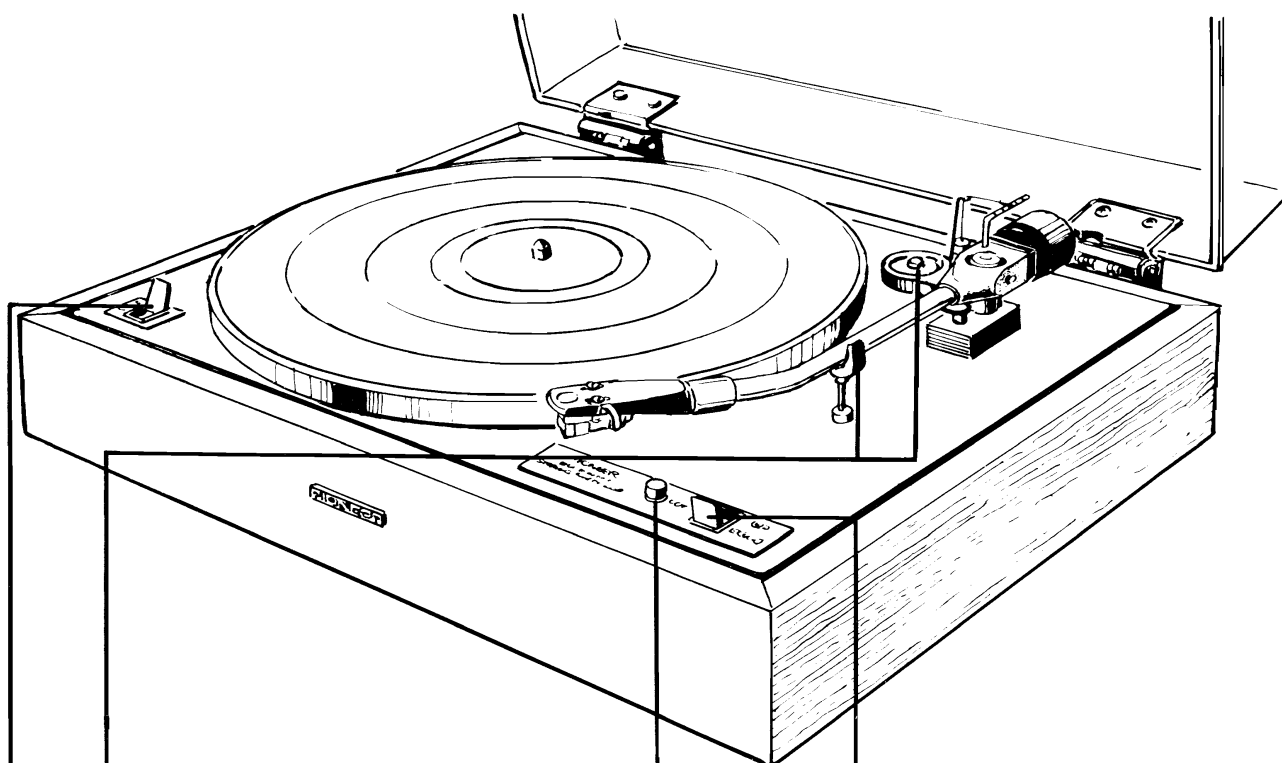


Fig. 8

3. OPERATION



ARM REST AND EP ADAPTOR

The arm rest supports the tonearm in place when the tonearm is not in use. An EP adaptor is supplied in the accessory group, which permits 45 rpm records to be fitted on the PL-15 platter shaft. When the adaptor is not in use, keep it on the stub located in the upper right of the baseplate.

SPEED SELECTOR LEVER

The PL-15 is two-speed model: 33-1/3 rpm and 45 rpm. Setting the lever to either speed position will automatically set the turntable for operation at that speed.

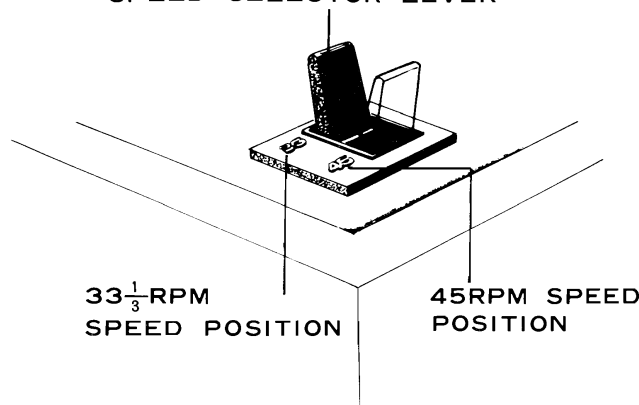
FUNCTION LEVER

This is a lever for controlling the movement of the tonearm. Setting the lever to "DOWN" will quietly put the arm head down on the record, and setting it to "UP" will raise the arm head from the record. This is a convenient device for cueing in any portion of the record without fear of scratching the record surface.

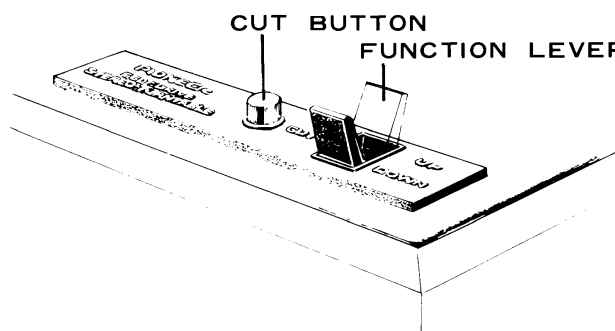
CUT BUTTON

With the button pressed to stop record playing temporarily, the tonearm returns onto the arm rest automatically, and then the power is cut off.

SPEED SELECTOR LEVER



CUT BUTTON FUNCTION LEVER



4. MOTION

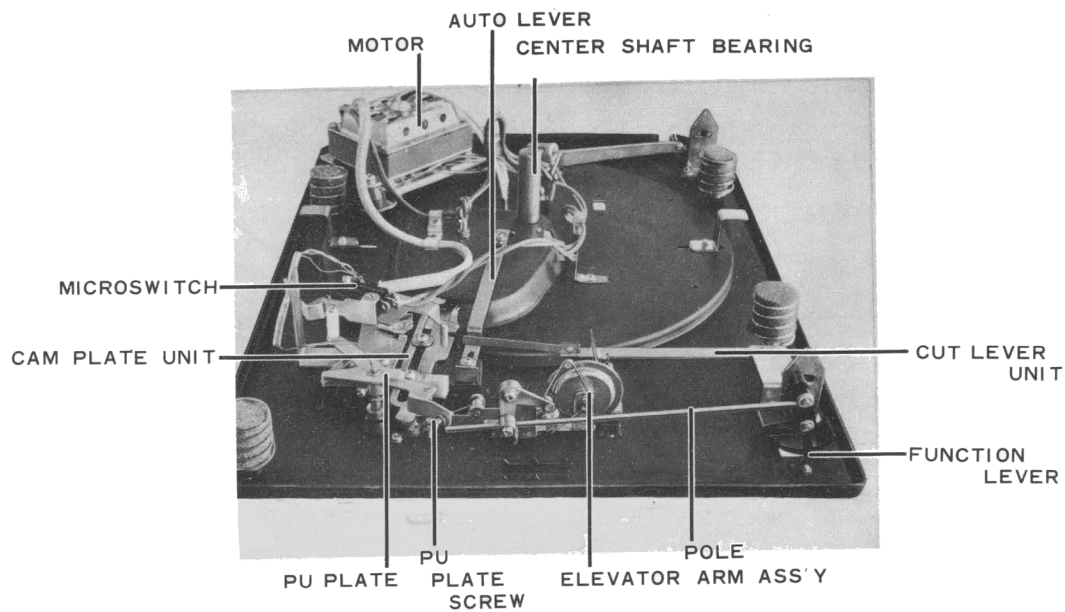


Photo 1

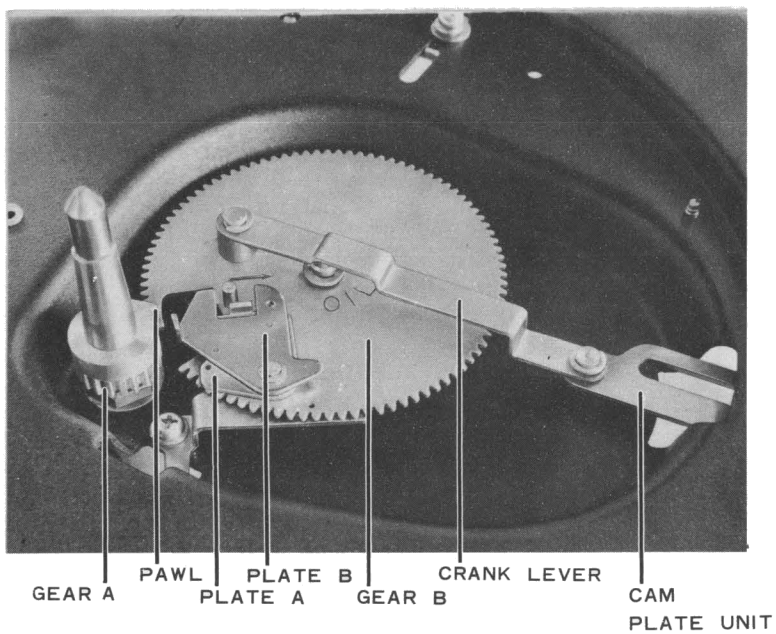


Photo 2

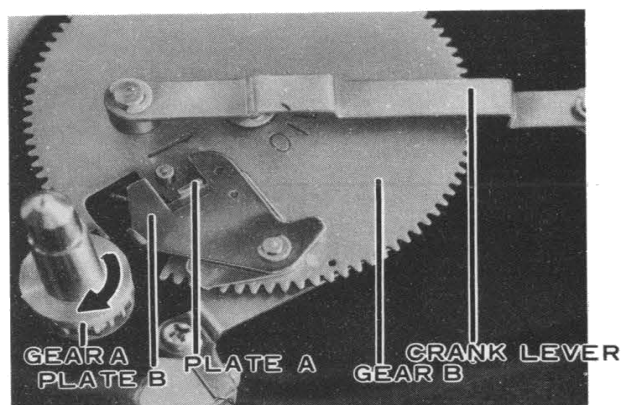
I. TONEARM: FROM STARTING TO RIDING IN THE CUEING GROOVE

1. With the function lever positioned to "UP", move the tonearm by hand toward the record. The PU PLATE assembly connected at the bottom of the ELEVATION SHAFT turns the MICROSWITCH to "ON" (the turntable platter starts revolving).
2. If the function lever is brought to "DOWN" now, the tonearm will lower onto the record face by the action of the elevator arm which goes down by means of oil damp.

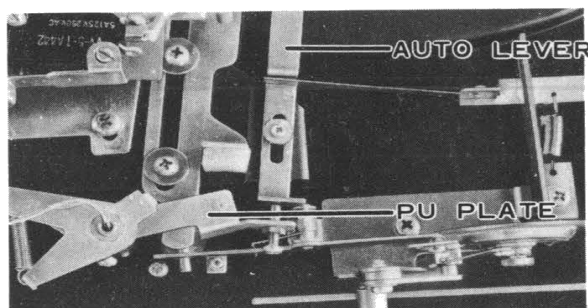
Note: If the function lever is kept at "DOWN" position thereafter, the tonearm will remain at the height of the playing position even if it is returned to the arm rest by the action of automatic tonearm return mechanism.

II. AUTOMATIC RETURN TONEARM MECHANISM

1. The GEAR A is fixed to the turntable shaft and therefore revolves with the shaft. When the record is coming to its end of play, the SCREW at the end of the PU PLATE assembly starts pushing the AUTO LEVER. (Photos 3, 4)
2. The AUTO LEVER then pushes the PLATE A which is located below the PLATE B. With the move of the PLATE A, the PLATE B is also moved toward the GEAR A by the frictional force between the PLATE A and PLATE B. The moment the PLATE B touches the GEAR A, the pawl of the GEAR A hits the PLATE B back to the position where it was before moved toward the GEAR A. This action is repeated several times thereafter (this repetition is due to the difference to the groove arrangement of the 30 cm LP record and 45 rpm record).
3. When the record has finished, the tonearm moves toward the center shaft with a large pitch. With this movement of the tonearm, the AUTO LEVER also makes a large movement and pushes the PLATE A with a large force.



AUTOMATIC RETURN 1 Photo 3



AUTOMATIC RETURN 2 Photo 4

4. With the movement of the PLATE A, the PLATE B also makes a large movement and catches the pawl of the GEAR A. Then, the pawl of the GEAR A kicks the GEAR B, causing it to turn counterclockwise slightly. The GEAR B then engages the GEAR A completely and starts turning counterclockwise slowly. (Photo 6)
5. With the turn of the GEAR B, the CRANK LEVER jointed to the GEAR B moves forward. With the move of the CRANK LEVER, the SLOPE PLATE provided at the end of the CRANK LEVER also moves forward, pushing up the ELEVATION PIN located at the bottom of the ELEVATION SHAFT. When the ELEVATION PIN is pushed up by the SLOPE PLATE, the tonearm is raised off the record face, and the return cushion pushes the PU PLATE, allowing the tonearm to return to the arm rest. (Photo 7)

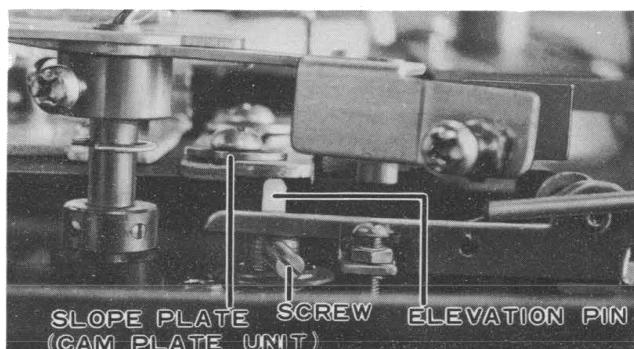


Photo 7

6. When the GEAR B makes one complete turn by the action of the CRANK LEVER, the SLOPE PLATE moves back and stays at the position where it was before moved by the turn of the GEAR B first. The PLATE A and PLATE B also return to their initial positions when the GEAR B completes its full turn.
7. The moment the tonearm returns to the arm rest, the PU PLATE assembly moves and turns the MICROSWITCH off, shutting off power to the motor and thus the turntable platter will come to a halt.

III. AUTOMATIC CUT OPERATION

With the auto cut button depressed, the PLATE SPRING fixed at the end of the CUT LEVER pushes the AUTO LEVER, causing the GEAR B to engage the GEAR A. The operation thereafter is the same as described in "AUTOMATIC TONEARM RETURN MECHANISM".

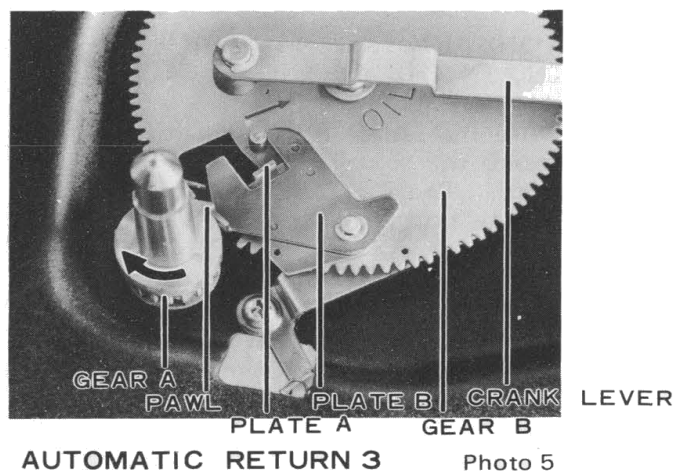


Photo 5

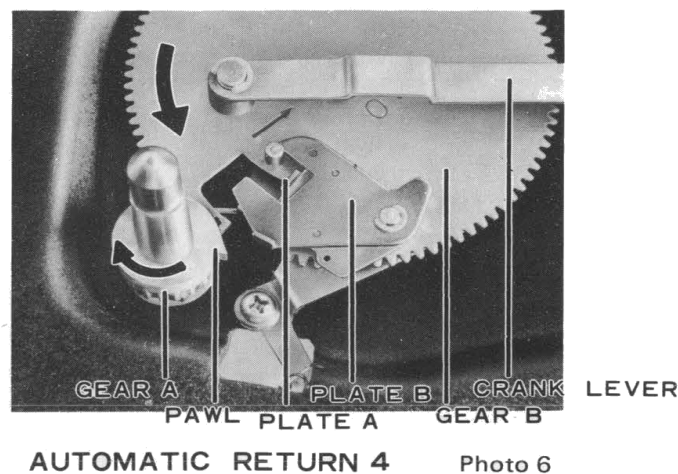


Photo 6

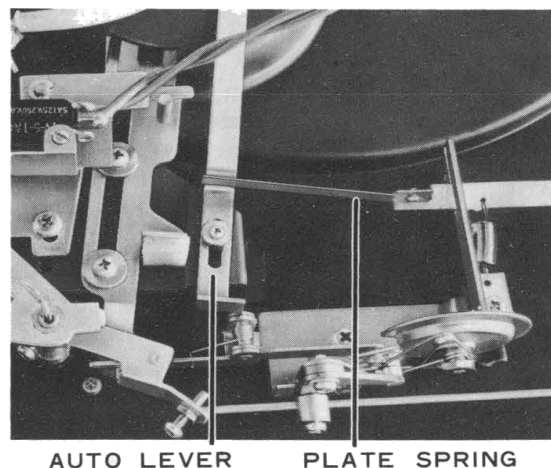


Photo 8

5. TROUBLESHOOTING

Symptoms	Possible Cause	Remedies
Turntable platter does not revolve.	a. Drive belt is not set. b. LINE CORD is not plugged in service outlet. c. Coils of the motor or the lead wires from the MICROSWITCH are open. d. The MICROSWITCH is defective.	a. Set the drive belt. b. Plug the cord in service outlet. c. Replace the motor or lead wires. d. Replace the MICROSWITCH.
Tonearm does not return automatically even when the record has finished.	a. The position of the AUTO LEVER is not properly adjusted. b. The pawl of the GEAR A is worn out.	a. See page 10, III. b. Replace the GEAR A.
Tonearm makes automatic return without lifting itself off the record face.	a. Adjustment of the ELEVATION SHAFT is not correct.	a. See page 10, I.
The stylus does not trace the groove smoothly.	a. Dust is stuck on the stylus. b. The stylus is damaged. c. The stylus pressure is not proper. d. AUTO LEVER does not move smoothly. e. PLATE A and PLATE B do not move smoothly.	a. Clean the stylus. b. Replace the stylus. c. Adjust the stylus pressure. d. Clean the sliding joint of the LEVER. e. Replace both plates.
No sound is reproduced through the speaker.	a. Cartridge is defective. b. Wires from the tonearm are open. c. Trouble in amplifier. d. Misoperation of amplifier.	a. Replace the cartridge. b. Connect the wires as necessary. c. Check the amplifier for trouble source and repair if any. d. Check the amplifier for correctness of wirings.
Tonearm does not return with the auto cut button depressed.	a. Joint connecting the PLATE SPRING with the PU PLATE assembly is loosened.	a. Secure the joint completely.
The turntable platter does not revolve at a rated speed.	a. Capstan is not proper to the line frequency. b. Capstan, drive belt, platter, etc., slipping. c. Capstan is not secure properly.	a. Use the correct capstan for the line frequency. b. Clean and remove dirt and dust from these parts. c. See page 11, IV.
Tonearm is in the arm rest, but the turntable platter keeps revolving.	a. The MICROSWITCH does not turn off. b. The MICROSWITCH itself is defective.	a. See page 10, II. b. Replace the MICROSWITCH.

6. ADJUSTMENTS

I. ADJUSTMENT OF THE ELEVATION SHAFT

Remove the turntable platter and turn the GEAR B counterclockwise by hand so that the ELEVATION PIN touches the slope of the SLOPE PLATE. Then, adjust the ELEVATION SHAFT and PIN in such a manner that there is about 50 mm clearance between the tip of the screw and the base panel. After making this adjustment, secure the ELEVATION PIN with the screw provided on the ELEVATION SHAFT. (Photo 9)

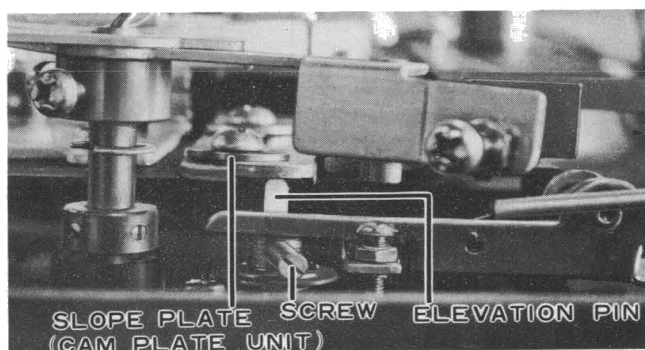


Photo 9

II. ADJUSTMENT OF THE POSITION OF THE MICROSWITCH

With the tonearm positioned correctly in the arm rest, the PU PLATE should be arranged in such a manner that it is level with the panel as shown in Photo 10., and also the MICROSWITCH should be secured with the M4 x 8 tapping screw (shown with * mark in the Photo 12) in such a manner that the switch is turned off with the tonearm in the arm rest. If the UP PLATE is not properly adjusted with respect to the position of the MICROSWITCH, the MICROSWITCH will not be turned off, allowing the turntable platter to keep revolving, regardless of the position of the tonearm. (Photos 10, 11, 12).

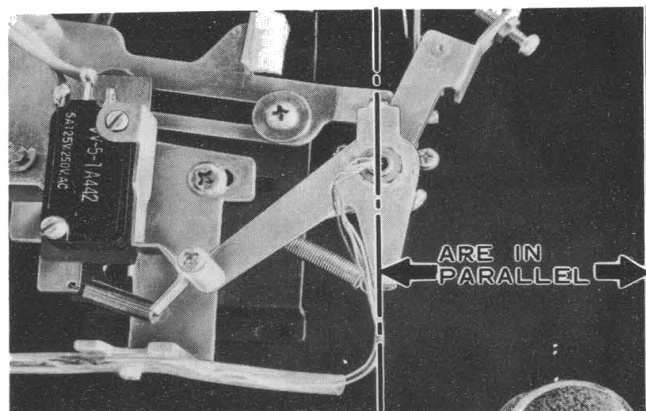


Photo 10

III. ADJUSTMENT OF AUTOMATIC TONE-ARM RETURN MECHANISM

Adjust the automatic tonearm return mechanism by turning the screw provided at the tip of the PU PLATE in such a manner that the tonearm should start returning action when the stylus traces the groove at more than 4 mm pitch at the point 122ϕ ($2\sim 3\phi$) diameter from the center shaft. The tonearm should always start returning action when the stylus reaches the point 88ϕ from the center shaft. (Photo 13)

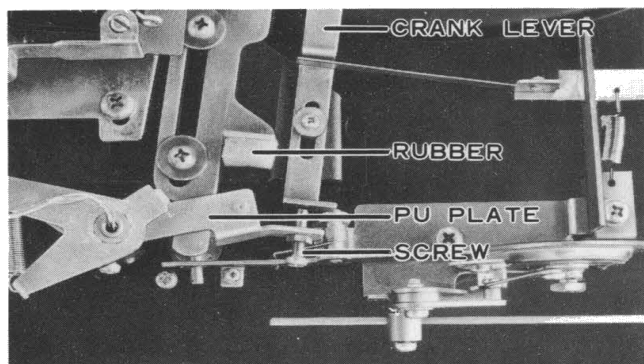


Photo 13

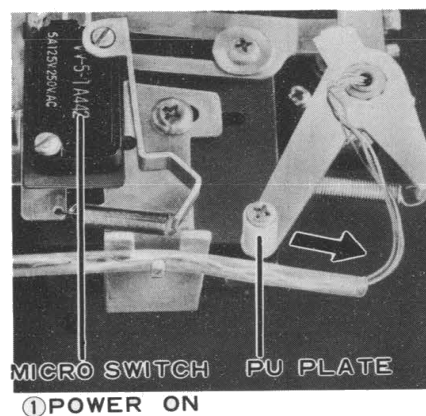


Photo 11

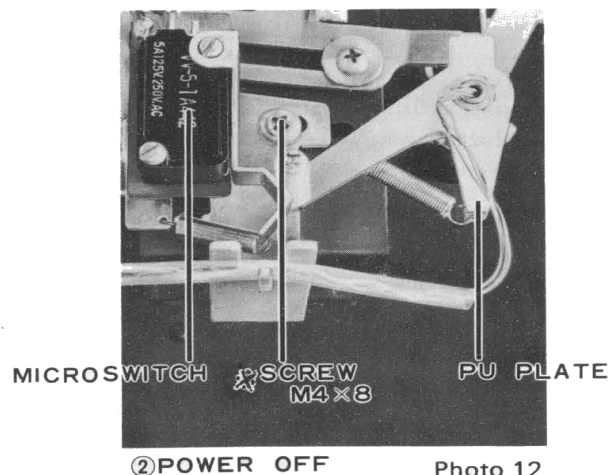


Photo 12

IV. ADJUSTMENT OF THE HEIGHT FOR THE CAPSTAN

Secure the capstan with small setscrews provided on the side of the capstan. Tighten the screws with a small screwdriver. When securing the capstan, make sure that the height of the capstan should be as such that the drive belt comes in the center of the shift lever guide, the guide and section of each speed. The section with a larger diameter is for 50-Hz operation and the section with a smaller diameter with a groove is for 60-Hz operation. (Photo 14)

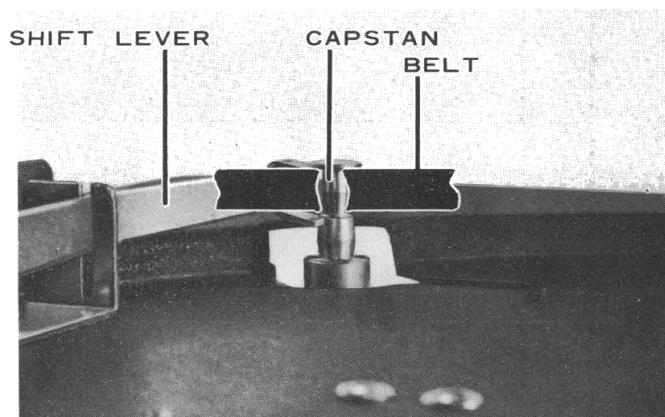


Photo 14

V. ADJUSTMENT OF HEIGHT FOR THE TONEARM

If the tonearm goes too high when the function lever is positioned to "UP", or if it goes down but does not touch the record face when the function lever is positioned to "DOWN" adjust the height of the ELEVATOR ARM by means of the screw shown in the Photograph 15. Turn the screw clockwise to increase the height, and turn the screw counterclockwise to decrease the height. When the height of the ELEVATOR ARM is properly adjusted, secure the screw by turning the nut clockwise. (Photo 15)

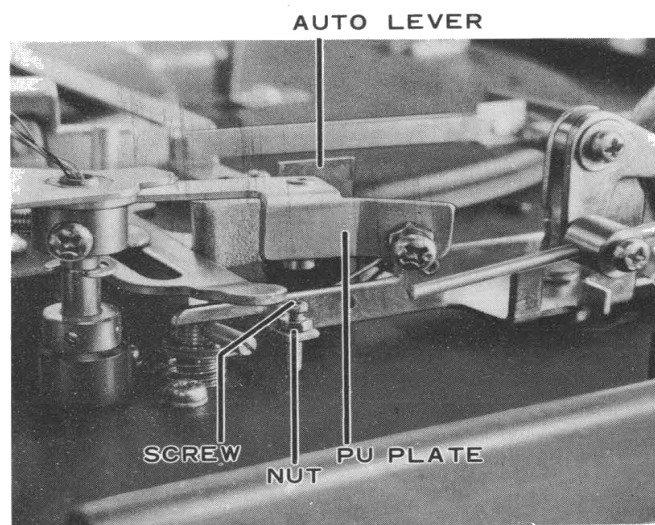


Photo 15

VI. ADJUSTMENT OF THE HINGES FOR DUST COVER

The spring incorporated in each of the hinges of the dust cover is properly adjusted so that the dust cover can remain open at an angle of 30° to 60°. If, however, the dust cover does not remain open at the above-mentioned angle, make an adjustment of the spring in each hinge. With the adjusting screw on the hinge turned clockwise, the tension of spring decreases and with the screw turned counterclockwise, the tension of the spring increases (Photo 16).

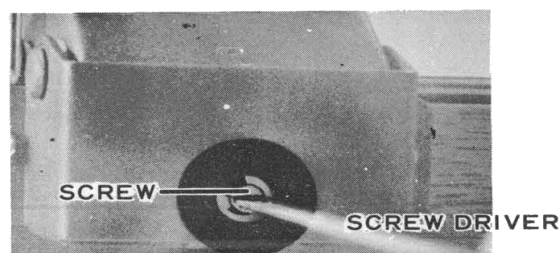


Photo 16

7. EXPLOSION PARTS LIST

KEY NO.	Description	Part No.
1	Center ring plate	A61-602-A
2	Rubber mat	E31-606-B
3	Turntable platter	N21-005-B
4	Belt	N28-612-D
5	Center shaft	N22-001-0
6	Hexagon nut for center shaft	B71-656-0
7	Flat washer for center shaft	B22-650-0
8	Center shaft bearing	N23-614-A
9	Flat washer 3 ϕ	
10	⊕ M3 x 5 Machine screw	
11	⊕ M3 x 6 Tapping screw	
12	Speed selector angle	N61-013-0
13	Speed selector lever unit	W72-006-C
14	Selector lever washer	N51-794-0
15	Spring washer 3 ϕ	
16	⊕ M3 x 6 Machine screw	
17	Speed selector nameplate	A41-024-D
18	Spring washer 2.6 ϕ	
19	Nut M2.6	
20	Printed circuit board	KNP-003-0
21	⊕ M3 x 6 Machine screw	
22	⊕ M4 x 10 Machine screw	
23	Spring washer 4 ϕ	
24	Flat washer 4 ϕ	
25	Angle	N61-063-A
26	Spring	B31-711-A
27		
28	Rubber grommet	E33-625-0
29	Cable fixed	N93-023-0
30	⊕ M4 x 8 Tapping screw	

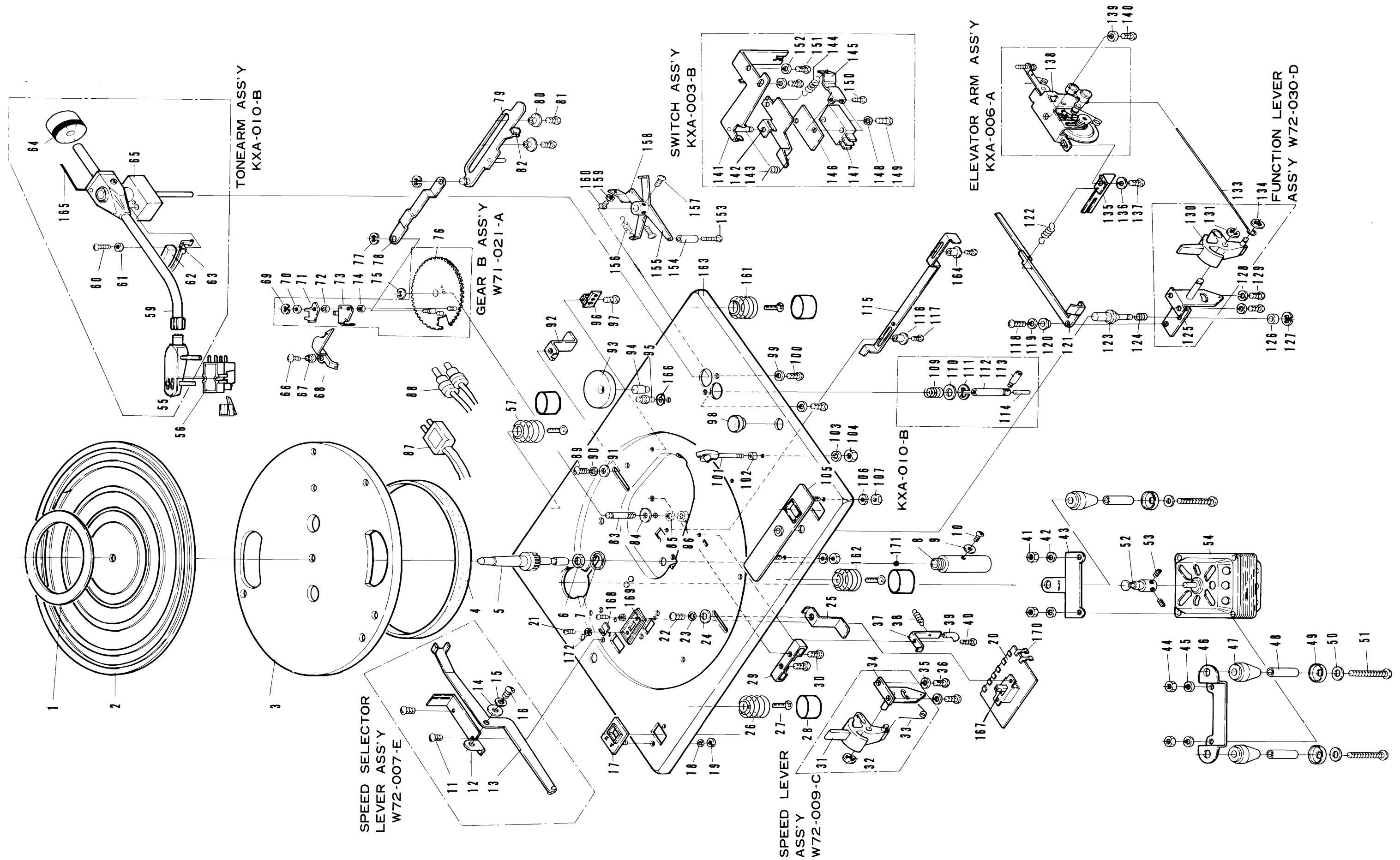
KEY NO.	Description	Part No.
31	Speed selector	N93-002-A
32	Retaining washer E-type (E-3)	
33	Spring	B31-009-B
34	Speed selector unit	W72-008-0
35	Spring washer 4 ϕ	
36	⊕ M4 x 6 Machine screw	
37	Sub-plate	N61-019-A
38	Spring	B31-617-0
39	Cover	
40	⊕ M3 x 6 Tapping screw	
41	Nut M4	
42	Spring washer 4 ϕ	
43	Motor panel (A)	N61-057-A
44	Nut M4	
45	Spring washer 4 ϕ	
46	Motor panel (B)	N61-058-A
47	Anti vibration rubber grommet	E31-605-A
48	Spacing post	N54-050-A
49	Tray type washer	N61-639-0
50	Spring washer 4 ϕ	
51	⊕ M4 x 30 Machine screw	
52	Capstan 50Hz 60Hz	N24-003-F N24-004-F
53	Set screw	
54	Motor	N11-006-C
55	Arm head unit	P21-613-B
56	Cartridge (PC-11)	
57	Spring (C)	B31-711-A
58		
59	Tonearm ass'y	KXA-010-C
60	⊕ M2.6 x 6 Machine screw	

KEY NO.	Description	Part No.
91	Flat washer 4 ϕ	N61-063-A
92	Angle	N93-603-A
93	EP-adaptor	N93-007-0
94	Adaptor catch	B11-042-A
95	Bar (A) fixed	
96	Terminal strip lug-type 1L2P	K13-601-0
97	⊕ M3 x 6 Tapping screw	
98	Rubber grommet (B)	E31-744-0
99	Spring washer 3 ϕ	
100	⊕ M3 x 8 Machine screw	
101	Arm rest	KXA-012-0
102	Arm rest base	KLA-010-0
103	Spring washer 2.6 ϕ	
104	Nut M2.6	
105	Nameplate	A41-029-D
106	Spring washer 2.6 ϕ	
107	Nut M2.6	
108		
109	Spring	B31-645-A
110	Washer (M)	B22-612-0
111	Retaining washer E-type (E-3.8)	
112	Shaft	N51-624-A
113	Screw	B11-646-0
114	Pin	N92-602-0
115	Auto lever	KNA-035-A
116	Shaft	B21-015-0
117	⊕ M2.6 x 10 Machine screw	
118	⊕ M3 x 6 Machine screw	
119	Spring washer 3 ϕ	
120	Shaft	N51-615-0

KEY NO.	Description	Part No.
61	Spring washer 2.6 ϕ	N93-034-0
62	Elevator arm cover	N61-066-0
63	Elevator arm	W73-013-B
64	Counter weight	KXA-009-0
65	Tonearm holder ass'y	
66	⊕ M3 x 6 Tapping screw	
67	Shaft	N51-044-0
68	OFF lever (set lever)	KHA-024-A
69	Retaining washer E-type (E-2)	
70	Washer (D)	B22-615-0
71	Plate B	N61-643-C
72	Washer teflon	B23-606-0
73	Plate A	N61-644-D
74	Washer teflon	B23-606-0
75	Retaining washer E-type (E-3.8)	
76	Gear B	W71-020-A
77	Retaining washer E-type (E-3)	
78	Crank lever	N61-044-B
79	Cam plate unit	W72-025-C
80	Shaft	N51-615-0
81	⊕ M3 x 10 Tapping screw	
82	Rubber	E33-602-A
83	Shaft	N54-623-A
84	Washer (G)	B22-609-0
85	Spring washer 4 ϕ	
86	Nut M4	
87	Power cable	D11-003-E
88	Output cable	D54-015-0
89	⊕ M4 x 10 Machine screw	
90	Spring washer 4 ϕ	

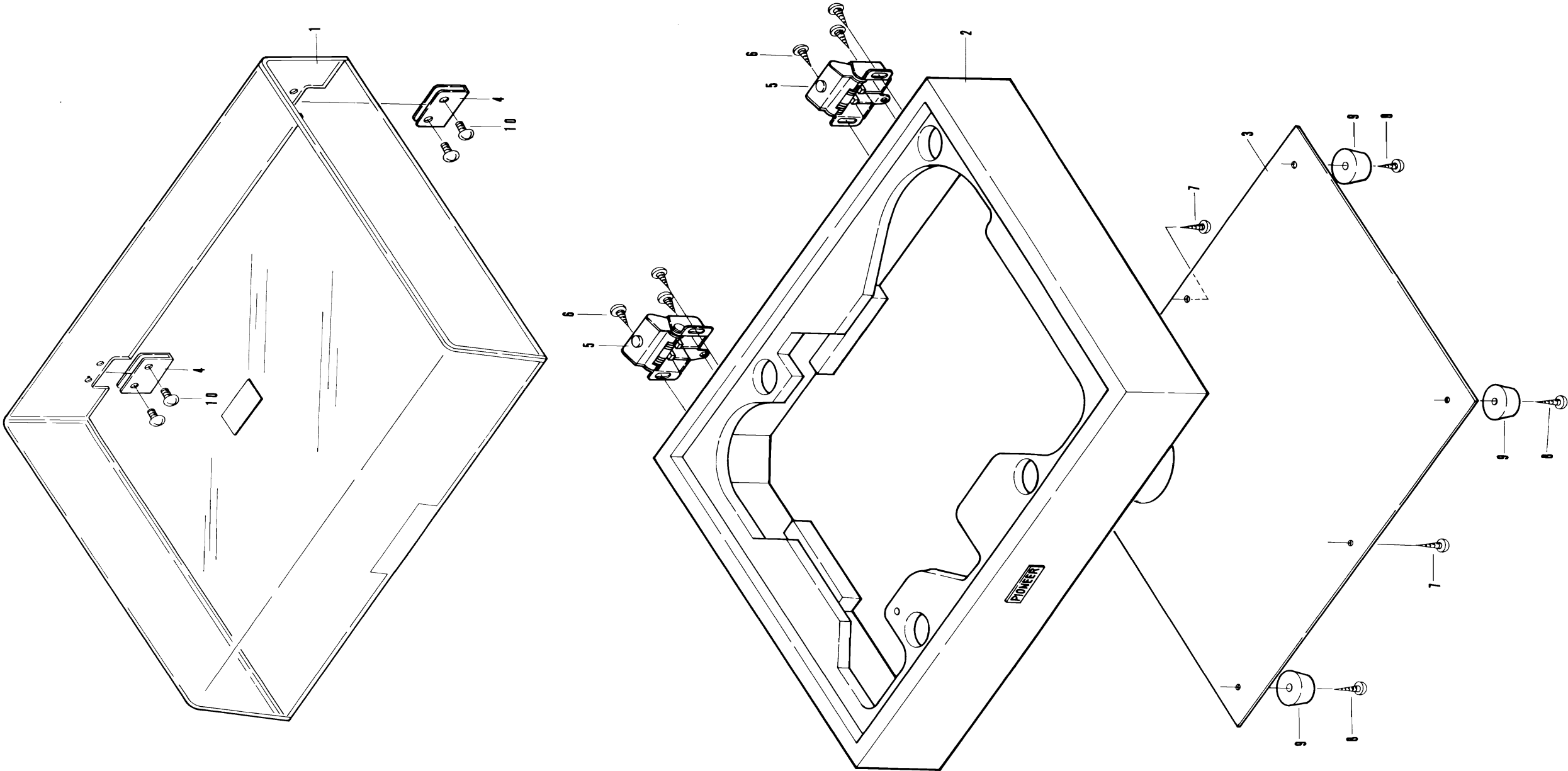
KEY NO.	Description	Part No.
121	Cut lever unit	W72-028-B
122	Spring	B31-020-C
123	Cut knob unit	W73-012-0
124	Spring	B31-021-A
125	Function lever angle unit (B)	W72-023-B
126	Washer (rubber)	B23-603-0
127	Retaining washer E-type (E-3)	
128	Spring washer 4 ϕ	
129	⊕ M4 x 6 Machine screw	
130	Function lever	N93-002-A
131	Retaining washer E-type (E-3)	
132		
133	Pole	KNA-029-0
134	Retaining washer E-type (E-3)	
135	Cut lever guide	N61-053-0
136	Spring washer 4 ϕ	
137	⊕ M4 x 6 Machine screw	
138	Elevator arm ass'y	KXA-006-0
139	Spring washer 4 ϕ	
140	⊕ M4 x 6 Machine screw	
141	Switch angle unit	W72-089-B
142	Panel	N61-100-B
143	Spring	B31-047-B
144	Spring	
145	Plate	KNA-016-0
146	Insulator	E32-072-0
147	Microswitch	KSF-003-0
148	Spring washer 2.6 ϕ	
149	⊕ M2.6 x 16 Machine screw	
150	⊕ M2.6 x 16 Machine screw	

KEY NO.	Description	Part No.
151	⊕ M4 x 8 Machine screw	
152	Spring washer 4 ϕ	
153	⊕ M3 x 20 Machine screw	N93-072-C
154	Spacing post	W72-026-C
155	PU Plate unit	
156	PU plate spring	B31-621-0
157	⊕ M3 x 6 Machine screw	B11-037-0
158	PU plate unit	W71-015-0
159	Nut M3	
160	⊕ M3 x 10 Machine screw	
161	Spring (G)	B31-040-0
162	Spring (A)	B31-751-0
163	Main panel	M11-162-F
164	Shaft	N51-043-0
165	Bar (B)	N51-056-A
166	Washer teflon	KBF-001-A
167	Slide switch	S41-609-A
168	Plate	M46-687-0
169	Power nameplate	A42-607-0
170	Lug	KNA-036-0
171	Steel ball 1/8"	
172	Spring washer 3 ϕ	



17 8. BASE ASSEMBLY AND PARTS LIST

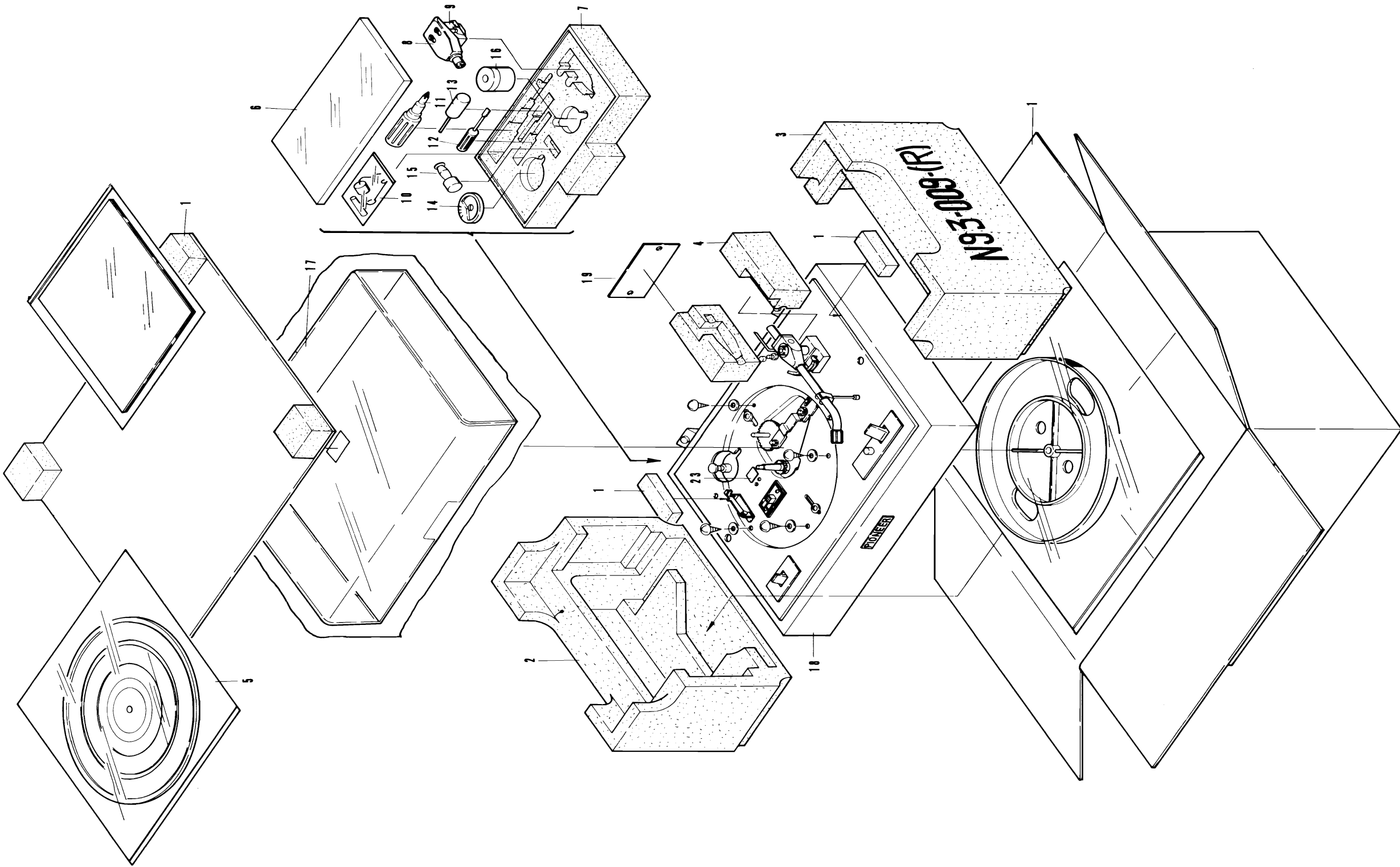
KEY NO.	Description	Part No.	
1	Dust cover	KEC-004-A	
2	Wooden base	KMM-002-B	
3	Bottom cover	M64-123-C	
4	Hinge ass'y	W72-079-0	
5	Hinge ass'y	W72-079-0	
6	⊕ 3.1 x 13 Wood screw		
7	⊕ 3.1 x 13 Wood screw		
8	⊕ 3.1 x 25 Wood screw		
9	Rubber foot		
10	⊕ M4 x 8 Machine screw	E31-147-0	



9. UNPACKING AND PARTS LIST

KEY NO.	Description	Part No.
1	Carton	KHK-013-A
2	Packing (L)	N93-068-C
3	Packing (R)	N93-069-C
4	Tonearm cover	H52-002-A
5	Rubber-mat fixed	H52-632-0
6	Miscellaneous box cover	KHX-004-A
7	Miscellaneous box	KHX-003-A
8	Arm head unit	P21-613-B
9	Cartridge (PC-11)	
10	Tonearm miscellaneous ass'y	KEA-003-0

11	⊕ Screwdriver	E11-123-A
12	⊖ Screwdriver	P25-607-0
13	Lubricator	N93-665-0
14	EP - adaptor	N93-603-A
15	Capstan 50Hz 60Hz	N24-003-F N24-004-F
16	Main weight	W73-013-B
17	Dust cover	KEC-044-0
18	PL-15/pv	
19	Nameplate	
20		KAL-008-0



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