

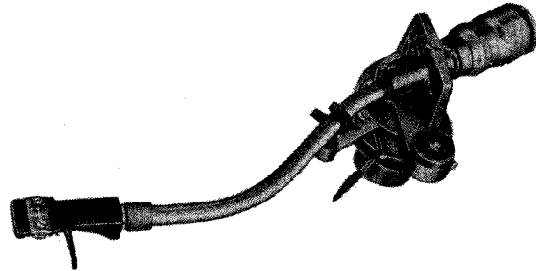
Service Manual

Universal Tonearm

EPA-100 (X)

Note:

The model EPA-100(X) is available in European, Scandinavia, Asia, Latin America, Oceania, Middle East and Africa.

**Specifications**

(Specifications are subject to change without notice for further improvement)

Type	Universal Tonearm with Variable Dynamic Damping system
Bearings	Gimbal-suspension system with shock-resistant pivot and coil spring, and highly precise ruby ball bearings (20)
Tubular tonearm	High-strength titanium tubular tonearm with special nitrification finish
Effective length	250 mm
Overall range	322—350 mm
Arm rear range	66—94 mm
Height adjustment range	42—90 mm (helicoid part: 6 mm)
Overhang	15 mm
Horizontal tracking error angle	+ 1.1° (internal perimeter of 30 cm record) + 2.1° (external perimeter of 30 cm record)
Friction	5 mg (horizontally and vertically)
Effective mass	22 g (at 6.5 g cartridge weight, 1.25 g stylus pressure)

Resonance frequency	9.8 Hz (at 6.5 g cartridge weight, 1.25 g stylus pressure, 12×10^{-6} cm/dyne compliance)
Resonance acute angle (Q)	6 dB or less (at optimum adjustment)

Damping adjustment range

Damping selector calibrations	Cartridge compliance (100 Hz dynamic)
4~5	more than 15×10^{-6} cm/dyne
2~4	$10 \sim 15 \times 10^{-6}$ cm/dyne
1~2	$5 \sim 10 \times 10^{-6}$ cm/dyne

Stylus pressure adjustment range	0—3 g
Head shell weight	9.5 g
Cartridge mounting dimensions	12.7 mm (1/2 inch) mounting space
Head shell terminal lug	1.2ø, for 4-pin terminal
Cartridge weight range	5—10 g
Arm installation opening	38 mmø

■ Parts identifications

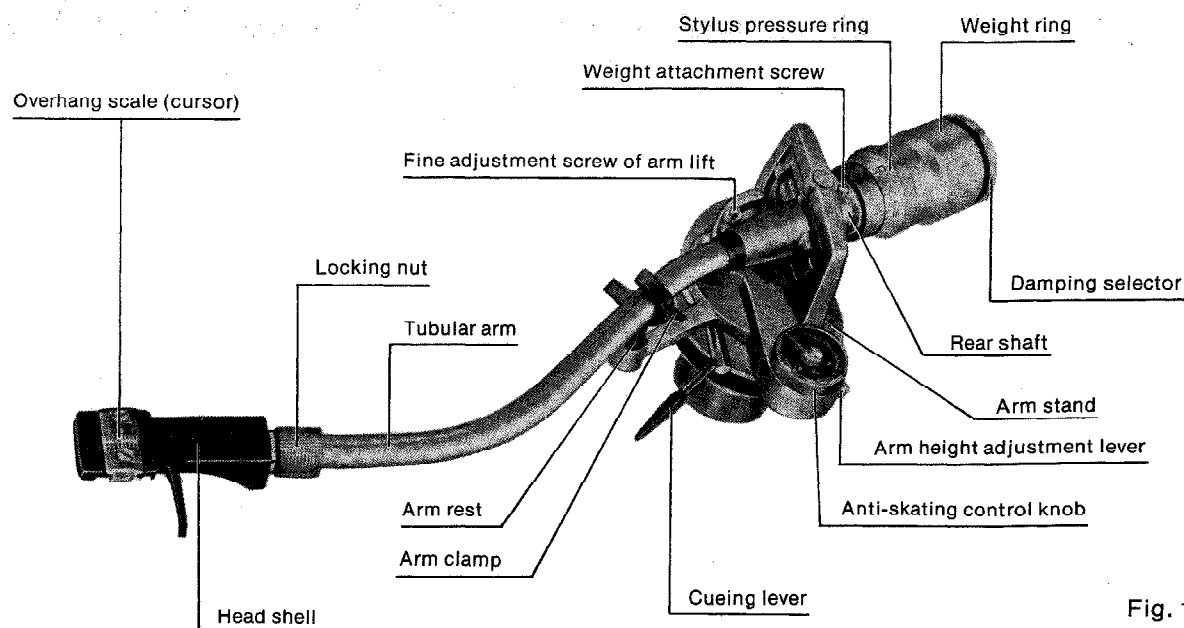


Fig. 1

■ Assembly and set-up

Installation of the balance weight

Place the balance weight onto the rear shaft of the tonearm, align the hole for the screw, and tighten the screw completely (Fig. 2).

Adjustment of the damping selector

This tonearm includes a unique magnetic damping selector which can be used to assure that the tonearm is perfectly matched to the compliance of the cartridge to be used.

The damping selector is calibrated in five positions, (1—5), and the position which corresponds to the compliance and weight of the cartridge should be aligned with the index mark on the balance weight. (Refer to the chart of Fig. 3 and see Fig. 4.)

The following are the standards of applicable calibrations depending upon the compliance of the cartridge to be used.

For precision, also refer to feature (1).

Damping selector calibrations	Cartridge compliance (100Hz dynamic)
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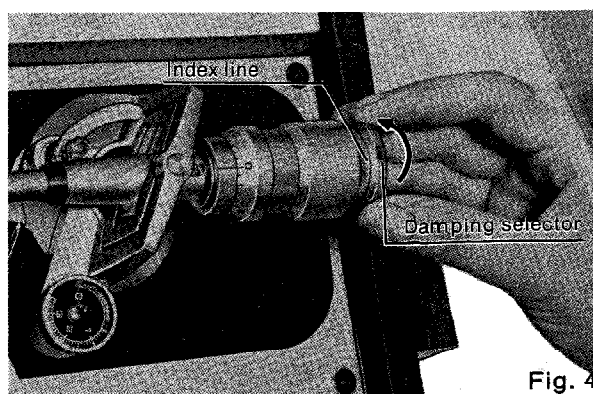
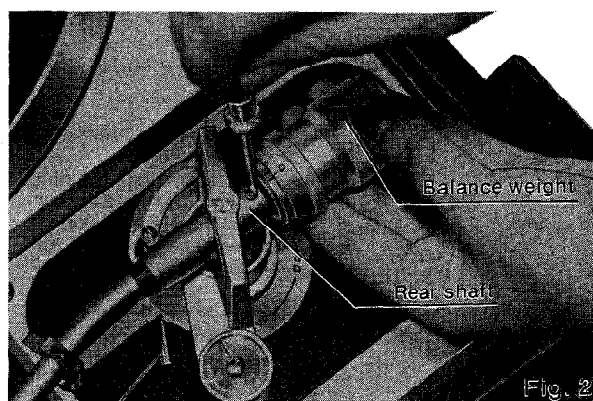
Fig. 3

Note that the damping selector position is continuously variable, and any position between the calibrations can therefore also be selected.

Note:

If the damping selector is rotated completely in the direction of the [1] mark, the movable weight inside the balance weight will become locked, and the tonearm can be used as an ordinary high-sensitivity tonearm, without dynamic damping.

When the unit is moved, be sure to rotate the damping selector completely to the [1] mark in order to lock and protect the internal structure of the balance weight.

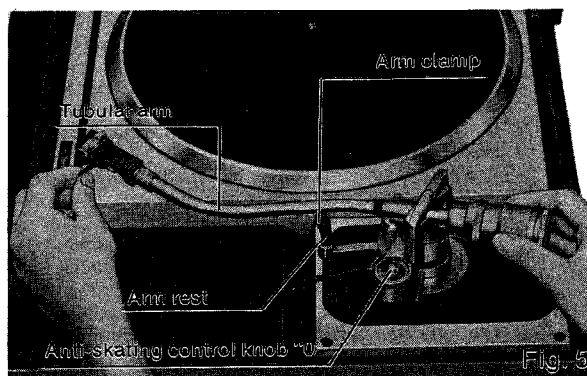


■ Adjustment of parts

1. Adjustment of the "0" balance

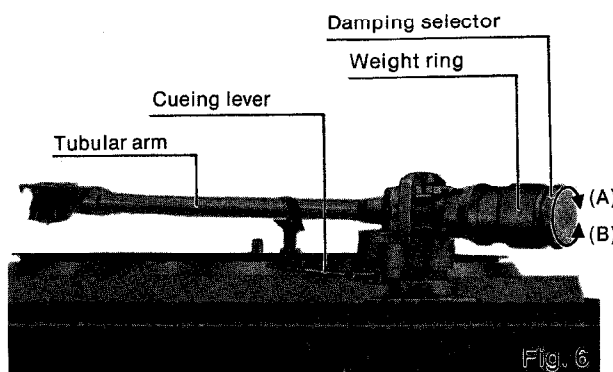
Before making the adjustment of horizontal balance, check the following points:

1. Check whether the cueing lever is in the down position or not.
2. Check whether the anti-skating control is set to the "0" position or not.
Although the tonearm may move very slightly to the left and right when the anti-skating control is set to the "0" position, this is because of the high sensitivity of the rotating part of the tonearm, and is no problem, because the lateral force is very small.
3. If the cartridge to be used has a removal cover, remove it.



2) Adjustment of horizontal (zero) balance and of stylus pressure

1. Remove the arm clamp, and move the tonearm away from the arm rest so that it is freely suspended (Fig. 5).
2. While turning the weight ring in direction "A" or "B" (as indicated by the arrows), adjust so that the tonearm is as horizontal as possible (Fig. 6). Do not touch the damping selector while making this adjustment.
3. After finishing the adjustment of the horizontal balance, return the tonearm to the arm rest, and secure it with the arm clamp.

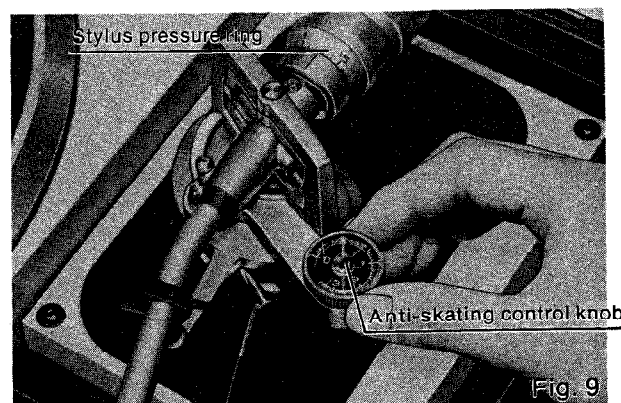
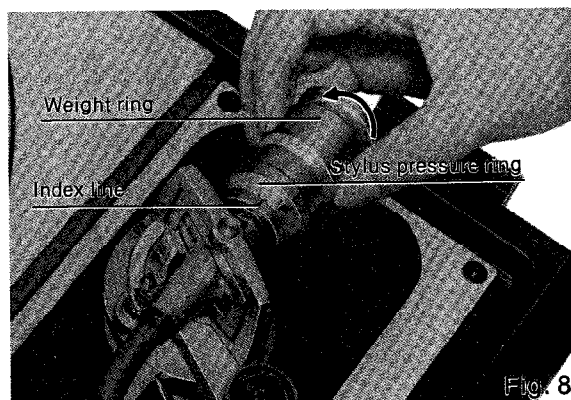
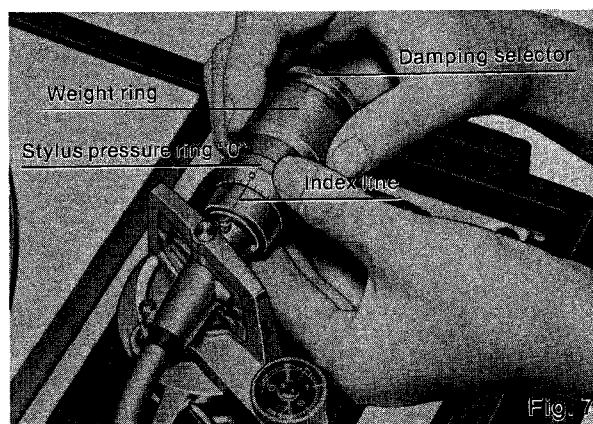


4. As shown in the figure, hold the weight ring with a finger so that it does not move, and turn only the stylus pressure ring so that the "0" indication of the ring is aligned with the index mark on the weight (Fig. 7).

Note:

When the horizontal balance is adjusted, be careful that the stylus tip of the cartridge does not touch the turntable mat or the turntable base.

5. Next turn the weight ring, and set it to the numerical value corresponding to the rated stylus pressure of the cartridge to be used (Fig. 8). Because the stylus pressure ring also moves when the weight ring is turned, the calibration can be read directly, thus making it easy to correctly adjust the stylus pressure.
6. Turn the anti-skating control, and set it to the same numerical value as the stylus pressure (Fig. 9).



3) Adjustment of arm height and confirmation of arm movement range

1. Place a record on the turntable, and, without rotating the turntable, gently place the stylus tip on the record.
2. While turning the arm height adjustment lever to the "DOWN" position, adjust the tubular arm until it is nearly parallel with the record surface. (See Fig. 10).

The arm height adjustment can be fine adjusted in 0.5mm steps over a range of 6mm.

Note:

If the fine adjustment of the correct height within the range can not be made, turn the fine adjustment height lever in the "UP" direction to "6," loosen the securing screws, and slightly raise the tonearm. Afterward, re-adjust the fine adjustment.

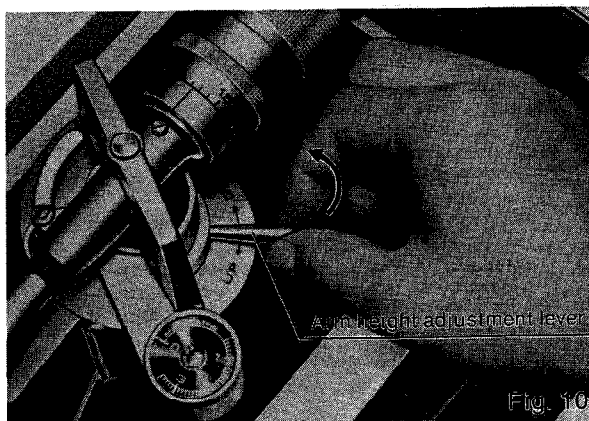


Fig. 10

4) Adjustment of arm lift distance

The arm lift distance (the space between the stylus tip and the record surface when the cueing lever is raised as shown in the figure) is most suitable at about 5~10mm. Adjust, if necessary, so that the distance will be within this range (Fig. 11).

1. Raise the cueing lever.
2. To make the adjustment, first loosen the lock nut and then turn the screw for fine adjustment of the arm lift (Fig. 12).

After adjustment, re-tighten the lock nut.

Clockwise

The distance between the stylus tip and the record surface will increase.

Counterclockwise

The distance between the stylus tip and the record surface will decrease.

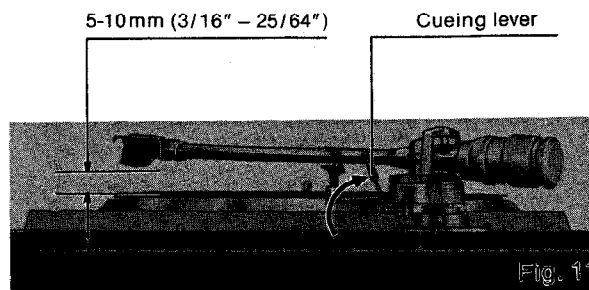


Fig. 11



Fig. 12

■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
MECHANICAL PARTS				
1	SFPCC10001K	Head Shell	1	○
1-1	SFPKS10001	Cursor	1	○
1-2	SFPEV10005	Screw	2	○
1-3	SFPEV7805	Screw	2	
1-4	SFPEW9601	Washer	4	
1-5	SFPEN9200	Nut	4	
2	SFPAM10001K	Tone Arm	1	○
3	SFPRT10001	Arm Lift	1	
3-1	XSS17-4BN	Screw	1	○
4	SFPRT10003K	Arm Rest	1	○
4-1	SFYBM30	Steel Ball	1	*○
4-2	SFSP10006	Spring, Arm Rest	1	○
4-3	XWA4BFM	Washer	1	○
4-4	SFPRT10004	Screw	1	○
5	SFPRT10001K	Lift Ass'y	1	○
6	SFPWG10001K	Balance Weight Ass'y	1	○
6-1	SFPEV10001	Screw	1	○
8	SFPKD10003K	Arm Stand	1	○
8-1	SFPEV10008K	Screw	2	○
8-2	SFPGM10002	Rubber, Arm Stand	2	○
8-3	SFPEW1001	Washer	1	○
8-4	SFPEN10003	Nut	1	○
9	SFPZB10106	Phono Cord	1	
ACCESSORY PARTS				
A1	SFPZB10005	Template	1	○
A2	SFPZB10004	Wrench	1	○
A3	SFPZB10006	Screwdriver	1	○
A4	SFPZB4500	Spacer	1	○
A5	SFPZB3501	Spacer	1	○
A6	SFPDS10002	Instruction Book	1	○
PACKING MATERIALS				
P1	SFPHH10002	Packing Case	1	○
P2	SFHH101-07	Pad, Top	1	○
P3	SFHH101-06	Pad, Bottom	1	○
P4	SFYF15A20	Polyethylene Cover	1	
P5	SFYF10A30	Polyethylene Cover	1	
P6	SFYF09B15	Polyethylene Cover	1	

■ EXPLODED VIEW OF UNIVERSAL TONEARM

