Clarion

SERVICE MANUAL

Closer Relations through "CLARION SERVICE MANUAL"

MODEL PE-827A

Fabricant: CLARION CO., LTD./ Exportations: CLARION SHOJI CO., LTD.
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■SPECIFICATIONS:

Reproduction system:	4 track, 2 program, 2 channel Stereo cassette tape player
Tape speed:	4.75cm/sec
Wow and flutter:	Less than 0.35% (WRMS)
Fast forward time:	Less than 90 seconds (C-60)
Output:	3.5W×2 (for 10% distortion) 5.5W×2 (for Max volume)
S/N ratio:	More than 40dB
Left-right crosstalk:	More than 30dB
Adjacent crosstalk:	More than 40dB
Reproduction frequency range:	50~10,000Hz
Load impedance:	4Ω(or 8Ω)×2
Power supply voltage:	DC 14V Negative ground
Current consumption:	Less than 2A
Semiconductors:	4 ICs
Weight:	1.16kg (2.56 lb)
Dimensions:	Width 140m/m Height 47m/m Depth 150m/m

■FEATURES:

●All monolithic IC

Since the amplifier is all IC, stable, faithful sound is reproduced.

●Simple design, thin cassette stereo

Since the basic is black design and operability is stressed, the harmony of the interior of the car is increased.

Since it has been made thin through a newly designed mechanism, it can be installed in any vehicle and does not take up any space even in under the dash installation.

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●FF mechanism with lock mechanism

Since an FF (fast forward) mechanism and lock mechanism are built-in, tape operation is uncomplicated.

(Lock can be released by lightly pressing the EJECT knob.)

●Auto-Eject Mechanism

Since CLARION original new design of mechanism employs an auto-eject device, pack automatically comes out and power is automatically cut off after completion of play and after FF.

■Brief description of the operation of auto eject mechanism (See Fig. 1)

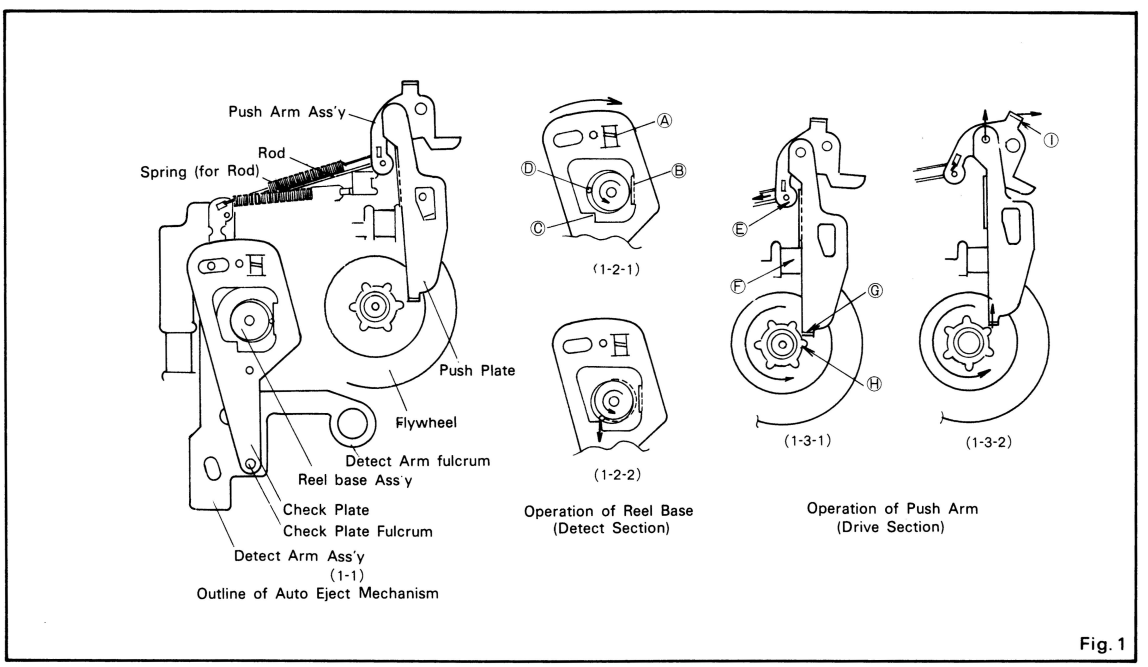


Fig. 1

[**Detector**]

Tape end is detected by the operation of the reel base and check plate.

1) While tape is running, the bent part (B) of the check plate is pushed against the eccentric cam of the reel base by the claw (A) of the reel base Ass'y. From the rotation of the eccentric cam the part (B) receives force that tends it to recede from the center of the reel base but by the force of the claw (A) it passes over the thickest part of the cam and moves along the cam (decreasing thickness) towards the center of the reel base. In this manner, by the force of the cam (B) and claw (A) the check plate performs swinging motion in synchronism with the motion of the cam and the claw (C) of the check plate is always away from the pin (D) of the reel base.

2) When tape end is reached and the rotation of the base of the reel base stops, the situation becomes as shown in Fig. 1-2-2. When rotation of the base stops, force of (A) disappears and motion is accomplished only by means of the cam. Therefore, the check plate is pushed up to the thickest position of the cam and stopped there. At this time, since (C) of the check plate is designed to come into rotating track of the pin (D) of the reel base, when the pin (D) comes rotating, the pin (D) strikes the claw (C). Here, since the pin (D) further tends to rotate, the claw (C) is pushed towards the direction of the arrow and the check plate as a whole moves towards the direction of the arrow.

■OPERATION AND ADJUSTMENT OF AUTO EJECT MECHANISM:

A purely mechanical mechanism with no electrical parts is employed.

This auto eject mechanism is the special feature of this mechanism.

An outline of the auto eject mechanism and adjusting procedure are given below.

3) Since the check plate is mounted to the detect arm, the detect arm also rotates pressed by the pin (D) together with the check plate.

4) Due to rotation of the detect arm the (rod arm use) spring and the rod arm mounted at the hole part of the end pull the push arm in the direction of the arrow (Fig. 1-3-1).

5) Since the push plate is pushed against the push arm (E) by means of the spring, it moves in the direction of the flywheel until it touches the section (F) of the rib of the sub deck. At this time, the push plate end (G) enters into the rotating track of the pin (H) at 6 places on the internal circumference of the flywheel.

[**Drive section**]

In the detect operation, the end claw (G) of the push plate remains in the state of tending to enter into the track and after that the lock is released by the rotation of the flywheel.

1) As regards the push plate, the claw (G) is pressed by the pin (H) of the flywheel and while being guided by the rib section (F) of the subdeck it moves in the direction of the arrow. (Fig.1-3-2)

2) At this time since the push plate is fixed to the push arm so that it can rotate, the push arm is rotated in the direction of the arrow as shown in Fig. 1-3-2. Due to this rotation the push arm gets released of the lock by means of the bent part end (I).
The above series of operations is performed in a few seconds from the end of tape and in this manner eject is securely accomplished.

■Adjustment of auto eject mechanism

As described in the brief description of operation, in order that the auto eject mechanism operate smoothly it is necessary that two things, namely the position of check plate and reel base and the position of push plate and flywheel, must be properly adjusted. The method of adjusting these two positions is described below.

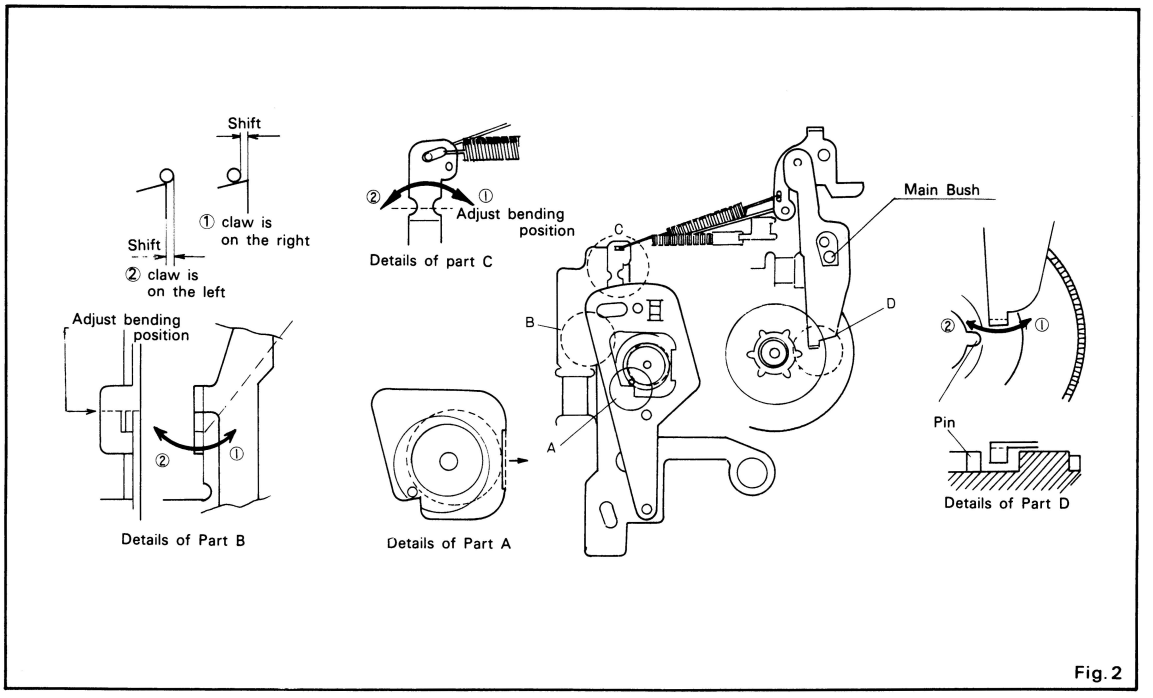


Fig. 2

1) Adjusting check plate

a) Check two positions, that is, the position of the pin of the reel base and that of the claw of the check plate when the check plate has moved fully towards the direction of the arrow (Dtails of part A).
by means of the eccentric cam of the reel base. (However, care must be taken at this time so that the check plate may not shift from the position to which it is moved by means of the cam.)

b) At this time if the end of the claw and the right side of the pin lie on the same line, there is no need of adjusting. If not, perform the following adjustment.

c) Since position is determined by stopping of the part (B) of the detect arm by means of the end of the subdeck, adjust by bending this.

1) When the claw of the check plate enters too much on the right side of the pin of the reel base
In this case bend the detect arm (B) in direction ①

2) When the position of the claw of the check plate falls short on the right side of the pin of the reel base
In this case bend the detect arm in direction ②

NOTE) When bent in direction ②, since the detect arm strikes the rod and adjustment is not possible, bend the part (C) also in direction ② (Details of part A.) at the same time.

d) After the adjustment check by the above procedure if the position of check plate and reel base has been properly adjusted or not.

2) Adjusting push plate

a) In order that the claw of the end (D) of the push plate be smoothly attracted towards the center of the pin of the flywheel by means of the detect arm it is necessary that the claw must lie almost in the center of the pin of the flywheel and the external circumference.

b) Position of the push plate is determined by being connected between the detect arm (C) by the spring. Therefore, the adjustment is performed by means of the detect arm (C).

1) When the push plate enters too much on the left and touches with the pin
In this case bend the detect arm (C) in direction ① so that it does not touch with the pin.

2) When the push plate is too much on the right and the bent part touches with the main bush and pushes the detect arm
In this case bend the detect arm (C) in direction ② so that a small gap remains between the push plate and the main bush.

NOTE) Due precaution must be taken not to deform other places while performing the above adjustment.

■ADJUSTING PROCEDURE:

■Head Azimuth Adjustment

For a recording tape, if head azimuth is not properly adjusted, quality of sound may deteriorate, crosstalk may be caused,etc.
If head azimuth is not proper, adjust according to the follwing procedure.

1. Play the test tape 333Hz−20VU (gain tape), keep the volume control at the maximum position and obtain left-right balance by means of the balance control or the left and right volume controls.

2. Next play the test tape 6.3KHz−10VU (azimuth tape) and adjust the head azimuth screw so that the output level becomes maximum.

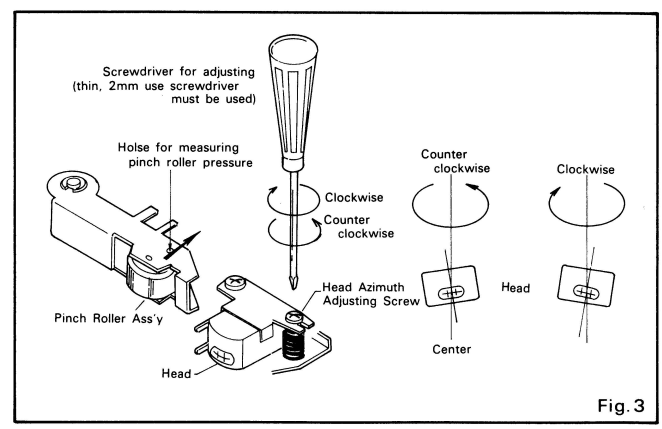


Fig.3

■Measuring Pinch Roller Pressure

If pinch roller pressure is improper, speed defect, wow and flutter, etc. may be caused. Measure the pinch roller pressure through the pinch roller measuring hole. If the pressure is not within 150~250g range, replace the spring (750-1775-00).

■Adjusting Gearing of FF Gear

When FF is accomplished by pressing the FF button, misengagement of gears at FF end may happen and auto eject may not be possible.

This may be caused by fatigued tension spring of the FF gear, worn or damaged gear of the reel base or FF gear, etc. When damaged or worn FF gear or reel base gear is the cause of trouble and is required to be replaced. Check and adjust gearing of the gears according to the following procedure. (See Fig.4)

1. Push the idler plate in the direction of the arrow and check gearing of the gears of the flywheel, reel base and FF gear. Now operate the motor.
   1) Motor does not stop even when pushed hard.
   2) Noise is produced and gears do not revolve smoothly.
   3) Gearing is insufficient.
   Check for the above phenomenon.

2. In the case of 1), check if teeth of the 3 gears are not scratched or deformed.
   If the gears are normal, since gearing is too hard, bend the Ⓐ adjusting stopper rib in the direction of ①.
   In the case of 2), check if the teeth are not abnormal. Adjust by bending the rib of stopper in the direction of ①.
   In the case of 3), check if the teeth are not abnormal. Adjust by bending the rib of stopper in the direction of ②.
   After bending, check that the Idler plate does not touch with guide pin, etc. and the motion is not unstable.

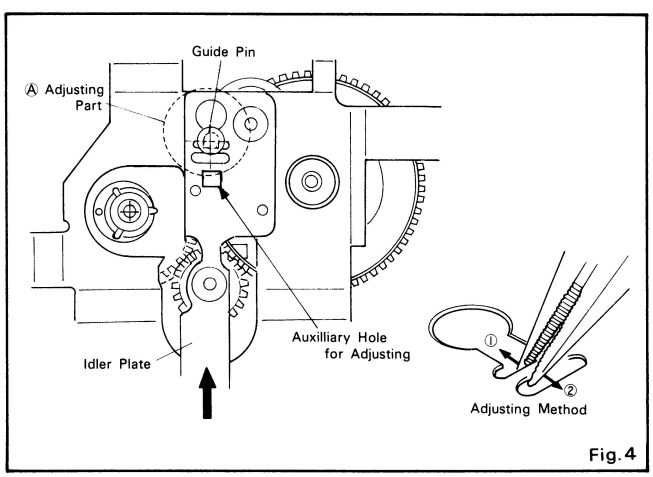


Fig.4

■Measurements Concerning Reel Base

Faulty take-up torque of reel base gives rise to Wow and flutter fault, auto eject fault, etc. Moreover, faulty turning torque of the claw (B) of friction arm of reel bace gives rise to faulty operation of the auto eject mechanism. Therefore, perform measurements concening the reel base according to the following procedures and replace the faulty parts.

1) Remove the check plate (A) from the reel base by removing the E-ring and the C-ring.

2. Next operate the motor and measure the take-up torque of the reel base with torque meter. At this time if the torque is not within 45g~75g range, replace.

3. Next measure the turning torque of the claw (B) of the friction arm.
   Attach a tension gauge to the claw (B) from the direction of the arrow and measure the load when the claw is separated from the end of the hole of the subdeck. At this time if the loads is found not to be in 3~13g range, replace.

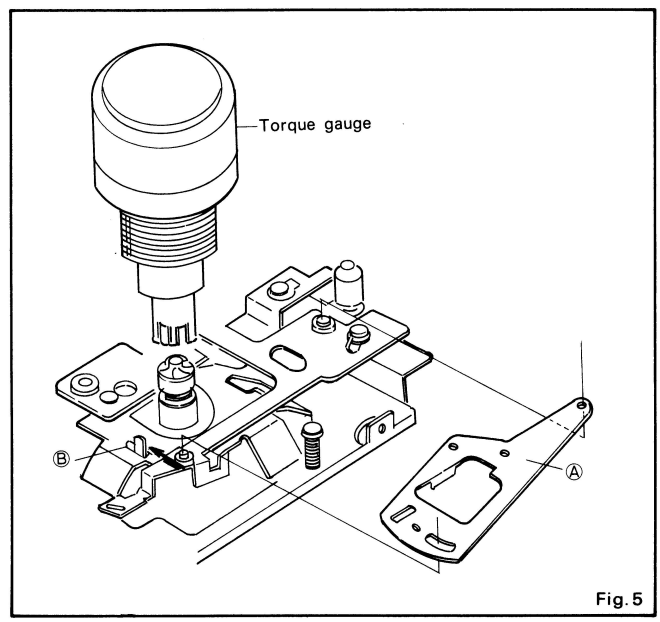


Fig.5

■Method of Replacing Motor

When replacing faulty motor, follow the procedure given below.

1. Disconnect the motor leads from the PWB using a soldering iron.
   Loosen the lead clamp and remove the leads.

2. Remove the 3 mounting screws of the motor.

3. Mount the replacement motor Ass'y (960-3063-00) with the 3 mounting screws.
   NOTE) 1. After replacing motor lock the screws with screw lock.
   2. As regards mounting screw, only the combination of sems screw (732-2603-11) or machine screw (714-2604-11) and lock washer (741-2600-21) must be used.

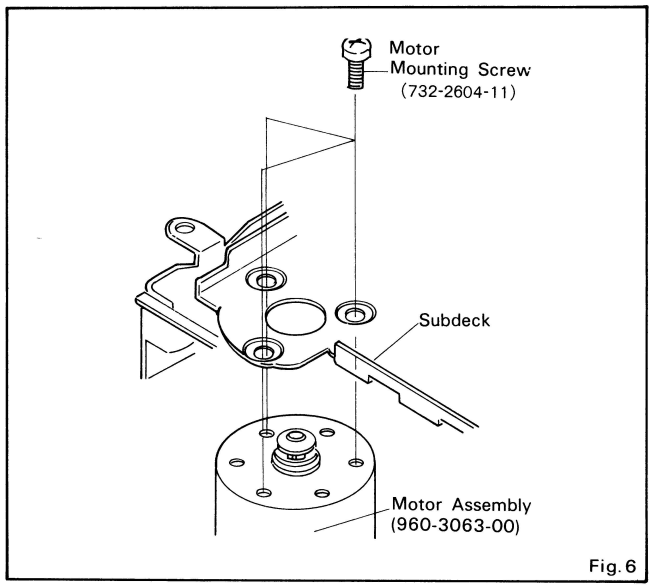


Fig. 6

■Adjusting Switch Arm

The switch arm is adjusted when the power switch does not turn on not because the switch is faulty but because the switch arm does not press the switch completely.
Perform the adjustment by bending the part (A) of the slide plate on which the switch arm is mounted so that the arm completely presses the switch. However, care must be taken at this time not to bend too much so that motion becomes bad due to rubbing of the arm and switch.

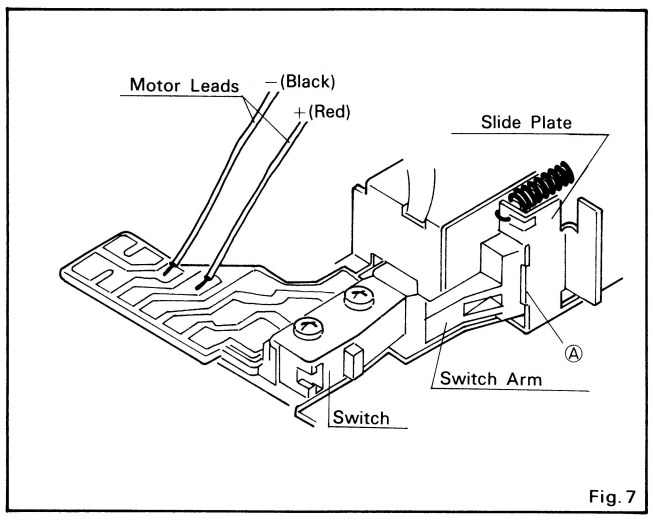


Fig. 7

■DISMOUNTING, MOUNTING MAIN PARTS:

A) Subdeck

[**Dismounting**]

1. Remove the clamp of the motor lead and disconnect soldering of the lead from the PWB.

2. Set the mechanism in eject state and remove the spring (750-1774-00).

3. Remove the 4 special screws [716-0305-00 (3 screws), 716-0306-00 (1 screw)] and lift up the main deck in the vertical direction.

[**Mounting**]

1. Insert the main shaft of the deck slide plate into the subdeck main bush.
   At this time, since the idler plate will touch the front end of the deck, inserty by slightly pressing in.

2. Next perform by pushing the subdeck as a whole in the play state.
   At this time see that the deck's rear end support plate (630-0980-00) enters into the hole of the subdeck and take care so that it does not get deformed by entering on the upper or the lower side of the subdeck.
   As regards the method of pressing in, press along the direction of the left, right guide holes of the deck. Press in to the position where it gets locked.

3. Next keep it supported so that the subdeck remains in position and mount with the special screws passed through the bush from left and right. At this time, since there are two kinds of guide bush, care must be taken not to mistake the right and left.
   Use the long special screw at the rear part of the head, first insert the pull plate, then insert the guide bush and righten the screw.

4. Mount the spring to the pull plate and the deck.

5. Solder the motor lead to the PWB and clamp the lead. When clamping, sufficient margin should be allowed so that the motor lead does not obstruct with the PLAY-EJECT operation (See fig.8)

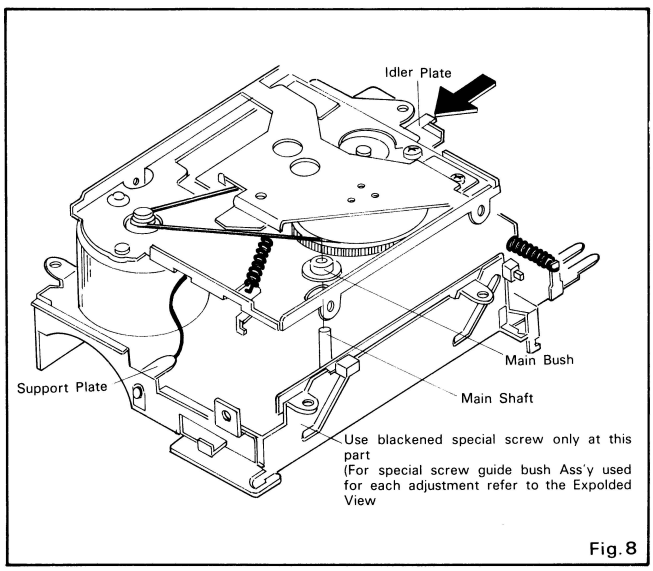


Fig.8

B) Bottom plate

[**Mounting**]

1. Mount taking care to insert the claw (A) of the side of the reel base into the sub-deck and the hole (B) of the check plate. At this time since the idler and belt will touch the reel base, separate the idler by slightly pushing the idler plate so that the belt comes in between the reel base outer circumference and the bottom plate.

2. Slightly turn the idler and check that the claw is entered into the hole of the check plate.

3. Make sure that the dowels of the subdeck are entered into the 2 long holes of the bottom plate and check the engagement of the bottom plate left and right parallel parts and the subdeck side wall slot. Rigten the 3 screws.

   NOTE) 1. At this time use maching screw (714-2603-81) for mounting. However, never use a screw longer than 3mm.
   2. After tightening the screws, fix the screw locks.

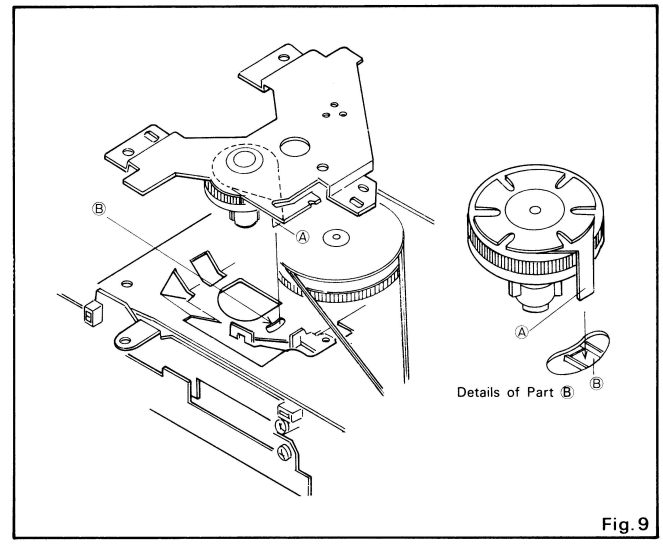


Fig.9

C) Guide plate

[**Dismounting**]

1. Set the mechanism in eject state.

2. Remove the spring (750-1776-00) mounted to the guide plate and the slide plate.

3. Remove the eject link together with the spring.

4. Remove the 3 screws with which the guide plate is mounted.

5. By arranging in the position to remove the dowels of the deck plate from the long holes of the left side (the side without head) of the guide plate, shift the guide plate to the front side of the deck. As regards the guide plate (A) part, since it is so designed that the claw catches the deck plate as shown in the Fig., shift the guide plate until this claw gets disengaged.

6. After shifting forward so that the claw gets disengaged, lift up taking care not to scratch the head and take off the claw from the hole of the deck.

[**Mounting**]

For mounting, follow the procedure used for dismounting with reversed order.
However, take the following precautions.

1. Arrange so that the bent part (B) of the eject plate comes in front of the bent part of the FF lock plate.

2. After inserting the claw of the guide plate (A) part, completely push in the backward direction so that the claw properly catches.

3. As regards the left side (the side without head) of the guide plate, the dowels should enter into the long holes on the front side. On the rear side, it should fix exactly on the upper side of the die-cut claw of the deck plate.

4. On the left side, the guide spring fixed together should be inserted in between the bent claws the guide plate and the claw of the guide spring should be inserted into the position fixing hole.

5. As regards the eject link, insert the claw into the hole of the guide plate and check that it moves smoothly. Fix the spring the specified place so that it may not come off.

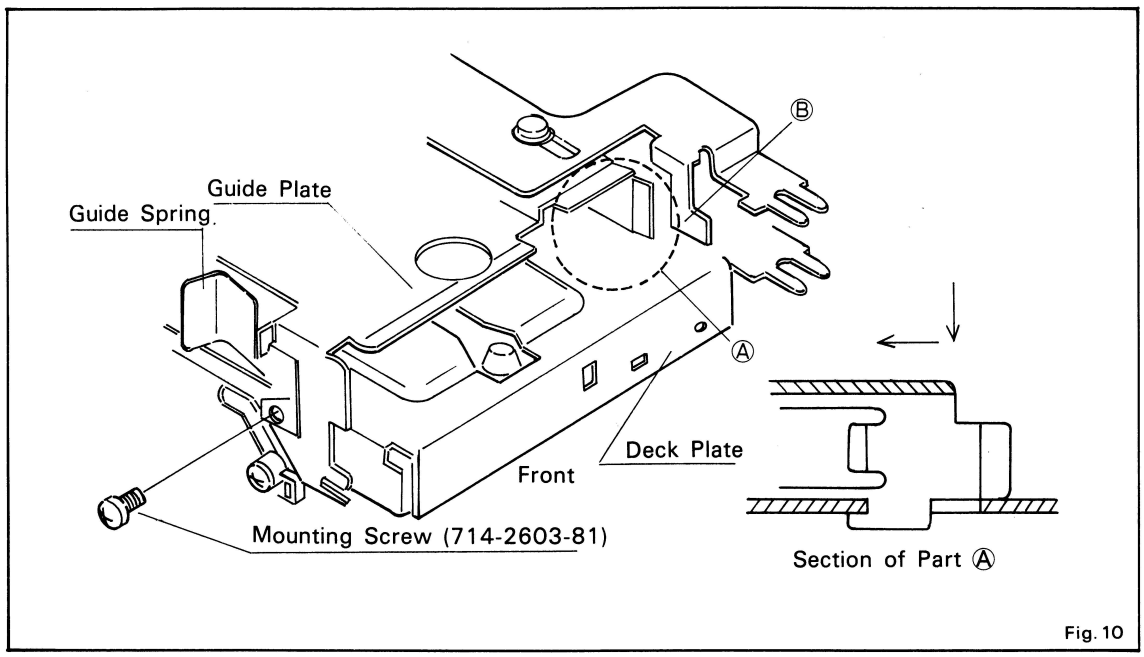
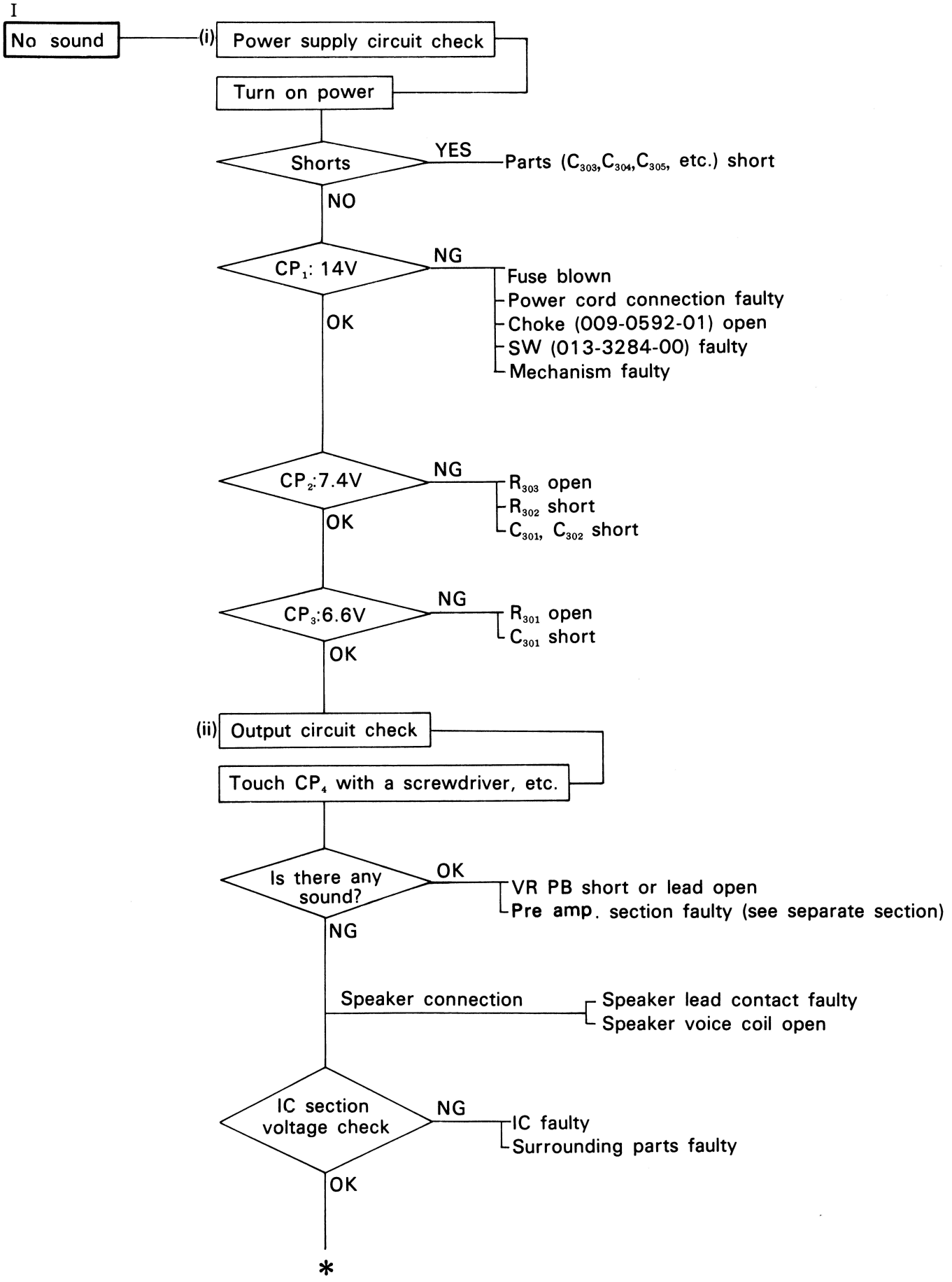


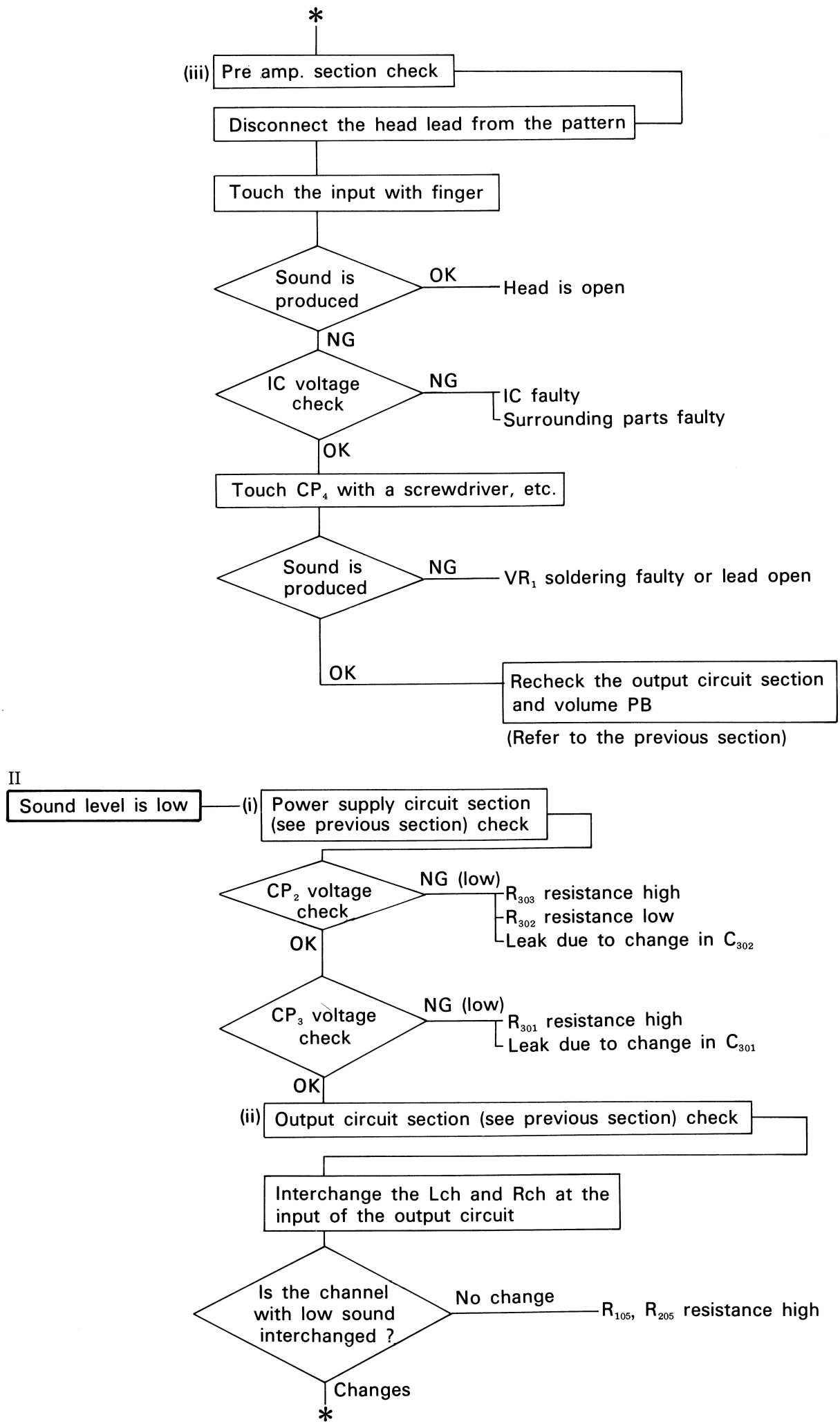
Fig. 10

■TROUBLESHOOTING:

Electrical Circuit (Refer to the Circuit Diagram, actual Wiring Diagram)

Symptom

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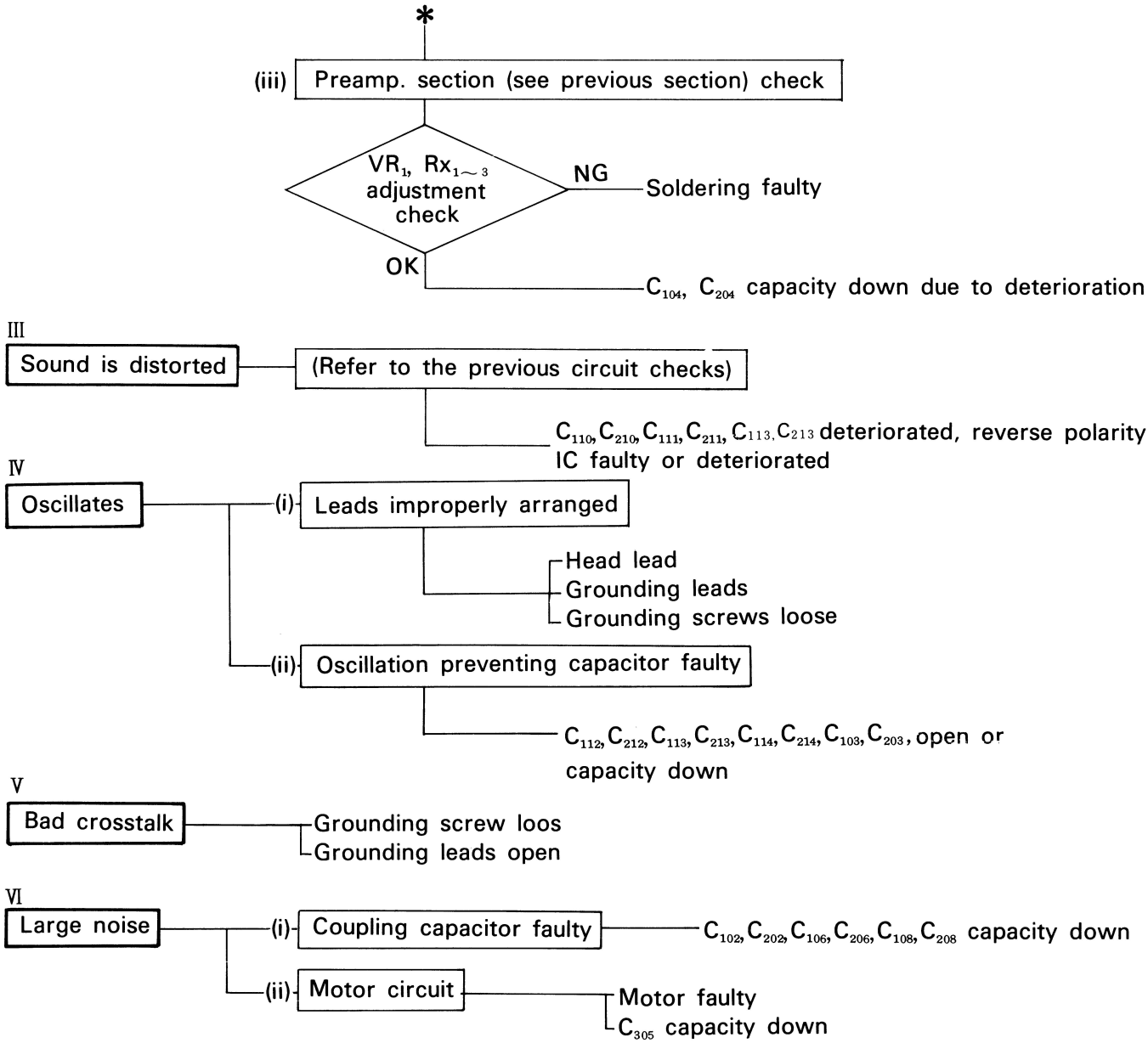
(iii) Pre amp. section check
Disconnect the head lead from the pattern
Touch the input with finger
Sound is produced
OK
Head is open
NG
IC voltage check
NG
IC faulty
Surrounding parts faulty
OK
Touch CP4 with a screwdriver, etc.
Sound is produced
NG
VR1 soldering faulty or lead open
OK
Recheck the output circuit section and volume PB
(Refer to the previous section)
II
Sound level is low
(i) Power supply circuit section (see previous section) check
CP2 voltage check
NG (low)
R303 resistance high
R302 resistance low
Leak due to change in C302
OK
CP3 voltage check
NG (low)
R301 resistance high
Leak due to change in C301
OK
(ii) Output circuit section (see previous section) check
Interchange the Lch and Rch at the input of the output circuit
Is the channel with low sound interchanged ?
No change
R105, R205 resistance high
Changes
*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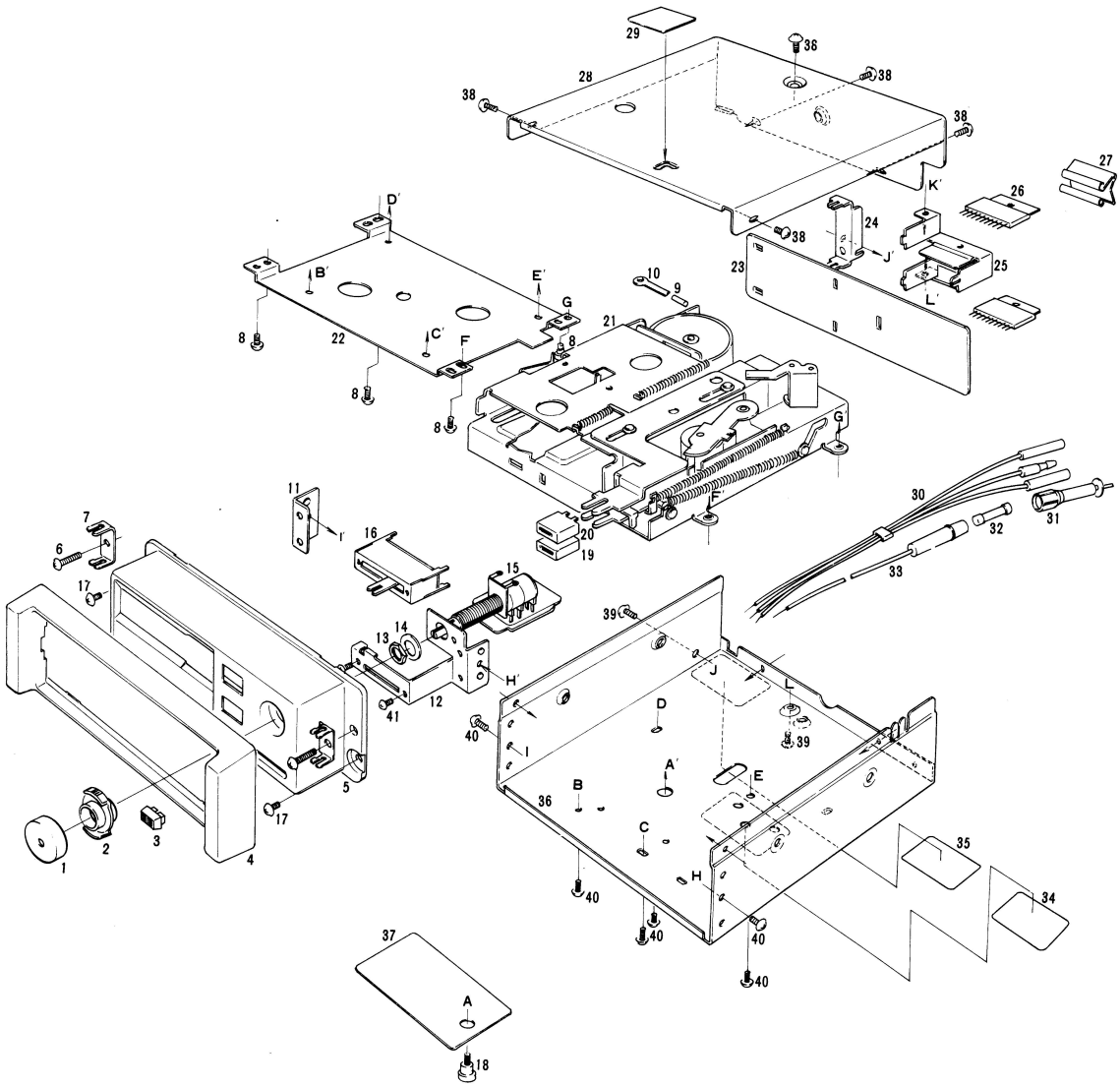
(iii) Preamp. section (see previous section) check
VR1, Rx1~3 adjustment check
NG
Soldering faulty
OK
C104, C204 capacity down due to deterioration
III
Sound is distorted
(Refer to the previous circuit checks)
C110, C210, C111, C211, C113, C213 deteriorated, reverse polarity IC faulty or deteriorated
IV
Oscillates
(i) Leads improperly arranged
Head lead
Grounding leads
Grounding screws loose
(ii) Oscillation preventing capacitor faulty
C112, C212, C113, C213, C114, C214, C103, C203, open or capacity down
V
Bad crosstalk
Grounding screw loos
Grounding leads open
VI
Large noise
(i) Coupling capacitor faulty
C102, C202, C106, C206, C108, C208 capacity down
(ii) Motor circuit
Motor faulty
C305 capacity down

■EXPLODED VIEW:

◎Main section



■PARTS LIST:

◎Main section　　※Indicate new part.

REF.NO.	PART NO.	DESCRIPTION	Rank
1	※380-3599-00	Knob	2
2	※380-3600-01	Knob	2
3	※380-3602-00	Knob	2
4	※370-3022-00	Escutcheon	
5	※940-0065A	Escutcheon Ass'y	
6	714-4014-11	Machine screw (M4x14)	3
7	330-4868-03	Pressed part	
8	732-3006-11	Sems screw(M3x6)	
9	820-0015-03	Vinyltube	
10	※321-0690-00	Clamp	
11	330-5977-00	Pressed part	
12	※330-5976-01	Pressed part	
13	722-0231-00	Special nut	3
14	745-0430-01	Special washer	3
15	※012-0010A	Variable resistor	2
16	※012-0011A	Variable resistor	2
17	※731-3006-89	Taptight(M3x6)	
18	716-0308-00	Special screw	
19	※380-3601-03	Knob	2
20	※380-3601-02	Knob	2
21	※930-0442-00	Tape mechanism	

REF.NO.	PART NO.	DESCRIPTION	Rank
22	330-5973-01	Pressed part	
23	099-4635-01	PWB	
24	944-0471-00	Filter assembly	
25	313-0961-00	Heat sink	
26	051-0055-$^{00}_{04}$	IC (TA7205P)	1
27	321-0792-00	Clamp	
28	310-0876-01	Upper case	
29	347-0517-00	Paper part	
30	851-2057-05	Speaker lead	
31	850-1460-04	A · lead	
32	120-0030-00	Fuse(3A)	1
33	850-1822-00	A · lead	
34	286-3678-00	Set plate	
35	285-0656-00	Guide label	
36	311-0901-01	Lower case	
37	285-0675-00	Guide label	3
38	731-3005-89	Tap tight(M3x5)	3
39	714-3005-89	Machine screw (M3x5)	3
40	714-3004-89	Machine screw (M3x4)	3
41	714-2004-81	Machine screw (M2x4)	3

■PARTS LIST:

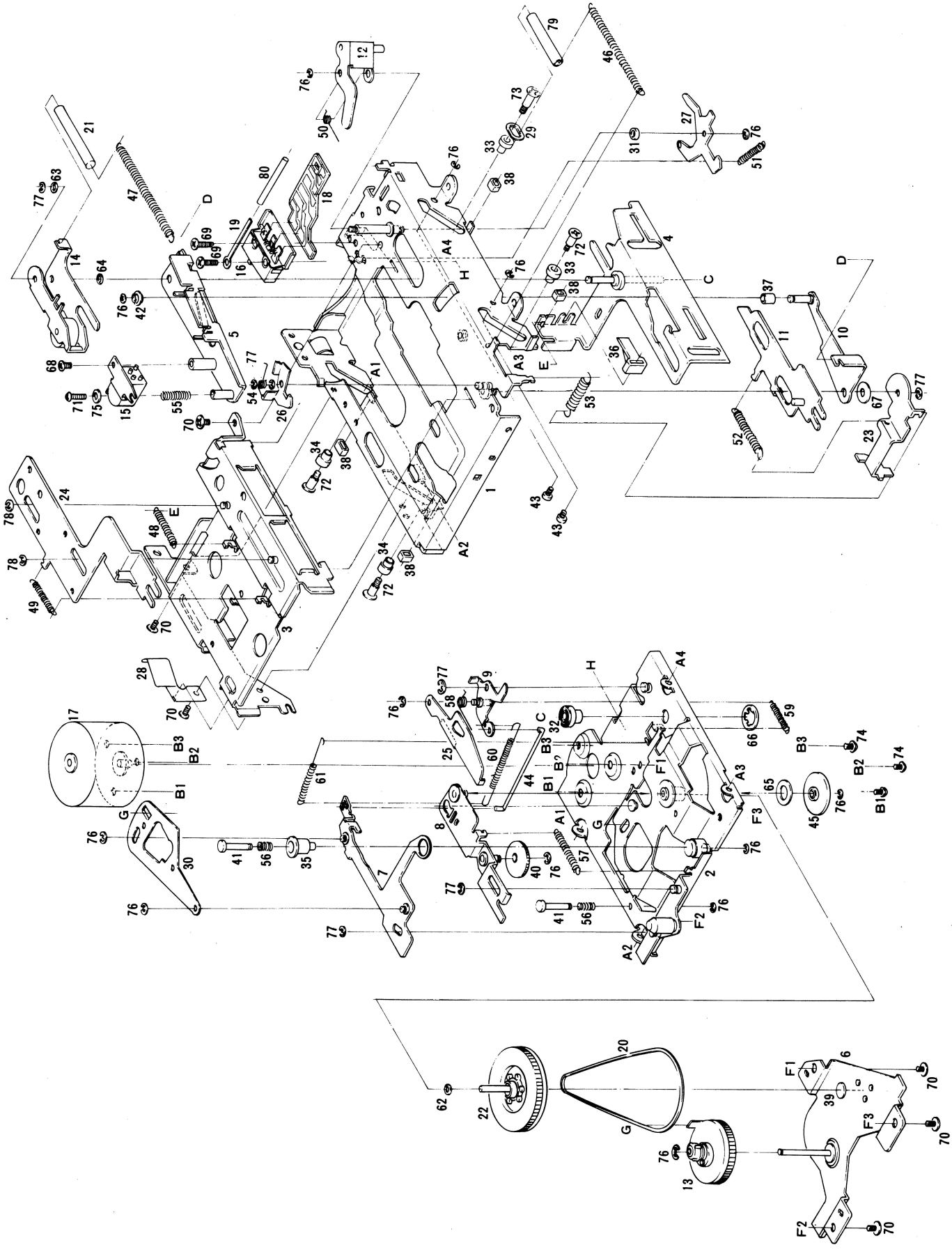
◎E lectric section

REF.NO.	PART NO.	DESCRIPTION	Rank
$R_{x102,202}$	111-1031-32	Film resistor (¼W10KΩ)	
$R_{101,201}$	111-6831-32	Film resistor (¼W68KΩ)	
$R_{105,205}$	111-1211-32	Film resistor (¼W120Ω)	
R_{303}	111-1221-32	Film resistor (¼W1.2KΩ)	
$R_{102,202}$	111-1531-32	Film resistor (¼W15KΩ)	
R_{302}	111-2221-32	Film resistor (¼W2.2KΩ)	
$R_{103,203}$	111-2241-32	Film resistor (¼W220KΩ)	
$R_{106,206}$	111-2731-32	Film resistor (¼W27KΩ)	
$R_{x101,201}$	111-3321-32	Film resistor (¼W3.3KΩ)	
R_{301}	111-4721-32	Film resistor (¼W4.7KΩ)	
$R_{104,204}$	111-5621-32	Film resistor (¼W5.6KΩ)	
R_{304}	115-2291-52	Film resistor (1W2.2Ω)	
$C_{109,209}$	141-1522-12	Polyester capacitor (50V0.0015μF)	
$C_{107,207}$	141-3932-14	Polyester capacitor (50V0.039μF)	
$C_{105,205}$	141-1032-12	Polyester capacitor (50V0.001)	

REF.NO.	PART NO.	DESCRIPTION	Rank
$C_{203,212}^{103,112}$	153-3302-13	Ceramic capacitor (33PF)	
$C_{113,213}$	153-5602-13	Ceramic capacitor (56PF)	
C_{304}	180-4774-32	Electrolytic capacitor (VL16V470μF)	
$C_{108,208}$	180-1054-62	Electrolytic capacitor (VL50V1μF)	
$C_{111,211}$	180-1074-22	Electrolytic capacitor (VL10V100μF)	
$C_{106,206}$	180-2254-62	Electrolytic capacitor (VL50V2.2μF)	
C_{302}	180-2274-32	Electrolytic capacitor (VL16V220μF)	
C_{301}	180-3364-22	Electrolytic capacitor (VL10V33μF)	
$C_{116,216}$	180-3374-22	Electrolytic capacitor (VL10V330μF)	
C_{305}	180-3374-32	Electrolytic capacitor (VL16V330μF)	
$C_{102,202}$	180-4754-32	Electrolytic capacitor (VL16V4.7μF)	
$C_{210,115,215}^{104,204,110}$	180-4764-22	Electrolytic capacitor (VL10V47μF)	
L_1	009-0592-01	Choke	
C_{303}	141-1043-15	Polyester capacitor (50V0.1)	
$C_{114,214}$	043-0020-00	Special capacitor (12V0.2)	

■EXPLODED VIEW:

◎Mechanism section



■PARTS LIST:

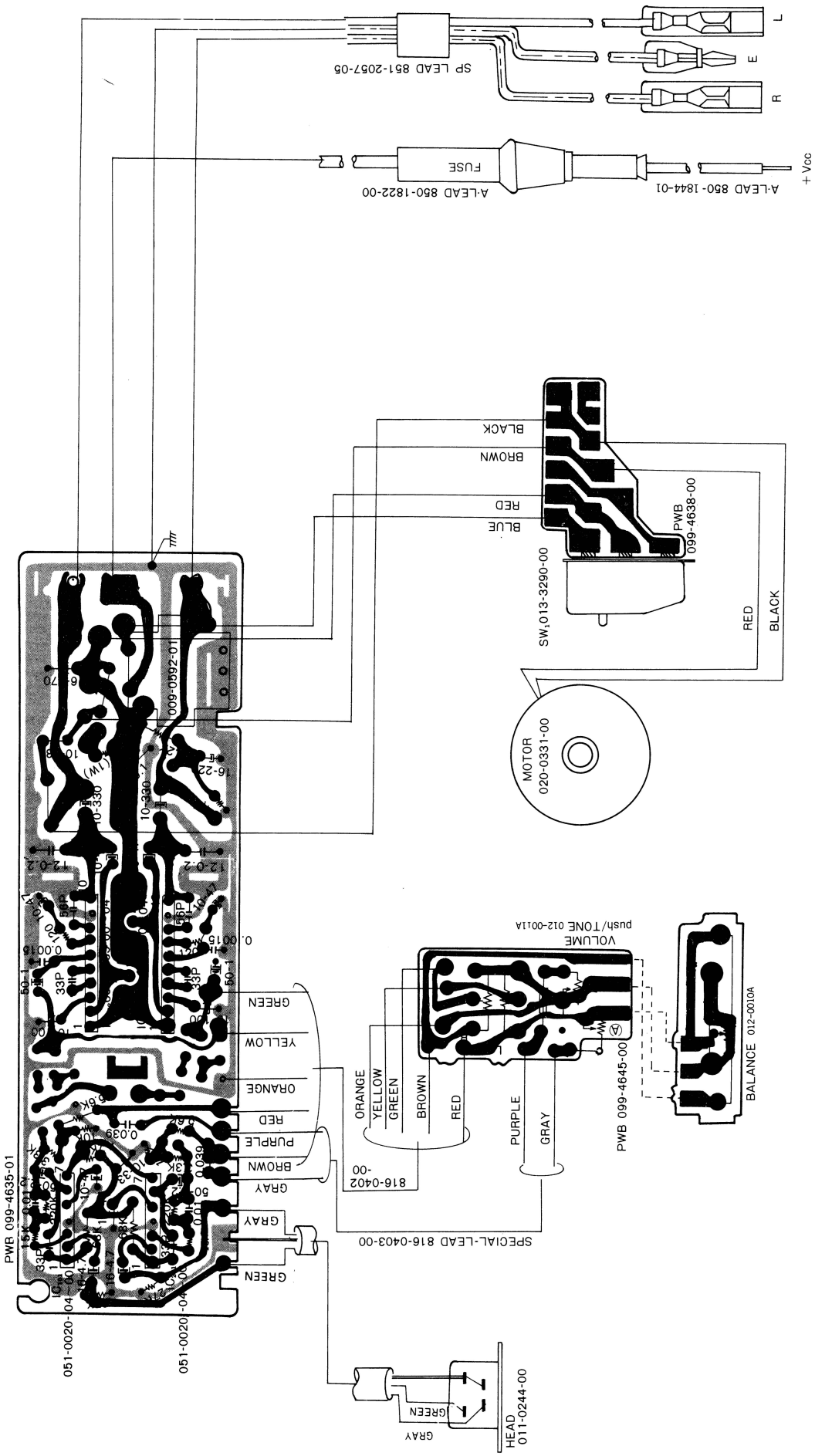
◎Mechanism section

※Indicates new part.

REF.NO.	PART NO.	DESCRIPTION	Rank
1	960-3013-00	Deck plate assembly	
2	960-3014-00	Sub-Deck assembly	
3	960-3015-00	Guide assembly	
4	960-3016-00	Slide plate assembly	
5	960-3017-00	Head plate assembly	
6	960-3018-00	Bottom plate assembly	
7	960-3019-00	Detect arm assembly	
8	960-3020-00	Idler plate assembly	
9	960-3021-00	Push arm assembly	
10	960-3022-00	Slide arm assembly	
11	960-3023-00	F.F plate assembly	
12	960-3024-00	Eject link assembly	
13	※960-3025-00	Reel base assembly	3
14	※960-3026-00	Roller assembly	3
15	※011-0244-00	Head	2
16	※013-3290-00	Swich	2
17	※960-3063-00	D.C motor assembly	1
18	099-4638-00	PWB	
19	330-5131-00	Pressed part	
20	※602-0040-00	Belt	1
21	860-4025-45	Vinyl tube	
22	※611-0045-00	Flywheel	
23	630-0993-00	F.F arm	
24	630-0994-00	Eject plate	
25	630-0995-00	Push plate	
26	630-0996-00	F.F lock plate	
27	630-0997-00	Lock plate	
28	630-0998-00	Guide spring	
29	630-0999-00	Pull plate	
30	630-1039-00	Check plate	
31	631-0212-00	Ring	
32	631-0215-00	Main bush	
33	631-0216-00	Guide bush R	
34	631-0217-00	Guide bush L	
35	631-0218-00	Special bush	
36	631-0219-00	Swich arm	
37	631-0220-00	F.F roller	
38	631-0221-00	Rubber pad	
39	631-0222-00	Slast plate	
40	631-0241-00	F.F gear	
41	632-0686-00	Push pin	

REF.NO.	PART NO.	DESCRIPTION	Rank
42	632-0687-00	Roller	
43	632-0688-00	Slide guide pin	
44	632-0689-00	Rod	
45	632-0690-00	Idler	
46	750-1774-00	Spring	3
47	750-1775-00	Spring	3
48	750-1776-00	Spring	3
49	750-1777-00	Spring	3
50	750-1778-00	Spring	3
51	750-1779-00	Spring	3
52	750-1780-00	Spring	3
53	750-1781-00	Spring	3
54	750-1782-00	Spring	3
55	750-1783-00	Spring	3
56	750-1784-00	Spring	3
57	750-1787-00	Spring	3
58	750-1790-00	Spring	3
59	750-1791-00	Spring	3
60	750-1821-00	Spring	3
61	750-1822-00	Spring	3
62	746-0617-00	Special washer	3
63	746-0625-00	Special washer	3
64	746-0626-00	Special washer	3
65	746-0666-00	Special washer	3
66	746-0667-00	Special washer	3
67	746-0672-00	Special washer	3
68	714-2004-81	Machine screw (M2x4)	3
69	714-2308-81	Machine screw (M2.3x8)	3
70	714-2603-81	Machine screw (M2.6x3)	3
71	716-0286-00	Special screw	3
72	716-0305-00	Special screw	3
73	716-0306-00	Special screw	3
74	732-2604-11	Sems screw	3
75	740-2000-11	Flat washer	3
76	743-1500-10	E-ring(M1.5)	3
77	743-2000-10	E-ring(M2.0)	3
78	743-2500-10	E-ring(M2.5)	3
79	820-3025-05	Vinyl tube	
80	820-4030-02	Vinyl tube	

■PRINTED WINING BOARD:



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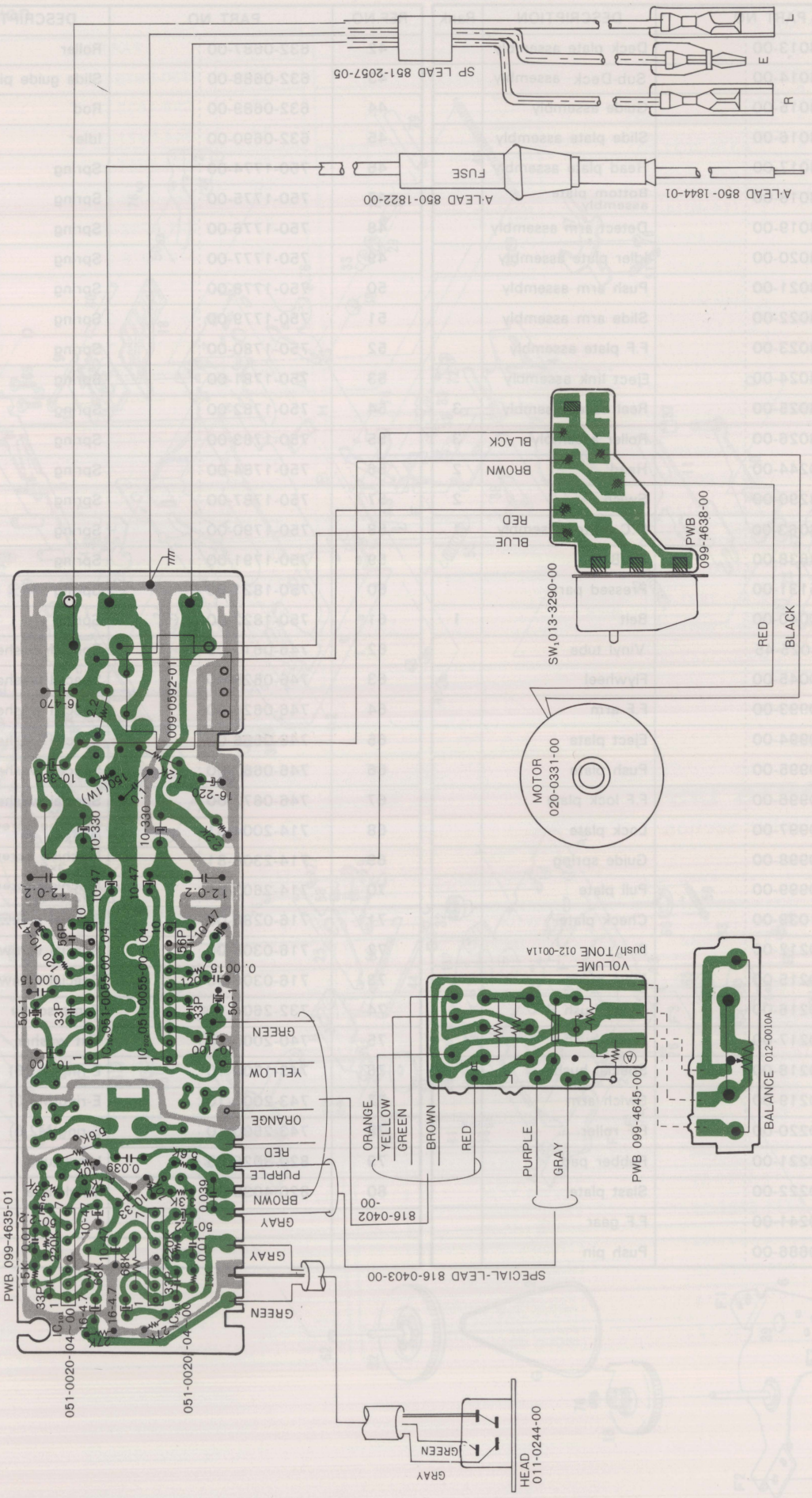
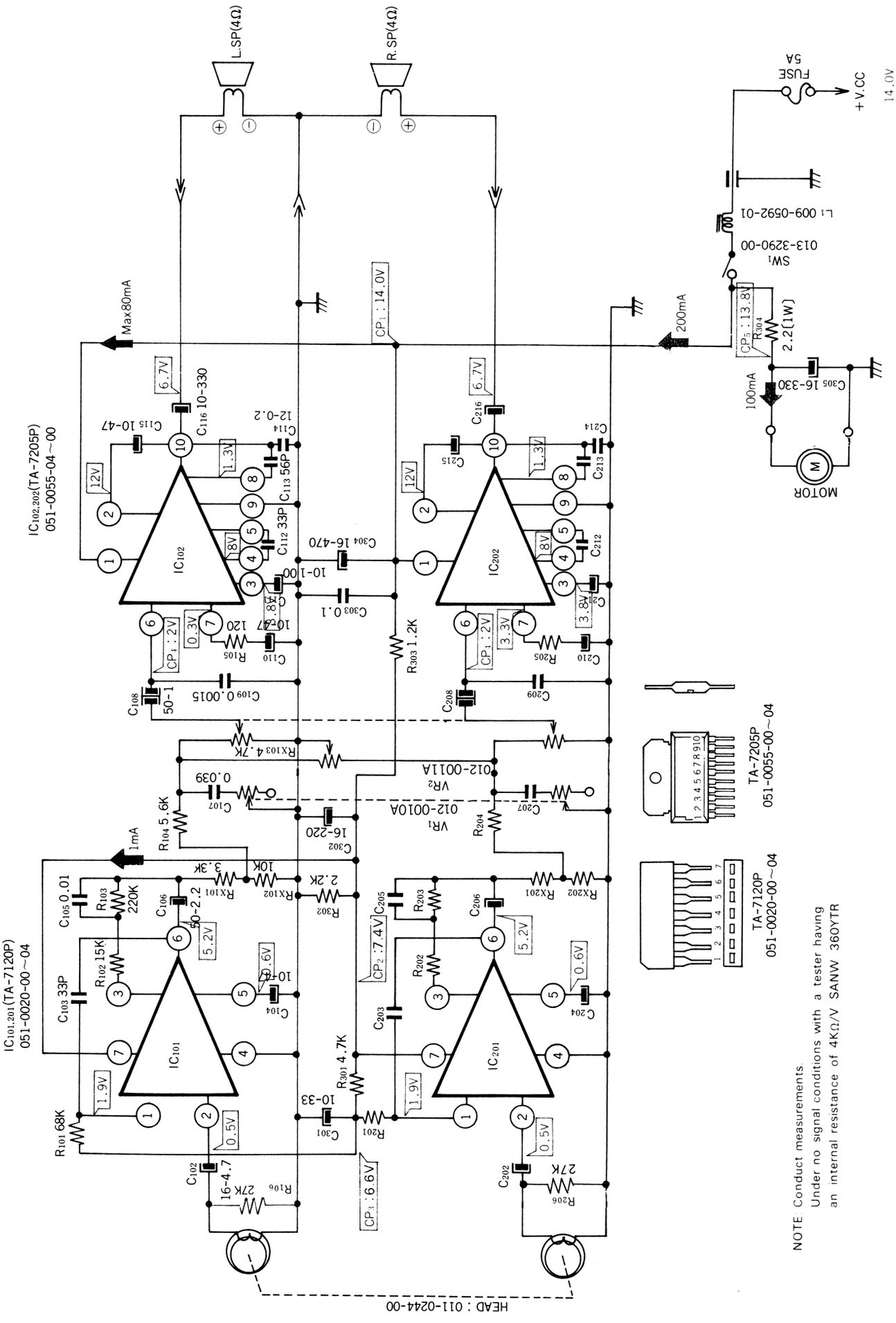
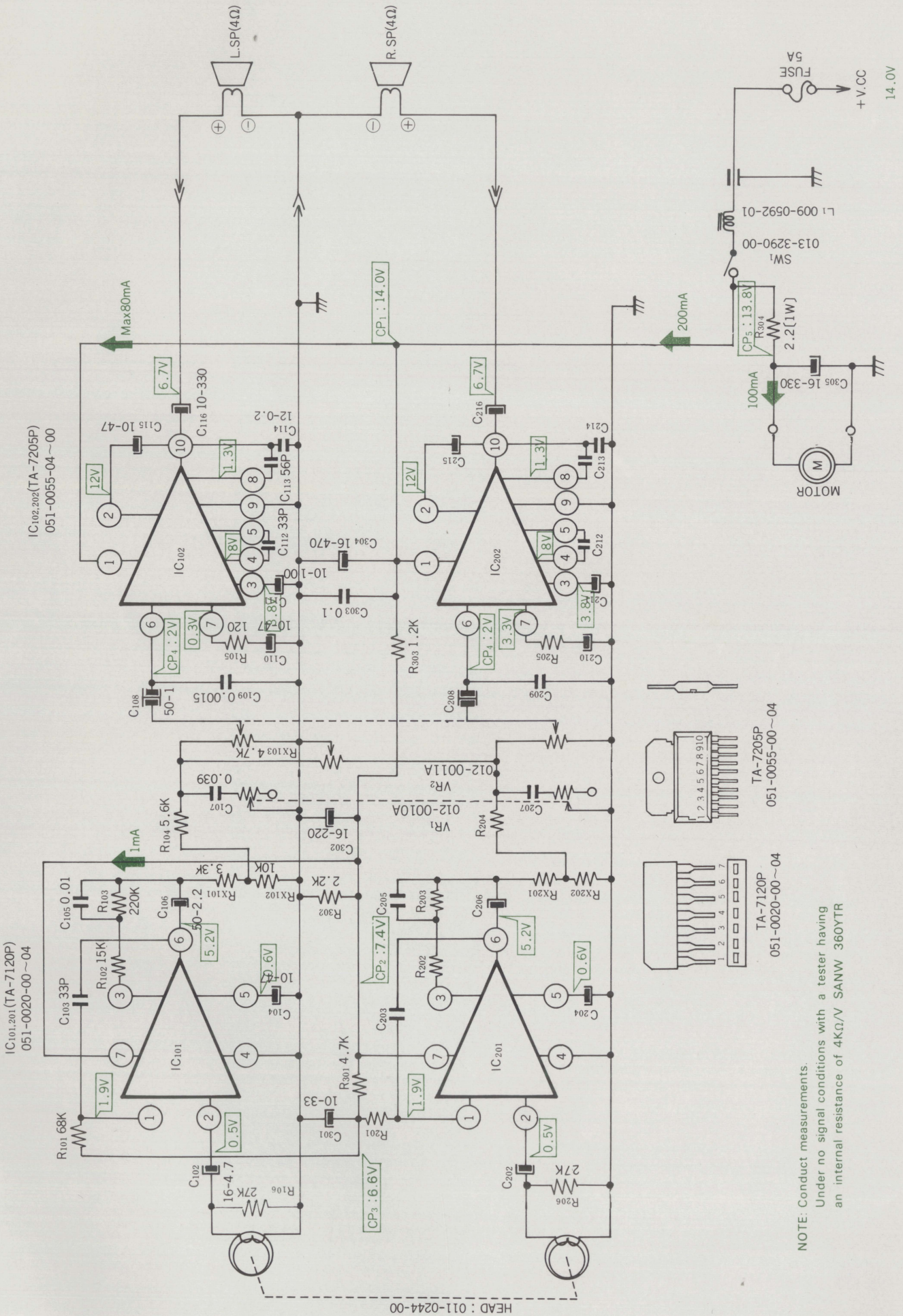


■CIRCUIT DIAGRAM:



■CIRCUIT DIAGRAM:



■MEMO