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# PS-X9

*AEP Model  
E Model*



## STEREO TURN TABLE SYSTEM

### SPECIFICATIONS

#### GENERAL

|                            |                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Requirements:</b> | 110, 220V ac, 50/60 Hz                                                                                                          |
| <b>Power Consumption:</b>  | 50W                                                                                                                             |
| <b>Dimensions:</b>         | Approx. 540 (w) x 220 (h) x 450 (d) mm<br>21 1/4 (w) x 8 5/8 (h) x 17 3/4 (d) inches<br>Including projecting parts and controls |
| <b>Weight:</b>             | Approx. 35 kg, 77 lb 3 oz (net)<br>Approx. 39 kg, 86 lb (with shipping carton)                                                  |

#### TURNTABLE

|                             |                                                    |
|-----------------------------|----------------------------------------------------|
| <b>Platter:</b>             | 38 cm (15 inches), diecasting aluminum alloy       |
| <b>Motor:</b>               | Linear BSL (brushless and slotless) dc servo motor |
| <b>Drive System:</b>        | Direct drive, crystal lock control system          |
| <b>Speeds:</b>              | 33 1/3, 45 rpm                                     |
| <b>Speed Control Range:</b> | ±6% (crystal lock OFF)                             |

|                                  |                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------|
| <b>Starting Characteristics:</b> | Comes to nominal speed<br>Within 1/8 revolution (33 1/3 rpm)<br>Within 1/5 revolution (45 rpm) |
|----------------------------------|------------------------------------------------------------------------------------------------|

|                              |                                  |
|------------------------------|----------------------------------|
| <b>Wow and Flutter:</b>      | ±0.03% (DIN)<br>0.02% (WRMS)     |
| <b>S/N Ratio:</b>            | 75 dB (DIN-B)                    |
| <b>Initial Drift:</b>        | Within 0.0001% (crystal lock ON) |
| <b>Load Characteristics:</b> | 0% up to 1,100 g tracking force  |
| <b>Speed Deviation:</b>      | Within 0.002% (crystal lock ON)  |
| <b>Automatic System:</b>     | Arm return reject                |

#### TO NEARM

|                                         |                                                                                      |
|-----------------------------------------|--------------------------------------------------------------------------------------|
| <b>Type:</b>                            | Statically balanced, universal                                                       |
| <b>Pivot to Stylus Length:</b>          | 264 mm (10 3/8 inches)                                                               |
| <b>Overall Arm Length:</b>              | 356 mm (14 inches)                                                                   |
| <b>Overhang:</b>                        | 14 mm (1/2 inches)                                                                   |
| <b>Tracking Error:</b>                  | +1° 45', -1° 18'                                                                     |
| <b>Tracking Force Adjustment Range:</b> | 0-3 g                                                                                |
| <b>Cartridge Weight Range:</b>          | 10.5-18.5 g (with the small counterweight)<br>18-33 g (with the large counterweight) |

- Continued on page 2 -

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

# SONY®

## SERVICE MANUAL

**CARTRIDGE XL-55 PRO**

|                     |                                                   |
|---------------------|---------------------------------------------------|
| Type:               | Moving-coil                                       |
| Output Voltage:     | 0.2 mV (1 kHz, 5 cm/sec, 45°)                     |
| Frequency Response: | 10–50,000 Hz                                      |
| Channel Separation: | More than 30 dB (1 kHz)                           |
| Channel Balance:    | Less than 1.0 dB (1 kHz)                          |
| DC Resistance:      | 40 $\Omega$                                       |
| Impedance:          | 40 $\Omega$ (1 kHz)                               |
| Load Impedance:     | More than 40 $\Omega$                             |
| Compliance:         | 15 $\times 10^{-6}$ cm/dyne                       |
| Tracking Force:     | 1.5–2.5 g (recommended value 2.0 g)               |
| Type of Stylus:     | Elliptical (0.3 $\times$ 0.8 mil)<br>Nude diamond |
| Weight:             | 22 g (including the shell)                        |

**AUDIO SECTION**

|         |                                                                                                                                                                                       |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System: | Head amplifier<br>first stage LEC transistor differential amplifier<br>Equalizer amplifier<br>first stage direct-coupled dual-FET differential amplifier, NF type<br>final stage SEPP |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|          |                                                                           |
|----------|---------------------------------------------------------------------------|
| Outputs: | PHONO<br>LINE OUT<br>voltage 150 mV (max. 14 V)<br>impedance 600 $\Omega$ |
|----------|---------------------------------------------------------------------------|

**HEAD AMPLIFIER + EQUALIZER AMPLIFIER**

|                           |                                                  |
|---------------------------|--------------------------------------------------|
| S/N Ratio:                | 80 dB (A weighting network, 0.2 mV)              |
| Harmonic Distortion:      | Less than 0.005% at 1 V output<br>(20–20,000 Hz) |
| Voltage Gain:             | 63 dB (1 kHz)                                    |
| Input Impedance:          | 100 $\Omega$                                     |
| Maximum Input Capability: | 10 mV                                            |

**EQUALIZER AMPLIFIER**

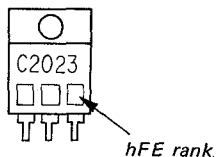
|                                  |                                                                                                           |
|----------------------------------|-----------------------------------------------------------------------------------------------------------|
| S/N Ratio:                       | 87 dB (A weighting network, 2.5 mV)                                                                       |
| Harmonic Distortion:             | Less than 0.005% at 1 V output<br>(20–20,000 Hz)                                                          |
| RIAA Curve Deviation:            | 20–20,000 Hz $\pm$ 0.2 dB                                                                                 |
| Voltage Gain:                    | 36 dB (1 kHz)                                                                                             |
| Input Impedance:<br>(selectable) | Load resistance 25 k $\Omega$ , 50 k $\Omega$ , 100 k $\Omega$<br>Load capacitance 100 pF, 200 pF, 400 pF |
| Maximum Input Capability:        | 240 mV (1 kHz)                                                                                            |

**SERVICING NOTE**

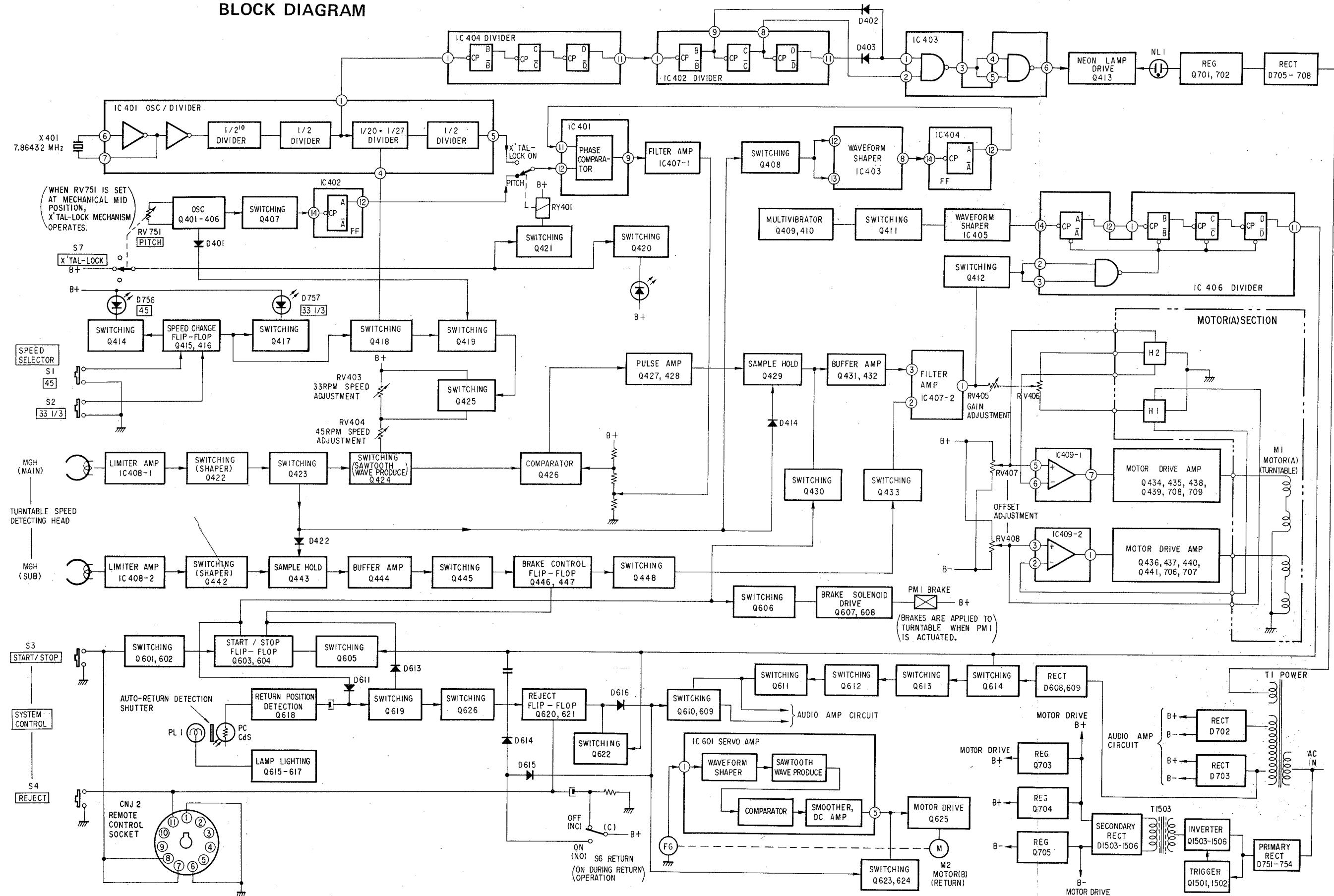
**INVERTER CIRCUIT TRANSISTOR REPLACEMENT (Q1503–1506)**

**CAUTION**

When replacing Q1503–1506 in the pulse power-supply circuit, use those which have the same hFE rank.

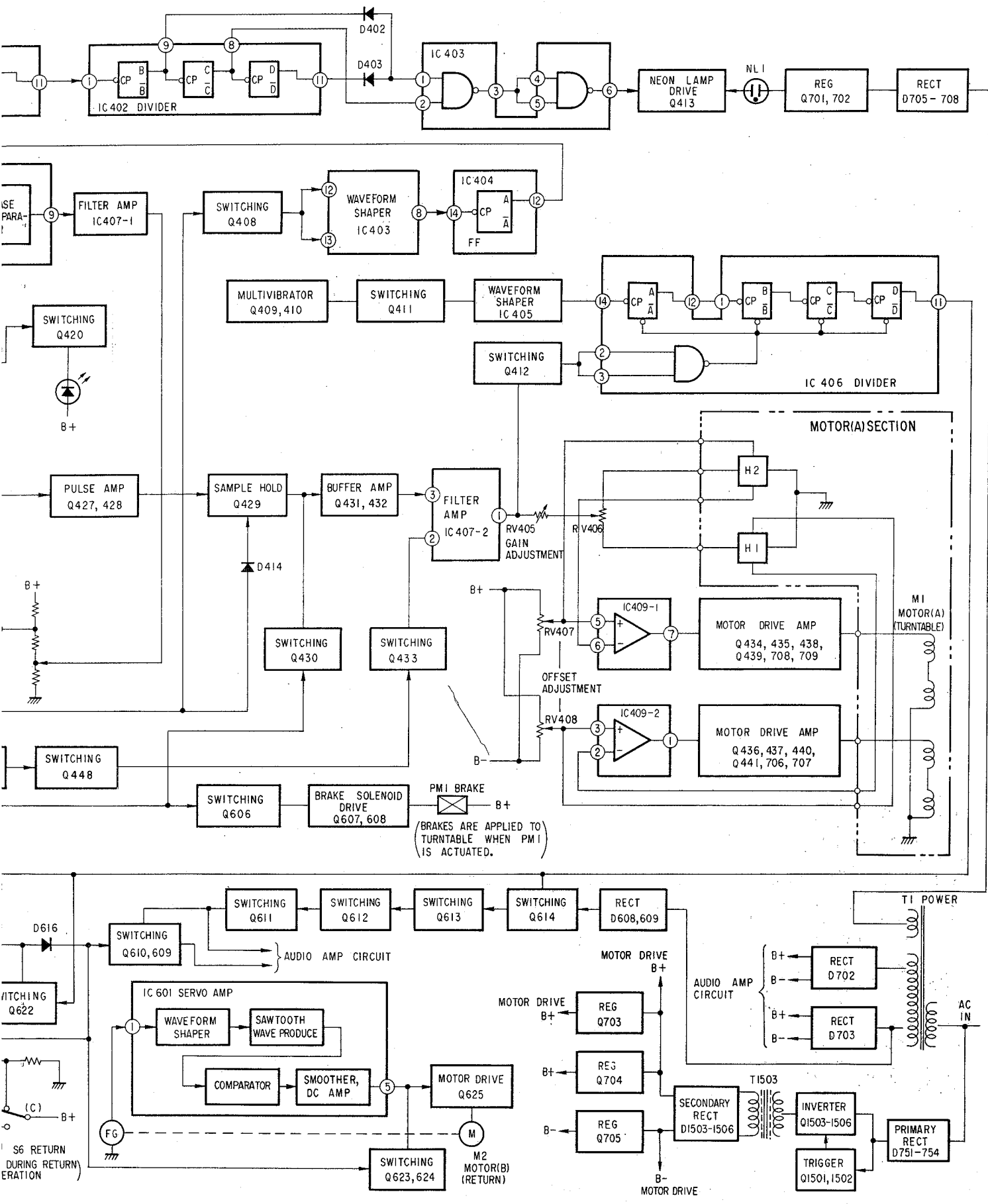


SECTION 1  
BLOCK DIAGRAM

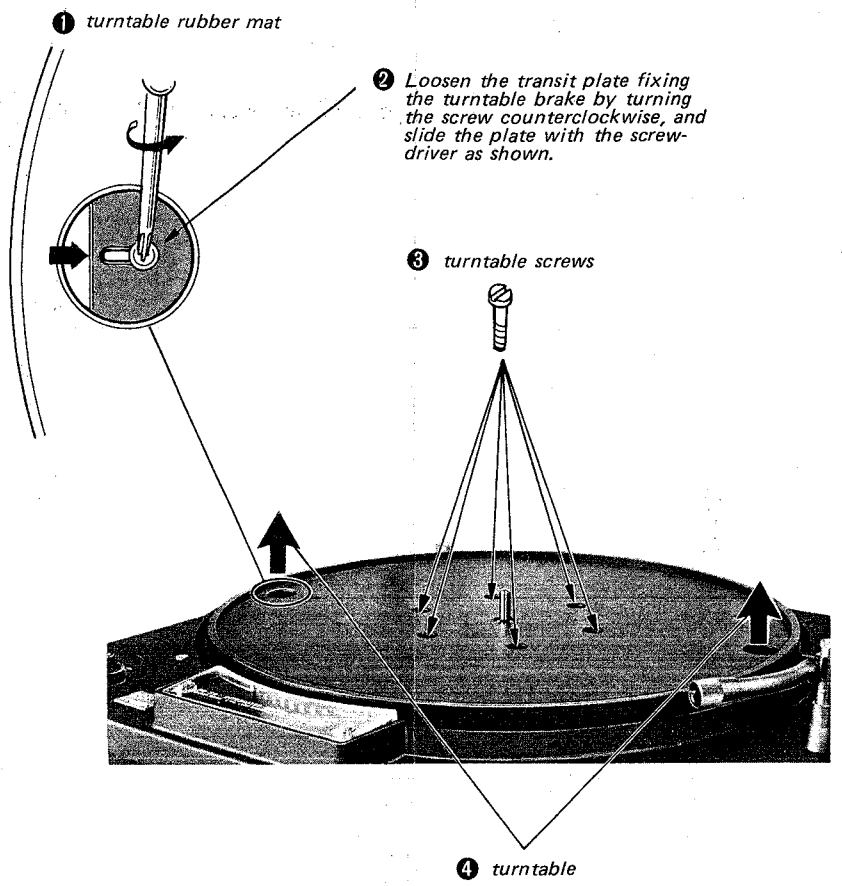


SECTION 2  
DISASSEMBLY AND INSTALLATION

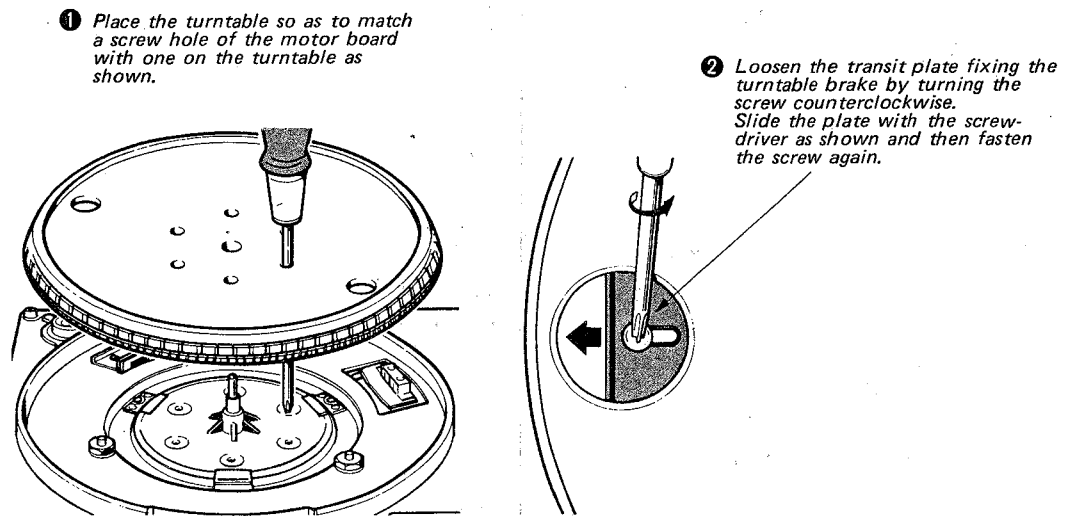
Note: Follow the disassembly procedure in the numerical order given.



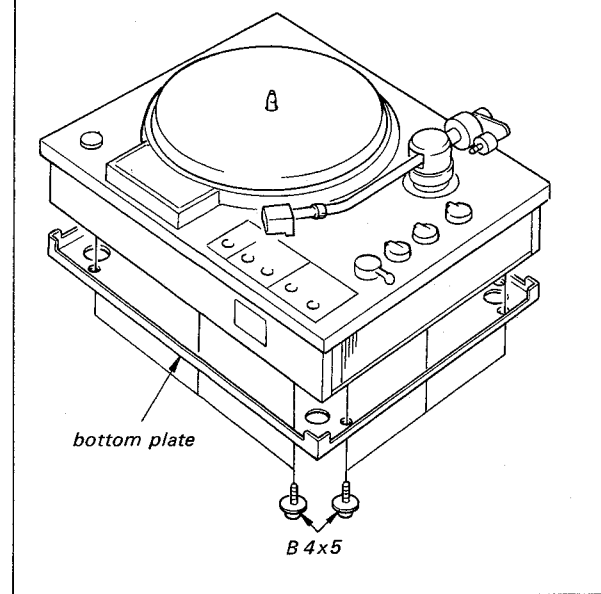
TURNTABLE REMOVAL



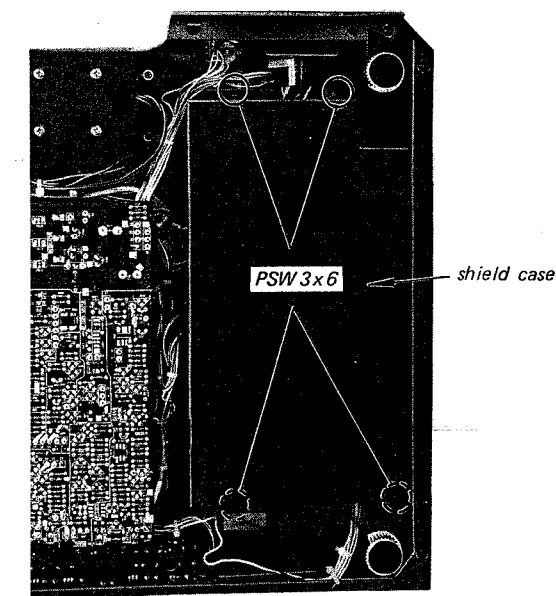
NOTE ON THE TURNTABLE ASSEMBLY



## BOTTOM PLATE REMOVAL

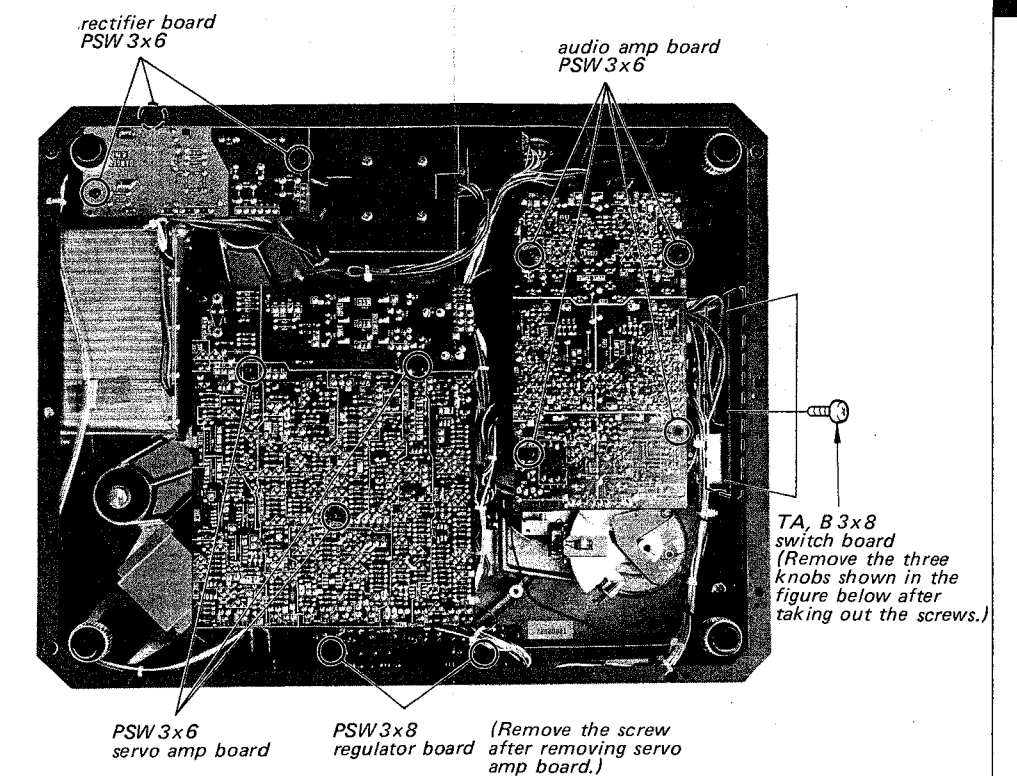


## SHIELD CASE REMOVAL

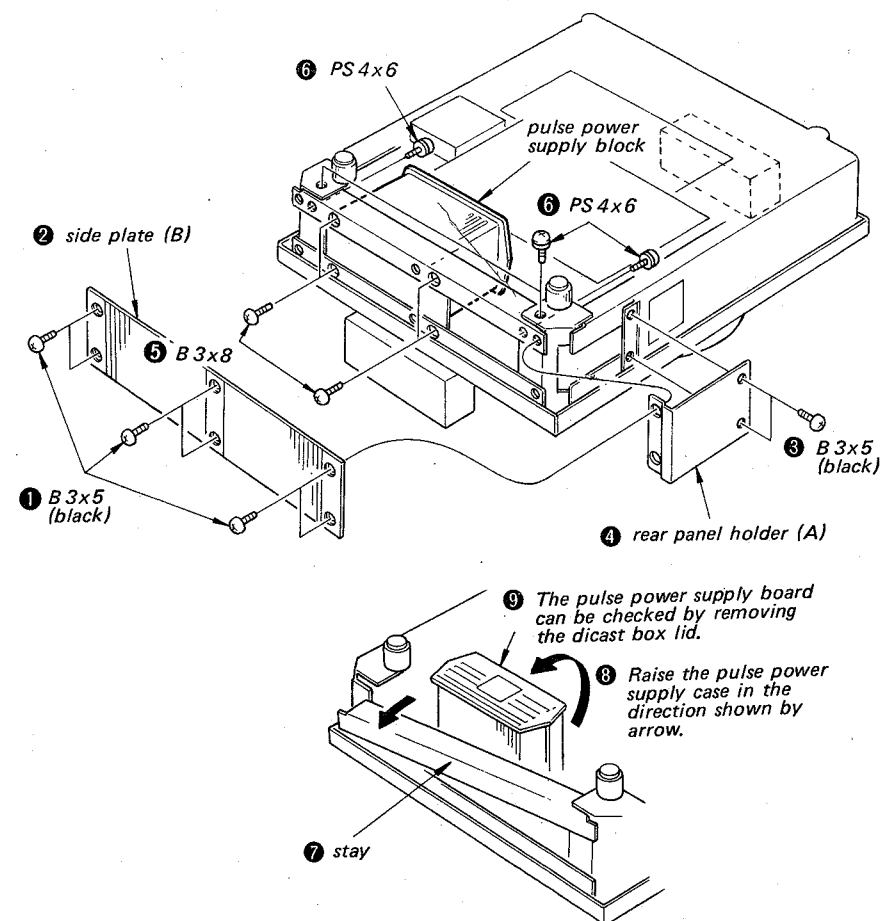


## CIRCUIT BOARD REMOVAL

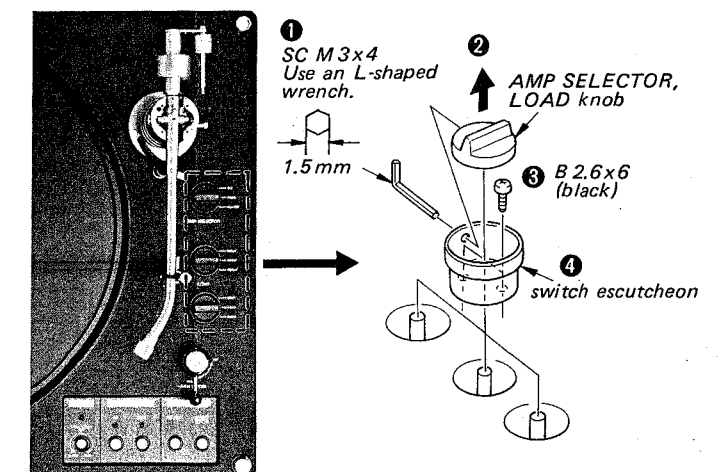
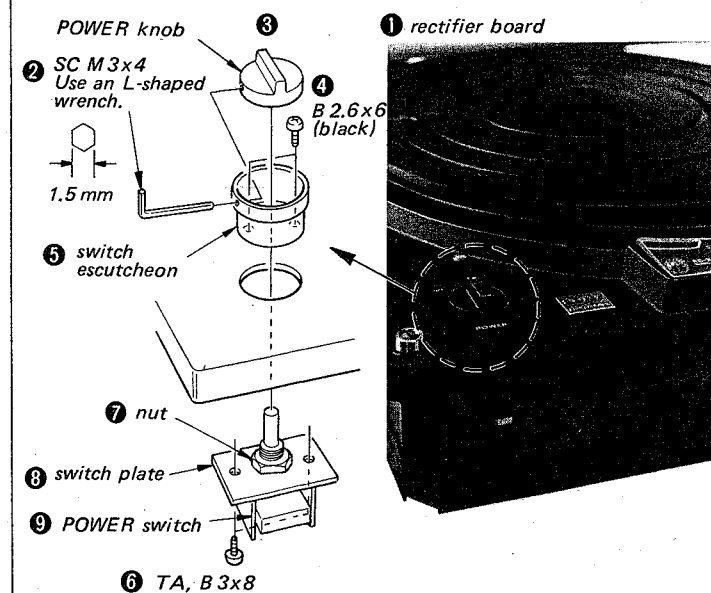
Under this condition, the each circuit board can be checked. When replacing the parts on the circuit board, remove the each screw as shown.



## PULSE POWER SUPPLY BLOCK REMOVAL

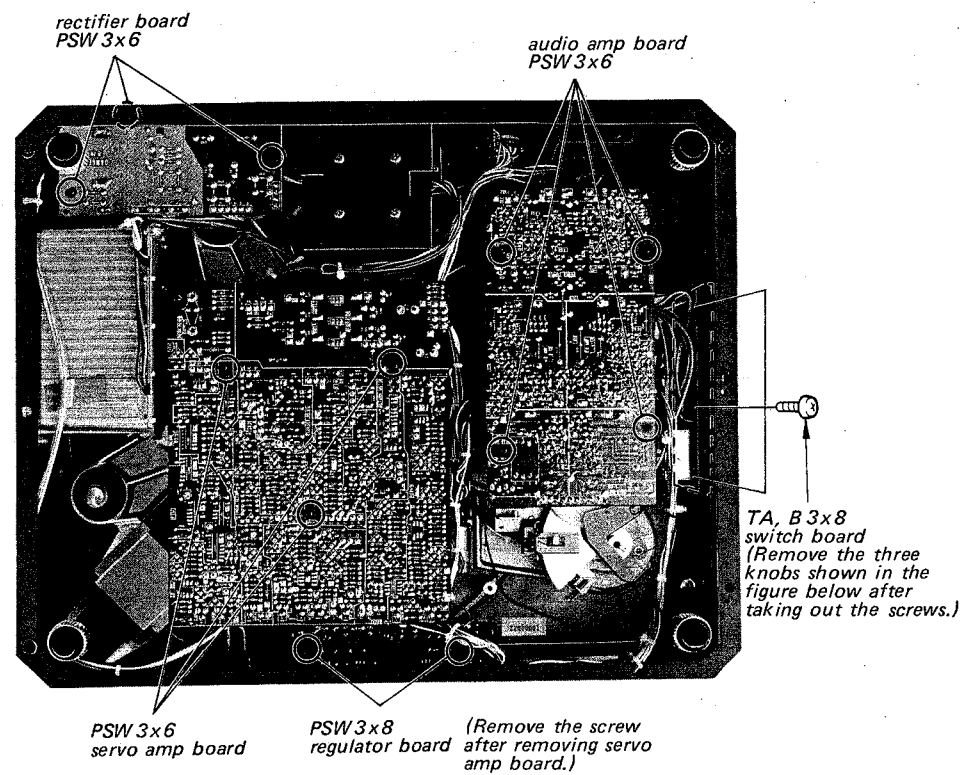


## POWER SWITCH REPLACEMENT

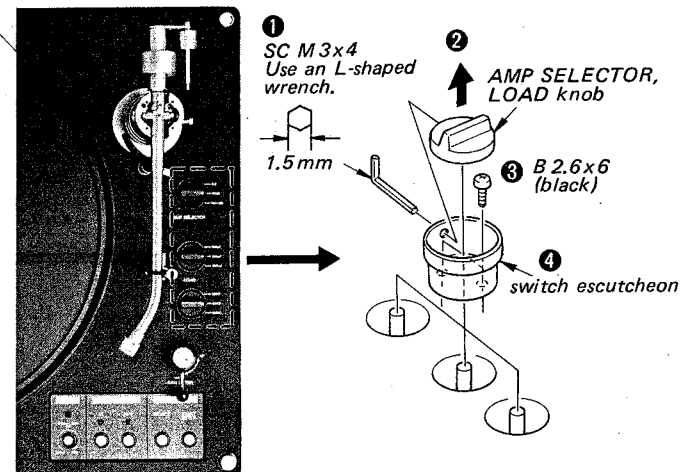
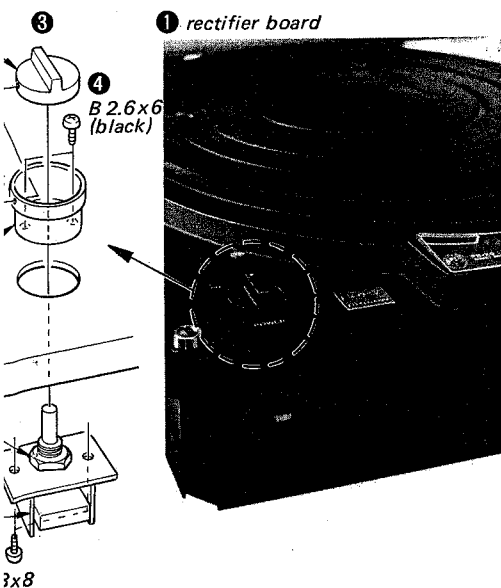


## CIRCUIT BOARD REMOVAL

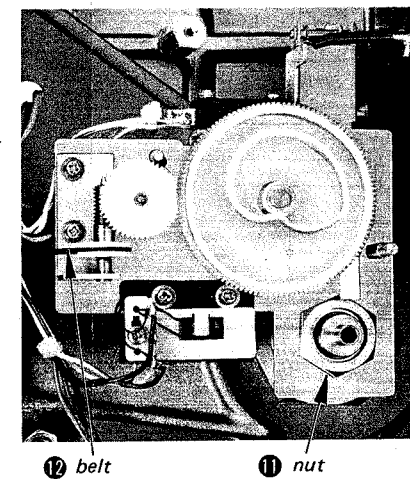
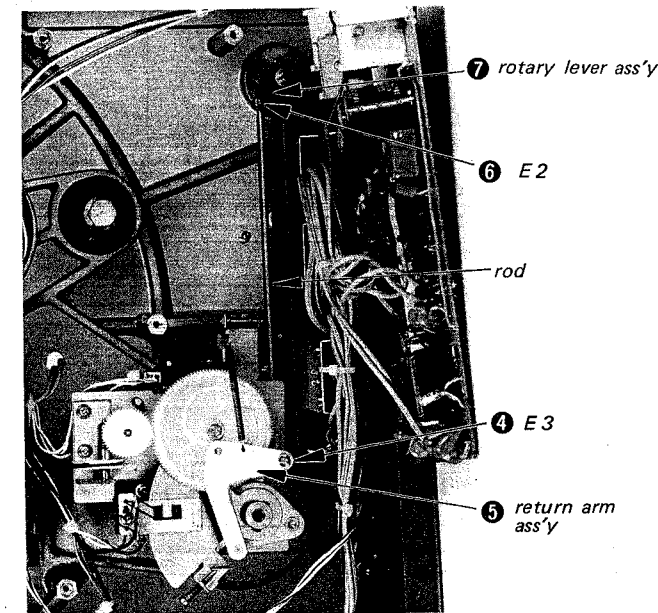
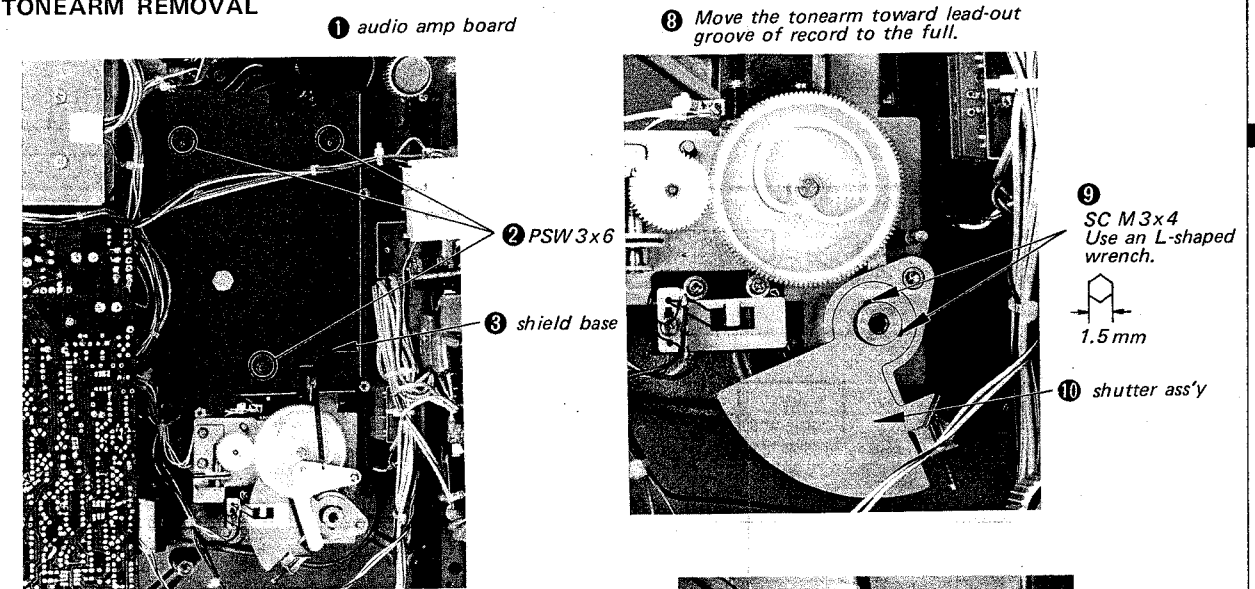
Under this condition, the each circuit board can be checked. When replacing the parts on the circuit board, remove the each screw as shown.



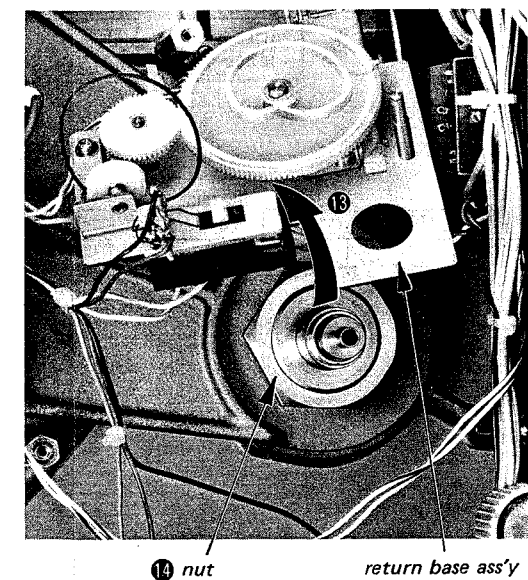
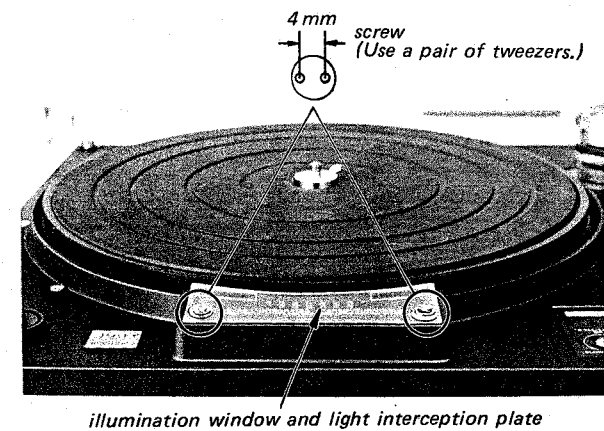
## H REPLACEMENT



## TONEARM REMOVAL



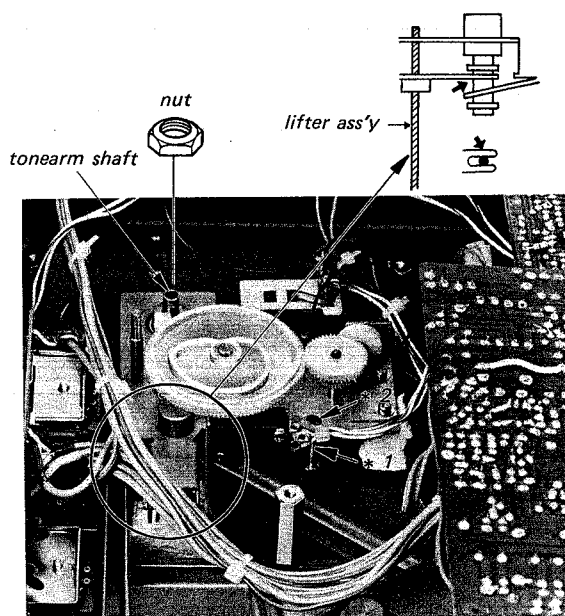
## STROBOSCOPE NEON LAMP REPLACEMENT



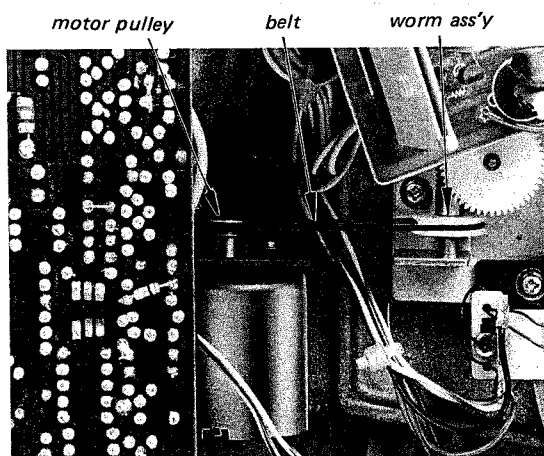
The tonearm can be removed by performing step 15.

## TONEARM INSTALLATION

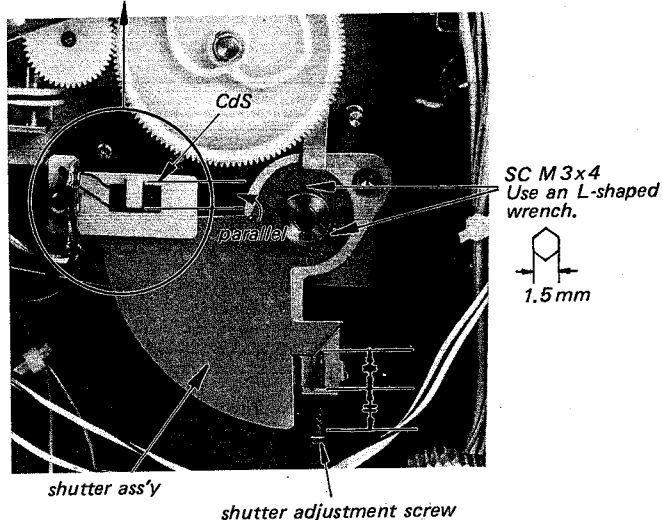
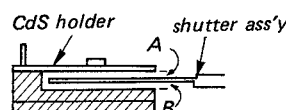
1. Install the lifter ass'y as shown.
2. Insert the shaft (\*1) into the hole (\*2).
3. Install the nut to the tonearm shaft.



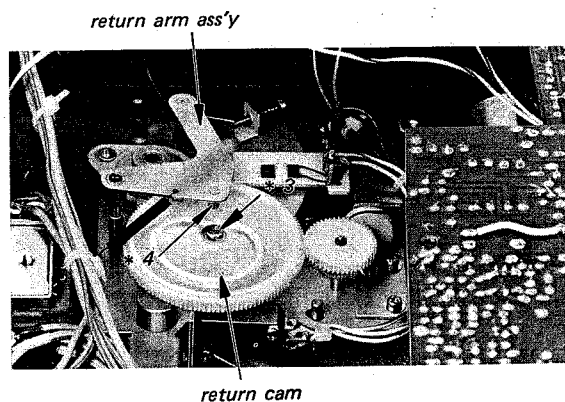
4. Install the belt.
5. Make sure that the motor pulley is even with the worm ass'y.



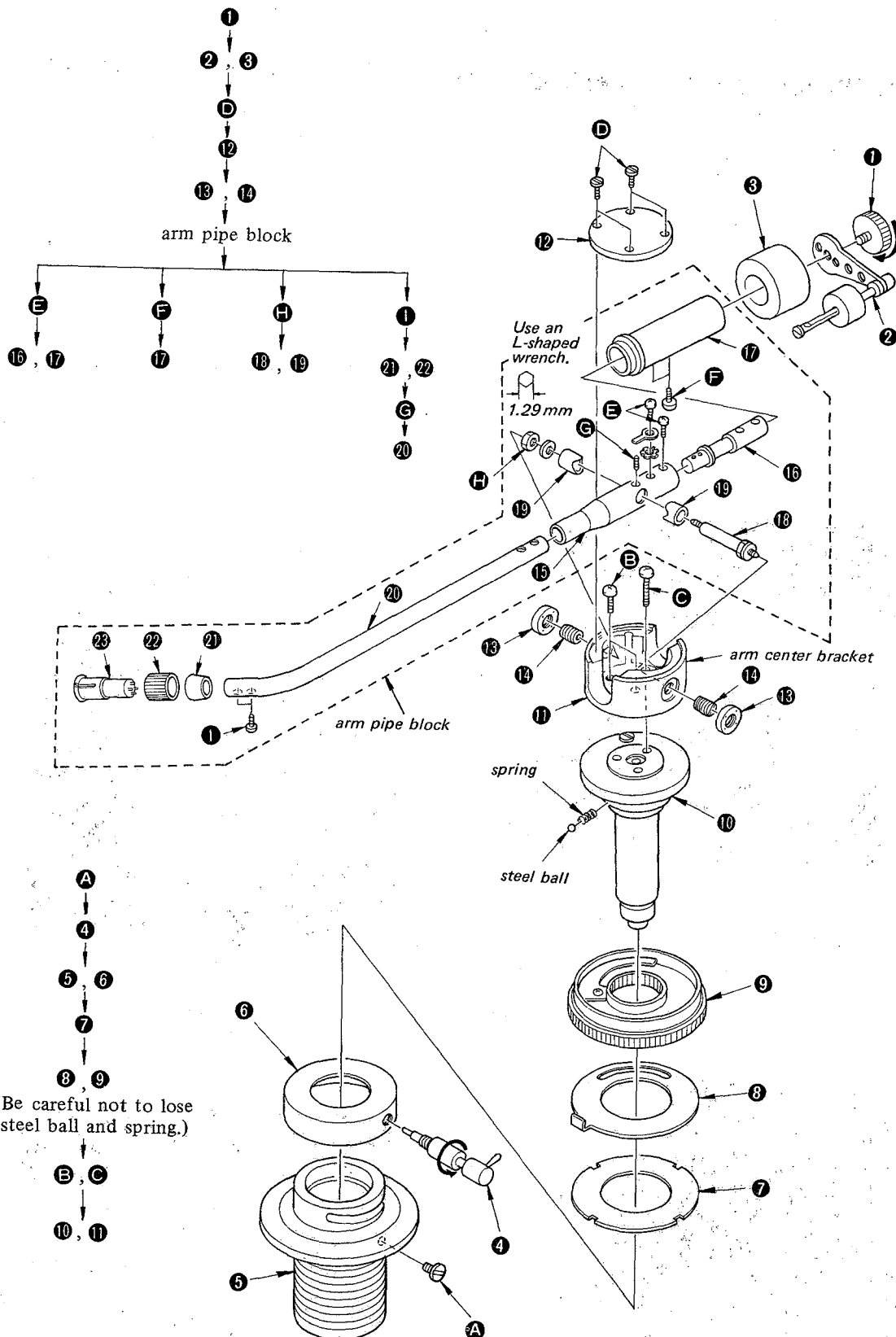
6. Adjust the tonearm so that clearance A is equal to B in the figure below.
7. Turn the shutter adjustment screw clockwise by half a turn.
8. When moving the tonearm toward the lead-out groove of record to the full, turn the screw so that CdS is parallel with shutter ass'y.
9. Temporarily, set the shutter ass'y with a screw (SC M 3×4).
10. Make the automatic-return adjustment on page 15.



11. Install the return arm ass'y. Make sure that the shaft (\*4) is inserted into the bearing (\*3).

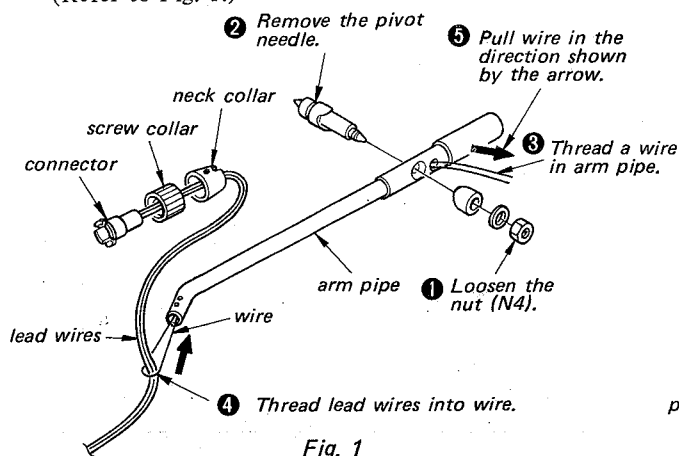


# TONEARM BLOCK DISASSEMBLY

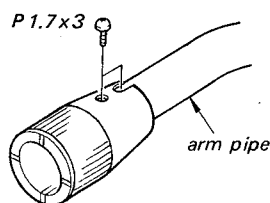


## TONEARM BLOCK ASSEMBLY

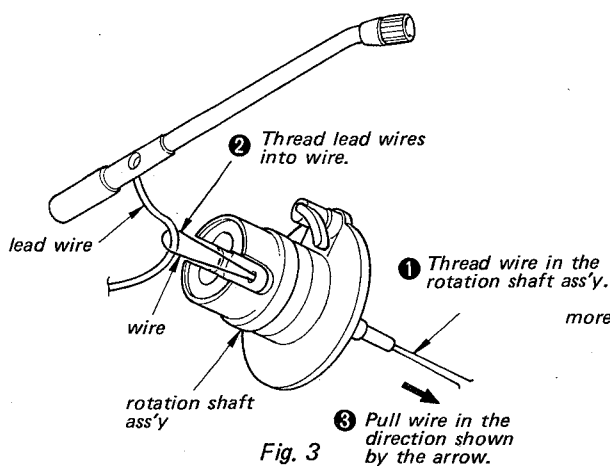
1. Thread the lead wires into the arm pipe.  
(Refer to Fig. 1.)



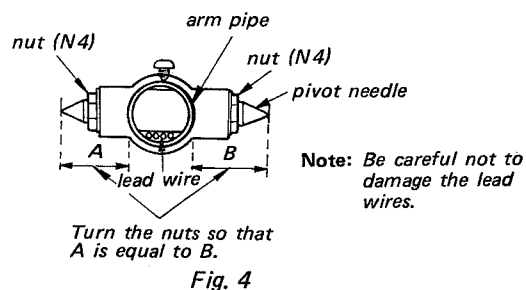
2. Install the neck-cylinder connector, screw collar and neck collar to the arm pipe. (Refer to Fig. 2.)



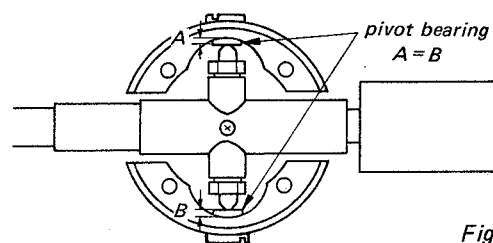
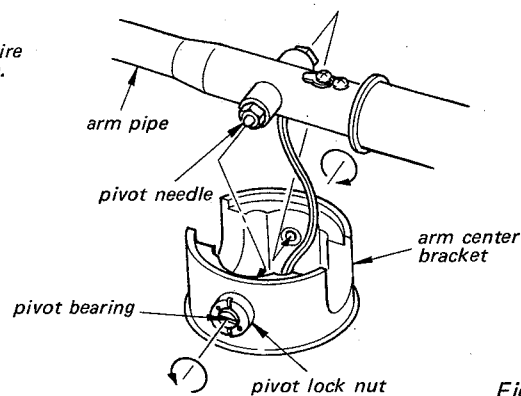
3. Thread the lead wires into the rotation shaft ass'y. (Refer to Fig. 3.)



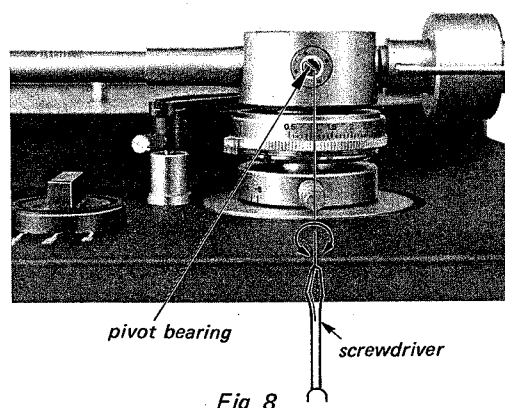
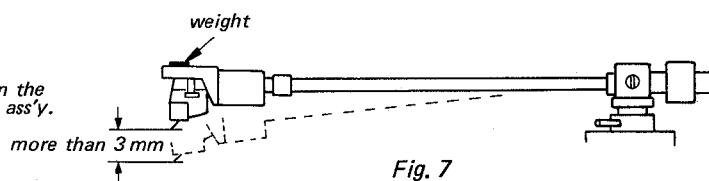
4. Install the pivot needle.



5. Install the arm pipe to the rotation shaft ass'y.
  - 1) Loosen the pivot bearings and lock nuts.
  - 2) Install the pivot needle as shown in Fig. 5. Temporarily, secure the two bearings for  $A = B$  as shown in Fig. 6. Do not tighten the two bearings strongly.



- 3) Install the tonearm, and make the balance adjustment with the two bearings. (Refer to Fig. 7 and Fig. 8.)
  - a. When the 20 mg weight is placed on the top of the shell (just above a stylus), the tonearm sinks more than 3 mm (measured at the stylus tip).
  - b. When the weight is removed, the tonearm returns horizontally.



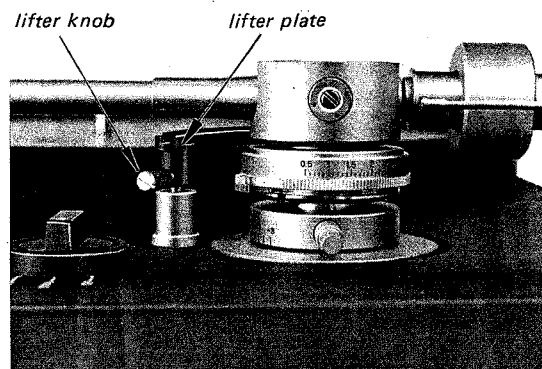
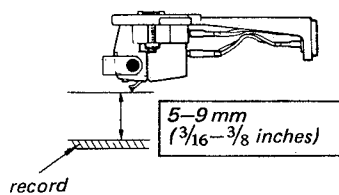
## SECTION 3

### ADJUSTMENTS

#### 3-1. MECHANICAL ADJUSTMENT

##### LIFTER PLATE HEIGHT ADJUSTMENT

1. Bring the tonearm above the record.
2. Set the arm lifter to UP position.  
Make sure that the distance between the record and the stylus is 5–9 mm ( $\frac{3}{16}$ – $\frac{3}{8}$  inches).
3. If necessary, adjust the height of arm lifter by loosening the lifter knob.



## 3-2. ELECTRICAL ADJUSTMENTS

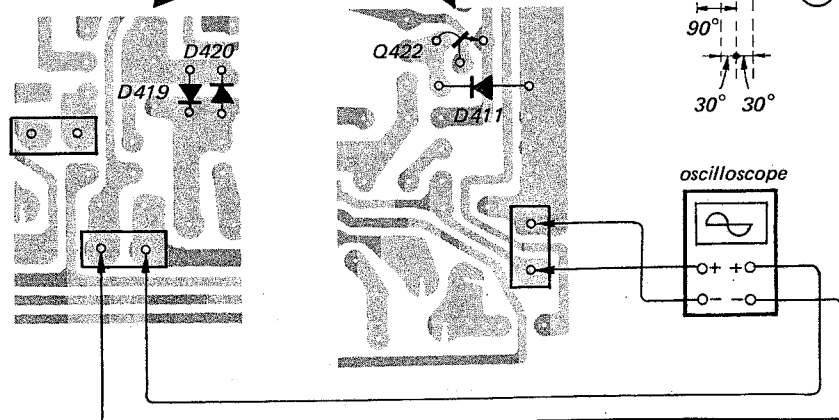
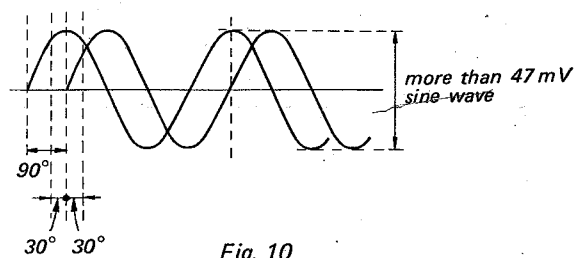
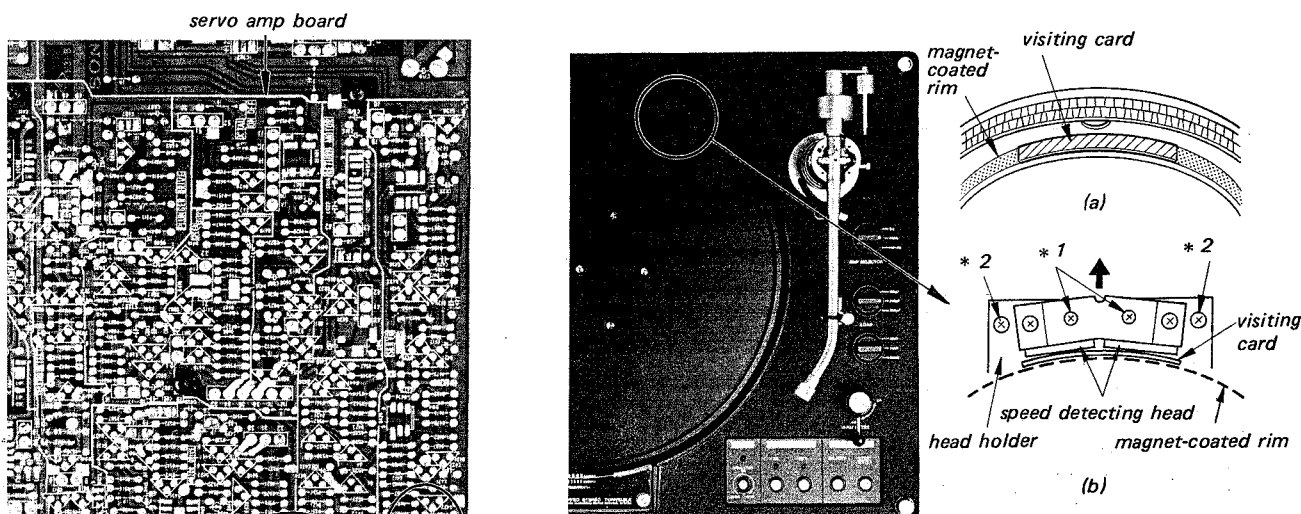
## SPEED DETECTING HEAD (MGH) POSITION ADJUSTMENT

Make this adjustment when replacing the speed detecting head and the turntable.

The improper adjustment will result in wow and flutter and mis-operation of servo control.

1. Remove the turntable. (Refer to page 5.)
2. Temporarily, secure the head bracket (with head mounted) to the frame.
3. Stick a visiting card (0.3 mm in thickness) on the magnet-coated rim as shown in Fig. 9 (a).
4. Install the turntable described on page 5.
5. Bring the head above the visiting card as shown in Fig. 9 (b).  
Adjust the position of head bracket so that the two heads touch the visiting card at the center of head slightly as shown in Fig. 9 (b).

6. Remove the turntable gently. Fix the two head bracket screws.
7. Remove the visiting card and install the turntable. Make sure that the two heads do not touch the magnet-coated rim.
8. Turn on the POWER switch and rotate the turntable at 33 rpm.
9. Connect an oscilloscope across the head as shown in Fig. 11.
10. Make sure that the waveform on the oscilloscope is shown in Fig. 10.
11. Adjust the two screws (\*1) when phase difference is improper, and the two screws (\*2) when output voltage is improper. (Refer to Fig. 9 (b).)



HALL DEVICE GAIN ADJUSTMENT (33<sup>1</sup>/<sub>3</sub> rpm)

- 1. Disconnect the jumper wire, and supply 1V dc as shown in Fig. 14.
- 2. Connect an oscilloscope to H1 and adjust RV405 and RV406 for 6Vp-p on the oscilloscope.
- 3. Connect an oscilloscope to H2 and adjust RV405 and RV406 for 6Vp-p on the oscilloscope.
- 4. Repeat the steps 2 and 3 two or three times.

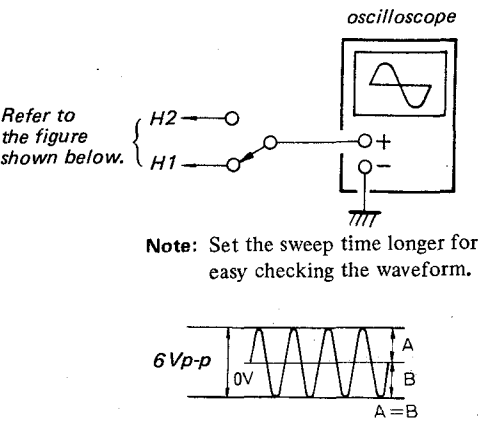


Fig. 12

MOTOR AMP OFFSET ADJUSTMENT (33<sup>1</sup>/<sub>3</sub> rpm)

- 1. Disconnect the jumper wire, and supply 1V dc as shown in Fig. 14.
- 2. Connect a VTVM (or oscilloscope) to H1 and adjust RV407 for 0V dc reading on the VTVM (for waveform shown below when using oscilloscope).
- 3. Connect a VTVM (or oscilloscope) to H2 and adjust RV408 for 0V dc reading on the VTVM (for waveform shown below when using oscilloscope).

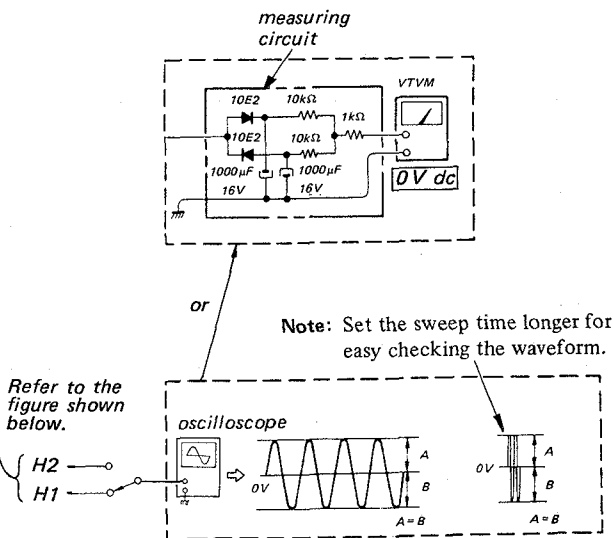


Fig. 13

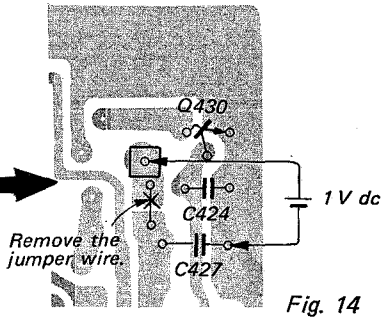
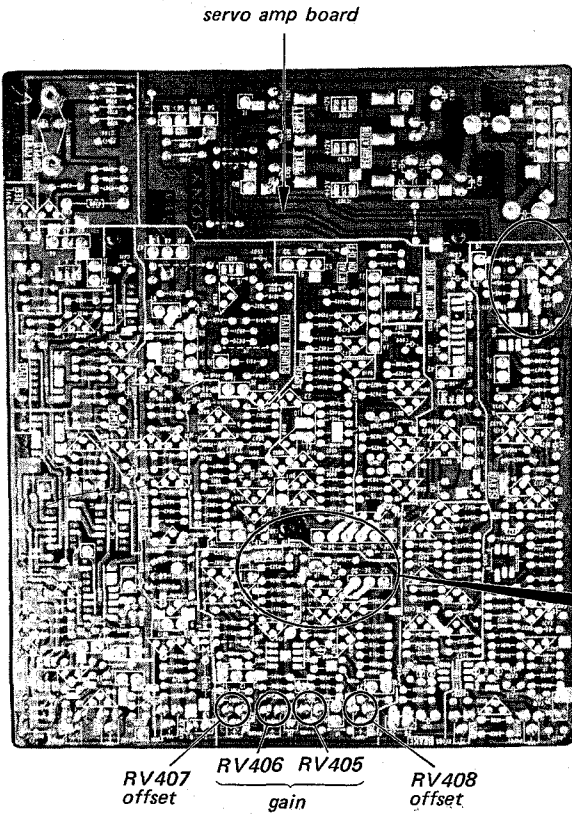


Fig. 14

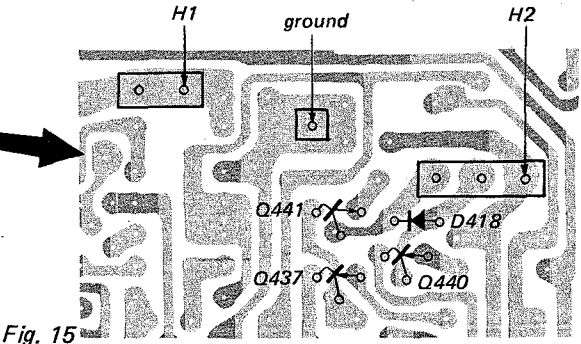
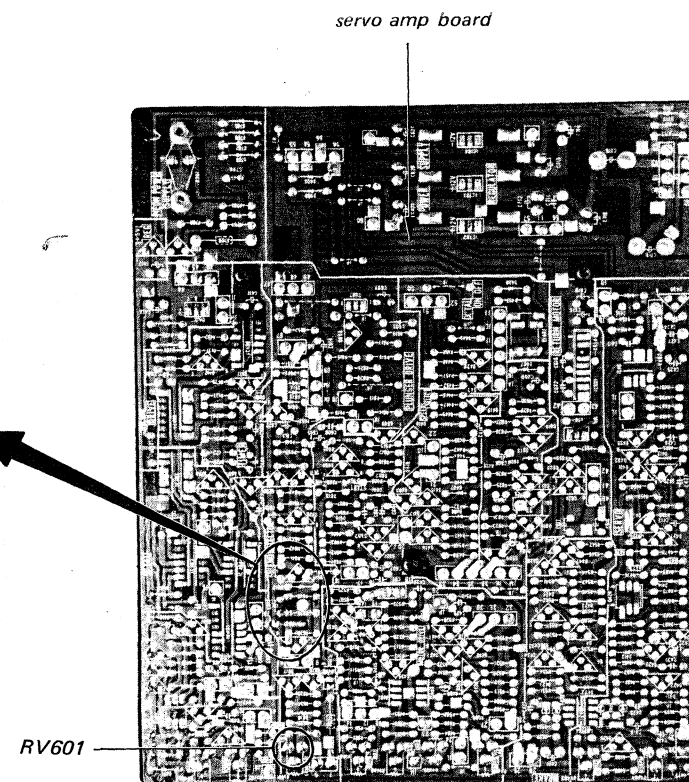
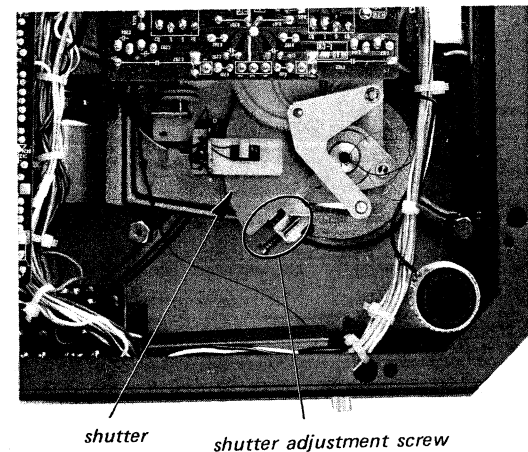
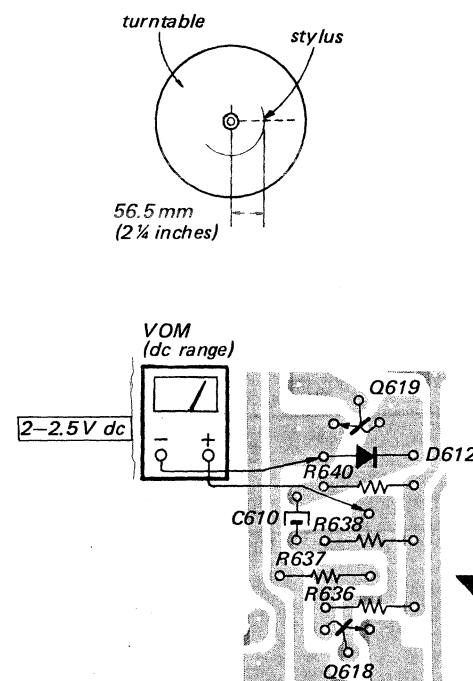


Fig. 15

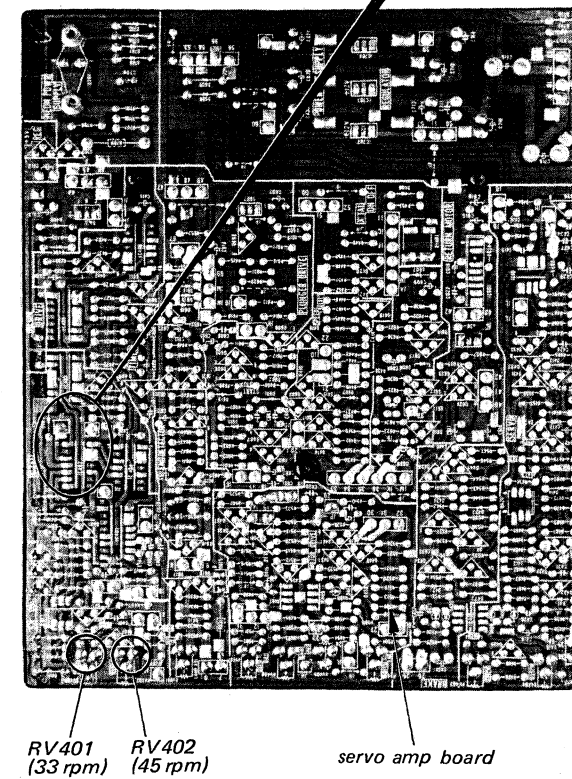
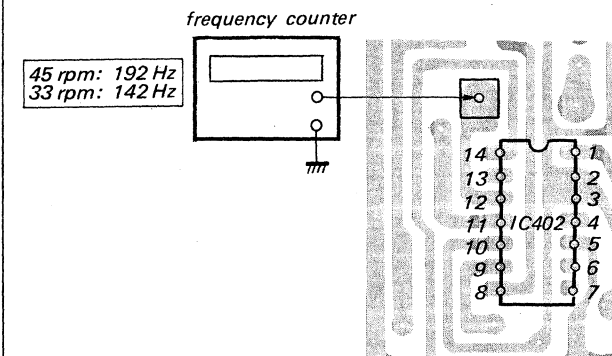
# AUTOMATIC RETURN POSITION ADJUSTMENT

1. Connect a VOM as shown below.
2. Bring the tonearm toward out-of lead groove of record to the full.
3. Adjust RV601 for 2–2.5 V dc reading on the VOM.
4. When the stylus is set as shown below, adjust the shutter adjustment screw for 8 V dc reading on the VOM.
5. Play a test record (SONY YFSC-6, BAND 2) at 33 rpm. Confirm that the tonearm automatically returns within 15–17 counts. If not, adjust the shutter adjustment screw again.
6. Play a test record (SONY YFSC-6, BAND 3–6) at 33 rpm. Make sure that the tonearm returns only when 1 kHz signal sound is output from a speaker. If not, adjust RV601.
7. When RV601 is readjusted, repeat the steps 5 and 6.



# OSCILLATOR FREQUENCY ADJUSTMENT

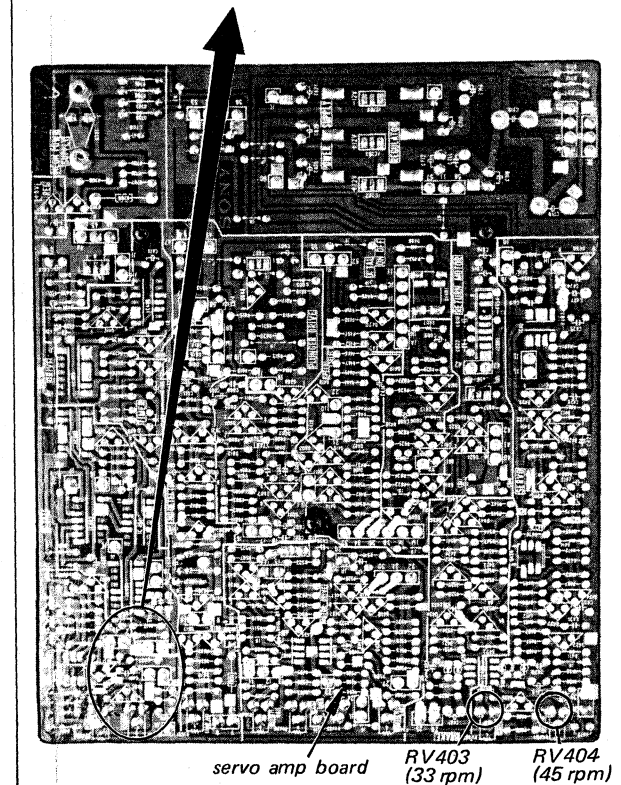
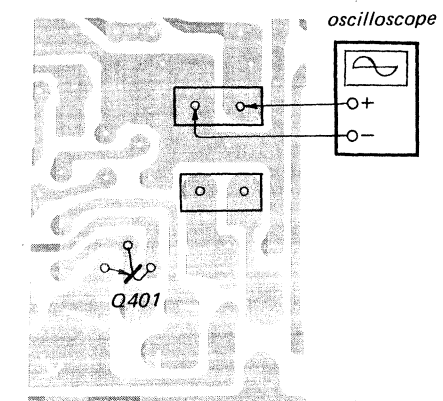
1. Connect a frequency counter to terminal ⑫ of IC402 on the servo amp board.
2. Set the speed switch to 45 rpm position.
3. Adjust RV402 for 192 Hz on the counter.
4. Set the speed switch to 33 rpm position.
5. Adjust RV401 for 142 Hz on the counter.



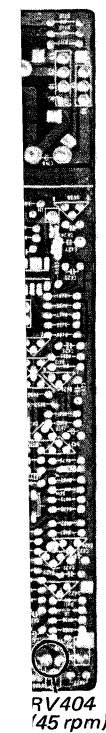
# TURNTABLE SPEED ADJUSTMENT

1. Connect an oscilloscope to terminal ⑨ of IC401.
2. Set the crystal-lock switch to X'TAL-LOCK position.
3. Set the speed switch to 45 rpm position.
4. Adjust RV404 for waveform on the oscilloscope as shown below.
5. Set the speed switch to 33 rpm position.
6. Adjust RV403 for waveform on the oscilloscope as shown below.

5V — — — — — ← as straight as possible  
 2.5V — — — — — ← dotted lines sometimes appear  
 0V — — — — — ← as straight as possible

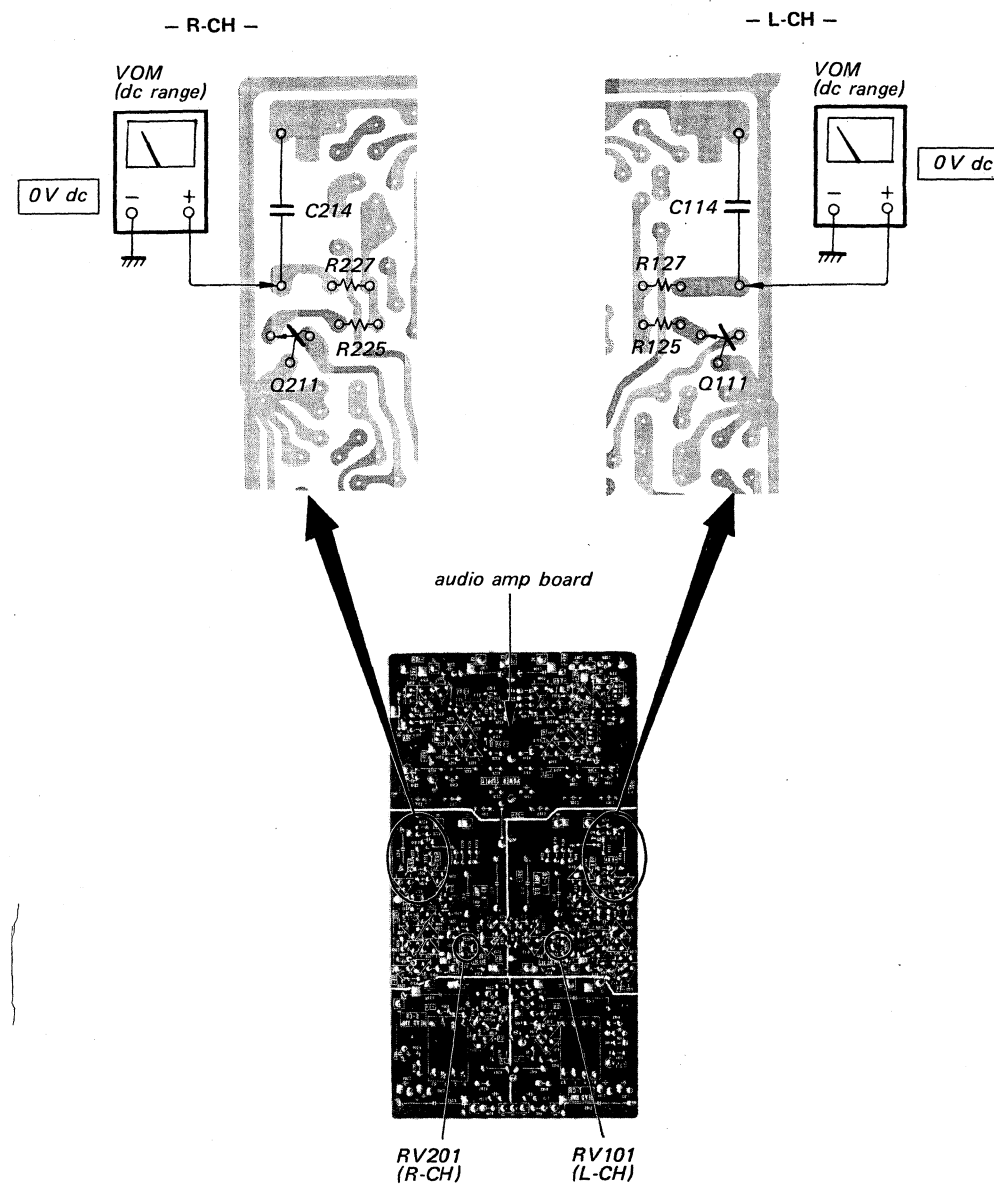


1 ⑨ of  
L-LOCK  
n.  
illoscope  
n.  
illoscope  
s possible  
sometimes  
as possible



## DC BALANCE ADJUSTMENT

1. Turn on the POWER switch.
2. Adjust RV101 (L-CH) and RV201 (R-CH) for 0V dc on the VOM with no signal input.



## Replacement Semiconductors

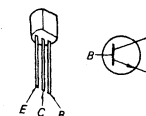
For replacement, use semiconductors except in ( ).

Q402  
Q407-412  
Q414-424  
Q429-432  
Q442-448  
Q601-606  
Q609-614  
Q616-624  
Q626, 1502  
Q434, 436  
Q439, 441  
Q608:

2SC1364

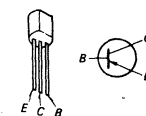
2SC1509

2SC1475



Q435, 437  
Q438, 440

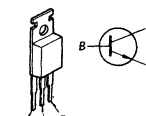
2SA777



Q607, 615  
Q625  
Q703, 704  
Q706, 708

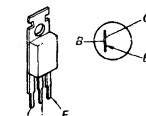
2SC1061

2SD476A



Q705, 707  
Q709

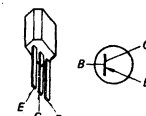
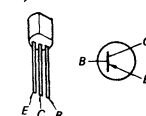
2SB566A



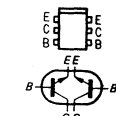
Q401  
Q404-406  
Q425, 427  
Q428, 433  
Q1501

2SA893

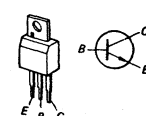
(2SA678)



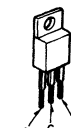
Q403, 426: 2SC1963



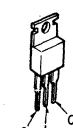
Q413: 2SC2278 (2SC1127)



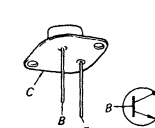
IC702, 703:  $\mu$ PC14312H



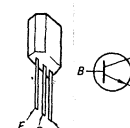
IC704: FS7912M



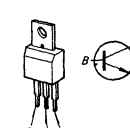
Q701: 2SC1431



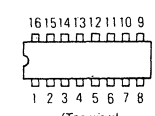
Q702: 2SC926A



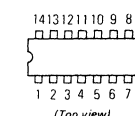
Q1503-1506: 2SC2023-R (2SC2023)



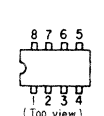
IC401: MSM5811



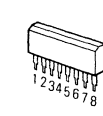
IC402, 404: M53293P (SN7493AN)  
IC406: M53200P (SN7400N)  
IC403, 405:



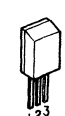
IC407-409:  $\mu$ PC1458C ( $\mu$ PC1458)



IC601: CX065A

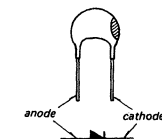


IC701:  $\mu$ PC78L05

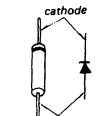


D409, 410  
D415, 416  
D419, 420  
D604, 606

VD1221

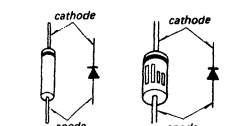


D401-404  
D411-414  
D417, 418  
D421-424  
D601-603  
D611-616  
D1501, 1502: 1S1555  
D407, 605: RD3.9E

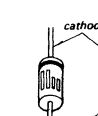


D405, 408  
D608, 609  
D704, 1001

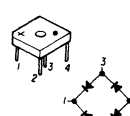
10E2 (SIB01-02)



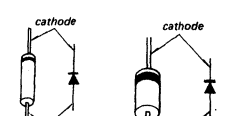
D406: EQB01-05 (EQA01-05R)  
D607: EQB01-13 (EQA01-13)  
D610: EQB01-06 (EQA01-06R)  
D709, 711: EQB01-33 (EQA01-33R)  
D710: EQB01-20 (EQA01-20R)  
D712: EQB01-18 (EQA01-18R)  
D713: EQB01-12Z (EQA01-12R)



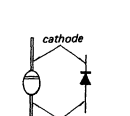
D702, 703: S2VB20



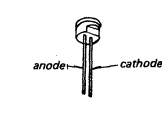
D705-708: 10E2 (GP08D)



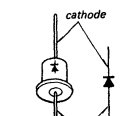
D751-754: U05G (U05E)



D755-757: SLP24B



D1503-1506: S34



H1, 2: 5GF-MS-07F



## SECTION 4

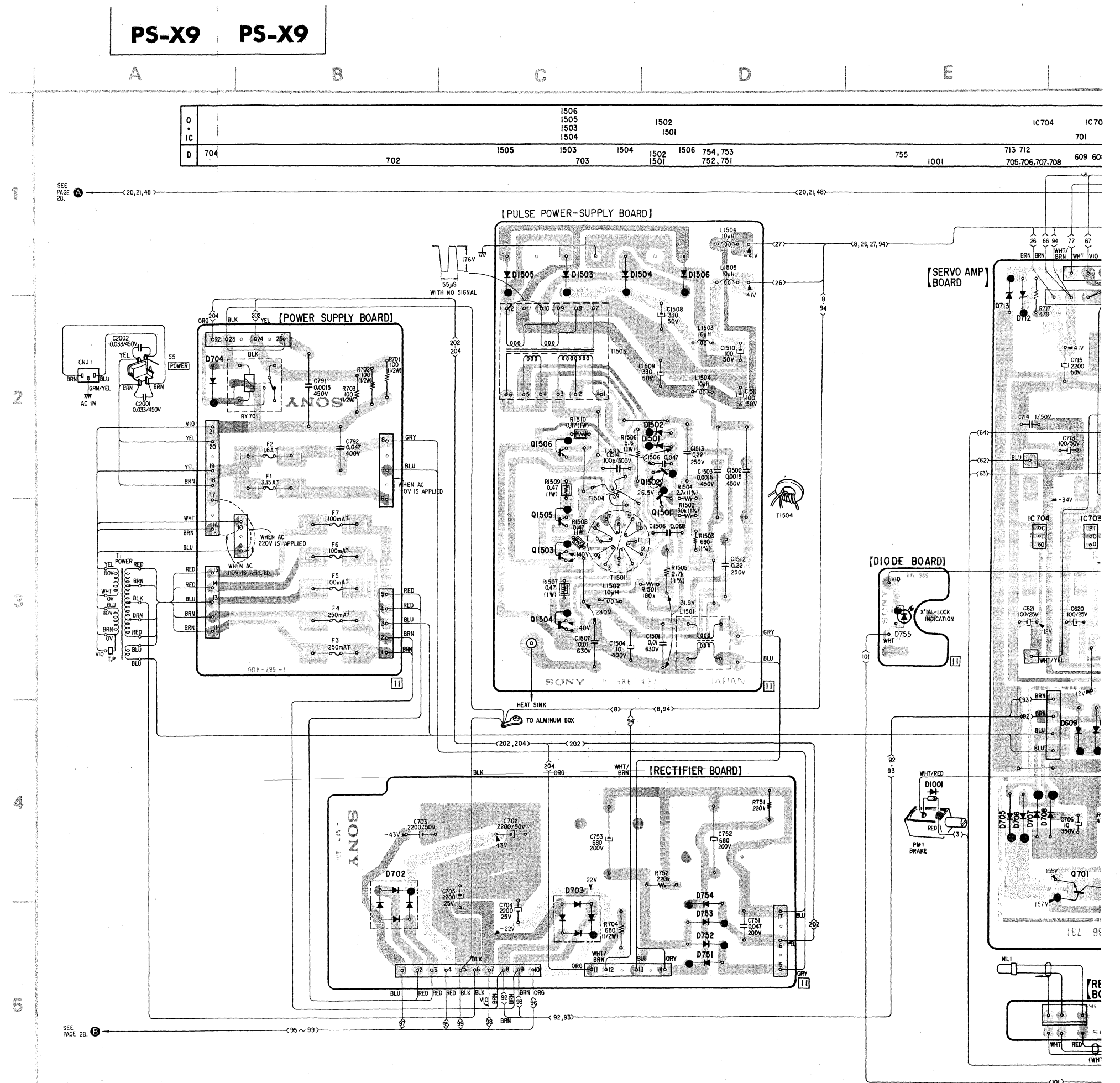
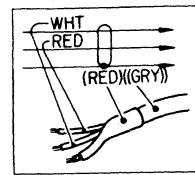
### DIAGRAMS

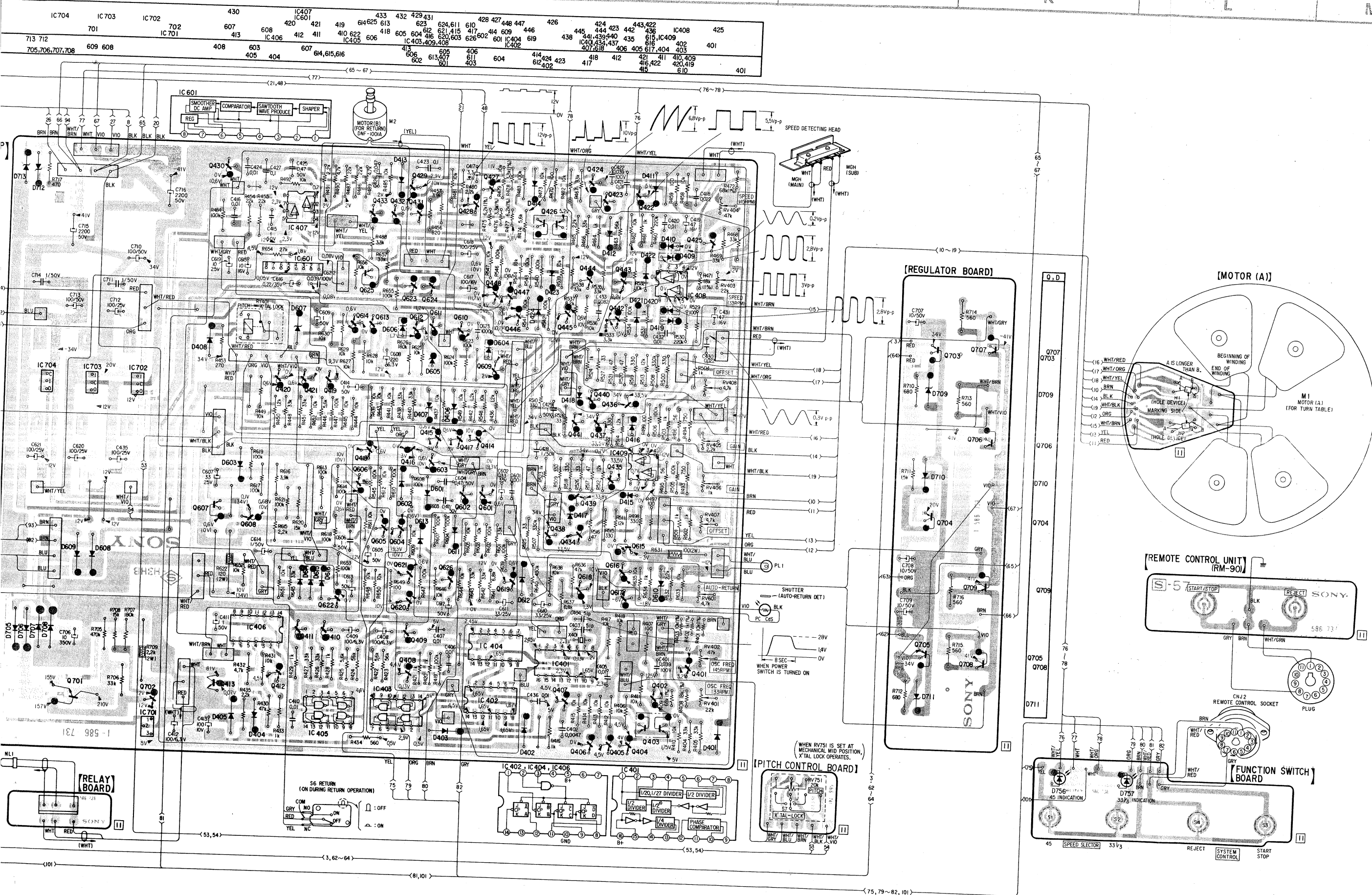
#### 4-1. MOUNTING DIAGRAM (SYSTEM CONTROL SECTION)

**Replacement Semiconductors:** See page 18.

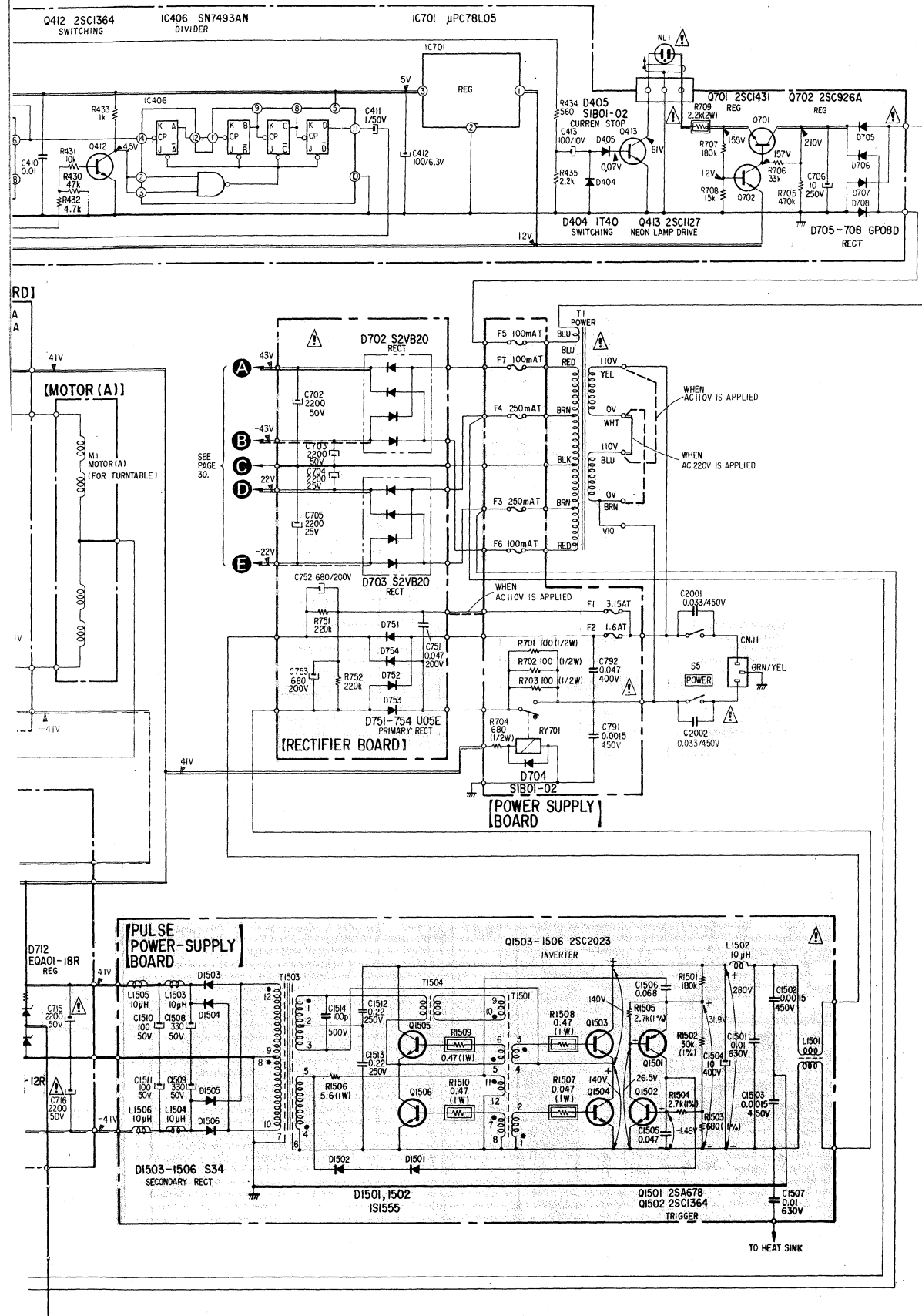
**Note:**

-  — : parts extracted from the component side.
-  : B+ pattern
-  : B- pattern
- Color code of sleeving over the end of the jacket.









Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note:

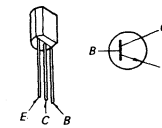
- All capacitors are in  $\mu F$  unless otherwise noted. pF:  $\mu F$  50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms,  $\frac{1}{4}W$  unless otherwise noted.  $k\Omega$ : 1000  $\Omega$ ;  $M\Omega$ : 1000  $k\Omega$
-  : nonflammable resistor.
-  : panel designation.
-  : adjustment for repair.
-  : B+ bus.
-  : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20  $k\Omega/V$ ). ( ) : stop
- Voltage variations may be noted due to normal production tolerances.
- (1%) indicates component tolerance.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Switch

| Ref. No. | Switch            | Position |
|----------|-------------------|----------|
| S1       | 45 SPEED          | OFF      |
| S2       | 33 1/3 SELECTOR   | OFF      |
| S3       | START/STOP SYSTEM | OFF      |
| S4       | REJECT CONTROL    | OFF      |
| S5       | POWER             | OFF      |
| S6       | RETURN            | OFF      |
| S7       | X'TAL-LOCK        | ON       |

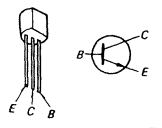
Replacement Semiconductors

For replacement, use semiconductors except in ( ).

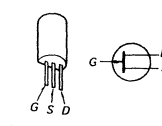
Q101, 201  
Q104, 204  
Q106, 206  
Q109, 209  
Q112, 212 : 2SC1775E (2SC1775)  
Q113, 213  
Q304, 306  
Q309, 311  
Q313, 314



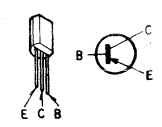
Q102, 202  
Q111, 211 : 2SC1811



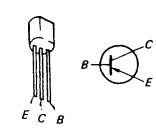
Q103, 203  
Q114, 214 : 2SK43-2 (2SK43)  
Q303, 316  
Q308, 321 : 2SK43-5 (2SK43)



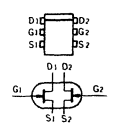
Q105, 205  
Q108, 208  
Q110, 210  
Q301, 302  
Q315, 317  
Q320, 322 : 2SA872E (2SA872)



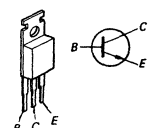
Q115, 215: 2SA896



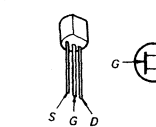
Q107, 207: 2SK97



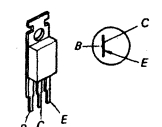
Q305: 2SC1061 (2SC1061C)  
Q310: 2SC1173



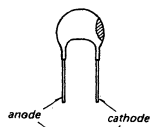
Q307, 312  
Q319, 324 : 2SK30A



Q318: 2SA671  
Q323: 2SA473



D101, 201  
D102, 202 : VD1221 (VD1221M)



# 4-3. MOUNTING DIAGRAM (AMP SECTION)

PS-X9 PS-X9

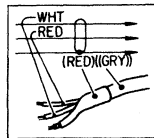
# 4-4. SCHEMATIC DIAGRAM (AMP SECTION)

— Conductor Side —

Replacement Semiconductors:  
See page 26.

## Note: For Mounting Diagram

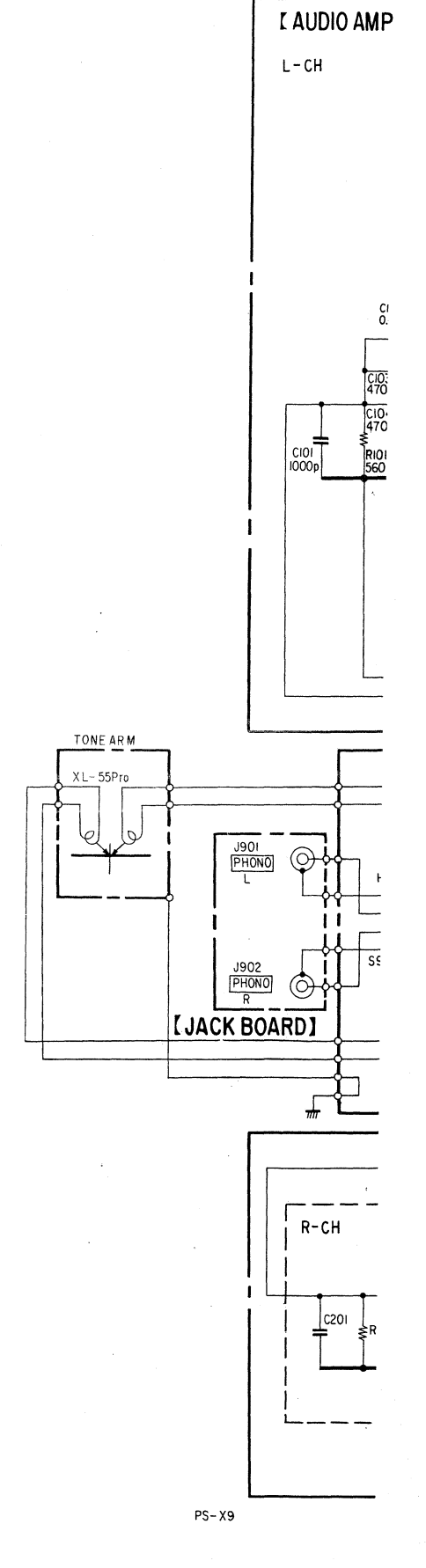
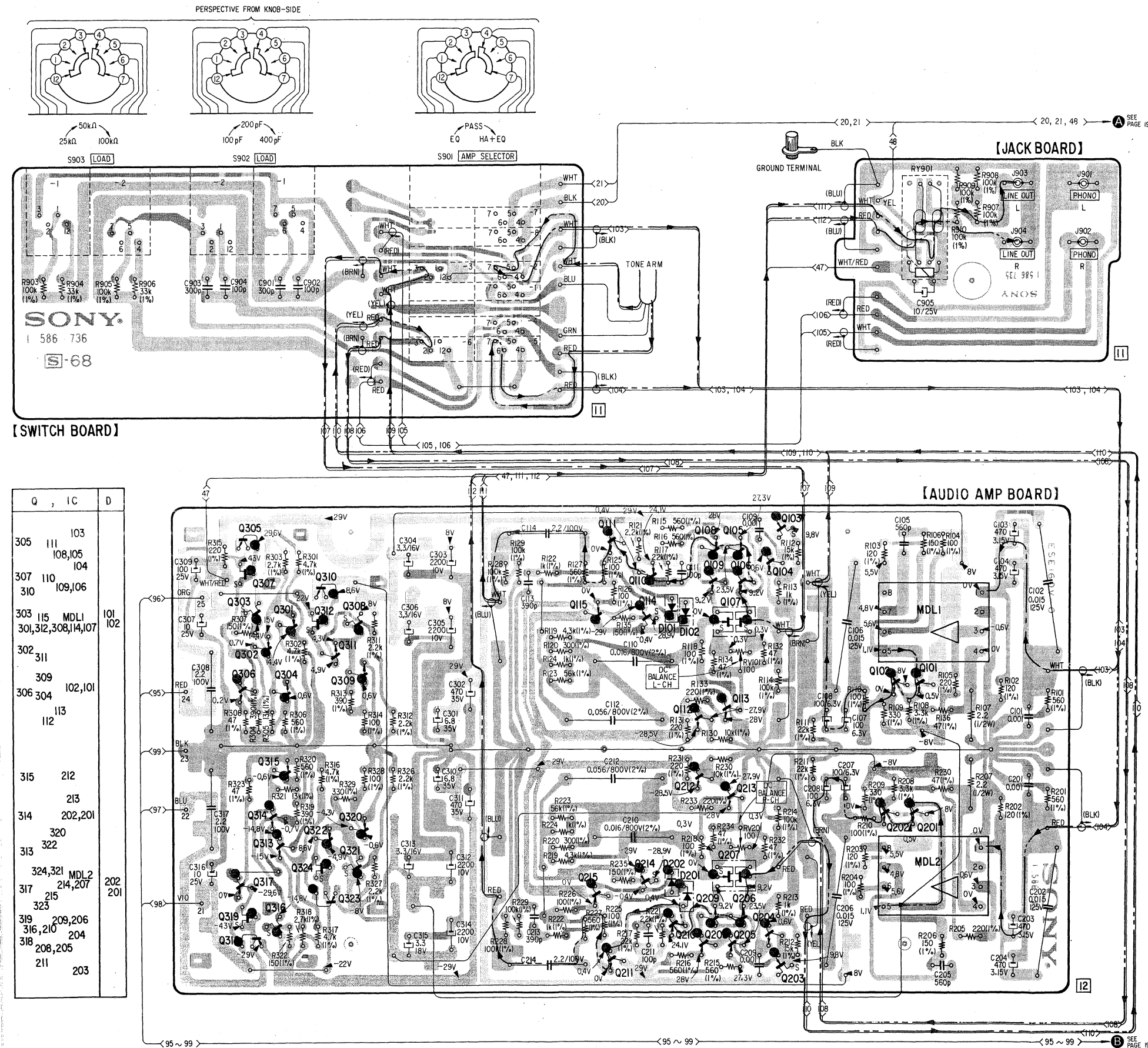
- : parts extracted from the component side.
- : B+ pattern
- : B- pattern
- : signal path
- : L-CH signal path
- : R-CH signal path
- Color code of sleeving over the end of the jacket.



## Note: For Schematic Diagram

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalum.
- All resistors are in ohms,  $\frac{1}{2}\text{W}$  unless otherwise noted.  $\text{k}\Omega$ : 1000 $\Omega$ ;  $\text{M}\Omega$ : 1000  $\text{k}\Omega$ .
- : panel designation.
- : adjustment for repair.
- : B+ bus.
- - -: B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).
- Voltage variations may be noted due to normal production tolerances.
- 1% indicates component tolerance.
- All adjustable resistors have characteristic curve B, unless otherwise noted.
- Switch

| Ref. No.    | Switch       | Position            |
|-------------|--------------|---------------------|
| S901-1 to 8 | AMP SELECTOR | EQ                  |
| S902-1, 2   | LOAD         | 100pF               |
| S903-1, 2   | LOAD         | 25 $\text{k}\Omega$ |



[ AUDIO AMP BOARD ]

L-CH

MDL1  
AMP

Q101 2SC1775 Q102 2SC1811  
HEAD AMP  
BUFFER AMP

Q103 2SK43  
CURRENT REG  
Q104 2SC1775  
REG  
Q112,113 2SC1775  
CURRENT MIRROR

Q105,108 2SA872  
CURRENT MIRROR  
Q106,109 2SC1775  
CASCODE AMP  
Q107 2SK97  
EQ PRE AMP

Q110 2SA872  
EQ 2nd AMP  
Q114 2SK43  
CURRENT REG  
D101,102 VD1221M  
REG

Q111 2SC1811 Q115 2SA896  
EQ AMP OUT

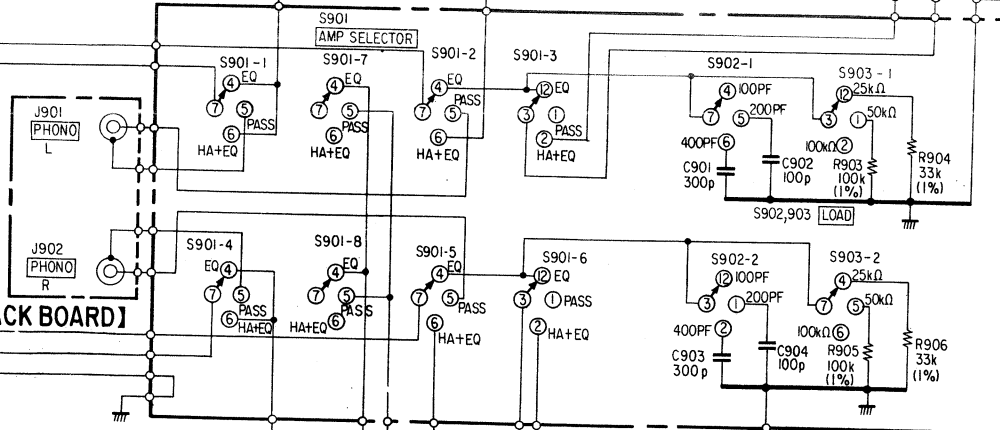
Q301,302 2SA872  
DIFFERENTIAL AMP  
Q304 2SC1775  
REG

Q303 2SK43  
CURRENT REG  
Q305 2SC1061C  
REG  
Q306 2SC1775  
DET-AMP

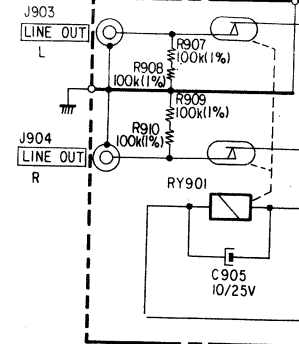
Q307 2SK30A  
CURRENT REG  
Q308 2SK43  
CURRENT REG  
Q309 2SC1775  
REG

Q310 2SC1173  
REG  
Q312 2SK30A  
CURRENT REG  
Q311 2SC1775  
DET-AMP

VOLTAGE REGULATOR



[ JACK BOARD ]



R-CH

R-CH  
(SAME AS L-CH.  
REF NO. FROM 201)







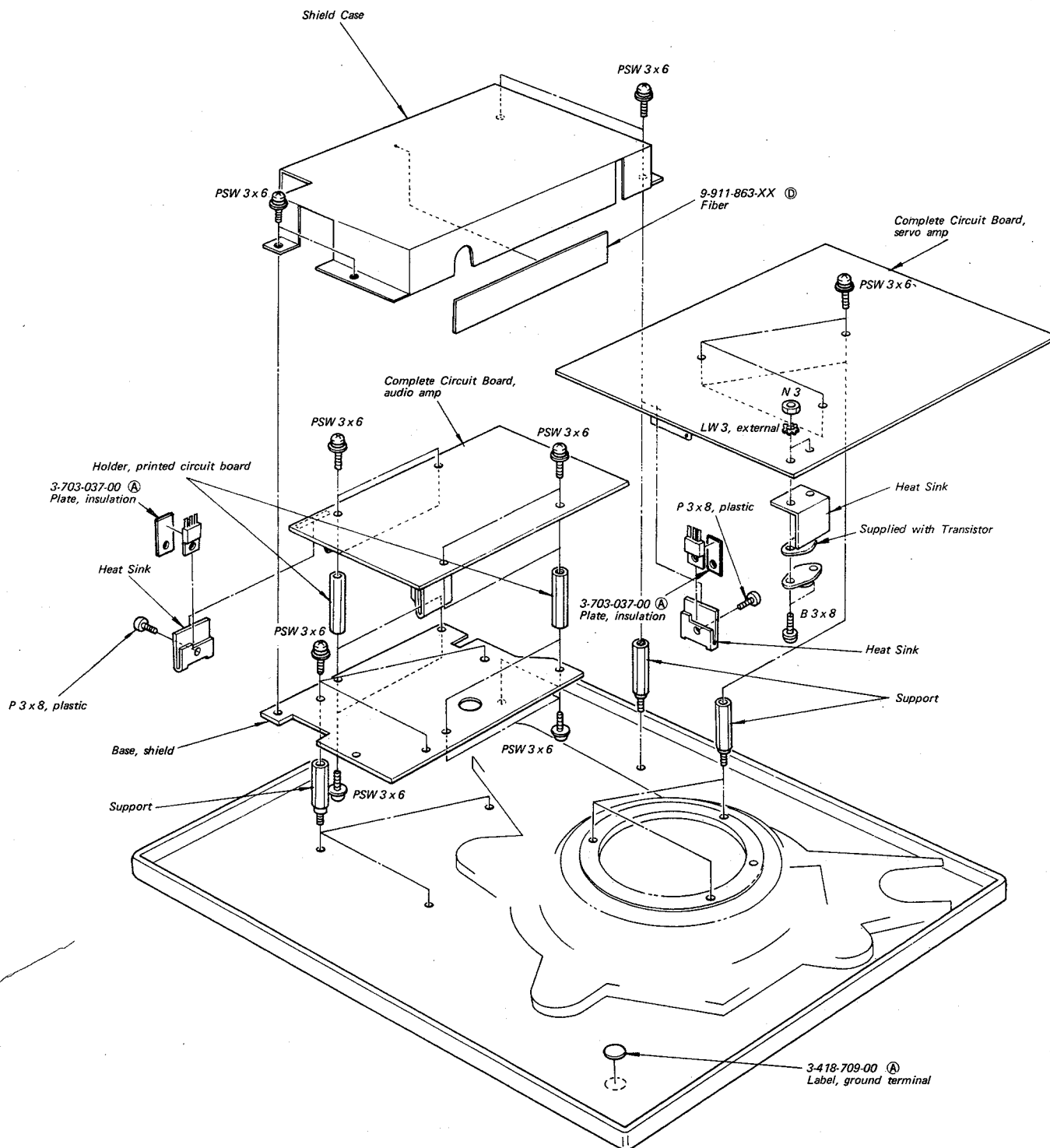
A

B

C

D

- 5-4. Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.
  - (-) = slotted head
  - Circled letters (A to Z) are applicable to European models only.



A

B

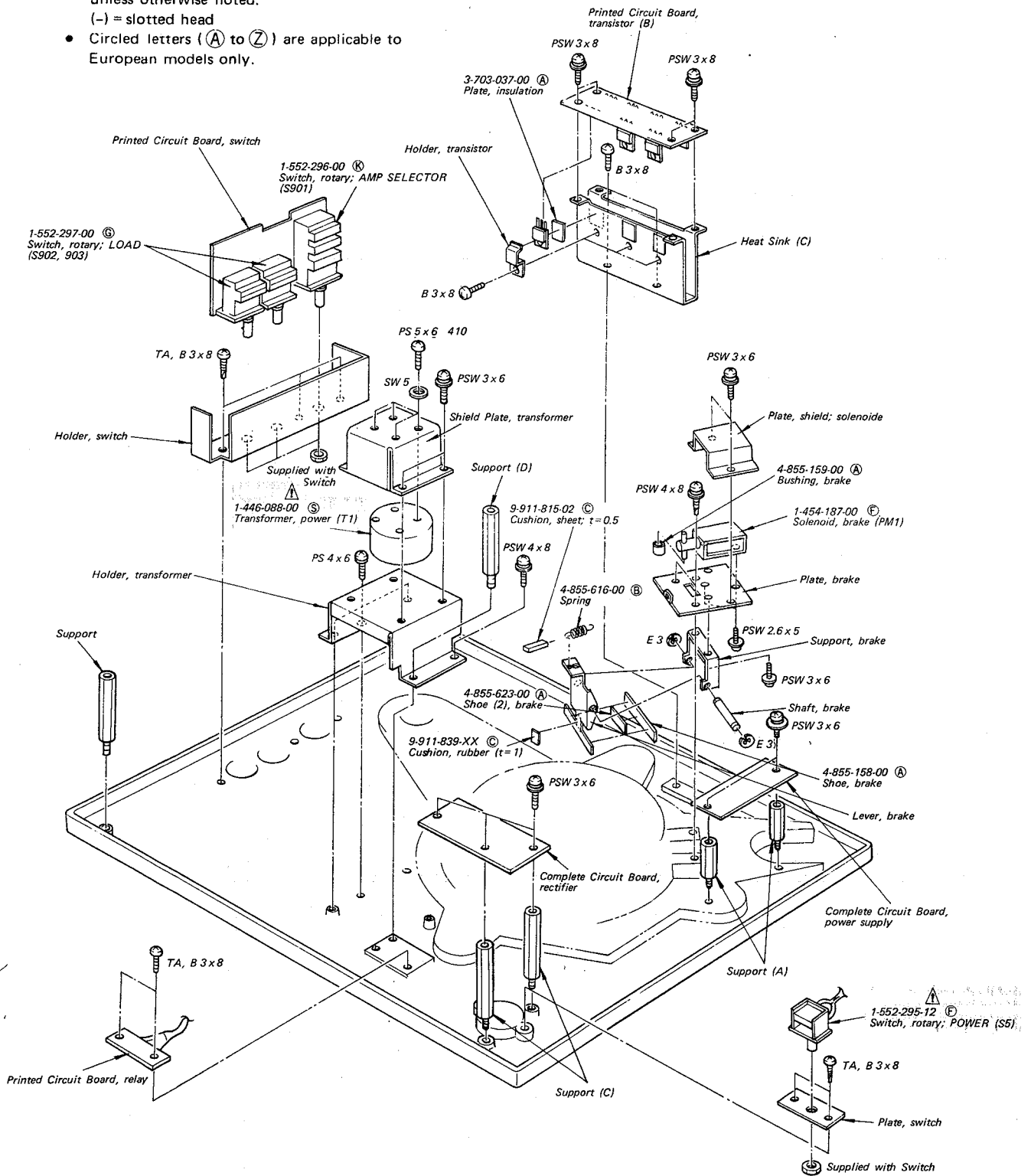
C

D

5-5.

- Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head
  - Circled letters (A to Z) are applicable to European models only.

**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.



A

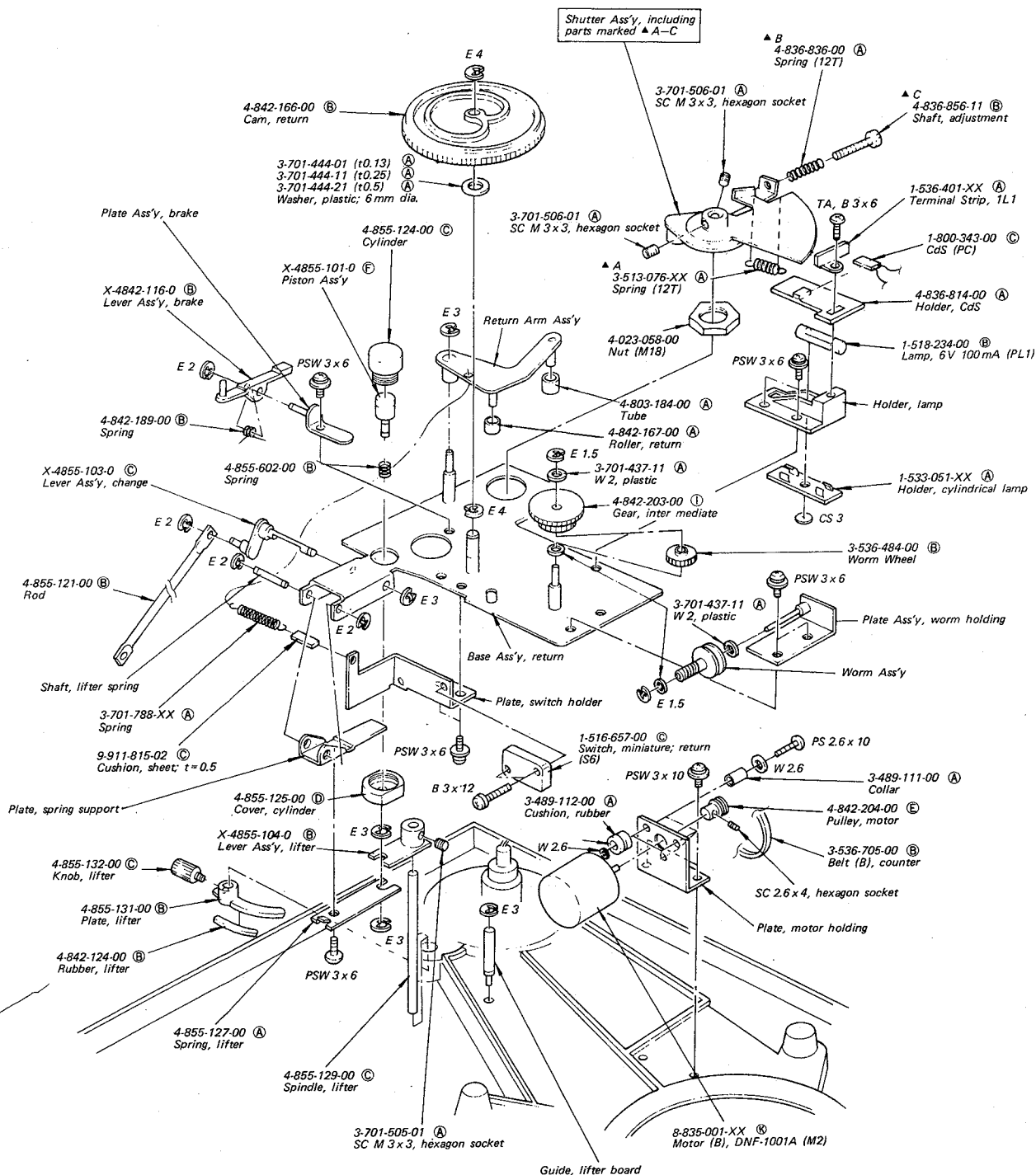
B

C

D

5-6.

- Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.
  - (-) = slotted head
  - (□□T) shows the number of coils in spring.
  - Circled letters (A to Z) are applicable to European models only.



A

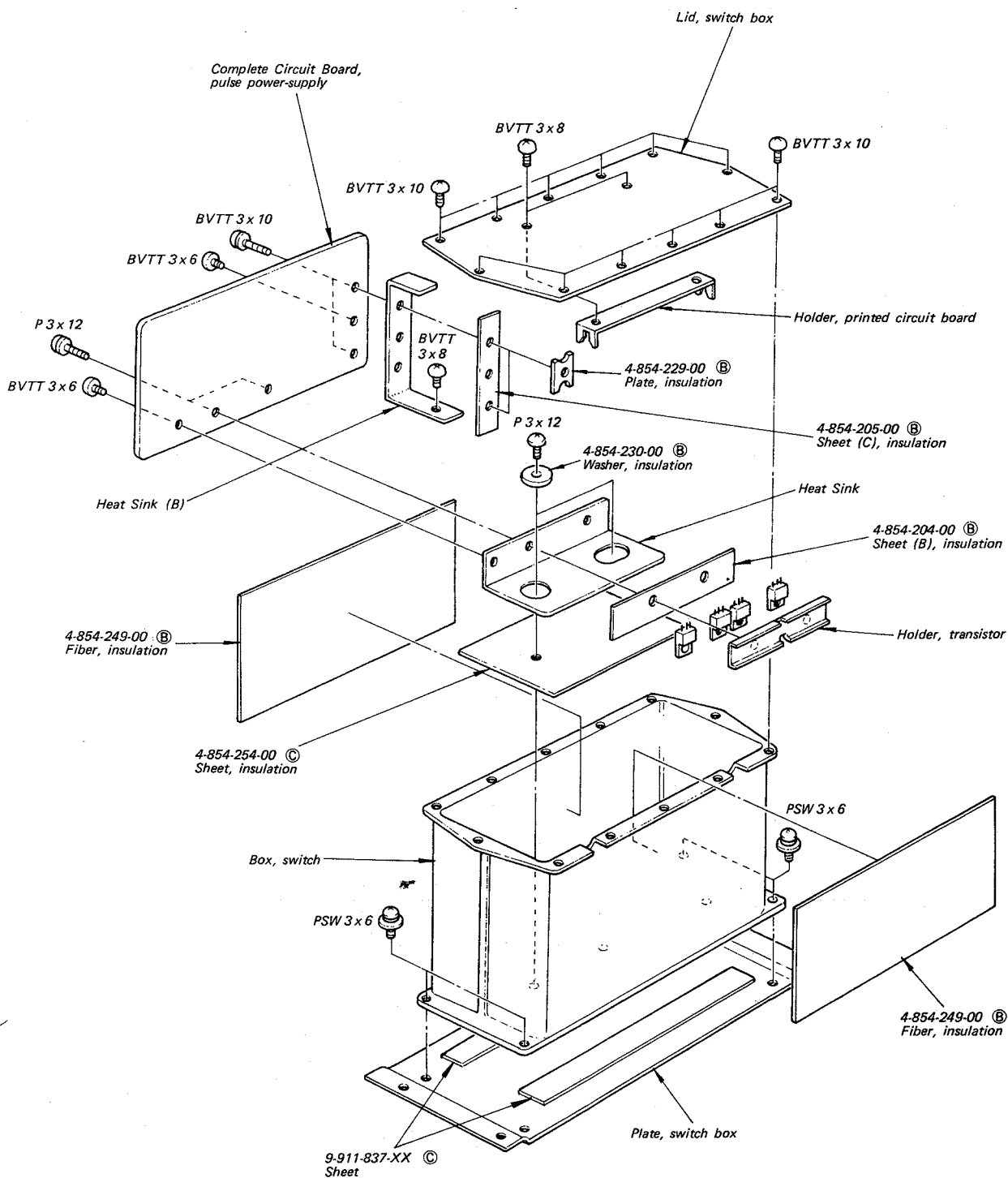
B

C

D

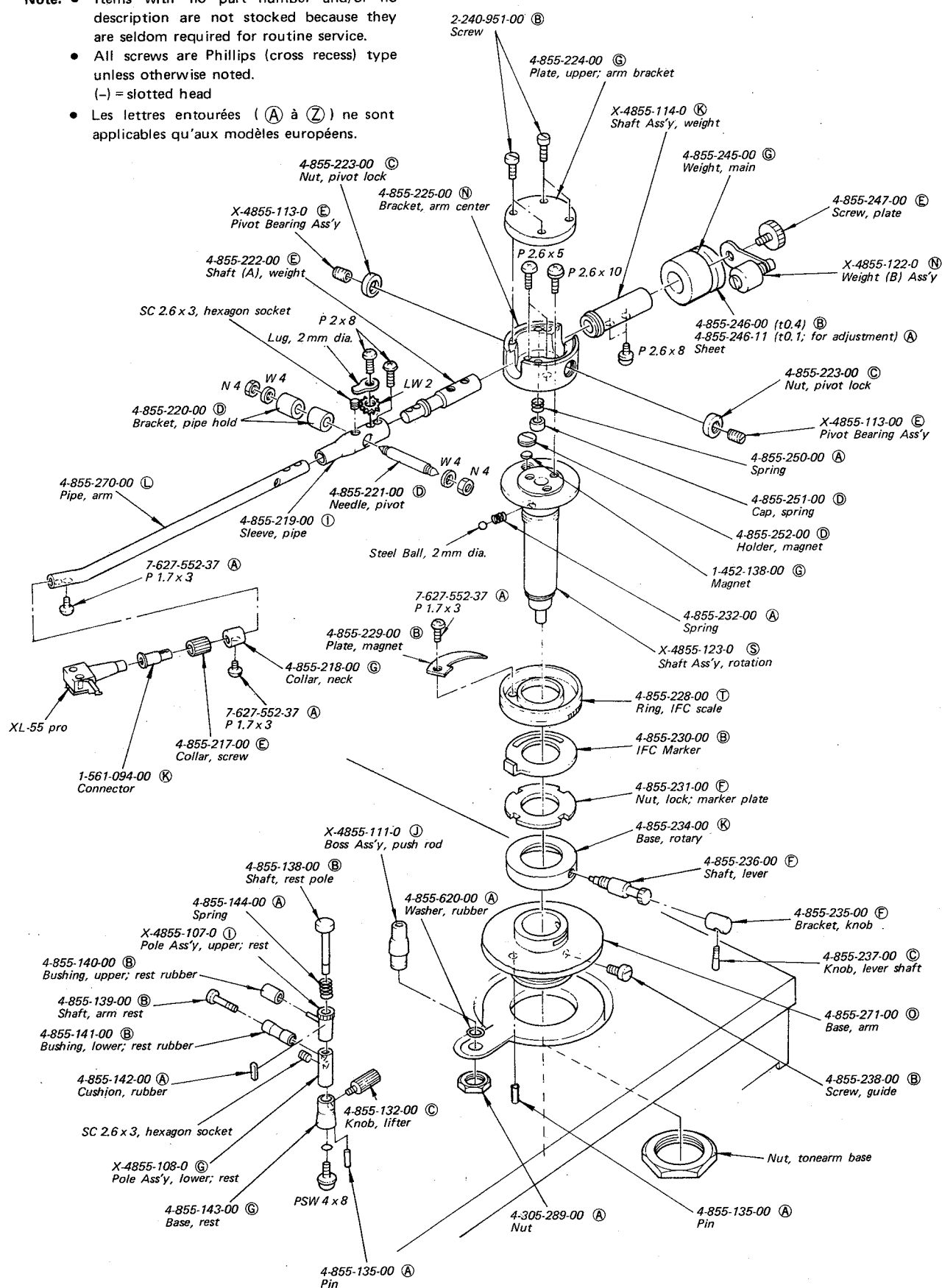
5-7.

- Note:**
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.  
(-) = slotted head
  - Les lettres entourées (A à Z) ne sont applicables qu'aux modèles européens.



A B C D

- 5-8. Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.
  - (-) = slotted head
  - Les lettres entourées (A à Z) ne sont applicables qu'aux modèles européens.



# SECTION 6 ELECTRICAL PARTS LIST

Note: Circled letters (A to Z) are applicable to European models only.

- 5-9. Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - All screws are Phillips (cross recess) type unless otherwise noted.
  - (-) = slotted head
  - Circled letters (A to Z) are applicable to European models only.

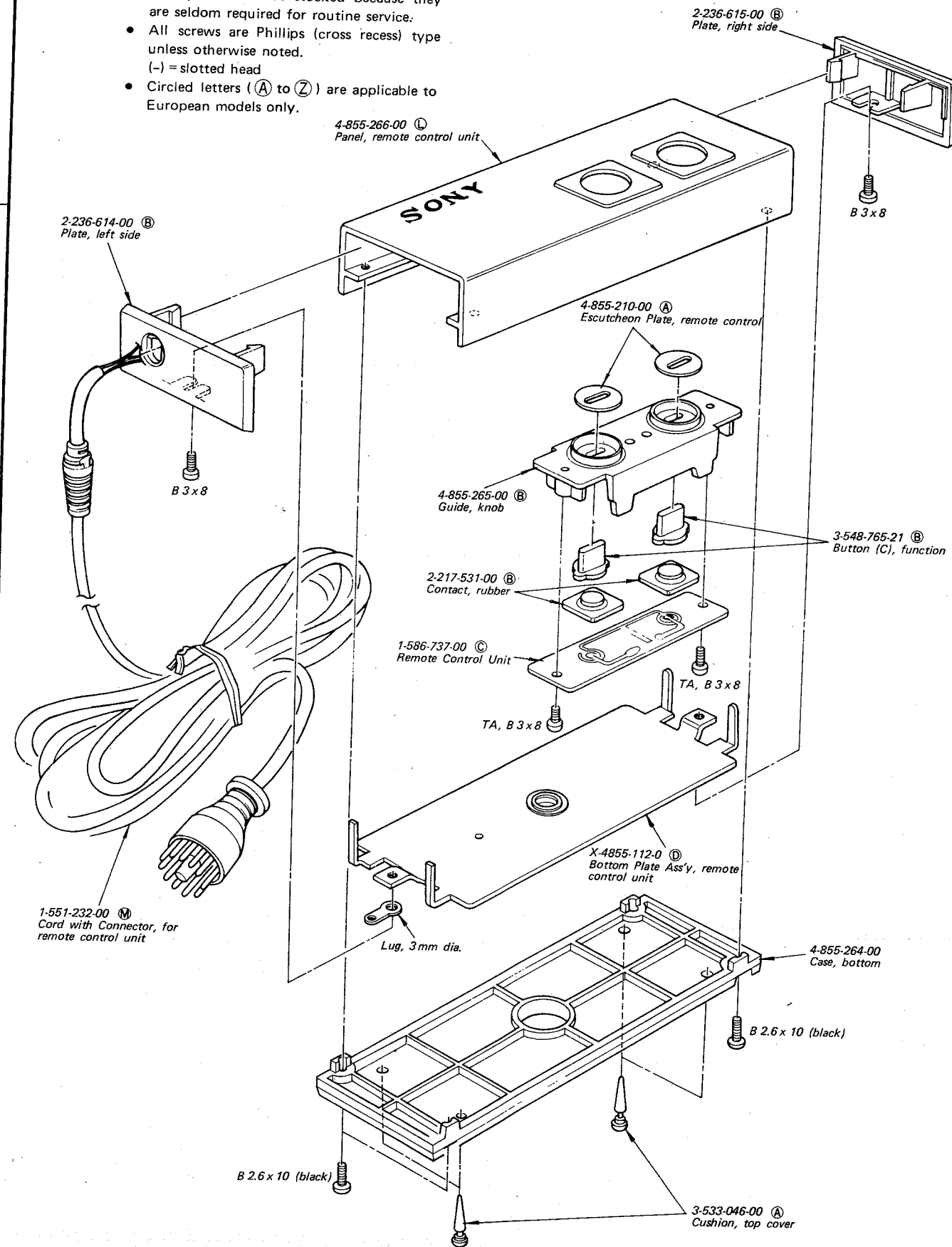
1

2

3

4

5



Ref. No. Part No. Description

## SEMICONDUCTORS

### Transistors

|            |              |              |
|------------|--------------|--------------|
| ⇒ Q101,201 | 8-729-377-58 | (B) 2SC1775E |
| Q102,202   | 8-765-012-20 | (B) 2SC1811  |
| ⇒ Q103,203 | 8-723-302-00 | (D) 2SK43-2  |
| ⇒ Q104,204 | 8-729-377-58 | (B) 2SC1775E |
| ⇒ Q105,205 | 8-729-387-28 | (B) 2SA872E  |
| ⇒ Q106,206 | 8-729-377-58 | (B) 2SC1775E |
| Q107,207   | 8-765-342-10 | (F) 2SK97    |
| ⇒ Q108,208 | 8-729-387-28 | (B) 2SA872E  |
| ⇒ Q109,209 | 8-729-377-58 | (B) 2SC1775E |
| ⇒ Q110,210 | 8-729-387-28 | (B) 2SA872E  |
| Q111,211   | 8-765-012-20 | (C) 2SC1811  |
| ⇒ Q112,212 | 8-729-377-58 | (B) 2SC1775E |
| ⇒ Q113,213 | 8-729-377-58 | (B) 2SC1775E |
| ⇒ Q114,214 | 8-723-302-00 | (D) 2SK43-2  |
| Q115,215   | 8-765-082-20 | (C) 2SA896   |
| ⇒ Q301,302 | 8-729-387-28 | (B) 2SA872E  |
| ⇒ Q303     | 8-723-302-00 | (D) 2SK43-2  |
| ⇒ Q304     | 8-729-377-58 | (B) 2SC1775E |
| ⇒ Q305     | 8-729-316-12 | (D) 2SC1061  |
| ⇒ Q306     | 8-729-377-58 | (B) 2SC1775E |
| Q307       | 8-729-203-04 | (B) 2SK30A   |
| ⇒ Q308     | 8-723-305-00 | (B) 2SK43-5  |
| ⇒ Q309     | 8-729-377-58 | (B) 2SC1775E |
| Q310       | 8-729-217-33 | (D) 2SC1173  |
| ⇒ Q311     | 8-729-377-58 | (C) 2SC1775E |
| Q312       | 8-729-203-04 | (B) 2SK30A   |
| ⇒ Q313,314 | 8-729-377-58 | (D) 2SC1775E |
| ⇒ Q315     | 8-729-387-28 | (B) 2SC872E  |
| ⇒ Q316     | 8-723-302-00 | (D) 2SK43-2  |
| ⇒ Q317     | 8-729-387-28 | (B) 2SA872E  |
| Q318       | 8-729-317-12 | (E) 2SA671   |
| Q319       | 8-729-203-04 | (B) 2SK30A   |
| ⇒ Q320     | 8-729-387-28 | (B) 2SA872E  |
| ⇒ Q321     | 8-723-305-00 | (B) 2SK43-5  |
| ⇒ Q322     | 8-729-387-28 | (B) 2SA872E  |
| Q323       | 8-729-247-33 | (C) 2SA473   |

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No. Part No. Description

|            |              |             |
|------------|--------------|-------------|
| Q324       | 8-729-203-04 | (B) 2SK30A  |
| ⇒ Q401     | 8-729-389-37 | (B) 2SA893  |
| Q402       | 8-729-633-47 | (D) 2SC1364 |
| Q403       | 8-765-222-20 | (D) 2SC1963 |
| ⇒ Q404-406 | 8-729-389-37 | (B) 2SA893  |
| Q407-412   | 8-729-633-47 | (D) 2SC1364 |
| ⇒ Q413     | 8-729-322-78 | (C) 2SC2278 |
| Q414-424   | 8-729-663-47 | (D) 2SC1364 |
| ⇒ Q425     | 8-729-389-37 | (B) 2SA893  |
| Q426       | 8-765-222-20 | (D) 2SC1963 |
| ⇒ Q427,428 | 8-729-389-37 | (B) 2SA893  |
| Q429-432   | 8-729-663-47 | (D) 2SC1364 |
| ⇒ Q433     | 8-729-389-37 | (B) 2SA893  |
| Q434       | 8-729-450-93 | (B) 2SC1509 |
| Q435       | 8-729-477-73 | (C) 2SA777  |
| Q436       | 8-729-450-93 | (B) 2SC1509 |
| Q437,438   | 8-729-477-73 | (C) 2SA777  |
| Q439       | 8-729-450-93 | (B) 2SC1509 |
| Q440       | 8-729-477-73 | (C) 2SA777  |
| Q441       | 8-729-450-93 | (B) 2SC1509 |
| Q442-448   | 8-729-663-47 | (B) 2SC1364 |
| Q601-606   | 8-729-663-47 | (B) 2SC1364 |
| Q607       | 8-729-316-12 | (D) 2SC1061 |
| Q608       | 8-760-413-10 | (C) 2SC1475 |
| Q609-614   | 8-729-663-47 | (D) 2SC1364 |
| Q615       | 8-729-316-12 | (D) 2SC1061 |
| Q616-624   | 8-729-663-47 | (B) 2SC1364 |
| Q625       | 8-729-316-12 | (D) 2SC1061 |
| Q626       | 8-729-663-47 | (B) 2SC1364 |
| Q701       | 8-760-122-01 | (E) 2SC1431 |
| Q702       | 8-720-950-03 | (C) 2SC926A |
| Q703,704   | 8-729-307-62 | (D) 2SD476A |
| Q705       | 8-729-306-62 | (E) 2SB566A |
| Q706       | 8-729-307-62 | (D) 2SD476A |
| Q707       | 8-729-306-62 | (E) 2SB566A |
| Q708       | 8-729-307-62 | (D) 2SD476A |
| Q709       | 8-729-306-62 | (E) 2SB566A |

Note: Circled letters (A to Z) are applicable to European models only.

| Ref. No.      | Part No.                     | Description |
|---------------|------------------------------|-------------|
| ⇒ Q1501       | △ 8-729-389-37 (B) 2SA893    |             |
| Q1502         | △ 8-729-633-47 (D) 2SC1364   |             |
| ⇒ Q1503       |                              |             |
| I             | △ 8-729-302-31 (E) 2SC2023-R |             |
| ⇒ Q1506       |                              |             |
| H1,2          | 8-719-905-07 (D) 5GF-MS-07F  |             |
| <b>Diodes</b> |                              |             |
| ⇒ D101,201    |                              |             |
| ⇒ D102,202    | 8-719-122-10 (A) VD1221      |             |
| ⇒ D401-404    | 8-719-815-55 (B) 1S1555      |             |
| ⇒ D405        | 8-719-200-02 (B) 10E2        |             |
| ⇒ D406        | 8-719-931-05 (B) EQB01-05    |             |
| D407          | 8-719-139-07 (B) RD3.9E      |             |
| ⇒ D408        | 8-719-200-02 (B) 10E2        |             |
| D409,410      | 8-719-122-10 (A) VD1221      |             |
| ⇒ D411-414    | 8-719-815-55 (B) 1S1555      |             |
| D415,416      | 8-719-122-10 (A) VD1221      |             |
| ⇒ D417,418    | 8-729-815-55 (B) 1S1555      |             |
| D419,420      | 8-719-122-10 (A) VD1221      |             |
| ⇒ D421-424    | 8-719-815-55 (B) 1S1555      |             |
| ⇒ D601-603    | 8-719-815-55 (B) 1S1555      |             |
| D604          | 8-719-122-10 (A) VD1221      |             |
| D605          | 8-719-139-07 (B) RD3.9E      |             |
| D606          | 8-719-122-10 (A) VD1221      |             |
| ⇒ D607        | 8-719-931-13 (B) EQB01-13    |             |
| ⇒ D608,609    | 8-719-200-02 (B) 10E2        |             |
| ⇒ D610        | 8-719-931-06 (B) EQB01-06    |             |
| ⇒ D611-616    | 8-719-815-55 (B) 1S1555      |             |
| D702,703      | △ 8-719-502-20 (C) S2VB20    |             |
| ⇒ D704        | 8-719-200-02 (B) 10E2        |             |
| ⇒ D705-708    | △ 8-719-200-02 (B) 10E2      |             |
| ⇒ D709        | 8-719-931-33 (B) EQB01-33    |             |
| ⇒ D710        | 8-719-931-20 (B) EQB01-20    |             |
| ⇒ D711        | 8-719-931-33 (B) EQB01-33    |             |
| ⇒ D712        | 8-719-931-18 (B) EQB01-18    |             |
| ⇒ D713        | 8-719-930-12 (B) EQB01-12Z   |             |
| ⇒ D751-754    | △ 8-719-911-55 (B) U05G      |             |
| D755-757      | 8-719-900-24 (C) SLP24B      |             |
| ⇒ D1001       | 8-719-200-02 (B) 10E2        |             |

D1501  
D1502 △ 8-719-815-55 (B) 1S1555

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

| Ref. No.                                                                                                                                             | Part No.                              | Description |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------|
| D1503                                                                                                                                                |                                       |             |
| I                                                                                                                                                    | △ 8-719-303-41 (C) S34                |             |
| D1506                                                                                                                                                |                                       |             |
| <b>ICs</b>                                                                                                                                           |                                       |             |
| IC401                                                                                                                                                | 8-759-958-11 (L) MSM5811              |             |
| ⇒ IC402                                                                                                                                              | 8-759-632-93 (K) M53293P              |             |
| ⇒ IC403                                                                                                                                              | 8-759-632-00 (E) M53200P              |             |
| ⇒ IC404                                                                                                                                              | 8-759-632-93 (K) M53293P              |             |
| ⇒ IC405                                                                                                                                              | 8-759-632-00 (E) M53200P              |             |
| ⇒ IC406                                                                                                                                              | 8-759-632-93 (K) M53293P              |             |
| ⇒ IC407-409                                                                                                                                          | 8-759-114-58 (E) μPC1458C             |             |
| IC601                                                                                                                                                | 8-759-600-65 (F) CX065A               |             |
| IC701                                                                                                                                                | 8-759-178-05 (C) μPC78L05             |             |
| IC702,703                                                                                                                                            | 8-759-143-12 (F) μPC14312H            |             |
| IC704                                                                                                                                                | 8-759-379-12 (I) FS7912M              |             |
| <b>COILS</b>                                                                                                                                         |                                       |             |
| L1501                                                                                                                                                | △ 1-421-340-00 (E) Choke, line filter |             |
| L1502                                                                                                                                                |                                       |             |
| I                                                                                                                                                    | △ 1-421-329-00 (B) Choke, 10μH        |             |
| L1506                                                                                                                                                |                                       |             |
| <b>TRANSFORMERS AND FILTER</b>                                                                                                                       |                                       |             |
| T1                                                                                                                                                   | △ 1-446-088-00 (S) Power              |             |
| T1501                                                                                                                                                | △ 1-433-197-11 (F) OSC                |             |
| T1503                                                                                                                                                | △ 1-446-087-00 (K) Converter          |             |
| T1504                                                                                                                                                | △ 1-543-129-00 (A) Core               |             |
| <b>CAPACITORS</b>                                                                                                                                    |                                       |             |
| All capacitors are in μF and ceramic unless otherwise noted.<br>50 WV or less are not indicated except for electrolytics. p: μμF, elect=electrolytic |                                       |             |
| C101,201                                                                                                                                             | 1-102-074-00 (A) 1000p                |             |
| C102,202                                                                                                                                             | 1-104-129-00 (C) 0.015 125V styrol    |             |
| C103,203                                                                                                                                             |                                       |             |
| C104,204                                                                                                                                             | 1-131-429-00 (F) 470 3.15V tantalum   |             |
| C105,205                                                                                                                                             | 1-102-115-00 (A) 560p                 |             |

Note: The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

| Ref. No. | Part No.                                       | Description |
|----------|------------------------------------------------|-------------|
| C106,206 | 1-104-129-00 (C) 0.015 125V styrol             |             |
| C107,207 |                                                |             |
| C108,208 | 1-131-295-00 (C) 100 6.3V tantalum             |             |
| C109,209 | 1-102-074-00 (A) 1000p                         |             |
| C110,210 | 1-130-145-00 (B) 0.016 800V polyethylene (2%)  |             |
| C111,211 | 1-102-973-00 (A) 100p                          |             |
| C112,212 | 1-130-146-00 (C) 0.056 800V polyethylene (2%)  |             |
| C113,213 | 1-102-822-00 (A) 390p                          |             |
| C114,214 | 1-130-084-00 (D) 2.2 100V polyethylene         |             |
| C301     | 1-131-239-00 (B) 6.8 35V tantalum              |             |
| C302     | 1-121-941-00 (B) 470 35V elect                 |             |
| C303     | 1-123-074-00 (A) 2200 10V elect                |             |
| C304     | 1-131-449-00 (C) 3.3 16V tantalum              |             |
| C305     | 1-123-074-00 (A) 2200 10V elect                |             |
| C306     | 1-131-449-00 (C) 3.3 16V tantalum              |             |
| C307     | 1-123-187-00 (A) 10 25V elect                  |             |
| C308     | 1-130-084-00 (D) 2.2 100V polyethylene         |             |
| C309     | 1-121-935-00 (B) 100 25V elect                 |             |
| C310     | 1-131-239-00 (B) 6.8 35V tantalum              |             |
| C311     | 1-121-941-00 (B) 470 35V elect                 |             |
| C312     | 1-123-074-00 (A) 2200 10V elect                |             |
| C313     | 1-131-449-00 (C) 3.3 16V tantalum              |             |
| C314     | 1-123-074-00 (A) 2200 10V elect                |             |
| C315     | 1-131-449-00 (C) 3.3 16V tantalum              |             |
| C316     | 1-123-187-00 (A) 10 25V elect                  |             |
| C317     | 1-130-084-00 (D) 2.2 100V polyethylene         |             |
| C401     | 1-130-140-00 (B) 0.039 100V polyethylene mylar |             |
| C402     | 1-108-800-00 (A) 0.0047                        |             |
| C403,404 | 1-102-491-00 (A) 51p                           |             |
| C405-407 | 1-101-923-00 (A) 0.01                          |             |
| C408,409 | 1-131-295-00 (C) 100 6.3V tantalum             |             |
| C410     | 1-101-923-00 (A) 0.01                          |             |
| C411     | 1-121-391-00 (A) 1 50V elect                   |             |
| C412     | 1-123-197-00 (A) 100 6.3V elect                |             |
| C413     | 1-123-196-00 (A) 100 10V elect                 |             |
| C414     | 1-121-391-00 (A) 1 50V elect                   |             |
| C415     | 1-123-228-00 (B) 1 50V elect                   |             |
| C416     | 1-108-804-00 (A) 0.01 mylar                    |             |
| C417     | 1-131-218-00 (B) 3.3 35V elect                 |             |

| Ref. No.   | Part No.                                       | Description |
|------------|------------------------------------------------|-------------|
| C418       | 1-108-808-00 (A) 0.022 mylar                   |             |
| C419       | 1-123-192-00 (A) 47 16V elect                  |             |
| C420,421   | 1-108-804-00 (A) 0.01 mylar                    |             |
| C422       | 1-130-140-00 (B) 0.039 100V polyethylene       |             |
| C423       | 1-108-816-00 (B) 0.1 mylar                     |             |
| C424       | 1-108-804-00 (A) 0.01 mylar                    |             |
| C425       | 1-123-021-00 (B) 0.47 50V elect (nonpolarized) |             |
| C426       | 1-108-812-00 (A) 0.047 mylar                   |             |
| C427       | 1-108-816-00 (B) 0.1 mylar                     |             |
| C428,429   | 1-123-228-00 (B) 1 50V elect                   |             |
| C430       | 1-108-808-00 (A) 0.022 mylar                   |             |
| C431       | 1-123-192-00 (A) 47 16V elect                  |             |
| C432       | 1-108-804-00 (A) 0.01 mylar                    |             |
| C433       | 1-108-803-00 (A) 0.0082 mylar                  |             |
| C435       | 1-121-935-00 (B) 100 25V elect                 |             |
| C1501      | △ 1-130-141-00 (A) 0.01 630V polyethylene      |             |
| C1502,1503 | △ 1-115-149-00 (C) 0.0015 450V paper           |             |
| C1504      | △ 1-123-290-00 (B) 10 400V elect               |             |
| C1505      | △ 1-108-595-00 (A) 0.047 mylar                 |             |
| C1506      | △ 1-108-599-00 (A) 0.068 mylar                 |             |
| C1507      | △ 1-130-141-00 (A) 0.01 630V polyethylene      |             |
| C1508,1509 | △ 1-121-656-00 (B) 330 50V elect               |             |
| C1510,1511 | △ 1-121-417-00 (B) 100 50V elect               |             |
| C1512,1513 | △ 1-108-969-00 (B) 0.22 250V film              |             |
| C1514      | △ 1-102-973-00 (A) 100p 500V mica              |             |
| C601       | 1-101-918-00 (A) 1000p                         |             |
| C602       | 1-131-212-00 (B) 0.33 35V tantalum             |             |
| C603,604   | 1-123-021-00 (B) 0.47 50V elect (nonpolarized) |             |
| C605       | 1-121-391-00 (A) 1 50V elect                   |             |
| C606       | 1-123-228-00 (B) 1 50V elect                   |             |
| C607       | 1-123-189-00 (A) 33 25V elect                  |             |
| C608       | 1-121-981-00 (B) 220 6.3V elect                |             |
| C609       | 1-121-391-00 (A) 1 50V elect                   |             |
| C610       | 1-123-044-00 (B) 33 25V elect                  |             |
| C611       | 1-121-392-00 (A) 3.3 25V elect                 |             |
| C612-614   | 1-121-391-00 (A) 1 50V elect                   |             |
| C615       | 1-121-651-00 (A) 10 16V elect                  |             |
| C616       | 1-131-211-00 (B) 0.22 35V tantalum             |             |
| C617       | 1-123-193-00 (A) 100 16V elect                 |             |

Note: The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

| Ref. No.   | Part No.                  | Description        |
|------------|---------------------------|--------------------|
| C618       | 1-121-935-00 (B) 100      | 25 V elect         |
| C619       | 1-123-187-00 (A) 10       | 25 V elect         |
| C620,621   | 1-121-935-00 (B) 100      | 25 V elect         |
| C622       | 1-108-810-00 (A) 0.033    | 100 V mylar        |
| C623       | 1-101-918-00 (A) 1000p    |                    |
| C702,703   | △ 1-125-136-00 (E) 2200   | 50 V elect         |
| C704,705   | △ 1-123-067-00 (A) 2200   | 25 V elect         |
| C706       | △ 1-123-254-00 (B) 10     | 250 V elect        |
| C707-709   | 1-123-183-00 (A) 10       | 50 V elect         |
| C710       | 1-123-059-00 (B) 100      | 50 V elect         |
| C711       | 1-123-228-00 (B) 1        | 50 V elect         |
| C712       | 1-121-935-00 (B) 100      | 25 V elect         |
| C713       | 1-123-059-00 (B) 100      | 50 V elect         |
| C714       | 1-123-228-00 (B) 1        | 50 V elect         |
| C715,716   | △ 1-125-136-00 (E) 2200   | 50 V elect         |
| C751       | △ 1-129-773-00 (A) 0.047  | 200 V polyethyene  |
| C752,753   | △ 1-123-291-00 (G) 680    | 200 V elect        |
| C791       | △ 1-115-149-00 (C) 0.0015 | 450 V paper        |
| C792       | △ 1-129-755-00 (B) 0.047  | 400 V polyethylene |
| C901       | 1-102-981-00 (A) 300p     |                    |
| C902       | 1-102-973-00 (A) 100p     |                    |
| C903       | 1-102-981-00 (A) 300p     |                    |
| C904       | 1-102-973-00 (A) 100p     |                    |
| C905       | 1-123-187-00 (A) 10       | 25 V elect         |
| C2001,2002 | △ 1-115-147-00 (C) 0.033  | 450 V paper        |

### RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted.

Refer to the list on the last page for their part numbers.

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

kΩ: 1000Ω

|          |                        |                     |
|----------|------------------------|---------------------|
| R101,201 | 1-214-126-00 (A) 560   | ¼W metal oxide (1%) |
| R102,202 | 1-214-110-00 (A) 120   | ¼W metal oxide (1%) |
| R103,203 |                        |                     |
| R104,204 | 1-214-108-00 (A) 100   | ¼W metal oxide (1%) |
| R105,205 | 1-214-116-00 (A) 220   | ¼W metal oxide (1%) |
| R106,206 | 1-214-112-00 (A) 150   | ¼W metal oxide (1%) |
| R107,207 | 1-244-809-00 (A) 2.2   | ½W carbon           |
| R108,208 | 1-214-144-00 (A) 3.3 k | ¼W metal oxide (1%) |

| Ref. No. | Part No.               | Description         |
|----------|------------------------|---------------------|
| R109,209 | 1-214-120-00 (A) 330   | ¼W metal oxide (1%) |
| R110,210 | 1-214-108-00 (A) 100   | ¼W metal oxide (1%) |
| R111,211 | 1-214-164-00 (A) 22 k  | ¼W metal oxide (1%) |
| R112,212 | 1-214-160-00 (A) 15 k  | ¼W metal oxide (1%) |
| R113,213 | 1-214-132-00 (A) 1 k   | ¼W metal oxide (1%) |
| R114,214 | 1-214-180-00 (A) 100 k | ¼W metal oxide (1%) |
| R115,215 | 1-214-126-00 (A) 560   | ¼W metal oxide (1%) |
| R116,216 |                        |                     |
| R117,217 | 1-214-164-00 (A) 22 k  | ¼W metal oxide (1%) |
| R118,218 | 1-214-108-00 (A) 100   | ¼W metal oxide (1%) |
| R119,219 | 1-214-147-00 (A) 4.3 k | ¼W metal oxide (1%) |
| R120,220 | 1-214-119-00 (A) 300   | ¼W metal oxide (1%) |
| R121,221 | 1-214-140-00 (A) 2.2 k | ¼W metal oxide (1%) |
| R122,222 | 1-214-132-00 (A) 1 k   | ¼W metal oxide (1%) |
| R123,223 | 1-214-174-00 (A) 56 k  | ¼W metal oxide (1%) |
| R124,224 | 1-214-132-00 (A) 1 k   | ¼W metal oxide (1%) |
| R125,225 | 1-214-108-00 (A) 100   | ¼W metal oxide (1%) |
| R126,226 |                        |                     |
| R127,227 | 1-214-126-00 (A) 560   | ¼W metal oxide (1%) |
| R128,228 | 1-214-180-00 (A) 100 k | ¼W metal oxide (1%) |
| R129,229 |                        |                     |
| R130,230 | 1-214-156-00 (A) 10 k  | ¼W metal oxide (1%) |
| R131,231 | 1-214-116-00 (A) 220   | ¼W metal oxide (1%) |
| R132,232 | 1-214-100-00 (A) 47    | ¼W metal oxide (1%) |
| R133,233 | 1-214-116-00 (A) 220   | ¼W metal oxide (1%) |
| R134,234 | 1-214-100-00 (A) 47    | ¼W metal oxide (1%) |
| R135,235 | 1-214-112-00 (A) 150   | ¼W metal oxide (1%) |
| R301,302 | 1-214-148-00 (A) 4.7 k | ¼W metal oxide (1%) |
| R303     | 1-214-142-00 (A) 2.7 k | ¼W metal oxide (1%) |
| R304     | 1-214-122-00 (A) 390   | ¼W metal oxide (1%) |
| R305     | 1-214-159-00 (A) 13 k  | ¼W metal oxide (1%) |
| R306     | 1-214-126-00 (A) 560   | ¼W metal oxide (1%) |
| R307     | 1-214-112-00 (A) 150   | ¼W metal oxide (1%) |
| R308     | 1-214-100-00 (A) 47    | ¼W metal oxide (1%) |
| R311,312 | 1-214-140-00 (A) 2.2 k | ¼W metal oxide (1%) |
| R313     | 1-214-122-00 (A) 390   | ¼W metal oxide (1%) |
| R314     | 1-214-108-00 (A) 100   | ¼W metal oxide (1%) |
| R315     | 1-214-116-00 (A) 220   | ¼W metal oxide (1%) |
| R316,317 | 1-214-148-00 (A) 4.7 k | ¼W metal oxide (1%) |
| R318     | 1-214-142-00 (A) 2.7 k | ¼W metal oxide (1%) |

Note: The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

| Ref. No.   | Part No.                                     | Description                   |
|------------|----------------------------------------------|-------------------------------|
| R319       | 1-214-122-00 (A) 390                         | ¼W metal oxide (1%)           |
| R320       | 1-214-126-00 (A) 560                         | ¼W metal oxide (1%)           |
| R321       | 1-214-159-00 (A) 13 k                        | ¼W metal oxide (1%)           |
| R322       | 1-214-112-00 (A) 150                         | ¼W metal oxide (1%)           |
| R323       | 1-214-100-00 (A) 47                          | ¼W metal oxide (1%)           |
| R326,327   | 1-214-140-00 (A) 2.2 k                       | ¼W metal oxide (1%)           |
| R328       | 1-214-108-00 (A) 100                         | ¼W metal oxide (1%)           |
| R329       | 1-214-122-00 (A) 390                         | ¼W metal oxide (1%)           |
| R401       | 1-214-156-00 (A) 10 k                        | ¼W metal oxide (1%)           |
| R402       | 1-214-132-00 (A) 1 k                         | ¼W metal oxide (1%)           |
| R403       | 1-214-156-00 (A) 10 k                        | ¼W metal oxide (1%)           |
| R408       | 1-214-162-00 (A) 18 k                        | ¼W metal oxide (1%)           |
| R409       | 1-214-176-00 (A) 68 k                        | ¼W metal oxide (1%)           |
| R471       | 1-214-162-00 (A) 18 k                        | ¼W metal oxide (1%)           |
| R472       | 1-214-176-00 (A) 68 k                        | ¼W metal oxide (1%)           |
| R475       | 1-214-151-00 (A) 6.2 k                       | ¼W metal oxide (1%)           |
| R476       | 1-214-144-00 (A) 3.3 k                       | ¼W metal oxide (1%)           |
| R477       | 1-214-151-00 (A) 6.2 k                       | ¼W metal oxide (1%)           |
| R478       | 1-214-144-00 (A) 3.3 k                       | ¼W metal oxide (1%)           |
| R622       | (A) 1-206-642-00 (A) 120                     | 2W metal oxide (nonflammable) |
| R631       | (A) 1-206-640-00 (A) 100                     | 2W metal oxide (nonflammable) |
| R701-703   | (A) 1-244-849-00 (A) 100                     | ½W carbon                     |
| R704       | 1-244-869-00 (A) 680                         | ½W carbon                     |
| R709       | (A) 1-206-672-00 (A) 2.2 k                   | 2W metal oxide (nonflammable) |
| R751,752   | (A) 1-246-529-00 (A) 220 k                   | ¼W carbon                     |
| R903       | 1-214-180-00 (A) 100 k                       | ¼W metal oxide (1%)           |
| R904       | 1-214-168-00 (A) 33 k                        | ¼W metal oxide (1%)           |
| R905       | 1-214-180-00 (A) 100 k                       | ¼W metal oxide (1%)           |
| R906       | 1-214-168-00 (A) 33 k                        | ¼W metal oxide (1%)           |
| R907-910   | 1-214-180-00 (A) 100 k                       | ¼W metal oxide (1%)           |
| R1502      | (A) 1-214-167-00 (A) 30 k                    | ¼W metal oxide (1%)           |
| R1503      | (A) 1-214-128-00 (A) 680                     | ¼W metal oxide (1%)           |
| R1504,1505 | (A) 1-214-142-00 (A) 2.7 k                   | ¼W metal oxide (1%)           |
| R1506      | (A) 1-212-369-00 (B) 5.6                     | 1W metal oxide                |
| R1507      | (A) 1-212-356-00 (B) 0.47                    | 1W metal oxide (nonflammable) |
| R1510      |                                              |                               |
| RV101,201  | 1-224-247-XX (C) 100, adjustable; dc balance |                               |

| Ref. No. | Part No.                                            | Description |
|----------|-----------------------------------------------------|-------------|
| RV401    | 1-224-491-00 (B) 22 k, adjustable; 33 rpm osc freq. |             |
| RV402    | 1-224-661-00 (B) 47 k, adjustable; 45 rpm osc freq. |             |
| RV403    | 1-224-491-00 (B) 22 k, adjustable; 33 rpm speed     |             |
| RV404    | 1-224-661-00 (B) 47 k, adjustable; 45 rpm speed     |             |
| RV405    | 1-224-489-00 (B) 2.2 k, adjustable; gain            |             |
| RV406    | 1-224-660-00 (B) 1 k, adjustable; gain              |             |
| RV407    | 1-224-490-00 (B) 4.7 k, adjustable; offset          |             |
| RV408    | 1-224-490-00 (B) 4.7 k, adjustable; offset          |             |
| RV601    | 1-224-490-00 (B) 4.7 k, adjustable; auto return     |             |
| RV751    | 1-226-150-00 (B) 20 k, variable with switch; PITCH  |             |

## MISCELLANEOUS

|          |                                                 |
|----------|-------------------------------------------------|
| CNJ1     | (A) 1-509-547-00 (B) Connector, 3-p; AC IN      |
| CNJ2     | 1-509-991-00 (B) Socket, 11-p; REMOTE CONTROL   |
| F1       | (A) 1-532-237-00 (B) Fuse, 3.15 AT              |
| F2       | (A) 1-532-259-00 (B) Fuse, 1.6 AT               |
| F3,4     | (A) 1-532-273-00 (B) Fuse, 250 mAT              |
| F5-7     | (A) 1-532-469-00 (C) Fuse, 100 mAT              |
| J901-904 | 1-507-416-XX (C) Pin Jack, 4-p; PHONO, LINE OUT |
| M1       | A-4608-034-A (Z) Motor (A) Ass'y                |
| M2       | 8-835-001-XX (K) Motor (B), DNF-1001A           |
| MGH      | 1-543-079-00 (I) Head, speed detecting          |
| NL1      | (A) 1-519-138-11 (G) Lamp, neon                 |
| PC       | 1-800-343-00 (C) CdS                            |
| PL1      | 1-518-234-00 (B) Lamp, 6V 100 mA                |
| PM1      | 1-454-187-00 (F) Solenoid, brake                |
| RY401    | 1-515-296-00 (F) Relay                          |
| RY701    | 1-515-278-00 (F) Relay                          |
| RY901    | 1-515-294-11 (F) Relay, reed                    |
| S5       | (A) 1-552-295-12 (F) Switch, rotary; POWER      |
| S6       | 1-516-657-00 (C) Switch, miniature; return      |
| S901     | 1-552-296-00 (K) Switch, rotary; AMP SELECTOR   |
| S902,903 | 1-552-297-00 (G) Switch, rotary; LOAD           |
| X401     | 1-527-304-00 (F) Crystal                        |

Note: The components identified by shading and mark (A) are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>                           |
|-----------------|-----------------|----------------------------------------------|
| 1-452-138-00    | Ⓒ               | Magnet                                       |
| 1-533-051-XX    | Ⓐ               | Holder, cylindrical lamp                     |
| 1-536-401-XX    | Ⓐ               | Terminal Strip, 1L1                          |
| 1-551-232-00    | Ⓜ               | Cord with Connector, for remote control unit |
| 1-561-094-00    | Ⓚ               | Connector                                    |
| 1-586-737-00    | Ⓒ               | Remote Control Unit                          |

#### PACKING MATERIALS AND ACCESSORIES

| <u>Part No.</u> | <u>Description</u>               |
|-----------------|----------------------------------|
| X-2219-805-0    | Ⓒ Brush Ass'y                    |
| 1-551-315-00    | Ⓜ Cord, connection; RK-112       |
| 3-701-616-00    | Ⓐ Bag, plastic                   |
| 3-701-620-00    | Ⓐ Bag, plastic                   |
| 3-770-427-11    | Ⓛ Manual, instruction            |
| 3-793-395-14    | Ⓐ Gauge, tracking error          |
| 3-794-154-11    | Ⓜ Booklet, technical information |
| 4-808-461-00    | Ⓔ Adaptor, 45 rpm                |
| 4-844-442-00    | Ⓒ Bag, plastic                   |
| 4-847-092-00    | Ⓒ Screwdriver                    |
| 4-855-176-00    | Ⓒ Screw, turntable               |
| 4-855-208-00    | Ⓒ Escutcheon, spindle            |
| 4-855-247-00    | Ⓔ Screw, plate                   |
| 4-855-248-00    | Ⓛ Weight, sub                    |
| 4-855-261-00    | Ⓟ Rubber Mat, turntable          |
| 4-855-284-00    | Ⓣ Turntable                      |
| 4-855-606-00    | Ⓒ Frame                          |
| 4-855-607-00    | Ⓑ Sheet, protection              |
| 4-855-608-00    | Ⓒ Bag, protection                |
| 4-855-609-00    | Ⓒ Cushion, upper                 |
| 4-855-610-00    | Ⓔ Cushion, inner                 |
| 4-855-611-00    | Ⓕ Cushion, lower                 |
| 4-855-612-00    | Ⓔ Cushion, turntable             |
| 4-855-613-00    | Ⓑ Case, accessory                |
| 4-855-614-00    | Ⓑ Case, accessory                |
| 4-855-633-00    | Ⓚ Carton                         |
| 4-855-634-00    | Ⓐ Cushion, weight bar            |
| 4-855-635-00    | Ⓐ Sheet (B), protection          |

## 1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

| Ω   | Part No.     | Ω  | Part No.     | Ω   | Part No.     | Ω    | Part No.     | Ω   | Part No.     | Ω    | Part No.     | Ω    | Part No.     |
|-----|--------------|----|--------------|-----|--------------|------|--------------|-----|--------------|------|--------------|------|--------------|
| 1.0 | 1-246-401-00 | 10 | 1-246-425-00 | 100 | 1-246-449-00 | 1.0k | 1-246-473-00 | 10k | 1-246-497-00 | 100k | 1-246-521-00 | 1.0M | 1-246-545-00 |
| 1.1 | 1-246-402-00 | 11 | 1-246-426-00 | 110 | 1-246-450-00 | 1.1k | 1-246-474-00 | 11k | 1-246-498-00 | 110k | 1-246-522-00 | 1.1M | 1-210-814-00 |
| 1.2 | 1-246-403-00 | 12 | 1-246-427-00 | 120 | 1-246-451-00 | 1.2k | 1-246-475-00 | 12k | 1-246-499-00 | 120k | 1-246-523-00 | 1.2M | 1-210-815-00 |
| 1.3 | 1-246-404-00 | 13 | 1-246-428-00 | 130 | 1-246-452-00 | 1.3k | 1-246-476-00 | 13k | 1-246-500-00 | 130k | 1-246-524-00 | 1.3M | 1-210-816-00 |
| 1.5 | 1-246-405-00 | 15 | 1-246-429-00 | 150 | 1-246-453-00 | 1.5k | 1-246-477-00 | 15k | 1-246-501-00 | 150k | 1-246-525-00 | 1.5M | 1-210-817-00 |
| 1.6 | 1-246-406-00 | 16 | 1-246-430-00 | 160 | 1-246-454-00 | 1.6k | 1-246-478-00 | 16k | 1-246-502-00 | 160k | 1-246-526-00 | 1.6M | 1-210-818-00 |
| 1.8 | 1-246-407-00 | 18 | 1-246-431-00 | 180 | 1-246-455-00 | 1.8k | 1-246-479-00 | 18k | 1-246-503-00 | 180k | 1-246-527-00 | 1.8M | 1-210-819-00 |
| 2.0 | 1-246-408-00 | 20 | 1-246-432-00 | 200 | 1-246-456-00 | 2.0k | 1-246-480-00 | 20k | 1-246-504-00 | 200k | 1-246-528-00 | 2.0M | 1-210-820-00 |
| 2.2 | 1-246-409-00 | 22 | 1-246-433-00 | 220 | 1-246-457-00 | 2.2k | 1-246-481-00 | 22k | 1-246-505-00 | 220k | 1-246-529-00 | 2.2M | 1-210-821-00 |
| 2.4 | 1-246-410-00 | 24 | 1-246-434-00 | 240 | 1-246-458-00 | 2.4k | 1-246-482-00 | 24k | 1-246-506-00 | 240k | 1-246-530-00 | 2.4M | 1-244-754-00 |
| 2.7 | 1-246-411-00 | 27 | 1-246-435-00 | 270 | 1-246-459-00 | 2.7k | 1-246-483-00 | 27k | 1-246-507-00 | 270k | 1-246-531-00 | 2.7M | 1-244-755-00 |
| 3.0 | 1-246-412-00 | 30 | 1-246-436-00 | 300 | 1-246-460-00 | 3.0k | 1-246-484-00 | 30k | 1-246-508-00 | 300k | 1-246-532-00 | 3.0M | 1-244-756-00 |
| 3.3 | 1-246-413-00 | 33 | 1-246-437-00 | 330 | 1-246-461-00 | 3.3k | 1-246-485-00 | 33k | 1-246-509-00 | 330k | 1-246-533-00 | 3.3M | 1-244-757-00 |
| 3.6 | 1-246-414-00 | 36 | 1-246-438-00 | 360 | 1-246-462-00 | 3.6k | 1-246-486-00 | 36k | 1-246-510-00 | 360k | 1-246-534-00 | 3.6M | 1-244-758-00 |
| 3.9 | 1-246-415-00 | 39 | 1-246-439-00 | 390 | 1-246-463-00 | 3.9k | 1-246-487-00 | 39k | 1-246-511-00 | 390k | 1-246-535-00 | 3.9M | 1-244-759-00 |
| 4.3 | 1-246-416-00 | 43 | 1-246-440-00 | 430 | 1-246-464-00 | 4.3k | 1-246-488-00 | 43k | 1-246-512-00 | 430k | 1-246-536-00 | 4.3M | 1-244-760-00 |
| 4.7 | 1-246-417-00 | 47 | 1-246-441-00 | 470 | 1-246-465-00 | 4.7k | 1-246-489-00 | 47k | 1-246-513-00 | 470k | 1-246-537-00 | 4.7M | 1-244-761-00 |
| 5.1 | 1-246-418-00 | 51 | 1-246-442-00 | 510 | 1-246-466-00 | 5.1k | 1-246-490-00 | 51k | 1-246-514-00 | 510k | 1-246-538-00 | 5.1M | 1-244-762-00 |
| 5.6 | 1-246-419-00 | 56 | 1-246-443-00 | 560 | 1-246-467-00 | 5.6k | 1-246-491-00 | 56k | 1-246-515-00 | 560k | 1-246-539-00 |      |              |
| 6.2 | 1-246-420-00 | 62 | 1-246-444-00 | 620 | 1-246-468-00 | 6.2k | 1-246-492-00 | 62k | 1-246-516-00 | 620k | 1-246-540-00 |      |              |
| 6.8 | 1-246-421-00 | 68 | 1-246-445-00 | 680 | 1-246-469-00 | 6.8k | 1-246-493-00 | 68k | 1-246-517-00 | 680k | 1-246-541-00 |      |              |
| 7.5 | 1-246-422-00 | 75 | 1-246-446-00 | 750 | 1-246-470-00 | 7.5k | 1-246-494-00 | 75k | 1-246-518-00 | 750k | 1-246-542-00 |      |              |
| 8.2 | 1-246-423-00 | 82 | 1-246-447-00 | 820 | 1-246-471-00 | 8.2k | 1-246-495-00 | 82k | 1-246-519-00 | 820k | 1-246-543-00 |      |              |
| 9.1 | 1-246-424-00 | 91 | 1-246-448-00 | 910 | 1-246-472-00 | 9.1k | 1-246-496-00 | 91k | 1-246-520-00 | 910k | 1-246-544-00 |      |              |

## HARDWARE NOMENCLATURE

Screw:

P 3 x 10

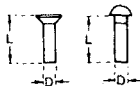
L: Length in mm

D: Diameter in mm

Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3

Diameter of usable screw or shaft

Reference designation

| Reference Designation | Shape | Description                                 | Remarks                                                            |
|-----------------------|-------|---------------------------------------------|--------------------------------------------------------------------|
| <b>SCREWS</b>         |       |                                             |                                                                    |
| P                     |       | pan-head screw                              | binding-head (B) screw for replacement                             |
| PWH                   |       | pan-head screw with washer face             | binding-head (B) screw and flat washer for replacement             |
| PS<br>PSP             |       | pan-head screw with spring washer           | binding-head (B) screw and spring washer for replacement           |
| PSW<br>PSPW           |       | pan-head screw with spring and flat washers | binding-head (B) screw and spring and flat washers for replacement |
| R                     |       | round-head screw                            | binding-head (B) screw for replacement                             |
| K                     |       | flat-countersunk-head screw                 |                                                                    |
| RK                    |       | oval-countersunk-head screw                 |                                                                    |
| B                     |       | binding-head screw                          |                                                                    |
| T                     |       | truss-head screw                            | binding-head (B) screw for replacement                             |
| F                     |       | flat-fillister-head screw                   |                                                                    |
| RF                    |       | fillister-head screw                        |                                                                    |
| BV                    |       | brazer-head screw                           |                                                                    |

| Reference Designation      | Shape | Description                                    | Remarks                                                                 |
|----------------------------|-------|------------------------------------------------|-------------------------------------------------------------------------|
| <b>SELF-TAPPING SCREWS</b> |       |                                                |                                                                         |
| TA                         |       | self-tapping screw                             | ex: TA, P 3 x 10                                                        |
| PTP                        |       | pan-head self-tapping screw                    | binding-head self-tapping (TA, B) screw for replacement                 |
| PTPWH                      |       | pan-head self-tapping screw with washer face   | binding-head self-tapping (TA, B) screw and flat washer for replacement |
| PTTWH                      |       | pan-head thread-rolling screw with washer face | binding-head (B) screw and flat washer for replacement                  |
| <b>SET SCREWS</b>          |       |                                                |                                                                         |
| SC                         |       | set screw                                      |                                                                         |
| SC                         |       | hexagon-socket set screw                       | ex: SC 2.6 x 4, hexagon socket                                          |
| <b>NUT</b>                 |       |                                                |                                                                         |
| N                          |       | nut                                            |                                                                         |
| <b>WASHERS</b>             |       |                                                |                                                                         |
| W                          |       | flat washer                                    |                                                                         |
| SW                         |       | spring washer                                  |                                                                         |
| LW                         |       | internal-tooth lock washer                     | ex: LW3, internal                                                       |
| LW                         |       | external-tooth lock washer                     | ex: LW3, external                                                       |
| <b>RETAINING RINGS</b>     |       |                                                |                                                                         |
| E                          |       | retaining ring                                 |                                                                         |
| G                          |       | grip-type retaining ring                       |                                                                         |

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