

# HTC-D209/D309

## SERVICE MANUAL

*AEP Model  
UK Model  
E Model  
Australian Model*



Photo: HTC-D209

HTC-D209 is the compact disc deck in LBT-A27CD / A27CDK / D209CD.  
HTC-D309 is the compact disc deck in LBT-A37CD / A37CDK / D309CD.

### SPECIFICATIONS


#### Cassette deck

Recording system 4-track 2-channel stereo  
Frequency response DOLBY NR OFF  
With Type II cassette (Sony UX-S)  
40 Hz to 14 kHz ( $\pm 3$  dB)  
With Type I cassette (Sony HF-S)  
40 Hz to 13 kHz ( $\pm 3$  dB)  
Wow and flutter W.PEAK  $\pm 0.2\%$  (DIN)

#### Compact disc player

Laser Semiconducto<sup>r</sup> laser ( $\lambda = 780$  nm)  
Laser output Max, 44.6  $\mu$ W\*  
\* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.  
Frequency response 2 Hz to 20 kHz  $\pm 0.5$  dB  
Signal-to-noise ratio More than 93 dB  
Dynamic range More than 90 dB  
Harmonic distortion Less than 0.008% (1 kHz)  
Channel separation More than 90 dB (1 kHz)  
Mass Approx. 5.1 kg  
Dimensions Approx. 355  $\times$  225  $\times$  305 mm (w/h/d, including projections)

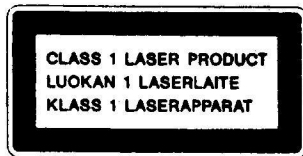
CD Section	Model Name Using Similar Mechanism		HCD-D109
	Base Unit Name		BU-5BD1
DECK Section	Model Name Using Similar Mechanism		HCD-H170/H170K /H700
	Tape Transport Mechanism Type	DECK A	TCM-190RA12CL
		DECK B	TCM-190RB22CL

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.  
"DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.



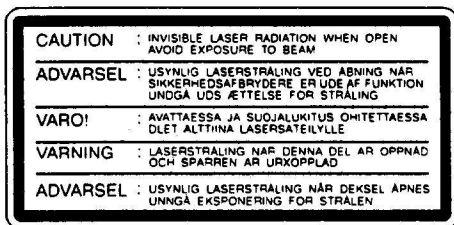
COMPACT DISC DECK  
**SONY**®

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.



Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

The following caution label is located inside the unit.



#### NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

#### NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 30 cm away from the objective lens.

#### SAFETY-RELATED COMPONENT WARNING!!

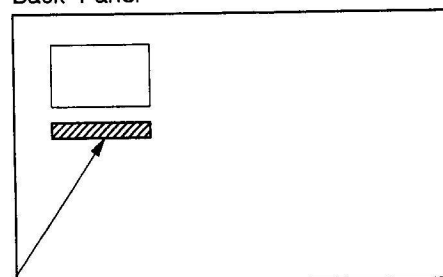
COMPONENTS IDENTIFIED BY MARK OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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## MODEL IDENTIFICATION

Back Panel



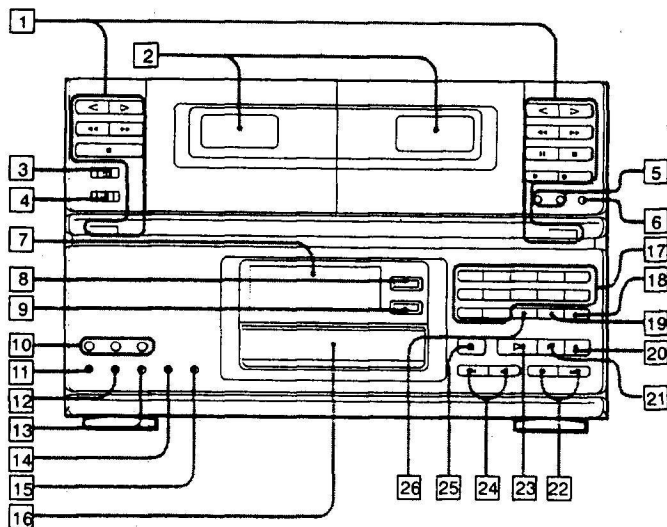
- 4-955-819-01: HTC-D209 AEP, UK, Italian, Germany Mdels.
- 4-955-819-11: HTC-D209 E, East European, Malaysia, Singapore Models.
- 4-955-819-21: HTC-D209 Saudi Arabia, Australian Models.
- 4-955-819-31: HTC-D309 AEP, UK, Italian, Germany Models.
- 4-955-819-41: HTC-D309 E, East European, Malaysia, Singapore, CIS Models.
- 4-955-819-51: HTC-D309 Saudi Arabia, Australian Models.

## SECTION 1 GENERAL

### Location of Controls

#### Cassette Deck

- 1 Tape operation buttons
  - ◀◀ Leftward fast winding/AMS\*
  - ▶▶ Rightward fast winding/AMS\*
  - ▶ Forward play
  - ◀ Reverse play
  - Stop
  - ▲ EJECT
  - || PAUSE (deck B only)
  - REC MUTE (record muting) (deck B only)
  - REC (record) (deck B only)
- 2 Cassette holders
- 3 DOLBY NR (noise reduction) switch (32, 80)
- 4 DIRECTION MODE selector (28, 32, 38, 80)
- 5 DUBBING SPEED (HIGH/NORMAL) button (38, 40)
- 6 CD SYNCHRO button (80, 84)



#### Compact Disc Player

- 7 Display window
- 8 EDIT/TIME FADE button (86, 88, 94)
- 9 TIME SET button (86, 94)
- 10 PLAY MODE buttons
  - PROGRAM button (54)
  - SHUFFLE button (50, 52)
  - CONTINUE button (52)
- 11 MUSIC SCAN button (58)
- 12 A.SPACE/A.CUE (auto space/auto cue) button (48, 96)
- 13 TIME button (44)
- 14 REPEAT button (60)
- 15 FADER button (92)
- 16 Disc tray
- 17 Numeric buttons (46, 52)
- 18 CLEAR (program clear) button (56)
- 19 CHECK (program check) button (56)
- 20 ■ (stop) button (42)
- 21 || (pause) button (42)
- 22 ◀◀/▶▶ (manual search) buttons (46)
- 23 ▶ (play) button (42)
- 24 ◀◀/▶▶ (AMS\*) buttons (46)
- 25 OPEN/CLOSE ▲ button (42)
- 26 > 12 (over 12) button (46)

\* AMS is the abbreviation of Automatic Music Sensor.

## SECTION 2 ADJUSTMENTS

### 2-1. MECHANICAL ADJUSTMENTS

#### Precautions:

1. Clean the following parts with a denatured-alcoholmoistened swab;
 

record/playback/erase head	
pinch roller	rubber belts
capstan	idler
2. Demagnetize the record/playback head with a head demagnetizer.  
(Head demagnetizer do not approach for the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed in the rated power supply voltage unless otherwise noted.

#### Torque Measurement

Torque	Torque meter	Meter reading
FWD	CQ-102C	35 to 60g · cm (0.49 to 0.83 oz · inch)
FWD Back tension	CQ-102C	2 to 6g · cm (0.03 to 0.08 oz · inch)
REV	CQ-102RC	35 to 60g · cm (0.49 to 0.83 oz · inch)
REV Back tension	CQ-102RC	2 to 6g · cm (0.03 to 0.08 oz · inch)
FF, REW	CQ-201B	70 to 110g · cm (0.98 to 1.52 oz · inch)

### 2-2. ELECTRICAL ADJUSTMENTS

0 dB=0.775 V (AF)

#### Precautions:

#### CASSETTE DECK SECTION

1. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
2. Do not use a magnetized screwdriver for the adjustments.
3. After the adjustments, apply suitable locking compound to the parts adjusted.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
5. The adjustments should be performed in the order given in this service manual. (As a general rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)
6. The adjustments should be performed for both L-CH and R-CH.
- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch : OFF

TAPE : TYPE I

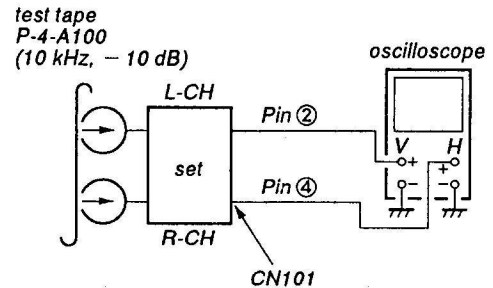
Type	Signal	Used for
P-4 A100	6.3kHz, -10dB	Azimuth Adjustment
P-4 L300	315Hz, 0dB	PB Level Adjustment
WS 48B	3kHz, 0dB	Tape Speed Adjustment

#### Record/Playback Head Azimuth Adjustment

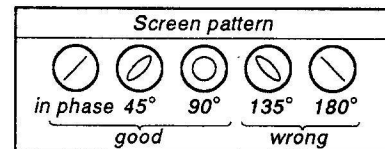
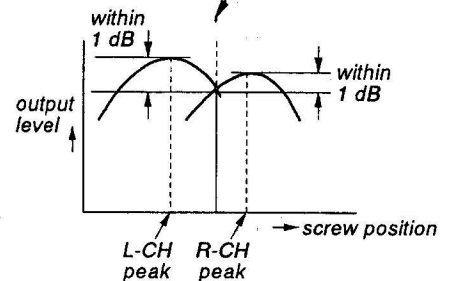
**Note :** Perform this adjustments for both decks.

#### Procedure :

1. Mode : FWD playback

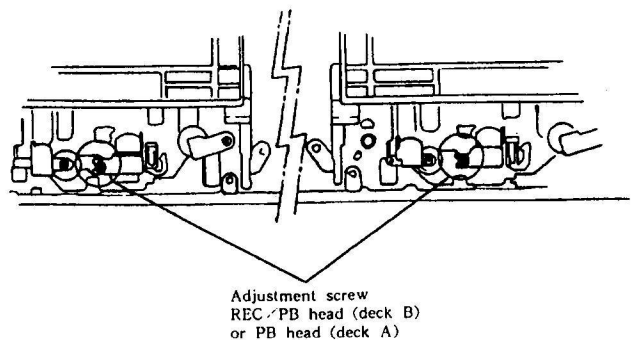


2. Turn the adjustment screw and check output peaks. If the peaks do not match for L-CH and R-CH, turn the adjustment screw so that outputs match within 1 dB of peak.



3. After the adjustments, apply suitable locking compound to the parts adjusted.

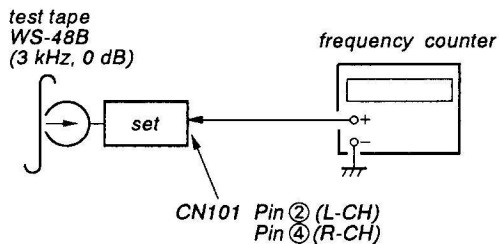
#### Adjustment Location :



## Tape Speed Adjustment. DECK A DECK B

### Procedure :

Mode : playback



### • High speed adjustment (Must be first Adjustment B deck)

1. Push HIGH speed button.
2. Adjust RV71 so that the frequency counter reads  $6,000 \pm 30\text{Hz}$ .

### • NORMAL speed adjustment

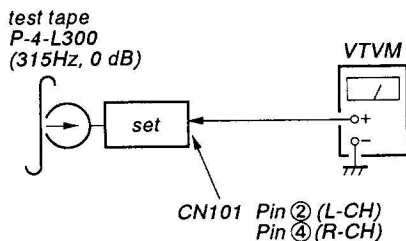
1. Push NORMAL speed button.
2. Adjust RV72 so that the frequency counter reads  $3,000 \pm 15\text{Hz}$ .

(See right for Adjusting Parts Location)

Frequency difference between deck A and deck B the beginning of the tape should be within 1%.

## Playback Level Adjustment DECK A DECK B

### Procedure :



Mode : FWD playback

DECK-A side RV11 (L-CH), RV21 (R-CH)

DECK-B side RV11 (L-CH), RV21 (R-CH)

so that the limits below are satisfied.

### Adjustable limits :

CN101 level :  $-7.7 \pm 0.5\text{ dB}$  (0.301 - 0.338)

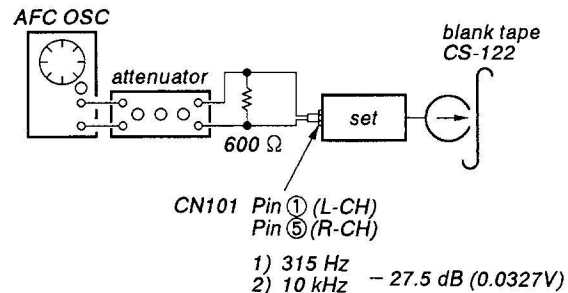
level difference between the channels : within 1.0dB

(See right for Adjusting Parts Location)

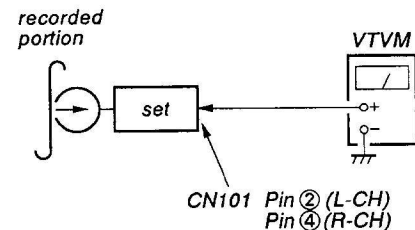
## Record BIAS Current Adjustment DECK B

### Procedure :

1. Mode : record



2. Mode : Playback



Playback the signal recorder in step 1.

Confirm that the 10kHz playback output is  $0 \pm 0.5\text{dB}$  relative to the 315Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given above.

(See right for Adjusting Parts Location)

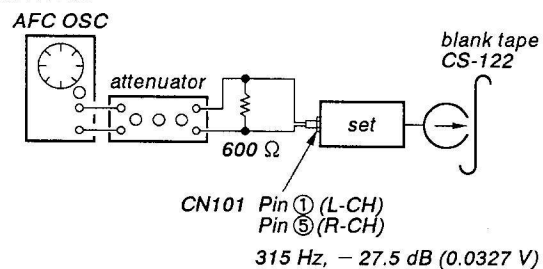
## Record Level Adjustment DECK B

### Setting :

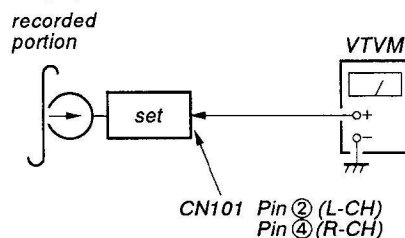
TAPE : TYPE I

### Procedure :

1. Mode : record



2. Mode : playback



3. Playback the signal recorded in step 1.

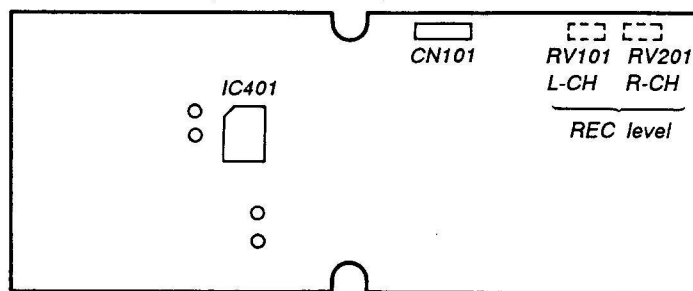
Confirm that the signal level is within the adjustment limits below. If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the step 1-3.

Adjustable limits :  $-27.5 \pm 0.5\text{ dB}$  (0.0309 - 0.0346)

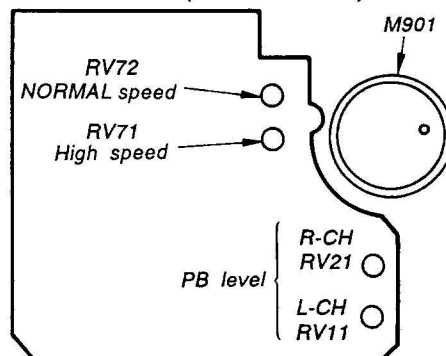
(See right for Adjusting Parts Location)

- Adjusting Parts Location

#### TC MAIN BOARD (Conductor Side)



#### AUDIO BOARD (Conductor Side)

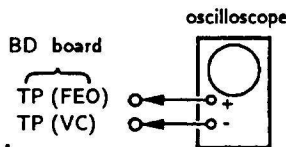


## CD SECTION

### Note :

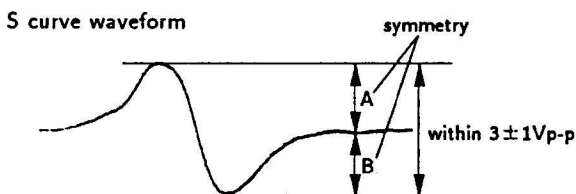
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than  $10M\Omega$  impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

### S Curve Check



#### Procedure :

1. Connect oscilloscope to test point TP (FEO) on BD board.
2. Connect between test point TP (FES) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical between A and B. And confirm peak to peak level within  $3 \pm 1V_{p-p}$ .

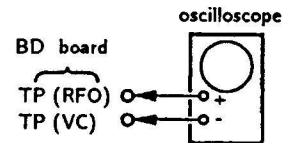


5. After check, remove the lead wire connected in step 2.

**Note :**

- Try to measure several times to make sure that the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

### RF Level Check



#### Procedure :

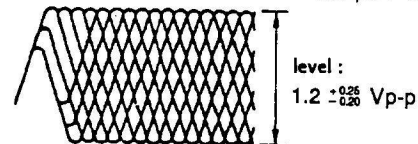
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

### Note :

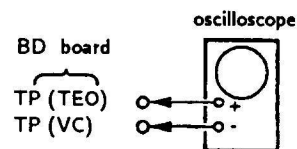
Clear RF signal waveform means that the shape "◇" can be clearly distinguished at the center of the waveform.

RF signal waveform

VOLT/DIV : 200mV  
TIME/DIV : 500nS



### E-F Balance Check



#### Procedure :

1. Connect test point TP (ADJ) to ground and TP (TES) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TEO) on BD board.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and playback.
5. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

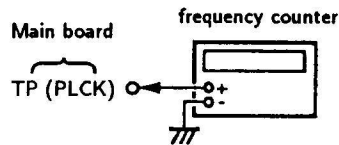
Traverse oscilloscope



6. Remove the lead wire connected in step 1.

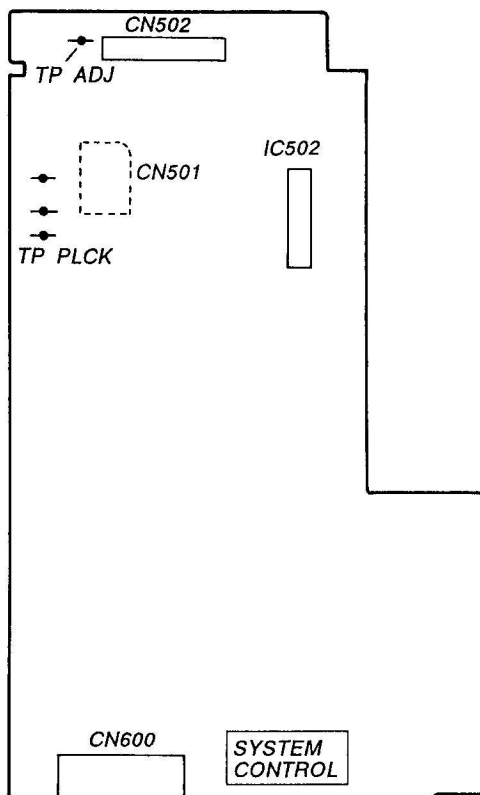
### Procedure :

2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4.3218MHz.

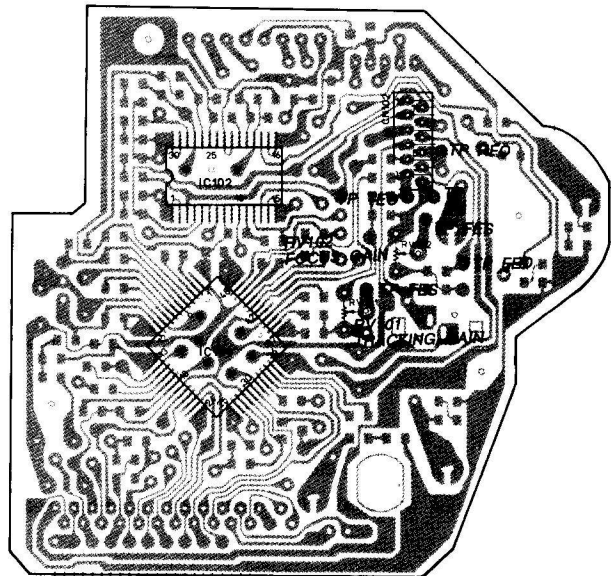


This gain has a margin, so even if it is slightly off.  
There is no problem.  
Therefore, do not perform, this adjustment.  
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

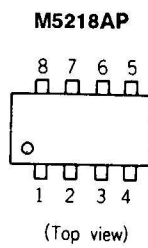
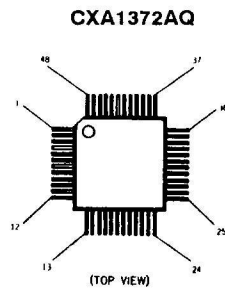
### CD MAIN BOARD (Component Side)



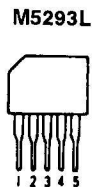
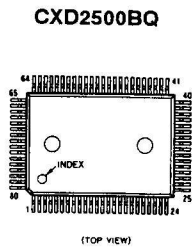
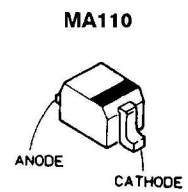
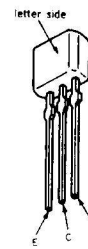
— conductor side —



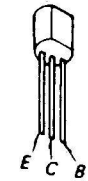
• Semiconductor Lead Layouts



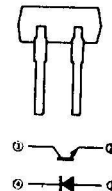
2SA1175-HFE  
2SC2785-HFE  
2SC3623A-LK



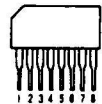
2SB1013-4  
2SD1616A-K



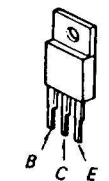
**NJL5165K-B**



**M54641L**



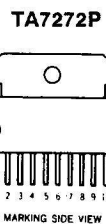
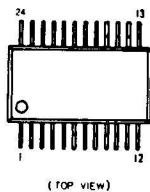
**2SB1094-LK**



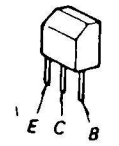
**UZM4.7X**



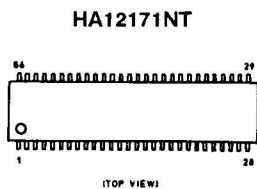
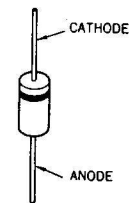
**CXD2565M**



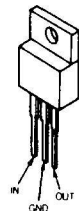
**2SD774-34**



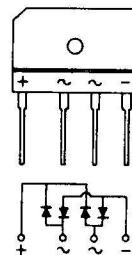
**1N4148M**



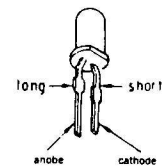
**TA7807S**



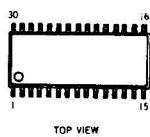
**D2SB20**



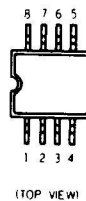
**SEL2210S-CD  
SEL2410E-TH10**



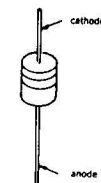
**LA6532M**



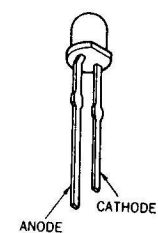
**PC4570G2**



HZS9A2L  
UZL-6L3  
UZL-7L2  
UZL-9H1  
11ES2  
11EQS04



**SEL2810A**



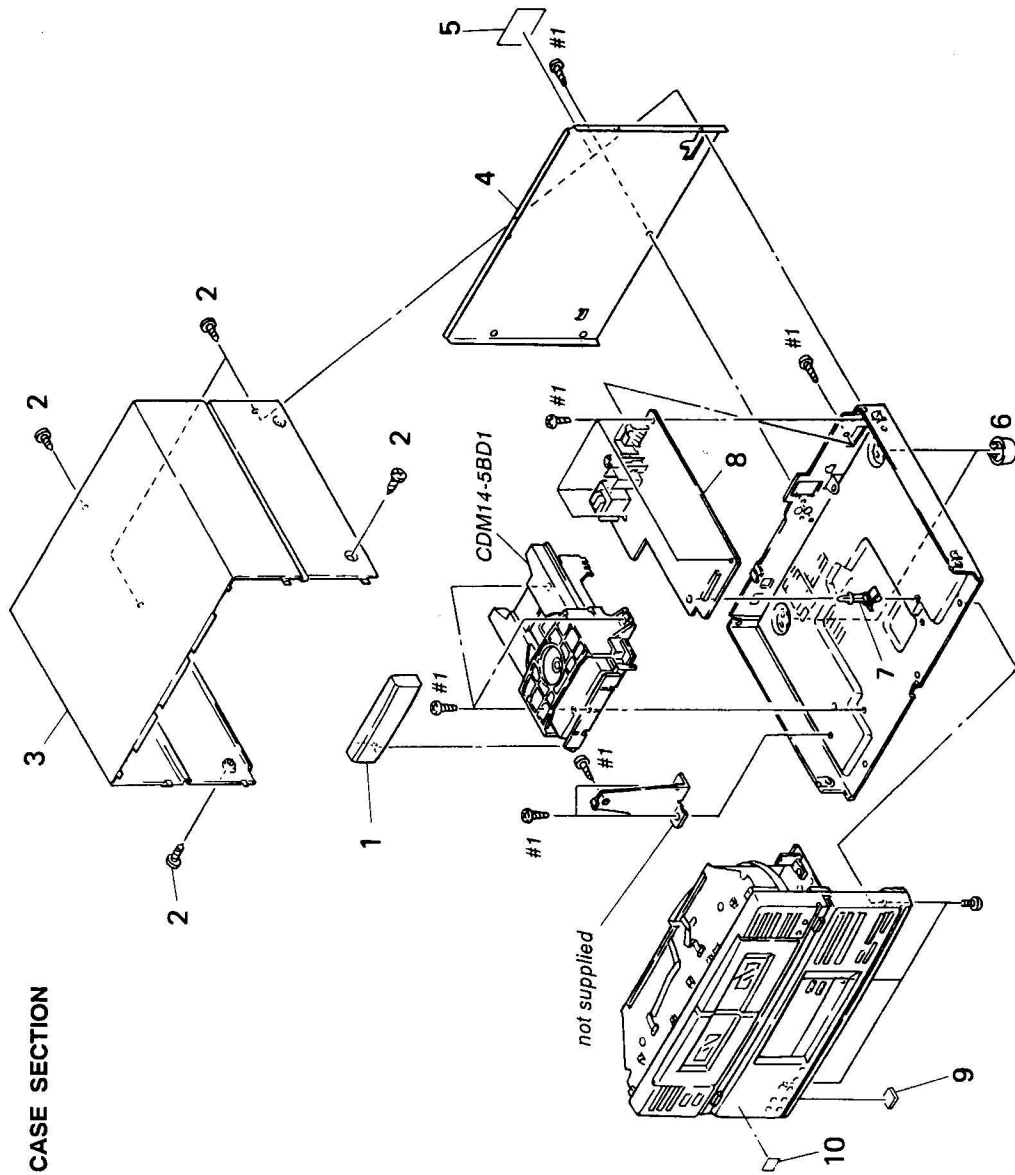
**M51943BSL**



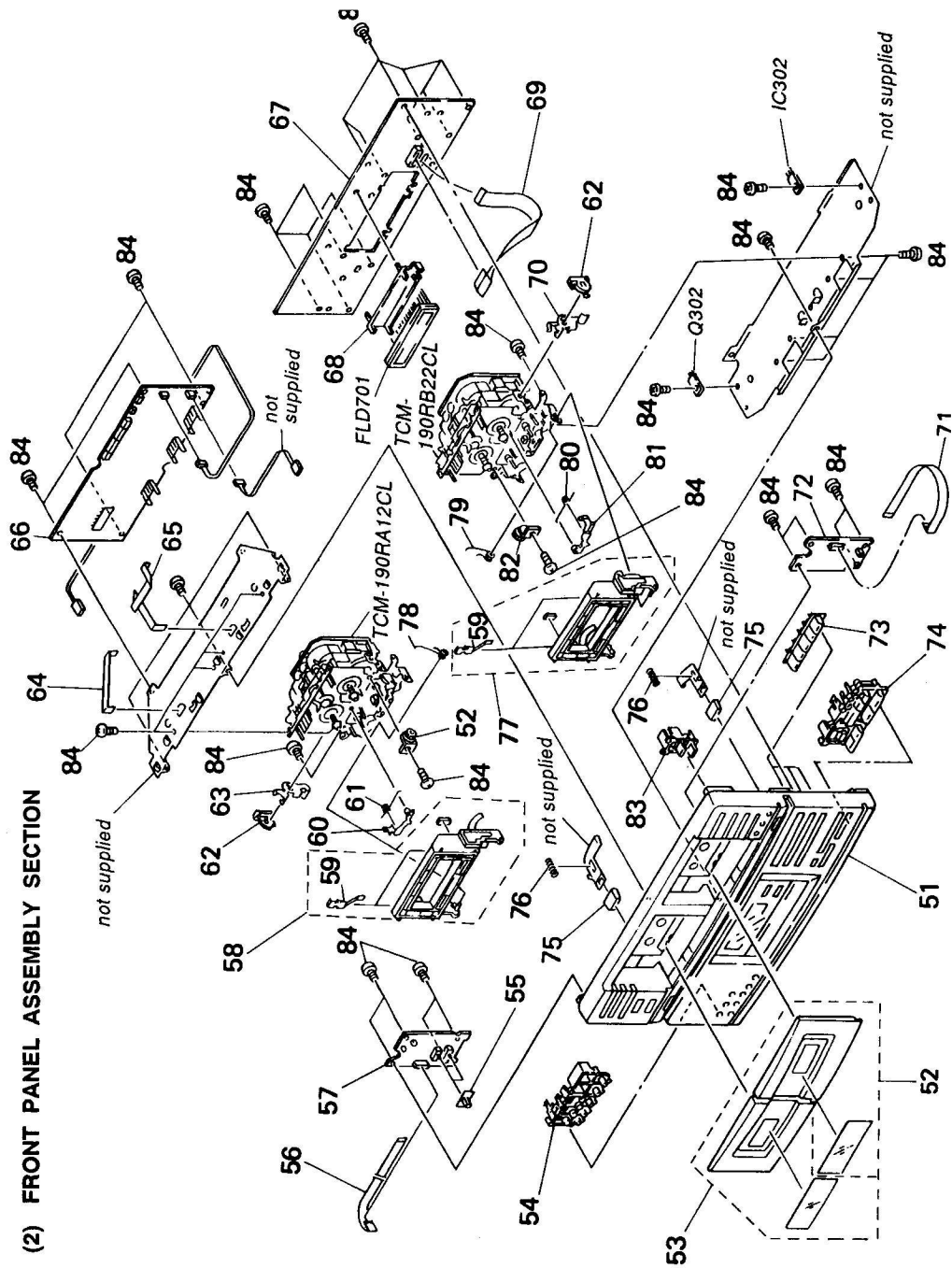
**DTA144ES  
DTC144ES**



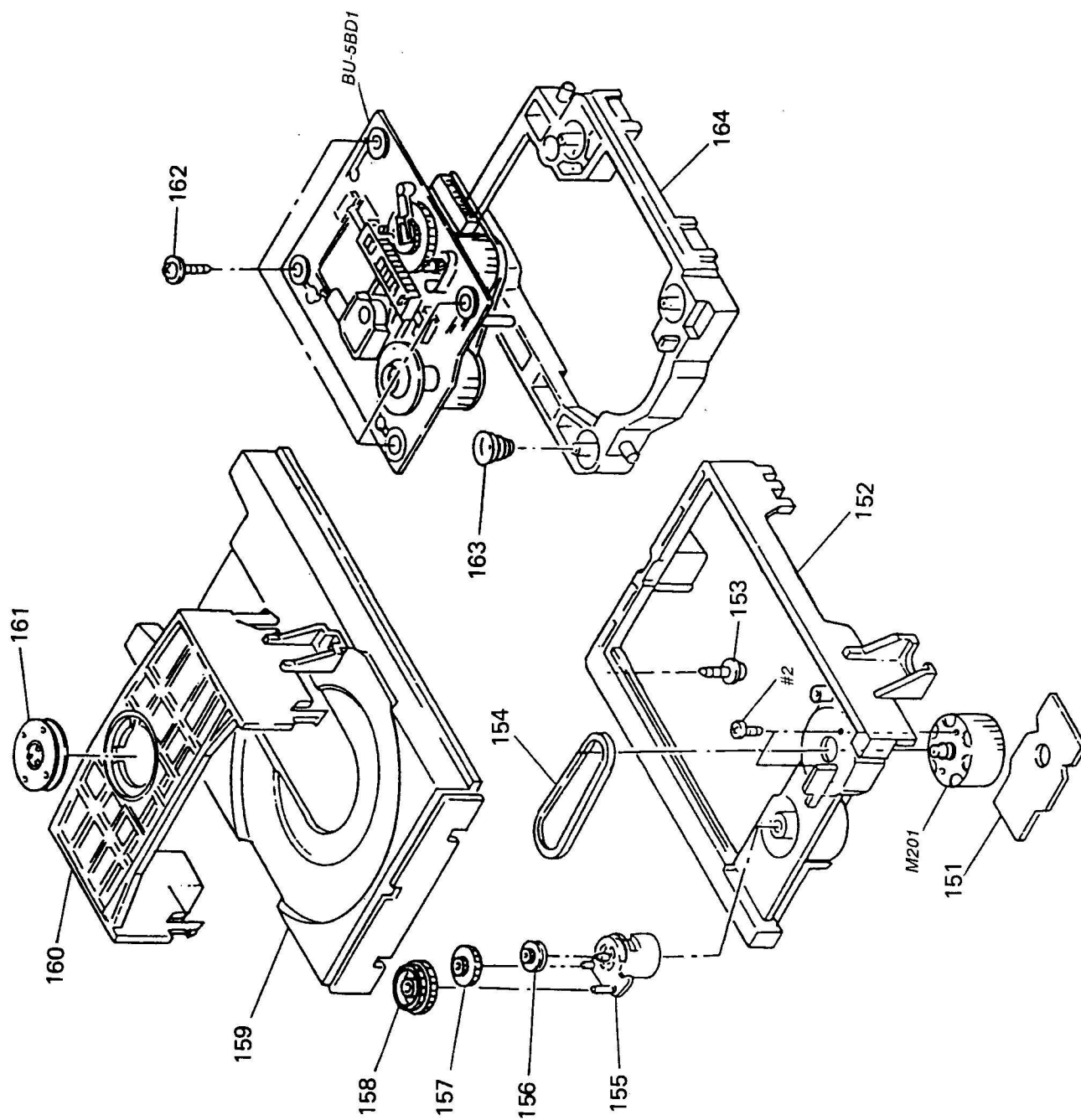
(1) CASE SECTION



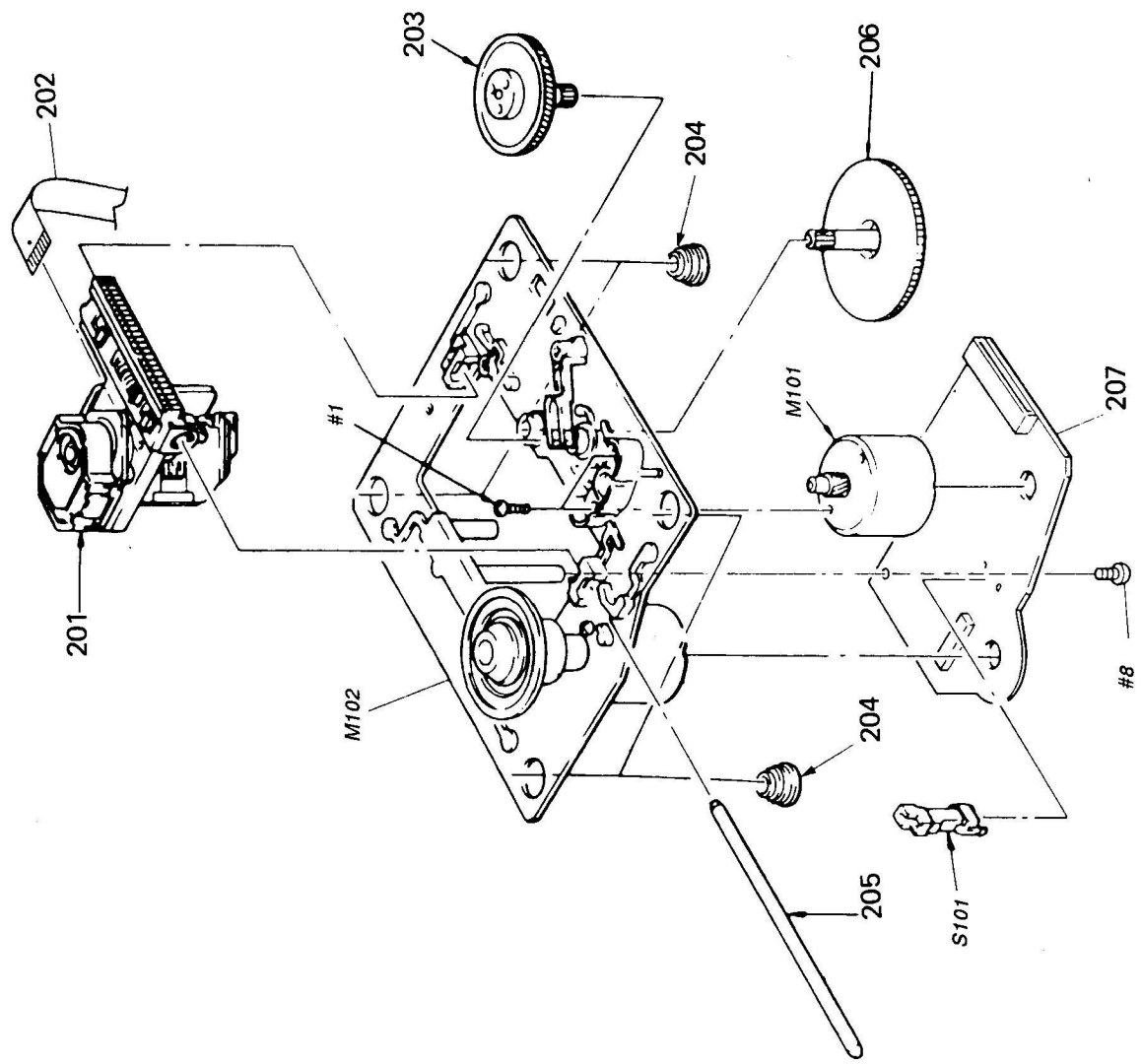
(2) FRONT PANEL ASSEMBLY SECTION



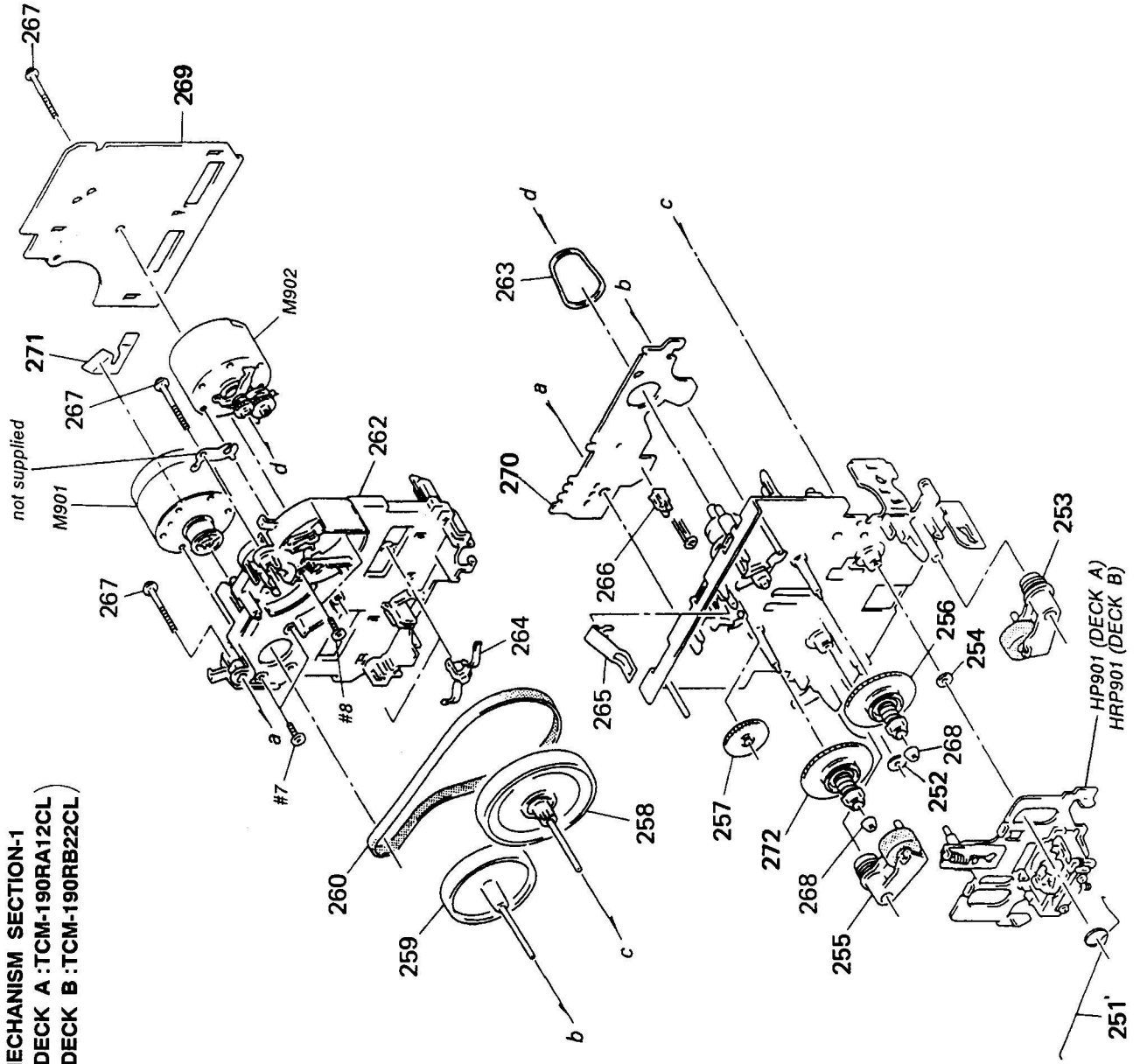
(3) CD MECHANISM SECTION (CDM14-5BD1)



(4) OPTICAL PICK-UP BLOCK ASSEMBLY (BU-5BD1)



(5) MECHANISM SECTION-1  
 (DECK A :TCM-190RA12CL)  
 (DECK B :TCM-190RB22CL)



(6) MECHANISM SECTION-2  
(DECK A :TCM-190RA12CL)  
(DECK B :TCM-190RB22CL)

