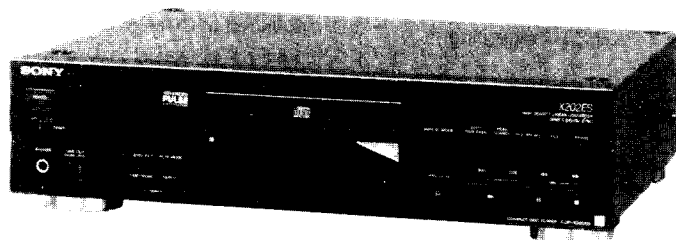


CDP-X202ES

SERVICE MANUAL

*US Model
Canadian Model
AEP Model
E Model
Australian Model*



| | |
|------------------------------------|-------------|
| Model Name Using Similar Mechanism | NEW |
| CD Mechanism Type | CDM25-5BD10 |
| Optical Pick-up Block Type | BU-5BD10B |

SPECIFICATIONS

Compact disc player

| | |
|-----------------------|-----------------------------|
| Laser | Semiconductor laser |
| Wavelength | 780-790 nm |
| Frequency response | 2 Hz to 20 kHz ± 0.3 dB |
| Signal-to-noise ratio | More than 116 dB |
| Dynamic range | More than 100 dB |
| Harmonic distortion | Less than 0.0023 % |
| Channel separation | More than 110 dB |

Outputs

| | |
|----------------------------|---|
| LINE OUT (FIXED) | Output level 2 V (at 50 kilo-ohms) Load impedance over 10 kilo-ohms |
| LINE OUT (VARIABLE) | Output level max. 2 V (at 50 kilo-ohms) Load impedance over 50 kilo-ohms |
| DIGITAL OUT (OPTICAL) | Wave length 660 nm Output level -18 dBm |
| PHONES (stereo phone jack) | Output level max. 28 mW Load impedance 32 ohms |

General

| | |
|-----------------------------|---------------------------------------|
| Power requirements | |
| Continental European model: | 220 V - 230 V AC, 50/60 Hz |
| Canadian model: | 120 V AC, 60 Hz |
| UK and Australian model: | 240 V AC, 50 Hz |
| Other country models: | 110 - 120 or 220 - 240 V AC, 50/60 Hz |
| Power consumption | 16 W |

| | |
|---|--|
| Dimensions (approx., including projections) | 430 x 110 x 340 mm (w/h/d) (17 x 4 ³ / ₈ x 13 ¹ / ₂ inches) |
|---|--|

| | |
|----------------|-----------------------|
| Mass (approx.) | 5.8 kg (12 lbs 13 oz) |
|----------------|-----------------------|

Remote commander

| | |
|---|--|
| Remote control system | Infrared control |
| Power requirements | 3 V DC with two R6 (size AA) batteries |
| Dimensions (approx., including projections) | 62 x 17 x 175 mm (w/h/d) (2 ¹ / ₂ x ²³ / ₃₂ x 7 inches) |
| Mass (approx.) | 135 g (5 oz) |

Design and specifications are subject to change without notice.



COMPACT DISC PLAYER
SONY®

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

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

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

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

The following caution label is located in the side of the unit.

| | |
|----------|---|
| CAUTION | : INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM. |
| ADVARSEL | : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSÅFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING. |
| VARO! | : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA DLET ALTTIINA LASERSÄTEILYLLÄ. |
| VARNING | : LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPARREN ÄR URKOPPLAD. |
| ADVARSEL | : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN. |

For the customers in Canada

CAUTION



TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

THIS APPARATUS COMPLIES WITH THE CLASS B LIMITS FOR RADIO NOISE EMISSIONS SET OUT IN RADIO INTERFERENCE REGULATIONS.


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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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

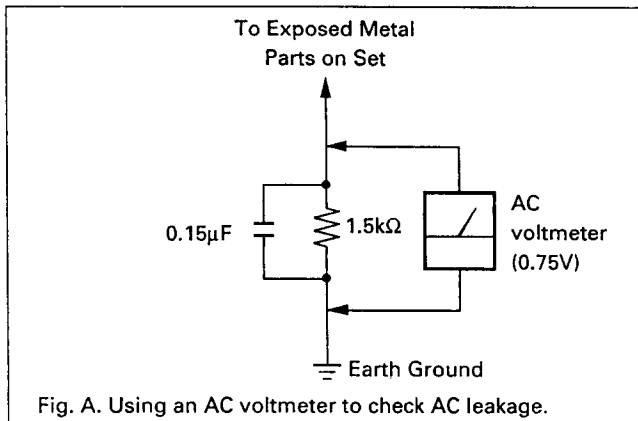
SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer: Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

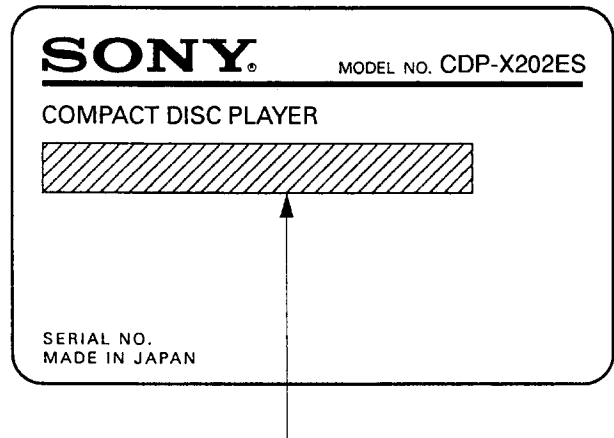
The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig.A)



MODEL IDENTIFICATION

– SPECIFICATION LABEL –



US, Canadian MODEL : AC120V, 60Hz, 16W

Australian MODEL : AC240V, 50Hz,

AEP Model : AC220 — 230V, 50/60Hz, 16W

E MODEL : AC110 — 120V, 220 — 240V, 50/60Hz, 16W

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

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

During repair, pay attention to electrostatic break-down 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

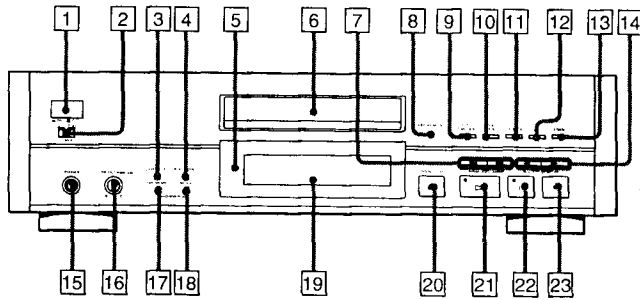
The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SECTION 1 GENERAL

This section is extracted from instruction manual.

Identifying the Parts

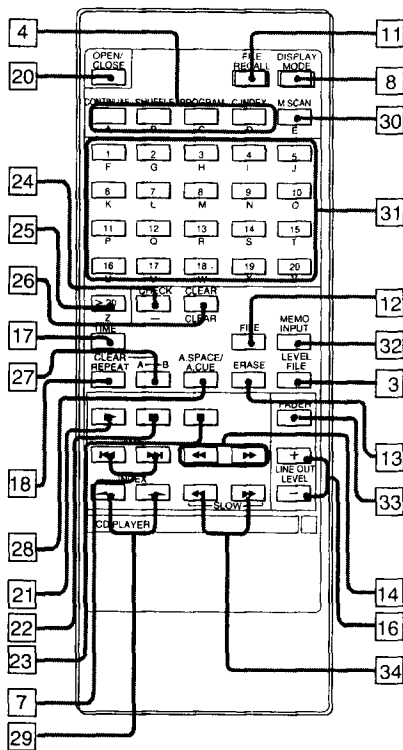
Refer to the pages indicated in parentheses for details.



Front Panel/ Remote Commander

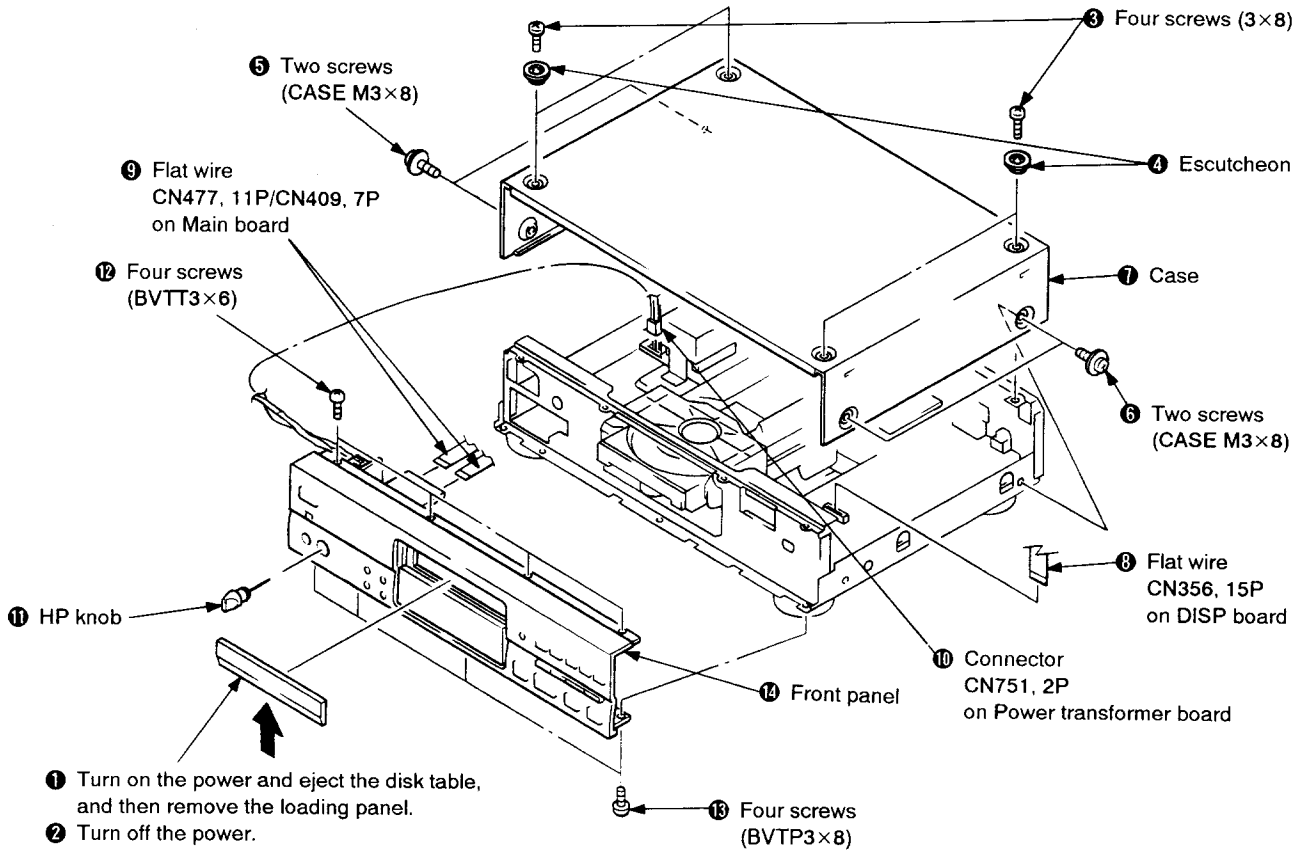
- 1 POWER switch (18)
- 2 TIMER switch (92)
- 3 LEVEL FILE button (90)
- 4 PLAY MODE button
- On the remote commander:
 - CONTINUE button (18)
 - SHUFFLE button (28)
 - PROGRAM button (34, 48)
 - C.INDEX button (76)
- 5 Remote sensor
- 6 Disc tray
- 7 ◀▶ (AMS*) buttons (22)
- 8 DISPLAY MODE button (20)
- 9 EDIT/TIME FADE button (58, 64)
- 10 PEAK SEARCH button (66)
- 11 FILE RECALL button (84, 88)
- 12 FILE (custom file) button (70, 74, 76, 82, 86)
- 13 ERASE button (80, 84, 88)
- 14 ◀▶ (manual search) buttons (24)
- 15 PHONES jack (18)
- 16 LINE OUT/PHONE LEVEL control (18, 90)
(LINE OUT LEVEL +/- buttons on the remote commander)
- 17 TIME/MEMO button (20)
- 18 REPEAT button (40)
- 19 Display
- 20 ▲ OPEN/CLOSE button (18)
- 21 ▶ (play) button and indicator (18)
- 22 || (pause) button and indicator (18)
- 23 ■ (stop) button (18)
- 24 CHECK (program check) button (36)
- 25 >20 button (22)
- 26 CLEAR button (30, 32, 34, 36)
- 27 A↔B button (42)
- 28 A.SPACE/A.CUE button (26)
- 29 ←/→ INDEX buttons (24, 78)
- 30 M.SCAN button (38)
- 31 Numeric buttons (22)
- 32 MEMO INPUT button (72)
- 33 FADER button (44)
- 34 ◀▶ SLOW buttons (24)

* AMS is the abbreviation of Automatic Music Sensor.

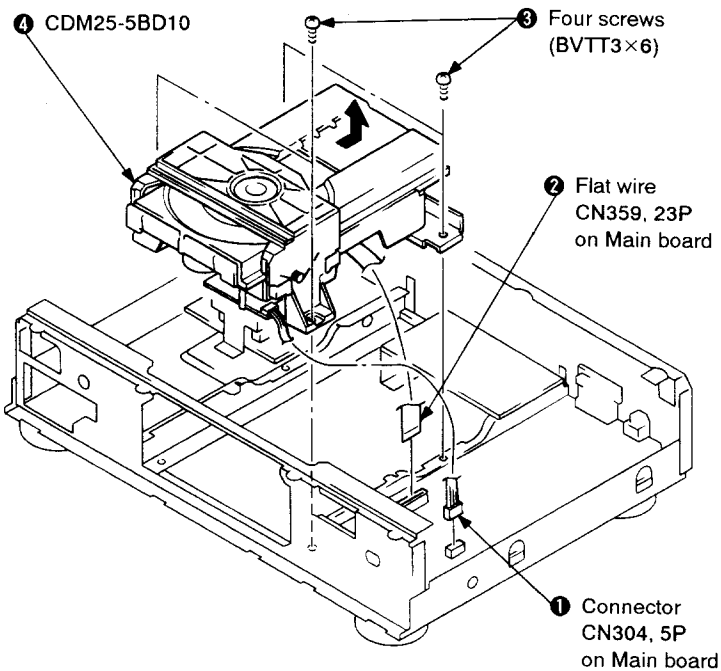


SECTION 2 DISASSEMBLY

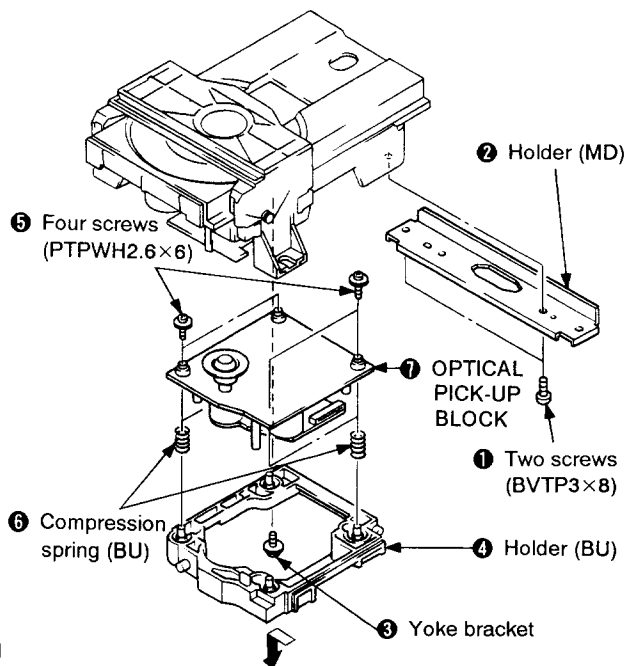
2-1. REMVAL OF FRONT PANEL AND CASE ASSEMBLIES



2-2. REMVAL OF CDM25-5BD10



2-3. REMVAL OF OPTICAL PICK-UP BLOCK ASSEMBLY

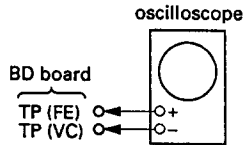


SECTION 3 ELECTRICAL BLOCK CHECKING

Note :

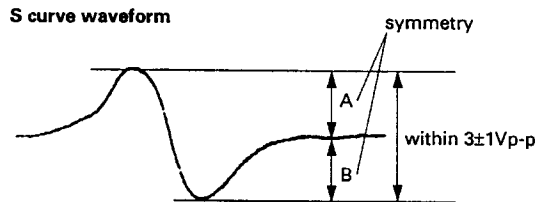
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal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

S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect between test point TP (FEI) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus search. (actuate the focus search 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 $3 \pm 1V_{p-p}$.

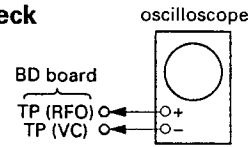


5. After check, remove the lead wire connected in step 2.

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

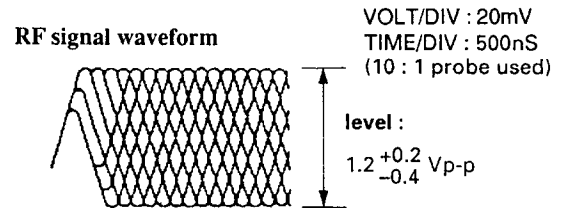


Procedure :

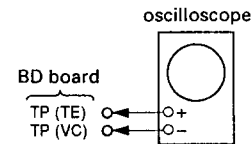
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

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



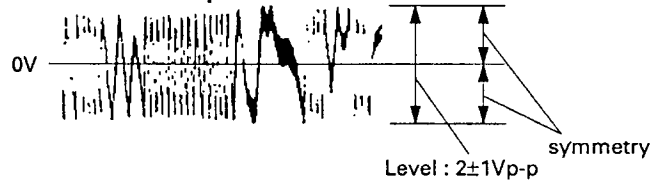
E-F Balance Check



Procedure :

1. Connect test point TP (ADJ) (on main board) to ground and TP (TEI) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TE) 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

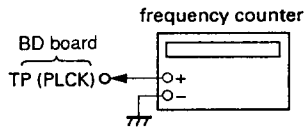


6. Remove the lead wire connected in step 1.

RF PLL Free-run Frequency Check

Procedure :

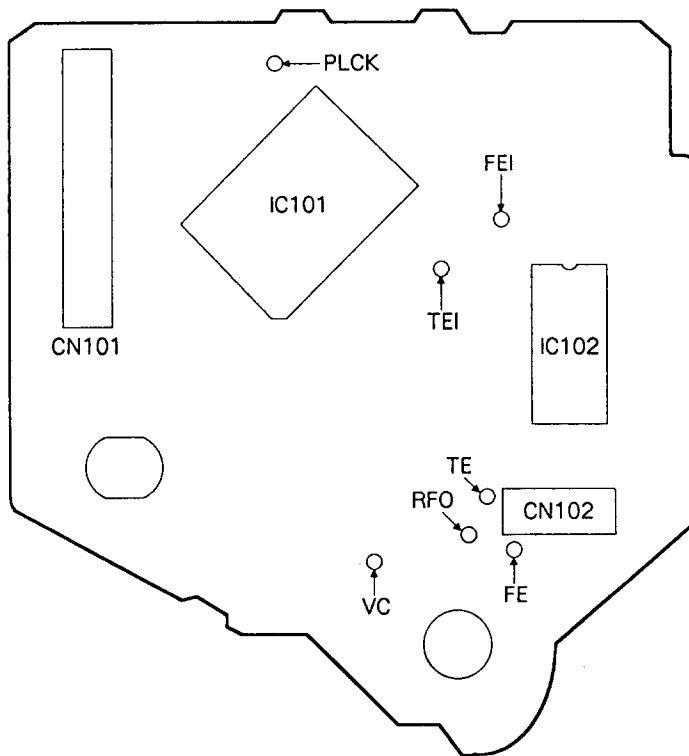
1. Connect frequency counter to test point (PLCK) with lead wire.



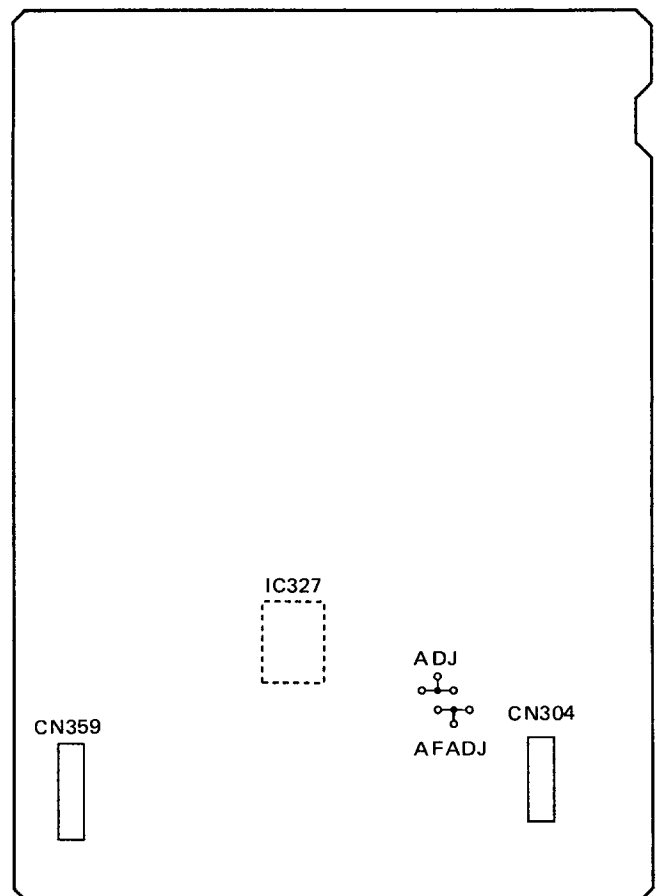
2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4.3218MHz.

Checking Location :

[BD BOARD] – Conductor Side –



[MAIN BOARD] – Component Side –



SECTION 4 IC PIN FUNCTIONS

• IC327 main system controller (M37451M8-334FP)

Functions effected by the captioned controller include IC101 (RF signal processing, servo, DSP), and loading control in the CD unit, data exchange with IC801 (Display, key control), audio bus entry, etc.

| Pin No. | Pin Name | I/O | Description |
|---------|-------------|-----|--|
| 1,2 | N.C. | – | No connection |
| 3 | CNIN | I | Count input from CXD2515Q (IC101) |
| 4 | QINT | O | Command output pulse output terminal |
| 5 | M/F | I/O | Master/File command select input/output |
| 6 | SACK | O | Command acknowledge output |
| 7 | MREQ | I | Command request input |
| 8–11 | CMD3 – CMD0 | I/O | Master micro-computer inter-face 3-0 |
| 12 | CLK | O | Data clock signal output to CXD2515Q (IC101) |
| 13 | XLT | O | Data latch pulse signal output to CXD2515Q (IC101) |
| 14 | DATA | O | Data signal output to CXD2515Q (IC101) |
| 15 | ATT | O | Attenuate data signal output to CXD2567M (IC301) |
| 16 | SHIFT | O | Attenuate data clock signal output to CXD2567M (IC301) |
| 17 | LATCH | O | Attenuate data latch pulse signal output to CXD2567M (IC301) |
| 18 | LDON | O | Laser diode ON/OFF signal output |
| 19 | SCOR | I | SCOR signal input from CXD2515Q (IC101) |
| 20–24 | N.C. | – | No connection |
| 25 | CNVSS | – | Power terminal (GND) |
| 26 | RESET | I | Reset signal input |
| 27 | N.C. | – | No connection |
| 28 | XIN | I | Clock input (10 MHz) |
| 29 | XOUT | O | Clock output |
| 30,31 | N.C. | – | No connection |
| 32 | GND | – | Power terminal (GND) |
| 33 | N.C. | – | No connection |
| 34 | MUTE | O | Muting signal output (Digital mute) |
| 35 | WE | O | Write enable output to 64k-bit static RAM (IC325) |
| 36–40 | A12 – A8 | O | Address output to 64k-bit static RAM (IC325) |
| 41 | N.C. | – | No connection |
| 42–49 | A7 – A0 | O | Address output to 64k-bit static RAM (IC325) |
| 50–57 | D7 – D0 | I/O | Data input and output to 64k-bit static RAM (IC325) |
| 58 | SENSE | I | Sense signal input from CXD2515Q (IC101) |
| 59 | GFS | I | GFS monitor input from CXD2515Q (IC101) |
| 60 | FOK | I | FOK monitor input from CXD2515Q (IC101) |
| 61 | ADJ | I | Test mode terminal ("L": test mode) |
| 62 | AFADJ | I | Test mode terminal for adjustment ("L": test mode) |
| 63 | INSW | I | Loading-in switch input |
| 64 | OUTSW | I | Loading-out switch output |
| 65 | VLEVEL | I | Remote control volume level input |
| 66 | VOLUP | O | Remote control volume control output (Volume up) |
| 67 | VOLDWN | O | Remote control volume control output (Volume down) |
| 68,69 | VREF | – | Power terminal (+5V) |
| 70 | AVSS | – | Power terminal (GND) |
| 71 | AVCC | – | Power terminal (+5V) |
| 72 | VCC | – | Power terminal (+5V) |
| 73 | GND | – | Power terminal (GND) |

| Pin No. | Pin Name | I/O | Description |
|---------|----------|-----|---|
| 74 | SCLK | O | Read data clock signal output to CXD2515Q (IC101) |
| 75 | SQCK | O | Read data sub code clock output to CXD2515Q (IC101) |
| 76 | VOLLED | O | Remote control volume LED output |
| 77 | SUBQ | I | Sub code data input to CXD2515Q (IC101) |
| 78 | LODIN | O | Loading motor drive signal output (Load-in) |
| 79 | LODOUT | O | Loading motor drive signal output (Load-out) |
| 80 | N.C. | - | No connection |

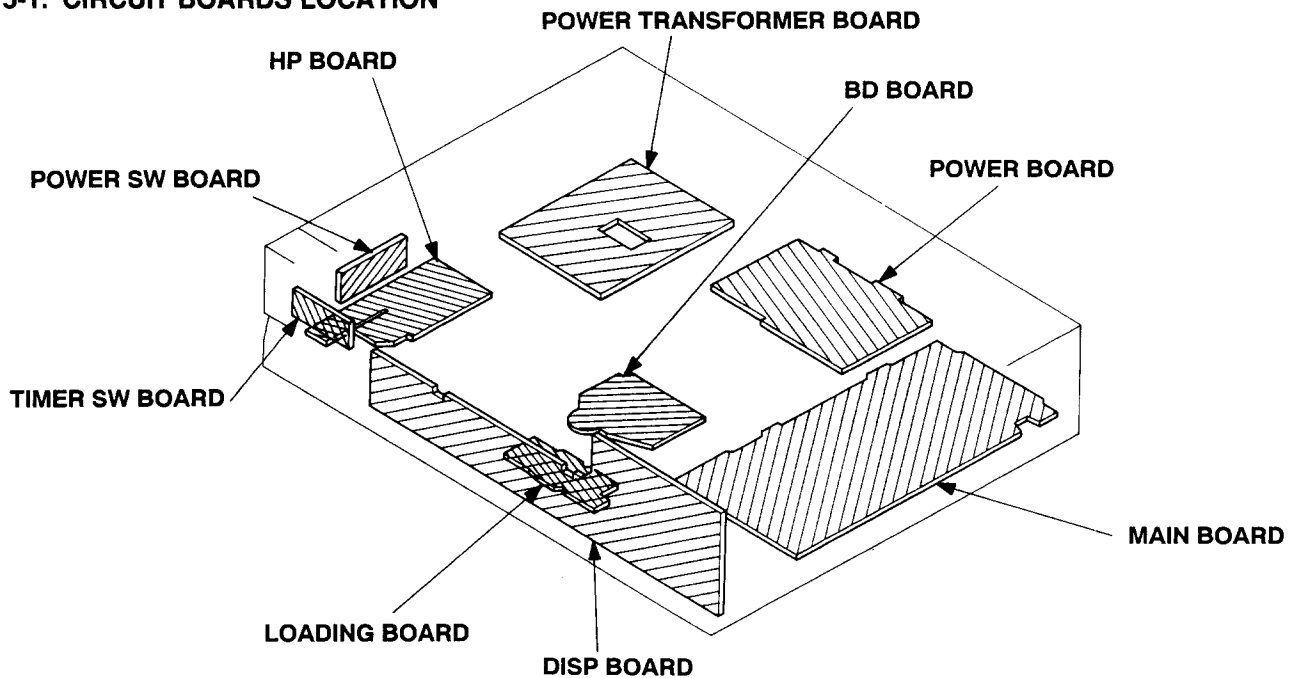
• **IC801 SUB-SYSTEM CONTROLLER (MSC62408-100GS-V1K)**

Exchanges data with IC327 (main system control microcomputer), controls display tube driving, performs key inputs/outputs, etc.

| Pin No. | Pin Name | I/O | Description |
|---------|---------------|-----|---|
| 1 | SCAN6 | O | Key scan control signal output. (No connection) |
| 2 | TIMER | I | Timer switch control input. |
| 3 - 9 | KEY0 - KEY6 | I | Key inputs. (9 pin: Connected to the GND) |
| 10 - 13 | CMD0 - CMD3 | I/O | Data exchange input/output pin with the main system control (IC327). |
| 14 | M.REQ | O | Command request output to the main system control (IC327) |
| 15 | S.ACK | I | Command acknowledge input from the main system control (IC327) |
| 16 | M/F | I/O | Master/file command select signal input/output pin with the main system control (IC327) |
| 17 | RMIN | I | Remote control signal input from the sensor (IC802) of the remote control. |
| 18 | 997X/ES | I | Model selecting port. Fixed at "H" in this unit. |
| 19 | Q.INT | I | Command pulse input from the main system control (IC327). |
| 20 | RESET | I | Reset signal input. "L": RESET |
| 21 | TEST | I | Not used. Connected to the GND in this unit. |
| 22 | - | - | Non connection. |
| 23 | TEST | I | Test mode setting pin. Carries out various operation tests when "L" during POWER ON. |
| 24 - 27 | NC | - | Non connection. |
| 28 | PAUSE | O | Output for driving the PAUSE display LED. |
| 29 | PLAY | O | Output for driving the PLAY display LED. |
| 30 | OSC1 | I | Clock input. (4.19MHz) |
| 31 | OSC0 | O | Clock output. |
| 32 | Vss | - | GND pin. |
| 33 - 34 | T0 - T11 | O | Grid driving output to the fluorescent display tube (FLD801). |
| 45 - 48 | S28 - S25 | O | Segment driving output to the fluorescent display tube (FLD801). |
| 49 | VFLT | I | Voltage input pin (+35V) for the fluorescent display tube (FLD801). |
| 50 - 73 | S24 - S1 | I | Segment driving output to the fluorescent display tube (FLD801). |
| 74 | VDD | - | Power supply pin. (+5V) |
| 75 - 80 | SCAN0 - SCANS | O | Key scan control signal output. (78 to 80 pins:No connection) |

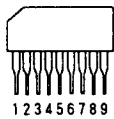
SECTION 5 DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION

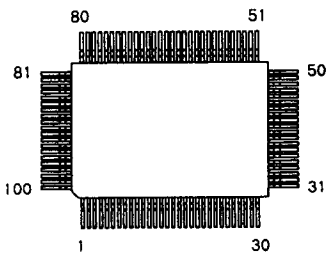


5-2. SEMICONDUCTOR LEAD LAYOUTS

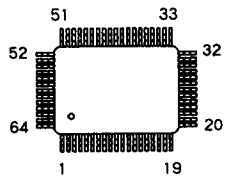
BA6208



CXD2515Q

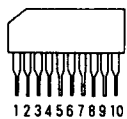


CXD2562Q

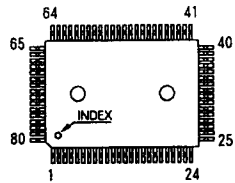


TOP VIEW

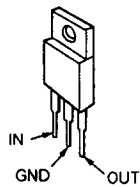
LB1641



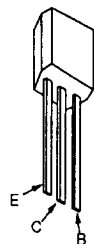
M37451M8-334FP
MSC62408-100GS-V1K



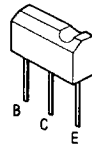
M5F78M07
TA78075-LC



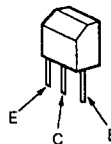
2SC2878-B
2SA1348-TP
2SA1345-TP
2SC3402-TP



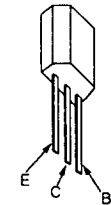
DTC114EL



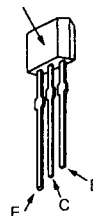
2SB734-34
2SD774-34



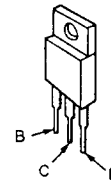
2SC2878-B



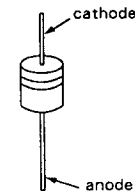
2SC3623A-LK
LETTER SIDE



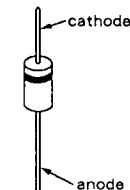
2SD1944-K



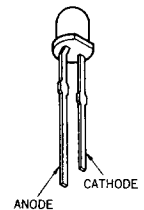
HZS36-3L
RD4.7ES-B3
RD5.1ES-B2
RD8.2ES-B2
11EQS04

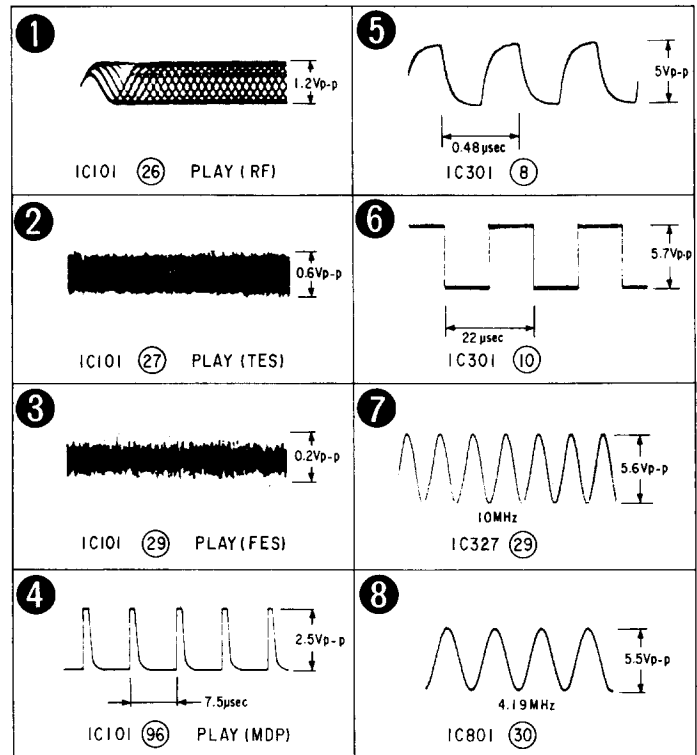


1N4148M
11E2




MAY3371X-M-177
MBG3371X-9.5









Notes on schematic diagram:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50WV or less are not indicated except for electrolytics and tantalums
- All resistors are in ohms, 1/4W or less unless otherwise noted
- \triangle : Internal component
- % : Indicates permissible margin
-  : Fuse resistor

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque \triangle sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

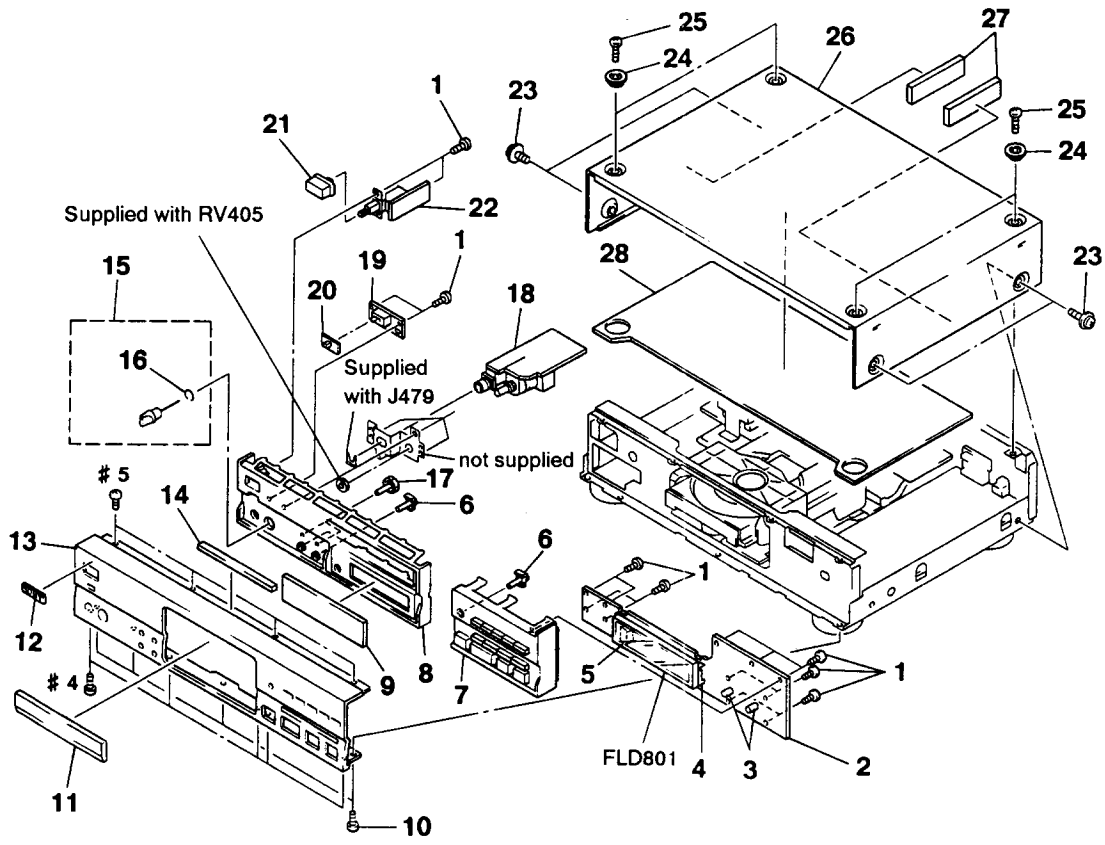
-  : B+ line
-  : B- line
-  : Adjustment for repair
- Voltage are dc with respect to ground under no-signal conditions.
- no mark : STOP
() : PLAY
- Voltages are taken with a VOM (input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Waveforms are taken with a oscilloscope.
Voltage variations may be noted due to normal production tolerances.
- Signal path.
 : CD

6-1. FRONT PANEL AND CASE ASSEMBLIES

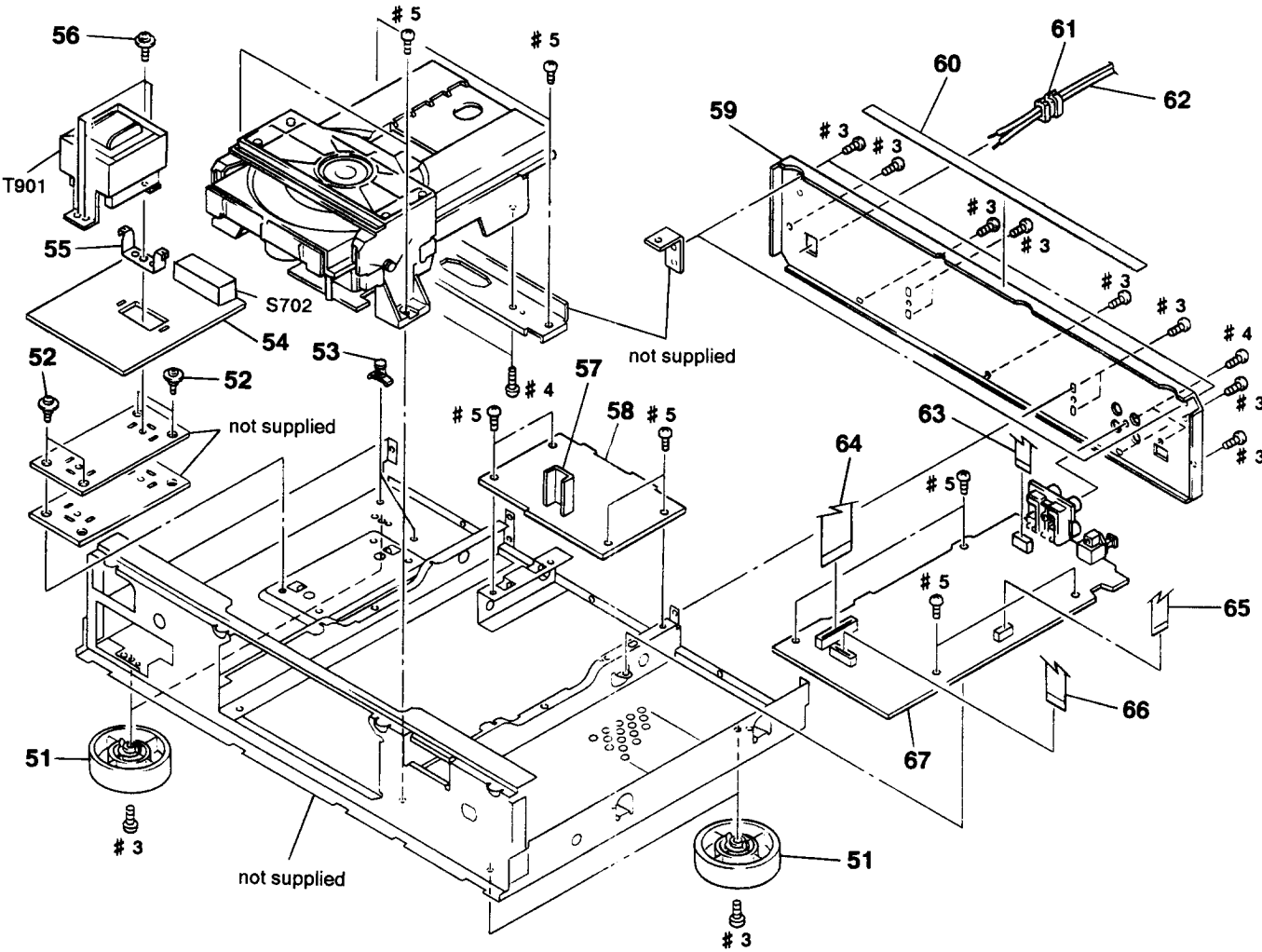
supplied.

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

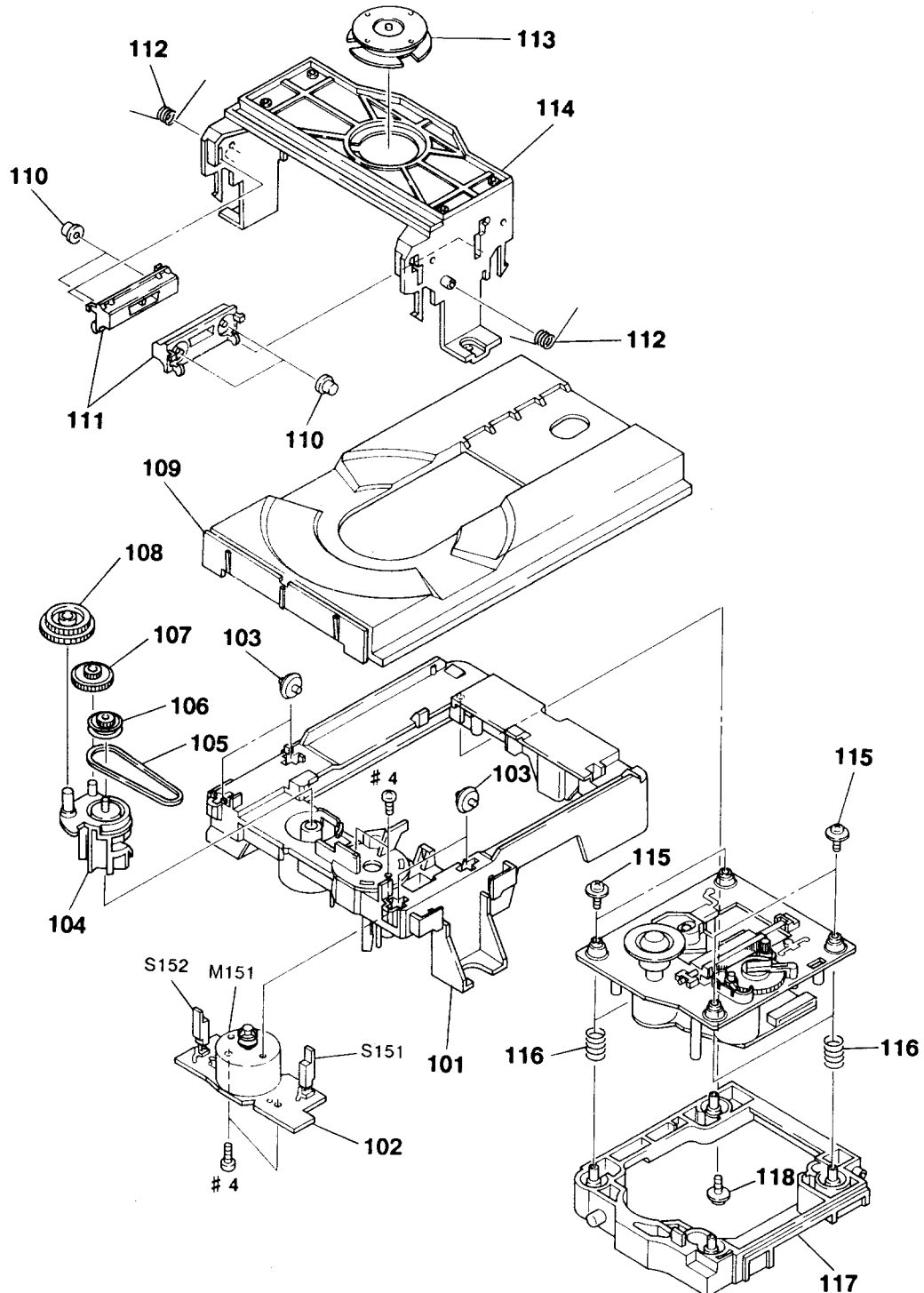
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



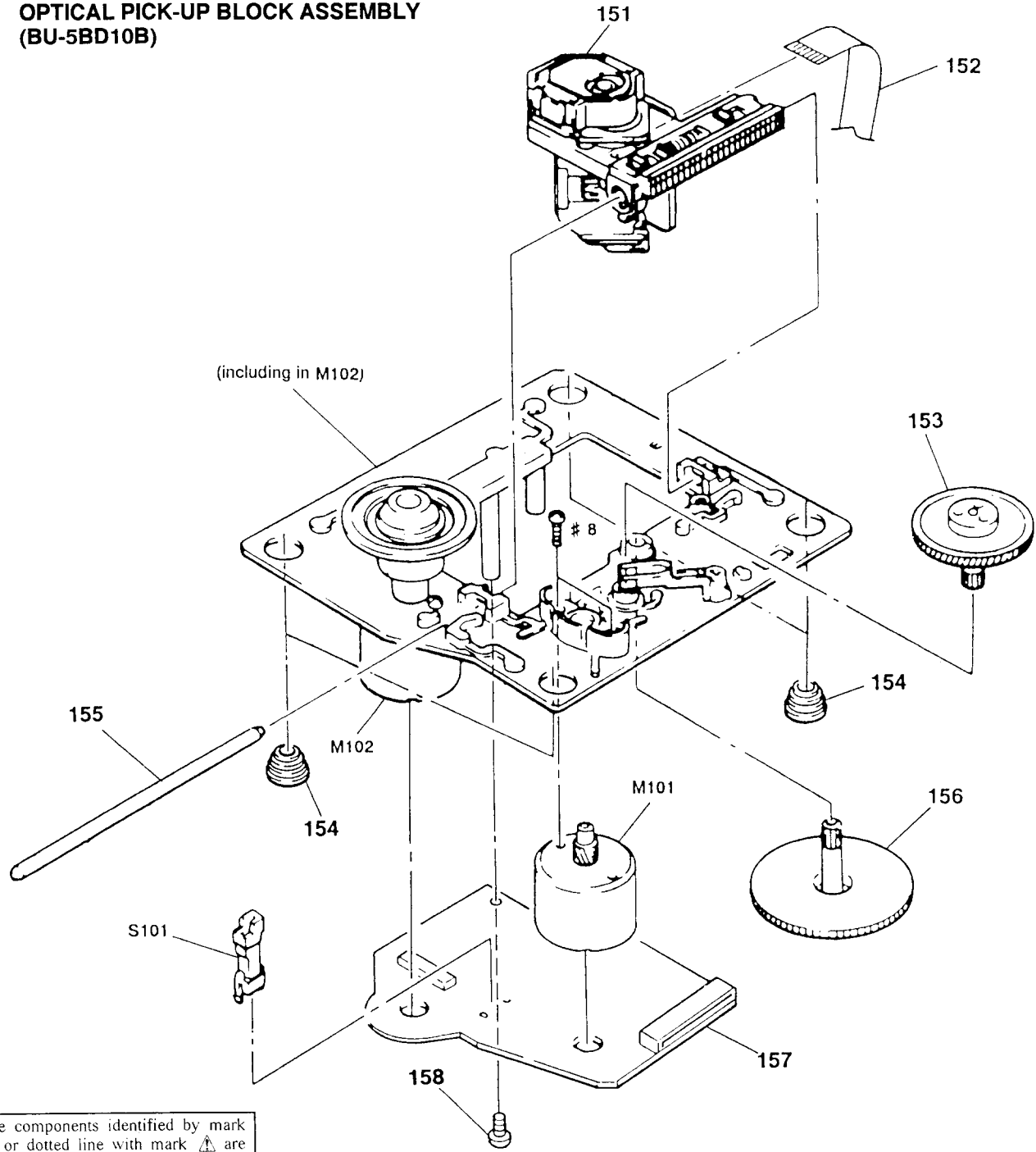
6-2. CHASSIS ASSEMBLY






6-3. CDM25-5BD10



**6-4. OPTICAL PICK-UP BLOCK ASSEMBLY
(BU-5BD10B)**



The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.