

CDL1100

SONY[®]

SERVICE MANUAL

For Primary Service

SUPPLEMENT-2

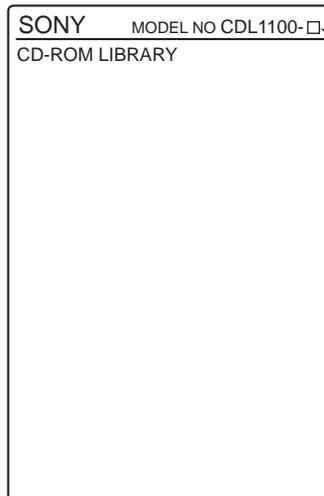
File this supplement with the service manual.

**SUBJECT : 1. ADDITIONS CDL1100-40 SERIES
2. CHANGES IN MECHANICAL ADJUSTMENT**

(ENG-99001)

The 40 series has been added to the CDL1100. Use this manual together with the service manual already distributed (SUPPLEMENT-1).

MODEL IDENTIFICATION — SPECIFICATION LABEL —



-2□ : 20 series
-4□ : 40 series

OUTLINE AND SPECIFICATIONS OF THE CDL1100-40 SERIES

The CDL1100-40 series is a CD-ROM library system with two 24x(MAX). It incorporates the compact feature of the CDL1100-20 series.

The main specifications are as follows.

SPECIFICATIONS

CDL1100-40 series (* indicates the differences from the CDL1100-20 series.)

Capacity

Number of drives	2
Number of slots	100
Total capacity	65GB

Library Performance

Disc Exchange Time	Typ.12.2sec. (average)
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Drive Performance

*Sustained Transfer Rate	1800-3600KB (P-CAV)
*Access Time	Typ.90ms (average)

Interface

Robotics	SCSI-2 single ended
Drives	SCSI-2 single ended
Analog Audio	Output Stereo mini jack
Async	RS-232C

Readable Format

CD-DA
CD-ROM (Mode 1 and Mode 2)
CD-ROM XA (Mode 2 Form 1 and Mode 2 Form 2)
CD-I Ready
CD-Bridge
CD-EXTRA
Video CD
Photo CD (Single and multiple session)

Physical Size

Dimensions (WxHxD)	215x430x435 (mm)
*Weight	14.0Kg

Power Requirements

Line Voltage	120V/230V
Line Frequency	50Hz/60Hz

Power Consumption

*0.33A	120V
*0.17A	230V

Temperature

Operating	5 to 35degC
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Relative Humidity

Operating	30 to 80%
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FRU (FIELD REPLACEABLE UNITS) LISTING OF REMOVAL

FRU	Parts No.	CDL1100-20 Series	CDL1100-40 Series	Time of Replacement (Typ. min.)	Edition and page Describing Replacement Method
Main Mounted Board, Complete	A-4699-367-A	○	○	22	Orig.5-9, Spl. (1) 13
Power Supply Mounted Board, Complete	A-4699-382-A	○	○	18	Orig.5-8
Front Assembly	A-4672-420-A	○	○	8	Orig.5-3
Mail Box Assembly	A-4672-423-A	○	○	7	Orig.5-4
Disc Case Assembly	A-4672-422-A	○	○	29	Orig.5-4, Spl. (1) 12
Carrier Assembly	A-4672-421-A	○	○	28	Orig.5-6, Spl. (1) 12
CDM-47 CD-ROM Drive Unit	A-4672-424-A	○	✕	12	Spl. (2) 9
CDM-57 CD-ROM Drive Unit	A-4672-719-A	✕	○	12	Spl. (2) 9

LIST OF FREQUENTLY REPLACED PARTS EXCEPT FOR FRU

Name	Parts No.	CDL1100-20 Series	CDL1100-40 Series	Time of Replacement (Typ. min.)	Edition and page Describing Replacement Method
INDIVIDUAL CARTON	4-987-968-02	○	○	-	Orig.1-14
CUSHION	4-997-220-01	○	○	-	Orig.1-14
Fuse2.0A (Time Lag) (Primary side)	1-532-388-51	○	○	15	Orig.5-7
Fuse2.0A (Time Lag) (Secondary side)	1-532-388-51	○	○	12	Orig.5-8
Fuse, Time Lag 3.15A	1-532-465-51	○	○	12	Orig.5-8
Wire (Flat Type) (20 Core)	1-777-656-11	○	○	11	Orig.5-6, Spl. (1) 12
BATTERY, LITHIUM (CR-2450)	1-528-229-41	○	○	12	Orig.5-10, Spl. (1) 13

To rest the hardware error

When an error has occurred, the POWER LED blinks in green and red in turn.

Button except for Other buttons than the **CLIPIN**, **CLIPOUT**, **ELVUP**, **ELVDWN**, **MDCHA**, and **MDCHB** on the internal Service board become invalid at this time.

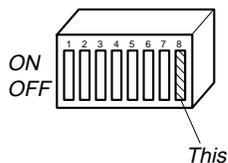
Follow (either) the procedures below to cancel this error status.

Procedure 1:

1. Referring to the troubleshooting, remove the error causes by removing the disc and so on. (Refer to 4-3. REMOVING THE DISC WHEN PROBLEMS OCCUR)
2. During the power is turned on, once set the ROBOTICS' ID SELECTOR switch "8" to ON, and set to OFF again.
3. In case the unit is in the normal mode, the manual mode, and the aging mode, a calibration will be started.

Procedure 2:

1. Referring to the troubleshooting, remove the error causes by removing the disc and so on.
2. Use the REZERO UNIT command of SCSI or the REZ command of RS-232C.
3. In case the unit is in the normal mode and the manual mode, a calibration will be started.



LIST OF PRIMARY SERVICE TOOLS

FRU	Parts No.	CDL1100-20 Series	CDL1100-40 Series
Test software-Field.exe Ver. 1.1x	Supplied separately	○	✕
Test software-Field.exe Ver. 1.2x	Supplied separately	○	○
Test disc TGRS-21	J-2501-110-A	○	○
Firmware download VIAASPI Ver. 1.00.00	Supplied separately	○	○
Height adjusting tool	J-2501-118-A	○	○

Note

1. For details on downloading the drive unit (CDM-47, CDM-57) firmware, refer to pages 6-20, -21E of the CDL1100 SERVICE MANUAL Technical Service ORIGINAL (9-920-921-81), or refer to pages 23, 24, of the CDL1100 SERVICE MANUAL Technical Service SUPPLEMENT-2.
2. Pay careful attention when connecting the CNJ202 connector of the drive unit (CDM-47, CDM-57).
(Refer to the diagram on page 9 of the SUPPLEMENT-2 for Primary Service.)

3-2-4. Drive Unit (CDM-57)

• P-CAV DRIVE

By using latest P-CAV (partial CAV) technology, the CDM-57 realizes data transferring with variable transfer rate, from 12* (inner track) to 24X (outer track).

Achieving 20X (3000kBytes/s) average data transfer rate, the CDM-57 shows excellent performance.

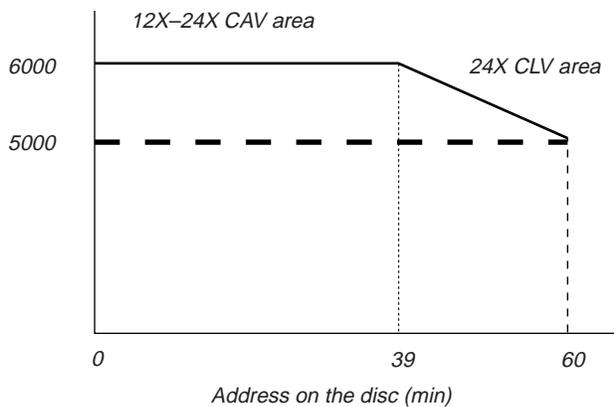
* In the case of scanning velocity 1.3m/s and 60 min. disc reading

FUNCTION OF PARTIAL CAV

CDM-57 (Drive Unit) features Partial CAV capability for Maximum Speed, taking advantage of Wide Capture Range capability of PLL (Phase Locked Loop) in its fastest speed mode.

Spindle Rotational Speed

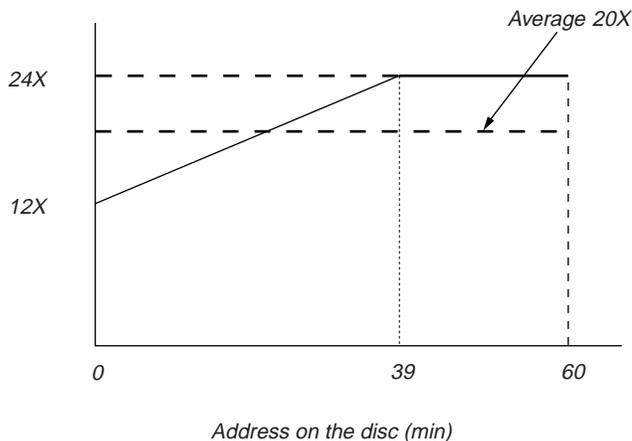
Spindle Rotational Speed



Spindle Motor rotates constant at approximately 6,000 rpm, equal to the rotational speed of 12X CLV on the innermost track, in the area between the innermost track and the point of approximately 39 minutes. (CAV area)

Data Transfer Rate

Data Transfer Rate (x 150kB/s)



In the disc area outside the fore said 39 minutes, the spindle motor follows the spindle speed curve of 24X CLV (CLV area).

• CANCEL FUNCTION OF INBALANCED DISC

① Adoption of VCAN (Vibration Cancel) motor for the spindle

CDM-57 has new type of spindle motor that cancels imbalance of a disc automatically. Thanks to the new spindle motor, self-vibration of the drive is reduced when the drive reads the imbalance disc.

② Adoption of shock sensor

CDM-57 has a feature that can detect excess vibration caused by imbalance disc. Thanks to this feature, CDM-57 automatically reduce its spindle speed to 8X-20X CAV mode when such imbalance disc is inserted. It contributes to less vibration, less audible noise, better readability and provides comfortable operating condition to end user.

• CAPABLE OF READING CD-RW DISC

CDM-57 has the capability of reading CD-RW disc. CDM-57 can automatically adjust RF amp gain and error amp gain to the proper value for CD-RW disc, when CD-RW disc is inserted. But CDM-57 can read CD-RW disc only at 4X maximum speed.

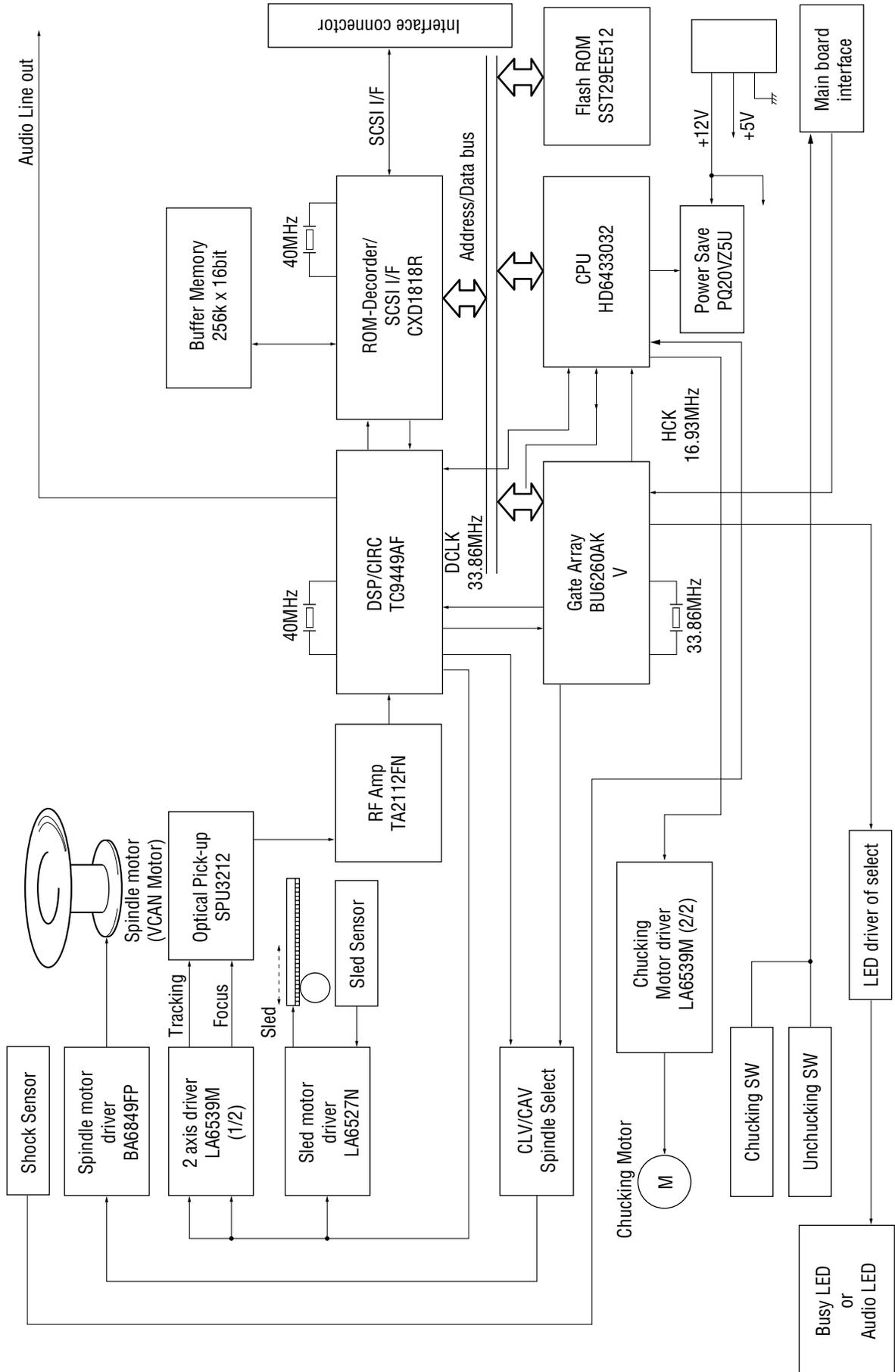
• FAST ACCESS TIME

Random access time is Typ. 90 ms at P-CAV mode, which reduces vibration of spindle rotational speed so that the access time improved.

• POWER SAVING MODE

CDM-57 has a power saving mode. If any command which requires disc access (such as READ of SEEK command) is not issued to the drive for more than the inactivity time, which can be set by mode select command, the drive goes into "standby mode" automatically. Any command that requires disc access can resume the drive from "standby mode".

FUNCTIONAL BLOCK DIAGRAM OF CDM-57

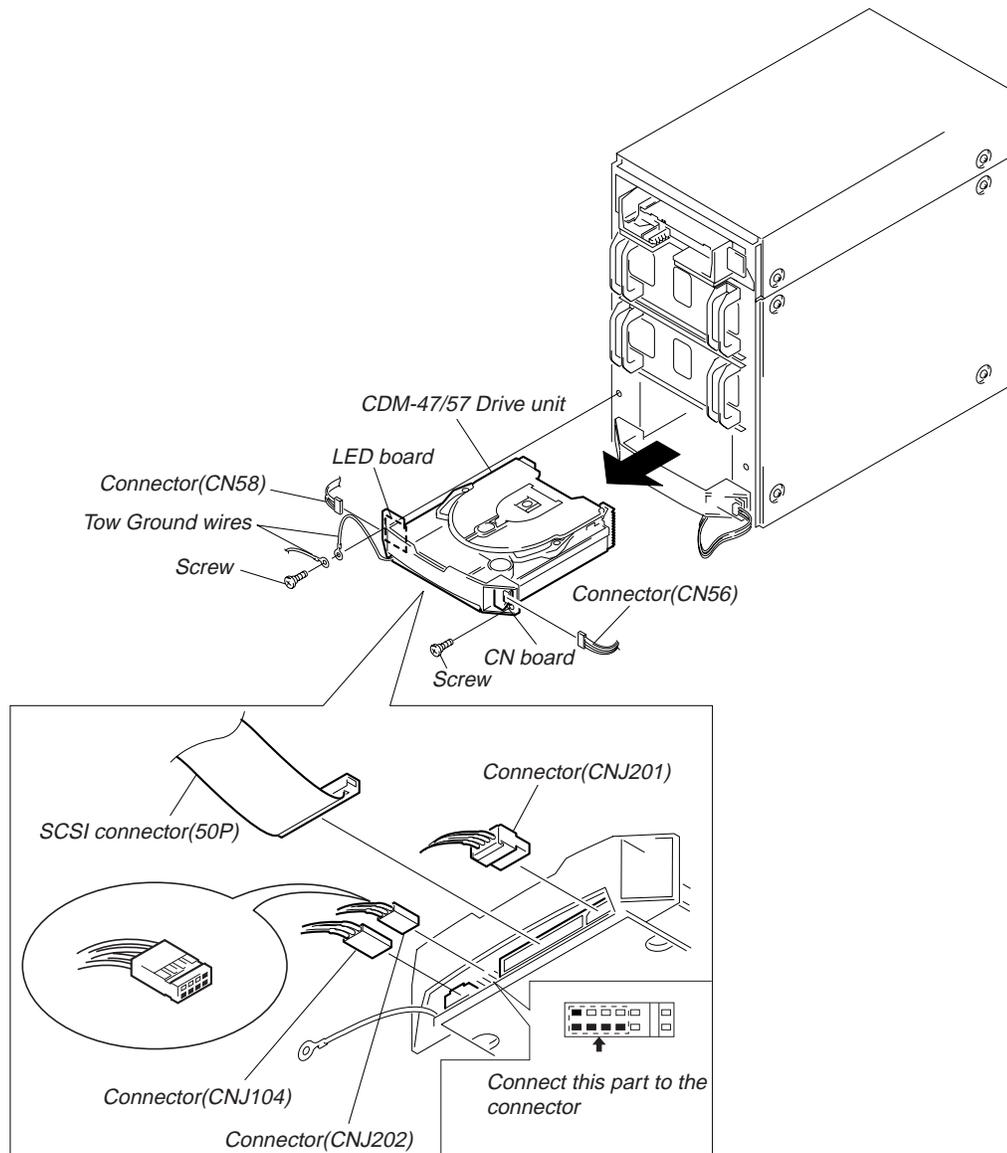


5-2-8. Replacing the CDM-47/57 Drive Unit

NOTE: Set to the Park state before replacing.

1. Remove the front panel. (Refer to 5-2-4.)
2. Remove the two connectors (CNJ104, 202), 50-pin SCSI connector, and power supply connector (CNJ201).
3. Remove the connector (CN58) from the LED board and connector (CN56) from the CN board.
4. Remove the screw, attaching the ground wires, on the left side of the unit.

5. Remove the screw on the right side of the unit, and remove the unit.
6. Attach the new separate drive unit, tighten the screw on the right side, and tighten the screw on the left side with the ground wires.
7. Connect the connector (CN58) to the LED board and connector (CN56) to the CN board.
8. Insert the power supply connector (CNJ201), two connectors (CNJ104, 202), and 50-pin SCSI connector into the unit.
9. Attach the front panel. (Refer to 5-2-5.)



5-3. MECHANICAL ADJUSTMENTS

If the offset value is known beforehand, perform the "Offset Value Registration".

If not, perform the "Height Adjustment".

"Offset Value Check of the Carrier"

Procedure:

1. Set the **MODE SELECT** knob on the PANEL board to "2" and turn on the power.
2. "Offset= @@@ step" is displayed on the PANEL board.

"Offset Value Registration"

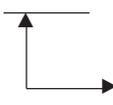
Procedure:

1. Remove both sides of the panels and top panel.
2. Set the **MODE SELECT** knob on the PANEL board to "2" and turn on the power.
3. The currently set offset value will be displayed.
4. Press the **DISP** button on the SERVICE board to display "CA=000[CS?0000]".
5. Press the **ELVUP** or **ELVDWN** button to display the offset value. (*Note 1)
6. Press the **ENTER** button and register the offset value.
7. The registered offset value will be displayed as "Offset= @@@ step".
8. Turn off the power and attach the side panels and top panel.

*NOTE 1:

The offset value will be displayed as follows. (Only when the reset position has not been detected.)

```
CA?000[CS=@@@] :
                  :
                  +2 : 0002
                  +1 : 0001
                  0  : 0000
                  -1 : 5535
                  -2 : 5534
                  :
                  :
```



"Height Adjustment"

Outline:

Perform this adjustment when:

- The disc case assembly has been replaced.
- The carrier assembly has been replaced.
- "Grip Err." and "Return Err." occur frequently.
- "Grip Retry" and "Return Retry" occur frequently.

Tools:

Part. No Description

J-2501-118-A CDL1100 Height adjusting tool

Preparation:

- Remove the top panel, and left and right side panels. Do not remove the wire connected to the front panel.
- Check that the disc is not protruding out of the disc case.
- Check that the disc is not positioned over both the disc case and carrier. If it is, refer to troubleshooting and remove the disc.
- Remove the discs from slots 96, 80 and 56.

Procedure:

1. Set the **MODE SELECT** knob on the PANEL board to "2" and turn ON the power.
2. The offset value set will be displayed.
3. Press the **ENTER** button on the SERVICE board, and execute reset position detection.
4. The display panel shows "[CA?100]CS=1200".
5. Press the **100**, **10**, **1** buttons and input the absolute address 200 (96th SLOT position). Set the display panel to [DA=200]CS=1200, press the **ENTER** button, and move the carrier.
6. The display panel shows "[CA?200]CS=2400".
7. Press the **CLIPOUT** button, and move the clip to the release position (near the rear panel).
8. Set the tool on the carrier. Make sure that the tool does not tilt or adjustments will not be accurate.
9. Slide the tool to the edge of the carrier assembly of the disc case side. As the limiter (disc) will come in the way, pull the tool with your hand and let it pass through.
10. Press the **DISP** button on the SERVICE board. The display panel will display "CA?200[CS=2400]".
11. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the right side of the carrier assembly. Check if the tool gets caught at the rib on the right side of the disc case.
12. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the left side of the carrier assembly. Check if the tool gets caught at the rib on the left side of the disc case.
13. Perform procedure 11 and 12. If the tool gets caught at both sides, press the **ELVUP** button on the SERVICE board once to raise the carrier by one step, and repeat from procedure 11. If the tool is able to slide without getting caught at either side, press the **ELVDWN** button on the SERVICE board to lower the carrier by one step.
14. When the **ENTER** button on the SERVICE board is pressed, "Offset=A step" will be shown on the display panel. Note down the A value.
15. Press the **ENTER** button on the SERVICE board and execute reset position detection.
16. The display panel will show "[CA?100]CS=1200".
17. Press the **100**, **10**, **1** buttons and input the absolute address 184 (80th SLOT position). Set the display panel to [DA=184]CS=1200, press the **ENTER** button, and move the carrier.
18. The display panel shows "[CA?184]CS=2208".
19. Press the **DISP** button on the SERVICE board. The display panel will show "CA?184[CS=2208]".
20. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the right side of the carrier assembly. Check if the tool gets caught at the rib on the right side of the disc case.
21. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the left side of the carrier assembly. Check if the tool gets caught at the rib on the left side of the disc case.

22. Perform procedure 20 and 21. If the tool gets caught at both sides, press the **[ELVUP]** button on the SERVICE board once to raise the carrier by one step, and repeat from procedure 20. If the tool is able to slide without getting caught at either side, press the **[ELVDWN]** button on the SERVICE board carrier by one step.
23. When the **[ENTER]** button on the SERVICE board is pressed, "Offset=B step" will be shown on the display panel. Note down the B value.
24. Press the **[ENTER]** button on the SERVICE board and execute reset position detection.
25. The display panel will show "[CA?100]CS=1200".
26. Press the **[100]** , **[10]** , **[1]** button and input the absolute address 160 (56th SLOT position) .
Set the display panel to [DA=160]CS=1200, press the **[ENTER]** button, and move the carrier.
27. The display panel shows "[CA?160]CS=1920".
28. Press the **[DISP]** button on the SEARVICE board.
The display panel will show "CA?160[CS=1920]".
29. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the right side of the carrier assembly.
Check if the tool gets caught at the rib on the right side of the disc case.
30. Press the tool vertically from the top very lightly, and slide the tool to and fro along the groove on the left side of the carrier assembly .
Check if the tool gets caught at the rib on the left side of the disc case.
31. Perform procedure 29 and 30. If the tool gets caught at both sides, press the **[ELVUP]** button on the SERVICE board once to raise the carrier by one step, and repeat from procedure 29. If the tool is able to slide without getting caught at either side, press the **[ELVDWN]** button on the SERVICE board to lower the carrier by one step.
32. When the **[ENTER]** button on thr SERVICE board is pressed, "Offset=C step" will be shown on the display panel. Note down the C value.
33. Calculate $\text{Max}(A, B, C) - \text{Min}(A, B, C) = \text{the difference}$, and the offset value E is obtaines as the following.
Case1 $\text{Max}(A, B, C) - \text{Min}(A, B, C) = 0$
D(difference)=0 (Max=Min) Then judgment is OK
take the offset value E $E = A = B = C$
Case2 $\text{Max}(A, B, C) - \text{Min}(A, B, C) = 1$
D(difference)=1 (Min=Max-1) Then judgment is OK
take the offset value E $E = \text{Min}(A, B, C)$
Case3 $\text{Max}(A, B, C) - \text{Min}(A, B, C) = 2$
D(difference)=2 (Min=Max-2) Then judgment is OK
take the offset value E $E = \text{Mid}(A, B, C)$
Case4 $\text{Max}(A, B, C) - \text{Min}(A, B, C) \geq 3$
D(difference)=3 (Min=Max-2) Then judgment is NG
Perform procedure 3 and 33.
34. Press the **[ENTER]** button on the SERVICE board, and execute reset position detection.
35. The display panel show "[CA?100]CS=1200".
36. Press the **[DISP]** button on the SERVICE board.
The display panel will show "CA?100[CS=1200]".

37. If the offset value E obtained at procedure 33 is "+", press the **[ELVUP]** button the number of times corresponding to the offset value. If "-", press the **[ELVDWN]** button in the same way.
Offset value CS=@@@@

.	.
.	.
+2	1202
+1	1201
+0	1200
-1	1199
-2	1198
.	.
.	.

38. The display panel shows "Offset=E step". Check that it is the same as the E value obtained at procedure 33.

NOTE:

- Set the longer side of the tool towards the disc case. (Fig. 1)

Face the longer side towards the disc case.

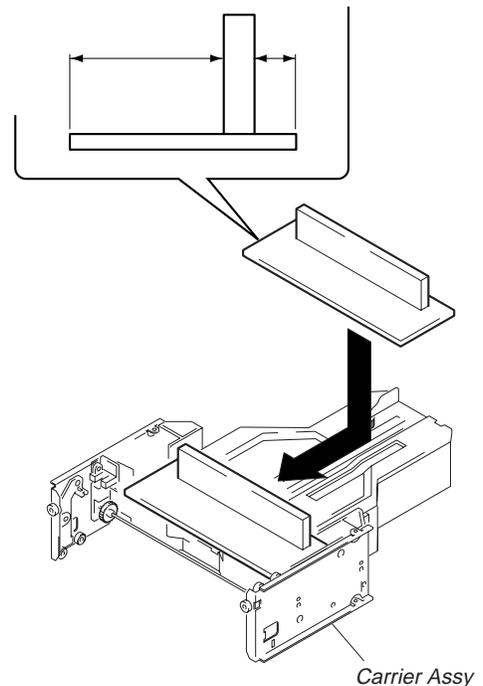


Fig. 1

- Tilt the tool slightly as shown in Fig. 2 to make it easier for it to be inserted. As it will be caught by the limiter (disc), pull it with your hand and mount it.

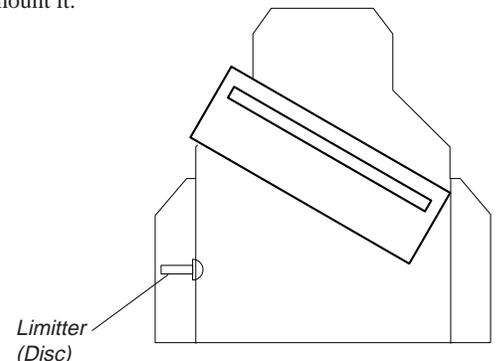


Fig. 2

- When moving the carrier by address or detecting the reset position, remove the tool and then execute it to prevent unintentional accidents.
- Adjustments cannot be carried out accurately if the tool is tilted during adjustments.
(Make sure that the tool moves horizontally as shown in Fig. 3.)

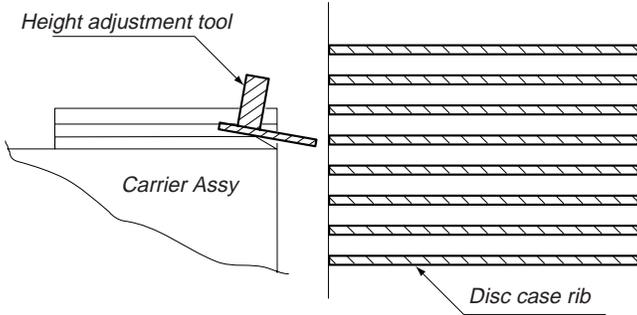
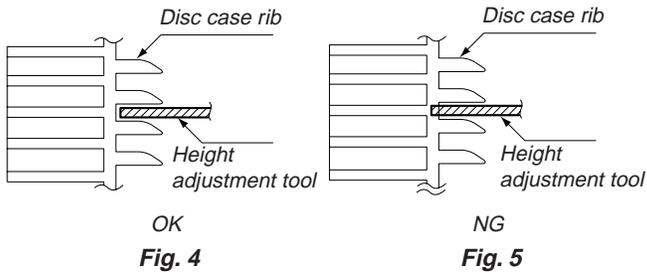


Fig. 3

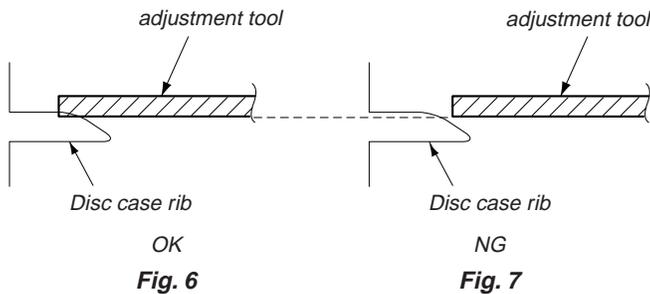
- Normally, the tool will not get caught by the vertical portion of the rib of the disc case. (Fig. 4)
However, if the unit is in a poor condition, it may sometimes get caught. (Fig. 5)
In this state, as height adjustment cannot be carried out properly. To prevent the tool from being caught by the vertical position, move the tool slightly and adjust.



OK
Fig. 4

NG
Fig. 5

- When the tool is moved to the left or right and in a wrong position (Fig. 6), it may appear to have become free (Fig. 7).
Move the tool while checking if tool touches the part on which the disc slides (Fig. 8).



OK
Fig. 6

NG
Fig. 7

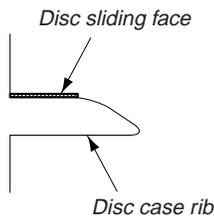


Fig. 8

- If the tool does not get caught by the rib at both the left and right sides immediately after the carrier is moved to the adjustment address (56, 80, 90) in procedure 11, 12 or 20, 21, 29, 30 the offset value may become a negative value. In this case, press the **ELVDWN** button 3 or 4 times, lower the carrier by several procedure, and perform procedure 11 and 12 or 20 and 21 or 29 and 30.

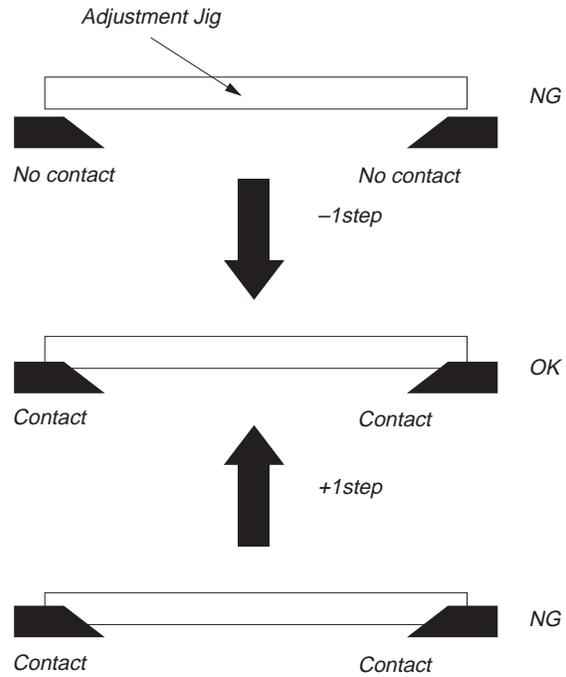


Fig. 9

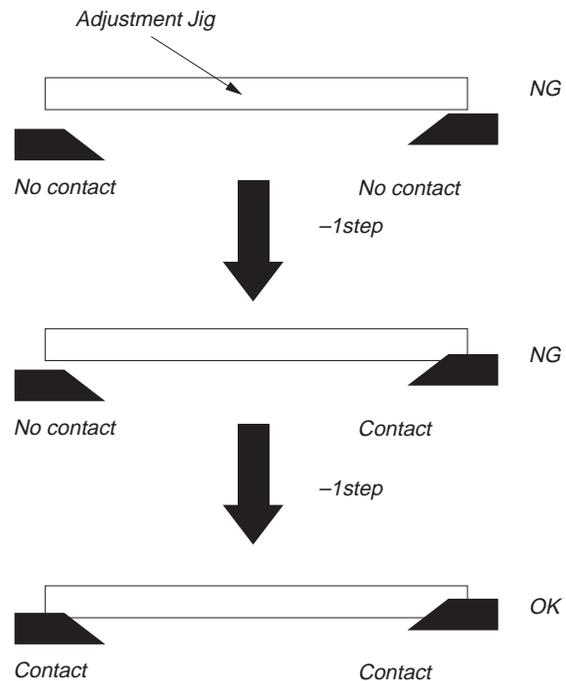


Fig. 10