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4. Removing Storage System

4.1 Before Starting the Removal Work

NOTICE:	During the removal work, the part statuses in the "Web Console", "Maintenance Utility", and "Maintenance" windows might be displayed differently from the actual statuses. (Example: The Drives during the removal are displayed as the [Blocked] status.) In that case, complete the running maintenance operation, and then refresh the display information in each window.

If you make a mistake in the operation of the removal work, user data in the Storage System may be lost. Therefore, perform the followings before starting the removal work to prepare against an unexpected accident.

1. Back up user data.
   Back up user data in the Storage System by the operation on the host computer side.
2. The removal operation varies depending on the component and the location where the component is installed. Besides, remove an optional component after making sure whether the work must be done with the Storage System power on or off.
   - A removal with the Storage System power turned on :
     A status in which the Storage System power is turned on regardless of whether the system (host computer) is turned on or off.
   - A removal with the Storage System power turned off :
     A status in which the Storage System power is turned on regardless of whether the system (host computer) is turned on or off.
3. When removing the optional component, it is required to change the settings of the Storage System using a Maintenance PC connected via a LAN. Make the following preparations before starting to remove the optional component.
   - Prepare a PC in which Web Console is installed. The PC must be used in the LAN environment.
   - Ask the customer whether the Storage System is operable via a LAN. If not, obtain customer's permission to operate the Storage System via a LAN.
4. Promote mutual understanding with the user about the possibility of a system down in order to minimize damage caused by failures.

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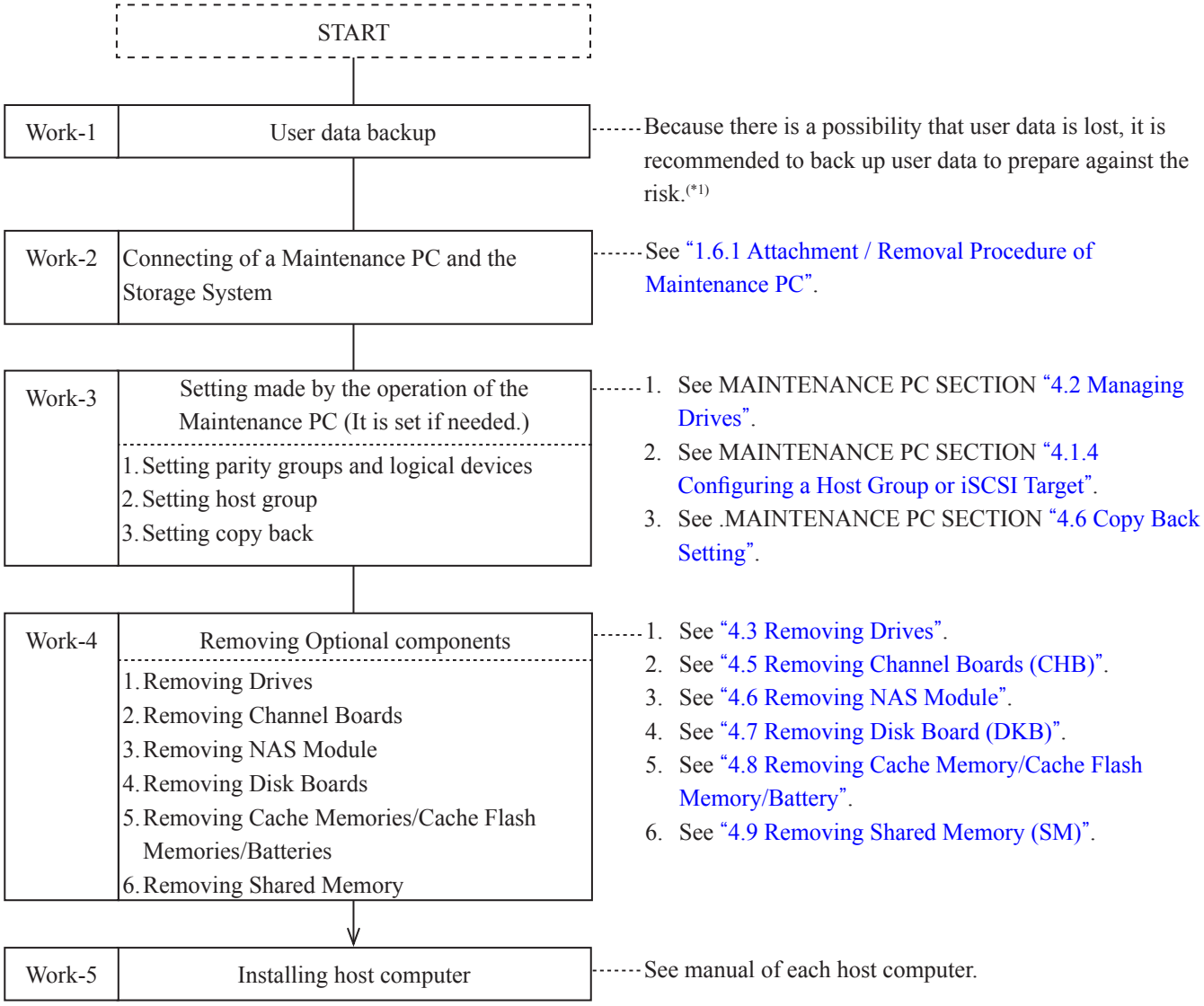
5. Be sure to install a dummy (Controller Board) and a dummy (Drive) in a free slot because dummy (Controller Board) and dummy (Drive) are required for adjusting the cooling air flow.
   When removing the optional component with the power on, the operation replacing Drive with dummy (Drive) has to be finished within 10 minutes.
6. Do not remove the parts while the Storage System is being started.
   When the Storage System is being started, remove the parts after the Storage System becomes the Ready status.
7. Do not work behind DB60 for a long time.

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4.2 Procedures for the Removal Work

1. Procedure for the online removal work

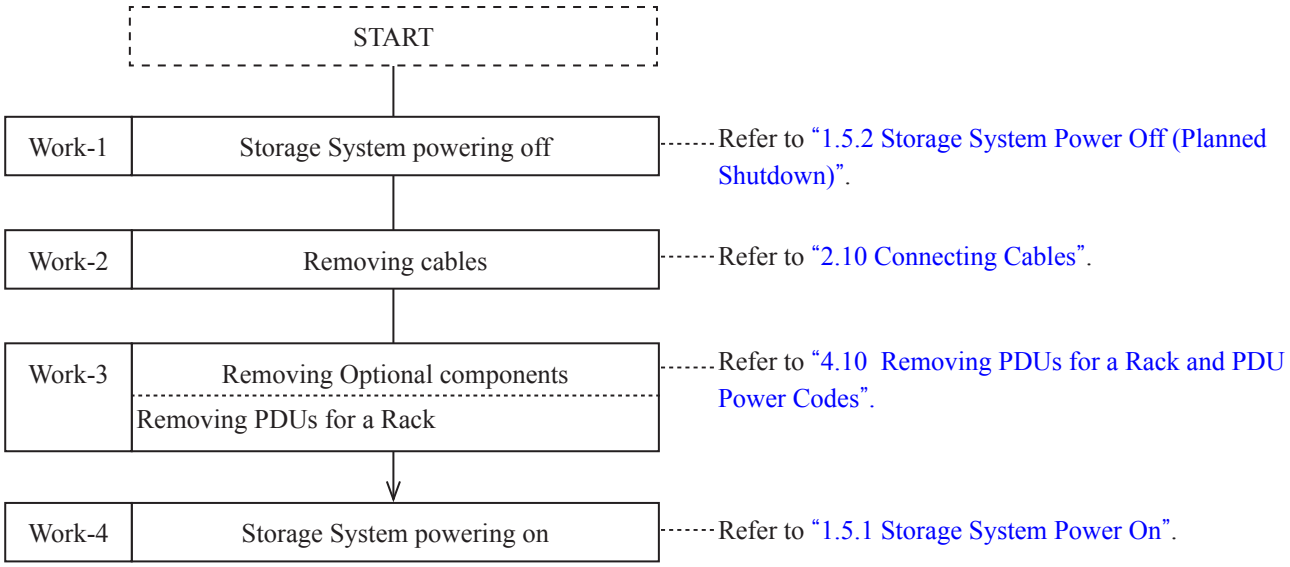
NOTE : For safety use, always close the Front Bezel after the operation.



*1 : Service personnel must check if a customer has backed up user data. If the customer does not perform the backup, start the work after getting customer's permission.

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2. Procedure for the offline removal work (with the Storage System power turned off)



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4.3 Removing Drives

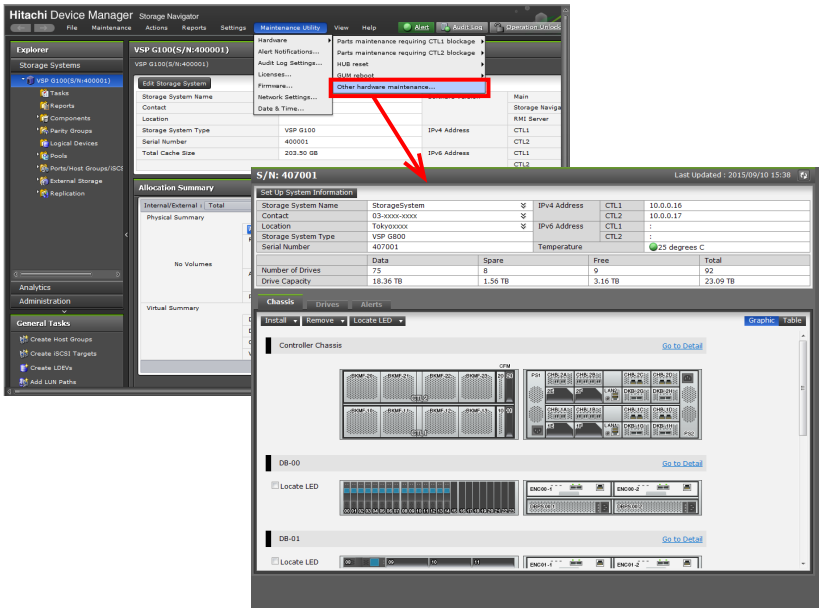
NOTE : • When removing the Drives included in the parity group, it is necessary to delete the parity group in advance. Refer to MAINTENANCE PC SECTION "4.2.2.3 Deleting Parity Group".
• When removing the Drives allocated to the Spare Drive, it is necessary to delete the Spare Drive in advance. Refer to MAINTENANCE PC SECTION "4.2.1.3 Allocating/Deleting Spare Drives".

4.3.1 Before Removing Drives

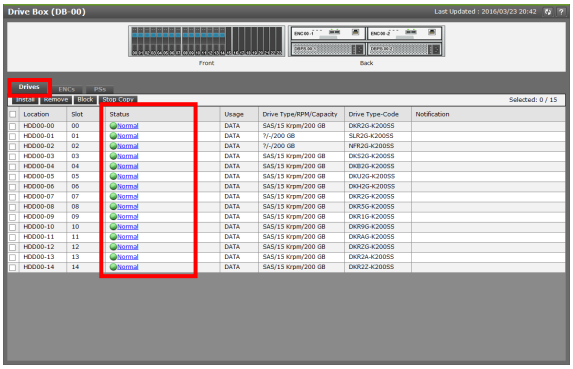
NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Drives, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

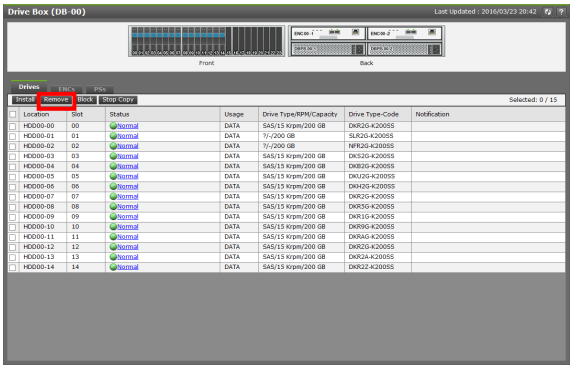


3. <Controller Chassis Window/Drive Box Window>
   Click the [Drives] tab in the “Controller Chassis” window or “Drive Box” window and display the Drive status.



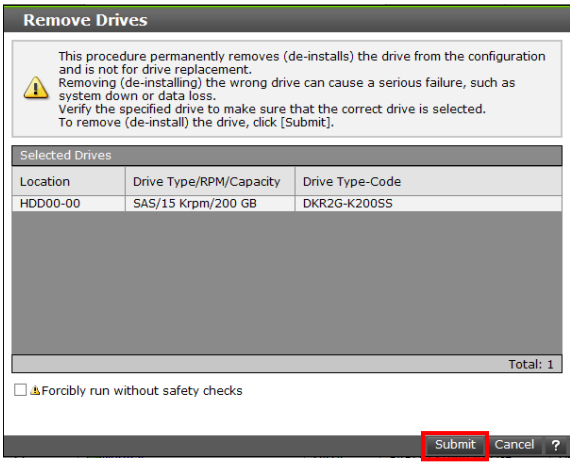
NOTE: The [Slot] is displayed in the “Maintenance Utility” window for the firmware version 83-03-21-x0/xx or more.

4. <Removal Drive Selection Window>
   Check the Drives to be removed and click the [Remove] button.



NOTE: The [Slot] is displayed in the “Maintenance Utility” window for the firmware version 83-03-21-x0/xx or more.

5. <Removal Execution Window>
   Check the Drives to be removed and click the [Submit] button.



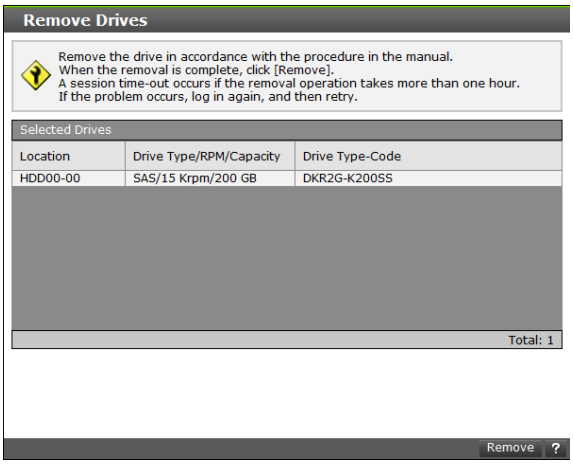
6. <Displaying the Password entry window>

> **CAUTION**
>
> This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

   Enter the password and click the [OK] button.

7. <Removal Work Start Message>
   Check that the following message is displayed.
   If a message other than the following is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.

   NOTE : Do not click the [Remove] button at this time.
   Click the [Remove] button after completing the removal work.



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8. Remove the Front Bezel. (See "1.4.1 How to Attach/Remove the Front Bezel".)
   In case of DB60 Pull out from the rack and remove the top cover. (See "1.4.1.3 In Case of DB60".)

9. Checking the Drives

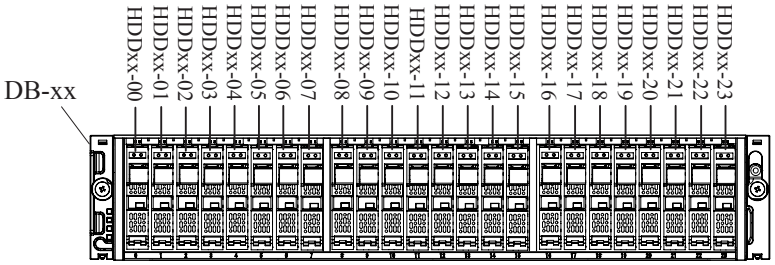
Table 4-1 List of Removal Drive Model Names

No.	Location	Model Number	Model Name	Remarks
1	CBSS/DBS	DKC-F810I-600JCM(*1) DKC-F810I-600JCMC DKC-F810I-600KGM DKC-F810I-1R2JCM(*1) DKC-F810I-1R2JCMC DKC-F810I-300KCM(*1) DKC-F810I-300KCMC DKC-F810I-200MEM DKC-F810I-400MEM DKC-F810I-480MGM DKC-F810I-960MGM DKC-F810I-1R9MEM DKC-F810I-1R9MGM DKC-F810I-3R8MGM DKC-F810I-1R8JGM	Disk Drive	–
2	CBSL/DBL	DKC-F810I-1R2J5M(*1) DKC-F810I-1R2J5MC DKC-F810I-4R0H3M(*1) DKC-F810I-4R0H3MC DKC-F810I-6R0H9M DKC-F810I-10RH9M DKC-F810I-400M6M DKC-F810I-1R8J6M	Disk Drive	–
3	DB60	DKC-F810I-1R2J7M(*1) DKC-F810I-1R2J7MC DKC-F810I-4R0H4M(*1) DKC-F810I-4R0H4MC DKC-F810I-6R0HLM DKC-F810I-10RHLM DKC-F810I-400M8M DKC-F810I-1R8J8M	Disk Drive	–
4	DBF	DKC-F710I-1R6FM DKC-F810I-1R6FN DKC-F710I-3R2FM DKC-F810I-3R2FN DKC-F810I-6R4FN DKC-F810I-7R0FP DKC-F810I-14RFP	Flash Module Drive	–

*1 : Contains BNST

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Figure 4-1 Drive Mounting Location (CBSS/DBS)



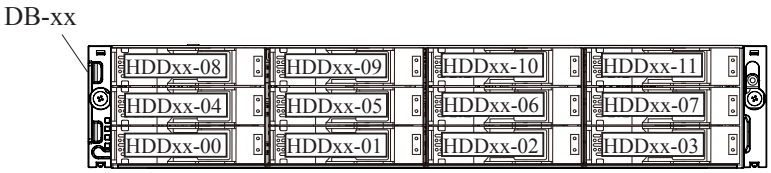
Front view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.

*2 : DB-xx

└→ DB No. (00, 01, 02, ..., 47)

Figure 4-2 Drive Mounting Location (CBSL/DBL)



Front view

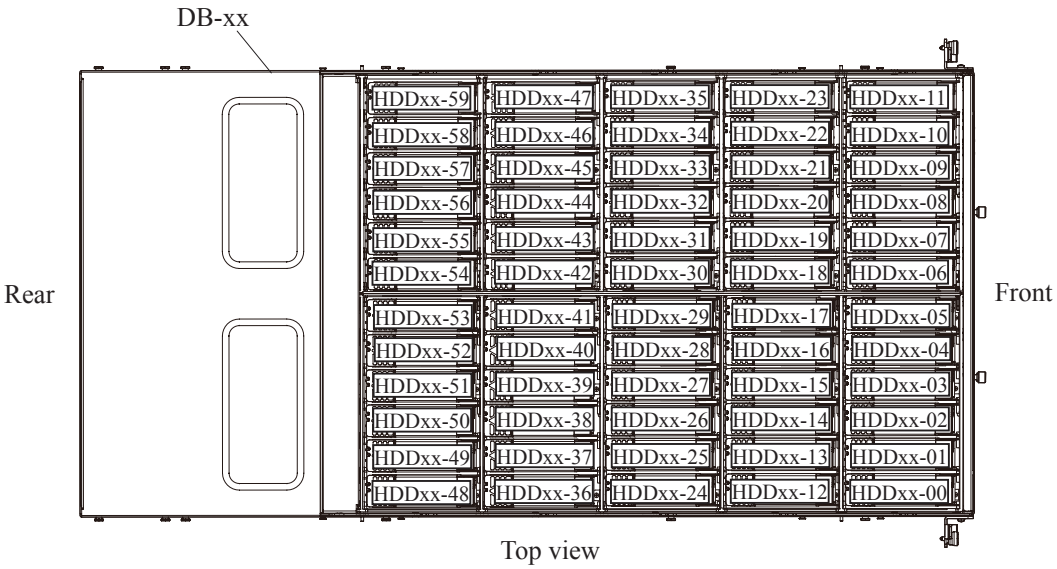
*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.

*2 : DB-xx

└→ DB No. (00, 01, 02, ..., 47)

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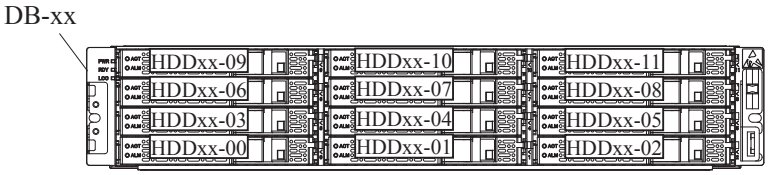
Figure 4-3 Drive Mounting Location (DB60)



Top view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.
*2 : DB-xx
└> DB No. (00, 01, 02, ..., 23)

Figure 4-4 Drive Mounting Location (DBF)



Front view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.
*2 : DB-xx
└> DB No. (00, 01, 02, ..., 47)

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "1.1.2 Note when Installing and Removing Parts".

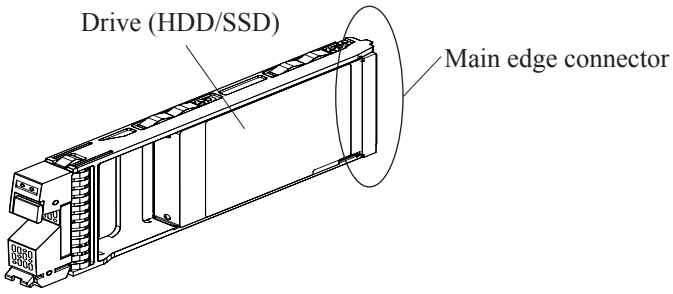
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4.3.2 Removing Work Drives

NOTICE: Check that the main edge connector of the Drive (HDD/SSD) has no deformation, damage or sticking of dust before installing the Drive.

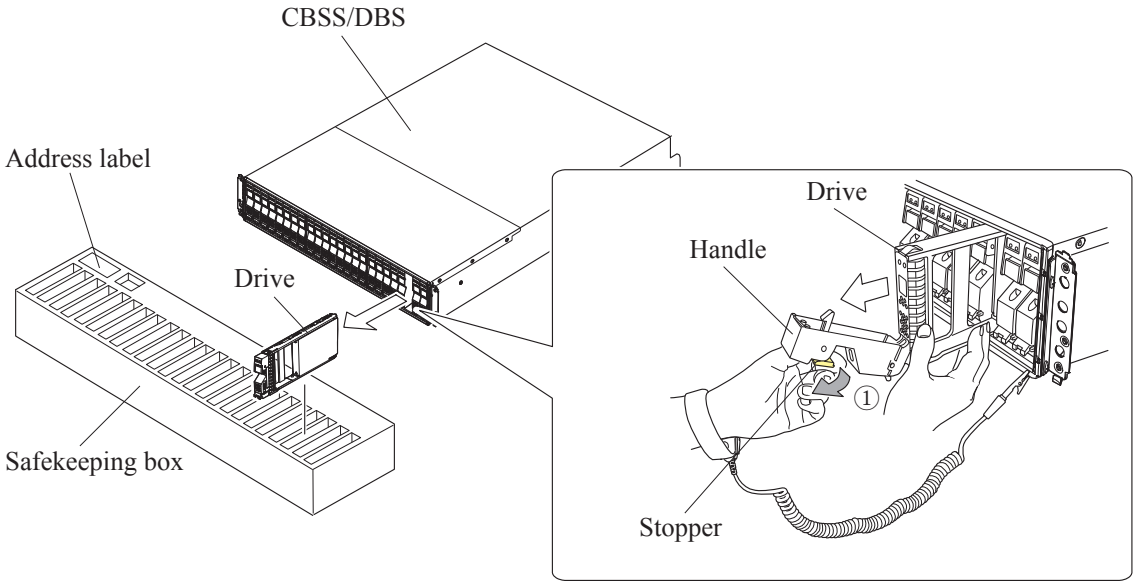


1. Removing Drives for CBSS/DBS
   (1) Detaching the Drive

NOTICE: Since the HDD is a precision component, handle it very carefully not to apply a vibration or shock to it.

(a) Pull the stopper of the handle toward you to unlock (①), open the handle, and then remove the Drive by pulling it out taking care not to apply a shock to it.
When using the removed Drive for the purpose of addition to another Storage System, keep it in custody with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

Figure 4-5 Removing the Drive (CBSS/DBS)



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(2) Installing dummy (Drive)

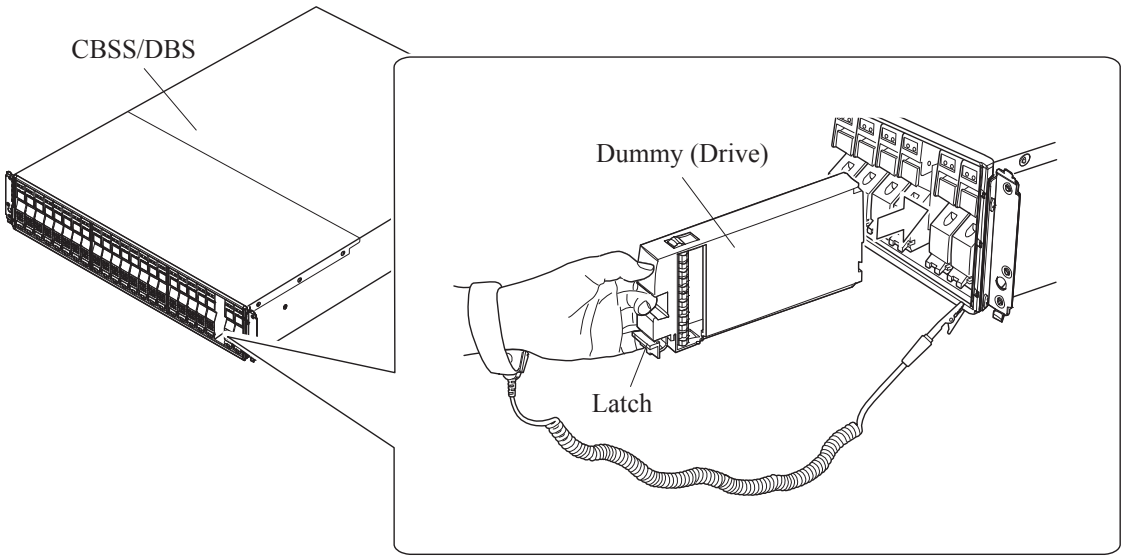
NOTICE: Do not subject the drive to strong vibrations or shocks during handling due to the precision part.

(a) Install the dummy (Drive) in the slot from which the Drive has been removed.

NOTE : Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.

(b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the lower side.

Figure 4-6 Installing the Dummy (Drive) (CBSS/DBS)



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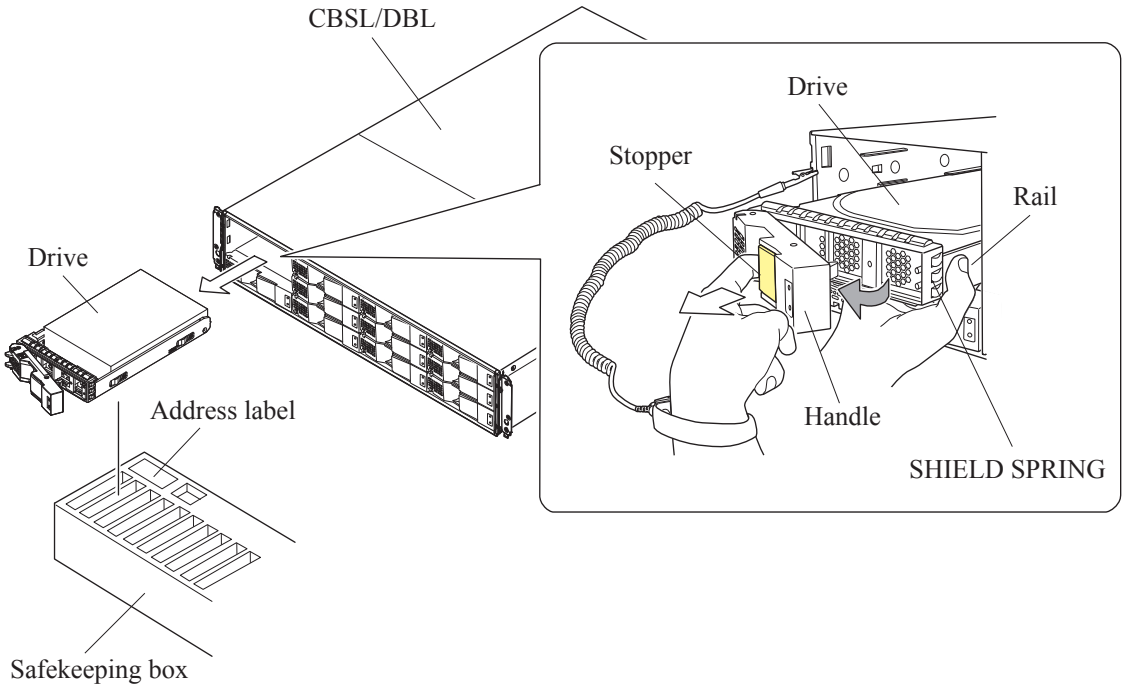
2. Removing Drives for CBSL/DBL
   (1) Detaching the Drive

NOTICE: Since the HDD is a precision component, handle it very carefully not to apply a vibration or shock to it.

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(a) Pull the stopper of the handle toward you to have the lock off, and then remove the Drive by pulling it out taking care not to apply a shock to it.
When using the removed Drive for the purpose of addition to another Strage System, keep it in custody with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

Figure 4-7 Removing the Drive (CBSL/DBL)



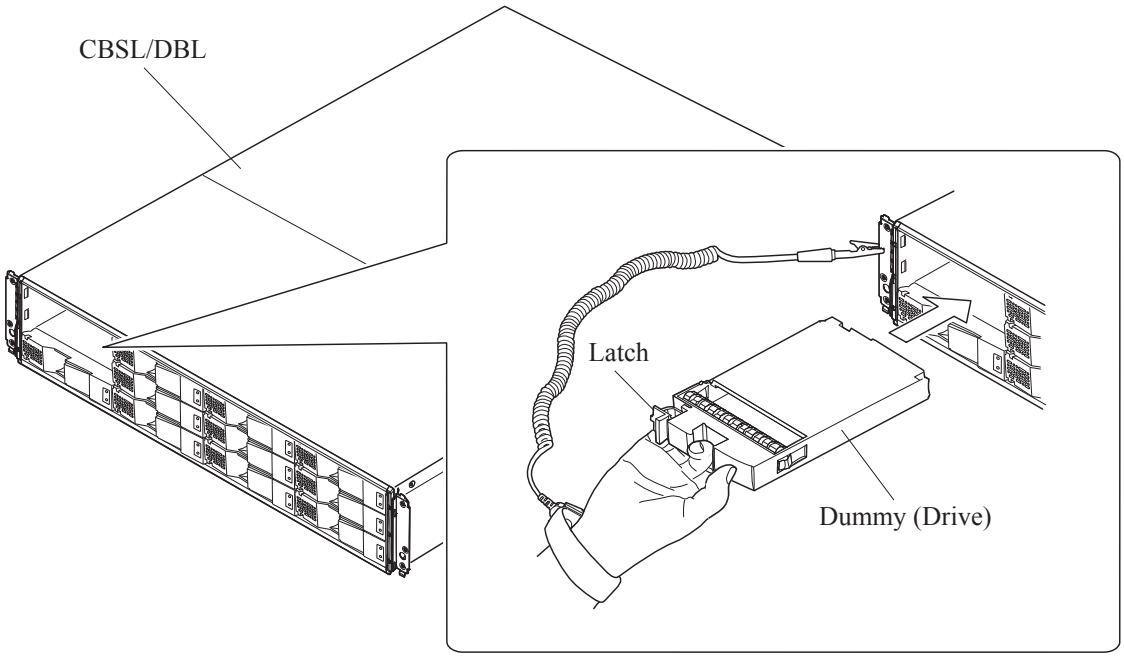
(2) Installing dummy (Drive)

(a) Install the dummy (Drive) in the slot from which the Drive has been removed.

NOTE : Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.

(b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the left side.

Figure 4-8 Installing the Dummy (Drive) (CBSL)



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3. Removing Drives for DB60

⚠ CAUTION

- Be careful of the workers on the other side when pulling out or storing the DB60.
- Do not pull out multiple DB60s at a time because the rack may fall over.
- Do not put objects on the DB60 which has been pulled out of the rack or use it as working space because the rack may fall over.

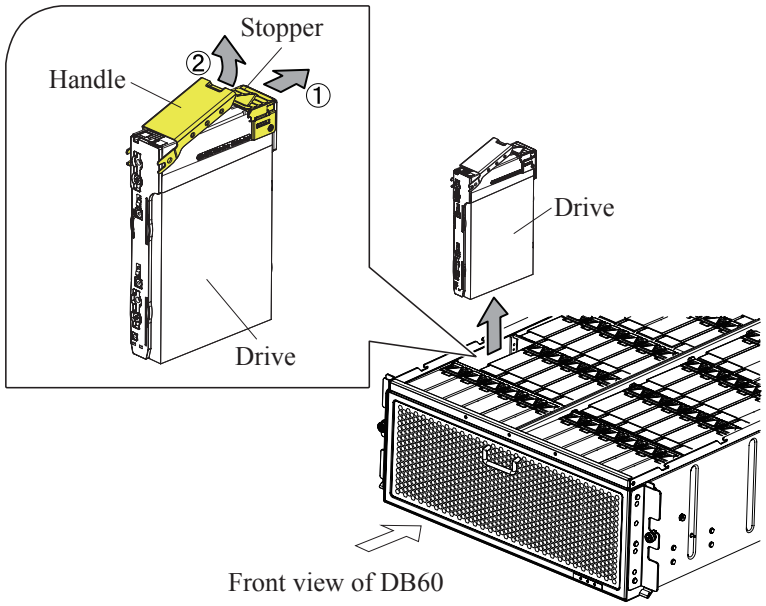
(1) Pull the DB60 out of the rack, and remove the top cover. (Refer to "1.4.1.3 In Case of DB60".)

(2) Detaching the Drive

NOTICE: Since the HDD is a precision component, handle it very carefully not to apply a vibration or shock to it.

(a) Slide the latch (blue) on the Drive and open the handle, and then pull out and remove the Drive taking care not to apply a shock to it.
(b) Temporarily store the removed Drive with its handle returned to the original status.

Figure 4-9 Removing the Drive (DB60)



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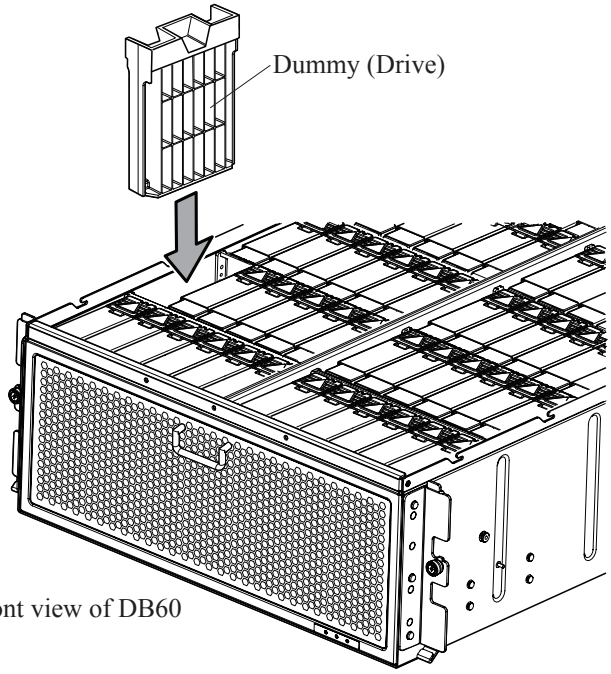
(3) Installing dummy (Drive)

(a) Install the dummy (Drive) in the slot from which the Drive has been removed.

NOTE : Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.

(b) Insert a dummy (Drive) slowly into the slot where the Drive was removed.

Figure 4-10 Installing the Dummy (Drive) (DB60)



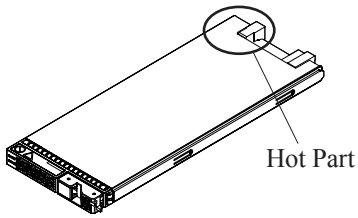
(4) Return the DB60 into the rack after attaching its cover. (Refer to "1.4.1.3 In Case of DB60".)

4. Removing Drives for DBF
   (1) Detaching the Drive

NOTICE: Be sure to read "1.1.9 Notes when Handling the Flash Module Drive (FMD)" before handling the FMD and perform the procedure following the notes.

⚠ CAUTION

Be careful of a hot part:
A Flash Module Drive that has been just removed from the system in operation has a hot part on its top surface. Be careful not to touch the hot part.

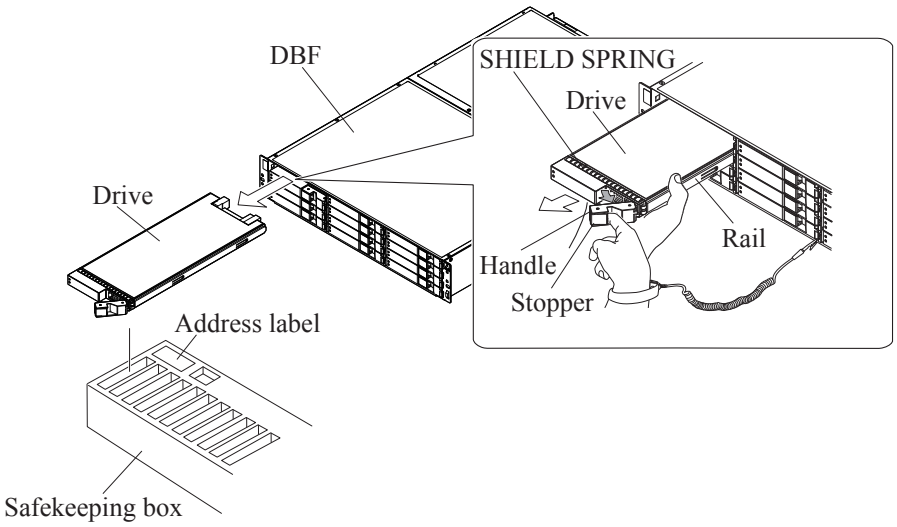


NOTICE: Since the HDD is a precision component, handle it very carefully not to apply a vibration or shock to it.

NOTE : When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

(a) Pull the stopper of the handle toward you to unlock, open the handle, and then remove the Drive by pulling it out taking care not to apply a shock to it.
When using the removed Drive for the purpose of addition to another Storage System, keep it with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

Figure 4-11 Removing the Drive (DBF)



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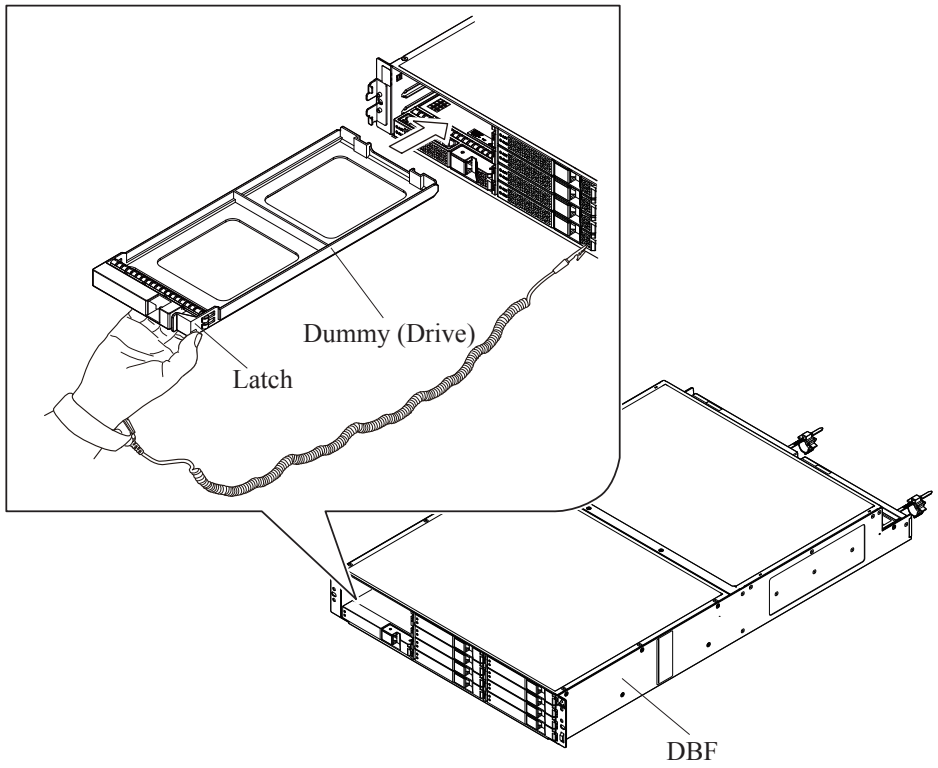
(2) Installing dummy (Drive).

(a) Install the dummy (Drive) in the slot from which the Drive has been removed.

NOTE : Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.

(b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the left side.

Figure 4-12 Installing the Dummy (Drive) (DBF)

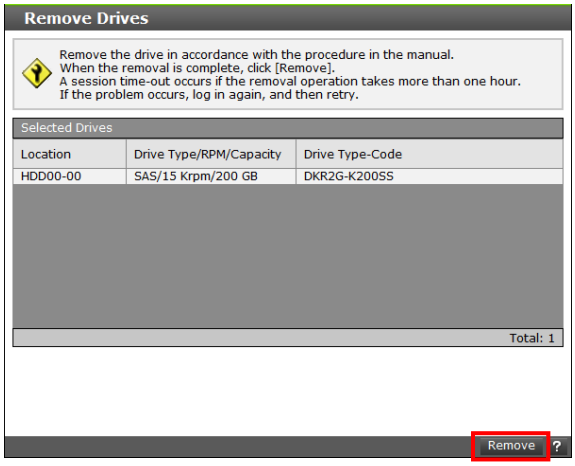


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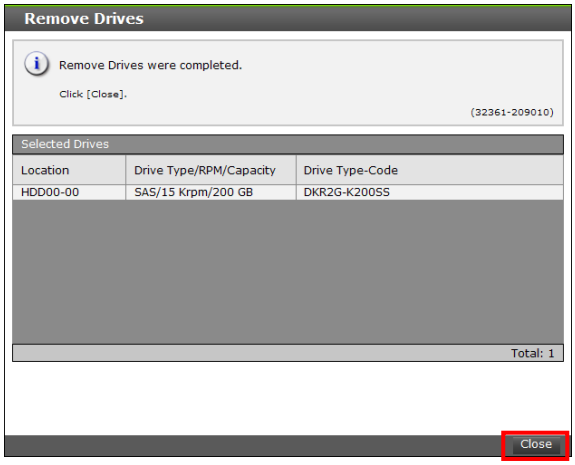
4.3.3 Checking the Drive Removal by Maintenance Utility

1. <Drive Removal Preparation Completion Window>
   Click the [Remove] button.

   NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
   If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



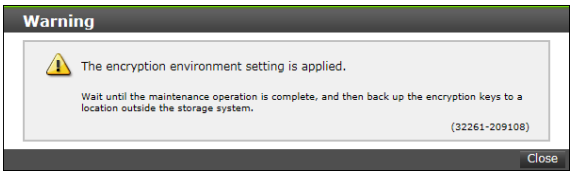
2. <Drive Removal Completion Window>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



   When the Drive removal fails, click the [Close] button of the completion message. After that, click the [Drives] tab in the “Controller Chassis” window or “Drive Box” window and check the Drive status.

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3. <Check back up the encryption key Messages>
   When the encryption environment is applied, the following message is displayed.
   Check the message and click the [Close] button.



4. Attach the Front Bezel. (See "1.4.1 How to Attach/Remove the Front Bezel".)
   In case of DB60, attach the cover and return it to the rack. (See "1.4.1.3 In Case of DB60".)

---

5. See MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

---

6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

---

7. Back up the encryption key
   When a message is displayed in Step 3, see "Primary and secondary data encryption license keys" of "Encryption License Key User Guide Hitachi Virtual Storage Platform G200, G400, G600, G800 and Hitachi Virtual Storage Platform F400, F600, F800" and back up the encryption key by Storage Navigator.

   NOTE : When a message is not displayed in Step 3, this procedure is not required.

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4.4 Removing Drive Boxes

Do this work after confirming the notices shown below.

NOTICE: Check that no Drives are installed in Drive Boxes to be installed. If Drives are installed, see "4.3 Removing Drives" and remove them.

4.4.1 Estimated Work Time

The estimated working hours for removing Drive Boxes are the total of the following A, B, C, D, and E.

Table 4-2 Estimated Working Hours for Removing Drive Boxes

	Addition type	Process	Estimated work time	Remarks
A	Chassis	Chassis removal time	DBS/DBL/DBF: 60min DB60: 120 min	
B		Firmware processing time (path)	90 sec × (The number of existing chassis + number of additional chassis)	(*1)
C	HDD	HDD removal time	1 min / 1 HDD	
D		Firmware processing time (HDD)	• In case of DBS: 30 seconds up to 16, 45 seconds up to 23, 60 seconds up to 24. • In case of DBL/DBF: 40 seconds up to 8, 60 seconds up to 11, 80 seconds up to 12. • In case of DB60: 40 seconds up to 21, 60 seconds up to 38, 80 seconds up to 51, 100 seconds up to 60.	

*1: The number of paths of each model is as shown below.
VSP G200: One path
VSP G400, G600: Two paths
VSP G800: Four paths or eight paths (when using one Disk Board option (eight paths), and the firmware processing time includes the time for replacing the firmware)

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4.4.2 Parts List

4.4.2.1 DW-F800-DBS/DBSC/DBSD

Table 4-3 Parts List of DW-F800-DBS/DBSC/DBSD

Item No.	Part Name	Part No.	Quantity	Remarks
1	SFF Drive Box	3290643-E	1	For DBS
		3290953-E		For DBSC
		3290953-G		For DBSD
2	Front Bezel	5560002-A	1	For DBS/DBSC
		5560002-B		For DBSD
3	Accessory Packing	5548213-A	1	–
4	Bracket (L)	3282470-1	1	(*1)
5	Bracket (R)	3290548-101	1	(*1)
6	Side Bezel (L)	2855177-1	1	(*1)
7	Side Bezel (R)	2855176-1	1	(*1)
8	Binding screw (M5 x 10)	SB510N	5	(*1)
9	Key	–	2	Key No. T750 (*1)
10	Packing Work (ACC)	3287022-B	1	–
11	Repeat Binder	5409042-1	2	100 mm, Color: Black (*2)
12	Binder	5532297-1	2	292 mm, Color: White (*2)
13	Binder (OMEGA LOCK)	5552817-1	4	–
14	Slide Rail	2853847-C	1	–
15	Repeat Binder	5409042-3	4	–
16	AC Power Cable	5522210-1	2	2,500 mm (*3)
17	AC Power Cable	5522210-2	2	900 mm (*3)
18	DC Power Cable	3285423-A	2	1,500 mm
19	DC Power Cable	3285422-A	2	3,000 mm

*1 : These parts are included in Accessory Packing (Item No.3).

*2 : These parts are included in Packing Work (ACC) (Item No.10).

*3 : Normally, use Item No. 18 Power Cable (900 mm). If it is too short, use Item No. 17 Power Cable (2,500 mm) .

When removing DBS, execute “4.4.3 Removing Drive Boxes (DW-F800-DBS/DBL)”.

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4.4.2.2 DW-F800-DBL/DBLC/DBLD

Table 4-4 Parts List of DW-F800-DBL/DBLC/DBLD

Item No.	Part Name	Part No.	Quantity	Remarks
1	LFF Drive Box	3290643-D	1	For DBL
		3290953-D		For DBLC
		3290953-F		For DBLD
2	Front Bezel	5560002-A	1	For DBL/DBLC
		5560002-B		For DBLD
3	Accessory Packing	5548213-A	1	–
4	Bracket (L)	3282470-1	1	(*1)
5	Bracket (R)	3290548-101	1	(*1)
6	Side Bezel (L)	2855177-1	1	(*1)
7	Side Bezel (R)	2855176-1	1	(*1)
8	Binding screw (M5 x 10)	SB510N	5	(*1)
9	Key	–	2	Key No. T750 (*1)
10	Packing Work (ACC)	3287022-B	1	–
11	Repeat Binder	5409042-1	2	100 mm, Color: Black (*2)
12	Binder	5532297-1	2	292 mm, Color: White (*2)
13	Binder (OMEGA LOCK)	5552817-1	4	–
14	Slide Rail	2853847-C	1	–
15	Repeat Binder	5409042-3	4	–
16	AC Power Cable	5522210-1	2	2,500 mm (*3)
17	AC Power Cable	5522210-2	2	900 mm (*3)
18	DC Power Cable	3285423-A	2	1,500 mm
19	DC Power Cable	3285422-A	2	3,000 mm

*1 : These parts are included in Accessory Packing (Item No.3).

*2 : These parts are included in Packing Work (ACC) (Item No.10).

*3 : Normally, use Item No. 18 Power Cable (900 mm). If it is too short, use Item No. 17 Power Cable (2,500 mm) .

When removing DBL, execute “4.4.3 Removing Drive Boxes (DW-F800-DBS/DBL)”.

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4.4.2.3 DW-F800-DB60

Table 4-5 Parts List of DW-F800-DB60

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box	3289096-A	1	–
2	DB60-Rail	3289061-A	1	Rail
3	CMA	3285498-R	1	CMA
4	Clamp Tape	3285498-R	12	–
5	Packing Work (ACC)	3287022-C	1	–
6	Repeat Binder	5409042-3	2	250mm, Color: Black (*1)
7	Binder	5532297-1	4	292mm, Color: White (*1)
8	Accessory Bracket	—	2	(*2)
9	Cage Nut	—	5	(*2)
10	Rack Nut	—	5	(*2)
11	Hex Head Flange Screw	—	5	(*2)
12	Truss Head Screw	—	5	(*2)
13	Front Bezel	3290632-A	1	–
14	Flange (L)	3290550-1	1	Plate (L)
15	Flange (R)	3290549-1	1	Plate (R)
16	Side Cover (L)	2856458-1	1	–
17	Side Cover (R)	2856459-1	1	–
18	Screw	SB306N	4	–
19	Key	3276491-1	1	–
20	SAS Cable	3290632-A	2	–

*1 : These parts are included in Packing Work (ACC) (Item No. 5).

*2 : These parts are put in one plastic bag.

When removing DB60, execute “4.4.4 Removing Drive Boxes (DW-F800-DB60)”.

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4.4.2.4 DW-F800-DBF

Table 4-6 Parts List of DW-F800-DBF

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box (DBF)	2854522-B	1	–
2	Front Bezel	3286660-A	1	–
3	Packing (BZL H8-PARTS)	3286648-A	1	–
4	Side cover	3286646-001	1	(*1)
5	Plate	5550593-001	1	(*1)
6	Key	–	2	Key No. T750 (*1)
7	Packing Work (ACC)	3290780-A	1	–
8	Binder (omega lock)	5552817-001	4	(*2)
9	Binder	5532297-001	2	292 mm, Color: White (*2)
10	Repeat Binder	5409042-001	2	100 mm, Color: Black (*2)
11	Slide rail (DBF)	2854551-A	1 set	A pair of right and left
12	Repeat Binder	5409042-003	4	250 mm black (*1)
13	Screw (M4 FLAT)	5550657-001	6	(*3)
14	Power cable	5522210-001	2	2,500 mm (*4)
15	Power cable	5522210-002	2	900 mm (*4)
16	Screw	3261898-512	6	(*5)

*1 : These parts are included in Accessory Packing (Item No.3).

*2 : These parts are included in Packing Work (ACC) (Item No.7).

*3 : These parts are included in Slide rail (DBF) (Item No.11).

*4 : Normally, use Item No. 15 Power Cable (900 mm). If it is too short, use Item No. 14 Power Cable (2,500 mm).

*5 : These parts are supplied separately as two in Item No. 3 Packing (BZL H8-PARTS) and four in Item No. 11 Slide Rail (DBF).

When removing DBF, execute “4.4.5 Removing Flash Module Drive Boxes (DW-F800-DBF)”.

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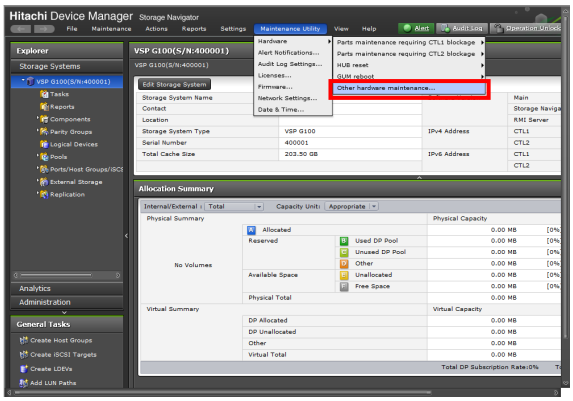
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4.4.3 Removing Drive Boxes (DW-F800-DBS/DBL)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

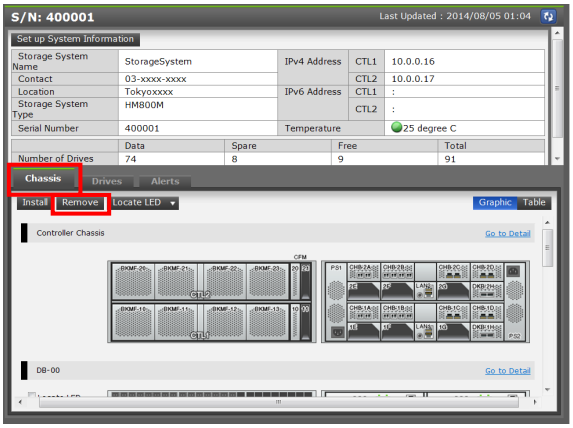
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



3. Instructing to start removal by Maintenance Utility

   NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

   (1) <Main Window>
   Click the [Chassis] tab in the main window, and click the [Remove] button. For CBLH, click the [Remove] button and select [Drive Box].

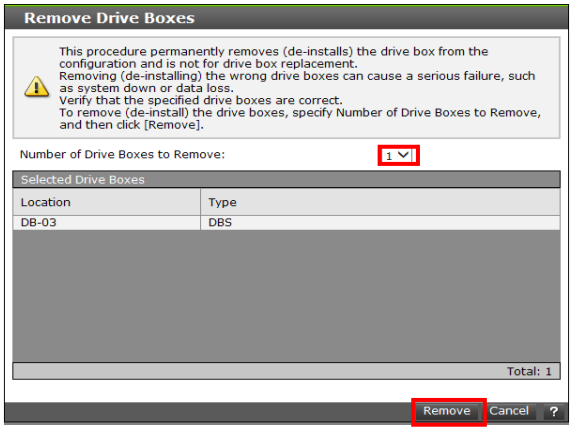


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(2) <Specify Removal Drive Boxes>

Select the number of Drive Boxes to be removed and click the [Remove] button.
When the Controller Chassis is a CBLH, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(3) <Displaying the Password entry window>

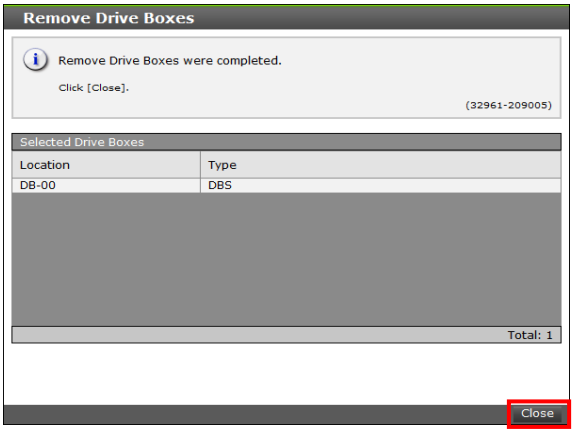
CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(4) <Removal Work Start Message>

Check that the following message is displayed and click the [Close] button.
If a message other than the following is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.

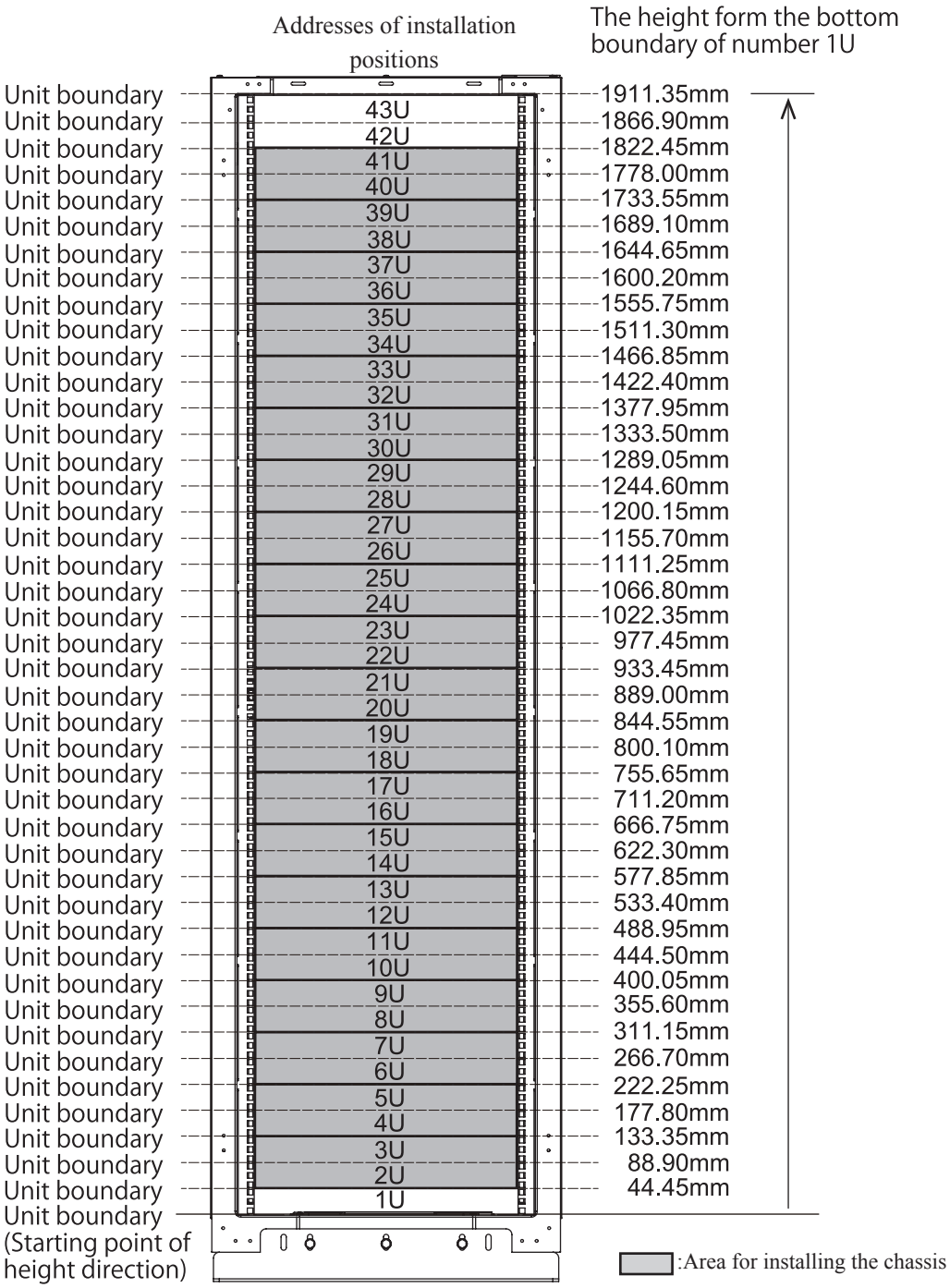


When the Drive Box removal fails, click the [Close] button of the completion message. After that, click the [Drive Box] tab and check the Drive Box status.

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4. Confirming of removal positions
   The following figure shows an example of installing Drive Boxes.
   The mounting locations of the Drive Boxes are different according to the configuration.

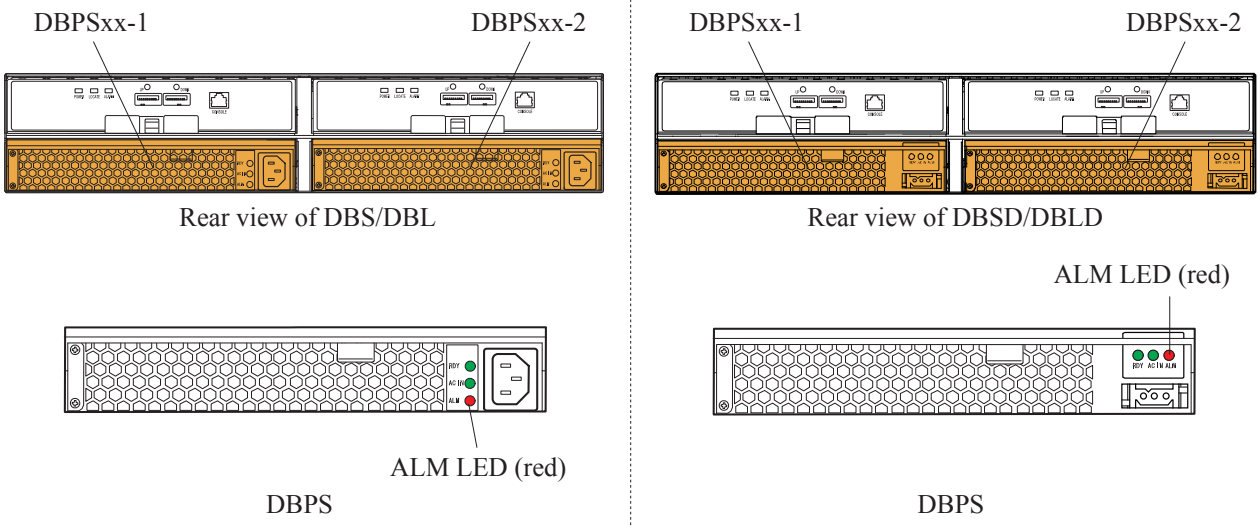
Figure 4-13 Mounting Position of Drive Box



5. Removing the Front Bezel
   Remove the Front Bezel. (Refer to "1.4.1 How to Attach/Remove the Front Bezel".)

6. Checking the Drive Box LEDs
   Check that the ALM LED (red) on the DBPS installed in the Drive Box to be removed lights up.

Figure 4-14 ALM LED on DBPS



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7. Removing the Power Cables

The procedure is different between the AC Power Models (DBS/DBL) and the DC Power Models (DBSD/DBLD).

- When removing AC power cables: “(1) AC power supply model (DBS/DBL)”
- When removing DC power cables: “(2) DC power supply model (DBSD/DBLD)”

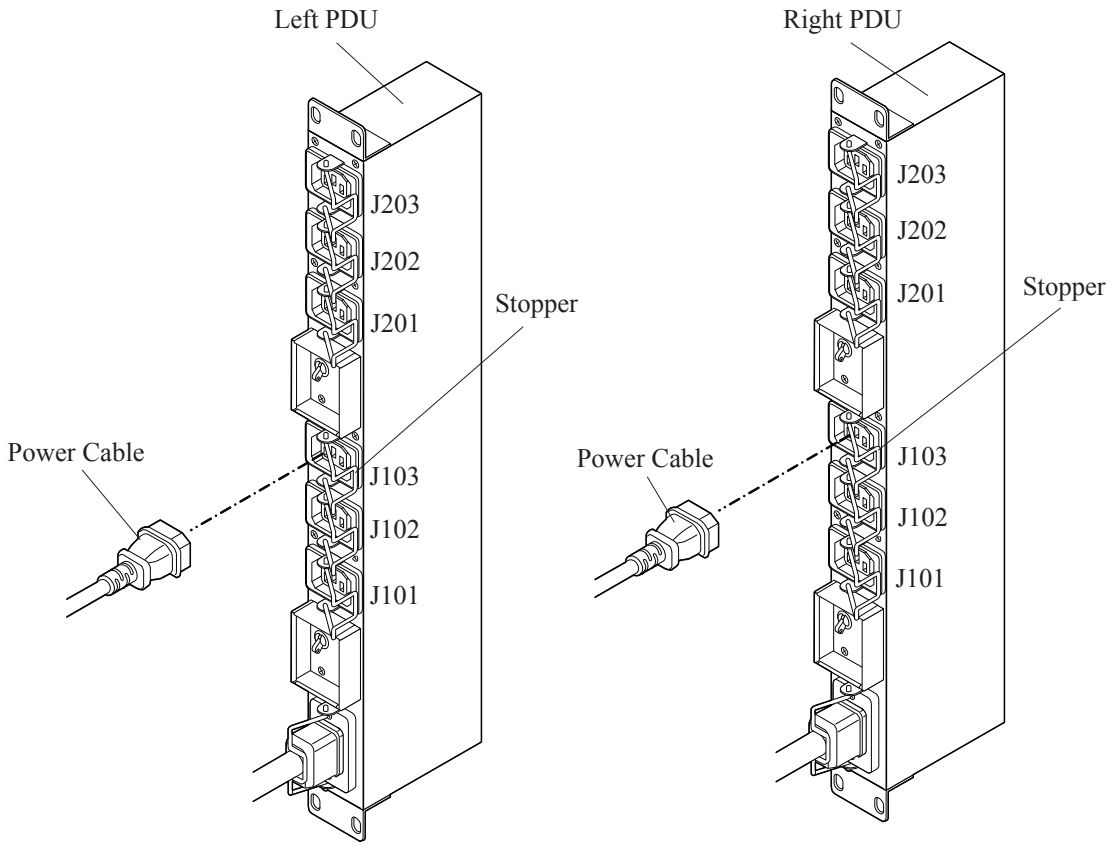
(1) AC power supply model (DBS/DBL)

(a) Check the connection of the power cables.
Figure 4-16 shows a connection example of power cables in the configuration that only DBS/DBL are installed in the same rack.

(b) Open the stopper and remove two power cables from the PDU.

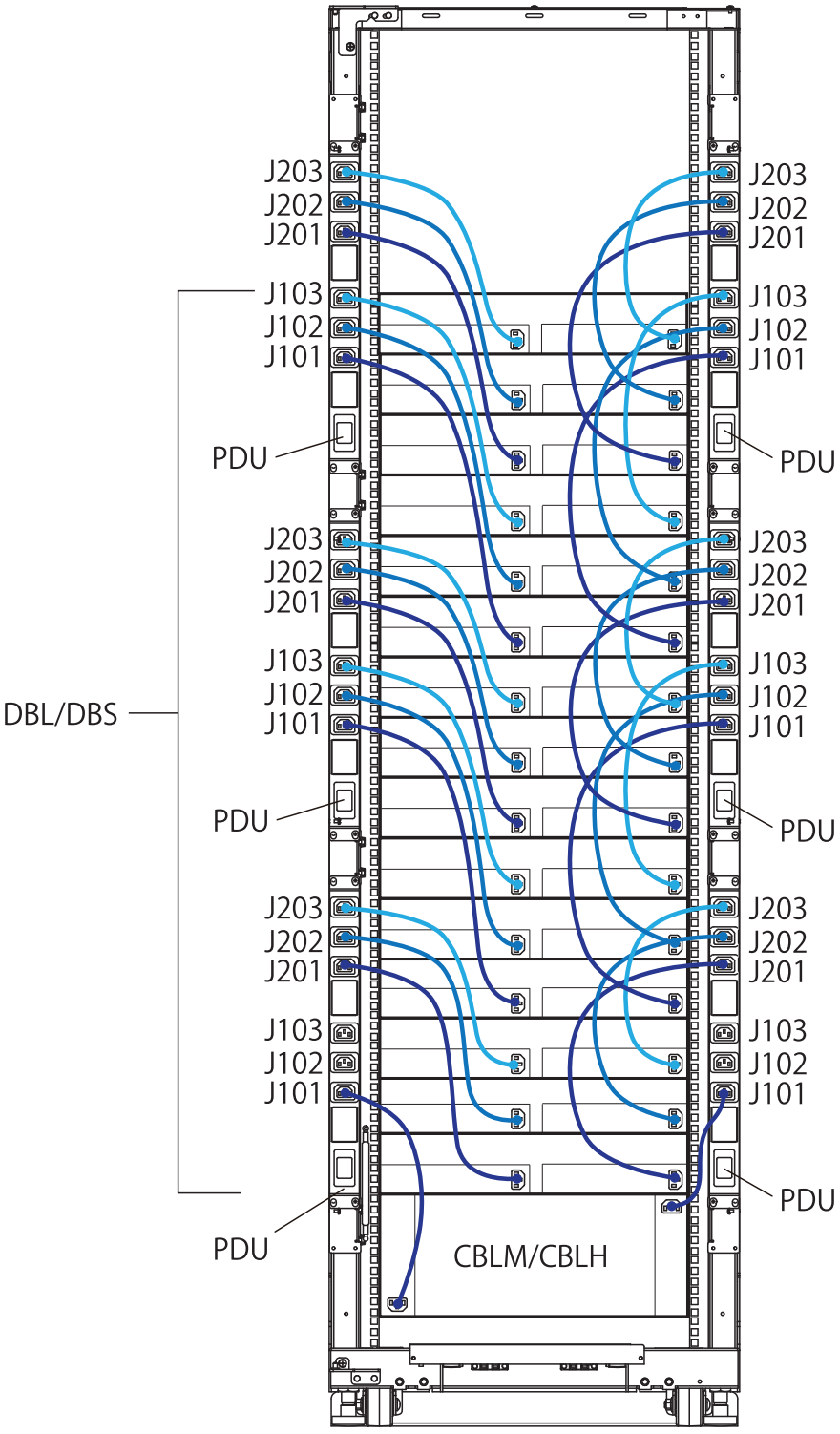
Figure 4-15 Removal Example of Power Cables

[Removal example (when removing from J103)]



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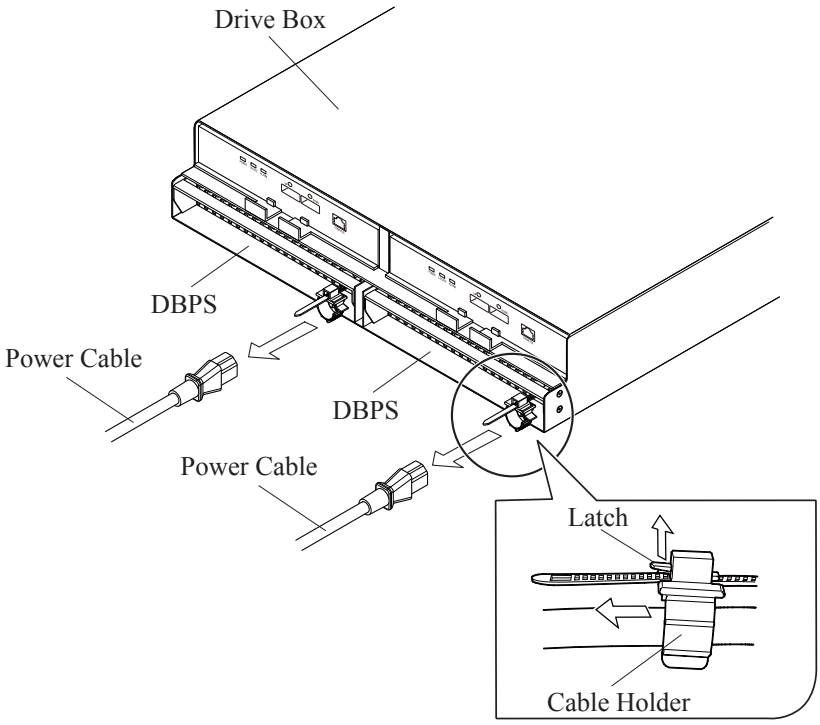
Figure 4-16 Connection Example of Power Cables (Configuration which Mounts Only DBSs/ DBLs on the Same Rack)



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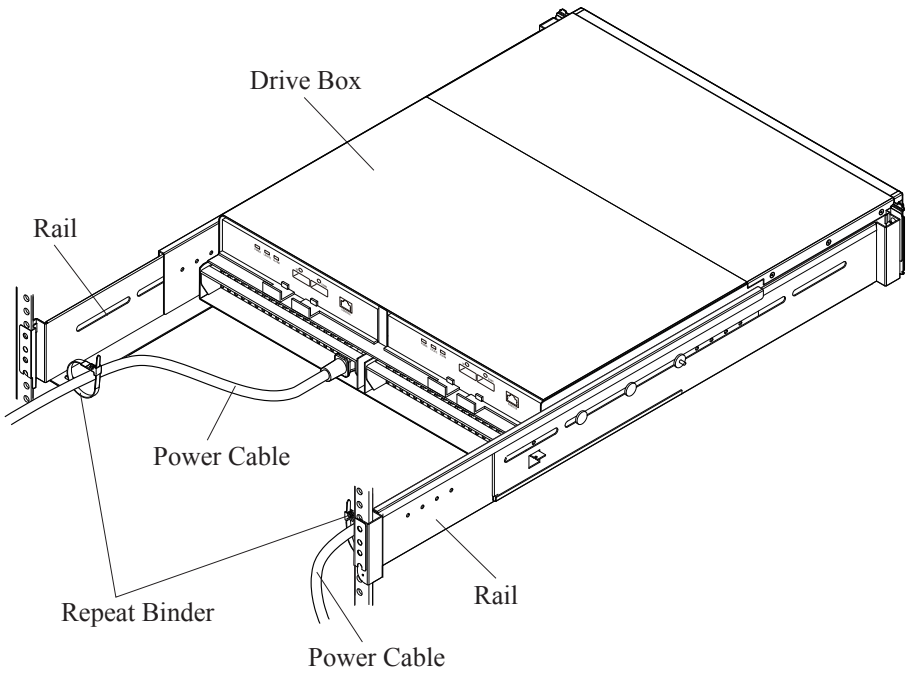
(c) Lift the latch of the cable holder and pull out the cable holder toward you.
(d) Open the cable holder and remove the two power cables from the DBPS.

Figure 4-17 Removing Power Cables



(e) Remove two repeat binders fixing the power cables.

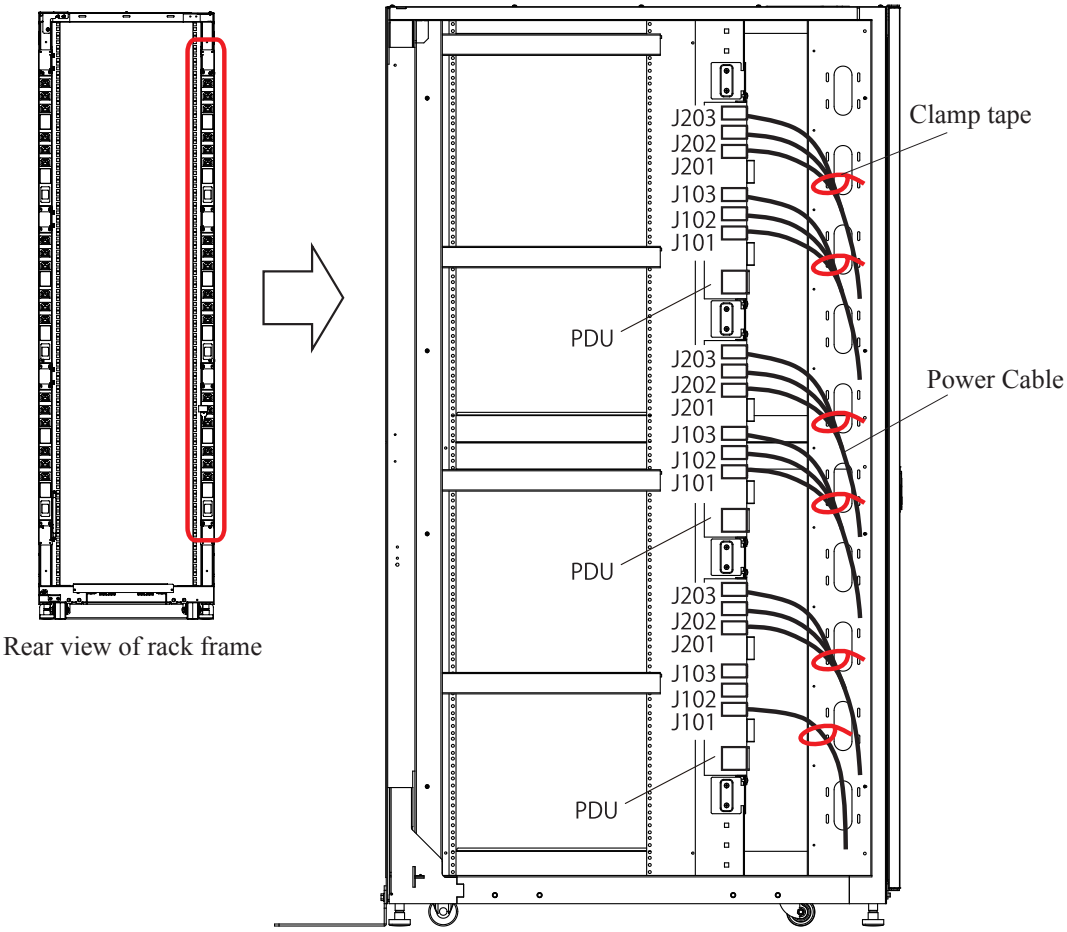
Figure 4-18 Removing Repeat Binders



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(f) Detach the clamp tapes on the both sides of the rear of the rack frame and remove the power cables.

Figure 4-19 Removing Power Cables



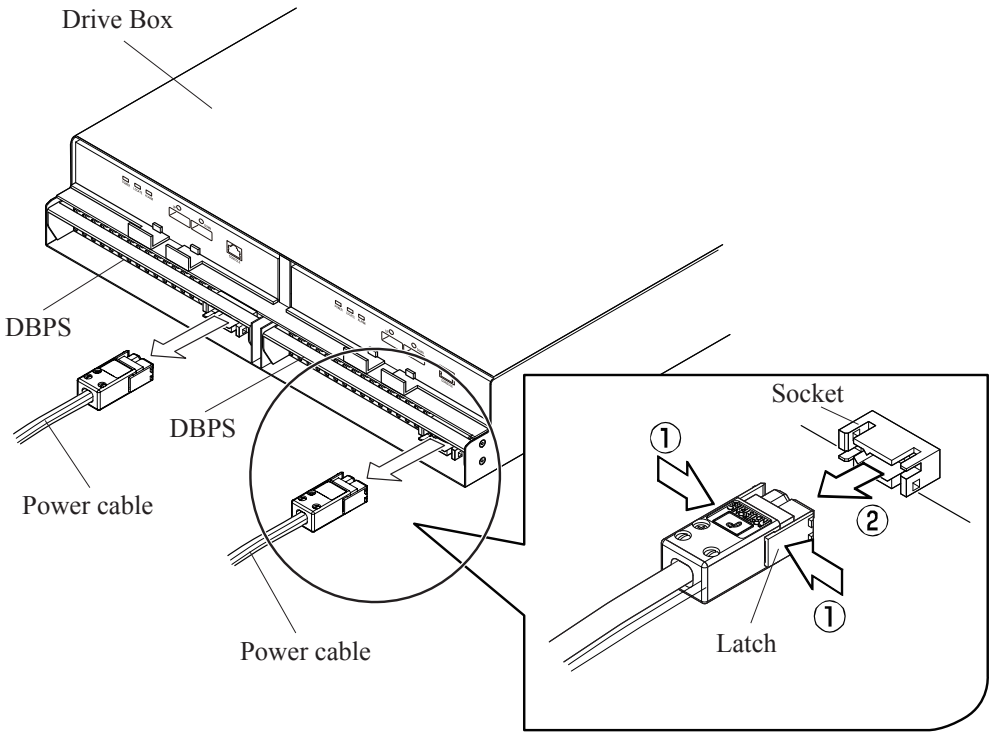
*1 : The figure shows fixation of the right side.

(2) DC power supply model (DBSD/DBLD)

(a) Request the customer to shut down the input Power Supply connected to the DBSD/DBLD to be removed.

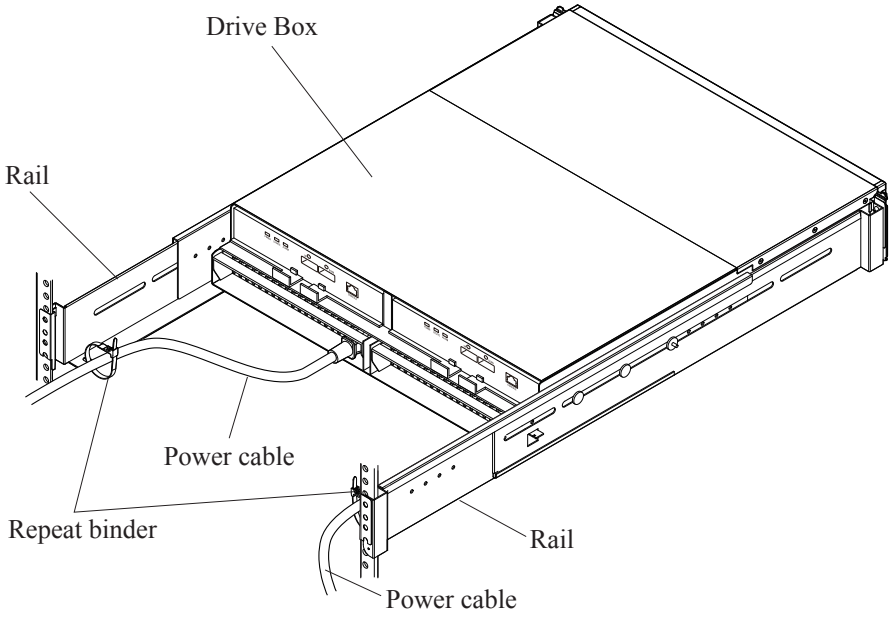
(b) Remove two power cables from the DBPS.
Pinch both ends of the power cables. Release the latch (①) and remove the socket from the DBPS.

Figure 4-20 Removing Power Cables



(c) Remove two repeat binders fixing the power cables.

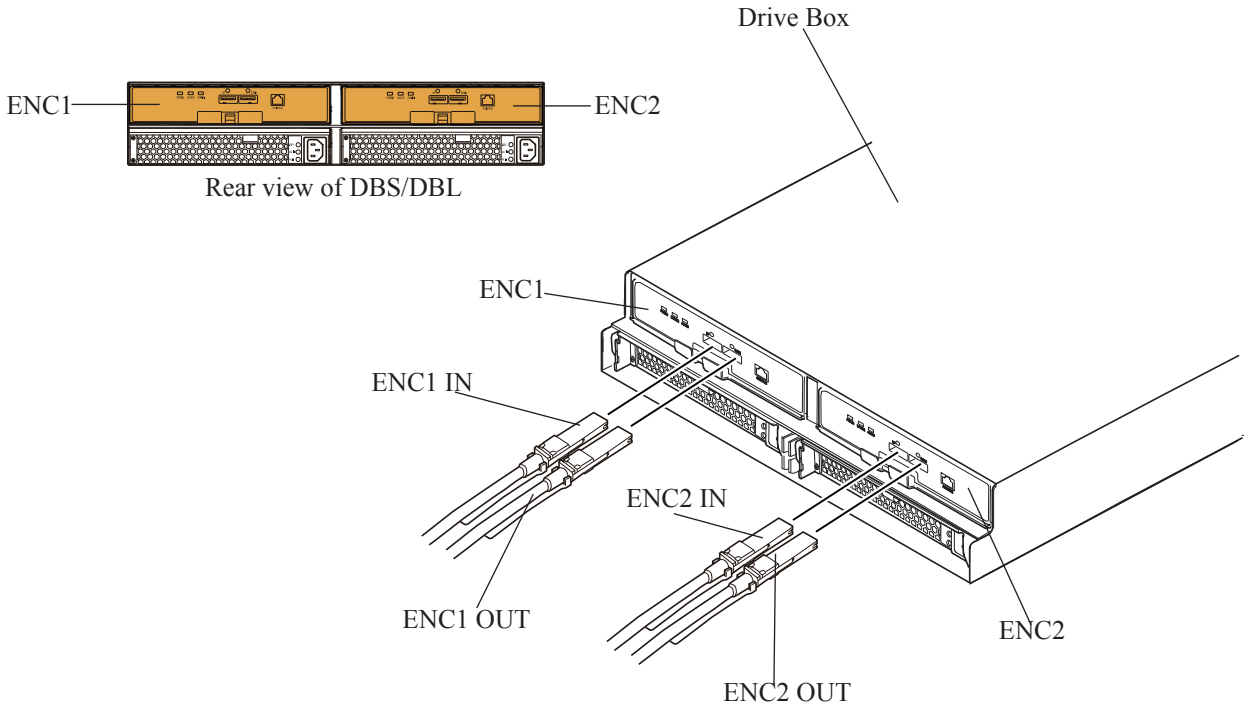
Figure 4-21 Removing Repeat Binders



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8. Removing the SAS Cables
   (1) Remove the SAS cables from the ENC1 on the rear of the Drive Box.
   (2) Remove the SAS cables from the ENC2 on the rear of the Drive Box.

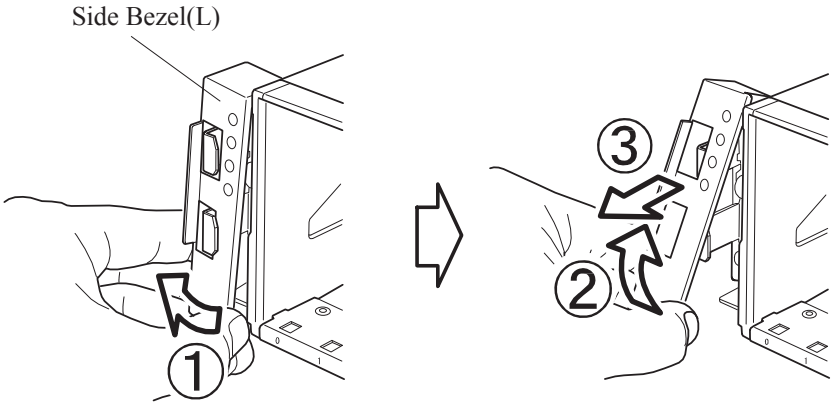
Figure 4-22 Removing SAS Cables



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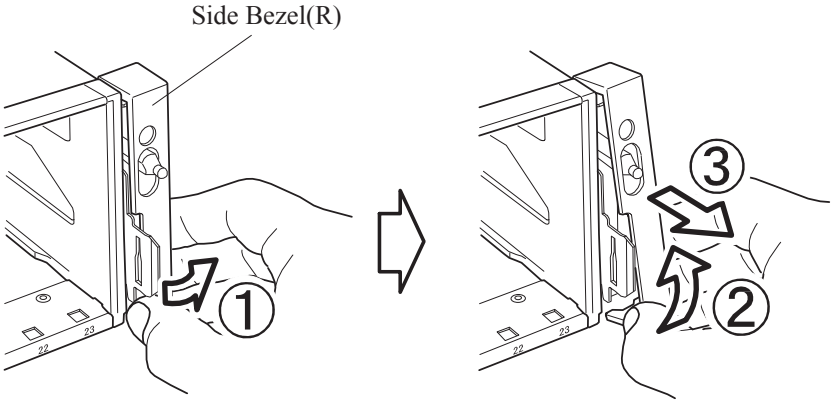
9. Removing the Side Bezels
   (1) Hold the bottom of the left side bezel (L) on the front side of the Drive Box while opening outward (①), and then pull and remove (② , ③) the bottom of the left side bezel (L) by pulling it toward you.

Figure 4-23 Removing Side Bezel (L)



   (2) Hold the bottom of the right side bezel (R) on the front side of the Drive Box while opening outward (①), and then pull and remove (② , ③) the bottom of the right side bezel (R) by pulling it toward you.

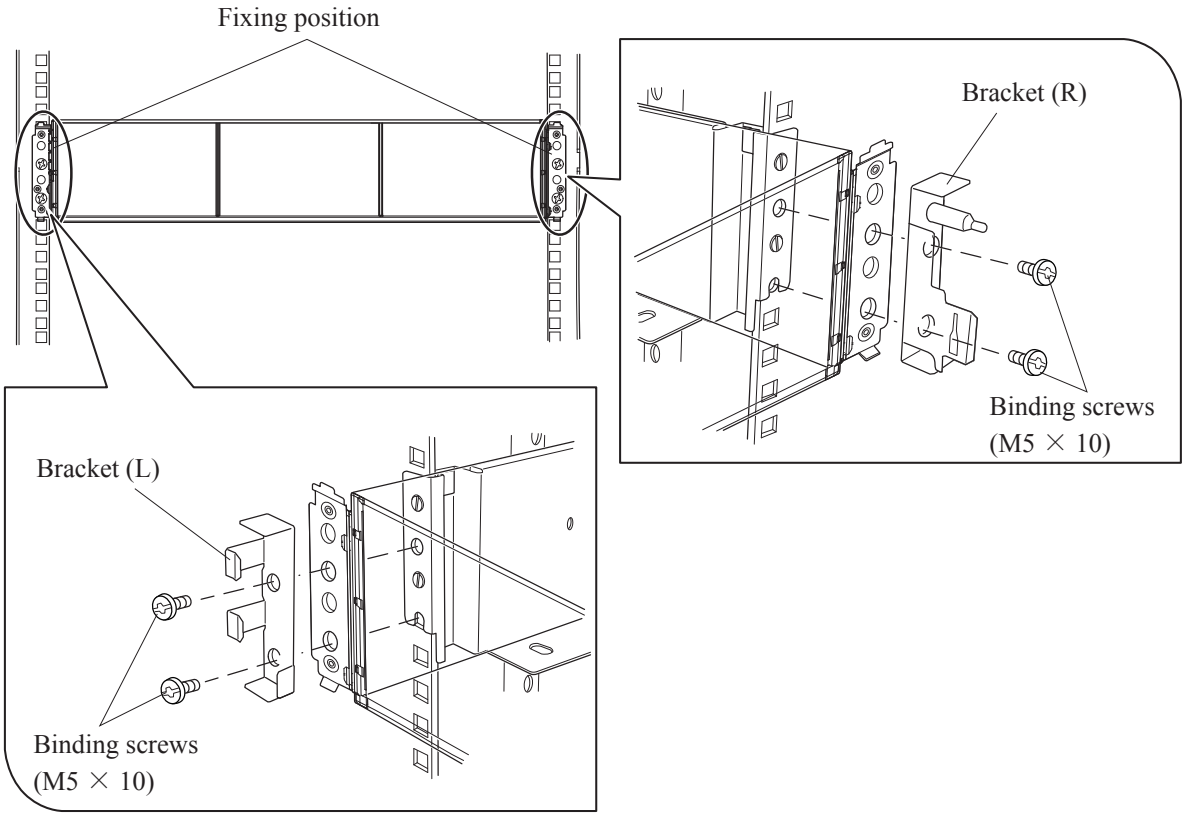
Figure 4-24 Removing Side Bezel (R)



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10. Removing the Brackets
    Remove the four Binding screws (M5 × 10) and two brackets from the Drive Box.

Figure 4-25 Removing Brackets



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11. Removing the parts

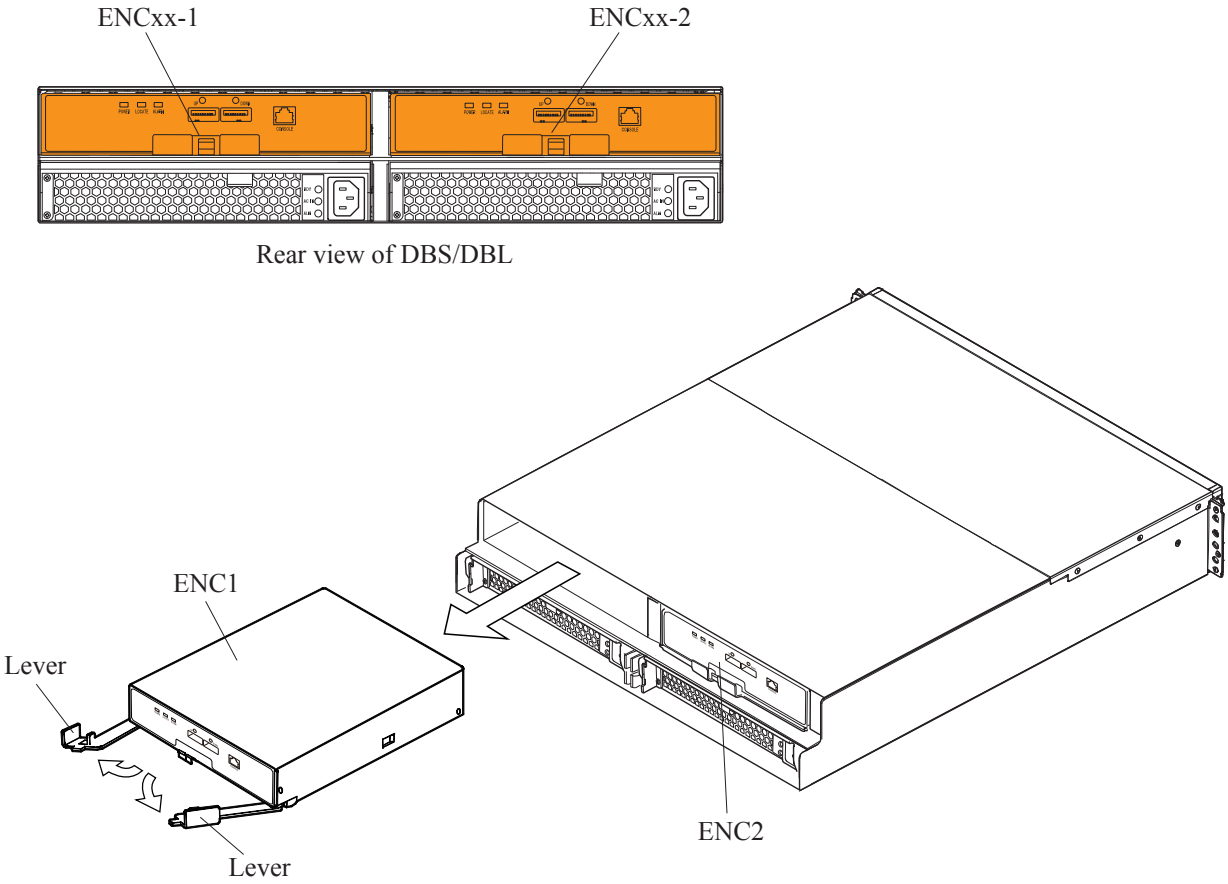
If the Drive Box is removed at a height of 1m or below removed by using the special lifter, this procedure is not required because the Drive Box is removed from the rack frame with its parts mounted. (Go to Step 13.)

If other than above, remove the parts first and then remove the Drive Box from the rack frame.

NOTICE:	To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
(2) Pull the right and left levers and remove the ENC.
(3) Remove the other ENC in the same manner.

Figure 4-26 Removing ENCs

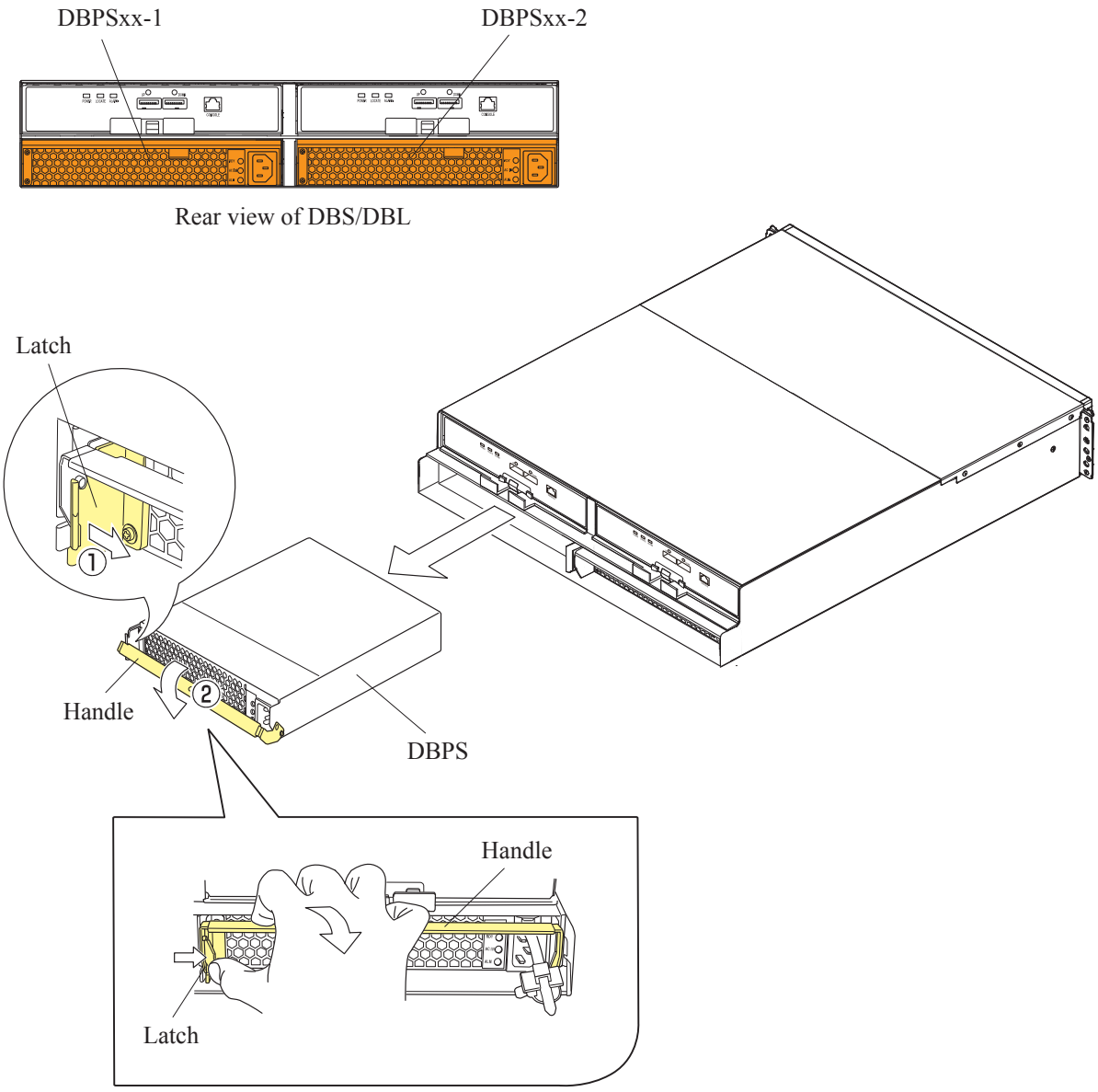


*1 : ENCxx-1
└> DB No. (00, 01, 02, ..., 47)

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(4) Bring the handle down and forward (②) while pushing the latch of the DBPS inward (①).
(5) Pull the DBPS and remove it from the Drive Box.
(6) Remove the other DBPS in the same manner.

Figure 4-27 Removal of DBPS



*1 : DBPSxx-1
└→DB No. (00, 01, 02, ..., 47)

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12. Removing the Drive Boxes

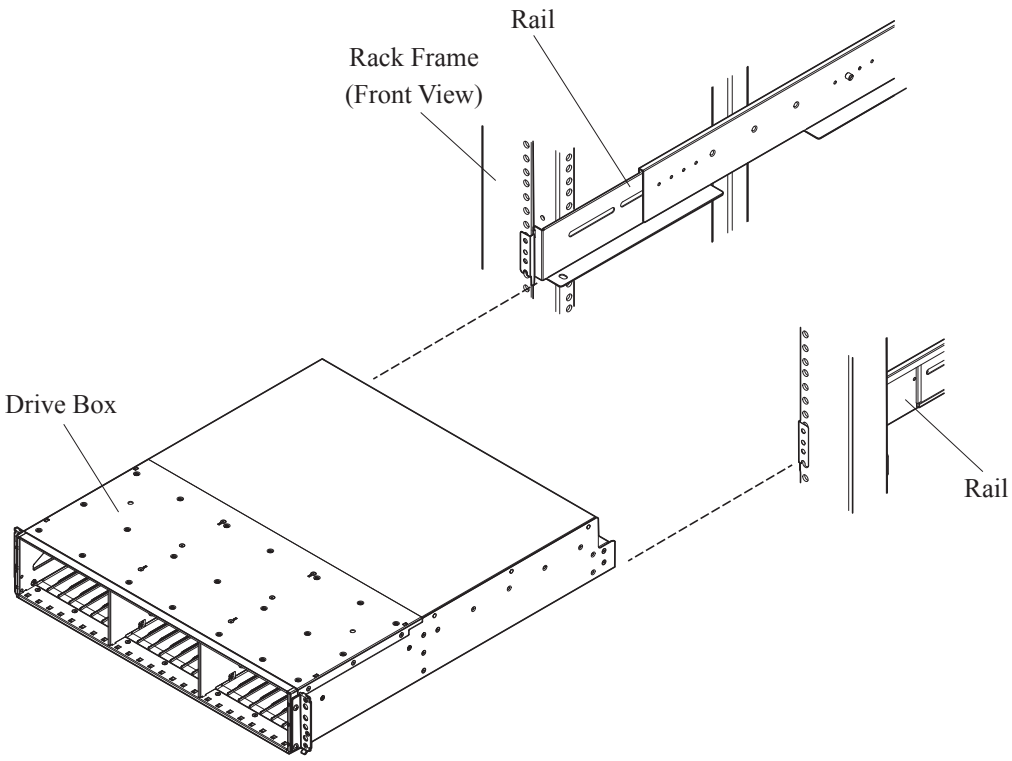
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DBS is about 23 kg and DBL is about 27 kg.

Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

(1) Remove the Drive Box on the Rack frame referring to mounting procedure using the special lifter. (Refer to "2.6.1 Mounting Storage System on a Special Lifter".)

Figure 4-28 Removing Drive Boxes



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13. Reinstalling the removed parts

    If parts were removed in "12. Removing the Drive Boxes", reinstall the removed parts.

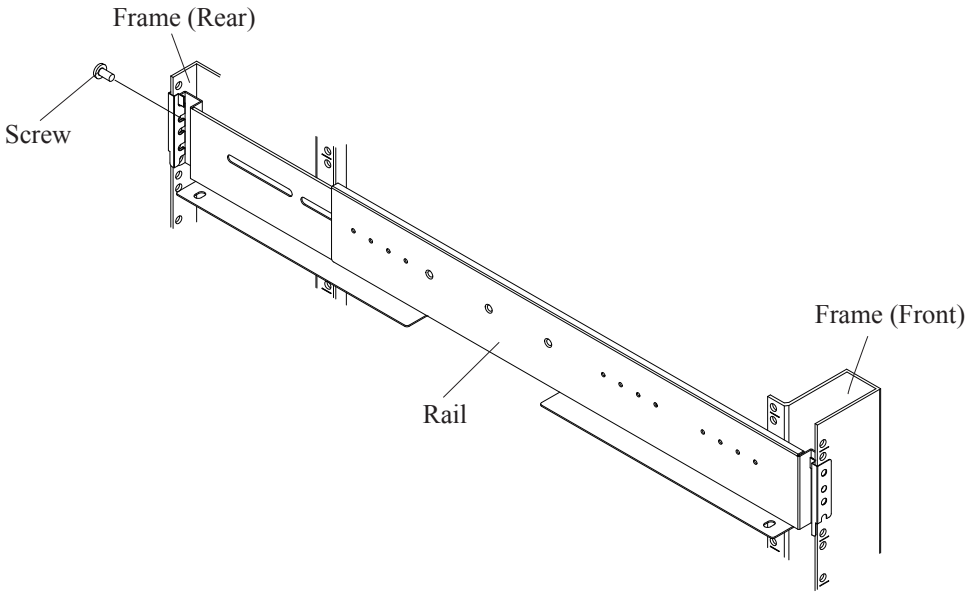
    If parts were not removed, go to Step 15.

    (1) Open the handle of the DBPS completely. (Refer to Figure 4-26.)
    (2) Insert the DBPS into the slot and push it to the end.
    (3) Close the handle completely and fix the DBPS.
    (4) Install the other DBPS in the same manner.
    (5) Keep the right and left levers of the ENC open. (Refer to Figure 4-27.)
    (6) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
    (7) Close the right and left levers to insert the ENC completely.
    (8) Install the other ENC in the same manner.

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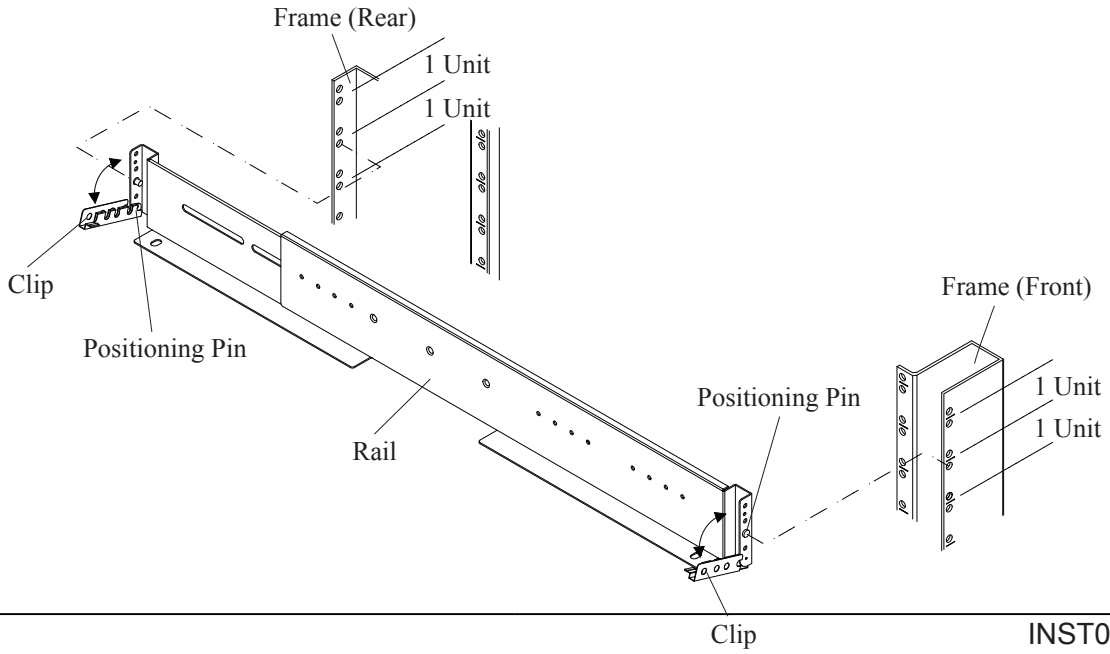
14. Removing the rails
    (1) Remove the screw from the rear side of right rail.
    (2) Remove the screw from the rear side of left rail in the same way.

Figure 4-29 Removing Screws



    (3) Open two Clips located in the front and the rear side of the rail that is mounted at the right side of the rack frame.
    (4) Push the rail that is mounted at the right side of the rack frame and remove the Positioning Pin on the front side of the rail. Then remove the rail from the rack frame.
    (5) Remove the left side rail from the rack frame in the same way as Step (3) and Step (4).

Figure 4-30 Removal of Slide Rail



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15. Refer to MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

16. Disconnecting the Maintenance PC and the Storage System.
    Remove the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

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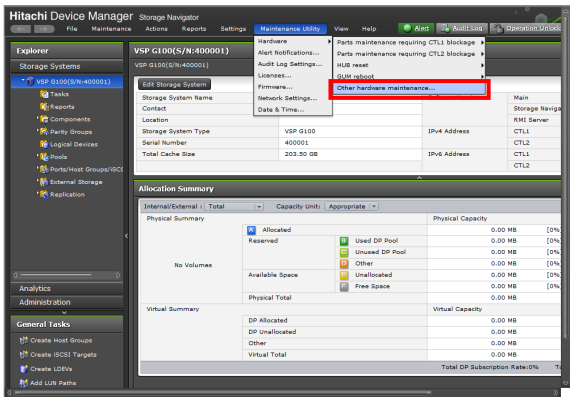
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4.4.4 Removing Drive Boxes (DW-F800-DB60)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

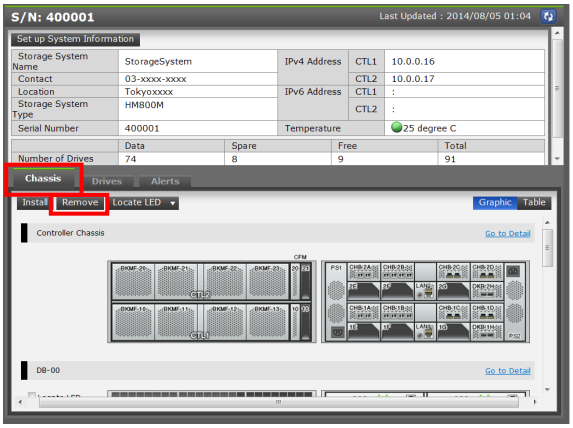
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



3. Instructing to start removal by Maintenance Utility

   NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Remove] button. For CBLH, click the [Remove] button and select [Drive Box].

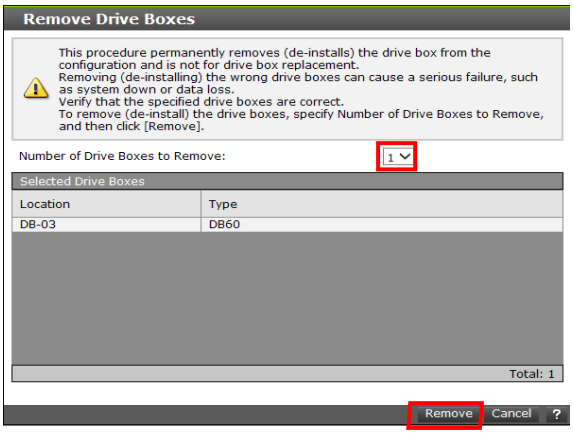


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(2) <Specify Removal Drive Boxes>

Select the number of Drive Boxes to be removed and click the [Remove] button.
When the Controller Chassis is a CBLH, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(3) <Displaying the Password entry window>

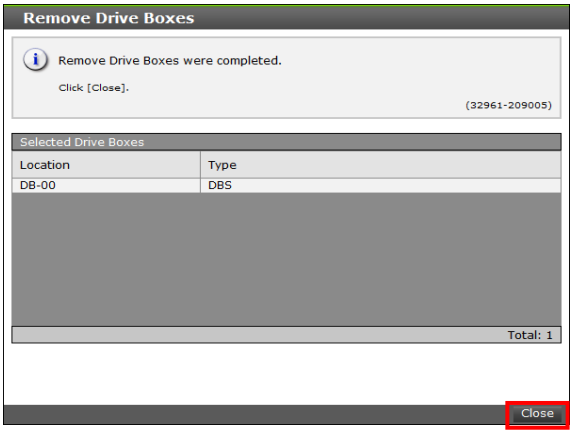
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(4) <Removal Work Start Message>

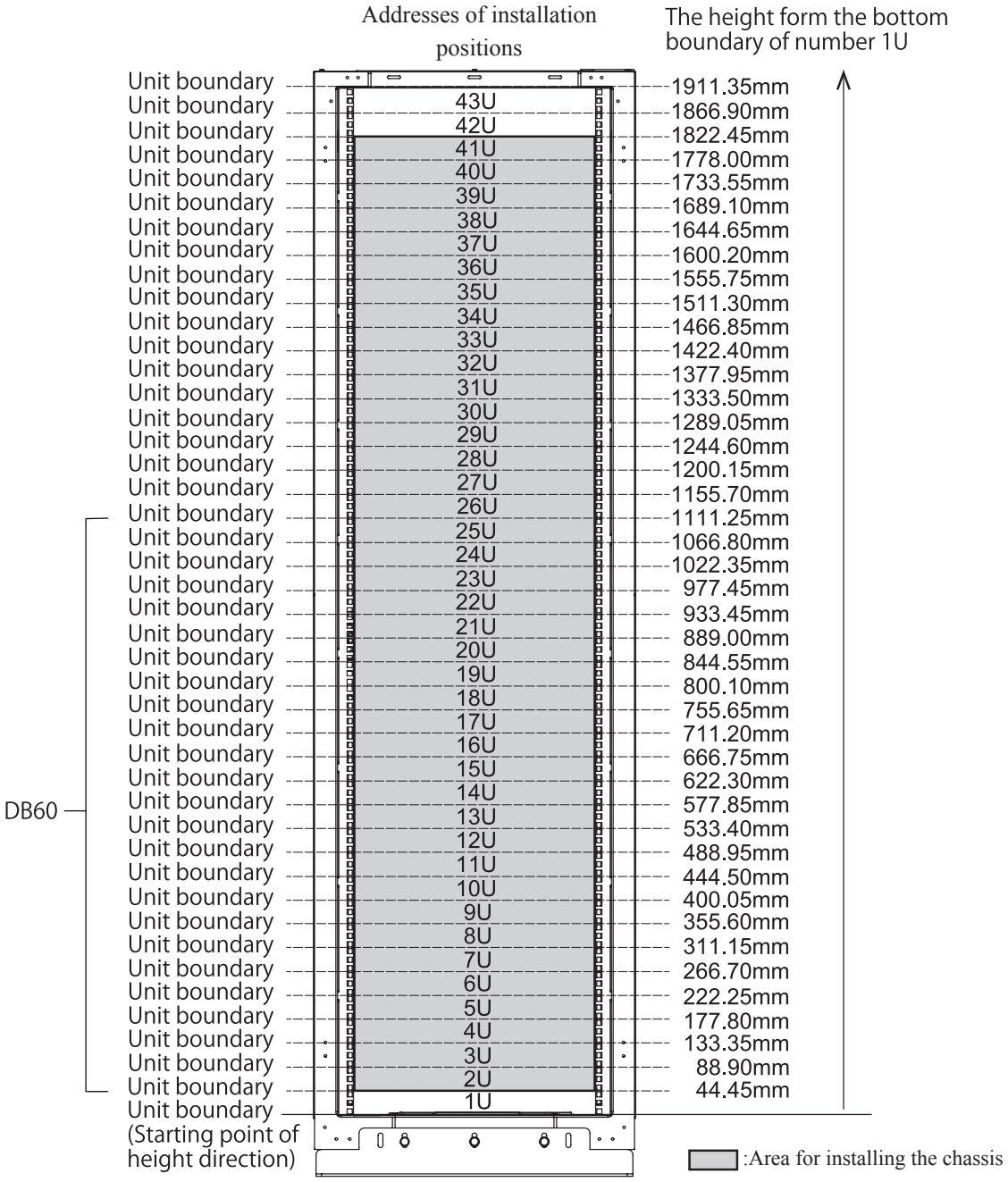
Check that the following message is displayed and click the [Close] button.
If a message other than the following is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



When the Drive Box removal fails, click the [Close] button of the completion message. After that, click the [Drive Box] tab and check the Drive Box status.

4. Confirming the removal positions
   Confirm the removal positions of Drive Box (DB60).
   The following figure shows a configuration example of installing Drive Boxes.

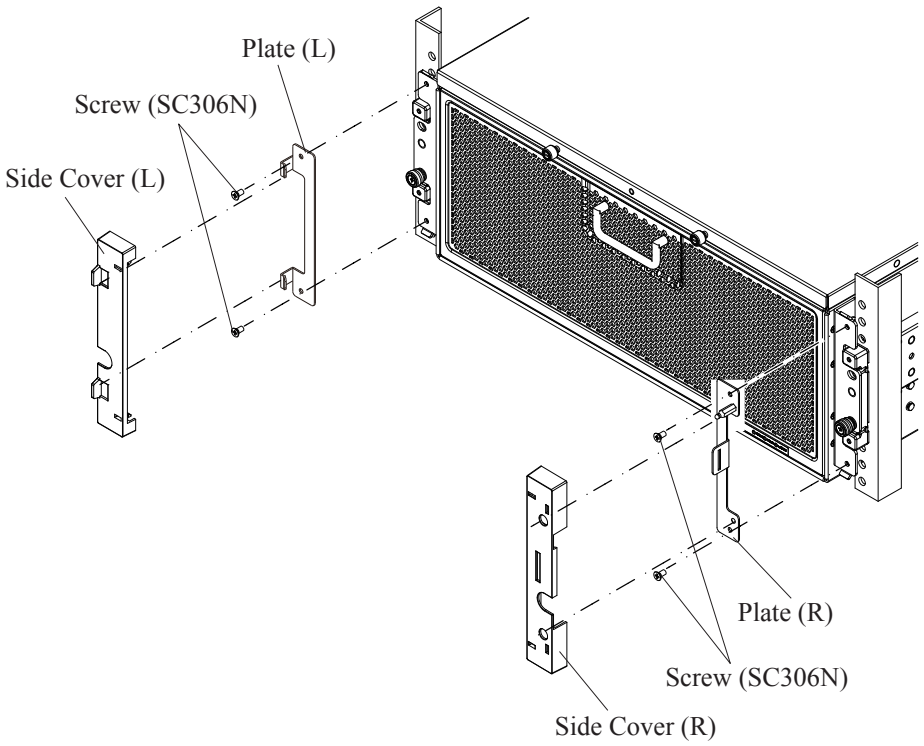
Figure 4-31 Mounting Position of Drive Box



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5. Removing the Front Bezel
   (1) Remove the Front Bezel referring to "1.4.1 How to Attach/Remove the Front Bezel".
      (a) Remove the Side Cover (L) from the left side of the front of the Drive Box.
      (b) Remove the Side Cover (R) from the right side of the front of the Drive Box.
      (c) Remove the two screws and remove the Plate (L).
      (d) Remove the two screws and remove the Plate (R).

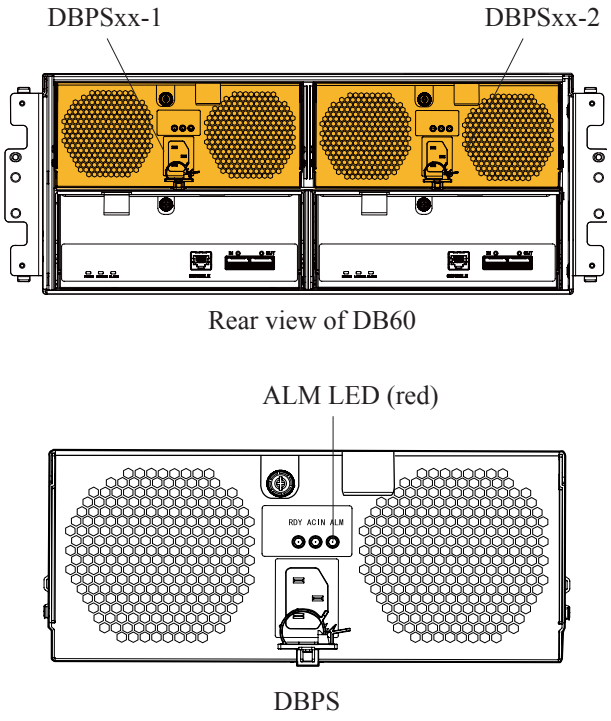
Figure 4-32 Removing Parts for the Front Bezel



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6. Checking the Drive Box LEDs
   Check that the ALM LED (red) on the DBPS installed in the Drive Box to be removed lights up.

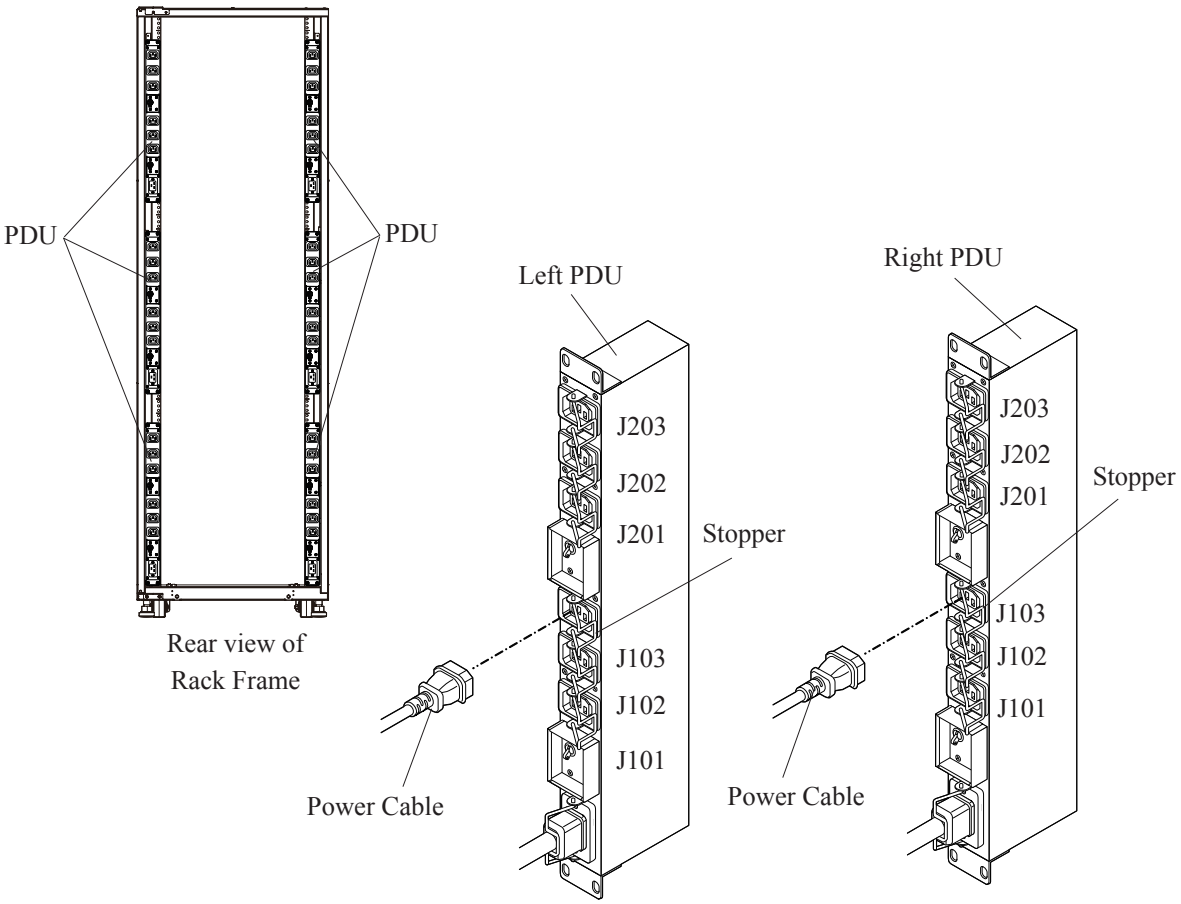
Figure 4-33 ALM LED on DBPS



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7. Removing Power Cables (PDU side)
   (1) Check the connection destination of the power cables of the Drive Box to be removed.
   (2) Open the PDU stopper and remove two power cables from the PDU.

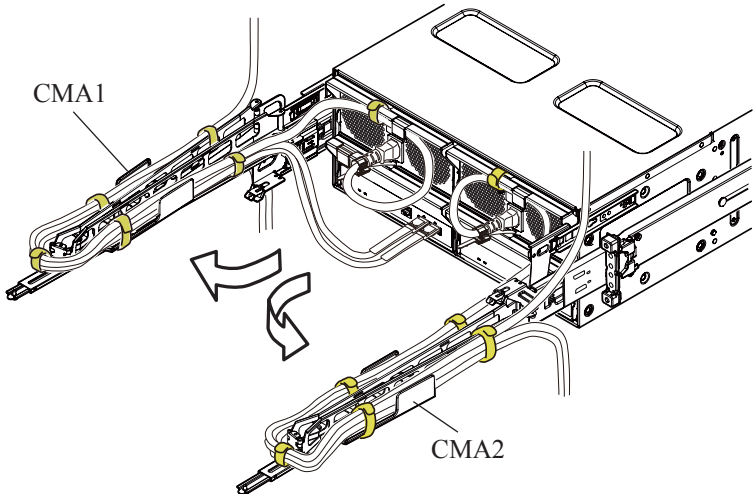
Figure 4-34 Removal Example of Power Cables



[Removal example (when removing from J103)]

8. Removing the cables
   (1) Open the CMA1 and CMA2 on the rear right side.

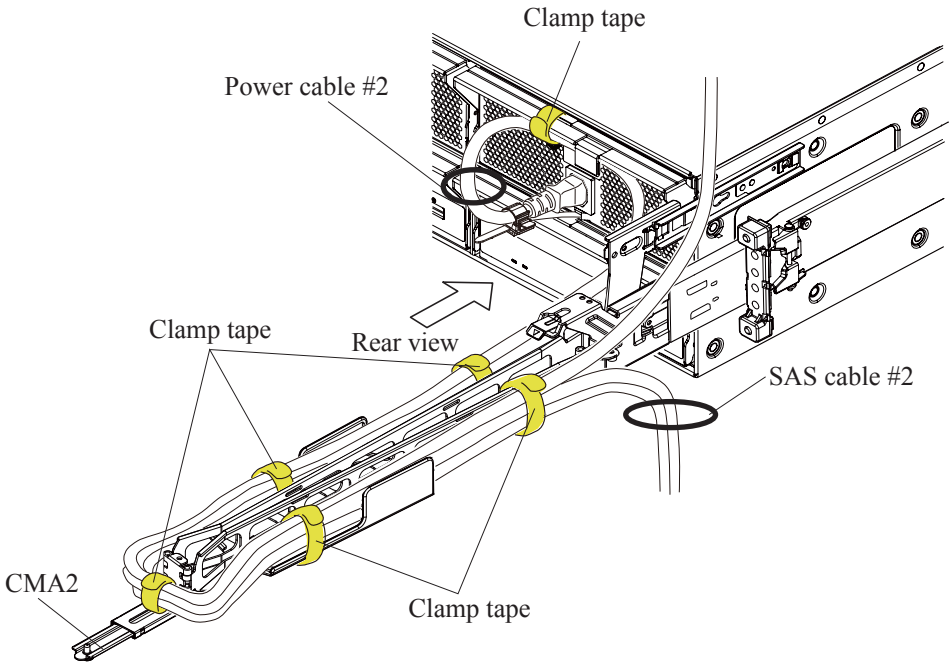
Figure 4-35 Moving CMAs



(2) Open the six clamp tapes on the CMA2 and remove the SAS cables and the power cable.

NOTE : Put the cables where they do not obstruct the work in the way so that the cable connectors are not applied stress.

Figure 4-36 Removing SAS Cables and Power Cable

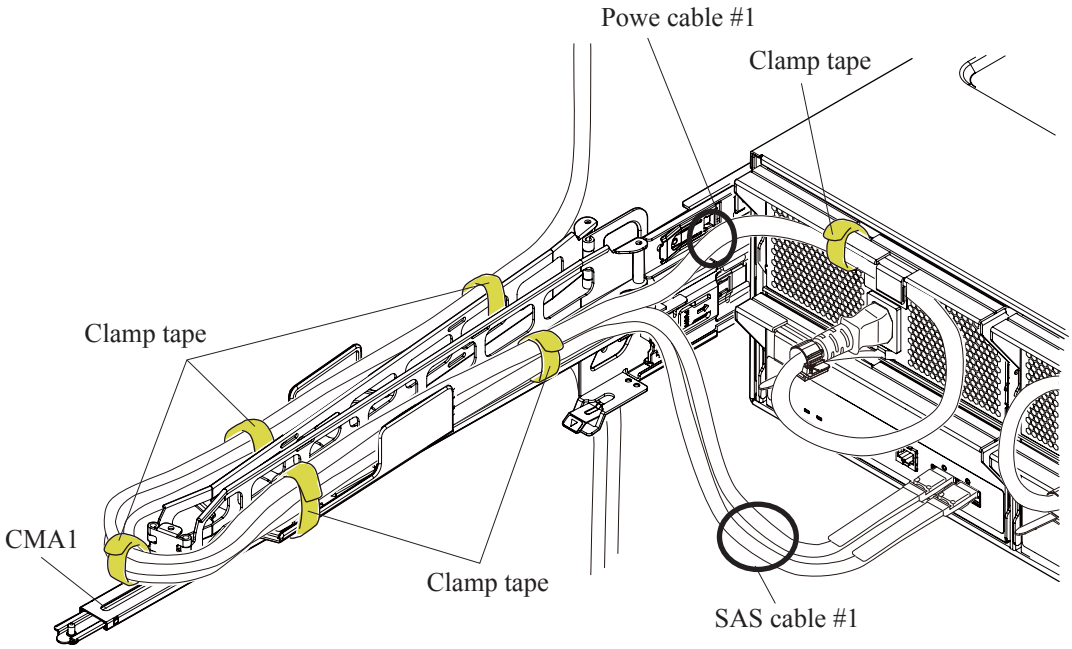


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(3) Open the six clamp tapes on the CMA1 and remove the SAS cables and the power cable.

NOTE : Put the cables where they do not obstruct the work in the way so that the cable connectors are not applied stress.

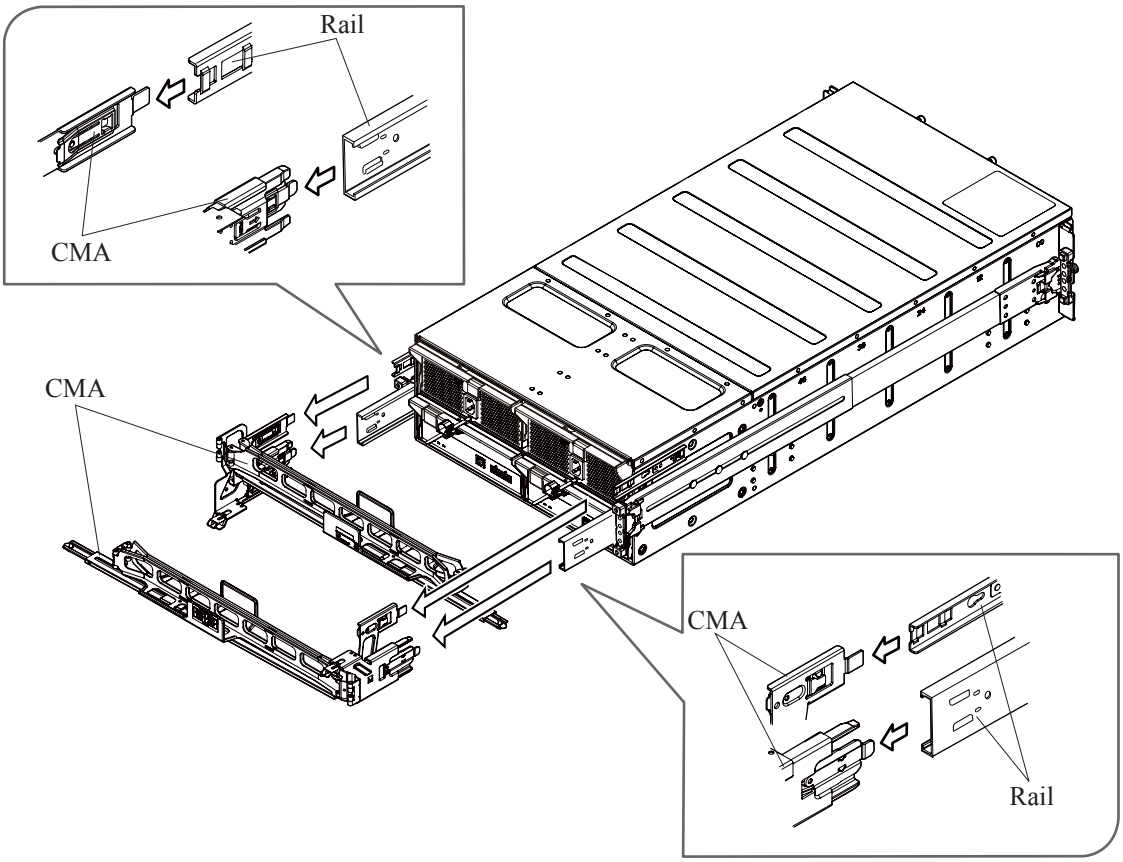
Figure 4-37 Removing SAS Cables and Power Cable



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9. Removing the CMAs
   Remove the two CMAs from the rails.

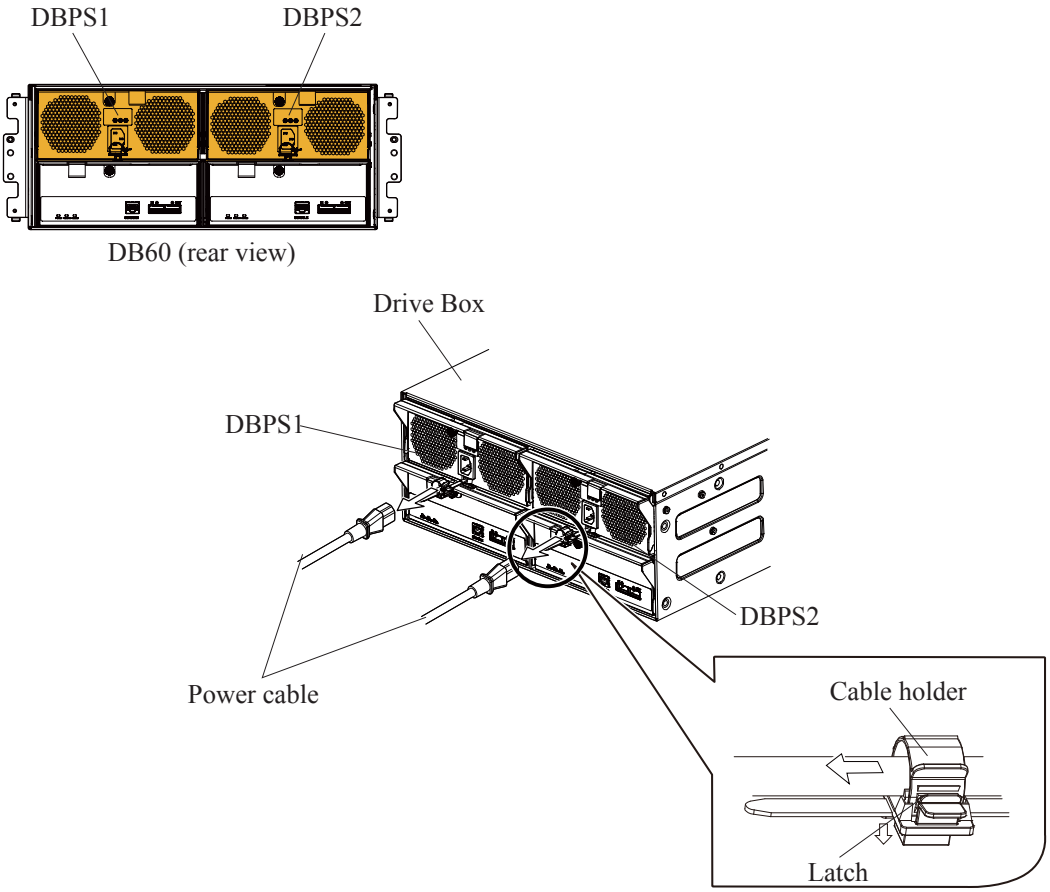
Figure 4-38 Removing CMAs



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10. Removing the Power Cables (DBPS side)
    (1) Push down the latch on the cable holder on the DBPS on the rear left side of the Drive Box and pull the cable holder toward you.
    (2) Open the cable holder and remove the power cable from the DBPS.
    (3) Remove the power cable on the other DBPS in the same manner.

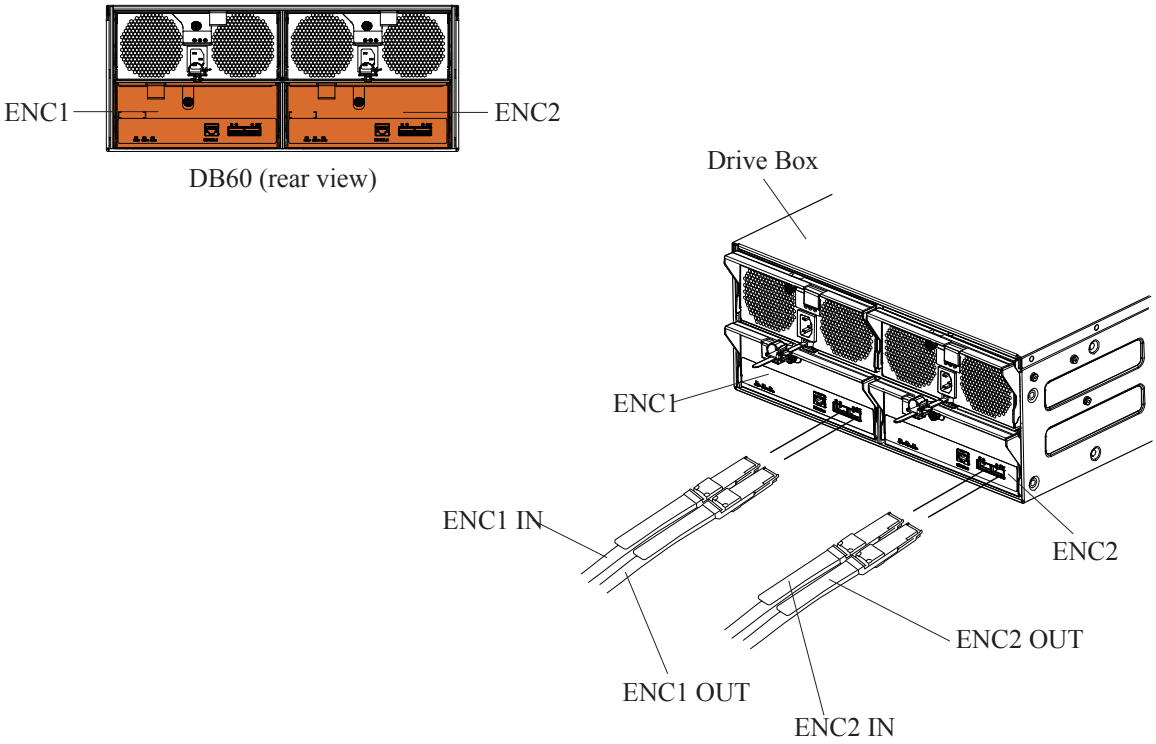
Figure 4-39 Removing Power Cables



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11. Removing the SAS Cables
    (1) Remove the SAS cables from the ENC1 on the rear of the Drive Box.
    (2) Remove the SAS cables from the ENC2 on the rear of the Drive Box.

Figure 4-40 Removing SAS Cables



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12. Removing parts

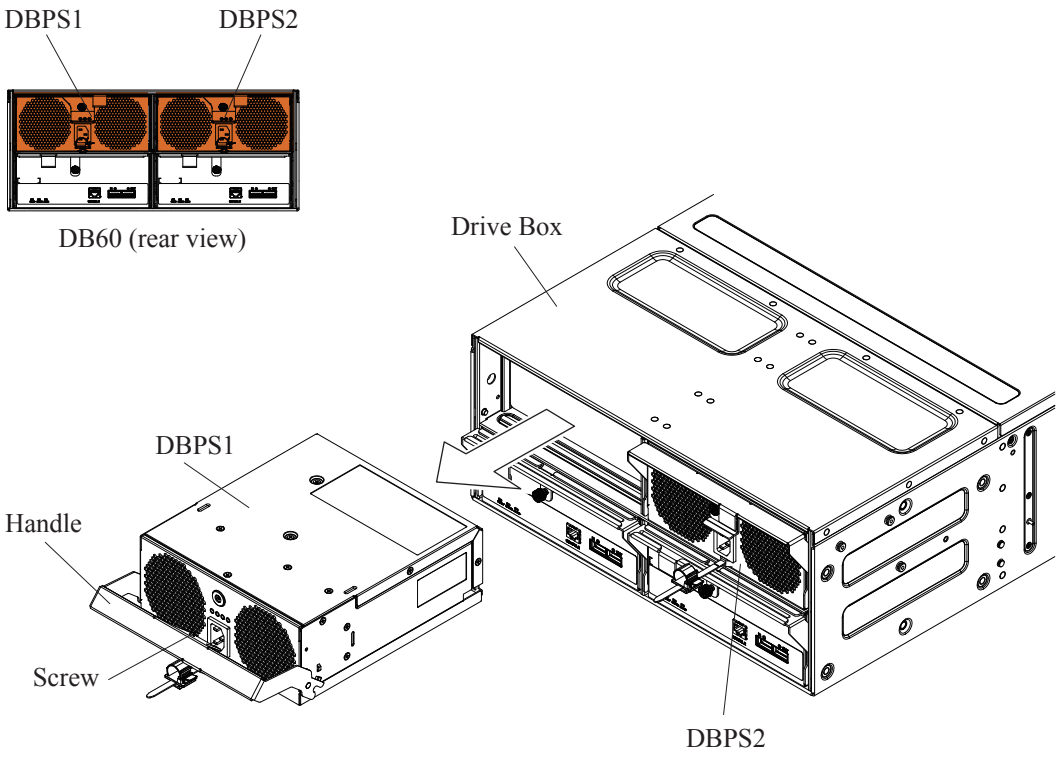
If the Drive Box is removed at a height of 1m or below removed by using the special lifter, this procedure is not required because the Drive Box is removed from the rack frame with its parts mounted. (Go to Step 13.)

If other than above, remove the parts first, and then remove the Drive Box from the rack frame.

NOTICE:	To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
(2) Loosen the screw on the DBPS on the rear left side of the Drive Box and pull down the handle toward you.
(3) Pull the DBPS toward you and remove it from the Drive Box.
(4) Remove the other DBPS in the same manner.

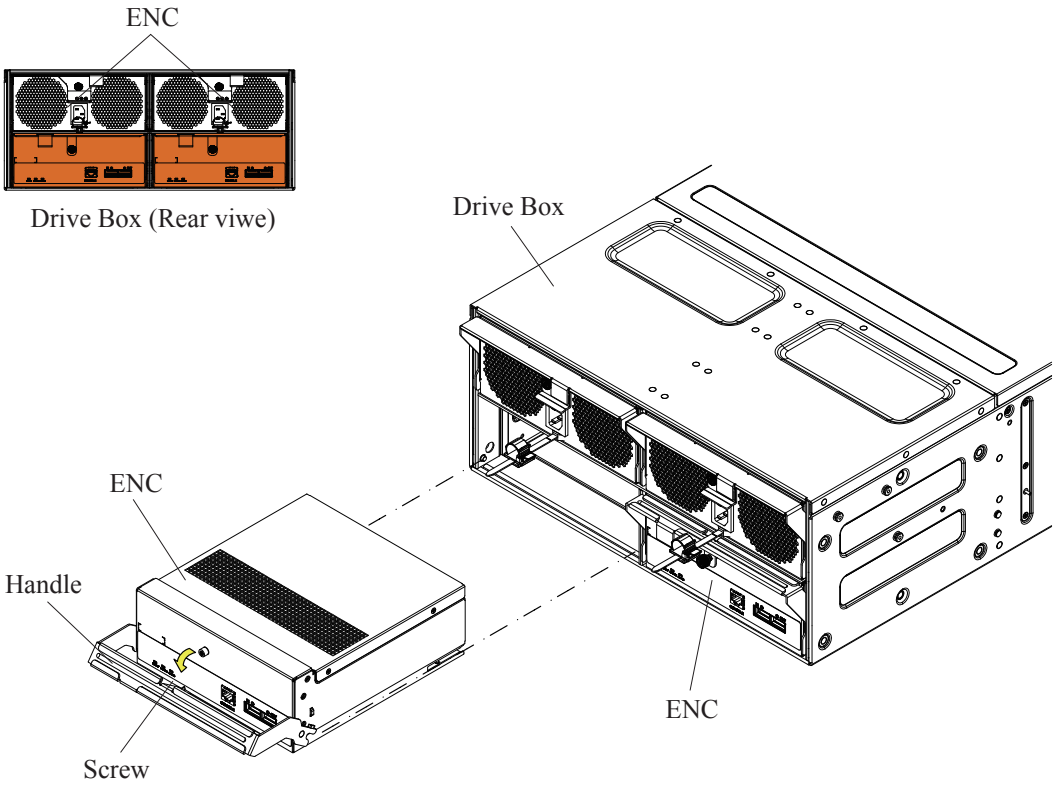
Figure 4-41 Removing DBPS



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(5) Loosen the screw on the ENC on the rear left side of the Drive Box and pull down the handle toward you.
(6) Pull the ENC and remove it from the Drive Box.
(7) Remove the other ENC in the same manner.

Figure 4-42 Removing ENC



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13. Removing the Drive Boxes

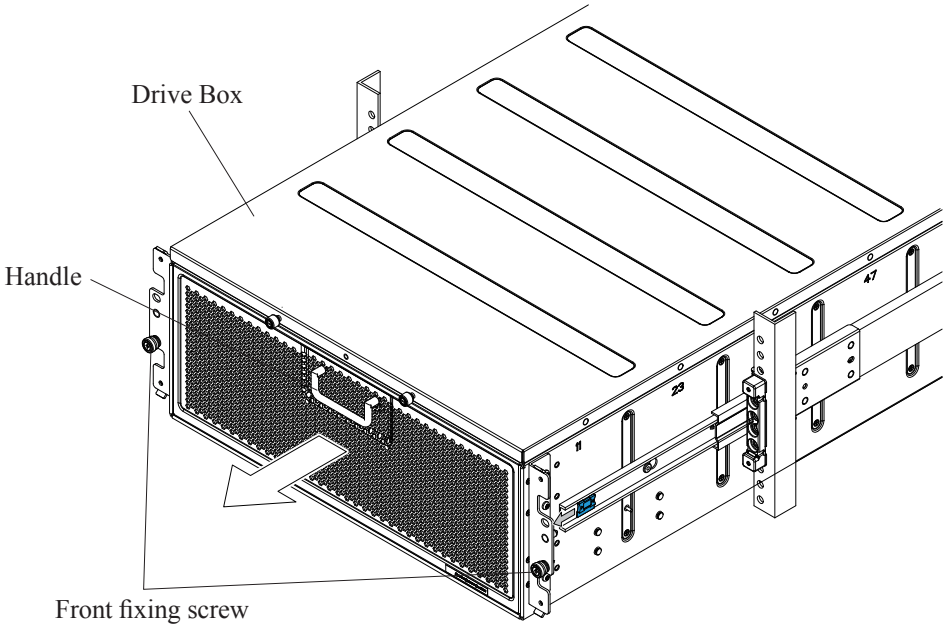
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DB60 is about 90 kg.

Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

(1) Move the lifter at the removal position of the Drive Box referring to mounting procedure using the special lifter. (Refer to "2.6.1 Mounting Storage System on a Special Lifter".)
(2) Loosen the front fixing screws. (one place each at right and left)
(3) Pull out the Drive Box slowly holding the handle on the front side until the latch of the rail clicks.

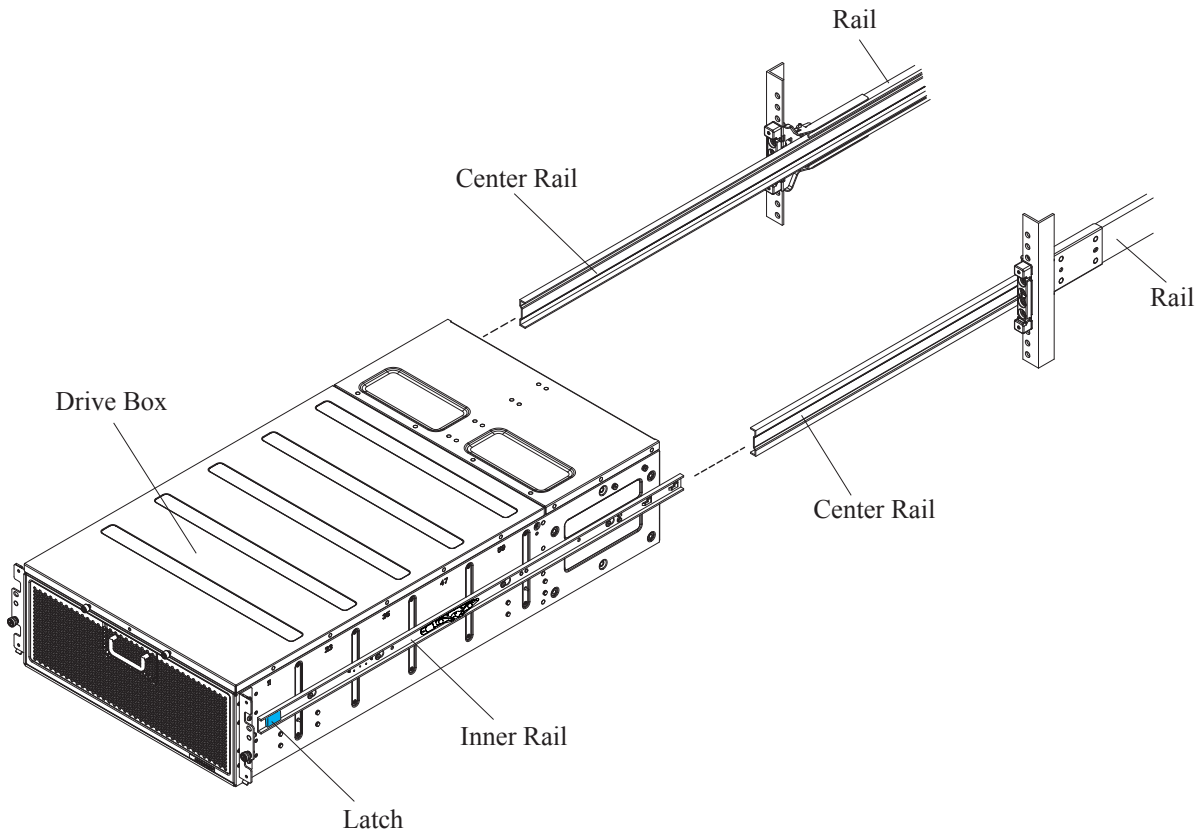
Figure 4-43 Removing Drive Boxes



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(4) Release the locks by sliding the latch release lever located in the front of the right and left rail, and pull the drive box over the lifter.

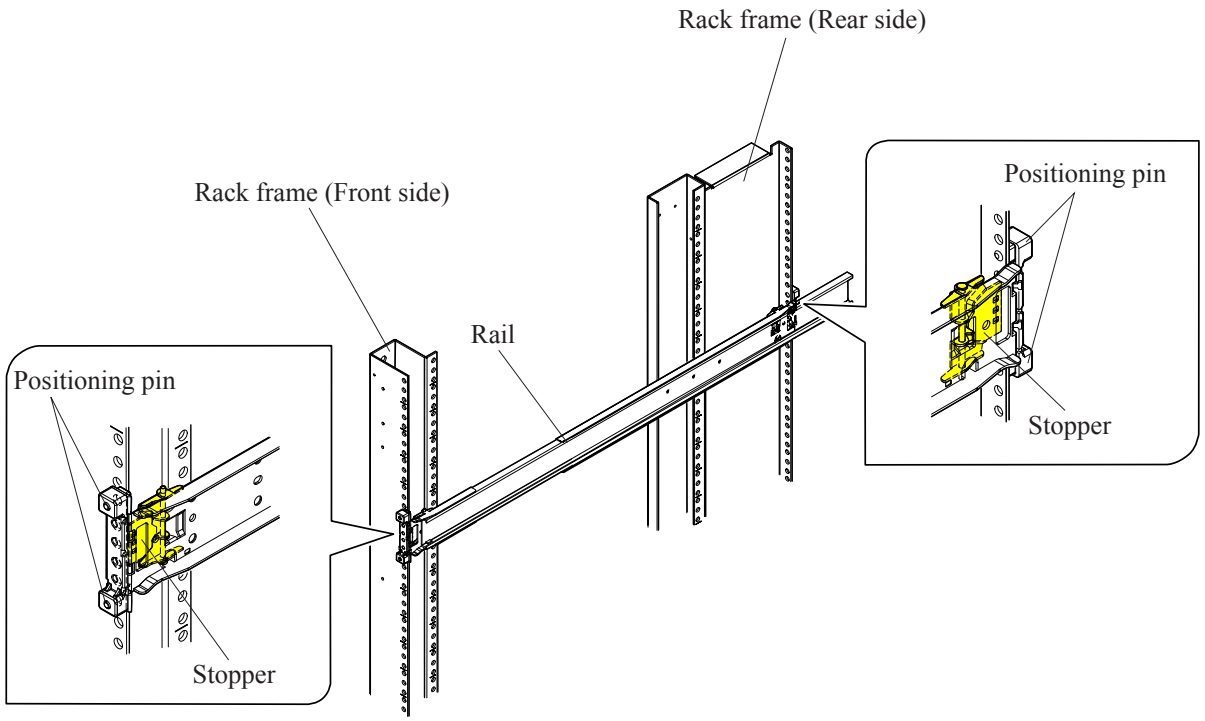
Figure 4-44 Removing Drive Boxes



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14. Removing the Rails
    (1) Press the Stopper on the front side of the rail to unlock and remove the two Positioning Pins on the Rail from the front side of the rack frame.
    (2) Press the Stopper on the rear side of the rail to unlock and remove the two Positioning Pins on the Rail from the rear side of the rack frame.
    (3) In the same way, remove the rail from to the right side of the rack frame.

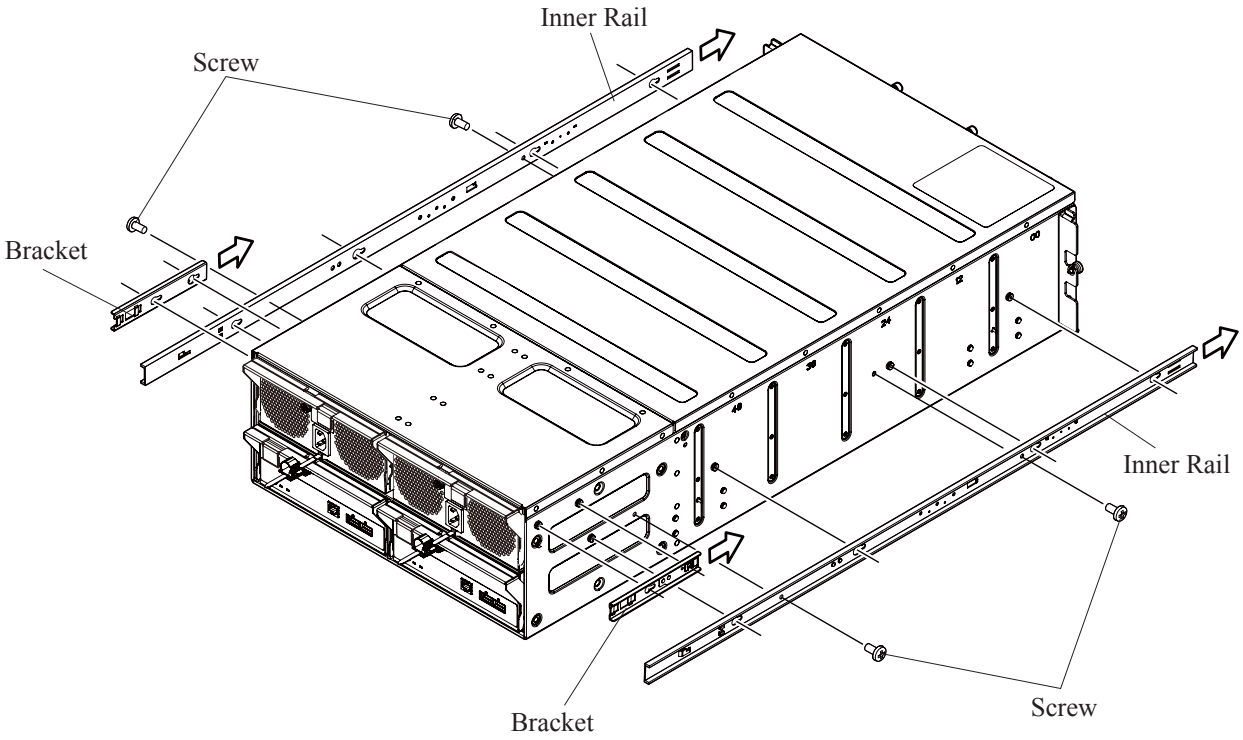
Figure 4-45 Removing Rail



15. Removing the Inner Rails

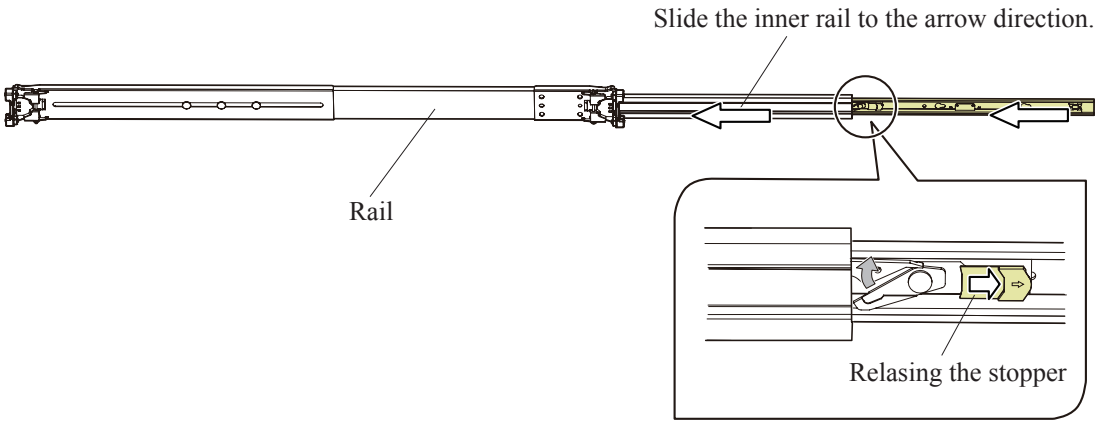
(1) Remove the screws (two each for right and left) from both sides of the Drive Box and remove inner rails (two each for right and left).

Figure 4-46 Removing Inner Rails



(2) Release the stopper and slide the middle rails back inside the outer rails.
Make sure to slide two middle rails back inside the outer rails respectively.

Figure 4-47 Sliding back of Inner Rail



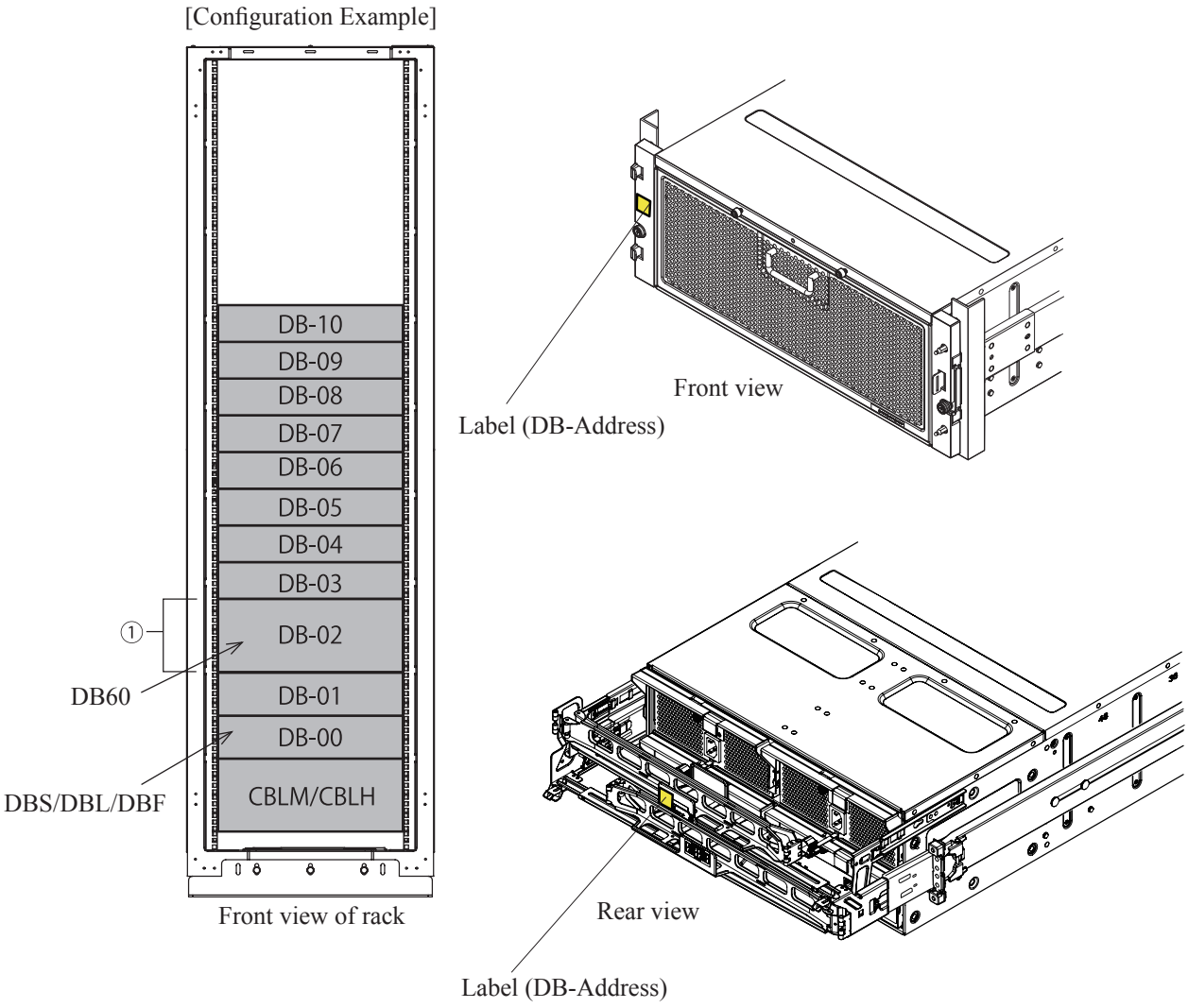
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16. Reinstalling the removed parts
    If parts were removed in "13. Removing the Drive Boxes", reinstall the removed parts.
    If parts were not removed, go to Step 18.

    (1) Open the handle of the ENC. (Refer to Figure 4-42.)
    (2) Insert the ENC until its handle edges reach the Drive Box.
    (3) Close the ENC handle and fix the screws.
    (4) Install the other ENC in the same manner.
    (5) Open the handle of the DBPS. (Refer to Figure 4-41.)
    (6) Insert the DBPS into the slot until its handle edges reach the Drive Box.
    (7) Close the DBPS handle and fix with screws.
    (8) Install the other DBPS in the same manner.

17. Removing the Cable labels
    (1) Remove the labels from the SAS cables.
    (2) Remove the labels from the other SAS cables in the same manner.

Figure 4-48 Removing Labels



18. Refer to MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

19. Disconnecting the Maintenance PC and the Storage System.
    Remove the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

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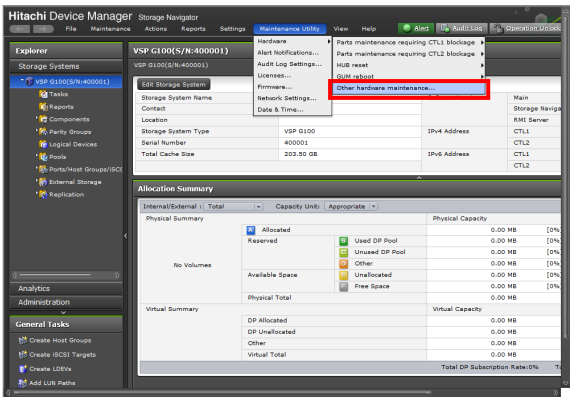
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4.4.5 Removing Flash Module Drive Boxes (DW-F800-DBF)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Flash Module Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

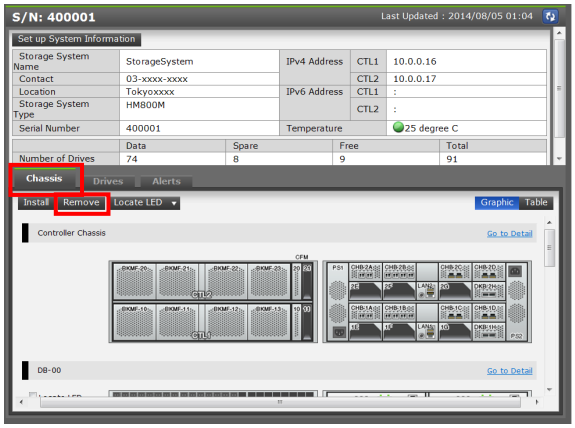
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



3. Instructing to start removal by Maintenance Utility

   NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Remove] button. For CBLH, click the [Remove] button and select [Drive Box].

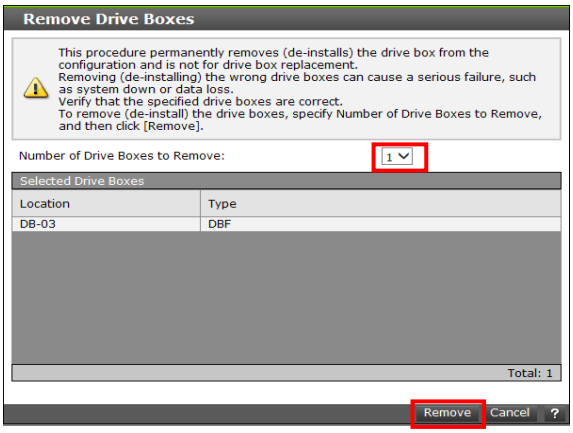


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(2) <Specify Removal Drive Boxes>

Select the number of Drive Boxes to be removed and click the [Remove] button.
When the Controller Chassis is a CBLH, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(3) <Displaying the Password entry window>

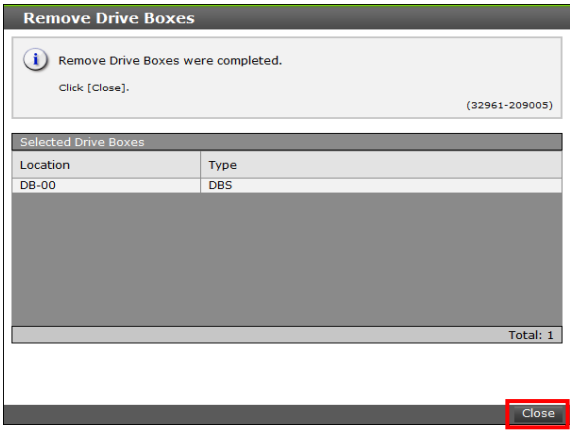
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(4) <Removal Work Start Message>

Check that the following message is displayed and click the [Close] button.
If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



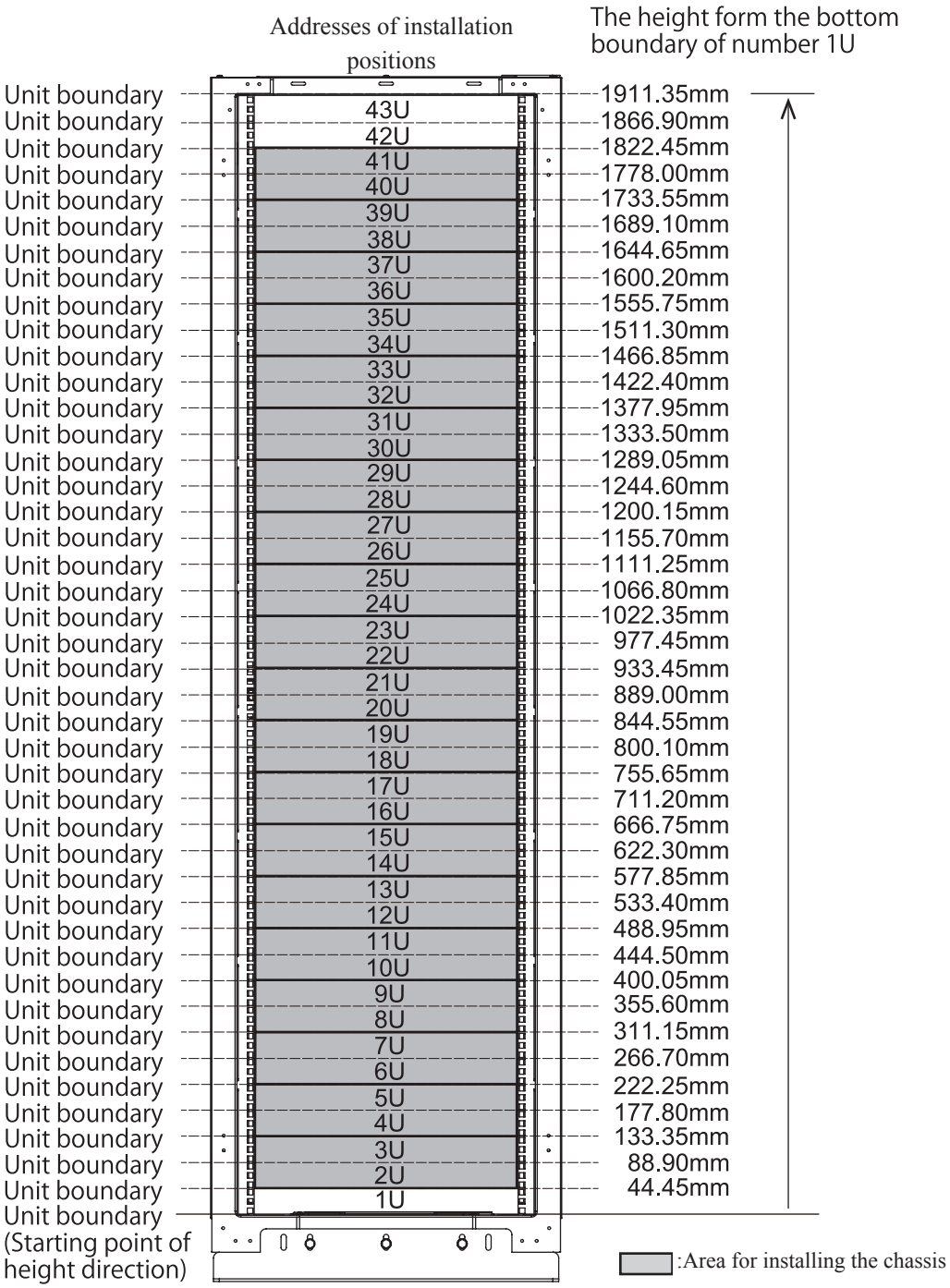
When the Drive Box removal fails, click the [Close] button of the completion message. After that, click the [Drive Box] tab and check the Drive Box status.

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4. Confirming the removal positions

The following figure shows a configuration example of installing Flash Module Drive Boxes.
The mounting location of Flash Module Drive Boxes are different according to the configuration.

Figure 4-49 Mounting Position of Drive Box

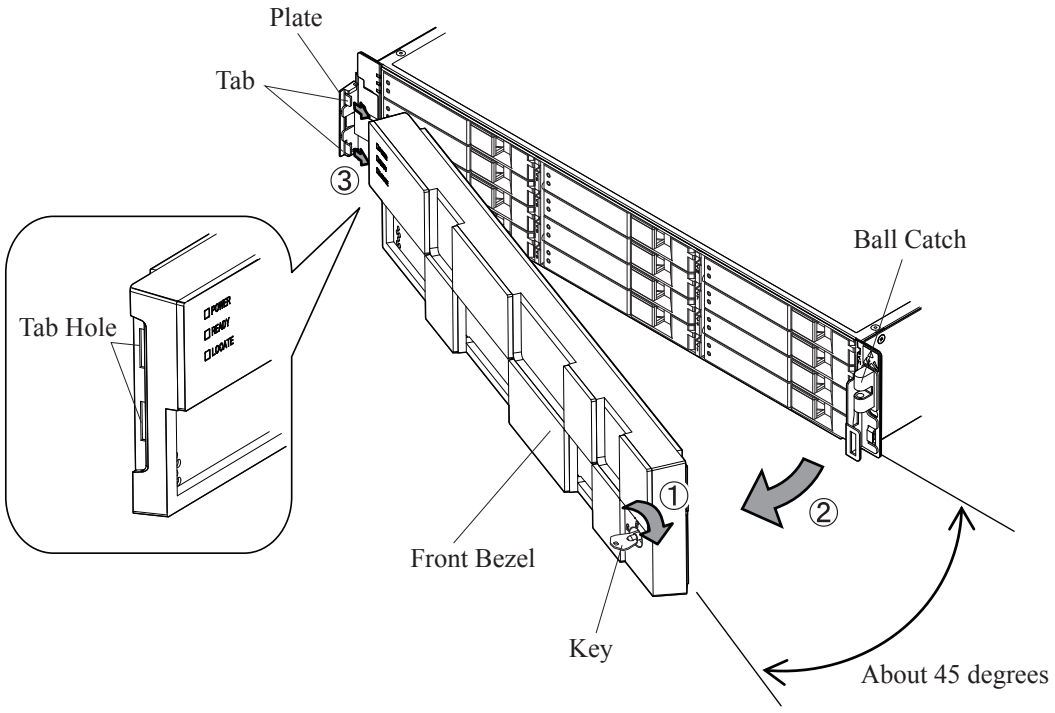


5. Removing the Front Bezel
   (1) Insert the key into the keyhole on the Front Bezel and release the lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right portion of the Front Bezel, and then disengage the right side of the Front Bezel from the ball catch (②).

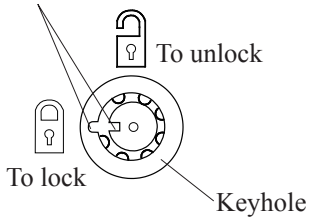
       NOTE : When disengaging the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.
       Do not force the Front Bezel open too wide. Otherwise, a damage of Front Bezel may be caused.

   (3) Disengage the Front Bezel from the left tabs and then remove it (③).

Figure 4-50 Removing Front Bezel



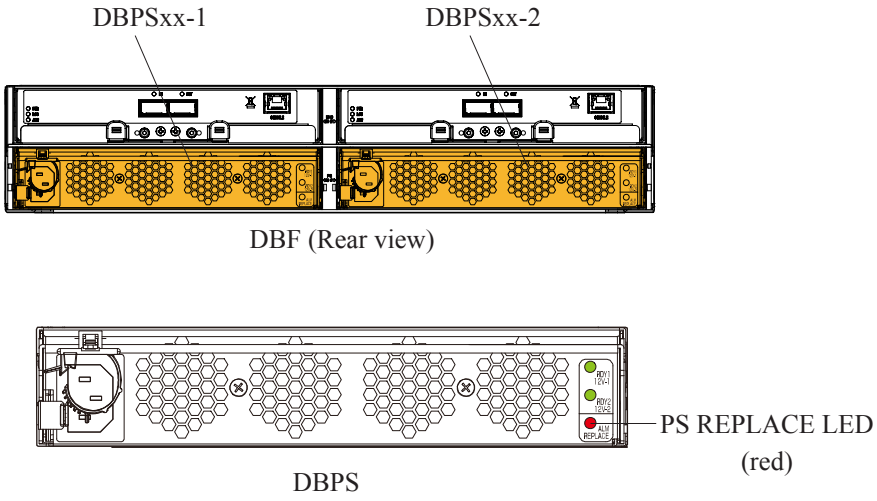
The state in which the slit of the keyhole is aligned with the mark.
(The key can be inserted or pulled out in this state.)



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6. Checking the Drive Box LEDs
   Check that the PS REPLACE LEDs (red) on the DBPS installed in the Drive Box to be removed lights up.

Figure 4-51 PS REPLACE LEDs on DBPS

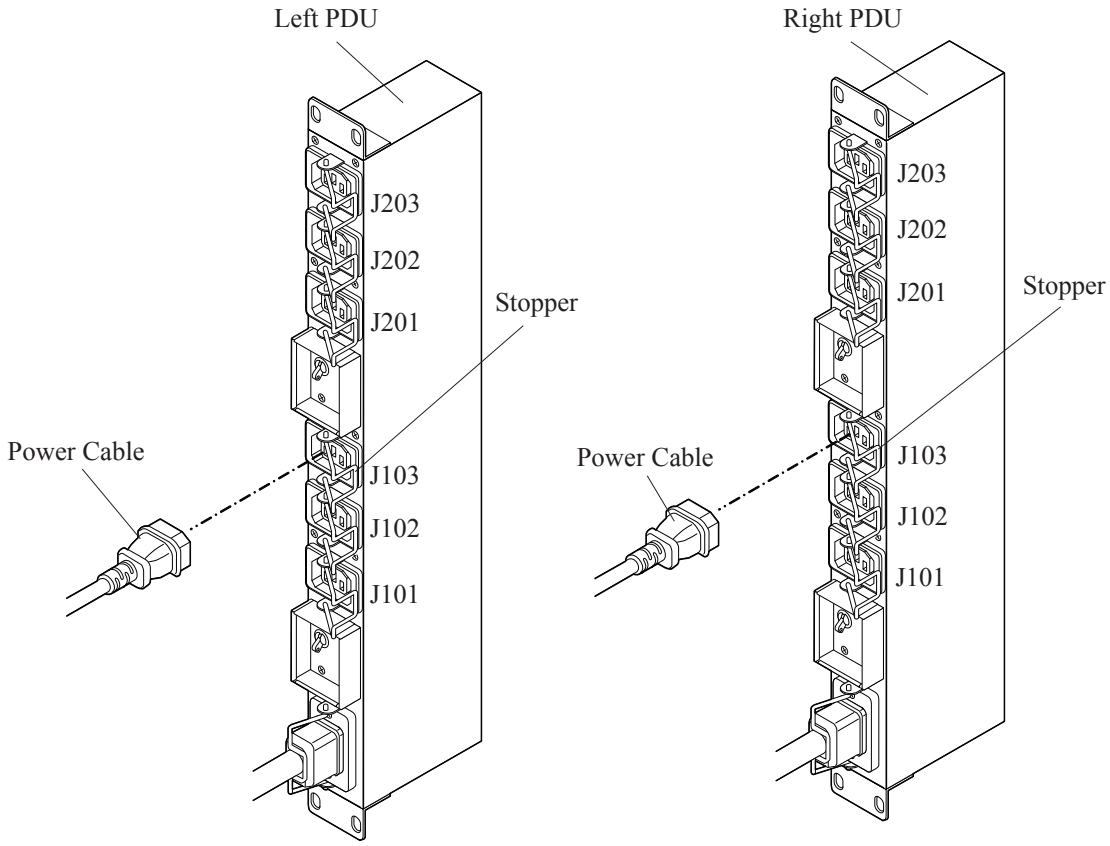


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7. Removing the Power Cables
   (1) Check the connection of the power cables.
   (2) Open the stopper and remove two power cables from the PDU.

Figure 4-52 Removal Example of Power Cables

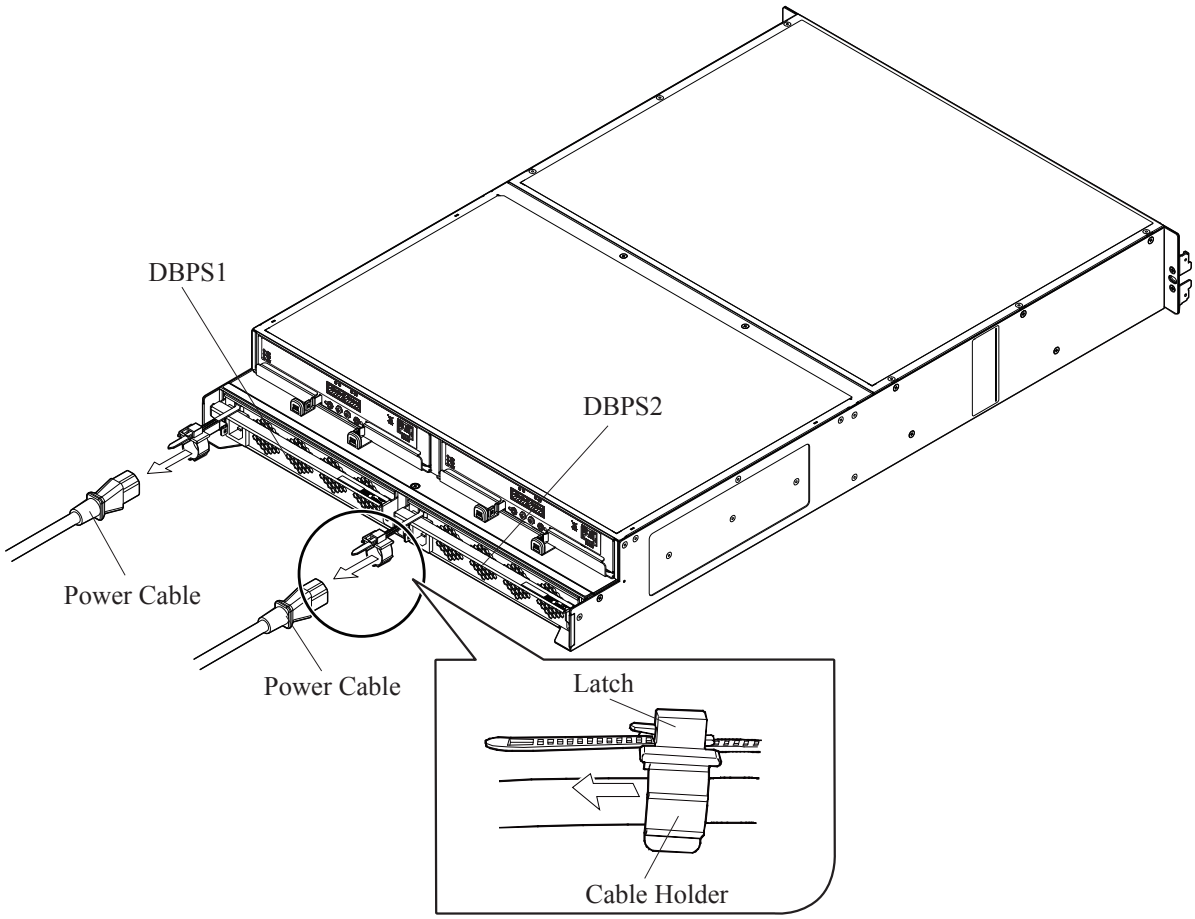
[Removal example (when removing from J103)]



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(3) Lift the latch of the cable holder and pull out the cable holder toward you.
(4) Open the cable holder and remove the two power cables from the DBPS.

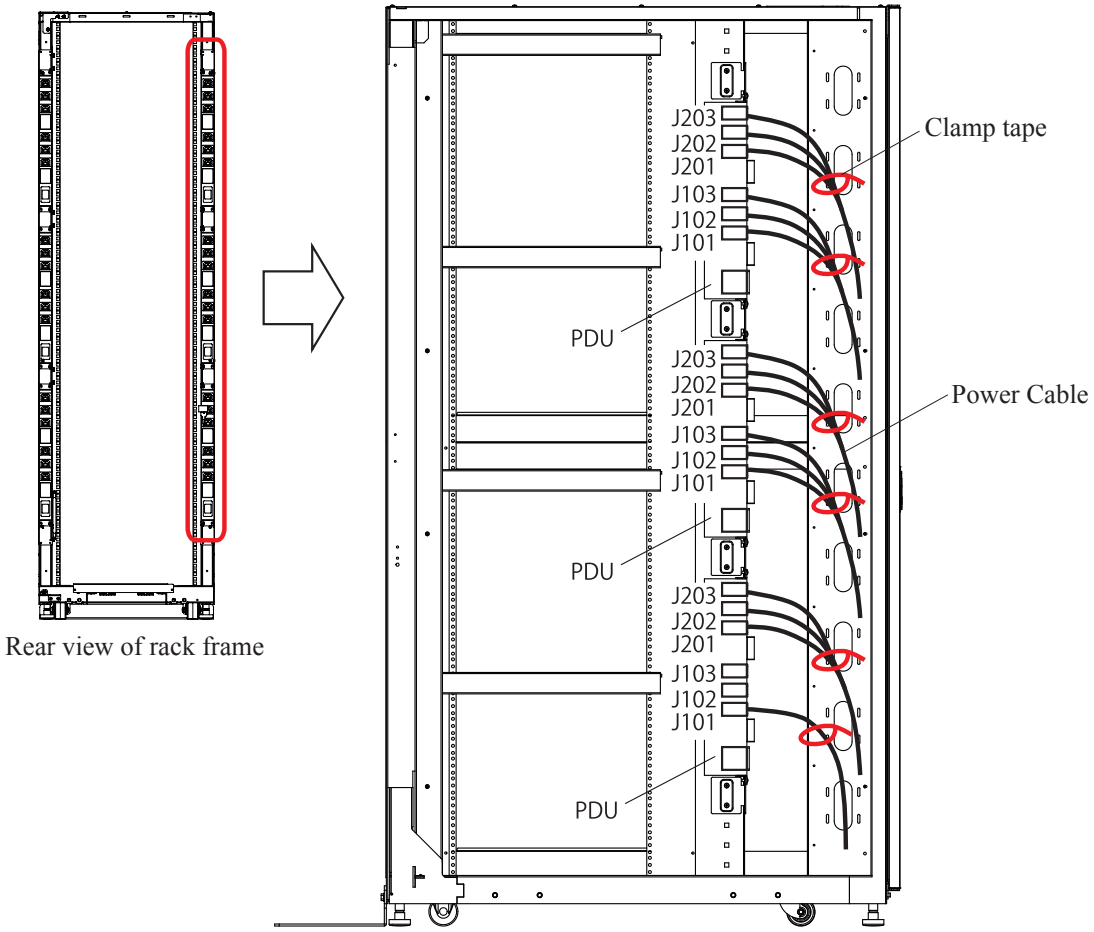
Figure 4-53 Removing Power Cables



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(5) Detach the clamp tapes on the both sides of the rear of the rack frame and remove the power cables.

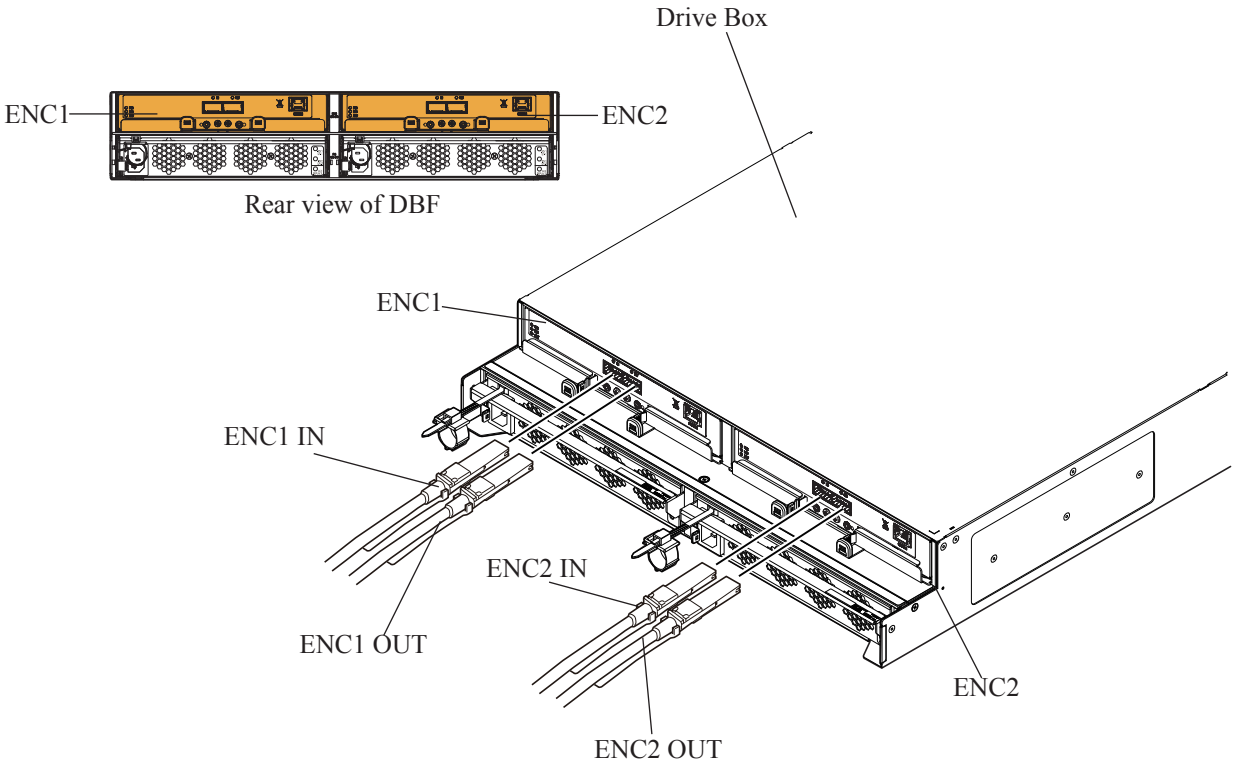
Figure 4-54 Removing Power Cables



*1 : The figure shows fixation of the right side.

8. Removing the SAS Cables
   (1) Remove the SAS cables from the ENC1 on the rear of the Drive Box.
   (2) Remove the SAS cables from the ENC2 on the rear of the Drive Box.

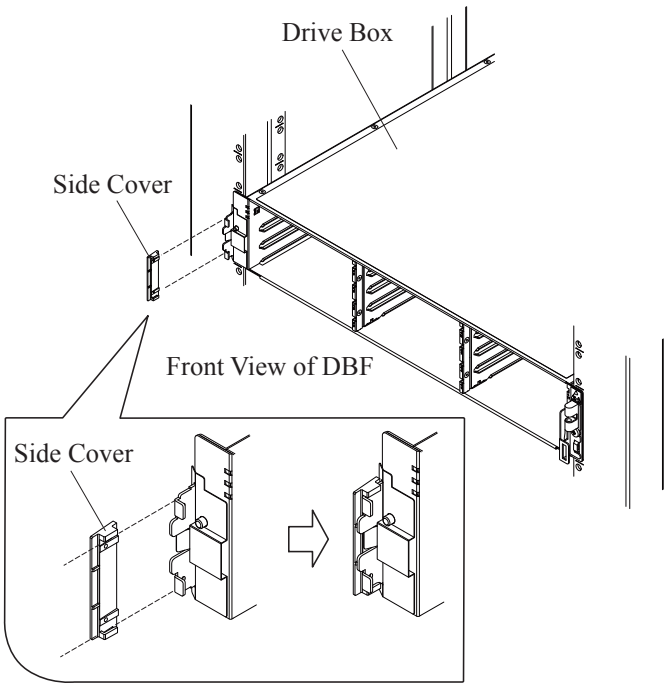
Figure 4-55 Removing SAS Cables



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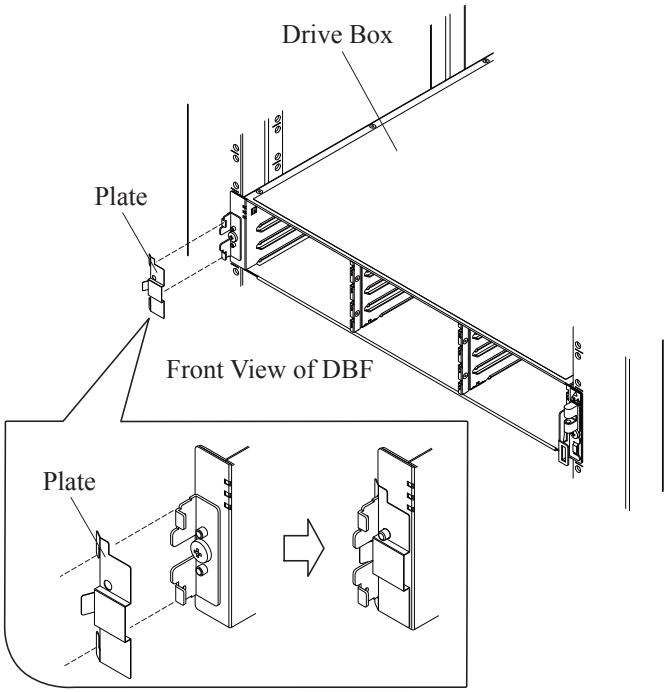
9. Removing the Plate
   (1) Remove the side plate from the left side of the front of the Drive Box.

Figure 4-56 Removing Side Cover



(2) Remove the plate from the left side of the front of the Drive Box.

Figure 4-57 Removing Plate



10. Removing the Parts

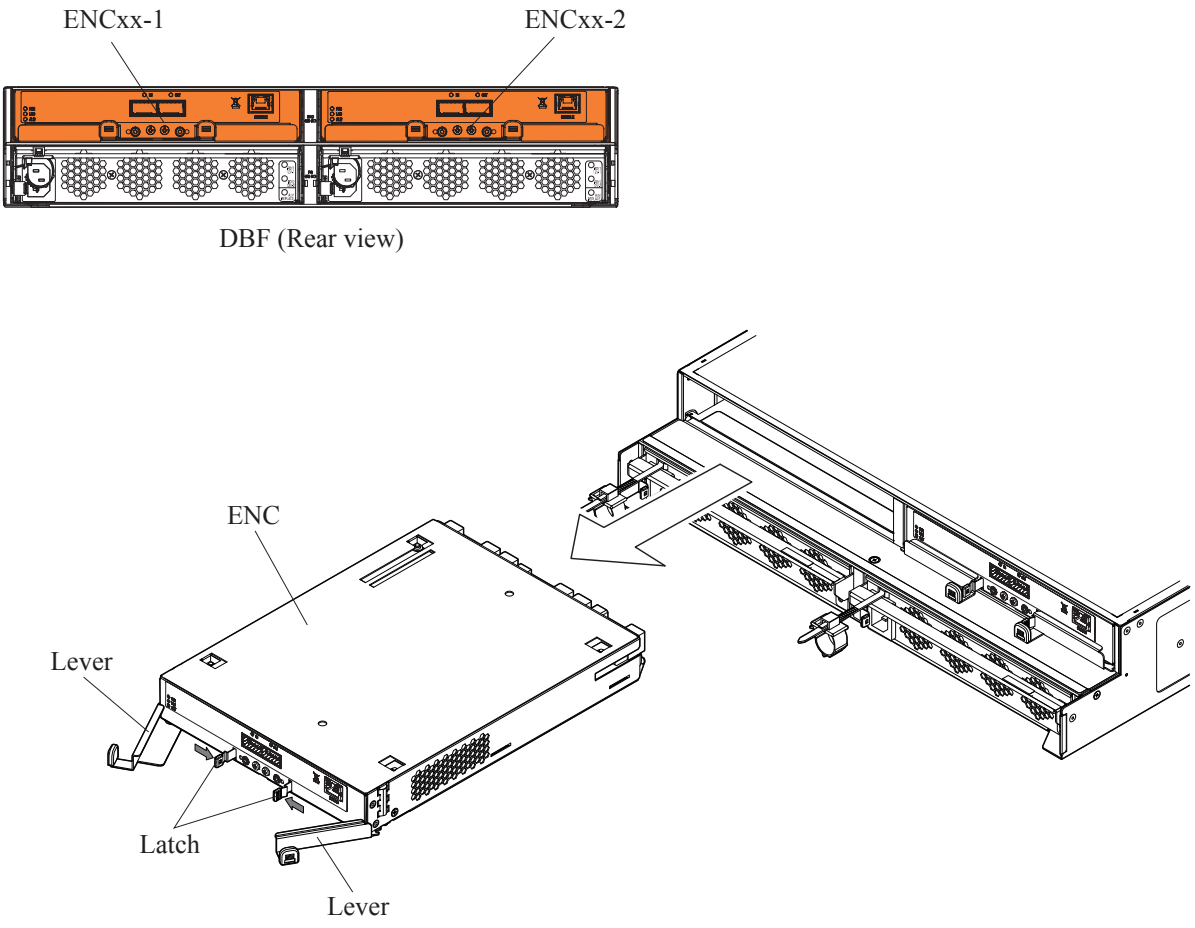
If the Drive Box is removed at a height of 1m or below removed by using the special lifter, this procedure is not required because the Drive Box is removed from the rack frame with its parts mounted. (Go to Step 11.)

If other than above, remove the parts first, and then remove the Drive Box from the rack frame.

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
(2) Press the latches of the ENC inward to unlock the levers.
(3) Open the right and left levers and remove the ENC.
(4) Remove the other ENC in the same manner.

Figure 4-58 Removal of ENC

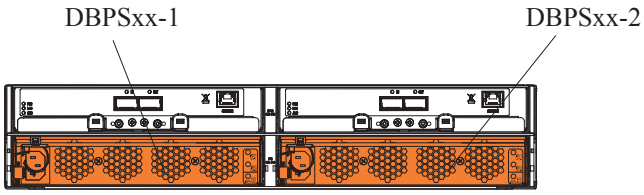


*1 : ENCxx-1
└> DB No. (00, 01, 02, ..., 47)

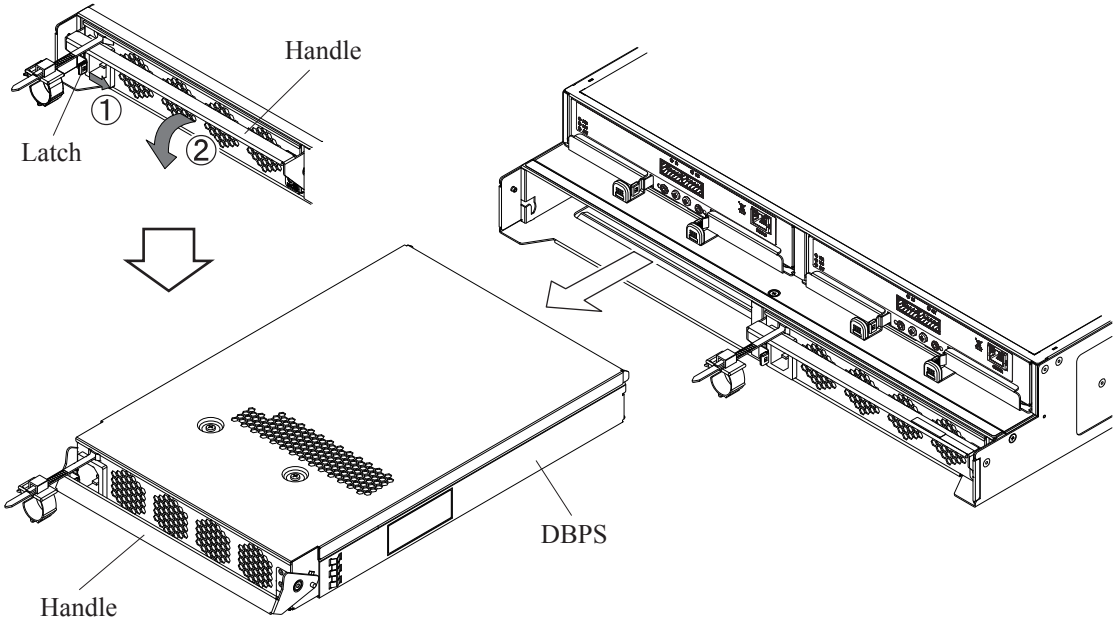
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(5) Push the handle down and forward (②) while pushing the latch of the DBPS inward (①).
(6) Pull the DBPS and remove it from the Drive Box.
(7) Remove the other DBPS in the same manner.

Figure 4-59 Removing DBPS



DBF (Rear view)



*1 : DBPSxx-1
└> DB No. (00, 01, 02, ..., 47)

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11. Removing the Drive Boxes

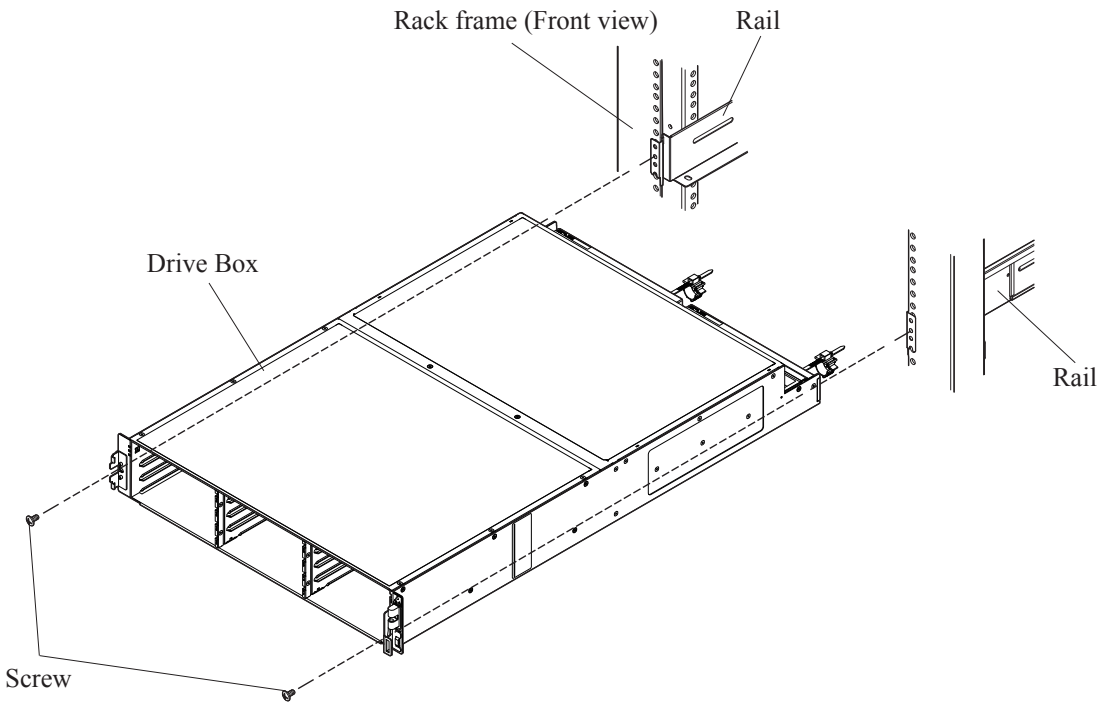
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DBF is about 38 kg.

Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

(1) Remove the two screws from the Drive Box.
(2) Remove the Drive Box from the front side of the rack frame by seeing the mounting procedure using the speciak lifter. (Refer to "2.6.1 Mounting Storage System on a Special Lifter".)

Figure 4-60 Removing Drive Box



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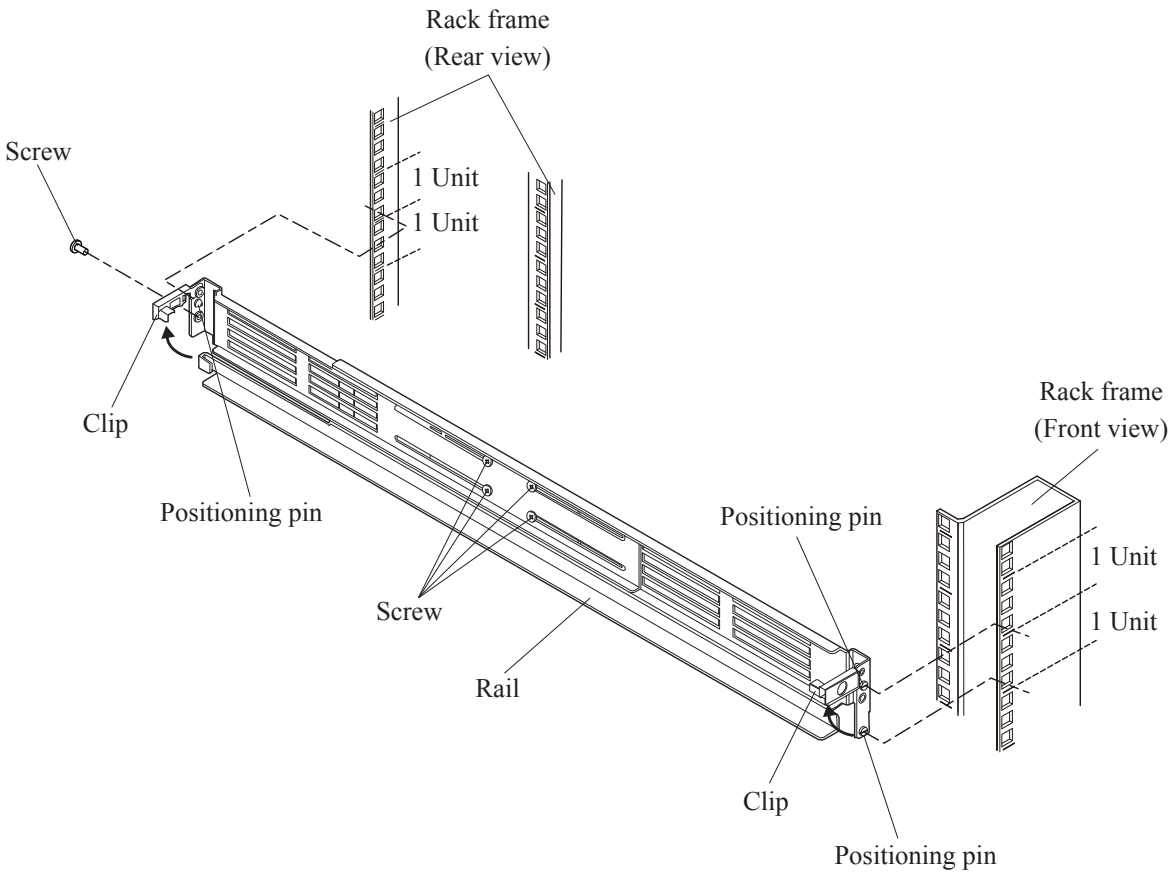
12. Reinstalling the removed parts
    If parts were removed in "10. Removing the Parts", reinstall the removed parts.
    If parts were not removed, go to Step 14.

    (1) Open the handle of the DBPS completely. (Refer to Figure 4-59.)
    (2) Insert the DBPS into the slot and push it to the end.
    (3) Open the handle completely and fix the DBPS.
    (4) Install the other DBPS in the same manner.
    (5) Keep the right and left levers of the ENC open. (Refer to Figure 4-58.)
    (6) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
    (7) Close the right and left levers to insert the ENC completely.
    (8) Install the other ENC in the same manner.

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13. Removing the Slide Rails
    (1) Remove the screw from the rear side of rail.
    (2) Loosen the four screws on the rail.
    (3) Open the clips on the rail and remove them.
    (4) Remove the positioning pins on the rail from the rack and remove the rail.
    (5) Remove the other rail in the similar procedure.

Figure 4-61 Removing Slide Rails



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14. Refer to MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

15. Disconnecting the Maintenance PC and the Storage System.
    Remove the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

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4.5 Removing Channel Boards (CHB)

When removing Channel Boards, the window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

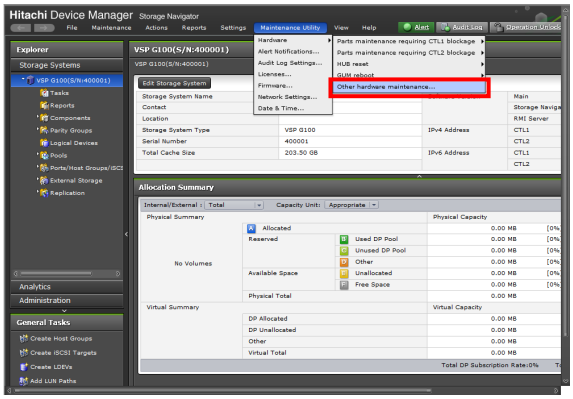
- When removing Channel Boards from the CBSS/CBSL:
  "4.5.1 Removing Channel Boards for CBSS/CBSL"
- When removing Channel Boards from the CBLM/CBLH:
  "4.5.2 Removing Channel Boards for CBLM/CBLH"
- When removing Channel Boards from the Channel Board Box:
  "4.5.3 Removing Channel Boards for Channel Board Box"

4.5.1 Removing Channel Boards for CBSS/CBSL

NOTE : • You cannot remove the Channel Boards to which the LUN paths are assigned. Before removing them, refer to MAINTENANCE PC SECTION "4.2.3.8 Releasing Logical Device Assignments" and release the assignment of the LUN paths.
• Remove the Channel Boards so that Controller Boards 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

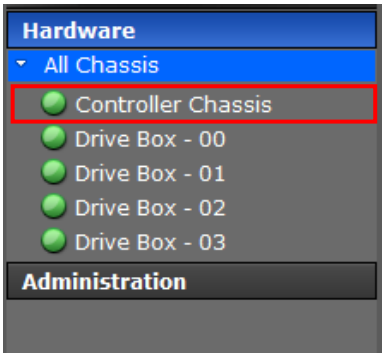


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3. Selecting removal parts by Maintenance Utility

NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

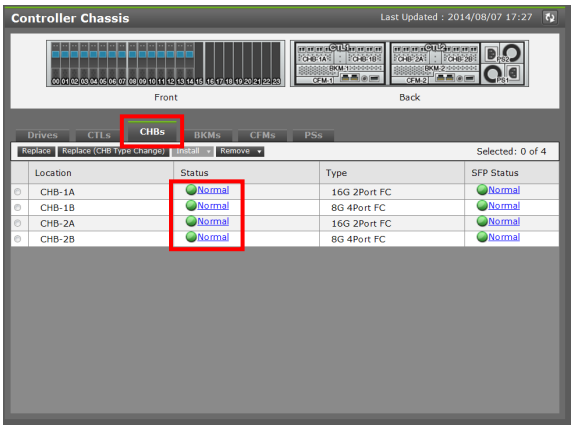
(1) <Main Window>
Click the [Controller Chassis] tab in the main window.



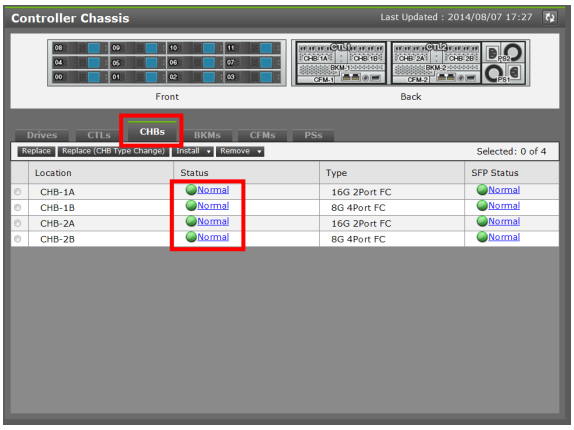
(2) <Controller Chassis Window>
Click the [CHBs] tab in the “Controller Chassis” window and display the Channel Board status.

NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.

• In case of CBSS



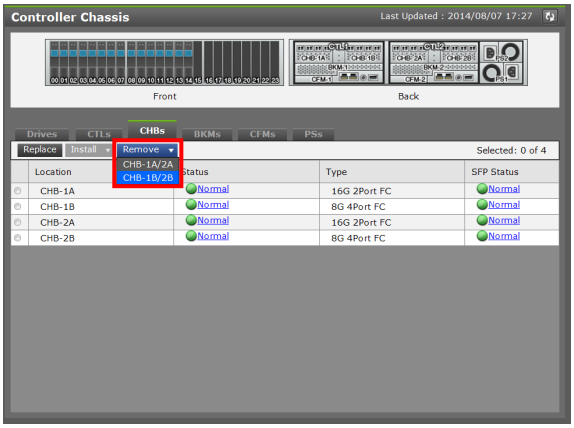
• In case of CBSL



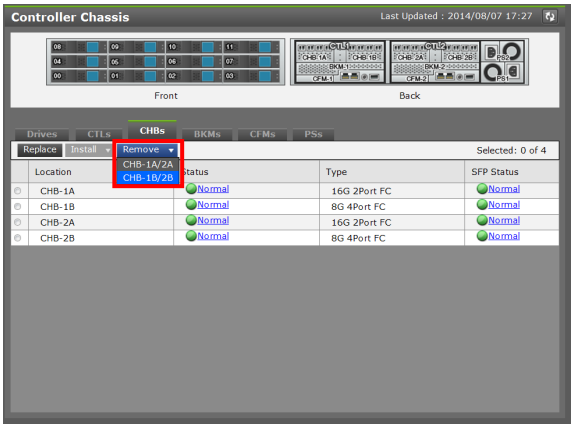
(3) <Select Channel Board>

Select the Channel Boards to be removed and click the [Remove] button.

• In case of CBSS



• In case of CBSL



(4) <Channel Board Removal Execution Window>

⚠ CAUTION

About "Forcibly run without safety checks":

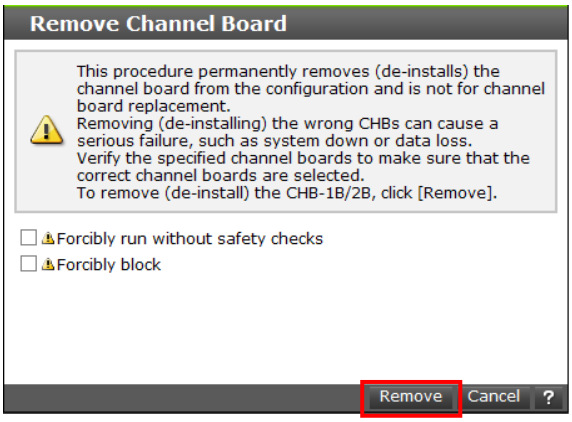
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

About "Forcibly block":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the contact described in the manual.

Check the Channel Boards to be removed and click the [Remove] button.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Displaying the Password entry window>

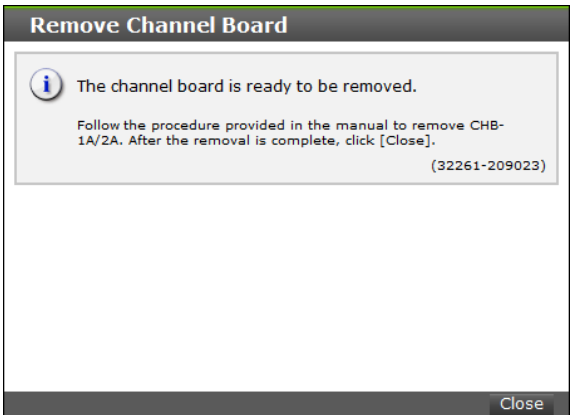
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(6) <Removal Work Start Message>
Check that the following message is displayed.
If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the removal work.

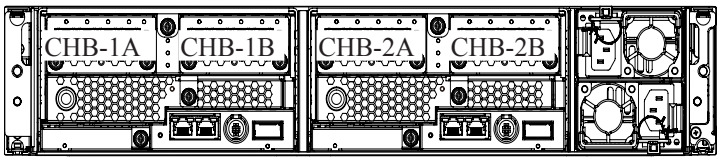


When the Channel Board removal fails, click the [Close] button of the completion message. After that, click the [CHBs] tab in the "Controller Chassis" window and check the Channel Board status.

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4. Removal work of Channel Boards for CBSS/CBSL
   Remove the Channel Boards in the same positions of Controller Boards 1 and 2 at the same time.

Location	Removal part name		Parts name
Rear View of CBSS/CBSL	1	Channel Board	• DW-F800-4HF8 (8 G FC) • DW-F800-2HF16 (16 G FC) • DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



CBSS/CBSL (Rear view)

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

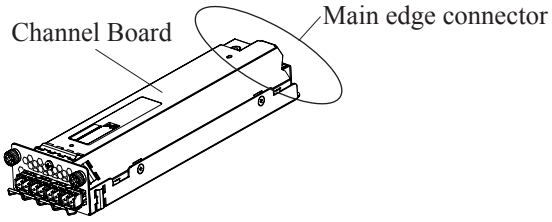
(1) Remove the cable from the Channel Boards to be removed.

(2) Removing Channel Boards.

⚠ CAUTION

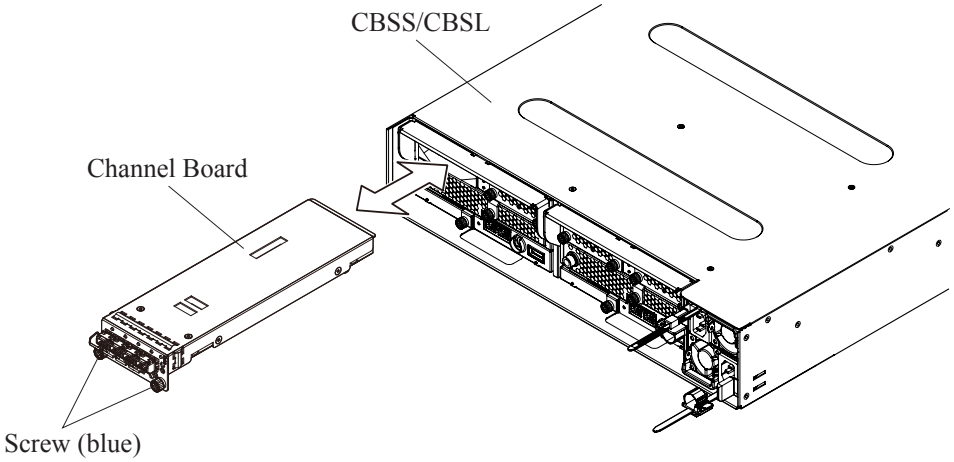
Install the Channel Board (CHB) for CBSS/CBSL upside down.

NOTICE: When removing the Channel Board, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen two screws (blue) fixing the Channel Board to be removed.
(b) Hold the screws (blue) and pull out and remove the Channel Board.
(c) Installing a dummy into the removed slot.
Two types of dummies exist, which are installed in different ways.
• Metal dummy
(i) Insert a dummy into the removed slot.
(ii) Tighten two screws (blue) and fix the dummy.
• Plastic dummy
(i) Insert the dummy into the slot to the end from which the Channel Board (CHB) has been removed.

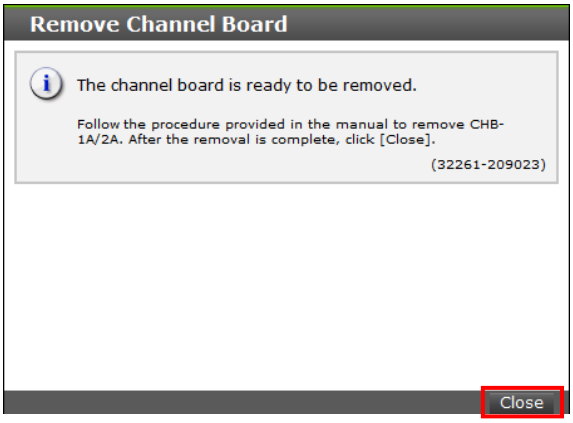
Figure 4-62 Removing Channel Boards (CBSS/CBSL)



(3) After completing the work of both Controller Boards 1 and 2, go to Step 5.

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5. <Check Removal Completion>
   (1) Click the [Close] button in the “Remove Channel Board” window.



   (2) Refer to MAINTENANCE PC SECTION “1.8.2.4 Close the Window” to close the window.

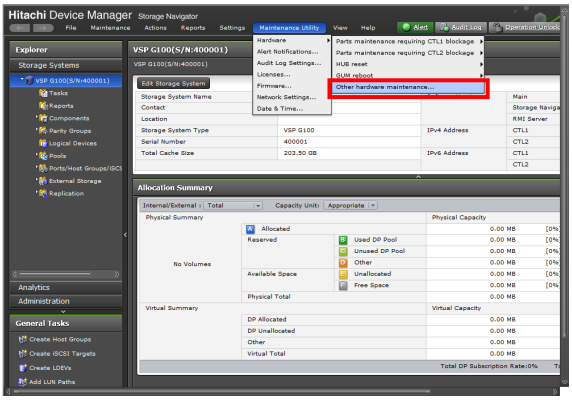
6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.

4.5.2 Removing Channel Boards for CBLM/CBLH

NOTE : • You cannot remove the Channel Boards to which the LUN paths are assigned. Before removing them, refer to MAINTENANCE PC SECTION "4.2.3.8 Releasing Logical Device Assignments" and release the assignment of the LUN paths.
• Remove the Channel Boards so that Controller Boards 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

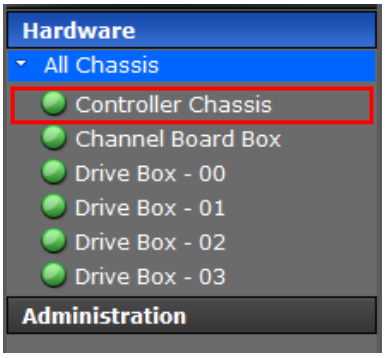


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3. Selecting removal parts by Maintenance Utility

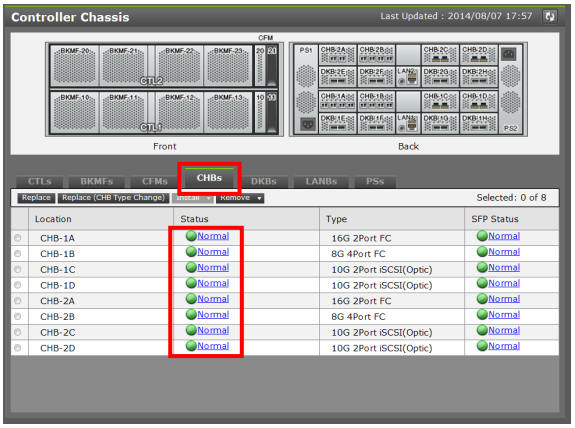
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Main Window>
Click the [Controller Chassis] tab in the main window.

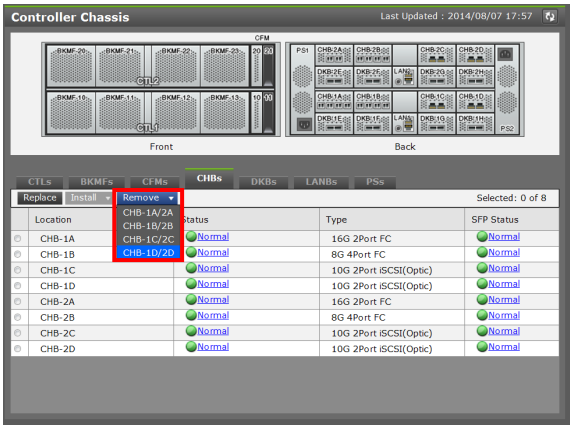


(2) <Controller Chassis Window>
Click the [CHBs] tab in the “Controller Chassis” window and display the Channel Board status.

NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.



(3) <Select Channel Board>
Click the [Remove] button and select the Channel Boards to be removed.



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(4) <Channel Board Removal Execution Window>

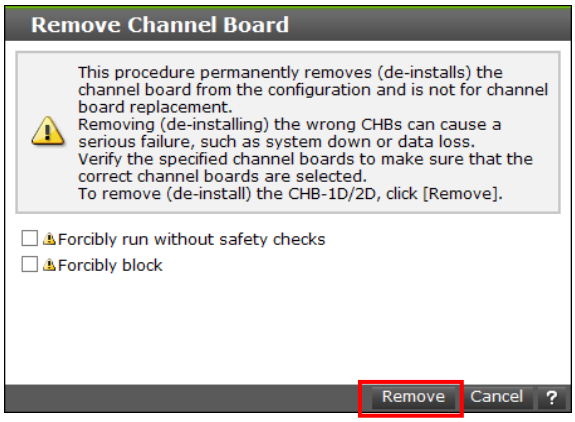
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

About "Forcibly block":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the contact described in the manual.

Check the Channel Boards to be removed and click the [Remove] button.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(5) <Displaying the Password entry window>

⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

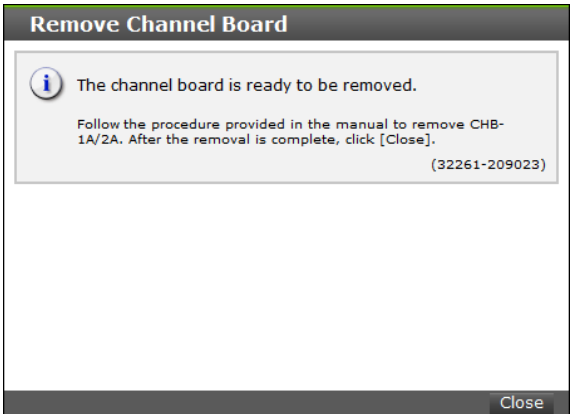
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(6) <Removal Work Start Message>

Check that the following message is displayed.

If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the removal work.

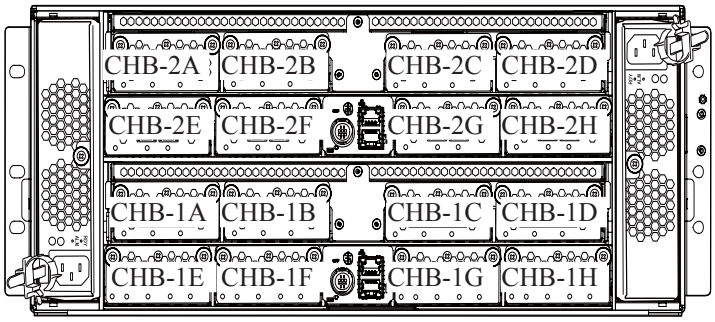


When the Channel Board removal fails, click the [Close] button of the completion message. After that, click the [CHBs] tab in the "Controller Chassis" window and check the Channel Board status.

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4. Removal work of Channel Boards for CBLM/CBLH
   Remove the Channel Boards in the same positions of Controller Boards 1 and 2 at the same time.

Location	Removal part name		Parts name
Rear View of CBLM/CBLH	1	Channel Board	• DW-F800-4HF8 (8 G FC) • DW-F800-2HF16 (16 G FC) • DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



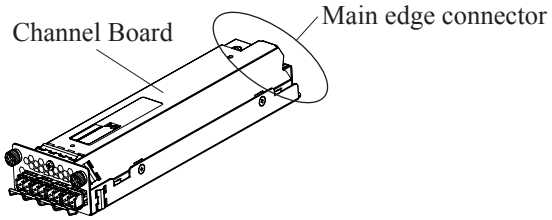
CBLM/CBLH (Rear view)

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Remove the cable from the Channel Boards to be removed.

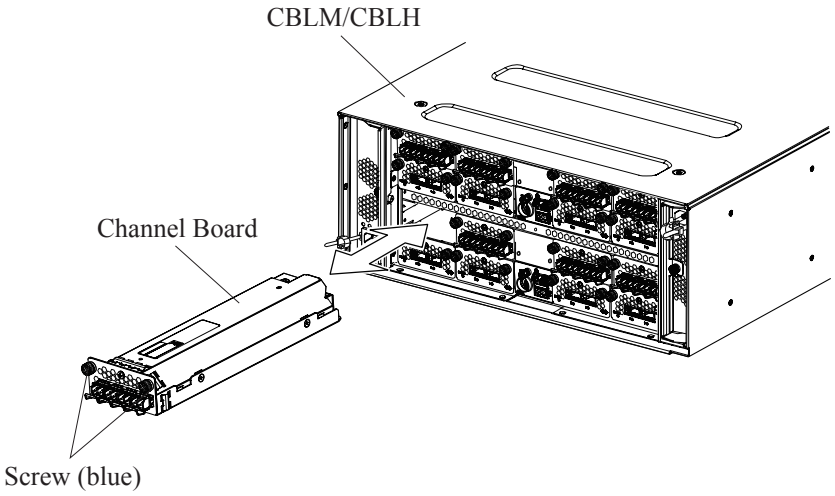
(2) Removing Channel Boards.

NOTICE: When removing the Channel Board, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen two screws (blue) fixing the Channel Board to be removed.
(b) Hold the screws (blue) and pull out and remove the Channel Board.
(c) Installing a dummy into the removed slot.
Two types of dummies exist, which are installed in different ways.
• Metal dummy
(i) Insert a dummy into the removed slot.
(ii) Tighten two screws (blue) and fix the dummy.
• Plastic dummy
(i) Insert the dummy into the slot to the end from which the Channel Board (CHB) has been removed.

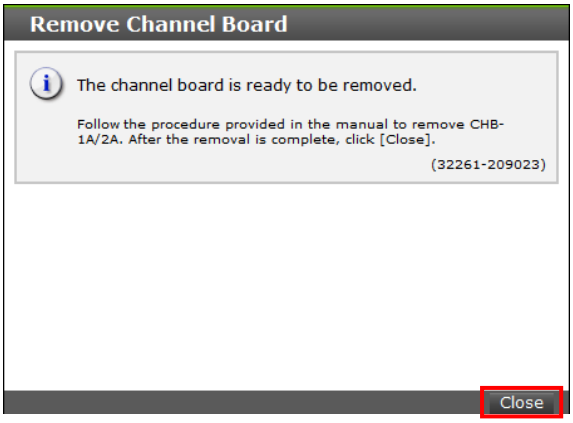
Figure 4-63 Removing Channel Boards (CBLM/CBLH)



(3) After completing the work of both Controller Boards 1 and 2, go to Step 5.

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5. <Check Removal Completion>
   (1) Click the [Close] button in the “Remove Channel Board” window.



   (2) Refer to MAINTENANCE PC SECTION “1.8.2.4 Close the Window” to close the window.

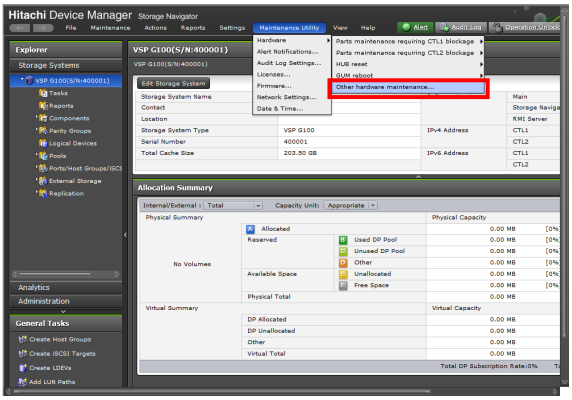
6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.

4.5.3 Removing Channel Boards for Channel Board Box

NOTE : • You cannot remove the Channel Boards to which the LUN paths are assigned. Before removing them, refer to MAINTENANCE PC SECTION "4.2.3.8 Releasing Logical Device Assignments" and release the assignment of the LUN paths.
• Remove the Channel Boards so that Switch Packages 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

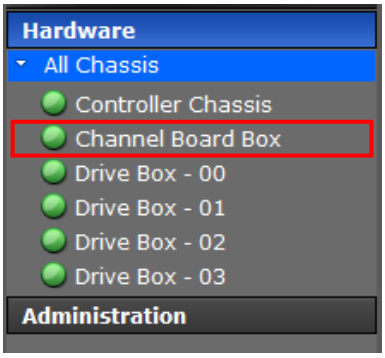


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3. Selecting removal parts by Maintenance Utility

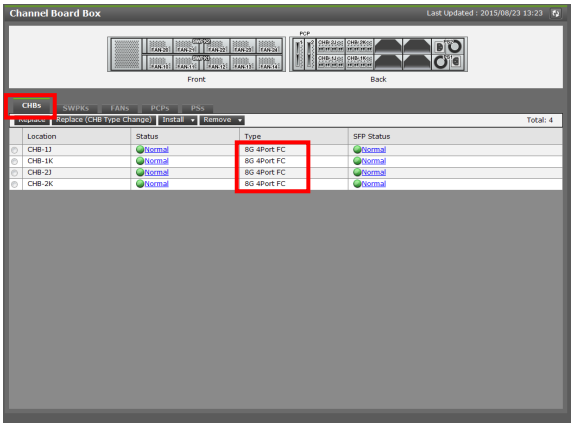
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Main Window>
Click the [Channel Board Box] tab in the main window.

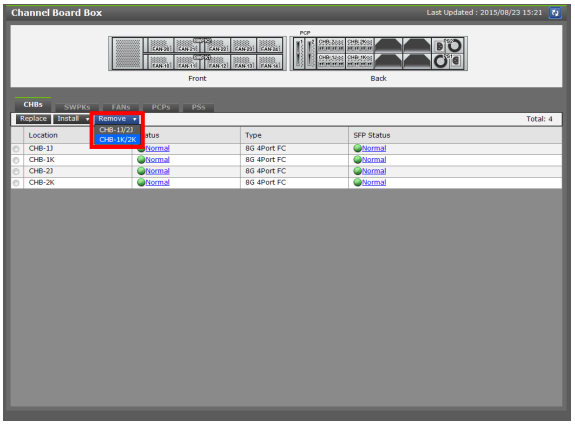


(2) <Channel Board Box Window>
Click the [CHBs] tab in the “Channel Board Box” window and display the Channel Board status.

NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.



(3) <Select Channel Board>
Click the [Remove] button and select the Channel Boards to be removed.



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(4) <Channel Board Removal Execution Window>

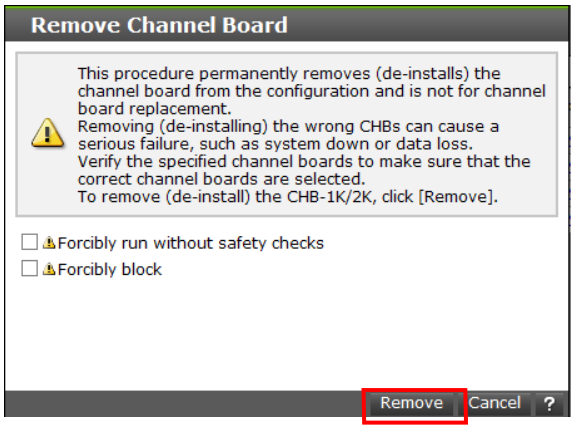
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

About "Forcibly block":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the contact described in the manual.

Check the Channel Boards to be removed and click the [Remove] button.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(5) <Displaying the Password entry window>

⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

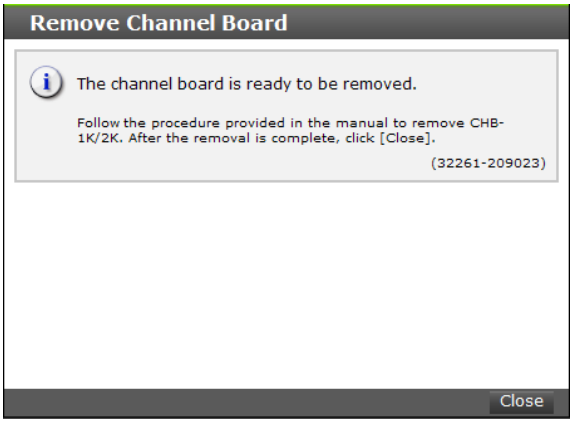
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(6) <Removal Work Start Message>

Check that the following message is displayed.

If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the removal work.

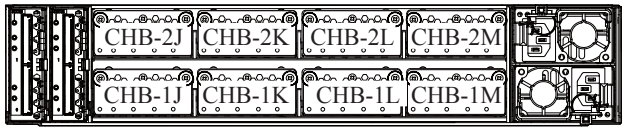


When the Channel Board removal fails, click the [Close] button of the completion message. After that, click the [CHBs] tab in the "Channel Board Box" window and check the Channel Board status.

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4. Removal work of Channel Boards for CHBB

Location	Removal part name		Parts name
Rear View of CHBB	1	Channel Board	• DW-F800-4HF8 (8 G FC) • DW-F800-2HF16 (16 G FC) • DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



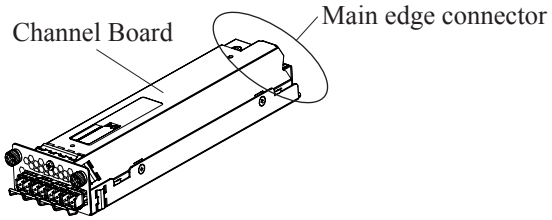
CHBB (Rear view)

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Remove the cable from the Channel Boards to be removed.

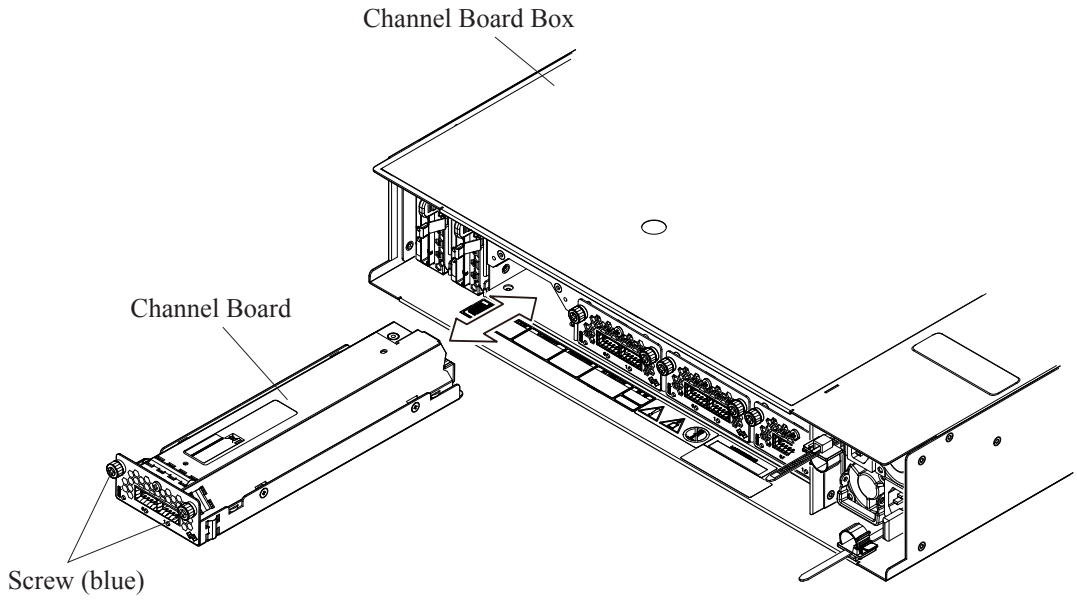
(2) Removing Channel Boards.

NOTICE: When removing the Channel Board, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen two screws (blue) fixing the Channel Board to be removed.
(b) Hold the screws (blue) and pull out and remove the Channel Board.
(c) Installing a dummy into the removed slot.
Two types of dummies exist, which are installed in different ways.
• Metal dummy
(i) Insert a dummy into the removed slot.
(ii) Tighten two screws (blue) and fix the dummy.
• Plastic dummy
(i) Insert the dummy into the slot to the end from which the Channel Board (CHB) has been removed.

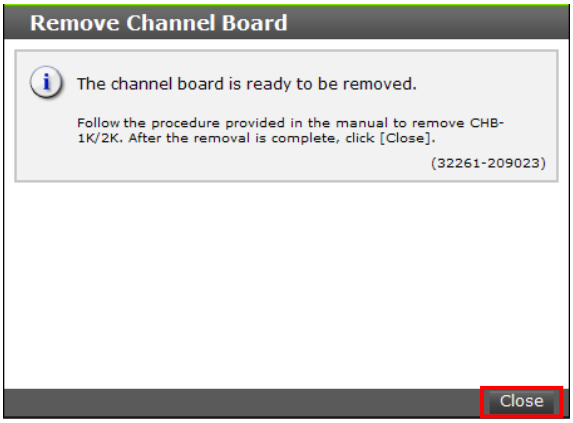
Figure 4-64 Removing Channel Boards (CHBB)



(3) After completing the work of both Switch Package 1 and 2, go to Step 5.

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5. <Check Removal Completion>
   (1) Click the [Close] button in the “Remove Channel Board” window.



   (2) Refer to MAINTENANCE PC SECTION “1.8.2.4 Close the Window” to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.

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4.6 Removing NAS Module

NOTICE:	To remove NAS Modules, all I/O need to stop because the Storage System restarts. Stop all I/O, and then remove NAS Modules.

4.6.1 Removing NAS Module for CBLM/CBLH

NOTE: Remove the NAS Modules so that Controller Board 1 and Controller Board 2 have the same configuration.

1. Removing the NAS Unified Firmware
   - See "7.2 Removing the NAS Unified Firmware" to remove the NAS Unified Firmware.

---

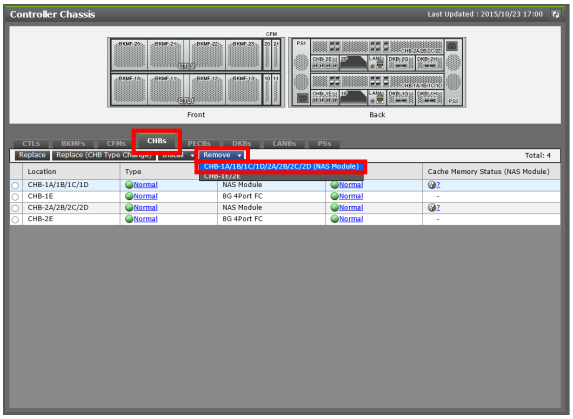
2. Removing the NAS Module Unit

   (1) Connecting the Maintenance PC
   Connect the Maintenance PC and the Storage System.
   To remove NAS modules, connect the Maintenance PC and Controller Board 1.
   - See "1.6.1 Attachment / Removal Procedure of Maintenance PC" to connect the Maintenance PC and the Controller Board via LAN cables.

   (2) Starting Maintenance Utility
   (a) See "1.6.2 Connecting to the Storage System" to start Web Console.
   (b) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance...] in the "Web Console" window displays the "Maintenance Utility" window.

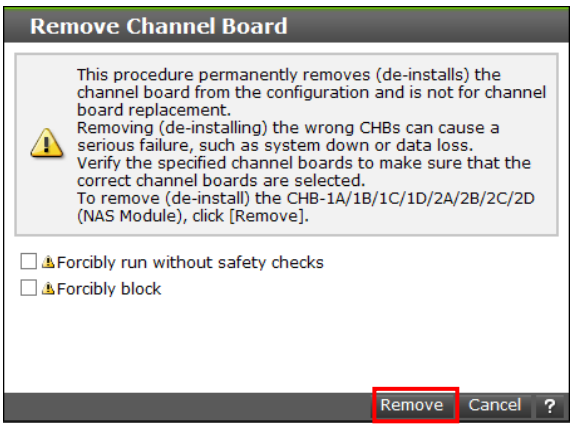
   (3) Selecting the NAS Modules to be removed
   (a) Click the [CHBs] tab – the [Remove] button to select "CHB-1A/1B/1C/1D/2A/2B/2C/2D (NAS Module)".

   NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.

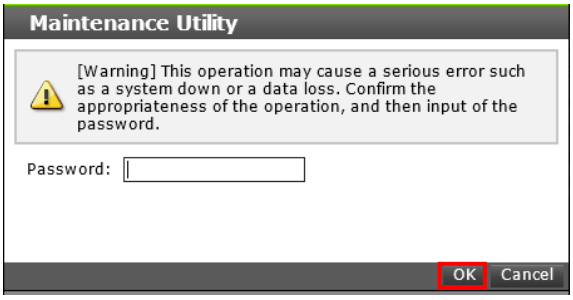


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(b) Check “NAS Module” to be removed and click the [Remove] button.

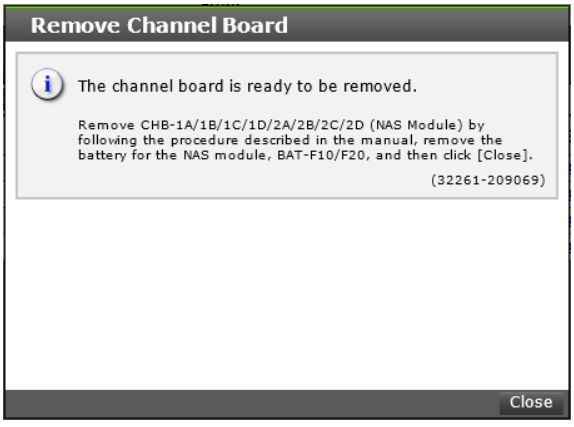


(c) The password input window is displayed. Enter the password and click [OK] button.



(d) Check the completion of removal preparation.
Check that the NAS Modules are ready to be removed.

NOTE: Do not click the [Close] button at this time.
Complete the removal work of the NAS Modules, and then click the [Close] button.



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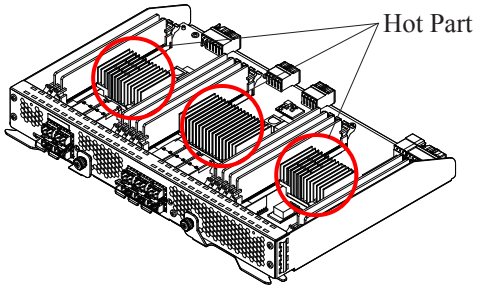
(4) Removal work of the NAS Modules

Remove the NAS Modules of the CHB ports 1A/1B/1C/1D and 2A/2B/2C/2D on the rear of the CBLM/CBLH.

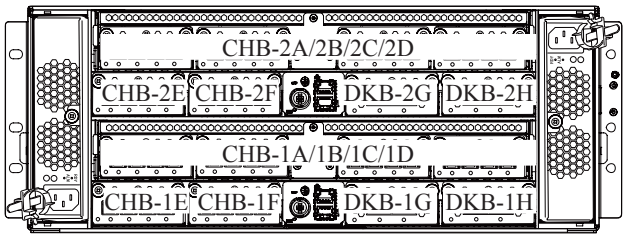
⚠ CAUTION

Be careful of a hot part:

A NAS Module that has been just removed from the storage system in operation has a hot heatsink part. Be careful not to touch the hot part.



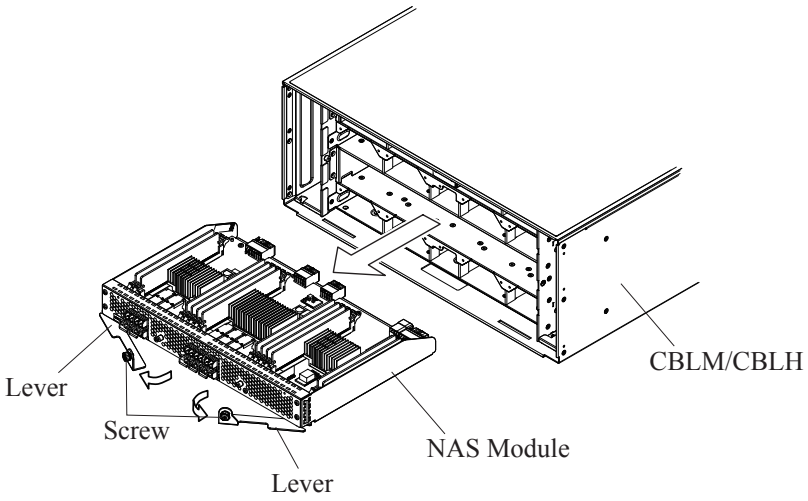
Location	Removal part name		Parts name
Rear View of CBLM/CBLH	1	NAS Module	DW-F800-NAS



CBLM/CBLH (Rear view)

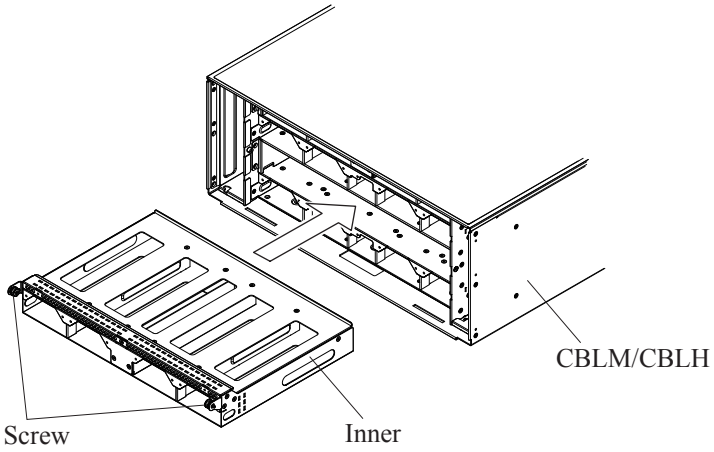
(a) Remove the NAS Module of the CHB ports (1A/1B/1C/1D or 2A/2B/2C/2D).
(i) Loosen the screws (two places)
(ii) Open the lever of the NAS Module.
(iii) Remove the NAS Module from the slot.

Figure 4-65 Removing the NAS Module



(b) Install the Inner in the slot where the NAS Module was removed.
Tighten the screws (two places) to fix the Inner.

Figure 4-66 Installing the Inner

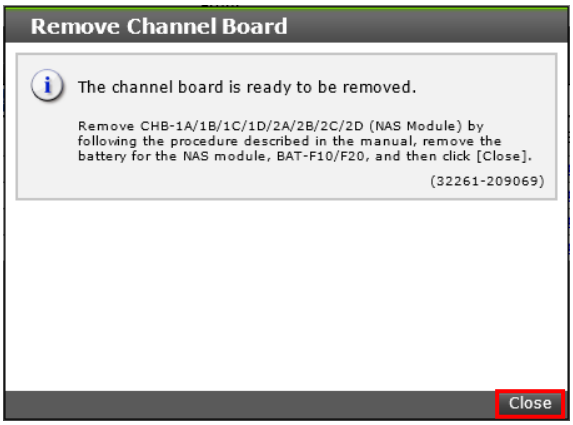


(c) Remove the NAS Modules of the CHB ports 1A/1B/1C/1D and 2A/2B/2C/2D in the procedures of Step (a) and Step (b).

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(5) Removing batteries for NAS Modules
Remove batteries for NAS Modules.
See "4.8.3 Removing Batteries for NAS Modules (CBLM/CBLH)" for the details of the removal procedure.

(6) Checking the completion of the NAS Module removal in Maintenance Utility
Click the [Close] button in the removal completion window.



(7) See MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

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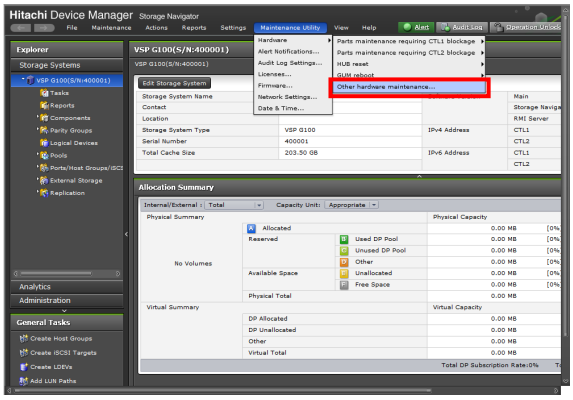
4.7 Removing Disk Board (DKB)

4.7.1 Removing Disk Boards for CBLM/CBLH

NOTE : Remove the Disk Boards so that Controller Boards 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Disk Boards, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.

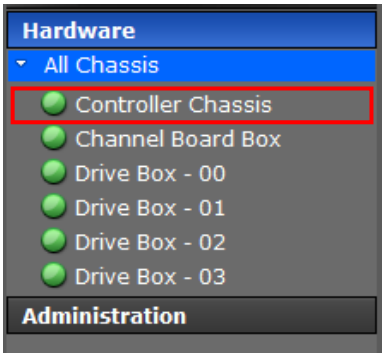
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “1.6.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



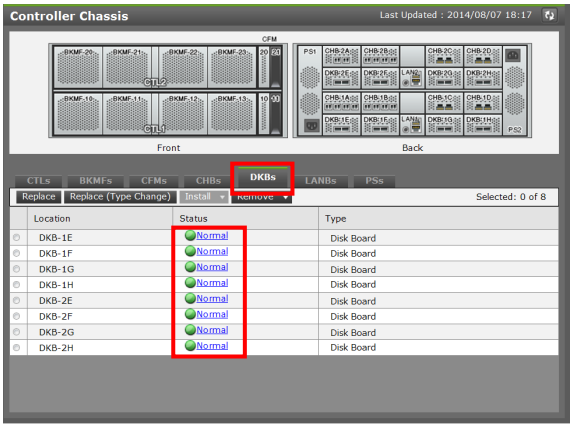
3. Selecting removal parts by Maintenance Utility

NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

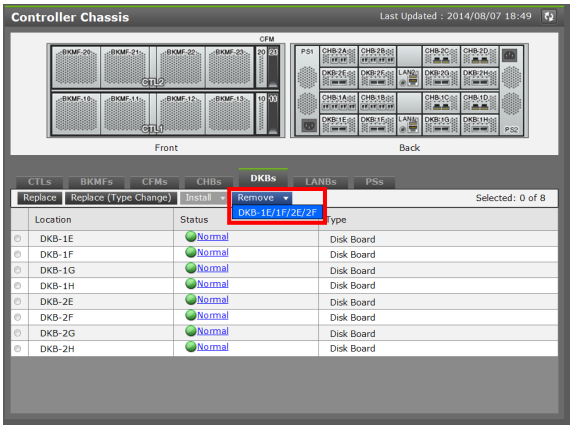
(1) <Main Window>
Click the [Controller Chassis] tab in the main window.



(2) <Controller Chassis Window>
Click the [DKBs] tab in the Controller Chassis window and display the Disk Board status.



(3) <Select Disk Board>
Click the [Remove] button and select the Disk Boards to be removed.



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(4) <Disk Board Removal Execution Window>

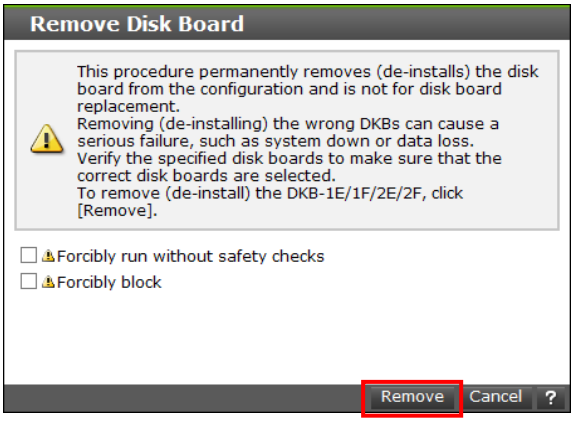
CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

About "Forcibly block":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the contact described in the manual.

Check the Disk Boards to be removed and click the [Remove] button.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(5) <Displaying the Password entry window>

CAUTION

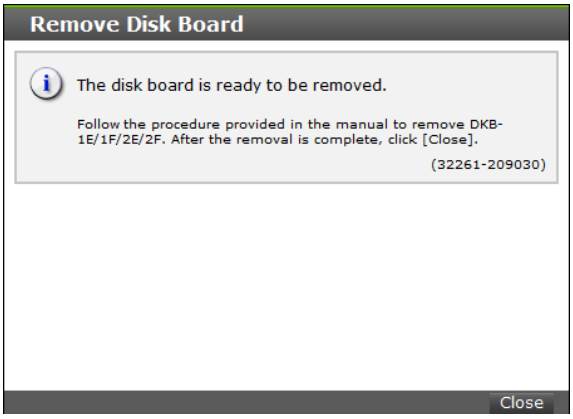
This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

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(6) <Removal Work Start Message>
Check that the following message is displayed.
If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the removal work.

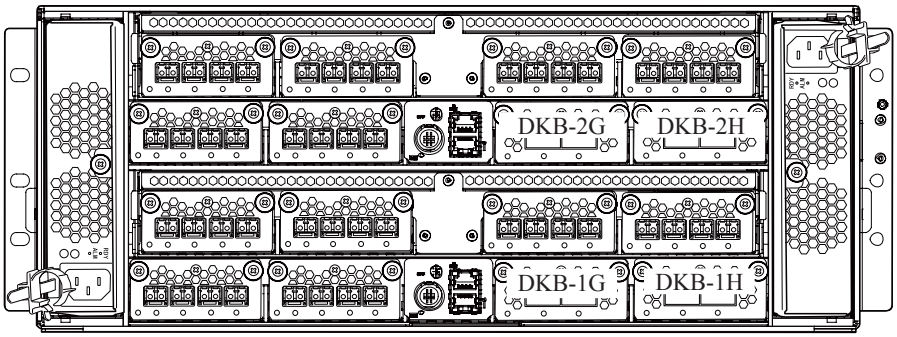


When the Disk Board removal fails, click the [Close] button of the completion message. After that, click the [DKBs] tab in the "Controller Chassis" window and check the Disk Board status.

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4. Removal work of Disk Boards for CBLM/CBLH
   Remove the Disk Boards in the same positions of Controller Boards 1 and 2 at the same time.

Location	Removal part name		Parts name
Rear View of CBLM/CBLH	1	Disk Board	DW-F800-BS12G DW-F800-BS12GE



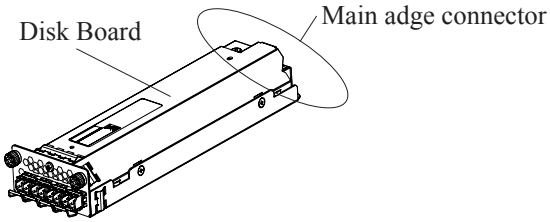
CBLM/CBLH (Rear view)

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Remove the SAS cable from the Disk Boards to be removed.

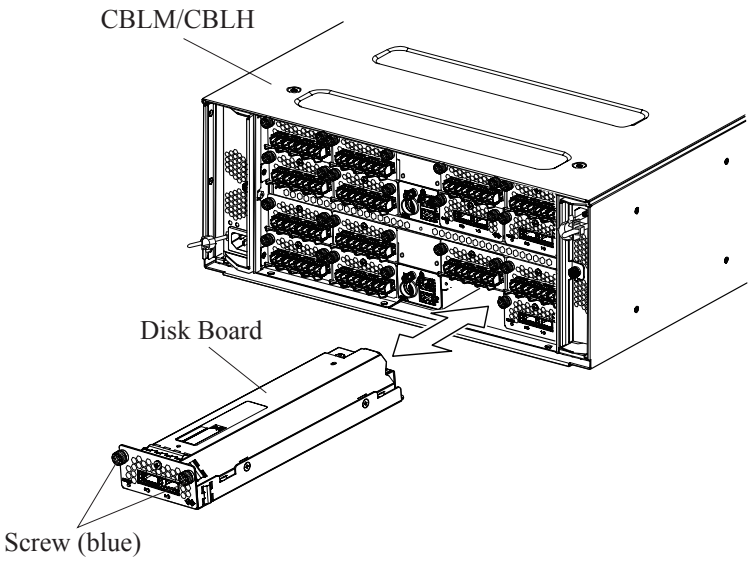
(2) Removing Disk Boards.

NOTICE: When removing the Disk Board, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen two screws (blue) fixing the Disk Board to be removed.
(b) Hold the screws (blue) and pull out and remove the Disk Board.
(c) Installing a dummy into the removed slot.
Two types of dummies exist, which are installed in different ways.
• Metal dummy
(i) Insert a dummy into the removed slot.
(ii) Tighten two screws (blue) and fix the dummy.
• Plastic dummy
(i) Insert the dummy into the slot to the end from which the Disk Board (DKB) has been removed.

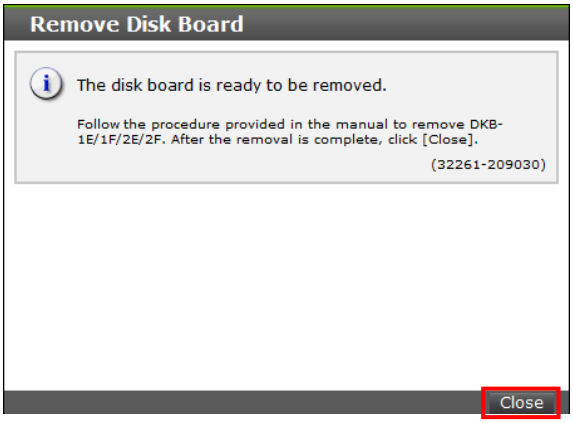
Figure 4-67 Removing Disk Boards



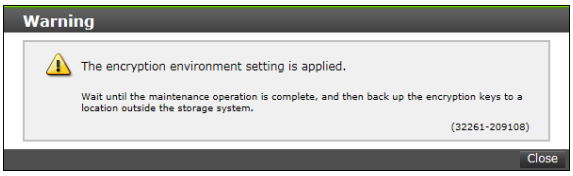
(3) After completing the work of both Controller Boards 1 and 2, go to Step 5.

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5. <Check Removal Completion>
   (1) Click the [Close] button in the "Remove Disk Board" window.



   (2) <Check back up the encryption key Messages>
   When the encryption environment is applied, the following message is displayed.
   Check the message and click the [Close] button.



   (3) See MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

---

6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

---

7. Back up the encryption key
   When a message is displayed in Step 5(2), see "Primary and secondary data encryption license keys" of Encryption License Key User Guide Hitachi Virtual Storage Platform G200, G400, G600, G800 and Hitachi Virtual Storage Platform F400, F600, F800" and back up the encryption key by Storage Navigator.

   NOTE: When a message is not displayed in Step 5(2), this procedure is not required.

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4.8 Removing Cache Memory/Cache Flash Memory/Battery

When removing Cache Memories, the window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

- When removing Cache Memories from the CBSS/CBSL: "4.8.1 Removing Cache Memory for CBSS/CBSL"
- When removing Cache Memories from the CBLM/CBLH: "4.8.2 Removing Cache Memory/Cache Flash Memory/Battery for CBLM/CBLH"
- When removing Batteries from the NAS Modules (CBLM/CBLH): "4.8.3 Removing Batteries for NAS Modules (CBLM/CBLH)"

NOTICE: When the I/O load is much higher than the appropriate value, it might take up to four hours to complete the procedure on one Controller Board.
For the appropriate value, refer to System Configuration Guideline.

4.8.1 Removing Cache Memory for CBSS/CBSL

Table 4-7 Parts List

Locations	Removal parts name		Part name
Front View of CBSS/CBSL	1	Cache Memory	• DKC-F810I-CM8G • DKC-F810I-CM16G

The estimated work time for removing Cache Memories and Cache Flash Memories is the total of the following A, B, C and D.

Table 4-8 Estimated Work Time

	Process	Estimated Work Time
A	Controller Board blocking time	5 ~ 60 min × 2 (*1)
B	Cache Memory, Cache Flash Memory installation work	5 min × 2
C	Controller Board diagnosis time	10 min × 2
D	Controller Board recovery time	5 ~ 60 min × 2 (*1)

*1 : Standard processing time is indicated. The processing time depends on the use situation, especially, the influence of the amount of write pending is received. When the amount of write pending is large, time more than the indication value might be required.

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1. Selecting removal parts
   (1) Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Cache Memories, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

   (2) Open the "Web Console" window. (See "1.6.2 Connecting to the Storage System".)

   (3) Open the "MPC" window. (See MAINTENANCE PC SECTION "1.8.1.1 Open the Window".)

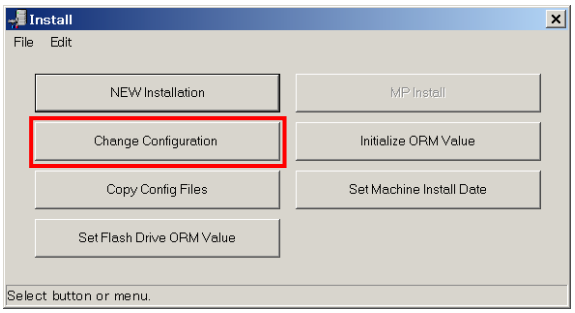
   (4) <Set path offline or switch of channel path>

⚠ CAUTION

The switch to the alternate channel path or host shutdown is that connected with the Channel Board concerned. As for other channel path, switching to the alternate channel path or host shutdown is unnecessary.
However, the host must be shut down when the Pinned track in Channel Board connected port.

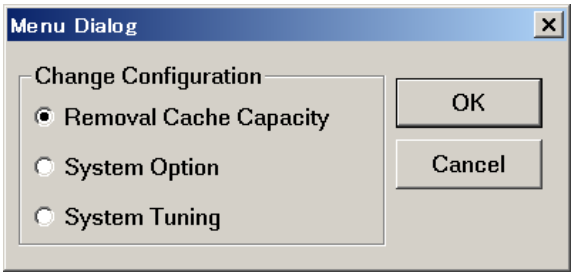
   (5) <Mode Change>
   Click the [View Mode] display to change the mode to Modify Mode.
   After that, click the [Install] button.

   (6) <Start the "Menu Dialog" window>
   Click the [Change Configuration] button.



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(7) <Select Removal Cache Capacity>
Click the [Removal Cache Capacity] in the "Menu Dialog" dialog box and click the [OK] button.



(8) Click the [No] button in response to "[0868] Removal of features may cause fatal damage to storage system. Check that any features be removed are not required by host operations. Data will be lost from any ECC group that are removed. Do you want to stop this process?".

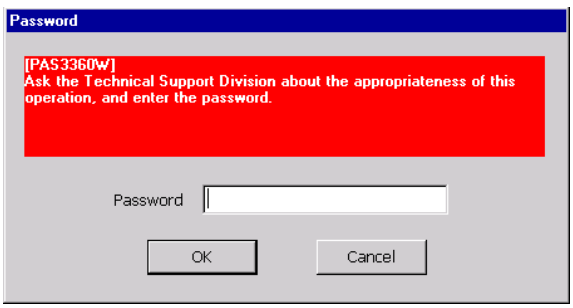


(9) <Input password>

⚠ CAUTION

This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

"Password"[3360] window is displayed.
The enter the password and click the [OK] button.



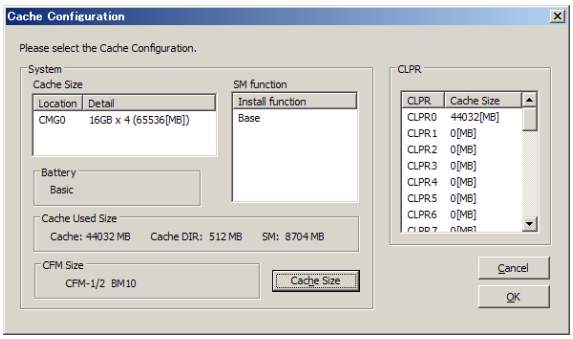
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(10) <Update configuration information>

(a) <Define Cache>

Define each item in the "Cache Configuration" window.

Refer to "1.2.3 MPC Window Display and Conversion Table of Option Type Names" for the "MPC" window display and the conversion of the option type names.

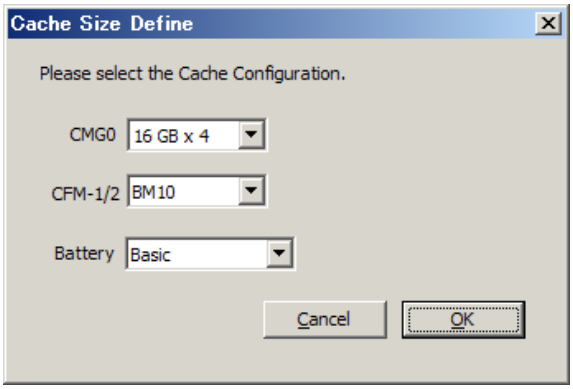


NOTE : The capacity reduced by the [Cache Size] operation is reduced from the Cache capacity of CLPR0.
The setting that Cache capacity of CLPR0 becomes less than 4096 [MB] (minimum Cache capacity) is prevented by a [DEF3124W] message in this case.
Confirm that the Cache capacity of CLPR0 to be reduced is larger than 4096 [MB].

(b) When the change of Cache setting is required, click the [Cache Size] button.

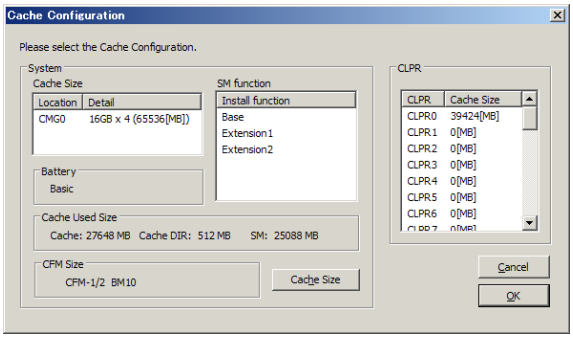
(c) <Cache Size Define window>

Set the CMG type, CFM type, and Battery installation pattern to the changed values in the "Cache Size Define" window, and then click the [OK] button.



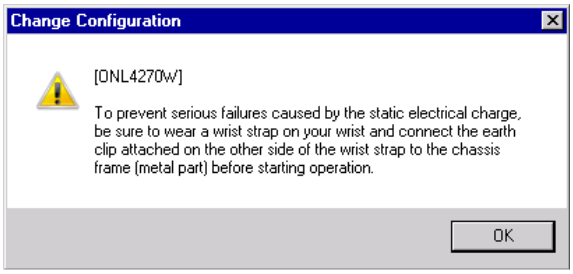
NOTE : The setting that the total of the Cache capacity and the Cache DIR capacity becomes less than 8192[MB] is prevented by a [DEF4567W] message. Remove SM function at first.

(d) After setting up all items, click the [OK] button.



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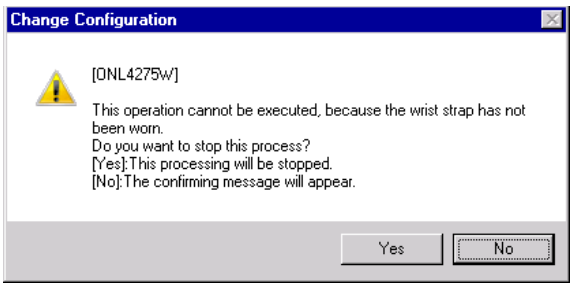
(11) <Check wearing of a wrist strap>
Click the [OK] button in response to "[4270] To prevent serious failures caused by the static electrical charge, be sure to wear a wrist strap on your wrist and connect the earth clip attached on the other side of the wrist strap to the chassis frame (metal part) before starting operation.".



(a) In response to a message, "[4271] Did you put on a wrist strap on your wrist?".
Click the [Yes] button when wrist strap is on your wrist.
Click the [No] button when no wrist strap is your wrist.
When the [No] button is clicked, go to Step (b).

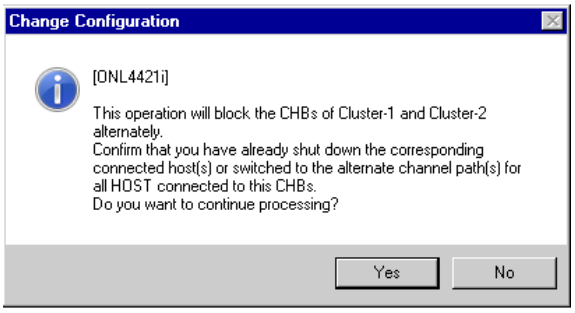


(b) In response to a message, "[4275] This operation cannot be excuted, because the wrist strap has not been worn. Do you want to stop this process?
[Yes]: This processing will be stopped.
[No]: This confirming message will appear."
When the [Yes] button is selected, the routine is returned to "(6) <Start the "Menu Dialog" window>".
When the [No] button is selected, returned to "(11) <Check wearing of a wrist strap>".

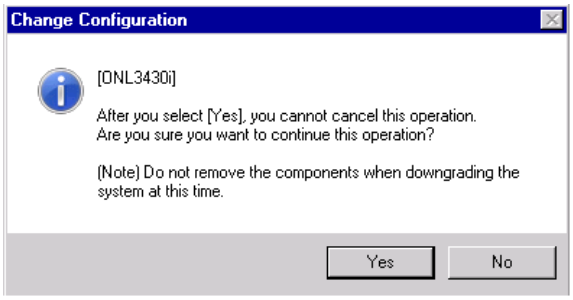


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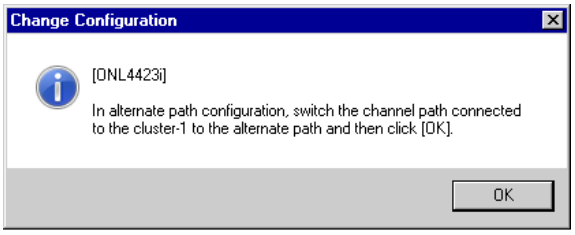
2. Maintenance PC pre procedure on the Cluster 1
   (1) <Check Channel Path Offline>
   Click the [Yes] button in response to the following message.
   "[4421] This operation will block the CHBs of Cluster-1 and Cluster-2 alternately. Confirm that you have already shut down the corresponding connected host(s) or switched to the alternate channel path(s) for all HOST connected to this CHBs. Do you want to continue processing?"



   (2) <Start removal>
   Click the [Yes] button in response to "[3430] After you select [Yes], you cannot cancel this operation. Are you sure you want to continue this operation? (Note) Do not remove the components when downgrading the system at this time.".



   (3) Click the [OK] button in response to "[4423] In alternate path configuration, switch the channel path connected to the cluster-1 to the alternate path, and then click [OK].".

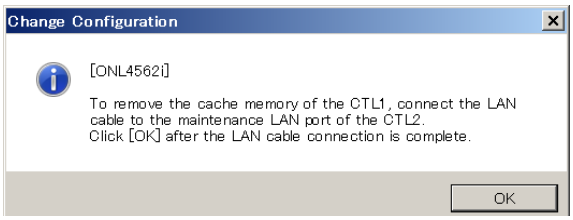


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(4) Reconnecting the Maintenance PC

Connect the Maintenance PC and Controller Board 2 in accordance with the message "[4562] To remove the cache memory of the CTL1, connect the LAN cable to the maintenance LAN port of the CTL2. Click [OK] after the LAN cable connection is complete.". (Refer to "1.6.1 Attachment / Removal Procedure of Maintenance PC".)

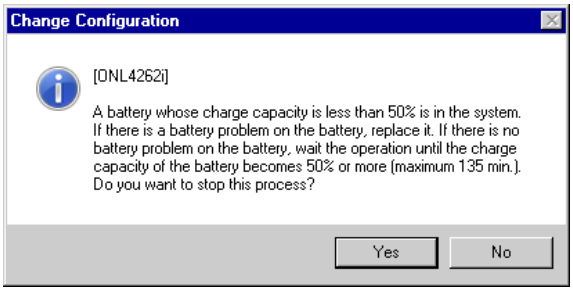
- When there is PCB whose amount of charge of the battery is less than 50%: go to "(5) <Confirmation of Amount of Battery Charge>".
- When there is no PCB whose amount of charge of the battery is less than 50%: go to "(7) <Block Controller Board on Cluster1>".



(5) <Confirmation of Amount of Battery Charge>

- When there is PCB whose amount of charge of the battery is less than 50%: In response to a message, "[4262] A battery whose charge capacity is less than 50% is in the system. If there is a battery problem on the battery, replace it. If there is no battery problem on the battery, wait the operation until the charge capacity of the battery becomes 50% or more (maximum 135 min.). Do you want to stop this process?"

- When stopping this process, click the [Yes] button to return to "1. Selecting removal parts" Step (5).
- When continuing this process, click the [No] button.

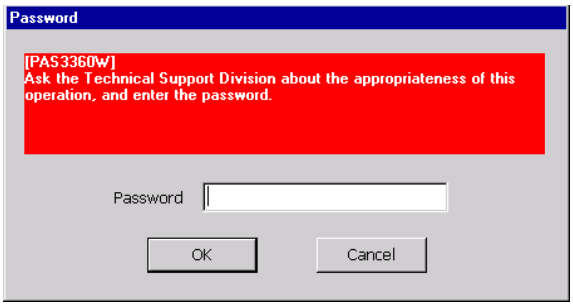


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⚠ CAUTION

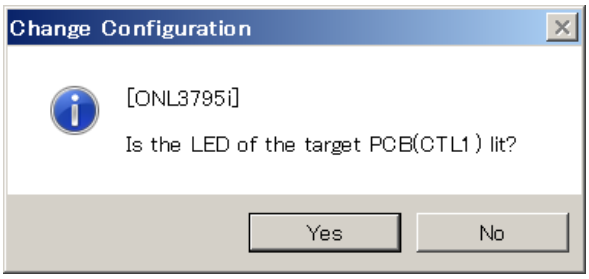
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(6) <Enter password>
"Password"[3360] window is displayed.
The enter the password and click the [OK].

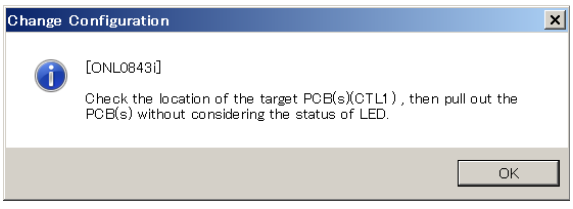


(7) <Block Controller Board on Cluster1>
The Controller Board on the Cluster 1 is blocked and a message of the processing status is displayed.

(8) <Check ALM Down LED>
Click the following in response to "[3795] Is the LED of the target PCB(CTL1) lit?".
Click the [Yes] button if ALM LED is on.
Click the [No] button if ALM LED is off.



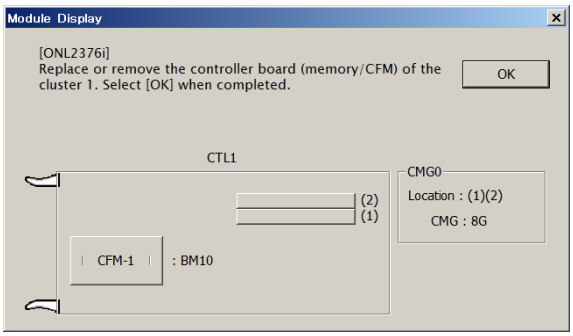
(a) When selecting the [No] button.
Click the [OK] button after responding to "[0843] Check the location of the target PCB(s) (CTL1), then pull out the PCB(s) without considering the status of LED.".



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(9) <Execute hardware removal>
At this point, do not click the [OK] button yet.

When "[2376] Replace or remove the controller board (memory/CFM) of the cluster 1. Select [OK] when completed.", perform the hardware removal work according to the hardware removal procedure.



Make sure of the installation location of the module and remove the correct module. (The Shared Memory capacity may be changed at the same time depending on the set Cache Memory capacity.)

3. Procedure for removing Controller Board 1.

NOTICE:	To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBSS/CBSL Controller Board 1 in which the removed cache memory is installed lights up.

Figure 4-68 Position of the ALM LED

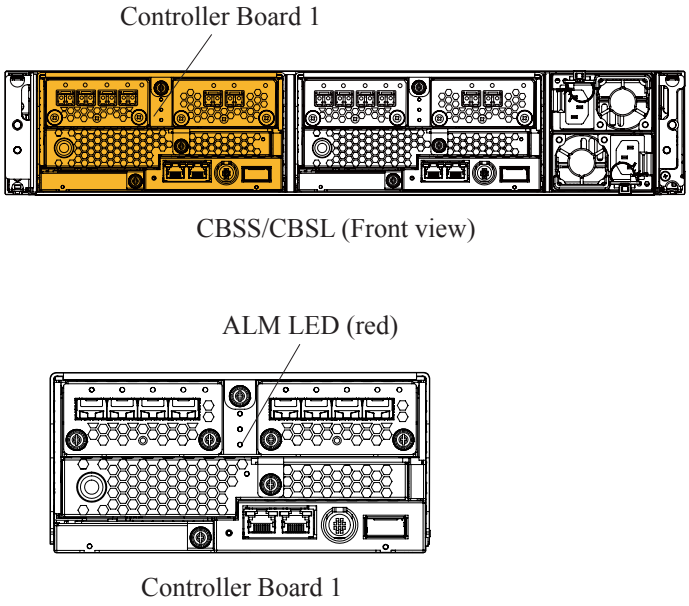


Table 4-9 Location of the Controller Board

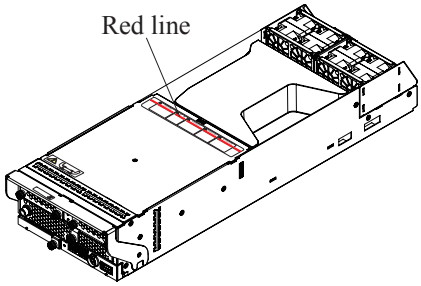
Cluster	Location	Location No.
1	Front of CBSS/CBSL	Controller Board 1

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(2) Remove all the Optical cables and SAS cables connected to the Controller Board.
(3) Removing the Controller Board 1 from CBSS/CBSL

⚠ CAUTION

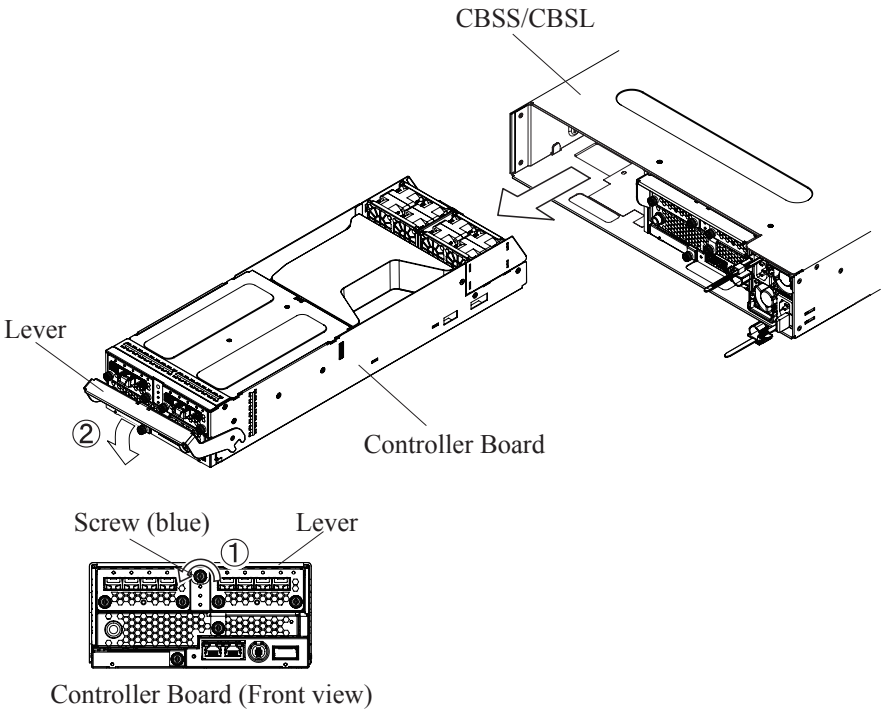
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

(a) Loosen the screw (blue) fixing the Controller Board 1 (①) and open the lever (②).
(b) Hold the Controller Board 1 with both hands and pull out it to remove.

Figure 4-69 Removing Controller Board 1 (CBSS/CBSL)



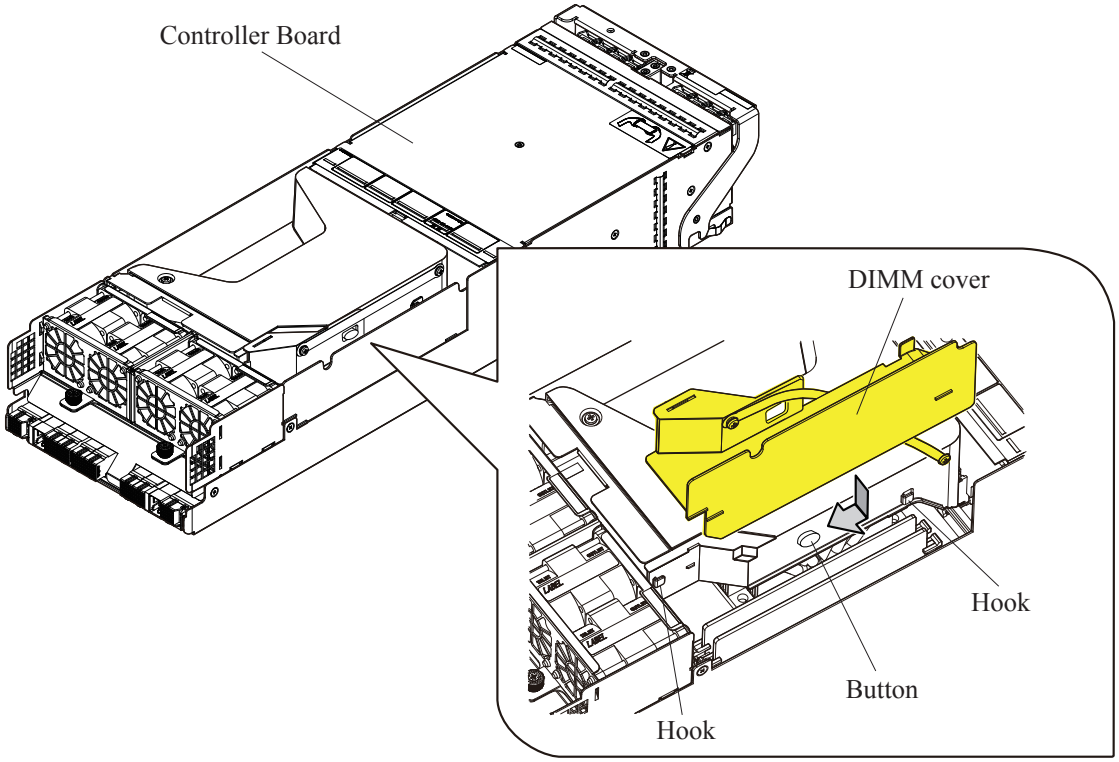
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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "4. Maintenance PC post procedure (on the Cluster 1)" of the "4.8.1".

(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
(5) Lift the DIMM cover to remove.

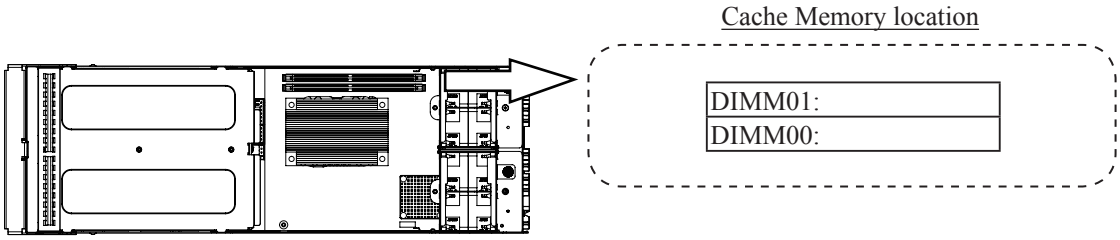
NOTE : The DIMM cover has a band. Do not pull it hard when removing the DIMM cover.

Figure 4-70 Removing DIMM Cover



(6) Removing Cache Memories

Remove the installed Cache Memory and install a Cache Memory of smaller capacity.



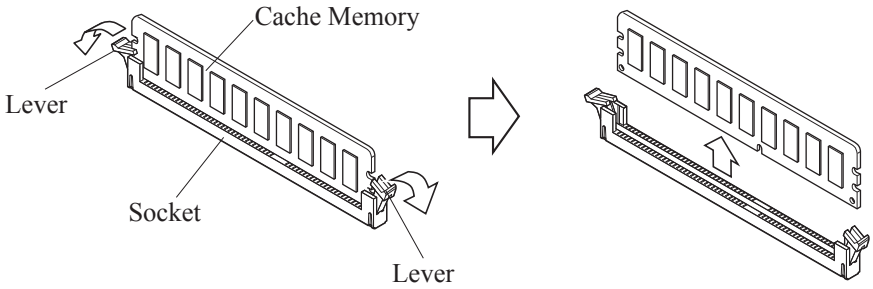
Position of Cache Memory (Controller Board top view)

(a) The procedure for removing.

(i) Pull the lever outward.

(ii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 4-71 Removing the Cache Memory (CBSS/CBSL)

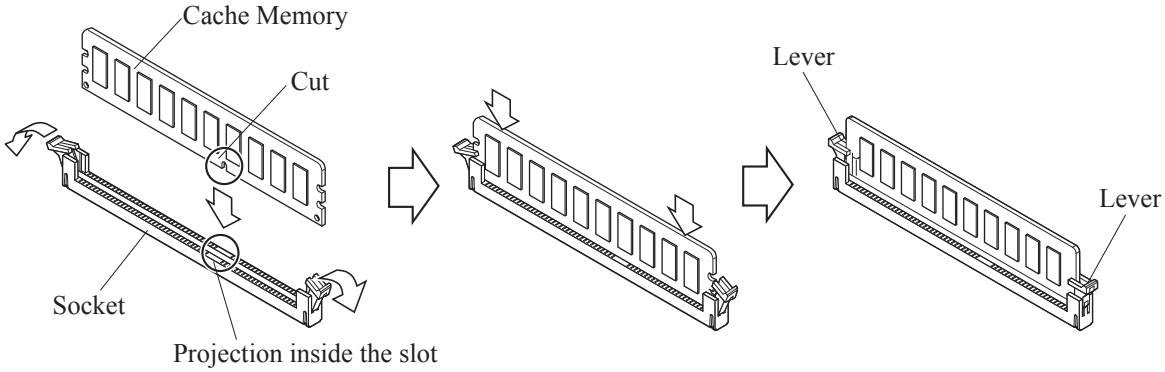


(b) Procedure for installing.

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.

Figure 4-72 Adding Cache Memory

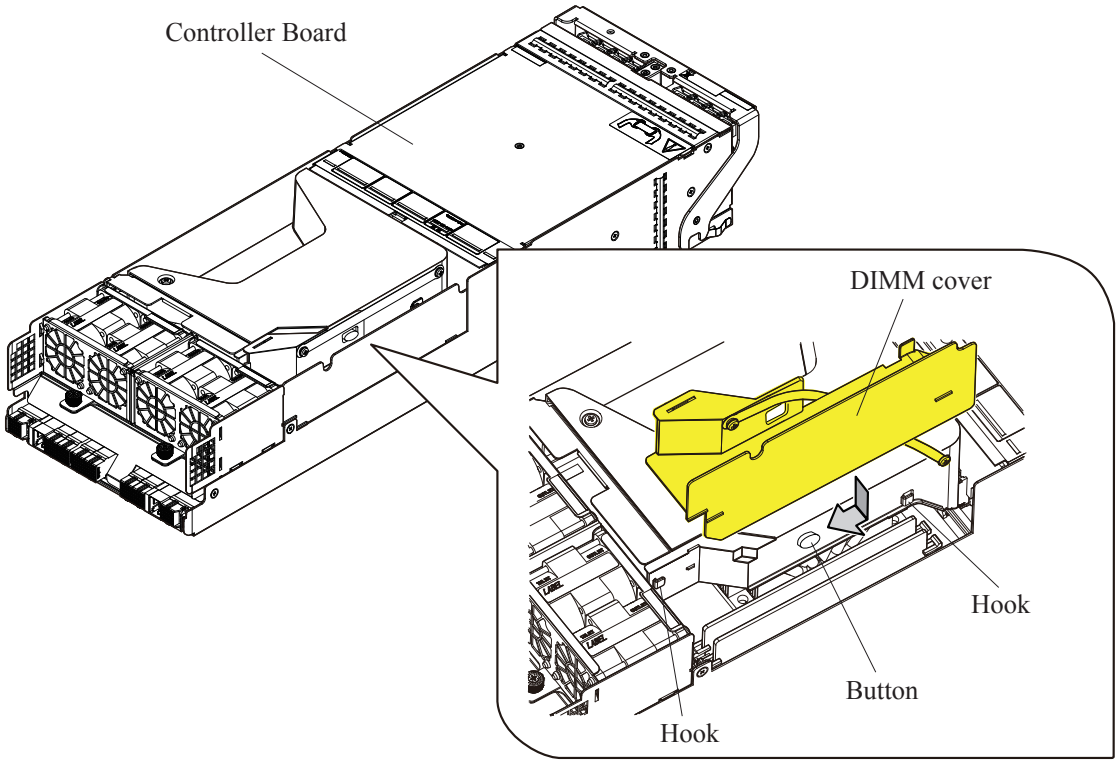


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(7) Slide the DIMM cover to the arrow direction to attach.

NOTE : Check that the DIMM cover is surely fixed by hooks (two places).

Figure 4-73 Attaching DIMM Cover

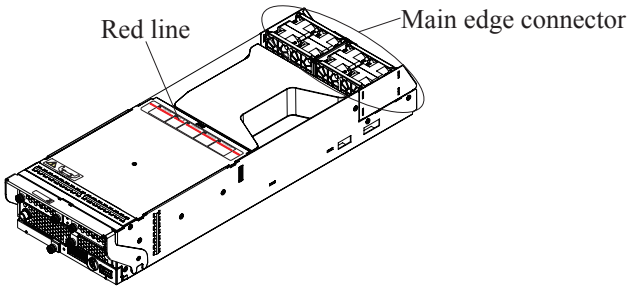


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(8) Installing the Controller Board 1.

⚠ CAUTION

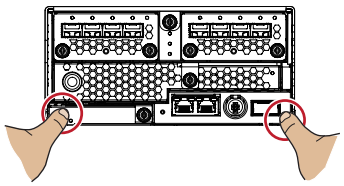
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

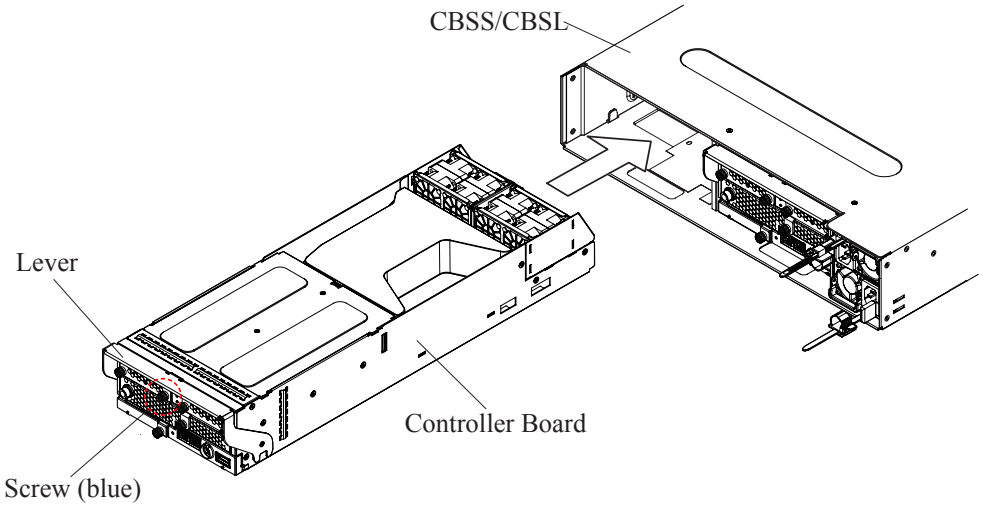
(a) With the lever on the Controller Board 1 opened completely, insert the Controller Board 1 into the slot of the CBSS/CBSL.
(b) Push the Controller Board 1 all the way in and close the lever completely.

NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



(c) Tighten the screw (blue) and fix the Controller Board 1.

Figure 4-74 Installing the Controller Board (CBSS/CBSL)

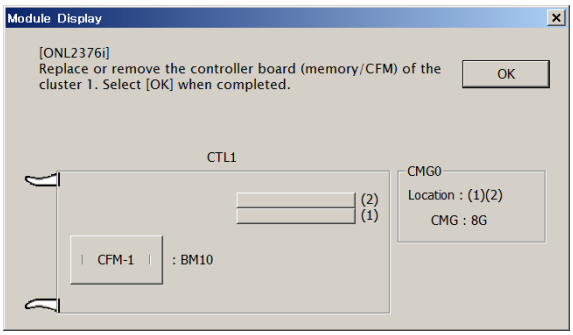


(9) Connect all the removed Optical cables and SAS cables to the Controller Board.

4. Maintenance PC post procedure (on the Cluster 1)

(1) <Check Hardware Removal Completion>

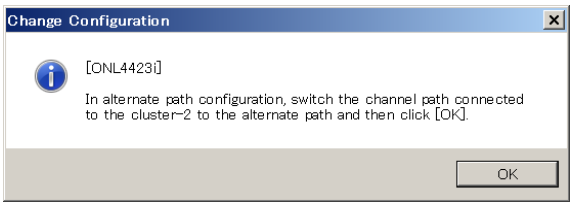
After the hardware procedure for Cluster 1 of Cache Memory is completed, click the [OK] button in response to "[2376] Replace or remove the controoller board (memory/CFM) of the cluster 1. Select [OK].when completed.".



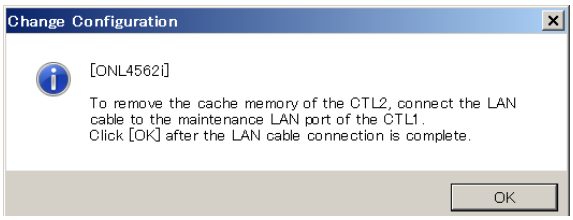
A message of the processing status is displayed.

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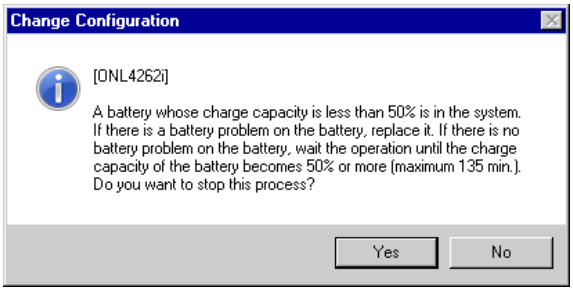
5. Maintenance PC pre procedure (on the Cluster 2)
   (1) Click the [OK] in response to "[4423] In alternate path configuration, switch the channel path connected to the cluster-2 to the alternate path and then click [OK].".



   (2) Reconnecting the Maintenance PC
   Connect the Maintenance PC and Controller Board 1 in accordance with the message "[4562] To remove the cache memory of the CTL2, connect the LAN cable to the maintenance LAN port of the CTL1. Click [OK] after the LAN cable connection is complete.". (Refer to "1.6.1 Attachment / Removal Procedure of Maintenance PC".)
   When connected, click the [OK] button.
   - When there is PCB whose amount of charge of the battery is less than 50%:
     go to "(3) <Confirmation of Amount of Battery Charge >"
   - When there is no PCB whose amount of charge of the battery is less than 50%:
     go to "(5) <Block Controller Board on Cluster 2>".



   (3) <Confirmation of Amount of Battery Charge >
   - When there is PCB whose amount of charge of the battery is less than 50%:
     "[4262] A battery whose charge capacity is less than 50% is in the system. If there is a battery problem on the battery, replace it. If there is no battery problem on the battery, wait the operation until the charge capacity of the battery becomes 50% or more (maximum 135 min.). Do you want to stop this process?"
   - When stopping this process, click the [Yes] button to return to "1. Selecting removal parts" Step (5).
   - When continuing this process, click the [No] button.

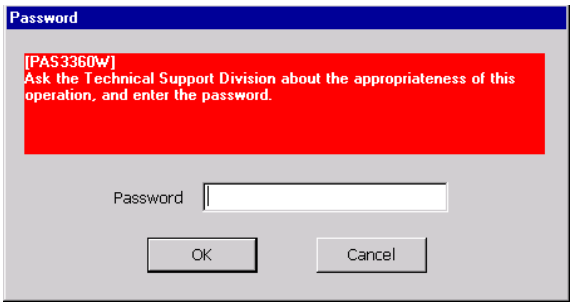


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⚠ CAUTION

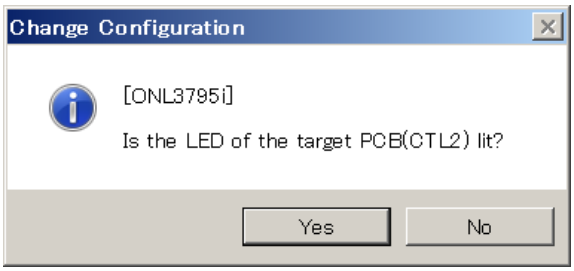
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(4) <Input password>
"Password"[3360] window is displayed.
The Enter the password and click the [OK] button.

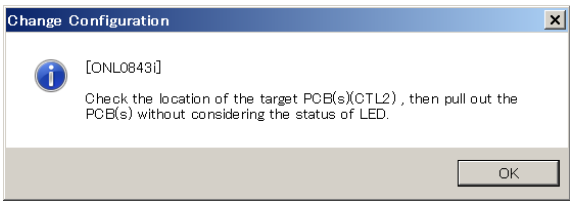


(5) <Block Controller Board on Cluster 2>
The Controller Board on the Cluster 2 is blocked and a message of the processing status is displayed.

(6) <Check ALM LED>
In response to "[3795] Is the LED of the target PCB(CTL2) lit?".
Click the [Yes] button if ALM LED is on
Click the [No] button if ALM LED is off



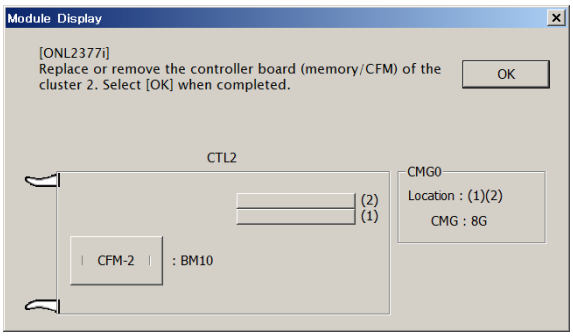
(a) When selecting the [No] button.
Click the [OK] button after responding to "[0843] Check the location of the target PCB(s) (CTL2), then pull out the PCB(s) without considering the status of LED.".



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(7) <Execute hardware removal>
At this point, do not press the [OK] button yet.

When "[2377] Replace or remove the controller board (memory/CFM) of the cluster 2. Select [OK] when completed." is displayed, perform the hardware removal work according to the hardware removal procedure.



Make sure of the installation location of the module and remove the correct module. (The Shared Memory capacity may be changed at the same time depending on the set Cache Memory capacity.)

6. Procedure for removing the Controller Board 2.

NOTICE:	To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBSS/CBSL Controller Board 2 in which the removed cache memory is installed lights up.

Figure 4-75 Position of the ALM LED

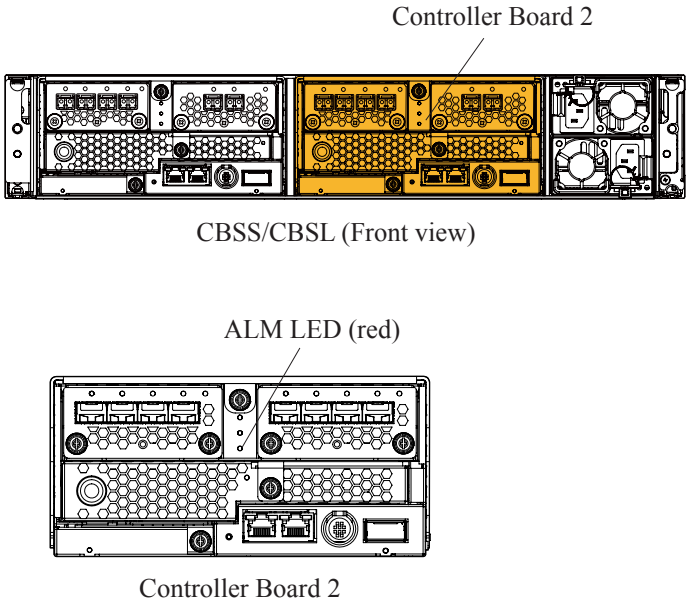


Table 4-10 Location of the Controller Board

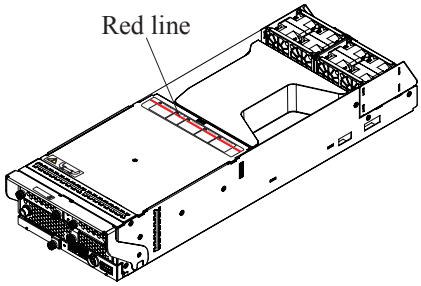
Cluster	Location	Location No.
2	Front of CBSS/CBSL	Controller Board 2

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(2) Remove all the Optical cables and SAS cables connected to the Controller Board.
(3) Remove the Controller Board 2 from CBSS/CBSL

⚠ CAUTION

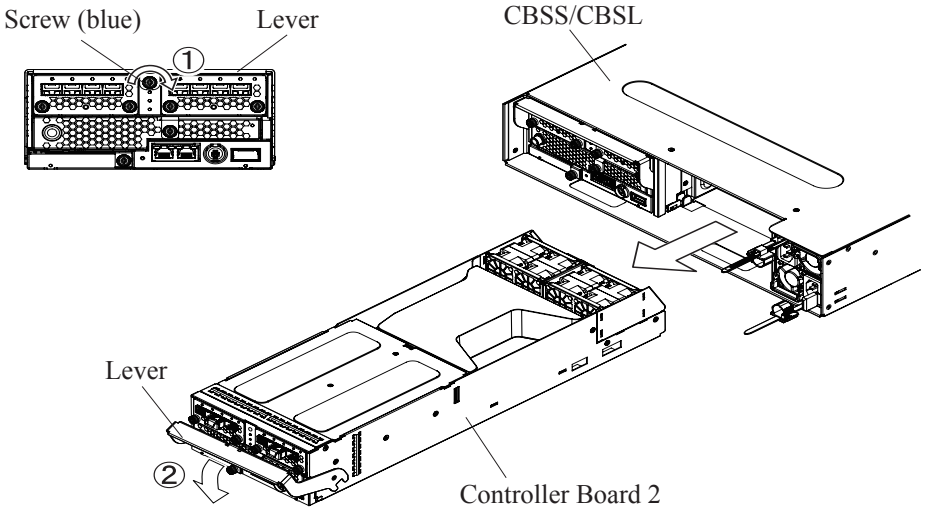
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

(a) Loosen the screw (blue) fixing the Controller Board 2 (①) and open the lever (②).
(b) Hold the Controller Board 2 with both hands and pull out it to remove.

Figure 4-76 Removing Controller Board 2 (CBSS/CBSL)



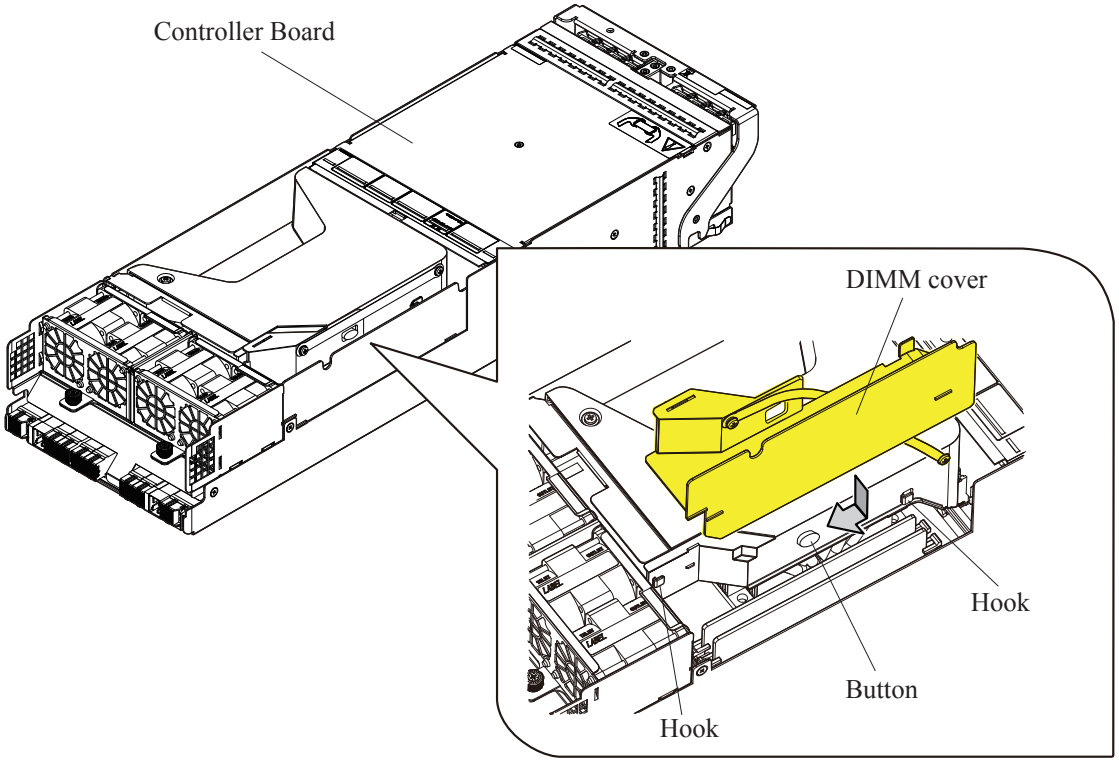
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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "7. Maintenance PC post procedure (on the Cluster 2)" of the "4.8.1".

(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
(5) Lift the DIMM cover to remove.

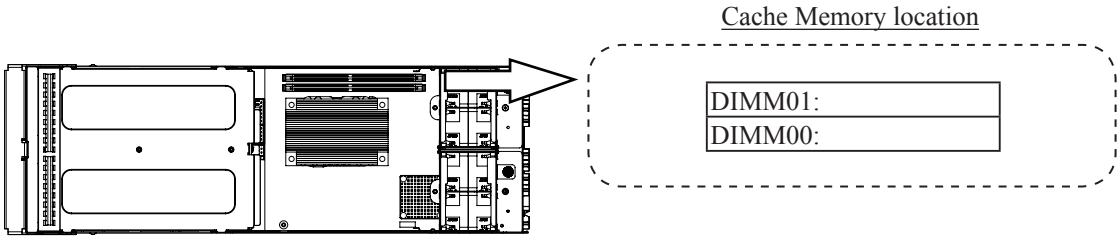
NOTE : The DIMM cover has a band. Do not pull it hard when removing the DIMM cover.

Figure 4-77 Removing DIMM Cover



(6) Removing Cache Memories

Remove the installed Cache Memory and install a Cache Memory of the smaller capacity.



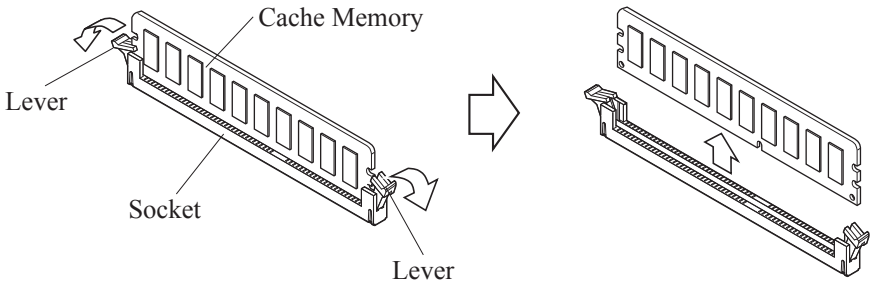
Position of Cache memory (Controller Board top view)

(a) The procedure for removing.

(i) Pull the lever outward.

(ii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 4-78 Removing the Cache Memory (CBSS/CBSL)

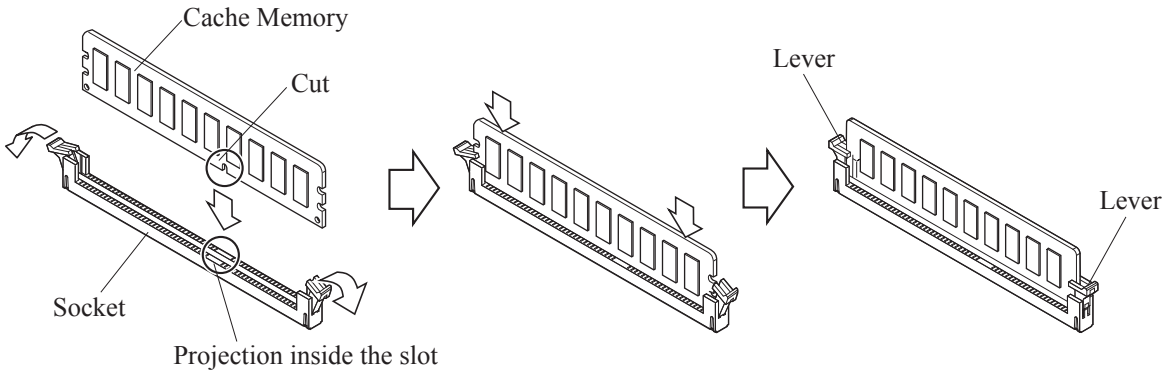


(b) Procedure for installing.

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.

Figure 4-79 Removing Cache Memory (CBSS/CBSL)

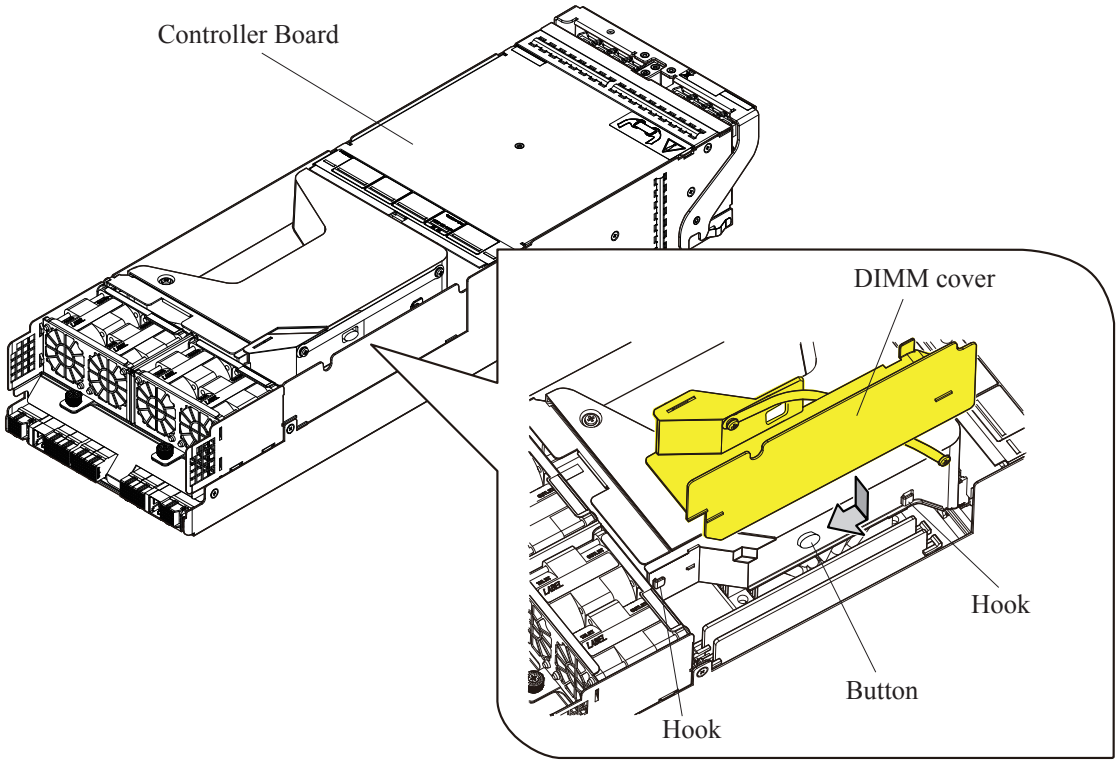


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(7) Slide the DIMM cover to the arrow direction to attach.

NOTE : Check that the DIMM cover is surely fixed by hooks (two places).

Figure 4-80 Attaching DIMM Cover

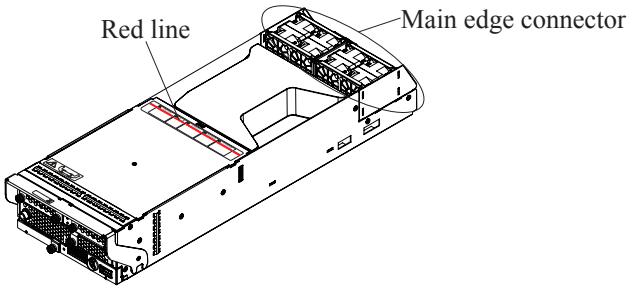


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(8) Installing the Controller Board 2.

⚠ CAUTION

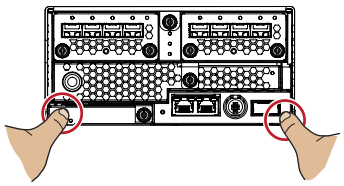
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

(a) With the lever on the Controller Board 2 opened completely, insert the Controller Board 2 into the slot of the CBSS/CBSL.
(b) Push the Controller Board 2 all the way in and close the lever completely.

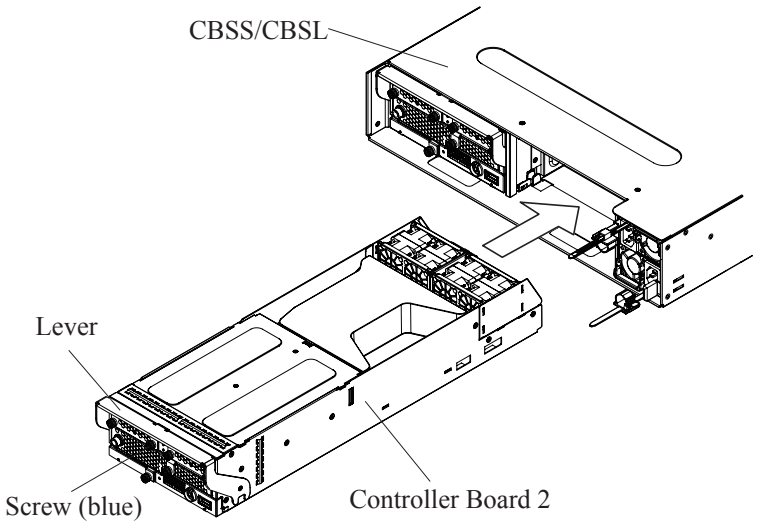
NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



(c) Tighten the screw (blue) and fix the Controller Board 2.

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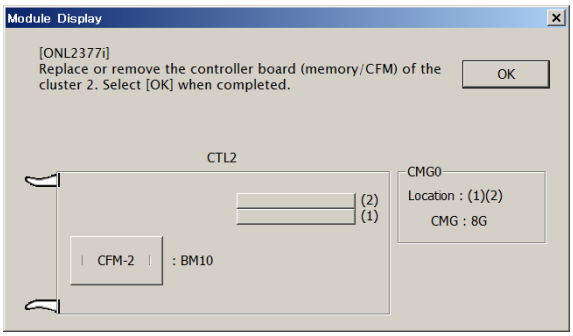
Figure 4-81 Installing the Controller Board (CBSS/CBSL)



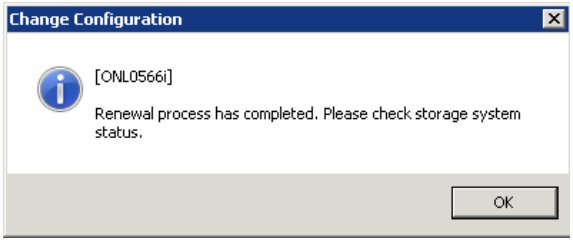
(9) Connect all the removed Optical cables and SAS cables to the Controller Board.

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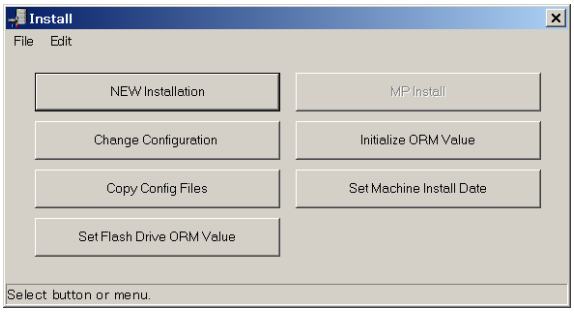
7. Maintenance PC post procedure (on the Cluster 2)
   (1) <Check Hardware Removal Completion>
   After completing the hardware procedure for Cluster 2 of cache memory, click the [OK] button in response to "[2377] Replace or remove the controller board (memory/CFM) of the cluster 2. Select [OK] when completed.".



   (2) <Check completion of removal procedure>
   In response to the message "[0566] Renewal process has completed. Please check storage system status.", click the [OK] button.



   (3) <Terminate removal work>
   After completing the procedure, return to the "Install" window.
   Select [File]-[Exit].



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(4) <Mode Change>
Click the [Modify Mode] display in the “MPC” window to return the mode to View Mode.

(5) <Path online>
Set the stopped channel path online by your customer.

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4.8.2 Removing Cache Memory/Cache Flash Memory/Battery for CBLM/CBLH

Table 4-11 Parts List

Locations	Removal parts name		Part name
Front View of CBLM/CBLH	1	Cache Memory	• DKC-F810I-CM8G • DKC-F810I-CM16G • DKC-F810I-CM32G (CBLH only)
	2	Cache Flash Memory	• DW-F800-BM20 (CBLM) • DW-F800-BM30 (CBLH)
	3	Battery	• BAT (CBLM/CBLH)

The estimated work time for removing Cache Memories and Cache Flash Memories is the total of the following A, B, C and D.

Table 4-12 Estimated Work Time

	Process	Estimated work time
A	Controller Board blocking time	5 ~ 60 min × 2 (*1)
B	Cache Memory, Cache Flash Memory nstallation work	5 min × 2
C	Controller Board diagnosis time	10 min × 2
D	Controller Board recovery time	5 ~ 60 min × 2 (*1)

*1 : Standard processing time is indicated. The processing time depends on the use situation, especially, the influence of the amount of write pending is received. When the amount of write pending is large, time more than the indication value might be required.

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1. Selecting removal parts
   (1) Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Cache Memories, connect the Maintenance PC and the Controller Board 1.
   • Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".
   In case of the NAS Module installed configuration, perform the EVS manual migration.
   For the details of the EVS manual migration, see MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations".

   (2) Open the "Web Console" window. (See "1.6.2 Connecting to the Storage System".)

   (3) Open the "MPC" window. (See MAINTENANCE PC SECTION "1.8.1.1 Open the Window".)

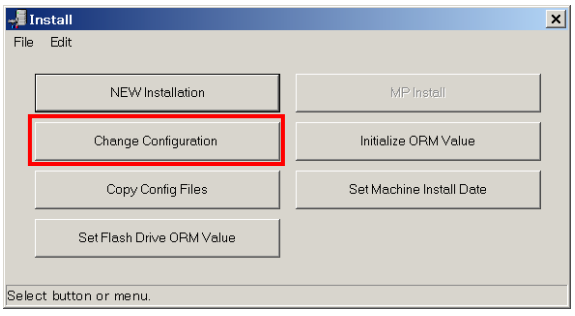
   (4) <Set path offline or switch of channel path>

⚠ CAUTION

The switch to the alternate channel path or host shutdown is that connected with the Channel Board concerned. As for other channel path, switching to the alternate channel path or host shutdown is unnecessary.
However, the host must be shut down when the Pinned track in Channel Board connected port.

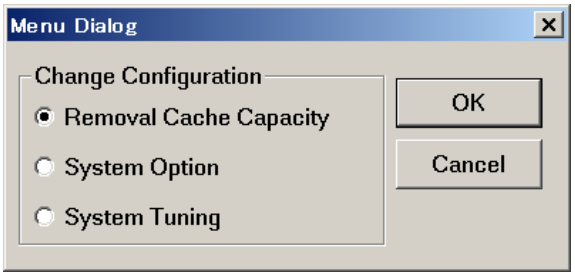
   (5) <Mode Change>
   Click the [View Mode] display to change the mode to Modify Mode.
   After that, click the [Install] button.

   (6) <Start the "Menu Dialog" window>
   Click the [Change Configuration] button.



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(7) <Select Removal Cache Capacity>
Click the [Removal Cache Capacity] in the "Menu Dialog" dialog box and click the [OK] button.



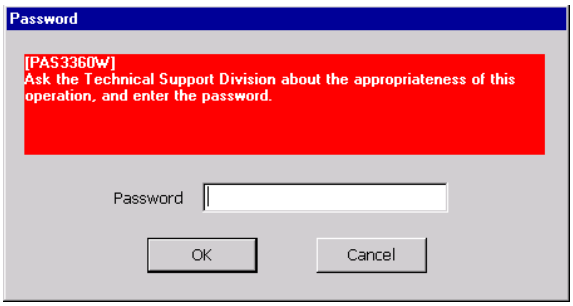
(8) Click the [No] button in response to "[0868] Removal of features may cause fatal damage to storage system. Check that any features be removed are not required by host operations. Data will be lost from any ECC group that are removed. Do you want to stop this process?".



⚠ CAUTION

This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(9) <Input password>
"Password"[3360] window is displayed.
The enter the password and click the [OK] button.



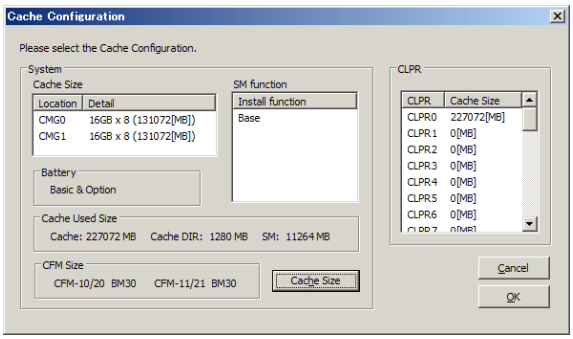
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(10) <Update configuration information>

(a) <Define Cache>

Define each item in the "Cache Configuration" window.

Refer to "1.2.3 MPC Window Display and Conversion Table of Option Type Names" for the "MPC" window display and the conversion of the option type names.

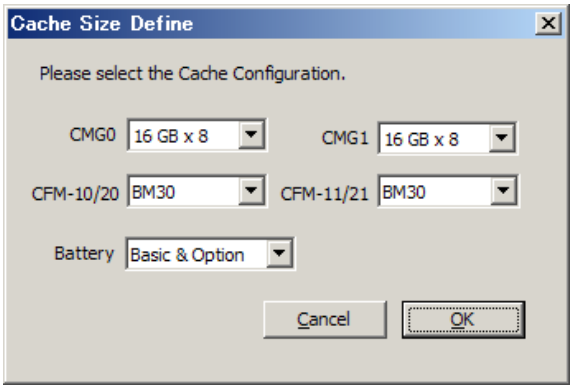


NOTE : The capacity reduced by the [Cache Size] operation is reduced from the Cache capacity of CLPR0.
The setting that Cache capacity of CLPR0 becomes less than 4096 [MB] (minimum Cache capacity) is prevented by a [DEF3124W] message in this case.
Confirm that the Cache capacity of CLPR0 to be reduced is larger than 4096 [MB].

(b) When the change of Cache setting is required, click the [Cache Size] button.

(c) <Cache Size Define window>

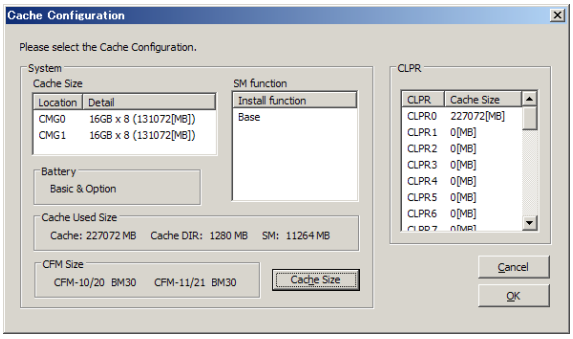
Set the CMG type, CFM type and Battery installation pattern in the "Cache Size Define" window and click the [OK] button.



NOTE : The setting that the total of the Cache capacity and the Cache DIR capacity becomes less than 8192[MB] is prevented by a [DEF4567W] message. Remove SM function at first.

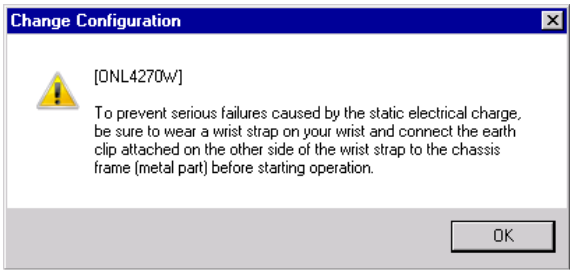
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(d) After setting up all items, click the [OK] button.



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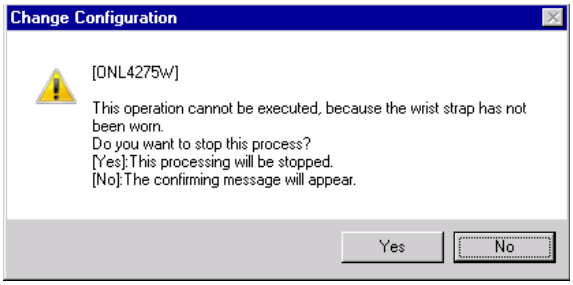
(11) <Confirm wearing of wear a wrist strap>
Click the [OK] button in response to "[4270] To prevent serious failures caused by the static electrical charge, be sure to wear a wrist strap on your wrist and connect the earth clip attached on the other side of the wrist strap to the chassis frame (metal part) before starting operation.".



(a) In response to a message, "[4271] Did you put on a wrist strap on your wrist?".
Click the [Yes] button when wrist strap is on your wrist.
Click the [No] button when no wrist strap is your wrist.
When the [No] button is clicked, go to Step (b).

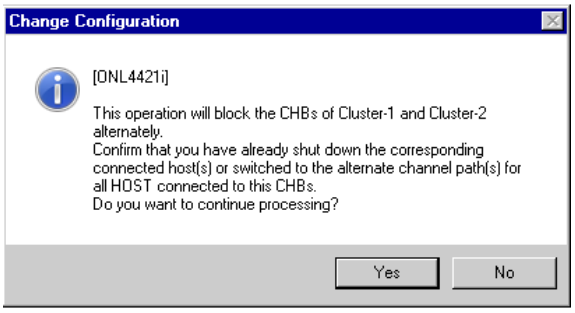


(b) In response to a message, "[4275] This operation cannot be executed, because the wrist strap has not been worn. Do you want to stop this process?
[Yes]: This processing will be stopped.
[No]: This confirming message will appear."
Click the [Yes] button to return to "(6) <Start the "Menu Dialog" window>".
Click the [No] button to return to "(11) <Confirm wearing of wear a wrist strap>".

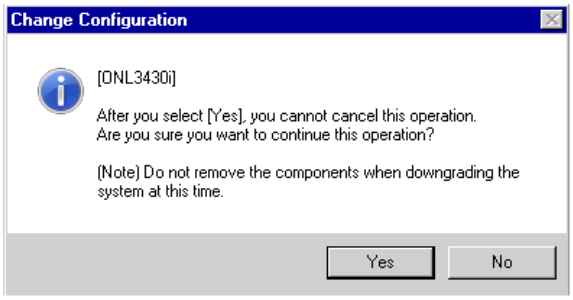


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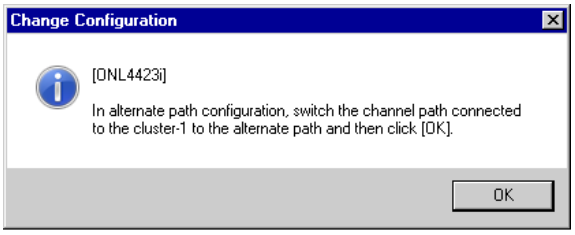
2. Maintenance PC pre procedure on the Cluster 1
   (1) <Check Channel Path Offline>
   Click the [Yes] button in response to the following message.
   "[4421] This operation will block the CHBs of Cluster-1 and Cluster-2 alternately. Confirm that you have already shut down the corresponding connected host(s) or switched to the alternate channel path(s) for all HOST connected to this CHBs. Do you want to continue processing?"



   (2) <Start removal>
   Click the [Yes] button in response to "[3430] After you select [Yes], you cannot cancel this operation. Are you sure you want to continue this operation? (Note) Do not remove the components when downgrading the system at this time.".



   (3) Click the [OK] button in response to "[4423] In alternate path configuration, switch the channel path connected to the cluster-1 to the alternate path and then click [OK].".



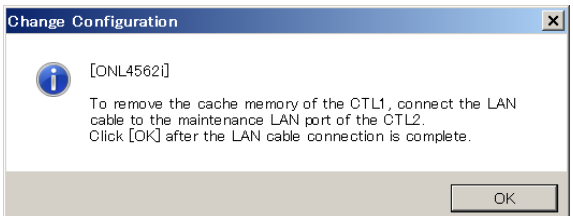
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(4) Reconnecting the Maintenance PC

Connect the Maintenance PC and Controller Board 2 in accordance with the message "[4562] To remove the cache memory of the CTL1, connect the LAN cable to the maintenance LAN port of the CTL2. Click [OK] after the LAN cable connection is complete.". (Refer to "1.6.1 Attachment / Removal Procedure of Maintenance PC".)

When connected, click the [OK] button.

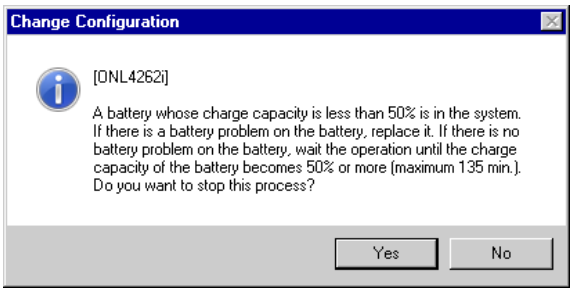
- When there is PCB whose amount of charge of the battery is less than 50%: go to "(5) < Confirmation of Amount of Battery Charge >".
- When there is no PCB whose amount of charge of the battery is less than 50%: go to "(7) <Block Controller Board on Cluster 1>".



(5) < Confirmation of Amount of Battery Charge >

- When there is PCB whose amount of charge of the battery is less than 50%: "[4262] A battery whose charge capacity is less than 50% is in the system. If there is a battery problem on the battery, replace it. If there is no battery problem on the battery, wait the operation until the charge capacity of the battery becomes 50% or more (maximum 135 min.). Do you want to stop this process?"

- When stopping this process, click the [Yes] button to return to "1. Selecting removal parts" Step (5).
- When continuing this process, click the [No] button.

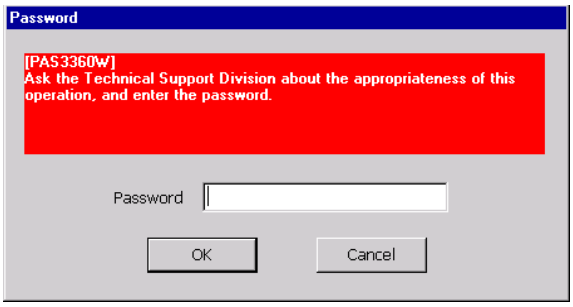


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⚠ CAUTION

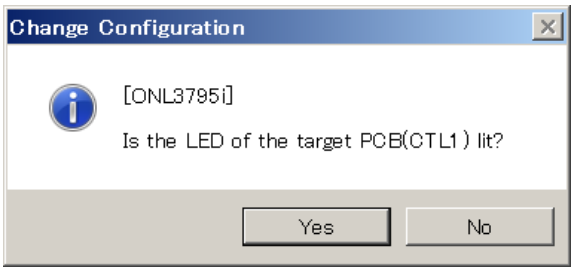
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(6) <Enter password>
"Password"[3360] window is displayed.
The enter the password and click the [OK] button.

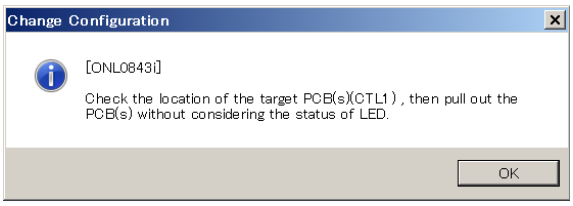


(7) <Block Controller Board on Cluster 1>
The Controller Board on the Cluster 1 is blocked and a message of the processing status is displayed.

(8) <Check ALM LED>
Click the following in response to "[3795] Is the LED of the target PCB(CTL1) lit?".
Click the [Yes] button if ALM LED is on.
Click the [No] button if ALM LED is off.



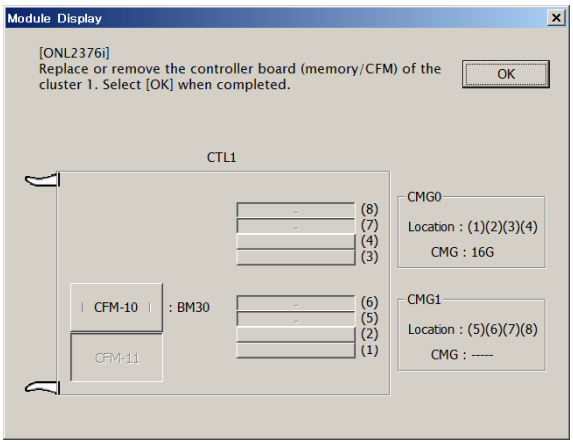
(a) When selecting the [No] button
Click the [OK] button after responding to "[0843] Check the location of the target PCB(s) (CTL1), then pull out the PCB(s) without considering the status of LED.".



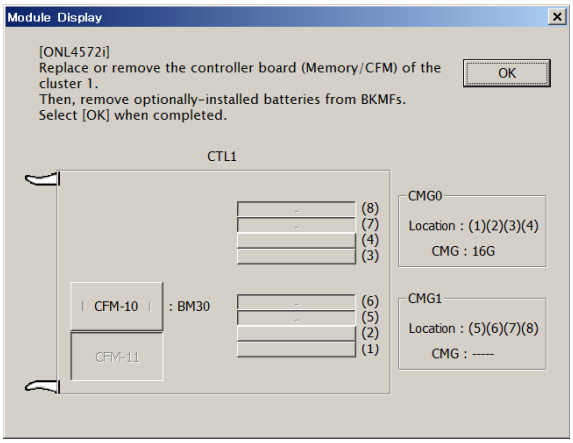
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(9) <Execute hardware removal>
At this point, do not press the [OK] button yet.

- When the Battery installation pattern of "(c) <Cache Size Define window>" (INST04-08-340) is not changed
  If the message "[2376] Replace or remove the controller board (memory/CFM) of the cluster1. Select [OK] when completed." is displayed, remove the hardware in accordance with "3. Procedure for removing Controller Board 1.".



- When the Battery installation pattern of "(c) <Cache Size Define window>" (INST04-08-340) is changed from "Basic & Option" to "Basic"
  If the message "[4572] Replace or remove the controller board (Memory/CFM) of the cluster 1. Then, remove optionally-installed batteries from BKMFs. Select [OK] when completed." is displayed, remove the hardware in accordance with "3. Procedure for removing Controller Board 1.".



Make sure of the installation location of the module and remove the correct module.

3. Procedure for removing Controller Board 1.

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBLM/CBLH Controller Board 1 in which the removed cache memory is installed lights up.

Figure 4-82 Position of the ALM LED

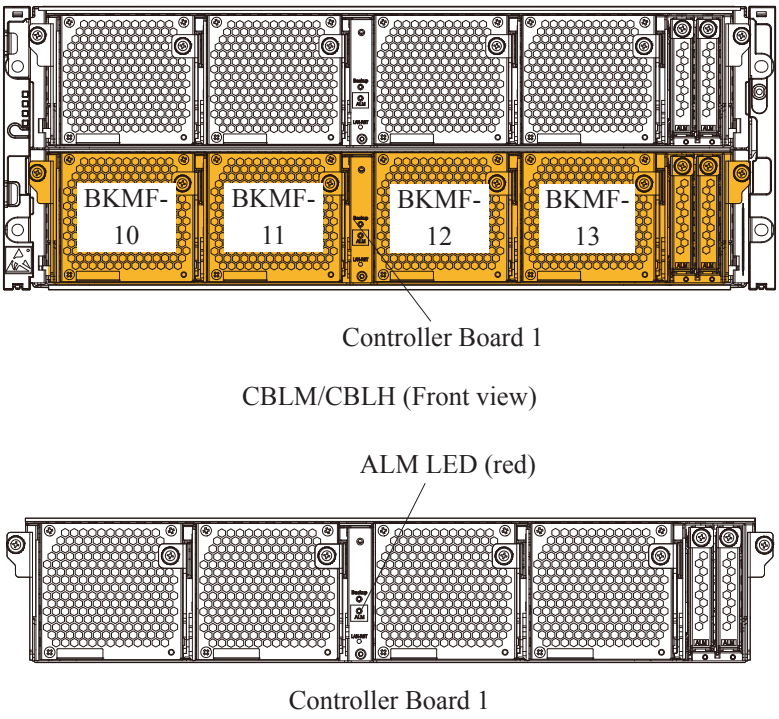


Table 4-13 Location of the Controller Board

Cluster	Location	Location No.
1	Front of CBLM/CBLH	Controller Board 1

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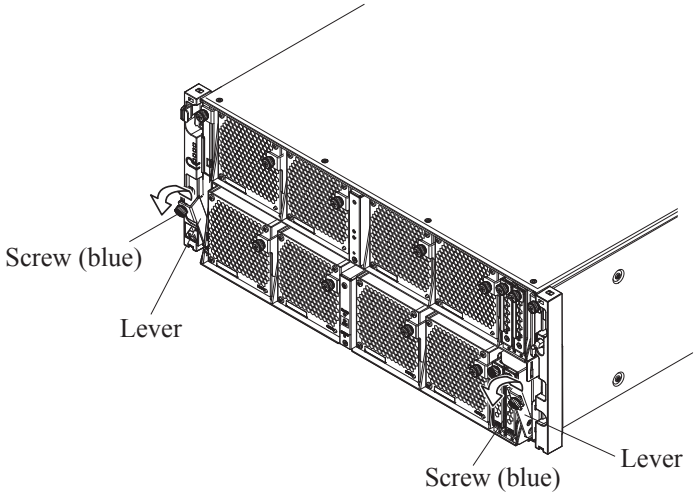
(2) Removing the Controller Board 1 from CBLM/CBLH

⚠ CAUTION

When removing a Controller Board of the CBLM/CBLH, be sure to remove BKMFs first because the mass of the Controller Board is about 19 kg.

(a) Loosen the right and left screws (blue) on the lever of the Controller Board 1in the front of the CBLM/CBLH and open the lever.

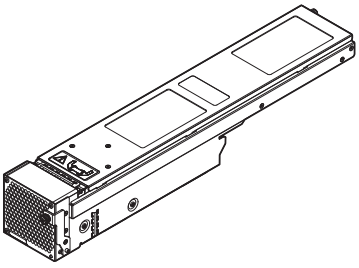
Figure 4-83 Removing Controller Board 1 (CBLM/CBLH)



NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBLM/CBLH lights up after performing "4. Maintenance PC post procedure (on the Cluster 1)" of the "4.8.2".

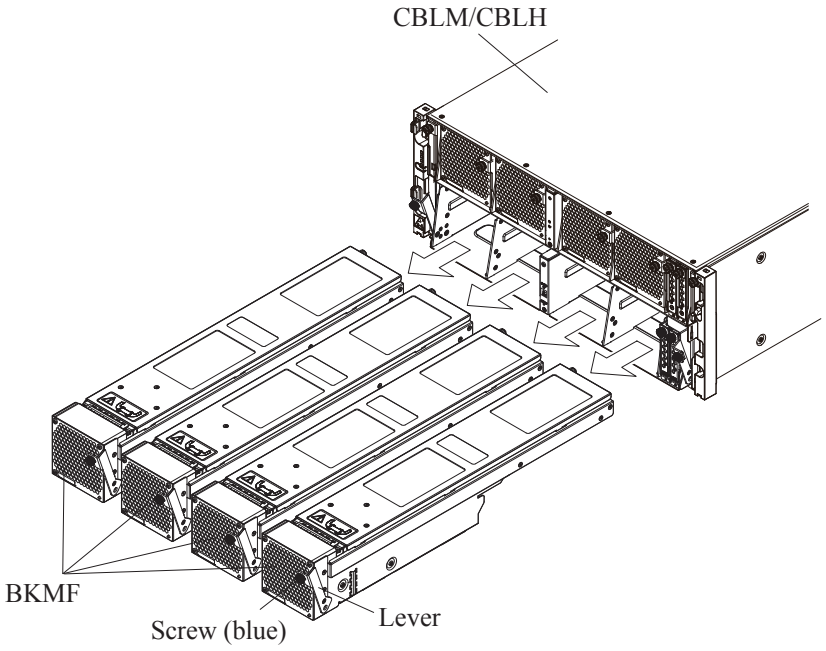
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NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



(b) Remove all BKMFs (four) installed in the Controller Board 1.
  (i) Loosen the screws (blue) fixing the BKMF.
  (ii) Open the lever and pull out the BKMF to remove.

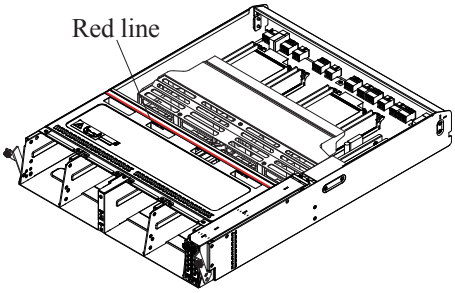
Figure 4-84 Removing BKMF(CBLM/CBLH)



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⚠ CAUTION

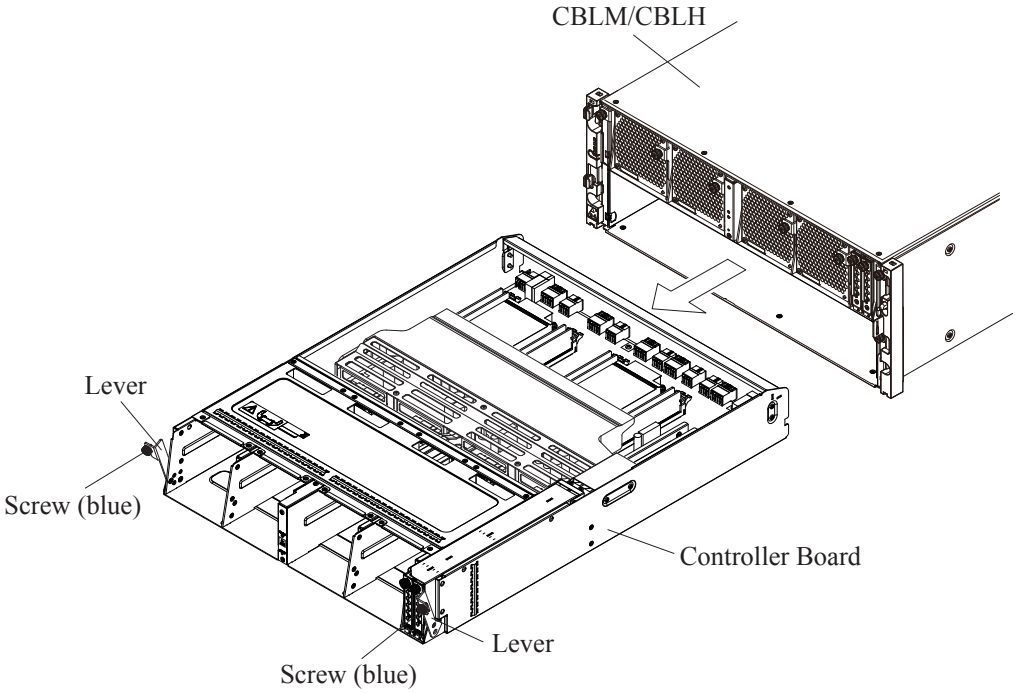
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

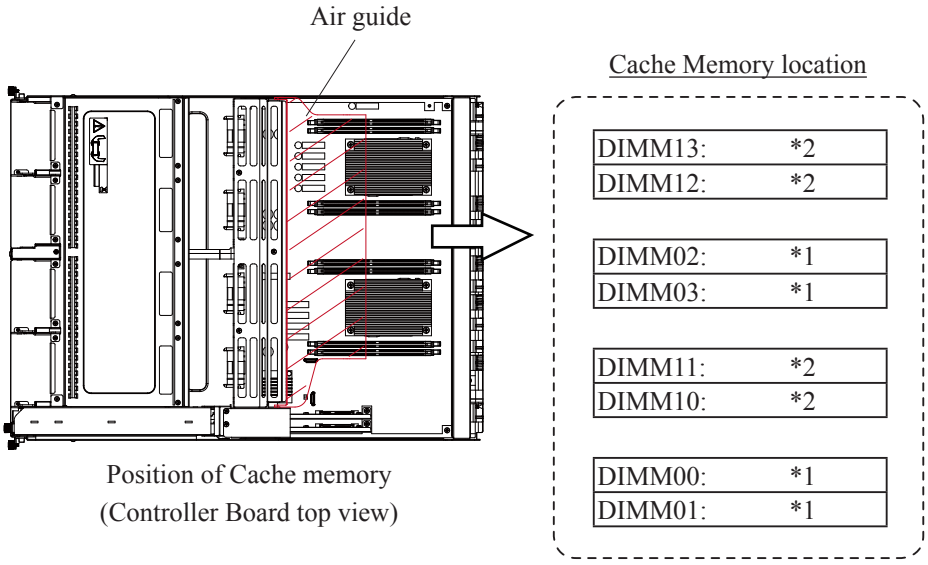
(c) With the lever opened completely, pull out and remove the Controller Board 1.

Figure 4-85 Removing Controller Board 1 (CBLM/CBLH)



(3) Removing Cache Memories

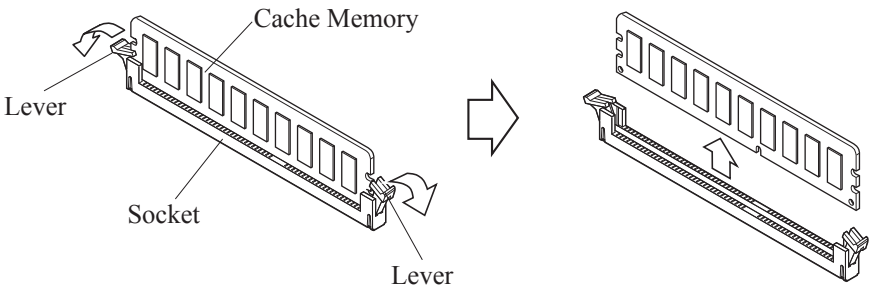
Remove the installed Cache Memory and install a Cache Memory of the smaller capacity.



*1 : Belonging to CMG0 (Cache Memory Group 0).
*2 : Belonging to CMG1 (Cache Memory Group 1).
Be sure to install DIMM in CMG0.
CMG1 is an additional slot of DIMM.
Install DIMM in sets of four.

(a) The procedure for removing.
(i) Open the air guide.
(ii) Pull the lever outward.
(iii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 4-86 Removing the Cache Memory (CBLM/CBLH)



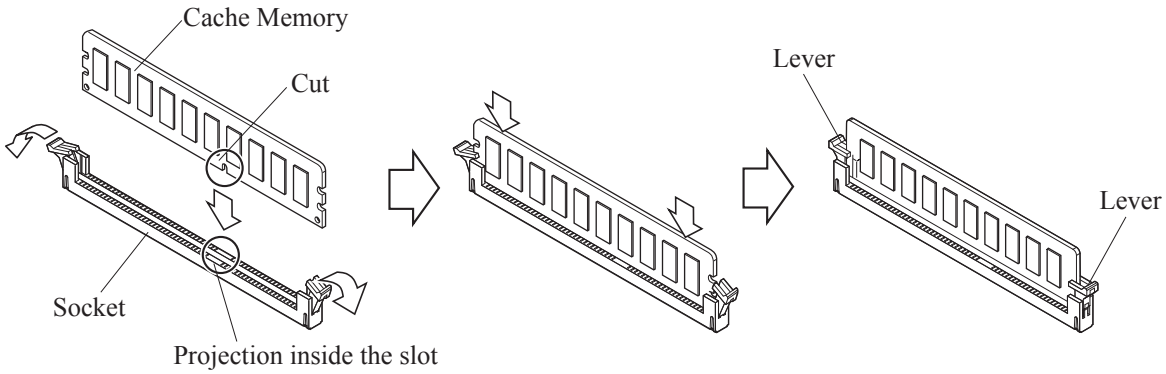
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(b) Procedure for installing.

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.
(iv) Close the air guide.

Figure 4-87 Removing Cache Memory (CBLM/CBLH)



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(4) Replacing/Removing Cache Flash Memories.

(a) Removal Procedure

(i) Loosen the screw (blue) fixing the Cache Flash Memory to be removed and open the lever.

(ii) Pull out and remove the Cache Flash Memory while holding it with both hands.

(b) Installation procedure

For replacement work:

(i) Open the lever of the Cache Flash Memory of the smaller capacity completely and insert the Cache Flash Memory into the slot of Controller Board 1.

(ii) Push the Cache Flash Memory all the way in.

(iii) Close the lever completely.

(iv) Tighten the screw (blue) and fix the Cache Flash Memory.

For removal work:

Install a dummy in a vacant slot.

There are two types of dummies and the installation procedure is different between them.

• Metal dummy

(i) Loosen the screw (blue) on the lever of the dummy and pull down the lever toward you.

(ii) Insert the dummy all the way.

(iii) Raise the lever fully.

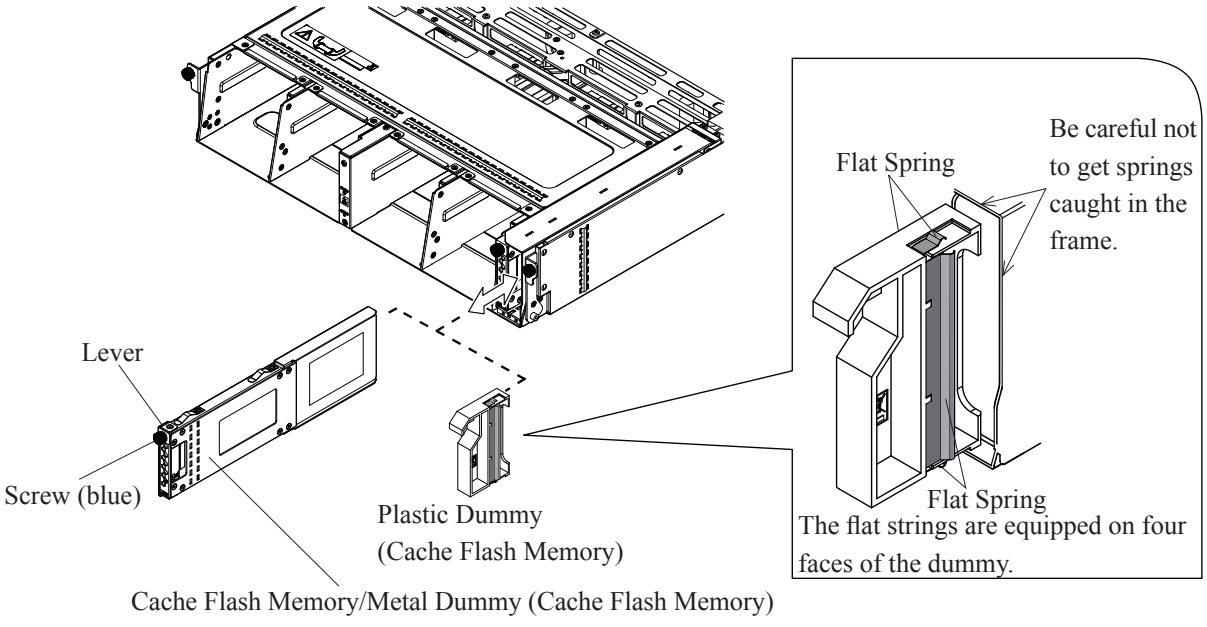
(iv) Tighten the screw (blue) to fix the dummy.

• Plastic dummy

(i) Insert the dummy straight in the slot all the way while being careful of the springs of the dummy.

NOTE: If the dummy is not inserted straight, the spring of the dummy gets caught in the chassis and the dummy cannot be inserted all the way. When you insert the dummy and the dummy is not inserted all the way, remove it and insert it again.

Figure 4-88 Replacing/Removing Cache Flash Memory



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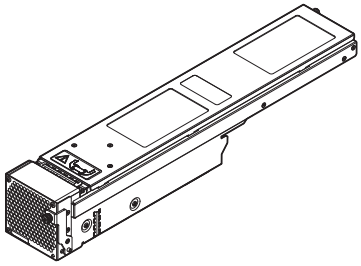
(5) Removing the Batteries.
If you have changed the Battery installation pattern in the "(c) <Cache Size Define window>", remove the Battery.
When you need to add a BKMF, refer to "Table 3-4 Cache Memory Capacity, Cache Flash Memory and Backup Module Installation Patterns (when NAS Module is not installed)" to remove the Battery.

⚠ CAUTION

Use only with designated Battery.
May cause overheating, fire or bursting.

NOTICE:
- You can remove the Batteries installed in the rear of BKMF-11, BKMF-21, BKMF-12, BKMF-22, BKMF-13 and BKMF-23.
- You cannot remove the Batteries installed in the front of the BKMFs.
- Remove a battery from each of BKMF-11, BKMF-21, BKMF-12, BKMF-22, BKMF-13 and BKMF-23.
- Remove a battery from a BKMF one by one.

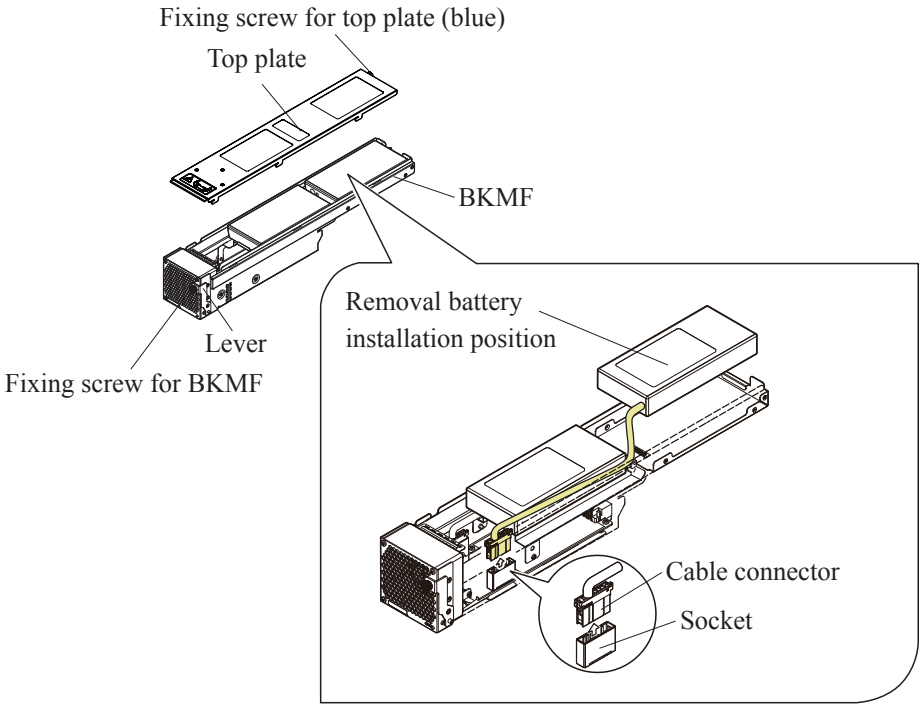
NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen the screw (blue) on the rear side of the BKMF.
(b) Slide the top panel of the BKMF and remove it.
(c) Release the latch of the cable connector of the Battery to remove.
(d) Remove the Battery.
(e) Slide the top panel of the BKMF and attach it.
(f) Tighten the screw (blue) on the rear side of the BKMF.
(g) Remove three batteries per Controller Board.

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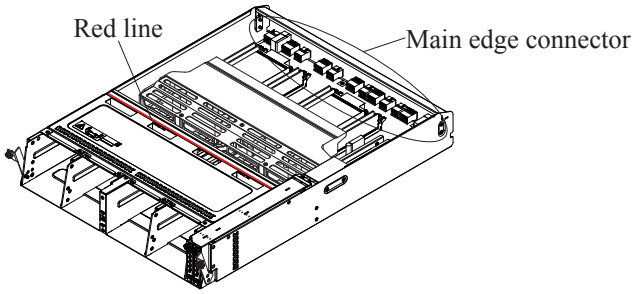
Figure 4-89 Removing Battery



(6) Installing the Controller Board 1.

⚠ CAUTION

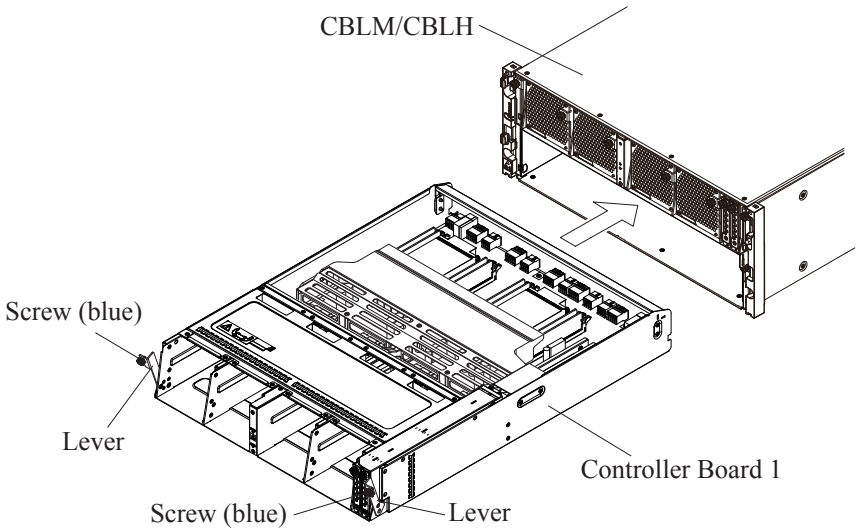
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

(a) With the lever on the Controller Board 1 opened completely, insert the Controller Board 1 into the slot of the CBLM/CBLH.
(b) Install four BKMFs in the Controller Board.
  (i) Open the BKMF lever and insert the BKMF into the slot.
  (ii) Close the BKMF lever and tighten the screws (blue) and fix it.

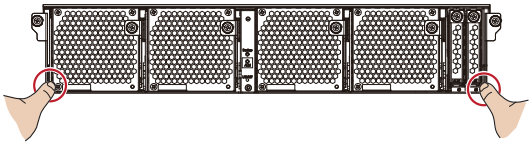
Figure 4-90 Installing Controller Board 1 (CBLM/CBLH)



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(c) Push the Controller Board all the way in, and then the right and left levers closed completely.

NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



(d) Tighten the screw (blue) and fix the Controller Board.

Figure 4-91 Installing BKMFs

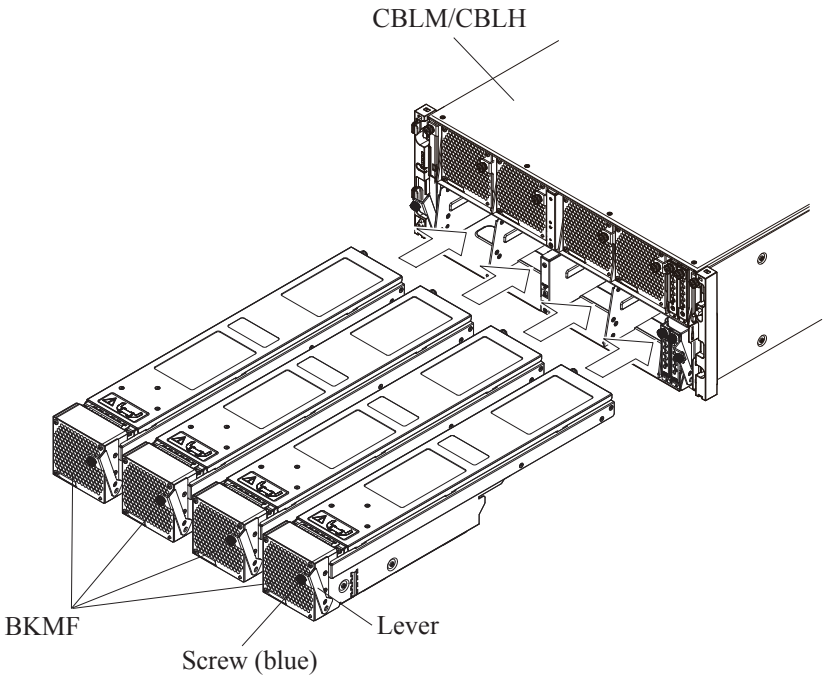
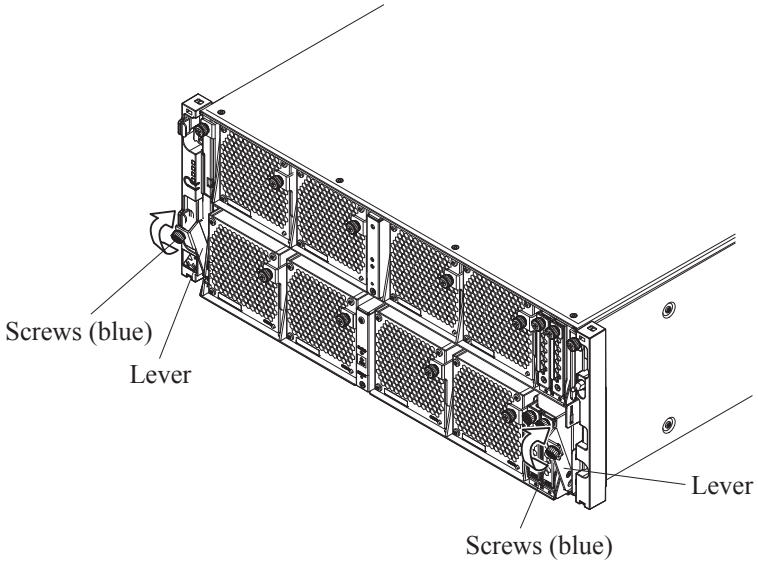
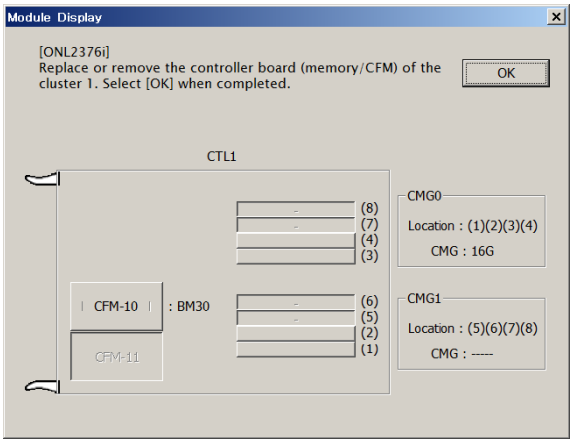


Figure 4-92 Fixing Controller Board



4. Maintenance PC post procedure (on the Cluster 1)
   (1) <Check Hardware Removal Completion>
   After completing the removal of the Cache Memory of the cluster 1, click the [OK] button in response to the message "[2376] Replace or remove the controller board (memory/CFM) of the cluster 1. Select [OK] when completed." or "[4572] Replace or remove the controller board (Memory/CFM) of the cluster 1. Then, remove optionally-installed batteries from BKMFs. Select [OK] when completed.".



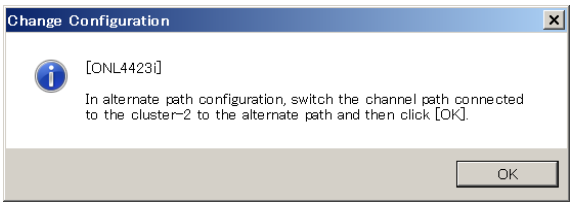
   A message of the processing status is displayed.

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5. Maintenance PC pre procedure (on the Cluster 2)

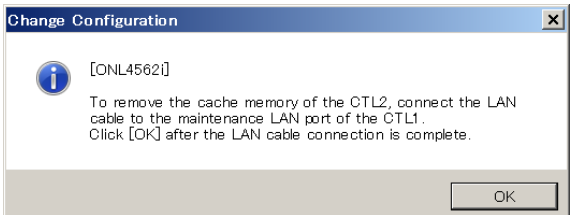
In case of the NAS Module installed configuration, perform the EVS manual migration.
For the details of the EVS manual migration, see MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations".

(1) In response to the message "[4423] In alternate path configuration, switch the channel path connected to the cluster-2 to the alternate path and then click [OK].", click the [OK] button.



(2) Reconnecting the Maintenance PC
Connect the Maintenance PC and Controller Board 1 in accordance with the message "[4562] To remove the cache memory of the CTL2, connect the LAN cable to the maintenance LAN port of the CTL1. Click [OK] after the LAN cable connection is complete.". (Refer to "1.6.1 Attachment / Removal Procedure of Maintenance PC".)
When connected, click the [OK] button.

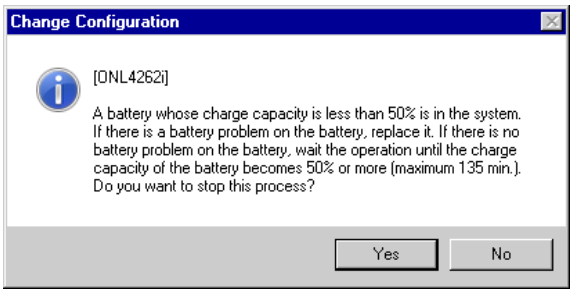
- When there is PCB whose amount of charge of the battery is less than 50%:
  go to "(3) < Confirmation of Amount of Battery Charge >"
- When there is no PCB whose amount of charge of the battery is less than 50%:
  go to "(5) <Block Controller Board on Cluster 2>".



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(3) < Confirmation of Amount of Battery Charge >

- When there is PCB whose amount of charge of the battery is less than 50%:
  "[4262] A battery whose charge capacity is less than 50% is in the system. If there is a battery problem on the battery, replace it. If there is no battery problem on the battery, wait the operation until the charge capacity of the battery becomes 50% or more (maximum 135 min.). Do you want to stop this process?"
- When stopping this process, click the [Yes] button to return to "1. Selecting removal parts" Step (5).
- When continuing this process, click the [No] button.

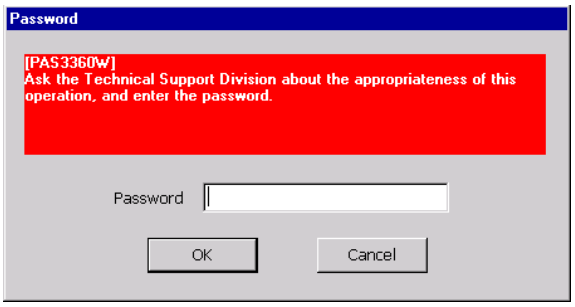


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⚠ CAUTION

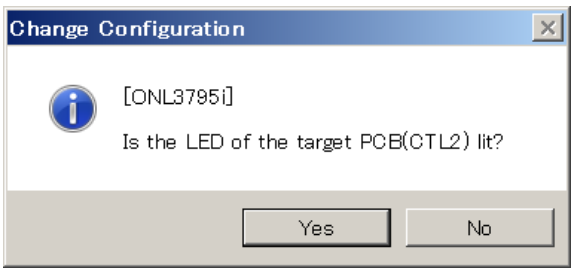
This is a special (exceptional) operation that can cause a serious failure such as a system down or a data loss if a wrong part to be removed is selected, and requires an input of a password. Ask the technical support division about the appropriateness of the operation, and input the password after getting an approval of executing the operation.

(4) <Input password>
"Password"[3360] window is displayed.
The enter the password and click the [OK] button.

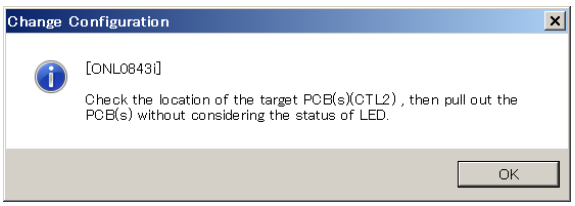


(5) <Block Controller Board on Cluster 2>
The Controller Board on the Cluster 2 is blocked and a message of the processing status is displayed.

(6) <Check ALM LED>
Click the following in response to "[3795] Is the LED of the target PCB(CTL2) lit?".
Click the [Yes] button if ALM LED is on
Click the [No] button if ALM LED is off



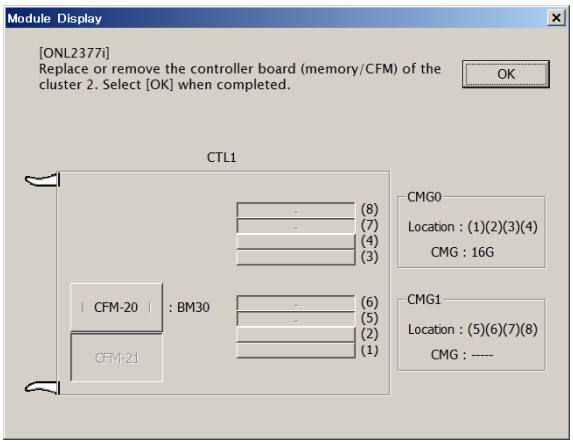
(a) When selecting the [No] button.
Click the [OK] button after responding to "[0843] Check the location of the target PCB(s) (CTL2) and then pull out the PCB(s) without considering the status of LED.".



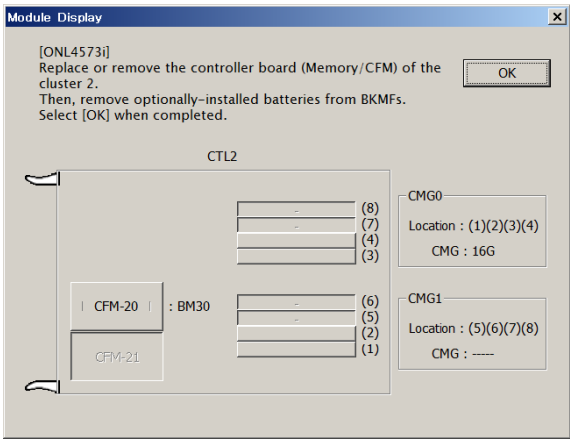
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(7) <Execute hardware removal>
At this point, do not press the [OK] button yet.

- When the Battery installation pattern of "(c) <Cache Size Define window>" (INST04-08-340) is not changed
  If the message "[2377] Replace or remove the controller board (memory/CFM) of the cluster 2. Select [OK] when completed." is displayed after completing the blockade of the controller board of the cluster 2, remove the hardware components in accordance with "6. Procedure for removing Controller Board 2.".



- When the Battery installation pattern of "(c) <Cache Size Define window>" (INST04-08-340) is changed from "Basic & Option" to "Basic"
  If the message "[4573] Replace or remove the controller board (Memory/CFM) of the cluster 2. Then, remove optionally-installed batteries from BKMFs. Select [OK] when completed." is displayed, remove the hardware in accordance with "6. Procedure for removing Controller Board 2.".



Make sure of the installation location of the module and remove the correct module.

6. Procedure for removing Controller Board 2.

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBLM/CBLH Controller Board 2 in which the removed cache memory is installed lights up.

Figure 4-93 Position of the ALM LED

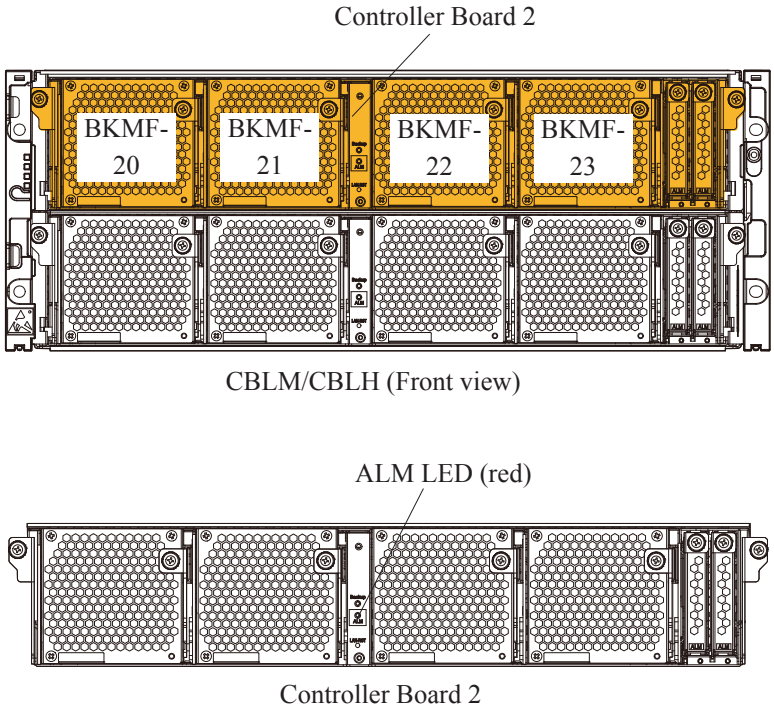


Table 4-14 Location of the Controller Board

Cluster	Location	Location No.
2	Front of CBSS/CBSL	Controller Board 2

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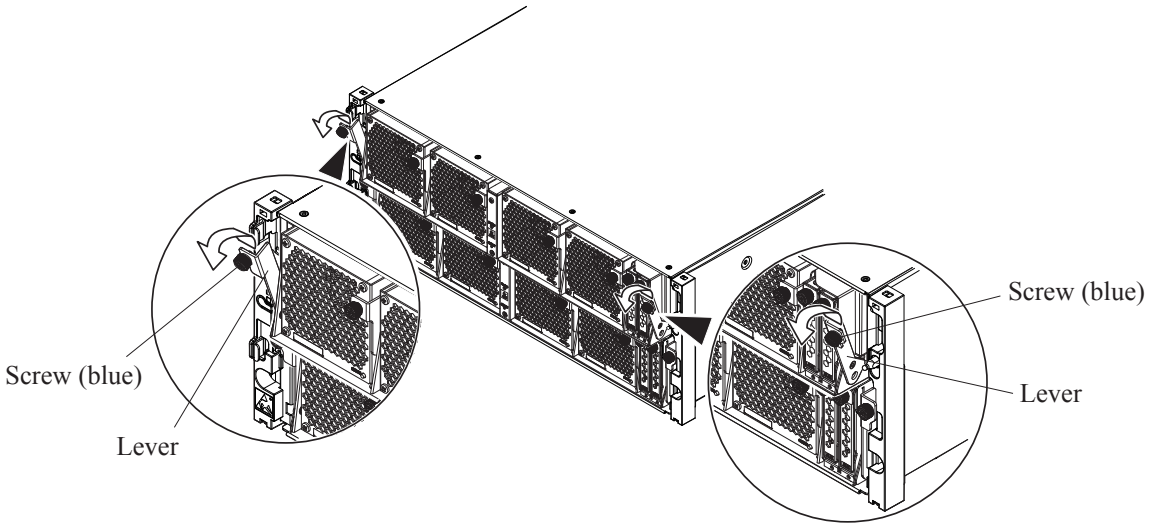
(2) Removing the Controller Board 2 from CBLM/CBLH

⚠ CAUTION

When removing a Controller Board of the CBLM/CBLH, be sure to remove BKMFs first because the mass of the Controller Board is about 19 kg.

(a) Loosen the right and left screws (blue) on the lever of the Controller Board 2 in the front of the CBLM/CBLH and open the lever.

Figure 4-94 Removing Controller Board 2 (CBLM/CBLH)

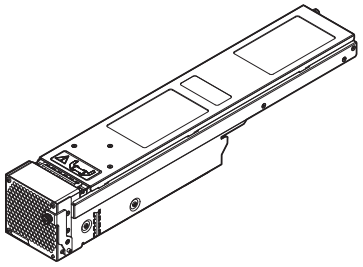


NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBLM/CBLH lights up after performing "7. Maintenance PC post procedure (on the Cluster 2)" of the "4.8.2"

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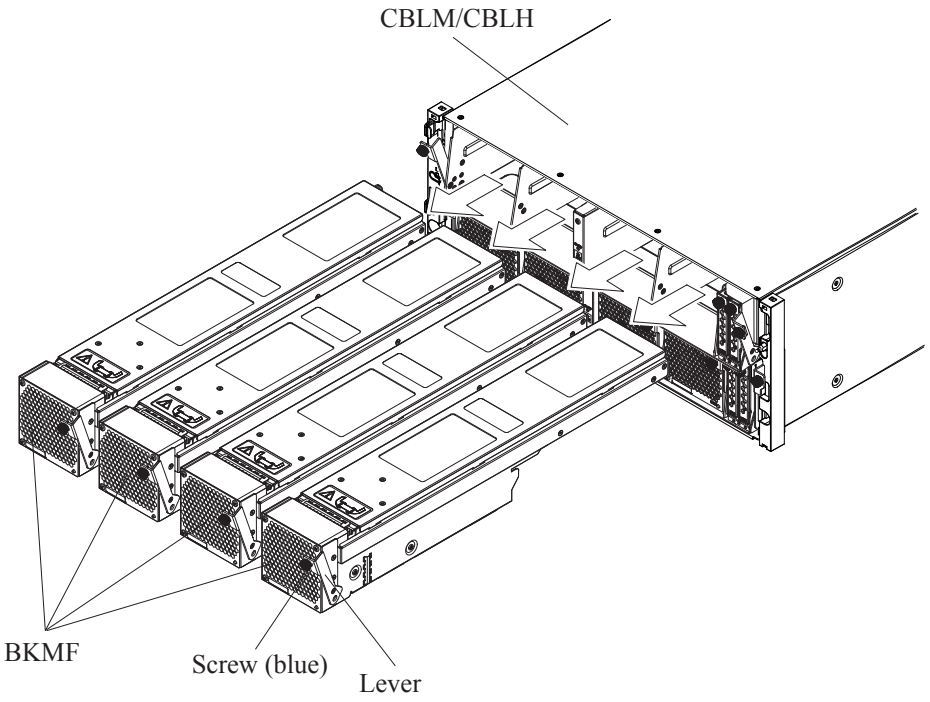
(b) Remove all BKMFs (four) installed in the Controller Board.

NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



(i) Loosen the screws (blue) fixing the BKMF.
(ii) Open the lever and pull out the BKMF to remove.

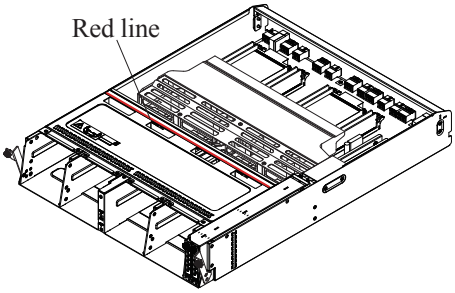
Figure 4-95 Removing BKMFs (CBLM/CBLH)



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⚠ CAUTION

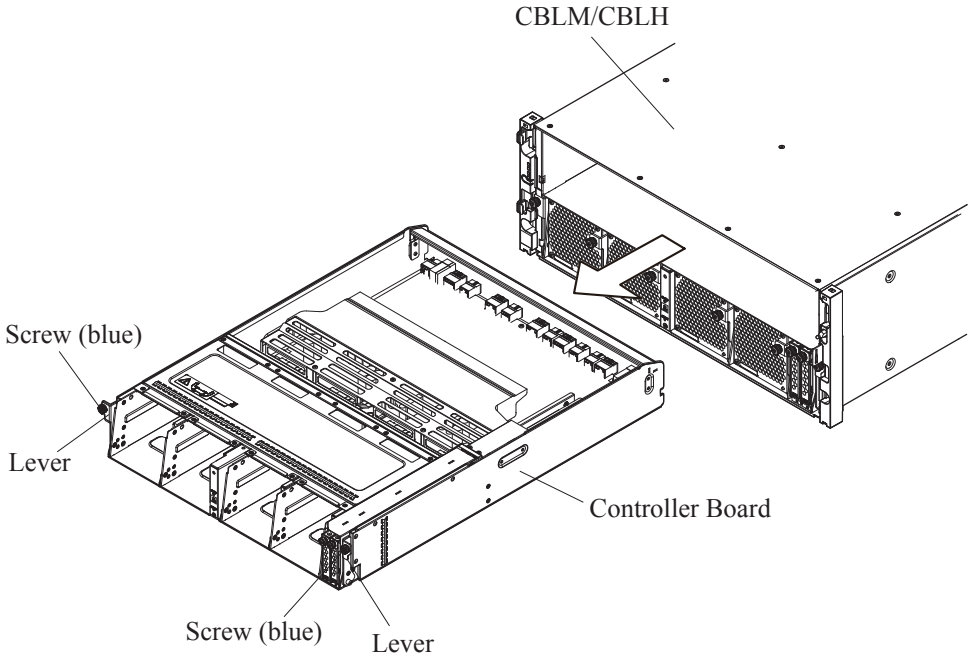
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

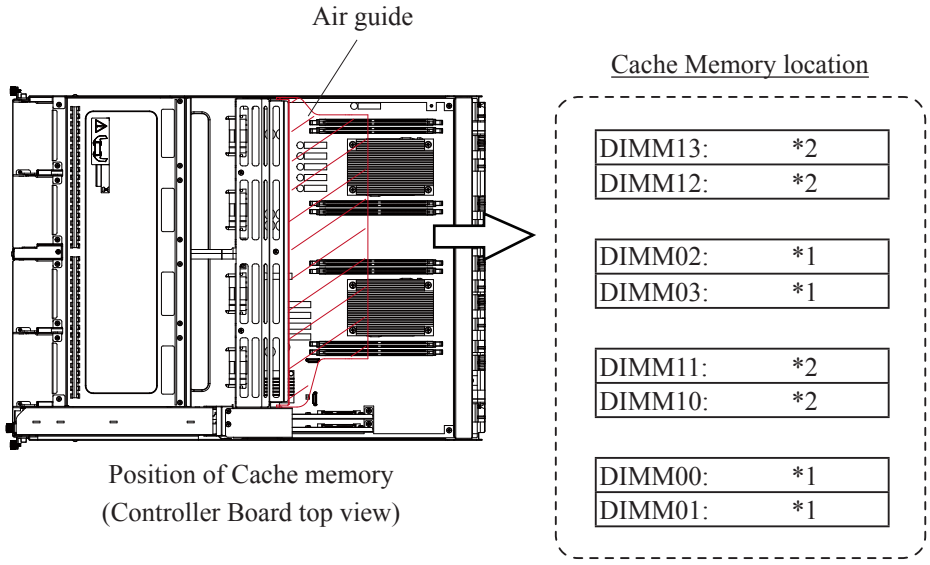
(c) With the lever opened completely, pull out and remove the Controller Board 2.

Figure 4-96 Removing Controller Board 2 (CBLM/CBLH)



(3) Removing Cache Memories

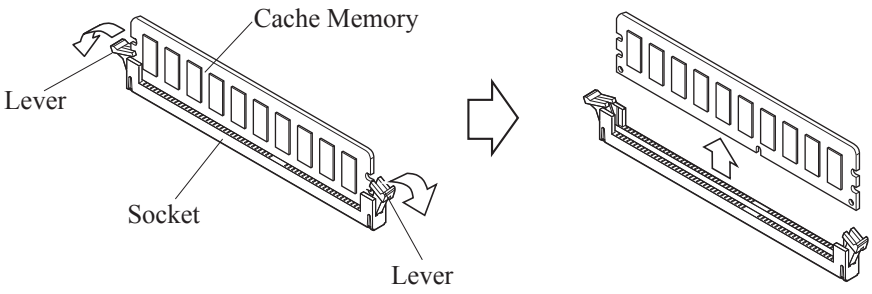
Remove the installed Cache Memory and install a Cache Memory of the smaller capacity.



*1 : Belonging to CMG0 (Cache Memory Group 0).
*2 : Belonging to CMG1 (Cache Memory Group 1).
Be sure to install DIMM in CMG0.
CMG1 is an additional slot of DIMM.
Install DIMM in sets of four.

(a) The procedure for removing.
(i) Open the air guide.
(ii) Pull the lever outward.
(iii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 4-97 Removing the Cache Memory (CBLM/CBLH)



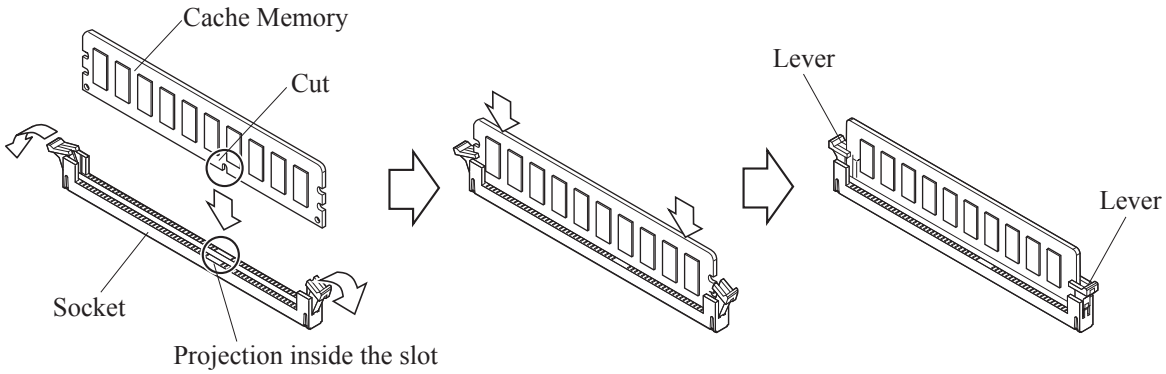
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(b) Procedure for installing.

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.
(iv) Close the air guide.

Figure 4-98 Removing Cache Memory (CBLM/CBLH)



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(4) Replacing/Removing Cache Flash Memories.

(a) Removal Procedure

(i) Loosen the screw (blue) fixing the Cache Flash Memory to be removed and open the lever.

(ii) Pull out and remove the Cache Flash Memory while holding it with both hands.

(b) Installation procedure

For replacement work:

(i) Open the lever of the Cache Flash Memory of the smaller capacity completely and insert the Cache Flash Memory into the slot of Controller Board 2.

(ii) Push the Cache Flash Memory all the way in.

(iii) Close the lever completely.

(iv) Tighten the screw (blue) and fix the Cache Flash Memory.

For removal work:

Install a dummy in a vacant slot.

There are two types of dummies and the installation procedure is different between them.

• Metal dummy

(i) Loosen the screw (blue) on the lever of the dummy and pull down the lever toward you.

(ii) Insert the dummy all the way.

(iii) Raise the lever fully.

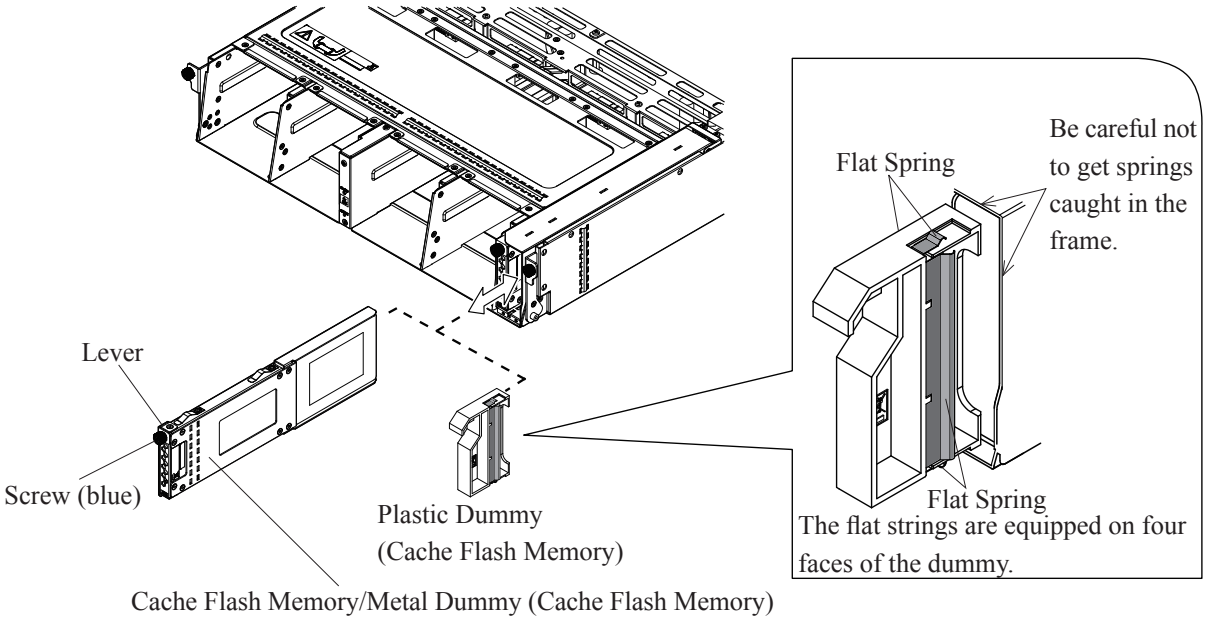
(iv) Tighten the screw (blue) to fix the dummy.

• Plastic dummy

(i) Insert the dummy straight in the slot all the way while being careful of the springs of the dummy.

NOTE: If the dummy is not inserted straight, the spring of the dummy gets caught in the chassis and the dummy cannot be inserted all the way. When you insert the dummy and the dummy is not inserted all the way, remove it and insert it again.

Figure 4-99 Replacing/Removing Cache Flash Memory



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(5) Removing the Battery.

If you have changed the Battery installation pattern in the "(c) <Cache Size Define window>", remove the Battery

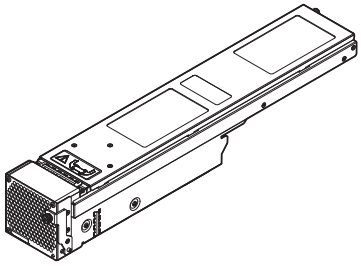
When you need to add a BKMF, refer to "Table 3-4 Cache Memory Capacity, Cache Flash Memory and Backup Module Installation Patterns (when NAS Module is not installed)" to remove the Battery.

⚠ CAUTION

Use only with designated Battery.
May cause overheating, fire or bursting.

NOTICE:
- You can remove the Batteries installed in the rear of BKMF-11, BKMF-21, BKMF-12, BKMF-22, BKMF-13 and BKMF-23.
- You cannot remove the Batteries installed in the front of the BKMFs.
- Remove a battery from each of BKMF-11, BKMF-21, BKMF-12, BKMF-22, BKMF-13 and BKMF-23.
- Remove a battery from a BKMF one by one.

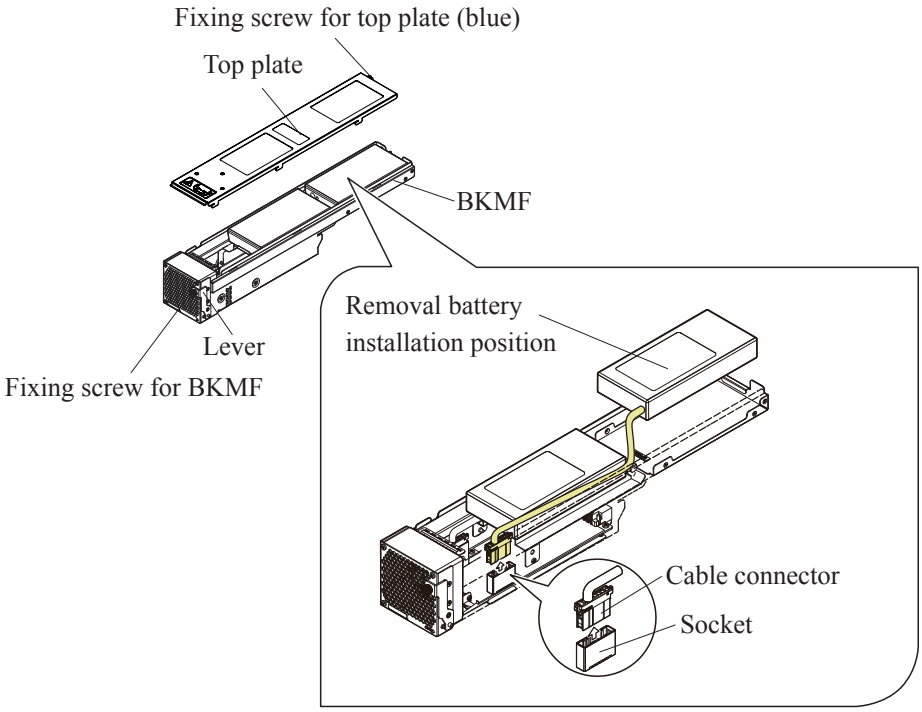
NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



(a) Loosen the screw (blue) on the rear side of the BKMF.
(b) Slide the top panel of the BKMF and remove it.
(c) Release the latch of the cable connector of the Battery to remove.
(d) Remove the Battery.
(e) Slide the top panel of the BKMF and attach it.
(f) Tighten the screw (blue) on the rear side of the new BKMF.
(g) Remove three batteries per Controller Board.

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Figure 4-100 Removing Battery

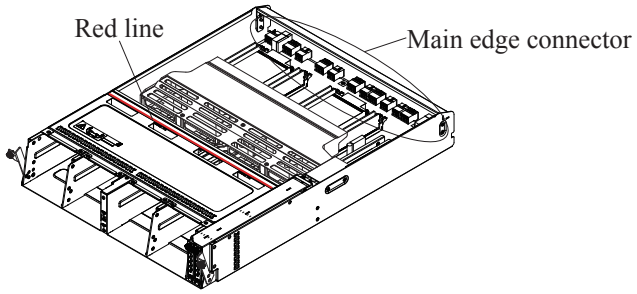


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(6) Installing the Controller Board 2.

⚠ CAUTION

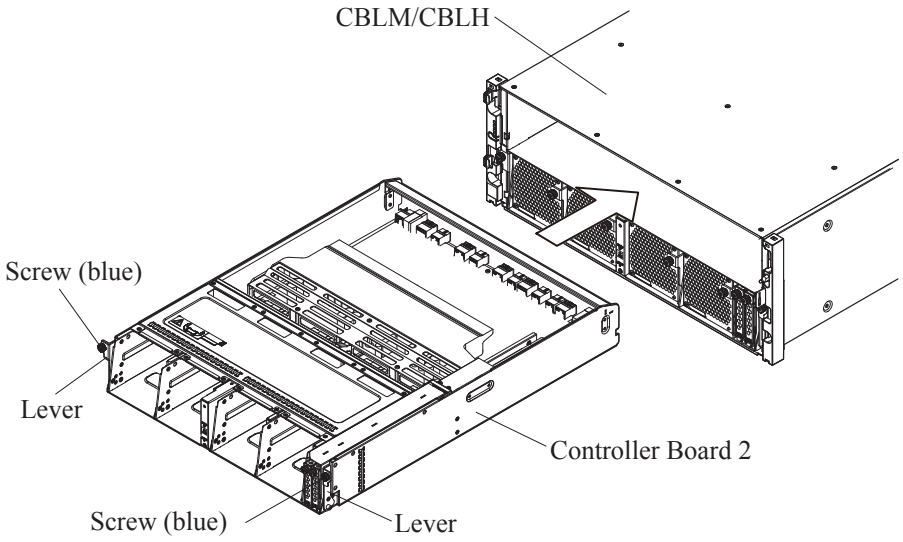
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

(a) With the lever on the Controller Board 2 opened completely, insert the Controller Board 2 into the slot of the CBLM/CBLH.
(b) Install four BKMFs in the Controller Board.
  (i) Open the BKMF lever and insert the BKMF into the slot.
  (ii) Close the BKMF lever and tighten the screws (blue) and fix it.

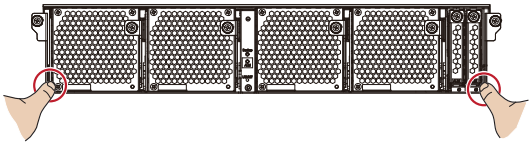
Figure 4-101 Installing Controller Board 2 (CBLM/CBLH)



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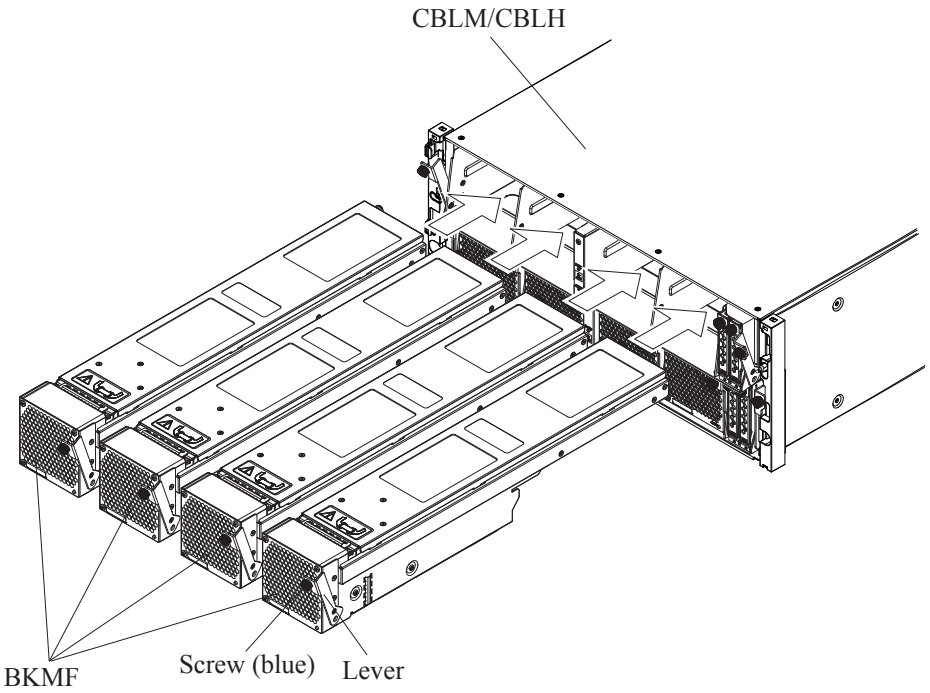
(c) Push the Controller Board all the way in, and then the right and left levers closed completely.

NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



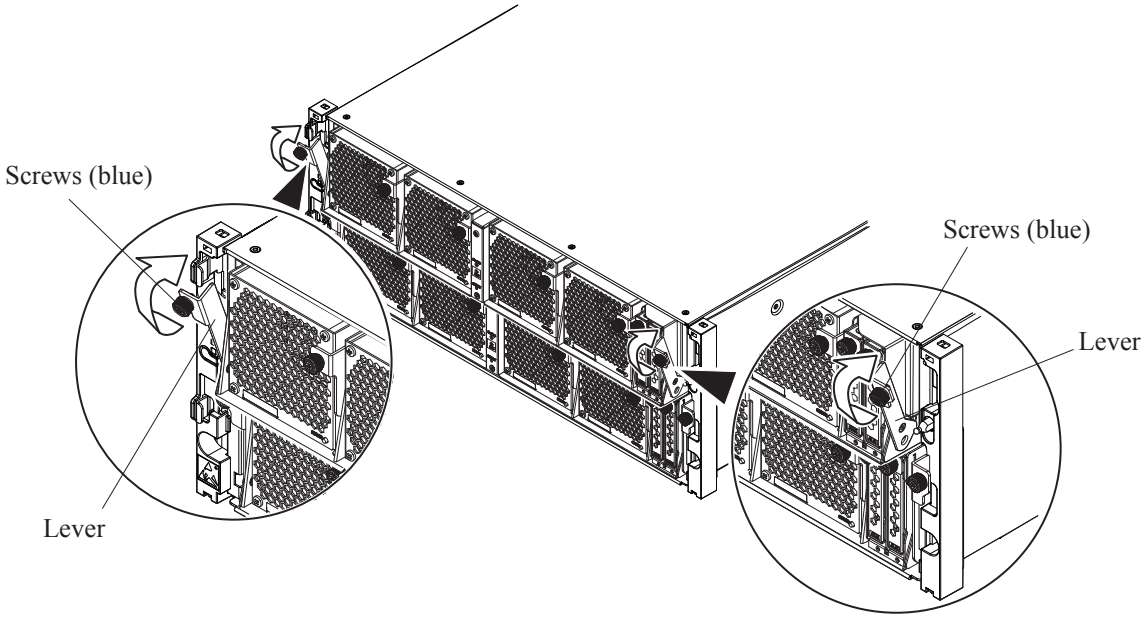
(d) Tighten the screw (blue) and fix the Controller Board.

Figure 4-102 Installing the BKMFs



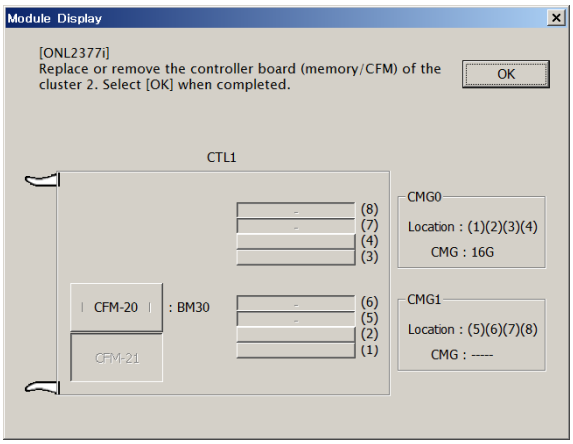
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Figure 4-103 Fixing Controller Board

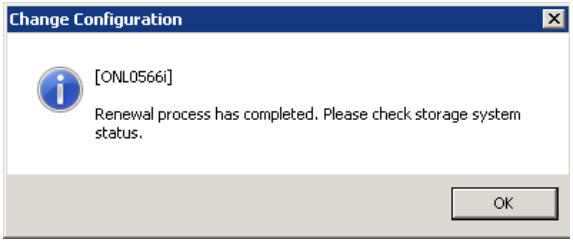


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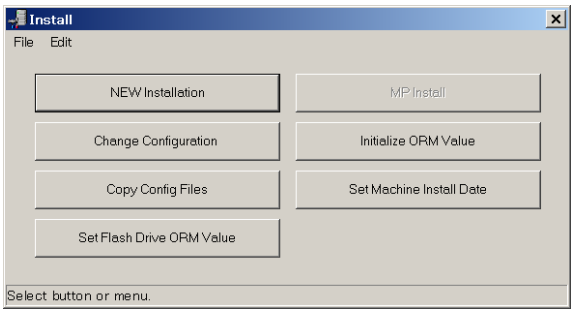
7. Maintenance PC post procedure (on the Cluster 2)
   (1) <Check Hardware Removal Completion>
   After completing the hardware procedure for Cluster 2 of cache memory, click the [OK] button in response to the message “[2377] Replace or remove the controller board (memory/CFM) of the cluster 2. Select [OK] when completed.” or “[4573] Replace or remove the controller board (Memory/CFM) of the cluster 2. Then, remove optionally-installed batteries from BKMFs. Select [OK] when completed.”.



   (2) <Check the end completion of removal procedure>
   In response to the message “[0566] Renewal process has completed. Please check storage system status.”, click the [OK] button.



   (3) <End completion of removal work>
   After completing the procedure, return to the “Install” window.
   Select [File]-[Exit].



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(4) <Mode Change>
Click the [Modify Mode] display in the “MPC” window to return the mode to View Mode.

(5) <Path online>
Set the stopped channel path online by your customer.

- In case of the NAS Module installed configuration, the EVS manual migration to the post-maintenance NAS Module is required.
  Perform the manual EVS migration with reference to Step 8.

---

8. Manual EVS Migration
   Migrate EVS manually from the NAS Module in operation to the NAS Module after the completion of the maintenance.

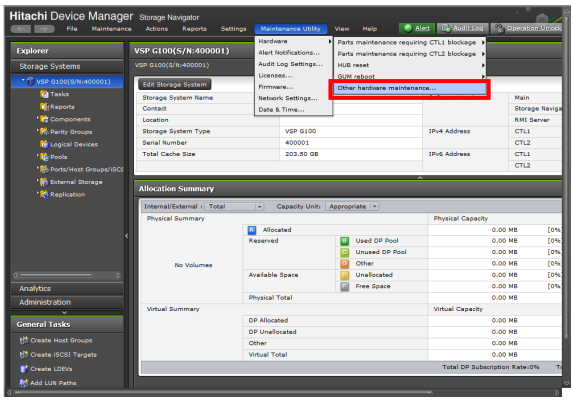
   (1) See MAINTENANCE PC SECTION “6.1.1 Logging into NAS Manager” for how to log into NAS Manager.
   (2) See MAINTENANCE PC SECTION “6.4.2 Migration after the Maintenance Operations” for how to migrate EVS manually.
   (3) See MAINTENANCE PC SECTION “6.1.2 Logging out from NAS Manager” for how to log out from NAS Manager.

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4.8.3 Removing Batteries for NAS Modules (CBLM/CBLH)

1. Connecting the Maintenance PC
   Connect the Maintenance PC and the Storage System.
   To remove batteries for NAS Modules, connect the Maintenance PC and Controller Board 1.
   - See "1.6.1 Attachment / Removal Procedure of Maintenance PC" to connect the Maintenance PC and the Controller Board via LAN cables.

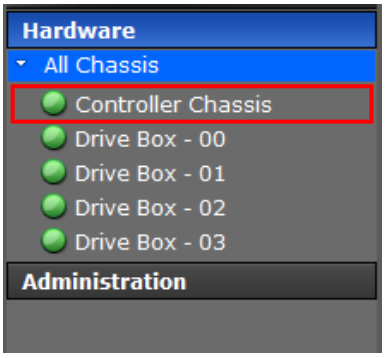
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance...] in the "Web Console" window displays the "Maintenance Utility" window.



3. Selecting additional parts by Maintenance Utility

   NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

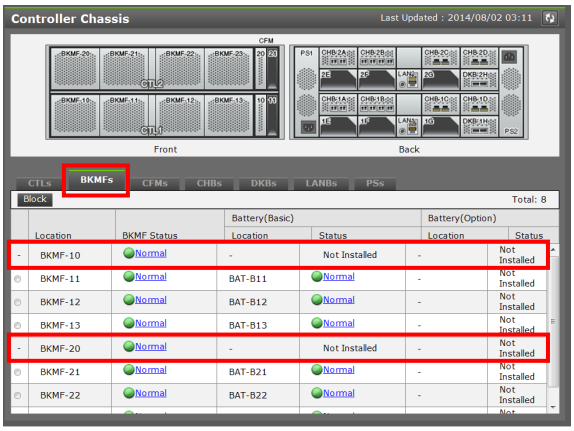
   (1) <Main Window>
   Click the [Controller Chassis] tab in the main window.



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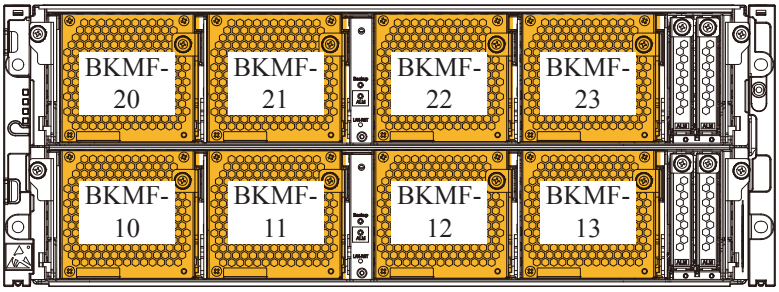
(2) <Controller Chassis window>

Click the [BKMF] tab in the "Controller Chassis" window, and check that the batteries for NAS modules to be removed are installed in BKMF (BKMF-10, BKMF-20).



4. Battery Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLM/CBLH	1	Battery	BKMF



Front view of CBLM/CBLH

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "1.1.2 Note when Installing and Removing Parts".

⚠ CAUTION

Hazardous rotating mechanism:
Can cause injury if touched. Stay clear of it when machine is running.
Be careful of your hairs, ties, scarves and shirts not to be caught in the rotating part.

(1) Remove the Front Bezel. (See "1.4.1 How to Attach/Remove the Front Bezel".)

(2) Remove batteries.

NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.

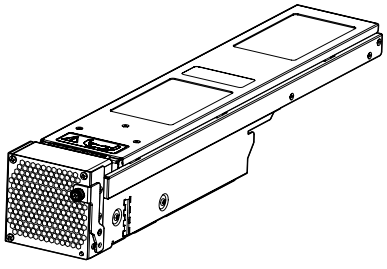
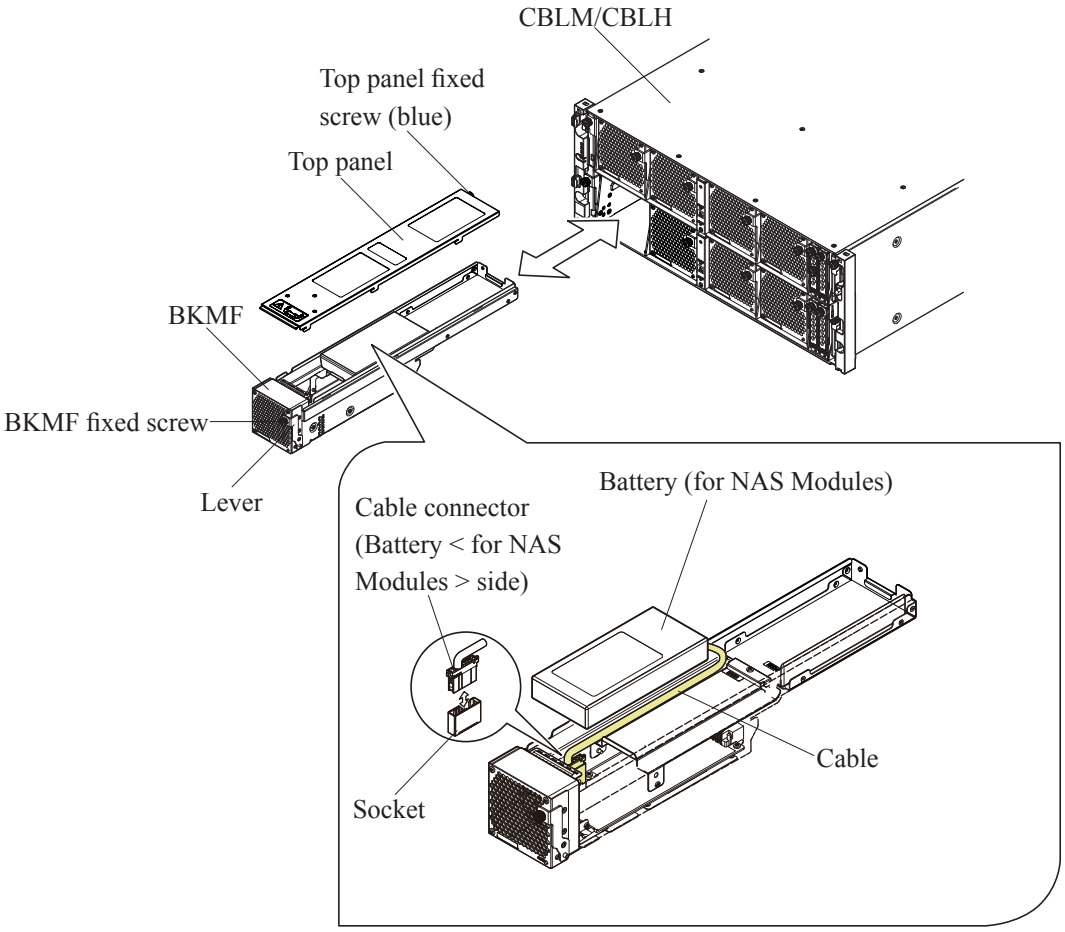


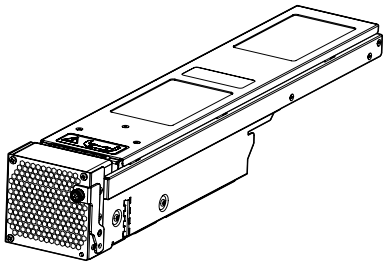
Figure 4-104 Adding batteries for NAS Modules



(a) Loosen the BKMF fixed screw that fixes BKMF (BKMF-10, BKMF-20) to remove batteries for NAS Modules.
(b) Open the lever to pull out and remove the BKMF.
(c) Loosen the top panel fixed screw (blue) on the rear side of the BKMF.
(d) Slide the top panel of the BKMF and remove it.
(e) Release the latch of the cable connector of the battery for the NAS Module to be removed, and remove the connector from the socket.
(f) Remove the battery.
(g) Slide the top panel of the BKMF and attach it.
(h) Tighten the top panel fixed screw (blue) on the rear side of the BKMF.
(i) Check that the batteries for NAS Modules are removed from the two places of BKMF-10 and BKMF-20.

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NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



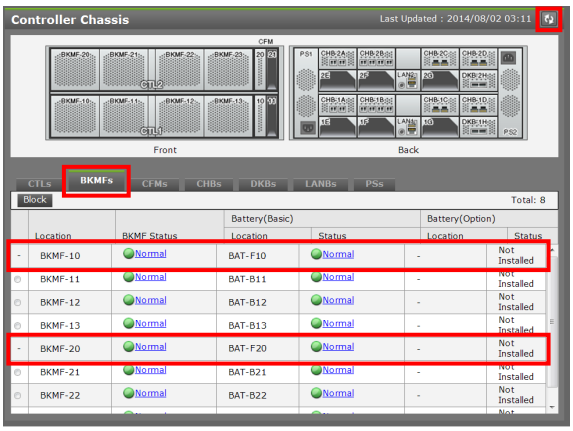
(j) With the lever of the BKMF opened, insert the BKMF into the slot.
(k) Close the lever of the BKMF and tighten the screw (blue).

5. Checking removal completion by Maintenance Utility

NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Checking removal of batteries for NAS modules>
Click the [BKMF] tab in the “Controller Chassis”, and check that the status of the removed batteries for NAS modules (BAT-F10, F20) is “Not Installed”.

NOTE: Click the refresh button on the upper right of the window to update the window, and then check the status.



(2) See MAINTENANCE PC SECTION “1.8.2.4 Close the Window” to close the window.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.

4.9 Removing Shared Memory (SM)

Decide Shared Memories to be removed referring to "3.1.1 Cache Capacity and the Number of Required Options".

When removing Shared Memories, the window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

- When removing Shared Memories from the CBSS/CBSL: "4.9.1 Removing Shared Memory for CBSS/CBSL"
- When removing Shared Memories from the CBLM/CBLH: "4.9.2 Removing Shared Memory for CBLM/CBLH"

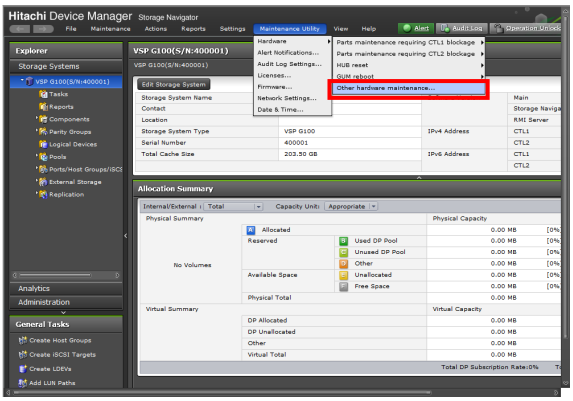
NOTICE: When the I/O load is much higher than the appropriate value, it might take up to eight hours to complete the procedure.
For the appropriate value, refer to System Configuration Guideline.

4.9.1 Removing Shared Memory for CBSS/CBSL

NOTE : Remove the Shared Memories so that Controller Boards 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Shared Memories, connect the Maintenance PC and the Controller Board 1 or Controller Board 2.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

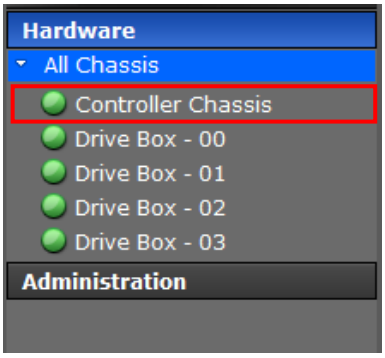


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3. Selecting removal parts by Maintenance Utility

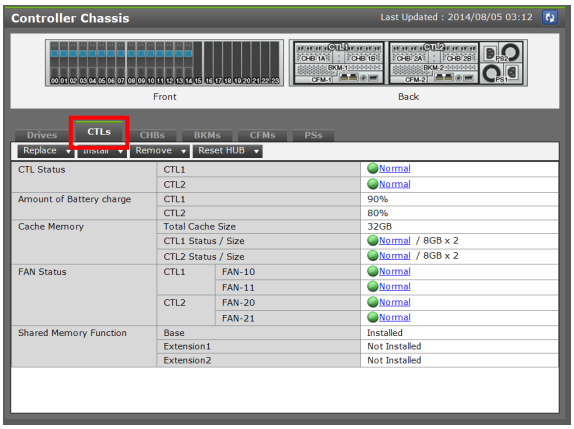
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Main Window>
Select the [Controller Chassis] tab in the main window.

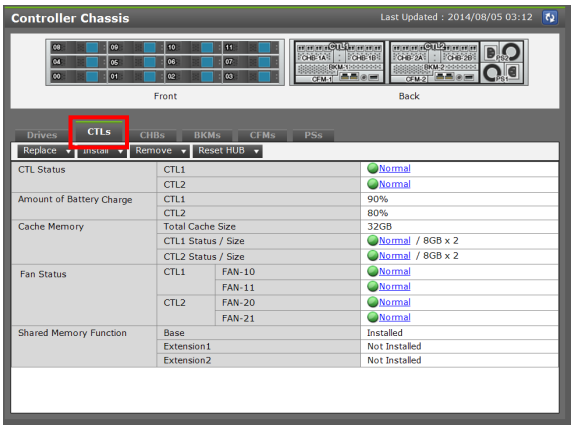


(2) <Controller Chassis Window>
Click the [CTLs] tab in the “Controller Chassis” window to display the Cache Memory status and the mounted capacity.

• In case of CBSS



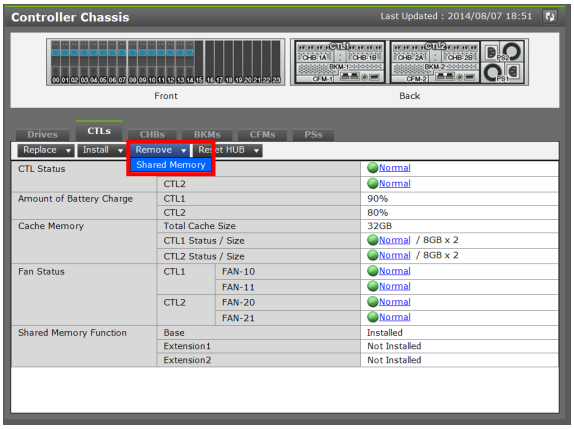
• In case of CBSL



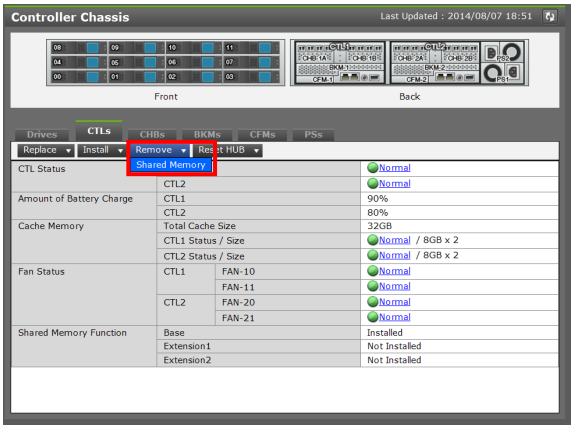
(3) <Select Controller Board>

Check the status display. Click the [Remove] button and select the [Shared Memory].

• In case of CBSS

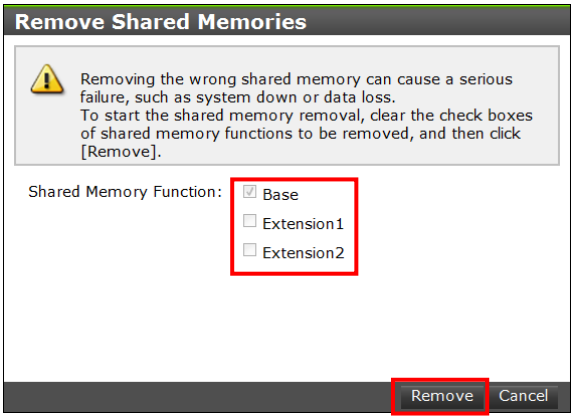


• In case of CBSL



(4) <Shared Memory Removal Window>

Uncheck [Shared Memory Function] to be deleted in the “Remove Shared Memories” window and click the [Remove] button.



(5) <Displaying the Password entry window>

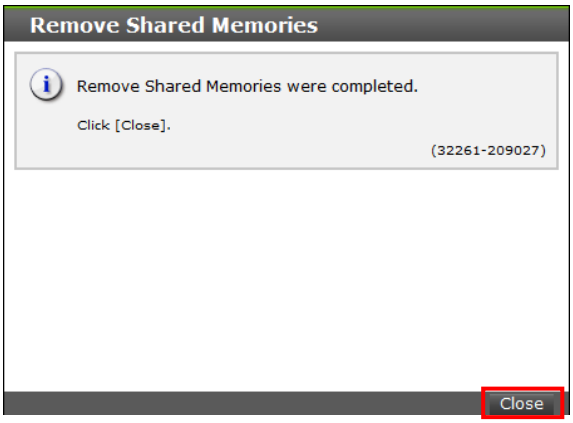
CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

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(6) <Shared Memory Removal Completion Window>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



When the Shared Memory removal fails, click the [Close] button of the completion message. After that, click the [CTL] tab in the "Controller Chassis" window and check the Shared Memory Function status.

(7) Refer to MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

4. Disconnecting the Maintenance PC and the Storage System.
Removing the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

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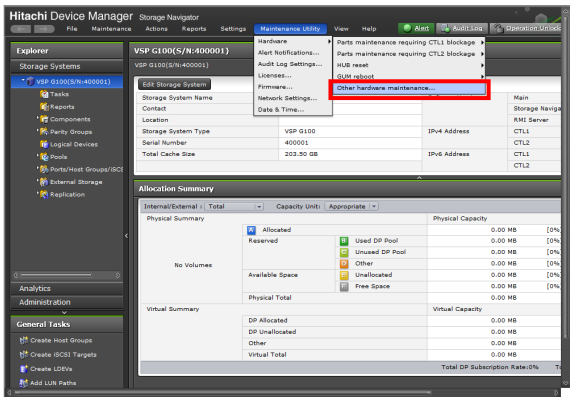
4.9.2 Removing Shared Memory for CBLM/CBLH

NOTE : Remove the Shared Memories so that Controller Boards 1 and 2 have the same configuration.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Shared Memories, connect the Maintenance PC and the Controller Board 1 or Controller Board 2.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.

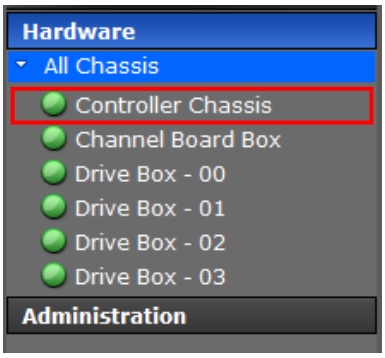


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3. Selecting removal parts by Maintenance Utility

NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

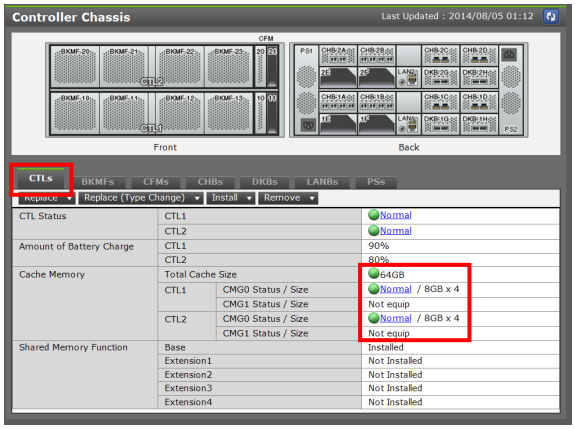
(1) <Main Window>
Select the [Controller Chassis] tab in the main window.



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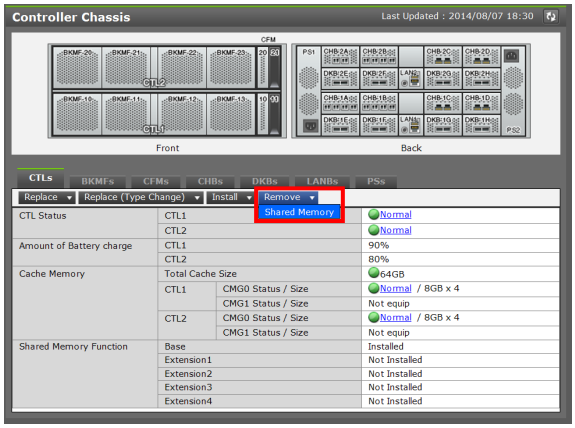
(2) <Controller Chassis Window>

Click the [CTLs] tab in the “Controller Chassis” window to display the Cache Memory status and the mounted capacity.



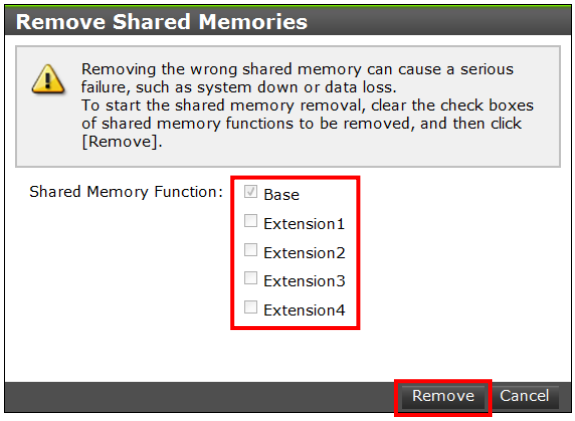
(3) <Select Controller Board>

Click the [Remove] button and select [Shared Memory].



(4) <Shared Memory Removal Window>

Uncheck [Shared Memory Function] to be deleted in the “Remove Shared Memories” window and click the [Remove] button.



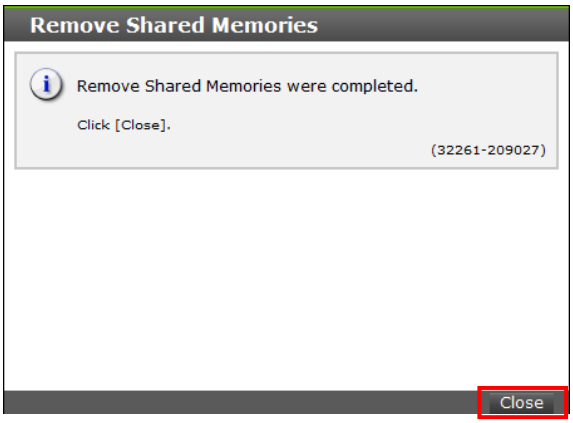
(5) <Displaying the Password entry window>

CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(6) <Shared Memory Removal Completion Window>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



When the Shared Memory removal fails, click the [Close] button of the completion message. After that, click the [CTLs] tab in the "Controller Chassis" window and check the Shared Memory Function status.

(7) Refer to MAINTENANCE PC SECTION "1.8.2.4 Close the Window" to close the window.

4. Disconnecting the Maintenance PC and the Storage System.
Removing the LAN cable from the Controller Board referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

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4.10 Removing PDUs for a Rack and PDU Power Codes

Table 4-15 Parts List

No.	Model Number	Model Name	Parts No	Quantity	Remarks
1	A-F6516-PDU6	PDB (PDU6) ASSY	3276098-A	2	PDU
		Binding screw (M5 x 10)	SB510N	10(*1)	–
		Rack nut	5510146-1	10	Unused
2	A-F6516-P620	PDU power cable	3279357-A	2	–
3	HT-F4933-PDU6	PDU	3276098-A	2	–
		Rack nut	5510146-1	10(*2)	–
		Binding screw (M5 x 10)	SB510N	10(*2)	–
		Cage nut	5528564-1	10(*2)	–
		LL washer	5513553-5	10(*2)	–
		Support bracket	3272220-1	4	–
		Socket bolt M5 × 20	3261899-520	10(*2)	–
		Cable holder	3230194-1	2	–
		Socket bolt M4 × 30	5538207-1	6	–
		Plate holder	5519109-1	1	–
		Socket bolt M4 × 8	BS408	4	–
		Hexagon socket bolts (unified)	5503443-1	10	Unused

*1 : 6 spares are included.

*2 : 2 spares are included.

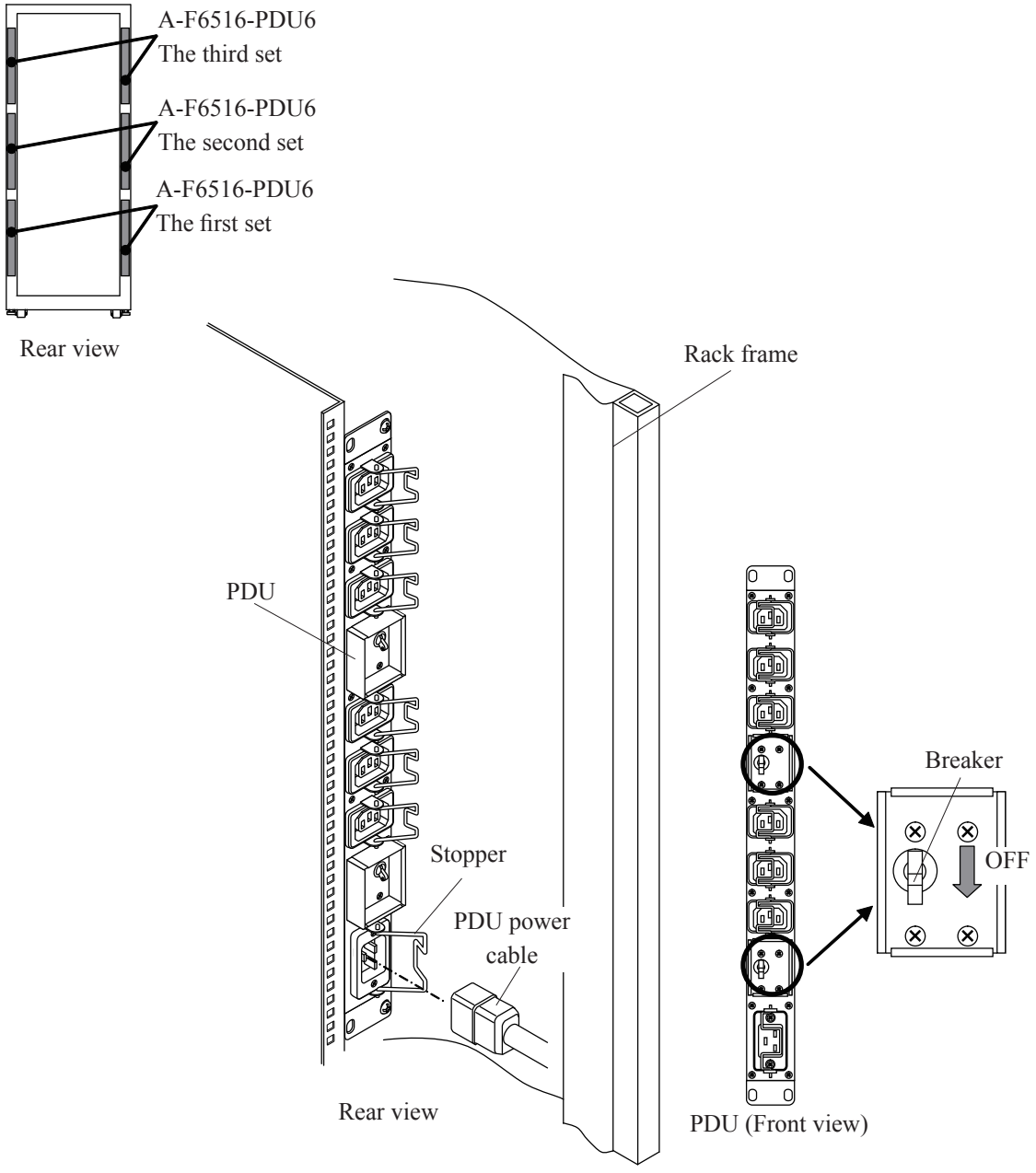
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4.10.1 Removing PDUs for a Rack and PDU Power Codes

Removing the PDUs (A-F6516-PDU6) for a rack and PDU power codes (A-F6516-P620).

1. Removing PDU power cables
   (1) Turn off the breaker on the distribution board connected to the PDU power cable.
   (2) Turn off the breaker of the PDU to be removed.
   (3) Open the stopper of the PDU on the right side of the rear of the rack frame and remove the PDU power cable.
   (4) Remove the PDU on the left side in the similar procedure.

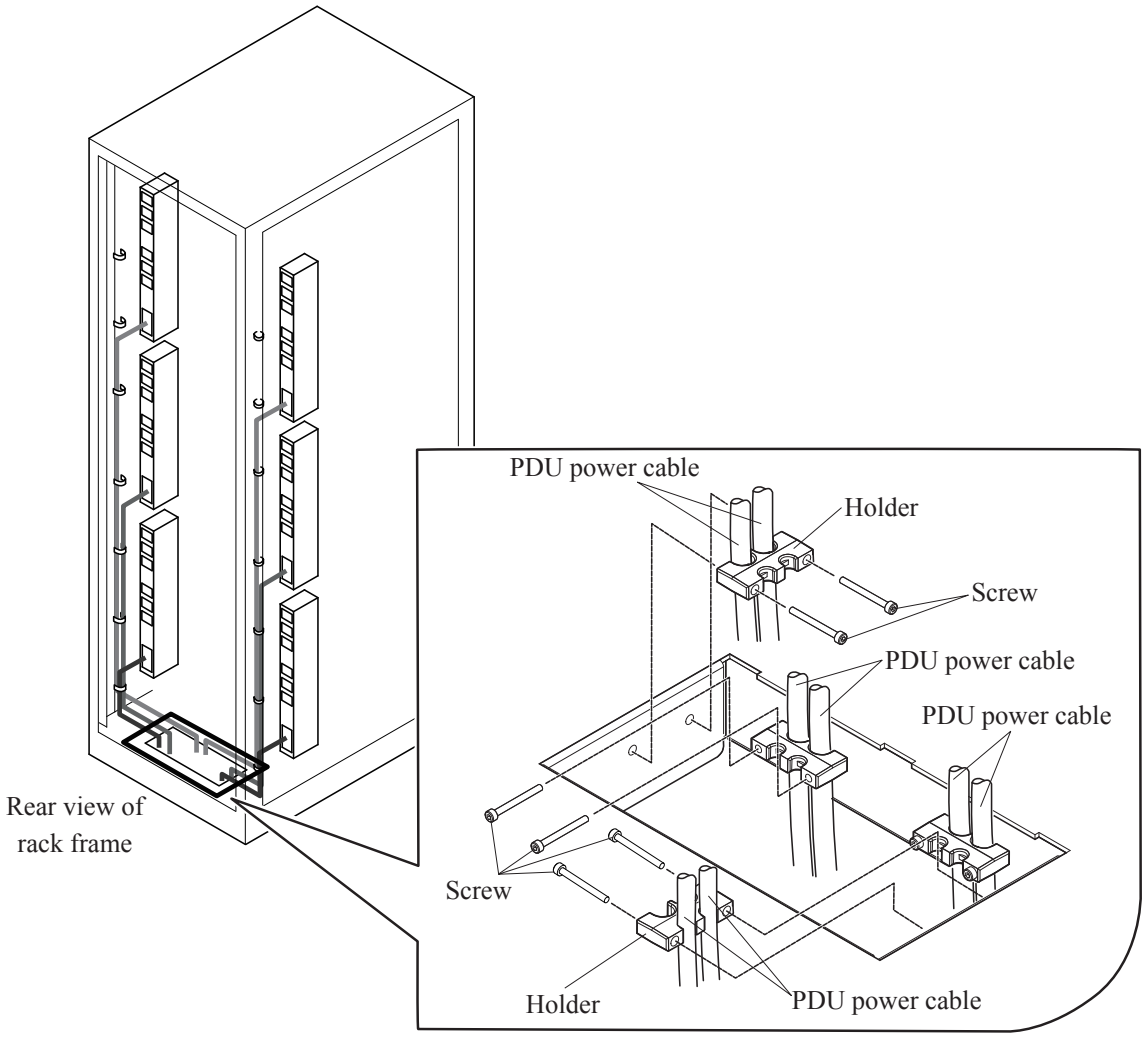
Figure 4-105 Removing PDU Power Cables



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(5) Remove the holder of the opening at the lower part of the rack and remove two PDU power cables.

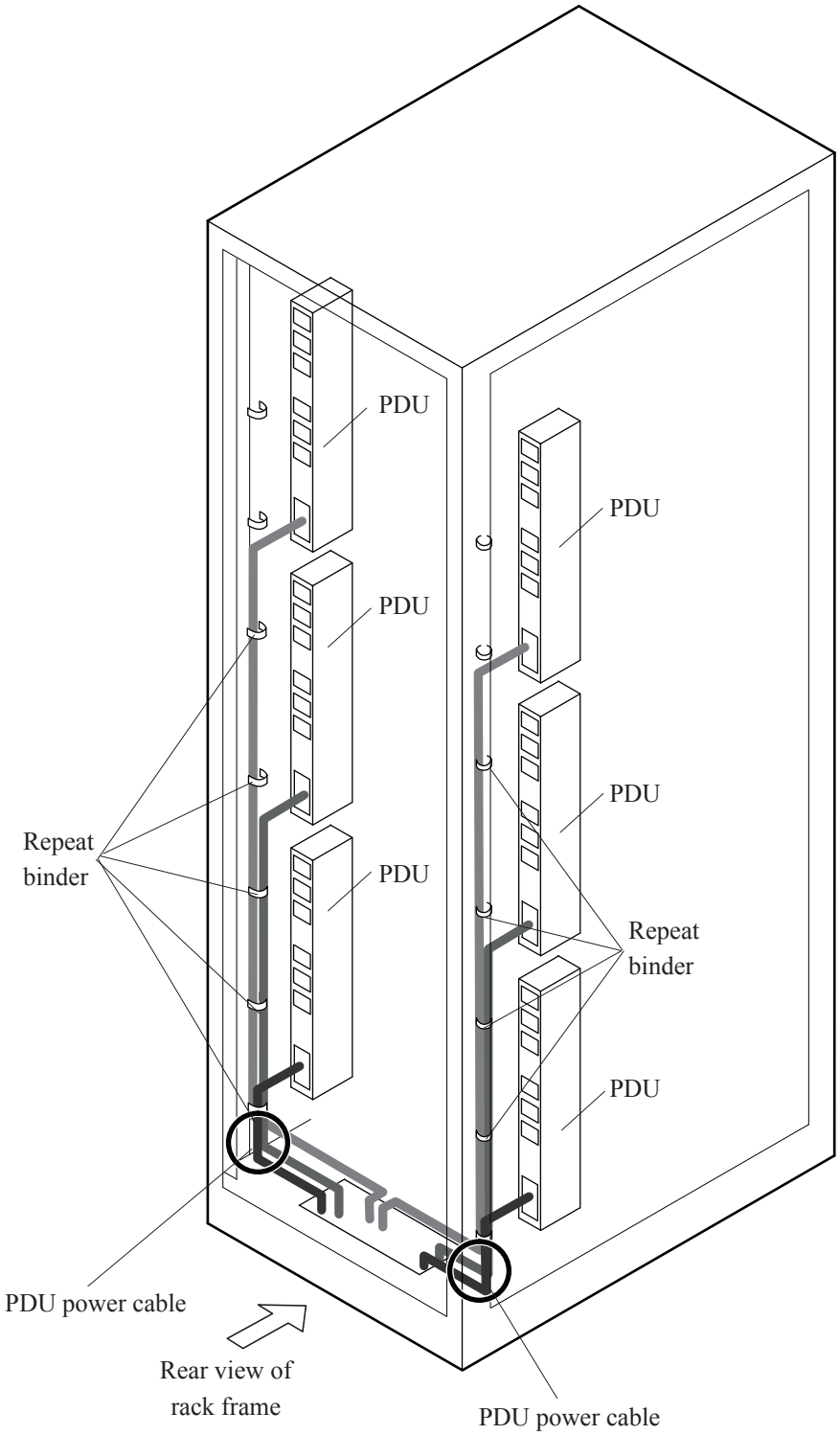
Figure 4-106 Removing PDU Power Cables



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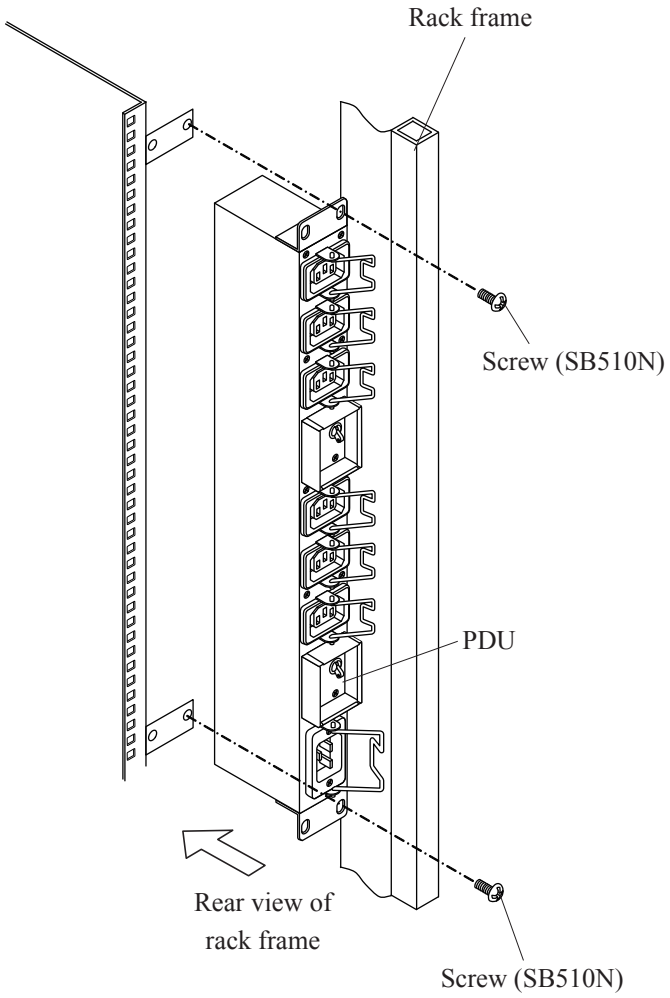
(6) Open the repeat binders on the rear of the rack and remove two power cables.

Figure 4-107 Removing PDU Power Cables



2. Removing PDUs
   (1) Remove two screws from the PDU on the right side of the rear of the rack frame and remove the PDU.
   (2) Remove the PDU on the left side in the similar procedure.

Figure 4-108 Removing PDUs



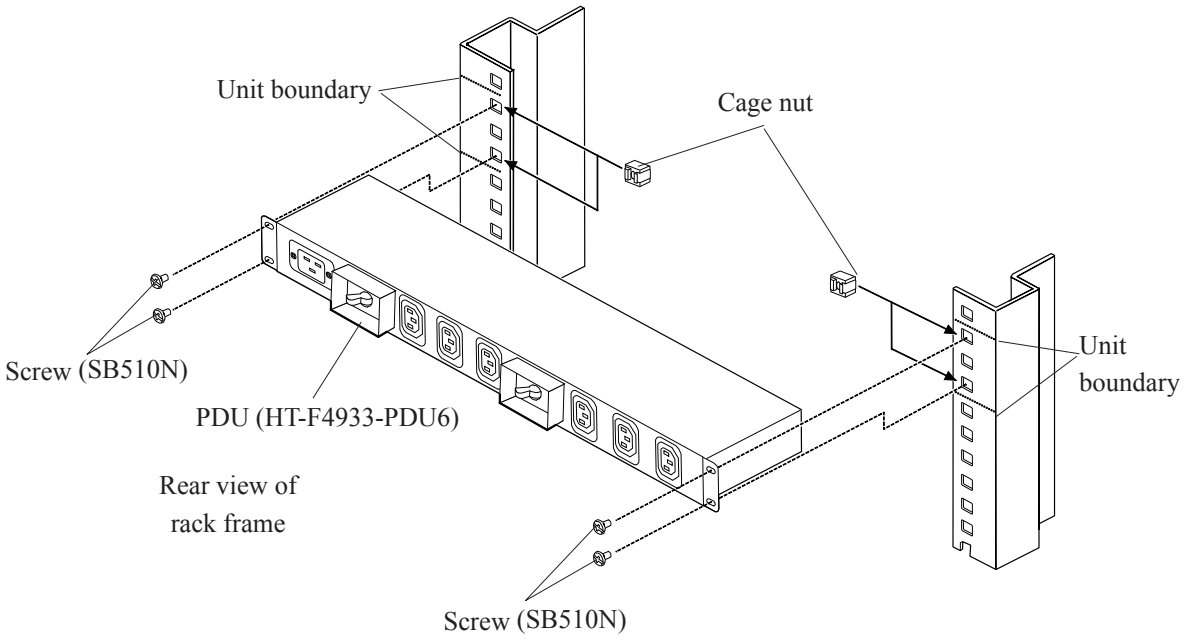
Copyright © 2015, 2017, Hitachi, Ltd.

4.10.2 Procedure for Removing PDUs for a Rack

Removing the PDUs (HT-F4933-PDU6) for a rack.

1. In case of square holes in rack frame.
   (1) Remove four screws and remove the PDU from the rear side of the rack frame.
   (2) Remove four cage nuts from the upper and lower holes of the unit in the rear side of the rack frame.
   (3) Remove the other PDU in the same procedure.

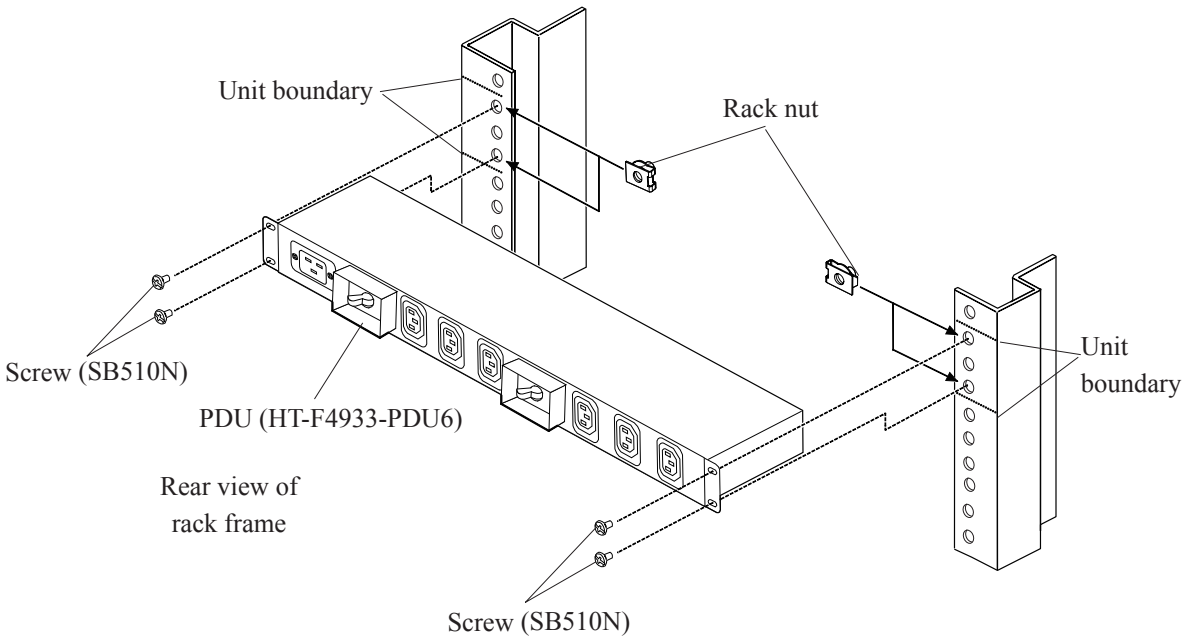
Figure 4-109 Removing the Square Holes Rack Frame (Top and Bottom)



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2. In case of circular holes in rack frame.
   (1) Remove four screws and remove the PDU from the rear side of the rack frame.
   (2) Remove four rack nuts from the upper and lower holes of the unit in the rear side of the rack frame.
   (3) Remove the other PDU in the same procedure.

Figure 4-110 Removing the Circular Holes Rack Frame (Top and Bottom)



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4.11 Removing Channel Board Box

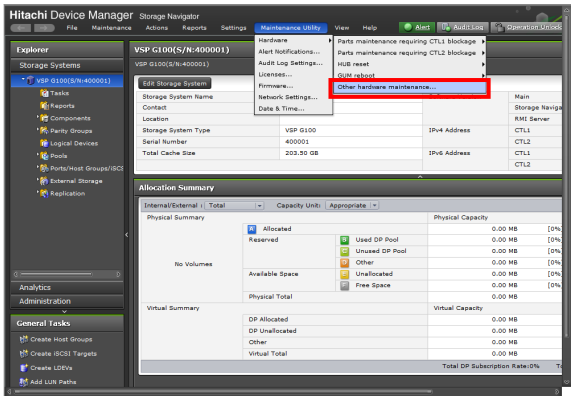
Table 4-16 Parts List of DW-F800-CHBB

Item No.	Part Name	Part No.	Quantity	Remarks
1	Channel Board Box	5560929-A	1	CHBB
2	CHBB Front Bezel	5560931-A	1	-
3	Bezel Key	-	2	-
4	PCIe Channel Board	3289195-A	2	-
5	PCIe Cable	3290994-A	2	1,500 mm
6	Binder	5559281-1	2	122 mm
7	Label (PCIe cable)	3290993-1	1	PCP1
8	Label (PCIe cable)	3290993-2	1	PCP2

NOTE: Check that the Channel Board is not mounted on the Channel Board Box. When the Channel Board is mounted, Refer to "4.5.3 Removing Channel Boards for Channel Board Box" to remove all Channel Boards.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When removing the Channel Board Box, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to "1.6.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "1.6.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



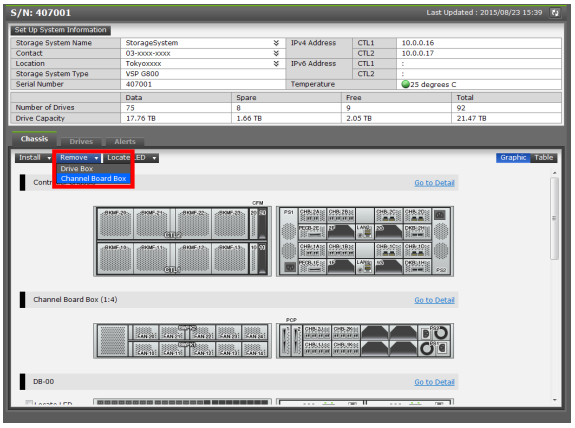
Copyright © 2015, 2017, Hitachi, Ltd.

3. Selecting removal parts by Maintenance Utility

NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

(1) <Main Window>

Click the [Chassis] tab in the main window and click the [Channel Board Box] from the [Remove] pull down list.



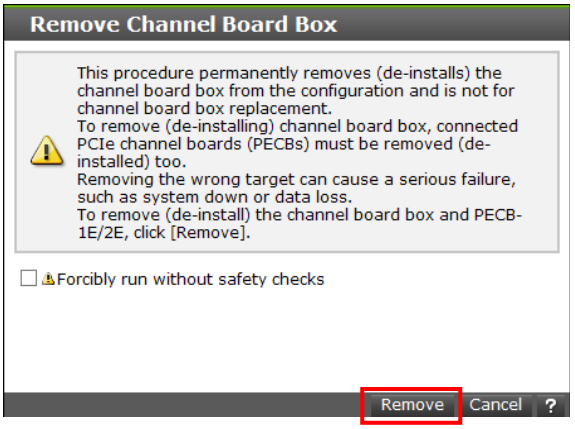
(2) <Remove Channel Board Box Window>

⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

Click the [Remove] button in the "Remove Channel Board Box" window.

NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(3) <Displaying the Password entry window>

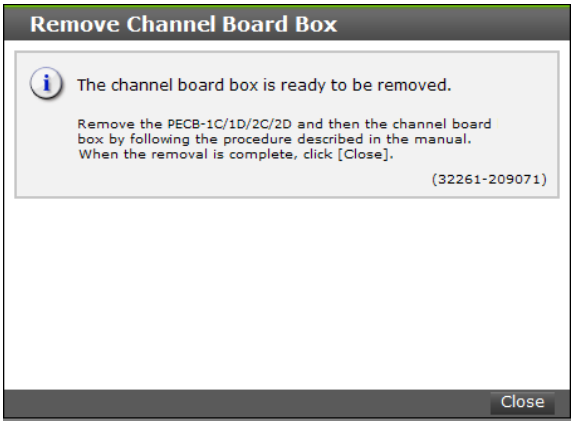
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the password and click the [OK] button.

(4) <Removal Work Start Message>
Check that the following message is displayed.
If a message other than the following is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the removal work.



When the Channel Board Box removal fails, click the [Close] button of the completion message. After that, click the [PECBs] tab in the "Controller Chassis" window and check the PCIe Channel Board status.

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4. Removal work of Channel Board Box

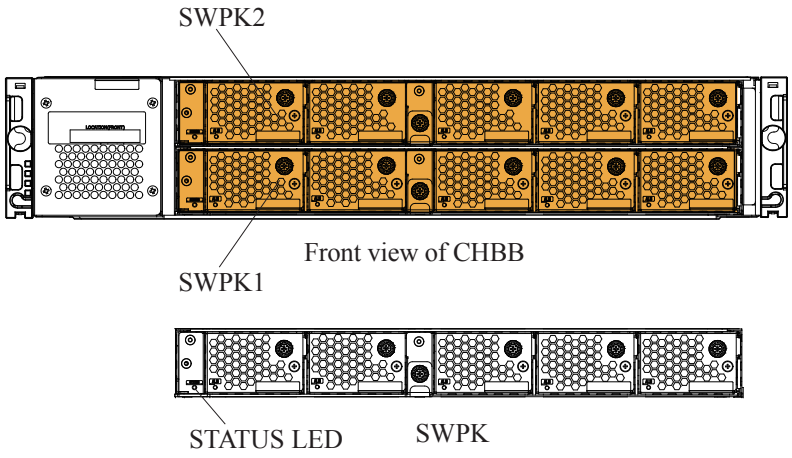
Location	Removal part name		Parts name
Rear View of CBLH	1	PCIe Channel Board (PECB)	• DW-F800-1HP8
Rack	2	Channel Board Box (CHBB)	• DW-F800-CHBB

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Removing the Front Bezel
Remove the Front Bezel referring to "1.4.1 How to Attach/Remove the Front Bezel".

(2) Checking the Channel Board Box LEDs
Check that the STATUS LED (red) on Switch Package (SWPK) installed in the Channel Board Box to be removed lights up.

Figure 4-111 STATUS LED Location



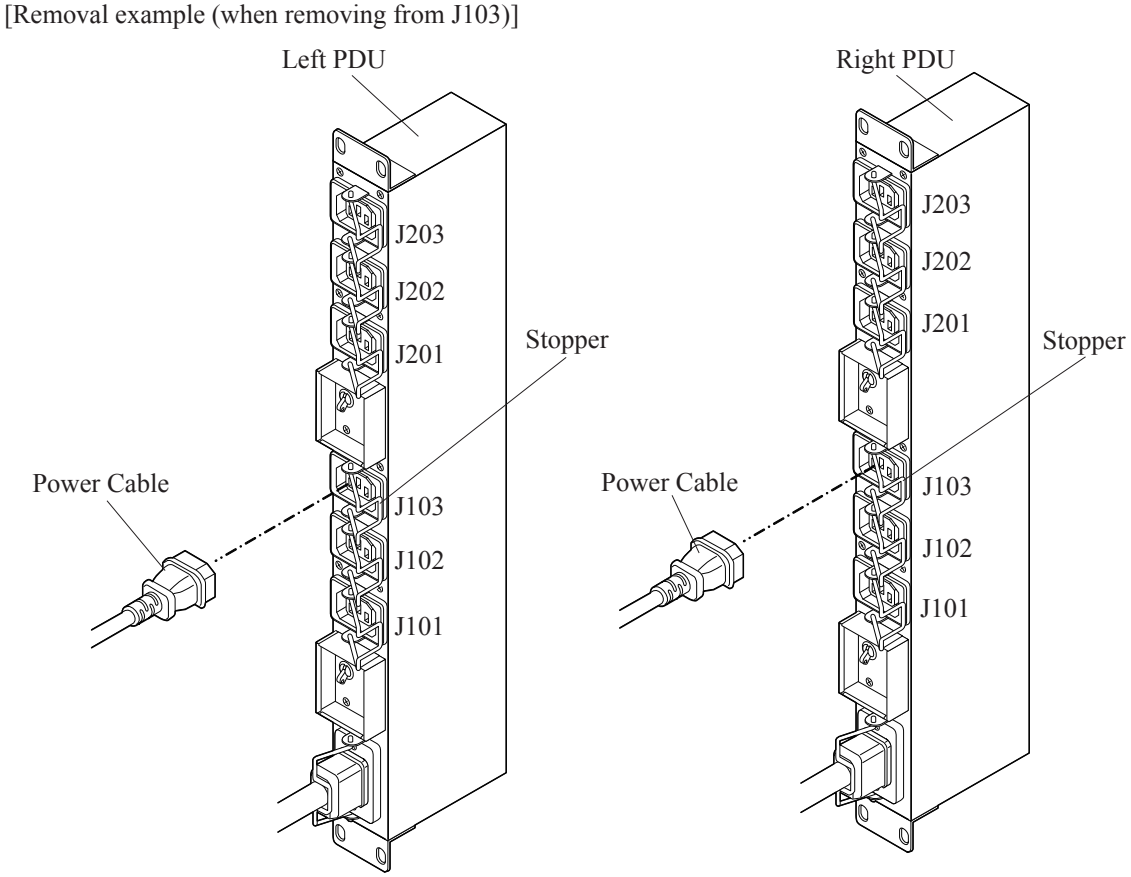
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(3) Removing the Power Cables

(a) Check the connection of the power cables.
Figure 4-112 shows a connection example of power cables in the configuration that only Channel Board Box are installed in the same rack.

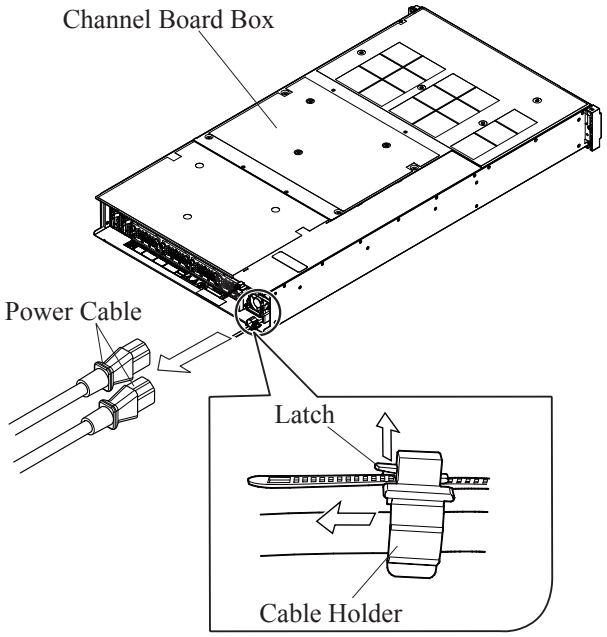
(b) Open the stopper and remove two power cables from the PDU.

Figure 4-112 Removal Example of Power Cables



(c) Lift the latch of the cable holder and pull out the cable holder toward you.
(d) Open the cable holder and remove the two power cables from the CHBBPS.

Figure 4-113 Removing the Power Cables



(4) Removing the PCIe Cables
Remove the PCIe Channel Board of the Controller Board and PCP of the Channel Board Box with the PCIe cable.

(5) Removing the PCIe Channel Board

Remove the PCIe Channel Boards to the same positions of Controller Boards 1 and 2.

(a) Loosen two screws (blue) fixing the PCIe Channel Board.

(b) Hold the screws (blue) and pull out the PCIe Channel Board to remove.

(c) Installing a dummy into the removed slot.

Two types of dummies exist, which are installed in different ways.

- Metal dummy

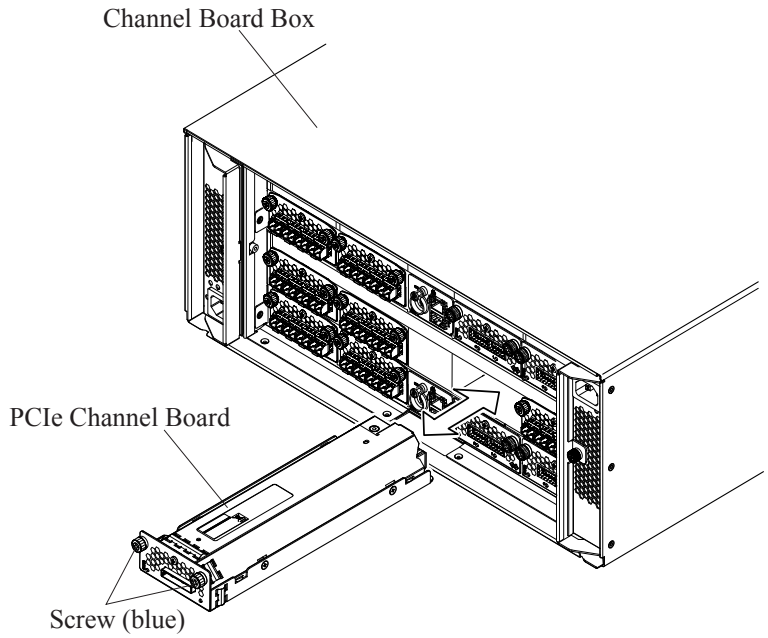
(i) Insert a dummy into the removed slot.

(ii) Tighten two screws (blue) and fix the dummy.

- Plastic dummy

(i) Insert the dummy into the slot to the end from which the PCIe Channel Board has been removed.

Figure 4-114 Removing the PCIe Channel Board



(6) Removing Channel Board Box

(a) Removing the parts

See "2.5.6 Removing Built-in Parts from the Channel Board Box" and remove the switch package, PCIe-cable connecting Package, Channel Board, and CHBBPS from the Channel Board Box to be removed.

(b) Removing Channel Board Box

See "2.7.5 Fixing Channel Board Box" and remove the Channel Board Box from the rack.

(c) Removing the rails

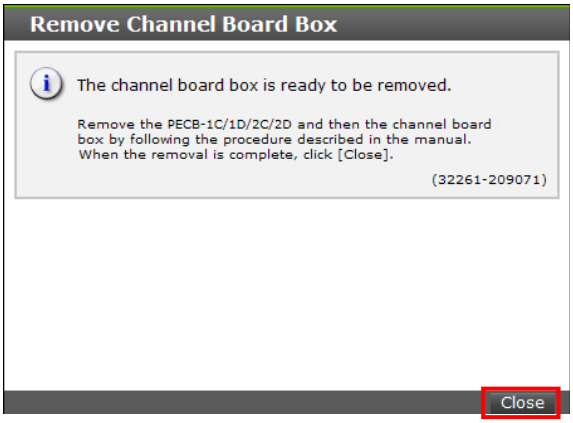
See "5. Installing rails for Channel Board Box" of the "2.3" and remove the rails of the Channel Board Box.

(d) Mounting the parts

See "2.8.6 Installing Built-in Parts of the Channel Board Box" and mount the removed switch package, PCIe-cable connecting Package, Channel Board, and CHBBPS on the Channel Board Box that was removed.

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5. <Check Removal Completion>
   Click the [Close] button in the “Remove Channel Board Box” window.



6. Refer to MAINTENANCE PC SECTION “1.8.2.4 Close the Window” to close the window.

7. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to “1.6.1 Attachment / Removal Procedure of Maintenance PC”.