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REPLACEMENT SECTION

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NOTICE: Unless otherwise stated, "firmware version" in this section indicates DKCMAIN firmware.

1. Before Starting Replacement Work

This section explains procedures for replacing parts which are specified as maintenance parts and identified as failed parts through troubleshooting, etc.
The DW800 is used in a form of rackmount model.

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

1.1 Before Starting Replacement Work

Take notice of the following when performing a maintenance work for the Storage System. Notes for work are described with "NOTE". Read and understand them well before performing the maintenance.

1.1.1 Note at the Time of the Unpacking

- Unpack it indoor.
  Especially, do not unpack it in such places with the outdoor dust, the direct sunlight, and the infiltration of rainwater.
- Work on the unpacking in the place where a rapid difference of temperature does not occur.
  It may have dew condensation when it is unpacked in the place where a difference of temperature is extreme.
  Further, if the part that remains at high or low temperature in transport is installed in the Storage System, it may not operate normally.

1.1.2 Note on Turning Off the Power

- The user data may be lost unless the power is turned off in the correct procedure.
- Since the power feeding to the Storage System is duplicated, when turning off the power, remove the power cables from two Power Supply per Storage System.

⚠ WARNING

When doing a hot replacement of a part, do not wear metallic accessories or a watch so as to avoid an electric shock. Be careful not to touch any of live parts with a screwdriver, etc.

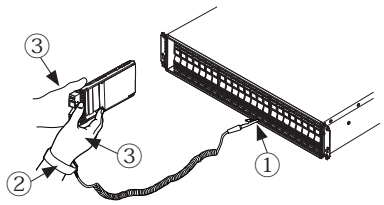
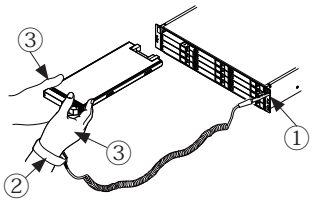
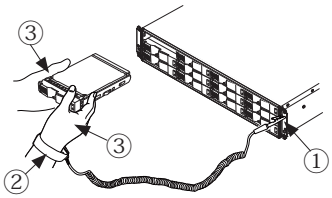
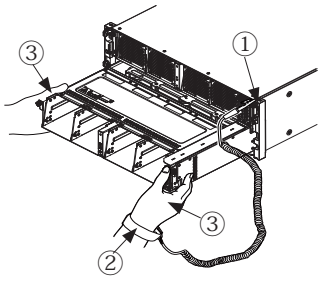
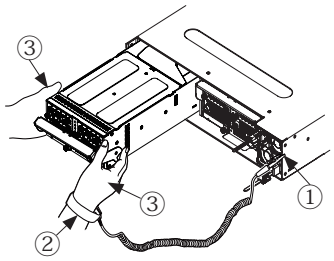
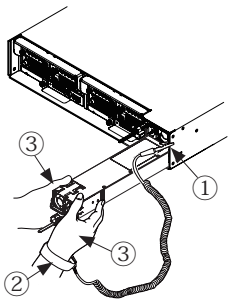
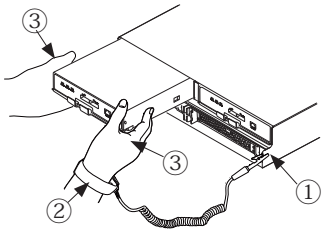
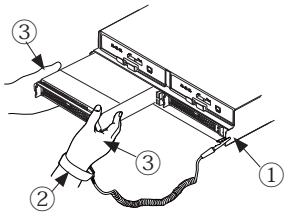
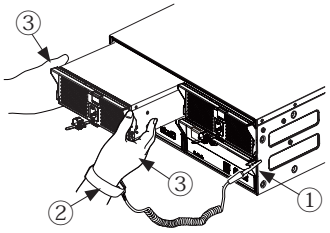
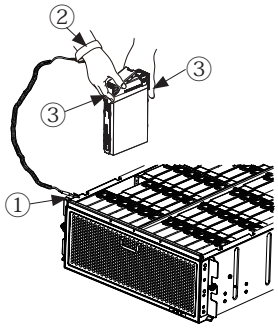
NOTICE:
- Do not disassemble or remodel parts for maintenance. Otherwise, a failure or a serious accident may be caused. Be sure to replace parts in units of formally defined maintenance part.
- When replacing the Power Supply, do it in haste after preparing a replacement Power Supply and arranging cables, etc. so that they do not disturb the replacement.

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1.1.3 Note on Installing and Removing Parts

- Generally, each part is installed with high-precision components. Remove and install the part gently so as not to give it any shock.
- Be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish.
- When you install a Drive, Controller Board, Channel Board, Disk Board and ENC support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.

Table 1-1 Attaching the Wrist Strap

<table>
<tr><td colspan="3">Front view</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Front view</td><td colspan="2">Rear view</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="3">Rear view</td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Top view</td><td colspan="2" rowspan="2">① : The clip side of wrist strap: Connect this to the metal part on the frame of the Storage System
② : A wrist strap (Be sure to wear this before starting maintenance.)
③ : Support the part by touching its metal part (metal plate) with your fingers</td></tr>
<tr><td>  </td></tr>
</table>

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1.1.4 Notes at the Time of the Replacement

- Backup user data.
  Backup user data in the Storage System by the operation on the host computer side.
- When replacing a Drive, Controller Board, Cache Memory, Channel Board, Disk Board, BKMF, BKM, ENC, FAN, and Power Supply while a Storage System is powered on, replace those units 20 seconds or more after their respective failed units are removed.
- When replacing the Drive, Controller Board, Cache Memory, Channel Board, Disk Board, BKMF, BKM, ENC, FAN and Power Supply while the Storage System power is turned on, complete the replacement within ten minutes. Otherwise, a Storage System down may occur because of an abnormal temperature rise. Perform the part replacement in haste.
- When the Power Supply and another module fail at the same time, replace the Power Supply first, duplicate the Power Supply again, and then replace the module. Otherwise, a Storage System down may occur because of an abnormal temperature rise.
- When inserting a component, do it completely to the end and quickly. If the insertion is made incompletely or extremely slowly, it is possible that the recovery from the error fails.
- When an allowable time limit for part replacement is specified in the replacement procedure, observe the time limit.
- With only the main switch power off, Power Supply is supplied. In this situation, do not leave the components removed from the Storage System for a long time. Because of an abnormal temperature, the Power Supply alarm can be given.
- Please execute the maintenance work according to the instruction when an abnormal Storage System and another failure message have been generated the diagnosis and after the diagnosis terminates.
- Connect only the regular parts defined in the “Maintenance Manual” for the maintenance parts.
- When there is a cover on the connector of the new parts, remove the cover of the connector part to be used.
- Do not work behind DB60 for a long time.

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1.1.5 Note on Cable Routing

1. Handling of cables on the floor
   - Protect cables which cannot be accommodated by the Storage System and thus laid on the floor or cables which cross a passage with cable protecting duct, etc.
   - Do not make inter-Storage System cables apart from the floor but lay them on the floor.
2. Handling of under-floor cables when the Storage System is installed on the free access floor.
   - Give excess lengths to cables routed under the floor so that they can easily be laid on the slab. Do not make them to be hung dangling.
3. How to route cables
   - Give adequate margin of length to cables to withstand earthquakes, etc.
   - Route cables giving them excess lengths lest they should disturb replacement of part to be done for maintenance.
   - When using cable protecting duct, be careful not to damage or break cables by catching them.
4. Be sure to insert or pull out a cable by holding its connector with your hand. If you pull a cable, trouble may be caused.
5. When bending the Interface cable or SAS cable to connect it, give it a bend with a long radius (not less than 30 mm) so as not to apply the cable and the connector excessive stresses.

1.1.6 Note on Restarting

- When restarting the Storage System, turn off the main switch (after the POWER LED goes out), and then turn on the main switch after waiting for one minute or more.

1.1.7 Note on Completing the Work

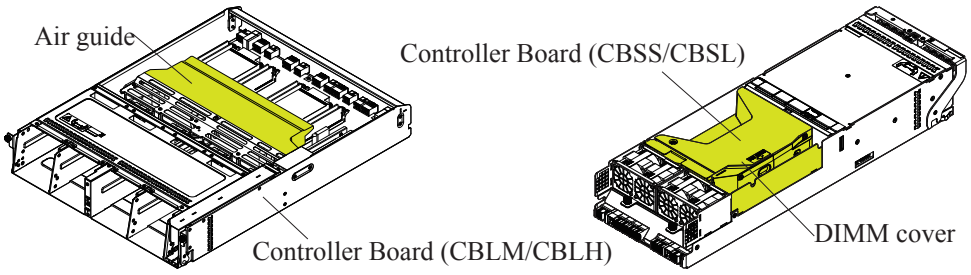
- Close all the external covers when the work is completed. (The cover is to maintain the performance of the Storage System (radio wave noise suppression and others), so that be sure to keep all the external covers closed to operate the Storage System normally.)

1.1.8 Notes while the Storage System Is Being Started

- Because the status where the Storage System is being started is in the middle of the transition to the status of the power turned on (Ready status) from the status of the power turned off, do not replace the parts while the Storage System is being started.
- Replace the parts after the Storage System become the Ready status.

1.1.9 Note at the Time of Replacement Work

- Do not put anything on the air guide of the CBLM/CBLH Controller Board and the DIMM cover of the CBSS/CBSL at the time of work. It may cause breakage.

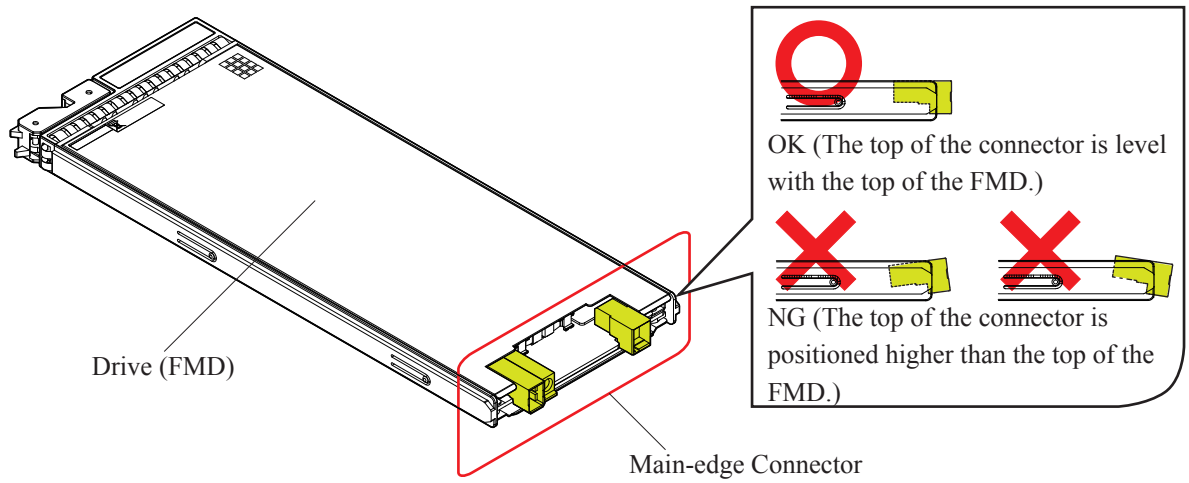


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1.1.10 Notes when Handling the Flash Module Drive (FMD)

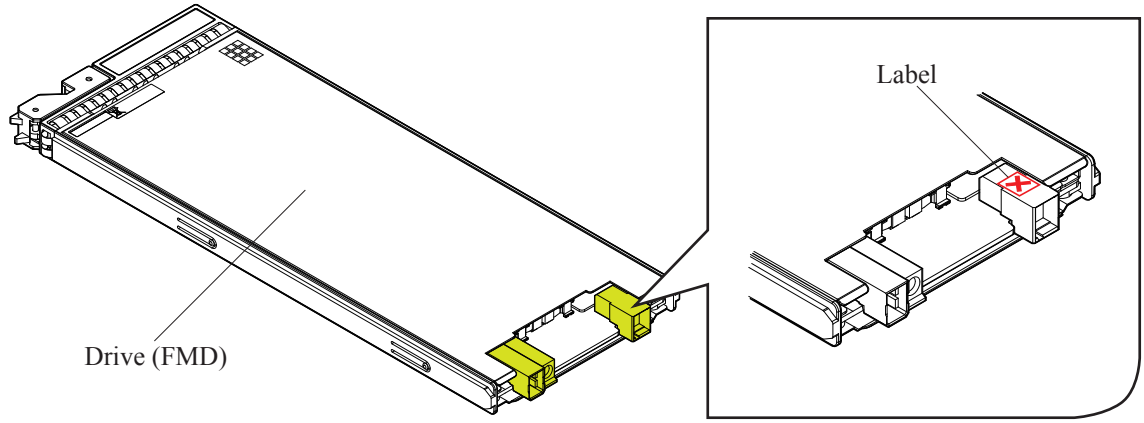
1. Be sure to check that the main edge connector of the drive (FMD) has no deformation, damage, float or sticking of dust before installing the drive (FMD).

Figure 1-1 Checking connectors



2. When there is a float or a position gap in a connector, mark it with a label, etc.

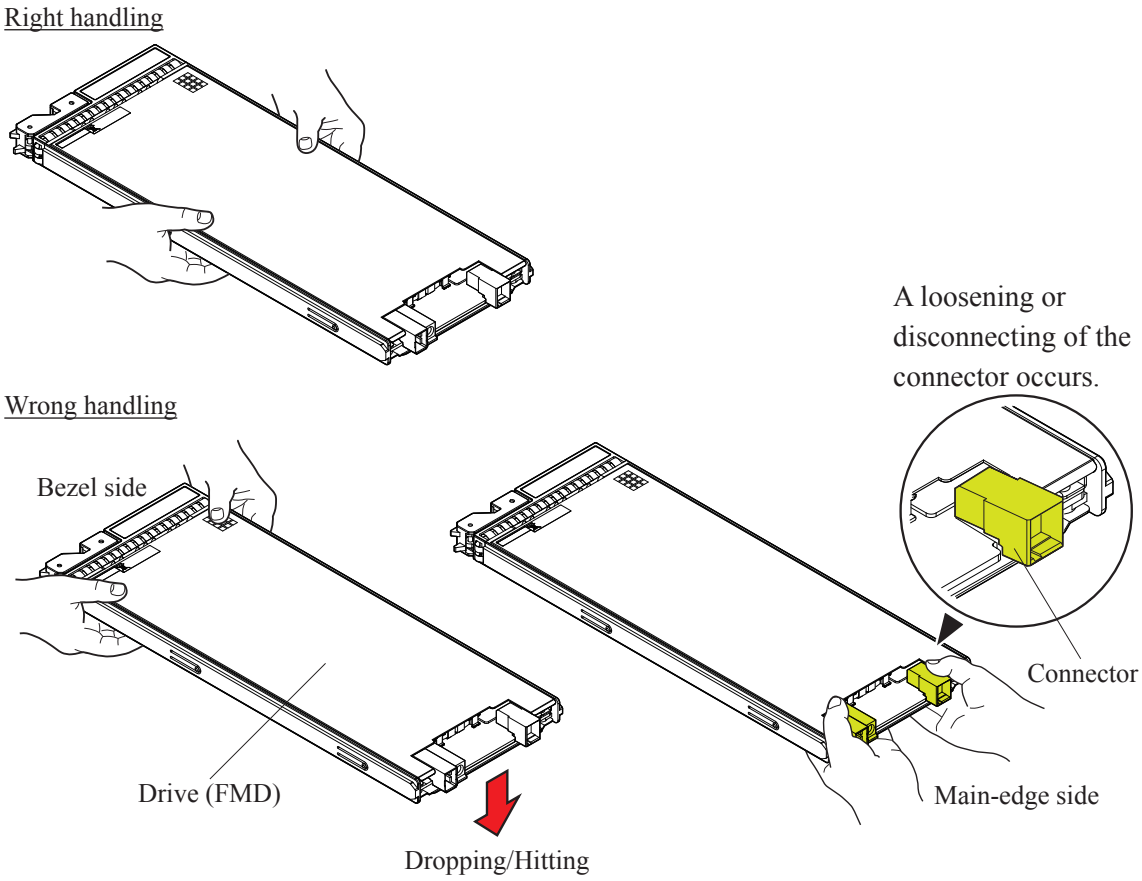
Figure 1-2 Marking of defective connectors



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3. When holding the drive (FMD), hold the middle part of the drive (FMD) with both hands.
   Holding the main-edge side or bezel side of the drive (FMD) may cause a breakdown of the drive (FMD) by dropping it under its weight or hitting it against something. Moreover, holding the main-edge side or bezel side of the drive (FMD) may cause a loosening or disconnecting of the connector.

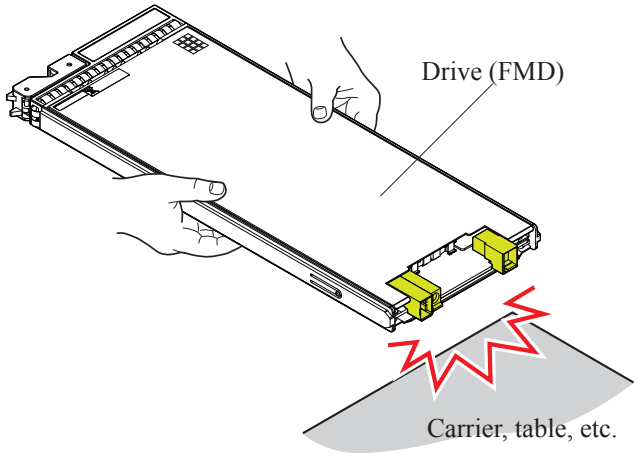
Figure 1-3 Handling of the Drive (FMD) (at maintenance)



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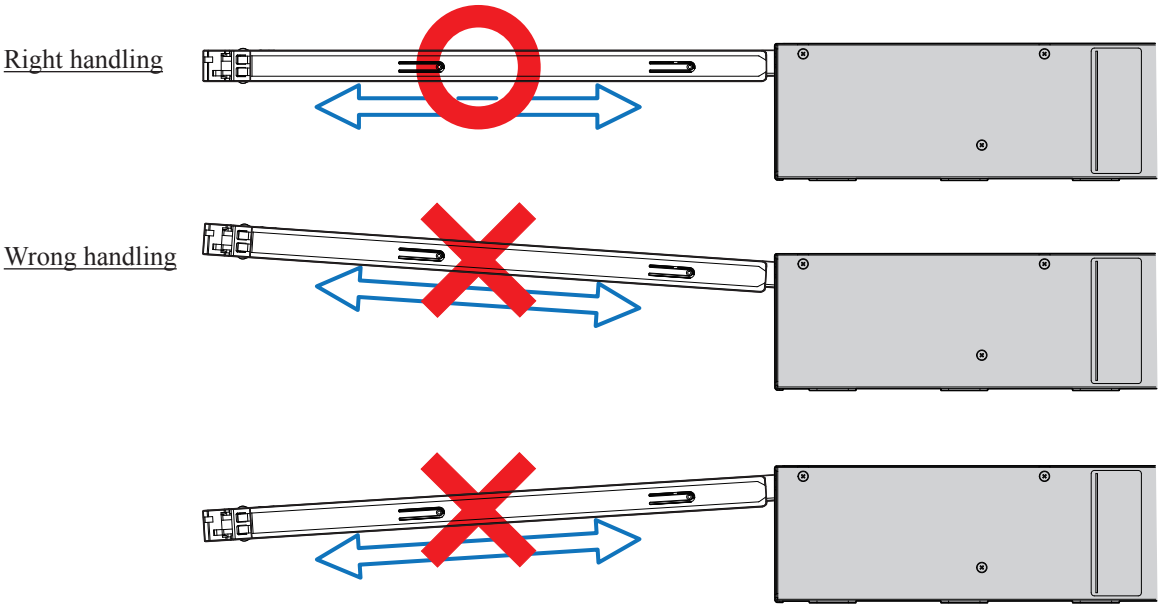
4. When moving the drive (FMD), be careful not to hit it against device or something.
   Hitting the main-edge connector against the device or something may cause damage, distortion or float on the main edge connector.

Figure 1-4 Handling of the Drive (FMD) (at moving)



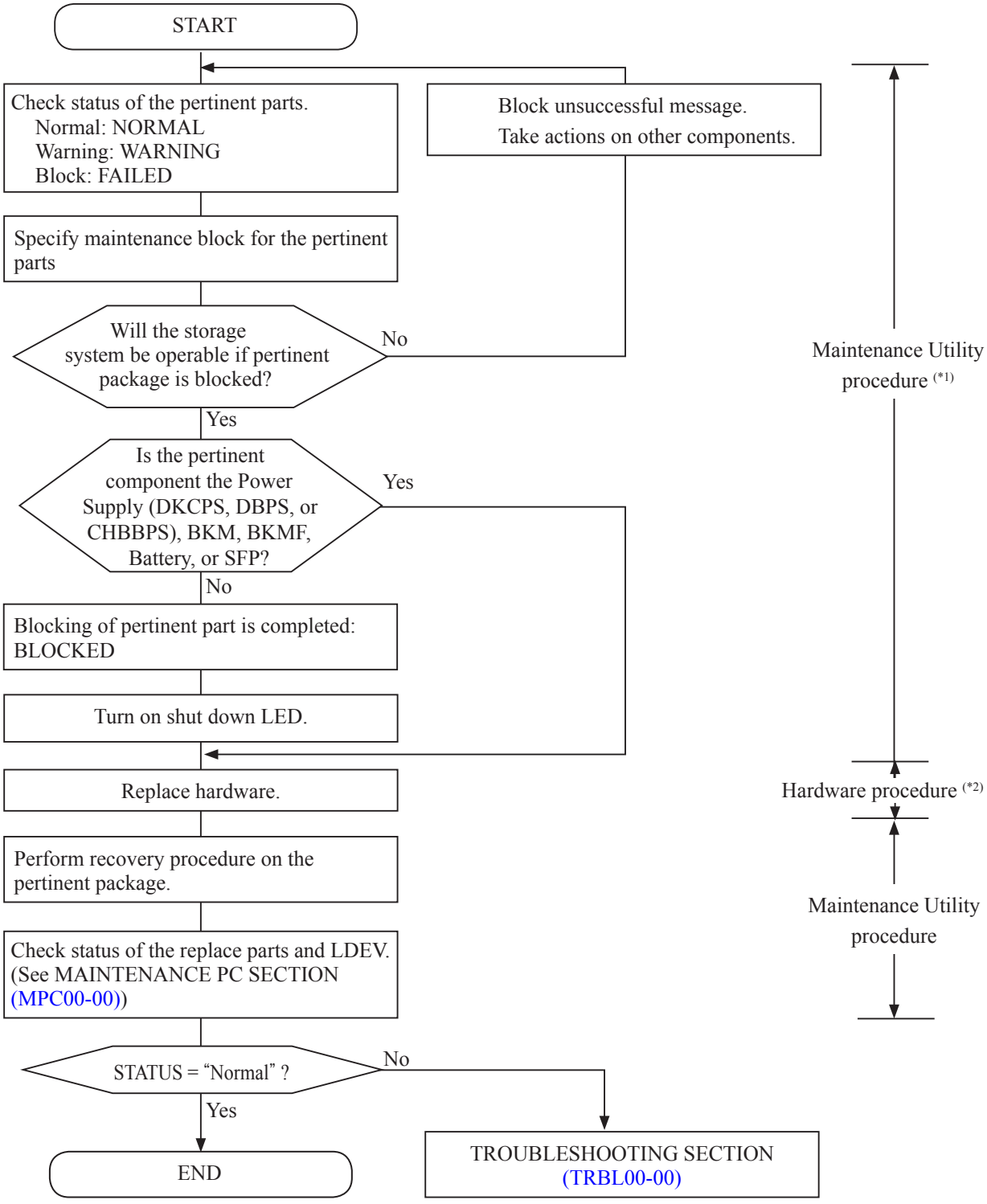
5. Installing and removing the drive (FMD) at an angle may damage the connector. When installing and removing the drive (FMD), install and remove it straight horizontally.

Figure 1-5 Handling of the Drive (FMD) (at Installation and Removal)



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1.2 Hot Replacement Flowchart



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*1 : Maintenance Utility processing : Check a status of the replacement target parts by Maintenance Utility. Issue an instruction when a maintenance blockade is necessary and enable hot-swap.

*2 : Hardware processing : A process of removing a parts to be replaced and installing a maintenance package. 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 terminate. Refer to "1.1.3 Note on Installing and Removing Parts".

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1.3 Concept of Drive Maintenance

1.3.1 Copy Back Mode

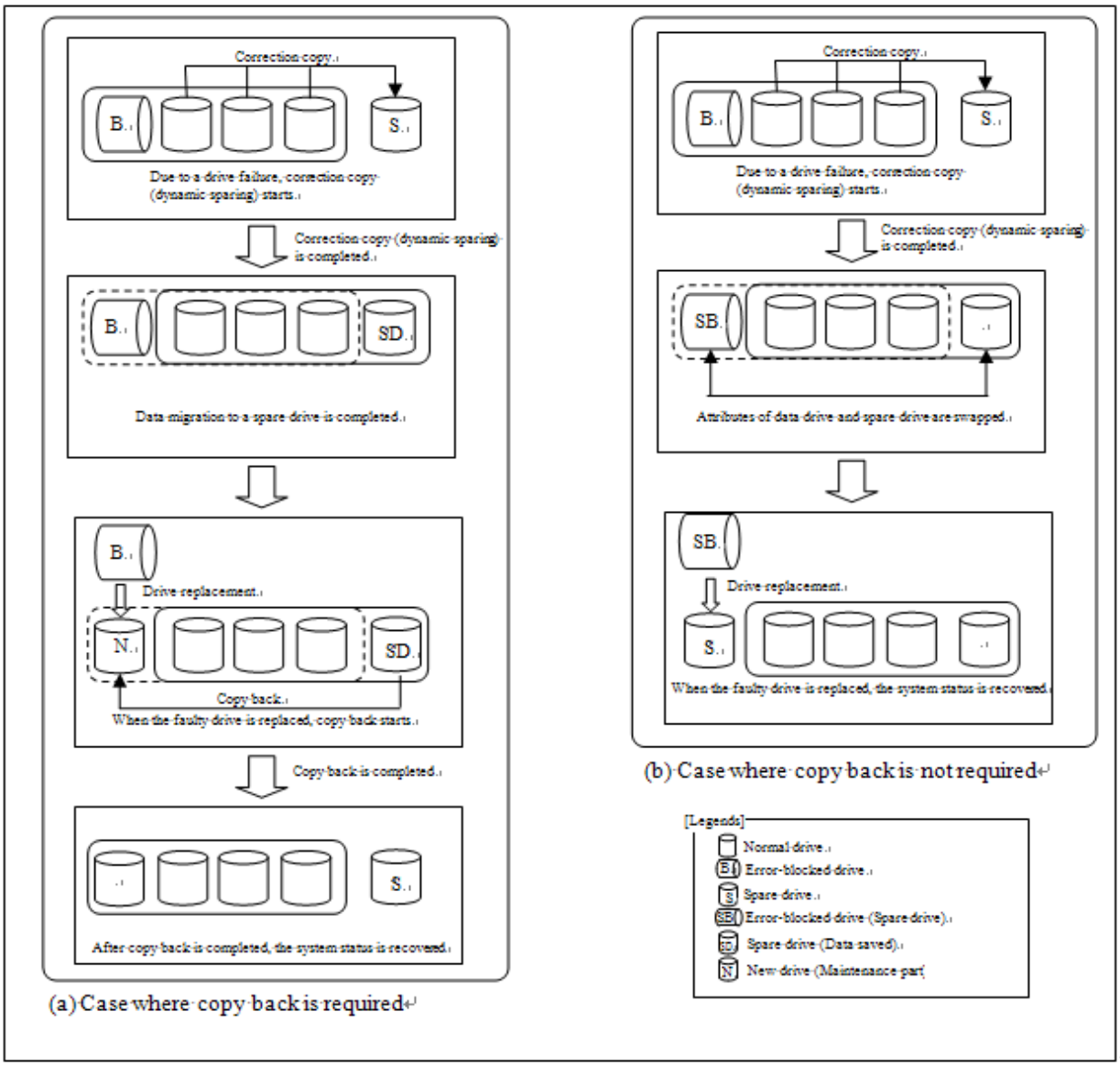
By changing the Copy Back Mode setting from Web Console, it is possible to switch whether copy back is required.

Table 1-2 Copy Back Mode Setting and Need for Copy Back

No.	Copy Back Mode setting	Whether copy back is required
1	Enable	Required
2	Disable	Not required (*1)

*1: When the drive capacity of the source Drive is different from that of the spare drive, copy back needs to be performed.

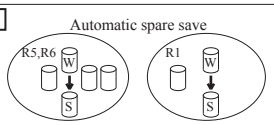
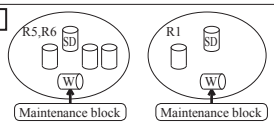
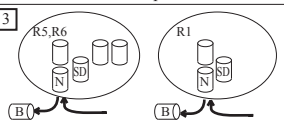
Figure 1-6 Maintenance Flow when Copy Back Is Required/Not Required

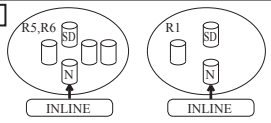
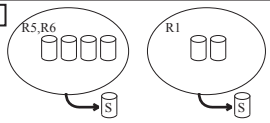


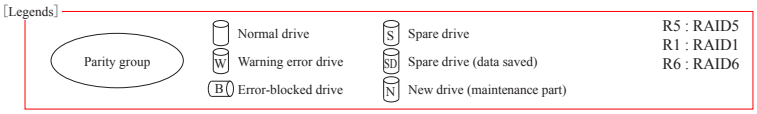
1.3.2 Drive Maintenance

[Spare drive present]

[Case 1] When a drive exceeds the warning threshold value (copy back is required)

Condition item		Condition	Procedure		
			Threshold value exceeded	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	○	1 	2 	3 
	Block SIM	–			
Other case (secondary measure)			① Block copy source drive (case 2) Block copy destination drive a) Unused spare present (case 6) b) Unused spare absent (case 7)		

Procedure		
INLINE	Copy back	Restoration
4 	5 	6 
① Block new drive (case 8)	① Block copy source drive (case 9) Block copy destination drive (case 8)	



NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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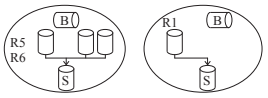
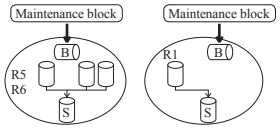
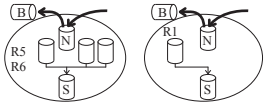
[Spare drive present]

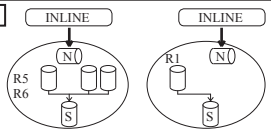
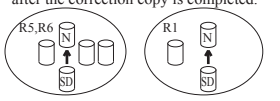
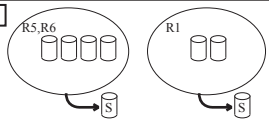
[Case 2] A case where one drive is blocked

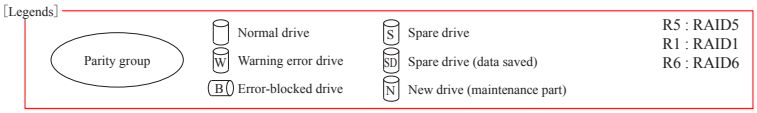
When a spare drive exists, a correction copy from the blocked drive is started automatically.

In this case, go to Case 2.1 when the blocked drive is to be replaced during the correction copy from it and a copy back that follows is to be made automatically, or go to Case 2.2 when the blocked drive is to be replaced after the correction copy is completed.

[Case 2.1] A case where one drive is blocked and it is replaced during an automatic correction copy is made from it

Condition item		Condition	Procedure		
			Block one drive	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy	2 A blocked drive is replaced during an automatic correction copy.	3 A blocked drive is replaced during an automatic correction copy.
	Block SIM	○			
Other case (secondary measure)			① When a copy destination drive is blocked a) Unused spare present (case 10) b) Unused spare absent (case 11)	NOTE: When the blocked drive is replaced while the automatic correction copy is being made from it, the copy back written in Item [5] is started automatically. When you replace the drive after the automatic correction copy is completed, refer to Case 2.2.	

Procedure		
INLINE	Automatic copy back	Restoration
4 	5 The copy back is started automatically after the correction copy is completed. 	6 
① Block new drive (case 8)	Block copy source drive (case 9) Block copy destination drive (case 8)	

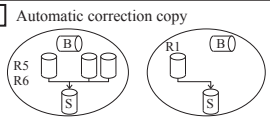
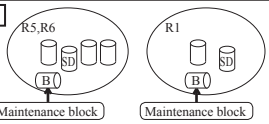
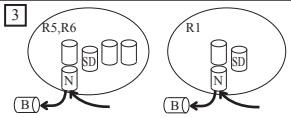


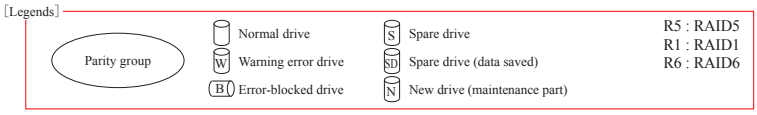
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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[Spare drive present]

[Case 2.2] A case where one drive is blocked and it is replaced after an automatic correction copy is made from it

Condition item		Condition	Procedure		
			Block one drive	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy 	2 	3 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)		
			Procedure		
			INLINE	Copy back	Restoration
			4 	5 	6 
			① Block new drive (case 8)	Block copy source drive (case 9) Block copy destination drive(case 8)	

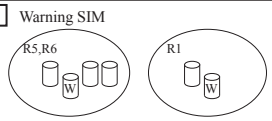
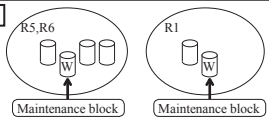
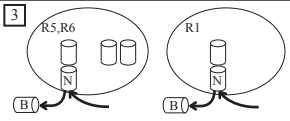


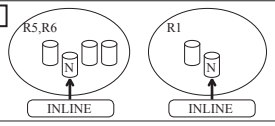
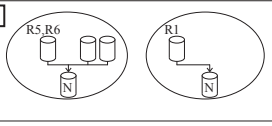
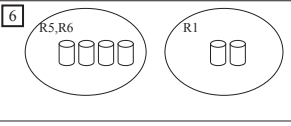
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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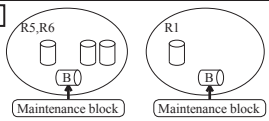
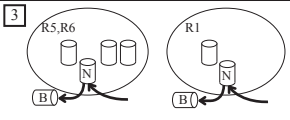
[[Spare drive absent]

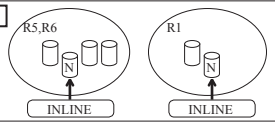
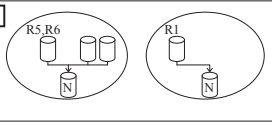
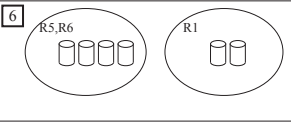
[Case 3] When a drive exceeds the warning threshold value (without spare drive)

Condition item		Condition	Procedure		
			Threshold value exceeded	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	○	1 Warning SIM 	2 	3 
	Block SIM	–			
Other case (secondary measure)					

	Procedure		
	INLINE	Correction copy	Restoration
	4 	5 	6 
	① Block new drive (case 5)	① Block copy destination drive (case 5)	

[Case 4] When a drive is blocked (without spare drive)

Condition item		Condition	Procedure		
			Block one drive	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	–	1 	2 	3 
	Block SIM	○			
Other case (secondary measure)					

	Procedure		
	INLINE	Correction copy	Restoration
	4 	5 	6 
	① Block new drive (case 5)	① Block copy destination drive (case 5)	

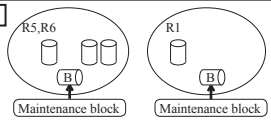
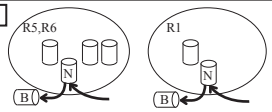


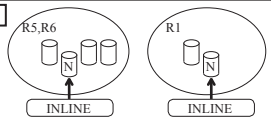
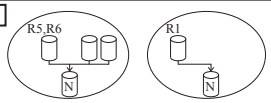
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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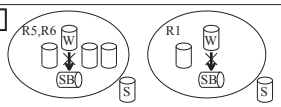
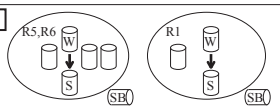
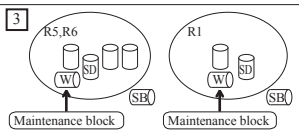
[Case in which a secondary failure occurred during recovery]

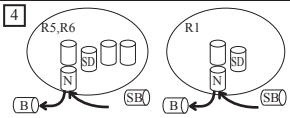
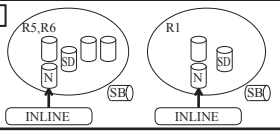
[Case 5] When a copy destination is blocked during the correction copy

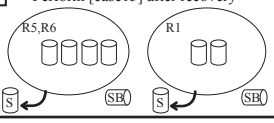
Condition item	Procedure		
		Maintenance block	Drive replacement
Blocked during INLINE	1 	2 	3 
Copy destination blocked during correction copy			

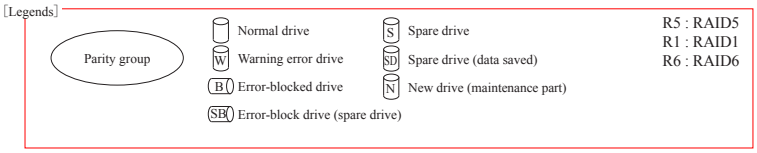
Procedure		
INLINE	Correction copy	Recovery
4 	5 	6 

[Case 6] When a copy destination is blocked during the automatic saving to the spare drive

Condition item	Procedure		
		Re-automatic spare save	Maintenance block
Copy destination blocked during automatic spare save (unused spare present)	1 	2 	3 

Procedure		
Drive replacement	INLINE	Copy back
4 	5 	6 

Procedure
Recovery
7 Perform [case15] after recovery 

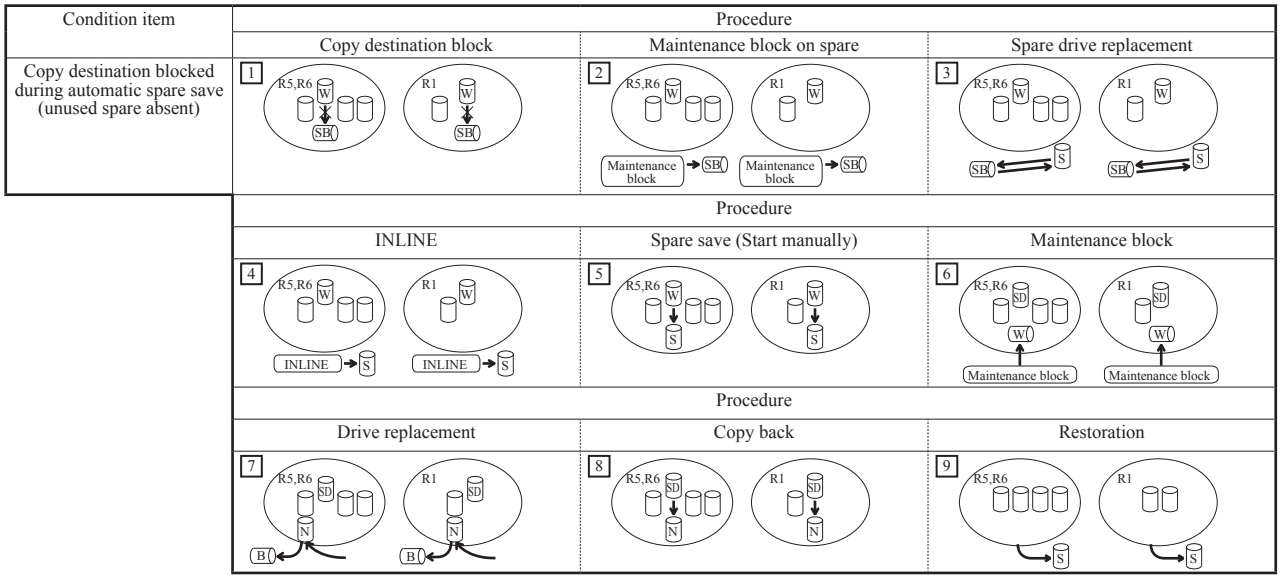


NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

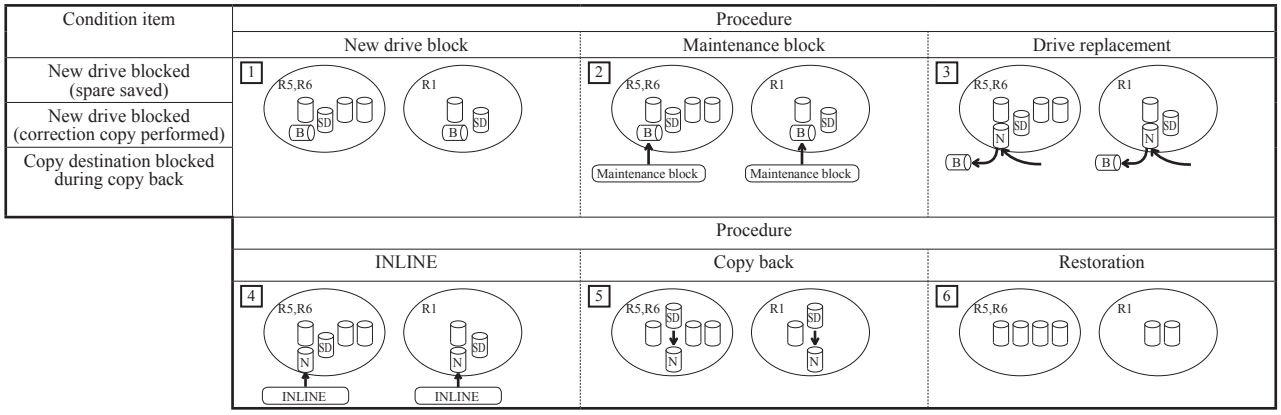
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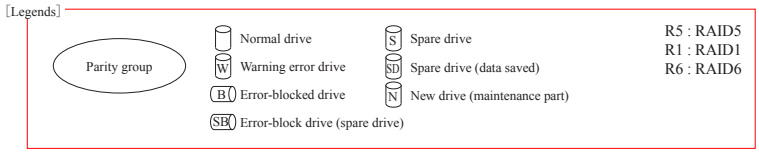
[Case in which a secondary failure occurred during recovery]

[Case 7] When a copy destination drive is blocked during the automatic saving to the spare drive (without unused spare drive)



[Case 8] When the new drive is blocked during the copy back



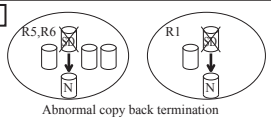
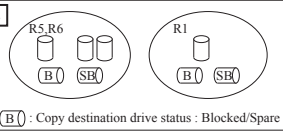
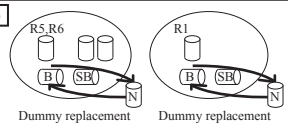


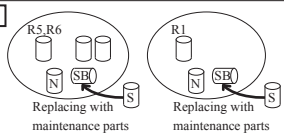
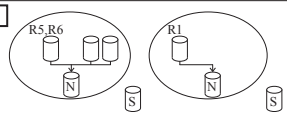
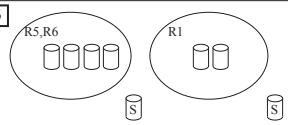
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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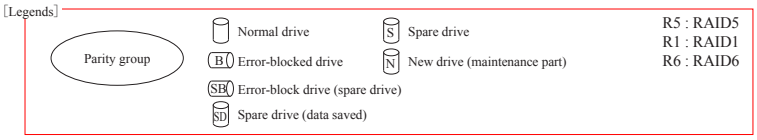
[Case in which a secondary failure occurred during recovery]

[Case 9] When a copy source drive is blocked during the copy back

Condition item	Procedure		
	Copy source block	Copy destination automatic maintenance block at the time of abnormal copy back termination	Dummy replacement of copy destination drive (*1)
Copy source blocked during copyback	1 	2 	3 

Procedure		
Spare drive replacement	Starting correction copy automatically	Recovery
4 	5 	6 

*1: A message indicating the copy disabled is displayed at the time of dummy replacement of the copy destination drive, but the copy does not start at this step. Go to the next step.



NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

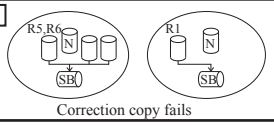
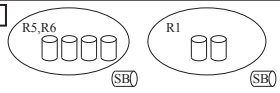
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[Case in which a secondary failure occurred during recovery]

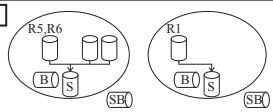
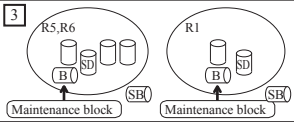
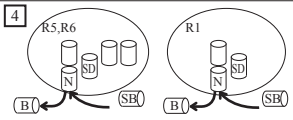
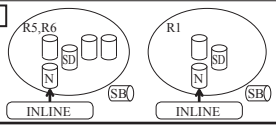
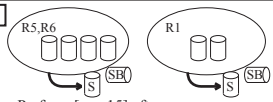
[Case 10] A case where the copy destination drive is blocked during the automatic correction copy (and a unused spare drive exists)

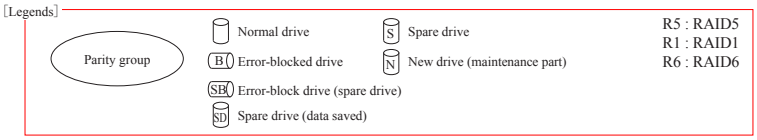
When the blocked drive has been replaced through performance of the operation for Case 2.1, go to Case 10.1 or otherwise, go to Case 10.2.

[Case 10.1] When the blocked drive has been replaced through performance of the operation for Case 2.1

Condition item	Procedure		
	Copy destination block	Starting correction copy automatically	Maintenance block
Copy destination blocked during automatic correction copy (unused spare present)	1  Correction copy fails	2 	3  Perform [case15] after recovery

[Case 10.2] When the operation for Case 2.1 has not been performed

Condition item	Procedure		
	Copy destination block	Re-automatic correction copy	Maintenance block
Copy destination blocked during automatic correction copy (unused spare present)	1 	2 	3 
	Procedure		
	Drive replacement	INLINE	Copy back
	4 	5 	6 
	Procedure		
	Recovery		
	7  Perform [case15] after recovery		



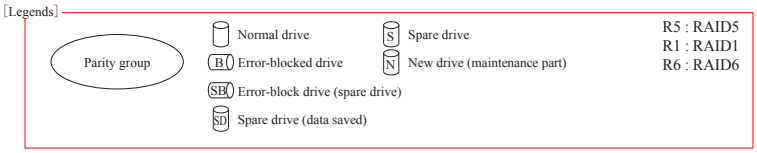
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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[Case in which a secondary failure occurred during recovery]

[Case 11] When a copy destination drive is blocked during the automatic correction copy (without unused spare drive)

Condition item	Procedure		
		Maintenance block	Drive replacement
Copy destination blocked during automatic correction copy (unused spare absent)	1 R5,R6 B SB, R1 B SB NOTE: When the blocked drive is replaced in the case 2, same as a case 10.1, collection copy starting automatically.	3 R5,R6 B SB, R1 B SB, Maintenance block, Maintenance block	3 R5,R6 N SB, R1 N SB, B, B
	Procedure		
	INLINE	Correction copy	Restoration
	4 R5,R6 N SB, R1 N SB, INLINE, INLINE	5 R5,R6 N SB, R1 N SB	6 R5,R6 SB, R1 SB Perform [case15] after recovery

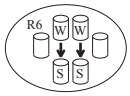
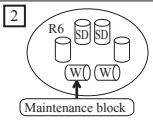
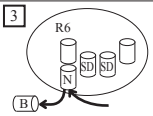


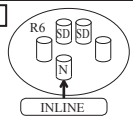
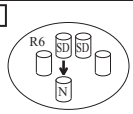
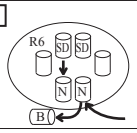
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

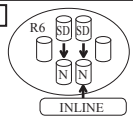
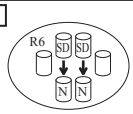
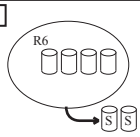
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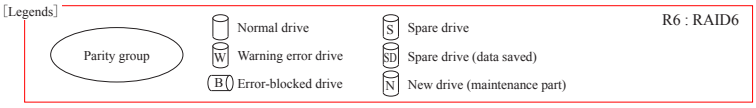
[Spare drive present]

[Case 12] RAID6 When two drives exceed the warning threshold value

Condition item		Condition	Procedure		
			Threshold value exceeded	Maintenance block	Replacement of the first drive
Threshold value exceeded	Warning SIM	○	1 Automatic saving(s) to the spare drive allowed to be made up to twice 	2  Proceed the drive to the next step when the copying from it is completed. It is not necessary to wait until the copying from the two drives is completed.	3 
	Block SIM	–			
Other case (secondary measure)			① Block copy source drive (case 2) ② Block copy destination drive a) Unused spare present (case 6) b) Unused spare absent (case 7)		

Procedure		
INLINE test of the first drive	Copy back to the first drive	Replacement of the second drive during the copy back to the first drive
4 	5 	6 
① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	

Procedure		
INLINE test of the second drive	Copy back to the second drive	Restoration
7 	8 	9 
① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	



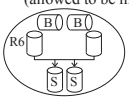
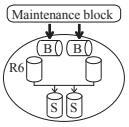
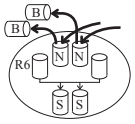
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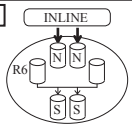
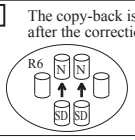
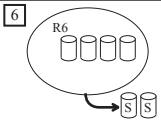
[Spare drive present]

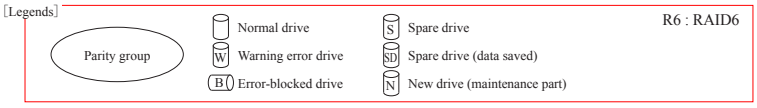
[Case 13] RAID6 When two drives are blocked

- When you replace the two blocked drives while making an automatic correction copy from them, go to Case 13.1.
- When you replace the two blocked drives after making an automatic correction copy from them, go to Case 13.2.
- When you replace one of the two blocked drives from each of which an automatic correction copy is being made, go to Case 13.3.

[Case 13.1] RAID6 A case where the two drives are blocked and they are replaced while an automatic correction copy is made from it

Condition item		Condition	Procedure		
			Detachment of the two drives	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy (allowed to be made up to twice) 	2 A blocked drive is replaced during an automatic correction copy. 	3 A blocked drive is replaced during an automatic correction copy. 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)	NOTICE: When the blocked drive is replaced while an automatic correction copy is being made from it, the copy back written in Item [5] is started automatically. When you replace the drive after the automatic correction copy is completed, refer to Case 13.2.	

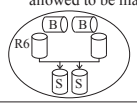
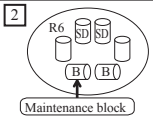
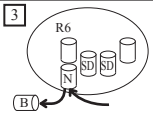
	Procedure		
	INLINE test	Copy back	Restoration
	4 	5 The copy-back is started automatically after the correction copy is completed. 	6 
	① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive(case 8)	

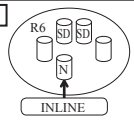
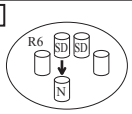
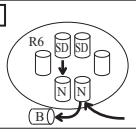


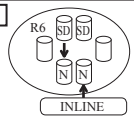
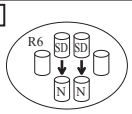
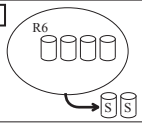
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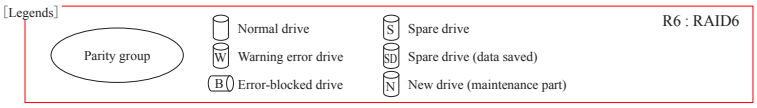
[Spare drive present]

[Case 13.2] RAID6 A case where the two drives are blocked and they are replaced after an automatic correction copy is made from it

Condition item		Condition	Procedure		
			Detachment of the two drives	Maintenance block	Replacement of the first drive
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy or copies allowed to be made up to twice 	2 	3 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)		

	Procedure		
	INLINE test of the first drive	Copy back to the first drive	Replacement of the second drive during the copy back to the first drive
	4 	5 	6 
	① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	

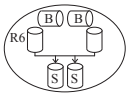
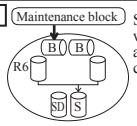
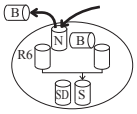
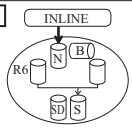
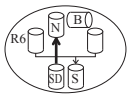
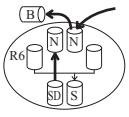
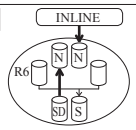
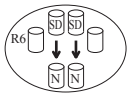
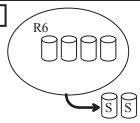
	Procedure		
	INLINE test of the second drive	Copy back to the second drive	Restoration
	7 	8 	9 
	① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	

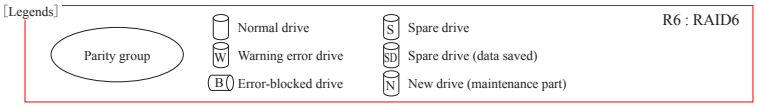


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[Spare drive present]

[Case 13.3] RAID6 A case where the two drives are blocked and they are an automatic correction copy from one of the drives is in progress and that from the other drive is completed

Condition item		Condition	Procedure		
			Detachment of the two drives	Maintenance block	Replacement of the first drive
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy or copies allowed to be made up to twice. 	2 Maintenance block Select the drive which is completed automatic correction copy. 	3 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)		
			Procedure		
			INLINE test of the first drive	Copy back to the first drive	Replacement of the second drive during the copy back to the first drive
			4 INLINE 	5 	6  Make a copy back to the first drive, and then replace the second drive while an automatic correction copy is being made from the second drive.
			① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	
			Procedure		
			INLINE test of the second drive	Copy back to the second drive	Restoration
			7 INLINE 	8  When an automatic correction copy from the second drive is completed, a copy back to the second drive is started automatically in the same way as Case 2.1.	9 
			① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	



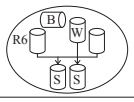
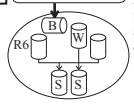
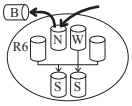
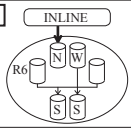
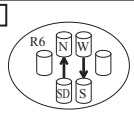
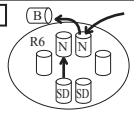
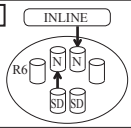
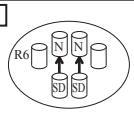
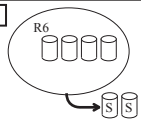
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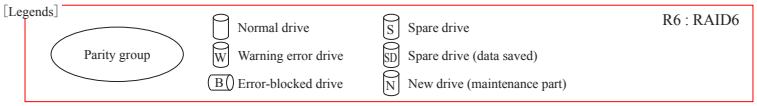
[Spare drive present]

[Case 14] RAID6 When a drive is blocked and another drive exceeds the warning threshold value

- When replacing a blocked drive while an automatic correction copy is being made from it, go to Case 14.1.
- When replacing a blocked drive after the automatic correction copy from it is completed, go to Case 14.2.

[Case 14.1] When replacing a blocked drive while an automatic correction copy is being made from it

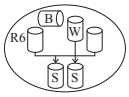
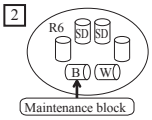
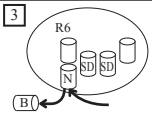
Condition item		Condition	Procedure		
			Detachment of the two drives	Maintenance block	Replacement of the first drive
Threshold value exceeded	Warning SIM	–	1 Automatic correction copy + Automatic saving to the spare disk 	2 Maintenance block A blocked drive is replaced during an automatic correction copy. 	3 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)	NOTE: When an automatic saving to a spare drive is completed before this operation is performed, the following Items [6] and [7] may be executed in advance.	
			Procedure		
			INLINE test of the first drive	Copy back to the first drive	Replacement of the second drive during the copy back to the first drive
			4 	5  A blocked drive is replaced during an automatic correction copy.	6 
			① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	
			Procedure		
			INLINE test of the second drive	Copy back to the second drive	Restoration
			7 	8 	9 
			① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	

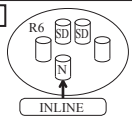
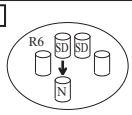
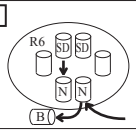


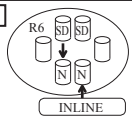
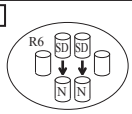
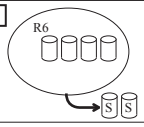
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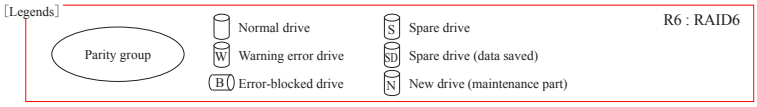
[Spare drive present]

[Case 14.2] When replacing a blocked drive after the automatic correction copy from it is completed

Condition item		Condition	Procedure		
			Detachment of the two drives	Maintenance block	Replacement of the first drive
Threshold value exceeded	Warning SIM	○	1 Automatic correction copy + Automatic saving to the spare disk 	2  Proceed the drive to the next step when the copying from it is completed. It is not necessary to wait until the copying from the two drives is completed.	3 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (case 10) b) Unused spare absent (case 11)		

Procedure		
INLINE test of the first drive	Copy back to the first drive	Replacement of the second drive during the copy back to the first drive
4 	5 	6 
① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	

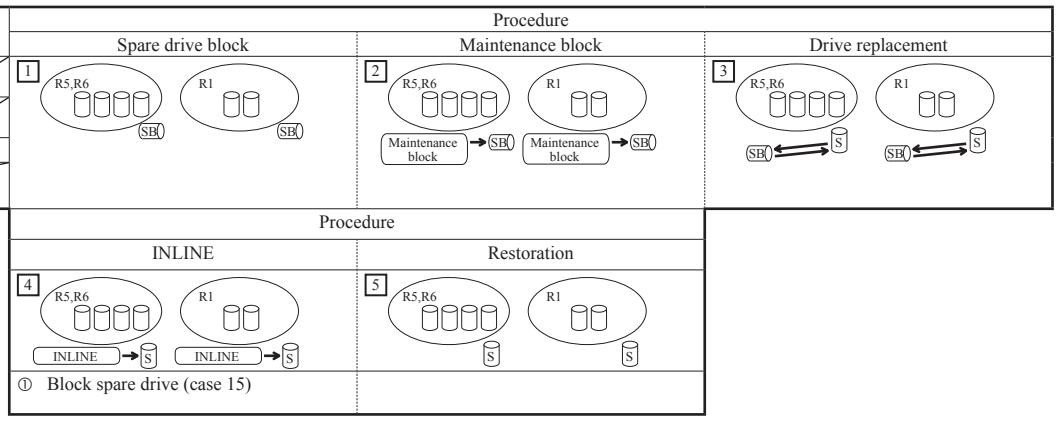
Procedure		
INLINE test of the second drive	Copy back to the second drive	Restoration
7 	8 	9 
① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)	



[Other Cases]

[Case 15] Spare drive blocked

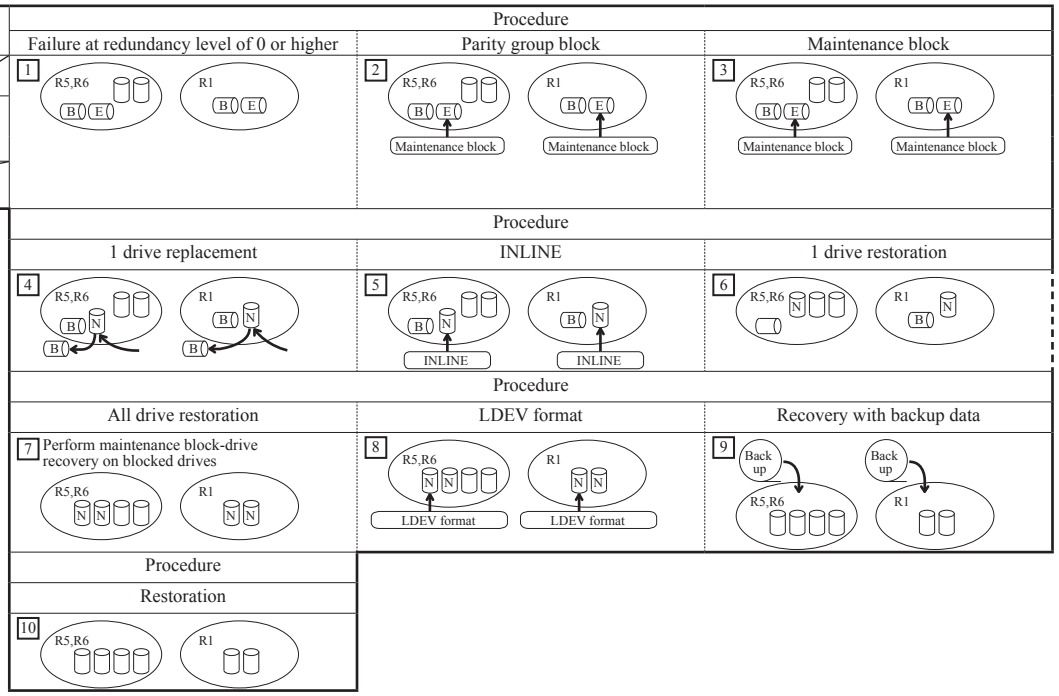
Condition item		Condition
Threshold value exceeded	Warning SIM	
	Block SIM	
Failure block SIM		○

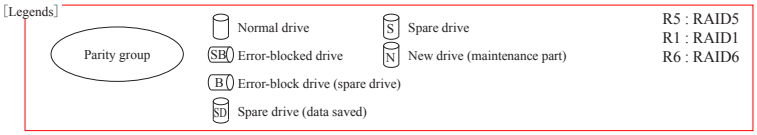


[Case 16] Case in which a block level failure occurred in a normal drive with a redundancy level of 0

RAID5 : When two or more drives are blocked in a parity group.
RAID1 : When two drives are blocked in a Mirroring pair.
RAID6 : When three or more drives are blocked in a parity group.

Condition item		Condition
Threshold value exceeded	Warning SIM	
	Block SIM	○ or ○
Failure block SIM		



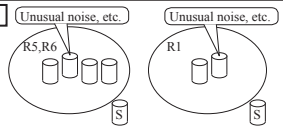
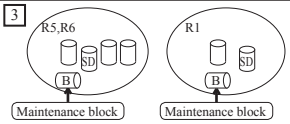


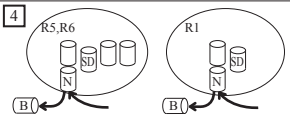
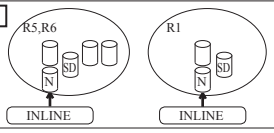
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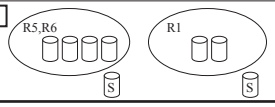
[Other Cases]

[Case 17] Preventive drive replacement 1

Condition item		Condition
Threshold value exceeded	Warning SIM	–
	Block SIM	–
Others (unusual noise, etc.)		○
Spare drive		○
Other case (secondary measure)		

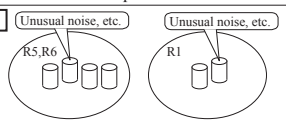
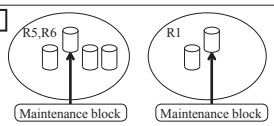
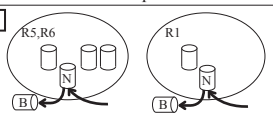
Procedure		
Replacement	Spare save	Maintenance block
1 	2 	3 
	① Block copy source drive (case 4) ② Block copy destination drive (case 7)	

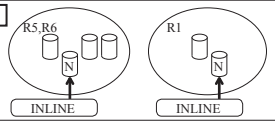
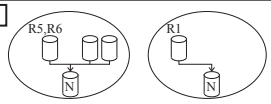
Procedure		
Drive replacement	INLINE	Copy back
4 	5 	6 
	① Block new drive (case 8)	① Block copy source drive (case 9) ② Block copy destination drive (case 8)

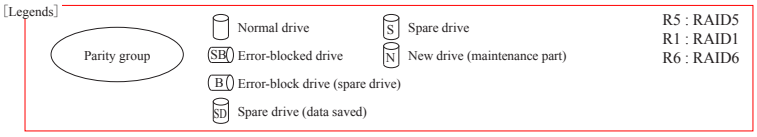
Procedure
Restoration
7 

[Case 18] Preventive drive replacement 2

Condition item		Condition
Threshold value exceeded	Warning SIM	–
	Block SIM	–
Others (unusual noise, etc.)		○
Spare drive		–
Other case (secondary measure)		

Procedure		
Replacement	Maintenance block	Drive replacement
1 	2 	3 

Procedure		
INLINE	Correction copy	Restoration
4 	5 	6 
① Block new drive (case 5)	① Block new drive (case 5)	

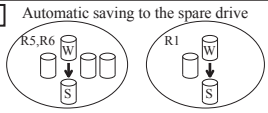
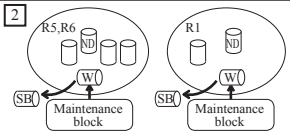


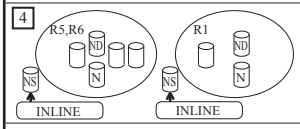
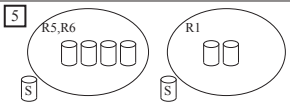
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

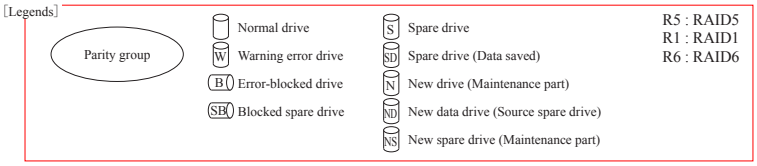
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[Copy back is not required]

[Case 19] When a drive exceeds the warning threshold value

Condition item		Condition	Procedure		
			Threshold value exceeded	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	○	1 Automatic saving to the spare drive 	2 	3 
	Block SIM	—			
Other case (secondary measure)			① Block copy source drive (Case 20) ② Block copy destination drive a) Unused spare present (Case 21) b) Unused spare absent (Case 22)		

Procedure		
INLINE	Restoration	
4 	5 	



NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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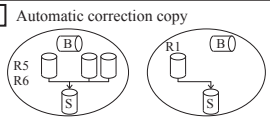
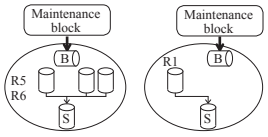
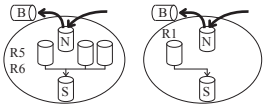
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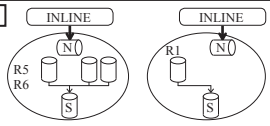
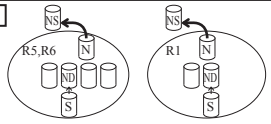
[Case 20] A drive is blocked

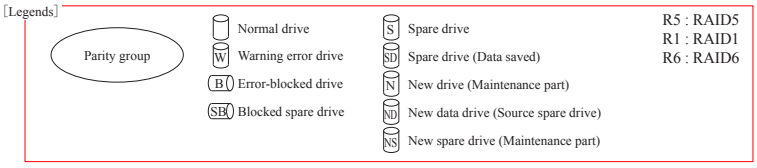
When there is a spare drive, correction copy is automatically activated.

- In this case, to replace a drive during correction copy, go to Case 20.1.
- To replace a drive after correction copy is completed, go to Case 20.2.

[Case 20.1] A drive is blocked. Drive replacement during an automatic correction copy

Condition item		Condition	Procedure		
			Blockage of a drive	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	—	1 Automatic correction copy 	2 Replacement of the blocked drive during automatic correction copy 	3 Replacement of the blocked drive during automatic correction copy 
	Block SIM	○			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (Case 23) b) Unused spare absent (Case 11)		

Procedure		
INLINE	Restoration	
4 	5 	

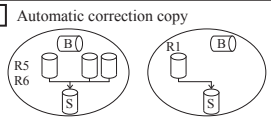
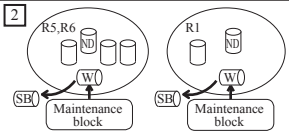
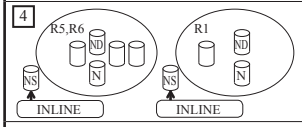
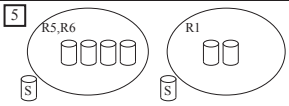


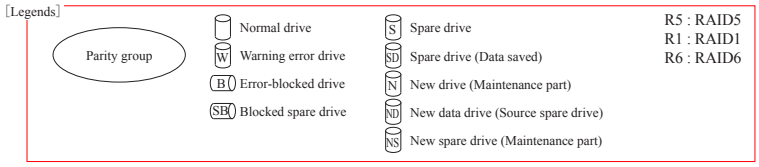
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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[Copy back is not required]

[Case 20.2] A drive is blocked. Drive replacement after an automatic correction copy

Condition item		Condition	Procedure		
			Blockage of a drive	Maintenance block	Drive replacement
Threshold value exceeded	Warning SIM	○	1 Automatic correction copy 	2 	3 
	Block SIM	—			
Other case (secondary measure)			① Block copy destination drive a) Unused spare present (Case 23) b) Unused spare absent (Case 11)		
			Procedure		
			INLINE	Restoration	
			4 	5 	



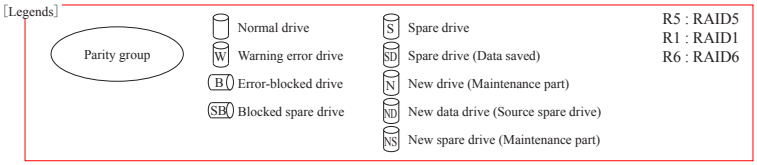
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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[Case in which a secondary failure occurred during recovery]

[Case 21] When a copy destination is blocked during the automatic saving to the spare disk

Condition item	Procedure		
		Re-automatic spare save	Maintenance block
Copy destination blocked during automatic spare save (Unused spare present)	1 R5,R6 W SB S; R1 W SB S	2 R5,R6 W S SB; R1 W S SB	3 R5,R6 ND W SB SB; R1 ND W SB SB; Maintenance block; Maintenance block
	Procedure		
	Drive replacement	INLINE	Restoration
	4 R5,R6 ND SB NS SB; R1 ND SB NS SB	5 R5,R6 ND NS SB; R1 ND NS SB; INLINE; INLINE	6 Perform [case15] after recovery; R5,R6 S SB; R1 S SB

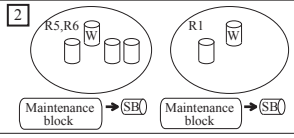
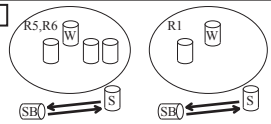


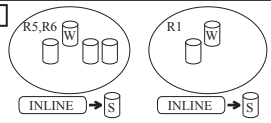
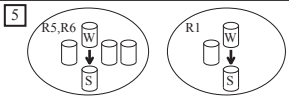
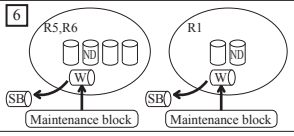
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

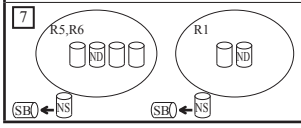
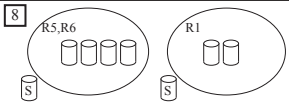
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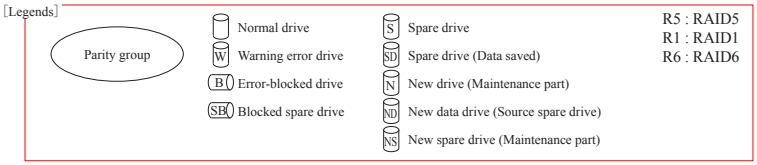
[Case in which a secondary failure occurred during recovery]

[Case 22] When a copy destination is blocked during the automatic saving to the spare disk (without unused spare drive)

Condition item	Procedure		
		Maintenance block on spare	Spare drive replacement
Copy destination blocked during automatic spare save (Unused spare absent)	1 	2 	3 

Procedure		
INLINE	Spare save	Maintenance block
4 	5 	6 

Procedure		
Drive replacement	Restoration	
7 	8 	



NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

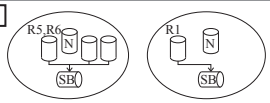
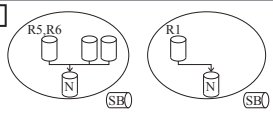
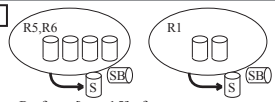
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[Case in which a secondary failure occurred during recovery]

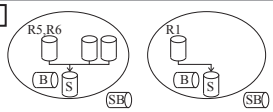
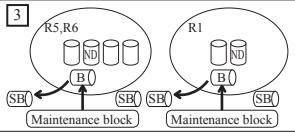
[Case 23] When a copy destination is blocked during the automatic correction copy (Unused spare drive exists)

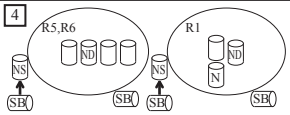
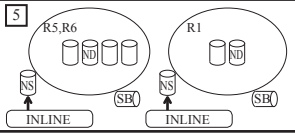
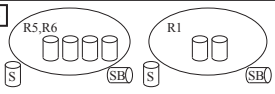
- When Case 20.1 was performed and the blocked drive has been replaced, go to Case 23.1.
- In other cases, go to Case 23.2.

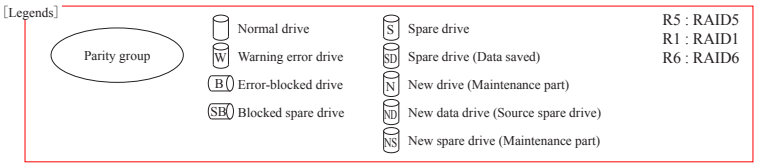
[Case 23.1] The blocked drive has been replaced in [Case 20.1]

Condition item	Procedure		
		Starting self-drive correction copy automatically	Maintenance block
Copy destination blocked during automatic correction copy (Unused spare absent)	1  Correction copy fails	2 	3  Perform [case15] after recovery

[Case 23.2] [Case 20.1] is not performed

Condition item	Procedure		
		Re-automatic correction copy	Maintenance block
Copy destination blocked during automatic correction copy (Unused spare present)	1 	2 	3  Maintenance block Maintenance block

Procedure		
Drive replacement	INLINE	Restoration
4 	5  INLINE INLINE	6  Perform [case15] after recovery



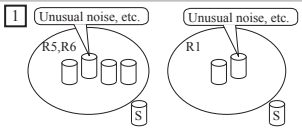
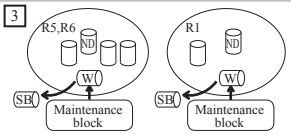
NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

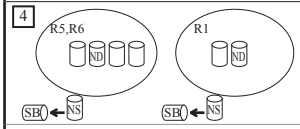
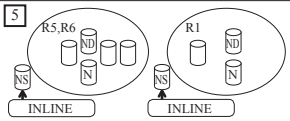
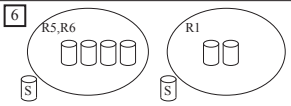
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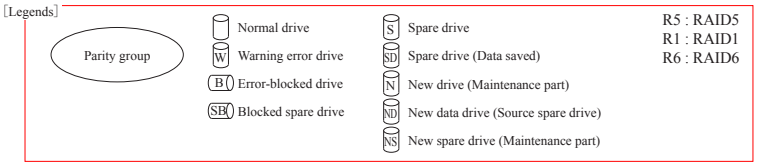
[Case in which copy back is not required]

[Case 24] Preventive drive replacement 1

Condition item		Condition
Threshold value exceeded	Warning SIM	—
	Block SIM	—
Others (unusual noise, etc.)		○
Spare drive		○
Other case (secondary measure)		

Procedure		
Drive replacement	Spare save	Maintenance block
1 	2 	3 
	① Block copy source drive (Case 4) ② Block copy destination drive (Case 22)	

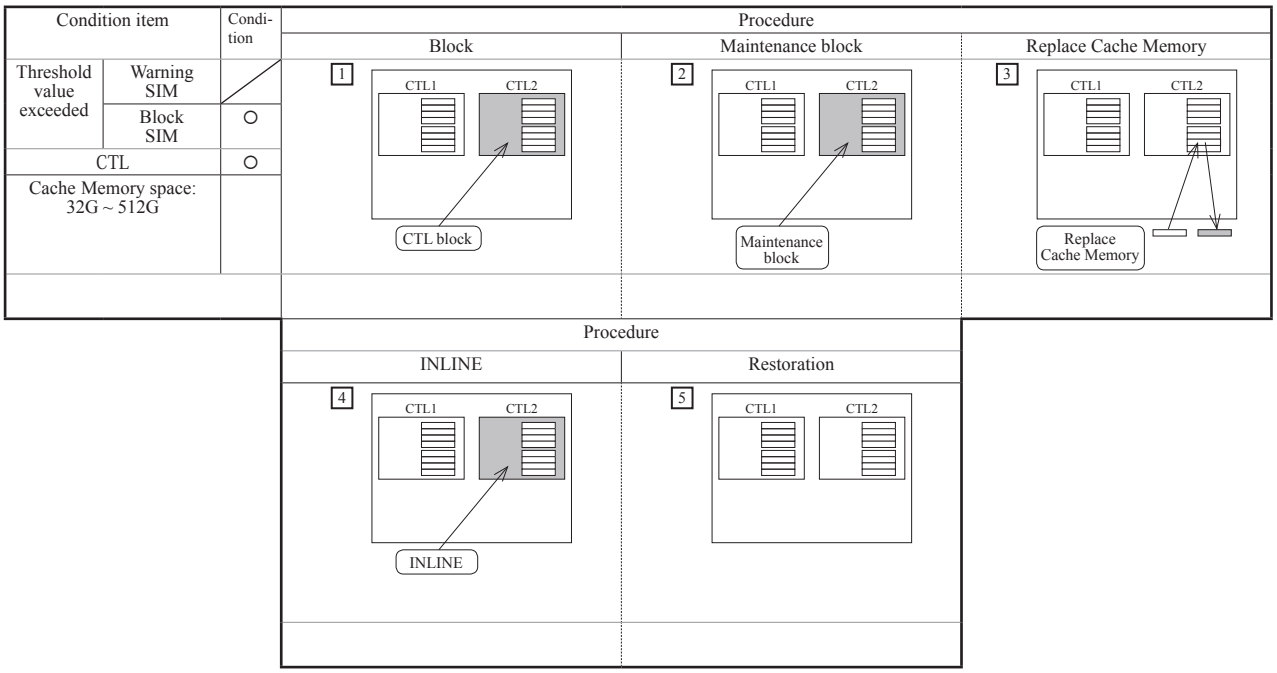
Procedure		
Drive replacement	INLINE	Restoration
4 	5 	6 



NOTE: In the RAID1 system, two drives form a mirroring pair and the two mirroring pairs (four drives) compose the parity group. In the above diagram, only the two mirroring pairs are shown.

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1.4 Concept of Cache Memory Maintenance



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1.5 How to Interpret the Replace Procedure

1.5.1 In Case of Replacement when SIM Has Occurred

1. Search a work ID which coincides with the work ID corresponding to SIM ACC (PKC) (refer to ACC SECTION "4. List of ACC") from Parts Replacement Process Table in "1.6 Parts Replacement Processing List".
   Search a work ID corresponding to the pertinent condition if "Condition Item" is described in Parts Replacement Process Table.
2. If the work ID is found,
   - Take actions according to that match the work ID.
3. If no work ID is found,
   - Search a work ID corresponding to SIM ACC (PKC and error details) from Parts Replacement Process Table in "1.6 Parts Replacement Processing List".
   - Take actions according to that match the work ID.

NOTE: Refer to "1.5.5 How to Search a Work ID to Replace a Drive" for the procedure for searching a work ID to replace a drive.
When replacing a drive, be sure to refer to "1.5.3 Procedure before PDEV Replacement and Correction Copy" and "1.5.4 Confirmation Procedure".

1.5.2 In Case of Replacement when SIM Has Not Occurred

1. Search a work ID corresponding to the part to be replaced from Parts Replacement Process Table in "1.6 Parts Replacement Processing List".
2. Take actions according to the procedure number that matches the work ID.

NOTE: Refer to "1.5.5 How to Search a Work ID to Replace a Drive" for the procedure for searching the work ID to replace a drive.
When replacing a drive, be sure to refer to "1.5.3 Procedure before PDEV Replacement and Correction Copy" and "1.5.4 Confirmation Procedure".

----------<Example>----------

Condition to replace

- SIM has occurred.
- Work ID corresponding to SIM ACC PKC is RCA1

Search an applicable Work ID identified by shaded area in the following sample of Parts Replacement Process Table under the above conditions.

Table 1-3 <Cache Memory>

Work ID	Part Name	Procedure	Replacing Time (*1)(*2)
RCTL	Controller Board	Replacing a Controller Board ("2.4 Replacing a Controller Board")	20 min

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1.5.3 Procedure before PDEV Replacement and Correction Copy

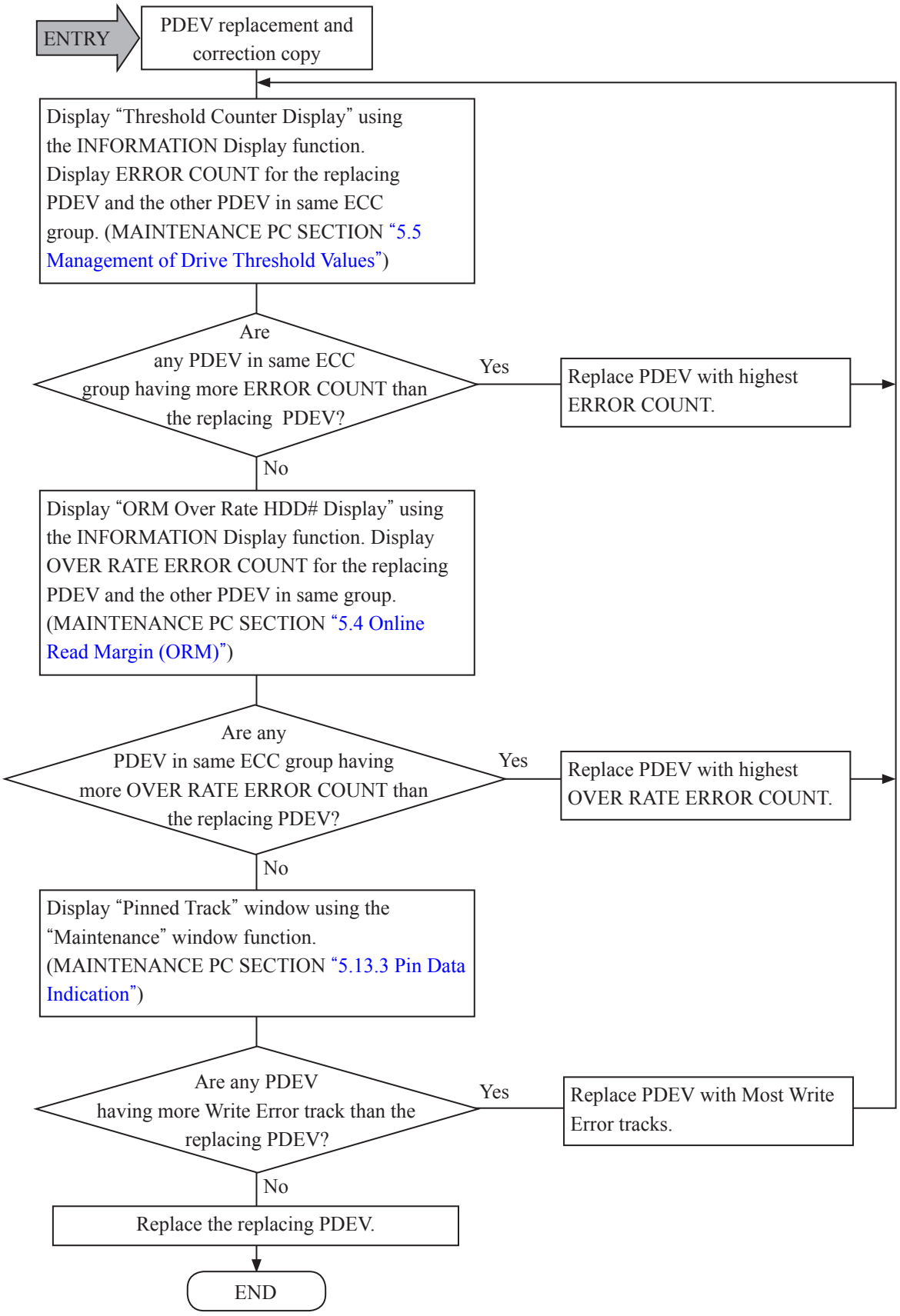
NOTICE: Instructions before blocking and replacing PDEV with a drive failure are listed below:
When replacing unblocked PDEV, redundancy in the ECC group is lost. Therefore, during PDEV replacement, the other PDEV in the same ECC group is blocked by a drive failure, all the LDEV in the ECC group is blocked. Accordingly, to prevent the above problem, check the status of PDEV other than the PDEV to be replaced in the same ECC group before PDEV replacement. When a PDEV having more drive failures than the replacing PDEV exists, replace the PDEV with the highest drive failures.

Table 1-4 Check Items before PDEV Replacement

#	Items checked	Procedure
1	Failure Count	"Threshold Counter Display" (Refer to MAINTENANCE PC SECTION "5.5 Management of Drive Threshold Values")
2	ORM Over Rate	"ORM Over Rate HDD# Display" (Refer to MAINTENANCE PC SECTION "5.4 Online Read Margin (ORM)")
3	Write Error Failed Track Rate	"Pinned Track Display" (Refer to MAINTENANCE PC SECTION "5.13.3 Pin Data Indication")

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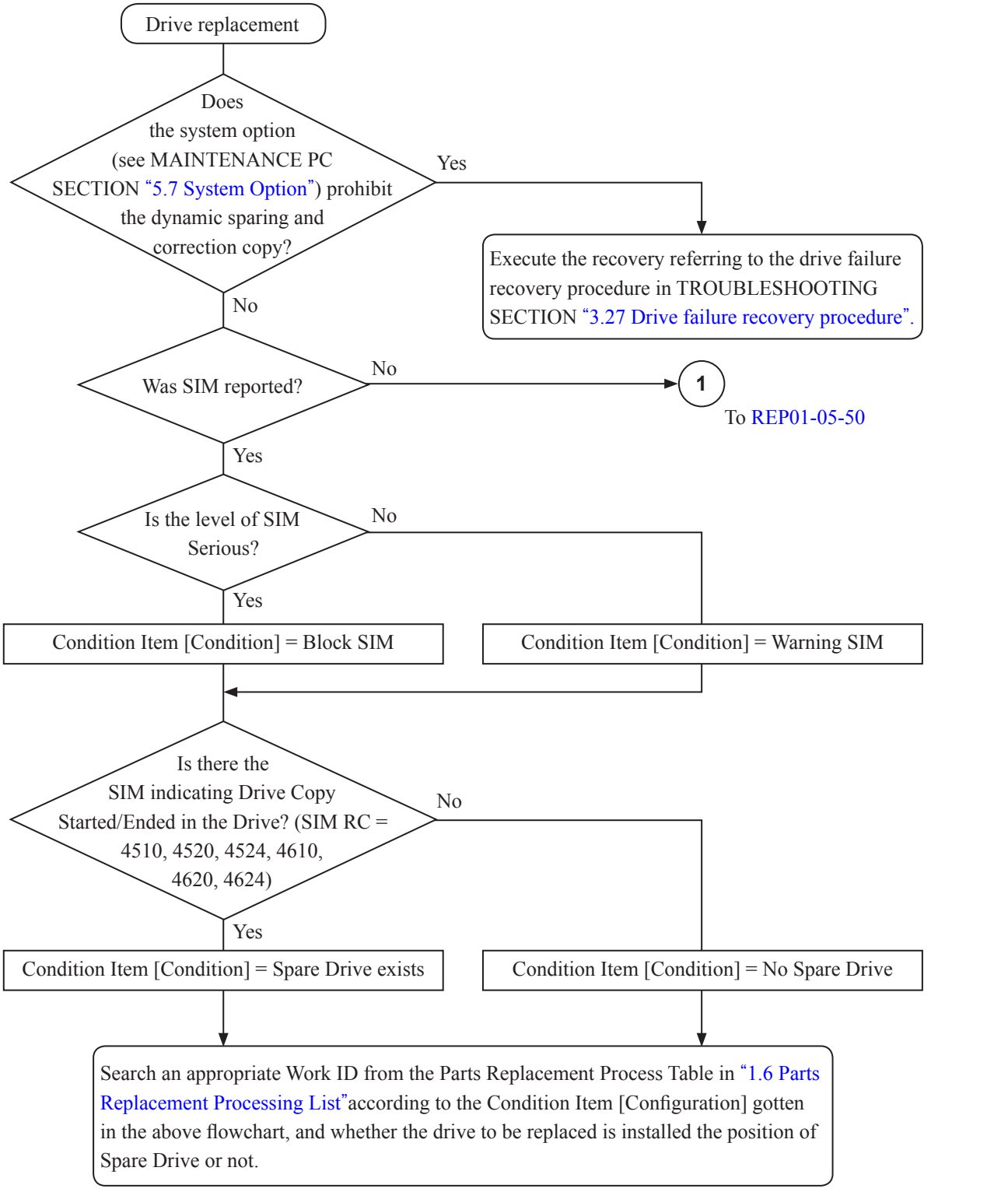
1.5.4 Confirmation Procedure



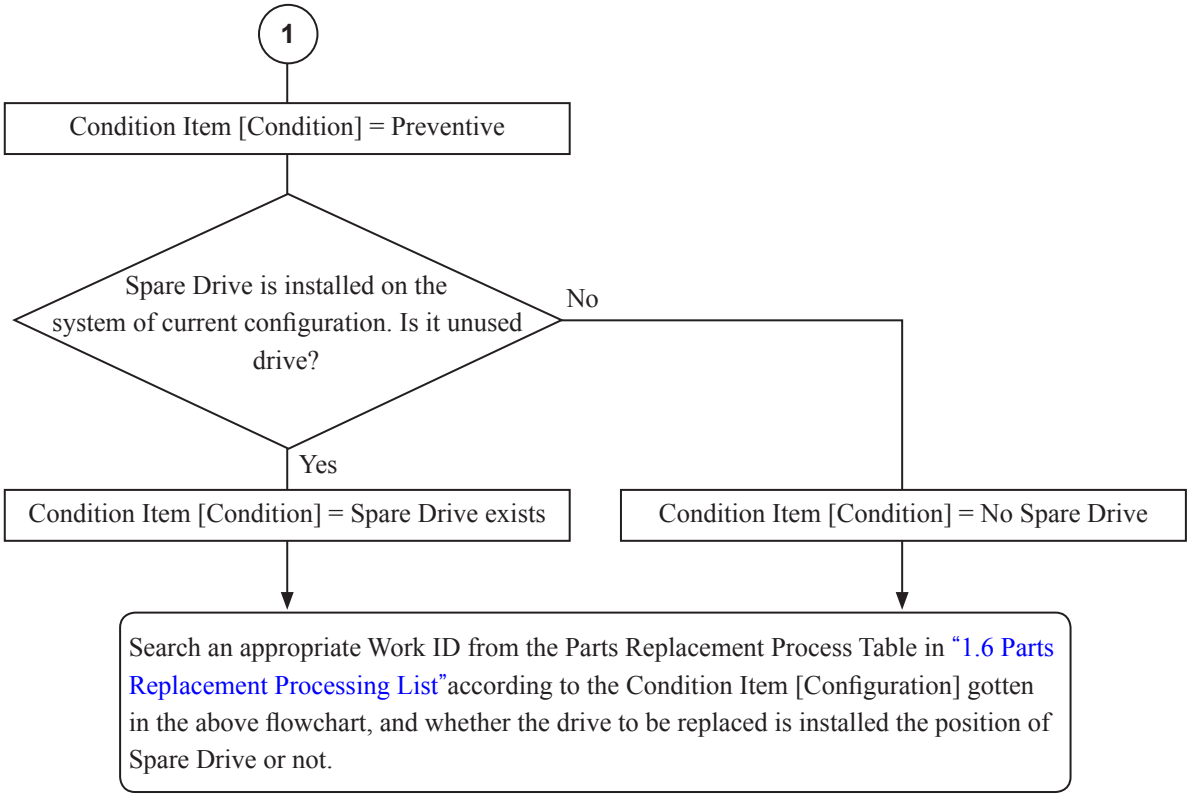
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1.5.5 How to Search a Work ID to Replace a Drive

NOTICE: When a work ID cannot be found by this procedure or when multiple errors in Drives, refer to TROUBLESHOOTING SECTION "3.27 Drive failure recovery procedure".



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----------<<Example>>----------

- SIM has occurred.
- Level of the occurred SIM is not "Serious". = Condition Item[Condition] is "Warning SIM".
- There is the SIM that RC is 4510 in the drive. = Condition Item[Configuration] is "Unused spare drive exists".
- The drive to be replaced is not a spare drive. = "Data Drive"

NOTE: Under the above conditions, the shaded area is searched from Parts Replacement Process List (sample). Therefore, in this example Work ID should be RDK1.

<Data Drive, Spare Drive>

Work ID	Parts Name	Condition Item				Procedure	Reference information		
		Condition			Config-uration		Replacing time	Outline	Case
		Failure		Preventive	Unused Spare drive				
		Warning SIM	Block SIM						
RDK1	Data Drive	×	×	—	Yes	Replacing a Drive ("2.3 Replacing a Drive")	20 min	Drive replace ~ Copy back	Case 1 Case 2

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1.6 Parts Replacement Processing List

NOTE: If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.

1. Data Drive, Spare Drive>

Work ID	Parts Name	Condition Item				Procedure	Reference information		
		Condition			Config-uration		Replacing time (*2) (*8) (*9) (*10)	Outline(*1)	Case
		Failure							
		Warning SIM	Block SIM	Preventive	Unused Spare drive				
RDK1	Data Drive (*3)	×	×	-	Yes	Replacing a Drive (“2.3 Replacing a Drive”)	20 min	Drive replace ~ Copy back	Case 1 Case 2 Case 19 Case 21
	Data Drive (*3)	-	-	×	Yes	Replacing a Drive (“2.3 Replacing a Drive”)	-	Copy to Spare drive ~ Drive replace ~ Copy back	Case 17 Case 24
	Data Drive (*3) (*6)	×	×	×	No	Replacing a Drive (“2.3 Replacing a Drive”)	20 min	Drive replace ~ Correction copy	Case 3 Case 4 Case 18
	Data Drive (*3)	Case that two or more drives in a same parity group are blocked. As to RAID 6, when three or more drives are blocked. (*4) (*7)				Replacing a Drive (“2.3 Replacing a Drive”)	-	LDEV formatting after replacing all the HDDs blocked in a parity group (*5)	Case 16
	Spare Drive (*3)	-				Replacing a Drive (“2.3 Replacing a Drive”)	20 min	Spare drive replace	Case 15

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*1: See "1.3 Concept of Drive Maintenance".

*2: This time does not include copy back time of data in HDD. Refer to (*8) for the HDD copy time.

*3: Parts Name indicates attribute of a drive.
Data Drive: The Drive is installed in the position for a Drive except Spare Drive (Data Drive).
Spare Drive: The Drive is installed in the position for a Spare Drive.

*4: When the work procedure in the case of two or more Drives blocked in the same parity group (as to RAID 6, three or more Drives) is executed, the data will be erased. Ask the Technical Support Division about the appropriateness of the operation. When you want to restore LDEV status for the purpose of data backup, please go to TROUBLESHOOTING SECTION "3.13 Recovery Procedure for LDEV Blockade (SIM = ef9xxx, dfaxxx, dfbxxx)".

*5: Confirm the parity group and the LDEV No. corresponding to the HDD through the STATUS. Refer to MAINTENANCE PC SECTION "11.3.4.3 HDD Information View" for the procedure for referring to STATUS.

*6: See "1.5.3 Procedure before PDEV Replacement and Correction Copy".

*7: In case of RAID6, when two HDDs are blocked in the parity group, you can start the replacement from either of two HDDs.

NOTE: If a Work ID cannot be found or if multiple drive failures have occurred, see TROUBLESHOOTING SECTION "3.27 Drive failure recovery procedure".

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*8: HDD copy time

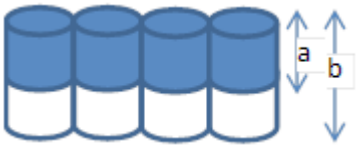
- In the case of RAID1 (2D+2D), the copy time of the primary HDD and that of the secondary HDD are the same.
- The copy time of RAID1 (4D+4D) is the same as RAID1 (2D+2D).
- When CVS is used, the copy time is proportional to the amount of LDEV assigned in the parity group.

  Eg:
  - If the amount of LDEV assigned is 50%, the copy time is half the above-mentioned values.
  - When the LDEV eight times the write guaranteed capacity of the parity group is assigned using the Accelerated Compression, the eightfold copy time is required.

- When the parity group is used for DP/DT/DT (active flash)-POOL, depending on the POOL used amount, the copy time becomes shorter than the above-mentioned values.
- When the copy is executed while executing the Quick Format, the copy might be completed earlier than the above-mentioned values because the area under the format is not copied.
- When the Accelerated Compression function of FMC is used, the copy time is longer than the time in the following tables. Calculate the copy time by using the following formula.

(1) Percentage of defined LDEVs in a PG (Parity Group) (%): C (%)

C(%) = Total capacity of LDEVs in a PG (a) / Physical data capacity of a PG (b)



Item	PG capacity	How to check/calculate capacity
a	Total capacity of LDEVs in a PG	See the“Parity Groups window” section in Provisioning Guide for Open Systems.
b	Physical data capacity of a PG (excluding parity)	Physical capacity of a drive × The number of data drives Eg: 1.6TB FMD (RAID5 3D+1P) b = 1.6TB × 3 = 4.8TB

NOTE: When the Accelerated Compression function is used for FMDs, “a” might be larger than “b”.

(2) Utilization rate of Pool (%): D(%)

Check the utilization rate seeing the“Pools window” section in Provisioning Guide for Open Systems.

(3) Estimation of copy time

The value in the following tables × C (%) × D (%).

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(4) CBSS/CBSL, No I/O, OPEN-V : Copy Mode = Interleave Medium

HDD type	Copy type	RAID1	RAID5/6	
			Group 1	Group 2
4R0H3M/4R0H3MC/ 4R0H4M/4R0H4MC (7.2 krpm)	Drive copy	11h 50m	←	←
	Correction copy	10h 40m	10h 40m	11h 10m
6R0H9M/6R0HLM (7.2 krpm)	Drive copy	16h 40m	←	←
	Correction copy	14h 50m	14h 30m	15h 50m
10RH9M/10RHLM (7.2 krpm)	Drive copy	28h 20m	←	←
	Correction copy	25h 20m	24h 40m	27h 00m
300KCM/300KCMC (15 krpm)	Drive copy	50m	←	←
	Correction copy	40m	50m	1h 00m
600KGM (15 krpm)	Drive copy	1h 30m	←	←
	Correction copy	1h 10m	1h 20m	1h 20m
600JCM/600JCMC (10 krpm)	Drive copy	1h 40m	←	←
	Correction copy	1h 20m	1h 30m	1h 30m
1R2JCM/1R2JCMC/ 1R2J5M/1R2J5MC/ 1R2J7M/1R2J7MC (10 krpm)	Drive copy	3h 10m	←	←
	Correction copy	2h 50m	3h 00m	3h 00m
1R8JGM/1R8J6M/ 1R8J8M (10 krpm)	Drive copy	3h 30m	←	←
	Correction copy	3h 20m	3h 20m	3h 20m
200MEM (SSD)	Drive copy	20m	←	←
	Correction copy	20m	20m	30m
400MEM/400M6M/ 400M8M (SSD)	Drive copy	40m	←	←
	Correction copy	40m	40m	50m
480MGM (SSD)	Drive copy	45m	←	←
	Correction copy	45m	45m	1h 00m
960MGM (SSD)	Drive copy	1h 30m	←	←
	Correction copy	1h 30m	1h 30m	2h 00m
1R9MEM/1R9MGM (SSD)	Drive copy	2h 50m	←	←
	Correction copy	2h 50m	2h 50m	3h 50m
3R8MGM (SSD)	Drive copy	6h 00m	←	←
	Correction copy	6h 00m	6h 00m	8h 00m
1R6FM (FMD)	Drive copy	3h 30m	←	←
	Correction copy	3h 30m	2h 20m	4h 00m
3R2FM (FMD)	Drive copy	7h 00m	←	←
	Correction copy	7h 00m	4h 40m	8h 00m
1R6FN (FMD)	Drive copy	3h 30m	←	←
	Correction copy	3h 30m	2h 20m	4h 00m
3R2FN (FMD)	Drive copy	7h 00m	←	←
	Correction copy	7h 00m	4h 40m	8h 00m
6R4FN (FMD)	Drive copy	14h 00m	←	←
	Correction copy	14h 00m	9h 20m	16h 00m
7R0FP (FMD)	Drive copy	14h 00m	←	←
	Correction copy	14h 00m	9h 20m	16h 00m
14RFP (FMD)	Drive copy	28h 00m	←	←
	Correction copy	28h 00m	18h 40m	32h 00m

• Group 1: RAID5 (3D+1P, 4D+1P, 6D+1P, 7D+1P) and RAID6 (6D+2P)

• Group 2: RAID6 (12D+2P, 14D+2P)

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(5) CBLM, No I/O, OPEN-V : Copy Mode = Interleave Medium

HDD type	Copy type	RAID1	RAID5/6	
			Group 1	Group 2
4R0H3M/4R0H3MC/ 4R0H4M/4R0H4MC (7.2 krpm)	Drive copy	9h 20m	←	←
	Correction copy	9h 00m	9h 50m	10h 00m
6R0H9M/6R0HLM (7.2 krpm)	Drive copy	12h 20m	←	←
	Correction copy	12h 20m	12h 00m	12h 20m
10RH9M/10RHLM (7.2 krpm)	Drive copy	21h 00m	←	←
	Correction copy	21h 00m	20h 30m	21h 00m
300KCM/300KCMC (15 krpm)	Drive copy	30m	←	←
	Correction copy	30m	40m	40m
600KGM (15 krpm)	Drive copy	50m	←	←
	Correction copy	50m	50m	1h 00m
600JCM/600JCMC (10 krpm)	Drive copy	1h 20m	←	←
	Correction copy	1h 00m	1h 10m	1h 20m
1R2JCM/1R2JCMC/ 1R2J5M/1R2J5MC/ 1R2J7M/1R2J7MC (10 krpm)	Drive copy	2h 30m	←	←
	Correction copy	2h 20m	2h 30m	2h 30m
1R8JGM/1R8J6M/ 1R8J8M (10 krpm)	Drive copy	2h 40m	←	←
	Correction copy	2h 40m	2h 40m	2h 50m
200MEM (SSD)	Drive copy	20m	←	←
	Correction copy	20m	20m	20m
400MEM/400M6M/ 400M8M (SSD)	Drive copy	40m	←	←
	Correction copy	30m	30m	40m
480MGM (SSD)	Drive copy	45m	←	←
	Correction copy	45m	30m	45m
960MGM (SSD)	Drive copy	1h 30m	←	←
	Correction copy	1h 30m	1h 00m	1h 30m
1R9MEM/1R9MGM (SSD)	Drive copy	2h 50m	←	←
	Correction copy	2h 50m	2h	2h 50m
3R8MGM (SSD)	Drive copy	6h 00m	←	←
	Correction copy	6h 00m	4h 10m	6h 00m
1R6FM (FMD)	Drive copy	3h 20m	←	←
	Correction copy	3h 20m	1h 50m	2h 20m
3R2FM (FMD)	Drive copy	6h 40m	←	←
	Correction copy	6h 40m	3h 40m	4h 40m
1R6FN (FMD)	Drive copy	3h 20m	←	←
	Correction copy	3h 20m	1h 50m	2h 20m
3R2FN (FMD)	Drive copy	6h 40m	←	←
	Correction copy	6h 40m	3h 40m	4h 40m
6R4FN (FMD)	Drive copy	13h 20m	←	←
	Correction copy	13h 20m	7h 20m	9h 20m
7R0FP (FMD)	Drive copy	13h 20m	←	←
	Correction copy	13h 20m	7h 20m	9h 20m
14RFP (FMD)	Drive copy	26h 40m	←	←
	Correction copy	26h 40m	14h 40m	18h 40m

• Group 1: RAID5 (3D+1P, 4D+1P, 6D+1P, 7D+1P) and RAID6(6D+2P)

• Group 2: RAID6 (12D+2P, 14D+2P)

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(6) CBLH, No I/O, OPEN-V : Copy Mode = Interleave Medium

HDD type	Copy type	RAID1	RAID5/6	
			Group 1	Group 2
4R0H3M/4R0H3MC/ 4R0H4M/4R0H4MC (7.2 krpm)	Drive copy	9h 20m	←	←
	Correction copy	9h 00m	9h 50m	10h 00m
6R0H9M/6R0HLM (7.2 krpm)	Drive copy	12h 20m	←	←
	Correction copy	12h 20m	12h 00m	12h 20m
10RH9M/10RHLM (7.2 krpm)	Drive copy	21h 00m	←	←
	Correction copy	21h 00m	20h 30m	21h 00m
300KCM/300KCMC (15 krpm)	Drive copy	30m	←	←
	Correction copy	30m	40m	40m
600KGM (15 krpm)	Drive copy	50m	←	←
	Correction copy	50m	50m	1h 00m
600JCM/600JCMC (10 krpm)	Drive copy	1h 20m	←	←
	Correction copy	1h 00m	1h 10m	1h 20m
1R2JCM/1R2JCMC/ 1R2J5M/1R2J5MC/ 1R2J7M/1R2J7MC (10 krpm)	Drive copy	2h 30m	←	←
	Correction copy	2h 20m	2h 30m	2h 30m
1R8JGM/1R8J6M/ 1R8J8M (10 krpm)	Drive copy	2h 40m	←	←
	Correction copy	2h 40m	2h 40m	2h 50m
200MEM (SSD)	Drive copy	20m	←	←
	Correction copy	20m	20m	20m
400MEM/400M6M/ 400M8M (SSD)	Drive copy	40m	←	←
	Correction copy	30m	30m	40m
960MGM (SSD)	Drive copy	1h 30m	←	←
	Correction copy	1h 30m	1h 00m	1h 30m
1R9MEM/1R9MGM (SSD)	Drive copy	2h 50m	←	←
	Correction copy	2h 50m	2h	2h 50m
3R8MGM (SSD)	Drive copy	6h 00m	←	←
	Correction copy	6h 00m	4h 10m	6h 00m
1R6FM (FMD)	Drive copy	3h 20m	←	←
	Correction copy	3h 20m	1h 50m	2h 20m
3R2FM (FMD)	Drive copy	6h 40m	←	←
	Correction copy	6h 40m	3h 40m	4h 40m
1R6FN (FMD)	Drive copy	3h 20m	←	←
	Correction copy	3h 20m	1h 50m	2h 20m
3R2FN (FMD)	Drive copy	6h 40m	←	←
	Correction copy	6h 40m	3h 40m	4h 40m
6R4FN (FMD)	Drive copy	13h 20m	←	←
	Correction copy	13h 20m	7h 20m	9h 20m
7R0FP (FMD)	Drive copy	13h 20m	←	←
	Correction copy	13h 20m	7h 20m	9h 20m
14RFP (FMD)	Drive copy	26h 40m	←	←
	Correction copy	26h 40m	14h 40m	18h 40m

- Group 1: RAID5 (3D+1P, 4D+1P, 6D+1P, 7D+1P) and RAID6(6D+2P)
- Group 2: RAID6 (12D+2P, 14D+2P)

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*9: The drive copy to the spare drive of the RAID1 is copied from the drive (normal drive) of the pair of which the failure occurred.
(Because there is a case where a failure occurs in the copy source drive and the copy time is delayed in the usual form that performs copying from the drive of which the failure occurred.)
However, the copy back (copy from the spare drive to the data drive) is copied from the spare drive as usual.
- Time changes by the Device constitution and the Internal re-try processing (Head positioning, Handling of re-covered process).
  Please make a range to 1.5 times of above time an aim.

*10: This includes working hours necessary for replacing parts such as attaching/removing a Front Bezel and opening/closing the door of a rack frame.

2. Controller Board

Work ID	Part Name	Procedure	Replacing Time (*1)
RCTL	Controller Board	Replacing a Controller Board (“2.4 Replacing a Controller Board”)	30 min
RCM1	Cache Memory	Replacing a Cache Memory (“2.5 Replacing a Cache Memory”)	20 min
RCFM	Cache Flash Memory	When a Controller Board is “Normal”: Replace the Cache Flash Memory “2.10 Replacing a Cache Flash Memory (CFM)” When a Controller Board is blocked: Perform the procedure for replacing the Controller Board (“2.4 Replacing a Controller Board”) and remove the Controller Board from the Controller Chassis as described in the procedure. Then, replace the Cache Flash Memory only and return the Controller Board to the Controller Chassis. (The components including the Controller Board can be used, except for the Cache Flash Memory.)	20 min

*1: The destaging time and the Update Firmware time is not included. (The destaging operation takes 30 minutes to two hours.).

NOTICE: Replacing a Controller Board may block Quorum Disk when there is much write pending data in cache.
When Quorum Disk is block, GAD pairs may be suspended by some failures.
We recommend to replace a Controller Board when all the cache write pending rate per CLPR in a Controller Board is less than 40%.

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3. Channel Board, Disk Board

Work ID	Part Name	Procedure	Replacing Time (*1)
RCHB	Channel Board	Replacing a Channel Board (CHB) (“2.12 Replacing a Channel Board (CHB)”)	20 min
RDKB	Disk Board	Replacing a Disk Board (“2.14 Replacing a Disk Board (DKB)”)	20 min

*1: The destaging time and the Update Firmware time is not included. (The destaging operation takes 30 minutes to two hours.)

If a failure occurs in replacing a Channel Board or a Disk Board, see TROUBLESHOOTING SECTION “2.2.3 Error Recovery Procedure during CHB/DKB replacement”.

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4. Other Parts of DKC

Work ID	Part Name	Procedure	Replacing Time(*3)
RFAN	FAN (CBSS/CBSL)	Replacing a FAN (“2.6 Replacing a FAN”)	10 min
RBK2	BKMF (CBLM/CBLH)	Replacing a BKMF (“2.7 Replacing a BKMF”)	10 min
RBTR	Battery	Replacing a Battery (“2.8 Replacing a Battery”)	10 min
RBK1	BKM (CBSS/CBSL)	Replacing a BKM (“2.9 Replacing/Preventive Replacement of a BKM”)	10 min
RPSU	Power Supply	Replacing a Power Supply (“2.15 Replacing a Power Supply”)	10 min
RSFP	Small Form-Factor Pluggable	Replacing a Small Form-Factor Pluggable (SFP) (Follow the flowchart in REP02-13-10 to decide which replacement procedure to perform, and then perform “2.13 Replacing a Small Form-Factor Pluggable (SFP)” or INSTALLATION SECTION “3.15 Changing Data Transfer Speed of Small Form-Factor Pluggable (SFP)”.)	5 min
RCML	LAN Board	Replacing a LAN Board (“2.11 Replacing a LAN Board”)	20 min
—	Controller Chassis	Replacing a Controller Chassis (“2.17 Replacing a Controller Chassis/Drive Box”)	60 min (*1)(*2)
—	Front Bezel	Replacing a Front Bezel (“2.18 Replacing the Front Bezel”)	5 min
RENC	ENC	Replacing a ENC (“2.16 Replacing an ENC”)	10 min
—	Drive Box	Replacing a Drive Box (“2.17 Replacing a Controller Chassis/Drive Box”)	DB60: 120 min The others: 40 min
RSC1	SAS Cable	Replacing a SAS Cable (“2.20 Replacing a SAS Cable”)	CBSS/CBSL: 30 min CBLM/CBLH: 20 min DBS/DBL/DB60/DBF: 10 min
RAF1	DKCAIRFILTER	Replacing a Air Filter (“2.22 Replacing Air Filters”)	10 min
RAF2	DBAIRFILTER	Replacing a Air Filter (“2.22 Replacing Air Filters”)	10 min
RSPK	Switch Package	Replacing a Switch Package (SWPK) (“2.26 Replacing a Switch Package”)	30 min

*1: The time for replacing hardware parts. The time for powering on/off is not included.
*2: The replacement work must be done by two or more personnel.
*3: The destaging time and the Update Firmware time is not included. (The destaging operation takes 30 minutes to two hours.)

(To be continued)

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(Continued from preceding sheet)

Work ID	Part Name	Procedure	Replacing Time (*1)
RFN2	FAN (CHBB)	Replacing a FAN (CHBB) (“2.27 Replacing a FAN (CHBBFAN)”)	10 min
RPCP	PCIe-cable Connecting Package	Replacing a PCIe-cable Connecting Package (“2.25 Replacing a PCIe-cable Connecting Package”)	20 min
RPEC	PCIe Channel Board	Replacing a PCIe Channel Board (“2.24 Replacing a PCIe Channel Board”)	20 min
RPCC	PCI cable	Replacing a PCI cable (“2.28 Replacing a PCIe Cable”)	10 min
RPCA	• PCIe Channel Board • PCI cable	• Replacing a PCIe Channel Board (“2.24 Replacing a PCIe Channel Board”) • Replacing a PCI cable (“2.28 Replacing a PCIe Cable”)	30 min
RNAS	NAS Module	Replacing a NAS Module (“2.29.1 Replacing a NAS Module”)	20 min (*2)
RND1	Cache Memory for NAS Module	Replacing a Cache Memory for NAS Module (“2.29.2 Replacing a Cache Memory for NAS Module”)	20 min (*2)
RSFP	Small Form-Factor Pluggable (SFP+) for NAS Module	Replacing a Small Form-Factor Pluggable (SFP+) for NAS Module (“2.29.3 Replacing a Small Form-Factor Pluggable (SFP+) for NAS Module”)	5 min (*2)
—	Channel Board Box	Replacing a Channel Board Box (CHBB) (“2.23 Replacing a Channel Board Box”)	40 min

*1: The destaging time and the Update Firmware time is not included. (The destaging operation takes 30 minutes to two hours.)

*2: The time for replacing hardware parts. The time for migration is not included.

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1.7 Availability of the Online Maintenance When TrueCopy Is Used

× : Maintenance is available.

Message is displayed in the following case.

Refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

Component	Maintenance Type	Condition	TC path established		COPY status		PAIR status	
			M-DKC	R-DKC	P-VOL	S-VOL	P-VOL	S-VOL
Logical Device	Blockade	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Recovery	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Format	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Verify	—	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	30762-208206	30762-208213 30762-208204 (*1)	×	30762-208204 (*1)
		Without Alternate path	×	×	30762-208206	30762-208213 30762-208204 (*1)	×	30762-208204 (*1)
	Replace (Initiator)	With Alternate path	×	×	30762-208206	30762-208213	×	×
		Without Alternate path	×	×	30762-208206 30762-208207	30762-208213	30762-208208	×
Channel Board	Replace (RCU Target)	With Alternate path	×	×	×	30762-208204 (*1)	×	30762-208204 (*1)
		Without Alternate path	×	×	×	30762-208204 (*1)	×	30762-208204 (*1)
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	30762-208207	×	30762-208208	×
Disk Board	Replace	—	×	×	×	×	×	×

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Component	Maintenance Type	Condition	PAIR status	
			P-VOL	S-VOL
Logical Device	Blockade	—	03005-002515	03005-002515
	Recovery	—	03005-002515	03005-002515
	Format	—	03005-002515	03005-002515
	Verify	—	×	×
HDD canister	Replace	—	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	30762-208204 (*1)
		Without Alternate path	×	30762-208204
	Replace (Initiator)	With Alternate path	×	×
		Without Alternate path	×	×
Channel Board	Replace (RCU Target)	With Alternate path	×	30762-208204 (*1)
		Without Alternate path	×	30762-208204 (*1)
	Replace (Initiator)	With Alternate path	×	×
		Without Alternate path	×	×
Disk Board	Replace	—	×	×

The pair can be suspended if paircreate (pairresync) command is issued during the HDD Canister or the Cache Memory replacement. Please ask your customer before the online maintenance operation.

*1: Might be prevented when the M-DKC that does not make a pair forms a path.

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1.8 Availability of the Online Maintenance When ShadowImage Is Used

× : Maintenance is available.

Message is displayed in the following case.

Refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

Component	Maintenance Type	Condition	Pending/Resync/ SP-PEND	Duplex	Split	Suspend
			S-VOL/P-VOL	S-VOL/P-VOL	S-VOL/P-VOL	S-VOL/P-VOL
Logical Device	Blockade	—	03005-002517	03005-002517	03005-002517	×
	Recovery	—	03005-002517	03005-002517	03005-002517	×
	Format	—	03005-002517	03005-002517	03005-002517	×
	Verify	—	×	×	×	×
HDD canister	Replace	—	×	×	×	×
	Dynamic Sparing	—	×	×	×	×
	Correction Copy	—	×	×	×	×
Controller Board	Replace	—	×	×	×	×
Channel Board	Replace	—	×	×	×	×
		—	×	×	×	×
Disk Board	Replace	—	×	×	×	×

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1.9 Availability of the Online Maintenance When UR Is Used

× : Maintenance is available.

Message is displayed in the following case.

Refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

JNL-GROUP

Component	Maintenance Type	Condition	Path established		Initial		Active	
			M-DKC	R-DKC	M-DKC	R-DKC	M-DKC	R-DKC
Logical Device	Blockade	—	×	×	03005-208121	03005-208121	03005-208121	03005-208121
	Recovery	—	×	×	03005-208121	03005-208121	03005-208121	03005-208121
	Format	—	×	×	03005-208121	03005-208121	03005-208121	03005-208121
	Verify	—	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
Channel Board	Replace (RCU Target)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
Disk Board	Replace	—	×	×	×	×	×	×

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Component	Maintenance Type	Condition	Halting		Stop		Stopping	
			M-DKC	R-DKC	M-DKC	R-DKC	M-DKC	R-DKC
Logical Device	Blockade	—	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121
	Recovery	—	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121
	Format	—	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121	03005-208121
	Verify	—	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
Channel Board	Replace (RCU Target)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	×	×	×	×
Disk Board	Replace	—	×	×	×	×	×	×

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DATA-VOL

Component	Maintenance Type	Condition	Path established		During initial copy		After completing initial copy	
			M-DKC	R-DKC	P-VOL	S-VOL	P-VOL	S-VOL
Logical Device	Blockade	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Recovery	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Format	—	×	×	03005-002515	03005-002515	03005-002515	03005-002515
	Verify	—	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	30762-208206 30762-208205 (*1)	30762-208213	30762-208205 (*1)	×
		Without Alternate path	×	×	30762-208206 30762-208205 (*1)	30762-208213	30762-208205 (*1)	×
	Replace (Initiator)	With Alternate path	×	×	30762-208206	30762-208213	×	×
		Without Alternate path	×	×	30762-208206 30762-208205	30762-208207 30762-208213	30762-208205	30762-208208
Channel Board	Replace (RCU Target)	With Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
		Without Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	30762-208205	30762-208207	30762-208205	30762-208208
Disk Board	Replace	—	×	×	×	×	×	×

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Component	Maintenance Type	Condition	Suspend		Suspending		Deleting	
			P-VOL	S-VOL	P-VOL	S-VOL	P-VOL	S-VOL
Logical Device	Blockade	—	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515
	Recovery	—	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515
	Format	—	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515	03005-002515
	Verify	—	×	×	×	×	×	×
HDD canister	Replace	—	×	×	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
		Without Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	30762-208205	30762-208209	30762-208205	30762-208209
Channel Board	Replace (RCU Target)	With Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
		Without Alternate path	×	×	30762-208205 (*1)	×	30762-208205 (*1)	×
	Replace (Initiator)	With Alternate path	×	×	×	×	×	×
		Without Alternate path	×	×	30762-208205	30762-208209	30762-208205	30762-208209
Disk Board	Replace	—	×	×	×	×	×	×

*1: Might be prevented when the R-DKC that does not make a pair forms a path.

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1.10 Availability of the Online Maintenance When GAD Is Used

× : Maintenance is available.

Message is displayed in the following case.

Refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

Component	Maintenance Type	Condition	Path established		Quorum established
			M-DKC	R-DKC	
Logical Device	Blockade	—	×	×	03005-068884
	Recovery	—	×	×	×
	Format	—	×	×	03005-068884
	Verify	—	×	×	×
HDD canister	Replace	—	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	×	×	×
		Without Alternate path	×	×	×
	Replace (Initiator)	With Alternate path	×	×	×
		Without Alternate path	×	×	×
Channel Board	Replace	With Alternate path	×	×	×
		Without Alternate path	×	×	×
Disk Board	Replace	—	×	×	×

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Component	Maintenance Type	Condition	Pair status = COPY		Pair status = PAIR	
			P-VOL	S-VOL	P-VOL	S-VOL
Logical Device	Blockade	—	03005-068885	03005-068886	03005-068885	03005-068886
	Recovery	—	03005-068885	03005-068886	03005-068885	03005-068886
	Format	—	03005-068885	03005-068886	03005-068885	03005-068886
	Verify	—	×	×	×	×
HDD canister	Replace	—	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	30762-208363 30762-208205 (*1)	30762-208366 30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
		Without Alternate path	30762-208363 30762-208205 (*1)	30762-208366 30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
	Replace (Initiator)	With Alternate path	30762-208363	30762-208366	×	×
		Without Alternate path	30762-208363 30762-208365	30762-208366 30762-208365	30762-208365	30762-208365
Channel Board	Replace (RCU Target)	With Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
		Without Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
	Replace (Initiator)	With Alternate path	×	×	×	×
		Without Alternate path	30762-208365	30762-208365	30762-208365	30762-208365
Disk Board	Replace	—	×	×	×	×

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Component	Maintenance Type	Condition	Pair status = PSUS/PSUE (Local)	Pair status = SSWS (Local)	Pair status = PSUS/PSUE (Block)	Pair status = SSUS/PSUE (Block)
			P-VOL	S-VOL	P-VOL	S-VOL
Logical Device	Blockade	—	03005-068885	03005-068886	03005-068885	03005-068886
	Recovery	—	03005-068885	03005-068886	03005-068885	03005-068886
	Format	—	03005-068885	03005-068886	03005-068885	03005-068886
	Verify	—	×	×	×	×
HDD canister	Replace	—	×	×	×	×
Controller Board	Replace (RCU Target)	With Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
		Without Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
	Replace (Initiator)	With Alternate path	×	×	×	×
		Without Alternate path	×	×	×	×
Channel Board	Replace (RCU Target)	With Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
		Without Alternate path	30762-208205 (*1)	30762-208204 (*2)	30762-208205 (*1)	30762-208204 (*2)
	Replace (Initiator)	With Alternate path	×	×	×	×
		Without Alternate path	×	×	×	×
Disk Board	Replace	—	×	×	×	×

*1: Might be prevented when the R-DKC that does not make a pair forms a path.
*2: Might be prevented when the M-DKC that does not make a pair forms a path.

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1.11 About the Storage Media Used for Installation/Maintenance Process

The media showed in following table are attached in storage system, in order to advance installation, maintenance, and failure analysis smoothly. Please implement installation or collect information according to the work procedure indicated in each section.

No.	Media	Description	Installation device	Remarks
1	CD-ROM	CD-R for micro-program storage. Used for installation or micro-program download in time of micro FC.	CD-R Drive of maintenance PC	Attached to the device

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1.12 Specifying the Installation Location by Using the Locate LED

1.12.1 Trun on Locate LED

Refer to MAINTENANCE PC SECTION ”3.9.1 Trun on Locate LED”.

1.12.2 Trun off Locate LED

Refer to MAINTENANCE PC SECTION ”3.9.2 Trun off Locate LED”.

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2. Replacement Processing

2.1 Connecting the Maintenance PC

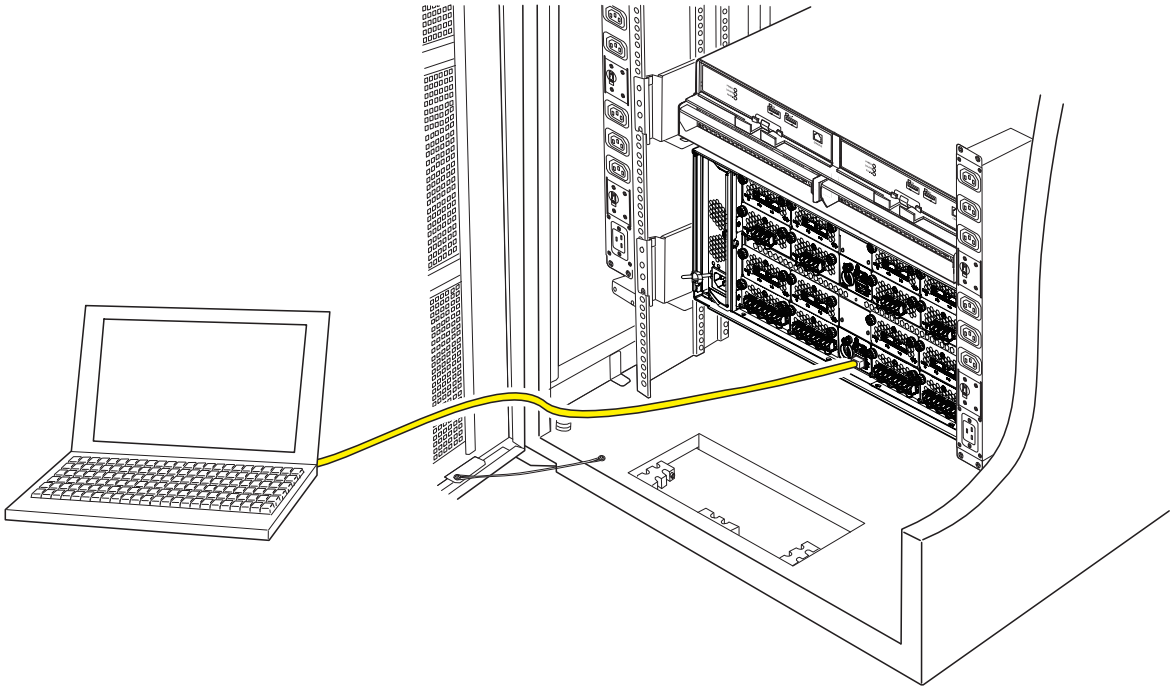
2.1.1 Attachment / Removal Procedure of Maintenance PC

2.1.1.1 Attachment Procedure of Maintenance PC

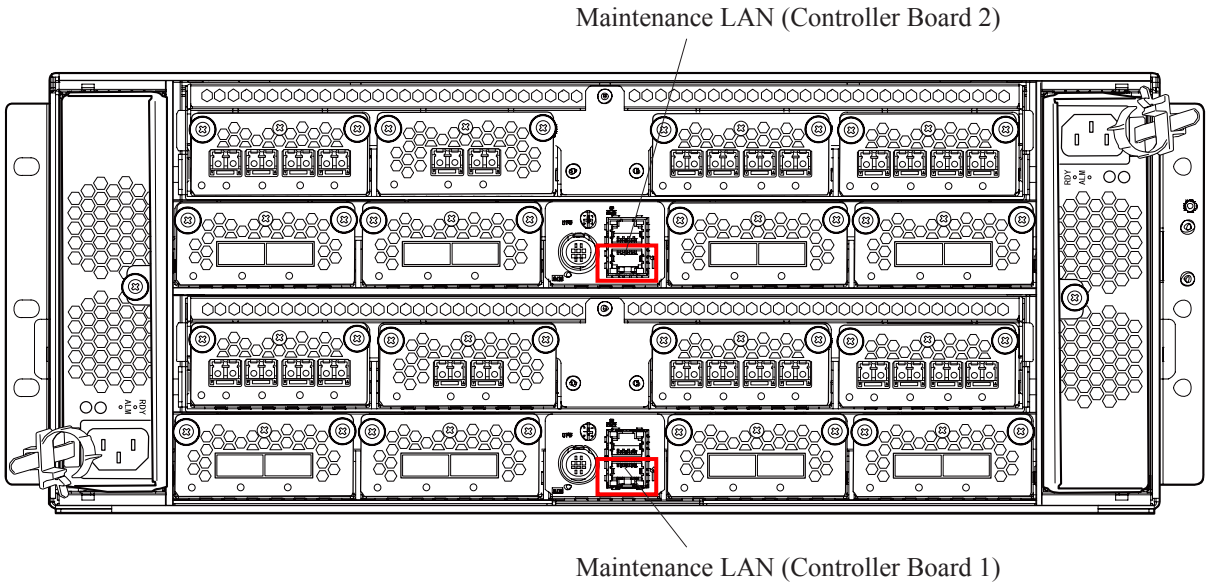
1. Connect a power cable and LAN cable to the Maintenance PC
2. Connect the LAN cable to the maintenance LAN port at the Controller Board1. (Refer to Figure 2-1.)
   Connect the LAN cable to the maintenance LAN port at the CTL2 side, when that at the CTL1 side cannot be used because of the device failure.
3. Connect the power cable of the Maintenance PC to a 100V AC outlet prepared by customers.
4. Turn on the power supply of the Maintenance PC.

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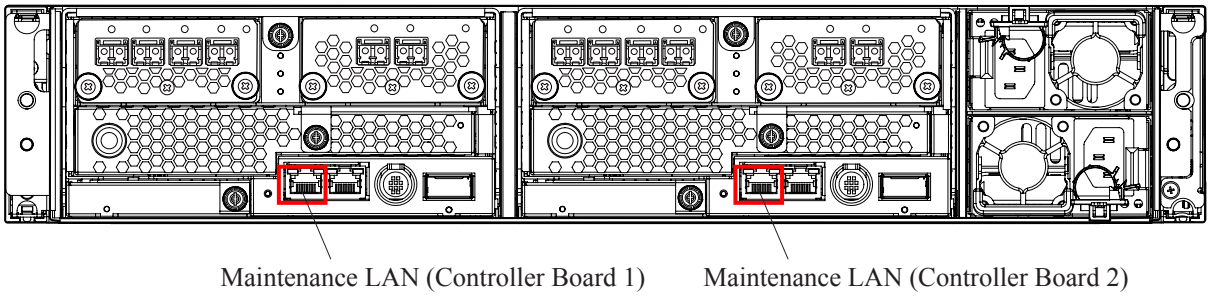
Figure 2-1 Connection of Cables



• CBLM/CBLH (Rear view)



• CBSS/CBSL (Rear view)



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2.1.1.2 Removal Procedure of Maintenance PC

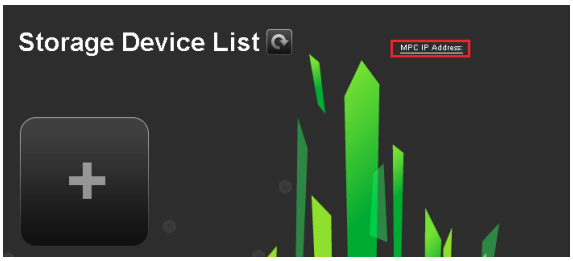
1. Power off the Maintenance PC.
2. Disconnect the power cable from the 100V AC outlet prepared by customers.
3. Disconnect the LAN cable from the Maintenance LAN port at the Controller Board. (Refer to Figure 2-1.)
4. Disconnect the power cable and LAN cable from the Maintenance PC.

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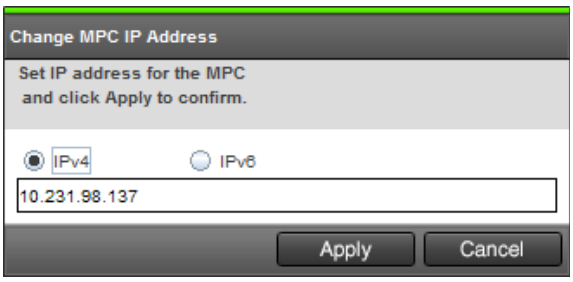
2.1.2 Connecting to the Storage System

1. Right-click the connection icon “Storage Device List” on the desktop of the Maintenance PC and select [Run as administrator].

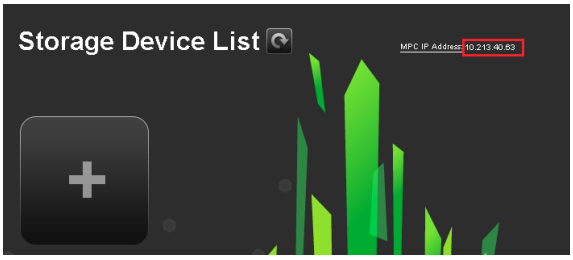
2. Set an IP Address.
   (1) Click the [MPC IP Address] link in the “Storage Device List” window.



   (2) Enter the IP address set in MAINTENANCE PC SECTION “1.3.1 IP Address Setting Method of Maintenance PC” into the “Change MPC IP Address” window and click the [Apply] button.



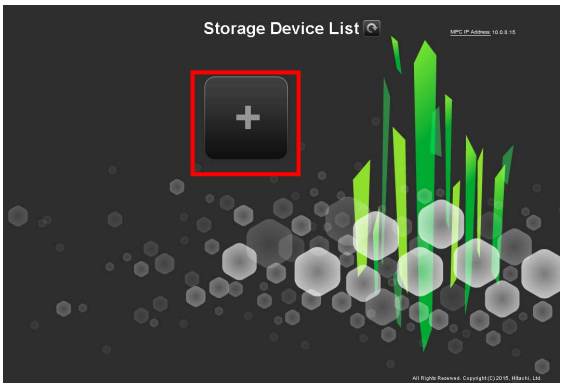
   (3) Check that the IP address is displayed beside the [MPC IP Address] link.



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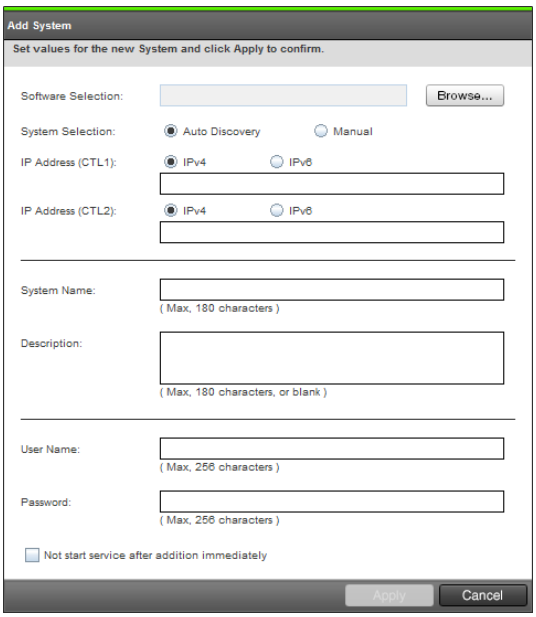
3. Create a Storage System icon.
   If the icon already exists, go to "2.1.3 Starting Web Console".

   (1) Click the plus button in the displayed "Storage Device List" window.



   (2) Perform the Storage System settings in the "Add System" window.
   Enter all the items, and then click the [Apply] button.
   See the REP02-01-61 to perform it manually.

   • When selecting [Auto Discovery]

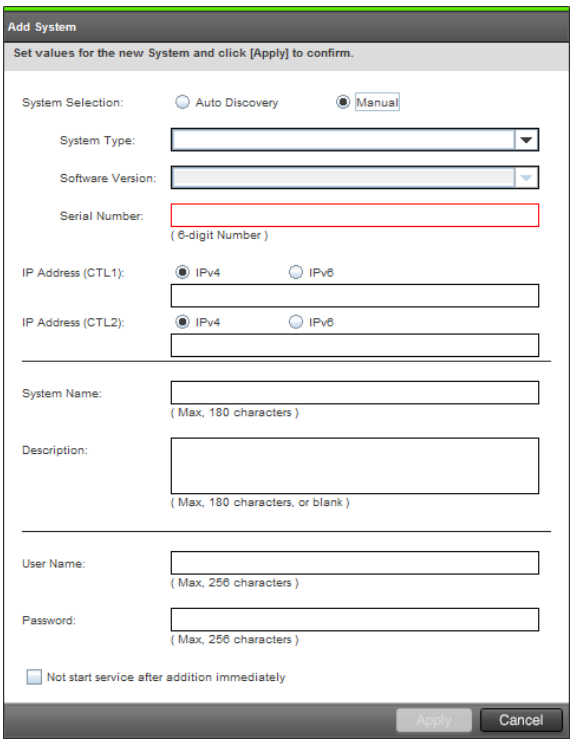


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Item	Description
Software Selection	Specify “Software\productname.inf” in the setup media by the [Browse] button and acquire the installation information.
System Selection	Select the input method of the Storage System information. • [Auto Discovery] (default selection): Acquire the Storage System information automatically. • [Manual]: Set each of the displayed items, [System Type], [Software Version] and [Serial Number].
IP Address (CTL1)	• Select a type of IP address of the maintenance port of CTL1. [IPv4] (Default) [IPv6] • Enter the CTL1 IP address in a format corresponding to the selected IP address.
IP Address (CTL2)	• Select a type of IP address of the maintenance port of CTL2. [IPv4] (Default) [IPv6] • Enter the CTL2 IP address in a format corresponding to the selected IP address.
System Name	Enter a Storage System display name. The number of characters you can enter is zero to 180.
Description	Enter the description of the Storage System. The number of characters you can enter is zero to 180.
User Name	Enter a user name. The number of characters you can enter is one to 256. Only alphanumeric characters and signs (! # $ % & ' * + - . / = ? @ ^ _ ` { | } ~) are usable.
Password	Enter a password. The number of characters you can enter is six to 256.
Not start service after addition immediately	Select whether to connect the registered Storage System immediately. If the checkbox is unchecked, the service starts and Web Console gets ready to start immediately. (Default is unchecked)

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- When selecting [Manual]



Item	Description
Software Selection	Specify “Software\productname.inf” in the setup media by the [Browse] button and acquire the installation information.
System Selection	Select the input method of the Storage System information. • [Auto Discovery] (default selection): Acquire the Storage System information automatically. • [Manual]: Set each of the displayed items, [System Type], [Software Version] and [Serial Number].
System Selection - System Type	Select a Storage System type. [VSP G800 and VSP F800] [VSP G400/G600 and VSP F400/F600] [VSP G200]

(To be continued)

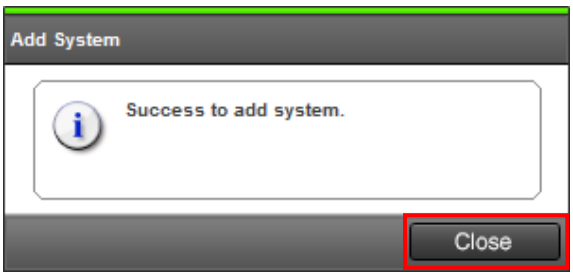
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(Continued from preceding page)

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>System Selection - Software Version</td><td>Select the Software version, which is supported by the selected System Type in the setup media. The Config version is in parentheses of the Software version.
A phrase to identify whether the software is designed for use in Japan or for global use is displayed at the end of the software version.
<Example>
xx-xx-xx-xx/xx(xx-xx-xx/60) for Japan domestic
xx-xx-xx-xx/xx(xx-xx-xx/00) for global
• Notes:
When a Config version model is 60, “for Japan domestic” is displayed; when a Config version model is 00, “for global” is displayed.
Select the corresponding model of the Config version (last two digits after “/”) from the following models depending on the model name of the Storage System.
<table>
<tr><th>Model name of the Storage System</th><th>Model of Config version to be selected</th></tr>
<tr><td>HT-40SB, HT-40SC, HT-40SD</td><td>60</td></tr>
<tr><td>DW800</td><td>00</td></tr>
</table>
</td></tr>
<tr><td>System Selection - Serial Number</td><td>Enter the serial number. The serial number consists of a six digit number beginning with “4”. Only numbers are usable.</td></tr>
<tr><td>IP Address (CTL1)</td><td>Enter the CTL1 IP address. Select IPv4 (Default) or IPv6, and then enter the IP address.</td></tr>
<tr><td>IP Address (CTL2)</td><td>Enter the CTL2 IP address. Select IPv4 (Default) or IPv6, and then enter the IP address.</td></tr>
<tr><td>System Name</td><td>Set the display name of the storage system.
The number of characters you can enter up to 180.</td></tr>
<tr><td>Description</td><td>Enter the description of the Storage System.
The number of characters you can enter is zero to 180.</td></tr>
<tr><td>User Name</td><td>Enter a user name.</td></tr>
<tr><td>Password</td><td>Enter the password of the Storage System.</td></tr>
<tr><td>Not start service after addition immediately</td><td>Select whether to connect the registered Storage System immediately.
If the checkbox is unchecked, the service starts and Web Console gets ready to start immediately. (Default is unchecked)</td></tr>
</table>

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(3) The confirmation message is displayed. Click the [Close] button.



(4) A Storage System icon is added.

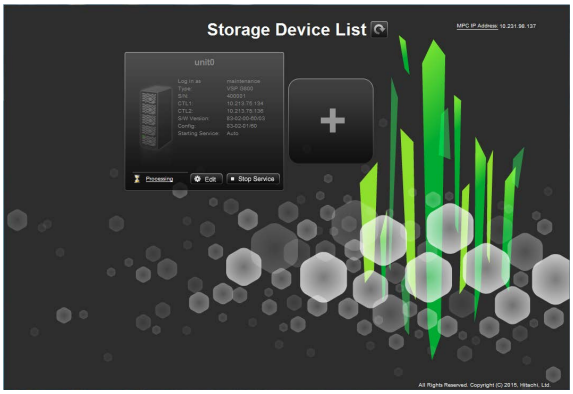


Table 2-1 Icon Display Item

Item	Displayed Description
Storage System Display Name	Display a display name of the Storage System.
Login user name	Display a login user name in the form of “Log in as [user name]”.
Storage System type	Display a model type of the Storage System.
Storage System serial number	Display the Storage System serial number.
CTL1 IP address	Display the set CTL1 IP address.
CTL2 IP address	Display the set CTL2 IP address.
Software version	Display the applied Software version.
Config version	Display the applied Config version.
Service start	Display whether the service starts automatically when starting the Maintenance PC.
Description	Display the descriptive text entered by a user.

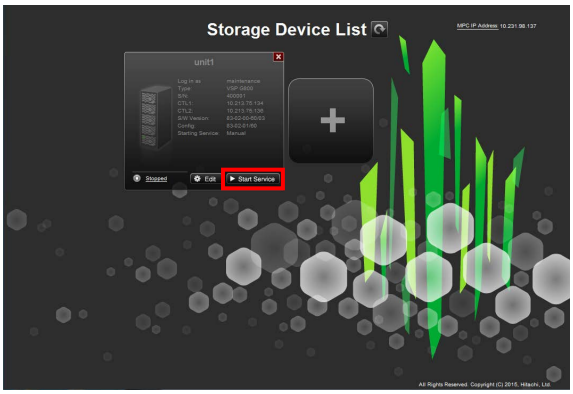
4. Eject media
I will remove the media from the DVD drive.

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2.1.3 Starting Web Console

1. Click the [Start Service] button of the Storage System icon.

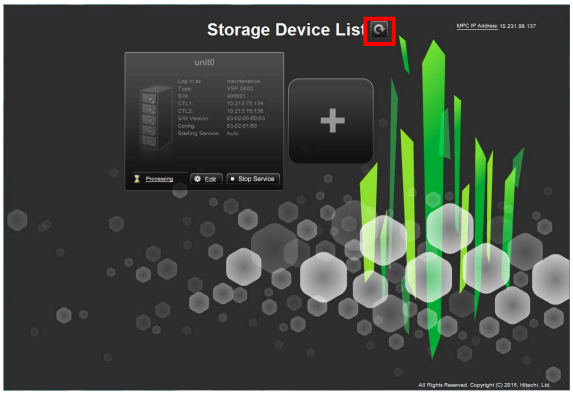
   NOTE : When Starting Service is [Auto], the service starts automatically after starting the service PC. Go to Step 4.



2. The message “Start the service. Is it OK?” is displayed. Click the [Confirm] button.

3. The message “The service started” is displayed. Click the [Close] button.

4. Click the refresh button beside the title of “Storage Device List” and update the Storage System icon to the enable operation status.
   - 5 to 10 minutes is needed for changing the Storage System icon to the enable operation status.
   - If the Storage System icon is not changed to the enable operation status after 30 minutes, refer to TROUBLESHOOTING SECTION “3.29 MPC Failure Recovery” and “3.28.1.5 Background Service Log”.



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5. Click the Storage System icon.

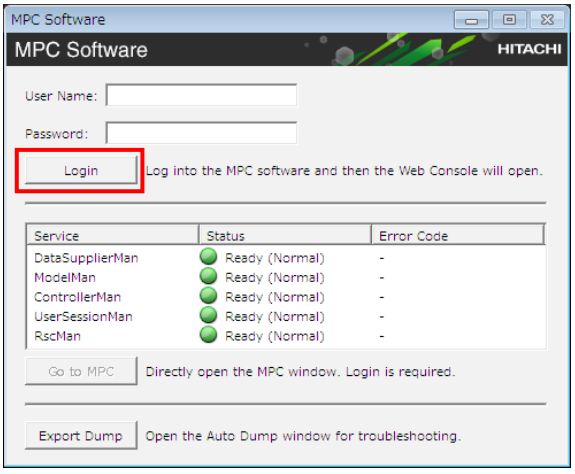


NOTE: When the Firmware version is less than 83-01-21-x0/xx, the [Stop Service] button is not displayed.

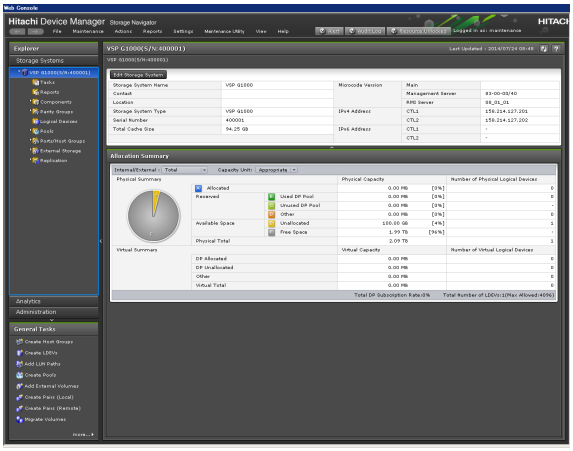
---

6. "MPC Software" is displayed and the service status is checked automatically.
Enter a user name and password and click the [Login] button.
When all become [Ready (Normal)], go to Step 7.

NOTE : If not logged in, the "Web Console" window is not displayed. Check that the [Login] button is inactive.



7. Web Console starts.

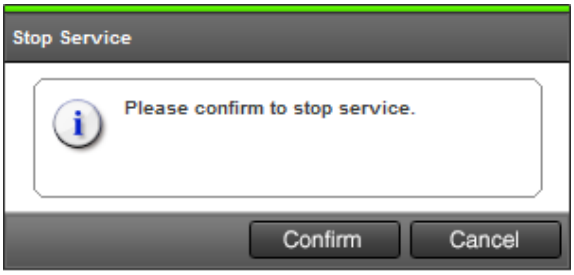


2.1.4 Stopping Web Console

1. Click the [Stop Service] button of the Storage System icon which is running Web Console.



2. The confirmation message is displayed. Click the [Confirm] button.



3. Click the [×] button in the upper right of the Web Console window to stop Web Console.

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2.2 How to Open/Close Door or Attach/Remove Front Bezel/Rear Door

2.2.1 How to Attach/Remove Front Bezel

⚠ CAUTION

Attach or remove the Front Bezel carefully following the procedure. Otherwise, you may hurt your fingers by pinching them.

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 "1.1.3 Note on Installing and Removing Parts".
- The Front Bezels of CBSS/CBSL/DBL/DBS/DBF/CHBB, CBLM/CBLH and DB60 are different in size.
- When installing or removing the Front Bezel, try not to operate the main switch incorrectly with the hook or the ON/OFF button of the Front Bezel.

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2.2.1.1 CBSS/CBSL/DBL/DBS/DBF/CHBB

A key is necessary to attach or remove a Front Bezel.

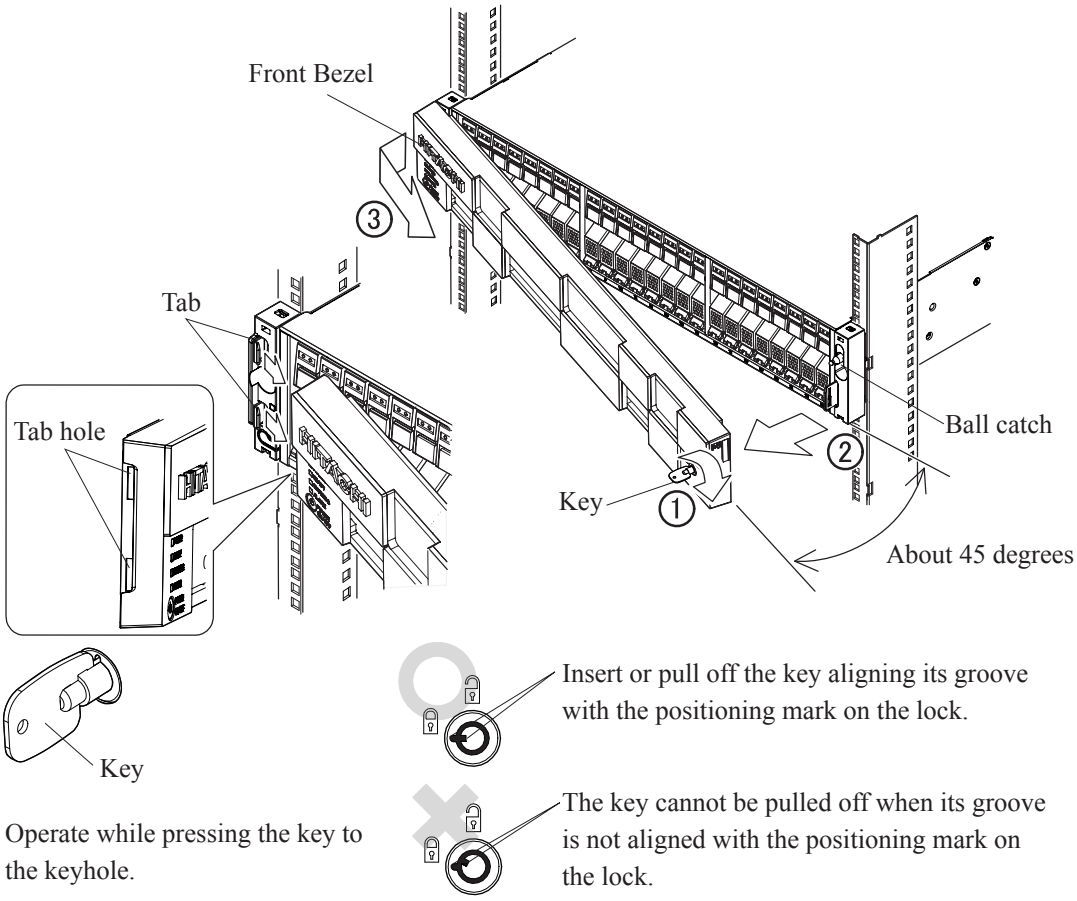
1. Procedure for removal
   (1) Insert the key into the keyhole on the Front Bezel and release the Lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right portion of the Front Bezel, and then disengage the right side of the Front Bezel from the ball catch (②).

      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) Remove the Front Bezel from the left tabs while pulling, and then remove it (③).

      NOTE: When removing Front Bezel, don't push left side of Front Bezel.

Figure 2-2 Procedure for Removing Front Bezel (CBSS/CBSL/DBL/DBS/DBF/CHBB)



NOTE : • When inserting and turning the key, have it inserted completely. If it is turned when it is inserted half way, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

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2. Procedure for attachment
   (1) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (2) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).

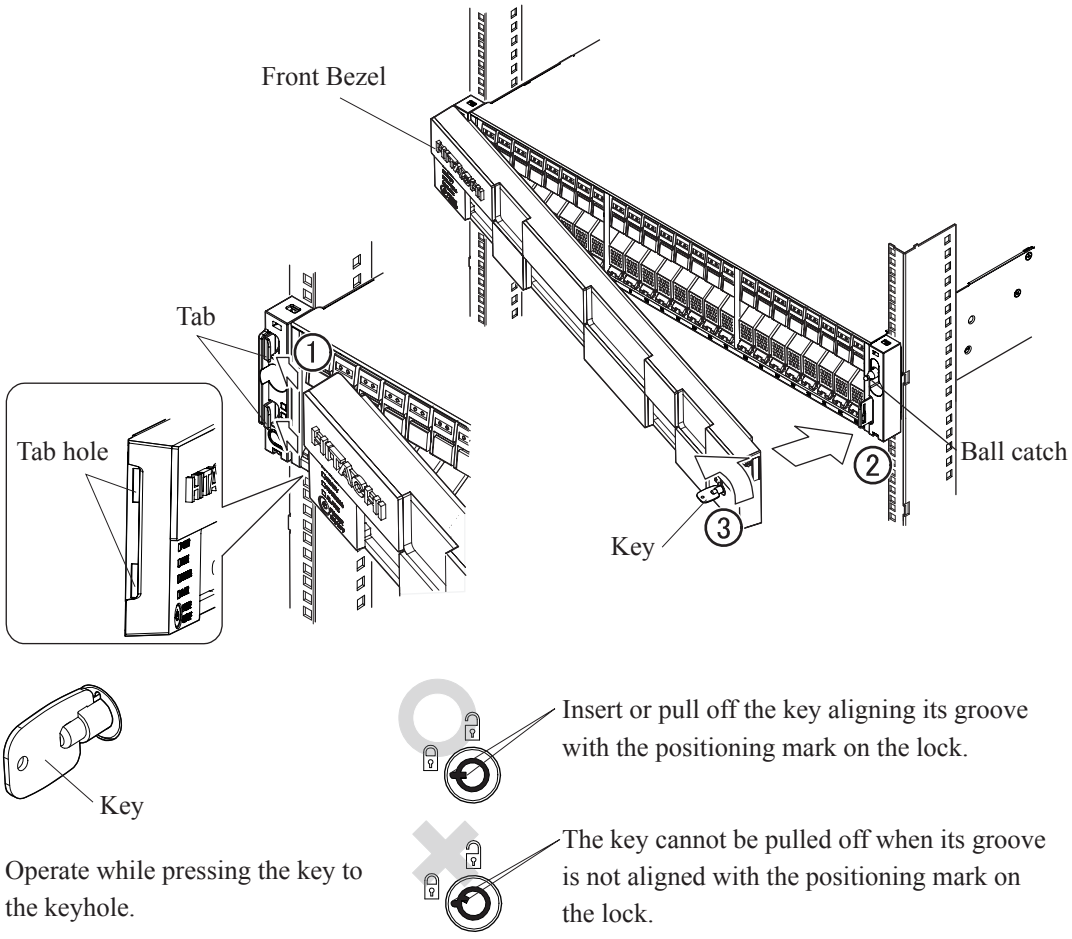
       NOTE: When inserting Front Bezel, don't push left side of Front Bezel.

   (3) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the Storage System (②).

       NOTE: When fixing Front Bezel, don't push left side of Front Bezel.

   (4) Lock the Front Bezel with the key (③).

Figure 2-3 Procedure for Attaching Front Bezel (CBSS/CBSL/DBL/DBS/DBF/CHBB)



NOTE : • When inserting and turning the key, have it inserted completely. If it is turned when it is inserted half way, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

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2.2.1.2 CBLM/CBLH

A key is necessary to attach or remove a Front Bezel.

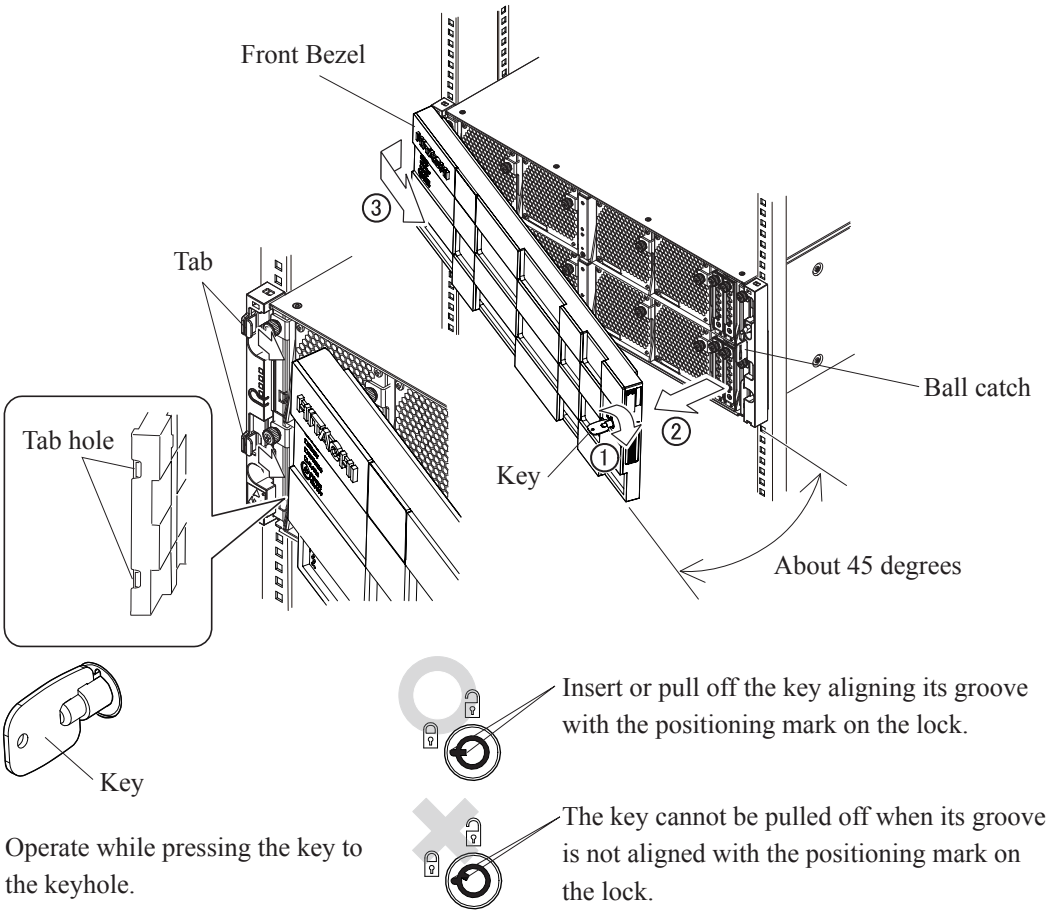
1. Procedure for removal
   (1) Insert the key into the keyhole on the Front Bezel and release the Lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right portion of the Front Bezel, and then disengage the right side of the Front Bezel from the ball catch (②).

      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) Remove the Front Bezel from the left tabs while pulling, and then remove it (③).

      NOTE: When removing Front Bezel, don't push left side of Front Bezel.

Figure 2-4 Procedure for Removing Front Bezel (CBLM/CBLH)



NOTE : • When inserting and turning the key, have it inserted completely. If it is turned when it is inserted half way, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

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2. Procedure for attachment
   (1) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (2) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).

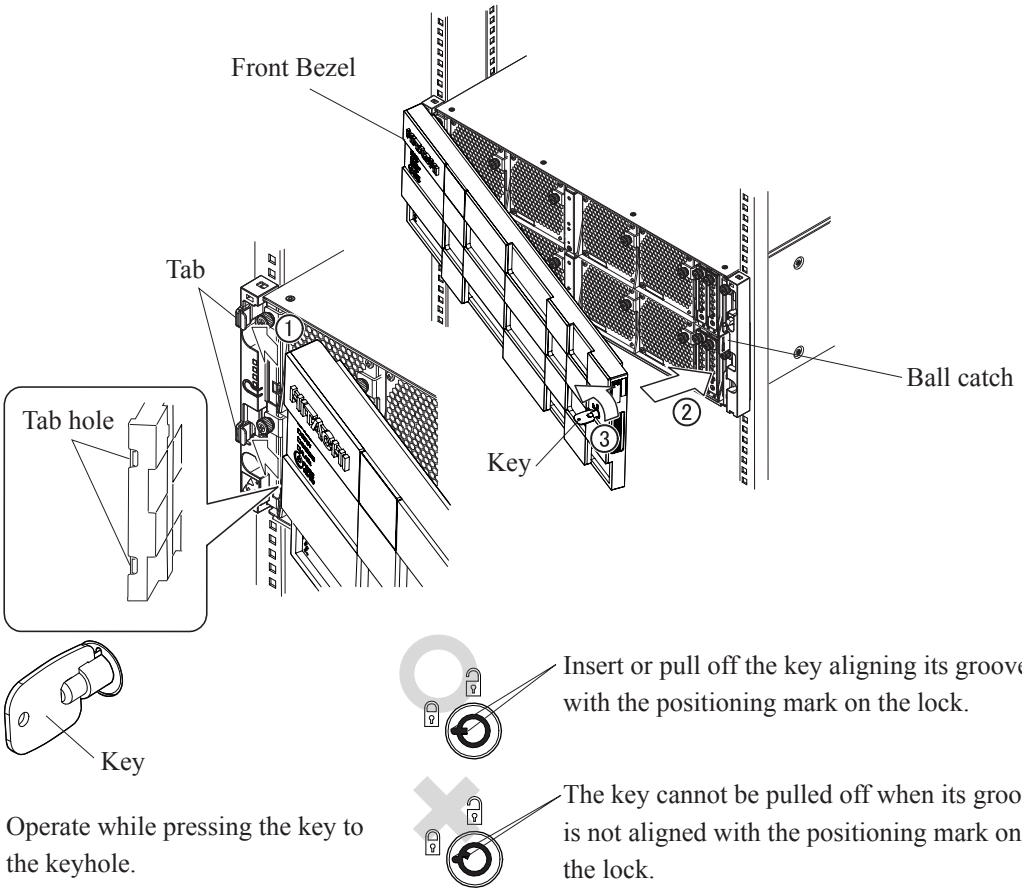
       NOTE: When inserting Front Bezel, don't push left side of Front Bezel.

   (3) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the Storage System (②).

       NOTE: When fixing Front Bezel, don't push left side of Front Bezel.

   (4) Lock the Front Bezel with the key (③).

Figure 2-5 Procedure for Attaching Front Bezel (CBLM/CBLH)



NOTE : • When inserting and turning the key, have it inserted completely. If it is turned when it is inserted half way, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

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2.2.1.3 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.

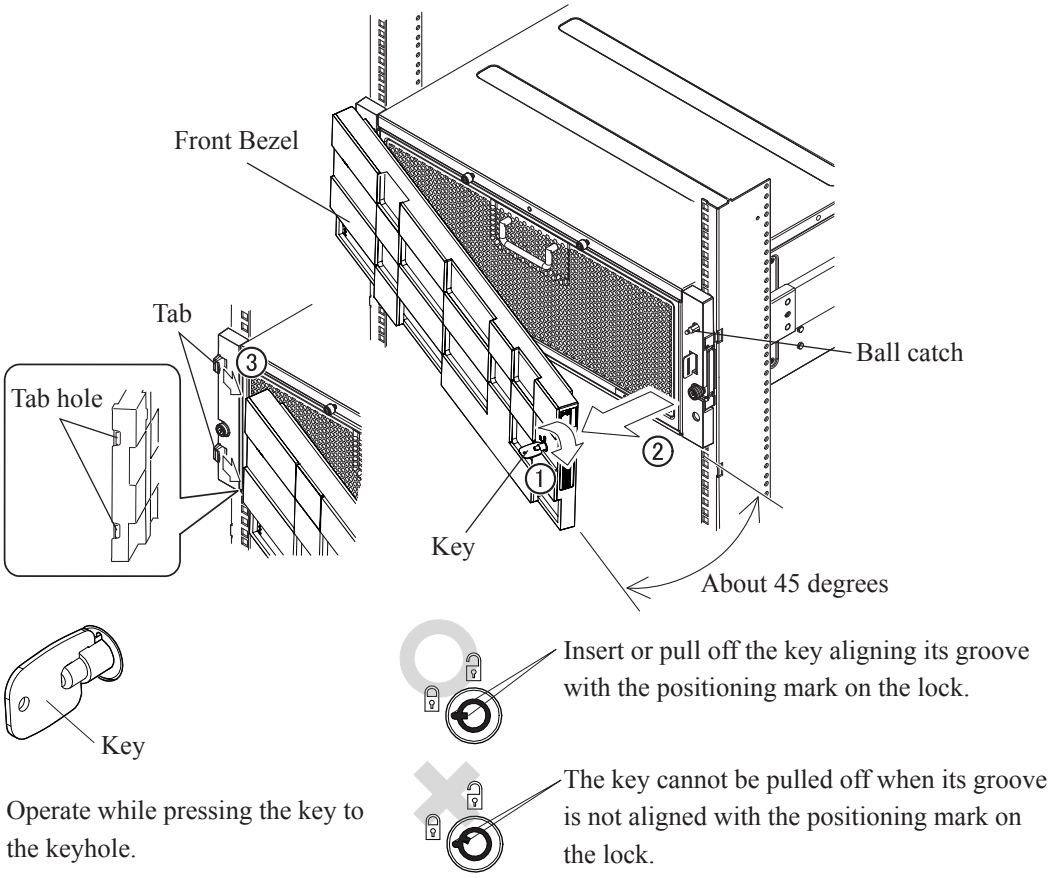
NOTE : Check that the stabilizer is attached to the front side of the rack.
If the stabilizer is not attached, attach it to the rack.

1. How to pull the DB60 out of the rack frame
   (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 catches (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 2-6 Procedure for Removing Front Bezel (DB60)



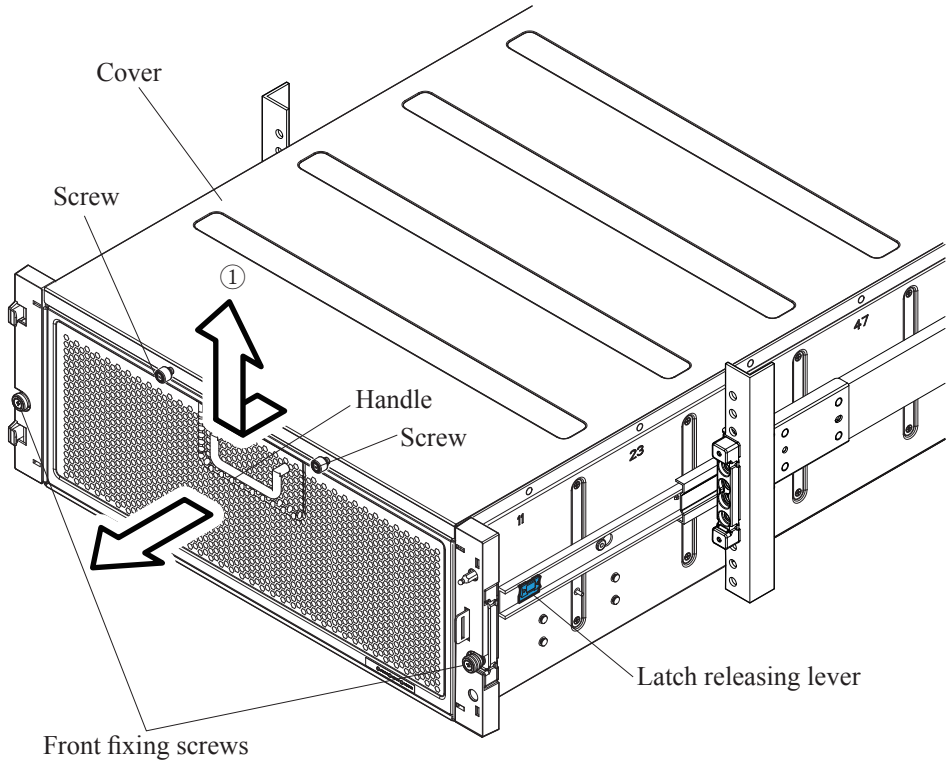
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(4) Loosen two front fixing screws.
(5) Hold the handle in the front of the Drive Box and pull out slowly until it stops.

NOTE : Be careful not to hit your head on the Storage System which was pulled out.

(6) Loosen two screws and slide the cover on the top of the DB60 to the direction shown by the arrow ① and remove it.

Figure 2-7 How to Pull Out the DB60

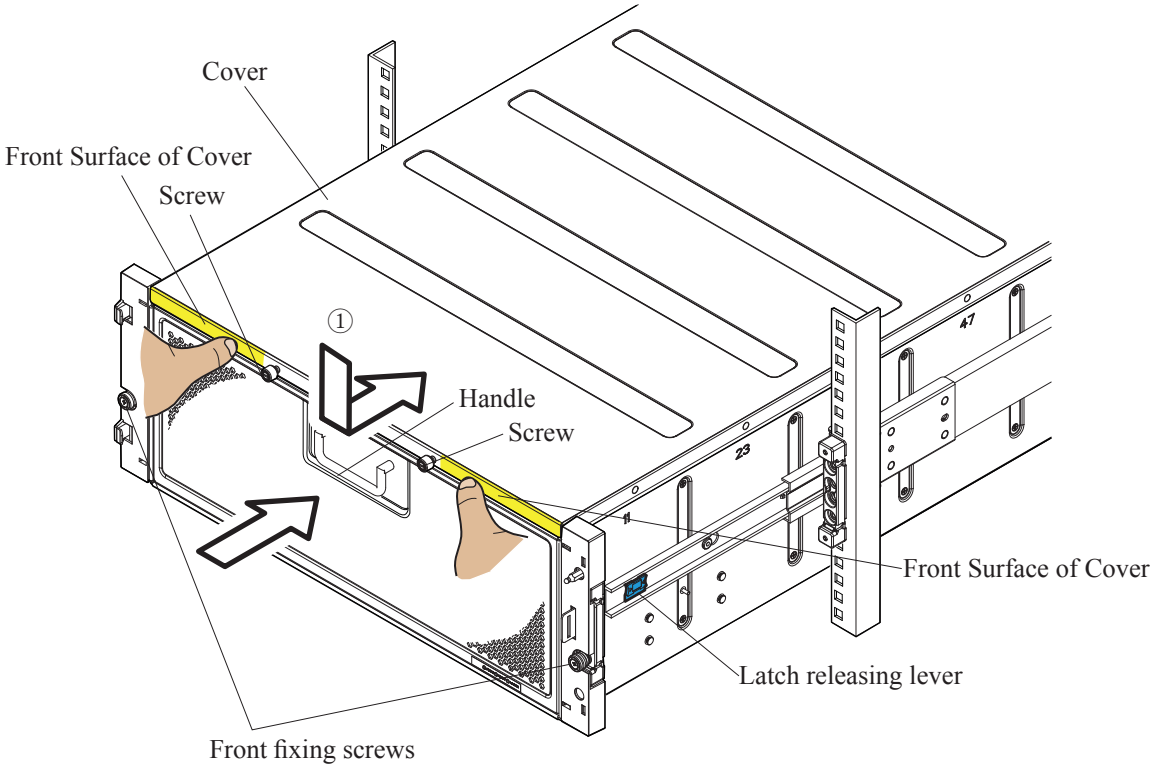


2. How to store the DB60 in the rack frame.
   (1) Attach the top cover of DB60 by sliding it in the direction shown by the arrow (①) and tightening the two screws by hand.
   Press the front surface of the cover with your hands away from the top surface of the cover when attaching the cover.

   NOTE : • Pressing the top surface of the cover might distort the cover.
   • Do not drop a screw and such in the Storage System.
   • If you dropped it, immediately remove it.
   • If you leave it unattended, the parts will short out, and it will cause a fire or a failure.

   (2) Release the lock by sliding the latch releasing lever which is located in the right and left rack rails, and push the front side of the DB60 gently all the way into the rack frame.
   (3) Tighten two front fixing screws by hand to fix it.

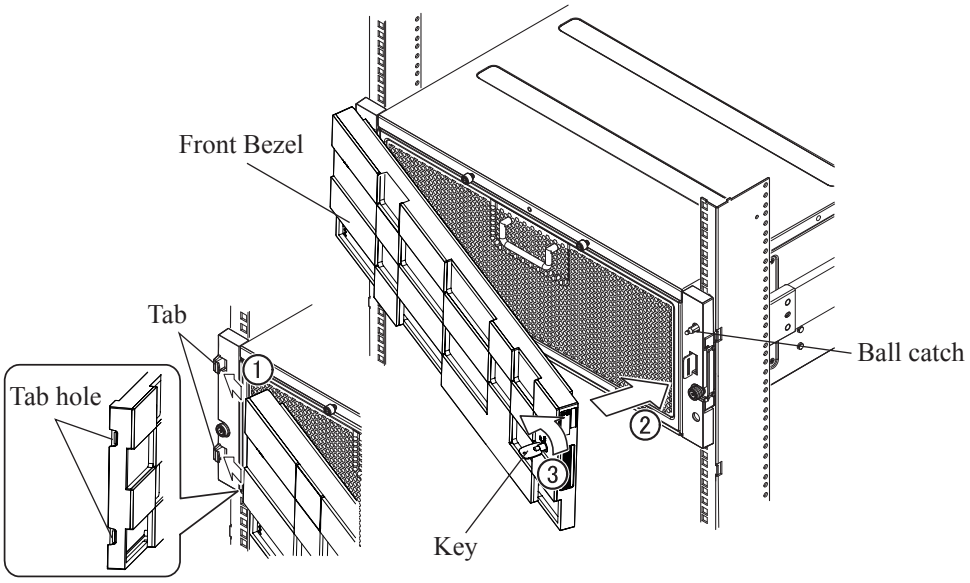
Figure 2-8 How to Store DB60

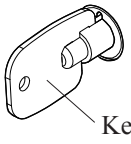


   (4) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the Storage System (②).
   (7) Lock the Front Bezel with the key (③).

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Figure 2-9 Procedure for Attaching Front Bezel (DB60)

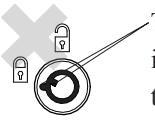




Operate while pressing the key to the keyhole.



Insert or pull off the key aligning its groove with the positioning mark on the lock.



The key cannot be pulled off when its groove is not aligned with the positioning mark on the lock.

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2.2.2 How to Open/Close the Rear Door of RKU Rack Frame

> **⚠ CAUTION**
>
> Open or close the door carefully following the procedure. Otherwise, you may hurt your fingers by pinching them.

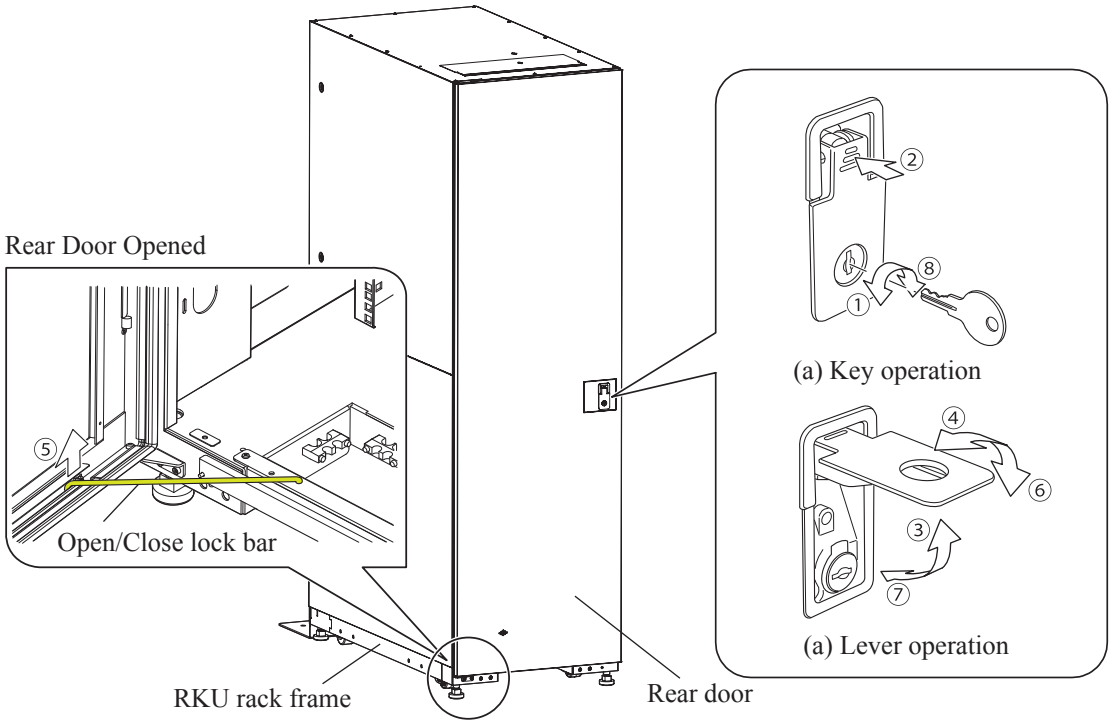
For information about the Hitachi Universal V2 rack used with HDS VSP storage systems, refer to the Hitachi Universal V2 Rack Reference Guide(MK-94HM8035).

For the procedure for removing and installing the Front Bezel, refer to "2.2.1 How to Attach/Remove Front Bezel".

1. Procedure for opening rear door
   (1) Insert the key to the keyhole on the rear door, and turn the key to the left to open lock (①).
   (2) Push the upper part of the lever, and raise the lower part of the lever toward (② , ③).
   (3) Turn the lever to the left, and pull the lever toward, and then open the rear door (④).

2. Procedure for closing rear door
   (1) Lift the open/close lock bar on the bottom of the back of the rear door to release the lock (⑤).
   (2) Close the rear door, and push and turn the lever to the right (⑥).
   (3) Push down the lever, and push the lower part of the lever (⑦).
   (4) Insert the key to the keyhole on the rear door, and turn the key to the right to lock (⑧).

Figure 2-10 Procedure for Opening/Closing Rear Door

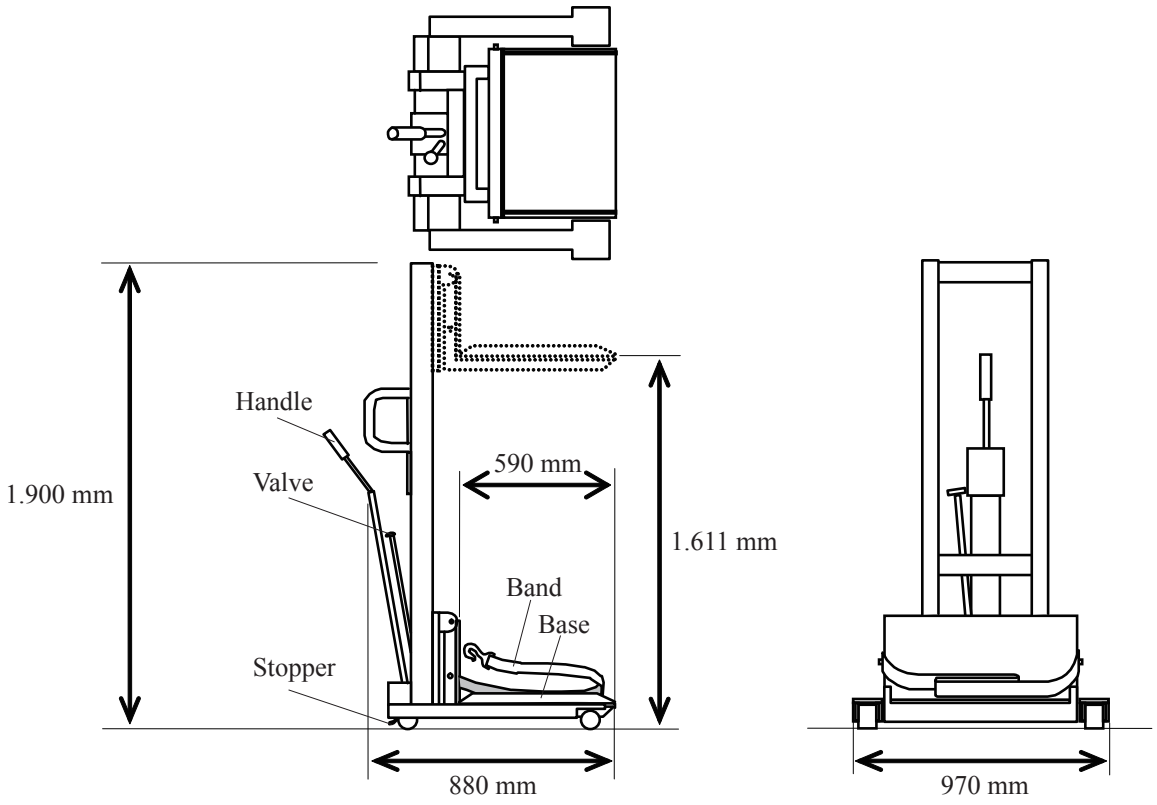


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2.2.3 Mounting Lifter on Rack Frame

Figure 2-11 shows appearance of the special lifter.

Figure 2-11 Appearance of the Special Lifter



⚠ CAUTION

- Rack mounting and lifter operation should only be conducted by a person who has been trained and qualified since the Storage System could turn over or a worker could be caught under the Storage System.
- Be sure to perform the operation with two or more workers.
- Work carefully because the mass of the single CBSS/CBSL is about 46 kg, CBLM/CBLH is about 85 kg, DBS is about 23 kg, DBL is about 27 kg, DB60 is about 90 kg, and DBF is about 38 kg.

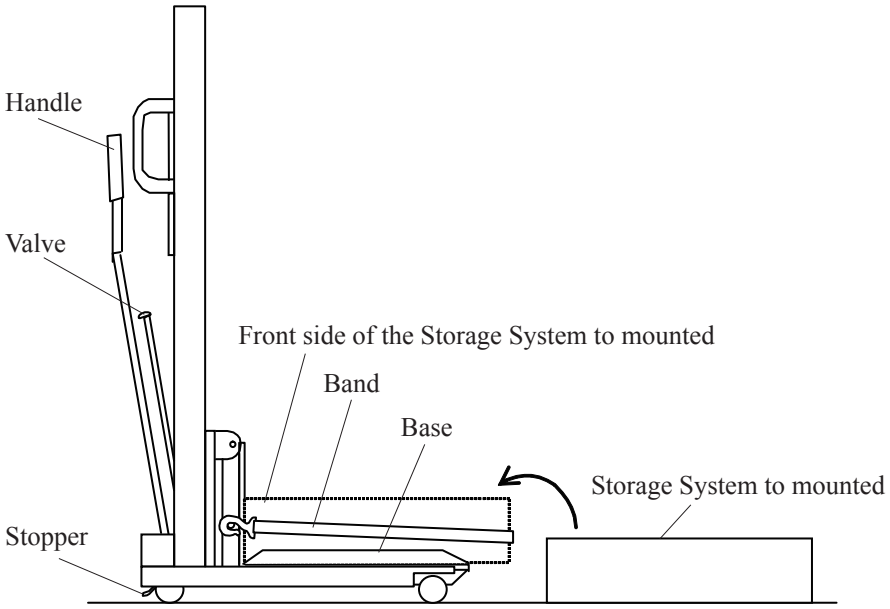
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1. Bring the special lifter close to the Storage System to be mounted and apply the brake to the lifter.

   NOTE : When putting the Storage System on the special lifter, be sure to remove the Front Bezel beforehand.

2. Put the Storage System on the special lifter.
   Put the Storage System with its Front Bezel removed on the lifter.
3. Secure the Storage System to the lifter with a band of the lifter.
   Bind the Storage System with the band tightly by fitting the length of the belt to the Storage System.

Figure 2-12 Setting the Storage Systems on Special Lifter



2.3 Replacing a Drive

CAUTION

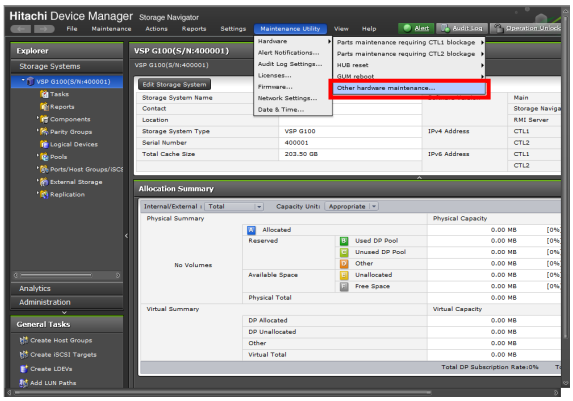
Notes when replacing drives:

- Do not replace drives during "System is locked". The drive replacement might fail. If the replacement fails because the drives are replaced during "System is locked", complete the operation that causes the system lock, wait for 20 minutes after the system is unlocked, and then replace the drives again.
- When replacing multiple drives, replace one drive at a time. After completing the drive replacement, confirm the normal completion of the drive replacement in the "Maintenance Utility" window, and then replace the next drive.

2.3.1 Before Replacing Drive

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Drives, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

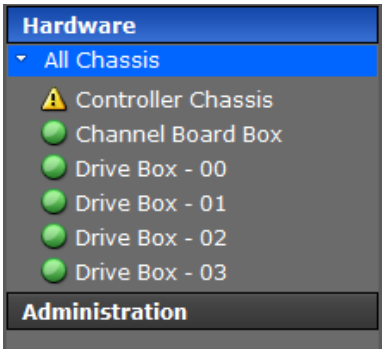
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



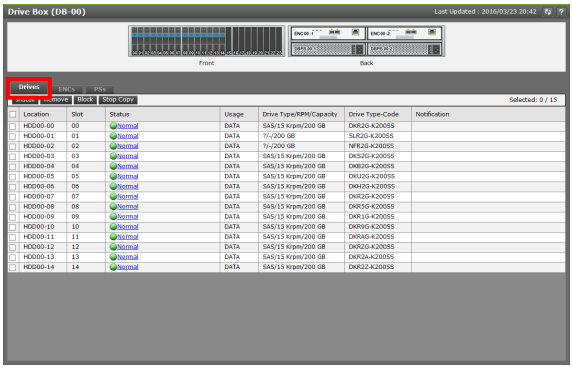
3. Selecting replacement parts by Maintenance Utility

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 [Controller Chassis] or [Drive Box] in the main window.



(2) <Controller Chassis window/Drive Box Window>
Click the [Drives] tab in the “Controller Chassis” window or “Drive Box” window to display a Drive status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].
Replace a Drive whose Status is “Warning”, “Failed”, “Block”, “Copy incomplete”, “Reserved”.



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

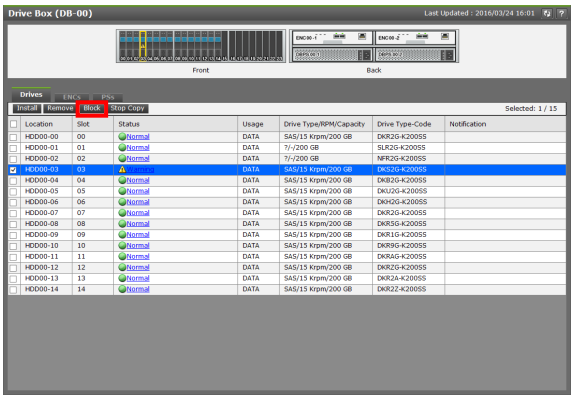
(3) Check the ALM LED (red) on the Drive
When the ALM LED (red) does not light up, perform Step (4) to Step (9).
When the ALM LED (red) lights up, go to “4. Checking the Drives”.

(4) <Controller Chassis Window/Drive Box Window >

Click the [Drives] tab in the “Controller Chassis ”window or “Drive Box” window to display a Drive status.

Select a Drive to be blocked and click the [Block] button.

When the Drive Type is SSD (FMD) or SSD (FMC), make a note of the Drive Type-Code. The Drive Type-Code will be required when the Flash Module Drive is replaced.



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

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(5) <Block Drive>

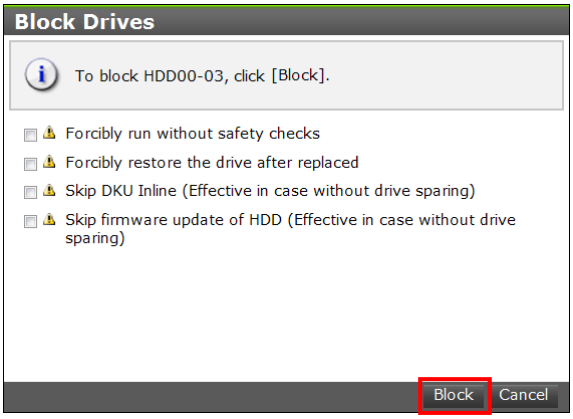
⚠ CAUTION

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 restore the drive replaced", "Skip DKU Inline (Effective in case without drive sparing" and "Skip firmware update of HDD (Effective in case without drive sparing)":
If you check these checkboxes and execute the maintenance, the system may go down. Do not check them unless instructed by the contact described in the manual.

Click the [Block] button after checking that the Drive to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

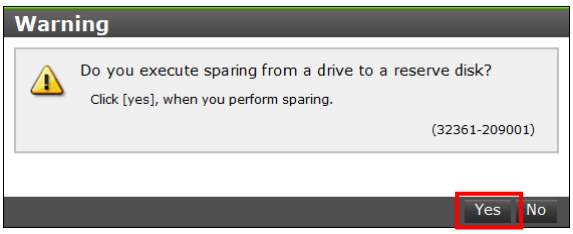
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



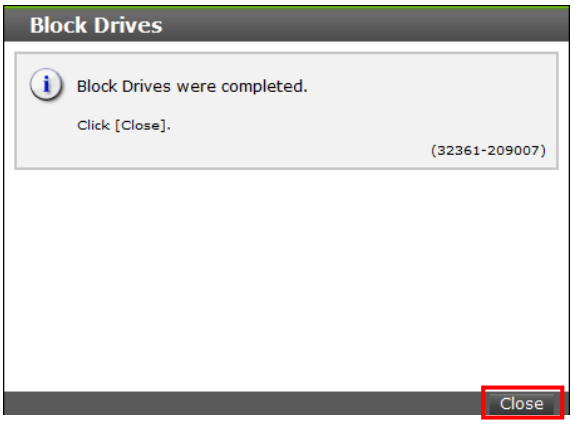
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(6) <Saving the spare>
Click the [Yes] button, when you perform sparing.

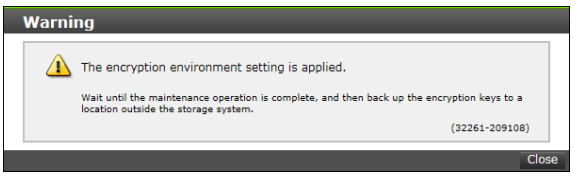
NOTE : If a spare drive that is available for performing sparing is not set, this window is not displayed. Go to the next procedure. See "3.4 Inter Mix of Drives" in THEORY OF OPERATION SECTION for the conditions of the available spare drives.



(7) When the following window is displayed, 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"..



(8) <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.



NOTE: If this message is displayed, back up the encryption key after finishing the drive replacement work.

(9) Check that the drive status is "Blocked" or "Failed" in the "Controller Chassis" window/ "Drive Box" window.
If the drive status is "Copying", wait until it changes to "Blocked" or "Failed" .

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4. Checking the Drives

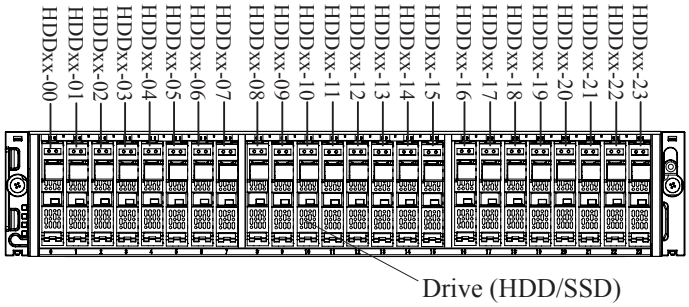
Table 2-2 List of Mountable Drive Model Names

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-6R0HLM DKC-F810I-10RHLM DKC-F810I-4R0H4M (*1) DKC-F810I-4R0H4MC 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	

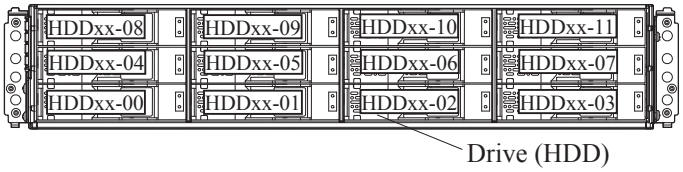
*1 :Contains BNST

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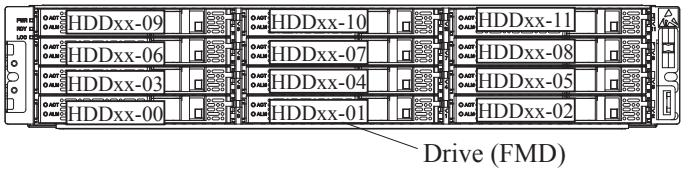
Figure 2-13 Drive Installation Location



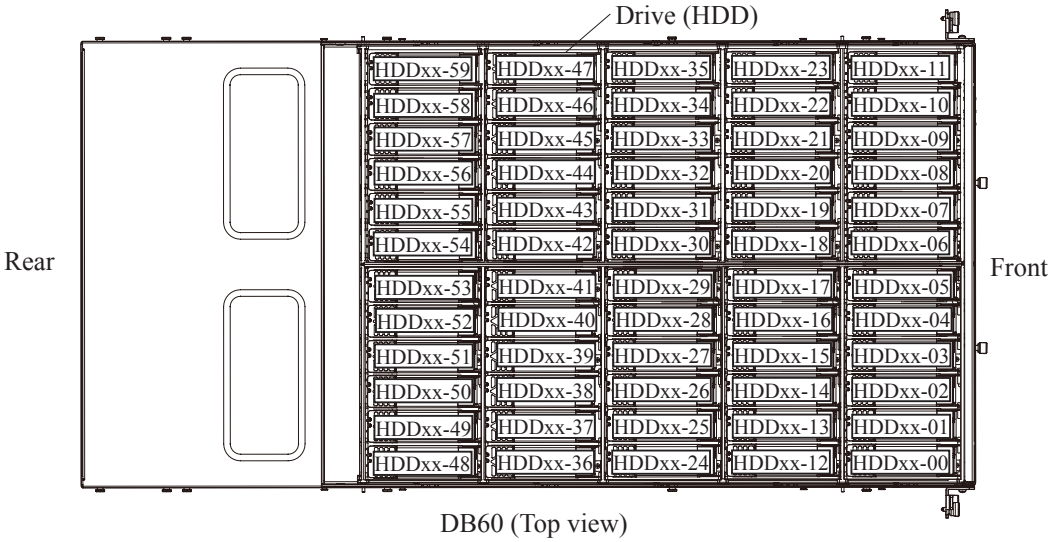
CBSS/DBS (Front view)



CBSL/DBL (Front view)



DBF (Front view)



DB60 (Top view)

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⚠ 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.

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 "1.1.3 Note on Installing and Removing Parts".

(1) Remove the Front Bezel. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)
In case of DB60 Pull out from the rack and remove the top cover. (Refer to "2.2.1.3 DB60".)
(2) Check that the ALM LED (red) on the Drive to be replaced lights up.

Figure 2-14 ALM LED Location (CBSS/DBS)

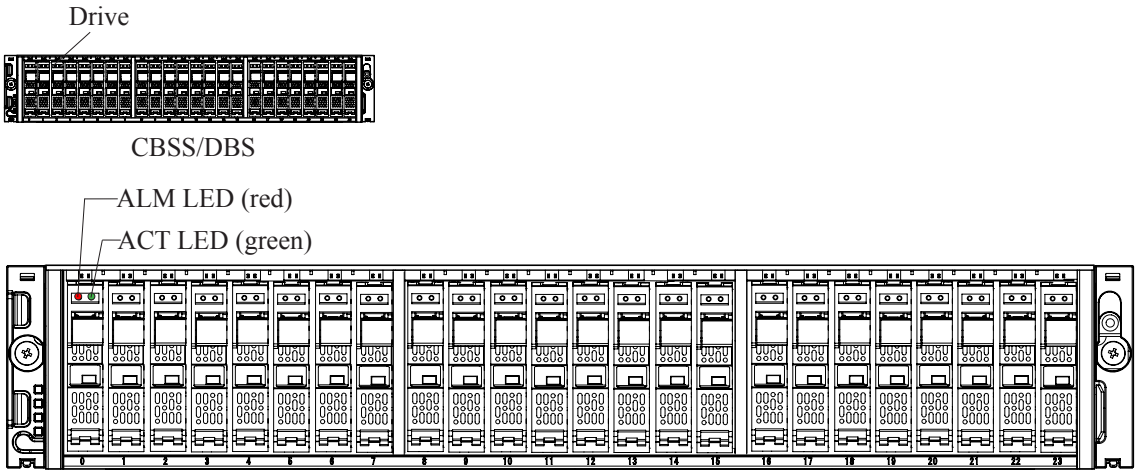


Figure 2-15 ALM LED Location (CBSL/DBL)

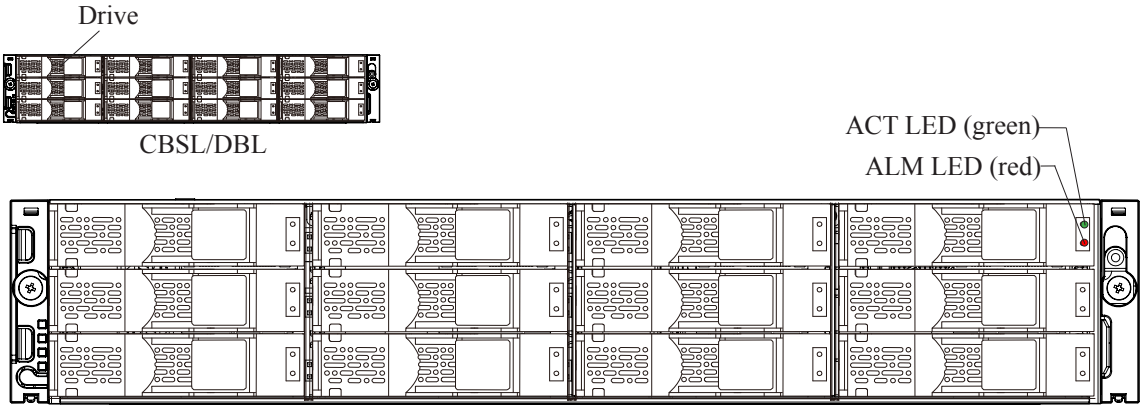


Figure 2-16 ALM LED Location (DB60)

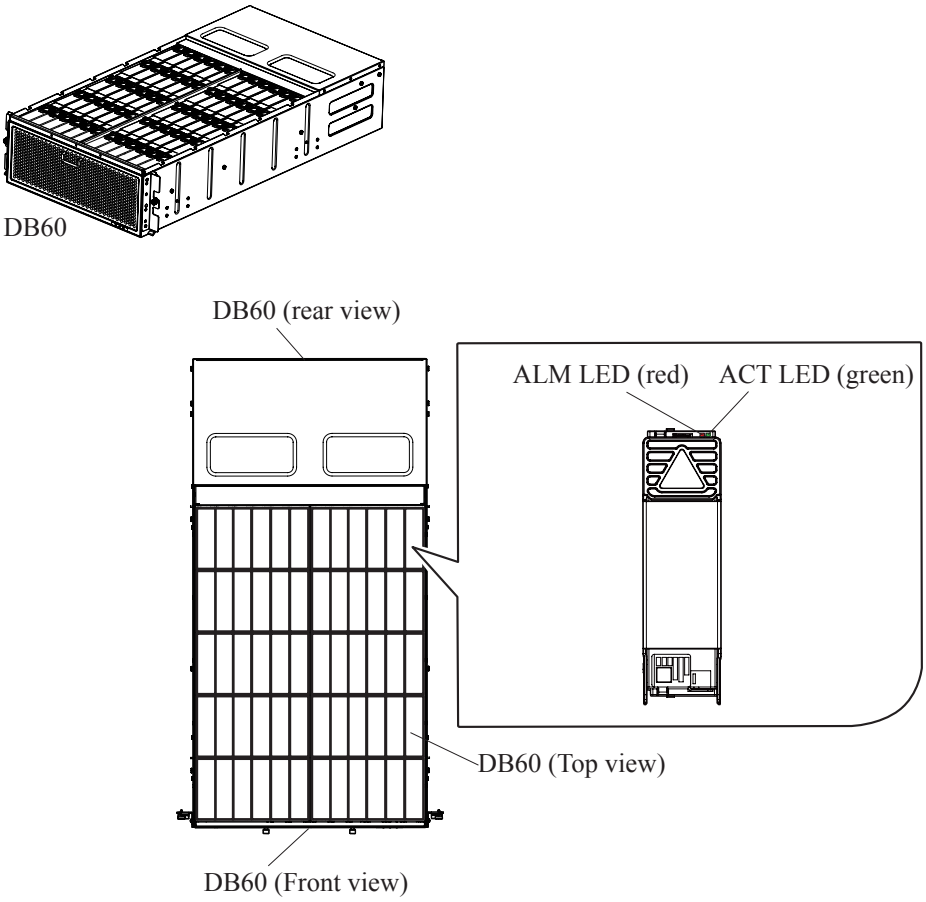
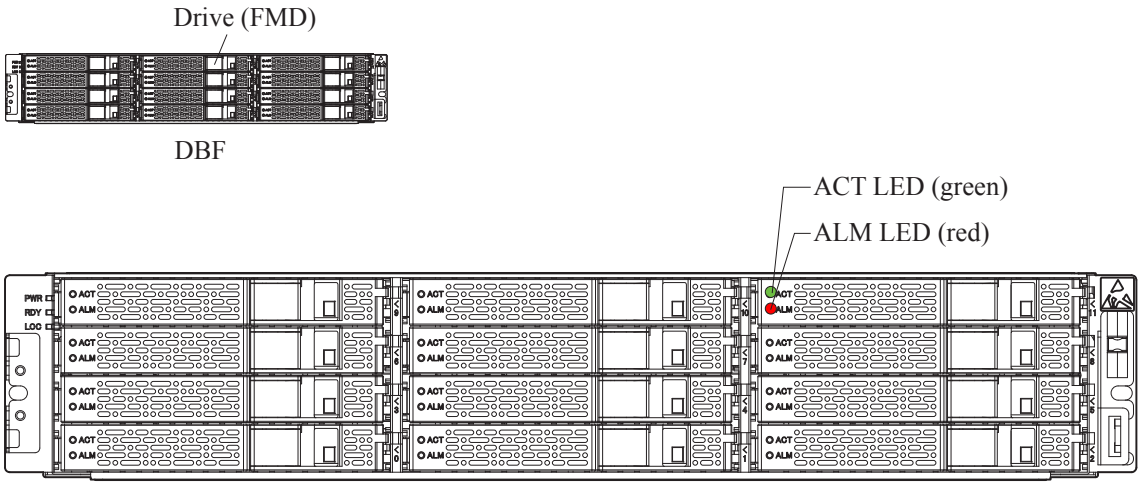


Figure 2-17 ALM LED Location (DBF)



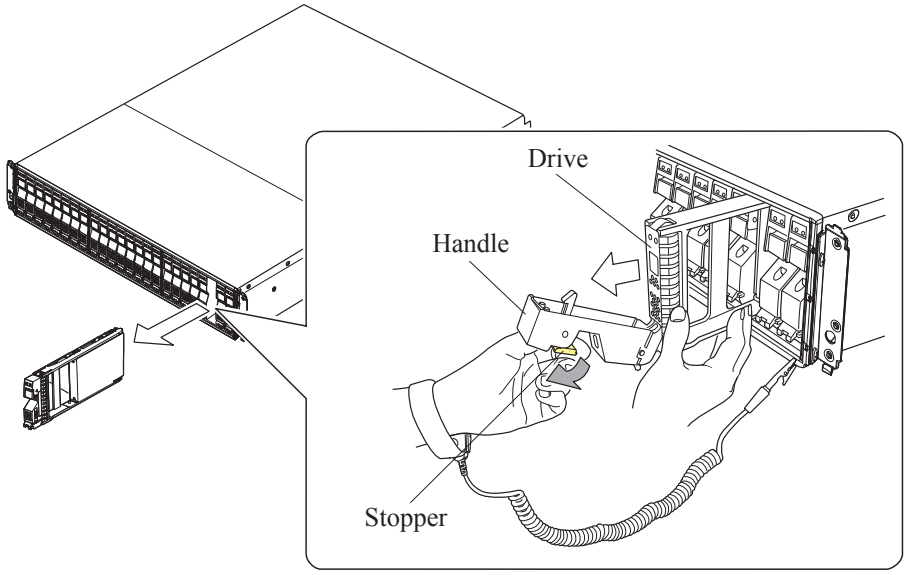
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2.3.2 Replacing a Drive

The Drive size and removal or installation operation vary depending on the Storage System to be installed. Check the Storage System and the Drive before starting the work.

1. Removing the Drive
   (1) In case of CBSS/DBS
      (a) Pull up the stopper of the Drive handle toward you to release the lock.
      (b) Open the handle, and pull out and remove the Drive to be replaced not to give a shock.

Figure 2-18 Removal of Drive (CBSS/DBS)



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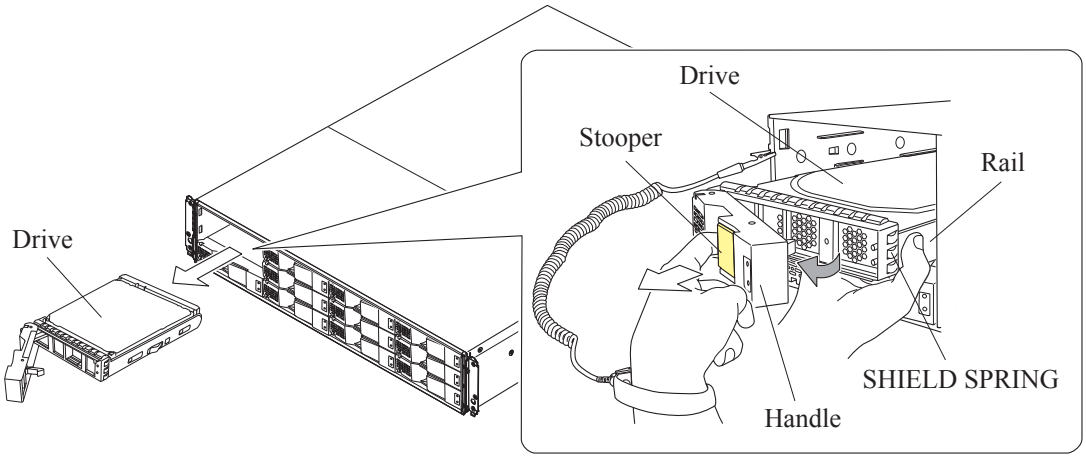
(2) In case of CBSL/DBL

(a) Pull up the stopper of the Drive handle lightly to release the lock.

(b) Open the handle, and pull out and remove the Drive to be replaced not to give a shock.

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

Figure 2-19 Removal of Drive (CBSL/DBL)



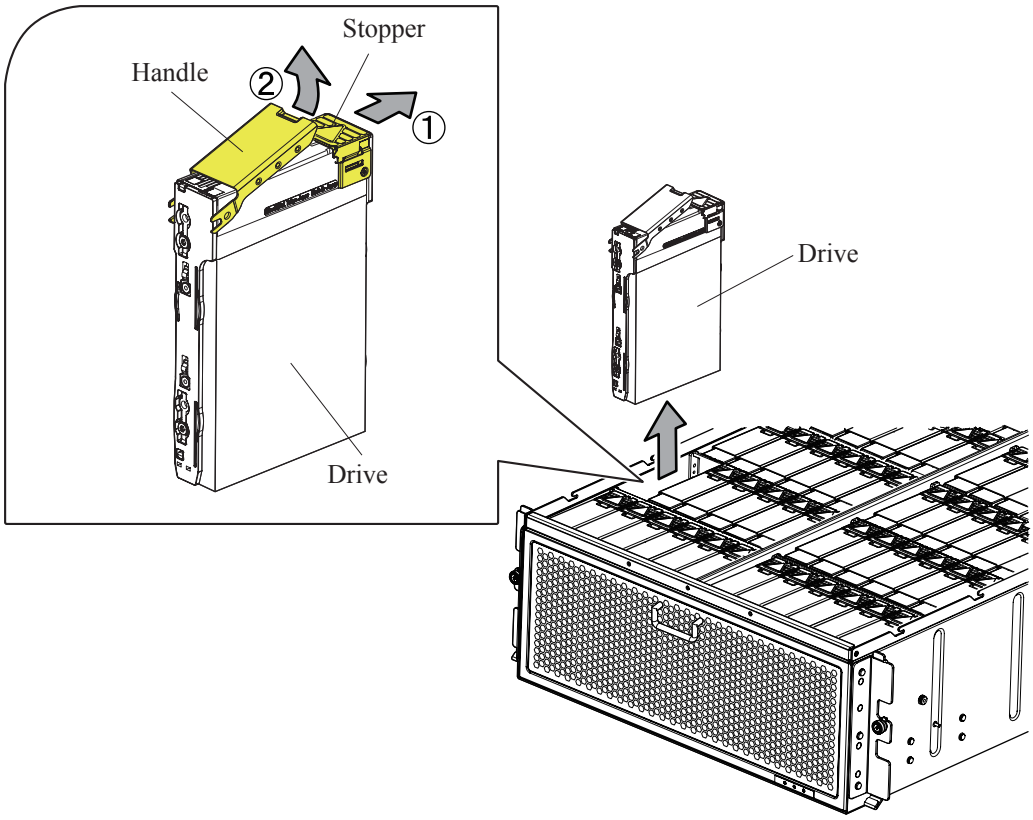
(3) In case of DB60

(a) Slide (①) the stopper of the Drive handle and release the lock.

(b) Open (②) the handle and pull out the Drive to be replaced gently to remove.

NOTE: When handling the Drive, hold the rail side because the shield spring is subject to breakage.

Figure 2-20 Removal of Drive (DB60)



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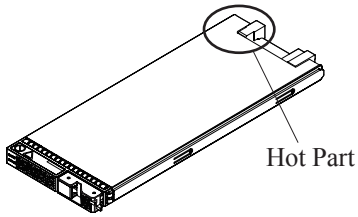
(4) In case of DBF

NOTICE: Be sure to read "1.1.10 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: When the FMD is removed in replacing procedure, the fans of the DBPS installed in the rear of the DBF rotate at the highest speed. When the spare FMD is installed, the fans of the DBPS rotate at the speed suitable for environmental temperature.

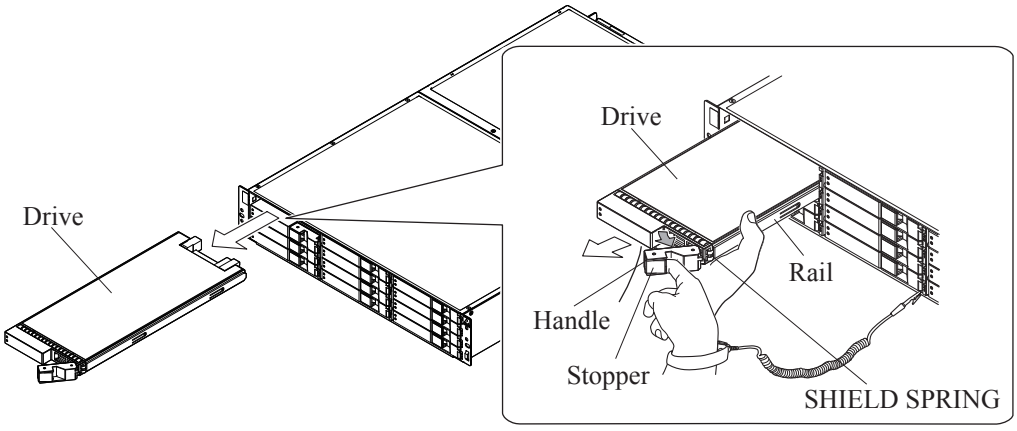
(a) Pull the stopper of the Drive handle lightly to have the lock off.

(b) Open the handle, and then remove the Drive by pulling it out taking care not to apply a shock to it.

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

(c) When the drive type code is NFH1A/NFH1B/NFH1C-PxRxSS, go to "(5) Removing a Flash Module Drive (FMD) built-in battery".
When the drive type code is NFHAx-QxRxSS or NFH1D-PxRxSS, go to "2. Installing the Drive.".

Figure 2-21 Removal of Drive (DBF)



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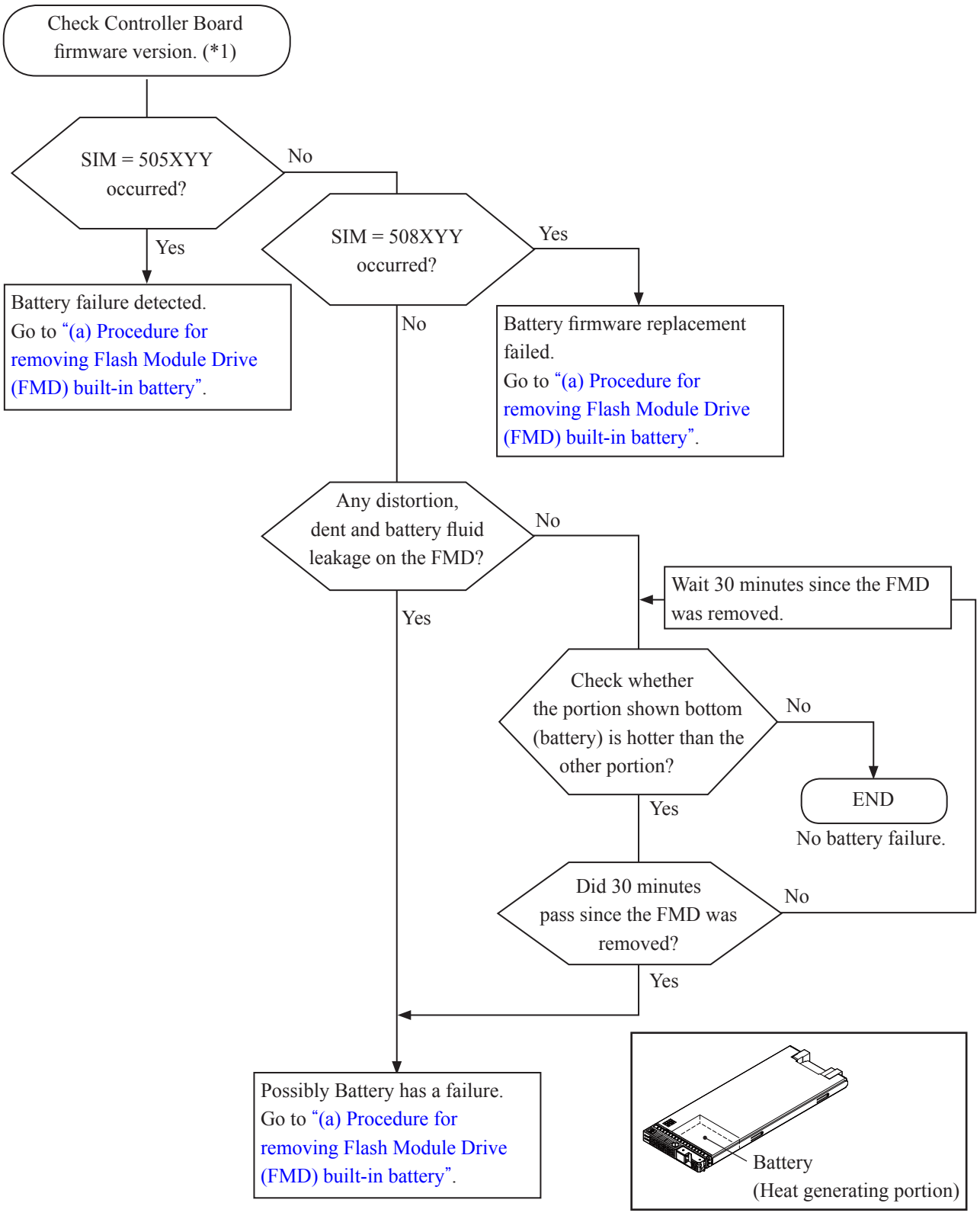
For a Drive for DBF, determine whether a failure has occurred in the Flash Module Drive (FMD) built-in battery following "(5) Removing a Flash Module Drive (FMD) built-in battery". If the failure has occurred, remove the battery.

NOTE : The service personnel must work on the removal of a Flash Module Drive (FMD) built-in battery. Do not give the written material supplied with the Drives to the customers.

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(5) Removing a Flash Module Drive (FMD) built-in battery

Follow the flowchart shown below. If a failure has occurred, remove the battery.



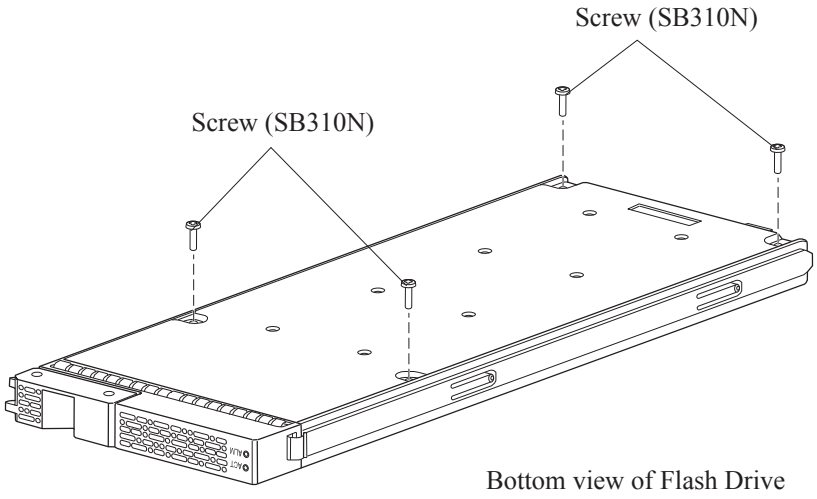
*1: For firmware version, FIRMWARE SECTION "3.4 Procedure for Checking Firmware Version".

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(a) Procedure for removing Flash Module Drive (FMD) built-in battery

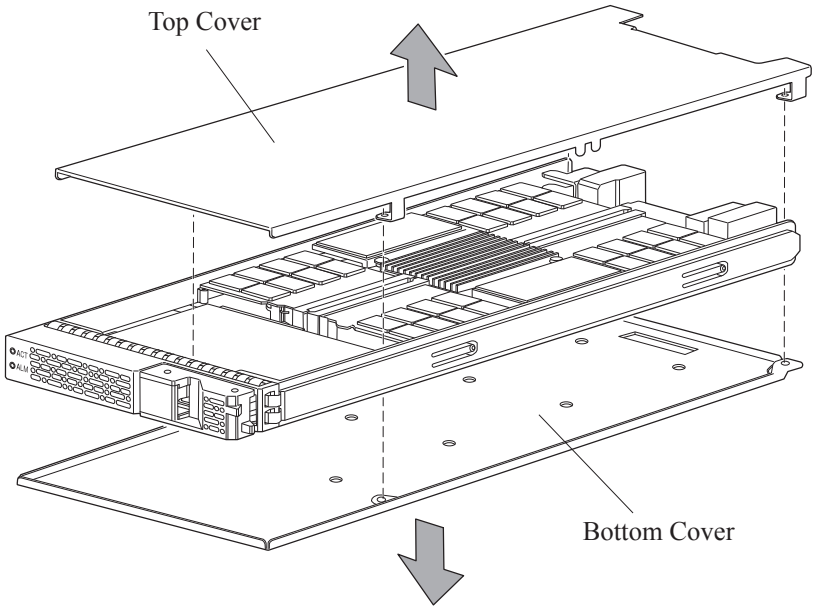
(i) Remove four Screws (SB310N) on the bottom side of Flash Module Drive (FMD) by using Phillips screwdriver.

Figure 2-22 Removing Screws



(ii) Remove TOP COVER and BOTTOM COVER.

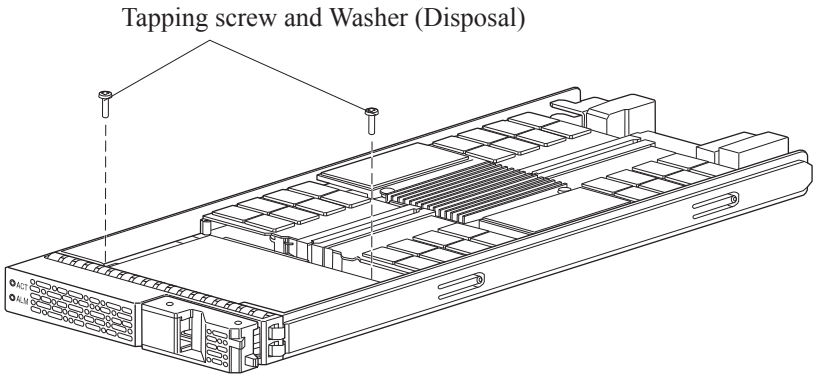
Figure 2-23 Removing Covers



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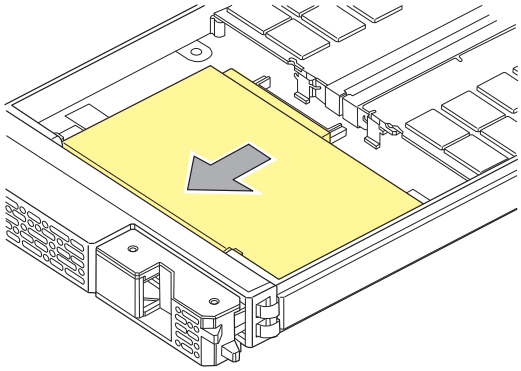
(iii) Remove two sets of Tapping-screw and Washer by using Phillips screwdriver.

Figure 2-24 Removing Tapping-Screws and Washers



(iv) Move the Battery to the Front Bezel side and disconnect the Battery from the circuit board.

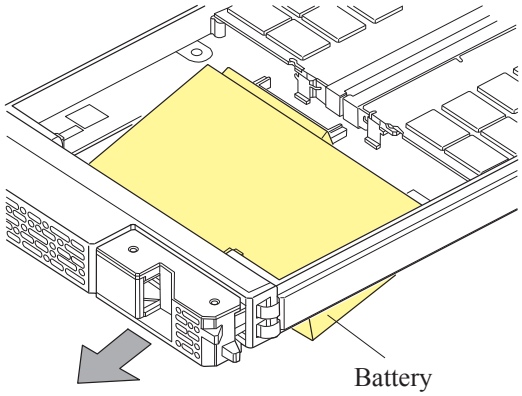
Figure 2-25 Disconnecting from the Connector



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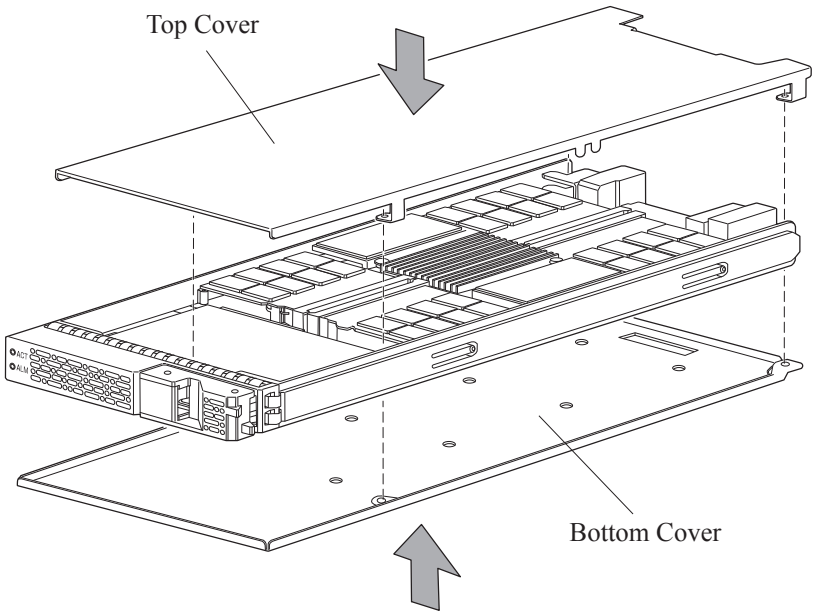
(v) Remove the Battery to the bottom side of Flash Drive (FMD). (After the connector comes off, battery is lowered below.)

Figure 2-26 Removing the Battery



(vi) Installing the TOP COVER and BOTTOM COVER.

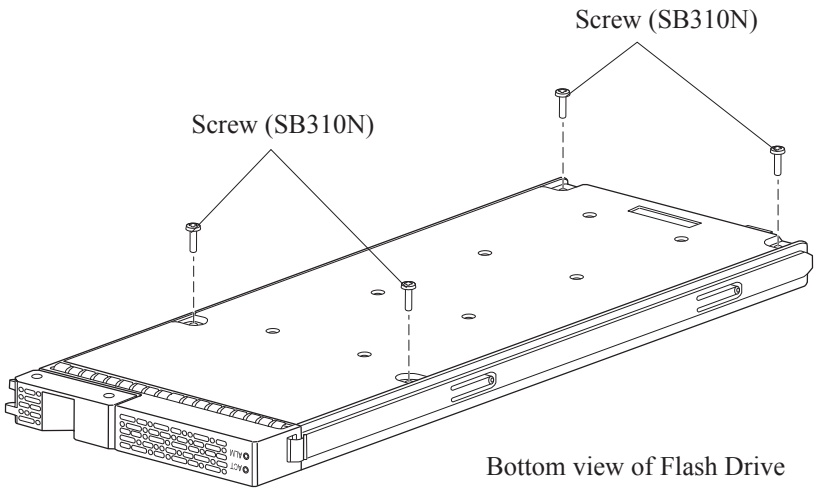
Figure 2-27 Reassembling the Flash Module Drive (FMD)



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(vii) Installing the four Screws (SB310N) on the bottom side of Flash Drive (FMD) by using Phillips screwdriver.

Figure 2-28 Installing Screws



(viii) Dispose of the Tapping-screws, Washers and Battery removed in procedures Step (iii) and Step (v).
When dispose of the Battery, follow the directions given by the local law where the product is used. (Refer to "3. Processing Method of Batteries".)

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2. Installing the Drive.

NOTE: • Remove the Drive. After 30 seconds or more past, install the Drive.
• When installing two or more Drives, install the next Drive after elapsing 20 seconds or more after the previous Drive installation.

(1) In case of CBSS/DBS

(a) Fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.

(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.

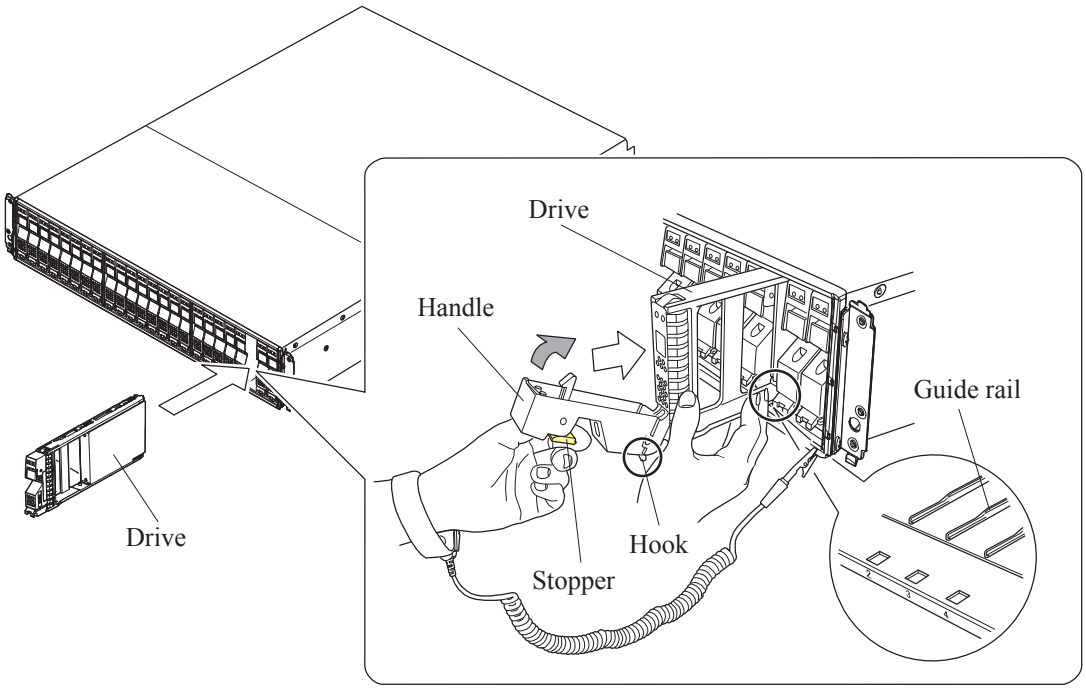
(c) Close the stopper, which has been opened, and then press the stopper to have the lock on.

NOTE: If the handle is closed in the status where the hook of the handle cannot enter into each hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

(d) Pull the Drive lightly by holding the handle to check that it is not pulled out.

NOTE: At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

Figure 2-29 Installation of Drive (CBSS/DBS)



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(2) In case of CBSL/DBL

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

(a) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.

(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.

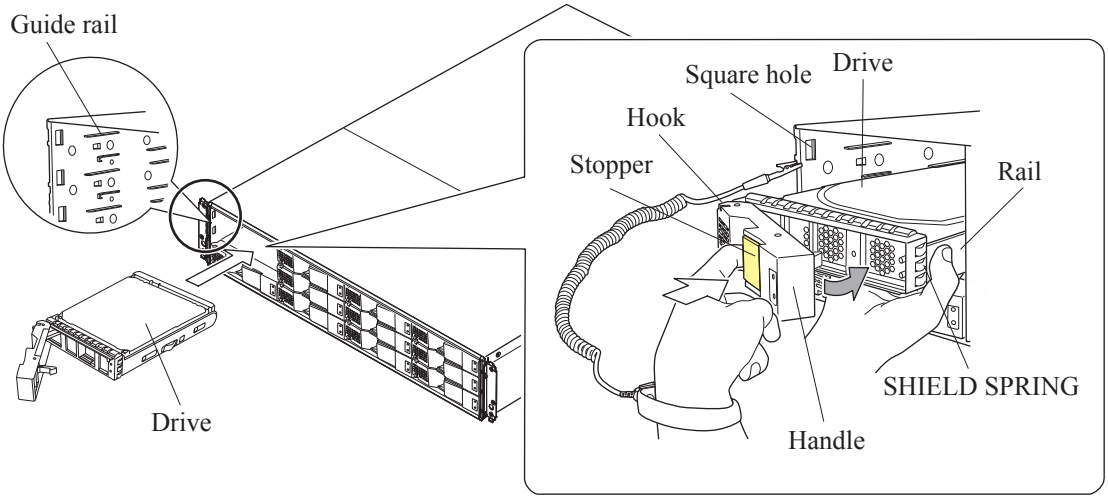
(c) Pull the stopper lightly and close the handle, and then press the stopper to have the lock on.

NOTE : If the handle is closed in the state where the hook of the handle cannot enter into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

(d) Pull the Drive lightly by handling the handle to check that it is not pulled out.

NOTE : At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

Figure 2-30 Installation of Drive (CBSL/DBL)



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(3) In case of DB60

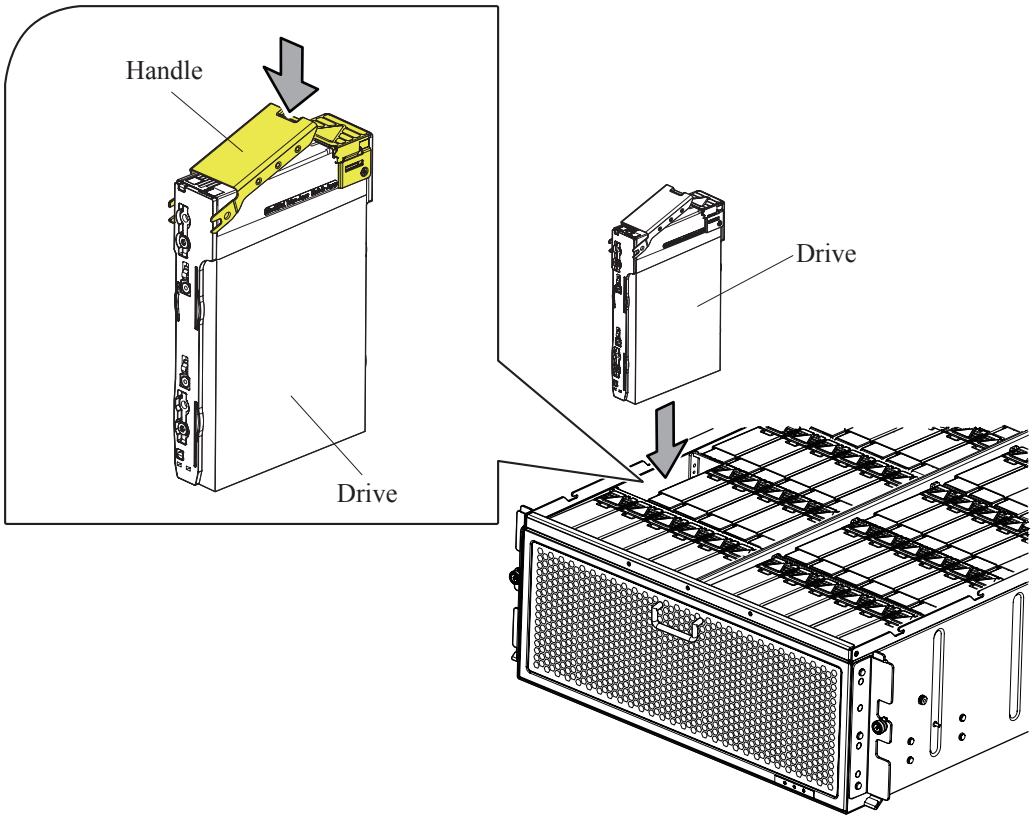
(a) Open the handle fully and slide the Drive gently to the arrow direction.

(b) Push the handle to lock until it clicks.

(c) Pull the Drive lightly by holding the handle to check that it cannot be not pulled out.

NOTE : At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

Figure 2-31 Installation of Drive (DB60)



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(4) In case of DBF

(a) Open the handle fully.

(b) Fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.

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

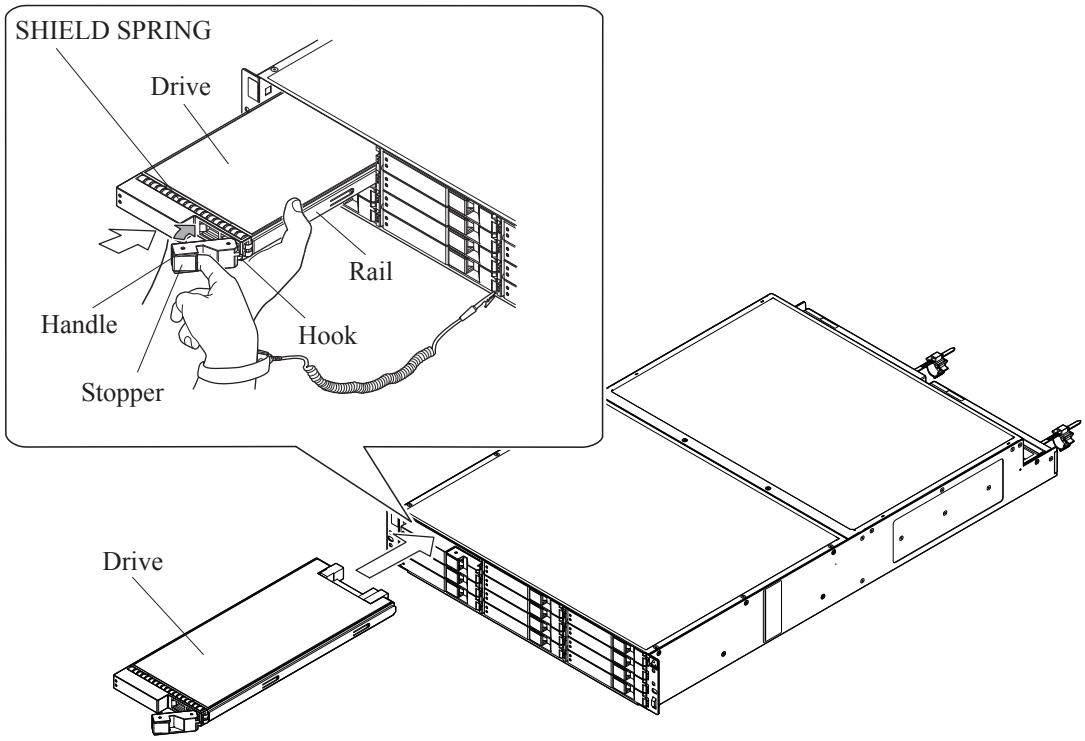
(c) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.

(d) Pull the stopper lightly and close the handle, and then press the stopper to have the lock on.

NOTE : If the handle is closed in the status where the hook of the handle cannot enter into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

(e) Pull the Drive lightly by handling the handle to check that it is not pulled out.

Figure 2-32 Installation of Drive (DBF)



3. Check that the ALM LED (red) on the replaced Drive does not light up.

NOTE: When the Drive status is “Normal” and the ALM LED (red) light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.

4. Attach the Front Bezel. (See “2.2.1 How to Attach/Remove Front Bezel”.)
In case of DB60, attach the cover and return it to the rack. (See “2.2.1.3 DB60”.)

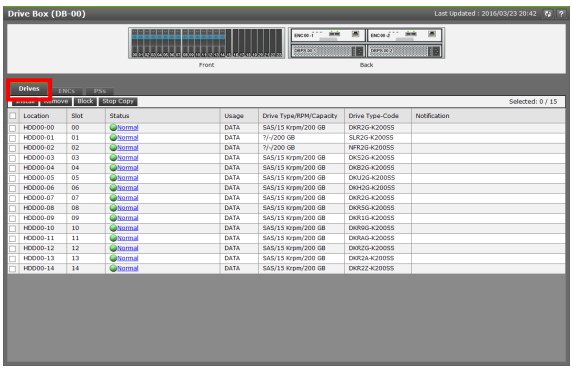
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5. Restoring replacement parts by Maintenance Utility

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

(1) <Check drive restoration>
Click the [Drives] tab in the “Controller Chassis” window or “Drive Box” window and check that a Status of the replaced Drive is “Normal”.

NOTE : • Click the refresh button on the upper right of the window to update the window, and then check the replaced Drive status.
• When replacing the Drive after saving to the Spare Drive, the status changes to “Normal” after executing the copy back processing.
• When the Drive status is “Copy incomplete”:
Correction copy cannot be performed because more than one copy processing is operating in the parity group to which the target Drive belongs.
After completing other copy operations, replace the drive again by following the drive replacement procedure. For the drive replacement, reuse the drive that was removed at the time of replacement instead of using a new drive.
Refer to MAINTENANCE PC SECTION “4.2.2.2 Checking Parity Group” for checking the parity group.
• When the Drive status is “Reserved”:
Copy back cannot be performed because more than one copy processing is operating in the parity group to which the copy back source Drive of the target Drive belongs.
After completing other copy operations, replace the drive again by following the drive replacement procedure. For the drive replacement, reuse the drive that was removed at the time of replacement instead of using a new drive.
Refer to MAINTENANCE PC SECTION “4.2.2.2 Checking Parity Group” for checking the parity group.
• When the copy back is set to disabled, the copy back will not be executed.
• When the Drive status is “Normal” and the ALM LED (red) light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.

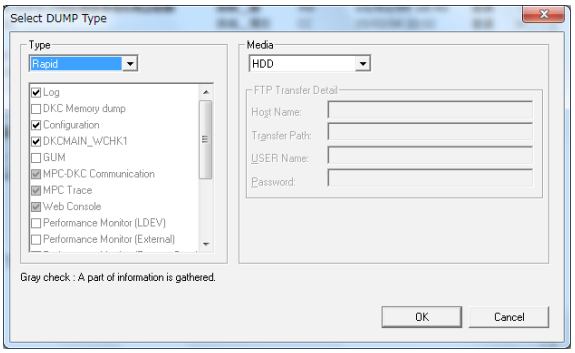


NOTE : The [Slot] is displayed in the “Maintenance Utility” window for the firmware version 83-03-21-x0/xx or more.

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

(3) <Get the error information>
See MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

NOTE: Both the Rapid Dump and System Dump contain logging facilities to collect error information related to drive failures and subsequent replacements. Drive replacement error log information is retained for a maximum of 16 generations, and the oldest error log is overwritten when a new drive replacement is performed. To avoid overwriting error log information, do not exceed
16 consecutive drive replacements without first ensuring that a Rapid or System Dump is collected.
Therefore, when performing multiple drive replacements during maintenance procedures, ensure that a Rapid or System Dump is collected following the first drive replacement. Monitor the amount of replacements being performed and execute a subsequent Rapid or System Dump prior to exceeding the 16 generation replacement error log capacity. Additionally, ensure that a Rapid or System dump is collected at the completion of the multiple drive replacement maintenance process.
The capacity of collected Rapid dump/System dump can be 100 MB or greater because error log information, such as SIM and SSB, is accumulated.

(4) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

---

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

7. Back up the encryption key
When a message is displayed in Step 3(8), 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(8), this procedure is not required.

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2.4 Replacing a Controller Board

The window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

- When replacing the Controller Board of the CBSS/CBSL
  "2.4.1 Replacing a Controller Board for CBSS/CBSL"

  NOTE: Both encrypted and unencrypted Controller Boards exist on CBSS/CBSL. Check the Controller Boards to be replaced.

- When replacing the Controller Board of the CBLM/CBLH
  "2.4.2 Replacing a Controller Board for CBLM/CBLH"

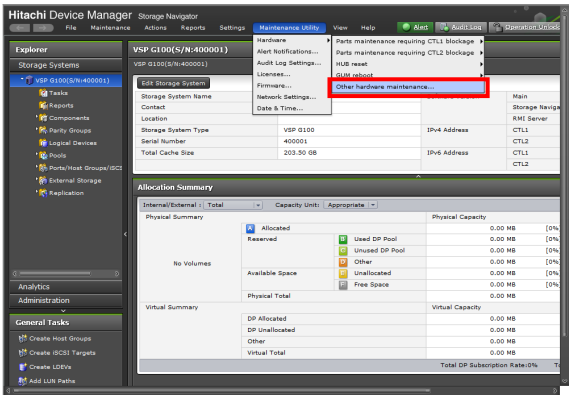
NOTICE:	When the I/O load is much higher than the appropriate value, it might take up to four hours to complete the procedure. For the appropriate value, refer to System Configuration Guideline.

2.4.1 Replacing a Controller Board for CBSS/CBSL

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

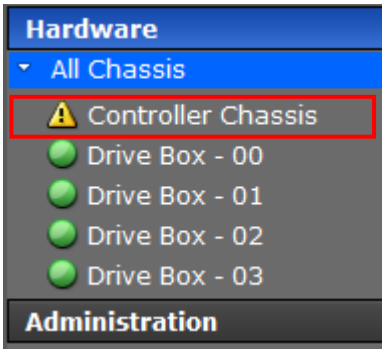


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3. Selecting replacement parts by Maintenance Utility.

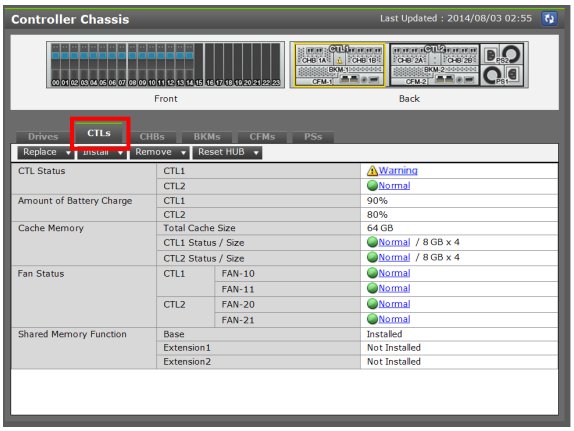
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

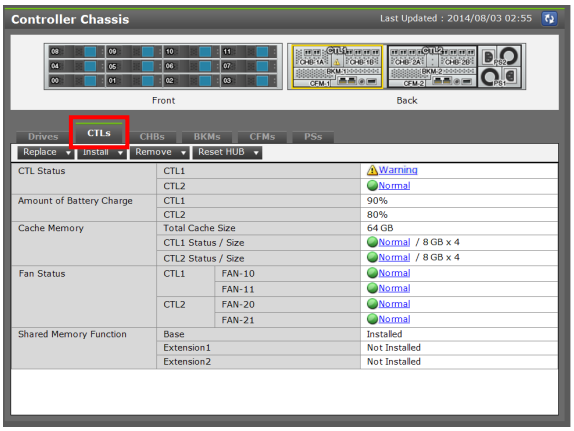


(2) <Controller Chassis window>
Click the [CTLs] tab in the “Controller Chassis” window to display a Controller Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

• In case of CBSS



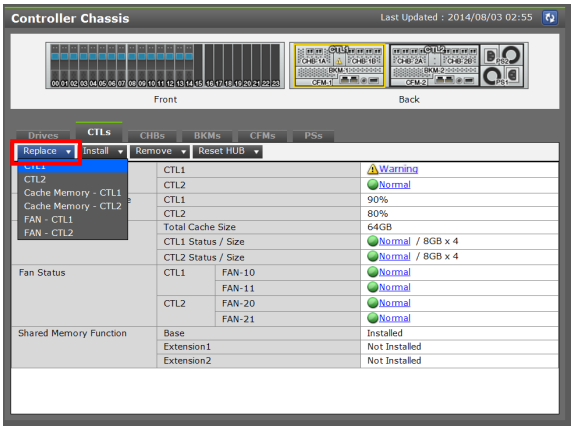
• In case of CBSL



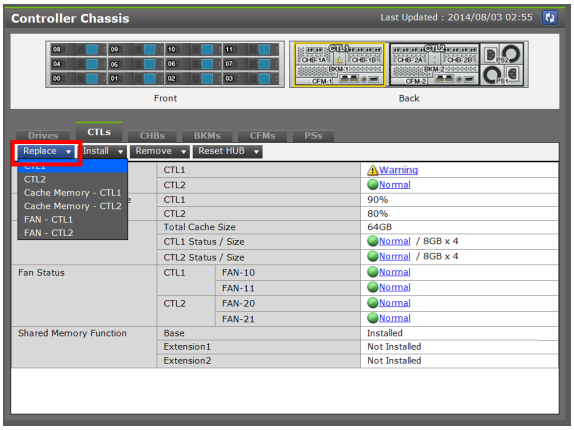
(3) <Select Controller Board>

Click [Replace] and select a Controller Board to be replaced.

• In case of CBSS



• In case of CBSL



(4) <Block Controller Board>

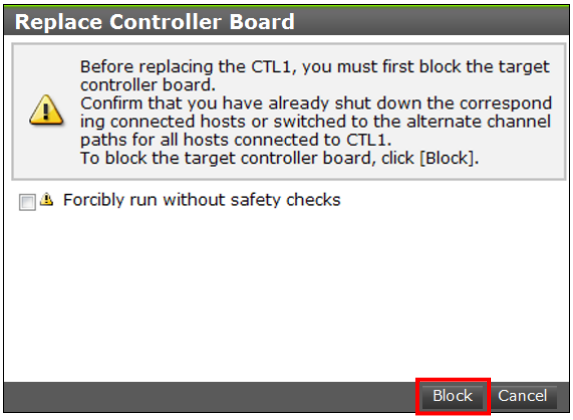
⚠ CAUTION

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 [Block] button after checking that the Controller Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

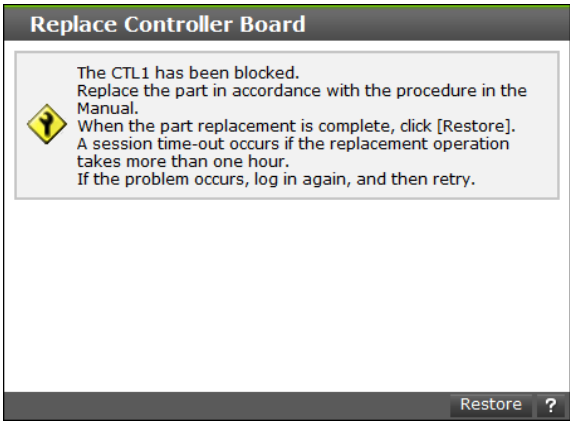
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Controller Board replacement>
Check that the Controller Board is blocked and becomes ready for replacing.

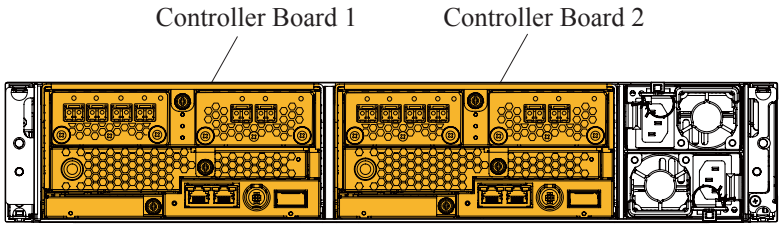
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBSS/CBSL Controller Board Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	Controller Board	• DW-F800-CTLS
	2	Controller Board (Encryption)	• DW-F800-CTLSE

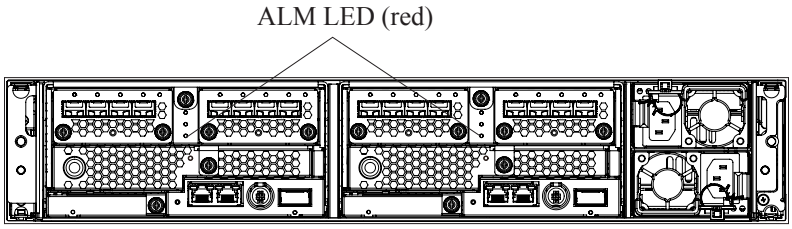


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBSS/CBSL Controller Board to be replaced lights up.

Figure 2-33 ALM LED Position



Controller Board

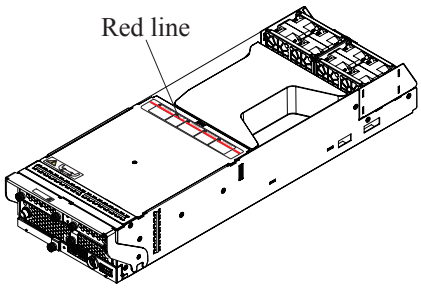
(2) Remove all the cables connected to the Controller Board.

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(3) Remove the Controller Board from the CBSS/CBSL.
(a) Loosen the screw (blue) which fixes the Controller Board (①) and open the lever to pull out (②).
(b) Pull out and remove the Controller Board while holding its body with both hands.

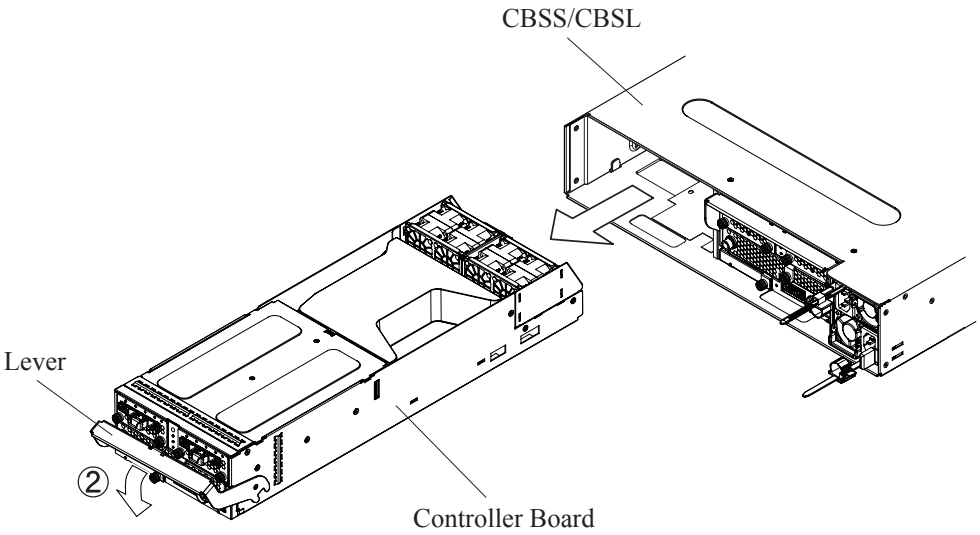
⚠ CAUTION

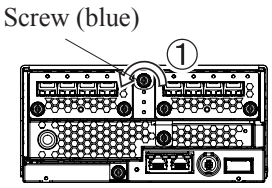
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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

Figure 2-34 Removal of Controller Board (CBSS/CBSL)





Controller Board (Front view)

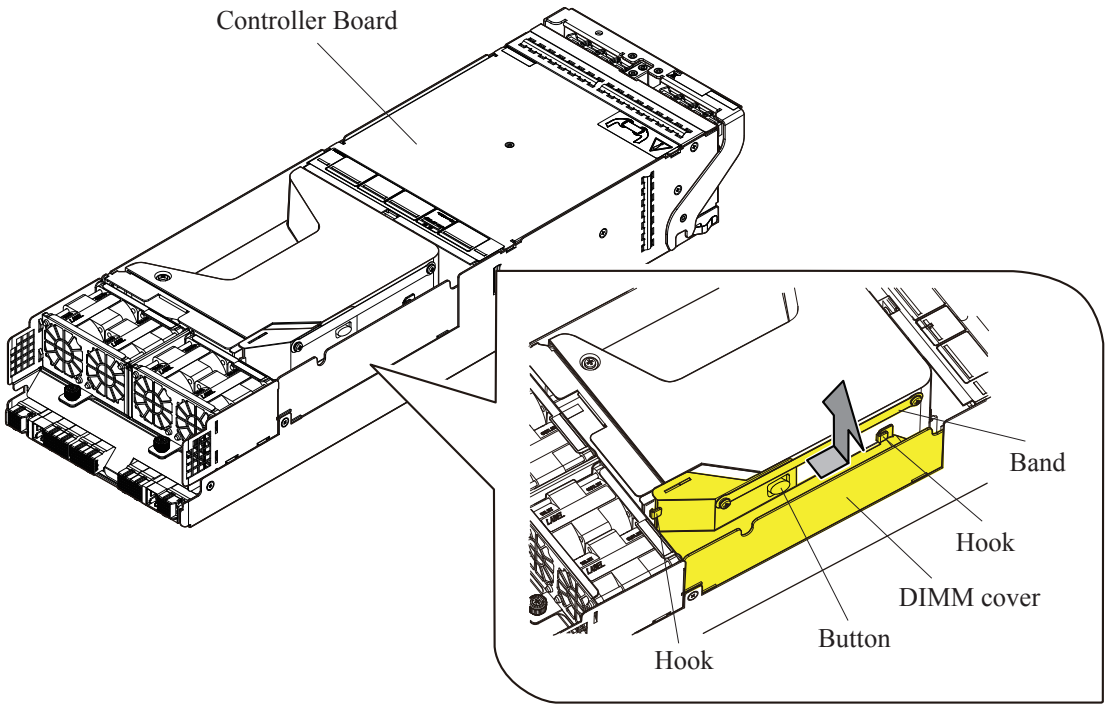
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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.4.1".

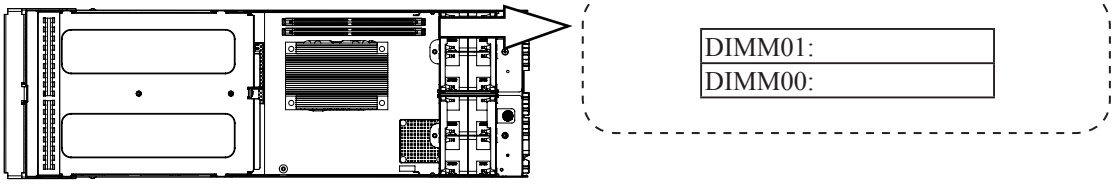
(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
(5) Lift the DIMM cover to remove.

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

Figure 2-35 Removal of DIMM Cover



(6) Move all the Cache Memories (including dust covers if any) mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.
As with Step (3), remove the cover of a new Controller Board before starting the work.



Cache memory location (Controller Board top view)

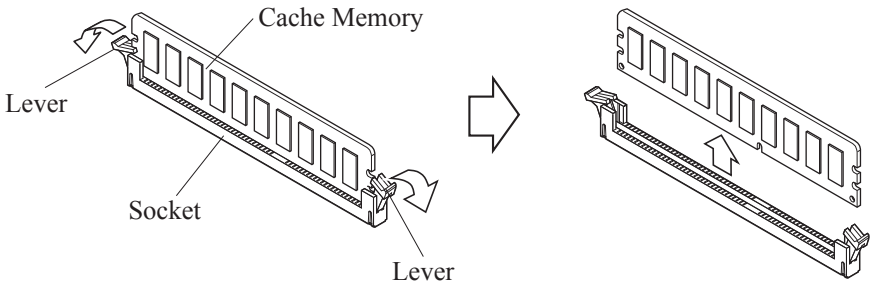
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(7) Installation/Removing Cache Memory

NOTICE: Do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is secured with the levers in installation procedure of the Cache Memory. The PCB may be damaged when intense pressure is applied.

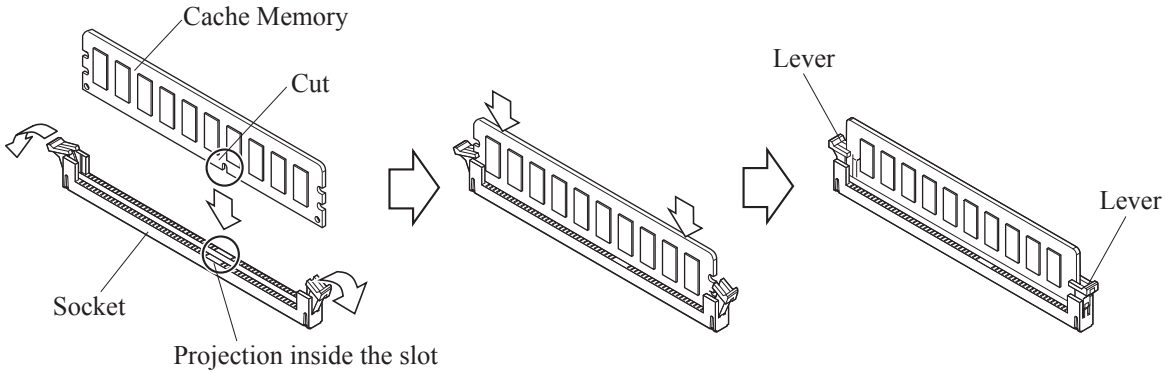
(a) Procedure for removing.
(i) Pull the lever outward.
(ii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-36 Removal of the Cache Memory



(b) Procedure for installing.
(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 by the fingers, and fit it into the socket.
(iii) Check that the lever is firmly fitted in the Cache Memory.

Figure 2-37 Installation of the Cache Memory

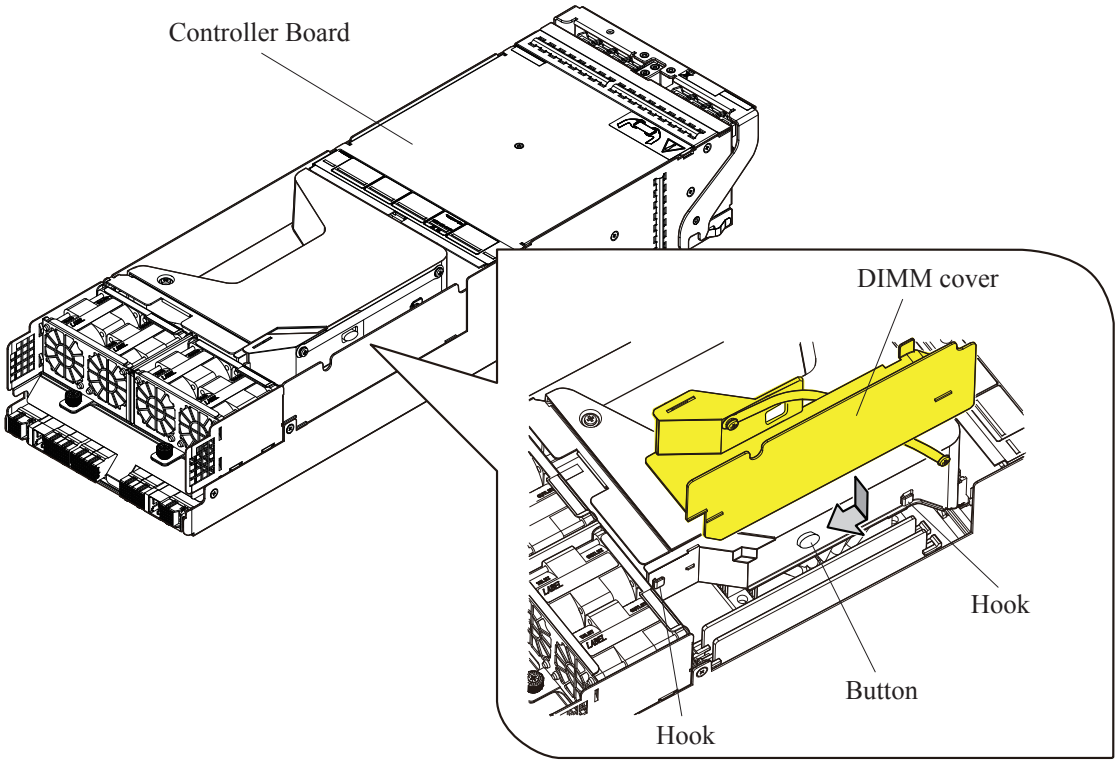


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(8) Slide the DIMM cover to the arrow direction to attach.

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

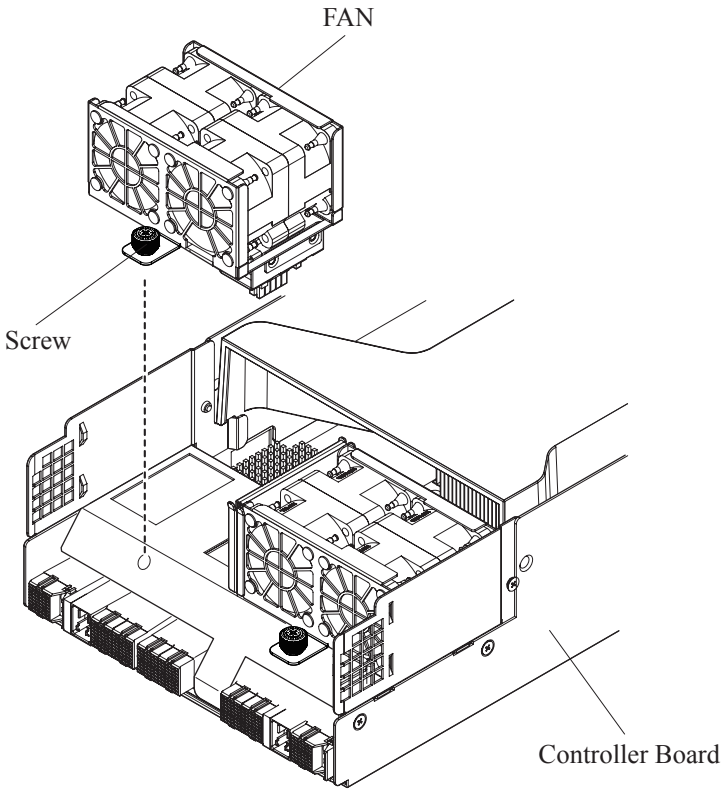
Figure 2-38 Installation of DIMM Cover



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(9) Move the Fan, BKM, Channel Board and Cache Flash Memory.
(a) Loosen the screw (blue) which fixes the FAN installed in the failed Controller Board.
(b) Lift the FAN to pull out the cable from the connector.

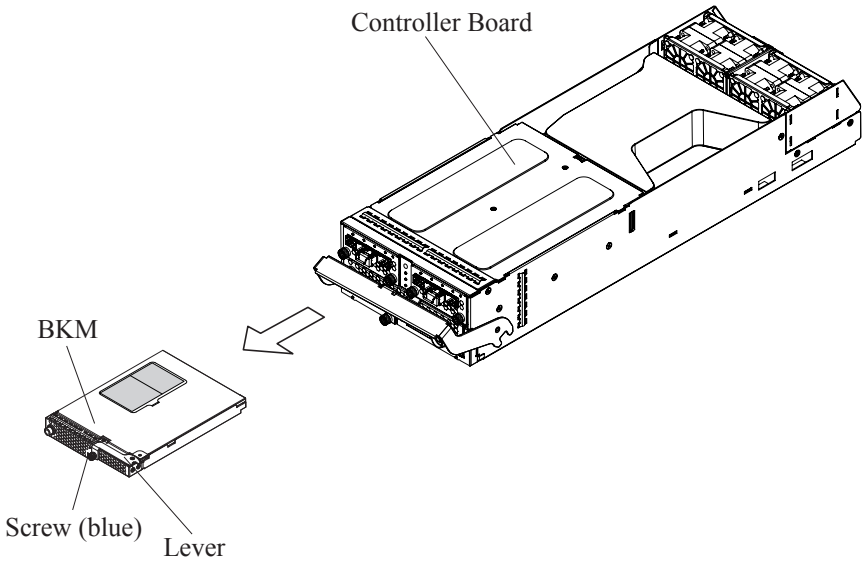
Figure 2-39 Removal of DKCFAN



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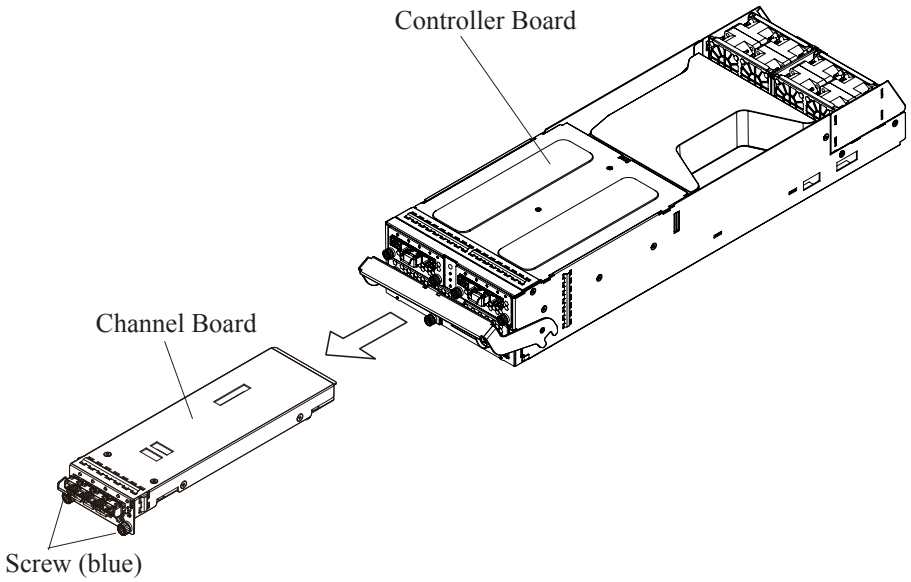
(c) Loosen the screw (blue) which fixes the BKM installed in the failed Controller Board.
(d) Open the lever.
(e) Pull out and remove the Backup Module while holding its body with both hands.

Figure 2-40 Removal of BKM



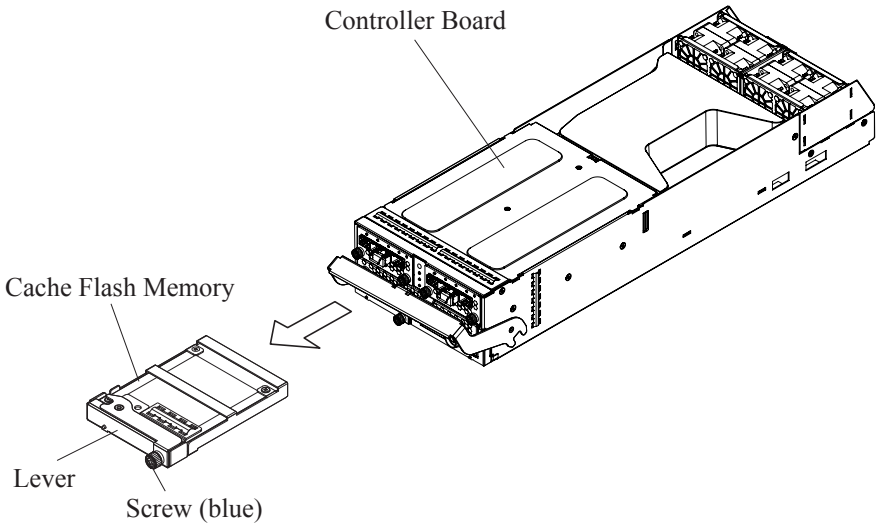
(f) Loosen the two screws (blue) which fix the Channel Board installed in the failed Controller Board.
(g) Pull out and remove the Channel Board while holding the screws (blue).

Figure 2-41 Removal of Channel Board



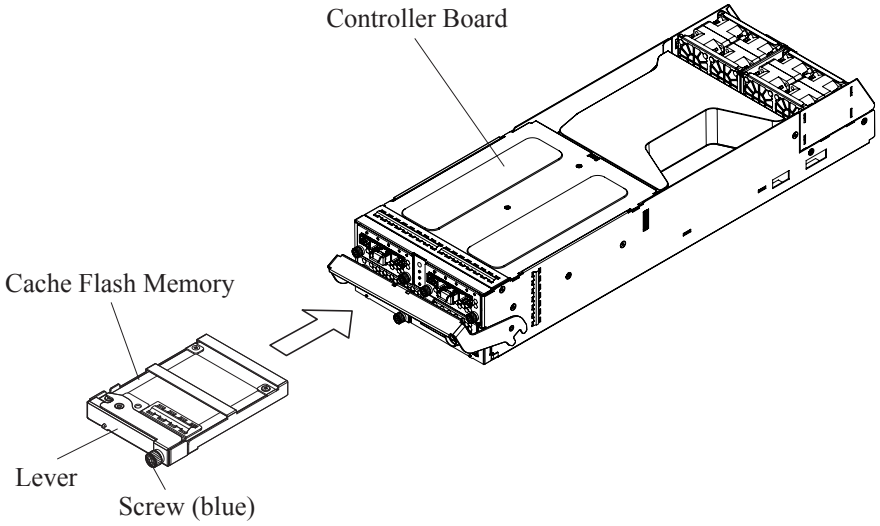
(h) Loosen the screw (blue) which fixes the Cache Flash Memory.
(i) Open the lever to pull out and remove the Cache Flash Memory.

Figure 2-42 Removal of Cache Flash Memory



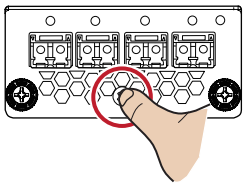
(j) With the lever opened completely, insert the Cache Flash Memory into the slot of the new Controller Board.
(k) Push the Cache Flash Memory all the way in and close the lever completely.
(l) Tighten the screw (blue) and fix the Cache Flash Memory.

Figure 2-43 Installation of Cache Flash Memory



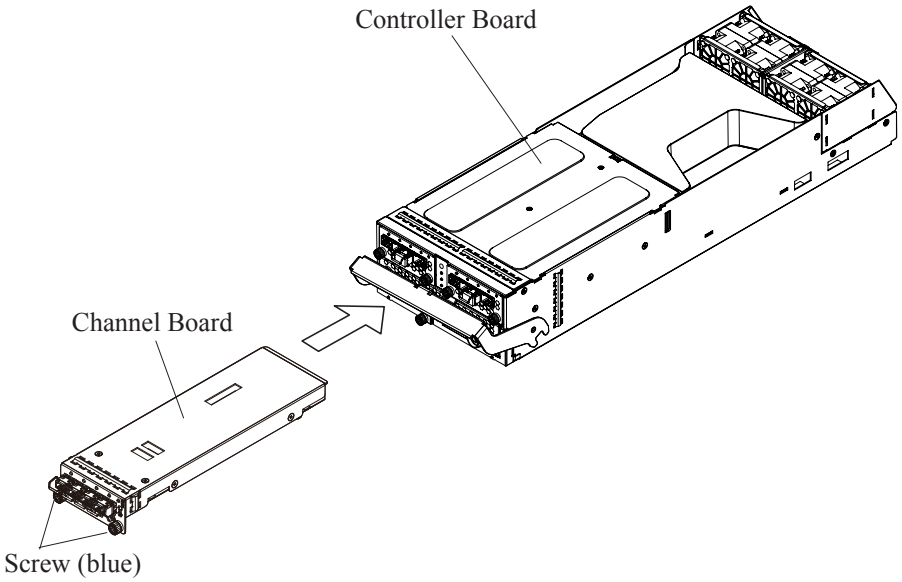
(m) Insert the Channel Board into the new controller slot.
(n) Push the Channel Board all the way in.

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



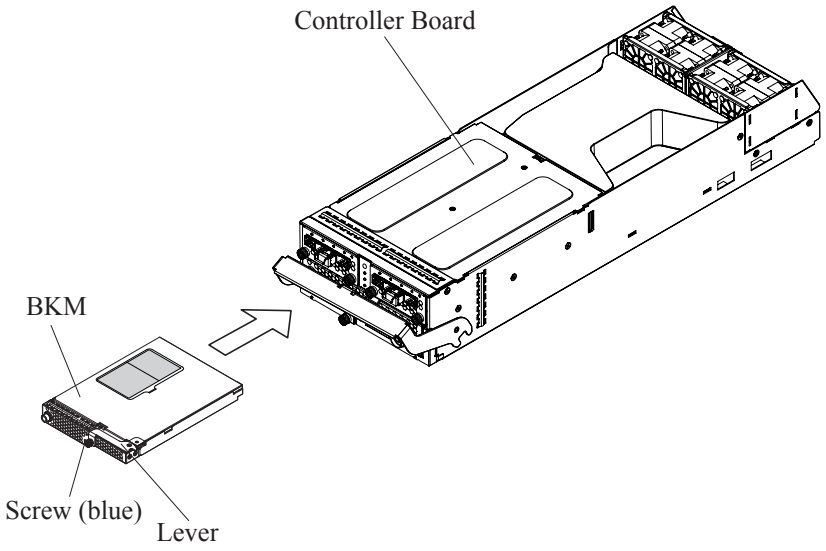
(o) Tighten the two screws (blue) to fix the Channel Board.

Figure 2-44 Installation of Channel Board



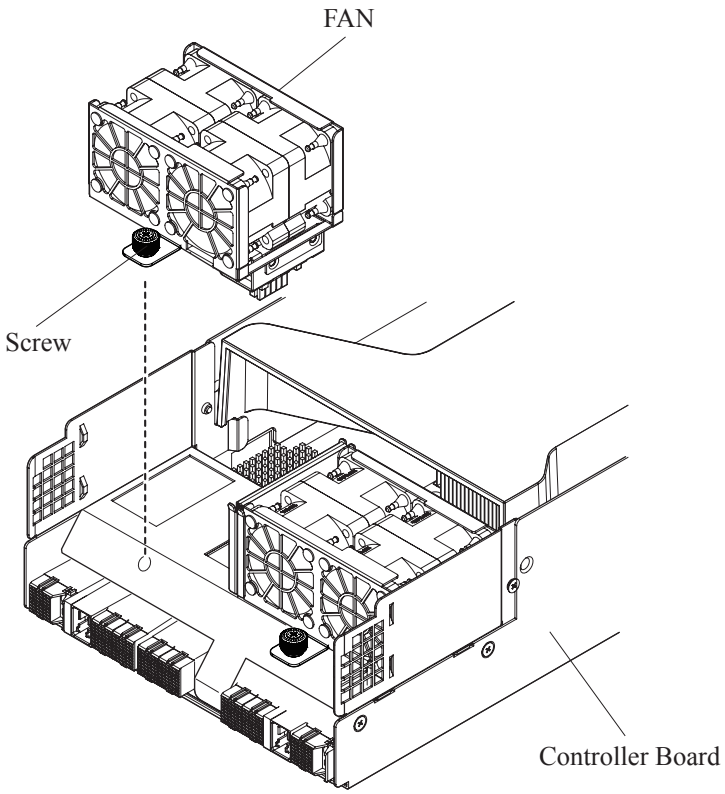
(p) With the lever opened completely, insert the BKM into the new Controller Board.
(q) Push the BKM all the way in.
(r) Close the lever completely and tighten the screw (blue) to fix the BKM.

Figure 2-45 Installation of BKM



(s) Connect the FAN into the slot of the new Controller Board.
(t) Tighten the screw (blue) and fix the FAN.

Figure 2-46 Installation of FAN

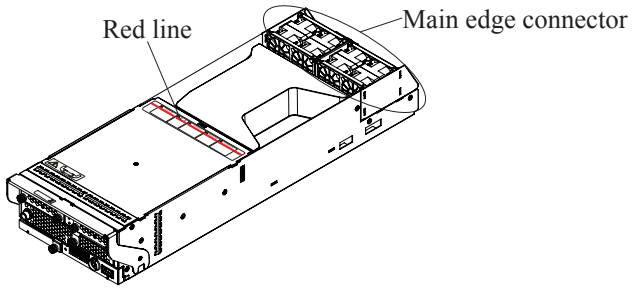


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(10) Install a new Controller Board.

⚠ CAUTION

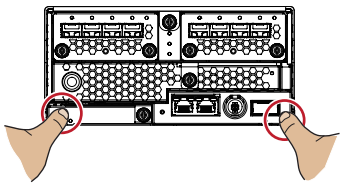
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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 right and left levers on the Controller Board opened completely, insert it into the slot of the CBSS/CBSL.
(b) Push the Controller Board all the way in and close the lever completely.

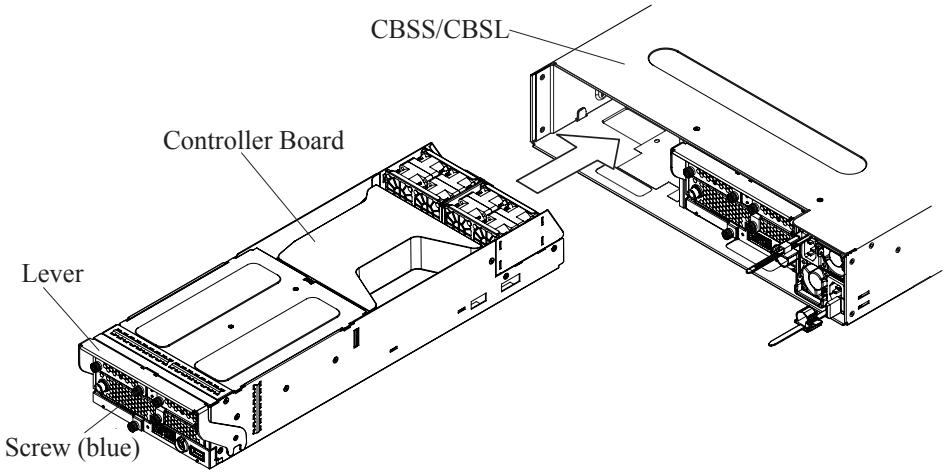
NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



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

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Figure 2-47 Installation of Controller Board (CBSS/CBSL)



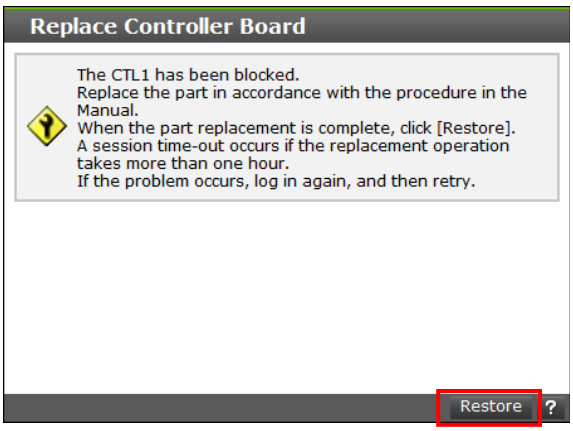
(11) Connect all the removed cables to the Controller Board.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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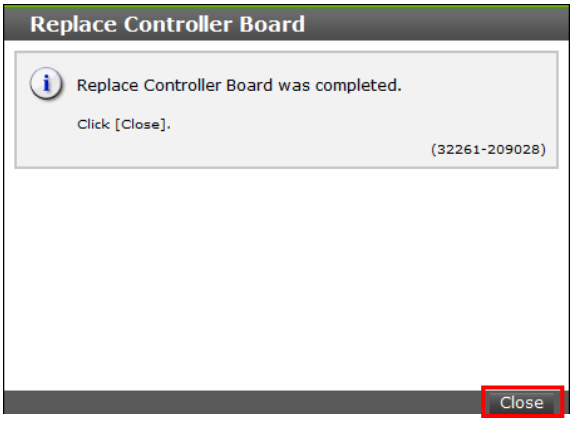
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

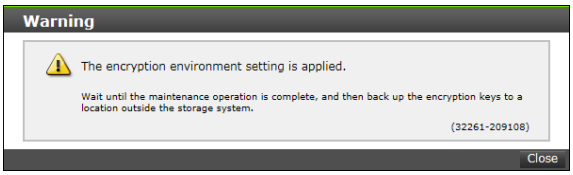


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



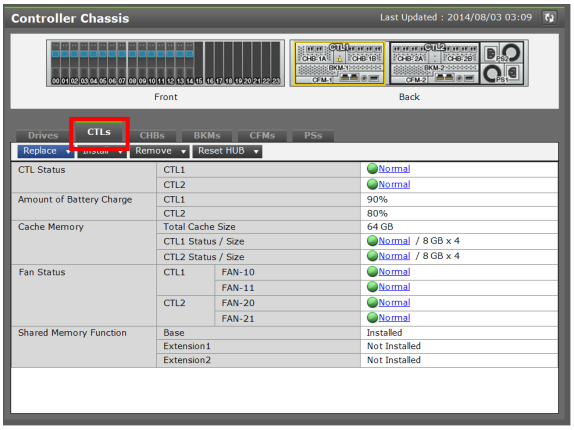
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

(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.

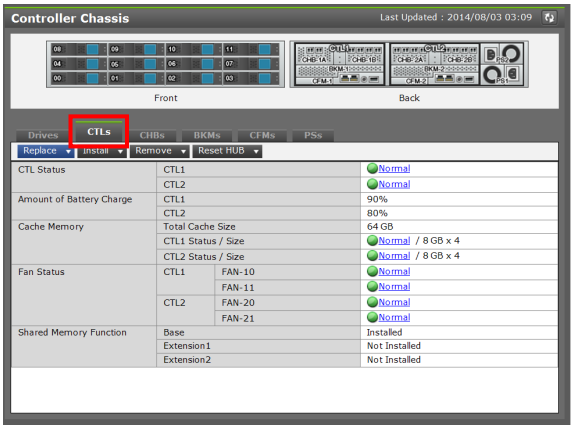


(4) <Controller Chassis window>
Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced Controller Board is "Normal".

• In case of CBSS

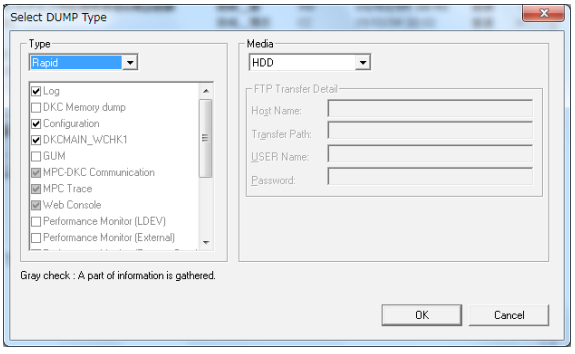


• In case of CBSL



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

(6) <Get the error information>
See MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(7) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

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6. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

7. Back up the encryption key
   When a message is displayed in Step 5(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 5(3), this procedure is not required.

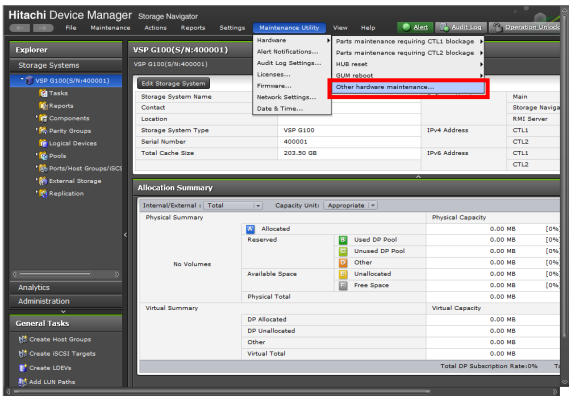
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2.4.2 Replacing a Controller Board for CBLM/CBLH

NOTE:
- The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.
- When the NAS Modules are installed in the configuration, be sure to migrate EVS manually before maintenance operations.
  For the details of the EVS manual migration, see MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations".

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

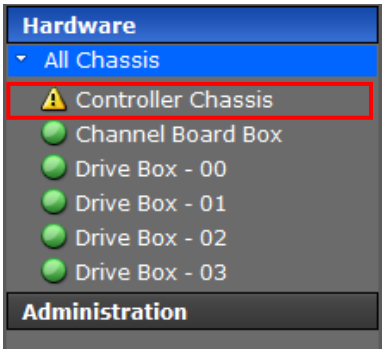


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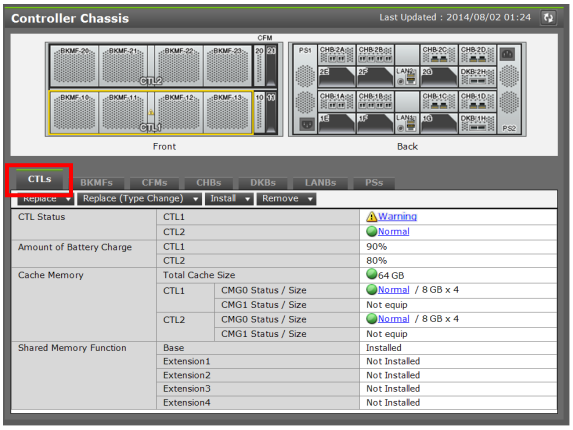
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.

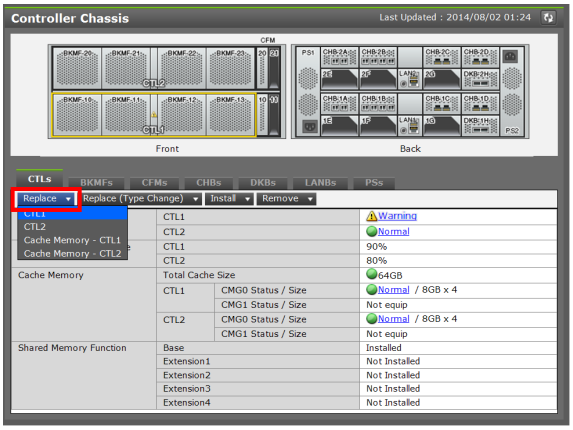


(2) <Controller Chassis window>
Click the [CTLs] tab in the “Controller Chassis” window to display a Controller Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



(3) <Select Controller Board>

Click [Replace] and select a Controller Board to be replaced.



(4) <Block Controller Board>

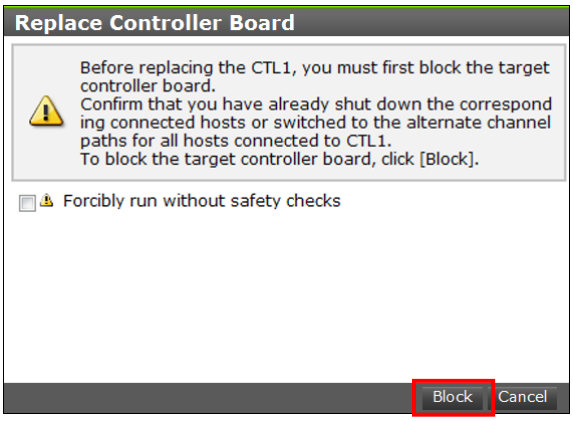
CAUTION

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 [Block] button after checking that the Controller Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

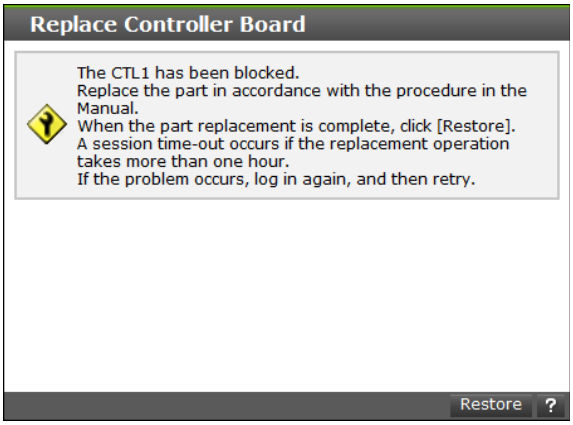
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Controller Board replacement>
Check that the Controller Board is blocked and becomes ready for replacing.

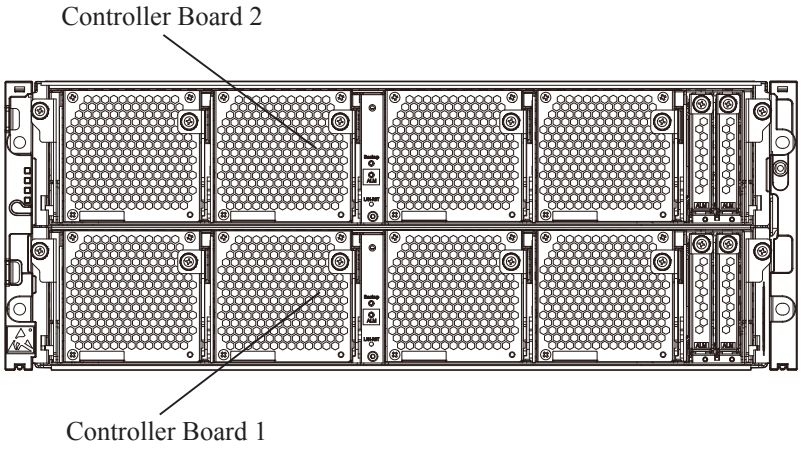
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBLM/CBLH Controller Board Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLM/CBLH	1	Controller Board	• DW-F800-CTLM (CBLM) • DW-F800-CTLH (CBLH)



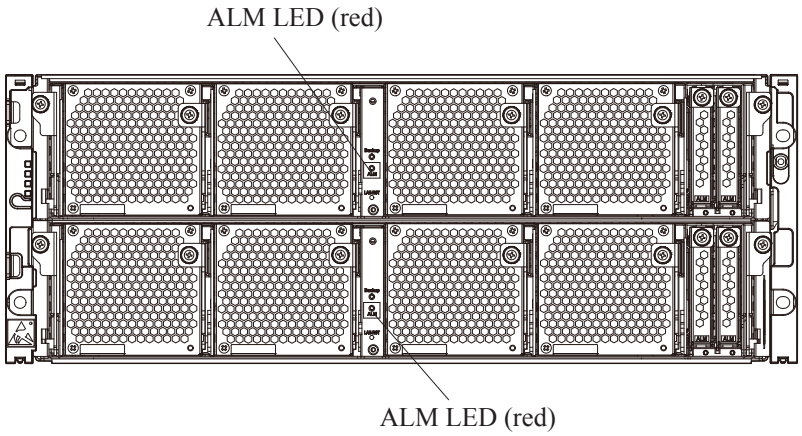
Rear view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBLM/CBLH Controller Board to be replaced lights up.

Figure 2-48 ALM LED Position



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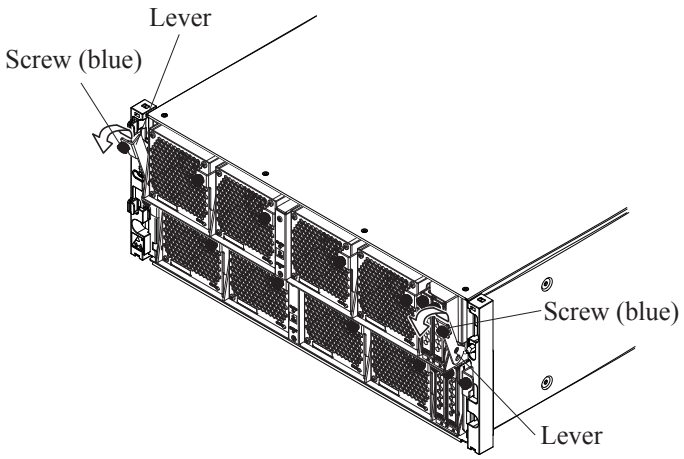
(2) Remove the Controller Board from the CBLM/CBLH.

⚠ 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 to be replaced in the front of the CBLM/CBLH and open the lever.

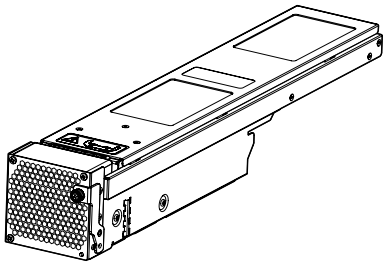
Figure 2-49 Removing Controller Board (CBLM/CBLH)



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 replacement.
The READY LED (green) on the front of CBLM/CBLH lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.4.2".

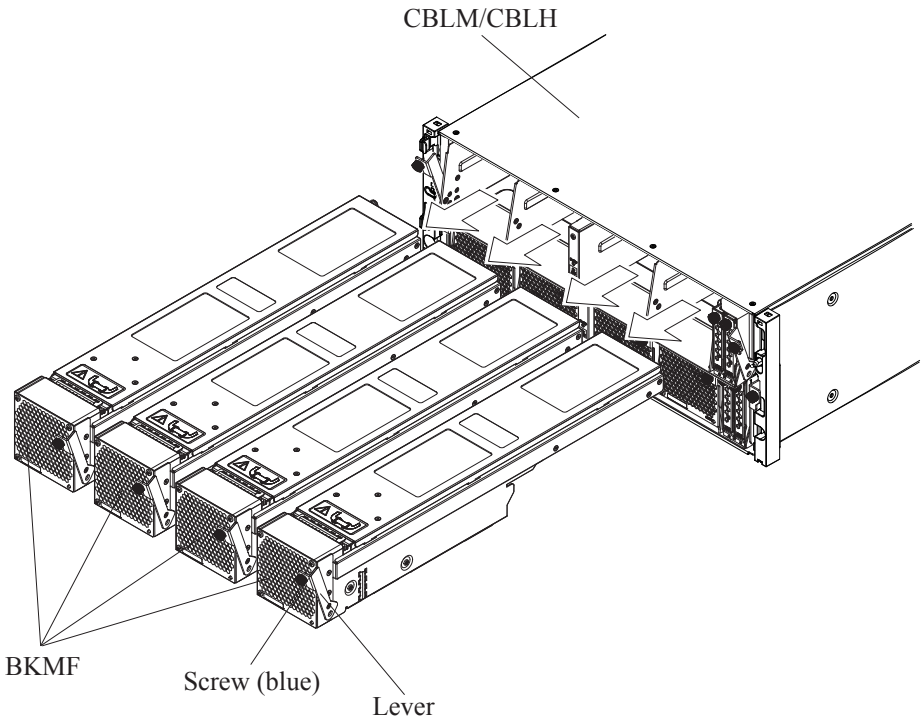
Copyright © 2015, 2017, Hitachi, Ltd.

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

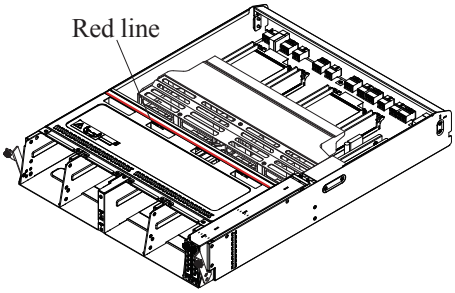
Figure 2-50 Removing BKMF(CBLM/CBLH)



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⚠ CAUTION

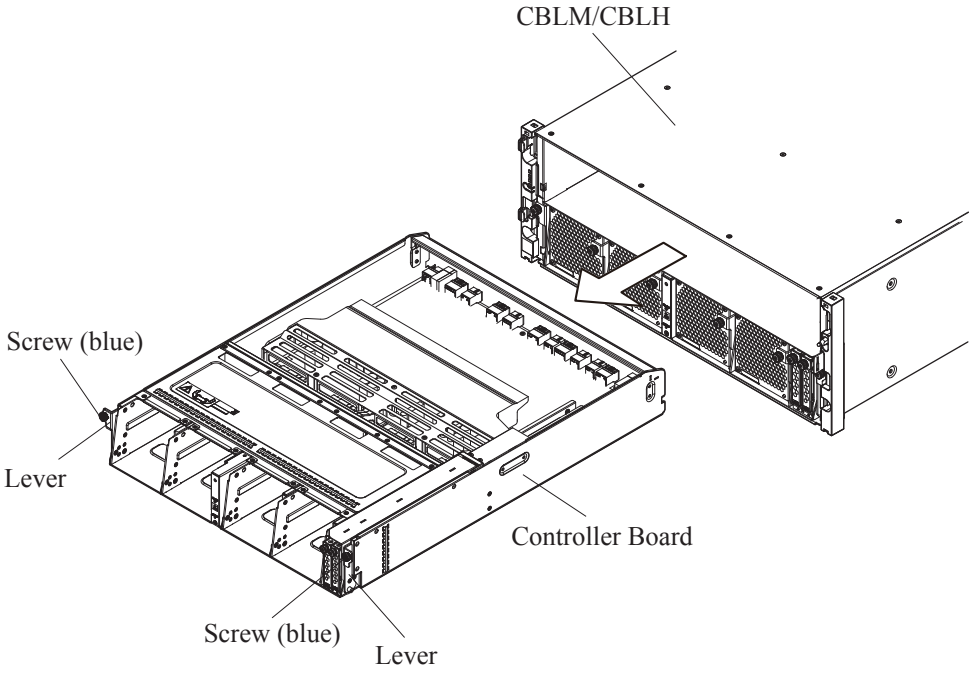
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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

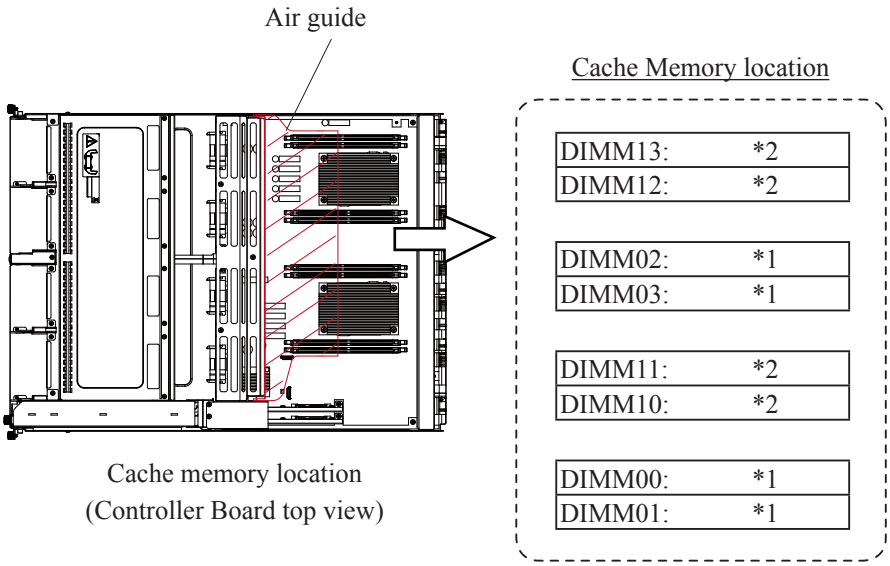
(c) With the lever opened completely, pull out and remove the Controller Board.

Figure 2-51 Removing Controller Board (CBLM/CBLH)



(3) Move all the Cache Memories (including dust covers if any) mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.

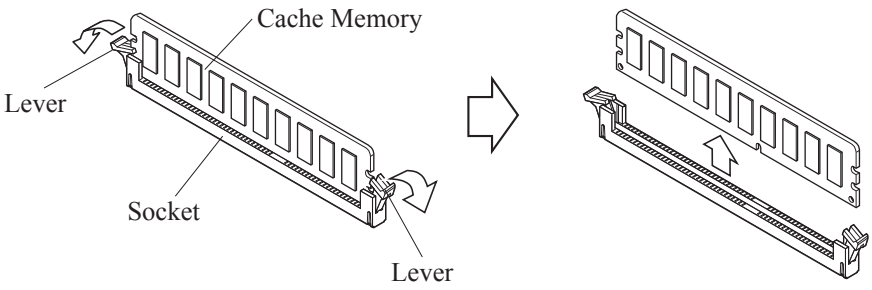
Figure 2-52 Installation Location of Cache Memory



*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) Removal procedure
(i) Open the air guide.
(ii) Pull the lever outward.
(iii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-53 Removal of Cache Memory

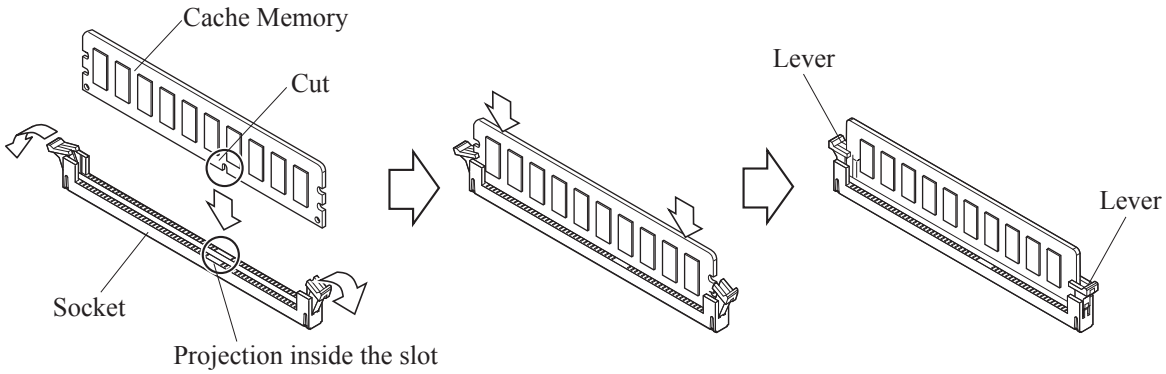


(b) Installation procedure

NOTICE:	Do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is secured with the levers in installation procedure of the Cache Memory. The PCB may be damaged when intense pressure is applied.

(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 by the fingers and fit it into the socket.
(iii) Check that the lever is firmly fitted in the Cache Memory.
(iv) Close the air guide.

Figure 2-54 Installation of Cache Memory

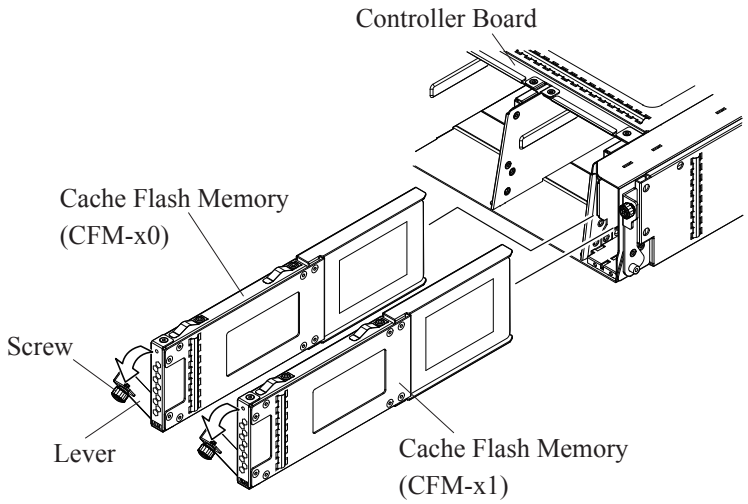


(4) Move all the Cache Flash Memories mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.

NOTICE:	Mounting the Cache Flash Memories to wrong mounting positions might cause the Controller Board not to recover normally.

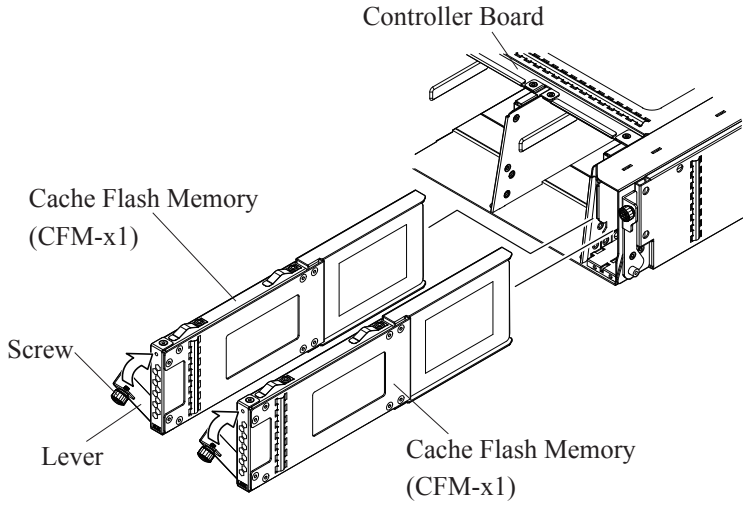
(a) Loosen the screw (blue) which fixes the Cache Flash Memory.
(b) Open the lever to pull out and remove the Cache Flash Memory.

Figure 2-55 Removal of Cache Flash Memory



(c) With the lever opened completely, insert the Cache Flash Memory into the same slot of the new Controller Board.
(d) Push the Cache Flash Memory all the way in and close the lever completely.
(e) Tighten the screw (blue) and fix the Cache Flash Memory.

Figure 2-56 Installation of Cache Flash Memory

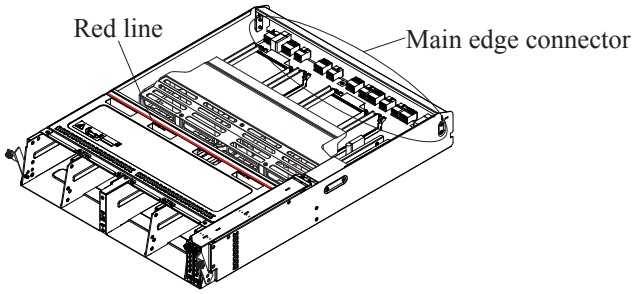


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(5) Install a new Controller Board.

⚠ CAUTION

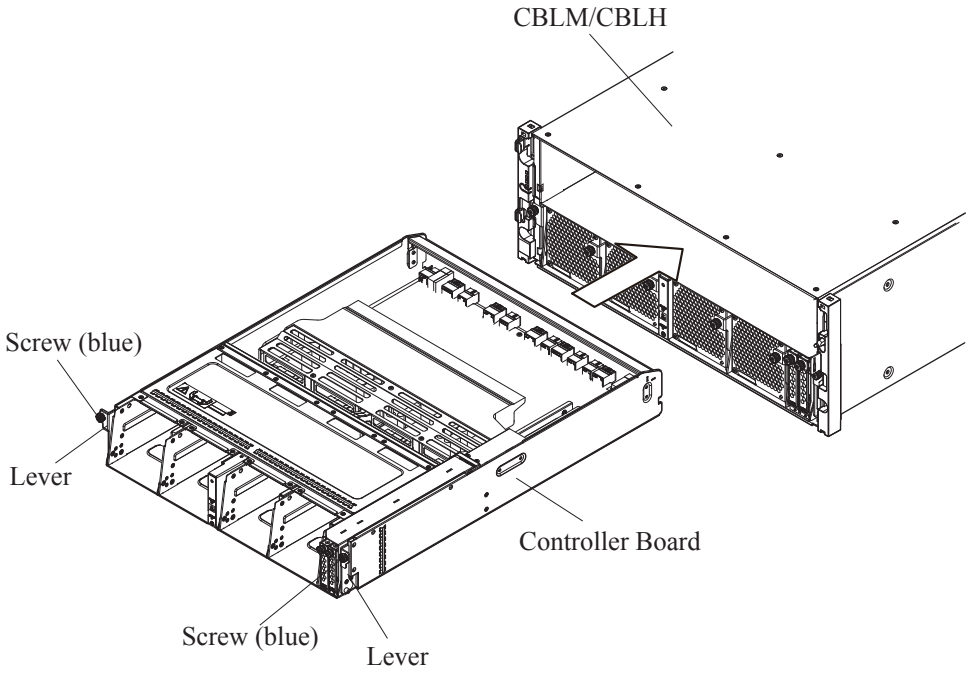
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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.

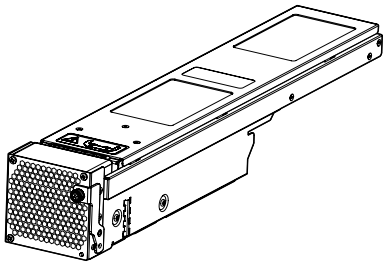
(a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBLM/CBLH.

Figure 2-57 Installing the Controller Board (CBLM/CBLH)



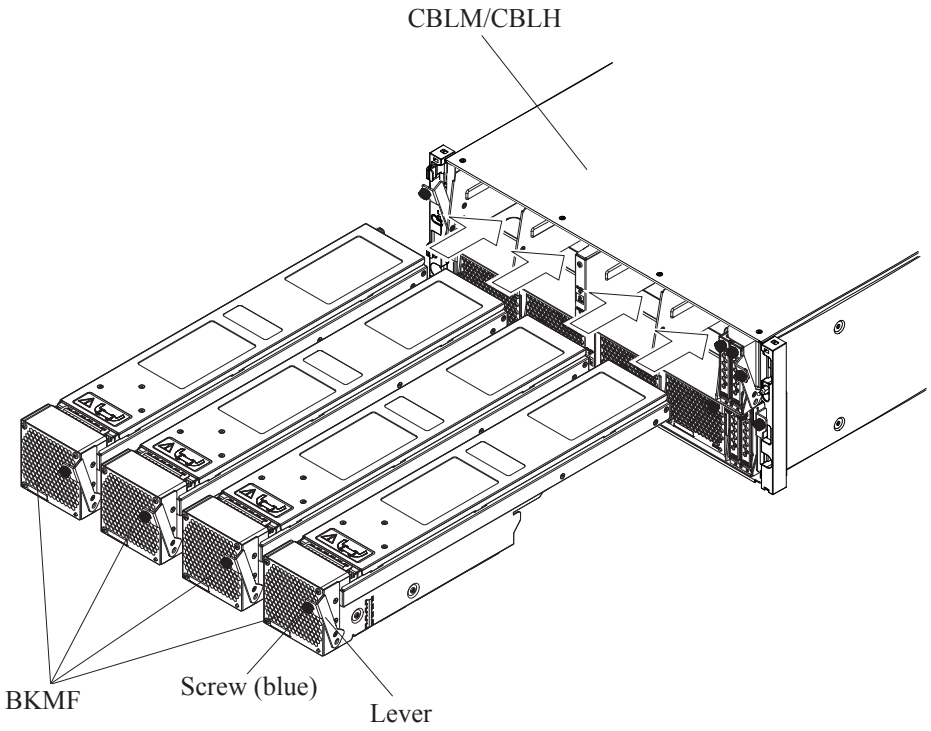
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NOTICE: When installing the BKMF, hold it with both hands and install it straight not to apply a shock to with any components.



(b) Install four BKMFs in the Controller Board.
(i) Open the BKMF lever and insert the BKMF into the slot.
(ii) Raise the BKMF lever and tighten the screw (blue) and fix it.

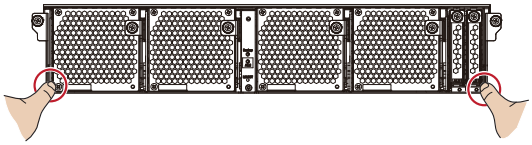
Figure 2-58 Installing the BKMF



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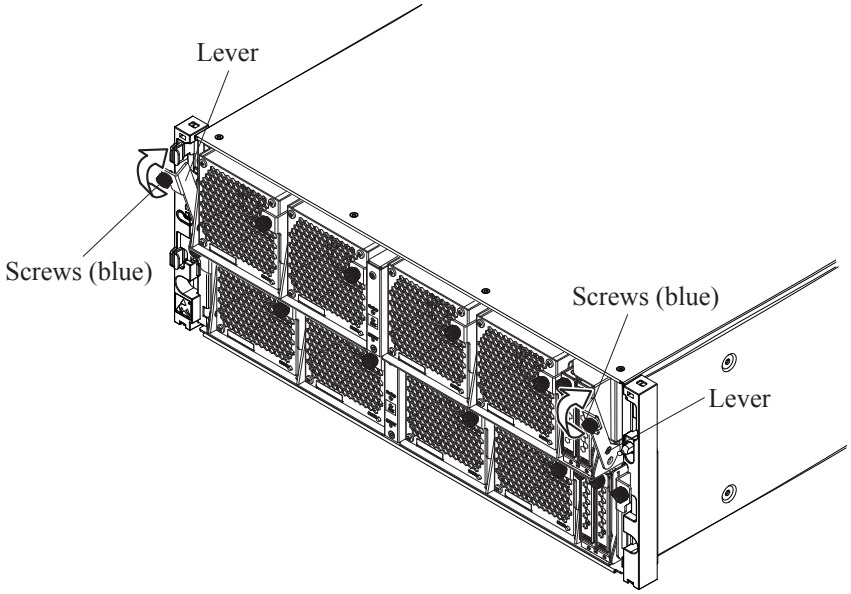
(c) Push the Controller Board all the way in and close the right and left levers completely.

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



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

Figure 2-59 Fixing the Controller Board

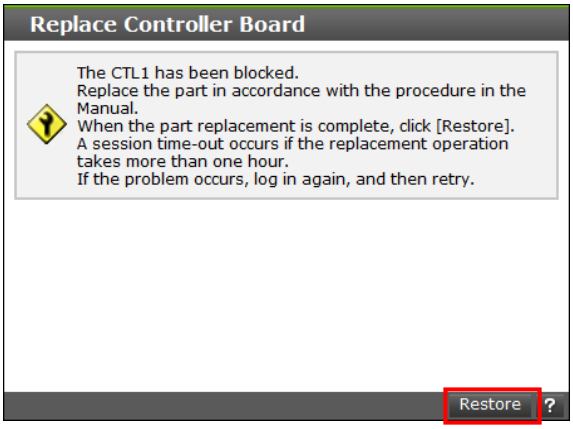


Copyright © 2015, 2017, Hitachi, Ltd.

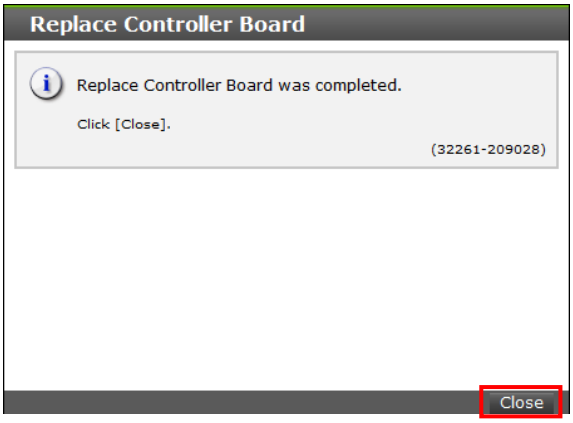
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

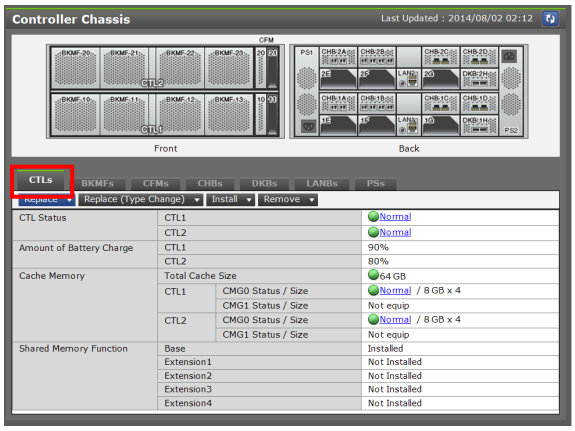


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



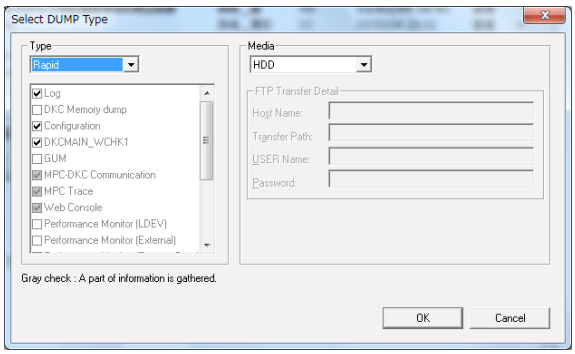
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

(3) <Check Controller Board restoration>
Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced Controller Board is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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7. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

   NOTE: For migration performed due to a failure, inform your customer that the EVS have been migrated to the NAS Module without failure.

   - In case of the NAS Module mounted 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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2.5 Replacing a Cache Memory

The window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

- When replacing the Cache Memory of the CBSS/CBSL
  "2.5.1 Replacing a Cache Memory for CBSS/CBSL"
- When replacing the Cache Memory of the CBLM/CBLH
  "2.5.2 Replacing a Cache Memory for CBLM/CBLH"

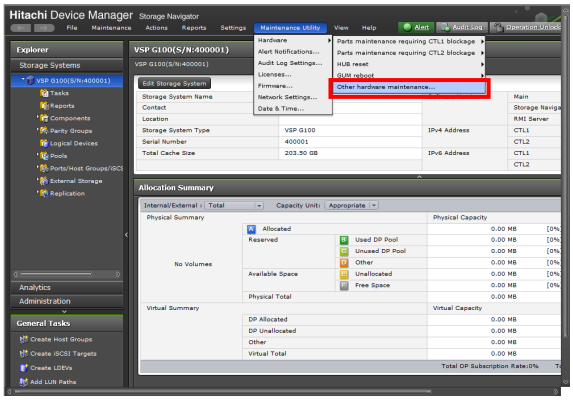
NOTICE:	When the I/O load is much higher than the appropriate value, it might take up to four hours to complete the procedure. For the appropriate value, refer to System Configuration Guideline.

2.5.1 Replacing a Cache Memory for CBSS/CBSL

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Cache Memory on the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the Cache Memory on the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

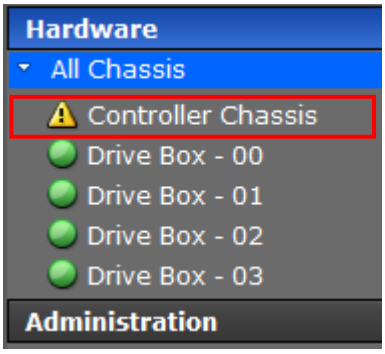


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3. Selecting replacement parts by Maintenance Utility.

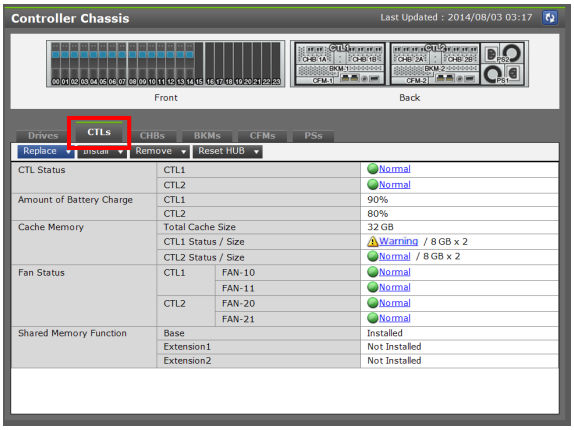
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

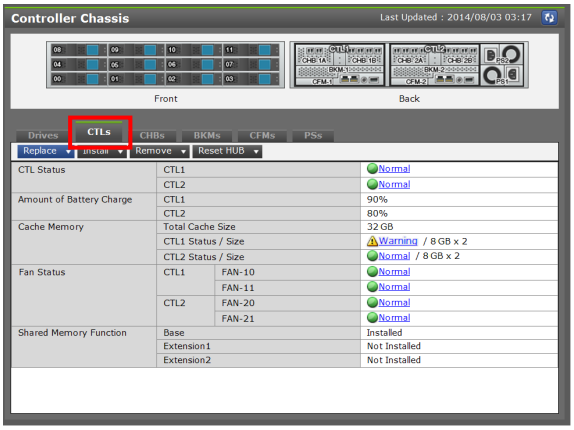


(2) <Controller Chassis window>
Click the [CTLs] tab in the Controller Chassis” window to display a Cache Memory status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

• In case of CBSS



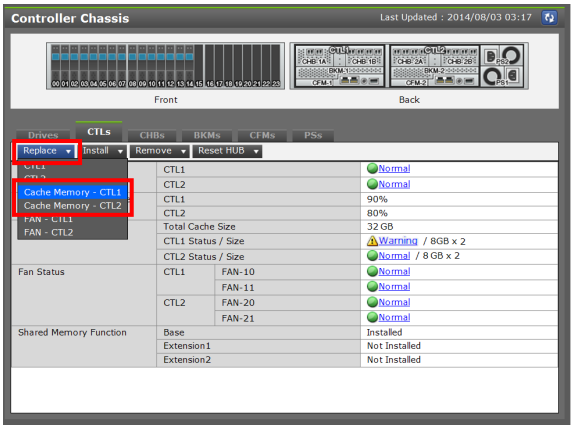
• In case of CBSL



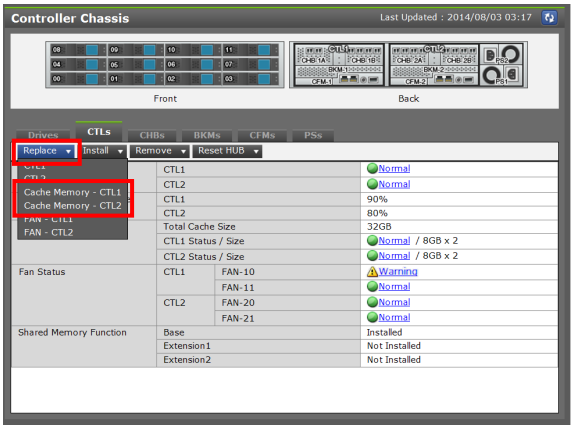
(3) <Select Controller Board>

Click [Replace] and select a Controller Board in which a Cache Memory is installed.

• In case of CBSS



• In case of CBSL



(4) <Block Controller Board>

⚠ CAUTION

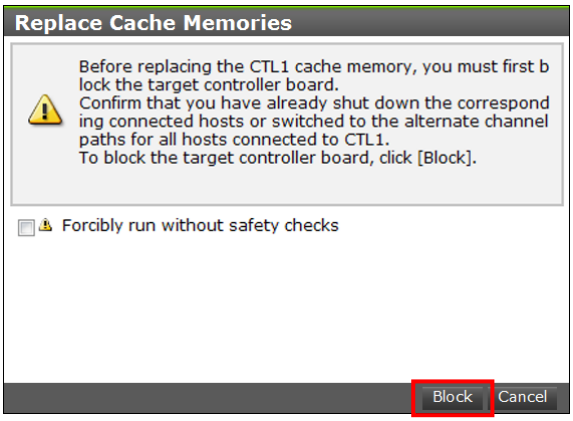
About "Forcibly run without safety checks":

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.

Check that the Controller Board has the Cache Memory to be replaced, and then click the [Block] button.

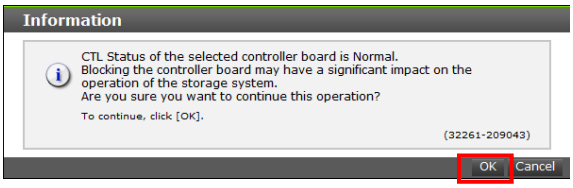
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

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.



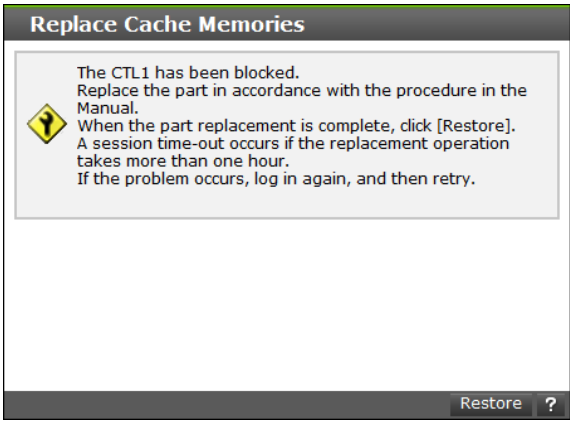
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(5) <Check Controller Board>
Check that the Controller Board to replace the Cache Memory is correct again and click the [OK] button.



(6) <Check the beginning of Cache Memories replacement>
Check that the Controller Board is blocked and becomes ready for replacing.

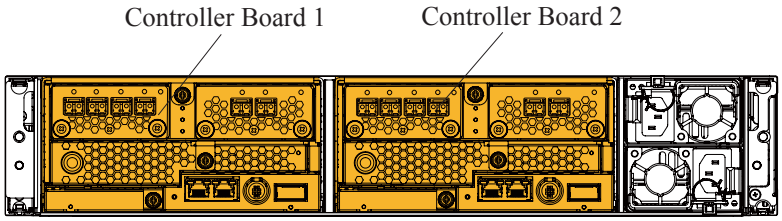
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. Cache Memory Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	Cache Memory	• DKC-F810I-CM8G • DKC-F810I-CM16G

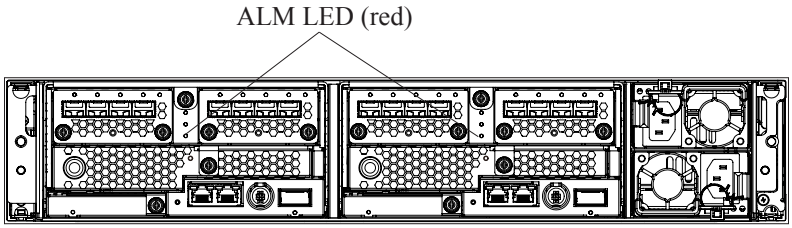


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBSS/CBSL Controller Board to be replaced lights up.

Figure 2-60 ALM LED Position



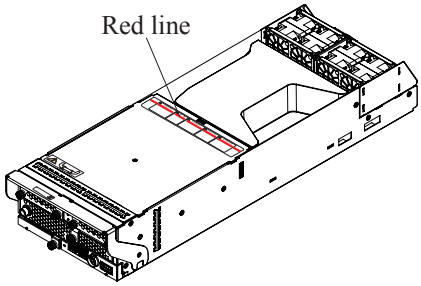
Controller Board

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(2) Remove all the cables connected to the Controller Board.
(3) Remove the Controller Board from the CBSS/CBSL.
  (a) Loosen the screw (blue) which fixes the Controller Board (①) and open the lever to pull out (②).
  (b) Pull out and remove the Controller Board while holding its body with both hands.

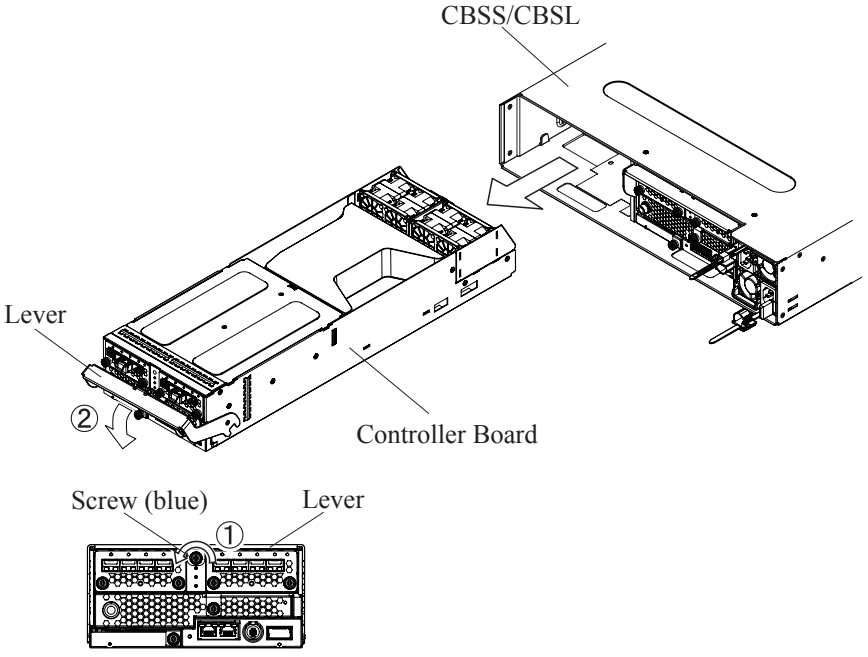
⚠ CAUTION

Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal 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.

Figure 2-61 Removal of Controller Board (CBSS/CBSL)



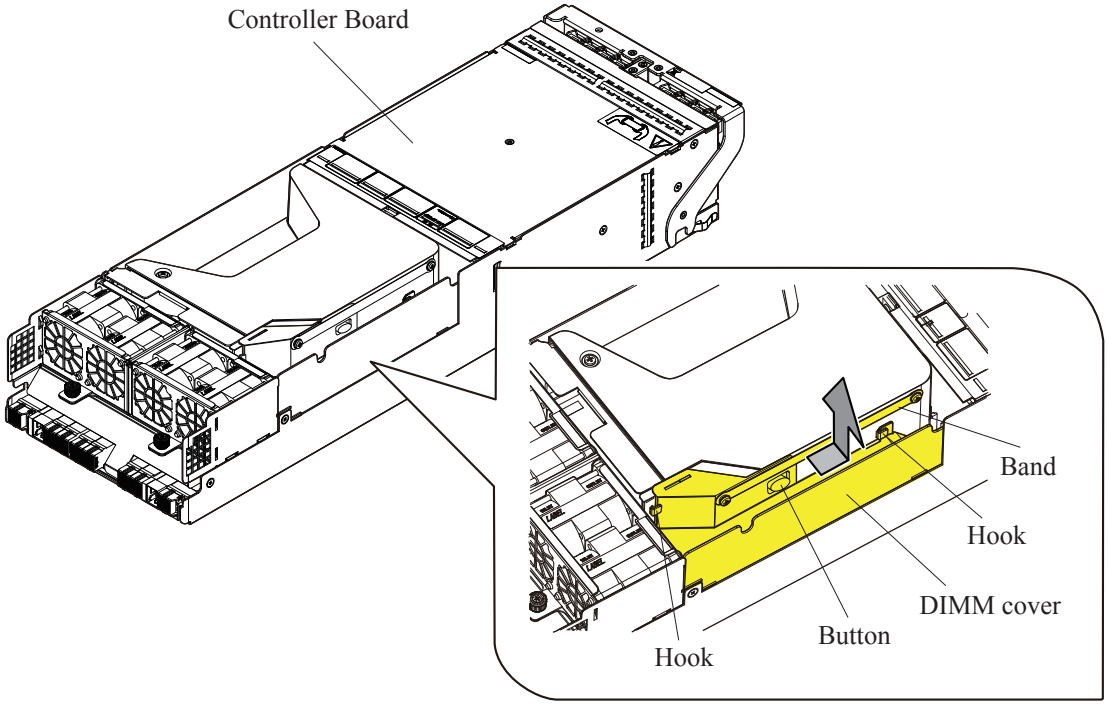
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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.5.1".

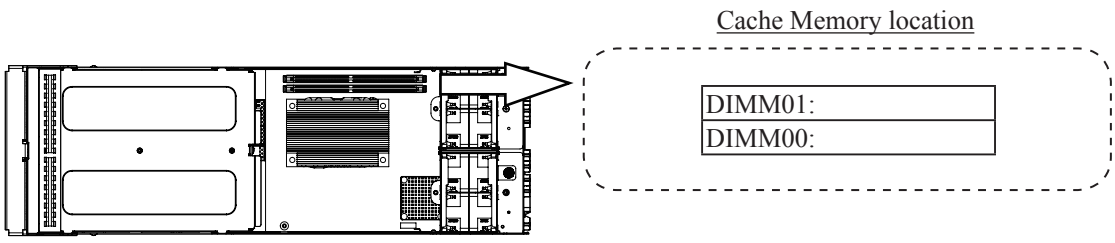
(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
(5) Lift the DIMM cover to remove.

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

Figure 2-62 Removal of DIMM Cover



(6) Replace the failed Cache Memory with a new Cache Memory.



Cache memory location (Controller Board top view)

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(7) Procedure for installation/removal the Cache Memory

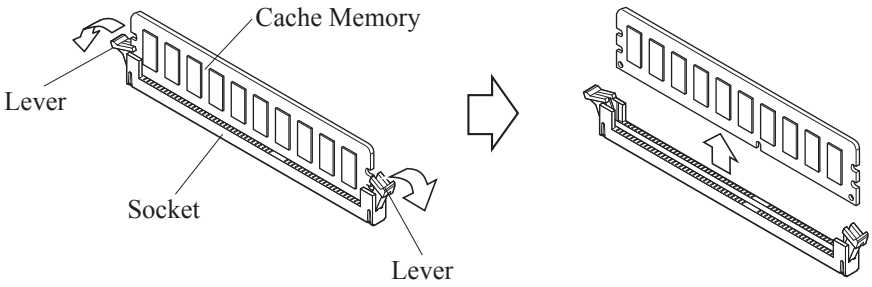
NOTICE:	Do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is secured with the levers in installation procedure of the Cache Memory. The PCB may be damaged when intense pressure is applied.

(a) Removal procedure

(i) Pull the lever outward.

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

Figure 2-63 Removal of the Cache Memory



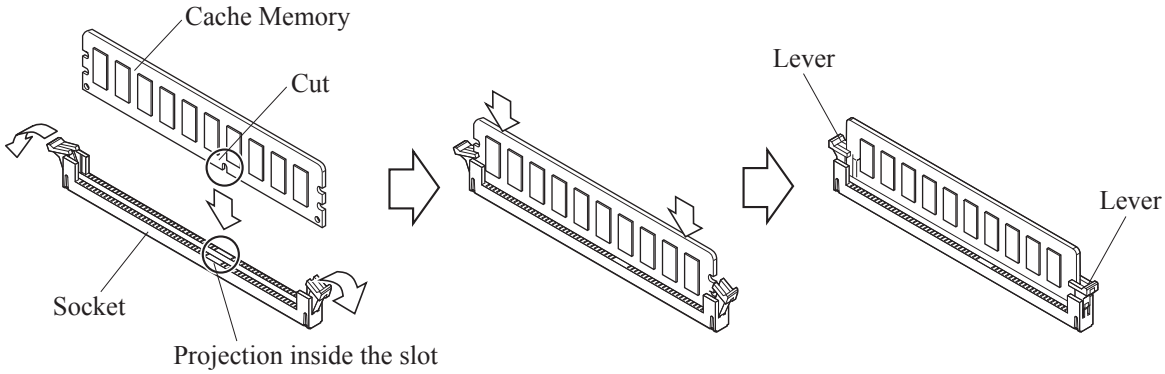
(b) Installation procedure

(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 by the fingers and fit it into the socket.

(iii) Check that the lever is firmly fitted in the Cache Memory.

Figure 2-64 Installation of the Cache Memory

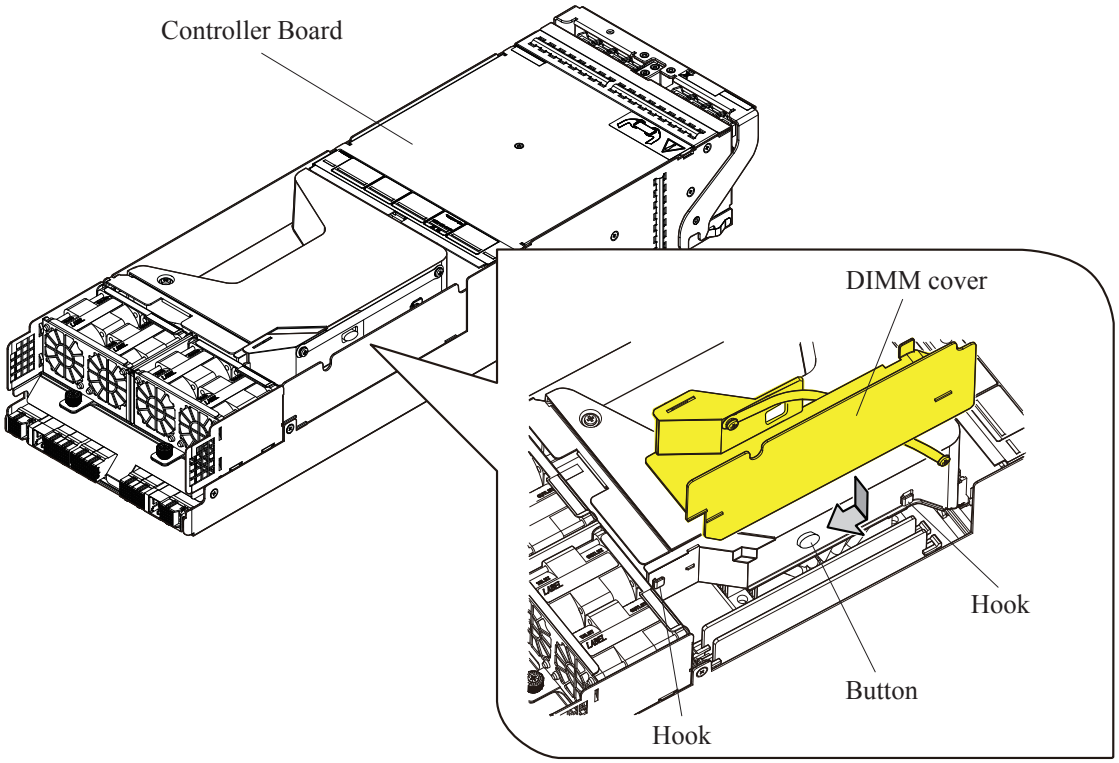


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(8) Slide the DIMM cover to the arrow direction to attach.

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

Figure 2-65 Installation of DIMM Cover

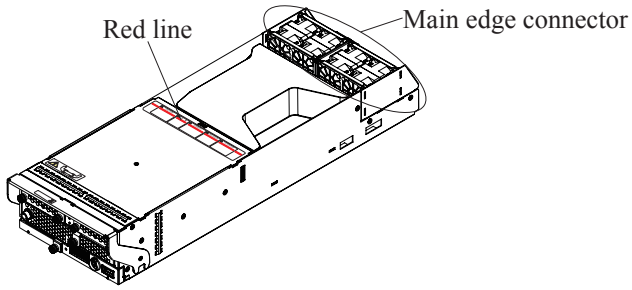


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(9) Installing a Controller Board.

⚠ CAUTION

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

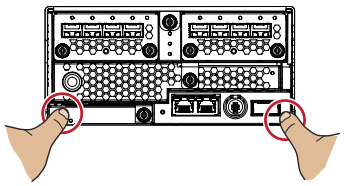


NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

(a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBSS/CBSL.

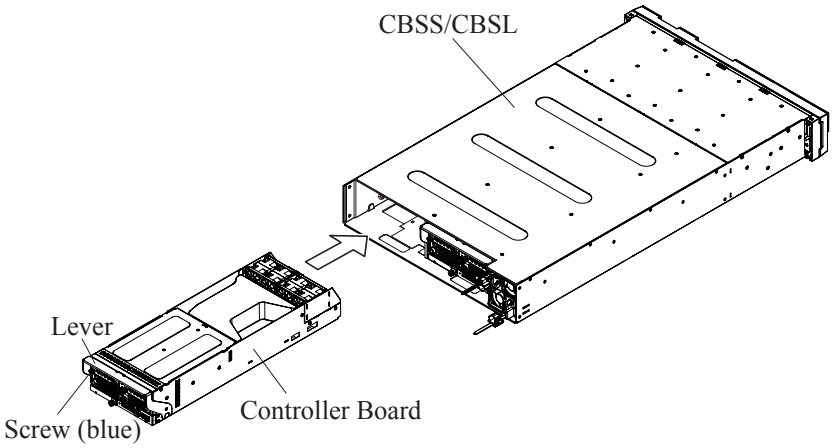
(b) Push the Controller Board to the end and close the lever completely. Push the Controller Board all the way in, and then the right and left levers closed completely.

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



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

Figure 2-66 Installation of Controller Board (CBSS/CBSL)



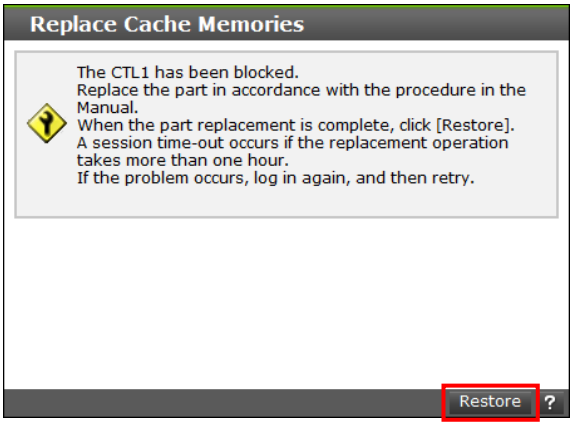
(10) Connect all the removed cables to the Controller Board.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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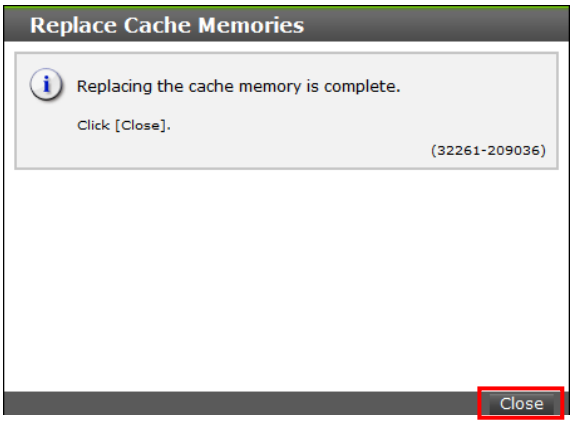
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



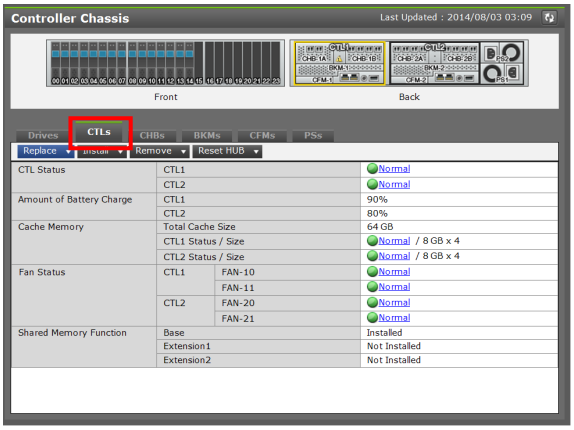
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



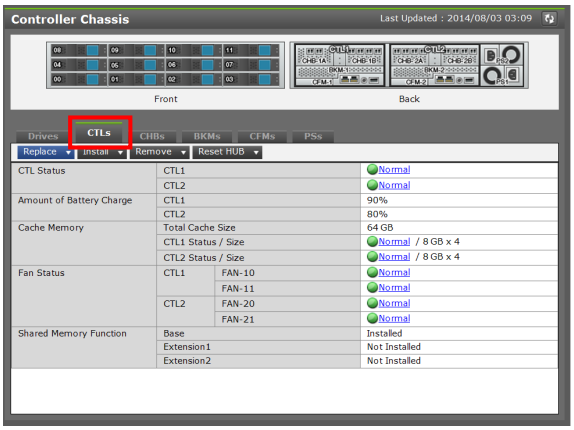
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

(3) Controller Chassis window
Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced Cache Memory is "Normal".

• In case of CBSS



• In case of CBSL



(4) 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

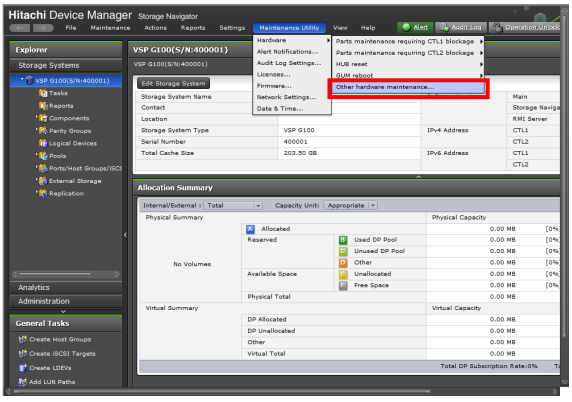
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2.5.2 Replacing a Cache Memory for CBLM/CBLH

NOTE:
- The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.
- When the NAS Modules are installed in the configuration, be sure to migrate EVS manually before maintenance operations.
  For the details of the EVS manual migration, see MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations".

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Cache Memory on the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the Cache Memory on the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

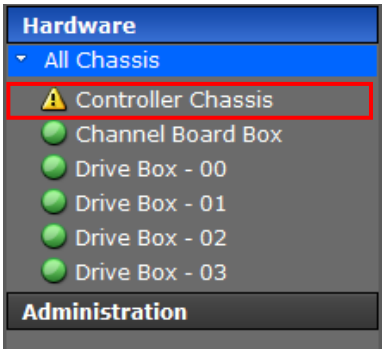


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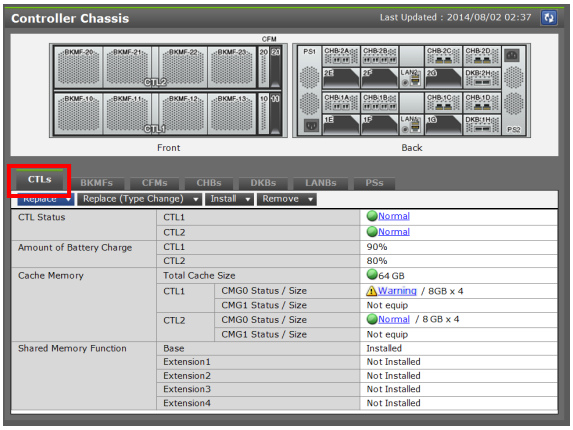
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



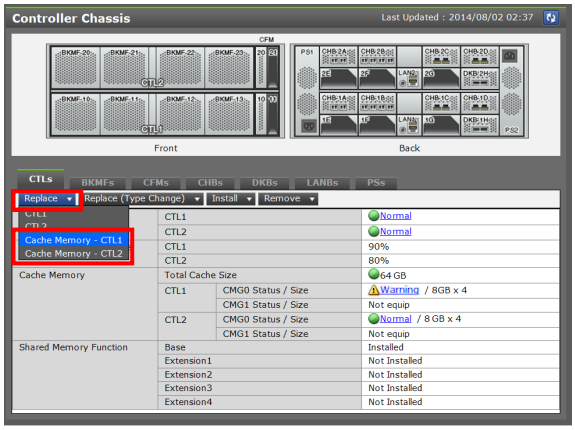
(2) <Controller Chassis window>
Click the [CTLs] tab in the “Controller Chassis” window to display a Cache Memory status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select Controller Board>

Click [Replace] and select a Controller Board in which a Cache Memory is installed.



(4) <Block Controller Board>

⚠ CAUTION

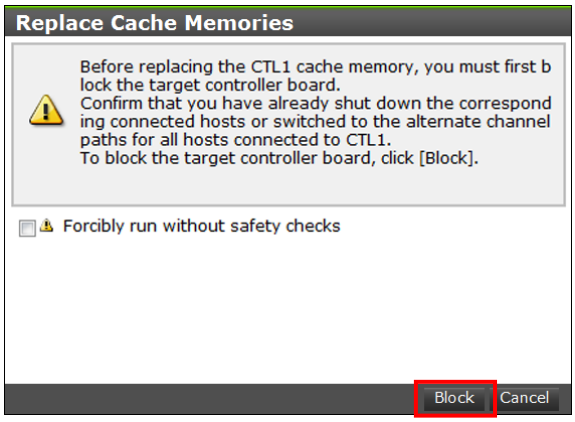
About "Forcibly run without safety checks":

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.

Check that the Controller Board has the Cache Memory to be replaced, and then click the [Block] button.

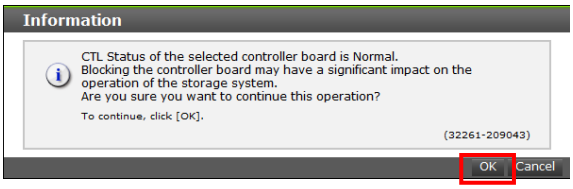
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

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.



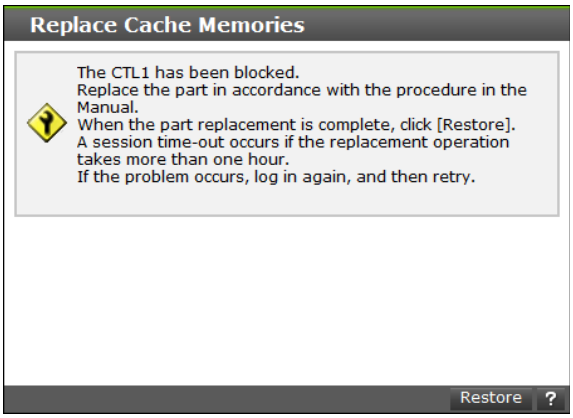
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(5) <Check Controller Board>
Check that the Controller Board to replace the Cache Memory is correct again and click the [OK] button.



(6) <Check the beginning of Cache Memories replacement>
Check that the Controller Board is blocked and becomes ready for replacing.

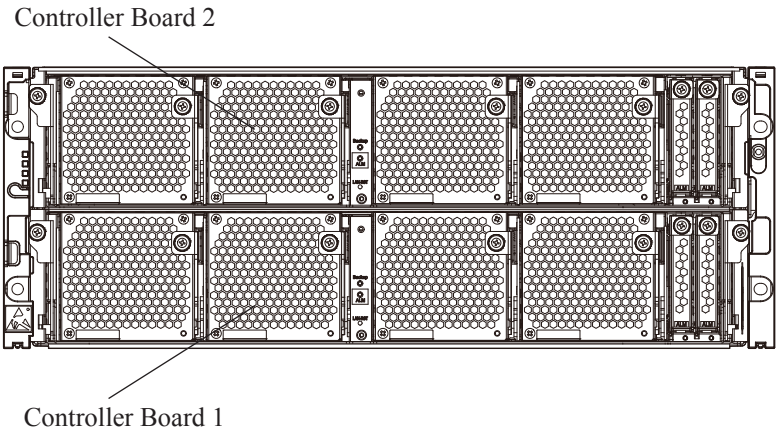
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBLM/CBLH Controller Board Replacement Processing

Location	Function Name of Component		Part Name
CBLM/CBLH (Front)	1	Cache Memory	• DKC-F810I-CM8G • DKC-F810I-CM16G • DKC-F810I-CM32G (CBLH only)

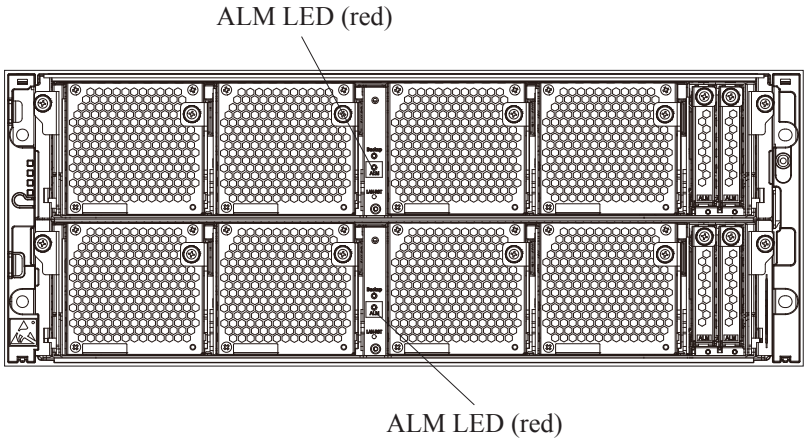


CBLM/CBLH (Front)

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBLM/CBLH Controller Board in which the Cache Memory to be replaced is installed lights up.

Figure 2-67 ALM LED Location



Controller Board

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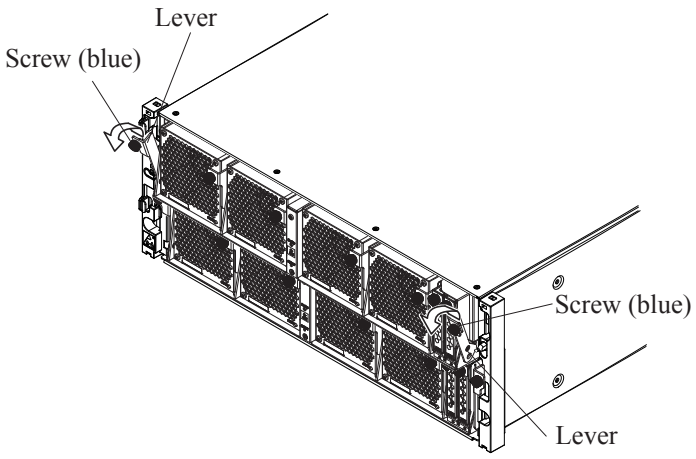
(2) Remove the Controller Board from the CBLM/CBLH.

⚠ 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 to be replaced in the front of the CBLM/CBLH and open the lever.

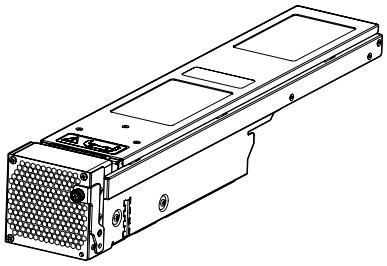
Figure 2-68 Removing Controller Board(CBLM/CBLH)



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 replacement.
The READY LED (green) on the front of CBLM/CBLH lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.5.2".

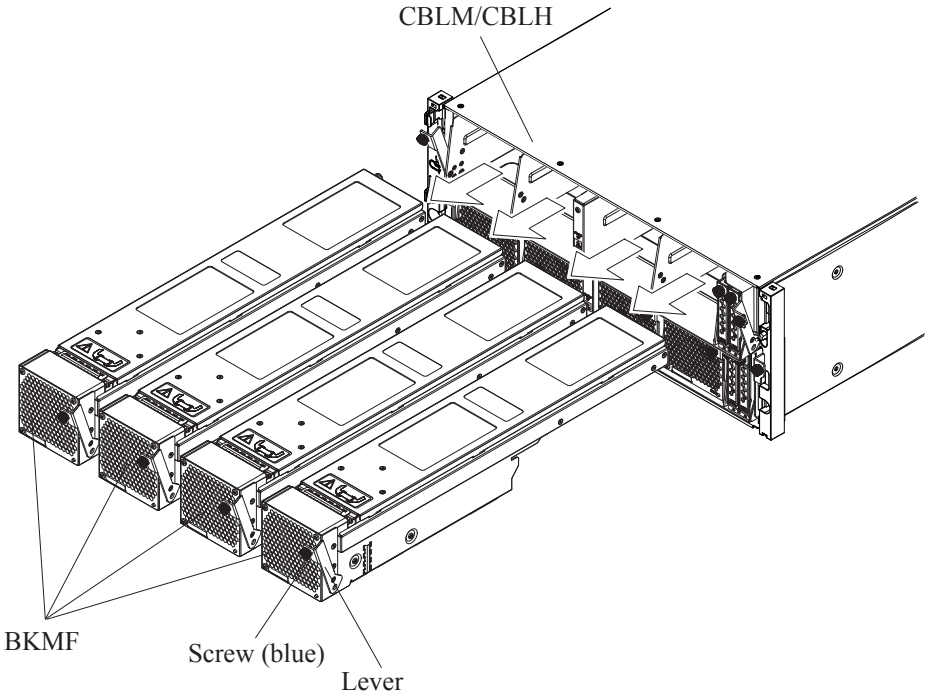
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NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



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

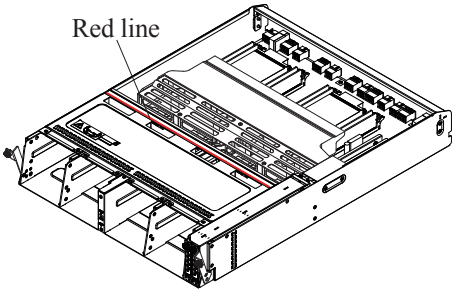
Figure 2-69 Removing BKMF(CBLM/CBLH)



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⚠ CAUTION

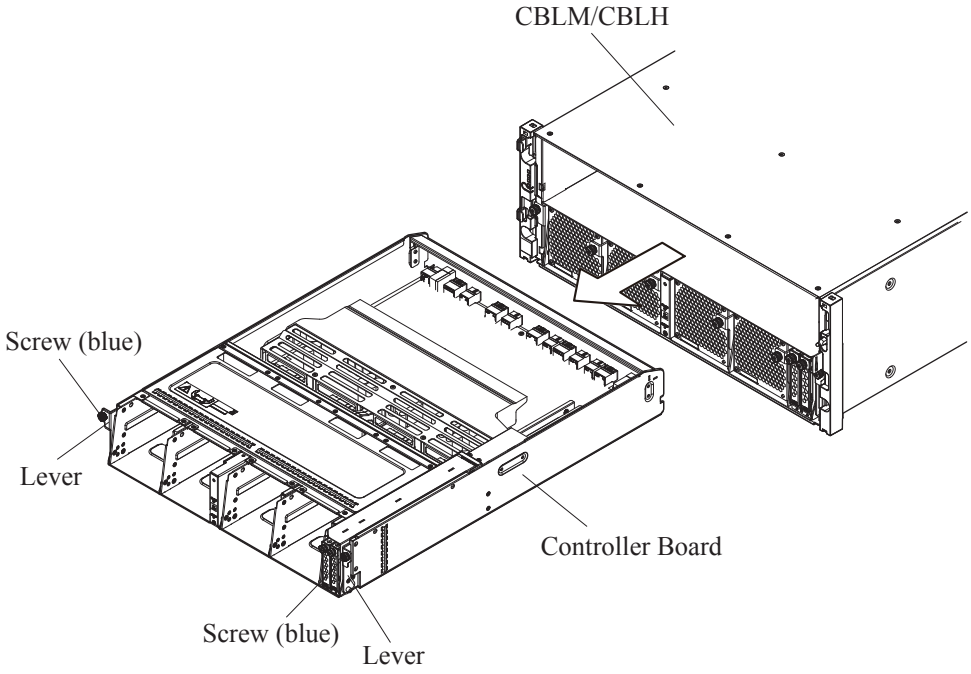
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



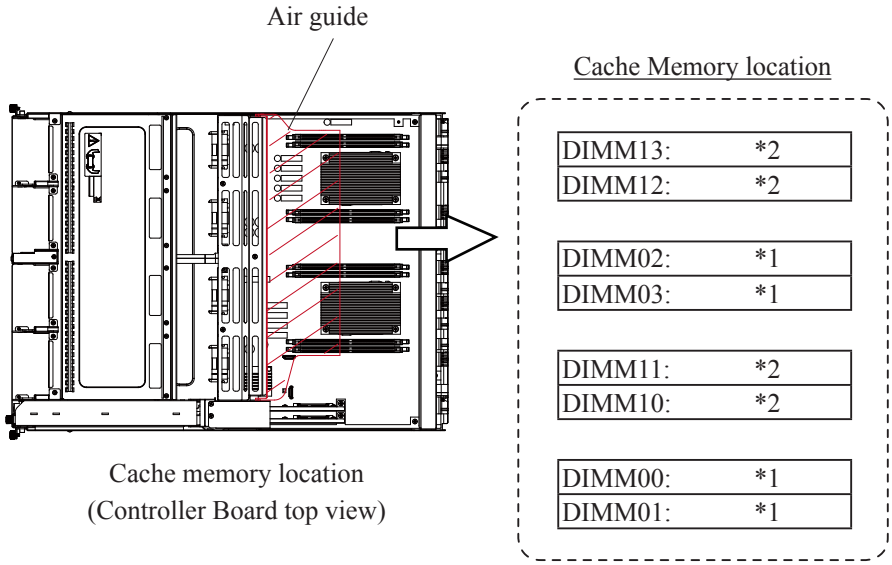
NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

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

Figure 2-70 Removing Controller Board (CBLM/CBLH)



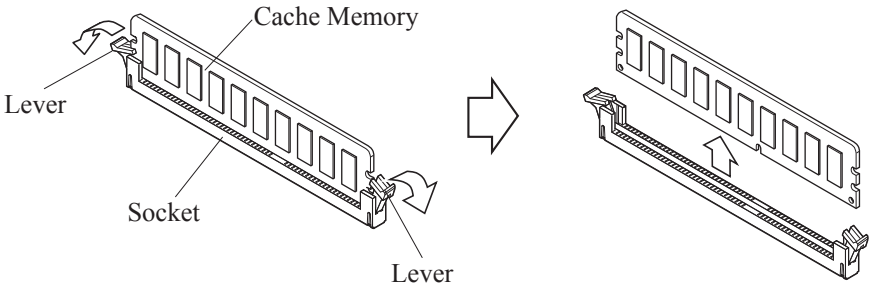
(3) Replace the failed Cache Memory with a new Cache Memory.



*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) Removal procedure
(i) Open the air guide.
(ii) Pull the lever outward.
(iii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-71 Removal of Cache Memory



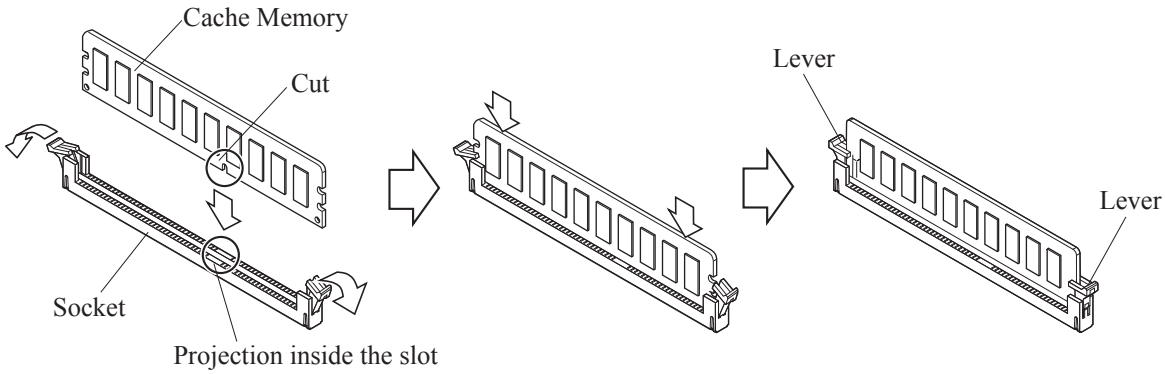
Copyright © 2015, 2017, Hitachi, Ltd.

(b) Installation procedure

NOTICE:	Do not put intense pressure on the cache memory to the extent that the printed-circuit board greatly bends after the cache memory is secured with the levers in installation procedure of the cache memory. The printed-circuit board may be damaged when intense pressure is applied.

(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 by the fingers and fit it into the socket.
(iii) Check that the lever is firmly fitted in the Cache Memory.
(iv) Close the air guide.

Figure 2-72 Installation of Cache Memory

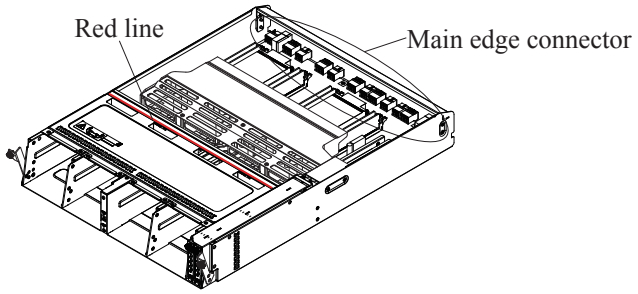


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(4) Install a new Controller Board.

⚠ CAUTION

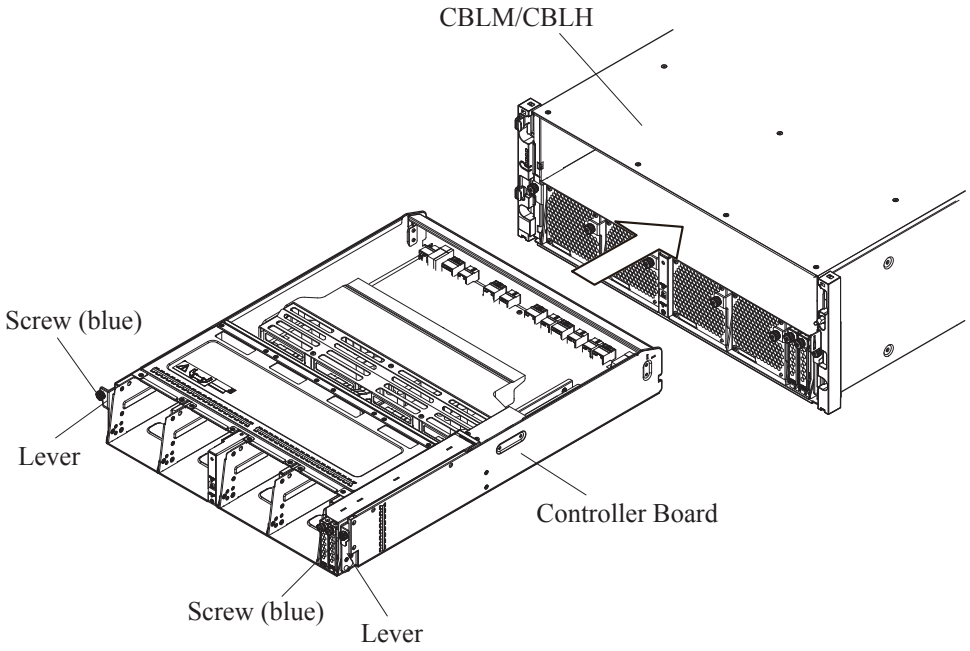
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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.

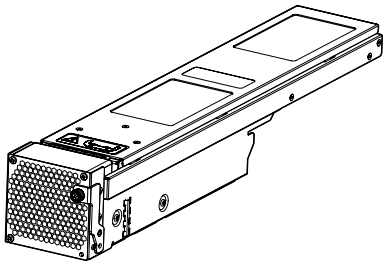
(a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBLM/CBLH.

Figure 2-73 Installing the Controller Board (CBLM/CBLH)



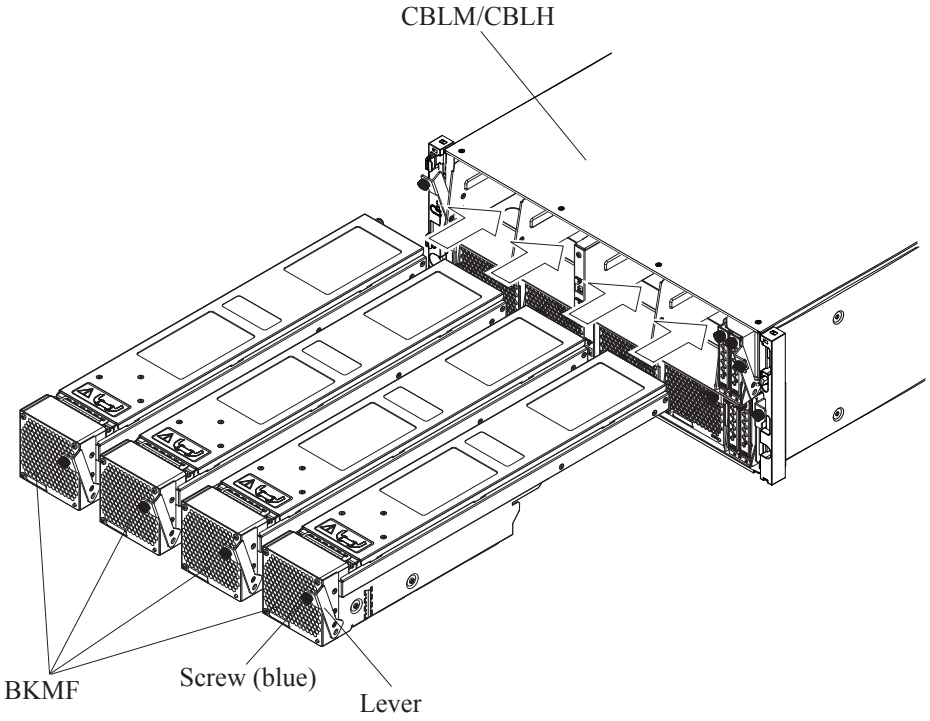
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NOTICE: When installing the BKMF, hold it with both hands and install it straight not to apply a shock to with any components.



(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.

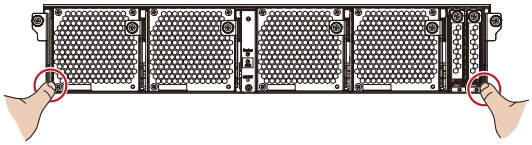
Figure 2-74 Installing the BKMF



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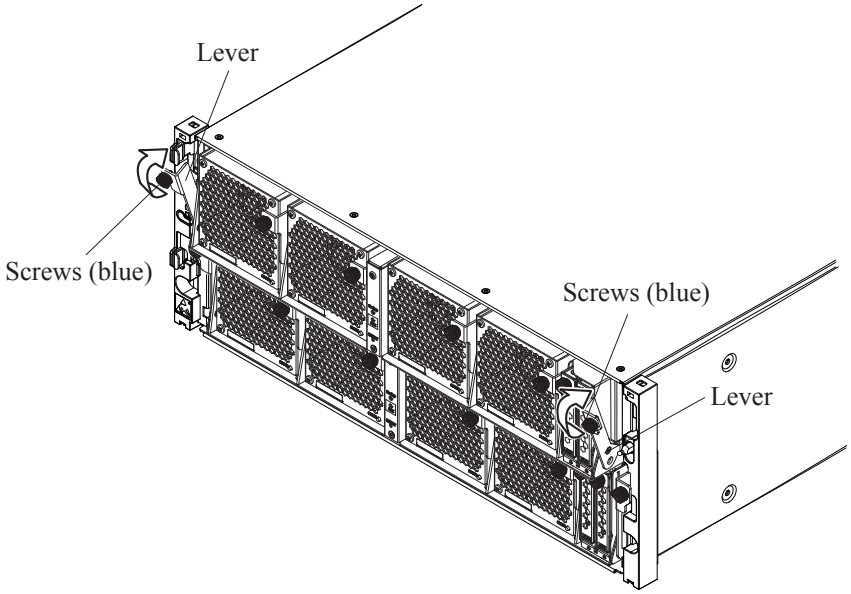
(c) Push the Controller Board all the way in, and then the right and left levers closed completely.

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 2-75 Fixing the Controller Board

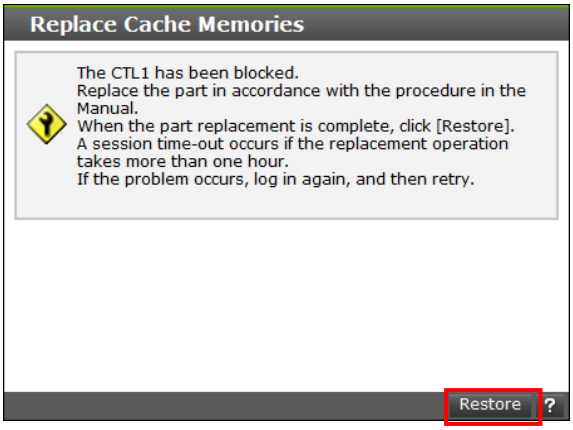


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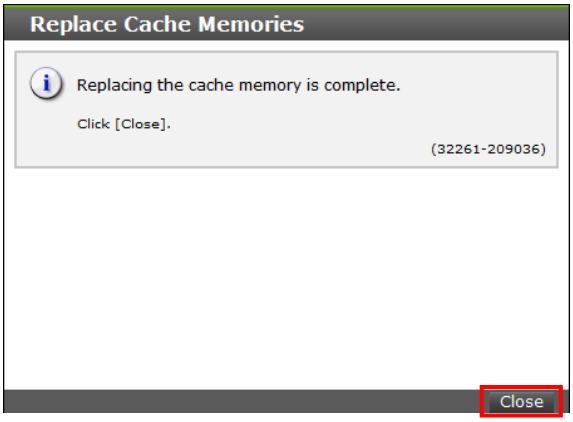
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



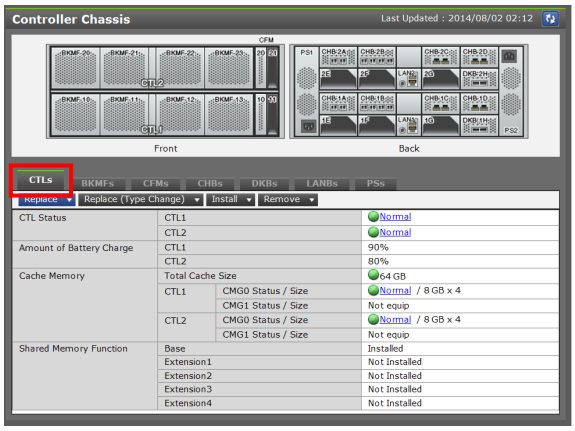
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

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(3) <Check Controller Board restoration>
Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced Controller Board is "Normal".



(4) 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

NOTE: For migration performed due to a failure, inform your customer that the EVS have been migrated to the NAS Module without failure.

In case of the NAS Module mounted configuration, the EVS manual migration to the post-maintenance NAS Module is required.
Perform the manual EVS migration with reference to Step 7.

---

7. 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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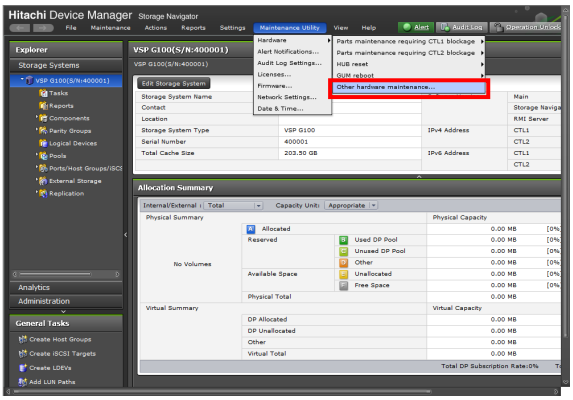
2.6 Replacing a FAN

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

This work is only required for the CBSS/CBSL.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the FAN on the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the FAN on the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

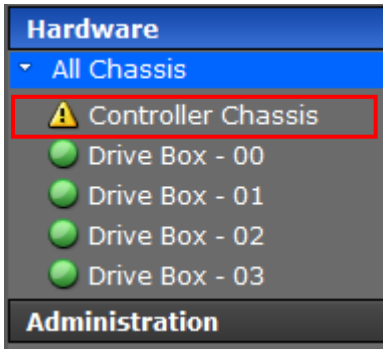


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3. Selecting replacement parts by Maintenance Utility.

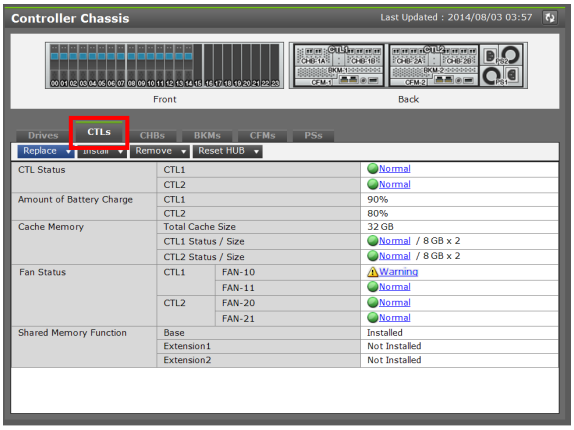
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

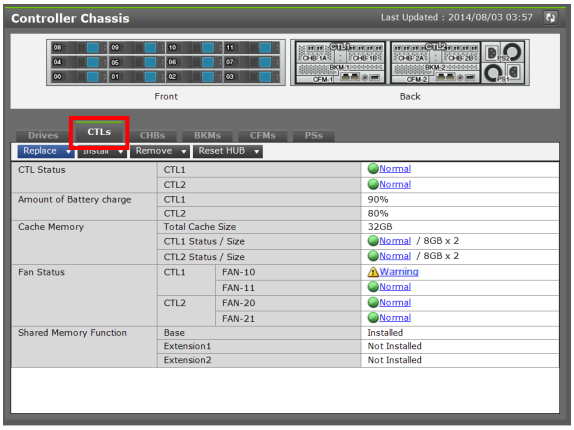


(2) <Controller Chassis window>
Click the [CTLs] tab in the “Controller Chassis” window and display the Fan status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

• In case of CBSS



• In case of CBSL

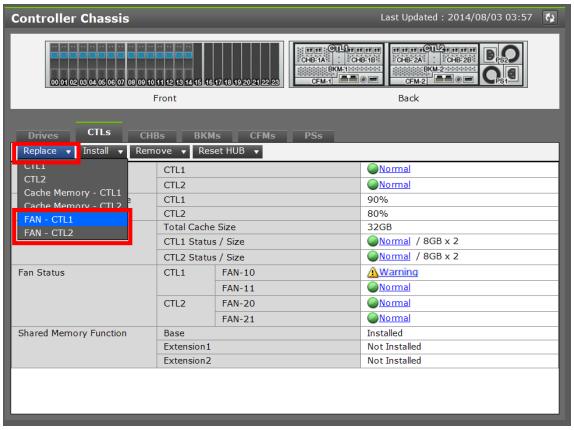


(3) <Select FAN-CTL>

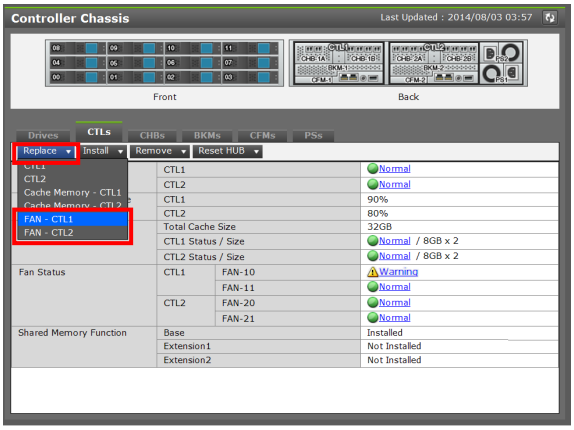
Click the [Replace] button and select a controller board in which a fan to be replaced is installed.

NOTE: Only a controller board to which the Maintenance PC is not connected is displayed.

• In case of CBSS



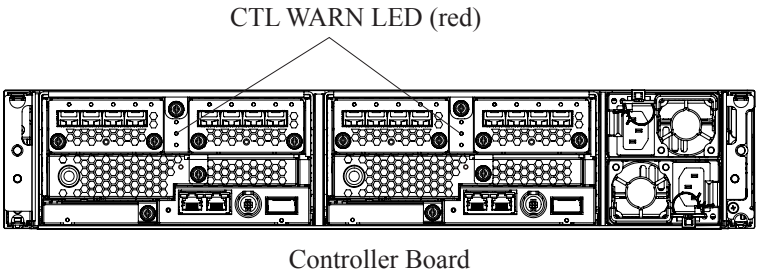
• In case of CBSL



(4) Check that the CTL WARN LED (amber) on the CBSS/CBSL Controller Board blinks up.

- Blinking once: Replace the FAN-x0.
- Blinking twice : Replace the FAN-x1.

Figure 2-76 CTL WARN LED Position

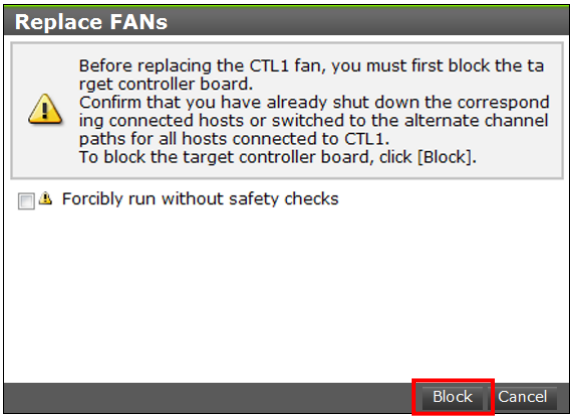


(5) <Block Controller Board>

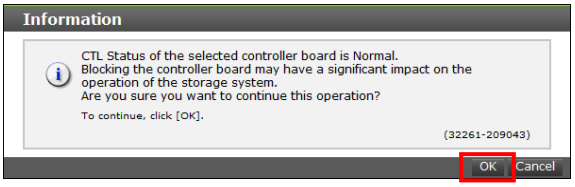
CAUTION

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.

Check that the Controller Board has the FAN to be replaced, and then click the [Block] 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".

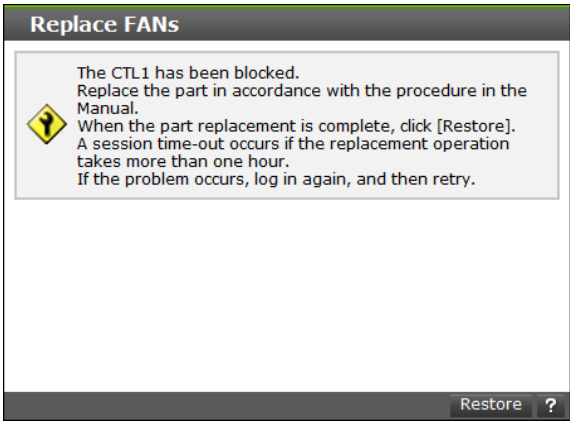


(6) <Check Controller Board>
Check that the Controller Board to replace the FAN is correct again and click the [OK] button.



(7) <Check the beginning of FAN replacement>
Block the Controller Board and check that the replacement is ready to start.

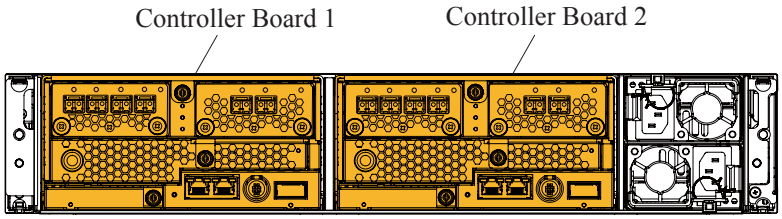
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. FAN Replacement Processing for CBSS/CBSL

Location	Function Name of Component		Part Name
Rear View of CBSS/CBSL	1	FAN	FAN

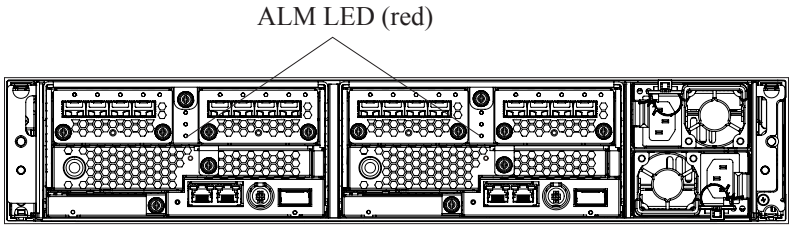


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBSS/CBSL Controller Board to be replaced lights up.

Figure 2-77 ALM LED Position



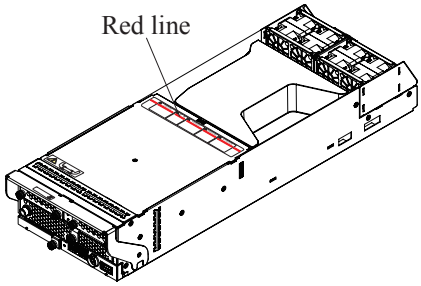
Controller Board

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

⚠ CAUTION

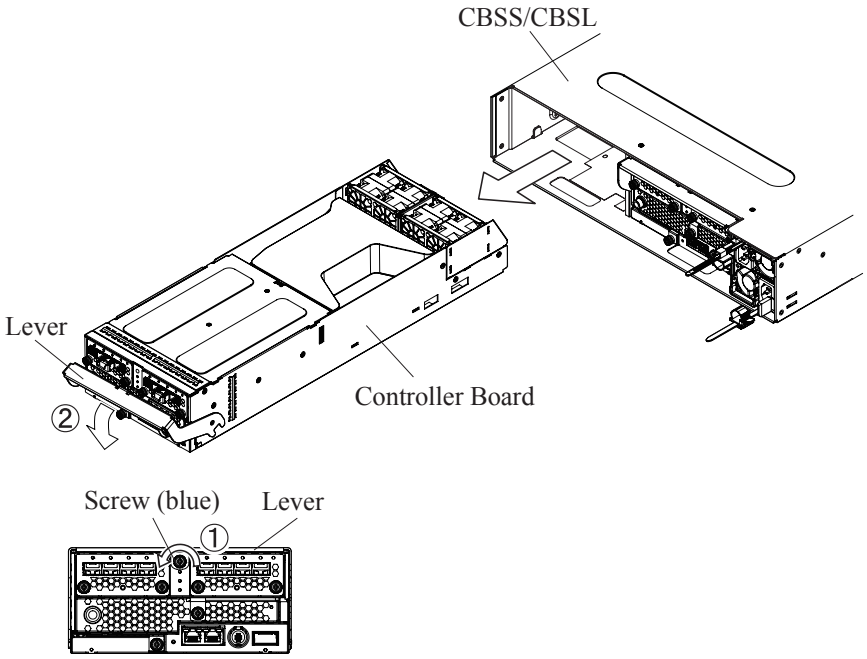
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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 screws (blue) fixing the Controller Board (①) and open the lever (②) completely.
(b) Remove the Controller Board while holding its body with both hands.

Figure 2-78 Removing the Controller Board

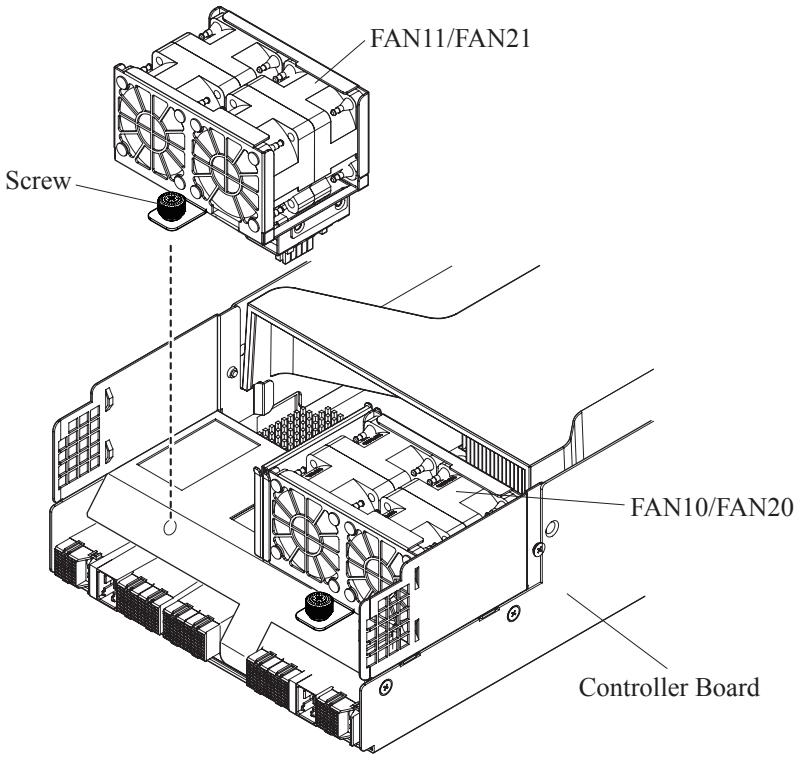


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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.6".

(4) Replace the FAN.
(a) Loosen the screw (blue) fixing the FAN to be replaced.
(b) Lift the FAN to pull out the cable from the connector.
(c) Connect the new FAN to the connector of the Controller Board.
(d) Tighten the screw (blue) and fix the FAN.

Figure 2-79 Replacing the FAN

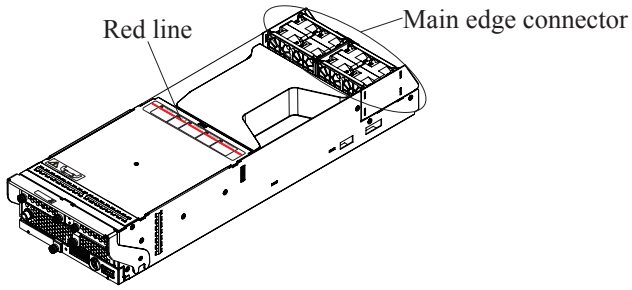


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(5) Install the Controller Board.

⚠ CAUTION

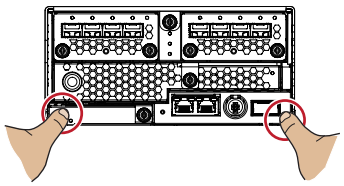
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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

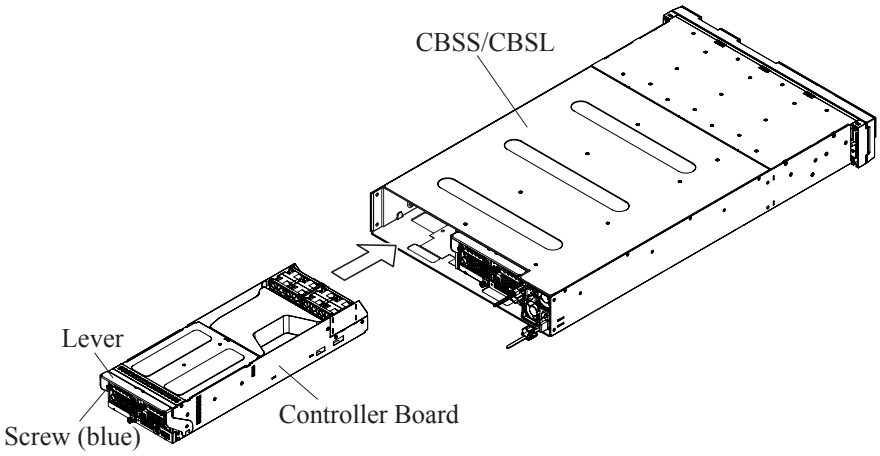
(a) With the levers on the Controller Board opened completely, insert the Controller Board into the slot of the CBSS/CBSL.
(b) Push the Controller Board all the way in and close the levers completely.

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



(c) Tighten the screws (blue) and fix the Controller Board.

Figure 2-80 Installing the Controller Board



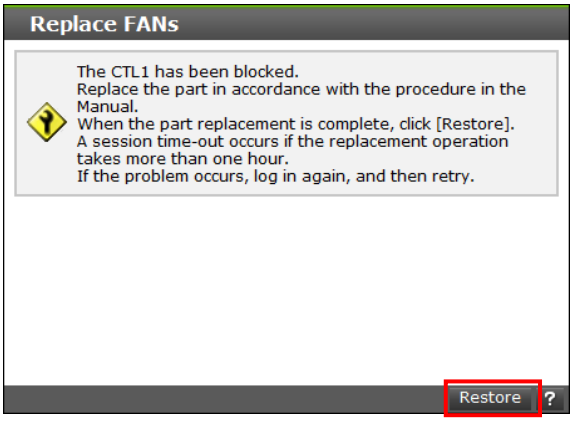
(6) Connect all the removed cables to the Controller Board.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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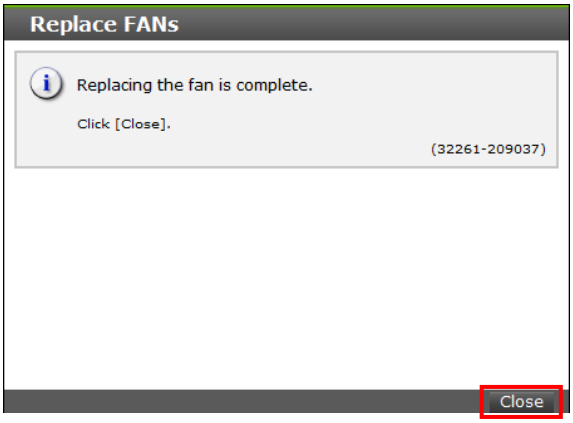
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



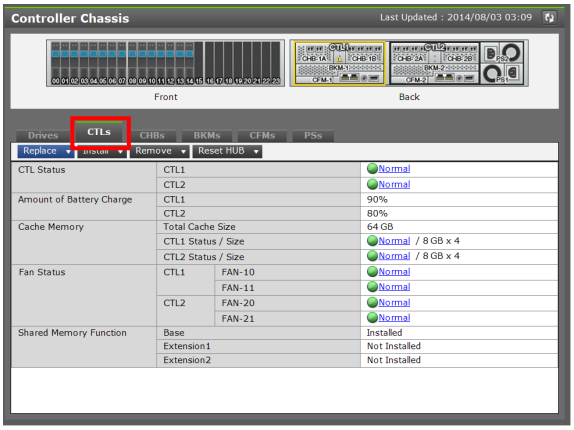
(2) <Check replacement parts Restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



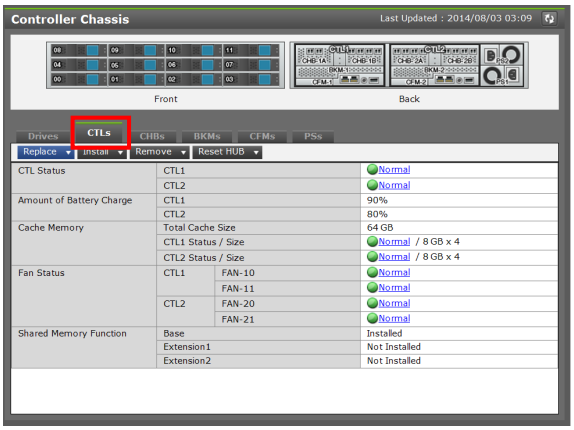
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

(3) <Controller Chassis window>
Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced FAN is "Normal.

• In case of CBSS



• In case of CBSL



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

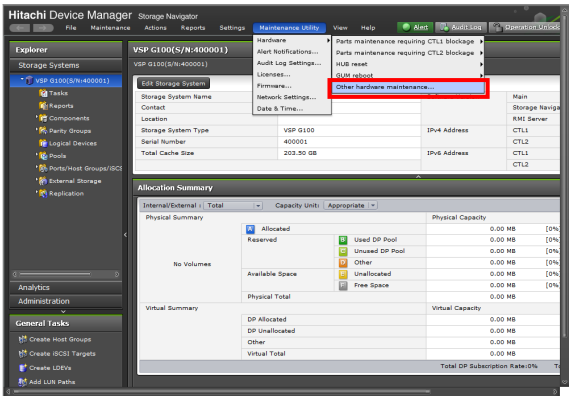
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2.7 Replacing a BKMF

This work is only required for the CBLM/CBLH.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the BKMF, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

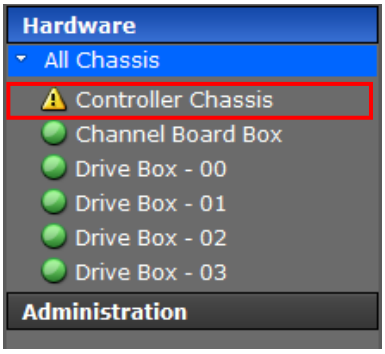


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3. Selecting replacement parts by Maintenance Utility.

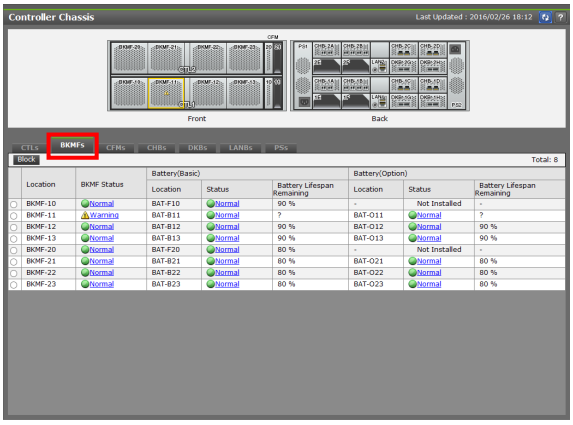
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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



(2) <Check BKMF>
Click the [BKMF] tab in the “Controller Chassis” window to check that the status of the BKMF to be replaced is “Warning”. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

NOTE: Do not click the [Block] button.



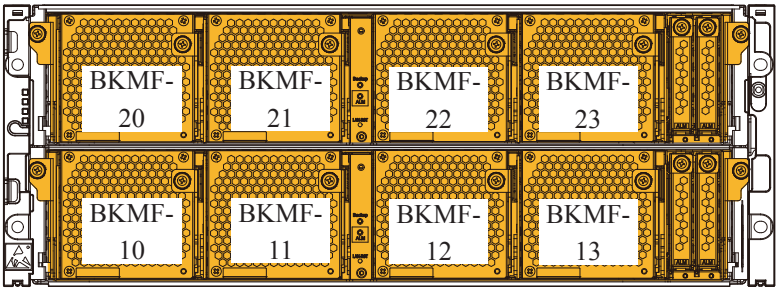
NOTE: When “Warning” is displayed in the “BKMF Status”, “?” is displayed for the “Battery Lifespan Remaining” of the batteries (Basic) (batteries (Option) if batteries are added). In this case, resolve “Warning” in “BKMF Status” to return “?” to a numeral value display.

NOTE: When performing the preventive replacement of a BKMF in which no error occurs, block the BKMF to be replaced and then replace the BKMF according to “2.8.2.1 Preventive Replacement of a Battery for BKMF”.

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4. BKMF Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLM/CBLH	1	BKMF	DW-F800-BKMF



Front view of CBLM/CBLH

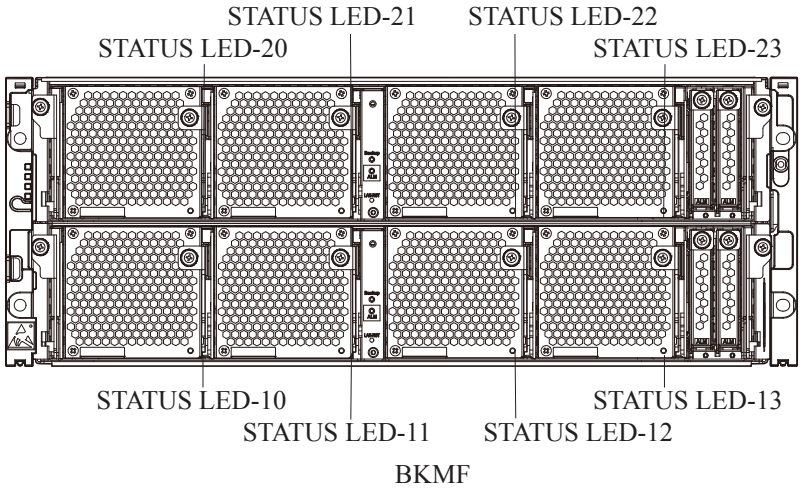
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing and Removing Parts".

⚠ 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) Check that the STATUS LED (red) on the CBLM/CBLH BKMF to be replaced lights up. When the LED does not light up, check the location of the BKMF to be replaced in the "Maintenance Utility" window.

Figure 2-81 STATUS LED Location

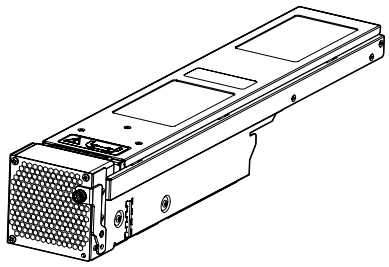


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(2) Replace the BKMF.

(a) Loosen the screw (blue) fixing the BKMF whose STATUS LED (red) lights up.

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



(b) Open the lever to pull out and remove the BKMF.

(c) Loosen the screw (blue) on the rear side of the BKMF.

(d) Slide the top panel of the BKMF and remove it.

(e) Hold the latch of the cable connector of the battery to be installed in the BKMF and remove the connector.

(f) Remove the Battery.

NOTE : The maximum of two Batteries are mounted.
Remove all batteries installed.

(g) Loosen the screw (blue) on the rear side of the new BKMF.

(h) Slide the top panel of the new BKMF and remove it.

(i) Install all the removed BKMs in the new BKMF and route cables along the groove of the BKMF.

NOTE : • When one Battery was removed, install a Battery in the front side (FAN side).
• When replacing the battery on the front side of the BKMF, route cables with careful attention to the bending condition.

(j) Connect cable connectors to the socket.

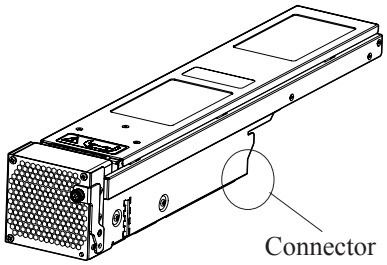
NOTE : • When one Battery was removed, connect a Battery to the connector on the standard installation side.
• Check that the connector latch is surely connected with a click.

(k) Slide the top panel of the BKMF and attach it.

(l) Tighten the screw (blue) on the rear side of the BKMF.

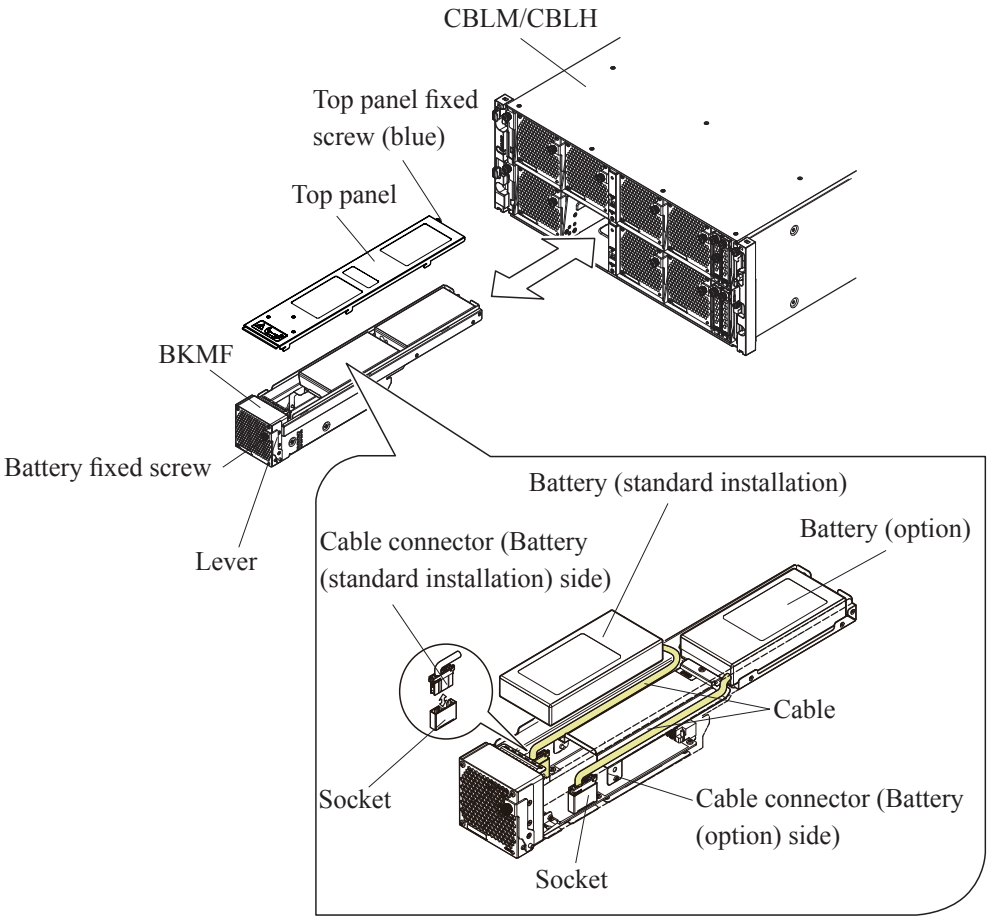
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NOTICE:
- Check that the connector of the BKFM has no deformation, damage or sticking of dust before installing the BKMF.
- When installing the BKMF, hold it with both hands and install it straight not to apply a shock to with any components.



(m) With the lever of the BKMF opened, insert the slot.
(n) Close the lever of the BKMF and tighten the screw (blue).

Figure 2-82 Replacement of BKMF



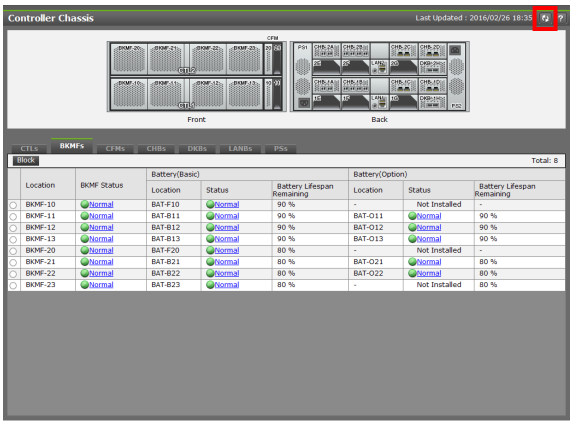
(3) Check that the STATUS LED (green) on the replaced BKMF is blinking.

5. Restoring replacement 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) <Check BKMF restoration>
Check that no alert icon is displayed for the replaced BKMF in the “Controller Chassis” window.

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



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.8 Replacing a Battery

The replacement procedure differs depending on the SIM reference code.
See the following.

- When the SIM reference code is “FFFAxx”: “2.8.1 Failure Replacement of a Battery (CBLM/CBLH)”
- When the SIM reference code is “AF41xx”: “2.8.2 Preventive Replacement of a Battery (CBLM/CBLH)”

2.8.1 Failure Replacement of a Battery (CBLM/CBLH)

Failure Replacement of a Battery is only for CBLM/CBLH.
Replacing a Battery for the CBSS/CBSL is performed in “2.9 Replacing/Preventive Replacement of a BKM”.

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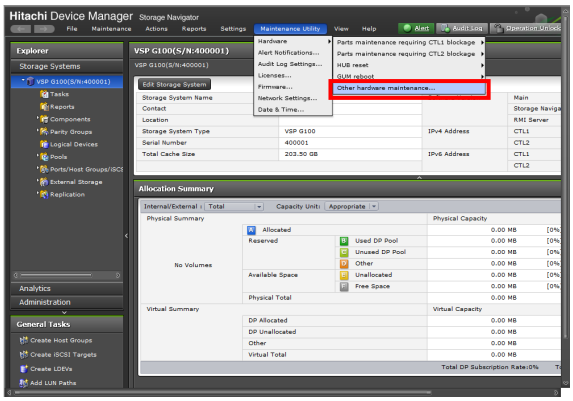
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2.8.1.1 Failure Replacement of a Battery for BKMF

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Batteries, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

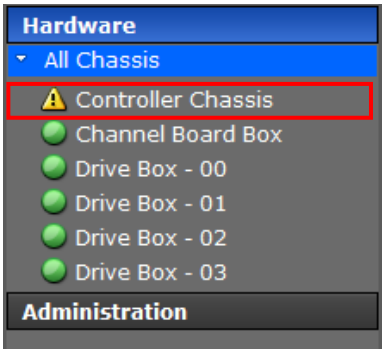
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



3. Selecting replacement parts by Maintenance Utility.

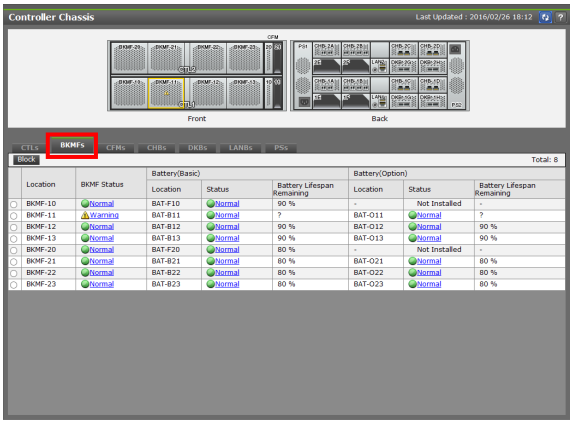
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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



(2) <Controller Chassis window>
Click the [BKMFs] tab in the “Controller Chassis” window to display a Battery status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

NOTE : In case of a battery failure, do not click the [Block] button.

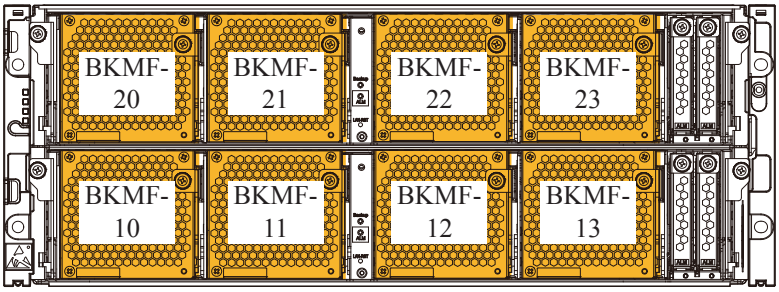


NOTE: When “Warning” is displayed in the “BKMF Status”, “?” is displayed for the “Battery Lifespan Remaining” of the batteries (Basic) (batteries (Option) if batteries are added). In this case, resolve “Warning” in “BKMF Status” to return “?” to a numeral value display.

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4. Battery Replacement Processing

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



Front view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

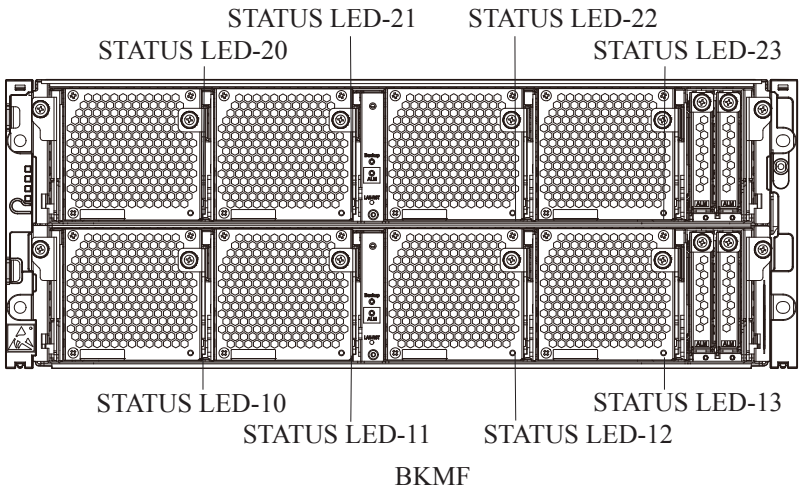
⚠ CAUTION

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. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

(2) Check that the STATUS LED (red) on the CBLM/CBLH BKMF to be replaced is blinking. When the LED does not blinking, check the location of the Battery to be replaced in the "Maintenance Utility" window.

Figure 2-83 STATUS LED Location (BKMF)



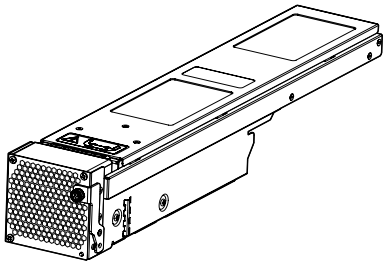
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(3) Replace the Battery.

⚠ CAUTION

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

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



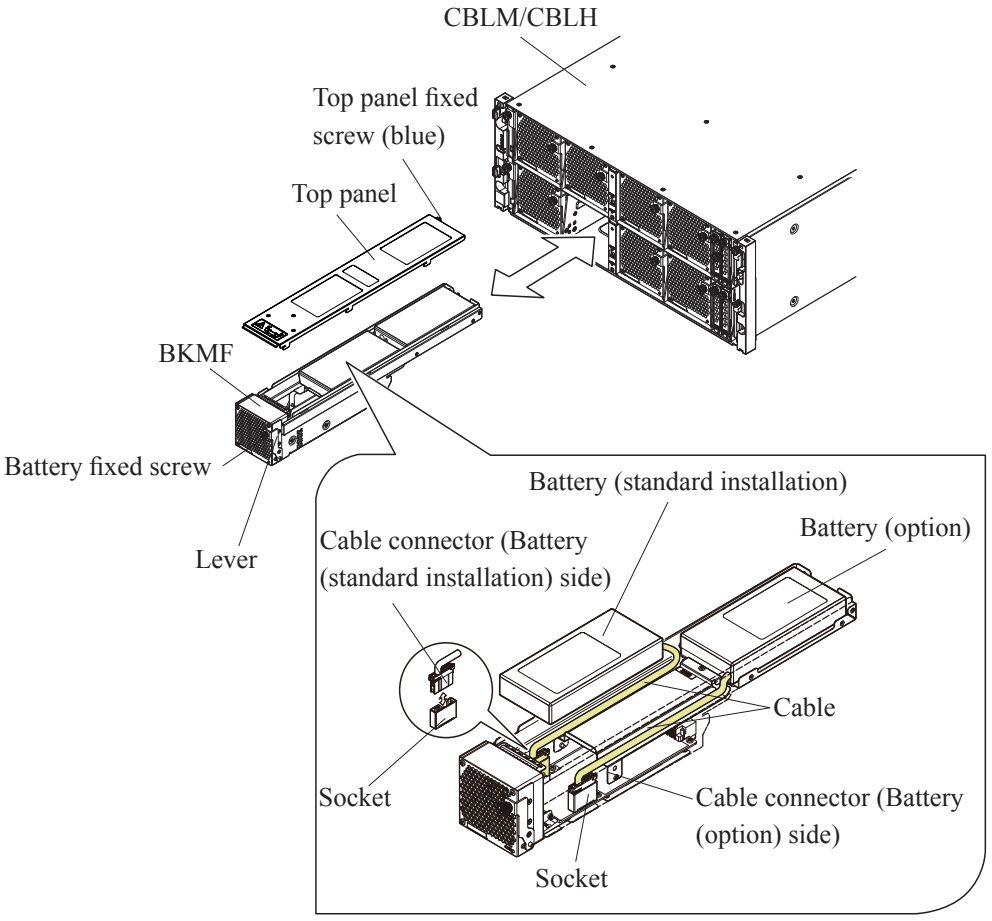
(a) Loosen the screw (blue) fixing the BKMF whose STATUS LED (red) is blinking.

NOTE : Check the battery to be replaced by the blinking pattern of the STATUS LED (red).
- Blinking once: Standard installation side
- Blinking twice: Option installation side
- Blinking three times: Both standard and option

(b) Open the lever to pull out and remove the BKMF.
(c) Loosen the screw (blue) on the rear side of the BKMF.
(d) Slide the top panel of the BKMF and remove it.
(e) Hold the latch of the cable connector of the Battery to be replaced and remove the connector from the socket.
(f) Remove the Battery to be replaced.

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Figure 2-84 Replacement of Battery



(g) Install a new Battery in the BKMF and route cables along the groove of the BKMF.

NOTE : • When one Battery was removed, install a Battery in the front side (FAN side).
• When replacing the battery on the front side of the BKMF, route cables with careful attention to the bending condition.

(h) Connect the cable connector to the socket.

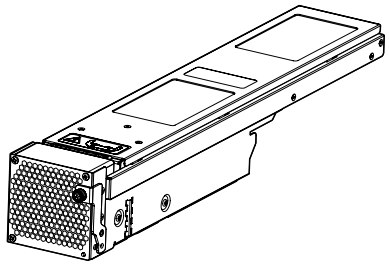
NOTE : • When one Battery was removed, connect a Battery to the connector on the standard installation side.
• Check that the connector latch is surely connected with a click.

(i) Slide the top panel of the BKMF and attach it.

(j) Tighten the screw (blue) on the rear side of the new BKMF.

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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.



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

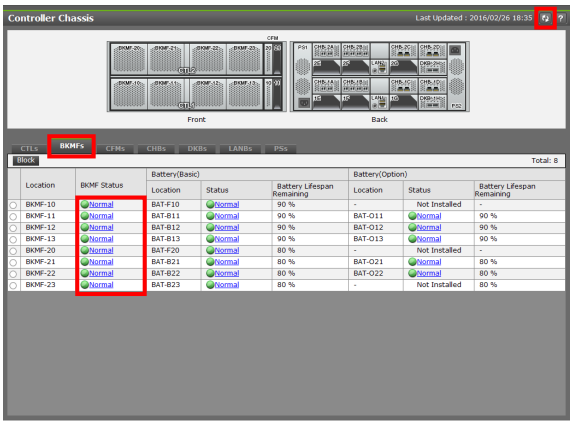
(4) Check that the STATUS LED (green) on the replaced BKMF is blinking.
(5) Attach the Front Bezel. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)
(6) Discard the replaced batteries.
Discard the batteries appropriately according to the law of the Storage System use place (refer to "3. Processing Method of Batteries").

5. Restoring replacement 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) <Check Battery restoration>
Click the [BKMFs] tab in the “Controller Chassis” window and check that a Status of the replaced Battery is Normal.

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



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.8.2 Preventive Replacement of a Battery (CBLM/CBLH)

Preventive Replacement of a Battery is only for CBLM/CBLH.

Replacing a Battery for the CBSS/CBSL is performed in “2.9 Replacing/Preventive Replacement of a BKM”.

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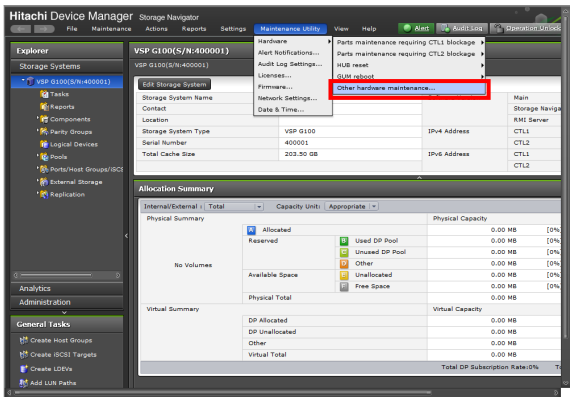
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2.8.2.1 Preventive Replacement of a Battery for BKMF

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Batteries, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

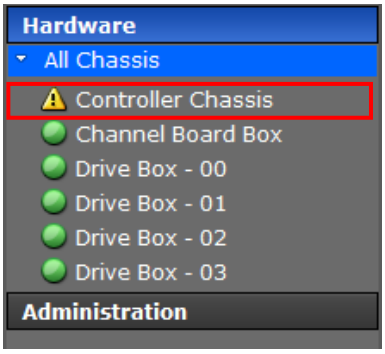


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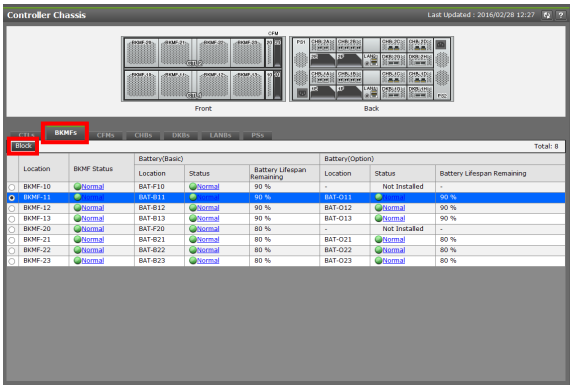
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



(2) <Controller Chassis window>
Click the [BKMF] tab in the “Controller Chassis” window and select a BKMF in which the battery for preventive replacement is installed. Click the [Block] button.



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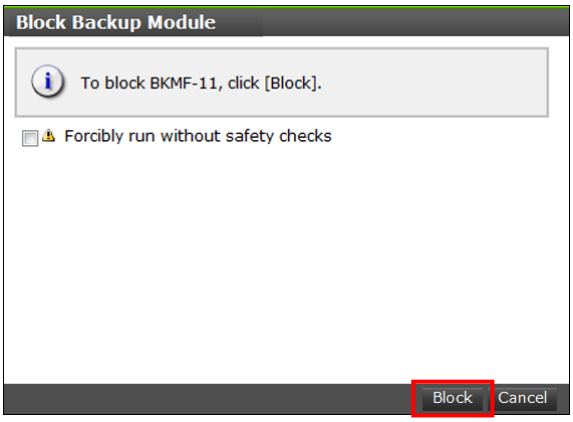
(3) <Block Controller Board>

⚠ 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.

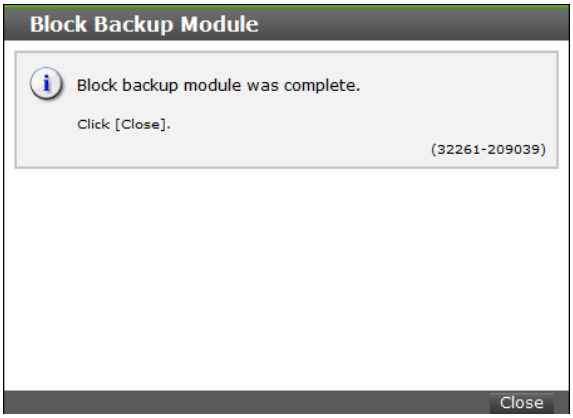
Check that the BKMF has the Battery to be replaced, and then click the [Block] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

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.



(4) <Check the beginning of Battery replacement>
Check that the BKMF is blocked and the Battery is ready to start the replacement.

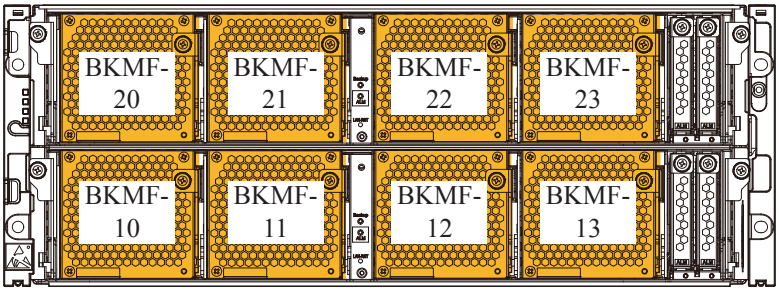
NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the replacement work.



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4. Battery Replacement Processing

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



Front view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

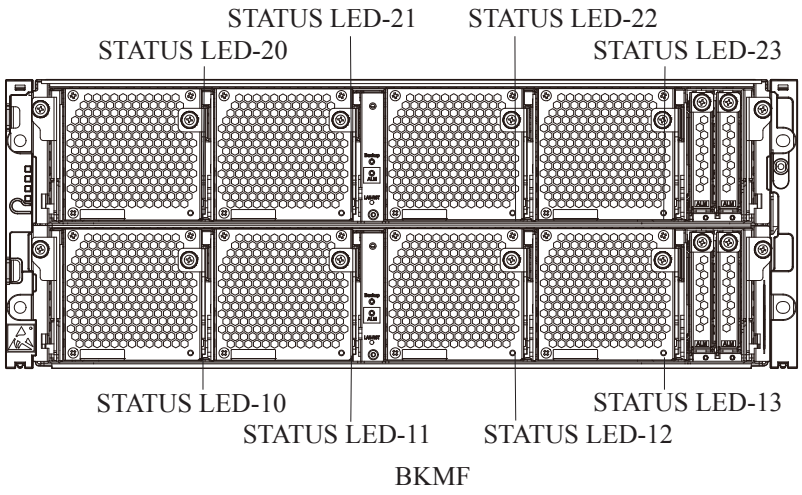
⚠ CAUTION

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. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

(2) Check that the STATUS LED (red) on the CBLM/CBLH BKMF to be replaced lights up.

Figure 2-85 STATUS LED Location (BKMF)



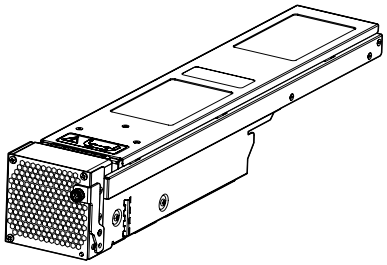
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(3) Replace the Battery.

⚠ CAUTION

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

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

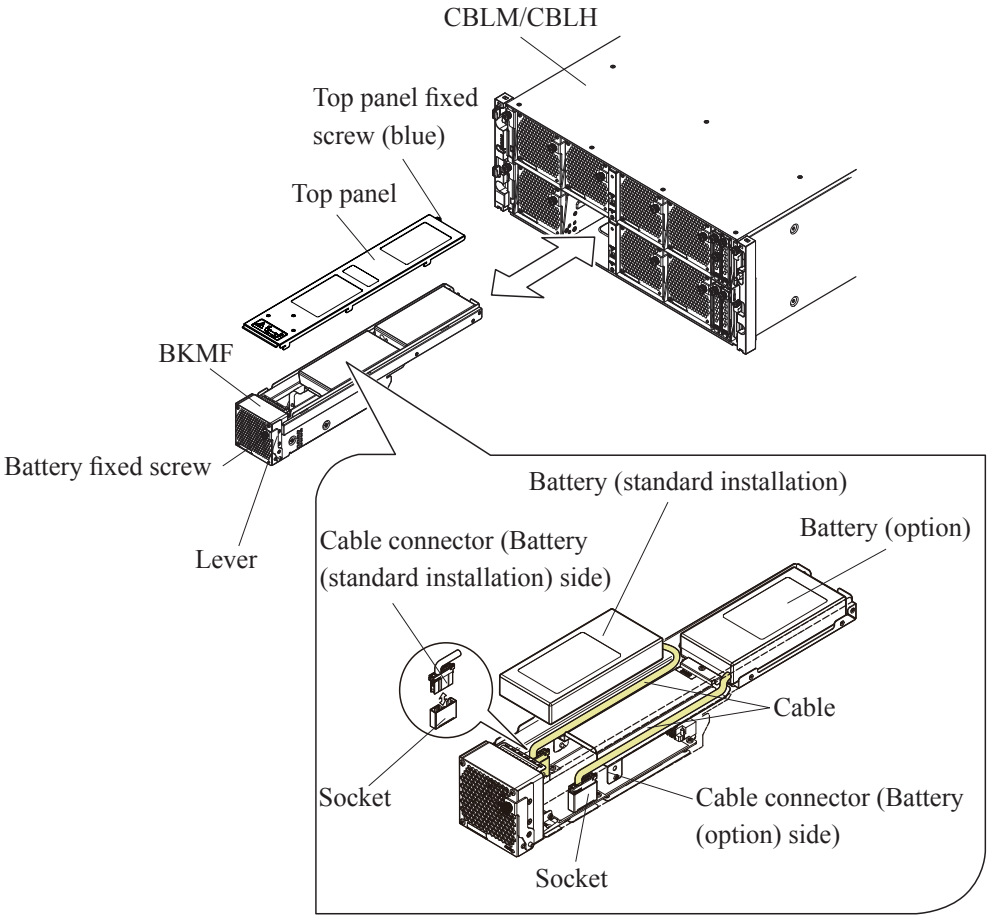


(a) Loosen the screw (blue) fixing the BKMF whose STATUS LED (red) is blinking.

NOTE : Check the battery to be replaced by the blinking pattern of the STATUS LED (red).
- Blinking once: Standard installation side
- Blinking twice: Option installation side
- Blinking three times: Both standard and option

(b) Open the lever to pull out and remove the BKMF.
(c) Loosen the screw (blue) on the rear side of the BKMF.
(d) Slide the top panel of the BKMF and remove it.
(e) Hold the latch of the cable connector of the Battery to be replaced and remove the connector from the socket.
(f) Remove the Battery to be replaced.

Figure 2-86 Replacement of Battery



(g) Install a new Battery in the BKMF and route cables along the groove of the BKMF.

NOTE : • When one Battery was removed, install a Battery in the front side (FAN side).
• When replacing the battery on the front side of the BKMF, route cables with careful attention to the bending condition.

(h) Connect the cable connector to the socket.

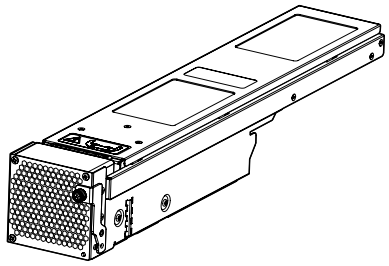
NOTE : Check that the connector latch is surely connected with a click.

(i) Slide the top panel of the BKMF and attach it.

(j) Tighten the screw (blue) on the rear side of the new BKMF.

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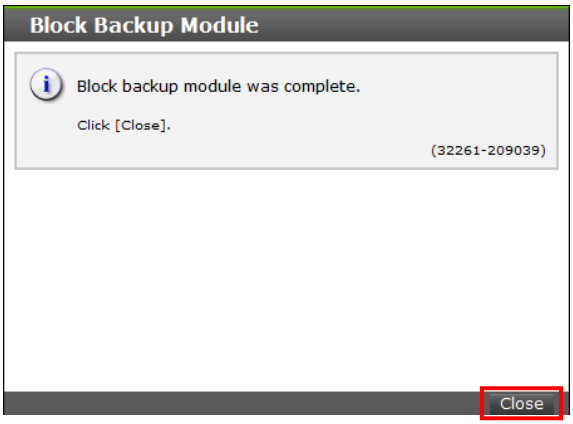
NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to with any components.



(k) With the lever of the new BKMF opened, insert the BKMF into the slot.
(l) Close the lever of the BKMF and tighten the screw (blue).
(m) Discard the replaced batteries.
Discard the batteries appropriately according to the law of the Storage System use place (refer to "3. Processing Method of Batteries").

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5. Restoring replacement parts by Maintenance Utility
   (1) <Check replacement parts restoration>
   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".



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

6. Check that the STATUS LED (green) on the replaced BKMF is blinking or lights up.

7. Attach the Front Bezel. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

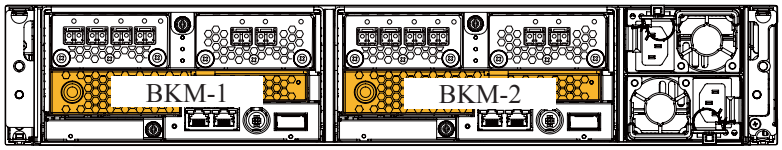
8. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.8.3 Replacement of a Battery for BKM (Factory and distribution center only)

1. Battery Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	Battery	Battery



Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

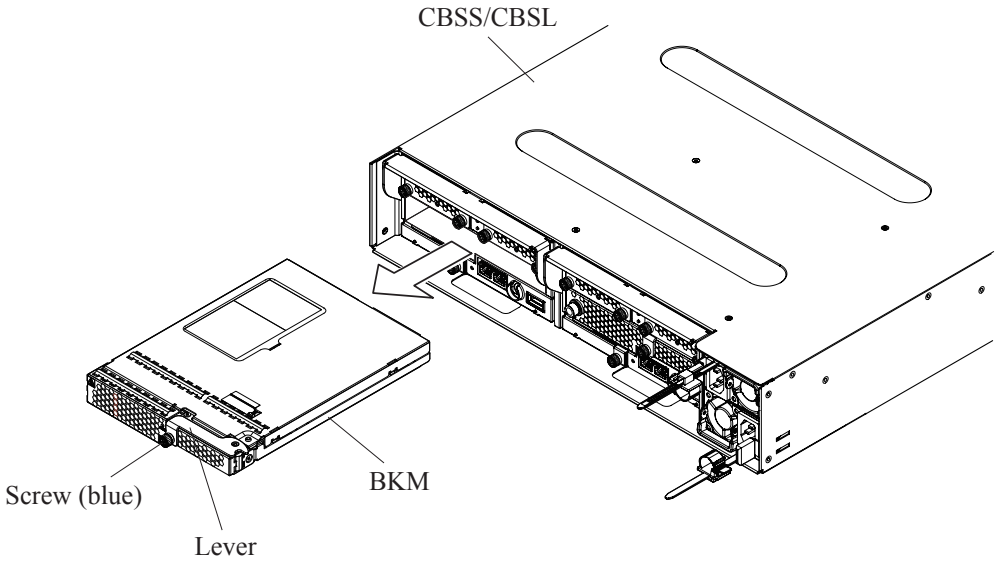
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(1) Replace the Battery.

> **⚠ CAUTION**
>
> Use only with designated Battery.
> May cause overheating, fire or bursting.

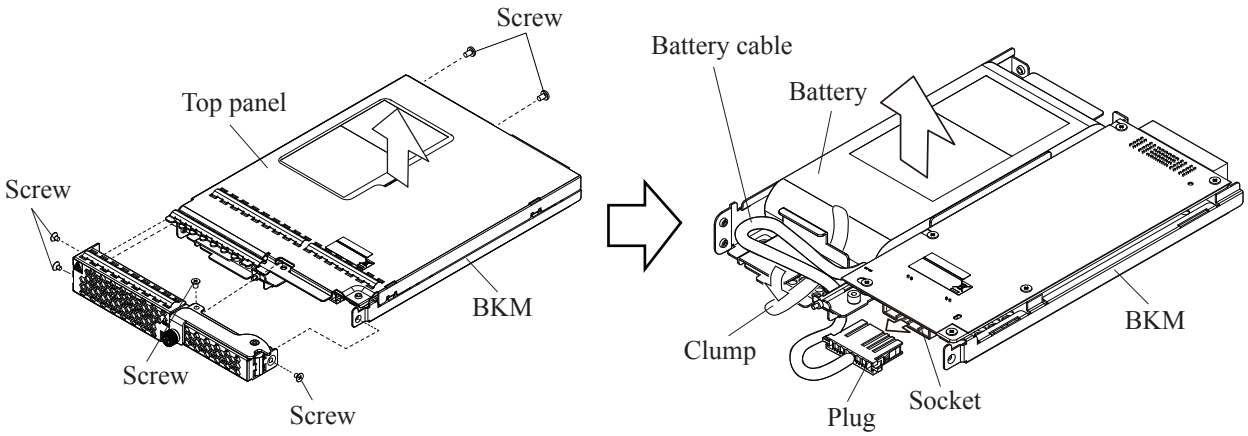
(a) Loosen the screw (blue) fixing the BKM.
(b) Open the lever.
(c) Pull out and remove the BKM while holding its body with both hands.

Figure 2-87 Replacement of BKM



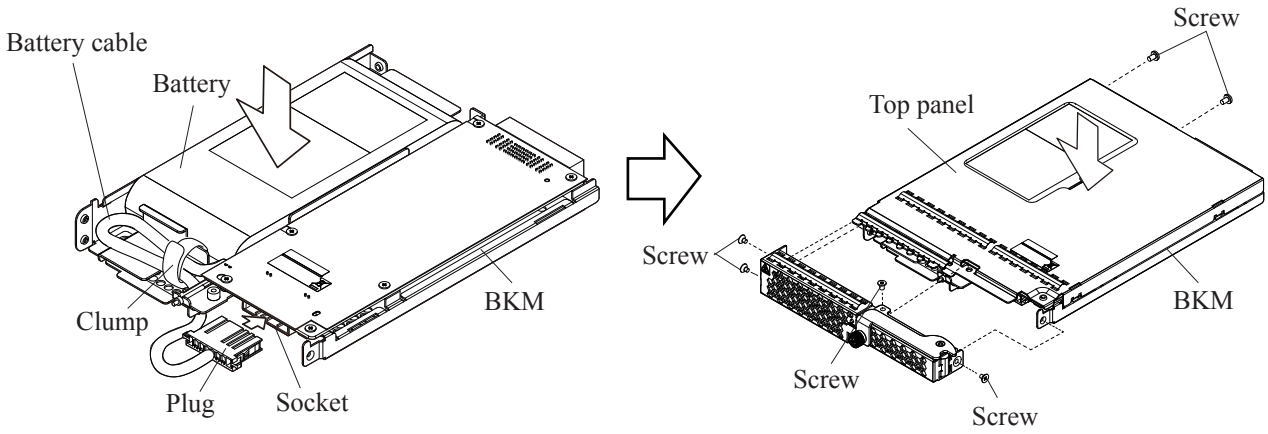
(d) Remove the screws (four places) on the front of the BKM and remove the front panel.
(e) Remove the screws (two places) on the rear of the BKM and remove the top panel.
(f) Open the clamp bundling the battery cable.
(g) Pull the plug of the battery cable out of the socket.
(h) Remove the battery.

Figure 2-88 Removing Batteries



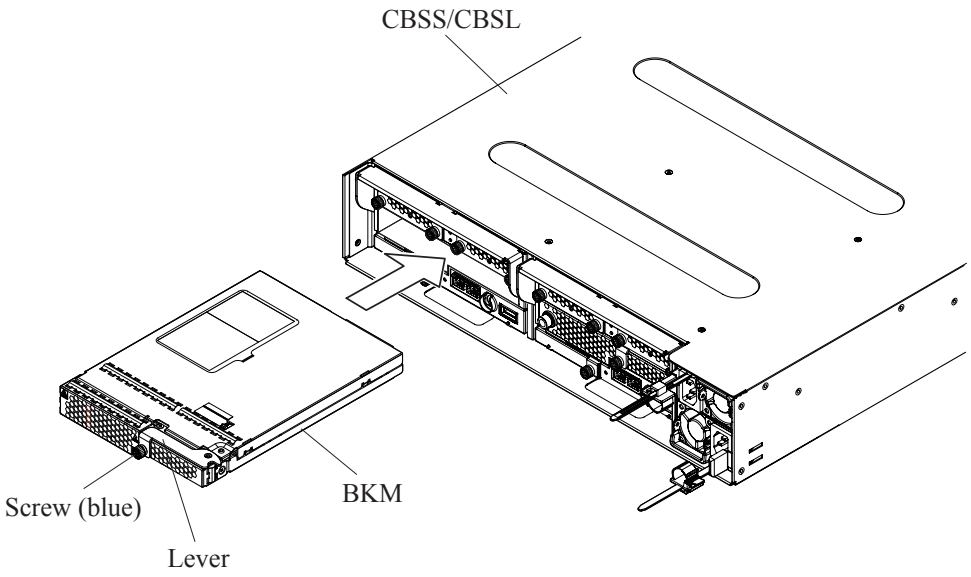
(i) Install a new Battery in the BKM.
(j) Insert the plug of the battery cable into a socket.
(k) Route the battery cable as it was and bundle it with a clamp.
(l) Attach the top panel and tighten the screws (two places) on the rear of the BKM to fix.
(m) Attach the front panel on the front of the BKM and tighten the screws (four places) to fix.

Figure 2-89 Attachment of Battery



(n) Open the BKM lever and insert the BKM into the slot.
(o) Push the BKM all the way in.
(p) Close the lever and tighten the screw (blue) to fix the BKM.

Figure 2-90 Attachment of BKM



(2) Discard the replaced batteries.
Discard the batteries appropriately according to the law of the Storage System use place (refer to "3. Processing Method of Batteries").

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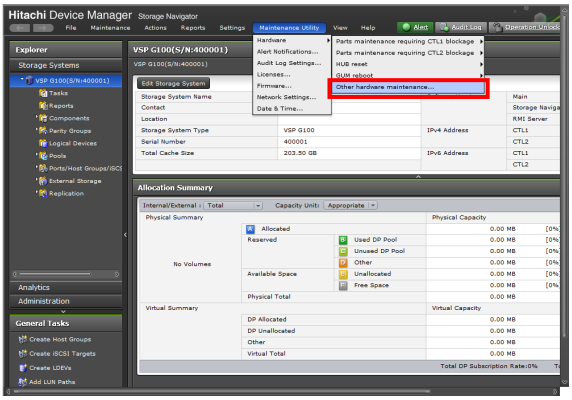
2.9 Replacing/Preventive Replacement of a BKM

2.9.1 Replacing a BKM

This work is only required for the CBSS/CBSL.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the BKM, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

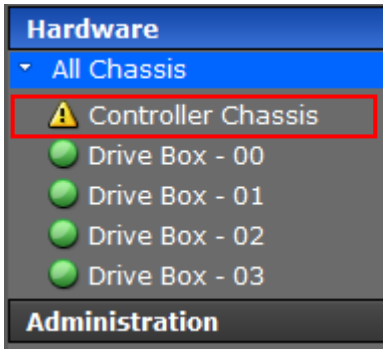


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3. Selecting replacement parts by Maintenance Utility.

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

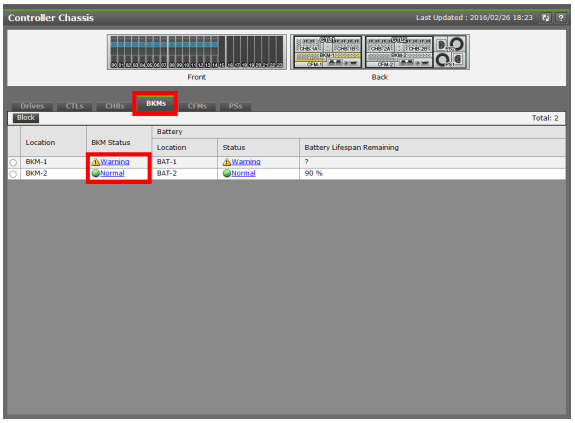
(1) <Main window>
Select [Controller Chassis] in the main window.



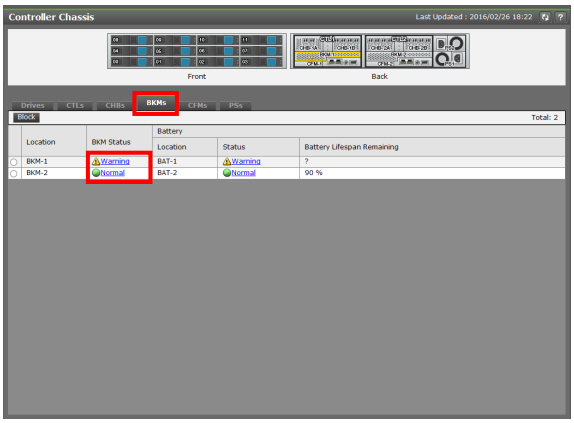
(2) <Controller Chassis window>
Click the [BKM] tab in the "Controller Chassis" window to check that the status of the BKMF to be replaced is "Warning". See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].

NOTE: Do not click the [Block] button.

• In case of CBSS



• In case of CBSL

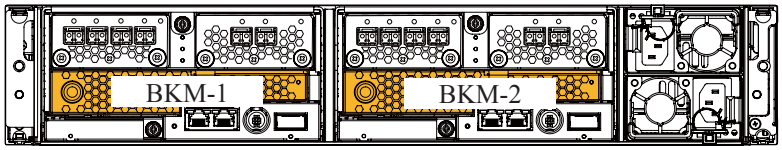


NOTE: When "Warning" is displayed in the "BKM Status", "?" is displayed for the "Battery Lifespan Remaining" of the batteries.
In this case, resolve "Warning" in "BKM Status" to return "?" to a numeral value display.

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4. BKM Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	BKM	BKM

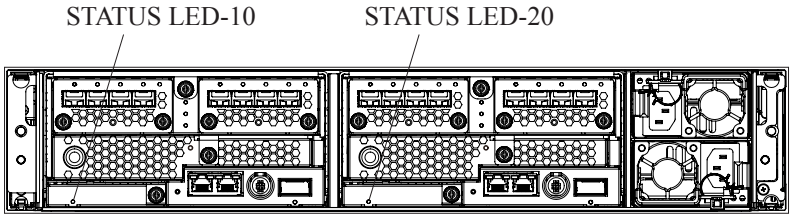


Front view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the CBSS/CBSL BKM to be replaced lights up.

Figure 2-91 STATUS LED Location (BKM)

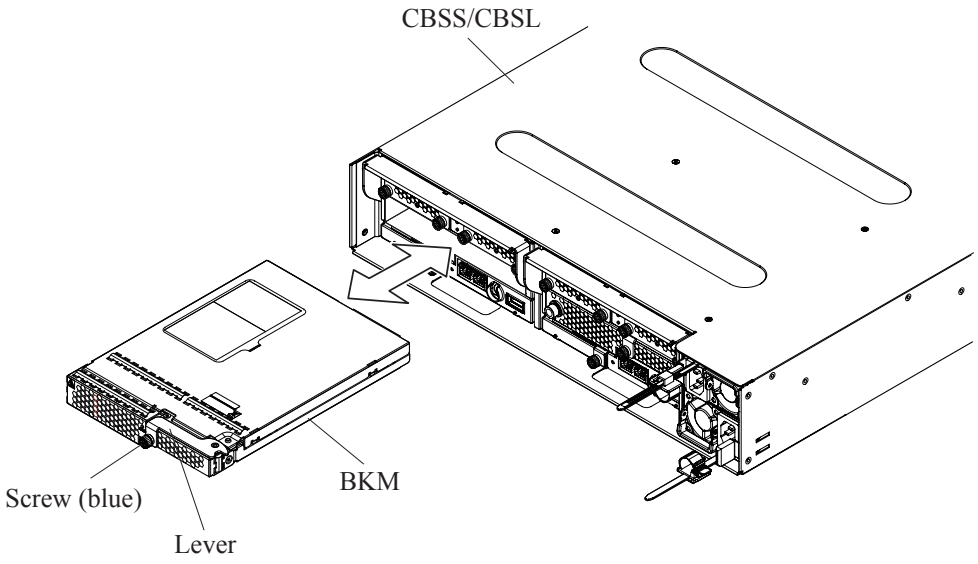


BKM

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(2) Replace the BKM.
   (a) Loosen the screw (blue) fixing the BKM whose STATUS LED (red) lights up.
   (b) Open the lever.
   (c) Pull out and remove the BKM while holding its body with both hands.
   (d) With the lever opened completely, insert the BKM into the slot.
   (e) Push the BKM all the way in.
   (f) Close the lever completely and tighten the screw (blue) to fix the BKM.

Figure 2-92 Replacement of BKM



(3) Check that the STATUS LED (green) on the replaced BKM is blinking.

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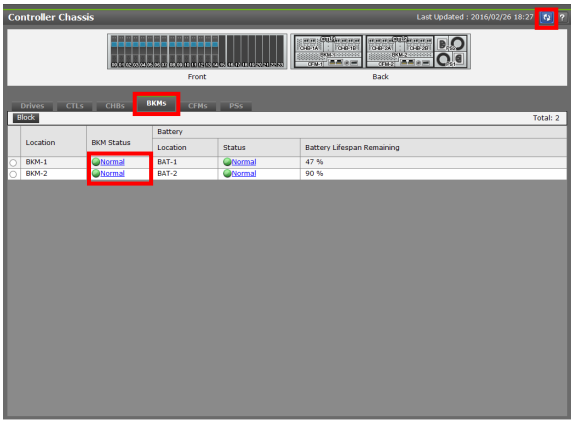
5. Restoring replacement parts by Maintenance Utility

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

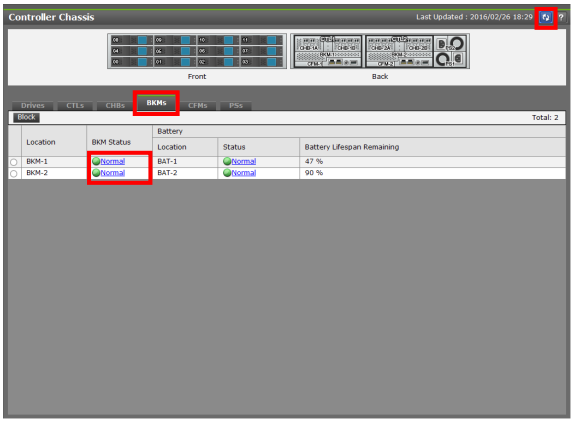
(1) <Check BKM restoration>
Click the [BKMs] tab in the “Controller Chassis” window and check that a Status of the replaced BKM is “Normal”.

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

• In case of CBSS



• In case of CBSL



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

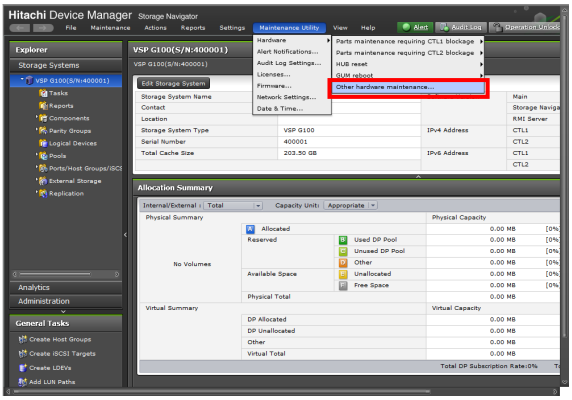
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2.9.2 Preventive Replacement of a BKM

This work is only required for the CBSS/CBSL.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the BKM, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

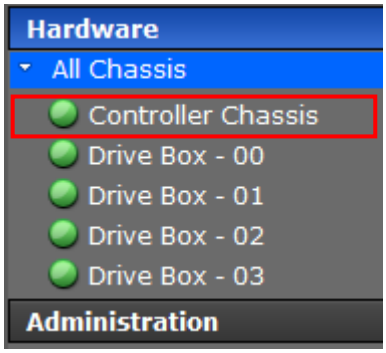


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3. Selecting replacement parts by Maintenance Utility.

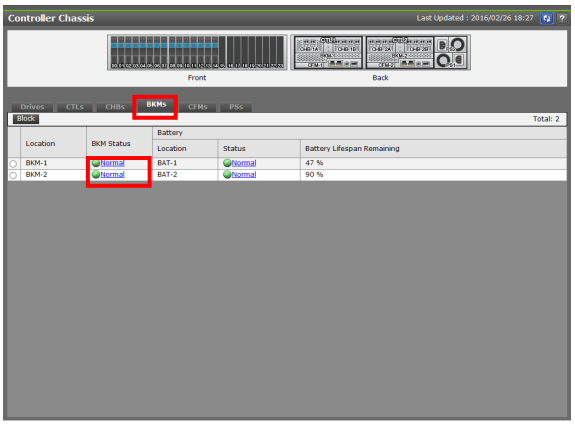
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

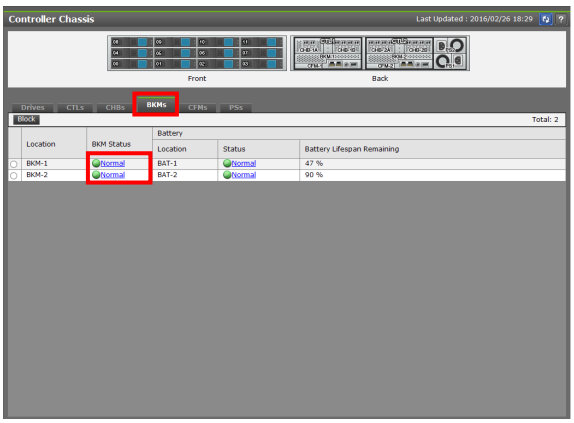


(2) <Controller Chassis window>
Click the [BKM] tab in the “Controller Chassis” window select BKM in to perform the preventive replacement and click the [Block] button.

• In case of CBSS



• In case of CBSL



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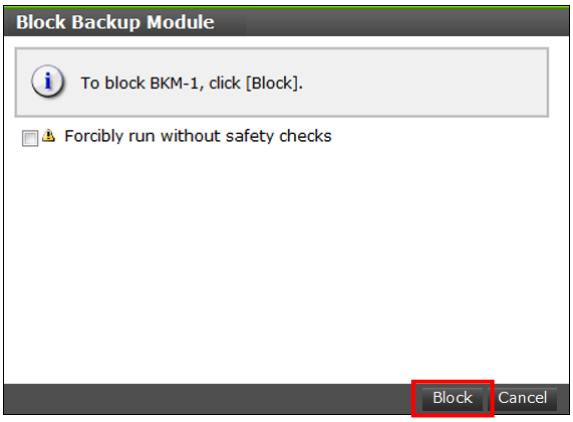
(3) <Block Controller Board>

⚠ 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.

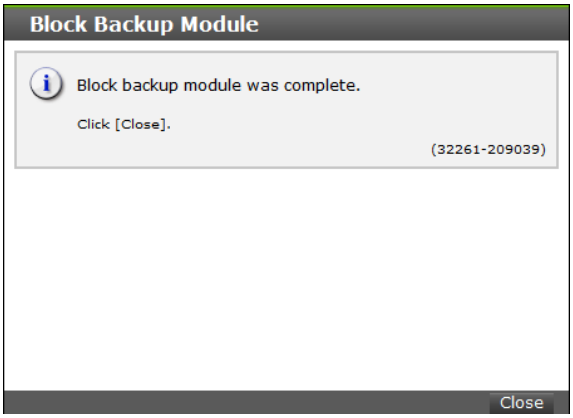
Check that the BKM to be replaced, and then click the [Block] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

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.



(4) <Check the beginning of Battery replacement>
Check that the BKM is blocked and ready to start replacement.

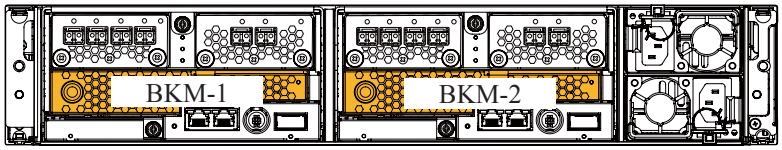
NOTE : Do not click the [Close] button at this time.
Click the [Close] button after completing the replacement work.



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4. BKM Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	BKM	BKM

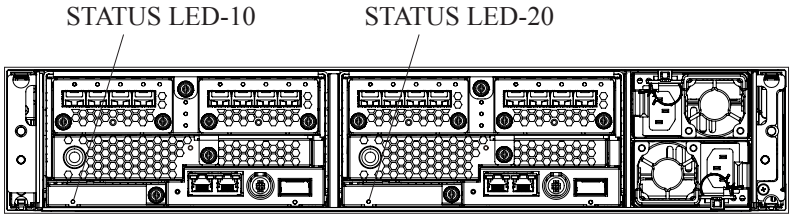


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the CBSS/CBSL BKM to be replaced lights up.

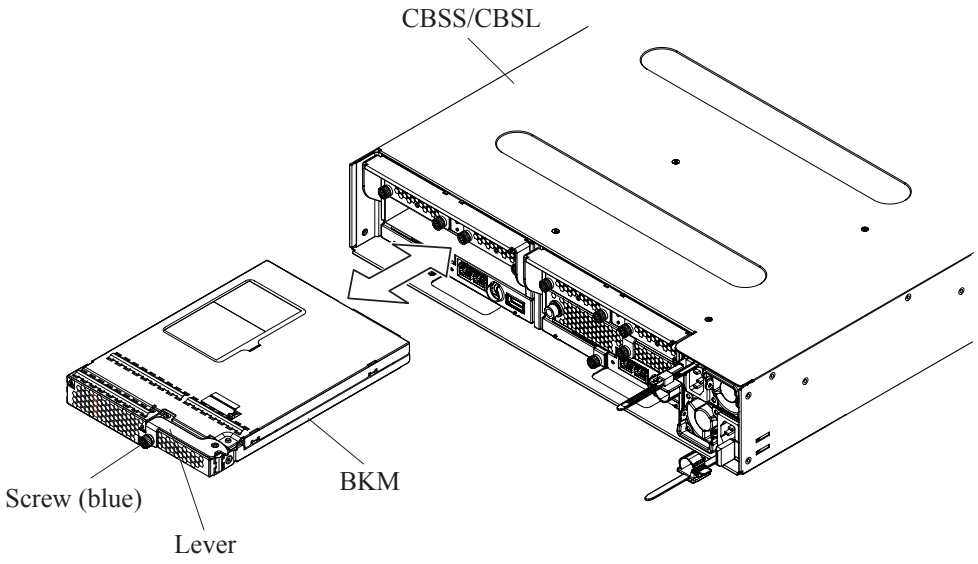
Figure 2-93 STATUS LED Location (BKM)



BKM

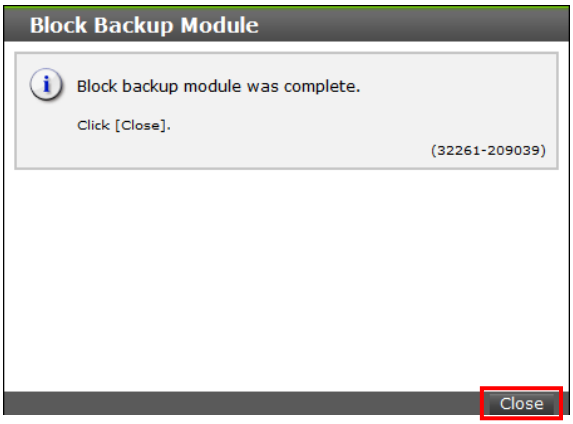
(2) Replace the BKM.
   (a) Loosen the screw (blue) fixing the BKM whose STATUS LED (red) lights up.
   (b) Open the lever.
   (c) Pull out and remove the BKM while holding its body with both hands.
   (d) With the lever of the new BKM opened completely, insert the BKM into the slot.
   (e) Push the BKM all the way in.
   (f) Close the lever completely and tighten the screw (blue) to fix the BKM.

Figure 2-94 Replacement of BKM



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5. Restoring replacement parts by Maintenance Utility
   (1) <Check replacement parts restoration>
   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".



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

6. Check that the STATUS LED (green) on the replaced BKMF is blinking or lights up.

7. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.10 Replacing a Cache Flash Memory (CFM)

The window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

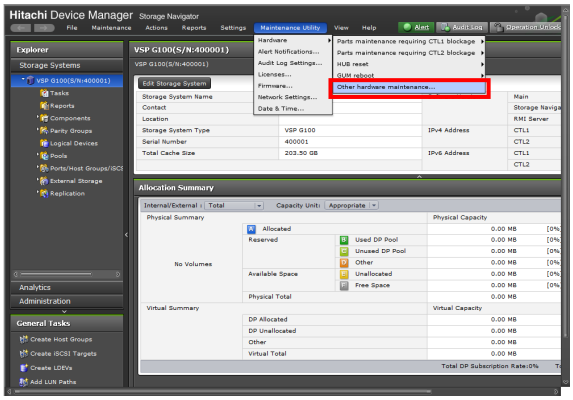
- When replacing the Cache Flash Memory of the CBSS/CBSL
  "2.10.1 Replacing a Cache Flash Memory for CBSS/CBSL"
- When replacing the Cache Flash Memory of the CBLM/CBLH
  "2.10.2 Replacing a Cache Flash Memory for CBLM/CBLH"

2.10.1 Replacing a Cache Flash Memory for CBSS/CBSL

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Cache Flash Memory, connect the Maintenance PC and Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

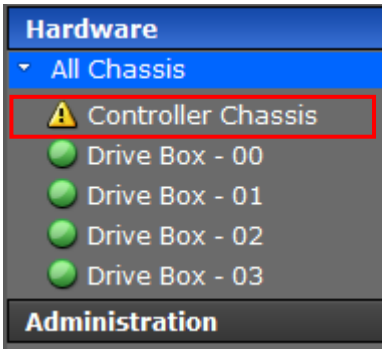


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3. Selecting replacement parts by Maintenance Utility

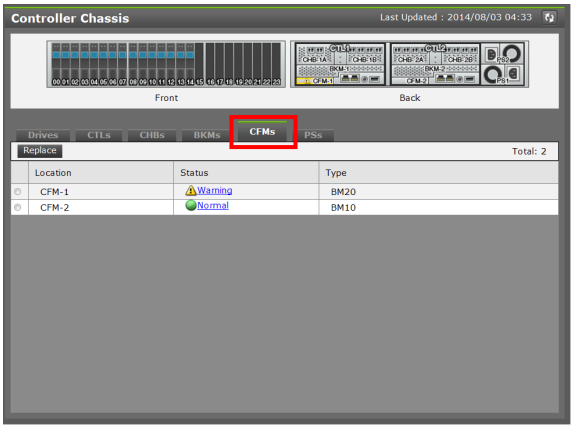
NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

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

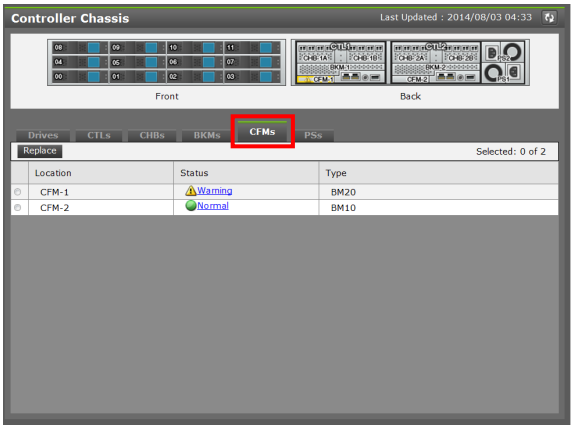


(2) Check the status of Cache Flash Memory
Select the [CFMs] tab and check the status of the Cache Flash Memory on the "Controller Chassis" window. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].

• In case of CBSS



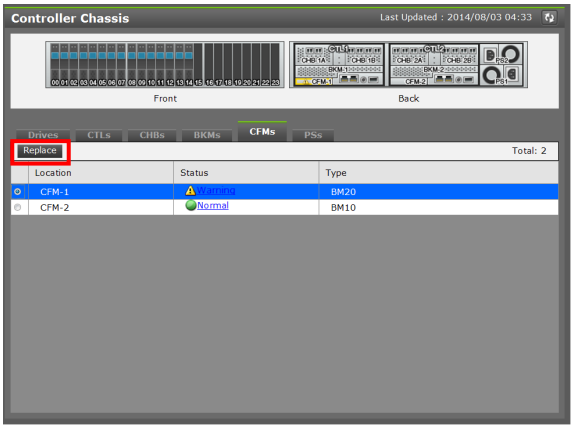
• In case of CBSL



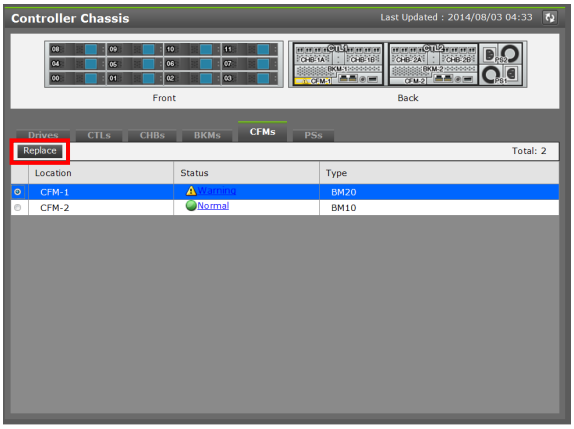
(3) <Select Cache Flash Memory>

Select a Cache Flash Memory to be replaced and click the [Replace] button.

• In case of CBSS



• In case of CBSL



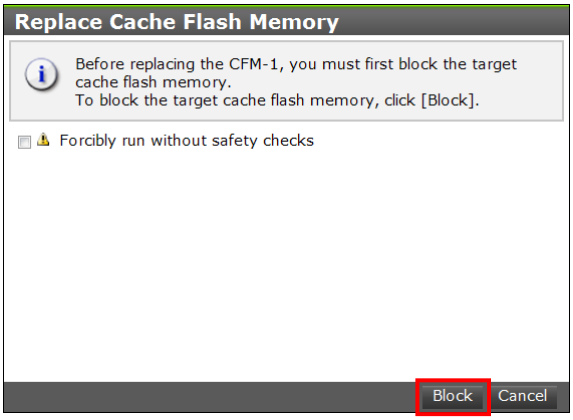
(4) <Block Cache Flash Memory>

⚠ 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 [Block] button after checking that the Cache Flash Memory to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

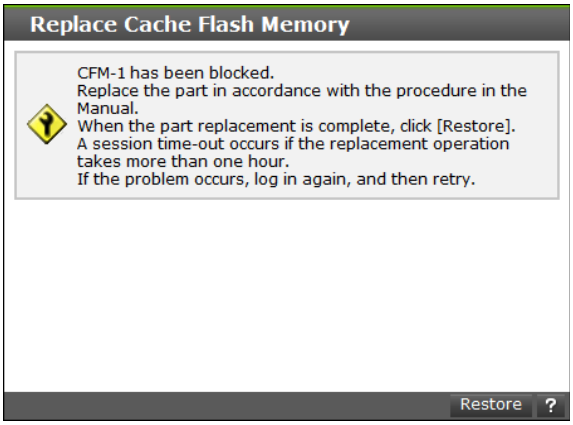
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Cache Flash Memory replacement>
Check that the Cache Flash Memory is blocked and becomes ready for replacing.

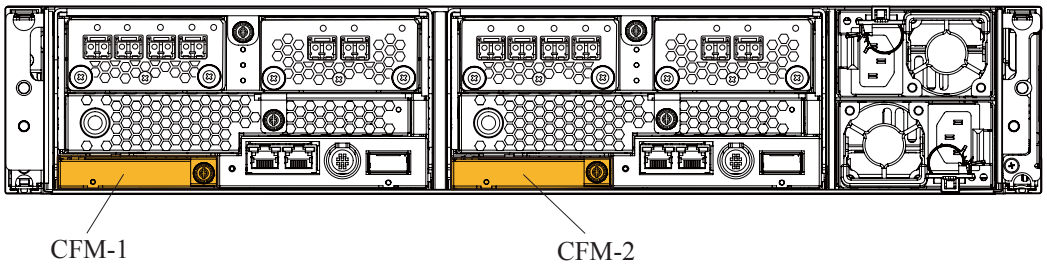
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBSS/CBSL Cache Flash Memory Replacement Processing

Location	Function Name of Component		Part Name
Rear View of CBSS/CBSL	1	Cache Flash Memory	• DW-F800-BM10



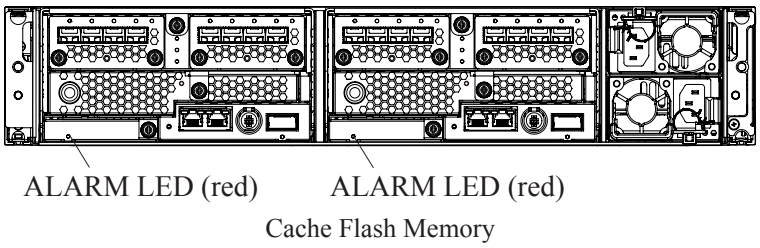
Front view of CBSS/CBSL

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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 "1.1.3 Note on Installing and Removing Parts".

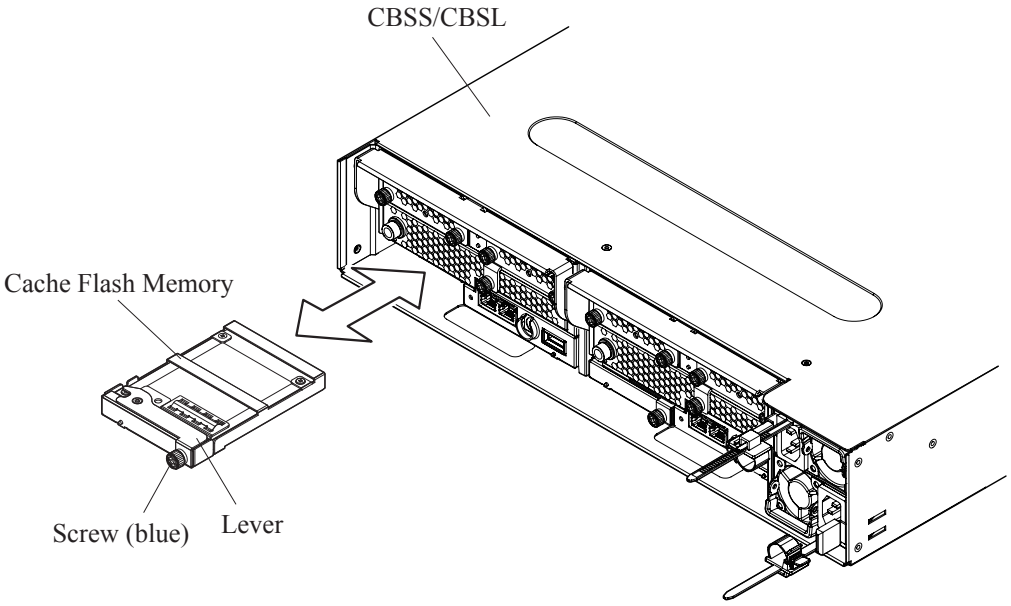
(1) Check that the ALARM LED (red) on the CBSS/CBSL Cache Flash Memory to be replaced lights up. When the LED does not light up, check the location of the Cache Flash Memory to be replaced in the "Maintenance Utility" window.

Figure 2-95 ALARM LED Position



(2) Replace the Cache Flash Memory.
- (a) Loosen the screw (blue) fixing the failed Cache Flash Memory.
- (b) Open the lever.
- (c) Pull out and remove the Cache Flash Memory while holding its body with both hands.
- (d) With the lever opened completely, insert the new Cache Flash Memory into the slot.
- (e) Push the Cache Flash Memory all the way in.
- (f) Close the lever completely and tighten the screw (blue) to fix the Cache Flash Memory.

Figure 2-96 Replacement of Cache Flash Memory

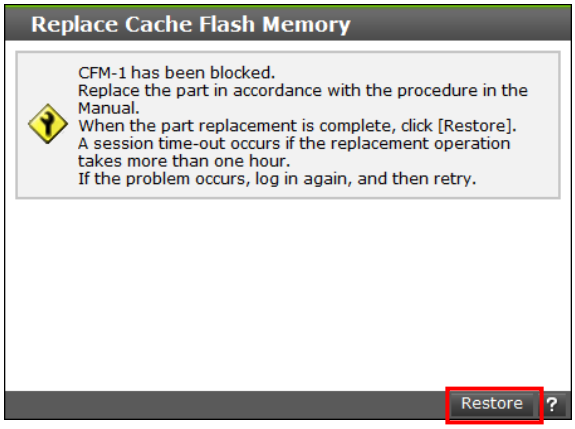


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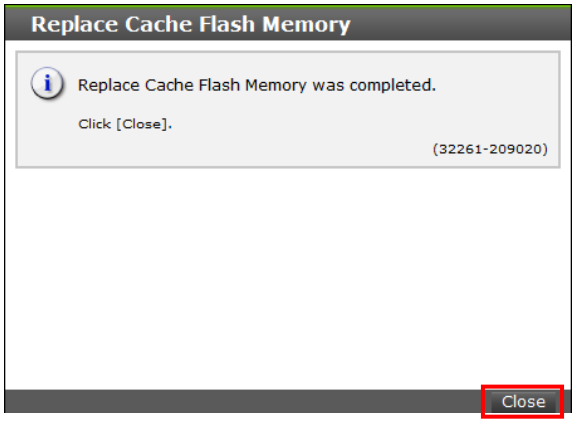
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

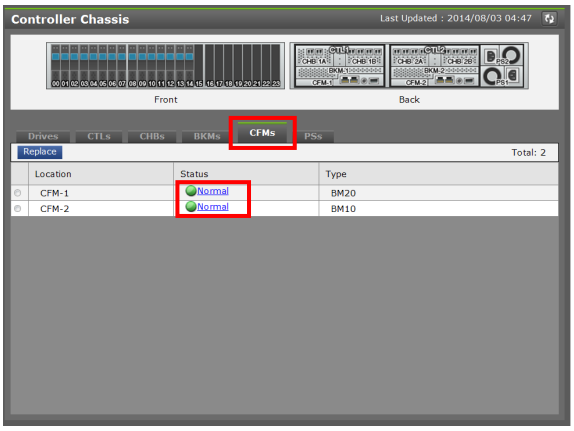


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.

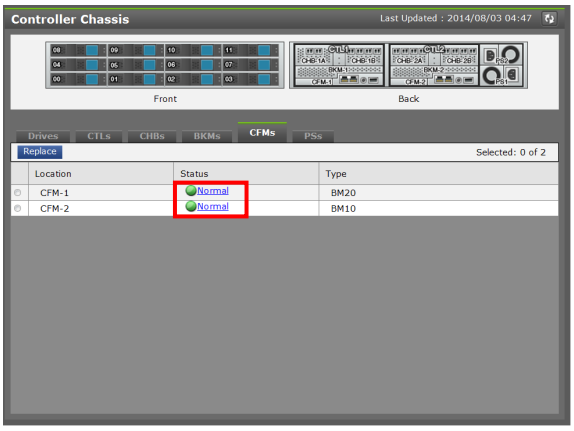


(3) <Check Cache Flash Memory restoration>
Click the [CFMs] tab in the "Controller Chassis" window and check that a Status of the replaced Cache Flash Memory is "Normal".

• In case of CBSS

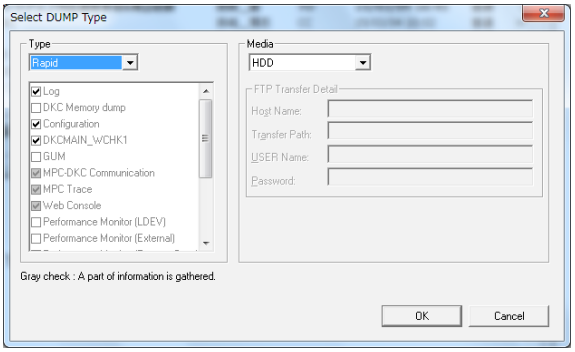


• In case of CBSL



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

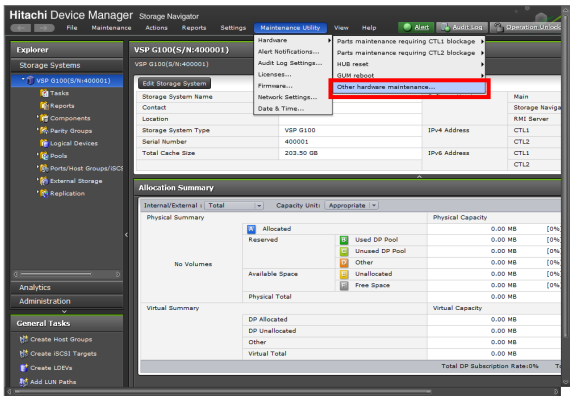
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2.10.2 Replacing a Cache Flash Memory for CBLM/CBLH

NOTE : • It is necessary to match the type (model name) of CFM-10/20 and CFM-11/21 (addition side).
When adding Cache Memories, check the model name of CFM-10/20 and add the same model.
• When replacing Cache Memories, it is necessary to match the type (model name) defined in the configuration information.
Example: When the configuration information is defined as BM20, replacing to BM30 is impossible.

1. Connecting a maintenance PC
Connect the maintenance PC and the Storage System.
When replacing the Cache Flash Memory, connect the Maintenance PC and Controller Board 1.
• Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
(1) Start the Web Console referring to "2.1.2 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.

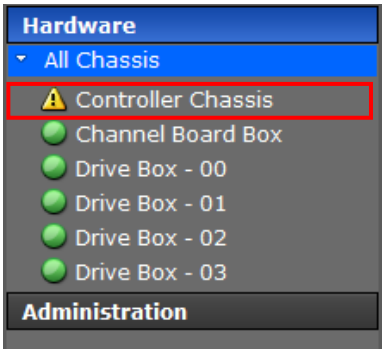


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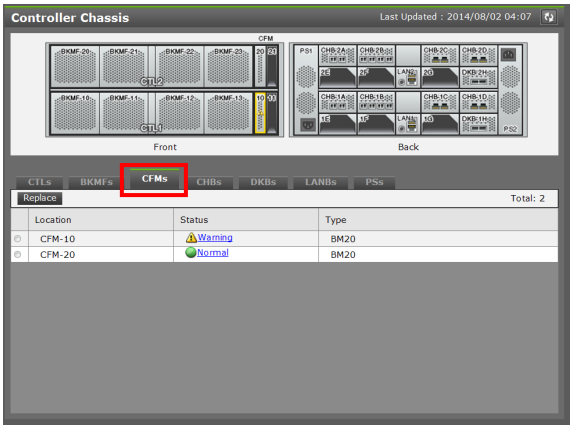
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.

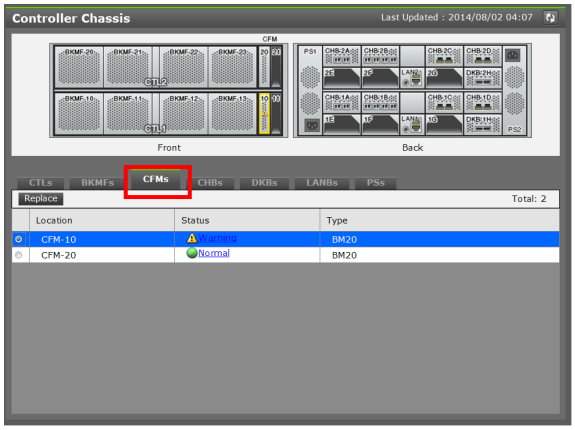


(2) <Controller Chassis window>
Click the [CFMs] tab in the “Controller Chassis” window to display a Cache Flash Memory status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



(3) <Select CFM>

Select a CFM to be replaced. Click the [Replace] button.



(4) <Block Cache Flash Memory>

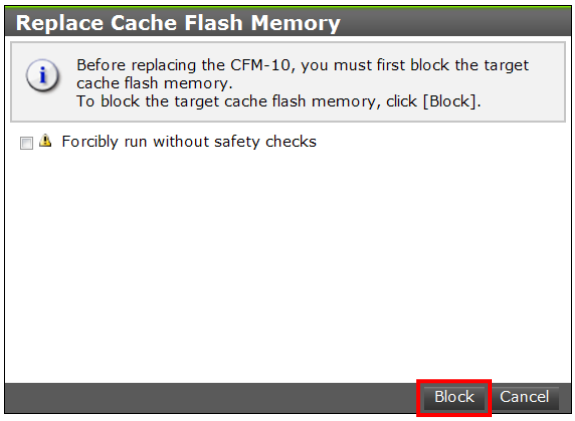
⚠ CAUTION

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 [Block] button after checking that the Cache Flash Memory to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

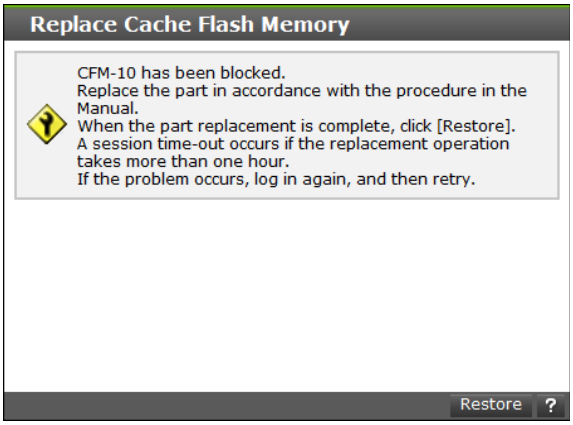
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Cache Flash Memory replacement>
Check that the Cache Flash Memory is blocked and becomes ready for replacing.

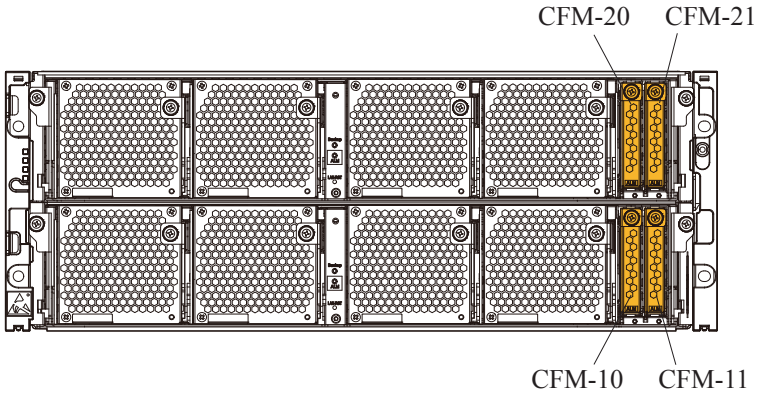
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. Cache Flash Memory for CBLM/CBLH Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLM/CBLH	1	Cache Flash Memory	• DW-F800-BM20 • DW-F800-BM30

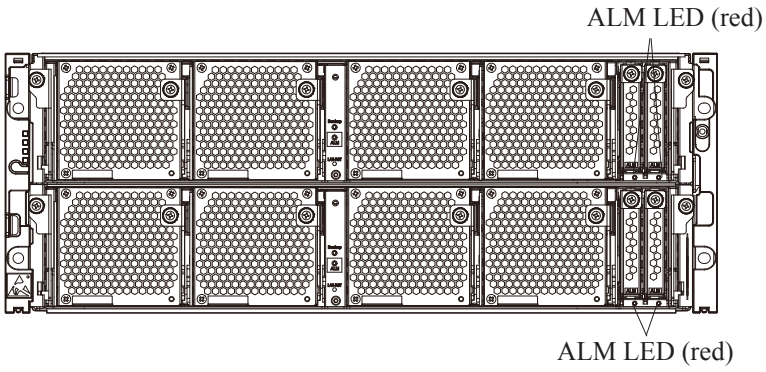


Front view of CBLM/CBLH

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the CBLM/CBLH Cache Flash Memory to be replaced lights up. When the LED does not light up, check the location of the Cache Flash Memory to be replaced in the "Maintenance Utility" window.

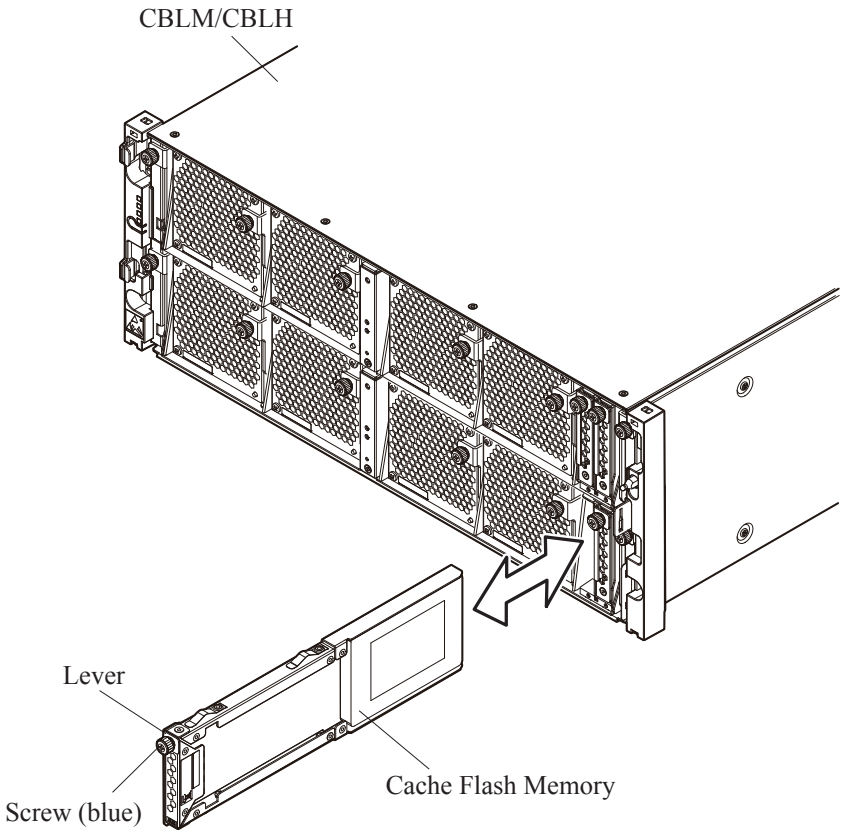
Figure 2-97 ALM LED Location



Cache Flash Memory

(2) Replace the Cache Flash Memory.
   (a) Loosen the screw (blue) fixing the failed Cache Flash Memory.
   (b) Open the lever.
   (c) Pull out and remove the Cache Flash Memory while holding its body with both hands.
   (d) With the lever opened completely, insert the new Cache Flash Memory into the slot.
   (e) Push the Cache Flash Memory all the way in.
   (f) Close the lever completely.
   (g) Tighten the screw (blue) to fix the Cache Flash Memory.

Figure 2-98 Replacement of Cache Flash Memory

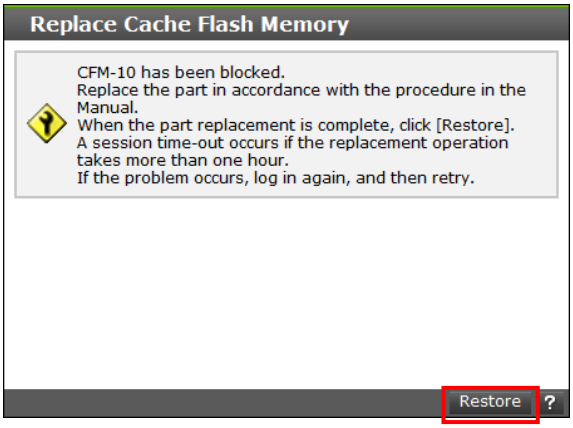


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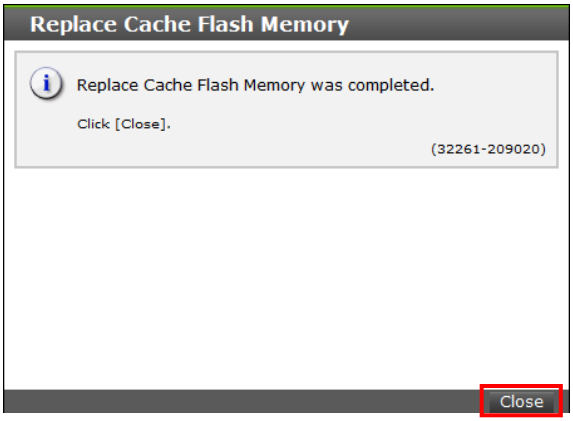
5. Restoring replacement parts by Maintenance Utility

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

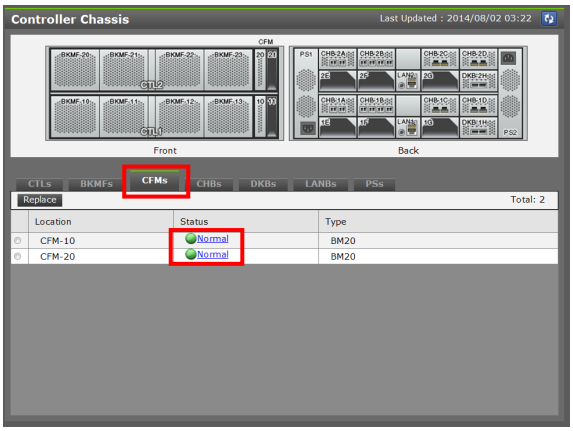
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.

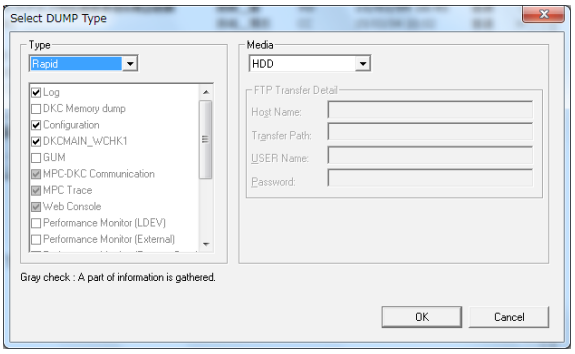


(3) <Check Cache Flash Memory restoration>
Click the [CFMs] tab in the "Controller Chassis" window and check that a Status of the replaced Cache Flash Memory is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.11 Replacing a LAN Board

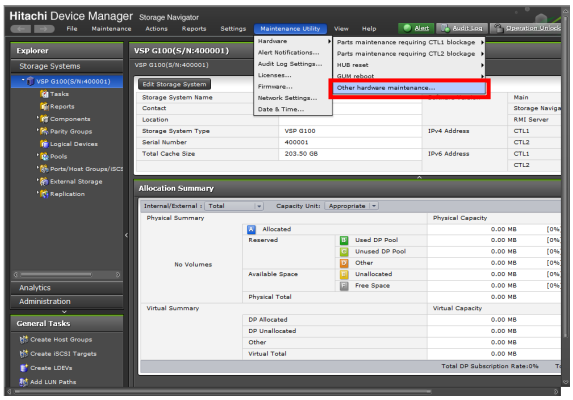
2.11.1 Replacing a LAN Board for CBLM/CBLH

NOTE:
- The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.
- To terminate the NAS Module for preventive maintenance or others in the configuration in which the NAS Module is installed, migrate EVS manually in advance.
  For the details of the EVS manual migration, see MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations".

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the LAN board on Controller Board 1, connect the Maintenance PC and Controller Board 2.
   When replacing the LAN board on Controller Board 2, connect the Maintenance PC and Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.



If NAS Modules are not installed, go to Step 3.
The procedure of Step 3. (4) varies depending on the status of the NAS Unified Firmware.
Therefore, check [Status] of the NAS Unified Firmware on the Controller side that no error occurs.
For how to check the status, see the following.

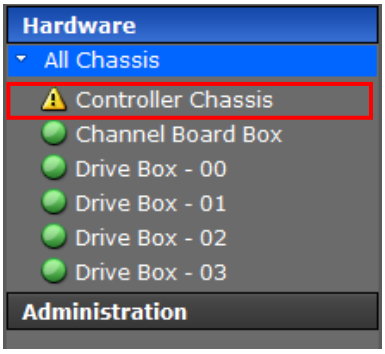
(a) Click [NAS Module Status] in the main window.
(b) Check [Status] of the NAS Unified Firmware in the "NAS Module Status" window.

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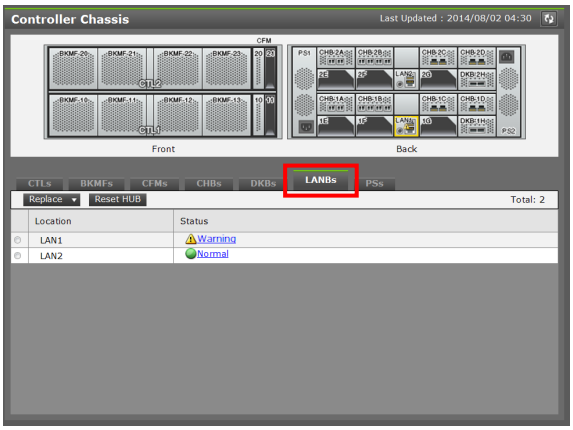
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



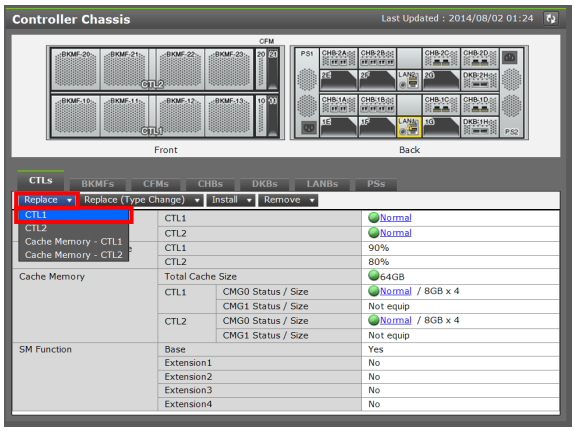
(2) <Controller Chassis window>
Click the [LANBs] tab in the “Controller Chassis” window to display a LAN Board status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



(3) <Select Controller Board>

(a) Click the [CTLs] tab.

(b) Click [Replace] button, and select the Controller Board in which the LAN Board to be replaced is installed.



(4) <Block Controller Board>

⚠ CAUTION

About "Forcibly run without safety checks":

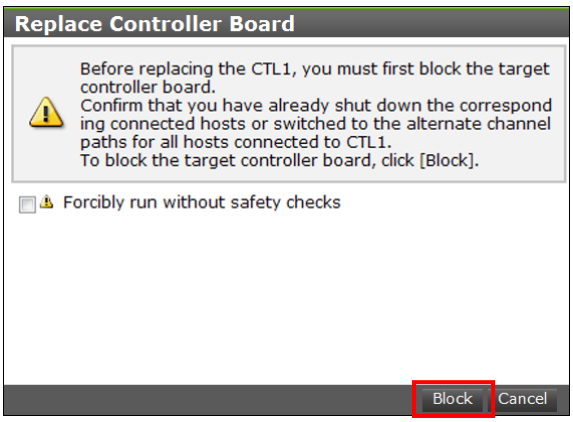
- If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.
- When NAS Modules are installed, the replacement work varies depending on [Status] on the Controller side that no error occurs checked in Step 2. (b).
  In the case of Active: Uncheck the checkbox, and then block it.
  In the case of Active (Warning): Check the checkbox, and then block it. (*1)
  In the case other than the above: Contact the Technical Support Division.
  *1: In the process of the LAN board failure, an error might be detected in the NAS Unified Firmware on the Controller side that no failure occurs and might be Active (warning). In this case, check the checkbox of "Forcibly run without safety checks", and then click the [Block] button.

Check that the Controller Board has the LAN Board to be replaced, and then click the [Block] button.

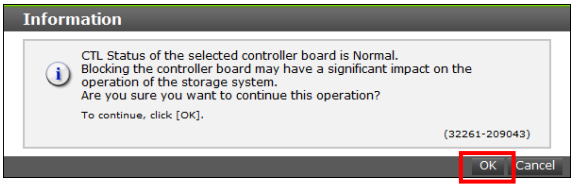
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

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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.

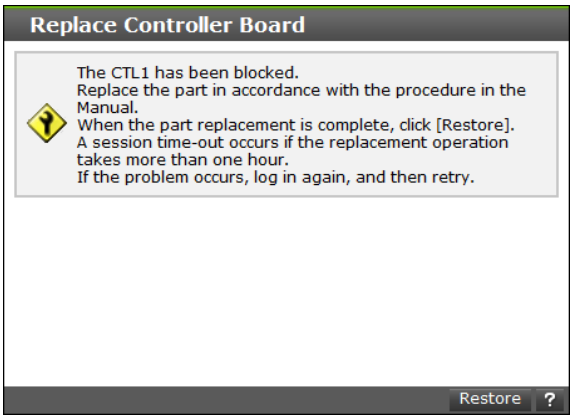


(5) <Check Controller Board>
Check that the Controller Board to replace the LAN Board is correct again and click the [OK] button.



(6) <Check the beginning of LAN Board replacement>
Check that the Controller Board is blocked and becomes ready for replacing.

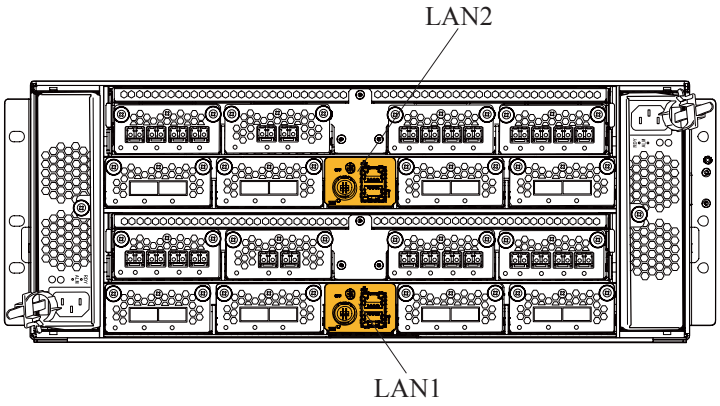
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBLM/CBLH LAN Board Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLM/CBLH	1	LAN Board	LAN Board



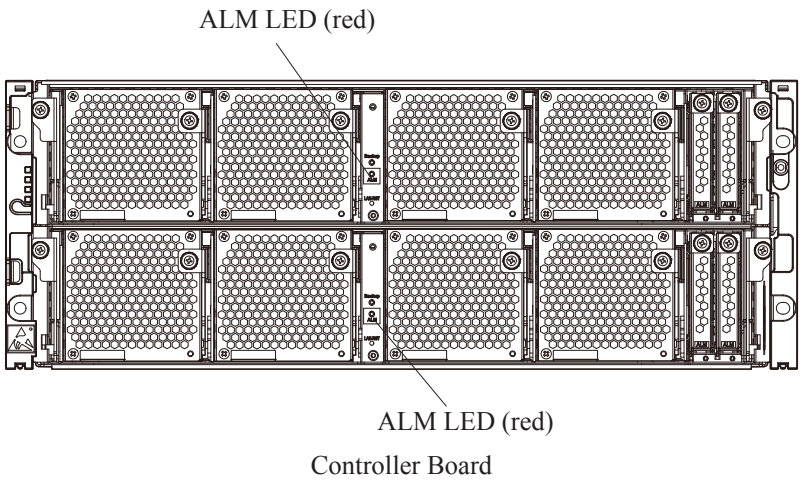
Rear view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

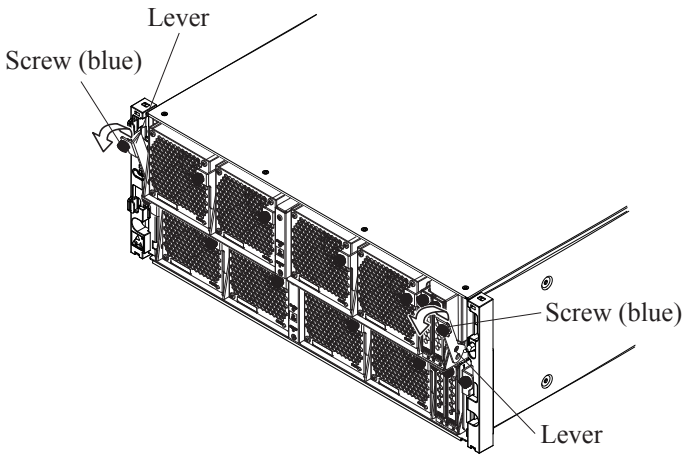
(1) Check that the ALM LED (red) on the CBLM/CBLH Controller Board to be replaced lights up. When the LED does not light up, check the location of the LAN Board to be replaced in the "Maintenance Utility" window.

Figure 2-99 ALM LED Position



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

Figure 2-100 Removing Controller Board (CBLM/CBLH)

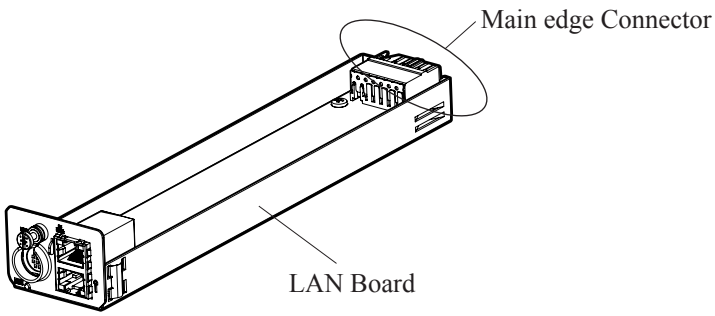


NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement.
The READY LED (green) on the front of CBLM/CBLH lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.11.1".

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(3) Replace the LAN Board.

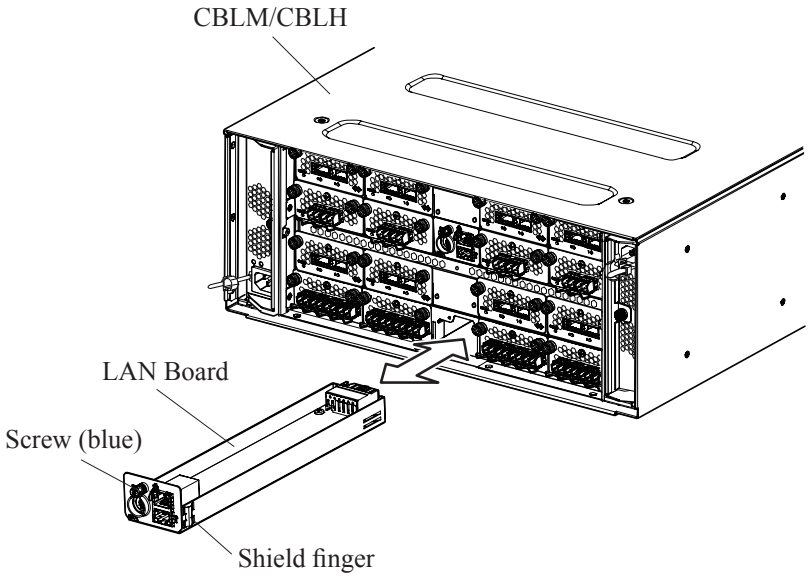
NOTICE: When removing the LAN Board, hold it with both hands and remove it straight not to apply a shock to with any components.



NOTICE: If LAN Boards are inserted randomly, malfunction may occur. Therefore, insert the LAN Boards in two steps, Step (c) and Step (d) shown below.

(a) Loosen the one screw (blue) which fixed the LAN Board.
(b) Pull out and remove the LAN Board while holding its screw.
(c) Insert the LAN Boards to be added into the slots just before the shield finger.
(d) Push the LAN Boards gently all the way in.
(e) Tighten the one screw (blue) to fix the LAN Board.

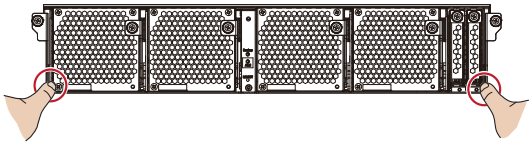
Figure 2-101 Replacement of LAN Board



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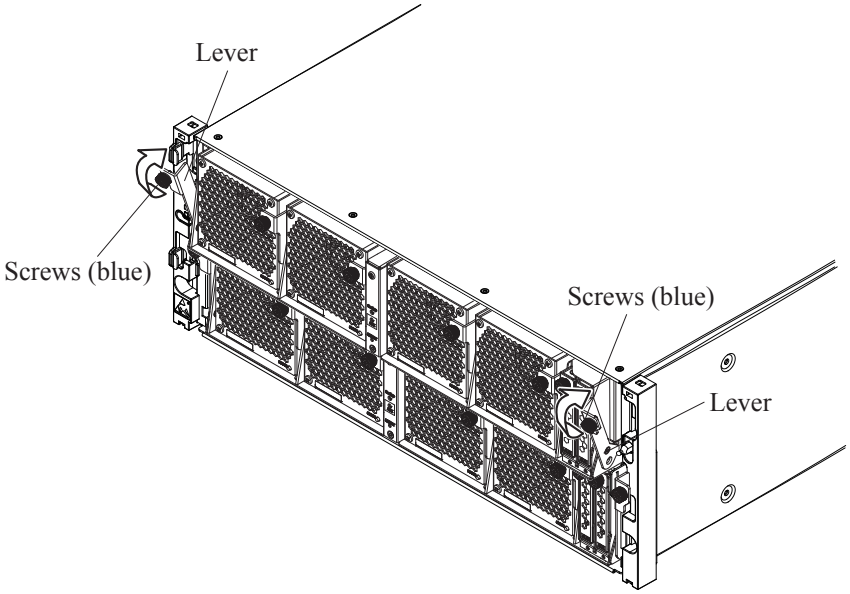
(4) Push the Controller Board all the way in and close the right and left levers completely.

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



(5) Tighten the screws (blue) and fix the Controller Board.

Figure 2-102 Fixing the Controller Board

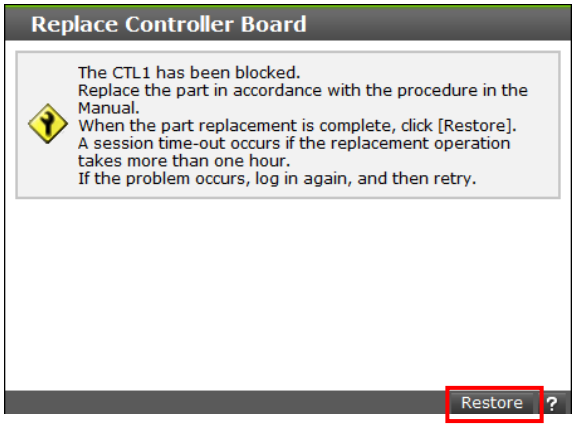


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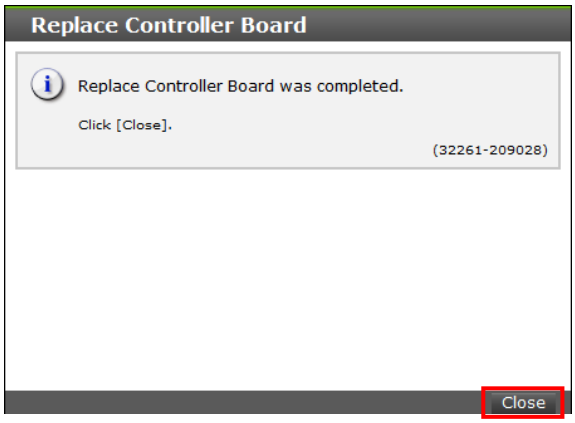
5. Restoring replacement parts by Maintenance Utility

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

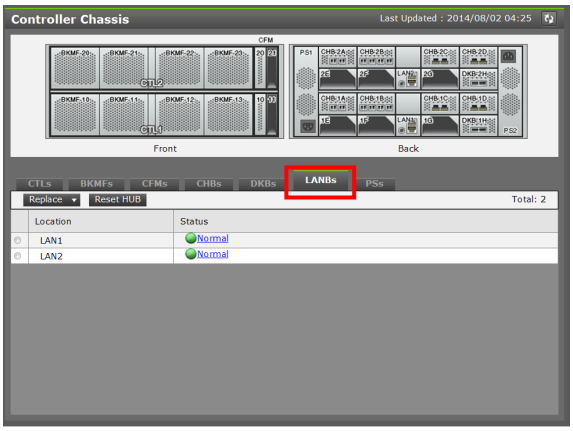
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.

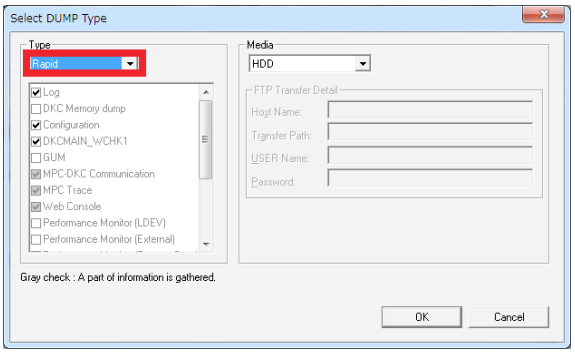


(3) <Check LAN Board restoration>
Click the [LANBs] tab in the "Controller Chassis" window and check that a Status of the replaced LAN Board is "Normal".



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

(5) <Get the error information>
See MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the firmware version 83-02-01-x0/xx or later.

(6) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

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6. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

   - In case of the NAS Module mounted configuration, the EVS manual migration to the post-maintenance NAS Module is required.
     Perform the manual EVS migration with reference to Step 7.

7. 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 of NAS Manager.

2.12 Replacing a Channel Board (CHB)

The window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

- When replacing the Channel Board of the CBSS/CBSL
  "2.12.1 Replacing a Channel Board for CBSS/CBSL"
- When replacing the Channel Board of the CBLM/CBLH
  "2.12.2 Replacing a Channel Board for CBLM/CBLH"
- When replacing the Channel Board of the Channel Board Box
  "2.12.3 Replacing a Channel Board for Channel Board Box"

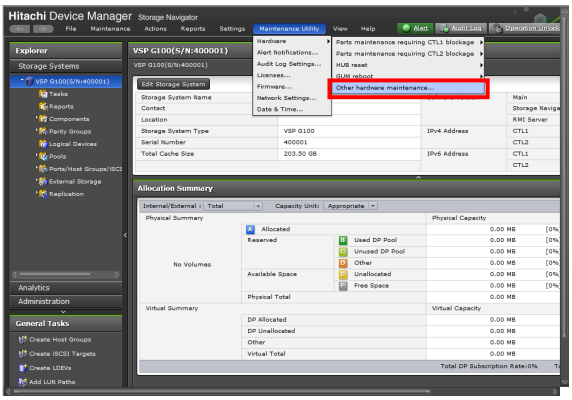
2.12.1 Replacing a Channel Board for CBSS/CBSL

NOTE: This maintenance work stops I/O from the host connected to the Channel Board to be replaced. Since the alternate path setting might be required, consult with the customer, and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

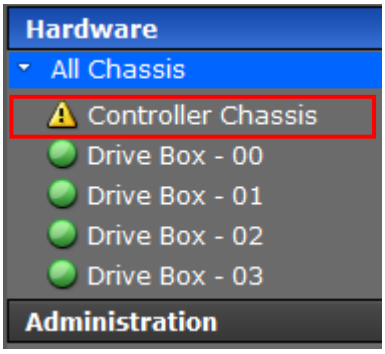


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3. Selecting replacement parts by Maintenance Utility.

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

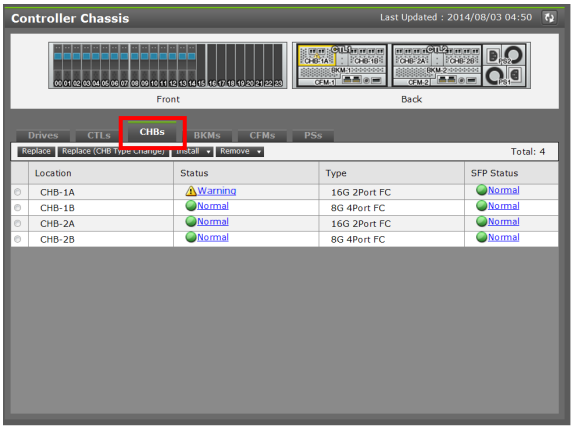
(1) <Main window>
Select [Controller Chassis] in the main window.



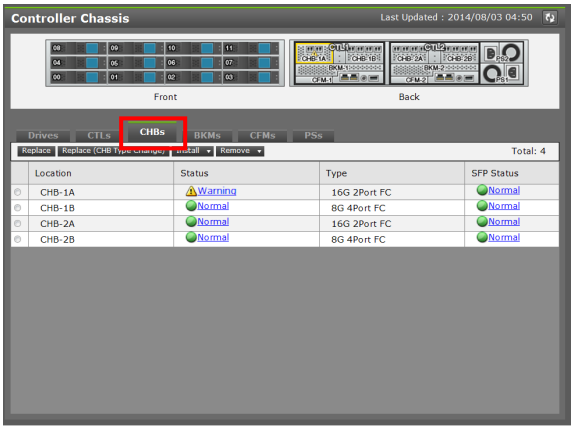
(2) <Controller Chassis window>
Click the [CHBs] tab in the “Controller Chassis” window to display a Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

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

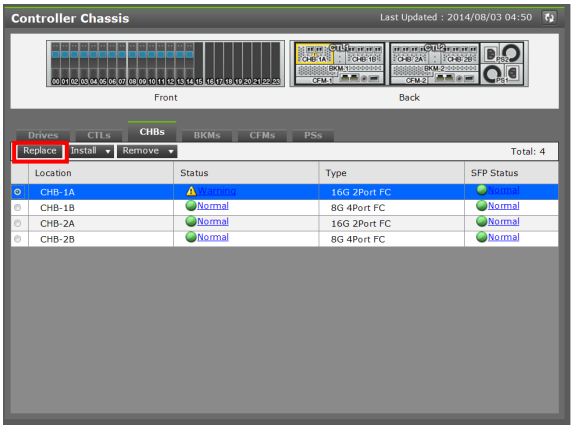


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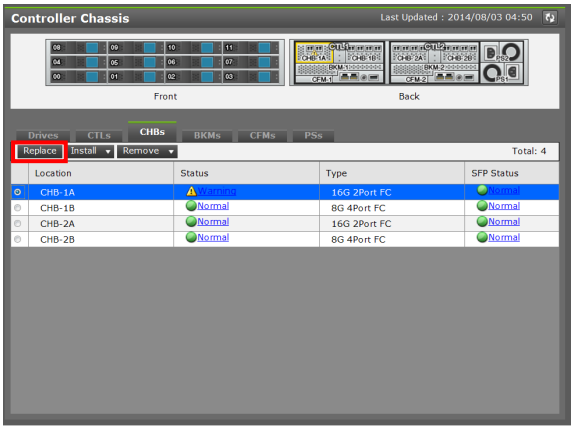
(3) <Select Channel Board>

Select a Channel Board to be replaced. Click the [Replace] button.

• In case of CBSS



• In case of CBSL



(4) <Block Channel Board>

⚠ CAUTION

About "Forcibly run without safety checks":

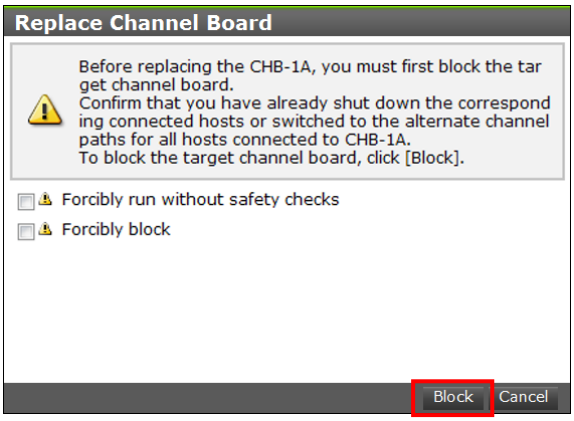
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the Channel Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

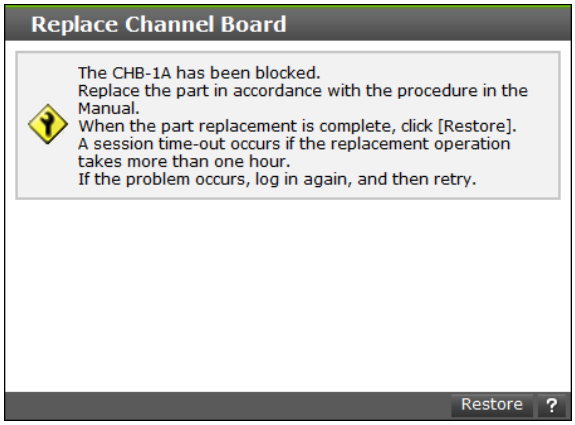
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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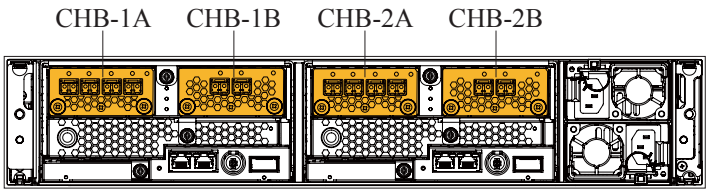
(5) <Check the beginning of Channel Board replacement>
Check that the Channel Board is blocked and becomes ready for replacing.

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



4. Channel Board for CBSS/CBSL replacement processing

Location	Replacement parts name		Part 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))

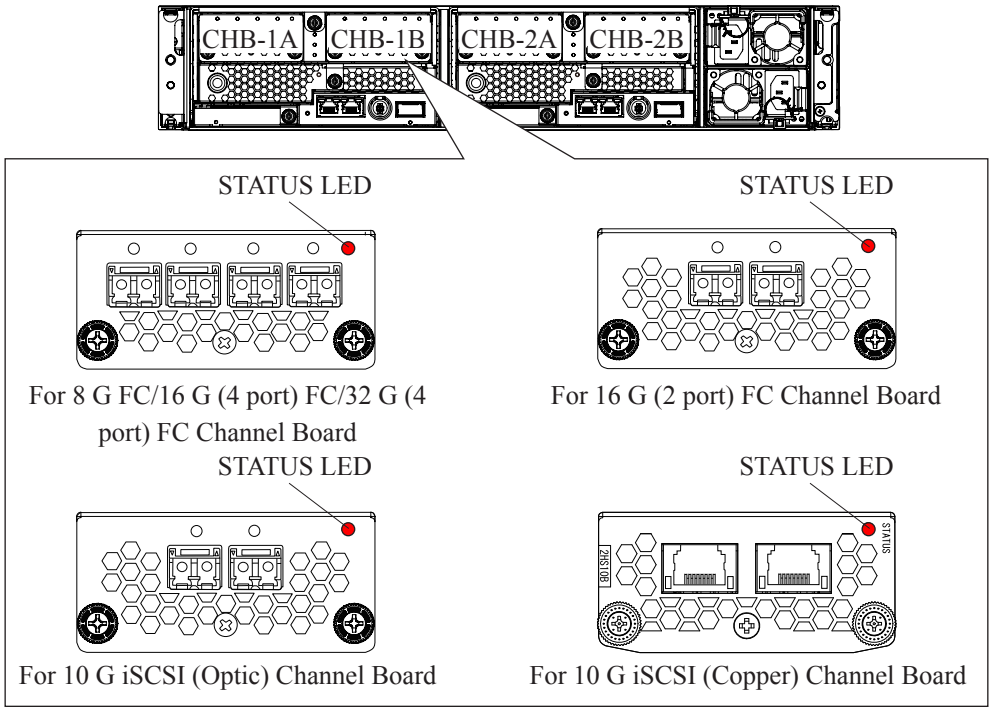


CBSS/CBSL (Rear view)

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the Channel Board to be replaced lights up. When the LED does not light up, check the location of the Channel Board to be replaced in the "Maintenance Utility" window.

Figure 2-103 STATUS LED Location



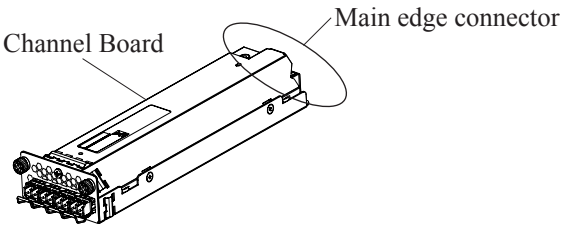
(2) Remove the cables from the Channel Board to be replaced.

(3) Replace the Channel Board.

⚠ 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.



NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (d) and Step (e) shown below.

(a) Loosen the two screws (blue) which fix the module.
(b) Pull out and remove the Channel Board while holding the screws (blue).
(c) Move the Small Form-Factor Pluggable (SFP).
If the following condition is met, mount the Small Form-Factor Pluggable (SFP) in the removed Channel Board (CHB) on a new Channel Board (CHB). If the following condition is not met, go to Step (d) without mounting the Small Form-Factor Pluggable (SFP).
[When replacing 8 Gbps or 16 Gbps (2-port) CHB with Small Form-Factor Pluggable (SFP) for Longwave mounted]

NOTE: Small Form-Factor Pluggable (SFP) for Longwave has a blue lever.

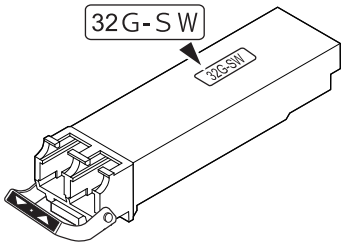
(i) Pull the Small Form-Factor Pluggable (SFP) for Longwave lever down toward you and pull out the Small Form-Factor Pluggable (SFP) for Longwave from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP) for Longwave, pull it out while pushing the lever open toward you.
(ii) Remove the Small Form-Factor Pluggable (SFP) for Shortwave from a new CHB in the same way as Step (i).
(iii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) for Longwave removed in Step (i), and insert it into the same location on the new CHB until it clicks.

[When replacing 32 Gbps/16 Gbps (4-port) CHB]

(i) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the Small Form-Factor Pluggable (SFP) from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing the lever open toward you.
(ii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) removed in Step (i), and insert it into the same location on the new CHB until it clicks.

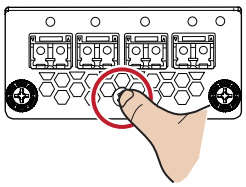
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The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



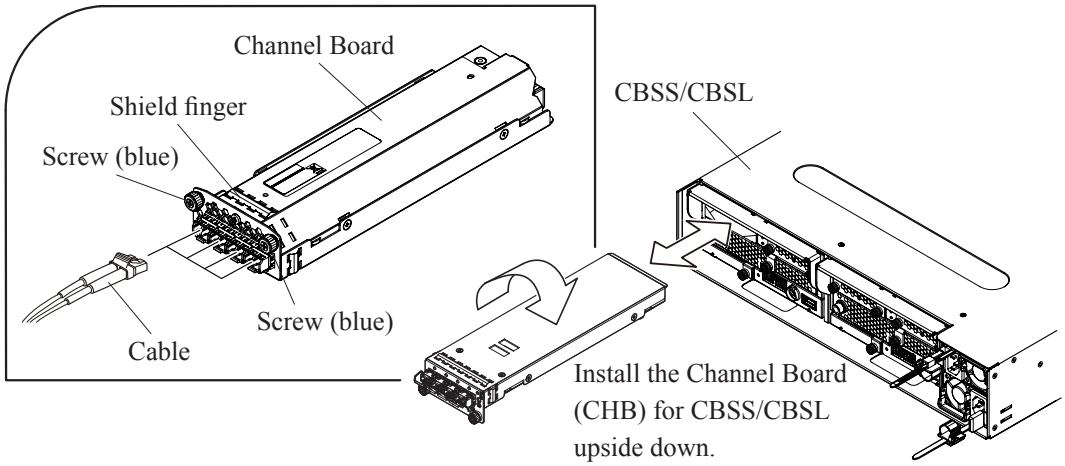
(d) Insert the Channel Boards to be added into the slots just before the shield finger.
(e) Push the Channel Boards gently all the way in.

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



(f) Tighten the two screws (blue) to fix the Channel Board.

Figure 2-104 Replacement of Channel Board (CBSS/CBSL)



(4) Clean the cable connectors.
(a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
(b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
(c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

(5) Connect the cables to the replaced Channel Board.

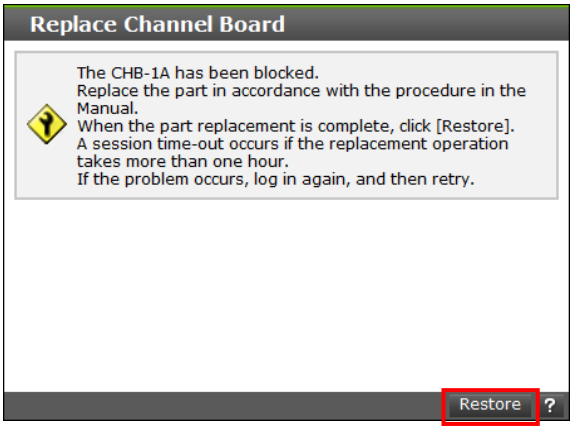
NOTE: Check that cable latch clicks and the cables are surely connected.

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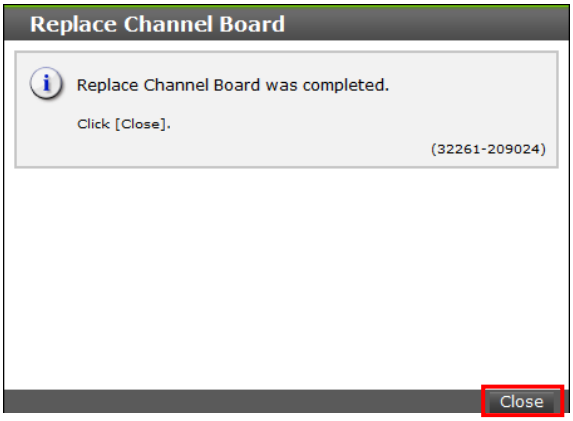
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



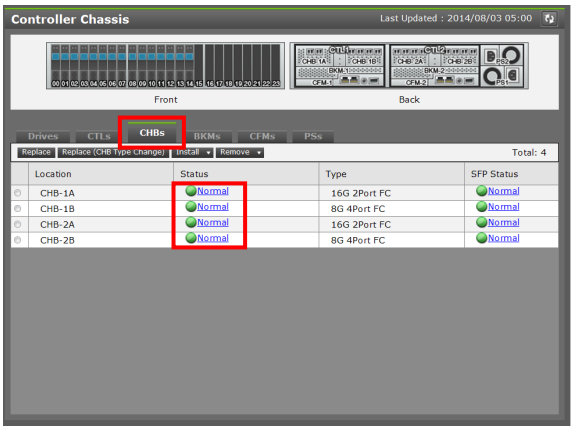
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



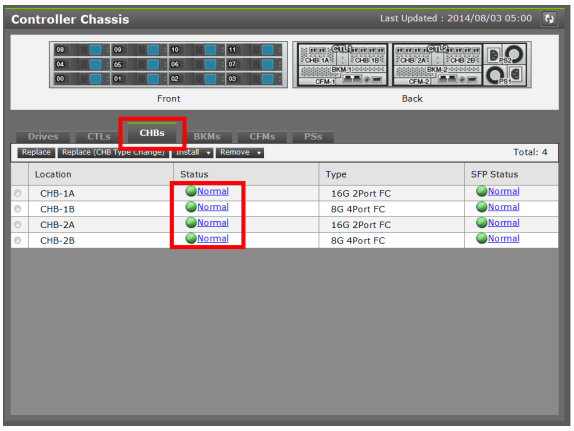
(3) <Check Channel Board restoration>
Click the [CHBs] tab in the "Controller Chassis" window and check that a Status of the replaced Channel Board is "Normal".

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

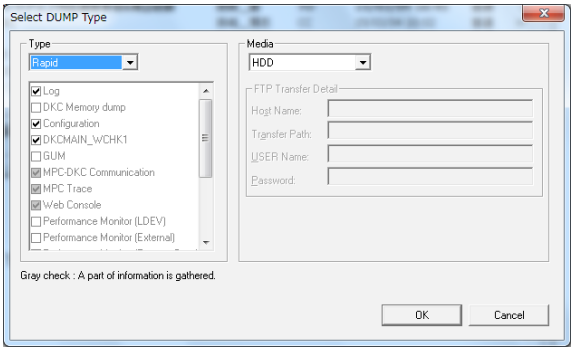


• In case of CBSL



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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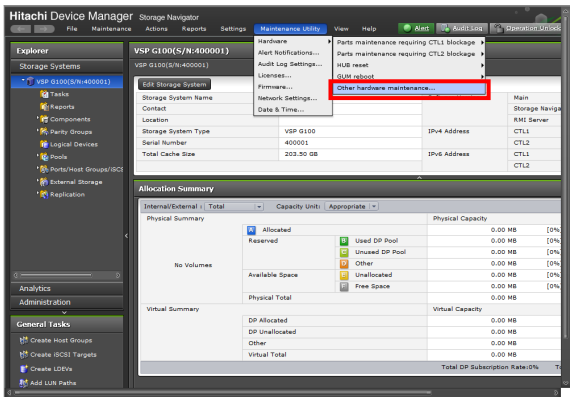
2.12.2 Replacing a Channel Board for CBLM/CBLH

NOTE: This maintenance work stops I/O from the host connected to the Channel Board to be replaced. Since the alternate path setting might be required, consult with the customer, and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

---

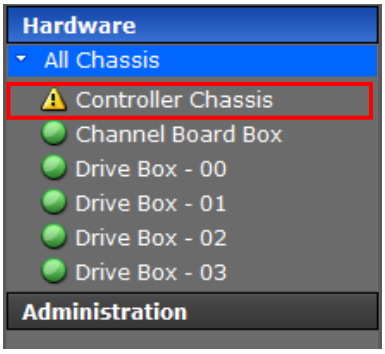
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



3. Selecting replacement parts by Maintenance Utility.

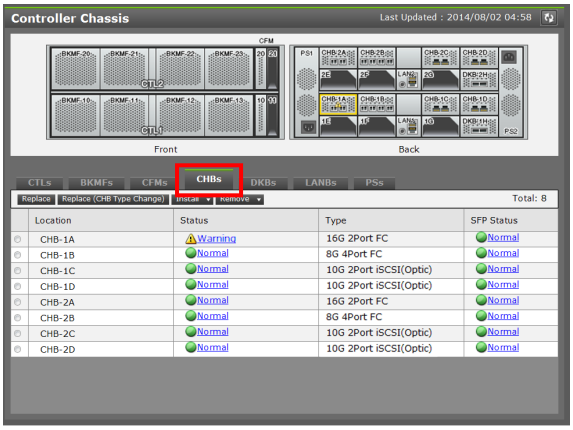
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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



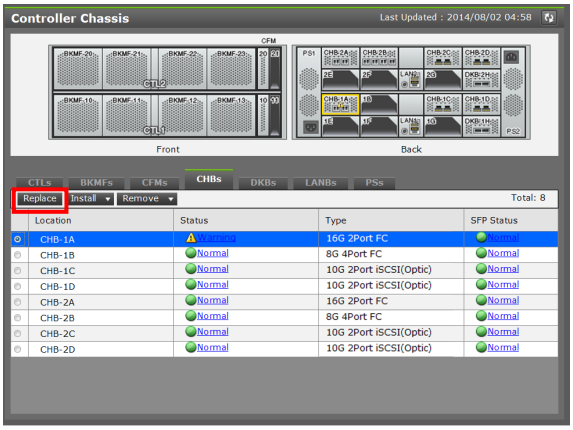
(2) <Controller Chassis window>
Click the [CHBs] tab in the “Controller Chassis” window to display a Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

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>

Select a Channel Board to be replaced. Click the [Replace] button.



(4) <Block Channel Board>

⚠ CAUTION

About "Forcibly run without safety checks":

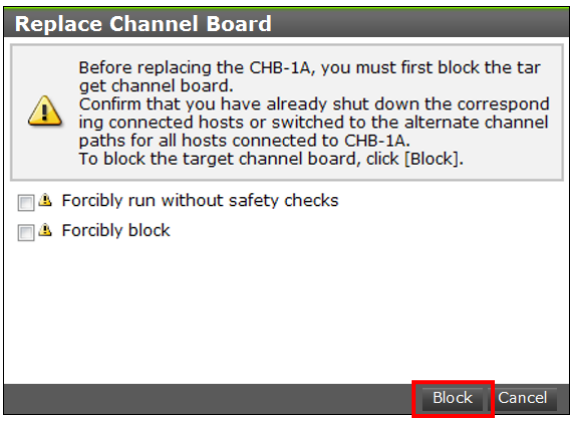
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the Channel Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

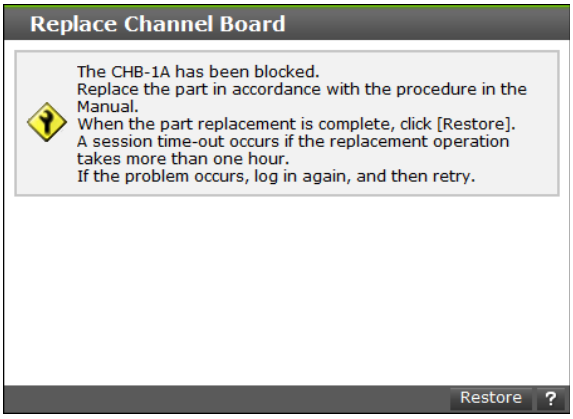
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Channel Board replacement>
Check that the Channel Board is blocked and becomes ready for replacing.

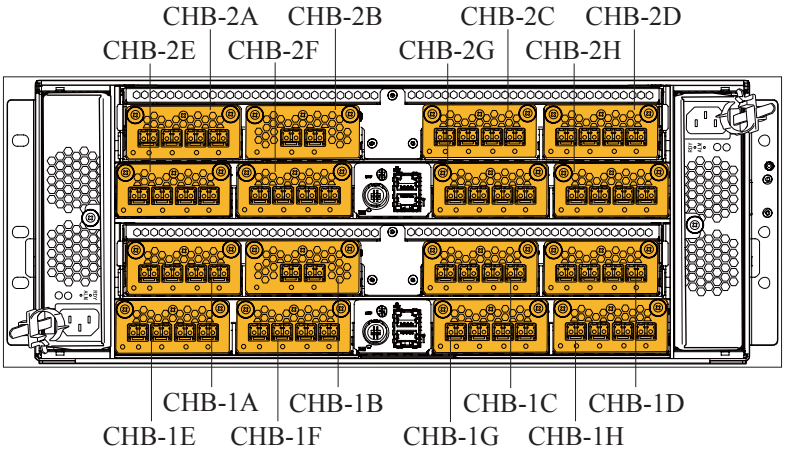
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. Channel Board for CBLM/CBLH replacement processing

Location	Replacement parts name		Part 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))



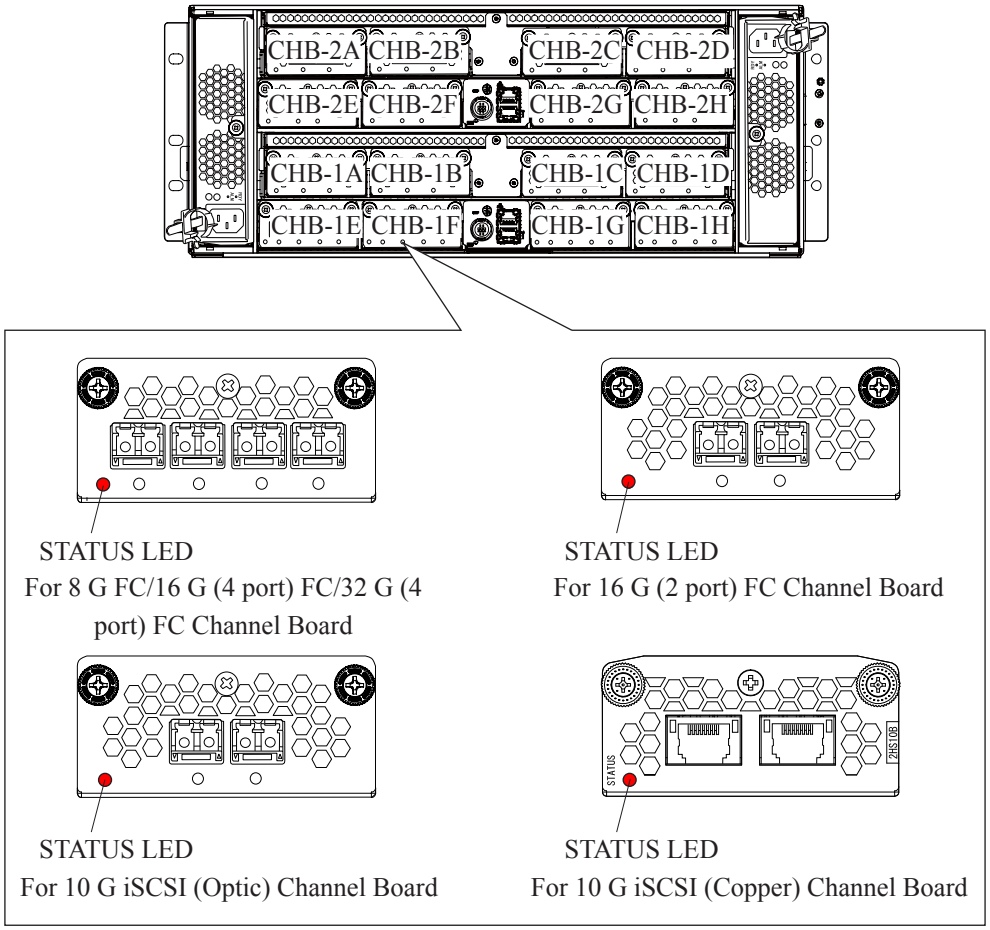
CBLM/CBLH (Rear view)

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the Channel Board to be replaced lights up. When the LED does not light up, check the location of the Channel Board to be replaced in the "Maintenance Utility" window.

Figure 2-105 STATUS LED Location

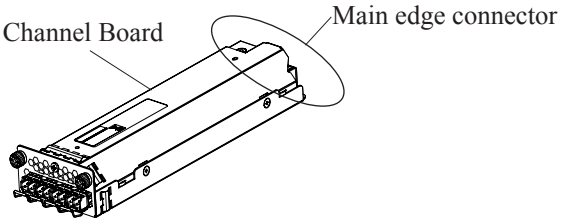


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(2) Remove the cables from the Channel Board to be replaced.

(3) Replace the Channel Board.

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



NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (d) and Step (e) shown below.

(a) Loosen the two screws (blue) which fix the Channel Board.
(b) Pull out and remove the Channel Board while holding the screws (blue).
(c) Move the Small Form-Factor Pluggable (SFP).
If the following condition is met, mount the Small Form-Factor Pluggable (SFP) in the removed Channel Board (CHB) on a new Channel Board (CHB). If the following condition is not met, go to Step (d) without mounting the Small Form-Factor Pluggable (SFP).
[When replacing 8 Gbps or 16 Gbps (2-port) CHB with Small Form-Factor Pluggable (SFP) for Longwave mounted]

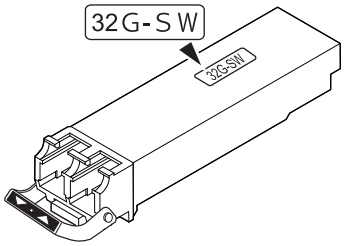
NOTE: Small Form-Factor Pluggable (SFP) for Longwave has a blue lever.

(i) Pull the Small Form-Factor Pluggable (SFP) for Longwave lever down toward you and pull out the Small Form-Factor Pluggable (SFP) for Longwave from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP) for Longwave, pull it out while pushing the lever open toward you.
(ii) Remove the Small Form-Factor Pluggable (SFP) for Shortwave from a new CHB in the same way as Step (i).
(iii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) for Longwave removed in Step (i), and insert it into the same location on the new CHB until it clicks.

[When replacing 32 Gbps/16 Gbps (4-port) CHB]
(i) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the Small Form-Factor Pluggable (SFP) from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing the lever open toward you.
(ii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) removed in Step (i), and insert it into the same location on the new CHB until it clicks.

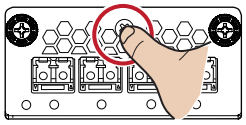
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The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



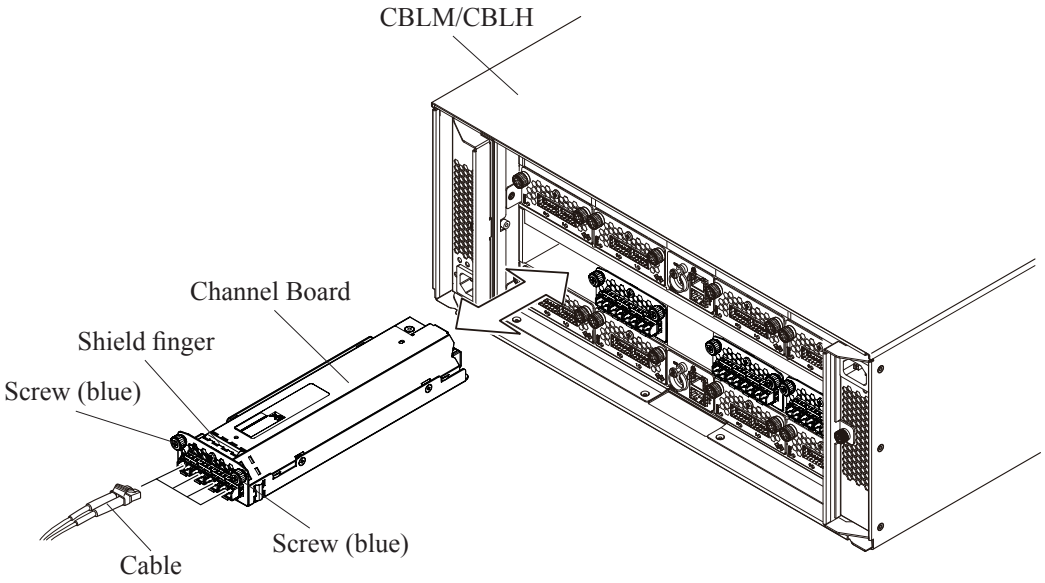
(d) Insert the Channel Boards to be added into the slots just before the shield finger.
(e) Push the Channel Boards gently all the way in.

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



(f) Tighten the two screws (blue) to fix the Channel Board.

Figure 2-106 Replacement of Channel Board (CBLM/CBLH)



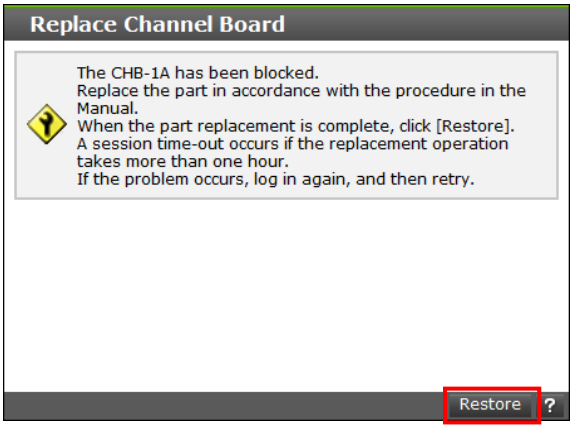
(4) Clean the cable connectors.
(a) Spray compressed gas to the connector part using an air spray (approx. five seconds)
(b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
(c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)
(5) Connect the cables to the replaced Channel Board.

NOTE: Check that cable latch clicks and the cables are surely connected.

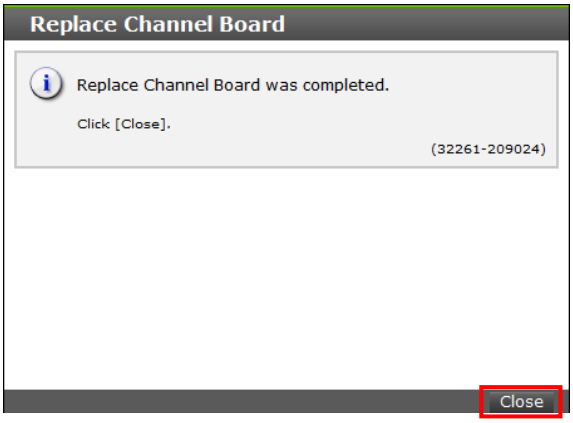
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

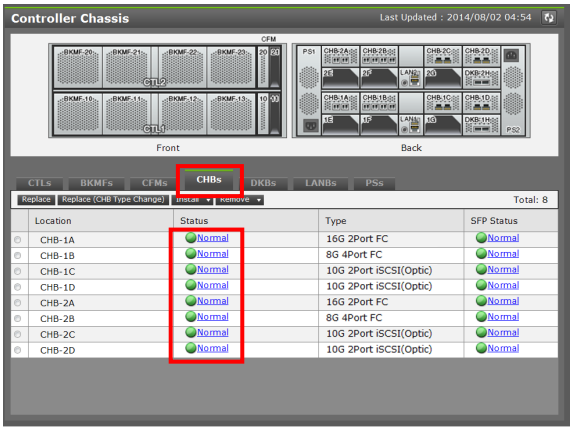


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



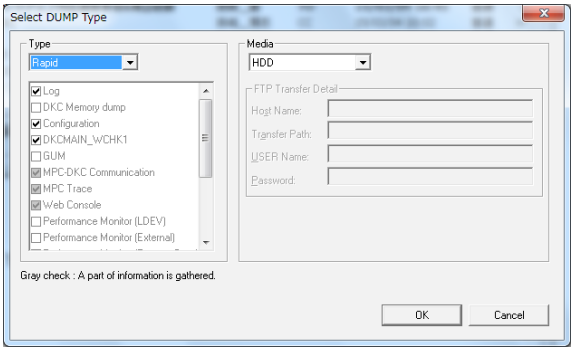
(3) <Check Channel Board restoration>
Click the [CHBs] tab in the "Controller Chassis" window and check that a Status of the replaced Channel Board is "Normal".

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



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

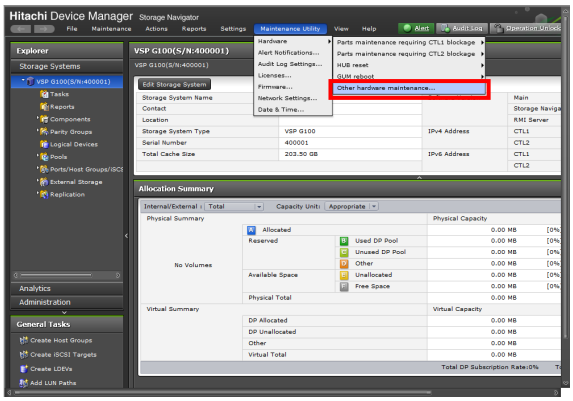
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.12.3 Replacing a Channel Board for Channel Board Box

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

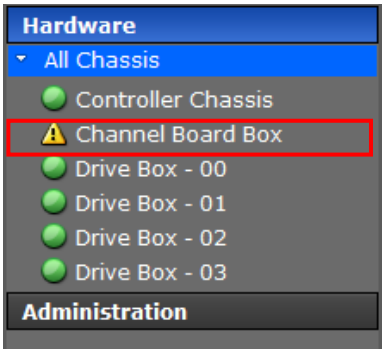
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



3. Selecting replacement parts by Maintenance Utility.

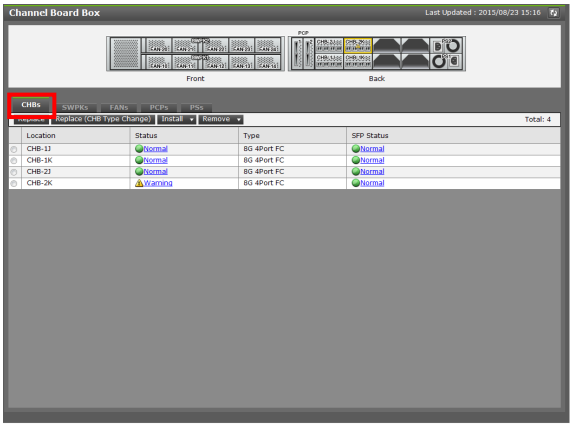
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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



(2) <Channel Board Box window>
Click the [CHBs] tab in the “Channel Board Box” window to display a Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

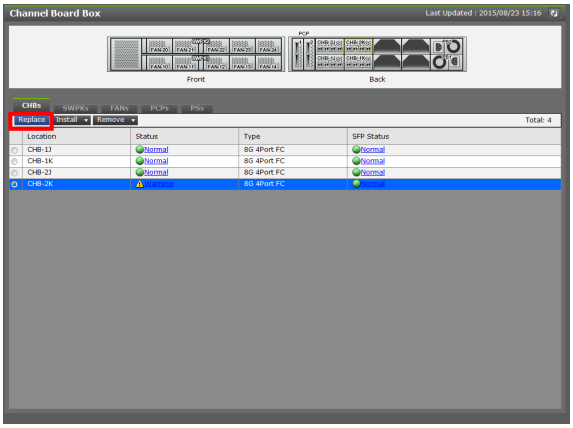
NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.



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(3) <Select Channel Board>

Select a Channel Board to be replaced. Click the [Replace] button.



(4) <Block Channel Board>

⚠ CAUTION

About "Forcibly run without safety checks":

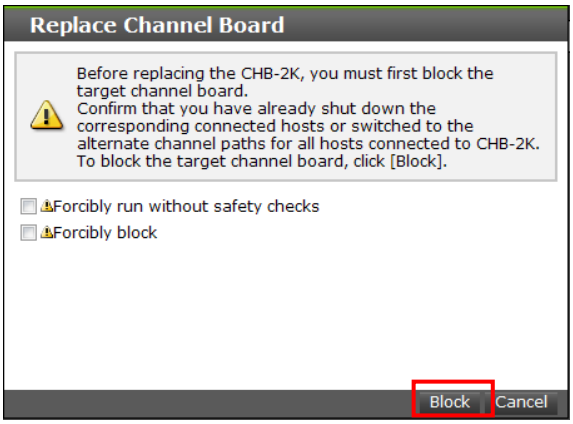
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the Channel Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

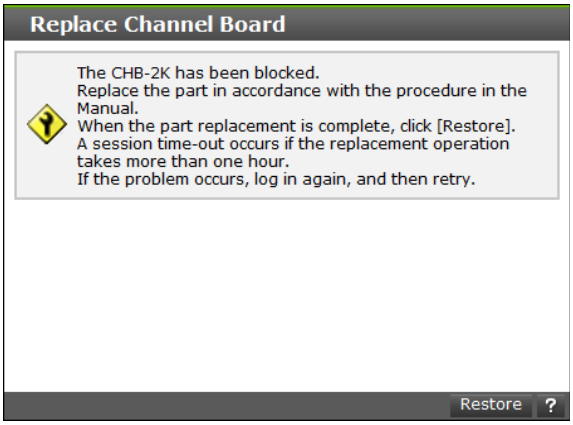
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Channel Board replacement>
Check that the Channel Board is blocked and becomes ready for replacing.

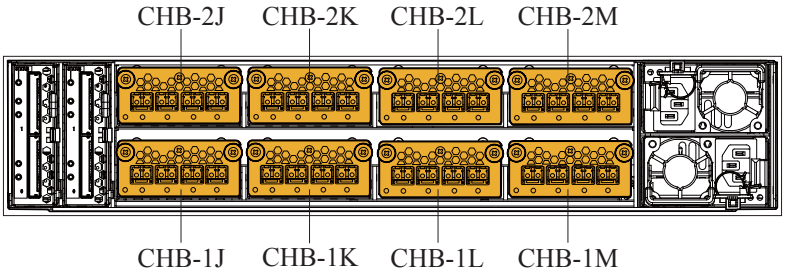
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. Channel Board for CHBB replacement processing

Location	Replacement parts name		Part 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))



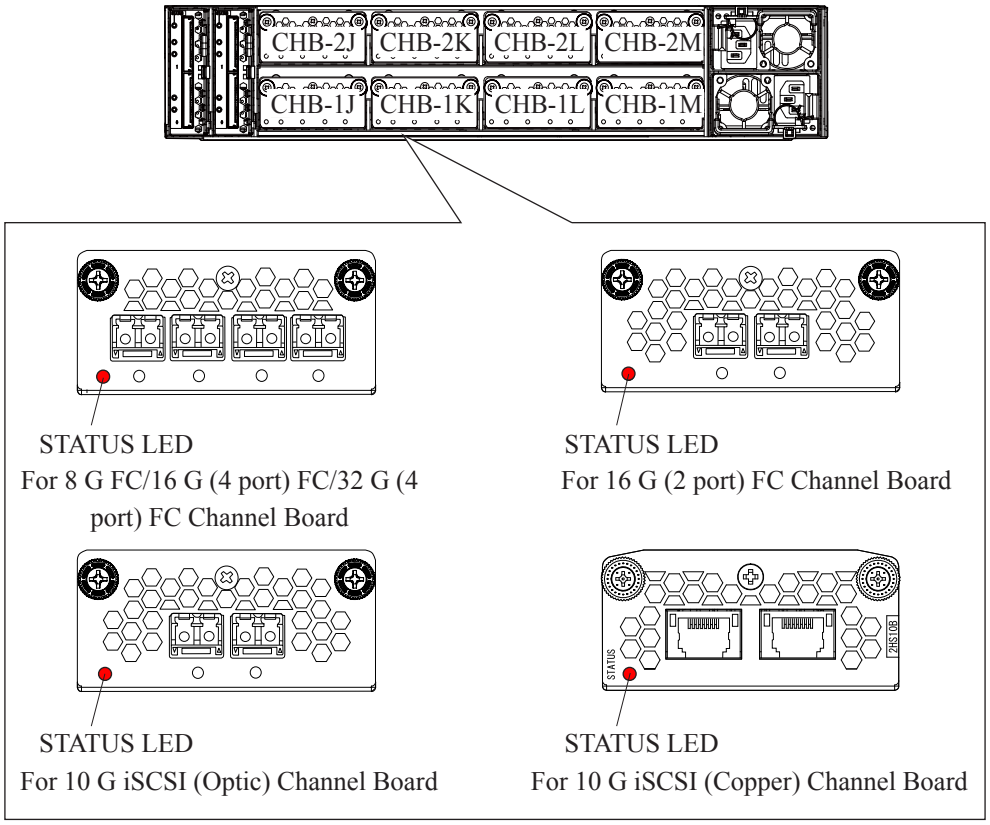
CHBB (Rear view)

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the Channel Board to be replaced lights up. When the LED does not light up, check the location of the Channel Board to be replaced in the "Maintenance Utility" window.

Figure 2-107 STATUS LED Location

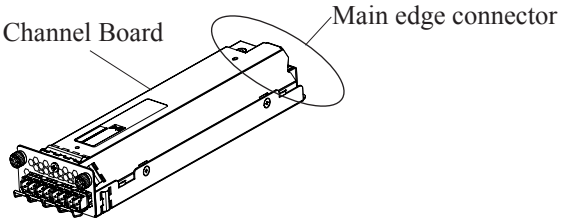


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(2) Remove the cables from the Channel Board to be replaced.

(3) Replace the Channel Board.

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



NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (d) and Step (e) shown below.

(a) Loosen the two screws (blue) which fix the Channel Board.
(b) Pull out and remove the Channel Board while holding the screws (blue).
(c) Move the Small Form-Factor Pluggable (SFP).
If the following condition is met, mount the Small Form-Factor Pluggable (SFP) in the removed Channel Board (CHB) on a new Channel Board (CHB). If the following condition is not met, go to Step (d) without mounting the Small Form-Factor Pluggable (SFP).
[When replacing 8 Gbps or 16 Gbps (2-port) CHB with Small Form-Factor Pluggable (SFP) for Longwave mounted]

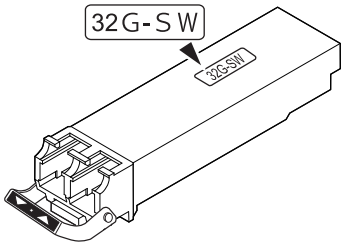
NOTE: Small Form-Factor Pluggable (SFP) for Longwave has a blue lever.

(i) Pull the Small Form-Factor Pluggable (SFP) for Longwave lever down toward you and pull out the Small Form-Factor Pluggable (SFP) for Longwave from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP) for Longwave, pull it out while pushing the lever open toward you.
(ii) Remove the Small Form-Factor Pluggable (SFP) for Shortwave from a new CHB in the same way as Step (i).
(iii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) for Longwave removed in Step (i), and insert it into the same location on the new CHB until it clicks.

[When replacing 32 Gbps/16 Gbps (4-port) CHB]
(i) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the Small Form-Factor Pluggable (SFP) from the removed CHB.
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing the lever open toward you.
(ii) Check the insertion direction of the Small Form-Factor Pluggable (SFP) removed in Step (i), and insert it into the same location on the new CHB until it clicks.

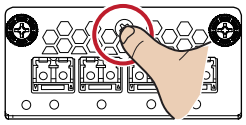
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The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



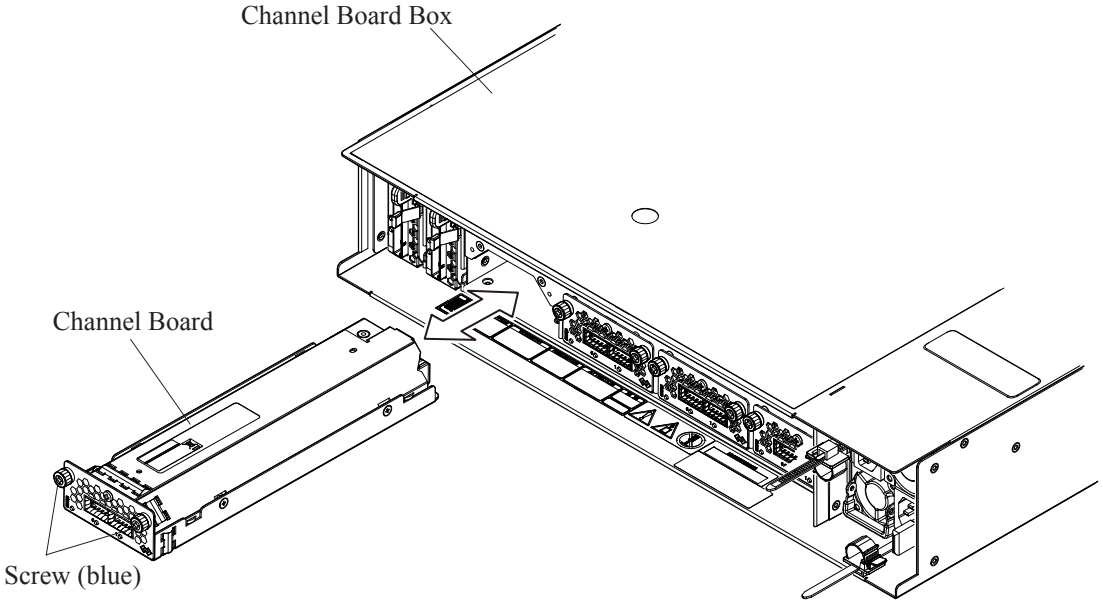
(d) Insert the new Channel Board into the slot just before the shield finger.
(e) Push the Channel Boards gently all the way in.

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



(f) Tighten the two screws (blue) to fix the Channel Board.

Figure 2-108 Replacement of Channel Board



(4) Clean the cable connectors.
(a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
(b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
(c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

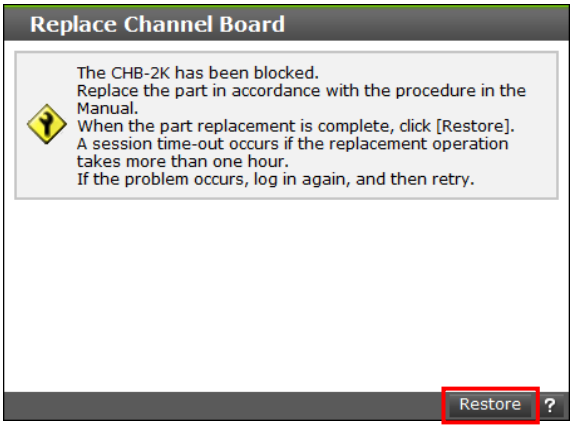
(5) Connect the cables to the replaced Channel Board.

NOTE: Check that cable latch clicks and the cables are surely connected.

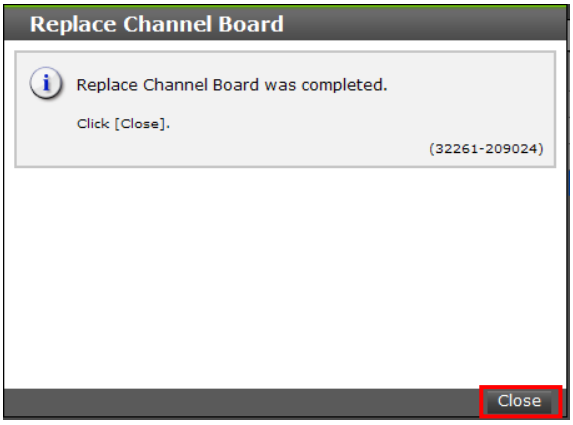
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

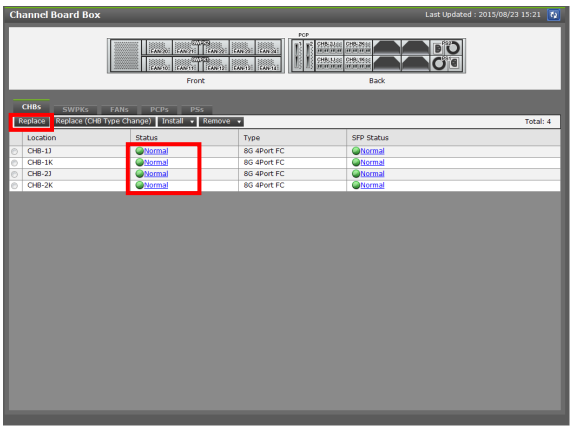


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



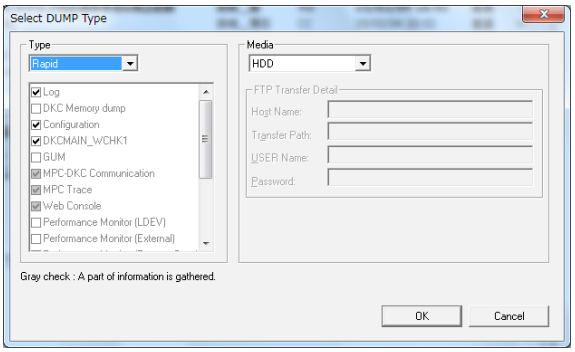
(3) <Check Channel Board restoration>
Click the [CHBs] tab in the "Channel Board Box" window and check that a Status of the replaced Channel Board is "Normal".

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



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

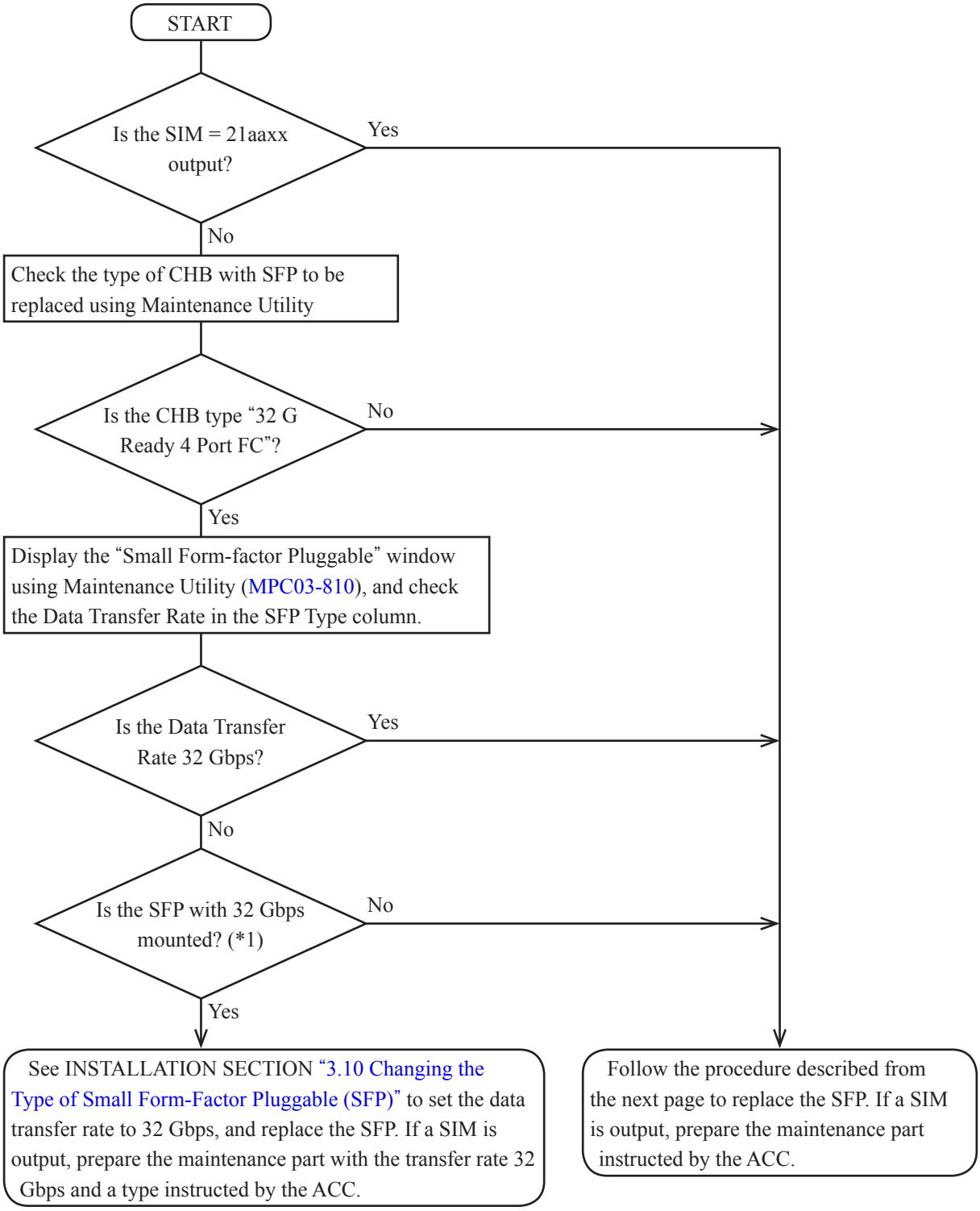
(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.13 Replacing a Small Form-Factor Pluggable (SFP)

If the SFP is replaced with the one for the 32G Ready 4Port FC CHB, the replacement might need to be performed using the procedure in "3.10 Changing the Type of Small Form-Factor Pluggable (SFP)". Follow the flowchart below to check which replacement procedure to perform.



*1: Check the record at the time of delivery, or remove the SFP and check the appearance. See INST03-10-60, INST03-10-130, INST03-10-200.

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The window and the procedure differ between the CBSS/CBSL and the CBLM/CBLH.

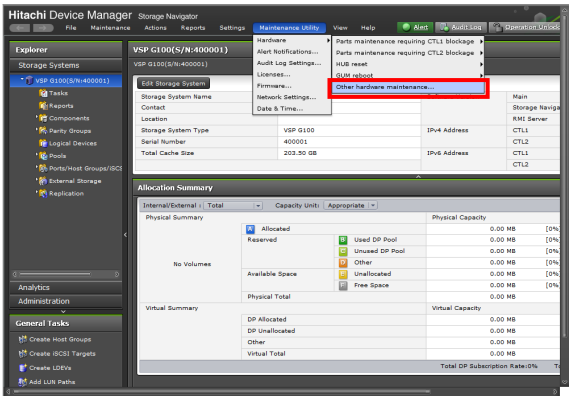
- When replacing a Small Form-Factor Pluggable (SFP) of the CBSS/CBSL
  "2.13.1 Replacing a Small Form-Factor Pluggable (SFP) for CBSS/CBSL"
- When replacing a Small Form-Factor Pluggable (SFP) of the CBLM/CBLH
  "2.13.2 Replacing a Small Form-Factor Pluggable (SFP) for CBLM/CBLH"
- When replacing a Small Form-Factor Pluggable (SFP) of the Channel Board Box
  "2.13.3 Replacing a Small Form-Factor Pluggable (SFP) for Channel Board Box"

2.13.1 Replacing a Small Form-Factor Pluggable (SFP) for CBSS/CBSL

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Small Form-Factor Pluggable (SFP), connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

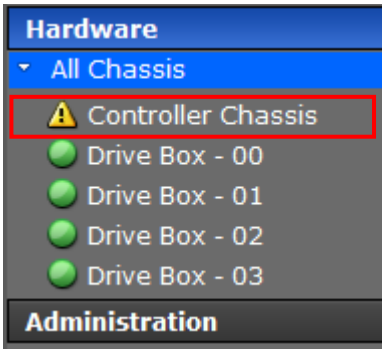
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



3. Selecting replacement 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.

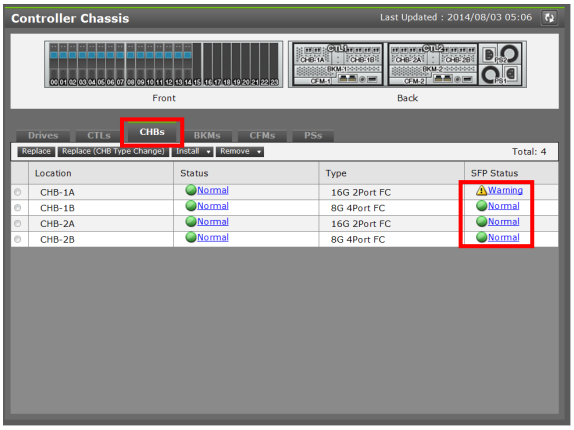
(1) <Main window>
Select [Controller Chassis] in the main window.



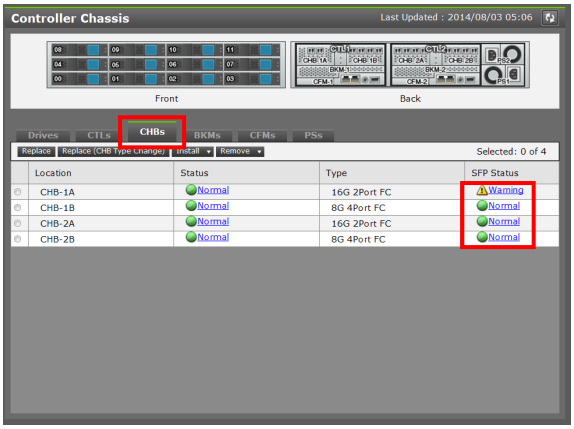
(2) <Controller Chassis window>
Click the [CHBs] tab in the “Controller Chassis” window and click “Warning” in the [SFP Status] column. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

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

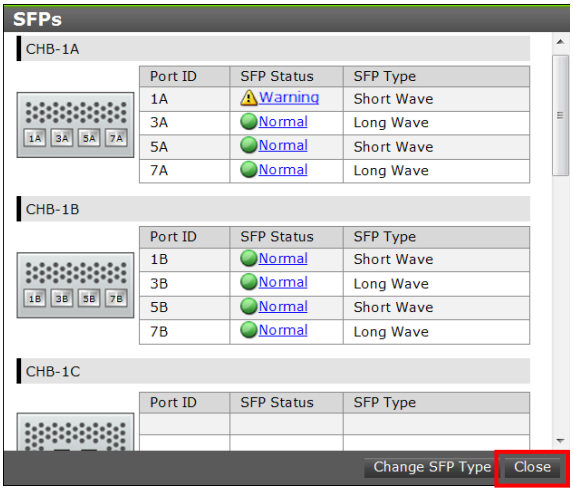
• In case of CBSS



• In case of CBSL



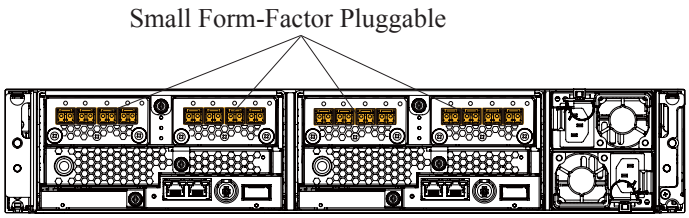
(3) <Check Small Form-Factor Pluggable (SFP)>
Select a Small Form-Factor Pluggable (SFP) to be replaced. Click the [Close] button.



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4. Small Form-Factor Pluggable (SFP) for CBSS/CBSL Replacement Processing

Location	Replacement parts name		Part Name
Rear View of CBSS/CBSL	1	Small Form-Factor Pluggable	• Shortwave, For 8 G FC • Longwave, For 8 G FC • Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC • Shortwave, For 10 G iSCSI

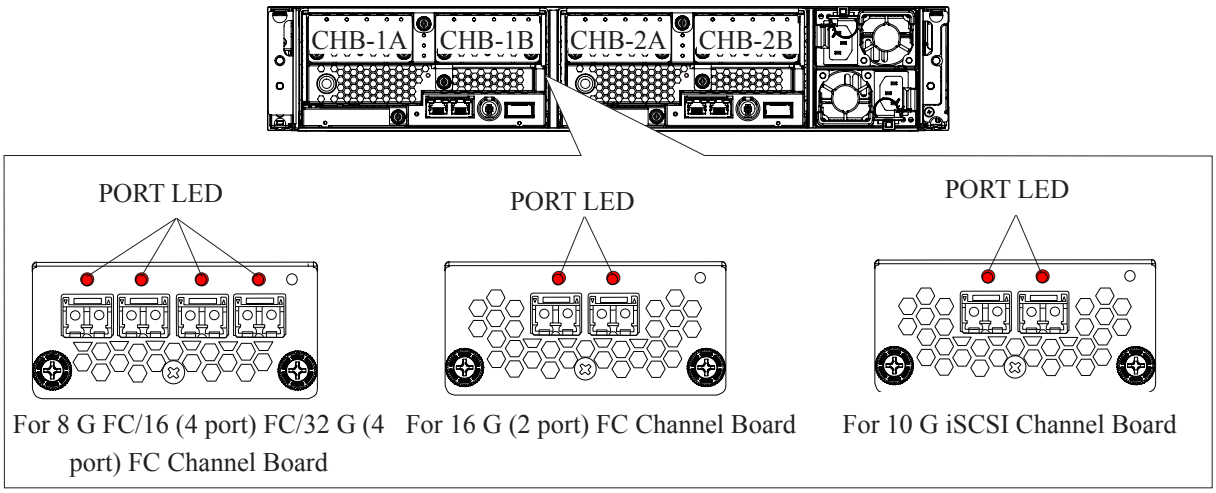


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the PORT LED (red) on the CBSS/CBSL Small Form-Factor Pluggable (SFP) to be replaced lights up. When the LED does not light up, check the location of the Small Form-Factor Pluggable (SFP) to be replaced in the "Maintenance Utility" window.

Figure 2-109 PORT LED Location



(2) Remove the cables from the Small Form-Factor Pluggable (SFP) to be replaced.

(3) Replace the Small Form-Factor Pluggable (SFP).

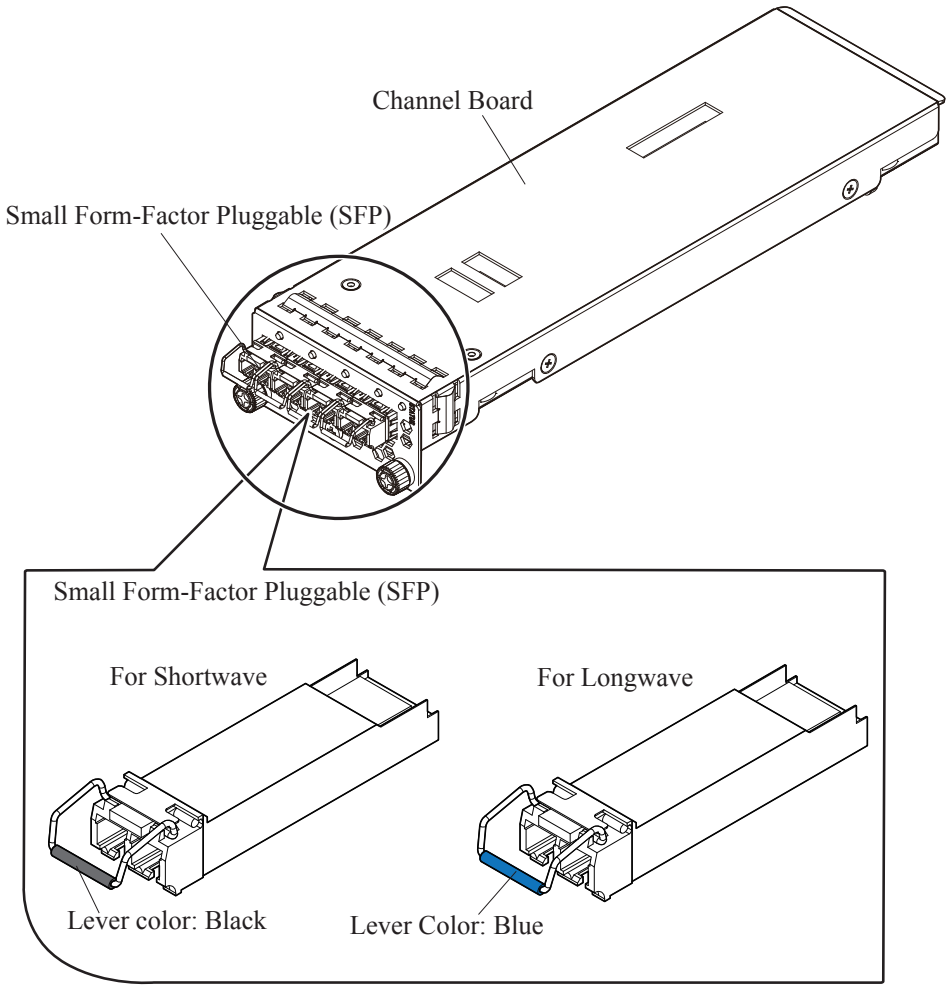
(a) Open the SFP lever and pull out the Small Form-Factor Pluggable (SFP).
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing open the lever toward you.

NOTE : After removing the Small Form-Factor Pluggable, wait for about 10 seconds before inserting a new one.

(b) Check the Small Form-Factor Pluggable (SFP) insertion direction and inset the Small Form-Factor Pluggable (SFP) into the port until it clicks.

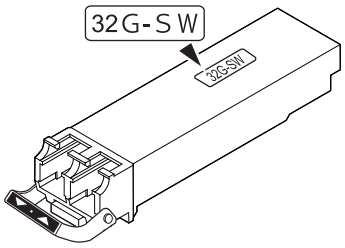
NOTE : Be sure to install the same type of Small Form-Factor Pluggable (SFP) as the removed one.

Figure 2-110 Replacement of Small Form-Factor Pluggable (SFP)



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The label “32G-SW” is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



(4) Clean the cable connectors.
   (a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
   (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
   (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

(5) Connect the cables to the replaced Small Form-Factor Pluggable (SFP).

   NOTE: Check that cable latch clicks and the cables are surely connected.

5. Restoring replacement parts by Maintenance Utility

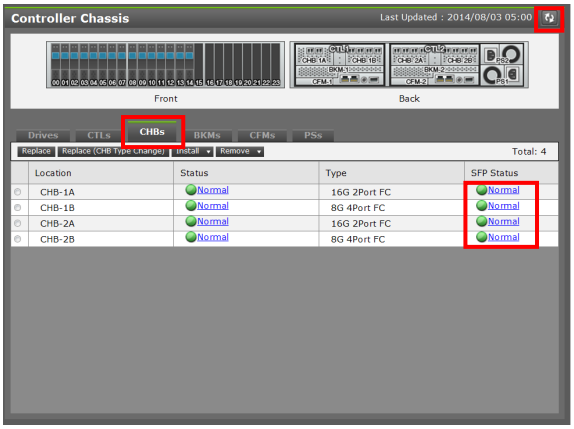
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Check Small Form-Factor Pluggable (SFP) restoration>
Click the [CHBs] tab in the “Controller Chassis” window and check that a Status of the replaced Small Form-Factor Pluggable (SFP) is “Normal”.

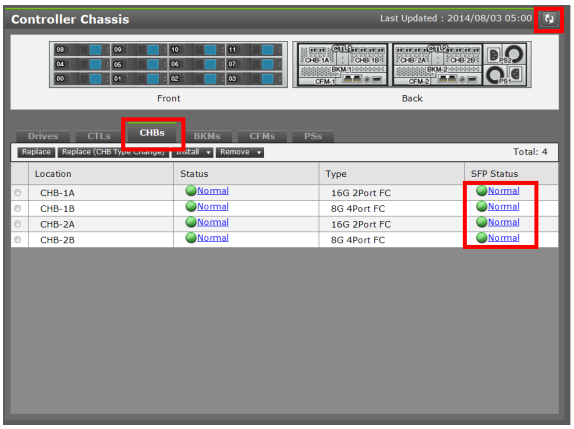
NOTE : Click the refresh button on the upper right of the window to update the window, and then check the status.

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



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

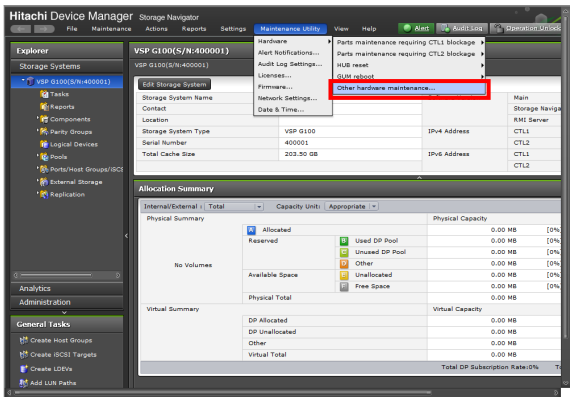
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.13.2 Replacing a Small Form-Factor Pluggable (SFP) for CBLM/CBLH

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Small Form-Factor Pluggable (SFP), connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

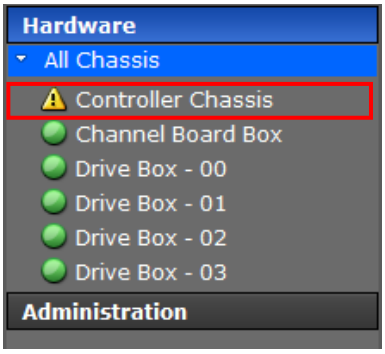
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



3. Selecting replacement parts by Maintenance Utility.

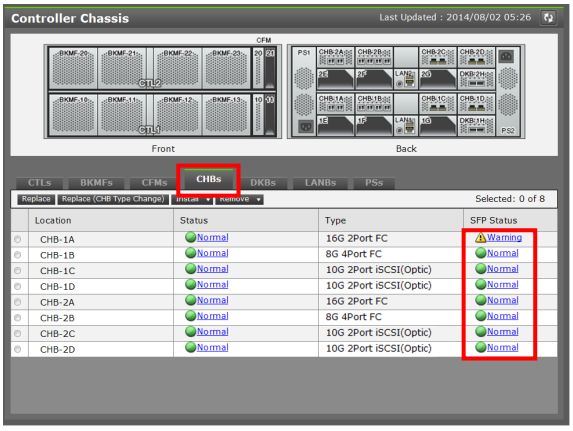
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

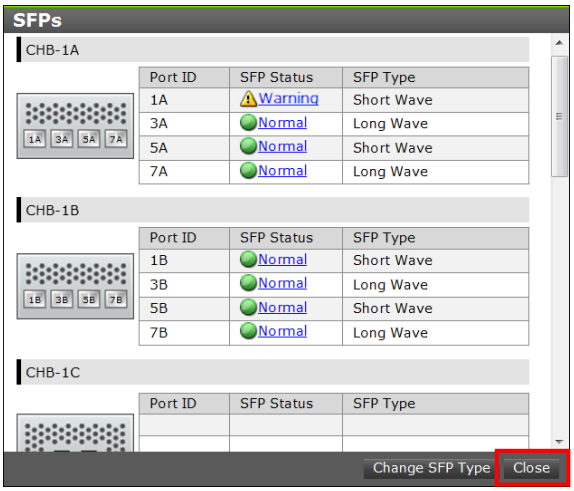


(2) <Controller Chassis window>
Click the [CHBs] tab in the “Controller Chassis” window and click “Warning” in the [SFP Status] column. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

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



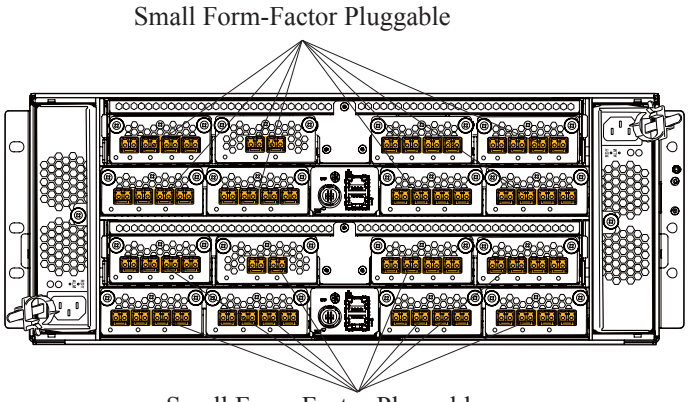
(3) <Check Small Form-Factor Pluggable (SFP)>
Select a Small Form-Factor Pluggable (SFP) to be replaced. Click the [Close] button.



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4. Small Form-Factor Pluggable (SFP) for CBLM/CBLH Replacement Processing

Location	Replacement parts name		Part Name
Rear View of CBLM/CBLH	1	Small Form-Factor Pluggable	• Shortwave, For 8 G FC • Longwave, For 8 G FC • Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC • Shortwave, For 10 G iSCSI



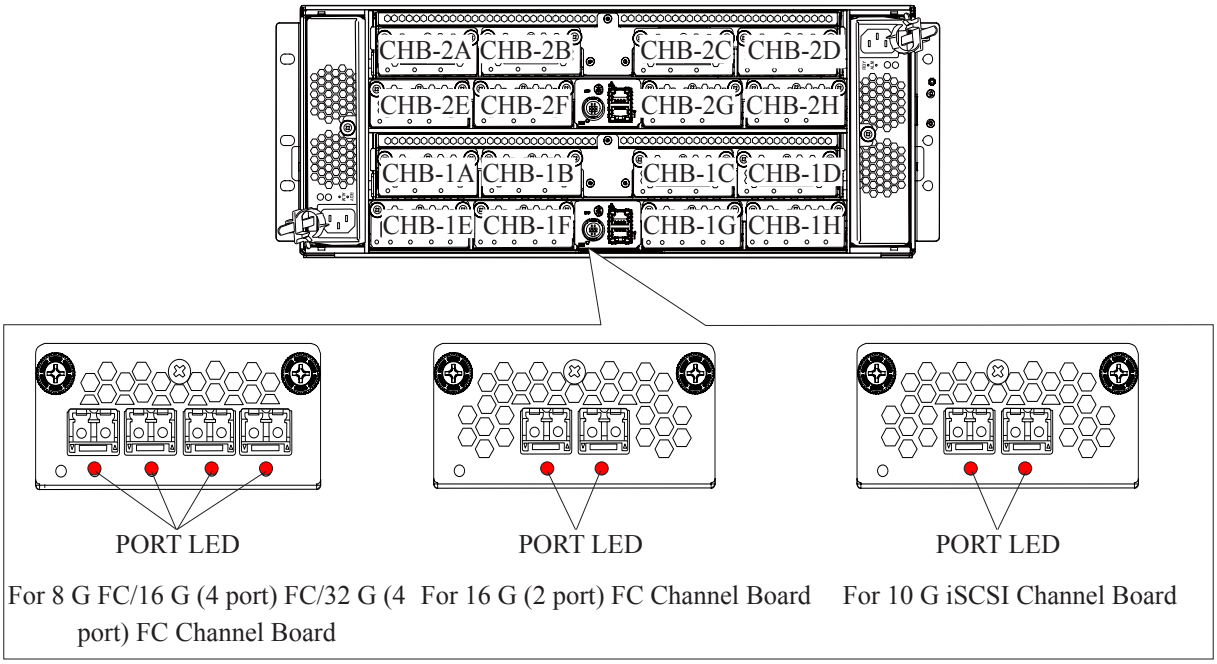
Rear view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the PORT LED (red) on the CBLM/CBLH Small Form-Factor Pluggable (SFP) to be replaced lights up. When the LED does not light up, check the location of the Small Form-Factor Pluggable (SFP) to be replaced in the "Maintenance Utility" window.

Figure 2-111 PORT LED Location



(2) Remove the cables from the Small Form-Factor Pluggable (SFP) to be replaced.

(3) Replace the Small Form-Factor Pluggable (SFP).

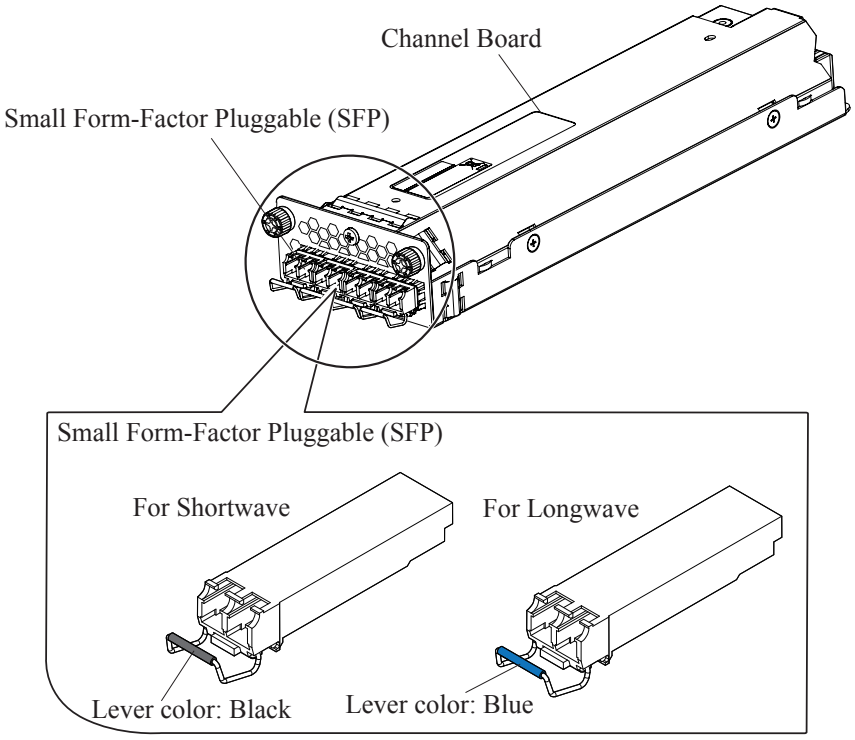
(a) Open the Small Form-Factor Pluggable (SFP) lever and pull out the Small Form-Factor Pluggable (SFP).
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing open the lever toward you.

NOTE : After removing the Small Form-Factor Pluggable, wait for about 10 seconds before inserting a new one.

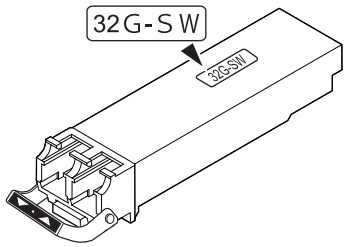
(b) Check the Small Form-Factor Pluggable (SFP) insertion direction and inset the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE : Be sure to install the same type of Small Form-Factor Pluggable (SFP) as the removed one.

Figure 2-112 Replacement of Small Form-Factor Pluggable (SFP)



The label “32G-SW” is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



(4) Clean the cable connectors.
(a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
(b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
(c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

(5) Connect the cables to the replaced Small Form-Factor Pluggable (SFP).

NOTE: Check that cable latch clicks and the cables are surely connected.

---

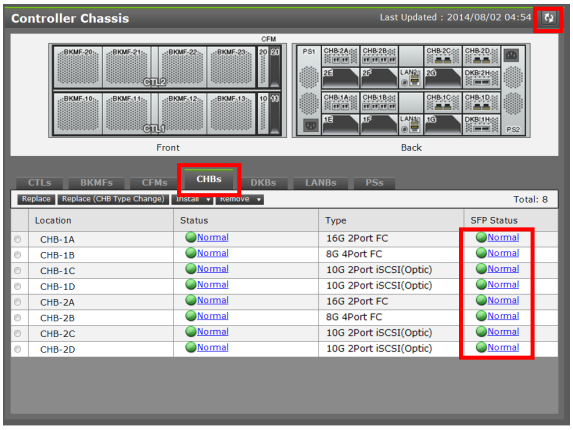
5. Restoring replacement parts by Maintenance Utility

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

(1) <Check Small Form-Factor Pluggable (SFP) restoration>
Click the [CHBs] tab in the “Controller Chassis” window and check that a Status of the replaced Small Form-Factor Pluggable (SFP) is “Normal”.

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

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



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

---

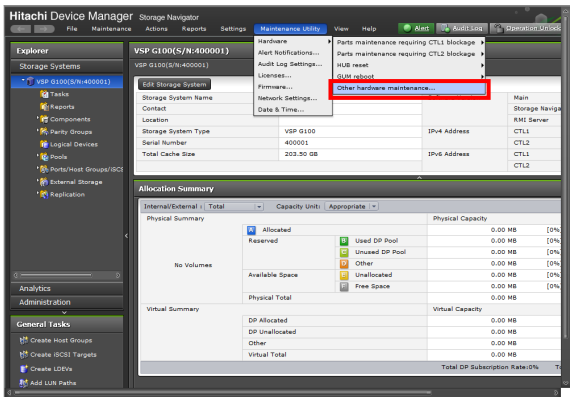
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.13.3 Replacing a Small Form-Factor Pluggable (SFP) for Channel Board Box

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Small Form-Factor Pluggable (SFP), connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

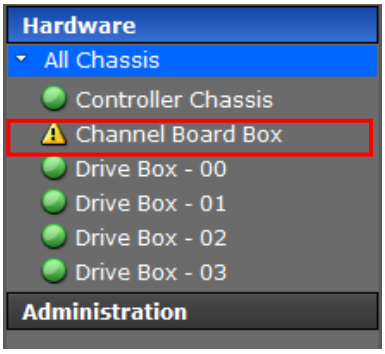


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3. Selecting replacement parts by Maintenance Utility.

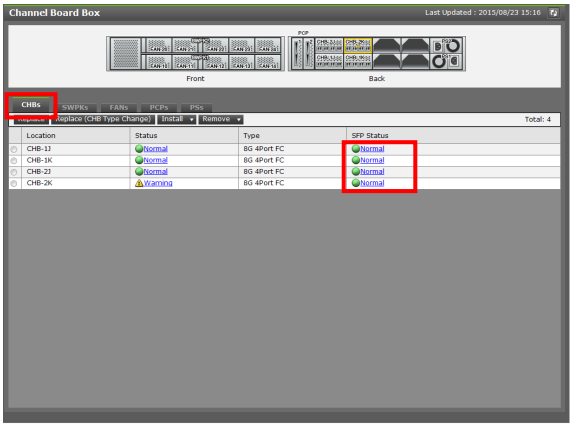
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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



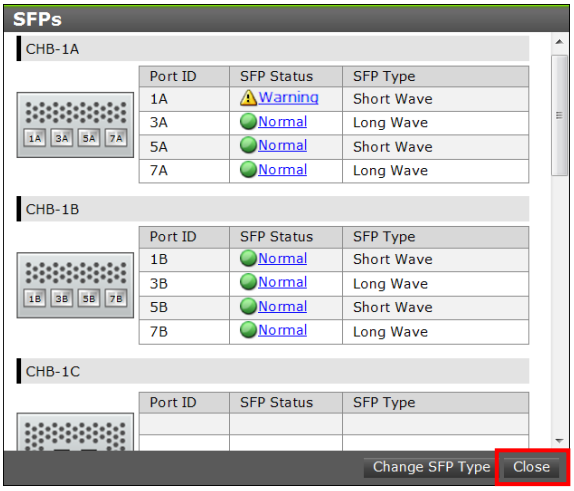
(2) <Channel Board Box window>
Click the [CHBs] tab in the “Channel Board Box” window and display the Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

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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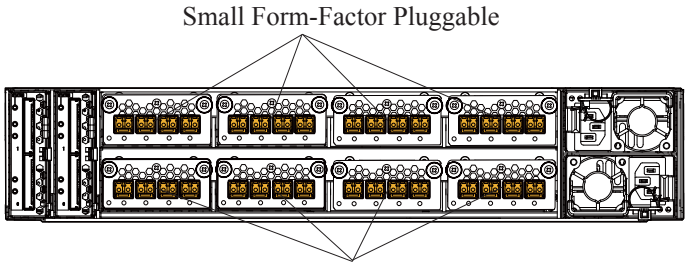
(3) <Check Small Form-Factor Pluggable (SFP)>
Check a Small Form-Factor Pluggable (SFP) to be replaced. Click the [Close] button.



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4. Small Form-Factor Pluggable (SFP) for Channel Board Box Replacement Processing

Location	Replacement parts name		Part Name
Rear View of CHBB	1	Small Form-Factor Pluggable	• Shortwave, For 8 G FC • Longwave, For 8 G FC • Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC • Shortwave, For 10 G iSCSI

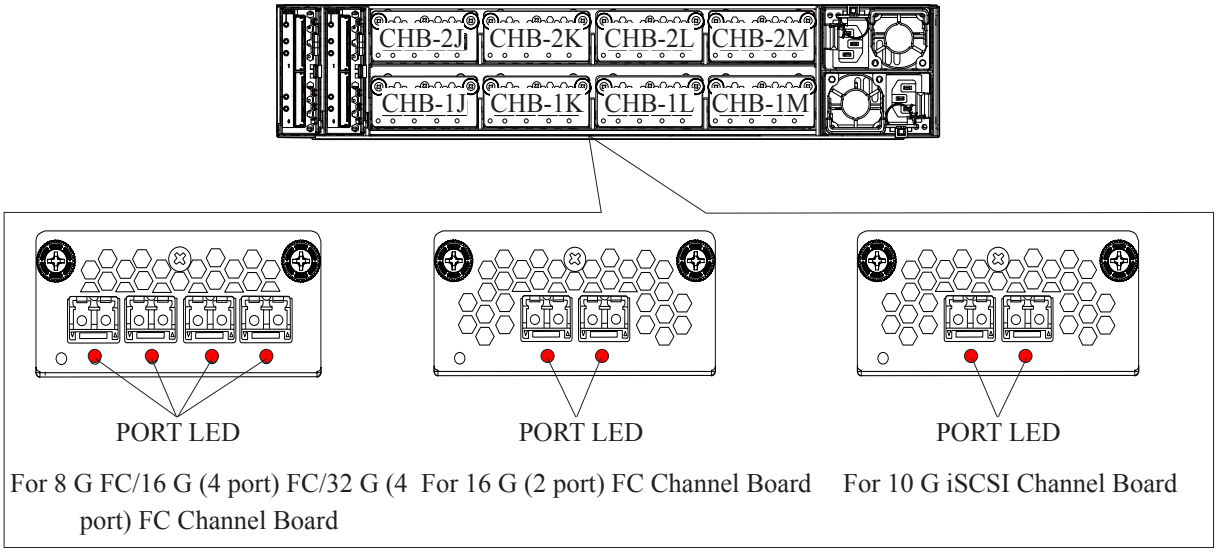


Rear view of CHBB

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the PORT LED (red) on the Channel Board Box Small Form-Factor Pluggable (SFP) to be replaced lights up. When the LED does not light up, check the location of the Small Form-Factor Pluggable (SFP) to be replaced in the "Maintenance Utility" window.

Figure 2-113 PORT LED Location



(2) Remove the cables from the Small Form-Factor Pluggable (SFP) to be replaced.

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(3) Replace the Small Form-Factor Pluggable (SFP).

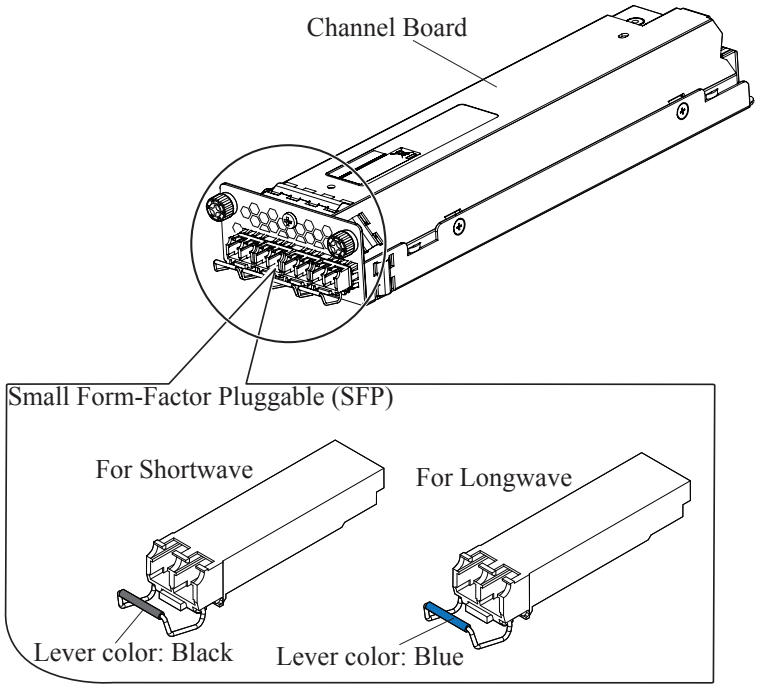
(a) Open the Small Form-Factor Pluggable (SFP) lever and pull out the Small Form-Factor Pluggable (SFP).
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing open the lever toward you.

NOTE : After removing the Small Form-Factor Pluggable, wait for about 10 seconds before inserting a new one.

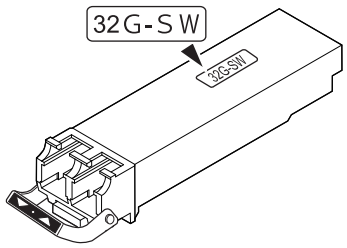
(b) Check the Small Form-Factor Pluggable (SFP) insertion direction and inset the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE : Be sure to install the same type of Small Form-Factor Pluggable (SFP) as the removed one.

Figure 2-114 Replacement of Small Form-Factor Pluggable (SFP)



The label “32G-SW” is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



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(4) Clean the cable connectors.
(a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
(b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
(c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

(5) Connect the cables to the replaced Small Form Factor Pluggable (SFP).

NOTE: Check that cable latch clicks and the cables are surely connected.

---

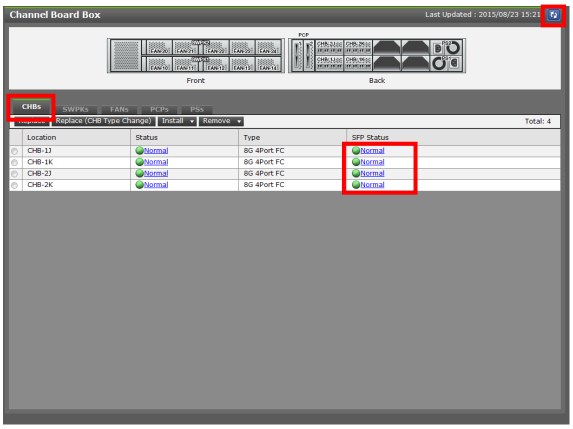
5. Restoring replacement parts by Maintenance Utility

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

(1) <Check Small Form-Factor Pluggable (SFP) restoration>
Click the [CHBs] tab in the “Channel Board Box” window and check that a Status of the replaced Small Form-Factor Pluggable (SFP) is “Normal”.

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

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



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.14 Replacing a Disk Board (DKB)

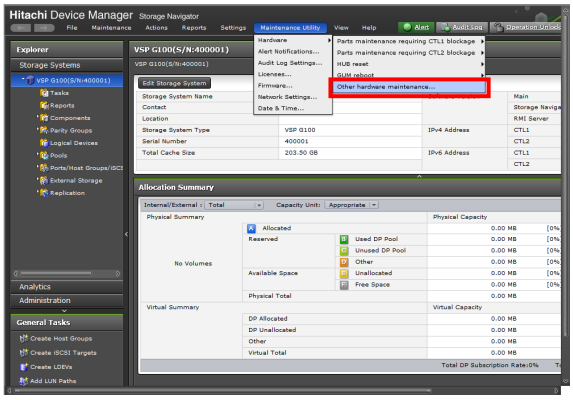
2.14.1 Replacing a Disk Board for CBLM/CBLH

NOTE: Both encrypted and unencrypted Disk Boards exist on CBLM/CBLH. Check the Disk Boards to be replaced.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

---

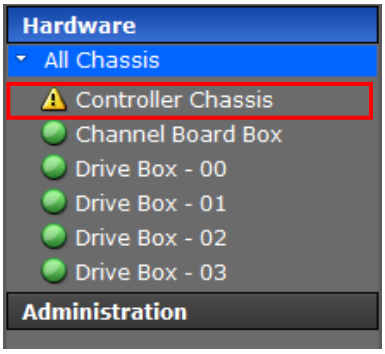
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



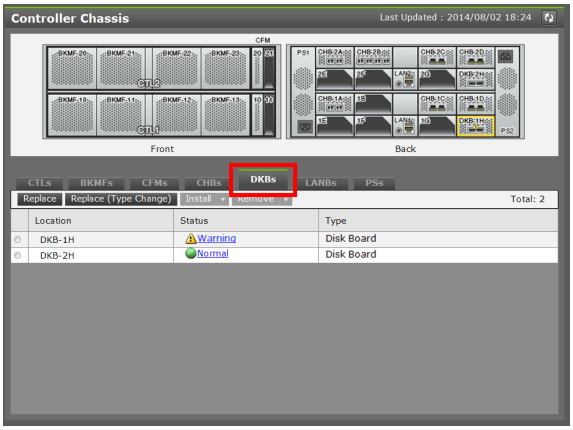
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



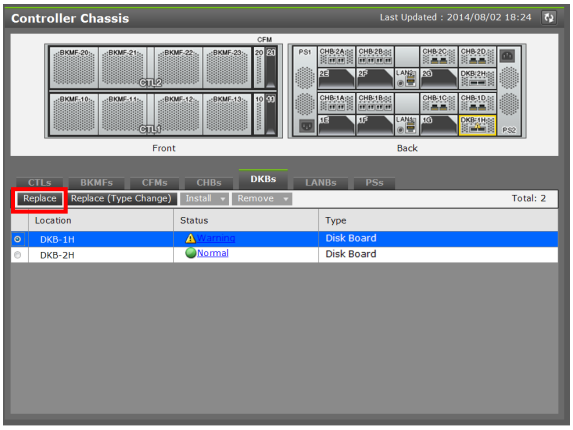
(2) <Controller Chassis window>
Click the [DKBs] tab in the “Controller Chassis” window to display a Disk Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select Disk Board>

Select a Disk Board to be replaced. Click the [Replace] button.



(4) <Block Disk Board>

⚠ CAUTION

About "Forcibly run without safety checks":

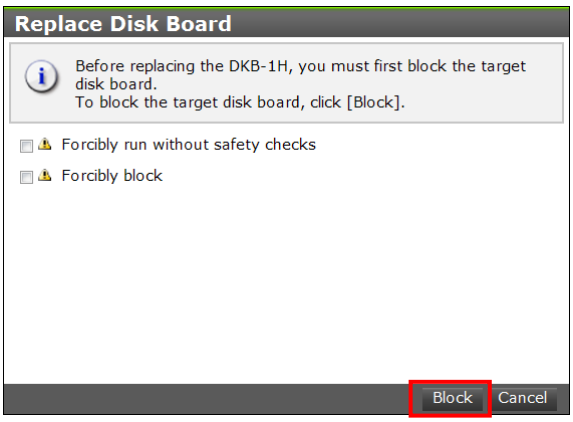
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the Disk Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

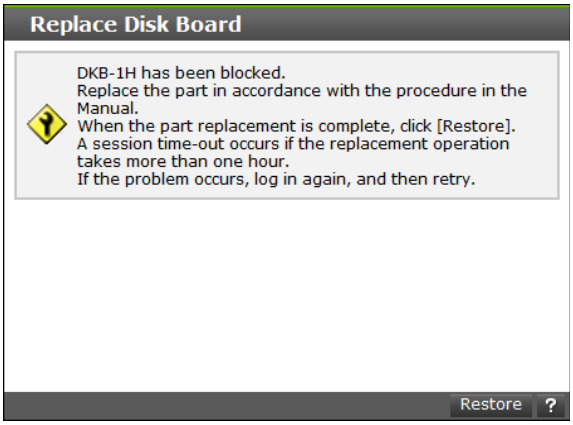
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Disk Board replacement>
Check that the Disk Board is blocked and becomes ready for replacing.

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

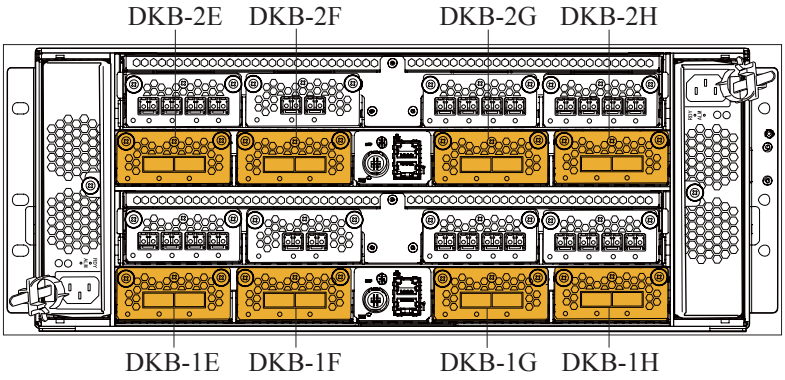


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4. Disk Board for CBLM/CBLH Replacement Processing

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	Disk Board	• DW-F800-BS12G • DW-F800-BS12GE

NOTE : Two types of Disk Boards exist.
Since you cannot install them by mixing the types, check the Disk Boards and replace them.



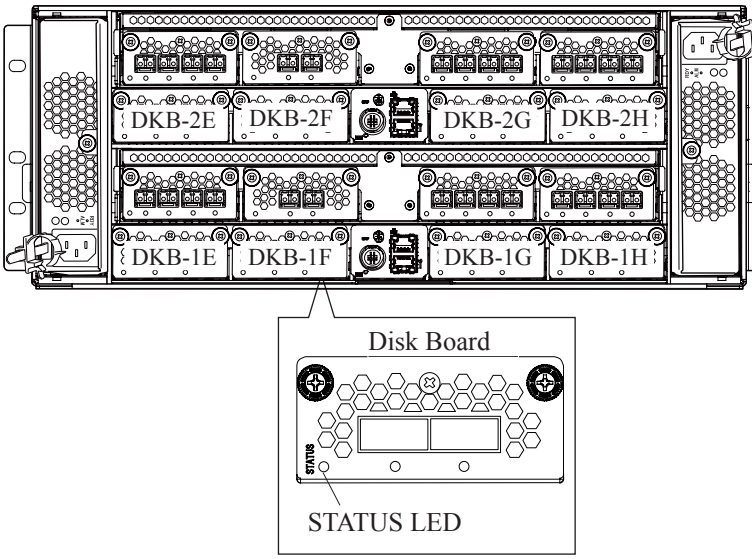
CBLM/CBLH (Rear view)

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the CBLM/CBLH Disk Board to be replaced lights up. When the LED does not light up, check the location of the Disk Board to be replaced in the "Maintenance Utility" window.

Figure 2-115 STATUS LED Location

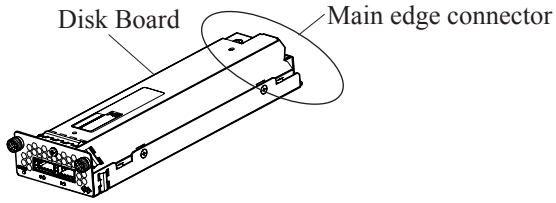


(2) Remove the SAS cables from the Disk Board to be replaced.

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(3) Replace the Disk Board.

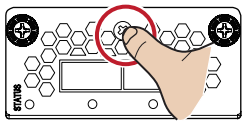
NOTICE: When removing the Disk Board, hold it with both hands and remove it straight not to apply a shock to with any components.



NOTICE: If Disk Boards are inserted randomly, malfunction may occur. Therefore, insert the Disk Boards in two steps, Step (c) and Step (d) shown below.

(a) Loosen the two screws (blue) which fix the Disk Board.
(b) Pull out and remove the Disk Board while holding the screws (blue).
(c) Insert the Disk Boards to be added into the slots just before the shield finger.
(d) Push the Disk Boards gently all the way in.

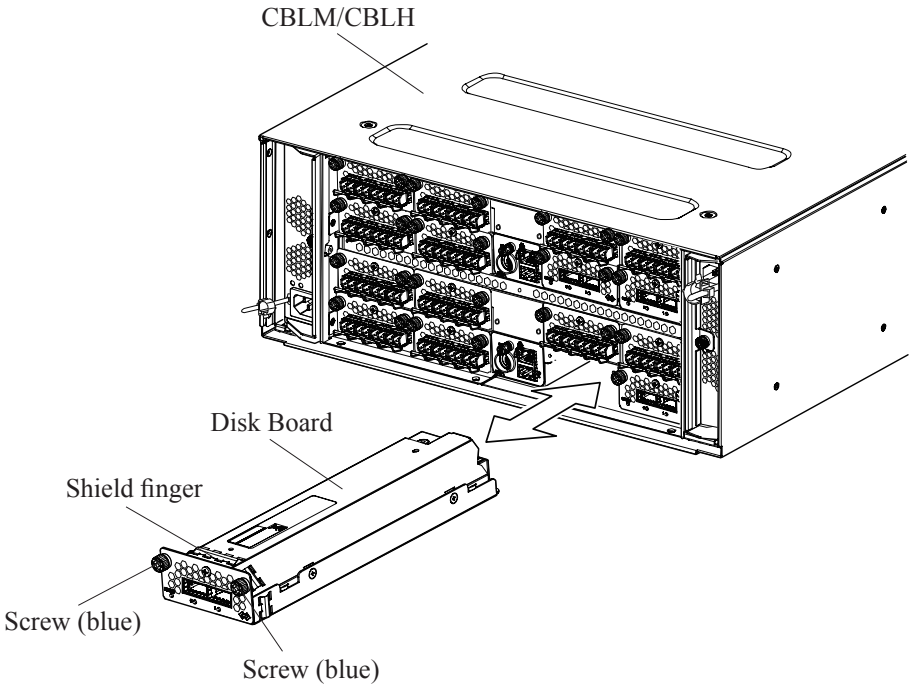
NOTICE: Push the front side of the Disk Board all the way to insert it to the end.



(e) Tighten the two screws (blue) to fix the Disk Board.

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Figure 2-116 Replacement of Disk Board



(4) Clean the SAS cable connectors.
   (a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
   (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
   (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)
   (d) Connect the SAS cables to the replaced Disk Board.

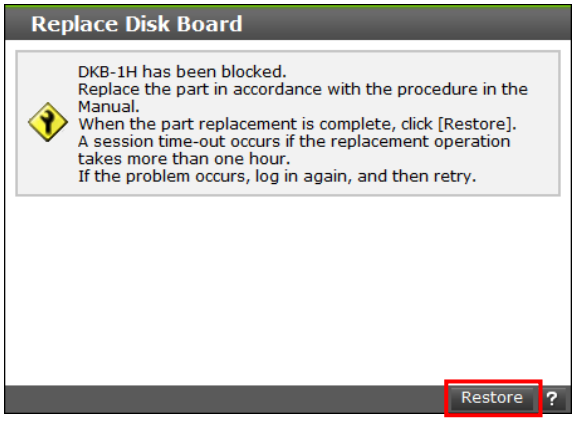
(5) Connect the SAS cables to the replaced Disk Board.
   When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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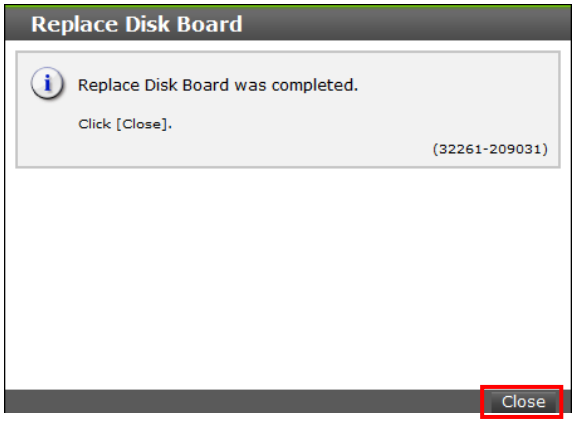
5. Restoring replacement parts by Maintenance Utility

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

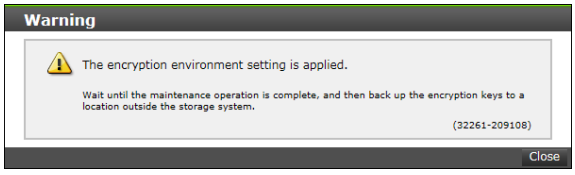
(1) <Restore replacement parts>
Click the [Restore] button.



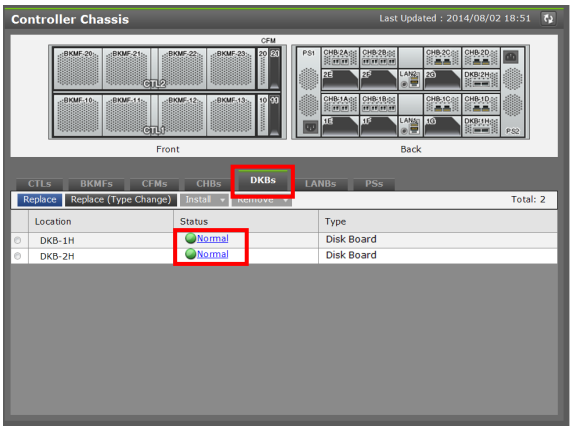
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



(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.

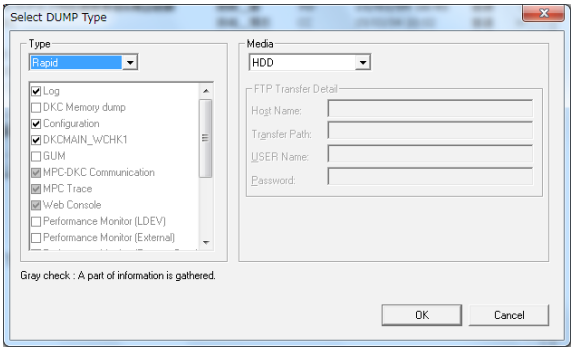


(4) <Check Disk Board restoration>
Click the [DKBs] tab in the "Controller Chassis" window and check that a Status of the replaced Disk Board is "Normal".



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

(6) <Get the error information>
See MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(7) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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7. Back up the encryption key
   When a message is displayed in Step 5(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 5(3), this procedure is not required.

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2.15 Replacing a Power Supply

NOTICE:
- The Power Supply to be removed differs depending on the type of Controller Chassis or Drive Box. Check the Storage System to replace the Power Supply.
- Storage Systems install either AC Power Supply or DC Power Supply. Do not install a DC Power Supply to an AC Power Supply model and vice versa.

The window and the procedure differ according to Controller Chassis and Drive Boxes.

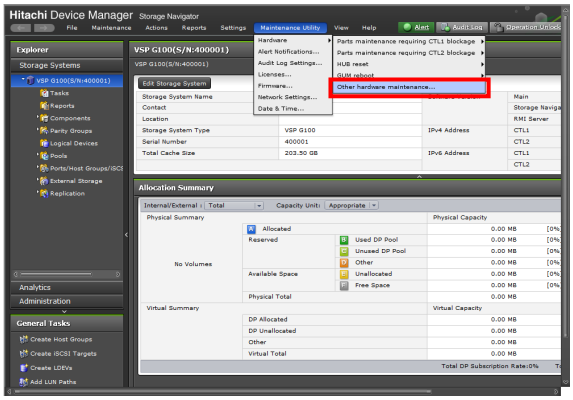
- When replacing the Power Supply of the CBSS/CBSL
  "2.15.1 Replacing a Power Supply (DKCPS) for CBSS/CBSL"
- When replacing the Power Supply of the CBLM/CBLH
  "2.15.2 Replacing a Power Supply (DKCPS) for CBLM/CBLH"
- When replacing the Power Supply of the DBS/DBL
  "2.15.3 Replacing a Power Supply (DBPS) for DBS/DBL"
- When replacing the Power Supply of the DB60
  "2.15.4 Replacing a Power Supply (DBPS) for DB60"
- When replacing the Power Supply of the DBF
  "2.15.5 Replacing a Power Supply (DBPS) for DBF"
- When replacing the Power Supply of the CHBB
  "2.15.6 Replacing a Power Supply (CHBBPS) for CHBB"

2.15.1 Replacing a Power Supply (DKCPS) for CBSS/CBSL

AC Power Supply models (CBSS/CBSL) and DC Power Supply models (CBSSD/CBSLD) exist.
AC Power Supply model names are described except for the different procedure.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Power Supplies, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

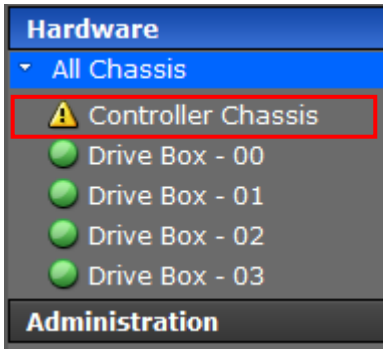


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3. Selecting replacement parts by Maintenance Utility.

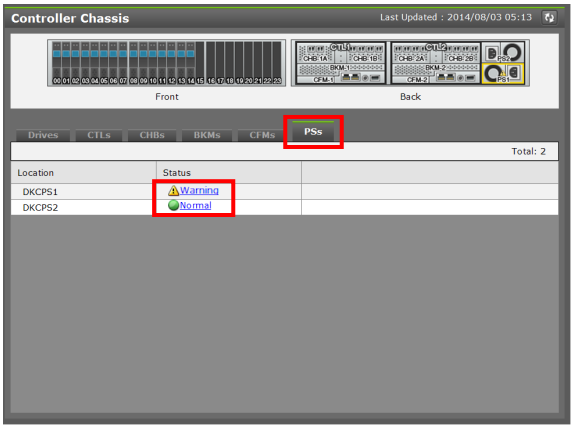
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

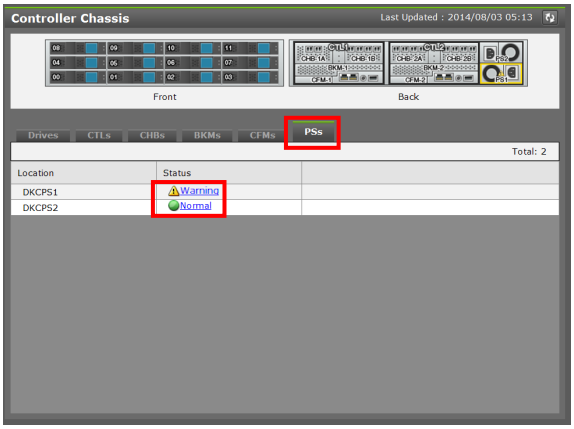


(2) <Controller Chassis window>
Click the [PSs] tab in the “Controller Chassis” window to display a DKCPS status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].
The status of the failed DKCPS is “Warning”.

• In case of CBSS



• In case of CBSL

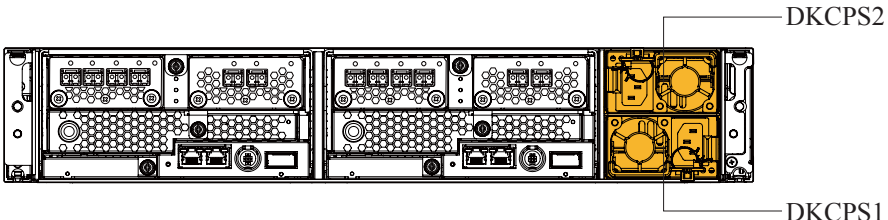


NOTE: When performing the preventive replacement of a DKCPS in which no error occurs, confirm that the status of the other DKCPS is Normal, and then replace the target DKCPS. If there is any error in the other DKCPS, resolve the error, and then replace the target DKCPS.

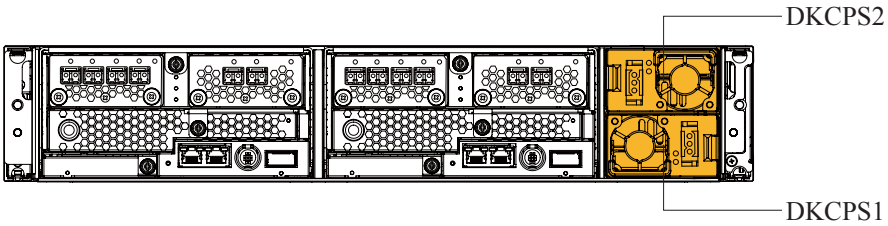
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4. Power Supply for CBSS/CBSL Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	DKCPS	DKCPS



Rear view of CBSS/CBSL



Rear view of CBSSD/CBSLD

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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 "1.1.3 Note on Installing and Removing Parts".

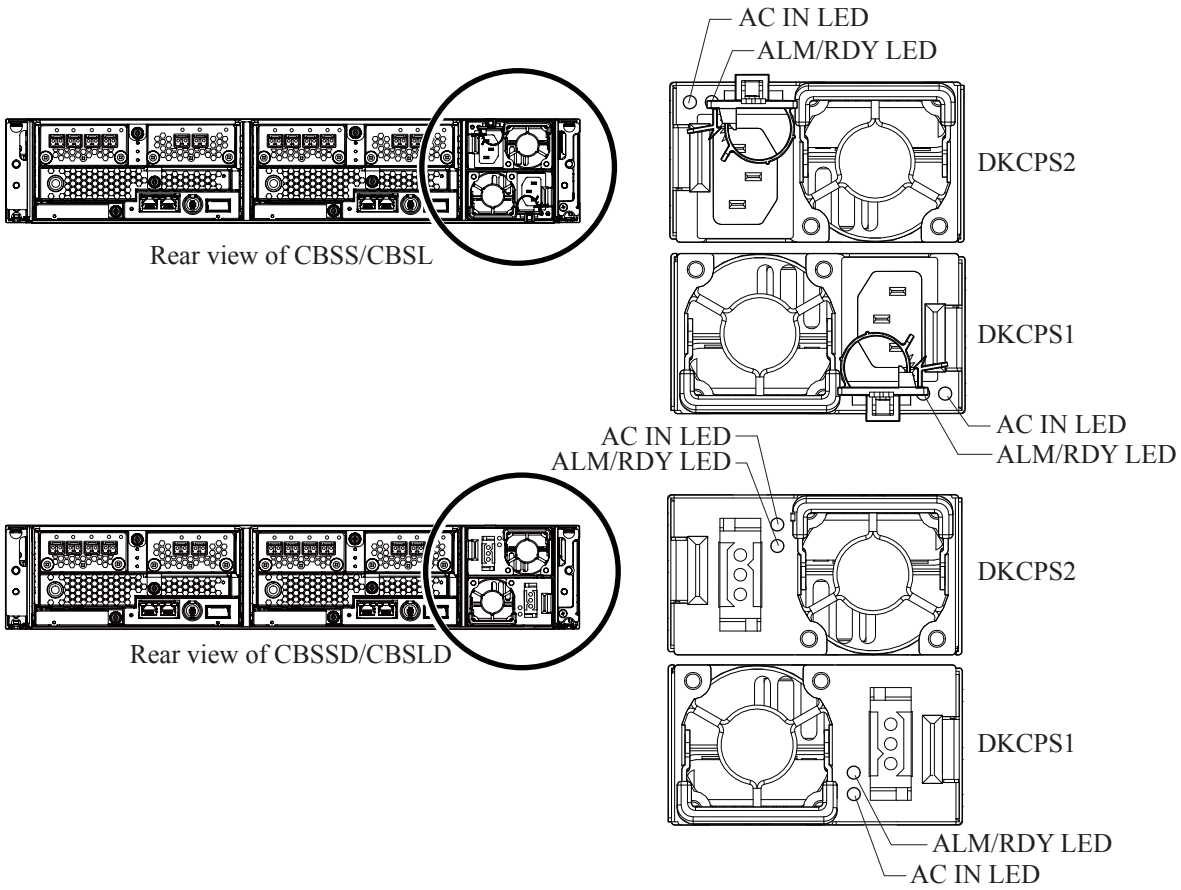
NOTICE: The insertion direction of DKCPS1 and DKCPS2 is opposite.(Refer to Figure 2-117.)

(1) Check that the ALM/RDY LED (red) on the CBSS/CBSL DKCPS to be replaced lights up. When the LED does not light up, check the location of the DKCPS to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the DKCPS not to be replaced, the system will be down. Check that the DKCPS is to be replaced.

Figure 2-117 ALM LED Location



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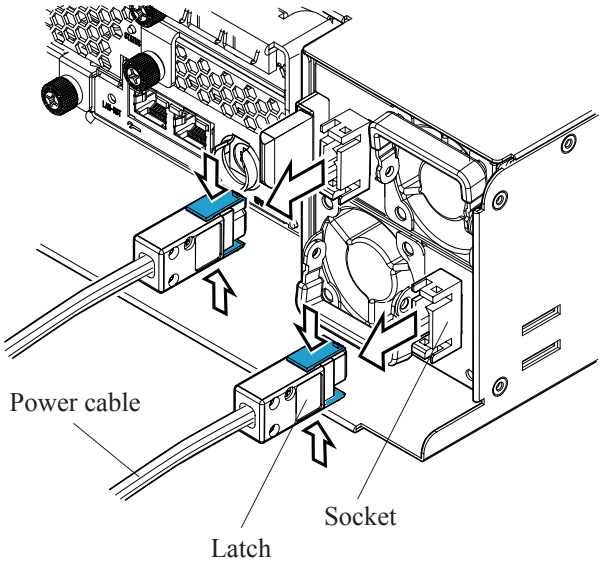
(2) Remove the power cables from the DKCPS to be replaced.

⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

- In case of CBSS/CBSL, remove the cable holder from the power cable and remove the power cable from the DKCPS.
- In case of CBSSD/CBSLD, pinch both ends of the power socket to release the latch, and then remove the socket from the DBPS.

Figure 2-118 Removing Power Cables



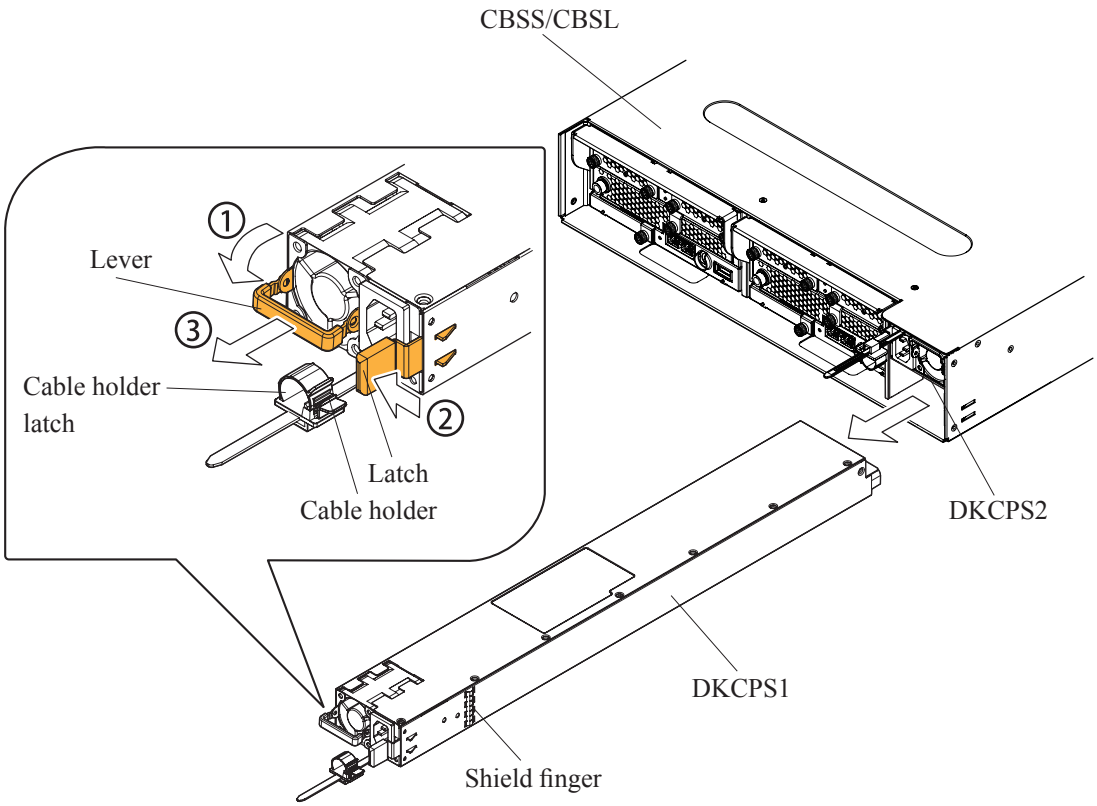
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(3) Replace the DKCPS.
(a) Pull the lever open (①).
(b) Pull the lever (③) while pressing the latch on the DKCPS inward (②).
(c) Pull out and remove the DKCPS while holding its body with both hands.

NOTICE:
- Wait for more than or equal to 20 seconds, and then insert the replacement DKCPS.
- If DKCPSs are inserted randomly, malfunction may occur. Therefore, insert the DKCPSs in two steps, Step (d) and Step (e) shown below.

(d) Insert the new DKCPS to be added into the slots just before the shield finger.
(e) Push the Power Supply gently until the latch of the DKCPS clicks and locks.

Figure 2-119 Replacement of DKCPS



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(4) Connect the removed power cables to the DKCPS.
- In case of CBSS/CBSL, fix a cable with a cable holder.
- In case of CBSSD/CBSLD, insert the socket of the power cable straight into the connector of the DKCPS. At this time, check that the latches on both sides of the socket click and lock.

(5) Check that the ALM/RDY LED on the DKCPS changes from red to green.

NOTE: If the ALM/RDY LED (red) does not go out for more than 30 minutes after replacing the DKCPS, redo the steps from Step (2).

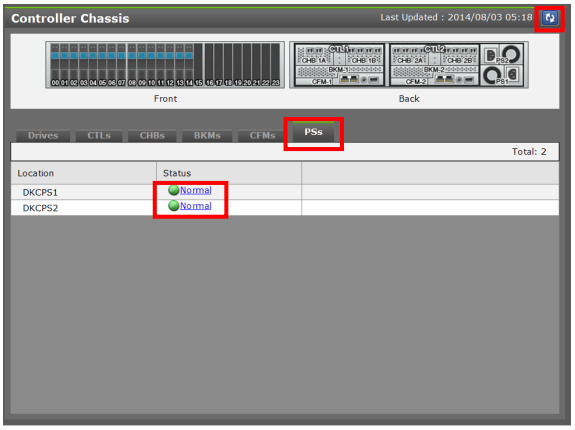
5. Restoring replacement parts by Maintenance Utility

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

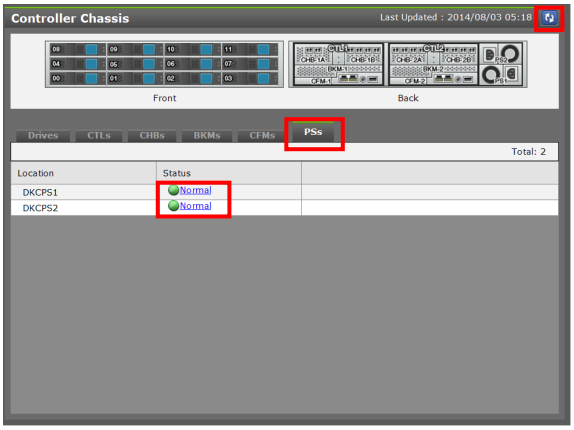
(1) <Check DKCPS restoration>
Click the [PSs] tab in the “Controller Chassis” window and check that a Status of the replaced DKCPS is “Normal”.

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

• In case of CBSS



• In case of CBSL



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

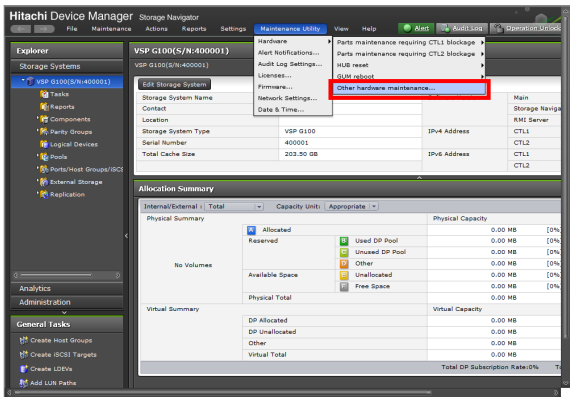
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.15.2 Replacing a Power Supply (DKCPS) for CBLM/CBLH

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Power Supplies, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

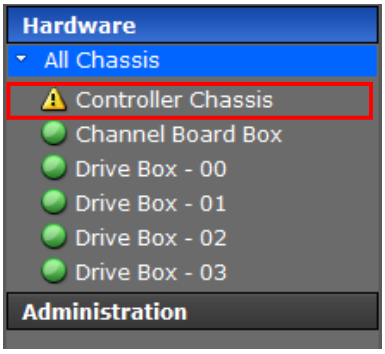


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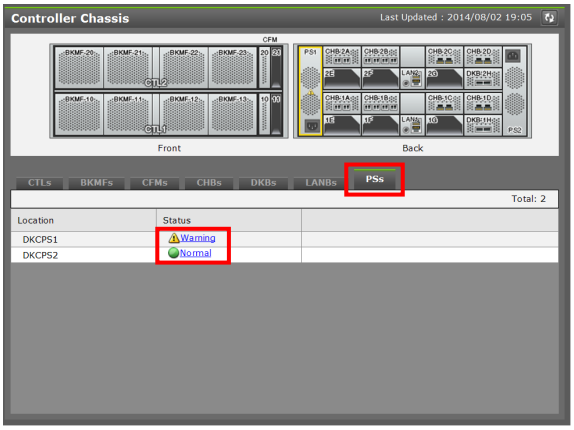
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



(2) <Controller Chassis window>
Click the [PSs] tab in the “Controller Chassis” window to display a DKCPS status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].
Replace a DKCPS whose Status is “Warning”.

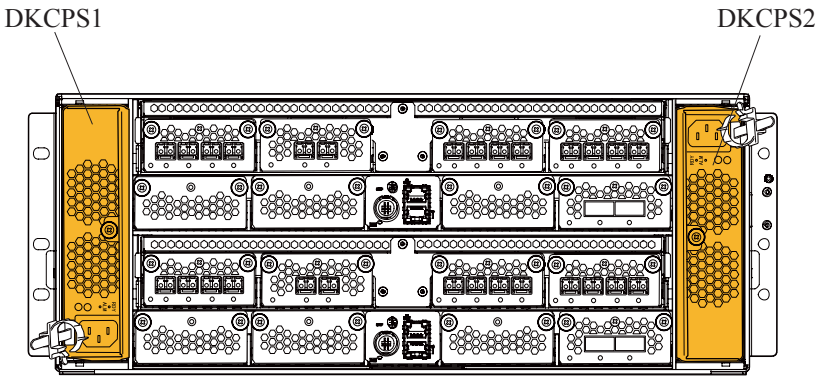


NOTE: When performing the preventive replacement of a DKCPS in which no error occurs, confirm that the status of the other DKCPS is Normal, and then replace the target DKCPS. If there is any error in the other DKCPS, resolve the error, and then replace the target DKCPS.

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4. Power Supply for CBLM/CBLH Replacement Processing

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	DKCPS	DKCPS



Rear view of CBLM/CBLH

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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 "1.1.3 Note on Installing and Removing Parts".

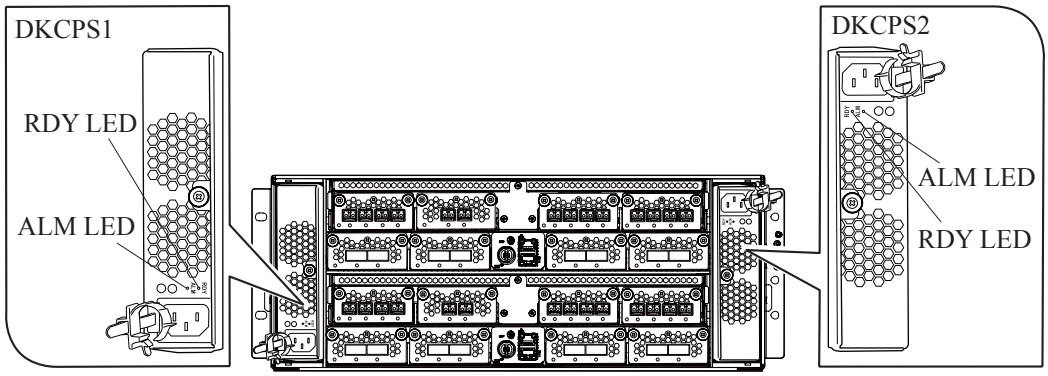
NOTICE: The insertion direction of DKCPS1 and DKCPS2 is opposite.

(1) Check that the ALM LED (red) on the CBLM/CBLH DKCPS to be replaced lights up. When the LED does not light up, check the location of the DKCPS to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the DKCPS not to be replaced, the system will be down. Check that the DKCPS is to be replaced.

Figure 2-120 ALM LED Location



Rear view of CBLM/CBLH

(2) Remove the power cables from the DKCPS to be replaced.
Remove the cable holder to remove the power cable from the DKCPS.

⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

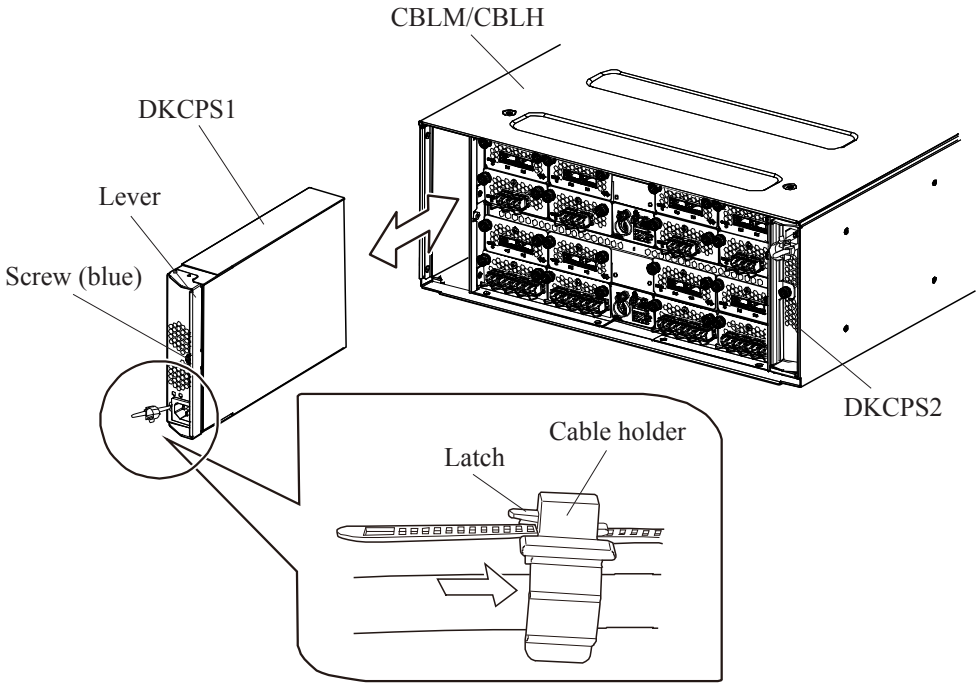
Copyright © 2015, 2017, Hitachi, Ltd.

(3) Replace the DKCPS.
(a) Loosen the screw (blue) which fixed the DKCPS.
(b) Open the lever to pull out and remove the DKCPS.
When the lever is completely opened, the DKCPS comes out forward.
(c) Pull out and remove the DKCPS while holding its body with both hands.
(d) Hold up the latch on the cable holder of the new DKCPS to release the lock, and then slide the cable holder forward.

NOTICE: Wait for more than or equal to 20 seconds, and then insert the replacement DKCPS.

(e) With the lever opened completely, insert the new DKCPS into the slot.
(f) Push the new DKCPS all the way in.
(g) Close the lever completely.
(h) Tighten the screw (blue) to fix the DKCPS.

Figure 2-121 Replacement of DKCPS



(4) Connect the removed power cable to the DKCPS, and then fix the cable by the cable holder. Check that the ALM LED (red) on the DKCPS goes out and the RDY LED (green) lights up.

NOTICE: If the ALM LED (red) does not go out for more than or equal to 30 minutes after replacing the DKCPS, redo the steps from Step (2).

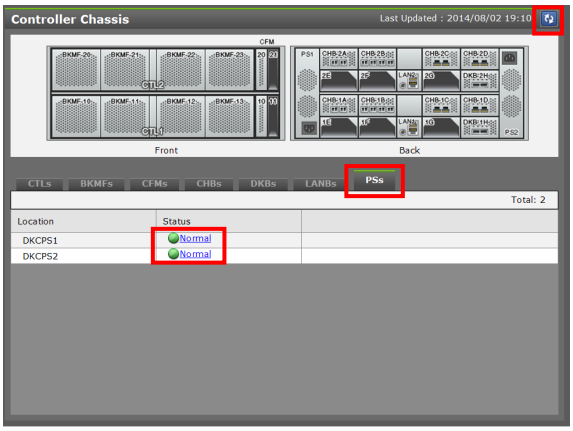
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5. Restoring replacement parts by Maintenance Utility

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

(1) <Check DKCPS restoration>
Click the [PSs] tab in the “Controller Chassis” window and check that a Status of the replaced DKCPS is “Normal”.

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



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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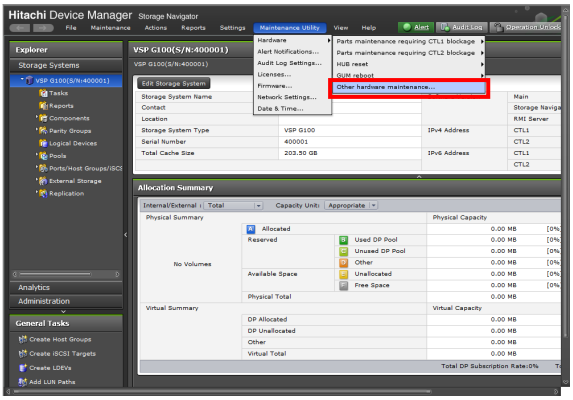
2.15.3 Replacing a Power Supply (DBPS) for DBS/DBL

AC Power Supply models (DBS/DBL) and DC Power Supply models (DBSD/DBLD) exist.
AC Power Supply model names are described except for the different procedure.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Power Supplies, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

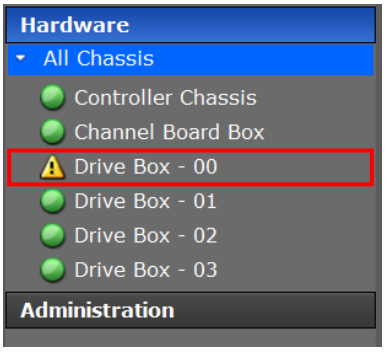


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3. Selecting replacement parts by Maintenance Utility.

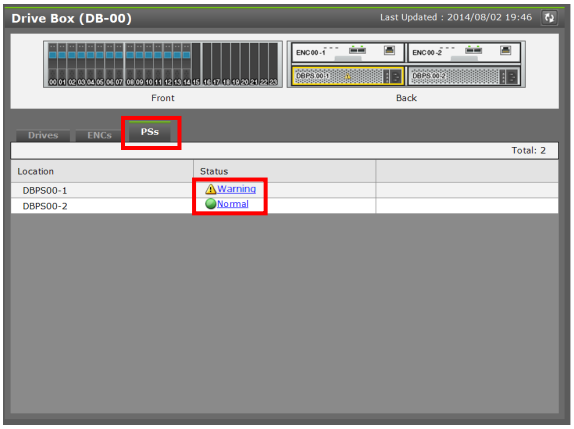
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

(1) <Main window>
Select [Drive Box] in the main window.

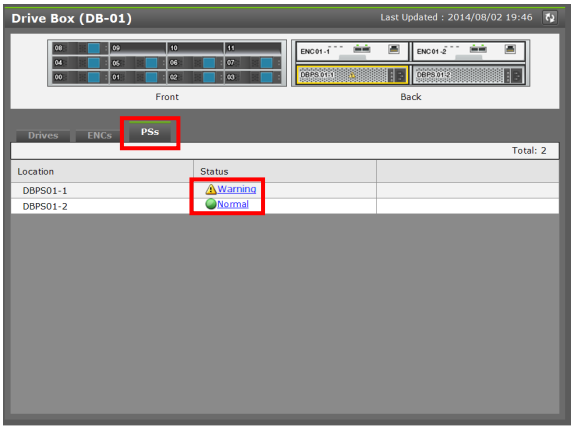


(2) <Drive Box window>
Click the [PSs] tab in the “Drive Box” window to display a DBPS status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status]. The status of the failed DBPS is “Warning”.

• In case of DBS



• In case of DBL

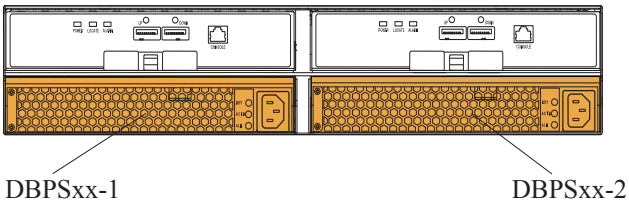


NOTE: When performing the preventive replacement of a DBPS in which no error occurs, confirm that the status of the other DBPS is Normal, and then replace the target DBPS. If there is any error in the other DBPS, resolve the error, and then replace the target DBPS.

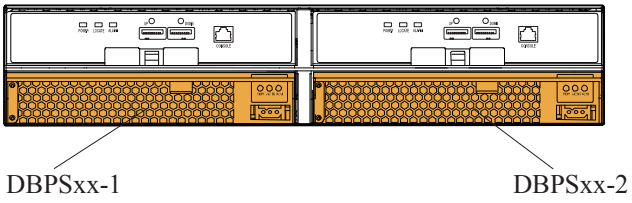
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4. Power Supply for DBS/DBL Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DBS/DBL	1	DBPS	DBPS



Rear view of DBS/DBL



Rear view of DBSD/DBLD

*1 : DBPSxx-1
└→ 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. Refer to "1.1.3 Note on Installing and Removing Parts".

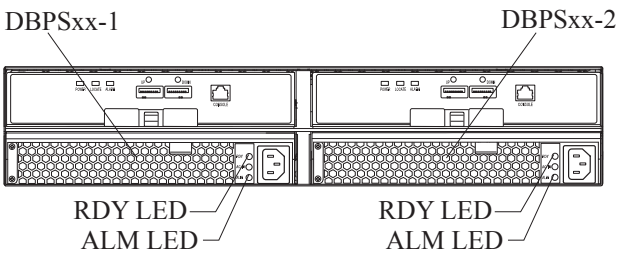
⚠ CAUTION

If replacing the DBPS not to be replaced, the system will be down. Check that the DBPS is to be replaced.

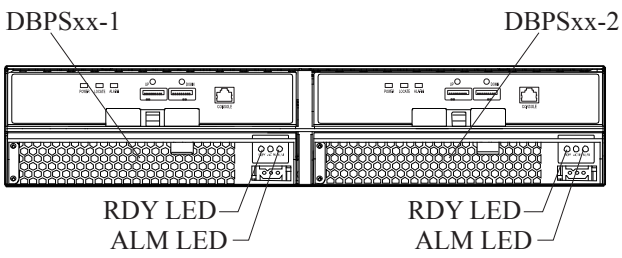
(1) Check that the ALM LED (red) on the DBS/DBL DBPS to be replaced lights up. When the LED does not light up, check the location of the DBPS to be replaced in the "Maintenance Utility" window.

NOTICE: Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

Figure 2-122 ALM LED Location



Rear view of DBS/DBL



Rear view of DBSD/DBLD

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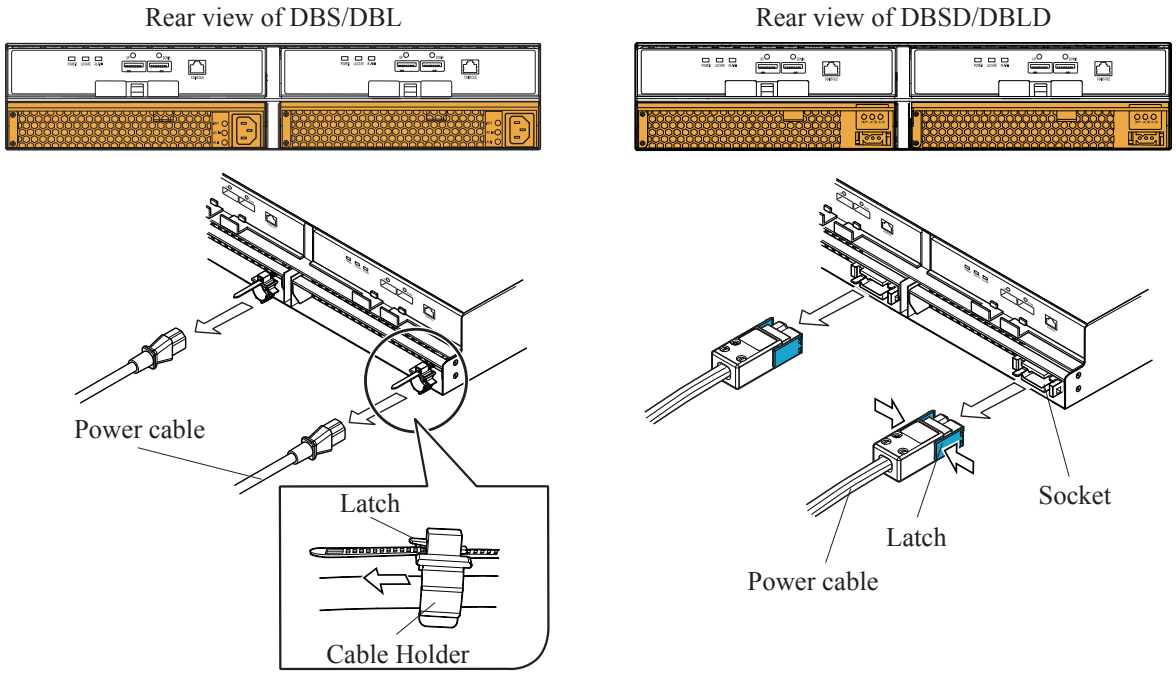
(2) Remove the power cables from the DBPS to be replaced.

⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

- In case of DBS/DBL, remove the cable holder from the power cable and remove the power cable from the DBPS.
- In case of DBSD/DBLD, pinch both ends of the power socket to release the latch, and then remove the socket from the DBSD/DBLD.

Figure 2-123 Removing Power Cables



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(3) Replace the DBPS.

(a) Pull the lever open (②) while pressing the latch on the DBPS inward with right thumb (①). When the lever is completely opened, the DBPS comes out forward.

(b) Pull out and remove the DBPS while holding its body with both hands.

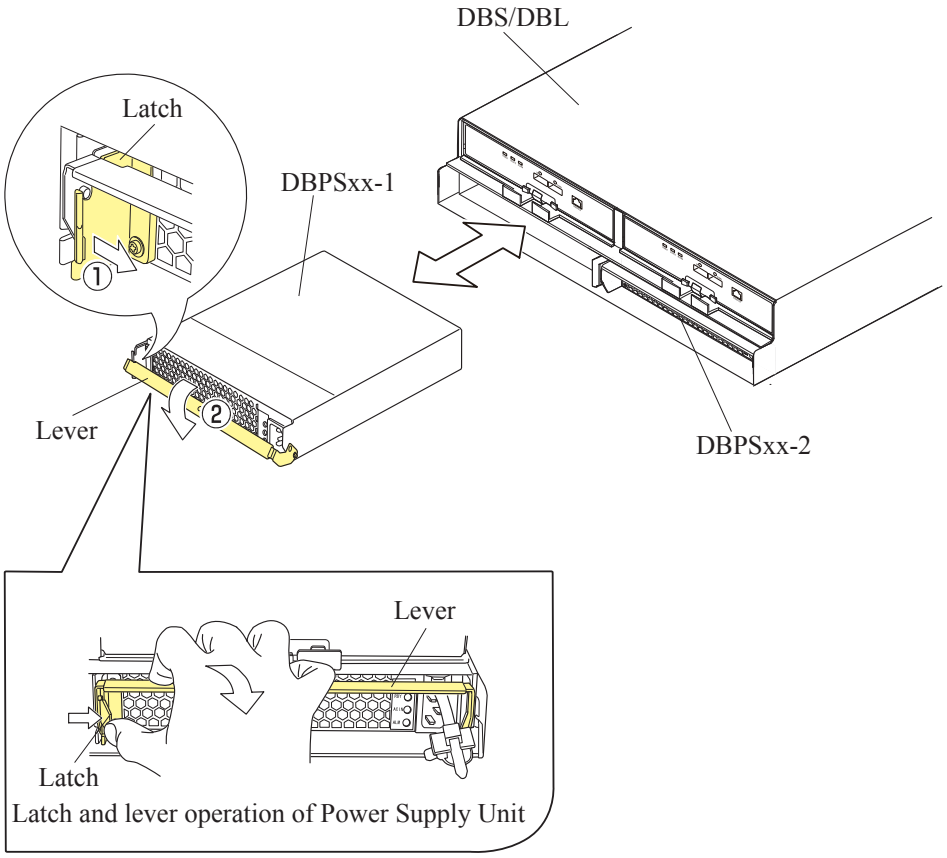
(c) With the lever opened completely, insert the new DBPS into the slot.
If you cannot insert the DBPS into the slot easily, insert it after adjusting the position by slightly returning the lever.

NOTICE: Wait for more than 20 or equal to seconds, and then insert the replacement DBPS.

(d) Push the new DBPS all the way in.

(e) Close the lever completely and fix the DBPS.

Figure 2-124 Replacement of DBPS



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(4) Connect the removed power cables to the DBPS. (Refer to Figure 2-123.)
- In case of DBS/DBL, fix a cable with a cable holder.
- In case of DBSD/DBLD, insert the socket of the power cable straight into the connector of the DBSD/DBLD. At this time, check that the latches on both sides of the socket click and lock.

(5) Check that the RDY LED (green) on the DBPS lights up.

NOTE:
- If the DBPS status is "Normal" and the RDY LED (green) does not light up, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".
- If the ALM LED (red) does not go out for more than 30 minutes after replacing the DBPS, redo the steps from Step (2).

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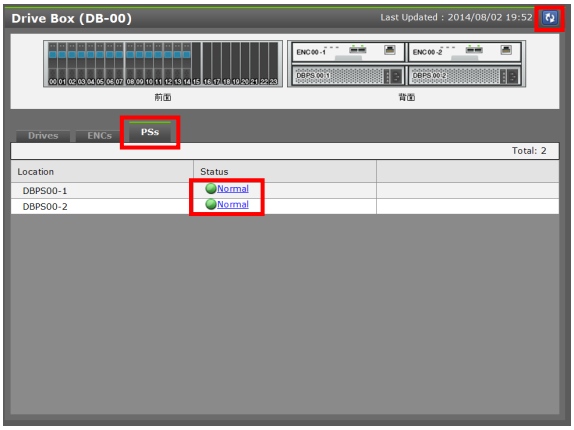
5. Restoring replacement parts by Maintenance Utility

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

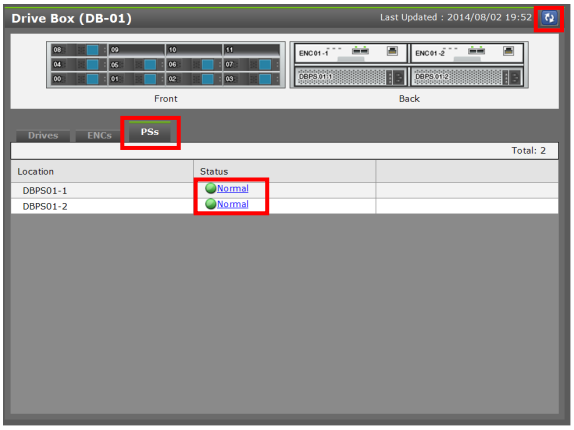
(1) <Check DBPS restoration>
Click the [PSs] tab in the “Drive Box” window and check that a Status of the replaced DBPS is “Normal”.

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

• In case of DBS



• In case of DBL



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

---

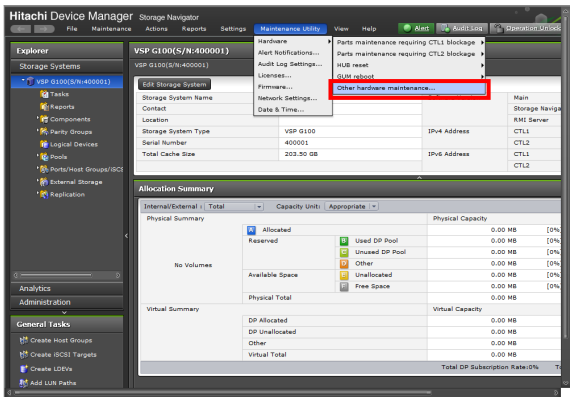
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.15.4 Replacing a Power Supply (DBPS) for DB60

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Power Supplies, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

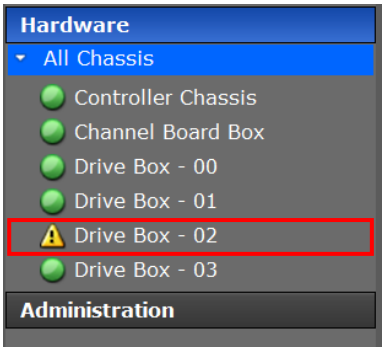
2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 Connecting to the Storage System”.
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the “Web Console” window displays the “Maintenance Utility” window.



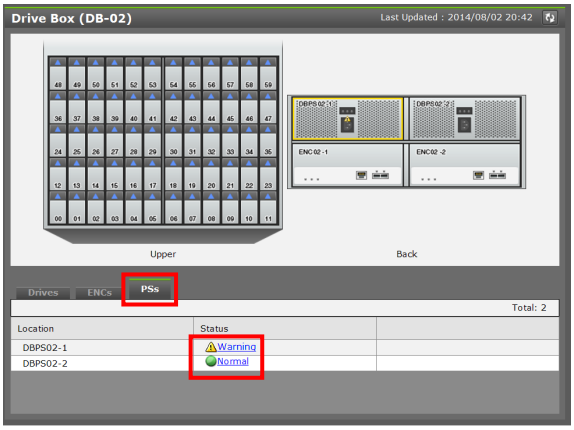
3. Selecting replacement parts by Maintenance Utility.

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 [Drive Box] in the main window.



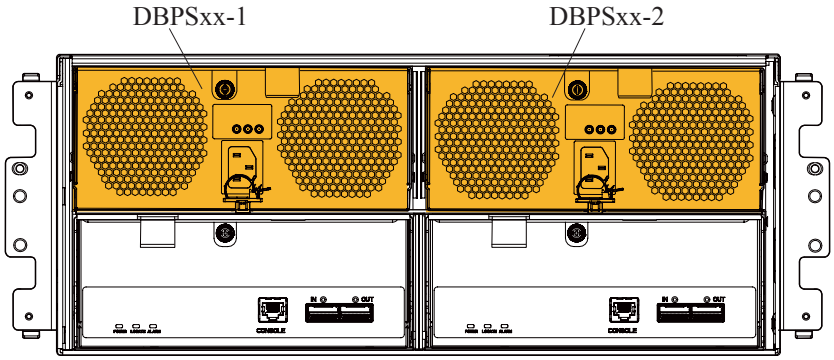
(2) <Drive Box window>
Click the [PSs] tab in the “Drive Box window to display a DBPS status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].
The status of the failed DBPS is “Warning”.



NOTE: When performing the preventive replacement of a DBPS in which no error occurs, confirm that the status of the other DBPS is Normal, and then replace the target DBPS. If there is any error in the other DBPS, resolve the error, and then replace the target DBPS.

4. Power Supply for DB60 Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DB60	1	DBPS	DBPS



Rear view of DB60

*1 : DBPSxx-1
└> 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. Refer to "1.1.3 Note on Installing and Removing Parts".

⚠ CAUTION

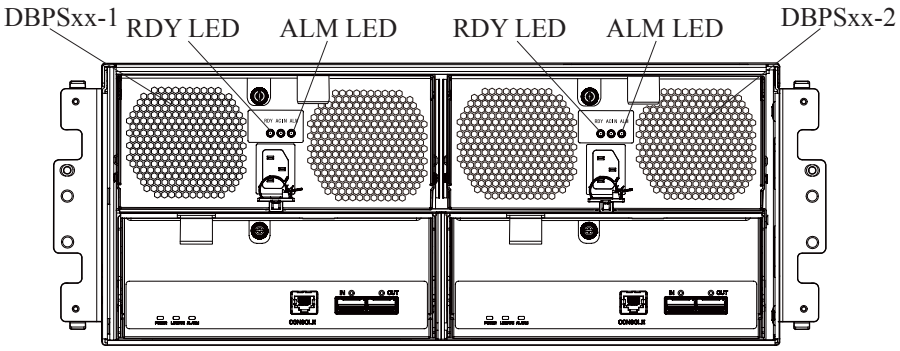
If replacing the DBPS not to be replaced, the system will be down. Check that the DBPS is to be replaced.

(1) Check that the ALM LED (red) on the DB60 DBPS to be replaced lights up. When the LED does not light up, check the location of the DBPS to be replaced in the "Maintenance Utility" window.

NOTICE: Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

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Figure 2-125 ALM LED Location



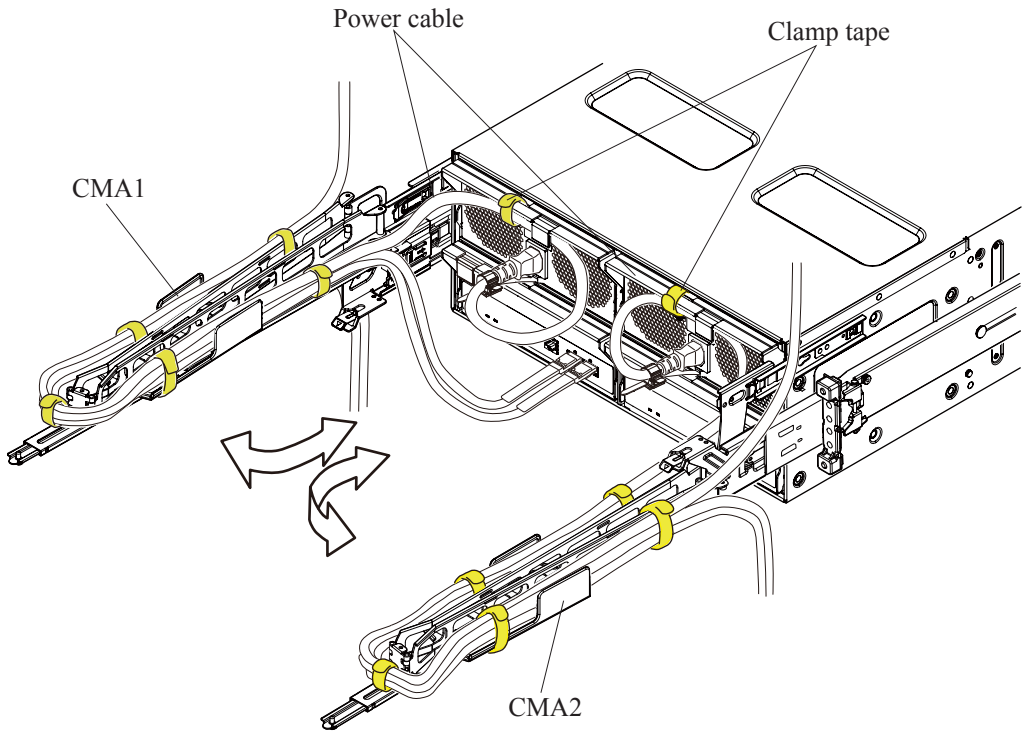
Rear view of DB60

(2) Remove the power cables from the DBPS to be replaced.
   (a) Unlock CMA1 and CMA2 and open them.
   (b) Remove the cable holder from the power cable.
   (c) Remove the clamp tapes fixed to the DBPS lever.
   (d) Remove the power cable from DBPS.

⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

Figure 2-126 Opening/Closing CMAs



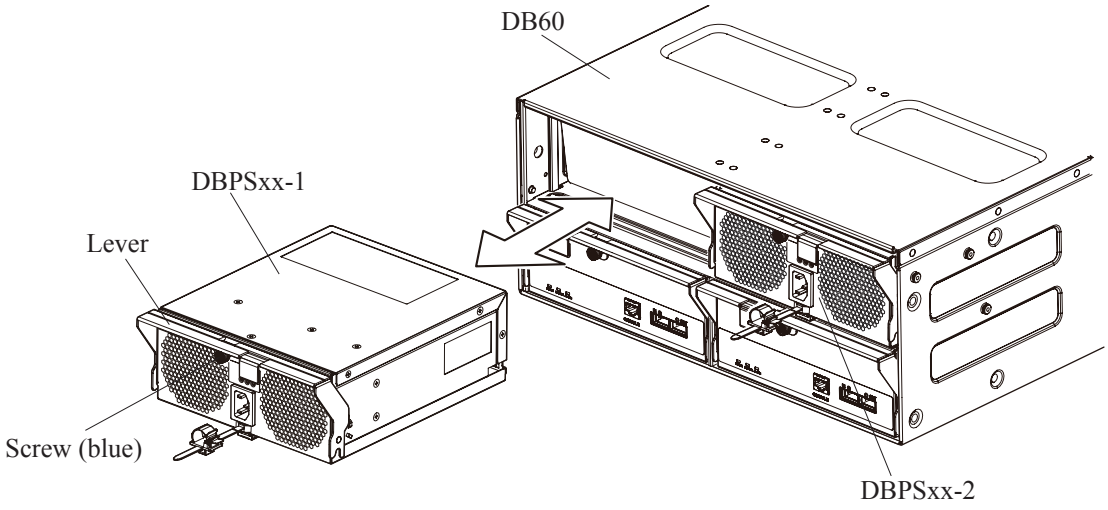
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(3) Replace the DBPS.
   (a) Loosen the screw (blue) fixing the DBPS.
   (b) Open the lever.
   (c) Pull out and remove the DBPS while holding its body with both hands.
   (d) With the lever opened completely, insert the new DBPS into the slot.
   If you cannot insert the DBPS into the slot easily, insert it after adjusting the position by slightly returning the lever.

NOTICE: Wait for more than or equal to 20 seconds, and then insert the replacement DBPS.

   (e) Push the new DBPS all the way in.
   (f) Close the lever completely.
   (g) Tighten the screw (blue) to fix the DBPS.

Figure 2-127 Replacement of DBPS



(4) Connect the removed power cable to the DBPS, and then fix the cable by the cable holder. Check that the RDY LED (green) on the DBPS lights up.

NOTE: • If the DBPS status is “Normal” and the RDY LED (green) does not light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.
• If the ALM LED (red) does not go out for more than or equal to 30 minutes after replacing the DBPS, redo the steps from Step (2).

(5) Route the power cable in the same configuration as before the replacement and fix it to the DBPS with clamp tapes.
(6) Close CMA1 and CMA2 and lock them to fix.

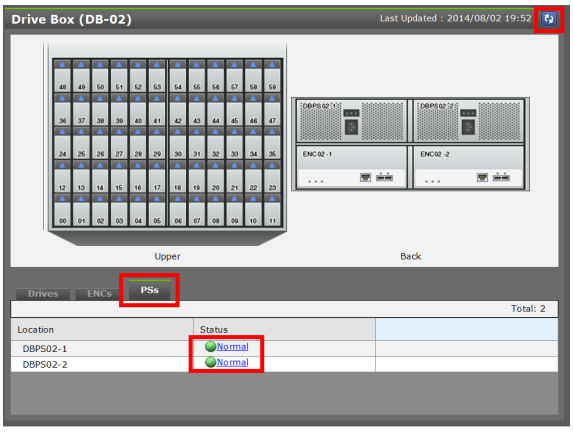
Copyright © 2015, 2017, Hitachi, Ltd.

5. Restoring replacement 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) <Check DBPS restoration>
   Click the [PSs] tab in the “Drive Box” window and check that a Status of the replaced DBPS is “Normal”.

   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.

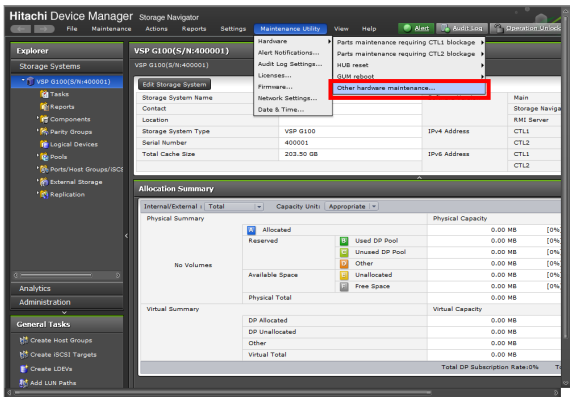
6. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.15.5 Replacing a Power Supply (DBPS) for DBF

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Power Supplies, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

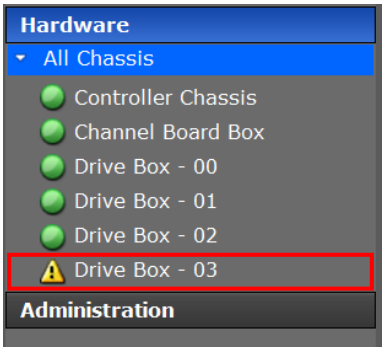


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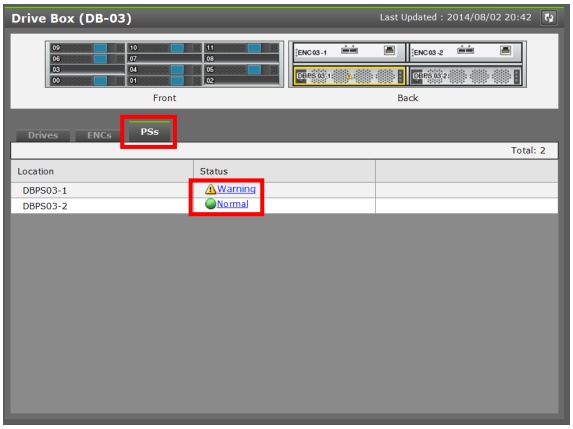
3. Selecting replacement parts by Maintenance Utility.

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 [Drive Box] in the main window.



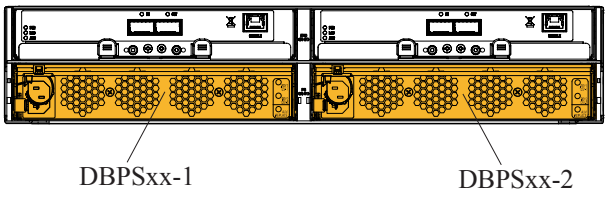
(2) <Drive Box window>
Click the [PSs] tab in the “Drive Box” window to display a DBPS status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status]. The status of the failed DBPS is “Warning”.



NOTE: When performing the preventive replacement of a DBPS in which no error occurs, confirm that the status of the other DBPS is Normal, and then replace the target DBPS. If there is any error in the other DBPS, resolve the error, and then replace the target DBPS.

4. Power Supply for DBF Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DBF	1	DBPS	DBPS



Rear view of DBF

*1 : DBPSxx-1
└> 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 "1.1.3 Note on Installing and Removing Parts".

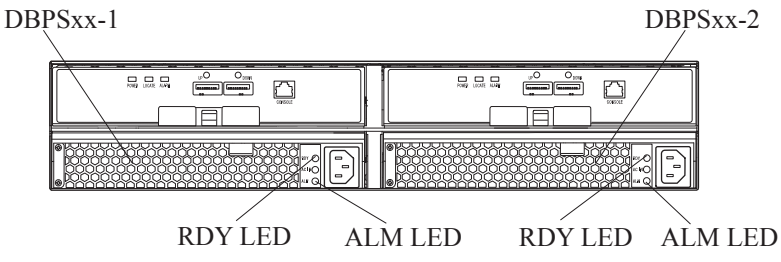
⚠ CAUTION

If replacing the DBPS not to be replaced, the system will be down. Check that the DBPS is to be replaced.

(1) Check that the ALM LED (red) on the DBF DBPS to be replaced lights up. When the LED does not light up, check the location of the DBPS to be replaced in the "Maintenance Utility" window.

NOTICE: Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

Figure 2-128 ALM LED Location



Rear view of DBF

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(2) Remove the power cables from the DBPS to be replaced.
Remove the cable holder to remove the power cable from the DBPS.

⚠ CAUTION

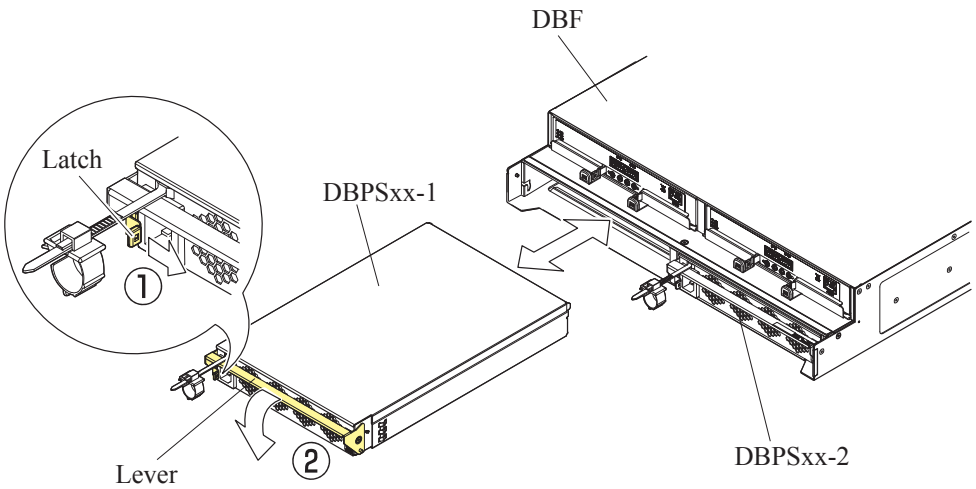
Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

(3) Replace the DBPS.
(a) Pull the lever open (②) while pressing the latch on the DBPS inward with right thumb (①).
When the lever is completely opened, the DBPS comes out forward.
(b) Pull out and remove the DBPS while holding its body with both hands.
(c) With the lever opened completely, insert the new DBPS into the slot.
If you cannot insert the DBPS into the slot easily, insert it after adjusting the position by slightly returning the lever.

NOTICE: Wait for more than or equal to 20 seconds, and then insert the replacement DBPS.

(d) Push the new DBPS all the way in.
(e) Close the lever completely and fix the DBPS.

Figure 2-129 Replacement of DBPS



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(4) Connect the removed power cable to the DBPS, and then fix the cable by the cable holder. Check that the RDY LED (green) on the DBPS lights up.

NOTE:
- If the DBPS status is “Normal” and the RDY LED (green) does not light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.
- If the ALM LED (red) does not go out for more than or equal to 30 minutes after replacing the DBPS, redo the steps from Step (2).

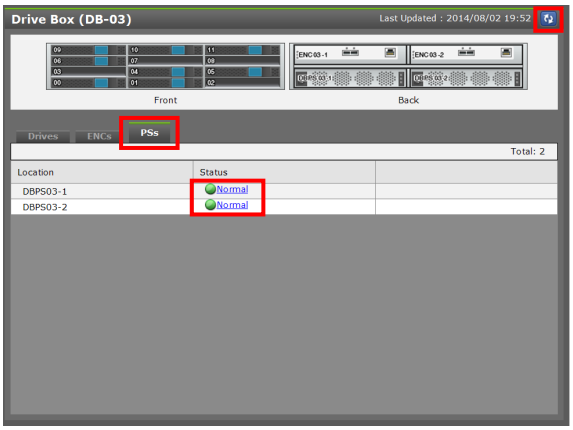
Copyright © 2015, 2017, Hitachi, Ltd.

5. Restoring replacement 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) <Check DBPS restoration>
Click the [PSs] tab in the “Drive Box” window and check that a Status of the replaced DBPS is “Normal”.

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.

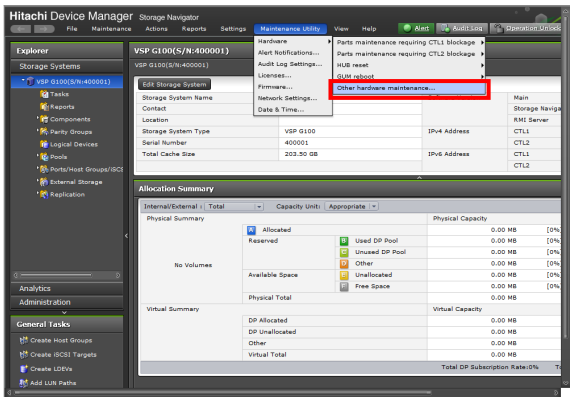
6. Disconnecting the maintenance PC and the Storage System
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.15.6 Replacing a Power Supply (CHBBPS) for CHBB

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the CHBBPS, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

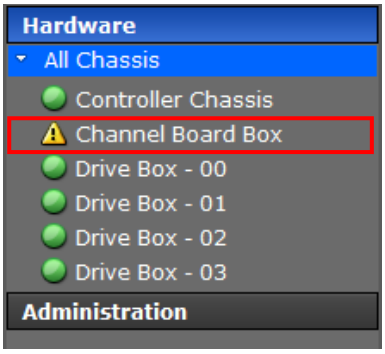


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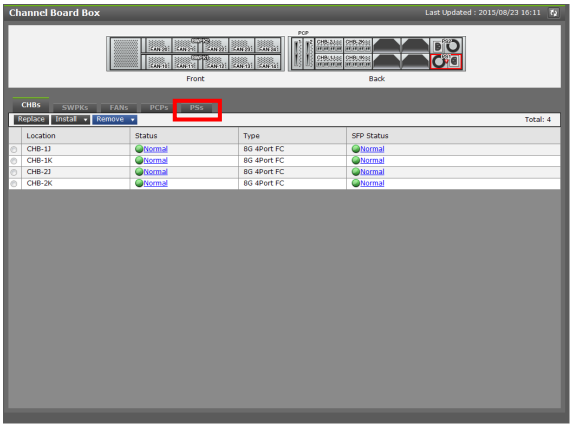
3. Selecting replacement parts by Maintenance Utility.

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 [Channel Board Box] in the main window.



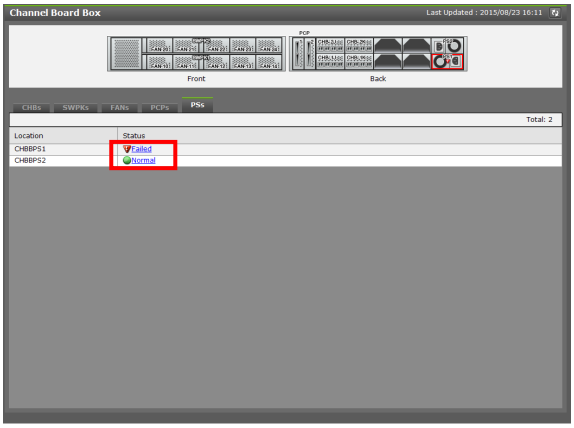
(2) <Channel Board Box window>
Click the [PSs] tab in the “Channel Board Box” window to display a CHBBPS status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



NOTE: When performing the preventive replacement of a CHBBPS in which no error occurs, confirm that the status of the other CHBBPS is Normal, and then replace the target CHBBPS. If there is any error in the other CHBBPS, resolve the error, and then replace the target CHBBPS.

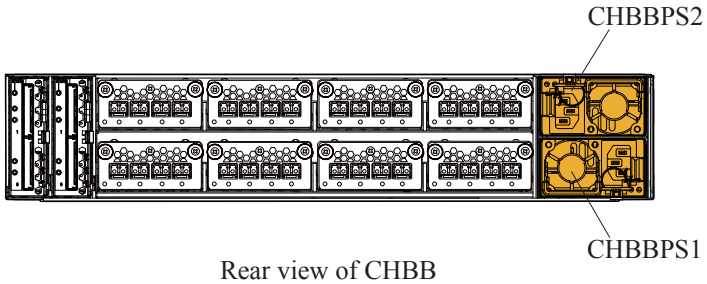
(3) <Check CHBBPS>

Check status of the CHBBPS to be replaced is “Warning”.



4. CHBBPS Replacement Processing

Location	Function Name of Component		Part Name
Rear View of CHBB	1	CHBBPS	CHBBPS



Rear view of 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 "1.1.3 Note on Installing and Removing Parts".

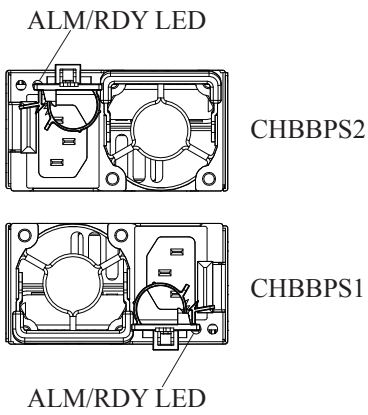
NOTICE: The insertion direction of CHBBPS1 and CHBBPS2 is opposite

(1) Check that the ALM/RDY LED (red) on the CHBBPS to be replaced lights up. When the LED does not light up, check the location of the CHBBPS to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the CHBBPS not to be replaced, the system will be down. Check that the CHBBPS is to be replaced.

Figure 2-130 ALM/RDY LED Location



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(2) Remove the power cable from the CHBBPS to be replaced.
Remove the cable holder from the power cable and remove the power cable from the CHBBPS.

⚠ CAUTION

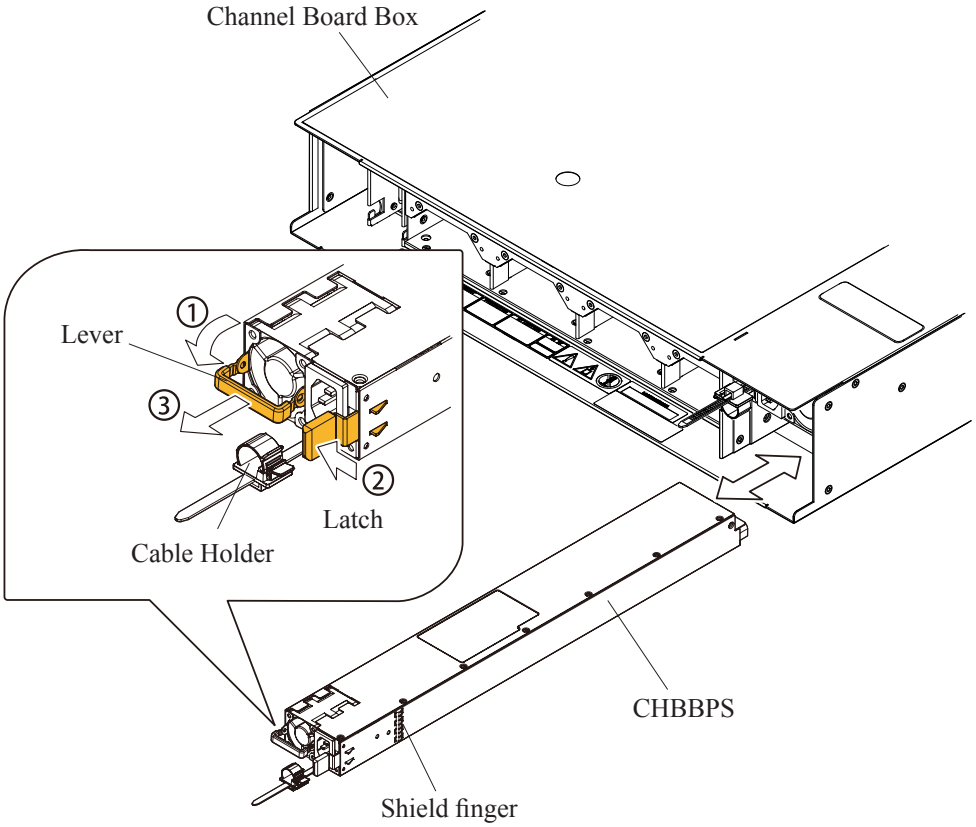
Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

(3) Replace the CHBBPS.
(a) Pull the lever open (①).
(b) Pull the lever (③) while pressing the latch (②) on the CHBBPS inward
(c) Pull out and remove the CHBBPS while holding its body with both hands.

NOTICE:
- Wait for more than or equal to 20 seconds from removal of CHBBPS, and then insert the new CHBBPS.
- If CHBBPSs are inserted randomly, malfunction may occur. Therefore, insert the CHBBPSs in two steps, Step (d) and Step (e) shown below.

(d) Insert the new CHBBPS to be added into the slots just before the shield finger.
(e) Push the Power Supply gently until the latch of the CHBBPS clicks and locks.

Figure 2-131 Replacement of CHBBPS



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(4) Connect the removed power cable to the CHBBPS, and then fix the cable by the cable holder.

(5) Check that the ALM/RDY LED on the CHBBPS changes from red to green.

NOTICE: If the ALM/RDY LED (red) does not go out for more than 30 minutes after replacing the CHBBPS, redo the steps from Step (2).

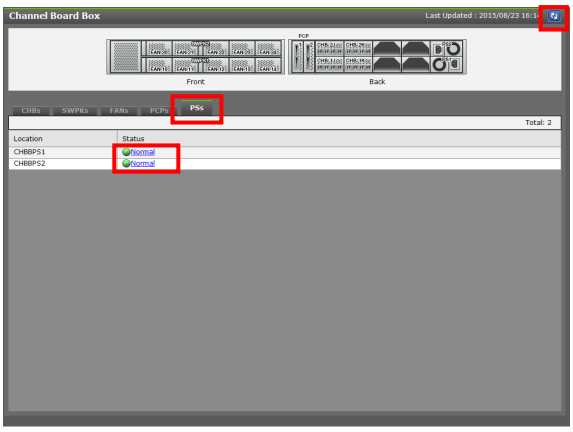
Copyright © 2015, 2017, Hitachi, Ltd.

5. Restoring replacement 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) <Check CHBBPS restoration>
Click the [PSs] tab in the “Channel Board Box” window and check that the status of the replaced CHBBPS is “Normal”.

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



(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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.16 Replacing an ENC

The window and the procedure differ according to Drive Boxes.

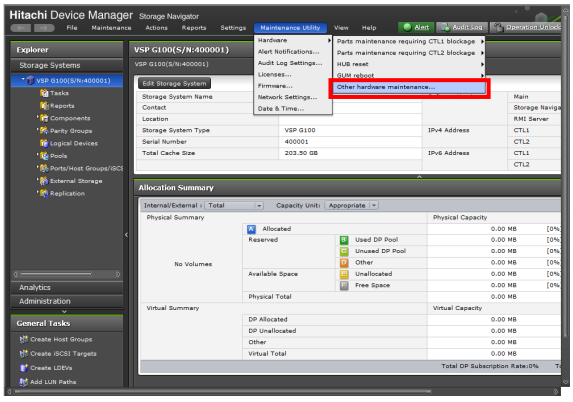
- When replacing the ENC of the DBS/DBL
  "2.16.1 Replacing an ENC for DBS/DBL"
- When replacing the ENC of the DB60
  "2.16.2 Replacing an ENC for DB60"
- When replacing the ENC of the DBF
  "2.16.3 Replacing an ENC for DBF"

2.16.1 Replacing an ENC for DBS/DBL

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the ENC, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

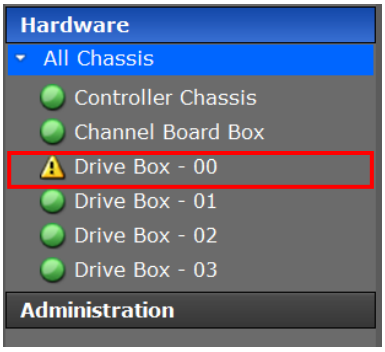


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3. Selecting replacement parts by Maintenance Utility.

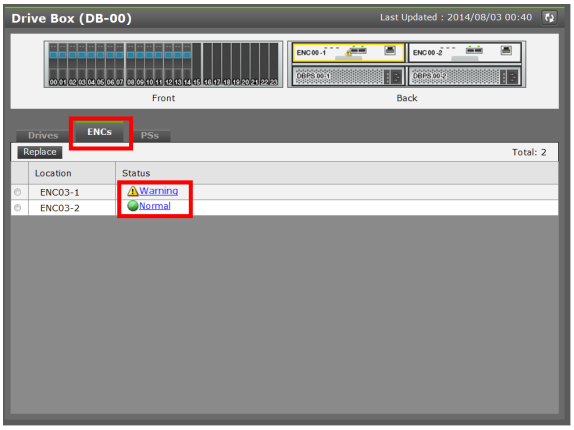
NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

(1) <Main window>
Select [Drive Box] in the main window.

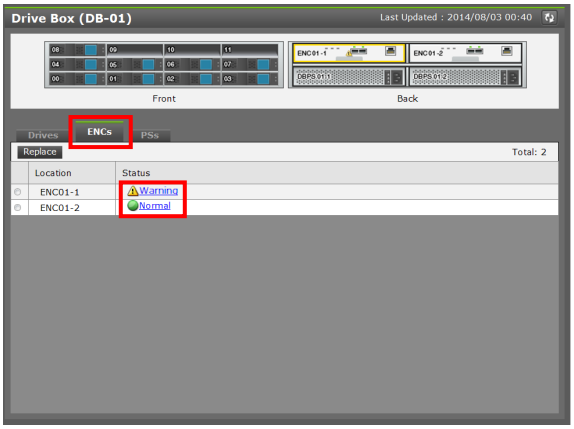


(2) <Controller Chassis window>
Click the [ENCs] tab in the "Drive Box" window to display an ENC status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status]. The status of the failed ENC is "Warning".

• In case of DBS



• In case of DBL

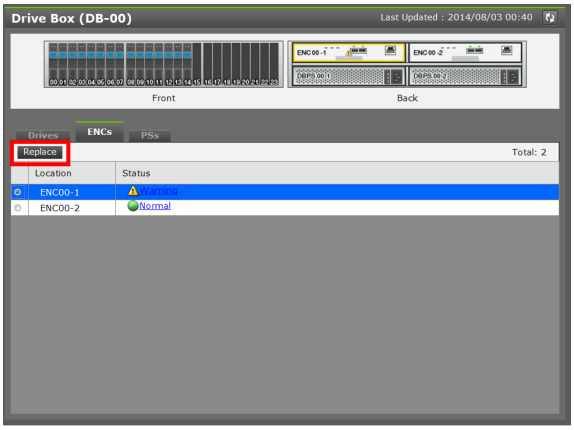


NOTICE:	Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

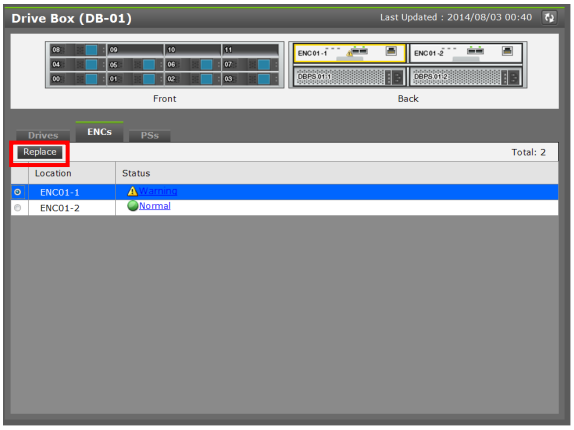
(3) <Select ENC>

Select an ENC to be replaced. Click the [Replace] button.

• In case of DBS



• In case of DBL



(4) <Block ENC>

⚠ CAUTION

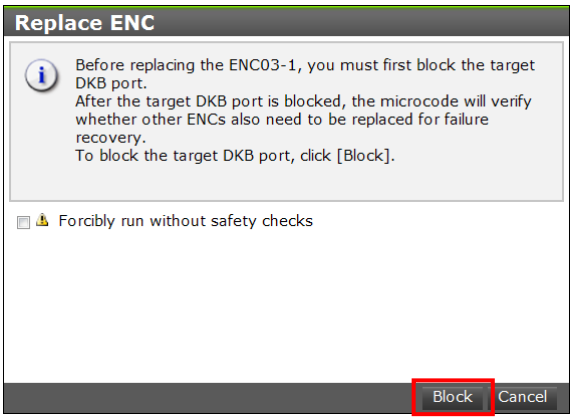
About "Forcibly run without safety checks":

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 [Block] button after checking that the ENC to be replaced is correct.

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

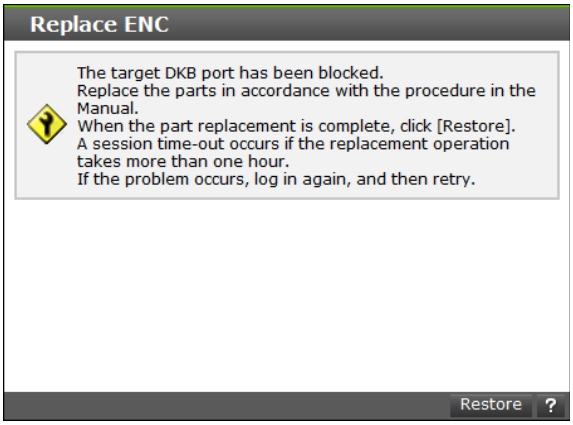
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of ENC replacement>
Check that the ENC is blocked and becomes ready for replacing.

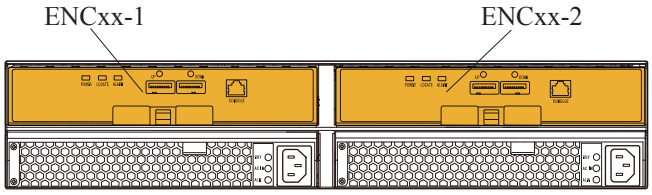
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. ENC for DBS/DBL Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DBS/DBL	1	ENC	ENC



Rear view of DBS/DBL

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

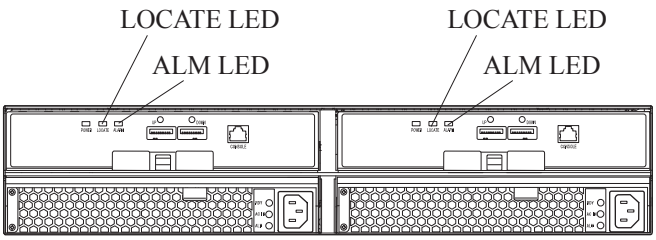
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the DBS/DBL ENC to be replaced lights up. When the LED does not light up, check the location of the ENC to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-132 ALM LED Location



Rear view of DBS/DBL

(2) Remove the SAS cables from the ENC to be replaced.

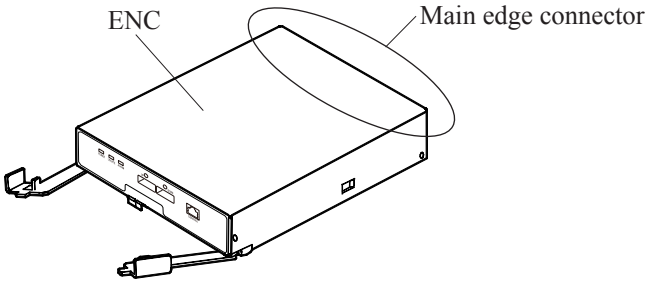
⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

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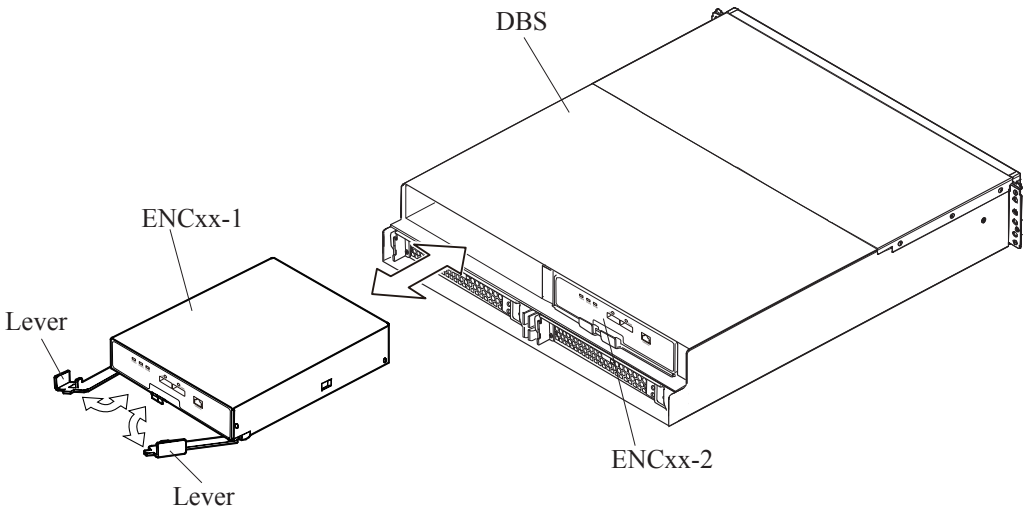
(3) Replace the ENC.

NOTICE:
- When replacing the ENC, hold it with both hands and install it straight not to apply a shock to with any components.
- Be careful not to hit the connector when placing the ENC temporarily.
- Do not touch the main edge connector of the ENC directly because it is breakable.
- Check that the main edge connector of the ENC has no deformation, damage or sticking of dust before installing the ENC.



(a) Open the right and left levers which fix the ENC.
When the levers are completely opened, the ENC comes out forward.
(b) Pull out and remove the ENC while holding its body with both hands.
(c) Open the right and left levers of the new ENC to be installed completely.
(d) Insert the new ENC into the slot.
Push the right and left levers toward the ENC after inserting the ENC until its levers slightly opened.

Figure 2-133 Replacement of ENC



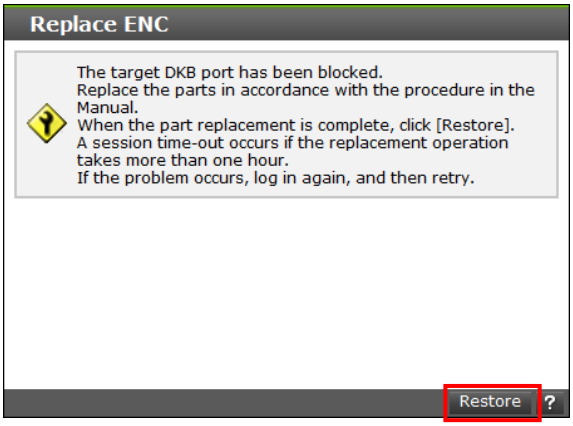
(4) Connect the SAS cables to the replaced ENC.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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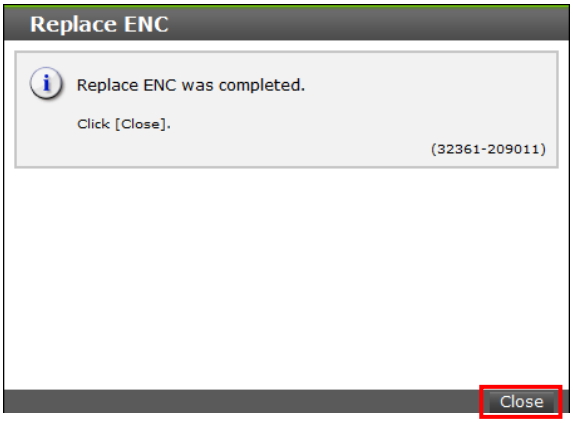
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



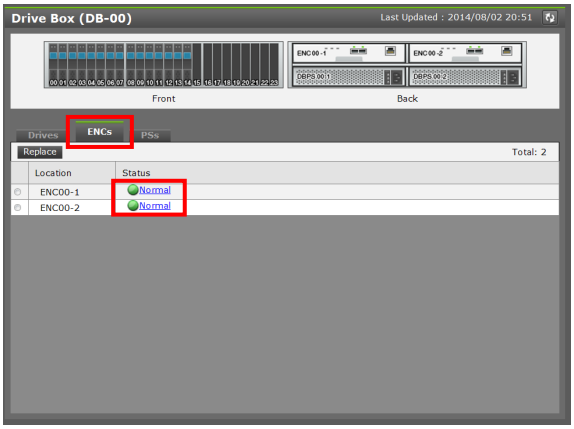
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



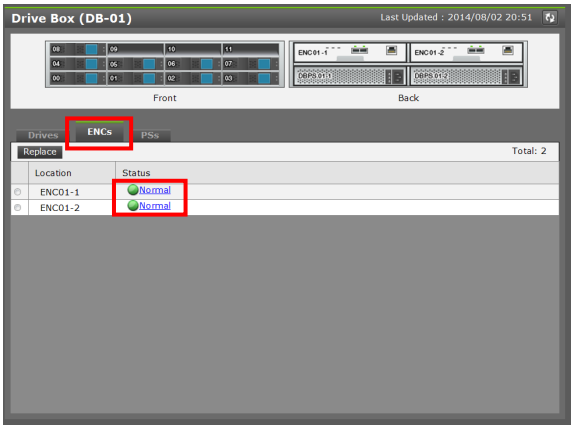
(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window and check that a Status of the replaced ENC is “Normal”.

NOTE: When the ENC status is “Normal” and the ALM LED (red) light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.

• In case of DBS

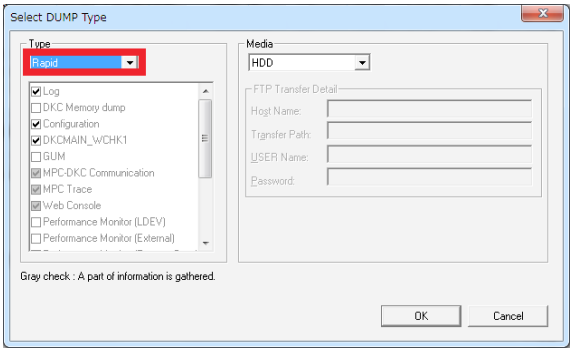


• In case of DBL



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

(5) <Get the error information>
See MAINTENANCE PC SECTION “5.2 Dump”, please collect “Rapid” dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION “1.8.2.3 Starting the Browser”, see MAINTENANCE PC SECTION “3.27 Acquiring System Dumps” to collect dumps.
However, System Dump is supported in the firmware version 83-02-01-x0/xx or later.

(6) See MAINTENANCE PC SECTION “9.1 Use of OnlineDumpTool”, please upload the error information.

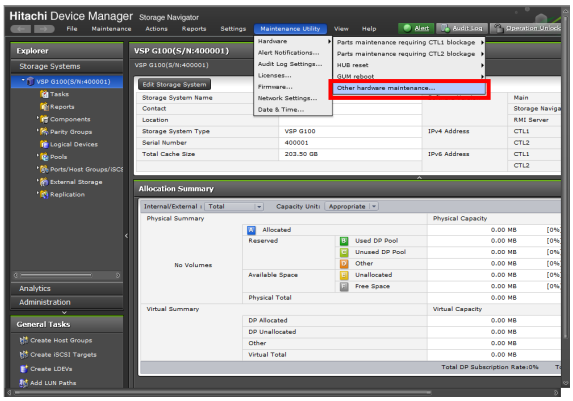
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.16.2 Replacing an ENC for DB60

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the ENC, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

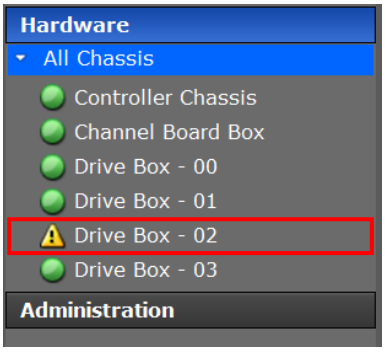


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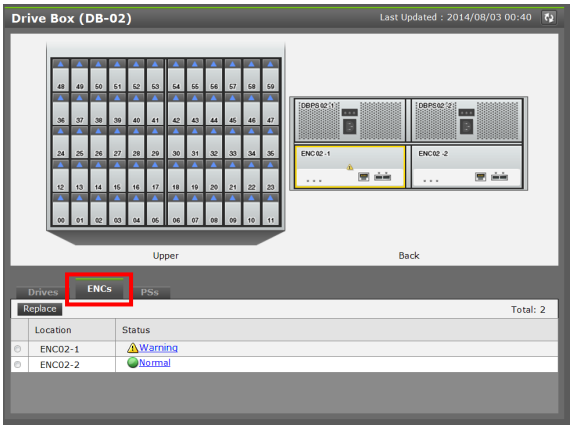
3. Selecting replacement parts by Maintenance Utility.

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 [Drive Box] in the main window.



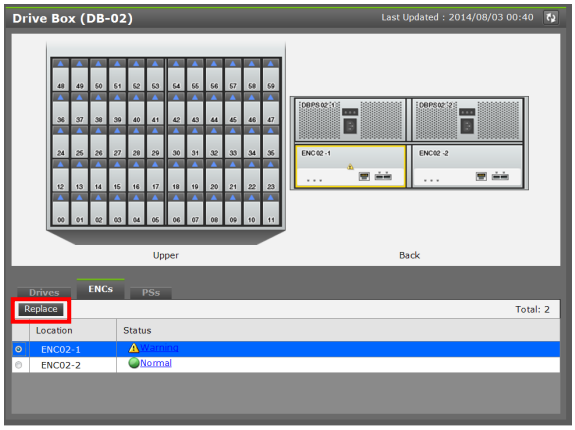
(2) <Drive Box window>
Click the [ENCs] tab in the "Drive Box" window to display an ENC status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status]. The status of the failed ENC is "Warning".



NOTICE:	Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

(3) <Select ENC>

Select an ENC to be replaced. Click the [Replace] button.



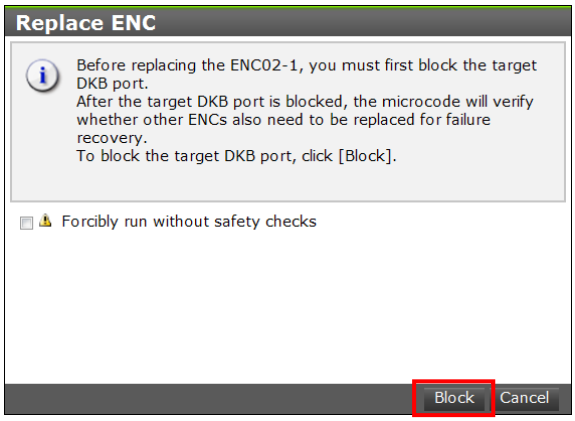
(4) <Block ENC>

⚠ 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 [Block] button after checking that the ENC to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

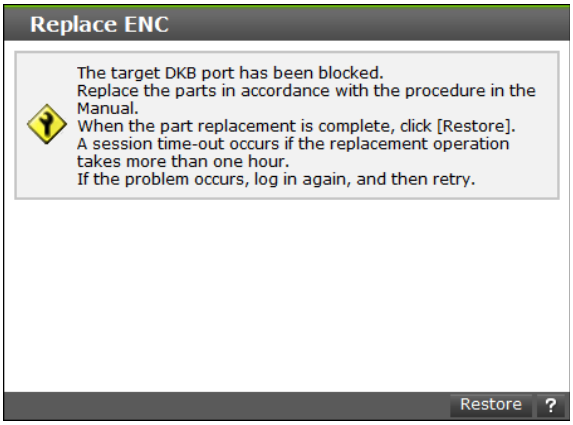
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of ENC replacement>
Check that the ENC is blocked and becomes ready for replacing.

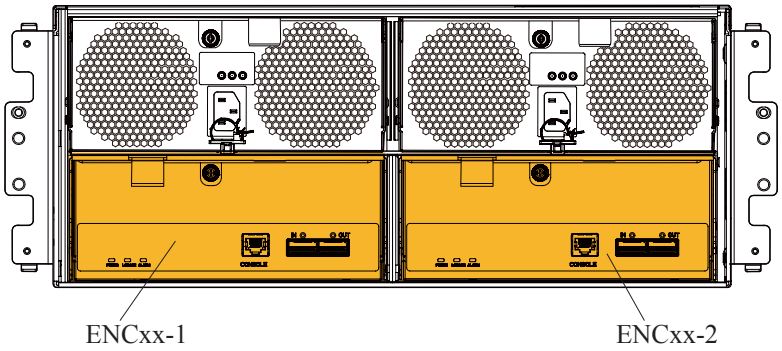
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. ENC for DB60 Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DB60	1	ENC	ENC



Rear view of DB60

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

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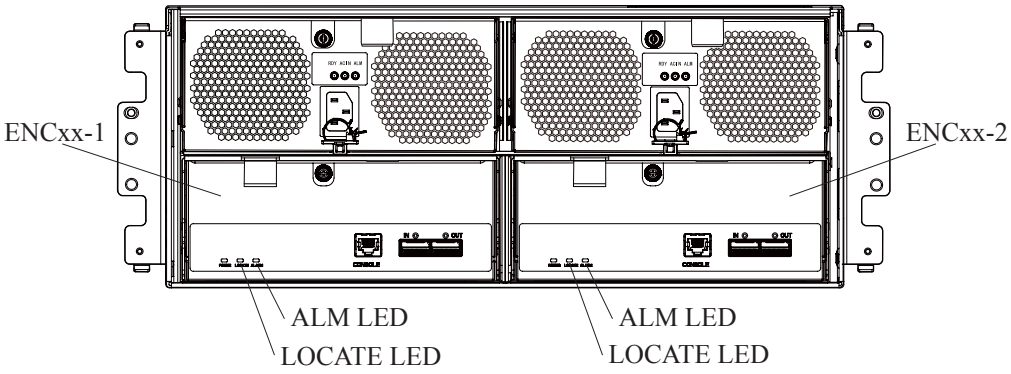
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the DB60 ENC to be replaced lights up. When the LED does not light up, check the location of the ENC to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-134 ALM LED Location



Rear view of DB60

(2) Remove the SAS cables from the ENC to be replaced.

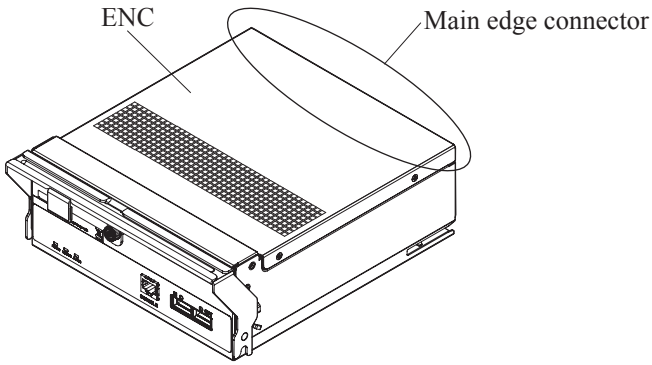
⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

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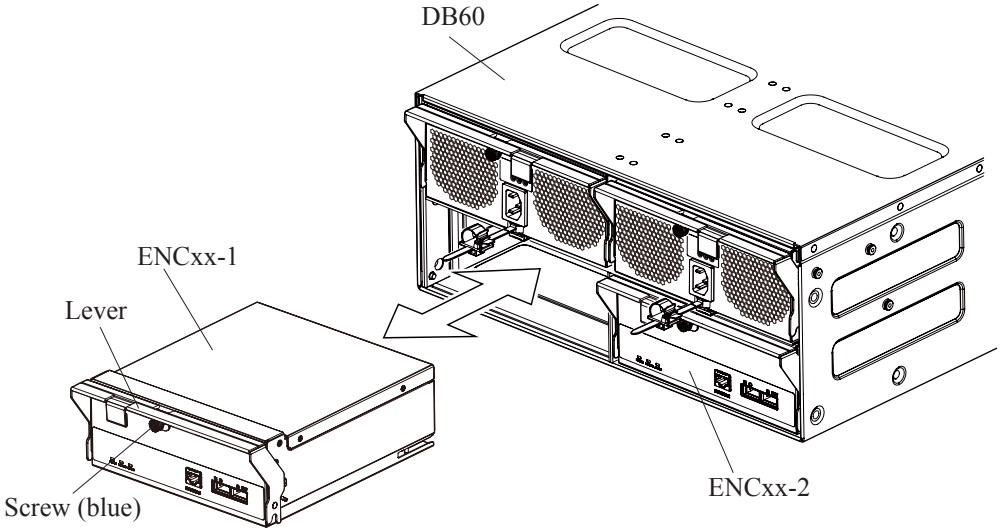
(3) Replace the ENC.

NOTICE:
- When replacing the ENC, hold it with both hands and install it straight not to apply a shock to with any components.
- Be careful not to hit the connector when placing the ENC temporarily.
- Do not touch the main edge connector of the ENC directly because it is breakable.
- Check that the main edge connector of the ENC has no deformation, damage or sticking of dust before installing the ENC.



(a) Loosen the screw (blue) fixing the ENC.
(b) Open the lever.
(c) Pull out and remove the ENC while holding its body with both hands.
(d) Open the lever of a new ENC completely.
(e) Insert the new ENC into the slot.
(f) Tighten the screw (blue) to fix the ENC.

Figure 2-135 Replacement of ENC



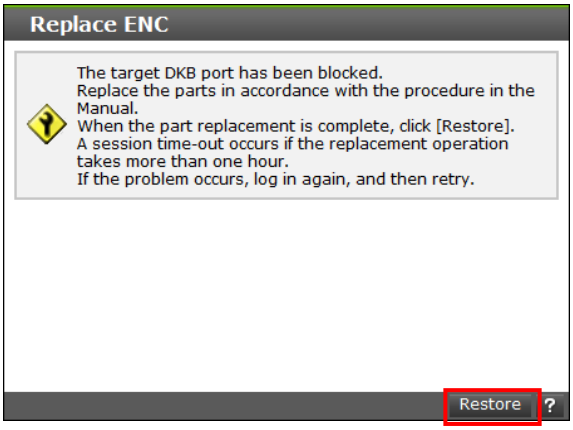
(4) Connect the SAS cables to the replaced ENC.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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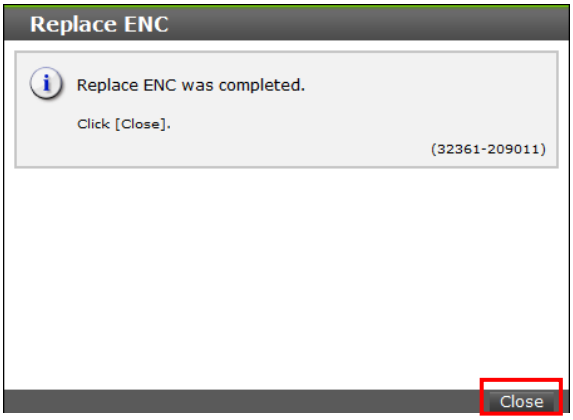
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

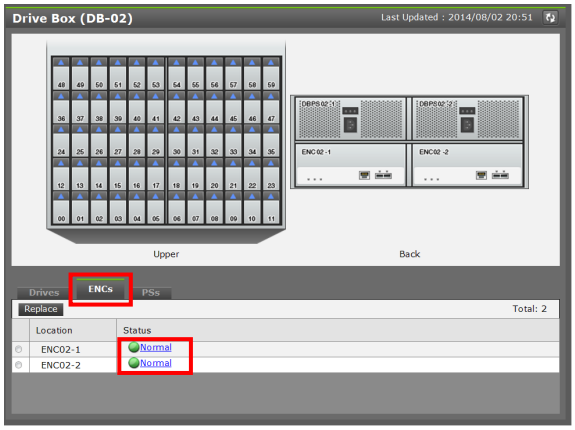


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



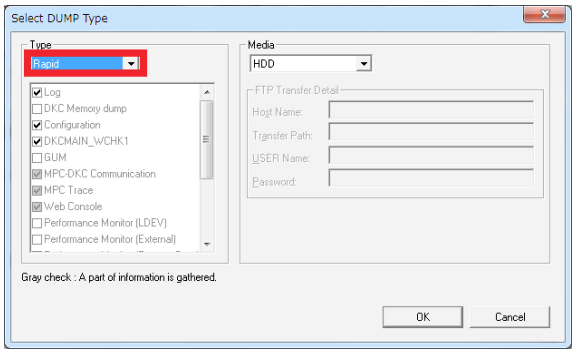
(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window and check that a Status of the replaced ENC is “Normal”.

NOTE: When the ENC status is “Normal” and the ALM LED (red) light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.



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

(5) <Get the error information>
See MAINTENANCE PC SECTION “5.2 Dump”, please collect “Rapid” dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION “1.8.2.3 Starting the Browser”, see MAINTENANCE PC SECTION “3.27 Acquiring System Dumps” to collect dumps.
However, System Dump is supported in the firmware version 83-02-01-x0/xx or later.

(6) See MAINTENANCE PC SECTION “9.1 Use of OnlineDumpTool”, please upload the error information.

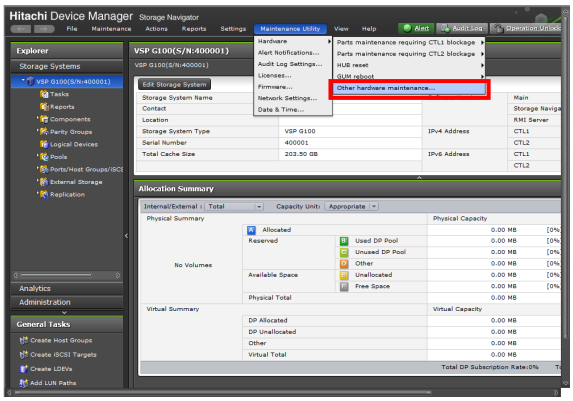
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.16.3 Replacing an ENC for DBF

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the ENC, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

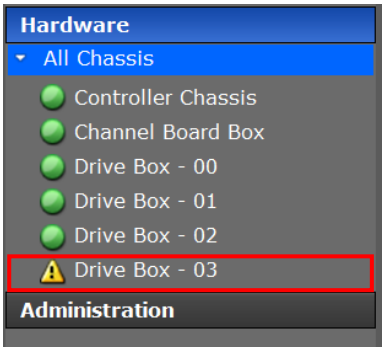


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3. Selecting replacement parts by Maintenance Utility.

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 [Drive Box] in the main window.



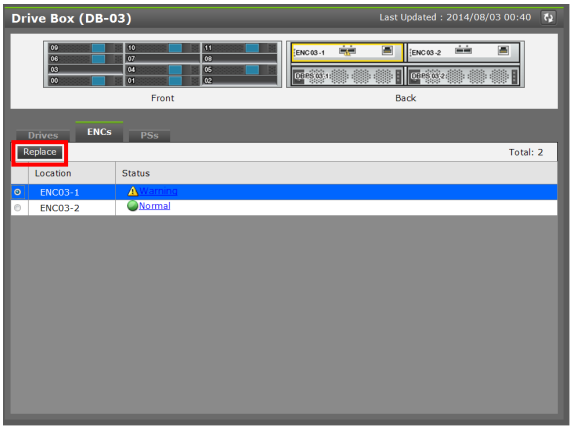
(2) <Drive Box window>
Click the [ENCs] tab in the "Drive Box" window to display an ENC status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status]. The status of the failed ENC is "Warning".



NOTICE:	Even if the ALM LED (red) lights up, the DBPS status might be "Normal". In that case, follow TROUBLESHOOTING SECTION "2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF".

(3) <Select ENC>

Select an ENC to be replaced. Click the [Replace] button.



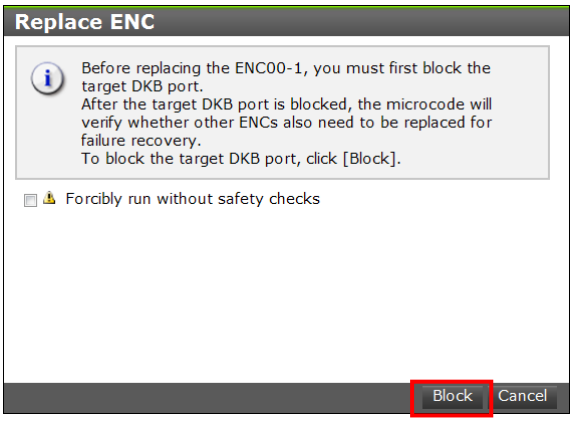
(4) <Block ENC>

⚠ 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 [Block] button after checking that the ENC to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

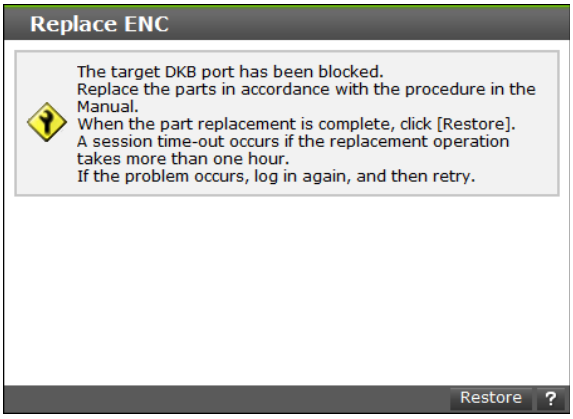
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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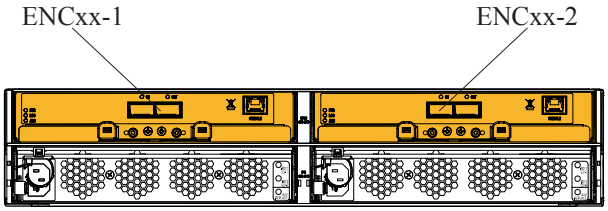
(5) <Check the beginning of ENC replacement>
Check that the ENC is blocked and becomes ready for replacing.

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



4. ENC for DBF Replacement Processing

Location	Function Name of Component		Part Name
Rear View of DBF	1	ENC	ENC (DBF)



Rear view of DBF

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

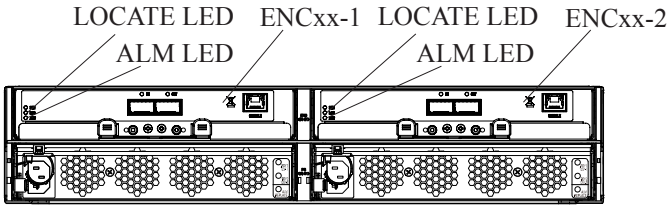
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the DBF ENC to be replaced lights up. When the LED does not light up, check the location of the ENC to be replaced in the "Maintenance Utility" window.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-136 ALM LED Location



Rear view of DBF

(2) Remove the SAS cables from the ENC to be replaced.

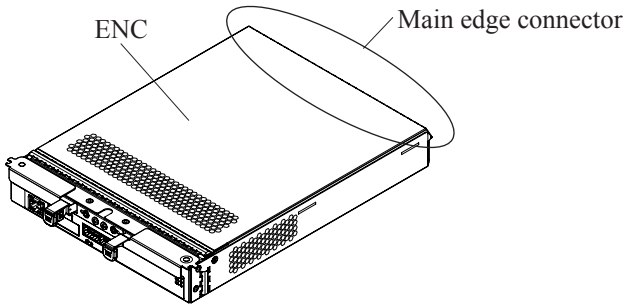
⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

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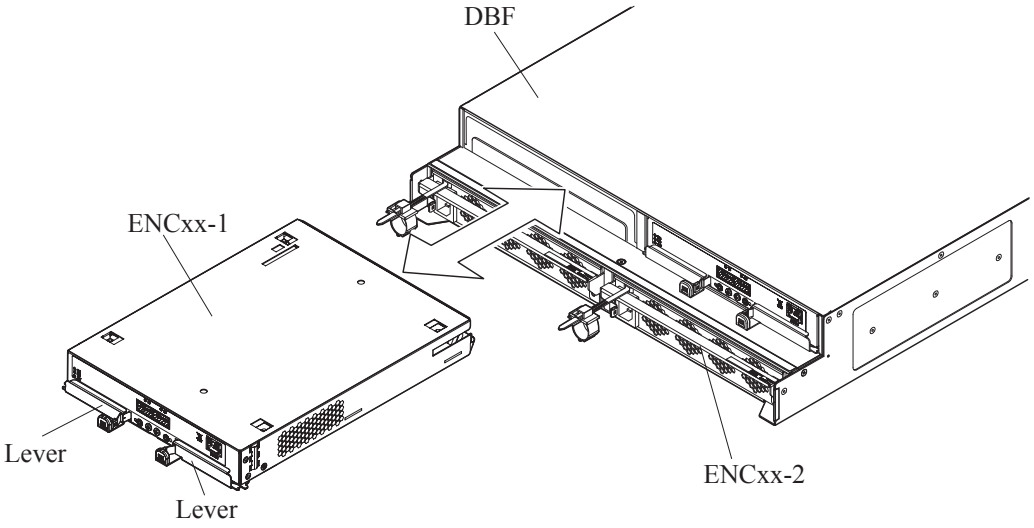
(3) Replace the ENC.

NOTICE:
- When replacing the ENC, hold it with both hands and install it straight not to apply a shock to with any components.
- Be careful not to hit the connector when placing the ENC temporarily.
- Do not touch the main edge connector of the ENC directly because it is breakable.
- Check that the main edge connector of the ENC has no deformation, damage or sticking of dust before installing the ENC.



(a) Open the right and left levers which fix the ENC.
When the levers are completely opened, the ENC comes out forward.
(b) Pull out and remove the ENC while holding its body with both hands.
(c) Open the right and left levers of the new ENC to be installed completely.
(d) Insert the new ENC into the slot.
Push the right and left levers toward the ENC after inserting the ENC until its levers slightly opened.

Figure 2-137 Replacement of ENC



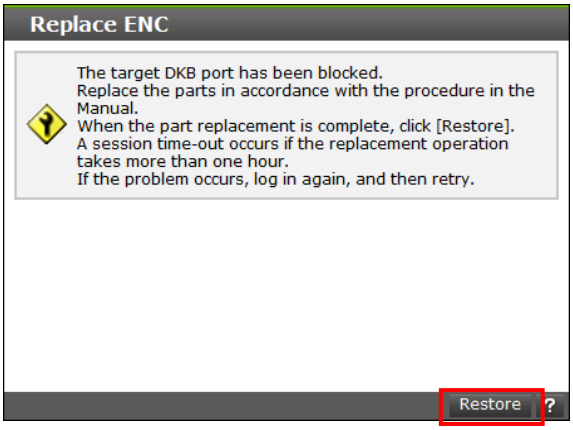
(4) Connect the SAS cables to the replaced ENC.
When connecting SAS cables, be careful not to damage the tips of the cables. (See INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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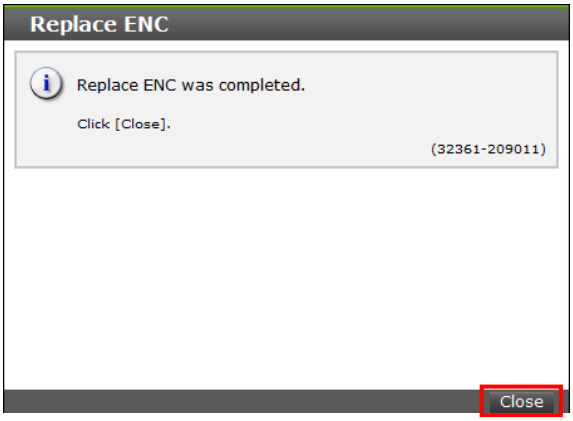
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

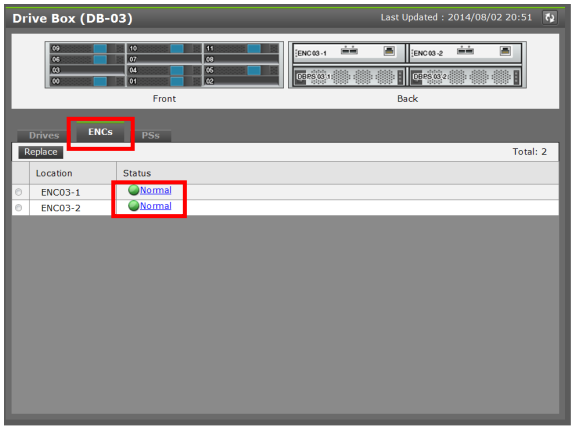


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



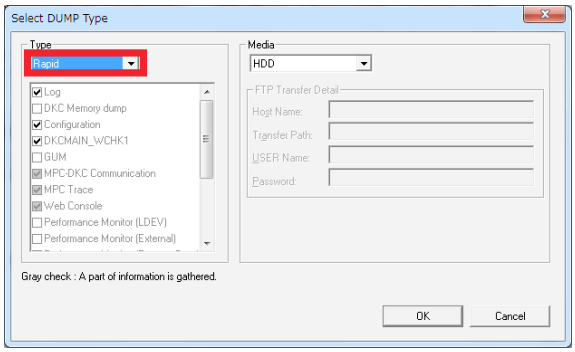
(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window and check that a Status of the replaced ENC is “Normal”.

NOTE: When the ENC status is “Normal” and the ALM LED (red) light up, follow TROUBLESHOOTING SECTION “2.2.16 Recovery Procedure when ALM LED (red) is not Turned OFF”.



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

(5) <Get the error information>
See MAINTENANCE PC SECTION “5.2 Dump”, please collect “Rapid” dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION “1.8.2.3 Starting the Browser”, see MAINTENANCE PC SECTION “3.27 Acquiring System Dumps” to collect dumps.
However, System Dump is supported in the firmware version 83-02-01-x0/xx or later.

(6) See MAINTENANCE PC SECTION “9.1 Use of OnlineDumpTool”, please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.17 Replacing a Controller Chassis/Drive Box

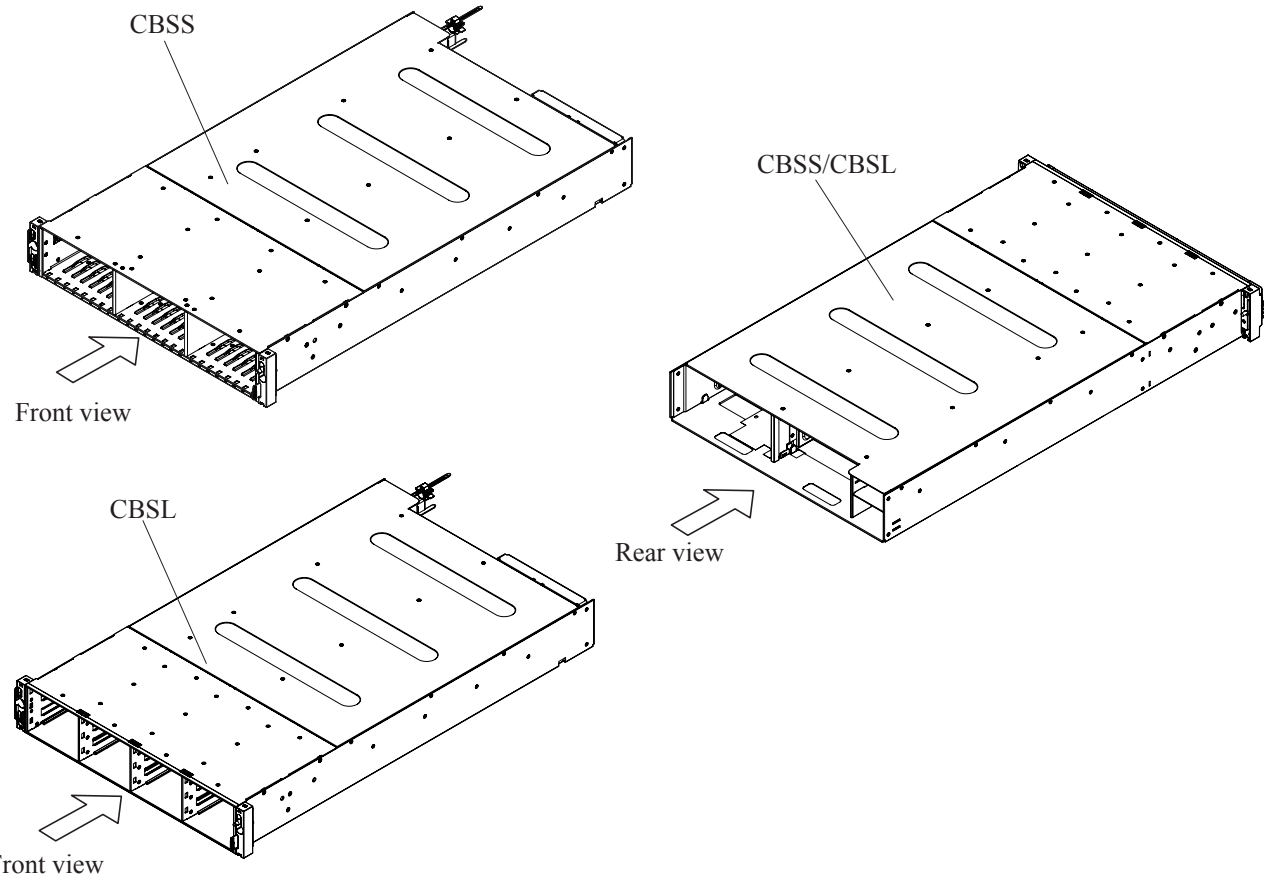
The procedure differs according to Controller Chassis/Drive Boxes.

- When replacing the CBSS/CBSL
  "2.17.1 Replacing a CBSS/CBSL"
- When replacing the CBLM/CBLH
  "2.17.2 Replacing a CBLM/CBLH"
- When replacing the DBS/DBL Drive Box
  "2.17.3 Replacing a DBS/DBL Drive Box"
- When replacing the DB60 Drive Box
  "2.17.4 Replacing a DB60 Drive Box"
- When replacing the DBF Drive Box
  "2.17.5 Replacing a DBF Drive Box"

2.17.1 Replacing a CBSS/CBSL

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rack	1	CBSS	• DW800-CBSS
		CBSL	• DW800-CBSL



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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 "1.1.3 Note on Installing and Removing Parts".
- The PDU may connect to other devices. When replacing it, check the precautions for the connected devices before the replacement.

2.17.1.1 Replacement of Controller Chassis

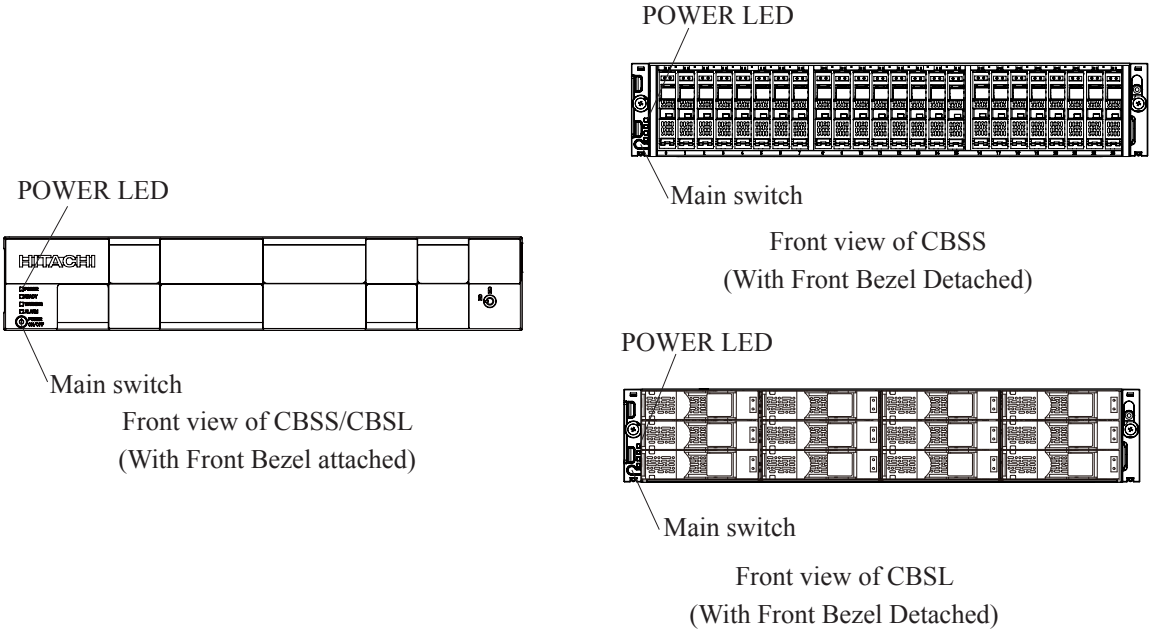
1. Power off the rack.

⚠ WARNING

Hazardous voltage:
Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBSS/CBSL for three second to turn off.
(2) Confirm that the POWER LED on the front side of the CBSS/CBSL lights in amber.

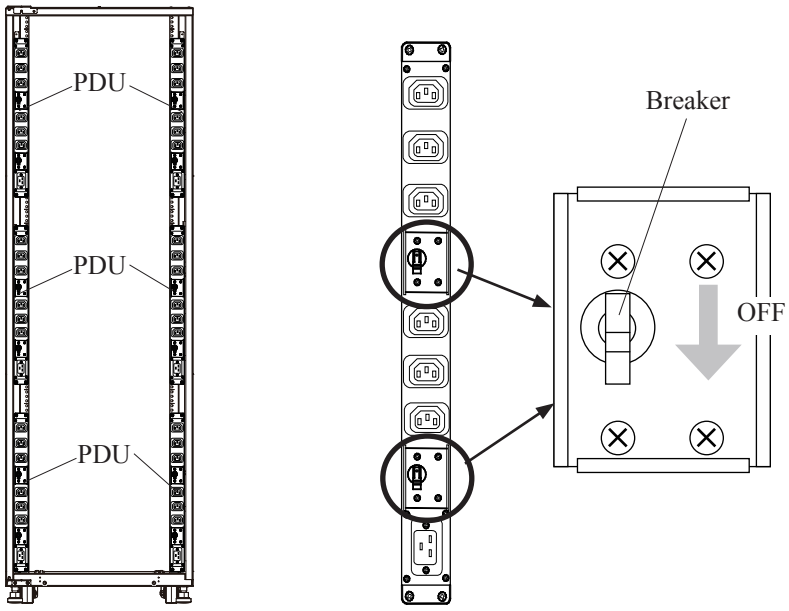
Figure 2-138 Main Switch and POWER LED on the front of CBSS/CBSL



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(3) Turn off the breaker at the PDU on the rack frame.
In case of DC power models (CBSSD/CBSLD), request the customer to shut down the connected input Power Supply.

Figure 2-139 Turning-off Breakers



Rear view of rack frame Front view of PDU

(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

NOTE : The circuit has residual voltage after turning off the breakers, so wait for one minute.

2. Remove the Front Bezel.
(1) Remove the Front Bezel from the CBSS/CBSL. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

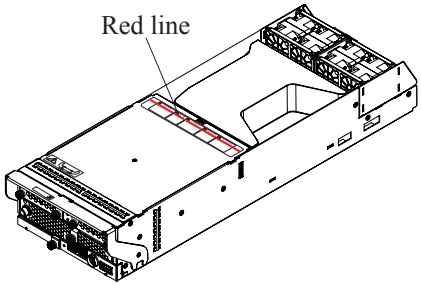
3. Attach a label.
(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the spare Controller Chassis.

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4. Remove the Controller Boards.
   (1) Remove all the cables connected to the Controller Board.
   (2) Loosen the screws (blue) fixing the Controller Board (①) and open the lever (②).
   (3) Hold the Controller Board with both hands and pull out it to remove.
   (4) Remove the other Controller Board in the same manner.

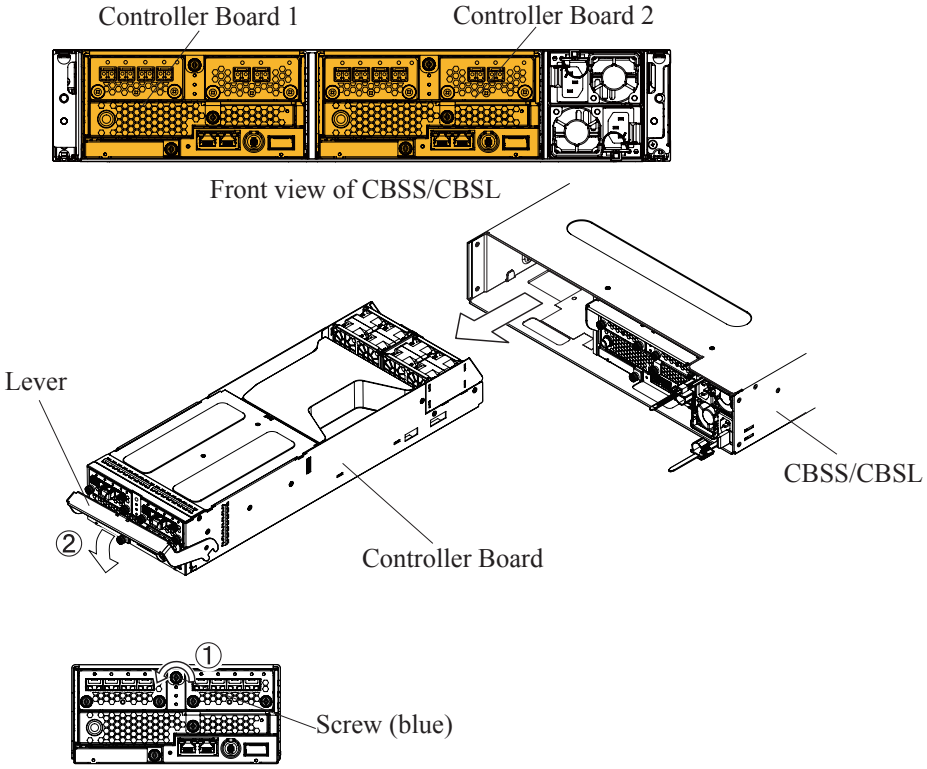
⚠ CAUTION

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



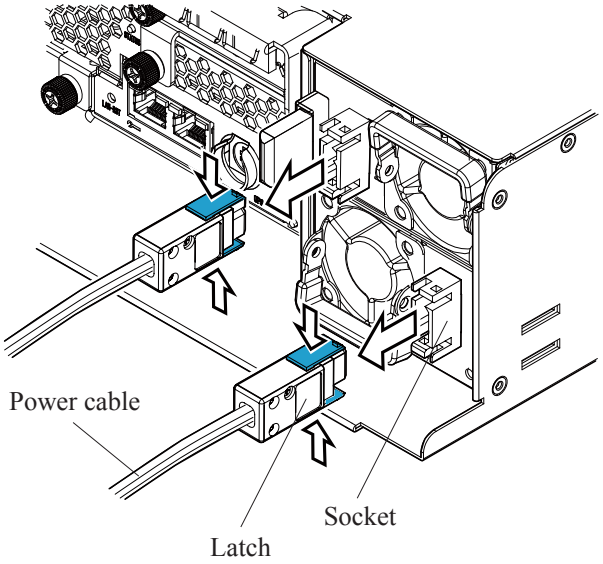
NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

Figure 2-140 Removing Controller Boards (CBSS/CBSL)



5. Remove a DKCPS.
   (1) Remove all the power cables connected to the DKCPS.
   - In case of CBSS/CBSL, remove the cable holder from the power cable and remove the power cable from the DKCPS.
   - In case of CBSSD/CBSLD, pinch both ends of the power socket to release the latch, and then remove the socket from the DKCPS.

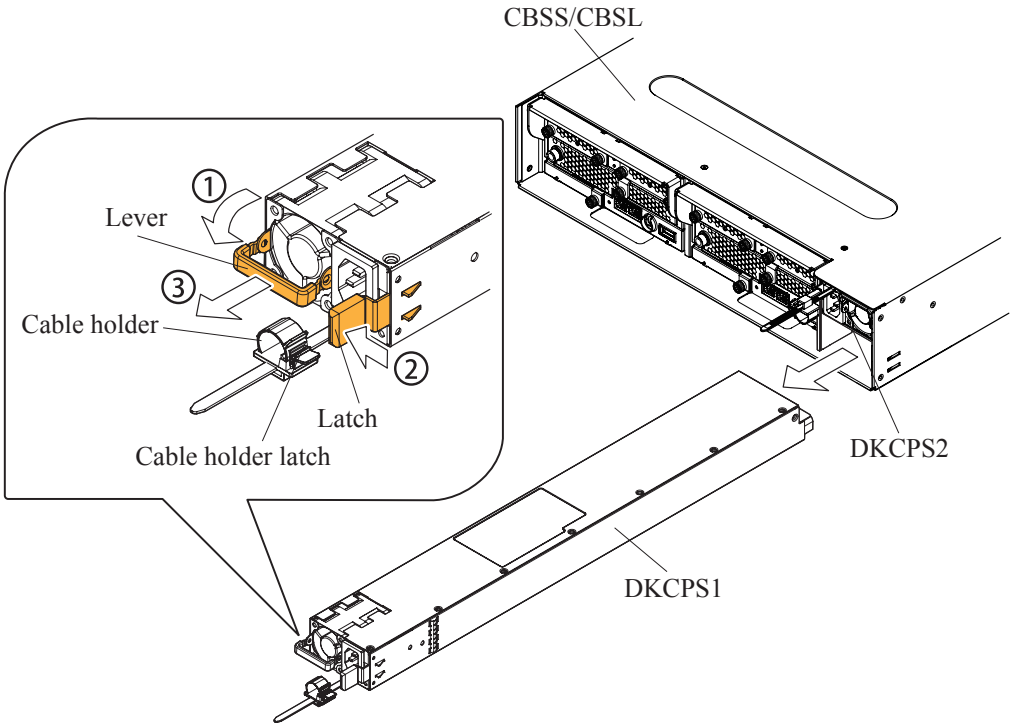
Figure 2-141 Removing Power Cables



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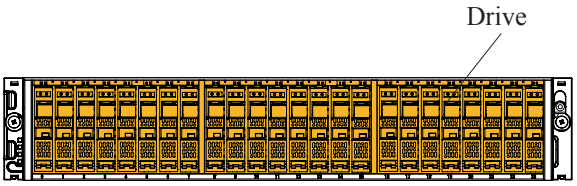
(2) Pull the lever open (①).
(3) Pull the lever (③) while pressing the latch on the DKCPS inward (②).
(4) Pull out and remove the DKCPS while holding its body with both hands.
(5) Remove the other DKCPS in the same manner.

Figure 2-142 Removal of DKCPS

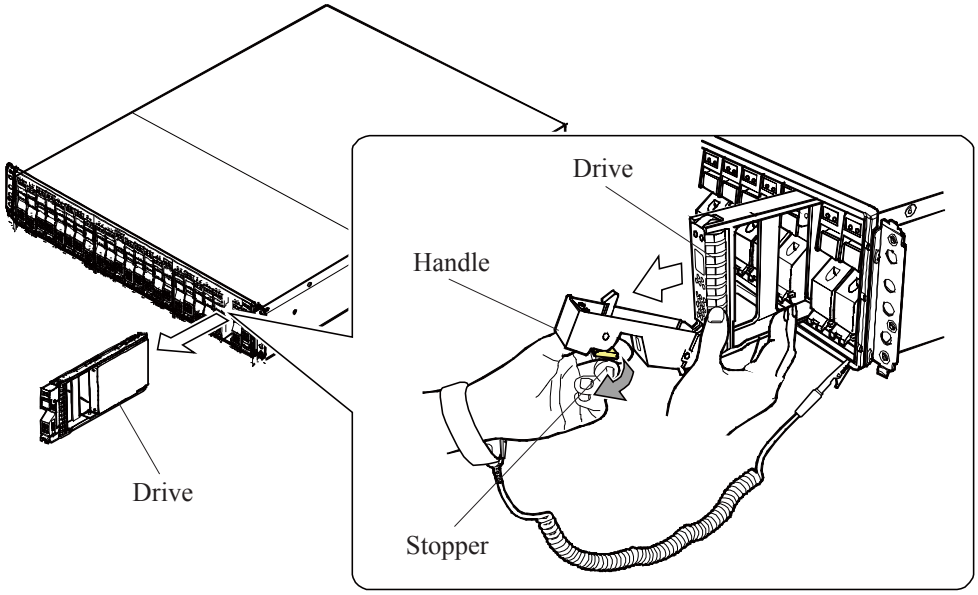


6. Remove the Drive.
   (1) In case of CBSS Drives
      (a) Pull up the stopper of the Drive handle toward you to release the lock.
      (b) Open the handle toward you, and pull out and remove the Drive to be replaced not to give a shock.
      (c) Remove the other Drives in the same manner.

Figure 2-143 Removal of Drives (CBSS)



Front view of CBSS



(2) In case of CBSL Drives

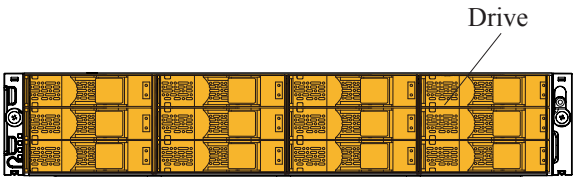
(a) Pull up the stopper of the Drive handle toward you to release the lock.

(b) Open the handle toward you, and pull out and remove the Drive to be replaced not to give a shock.

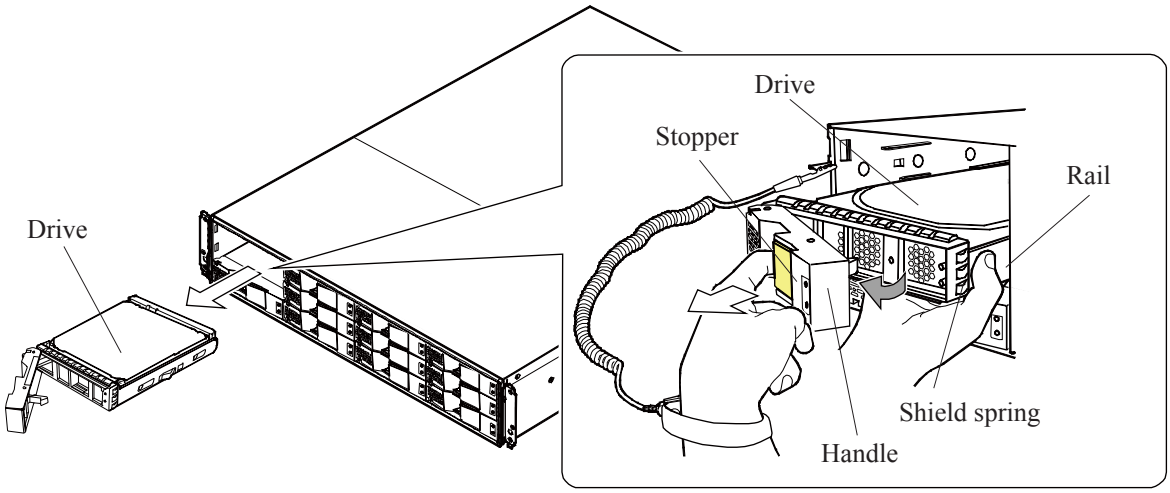
NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

(c) Remove the other Drives in the same manner.

Figure 2-144 Removal of Drive (CBSL)



Front view of CBSL

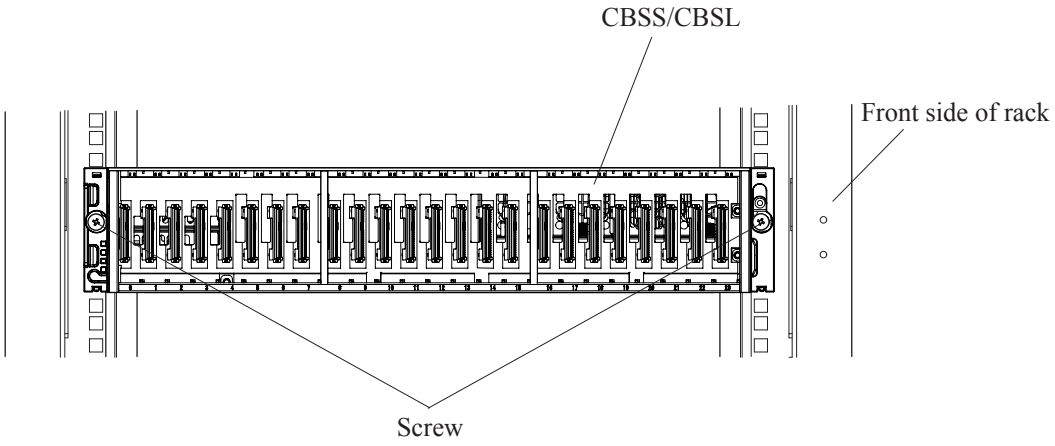


7. Replace the Controller Chassis
   (1) Remove the right and left screws (one each) fixing the CBSS/CBSL.

> **⚠ CAUTION**
>
> Be careful of the mass:
> Work carefully because the mass of the Controller Chassis is about 29 kg.

   (2) Remove the Controller Chassis from the rack frame referring to mounting procedure using the special lifter. (Refer to "2.2.3 Mounting Lifter on Rack Frame".)
   (3) Install a new Controller Chassis from the front of the rack.
   (4) Fix the right and left of the CBSS/CBSL with screws (one each).

Figure 2-145 Removal of Controller Chassis

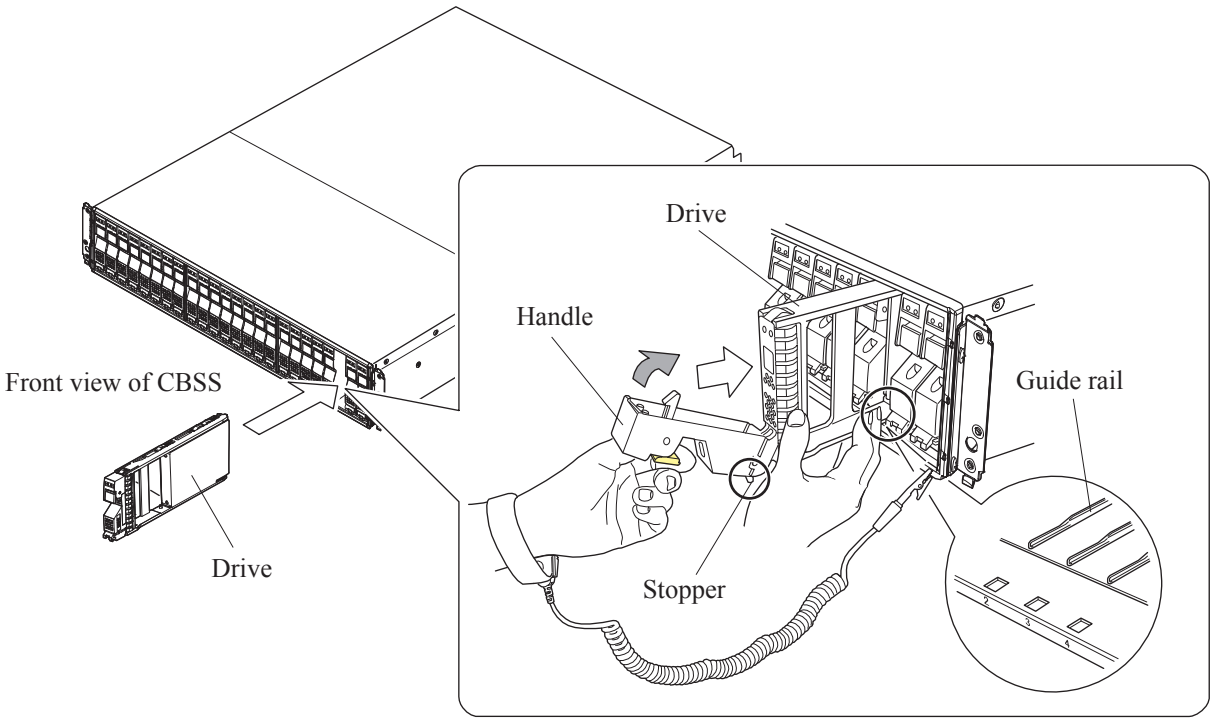


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8. Install the Drives.
   Install all the removed Drives in the same positions of the Drive Boxes of the maintenance parts referring to the attached label.

   (1) In case of CBSS Drives
   (a) Fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
   (b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.
   (c) Raise the stopper, which has been tilted toward you, and then press the stopper to have the lock on. If the handle is raised in the state where the hook of the handle cannot enter into each hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.
   (d) Install the other Drives in the same manner.

Figure 2-146 Installation of Drive (CBSS)



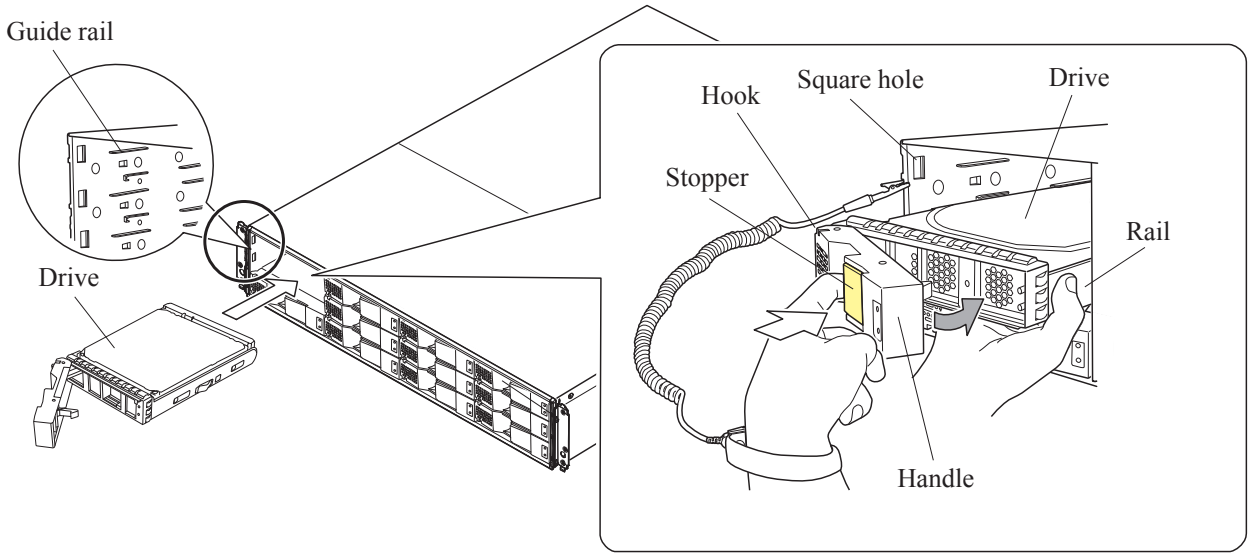
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(2) In case of CBSL Drives

NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

(a) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.
(c) Pull the stopper lightly and close the handle, and then press the stopper to have the lock on. If the handle is closed in the state where the hook of the handle cannot enter into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.
(d) Install the other Drives in the same manner.

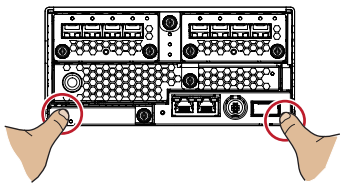
Figure 2-147 Installation of Drive (CBSL)



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9. Install the Controller Board.
   (1) With the levers on the Controller Board opened completely, insert it into the slot of the CBSS/CBSL. (Refer to Figure 2-140.)
   (2) Push the Controller Board in all the way 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.



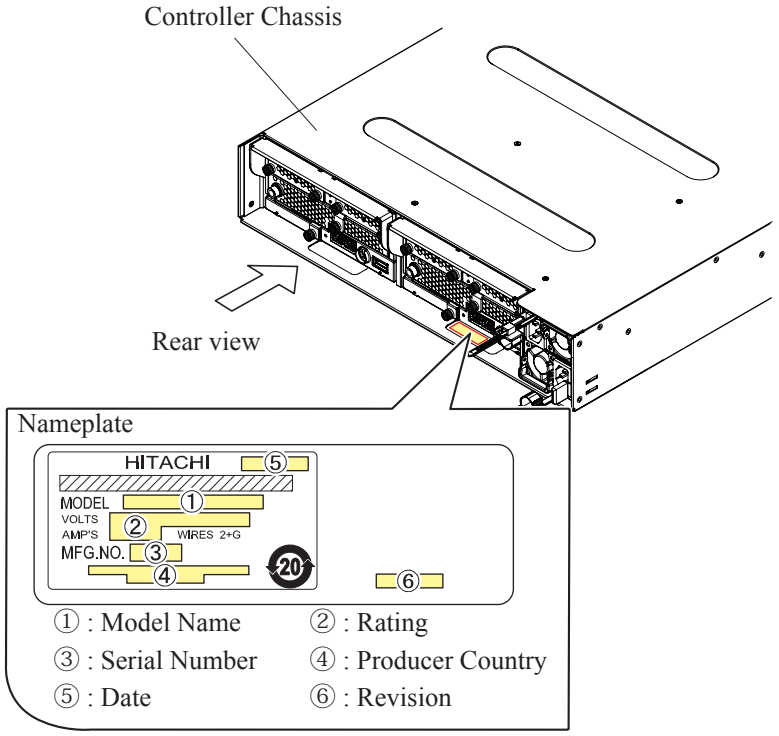
   (3) Tighten the screw (blue) and fix the Controller Board.
   (4) Install the other Controller Board in the same manner.
   (5) Clean the cable connectors.
      (a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
      (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
      (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)
   (6) Connect all the removed cables to the Controller Board.
   When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

10. Install the DKCPS.
   (1) In case of CBSS/CBSL, hold up the latch on the cable holder of the DKCPS to release the lock, and then slide the cable holder forward. (Refer to Figure 2-142.)
   (2) With the lever completely opened, insert the DKCPS into the slot.
   (3) Push the DKCPS in until the latch is clicked.
   (4) Connect the power cable to the DKCPS, and then fix the cable by the cable holder.
      • In case of CBSS/CBSL, fix a cable with a cable holder.
      • In case of CBSSD/CBSLD, insert the socket of the power cable straight into the connector of the DKCPS. At this time, check that the latches on both sides of the socket click and lock.
   (5) Install the other DKCPS in the same manner.

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11. Attach the nameplate.
    (1) Take out the nameplate in which the same model name as the removed Controller Chassis is described from the nameplates attached to the spare Controller Chassis. Write down the same serial number as the removed Controller Chassis in the nameplate, and then affix the nameplate to the spare Controller Chassis.
    When the nameplate in which the same model name as the removed Controller Chassis is described is not attached, take out the nameplate in which the same rating and producer country as the removed Controller Chassis are described and which the model name is not described. Write down the same model name and serial number as the removed Controller Chassis in the nameplate, and then affix it to the spare Controller Chassis.
    To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-148 Attachment of Nameplate

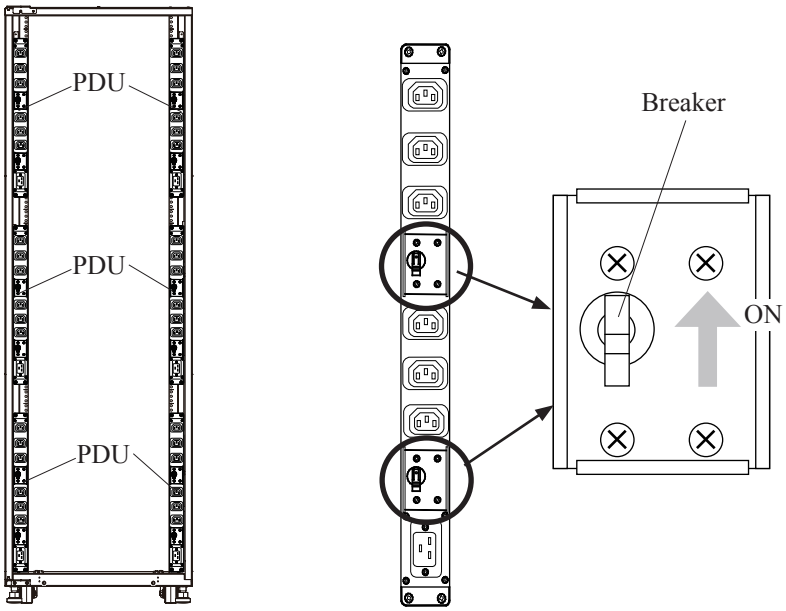


12. Attach the Front Bezel.
    (1) Attach the Front Bezel to the CBSS/CBSL. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

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13. Powering on the rack frame
    (1) Turn on the breaker on the power distribution panel.
    In case of DC power models (CBSSD/CBSLD), request the customer to turn on the connected input Power Supply.
    (2) Turn on the breaker at the PDU on the rack frame.

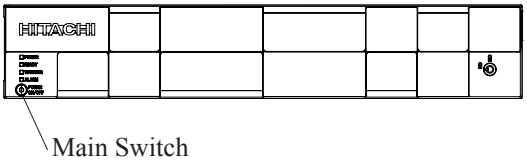
Figure 2-149 Turning-on Breakers



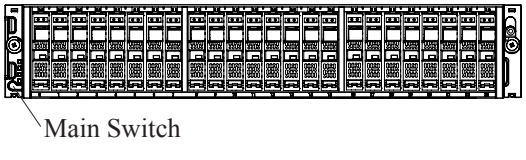
Rear view of rack frame Front view of PDU

(3) Press the Main Switch on the front of the CBSS/CBSL for three second to turn on.

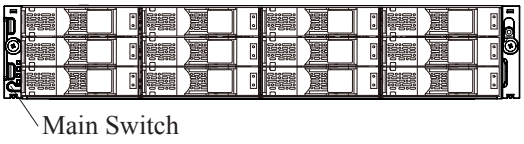
Figure 2-150 Main Switch on CBSS/CBSL



Front view of CBSS/CBSL
(With the Front Bezel attached)



Front view of CBSS
(With the Front Bezel detached)



Front view of CBSL
(With the Front Bezel detached)

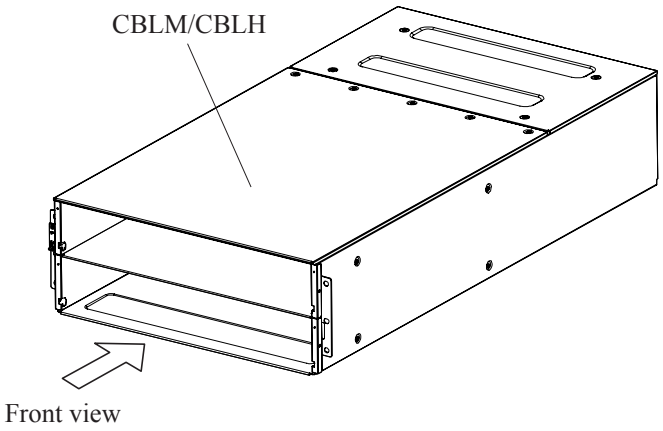
14. End

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2.17.2 Replacing a CBLM/CBLH

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rack	1	CBLM	• DW800-CBLM
		CBLH	• DW800-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. Refer to "1.1.3 Note on Installing and Removing Parts".
- The PDU may connect to other devices. When replacing it, check the precautions for the connected devices before the replacement.

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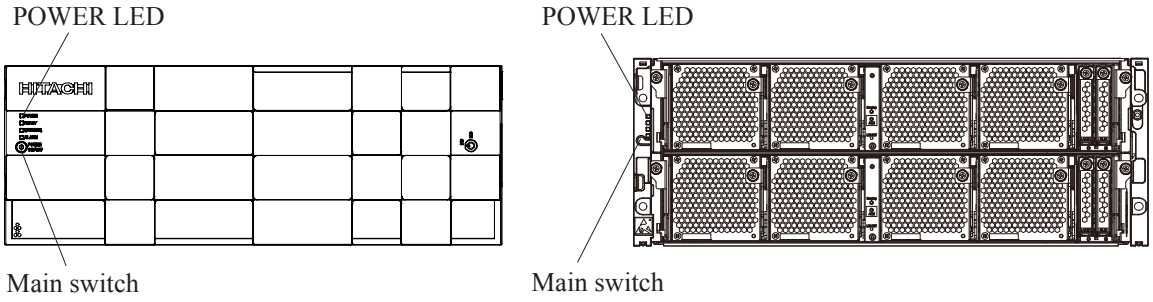
2.17.2.1 Replacement of Controller Chassis

1. Power off the rack.

> **⚠ WARNING**
>
> Hazardous voltage:
> Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBLM/CBLH for three second to turn off.
(2) Confirm that the POWER LED on the front side of the CBLM/CBLH lights in amber.

Figure 2-151 Main Switch and POWER LED on the front of CBLM/CBLH



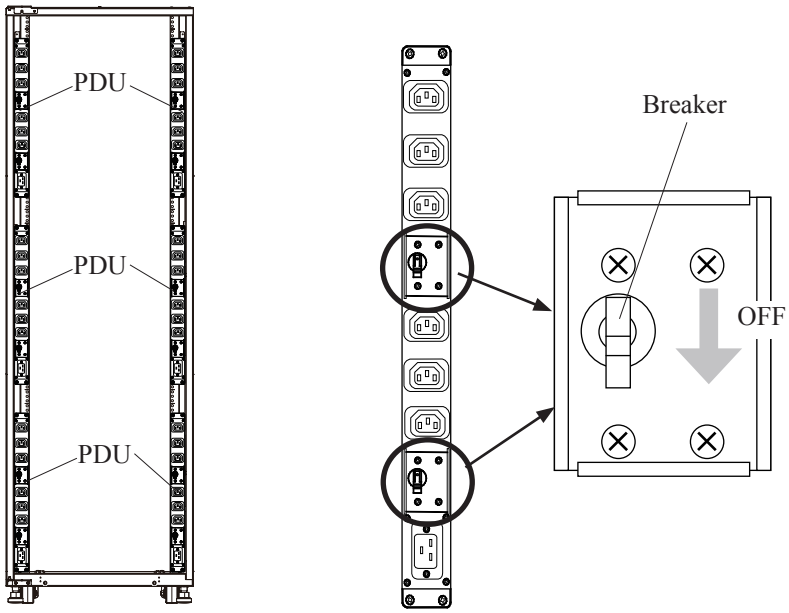
Front view of CBLM/CBLH
(With the Front Bezel attached)

Front view of CBLM/CBLH
(With the Front Bezel detached)

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(3) Turn off the breaker at the PDU on the rack frame.

Figure 2-152 Turning-off Breakers



Rear view of rack frame Front view of PDU

(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

NOTE : The circuit has residual voltage after turning off the breakers, so wait for one minute.

2. Remove the Front Bezel.
   (1) Remove the Front Bezel from the CBLM/CBLH. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

3. Attach a label.
   (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 spare Controller Chassis.

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4. Remove the BKMF.
   (1) Loosen the screw (blue) fixing the BKMF.
   (2) Open the lever and pull out the BKMF to remove.
   (3) Remove the other BKMFs in the same manner.

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

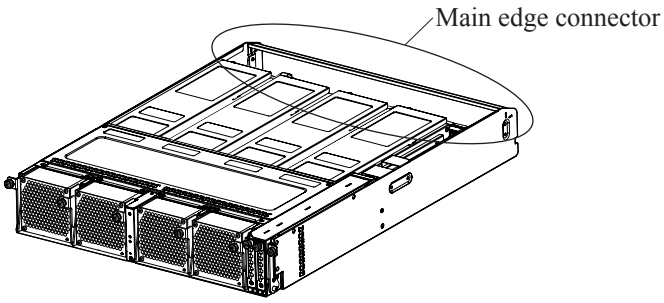
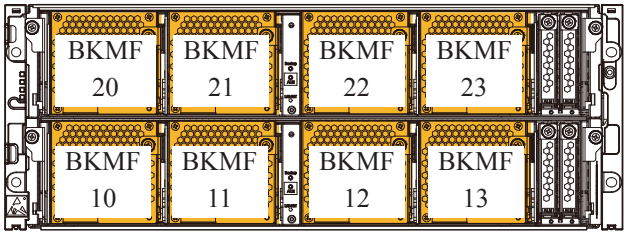
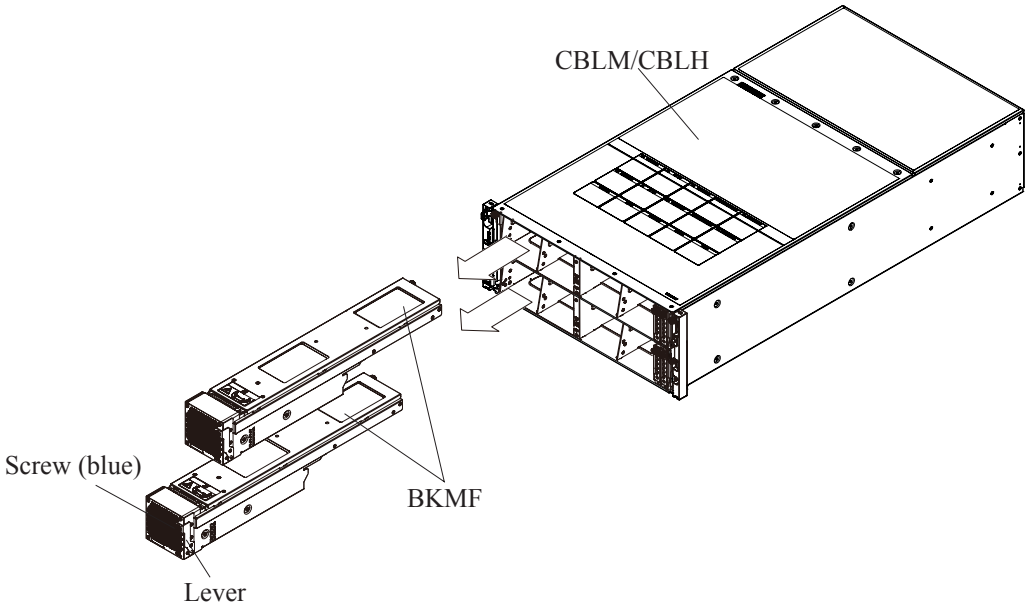


Figure 2-153 Removal of BKMF



Front view of CBLM/CBLH

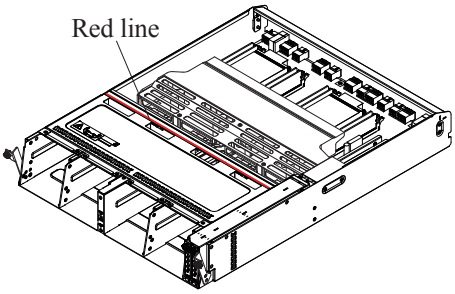


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5. Remove a Controller Board.
   (1) Loosen the right and left screws (blue) on the lever of the Controller Board in the front of the CBLM/CBLH and open the lever.
   (2) With the lever opened completely, pull out and remove the Controller Board.
   (3) Remove the other Controller Board in the same manner.

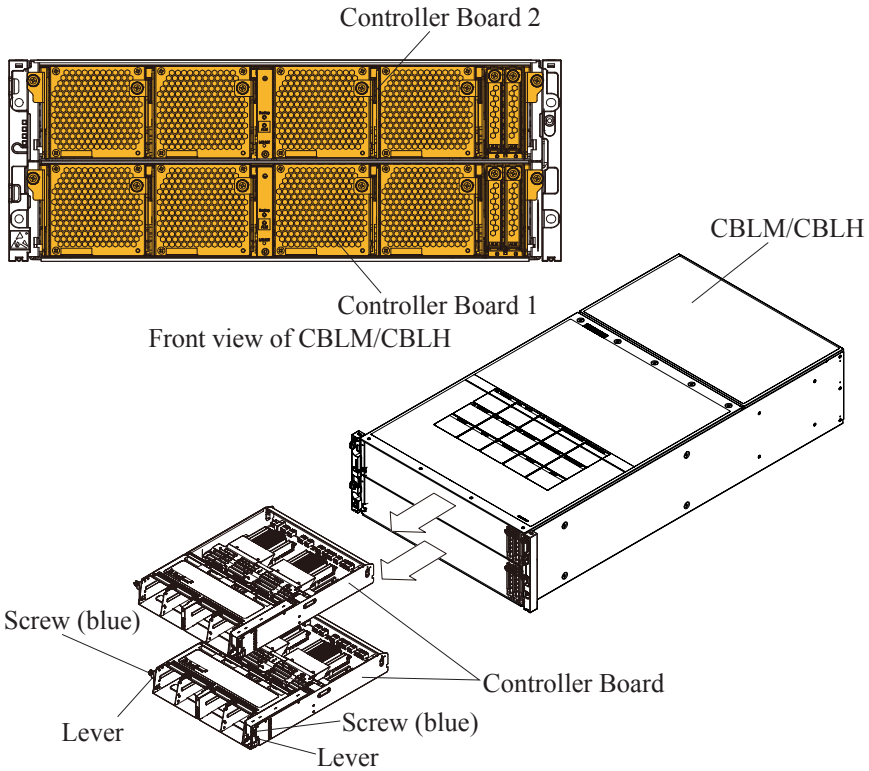
⚠ CAUTION

Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal 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.

Figure 2-154 Removal of Controller Board



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6. Remove the Channel Board/Dummy.
   Remove all the Channel Boards and dummies installed in the CBLM/CBLH.
   (1) Remove all the cables connected to the Channel Board.
   (2) Loosen the two screws (blue) which fix the Channel Board/dummy.
   (3) Pull out and remove the Channel Board/dummy while holding the screws (blue).
   (4) Remove the other Channel Boards/dummies in the same manner.

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

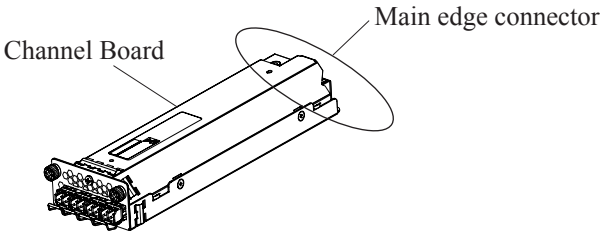
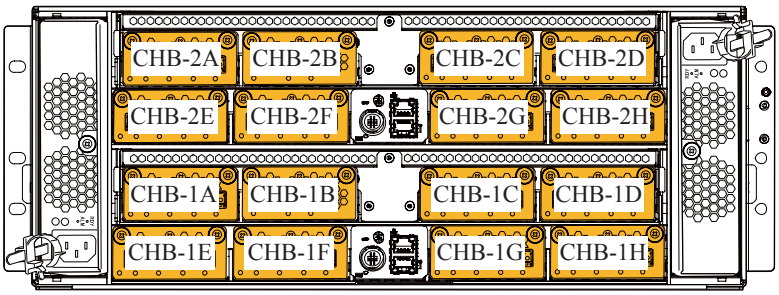
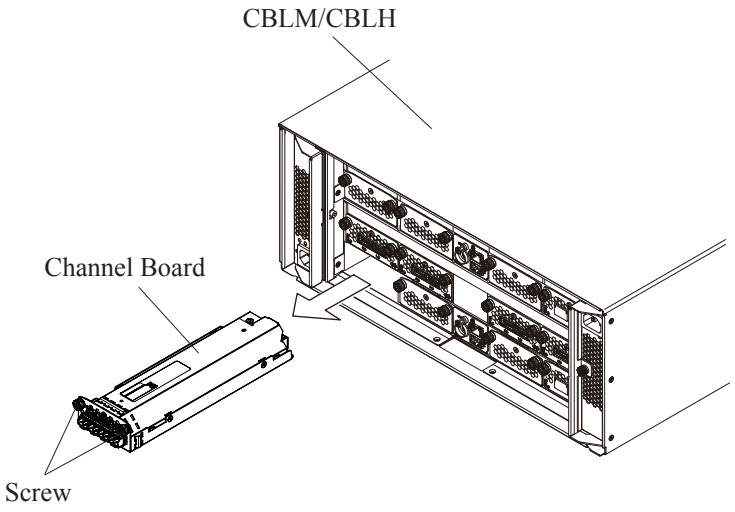


Figure 2-155 Removal of Channel Board/Dummy



Rear view of CBLM/CBLH

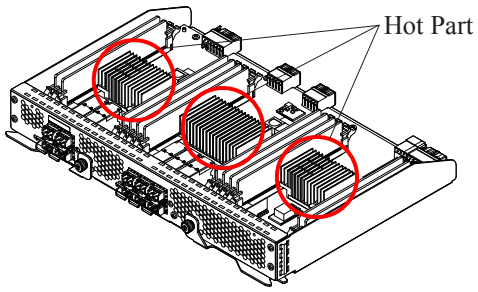


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7. Remove the NAS Module

⚠ 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.



NOTICE: To remove the NAS Module, hold the NAS Module with both hands and remove it straight so that no physical shock is exerted on the parts.

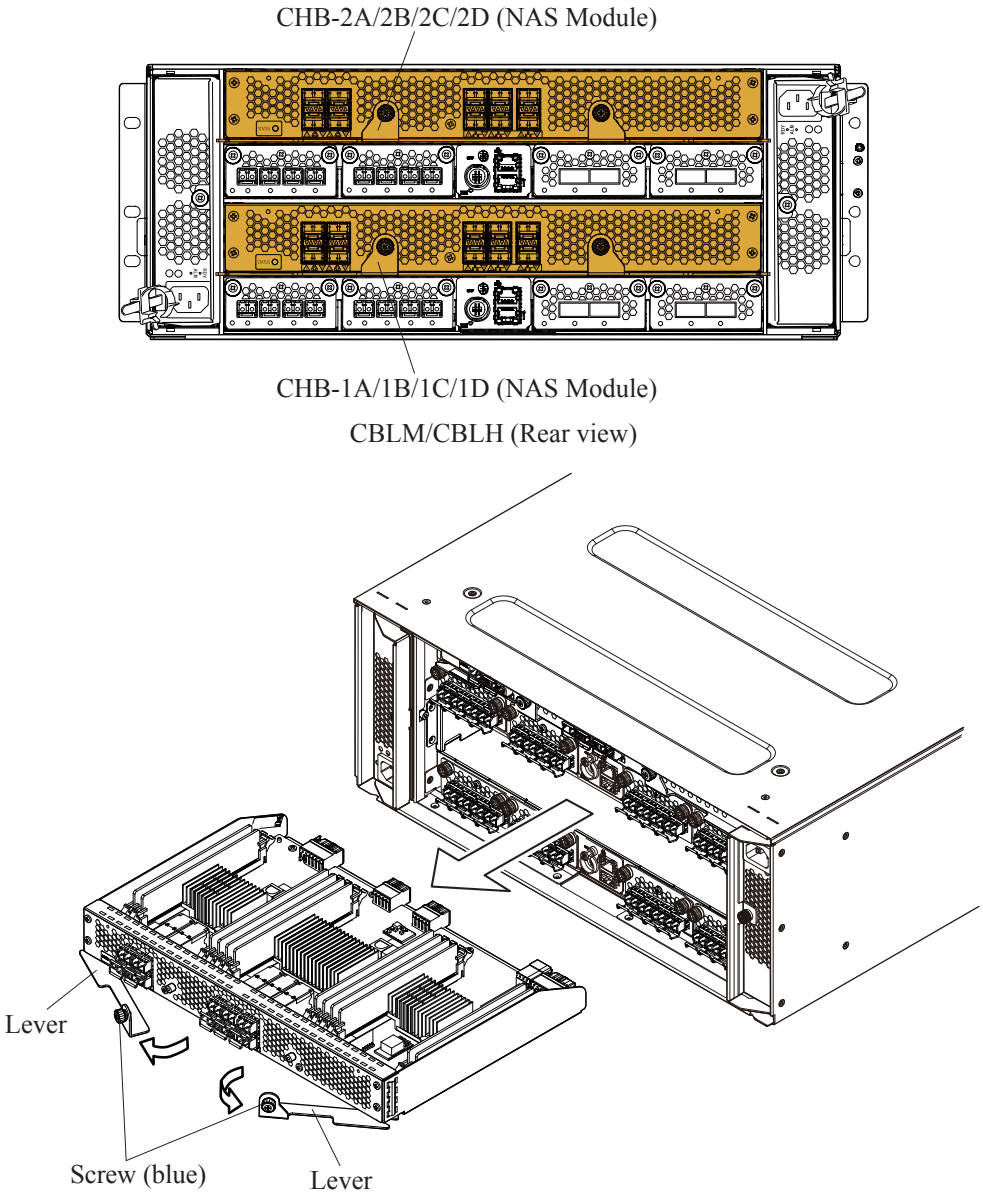
(1) Remove the cable connected to the NAS Module.

NOTE: Take notes or mark on the removed cable to be able to connect it to the original place after replacement.

(2) Loosen the two screws (blue) fixing the NAS Module and open the lever.
(3) Hold the NAS Module with both hands and pull it toward you to remove.

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Figure 2-156 Removal of NAS Module



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8. Remove the Disk Board/Dummy.
   Remove all the Disk Boards and dummies installed in the CBLM/CBLH.
   (1) Remove all the SAS cables connected to the Disk Board.
   (2) Loosen the two screws (blue) which fix the Disk Board/dummy.
   (3) Pull out and remove the Disk Board/dummy while holding the screws (blue).
   (4) Remove the other Disk Boards/dummies in the same manner.

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

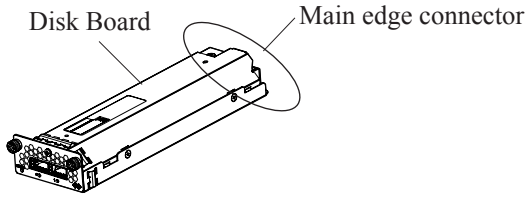
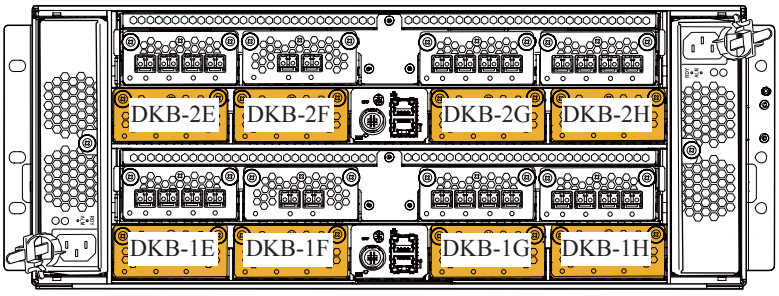
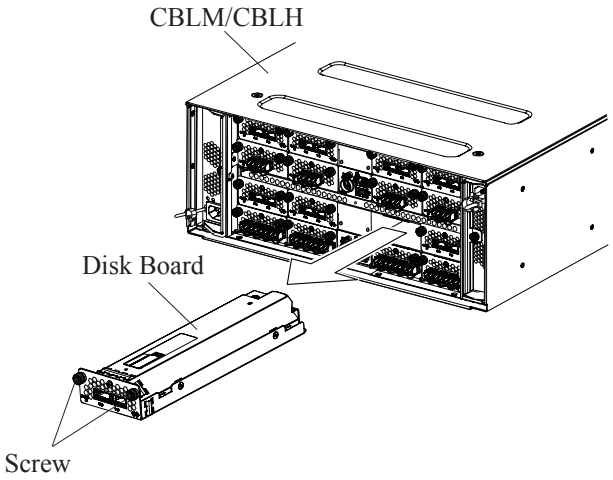


Figure 2-157 Removal of Disk Board/Dummy

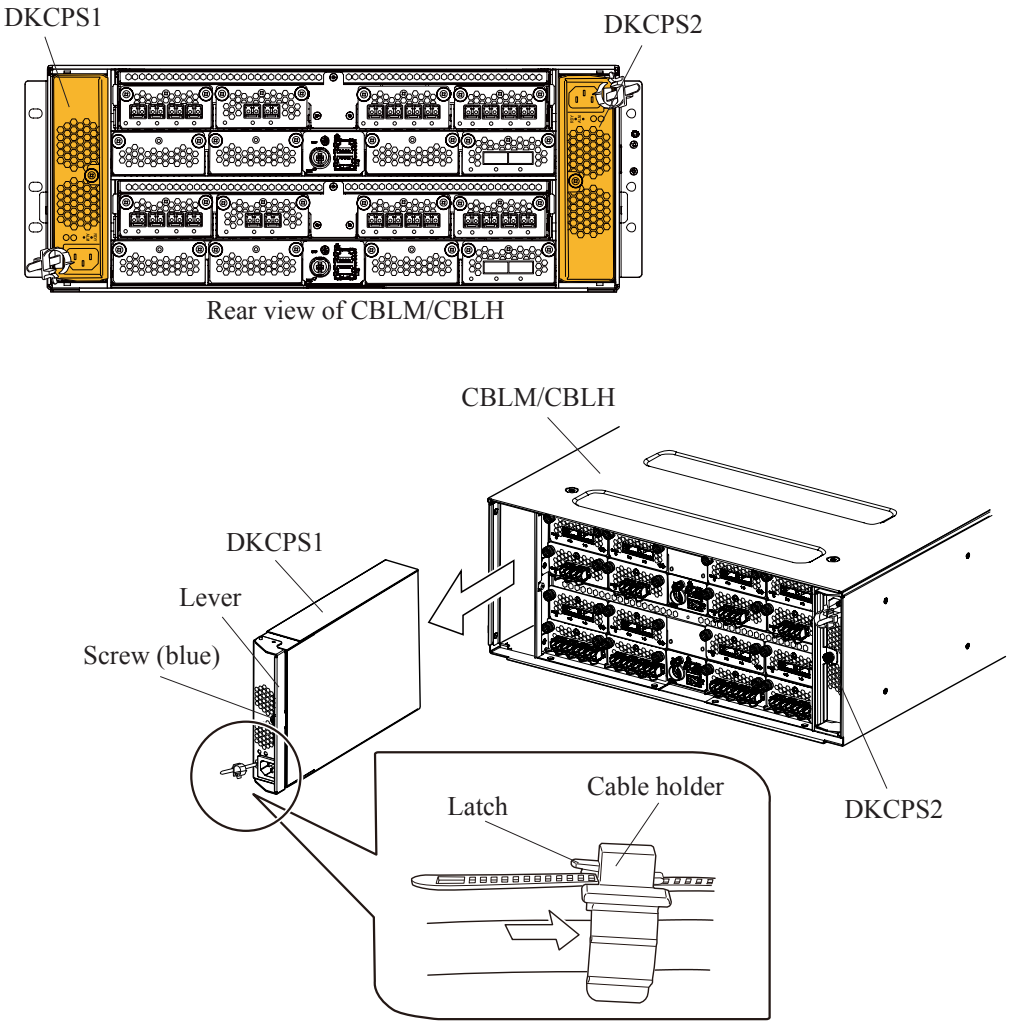


Rear view of CBLM/CBLH



9. Remove the DKCPS.
   (1) Remove all the power cables connected to the DKCPS.
   (2) Loosen the screw (blue) which fixed the DKCPS.
   (3) Open the lever and pull out and remove the DKCPS while holding its body with both hands.
   (4) Remove the other DKCPS in the same manner.

Figure 2-158 Removal of DKCPS



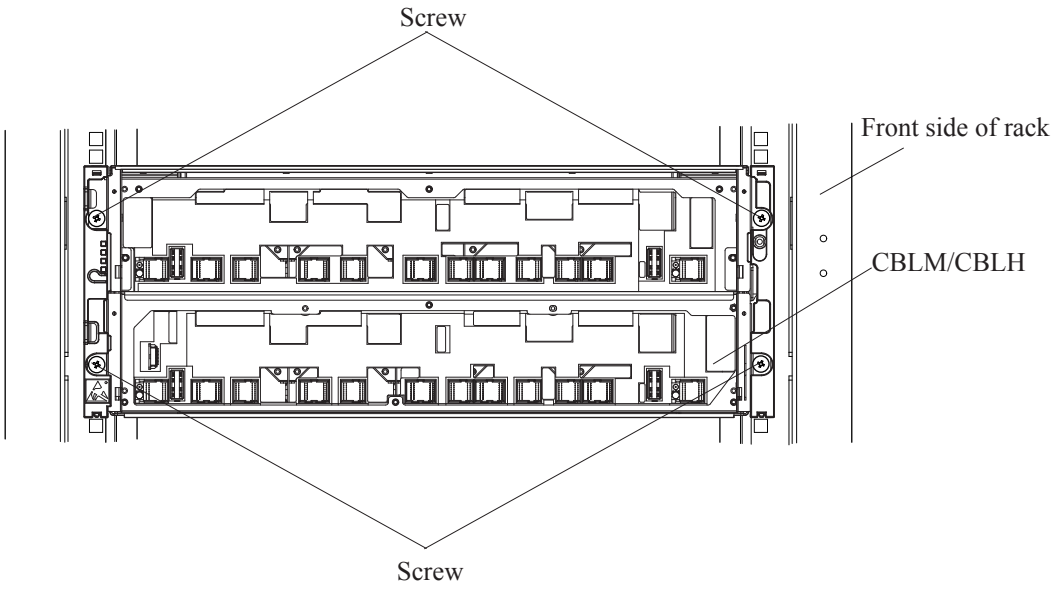
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10. Replace the Controller Chassis
    (1) Remove the right and left screws (two each) fixing the CBLM/CBLH.

> **⚠ CAUTION**
>
> Be careful of the mass:
> Work carefully because the mass of the Controller Chassis is about 29 kg.

    (2) Remove the Controller Chassis from the rack frame referring to mounting procedure using the special lifter. (Refer to "2.2.3 Mounting Lifter on Rack Frame".)
    (3) Install a new Controller Chassis from the front of the rack.
    (4) Fix the right and left of the CBLM/CBLH with screws (two each).

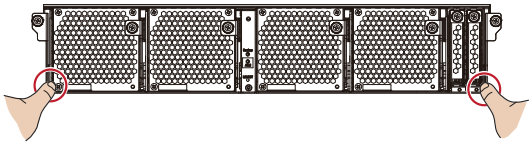
Figure 2-159 Removal of Controller Chassis



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11. Install the Controller Board.
    (1) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBLM/CBLH. (Refer to Figure 2-154.)
    (2) Push the Controller Board in all the way 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.

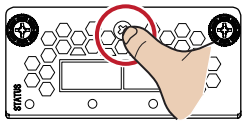


    (3) Tighten the screw (blue) and fix the Controller Board.
    (4) Install the other Controller Board in the same manner.

12. Install the BKMF.
    (1) Open the BKMF lever and insert the BKMF into the slot of the Controller Board (refer to Figure 2-153).
    (2) Push the BKMF in all the way, and close the lever completely.
    (3) Tighten the screw (blue) and fix the BKMF.
    (4) Install the other BKMF in the same manner.

13. Install the Disk Board/dummy.
    (1) Insert the Disk Board/dummy into the slot. (Refer to Figure 2-157.)
    (2) Push the Disk Board/dummy in all the way.

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

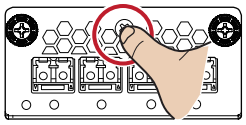


    (3) Tighten the two screws (blue) to fix the Disk Board/dummy.
    (4) Check "1.1.5 Note on Cable Routing", and then connect the SAS cables to the Disk Board. When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".
    (5) Install the other Disk Boards in the same manner.

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14. Install the Channel Board/dummy.
    (1) Insert the Channel Board/dummy into the slot. (Refer to Figure 2-155.)
    (2) Push the Channel Board/dummy in all the way.

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



    (3) Tighten the two screws (blue) to fix the Channel Board/dummy.
    (4) Clean the cable connectors.
        (a) Spray compressed gas to the cable connector part using an air spray (approx. five seconds).
        (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
        (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)
    (5) Connect the cables to the Channel Board.

        NOTE: Check that cable latch clicks and the cables are surely connected.

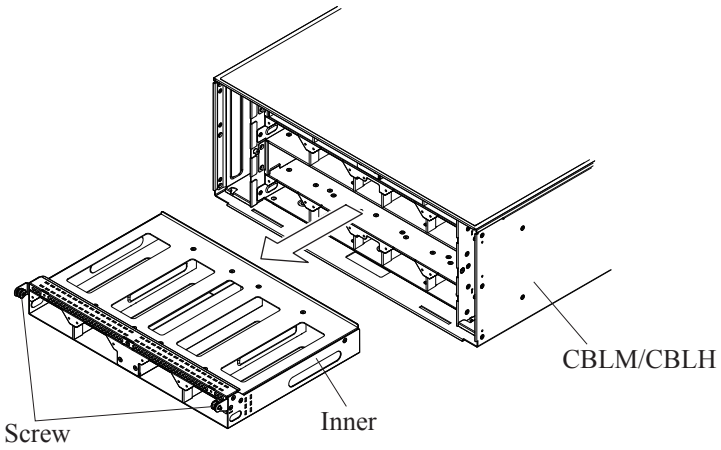
    (6) Install the other Channel Boards in the same manner.

15. Install the DKCPS.
    (1) Hold up the latch on the cable holder of the DKCPS to release the lock, and then slide the cable holder forward. (Refer to Figure 2-158.)
    (2) With the lever completely opened, insert the DKCPS in to the slot.
    (3) Push the DKCPS in all the way.
    (4) Close the lever completely.
    (5) Tighten the screw (blue) to fix the DKCPS.
    (6) Connect the power cable to the DKCPS, and then fix the cable by the cable holder.
    (7) Install the other DKCPS in the same manner.

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16. Install the NAS Module.
    (1) Remove the Inner
    Remove the Inner of the CHB ports (1A/1B/1C/1D or 2A/2B/2C/2D).
    Loosen the screws (two places) and pull the Inner forward to remove.

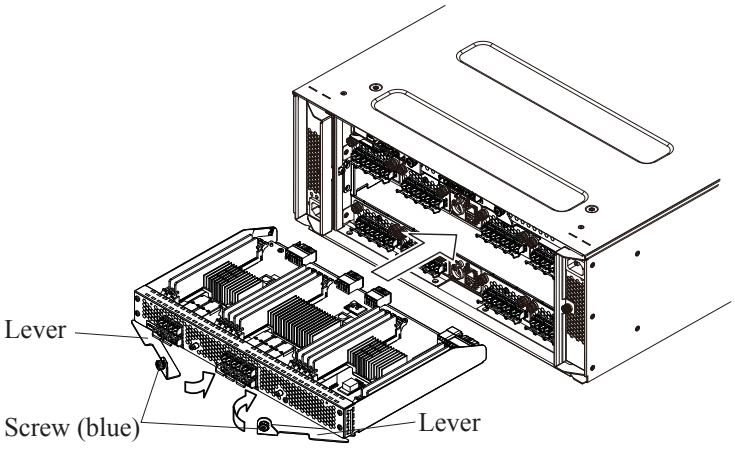
Figure 2-160 Removing the Inner



(2) Insert the new NAS Module into the slot while opening the lever.
(3) Push the NAS Module all the way in and close the lever.
(4) Tighten the two screws (blue) to fix the NAS Module.
(5) Clean the cable connectors.
    (a) Spray compressed gas to the connector part using an air spray (approx. five seconds)
    (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
    (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached).
(6) Connect the cable to the replaced NAS Module.

NOTE: • Be sure to connect the cable to the same port as before the replacement.
• Check that cable latch clicks and the cables are surely connected.

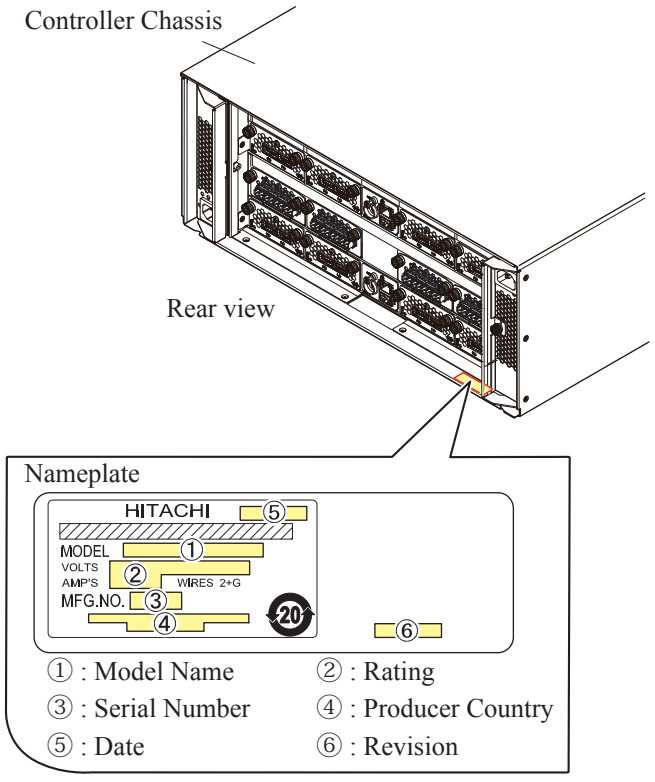
Figure 2-161 Installing the NAS Module



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17. Attach the nameplate.
    (1) Take out the nameplate in which the same model name as the removed Controller Chassis is described from the nameplates attached to the spare Controller Chassis. Write down the same serial number as the removed Controller Chassis in the nameplate, and then affix the nameplate to the spare Controller Chassis.
    When the nameplate in which the same model name as the removed Controller Chassis is described is not attached, take out the nameplate in which the same rating and producer country as the removed Controller Chassis are described and which the model name is not described. Write down the same model name and serial number as the removed Controller Chassis in the nameplate, and then affix it to the spare Controller Chassis.
    To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-162 Attachment of Nameplate

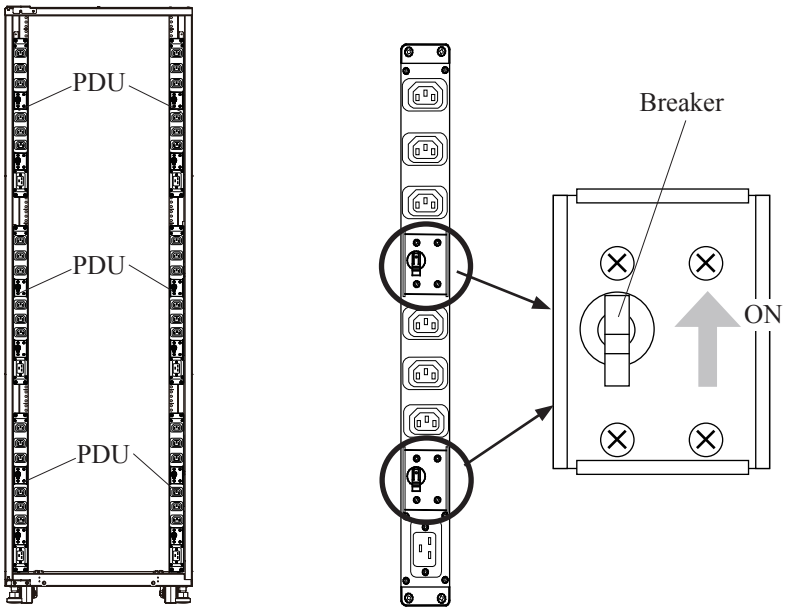


18. Attach the Front Bezel.
    (1) Attach the Front Bezel to the CBLM/CBLH. (Refer to “2.2.1 How to Attach/Remove Front Bezel”.)

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19. Power On the component
    (1) Turn on the breaker on the power distribution panel.
    (2) Turn on the breaker at the PDU on the rack frame.

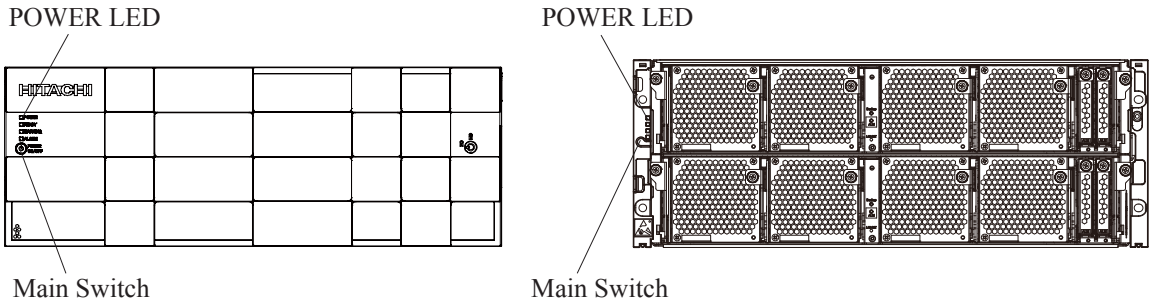
Figure 2-163 Turning on Breakers



Rear view of rack frame Front view of PDU

(3) Press the Main Switch on the front of the CBLM/CBLH for three second to turn on.

Figure 2-164 Main Switch on CBLM/CBLH



Front view of CBLM/CBLH
(With the Front Bezel attached)

Front view of CBLM/CBLH
(With the Front Bezel detached)

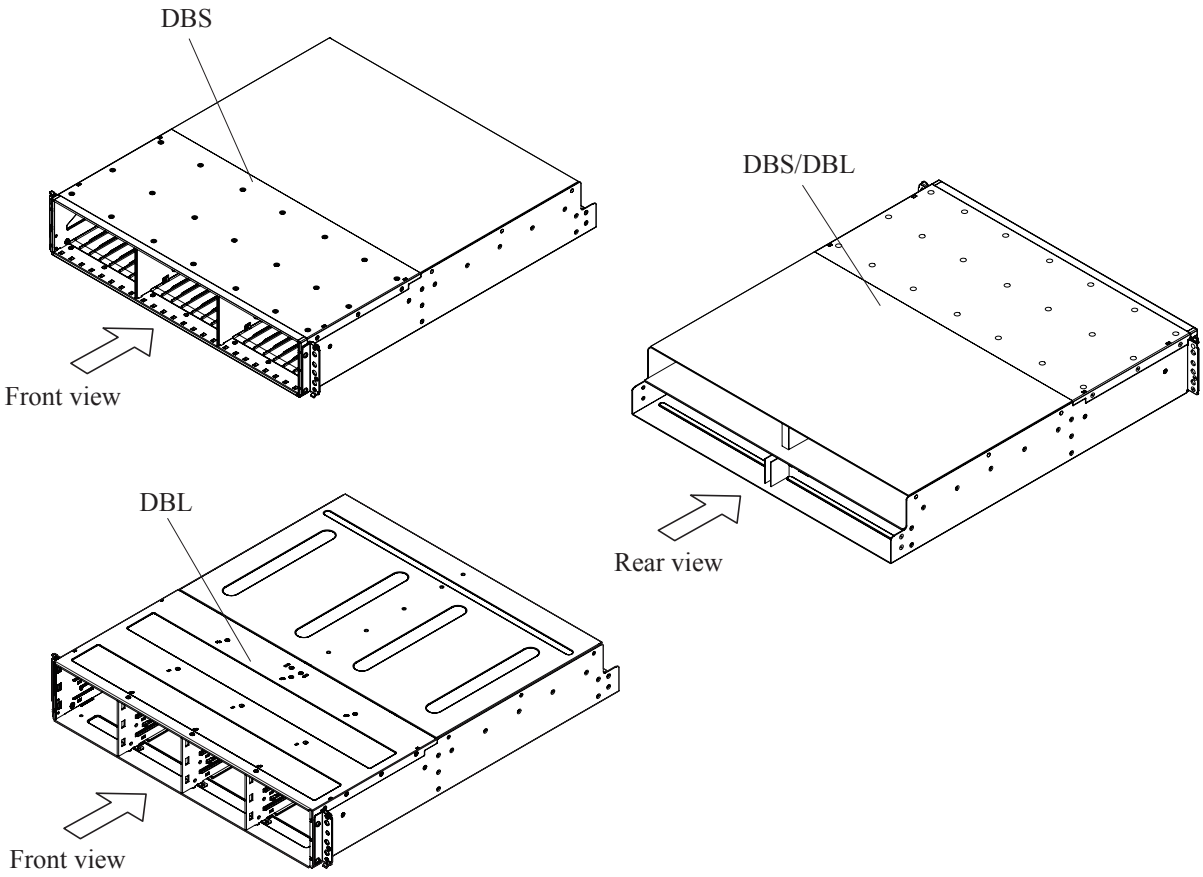
20. End

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2.17.3 Replacing a DBS/DBL Drive Box

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rack	1	DBS	• DW-F800-DBS/DBSC/DBSD
		DBL	• DW-F800-DBL/DBLC/DBLD



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 "1.1.3 Note on Installing and Removing Parts".
- Replace the Drive Box while the Storage System is powered off. Do not replace the Drive Box while the Storage System is powered on.

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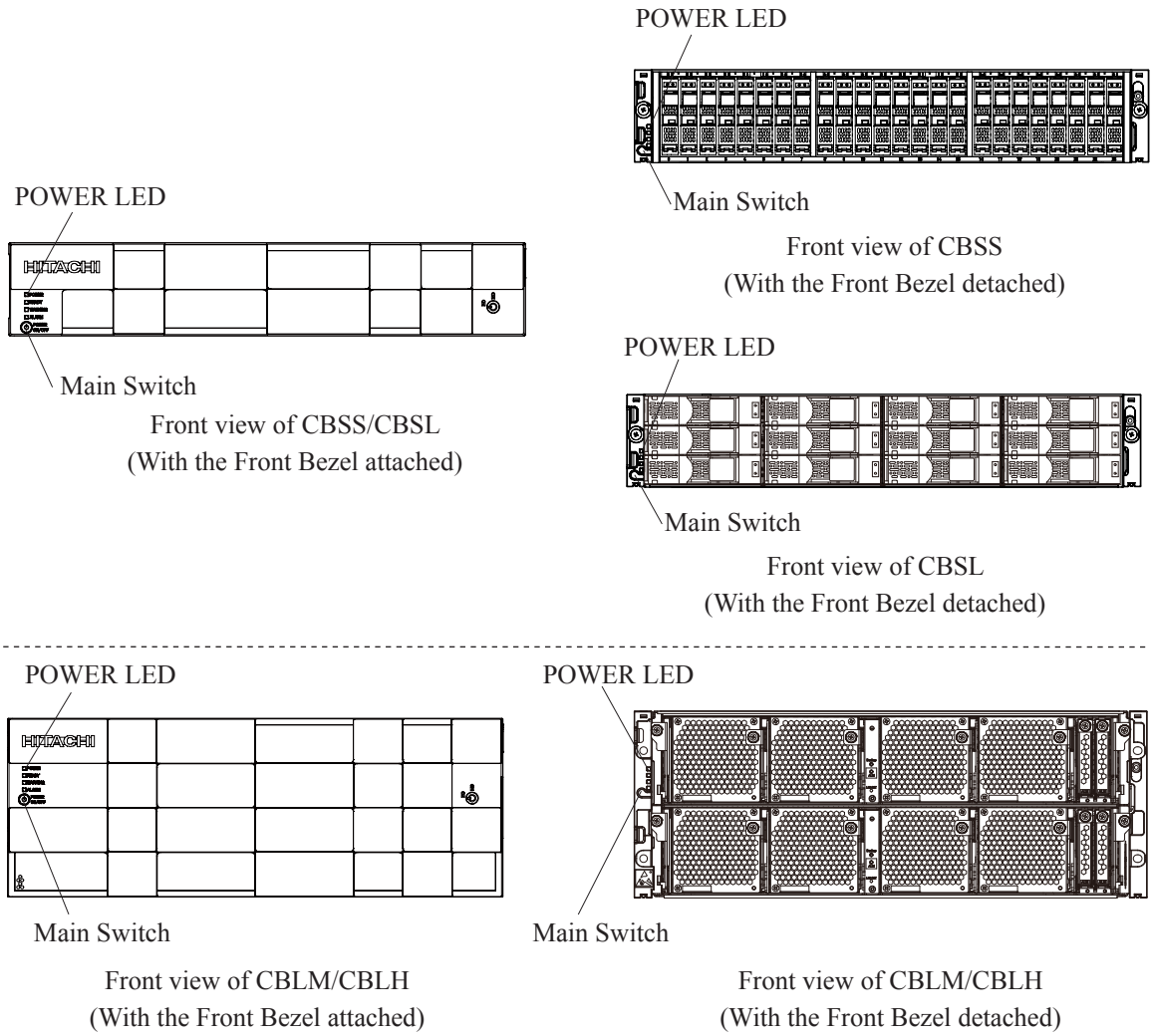
2.17.3.1 Replacement of Drive Box

1. Power off the rack.

> **⚠ WARNING**
>
> Hazardous voltage:
> Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBSS/CBSL/CBLM/CBLH for three second to turn off.
(2) Confirm that the POWER LED on the front side of the CBSS/CBSL/CBLM/CBLH lights in amber.

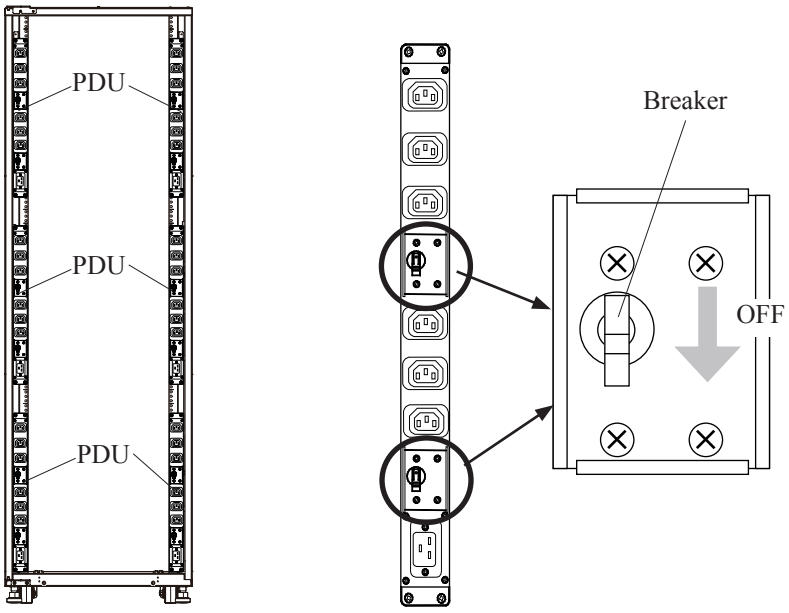
Figure 2-165 Main Switch and POWER LED on the Front of CBSS/CBSL/CBLM/CBLH



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(3) Turn off the breaker at the PDU on the rack frame.
In case of DC power models (DBSD/DBLD), request the customer to shut down the connected input Power Supply.

Figure 2-166 Turning-off Breakers



Rear view of rack frame Front view of PDU

(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

NOTE: The circuit has residual voltage after turning off the breakers, so wait for one minute.

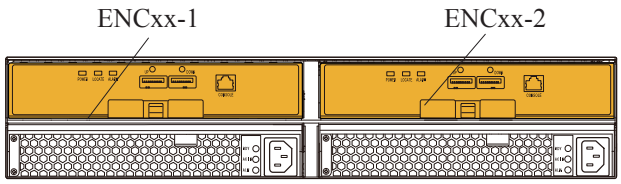
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2. Remove the Front Bezel.
   (1) Remove the Front Bezel from the Drive Box. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

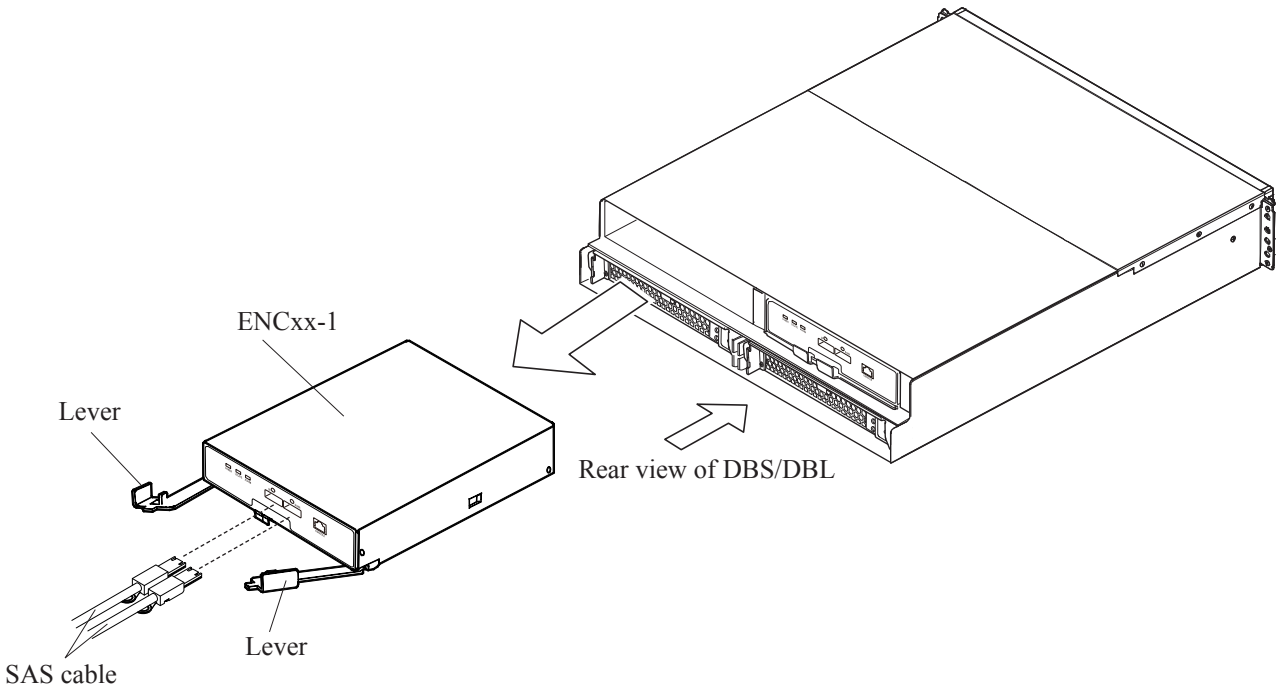
3. Attach a label.
   (1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the spare Drive Box.

4. Remove the ENC.
   (1) Disconnect the SAS cable which connects to the ENC.
   (2) Pull the right and left levers and remove the ENC.
   (3) Remove the other ENC in the same manner.

Figure 2-167 Removal of ENC (DBS/DBL)



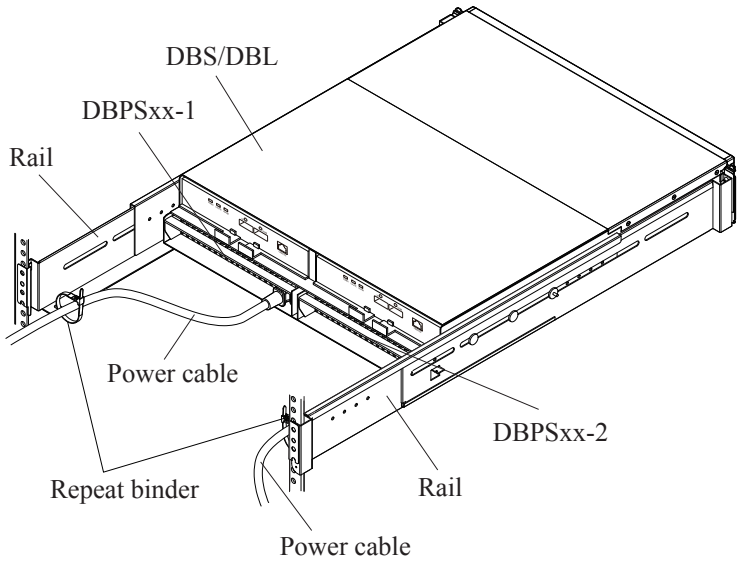
Rear view of DBS/DBL



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

5. Remove a DBPS.
   (1) Remove the two repeat binders from the rail of the rear side of the Drive Box.

Figure 2-168 Removal of Repeat Binders



(2) Remove the power cables.

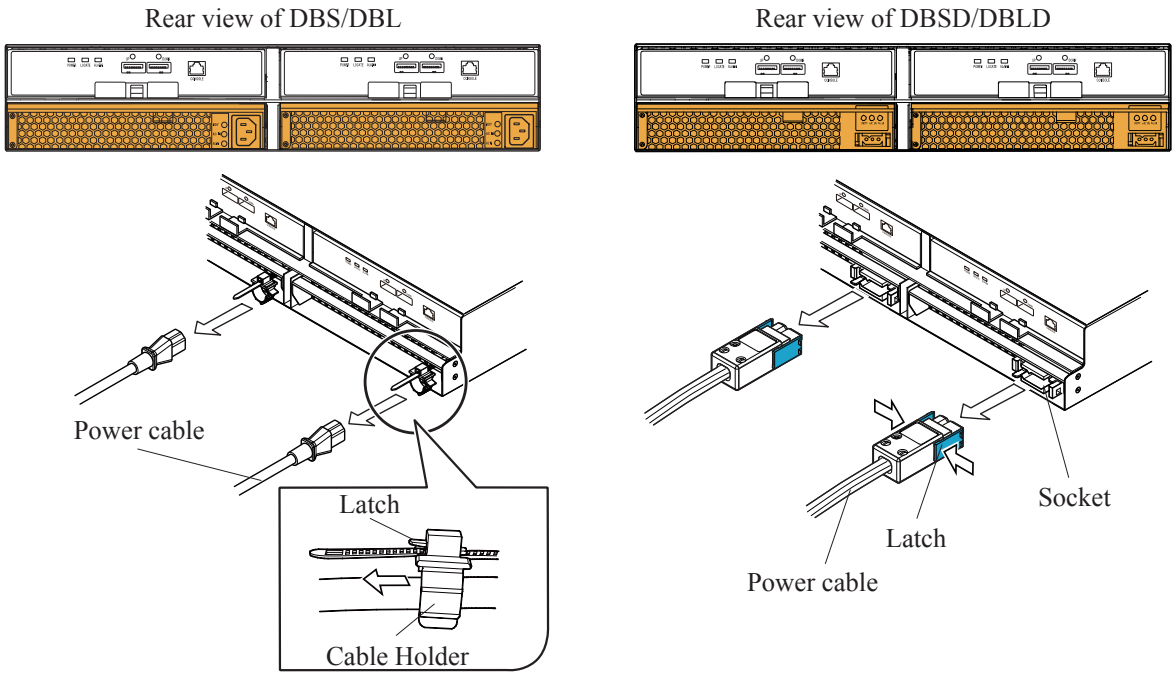
- In case of CBSS/CBSL

(a) Pull and open the cable holder.

(b) Disconnect the power cable from the DBPS.

- In case of CBSSD/CBSLD, pinch both ends of the power socket to release the latch, and then remove the socket from the DBPS.

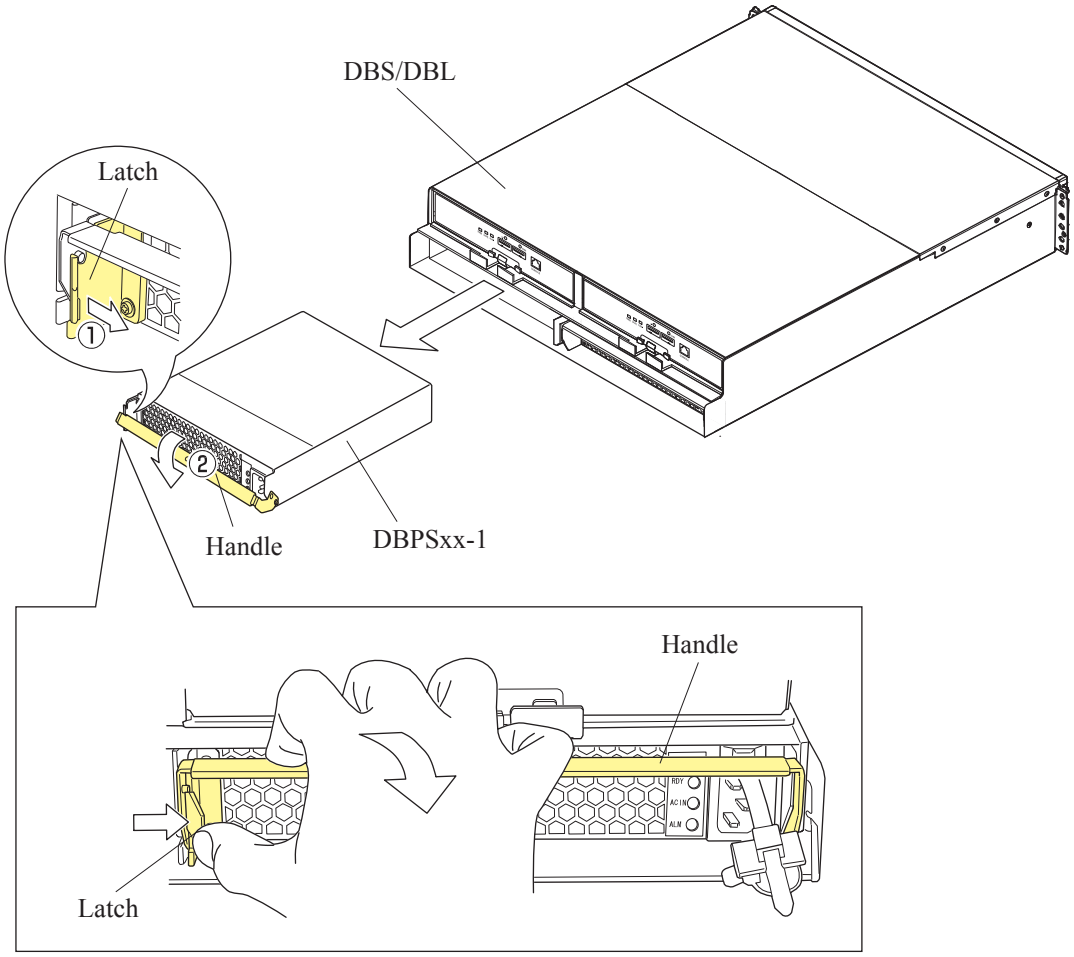
Figure 2-169 Removing Power Cables



(3) Disconnect the power cable from the other DBPS in the same manner.

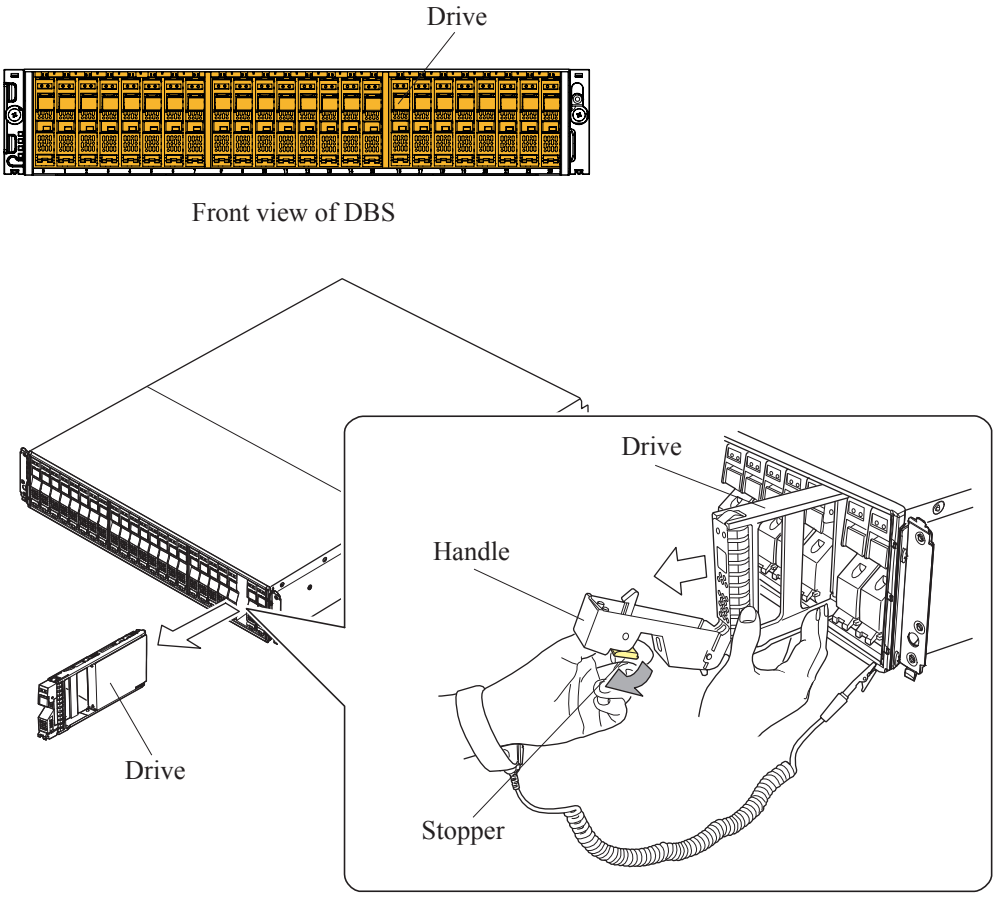
(4) Bring the handle down and forward (②) while pushing the latch of the DBPS inward (①).
(5) Pull the DBPS and remove it from the DBS/DBL.
(6) Remove the other DBPS in the same manner.

Figure 2-170 Removal of DBPS



6. Remove the Drive.
   (1) In case of DBS Drives
      (a) Pull up the stopper of the Drive handle toward you to release the lock.
      (b) Open the handle toward you, and pull out and remove the Drive to be replaced not to give a shock.
      (c) Remove the other Drives in the same manner.

Figure 2-171 Removal of Drive (DBS)



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(2) In case of DBL Drives

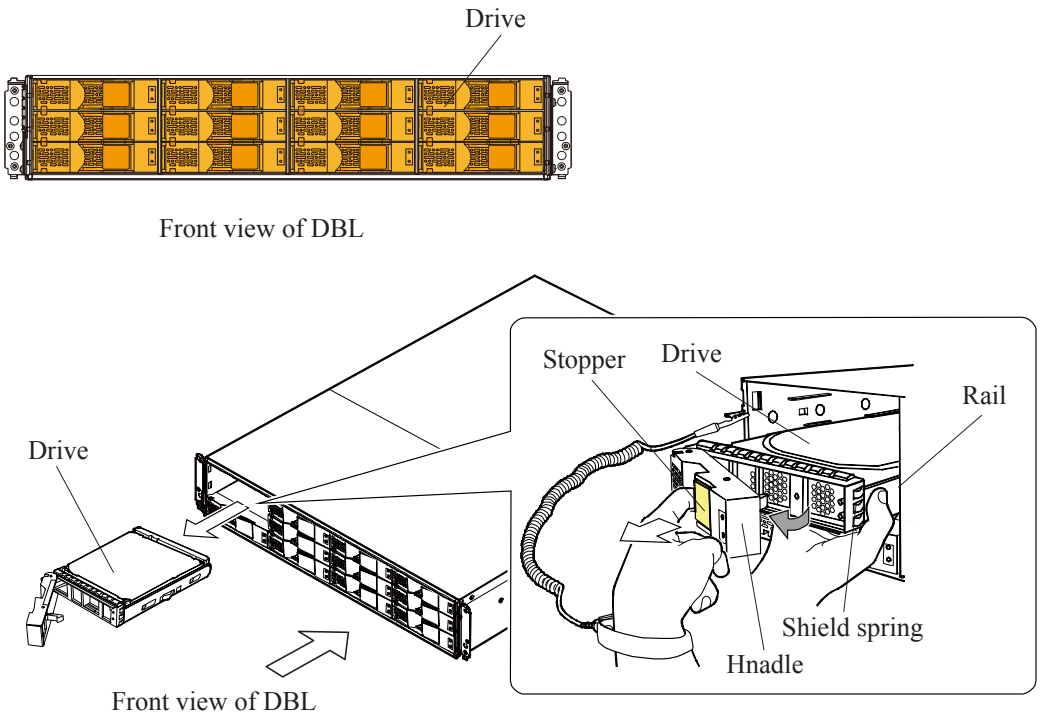
(a) Pull up the stopper of the Drive handle toward you to release the lock.

(b) Open the handle toward you, and pull out and remove the Drive to be replaced not to give a shock.

NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

(c) Remove the other Drives in the same manner.

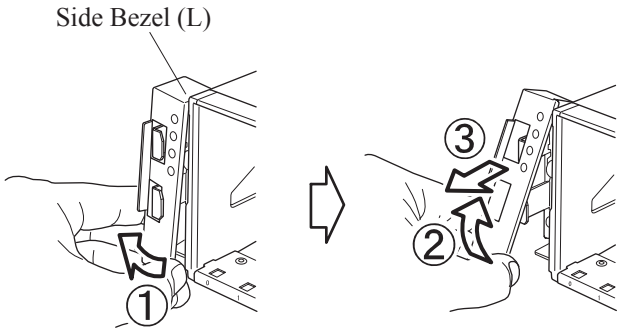
Figure 2-172 Removal of Drive (DBL)



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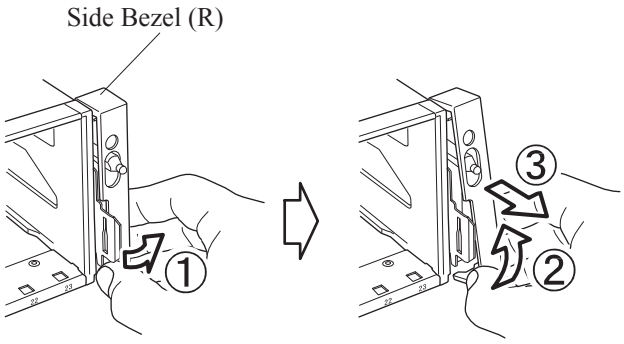
7. Replace the Drive Box
   (1) Hold the bottom of the left side bezel (L) on the front side of the Drive Box while opening outward (①) and then tilt and remove (② , ③) the bottom of the left side bezel (L) by pulling it toward you.

Figure 2-173 Removal of 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 tilt and remove (② , ③) the bottom of the right side bezel (R) by pulling it toward you.

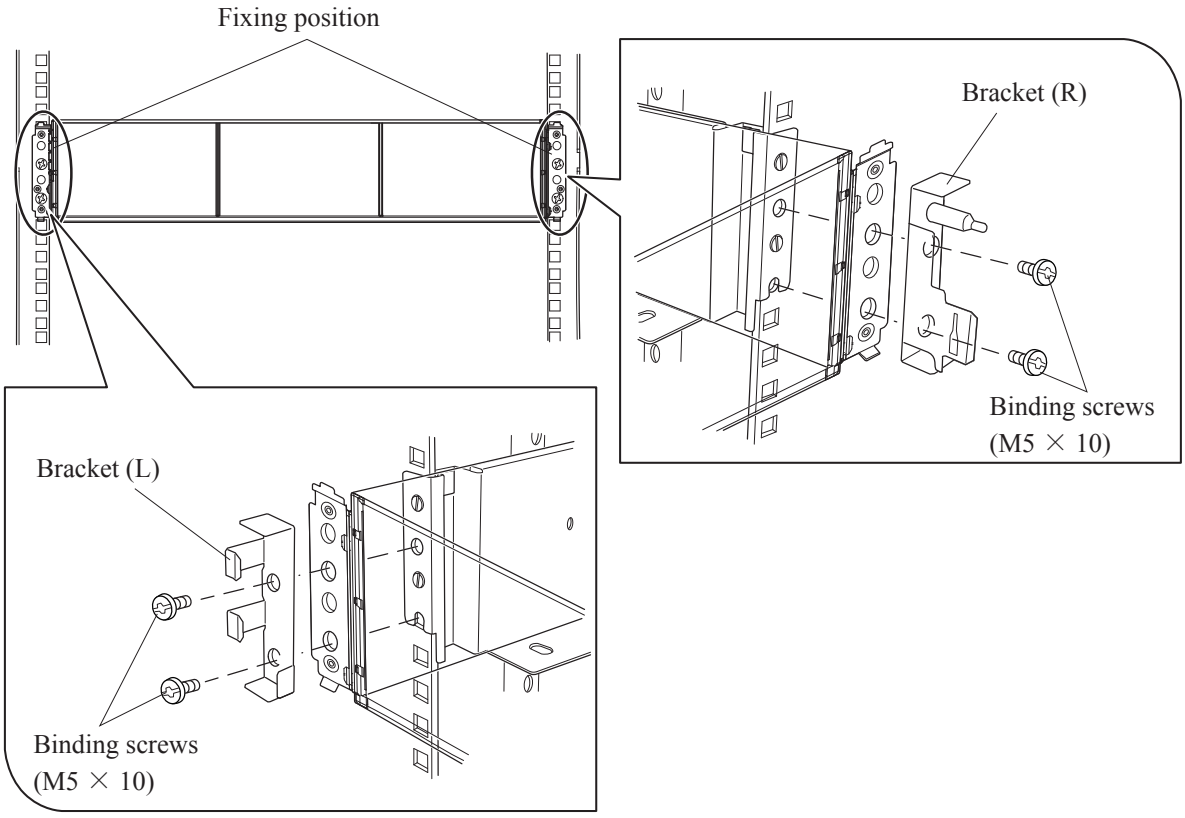
Figure 2-174 Removal of Side Bezel (R)



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

Figure 2-175 Removal of Brackets



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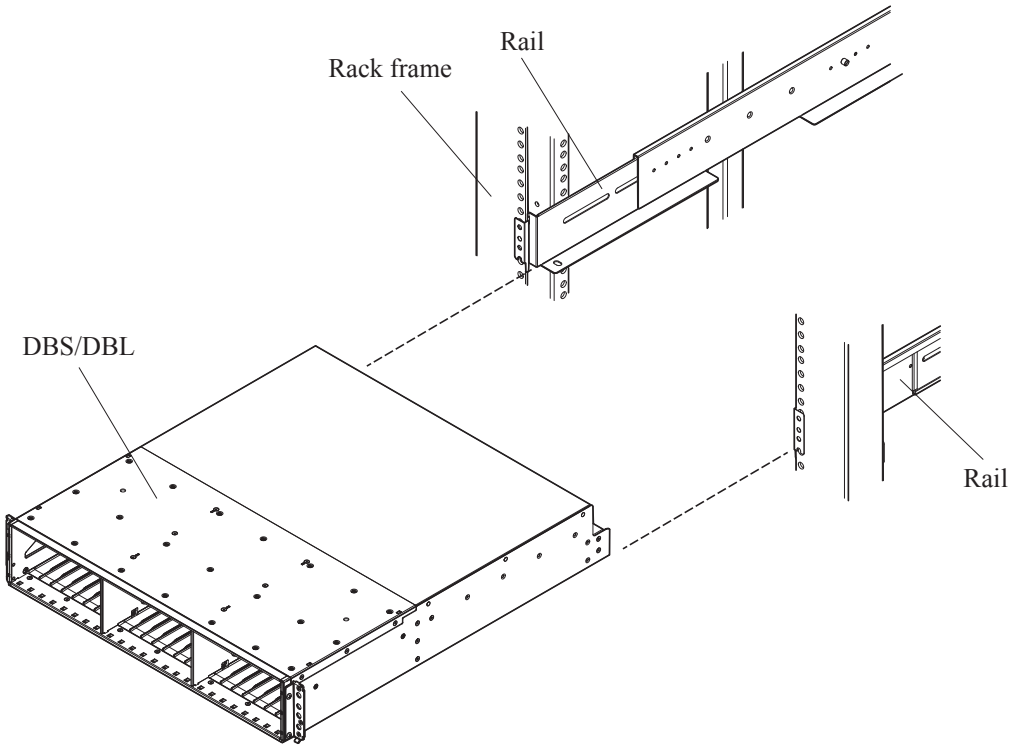
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the Drive Box is about 13 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.

(4) Remove the Drive Box from the rack frame referring to mounting procedure using the special lifter. (Refer to "2.2.3 Mounting Lifter on Rack Frame".)
(5) Install the Drive Box on the front side of the Rack frame.

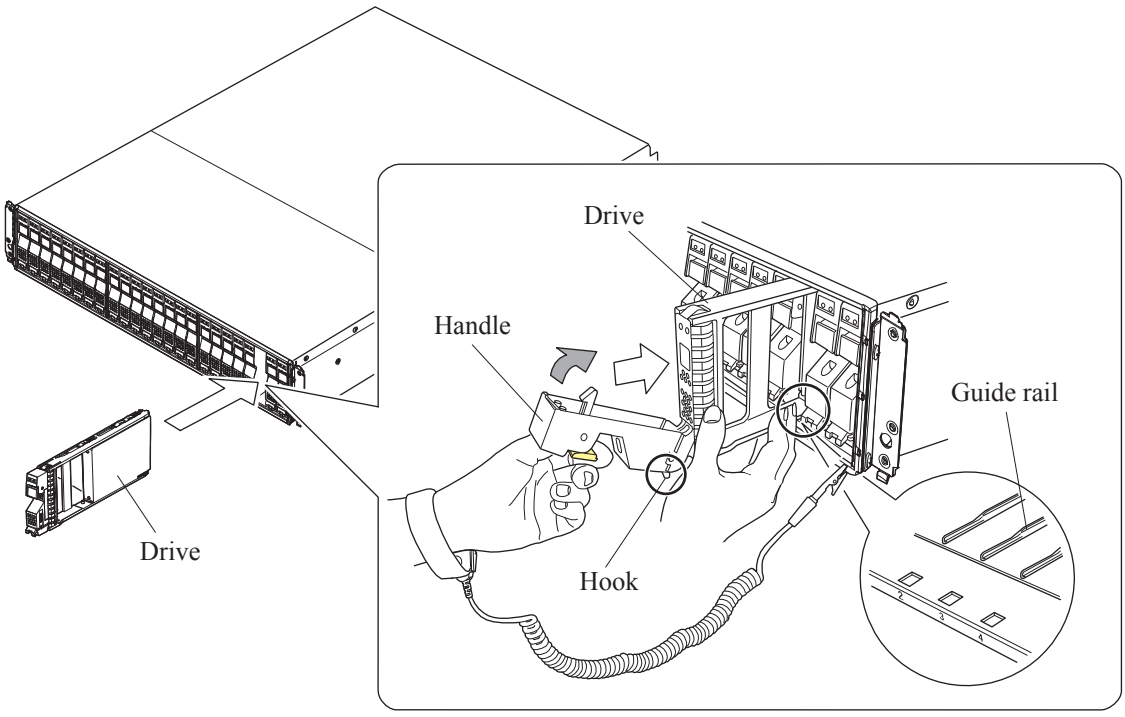
Figure 2-176 Replacement of DBS/DBL



(6) Install the Drive Box with the brackets. Fasten the DBS/DBL to the rack frame with the Binding screws (M5 × 10). (Refer to Figure 2-175.)
(7) Attach the two side bezels to the front side of the DBS/DBL. (Refer to Figure 2-173 and Figure 2-174 .)

8. Install the Drive.
   Install all the removed drives to the same place in the spare Drive Box according to the label attached to them.
   (1) In case of DBS Drives
      (a) Fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
      (b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.
      (c) Raise the stopper, which has been tilted toward you, and then press the stopper to have the lock on. If the handle is raised in the state where the hook of the handle cannot enter into each hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.
      (d) Install the other Drives in the same manner.

Figure 2-177 Installation of Drives (DBS)



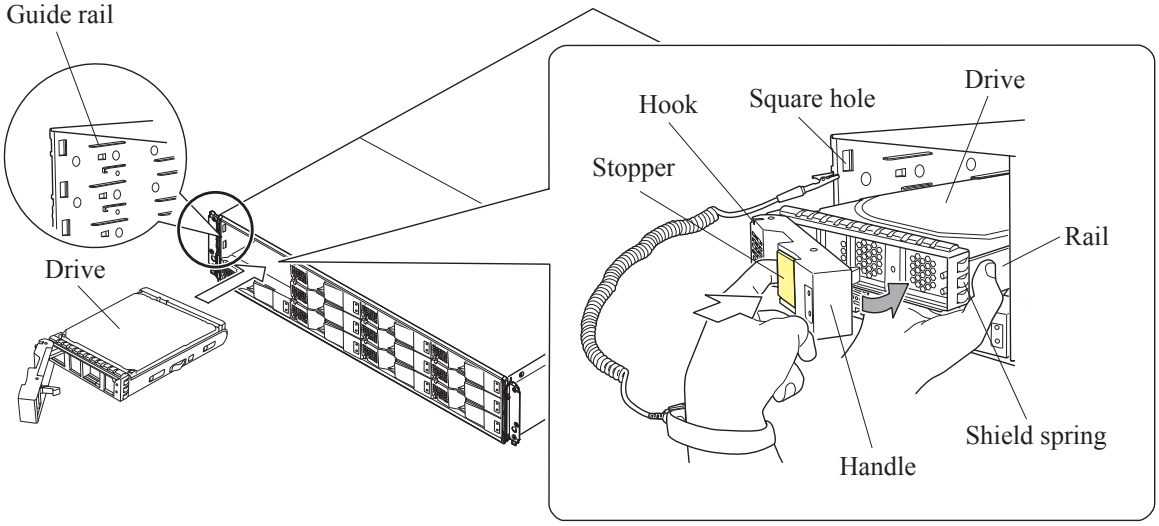
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(2) In case of DBL

NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

(a) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.
(c) Pull the stopper lightly and close the handle, and then press the stopper to have the lock on. If the handle is closed in the state where the hook of the handle cannot enter into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.
(d) Install the other Drives in the same manner.

Figure 2-178 Installation of Drive (DBL)

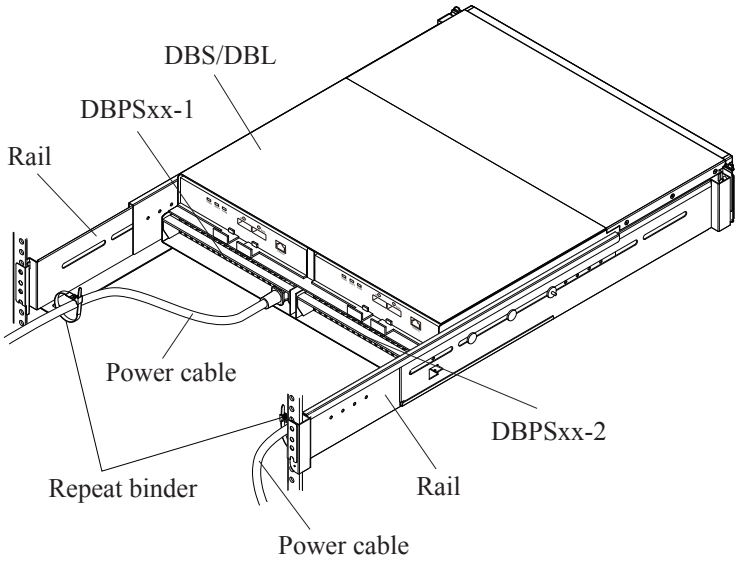


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9. Install the DBPS.
   (1) Make the handle of the DBPS completely fall down and forward. (Refer to Figure 2-170.)
   (2) Insert the DBPS into the slot and push it to the full.
   (3) Completely raise the handle and fix the DBPS.
   (4) Connect the power cable to the DBPS and fasten it with the cable holder.
   - In case of DBS/DBL, fix a cable with a cable holder.
   - In case of DBSD/DBLD, insert the socket of the power cable straight into the connector of the DBPS. At this time, check that the latches on both sides of the socket click and lock.

   (5) Install the other DBPS in the same manner.
   (6) Attach the two repeat binders to the rail of the rear side of the Drive Box to fix the power cable.

Figure 2-179 Removal of Repeat Binders



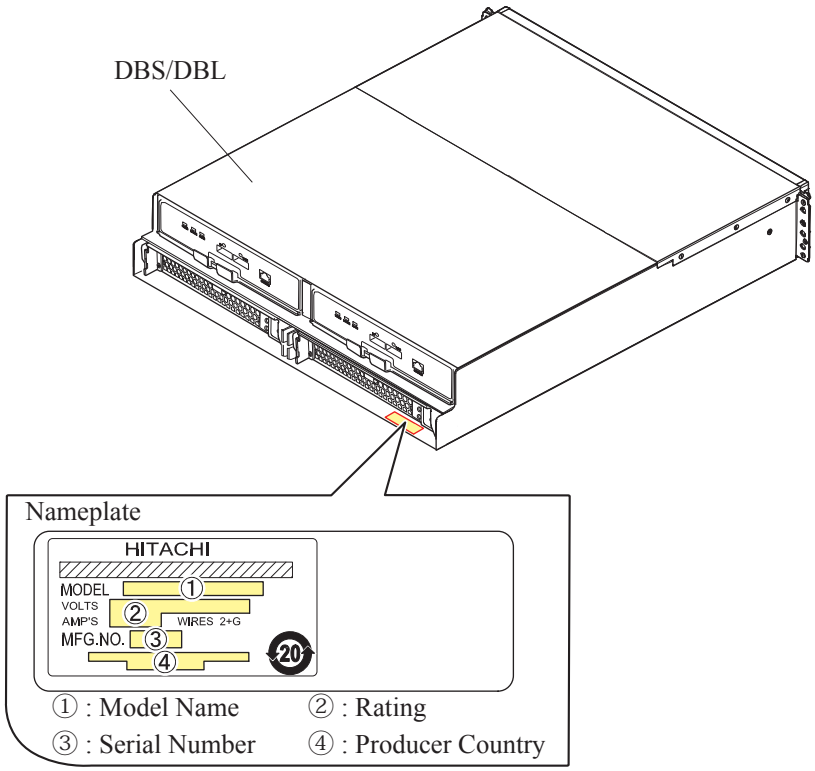
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10. Insert the ENC.
    (1) Make the right and left levers of the ENC open. (Refer to Figure 2-167.)
    (2) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
    (3) Close the right and left levers to insert the ENC completely.
    (4) Connect the cables to the ENC after checking "1.1.5 Note on Cable Routing".
    When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".
    (5) Install the other ENC in the same manner.

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11. Attach the nameplate.
    (1) Take out the nameplate in which the same model name as the removed DBS/DBL is described from the nameplates attached to the spare DBS/DBL. Write down the same serial number as the removed DBS/DBL in the nameplate, and then affix the nameplate to the spare DBS/DBL.
    When the nameplate in which the same model name as the removed DBS/DBL is described is not attached, take out the nameplate in which the same rating and producer country as the removed DBS/DBL are described and which the model name is not described. Write down the same model name and serial number as the removed DBS/DBL in the nameplate, and then affix it to the spare DBS/DBL.
    To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-180 Attachment of Nameplate

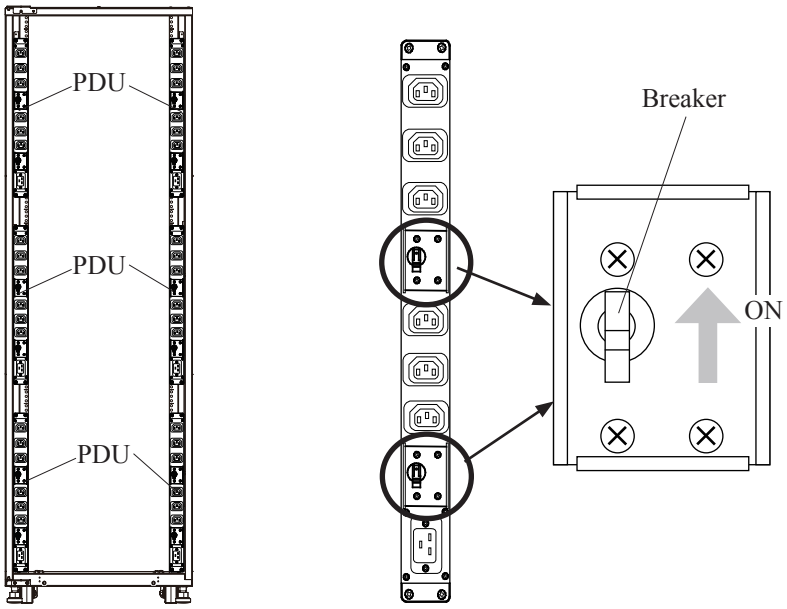


12. Attach the Front Bezel.
    (1) Attach the Front Bezel to the DBS/DBL. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

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13. Power On the component
    (1) Turn on the breaker on the power distribution panel.
    In case of DC power models (DBSD/DBLD), request the customer to turn on the connected input Power Supply.
    (2) Turn on the breaker at the PDU on the rack frame.

Figure 2-181 Turning on Breakers

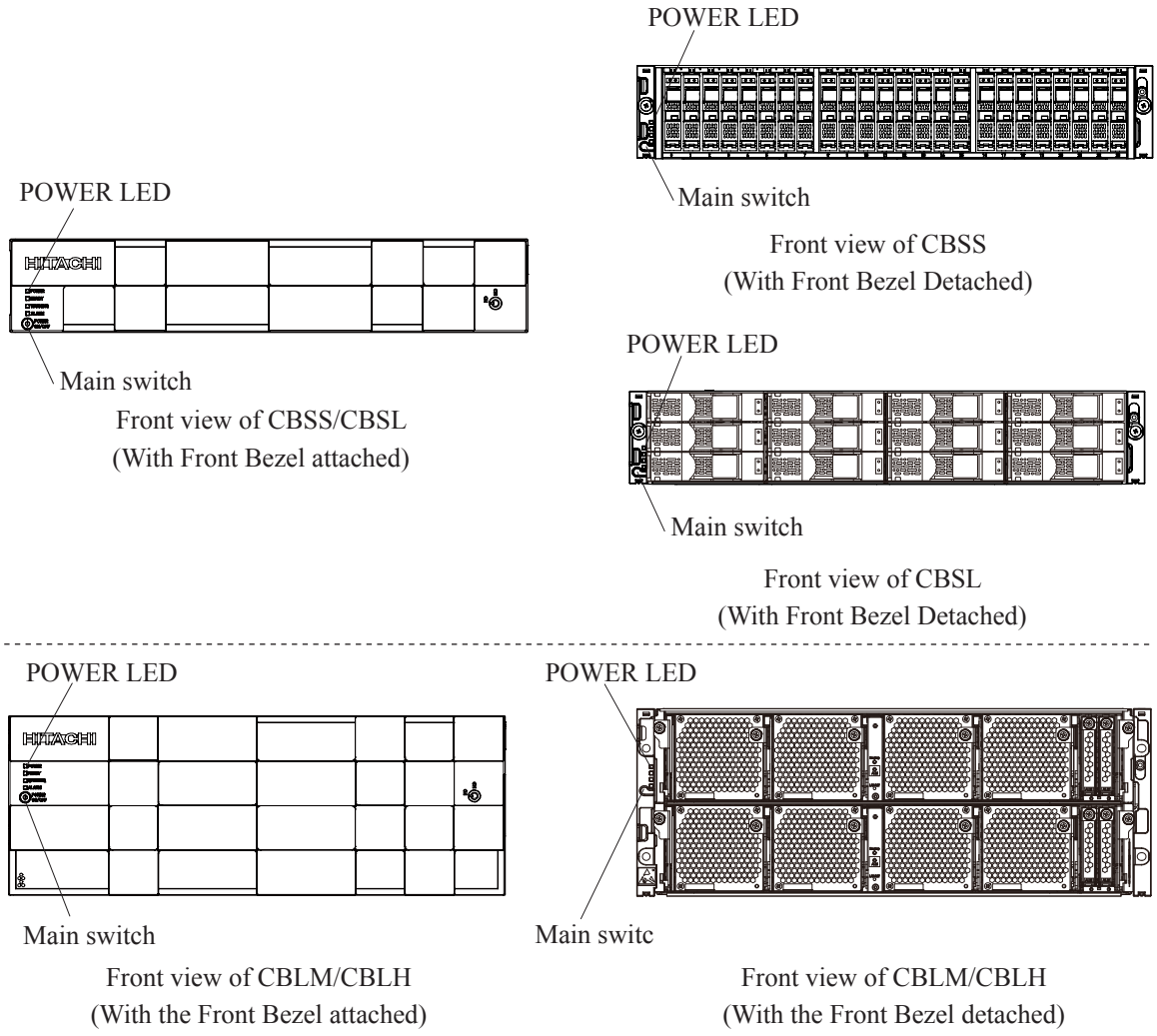


Rear view of rack frame Front view of PDU

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(3) Press the Main Switch on the front of the CBSS/CBSL/CBLM/CBLH for three second to turn on.

Figure 2-182 Main Switch on CBSS/CBSL/CBLM/CBLH



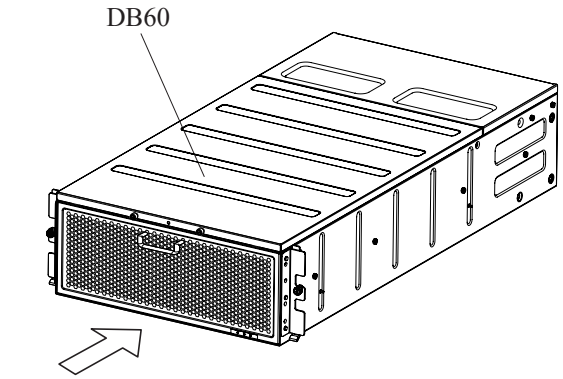
14. End

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2.17.4 Replacing a DB60 Drive Box

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rack	1	DB60	• DW-F800-DB60



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 "1.1.3 Note on Installing and Removing Parts".
- Replace the Drive Box while the Storage System is powered off. Do not replace the Drive Box while the Storage System is powered on.

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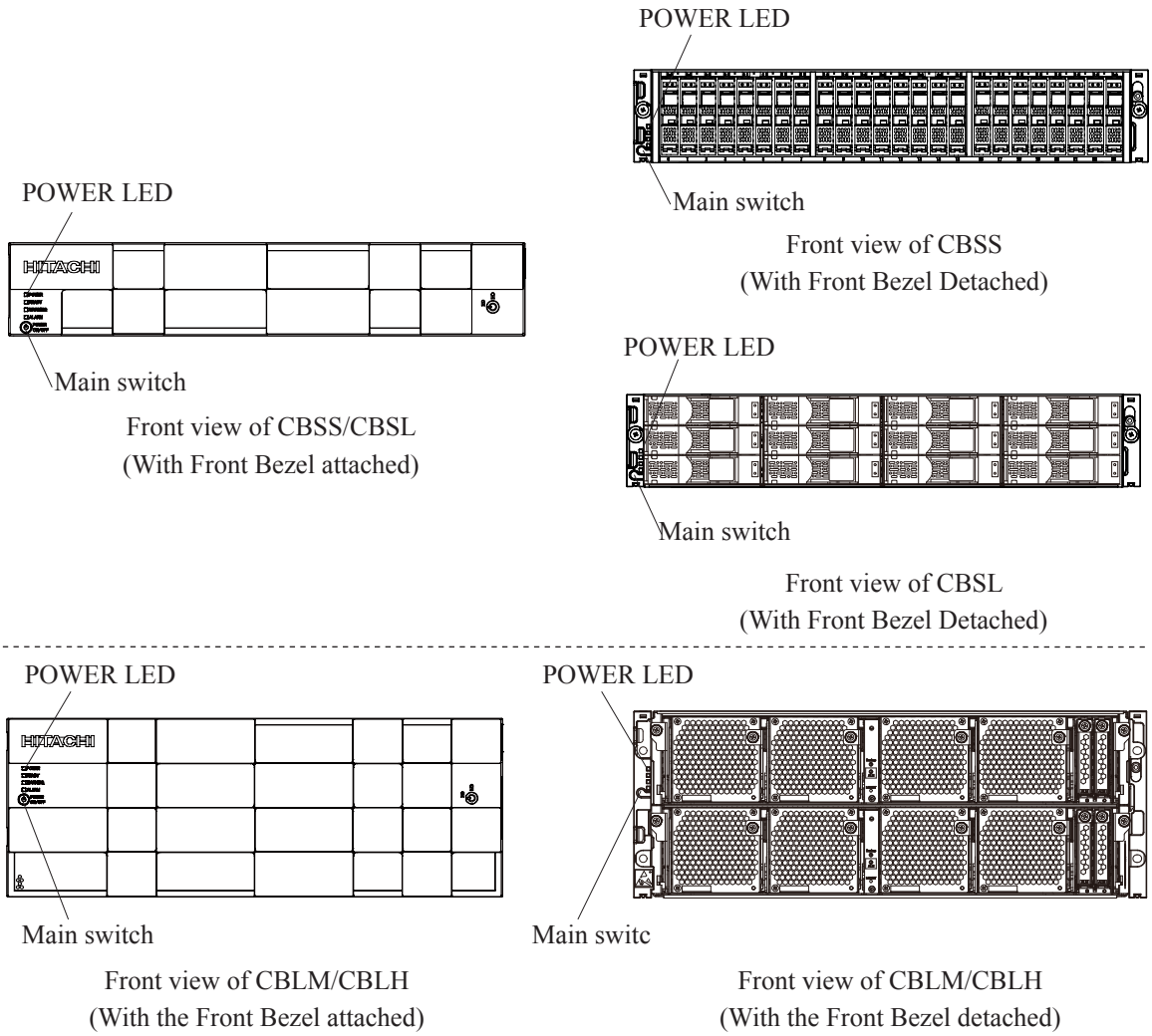
2.17.4.1 Replacement of Drive Box

1. Power off the rack.

> **⚠ WARNING**
>
> Hazardous voltage:
> Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBSS/CBSL/CBLM/CBLH for three seconds to turn off.
(2) Confirm that the POWER LED on the front side of the CBSS/CBSL/CBLM/CBLH lights in amber.

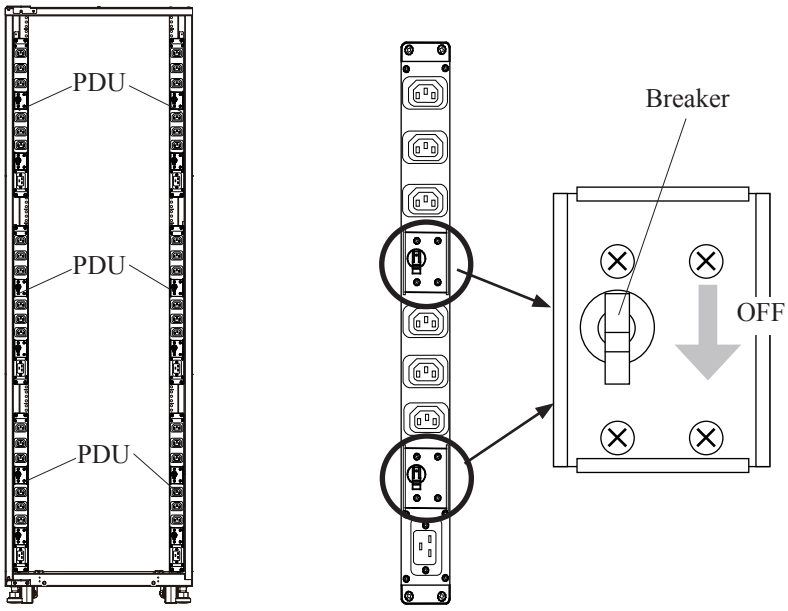
Figure 2-183 Main Switch and POWER LED on the Front of CBSS/CBSL



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(3) Turn off the breaker at the PDU on the rack frame.

Figure 2-184 Turning-off Breakers



Rear view of rack frame Front view of PDU

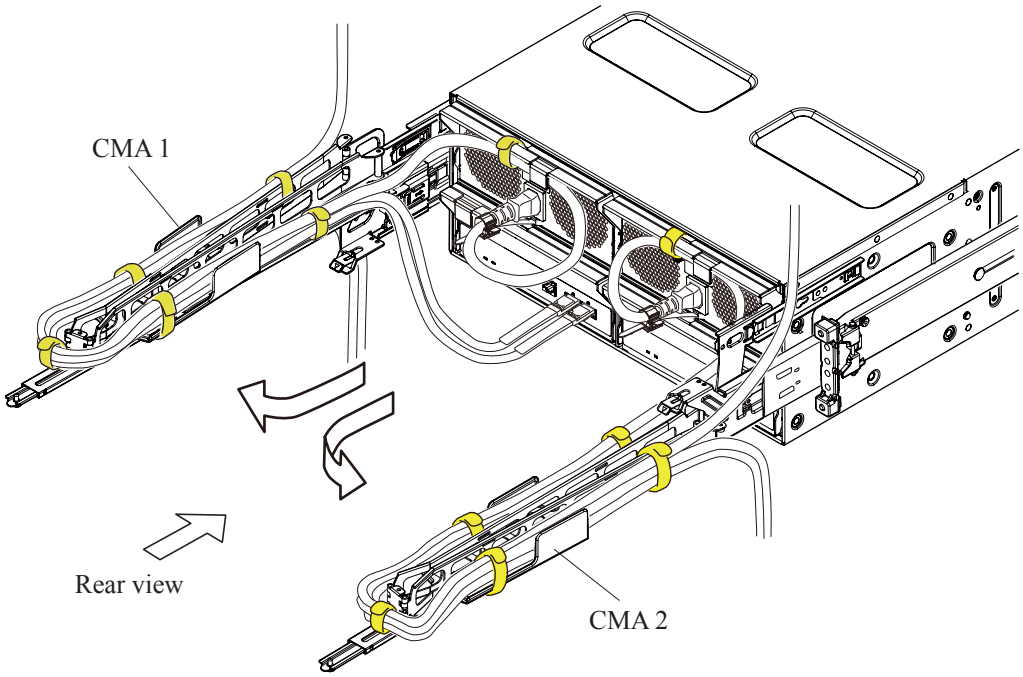
(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

NOTE: The circuit has residual voltage after turning off the breakers, so wait for one minute.

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2. Remove the cables.
   (1) Open CMA 1 and CMA 2 in the rear side of the Drive Box.

Figure 2-185 Moving CMAs

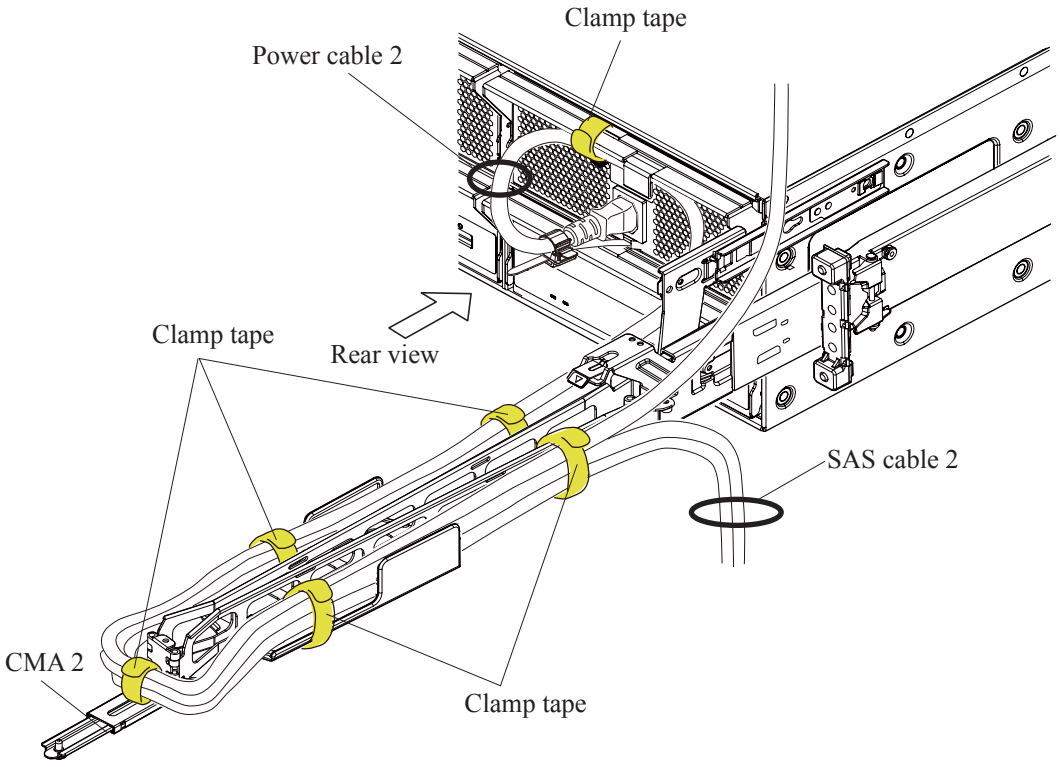


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(2) Detach the six clamp tapes of CMA 2 and remove the SAS cables and power cables.

NOTE : Place the cables so that they do not put loads on the cable connectors or disturb the work.

Figure 2-186 Removing SAS Cables and Power Cables

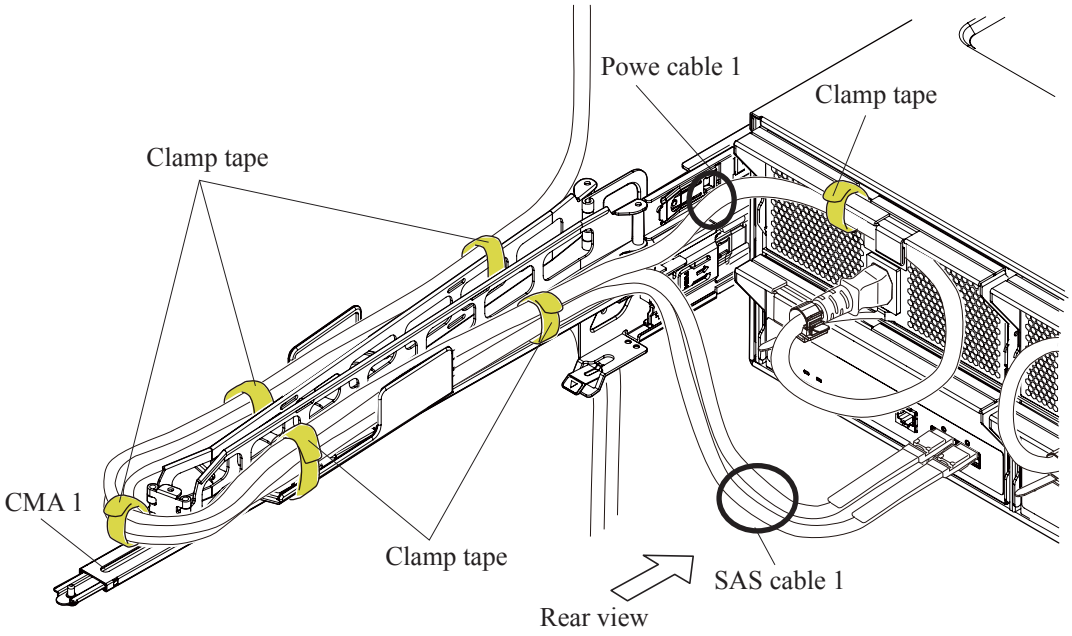


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(3) Detach the six clamp tapes of CMA 1 and remove the SAS cables and power cables.

NOTE : Place the cables so that they do not put loads on the cable connectors or disturb the work.

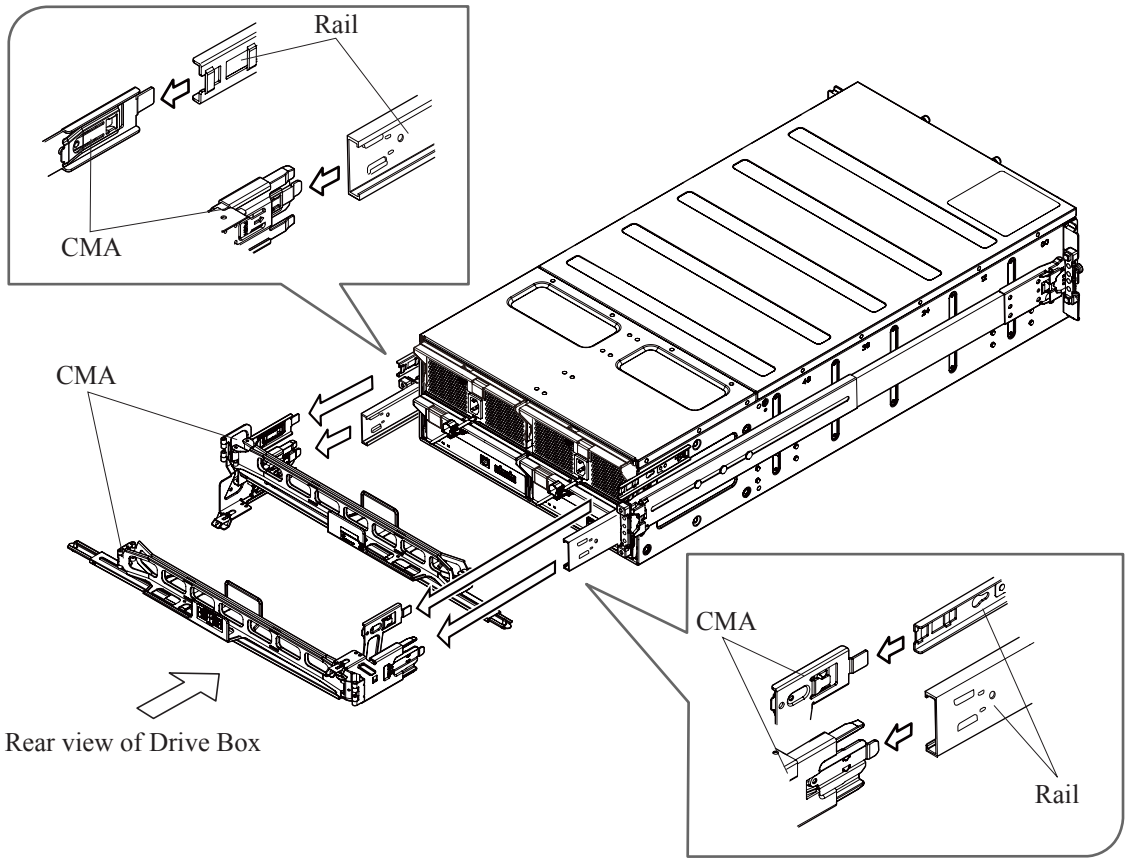
Figure 2-187 Removing SAS Cables and Power Cables



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(4) Remove two CMAs from the rails.

Figure 2-188 Removing CMAs

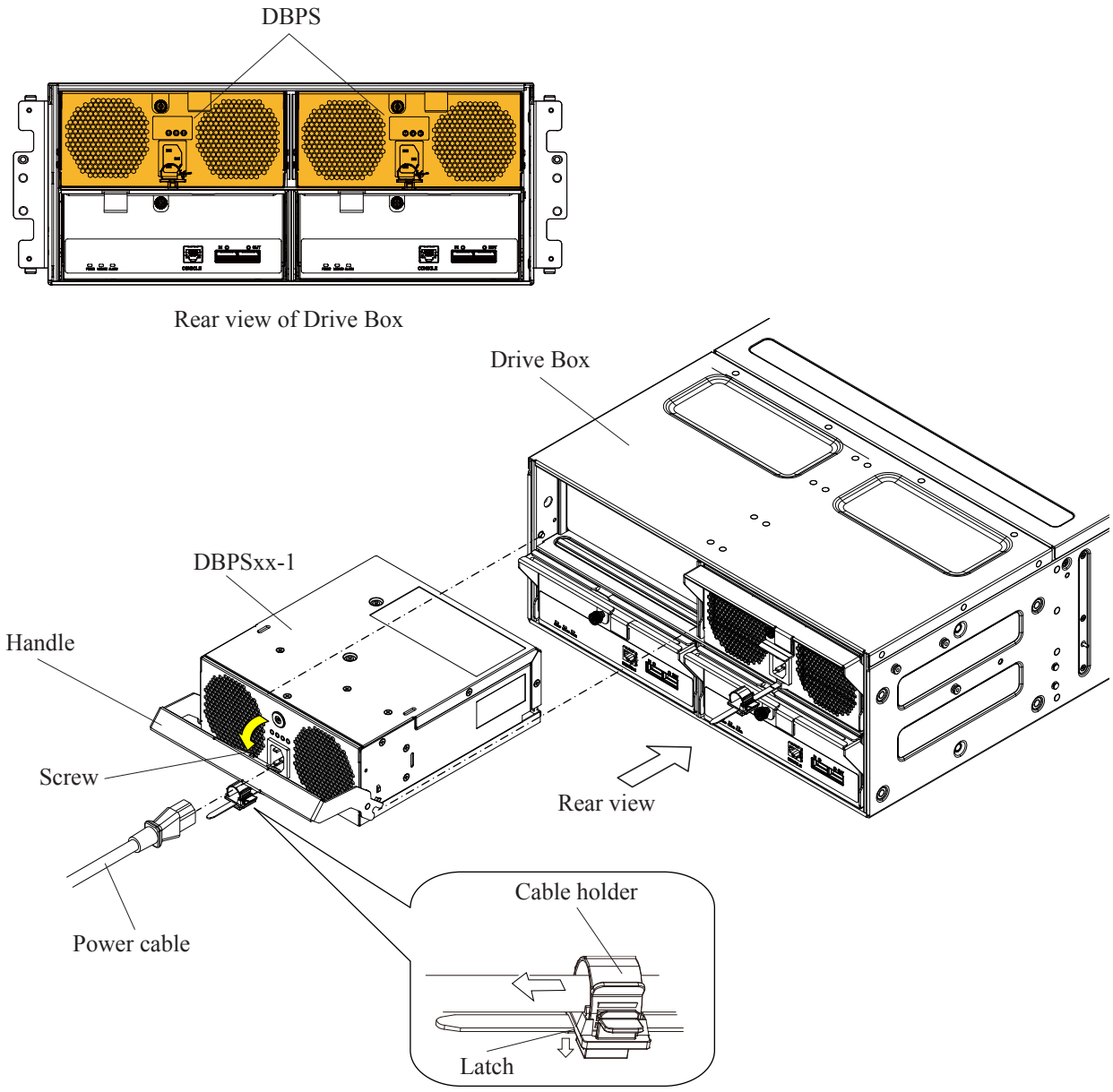


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3. Attach a label.
   (1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the spare Drive Box.

4. Remove a DBPS.
   (1) Push down the latch of the cable holder of the DBPS and pull out the cable holder.
   (2) Open the cable holder and remove the power cable from the DBPS.
   (3) Loosen the screw of the DBPS and open the handle.
   (4) Pull out the DBPS to remove.
   (5) Remove the other DBPS in the same manner.

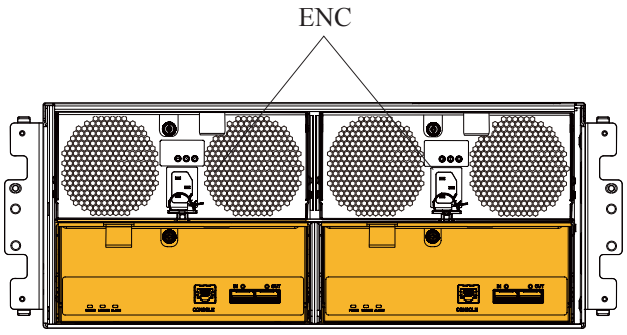
Figure 2-189 Removing DBPSs



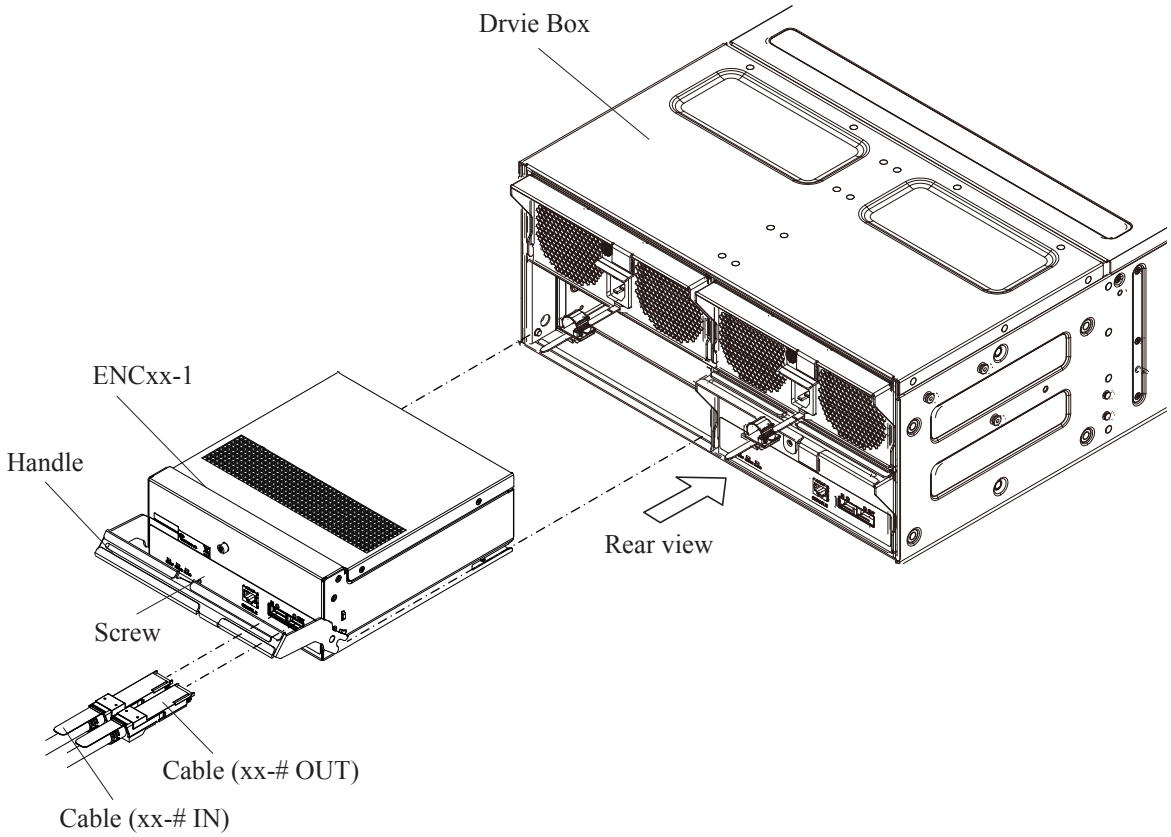
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5. Remove an ENC.
   (1) Remove the cable from the ENC.
   (2) Loosen the screw of the ENC and open the handle.
   (3) Pull out the ENC to remove.
   (4) Remove the other ENC in the same manner.

Figure 2-190 Removing ENCs



Rear view of Drive Box

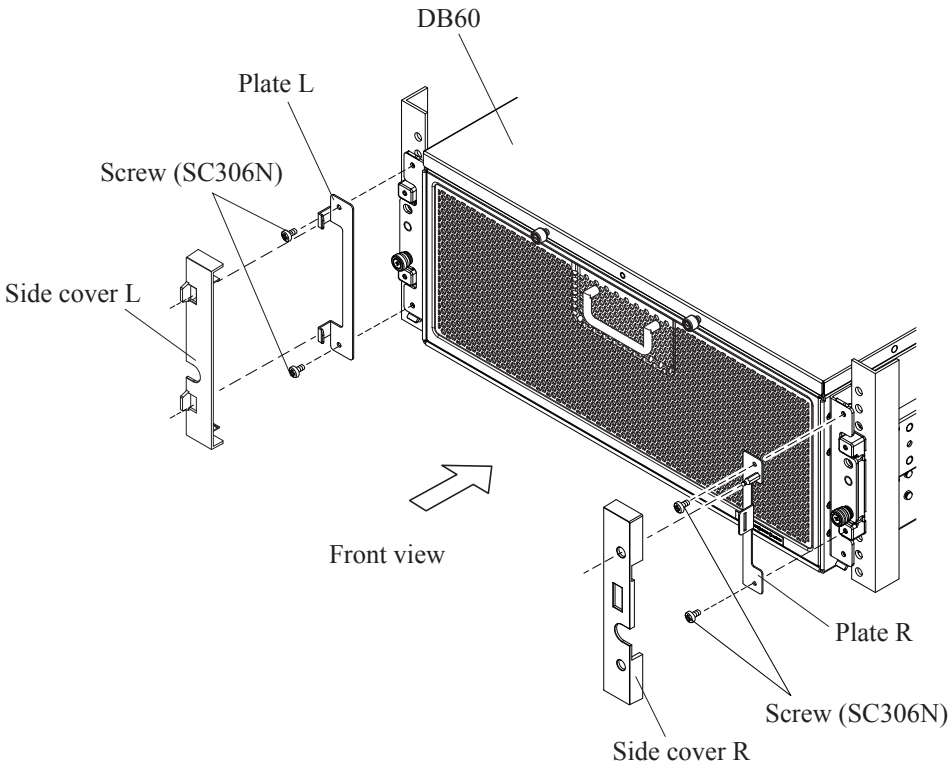


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6. Pull out a DB60.
   (1) Pull the DB60 out of the rack, and remove the top cover. (Refer to "2.2.1.3 DB60".)

7. Removing parts for Front Bezel
   (1) Remove the side cover L from the left front side of the Drive Box.
   (2) Remove the side cover R from the right front side of the Drive Box.
   (3) Remove two screws to remove the plate L.
   (4) Remove two screws to remove the plate R.

Figure 2-191 Removing Parts for Front Bezel

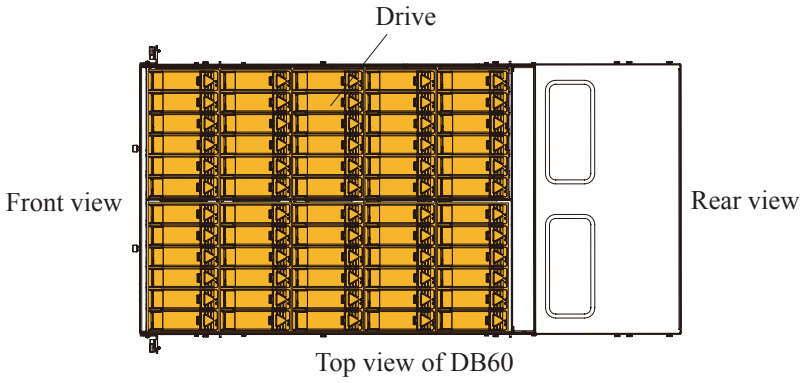


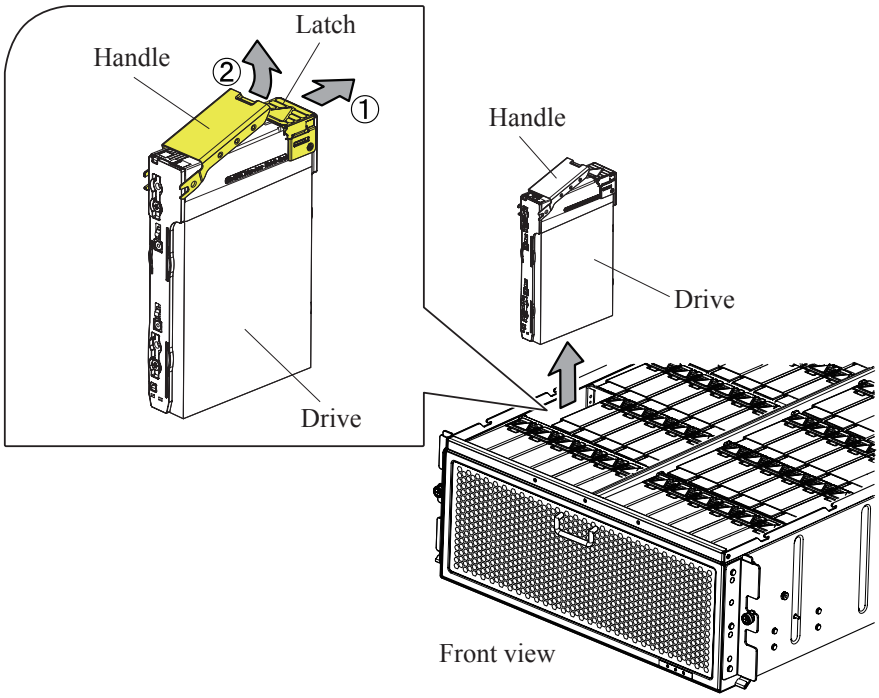
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8. Attach a label.
   (1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the spare Drive Box.

9. Remove the Drive.
   (1) Slide the latch of the Drive handle and raise the handle.
   (2) Pull out and remove the Drive to be replaced not to give a shock.
   (3) Remove the other Drives in the same manner.

Figure 2-192 Removal of Drives





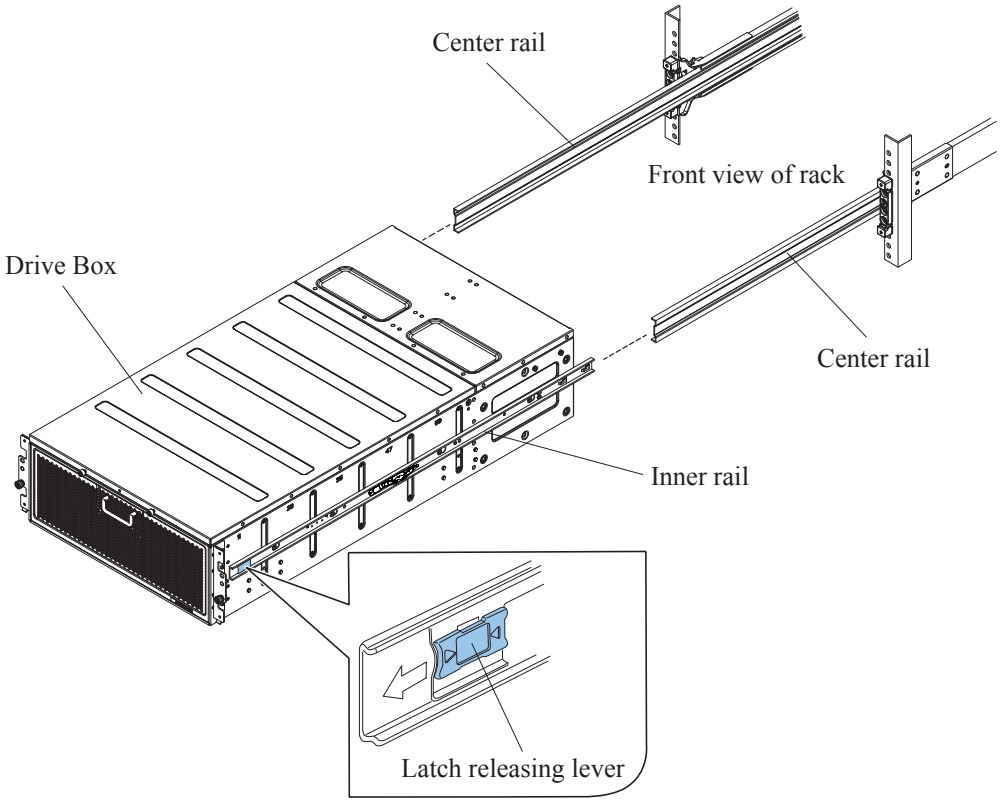
Copyright © 2015, 2017, Hitachi, Ltd.

10. Remove the Drive Box

> **⚠ CAUTION**
>
> Be careful of the mass:
> Work carefully because the mass of the DB60 is about 34 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 from the rack frame referring to mounting procedure using the special lifter. (Refer to "2.2.3 Mounting Lifter on Rack Frame".)
(2) Release the lock by sliding the latch releasing lever which is located in the right and left rack rails, and pull out the DB60 on the lifter.

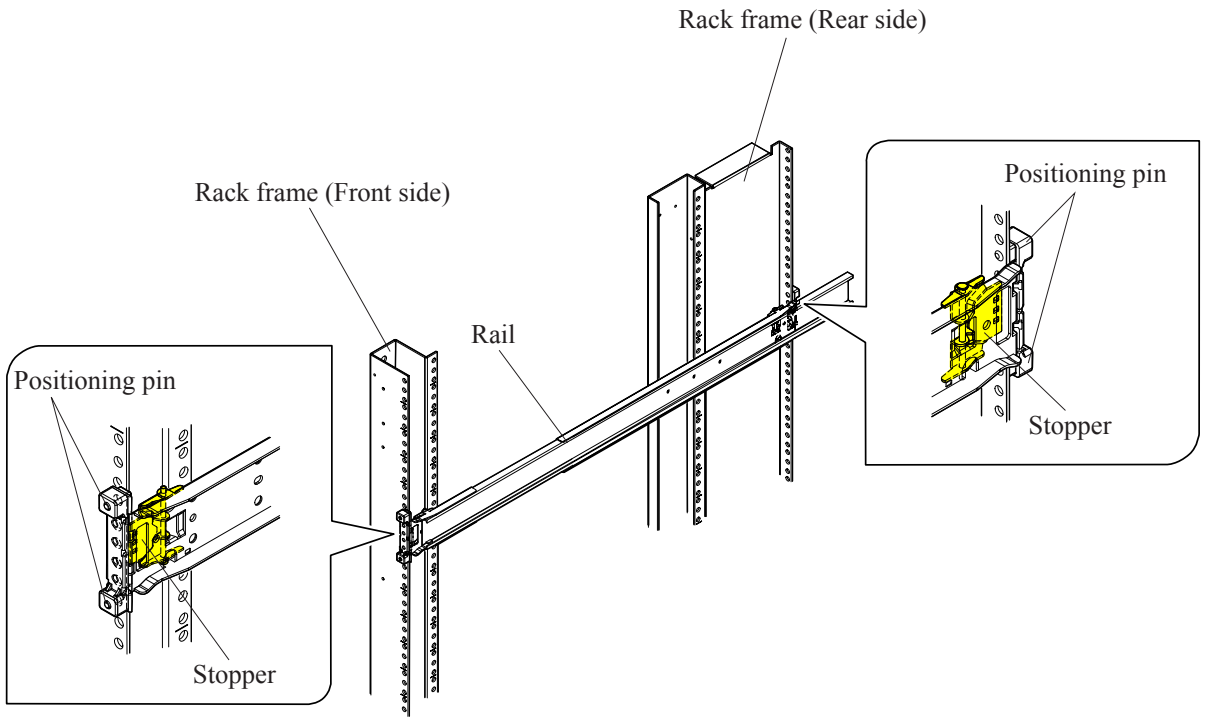
Figure 2-193 Removal of Drive Box



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11. Replace the rails.
    (1) Push the stopper on the front of the rail to unlock and remove two positioning pins of the rail from the front of the rack frame.
    (2) Push the stopper on the rear of the rail to unlock and remove two positioning pins of the rail from the rear of the rack frame.
    (3) In the same way, remove the rail from the right front side of the rack frame.

Figure 2-194 Removing Rails



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(4) Remove the inner rails

Remove the inner rails of two rails respectively.

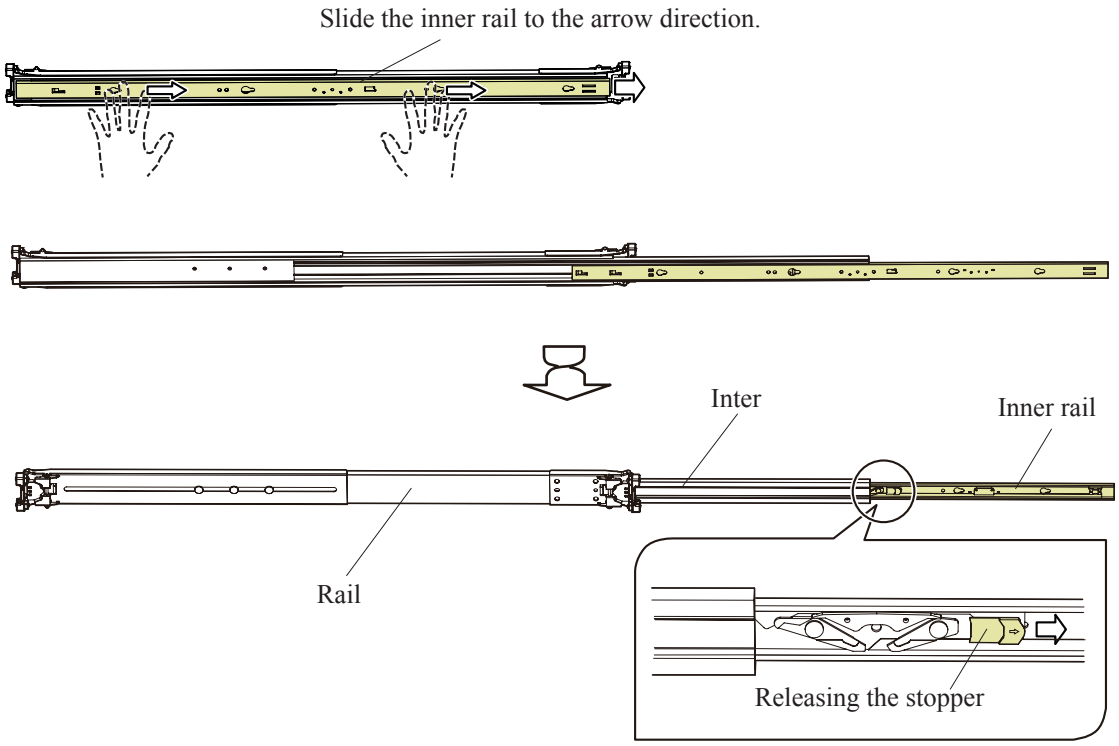
(a) Slide the inner rail to the front side until it stops while pressing the portions indicated by arrows in the figure below.

(b) Turn over the rail and release the stopper of the inner rail.

(c) Remove the inner rails.

(d) Remove the inner rail from the other rail in the same manner.

Figure 2-195 Removing Inner Rails



(5) Install the inner rails.

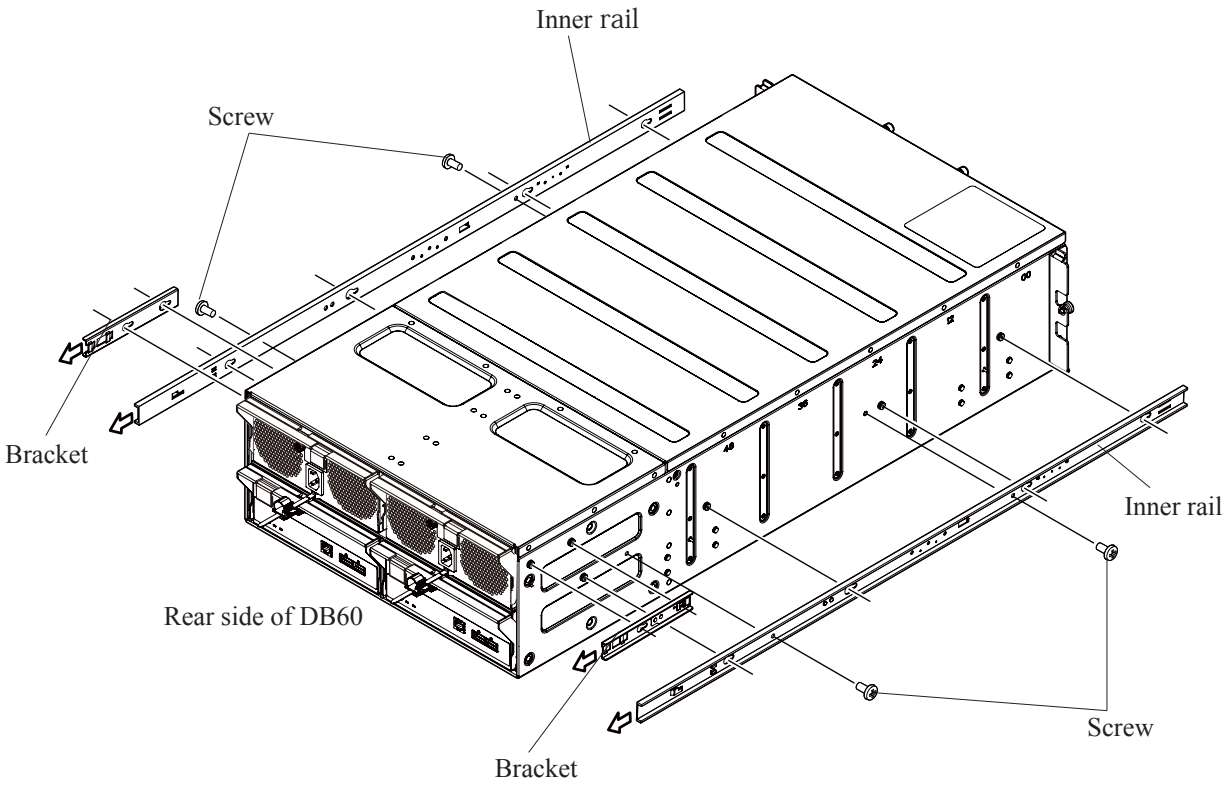
(a) Fit the projections (four places) on the sides of the DB60 in the holes of the inner rail and slide the rail backward to fix.

(b) Fit the projections (four places) on the sides of the DB60 in the holes of the bracket and slide the rail backward to fix.

(c) Fix the inner rail with screws (two places).

NOTE : • Check that the inner rails and brackets are surely installed.
• Install the inner rails and brackets in the right and left of the DB60.

Figure 2-196 Installing the Inner Rails



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(6) Install the rails in the rack.

(a) Install rack nuts in the sixth holes from the bottom unit separation line on the front side of the rack to install the rails.

(b) Install rack nuts in the seventh holes from the bottom unit separation line on the rear side of the rack to install the rails.

(c) Fit the positioning pins (two places each) on the front and rear side of the rails to the fourth and ninth holes from the bottom unit separation line on the rack to install the pins with the stopper.

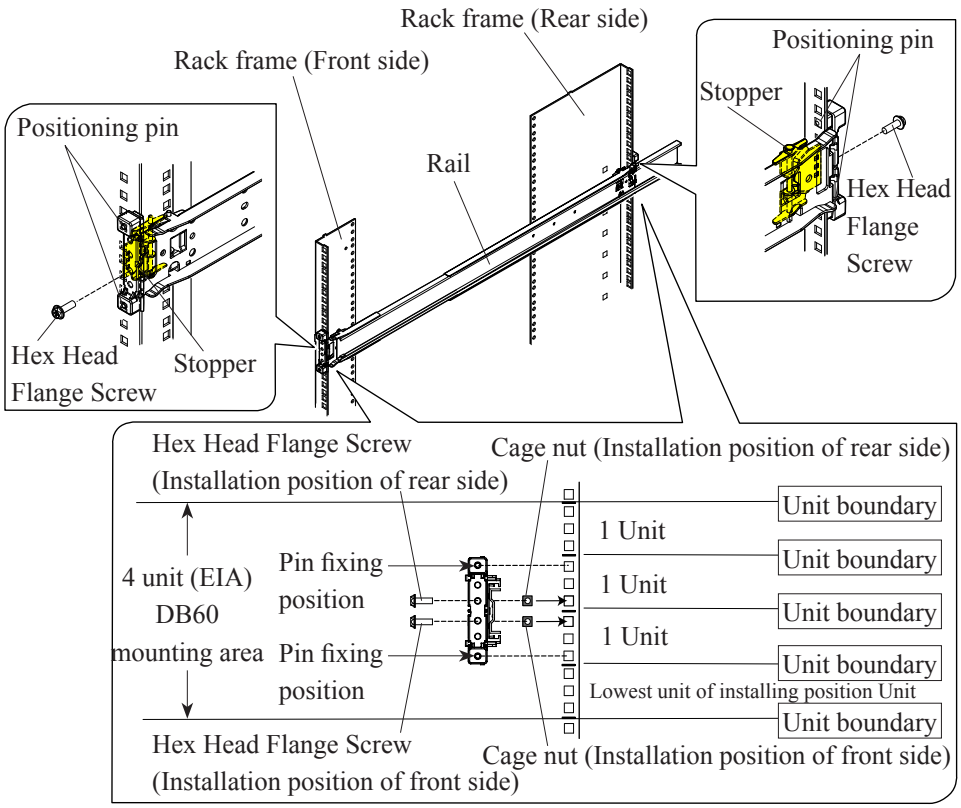
NOTE : When the rails are installed normally, the stopper on the rear of the positioning pins clicks and locks.
Check that the rails are surely fixed.

(d) Fix the front side with screws. The fixing position is the sixth hole from the bottom of the unit boundary line.

(e) Fix the rear side with screws. The fixing position is the seventh hole from the bottom of the unit boundary line.

(f) Install the rails in the right and left.

Figure 2-197 Fixing the Rails to the Rack Frame



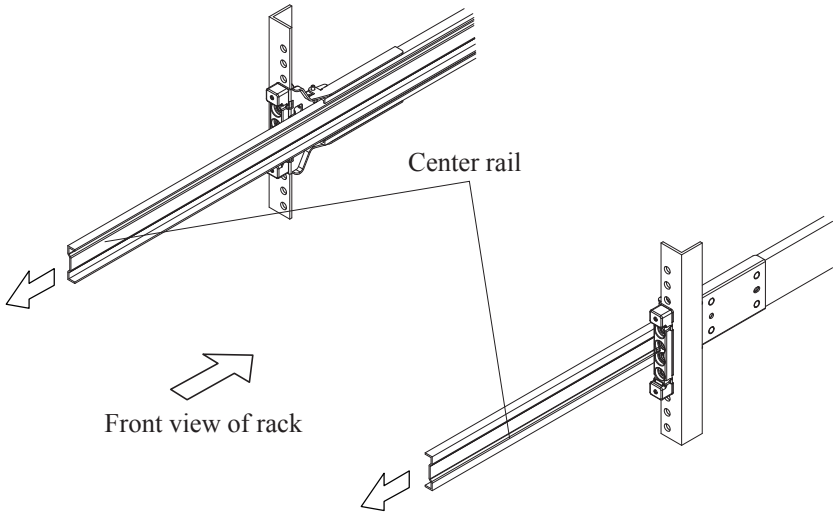
*1: One EIA unit is approximately 44.45 mm.

*2 : This figure shows the rail is installed in the left side of the rack frame.

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12. Install the DB60.
    (1) Pull out the right and left center rails until they lock.

Figure 2-198 Pulling out the Center Rail



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⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DB60 is about 34 kg.

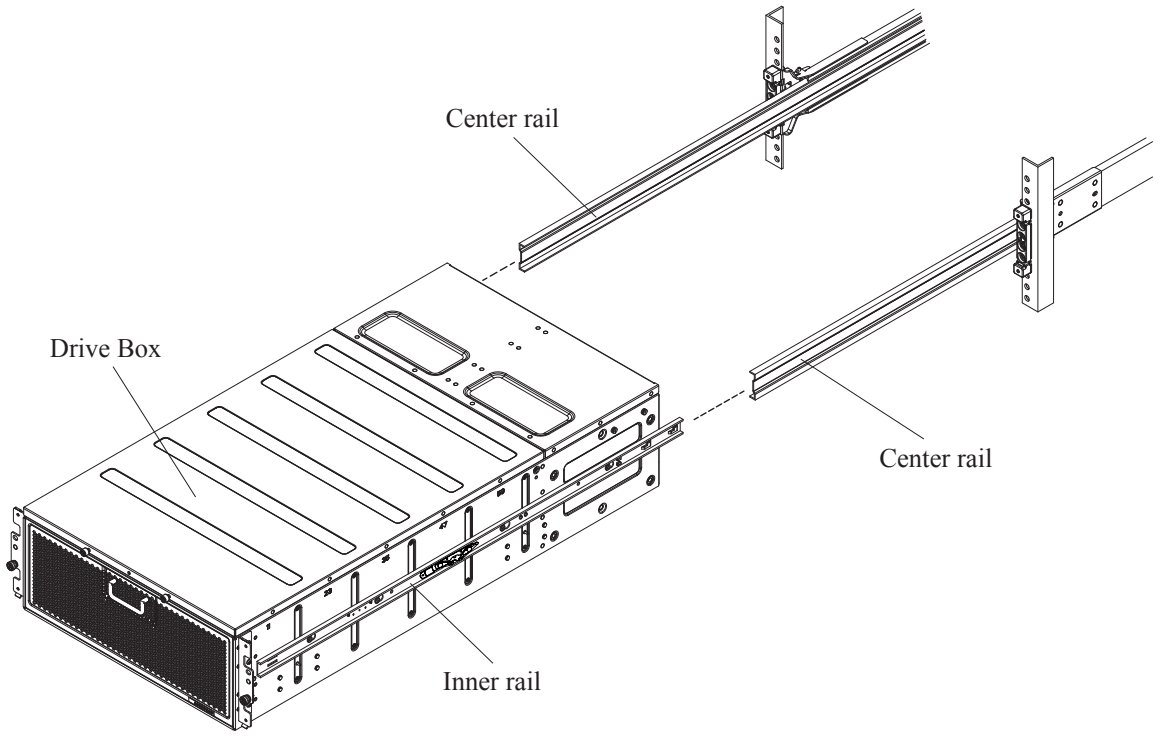
Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

(a) Move the Drive Box to the mounting position.

NOTE : Use the handle in front of the Drive Box to pull out the Drive Box.
Do not hold this handle when lifting the Drive Box.

(b) Adjust the position of the inner rails by pushing the right and left center rails inward by hand, and then insert the Drive Box.
(c) Slide the latches (blue) of the inner rails toward you to unlock.
(d) Push the inner rails in about 2 cm, leave your fingers from the latches and push the Drive Box.

Figure 2-199 Inserting Inner Rails



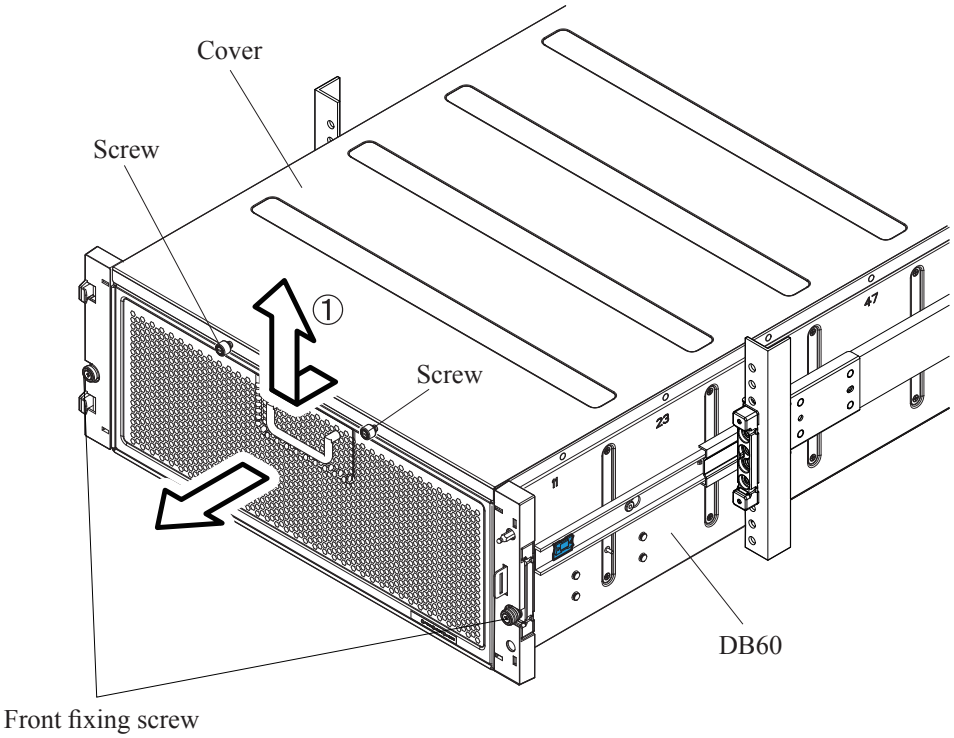
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(2) Push the Drive Box gently all the way.
(3) Hold the handle in the front of the Drive Box and pull out slowly until it stops.

NOTE : Be careful not to hit your head on the Storage System which was pulled out.

(4) Loosen two screws and slide the cover on the top of the DB60 to the direction shown by the arrow ① and remove it.

Figure 2-200 Removing Cover



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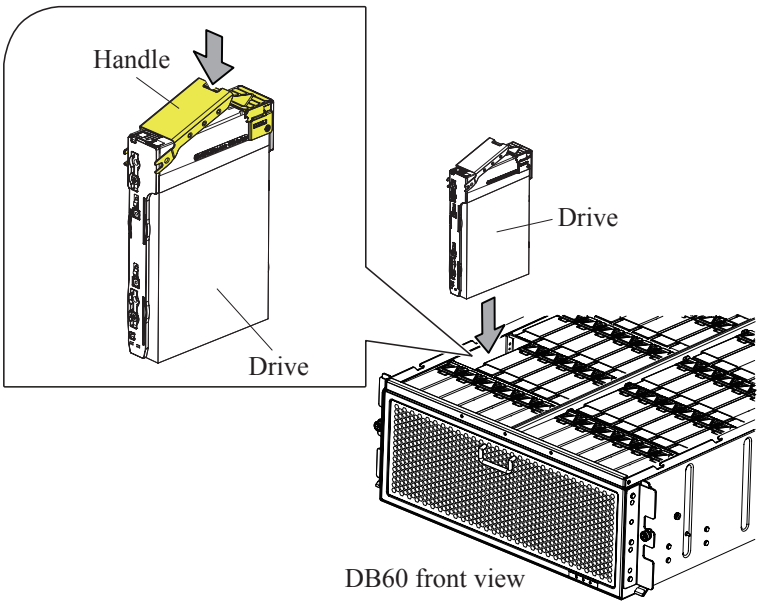
13. Install the Drives.
    Install all the removed drives to the same place in the spare Drive Box according to the label attached to them.

    (1) Open the handle, and insert the Drive holding it with both hands.

        NOTE : Check that there is no foreign substance near the connector and in the Storage System before inserting the Drive.

    (2) Close the handle, and push the handle until it clicks and locks.
    (3) Install the other Drives in the same manner.

Figure 2-201 Installing Drives



14. Installing parts for Front Bezel
    (1) Install the plate L in the left front side of the Drive Box and fix it with two screws (refer to Figure 2-191).
    (2) Install the plate R in the right front side of the Drive Box and fix it with two screws.
    (3) Attach the side cover L to the plate L.
    (4) Attach the side cover R to the plate R.

15. Storing the Drive Box
    (1) Attach the top cover to the Drive Box, and store it in the rack. (Refer to "2.2.1.3 DB60".)

        NOTE : Do not install a Front Bezel.

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16. Insert the ENC.
    (1) Make the handle of the ENC completely fall down and forward. (Refer to Figure 2-190.)
    (2) Insert the ENC into the slot and push it to the full.
    (3) Open the DBPS handle completely and fix it with screws.
    (4) Connect the optical cable to the ENC.

        NOTE: Check that optical cable latch clicks and the cables are surely connected.

    (5) Install the other ENC in the same manner.

---

17. Install the DBPS.
    (1) Make the handle of the DBPS completely fall down and forward. (Refer to Figure 2-189.)
    (2) Insert the DBPS into the slot and push it to the full.
    (3) Open the DBPS handle completely and fix it with screws.
    (4) Connect the power cable to the DBPS and fasten it with the cable holder.
    (5) Push the cable holder to the DBPS side until it stops.
    (6) Route the power cable and fix it to the handle with a clamp tape.
    (7) Install the other DBPS in the same manner.

---

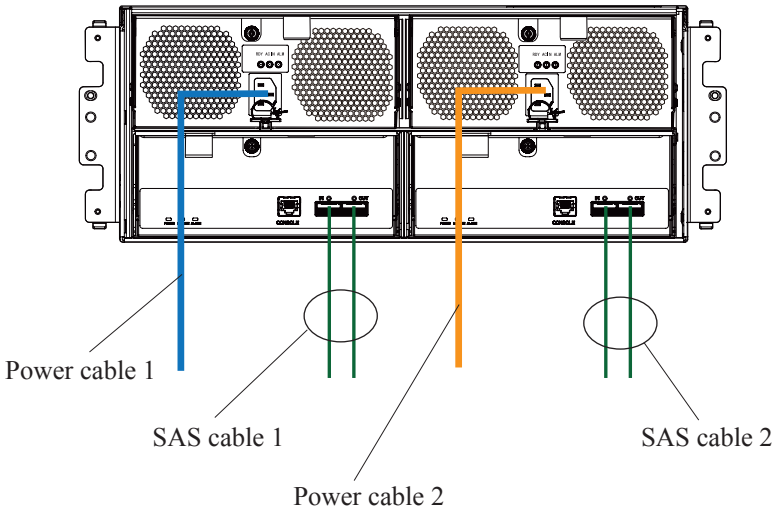
18. Install parts.
    (1) Install CMAs of the maintenance parts. (Refer to Figure 2-188.)

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19. Route the Cables.
    Route the SAS cables and power cables.
    The following figure shows routing cable numbers.

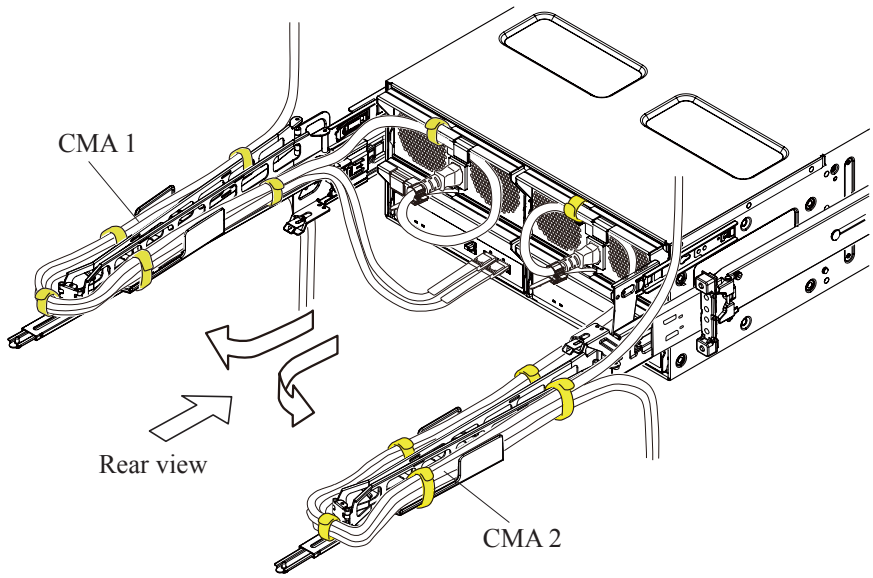
    NOTE : When bending the cable to connect it, give it a bend with a long radius (not less than 40 mm) so as not to apply the cable and the connector excessive stresses.

Figure 2-202 Cable Number



(1) Open the CMA 1 and CMA 2.

Figure 2-203 Moving CMAs

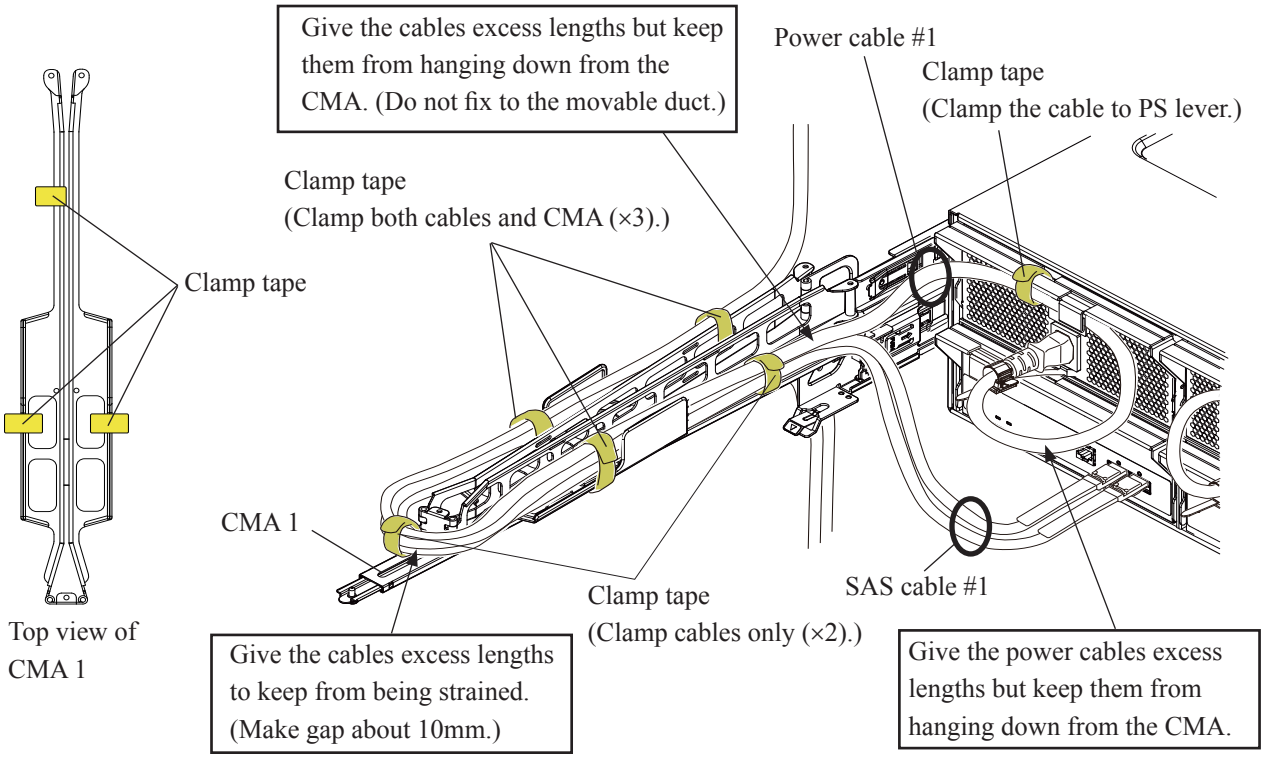


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(2) Route SAS cable 1 and power cable 1 for CMA 1 and fix the cables with six clamp tapes.

NOTE : • Give the cables excess lengths to keep from strain or load when pulling out the DB60.
• Keep the cables from hanging down below the DB60.
• Do not give excessive twists to the cables.
• Route and clamp cables with CMA1 (upper) and CMA2 (lower) are fully opened.
• Do not route another chassis cables inside CMA.

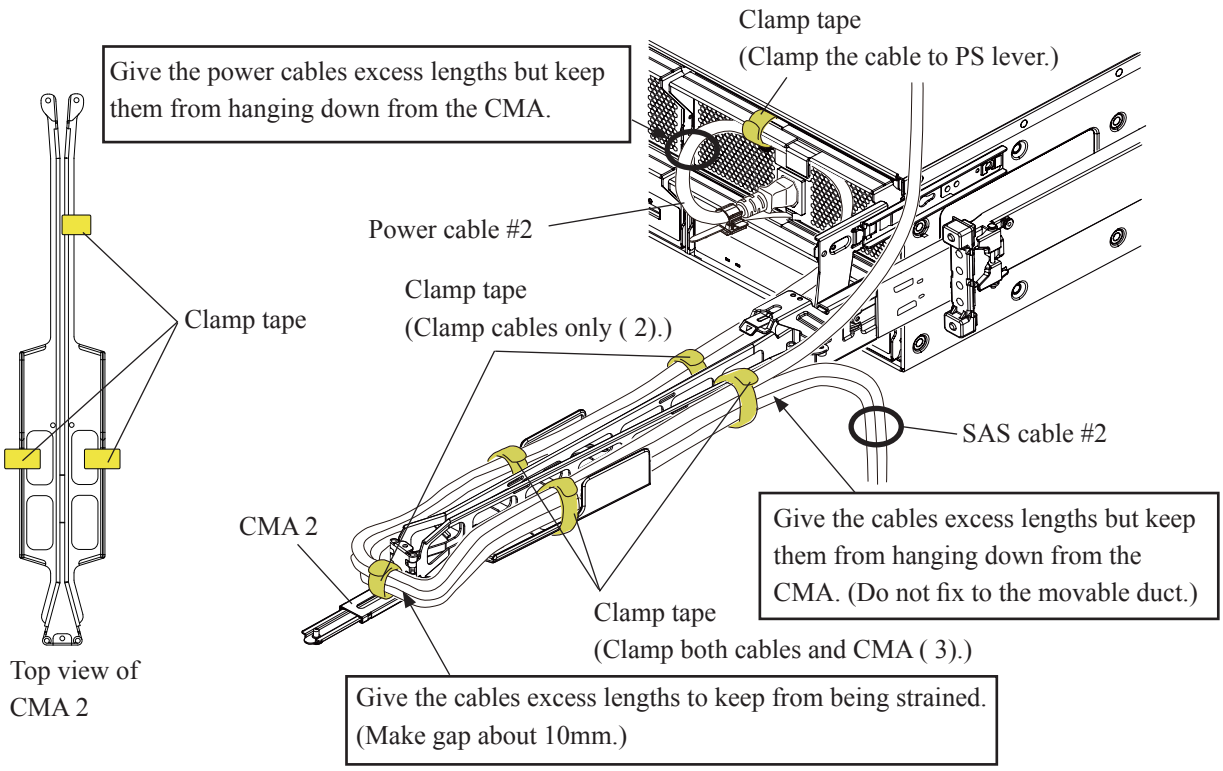
Figure 2-204 Routing of the SAS Cable 1 and Power Cable 1



(3) Route SAS cable 2 and power cable 2 for CMA 2 and fix the cables with six clamp tapes.

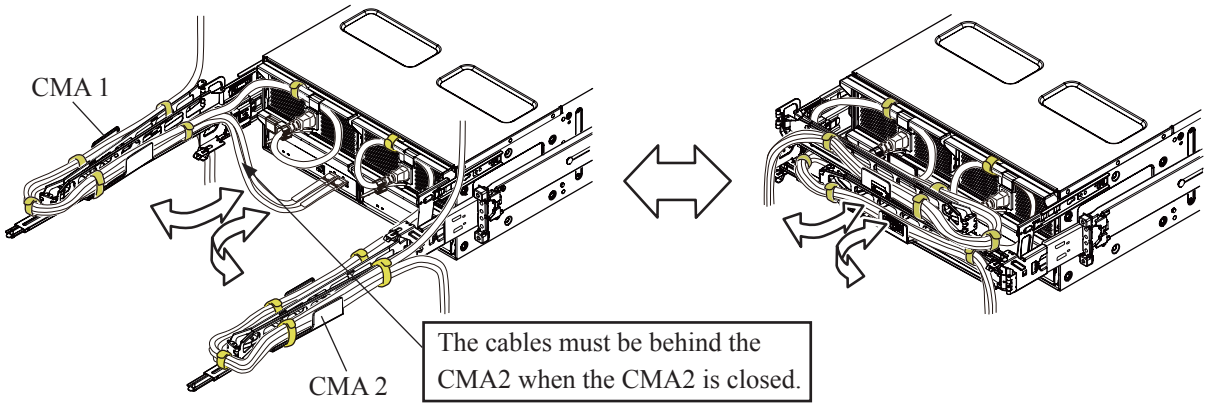
NOTE : • Give the cables excess lengths to keep from strain or load when pulling out the DB60.
• Keep the cables from hanging down below the DB60.
• Do not give excessive twists to the cables.
• Route and clamp cables with CMA1 (upper) and CMA2 (lower) are fully opened.
• Do not route another chassis cables inside CMA.

Figure 2-205 Routing of the SAS Cable 2 and Power Cable 2



(4) Move CMA 1 and CMA 2 to the storage position and check that the cables do not have strain or load. Adjust the excess lengths, routes and others.

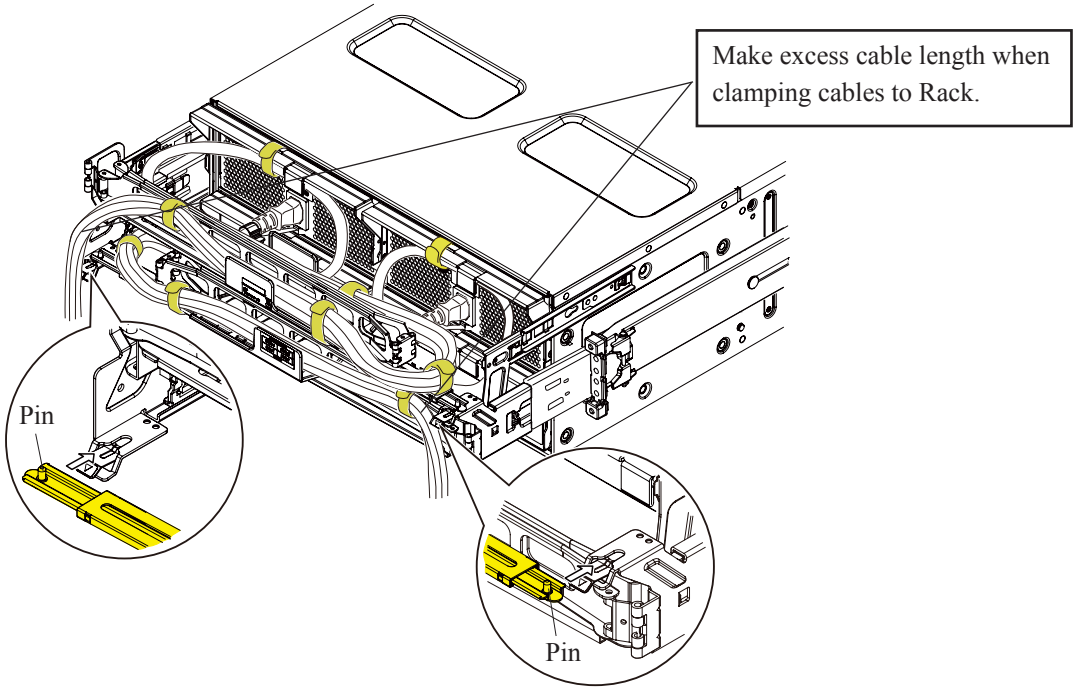
Figure 2-206 Checking the Routing of SAS Cables and Power Cables



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(5) Close CMA 1 and CMA 2 and fit the right and left pins in the CMAs to lock.

Figure 2-207 Locking CMA 1 and CMA 2



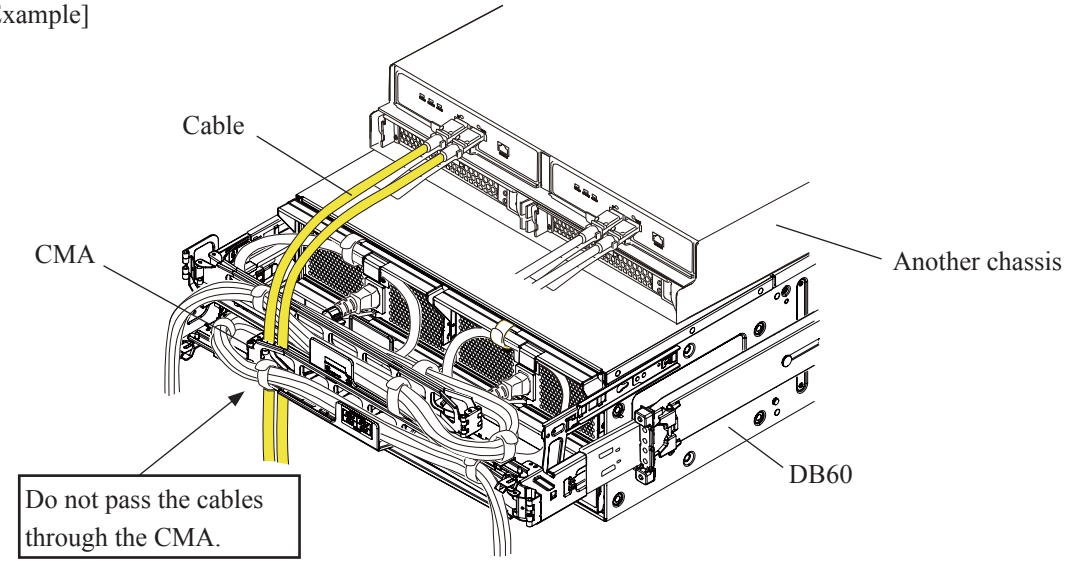
20. Check the routing.

(1) Pull out the Drive Box and check that the routing is performed correctly.

NOTE : • Check that the routing is not performed with other cables.
• Confirm that cables are not caught in CMA1 (upper)/CMA2 (lower).

Figure 2-208 Checking Cable Routing

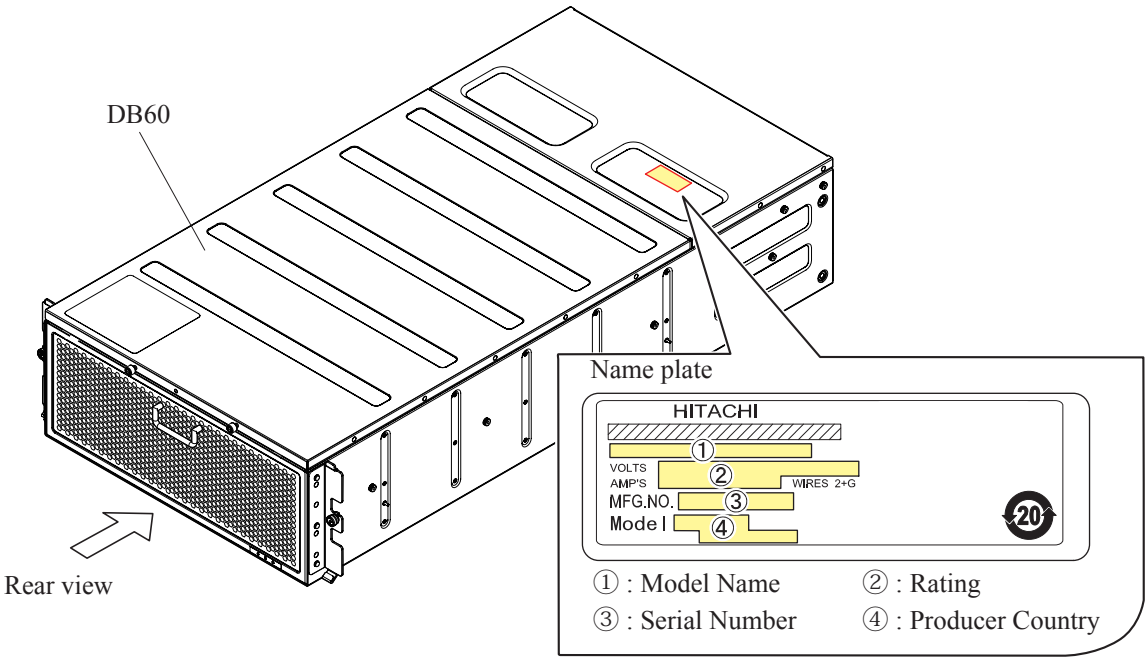
[Example]



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21. Attach the nameplate.
    (1) Take out the nameplate in which the same model name as the removed DB60 is described from the nameplates attached to the spare DB60. Write down the same serial number as the removed DB60 in the nameplate, and then affix the nameplate to the spare DB60.
    When the nameplate in which the same model name as the removed DB60 is described is not attached, take out the nameplate in which the same rating and producer country as the removed DB60 are described and which the model name is not described. Write down the same model name and serial number as the removed DB60 in the nameplate, and then affix it to the spare DB60.
    To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-209 Attachment of Nameplate

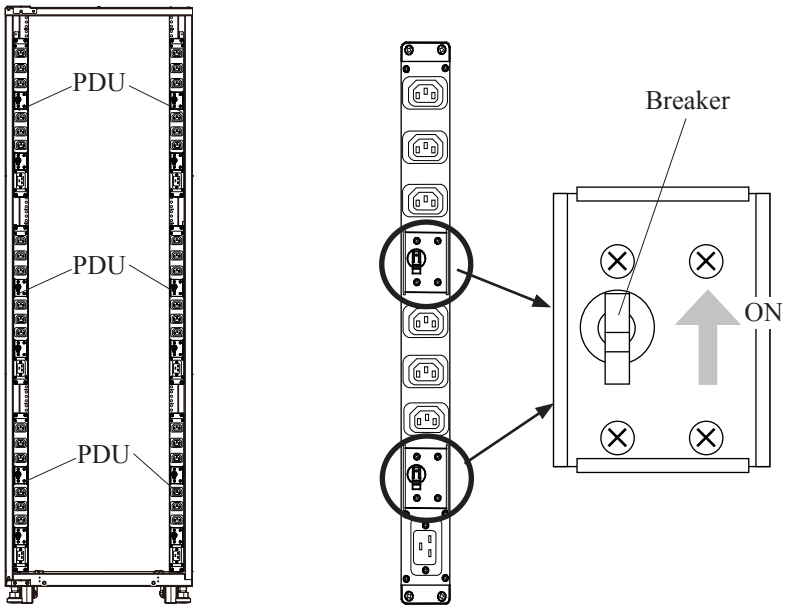


22. Store the Drive Box and attach the Front Bezel.
    (1) Return the Drive Box on the rack, and then attach the front Front Bezel. (Refer to"2.2.1 How to Attach/Remove Front Bezel".)

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23. Turning on Breakers
    (1) Turn on the breaker on the power distribution panel.
    (2) Turn on the breaker at the PDU on the rack frame.

Figure 2-210 Turning-on Breakers

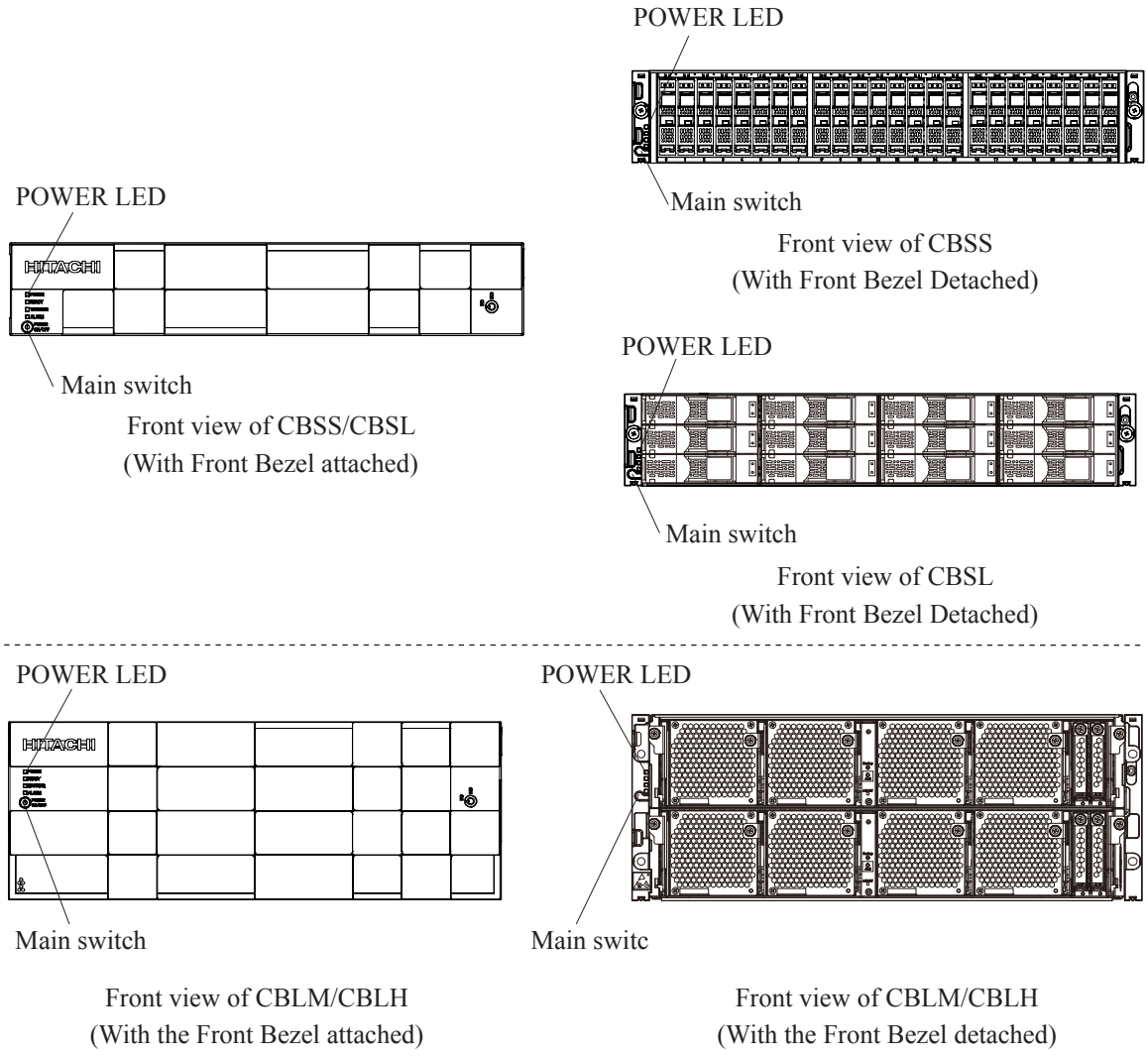


Rear view of rack frame Front view of PDU

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(3) Turn on the Main Switch on the front of the CBSS/CBSL/CBLM/CBLH.

Figure 2-211 Main Switch on CBSS/CBSL/CBLM/CBLH



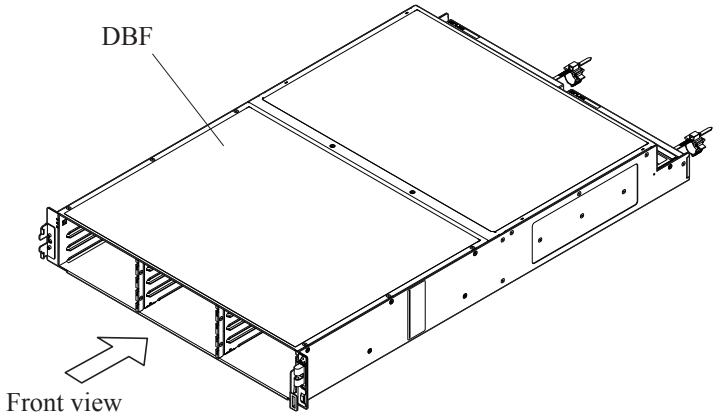
24. End

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2.17.5 Replacing a DBF Drive Box

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rack	1	DBF	• DW-F800-DBF



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 "1.1.3 Note on Installing and Removing Parts".
- Replace the Drive Box while the Storage System is powered off. Do not replace the Drive Box while the Storage System is powered on.

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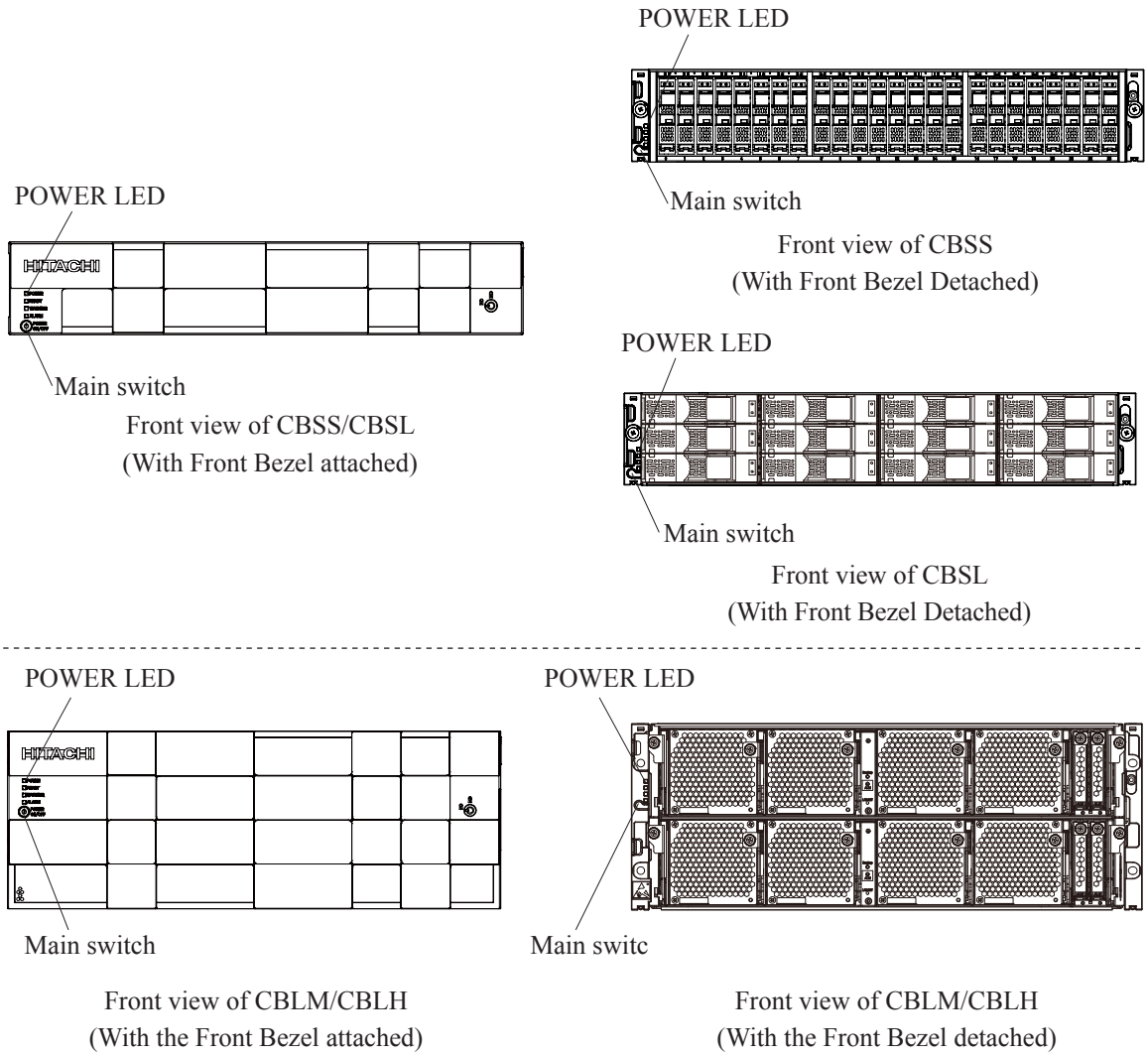
2.17.5.1 Replacement of Drive Box (DBF)

1. Power off the rack.

> **⚠ WARNING**
>
> Hazardous voltage:
> Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBLM/CBLH/CBLM/CBLH for three second to turn off.
(2) Confirm that the POWER LED on the front side of the CBSS/CBSL/CBLM/CBLH lights in amber.

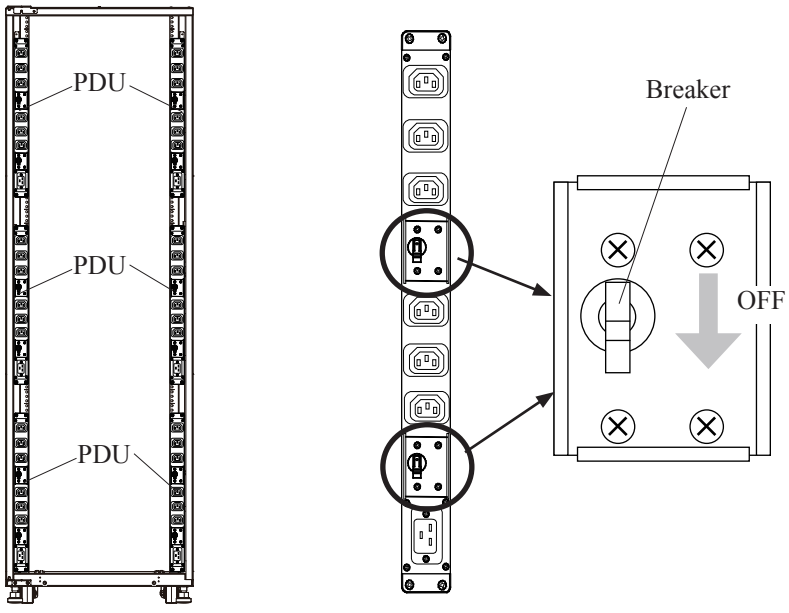
Figure 2-212 Main Switch and POWER LED on the Front of CBSS/CBSL/CBLM/CBLH



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(3) Turn off the breaker at the PDU on the rack frame.

Figure 2-213 Turning-off Breakers



Rear view of rack frame Front view of PDU

(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

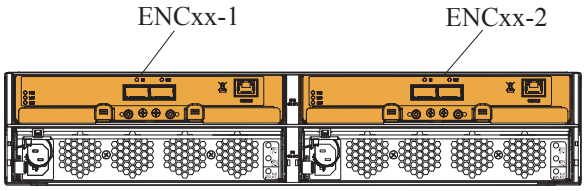
NOTE: The circuit has residual voltage after turning off the breakers, so wait for one minute.

2. Remove the Front Bezel.
   (1) Remove the Front Bezel from the Drive Box. (See "2.2.1 How to Attach/Remove Front Bezel".)

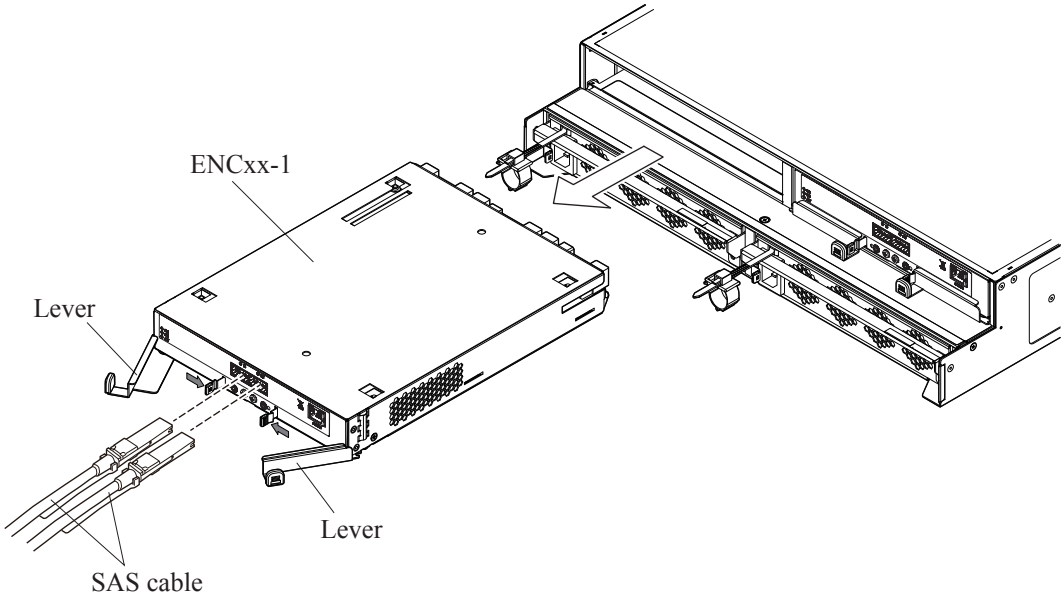
3. Attach a label.
   (1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the spare Controller Chassis.

4. Remove the ENC.
   (1) Disconnect the SAS cable which connects to the ENC.
   (2) Press the latches of the ENC inward to unlock the levers.
   (3) Pull the right and left levers and remove the ENC.
   (4) Remove the other ENC in the same manner.

Figure 2-214 Removal of ENC (DBF)



Rear view of DBF

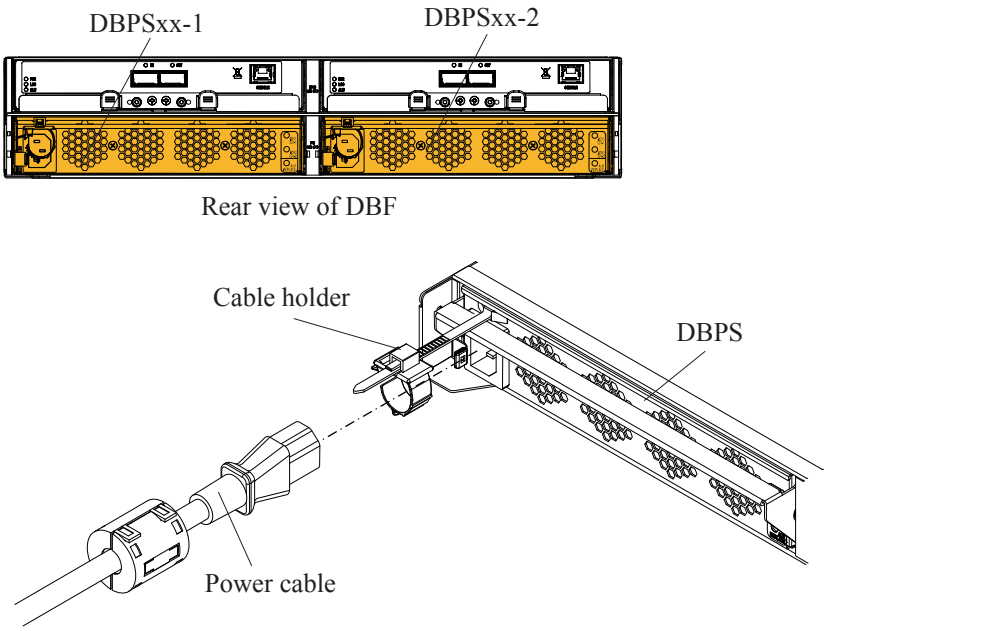


*1 : ENCxx-1
└→ DB No. (00, 01, 02, ..., 47)

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5. Remove a DBPS.
   (1) Pull and open the cable holder.
   (2) Disconnect the power cable from the DBPS.
   (3) Disconnect the power cable from the other DBPS in the same manner.

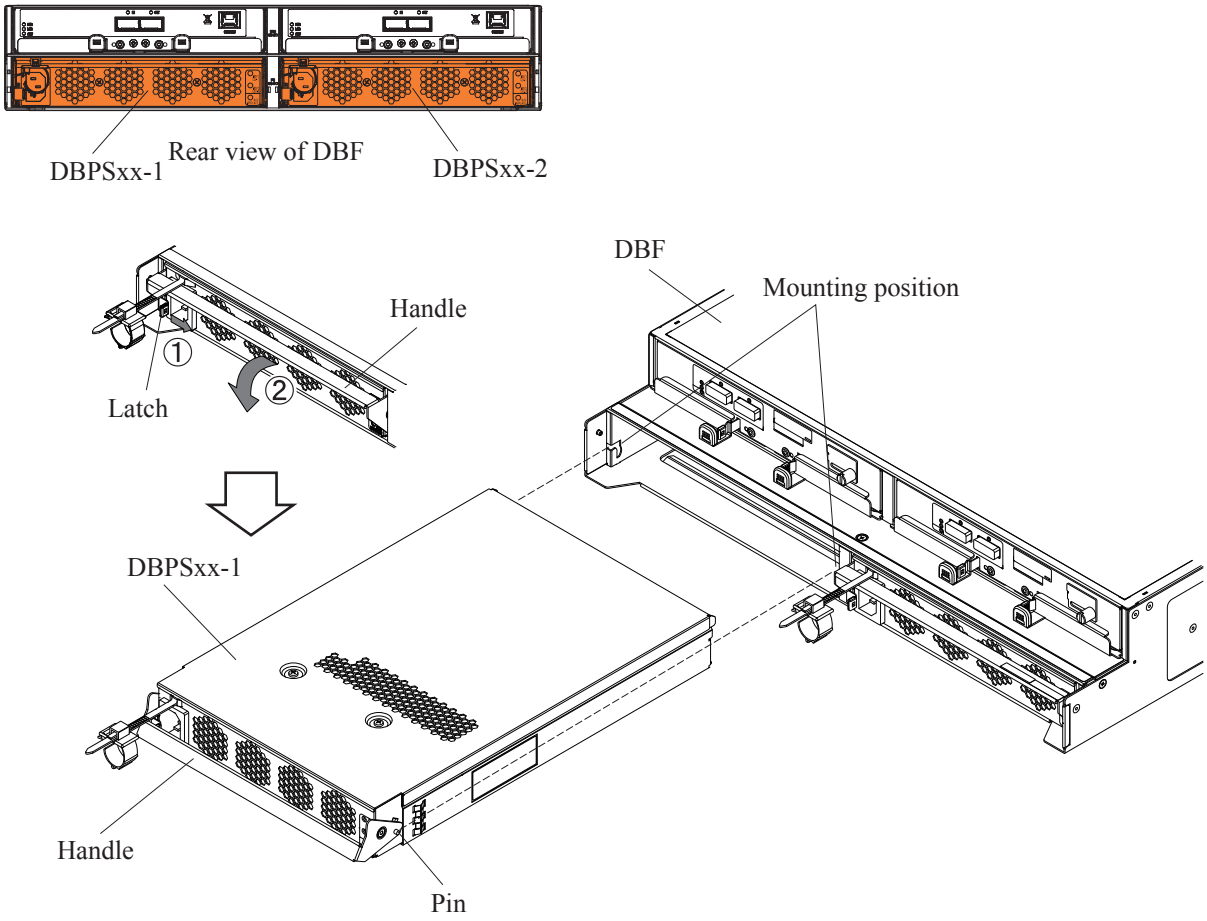
Figure 2-215 Disconnection of Power Cables



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

(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 DBF.
(6) Remove the other DBPS in the same manner.

Figure 2-216 Removal of DBPS



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6. Remove the Drives.

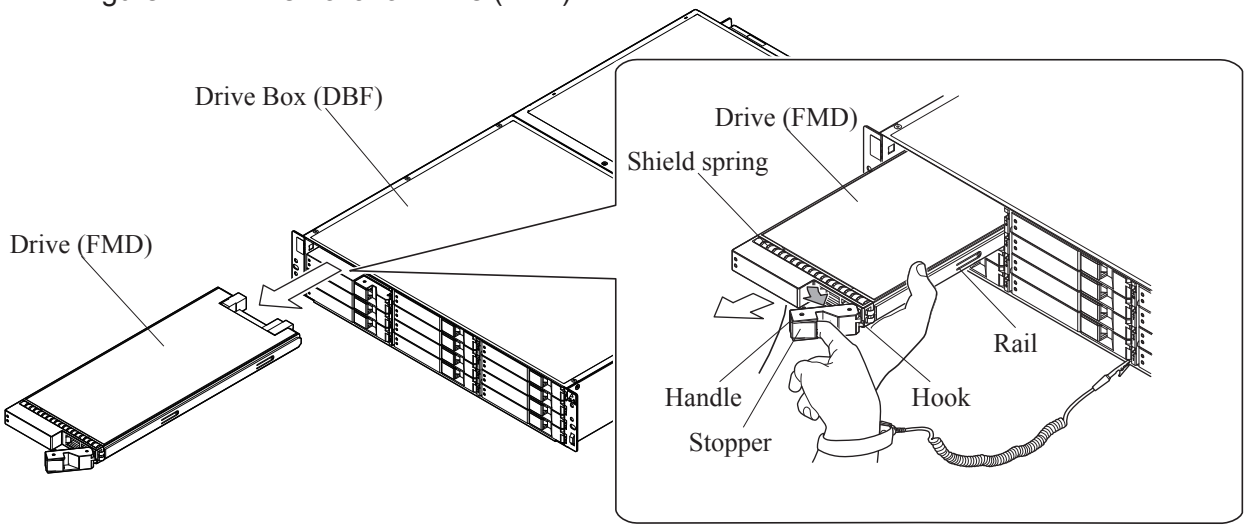
NOTICE:	Be sure to read "1.1.10 Notes when Handling the Flash Module Drive (FMD)" before handling the FMD and perform the procedure following the notes.

(1) Pull up the stopper of the Drive handle toward you to release the lock.
(2) Open the handle toward you, and pull out and remove the Drive to be replaced not to give a shock.

NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

(3) Remove the other Drives in the same manner.

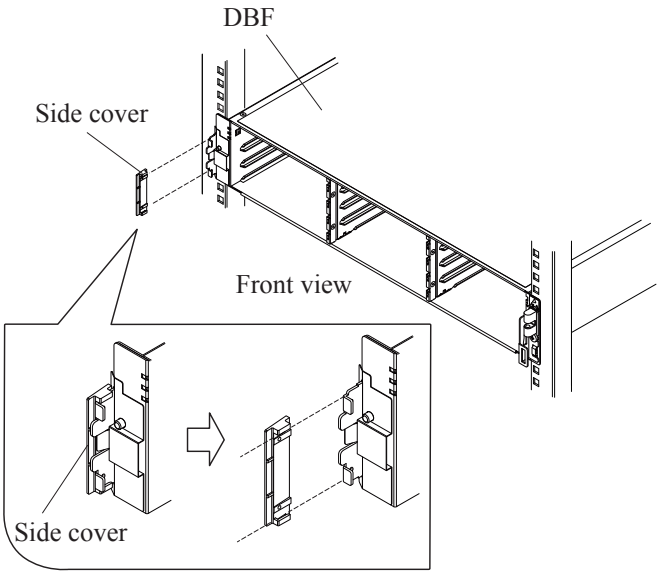
Figure 2-217 Removal of Drive (DBF)



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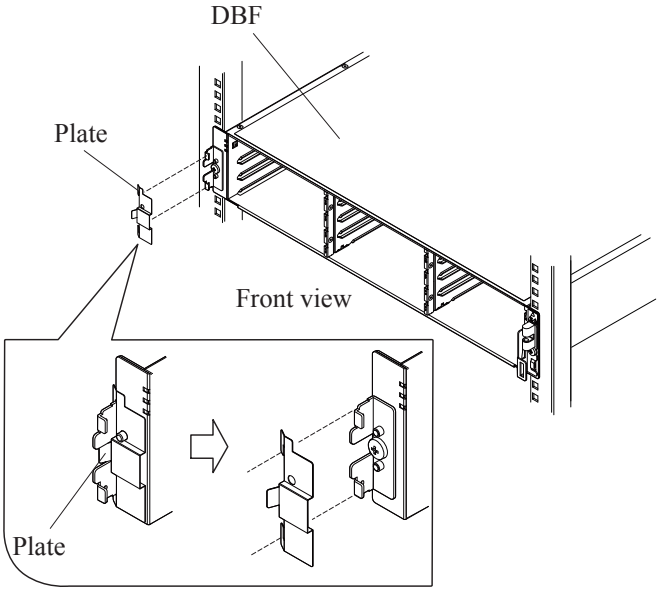
7. Replace the DBF
   (1) Remove the side cover from the left side of the front of the DBF.

Figure 2-218 Removal of Side Cover



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

Figure 2-219 Removal of Plate



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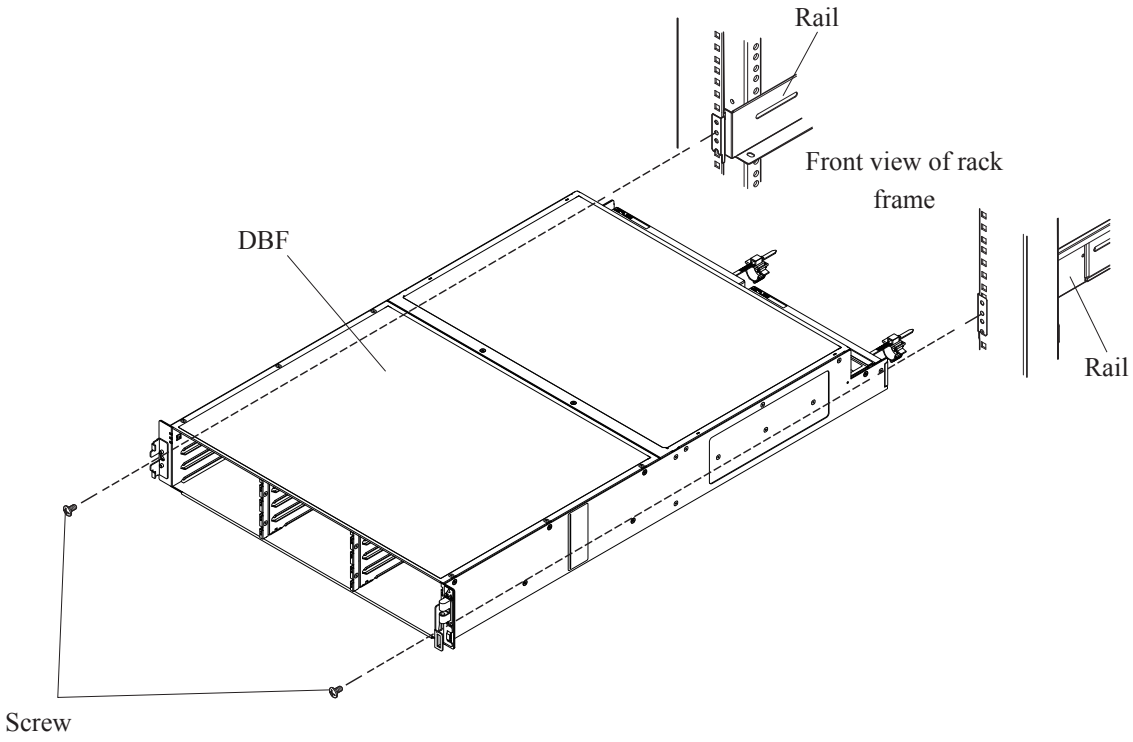
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DBF is about 10 kg.

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

(3) Remove the two screws from the DBF.
(4) Remove the DBF from the Rack frame referring to mounting procedure using the special lifter. (See "2.2.3 Mounting Lifter on Rack Frame".)
(5) Install the spare DBF on the front side of the Rack frame.
(6) Fix the DBF with the two screws.
(7) Attach the plate to the left side of the front of the DBF. (See Figure 2-219.)
(8) Attach the side cover to the left side of the front of the DBF. (See Figure 2-218.)

Figure 2-220 Removal of DBF



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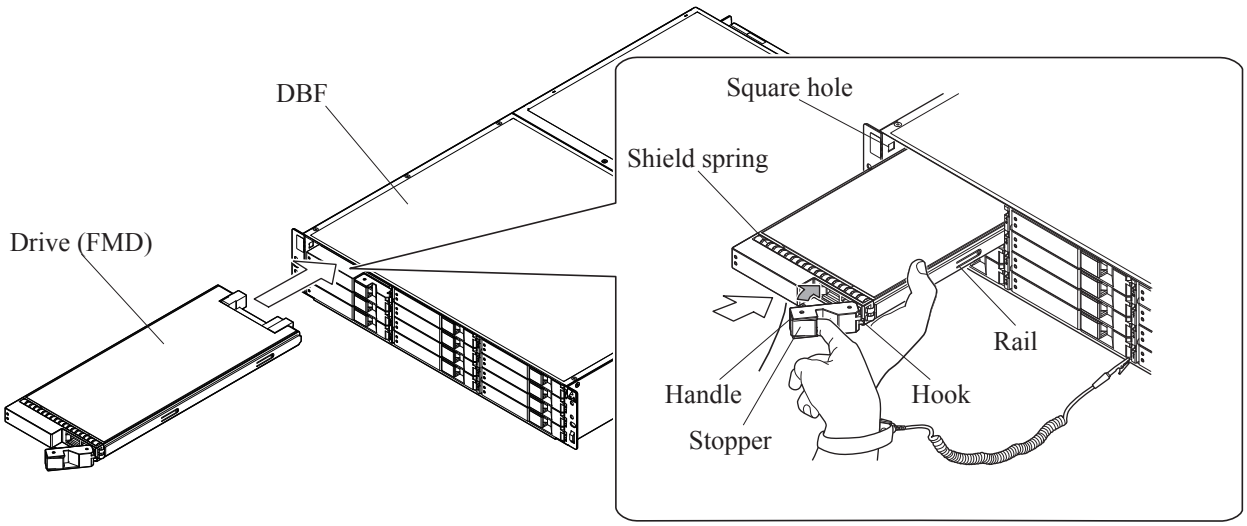
8. Install the Drives.
   Install all the removed drives to the same place in the spare Drive Box according to the label attached to them.

   (1) Open the handle fully and fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
   (2) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole on a frame.

       NOTE : When handling the Drive, hold the rail side because the shield spring is subject to breakage.

   (3) Push it in until it reaches the position where a hook of the handle can be entered into the square hole on the frame
   (4) Pull the stopper lightly and close the handle, and then press the stopper to have the lock on. If the handle is closed in the state where the hook of the handle cannot enter into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.
   (5) Install the other Drives in the same manner.

Figure 2-221 Installation of Drive (DBF)



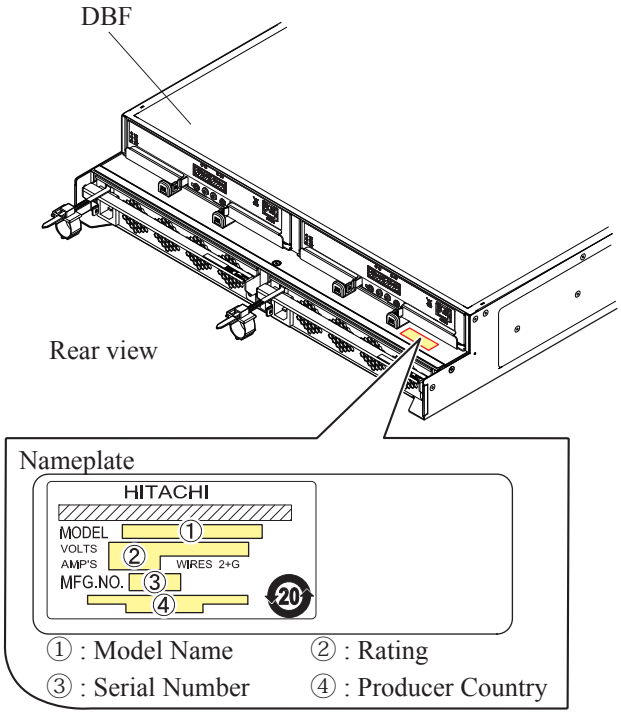
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9. Insert the DBPS.
   (1) Make the handle of the DBPS completely fall down and forward. (Refer to Figure 2-216.)
   (2) Insert the DBPS into the slot and push it to the full.
   (3) Completely raise the handle and fix the DBPS.
   (4) Connect the power cable to the DBPS and fasten it with the cable holder. (Refer to Figure 2-215.)
   (5) Push the cable holder toward the DBPS until it stops.
   (6) Install the other DBPS in the same manner.

10. Insert the ENC.
   (1) Make the right and left levers of the ENC open. (Refer to Figure 2-214.)
   (2) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
   (3) Close the right and left levers to insert the ENC completely.
   (4) Connect the cables to the ENC after checking "1.1.5 Note on Cable Routing".
   When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".
   (5) Install the other ENC in the same manner.

11. Attach the nameplate.
    (1) Take out the nameplate in which the same model name as the removed DBF is described from the nameplates attached to the spare DBF. Write down the same serial number as the removed DBF in the nameplate, and then affix the nameplate to the spare DBF.
    When the nameplate in which the same model name as the removed DBF is described is not attached, take out the nameplate in which the same rating and producer country as the removed DBF are described and which the model name is not described. Write down the same model name and serial number as the removed DBF in the nameplate, and then affix it to the spare DBF.
    To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-222 Attachment of Nameplate

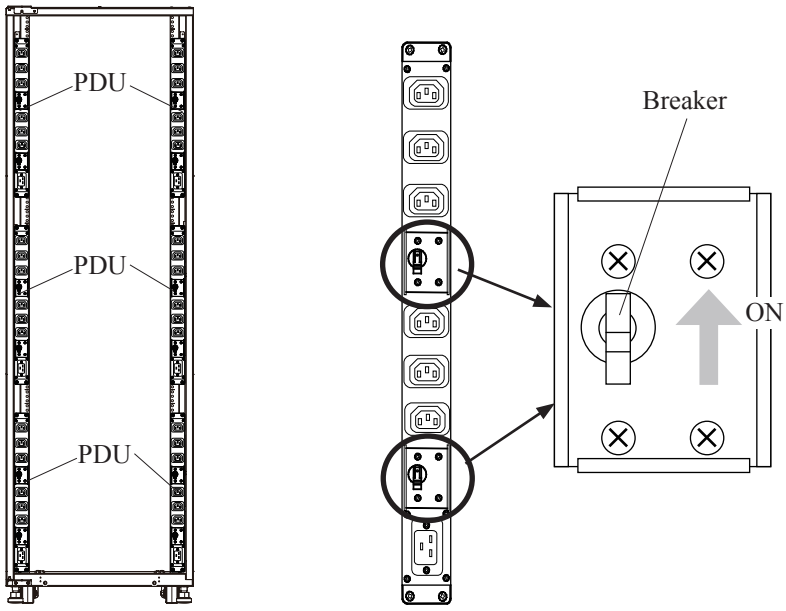


12. Attach the Front Bezel.
    (1) Attach the Front Bezel to the DBF. (See "2.2.1 How to Attach/Remove Front Bezel".)

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13. Powering on the rack frame
    (1) Turn on the breaker on the power distribution panel.
    (2) Turn on the breaker at the PDU on the rack frame.

Figure 2-223 Turning-on Breakers

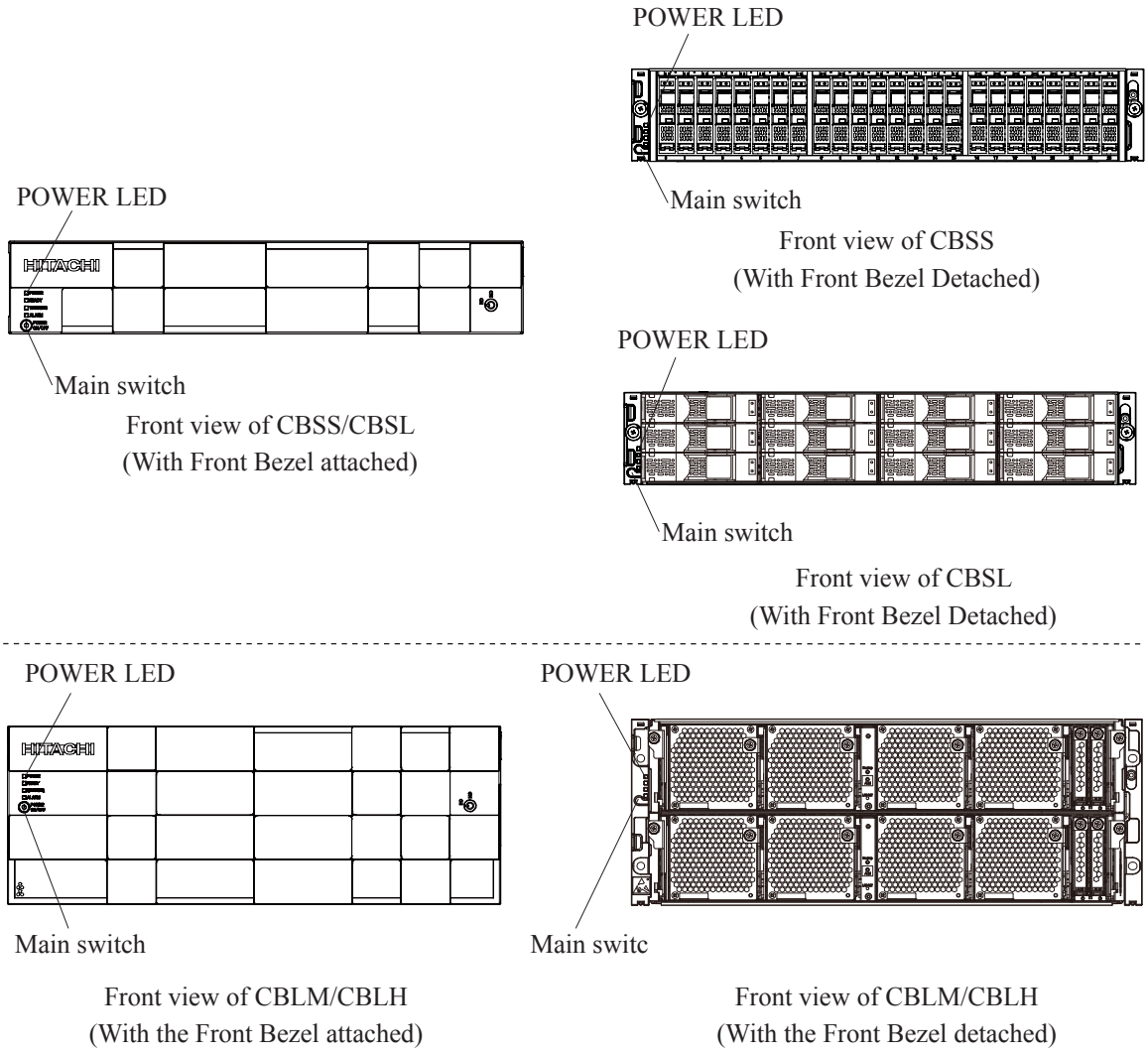


Rear view of rack frame Front view of PDU

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(3) Turn on the Main Switch on the front of the CBSS/CBSL/CBLM/CBLH.

Figure 2-224 Main Switch and POWER LED on the front of CBSS/CBSL/CBLM/CBLH



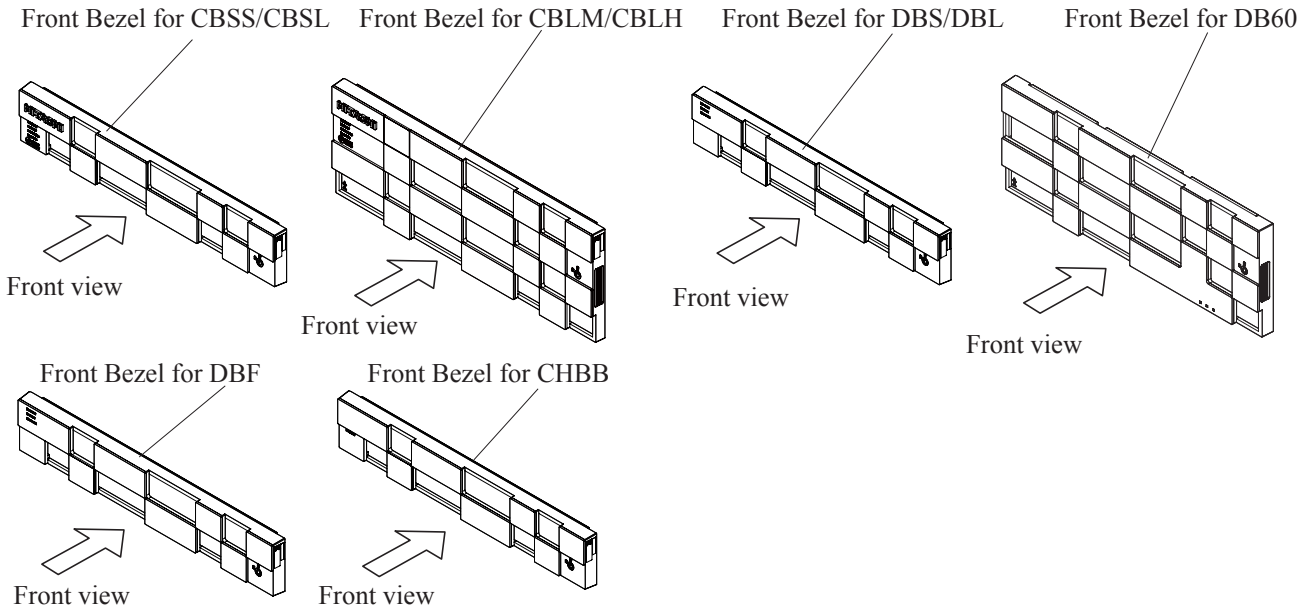
14. End

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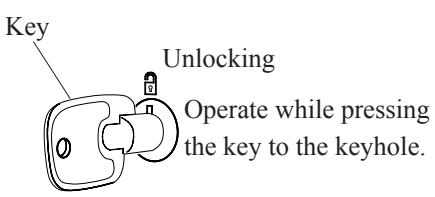
2.18 Replacing the Front Bezel

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
CBSS/CBSL	1	Front Bezel	• Front Bezel for CBSS/CBSL
CBLM/CBLH	2	Front Bezel	• Front Bezel for CBLM/CBLH
DBS/DBL	3	Front Bezel	• Front Bezel for DBS/DBL
DB60	4	Front Bezel	• Front Bezel for DB60
DBF	5	Front Bezel	• Front Bezel for DBF
CHBB	6	Front Bezel	• Front Bezel for 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. See "1.1.3 Note on Installing and Removing Parts".
- When inserting and turning the key, have it inserted completely. If it is turned when it is inserted half way, a damage of it may be caused.
- When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
  When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.




Insert or pull off the key aligning its groove with the positioning mark on the lock.


The key cannot be pulled off when its groove is not aligned with the positioning mark on the lock.

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The procedure differs according to Controller Chassis/Drive Box.

- When replacing the Front Bezel of CBSL/CBSS
  "2.18.1 Replacing the Front Bezel of CBSS/CBSL"
- When replacing the Front Bezel of CBLM/CBLH
  "2.18.2 Replacing the Front Bezel of CBLM/CBLH"
- When replacing the Front Bezel of DBS/DBL
  "2.18.3 Replacing the Front Bezel of DBS/DBL"
- When replacing the Front Bezel of DB60
  "2.18.4 Replacing the Front Bezel of DB60"
- When replacing the Front Bezel of DBF
  "2.18.5 Replacing the Front Bezel of DBF"
- When replacing the Front Bezel of CHBB
  "2.18.6 Replacing the Front Bezel of CHBB"

2.18.1 Replacing the Front Bezel of CBSS/CBSL

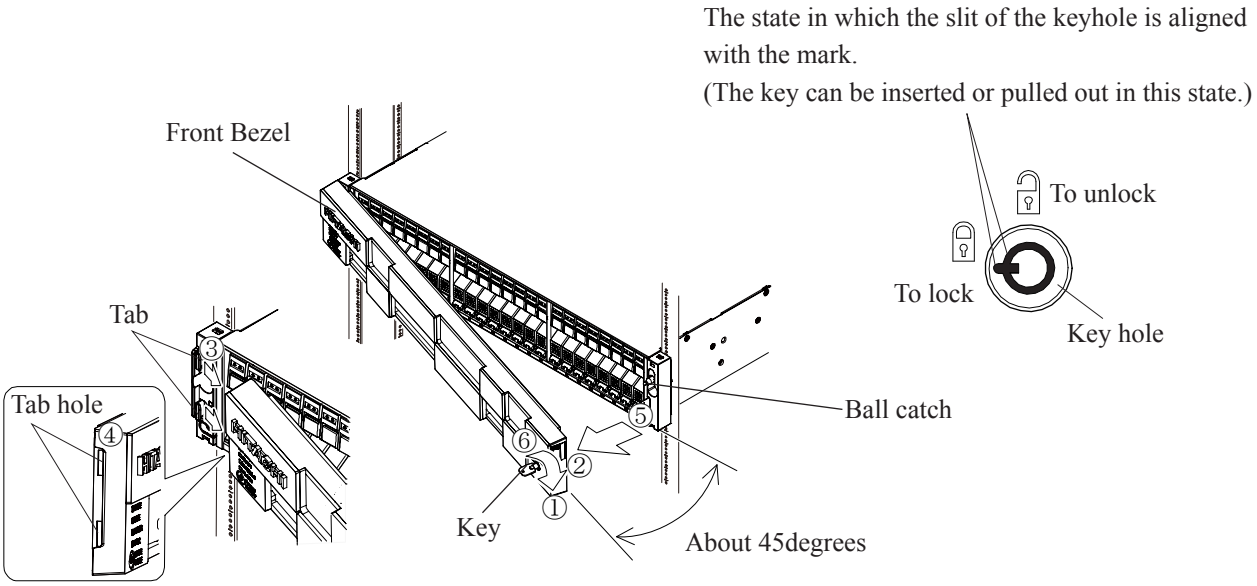
1. Replace the Front Bezel.
   A key is necessary to attach or remove a Front Bezel.
   (1) Insert the key into the keyhole on the Front Bezel and release the Lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right portion of the Front Bezel, and then disengage the right 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 spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

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Figure 2-225 Procedure for Replacing Front Bezel for CBSS/CBSL



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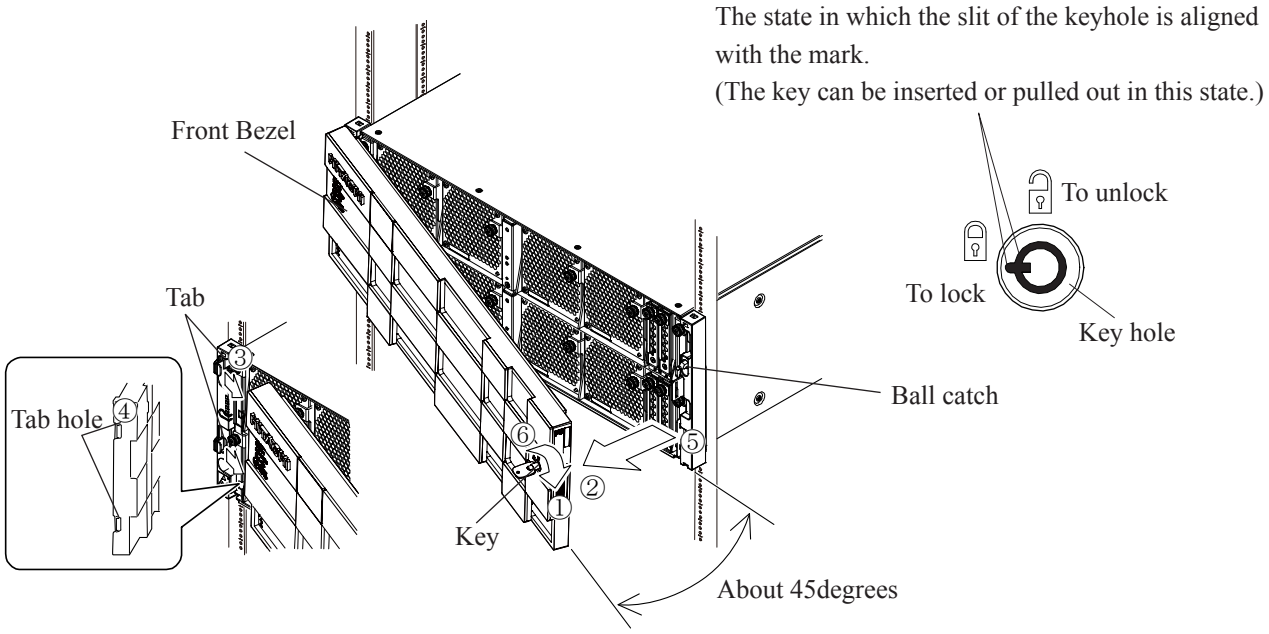
2.18.2 Replacing the Front Bezel of CBLM/CBLH

1. Replace the Front Bezel.
   A key is necessary to attach or remove a 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 spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

Figure 2-226 Procedure for Replacing Front Bezel for CBLM/CBLH



2. End

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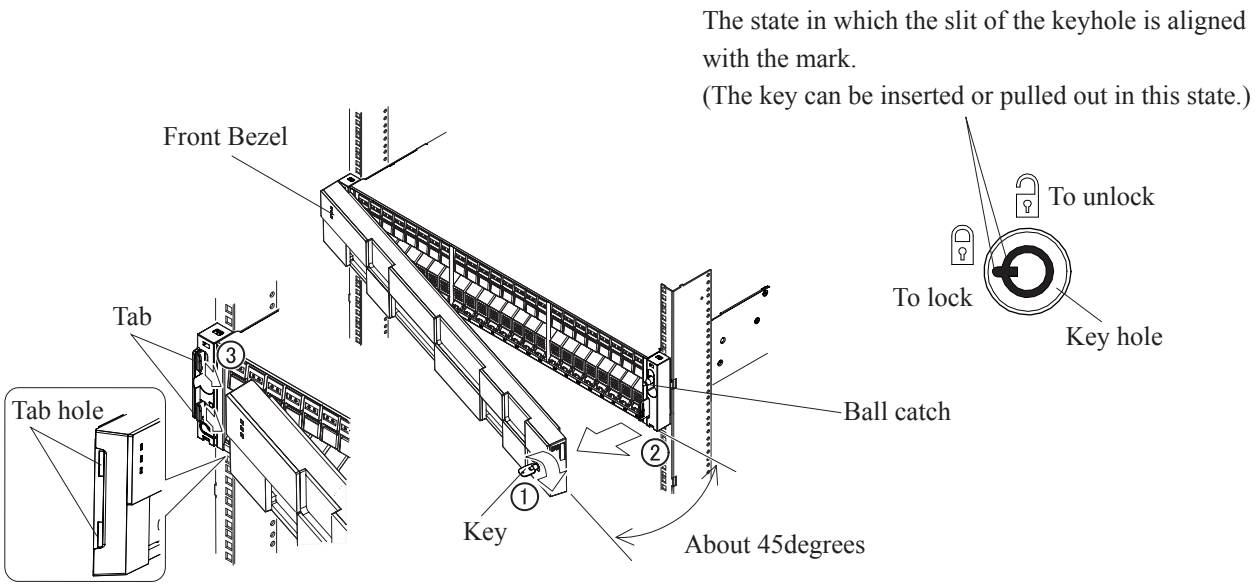
2.18.3 Replacing the Front Bezel of DBS/DBL

1. Replace the Front Bezel.
   A key is necessary to attach or remove a 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 spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

Figure 2-227 Procedure for Replacing Front Bezel for DBS/DBL



2. End

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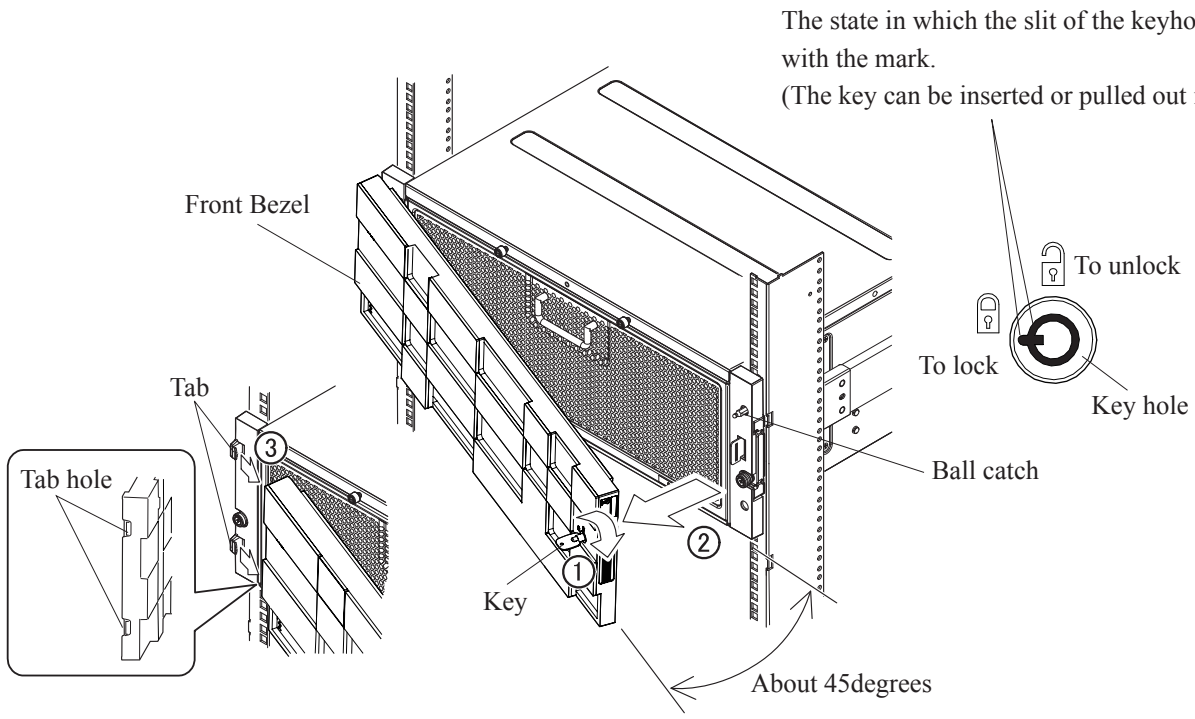
2.18.4 Replacing the Front Bezel of DB60

1. Replace the Front Bezel.
   A key is necessary to attach or remove a 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 spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

Figure 2-228 Procedure for Replacing Front Bezel for DB60



2. End

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2.18.5 Replacing the Front Bezel of DBF

1. Replace the Front Bezel.
   A key is necessary to attach or remove a 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).

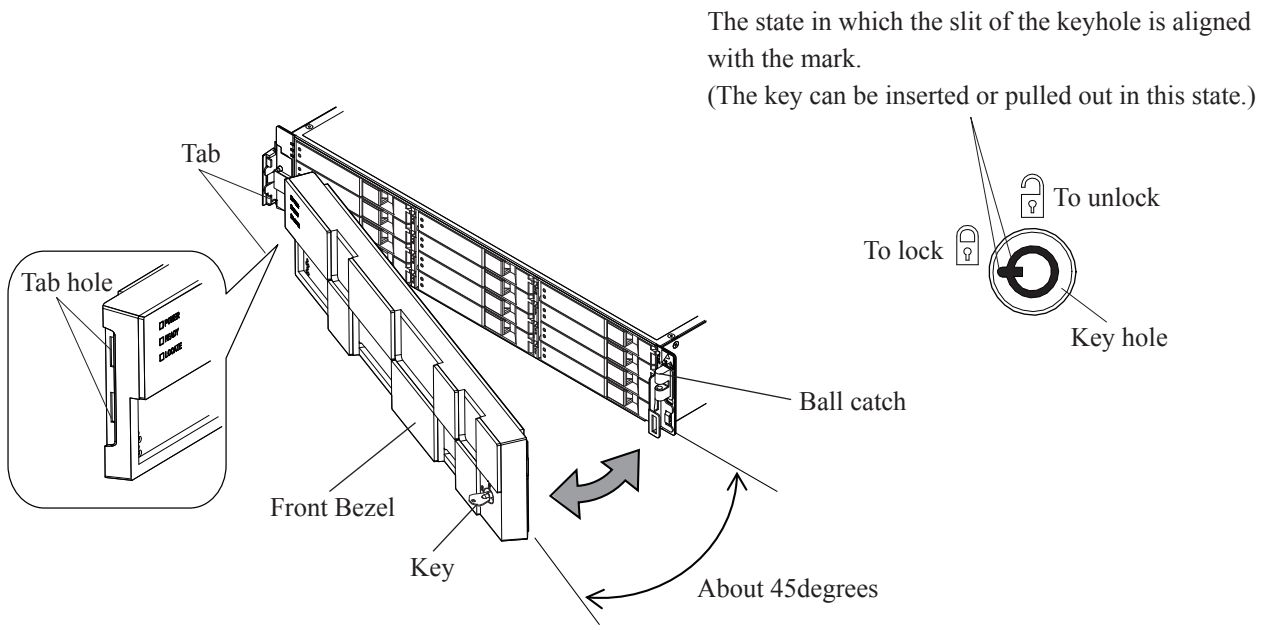
      NOTE : When disengaging the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.
      Do not force the Front Bezel open too wide. Otherwise, a damage of Front Bezel may be caused.

   (3) Disengage the spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④) with the opening angle between the Front Bezel and the Storage System of 45 degrees.

      NOTE: Be careful not to catch the Plate between the chassis and the Front Bezel when inserting the tabs on the chassis into the tab holes on the Front Bezel. The Plate may be damaged if catched.

   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

Figure 2-229 Procedure for Replacing Front Bezel for DBF



2. End

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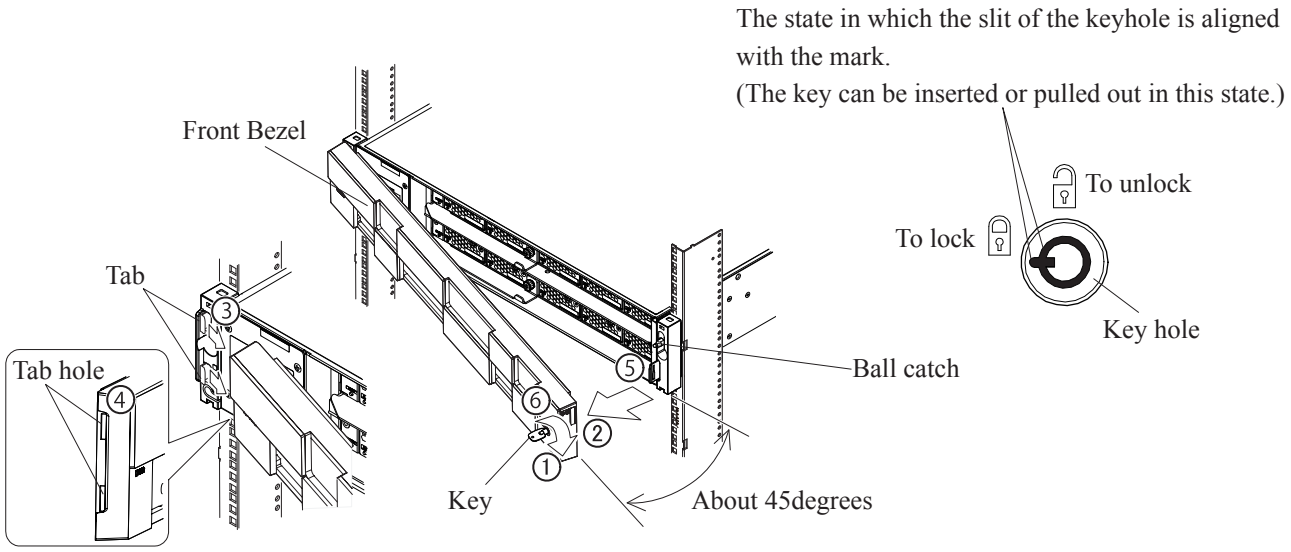
2.18.6 Replacing the Front Bezel of CHBB

1. Replace the Front Bezel.
   A key is necessary to attach or remove a 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 spare Front Bezel from the left tabs and then remove it (③).
   (4) Unlock the spare Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (5) Insert the tabs on the left front side of the chassis into the tab holes on the spare Front Bezel (④).
   (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the chassis (⑤).
   (7) Lock the Front Bezel with the key (⑥).

Figure 2-230 Procedure for Replacing Front Bezel for CHBB



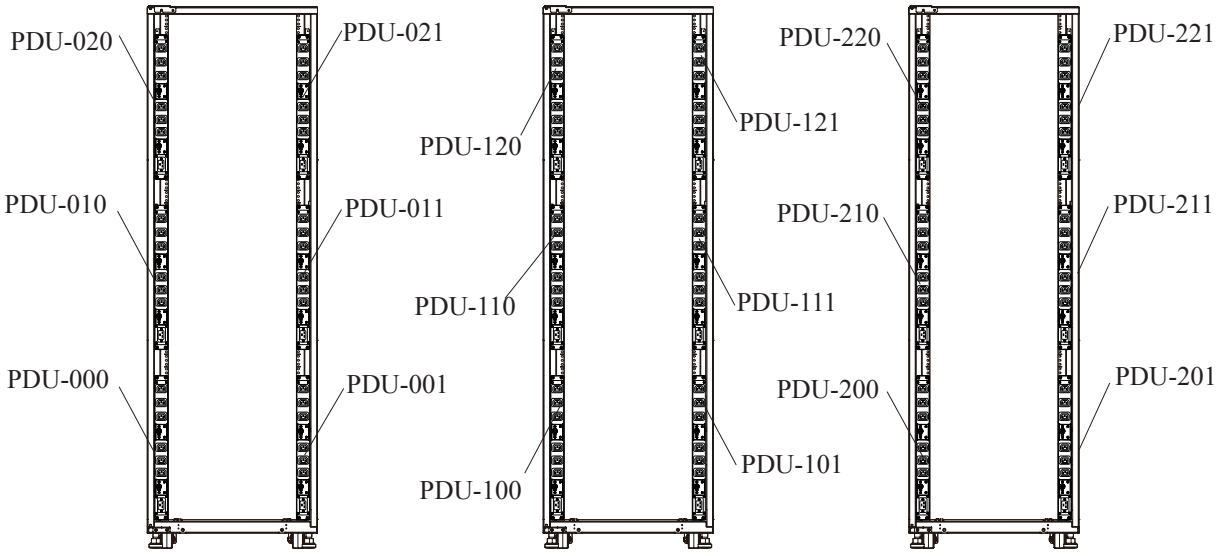
2. End

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2.19 Replacing PDUs

1. Hardware Replacement Processing

Location	Function Name of Component		Part Name
Rear view of rack	1	PDU	



Rear view of RACK-0 Rear view of RACK-1 Rear view of RACK-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 "1.1.3 Note on Installing and Removing Parts".
- The PDU may connect to other devices. When replacing it, check the precautions for the connected devices before the replacement.

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(1) Turning off the breakers of the replacement target parts

⚠ WARNING

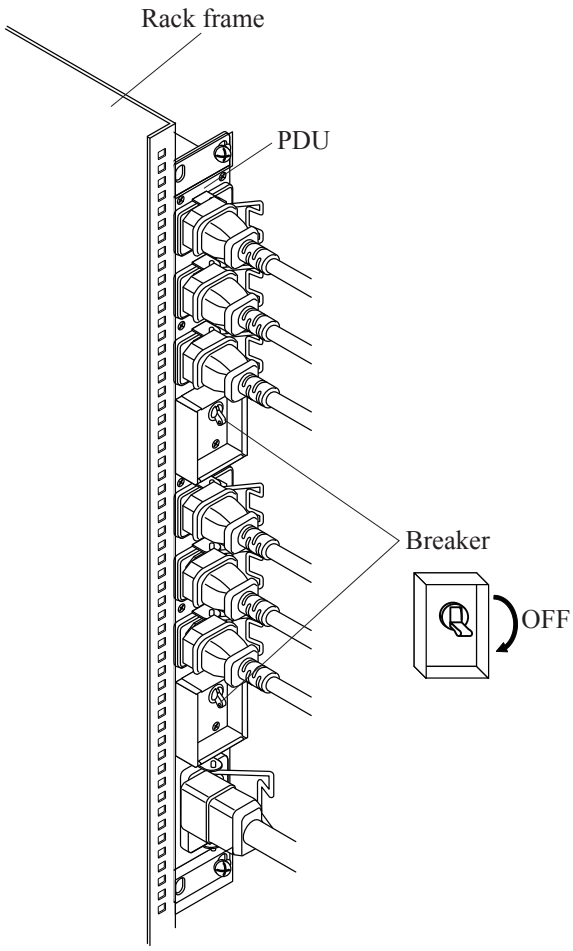
Hazardous voltage:
Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

⚠ CAUTION

If turning off any other breakers than the following, the Power Supply of the entire Storage System may be turned off.

(a) Turn off the breaker of the PDU to be replaced.

Figure 2-231 Turning-off Breakers



(b) Turn off the breaker on the distribution board connected to the PDU to be replaced.

NOTE: The circuit has the residual voltage after turning off the breakers, so that wait for one minute before starting the work.

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(2) Replacing PDUs

(a) Open the stopper and remove the power cable.

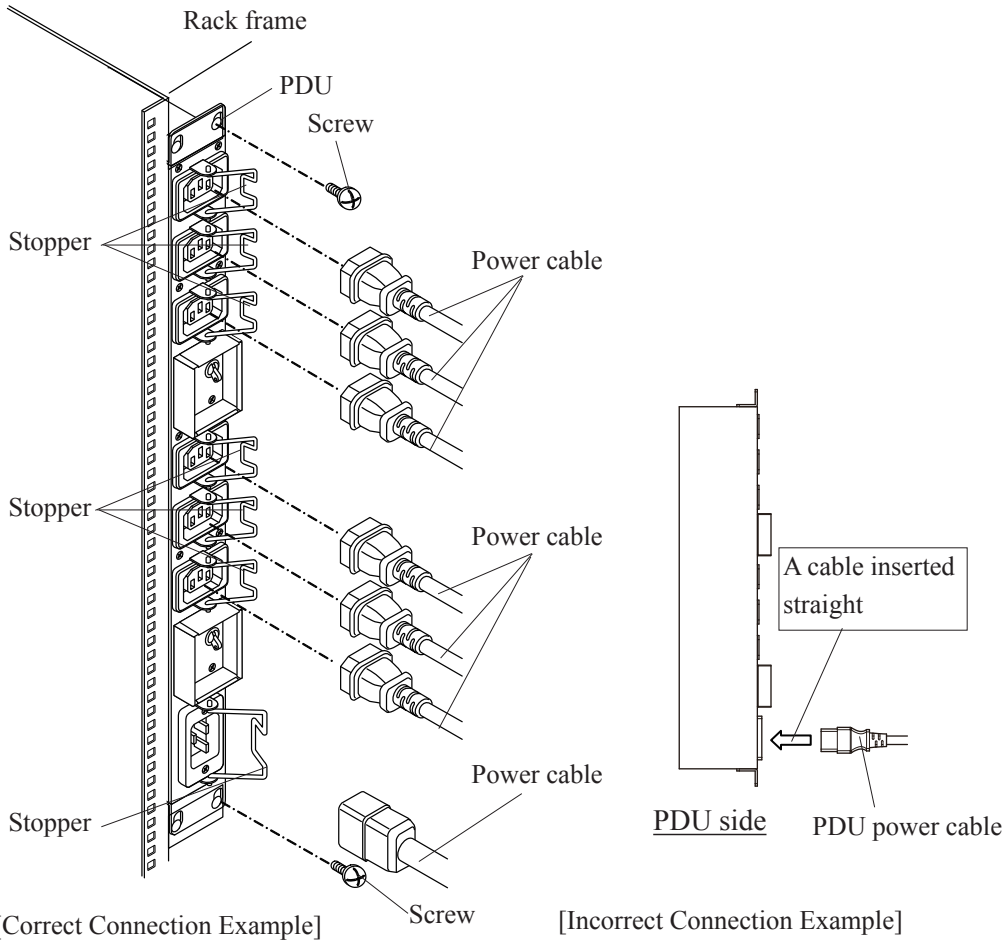
(b) Loosen the two screws and remove the failed PDU.
The failed PDU may drop. Therefore, when removing the failed PDU, do not remove the screws completely.

(c) Install a new PDU and fix it with screws.

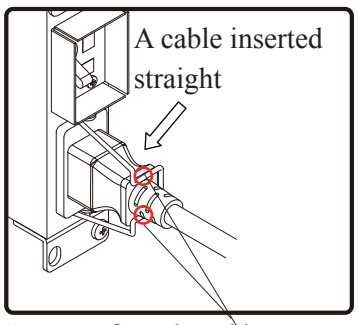
(d) Insert the power cable into the PDU straight and fix it with a stopper.

NOTE: Check that the stopper fixes the cable at two places (top and bottom).

Figure 2-232 Replacing PDU

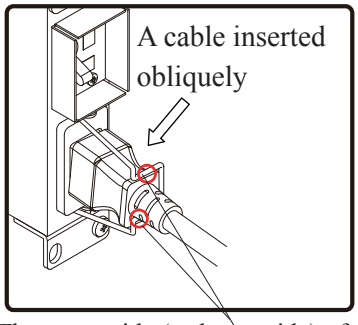


[Correct Connection Example]



A stopper fixes the cable at two places (top and bottom).

[Incorrect Connection Example]



The upper side (or lower side) of the stopper does not fix the cable.

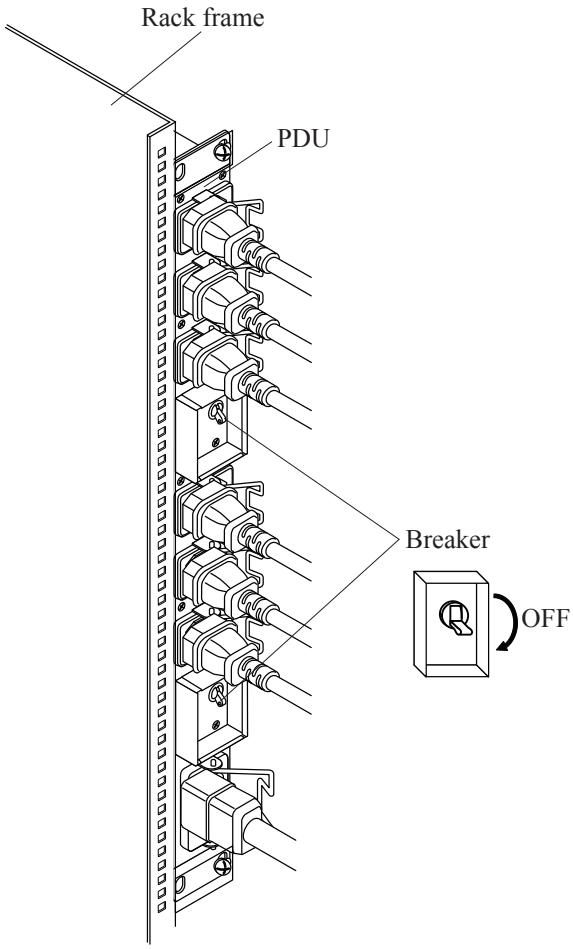
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(3) Turning on the Power Supply after the replacement

(a) Turn on the breaker on the distribution panel after replacing the PDUs.

(b) Turn on the PDU circuit breaker.

Figure 2-233 Turning-on Power Supply



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2.20 Replacing a SAS Cable

- When replacing the SAS cable of the CBSS/CBSL first
  "2.20.1 Replacing a SAS Cable of CBSS/CBSL"
- When replacing the SAS cable of the CBLM/CBLH first
  "2.20.2 Replacing a SAS cable of CBLM/CBLH"
- When replacing the SAS cable of the DBS/DBL first
  "2.20.3 Replacing a SAS Cable of DBS/DBL"
- When replacing the SAS cable of the DB60 first
  "2.20.4 Replacing a SAS Cable of DB60"
- When replacing the SAS cable of the DBF first
  "2.20.5 Replacing a SAS Cable of DBF"

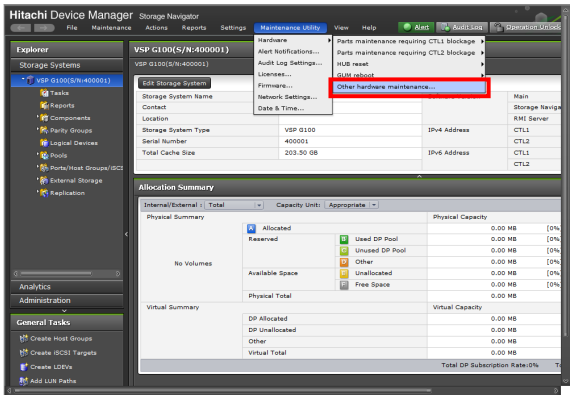
2.20.1 Replacing a SAS Cable of CBSS/CBSL

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

When replacing the SAS cable connected to the CBSS/CBSL, it is necessary to block the Controller Boards.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the SAS cable connected to the Controller Board 1, connect the maintenance PC and the Controller Board 2.
   When replacing the SAS cable connected to the Controller Board 2, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

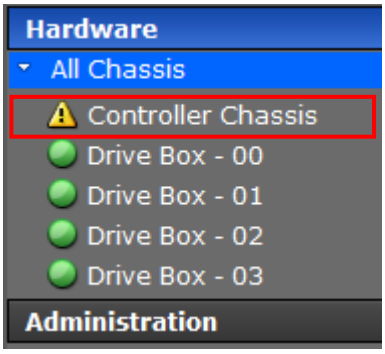


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3. Selecting replacement parts by Maintenance Utility.

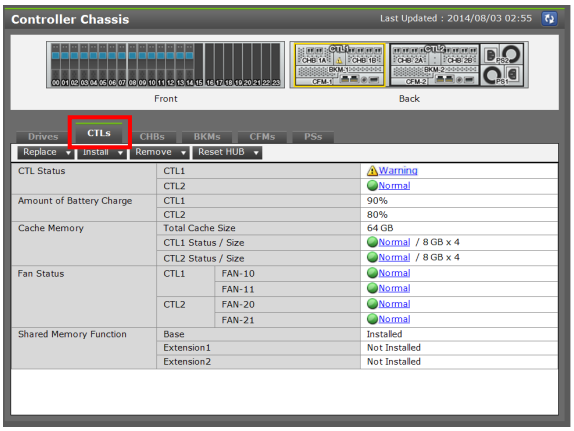
NOTE: The location number is displayed in the “Maintenance Utility” window for the firmware version 83-01-21-x0/xx or more.

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

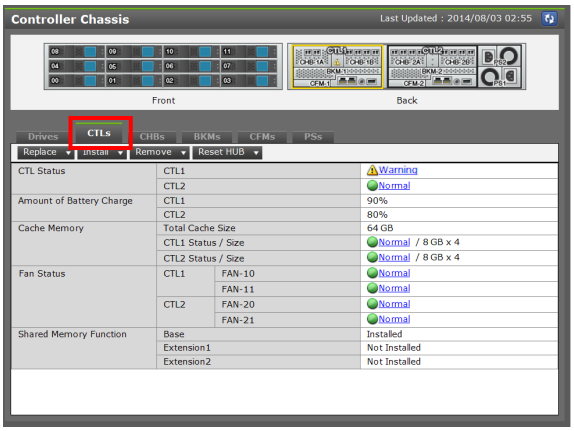


(2) <Controller Chassis window>
Click the [CTLs] tab in the “Controller Chassis” window to display a Controller Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].

• In case of CBSS



• In case of CBSL

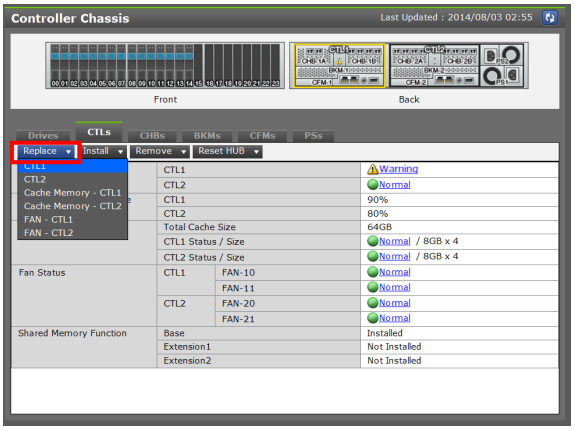


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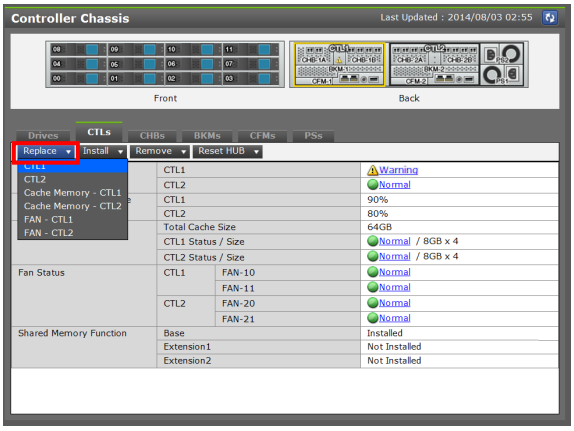
(3) <Select Controller Board>

Click the [Replace] button to select the Controller Board that is connected to the SAS cable to be replaced.

• In case of CBSS



• In case of CBSL



(4) <Block Controller Board>

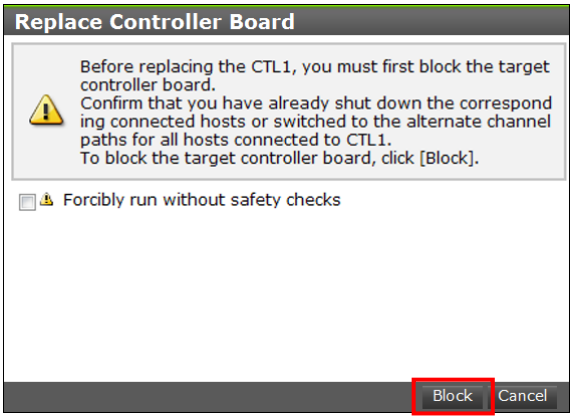
⚠ CAUTION

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.

Check that the Controller Board to replace the SAS cable is correct and click the [Block] button.

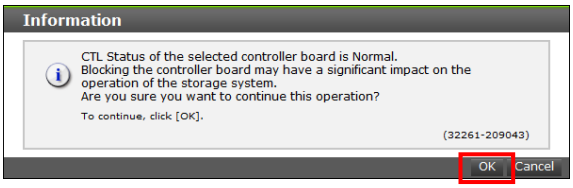
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

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



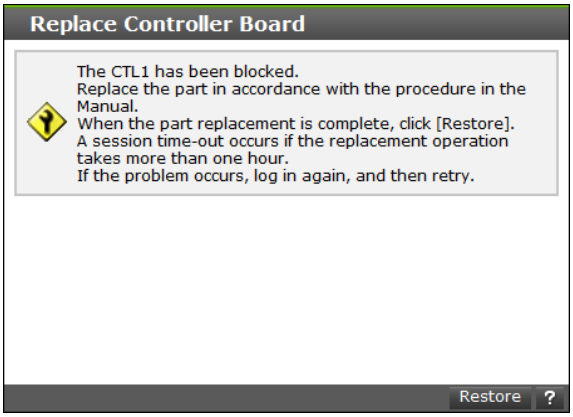
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(5) <Check Controller Board>
Check that the Controller Board to replace the SAS cable is correct again and click the [OK] button.



(6) <Check the beginning of SAS cable replacement>
Check that the Controller Board is blocked and the SAS cable becomes ready for replacing.

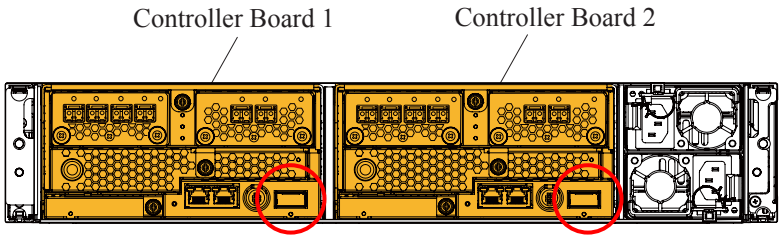
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. CBSS/CBSL SAS Cable Replacement Processing
   For the DW-F800-SCQ1HA cable, replace the SAS adapter first. If it is not recovered even after replacing the SAS adapter, replace the cable.

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	SAS cable	• DW-F800-SCQ1 • DW-F800-SCQ1F • DW-F800-SCQ3 • DW-F800-SCQ5 • DW-F800-SCQ10A • DW-F800-SCQ30A • DW-F800-SCQ1HA

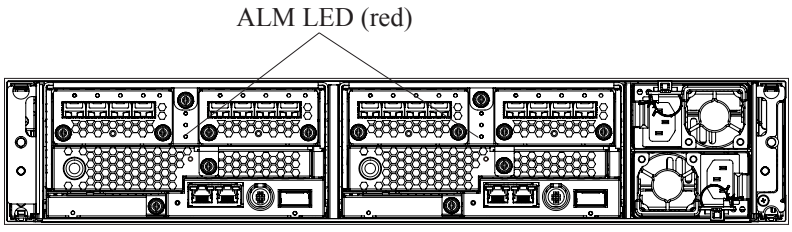


Rear view of CBSS/CBSL

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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the blocked Controller Board connecting to the SAS cable to be replaced lights up.

Figure 2-234 ALM LED Position



Controller Board

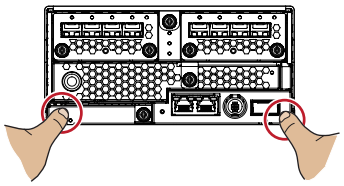
(2) Release the routing of the SAS cable connected to the CBSS/CBSL in the reverse procedure of INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).

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(3) Remove the SAS cable from the CBSS/CBSL and the ENC of the Drive Box connected to CBSS/CSSL.

(4) Perform the dummy replacement of the blocked Controller Board.
Remove the Controller Board once, and then install it again.
(a) Remove the Channel Board of the blocked Controller Board and the cables connected to LAN.
(b) Loosen the screws (blue) that are fixing the blocked Controller Board and open the lever.
(c) Wait for 20 seconds or more.
(d) Push the Controller Board 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.



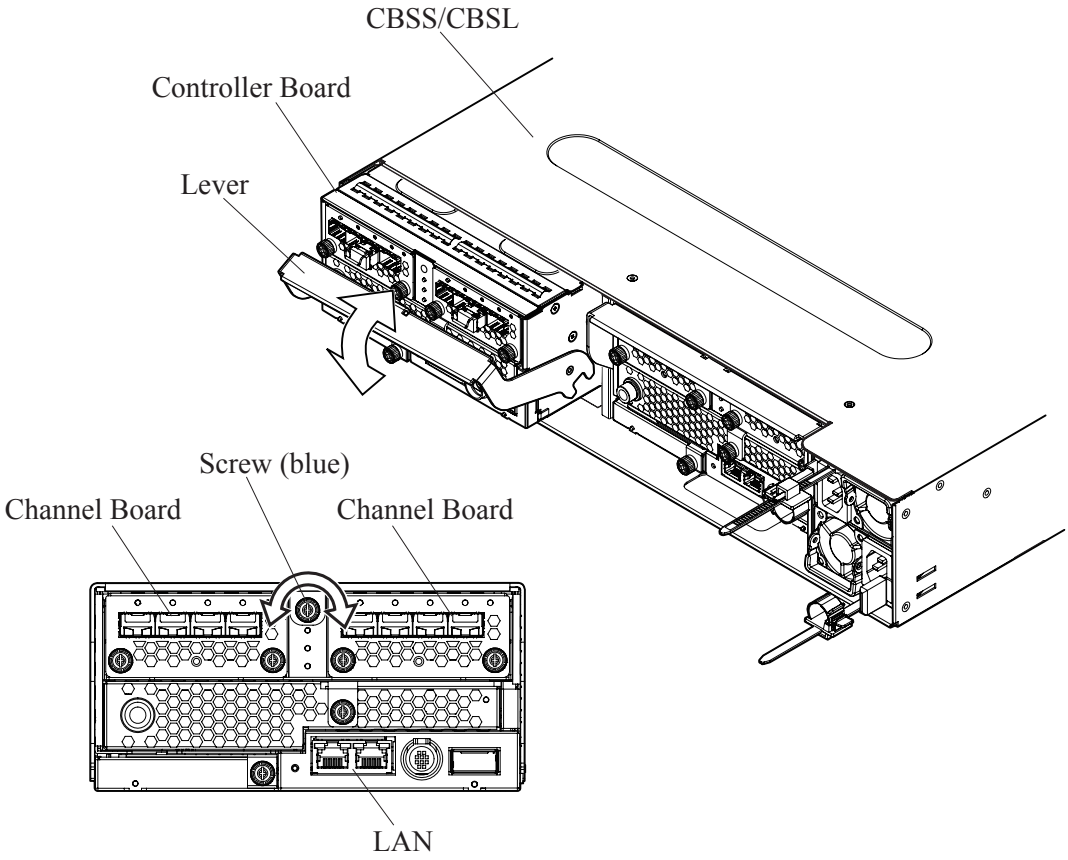
(e) Tighten the screws (blue) to fix the Controller Board.

NOTICE: After Step (a), 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 replacement.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.20.1".

(f) Connect the removed cables to the Channel Board and LAN.

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Figure 2-235 Dummy Replacement of the Controller Board



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(5) Connect a new SAS cable to the CBSS/CBSL and the ENC of the Drive Box. (Refer to INSTALLATION SECTION "2.10 Connecting Cables" and "2.10.2 Connecting SAS Cables".) The connection procedure is different for HT-F40SB-SCQ1HA. Follow the procedure shown below for the connection.

- When replacing the cable

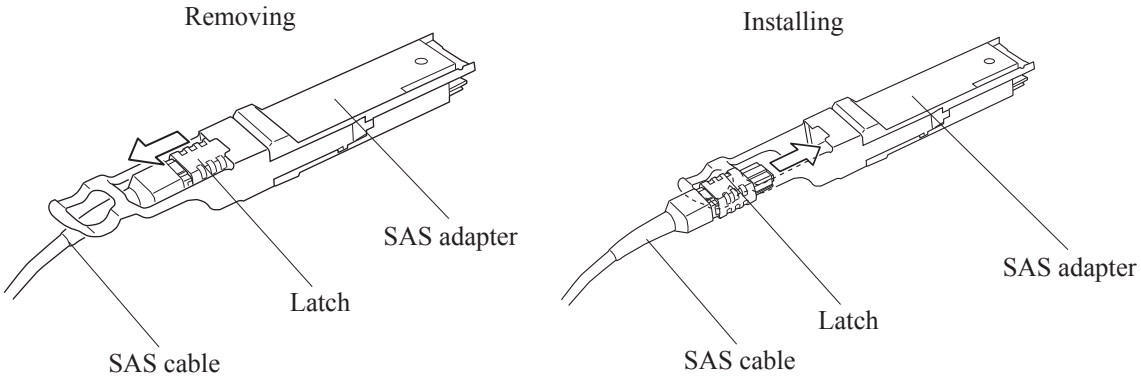
(a) Pull the latch of the SAS cable to remove from the SAS adapter.
(b) Attach the new SAS cable to the SAS adapter.
(c) Connect the SAS cable to the ENC.

- When replacing the SAS adapter of the cable

(a) Attach the new SAS adapter to the SAS cable.
(b) Connect the SAS cable to the ENC.

NOTE : When connecting the DW-F800-SCQ1HA cable to the SAS adapter, check that cable latch clicks and the cable is surely connected to the SAS adapter.

Figure 2-236 Removing/Installing DW-F800-SCQ1HA



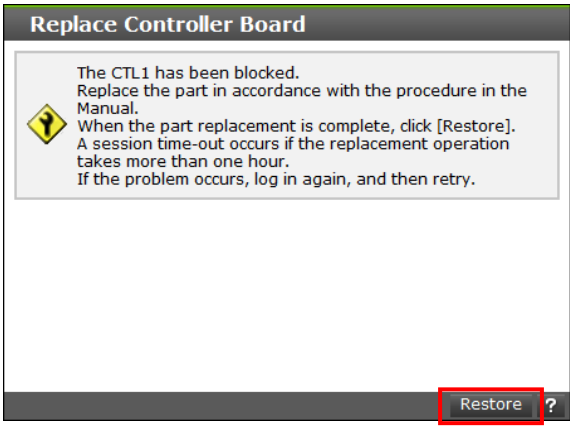
(6) Route the SAS cable. (Refer to INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).)

NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, the SAS cable routing is not required.

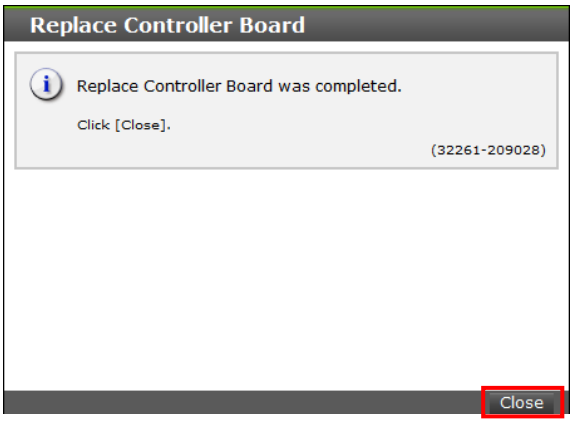
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.



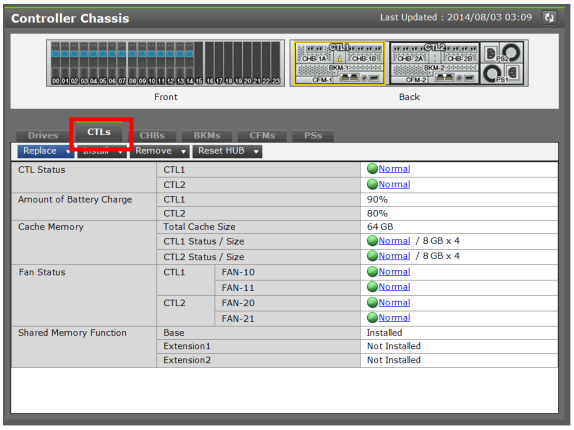
(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



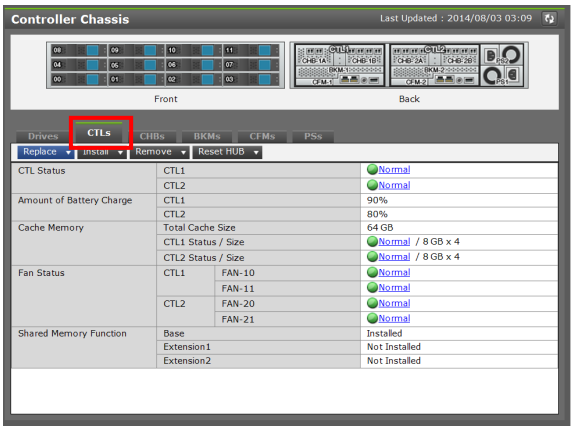
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(3) <Controller Chassis window>
Click the [CTLs] tab in the "Controller Chassis" window to check that the status of the Controller Board with the replaced SAS cables is "Normal".

• In case of CBSS



• In case of CBSL



(4) 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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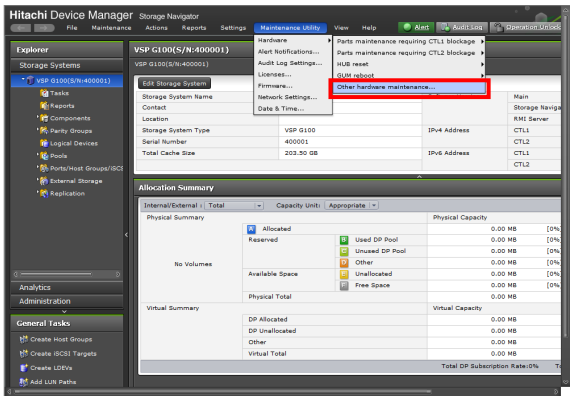
2.20.2 Replacing a SAS cable of CBLM/CBLH

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

When replacing the SAS cable connected to the CBLM/CBLH, it is necessary to block the Disk Board connected to the SAS cable to be replaced.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the SAS cable connected to the Disk Board, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

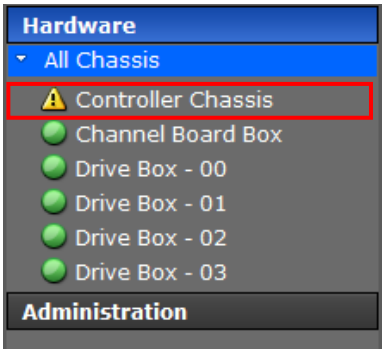


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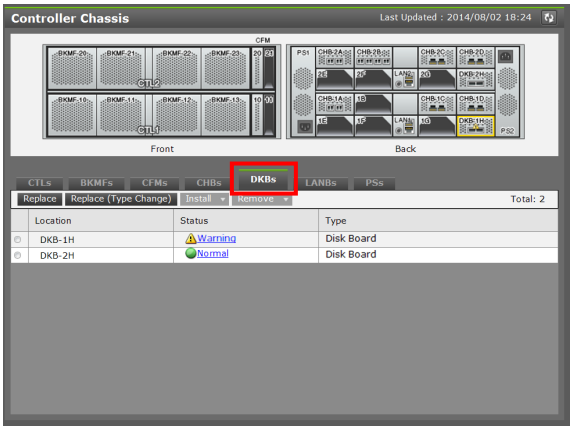
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



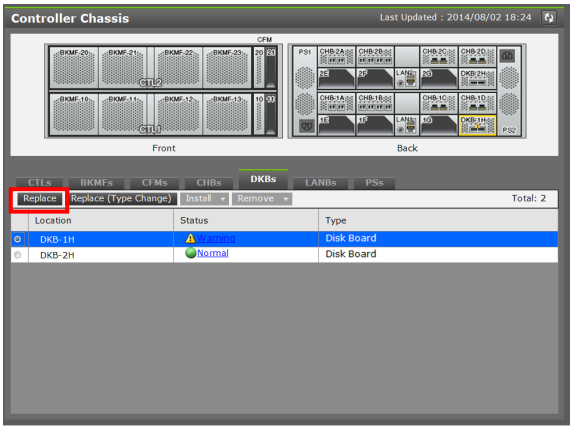
(2) <Controller Chassis window>
Click the [DKBs] tab in the “Controller Chassis” window to display a Disk Board status.
See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select Disk Board>

Select a Disk Board to replace the SAS cable and select the [Replace] button.



(4) <Block Disk Board>

⚠ 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.

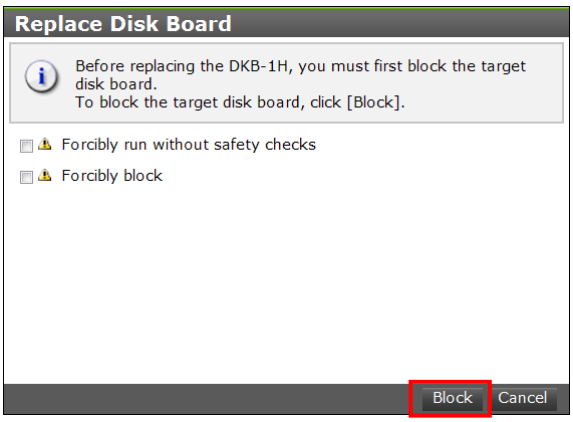
About "Forcibly block":

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 that the Disk Board to replace the SAS cable is correct and click the [Block] 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.

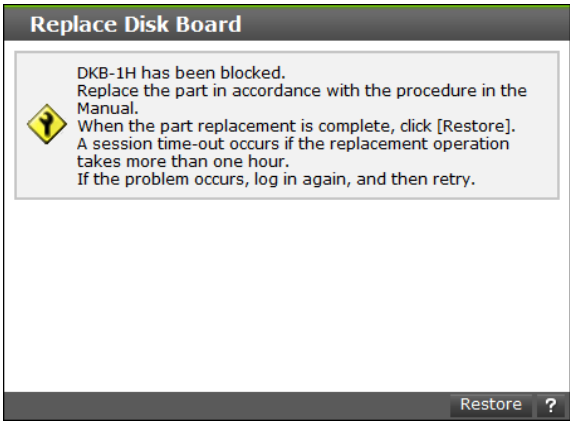
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



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(5) <Check the beginning of SAS cable replacement>
Check that the Disk Board is blocked and becomes ready for replacing.

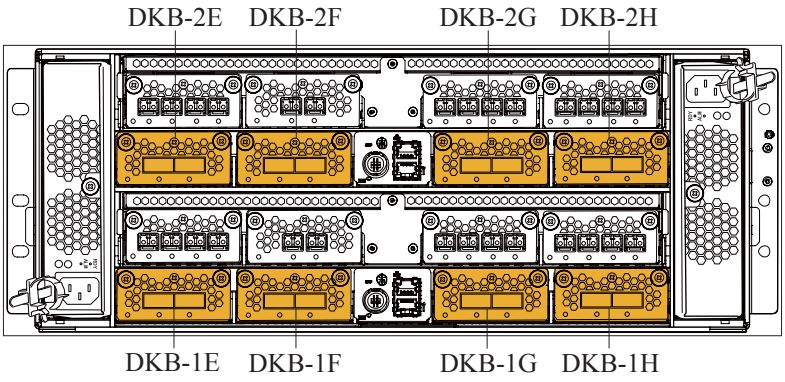
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. SAS Cable for CBLM/CBLH Replacement Processing
   For the DW-F800-SCQ1HA cable, replace the SAS adapter first. If it is not recovered even after replacing the SAS adapter, replace the cable.

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	SAS cable	• DW-F800-SCQ1F • DW-F800-SCQ3 • DW-F800-SCQ5 • DW-F800-SCQ10A • DW-F800-SCQ30A • DW-F800-SCQ1HA



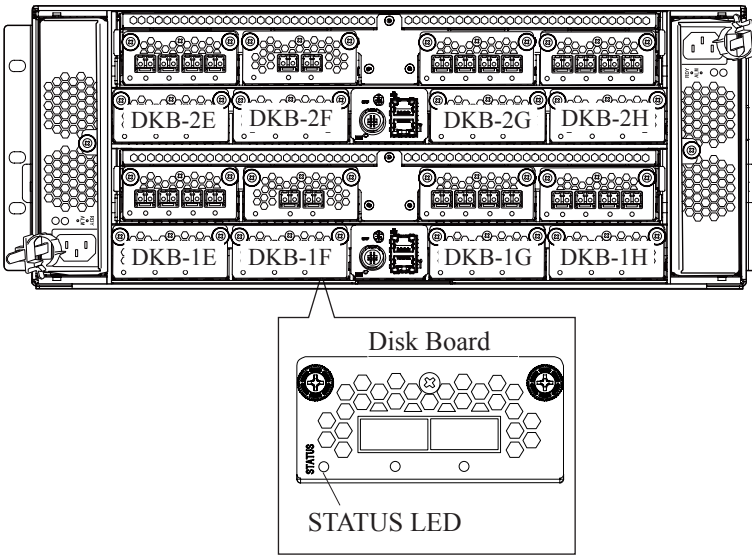
CBLM/CBLH (Rear view)

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the Disk Board to replace the SAS cable of CBLM/CBLH lights up.

Figure 2-237 STATUS LED Location



(2) Release the routing of the SAS cable connected to the CBLM/CBLH in the reverse procedure of INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).

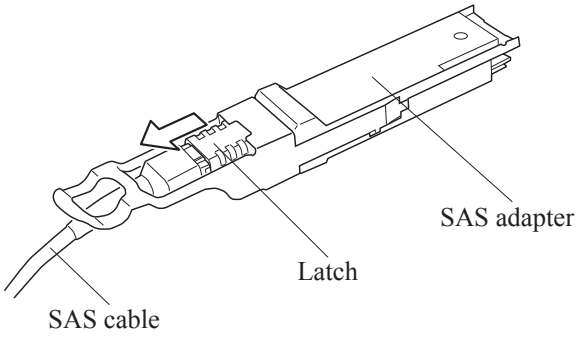
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, it is not required to release the routing of the SAS cable.

(3) Remove the SAS cable from the Disk Board and the ENC of the Drive Box connected to Disk Board.
The removal procedure of the SAS cable is different for HT-F40SB-SCQ1HA. Remove the SAS cable from the SAS adapter for replacement.

- When replacing the cable

(a) Pull the latch of the SAS cable to remove from the SAS adapter.

Figure 2-238 Removing DW-F800-SCQ1HA

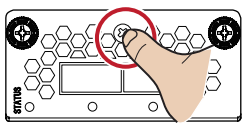


(4) Perform the dummy replacement of the blocked Disk Board.
Remove the Disk Board once, and then install it again.

NOTICE: If Disk Boards are inserted randomly, malfunction may occur. Therefore, insert the Disk Boards in two steps, Step (d) and Step (e) shown below.

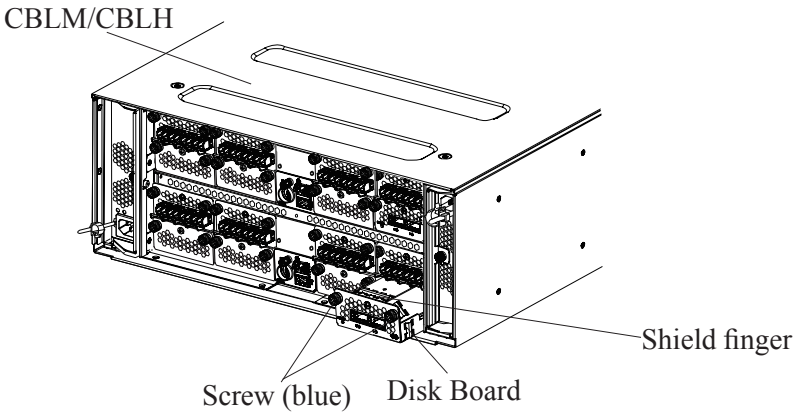
(a) Loosen the two screws (blue) which fix the Disk Board.
(b) Pull out the Disk Board slightly while holding the screw (blue).
(c) Wait for 20 seconds or more.
(d) Insert the Disk Board into just before the shield finger.
(e) Push the Disk Board gently.

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



(f) Tighten two screws (blue) to fix the Disk Board.

Figure 2-239 Dummy Replacement of the Disk Board



(5) Connect a new SAS cable to the Disk Board and the ENC of the Drive Box. (Refer to INSTALLATION SECTION "2.10 Connecting Cables" and "2.10.2 Connecting SAS Cables".) The connection procedure is different for HT-F40SB-SCQ1HA. Follow the procedure shown below for the connection.

- When replacing the cable

(a) Attach the SAS cable to the SAS adapter.

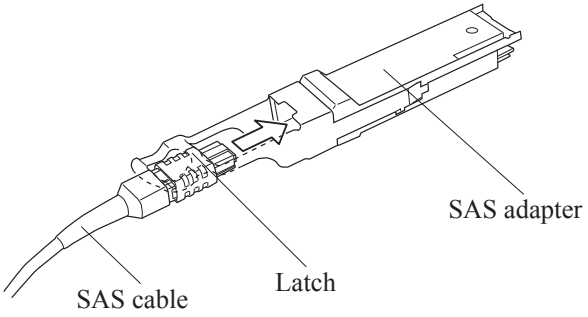
- When replacing the SAS adapter of the cable

(a) Attach the new SAS adapter to the SAS cable.

(b) Connect the SAS cable to the ENC.

NOTE : When connecting the DW-F800-SCQ1HA cable to the SAS adapter, check that cable latch clicks and the cable is surely connected to the SAS adapter.

Figure 2-240 How to Install DW-F800-SCQ1HA



(6) Route the SAS cable. (Refer to INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).)

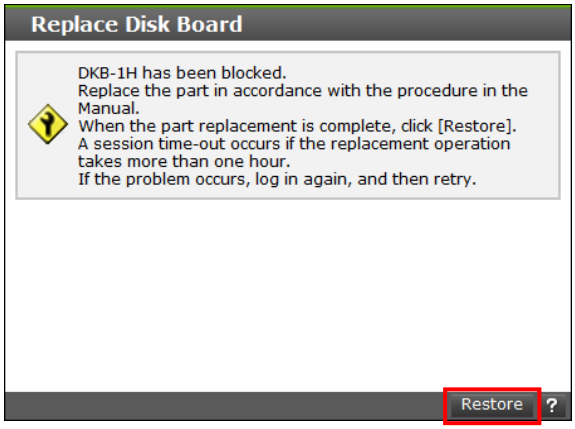
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, the SAS cable routing is not required.

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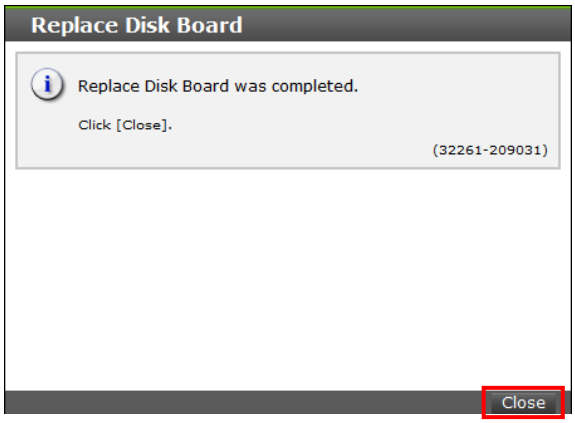
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

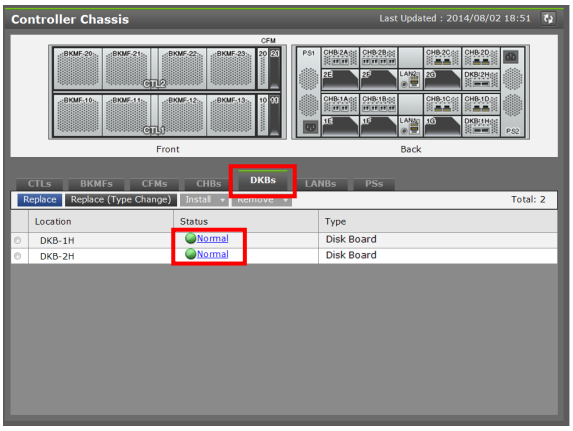


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



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(3) <Check Disk Board restoration>
Click the [DKBs] tab in the "Controller Chassis" window to check that the status of the Disk Board with the replaced SAS cables is "Normal".



(4) 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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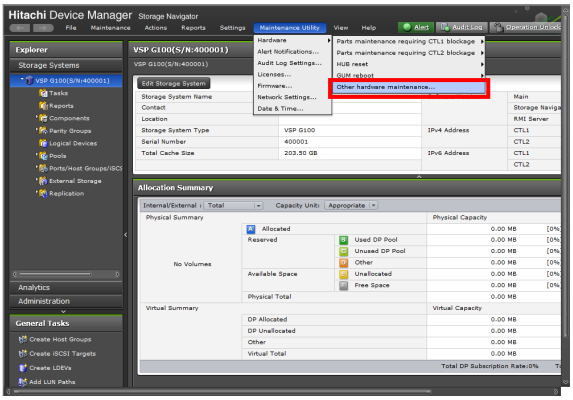
2.20.3 Replacing a SAS Cable of DBS/DBL

When replacing the SAS cable between the Drive Boxes, it is necessary to block the ENC on the Drive Box nearer to the Controller Chassis.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the SAS cable connected to the ENC, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

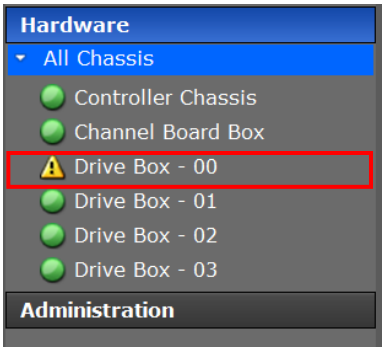


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3. Selecting replacement parts by Maintenance Utility.

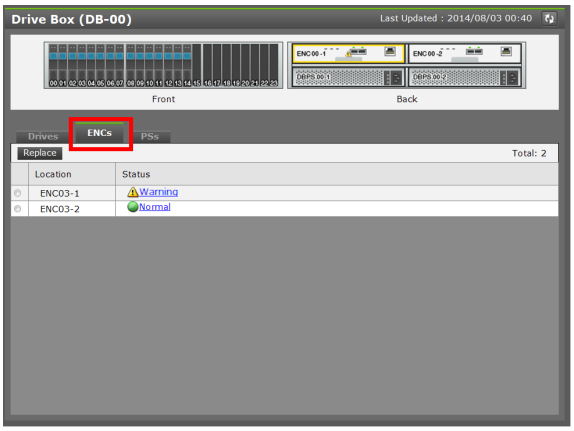
NOTE: The location number is displayed in the "Maintenance Utility" window for the firmware version 83-01-21-x0/xx or more.

(1) <Main window>
Select [Drive Box] in the main window.

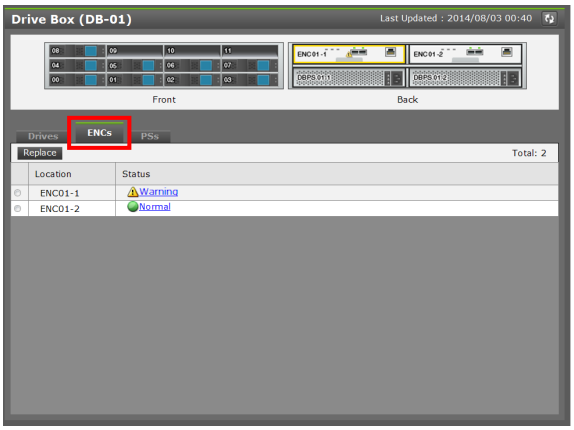


(2) <Controller Chassis window>
Click the [ENCs] tab in the "Drive Box" window to display an ENC status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].

• In case of DBS



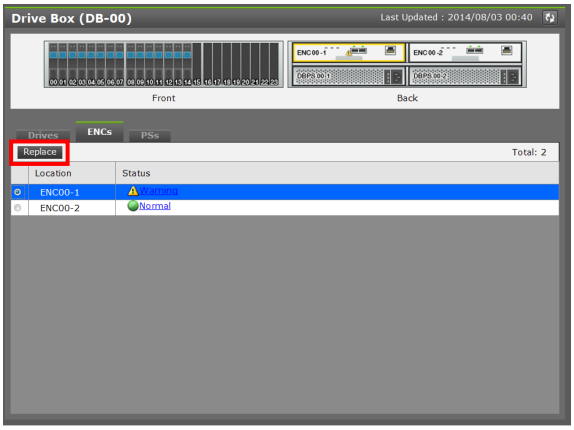
• In case of DBL



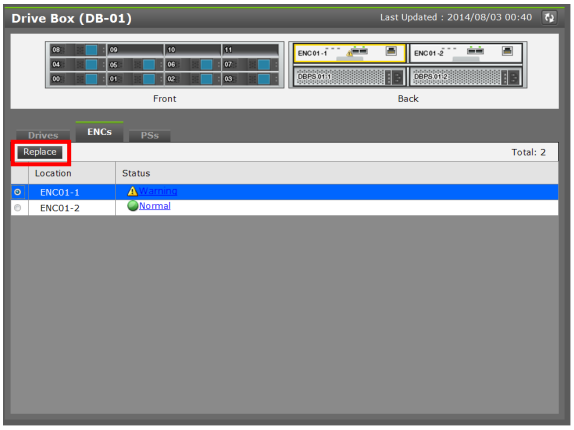
(3) <Select ENC>

Select an ECN to which the SAS cable to be replaced is connected, and click the [Replace] button.

• In case of DBS



• In case of DBL



(4) <Block ENC>

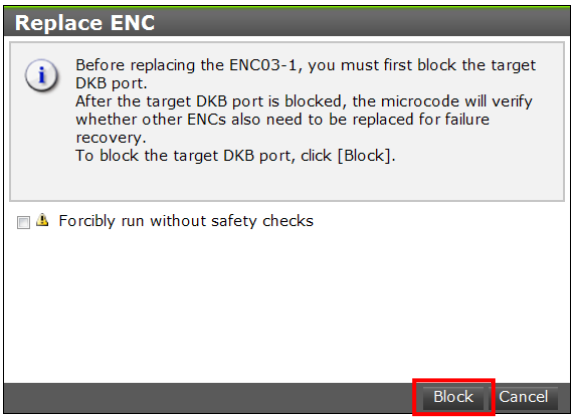
⚠ CAUTION

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.

Check that the ENC to replace the SAS cable is correct and click the [Block] 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.

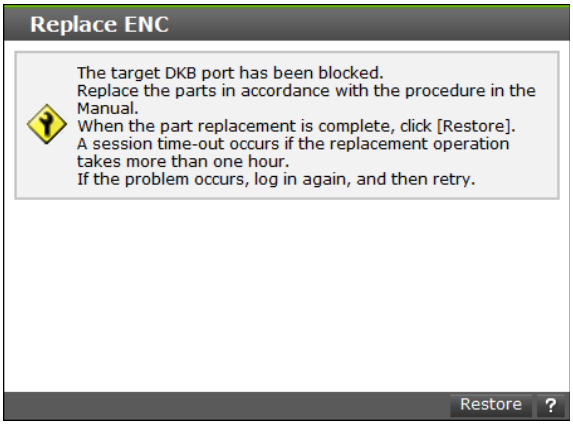
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



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(5) <Check the beginning of SAS cable replacement>
Check that the ENC is blocked and becomes ready for replacing.

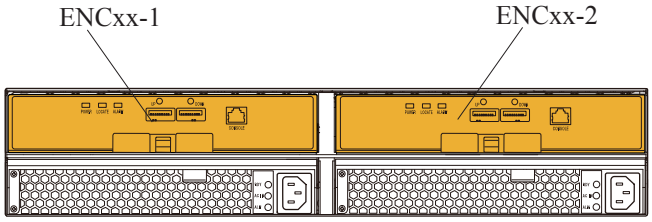
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. SAS Cable for DBS/DBL Replacement Processing
   For the DW-F800-SCQ1HA cable, replace the SAS adapter first. If it is not recovered even after replacing the SAS adapter, replace the cable.

Location	Function Name of Component		Part Name
Rear View of DBS/DBL	1	SAS cable	• DW-F800-SCQ1 • DW-F800-SCQ1F • DW-F800-SCQ3 • DW-F800-SCQ5 • DW-F800-SCQ10A • DW-F800-SCQ30A • DW-F800-SCQ1HA



Rear view of DBS/DBL

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

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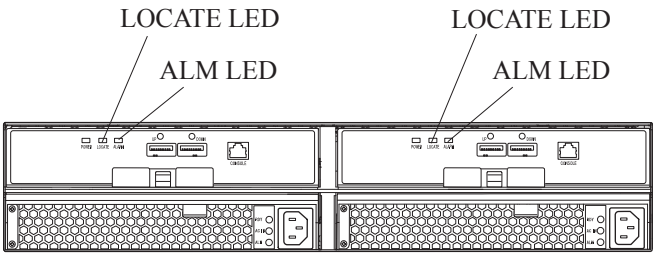
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the ENC to replace the SAS cable of the DBS/DBL lights up.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-241 ALM LED Location



Rear view of DBS/DBL

(2) Release the routing of the SAS cable connected to the DBS/DBL in the reverse procedure of INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).

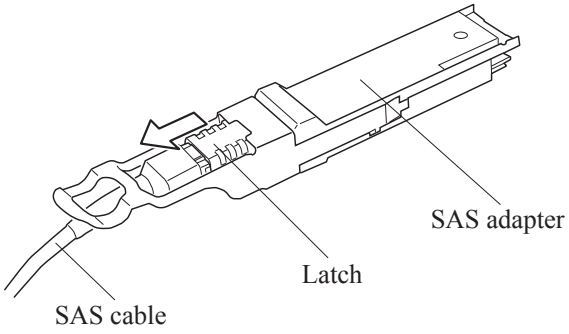
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, it is not required to release the routing of the SAS cable.

(3) Remove the SAS cable from the DBS/DBL and the ENC of the Drive Box connected to DBS/DBL.
The removal procedure of the SAS cable is different for HT-F40SB-SCQ1HA. Remove the SAS cable from the SAS adapter for replacement.

- When replacing the cable

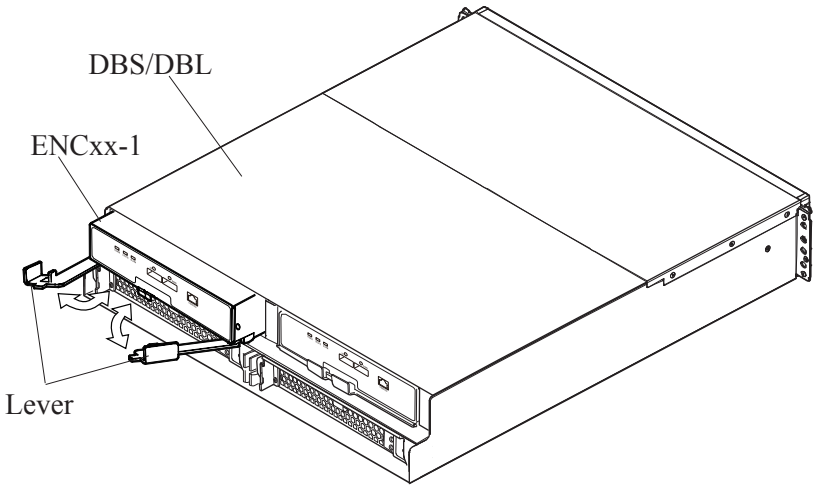
(a) Pull the latch of the SAS cable to remove from the SAS adapter.

Figure 2-242 Removing DW-F800-SCQ1HA



(4) Perform the dummy replacement of the blocked ENC.
Remove the ENC once, and then install it again.
(a) Open the lever fixing the ENC.
If the lever opens completely, the ENC is pulled out.
(b) Wait for 20 seconds or more.
(c) Insert the ENC until the right and left levers close slightly, and then push the lever into the ENC side.

Figure 2-243 Dummy Replacement of the ENC(DBS/DBL)



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⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

(5) Connect a new SAS cable to the DBS/DBL and the ENC of the Drive Box. (Refer to INSTALLATION SECTION "2.10 Connecting Cables" and "2.10.2 Connecting SAS Cables".) The connection procedure is different for HT-F40SB-SCQ1HA. Follow the procedure shown below for the connection.

- When replacing the cable

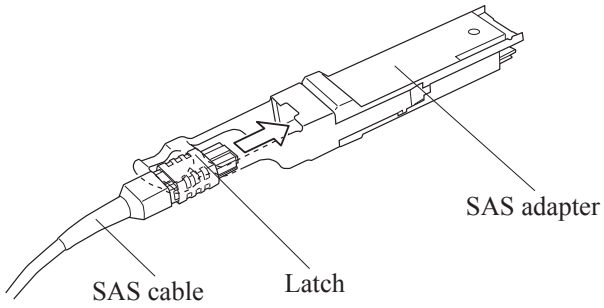
(a) Attach the SAS cable to the SAS adapter.

- When replacing the SAS adapter of the cable

(a) Attach the new SAS adapter to the SAS cable.
(b) Connect the SAS cable to the ENC.

NOTE : When connecting the DW-F800-SCQ1HA cable to the SAS adapter, check that cable latch clicks and the cable is surely connected to the SAS adapter.

Figure 2-244 How to Install DW-F800-SCQ1HA



(6) Route the SAS cable. (Refer to INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).)

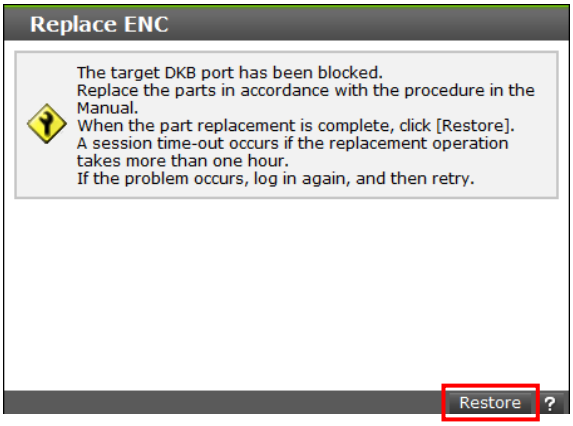
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, the SAS cable routing is not required.

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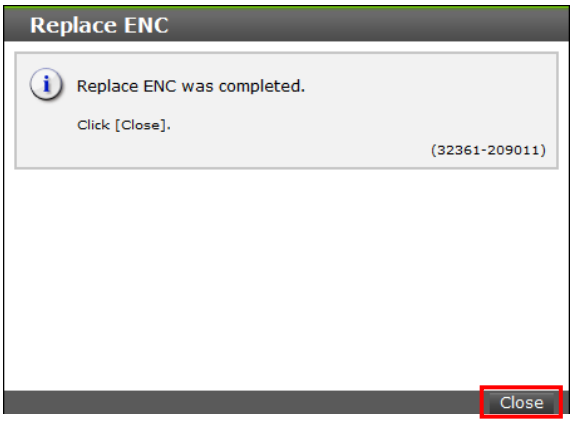
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

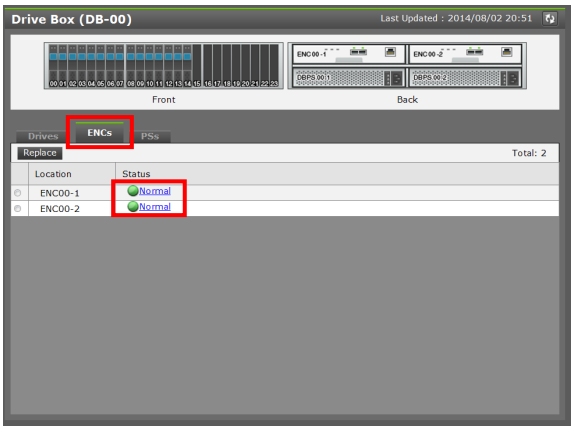


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.

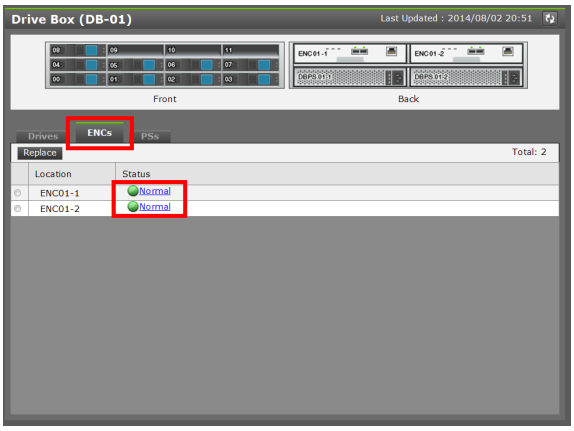


(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window to check that the status of the ENC with the replaced SAS cables is “Normal”.

• In case of DBS



• In case of DBL



(4) 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

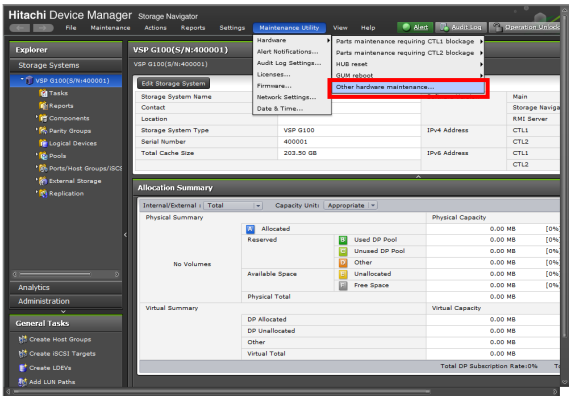
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2.20.4 Replacing a SAS Cable of DB60

When replacing the SAS cable between the Drive Boxes, it is necessary to block the ENC on the Drive Box nearer to the Controller Chassis.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the SAS cable connected to the ENC , connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

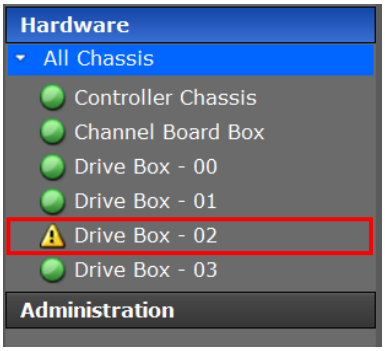


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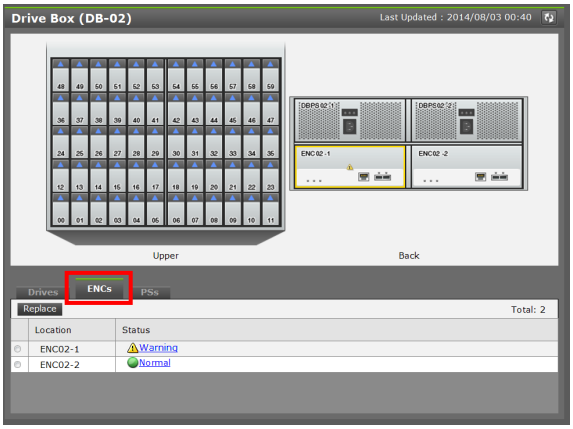
3. Selecting replacement parts by Maintenance Utility.

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

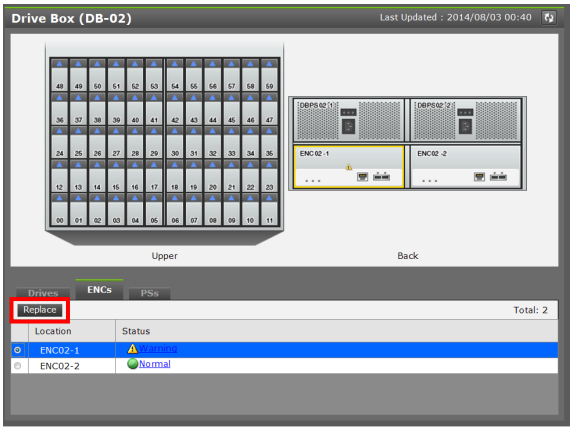
(1) <Main window>
Select [Drive Box] in the main window.



(2) <Drive Box window>
Click the [ENCs] tab in the “Drive Box” window to display an ENC status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



(3) <Select ENC>
Select an ECN to which the SAS cable to be replaced is connected, and click the [Replace] button.



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(4) <Block ENC>

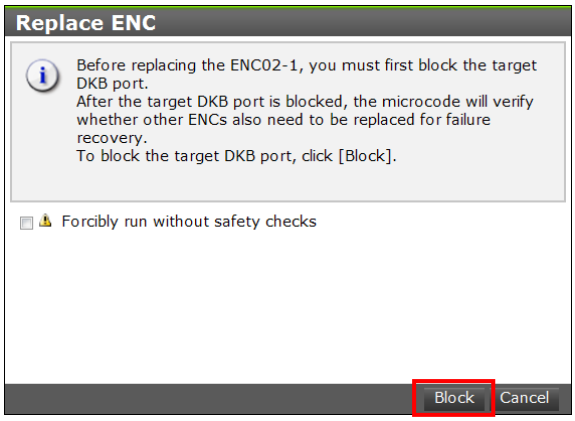
CAUTION

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.

Check the ENC to replace the SAS cable is correct and click the [Block] button.

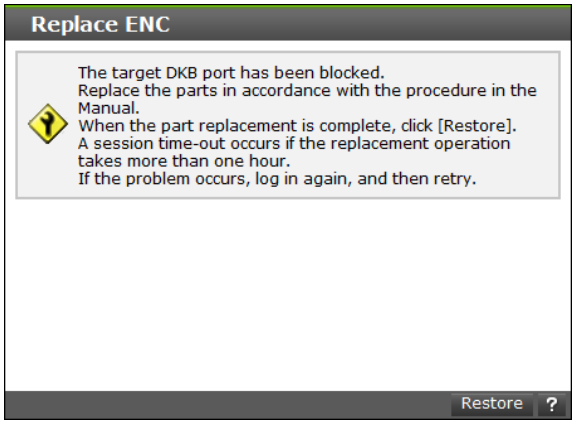
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

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



(5) <Check the beginning of SAS cable replacement>
Check that the ENC is blocked and becomes ready for replacing.

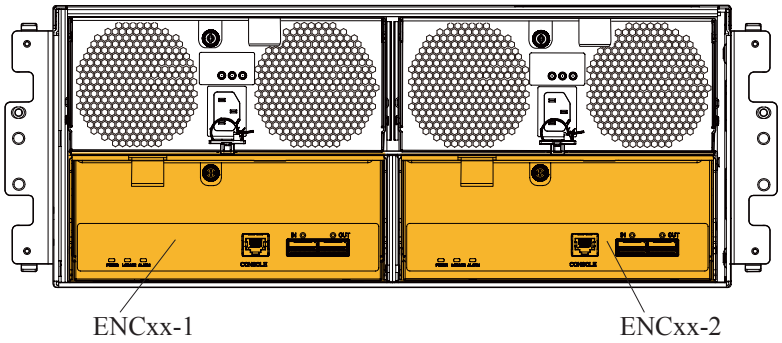
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. SAS Cable for DB60 Replacement Processing
   For the DW-F800-SCQ1HA cable, replace the SAS adapter first. If it is not recovered even after replacing the SAS adapter, replace the cable.

Location	Function Name of Component		Part Name
Rear View of DB60	1	SAS cable	• DW-F800-SCQ3 • DW-F800-SCQ5 • DW-F800-SCQ10A • DW-F800-SCQ30A • DW-F800-SCQ1HA



Rear view of DB60

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

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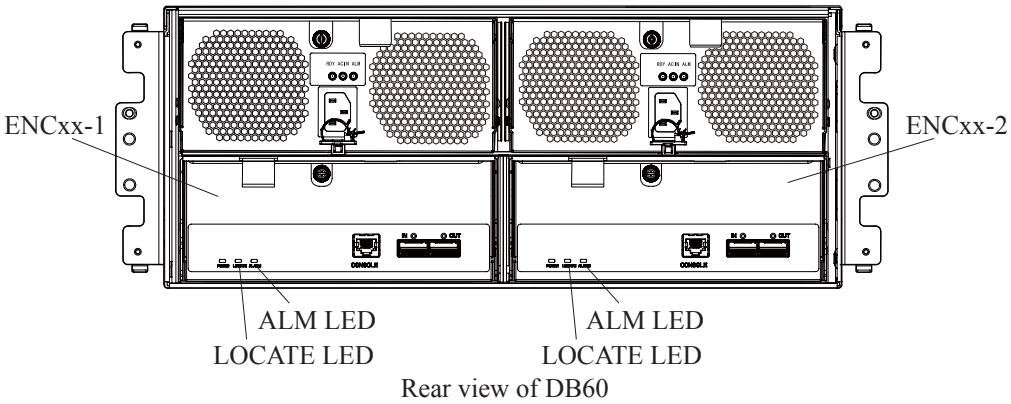
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the DB60 ENC to be replaced lights up.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-245 ALM LED Location



(2) Release the routing of the SAS cable connected to the DB60 in the reverse procedure of INSTALLATION SECTION "2.11 Routing Cables for DB60".

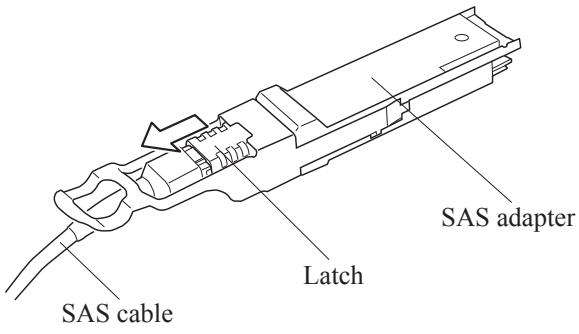
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, it is not required to release the routing of the SAS cable.

(3) Remove the SAS cable from the DB60 and the ENC of the Drive Box connected to DB60.
The removal procedure of the SAS cable is different for HT-F40SB-SCQ1HA. Remove the SAS cable from the SAS adapter for replacement.

- When replacing the cable

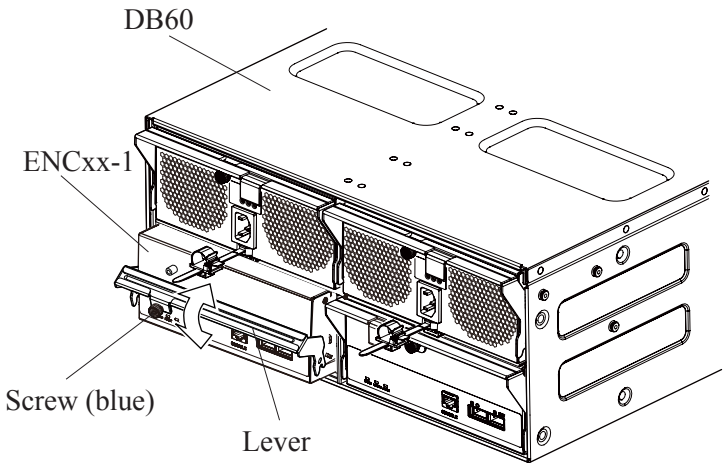
(a) Pull the latch of the SAS cable to remove from the SAS adapter.

Figure 2-246 Removing DW-F800-SCQ1HA



(4) Perform the dummy replacement of the blocked ENC.
Remove the ENC once, and then install it again.
(a) Loosen the screw (blue) fixing the ENC.
(b) Open the lever.
(c) Wait for 20 seconds or more.
(d) Push the ENC and close the lever.
(e) Tighten the screw (blue) to fix the ENC.

Figure 2-247 Dummy Replacement of the ENC (DB60)



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⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

(5) Connect a new SAS cable to the DB60 and the ENC of the Drive Box. (Refer to INSTALLATION SECTION "2.10 Connecting Cables" and "2.10.2 Connecting SAS Cables".)
The connection procedure is different for HT-F40SB-SCQ1HA. Follow the procedure shown below for the connection.

- When replacing the cable

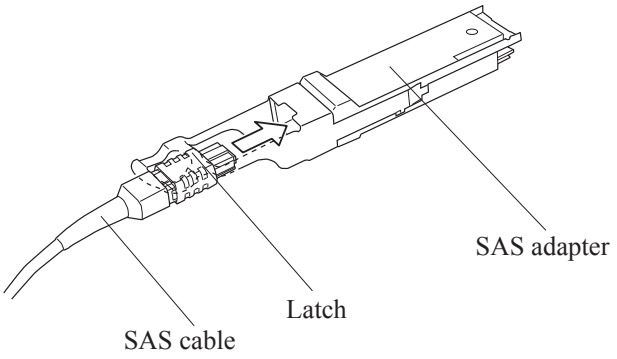
(a) Attach the SAS cable to the SAS adapter.

- When replacing the SAS adapter of the cable

(a) Attach the new SAS adapter to the SAS cable.
(b) Connect the SAS cable to the ENC.

NOTE : When connecting the DW-F800-SCQ1HA cable to the SAS adapter, check that cable latch clicks and the cable is surely connected to the SAS adapter.

Figure 2-248 How to Install DW-F800-SCQ1HA



(6) Route the SAS cable. (Refer to INSTALLATION SECTION "2.11 Routing Cables for DB60".)

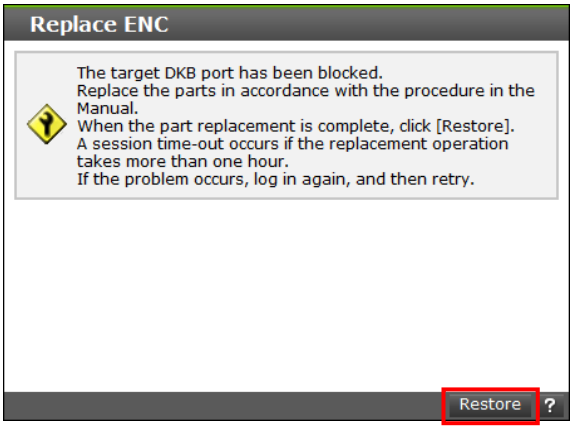
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, the SAS cable routing is not required.

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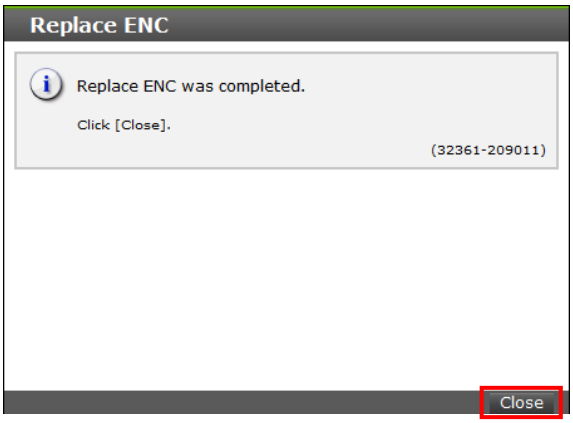
5. Restoring replacement parts by Maintenance Utility

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

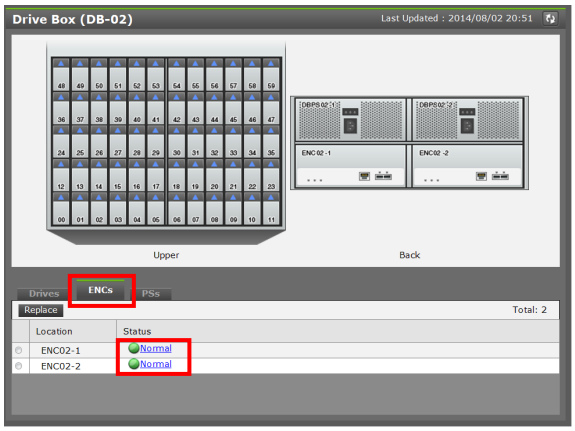
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.



(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window to check that the status of the ENC with the replaced SAS cables is “Normal”.



(4) 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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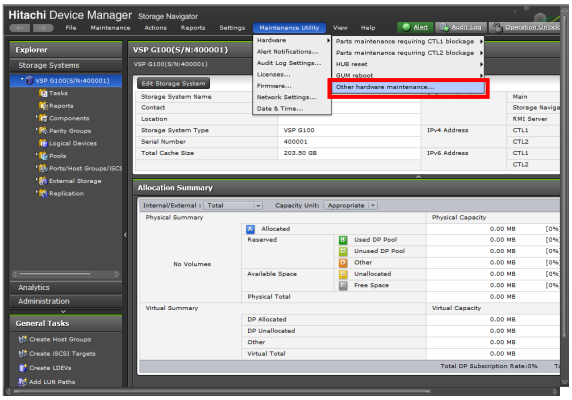
2.20.5 Replacing a SAS Cable of DBF

When replacing the SAS cable between the Drive Boxes, it is necessary to block the ENC on the Drive Box nearer to the Controller Chassis.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the SAS cable connected to the ENC, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

---

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

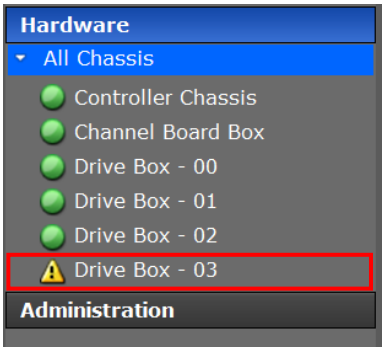


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3. Selecting replacement parts by Maintenance Utility.

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

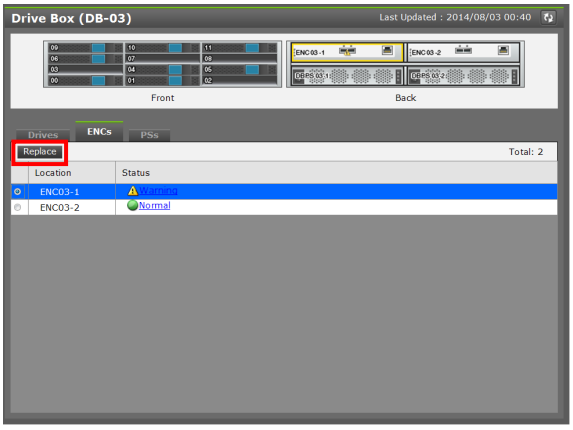
(1) <Main window>
Select [Drive Box] in the main window.



(2) <Drive Box window>
Click the [ENCs] tab in the "Drive Box" window to display an ENC status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].



(3) <Select ENC>
Select an ECN to which the SAS cable to be replaced is connected, and click the [Replace] button.



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(4) <Block ENC>

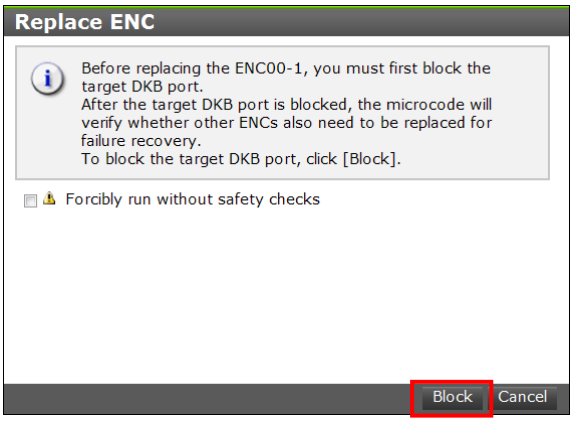
⚠ CAUTION

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.

Check that the ENC to replace the SAS cable is correct and click the [Block] button.

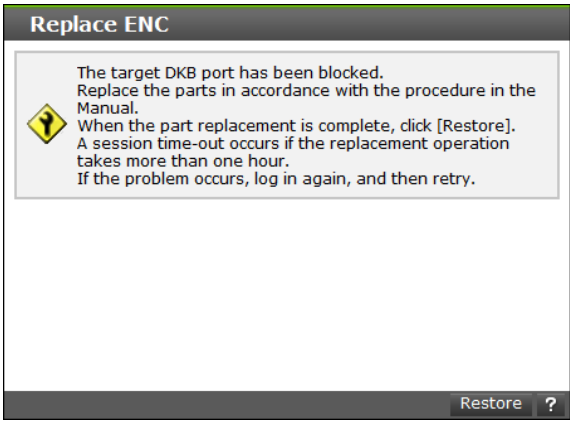
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

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



(5) <Check the beginning of ENC replacement>
Check that the ENC is blocked and becomes ready for replacing.

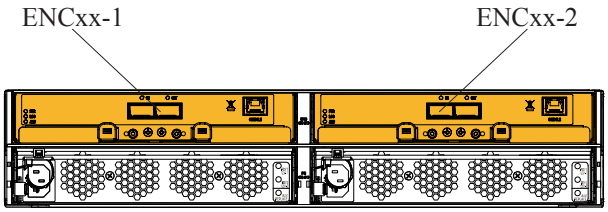
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. SAS Cable for DBF Replacement Processing
   For the DW-F800-SCQ1HA cable, replace the SAS adapter first. If it is not recovered even after replacing the SAS adapter, replace the cable.

Location	Function Name of Component		Part Name
Rear View of DBF	1	SAS Cable	• DW-F800-SCQ1 • DW-F800-SCQ1F • DW-F800-SCQ3 • DW-F800-SCQ5 • DW-F800-SCQ10A • DW-F800-SCQ30A • DW-F800-SCQ1HA



Rear view of DBF

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

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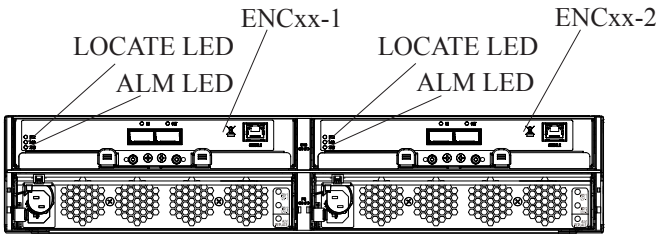
NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the ALM LED (red) on the DBF ENC to be replaced lights up.

⚠ CAUTION

If replacing the ENC not to be replaced, the system will be down. Check that the ENC is to be replaced.

Figure 2-249 ALM LED Location



Rear view of DBF

(2) Release the routing of the SAS cable connected to the DBF in the reverse procedure of INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).

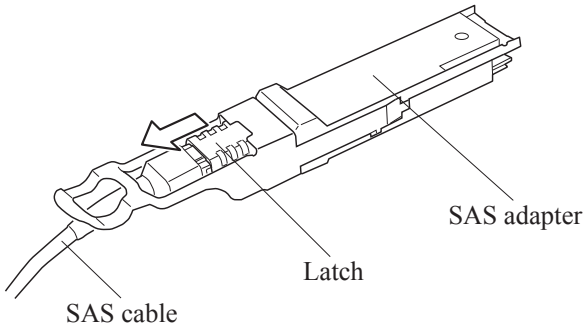
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, it is not required to release the routing of the SAS cable.

(3) Remove the SAS cable from the DBF and the ENC of the Drive Box connected to DBF.
The removal procedure of the SAS cable is different for HT-F40SB-SCQ1HA. Remove the SAS cable from the SAS adapter for replacement.

- When replacing the cable

(a) Pull the latch of the SAS cable to remove from the SAS adapter.

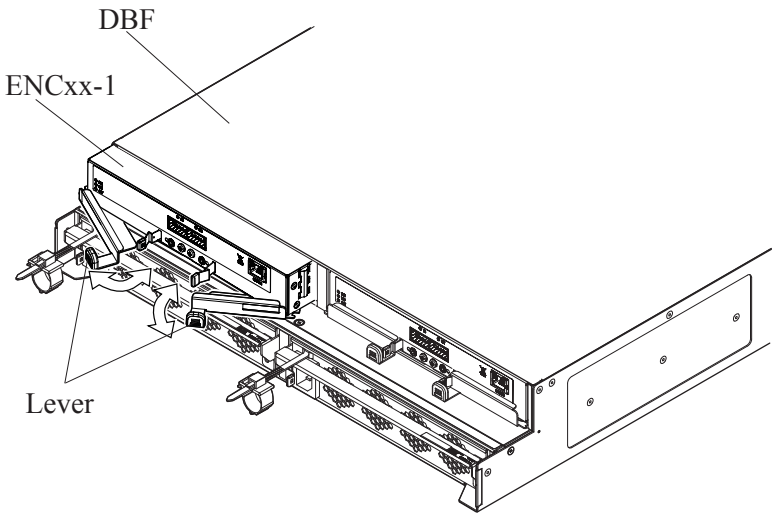
Figure 2-250 Removing DW-F800-SCQ1HA



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(4) Perform the dummy replacement of the blocked ENC.
Remove the ENC once, and then install it again.
(a) Open the lever fixing the ENC.
If the lever opens completely, the ENC is pulled out.
(b) Wait for 20 seconds or more.
(c) Insert the ENC until the right and left levers close slightly, and then push the lever into the ENC side.

Figure 2-251 Dummy Replacement of the ENC (DBF)



⚠ CAUTION

Watching for short-circuits:
A Short-circuit may cause a fire.
Never insert metal or the like into the cable connector or a short-circuit may occur.

(5) Connect a new SAS cable to the DBF and the ENC of the Drive Box. (See INSTALLATION SECTION "2.10 Connecting Cables" and "2.10.2 Connecting SAS Cables".)
The connection procedure is different for HT-F40SB-SCQ1HA. Follow the procedure shown below for the connection.

- When replacing the cable

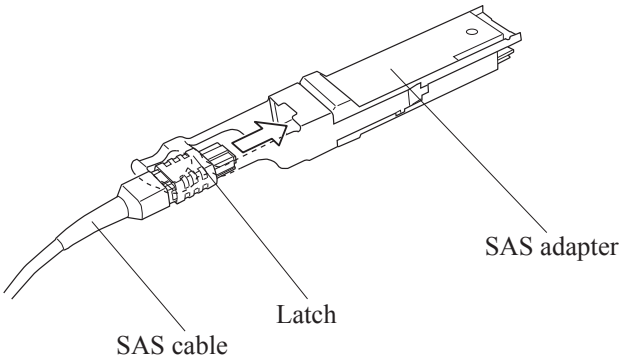
(a) Attach the SAS cable to the SAS adapter.

- When replacing the SAS adapter of the cable

(a) Attach the new SAS adapter to the SAS cable.
(b) Connect the SAS cable to the ENC.

NOTE : When connecting the DW-F800-SCQ1HA cable to the SAS adapter, check that cable latch clicks and the cable is surely connected to the SAS adapter.

Figure 2-252 How to Install DW-F800-SCQ1HA



(6) Route the SAS cable. (See INSTALLATION SECTION "3. Routing of SAS cables" (INST02-10-250).)

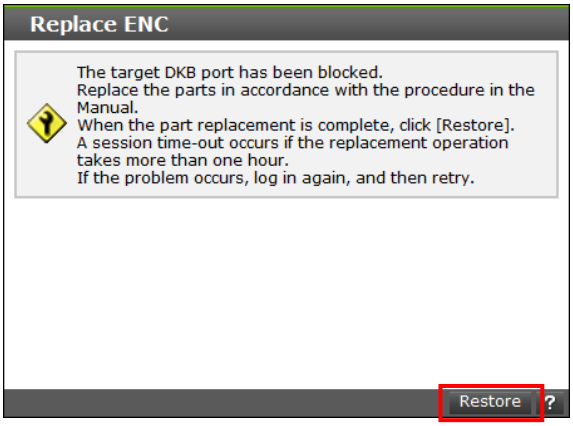
NOTE: When replacing the SAS adapter of DW-F800-SCQ1HA, the SAS cable routing is not required.

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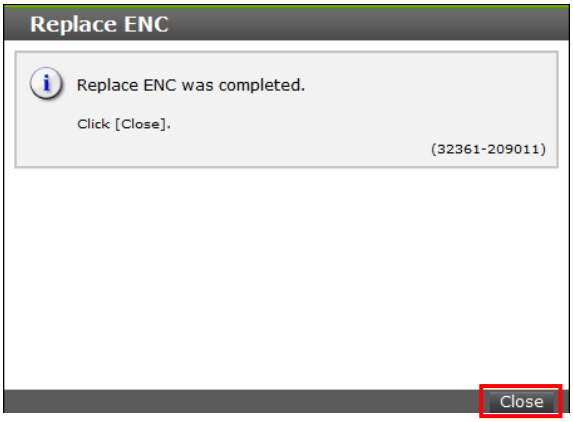
5. Restoring replacement parts by Maintenance Utility

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

(1) <Restore replacement parts>
Click the [Restore] button.

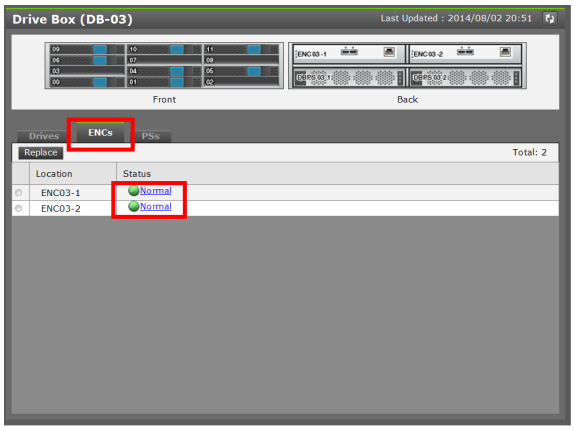


(2) <Check replacement parts restoration>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



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(3) <Check ENC restoration>
Click the [ENCs] tab in the “Drive Box” window to check that the status of the ENC with the replaced SAS cables is “Normal”.



(4) 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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

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2.21 Replacing a SVP

1. Login to the SVP.

---

2. Shutdown the SVP
   (1) In the desktop, click Start.
   (2) From the displayed menu, click Windows Security.
   (3) In the Windows Security window, click the option in the power menu.
   (4) From the displayed menu, click Shutdown.
   The SVP power goes OFF. Check the power LED of the SVP goes OFF.

   For Windows 10
   (1) Click the [Windows] button on the SVP desktop.
   (2) Select [Power] from the menu displayed and click [Shut Down].
   The SVP power goes OFF. Check the power LED of the SVP goes OFF.

---

3. For removing and installing the SVP
   For information about the service processor used with HDS VSP storage systems, refer to the Hitachi Virtual Storage Platform G200, G400, G600 Service Processor Technical Reference (FE-94HM8036).

---

4. Installing the storage management software

⚠ CAUTION

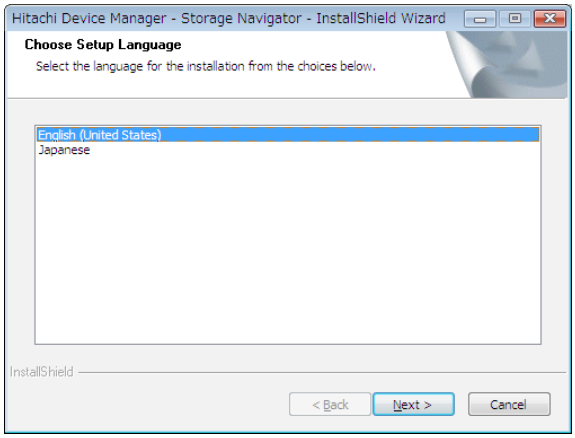
Use the installation media corresponding to the PC (Maintenance PC/SVP) for the installation/update.
If incorrect installation media is used, the Maintenance PC or the SVP does not operate correctly.
In that case, see MAINTENANCE PC SECTION "10.2 Maintenance PC Software Uninstallation" to remove it (The procedure for remove the SVP software is the same).
Then, use the correct installation media and install it again.

(1) Login to the SVP.
(2) Insert the installation media for SVP supplied with Storage System into the SVP.
(3) Right-click Setup.exe immediately under the drive to select [Execute as Administrator].

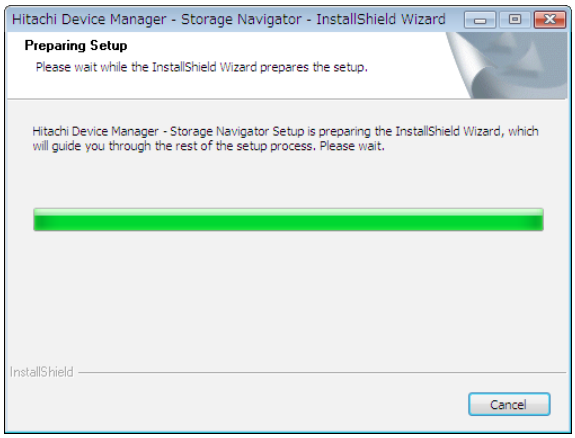
NOTE: If a DVD drive is not mounted on a PC, copy all the files of installation media for the SVP to "work folder". For a "work folder" name, do not use a double -byte character because Setup.exe might not start if a double-byte character is included in the name. Then, use the files in "work folder".

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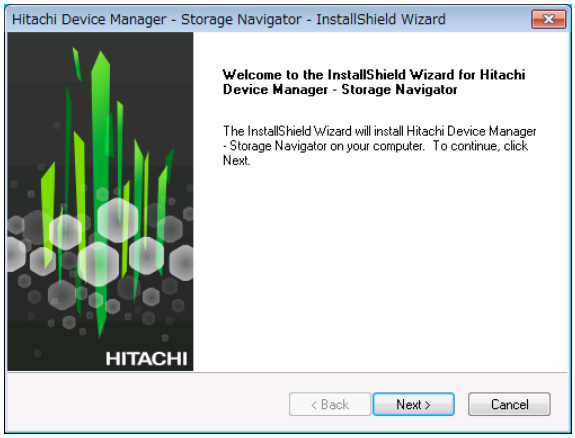
(4) Select the language.



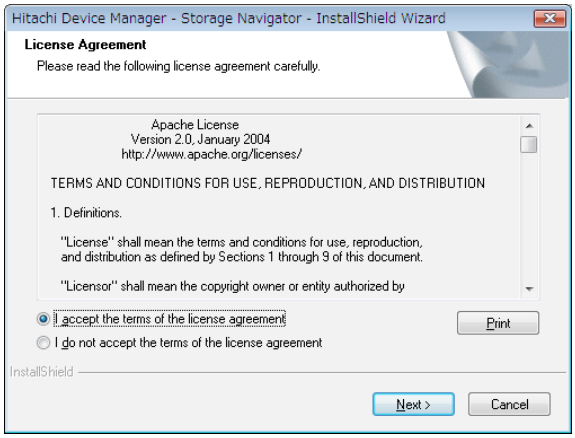
(5) Launch the Installation wizard.



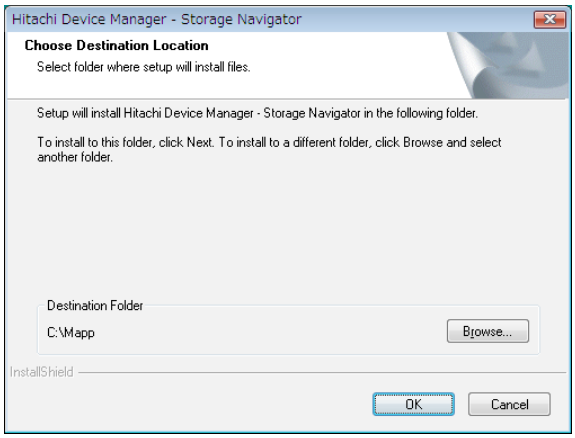
(6) The “InstallShield” window is displayed when the preparation is completed. Click the [Next >] button.



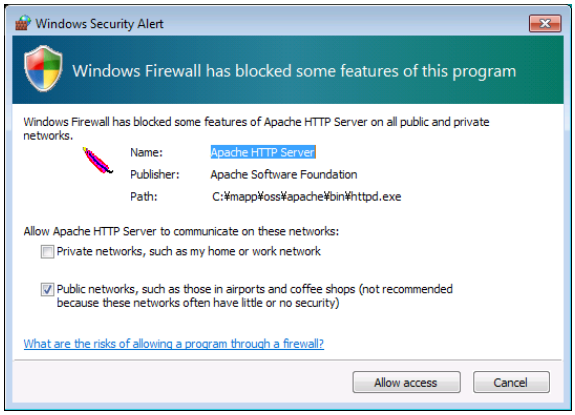
(7) The License Agreement window of JRE, Perl, Apache, Jetty, Openssl and Flash appears. Click I accept the terms in the license agreement, and then click Next.



(8) Select a directory to be installed and click [OK]. Specify [C:\Mapp] for the directory.

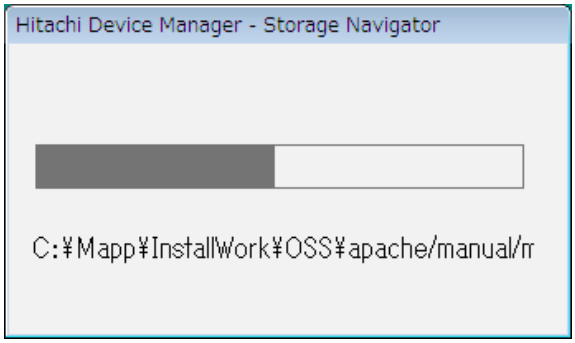


NOTE:
- The directory selection is the procedure required at the time of initial installation only. When OSS is installed, the skip confirmation message is displayed. Click [Yes]. When the “Windows Security Alert” window is displayed, click [Allow Access].
- If confirm the version of software that is installed in Maintenance PC, refer to MAINTENANCE PC SECTION “1.5.4 Maintenance PC Software Installation”.
- To change the default directory to a different one, available characters for the directory are one-byte alphanumeric characters, ‘-’ (hyphen), and ‘_’ (underscore). The number of characters for a directory path is up to 22.

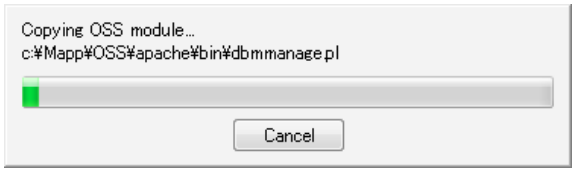


(9) Decompress the files in the media and copy them to the folder selected in Step 9. The following window is displayed during the processing. Wait until the decompression and copy are completed.

<Decompressing Files>



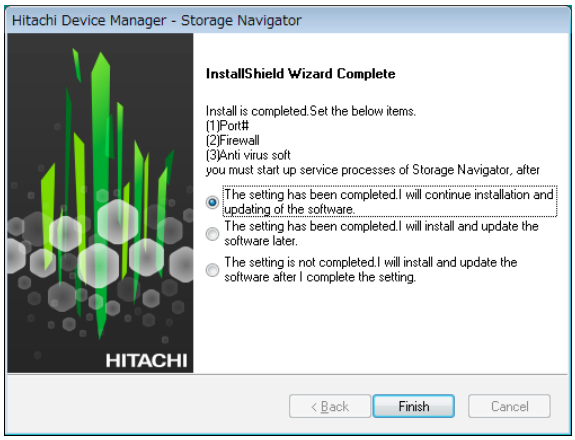
<Copying Files>



(10) The installation completion message is displayed.

- When the firmware version of Installation Media for SVP is 83-01-21 or later

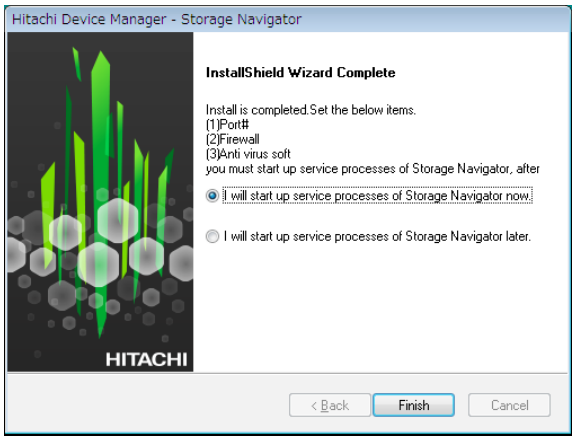
(a) Select [The setting has been completed. I will continue installation and updating of the software.] and click the [Finish] button.



Go to Step (11).

- When the firmware version of Installation Media for SVP is earlier than 83-01-21

(a) Select [I will start up service processes of Storage Navigator now.] and click the [Finish] button.



Go to Step (11).

(11) The “Storage Device List” window is displayed. Register the storage system.

NOTE: If the customer backed up the SVP, register the storage system in the Storage Device List, and then restore the SVP.

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2.22 Replacing Air Filters

1. Remove the Front Bezel. (Refer to 2.2.1 How to Attach/Remove Front Bezel.)

2. Remove the air filter from behind the Front Bezel.

   NOTE: The air filter is fixed by the hook behind the Front Bezel. Adjust the power and remove the air filter.

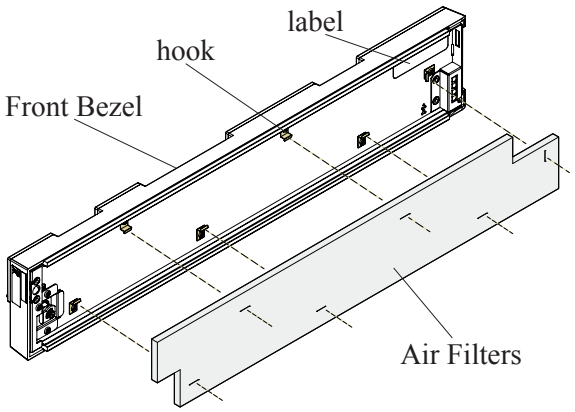
3. Place a new filter behind the Front Bezel so that you can see the label.

4. Hang the new air filer on the hook and fix it.

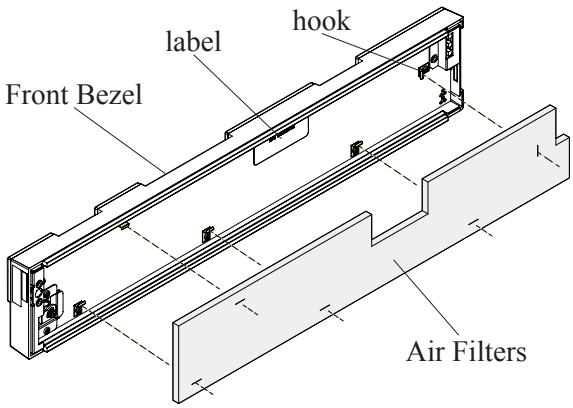
   NOTE: You can fix the air filter by pushing the hook behind the Front Bezel lightly.

5. Attach the Front Bezel. (Refer to 2.2.1 How to Attach/Remove Front Bezel.)

In case of CBSSD/CBSLD

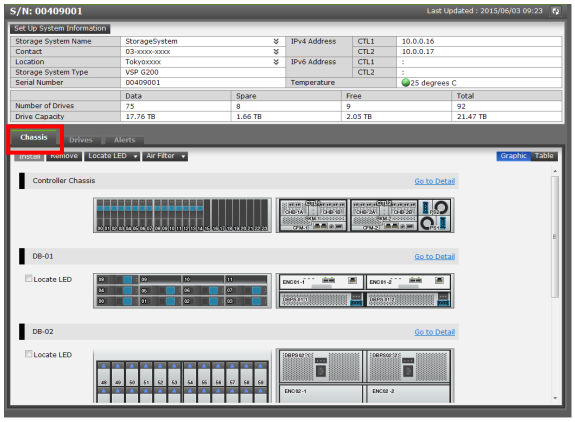


In case of DBSD/DBLD

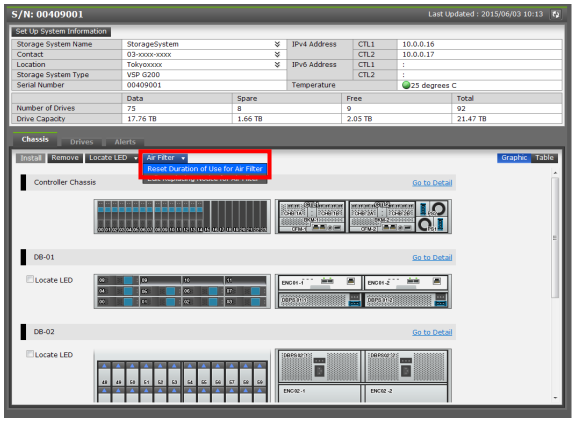


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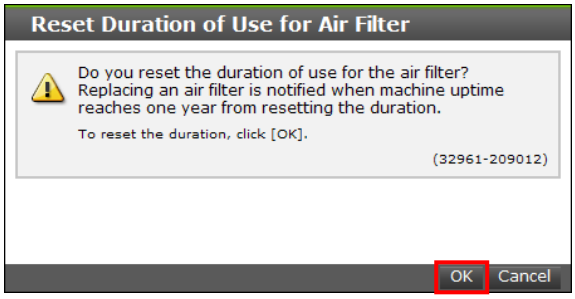
6. Click the [Chassis] tab in the “Maintenance Utility” window.



7. Click the [Air Filter] button and select [Reset Duration of Use for Air Filter].



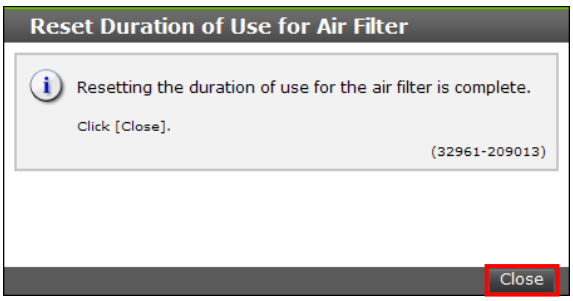
8. Click the [OK] button.



9. Enter the password and click the [OK] button.

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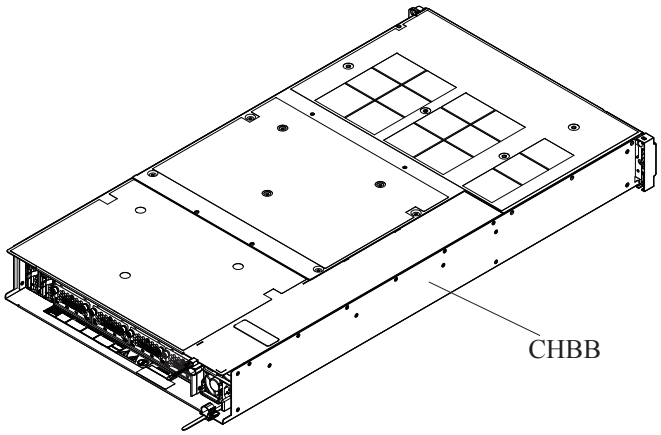
10. Check that a completion message is displayed. Click the [Close] button.



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2.23 Replacing a Channel Board Box

Location	Function Name of Component		Part Name
Rack	1	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 "1.1.3 Note on Installing and Removing Parts".
- The PDU may connect to other devices. When replacing it, check the precautions for the connected devices before the replacement.

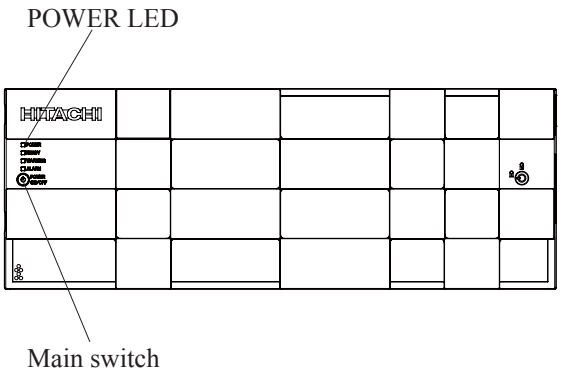
1. Power off the rack.

⚠ WARNING

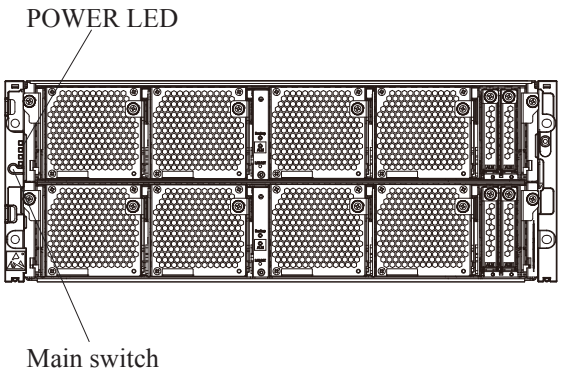
Hazardous voltage:
Contact could cause electric shock or burn. Turn off all related breakers and discharge residual voltage, as shown below. (Follow next procedures.)

(1) Press the Main Switch on the front of the CBLH for three second to turn off.
(2) Confirm that the POWER LED on the front side of the CBLH lights in amber.

Figure 2-253 Main Switch and POWER LED on the front of CBLH



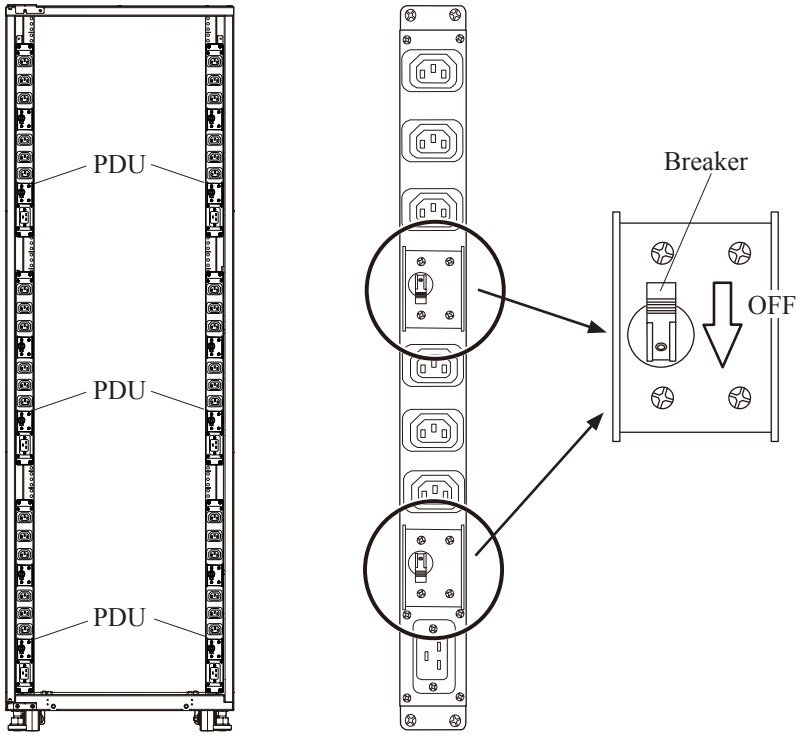
Front view of CBLH
(With Front Bezel attached)



Front view of CBLH
(With Front Bezel Detached)

(3) Turn off the breaker at the PDU on the rack frame.

Figure 2-254 Turning-off Breakers



Rear view of rack frame Front view of PDU

(4) Turn off the breaker on the power distribution panel in the plant that is connected to the PDU.

NOTE: The circuit has residual voltage after turning off the breakers, so wait for one minute.

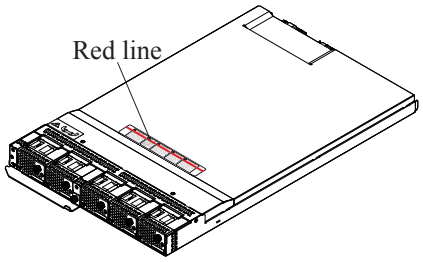
2. Remove the Front Bezel.
   (1) Remove the Front Bezel from the Channel Board Box. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

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3. Remove the Switch Package (SWPK)

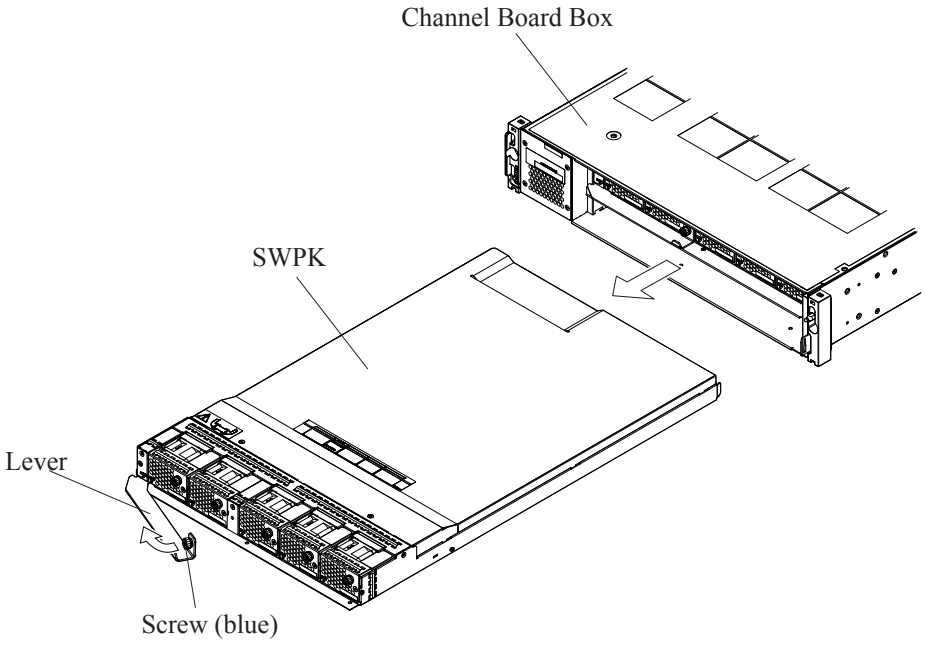
⚠ CAUTION

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



(1) Loosen the screw (blue) which fixes the Switch Package and open the lever to pull out.
(2) When the levers are completely opened, the Switch Package comes out forward.
(3) Pull out and remove the Switch Package while holding its body with both hands.
(4) Remove the other Switch Package in the same manner.

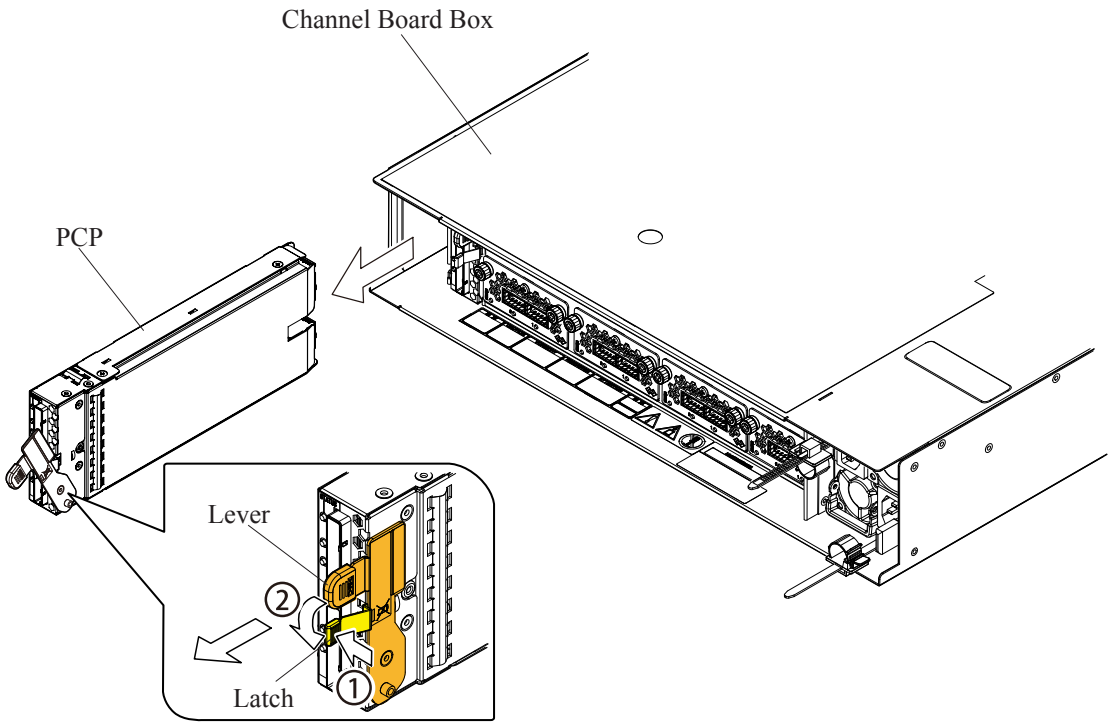
Figure 2-255 Removing Switch Package (SWPK)



4. Remove the PCIe-cable Connecting Package (PCP)

(1) Remove all the PCIe cables connected to the PCIe-cable Connecting Package.
(2) Open the lever toward you (②) while pressing the latch (①).
(3) Pull out and remove the PCIe-cable Connecting Package.
(4) Remove the other PCIe-cable Connecting Package in the same manner.

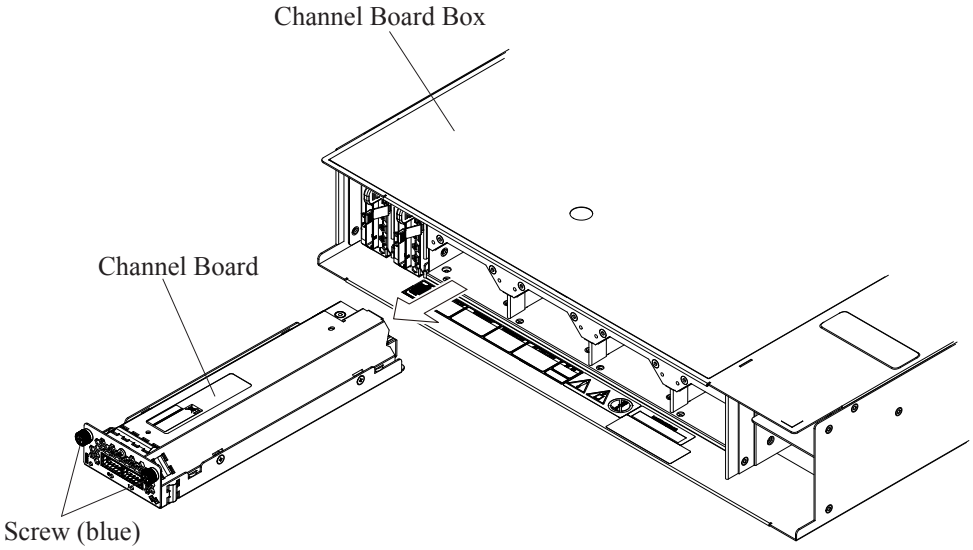
Figure 2-256 Removing PCIe-cable Connecting Package (PCP)



5. Remove the Channel Board

(1) Remove all the cables connected to the Channel Board.
(2) Loosen the two screws (blue) which fix the Channel Board.
(3) Pull out and remove the Channel Board while holding the screws (blue).
(4) Remove the other Channel Board in the same manner.

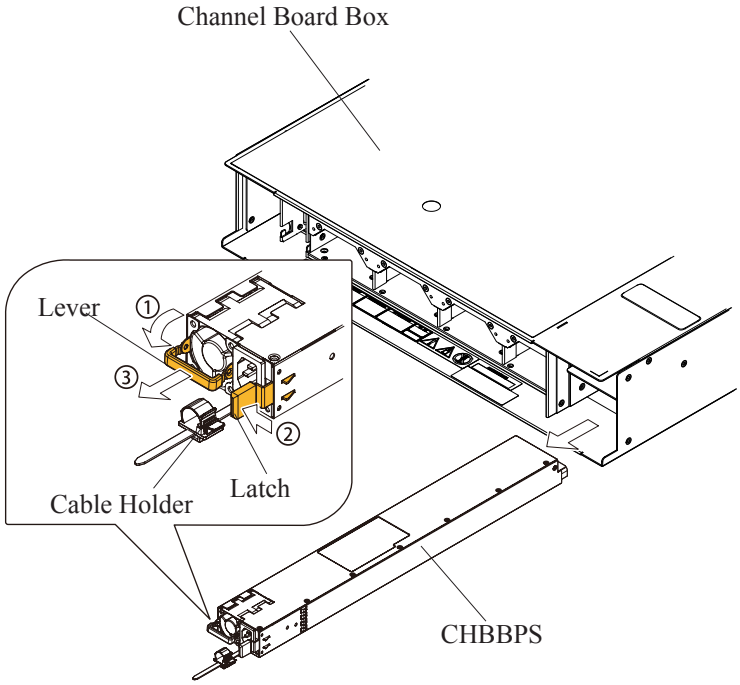
Figure 2-257 Removing Channel Board



6. Remove the CHBBPS

(1) Remove the cable holder from the power cable and remove the power cable from the CHBBPS.
(2) Pull the lever open (①).
(3) Pull the lever (③) while pressing the latch on the CHBBPS inward (②).
(4) Pull out and remove the CHBBPS while holding its body with both hands.
(5) Remove the other CHBBPS in the same manner.

Figure 2-258 Removing CHBBPS

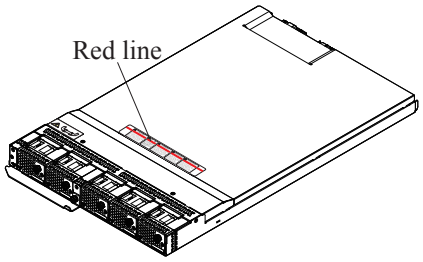


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7. Remove/Install the Channel Board Box

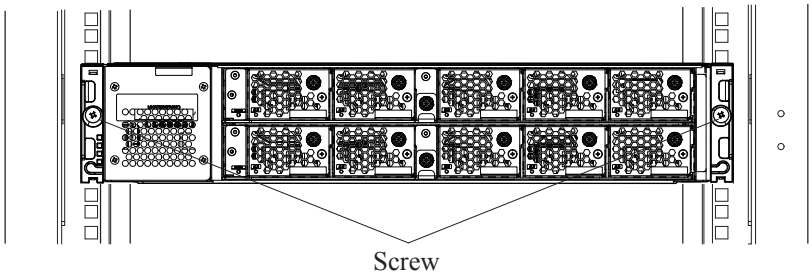
CAUTION

Dropping the Storage System may cause injury. Keep hands securely on array. Be aware of the red line marked on the Storage System top - when sliding the Storage System out of the rail terminal past this mark, keep a firm hold on the Storage System.



(1) Remove the right and left screws (one each) fixing the Channel Board Box.
(2) Remove the Channel Board Box from the rack frame.
(3) Install a new Channel Board Box from the front of the rack.
(4) Fix the right and left of the Channel Board Box with screws (one each).

Figure 2-259 Removing/Installing Channel Board Box

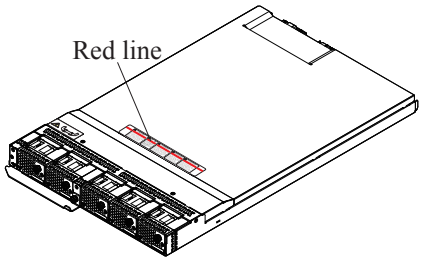


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8. Installing Switch Package (SWPK)

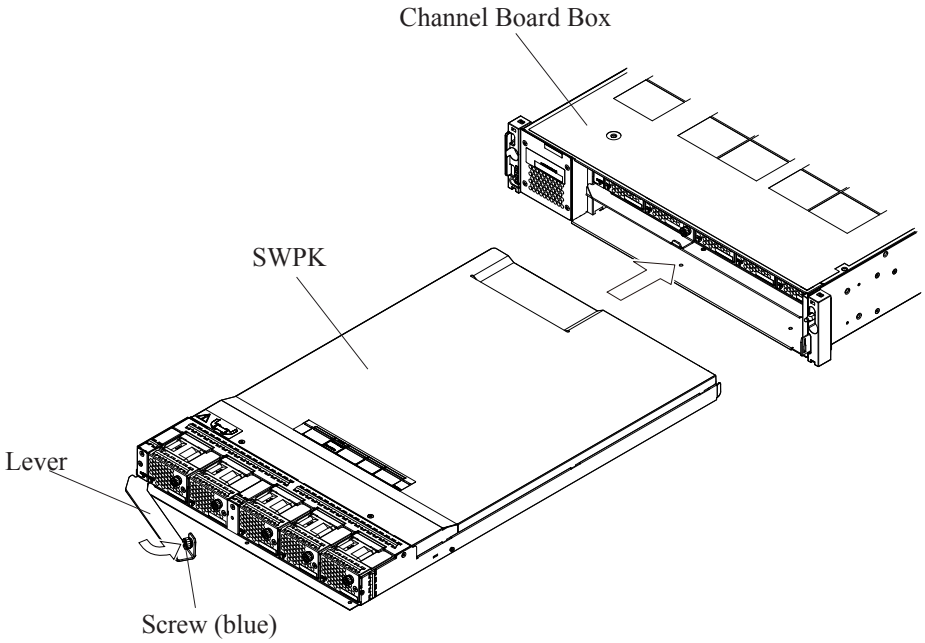
⚠ CAUTION

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



(1) With the Switch Package lever opened completely, insert the Switch Package into the slot position of the Channel Board Box.
(2) Insert the lever of the Switch Package is slightly closed, and then push the lever toward the Switch Package (SWPK).
(3) Tighten the screw (blue) and fix the Switch Package.
(4) Install the other Switch Package in the same manner.

Figure 2-260 Installing Switch Package (SWPK)

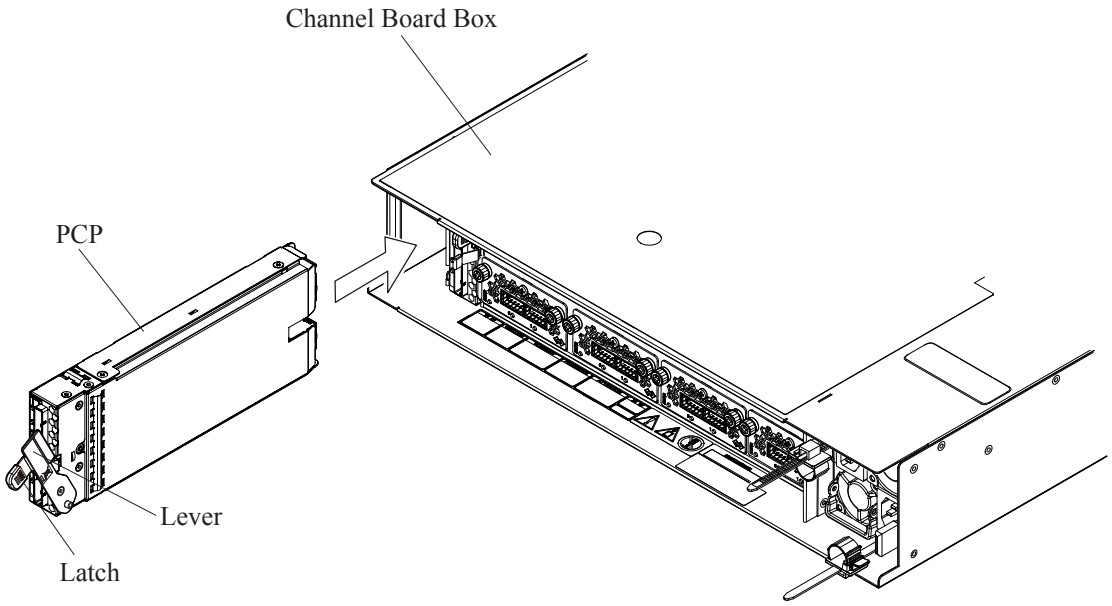


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9. Installing PCIe-cable Connecting Package (PCP)

(1) With the lever opened completely, insert the PCIe-cable Connecting Package into the slot.
(2) Push the PCIe-cable Connecting Package in all the way.
(3) Push the lever until the latch of PCIe-cable Connecting Package clicks.
(4) Install the other PCIe-cable Connecting Package in the same manner.
(5) Connect the PCIe cables to the replaced PCIe-cable Connecting Package.

Figure 2-261 Installing PCIe-cable Connecting Package (PCP)

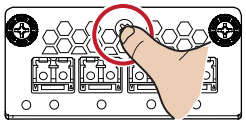


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10. Installing Channel Board

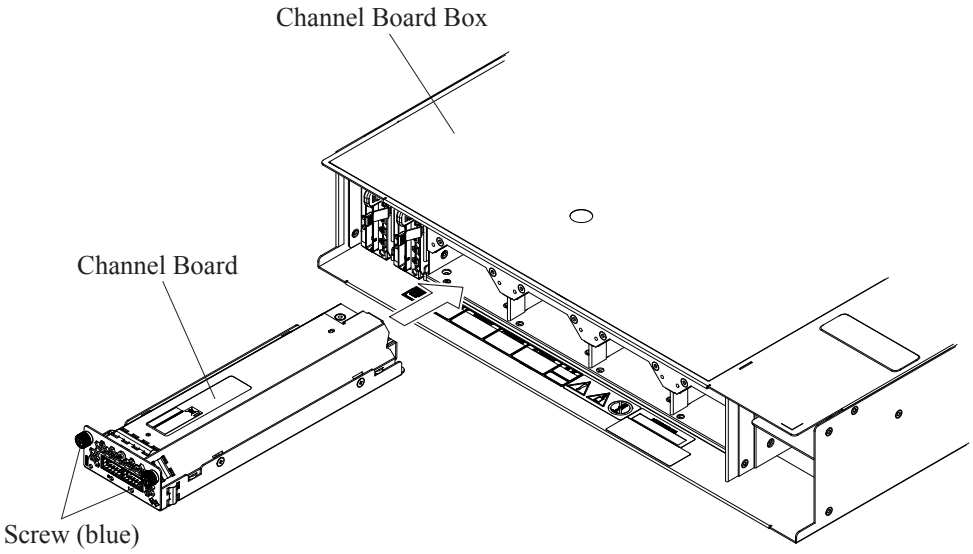
(1) Insert the Channel Board into the slot.
(2) Push the Channel Board in all the way.

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



(3) Tighten the two screws (blue) to fix the Channel Board.
(4) Install the other Channel Board in the same manner.
(5) Connect the cables to the Channel Board.

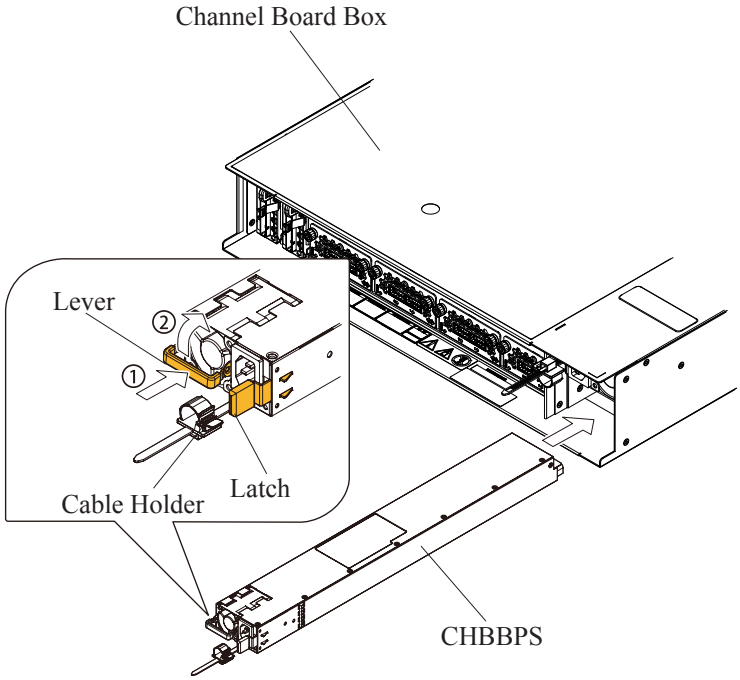
Figure 2-262 Installing Channel Board



11. Installing CHBBPS

(1) Hold up the latch on the cable holder of the CHBBPS to release the lock, and then slide the cable holder forward.
(2) With the lever completely opened, insert the CHBBPS into the slot.
(3) Push the Power Supply until the latch of the CHBBPS clicks.
(4) Close the lever completely to fix the CHBBPS.
(5) Install the other CHBBPS in the same manner.
(6) Connect the power cable to the CHBBPS, and then fix the cable by the cable holder.

Figure 2-263 Installing CHBBPS



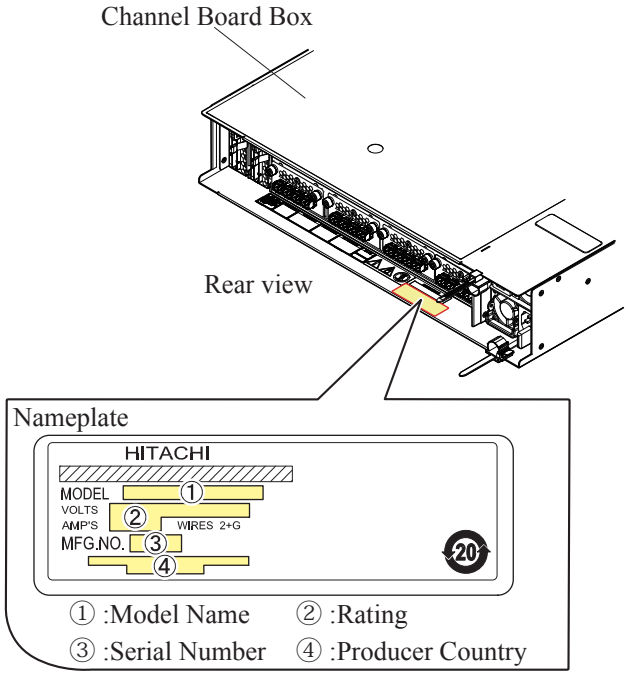
12. Attach the nameplate

Take out the nameplate in which the same model name as the removed Channel Board Box is described from the nameplates attached to the spare Channel Board Box. Write down the same serial number as the removed Channel Board Box in the nameplate, and then affix the nameplate to the spare Channel Board Box.

When the nameplate in which the same model name as the removed Channel Board Box is described is not attached, take out the nameplate in which the same rating and producer country as the removed Channel Board Box are described and which the model name is not described. Write down the same model name and serial number as the removed Channel Board Box in the nameplate, and then affix it to the spare Channel Board Box.

To fill in the nameplate, use the RoHS-compliant marker pen.

Figure 2-264 Attachment of Nameplate



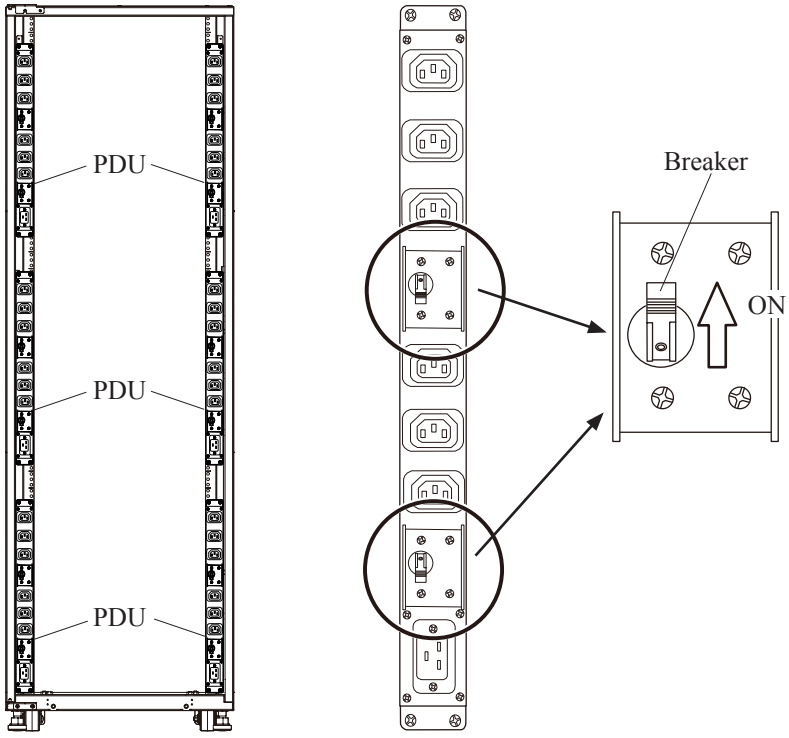
13. Attach the Front Bezel

Attach the Front Bezel referring to “2.2.1 How to Attach/Remove Front Bezel”.

14. Powering on the rack frame

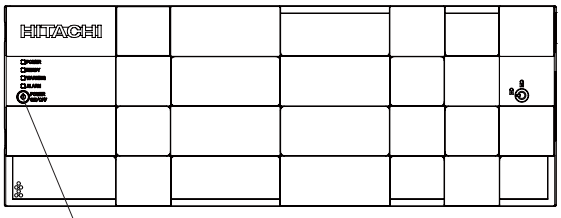
(1) Turn on the breaker on the power distribution panel.
(2) Turn on the breaker at the PDU on the rack frame.

Figure 2-265 Turning-on Breakers

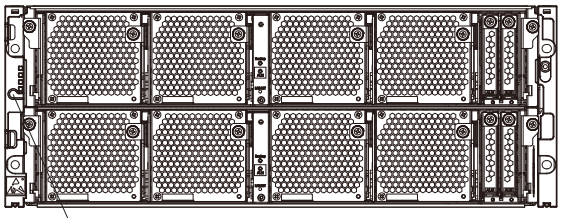


Rear view of rack frame Front view of PDU

(3) Press the Main Switch on the front of the CBLH for three second to turn on.



Front view of CBLH
(With Front Bezel attached)



Front view of CBLH
(With Front Bezel detached)

15. Check that the READY LED on the front of the CBLH lights up, and then the operation is complete.

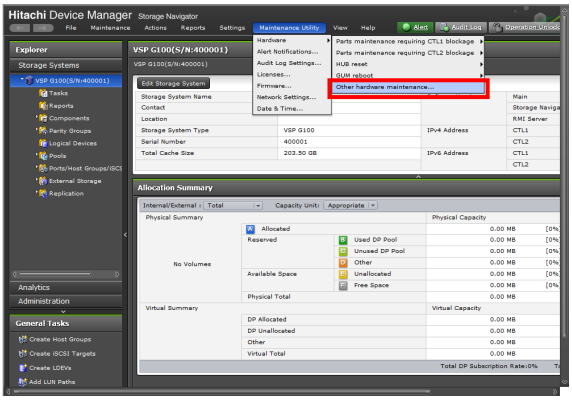
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2.24 Replacing a PCIe Channel Board

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the PCIe Channel Board, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

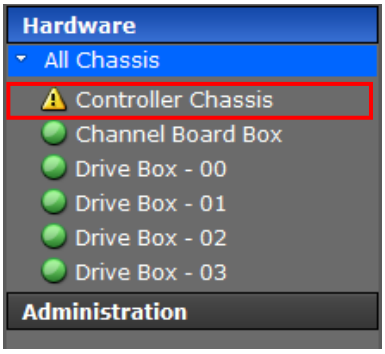


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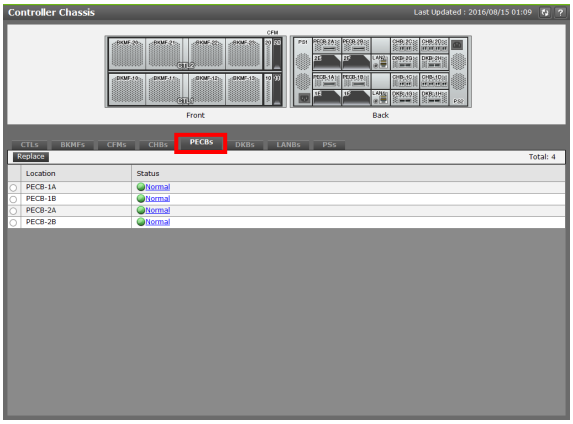
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.

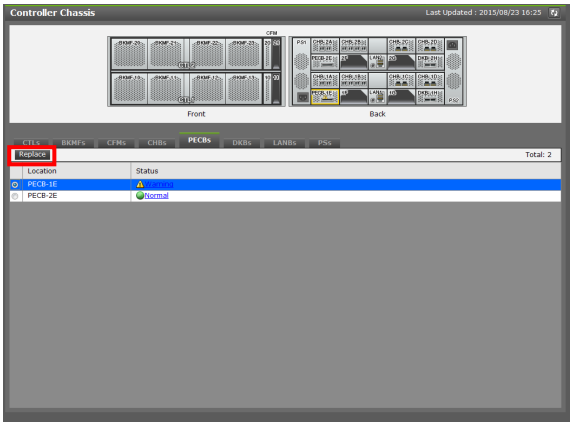


(2) <Controller Chassis window>
Click the [PECBs] tab in the “Controller Chassis” window to display a PCIe Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



(3) <Select PCIe Channel Board>

Select a PCIe Channel Board to be replaced. Click the [Replace] button.



(4) <Block PCIe Channel Board>

⚠ CAUTION

About "Forcibly run without safety checks":

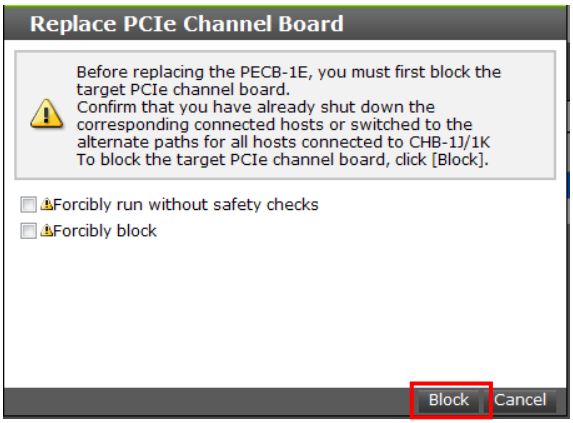
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the PCIe Channel Board to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

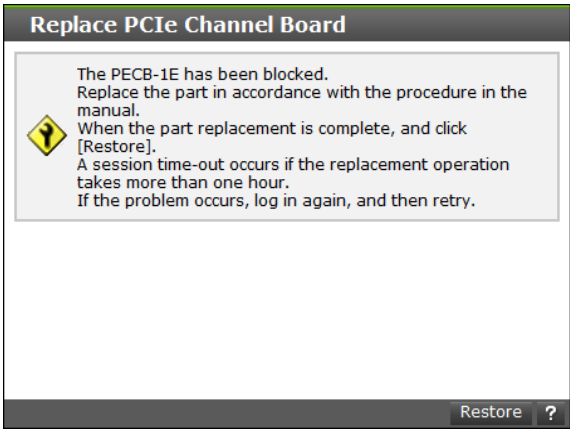
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of PCIe Channel Board replacement>
Check that the PCIe Channel Board is blocked and becomes ready for replacing.

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

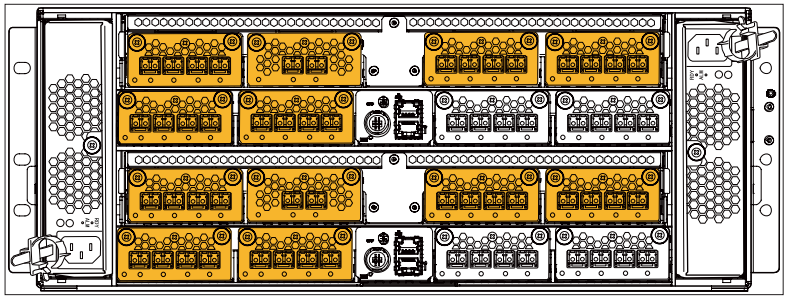


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4. PCIe Channel Board replacement processing

Location	Replacement parts name		Part Name
Rear side of CBLH	1	PCIe Channel Board	• DW-F800-1HP8

Up to two PCIe Channel Boards are mounted on the slots A/B, C/D, and E/F for each Controller Board.

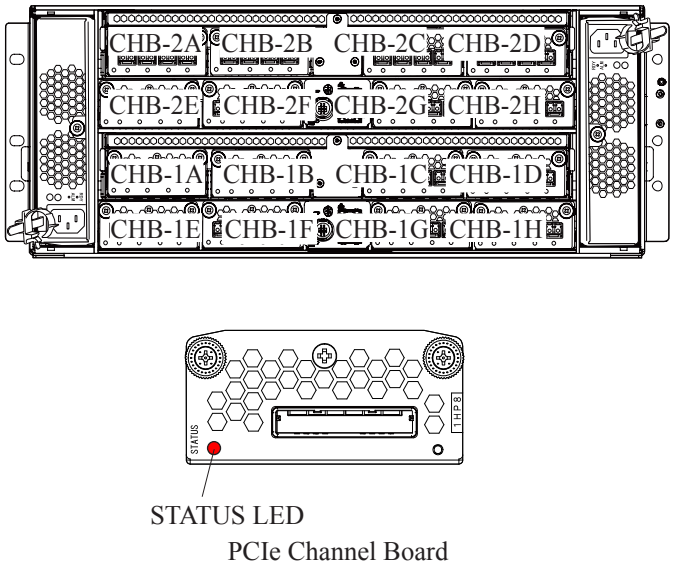


CBLH (Rear view)

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the PCIe Channel Board to be replaced lights up. If the LED does not light up, check the location of the PCIe Channel Board to be replaced in the "Maintenance Utility" window.

Figure 2-266 STATUS LED Location

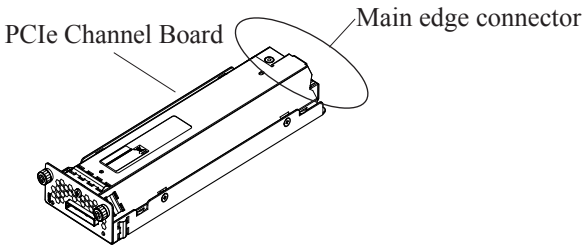


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(2) Remove the cables from the PCIe Channel Board to be replaced.

(3) Replace the PCIe Channel Board.

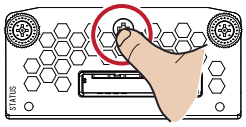
NOTICE: When removing the PCIe Channel Board, hold it with both hands and remove it straight not to apply a shock to with any components.



NOTICE: If PCIe Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the PCIe Channel Boards in two steps, Step (c) and Step (d) shown below.

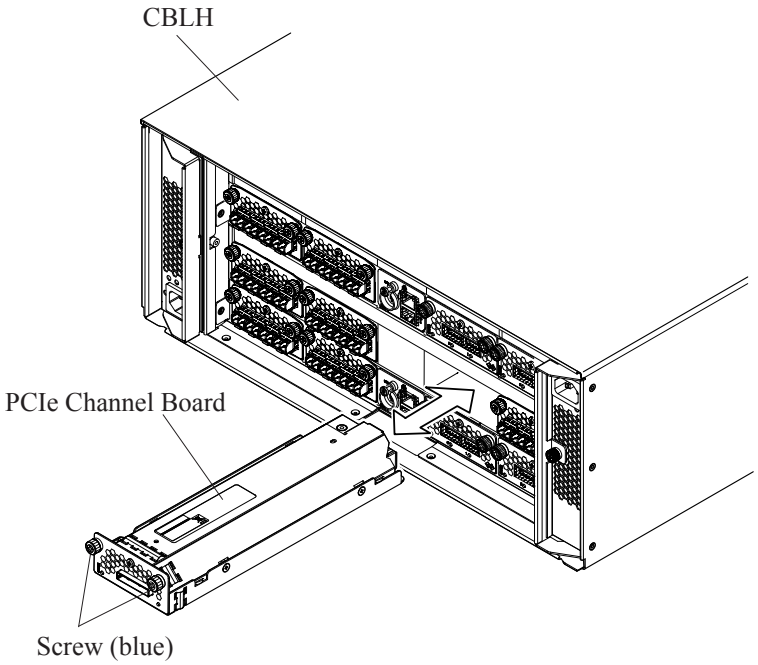
(a) Loosen the two screws (blue) which fix the PCIe Channel Board.
(b) Pull out and remove the PCIe Channel Board while holding the screws (blue).
(c) Insert the PCIe Channel Boards to be added into the slots just before the shield finger.
(d) Push the PCIe Channel Boards gently all the way in.

NOTICE: Push the front side of the PCIe Channel Board all the way to insert it to the end.



(e) Tighten the two screws (blue) to fix the PCIe Channel Board.

Figure 2-267 Replacement of PCIe Channel Board



(4) Clean the cable connectors.
   (a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
   (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
   (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached.)

(5) Connect the cables to the replaced PCIe Channel Board.

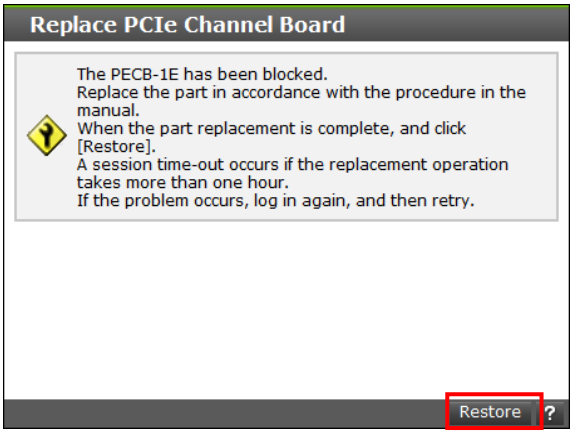
   NOTE: Check that cable latch clicks and the cables are surely connected.

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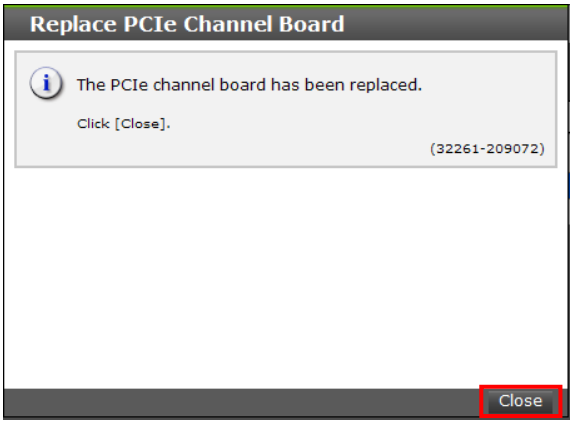
5. Restoring replacement parts by Maintenance Utility

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

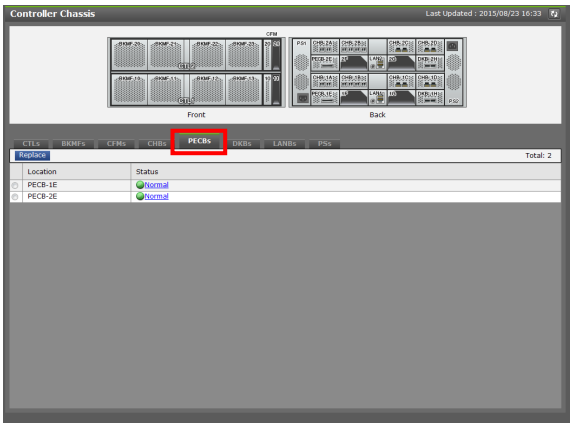
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.

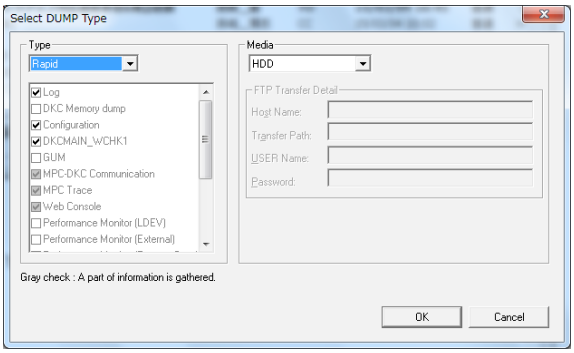


(3) <Check PCIe Channel Board restoration>
Click the [PECBs] tab in the "Controller Chassis" window and check that the status of the replaced PCIe Channel Board is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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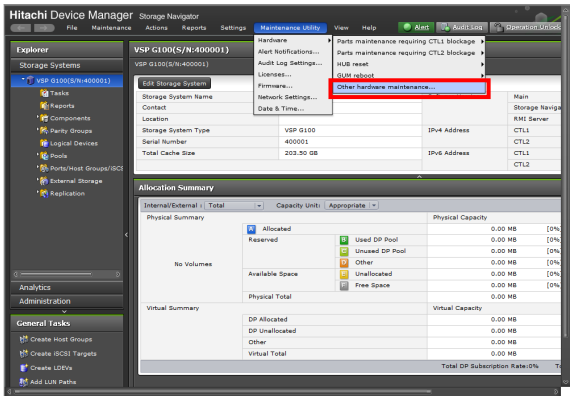
2.25 Replacing a PCIe-cable Connecting Package

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing a PCIe-cable Connecting Package, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

---

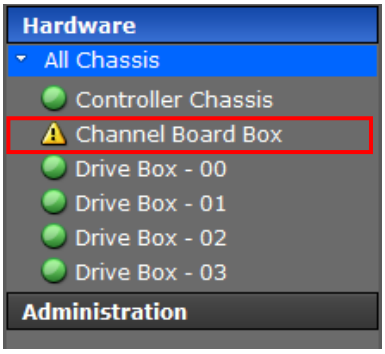
2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 Connecting to the Storage System".
   (2) Selecting the toolbar [Maintenance Utility] – [Hardware] – [Other Hardware Maintenance ⋯] in the "Web Console" window displays the "Maintenance Utility" window.



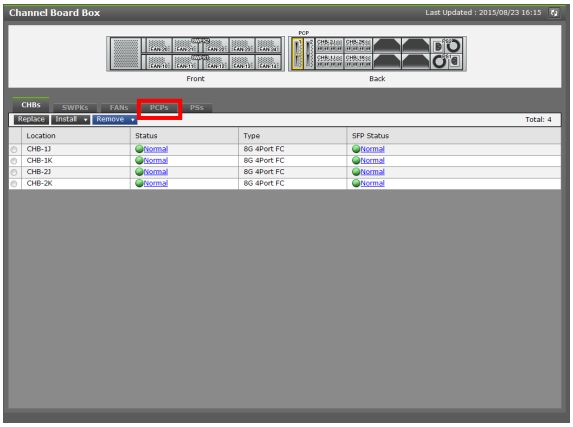
3. Selecting replacement parts by Maintenance Utility.

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 [Channel Board Box] in the main window.



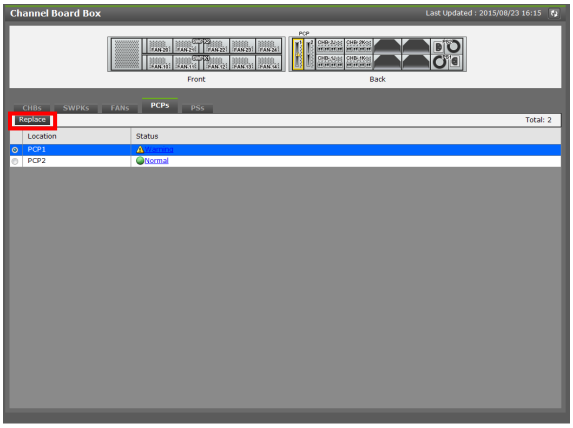
(2) <Channel Board Box window>
Click the [PCPs] tab in the “Channel Board Box” window to display a PCIe-cable Connecting Package status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select PCIe-cable Connecting Package>

Select a PCIe-cable Connecting Package to be replaced. Click the [Replace] button.



(4) <Block PCIe-cable Connecting Package>

⚠ 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.

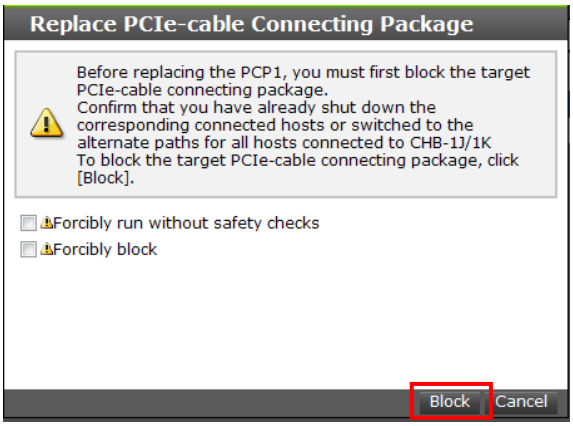
About "Forcibly block":

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.

Click the [Block] button after checking that the PCIe-cable Connecting Package to be replaced is correct.

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

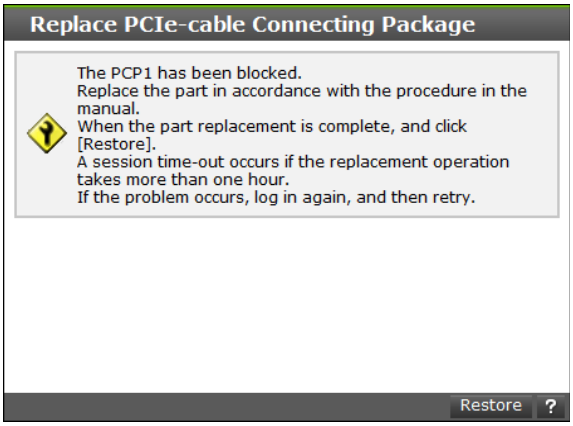
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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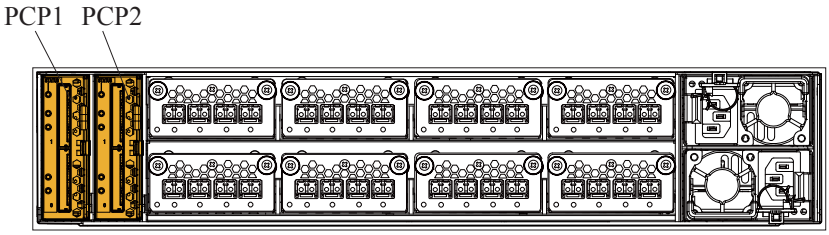
(5) <Check the beginning of PCIe-cable Connecting Package replacement>
Check that the PCIe-cable Connecting Package is blocked and becomes ready for replacing.

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



4. PCIe Channel Board replacement processing

Location	Replacement parts name		Part Name
Rear side of CHBB	1	PCIe-cable Connecting Package	• PCP

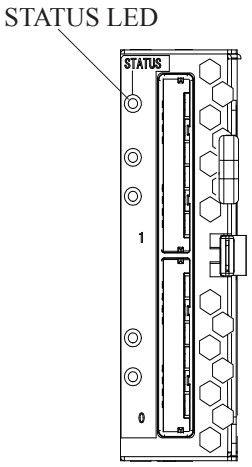


CHBB (Rear view)

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the PCIe-cable Connecting Package on the Channel Board Box to be replaced lights up. If the LED does not light up, check the location of the PCIe-cable Connecting Package to be replaced in the "Maintenance Utility" window.

Figure 2-268 STATUS LED Location



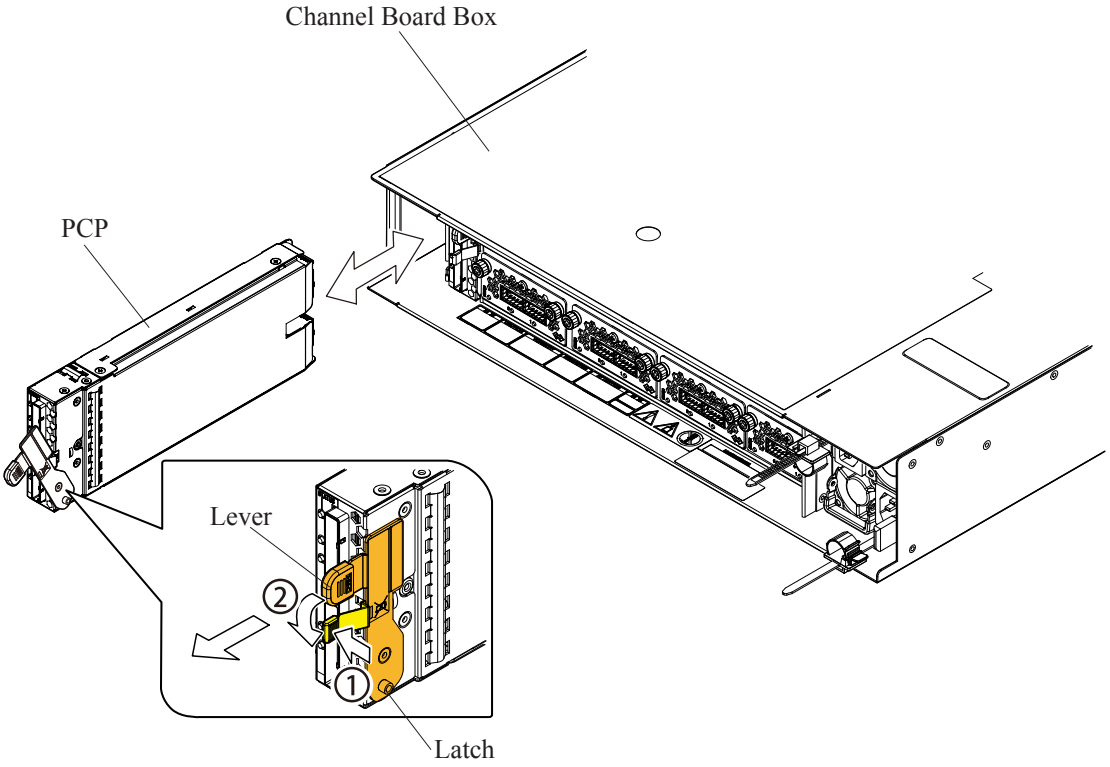
PCP

(2) Remove the cables from the PCIe-cable Connecting Package to be replaced.

(3) Replace the PCIe-cable Connecting Package.

(a) Open the lever toward you (②) while pressing the latch (①).
(b) Pull out and remove the PCIe-cable Connecting Package.
(c) With the lever opened completely, insert the PCIe-cable Connecting Package into the slot.
(d) Push the PCIe-cable Connecting Package in all the way.
(e) Push the lever until the latch of PCIe-cable Connecting Package clicks.

Figure 2-269 Replacement of PCIe-cable Connecting Package (PCP)



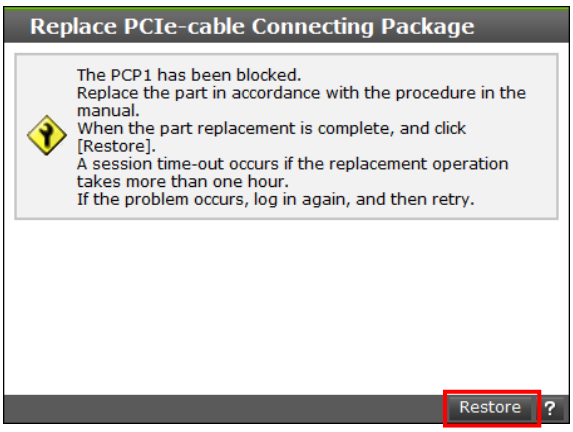
(4) Connect the cables to the replaced PCIe-cable Connecting Package.

NOTE: Check that cable latch clicks and the cables are surely connected.

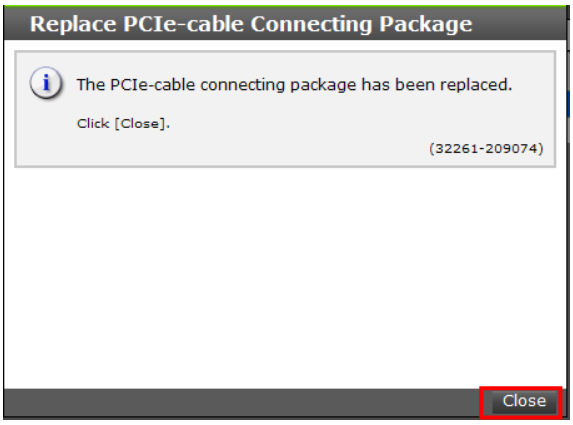
5. Restoring replacement parts by Maintenance Utility

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

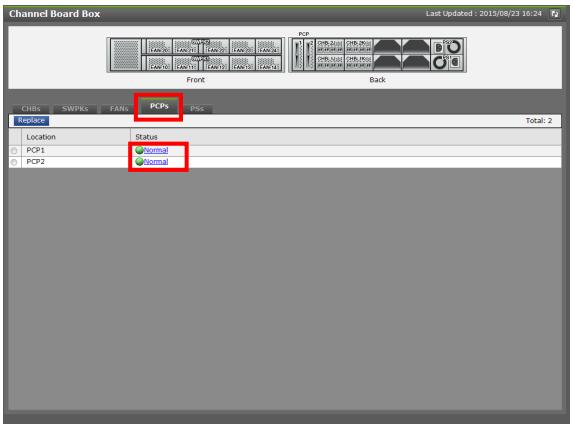
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.

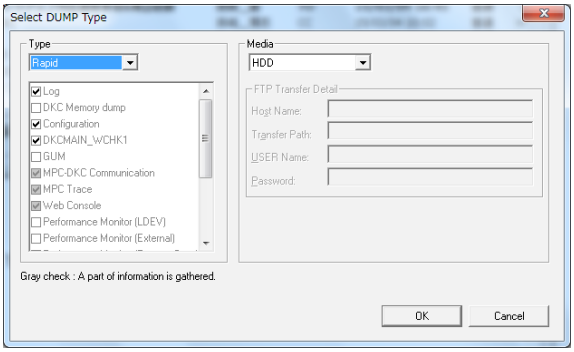


(3) <Check PCIe-cable Connecting Package restoration>
Click the [PCPs] tab in the "Channel Board Box" window and check that the status of the replaced PCIe-cable Connecting Package is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

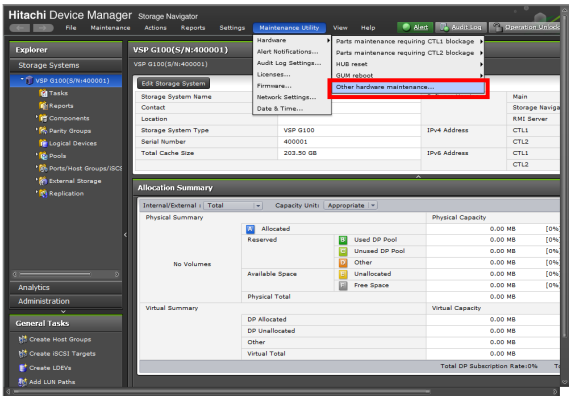
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2.26 Replacing a Switch Package

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing a Switch Package, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

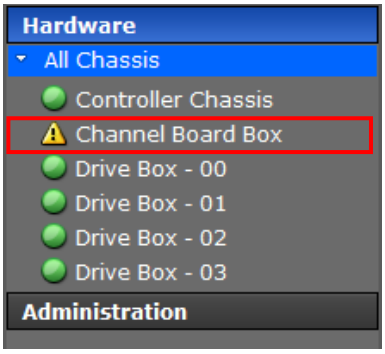


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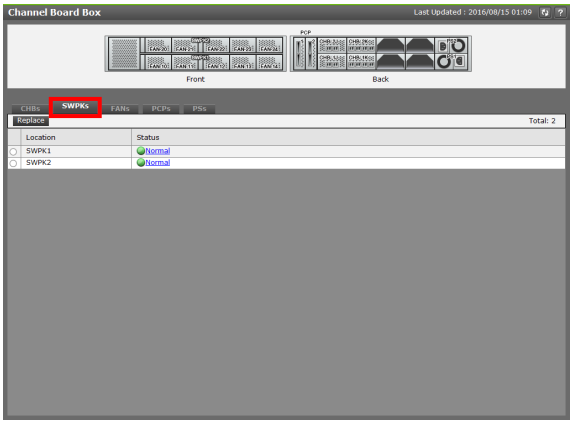
3. Selecting replacement parts by Maintenance Utility.

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 [Channel Board Box] in the main window.



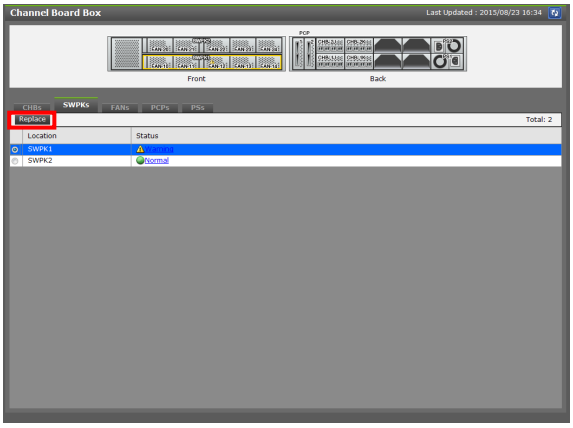
(2) <Channel Board Box window>
Click the [SWPKs] tab in the “Channel Board Box” window to display a Switch Package status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select Switch Package>

Select a Switch Package to be replaced. Click the [Replace] button.



(4) <Block Switch Package>

⚠ CAUTION

About "Forcibly run without safety checks":

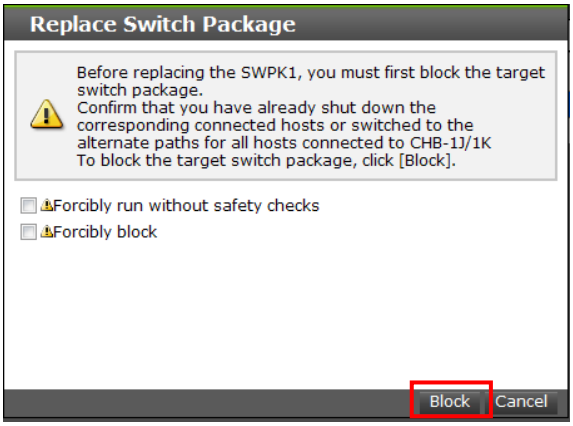
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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.

Click the [Block] button after checking that the Switch Package to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

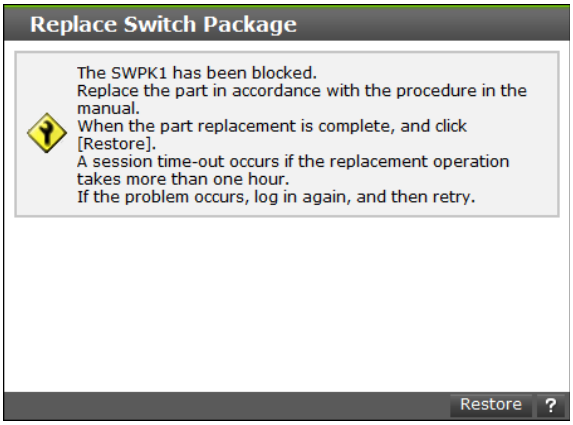
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of Switch Package replacement>
Check that the Switch Package is blocked and becomes ready for replacing.

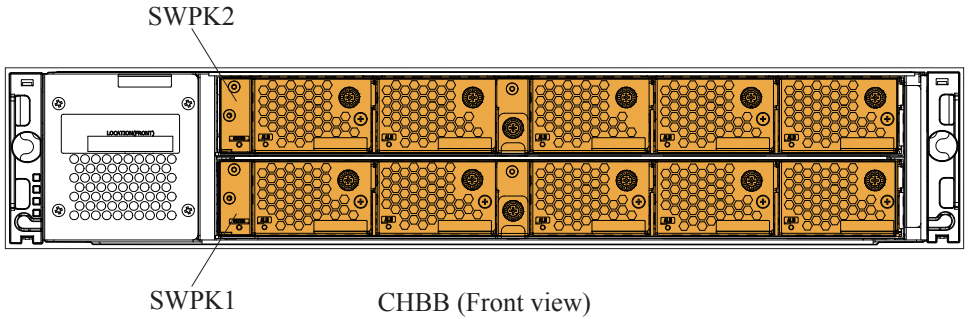
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. Switch Package replacement processing

Location	Replacement parts name		Part Name
Front side of CHBB	1	Switch Package (SWPK)	• SWPK

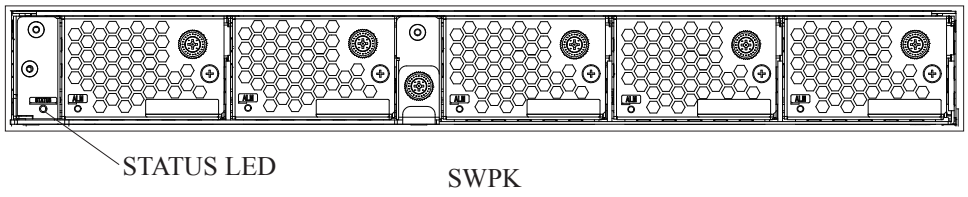


NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing and Removing Parts".

(1) Remove the Front Bezel from the Channel Board Box. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

(2) Check that the STATUS LED (red) on the Switch Package on the Channel Board Box to be replaced lights up. If the LED does not light up, check the location of the Switch Package to be replaced in the "Maintenance Utility" window.

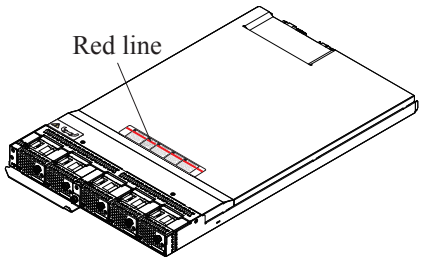
Figure 2-270 STATUS LED Location



(3) Replace the Switch Package (SWPK).

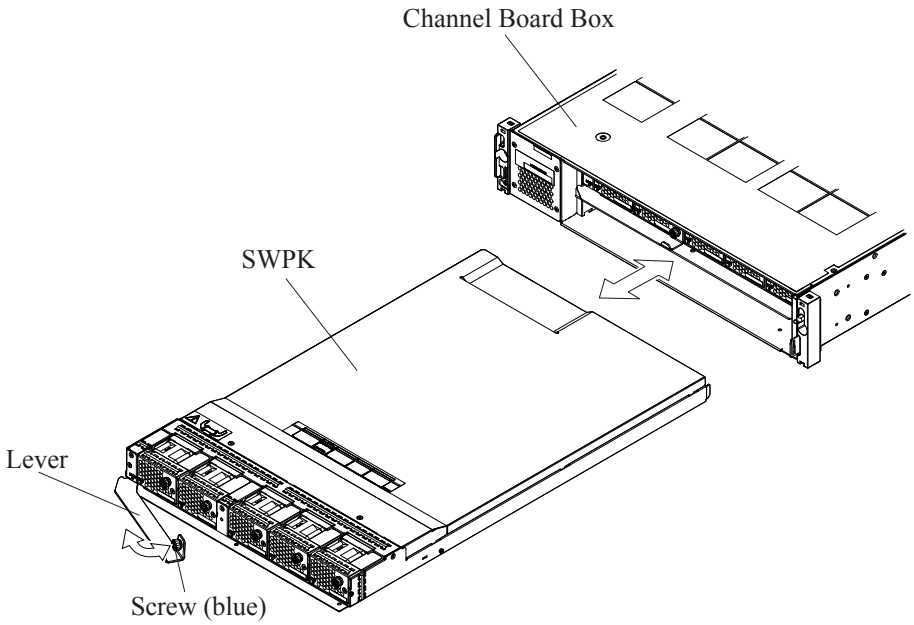
⚠ CAUTION

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.



(a) Loosen the screw (blue) which fixes the Switch Package and open the lever to pull out.
(b) When the levers are completely opened, the Switch Package comes out forward.
(c) Pull out and remove the Switch Package while holding its body with both hands.
(d) With the new Switch Package lever opened completely, insert the Switch Package into the slot position of the Channel Board Box.
(e) Insert the lever of the Switch Package is slightly closed, and then push the lever toward the Switch Package (SWPK).
(f) Tighten the screw (blue) and fix the Switch Package.

Figure 2-271 Replacement of Switch Package (SWPK)



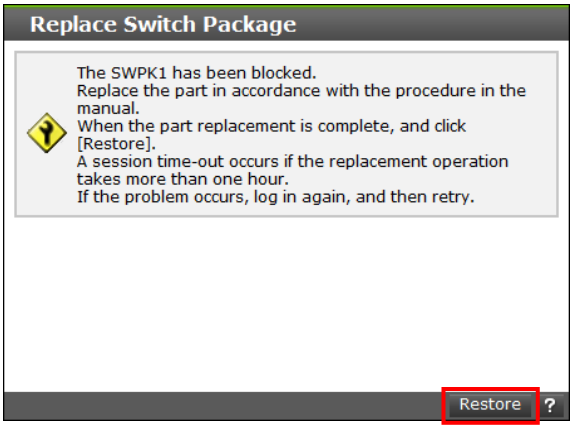
(4) Attach the Front Bezel to the Channel Board Box. (See "2.2.1 How to Attach/Remove Front Bezel".)

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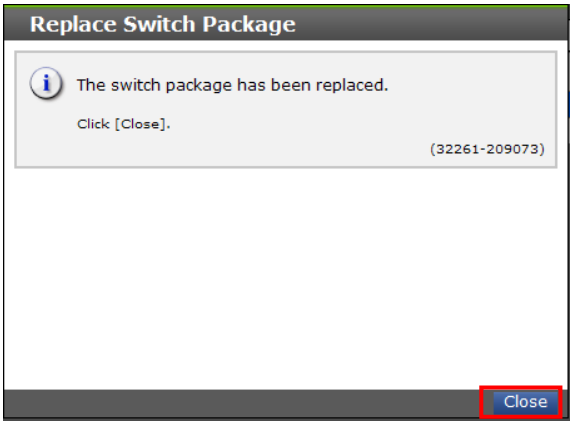
5. Restoring replacement parts by Maintenance Utility

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

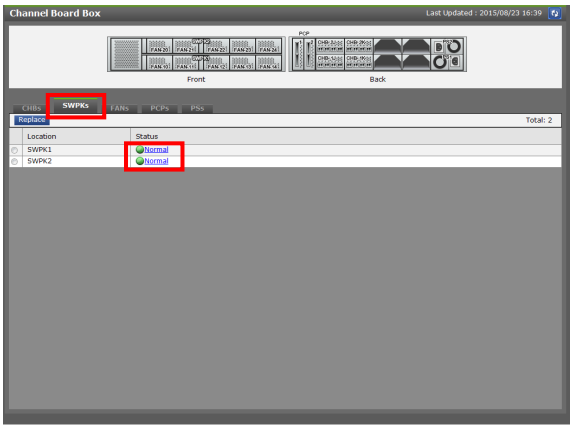
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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”.

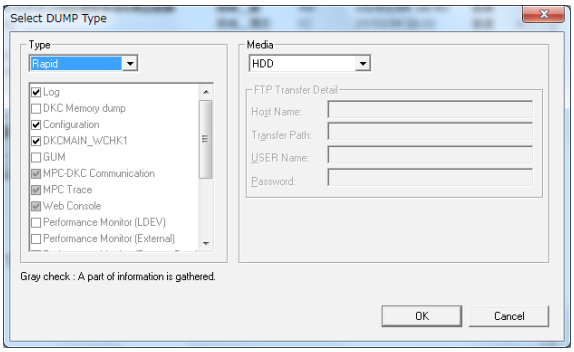


(3) <Check Switch Package restoration>
Click the [SWPKs] tab in the "Channel Board Box" window and check that the status of the replaced Switch Package is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

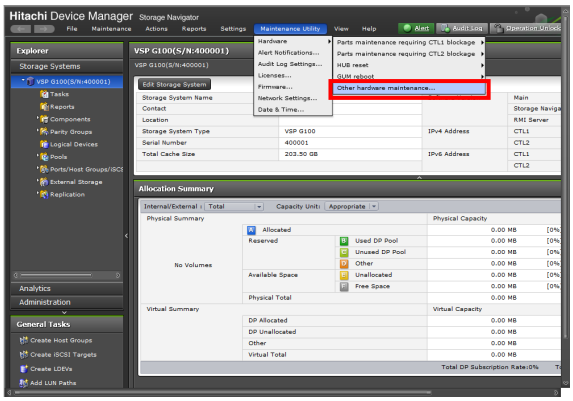
6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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2.27 Replacing a FAN (CHBBFAN)

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing a CHBBFAN, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

2. Starting Maintenance Utility
   (1) Start the Web Console referring to “2.1.2 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.

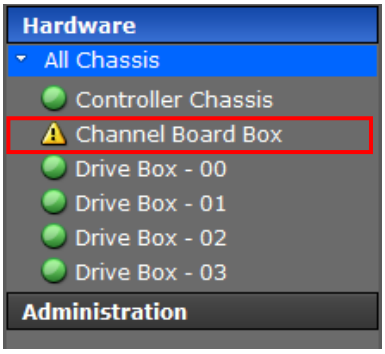


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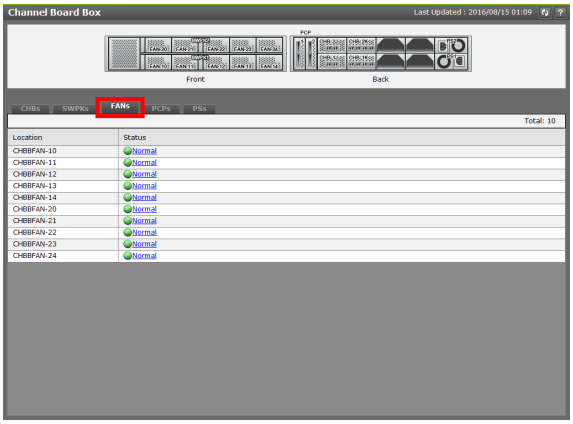
3. Selecting replacement parts by Maintenance Utility.

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 [Channel Board Box] in the main window.



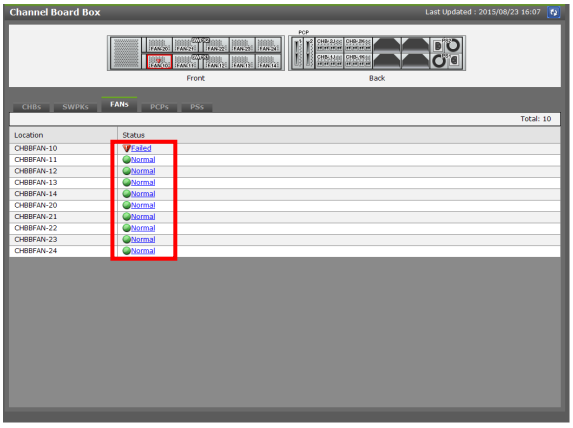
(2) <Channel Board Box window>
Click the [FANs] tab in the “Channel Board Box” window to display a CHBBFAN status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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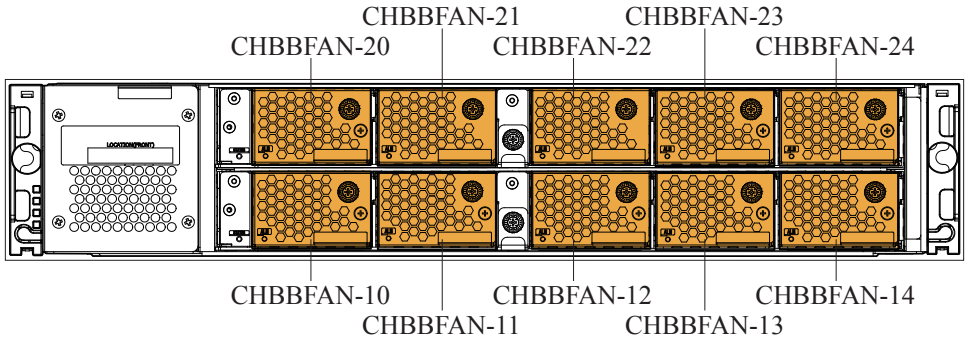
(3) <Check CHBBFAN>

Check status of the CHBBFAN to be replaced is “Warning”.



4. CHBBFAN replacement processing

Location	Replacement parts name		Part Name
Front side of CHBB	1	CHBBFAN	• CHBBFAN



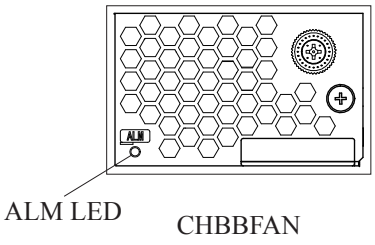
CHBB (Front view)

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 "1.1.3 Note on Installing and Removing Parts".

(1) Remove the Front Bezel from the Channel Board Box. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

(2) Check that the ALM LED (red) on the CHBBFAN on the Channel Board Box to be replaced lights up. If the LED does not light up, check the location of the Channel Board to be replaced in the "Maintenance Utility" window.

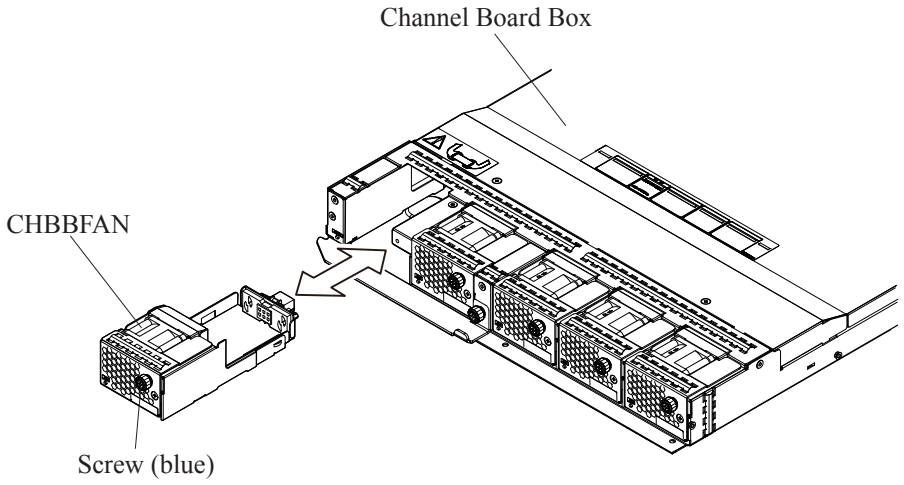
Figure 2-272 ALM LED Location



(3) Replace the CHBBFAN.

(a) Loosen the screw (blue) fixing the CHBBFAN whose ALM LED lights up. Pull out and remove CHBBFAN.
(b) Insert a new CHBBFAN into the slot and tighten the screw (blue).

Figure 2-273 Replacement of CHBBFAN



(4) Attach the Front Bezel to the Channel Board Box. (Refer to "2.2.1 How to Attach/Remove Front Bezel".)

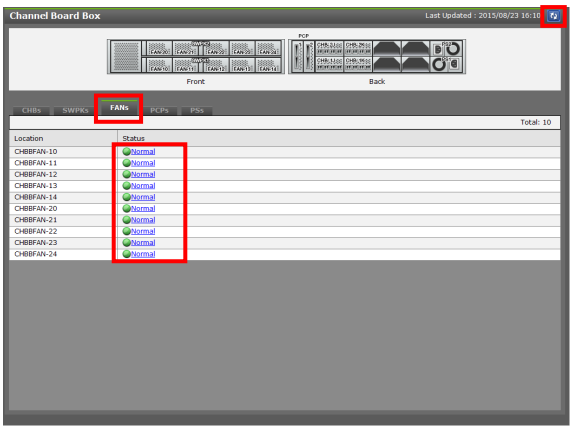
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5. Restoring replacement parts by Maintenance Utility

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

   (1) <Check CHBBFAN restoration>
   Click the [FANs] tab in the “Channel Board Box” window and check that the status of the replaced CHBBFAN is “Normal”.

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



   (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 “2.1.1 Attachment / Removal Procedure of Maintenance PC”.

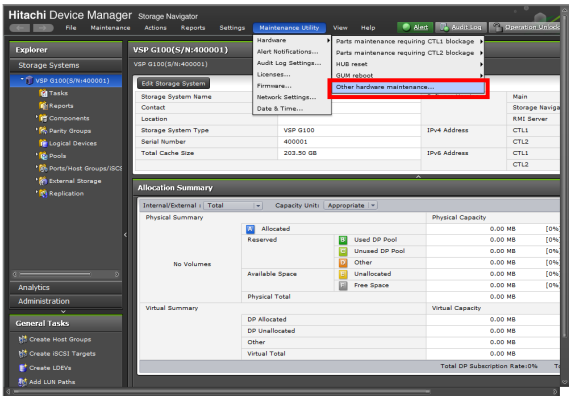
Copyright © 2015, 2017, Hitachi, Ltd.

2.28 Replacing a PCIe Cable

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the Controller Board is set for the Channel Board in the other Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing a PCIe cable, connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.

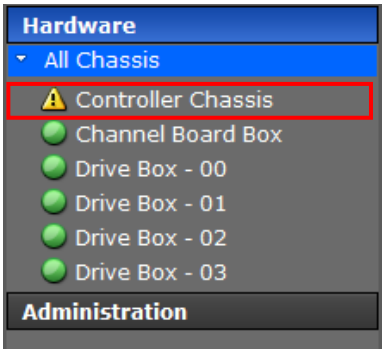


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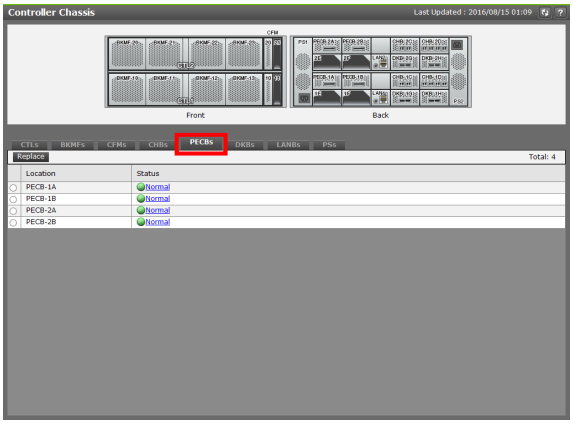
3. Selecting replacement parts by Maintenance Utility.

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 [Controller Chassis] in the main window.



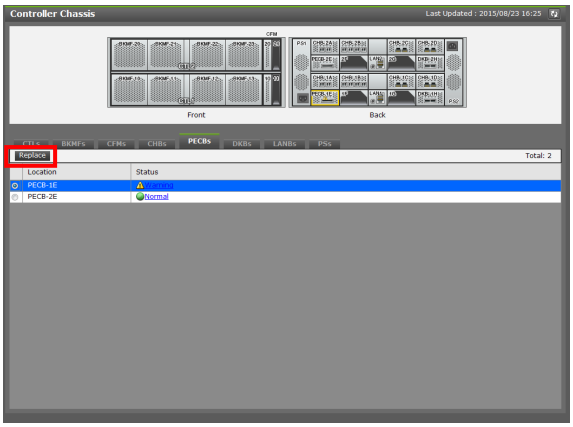
(2) <Controller Chassis window>
Click the [PECBs] tab in the “Controller Chassis” window to display a PCIe Channel Board status. See MAINTENANCE PC SECTION “3.22 Alert Display Related to FRU (Field Replacement Unit)” for the [Status].



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(3) <Select PCIe Channel Board>

Select an PCIe Channel Board to which the PCIe cable to be replaced is connected, and click the [Replace] button.



(4) <Block PCIe Channel Board>

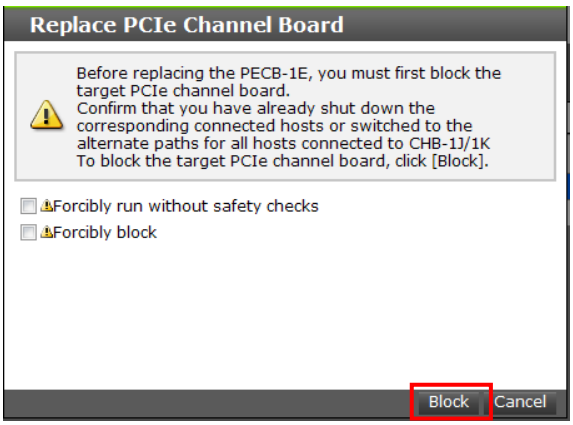
⚠ CAUTION

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.

Click the [Block] button after checking that the PCIe Channel Board which is connected to the PCIe cable to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".

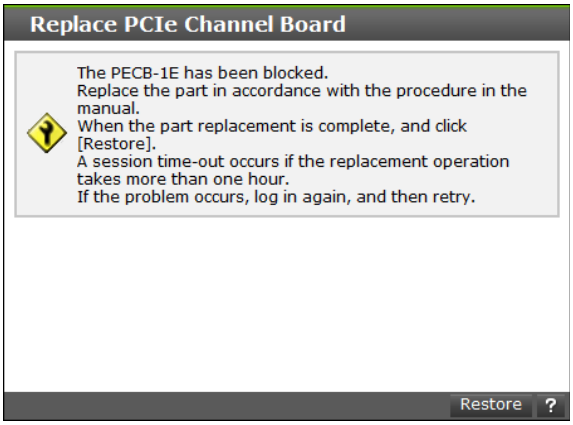
NOTE : When the firmware version is 83-03-01-x0/xx or later, the error list window is displayed if multiple errors are detected by the prior check.
If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(5) <Check the beginning of PCIe Channel Board replacement>
Check that the PCIe Channel Board is blocked and becomes ready for replacing.

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

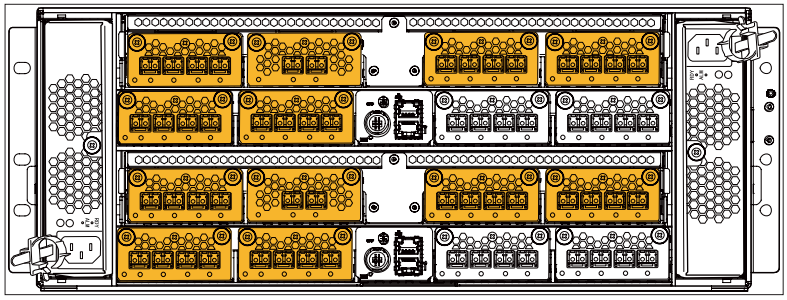


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4. PCIe cable replacement processing

Location	Replacement parts name		Part Name
Rear side of CBLH	1	PCIe Cable	• DW-F800-PC1F

Up to two PCIe Channel Boards are mounted on the slots A/B, C/D, and E/F for each Controller Board.

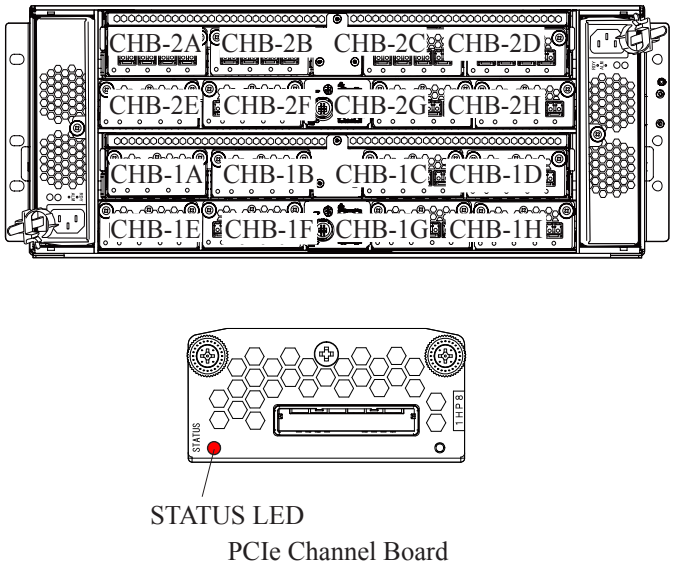


CBLH (Rear view)

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the PCIe Channel Board which is connected to the PCIe cable to be replaced lights up. If the LED does not light up, check the location of the PCIe Channel Board which is connected to the PCIe cable to be replaced in the "Maintenance Utility" window.

Figure 2-274 STATUS LED Location



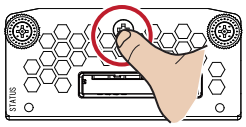
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(2) Remove the PCIe cable from the CBLH and the PCIe-cable Connecting Package of the Channel Board Box connected to CBLH.

(3) Perform the dummy replacement of the blocked PCIe Channel Board.
Remove the PCIe Channel Board once, and then install it again.

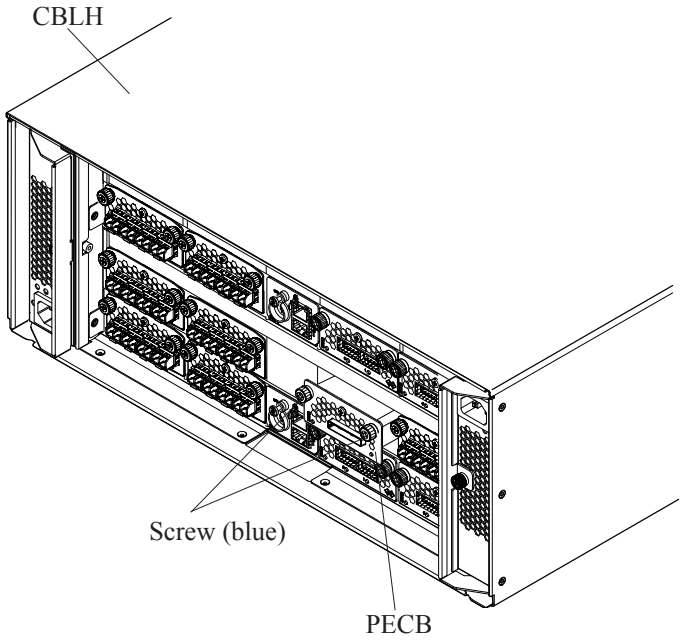
(a) Loosen the two screws (blue) which fix PCIe Channel Board.
(b) Hold the screws (blue) and pull out and remove the PCIe Channel Board.
(c) Wait for 20 seconds or more.
(d) Push the PCIe Channel Board gently all the way in.

NOTICE: Push the front side of the PCIe Channel Board all the way to insert it to the end.



(e) Tighten two screws (blue) and fix the PCIe Channel Board.

Figure 2-275 Dummy Replacement of the PCIe Channel Board (PECB)



(4) Connect the new PCIe cable to the PCIe Channel Board and PCIe-cable Connecting Package. (Refer to INSTALLATION SECTION "2.10 Connecting Cables".)

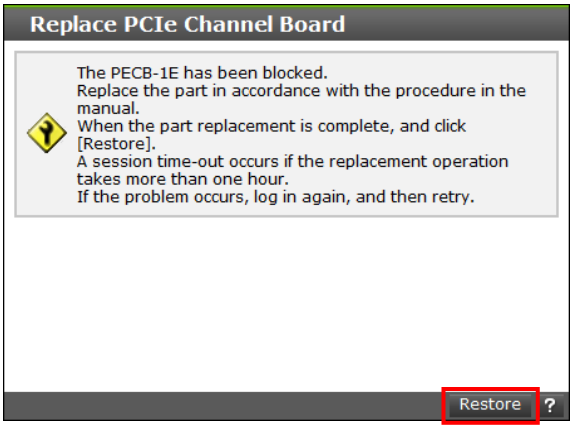
NOTE: Check that cable latch clicks and the cables are surely connected.

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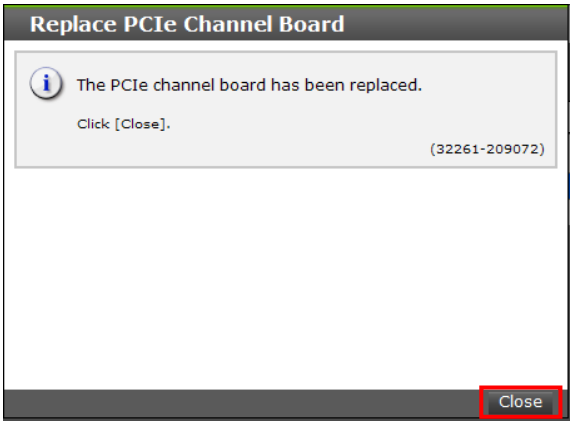
5. Restoring replacement parts by Maintenance Utility

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

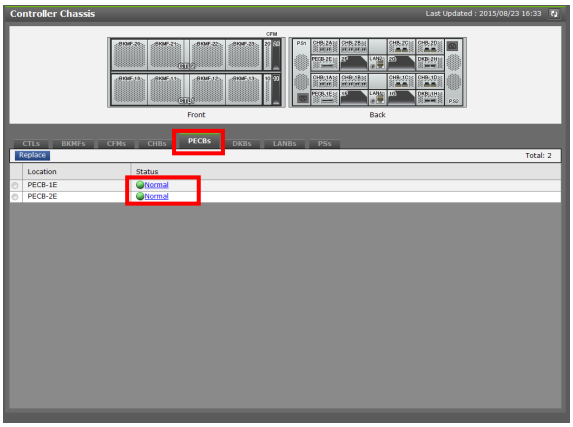
(1) <Restore replacement parts>
Click the [Restore] button.



(2) <Check replacement parts restoration>
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".

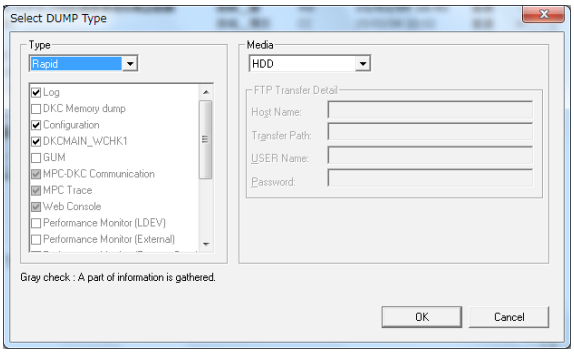


(3) <Check PCIe cable restoration>
Click the [PECBs] tab in the "Controller Chassis" window and check the status of the PCIe Channel Board that is connected by replaced PCIe cable is "Normal".



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

(5) <Get the error information>
Refer to the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) Refer to the MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2.29 Replacing a NAS Module

To replace NAS Module parts, see the following.

- When replacing NAS Modules: "2.29.1 Replacing a NAS Module"
- When replacing a Cache Memory for NAS Module: "2.29.2 Replacing a Cache Memory for NAS Module"
- When replacing a Small Form-Factor Pluggable (SFP+) for NAS Module: "2.29.3 Replacing a Small Form-Factor Pluggable (SFP+) for NAS Module"

2.29.1 Replacing a NAS Module

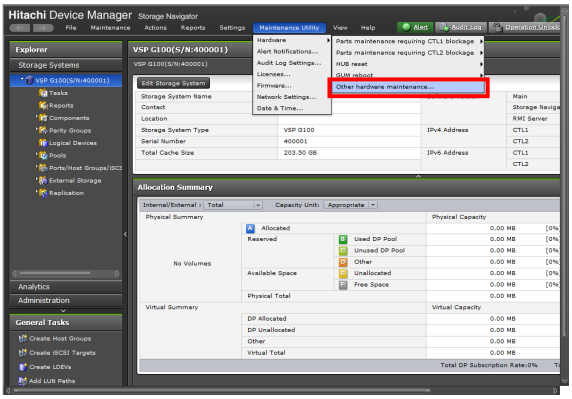
To block the NAN Modules, be sure to migrate EVS manually before the maintenance operation.

NOTE: When replacing NAS Modules at the time of the ICC failure (TROUBLESHOOTING SECTION "20.2.2 Recovery from ICC Failure"), manual migration of EVS is not required because EVS migration has been performed using the maintenance CLI in the procedure of the ICC failure recovery.

See MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations" for the details of EVS manual migration.

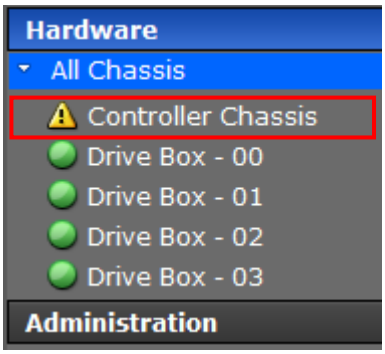
1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   To replace the NAS Module on Controller Board 1, connect the Maintenance PC and Controller Board 2.
   To replace the NAS Module on Controller Board 2, connect the Maintenance PC and Controller Board 1.
   When replacing 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.



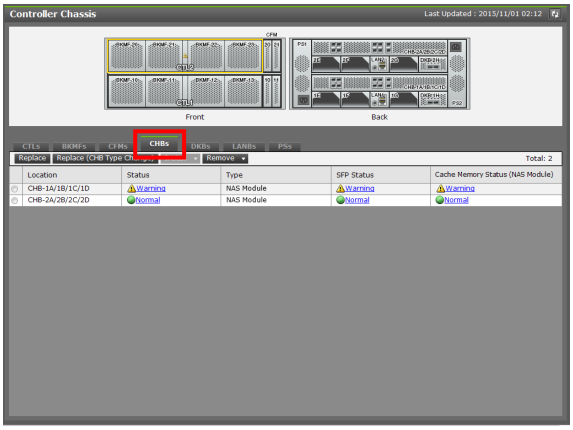
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3. Selecting replacement parts by Maintenance Utility.
   (1) <Main window>
   Select [Controller Chassis] in the main window.



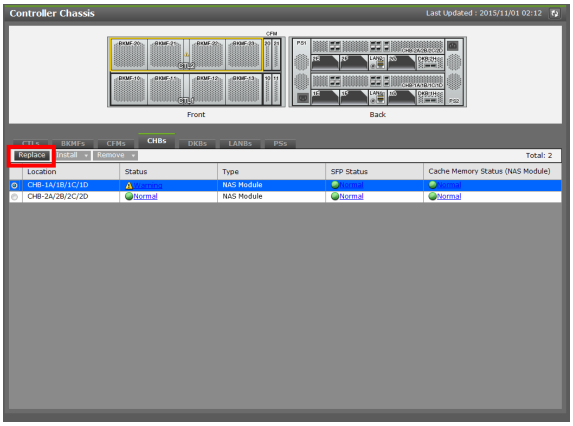
   (2) <Controller Chassis window>
   Click the [CHBs] tab in the "Controller Chassis" window to display a NAS Module status.
   See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the test procedure.

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



(3) <Select NAS Module>

Select a NAS Module to be replaced. Click the [Replace] button.



(4) <Block NAS Module>

⚠ 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.

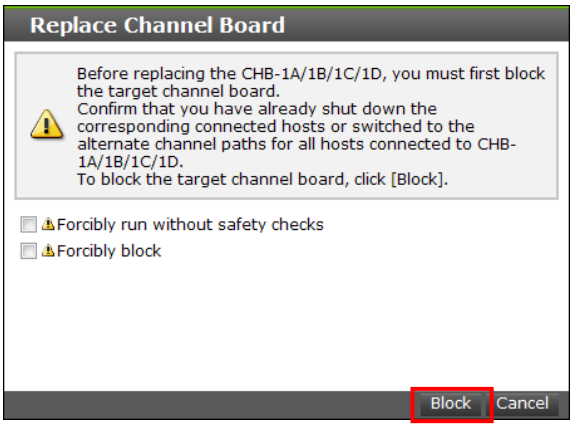
⚠ CAUTION

When replacing NAS Modules at the time of the ICC failure (TROUBLESHOOTING SECTION "20.2.2 Recovery from ICC Failure"), check the checkbox of "Forcibly run without safety checks" and click the [Block] button.

Since the ICC failure is a special failure in which both NAS Modules of CTL1 and CTL2 detect the failure, selecting "Forcibly run without safety checks" is required.

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Click the [Block] button after checking that the NAS Module to be replaced is correct.
If a message other than the described is displayed, refer to "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



(5) <Check the beginning of NAS Module replacement>
Check that the NAS Module is blocked and becomes ready for replacing.

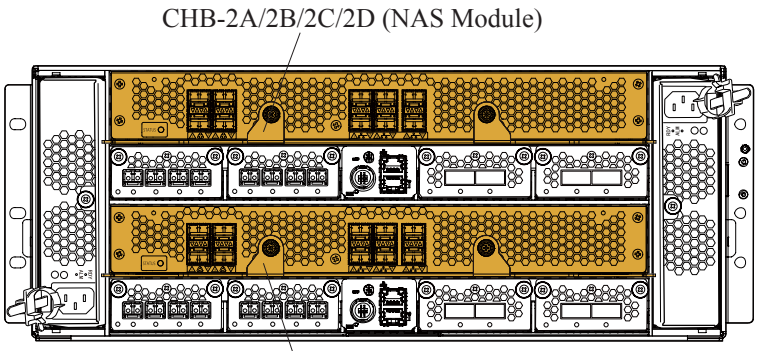
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the replacement work.



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4. NAS Module for CBLM/CBLH replacement processing

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	NAS Module	• DW-F800-NAS

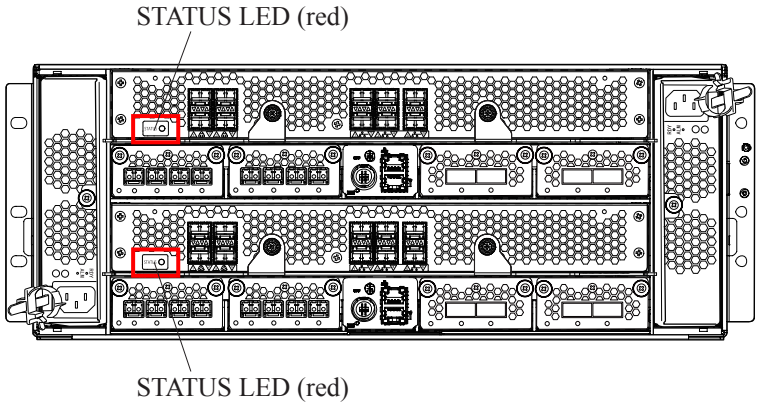


CBLM/CBLH (Rear view)

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the NAS Module to be replaced lights up.

Figure 2-276 STATUS LED Location



(2) Remove the cable connected to the NAS Module.

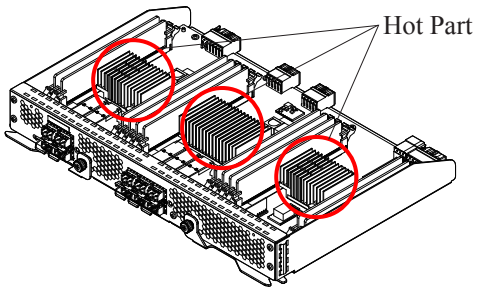
NOTE: Take notes or mark on the removed cable to be able to connect it to the original place after replacement.

(3) Removing the NAS Module

⚠ CAUTION

Be careful of a hot part:

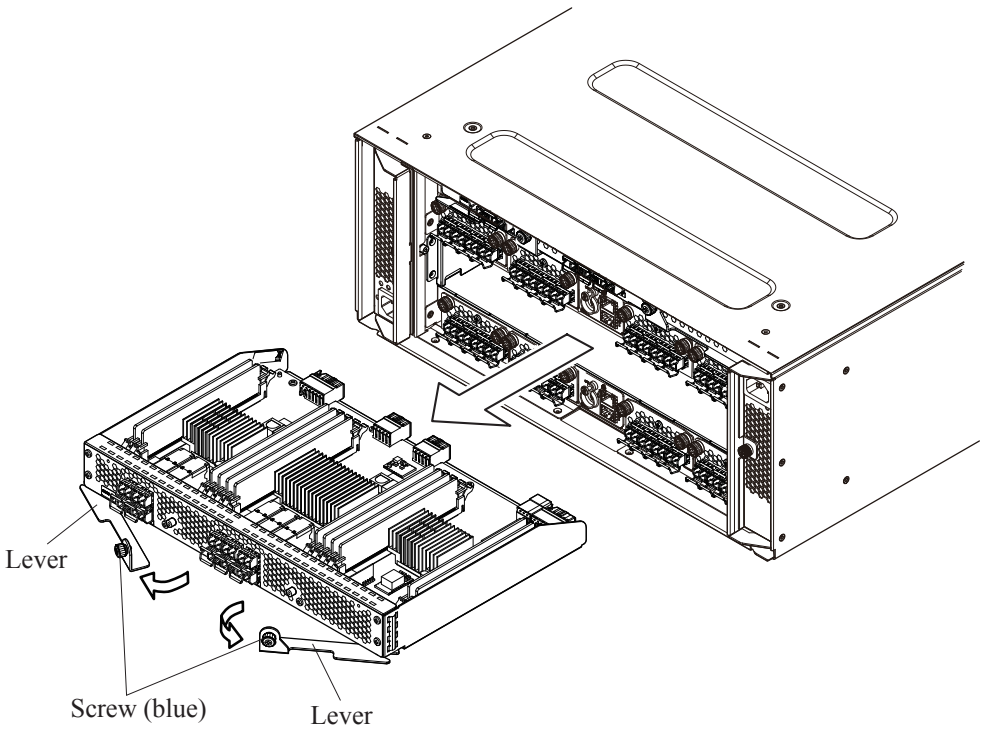
A NAS Module that has been just removed from the storage system in operation has a hot heatsink part. Be careful not to touch the hot part.



NOTICE:
- To remove the NAS Module, hold the NAS Module with both hands and remove it straight so that no physical shock is exerted on the parts.
- The heatsink might be heated. Do not touch it.

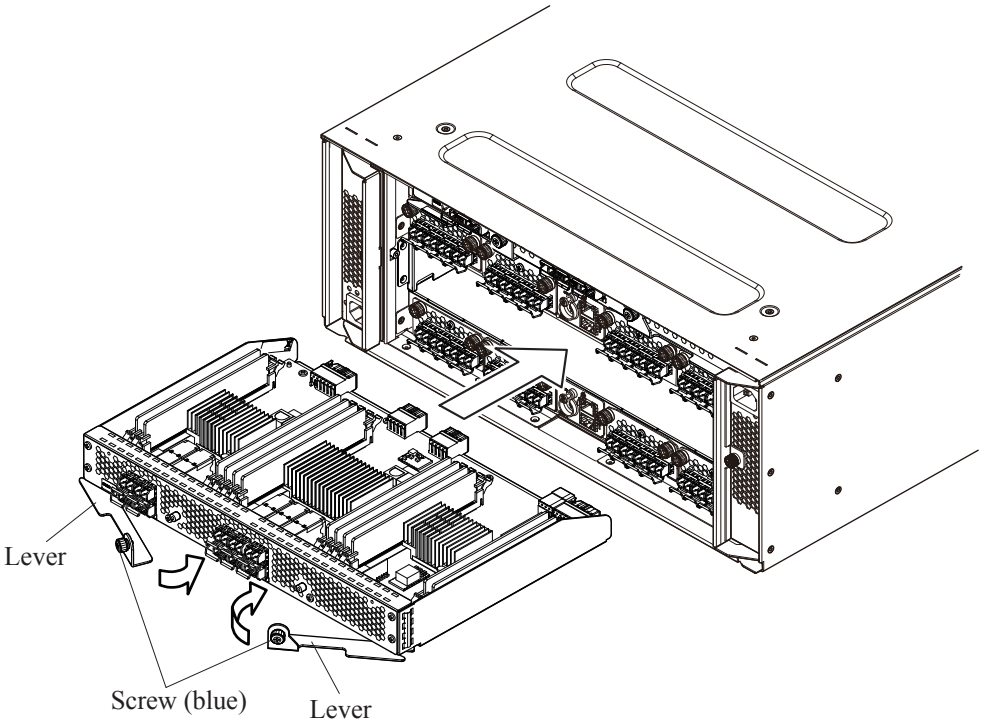
(a) Loosen the two screws (blue) fixing the NAS Module and open the lever.
(b) Hold the NAS Module with both hands and pull it toward you to remove.

Figure 2-277 Removal of NAS Module



(4) Installing the NAS Module
  (a) Insert the new NAS Module into the slot while opening the lever.
  (b) Push the NAS Module all the way in and close the lever.
  (c) Tighten the two screws (blue) to fix the NAS Module.

Figure 2-278 Installation of NAS Module



(5) Remove the Small Form-Factor Pluggable (SFP+) from the NAS Module before replacement and install it into the NAS Module after the replacement.

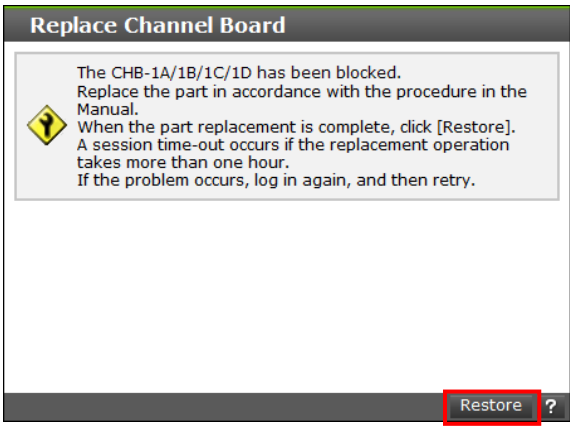
(6) Connect the cable to the replaced NAS Module.
  (a) Spray compressed gas to the connector part using an air spray. (approx. five seconds)
  (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
  (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached).

(7) Connect the cable to the replaced NAS Module.

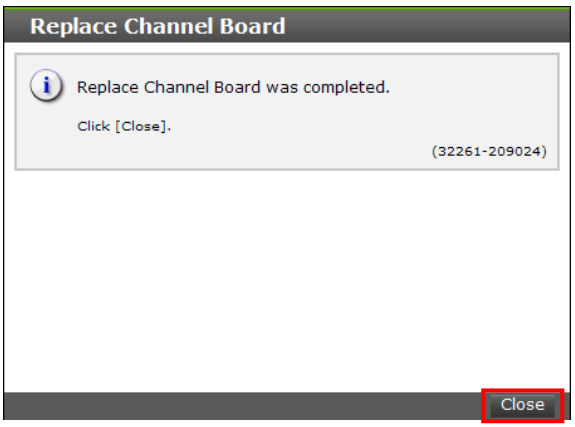
NOTE: • Be sure to connect the cable to the same port as before the replacement.
• Check that cable latch clicks and the cables are surely connected.

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5. Restoring replacement parts by Maintenance Utility
   (1) <Restore replacement parts>
   Click the [Restore] button.



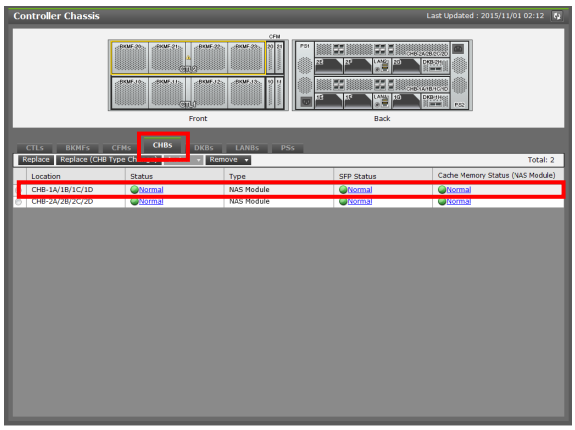
   (2) <Check replacement parts restoration>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



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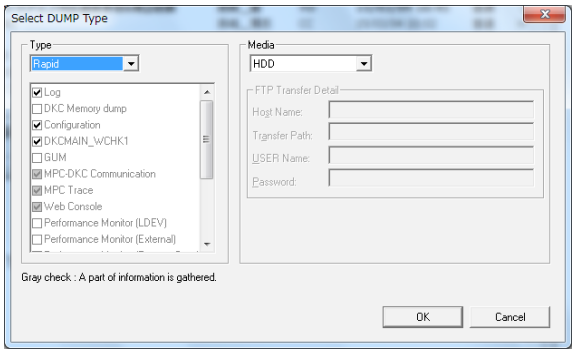
(3) <Check NAS Module restoration>
Click the [CHBs] tab in the "Controller Chassis" window, and then confirm that all the NAS Module statuses are "Normal".

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



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

(5) <Get the error information>



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(6) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

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NOTE: For migration performed due to a failure, inform your customer that the EVS have been migrated to the NAS Module without failure.

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

   NOTE: When replacing NAS Modules at the time of the ICC failure (TROUBLESHOOTING SECTION "20.2.2 Recovery from ICC Failure"), manual migration of EVS is not required because EVS migration has been performed using the maintenance CLI in the procedure of the ICC failure recovery.

   (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.

---

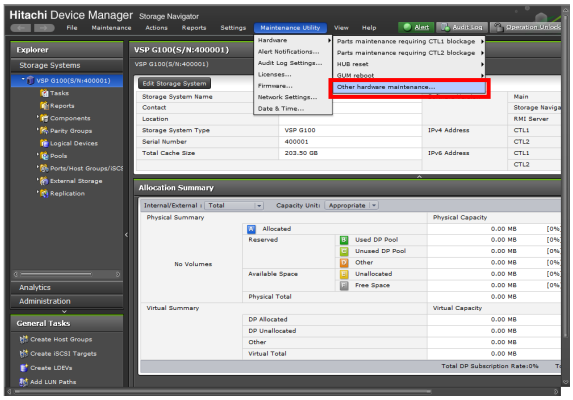
7. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2.29.2 Replacing a Cache Memory for NAS Module

To block the NAN Modules, be sure to migrate EVS manually before the maintenance operation.
See MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations" for the details of EVS manual migration.

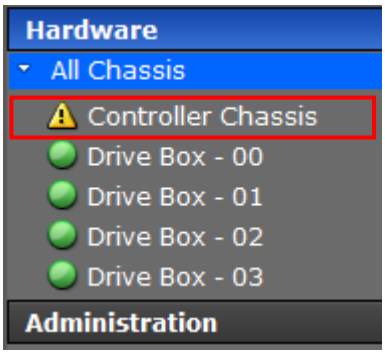
1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   To replace the NAS Module on Controller Board 1, connect the Maintenance PC and Controller Board 2.
   To replace the NAS Module on Controller Board 2, connect the Maintenance PC and Controller Board 1.
   When replacing 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 "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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.



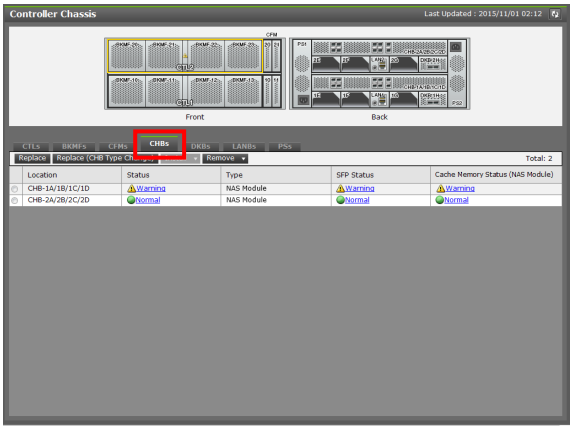
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3. Selecting replacement parts by Maintenance Utility.
   (1) <Main window>
   Select [Controller Chassis] in the main window.



   (2) <Controller Chassis window>
   Click the [CHBs] tab in the “Controller Chassis” window and click “Warning” in the [Cache Memory (NAS Module)] column.

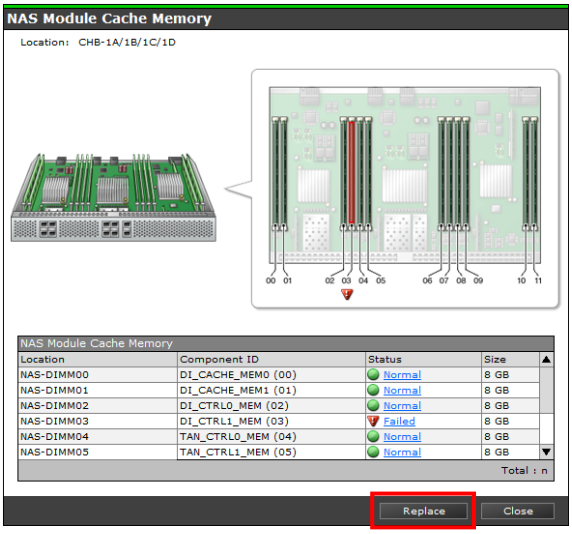
   NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.



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(3) <Check NAS Module cache memory>

Check the Cache Memory to be replaced and click the [Replace] button.



(4) <Block NAS Module>

⚠ CAUTION

About "Forcibly run without safety checks":

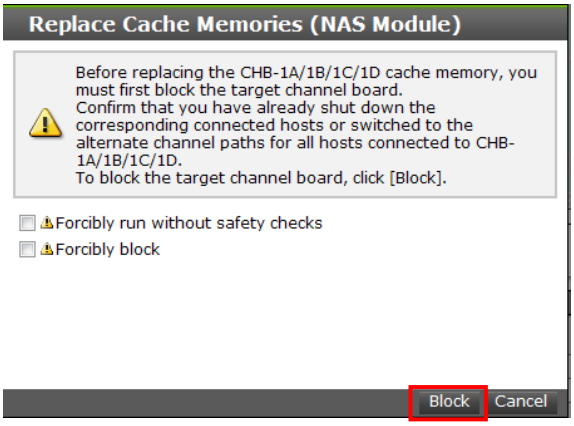
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

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 that the Controller Board has the Cache Memory to be replaced, and then click the [Block] button.

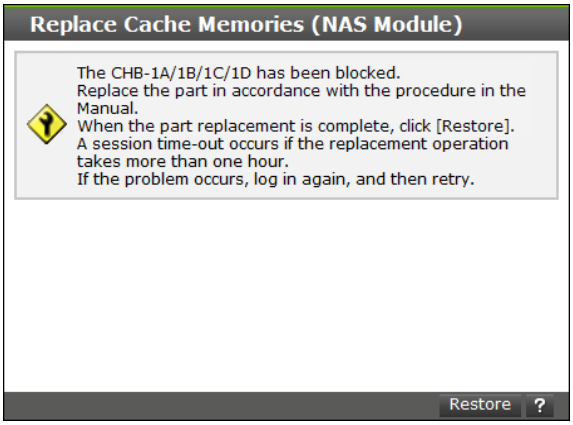
If a message other than the described is displayed, see "Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages".



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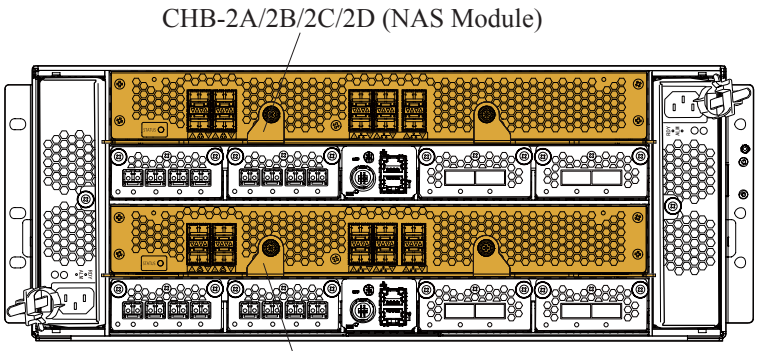
(5) <Check replacement start of NAS Module Cache Memory>
Check that the NAS Module is blocked and it is ready to start the replacement.

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



4. Replacing a Cache Memory for NAS Module

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	Cache Memory	• Cache Memory

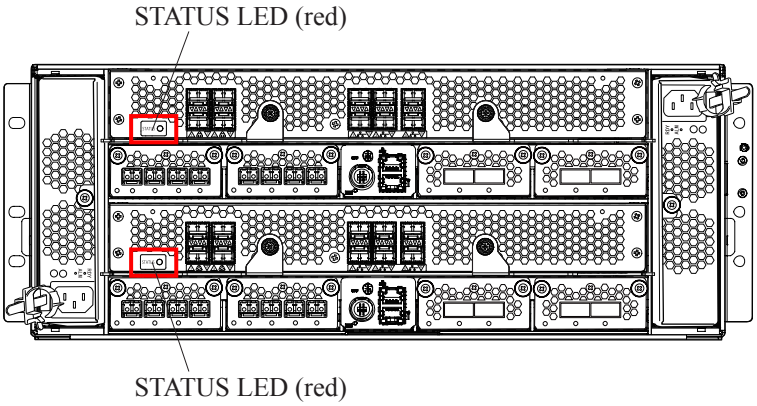


CBLM/CBLH (Rear view)

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. See "1.1.3 Note on Installing and Removing Parts".

(1) Check that the STATUS LED (red) on the NAS Module lights up.

Figure 2-279 STATUS LED Location



(2) Remove the cable connected to the NAS Module.

NOTE: Take notes or mark on the removed cable to be able to connect it to the original place after replacement.

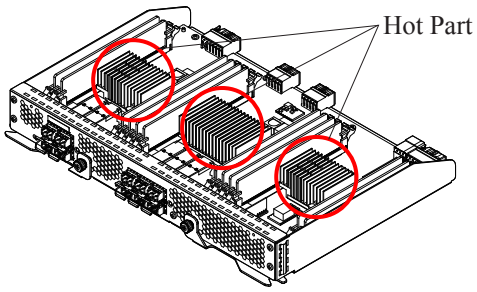
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(3) Removing the NAS Module

⚠ CAUTION

Be careful of a hot part:

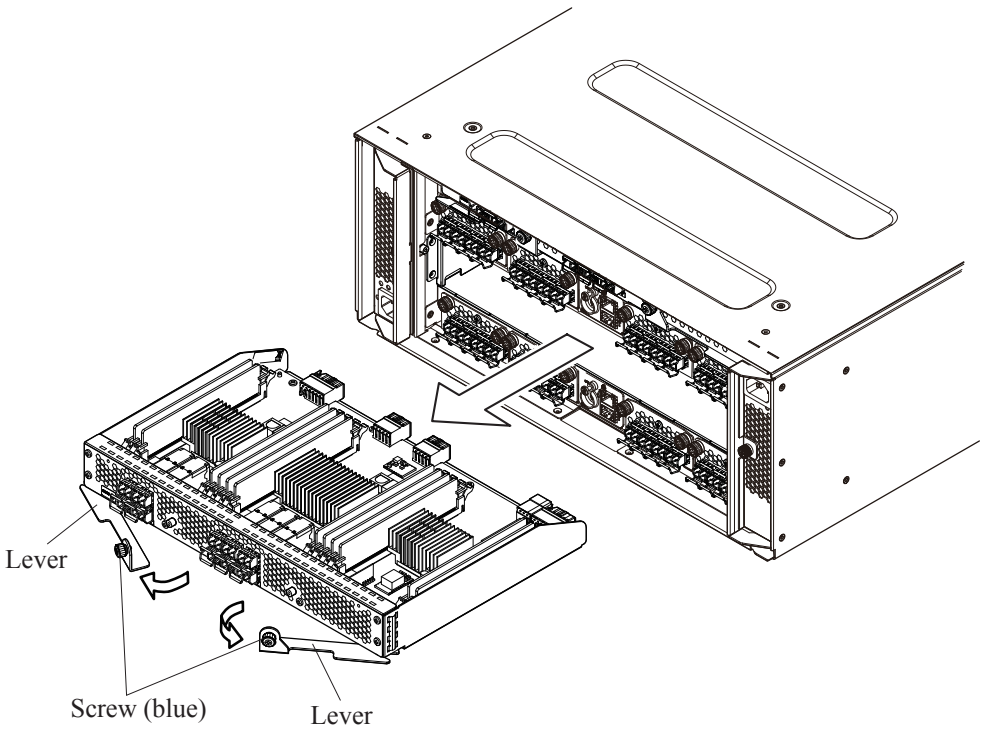
A NAS Module that has been just removed from the storage system in operation has a hot heatsink part. Be careful not to touch the hot part.



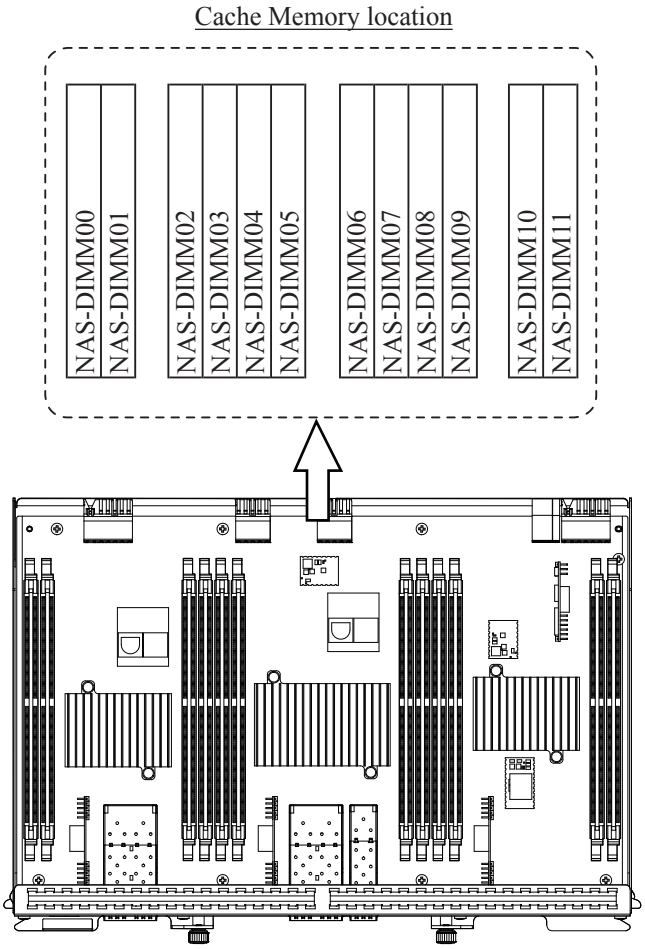
NOTICE:
- To remove the NAS Module, hold the NAS Module with both hands and remove it straight so that no physical shock is exerted on the parts.
- The heatsink might be heated. Do not touch it.

(a) Loosen the two screws (blue) fixing the NAS Module and open the lever.
(b) Hold the NAS Module with both hands and pull it toward you to remove.

Figure 2-280 Removal of NAS Module



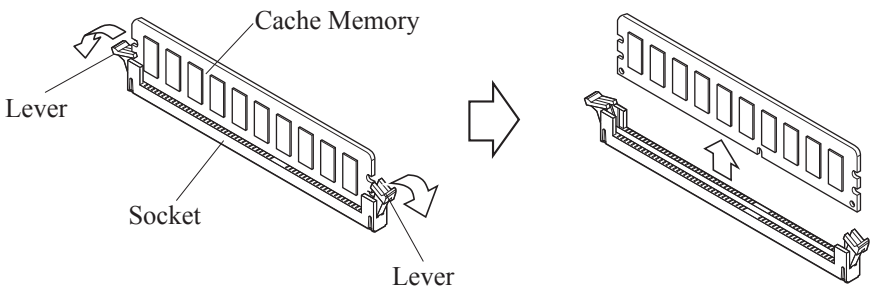
(4) Replace the failed Cache Memory with a new Cache Memory.



Cache memory location
(NAS Module top view)

(a) Removal procedure
(i) Open the air guide.
(ii) Pull the lever outward.
(iii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-281 Removal of Cache Memory



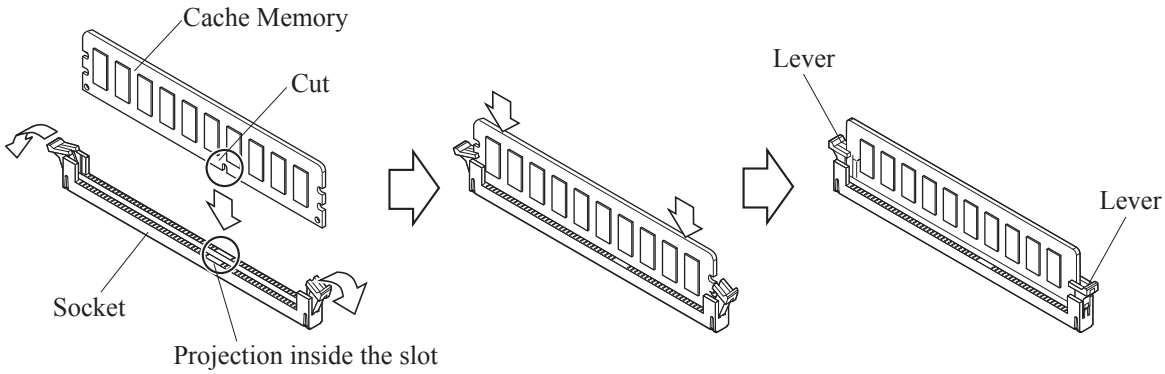
Copyright © 2015, 2017, Hitachi, Ltd.

(b) Installation procedure

NOTICE:	Do not put intense pressure on the cache memory to the extent that the printed-circuit board greatly bends after the cache memory is secured with the levers in installation procedure of the cache memory. The printed-circuit board may be damaged when intense pressure is applied.

(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 by the fingers and fit it into the socket.
(iii) Check that the lever is firmly fitted in the Cache Memory.
(iv) Close the air guide.

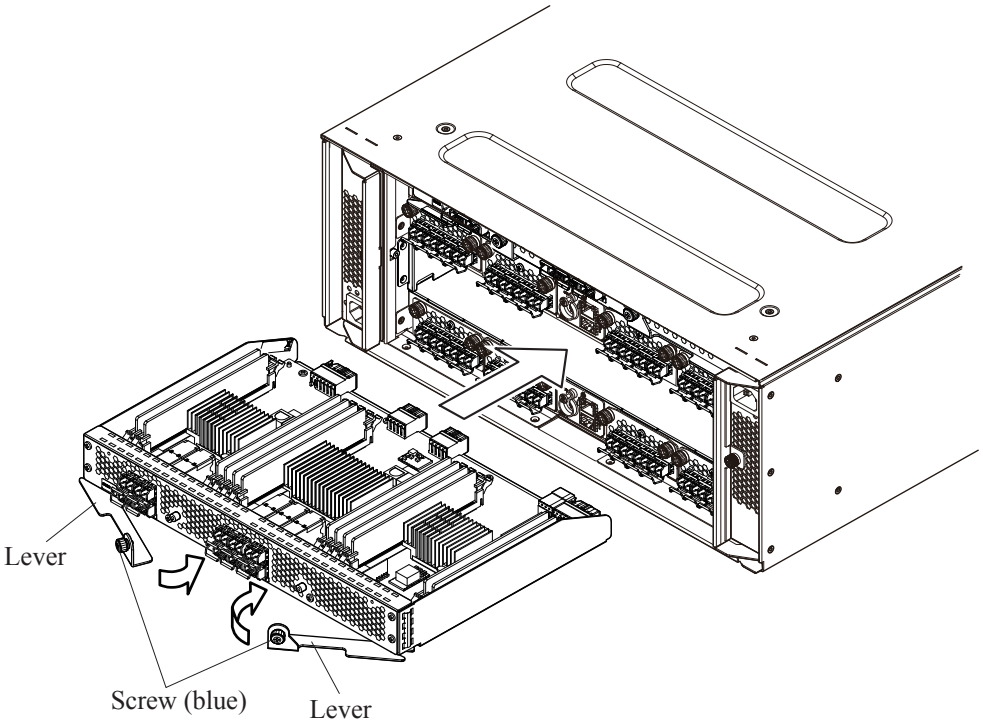
Figure 2-282 Installation of Cache Memory



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(5) Installing the NAS Module
  (a) Insert the NAS Module into the slot while opening the lever.
  (b) Push the NAS Module all the way in and close the lever.
  (c) Tighten the two screws (blue) to fix the NAS Module.

Figure 2-283 Installation of NAS Module



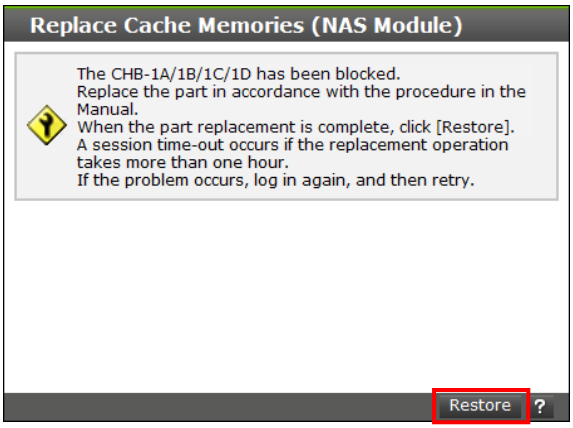
(6) Connect the cable to the replaced NAS Module.
  (a) Spray compressed gas to the connector part using an air spray. (approx. five seconds)
  (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
  (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached).

(7) Connect the cable to the replaced NAS Module.

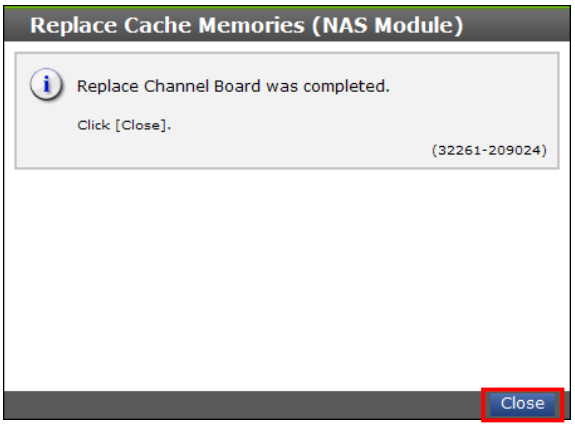
NOTE: • Be sure to connect the cable to the same port as before the replacement.
• Check that cable latch clicks and the cables are surely connected.

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5. Restoring replacement parts by Maintenance Utility
   (1) <Restore replacement parts>
   Click the [Restore] button.

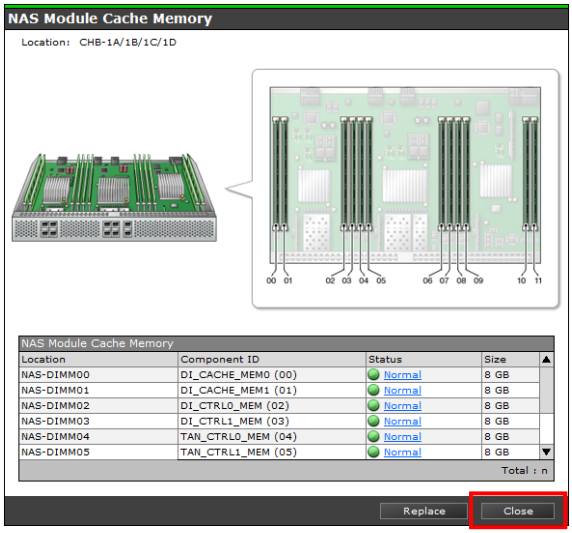


   (2) <Check replacement parts restoration>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Hitachi Virtual Storage Platform G200, G400, G600, G800 Device Manager-Storage Navigator Messages”.



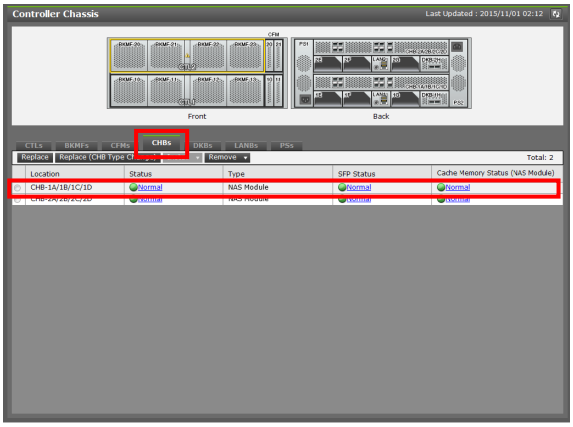
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(3) <Check NAS Module Cache Memory>
Check that a Status of the replaced Cache Memory is "Normal" and click the [Close] button.



(4) <Check NAS Module restoration>
Click the [CHBs] tab in the "Controller Chassis" window and then confirm that all the NAS Module statuses are "Normal".

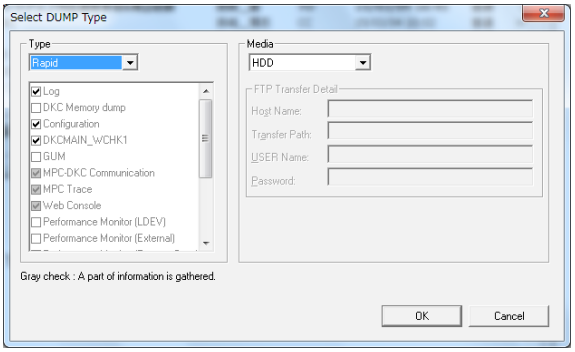
NOTE: The [Replace (CHB Type Change)] button is displayed only when the firmware version is 83-04-01-x0/xx or later.



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

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(6) <Get the error information>
See the MAINTENANCE PC SECTION "5.2 Dump", please collect "Rapid" dump.



NOTE: If Maintenance Utility started from the following the procedure of MAINTENANCE PC SECTION "1.8.2.3 Starting the Browser", see MAINTENANCE PC SECTION "3.27 Acquiring System Dumps" to collect dumps.
However, System Dump is supported in the version 83-02-01-x0/xx or later.

(7) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

NOTE: For migration performed due to a failure, inform your customer that the EVS have been migrated to the NAS Module without failure.

6. 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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7. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

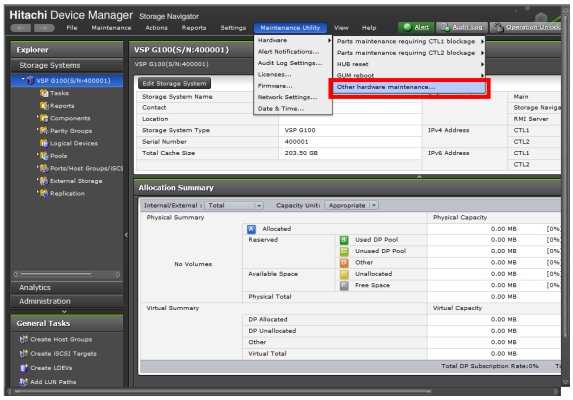
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2.29.3 Replacing a Small Form-Factor Pluggable (SFP+) for NAS Module

To replace a Small Form-Factor Pluggable (SFP+), be sure to migrate EVS manually before the maintenance operation.
See MAINTENANCE PC SECTION "6.4.1 Migration before the Maintenance Operations" for the details of EVS manual migration.

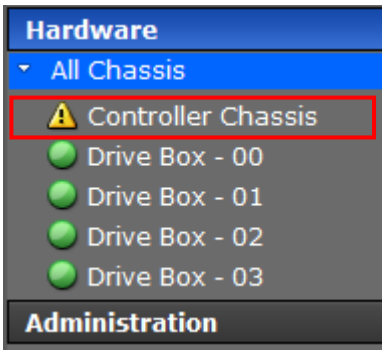
1. Connecting a maintenance PC
   Connect the maintenance PC and the Storage System.
   When replacing the Small Form-Factor Pluggable (SFP+), connect the maintenance PC and the Controller Board 1.
   - Connect the maintenance PC and the Controller Board via LAN cable referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

2. Starting Maintenance Utility
   (1) Start the Web Console referring to "2.1.2 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 replacement parts by Maintenance Utility.
   (1) <Main window>
   Select [Controller Chassis] in the main window.

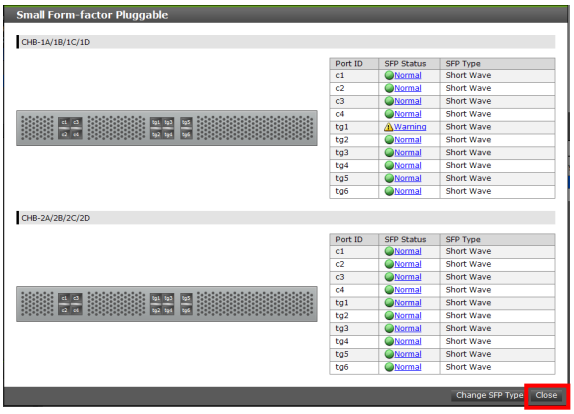


   (2) <Controller Chassis window>
   Click the [CHBs] tab in the "Controller Chassis" window and click "Warning" in the [SFP Status] column.

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



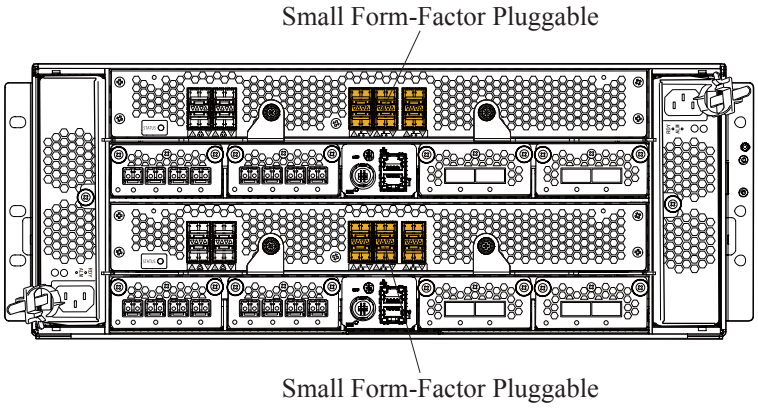
   (3) <Check Small Form-Factor Pluggable (SFP)>
   Select a Small Form-Factor Pluggable (SFP+) to be replaced. Click the [Close] button.



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4. Replacing a Small Form-Factor Pluggable (SFP+) for NAS Module

Location	Function Name of Component		Part Name
Rear View of CBLM/CBLH	1	Small Form-Factor Pluggable	• Shortwave, For 10 G FC



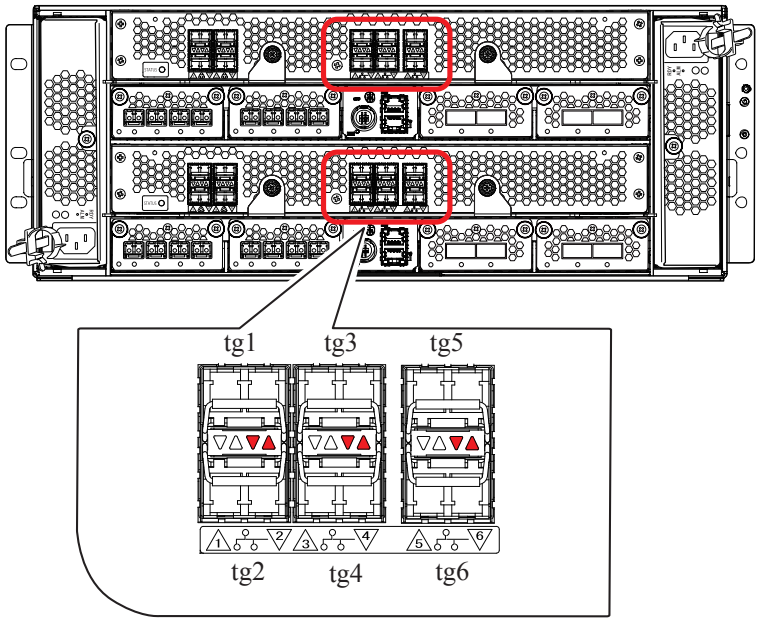
CBLM/CBLH (Rear view)

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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 "1.1.3 Note on Installing and Removing Parts".

(1) Check that the Network port LED (red) on the Small Form-Factor Pluggable to be replaced lights up. If the LED is turned off, check the location of the Small Form-Factor Pluggable to be replaced in the "Maintenance Utility" window.

Figure 2-284 Network port LED Location



(2) Remove the cables from the Small Form-Factor Pluggable (SFP) to be replaced.

NOTE: Take notes or mark on the removed cable to be able to connect it to the original place after replacement.

(3) Replace the Small Form-Factor Pluggable (SFP).

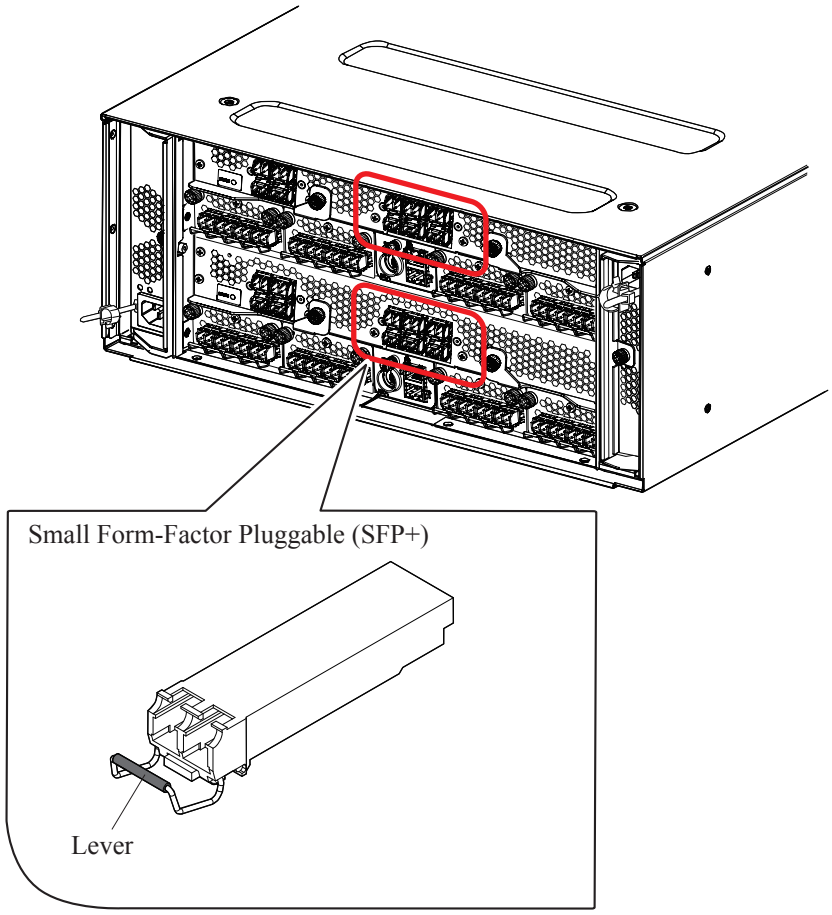
(a) Open the Small Form-Factor Pluggable (SFP) lever and pull out the Small Form-Factor Pluggable (SFP).
If you cannot remove the Small Form-Factor Pluggable (SFP), pull it out while pushing open the lever toward you.

NOTE : After removing the Small Form-Factor Pluggable, wait for about 10 seconds before inserting a new one.

(b) Check the Small Form-Factor Pluggable (SFP) insertion direction and inset the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE : Be sure to install the same type of Small Form-Factor Pluggable (SFP) as the removed one.

Figure 2-285 Replacement of Small Form-Factor Pluggable (SFP+)



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(4) Clean the cable connectors.
   (a) Spray compressed gas to the connector part using an air spray (approx. five seconds).
   (b) Wipe the connector part lightly with cut gauze soaked in ethyl alcohol.
   (c) Spray compressed gas again and check the cleanliness. (Be sure that no dust, foreign substance or dirt is attached).

(5) Connect the cables to the replaced Small Form-Factor Pluggable (SFP).

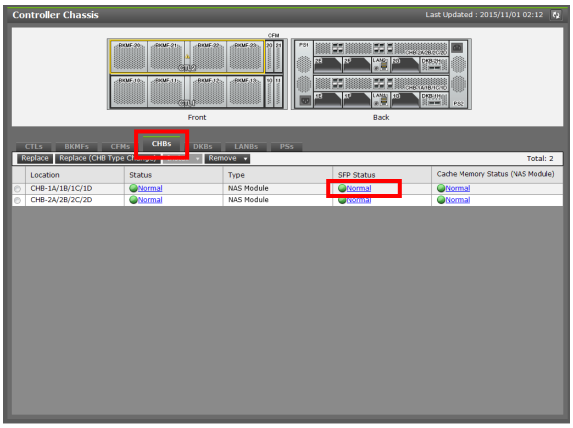
NOTE: • Be sure to connect the cable to the same port as before the replacement.
• Check that cable latch clicks and the cables are surely connected.

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5. Restoring replacement parts by Maintenance Utility
   (1) <Check Small Form-Factor Pluggable (SFP) restoration>
   Click the [CHBs] tab in the "Controller Chassis" window and check that a Status of the replaced Small Form-Factor Pluggable (SFP) is "Normal".

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

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



   (2) See MAINTENANCE PC SECTION "9.1 Use of OnlineDumpTool", please upload the error information.

   NOTE: For migration performed due to a failure, inform your customer that the EVS have been migrated to the NAS Module without failure.

6. 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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7. Disconnecting the maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to "2.1.1 Attachment / Removal Procedure of Maintenance PC".

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3. Processing Method of Batteries

NOTICE: The Flash Module Drive (FMD) in this section indicates NFH1A-PxRxSS/NFH1B-PxRxSS/NFH1C-PxRxSS.
NFHAx-QxRxSS/NFH1D-PxRxSS is excluded because the battery is not mounted on it.

3.1 Processing Method of Batteries and Flash Module Drive (FMD)

⚠ CAUTION

The Battery is an industrial waste. This is treated as specially-controlled waste. Dispose of it following the directions given by the manufacturer or according to the Waste Management Law.

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3.2 Recycling

1. Parts to be recycled
   The batteries used in the Storage System are a sealed Nickel-hydride rechargeable battery and Lithium ion battery.
   These batteries are valuable resources which can be recycled.
   When you replace them or dispose of a used Storage System, please cooperate in the recycling.
   How to dispose of the battery which becomes useless owing to replacement etc. is shown below.

⚠ DANGER

- Do not disassemble the case, do not modify it, or do not peel off the label. There are high voltage parts inside: If you attempt any of these actions, you may get an electrical shock or burn.
- Do not disassemble the battery; this may cause short circuits inside or outside of the battery. If the components are exposed to the air, the battery may cause overheat, burst or ignite. Disassembling the battery may expose you to the alkaline solution, which can be dangerous.
- Do not cut the output cable. Do not modify the connector. If you attempt any of these actions, you may get an electrical shock or burn. A short-circuit may cause abnormal chemical reactions inside the battery which leads to overheating, bursting or ignition.
- Follow the instructions when you recharge the battery pack. If you recharge it in a way different from specified here, it may cause the following problems: The battery may become charged excessively; excessive current may be produced; or the battery cannot be recharged. As a result, the battery may leak, become overheated, burst, or ignite.
- Do not use excessive force when you connect the battery pack to the charger or other devices. If you cannot connect it easily, check the positive and negative are correct for the connector. If you connect the battery in reverse, it will be charged incorrectly and abnormal chemical reactions may occur inside. As a result, the battery may become overheated, burst or ignite.
- Do not connect the battery to a power receptacle. If you apply an excessive amount of voltage to the battery, it may produce excessive current making the battery overheat, burst or ignite.
- Do not use or leave the battery where the temperature can become high, such as, near a fire or a heating element. High temperatures may damage the battery′s separator, which may cause short circuit, making it overheat, burst or ignite.
- Do not incinerate the battery pack or heat it. If you do so, the insulator may melt, the safety fuse/mechanism may be damaged, or the electrolyte may gush out. As a result, the battery may become burst, explode or ignite.
- Do not connect the negative terminal to the positive with metal wire. Do not carry or store the battery with other metal parts. This may cause a short circuit or produce excessive current which can cause the battery to leak, overheat, burst or ignite.
- Do not let the battery become wet by soaking it in the water or seawater. If the battery gets wet, a short circuit may occur and an excessive amount of current may be produced causing abnormal chemical reactions inside. As a result, the battery may become overheated, burst or ignite.

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⚠ DANGER

- Do not nail the battery, hit it with a hammer, or stamp on it. The battery may be broken or dented and a short circuit may occur inside. As a result, the battery may become overheated, burst or ignite.
- Do not solder directly to the battery. If you do so, heat will melt the insulator and damage the safety fuse/mechanism. As a result, the battery may leak or may become overheated, burst or ignite.
- Do not recharge the battery where there is a high temperature, such as near a fire.
- This may cause abnormal chemical reactions inside the battery and it may become overheated, burst or ignite. High temperatures may also cause deterioration of performance/life of the battery.
- Do not place the battery pack in the microwave oven or under high pressure. Either of these actions will rapidly heat the battery or break its seals: As a result, the battery may become overheated, burst or ignite.
- If you find anything strange or unusual with the battery when you use/carry/store it, remove the battery from the device and stop using it. For example, strange smells, strange colors, or deformation are a sign you must stop using the battery.
- If it takes longer than the specified time to complete recharging, stop recharging the battery: Otherwise, the battery may become overheated, burst or ignite.
- If the battery leaks and gets into your eyes, immediately flush your eyes with clean water (tap water) and do not rub your eye. Then visit the doctor immediately. If you do not seek any treatment for your eyes, problems may occur later. Because the battery uses highly concentrated alkaline as electrolyte, it may burn or you may lose your sight if it contacts your skin or eyes. If the battery's liquid contacts your skin or eyes, you must flush them with plenty of clean water and visit the doctor at once.

2. Display of recycling mark

   The following three-arrow recycling mark shows that the sealed Nickel-hydride rechargeable battery and Lithium ion battery are a part to be recycled. A label bearing the mark is affixed on the battery and Flash Module Drive (FMD).

Nickel-hydride rechargeable battery



Lithium ion battery



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3. Specifications of lead battery

Table 3-1 Specifications of Sealed Nickel-hydride Rechargeable Battery

	Battery
Manufacturer	FDK TWICELL Co., Ltd.
Model	9HR-4/3FAUHP-HRSD
Voltage (V)	10.8
Capacity (mAh)	2250

4. Specifications of Lithium ion battery

Table 3-2 Specifications of Lithium Ion Battery

	Flash Module Drive (FMD)
Manufacturer	FMD (Hitachi, Ltd.) / Battery (Hitachi Information & Telecommunication Engineering, Ltd.)
Drive type	NFH1A-PxRxSS/NFH1B-PxRxSS/NFH1C-PxRxSS
Voltage (V)	11.1
Capacity (mAh)	2500

5. Disposal and safety in storage
Before storing a sealed Nickel-hydride rechargeable battery and Lithium ion battery (Flash Module Drive (FMD)), cover its terminals with electric tape, etc. to prevent a short circuit. Store it separately from batteries of other type such as dry battery.