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2. Replacement Processing

2.1 Starting the Window for Maintenance Work

Set up the Maintenance PC, connect the Maintenance PC to the Storage System, and then start the window for maintenance work. For details, refer to the following workflows:

- MAINTENANCE PC SECTION "1.2 Maintenance PC Setup Workflow"
- MAINTENANCE PC SECTION "2.1 Workflow of Settings and Operations of the Maintenance PC at Client's Site"

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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



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 CBXSS/CBXSL/CBSS/CBSL/DBL/DBS/DBF/CHBB, 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.

2.2.1.1 CBXSS/CBXSL/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).

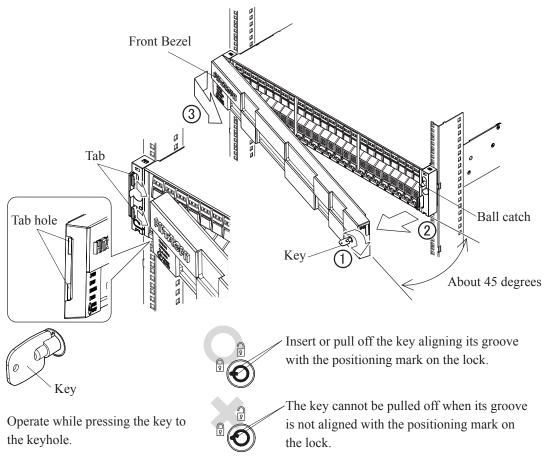
NOTE: When disengaging the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.

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 2-1 Procedure for Removing Front Bezel (CBXSS/CBXSL/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

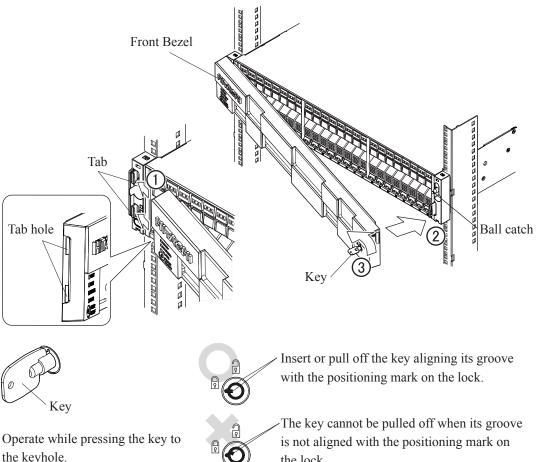
positioning mark on the lock, a damage of the lock may be caused.

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



the keyhole.

the lock.

- 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 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).

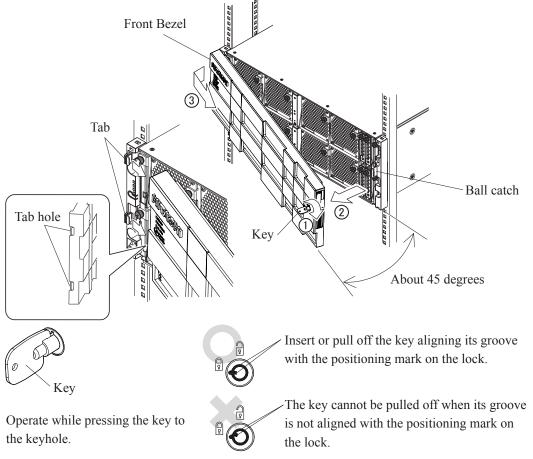
NOTE: When disengaging the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.

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 2-3 Procedure for Removing Front Bezel (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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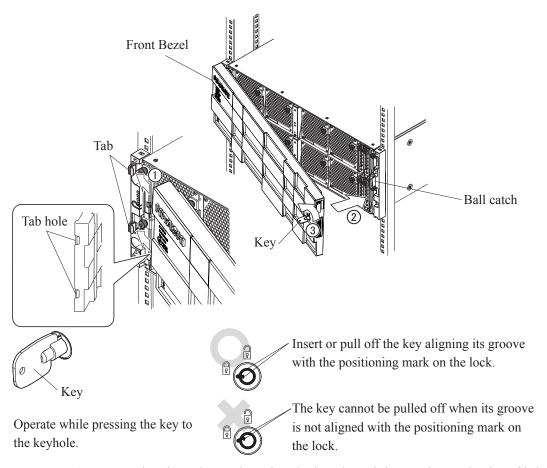
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2. Procedure for attachment

- (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 2-4 Procedure for Attaching Front Bezel (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.

2.2.1.3 DB60

CAUTION

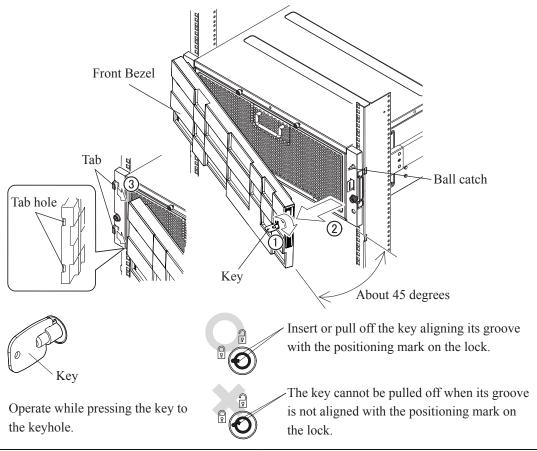
- Be careful of the workers on the other side when pulling out or storing the DB60.
- Do not pull out multiple DB60s at a time because the rack may fall over.
- Do not put objects on the DB60 which has been pulled out of the rack or use it as working space because the rack may fall over.

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 2-5 Procedure for Removing Front Bezel (DB60)



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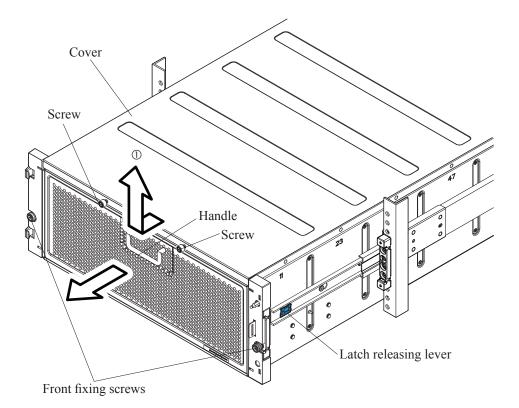
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- (4) Loosen two front fixing screws.
- (5) Hold the handle in the front of the Drive Box and pull out slowly until it stops.

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 2-6 How to Pull Out the DB60



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2. How to store the DB60 in the rack frame.

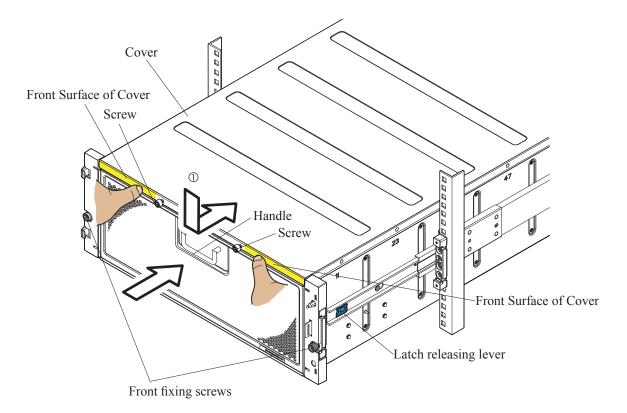
(1) Attach the top cover of DB60 by sliding it in the direction shown by the arrow (①) and tightening the two screws by hand.

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 2-7 How to Store DB60



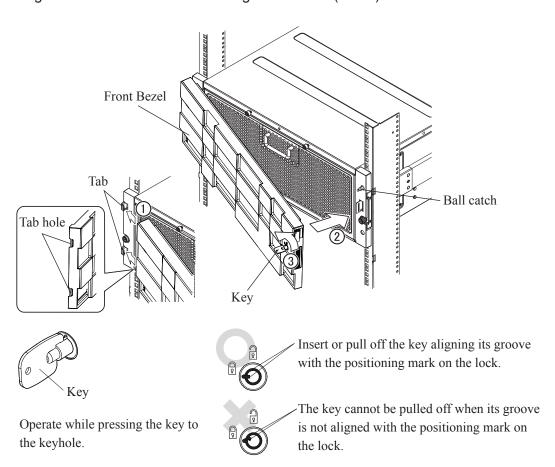
- (4) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
- (5) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).
- (6) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it 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 2-8 Procedure for Attaching Front Bezel (DB60)



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



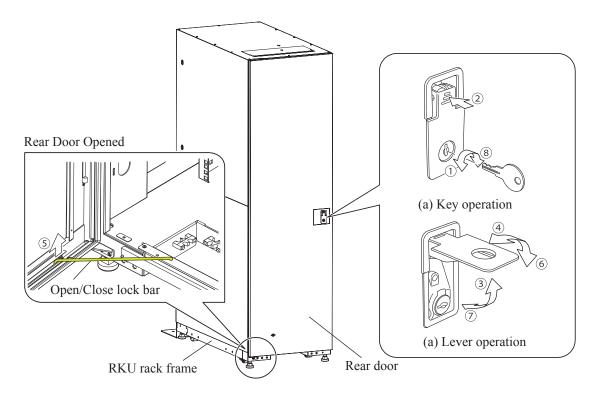
Open or close the door carefully following the procedure. Otherwise, you may hurt your fingers by pinching them.

For information about the Hitachi Universal V2 rack used with HDS VSP storage systems, refer to the Hitachi Universal V2 Rack Reference Guide, MK-97RK000-00.

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 (⑤).
 - (3) Push down the lever, and push the lower part of the lever (②).
 - (4) Insert the key to the keyhole on the rear door, and turn the key to the right to lock (8).

Figure 2-9 Procedure for Opening/Closing Rear Door



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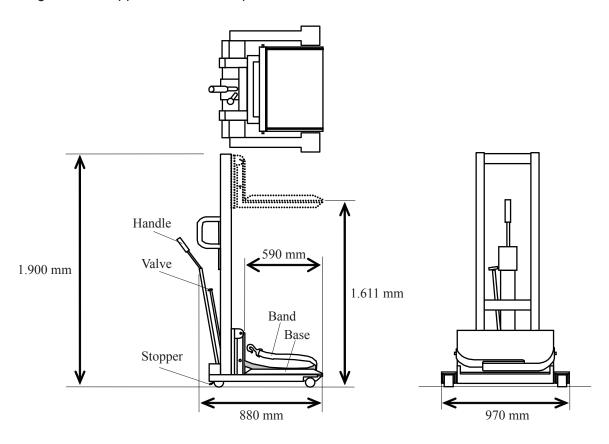
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2.2.3 Mounting Lifter on Rack Frame

Figure 2-10 shows appearance of the special lifter.

Figure 2-10 Appearance of the Special Lifter



A 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 CBXSS/CBSS is about 44 kg, CBXSL/CBSL is about 46 kg, CBLH is about 75 kg, DBS is about 23 kg, DBL is about 27 kg, DB60 is about 90 kg, DBF is about 38 kg, and CHBB is about 40 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.

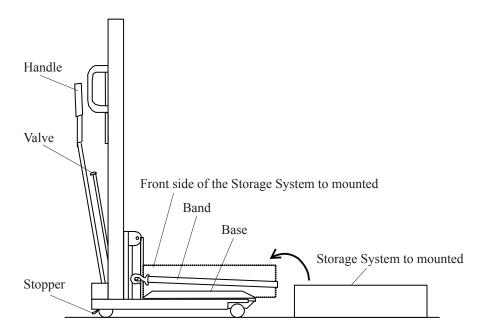
NOTE: When putting the Storage System on the special lifter, be sure to remove the Front Bezel beforehand.

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 2-11 Setting the Storage Systems on Special Lifter



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2.3 Replacing a Drive



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.

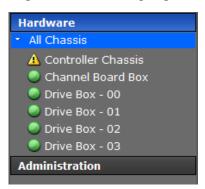
2.3.1 Before Replacing Drive

- 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 MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance
 Utility Window by Specifying IP Address of CTL").

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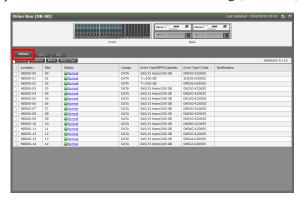
REP02-03-20

- 3. Selecting replacement parts by Maintenance Utility
 - (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".



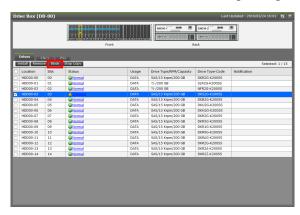
(3) Check the ALM LED (red) on the Drive
When the ALM LED (red) does not light up, perform Step (4) to Step (9).
When the ALM LED (red) lights up, go to "4. Checking the Drives".

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(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.



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(5) <Block Drive>

A 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)":

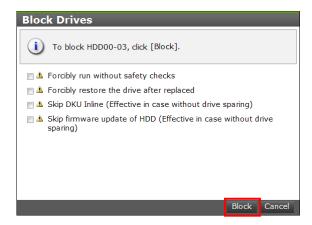
If you check these checkboxes and execute the maintenance, the system may go down. Do not check them unless instructed by the contact described in the manual.

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

NOTE: 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.



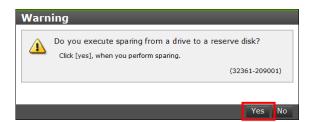
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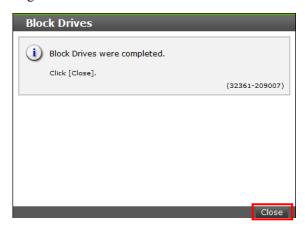
(6) <Saving the spare>

Click the [Yes] button, when you perform sparing.

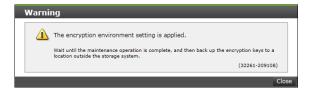
NOTE: If a spare drive that is available for performing sparing is not set, this window is not displayed. Go to the next procedure. See "3.4 Inter Mix of Drives" in THEORY OF OPERATION SECTION for the conditions of the available spare drives.



(7) When the following window is displayed, click the [Close] button.
If a message other than the described is displayed, refer to "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, complete the drive replacement work, and then ask your customer to back up the encryption key.

(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 2-1 List of Mountable Drive Model Names

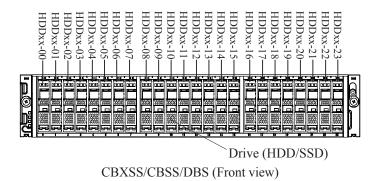
No.	Location	Model Number	Model Name	Remarks
1	CBXSS/CBSS/	DKC-F810I-600JCMC	Disk Drive	
	DBS	DKC-F810I-1R2JCMC		
		DKC-F810I-2R4JGM		
		DKC-F810I-480MGM		
		DKC-F810I-960MGM		
		DKC-F810I-1R9MGM		
		DKC-F810I-3R8MGM		
		DKC-F810I-7R6MGM		
		DKC-F810I-15RMGM		
2	CBXSL/CBSL/	DKC-F810I-6R0H9M	Disk Drive	
	DBL	DKC-F810I-10RH9M		
3	DB60	DKC-F810I-1R2J7MC	Disk Drive	
		DKC-F810I-2R4J8M		
		DKC-F810I-6R0HLM		
		DKC-F810I-10RHLM		
4	DBF	DKC-F810I-3R2FN	Flash Module Drive	
		DKC-F810I-7R0FP		
		DKC-F810I-14RFP		

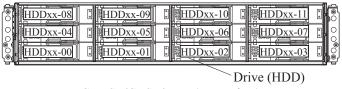
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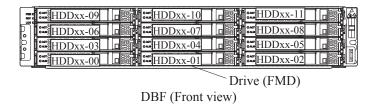
REP02-03-70

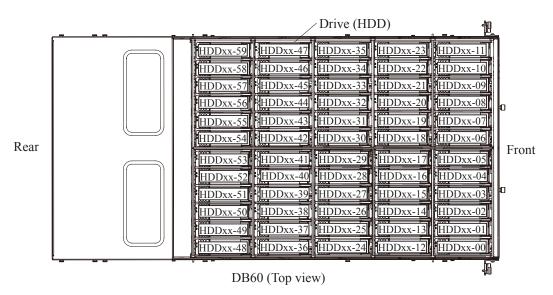
Figure 2-12 Drive Installation Location





CBXSL/CBSL/DBL (Front view)





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- 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 2-13 ALM LED Location (CBXSS/CBSS/DBS)

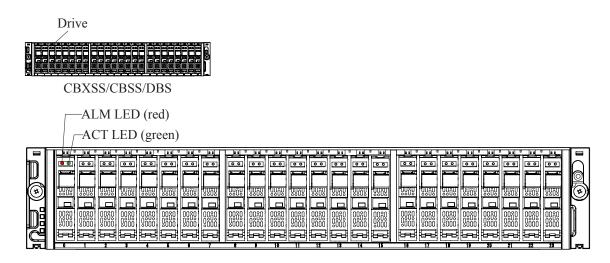
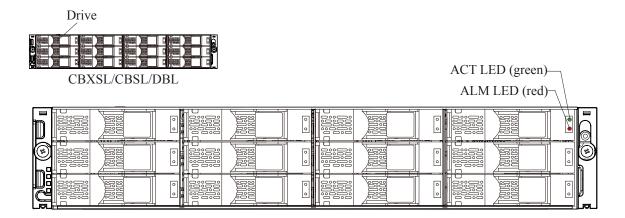


Figure 2-14 ALM LED Location (CBXSL/CBSL/DBL)

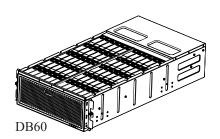


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Figure 2-15 ALM LED Location (DB60)



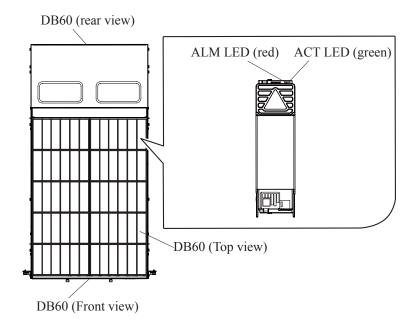
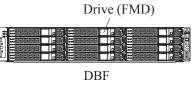
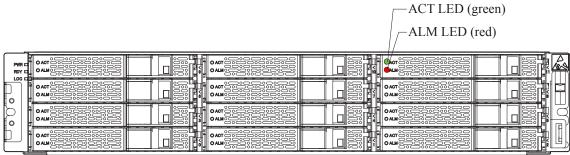


Figure 2-16 ALM LED Location (DBF)





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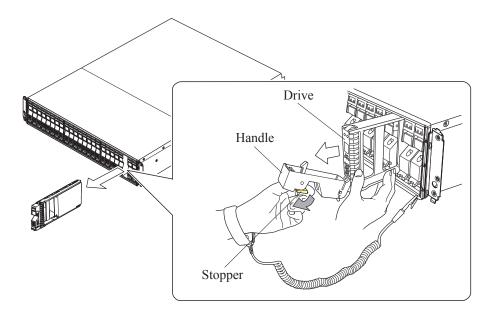
2.3.2 Replacing a Drive

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 CBXSS/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 2-17 Removal of Drive (CBXSS/CBSS/DBS)



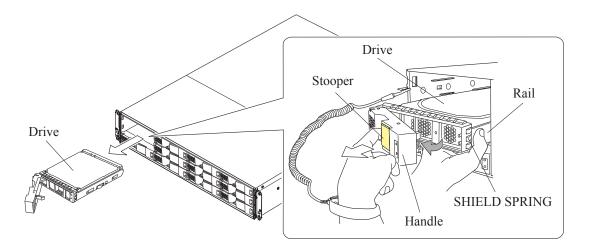
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- (2) In case of CBXSL/CBSL/DBL
 - (a) Pull up the stopper of the Drive handle lightly to release the lock.
 - (b) Open the handle, and pull out and remove the Drive to be replaced not to give a shock.

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

Figure 2-18 Removal of Drive (CBXSL/CBSL/DBL)



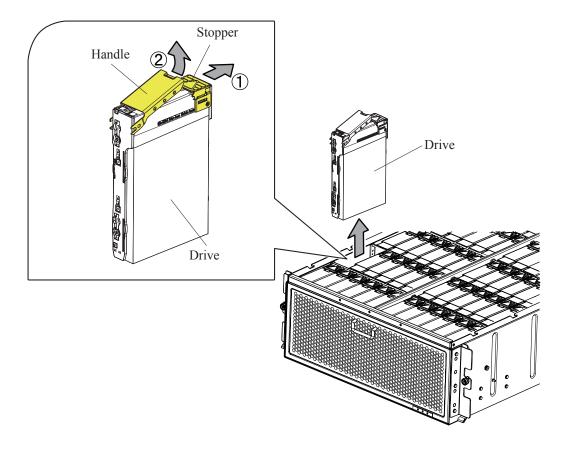
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- (3) In case of DB60
 - (a) Slide (\mathbb{O}) the stopper of the Drive handle and release the lock.
 - (b) Open (2) the handle and pull out the Drive to be replaced gently to remove.

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

Figure 2-19 Removal of Drive (DB60)



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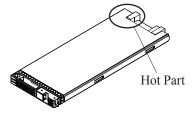
(4) In case of DBF

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.

A 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.

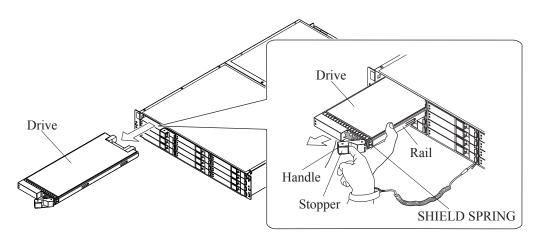


NOTICE: When the FMD is removed in replacing procedure, the fans of the DBPS installed in the rear of the DBF rotate at the highest speed. When the spare FMD is installed, the fans of the DBPS rotate at the speed suitable for environmental temperature.

- (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.

Figure 2-20 Removal of Drive (DBF)



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2. Installing the Drive.

NOTE: • Remove the Drive. After 30 seconds or more past, install the Drive.

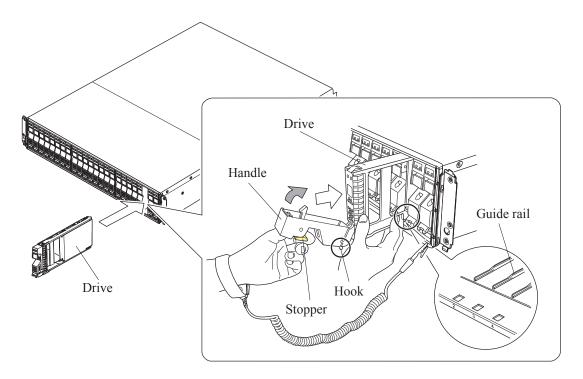
• When installing two or more Drives, install the next Drive after elapsing 20 seconds or more after the previous Drive installation.

(1) In case of CBXSS/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 2-21 Installation of Drive (CBXSS/CBSS/DBS)



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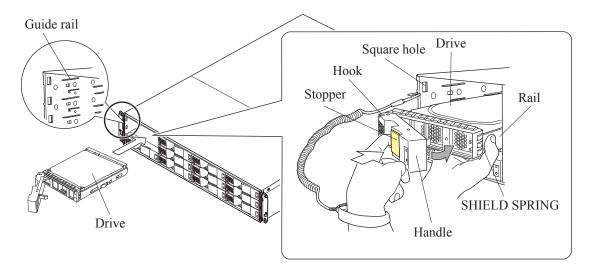
(2) In case of CBXSL/CBSL/DBL

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 2-22 Installation of Drive (CBXSL/CBSL/DBL)



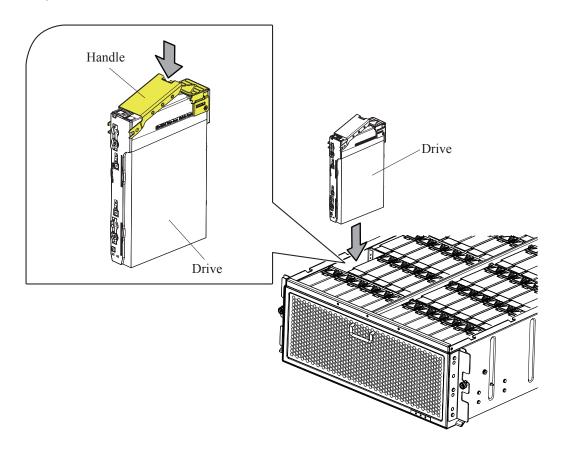
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- (3) In case of DB60
 - (a) Open the handle fully and slide the Drive gently to the arrow direction.
 - (b) Push the handle to lock until it clicks.
 - (c) Pull the Drive lightly by holding the handle to check that it cannot be not pulled out.

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

Figure 2-23 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.

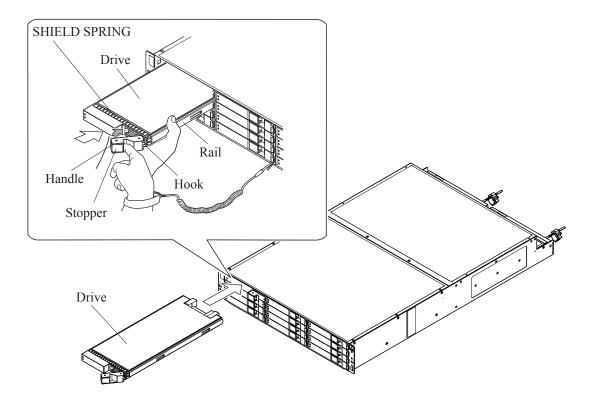
NOTE: When handling the Drive, hold the rail side because the SHIELD SPRING is subject to breakage.

- (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 2-24 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

(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.

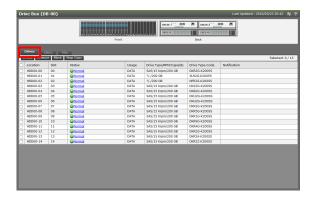
 After completing other copy operations, replace the drive again by following the drive replacement procedure. For the drive replacement, reuse the drive that was removed at the time of replacement instead of using a new drive.

 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".



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(2) Click the [Logout] button to close the window.

- (3) <Get the error information>
 Collect small system dumps by referring to "3.27 Acquiring Dumps using Maintenance Utility" in MAINTENANCE PC SECTION.
- (4) See MAINTENANCE PC SECTION "7.1 Use of OnlineDumpTool", please upload the error information.
- Disconnecting the maintenance PC and the Storage System.
 Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".
- 7. Back up the encryption key
 If the message is displayed in Step 3(8), ask your customer to back up the encryption key using Storage
 Navigator (refer to Encryption License Key User Guide).

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 CBXSS/CBXSL, the CBSS/CBSL and the CBLH.

• When replacing the Controller Board of the CBXSS/CBXSL

"2.4.3 Replacing a Controller Board for CBXSS/CBXSL"

NOTE: There are three types of CBXSS/CBXSL controller boards that have different types of channel ports: 16Gbps FC, iSCSI Optic, and iSCSI Copper. Check the type of the controller board to be replaced.

• 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.

NOTE: In the Web Console, open the "Encryption Keys" window. If the attributes of the encryption keys are KEK and CEK or either of them, ask the customer to create the maximum number of free encryption keys before the replacement.

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

NOTICE: The operation time depends on the I/O load. When the I/O load is extremely high, it might take up to about four hours to complete the procedure.

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.

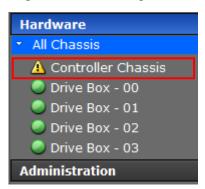
- Connect the maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

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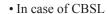
3. Selecting replacement parts by Maintenance Utility.

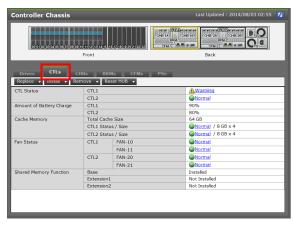
(1) <Main window> Select [Controller Chassis] in the main window.

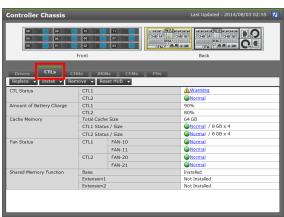


(2) <Controller Chassis window> Click the [CTLs] tab in the "Controller Chassis" window to display a Controller Board status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].

• In case of CBSS







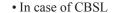
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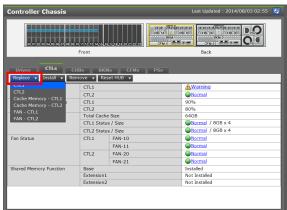
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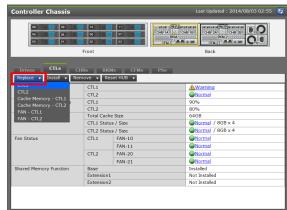
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(3) <Select Controller Board>
Click [Replace] and select a Controller Board to be replaced.

• In case of CBSS







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(4) <Block Controller Board>

A CAUTION

About "Forcibly run without safety checks":

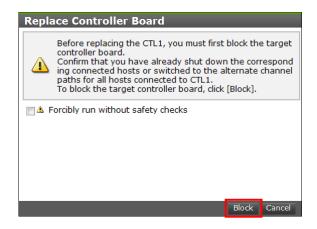
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. When the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

NOTE: 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.

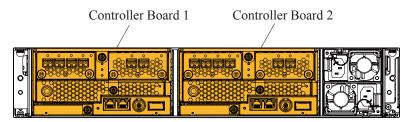
Click the [Restore] button after completing the replacement work.



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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-F850-CTLS
			• DW-F850-CTLSH
	2	Controller Board (Encryption)	• DW-F850-CTLSE
			• DW-F850-CTLSHE

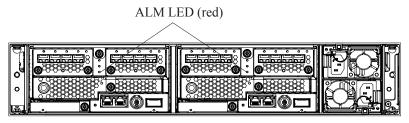


Rear view of CBSS/CBSL

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 2-25 ALM LED Position



Controller Board

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

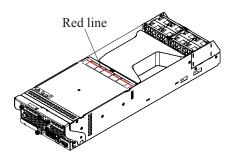
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- (3) Remove the Controller Board from the CBSS/CBSL.
 - (a) Loosen the screw (blue) which fixes the Controller Board (①) and open the lever to pull out (②).
 - (b) Pull out and remove the Controller Board while holding its body with both hands.

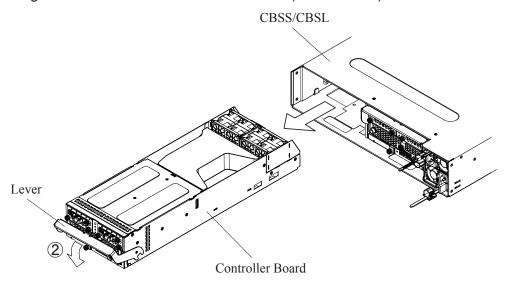
CAUTION

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.

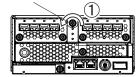


NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to any components.

Figure 2-26 Removal of Controller Board (CBSS/CBSL)



Screw (blue)



Controller Board (Front view)

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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.

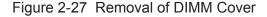
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement.

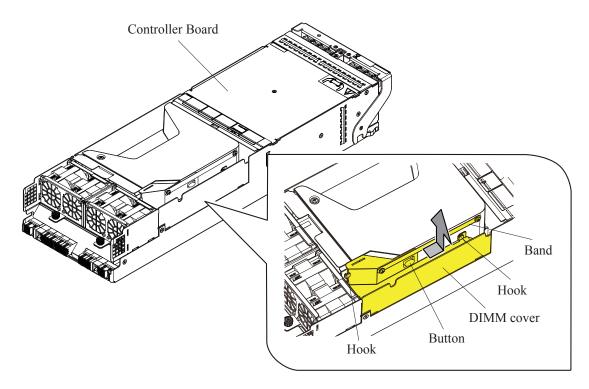
The READY LED (green) on the front of CBSS/CBSL lights up after performing

"5. Restoring replacement parts by Maintenance Utility" of the "2.4.1".

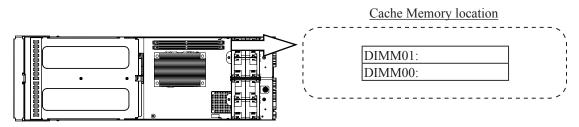
- (4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
- (5) Lift the DIMM cover to remove.

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





(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. Remove the cover of the new Controller Board in the same way as the removed Controller Board before starting the work.



Cache memory location (Controller Board top view)

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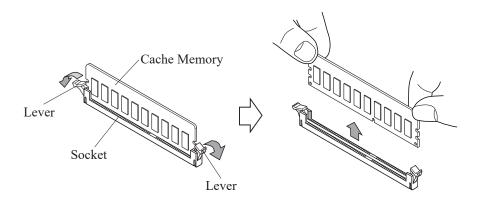
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(7) Installation/Removing Cache Memory

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.

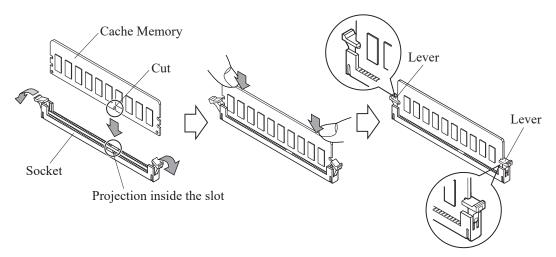
- (a) Procedure for removing.
 - (i) Pull the lever outward.
 - (ii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-28 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 2-29 Installation of the Cache Memory



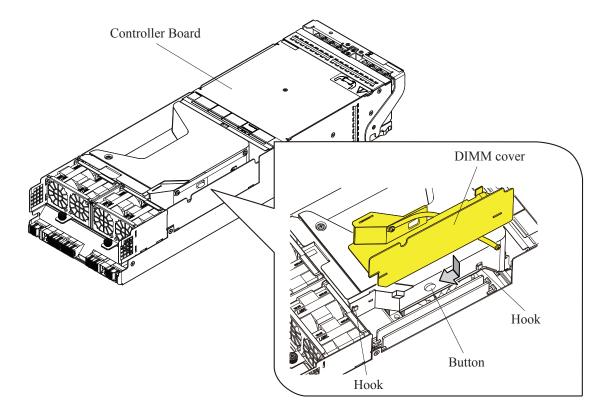
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(8) Slide the DIMM cover to the arrow direction to attach.

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

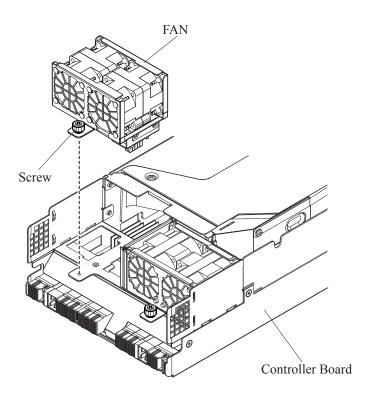
Figure 2-30 Installation of DIMM Cover



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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.

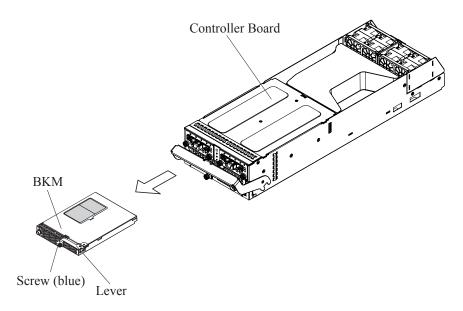
Figure 2-31 Removal of DKCFAN



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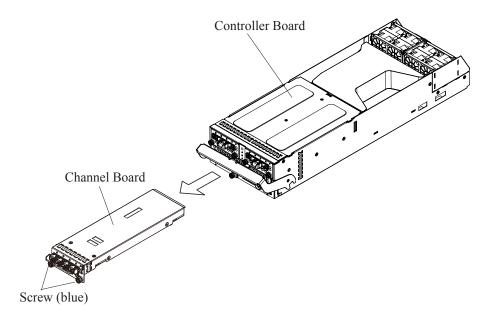
- (c) Loosen the screw (blue) which fixes the BKM installed in the failed Controller Board.
- (d) Open the lever.
- (e) Pull out and remove the Backup Module while holding its body with both hands.

Figure 2-32 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).

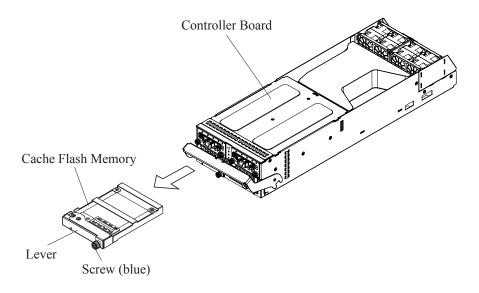
Figure 2-33 Removal of Channel Board



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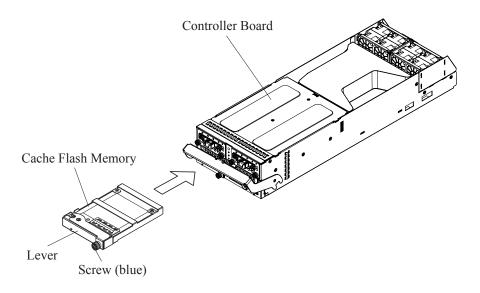
- (h) Loosen the screw (blue) which fixes the Cache Flash Memory.
- (i) Open the lever to pull out and remove the Cache Flash Memory.

Figure 2-34 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 2-35 Installation of Cache Flash Memory

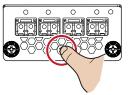


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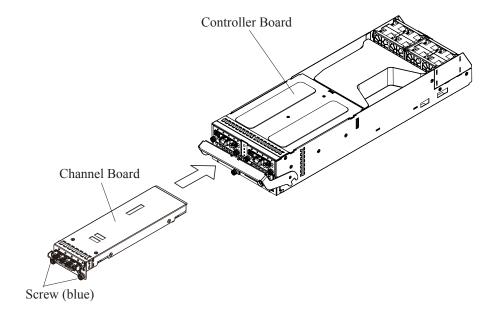
- (m) Insert the Channel Board into the new controller slot.
- (n) Push the Channel Board all the way in.





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

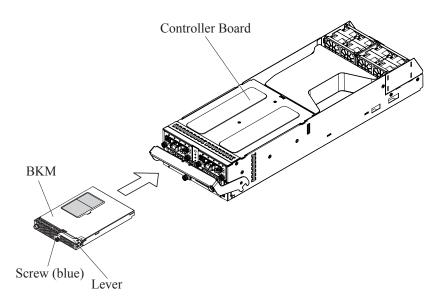
Figure 2-36 Installation of Channel Board



- (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.

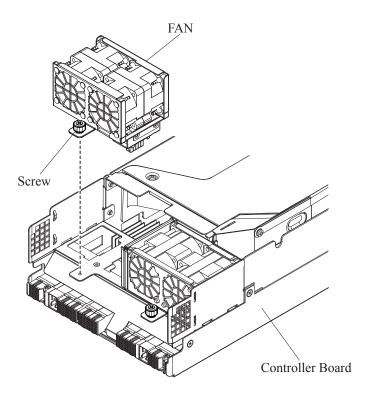
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Figure 2-37 Installation of BKM



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

Figure 2-38 Installation of FAN



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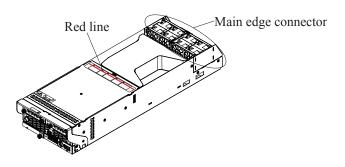
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(10) Install a new Controller Board.

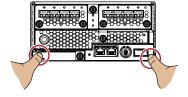


Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



- **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.



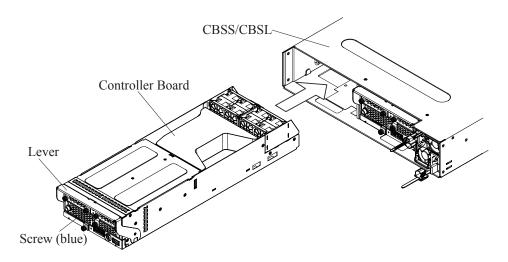
(c) Tighten the screw (blue) and fix the Controller Board.

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Figure 2-39 Installation of Controller Board (CBSS/CBSL)



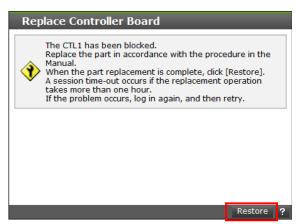
(11) Connect all the removed cables to the Controller Board.

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".

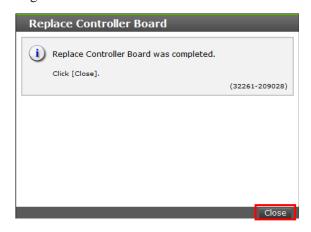
DW850 Rev.0

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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 "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.

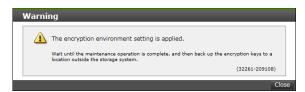
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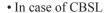
Copyright © 2018, Hitachi, Ltd.

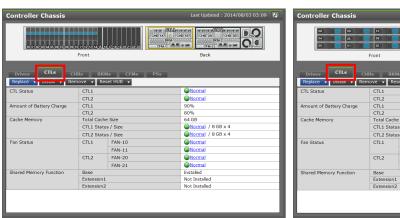
REP02-04-180

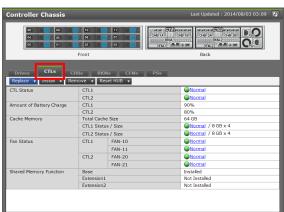
(3) <Check back up the encryption key Messages>
When the encryption environment is applied, the following message is displayed.
Check the message and click the [Close] button.



- (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







- (5) <Check of normality> Perform [Check of normality] in TROUBLESHOOTING SECTION "2.2.1 Error Recovery Procedure when Removing/Inserting CTL".
- (6) Click the [Logout] button to close the window.

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(7) <Get the error information>
Collect small system dumps by referring to "3.27 Acquiring Dumps using Maintenance Utility" in MAINTENANCE PC SECTION.

- (8) See MAINTENANCE PC SECTION "7.1 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 MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".
- 7. Back up the encryption key
 If the message is displayed in Step 5(3), ask your customer to back up the encryption key using Storage
 Navigator (refer to Encryption License Key User Guide).

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 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.

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 MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance
 Utility Window by Specifying IP Address of CTL").

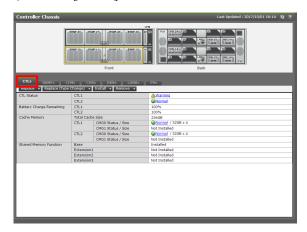
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- 3. Selecting replacement parts by Maintenance Utility.
 - (1) <Main window> Select [Controller Chassis] in the main window.



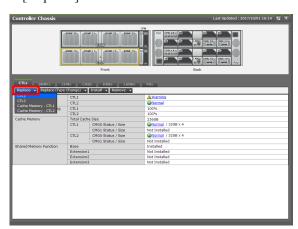
(2) <Controller Chassis window> Click the [CTLs] tab in the "Controller Chassis" window to display a Controller Board status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].



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(3) <Select Controller Board>
Click [Replace] and select a Controller Board to be replaced.



(4) <Block Controller Board>

A CAUTION

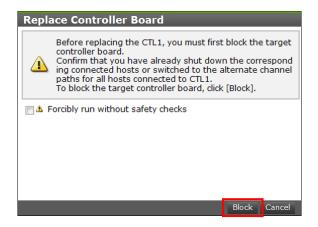
About "Forcibly run without safety checks":

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 the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

NOTE: 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.



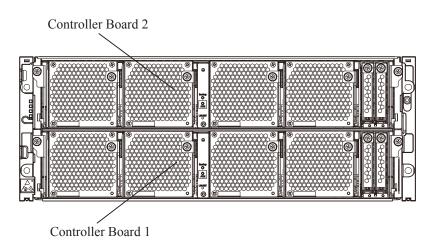
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4. CBLH Controller Board Replacement Processing

Location	Function Name of Component		Part Name
Front View of CBLH	1	Controller Board	• DW-F850-CTLM (CBLH1)
			• DW-F850-CTLH (CBLH2)



Rear view of CBLH

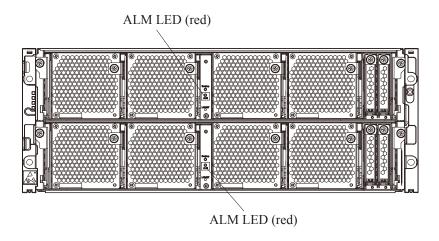
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NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.3 Note on Installing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

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

Figure 2-40 ALM LED Position



Controller Board

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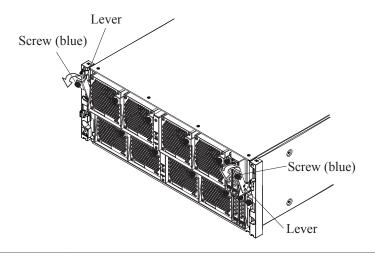
(2) Remove the Controller Board from the CBLH.



When removing a Controller Board of the 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 CBLH and open the lever.

Figure 2-41 Removing Controller Board (CBLH)



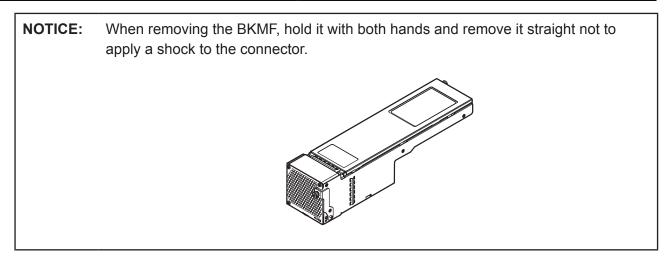
NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.

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 CBLH lights up after performing

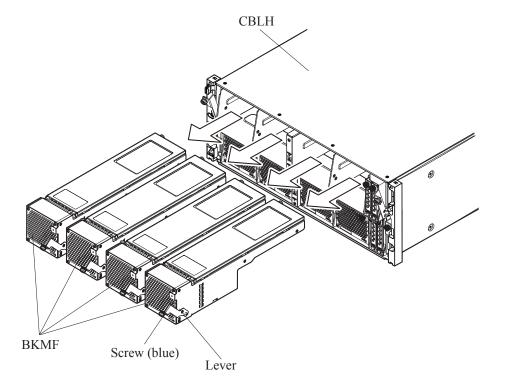
"5. Restoring replacement parts by Maintenance Utility" of the "2.4.2".

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- (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 2-42 Removing BKMF(CBLH)

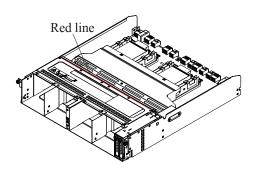


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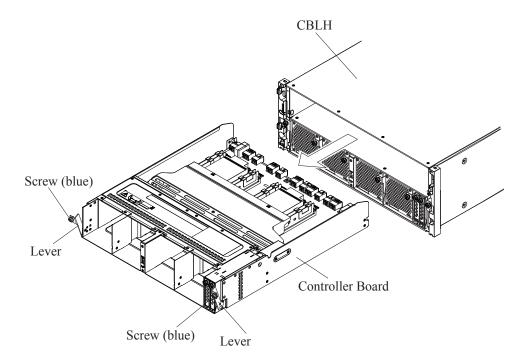
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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 2-43 Removing Controller Board (CBLH)



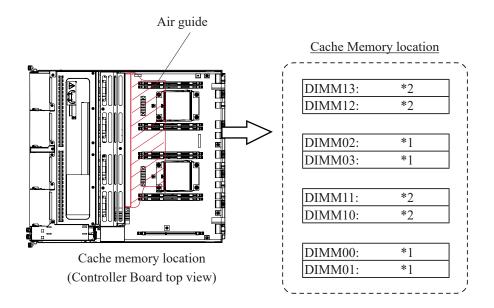
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(3) Move all the Cache Memories (including dust covers if any) mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.

Figure 2-44 Installation Location of Cache Memory



- *1: Belonging to CMG0 (Cache Memory Group 0).
- *2: Belonging to CMG1 (Cache Memory Group 1).

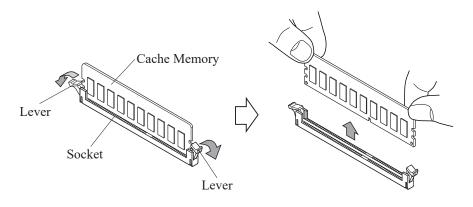
Be sure to install DIMM in CMG0.

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 2-45 Removal of Cache Memory



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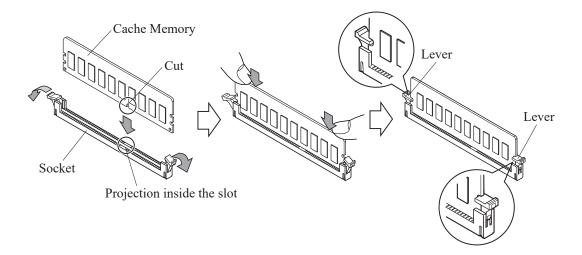
REP02-04-300

(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 2-46 Installation of Cache Memory



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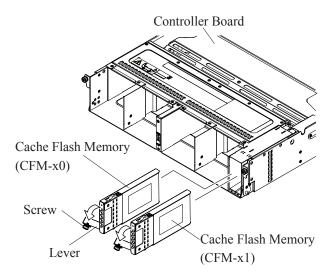
REP02-04-310

(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.

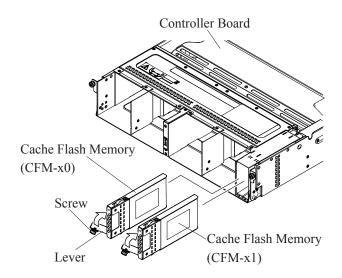
- (a) Loosen the screw (blue) which fixes the Cache Flash Memory.
- (b) Open the lever to pull out and remove the Cache Flash Memory.

Figure 2-47 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 2-48 Installation of Cache Flash Memory



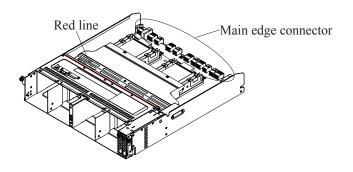
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(5) Install a new Controller Board.

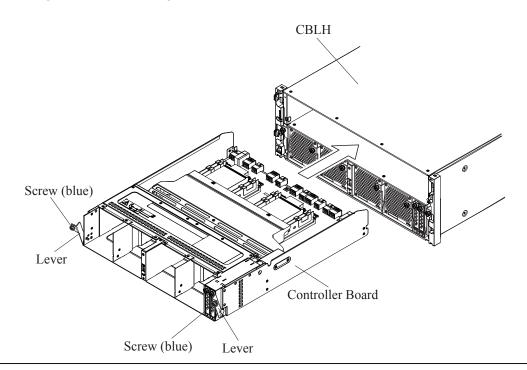


Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.

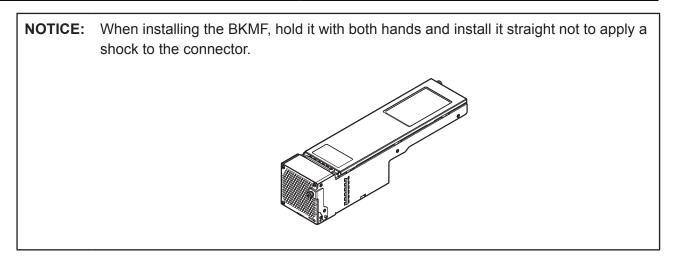


- **NOTICE:** Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
 - When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.
 - (a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBLH.

Figure 2-49 Installing the Controller Board (CBLH)

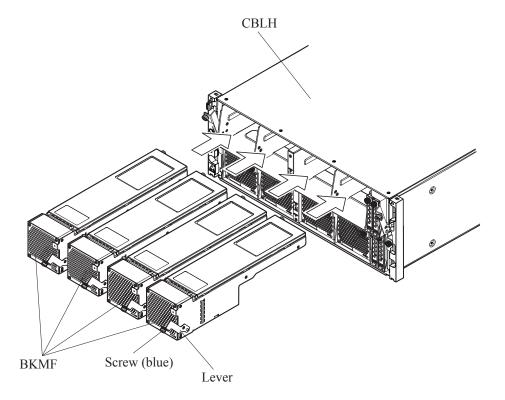


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- (b) Install four BKMFs in the Controller Board.
 - (i) Open the BKMF lever and insert the BKMF into the slot.
 - (ii) Raise the BKMF lever and tighten the screw (blue) and fix it.

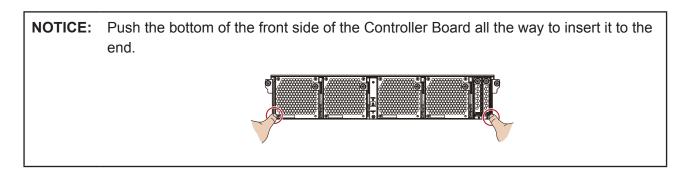
Figure 2-50 Installing the BKMF



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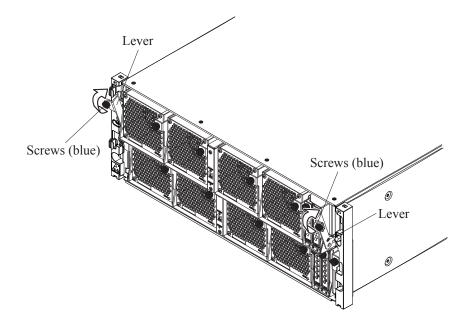
REP02-04-340

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



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

Figure 2-51 Fixing the Controller Board

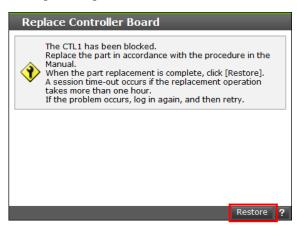


REP02-04-350

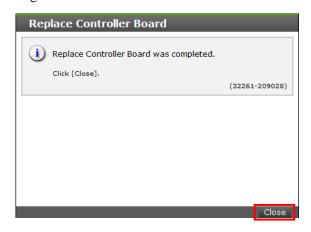
Rev.0

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 "Device Manager-Storage Navigator Messages".



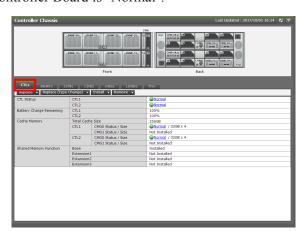
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.

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) <Check of normality>
 Perform [Check of normality] in TROUBLESHOOTING SECTION "2.2.1 Error Recovery Procedure when Removing/Inserting CTL".
- (5) Click the [Logout] button to close the window.
- (6) <Get the error information> Collect small system dumps by referring to "3.27 Acquiring Dumps using Maintenance Utility" in MAINTENANCE PC SECTION.
- (7) Refer to the MAINTENANCE PC SECTION "7.1 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 MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

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2.4.3 Replacing a Controller Board for CBXSS/CBXSL

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.

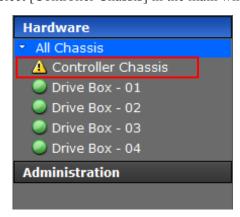
When replacing the Controller Board 1, connect the maintenance PC and the Controller Board 2. When replacing the Controller Board 2, connect the maintenance PC and the Controller Board 1.

- Connect the maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance
 Utility Window by Specifying IP Address of CTL").

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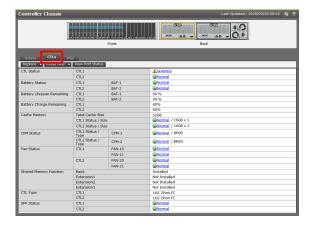
REP02-04-380

- 3. Selecting replacement parts by Maintenance Utility.
 - (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].

Example: In case of CBXSS



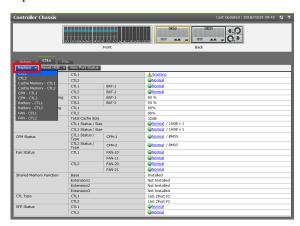
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(3) <Select Controller Board>

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

Example: In case of CBXSS



(4) <Block Controller Board>

A CAUTION

About "Forcibly run without safety checks":

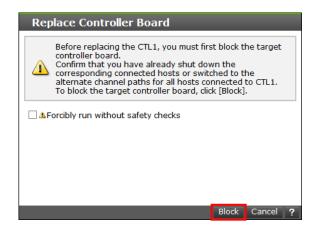
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. When the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

NOTE: 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.



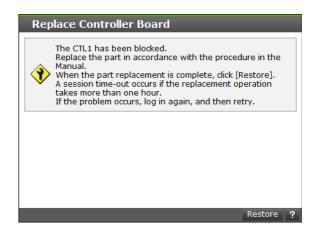
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(5) <Check the beginning of Controller Board replacement> Check that the Controller Board is blocked and becomes ready for replacing.

NOTE: Do not click the [Restore] button at this time.

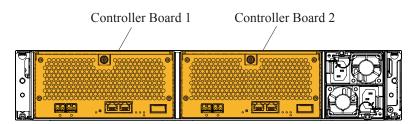
Click the [Restore] button after completing the replacement work.



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4. CBXSS/CBXSL Controller Board Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBXSS/CBXSL	1	Controller Board	• DW-F850-CTLXSFA (16 G Fibre)
			• DW-F850-CTLXSSA (iSCSI Optic)
			• DW-F850-CTLXSCA (iSCSI Copper)

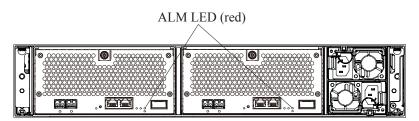


Rear view of CBXSS/CBXSL

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 CBXSS/CBXSL Controller Board to be replaced lights up.

Figure 2-52 ALM LED Position



Controller Board

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

Remove the cables from the channel ports with care so as not to damage the cables (see "1.1.12 Notes on Removing Optical Cables").

DW850

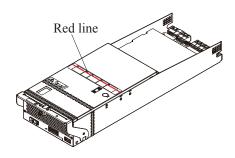
REP02-04-420

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- (3) Remove the Controller Board from the CBXSS/CBXSL.
 - (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.

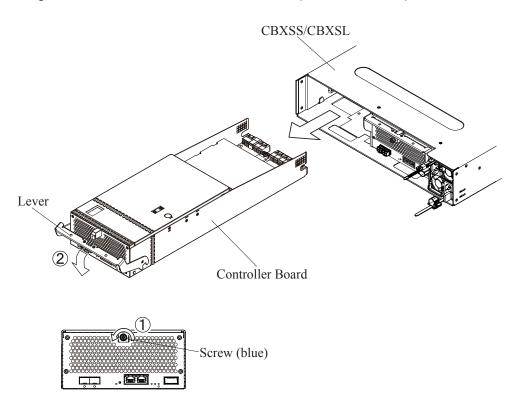
CAUTION

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.



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

Figure 2-53 Removal of Controller Board (CBXSS/CBXSL)



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NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.

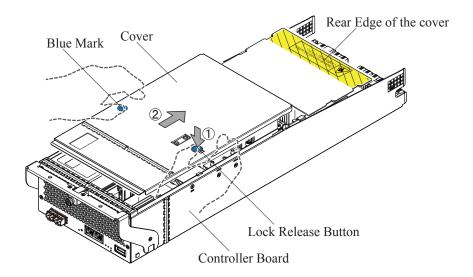
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the replacement. The READY LED (green) on the front of CBXSS/CBXSL lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.4.3".

(4) While pressing the lock release button on the cover (①), slide the cover in the direction of the arrow (②) with your hands on the blue marks.

CAUTION

When attaching or removing the cover, be careful not to hold the rear edge of the cover (hatched area in the figure below). Otherwise, you might get your fingers pinched.

Figure 2-54 Removal of Cover



DW850

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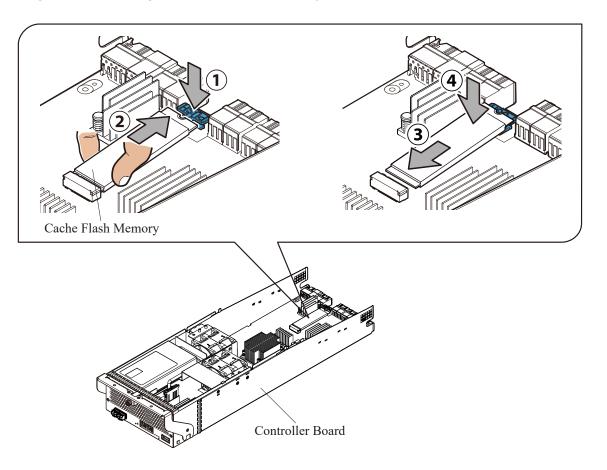
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- (5) Move the Cache Flash Memory.
 - (a) Press the clip (①) on the failed Controller Board to release the lock of the Cache Flash Memory. If the Cache Flash Memory cannot be fully lifted after being unlocked, lift it carefully not to hit it against the clip.

NOTE: If you lift the Cache Flash Memory by force, the connector might be damaged.

- (b) Pull out the Cache Flash Memory in the arrow direction (②).
- (c) Insert the Cache Flash Memory removed from the failed Control Board into the connector of the new Controller Board in the arrow direction (3).
- (d) Secure the Cache Flash Memory by pressing it in the arrow direction (4).
- (e) Likewise, attach the Cache Flash Memory that was removed from the new Controller Board to the failed Controller Board.

Figure 2-55 Moving the Cache Flash Memory



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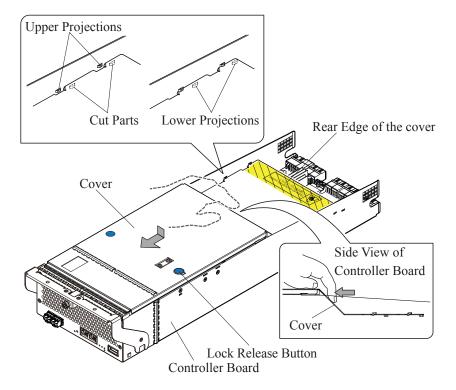
(6) Attach the cover to the Controller Board with the upper projections of the Controller Board placed on the cut parts of the cover. Push the cover in the arrow direction, and slide it until locked.

NOTE: Make sure to firmly attach the cover until the lock release button clicks.

A CAUTION

When attaching or removing the cover, be careful not to hold the rear edge of the cover (hatched area in the figure below). Otherwise, you might get your fingers pinched.

Figure 2-56 Installation of Cover



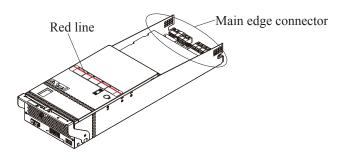
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(7) Install a new Controller Board.



Dropping the Controller Board might cause injury. Hold the Controller Board firmly with your hands.



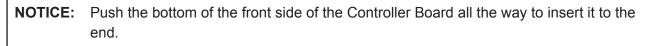
- NOTICE: Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
 - When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

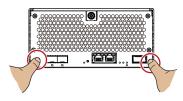
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(a) With the lever on the Controller Board opened completely, insert it into the slot of the CBXSS/CBXSL.

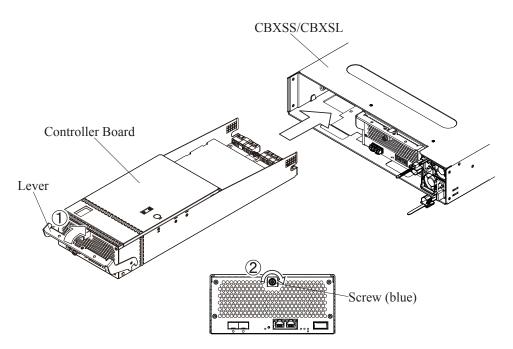
(b) Push the Controller Board all the way in and close the lever completely.





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

Figure 2-57 Installation of Controller Board (CBXSS/CBXSL)



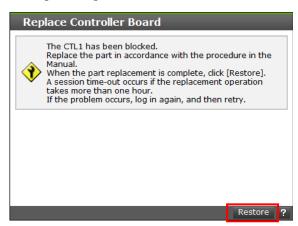
(8) Connect all the removed cables to the Controller Board.
When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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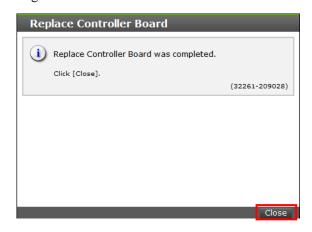
REP02-04-480

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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 "Device Manager-Storage Navigator Messages".



NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.

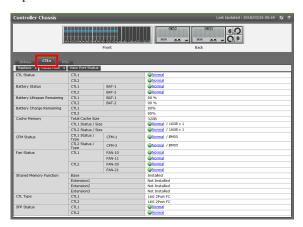
When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

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REP02-04-490

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

Example: In case of CBXSS



- (4) <Check of normality>
 Perform [Check of normality] in TROUBLESHOOTING SECTION "2.2.1 Error Recovery Procedure when Removing/Inserting CTL".
- (5) Click the [Logout] button to close the window.
- (6) <Get the error information> Collect small system dumps by referring to "3.27 Acquiring Dumps using Maintenance Utility" in MAINTENANCE PC SECTION.
- (7) See MAINTENANCE PC SECTION "7.1 Use of OnlineDumpTool", please upload the error information.
- Disconnecting the maintenance PC and the Storage System.
 Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

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REP02-05-10

2.5 Replacing a Cache Memory

The window and the procedure differ between the CBXSS/CBXSL, the CBSS/CBSL and the CBLH.

- When replacing the Cache Memory of the CBXSS/CBXSL
 - "2.5.3 Replacing a Cache Memory for CBXSS/CBXSL"
- 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 CBLH
 - "2.5.2 Replacing a Cache Memory for CBLH"

NOTICE: The operation time depends on the I/O load. When the I/O load is extremely high, it might take up to about four hours to complete the procedure.

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.

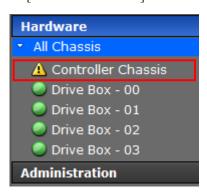
- Connect the maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility

Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

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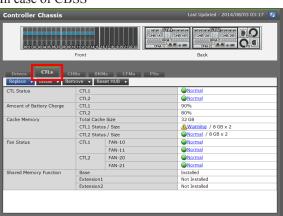
REP02-05-20

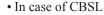
- 3. Selecting replacement parts by Maintenance Utility.
 - (1) <Main window> Select [Controller Chassis] in the main window.

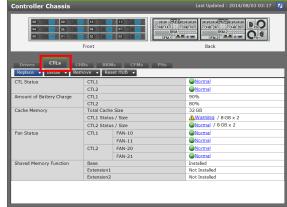


(2) <Controller Chassis window> Click the [CTLs] tab in the Controller Chassis" window to display a Cache Memory status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].









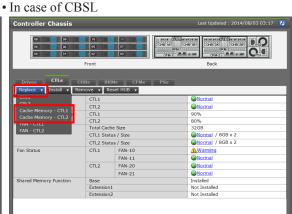
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(3) <Select Controller Board>
Click [Replace] and select a Controller Board in which a Cache Memory is installed.

• In case of CBSS





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(4) <Block Controller Board>

A CAUTION

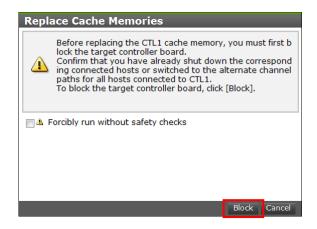
About "Forcibly run without safety checks":

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 the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

NOTE: 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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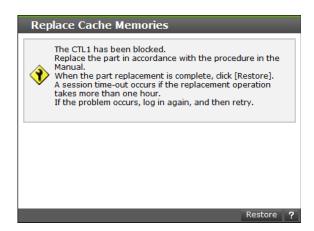
(5) < Check Controller Board>

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.

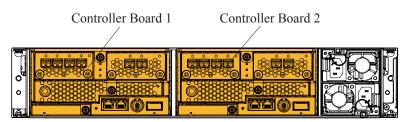
> NOTE: Do not click the [Restore] button at this time. Click the [Restore] button after completing the replacement work.



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4. Cache Memory Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBSS/CBSL	1	Cache Memory	• DW-F850-CM16G (CBSS1/CBSL1)
			• DW-F850-CM32G (CBSS1/CBSL1/CBSS2/
			CBSL2)
			• DW-F850-CM64G (CBSS2/CBSL2)

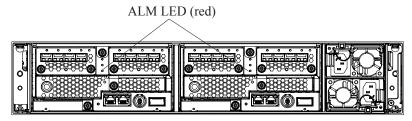


Rear view of CBSS/CBSL

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 removed lights up.

Figure 2-58 ALM LED Position



Controller Board

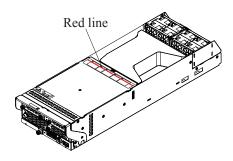
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- (2) Remove all the cables connected to the Controller Board.
- (3) Remove the Controller Board from the CBSS/CBSL.
 - (a) Loosen the screw (blue) which fixes the Controller Board (①) and open the lever to pull out (②).
 - (b) Pull out and remove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

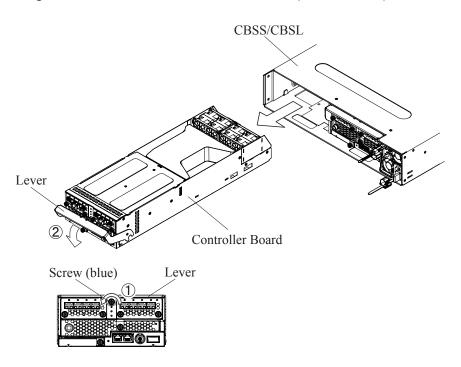
A CAUTION

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 2-59 Removal of Controller Board (CBSS/CBSL)



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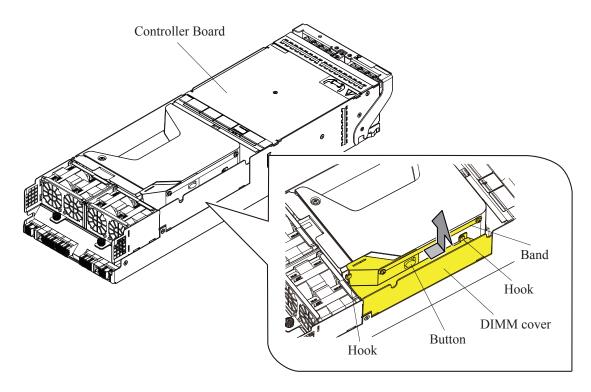
NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.

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".

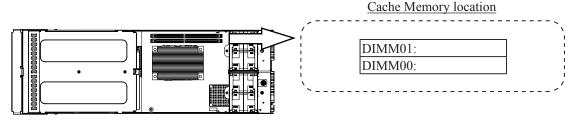
- (4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
- (5) Lift the DIMM cover to remove.

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





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



Cache memory location (Controller Board top view)

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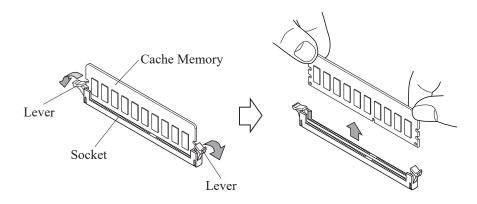
REP02-05-80

(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.

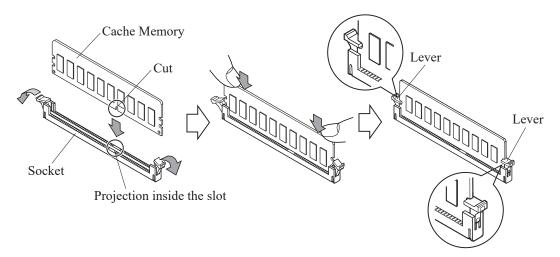
- (a) Removal procedure
 - (i) Pull the lever outward.
 - (ii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-61 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 2-62 Installation of the Cache Memory



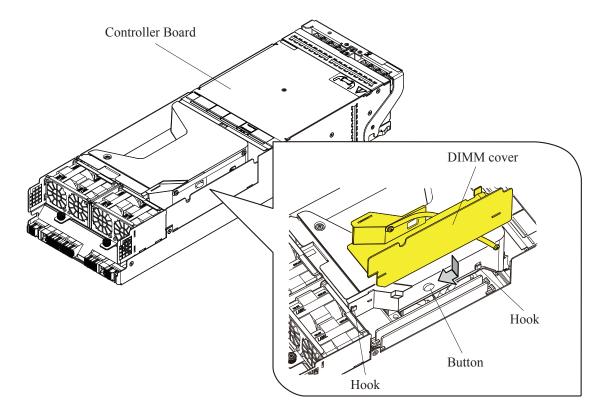
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(8) Slide the DIMM cover to the arrow direction to attach.

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

Figure 2-63 Installation of DIMM Cover



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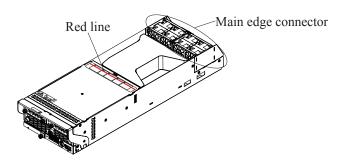
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(9) Installing a Controller Board.

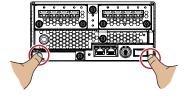


Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



- **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.



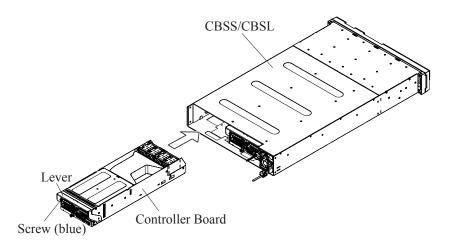
(c) Tighten the screw (blue) and fix the Controller Board.

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Figure 2-64 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".

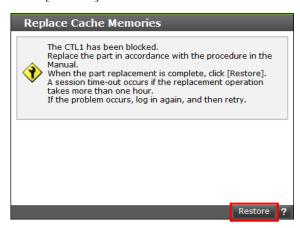
DW850

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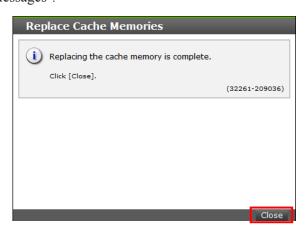
Rev.0

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 "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.

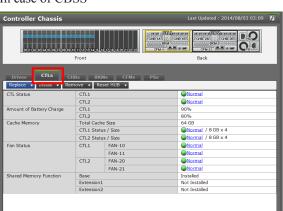
DW850

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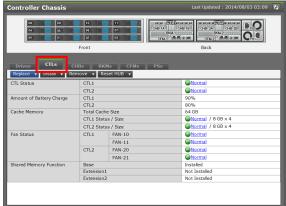
REP02-05-130

(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







- (4) Click the [Logout] button to close the window.
- 6. Disconnecting the maintenance PC and the Storage System. Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3" Disconnecting the Maintenance PC from the Storage System".

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2.5.2 Replacing a Cache Memory for 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.

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 MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance
 Utility Window by Specifying IP Address of CTL").

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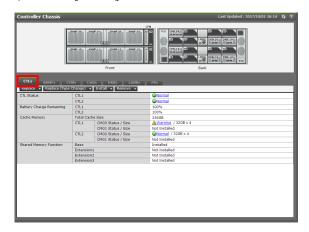
REP02-05-150

3. Selecting replacement parts by Maintenance Utility.

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



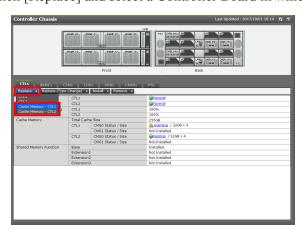
(2) <Controller Chassis window> Click the [CTLs] tab in the "Controller Chassis" window to display a Cache Memory status. See MAINTENANCE PC SECTION "3.22 Alert Display Related to FRU (Field Replacement Unit)" for the [Status].



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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>

A CAUTION

About "Forcibly run without safety checks":

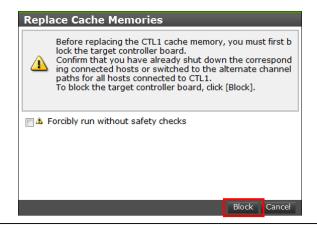
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. When the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

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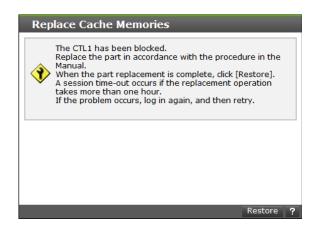
(5) <Check Controller Board> Check that the Controller Board to replace the Cache Memory is correct again and click the [OK] button.



(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.

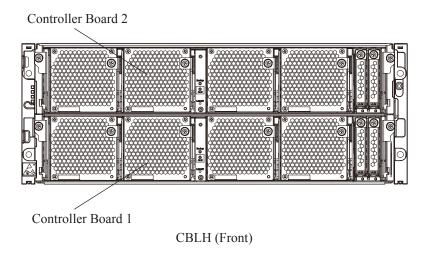


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4. CBLH Controller Board Replacement Processing

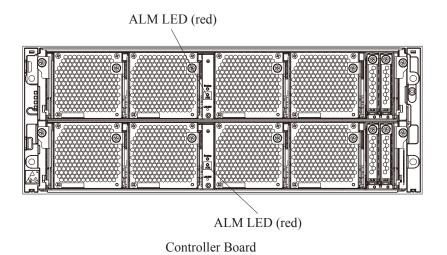
Location	Function Name of Component		Part Name
CBLH (Front)	1	Cache Memory	• DW-F850-CM16G (CBLH1)
			• DW-F850-CM32G (CBLH1/CBLH2)
			• DW-F850-CM64G (CBLH2)



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 CBLH Controller Board in which the Cache Memory to be replaced is installed lights up.

Figure 2-65 ALM LED Location



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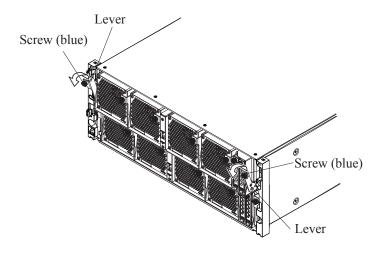
(2) Remove the Controller Board from the CBLH.

CAUTION

When removing a Controller Board of the 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 CBLH and open the lever.

Figure 2-66 Removing Controller Board (CBLH)

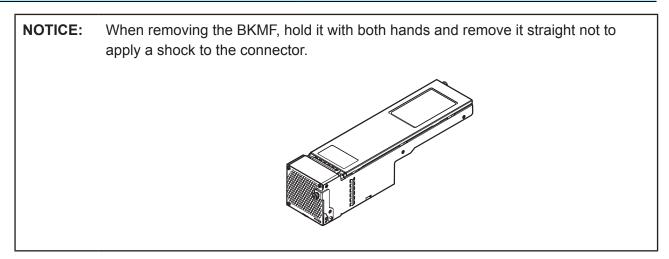


NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.

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 CBLH lights up after performing "5. Restoring replacement parts by Maintenance Utility" of the "2.5.2".

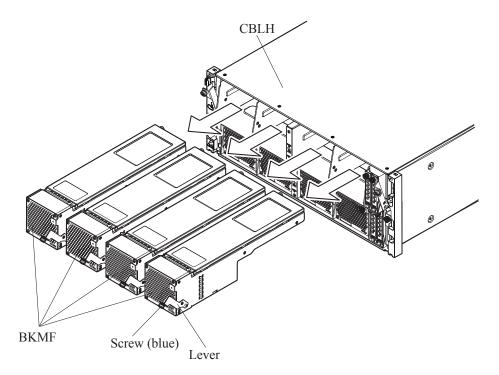
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- (b) Remove all BKMFs (four) installed in the Controller Board.
 - (i) Loosen the screws (blue) fixing the BKMF.
 - (ii) Open the lever and pull out the BKMF to remove.

Figure 2-67 Removing BKMF (CBLH)

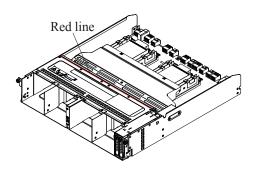


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REP02-05-210



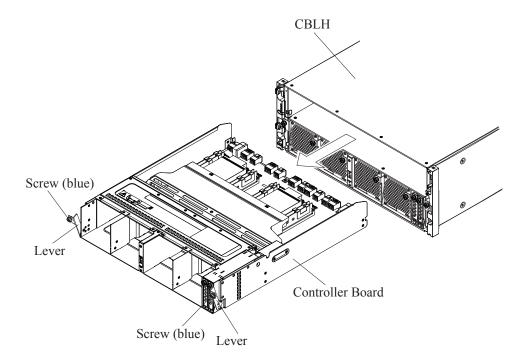
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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 2-68 Removing Controller Board (CBLH)

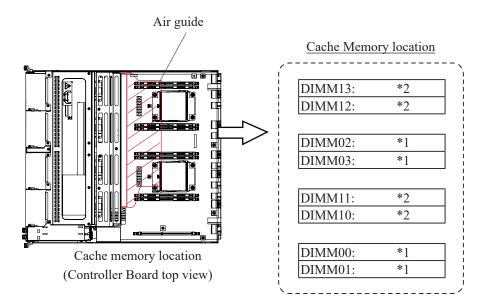


DW850

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Rev.2

(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).

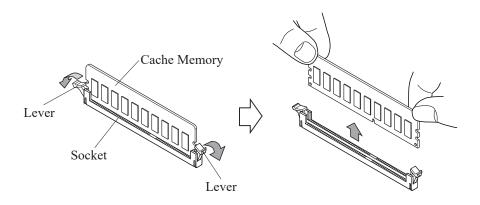
Be sure to install DIMM in CMG0.

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 2-69 Removal of Cache Memory



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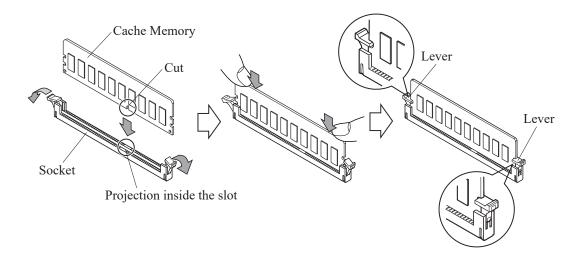
REP02-05-230

(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 2-70 Installation of Cache Memory



Rev.0

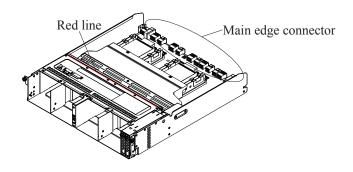
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(4) Install a new Controller Board.

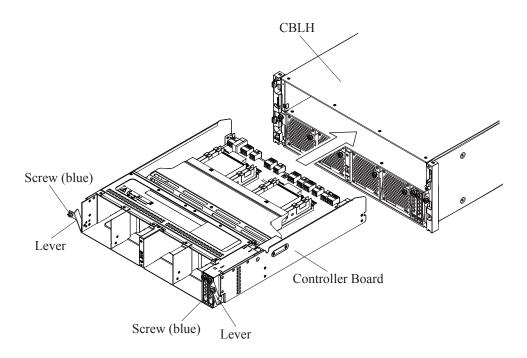


Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



- **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 CBLH.

Figure 2-71 Installing the Controller Board (CBLH)



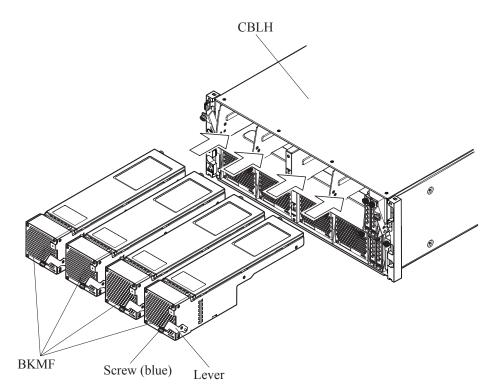
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NOTICE: When installing the BKMF, hold it with both hands and install it straight not to apply a shock to the connector.

- (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.

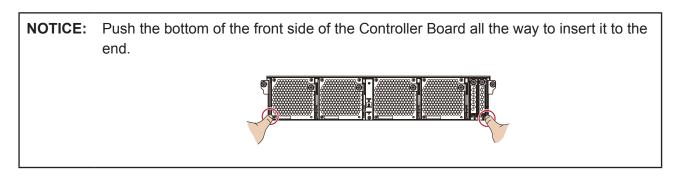
Figure 2-72 Installing the BKMF



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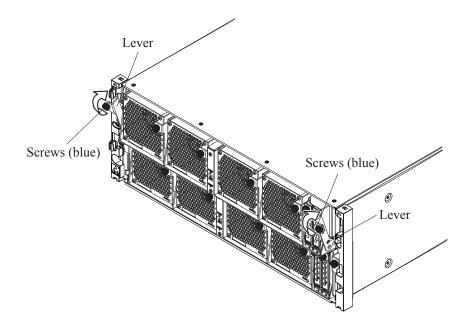
REP02-05-260

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



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

Figure 2-73 Fixing the Controller Board



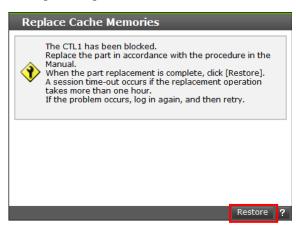
DW850

REP02-05-270

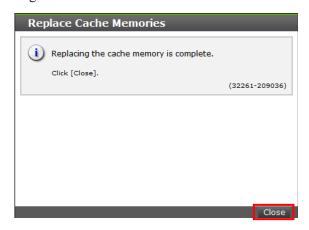
Rev.0

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 "Device Manager-Storage Navigator Messages".



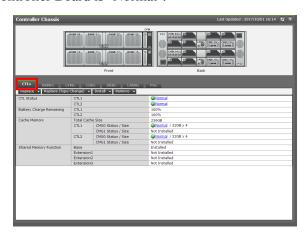
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.

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) Click the [Logout] button to close the window.
- 6. Disconnecting the maintenance PC and the Storage System.

 Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

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2.5.3 Replacing a Cache Memory for CBXSS/CBXSL

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 MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".
- 2. Starting Maintenance Utility
 Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance
 Utility Window by Specifying IP Address of CTL").

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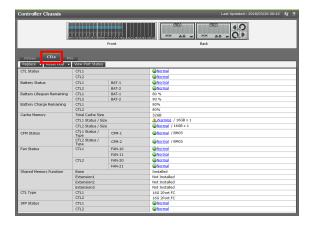
REP02-05-300

- 3. Selecting replacement parts by Maintenance Utility.
 - (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].

Example: In case of CBXSS



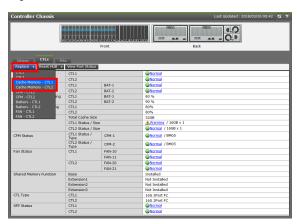
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REP02-05-310

(3) <Select Controller Board>

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

Example: In case of CBXSS



(4) <Block Controller Board>

A CAUTION

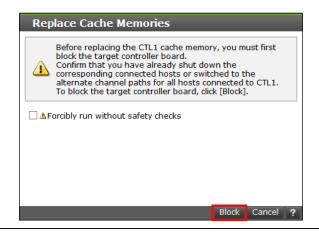
About "Forcibly run without safety checks":

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 the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "1.1.11 Note on Deleting Remote Paths".

This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

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 "Device Manager-Storage Navigator Messages".

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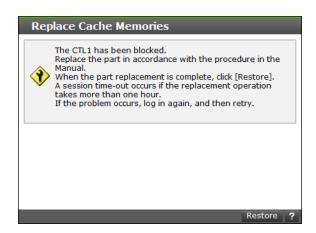
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(5) < Check Controller Board> Check that the Controller Board to replace the Cache Memory is correct again and click the [OK] button.



(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.

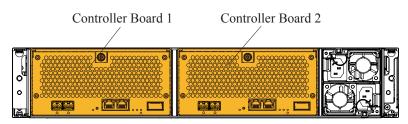


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4. Cache Memory Replacement Processing

Location	Function Name of Component		Part Name
Rear view of CBXSS/CBXSL	1	Cache Memory	• CM16G

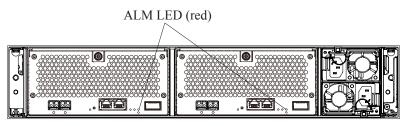


Rear view of CBXSS/CBXSL

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 CBXSS/CBXSL Controller Board to be removed lights up.

Figure 2-74 ALM LED Position



Controller Board

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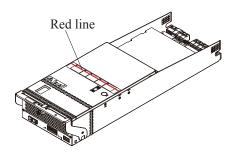
(2) Remove all the cables connected to the Controller Board.

Remove the cables from the channel ports with care so as not to damage the cables (see "1.1.12 Notes on Removing Optical Cables").

- (3) Remove the Controller Board from the CBXSS/CBXSL.
 - (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.

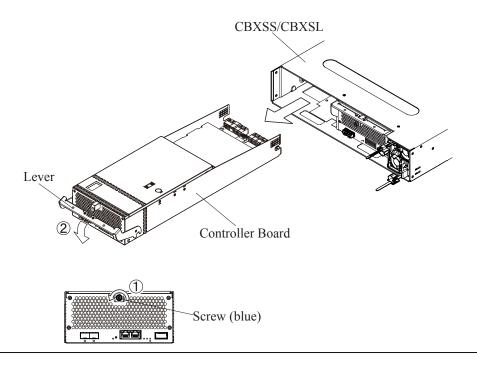
CAUTION

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 2-75 Removal of Controller Board (CBXSS/CBXSL)



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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 CBXSS/CBXSL lights up after performing

"5. Restoring replacement parts by Maintenance Utility" of the "2.5.3".

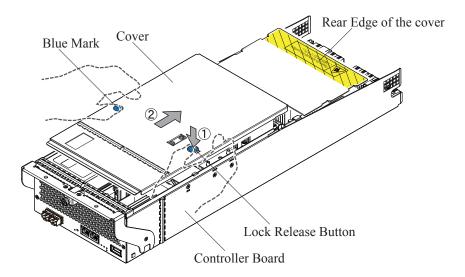
(4) While pressing the lock release button on the cover (①), slide the cover in the direction of the arrow (②) with your hands on the blue marks.



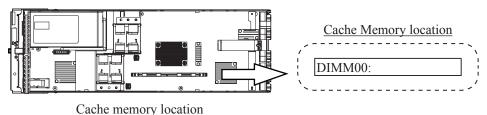
CAUTION

When attaching or removing the cover, be careful not to hold the rear edge of the cover (hatched area in the figure below). Otherwise, you might get your fingers pinched.

Figure 2-76 Removal of Cover



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



(Controller Board top view)

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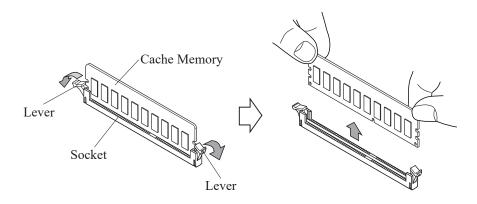
REP02-05-360

(6) 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.

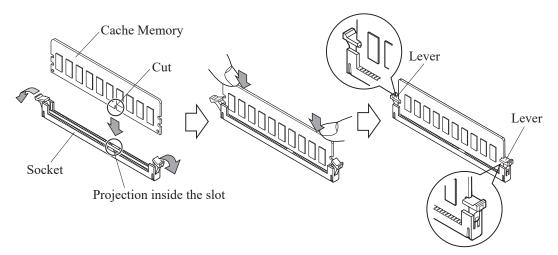
- (a) Procedure for removing.
 - (i) Pull the lever outward.
 - (ii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 2-77 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 2-78 Installation of the Cache Memory



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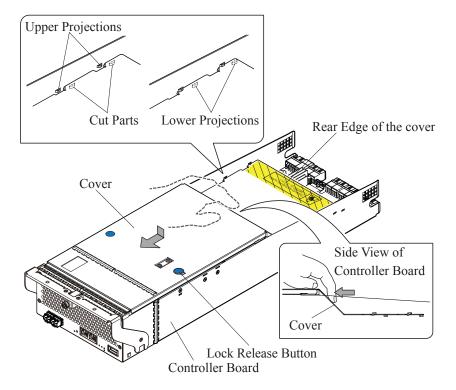
(7) Attach the cover to the Controller Board with the upper projections of the Controller Board placed on the cut parts of the cover. Push the cover in the arrow direction, and slide it until locked.

NOTE: Make sure to firmly attach the cover until the lock release button clicks.

A CAUTION

When attaching or removing the cover, be careful not to hold the rear edge of the cover (hatched area in the figure below). Otherwise, you might get your fingers pinched.

Figure 2-79 Installation of Cover



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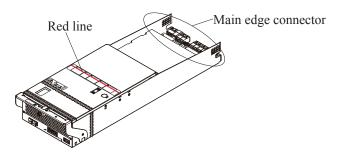
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(8) Install a Controller Board.



Dropping the Controller Board might cause injury. Hold the Controller Board firmly with your hands.



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.

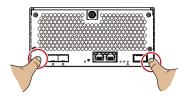
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(a) With the lever on the Controller Board opened completely, insert it into the slot of the CBXSS/CBXSL.

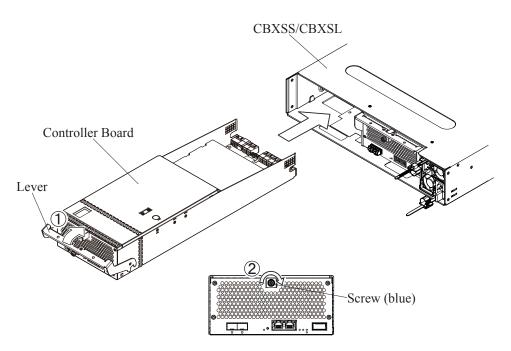
(b) Push the Controller Board all the way in and close the lever completely.

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.

Figure 2-80 Installation of Controller Board (CBXSS/CBXSL)



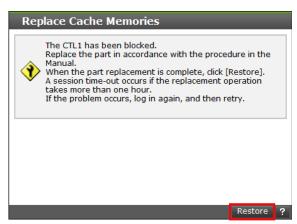
(9) Connect all the removed cables to the Controller Board. When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to INSTALLATION SECTION "2.10.2.1 Precautions when Connecting SAS Cables".

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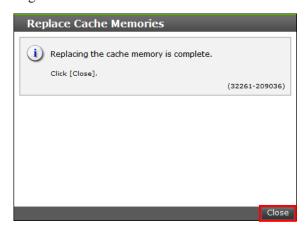
Rev.2

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 "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.

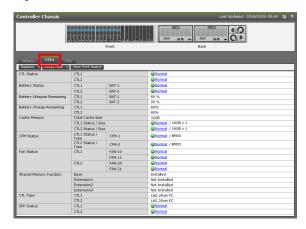
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(3) <Controller Chassis window> Click the [CTLs] tab in the "Controller Chassis" window and check that a Status of the replaced Cache Memory is "Normal".

Example: In case of CBXSS



- (4) Click the [Logout] button to close the window.
- 6. Disconnecting the maintenance PC and the Storage System. Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".