Rev.2

INST(RM)00-00-00

# INSTALLATION SECTION [Removal Procedures]

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#### INST(RM)00-00-10

# Contents

1.	Before Starting the Removal Work	. INST(RM)01-01-10
2.	Procedures for the Removal Work	. INST(RM)02-01-10
3.	Removing Drives	. INST(RM)03-01-10
	3.1 Before Removing Drives	. INST(RM)03-01-10
	3.2 Removing Work Drives	. INST(RM)03-02-10
	3.3 Checking the Drive Removal by Maintenance Utility	. INST(RM)03-03-10
4.	Removing Drive Boxes	INST(RM)04-01-10
	4.1 Estimated Work Time	. INST(RM)04-01-10
	4.2 Parts List	. INST(RM)04-02-10
	4.2.1 DKC-F910I-SBX	. INST(RM)04-02-10
	4.2.2 DKC-F910I-UBX/UBXE	. INST(RM)04-02-20
	4.2.3 DKC-F910I-FBX	. INST(RM)04-02-30
	4.2.4 DKC-F910I-NBX	. INST(RM)04-02-40
	4.2.5 Parts List of Bezels	. INST(RM)04-02-50
	4.3 Removing Drive Boxes	. INST(RM)04-03-10
5.	Removing Channel Boards	. INST(RM)05-01-10
6.	Removing Disk Board (DKB)	. INST(RM)06-01-10
7.	Removing Shared Memory (SM)	. INST(RM)07-01-10
8.	Removing SVP/SSVP	. INST(RM)08-01-10
9.	Removing PDUs for a Rack and PDU Power Codes	. INST(RM)09-01-10
	9.1 Removing PDUs for a Rack and PDU Power Codes	. INST(RM)09-01-20
10	Removing Controller Chassis	. INST(RM)10-01-10
	10.1 Estimated Work Time	. INST(RM)10-01-10
	10.2 Parts List	. INST(RM)10-02-10
	10.3 Removing Controller Chassis	INST(RM)10-03-10
	10.4 Removing Controller Chassis	INST(RM)10-04-10
	10.5 Confirming the Normality of the Storage System after Removing Controller	
	Chassis	. INST(RM)10-05-10
11	. Removing Controller Boards	INST(RM)11-01-10

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INST(RM)00-00-20	
11.1 Estimated Work Time	INST(RM)11-01-10
11.2 Parts List	INST(RM)11-02-10
11.3 Removing Controller Boards	INST(RM)11-03-10
11.4 Removing Controller Boards	INST(RM)11-04-10
11.5 Confirming the Normality of the Storage System after Removing Controll	er
Boards	INST(RM)11-05-10

Rev.0

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#### 1. Before Starting the Removal Work

During the removal work, the part statuses in the Web Console, Maintenance Utility, and Maintenance Utility (Sub Panel) windows might be displayed differently from the actual statuses. (Example: The Drives during the removal are displayed as the [Blocked] status.)

In that case, complete the running maintenance operation, and then refresh the display information in each window.

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

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

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#### INST(RM)01-01-20

5. Be sure to install a dummy (Controller Board) and a dummy (Drive) in a free slot because dummy (Controller Board) and dummy (Drive) are required for adjusting the cooling air flow.

When removing the optional component with the power on, the operation replacing Drive with dummy (Drive) has to be finished within 10 minutes.

6. Do not remove the parts while the Storage System is being started. When the Storage System is being started, remove the parts after the Storage System becomes the Ready status.

Rev.0.1

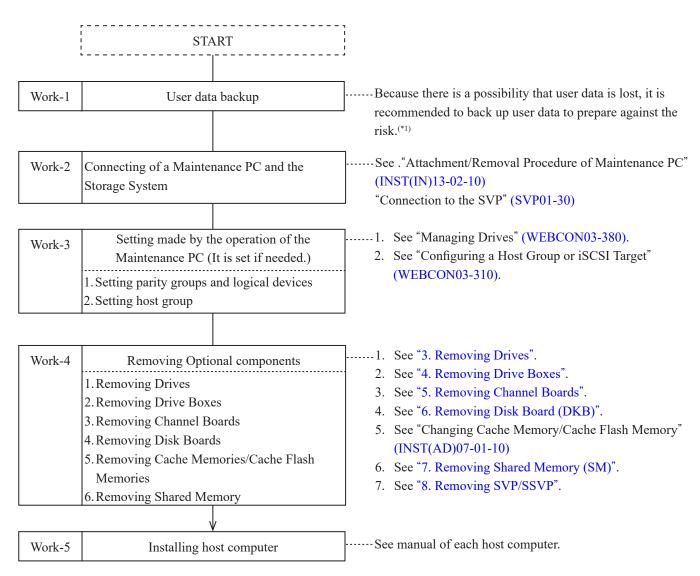
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#### INST(RM)02-01-10

#### 2. Procedures for the Removal Work

1. Procedure for the online removal work

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

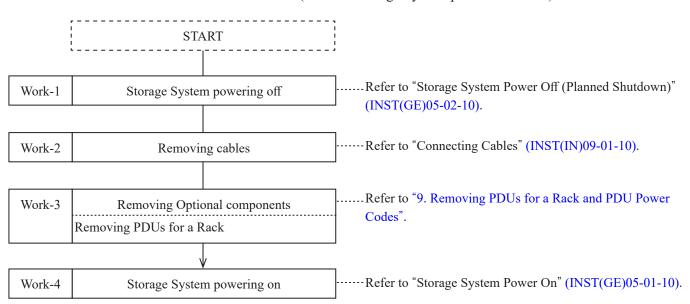


<sup>\*1:</sup> Service personnel must check if a customer has backed up user data. If the customer does not perform the backup, start the work after getting customer's permission.

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#### INST(RM)02-01-20

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



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#### INST(RM)03-01-10

#### 3. Removing Drives

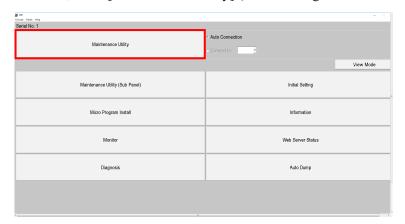
Decide drive position to be removed referring to "Relational Drive position with Parity Group" (INST(AD)01-02-10).

NOTE: • When removing the Drives included in the parity group, it is necessary to delete the parity group in advance. Refer to "Deleting Parity Group" (WEBCON03-450).

 When removing the Drives allocated to the Spare Drive, it is necessary to delete the Spare Drive in advance. Refer to "Allocating/Deleting Spare Drives" (WEBCON03-390).

#### 3.1 Before Removing Drives

- Connecting the Maintenance PC
   Connect the Maintenance PC to the SSVP, and then log in to the SVP.
  - "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
  - "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window
  From the menu of Web Console, click [Maintenance Components] [Maintenance Other Components].
- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting Maintenance Utility
  In the SVP window, click [Maintenance Utility] (See "Starting Maintenance Utility" (MU01-10).).

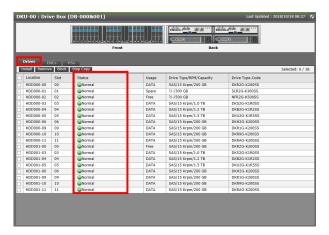


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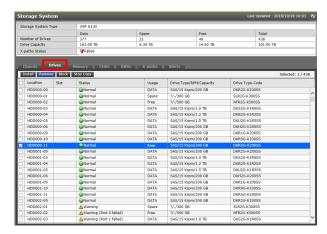
#### INST(RM)03-01-20

5. <Main Window>

Click the [Drives] tab in the Controller Chassis window or Drive Box window and display the Drive status.



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



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#### INST(RM)03-01-30

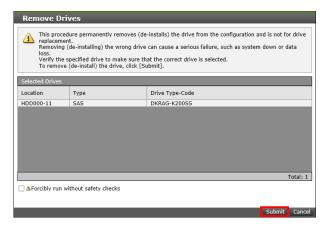
7. <Removal Execution Window>



About "Forcibly run without safety checks":

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

Check the Drives to be removed and click [Submit].



8. < Displaying the Password entry window>



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

Enter the login password for the maintenance account of the storage system, and then click [OK].

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#### INST(RM)03-01-40

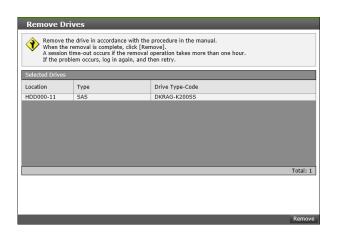
9. <Removal Work Start Message>

Check that the following message is displayed.

If a message other than the following is displayed, refer to Message Section (MSG00-00).

NOTE: Do not click [Remove] at this time.

Click [Remove] after completing the removal work.



10. Remove the Front Bezel. (See "How to Attach/Remove the Front Bezel" (INST(GE)04-01-10).)

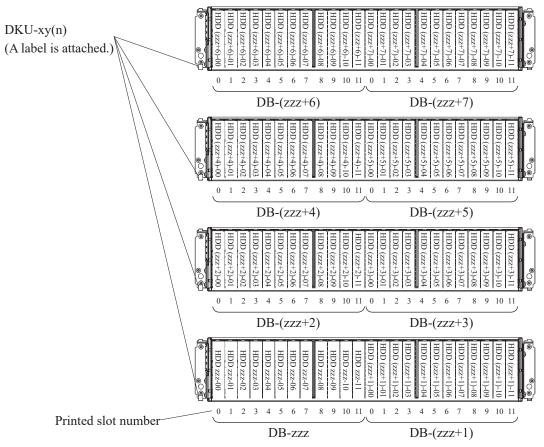
#### 11. Checking the Drives

Table 3-1 List of Removal Drive Model Names

No.	Location	Model Number	Model Name	Remarks
1	SBX	DKC-F810I-2R4JGM	Disk Drive	_
		DKC-F810I-960MGM		
		DKC-F810I-1T9MGM		
		DKC-F810I-3R8MGM		
		DKC-F810I-7R6MGM		
		DKC-F810I-15RMGM		
		DKC-F810I-30RMGM		
2	UBX	DKC-F810I-10RH9M	Disk Drive	_
		DKC-F810I-14RH9M		
3	FBX	DKC-F810I-7R0FP	Flash Module Drive	-
		DKC-F810I-14RFP		
4	NBX	DKC-F910I-1R9RVM	Disk Drive	_
		DKC-F910I-3R8RVM		
		DKC-F910I-7R6RVM		
		DKC-F910I-15RRVM		

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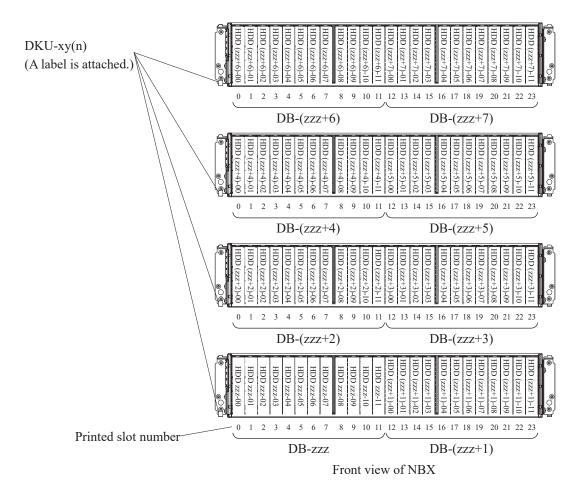
Figure 3-1 Parts Location of SBX (Front View)



Front view of SBX

#### INST(RM)03-01-51

Figure 3-2 Parts Location of NBX (Front View)



\*1: The name in parentheses in the SVP messages shows HDDxxx-yy here.

```
*2: DKU-xy(n)

n: Drive Box number in DKU (0, 1, 2, and 3)

y: DKU No. (0, 1, 2 ..., 7)

x: CBX Pair No. (0, 1, 2)

*3: DB-777
```

- \*3: DB-<u>zzz</u>

  DB No. (000, 001, 002, ......, 191)
- \*4: The slot numbers on DBS2 (SBX) displayed in the DKU-mm: Drive Box window of Maintenance Utility are the same as the slot numbers shown in Figure 3-1.
- \*5: The slot numbers on DBN (NBX) displayed in the DKU-mm: Drive Box window of Maintenance Utility are the same as the slot numbers shown in Figure 3-2.

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#### INST(RM)03-01-52

NOTE: Turn on the LOCATE LED by using Maintenance Utility during maintenance work. If you cannot turn on the LOCATE LED, check the number (\*2) shown on the label attached to the lower left part of the front side of SBX/NBX so that you do not confuse the maintenance target.

For example, numbers shown on the labels (DKU-xy(n)) and DB numbers (DB-zzz) of DKU-00 and DKU-01 are as follows:

For SBX/NBX, a smaller number on the label (DKU-xy(n)) corresponds to smaller DB numbers (two in total; (DB-zzz+(2n)) and (DB-zzz+(2n+1))).

DKU-00(0): DB-000, DB-001 DKU-00(1): DB-002, DB-003 DKU-00(2): DB-004, DB-005 DKU-00(3): DB-006, DB-007 DKU-01(0): DB-008, DB-009 DKU-01(1): DB-010, DB-011 DKU-01(2): DB-012, DB-013 DKU-01(3): DB-014, DB-015

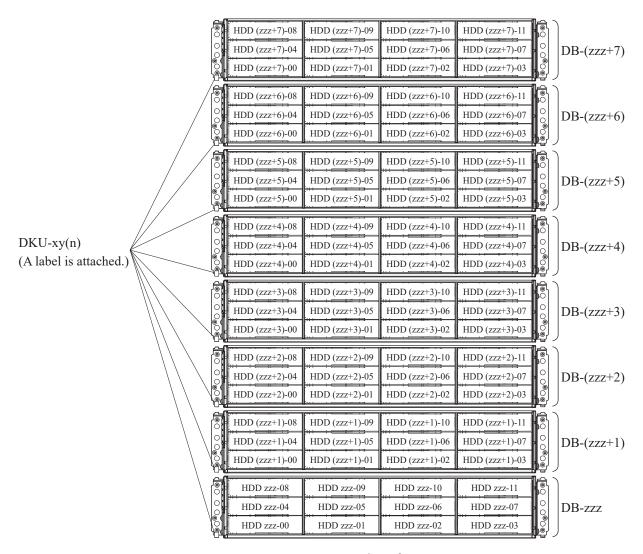
When the location of the target drive for maintenance is HDD013-02, the DB number is DB-013. The DKU in which the target drive is installed is DKU-01(2), and the slot number of the target drive is "2" (right side) for SBX, and "14" for NBX.

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#### INST(RM)03-01-60

Figure 3-3 Parts Location of UBX



Front view of UBX

\*1: The name in parentheses in the SVP messages shows HDDxxx-yy here.

```
*2: DKU-xy(n)

> n: Drive Box number in DKU (0, 1, 2 ..., 7)

> y: DKU No. (1, 2 ..., 7)

> x: CBX Pair No. (0, 1, 2)
```

\*3: DB-<u>zzz</u>

DB No. (008, 009, 010, ......, 191)

\*4: The slot number on DBL (UBX) displayed in the DKU-mm: Drive Box window of Maintenance Utility is the same as "yy" in "HDDxxx-yy".

Rev.1.1

#### INST(RM)03-01-61

NOTE: Turn on the LOCATE LED by using Maintenance Utility during maintenance work. If you cannot turn on the LOCATE LED, check the number (\*2) shown on the label attached to the lower left part of the front side of UBX so that you do not confuse the maintenance target.

For example, numbers shown on the labels (DKU-xy(n)) and DB numbers (DB-zzz) of DKU-01 are as follows:

For UBX, a smaller number on the label (DKU-xy(n)) corresponds to a smaller DB number (DB-zzz+n).

DKU-01(0): DB-008 DKU-01(1): DB-009 DKU-01(2): DB-010 DKU-01(3): DB-011 DKU-01(4): DB-012 DKU-01(5): DB-013 DKU-01(6): DB-014 DKU-01(7): DB-015

When the location of the target drive for maintenance is HDD013-02, the DB number is DB-013. The DKU in which the target drive is installed is DKU-01(5), and the slot number of the target drive is "2".

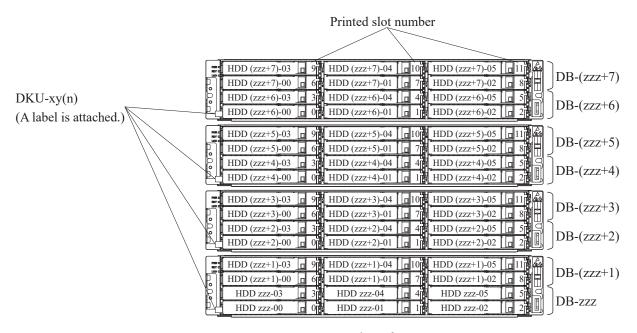
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#### INST(RM)03-01-70

Figure 3-4 Parts Location of FBX



Front view of FBX

\*1: The name in parentheses in the SVP messages shows HDDxxx-yy here.

```
*2: DKU-xy(n)

n: Drive Box number in DKU (0, 1, 2, and 3)

y: DKU No. (0, 1, 2 ..., 7)

x: CBX Pair No. (0, 1, 2)

*3: DB-zzz

DB No. (000, 001, 002, ......, 191)
```

\*4: The slot numbers on DBF (FBX) displayed in the DKU-mm: Drive Box window of Maintenance Utility are the same as the slot numbers shown in Figure 3-4.

Rev.1.1

INST(RM)03-01-71

NOTE: Turn on the LOCATE LED by using Maintenance Utility during maintenance work. If you cannot turn on the LOCATE LED, check the number (\*2) shown on the label attached to the lower left part of the front side of FBX so that you do not confuse the maintenance target.

For example, numbers shown on the labels (DKU-xy(n)) and DB numbers (DB-zzz) of DKU-00 and DKU-01 are as follows:

For FBX, a smaller number on the label (DKU-xy(n)) corresponds to smaller DB numbers (two in total; (DB-zzz+(2n)) and (DB-zzz+(2n+1))).

DKU-00(0): DB-000, DB-001
DKU-00(1): DB-002, DB-003
DKU-00(2): DB-004, DB-005
DKU-00(3): DB-006, DB-007
DKU-01(0): DB-008, DB-009
DKU-01(1): DB-010, DB-011
DKU-01(2): DB-012, DB-013
DKU-01(3): DB-014, DB-015

When the location of the target drive for maintenance is HDD013-02, the DB number is DB-013. The DKU in which the target drive is installed is DKU-01(2), and the slot number of the target drive is "8".

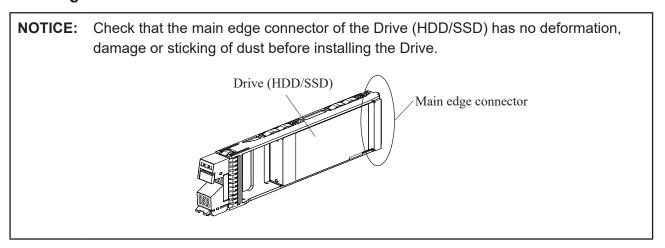
**NOTICE:** To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "Note when Installing and Removing Parts" (INST(GE)01-01-10).

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#### INST(RM)03-02-10

#### 3.2 Removing Work Drives



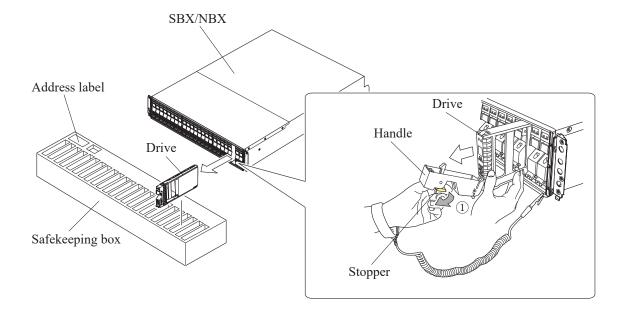
- 1. Removing Drives for SBX/NBX
  - (1) Detaching the Drive

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

Pull the stopper of the handle toward you to unlock (①), open the handle, and then remove the Drive by pulling it out taking care not to apply a shock to it.

When using the removed Drive for the purpose of addition to another Storage System, keep it in custody with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

Figure 3-5 Removing the Drive (SBX/NBX)



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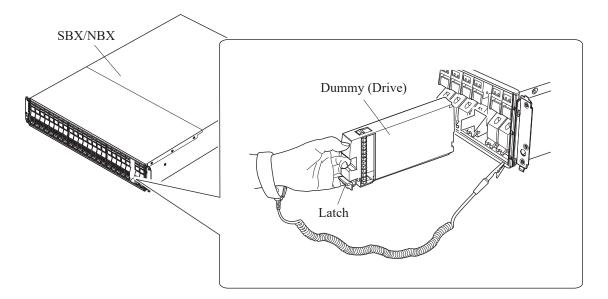
#### INST(RM)03-02-20

(2) Installing dummy (Drive)

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

- (a) Install the dummy (Drive) in the slot from which the Drive has been removed.
  - NOTE: Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.
- (b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the lower side.

Figure 3-6 Installing the Dummy (Drive) (SBX/NBX)



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#### INST(RM)03-02-30

#### 2. Removing Drives for UBX

(1) Detaching the Drive

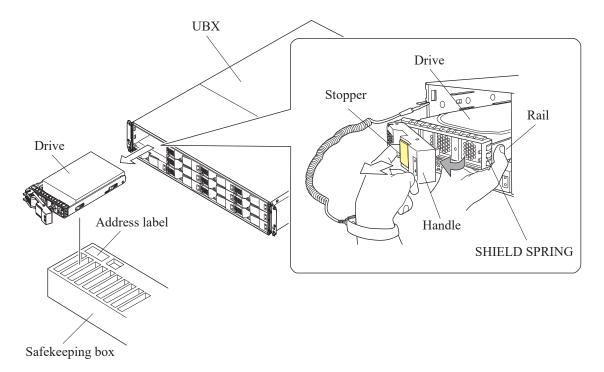
**NOTICE:** Since the HDD is a precision component, handle it very carefully not to apply a vibration or shock to it.

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

Pull the stopper of the handle toward you to have the lock off, and then remove the Drive by pulling it out taking care not to apply a shock to it.

When using the removed Drive for the purpose of addition to another Storage System, keep it in custody with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

Figure 3-7 Removing the Drive (UBX)

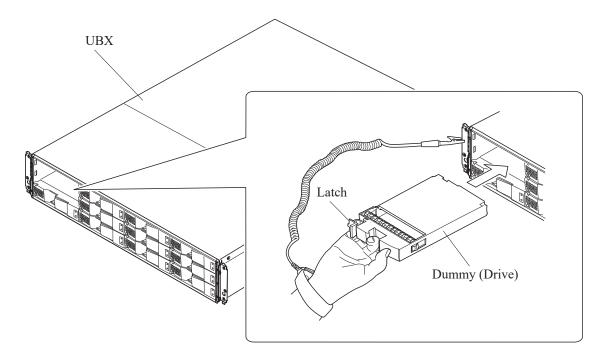


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#### INST(RM)03-02-40

- (2) Installing dummy (Drive)
  - (a) Install the dummy (Drive) in the slot from which the Drive has been removed.
    - NOTE: Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.
  - (b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the left side.

Figure 3-8 Installing the Dummy (Drive) (UBX)



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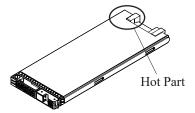
#### INST(RM)03-02-50

#### 3. Removing Drives for FBX



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 side surface. Be careful not to touch the hot part.



#### (1) Detaching the Drive

**NOTICE:** Be sure to read "Notes when Handling the Flash Module Drive (FMD)"

(INST(GE)01-01-60) before handling the FMD and perform the procedure following the notes.

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

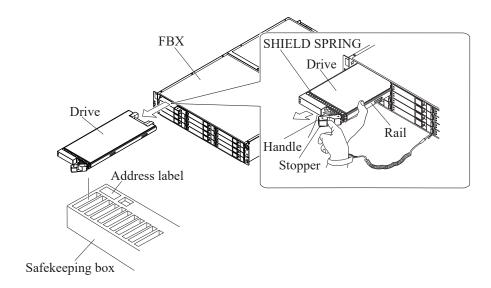
NOTE: When handling the Drive, hold the RAIL side because the SHIELD SPRING is subject to breakage.

Pull the stopper of the handle toward you to unlock, open the handle, and then remove the Drive by pulling it out taking care not to apply a shock to it.

When using the removed Drive for the purpose of addition to another Storage System, keep it with its handle returned to its original state (locked by the stopper) taking care not to apply a shock to it.

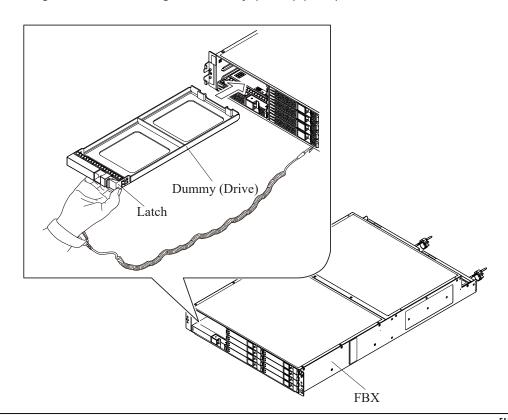
#### INST(RM)03-02-60

Figure 3-9 Removing the Drive (FBX)



- (2) Installing dummy (Drive).
  - (a) Install the dummy (Drive) in the slot from which the Drive has been removed.
    - NOTE: Be sure to insert the dummy (Drive) in the free slot because it is necessary to regulate a cooling air flow inside the Storage System.
  - (b) Insert it into the slot slowly so that the latch part of the dummy (Drive) comes to the lower side.

Figure 3-10 Installing the Dummy (Drive) (FBX)



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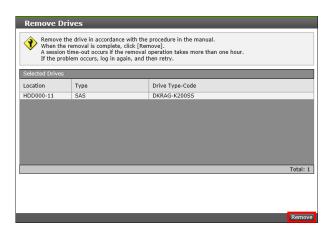
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### INST(RM)03-03-10

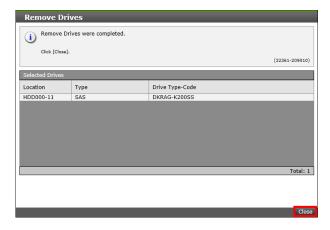
#### 3.3 Checking the Drive Removal by Maintenance Utility

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

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



<Drive Removal Completion Window>
 Check that the following message is displayed and click [Close].
 If a message other than the described is displayed, refer to Message Section (MSG00-00).



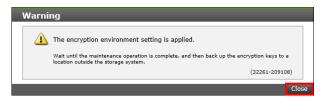
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**DKC910I** 

#### INST(RM)03-03-20

Rev.1

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



- 4. Checking Normality Perform the procedure described in "Checking Normality" (TRBL02-06-10).
- Attach the Front Bezel. (See "How to Attach/Remove the Front Bezel" (INST(GE)04-01-10)).
- Click [Logout] to close the window.
- 7. Removing the Maintenance PC Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10).
- 8. Back up the encryption key If the message is displayed in Step 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 3, this procedure is not required.

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#### INST(RM)04-01-10

#### 4. Removing Drive Boxes

Do this work after confirming the notices shown below.

**NOTICE:** Check that no Drives are installed in Drive Boxes to be installed. If Drives are installed, see "3. Removing Drives" and remove them.

#### 4.1 Estimated Work Time

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

Table 4-1 Estimated Working Hours for Removing Drive Boxes

	Removal type	Process	Estimated work time	Remarks
A	Chassis	Chassis removal time	SBX/UBX/FBX/NBX: 60 min	
В		Micro-program processing	20 sec × (number of existing chassis + number of	(*1)
		time (path)	chassis to be removed)	
С	HDD	HDD removal time	1 min / 1 HDD	
D Micro-program processing		Micro-program processing	• In case of SBX, UBX, FBX:	
time (HDD) (*2)		time (HDD) (*2)	30 seconds/Drive Box	
			• In case of NBX	
			20 seconds/Drive Box	

<sup>\*1:</sup> The number of paths of each model is as shown below.

DKC: Four paths or eight paths (when one Disk Board option (eight paths) is used.)

<sup>\*2:</sup> The micro-program processing time (HDD) is the time taken for Step 1 and Step 2 in "3.3 Checking the Drive Removal by Maintenance Utility"

Rev.2

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#### INST(RM)04-02-10

## 4.2 Parts List 4.2.1 DKC-F910I-SBX

Table 4-2 Parts List of DKC-F910I-SBX

Item No.	Part Name	Part No.	Quantity	Remarks
1	SFF Drive Box	3292500-A	4	SBX
2	Loop cable ties	5552567-1	8	_
3	Color Code Label (BE)	2857734-1	1	_
4	Color Code Label (SBB)	3292594-1	1	_
5	Label (UL3)	5515795-1	4	_
6	Nameplate (DKC-F910I-SBX)	2857688-6	4	for Hitachi Vantara
7	Nameplate (MDKC910I-SBX)	2857688-29	4	for Hitachi Vantara
8	Nameplate (R0K90-63001)	2857688-16	4	for HPE
9	Label (Regulatory) V	3292680-101	4	for Hitachi Vantara
10	Label (Regulatory) H	3292681-301	4	for HPE

When removing SBX, execute "4.3 Removing Drive Boxes".

Rev.2

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#### INST(RM)04-02-20

# 4.2.2 DKC-F910I-UBX/UBXE

Table 4-3 Parts List of DKC-F910I-UBX/UBXE

Item No.	Part Name	Part No.	Quantity	Remarks
1	LFF Drive Box	3292503-A	8	UBX
2	Loop cable ties	5552567-1	16	_
3	Color Code Label (BE)	2857734-1	1	_
4	Color Code Label (SBB)	3292594-1	1	_
5	Location Label (HDD)	5557125-1	2	_
6	Tag (HDD)	5557126-1	2	_
7	Label (UL3)	5515795-1	1	_
8	Nameplate (DKC-F910I-UBX)	2857688-8	8	for Hitachi Vantara
	Nameplate (DKC-F910I-UBXE)	2857688-9	8	for Hitachi Vantara
9	Nameplate (MDKC910I-UBX)	2857688-30	8	for Hitachi Vantara
	Nameplate (MDKC910I-UBXE)	2857688-30	8	for Hitachi Vantara
10	Nameplate (R0K91-63001)	2857688-18	8	for HPE
11	Label (Regulatory) V	3292680-101	8	for Hitachi Vantara
12	Label (Regulatory) H	3292681-301	8	for HPE

When removing UBX, execute "4.3 Removing Drive Boxes".

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#### INST(RM)04-02-30

#### 4.2.3 DKC-F910I-FBX

Table 4-4 Parts List of DKC-F910I-FBX

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box (FBX)	3286820-A	4	FBX
2	Loop cable ties	5552567-1	8	_
3	Color Code Label (BE)	2857734-1	1	_
4	Color Code Label (SBB)	3292594-1	1	_
5	Label (UL3)	5515795-1	1	_
6	Nameplate (DKC-F910I-FBX)	2857688-33	4	for Hitachi Vantara
7	Nameplate (MNF100R9-BOX)	2857688-32	4	for Hitachi Vantara
8	Nameplate (R0K93-63001)	2857688-34	4	for HPE
9	Label (Regulatory) V	3292680-101	4	for Hitachi Vantara
10	Label (Regulatory) H	3292681-301	4	for HPE

When removing FBX, execute "4.3 Removing Drive Boxes".

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#### 4.2.4 DKC-F910I-NBX

Table 4-5 Parts List of DKC-F910I-NBX

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box (NBX)	3292691-A	4	NBX
2	Loop cable ties	5552567-1	8	_
3	Color Code Label (BE)	2857734-1	1	_
4	Color Code Label (DBN)	3293001-1	1	_
5	Label (UL3)	5515795-1	1	_
6	Nameplate (DKC-F910I-NBX)	2857688-10	4	for Hitachi Vantara
7	Nameplate (MDKC910I-NBX)	2857688-31	4	for Hitachi Vantara
8	Nameplate (R0K92-63001)	2857688-20	4	for HPE
9	Label (Regulatory) V	3292680-101	4	for Hitachi Vantara
10	Label (Regulatory) H	3292681-301	4	for HPE

When removing NBX, execute "4.3 Removing Drive Boxes".

Rev.2

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#### INST(RM)04-02-50

#### 4.2.5 Parts List of Bezels

Table 4-6 Parts List of Bezel (DBFB/DBFBA/DBFBP)

Item No.	Part Name	Part No.	Quantity	Remarks
1	Front Bezel	3292729-A	1	DBFB (for Hitachi Vantara)
		3292729-В		DBFBA (for Hitachi Vantara)
		3292513-A		DBFBP (for HPE)
2	Accessory Set	5560175-A	1	_
3	Bracket (L)	3282470-1	1	(*1)
4	Bracket (R)	3290548-101	1	(*1)
5	Side Bezel (L)	2855177-1	1	(*1)
6	Side Bezel (R)	2855176-1	1	(*1)
7	Key	3292729-A	1	DBFB (for Hitachi Vantara) (*1)
		3292729-В		DBFBA (for Hitachi Vantara) (*1)
		3292513-A		DBFBP (for HPE) (*1)
8	Bind Screw (M5 × 10)	SB510N	5	(*1)

<sup>\*1:</sup> These parts are included in Item No.2

Table 4-7 Parts List of Bezel (FBFB/FBFBA/FBFBP)

Item No.	Part Name	Part No.	Quantity	Remarks
1	Front Bezel	3286818-B	1	FBFB (for Hitachi Vantara)
		3286818-A		FBFBA (for Hitachi Vantara)
		3286824-A		FBFBP (for HPE)
2	Accessory Set	2856820-1	1	FBFB (for Hitachi Vantara)
		2856823-1		FBFBA (for Hitachi Vantara)
		2856824-A		FBFBP (for HPE)
3	Side Cover	3286646-1	1	(*1)
4	Plate	5550593-1	1	(*1)
5	Key	_	1	(*1)
6	Bind Screw	3261898-512	2	(*1)

<sup>\*1:</sup> These parts are included in Item No.2

Rev.0.1

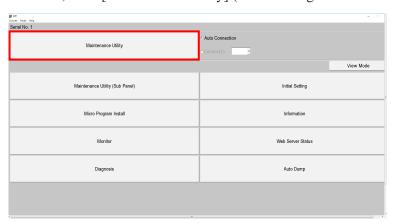
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#### INST(RM)04-03-10

#### 4.3 Removing Drive Boxes

Connecting the Maintenance PC
 Connect the Maintenance PC to the SSVP, and then log in to the SVP.

- "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
- "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window
  From the menu of Web Console, click [Maintenance Components] [Maintenance Other Components].
- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting Maintenance Utility
  In the SVP window, click [Maintenance Utility] (See "Starting Maintenance Utility" (MU01-10).).

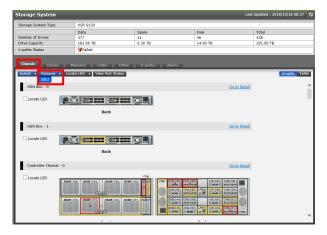


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#### INST(RM)04-03-20

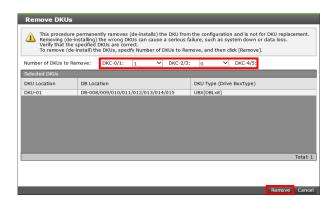
- 5. Instructing to start removal by Maintenance Utility
  - (1) <Main Window>

Click the [Chassis] tab in the main window, and click [Remove] and select [DKU].



(2) <Specify Removal DKUs> Select the number of DKUs to be removed and click [Remove].

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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#### INST(RM)04-03-30

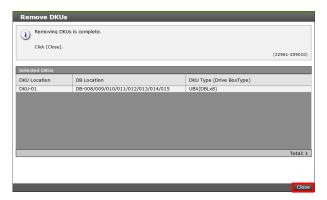
(3) <Displaying the Password entry window>

#### **A** CAUTION

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

Enter the login password for the maintenance account of the storage system, and then click [OK].

(4) <Removal Work Start Message>Check that the following message is displayed and click [Close].If a message other than the following is displayed, refer to Message Section (MSG00-00).



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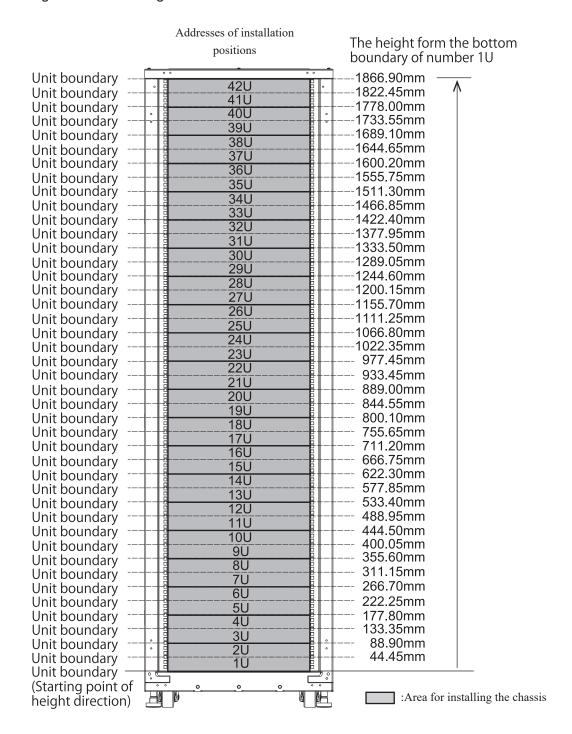
#### INST(RM)04-03-40

#### 6. Confirming of removal positions

The following figure shows an example of installing Drive Boxes.

The mounting locations of the Drive Boxes are different according to the configuration.

Figure 4-1 Mounting Position of Drive Box



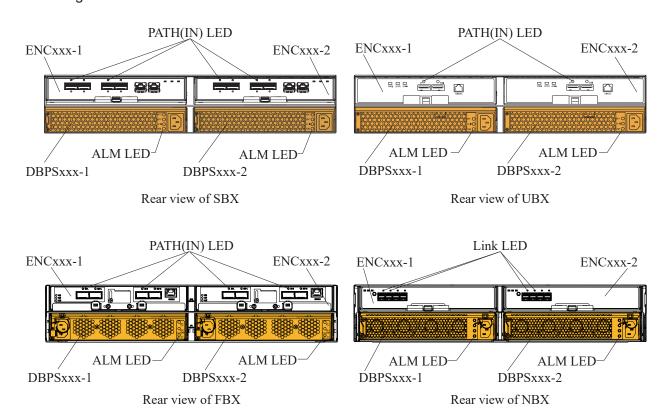
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### INST(RM)04-03-50

7. Removing the Front Bezel Remove the Front Bezel (Refer to "How to Attach/Remove the Front Bezel" (INST(GE)04-01-10).)

8. Checking the Drive Box LEDs
Check that the ALM LEDs (red) on the DBPSs installed in the Drive Box to be removed light up.
When the ALM LEDs do not light up, check that the PATH (IN) LEDs (green) / the Link LEDs (blue) on the ENCs installed in the Drive Box to be removed are off.

Figure 4-2 ALM LED on DBPS



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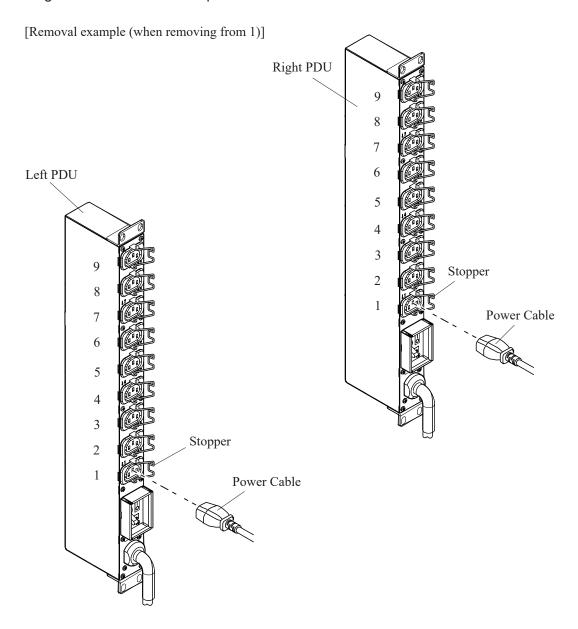
### INST(RM)04-03-60

- 9. Removing the Power Cables
  - (1) Check the connection of the power cables.

Figure 4-4 shows a connection example of power cables in the configuration that only SBX/UBX/FBX are installed in the same rack.

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

Figure 4-3 Removal Example of Power Cables

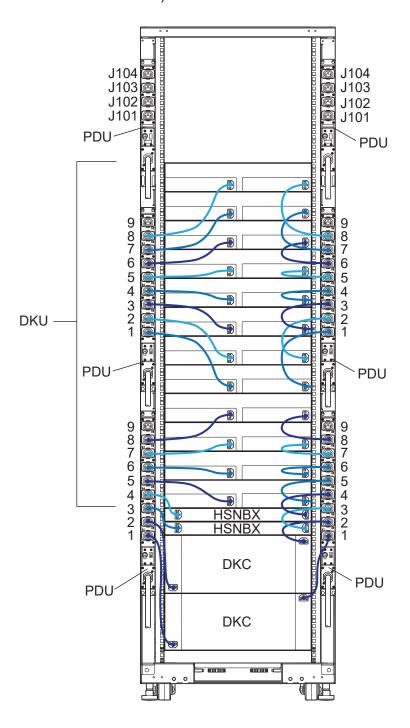


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### INST(RM)04-03-70

Figure 4-4 Connection Example of Power Cables (Configuration Where DKUs Are Installed in the Same Rack)

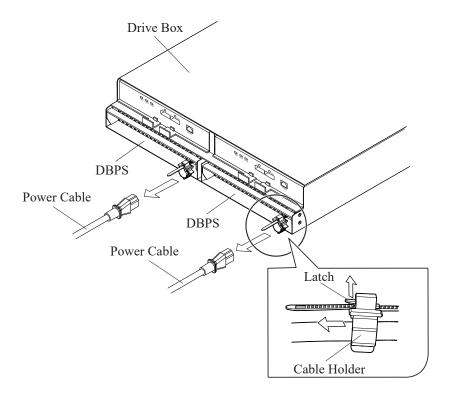


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### INST(RM)04-03-80

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

Figure 4-5 Removing Power Cables

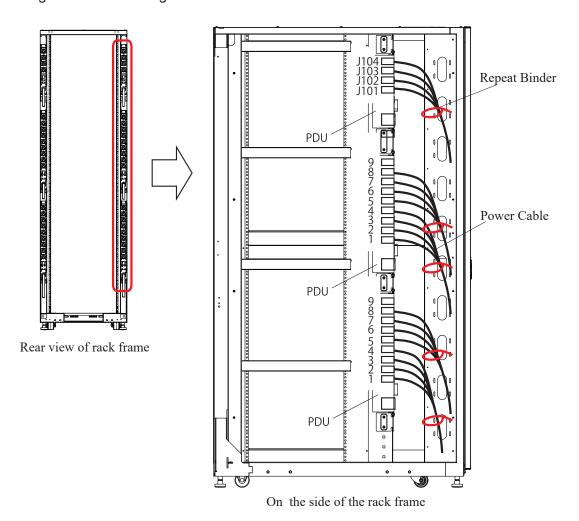


### INST(RM)04-03-90

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

(6) Remove the other power cables in the same way.

Figure 4-6 Removing Power Cables

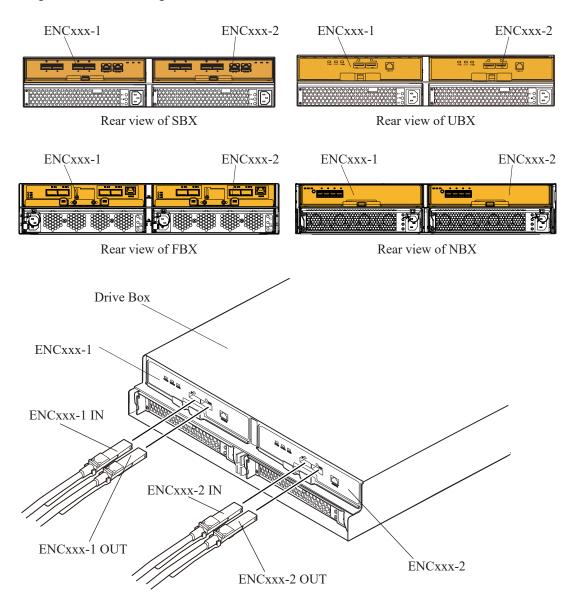


\*1: The figure shows fixation of the right side.

### INST(RM)04-03-100

- 10. Removing the SAS Cables/NVMe Cables
  - (1) Remove the SAS cables/NVMe cables from the ENCxxx-1 on the rear of the Drive Box.
  - (2) Remove the SAS cables/NVMe cables from the ENCxxx-2 on the rear of the Drive Box.
  - (3) Remove the SAS cables/NVMe cables from the other Drive Boxes in the same way.

Figure 4-7 Removing SAS Cables/NVMe Cables



UBX is illustrated as an example in the figure. The procedure for SBX/FBX/NBX is the same as that for UBX.

**DKC910I** 

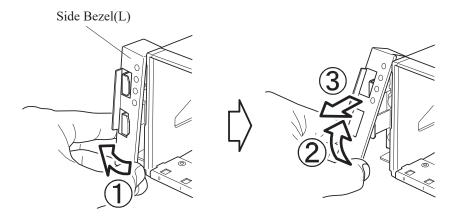
INST(RM)04-03-110

Rev.2

### 11. Removing the bezel fixing parts

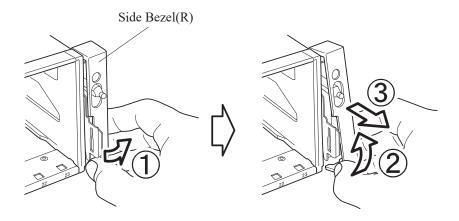
- (1) Procedure for SBX/UBX/NBX
  - (a) Hold the bottom of the left side bezel (L) on the front side of the Drive Box while opening outward (①), and then pull and remove (②, ③) the bottom of the left side bezel (L) by pulling it toward you.

Figure 4-8 Removing Side Bezel (L)



- (b) Hold the bottom of the right side bezel (R) on the front side of the Drive Box while opening outward (①), and then pull and remove (②, ③) the bottom of the right side bezel (R) by pulling it toward you.
- (c) Remove the side bezels from the other Drive Boxes in the same way.

Figure 4-9 Removing Side Bezel (R)



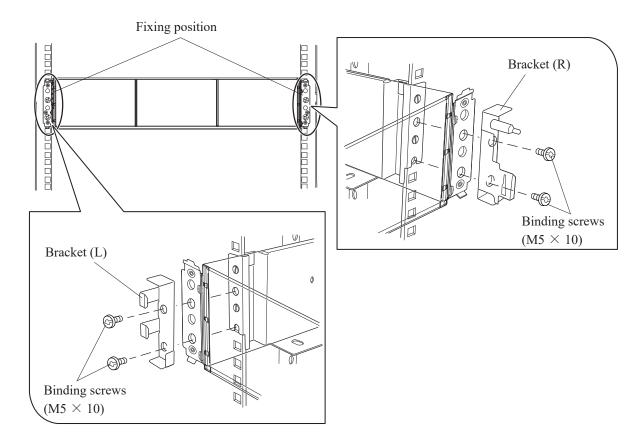
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### INST(RM)04-03-120

- (d) Remove the four Binding screws (M5  $\times$  10) and two brackets from the Drive Box.
- (e) Remove the brackets from the other Drive Boxes in the same way.

Figure 4-10 Removing Brackets

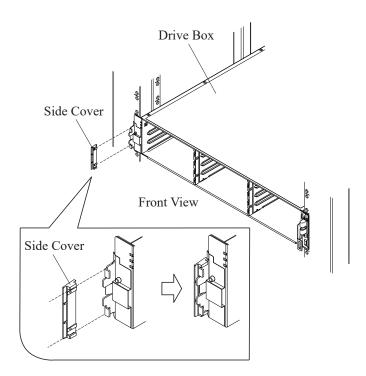


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### INST(RM)04-03-130

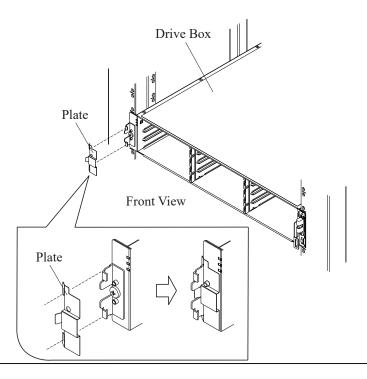
- (2) Procedure for FBX
  - (a) Remove the side plate from the left side of the front of the Drive Box.

Figure 4-11 Removing Side Cover



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

Figure 4-12 Removing Plate



### INST(RM)04-03-140

#### 12. Removing the parts

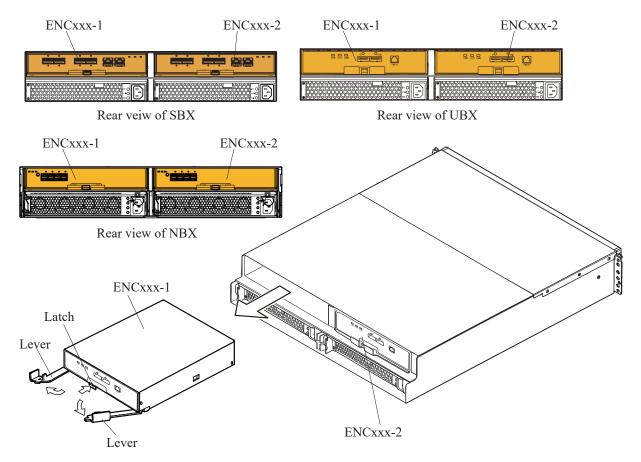
If the Drive Box is removed at a height of 1m or below removed by using the special lifter, this procedure is not required because the Drive Box is removed from the rack frame with its parts mounted. (Go to Step 13.)

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

**NOTICE:** To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "Note when Installing and Removing Parts" (INST(GE)01-01-10).

- (1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
- (2) Removing ENCs
  - (a) Push the latch on the ENC toward the arrow direction to unlock the lever.
  - (b) Pull the right and left levers and remove the ENC.
  - (c) Remove the other ENC in the same manner.

Figure 4-13 Removing ENCs (SBX/UBX/NBX)



\*1 :  $ENC\underline{xx}$ -1  $\longrightarrow$  DB No. (00, 01, 02, ......, 47)

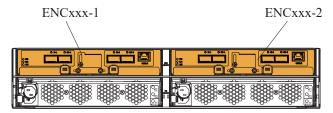
\*2: UBX is illustrated as an example in the figure. The procedure for SBX/NBX is the same as that for UBX.

Rev.0.1

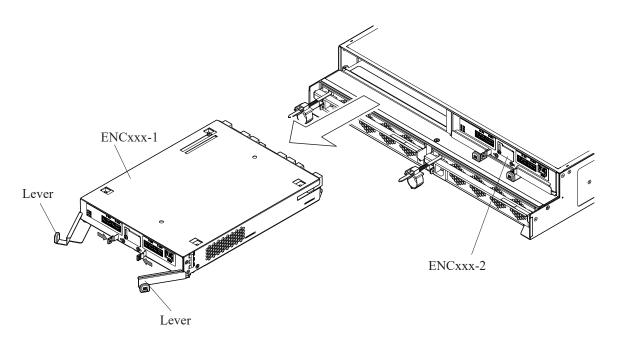
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### INST(RM)04-03-150

Figure 4-14 Removing ENCs (FBX)



Rear view of FBX

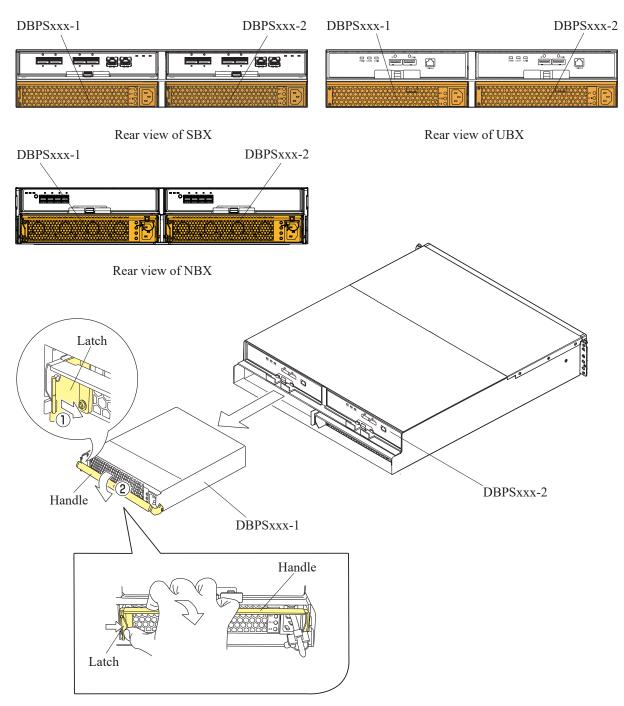


\*1: ENC<u>xxx</u>-1 DB No. (000, 001, 002, ......, 191)

### INST(RM)04-03-160

- (3) Removing DBPSs
  - (a) Bring the handle down and forward (②) while pushing the latch of the DBPS inward (①).
  - (b) Pull the DBPS and remove it from the Drive Box.
  - (c) Remove the other DBPS in the same manner.

Figure 4-15 Removal of DBPS (SBX/UBX/NBX)



\*1: DBPSxxx-1

DB No. (000, 001, 002, ....., 191)

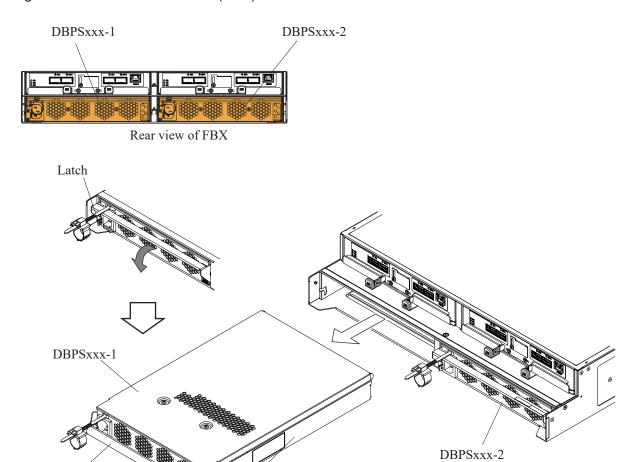
\*2: UBX is illustrated as an example in the figure. The procedure for SBX/NBX is the same as that for UBX.

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### INST(RM)04-03-170

Figure 4-16 Removal of DBPS (FBX)



\*1: DBPS<u>xxx</u>-1 DB No. (000, 001, 002, ......, 191)

Handle

(4) Remove the parts from the other Drive Boxes in the same manner.

### INST(RM)04-03-180

### 13. Removing the Drive Boxes



#### Be careful of the mass:

Work carefully because the mass of the SBX is about 24 kg, UBX is about 27 kg, FBX is about 38 kg, and NBX is about 21 kg.

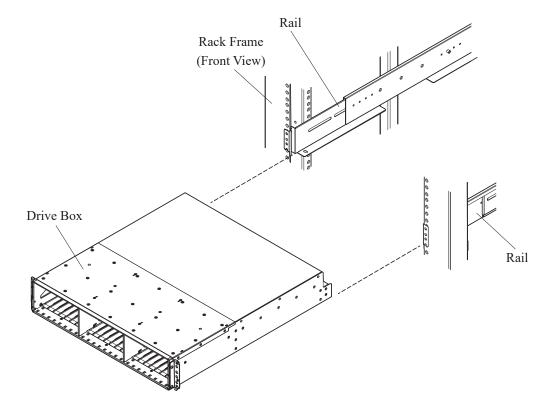
### Be careful of falling over and dropping:

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

### (1) Procedure for SBX/UBX/NBX

- (a) Remove the Drive Box on the Rack frame referring to mounting procedure using the special lifter. (Refer to "Mounting Storage System on a Special Lifter" (INST(IN)06-01-10).)
- (b) Remove the other Drive Boxes in the same way.

Figure 4-17 Removing Drive Boxes (SBX/UBX/NBX)

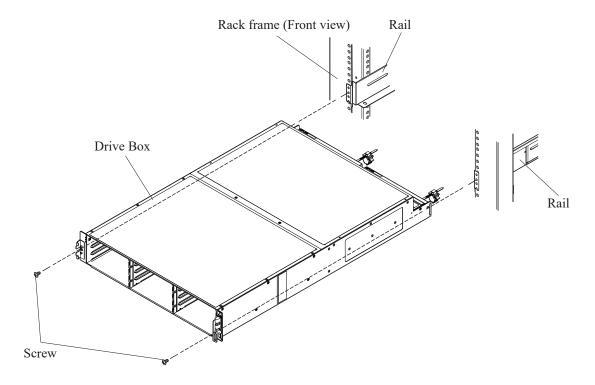


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### INST(RM)04-03-190

- (2) Procedure for FBX
  - (a) Remove the two screws from the Drive Box.
  - (b) Remove the Drive Box from the front side of the rack frame by seeing the mounting procedure using the special lifter. (Refer to "Mounting Storage System on a Special Lifter" (INST(IN)06-01-10).)
  - (c) Remove the other Drive Boxes in the same manner.

Figure 4-18 Removing Drive Boxes (FBX)



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### INST(RM)04-03-200

### 14. Reinstalling the removed parts

If parts were removed in "12. Removing the parts", reinstall the removed parts. If parts were not removed, go to Step 15.

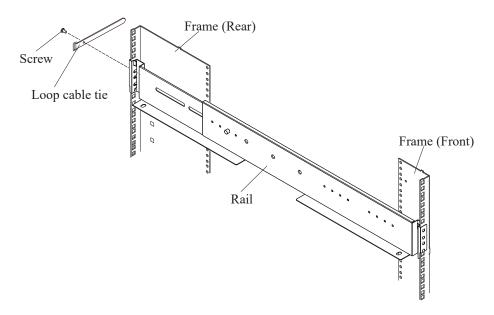
- (1) Open the handle of the DBPS completely. (Refer to Figure 4-15, Figure 4-16.)
- (2) Insert the DBPS into the slot and push it to the end.
- (3) Close the handle completely and fix the DBPS.
- (4) Install the other DBPS in the same manner.
- (5) Keep the right and left levers of the ENC open. (Refer to Figure 4-13, Figure 4-14.)
- (6) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
- (7) Close the right and left levers to insert the ENC completely.
- (8) Install the other ENC in the same manner.
- (9) Install the removed parts with the other Drive Boxes in the same manner.

### INST(RM)04-03-210

### 15. Removing the rails

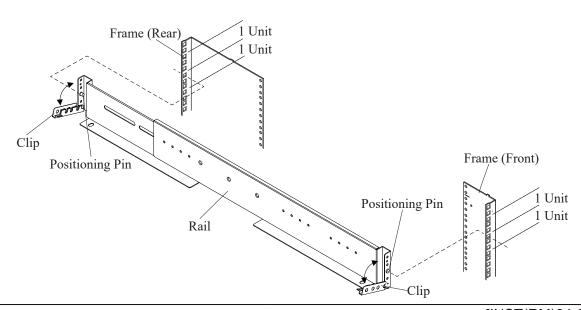
- (1) Procedure for SBX/UBX
  - (a) Remove the screw and the loop cable tie from the rear side of right rail.
  - (b) Remove the screw and the loop cable tie from the rear side of left rail in the same way.

Figure 4-19 Removing Screws



- (c) Open two Clips located in the front and the rear side of the rail that is mounted at the right side of the rack frame.
- (d) Push the rail that is mounted at the right side of the rack frame and remove the Positioning Pin on the front side of the rail. Then remove the rail from the rack frame.
- (e) Remove the left side rail from the rack frame in the same way as Step (c) and Step (d).
- (f) Remove the other rails in the same manner.

Figure 4-20 Removal of Slide Rail



**DKC910I** 

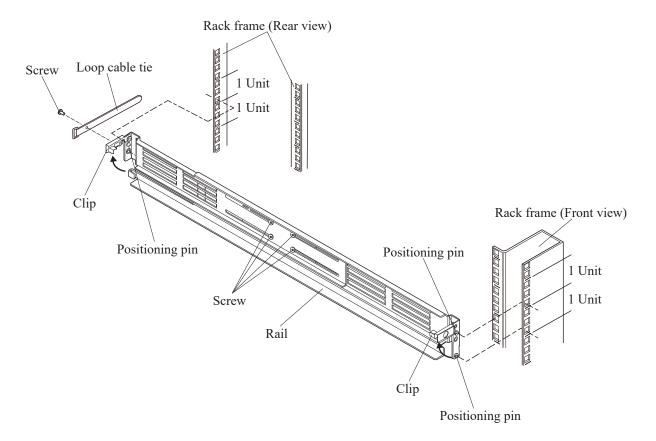
### INST(RM)04-03-220

Rev.2

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- (2) Procedure for FBX
  - (a) Remove the screw and the loop cable tie from the rear side of rail.
  - (b) Loosen the four screws on the rail.
  - (c) Open the clips on the rail and remove them.
  - (d) Remove the positioning pins on the rail from the rack and remove the rail.
  - (e) Remove the other rail in the similar procedure.

Figure 4-21 Removing Slide Rails

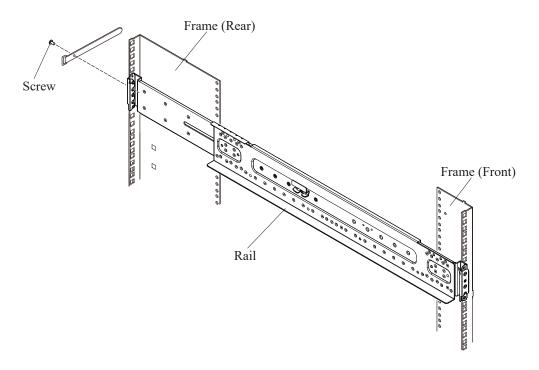


### INST(RM)04-03-230

### (3) Procedure for NBX

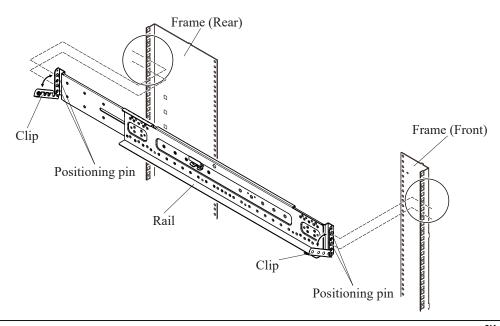
(a) Remove the screw from the rear side of the rail.

Figure 4-22 Removing Screws



- (b) Open the two clips on the front and rear sides of the rail.
- (c) Remove the four positioning pins fixing the rail from the front and rear sides of the rail.
- (d) Remove the rail.
- (e) Remove the other rails in the same manner.

Figure 4-23 Removing Slide Rails



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16. Checking Normality
Perform the procedure described in "Checking Normality" (TRBL02-06-10).

17. Click [Logout] to close the window.

18. Removing the Maintenance PC Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10).

Rev.1

# 5. Removing Channel Boards

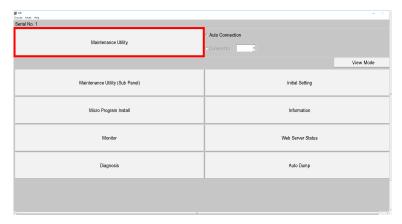
NOTE: You cannot remove the Channel Boards to which the LUN paths are assigned. Before removing them, refer to "Deleting LUN Paths from Ports" (WEBCON03-870) and release the assignment of the LUN paths.

NOTE: You need to remove two Channel Boards in a pair according to "Channel Board Option Installation Rule" (INST(GE)03-01-40).

- For VSP 5500 and VSP 5500H, remove two Channel Boards in one removal operation on Maintenance Utility.
- For VSP 5100 and VSP 5100H, remove one Channel Board in one removal operation on Maintenance Utility. To remove two Channel Boards in a pair, perform the removal operation on Maintenance Utility twice.

Follow the procedure below.

- 1. Connecting the Maintenance PC Connect the Maintenance PC to the SSVP, and then log in to the SVP.
  - "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
  - "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window
  From the menu of Web Console, click [Maintenance Components] [Maintenance Other Components].
- Changing the operation mode Change the mode to [View Mode].
- 4. Starting Maintenance Utility
  In the SVP window, click [Maintenance Utility] (See "Starting Maintenance Utility" (MU01-10).).



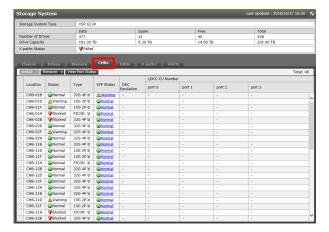
INST(RM)05-01-20

Rev.1

### 5. Selecting removal parts by Maintenance Utility

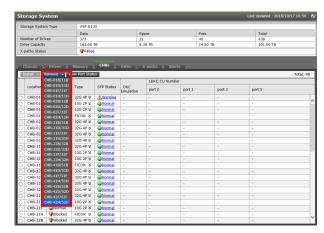
(1) <Main Window>

Click the [CHBs] tab in the main window.



(2) <Select Channel Board>

Click [Remove] and select the Channel Boards to be removed.



NOTE: • For VSP 5500 and VSP 5500H, two slots on the removal destination are displayed.

• For VSP 5100 and VSP 5100H, one slot on the removal destination is displayed.

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#### INST(RM)05-01-30

(3) < Channel Board Removal Execution Window>

### **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 block":

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

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

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(4) <Displaying the Password entry window>

# **A** CAUTION

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

Enter the login password for the maintenance account of the storage system, and then click [OK].

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### INST(RM)05-01-40

(5) <Removal Work Start Message>

Check that the following message is displayed.

If a message other than the following is displayed, refer to Message Section (MSG00-00).

NOTE: Do not click [Close] at this time.

Click [Close] after completing the removal work.



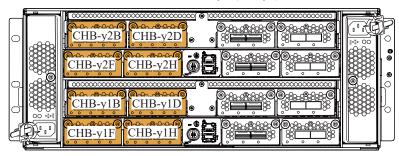
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### INST(RM)05-01-50

### 6. Removal work of Channel Boards

Location	Removal part name		Parts name
Rear View of DKC	1	Channel Board	• CHB (32 G Ready 4Port FC) (4HF32R)
			• CHB (10 G 2Port iSCSI (Optic)) (2HS10S)
			• CHB (16 G 4Port Mainframe Fibre SW)
			(4MS16)
			• CHB (16 G 4Port Mainframe Fibre LW)
			(4ML16)

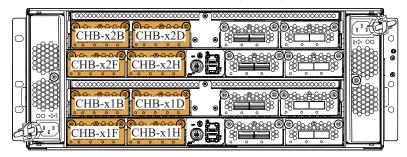
### Controller Board y2 (CTLy2)



Controller Board y1 (CTLy1)

DKC-y (Rear view)

### Controller Board x2 (CTLx2)



Controller Board x1 (CTLx1)

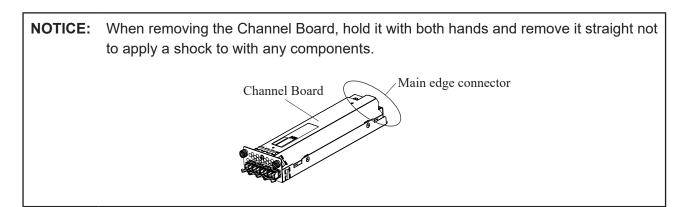
DKC-x (Rear view)

NOTE: The above illustrations are for VSP 5500 and VSP 5500H. For VSP 5100 and VSP 5100H, only CTL01 and CTL12 are installed.

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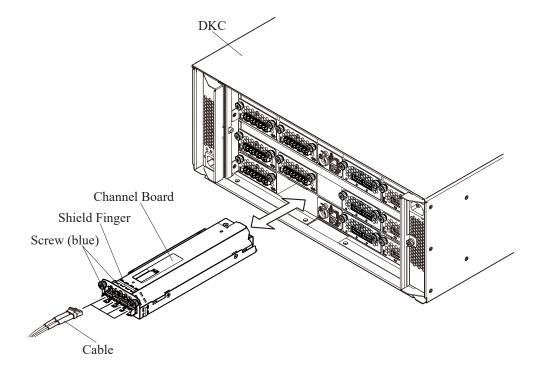
### INST(RM)05-01-60

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



- (a) Loosen two screws (blue) fixing the Channel Board to be removed.
- (b) Hold the screws (blue) and pull out and remove the Channel Board.
- (c) Insert the dummy into the slot to the end from which the Channel Board (CHB) has been removed.

Figure 5-1 Removing Channel Boards (DKC)



(3) For VSP 5500 and VSP 5500H, repeat the procedure from Step 6 (1) to remove the other Channel Board.

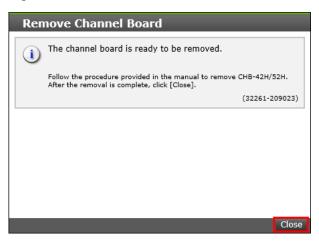
For VSP 5100 and VSP 5100H, go to Step 7.

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### INST(RM)05-01-70

7. <Check Removal Completion> Click [Close] in the Remove Channel Board window.



- 8. For VSP 5500 and VSP 5500H, go to Step 9. For VSP 5100 and VSP 5100H, repeat the procedure from Step 5 to remove the other Channel Board.
- Checking Normality
   Perform the procedure described in "Checking Normality" (TRBL02-06-10).
- 10. Click [Logout] to close the window.
- 11. Removing the Maintenance PC Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10).

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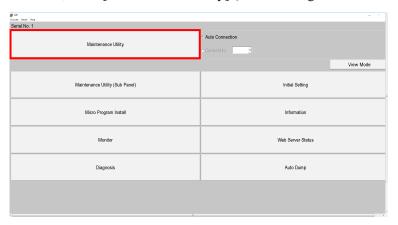
### INST(RM)06-01-10

# 6. Removing Disk Board (DKB)

Be sure to read the notice shown below before performing the following procedure.

**NOTICE:** Before removing Disk Boards (DKBs), check that Drive Boxes are already removed. If Drive Boxes are not yet removed, remove them by following the procedure in "4. Removing Drive Boxes".

- 1. Connecting the Maintenance PC
  - Connect the Maintenance PC to the SSVP, and then log in to the SVP.
  - "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
  - "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window
  From the menu of Web Console, click [Maintenance Components] [Maintenance Other Components].
- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting Maintenance Utility
  In the SVP window, click [Maintenance Utility] (See "Starting Maintenance Utility" (MU01-10).).

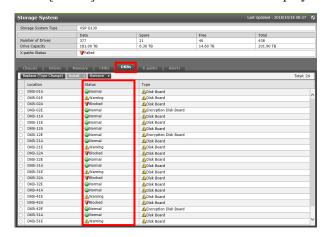


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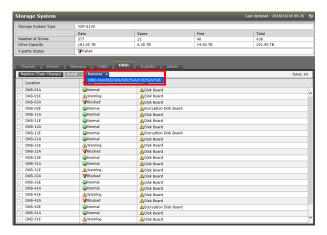
**DKC910I** Rev.0 Copyright © 2019, Hitachi, Ltd.

### INST(RM)06-01-20

- 5. Selecting removal parts by Maintenance Utility
  - (1) <Main Window> Click the [DKBs] tab in the main window and display the Disk Board status.



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



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#### INST(RM)06-01-30

(3) <Disk Board Removal Execution Window>

### **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 block":

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

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

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(4) < Displaying the Password entry window>

# **A** CAUTION

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

Enter the login password for the maintenance account of the storage system, and then click [OK].

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### INST(RM)06-01-40

(5) <Removal Work Start Message>

Check that the following message is displayed.

If a message other than the following is displayed, refer to Message Section (MSG00-00).

NOTE: Do not click [Close] at this time.

Click [Close] after completing the removal work.



Rev.2

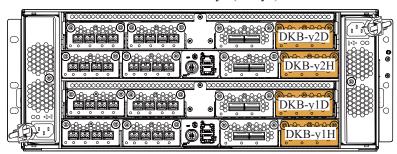
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### INST(RM)06-01-50

### 6. Removal work of Disk Boards

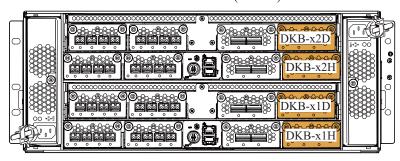
Location	Removal part name		Parts name
Rear View of DKC	1	Disk Board	• DKB (BS12G)
			• EDKB (BS12GE)
			• DKBN (BN8G)

### Controller Board y2 (CTLy2)



Controller Board y1 (CTLy1) DKC-y (rear view)

Controller Board x2 (CTLx2)



Controller Board x1 (CTLx1) DKC-x (rear view)

NOTE: The above illustrations are for VSP 5500 and VSP 5500H. For VSP 5100 and VSP 5100H, only CTL01 and CTL12 are installed.

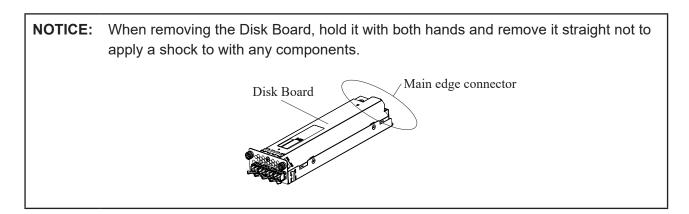
**NOTICE:** To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "Note when Installing and Removing Parts" (INST(GE)01-01-10).

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

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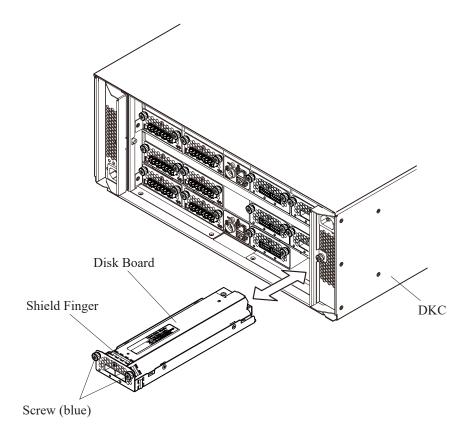
### INST(RM)06-01-60

(2) Removing Disk Boards.



- (a) Loosen two screws (blue) fixing the Disk Board to be removed.
- (b) Hold the screws (blue) and pull out and remove the Disk Board.
- (c) Insert the dummy into the slot to the end from which the Disk Board (DKB) has been removed.

Figure 6-1 Removing Disk Boards



(3) After completing the work of both DKCs, go to Step 7.

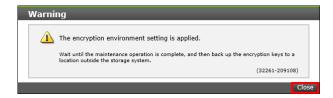
#### INST(RM)06-01-70

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

    If a message other than the following is displayed, refer to Message Section (MSG00-00).



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



- (3) Checking Normality
  Perform the procedure described in "Checking Normality" (TRBL02-06-10).
- (4) Click [Logout] to close the window.
- 8. Removing the Maintenance PC Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10).
- 9. Back up the encryption key
  If the message is displayed in Step 7(2), 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 7(2), this procedure is not required.

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### INST(RM)07-01-10

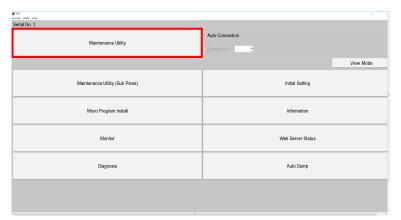
## 7. Removing Shared Memory (SM)

Decide Shared Memories to be removed referring to "Cache Capacity and the Number of Required Options" (INST(AD)01-01-20).

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

Connecting the Maintenance PC
 Connect the Maintenance PC to the SSVP, and then log in to the SVP.

- "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
- "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window
  From the menu of Web Console, click [Maintenance Components] [Maintenance Other Components].
- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting Maintenance Utility
  In the SVP window, click [Maintenance Utility] (See "Starting Maintenance Utility" (MU01-10).).



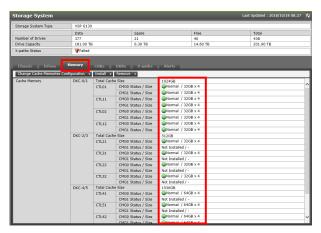
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### INST(RM)07-01-20

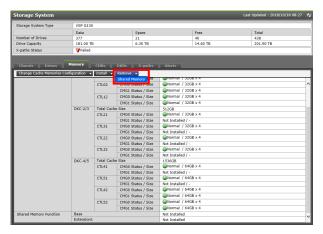
5. Selecting removal parts by Maintenance Utility

(1) <Main Window>

Click the [Memory] tab in the main window to display the Cache Memory status and the mounted capacity.



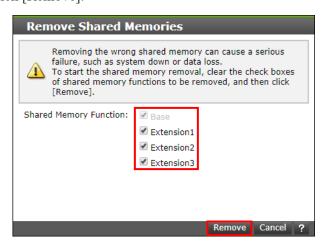
(2) <Select Controller Board> Click [Remove] and select [Shared Memory].



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#### INST(RM)07-01-30

(3) <Shared Memory Removal Window>
Uncheck [Shared Memory Function] to be deleted in the Remove Shared Memories window and click [Remove].



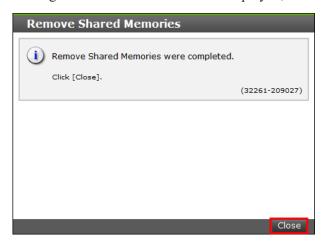
(4) <Displaying the Password entry window>

## **A** CAUTION

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

Enter the login password for the maintenance account of the storage system, and then click [OK].

(5) <Shared Memory Removal Completion Window>Check that the following message is displayed and click [Close].If a message other than the described is displayed, refer to Message Section (MSG00-00).



- (6) Checking Normality
  Perform the procedure described in "Checking Normality" (TRBL02-06-10).
- (7) Click [Logout] to close the window.

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## INST(RM)07-01-40

6. Removing the Maintenance PC Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10).

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## 8. Removing SVP/SSVP

NOTICE: This work takes about two hours. During the work, the Web Console cannot be used for some time because of a rebooting of the SVP PC and verification.

Inform the customer of the following before starting the removal.

- 1. During the removal, customer cannot use Web Console/Storage Navigator via a customer PC.
- 2. When SNMP is being used:
  - 'cold start' trap is reported several times.
  - The obstacle trap which occurred during work may not be notified.
  - · SNMP command may not answer normally.
- 3. The following SIMs may occur during this work, just complete them when finished:
  - bfe3a2 Duplex SVP setup fail
  - bf86a3 SVP RAS Switch#1 remains
  - 7ff2xx Standby SVP fail

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## INST(RM)08-01-20

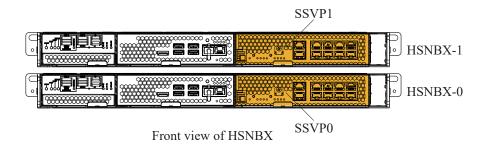
## 1. Status of the SVP-OPTION

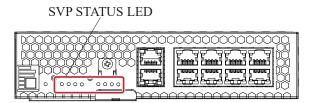
(1) Check statuses of the LEDs on the SSVP.

When they are in the statuses ①, start operation from Procedure 2, "2. Operating the Additional SVP".

When they are in the statuses ②, start operation from Procedure 3, "3. De-Installation Procedure of Service Processor".

Figure 8-1 LED Statuses on SSVP

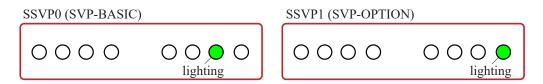




Front view of SSVP

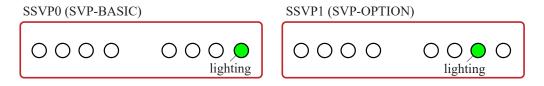
LED Statuses ①

A combination of LED statuses shown when the SVP-OPTION is operating as a Master SVP.



LED Statuses ②

A combination of LED statuses shown when the SVP-OPTION is operating as a Standby SVP.



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## INST(RM)08-01-30

2. Operating the Additional SVP

(1) Connecting the Maintenance PC Connect the Maintenance PC to the Additional SVP.

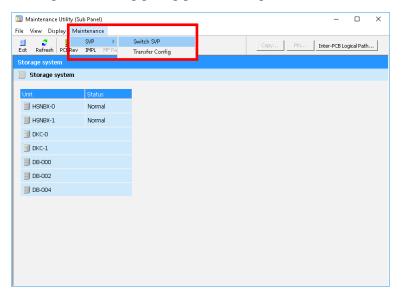
[Connected to]

The Additional SVP

xxx.xxx.xxx.15

(2) <Starting the SVP window> From the menu of Web Console, click [Maintenance Components] - [Maintenance Components (General)].

- (3) <Procedure of SVP switching>
  - (a) <Change the mode> Change [Modify Mode].
  - (b) <Open [Maintenance Utility (Sub Panel)]> Click [Maintenance Utility (Sub Panel)].
  - (c) Select [Maintenance]-[SVP]-[Switch SVP] from the menu.

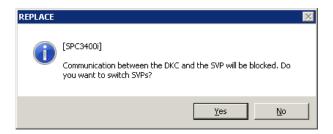


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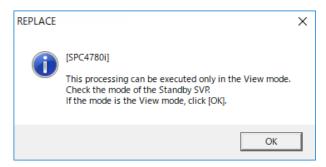
## INST(RM)08-01-40

(d) <Execution> Execute switching. Click [Yes].

NOTE: Switching might take up to 50 minutes.



(e) <Checking the mode of standby SVP>Check the mode of the Standby SVP.If the mode is View mode, click the [OK].



(f) <Configuration Information Transfer>
The message "Transferring storage system configuration data..." is displayed.



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## INST(RM)08-01-50

## (g) <SVP Switching>

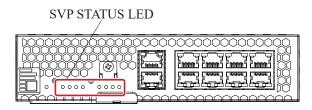
Wait for about three minutes until the switching is completed. The Additional SVP and the Maintenance PC are disconnected due to the SVP switching process.



## (h) Verifying the LED

Make sure that statuses of the LEDs on the SSVP0 and SSVP1 are those as shown in the figure below.

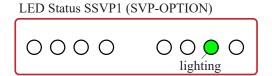
Figure 8-2 LED Statuses on SSVP



Front View of SSVP







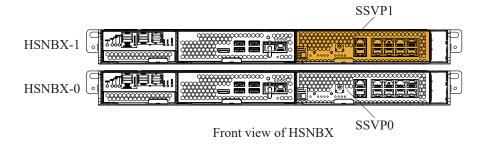
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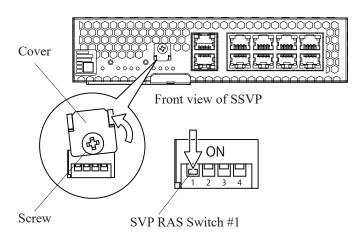
## INST(RM)08-01-60

- 3. De-Installation Procedure of Service Processor
  - (1) <Setting the SVP RAS switch#1 on SSVP1 to ON>
    - (a) Loosen the screw and rotate the switch cover of the SVP RAS switch upward. Then, tighten the screw.
    - (b) Set the SVP RAS switch#1 on SSVP1 to ON (lower position). To set the switch, use an object with a sharp edge such as a pen and precision screwdriver.

NOTE: Use an object with a sharp edge such as a pair of tweezers to manipulate the SVP RAS switch.

Figure 8-3 SVP RAS Switch Setting





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## INST(RM)08-01-70

## (2) <Performance of Shut Down>

(a) Connect the Maintenance PC to the Basic SVP.

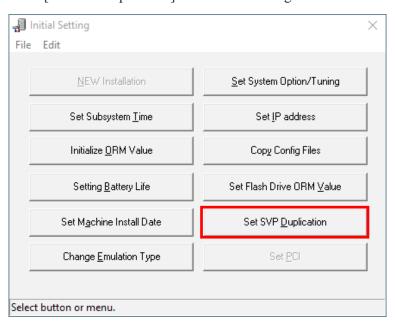
[Connected to]

The Basic SVP xxx.xxx.xxx.15

(b) <Starting the SVP window>From the menu of Web Console, click [Maintenance Components] - [Maintenance Components (General)].

(c) <Mode change>Change the mode to [Modify Mode].

- (d) <Select [Initial Setting]> Click [Initial Setting] in the SVP window.
- (e) <Select [Set SVP Duplication]> Click [Set SVP Duplication] from Initial Setting window.



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> (f) <Disabling [SVP Duplication]> Select [Disable] from SVP Duplication window, and click [OK].



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## INST(RM)08-01-90

(g) <Wear a wrist strap without fail>

The message "To prevent serious failures caused by the static electrical charge, be sure to wear a wrist strap on your wrist and connect the earth clip attached on the other side of the wrist strap to the chassis frame (metal part) before starting operation." is displayed.



Wear a wrist strap, and then click [OK].

(h) <Confirm wearing wrist strap>
The message "Did you put on a wrist strap on your wrist?" is displayed.
Click [Yes], and then go to Step (i).

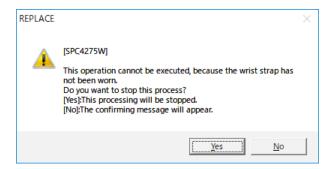


NOTE: If you are not wearing a wrist strap, click [No] in response to the message above. Then, the message below is displayed. Click [Yes] to stop the processing, wear a wrist strap, and then resume the operation.

"This operation cannot be executed, because the wrist strap has not been worn. Do you want to stop this process?

[Yes]: This processing will be stopped.

[No]: The confirming message will appear.".



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## INST(RM)08-01-100

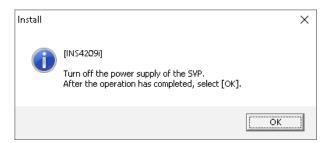
(i) <Start of the remove>

Click [Yes] in response to the message "The SVP and SSVP will be removed. Do you want to continue?"



The REP LED (red) on the Additional SSVP lights up. (see Figure 8-7)

(j) <The Additional SVP power off>"Turn off the power supply of the SVP. After the operation has completed, select [OK]." is displayed.



(k) <Powering off the Additional SVP>

Press the SVP PS ON/OFF switch on the Additional SVP for about one second to power off the Additional SVP.

Check that the SVP POWER LED on the front of the Additional SVP goes off (see Figure 8-4).

NOTE: If the SVP POWER LED does not go off after about three minutes have passed, press the SVP PS ON/OFF switch for five seconds or more (forced power-off), and then check that the SVP POWER LED goes off.

NOTE: If the Additional SVP is powered off, the REP LED (red) on the Additional SSVP goes off (see Figure 8-7).

Click [OK] in response to the message in Step (j).

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## INST(RM)08-01-110

## (1) <Checking the SVP SHUTDOWN LED>

The message "Is the LED to be removed turned on?" is displayed.

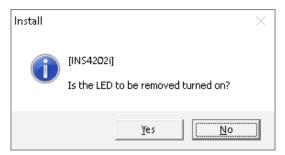
NOTE: Check the status of the SVP SHUTDOWN LED on the Additional SVP (see Figure 8-4).

When the SVP SHUTDOWN LED is on, select [Yes].

Then, go to Step (n).

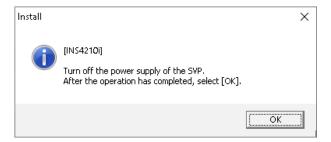
When the SVP SHUTDOWN LED is not on, select [No].

Then, go to Step (m).



## (m) < Removal of SVP>

The message "Check the location of the SVP and remove the SVP. (SVP-OPTION) After the operation has completed, select [OK]." is displayed. Go to Step (3).



NOTE: Do not click [OK] in this step.

After completing the procedure for removing the SVP hardware, click [OK].

#### (n) < Removal of The Additional SVP>

The message "Remove the hardware from the removed part (SVP with the LED on). After the operation has completed, select [OK]." is displayed.

Go to Step (3).



NOTE: Do not click [OK] in this step.

After completing the procedure for removing the SVP hardware, click [OK].

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## INST(RM)08-01-120

## (3) Removing SVP

Location	Additional parts name		Parts name	
Front side of HSNBX	1	SVP	• DKC-F910I-SVP	

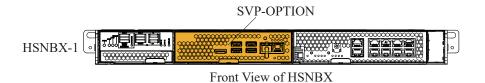
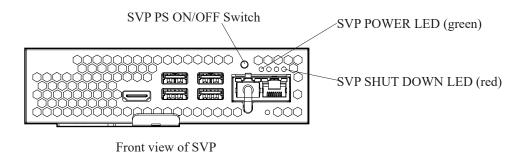


Figure 8-4 Location of SVP Switch and LEDs



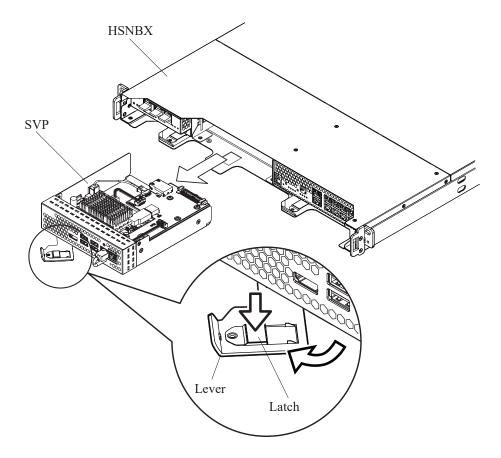
**NOTICE:** To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "Note when Installing and Removing Parts" (INST(GE)01-01-10).

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- (a) Removing the SVP
  - (i) Remove all LAN cables from the SVP.
  - (ii) Open the lever while pressing its latch securing the SVP.
  - (iii) Open the lever completely until the SVP is pulled out toward you.
  - (iv) Remove the SVP by pulling it out while holding it with your hands.

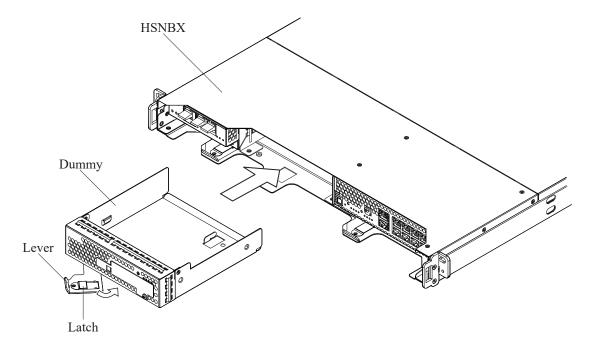
Figure 8-5 Removing the SVP



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- (b) Installing the dummy
  - (i) Completely open the lever of the dummy toward you.
  - (ii) Insert the dummy fully into the HSNBX and push the lever until the latch on the lever clicks and is locked.

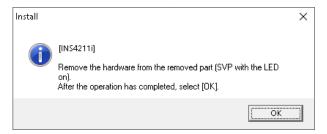
Figure 8-6 Installing the Dummy



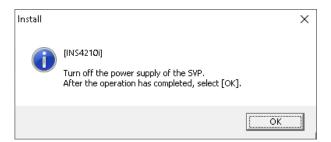
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## INST(RM)08-01-150

(4) <Confirming completion of the removal of SVP> After removal of the SVP, click [OK] in response to the massage shown below.



(Message displayed if the SVP SHUTDOWN LED lights up before removing the SVP)



(Message displayed if the SVP SHUTDOWN LED does not light up before removing the SVP)

- (5) <Removal of SSVP>
  - (a) <Start of the removal> Click [OK] in response to the message "The SSVP will be removed.".



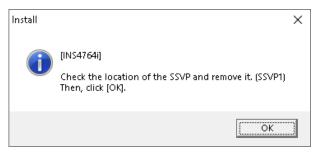
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## INST(RM)08-01-160

## (b) <Removal of SSVP>

The message "Check the location of the SSVP and remove it. (SSVP1) Then, click [OK]." is displayed.

Go to Step (6).



NOTE: Do not click [OK] in this step. After completing the procedure for removing the SSVP hardware, click [OK].

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## INST(RM)08-01-170

## (6) Removing the SSVP

Location	Additional parts name		Parts name	
Front side of HSNBX	1 SSVP • DKC-F910I-HUI		• DKC-F910I-HUB	

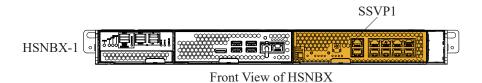
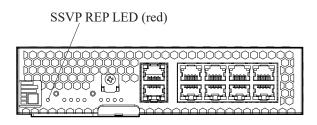


Figure 8-7 Location of SSVP REP LED



Front view of SSVP

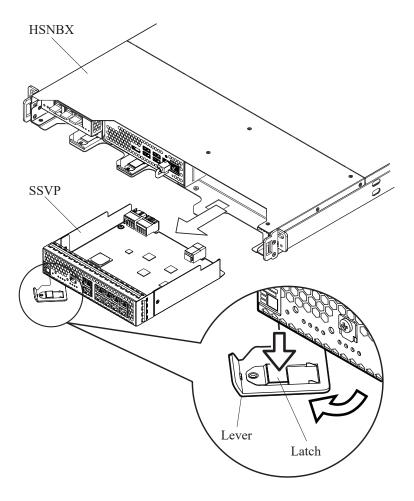
**NOTICE:** To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "Note when Installing and Removing Parts" (INST(GE)01-01-10).

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- (a) Removing the SSVP
  - (i) Remove the cables from the SSVP.
  - (ii) Open the lever while pressing its latch securing the SSVP.
  - (iii) Open the lever completely until the SSVP is pulled out toward you.
  - (iv) Remove the SSVP by pulling it out while holding it with your hands.

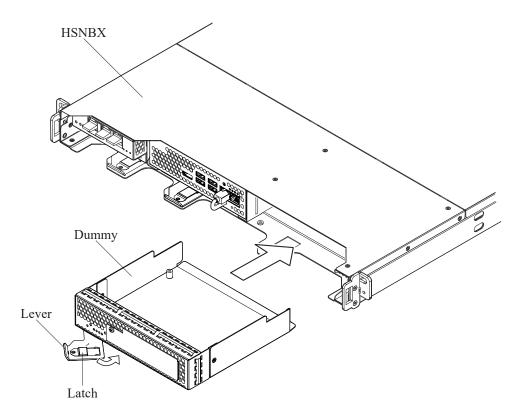
Figure 8-8 Removing the SSVP



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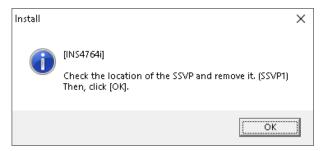
- (b) Installing the dummy
  - (i) Completely open the lever of the dummy toward you.
  - (ii) Insert the dummy fully into the HSNBX and push the lever until the latch on the lever clicks and is locked.

Figure 8-9 Installing the Dummy



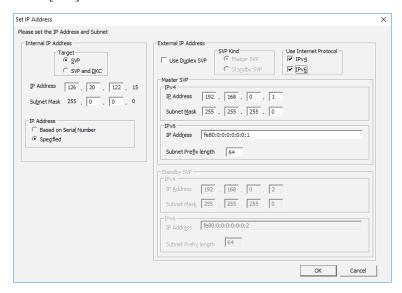
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- (c) Removing the LAN cables
  - (i) Remove the LAN cables from the LAN cable kit by following the steps for "Connecting LAN Cables" (INST(IN)09-03-10) in reverse order.
  - (ii) Remove the LAN cable kit from the rear side of the HSNBX.
  - (iii) If more than one LAN cable kit is installed, remove all the LAN cable kits in the same way.
  - (iv) For VSP 5500 and VSP 5500H, go to Step (7).
    For VSP 5100 and VSP 5100H, connect the LAN cables to SSVP0 (follow the procedure described in "For VSP 5100 and VSP 5100H in which SSVP1 is not installed" in "Install the LAN cables." in "Internal LAN Cable" (INST(IN)09-03-10)).
- (7) <Removal of The Additional SSVP> After removing the SSVP, click [OK].

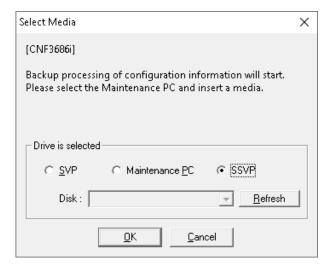


## INST(RM)08-01-210

- (8) Disabling the duplication setting of the Basic SVP
  - (a) <Disabling the setting of SVP duplication>
    Remove the check mark in the [Use Duplex SVP] check box.
    Click [OK].



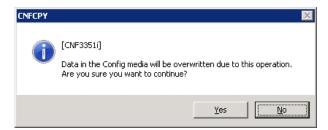
(b) <Backing up the configuration information>
Select SSVP as the location to back up the configuration information.
Then, click [OK].



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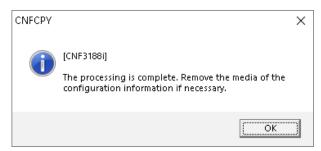
## INST(RM)08-01-220

(c) <Confirming the configuration information backup> Click [Yes].



(d) <Removing the Config media>

When the configuration information backup is complete, the message "The processing is complete. Remove the media of the configuration information if necessary." is displayed. Click [OK].



(e) <Confirming rebooting of the SVP> Click [OK].

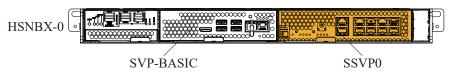


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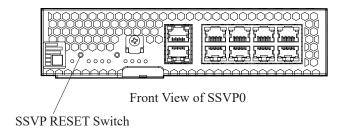
## INST(RM)08-01-230

- 4. Post-Procedure
  - (1) Press the SSVP RESET switch on the SSVP0.

Figure 8-10 Location of SSVP RESET Switch



Front View of HSNBX



(2) Connect to the Basic SVP, and then display the Maintenance Utility (Sub Panel) window. Confirm that the window opens normally, and then perform the procedure described in "Checking Normality" (TRBL02-06-10)).

## INST(RM)09-01-10

# 9. Removing PDUs for a Rack and PDU Power Codes

Table 9-1 Parts List

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

<sup>\*1: 6</sup> spares are included.

<sup>\*2: 2</sup> spares are included.

INST(RM)09-01-20

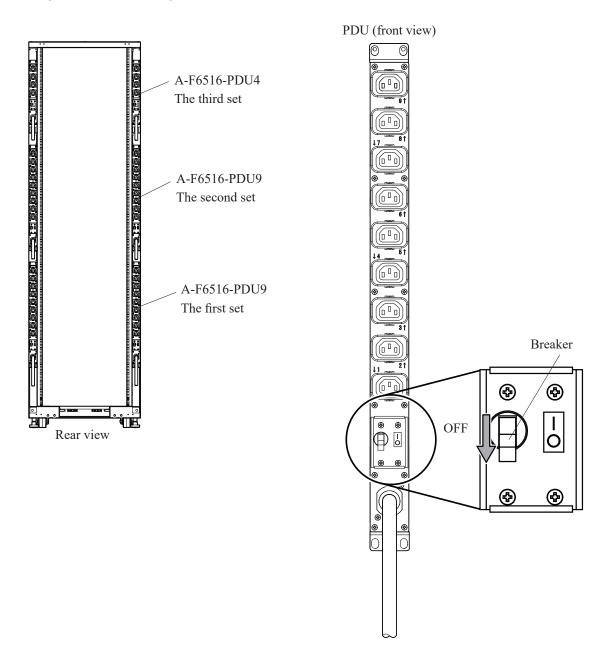
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## 9.1 Removing PDUs for a Rack and PDU Power Codes

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

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

Figure 9-1 Removing PDU Power Cables

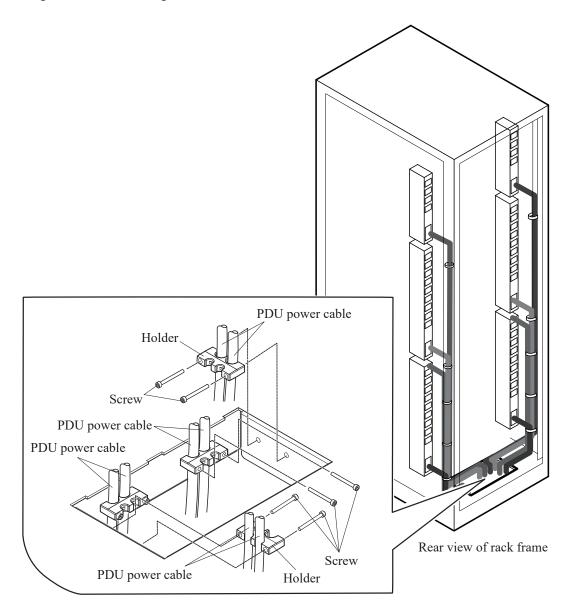


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## INST(RM)09-01-30

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

Figure 9-2 Removing PDU Power Cables

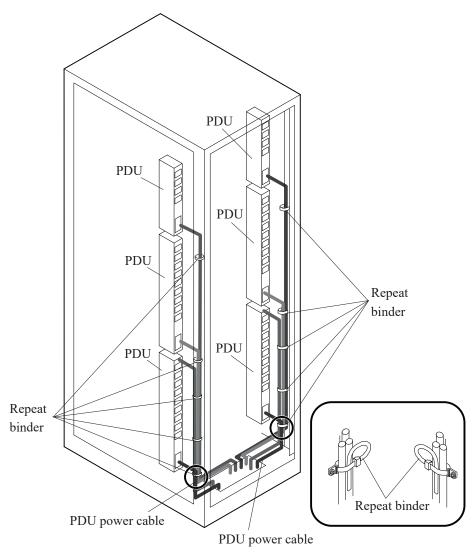


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## INST(RM)09-01-40

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

Figure 9-3 Removing PDU Power Cables



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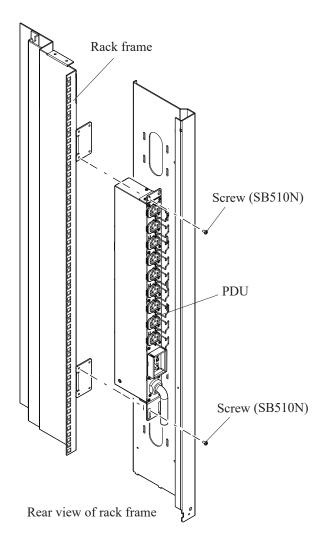
## INST(RM)09-01-50

## 2. Removing PDUs

(1) Remove two screws from the PDU on the right side of the rear of the rack frame and remove the PDU.

(2) Remove the PDU on the left side in the similar procedure.

Figure 9-4 Removing PDUs



Rev.1.1

INST(RM)10-01-10

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# 10. Removing Controller Chassis

- NOTICE: The removing procedure of Controller Chassis does not include the removal of Channel Board (CHB)/Disk Board (DKB).
  - Perform the removal of CHB/DKB before the removing procedure of Controller Chassis (see "5. Removing Channel Boards"/"6. Removing Disk Board (DKB)").
  - If you perform any of the following operations during the removal of Controller Chassis, a serious error such as system down and data loss might be caused. Never do the following:
    - Removing a CTL
    - Changing X-path cable connections
    - Turing off PDU breakers

#### 10.1 Estimated Work Time

To estimate the total time required for removing Controller Chassis, sum up relevant items in the table below.

Table 10-1 Estimated Working Hours for Removing Controller Chassis

Process.	Estimated work time		Remarks
	When removing two DKCs	When removing four DKCs	
Micro-program processing	10 min	15 min	The work time depends on
time			I/O load. When I/O load is
			very high, it might take up
			to about 4 hours.
Cable removal time	22 min	44 min	Removal of power cables
			and LAN cables
Component removal time	76 min	152 min	Removal of CTLs and HIEs
			from Controller Chassis, and
			removal of DIMMs, CFMs,
			BKNFs, and batteries from
			CTLs
Chassis removal time	12 min	24 min	

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## 10.2 Parts List

Each Controller Chassis to be removed contains the components shown below.

Table 10-2 Controller Chassis Parts List

No.	Model Name	Part No.	Quantity	Remarks
1	Controller Chassis	3292481-A	1	
2	Controller Board	3292483-A	2	
3	Front Bezel	_	1	(for Hitachi Vantara)
	Front Bezel	3292505-A	1	(for HPE)
4	BKMF (FANM)	3292494-A	4	
5	BKMF	3294485-A	4	
6	Battery	3292486-A	4	
7	DKCPS	3289056-K	2	
8	LAN Board	3292482-A	2	
9	HIE	3292484-A	4	
10	X-Path Cable	_	8	
11	Power Cable	_	2	

When removing Controller Chassis, execute "10.3 Removing Controller Chassis".

Rev 2

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#### INST(RM)10-03-10

## 10.3 Removing Controller Chassis

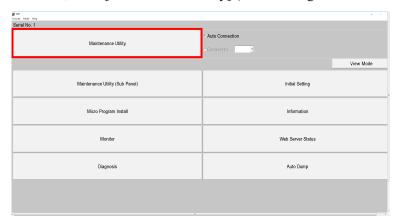
- **NOTICE:** When it is assumed that the MP operating rate exceeds 70% if Controller Chassis is removed, the removal of Controller Chassis is suppressed. Before removing Controller Chassis, lower the MP operating rate.
  - If a failure part exists in other than the Controller Chassis to be removed, or if a drive for which drive copy or correction copy is in progress exists in the system, the removal of Controller Chassis is suppressed. Check the system status before the
  - The work time becomes longer depending on I/O load and write pending. When the write pending rate of any of MPUs/CLPRs in the system exceeds 20%, the removal of Controller Chassis is suppressed. Before removing the Controller Chassis, lower the I/O load and write pending rate.
  - · When Virtual Partition Manager is used, the removal of Controller Chassis, which causes the cache capacity of CLPR0 to be smaller than 4 GB, fails. Before removing Controller Chassis, confirm that the cache capacity of CLPR0 is greater than that of the Controller Chassis to be removed by at least 4 GB. (Cache capacity of Controller Chassis to be removed + 4 GB  $\leq$  Cache capacity of CLPR0)
- 1. Connecting the Maintenance PC

Connect the Maintenance PC to the SSVP, and then log in to the SVP.

- "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
- "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window

From the menu of Web Console, click [Maintenance Components]-[Maintenance Other Components].

- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting the Maintenance Utility In the SVP window, click [Maintenance Utility] (see "Starting Maintenance Utility" (MU01-10).).



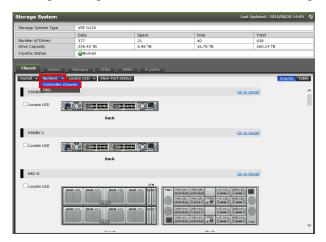
5. Turning on the Locate LED Turn on the Locate LED on the Controller Chassis to be removed (see (MU02-40)) to confirm the location.

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## INST(RM)10-03-20

- 6. Instructing to start removal by Maintenance Utility
  - (1) <Main Window>

Click the [Chassis] tab in the main window, and click [Remove] and select [Controller Chassis].



(2) <Specify Removal Controller Chassis>

## **A** CAUTION

About "Forcibly run without safety checks":

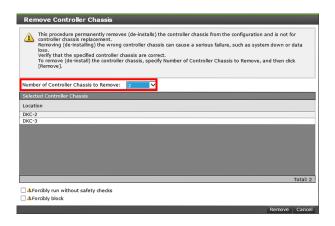
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

## About "Forcibly block":

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

Select the number of Controller Chassis to be removed, and click [Remove].

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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## INST(RM)10-03-30

(3) <Displaying the Password entry window>



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

Enter the login password for the maintenance account of the storage system, and then click [OK].

(4) <Confirming the completion of the removal>Check that the following message is displayed and click [Close].If a message other than the described is displayed, refer to Message Section (MSG00-00).



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## INST(RM)10-04-10

## 10.4 Removing Controller Chassis

1. Confirming of removal positions

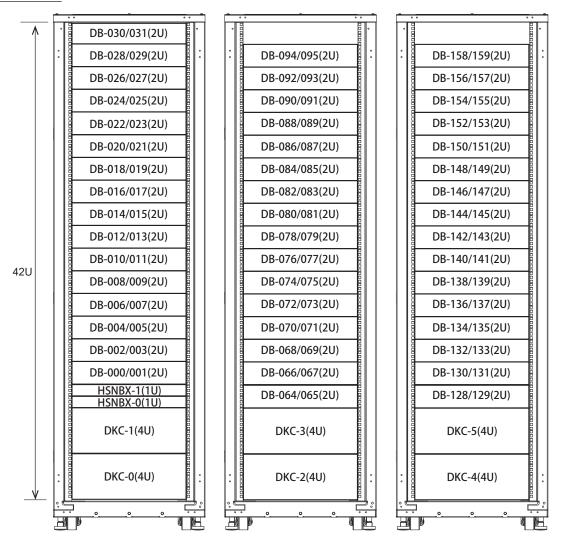
Check the locations of Controller Chassis (DKCs) to be removed.

The following figure shows an example of installing Controller Chassis.

The mounting locations of the Controller Chassis are different according to the configuration.

Figure 10-1 Example of Controller Chassis Locations

#### 3 CBX-Pair



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# INST(RM)10-04-20

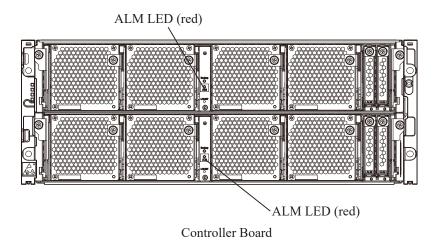
2. Removing the Front Bezel Remove the Front Bezel (see "How to Attach/Remove the Front Bezel" (INST(GE)04-01-10).)

3. Checking the LEDs on Controller Boards in Controller Chassis to be removed Check that the ALM LEDs (red) on all Controller Boards in the Controller Chassis to be removed light up.

NOTE: The ALM LEDs (red) on the Controller Boards might not light up depending on failure type.

When the ALM LEDs do not light up, be careful not to remove a wrong Controller Board. Confirm the locations of the Controller Boards to be removed, and then go to the next step.

Figure 10-2 Checking the ALM LEDs

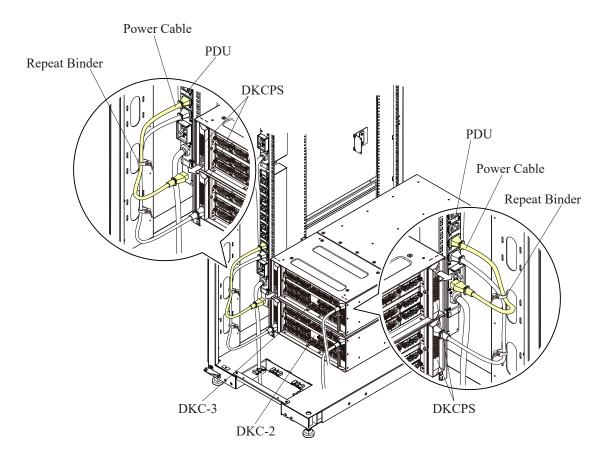


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# INST(RM)10-04-30

- 4. Removing the Power Cables
  - (1) Lift the latch of the cable holder and pull out the cable holder toward you.
  - (2) Open the cable holder and remove the two power cables from the DKCPS.
  - (3) Check the locations of the PDUs to which the power cables removed from the DKCPSs are connected.
  - (4) Open the stopper and remove two power cables from the PDU.
  - (5) Remove repeat binders from the rack frame.

Figure 10-3 Removal Example of Power Cables



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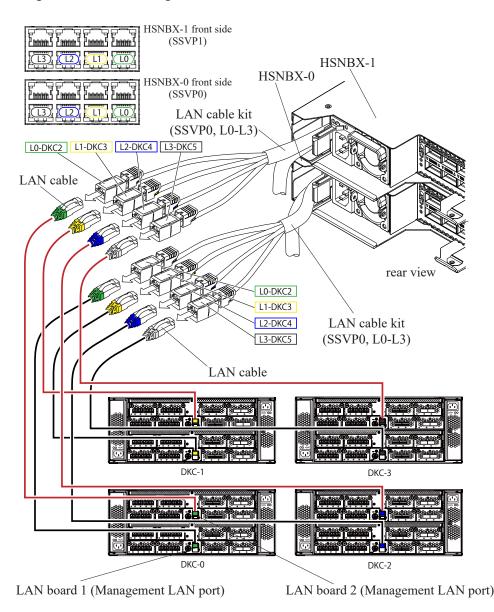
# INST(RM)10-04-40

# 5. Removing LAN cables

- (1) Disconnect the LAN cable from the LAN Board 1 (Management LAN port) in Controller Board x1.
- (2) Remove the LAN cable disconnected in Step (1) from Lx-DKCx on the LAN cable kit for relay connection to SSVP0.
- (3) Disconnect the LAN cable from the LAN Board 2 (Management LAN port) in Controller Board x2. (This step is not required when SSVP1 is not installed.)
- (4) Remove the LAN cable disconnected in Step (3) from Lx-DKCx on the LAN cable kit for relay connection to SSVP1. (This step is not required when SSVP1 is not installed.)
- (5) Remove the LAN cables from LAN ports Lx on the front sides of HSNBXs while checking the labels attached to the LAN cables.

  In the case that all of DKC-2, DKC-3, DKC-4, and DKC-5 are removed, perform Step (6).
- (6) Pull out the LAN cable kits for relay connection from the rear sides of HSNBXs.

Figure 10-4 Removing LAN cables



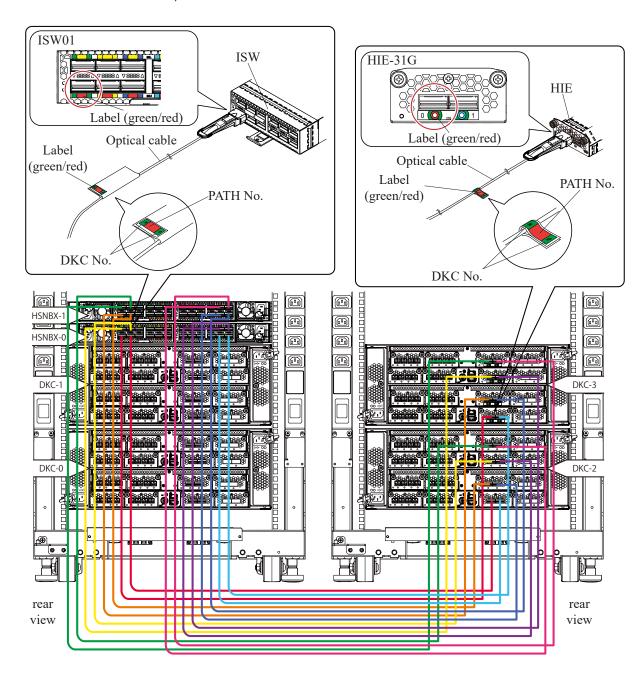
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# INST(RM)10-04-50

- 6. Removing X-path cables
  - (1) Disconnect the X-path cables from HIEs.
  - (2) Remove the X-path cables disconnected in Step (1) from ISWs in HSNBXs.

NOTE: Confirm that the cable color code of the cable to be removed from ISW is the same as that of the cable disconnected from HIE.

Figure 10-5 Removing X-path Cable (Example Where the Cable Is Removed from HIE-31G0 on DKC-3)



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# 7. Removing components

Remove the Controller Boards, components, and power supplies from the Controller Chassis (see "Removing Compnents" (INST(IN)05-01-10))

Then, attach labels or something to show their locations to them because you need to return them to the same locations later.

If you do not need to remove them, go to Step 8.

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# 8. Removing Controller Chassis

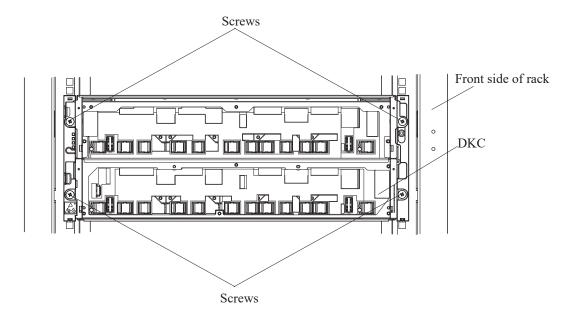


Be careful of the mass:

Work carefully because the mass of the Controller Chassis is about 29 kg.

(1) Remove the right and left screws (two each) fixing the DKC.

Figure 10-6 Removing Controller Chassis



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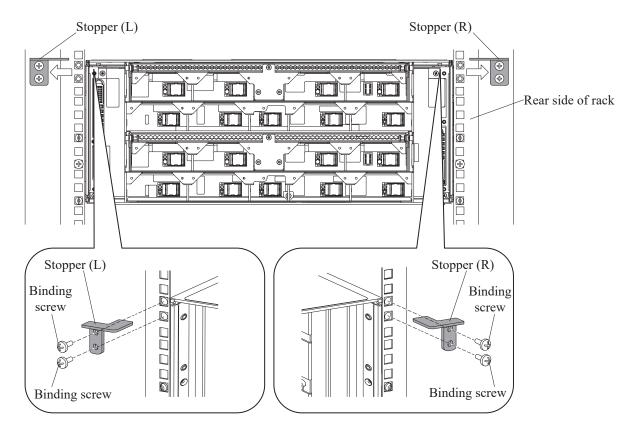
# INST(RM)10-04-80

(2) For the rail type with a stopper, go to Step (3).

For the rail type without a stopper, remove the stopper (R), the stopper (L), and the binding screws (two for each stopper) fixing them from the rear side of the rack.

Go to Step (3).

Figure 10-7 Removing Stoppers



- (3) Remove the Controller Chassis from the rack frame referring to mounting procedure using the special lifter. (see "Mounting Storage System on a Special Lifter" (INST(IN)06-01-10))
- 9. Reinstalling the removed parts
  Install the Controller Boards, components, and power supplies to the removed Controller Chassis (see "Installing Components" (INST(IN)08-01-10).)

If they are already installed, this step is not necessary.

Rev.2

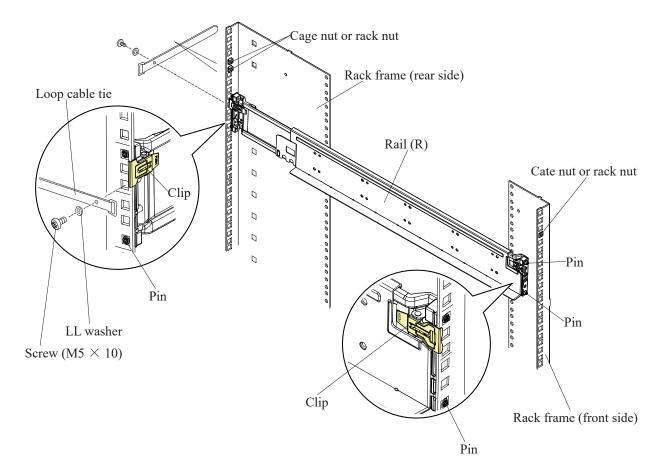
# INST(RM)10-04-90

# 10. Removing Rails

NOTE: • There are the rail (R) and the rail (L). Check that with the marking on the rail.

- These rails extend or shorten back and forth.
- Thease are the rail type with a stopper and the rail type without a stopper.
- (1) Remove the screw (M5  $\times$  10), loop cable tie and the LL washer from the rear side of right rail.
- (2) Open two Clips located in the front and the rear side of right rail
- (3) Push the rail that is mounted at the right side of the rack frame and remove the Positioning Pin on the front side of the rail. Then remove the rail from the rack frame.
- (4) Remove the left side rail from the rack frame in the same way.
- (5) Remove rack nuts or cage nuts from the rack frame.

Figure 10-8 Removing Rails



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# 10.5 Confirming the Normality of the Storage System after Removing Controller Chassis

1. Checking Normality
Perform the procedure described in "Checking Normality" (TRBL02-06-10).

Executing LAN Check
 Perform a diagnosis of LAN Check (DIAG03-10).
 When there is an error, perform "Recovery Procedure for Error Parts Detected by LAN Check"
 (TRBL02-04-440).

- 3. Click [Logout] to close the window.
- 4. Click [Execute]-[Exit] in the SVP window to exit the window.

NOTE: At this point, the removed CTLs are displayed as selectable CTLs for "Connect to".

Removing the Maintenance PC
 Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of
 Maintenance PC" (INST(IN)13-02-10).

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# 11. Removing Controller Boards

# **NOTICE:** When removing Controller Boards, you need to connect the LAN cable between the Maintenance LAN port on the LAN board 1 in DKC-0 and the Maintenance LAN port on the LAN board 2 in DKC-1. After the removal of Controller Boards is started,

until the connection of the LAN cable is complete, the following information might be missing:

- Monitoring information (Performance Monitor and monitoring on SVP)
- · Log information (SSB log, Reset log, HTP log, Power Event log, Incident log, and Detail log)
- If you perform any of the following operations during the removal of Controller Board, a serious error such as system down and data loss might be caused. Never do the following:
  - Removing a CTL
  - Changing X-path cable connections
  - Turing off PDU breakers

# 11.1 Estimated Work Time

To estimate the total time required for removing Controller Boards, sum up relevant items in the table below.

Table 11-1 Estimated Working Hours for Removing Controller Boards

Process	Estimated work time	Remarks	
Micro-program processing	10 min	The work time depends on I/O load. When I/O load is	
time		very high, it might take up to about 4 hours.	
Cable removal time	17 min	Removal of X-path cables, LAN cables, and SAS cables	
		(NVMe cables)	
Component removal time	38 min	Removal of CTLs, HIEs, CHBs, and DKBs (DKBNs)	
		from Controller Chassis in the rack, and removal of	
		DIMMs, CFMs, BKMFs, and batteries from Controller	
		Boards.	

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# 11.2 Parts List

Each Controller Chassis contains the components shown below.

Table 11-2 Controller Chassis Parts List

No.	Model Name	Part No.	Quantity	Remarks
1	Controller Board	3292483-A	2	
2	BKMF (FANM)	3292494-A	4	
3	BKMF	3294485-A	4	
4	Battery	3292486-A	4	
5	HIE	3292484-A	4	
6	X-Path Cable	_	8	
7	DKB, DKBN	_	4	Not contained for the DKB-less
				configuration
8	SAS Cable, NVMe Cable	_	8	Not contained for the DKB-less
				configuration

In addition to the components shown above, Cache Flash Memories, Cache Memories, and Channel Boards that are installed in the Controller Boards to be removed need to be removed.

When removing Controller Boards, execute "11.3 Removing Controller Boards".

# 11.3 Removing Controller Boards

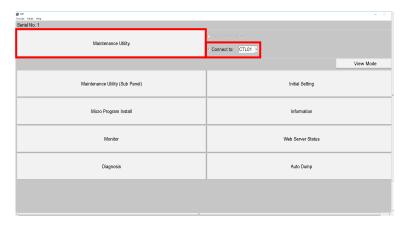
- NOTICE: When removing a Controller Board, Channel Boards (CHBs) installed in CTL02 and CTL11 also need to be removed. However, a Channel Board to which a LUN path is allocated cannot be removed. Before removing the Channel Board, delete the allocated LUN path (see "Deleting LUN Paths from Ports" (WEBCON03-870)).
  - When it is assumed that the MP operating rate exceeds 70% if Controller Boards are removed, the removal of Controller Boards are suppressed. Before removing Controller Boards, lower the MP operating rate.
  - The work time becomes longer depending on I/O load and write pending. When the write pending rate of any of MPUs/CLPRs in the system exceeds 20%, the removal of Controller Boards is suppressed. Before removing the Controller Boards, lower the I/O load and write pending rate.
  - · When Virtual Partition Manager is used, the removal of Controller Boards, which causes the cache capacity of CLPR0 to be smaller than 4 GB, fails. Before removing Controller Boards, confirm that the cache capacity of CLPR0 is greater than that of the Controller Boards to be removed by at least 4 GB. (Cache capacity of Controller Boards to be removed + 4 GB ≤ Cache capacity of CLPR0)
- 1. Connecting the Maintenance PC

Connect the Maintenance PC to the SSVP, and then log in to the SVP.

- "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
- "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window

From the menu of Web Console, click [Maintenance Components]-[Maintenance Other Components].

- 3. Changing the operation mode Change the mode to [View Mode].
- 4. Starting the Maintenance Utility Specify CTL01, and then start Maintenance Utility (see "Starting Maintenance Utility by Specifying CTL" (MU01-50)).



**DKC910I** 

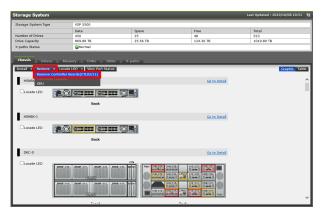
#### INST(RM)11-03-20

Rev.2

5. Instructing to start removal by Maintenance Utility

(1) <Main Window>

Click the [Chassis] tab in the main window, and click [Remove] and select [Remove Controller Boards (CTL02/11)]



(2) <Specify Removal Controller Board>

# CAUTION

About "Forcibly run without safety checks":

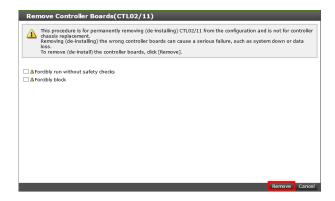
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.

# About "Forcibly block":

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

# Click [Remove].

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



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(3) <Displaying the Password entry window>

# **A** CAUTION

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

Enter the login password for the maintenance account of the storage system, and then click [OK].

(4) <Confirming the completion of the removal> Check that the message shown below is displayed. Do not click [Close] yet. If a message other than the below is described, see "Message Section" (MSG00-00).

After the message shown below is displayed, change LAN cable connections by following the procedures for VSP 5100 and VSP 5100H in "Install the LAN cables" (see (INST(IN)09-03-70) and (INST(INJ)09-03-80)).

Then, click [Close].



Rev.2

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# INST(RM)11-04-10

# 11.4 Removing Controller Boards

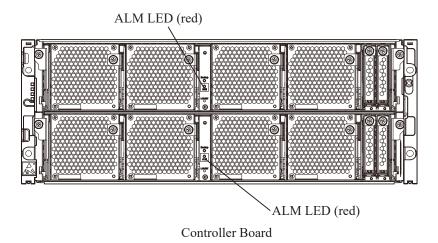
1. Removing the Front Bezel Remove the Front Bezel (see "How to Attach/Remove the Front Bezel" (INST(GE)04-01-10).)

2. Checking the LEDs on Controller Boards in Controller Chassis to be removed Check that the ALM LEDs (red) on all Controller Boards to be removed light up.

NOTE: The ALM LEDs (red) on the Controller Boards might not light up depending on failure type.

When the ALM LEDs do not light up, be careful not to remove a wrong Controller Board. Confirm the locations of the Controller Boards to be removed, and then go to the next step.

Figure 11-1 Checking the ALM LEDs



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# INST(RM)11-04-20

3. Removing SAS cables/NVMe cables

- (1) Disconnect SAS cables/NVMe cables from the Disk Boards (DKBs) in the Controller Boards to be removed.
- (2) Disconnect the other ends of the SAS cables/NVMe cables disconnected in Step (1) from the ENCs in the Drive Boxes

NOTE: Check that the cable color code on the cable end to be disconnected from the ENC is the same color as the cable color code on the cable end disconnected from the Disk Board (DKB).

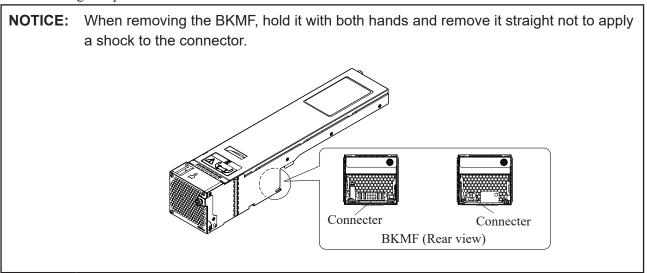
# 4. Removing X-Path cables

- (1) Disconnect X-path cables from the HIEs in the Controller Boards to be removed.
- (2) Disconnect the other ends of the X-path cables disconnected in Step (1) from the ISWs in the HSNBXs.

NOTE: Check that the cable color code on the cable end to be disconnected from the ISW is the same color as the cable color code on the cable end disconnected from the HIE.

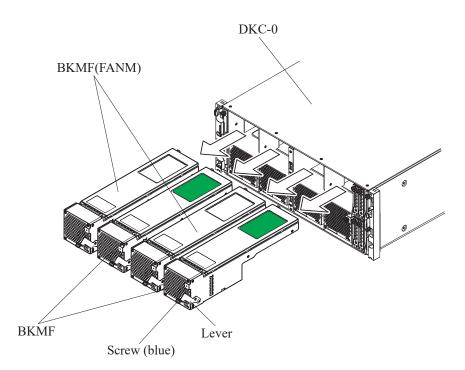
# INST(RM)11-04-30

# 5. Removing components



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

Figure 11-2 Removing BKMFs (DKC-0)



Rev.2

# INST(RM)11-04-40

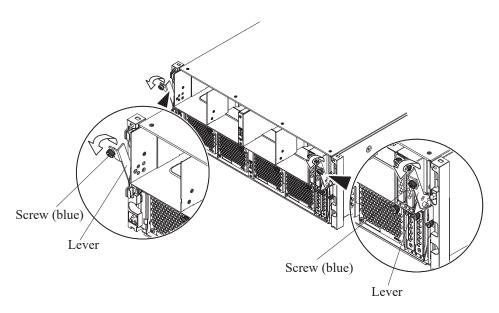
6. Removing Controller Board



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

(1) Loosen the right and left screws (blue) on the lever of the Controller Board to add the Cache Memory in the front of the DKC and open the lever.

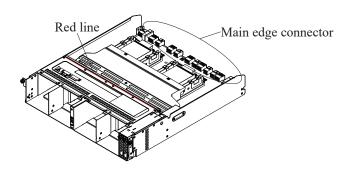
Figure 11-3 Disengaging Controller Board



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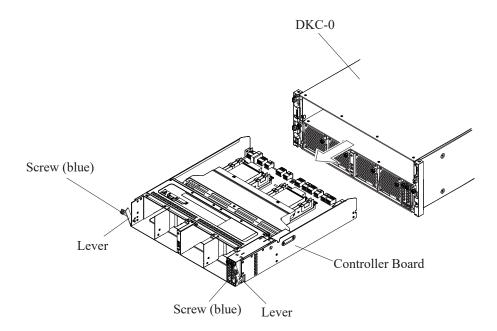
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



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

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

Figure 11-4 Removing Controller Board

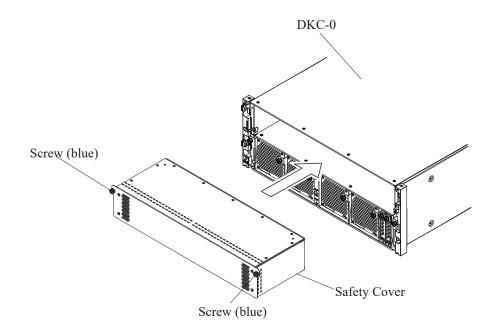


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# INST(RM)11-04-60

- 7. Installing Safety Cover
  - (1) Install the safety cover from the front side of the Controller Chassis.
  - (2) Tighten the screws (blue) and fix the Safety Cover.

Figure 11-5 Installing Safety Cover



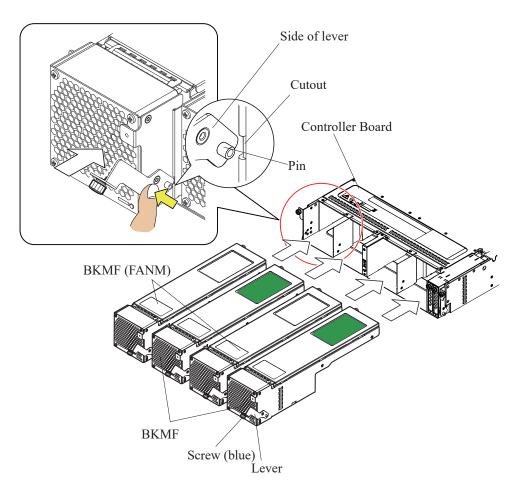
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# INST(RM)11-04-70

8. Installing the components again
Install the BKMFs in the removed Controller Board.

- (1) Install for BKMFs in the Controller Board.
  - (a) Keep the lever of BKMF pulled down toward you.
  - (b) Insert the BKMF up to the front of the shield finger.
  - (c) Insert the BKMF while pushing the side of its lever to the left until the pin of the lever goes through the cutout of the chassis and stops.
  - (d) Raise the BKMF lever and tighten the screws (blue) and fix it.

Figure 11-6 Installing BKMFs



9. Remove the Controller Board from the lower front side of the Controller Chassis (DKC-1) in the same way.

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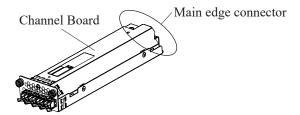
# INST(RM)11-04-80

Removing work of Channel Boards (CHB), Disk Boards (DKB), HIEs.
 Remove Channel Boards, Disk Boards, and HIEs from the removed Controller Boards (CTL02 and CTL11).

**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 "Note when Installing and Removing Parts" (INST(GE)01-01-10).

(1) Removing the Channel Board

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

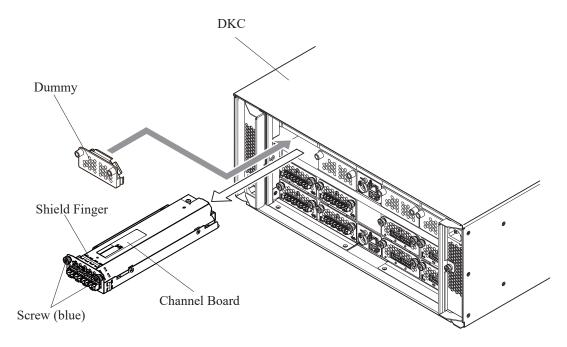


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# INST(RM)11-04-90

- (a) Loosen two screws (blue) fixing the Channel Board to be removed.
- (b) Hold the screws (blue) and pull out and remove the Channel Board.
- (c) Insert the dummy into the slot to the end from which the Channel Board (CHB) has been removed.

Figure 11-7 Removing the Channel Board



(d) Remove the other Channel Boards in the same way.

# INST(RM)11-04-100

# (2) Removing the Disk Board

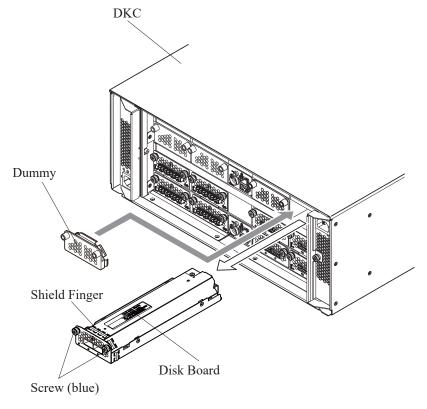
NOTICE: When removing the Disk Board, hold it with both hands and remove it straight not to apply a shock to with any components.

Disk Board

Main edge connector

- (a) Loosen two screws (blue) fixing the Disk Board to be removed.
- (b) Hold the screws (blue) and pull out and remove the Disk Board.
- (c) Insert the dummy into the slot to the end from which the Disk Board (DKB) has been removed.

Figure 11-8 Removing the Disk Board



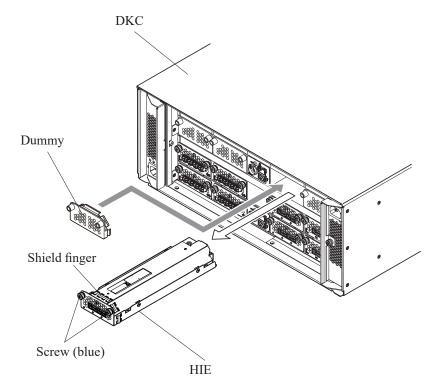
(d) Remove the other Disk Boards in the same way.

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# INST(RM)11-04-110

- (3) Removing HIEs
  - (a) Loosen two screws (blue) fixing the HIE to be removed.
  - (b) Hold the screws (blue) and pull out and remove the HIE.
  - (c) Insert the dummy into the slot to the end from which the HIE has been removed.

Figure 11-9 Removing the HIE



(d) Remove the other HIEs in the same way.

# 11. Attaching Front Bezel

Attach the Front Bezel to the Controller Chassis. (see "How to Attach/Remove Front Bezel" (INST(GE)04-01-10).)

Rev.2

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# INST(RM)11-05-10

# 11.5 Confirming the Normality of the Storage System after Removing Controller Boards

Checking Normality
 Perform the procedure described in "Checking Normality" (TRBL02-06-10).

Executing LAN Check
 Perform a diagnosis of LAN Check (DIAG03-10).
 When there is an error, perform "Recovery Procedure for Error Parts Detected by LAN Check"
 (TRBL02-04-440).

- 3. Click [Logout] to close the window.
- 4. Click [Execute]-[Exit] in the SVP window to exit the window.

NOTE: At this point, the removed CTLs are displayed as selectable CTLs for "Connect to".

Removing the Maintenance PC
 Remove the Maintenance PC from the storage system referring to "Attachment/Removal Procedure of
 Maintenance PC" (INST(IN)13-02-10).