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[Cache Memory REPLACEMENT PROCESSING - RCM1]

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REP(RCM1)01-10

1. Replacing a Cache Memory

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

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

1. Connecting 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

See Table 1-1 to check the Controller Board to which Maintenance Utility is connected. Specify an appropriate CTL number, and then start Maintenance Utility. (See "Starting Maintenance Utility by Specifying CTL" (MU01-50).)

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Table 1-1 Correspondence between Controller Board in which Cache Memory is replaced and Controller Board to which Maintenance Utility Is Connected.

| Controller Board in which Cache | Controller Board to which Ma | nintenance Utility is connected |
|---------------------------------|------------------------------|---------------------------------|
| Memory is replaced | Single SVP configuration | Dual SVP configuration |
| CTL01 | Other than CTL01 or CTL02 | Other than CTL01 |
| CTL02 | Other than CTL01 or CTL02 | Other than CTL02 |
| CTL11 | Other than CTL11 or CTL12 | Other than CTL11 |
| CTL12 | Other than CTL11 or CTL12 | Other than CTL12 |
| CTL21 | Other than CTL21 or CTL22 | Other than CTL21 |
| CTL22 | Other than CTL21 or CTL22 | Other than CTL22 |
| CTL31 | Other than CTL31 or CTL32 | Other than CTL31 |
| CTL32 | Other than CTL31 or CTL32 | Other than CTL32 |
| CTL41 | Other than CTL41 or CTL42 | Other than CTL41 |
| CTL42 | Other than CTL41 or CTL42 | Other than CTL42 |
| CTL51 | Other than CTL51 or CTL52 | Other than CTL51 |
| CTL52 | Other than CTL51 or CTL52 | Other than CTL52 |

NOTE : For example, when replacing Cache Memory in CTL01, connect to the following CTL.

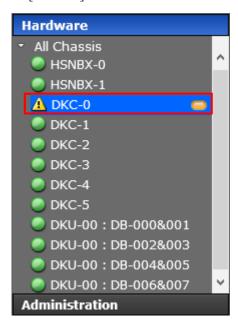
- Single SVP configuration: Other than CTL01 or CTL02
- Dual SVP configuration: Other than CTL01

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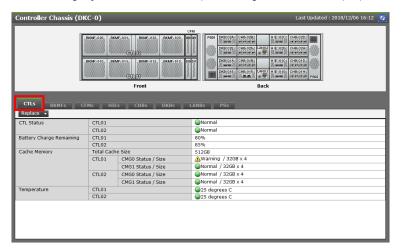
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5. Selecting replacement parts by Maintenance Utility.

(1) <Main window> Select [DKC-X] in the main window.



(2) <Controller Chassis window> Click the [CTLs] tab in the Controller Chassis window to display a Cache Memory status. See "Alert Display Related to FRU (Field Replacement Unit)" (MU02-10) for [Status].

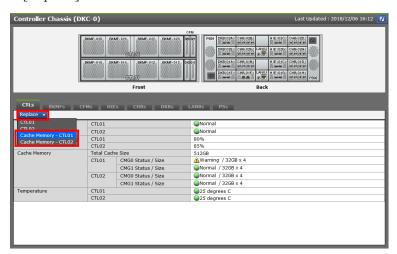


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(3) <Select Controller Board>
Click [Replace] and select a Controller Board in which a Cache Memory to be replaced is installed.



(4) <Block Controller Board>

A CAUTION

About "Forcibly run without safety checks":

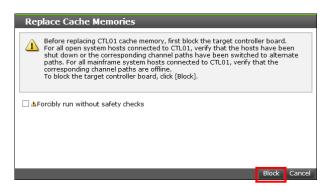
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. When the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "Note on Deleting Remote Paths" (REP(GE)01-60). When Universal Volume Manager is used for the target storage system, see "Notes on Maintenance Work for the Storage System for which External Paths Are Configured" (REP(GE)01-61).

Check that the Controller Board has the Cache Memory to be replaced, and then click [Block]. If a message other than the described is displayed, refer to Message Section (MSG00-00).

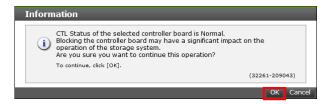
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NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



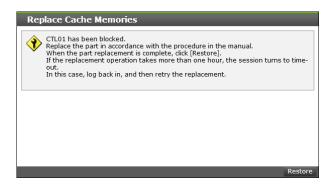
(5) <Check Controller Board>
Check that the Controller Board to replace the Cache Memory is correct again and click [OK].



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

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

Click [Restore] after completing the replacement work.

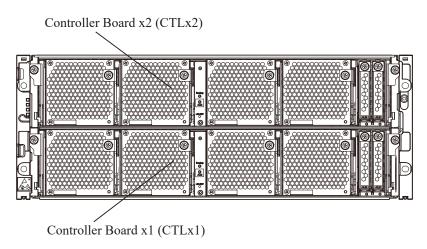


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6. Cache Memory Replacement Processing

| Location | Function Name of Component | | Part Name |
|--------------|----------------------------|--------------|-----------------------|
| Front of DKC | 1 | Cache Memory | Cache Memory (CM32G) |
| | | | Cache Memory (CM64GL) |



Front view of DKC -x

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. See "Note on Installing and Removing Parts (REP(GE)01-30)".

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

NOTE: The ALM LED (red) on the Controller Board might not light up depending on the failure. In such a case, perform the following steps in order from ① to ③ to locate the Controller Board to be replaced.

Step ①:

For VSP 5100 and VSP5100H, when either of the ALARM LED ((LOC03-70), No. 5-4) on DKC-0 or that on DKC-1 is lit, perform the procedure from Step (2) on the Controller Board in the DKC on which the ALARM LED ((LOC03-70), No. 5-4) is lit. When both of the ALARM LED ((LOC03-70), No. 5-4) on DKC-0 and that on DKC-1 are lit, go to Step ②.

For VSP 5500 and VSP 5500H, go to Step ②.

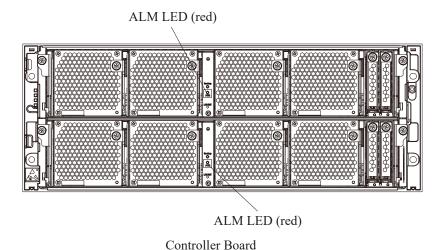
Step ②:

Turn on the Locate LED (see "Turn on/off Locate LEDs" (MU02-40)) to locate the Controller Board to be replaced, and then perform the procedure from Step (2). If the Locate LED does not light up, go to Step ③ .

Step ③:

Confirm the location (LOC02-40) of the Controller Board in which the Cache Memories to be maintained are installed so as not to remove a different Controller Board, and then perform the procedure from Step (2).

Figure 1-1 ALM LED Location



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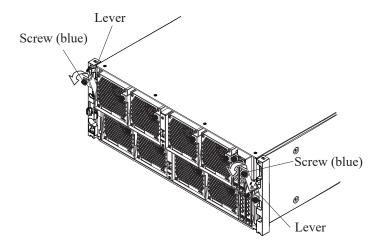
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When removing a Controller Board of the DKC, be sure to remove BKMFs first because the mass of the Controller Board is about 19 kg.

- (2) Remove the Controller Board from the DKC.
 - (a) Loosen the right and left screws (blue) on the lever of the Controller Board to be replaced in the front of the DKC and open the lever.

Figure 1-2 Removing Controller Board (DKC)



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

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

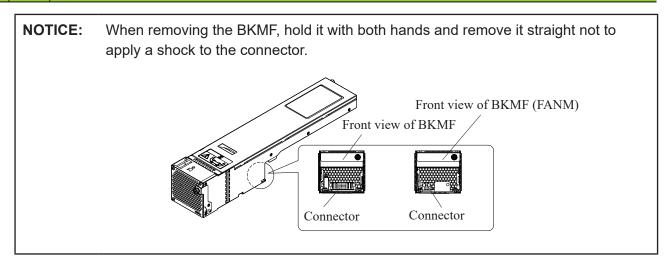
The READY LED (green) on the front of DKC lights up after performing

"7. Restoring replacement parts by Maintenance Utility".

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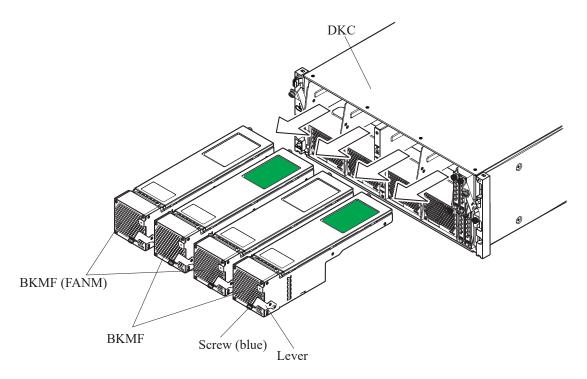
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- (b) Remove all BKMFs (four) installed in the Controller Board.
 - (i) Loosen the screws (blue) fixing the BKMF.
 - (ii) Open the lever and pull out the BKMF to remove.

Figure 1-3 Removing BKMF (DKC)

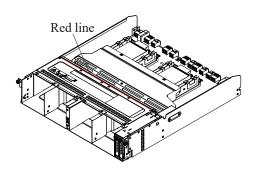


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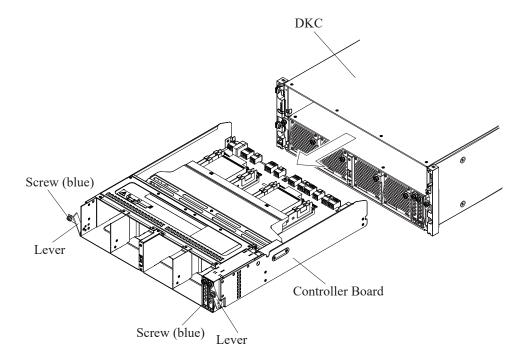
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



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

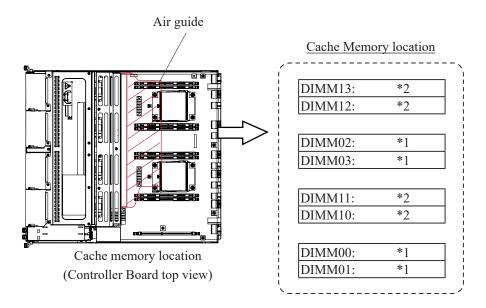
(c) With the lever opened completely, pull out and remove the Controller Board.

Figure 1-4 Removing Controller Board (DKC)



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



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

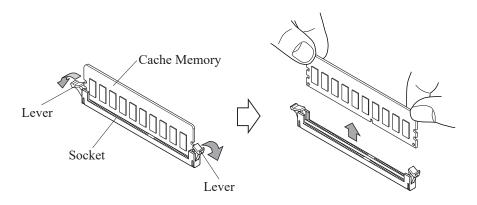
Be sure to install DIMM in CMG0.

CMG1 is an additional slot of DIMM.

Install DIMM in sets of four.

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

Figure 1-5 Removal of Cache Memory



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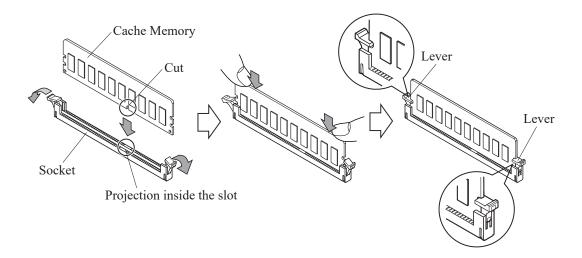
REP(RCM1)01-110

(b) Installation procedure

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

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

Figure 1-6 Installation of Cache Memory

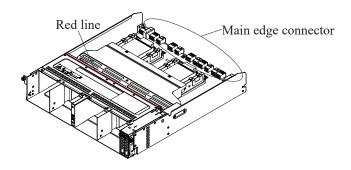


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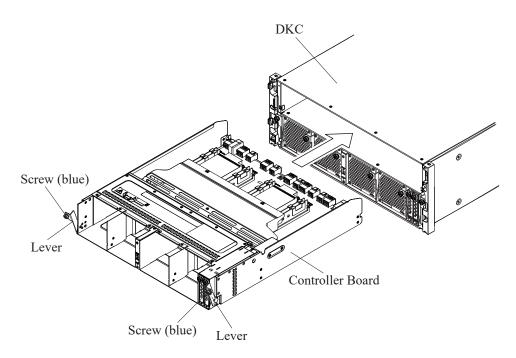
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



(4) Install the Controller Board.

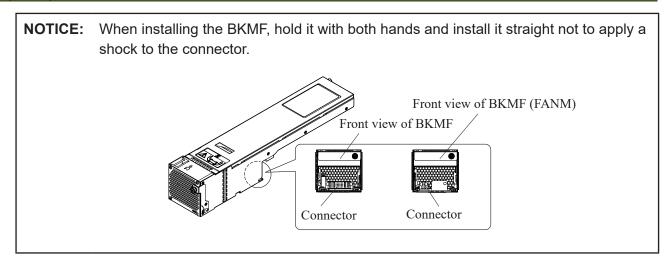
- **NOTICE:** Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
 - When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.
 - (a)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

Figure 1-7 Installing the Controller Board (DKC)



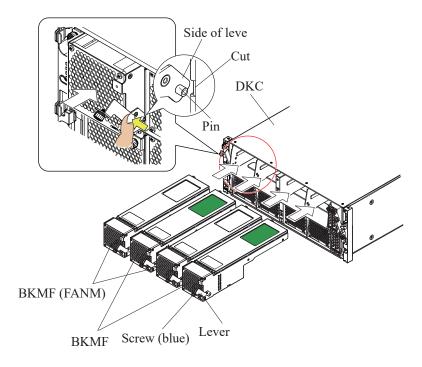
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- (b) Install four BKMFs in the Controller Board.
 - (i) Open the BKMF lever and insert the BKMF into the slot..
 - (ii) Insert the BKMF up to the front of the shield finger.
 - (iii) Insert the BKMF while pushing the side of its lever to the left until the pin of the lever goes through the cutout of the chassis and stops.
 - (iv) Close the BKMF lever and tighten the screws (blue) and fix it.

Figure 1-8 Installing the BKMF

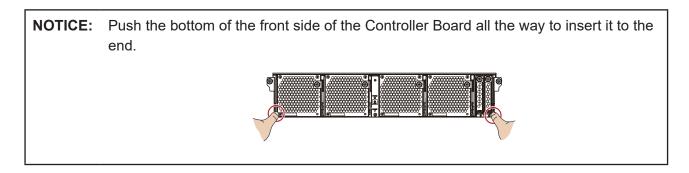


NOTE: BKMF (FANM) and BKMF contain different components. Be careful not to install them in wrong locations.

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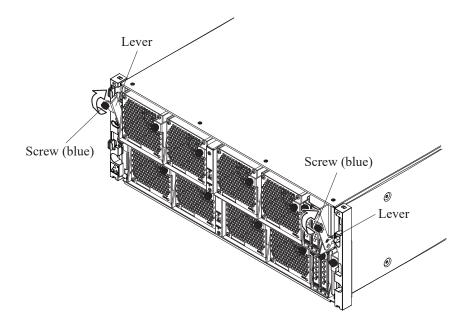
REP(RCM1)01-140

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



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

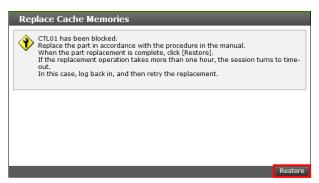
Figure 1-9 Fixing the Controller Board



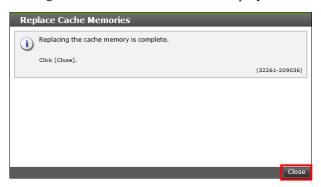
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- 7. Restoring replacement parts by Maintenance Utility
 - (1) <Restore replacement parts> Click [Restore].



(2) <Check replacement parts restoration>
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).



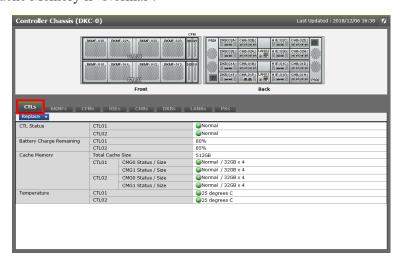
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.

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

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



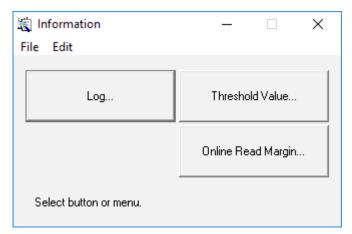
- 8. Closing Maintenance Utility
 - (1) Click [Logout] to close the window.
 - (2) <Get the error information>
 Get dumps with "Dump Type: Rapid" by referring to "Dump/Auto Dump" (SVP02-09-10).
 - (3) Refer to the "Use of OnlineDumpTool" (SVP02-21-10), please upload the error information.

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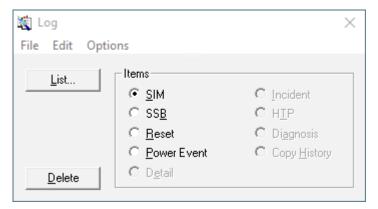
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9. Completing the SIM log

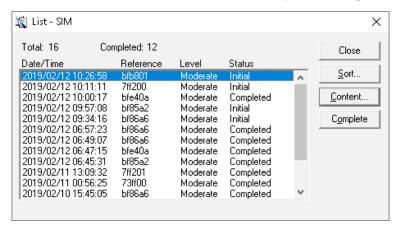
- (1) Change the mode to [Modify Mode], and then select [Information].
- (2) In the Information window, click [Log...].



(3) In the Log window, select [SIM] and then [List...].



(4) In the List-SIM window, select the data for which you end the process, and then click [Complete].

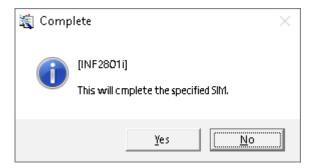


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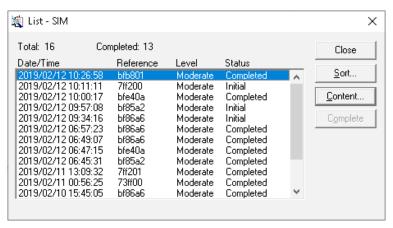
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(5) In the Complete window, click [Yes].



(6) In the List-SIM window, confirm that the "Status" of the data has become "Completed".



(7) In the List-SIM window, click [Close].Close the Log window, then the Information window.Change the mode from [Modify Mode] to [View Mode].

NOTE: If the MESSAGE LED is lit on the HSNPANEL after you complete all SIMs, display SIMs to check that SIM statuses are "Completed". If SIM statuses are not "Completed", wait for five minutes, and then perform the procedure for completing the SIM log again.

10. Checking Normality

Perform the normality check according to "Checking Normality (TRBL02-06-10)".