BMCSORT Reference Manual

Supporting

Version 2.3 of BMCSORT

June 2008
Contacting BMC Software

You can access the BMC Software website at http://www.bmc.com. From this website, you can obtain information about the company, its products, corporate offices, special events, and career opportunities.

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Customer support

You can obtain technical support by using the BMC Software Customer Support website or by contacting Customer Support by telephone or e-mail. To expedite your inquiry, see “Before contacting BMC.”
Support website

You can obtain technical support from BMC 24 hours a day, 7 days a week at http://www.bmc.com/support_home. From this website, you can

- read overviews about support services and programs that BMC offers
- find the most current information about BMC products
- search a database for issues similar to yours and possible solutions
- order or download product documentation
- download products and maintenance
- report an issue or ask a question
- subscribe to receive proactive e-mail alerts when new product notices are released
- find worldwide BMC support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

Support by telephone or e-mail

In the United States and Canada, if you need technical support and do not have access to the web, call 800 537 1813 or send an e-mail message to customer_support@bmc.com. (In the subject line, enter SupID:<yourSupportContractID>, such as SupID:12345). Outside the United States and Canada, contact your local support center for assistance.

Before contacting BMC

Have the following information available so that Customer Support can begin working on your issue immediately:

- product information
  - product name
  - product version (release number)
  - license number and password (trial or permanent)
- operating system and environment information
  - machine type
  - operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the issue
- commands and options that you used
- messages received (and the time and date that you received them)
  - product error messages
  - messages from the operating system, such as file system full
  - messages from related software
**License key and password information**

If you have questions about your license key or password, contact BMC as follows:

- **(USA or Canada)** Contact the Order Services Password Team at 800 841 2031, or send an e-mail message to ContractsPasswordAdministration@bmc.com.
- **(Europe, the Middle East, and Africa)** Fax your questions to EMEA Contracts Administration at +31 20 354 8702, or send an e-mail message to password@bmc.com.
- **(Asia-Pacific)** Contact your BMC sales representative or your local BMC office.
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About this book

This book contains information that you might need when you use a BMC Software product, component, or solution that uses BMCSORT technology. This document can assist DB2 system administrators, DB2 database administrators, and DB2 application programmers.

Like most BMC documentation, this book is available in printed and online formats. To request printed books or to view online books and notices (such as release notes and technical bulletins), see the Customer Support website at http://www.bmc.com/support_home. Most product shipments also include the books on a documentation CD.

**NOTE**

Online books are formatted as PDF or HTML files. To view, print, or copy PDF books, use the free Adobe Reader from Adobe Systems. If your product installation does not install the reader, you can obtain the reader at http://www.adobe.com.

Related publications

The following related publications supplement this book and the online Help:

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<th>Description</th>
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<td>installation documents</td>
<td><strong>OS/390 and z/OS Installer Guide</strong></td>
<td>provides information about using the OS/390 and z/OS Installer to install BMC Software mainframe products</td>
</tr>
<tr>
<td></td>
<td><strong>BMC Software product installation and customization guides</strong></td>
<td>provide information about customizing your installation of BMCSORT and other BMC Software products</td>
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<tr>
<td></td>
<td><strong>online help panel for BMCSORT option on installer panel</strong></td>
<td>provides help for required fields when installing BMCSORT</td>
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<tr>
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<td><strong>release notes, flashes, technical bulletins</strong></td>
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Summary of changes

This section summarizes changes to the functionality of the BMCSORT technology, listing the changes by version and release date. The summary includes enhancements to BMCSORT and any major changes to the documentation.

Version 2.3  June 15, 2008

This version fixes known problems in the technology. In addition, it includes the following enhancements:

- Obtain latest maintenance

The installation of any BMC Software product for DB2 should include action to obtain and apply the latest product maintenance, as documented in product Release Notes and installation documentation. This is a separate action that you perform after installation by using eFix PTF Distribution Services on the Customer Support website at http://www.bmc.com/support_home.

Because of ongoing efforts to improve the performance of BMCSORT, it is extremely important that you obtain and apply the latest BMCSORT maintenance whenever you install a product that uses this version of BMCSORT.

- zIIP and MIDAW exploitation

BMCSORT exploits important features of the IBM® z/OS® operating system and z9™ processors. With this version, products that use BMCSORT can derive performance gains from exploitation of the z9’s MIDAW I/O technology – reducing channel, director, and control unit overhead – and the System z9 Integrated Information Processor (zIIP), both of which are available on IBM System z9 Enterprise Class and IBM System z9 Business Class processors.

- enhanced memory management

BMCSORT obtains elapsed time savings from enhanced memory management techniques and the use of memory objects in more situations. Early release of pages backing a memory object provides benefits to the overall system by freeing the central storage resource at the earliest possible point.

Version 2.2  July 31, 2006

This version fixes known problems in the technology. In addition, it includes the following enhancements:

- SMP/E
BMC Software now packages and distributes BMCSORT by using the IBM product System Modification Program Extended (SMP/E). SMP/E is a program product, or an element of OS/390 or z/OS that installs software and software changes on z/OS systems. SMP/E consolidates installation data, allows more flexibility in selecting changes to be installed, provides a dialog interface, and supports dynamic allocation of data sets.

To apply maintenance, you must use SMP/E. For more information about installation and maintenance, see the installation documentation for the product, solution, or component that uses BMCSORT.

Installation System changes

The Installation System that you use to install a product or solution that uses BMCSORT includes the following changes:

— The LITE installation method is no longer available.
— The Basic and Advanced installation modes are no longer available.

All Installation System files are now located on the B-series tape set.

Version 1.7.01 July 31, 2003

This version fixes known problems in the technology. In addition, it includes the following enhancements:

— BMCSORT is now shipped as a separate and individual component with most of the BMC Software products that use it, rather than as a technology embedded in those products.

The BMCSORT technology is still embedded in the CHECK PLUS for DB2 product from BMC Software.

This reference manual is a new publication for BMCSORT.
Introducing BMCSORT

This chapter presents the following topics:

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Using BMCSORT ....................................................... 14

Overview of BMCSORT

BMCSORT is a BMC Software technology component that is required for full sort support for several BMC Software products. Earlier releases of this sort technology were embedded in the products that used it.

BMCSORT is not a replacement for a system sort routine. This technology can be used only if a BMC Software product or solution calls it. BMCSORT is automatically installed when you install any of the products that can invoke it, and the technology must be available through STEPLIB, JOBLIB, or LNKLIST when the product or solution is executed.
BMCSORT benefits

BMCSORT can provide sort processing for the invoking product and can dynamically allocate the sort work data sets that it needs. The sort work data sets that BMCSORT allocates are in addition to any that the invoking product allocates.

The products that invoke BMCSORT rather than an external sort routine gain the following benefits:

- faster sort processing and improved product performance
- efficient sort processing and allocation of sort work data sets and improved use of resources
- more control of the sort process to help prevent memory-related problems
- a common installation option macro ($AUPSMAC)

Values that you specify for the DYNALOC installation option in the $AUPSMAC macro apply to all products that invoke this version of BMCSORT. See Chapter 2, “BMCSORT installation” for more information about installation requirements for BMCSORT.

Using BMCSORT

You can specify SORTWK DD statements in your JCL or BMCSORT can dynamically allocate sort work data sets. UTPRINT is the output data set that contains messages from BMCSORT.

The sort work data sets that BMCSORT allocates dynamically might be used in one of the following circumstances:

- if you do not specify any SORTWK DD statements in your JCL
- in addition to any SORTWK data sets that you specify in your JCL if BMCSORT finds that your SORTWK data sets have insufficient space
BMCSORT Installation

This chapter presents the following topics:

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- Space requirements ................................................................. 15
- DYNALOC Installation Option .................................................... 16

Installation overview

BMCSORT is installed automatically when you install a product or solution that invokes BMCSORT. You do not need a password to run BMCSORT.

BMCSORT requires that you specify a value for the installation option DYNALOC. For more information about the DYNALOC option, see “DYNALOC Installation Option” on page 16.

Space requirements

Table 1 lists the estimated space requirements for the BMCSORT distribution data sets. These estimates are in addition to the estimated requirements for other BMC Software products or solutions that you install.

Table 1  Space estimates for BMCSORT distribution data sets

<table>
<thead>
<tr>
<th>BMCSORT distribution data sets</th>
<th>RECFM</th>
<th>LRECL</th>
<th>BLKSIZE</th>
<th>Estimated tracks, 3390</th>
<th>Directory blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLQ01.HLQ02.AUPLINK</td>
<td>U</td>
<td>0</td>
<td>6144</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>HLQ01.HLQ02.AUPMAC</td>
<td>FB</td>
<td>80</td>
<td>27920</td>
<td>15</td>
<td>45</td>
</tr>
</tbody>
</table>
DYNALOC Installation Option

The DYNALOC installation option provides information for dynamically allocating SORTWK data sets. BMCSORT deallocates these data sets at the end of each sort. The content of the $AUPSMAC macro in $C32SOPT follows, showing DYNALOC and the values that are shipped with BMCSORT.

$AUPSMAC DYNALOC=(SYSDA,3,ON,ON,6000000,3000000,3390,SC=,RETRY=(0,0)) X

DYNAMIC ALLOC OPTIONS FOR SORT

The values that you specify in this macro apply to all invocations of BMCSORT. BMCSORT uses the same options module for all BMC Software products that invoke BMCSORT. You can have only one options module for BMCSORT.

Table 2 on page 17 describes each parameter of the DYNALOC option. These parameters are positional. The values that you specify for these parameters should correspond to your site’s standards for any system sort routine.

BMCSORT overrides the values that you supplied if BMCSORT determines that it can complete sorting more efficiently than the specified values allow.

An invoking product’s options might override the BMCSORT options values that you specify as follows:

- the values in the invoking product’s dynamic allocation installation options or corresponding command options conflict with the values you specify
- you turn on BMCSORT SORTWK dynamic allocation using your product’s command and you specify OFF for the position 3 parameter.

BMCSORT dynamically allocates SORTWK files as necessary.
### Table 2  DYNALOC parameters

<table>
<thead>
<tr>
<th>Parameter Name or Position</th>
<th>Description</th>
<th>Initial Value</th>
<th>Valid Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>position 1</td>
<td>This parameter is the generic unit name from which BMCSORT should dynamically allocate SORTWK data sets. This parameter applies only when the Data Facility Storage Management System (DFSMS) product from IBM is not installed or is not active for temporary DASD work data sets. If DFSMS is active, use the SC parameter.</td>
<td>SYSDA</td>
<td>Use a unit name up to 8 characters.</td>
</tr>
<tr>
<td>position 2</td>
<td>Do not change this value. BMCSORT does not use this parameter, but it must exist for proper assembly of the installation options macro.</td>
<td>3</td>
<td>Do not change this value. Changing this value can prevent proper assembly of the installation options macro.</td>
</tr>
</tbody>
</table>
| position 3                | This parameter tells BMCSORT whether to dynamically allocate SORTWK files. **Note:** BMC Software recommends that you not change this value. | ON | **ON**— dynamically allocates SORTWK  
**OFF**— does not dynamically allocate SORTWK |
| position 4                | Do not change this value. BMCSORT does not use this parameter, but it must exist for proper assembly of the installation options macro. | ON | Do not change this value. Changing this value can prevent proper assembly of the installation options macro. |
| position 5                | Do not change this value. BMCSORT does not use this parameter, but it must exist for proper assembly of the installation options macro. | 6000000 | Do not change this value. Changing this value can prevent proper assembly of the installation options macro. |
| position 6                | Do not change this value. BMCSORT does not use this parameter, but it must exist for proper assembly of the installation options macro. | 3000000 | Do not change this value. Changing this value can prevent proper assembly of the installation options macro. |
| position 7                | This parameter specifies the DASD type with the smallest track capacity that a dynamically allocated SORTWK data set might encounter at your site. | 3390 | **3380,** track capacity of 47968  
**3390,** track capacity of 56664  
**9345,** track capacity of 46456 |
| SC                        | This parameter specifies the name of the DFSMS storage class from which to dynamically allocate SORTWK. If DFSMS is active and you do not specify a value for this parameter, BMCSORT uses the value from the first DYNALOC parameter. **Note:** If your installation has an automatic class selection (ACS) routine, it can override this specification. | blank | Use any valid DFSMS storage class. |
| RETRY                     | This parameter specifies how you want BMCSORT to handle retry attempts for SORTWK dynamic allocation. The first subparameter indicates the number of times that you want BMCSORT to retry the request. The second subparameter indicates the number of minutes to wait between each retry. Using this parameter allows you to avoid a capacity exceeded condition when disk space is not immediately available for a SORTWK dynamic allocation request.  
BMC Software recommends that you do not change this value because it can affect the elapsed time of your jobs. However, if you currently use SyncSort and you rely on this function, BMC Software recommends that you use the same values as your SyncSort RETRY installation parameter. | (0,0) | If you use this parameter, BMC Software recommends that you specify the same values as your SyncSort RETRY installation parameter. The following values are valid for this parameter:  
* first subparameter—0 through 16  
A value of 0 indicates that you do not want BMCSORT to retry the request.  
* second subparameter—0 through 15  
A value of 0 indicates that you do not want BMCSORT to retry the request. |
Chapter 3 BMCSORT messages and codes

This chapter presents the following topics:

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- Chicago-Soft MVS/QuickRef ................................................................. 19
- Online message processor ................................................................. 19
- BMCSORT codes .................................................................................. 20
- BMCSORT messages ........................................................................... 21

Online documentation for messages

This technology provides several options for viewing message information online. This section describes the options.

Chicago-Soft MVS/QuickRef

If your site installed the MVS/QuickRef product from Chicago-Soft, you can use it to view messages for this technology and other BMC Software products.

For MVS/QuickRef 5.7 version or earlier, if you specify a message number with the WER prefix, MVS/QuickRef provides information about the standard SyncSort message, not the corresponding BMCSORT message.

Online message processor

You cannot use the online message processor to access information about BMCSORT messages.
BMCSORT codes

BMCSORT message numbers (numbers with the prefix WER) end with a letter that indicates the severity and type of error. These codes differ from the standard BMC Software severity codes. If you receive an abend code with a BMCSORT message, contact BMC Software Customer Support. Table 3 describes the BMCSORT codes.

Table 3  BMCSORT message severity codes

<table>
<thead>
<tr>
<th>Severity code</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Action</td>
<td>The message indicates a critical error condition. BMCSORT terminates to allow you to correct errors and run a successful sort or merge.</td>
</tr>
<tr>
<td>B</td>
<td>Tuning</td>
<td>The message provides information that you can use to adjust the job control stream to the actual demands of your job.</td>
</tr>
<tr>
<td>C or I</td>
<td>Informational</td>
<td>The message documents decisions that are internal to the sort as well as the BMCSORT response to error conditions that are not severe enough to warrant sort or merge termination.</td>
</tr>
</tbody>
</table>
This section provides the messages that BMCSORT issues. Message numbers and text are formatted in bold font. When a message contains text that can vary, the variable is in lowercase letters and the explanation of the message describes it. The actual message contains the specific text of the variable.

**NOTE**
If you receive a message that is not documented in this section, contact BMC Software Customer Support.

SyncSort product services does not directly support BMCSORT. You must contact BMC Software Customer Support for assistance.

**WER001A  COL 1 OR 1-15 NOT BLANK**

*Explanation:* One of the following two conditions triggered this error message.

- BMCSORT found a character in column 1 of the END control statement or in columns 1-15 of a continuation statement that follows a statement with a character in column 72. These columns must be blank.
- BMCSORT found a non-blank character in columns 1-15 of a sort control statement in the $ORTParm data set. These columns must be blank.

*User response:* Contact BMC Software Customer Support for assistance.

**WER002A  EXCESS CARDS**

*Explanation:* The static internal storage area is inadequate for the quantity and/or complexity of the control statements in this application. Either the minimum storage value set at installation time is too low, or insufficient storage is available in your region.

*User response:* Ask the systems programmer in charge of installation to increase the minimum storage (MINCORE) value unless the storage available in the region is less than the minimum storage value. In that case, increase the storage available in the region or partition so that it at least equals the minimum storage value.

**WER012A  NO FLD DEFINER**

*Explanation:* The SORT/MERGE control statement does not contain a specified FIELDS operand.

*User response:* Contact BMC Software Customer Support for assistance.
WER017A ERR IN DISP LENGTH VALUE

Explanation: One of the control fields contains an error. One of the following conditions occurred:

- The length and displacement value of a control field is greater than 4092 (4084 for variable-length records), or less than one.
- The sum of the lengths of all control fields exceeds 4092 (4084 for variable-length records).

User response: Contact BMC Software Customer Support for assistance.

WER018A CTL FLD ERR

Explanation: The SORT/MERGE control statement contains a data format error for a control field. One of the following conditions occurred:

- You specified the format for one field, but not for another.
- You specified bit comparisons without specifying FORMAT=BI.

User response: Contact BMC Software Customer Support for assistance.

WER026A L1 NOT GIVEN

Explanation: The LENGTH operand on a RECORD control statement does not contain an l1 value.

User response: Contact BMC Software Customer Support for assistance.

WER027A CONTROL FIELD BEYOND RECORD

Explanation: The location of the last byte of a SORT/MERGE control field is beyond the maximum record length that was specified (or beyond column 32750), or a variable length record is shorter than the ending location of a specified control field.

User response: Contact BMC Software Customer Support for assistance.

WER029A IMPROPER EXIT

Explanation: The set of legal exits depends on the sorting technique chosen.

User response: Contact BMC Software Customer Support for assistance.
**WER036B**  
\[ G=\langle ggg \rangle, \ B=\langle bbb \rangle, \ SEGLEN=\langle sss \rangle, \ BIAS=\langle zz \rangle \]

**Explanation:** The tuning information displayed is as follows:

- **G=\( \langle ggg \rangle \)**  
  \( ggg \) is the number of records that can be contained in BMCSORT’s working virtual storage area. For variable-length records, this number is the number of segments.

- **B=\( \langle bbb \rangle \)**  
  \( bbb \) indicates the physical blocking used for intermediate storage. For fixed-length records, this number represents the blocking factor. For variable-length records, it represents the block size. The B value will not appear in the message for incore or turnaround sorts.

- **SEGLEN=\( \langle sss \rangle \)**  
  This value appears in the message for variable-length records, when the execution is not an incore or turnaround sort. It reflects the segment length used in BMCSORT’s working storage during Phase 1.

- **BIAS=\( \langle zz \rangle \)**  
  \( zz \) reflects the degree of prior sequencing in the input data. The number displayed ranges from 00 to 99 indicating random to highly sequenced input. The BIAS value is not included in the message for an incore or turnaround sort, where it is 100 by definition.

**User response:** No action is required.

**WER039A**  
**INSUFFICIENT VIRTUAL STORAGE**

**Explanation:** The amount of virtual storage available to BMCSORT is not large enough to permit execution.

**User response:** Contact BMC Software Customer Support for assistance.

**WER045C**  
**END SORT PH**

**Explanation:** BMCSORT has completed its sort phase.

**User response:** No action is required.

**WER046A**  
**SORT CAPACITY EXCEEDED**

**Explanation:** All available intermediate storage is exhausted, including any secondary allocation allowed in this job set. Sort processing cannot continue.

**User response:** Supply more intermediate storage (by using the SORTWK calculation formula).
WER047A  RCD CNT OFF, IN <x>, OUT <y>

Explanation: The actual number of records that you specified in the SIZE parameter on the SORT control statement is not equal to the number of records that BMCSORT read from the E15 exit routine.

User response: Contact BMC Software Customer Support for assistance.

WER052I  END SYNSORT - <jobName>, <stepName>, <procStepName>,
          DIAG=<hhhh>,<hhhh>,...

Explanation: BMCSORT executed successfully. The hexadecimal information that follows the DIAG keyword in this message can differ for each execution of BMCSORT. BMC Software Customer Support uses this internal diagnostic information.

User response: No action is required.

WER054I  RCD IN <x>, OUT <y>

Explanation: The x variable represents the number of records that BMCSORT read from the input data sets. The y variable represents the number of records in the output file.

User response: No action is required.

WER055I  INSERT <x>, DELETE <y>

Explanation: The x variable represents the number of records that user exit routines inserted. The y variable represents the number of records that user exit routines deleted.

User response: No action is required.

WER059A  RCD LNG INVALID FOR DEVICE

Explanation: The logical record length specified for a fixed-length input data set plus overhead, if any, is too large to fit on one disk track of the intermediate storage device.

User response: Specify SORTWK device types with a track capacity that is sufficient for the size of the record. If you need further assistance, contact BMC Software Customer Support.

WER061A  I/O ERR <jobName>, <stepName>, <unitAddress>, <deviceType>, <ddNname>,
          <operationAttempted>, <errorDescription>, <lastSeekAddress> or <blockCount>,
          <accessMethod>.

Explanation: An I/O error has occurred on the device whose address is given. I/O errors are often transient - resubmitting the job may result in a successful run.

User response: Resubmit the job. If it fails again, contact BMC Software Customer Support for assistance.
WER063A  <dataSetName> OPEN ERR

Explanation: BMCSORT cannot open the data set that is displayed in the message.
User response: Check for missing DD statements and supply them.

WER066A  APPROX RCD CNT <x>

Explanation: The sort ended when BMCSORT used all available sort space. The message shows the approximate number of records that BMCSORT processed before ending.
User response: Increase the amount of SORTWK space that you specified in the JCL or the default space that you specified in the DYNALOC installation option.

WER071A  MAXIMUM NUMBER OF RECORDS EXCEEDED

Explanation: BMCSORT’s default internal limit on the maximum number of records that can be sorted has been exceeded. By default, the internal limit on the number of records that can be processed for variable-length data or for a sort application that uses the EQUALS option is 4,294,967,295 records.
User response: Contact BMC Software Customer Support for assistance.

WER112A  INVALID VALUES IN FIELD PARAMETER

Explanation: An invalid value was specified in the FIELDS operand of the SORT/MERGE control statement.
User response: Contact BMC Software Customer Support for assistance.

WER113A  TOO MANY SORT FIELDS

Explanation: The number of sort control fields that you specified exceeded the internal limits of BMCSORT. The absolute upper limit on the number of sort control fields is 128. However, depending on the complexity of an application, the number limit might be less than 128. When BMCSORT uses locale processing, the length of those fields also limits the number of allowable CH control fields.
User response: Contact BMC Software Customer Support for assistance.

WER115A  ILLEGAL MOD NAME

Explanation: A program exit on a MODS control statement has an invalid name.
User response: Contact BMC Software Customer Support for assistance.
WER122A  INVALID INTERMEDIATE STORAGE DEVICE

Explanation: An invalid device was assigned as intermediate storage. Valid devices include IBM’s 3380, 3390, and 9345 mass storage system, and equivalent units.

User response: Select a valid device from those that are listed in the explanation for this message.

WER123A  IMPROPER RETURN CODE FROM E<xx>

Explanation: An invalid return code was passed by the exit that appears in the message. Valid return codes are 0, 4, 8, 12, 16.

User response: Contact BMC Software Customer Support for assistance.

WER124I  [ESTIMATED] PREALLOCATED/USED SORTWORK SPACE USAGE FACTOR

{=,<,>} <nn>.<nn>

Explanation: nn.nn represents the quotient obtained by dividing the number of tracks assigned within pre-allocated sort works (sort works allocated in the JCL or dynamically allocated by an invoking program) by the number of tracks actually used by BMCSORT. The word ESTIMATED is included in when BMCSORT’s derivation of this factor is inexact, for example, when all sort work data sets are not opened, or when data space or hiperspace are used to contain part or all of the sort work data.

User response: No action is required.

WER133A  E<nn> USER EXIT RETURNED CODE TERMINATE

Explanation: The exit routine that is displayed in the message passed return code 16, and BMCSORT terminated.

User response: Examine the message from the BMC Software product that invoked BMCSORT for more information. If you cannot determine the problem, contact BMC Software Customer Support for assistance.

WER135A  TASK CALL/E35 TERMINATED PREMATURELY

Explanation: An E35 exit routine (COBOL Output Procedure) passed a return code of 8, terminating the sort before the sort was able to pass all of the records.

User response: Examine the message from the BMC Software product that invoked BMCSORT and make the necessary corrections. If you cannot determine the problem, contact BMC Software Customer Support for assistance.

WER135I  TASK CALL/E35 TERMINATED PREMATURELY

Explanation: An E35 exit routine (COBOL Output Procedure) passed a return code of 8, terminating the sort before the sort was able to pass all of the records.

User response: No action is required.
WER144B  UNEXPECTED VIRTUAL STORAGE FRAGMENTATION

Explanation: The amount of virtual storage calculated by BMCSORT for Phases 2 or 3 was not available in a contiguous block. Additional virtual storage was obtained to satisfy the sort requirement. This condition was probably caused by virtual storage not released by the user program in the job step (for example, user exit buffer space was not released).

User response: No action is required.

WER146B  <nnn> BYTES OF EMERGENCY SPACE

Explanation: BMCSORT set aside the amount of virtual storage that is displayed in the message for other programs (for example, for the program that invokes the sort, system SVCs, or tape management system).

User response: No action is required.

WER149B  FRAGMENTED VIRTUAL STORAGE IN SORT PHASE

Explanation: The virtual storage that you specified for BMCSORT processing was not available in a contiguous block for phase 1. A calling program or user exit routine might have caused this condition. BMCSORT obtains its virtual storage in fragments and continues executing.

Note that the calling program or user exit routine can produce fragmentation when it uses virtual storage. This practice might also cause an abend 80A or S804.

User response: No action is required.

WER151B  SECONDARY EXTENTS OBTAINED <xxx>

Explanation: This message displays the number of secondary extents obtained for SORTWKxx data sets.

User response: No action is required.

WER152B  REQUESTED VIRTUAL STORAGE NOT AVAILABLE, <nnn> BYTES USED

Explanation: The CORE parameter specified a value which was not available when BMCSORT received control. The number of available bytes used by BMCSORT is given.

User response: No action is required.

WER153A  INSUFFICIENT VIRTUAL STORAGE IN [INTERMEDIATE,FINAL] MERGE PHASE

Explanation: BMCSORT cannot execute because an amount of virtual storage that is available for the merge phase (the intermediate or final merge phase) is insufficient.

User response: Contact BMC Software Customer Support for assistance.
WER161B ALTERNATE PARM USED

Explanation: The alternate PARM option was used and BMCSORT received the parameters specified.

User response: No action is required.

WER162B <ppp> PREALLOCATED SORTWORK TRACKS, <ddd> DYNAMICALLY ALLOCATED <sss> ACQUIRED IN <xxx> SECONDARY EXTENTS, <rrr> RELEASED, TOTAL OF <uuu> TRACKS USED

Explanation: The following list describes the variables in this message:

- **ppp**—This variable represents the available number of tracks found in SORTWK data sets that the utility allocated before BMCSORT gained control. You might have allocated these tracks in the JCL, or the invoking program might have dynamically allocated them. Note that the **ppp** variable might not represent all of the preallocated tracks available; BMCSORT might not have opened some preallocated SORTWK data sets.
- **ddd**—This variable represents the number of tracks that BMCSORT dynamically allocated as primary space.
- **sss**—This variable represents the number of tracks for secondary space on preallocated data sets, as well as on data sets that BMCSORT dynamically allocated.
- **xxx**—This variable represents the total number of secondary extents.
- **rrr**—This variable represents the total number of superfluous tracks that BMCSORT released from preallocated data sets, as well as on data sets that BMCSORT dynamically allocated.
- **uuu**—This variable represents the total number of tracks that BMCSORT actually used when sorting.

Note that the value of the **uuu** variable might be less than the sum of the values of the **ppp**, **ddd**, and **sss** variables because the **uuu** variable represents the space that BMCSORT actually used, rather than the available space.

User response: No action is required.
WER164B  <www> BYTES OF VIRTUAL STORAGE AVAILABLE, <xxx> BYTES REQUESTED, <yyy> BYTES RESERVE REQUESTED, <zzz> BYTES USED

Explanation: This message indicates the total amount of virtual storage below and above the 16-megabyte line that is available to BMCSORT and that BMCSORT used. The following list describes the variables in this message:

- www—This variable represents the amount of virtual storage available (free) when BMCSORT received control.
- xxx—This variable represents the amount of virtual storage requested for BMCSORT use.
- yyy—This variable represents the amount of virtual storage that the user requested BMCSORT to reserve below the 16-megabyte line.
- zzz—This variable represents the amount of virtual storage that BMCSORT used.

User response: No action is required.

WER167A  REC LEN GT L3, USER REQ ABORT

Explanation: Prior to output processing, BMCSORT has encountered a variable-length record longer than the l3 value on the RECORD control statement (if an E35 exit was in use).

User response: Contact BMC Software Customer Support for assistance.

WER168A  CONTROL FIELD WITHIN RDW

Explanation: A SORT/MERGE control field for a variable-length file fell within the Record Descriptor Word of each record. This is a critical error whenever the control field is specified with a ZD or PD format code.

User response: Contact BMC Software Customer Support for assistance.

WER168I  CONTROL FIELD WITHIN RDW

Explanation: A SORT/MERGE control field for a variable-length file falls within the Record Descriptor Word of each record. (The first byte of the data portion of a variable-length record is at byte position 5.)

User response: No action is required.

WER169I  RELEASE <>.<> BATCH <nnnn> TPF LEVEL <>.<>

Explanation: This message shows details on the release level, the batch number, and the last TPF that was applied to BMCSORT.

User response: No action is required.
WER175A  INCORE SORT CAPACITY EXCEEDED

*Explanation:* There are too many input records to fit in virtual storage.

*User response:* Either increase the amount of virtual storage the sort is able to use or supply SORTWKxx DD statements. (The DYNALLOC option may be used instead of SORTWKxx DD statements.)

WER177I  TURNDOWN SORT PERFORMED

*Explanation:* BMCSORT was able to sort the input file without using intermediate storage (SORTWKnn). All input data was contained in virtual storage.

*User response:* No action is required.

WER183A  SORTWORK DATASET REQUIRED

*Explanation:* If you specify INCORE=OFF as a PARM, you must include SORTWKnn data sets in this execution of BMCSORT.

*User response:* Specify SORTWK data sets in the JCL, or turn on dynamic allocation in BMCSORT or the product that invoked it.

WER186I  SVC <nnn> IS INCORRECT VERSION OR NON-SYNCSORT - SVC NOT USED - INEFFICIENT SORT

*Explanation:* Because the SVC did not return a code to indicate that it was at the correct version level, BMCSORT did not use SVC. The SVC is either at the wrong release of BMCSORT or its maintenance level, or it is not BMCSORT’s SVC. The problem can cause inefficient I/O.

*User response:* Contact BMC Software Customer Support for assistance.

WER206A  INVALID PAGEFIX SVC NUMBER

*Explanation:* Although you specified that BMCSORT should use the EXCPVR facility, you did not specify a page-fix SVC number during installation.

*User response:* Contact BMC Software Customer Support for assistance.

WER208I  MIXTURE OF SORTWK DEVICES

*Explanation:* BMCSORT assigned sort work data sets to different device types.

*User response:* No action is required.
WER209B  <xxx> PRIMARY AND <yyy> SECONDARY SORTOUT TRACKS ALLOCATED, <zzz> USED

*Explanation:* BMCSORT had to request one or more secondary allocations for SORTOUT.

- **xxx**—This variable represents the number of tracks that BMCSORT initially allocated.
- **yyy**—This variable represents the total number of tracks that secondary allocation acquired.
- **zzz**—This variable represents the total number of tracks that BMCSORT needs to contain the SORTOUT data set.

*User response:* No action is required.

WER210I  E15 RC INVALID, IGNORED

*Explanation:* An E15 exit routine passed a return code of 0 or 4. These return codes are invalid because BMCSORT had not passed the E15 a record address. BMCSORT ignores the invalid return code, and assumes that the return code is 8.

*User response:* No action is required.

WER217A  DYNALLOC [UNIT,STORCLASS] ASSIGNMENT ERROR

*Explanation:* Either the unit name or storage class name (DFSMS STORCLASS) is missing or specified incorrectly.

*User response:* Specify the correct DYNALLOC parameters for your installation, or contact BMC Software Customer Support for assistance.

WER218A  DYNALLOC WORKFILE ASSIGNMENT ERROR

*Explanation:* You specified more than 32 work files for dynamic allocation.

*User response:* Specify the correct DYNALLOC parameters for your installation, or contact BMC Software Customer Support for assistance.
WER219A DYNALLOC FAILED RC=(<rc>) - <name> [-SMS RC= <smsName>]

WER219I DYNALLOC FAILED RC=(<rc>) - <name> [-SMS RC= <smsRc>] SORT PROCESSING CONTINUES

Explanation: The execution of the DYNALOC macro instruction failed. The rc variable represents the error reason code. A reason code 021C indicates an undefined unit name; reason code 0214 indicates that the unit is not available. The name variable represents either the unit name or storage class name. The smsRc variable represents the return code received from DFSMS.

- When you receive the A version of this message, if all specified units are unavailable when DYNALOC is issued, the DYNALOC request fails.
- When you receive the I version of this message, sort processing continues with previously allocated SORTWKs and JCL-allocated SORTWKs.

User response: Specify the correct DYNALOC parameters for your installation, or contact BMC Software Customer Support for assistance. For information about reason codes, refer to the appropriate IBM technical documentation.

WER225I E35 RC INVALID, IGNORED

Explanation: BMCSORT received an invalid return code from an E35 exit routine. If an output data set was not available, the invalid code was not 4 or 8, but BMCSORT assumes that the return code was 4. If end of file was reached, the invalid code was not 8 or 12, but BMCSORT assumes that the return code was 8.

User response: No action is required.

WER233A VIO INVALID FOR DYNALLOC

Explanation: VIO is not a valid unit device for dynamic allocation. If you specify VIO data sets as SORTWK, BMCSORT performance declines.

User response: Allocate SORTWK data sets on non-VIO devices.

WER234I DYNALLOC REQUEST FOR GT 32 SORTWKs

Explanation: You specified a total of more than 32 work files in the JCL and the DYNALOC parameter (combined). BMCSORT reduced the number to 32.

User response: No action is required.

WER246I FILESIZE <x>

Explanation: The message gives the number of bytes of input data that BMCSORT sorted or copied for FILESIZE. This number reflects E15 processing.

User response: No action is required.
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<th>Code</th>
<th>Description</th>
<th>Explanation</th>
<th>User response</th>
</tr>
</thead>
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<tr>
<td>WER260I</td>
<td>RECOVERY FROM B37 SUCCESSFUL. SORT PROCESSING CONTINUES</td>
<td>BMCSORT recovered from a B37 abend and continued processing.</td>
<td>No action is required.</td>
</tr>
<tr>
<td>WER262I</td>
<td>REENTRANT SORT NOT RESIDENT - INEFFICIENT SORT</td>
<td>BMCSORT loaded the resident load modules into the private area instead of executing them from the link pack area or extended link pack area. If BMCSORT finds the modules in a STEPLIB or JOBLIB DD data set, this problem can occur. Loading the resident modules into the private area limits the amount of virtual storage that is available to the sort, and might reduce efficient processing.</td>
<td>Contact BMC Software Customer Support for assistance.</td>
</tr>
<tr>
<td>WER263A</td>
<td>ILLEGAL USE OF MULTI-VOLUME SORTWK</td>
<td>BMCSORT does not support the use of multi-volume disk SORTWK data sets. (However, if BMCSORT only requires the use of the space on the first volume of a multi-volume SORTWK file, this error message will not be issued.)</td>
<td>Remove the volume count subparameters of the UNIT parameter on all SORTWK DD statements that specify more than one volume.</td>
</tr>
<tr>
<td>WER266A</td>
<td>ALTPARM - PARM LENGTH GT MAX SUPPORTED</td>
<td>The length of the parameter list passed through the alternate parameter data set exceeded the 256 byte limitation.</td>
<td>Contact BMC Software Customer Support for assistance.</td>
</tr>
<tr>
<td>WER267A</td>
<td>&lt;statement&gt; STATEMENT: STATEMENT NOT FOUND</td>
<td>BMCSORT cannot find the required SORT/MERGE or RECORD statement that is displayed in the message.</td>
<td>Contact BMC Software Customer Support for assistance.</td>
</tr>
<tr>
<td>WER268A</td>
<td>&lt;statement&gt; STATEMENT: SYNTAX ERROR</td>
<td>The BMCSORT control statement that is displayed in the message contains a syntax error. The next line contains an asterisk that represents the approximate location of the syntax error.</td>
<td>Contact BMC Software Customer Support for assistance.</td>
</tr>
<tr>
<td>WER269A</td>
<td>&lt;statement&gt; STATEMENT: DUPLICATE STATEMENT FOUND</td>
<td>BMCSORT found more than one SORT/MERGE, RECORD, MODS, or END statement.</td>
<td>Contact BMC Software Customer Support for assistance.</td>
</tr>
</tbody>
</table>
WER270A  <statement> STATEMENT: DUPLICATE PARM FOUND

Explanation: You specified a single parameter multiple times on the BMCSORT control statement that is displayed in this message; or you specified a single parameter in the invoking parameter list and in the control statements.
User response: Contact BMC Software Customer Support for assistance.

WER271A  <statement> STATEMENT: NUMERIC FIELD ERROR

Explanation: You specified a numeric field incorrectly on the BMCSORT control statement that is displayed in this message.
User response: Contact BMC Software Customer Support for assistance.

WER272A  <statement> STATEMENT: PARMS NOT FOUND

Explanation: You did not include required parameters on the BMCSORT control statement that is displayed in this message.
User response: Contact BMC Software Customer Support for assistance.

WER273A  BLANK STATEMENT FOUND

Explanation: BMCSORT encountered a blank statement.
User response: Contact BMC Software Customer Support for assistance.

WER274A  CONTINUATION STATEMENT ERROR FOUND

Explanation: BMCSORT has encountered a statement containing a continuation indicator, but cannot locate a continuation statement which should follow.
User response: Contact BMC Software Customer Support for assistance.

WER275A  NO KEYWORDS FOUND ON CONTROL STATEMENT

Explanation: A required keyword has not been specified on a BMCSORT control statement.
User response: Contact BMC Software Customer Support for assistance.

WER276B  SYSDIAG=<nnnnnnnn>,<nnnnnnnn>,<nnnnnnnn>,<nnnnnnnn>

Explanation: This message contains internal diagnostic information intended for use by BMC Software Customer Support.
User response: No action is required.

WER353I  STARTING TIME <hh>.<mm>.<ss> - ENDING TIME <hh>.<mm>.<ss>

Explanation: The starting and ending times in hours, minutes, and seconds of the individual sort or merge just completed are given.
User response: No action is required.
WER407I **UNUSABLE SORTWK DEVICE ALLOCATED [NON RPS,UNIT=VIO]**

*Explanation:* During dynamic allocation, BMCSORT allocated an unusable device. BMCSORT holds the device during the sort, but does not use the device for SORTWK storage.

*User response:* When planning future executions, ensure that the DYNALOC parameter specifies a correct disk device. If the message cites NON RPS, specify RPS disk devices. If the message cites UNIT=VIO, specify a true disk device.

WER410B **<xxx> BYTES OF VIRTUAL STORAGE AVAILABLE ABOVE 16MEG LINE, <yyy> BYTES RESERVE REQUESTED, <zzz> BYTES USED**

*Explanation:* The following list describes the variables in this message:

- **xxx**—This variable represents the amount of virtual storage above the 16-megabyte line that was free and available when BMCSORT received control.
- **yyy**—This variable represents the amount of virtual storage that you requested that BMCSORT reserve above the 16-megabyte line.
- **zzz**—This variable represents the amount of virtual storage that BMCSORT uses above the 16-megabyte line.

*User response:* No action is required.

WER411B **<nnn> BYTES OF EMERGENCY SPACE ALLOCATED ABOVE 16MEG LINE**

*Explanation:* BMCSORT set aside an amount of virtual storage that is above the 16-megabyte line for other programs (for example, a program invoking the sort, system SVCs, or tape management system). This amount is displayed in the message.

*User response:* No action is required.

WER415B **DSM FACILITY DISABLED**

*Explanation:* BMCSORT’s dynamic storage management feature is not active for this sort execution.

*User response:* No action is required.
Explanation: This message provides summary I/O tuning information for files that BMCSORT processes. BMCSORT uses the first form when using an access method other than EXCP for a file. It uses a generic term for the access method (such as BSAM, HIPERBATCH, and so on) and the file for which it was used.

When BMCSORT uses EXCP, the message takes the second form, which has the component parts listed in succeeding paragraphs (for example, UNIT=uuuu). Some of these components might not be included in the message, depending on the level of the operating system and the availability of the information within BMCSORT.

For certain types of sorts, BMCSORT might dynamically allocate data sets other than SORTWK data sets for use in the sorting process. This allocation can occur if normal dynamic allocation of SORTWK data sets is enabled or if it is not enabled. When BMCSORT uses such data sets, they are collectively represented in a single WER416B message using the SORTWKXX ddname to report EXCPs issued against them.

In the third form of the message, the xxx variable provides a total of the EXCPs issued for SORTWORKS, SORTING, COPYING, or MERGING, as identified by the totalid variable.

- EXCP'S=eee—This variable identifies the number of EXCPs that BMCSORT issued for the file. For input files such as SORTIN, this number is the total EXCPs that BMCSORT issued for all concatenated input sets.
- UNIT=uuuu—This variable identifies the unit type on which the data set resides. For files that can consist of concatenations or multi-volume data sets, the displayed unit type is the first volume of the first data set.
- DEV=dddd—This variable identifies the device name for the first or only device for the file.
- CHP=cccccccc—This variable identifies the channel paths available to the first or only device.
- VOL=vvvvvv—This variable pertains only to DASD devices, and this variable identifies the volume serial number of the first or only volume for the file.

User response: No action is required.
WER417A  UNEQUAL MAINTENANCE LEVELS: <xxxxxxx>,<yy>,<zz>

*Explanation:* The maintenance levels of the load module and the BMCSORT root module do not correspond. The following list describes the variables in this message:
- xxxxxxxx—This variable represents the load module.
- yy—This variable represents the maintenance level of the xxxxxxxx module.
- zz—This variable represents the maintenance level of the root module.

*User response:* Contact BMC Software Customer Support for assistance.

WER418I  DATASPACE(S) AND/OR <xxxxxxx> USED

*Explanation:* The xxxxxxxx variable can represent either ZSPACE or HIPERSPACE(S). BMCSORT has dynamically chosen to use data space, ZSPACE, or Hiperspace™ during the execution of the sort.

*User response:* No action is required.

WER423I  DYNAMIC ALLOCATION RETRY - WAITING FOR SPACE

*Explanation:* BMCSORT used the DYNALOC options to acquire SORTWK space, but the system currently has insufficient disk space. BMCSORT waits for the number of minutes that you specified in the DYNALOC option before retrying the request.

*User response:* No action is required.

WER424I  DYNAMIC ALLOCATION RETRY SUCCESSFUL

*Explanation:* BMCSORT successfully allocated SORTWK space dynamically after a DYNALOC RETRY attempt. Sort processing continues.

*User response:* No action is required.

WER426I  SORT INTERNAL ERROR - RECOVERY ATTEMPT IN PROGRESS

*Explanation:* BMCSORT tried to execute again automatically after an internal error occurred. If error recovery is successful, the BMCSORT SYSOUT listing contains a subsequent set of messages that represents the complete information about the execution. A large diagnostic output might separate the subsequent set of messages from the initial set of listings. The new listing contains the message WER427I.

*User response:* No action is required.
WER427I  RECOVERY ATTEMPT IN PROGRESS

Explanation: BMCSORT generates the set of SYSOUT messages that contains the WER427I message from the automatic retry execution. Examine these messages to ensure that the set also contains a WER052I message that indicates that BMCSORT executed successfully. In addition, a successful recovery of BMCSORT completes with a return code of 0. Even if the WER426I and WER427I messages are displayed, you cannot be sure that a successful recovery occurred unless processing returns 0 as the step completion code.

User response: No action is required. However, if an execution of BMCSORT does use the recovery facility, whether successfully or not, contact BMC Software Customer Support to investigate and resolve the underlying error.

WER428I  CALLER-PROVIDED IDENTIFIER IS "<xxxx>"

Explanation: BMCSORT was invoked by another program, and that program used a 31-bit parameter list where the “call identifier” parameter was specified. xxxx is the identifier specified by the calling program.

User response: No action is required.

WER429I  SORT INTERNAL ERROR ON SORTWK<nn> - RECOVERY ATTEMPT IN PROGRESS

Explanation: An internal error occurred while BMCSORT was processing the SORTWK data set that is indicated by the nn variable in the message. BMCSORT initiated automatic error retry logic to correct this error. If the recovery is successful, processing resumes and BMCSORT issues message WER052I when the sort completes successfully. If BMCSORT does not display the WER052I message, it could not recover.

User response: If an execution of BMCSORT does use this recovery facility, whether successfully or not, contact BMC Software Customer Support to investigate and resolve the underlying condition.

WER432I  [SORT,MERGE] FORMAT OPERAND IGNORED

Explanation: On either a SORT or MERGE control statement, you specified the format of the keys in the FIELDS parameter and in the FORMAT parameter. BMCSORT ignores the FORMAT parameter and uses the individual format specifications within the FIELD parameter.

User response: No action is required.

WER440A  UNSUPPORTED OPERATING ENVIRONMENT

Explanation: The operating system on which BMCSORT executes must be an IBM operating system such as OS/390® or later.

User response: Contact BMC Software Customer Support for assistance.
WER447B PHASE 3 VIRTUAL STORAGE REDUCED TO <nnn> BYTES FOR OPTIMAL PERFORMANCE

Explanation: BMCSORT determined during phase 3 optimization that it should reduce virtual storage to execute more efficiently. The nnn variable represents the amount of virtual storage that BMCSORT used during phase 3. The value in message WER164B for the total bytes that were used indicates the virtual storage that BMCSORT used during earlier phases of the sort execution.

User response: No action is required.

WER493I ZIIP PROCESSOR USED

Explanation: BMCSORT has used IBM’s System z9 Integrated Information Processor (zIIP) for improved performance.

User response: No action is required.

WER494I [INPUT, OUTPUT] PHASE USED MIDAW

Explanation: This message indicates that BMCSORT has used IBM’s MIDAW I/O technology to optimize the performance of the input and/or output phases.

User response: No action is required.

WER998A <jobName>,<procName>,<stepName>- UNSUCCESSFUL SORT <nnn> <t>

Explanation: An error condition prevented successful sort completion. The meaning of each variable follows:

- jobName—This variable represents the name from the JOB card.
- procName—This variable represents the procedure step name from the EXEC PROC card.
- stepName—This variable represents the step name from the STEP EXEC card.
- nnn—This variable represents the hexadecimal abend number.
- t—This variable represents either a system abend (S), user abend (U), or BMCSORT internal abend (W).

User response: Note the abend code and contact BMC Software Customer Support for assistance. Providing the system dump or the BMCSORT SNAP dump can help BMC Software Customer Support to determine the solution more quickly.

WER999A UNSUCCESSFUL SORT

Explanation: An error condition prevented successful sort completion.

User response: Note the abend code and contact BMC Software Customer Support for assistance. Providing the system dump or the BMCSORT SNAP dump can help BMC Software Customer Support to determine the solution more quickly.
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