

Field Change Order Number: : KN304-XX-F001
Field Change Order Name: Asr4x00 B3002 & B3004 CPU



Field Change Order Instructions

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Applicability:

AlphaServer 4000/4100 **OpenVMS V7.1** systems

Problem Statement:

Real Time applications running on the AlphaServer 4100/4000 with B3002-AB or with older revisions of the B3004-xx CPU modules in an **OpenVMS 7.1 SMP** environment may experience Real-time process hangs or slow downs.

A bug in the pass-1 VCTY ASIC used on B3002-AB and older B3004-xx CPU modules is the root cause of the problem. The problem was corrected in the pass-2 VCTY ASIC. All B3005 CPU modules and later revisions of the B3004 CPU modules have the pass-2 VCTY ASIC.

Symptom:

The conditions required to cause this current problem to manifest itself are when an STL instruction is just ahead of the LDQ_L instruction, and the addresses of the STL and the LDQ_L are at the same cache index, but having different tags. Under these conditions, the two instructions can be reordered by the CPU, which causes the LDQ_L instruction to execute before the STL instruction. If these addresses become victimized and reordering occurs, then this results in the STQ_C instruction always failing. When the STQ_C fails with this configuration, the subsequent BEQ instruction causes the entire sequence to be retired and the hardware gets stuck in a loop.

Solution:

The FCO should only be administered when a customer's AlphaServer 4x00 OVMS V7.1 system, is experiencing slow-downs or hangs under the conditions listed in the problem & symptom statements.

Solution (continued):

Replace B3002-AB or B3004-xx CPU modules with the same speed B3004-xx with revision C0x or higher or with a B3005-xx CPU.

CPU to be Replaced	Replacement CPU	Stock Part	EQ-Kit to Order
B3002-AB or B3004-BA 300Mhz CPU	B3004-BA rev C04 or higher Or B3005-BA	KN304-FA	EQ-01767-01, 300Mhz CPU
B3004-AA 400 Mhz CPU	B3004-AA rev C07 or higher Or B3005-AA	KN304-AA	EQ-01767-02, 400Mhz CPU
B3004-DA 466Mhz CPU	B3004-DA rev C04 or higher Or B3005-DA	KN304-DA	EQ-01767-03, 466Mhz CPU

Each EQ-kit contains one CPU. When servicing an SMP system, ensure the appropriate number of EQ-kits are ordered.

Additional Information:

Quick Check: N/A

Pre/CO-Requisite: N/A

Mean Time To Install: 30 minutes

Tool/Test Equipment: Phillips and Flathead Screwdriver

Field Change Order Parts Information:

FCO KIT Number	DESCRIPTION OF CONTENTS
EQ-01767-01	AlphaServer 4100 FCO kit
KN304-FA	Qty 1, CPU Module, 300Mhz
FA-05103-01	DIGITAL Field Change Order Instructions

FCO KIT Number	DESCRIPTION OF CONTENTS
EQ-01767-02	AlphaServer 4100 FCO kit
KN304-AA	Qty 1, CPU Module, 400Mhz
FA-05103-01	DIGITAL Field Change Order Instructions

FCO KIT Number	DESCRIPTION OF CONTENTS
EQ-01767-03	AlphaServer 4100 FCO kit
KN304-DA	Qty 1, CPU Module, 466Mhz
FA-05103-01	DIGITAL Field Change Order Instructions

Special Instructions: None

Installation Procedure:

For pictorial instructions, reference AlphaServer4100 Service guide, EK-AS4100A-SV. Chapter seven, FRU Removal and Replacement.

Warning: *CPU and memory modules have parts that operate at high temperatures. Wait 2 minutes after power is removed before handling these parts*

Removal

1. Shut down the operating system and power down the system.
2. Expose the system drawer.
 - a. Open the front and rear doors of the cabinet.
 - b. At the front of the cabinet, unplug the drawer's power supplies.
 - c. At the rear, remove the two Phillips screws holding the shipping bracket on the right rail so that the drawer can be pulled out.
 - d. Using a Flathead screwdriver. Disengage the lock mechanism at the lower left hand corner of the drawer.
 - e. Pull the drawer out part way and release the lock mechanism by removing the screwdriver. If you wish to remove the whole drawer for some reason, leave the screwdriver in place.
3. Expose the system bus card cage. Remove the two Phillips head screws holding the cover in place and slide it off the drawer.
4. Identify and remove the faulty CPU. A label to the left of the system bus card cage identifies which slot contains CPU0, CPU1, CPU2, or CPU3. The CPU is held in place with levers at both ends; simultaneously raise the levers and lift the CPU from the cage.

Replacement

Reverse the steps in the removal process

Verification – OpenVMS systems

1. Bring the system up to the SRM console by pressing the Halt button, if necessary.
2. Issue the **show CPU** command to display the status of the new module.

CAUTION: Use ALL ESD safety precautions to prevent DOA's on material in kit. The module, as with all modules, contain electrostatic discharge sensitive devices (ESDS). The use of the Velostat Kit or ESD module box is essential to prevent damage, which may not be noticed immediately.