FRESA PS (G024)

SERVICE MANUAL

[Controller]

⚠IMPORTANT SAFETY NOTICES

PHYSICAL INJURY PREVENTION

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. Note that some printer components are supplied with electrical voltage even if the main switch is turned off.
4. If an adjustment or operation check must be made requiring the removal or opening of the exterior covers while the main switch is on, keep hands away from electrified or mechanically driven components.
5. The printer drives some of its components when it completes the warm-up period. Keep hands away from mechanical and electrical components when the printer starts operation.
6. The interior and metal parts for the fusing unit become extremely hot while the printer is operating. Do NOT touch these components with bare hands.

HEALTH SAFETY CONDITIONS

1. Never operate the printer without ozone filters installed.
2. Always replace the ozone filters with the specified replacement at the specified maintenance intervals.
3. Toner is non-toxic, but if it gets in your eyes by accident, it may cause temporary eye discomfort. Remove it with eye drops or flush eyes with water. If this is unsuccessful, get medical attention immediately.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do NOT incinerate toner cartridges, development toner magazine (DTM) or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner bottle and photoconductor unit (PCU) in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.

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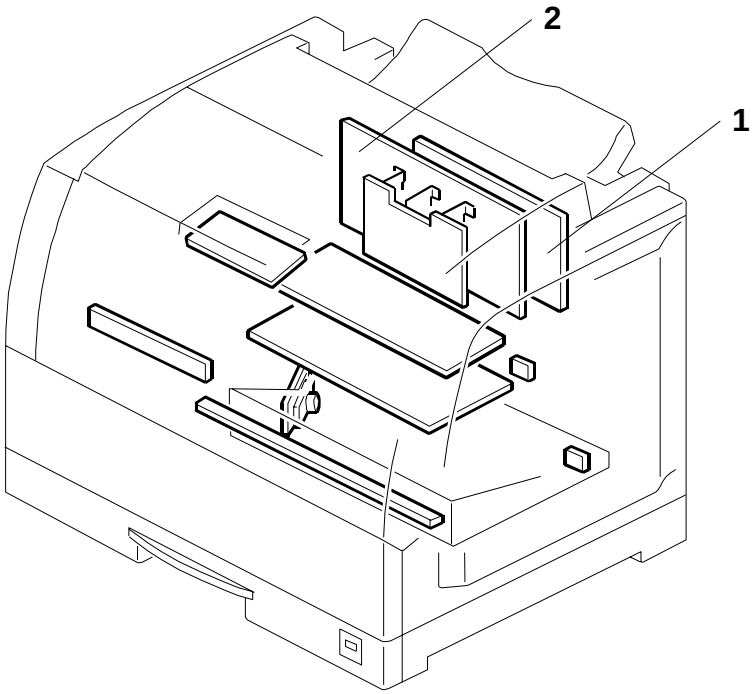
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Page Description Language:	Adobe PostScript 3 PCL 5e/5c compatible
Printer Driver Platform:	Macintosh, Windows 95/98, Windows NT4.0
Resolution:	600 dpi
Gradation Mode:	2 bits/pixel
Interface:	IEEE1284 Compatible, Nibble or ECP mode Ethernet 10BaseT/100BaseTX, 10Base 5
Network Protocol:	NetWare 3.10, 3.11, 4.X, IPX/SPX EtherTalk System 7 and later TCP/IP, SNMP, ARP, UDP
Frame Types:	802.2, 802.3, SNMP, Ethernet-II, Ethernet SNMP
Printing Services:	LPD (Line Printer Daemon)
	Pserver (Print Server)
	PAP (Printer Access Protocol)
	SMB (Server Message Block) over TCP/IP
Font:	136 PostScript fonts
	35 Intelli fonts, 10 TrueType fonts, and 1 bitmap line printer font for PCL5c
Memory:	Standard 32MB
DIMM Slots:	2 (for optional memory)
EIDE Interface:	1 (for optional HDD)
Options:	32/64MB DIMM 2.5-inch 1.6-GB hard disk drive

1.2 LAYOUT



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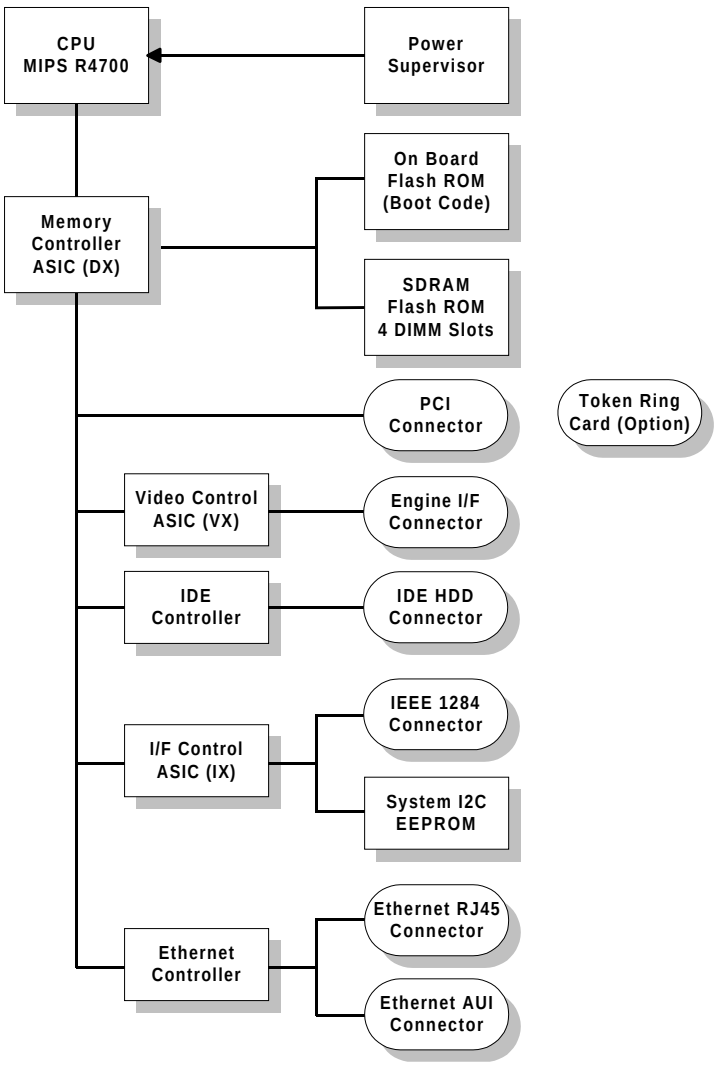
1. Controller
2. MCU

2. FUNCTIONAL OVERVIEW

2.1 BLOCK DIAGRAM AND FUNCTIONS



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CPU

This is a MIPS R4700 (133 MHz).

Memory

There is a proprietary memory ASIC that supports up to 8 DIMMs, up to 32 MB of boot PROM or flash memory. The ASIC can support burst accesses for 8 or 64 bit wide PROMs.

However, this controller only supports 4 DIMMs. Three of these are for optional memory, and one is for the flash/mask ROM that holds internal fonts.

DRAM

The Memory ASIC supports industry standard synchronous DRAM DIMMs for optional printer memory (see the previous page).

The R4700 bus is 64 bits wide. Architecturally, the system can support up to 256 bytes of DRAM and 8 DIMM slots (64 MB DIMMs will be supported when commercially available).

SRAM

The SRAM is used for processing print data.

NVRAM Functionality

The NVRAM holds printer parameters that must be maintained across power cycles. NVRAM space is in the order of 32KB.

The NVRAM consists of 1 MB of flash memory soldered to the motherboard.

Fiery Rip Chips (EFI ASICs)

The three ASICs (designed by EFI) are responsible for the high-speed and performance of the controller. They are as follows:

Memory ASIC (DX3)

This provides high speed interfaces between the CPU, memory, and PCI bus. The DX3 supports 64-MB DRAM DIMMs.

IO ASIC (IX)

This supports the internal and external I/O interfaces including:

- PCI direct memory access
- User interface (front panel)
- IEEE 1284 compliant parallel port (Centronics, Nibble, ECP)
- Generic synchronous serial interface

Video ASIC (VX)

The video ASIC is responsible for:

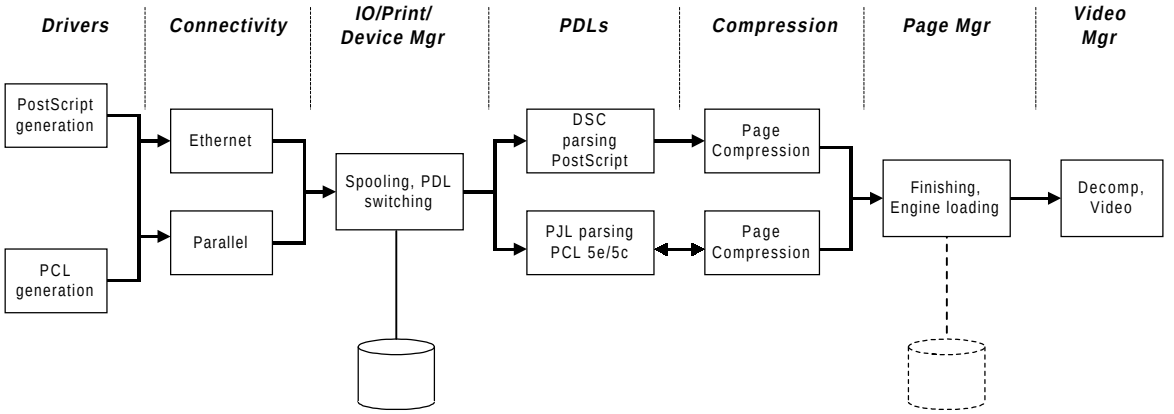
- PCI direct memory access
- Decompression
- Video interface to the engine

All three ASICs interface to a high speed PCI bus (64 bits wide) and comply Rev 2.1 of the PCI specification.

Real Time Clock

The controller does not have a real time clock.

2.2 PRINT DATA PROCESSING



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The key roles of each part of the print system are outlined below.

- The *drivers* are responsible for generating the page description on the host system and for transmitting data to the printer.
- The *I/O manager* mediates the connection between the parallel port or network interface and establishes a device or print manager connection.
- The *print manager* is responsible for spooling the job (if appropriate) and for feeding jobs to the correct PDL interpreter.
- The *PDL interpreters* are responsible for turning page descriptions into rendered pages and for parsing job management comments.
- The *compression* subsystem manages compressed pages in memory.
- The *page manager* coordinates pages for sending to the engine for the most efficient printing, finishing, and accessory handling.
- The *video* subsystem is responsible for decompressing pages and feeding the engine with appropriate engine signals. The video subsystem also handles certain print quality processing functions.

2.3 BUILT-IN COLOR MANAGEMENT

This controller has a full complement of built-in color management technologies.

Component	Description	Location/Platforms
PostScript color rendering dictionaries (CRDs)	CRDs optimized for photos, graphics, presentation objects; plain paper/transparency media types	In controller ROM/Flash memory
Press simulation control	Lookup tables to simulate density characteristics of offset printing processes	Controller SRAM
Device profiles	ColorSync 2/ICM profiles compatible with Macintosh and Windows color management systems	Macintosh/Windows 95 and 98

3. INSTALLATION

Refer to the following operation manuals.

- For the printer: Quick Installation Guide, Printer Reference, Getting Started and User's Guide.
- For options: Printer Reference

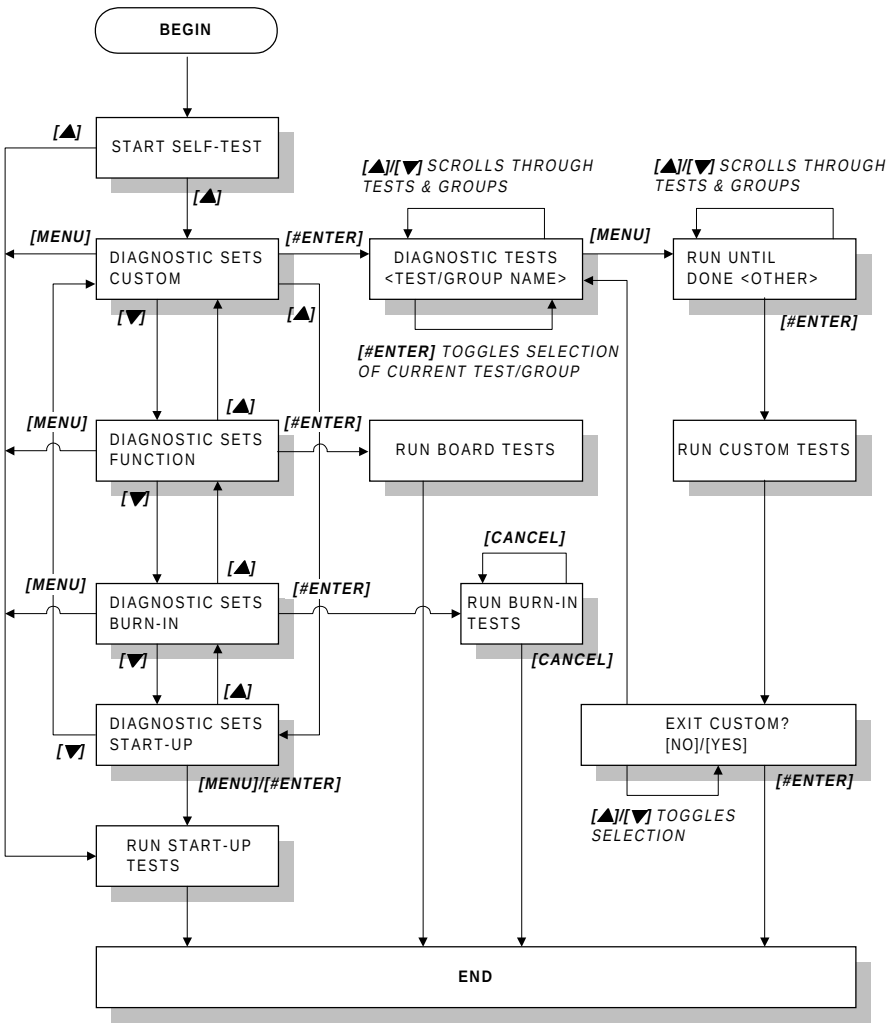
4. SERVICE TABLES AND PROCEDURES

4.1 DIAGNOSTICS MODE

4.1.1 OVERVIEW

There are several sets of diagnostic tests. This section includes an outline of how to select, run, and stop a custom diagnostic test set and a brief description of the messages displayed on the front panel during and after the diagnostic test.

Map of the Diagnostic Menu



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Using the diagnostics menu, you can use the printer's operation panel to select one of several different diagnostic sets (Custom, Start-up, Burn-in, Function) and various test options.

4.1.2 RUNNING THE DIAGNOSTICS

Basic Procedure

1. To run a diagnostic test, switch the printer off and on again.
   - By default, the power-up diagnostic self-test is run when the system is turned on. During the power-up diagnostics, optional components (such as hard disk drives) that are not installed will be reported on the front panel.
2. To run a different set of diagnostics, hold down the **[▲]** key when START SELF-TEST appears on the front panel display.
3. Release the **[▲]** key when the DIAGNOSTIC SETS menu is displayed. A diagnostic set can be selected from this menu.
4. Press the **[▲]** or **[▼]** buttons to scroll through the available diagnostic sets.
   - These are Custom, Start-up, Functional, or Burn-in; see the notes at the end of the procedure for more information.
5. Press the **[#Enter]** button to select the displayed diagnostic set and exit this menu.
   - Alternatively, the user may press the **[MENU]** button to select the start-up (default) diagnostic set and exit this menu.

Custom: If this set is selected, a series of menus appears that allows you to specify which tests should be run. It also allows you to specify the conditions for the tests to stop (e.g., stop if an error is detected, or do all tests until the end). If any diagnostic set other than ‘Custom’ is selected, it will begin immediately.

Start-Up: If this set is selected, the default (power-up) diagnostic set is run. This is the same set of tests that is done every time the system is powered up.

Functional: If this set is selected, a more comprehensive set of tests is run. These test the functionality of all the components.

Burn-In: If this is selected, a set of tests is executed repeatedly to exercise all board functions. External connections are unnecessary.

Using the Custom Diagnostics Set

1. If CUSTOM was selected, you may select the individual diagnostic tests. You can view all the available tests by pressing the **[▲]** or **[▼]** buttons to scroll up or down.
   - The tests in the menu are organized into groups of related tests. When scrolling through the menu, both groups and individual tests are displayed.

     A group is identified by a colon (:) after the group name (for example, IDE:).

     A test is identified by either a blank or "+" symbol before the test name (for example, +IDE), and this follows the group name. (The "+" symbol indicates that the test has been selected; see below.)
2. Initially, no group/test is selected. Select or deselect a group/test by pressing the **[#Enter]** button when the group/test name is displayed.
   - If a test is selected, the "+" symbol will be displayed before the test name.
   - If a test is deselected, the "+" symbol will disappear.
   - If a group is selected or deselected, all items in the group will be selected or deselected.
3. After selecting the tests to run, exit the Diagnostic Tests menu by pressing the **[MENU]** key.
   - You are now presented with a menu that allows you to specify the condition which will cause the tests to terminate. This menu will display RUN UNTIL followed by either DONE, TIME..., FAILURE, or INTERRUPTED.
4. Cycle through the choices with **[▲]** or **[▼]**.
5. To select the currently displayed condition, press **[#Enter]**.

   - If you select DONE or press the **[MENU]** button, each test that you selected will be run once. Selecting DONE will exit the menu and begin the tests.
   - If you select FAILURE, the tests will repeat until a failure is detected. To stop the test, press **[CANCEL]**.
   - If you select INTERRUPTED, the tests will run until you interrupt the tests by pressing the **[CANCEL]** button.
   - If you select TIME..., the tests will run for a preset duration.

   NOTE: Selecting FAILURE, INTERRUPTED or TIME... will exit the menu.

Diagnostic Test Result Display

When executing each selected test, the message "TESTING:", followed by the name of the test will be displayed on the front panel. The green LED will be lit for the duration of each test. If the test fails, the red LED will turn on.

At the end of the diagnostics, a summary error report is displayed in the event of any error(s). This error report consists of the message

TESTS FAILED
UP/DOWN/CANCEL

After this report appears, view the names of the failed tests and the corresponding error code using the **[▲]/[▼]** buttons. Refer to section 4-1-3 for descriptions of the individual tests and section 7 for descriptions of the error codes. Exit this process at any time by pressing the **[CANCEL]** key.

Exit Custom Menu

If CUSTOM was selected in the DIAGNOSTIC SETS selection menu, a menu is presented after the tests have ended, asking the user if he wants to exit the custom tests. The user can toggle between the choices YES and NO using the **[▲]/[▼]** buttons, and accept the choice using the **[#Enter]** button. Selecting YES exits the Diagnostic Menu, while selecting NO presents the Custom Diagnostic Tests menu again.

4.1.3 CONTENTS OF INDIVIDUAL DIAGNOSTIC TESTS

IDE Diagnostic Test

IDE CHIP

This is an IDE initialization and register test.

All CMD 64X controller chips are located on the controller board. For each IDE controller chip, the following tests are performed:

1. The PCI configuration registers are initialized.
2. The programming interface of the CMD 64X chips is made ready.
3. The IDE controller (PCI I/O) bus mastering is disabled.
4. A base address is specified. Note that this address is recycled to prevent I/O address space exhaustion. The normal value is 0x11F0.
5. PCI I/O is enabled.

IDE HD

If an optional hard disk drive is not present, the front panel will display a message and these tests will be skipped.

For a count of 128 (0 <= I <= 127).

- Set M to the last readable sector.
- Set buffer 1, buffer 2, buffer 3, buffer 4 to all zeros.
- Read sector 0+I into buffer 1.
- Read sector MI into buffer 2.
- Read sector 0+I into buffer 3.
- Read sector MI into buffer 4.
- Buffers 1 and 3 are compared. They should be equal, byte for byte, otherwise an error will result.
- Buffers 2 and 4 are compared. They should be equal, byte for byte, otherwise an error will result.
- Reading 128 alternating sectors from both ends of the disk will result in a 4-second buzzer sounding as the heads go back and forth, giving an audible indication that they are working.

Ethernet Diagnostics

ENET SLV REG (Slave register test)

This searches for the ethernet controller chip and performs an internal register test.

ENET INIT (Chip initialization test)

The ethernet chip is configured on the PCI bus. It can perform memory address recognition and bus mastering. It has the base address set and is compared to ensure the correct value was set.

A speed detection error may occur if the external loopback plug is not plugged in. Internal loopback testing is not done because of hardware idiosyncrasies.

ENET READ (Packet read test)

256 packets on the network are captured at random.

When these packets have been read without a single error, the test ends successfully.

For this test, the network must be clean, and there must be no collisions, runts (incomplete packets), etc. It is important that all packets on the network must be free of errors, as this test assumes that any kind of packet error will result in a test failure.

ENET WRITE (Packet write test)

128 packets are transmitted. The packet type is set to 0xDEAD to ensure that other systems ignore it.

When 128 packets transmit without a single error. The test passes successfully.

Each packet has a 1 millisecond gap between it and the next packet.

For this test, the network must be clean, and there must be no collisions, runts (incomplete packets), etc. It is important that all packets on the network must be free of errors, as this test assumes that any kind of packet error will result in a test failure.

RAM Diagnostics

RAM diagnostics tests the DIMMs and the system paths to the DIMMs (I2 C and memory bus).

These tests are running in memory without corrupting the diagnostics area. Before the memory test executes, it displays the test region on the serial port.

All tests are performed in a cache (L2 where available).

MEM DIMM INFO

Determines whether the DIMM configuration can be detected via I2 C (serial presence detect). It is presumed that the bus works; otherwise, diagnostics would not be running in memory. However, transient conditions and any additional DIMMs will be tested.

MEM PATTERN

This test writes various patterns to the entire untested memory area, then confirms that they were written correctly.

MEM ADDRESS

This test writes the inverse of the address into the address. It then reads it back and verifies.

MEM GND BOUNCE

This diagnostic tests the ground bounce in the memory.

Ground bounce occurs when there is excessive inductance on leads from the memory chip. If ground bounce causes the ground level on the chip to float to the logical 1 level, the chip will output a 1-level output when it should output a 0.

The stress test for this condition is to read all 1’s from the chip (maximizing the current flow through the leads), then read all 0’s.

This test writes alternating 64-bit words of all 1’s and all 0’s (i.e., 64-bits of 1, then 64-bits of 0, etc.) When written from or read into the processor’s internal cache, the chip will be stressed as described in the above paragraph.

MEM RANDOM

This diagnostic tests the memory by writing random data, reading it, and verifying.

Video Chip Diagnostics

VX CHIP (VX Internal Register)

This test locates the VX chip and tests its register.

Boot ROM Diagnostics

BOOTROM (General Boot ROM Diagnostics)

This tests the boot ROM to ensure that the checksum is valid, and that the parameter blocks are writable.

BOOTROM WRITE (Boot ROM Write Diagnostics)

This test writes various patterns to the parameter blocks in the boot ROM. If these parameter blocks are full, the test will not occur and a failure will be reported.

Firmware Diagnostics

EFIDIMM (System DIMM diagnostics)

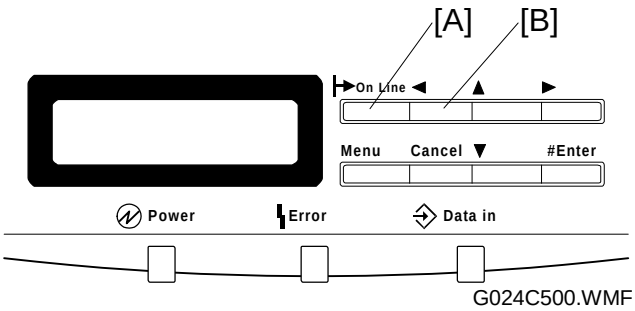
This test searches for the system DIMM, and calculates and verifies the checksum on the system DIMM.

I2CEEPROM diagnostics

This test reads the contents of the on-board I2C EEPROM at sequential and random addresses to ensure that data is readable.

4.2 BOOT ROM MENU

4.2.1 PURPOSE OF THE BOOT ROM MENU



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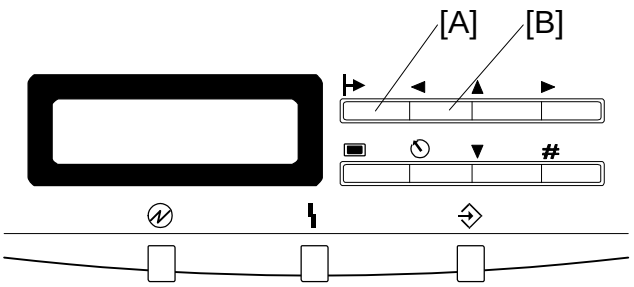


G024C501.WMF

Entering the Boot ROM Menu

During power-on, hold down the **[ONLINE]** [A] and **[◀]** [B] keys on the front panel until the LEDs turn off. The ROM menu will start after diagnostics.

Contents of the Boot ROM Menu

Currently there are 6 functions accessible from the front panel.

- Displaying the version information
- Installing software upgrades
- Formatting the hard disk drive
- Changing the Ethernet MAC address
- Selecting the brand name
- Clearing the NVRAM parameters

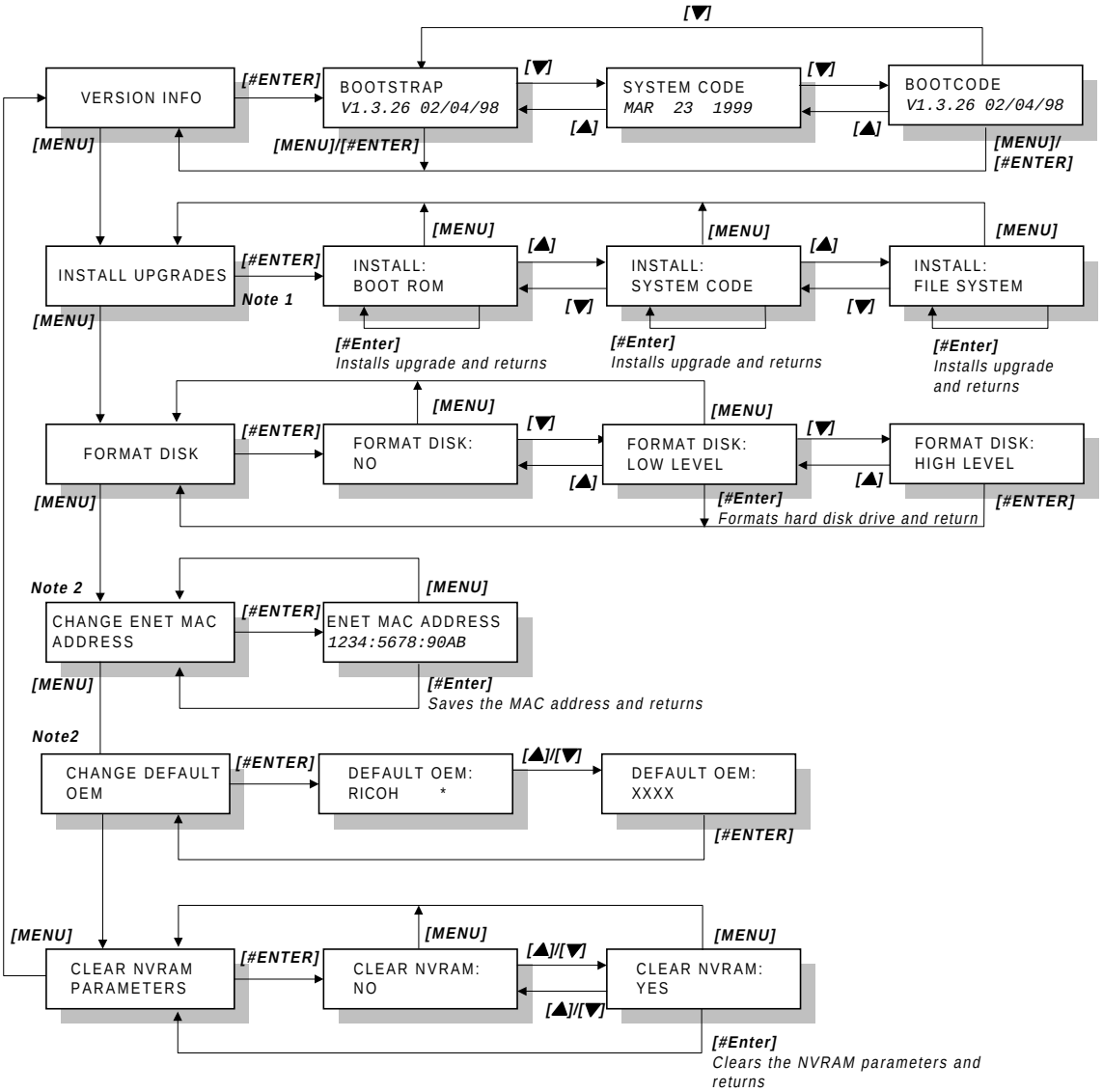
Exiting the Boot ROM Menu

Press the **[CANCEL]** key at the first level menu**.**

Service Tables

4.2.2 NAVIGATING THE MENU

Boot ROM menu map



Note 1: *J10 must be shorted.*
Note 2: *Short J8 to access these menus.*

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Key Usage in the Main Menu

Key	Description
[MENU]	Cycle through the functions in the menu.
[CANCEL]	Exit the Boot ROM menu and continue system startup.
[#Enter]	Enter a menu.

Key Usage in each Menu Item

Key	Description
[MENU]	Return to the main menu.
[CANCEL]	Exit the Boot ROM menu and continue system startup.
[#Enter]	Select the current item in the menu or save the current value.
[▲]/[▼]	Scroll through the list of items available. or change the value of the current item.
[◀]/[▶]	Position the cursor to select the character/number to change.

4.2.3 DISPLAYING VERSION INFORMATION

The version information for the bootstrap and the boot code can be displayed. The version number and the release date is shown. The version can be different for the bootstrap and the boot code.

For more information about bootstrap and boot code, see “Install Upgrades Menu”.

4.2.4 INSTALLING SOFTWARE UPGRADES

The system software has three different parts: the boot ROM, the system code and the file system. All of these can be upgraded through the parallel port.

The files used for upgrades are *bootrom.sys*, *system.sys* and *filesys.sys* for the boot ROM, system code and file system upgrades respectively. The file for recovering from a bad boot code is *bootrom.rcy*. The file formats are not interchangeable.

Preparation

If you are going to upgrade the boot ROM, turn off the printer, then short the jumper pins together at J10 on the controller board. Then turn the printer back on and enter the Boot ROM menu.

Procedure

1. Access the “Install Upgrades” menu, then press the **[#Enter]** key.
2. Use the **[▲]/[▼]** keys to select the item to upgrade (boot ROM, system code, or file system). The options for the system code and the file system will not appear if a flash DIMM is not installed.
3. Press the **[#Enter]** key to start the upgrade process.
4. Start downloading the appropriate file through the parallel port.
5. Downloading from a PC can be done by issuing the command

   copy /b <file name> lpt1

   - The file size and the checksum automatically verify the file. The downloaded file is processed and stored.
   - The front panel will display an error message if the upgrade fails. If an error occurred, press any key to acknowledge.
6. If the boot ROM was upgraded, clear the NVRAM parameters. (See “Clearing NVRAM parameters”)

Recovery Mechanism

The software in the boot ROM is divided into 2 sections: boot strap (in flash ROM) and boot code (in DIMM).

The boot-strap is a small memory block where essential initialization code resides. The system will continue to function properly even if the bootstrap is not upgraded.

The boot code is the section where the diagnostics and ROM menu function resides. This is not locked and can always be updated when necessary. Since it is possible to accidentally erase the boot code, a “disaster recovery” mechanism is provided. This recovery mechanism can reload the boot ROM if the bootstrap is valid. This should not be used as the procedure for upgrading the boot ROM.

1. Hold down any key on the front panel while booting.
2. After all LEDs turn off, start downloading the recovery file (bootrom.rcy) through the parallel port.

- The front panel will display the progress of the recovery. Only the special recovery file will be loaded. If a recovery file is not detected, the system will continue to boot.

4.2.5 FORMATTING THE HARD DISK

This function will perform a low-level or a high-level format of the hard disk drive, creating a file system on the hard disk. This option will be available only if there is a hard disk drive installed in the system.

Procedure

1. When in the appropriate menu (see section 4.2.2), use the **[▲]/[▼]** keys to select “LOW LEVEL” or “HIGH LEVEL” from the front panel.
2. Press the **[#Enter]** key to start formatting the hard disk drive.
   - To return to the main menu without formatting the disk, either select “NO” with the **[▲]/[▼]** keys and press **[#Enter]**, or press the **[MENU]** key.
   - The front panel will report whether the disk drive formatted successfully. If it was unsuccessful, press any key to continue.

4.2.6 CHANGING THE ETHERNET MAC ADDRESS

It is possible to change a Ethernet MAC address. This is necessary if the customer wishes to use the same MAC address after the controller board has been replaced (the network interface is built into the controller).

Preparation

Before entering the boot ROM menu, switch the machine off, then short the jumper pins together at J8 on the controller board to make this item available.

Procedure

1. When in the appropriate menu (see section 4.2.2), use the**[◀]/[▶]** keys to position the cursor at the digit to change, and the **[▲]/[▼]** keys to change the digit at the cursor.
   - While changing the address, an asterisk (“*”) will be shown after the address when the current address is displayed. This is a reference, in case you forget the current MAC address during editing.
2. Press the **[#Enter]** key to save the Ethernet MAC address.
   - To return to the main menu without saving the MAC address, press the **[MENU]** key.

4.2.7 BRAND NAME SELECTION

It is possible to change the machine's brand name.

Preparation

Before entering the boot ROM menu, switch the machine off, then short the jumper pins together at J8 on the controller board to make this item available.

Procedure

1. Use the **[▲]/[▼]** keys to select the required brand name.
2. Press the **[#Enter]** key to save the Brand name.

4.2.8 CLEARING THE NVRAM PARAMETERS

User configurable settings are stored in the non-volatile memory within the boot ROM. Use the following procedure to clear these parameters.

All data listed on the configuration sheet is erased, and these must be stored in the NVRAM again after clearing.

Procedure

1. Use the **[▲]/[▼]** keys to select "YES" at the front panel.
2. Press the **[#Enter]** key to clear the non-volatile RAM parameters.
   - To return to the main menu without clearing the non-volatile RAM parameters, either select "NO" with the **[▲]/[▼]** keys and press **[#Enter]**, or press the **[MENU]** key.
   - The front panel will report if the procedure was successful. If it is unsuccessful, press any key to continue.

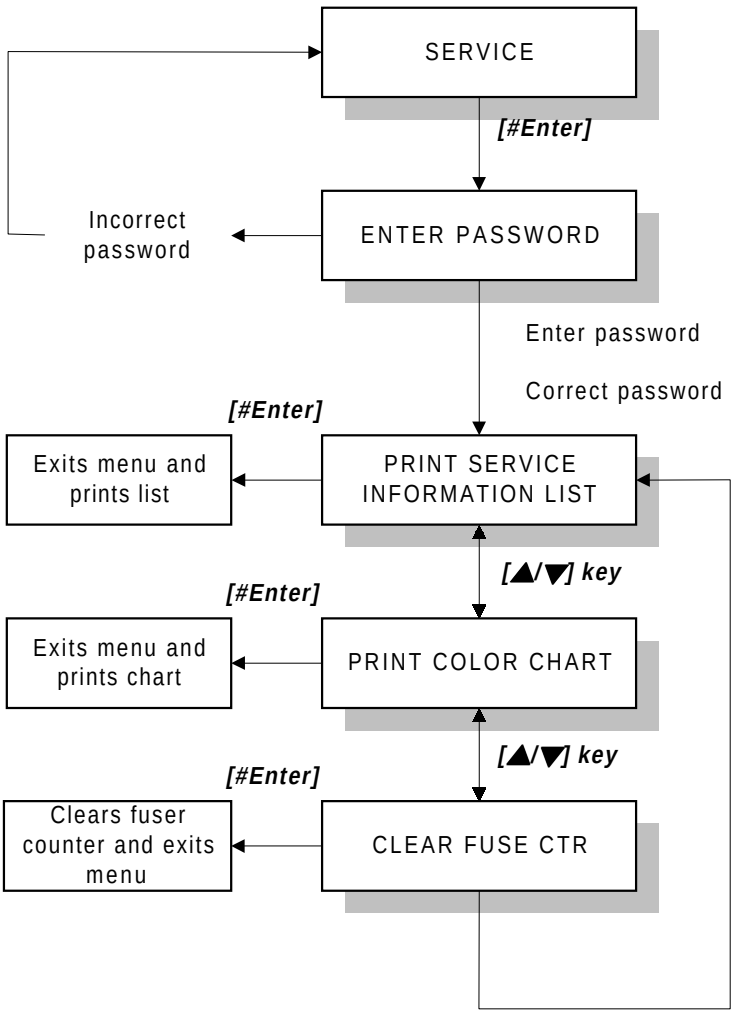
4.3 SERVICE MODE

4.3.1 OVERVIEW

Password

A special key combination is required to enter this menu to prevent customers from using this menu.

Service Menu Map



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Entering the Service Menu

While the LCD displays “ENTER PASSWORD”, press the **[ON LINE]** and **[◀]** keys at the same time.

To exit this menu, turn off the machine.

4.3.2 PRINT SERVICE INFORMATION LIST

The table below explains the contents of the engine maintenance list printout. The controller obtains the data from the engine (MCU).

Item		Description
MCU Firmware version		The MCU board firmware version number.
Density Settings		Customers can adjust the toner density via the maintenance menu. Adjusted values are stored in the NVRAM on the MCU.
Margin Settings		Customers can adjust side-to-side registration from the optional tray with the Maintenance Menu. In addition, leading edge registration can be done with engine SP mode (1. Margin). These values are stored in the NVRAM on the MCU.
Counters	Total	Indicates the total number of printouts. The counter is incremented when the paper exit sensor detects paper exit completion (regardless of paper size, type, and mono/color mode).
	Color Print	Counter value for printouts in color mode.
	B/W color	Counter value for printouts in monochrome mode.
	PCU	PCU replacement is indicated when this value reaches 60000. This value increases by 4 in color mode printing and by 1 in black mode printing. When printing in A3/DLT, double counting occurs.
	Fusing unit	Fusing unit replacement is indicated when this value reaches to 60000. This counter increases by 2 for A3/DLT size printing and by 1 for printing in other sizes.
	Fusing Unit Replacement	Number of fusing unit resets made with service mode.
	A3/DLT, A4/LT, LG, B4 and etc. Size counter	Number of sheets of each size of paper that passed the exit sensor.
	Feed Jam, Transfer Jam and Eject Jam	Number of paper jams in each section.
	SC	Number of SCs
SC Error History		The most recent 3 SC codes.
Jam History		The most recent 10 jam codes and the total counter value at the time. 000: Paper cassette 001: Paper feed path 002: Paper exit
Process-control error History		The most recent 3 errors during process control and the total counter value at the time. Not all of the errors are indicated as SC errors.
ID sensor PWM setting		The value set with engine SP mode, 9: ID Sensor PWM.

4.3.3 PRINT COLOR CHART

This prints a color test chart, so that the image quality can be tested for all colors at various densities. This chart prints on A4/LTR or A3/DLT size paper or larger.

4.3.4 CLEAR FUSER CTR

This mode resets the fusing unit counter (this counter is in the NVRAM on the MCU board). Use this mode after replacing the fusing unit.

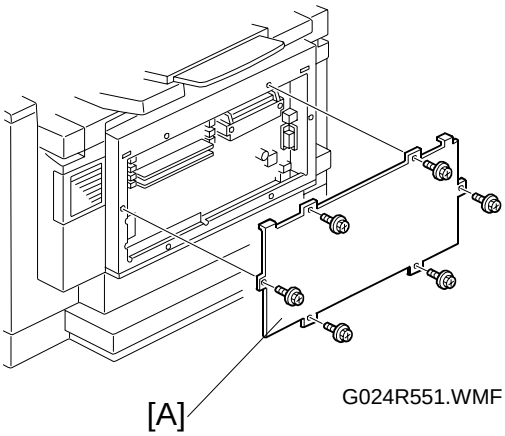
5. PERIODIC MAINTENANCE

Refer to Section 5 (Periodic Maintenance) in the engine service manual.

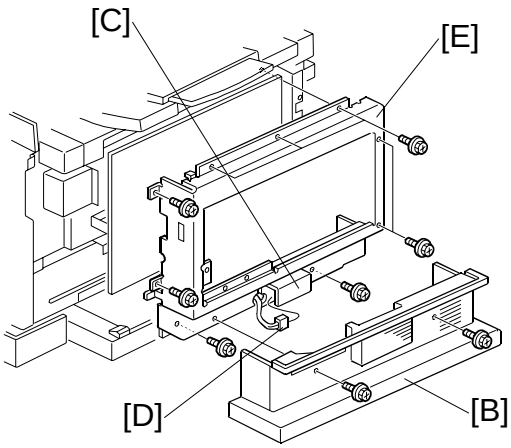
Refer to Section 4 (Service Tables and Procedures – Service Mode – Clear Fuser Ctr) for how to clear the fusing unit counter after fusing unit replacement.

6. REPLACEMENT AND ADJUSTMENT

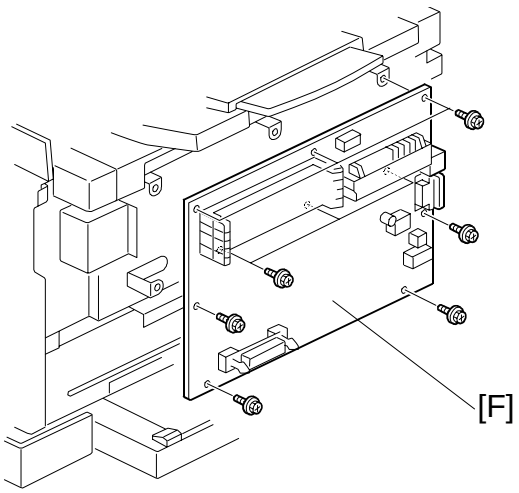
6.1 CONTROLLER BOARD REPLACEMENT



G024R551.WMF



G024R552.WMF



G024R553.WMF

NOTE: Print the “Configuration Sheet” (refer to the Operation Manual) prior to removing the controller board, because the NVRAMs cannot be exchanged. The user must restore this data manually.

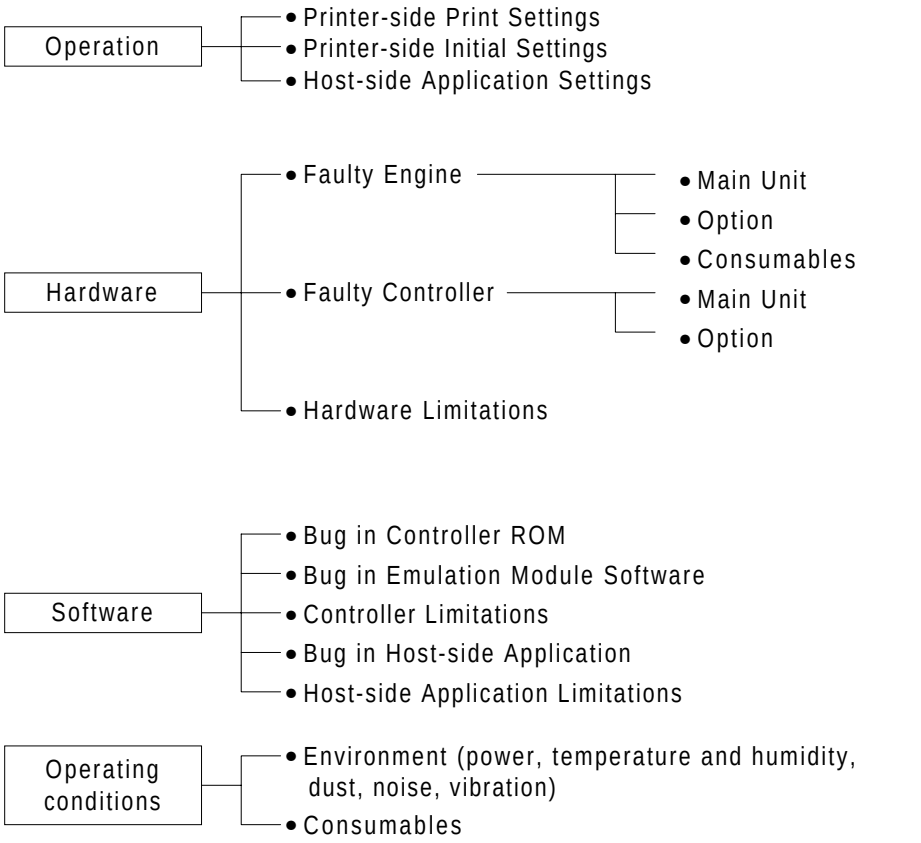
1. Remove the controller cover [A] (6 screws).
2. Remove the tray cover [B] (2 screws).
3. Remove the temperature/humidity sensor cover (1 screw) and sensor [C], (1 screw, 1 connector [D]).
4. Remove the controller bracket [E] (5 screws).
5. Remove the controller board [F] (6 screws).

After replacing the controller board, make sure that the brand name (and MAC address if required by the user) stored in the machine is correct. (See Section 4 “Service Tables and Procedures - Boot ROM Menu”.)

7. TROUBLESHOOTING

7.1 TYPES OF PROBLEMS

The problems can be classified as follows:



G024O014.WMF

7.2 TROUBLESHOOTING PROCEDURE

7.2.1 HARDWARE TESTS

1. Start-up diagnostics
   Turn on the power and check whether the LCD displays an error code.
2. Custom diagnostic test
   See “Section 4.1 Diagnostics Mode” in this manual for the procedure.
3. Checking the configuration page output.
   Print out from the user menu.
4. Connectivity test
   Make a test print from a computer.
   - Check that the correct cable is used (and connected properly).
   - Check the cable wire continuity
   - Check the cable length (Is it too long?).
   - Do not connect the printer to the computer through a printer selector switch – connect the printer to the computer directly.

7.2.2 OPERATION-RELATED TESTS

Check the print conditions and initial settings.

Check the printer settings against the application settings. Check whether the current settings match the settings on the configuration page that the customer keeps.

Ask the customer to print a configuration page at some time when the controller is working normally, and keep it for reference.

7.2.3 SOFTWARE-RELATED TESTS

Obtain information about the following:

- PC model
- OS type and version
- Configuration page
- Application software used, and the version
- Data file being printed when the problem occurred (if obtainable)
- Sample printouts when the error occurred and when the printer is normal
- Detailed operating procedure
- Controller version (bootstrap, system code and boot code)
- Engine firmware version
- Printer driver version

7.3 ERROR MESSAGES

7.3.1 OVERVIEW

The error messages for this unit are classified as follows:

1. Controller Diagnostics Errors
   Errors detected while the unit performs start-up diagnostics/custom diagnostics on the controller hardware.
2. Engine User Errors (Cautionary)
   Errors that do not require user intervention to continue printing (the printer can still communicate with the PC over the interface). However, for the best printing quality, the user should correct the problem as soon as possible.
3. Engine Service Codes (SCs)
   Severe errors that cause the unit to stop printing, requiring a technician to fix the problem before printing again.

7.3.2 CONTROLLER DIAGNOSTICS ERRORS

When a controller diagnostics error occurs, the first line of the operation panel LCD displays the name of the test that detected the error.

The second line contains a 6-digit code following “TYPE ID” that gives error details for designers to use when debugging.

IDE Test Error

Code	Description	Location
0x1001	IDE controller problems	IDE chip
0x1002	Hard disk problems or cable connection problem	HDD or cable
0x1003	Unexpected return values of function calls	Chip or HDD

Ethernet Test Error

Code	Description	Location
0x400	Cannot find Ethernet chip	Replace the controller.
0x401	Internal register test failed	
0x2001	Internal error	
0x2002	Chip error	
0x2003	Receive error	
0x2004	Transmit error	
0x2005	No net activity	
0x2006	Fatal summary	
0x2007	Lost carrier	
0x2008	Transmit flow error	
0x2009	No chip	
0x2010	Interrupt error	
0x2011	Low receive	

MEM Test Error

Code	Description	Location
0x0300	Bad memory information	Replace the controller.
0x0301	Bad memory	
0x0302	Ground bounce test failed	

VX Test Error

Code	Description	Location
0x1801	Bad VX chip; registers cannot be programmed correctly	Replace the controller.

Boot ROM Test Error

Code	Description	Location
0x1811	Internal error	Replace the controller.
0x1812	Unknown boot flash type	
0x1813	Incorrect chip installed	
0x1814	Successive reads return different values	
0x1815	Checksum failed for boot ROM	
0x1816	Erasing boot ROM not completed successfully.	
0x1817	Data written to the boot ROM cannot be verified correctly.	
0x1818	Boot ROM write test not performed since parameter blocks are not empty	
0x1819	Parameter blocks cannot be overwritten	

EFIDIMM Test Error

Code	Description	Location
0x1820	System DIMM not found	Replace the controller.
0x1821	Cannot read from system DIMM properly, or system DIMM located in an incorrect slot	
0x1823	Checksum for system code failed.	
0x1824	Checksum for file system failed	
0x1825	Checksum for system code and file system failed.	

I2CEEPROM Test Error

Code	Description	Location
0x1100	Read error at I2CEEPROM	Replace the controller.

7.3.3 ENGINE USER ERRORS (CAUTIONARY)

Refer to the Troubleshooting section in the Operating Instructions.

7.3.4 ENGINE SERVICE CODES

Refer to the Troubleshooting section in the Engine Service Manual.