

**NEC**  
***PowerMate ML5***  
***Disassembly Manual***



**NEC**

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## Overview

This document contains step-by-step disassembly instructions for the PowerMate ML5 chassis. The instructions are illustrated where necessary with images of the part that is being removed or disassembled. Furthermore, the screws that are removed are shown next to the image of the parts themselves.

NEC reserves the right to make changes to the PowerMate ML5 chassis without notice.

## Technician Notes

Only technicians authorized by NEC Computers International BV should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modifications may void any warranty or exchange allowances.

## Disassembly Instructions

When disassembling the system unit, follow these general rules:

- Do not disassemble the system into parts that are smaller than those specified in the instructions.
- Label all removed connectors. Note where the connector goes and in what position it was installed.
- Turn off the power and disconnect all power and all options.

## Reassembly Instructions

Reassembly is the reverse of the disassembly process. Use care to ensure that all cables and screws are returned to their proper positions. Check that no tools or any loose parts have been left inside the chassis. Check that everything is properly installed and tightened.

## Required Tools

All disassembly procedures can be performed using the following tools:

- Philips screwdriver
- Small Philips screwdriver
- Small flatbed screwdriver

## Hazardous Voltage

There is hazardous voltage present inside the computer when it is connected to an AC supply, even when the computer's power switch is off. Exposure to hazardous voltage could cause personal injury. To avoid risk of injury, contact an Authorized Service Provider for proper (un)installation of optional hardware devices.

## Avoid Electrostatic Discharge

Electrostatic electricity can easily damage circuit cards and integrated circuits (ICs). To reduce risk of damage, store them in protective packaging whenever they are not installed in your system.

Add-in cards can be extremely sensitive to ESD and always require careful handling. After removing the card from the computer, place the card flat on a grounded, static-free surface, component-side up. Use a conductive foam pad if available, but not the card wrapper. Do not slide the card over any surface.

Before you install or remove memory modules, video memory, disk drives, circuit cards or other devices, protect them from static electricity. To do so, make sure your computer's power switch is OFF. Then, unplug the computer's AC power cord. Before picking up the device you (un)install, you should wear an anti-static wrist wrap (available at electronic supply stores). Be sure to connect the wrist wrap to an unpainted metal portion of the computer chassis. As an alternative, you can dissipate electrostatic build-up by touching an unpainted metal portion of the computer chassis with one hand. Then touch the device you are (un)installing with the other hand, and maintain continuous contact with it until it is (un)installed in the computer.

## Power Supply Unit

Under no circumstances should you attempt to disassemble the power supply. The power supply contains no user-serviceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. Always return a defective power supply to your dealer.

### **WARNING**

Ensure that the computer is disconnected from its power source and from all telecommunications links, networks, or modem lines whenever the chassis cover is removed. Do not operate the computer with the cover removed.

### **AVERTISSEMENT**

Assurez-vous que le système est débranché de son alimentation ainsi que de toutes les liaisons de télécommunication, des réseaux, et des lignes de modem avant d'enlever le capot. Ne pas utiliser le système quand le capot est enlevé.

### **WARNUNG**

Das System darf weder an eine Stromquelle angeschlossen sein noch eine Verbindung mit einer Telekommunikationseinrichtung, einem Netzwerk oder einer Modem-Leitung haben, wenn die Gehäuseabdeckung entfernt wird. Nehmen Sie das System nicht ohne die Abdeckung in Betrieb.

### **ADVERTENCIA**

Asegúrese de que cada vez que se quite la cubierta del chasis, el sistema haya sido desconectado de la red de alimentación y de todos los enlaces de telecomunicaciones, de red y de líneas de módem. No ponga en funcionamiento el sistema mientras la cubierta esté quitada.

### **WAARSCHUWING**

Zorg er voor dat alle verbindingen van en naar de computer (stroom, modem netwerk, etc) verbroken worden voordat de behuizing geopend wordt. Zet de computer nooit aan als de behuizing geopend is.

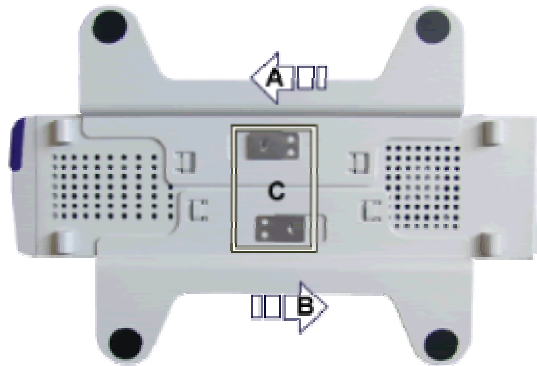
### **AVVERTENZA**

Prima di rimuovere il coperchio del telaio, assicurarsi che il sistema sia scollegato dall'alimentazione, da tutti i collegamenti di comunicazione, reti o linee di modem. Non avviare il sistema senza aver prima messo a posto il coperchio

## Removing the Stabilisers

To remove the stabilisers follow the next steps:

1. Place the computer body with the bottom side protruding a little away from the edge of a table.
2. Free the locks C and slice the stabilisers as indicated by the arrows A and B, towards the front of the system for stabiliser A and towards the rear for stabiliser B,.

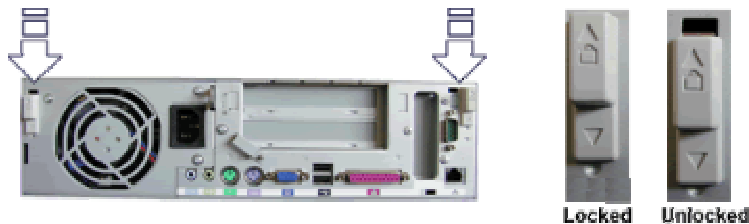


*Fig. 1: Removing the stabilisers*

## Opening the Chassis

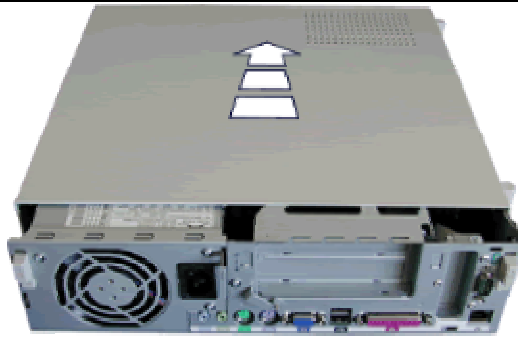
To open the chassis, first remove the stabilisers (see [Removing the Stabilisers](#)), then follow the next steps:

1. Put the chassis in horizontal position, rear side towards you.
2. Unlock the two cover locks shown in the picture below.



*Fig. 2: Unlocking the cover of the chassis*

3. Slide the cover towards the front of the chassis a few centimetres, then carefully lift the cover away from the system and set it aside.



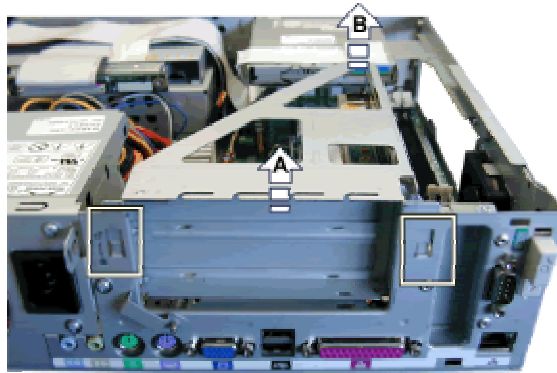
**Fig. 3:** Removing the cover of the chassis

**Note:** To prevent damaging the system, make sure no cables or other devices protrude from the chassis before replacing the cover.

## Removing the Riser Board Bracket and the Raiser Board

To remove the riser board bracket first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

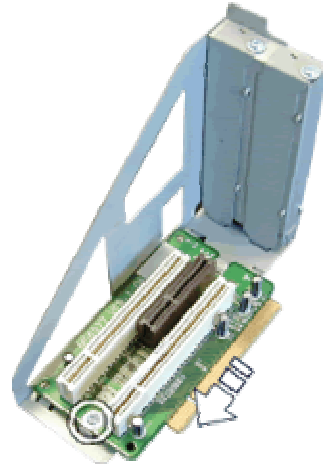
1. After removing the cover, put the chassis in the horizontal position, rear side towards you.
2. Hold the riser board bracket by its rear edge (A) and the other end (B) and lift it carefully until the riser board is disengaged from the PCI slot on the motherboard and the bracket is disengaged from the tabs marked with the squares in the picture below.



**Fig. 4:** Removing the riser board bracket

**Note:** When putting the riser board bracket in place, pay attention to correctly fit the tabs in the latches marked in Fig. 4: and the raiser board to its slot.

3. Remove the one screw holding the riser board in place
4. Slide the riser board as shown to free it from the latch and put the riser board and the riser board bracket aside.



*Fig. 5: Removing the riser board*



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## Removing a PCI or CNR Expansion Card

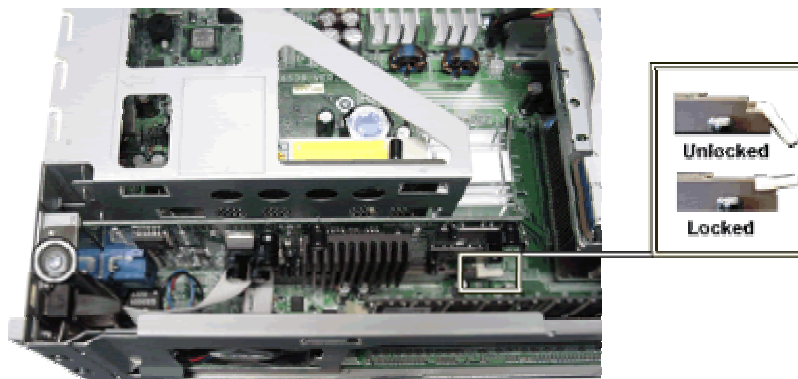
To remove a PCI or CNR expansion card, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), remove the riser board bracket (see [Removing the Riser Board Bracket and the Riser Board](#)), then follow the next steps:

1. Remove the screw holding the PCI or CNR expansion card in place.
2. Extract the PCI or CNR expansion card from its slot and put it aside.

## Removing the AGP Expansion Card

To remove an AGP expansion card, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Remove the screw holding the AGP expansion card in place.
2. Unlock the AGP expansion card by putting the AGP lock in the unlocked position.



*Fig. 6: Removing an AGP expansion card*



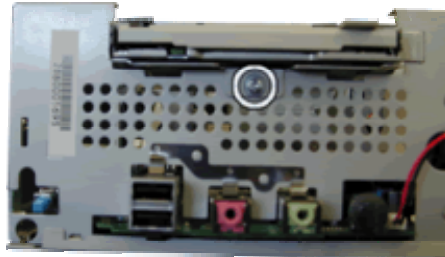
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3. Carefully extract the AGP expansion card from its slot and put it aside.

## Removing the Floppy Disk Drive

To remove the floppy disk drive, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

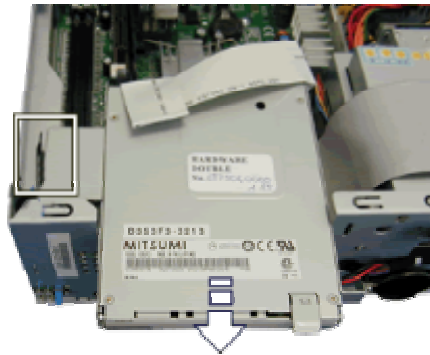
1. Remove the one screw securing the floppy disk drive bracket to the chassis.



*Fig. 7: Removing floppy disk drive screw*

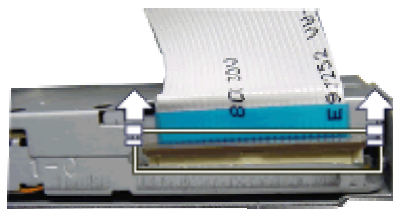


2. Slide the floppy disk drive and its bracket towards the front of the system until the tab marked in the picture below is free from the corresponding guide.



*Fig. 8: Removing the floppy disk drive assembly*

3. Carefully disconnect the flat cable from the floppy disk drive and take away the floppy disk drive assembly.



*Fig. 9: Disconnecting floppy disk drive cable*



**Note:** When reassembling the floppy disk drive, slide the floppy disk drive bracket in the chassis, taking care that the tabs (A, B, C, D) of the bracket fit perfectly in the corresponding holes of the chassis.

4. Remove the two screws securing the floppy disk drive to the bracket.



**Fig. 10:** Screws securing the floppy disk drive to the bracket

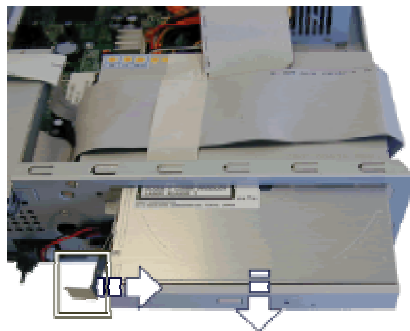


5. Take the floppy disk drive out of the bracket and put it aside.

## Removing the Optical Device Drive

To remove the optical device drive, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Disconnect the cable from the rear of the optical device drive.
2. Push the locking lever towards the optical device drive and pull the whole assembly outside the front of the chassis.



**Fig. 11:** Extracting the optical device drive assembly

3. Remove the two screws securing the converter board to the optical device drive bracket, disconnect the converter board and put it aside.

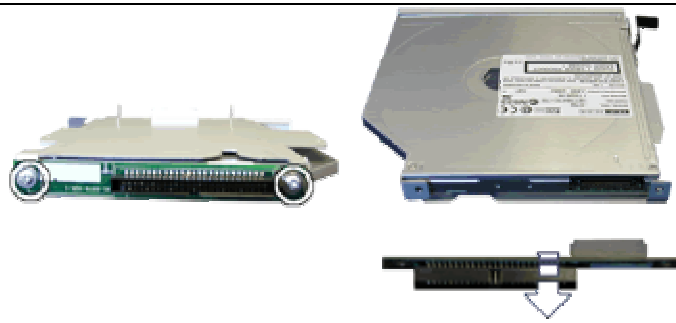


Fig. 12: Removing the converter board



4. Remove the two screws securing the optical device drive to its bracket and put it aside.



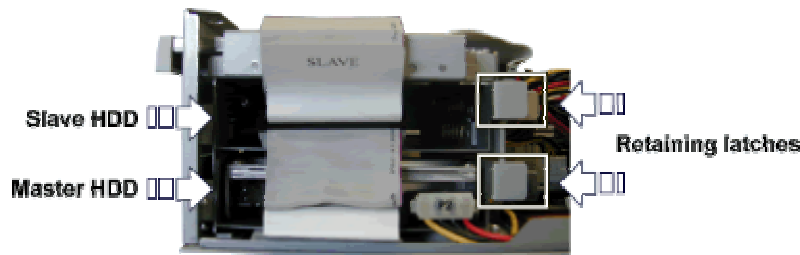
Fig. 13: Removing the optical device drive from its bracket



## Removing the Hard Disk Drive

To remove the hard disk drive, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

**Note:** The chassis has two bays for hard disk drives. Each bay contains a hard disk drive bracket locked by a latch



**Note:** If you want to remove the slave hard disk drive (the upper one), you will have to disconnect also the IDE cable from the master hard disk drive. This IDE cable is a master/slave cable which is connected to both hard disk drives. You will not be able to remove the upper hard disk drive if the IDE cable remains connected to the lower hard disk drive.

1. Disconnect the IDE cable and the power cable corresponding to the drive you want to remove.
2. Press the latch against the handle of the hard disk drive bracket to unlock it
3. Slide the hard disk drive bracket out of the chassis, and put it aside.

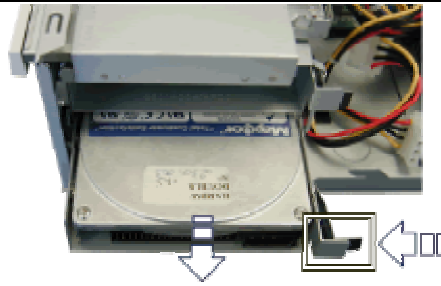


Fig. 14: Extracting hard disk drive assembly

4. Remove the four screws (two on each side) fixing the hard disk drive to the bracket, slide the hard disk drive out of the bracket and put it aside.



Fig. 15: Freeing the hard disk drive from the bracket



## Removing the Power Supply Unit

To remove the power supply unit, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Disconnect all power connectors from the motherboard and from all peripherals to which the power supply unit might be attached.
2. Remove the three screws shown in the picture below.

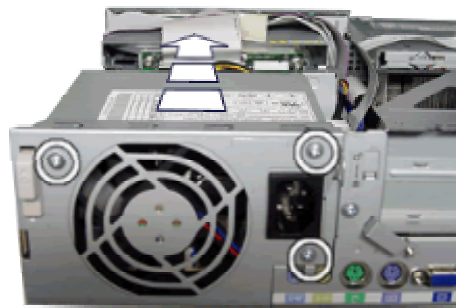


Fig. 16: Removing the screws of the power supply unit



3. Slide the power supply unit towards the front of the system and lift it out of the chassis.

## Removing the Auxiliary System Fan

To remove the auxiliary system fan, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Disconnect the auxiliary fan connector from the motherboard.
2. Remove the screws shown in the picture below. Take the auxiliary system fan out of the chassis and put it aside.



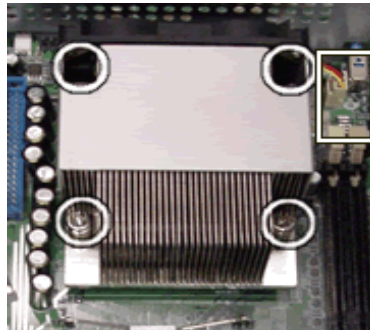
*Fig. 17: Removing the auxiliary system fan*



## Removing the CPU

To remove the CPU, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), remove the floppy disk drive (see [Removing the Floppy Disk Drive](#)), then follow the next steps:

1. Disconnect the active sink fan connector from the motherboard.
2. unscrew the four screws shown in the picture below.



*Fig. 18: Removing heat sink*

3. Carefully lift the heat sink out of the system and put it aside.
4. Lift the lever to unlock the CPU from its socket.
5. Take out the CPU and put it aside.

## Removing the Second Serial Port

To remove the second serial port, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Disconnect the serial cable from the header on the motherboard.
2. Remove the screws shown in the picture below.



Fig. 19: Removing the second serial port

3. Take the second serial port out of the chassis and put it aside.

### Removing the Switch/LED board

To remove the Switch/LED board, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Disconnect the cable from the Switch/LED board.
2. Remove one screw.
3. Carefully remove the Switch/LED board from the chassis and put it aside.



Fig. 20: Removing the Switch/LED board

**Note:** To remove also the cable of the Switch/LED board, the IDE cables must be disconnected from the motherboard, as they cover the cable of the Switch/LED. In order to easily reach the IDE cables it is better to first remove the floppy disk drive (see [Removing the Floppy Disk Drive](#)).

### Removing the Internal Speaker

To remove the internal speaker, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), then follow the next steps:

1. Remove the screws and the connector shown in the picture

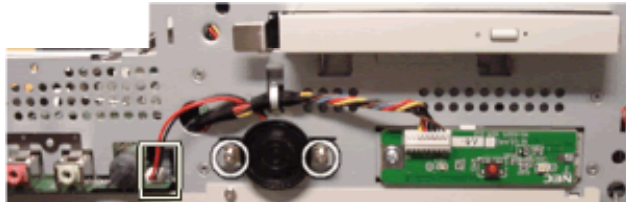


Fig. 21: Removing the internal speaker



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2. Take the speaker off the chassis and put it aside.

## Removing the Motherboard

To remove the motherboard, first remove the stabilisers (see [Removing the Stabilisers](#)), open the chassis (see [Opening the Chassis](#)), remove the riser board bracket (see [Removing the Riser Board Bracket and the Raiser Board](#)), if present remove the AGP expansion card (see [Removing the AGP Expansion Card](#)), remove the auxiliary system fan (see [Removing the Auxiliary System Fan](#)), remove the floppy disk drive (see [Removing the Floppy Disk Drive](#)), remove the power supply unit (see [Removing the Power Supply Unit](#)), then follow the next steps:

1. Remove any memory module present on the motherboard.
2. Disconnect the floppy disk drive cable and the IDE cable from the motherboard.
3. Disconnect the LED/Switch connector from the motherboard
4. Disconnect the serial port cable from the header on the motherboard.
5. Remove the four screws shown in the picture below.

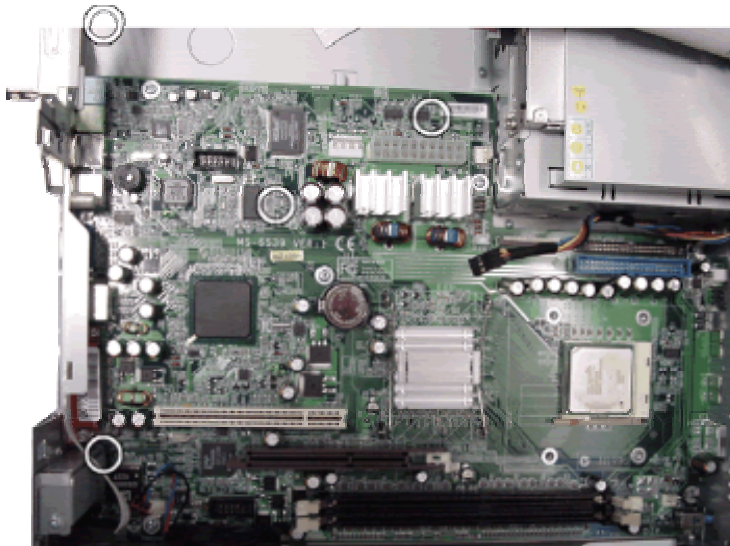


Fig. 22: Removing the motherboard



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6. Carefully lift the motherboard out of the chassis and put it aside.

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## PowerMate ML5 Disassembly Manual

Author: Vincenzo D'Apice

First Edition: January 2003

Document Part Number: NECDOCS05530100

Version: 1.0

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