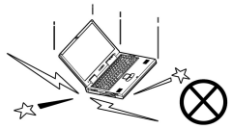
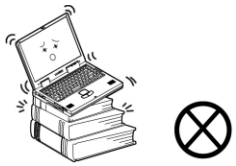
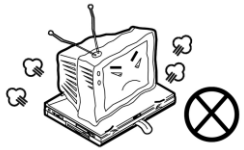
SERVICE MANUAL

notebook

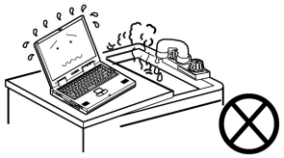
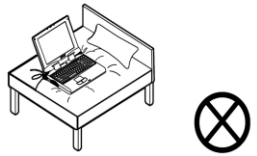
Instructions for Care and Operation

The notebook computer is quite rugged, but it can be damaged. To prevent this, follow these suggestions:

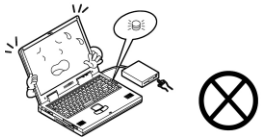
1. **Don't drop it, or expose it to shock.** If the computer falls, the case and the components could be damaged.

Do not expose the computer to any shock or vibration.	*Do not place it on an unstable surface.*	*Do not place anything heavy on the computer.*
		

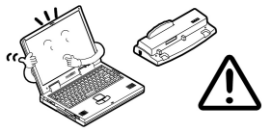
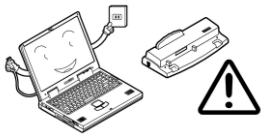
2. **Keep it dry, and don't overheat it.** Keep the computer and power supply away from any kind of heating element. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.

Do not expose it to excessive heat or direct sunlight.	*Do not leave it in a place where foreign matter or moisture may affect the system.*	*Don't use or store the computer in a humid environment.*	*Do not place the computer on any surface which will block the vents.*
			

3. **Follow the proper working procedures for the computer**. Shut the computer down properly and don't forget to save your work. Remember to periodically save your data as data may be lost if the battery is depleted.

Do not turn off the power until you properly shut down all programs.	*Do not turn off any peripheral devices when the computer is on.*	*Do not disassemble the computer by yourself.*	*Perform routine maintenance on your computer.*
			

4. **Avoid interference.** Keep the computer away from high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage your data.
5. **Take care when using peripheral devices**.

Use only approved brands of peripherals.	*Unplug the power cord before attaching peripheral devices.*
	

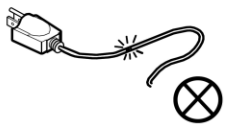
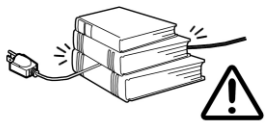
Power Safety

The computer has specific power requirements:

- Only use a power adapter approved for use with this computer.
- Your AC adapter may be designed for international travel but it still requires a steady, uninterrupted power supply. If you are unsure of your local power specifications, consult your service representative or local power company.
- The power adapter may have either a 2-prong or a 3-prong grounded plug. The third prong is an important safety feature; do not defeat its purpose. If you do not have access to a compatible outlet, have a qualified electrician install one.
- When you want to unplug the power cord, be sure to disconnect it by the plug head, not by its wire.
- Make sure the socket and any extension cord(s) you use can support the total current load of all the connected devices.
- Before cleaning the computer, make sure it is disconnected from any external power supplies.

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines and power cord). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

Do not plug in the power cord if you are wet.	*Do not use the power cord if it is broken.*	*Do not place heavy objects on the power cord.*
		

Battery Precautions

- Only use batteries designed for this computer. The wrong battery type may explode, leak or damage the computer.
- Do not continue to use a battery that has been dropped, or that appears damaged (e.g. bent or twisted) in any way. Even if the computer continues to work with a damaged battery in place, it may cause circuit damage, which may possibly result in fire.
- Recharge the batteries using the notebook's system. Incorrect recharging may make the battery explode.
- Do not try to repair a battery pack. Refer any battery pack repair or replacement to your service representative or qualified service personnel.
- Keep children away from, and promptly dispose of a damaged battery. Always dispose of batteries carefully. Batteries may explode or leak if exposed to fire, or improperly handled or discarded.
- Keep the battery away from metal appliances.
- Affix tape to the battery contacts before disposing of the battery.
- Do not touch the battery contacts with your hands or metal objects.

Battery Guidelines

The following can also apply to any backup batteries you may have.

- If you do not use the battery for an extended period, then remove the battery from the computer for storage.
- Before removing the battery for storage charge it to 60% - 70%.
- Check stored batteries at least every 3 months and charge them to 60% - 70%.

Battery Disposal

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Caution

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used battery according to the manufacturer's instructions.

Battery Level

Click the battery icon  in the taskbar to see the current battery level and charge status. A battery that drops below a level of 10% will not allow the computer to boot up. Make sure that any battery that drops below 10% is recharged within one week.

Related Documents

You may also need to consult the following manual for additional information:

User's Manual on CD/DVD

This describes the notebook PC's features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

System Startup

1. Remove all packing materials.
2. Place the computer on a stable surface.
3. Insert the battery and make sure it is locked in position.
4. Securely attach any peripherals you want to use with the computer (e.g. keyboard and mouse) to their ports.
5. Attach the AC/DC adapter to the DC-In jack at the rear of the computer, then plug the AC power cord into an outlet, and connect the AC power cord to the AC/DC adapter.
6. Use one hand to raise the lid/LCD to a comfortable viewing angle (do not exceed 135 degrees); use the other hand (as illustrated in Figure 1) to support the base of the computer (**Note**: **Never** lift the computer by the lid/LCD).
7. Press the power button to turn the computer "on".

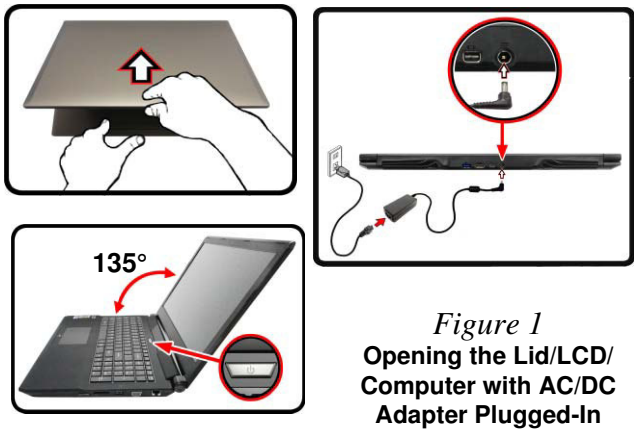


Figure 1
Opening the Lid/LCD/ Computer with AC/DC Adapter Plugged-In

Shut Down

Note that you should always shut your computer down by choosing the **Shut down** command in ***Windows*** (see below). This will help prevent hard disk or system problems.

Click the icon in the **Start Screen** and choose **Shut down** from the menu.

Or

Right-click the **Start button** at the bottom of the **Start Screen** or the **Desktop** and choose **Shut down or sign out > Shut down** from the context menu.

Specifications

Latest Specification Information

The specifications listed here are correct at the time of sending them to the press. Certain items (particularly processor types/speeds) may be changed, delayed or updated due to the manufacturer's release schedule. Check with your service center for more details.

CPU

The CPU is not a user serviceable part. Accessing the CPU in any way may violate your warranty.

Processor Options

Intel® Core™ i7 Processor
i7-4870HQ (2.50GHz), i7-4720HQ (2.60GHz)

6MB L3 Cache, **22nm**, DDR3L-1600MHz, TDP 47W

Intel® Core™ i5 Processor
i5-4210H (2.90GHz)

3MB L3 Cache, **22nm**, DDR3L-1600MHz, TDP 47W

Core Logic

Intel® HM87 Chipset

BIOS

48Mb SPI Flash ROM
AMI BIOS

Memory

Two 204 Pin SO-DIMM Sockets Supporting **DDR3L 1600MHz** Memory
Memory Expandable up to 16GB

(The real memory operating frequency depends on the FSB of the processor.)

Storage

(**Factory Option**) One 9.5mm(h) Optical Device Type Drive (Super Multi Drive)
(**Factory Option**) 2.5" 9.5mm 2nd HDD/SSD caddy
One Changeable 2.5" 9.5mm/7.0mm (h) SATA HDD/SSD

LCD Options

17.3" (43.94cm) FHD

Video Adapter

Intel® Integrated GPU and NVIDIA® Discrete GPU

Supports Microsoft Hybrid Graphics

Intel Integrated GPU

Intel® HD Graphics 5200 (Core i7-4870HQ/ i7-4770HQ/
Dynamic Frequency (Intel Dynamic Video Memory Technology for up to **1.7GB**)
Microsoft DirectX®11.1 Compatible
Intel® HD Graphics 4600 (Core i7-4720HQ/ i5-4210H
Dynamic Frequency (Intel Dynamic Video Memory Technology for up to **1.7GB**)
Microsoft DirectX®11.1 Compatible

NVIDIA® Discrete GPU
NVIDIA® GeForce GTX 960M
2GB GDDR5 Video RAM on board
Microsoft DirectX® 12 Compatible

Audio

High Definition Audio Compliant Interface
2 * Built-In Speakers
Built-In Microphone
Sound Blaster™ Cinema 2

Security

Security (Kensington® Type) Lock Slot
BIOS Password
(**Factory Option**) Fingerprint Reader
(**Factory Option**) TPM v 2.0

Keyboard

Illuminated Full-size “WinKey” keyboard (with numeric keypad)

Pointing Device

Built-in Touchpad

Interface

Four USB 3.0 Ports
One Mini DisplayPort
One HDMI-Out Port
One External Monitor Port
One Headphone-Out Jack
One Microphone-In Jack
One S/PDIF Out Jack
One RJ-45 LAN Jack
One DC-in Jack

M.2 Slots

Slot 1 for M.2 2230 WLAN Combo Module Card with PCIe & USB Interfaces
Slot 2 for M.2 2280 SSD Card with SATA/ PCIe x2/ x4 Interface

Communication

Built-In Gigabit Ethernet LAN
(**Factory Option**) 2.0M FHD PC Camera Module

WLAN/ Bluetooth M.2 Modules:

(**Factory Option**) Intel® Wireless-AC 7265 Wireless LAN (**802.11ac**) + Bluetooth **4.0**
(**Factory Option**) Intel® Wireless-N 7265 Wireless LAN (**802.11b/g/n**) + Bluetooth **4.0**
(**Factory Option**) Intel® Wireless-AC 3160 Wireless LAN (**802.11ac**) + Bluetooth **4.0**
(**Factory Option**) Qualcoumm® Atheros Killer™ Wireless-AC 1525 Dual Band 2x2 AC +BT M.2 1630
(**Factory Option**) Third-Party Wireless LAN **802.11b/g/n** + Bluetooth **4.0**

Card Reader

Embedded Multi-In-1 Card Reader
MMC (MultiMedia Card) / RS MMC
SD (Secure Digital) / Mini SD / SDHC/ SDXC

Environmental Spec

Temperature
Operating: 5°C - 35°C
Non-Operating: -20°C - 60°C
Relative Humidity
Operating: 20% - 80%
Non-Operating: 10% - 90%

Power

Full Range AC/DC Adapter
AC Input: 100 - 240V, 50 - 60Hz
DC Output: 19.5V, 6.15A (**120W**)

Built-in 6 Cell Smart Lithium-Ion Battery Pack, 62WH

Dimensions & Weight

413mm (w) * 285mm (d) * 31.9mm (h)
2.9kg (Barebone with 62WH Battery)

External Locator - Top View with LCD Panel Open

Figure 1
Top View

1. PC Camera
2. *PC Camera LED
   **When the PC camera is in use, the LED will be illuminated.*
3. Built-In Array Microphone
4. LCD
5. Speakers
6. Power Button
7. Keyboard
8. Touchpad & Buttons
9. Fingerprint Reader (**Optional**)

External Locator - Front & Right Side Views

FRONT VIEW

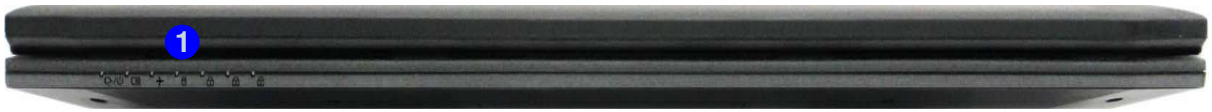


Figure 2
Front View

1. LED Indicator

RIGHT SIDE VIEW

Figure 3
Right Side View

1. Multi-in-1 Card Reader
2. USB 3.0 Port
3. External Monitor Port
4. RJ-45 LAN Jack

External Locator - Left Side & Rear View

Figure 4
Left Side View

1. Security Lock Slot
2. USB 3.0 Ports
3. S/PDIF-Out Jack
4. Microphone-In Jack
5. Headphone-Out Jack
6. Optical Device Drive Bay
7. Emergency Eject Hole

LEFT SIDE VIEW

Figure 5
Rear View

1. Vent
2. USB 3.0 Port
3. HDMI-Out Port
4. Mini Display Port
5. DC-In Jack

REAR VIEW

Chapter 2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling the ***N170SD*** series notebook's parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

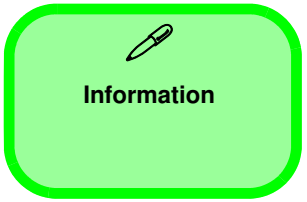
We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM, optical device and hard disk are included in the User's Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a  lists the relevant parts you will have after the disassembly process is complete. **Note**: The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a  will also provide any possible helpful information. A box with a  contains warnings.

An example of these types of boxes are shown in the sidebar.



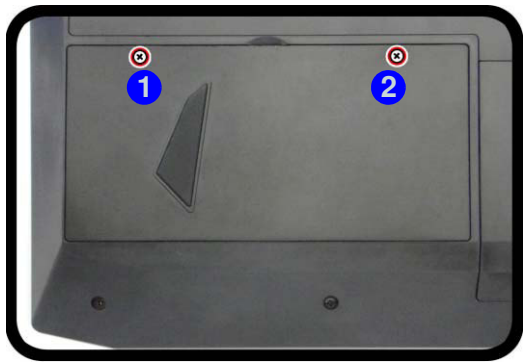
Removing the Battery

1. Turn the computer **off**, and turn it over.
2. Locate the battery and remove screws 1 - 2 (*Figure 1a*).
3. Carefully lift the battery 3 up in the direction of the arrow 4 (*Figure 1b*).
4. Remove the battery off the computer (*Figure 1c*).

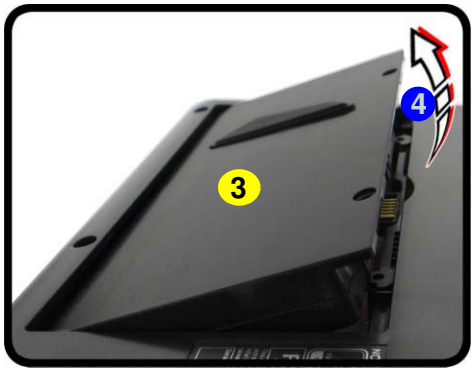
Figure 1
Battery Removal

a. Remove the screws.
b. Lift the battery.
c. Remove the battery.

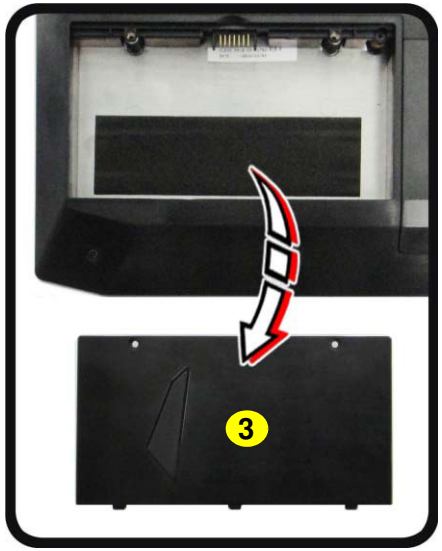
a.



b.



c.



3. Battery

- 2 Screws

Removing the Keyboard

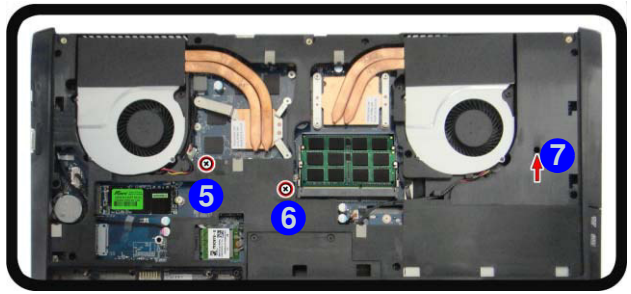
1. Turn **off** the computer, turn it over to remove the battery (*page 2 - 5*).
2. Remove screws 1 - 3 (screw size = M2.5x5L) and the component bay cover 4 (*Figure 3a*).
3. Remove screws 5 - 6 (screw size = M2.5x8L) to release the keyboard (*Figure 3a*).
4. Open it up with the LCD on a flat surface before pressing at point 7 to release the keyboard module (use the special eject stick to do this) while releasing the keyboard in the direction of the arrow 8 as shown (*Figure 3b*).
5. Carefully lift the keyboard 9 up, being careful not to bend the keyboard ribbon cable 10. Disconnect the keyboard ribbon cable 10 from the locking collar socket by using a flat-head screwdriver to pry the locking collar pins 11 away from the base (*Figure 3c*).

Figure 2
Keyboard Removal

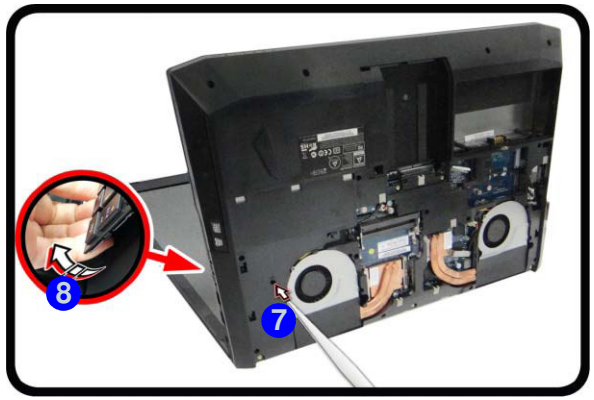
a. Remove the screws and component bay cover.
b. Remove the screws.
c. Eject the keyboard using a special eject stick to push the keyboard out while releasing the keyboard as shown.
d. Lift the keyboard up and disconnect the keyboard ribbon cable from the locking collar socket.

a.

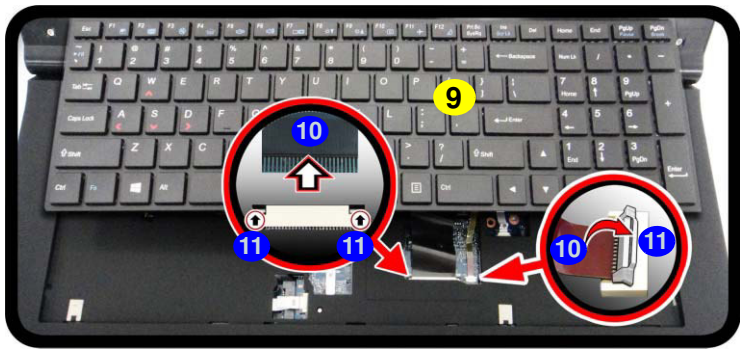
b.



c.



d.



4. Component Bay Cover
9. Keyboard

- 5 Screws

6. Carefully lift the keyboard 9 off the computer (*Figure 3e*).

e.

Figure 3
Keyboard Removal

e. Remove the keyboard.

Re-inserting the Keyboard

When re-inserting the keyboard firstly, align the keyboard tabs at the bottom of the keyboard with the slots in the case.

9. Keyboard

Removing the Hard Disk Drive

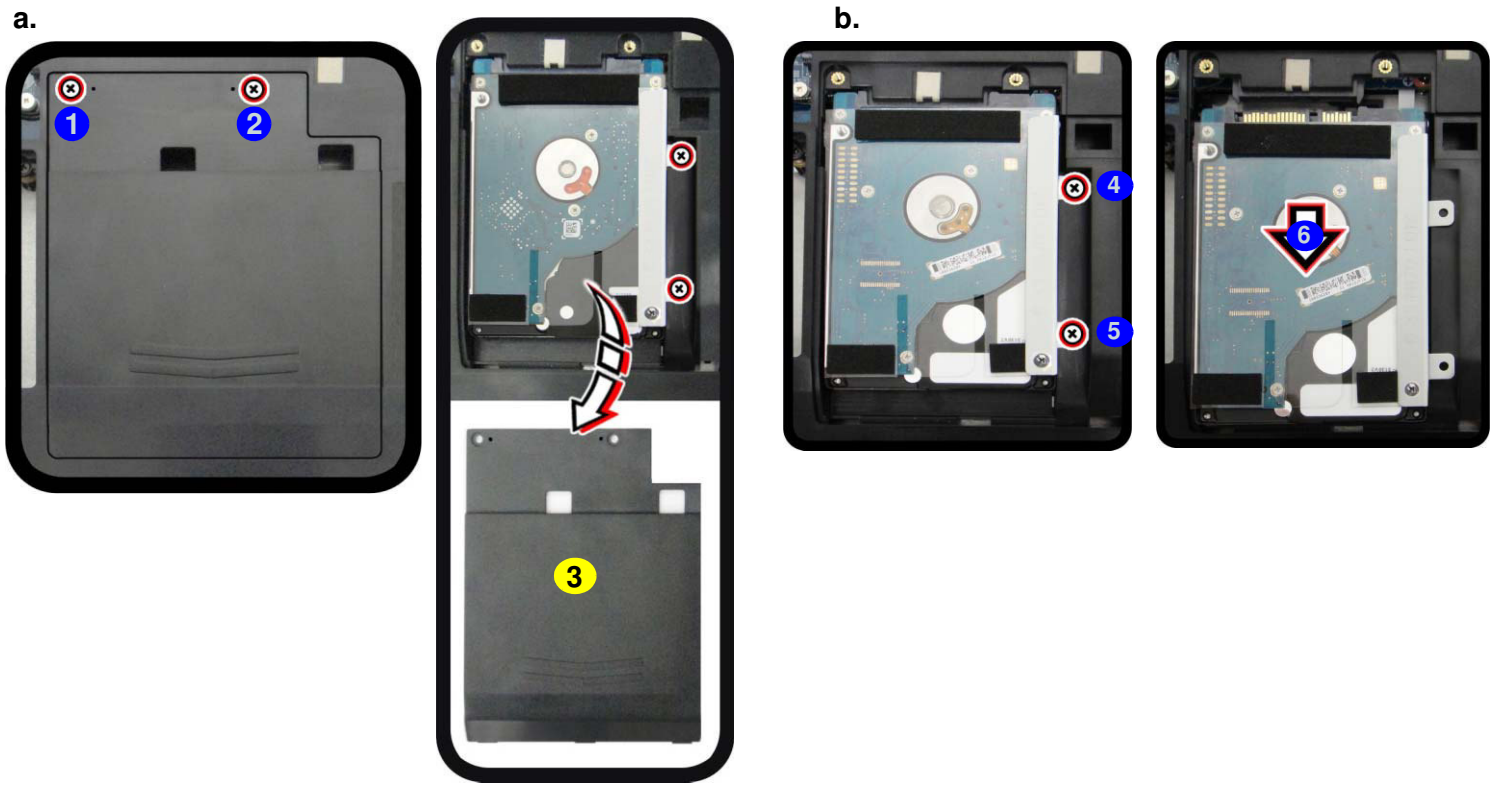
The hard disk drive can be taken out to accommodate other 2.5" serial (SATA) hard disk drives with a height of 9.5mm or 7mm (h). Follow your operating system's installation instructions, and install all necessary drivers and utilities (as outlined in **Chapter 4 of the User's Manual**) when setting up a new hard disk.

Hard Disk Disassembly Process

1. Turn **off** the computer, remove the battery (*page 2 - 5*) and keyboard (*page 2 - 6*).
2. Remove screws 1 - 2 and HDD cover 3 (*Figure 4a*).
3. Remove screws 4 - 5 and then slide the hard disk out in the direction of arrow 6 (*Figure 4b*).

Figure 4
HDD Assembly Removal

a. Remove the screws and HDD cover.
b. Slide the HDD in the direction of the arrow.



Screw Size

Note that the size of screws 1 & 2 is M2.5 x 5L.

3. HDD Cover

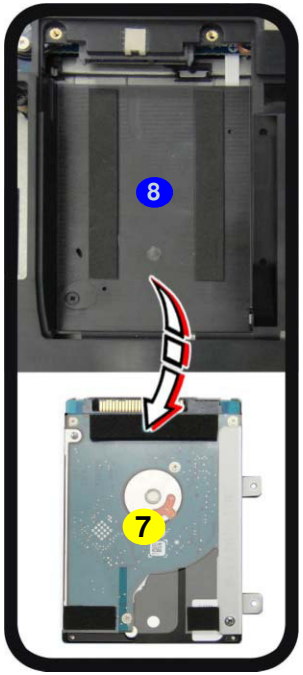
- 4 Screws

4. Lift the hard disk assembly 7 out of the bay 8 (*Figure 5c*).
5. Remove screws 9 - 11 and separate the hard disk 12 from the bracket 13 and mylar cover 14 (*Figure 5d*).
6. Reverse the process to install a new hard disk (do not forget to insert the mylar cover between the bracket and hard disk as shown before replacing the screws).

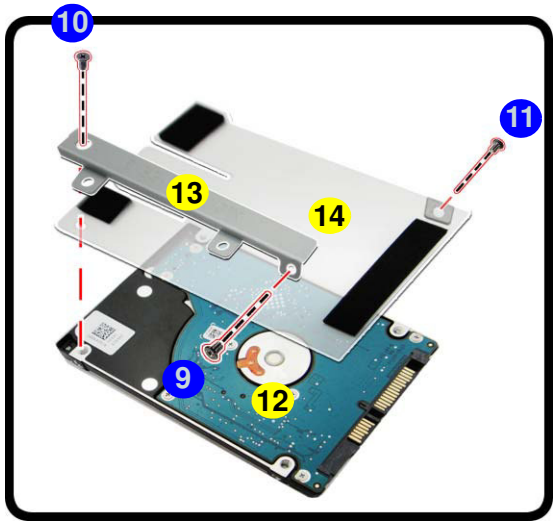
Figure 5
HDD Assembly Removal (cont'd.)

c. Lift the HDD assembly out of the bay.
d. Separate the HDD, mylar cover and bracket.

c.



d.



Installing 9.5mm or 7mm HDD

Note that the hard disks pictured on the following pages are all 9.5mm(h) hard disk drive.

In some cases, a 7.0mm(h) hard disk drive will be installed. Do pay attention on the alignment of the hard disk and bracket when tightening the screws.

For more information, contact your distributor/supplier, and bear in mind your warranty terms.

HDD System Warning

New HDD's are blank. Before you begin make sure:

You have backed up any data you want to keep from your old HDD.

You have all the CD-ROMs and FDDs required to install your operating system and programs.

If you have access to the internet, download the latest application and hardware driver updates for the operating system you plan to install. Copy these to a removable medium.

7. HDD Assembly
12. HDD
13. Bracket
14. Mylar Cover

- 3 Screws

Hard Disk Size Note (Foam Rubber Insert)

Note that the hard disks pictured on the following pages are all 9.5mm(H) hard disk drives. In some cases 7mm(H) hard disk drives will be installed. Also pay attention on the alignment of the hard disk and bracket when tightening the screws.

For more information contact your distributor/supplier, and bear in mind your warranty terms.

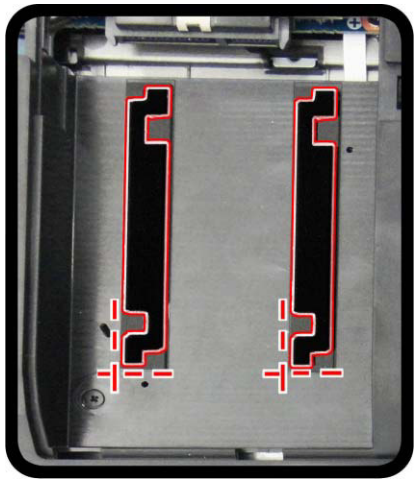


Figure 6
Foam Rubber Insert for 7mm(H) HDDs

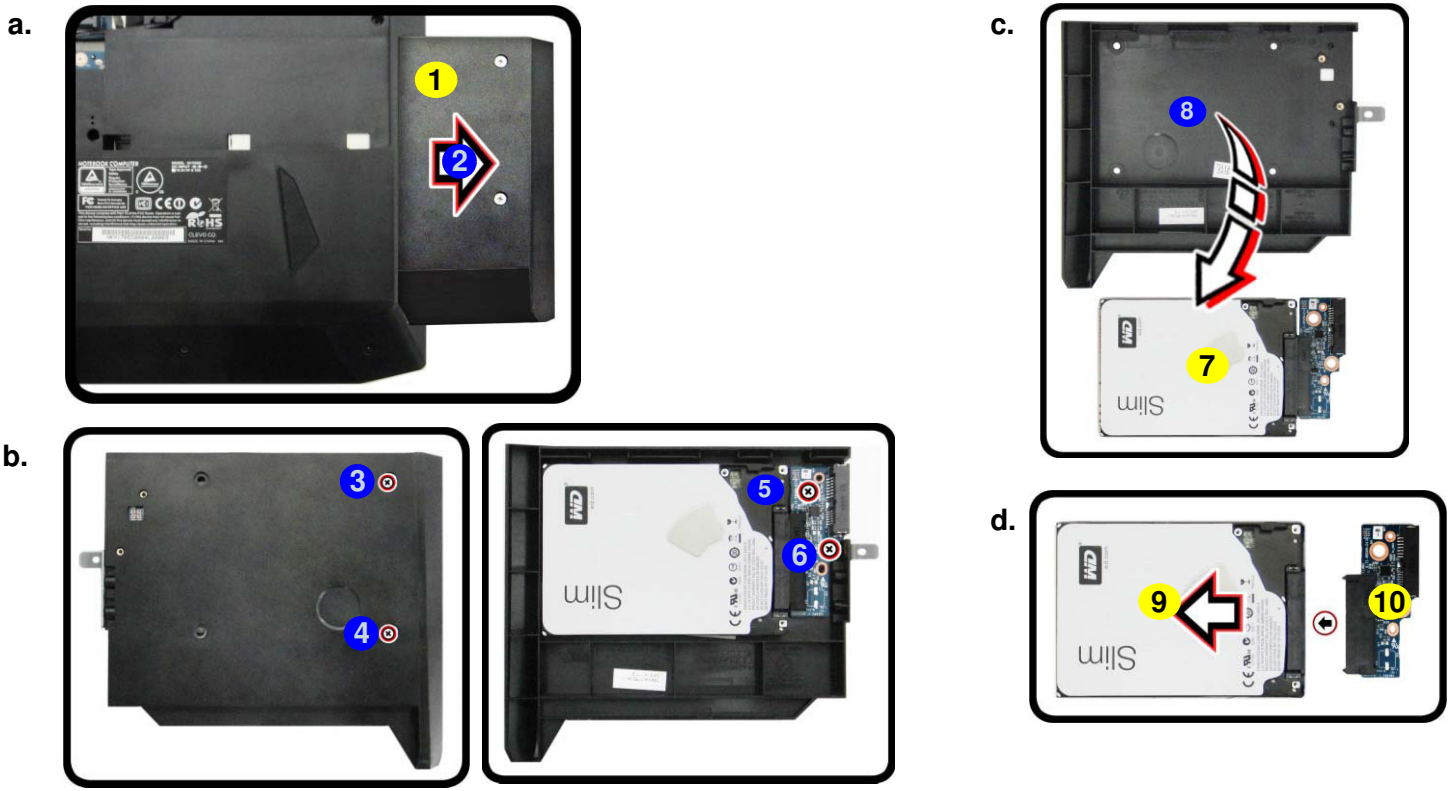
- If you are replacing a 9.5mm(H) HDD with a 7mm(H) HDD then insert the foam rubber insert (as shown above).
- If you are replacing a 7mm(H) HDD with a 9.5mm(H) HDD then remove the foam rubber insert.

Removing the 2nd Hard Disk from Caddy Bay

1. Turn **off** the computer, remove the battery (*page 2 - 5*), and bottom case (*page 2 - 8*).
2. Carefully push out the caddy bay 1 out in the direction of the arrow 2 (*Figure 7a*).
3. Remove screws 3 - 4 (will depends on the HDD type) from the bottom of the caddy bay.
4. Remove screws 5 - 6 to release the hard disk assembly (*Figure 7b*).
5. Lift the hard disk assembly 7 out of the caddy bay 8 (*Figure 7c*).
6. Separate the hard disk 9 and connector board 10 (*Figure 7d*).
7. Reverse the process to install a new hard disk.
8. Restart the computer to allow it to automatically detect the new device.

Figure 7
2nd HDD Removal

a. Push the caddy bay out off the computer.
b. Remove the screws.
c. Lift the hard disk assembly out of the caddy bay
d. Separate the hard disk and connector.



1. Dummy Bay
7. HDD Assembly
9. Hard Disk
10. Connector Board

- 4 Screws

Figure 8
Optical Device Removal

a. Remove screw and push the optical device out off the computer.
b. Pry the bezel off the optical device.
c. Separate the bezel and optical device
d. Install the front bezel.

Removing the Optical (CD/DVD) Device

1. Turn **off** the computer, remove the battery (*page 2 - 5*), and bottom case (*page 2 - 8*).
2. Remove screw 1 and carefully push the optical device 2 out of the bay at point 3 (*Figure 8a*).
3. Carefully pry the bezel 5 off the optical device at point 4 (*Figure 8b*).
4. Separate the bezel 5 and the optical device as shown (*Figure 8c*).
5. Reverse the process to attach the front bezel 5 with the new optical device at point 6 (*Figure 8d*).
6. Insert the new device and carefully slide it into the computer (the device only fits one way. DO NOT FORCE IT; The screw holes should line up). Replace the bottom cover and tighten the screws.
7. Restart the computer to allow it to automatically detect the new device.

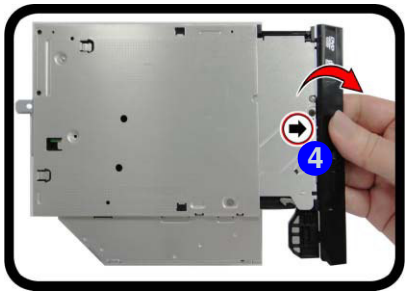
Screw Size

Note that the size of screw 1 is M2 x 8L.

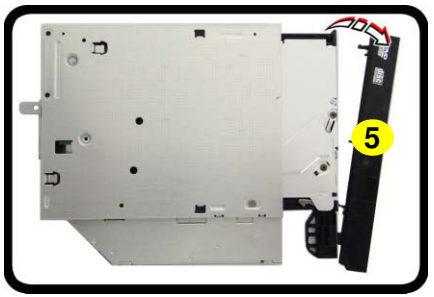
1. Optical Device
4. Bezel Cover

a.

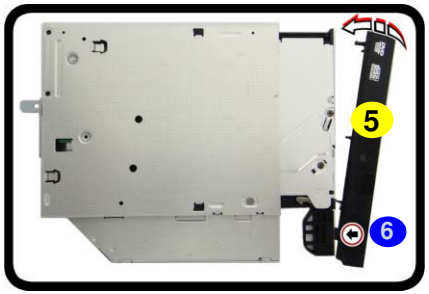
b.



c.



d.



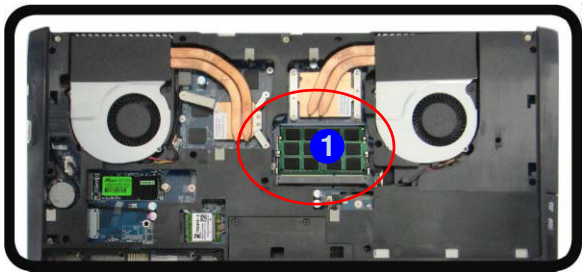
Removing the System Memory (RAM)

The computer has two memory sockets for 204 pin Small Outline Dual In-line Memory Modules (SO-DIMM) supporting DDR3L up to 1600 MHz. The main memory can be expanded up to 32GB. The total memory size is automatically detected by the POST routine once you turn on your computer.

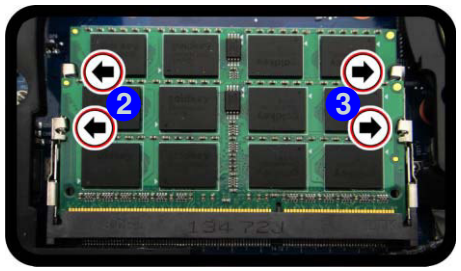
Memory Upgrade Process

1. Turn **off** the computer, remove the battery (*page 2 - 5*) and keyboard (*page 2 - 6*).
2. The RAM modules will be visible at point 1 on the mainboard (*Figure 9a*).
3. Gently pull the two release latches (2 & 3) on the sides of the memory socket in the direction indicated by the arrows (*Figure 9b*). The RAM module 4 will pop-up (*Figure 9c*), and you can then remove it.
4. Pull the latches to release the second module if necessary.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.
6. The module will only fit one way as defined by its pin alignment. Make sure the module is seated as far into the slot as it will go. DO NOT FORCE IT; it should fit without much pressure.
7. Press the module in and down towards the mainboard until the slot levers click into place to secure the module.
8. Replace the bottom cover and the screws (see *page 2 - 5*).
9. Restart the computer to allow the BIOS to register the new memory configuration as it starts up.

a.



b.



c.

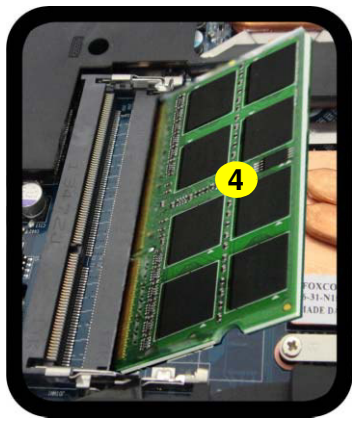


Figure 9
RAM Module Removal

a. The RAM modules will be visible at point 1 on the mainboard.
b. Pull the release latches.
c. Remove the module.

Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

4. RAM Module

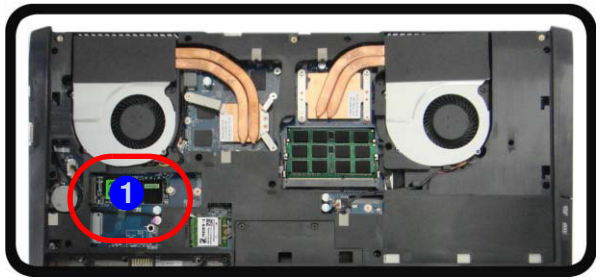
Figure 10
M.2 SSD Module Removal

a. Locate the M.2 SSD.
b. Remove the screw.
c. The M.2 SSD module will pop up.

Removing the M.2 SSD Module

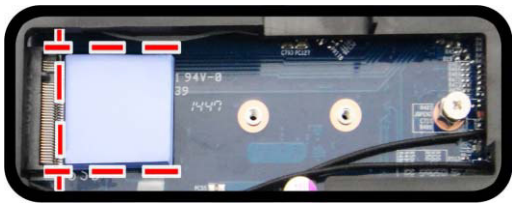
1. Turn **off** the computer, remove the battery (***page 2 - 5***), keyboard (***page 2 - 6***) and bottom case (***page 2 - 8***).
2. The M.2 SSD module will be visible at point 1 on the mainboard (***Figure 10a***).
3. Remove the screw 2 (***Figure 10b***)
4. The M.2 SSD module 3 (***Figure 10c***) will pop-up, and you can remove it from the computer.
5. Reverse the process to install a new SSD module (make sure that the thermal pad is in place as shown below).

a.



b.

c.



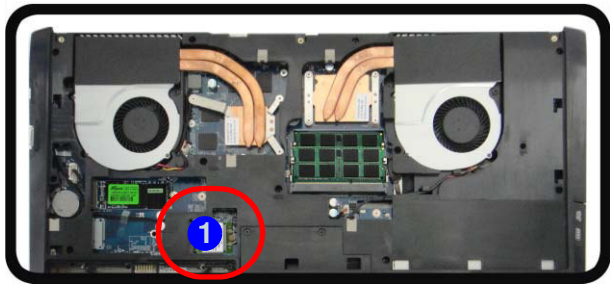
3.M2 SSD Module

- 1 Screw

Removing the Wireless LAN Module

1. Turn **off** the computer, remove the battery (*page 2 - 5*), keyboard (*page 2 - 6*) and bottom case (*page 2 - 8*).
2. The Wireless LAN module will be visible at point 1 on the mainboard (*Figure 11a*).
3. Carefully disconnect the cables 2 & 3, and then remove the screw 4 (*Figure 11b*)
4. The Wireless LAN module 5 (*Figure 11c*) will pop-up, and you can remove it from the computer.

a.



b.

c.

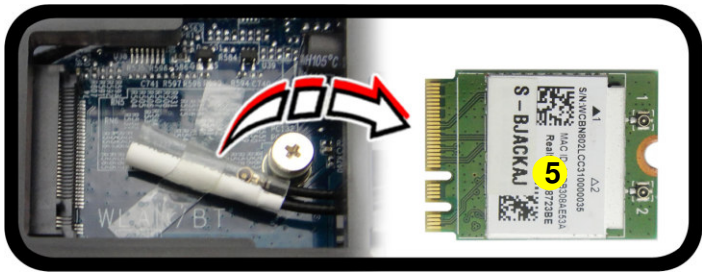


Figure 11
Wireless LAN Module Removal

a. Locate the WLAN.
b. Disconnect the cables and remove the screw.
c. The WLAN module will pop up.

Note: Make sure you reconnect the antenna cable to the "1 + 2" socket (*Figure 11b*).

5.Wireless LAN Module

- 1 Screw

Wireless LAN, & Combo Module Cables

Note that the cables for connecting to the antennae on WLAN, WLAN & Bluetooth Combo, 3G and LTE modules are not labelled. The cables/covers (each cable will have either a black or transparent cable cover) are color coded for identification as outlined in the table below.

Module Type	Antenna Type	Cable Color	Cable Cover Type
WLAN/WLAN & Bluetooth Combo	WM 1	Black	Transparent
	WM 2	Gray	
	WM 3	White	

Cable 1 is usually connected to antenna 1 (Main) on the module, and cable 2 to antenna 2 (Aux).