

9.2.6 Laptop Upgrade and Repair Facts

This lesson covers the following topics:

- Repair and upgrade considerations
- Laptop considerations

Repair and Upgrade Considerations

When upgrading or repairing laptop components, keep in mind the following considerations:

- To identify the source of problems on a notebook, plug in a known good external component. For example:
 - If the keyboard doesn't work, plug a keyboard into the USB or PS/2 slot.
 - If the video display doesn't work, connect an external monitor.

If the external device works but the internal device doesn't, then replace the internal device if the component is removable.
- Some notebook components are built into the motherboard and cannot be replaced without replacing the entire motherboard. In those cases, add a similar component using an external bus type (such as PC Card/PCMCIA, ExpressCard, or USB).
- An alternative to replacing failed components (because of cost) is to add external components. For example, you can use your notebook as a desktop computer by connecting an external monitor.
- Notebooks vary considerably in design and composition. Consult the documentation to find the location of screws and to identify installation sequences for accessing system components.
- Notebook parts are not as standardized as other PC components. In many cases, you will need to order from the manufacturer to get the correct part.
- Components with a high degree of standardization include the processor, memory, and internal hard drives.
- Before servicing a portable device, unplug it and remove any batteries.
- Plastic case components are sometimes screwed into place and sometimes snapped into place. For pieces of the case that snap into place, use a plastic tool to carefully pry the piece off.

Laptop Considerations

The following table lists several factors to consider when working with various components::

| Device | Considerations |
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| Hard Drive | <p>Internal hard drives are usually 2.5" or 3.5" in size.</p> <ul style="list-style-type: none"> Verify the interface type (SATA), speed, capacity, and RPM speed supported by the notebook before purchasing a replacement drive. Most hard drives are replaced by removing a cover on the bottom or side of the computer. Some disk drives are placed inside a caddy with a special connector. You will need this caddy when replacing the drive. |
| Memory | <p>Most notebooks use a small panel on the bottom to access the additional memory slots.</p> <ul style="list-style-type: none"> Some notebooks include a base amount of memory built onto the motherboard or a memory module soldered into the first memory slot. You will not be able to remove or upgrade this memory. Some notebooks have one memory slot located underneath the keyboard, and a second slot accessible through a door on the bottom of the case, or both slots are accessible from the bottom. The amount of base memory installed will affect the total amount of system memory you can have. |
| Keyboard | <p>When experiencing problems with the keyboard:</p> <ul style="list-style-type: none"> Cleaning the keyboard might correct stuck keys or keys that will not display a character when typed. If numbers type instead of letters (such as 1 for J, 2 for K, etc.), make sure that the Num Lock is turned off. If the keyboard doesn't work, you can connect an external keyboard to continue using the system until the keyboard is replaced. <p>When replacing the keyboard, be aware of the following:</p> <ul style="list-style-type: none"> You can replace the pointer stick pad by simply pulling off the old one and replacing it. Screws at the bottom of the notebook case or underneath a plastic bevel on the top hold the keyboard in place. A laptop keyboard is generally connected to the system board using a flat, ribbon-like cable. You will typically need to remove the keyboard to replace other internal components (such as the processor, wireless card, or video card). |
| Touchpad | <p>The touchpad takes the place of a mouse.</p> <ul style="list-style-type: none"> The most common problem for the touchpad is that the mouse cursor is not controlled properly based on where you press. In this case, recalibrate the touchpad. <ul style="list-style-type: none"> Some notebooks recalibrate the touchpad at every system boot. Reboot the computer, making sure not to press the touchpad during startup. |

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| | <ul style="list-style-type: none"> Most notebooks include a utility for calibrating the touchpad. Run the utility and follow the instructions to recalibrate. <p>A tablet PC with a touch screen might also need to be recalibrated periodically.</p> <ul style="list-style-type: none"> If you need to replace the touchpad, it is typically connected to the palm rest which is part of the inside case. You will need to remove the keyboard and the palm rest to replace the touchpad. |
| Wireless Network Card | <p>Wireless network cards might be integrated onto the motherboard, or added through add-on cards.</p> <ul style="list-style-type: none"> Mini-PCI or mini-PCIe slots are used to add devices such as a wireless card. Some card slots might be accessible through a panel on the bottom, or underneath the memory or the hard drive. Otherwise, you will typically need to remove the keyboard and the palm rest, or the rest of the case, to get at the expansion slots. Wireless cards require an antenna. Connectors on the card connect to the antenna, which is usually a wire routed into the lid and around the display. Be sure to reconnect both the antenna and keyboard connectors when reassembling. |
| Processor | <p>The processor is typically located underneath the keyboard.</p> <ul style="list-style-type: none"> Remove the keyboard to expose the processor. Some notebooks have processors soldered onto the motherboard. On these systems, you will not be able to upgrade or replace the processor. Because of the limited space in a notebook case, the processor uses a heat pipe to pull heat towards the side of the case where a small fan can vent the heat from the case. |
| LCD Display | <p>Multiple components make up the LCD display:</p> <ul style="list-style-type: none"> The <i>bezel</i> is the case in which the LCD is set. The backlight illuminates the LCD by evenly dispersing light over the entire screen. These backlights are usually cold cathode fluorescent lamps (CCFL) or LEDs. The <i>inverter</i> is a power supply for the LCD screen that converts the DC power used by the computer to AC power needed for the backlight. <p>An inverter is not used with LED backlights because LEDs use DC power.</p> <ul style="list-style-type: none"> The remainder of the LCD screen comes as a unit. The antenna for wireless network cards is typically housed in the display bezel. <p>When replacing video components:</p> <ul style="list-style-type: none"> You will need to remove the keyboard and any palm rests in order to remove the video card or the display components. Some video cards are integrated on the motherboard and cannot be replaced. If the video card can be replaced, you will need to disconnect the display wires first. Power cables run from your laptop to the LCD through the hinges that attach the LCD to the laptop. If these cables become bent or frayed, they can cause your LCD to lose power or display. To remove the display assembly, remove the screws holding the lid that are typically located beneath the keyboard or a plastic cover above the keyboard. Unplug the video cables and the wireless antenna or other device cables. To access the inverter, backlight, or other display components, remove the screws in the bezel. These screws are typically underneath rubber pads that keep the lid from hitting the palm rests. When replacing the video card or LCD components, be sure to reconnect the wireless network antenna when reassembling. |