

# Lenovo V155-15API

## Hardware Maintenance Manual



**Note:**

- Before using this information and the product it supports, be sure to read the general information under “Notices” on page 73.

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## About this manual

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This manual contains service and reference information for the following Lenovo product:

**Lenovo V155-15API**

Use this manual to troubleshoot problems.

The manual is divided into the following sections:

- The common sections provide general information, guidelines, and safety information required for servicing computers.
- The product-specific section includes service, reference, and product-specific parts information.

**Important:**

This manual is intended only for trained servicers who are familiar with Lenovo products. Use this manual to troubleshoot problems effectively.

Before servicing a Lenovo product, make sure to read all the information under “Safety information” on page 1 and “Important service information” on page 16.

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## **Safety information**

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This chapter presents the following safety information that you need to get familiar with before you service a Lenovo V155-15API computer:

- “General safety” on page 2
- “Electrical safety” on page 3
- “Safety inspection guide” on page 5
- “Handling devices that are sensitive to electrostatic discharge” on page 6
- “Grounding requirements” on page 6
- “Safety notices: multilingual translations” on page 7
- “Laser compliance statement” on page 14



## General safety

Follow these rules below to ensure general safety:

- Observe a good housekeeping in the area where the machines are put during and after the maintenance.
- When lifting any heavy object:
  1. Make sure that you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift it.
  4. Lift it by standing or pushing up with your leg muscles; this action could avoid the strain from the muscles in your back. Do not attempt to lift any object that weighs more than 16 kg (35 lb) or that you think is too heavy for you.
- Do not perform any action that causes hazards to the customer, or that makes the machine unsafe.
- Before you start the machine, make sure that other service representatives and the customer are not in a hazardous position.
- Please remove covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your toolcase away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of the machine. Make sure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with the nonconductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

**Attention:** Metal objects are good electrical conductors.
- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that may be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.
- Fan louvers on the machine help to prevent the overheating of internal components. Do not obstruct fan louvers or cover them with labels or stickers.

## Electrical safety

Observe the following rules when working on electrical equipments.

### Important:

Use only approved tools and test equipments. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have rubber floor mats near their machines that contain small conductive fibers to decrease electrostatic discharges. Do not use such kind of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near the equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine, and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.
 

**Attention:** Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
 

**Attention:** An electrical shock can occur only when there is a complete circuit. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; instructions for these precautions are in the safety sections of maintenance information. Be extremely careful when you measure the high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- Never assume that power has been disconnected from a circuit. First, check it to make sure that it has been powered off.



- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generatorsand similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Caution: do not become a victim yourself.
  - Switch off the power.
  - Send the victim to get medical aid.

## **Safety inspection guide**

The purpose of this inspection guide is to assist you in identifying potential unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service personnel from injury. This guide addresses only those items. You should use good judgment to identify potential safety hazards according to the attachment of non-Lenovo features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock)
- Explosive hazards, such as a damaged CRT face or a bulging capacitor
- Mechanical hazards, such as loose or missing hardware

To determine whether there are any potential unsafe conditions, use the following checklist at the beginning of every service task. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the computer. Disconnect the power cord.
3. Check the power cord for:
  - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
  - b. The power cord should be the type specified in the parts list.
  - c. Insulation must not be frayed or worn.
4. Check for cracked or bulging batteries.
5. Remove the cover.
6. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
7. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables.
9. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.



## Handling devices that are sensitive to electrostatic discharge

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

### Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

### Note:

The use of a grounding system to guard against ESD damage is desirable but not necessary.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- When working on a double-insulated or battery-operated system, use an ESD common ground or reference point. You can use coax or connector-outside shells on these systems.
- Use the round ground prong of the ac plug on ac-operated computers.

## Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.



## Safety notices: multilingual translations

The safety notices in this section are provided in English, French, German, Hebrew, Italian, Japanese, and Spanish.

### Safety notice 1

Before the computer is powered on after FRU replacement, make sure all screws, springs, and other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical shorts.

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder-splitter können Kurzschlüsse erzeugen.

לפני הפעלת המחשב לאחר החלפת FRU יש לוודא שכל הברגים, הקפיצים, וחלקים קטנים אחרים נמצאים במקומם ואינם חופשיים לזוז בתוך המחשב. כדי לוודא זאת, יש לטלטל את המחשב ולהקשיב לגילוי קולות שקשוק. חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.

Prima di accendere l'elaboratore dopo che é stata effettuata la sostituzione di una FRU, accertarsi che tutte le viti, le molle e tutte le altre parti di piccole dimensioni siano nella corretta posizione e non siano sparse all'interno dell'elaboratore. Verificare ciò scuotendo l'elaboratore e prestando attenzione ad eventuali rumori; eventuali parti o pezzetti metallici possono provocare cortocircuiti pericolosi.

FRU の交換後、コンピュータの電源を入れる前に、ねじ、バネ、その他の小さな部品がすべて正しい位置にあり、またコンピュータの内部で緩んでいないことを確認してください。これを確認するには、コンピュータを振って、カチャカチャと音がしないか確かめます。金属部品や金属破片はショートの原因になることがあります。

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

**Safety notice 2****⚠ DANGER**

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble a standby battery, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts-oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

סוללות המתנה מסוימות מכילות כמויות קטנות של ניקל וקדמיום, אין לפקק סוללות המתנה, לטעון אותה מחדש, להשליך אותה לאש או למים או לקצר אותה. יש לשלוק את הסוללה בנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המומינה ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

予備バッテリーの中には少量のニッケルとカドミウムが含まれているものがあります。したがって、予備バッテリーの分解、再充電、火または水の中への投棄、またはショートさせることは決して行わないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

### Safety notice 3

#### DANGER

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

מאזר הסוללה מכיל כמות קטנה של ניקל  
וקדמיום. אין לפרק את מאזר הסוללה, להשליך  
אותו לאש או למים או לקצר אותו. יש לסלק את  
מאזר הסוללה כנדרש על ידי התקנות  
והחוקים המקומיים. יש להשתמש רק בסוללה  
המופיעה ברשימת החלקים המותאימה בזמן החלפת  
מאזר הסוללה. שימוש בסוללה לא מתאימה עלול  
לגרום להצתה או התפוצצות של הסוללה.

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell'acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

バッテリー・パックには少量のニッケルが含まれています。バッテリー・パックを分解したり、火または水の中に投げ込んだり、ショートさせないでください。バッテリー・パックの廃棄にあたっては、地方自治体の条例または規則に従ってください。バッテリー・パックを交換するときは、適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

## Safety notice 4

### DANGER

The lithium battery can cause a fire, an explosion, or a severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une température supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systembatterie ist eine Lithiumbatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

סוללת הליתיום עלולה לגרום לשריפה, להתפוצצות או לכוויות קשות. אין לטעון אותה מחדש, לשלוק את המחבר המקוטב שלה, למרק אותה או לחמם אותה לטמפרטורה העולה על 100 מעלות צלזיוס. אין לשרוף את הסוללה ואין לחשוף את תוכן התא למים. יש לשלוק את הסוללה כנדרש בתקנות ובחוקים המקומיים. יש להשתמש רק בסוללה המומלצת ברשימת החלקים המתאימים. שימוש בסוללה אחרת עלול לגרום לסכנת שריפה או התפוצצות.

La batteria di supporto è una batteria al litio e può incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

リチウム・バッテリーは、火災、爆発、または重症のやけどを引き起こすことがあります。バックアップ・バッテリーの充電、その極性コネクタの取り外し、バッテリー本体の分解、100℃(212°F)以上の加熱、焼却、電池の中身を水に浸すことはしないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinerar ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

### Safety notice 5

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water at least for 15 minutes. Seek medical care if any symptoms caused by the fluid are present after washing.

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

אם מסך הנגיש הנוזלי (LCD) נשבר והנוזל מתוך המסך בא במגע עם עיניכם או ידיכם, שטפו את האזורים הנגועים מיד במים במשך 15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים הנובעים מהמגע עם הנוזל נמשכים לאחר השטיפה.

Nel caso che caso l'LCD si dovesse rompere ed il liquido in esso contenuto entrasse in contatto con gli occhi o le mani, lavare immediatamente le parti interessate con acqua corrente per almeno 15 minuti; poi consultare un medico se i sintomi dovessero permanere.

LCD が破損し、LCD の中の液体が目に入ったり、手に触れたりした場合は、液体が触れた部分を少なくとも 15 分間洗い流してください。洗い流した後に、液体によって何らかの症状が現れた場合は、医師の治療を受けてください。

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún síntoma del fluido despues de lavarse.

### Safety notice 6

#### DANGER

To avoid shock, do not remove the plastic cover that protects the lower part of the inverter card.

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק המגן על חלקו התחתון של הכרטיס ההפוך.

Per evitare scosse elettriche, non rimuovere la copertura in plastica che avvolge la parte inferiore della scheda invertitore.

感電を防ぐため、インバーター・カードの下部を保護しているプラスチック・カバーを外さないでください。

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

### Safety notice 7

#### DANGER

Though the main batteries have low voltage, a shorted or grounded battery can produce enough current to burn personnel or combustible materials.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

אף שהסוללות הראשיות הן בעלות מתח נמוך, יכולה מקוצרת או מוארקות עלולה להפיק זרם מספיק לגרימת כוויות או להצתת חומרים דליקים.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

メイン・バッテリーの電圧は低くても、ショートしたり、接地したバッテリーが、作業者にやけどを負わせたり、可燃物を燃やすだけの電流を発生させる場合があります。

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

### Safety notice 8

#### DANGER

Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

לפני סילוק FRU כלשהו, יש לכבות את המחשב, לנתק את כל כבלי החשמל משקעי החשמל, להוציא את מארז הסוללה, ואת לנתק כבלי חיבור אחרים אם יש כאלה.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

FRUを取り外す前に、ThinkPadの電源を切って、すべての電源コードをコンセントから外してください。次に、バッテリー・パックを外し、相互接続ケーブルを外してください。

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

## Laser compliance statement

Some models of Lenovo computer are equipped from the factory with an optical storage device such as a CD-ROM drive or a DVD-ROM drive. Such devices are also sold separately as options. If one of these drives is installed, it is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

If a CD-ROM drive, a DVD-ROM drive, or another laser device is installed, note the following:

### CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.

凡未在这里指明的任何控制用法、调整、行为，都会导致严重后果。

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.

Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.

Az itt előírt eljárásokról, beállításokról és vezérlésekről eltérni a lézersugárzás veszélye miatt kockázatos!

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a.

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrol, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

本書で指定された内容以外の、お客様による整備、調整、または手順を行った場合、レーザー光の放射の危険があります。

El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.

Opening the CD-ROM drive, the DVD-ROM drive, or any other optical storage device could result in exposure to hazardous laser radiation. There are no serviceable parts inside those drives. **Do not open.**



A CD-ROM drive, a DVD-ROM drive, or any other storage device installed may contain an embedded Class 3A or Class 3B laser diode. Note the following:

** DANGER**

Emits visible and invisible laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.

开启时会有激光发射时，请勿直视激光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.

Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.

Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést!

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Keď je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehládte priamo s optickými nástrojmi do lúča a vyhnite sa priamemu vystaveniu lúčov.

開けるとレーザー光が放射されます。光線を見つめたり、光学機械を使って直接見たりしないでください。

Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.



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## Important service information

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This chapter presents the following important service information:

- “Strategy for replacing FRU” on page 16
  - “Strategy for replacing a hard disk drive” on page 17
  - “Important notice for replacing a system board” on page 17
- “Important information about replacing RoHS compliant FRU” on page 18

### **Important:**

BIOS and device driver fixes are customer-installable. The BIOS and device drivers are posted on the customer support site:

<http://support.lenovo.com>.

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## Strategy for replacing FRU

### **Before replacing parts:**

Make sure that all software fixes, drivers, and BIOS downloads are installed before replacing any FRU listed in this manual.

After a system board is replaced, ensure that the latest BIOS is loaded to the system board before completing the service action.

To download software fixes, drivers, and BIOS, follow the steps below:

1. Go to <http://support.lenovo.com>.
2. Enter the serial number or select a product or use Lenovo smart downloading.
3. Select the BIOS/Driver/Applications and download.
4. Follow the directions on the screen and install the necessary software.

Use the following strategy to prevent unnecessary expense for replacing and servicing FRU:

- If you are instructed to replace an FRU, but the replacement does not solve the problem, reinstall the original FRU before you continue.
- Some computers have both a processor board and a system board. If you are instructed to replace either of them, and replacing one of them does not solve the problem, reinstall that board, and then replace the other one.
- If an adapter or a device consists of more than one FRU, any of the FRU may be the cause of the error. Before replacing the adapter or device, remove the FRU one by one to see if the symptoms change. Replace only the FRU that changed the symptoms.

**Attention:** The setup configuration on the computer you are servicing may have been customized. Running Automatic Configuration may alter the settings. Note the current configuration settings (using the View Configuration option); then, when service has been completed, verify that those settings remain in effect.

## **Strategy for replacing a hard disk drive**

Always try to run a low-level format before replacing a hard disk drive. This will cause all customer data on the hard disk to be lost. Make sure that the customer has a current backup of the data before performing this action.

**Attention:** The drive startup sequence in the computer you are servicing may have been changed. Be extremely careful during write operations such as copying, saving, or formatting. If you select an incorrect drive, data or programs can be overwritten.

## **Important notice for replacing a system board**

Some components mounted on a system board are very sensitive. Improper handling can cause damage to those components, and may cause a system malfunction.

**Attention:** When handling a system board:

- Do not drop the system board or apply any excessive force to it.
- Avoid rough handling of any kind.
- Avoid bending the system board and hard pushing to prevent cracking at each BGA (Ball Grid Array) chipset.



## Important information about replacing RoHS compliant FRU

**RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC)** is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the original FRU parts are non-compliant, replacement parts can also be non-compliant. In all cases if the original FRU parts are RoHS compliant, the replacement part must also be RoHS compliant.

**Note:** RoHS and non-RoHS FRU part numbers with the same fit and function are identified with unique FRU part numbers.

Lenovo plans to transit to RoHS compliance well before the implementation date and expects its suppliers to be ready to support Lenovo's requirements and schedule in the EU. Products sold in 2005 and 2006 might contain RoHS compliant FRU. The following statement pertains to these products and any product Lenovo produces containing RoHS compliant FRU.

RoHS compliant FRUs have unique FRU part numbers. Before or after the RoHS implementation date, failed RoHS compliant parts must always be replaced with RoHS compliant ones, so only the FRU identified as compliant in the system HMM or direct substitutions for the FRU may be used.

| Products marketed before June 2006 |                 | Products marketed after June 2006 |                 |
|------------------------------------|-----------------|-----------------------------------|-----------------|
| Current or original part           | Replacement FRU | Current or original part          | Replacement FRU |
| Non-RoHS                           | Can be Non-RoHS | Must be RoHS                      | Must be RoHS    |
| Non-RoHS                           | Can be RoHS     |                                   |                 |
| Non-RoHS                           | Can sub to RoHS |                                   |                 |
| RoHS                               | Must be RoHS    |                                   |                 |

**Note:** A direct substitution is a part with a different FRU part number that is automatically shipped by the distribution center at the time of the order.

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## General checkout

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This chapter presents the following information:

- “What to do first” on page 20
- “Power system checkout” on page 21

Before you go to the checkout, make sure to read the following important notes:

**Important notes:**

- **Only certified trained personnel can service the computer.**
- **Before replacing any FRU, read the entire page on removing and replacing FRU.**
- **Carefully remove screws for reuse when replacing FRU.**
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace an FRU only with another FRU of the correct model.** When you replace an FRU, make sure that the machine model and the FRU part number are correct by referring to the FRU parts list.
- **An FRU should not be replaced just because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. Consider replacing an FRU only when a problem recurs. If you suspect that an FRU is defective, clear the error logs and run the test again. If the error does not recur, do not replace the FRU.
- **Be careful not to replace a nondefective FRU.**



## What to do first

When you do return an FRU, you must include the following information in the parts exchange form or parts return form that you attach to it:

1. Name and phone number of servicer
2. Date of service
3. Date on which the machine failed
4. Date of purchase
5. Procedure index and page number in which the failing FRU was detected
6. Failing FRU name and part number
7. Machine type, model number, and serial number
8. Customer's name and address

**Note for warranty:** During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer.

The following is a list of some common items that are not covered under warranty and some symptoms that might indicate that the system was subjected to stress beyond normal use.

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following list:

### **The following are not covered under warranty:**

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic parts
- Plastic parts, latches, pins, or connectors that have been cracked or broken by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card or the installation of an incompatible card
- Improper disk insertion or use of an optical drive
- Diskette drive damage caused by pressure on the diskette drive cover, foreign material in the drive, or the insertion of a diskette with multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer unusable)
- Sticky keys caused by spilling a liquid onto the keyboard
- Use of an incorrect AC adapter on laptop products

### **The following symptoms might indicate damage caused by nonwarranted activities:**

- Missing parts might be a symptom of unauthorized service or modification.
- If the spindle of a hard disk drive becomes noisy, it may have been subjected to excessive force, or dropped.

## Power system checkout

To verify a symptom, follow the steps below:

1. Turn off the computer.
2. Remove the battery pack.
3. Connect the AC adapter.
4. Make sure that power is supplied when you turn on the computer.
5. Turn off the computer.
6. Disconnect the AC adapter and install the charged battery pack.
7. Make sure that the battery pack supplies power when you turn on the computer.

If you suspect a power problem, see the appropriate one of the following power supply checkouts:

- “Checking the AC adapter” on page 21
- “Checking operational charging” on page 21
- “Checking the battery pack” on page 22

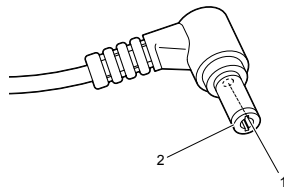
### Checking the AC adapter

You are here because the computer fails only when the AC adapter is used.

- If the power-on indicator does not turn on, check the power cord of the AC adapter for correct continuity and installation.
- If the computer does not charge during operation, go to “Checking operational charging”.

To check the AC adapter, follow the steps below:

1. Unplug the AC adapter cable from the computer.
2. Measure the output voltage at the plug of the AC adapter cable. See the following figure:



| Pin | Voltage (V DC) |
|-----|----------------|
| 1   | +20            |
| 2   | 0              |

**Note:** Output voltage for the AC adapter pin No. 2 may differ from the one you are servicing.

3. If the voltage is not correct, replace the AC adapter.
4. If the voltage is acceptable, do the following:
  - Replace the system board.
  - If the problem persists, go to “Lenovo V155-15API” on page 27.

**Note:** Noise from the AC adapter does not always indicate a defect.



## Checking operational charging

To check whether the battery charges properly during operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator or icon does not light on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator or icon is still off, replace the battery pack.

If the charge indicator still does not light on, replace the system board. Then reinstall the battery pack. If it is still not charged, go to the next section.

## Checking the battery pack

Battery charging does not start until the Power Meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check your battery, move your cursor to the Power Meter icon in the icon tray of the Windows® taskbar and wait for a moment (but do not click it), and the percentage of battery power remaining is displayed. To get detailed information about the battery, double-click the Power Meter icon.

**Note:** If the battery pack becomes hot, it may not be able to be charged. Remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall and recharge it.



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## Related service information

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This chapter presents the following information:

- “Restoring the factory contents by using OneKey Recovery” on page 23
- “Passwords” on page 24
- “Power management” on page 25

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## Restoring the factory contents by using OneKey Recovery

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### Restore of factory default

The Lenovo V155-15API computers come with pre-installed OneKey Recovery System. In order to save application files and the initial backed up files of the system, the hard disk in a Lenovo computer includes a hidden partition when it is shipped. If you need to restore the system to the point of your first boot up, just enter Lenovo OneKey Recovery System and run **System Recovery**. For details of OneKey Recovery System, see the User Guide for Lenovo OneKey Recovery system.

**Note:** This will delete all the new data on the system partition (C drive), which is not recoverable. Make sure to back up your critical data before you perform this action.

When you use the recovery discs to boot your computer, the system will enter the user interface for system recovery automatically. Please follow the prompt to insert the backup discs to complete the whole recovery process.

**Note:** The recovery process might take up to 2 hours.



## Passwords

As many as three passwords may be needed for any Lenovo computer: the power-on password (POP), the hard disk password (HDP), and the administrator password.

If any of these passwords has been set, a prompt for it appears on the screen whenever the computer is turned on. The computer does not start until the password is entered.

### Power-on password

A power-on password (POP) protects the system from being powered on by an unauthorized person. The password must be entered before an operating system can be booted.

### Hard-disk password

There are two hard-disk passwords (HDPs):

- + User HDP - for the user

- + Master HDP - for the system administrator, who can use it to get access to the hard disk drive even if the user has changed the user HDP

Attention: If the user HDP has been forgotten, check whether a master HDP has been set. If it has, it can be used for access to the hard disk drive. If no master HDP is available, neither Lenovo nor Lenovo authorized service technicians provide any services to reset either the user or the master HDP, or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

### Administrator password

Administrator password controls the access of the whole setup utility. Only after the Administrator password has been set can the User password be set. If Administrator password was cleared, the User password was cleared too.

## Power management

**Note:** Power management modes are not supported for APM operating system.

To reduce power consumption, the computer has three power management modes: screen blank, sleep (standby), and hibernation.

### Screen blank state

If the time set on the “Turn off monitor” timer in the operating system expires, the LCD backlight turns off. You can also turn off the LCD backlight by pressing .

To end screen blank state and resume normal operation, press any key on the keyboard.

### Putting the computer to sleep or shutting it down

When you have finished working with your computer, you can put it to sleep or shut it down.

### Putting your computer to sleep

If you will be away from your computer for only a short time, put the computer to sleep.

When the computer is in sleep mode, you can quickly wake it to resume use, bypassing the startup process.

To put the computer to sleep, do one of the following:

- Close the display lid.
- Press and hold the Power key for about 1 to 5 seconds.
- Move the cursor to the lower-left corner, and then select the Start button.  
Select **Power**  → **Sleep**.

**Note:** Put your computer to sleep before you move it. Moving your computer while the hard disk drive is spinning can damage the hard disk, causing loss of data.

To wake up the computer, perform the following:

- Press any key on the keyboard.

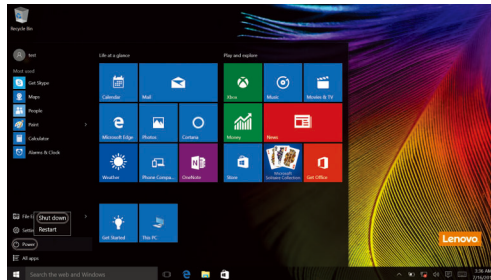


## Shutting down the computer

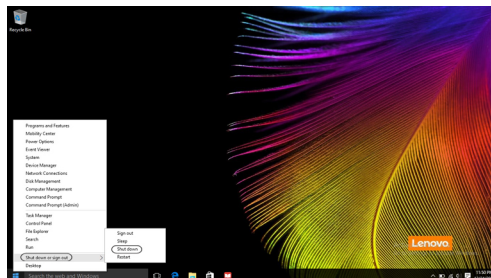
If you are not going to use your computer for a long time, shut it down.

To shut down your computer, do one of the following:

- Move the cursor to the lower-left corner, and then select the Start button. Select **Power**  → **Shut down**.



- Right-click or press the Start button in the lower-left corner and select **Shut down or sign out** → **Shut down**.



## Lenovo V155-15API

This chapter presents the following product-specific service references and product-specific parts information:

- “Specifications” on page 27
- “Status indicators” on page 29
- “Hotkeys” on page 30
- “FRU replacement notices” on page 31
- “Removing and replacing an FRU” on page 32
- “Locations” on page 66
- “Parts list” on page 68

### Specifications

The following table lists the specifications of the V155-15API:

*Table 1. Specifications*

| Form Factor                                                                                                                                                                                                                                       |                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Dimensions                                                                                                                                                                                                                                        | Approximately 363 mm × 254.6 mm × 22.9 mm |
| Weight                                                                                                                                                                                                                                            | Approximately 2.2 kg with battery         |
| LCD size                                                                                                                                                                                                                                          | 15.6-inch                                 |
| Processor                                                                                                                                                                                                                                         |                                           |
| See the system properties of your computer, you can do this as follows:<br>Click <b>Control Panel</b> , then click <b>Hardware and Sound</b> , click <b>Device Manager</b> under <b>Devices and Printers</b> and double click <b>Processors</b> . |                                           |
| Memory                                                                                                                                                                                                                                            |                                           |
| Type and speed                                                                                                                                                                                                                                    | On board x 1 + DIMM x 1, 2400MHz          |
| Maximum supported capacity                                                                                                                                                                                                                        | 16 GB                                     |
| SSD                                                                                                                                                                                                                                               |                                           |
| Interface                                                                                                                                                                                                                                         | 2.5-inch SATA/PCIe                        |
| Hard disk drive                                                                                                                                                                                                                                   |                                           |
| Form factor                                                                                                                                                                                                                                       | 2.5-inch, 7 mm                            |
| Capacity                                                                                                                                                                                                                                          | SSD + HDD                                 |
| Interface                                                                                                                                                                                                                                         | SATA                                      |



|                                                                                                                                                                                                                                        |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Optical Drive</b>                                                                                                                                                                                                                   |                                             |
| Form factor                                                                                                                                                                                                                            | 9.0 mm                                      |
| Type                                                                                                                                                                                                                                   | Writer                                      |
| <b>Display</b>                                                                                                                                                                                                                         |                                             |
| Display resolution (LCD)                                                                                                                                                                                                               | 1366 × 768 pixels HD/1920 × 1080 pixels FHD |
| LCD backlight                                                                                                                                                                                                                          | LED                                         |
| <b>I/O Ports</b>                                                                                                                                                                                                                       |                                             |
| USB                                                                                                                                                                                                                                    | USB 3.1 connector Gen1 × 2                  |
| Audio                                                                                                                                                                                                                                  | Combo audio jack × 1                        |
| Video/Audio                                                                                                                                                                                                                            | HDMI slot × 1                               |
| Ethernet                                                                                                                                                                                                                               | RJ-45 × 1                                   |
| <b>Battery pack</b>                                                                                                                                                                                                                    |                                             |
| Type                                                                                                                                                                                                                                   | Polymer                                     |
| Cells/Capacity                                                                                                                                                                                                                         | 3 Cell, 36 Wh                               |
| <b>Note:</b> The capacity given here is the typical or average capacity as measured in a specific test environment. Capacities measured in other environments may differ but are no lower than the rated capacity (see product label). |                                             |
| <b>AC power adapter</b>                                                                                                                                                                                                                |                                             |
| Input                                                                                                                                                                                                                                  | 100-240 V, 50-60 Hz                         |
| Output voltage                                                                                                                                                                                                                         | 20 V DC                                     |
| Power                                                                                                                                                                                                                                  | 65 W                                        |
| <b>Miscellaneous</b>                                                                                                                                                                                                                   |                                             |
| Camera                                                                                                                                                                                                                                 | 0.3 M/HD                                    |
| Security                                                                                                                                                                                                                               | Kensington slot × 1                         |

Status indicators

The system status indicators below show the computer status:

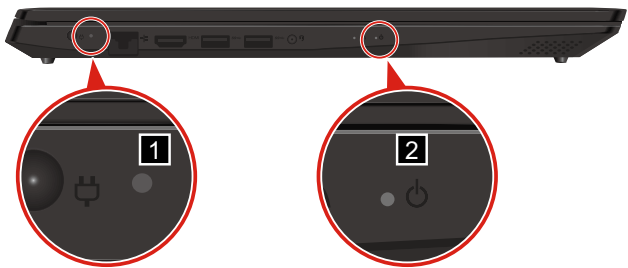


Table 2. Status indicators

| AC power adapter status | Indicator status | Meaning                                                       |
|-------------------------|------------------|---------------------------------------------------------------|
| Disconnected            | Off              | The computer is not connected to ac power.                    |
|                         | Amber            | The battery has between 1% and 90% charge and still charging. |
| Connected               | White            | The battery has between 91% and 100% charge.                  |

| Indicator              | Indicator status    | Meaning                                      |
|------------------------|---------------------|----------------------------------------------|
| Power status indicator | On (solid white)    | The computer is on (battery power 21%-100%). |
|                        | Fast blinking white | The computer is on (battery power 1%-20%).   |
|                        | Slow blinking white | The computer is in sleep mode.               |
|                        | Off                 | The computer is off or in hibernation mode.. |



## Hotkeys

You can access certain system settings quickly by pressing the appropriate hotkeys.

Table 3. Hotkeys

|                                                                                   |                                             |                                                                                   |                                                                 |
|-----------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|
|  | : Mute/unmute sound.                        |  | : Turn on/off airplane mode.                                    |
|  | : Decrease system volume.                   |  | : Enable/Disable the integrated camera.                         |
|  | : Increase system volume.                   |  | : Lock/Unlock the LCD screen.                                   |
|  | : Enable/Disable the integrated microphone. |  | : Enable the external projector or dangle the external display. |
|  | : Refresh page.                             |  | : Decrease display brightness.                                  |
|  | : Enable/Disable the touchpad.              |  | : Increase display brightness.                                  |



## FRU replacement notices

This section presents notices related to removing and replacing parts. Read this section carefully before replacing any FRU.

### Screw notices

Loose screws can cause a reliability problem. In the Lenovo computer, this problem is addressed with special nylon-coated screws that have the following characteristics:

- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They are harder to tighten.
- Each one should be used only once.

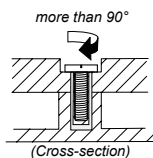
Do the following when you service this machine:

- Keep the screw kit in your tool bag.
- Carefully remove screws for reuse when replacing FRU.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

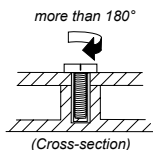
- **Plastic to plastic**

Turn an additional 90° after the screw head touches the surface of the plastic part:



- **Logic card to plastic**

Turn an additional 180° after the screw head touches the surface of the logic card:



- **Torque driver**

If you have a torque screwdriver, refer to the "Torque" column for each step.

- Make sure that you use the correct screws. If you have a torque screwdriver, tighten all screws firmly to the torque shown in the table. **Carefully remove screws for reuse when replacing FRU. Make sure that all screws are tightened firmly.**
- Ensure torque screwdrivers are calibrated correctly following country specifications.



## Removing and replacing an FRU

This section presents exploded figures with the instructions to indicate how to remove and replace the FRU. Make sure to observe the following general rules:

1. Do not attempt to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. Before replacing any FRU, review "FRU replacement notices" on page 31.
3. Begin by removing any FRUs that have to be removed before the failing FRU. Any of such FRU are listed at the top of the page. Remove them in the order in which they are listed.
4. Follow the correct sequence in the steps to remove the FRU, as given in the figures by the numbers in square callouts.
5. When turning a screw to replace an FRU, turn it in the direction as given by the arrow in the figure.
6. When removing the FRU, move it in the direction as given by the arrow in the figure.
7. To put the new FRU in place, reverse the removal procedures and follow any of the notes that pertain to replacement. For information about connecting and arranging internal cables, see "Locations" on page 66.
8. When replacing an FRU, use the correct screw as shown in the procedures.

### DANGER

Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any of the interconnecting cables.

**Attention:** After replacing an FRU, do not turn on the computer until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the computer. Verify this by shaking the computer gently and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

**Attention:** The system board is sensitive to, and can be damaged by, electrostatic discharge. Before touching it, establish personal grounding by touching a ground point with one hand or using an electrostatic discharge (ESD) strap (P/N 6405959) to remove potential shock reasons.

1010 Optical drive

- Step 1: Remove the screw 1.
- Step 2: Pull the optical drive out in the direction shown by arrow 2.

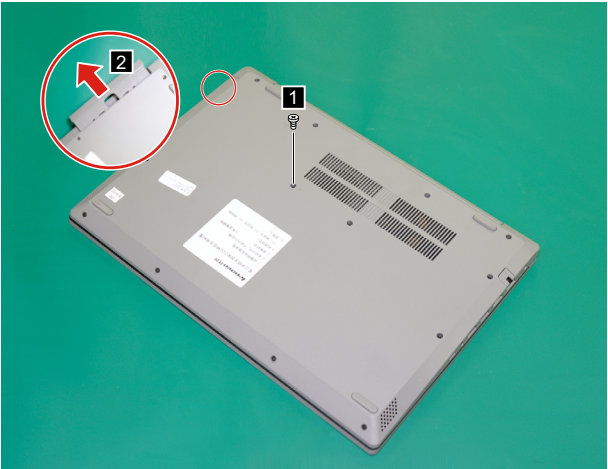


Figure 1. Remove the optical drive

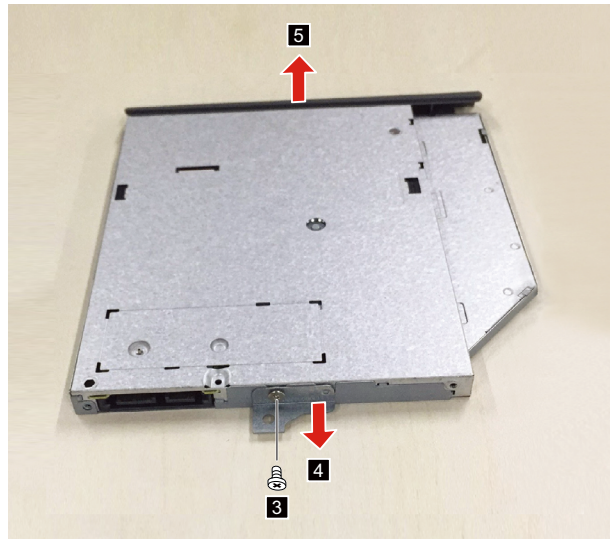
| Step | Screw (quantity)                             | Color            | Torque           |
|------|----------------------------------------------|------------------|------------------|
| 1    | M2.5 × 7 mm, Phillips head, nylok-coated (1) | Black/<br>Silver | 3.0+/-0.3 kgf/cm |



*Figure 1. Removal steps of optical drive (continued)*

Step 3: Remove the screw 3.

Step 4: Carefully remove the optical drive bracket and bezel in the directions shown by arrows 4 and 5.



*Figure 2. Remove the optical drive bracket and bezel*

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 3    | M2 × 3 mm, Phillips head, nylok-coated (1) | Black | 1.85+/-0.15 kgf/cm |

1020 Base cover

- For access, remove this FRU:
- “1010 Optical drive” on page 33

Step 1: Remove the screws 1.

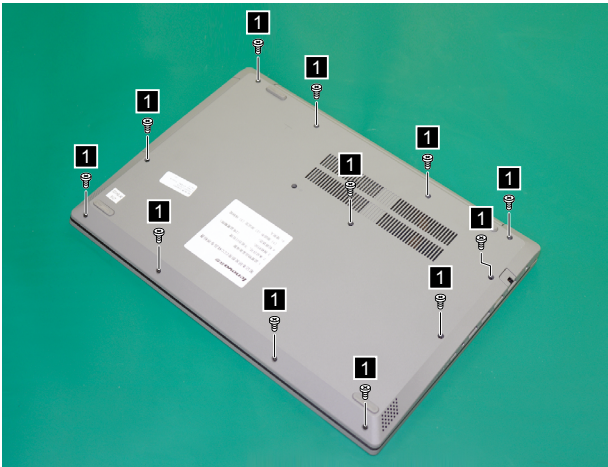


Figure 3. Remove the screws

| Step | Screw (quantity)                              | Color            | Torque           |
|------|-----------------------------------------------|------------------|------------------|
| 1    | M2.5 × 7 mm, Phillips-head, nylok-coated (12) | Black/<br>Silver | 3.0+/-0.3 kgf/cm |



Step 2: Remove the base cover in the directions shown by arrows 2 and 3.

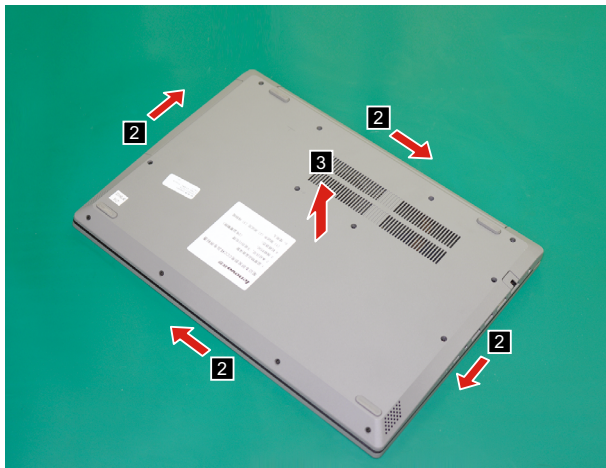


Figure 4. Remove the base cover

**Note: Applying labels to the base cover**

The new base cover FRU is shipped with a kit containing labels of several kinds. When you replace the base cover, you need to apply the following labels:

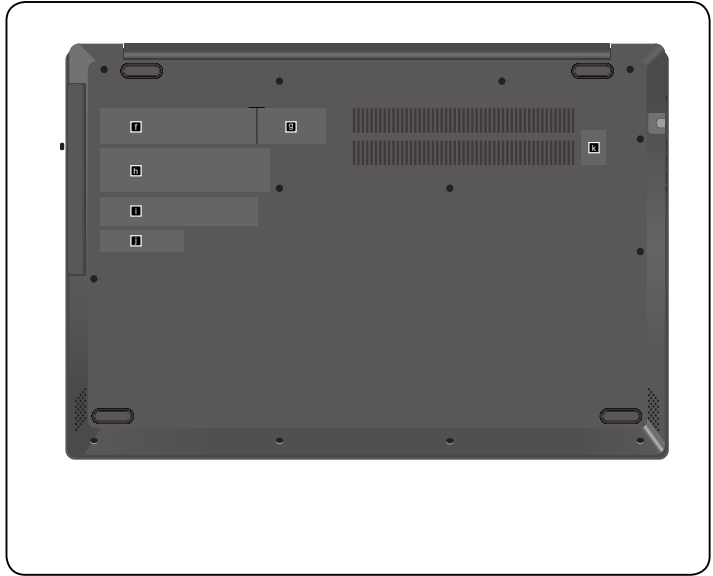
The following labels need to be peeled off from the old base cover and put on the new base cover.

- a** QR label
- b** Intel label/AMD label
- c** VGA label
- d** ES label
- e** Palmrest label 65 × 20mm
- f** Rating label 66 × 24mm
- g** Rating label for Print 43 × 24mm
- h** Country label
- i** Adapter label 65 × 20mm
- j** WL/BT label 35 × 15mm
- k** OS label 16 × 22.5mm

For some models, you also need to apply one or two FCC labels. Check the old base cover; if it has one or two FCC labels, find duplicates of them in the label kit and apply them to the new base cover.

For the location of each label, refer to the following figures:







## 1030 Hard disk drive

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35

**Attention:**

- **Do not drop the hard disk drive or apply any physical shock to it.** The hard disk drive is sensitive to physical shock. Improper handling can cause damage and permanent loss of data.
- Before removing the drive, suggest the customer to backup all the information on it if possible.
- Never remove the drive while the system is operating or in suspend mode.

Step 1: Remove the screws 1.

Step 2: Detach the HDD board connector in the direction shown by arrow 2.

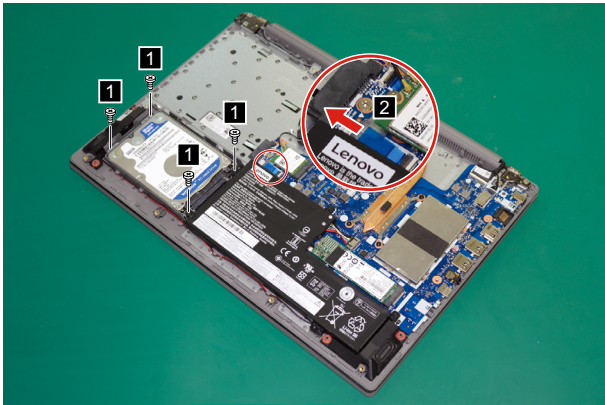


Figure 5. Remove the screws and detach the HDD board connector

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 1    | M2 × 6 mm, Phillips-head, nylok-coated (4) | Black | 1.85+/-0.15 kgf/cm |



- Step 3: Remove the hard disk drive from the slot in the direction shown by arrow 3.

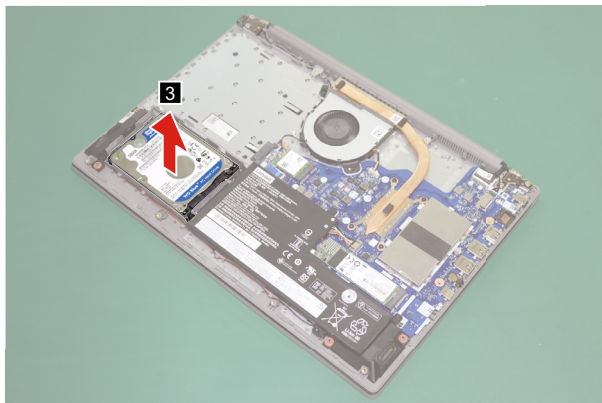


Figure 6. Remove the hard disk drive

- Step 4: Remove the screws 4.
- Step 5: Detach the bracket from the hard disk drive in the direction shown by arrow 5.

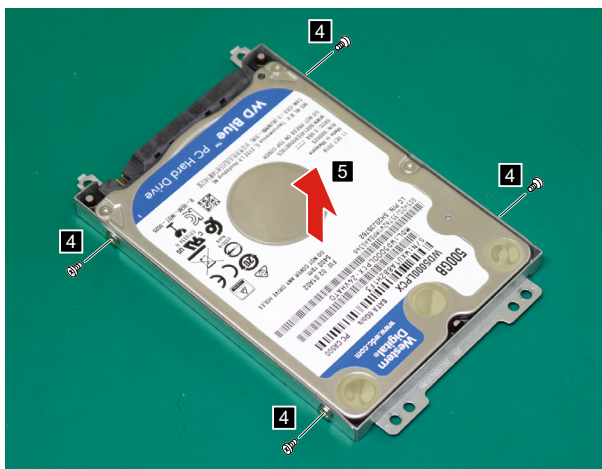


Figure 7. Remove the screws and detach the HDD bracket

**When installing:** Make sure that the HDD connector is attached firmly.

## 1040 Battery pack

**⚠ DANGER**

Only use the battery specified in the parts list for your computer. Any other battery could ignite or explode.

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35

- Step 1: Detach the battery pack connector in the direction shown by arrow 1.
- Step 2: Remove the screws 2.

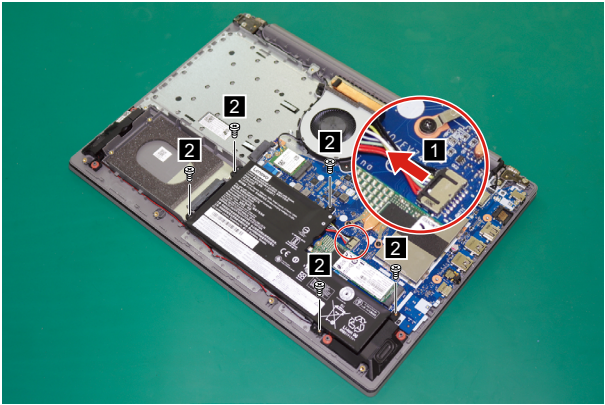


Figure 8. Detach the battery pack connector and remove the screws

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 2    | M2 × 6 mm, Phillips-head, nylok-coated (5) | Black | 1.85+/-0.15 kgf/cm |



Step 3: Remove the battery pack in the direction shown by arrow 3.

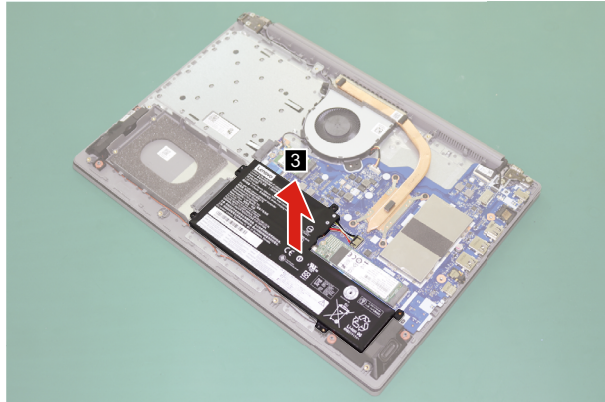


Figure 9. Remove the battery pack

## 1050 SSD card

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1040 Battery pack” on page 41

**Attention:**

- **Do not drop the SSD card or apply any physical shock to it.** The SSD card is sensitive to physical shock. Improper handling can cause damage and permanent loss of data.
- Before removing the SSD card, suggest the customer to backup all the information on it if possible.
- Never remove the SSD card while the system is operating or in suspend mode.

Step 1: Remove the screw 1.

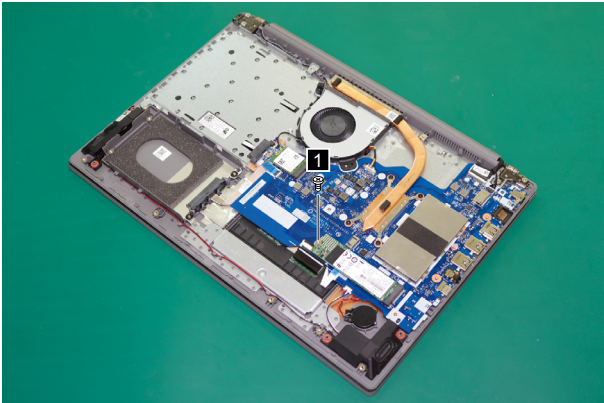


Figure 10. Remove the screw

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 1    | M2 × 6 mm, Phillips-head, nylok-coated (1) | Black | 1.85+/-0.15 kgf/cm |



Step 2: Remove the SSD card from the slot in the direction shown by arrow 2.

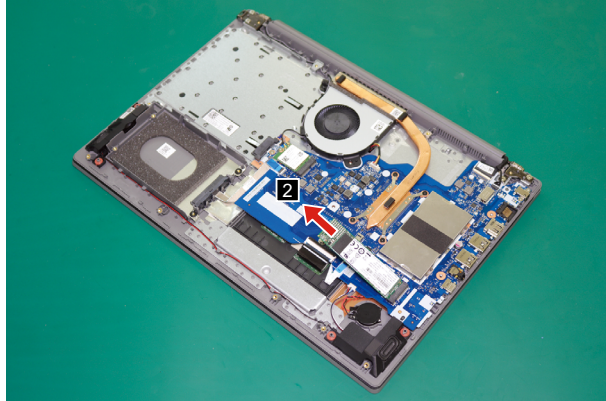


Figure 11. Remove the SSD card

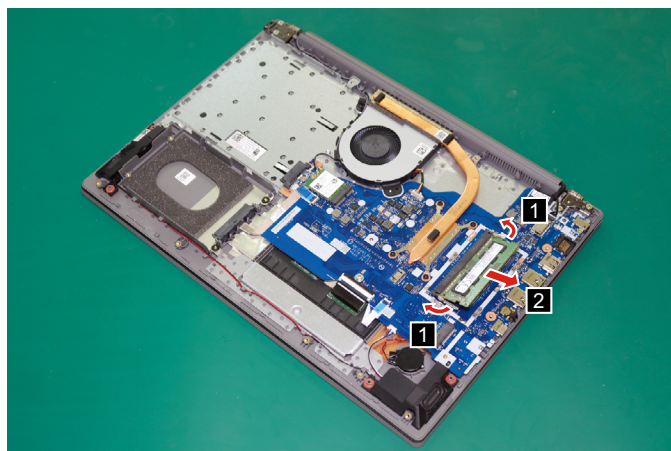
## 1060 DIMM

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1040 Battery pack” on page 41

Step 1: Release the two latches on both edges of the socket at the same time in the directions shown by arrows 1.

Step 2: Unplug the DIMM in the direction shown by arrow 2.



*Figure 12. Release the latches and unplug the DIMM*





## 1070 PCI Express Mini Card for wireless LAN

For access, remove the FRU in following order::

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1040 Battery pack” on page 41

### Important:

The preinstalled WLAN module may only be replaced with a Lenovo approved module in order to comply with FCC and IC regulations. Refer to Table 4 “Parts list—Overall” on page 69 for Lenovo part numbers for the approved modules.

- Step 1: Disconnect the two wireless LAN cables (black, gray) 1.
- Step 2: Remove the screw 2.

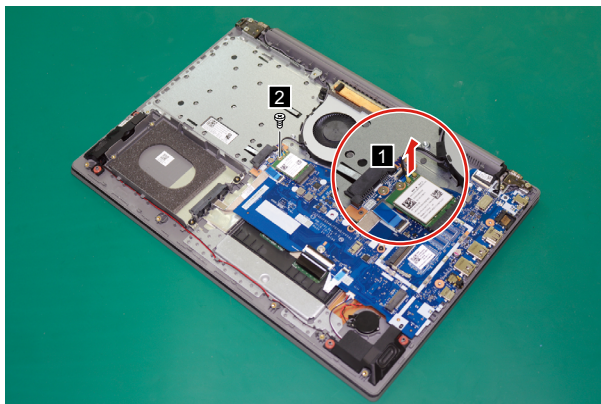


Figure 13. Disconnect the two wireless LAN cables and remove the screw

In step 1, unplug the jacks by using the removal tool antenna RF connector (P/N: 08K7159), or pick up the connectors with your fingers and gently unplug them in the direction shown by the arrows.

**Notes:** The wireless LAN card has 2 cables in step 1.

The wireless LAN card in some models might have 3 cables in step 1.

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 2    | M2 × 3 mm, Phillips-head, nylok-coated (1) | Black | 1.85+/-0.15 kgf/cm |



Step 3: Remove the card in the direction shown by arrow 3.

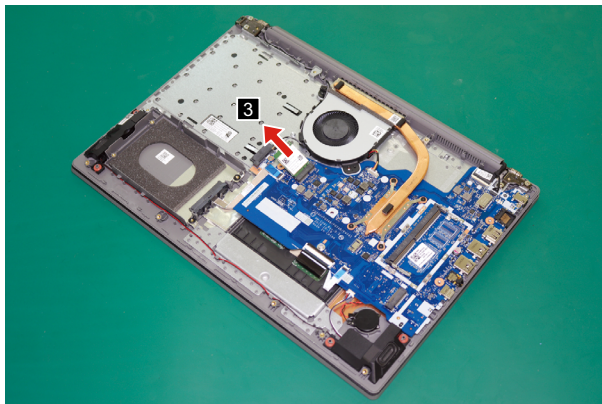


Figure 14. Remove the PCI Express mini card

**When installing:**

- In models with a wireless LAN card that has two antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **MAIN**, and the grey cable (2nd) (AUX) into the jack labeled **AUX** on the card.
- In models with a wireless LAN card that has three antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **1**, the grey cable (3rd) into the jack labeled **3**, and the white cable (2nd) (AUX) into the jack labeled **2** on the card.



## 1080 Fan assembly and Heat Sink assembly

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1040 Battery pack” on page 41
- “1070 PCI Express Mini Card for wireless LAN” on page 46

Step 1: Release the cables from the cable guides in the direction shown by arrows 1.



*Figure 15. Release the antenna cables*

**When installing:** Route the antenna cables along the cable guides. As you route the cables, make sure that they are not subjected to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.

- Step 2: Unplug the fan connector in the direction shown by arrow 2.
- Step 3: Remove the screw 3.

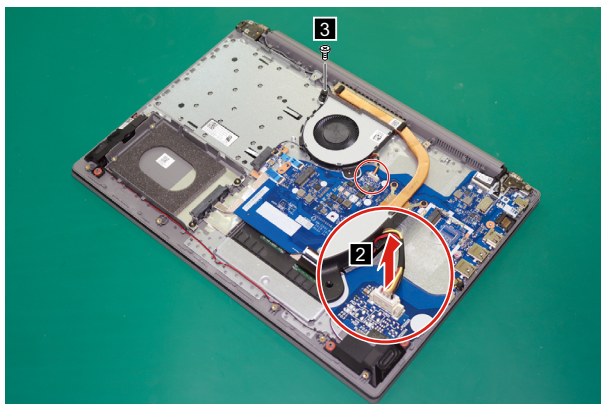


Figure 16. Unplug the fan connector and remove the screw

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 3    | M2 × 6 mm, Phillips head, nylok-coated (1) | Black | 1.85+/-0.15 kgf/cm |

**When installing:** Make sure that the connector is attached firmly.

- Step 4: Remove the fan in the direction shown by arrow 4. Be careful not to damage the connector.

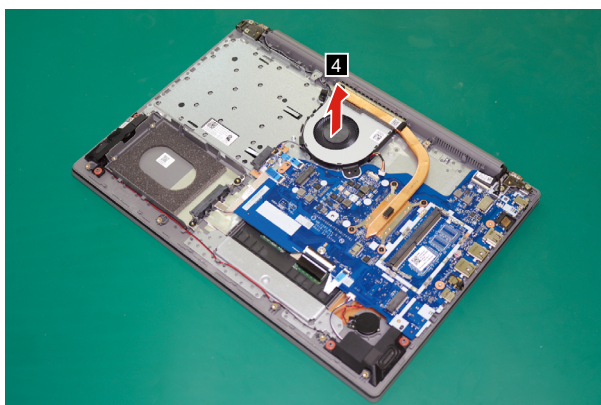


Figure 17. Remove the fan



Step 5: Remove the screws 5.

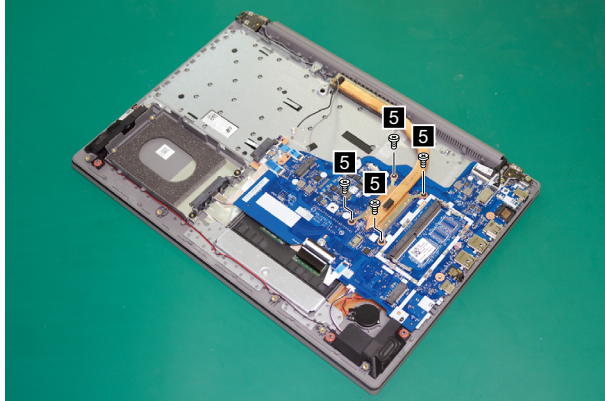


Figure 18. Remove the screws

Step 6: Lift the heat sink in the direction shown by arrows 6.

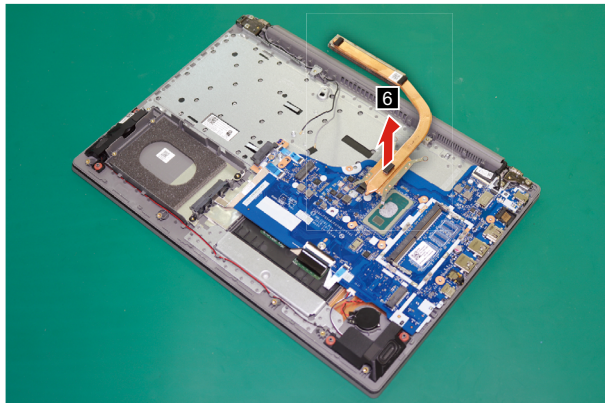
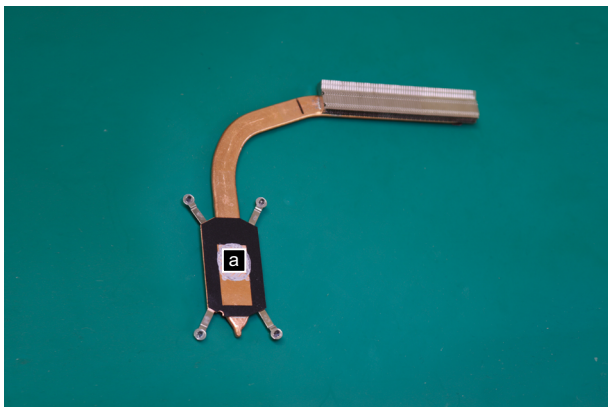


Figure 19. Remove the hest sink



*Figure 20. Heat sink*

**When installing:** Before you attach the fan assembly to the computer, apply thermal grease, at an amount of 0.2 grams, to the **a** part shown in the figure above. Either too much or too little grease application can cause a thermal problem due to imperfect contact with a component.



## 1090 System board

### Important notices for handling the system board:

When handling the system board, bear the following in mind.

- Be careful not to drop the system board on a bench top that has a hard surface, such as metal, wood, or composite.
- Avoid rough handling of any kind.
- During the whole process, make sure not to drop or stack the system board.
- If you put a system board down, make sure to put it only on a padded surface such as an ESD mat or conductive corrugated material.

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1050 SSD card” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48

**Step 1:** Disconnect the connectors in the directions shown by arrows 1.

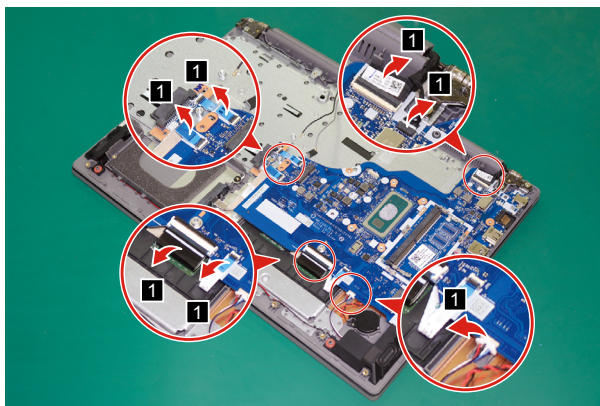


Figure 21. Disconnect the connectors

Step 2: Remove the screws 2.

Step 3: Remove the system board in the direction shown by arrow 3.

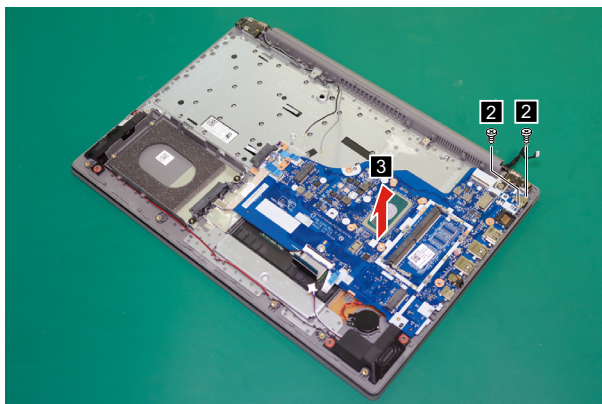


Figure 22. Remove the system board

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 2    | M2 × 3 mm, Phillips-head, nylok-coated (2) | Black | 1.85+/-0.15 kgf/cm |





## 1100 ODD transfer board and backup battery

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1050 SSD card” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48
- “1090 System board” on page 52

Step 1: Remove the screw 1.

Step 2: Remove the ODD transfer board in the direction shown by arrow 2.

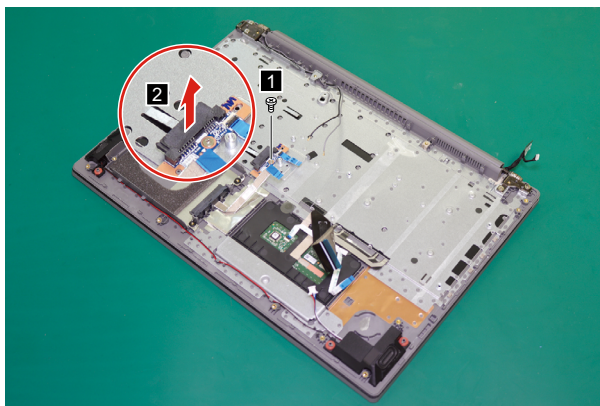


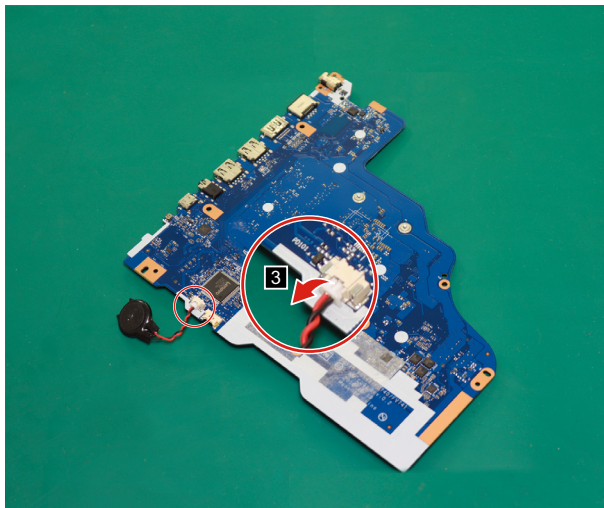
Figure 23. Remove the ODD transfer board

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 1    | M2 × 3 mm, Phillips-head, nylok-coated (1) | Black | 1.85+/-0.15 kgf/cm |

**When installing:** Make sure that the connectors are attached firmly.



- Step 3: Unplug the backup battery connector in the direction shown by arrow 3.



*Figure 24. Remove the backup battery*

**When installing:** Make sure that the connector is attached firmly.



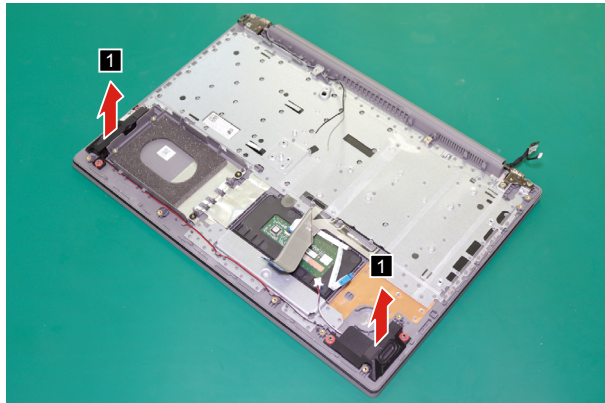
## 1110 Speakers

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1040 Battery pack” on page 41

Step 1: Unplug the speaker connector.

Step 2: Remove the speakers 1.



*Figure 25. Remove the speakers*

**When installing:** Make sure that the connector is attached firmly.

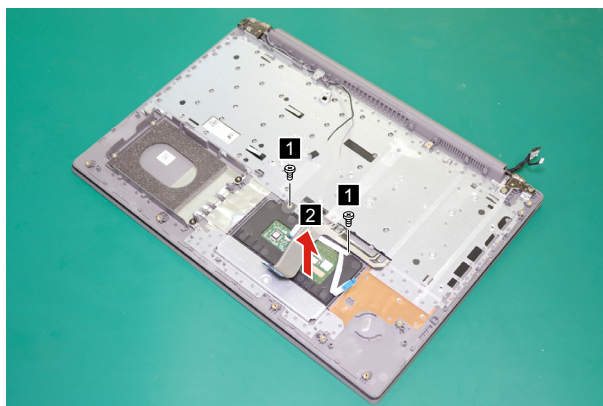
## 1120 Touchpad

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1050 SSD card” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48
- “1090 System board” on page 52
- “1100 ODD transfer board and backup battery” on page 54

Step 1: Remove the screws 1.

Step 2: Detach the touchpad in the direction shown by arrow 2.



*Figure 26. Remove the screws and detach the touchpad*

**When installing:** Make sure that the connector is attached firmly.



## 1130 Upper case

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48
- “1090 System board” on page 52
- “1100 ODD transfer board and backup battery” on page 54
- “1110 Speakers” on page 56
- “1120 Touchpad” on page 57

Step 1: Remove the screws 1.

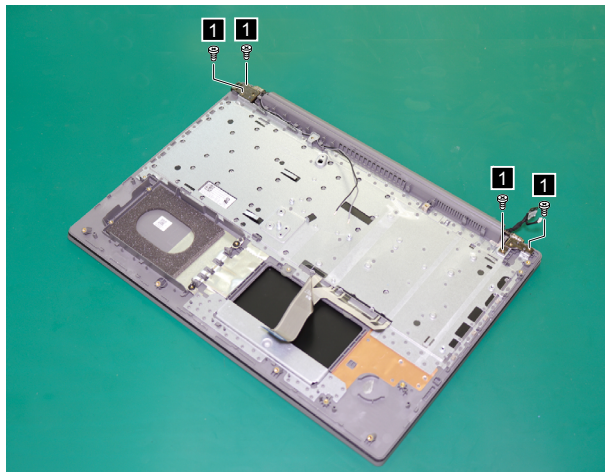
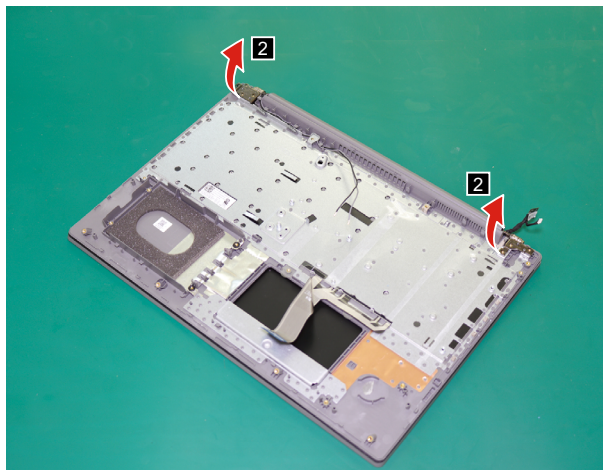


Figure 27. Remove the screws

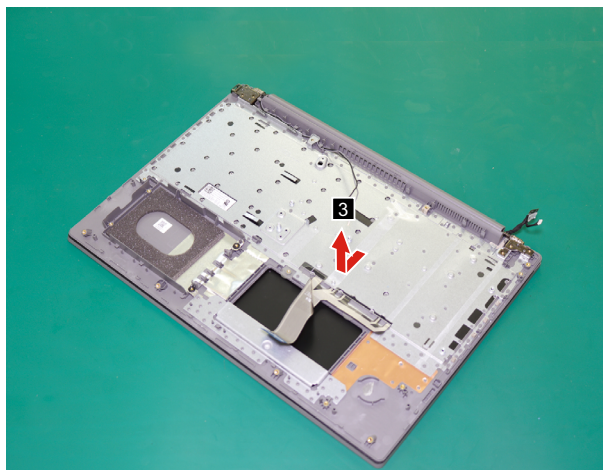
| Step | Screw (quantity)                             | Color  | Torque          |
|------|----------------------------------------------|--------|-----------------|
| 1    | M2.5 × 5 mm, Phillips-head, nylok-coated (4) | Silver | 3 +/-0.3 kgf/cm |

Step 2: Open the hinge in the direction shown by arrows 2.



*Figure 28. Open the hinge*

Step 3: Remove the upper case from the LCD module in the directions shown by arrow 3.



*Figure 29. Remove the uppercase*



## 1140 LCD unit

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1050 SSD card” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48
- “1090 System board” on page 52
- “1100 ODD transfer board and backup battery” on page 54
- “1110 Speakers” on page 56
- “1120 Touchpad” on page 57
- “1130 Upper case” on page 58

Step 1: Pull the hinge cap in the direction shown by arrow 1 to release the hooks.

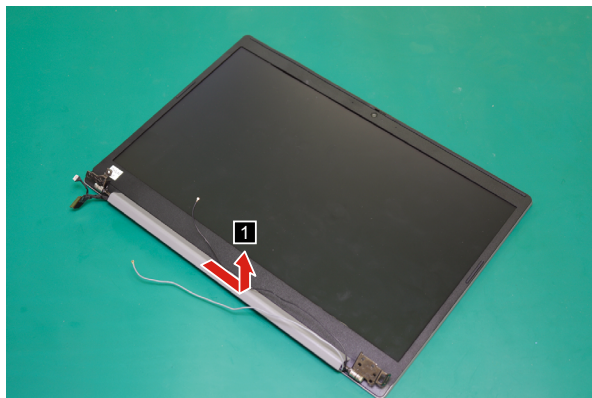


Figure 30. Remove the hinge cap

Step 2: Remove the LCD front bezel in the direction shown by arrows 2.

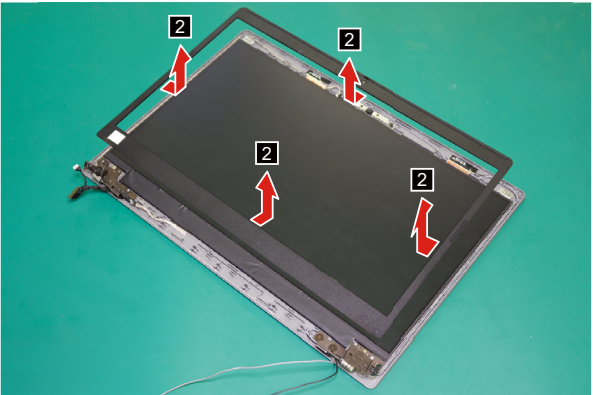


Figure 31. Remove the LCD front bezel

- Step 3: Remove the screws 3.
- Step 4: Lift the LCD module slightly 4.
- Step 5: Disconnect the connector in the direction shown by arrow 5.
- Step 6: Remove the LCD module.

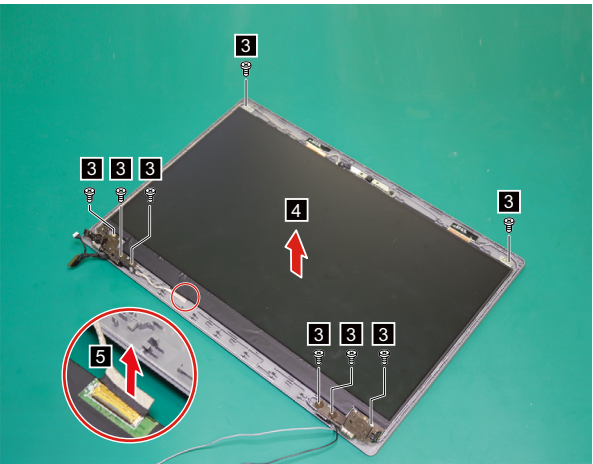


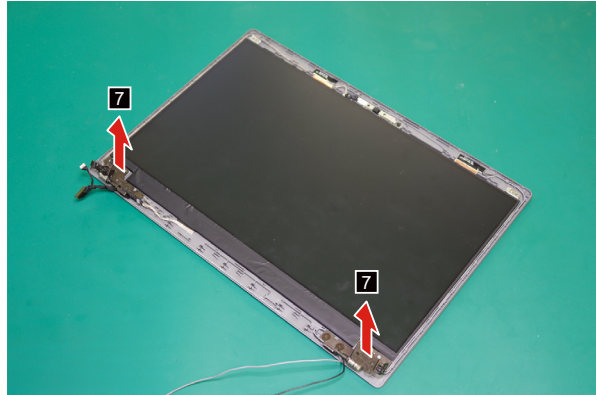
Figure 32. Remove the screws and LCD module connector

| Step | Screw (quantity)                           | Color | Torque             |
|------|--------------------------------------------|-------|--------------------|
| 3    | M2 × 3 mm, Phillips-head, nylok-coated (8) | Black | 1.85+/-0.15 kgf/cm |



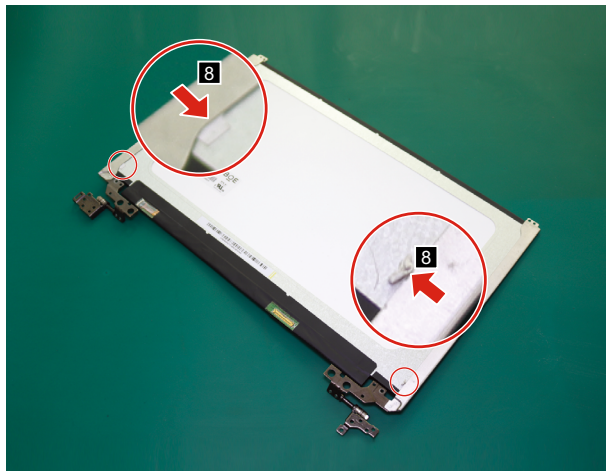


Step 7: Remove the LCD hinges in the direction shown by arrows 7.



*Figure 33. Remove the LCD hinges*

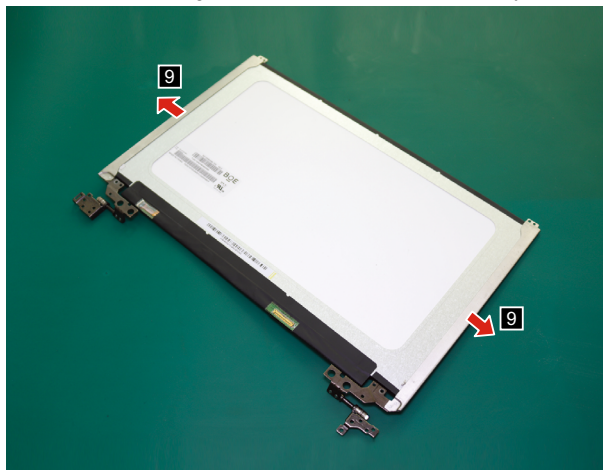
Step 8: Pull out the adhesive tapes in the direction shown by arrows 8.



*Figure 34. Pull out the adhesive tapes securing the hinge modules*



Step 9: Remove the hinge modules in the direction shown by arrow 9.



*Figure 35. Remove the hinge modules*

**When installing:** Make sure that the connector is attached firmly and that you do not pinch the antenna cables when you attach the LCD assembly. Route the LCD cable along the cable guides.



## 1150 Integrated camera and antenna assembly

For access, remove the FRU in following order:

- “1010 Optical drive” on page 33
- “1020 Base cover” on page 35
- “1030 Hard disk drive” on page 39
- “1040 Battery pack” on page 41
- “1050 SSD card” on page 43
- “1060 DIMM” on page 45
- “1070 PCI Express Mini Card for wireless LAN” on page 46
- “1080 Fan assembly and Heat Sink assembly” on page 48
- “1090 System board” on page 52
- “1100 ODD transfer board and backup battery” on page 54
- “1110 Speakers” on page 56
- “1120 Touchpad” on page 57
- “1130 Upper case” on page 58
- “1140 LCD unit” on page 60

Step 1: Detach the camera connector in the direction shown by arrow 1.

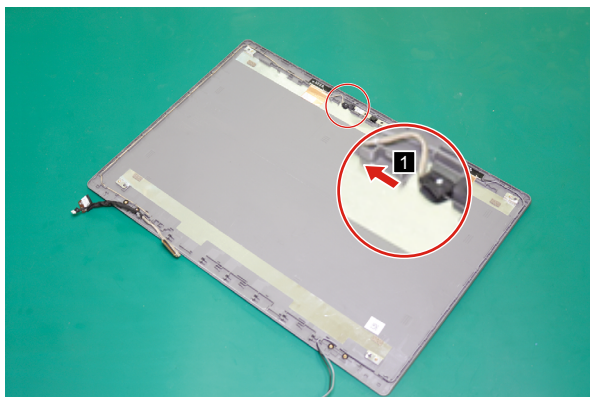


Figure 36. Detach the camera connector

**Note:** The integrated camera is stuck on the top center of the LCD cover.

Step 2: Remove the integrated camera in the direction shown by arrow 2.

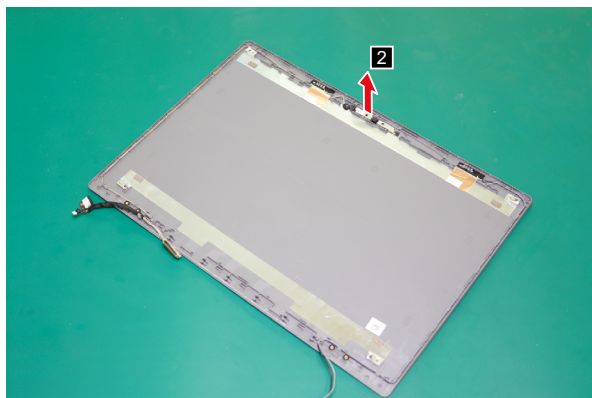


Figure 37. Remove the integrated camera

**When installing:** Stick the integrated camera to the top center of the LCD cover and adjust its placement to make sure the connector is attached firmly.

Step 3: Peel off the adhesive tape securing the antenna boards.

Step 4: Release the cables from the cable guide.

Step 5: Remove the antenna assembly in the direction shown by arrows 3.

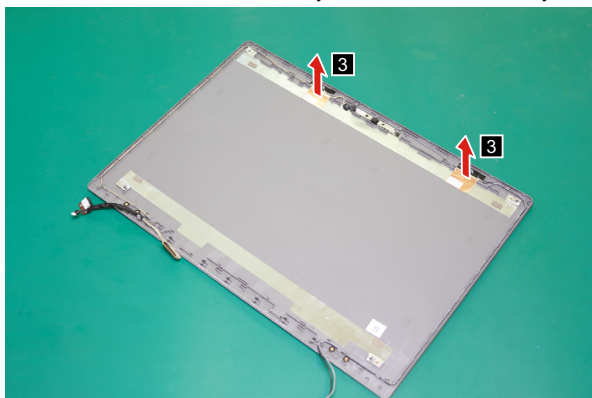


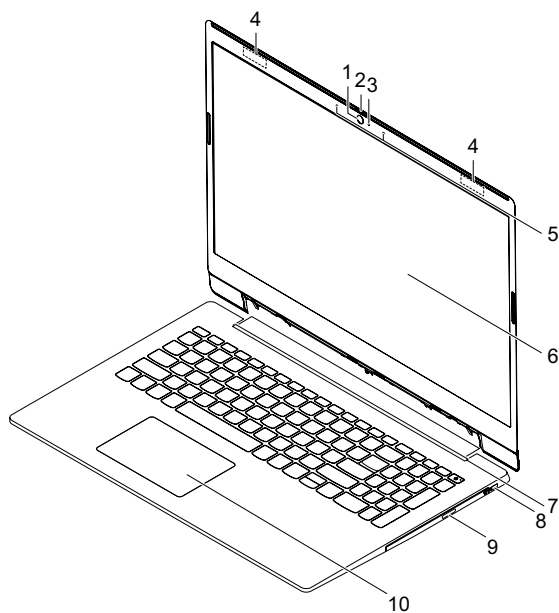
Figure 38. Remove the antenna assembly



## Locations

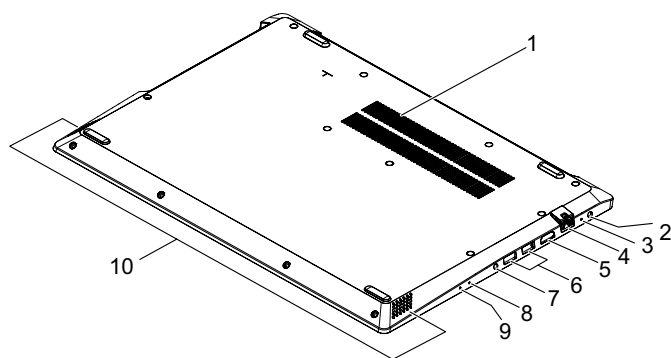
### Front view and right-side view

- 1 Camera
- 2 Shutter
- 3 Camera indicator
- 4 Wireless LAN/Bluetooth antennas
- 5 Microphones
- 6 Screen
- 7 Ventilation slots
- 8 Mini-security slot
- 9 CD/DVD drive
- 10 Touchpad



## Bottom and Left-side view

- 1 Ventilation slots
- 2 Power connector
- 3 Battery/Charging status indicator
- 4 Ethernet connector
- 5 HDMI™ connector
- 6 USB 3.1 connectors Gen 1
- 7 Audio connector
- 8 Novo button
- 9 Power LED
- 10 Speakers





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## Parts list

This section presents the following service parts:

- “Overall” on page 69
- “LCD FRUs” on page 71

**Note:**

Each FRU is available for all types or models, unless specific types or models are specified.

**Attention:**

**Do not attempt to replace an FRU on your own. If an FRU is damaged, contact a Lenovo authorized servicer or a marketing representative for replacement or repair. Only qualified technicians can inspect or repair this product.**

## Overall

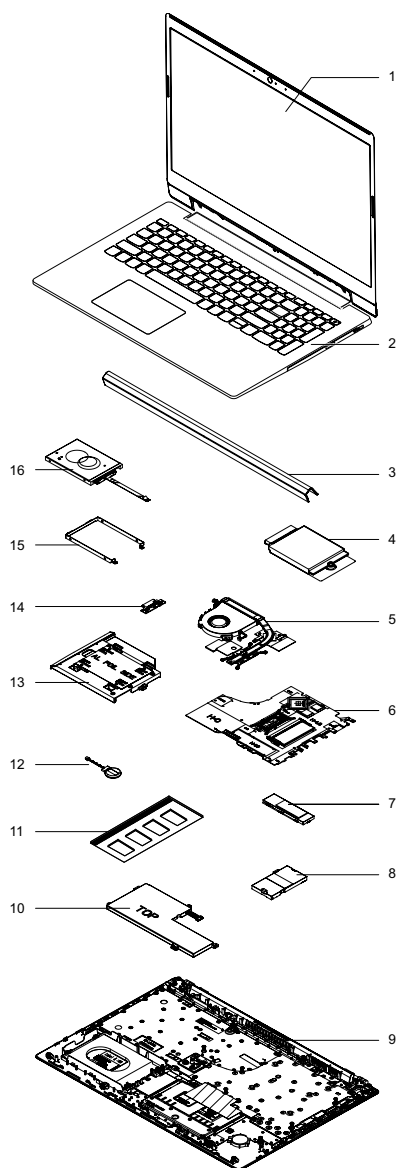




Table 4. FRU (CRU) category

| No. | FRU (CRU) category                    | Self-service CRU | Optional-service CRU |
|-----|---------------------------------------|------------------|----------------------|
| 1   | LCD unit (see "LCD FRUs" on page 71). | No               | No                   |
| 2   | Uppercase                             | No               | No                   |
| 3   | Hinge cap                             | No               | No                   |
| 4   | Wi-Fi card                            | No               | No                   |
| 5   | Fan and heat sink                     | No               | No                   |
| 6   | System board                          | No               | No                   |
| 7   | SSD                                   | No               | No                   |
| 8   | Memory module cover                   | No               | No                   |
| 9   | Lowercase                             | No               | No                   |
| 10  | Battery                               | No               | No                   |
| 11  | Memory module                         | No               | No                   |
| 12  | CMOS battery                          | No               | No                   |
| 13  | ODD                                   | Yes              | No                   |
| 14  | ODD transfer board                    | No               | No                   |
| 15  | HDD bracket                           | No               | No                   |
| 16  | HDD                                   | No               | No                   |



## LCD FRUs

In Lenovo V155-15API, there is following type of LCD.

- “15.6-in. HD LED”

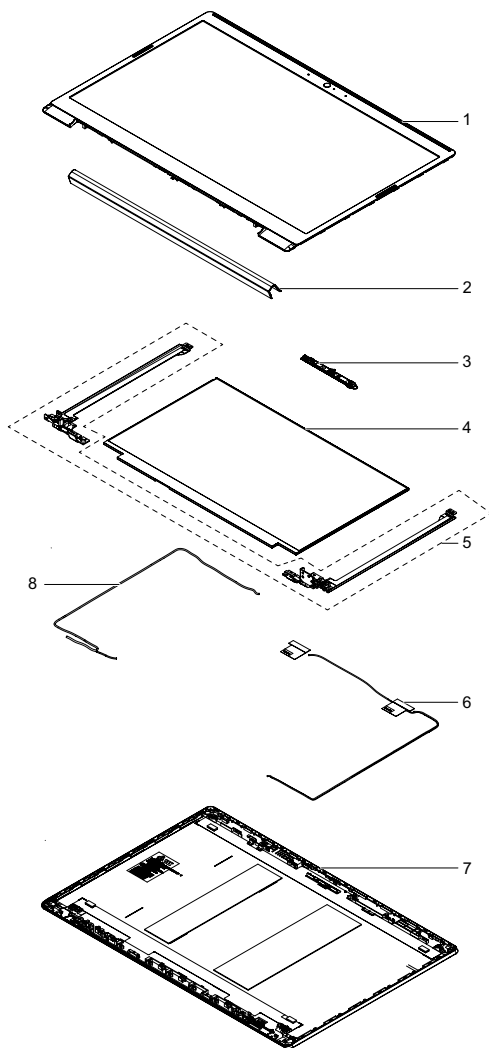




Table 5. FRU (CRU) categories for LCD module

| No. | FRU (CRU) category | Self-service CRU | Optional-service CRU |
|-----|--------------------|------------------|----------------------|
| 1   | LCD bezel          | No               | No                   |
| 2   | Hinge cap          | No               | No                   |
| 3   | Integrated camera  | No               | No                   |
| 4   | LCD panel          | No               | No                   |
| 5   | LCD Hinges         | No               | No                   |
| 6   | Wi-Fi antennas     | No               | No                   |
| 7   | LCD cover          | No               | No                   |
| 8   | LCD cable          | No               | No                   |

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