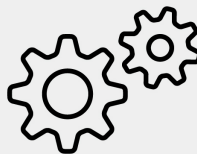
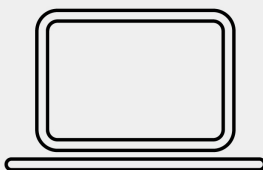


Lenovo ThinkPad C14 Gen 1 Chromebook Hardware Maintenance Manual



Lenovo

First Edition (June 2022)

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About this manual

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

Product name	Machine type (MT)
Lenovo Thinkpad C14 Gen 1 Chromebook	21C9, 21CA

Use this manual along with the advanced diagnostic tests to troubleshoot problems.

Important:

- This manual is intended only for trained service technicians who are familiar with Lenovo products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.
- Depending on the model, some hardware configuration and software programs might not be available on the Chromebook. Some statements in this manual might not be applicable to the Chromebook.
- Before servicing a Lenovo product, be sure to read all the information under Chapter 1 “Safety information” on page 1.

Chapter 1. Safety information

This chapter presents following safety information that you need to be familiar with before you service a notebook computer.

- “General safety” on page 1
- “Electrical safety” on page 1
- “Safety inspection guide” on page 3
- “Handling devices that are sensitive to electrostatic discharge” on page 3
- “Grounding requirements” on page 4
- “Safety notices (multilingual translations)” on page 4

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure 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.
 4. Lift by standing or by pushing up with your leg muscles; this action removes 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 equipment unsafe.
- Before you start the machine, ensure that other service technicians and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case 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 a machine. Ensure 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 a nonconductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing, because 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 might 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 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 equipment.

Important:

- Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.
- Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges (ESD). Do not use this type 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 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. That 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.

CAUTION:

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. Use extreme care when measuring 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 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:
 - Power supply units
 - Fans
 - Units similar to those listed above

This practice ensures correct grounding of the units.

- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The purpose of this inspection guide is to assist you in identifying potentially unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury. This guide addresses only those items. You should use good judgment to identify potential safety hazards due to attachment of non-ThinkPad / 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 potentially 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 authorized type specified for your computer. Go to: <https://support.lenovo.com/partslookup>.
 - 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-ThinkPad / non-Lenovo alterations. Use good judgment as to the safety of any non-ThinkPad / 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. Ensure 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 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 the following languages:

- English
- Arabic
- Brazilian Portuguese
- French
- German
- Hebrew
- Japanese
- Korean
- Spanish
- Traditional Chinese



Before the computer is powered on after FRU replacement, make sure that 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 short circuits.

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.

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.

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.

DANGER



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 for at least 15 minutes. Seek medical care if any symptoms from the fluid are present after washing.

DANGER



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

DANGER



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

DANGER



Unless hot swap is allowed for the FRU being replaced, do as follows before removing it: power off the computer, unplug all power cords from electrical outlets, remove the battery pack, and disconnect any interconnecting cables.

DANGER



قبل اعادة تشغيل الحاسب بعد الانتهاء من استبدال FRU، تأكد من أنه قد تم اعادة كل من المسامير و السوست وكل الأجزاء الصغيرة الأخرى في أماكنهم ولم يتم فقدانهم داخل الحاسب. ويمكن التحقق من ذلك عن طريق هز الحاسب والاستماع لأي صوت صاخب يصدر منه. قد تؤدي الأجزاء أو الرقائق المعدنية الى حدوث دائرة قصر.



تحتوي بعض البطاريات الاحتياطية على كمية صغيرة من مادتي النيكل والكادميوم. لا تقم بفك أو اعادة شحن البطارية الاحتياطية ولا تقم أيضا بالقائها في النار أو الماء ولا تتسبب في احداث دائرة قصر بها. قم بالتخلص من البطارية كما هو موضح في القوانين المحلية. استخدم نوع البطارية المحدد والذي يوصى باستخدامه. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.



تحتوي حزمة البطارية على كمية صغيرة من مادة النيكل. لا تقم بفكها أو القاءها في النار أو الماء ولا تتسبب في احداث دائرة قصر بها. تخلص من حزمة البطارية وفقا لما هو موضح في القوانين المحلية. قم، عند استبدال حزمة البطارية، باستخدام الأنواع المحددة فقط والتي يوصى باستخدامها. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.



قد تتسبب بطارية الليثيوم في حدوث حريق أو انفجار أو حدوث حروق شديدة. لا تقم باعادة شحن البطارية أو ازالة موصل الاستقطاب الخاص بها ولا تحاول أيضا فكها أو تسخينها لأكثر من ١٠٠ درجة مئوية (٢١٢ فهرنهايت) أو حرقها أو تعريض محتويات الخانة الخاصة بها للماء. قم بالتخلص من البطارية وفقا لما هو موضح في القوانين المحلية. استخدم نوع البطارية المحدد والذي يوصى باستخدامه. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.



إذا ما انكسرت شاشة LCD ولامس السائل الداخلي عينيك أو يديك، قم في الحال بغسلهما بالماء لمدة لا تقل عن ١٥ دقيقة. إذا ما وجدت أي أعراض بعد الغسل اطلب عندئذ المساعدة الطبية.



خطر

لتجنب التعرض لأي صدمات، لا تقم بإزالة الغطاء البلاستيكي الذي يحمي الجزء الأسفل من بطاقة العاكس.



خطر

على الرغم من أن البطاريات الرئيسية يكون لها جهد منخفض، إلا أنه قد تقوم البطاريات التي حدث قصور بها أو التي تم توصيلها أرضيا بإصدار تيار يكفي لحدوث حروق للأفراد أو تعرض المواد القابلة للاشتعال للحريق.



خطر

ما لم يتم السماح بالتبديل الفوري لأي FRU الجاري استبداله بدون ضرورة اغلاق النظام، قم بتنفيذ ما يلي قبل ازالته. قم بإيقاف تشغيل الحاسب ونزع كل أسلاك الطاقة من المخرج الكهربائية وقم أيضا بإزالة حزمة البطارية ثم قم بفصل أي كابلات متصلة.



PERIGO

Antes de ligar o computador após a substituição da FRU, certifique-se de que todos os parafusos, molas e outras peças pequenas estejam no lugar e não estejam soltos dentro do computador. Verifique isso sacudindo o computador e procurando ouvir sons de peças soltas. Peças metálicas ou lascas de metal podem causar curto-circuito.



PERIGO

Algumas baterias reserva contêm uma pequena quantidade de níquel e cádmio. Não desmonte uma bateria reserva, recarregue-a, jogue-a no fogo ou na água, ou deixe-a entrar em curto-circuito. Descarte a bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.



PERIGO

O pacote da bateria contém uma pequena quantidade de níquel. Não o desmonte, jogue-o no fogo ou na água, ou deixe-o entrar em curto-circuito. Descarte o pacote da bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas ao substituir o pacote da bateria. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.



PERIGO

A bateria de lítio pode causar incêndio, explosão ou graves queimaduras. Não a recarregue, remova seu conector polarizado, desmonte-a, aqueça-a acima de 100°C (212°F), incinere-a, ou exponha o conteúdo de sua célula à água. Descarte a bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.



PERIGO

Se o LCD quebrar e o fluido de dentro dele entrar em contato com seus olhos ou com suas mãos, lave as áreas afetadas imediatamente com água durante pelo menos 15 minutos. Procure cuidados médicos se algum sintoma causado pelo fluido surgir após a lavagem.



PERIGO

Para evitar choque elétrico, não remova a capa plástica que protege a parte inferior da placa inversora.



PERIGO

Embora as principais baterias possuam baixa voltagem, uma bateria em curto-circuito ou aterrada pode produzir corrente o bastante para queimar materiais de pessoal ou inflamáveis.



PERIGO

A menos que uma hot swap seja permitida para a FRU que está sendo substituída, faça o seguinte antes de removê-la: desligue o computador, desconecte todos os cabos de energia das tomadas, remova o pacote de baterias e desconecte quaisquer cabos de interconexão.



DANGER

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.



DANGER

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.



DANGER

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.



DANGER

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.



DANGER

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.



DANGER

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



DANGER

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.



DANGER

Si le remplacement à chaud n'est pas autorisé pour l'unité remplaçable sur site que vous remplacez, procédez comme suit avant de retirer l'unité : mettez l'ordinateur hors tension, débranchez tous les cordons d'alimentation des prises de courant, retirez le bloc de batterie et déconnectez tous les câbles d'interconnexion.



VORSICHT

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.



VORSICHT

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. 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.



VORSICHT

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.



VORSICHT

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.



VORSICHT

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.



VORSICHT

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



VORSICHT

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.



VORSICHT

Wenn ein Austausch der FRU bei laufendem Betrieb nicht erlaubt ist, gehen Sie beim Austausch der FRU wie folgt vor: Schalten Sie den Computer aus, ziehen Sie alle Netzkabel von den Netzsteckdosen ab, entfernen Sie den Akku und ziehen Sie alle miteinander verbundenen Kabel ab.



סכנה

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



סכנה

סוללות המתנה מסוימות מכילות כמות קטנה של ניקל וקדמיום. אין לפרק סוללות המתנה, לסעון אותה מחדש, להשליך אותה לאש או למים או לקצר אותה. יש לסלק את הסוללה בזהירות על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המומינה ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.



סכנה

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



סכנה

סכנה

סכנה

סכנה

危險

危險

危險

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。



危険

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 °C (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。



危険

LCD が破損し、LCD 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。



危険

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。



危険

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。



危険

交換しようとしている FRU がホット・スワップに対応していない場合、それを取り外す前に、コンピューターの電源をオフにし、すべての電源コードをコンセントから抜き、バッテリー・パックを取り外して、相互接続しているケーブルをすべて切り離してください。



위험

FRU를 교체하고 나서 컴퓨터 전원을 켜기 전에 모든 나사, 스프링 및 기타 작은 부품들이 올바른 위치에 있는지, 컴퓨터 내부에 단단하게 연결되어 있는지 확인하십시오. 컴퓨터를 흔들어 달각거리는 소리가 나지 않는지 확인하십시오. 금속 부품 또는 금속 조각은 누전을 일으킬 수 있습니다.



위험

일부 보조 배터리에는 소량의 니켈 및 카드뮴이 포함되어 있습니다. 보조 배터리를 분해하거나, 다시 충전하거나, 불 또는 물에 던지거나, 단락시키지 마십시오. 배터리 팩을 폐기할 때에는 해당 지역의 법률 규정을 따르십시오. 배터리 팩을 교체할 때에는 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.



위험

배터리 팩에는 소량의 니켈이 포함되어 있습니다. 배터리 팩을 분해하거나, 불 또는 물에 던지거나, 단락시키지 마십시오. 배터리 팩을 폐기할 때에는 해당 지역의 법률 규정을 따르십시오. 배터리 팩을 교체할 때에는 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.



위험

리튬 배터리는 화재, 폭발 또는 심각한 화상을 일으킬 수 있습니다. 리튬 배터리를 다시 충전하거나, 극성 커넥터를 제거하거나, 분해하거나, 100°C(212°F) 이상으로 가열하거나, 소각하거나, 전지 내용물을 물에 노출시키지 마십시오. 배터리를 폐기할 때에는 해당 지역의 법률 규정을 따르십시오. 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.



위험

LCD가 파손되어 LCD 내부의 액체가 눈에 들어가거나 손에 묻으면 즉시 깨끗한 물로 15분 이상 닦아 내십시오. 씻은 후에 조금이라도 이상을 느끼면 즉시 병원에 가서 의사의 진찰을 받아야 합니다.



위험

전기적 위험을 방지하려면 인버터 카드의 아래 부분을 보호하는 플라스틱 덮개를 제거하지 마십시오.



위험

기본 배터리의 전압은 낮지만, 단락되거나 접지된 배터리는 화상을 입히기에 충분한 전류와 가연성 물질을 발생시킬 수 있습니다.



위험

FRU 교체 시 Hot Swap이 지원되지 않는 경우, FRU를 제거하기 전에 컴퓨터의 전원을 끄고, 전기 콘센트에서 전원 코드를 분리하고, 배터리를 제거한 후, 연결된 모든 케이블을 분리하십시오.



PELIGRO

Antes de encender el sistema después 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.



PELIGRO

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.



PELIGRO

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.



PELIGRO

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 incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.



PELIGRO

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 médica si se presenta algún síntoma del fluido después de lavarse.



PELIGRO

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



PELIGRO

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.



PELIGRO

Salvo que se permita el intercambio en caliente para la unidad sustituible localmente, realice lo siguiente antes de extraerla: apague el sistema, desconecte todos los cables de alimentación de las tomas de alimentación eléctrica, extraiga la batería y desconecte los cables de interconexión.



危險

完成 FRU 更換之後，在開啟電腦的電源之前，請確定所有螺絲、彈簧及其他小零件都已歸位，沒有遺留在電腦內部。
若要確認這一點，請搖晃電腦，聽聽看是否有卡嗒的聲響。
金屬零件或鐵鏈的火花會造成電線短路。



危險

部分備用電池含有微量的鎳和鎘。請勿拆開備用電池、再充電、丟入火或水中，或使其形成短路。請按照當地法令或規定來棄置電池。
僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。



危險

電池套件含有微量的鎳。請勿拆開電池套件、丟入火或水中，或使其形成短路。請按照當地法令或規定來棄置電池套件。
更換電池套件時，僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。



危險

鋰電池會導致起火、爆炸或嚴重燒傷。請勿再充電、拔除其電極接頭、拆開、加熱超過 100°C (212°F)、焚燒，或讓電池組成物浸到水。請按照當地法令或規定來棄置電池。
僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。



危險

如果 LCD 破裂導致 LCD 流出的液體沾到您的眼睛或手，請立即以清水沖洗沾染部位至少 15 分鐘。如果在清洗後出現該液體所造成的任何症狀，請就醫治療。



危險

為避免電擊，請勿拆下轉換卡下面的塑膠護蓋。



危險

雖然主電池的電壓很低，但短路或接地電池所產生的電流，仍足以使人燒傷或使可燃物質起火。



危險

除非 FRU 允許以熱抽換來替換，否則請依下列方式將其移除：將電腦關機，拔除插座上所有電源線，移除電池包，並拔開任何交互連接的線材。

Chapter 2. General checkout

This chapter presents the following information:

- “What to do first” on page 19
- “Power system checkout” on page 20

Some descriptions in this chapter might not apply to your particular computer.

Before you go to the checkout guide, be sure to read the following important notes.

Important notes:

- **Only certified trained personnel should service the computer.**
- **Before replacing any FRU, read the entire page on removing and replacing FRUs.**
- **When you replace FRUs, it is recommended to use new nylon-coated screws.**
- **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 a FRU only with another FRU of the correct model.** When you replace a FRU, ensure that the model of the machine and the FRU part number are correct.
- **A FRU should not be replaced 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, ESD, or software errors. Consider replacing a FRU only when a problem recurs. If you suspect that a FRU is defective, clear the error log 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 return a 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 service technician
2. Date of service
3. Date on which the machine failed
4. Date of purchase
5. Failure symptoms, error codes appearing on the display, and beep symptoms
6. Procedure index and page number in which the failing FRU was detected
7. Failing FRU name and part number
8. Machine type, model number, and serial number
9. Customer's name and address

Note: 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. Following is a list of some common items that are not covered under warranty and some symptoms that might indicate that the system was subject 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
- 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 power 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.
- Check for obvious damage to a hard disk drive. If the spindle of a hard disk drive becomes noisy, the hard disk drive might have been dropped or subject to excessive force.

Power system checkout

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

- “Checking the ac power adapter” on page 20
- “Checking the built-in battery and operational charging” on page 20

Checking the ac power adapter

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

- If the system status indicator is not on when an ac power source is connected, check the power cord of the ac power adapter for correct continuity and installation.
- If the computer does not charge during operation, go to “Checking the built-in battery and operational charging” on page 20.

To check the ac power adapter, measure the output voltage across the plug of the ac power adapter cable to see if the voltage is correct.

Notes:

- Noise from the ac power adapter does not always indicate a defect.
- Ensure that you use the ac power adapter that is shipped with the computer to provide enough power to the computer. Otherwise, a message might be displayed, prompting you that the computer will not be charged or will be charged slowly.

Checking the built-in battery and operational charging

This computer supports only batteries specially designed for this specific system and manufactured by Lenovo or an authorized builder. The system does not support unauthorized batteries or batteries designed for other systems. If an unauthorized battery or a battery designed for another systems is installed, the system will not charge.

Attention: Lenovo has no responsibility for the performance or safety of unauthorized batteries, and provides no warranties for failures or damage arising out of their use.

To check whether the battery charges properly during operation, do the following:

1. Discharge the battery until the remained battery power is less than 50%.
2. Connect the computer to ac power to charge the battery. If the battery status icon indicates that the battery is not charging, remove the battery and let it return to room temperature.
3. Reinstall the battery. If the battery is still not charging, replace the battery.

4. Check the battery status icon again. If the same error still exists, replace the system board.

Chapter 3. Create and use a USB repair shim

This chapter contains the following topics:

- “What is a USB repair shim?” on page 23
- “Create a USB repair shim” on page 23
- “Use the USB repair shim” on page 24

What is a USB repair shim?

You can create a USB repair shim by writing a repair shim image to a USB storage drive. With the USB repair shim, you can:

- Refresh the Chromebook system with the latest firmware.
- Diagnose problems and restore the system to factory settings.

Note: Before replacing any FRUs, use the USB repair shim to diagnose and identify problems.

When you use the USB repair shim to diagnose problems, the Chromebook enters the factory-test-image environment and runs through the following factory test items.

Table 1. Factory test items

Test item	Description
Final Functional Test (FFT)	The FFT is designed to test the function of individual component, such as the display, audio, camera, and keyboard. Some test items might require an HDMI™ monitor or SD card. If the devices are not available, the tests can be bypassed. As a result, the overall test is marked as failed.
RunIn and FAT	The RunIn and FAT are designed to test how the system functions under stress by running the maximum workload. It takes about 10 minutes to finish.
Google Required Tests (GRT)	The GRT is designed to check the system status and help reset the system back to factory settings. If any test fails, the GRT has to be forced to end.

Create a USB repair shim

Step 1. Prepare a USB storage drive with at least 8 GB of storage capacity.


Attention: The creation process deletes anything stored on the USB storage drive. To avoid data loss, backup all the data that you want to keep.

Step 2. Download the image file of the repair shim from <https://support.lenovo.com>. A Lenovo service credential is required to download the image file.

Note: Make sure to download the latest version of the image file. A shim created with an earlier version of the image file might cause the repair process to fail.

Step 3. Use a disk imaging tool to write the downloaded image to the USB storage drive. An open-source tool Win32 Disk Imager is available at <http://sourceforge.net/projects/win32diskimager>.

Use the USB repair shim

- Step 1. Press the power button together with **esc** and . The Chrome operating system recovery screen is displayed. Follow the on-screen instructions to enter the developer mode.
- Step 2. Remove the base cover assembly, disconnect the built-in battery from the system board, and then attach the ac power adapter to the Chromebook.
- Step 3. Connect the prepared USB storage drive to the Chromebook and after the operating system verification screen is displayed, Press Ctrl + U.
- Step 4. Type **I** in the window prompted to install the shim image. The Chromebook will enter the factory-test-image environment after the process is completed.
- Step 5. Detach the ac power adapter, reconnect the built-in battery to the system board, and then reattach the ac power adapter to the Chromebook.
- Step 6. Remove the USB repair shim from the Chromebook and store it in a safe place.
- Step 7. Follow the on-screen instructions to start the FFT.

Note: If the FFT detects a defective component, turn off the Chromebook, detach the ac power adapter, and then replace the defective component.

- Step 8. Start the RunIn and FAT (This is an optional operation.)

- Step 9. Follow the on-screen instructions to start the GRT.
If the tests finish successfully, all data stored on the Chromebook is deleted and the Chromebook is turned off. If the GRT fails, it might result from hardware identity (HWID) mismatch and write-protect malfunction. Use the following information to identify problems.

Problem	Description
HWID mismatch	<p>A set of valid hardware identities (HWIDs) is provided by Google. Google logs the exact hardware combination into a Chromebook and creates an HWID. The HWID is used for the following purposes:</p> <ul style="list-style-type: none">• Auto-update new patches and software for the lifetime of the Chromebook• Reset the Chromebook to factory settings <p>HWID mismatch can be caused by using unauthorized or missing parts. If the write-protect function is not turned off before recovering the Chromebook with the USB repair shim, it can also cause HWID mismatch.</p>
Write-protect malfunction	<p>The Chromebook system cannot be finalized until the write-protect function is turned on.</p>










Note: You can terminate the GRT when the tests have to be bypassed because they cannot be performed. To end the process, press **f**.

Chapter 4. Locations

Locating controls and connectors

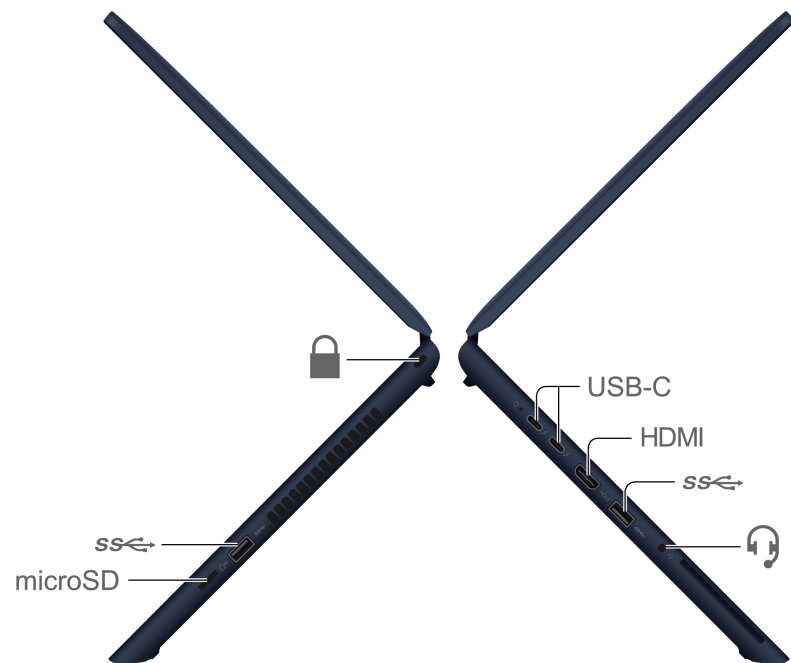
Front






Item	Description	Item	Description
	Camera		Webcam privacy shutter
	Microphone		Touch screen*
	Speaker		Power button/Fingerprint reader*
	TrackPoint® pointing stick		TrackPoint buttons
	Touchpad		

* for selected models

Left and right




Item	Description	Item	Description
	Security-lock slot	USB-C	USB-C® (Thunderbolt™ 4*) connector
	USB 3.2 Gen 2 connector		Audio connector
microSD	microSD-card reader		

* for selected models

Bottom



Item	Description
 *	Nano-SIM-card tray*

Locating FRUs and CRUs

This topic introduces the following service parts:

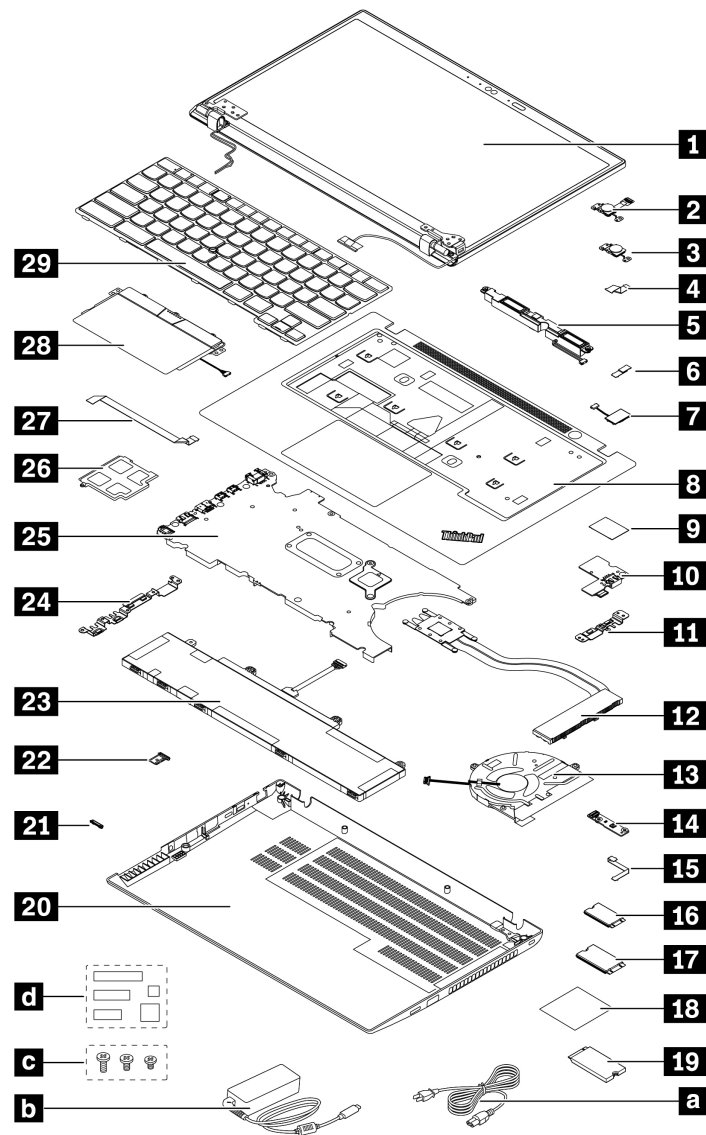
- “Major FRUs and CRUs” on page 29
- “LCD FRUs and CRUs” on page 31
- “Miscellaneous parts” on page 32

Notes:

- Each FRU is available for all types or models, unless otherwise specified.
- **CRU statement for customers:**

You can resolve some problems with your product with a replacement part you can install yourself, called a “Customer Replaceable Unit” or “CRU.” Some CRUs are designated as self-service CRUs and others are designated as optional-service CRUs. *Installation of self-service CRUs is your responsibility. For optional-service CRUs, you can either install the CRU yourself or you can request that a Service Provider install the CRU according to the warranty service for your product.* If you intend on installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You can find a list of CRUs for your product in this *Hardware Maintenance Manual*. An electronic version of this manual can be found at <https://support.lenovo.com>. Click **Documentation** and then follow the on-screen instructions to find the manual for your product. You might be required to return the defective CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you might be charged for the replacement CRU if Lenovo does not receive the defective CRU within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation for full details.
- Your Chromebook contains the following types of CRUs and FRUs:
 - **Self-service CRUs:** Refer to parts that can be installed or replaced easily by customer themselves or by trained service technicians at an additional cost.
 - **Optional-service CRUs:** Refer to parts that can be installed or replaced by customers with a greater skill level. Trained service technicians can also provide service to install or replace the parts under the type of warranty designated for the customer’s machine.
 - **FRUs:** Refer to parts that must be installed or replaced only by trained service technicians. If customers choose to replace the FRUs by themselves, the product warranty might be affected.

Major FRUs and CRUs



Note: Depending on the Chromebook model, your Chromebook might look different from the illustration above.

Table 2. Major FRUs and CRUs

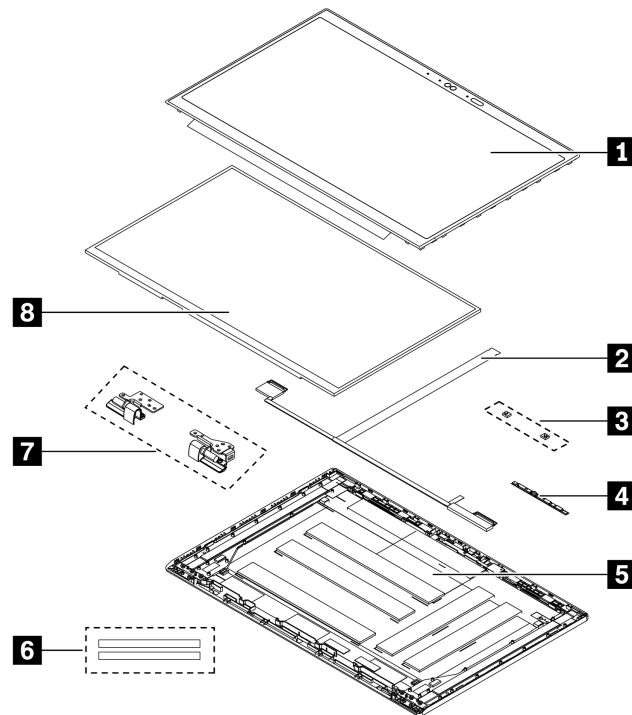
No.	FRU description	Self-service CRU	Optional-service CRU
1	LCD unit	No	No
2	Power button with bracket and fingerprint reader*	No	No
3	Power button with bracket	No	No
4	Fingerprint reader cable*	No	No
5	Speaker	No	Yes
6	NFC cable*	No	No

Table 2. Major FRUs and CRUs (continued)

No.	FRU description	Self-service CRU	Optional-service CRU
7	NFC module*	No	No
8	Keyboard bezel assembly	No	No
9	USB and microSD board cable	No	No
10	USB and microSD board	No	No
11	USB and microSD board bracket	No	No
12	Heat sink	No	No
13	Fan	No	No
14	Power board	No	No
15	Power board cable	No	No
16	Wireless LAN card	No	No
17	Wireless WAN card*	No	Yes
18	M.2 solid-state drive mylar	No	Yes
19	M.2 solid-state drive	Yes	Yes
20	Base cover assembly	No	Yes
21	Dummy SIM card*	No	No
22	Nano-SIM-card tray*	Yes	No
23	Battery pack	No	No
24	I/O bracket	No	No
25	System board	No	No
26	Smart card dummy door	No	No
27	Trackpad cable	No	No
28	Trackpad	No	No
29	Keyboard	No	Yes
a	Power cord	Yes	No
b	ac power adapter	Yes	No
c	Screw kit	No	No
d	Label kit	No	No

* for selected models

LCD FRUs and CRUs



Note: Depending on the Chromebook model, your Chromebook might look different from the illustration above.

Table 3. LCD FRUs and CRUs

No.	FRU description	Self-service CRU	Optional-service CRU
1	LCD bezel	No	No
2	LCD cable	No	No
3	Microphone rubbers	No	No
4	Camera and microphone module*	No	No
5	LCD cover assembly	No	No
6	LCD elastic adhesive tapes	No	No
7	LCD hinge	No	No
8	LCD panel	No	No

* for selected models

Miscellaneous parts

Table 4. Miscellaneous part

FRU descriptions	Self-service CRU	Optional-service CRU
Screw kit <ul style="list-style-type: none">• M2 x L2, silver (20)• M2 x L3, black (8)• M2 x L4, black (24)• M2 x L5, silver (4)• M2.5 x L4, black (10)• M2.5 x L5, black (1)• M2.5 x L8, silver (2)• Spec	No	No
Mechanical miscellaneous kit <ul style="list-style-type: none">• Trackpad spill mylar• IR camera sponge• Trackpad waterproof mylar• LCD unit tape pack• Conductive tape• Spec	No	No
Label kit: <ul style="list-style-type: none">• Label• Spec	No	No

Looking up FRU information

For detailed FRU information, including part numbers, descriptions, and substitution part numbers, go to:
<https://support.lenovo.com/partslookup>

Chapter 5. FRU replacement notices

Read this chapter carefully before replacing any FRU.

Service tool kit

Ensure that the following service tool kit is prepared before you service a Chromebook.

No.	Tool name	Tool type
1	Phillips-head screwdriver	Common tool
2	Conductive tweezers	Common tool
3	Silicone grease	Consumable tool
4	Polyamide tape	Consumable tool
5	Mylar tape	Consumable tool
6	Eraser	Consumable tool
7	Electrical tape	Consumable tool
8	Double-sided tape	Consumable tool
9	Conductive tape	Consumable tool
10	Trackpad jig (this might come with trackpad)	Consumable tool

Note: The silicone grease can be applied to the surfaces of the microprocessor and heatsink to eliminate air gaps.

Screw notices

Loose screws can cause a reliability problem. In your Chromebook, 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.

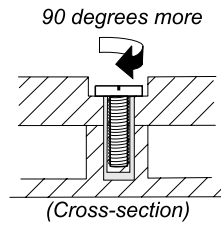
Do the following when you service the Chromebook:

- Keep the screw kit in your tool bag. For the part number of the screw kit, go to:
<https://support.lenovo.com/partslookup>

Tighten screws as follows:

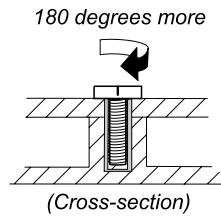
- **Plastic to plastic**

Turn an additional angle of 90 degrees after the screw head touches the surface of the plastic part.



- **Logic card to plastic**

Turn an additional angle of 180 degrees after the screw head touches the surface of the logic card.



Notes:

- Ensure that you use the correct screw. It is recommended to use new screws for replacements. If you have a torque screwdriver, tighten all screws firmly to the torque specified in the screw information table for each step.
- Ensure torque screwdrivers are calibrated correctly following country specifications.

Chapter 6. Removing or replacing a FRU

This chapter provides instructions on how to remove or replace a FRU.

General guidelines

When removing or replacing a FRU, be sure to observe the following general guidelines:

1. Do not try to service any Chromebook unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. Before replacing any FRU, review Chapter 5 “FRU replacement notices” on page 33.
3. Begin by removing any FRUs that have to be removed before replacing the failing FRU. Any such FRUs are listed at the beginning of each FRU replacement section. Remove them in the order in which they are listed.
4. Follow the correct sequence in the steps for removing a FRU, as given in the illustrations by the numbers in square callouts.
5. When turning a screw, turn it in the direction as given by the arrow in the illustration.
6. When removing a FRU, move it in the direction as given by the arrow in the illustration.
7. To put the new FRU in place, reverse the removal procedure and follow any notes that pertain to replacement.
8. When replacing a FRU, use the correct screws as shown in the replacement procedures.



Before removing any FRU, turn off the Chromebook, unplug all power cords from electrical outlets, disable the built-in battery, and then disconnect any interconnecting cables.

Attention:


- After replacing a FRU, do not turn on the Chromebook until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the Chromebook. Verify this by shaking the Chromebook gently and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.
- The system board is sensitive to, and can be damaged by ESD. Before touching it, establish personal grounding by touching a ground point with one hand or by using an ESD strap.

Before servicing the Chromebook

Carefully read this topic before servicing the Chromebook.

Disabling the built-in battery

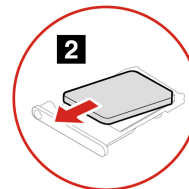
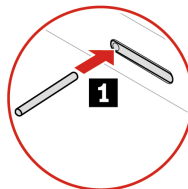
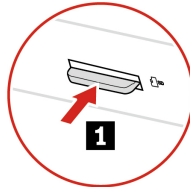
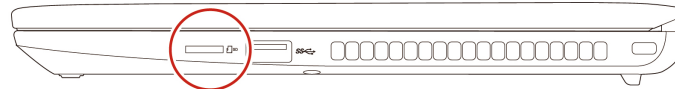
Before replacing any FRU, ensure that you disable the built-in battery.

To disable the built-in battery, press  together with the power button for about five seconds, and at the same time detach the ac power adapter from the Chromebook.

Note: Power supply from the built-in battery will resume after you reconnect the Chromebook to the ac power adapter.

Removing microSD card, SIM-card and SIM-card tray

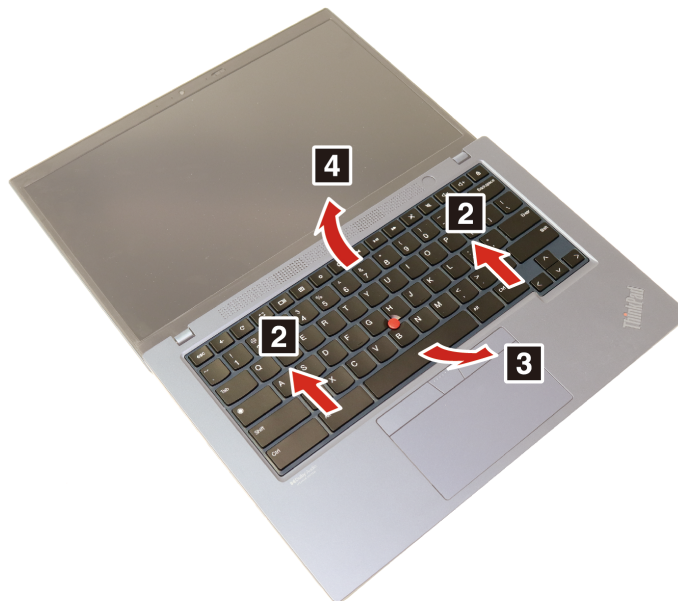
Note: If the Chromebook you are servicing has a nano-SIM card installed, remove the card with the tray together.

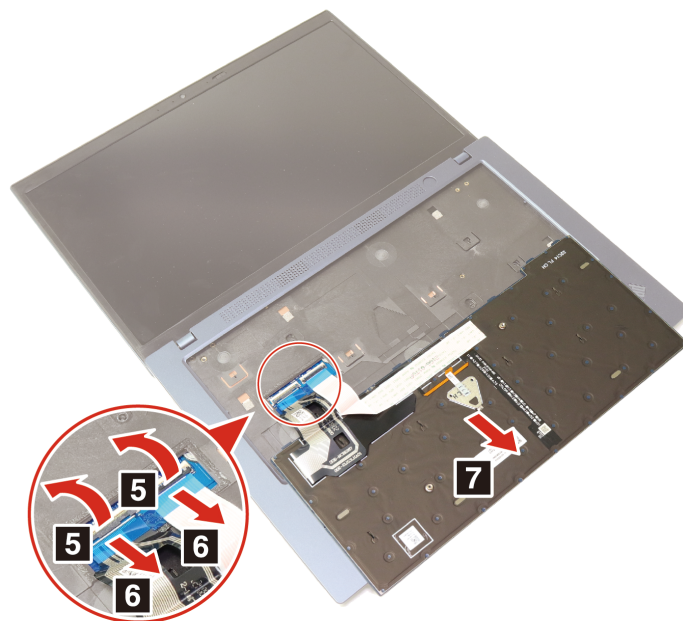


1010 Keyboard

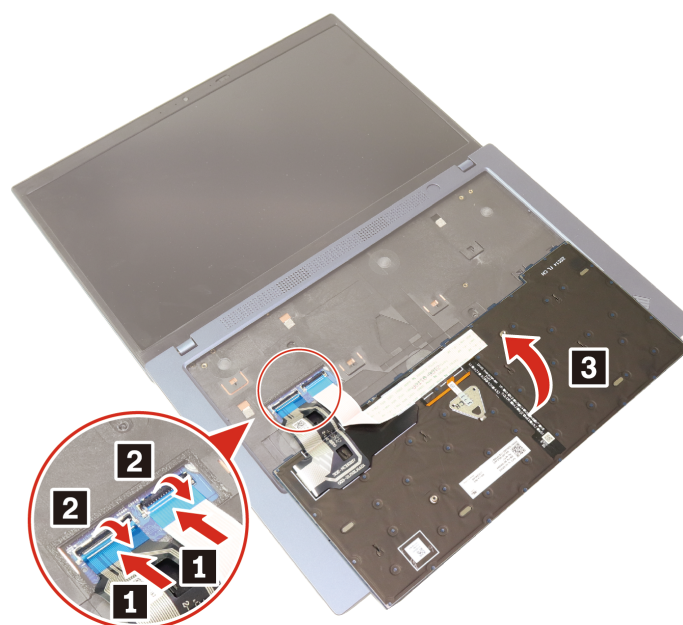
Note: You might be instructed to slide the keyboard frame forward or backward in some of the following steps. In this case, ensure that you do not press or hold the keys while sliding the keyboard frame. Otherwise, the keyboard frame cannot be moved.

Removal steps of the keyboard

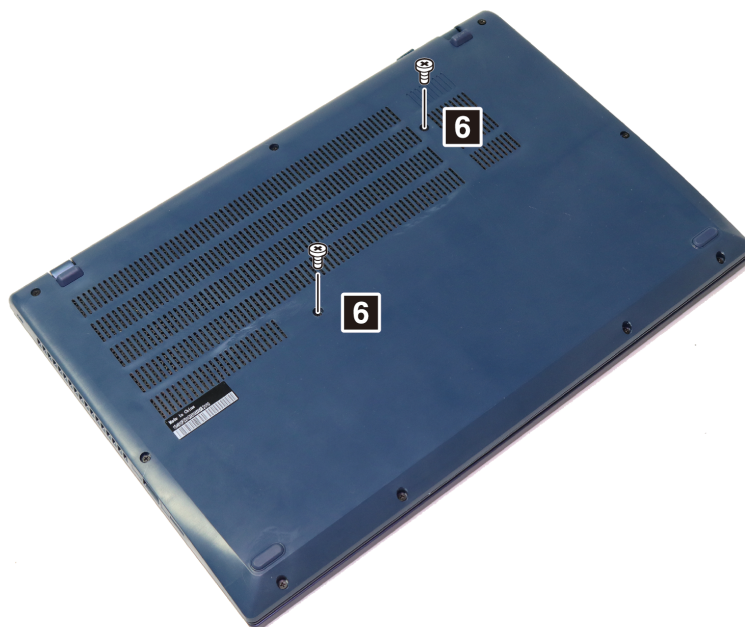




Installation steps of the keyboard

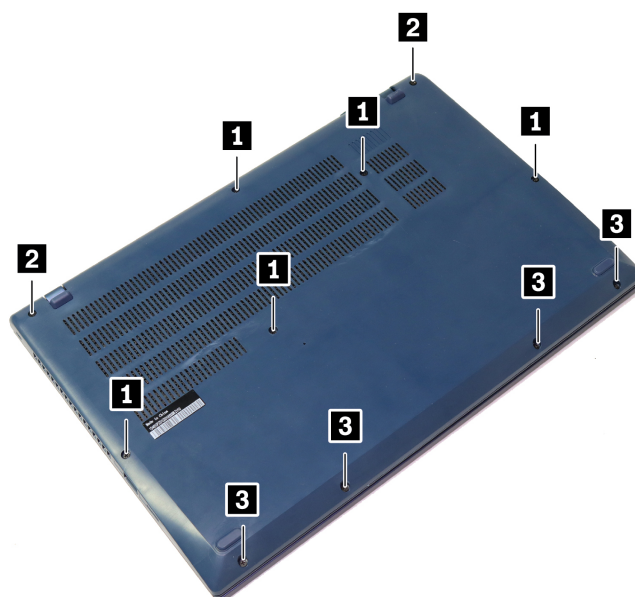


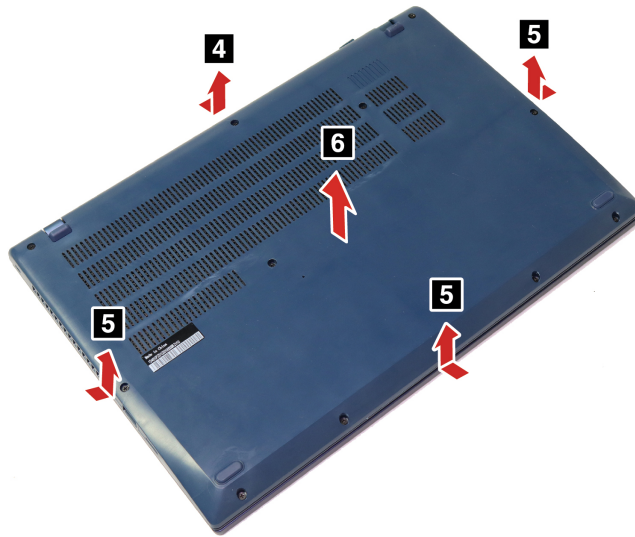




1020 Base cover assembly

Removal steps of the base cover assembly





Applying labels to the base cover assembly

Notes:

- Depending on the country or region of delivery, the labels might be slightly different from the ones in the following illustration.
- The new base cover assembly FRU is shipped with a kit containing labels of several kinds. Apply those labels when you replace the base cover assembly. For the labels that are not shipped with the new base cover assembly, peel them from the old base cover assembly, and adhere them to the new one.

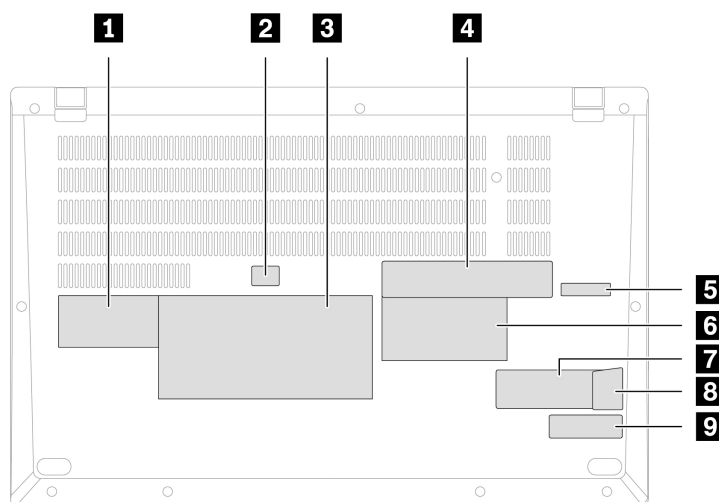


Table 5. All base cover labels

Label	Label description
1	Asset tag
2	Factory ID label for MTY
3	Asset tag
4	GEO label
5	IMEL label
6	Country label
7	Genuine Microsoft label
8	S/N label

1030 M.2 solid-state drive

For access, remove this FRU:

- “1020 Base cover assembly” on page 40

Attention: The M.2 solid-state drive is sensitive. Inappropriate handling might cause damage and permanent loss of data.

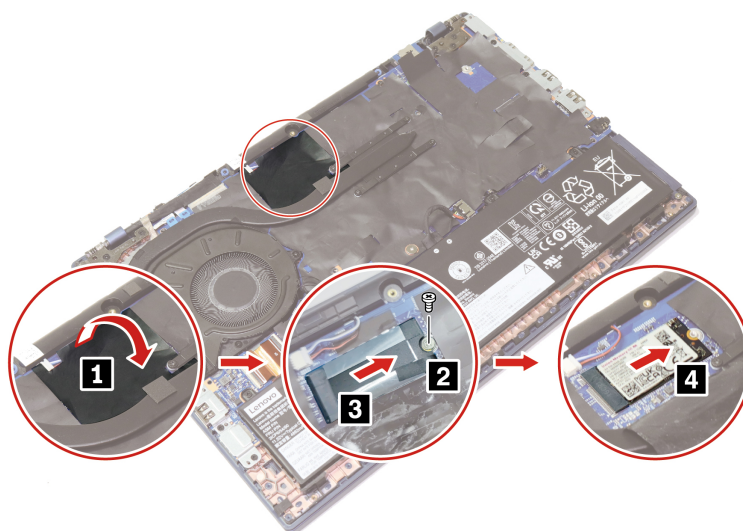
When handling the M.2 solid-state drive, observe the following guidelines:

- Replace the M.2 solid-state drive only for upgrade or repair. The M.2 solid-state drive is not designed for frequent changes or replacement.

- Before replacing the M.2 solid-state drive, make a backup copy of all the data that you want to keep.
- Do not apply pressure to the M.2 solid-state drive.
- Do not touch the contact edge or circuit board of the M.2 solid-state drive. Otherwise the M.2 solid-state drive might get damaged.
- Do not make the M.2 solid-state drive subject to physical shocks or vibration. Put the M.2 solid-state drive on a soft material, such as cloth, to absorb physical shocks.

If your Chromebook is installed with a hybrid solid-state drive (with Intel Optane memory), go to https://support.lenovo.com/docs/tg_ssd to know the details on how to replace it.

Removal steps of the M.2 solid-state drive



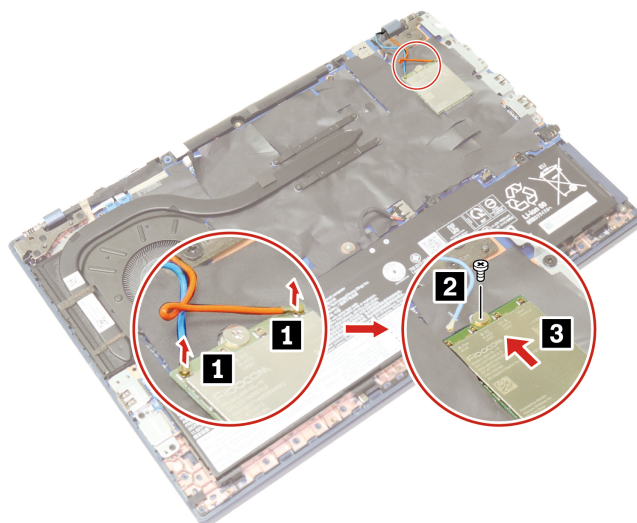
Step	Screw (quantity)	Color	Torque
1	M2 × 2 mm, flat-head, nylon-coated (1)	Silver	0.181 Nm (1.85 kgf-cm)

1040 Wireless WAN card (for selected models)

For access, remove this FRU:

- “1020 Base cover assembly” on page 40

Removal steps of the Wireless WAN card



Step	Screw (quantity)	Color	Torque
2	M2 × 2 mm, nylon-coated (1)	Silver	0.181 Nm (1.85 kgf-cm)

When installing:

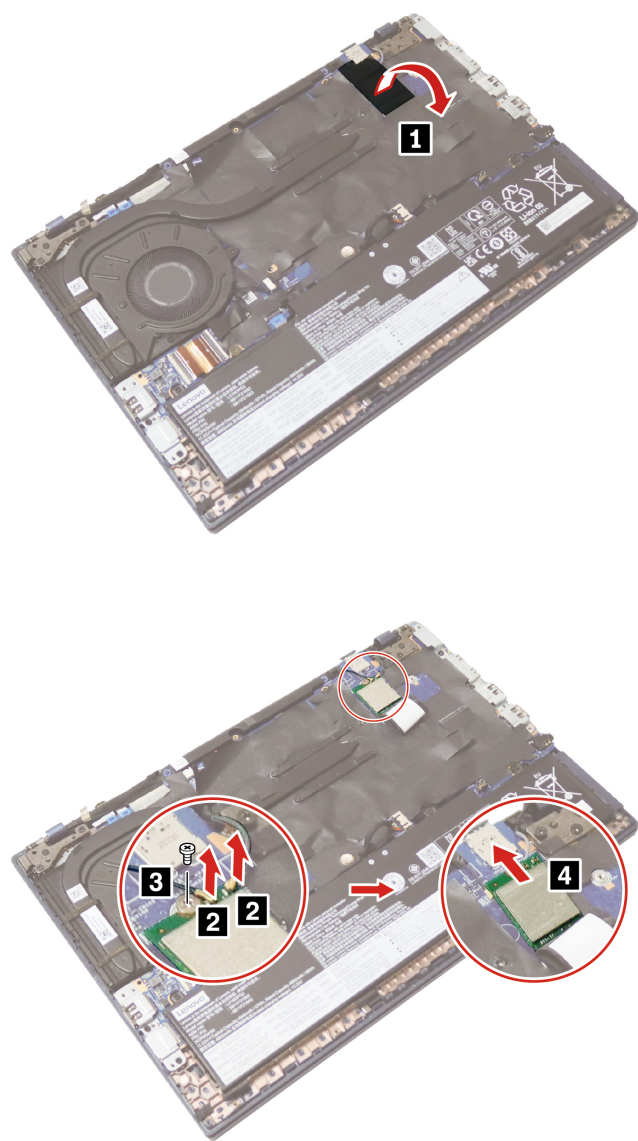
- For wireless WAN card with two antenna cables: ensure that you connect the orange cable to the main connector, and the blue cable to the auxiliary connector.
- For wireless WAN card with four antenna cables: ensure that you connect the orange cable to the main connector, the blue cable to the auxiliary connector, the white and grey cable to the M1 connector, and the black and grey cable to the M2 connector.

1050 Wireless LAN card

For access, remove this FRU:

- “1020 Base cover assembly” on page 40

Removal steps of the Wireless LAN card



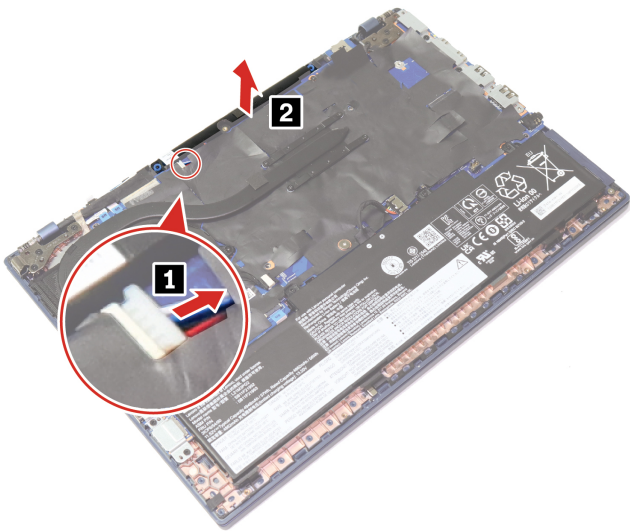
Step	Screw (quantity)	Color	Torque
1	M2 × 2 mm, flat-head, nylon-coated (1)	Silver	0.181 Nm (1.85 kgf-cm)

When installing: Plug the gray cable into the main connector, and the black cable into the auxiliary connector on the card.

1060 Speaker

- For access, remove these FRUs in order:
- “1020 Base cover assembly” on page 40

Removal steps of the speaker



When installing:

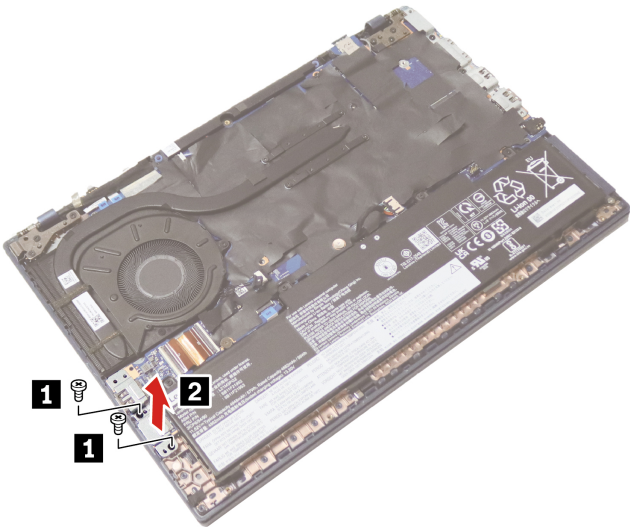
- Ensure that the connector is attached firmly.
- Ensure that the cable is routed properly.

1070 USB and microSD card board

For access, remove these FRUs:

- “1020 Base cover assembly” on page 40

Removal steps of the USB and microSD card board



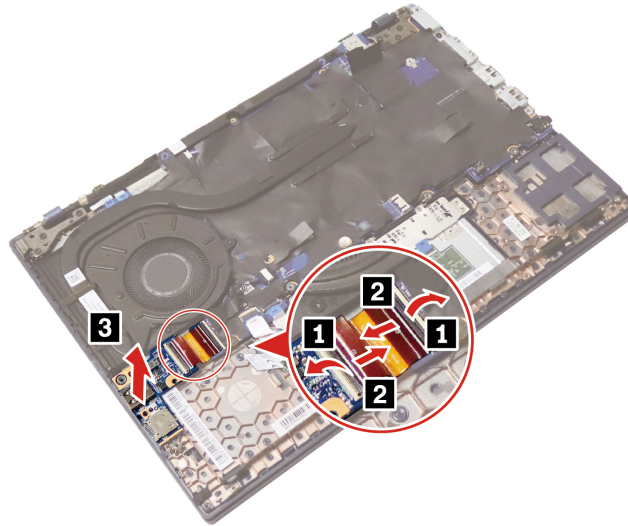
Step	Screw (quantity)	Color	Torque
1	M2 × 4 mm, flat-head, nylon-coated (1)	Black	0.181 Nm (1.85 kgf-cm)

1080 USB and microSD card board and cable

For access, remove these FRUs:

- “1020 Base cover assembly” on page 40
- “1110 Battery pack” on page 49

Removal steps of the USB and microSD card board and cable

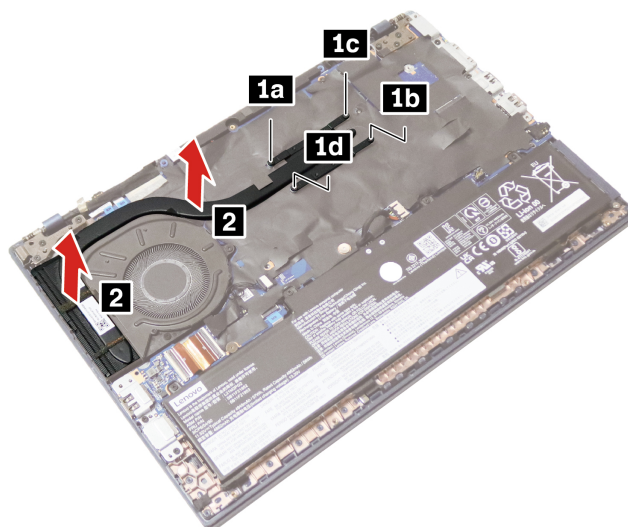


1090 Heat sink

For access, remove this FRU:

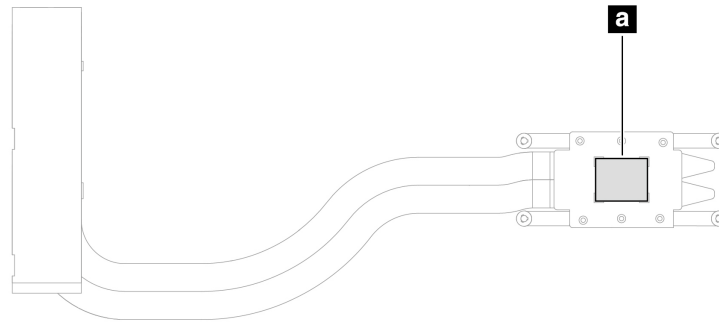
- “1020 Base cover assembly” on page 40

Removal steps of the heat sink



When installing:

- Do not press the top of the fan cover and the fan hub.
- Before you attach the heat sink to the Chromebook, apply thermal grease, at an amount of 0.2 grams, on the part marked **a** as shown in the following illustrations. Either too much or too less application of grease can cause a thermal problem due to imperfect contact with a component.

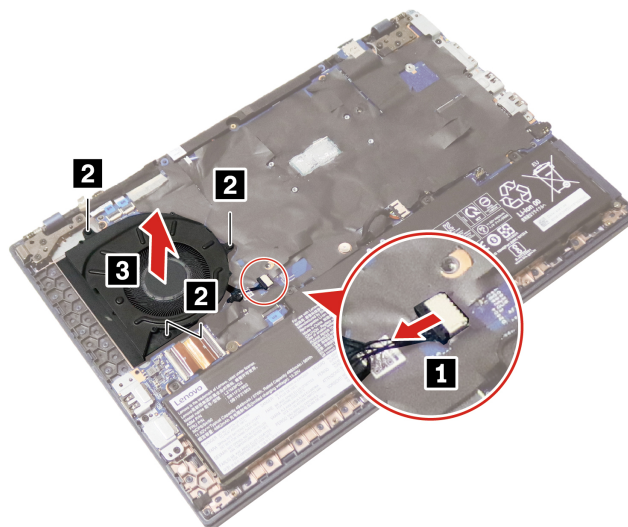


1100 Fan

For access, remove this FRU:

- “1020 Base cover assembly” on page 40
- “1090 Heat sink” on page 47

Removal steps of the fan



When installing:

- Ensure that the connector is attached firmly.
- Do not press the top of the fan cover and the fan hub.

1110 Battery pack



Use only the authorized battery specified for the Chromebook. Any other battery could ignite or explode.

Important notice for replacing a battery

Attention: Lenovo has no responsibility for the performance or safety of unauthorized batteries, and provides no warranties for failures or damage arising out of their use.

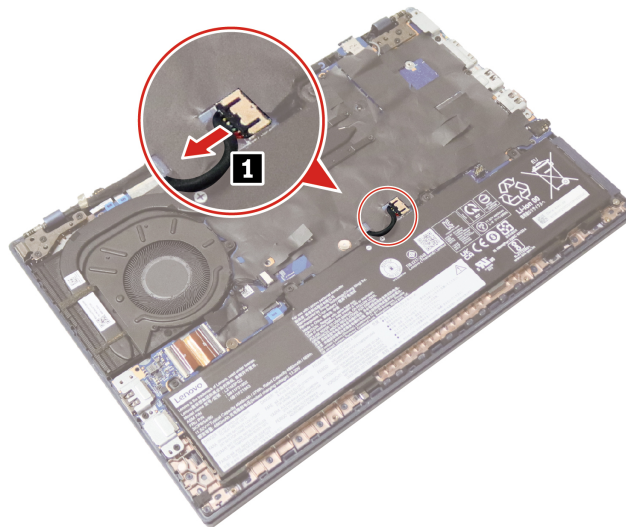
The Vantage app provides an automatic battery diagnostic test that determines if the built-in battery is defective. A built-in battery FRU should not be replaced unless this diagnostic test shows that the battery is defective. The only exception to this is if the built-in battery is physically damaged or a customer is reporting a possible safety issue.

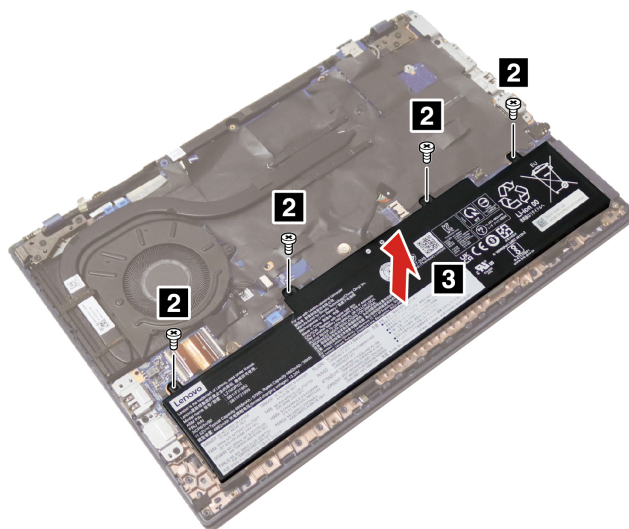
If the Vantage app is not installed on the Chromebook, the customer should download and install the program to diagnose the built-in battery, before getting a non-physically damaged built-in battery replaced. Note that the replacement of a physically damaged built-in battery is not covered by the warranty.

For access, remove this FRU:

- “1020 Base cover assembly” on page 40

Removal steps of the battery pack





Step	Screw (quantity)	Color	Torque
2	M2 × 5 mm, flat-head, nylon-coated (4)	Black	0.181 Nm (1.85 kgf-cm)

When installing:

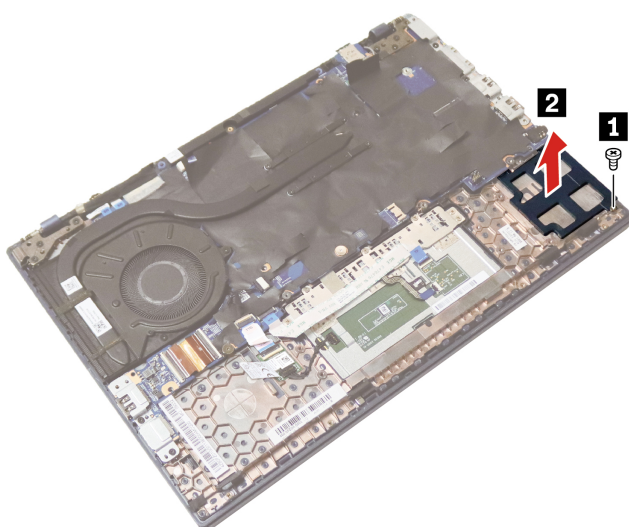
- Ensure that the connector is attached firmly.
- Ensure that the base cover assembly is secured in place. Otherwise, the battery connection may fail.

1120 Smart card dummy door

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1110 Battery pack” on page 49

Removal steps of the smart card dummy door



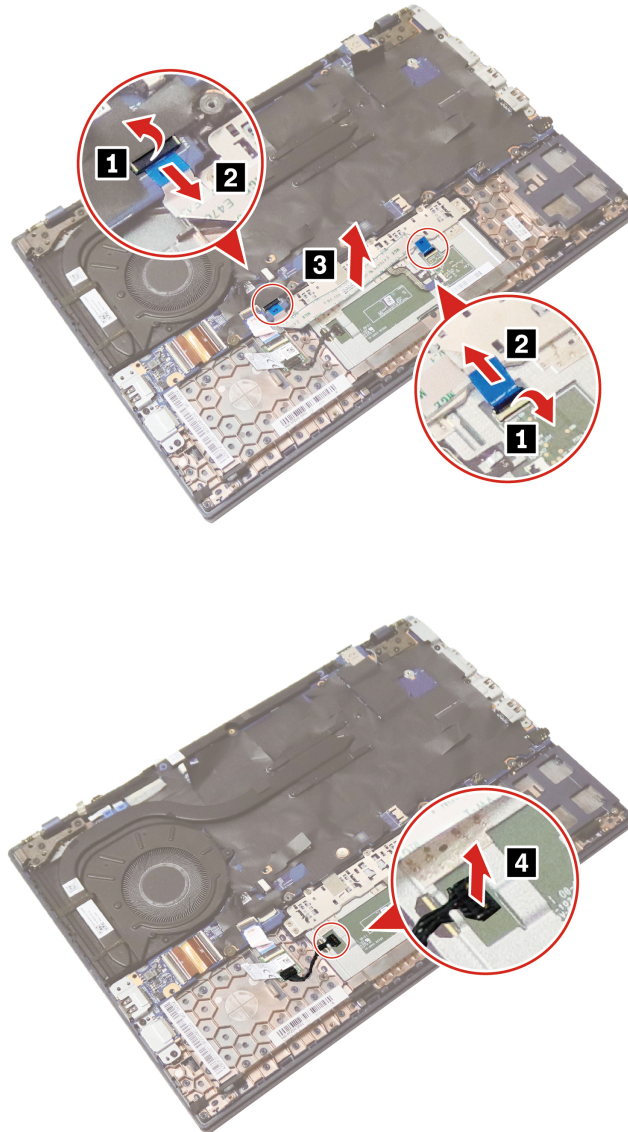
1130 Trackpad

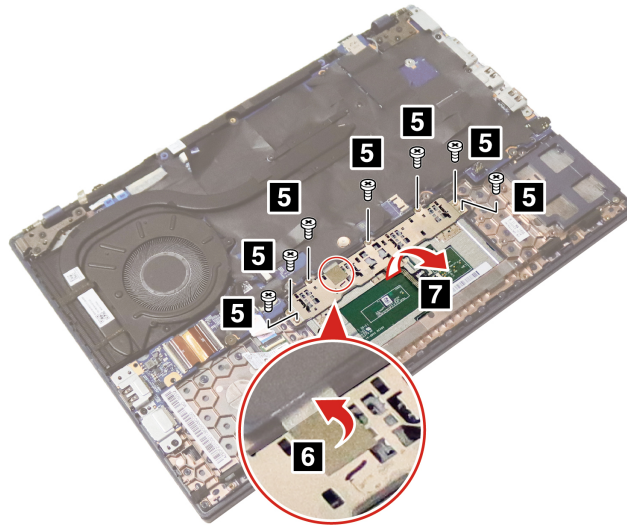
For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1110 Battery pack” on page 49

Removal steps of the trackpad

Note: There might exist a waterproof mylar covering the trackpad, remove the mylar before replacement.





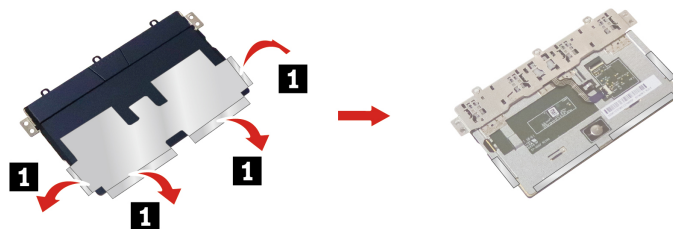
Step	Screw (quantity)	Color	Torque
5	M2 × L2 mm, flat-head, nylon-coated (7)	Silver	0.1 Nm (1.1 kgf-cm)

Notes:

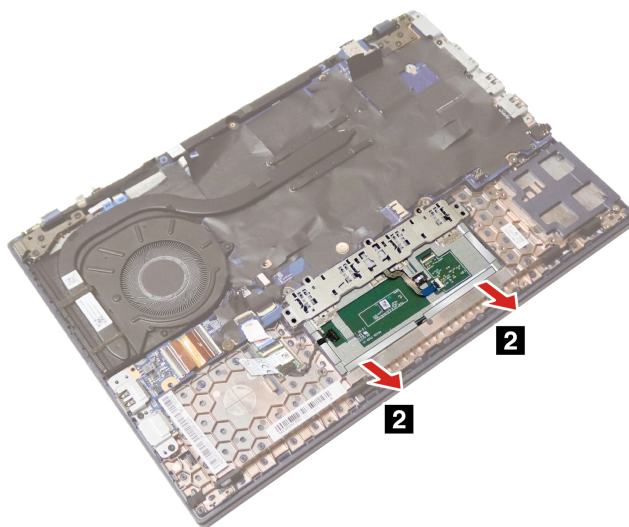
- A mylar might cover the trackpad, and ensure that you attach the mylar to the trackpad after replacement.
- Ensure that the connector is attached firmly.

Installation steps of trackpad

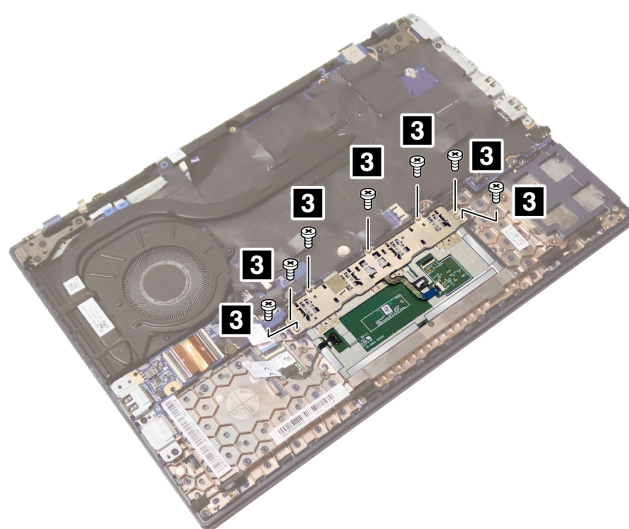
1. A trackpad jig might come with the trackpad which is used for fixing the location of the trackpad. Attach the trackpad jig to the trackpad and bend the four angles as shown by arrows below.



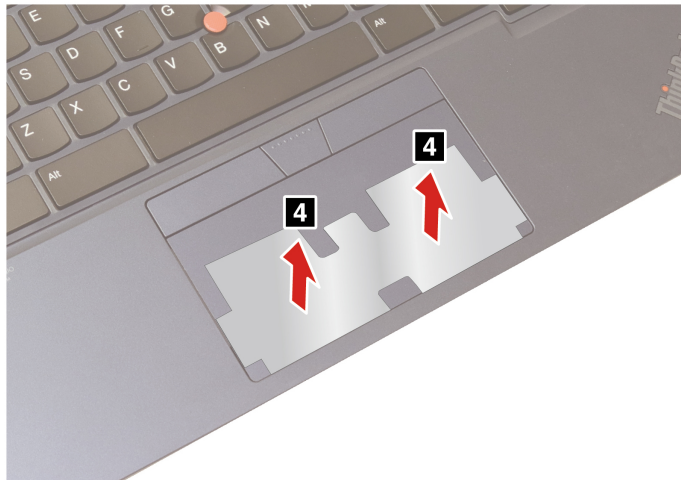
2. Install the trackpad with jig as shown.



3. Install the screws to fix the trackpad.



4. Remove the Jig.

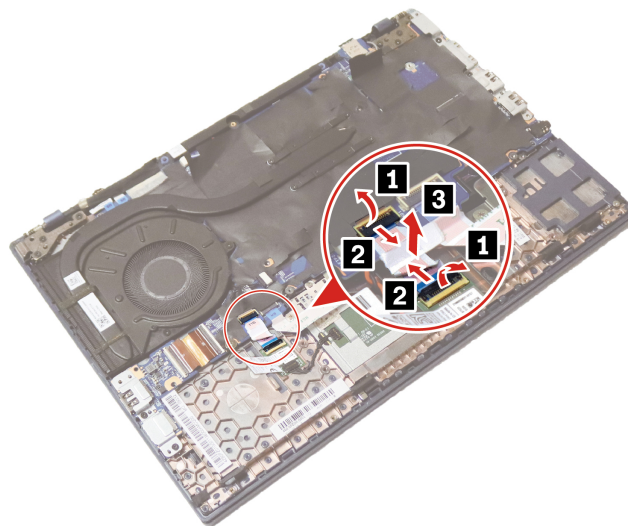


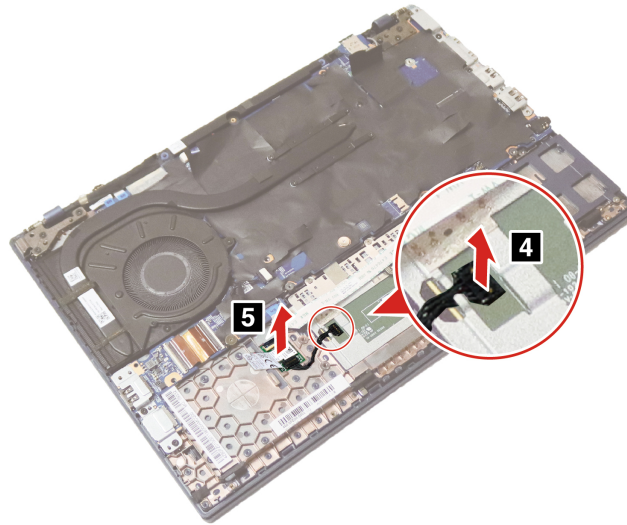
1140 NFC board and cable (for selected models)

For access, remove this FRU:

- “1020 Base cover assembly” on page 40
- “1110 Battery pack” on page 49

Removal steps of the NFC board and cable





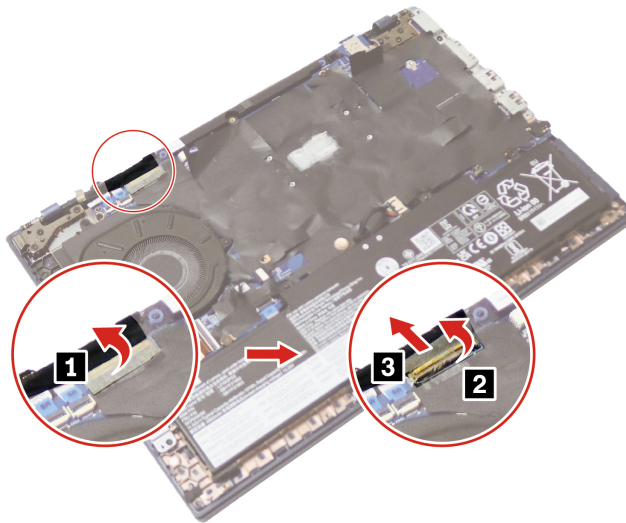
When installing: Ensure that the connector is attached firmly.

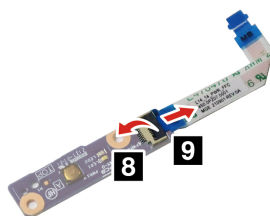
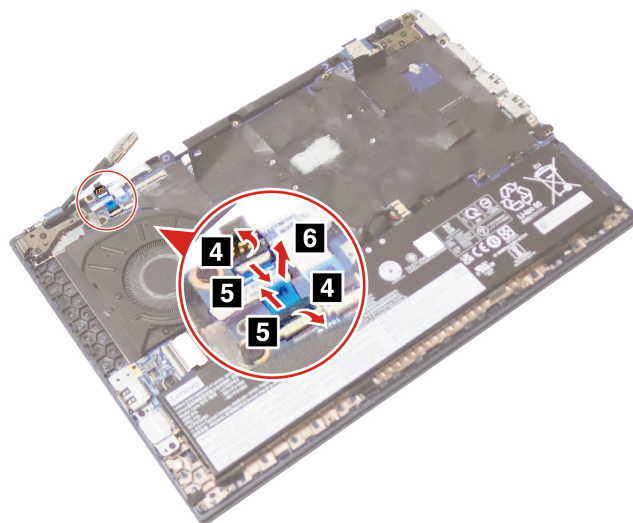
1150 Fingerprint reader cable (for selected models)

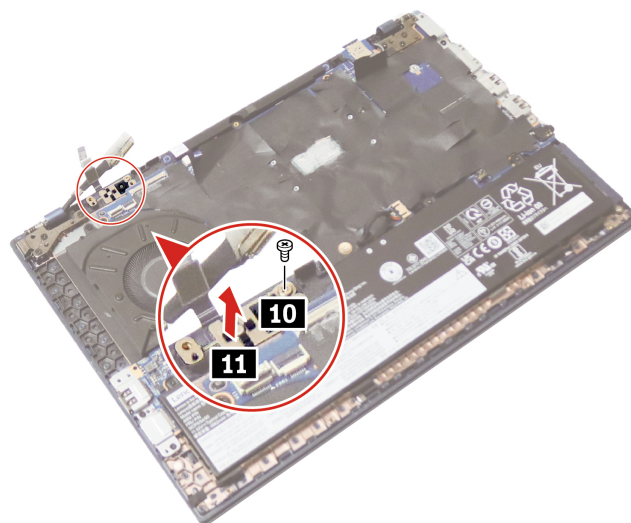
For access, remove these FRUs:

- “1020 Base cover assembly” on page 40

Removal steps of the fingerprint reader cable







Step	Screw (quantity)	Color	Torque
10	M2 × 4 mm, flat-head, nylon-coated (2)	Black	0.181 Nm (1.85 kgf-cm)

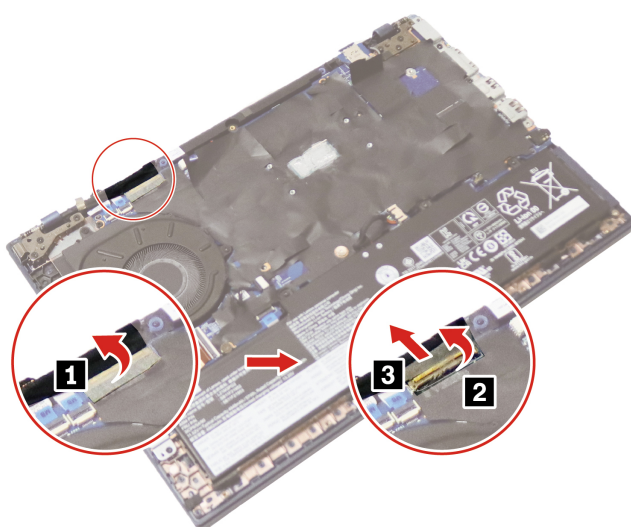
When installing: Ensure that the connector is attached firmly.

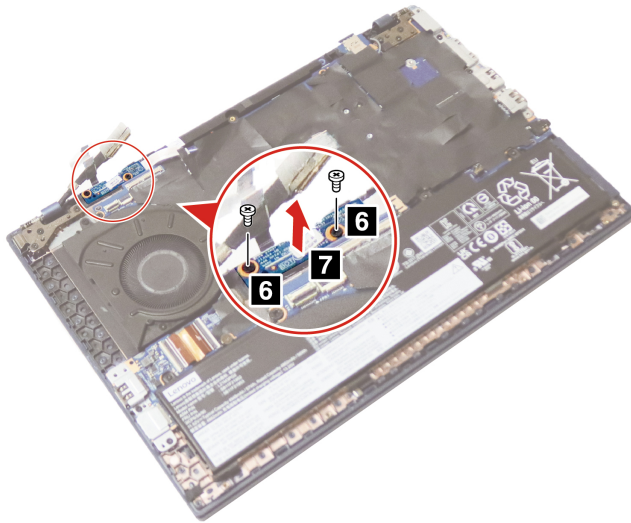
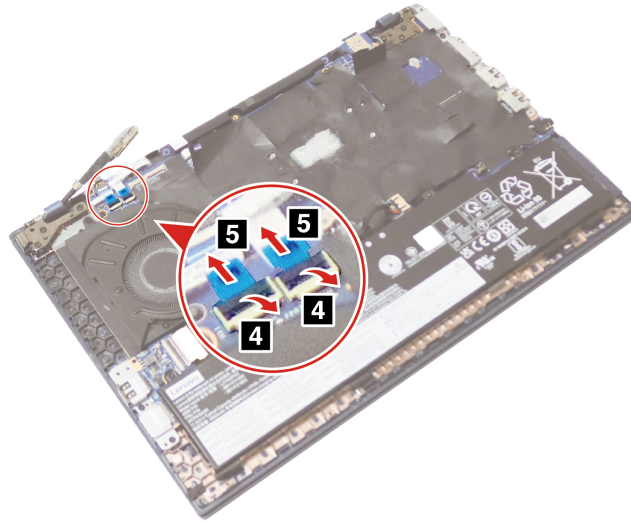
1160 Power board and power board cable with or without fingerprint reader (for selected models)

For access, remove this FRU:

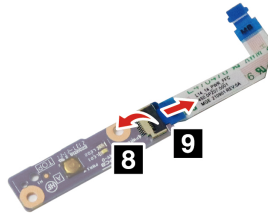
- “1020 Base cover assembly” on page 40

Removal steps of the power board and power board cable with or without fingerprint reader





Step	Screw (quantity)	Color	Torque
6	M2 × 4 mm, flat-head, nylon-coated (2)	Black	0.181 Nm (1.85 kgf-cm)



When installing: Ensure that the connector is attached firmly.

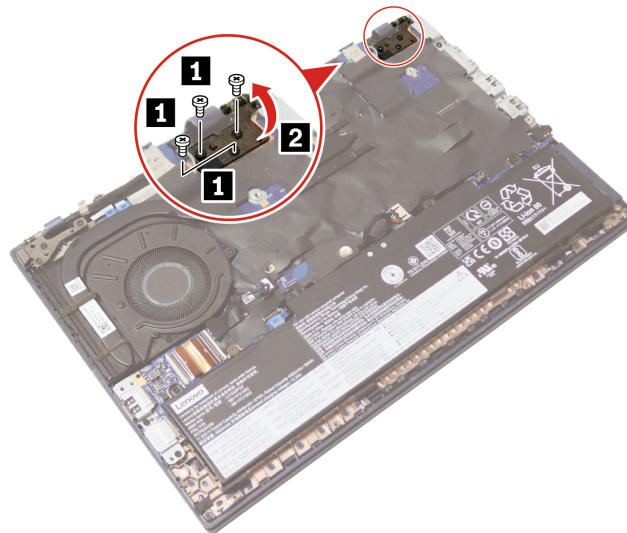
1170 I/O bracket

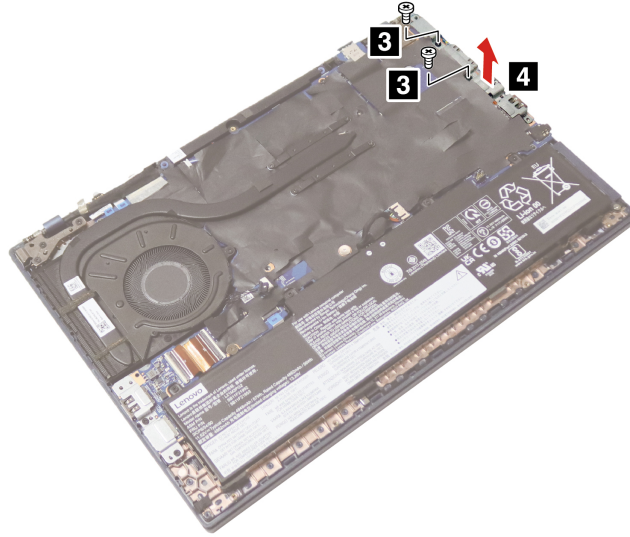
For access, remove this FRU:

- “1020 Base cover assembly” on page 40

For access, remove these FRUs in order:

Removal steps of the I/O bracket





Step	Screw (quantity)	Color	Torque
1	M2.5 × 4 mm, flat head, nylon-coated (3)	Black	0.294 Nm (2.94 kgf-cm)
3	M2 × 3 mm, flat head, nylon-coated (2)	Black	0.181 Nm (1.85 kgf-cm)

1180 System board

Important notices for handling the system board:

When handling the system board, read the following:

- Some components mounted on a system board are very sensitive. Improper handling of a system board can cause damage to those components, and may cause a system malfunction.
- The system board has an accelerometer, which can be broken when several thousands of G-forces are applied.

Note: Dropping a system board from a height of as little as 6 inches so that it falls flat on a hard bench can subject the accelerometer to as much as 6000 G's of shock.

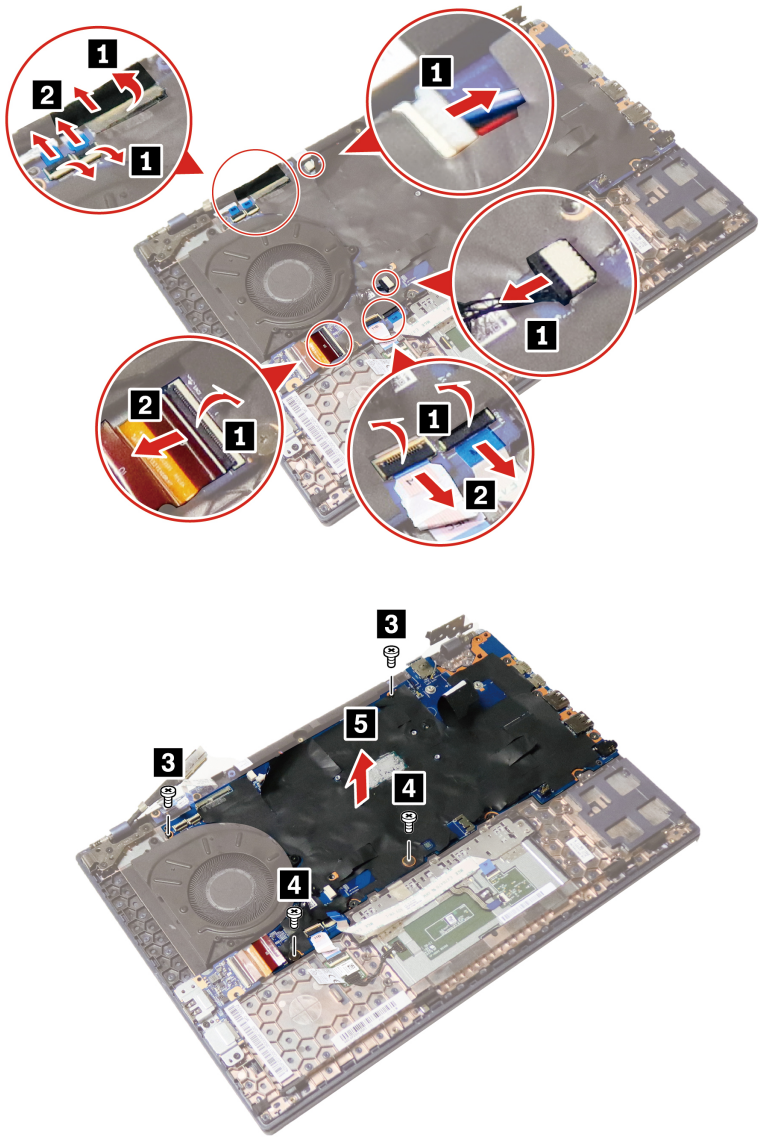
- Be careful not to drop the system board on a bench top that has a hard surface, such as metal, wood, or composite.
- Avoid rough handling of any kind.
- At every point in the process, be sure not to drop or stack the system board.
- If you put a system board down, be sure to put it only on a padded surface such as an ESD mat or a corrugated conductive surface.
- Avoid bending a system board and hard pushing to prevent cracking at each BGA (Ball Grid Array) chipset.

For access, remove these FRUs in order:

- “Removing microSD card, SIM-card and SIM-card tray” on page 36
- “1010 Keyboard” on page 36
- “1020 Base cover assembly” on page 40
- “1030 M.2 solid-state drive” on page 42
- “1040 Wireless WAN card (for selected models)” on page 43
- “1050 Wireless LAN card” on page 44

- “1100 Fan” on page 48
- “1110 Battery pack” on page 49
- “1170 I/O bracket” on page 59

Removal steps of the system board



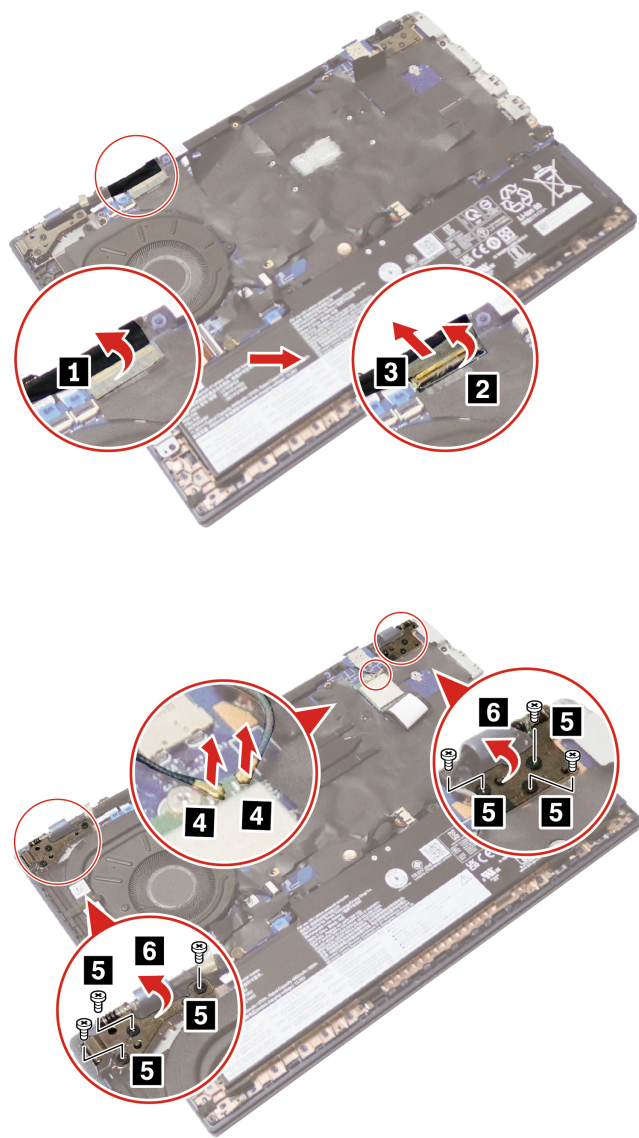
Step	Screw (quantity)	Color	Torque
3	M2 × 3 mm, flat head, nylon-coated (2)	Black	0.181 Nm (1.85 kgf-cm)
4	M2 × 2 mm, flat head, nylon-coated (2)	Silver	0.181 Nm (1.85 kgf-cm)

1190 LCD unit

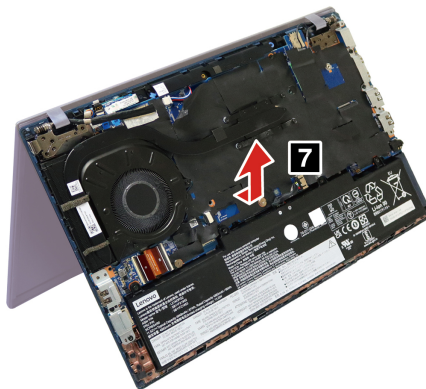
For access, remove this FRU:

- “1020 Base cover assembly” on page 40

Removal steps of the LCD unit



Step	Screw (quantity)	Color	Torque
5	M 2.5 × 4 mm, flat-head, nylon-coated (6)	Black	0.294 Nm (3.0 kgf-cm)



When installing: Ensure that the connector is attached firmly.

1200 Keyboard assembly

For access, remove these FRUs:

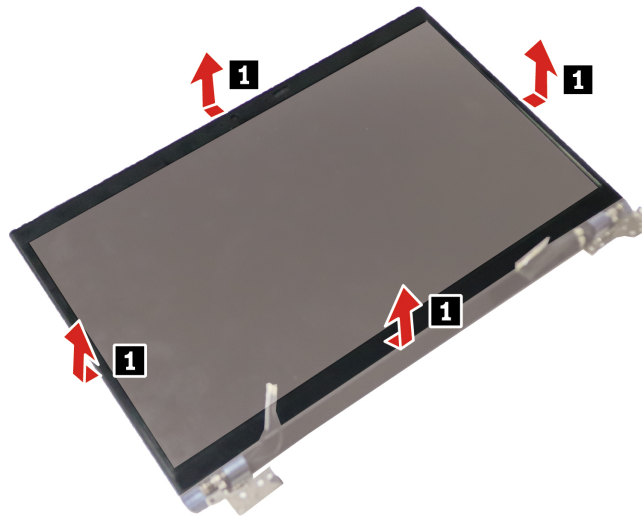
- “Removing microSD card, SIM-card and SIM-card tray” on page 36
- “1010 Keyboard” on page 36
- “1020 Base cover assembly” on page 40
- “1030 M.2 solid-state drive” on page 42
- “1040 Wireless WAN card (for selected models)” on page 43
- “1050 Wireless LAN card” on page 44
- “1060 Speaker” on page 45
- “1070 USB and microSD card board” on page 46
- “1080 USB and microSD card board and cable” on page 47
- “1090 Heat sink” on page 47
- “1100 Fan” on page 48
- “1110 Battery pack” on page 49
- “1120 Smart card dummy door” on page 50
- “1130 Trackpad” on page 51
- “1140 NFC board and cable (for selected models)” on page 54
- “1150 Fingerprint reader cable (for selected models)” on page 55
- “1160 Power board and power board cable with or without fingerprint reader (for selected models)” on page 57
- “1170 I/O bracket” on page 59
- “1180 System board” on page 60
- “1190 LCD unit” on page 61

2010 LCD bezel

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1190 LCD unit” on page 61

Removal steps of the LCD bezel



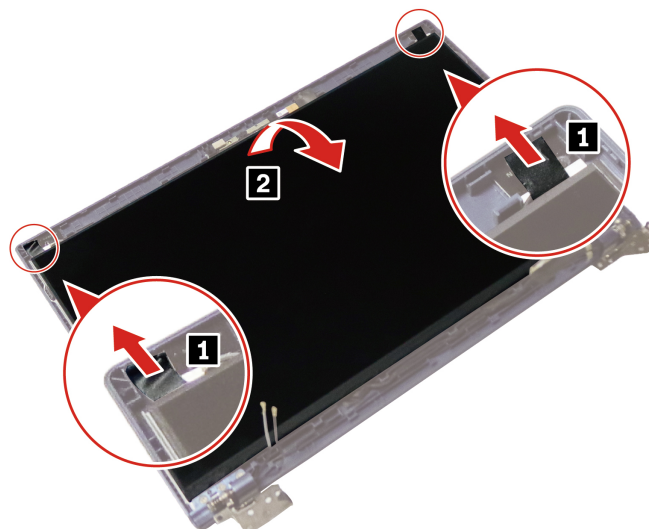
When installing: Ensure that all the latches are attached firmly.

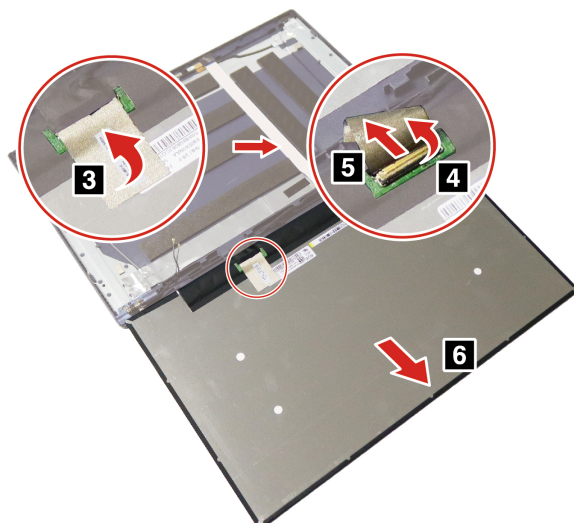
2020 LCD panel

For access, remove this FRU:

- “1020 Base cover assembly” on page 40
- “1190 LCD unit” on page 61
- “2010 LCD bezel” on page 63

Removal steps of the LCD panel





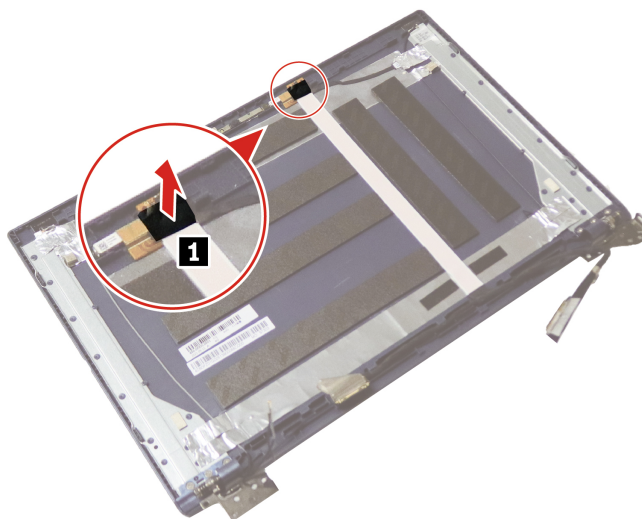
When installing: Ensure that the connector is attached firmly.

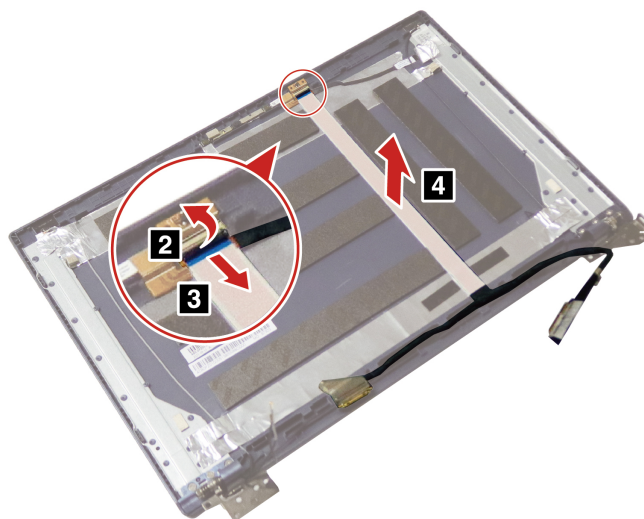
2030 LCD cable

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1190 LCD unit” on page 61
- “2010 LCD bezel” on page 63

Removal steps of the LCD cable





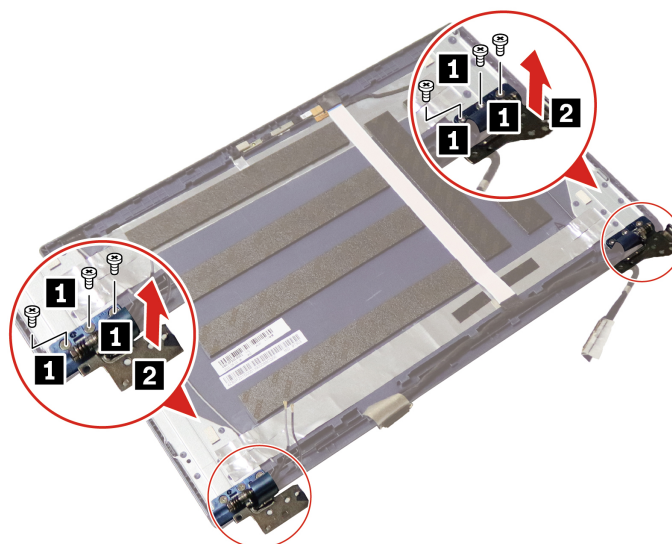
When installing: Ensure that the connector is attached firmly.

2040 LCD hinges

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1190 LCD unit” on page 61
- “2010 LCD bezel” on page 63
- “2020 LCD panel” on page 64

Removal steps of the LCD hinges



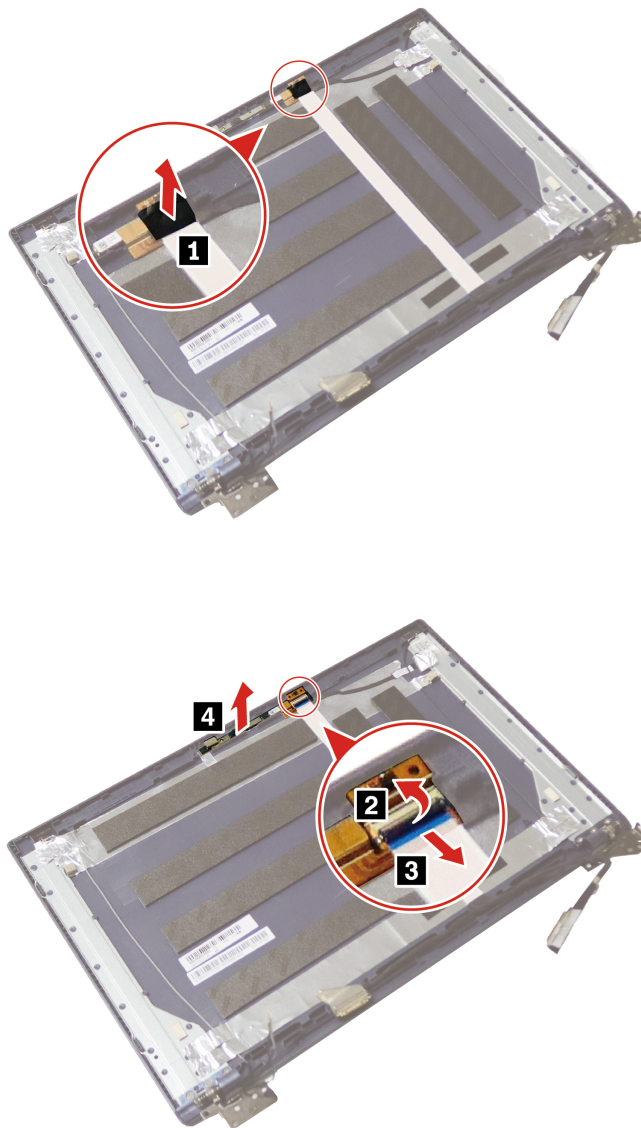
Step	Screw (quantity)	Color	Torque
1	M2.5 × 4 mm, flat-head, nylon-coated (6)	Black	0.294 Nm (3.0 kgf-cm)

2050 Camera-and-microphone module and cable (for selected models)

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40
- “1190 LCD unit” on page 61
- “2010 LCD bezel” on page 63
- “2020 LCD panel” on page 64

Removal steps of the camera-and-microphone module



When installing: Ensure that the connector is attached firmly.

2070 LCD cover assembly

For access, remove these FRUs in order:

- “1020 Base cover assembly” on page 40

- “1190 LCD unit” on page 61
- “2010 LCD bezel” on page 63
- “2020 LCD panel” on page 64
- “2040 LCD hinges” on page 66
- “2030 LCD cable” on page 65
- “2050 Camera-and-microphone module and cable (for selected models)” on page 67

Appendix A. Notices

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Part Number: SP40T10580

Printed in China

(1P) P/N: SP40T10580

