Lenovo ThinkPad C13 Yoga Gen 1 Chromebook
Hardware Maintenance Manual



Note: Before using this information and the product it supports, be sure to read the general information under Appendix A “Notices” on page 67.

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Contents

About this manual iii

Chapter 1. Safety information 1

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

Chapter 2. General checkout 21

What to do first 21
Power system checkout 22
Checking the ac power adapter 22
Checking the built-in battery and operational charging 22

Chapter 3. Create and use a Return Merchandise Authorization (RMA) . . . 25

What is a RMA? 25
Create a RMA 25
Use the RMA 26

Chapter 4. Use the keyboard shortcuts 28

Chapter 5. Locations 29

Locating controls and connectors 29
Locating FRUs and CRUs 31
Major FRUs and CRUs 32
LCD FRUs 34
Miscellaneous parts 35
Connector and cable guide 35
Looking up FRU information 37

Chapter 6. FRU replacement notices 39

Service tool kit 39
Screw notices 39

Chapter 7. FRU replacement notices 41

General guidelines 41
Before servicing the Chromebook 42
Disabling the built-in battery 42
1010 Lenovo Garaged USI pen (for selected models) 42
1020 Base cover assembly 42
1030 Built-in battery 43
1040 Wireless LAN card 44
1050 M.2 solid-state drive and M.2 solid-state drive cover 45
1060 I/O board brackets 46
1070 I/O board cable and I/O board 47
1080 Thermal fan assembly 48
1090 LCD unit 49
1110 Pen charger cable 51
1120 Speaker assembly 52
1130 Touchpad and touchpad cable 52
1140 Fingerprint reader bracket, fingerprint reader cable, and fingerprint reader 53
1150 System board 54
1160 World-Facing camera board and cable (for selected models) 55
1170 Keyboard assembly 56
Removing the LCD FRU 57
2010 Strip cover 57
2020 LCD panel 57
2030 LCD cable 60
2040 Camera board and camera with microphone cable 61
2050 Microphone board 61
2060 Microphone with sensor board (for selected models) 62
2070 Camera cable 62
2080 LED cable 63
2090 LCD hinges assembly 64
2100 LCD rear cover assembly 64

Appendix A. Notices 67

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About this manual

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

Lenovo ThinkPad C13 Yoga Gen 1 Chromebook	Machine types (MT): 20UX and 20UY

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.

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Chapter 1. Safety information

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

- “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 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 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.

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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
  - Pumps
  - Blowers and fans
  - Motor generators
  - 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-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-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. 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



DANGER

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.



خطر

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 فقدهم 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.



خطر

تحتوي بعض البطاريات الاحتياطية على كمية صغيرة من مادتي النيكل والكادميوم. لا تقم بفك أو اعادة شحن البطارية الاحتياطية ولا تقم أيضا بالقاءها 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.



خطر

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.



خطر

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 منوية (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.



خطر

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



خطر

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



خطر

على الرغم من أن البطاريات الرئيسية يكون لها جهد منخفض، الا أنه قد تقوم البطاريات التي حدث قصور بها أو التي تم توصيلها أرضيا باصدار 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 بايقاف تشغيل الحاسب ونزع كل أسلاك الطاقة من المخارج الكهربائية وقم أيضا بازالة 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 temperature 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 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.



סכנה

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



סכנה

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



סכנה

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



סכנה

אם מסך תגביש 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.



סכנה

כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק המגן על חלקו התחתון של הכונן הקשיח.



סכנה

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

סכנה

אלא אם כן מותרת יהחלפה חמה של ה-FRU המוחלף, פעלו כדלהלן לפני הסרתו:
כבו את המחשב, נתקו את כל כבלי החשמל מהשקעים, הוציאו את מארז הסוללות ונתקו את כל הכבלים המחוברים.

危険

FRU の交換後、コンピューター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、コンピューターの内部でそれらが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、コンピューターを振って、カチャカチャと音がしないか確認します。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。

危険

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。

危険

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、その極性コネクターの取り外し、バッテリー本体の分解、
100 ℃ (212 °F) 以上への加熱、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 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。



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 달깍거리는 소리가 나지 않는지 확인하십시오. 금속 부품 또는 금속 조각은 누전을 일으킬 수 있습니다.



위험

일부 보조 배터리에는 소량의 니켈 및 카트뮴이 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, 100C(212F) 이상으로 가열하거나, 소각하거나, 전지 내용물을 물에 노출시키지 마십시오. 배터리를 폐기할 때에는 해당 지역을 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 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.



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 medica si se presenta algún síntoma del fluido despues 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。
金屬零件或儀錶的火花會造成電線短路。



危險

部分備用電池含有微量的鋰和鎘。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鋰。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 21
- "Power system checkout" on page 22

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

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- 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 22
- “Checking the built-in battery and operational charging” on page 22

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 22.

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 Return Merchandise Authorization (RMA)

This chapter contains the following topics:

"What is a RMA?" on page 25

"Create a RMA" on page 25

"Use the RMA" on page 26

What is a RMA?

You can create a RMA by writing a repair shim image to a USB storage drive. With the RMA, 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 RMA to diagnose and identify problems.

When you use the RMA 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
FAT	The FAT is designed to test some functional settings.
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	The RunIn is designed to test how the system functions under stress by running the maximum workload. It takes about 15 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 RMA

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.

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Use the RMA

Step 1. 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 2. Press the power button together with **esc** and ↻. The Chrome operating system recovery screen is displayed. Then, Press Ctrl + D to enter to the developer mode after the operating system verification screen is displayed.

Step 3. Press the power button together with **esc** and ↻. Then, connect the prepared USB storage drive to the Chromebook.

Step 4. The shim image will be automatically installed. 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 RMA USB key from the Chromebook and store it in a safe place.

Step 7. Start the RMA process.

Note: If you detect a defective component during the process, turn off the Chromebook, detach the ac power adapter, and then replace the defective component.

Step 8. 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	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 resetting the Chromebook to factory settings HWID mismatch can be caused by using unauthorized or missing parts.

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

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Chapter 4. Use the keyboard shortcuts

The function keys on the keyboard help you work more easily and effectively.

←	Go to the previous page.
→	Go to the next page.
↻	Refresh your current page.
⛶	Make the current window full screen.
☐||	Open the task view to see all your open windows.
☼	Darken the display.
☼	Brighten the display.
🔇	Mute the speakers.
🔉	Decrease the speaker volume.
🔊	Increase the speaker volume.
🔒	Lock the screen.

Your Chromebook also supports some key combinations.

Ctrl + ☐||	Take a screenshot.
Alt + 🔍	Switch the letter case between the upper case and lower case.
L + 🔍	Lock the screen.
Ctrl + Alt + ?	View all keyboard shortcuts.

To change the keyboard settings:

1. Click the setting icon in the system tray, and then click **Device → Keyboard**.
2. Follow the on-screen instructions to change the settings as you prefer.

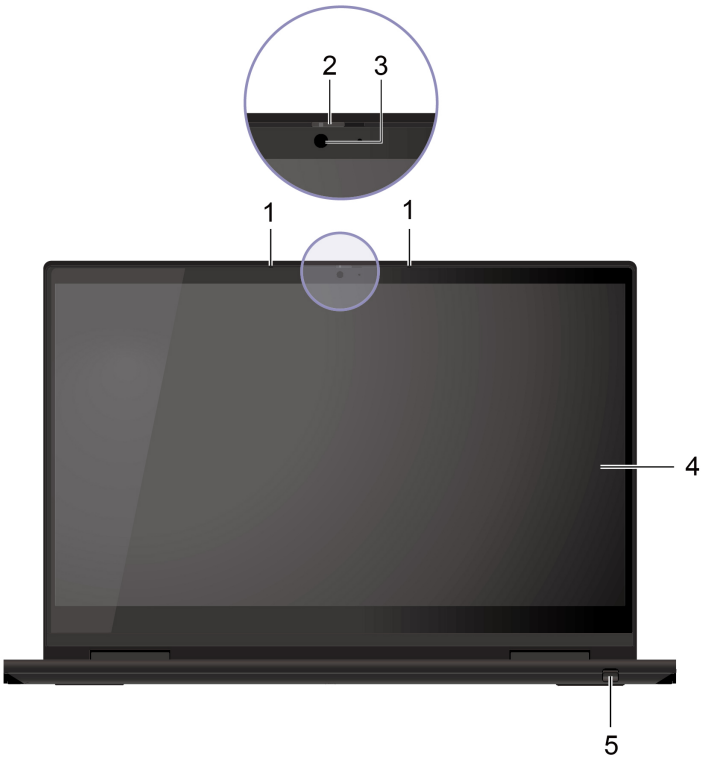
Chapter 5. Locations

This chapter introduces the locations of the hardware components on your computer.

Locating controls and connectors

This topic introduces the locations of the controls and connectors.

Front



1. Microphones	4. Multi-touch screen
2. ThinkShutter	5. Lenovo Garaged USI pen*
3. Camera	

* for selected models

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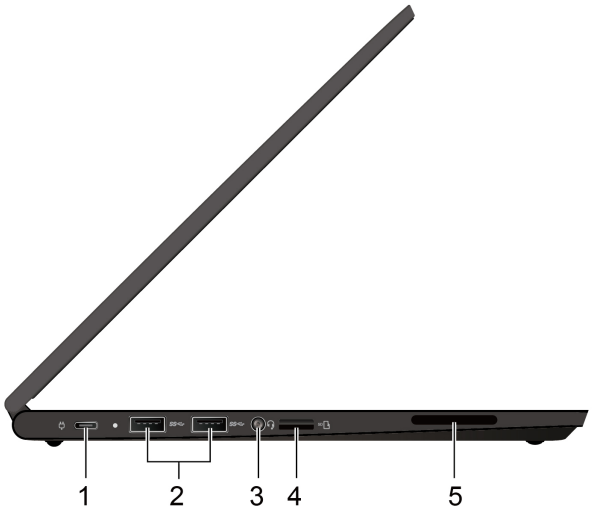
Base



1. Microphone*	4. Touchpad
2. World-Facing camera*	5. TrackPoint® pointing device
3. Fingerprint reader*	

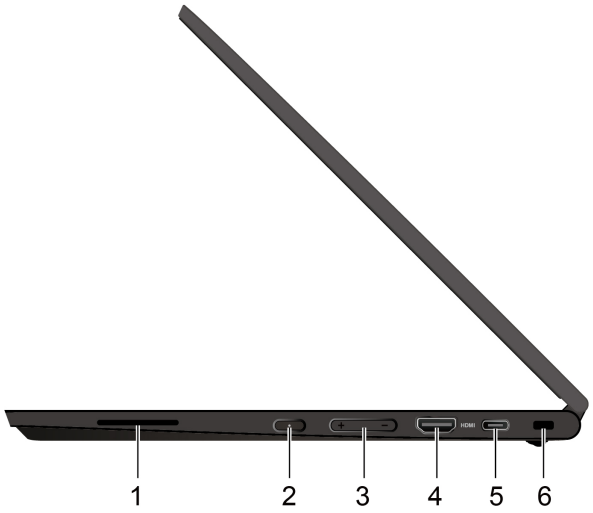
* for selected models

Left



1. Power connector (USB-C®)	4. microSD card slot
2. USB 3.2 Gen 1 connectors	5. Speaker
3. Audio connector	

Right



1. Speaker	4. HDMI™ connector
2. Power button	5. USB-C (3.2 Gen 2) connector
3. Volume button	7. Security-lock slot

Locating FRUs and CRUs

This topic introduces the following service parts:

"Major FRUs and CRUs" on page 32

"LCD FRUs" on page 34

"Miscellaneous parts" on page 35

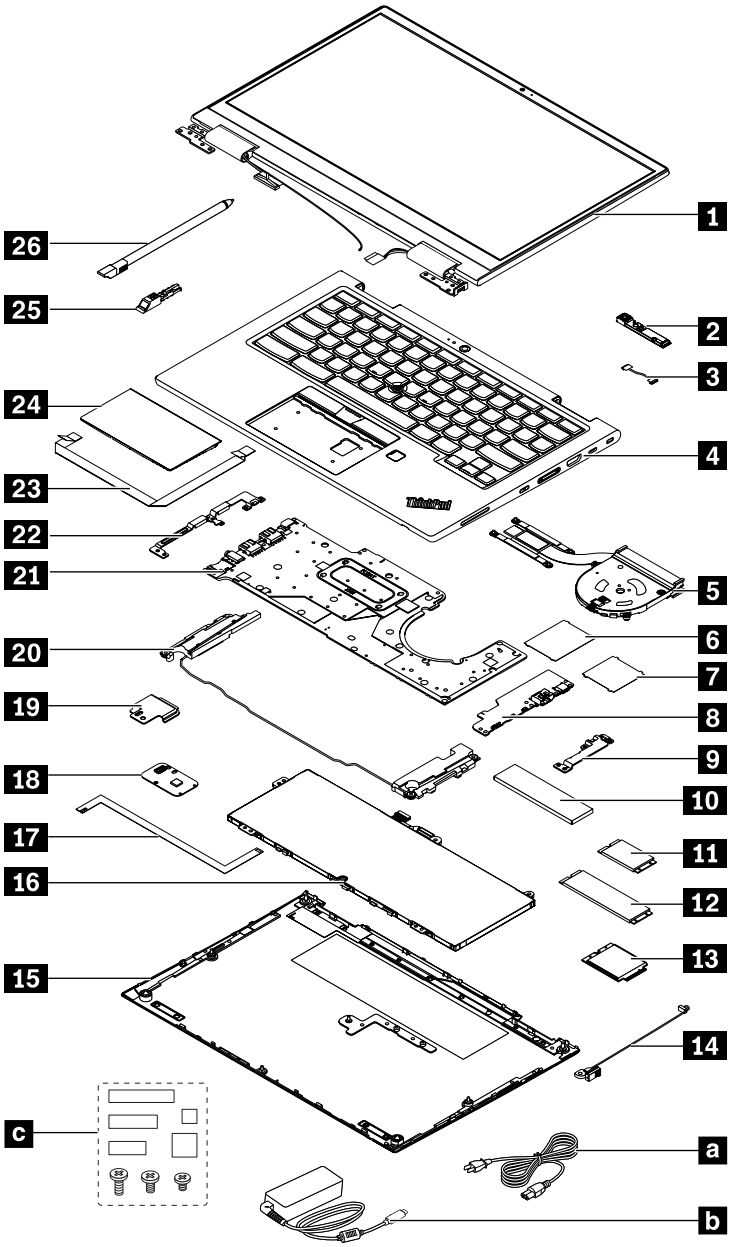
Notes:

- 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.

  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

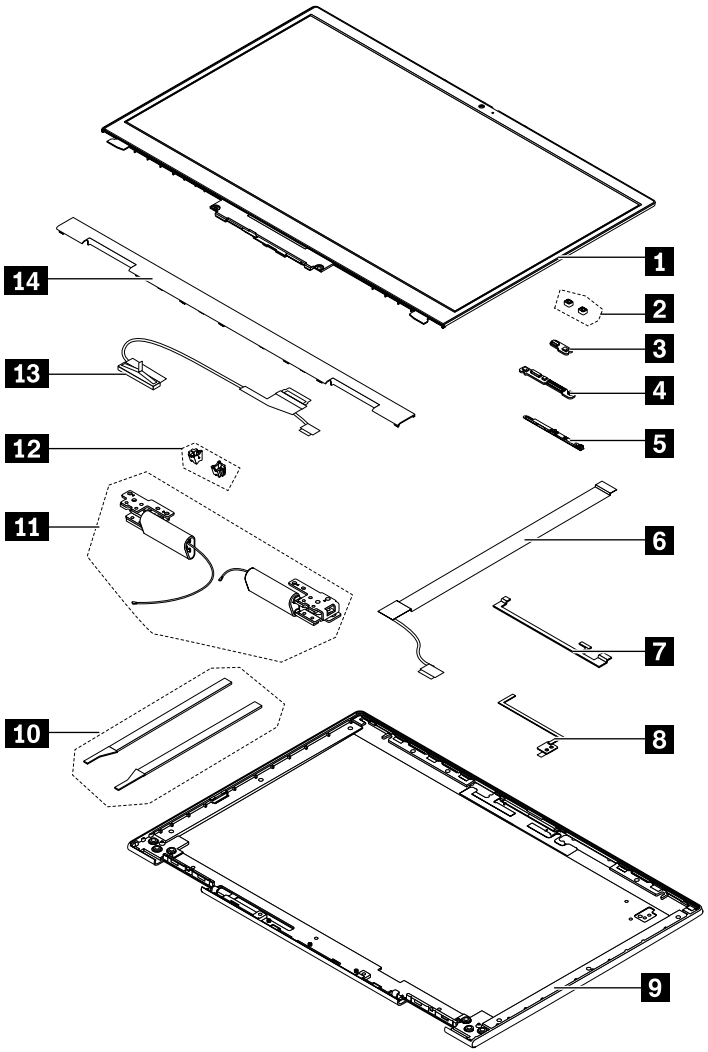
No.	FRU description	Self-service CRU	Optional-service CRU
1	LCD unit	No	No

Table 2. Major FRUs and CRUs (continued)

2	World-Facing camera board*	No	No
3	World-Facing camera cable*	No	No
4	Keyboard assembly	No	No
5	Thermal fan assembly	No	No
6 7	USB board cable	No	No
8	USB board	No	No
9	Short USB board bracket	No	No
10	M.2 solid-state drive cover*	No	No
11	M.2 2242 solid-state drive*	No	No
12	M.2 2280 solid-state drive*	No	No
13	Wireless LAN card	No	No
14	Pen charger with cable	No	No
15	Base cover assembly	Yes	No
16	Built-in battery	No	No
17	Fingerprint reader cable*	No	No
18	Fingerprint reader*	No	No
19	Fingerprint reader bracket*	No	No
20	Speaker assembly	No	No
21	System board	No	No
22	Long USB board bracket	No	No
23	Touchpad cable	No	No
24	Touchpad	No	No
25	Dummy pen cap*	No	No
26	Lenovo Garaged USI pen*	Yes	No
a	Power cord	Yes	No
b	ac power adapter	Yes	No
c	Miscellaneous parts kits (See “Miscellaneous parts” on page 35)	No	No

* for selected models

LCD FRUs



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 panel	No	No
2	Microphone rubber	No	No
3	Microphone board	No	No
4	Microphone with sensor board*	No	No
5	Camera board	No	No
6	Camera cable	No	No
7	Camera with microphone cable	No	No
8	LED cable	No	No
9	LCD cover assembly	No	No

Table 3. LCD FRUs and CRUs (continued)

10	LCD elastic tapes*	No	No
11	LCD hinge assembly	No	No
12	LCD hinge rubber	No	No
13	LCD cable	No	No
14	Strip cover	No	No

* for selected models

Miscellaneous parts

Table 4. Miscellaneous parts

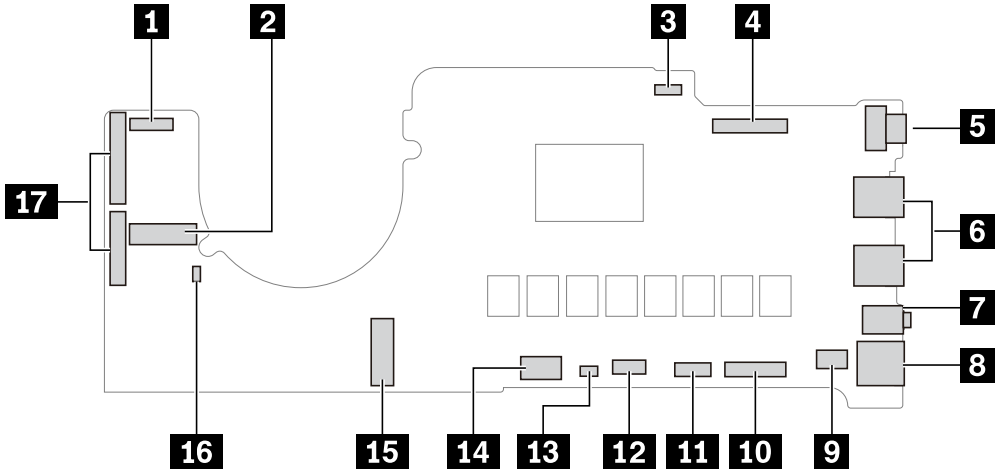
FRU descriptions	Self-service CRU	Optional-service CRU
Screw pack: • Screw M2.5 x L2.3, black (6) • Screw M2 x L2, silver (1) • Screw M2 x L2.5, silver (3) • Screw M2 x L4.5, silver (9) • Screw M2.5 x L5, black (4) • Screw M2 x L3.5, black (9) • Screw M2 x L2, black (4) • Screw M2.5 x L7.5 , black (2) • Screw M2 x L7.5 , black (4) • Screw M2 x L5.5 , black (2) • Spec	No	No

Connector and cable guide

This section provides information for Lenovo authorized service technicians to help identify connectors and cables for replacement purpose. To view each FRU and the exploded illustration of the Chromebook, see Major FRUs and CRUs and LCD FRUs.

Note: Depending on your model, some connectors or cables might not be available.

System board



Item	Connector (location)	Internal cable required	Cable connection
1	Camera with microphone and LED connector (internal)	No	Connect one end of the cable to the camera with microphone and LED board and the other end to this connector.
2	Wireless-LAN card slot (internal)	No	Insert the wireless-LAN card into this slot.
3	World-Facing camera board connector (internal)	World-Facing camera cable	Connect one end of the World-Facing camera cable to the World-Facing camera board and the other end to this connector.
4	LCD connector (internal)	LCD cable	Connect one end of the LCD cable to the LCD panel and the other end to this connector.
5	USB-C connector (external)	No	Connect USB-C compatible devices or a USB-C power adapter to this connector.
6	USB 3.2 connectors Gen 1 (external)	No	Connect USB-compatible devices to this connector.
7	Audio connector (external)	No	Connect headphones or a headset with 3.5-mm (0.14-inch) 4-pole plug to this connector.
8	microSD card slot (external)	No	Insert a microSD card into this slot
9	Speaker assembly connector (internal)	Speaker assembly cable	The speaker assembly comes with cable. Connect the cable to this connector.
10 11	Keyboard connectors (internal)	Keyboard assembly cables	The keyboard assembly comes with the cables. Connect the cables to these connectors.
12	Touchpad connector (internal)	Touchpad cable	Connect one end to the touchpad and the other end to this connector.
13	Fingerprint reader connector (internal)	Fingerprint-reader cable	Connect one end to the fingerprint reader card and the other end to this connector.
14	Battery connector (internal)	Battery with cable	The built-in battery comes with a cable. Connect the cable to this connector.
15	M.2 solid-state drive connector (internal)	No	Insert the M.2 solid-state drive into this slot.

Item	Connector (location)	Internal cable required	Cable connection
16	Thermal fan connector (internal)	Thermal fan assembly cable	The thermal fan assembly comes with cable. Connect the cable to this connector.
17	I/O board connector (internal)	I/O board cable	Connect one end of the cable to the USB board and the other end to this connector.

Looking up FRU information

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

Chapter 6. FRU replacement notices

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

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 part that is replaced by the 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.

Service tool kit

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

No.	Tool name	Tool type
1	Phillips-head screwdriver	Common tool
2	Torx-head screwdriver	Common tool
3	Conductive tweezers	Common tool
4	Hexagonal socket	Common tool
5	Silicone grease	Consumable tool
6	Polyamide tape	Consumable tool
7	Mylar tape	Consumable tool
8	Eraser	Consumable tool
9	Electrical tape	Consumable tool
10	Double-sided tape	Consumable tool
11	Conductive tape	Consumable tool

Note: The silicone grease can be applied to the surfaces of the microprocessor and heatsink to eliminate air gaps. The hexagonal socket is used to pick up the antenna connectors.

Screw notices

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

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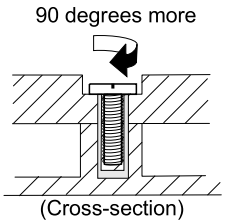
- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They are harder to tighten.

Do the following when you service this machine:

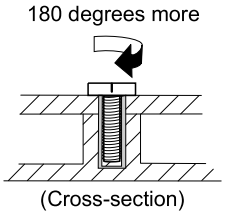
- Keep the screw kit in your tool bag. For the part number of the screw kit, go to https://support.lenovo.com/partslookup.
- It is recommended to use new screws.
- It is recommended to use each screw only once.

Tighten screws as follows:

- **Plastic to plastic**
  Turn an additional 90 degrees after the screw head touches the surface of the plastic part.



- **Logic card to plastic**
  Turn an additional 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 that torque screwdrivers are calibrated correctly following country specifications.

Chapter 7. FRU replacement notices

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

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 part that is replaced by the 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.

General guidelines

When removing or replacing a FRU, ensure that you observe the following general guidelines:

1. Do not try to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. 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 procedure. Remove them in the order in which they are listed.
3. Follow the correct sequence in the steps for removing a FRU, as shown in the illustrations by the numbers in square callouts.
4. When removing a FRU, move it in the direction as shown by the arrow in the illustration.
5. To install a new FRU in place, perform the removal procedure in reverse and follow any notes that pertain to replacement.
6. If screws are missing, look up details in "Miscellaneous parts" on page 35 for replacement screws and order them through the Lenovo CRM system.
7. When replacing the base cover, reapply all labels that come with the replacement base cover. If some original labels are not included with the replacement base cover, peal them off from the original base cover and paste them on the replacement base cover.

DANGER

Before removing any FRU or CRU, shut down the computer and unplug all power cords from electrical outlets.

Attention:

- After replacing a FRU, do not turn on the computer until you have ensured 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.

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- 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 (P/N 6405959).

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.

1010 Lenovo Garaged USI pen (for selected models)

Removal step of the Lenovo Garaged USI pen

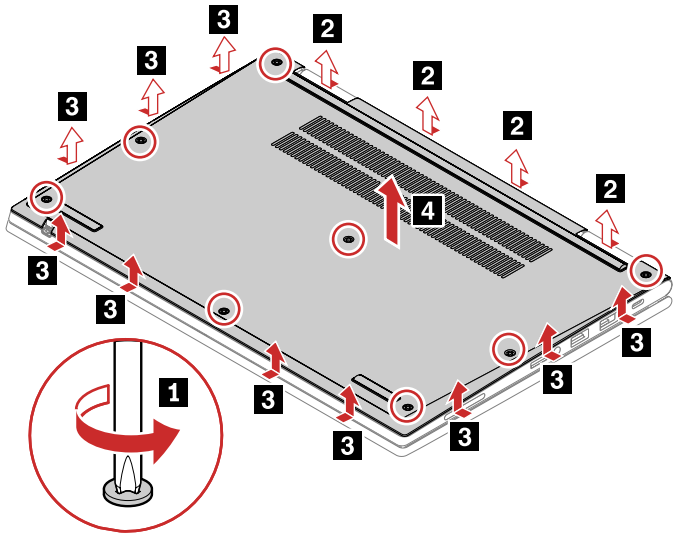


Note: Ensure that you reinstall the Lenovo Garaged USI pen after finishing the servicing.

1020 Base cover assembly

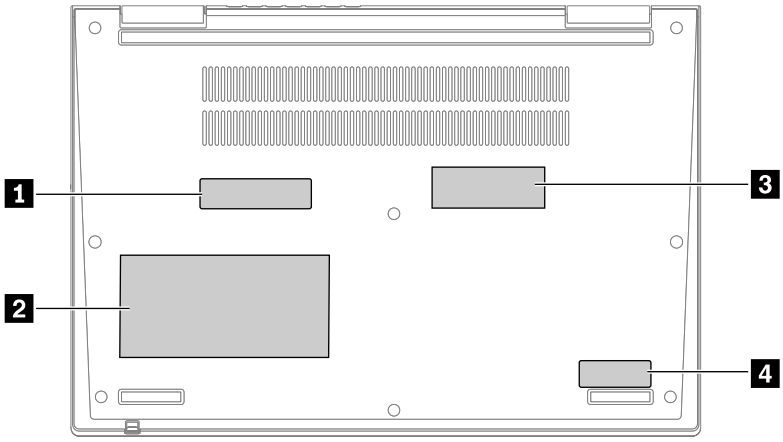
For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42

Removal steps of the base cover assembly



Applying labels to the base cover assembly

The following illustration and table show the label areas and what labels are applied in each area.



1 GEO label	2 Asset tag label
3 Country label	4 Serial number label

1030 Built-in battery

For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

Important notices for replacing a built-in 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.

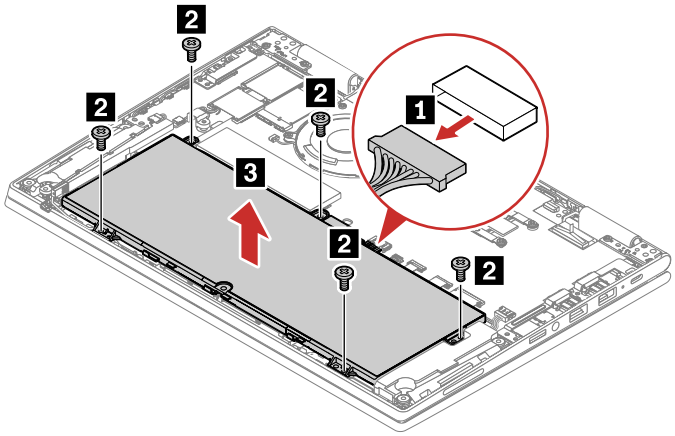
A battery FRU should not be replaced unless this diagnostic test shows that the battery is defective. The only exception to this is if the battery is physically damaged or a customer is reporting a possible safety issue.

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

Removal steps of the built-in battery

DANGER

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



Step	Screw (quantity)	Color	Torque
2	M2 × L3.5 mm, black nickel (5)	Black	0.18 Nm (1.85 kgf-cm)

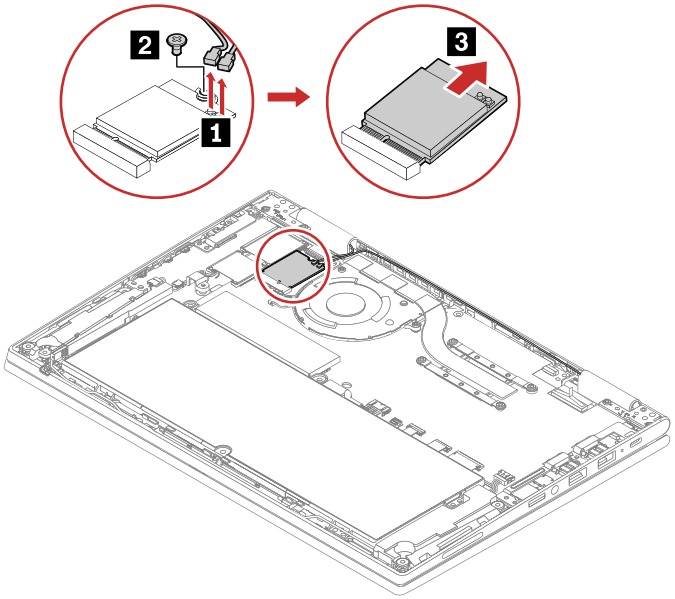
1040 Wireless LAN card

For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

Removal steps of the wireless LAN card

Unplug the connectors by using the antenna RF connector removal tool or pick the connectors with your fingers and gently unplug them as shown.



Step	Screw (quantity)	Color	Torque
2	M2 × 2.5 mm, flat-head, nylon-coated (1)	Black	0.18 Nm (1.85 kgf-cm)

1050 M.2 solid-state drive and M.2 solid-state drive cover

For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

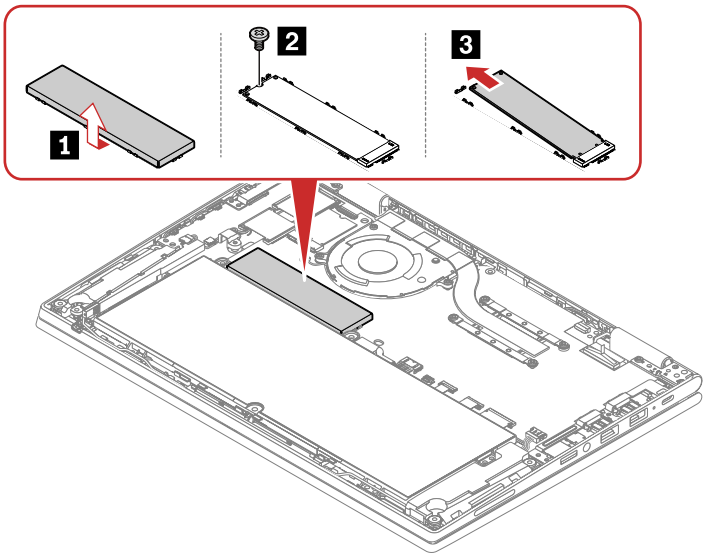
Attention: The M.2 solid-state drive is sensitive. Inappropriate handling might cause damage and permanent loss of data.

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 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.

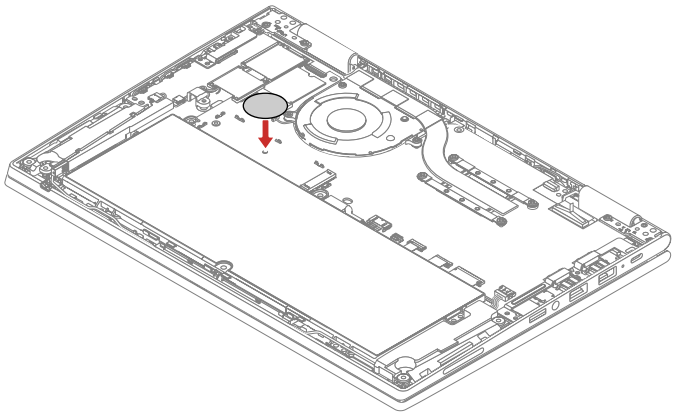
Removal steps of the M.2 solid-state drive and M.2 solid-state drive cover



Note: Depending on the model, your M.2 solid-state drive might look different from the illustration above.

Step	Screw (quantity)	Color	Torque
2	M2 × L2.5 mm, large flat (1)	Black	0.18 Nm (1.85 kgf-cm)

When installing: Remember to install a mylar before you upgrade your 2242 solid-state drive to 2280 solid-state drive or you install a new M.2 2280 solid-state drive on the empty SSD slot.

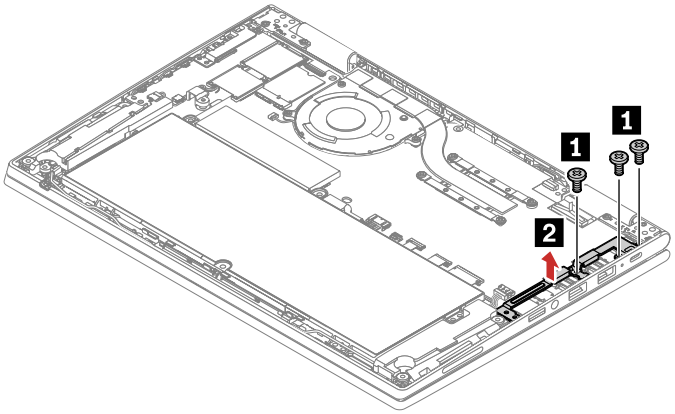


1060 I/O board brackets

For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

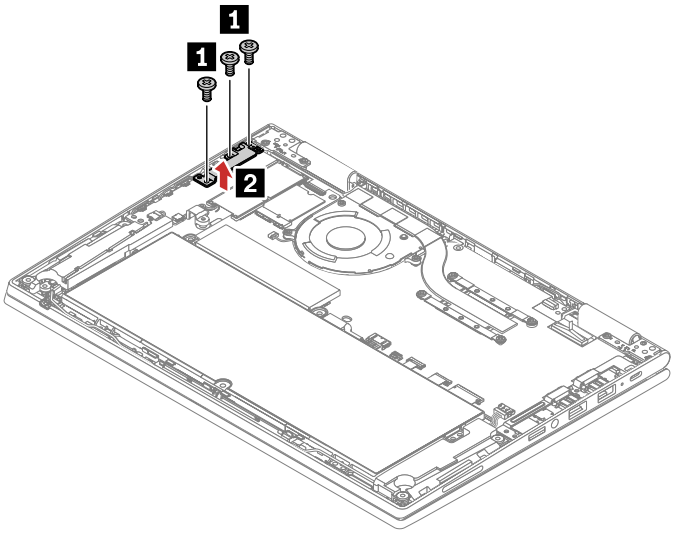
Removal steps of long I/O board bracket

Note: A Mylar film might cover the screw. To access it, peel off the film first.



Step	Screw (quantity)	Color	Torque
1	M2 × 4.5 mm, flat-head, nylon-coated (3)	Silver	0.18 Nm (1.85 kgf-cm)

Removal steps of short I/O board bracket



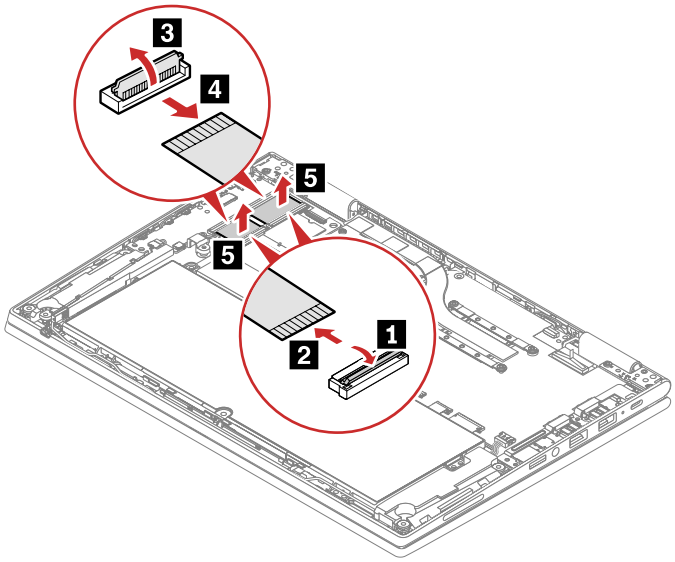
Step	Screw (quantity)	Color	Torque
1	M2 × 4.5 mm, flat-head, nylon-coated (3)	Silver	0.18 Nm (1.85 kgf-cm)

1070 I/O board cable and I/O board

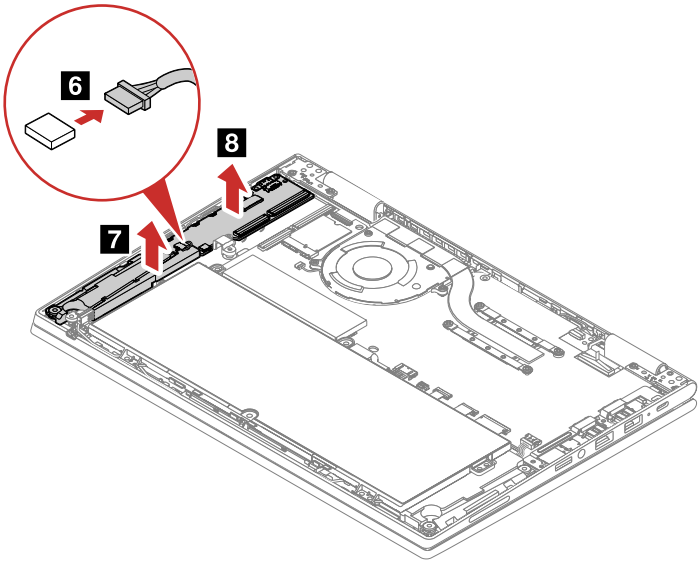
For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1060 I/O board brackets” on page 46

Removal steps of the I/O board cable and I/O board



Lift the speaker before you remove the I/O board.

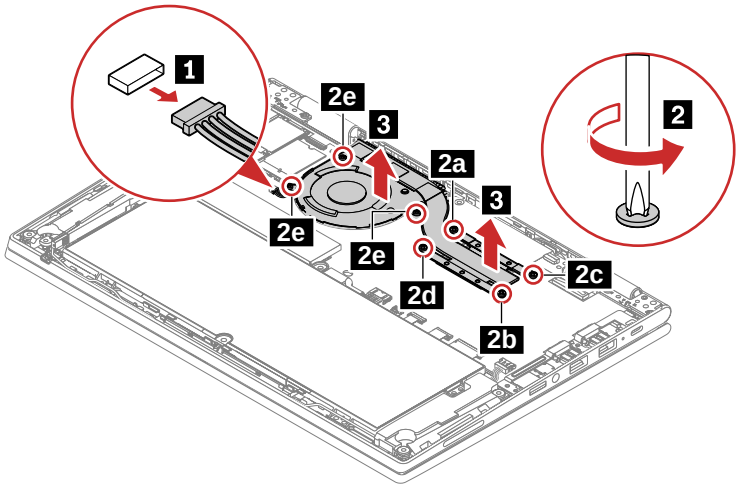


1080 Thermal fan assembly

For access, remove these FRUs in order:

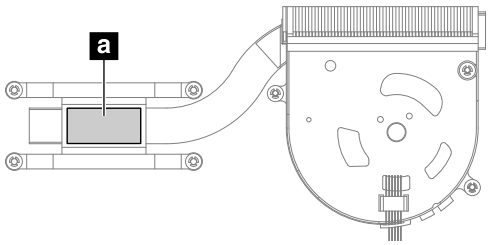
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

Removal steps of the thermal fan assembly



When installing:

- Always wear fingerstalls when handling the thermal fan assembly. Do not touch or hold any part of the thermal fan assembly with bare fingers.
- Before you attach the thermal fan assembly 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.



- Do not touch the thermal grease.
- Do not press, touch, or rotate the fan impeller.
- Do not touch the fan inlet hole.
- Do not twist or pull the cable of the thermal fan assembly.
- Do not apply pressure on the top and base covers of the thermal fan assembly.
- Do not press the heat pipe. Hold both sides of the heat pipe when you take the thermal fan assembly.
- Do not shake or drop the thermal fan assembly.
- Ensure that the fan connector is attached firmly.
- Replace the thermal fan assembly if you observe the following:
  - The cover of the thermal fan assembly is deformed or damaged.
  - There is abnormal noise during rotation.

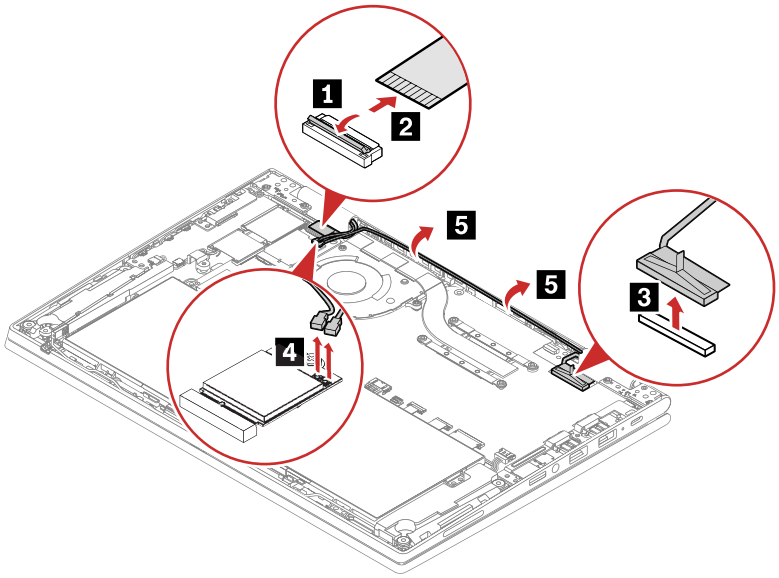
1090 LCD unit

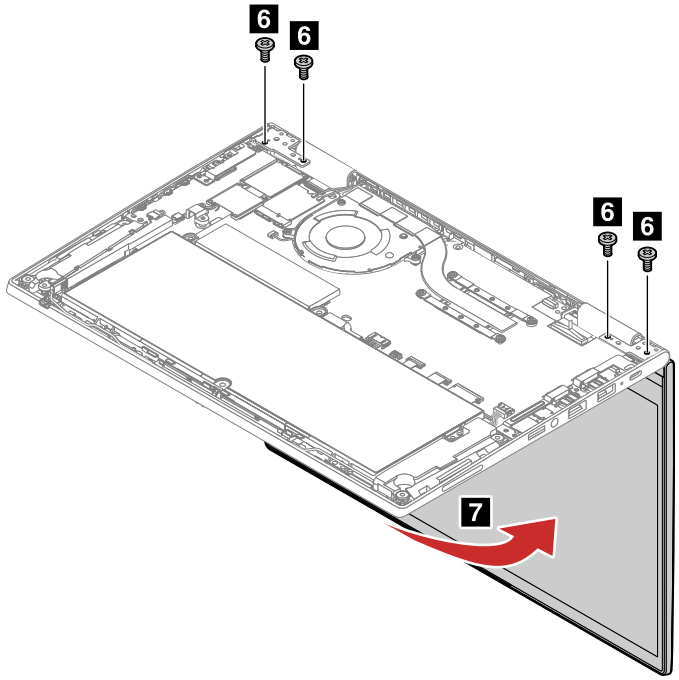
For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42

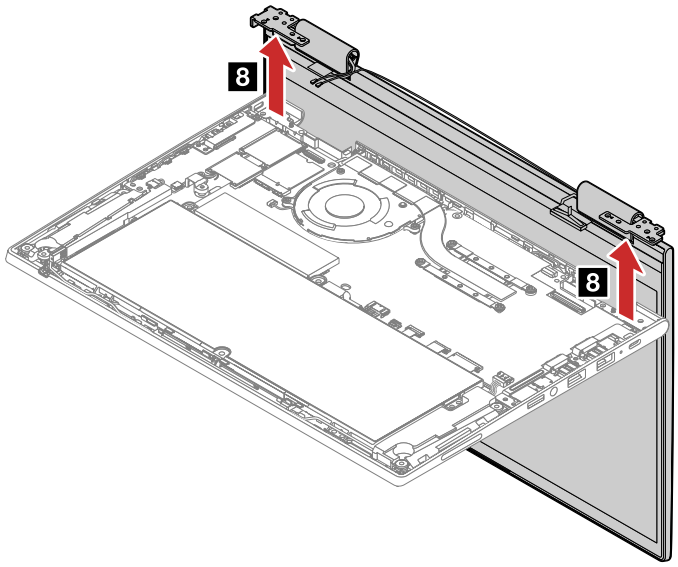
- “1020 Base cover assembly” on page 42

Removal steps of the LCD unit





Step	Screw (quantity)	Color	Torque
6	M2.5 × L5 mm, flat-head (4)	Black	0.29 Nm (3.0 kgf-cm)



When installing: Ensure that you attach the connectors firmly.

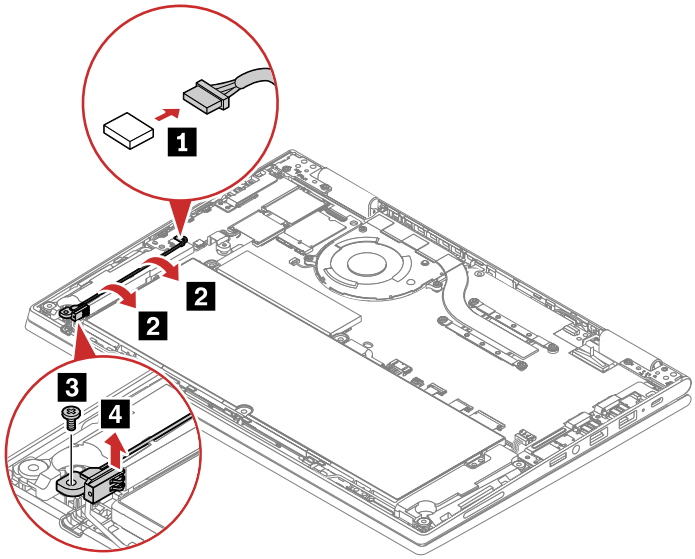
Attention: When you route the cables, ensure that they are not subject to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.

1110 Pen charger cable

For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42

Removal steps of the pen charger cable

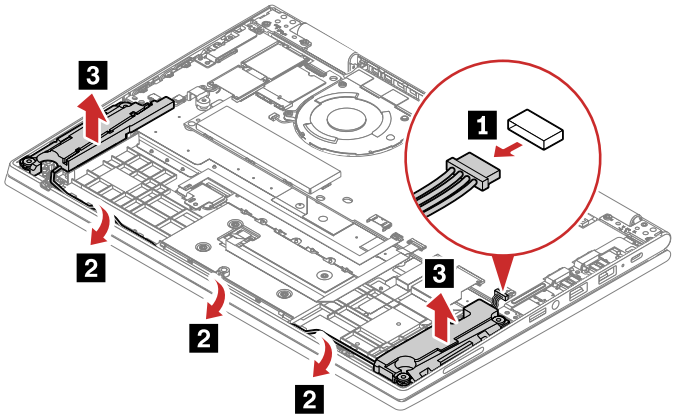


Step	Screw (quantity)	Color	Torque
3	M2 × L4.5 mm, large flat (1)	Silver	0.18 Nm (1.85 kgf-cm)

1120 Speaker assembly

For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43
- “1110 Pen charger cable” on page 51

Removal steps of the speaker assembly



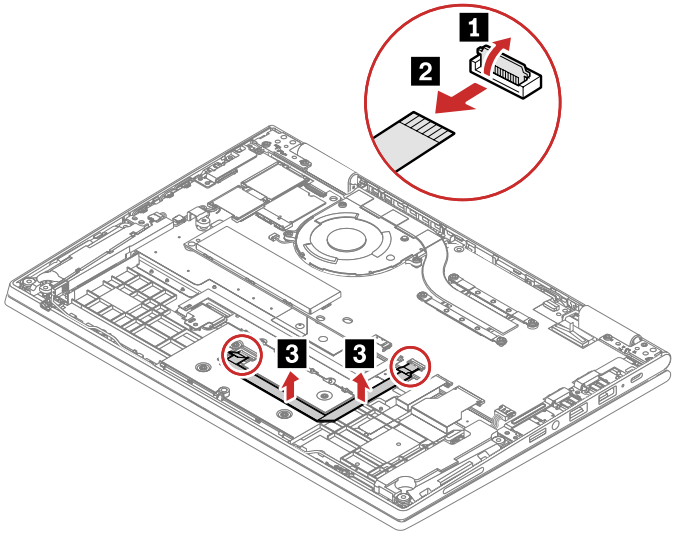
When installing: Ensure that the connector is attached firmly.

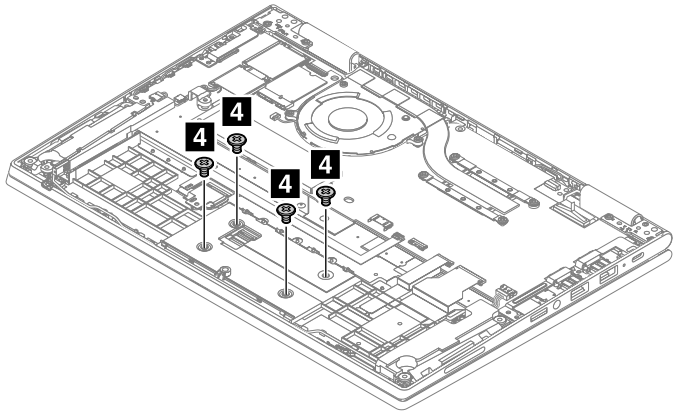
1130 Touchpad and touchpad cable

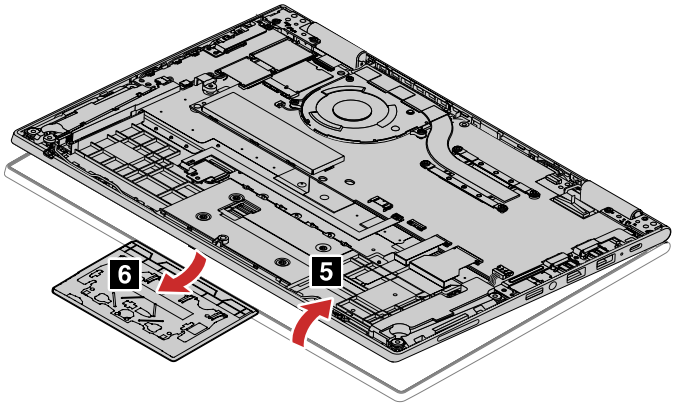
For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43

Removal steps of the touchpad and touchpad cable

Note: A Mylar film might cover the touchpad and touchpad cable. To access them, peel off the film first.







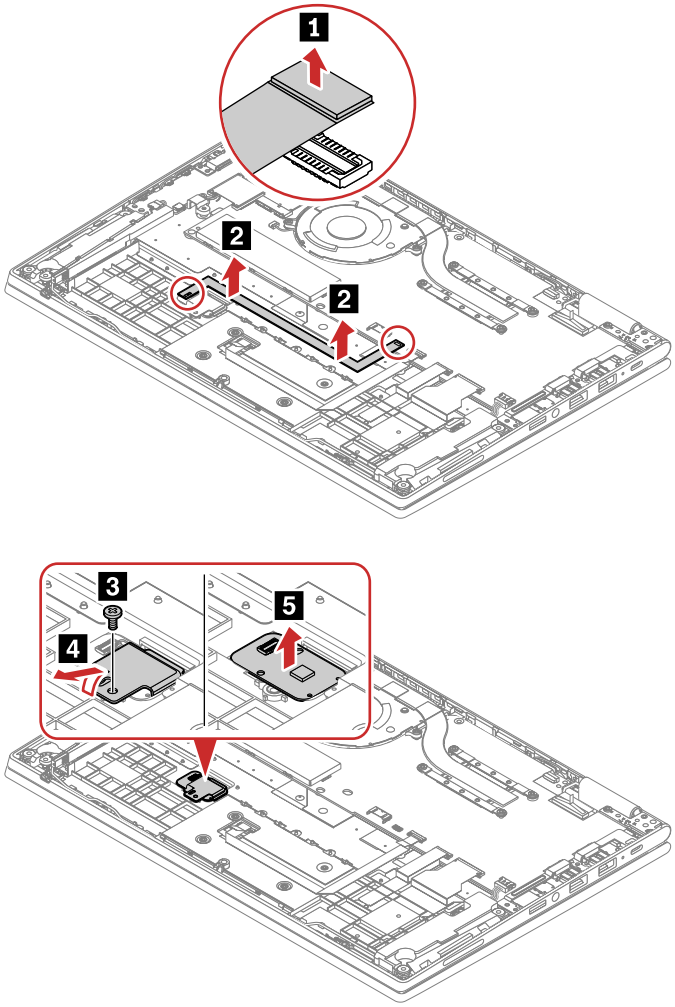
Step	Screw (quantity)	Color	Torque
4	M2 × L2 mm, flat-head, nylon-coated (4)	Black	0.18 Nm (1.85 kgf-cm)

1140 Fingerprint reader bracket, fingerprint reader cable, and fingerprint reader

For access, remove these FRUs:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43

Removal steps of the fingerprint reader bracket, fingerprint reader cable, and fingerprint reader



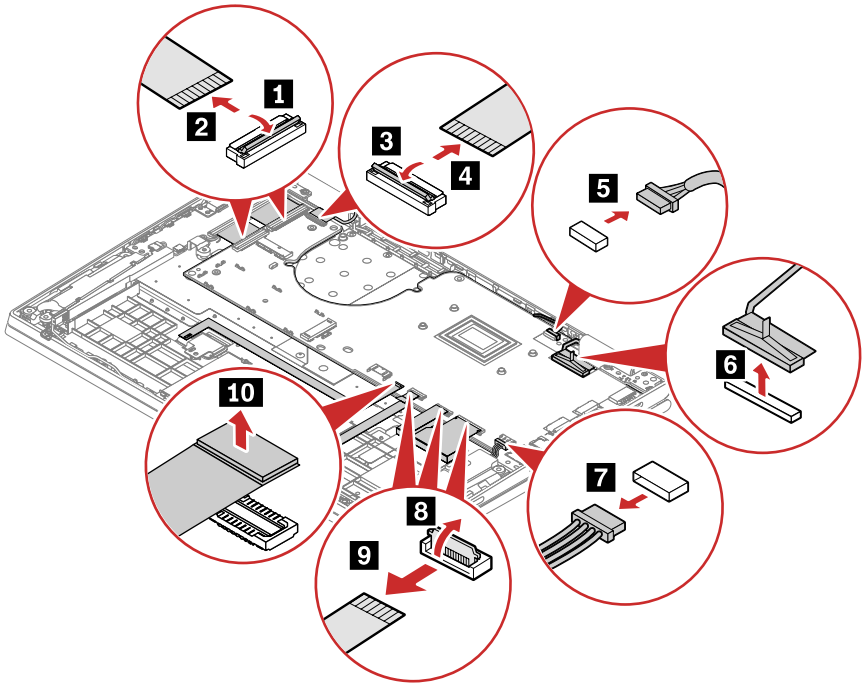
Step	Screw (quantity)	Color	Torque
3	M2 × L2.5 mm, thin head (1)	Silver	0.18 Nm (1.85 kgf-cm)

1150 System board

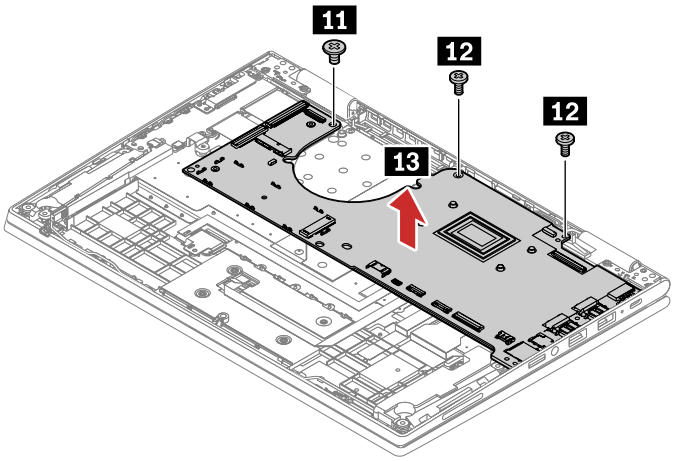
For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43
- “1040 Wireless LAN card” on page 44
- “1050 M.2 solid-state drive and M.2 solid-state drive cover” on page 45
- “1080 Thermal fan assembly” on page 48

Note: A Mylar film might cover the system board. To access it, peel off the film first.



Remember to remove the long I/O board bracket before removing the system board. See “1060 I/O board brackets” on page 46.



Step	Screw (quantity)	Color	Torque
11	M2 × L2 mm, flat-head, nylon-coated (1)	Silver	0.18 Nm (1.85 kgf-cm)
12	M2 × L4.5 mm, flat-head, nylon-coated (2)	Silver	0.18 Nm (1.85 kgf-cm)

When installing: Ensure that the connectors are attached firmly.

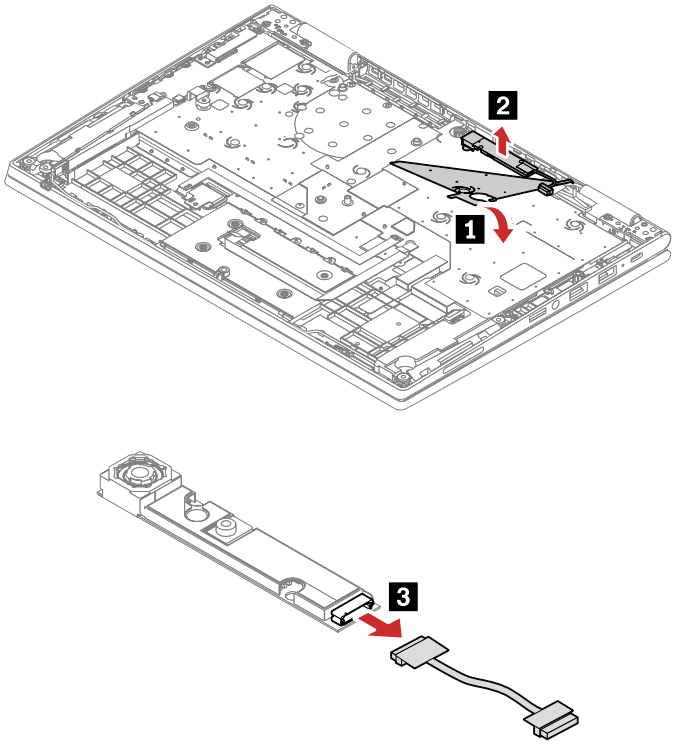
1160 World-Facing camera board and cable (for selected models)

For access, remove these FRUs in order:

- “1010 Lenovo Garaged USI pen (for selected models)” on page 42

- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43
- “1040 Wireless LAN card” on page 44
- “1050 M.2 solid-state drive and M.2 solid-state drive cover” on page 45
- “1080 Thermal fan assembly” on page 48
- “1150 System board” on page 54

Removal steps of the World-Facing camera board and cable



1170 Keyboard assembly

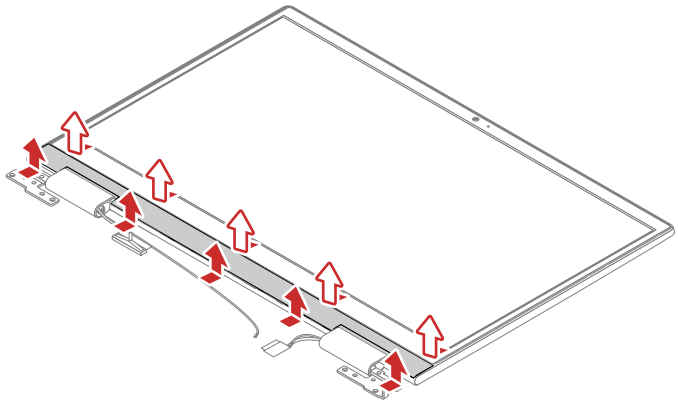
For access, remove these FRUs in order:
- “1010 Lenovo Garaged USI pen (for selected models)” on page 42
- “1020 Base cover assembly” on page 42
- “1030 Built-in battery” on page 43
- “1040 Wireless LAN card” on page 44
- “1050 M.2 solid-state drive and M.2 solid-state drive cover” on page 45
- “1070 I/O board cable and I/O board ” on page 47
- “1060 I/O board brackets” on page 46
- “1080 Thermal fan assembly” on page 48
- “1090 LCD unit” on page 49
- “1120 Speaker assembly” on page 52
- “1110 Pen charger cable” on page 51
- “1130 Touchpad and touchpad cable” on page 52
- “1140 Fingerprint reader bracket, fingerprint reader cable, and fingerprint reader ” on page 53
- “1150 System board” on page 54
- “1160 World-Facing camera board and cable (for selected models)” on page 55

Removing the LCD FRU

2010 Strip cover

For access, remove this FRU:
- “1090 LCD unit” on page 49

Removal step of the strip cover



Note: The strip cover is reusable, but it is recommended that you purchase a new strip cover after two years because the strip cover might become non-viscous over time.

2020 LCD panel

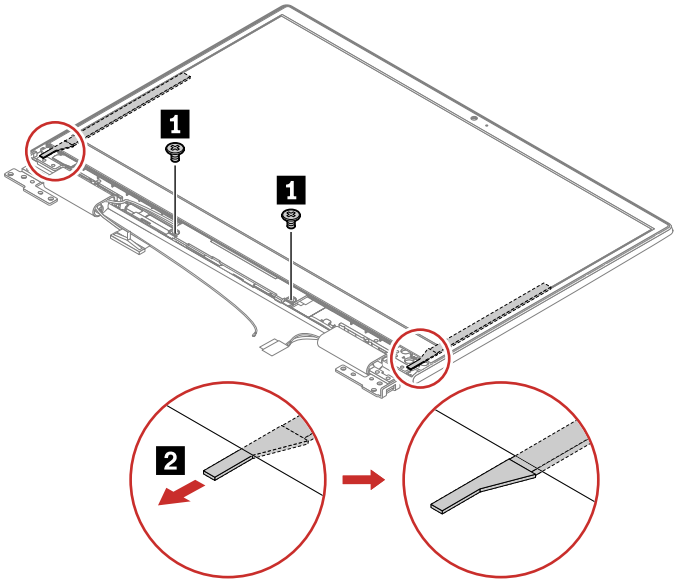
For access, remove this FRU:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57

Removal steps of removing the LCD panel

1. Remove the screws.

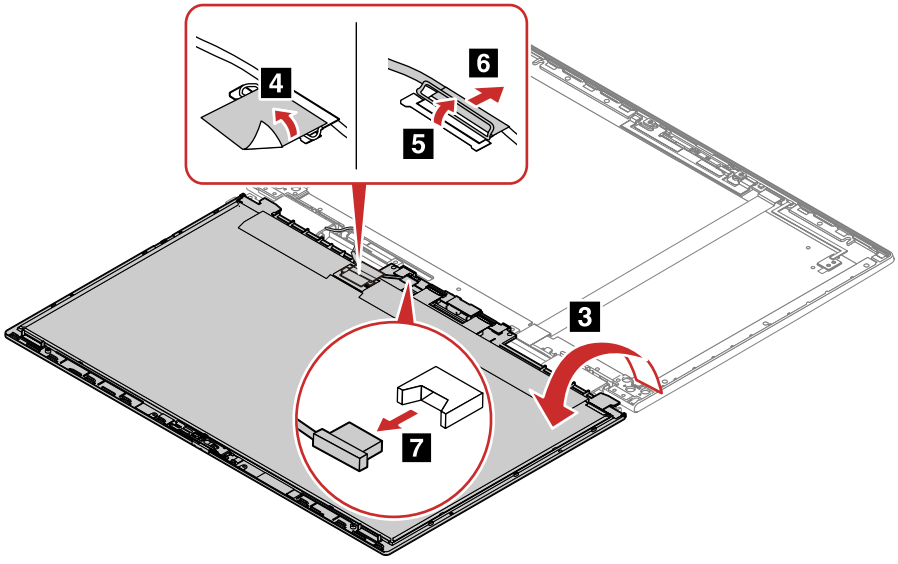
2. Grasp the end of two elastic adhesive tapes with tweezers. Pull out each tape slowly in the direction as shown until two elastic tapes are all released from LCD unit.

   Note: Do not pull the tapes too fast, otherwise, the tapes might snap.



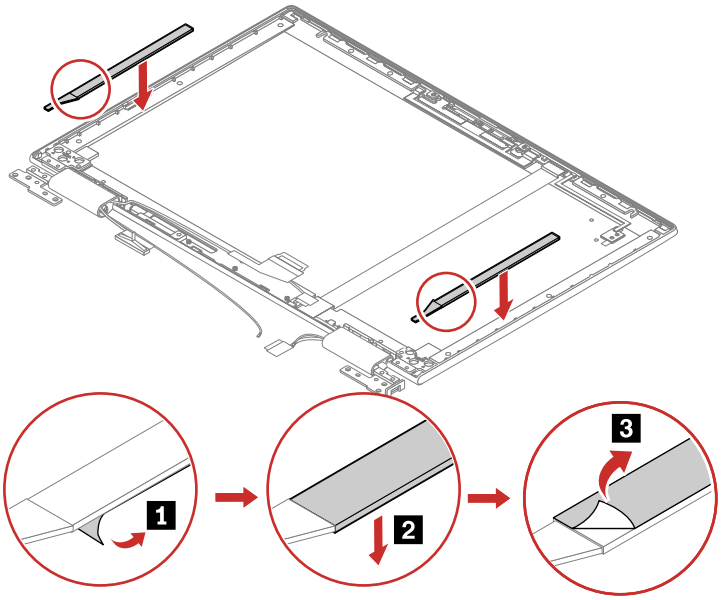
Step	Screw (quantity)	Color	Torque
1	M2 × 3.5 mm, flat-head, nylon-coated (2)	Black	0.18 Nm (1.85 kgf-cm)

3. Turn over the LCD panel and then detach the LCD cable from the LCD panel as shown.

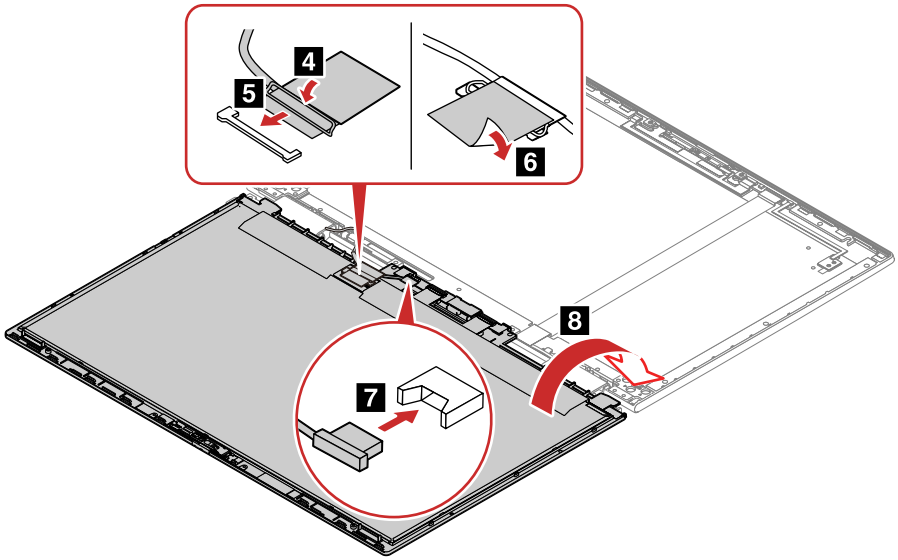


Installation steps of the LCD panel

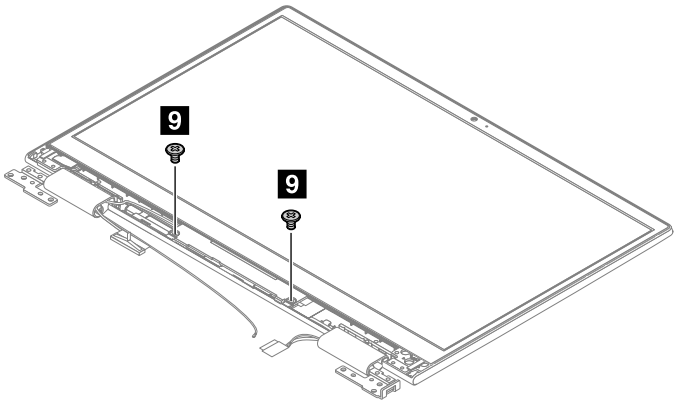
1. Peel off the release liners from one side of the new elastic adhesive tapes. Apply the tapes to the correct locations. Peel off the release liners from the other side of the tapes. Ensure that two tapes are applied correctly as shown.



2. Attach the LCD cable to the LCD panel as shown. Turn over the LCD panel to secure the LCD panel with tapes.



3. Tighten the screws that secure the LCD panel.

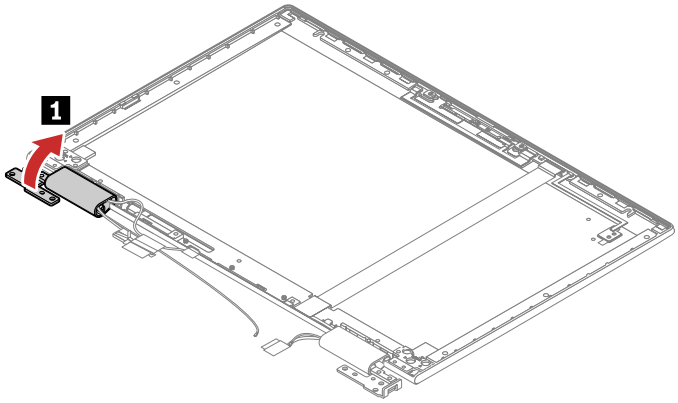


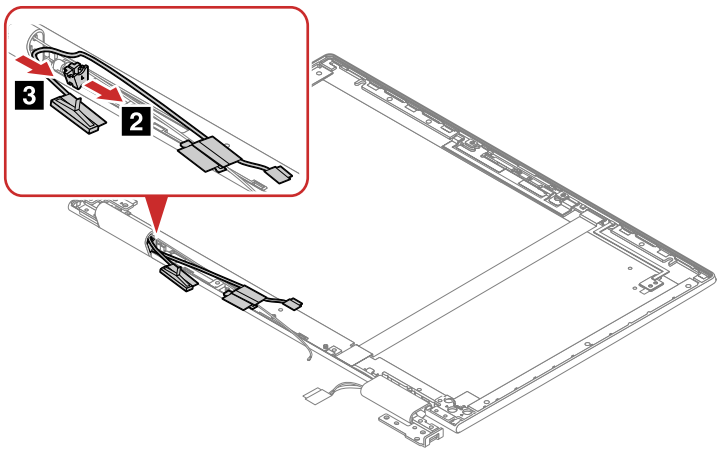
Step	Screw (quantity)	Color	Torque
9	M2 × 3.5 mm, flat-head, nylon-coated (2)	Black	0.18 Nm (1.85 kgf-cm)

2030 LCD cable

For access, remove these FRUs in order:

- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

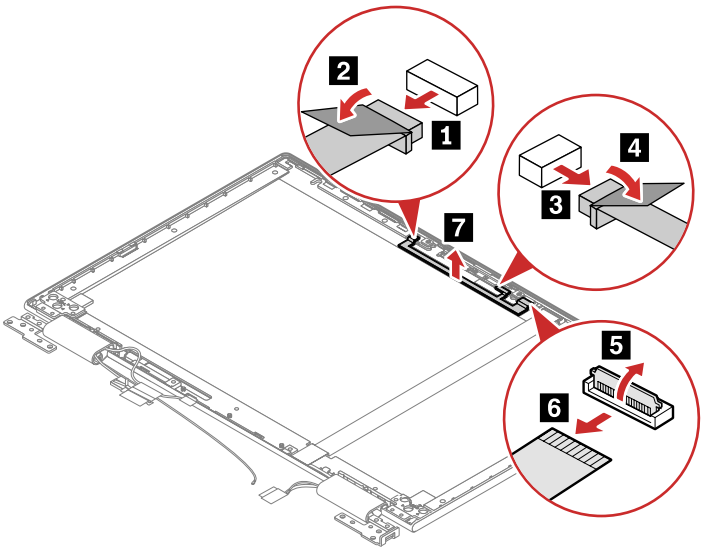




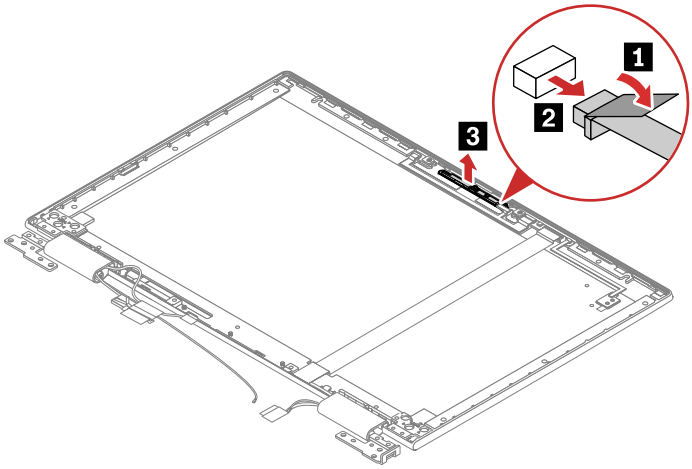
2040 Camera board and camera with microphone cable

For access, remove these FRUs in order:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

Removal steps of the camera with microphone cable



Removal steps of the camera board

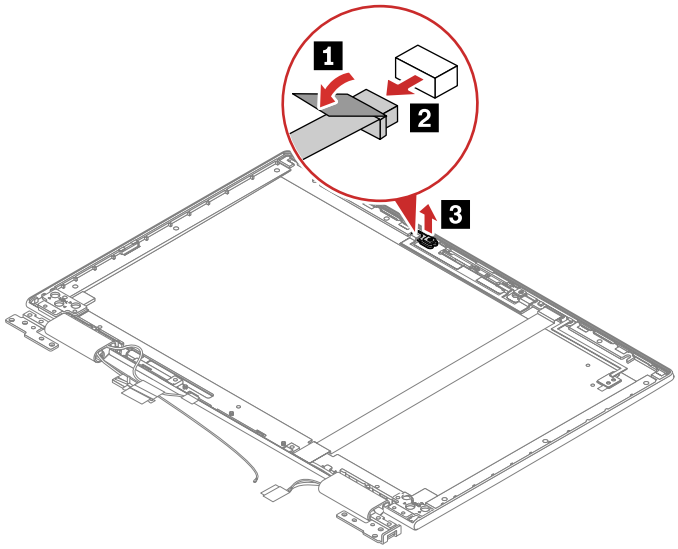


When installing: Ensure that the connector is attached firmly.

2050 Microphone board

For access, remove these FRUs in order:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

Removal steps of the microphone board

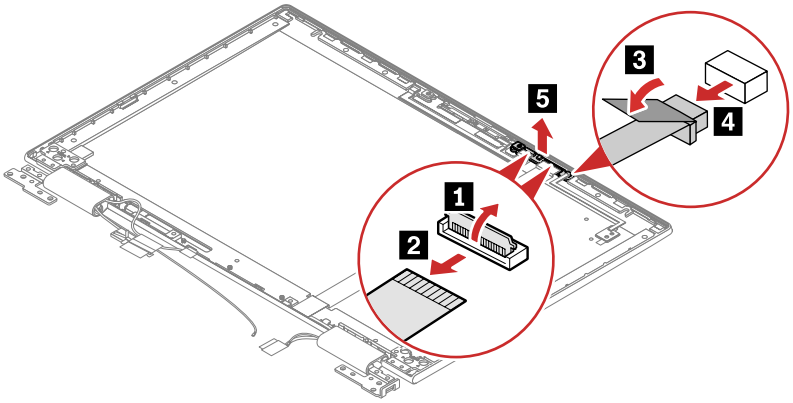


When installing: Ensure that the connector is attached firmly.

2060 Microphone with sensor board (for selected models)

For access, remove these FRUs in order:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

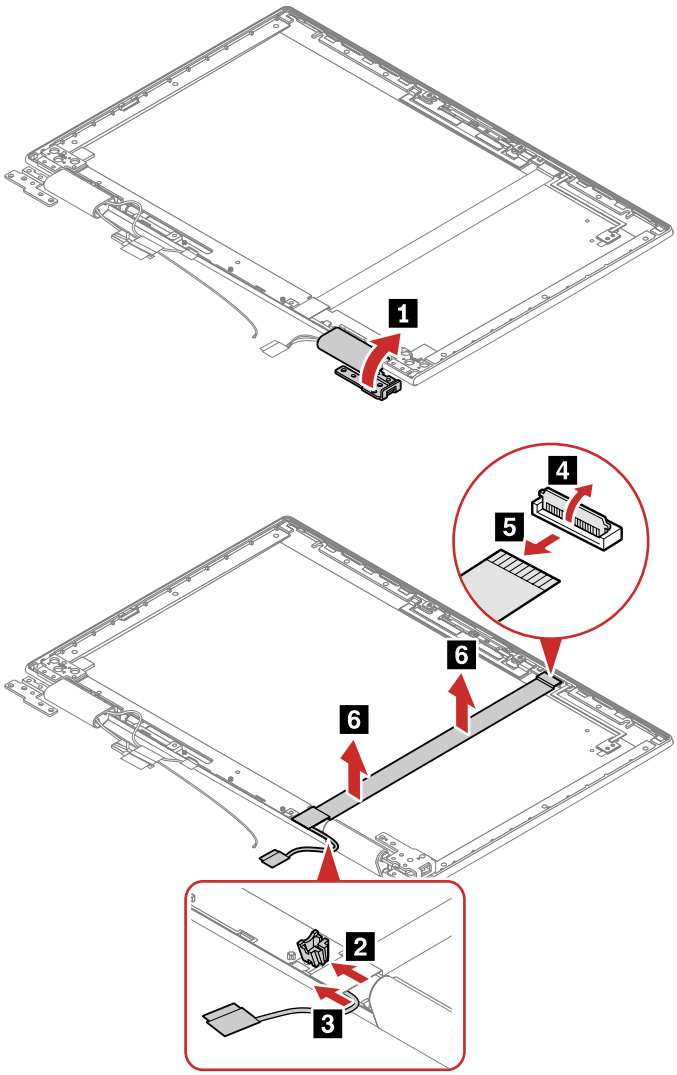
Removal step of the microphone with sensor board



2070 Camera cable

For access, remove this FRU:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

Removal steps of the camera cable

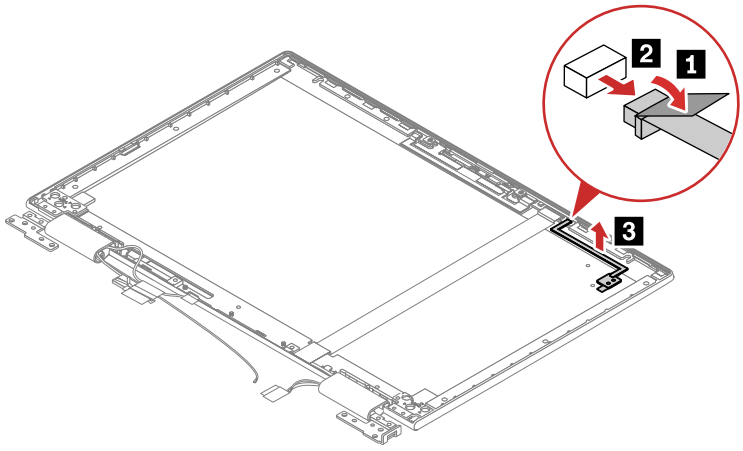


2080 LED cable

For access, remove this FRU:

- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57

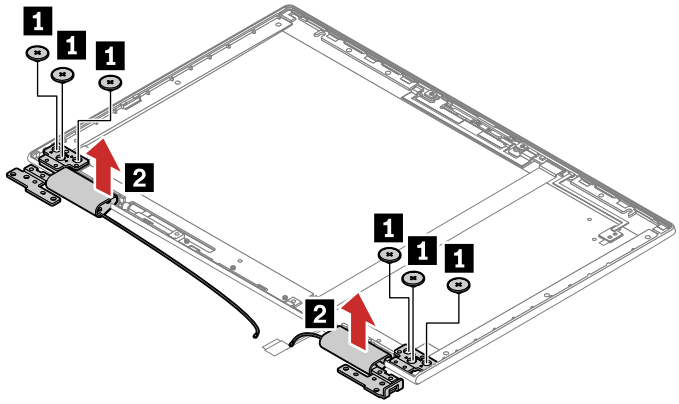
Removal steps of the LED cable



2090 LCD hinges assembly

For access, remove these FRUs in order:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57
- “2030 LCD cable” on page 60
- “2070 Camera cable” on page 62

Removal steps of the LCD hinges assembly



Step	Screw (quantity)	Color	Torque
1	M2.5 × L2.3 mm, thin head (6)	Black	0.29 Nm (3.0 kgf-cm)

2100 LCD rear cover assembly

For access, remove these FRUs in order:
- “1090 LCD unit” on page 49
- “2010 Strip cover” on page 57
- “2020 LCD panel” on page 57
- “2030 LCD cable” on page 60
- “2040 Camera board and camera with microphone cable” on page 61
- “2050 Microphone board” on page 61

- “2060 Microphone with sensor board (for selected models)” on page 62
- “2070 Camera cable” on page 62
- “2080 LED cable” on page 63
- “2090 LCD hinges assembly” on page 64

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