



Hardware Maintenance Manual

Lenovo 300e Chromebook



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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 Lenovo notebook computer.

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. Make sure that you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 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, make sure 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. Make sure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a non-conductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Attention: Metal objects are good electrical conductors.

- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that 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. 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.

Attention: Another person must be there to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Attention: An electrical shock can occur only when there is a complete circuit. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; Instructions for these precautions are in the safety sections of maintenance information. 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, non-grounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators
 - Similar units as 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 cathode ray tube (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. Power 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:
<http://www.lenovo.com/serviceparts-lookup>
 - c. Insulation must not be frayed or worn.
4. Check for cracked or bulging batteries.
5. Remove the cover.
6. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
7. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables.
9. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling devices that are sensitive to electrostatic discharge

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

Notes:

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

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use 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.



قبل إعادة تشغيل الحاسب بعد الانتهاء من استبدال FRU، تأكد من أنه قد تم إعادة 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 إلى حدوث دائرة قصر.



تحتوي بعض البطاريات الاحتياطية على كمية صغيرة من مادتي النيكل والكاديوم. لا تقم بفك أو إعادة شحن البطارية الاحتياطية ولا تقم أيضا بالقاءها في النار أو الماء ولا تتسبب في أحداث 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 إلى اشتعالها أو انفجارها.



تحتوي حزمة البطارية على كمية صغيرة من مادة النيكل. لا تقم بفكها أو القاءها في النار أو الماء ولا تتسبب في أحداث 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 إلى اشتعالها أو انفجارها.



قد تتسبب بطارية الليثيوم في حدوث حريق أو انفجار أو حدوث حروق شديدة. لا تقم بإعادة شحن البطارية أو إزالة 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 إلى اشتعالها أو انفجارها.



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



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



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.



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 المخارج 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 תפעלת 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 ולחקש לבגילי קולות שקשוק. חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.



סכנה

סוללות המתגנה מסוימות מכילות כמויות קטנות של ניקל וקדמיום. אין לפרק סוללות המתגנה, 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 המומיعة ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.



סכנה

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



סכנה

סוללות הליתיום עלולות לגרום לשריפה, להתפוצצות או לכוויות קשות. אין לטעון אותה מחדש, לסלק את המחבר המקוטב שלה, לפרק אותה או לחמם אותה לסמפרטורה 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 המומיعة ברשימת החלקים המתאימים. שימוש בסוללה אחרת עלול לגרום לסכנת שריפה או התפוצצות.



סכנה

אם מסך חגביש חנוזי (LCD) נשבר וחנוזל מתוך חמסך בא במגע עם עיניים או ידיכם, שטפו את האזורים חנוזים מיד במים במשך 15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים חנוזים מחמגע עם חנוזל נמשכים לאחר חשטיפה.



סכנה

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



סכנה

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



סכנה

אלא אם כן מותרת 'החלפה חמה' של ה-FRU המוחלף, פעלו כדלהלן לפני חסרתו: כבו את המחשב, נתקו את כל כבלי החשמל מחשקעים, חוציאו את מארז הסוללות ונתקו את כל הכבלים המחברים.



危険

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



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 달각거리는 소리가 나지 않는지 확인하십시오. 급속 부품 또는 급속 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 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. Important service information

Overview of the Chromebook USB repair shim

You can use a Chromebook USB repair shim (hereafter referred to as the repair shim) as the recovery solution on the Chrome OS operating system.

The repair shim is a bootable device that is required to service the computer. The repair shim is used for the following purposes:

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

The repair shim is not necessary when a Customer Replaceable Unit (CRU) is replaced. If a non-CRU is broken, or there is a strong suspicion that a particular non-CRU is defective, it can be replaced directly. Otherwise, the repair shim must be used to diagnose problems before any non-CRU is replaced.

The following is the list of CRUs for your computer:

1. ac power adapter
2. Power cord
3. Bottom cover
4. Upper Case (with keyboard)

For CRU definition, see “Chapter 5. Removing a FRU or CRU” on page 29.

For information about how to use the repair shim, see “Using the repair shim” on page 20.

Creating the repair shim

As a Lenovo service technician, do the following to create the repair shim:

1. Prepare a USB storage device formatted in FAT32 and with at least 8 gigabyte (GB) space. The required USB storage capacity depends on the size of the recovery image.

Attention: Creating the repair shim will delete all data stored on the USB device. To avoid data loss, make a backup copy of all the data that you want to keep.

2. Download latest version of the repair shim image from the Lenovo Support Web site at: <http://www.lenovo.com/support> to create a repair shim. A Lenovo service credential is required.

Note: Ensure that you create the repair shim using the latest version of the repair shim image. Using an earlier version might cause the repair process to fail.

3. Extract the downloaded file that contains the repair shim image.
4. Download the Win32 Disk Imager tool from <http://sourceforge.net/projects/win32diskimager/>.
5. Run the imager tool and follow the on-screen instructions to create the repair shim.
6. After using the repair shim, if you want to recover normal usage of the USB storage device, you will need to format the device. Otherwise, you cannot use the storage space on the device.

Removing and reinstalling the write-protect screw

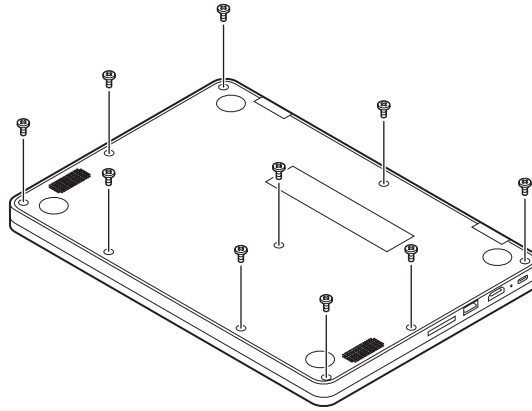
By default, the on-board Read-Only Memories (ROMs) are set as write-protected. Before refreshing the Chromebook firmware, set the ROMs as unprotected by removing the write-protect screw on the system board. After the refresh, reinstall the write-protect screw.

Attention: Turn off the computer before removing the write-protect screw.

To remove the write-protect screw, do the following:

1. Disable the built-in battery. See “Remove the battery pack” on page 31.

2. Disconnect the ac power adapter and all cables from the computer, and then remove the bottom cover. See “Chapter 5. Removing a FRU or CRU” on page 29.
3. Remove the battery. See “Remove the battery pack” on page 31.
4. Remove the keyboard. See “Remove the upper case (with keyboard)” on page 30.
5. Locate the write-protect screw on the system board as shown in the following illustration. To turn off the write-protect function, remove the write-protect screw.



6. After you have removed the write-protect screw, reassemble the computer. Reconnect the ac power adapter and all cables.
7. To turn on the write-protect function, follow the previous steps to locate the hole for the write-protect screw and reinstall the screw. Then reassemble your computer and reconnect the cables.

Using the repair shim

To use the repair shim that you have created, do the following:

1. Turn off the write-protect function. See “Removing and reinstalling the write-protect screw” on page 19.

Note: After you turn off the write-protect function, the computer will be in Developer mode. In some cases, the computer might not be in Developer mode after you turn off the write-protect function. If this happens, press and hold Ctrl+D when the recovery screen in step 2 is displayed, and then press the Enter key. The computer automatically restarts and enters Developer mode after several minutes. When prompted to log on to the computer, turn off the computer. Then repeat step 2 to start the computer and enter recovery mode.

2. Attach the ac power adapter to the power connector on the computer. Press and hold the Esc key and the refresh key (), and then press the power button to start the computer and enter recovery mode.

Note: If the computer fails to enter recovery mode, turn off the computer and repeat this step.

3. When the recovery screen is displayed, connect the repair shim to an available USB connector of the computer. The repair shim will update the firmware and image automatically. When prompted, input “i” and press the Enter key to install the shim to the computer. When the update process finishes, the computer restarts and enters the factory-test-image environment.

Note: The update process is automatic, and takes less than 10 minutes. Information about the update status will be displayed on the computer screen during the process.

4. Remove the repair shim and put it in a safe place. The Runin test starts automatically and you will be prompted for the Vital Product Data (VPD). If the VPD is already present, you may press the Esc key to continue. If the write-protect function is still on, this step will not proceed.

Note: If the system board is replaced, you are required to reenter VPD, a 20-character machine type and model (MTM) and serial number (SN) string. The string consists of the 7-digit machine type, 3-digit model number, 8-digit SN, and is preceded by the characters “1S”. You can find the MTM and SN information on the bottom cover. To locate the MTM and SN label, see “Applying labels to the bottom cover” on page 47.

If the MTM and SN information is already displayed, and match the numbers shown on bottom cover, press the Esc key to leave the values as they are.

5. The Stress test will run for 10 minutes and then the Final Assembly Test and Pack (FATP) section will start. This section includes the independent tests for each component. Follow the instructions on the screen to start the tests. For information about the factory test items, see “Factory test items” on page 21.
6. If the factory test items reveal a defective component, turn off the computer, disconnect the ac power adapter, and then replace the defective component. For information about the replacement procedure, see Chapter 6 “Removing or replacing a FRU” on page 45.
7. Turn on the write-protect function. See “Removing and reinstalling the write-protect screw” on page 19.
8. Turn on the computer. The computer enters the factory-test-image environment again. It is recommended that you run Stress Test and FATP Tests to ensure that new components function correctly.

Note: It is not necessary to turn off the write-protect function again if additional components must be replaced.

9. Run the GoogleRequiredTests. If the tests finish successfully, all data stored on the computer will be deleted and the computer will be turned off. If the GoogleRequiredTests fails, refer to the common mistakes that lead to GoogleRequiredTests failure in “Factory test items” on page 21.

Note: If any test is marked as failed, the final process cannot be completed. The final process can be forced to end by pressing f. Do not force the final process to end when a component fails the test. Force the final process to end only when the test has to be bypassed because it cannot be performed.

10. After the repair process finishes, the built-in battery is disabled. The system is in a clean out-of-box state. In order to turn on the computer, attach the ac power adapter to the power connector on the computer first. If applicable, customers must re-enroll the system for enterprise enrollment.

Factory test items

After the system enters the factory-test-image environment, factory test items will run. The factory test process contains the following three types of tests:

- **Stress Test:** The Stress Test is designed to test how the system functions under stress by running the maximum workload applications. The Stress Test includes the test of memory, microprocessor, and graphics card. The test takes about 10 minutes to finish.
- **FATP Test:** The FATP Test is designed to test the individual component to verify its function, such as the TPM, display, audio, camera, keyboard, and other components. It is recommended that you run all the FATP Test items. Some test items might require an HDMI monitor or an SD card. If the devices are not available, the tests can be bypassed, but with the overall test marked as failed. This will require the finalized step of the GoogleRequiredTests to be forced in order to complete the servicing of the computer (see step 9 in “Using the repair shim” on page 20).
- **GoogleRequiredTests:** GoogleRequiredTests checks the system status and helps reset the system back to the factory-default settings. If any tests fails, the system cannot be finalized. The following items are some common mistakes that lead to GoogleRequiredTests failure:

- **HWID mismatch:** Each Chromebook has a known hardware configuration. Each configuration is assigned an HWID. HWID mismatch can be caused by using unauthorized parts, or missing parts. For information about HWID, see “Hardware identity” on page 29.

If the write-protect function is not turned off before recovering the computer with the repair shim, it will also cause HWID mismatch. For instructions on how to turn off the write-protect function, see “Removing and reinstalling the write-protect screw” on page 19.

- **Write-protect function is off:** System cannot be finalized until the write-protect function is turned back on.

Chapter 3. General checkout

This chapter contains the following topics:

Before you go to the checkout instructions, ensure that you 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, make sure that the model of the machine and the FRU part number are correct by referring to the FRU parts list.
- **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, electrostatic discharge, 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 subjected to stress beyond normal use.

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

The following are not covered under warranty:

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic parts
- Plastic parts, latches, pins, or connectors that have been cracked or broken by excessive force
- Damage caused by liquid spilled into the system

- Damage caused by the improper insertion of a personal-computer card (PC card) or the installation of an incompatible card
- Improper disc insertion or use of an external optical drive
- Fuses blown by attachment of a non-supported 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 non-warranted 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.

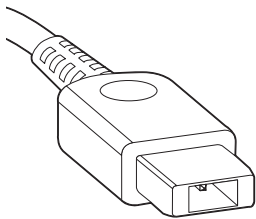
Checking the ac power adapter

If the computer fails only when the ac power adapter is used, refer to the information in this topic to check the ac power adapter.

If the power-on indicator does not turn on, check the power cord of the ac power adapter for correct continuity and installation.

To check the ac power adapter, do the following:

1. Unplug the ac power adapter cable from the computer.
2. Measure the output voltage across the plug of the ac power adapter cable. The correct voltages are shown in the following table.



Pin	Voltage (V dc)
1	20V/2.25A
2	15V/3A
3	9V/2A
4	5V/2A

Note: The output voltage across pin 2 might differ from the voltage that you measure.

3. Depending on the voltage that you measure, do one of the following:
 - If the voltage is not correct, replace the ac power adapter.
 - If the voltage is acceptable, do the following:
 - a. Replace the system board.
 - b. If the problem persists, call the Customer Support Center.

Note: Noise from the ac power adapter does not always indicate a defect.

Chapter 4. Identifying FRUs (CRUs)

All FRUs (CRUs) for Lenovo 300e Chromebook

The exploded illustrations help Lenovo service technicians identify FRUs or CRUs that they may need to replace when servicing a customer's computer.

Refer to "Appendix B. Lenovo part numbers for replacement FRUs" on page 43 if you need to look up Lenovo part numbers for a particular FRU or CRU.

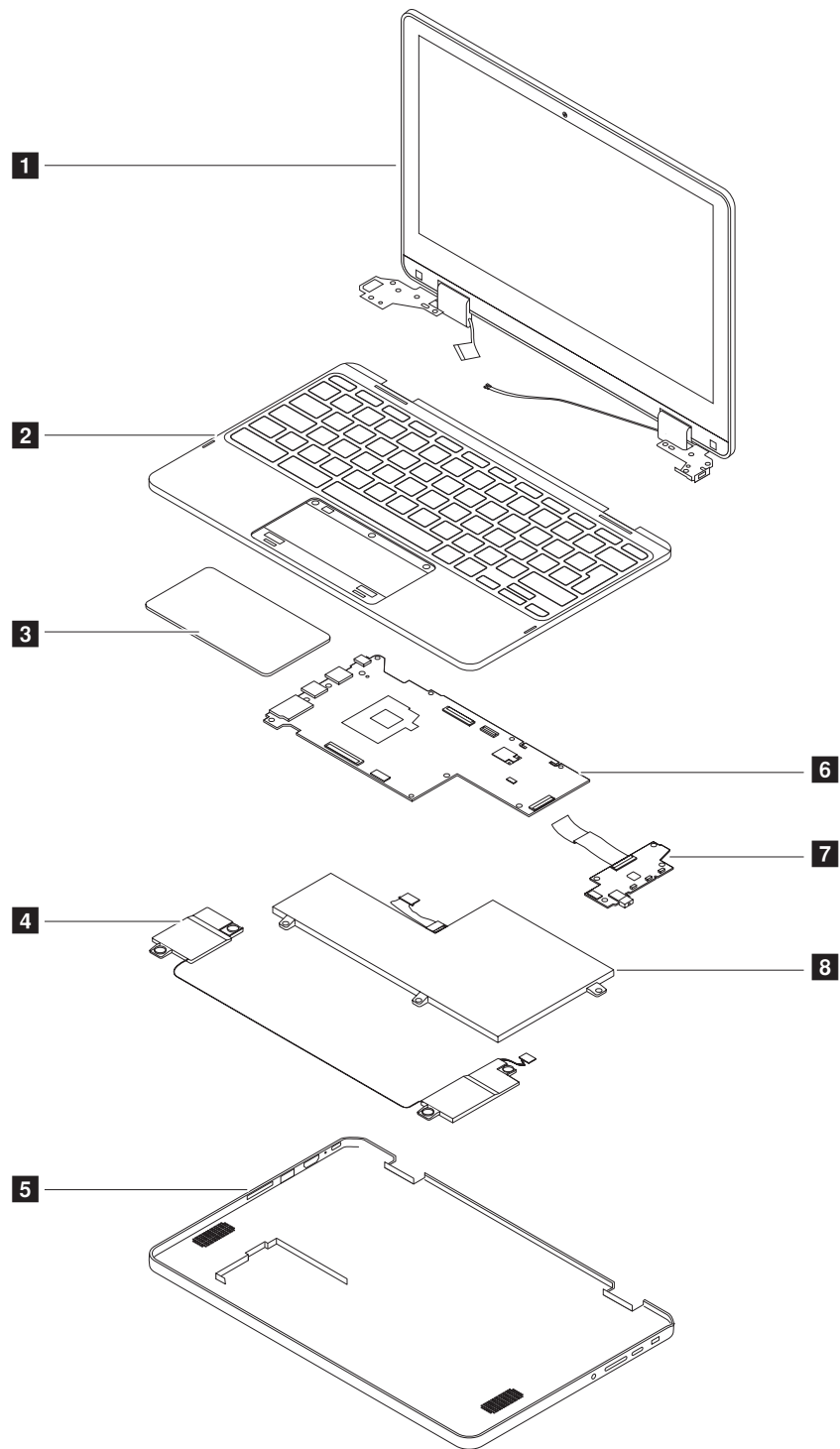


Figure 1. 300e Chromebook exploded view

Table 1. FRU (CRU) categories

No.	FRU (CRU) category
1	LCD module
2	Upper case (with keyboard)
3	Touchpad

Table 1. FRU (CRU) categories (continued)

4	Speakers
5	Base cover
6	System board
7	USB board
8	Battery pack

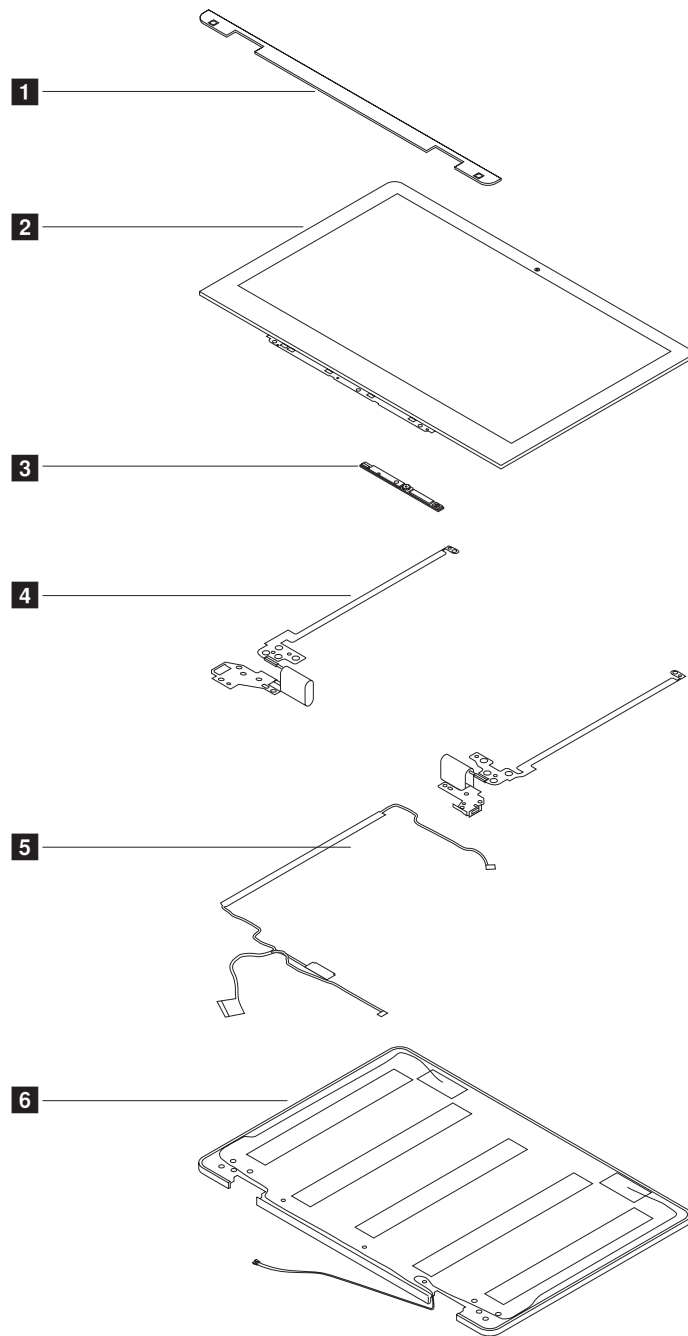


Figure 2. LCD module — exploded view

Table 2. FRU categories for the LCD module

No.	FRU (CRU) category
1	LCD bezel
2	LCD panel
3	Camera assembly
4	Hinges
5	LCD & camera cable
6	LCD base cover

Chapter 5. Removing a FRU or CRU

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. When replacing a FRU, carefully retain and reuse all screws. If screws are missing, look up the Lenovo parts numbers in “Appendix C. Lenovo part numbers for CRUs and miscellaneous parts” on page 45 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, peel them off from the original base cover and paste them on the replacement base cover. Refer to “Appendix D. Label locations” on page 47 for the layout of labels on the back side of the base cover.

Hardware identity

A set of valid hardware identities (HWIDs) are provided by Google. Google logs the exact hardware combination into a Chromebook and creates a HWID. The HWID is used to ensure that all parts are valid during the repair of the Chromebook. The HWID is used for the following purposes:

- Auto-update new patches and software for the lifetime of the computer
- Recover the computer to the factory default settings

If unauthorized parts are installed, you might not get the correct auto-updates for your computer, or you might not recover your computer successfully to the factory default settings. For example, if you install a different model of the wireless LAN card, which is not the required configuration, the HWID will not match.

HWID is checked by using the repair shim. For information about the repair shim, see “Overview of the Chromebook USB repair shim” on page 19.

Prerequisite for replacing a FRU

Use the repair shim before replacing any non-CRUs. The following is the list of CRUs for your Chromebook:

1. ac power adapter
2. Power cord
3. Bottom cover

For information about how to use the repair shim, see “Using the repair shim” on page 20.



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.

Attention: 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).

Remove the upper case (with keyboard)

Step 1. Remove the screws.

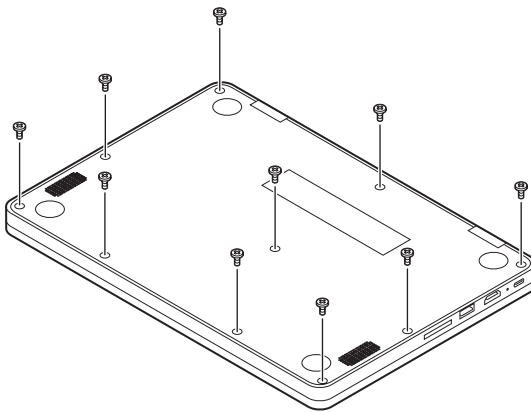


Figure 1. Remove 10 screws

Table 3. Screw specifications

Screw location	Number	Specifications	Color	Torque
on base cover	10	M2.5 × 7mm, flat-head, nylon-coated	Black	1.85 +/- 0.15kgf-cm

Step 2. Turn over the Chromebook and open the LCD cover to 180 degrees.

Step 3. Use a pry bar to slide through the grooves between the upper case and the base cover; slowly lift the upper case until the keyboard socket and the touch pad socket appear.

Attention: Do not pull up the upper case before detaching the keyboard and touch pad cables. Otherwise the cables may be damaged.

Make sure disassemble the upper case with a pry bar in a particular order as shown below.

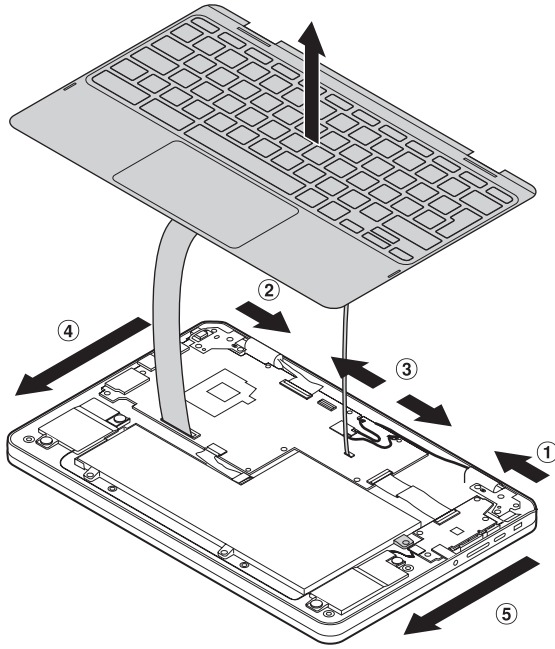


Figure 2. Lift the upper case

Step 4. Open the keyboard and touch pad sockets, detach the cables, and pull up the upper case.

Refer to “Table 12. Part numbers for FRUs (CRUs)” on page 43 to look up the Lenovo part numbers for the following replacement part:

Upper case

Remove the battery pack

Make sure the following FRUs (or CRUs) have been removed.

“Remove the upper case (with keyboard)” on page 30

Step 1. Unplug the battery cable from the system board and take the cable out of the cable guiders.

Attention: Use your fingernail to pull the connector to unplug it. Do not pull the cable itself.

Step 2. Remove the screws and take out the battery pack.

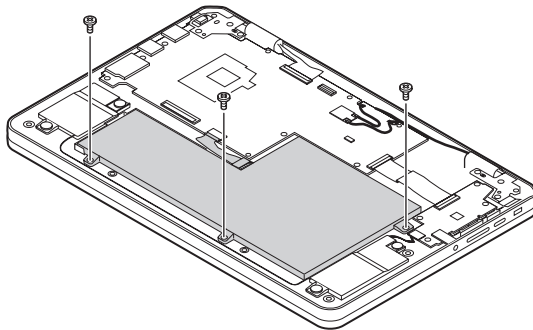


Figure 3. Remove screws and take out the battery pack

Table 4. Screw specifications

Screw location	Number	Specifications	Color	Torque
Battery pack to base cover	3	M2 × 3mm, flat-head, nylon-coated	Silver	1.85 +/- 0.15kgf-cm

Refer to “Table 12. Part numbers for FRUs (CRUs)” on page 43 to look up the Lenovo part numbers of the following replacement parts:

Battery pack

Remove the speakers

Make sure the following FRUs (CRUs) have been removed.

“Remove the upper case (with keyboard)” on page 30

“Remove the battery pack” on page 31

Step 1. Unplug the speakers’ cable from the system board. Remove screws.

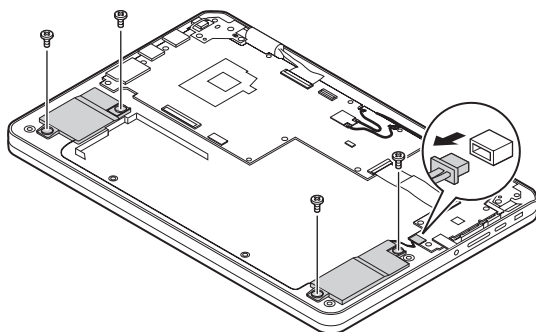


Figure 4. Unplug the speakers’ cable from the system board and remove screws

Step 2. Carefully remove the speakers off the piles.

Refer to “Table 12. Part numbers for FRUs (CRUs)” on page 43 to look up the Lenovo part numbers of replacement speakers.

Remove the LCD module

Make sure the following FRUs (CRUs) have been removed and the battery connector has been detached.

“Remove the upper case (with keyboard)” on page 30

Step 1. Open the socket and detach the LCD cable **1**. Disconnect the two wireless LAN cables **2**.

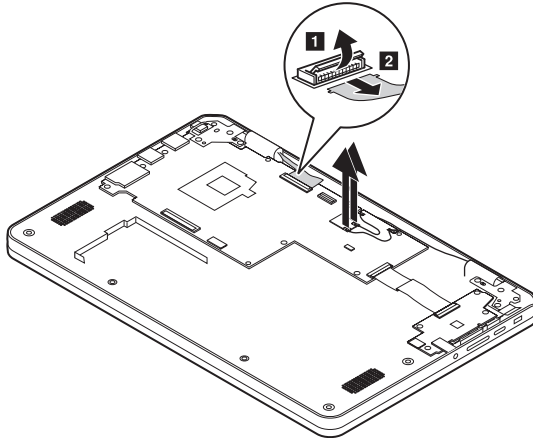


Figure 5. Unplug the LCD cable and disconnect the two wireless LAN cables

Step 2. Remove the screws.

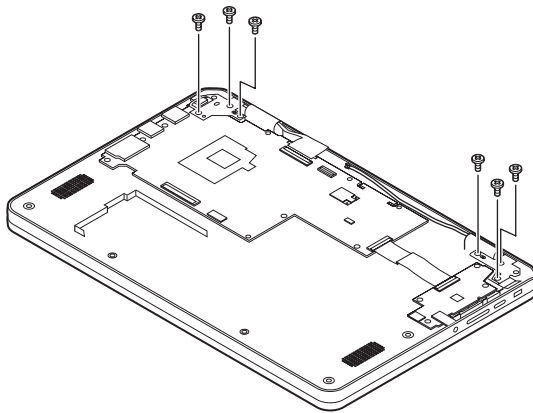


Figure 6. Remove 6 screws

Table 6. Screw specifications — removing the LCD module

Screw location	Number	Specifications	Color	Torque
LCD to base cover	6	M2.5 × 54 mm, flat-head, nylon-coated	Black	3.7 – 4.0 kgf * cm

Step 3. Lift up the LCD module to detach it from the base cover.

The LCD module is not a FRU. Instead, it contains FRUs as its components. Refer to “Disassemble the LCD module” on page 35 if you need to replace a FRU contained in the LCD module.

Remove the system board, USB board and touch pad module

- “Remove the upper case (with keyboard)” on page 30
- “Remove the battery pack” on page 31
- “Remove the speakers” on page 32
- “Remove the LCD module” on page 32

Step 1. Remove the screws and take out the system board.

Table 7. Screw specifications – removing the LCD module

Screw location	Screw used for	Specifications	Color	Torque
system board to base cover	7	M2 × 3 mm, flat-head, nylon-coated	Silver	1.85 +/- 0.15kgf-cm

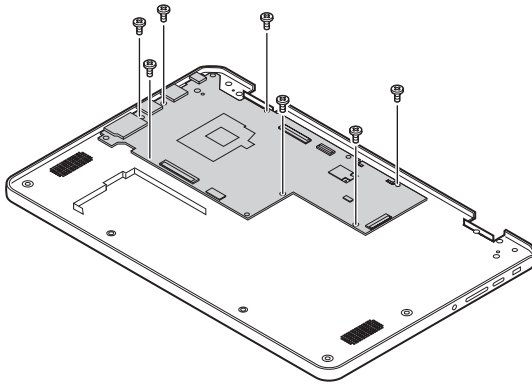


Figure 8. Remove the system board

Step 2. Open the two sockets and then remove the cable that connects the USB board to the system board.

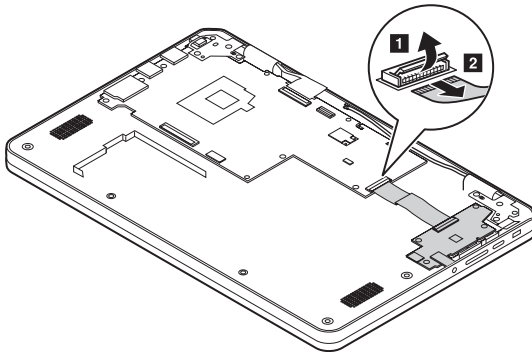


Figure 9. Remove the cable

Step 3. Remove the four screws and then remove the USB board.

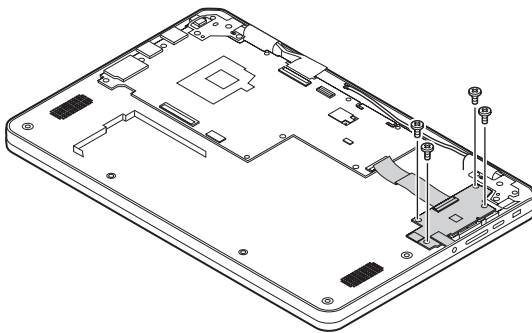


Figure 10. Remove the USB board

Refer to “Table 12. Part numbers for FRUs (CRUs)” on page 43 to look up the Lenovo part numbers of replacement USB board.

Step 4. Remove the screws. Remove the touch pad module.

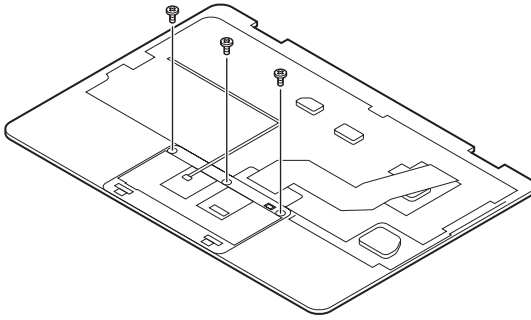


Figure 11. Remove the touch pad module

Refer to “Table 12. Part numbers for FRUs (CRUs)” on page 43 to look up the Lenovo part numbers of the following replacement parts:

System board
Base cover

Disassemble the LCD module

The LCD module as a whole is not a FRU. Instead, it contains FRUs as its components. Before disassembling the LCD module, make sure it has been detached from the base cover. Refer to “Remove the LCD module” on page 32 for instructions.

Remove the LCD bezel

Step 1. Pry the two rubbers **1** off the LCD bezel.

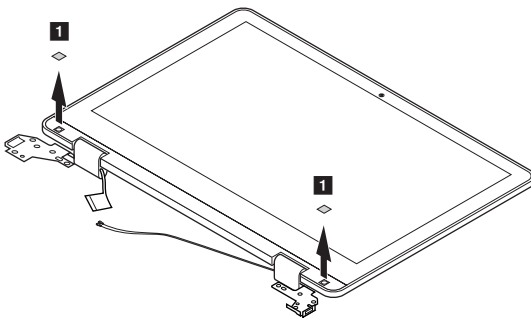


Figure 12. Pry the two rubbers

Step 2. Remove the two screws **2**.

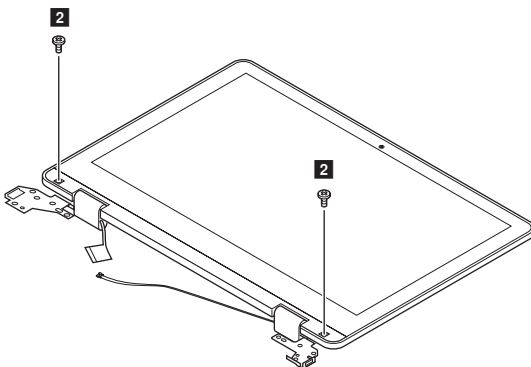


Figure 13. Remove 2 screws

Table 8. Screw specifications – removing the LCD bezel

Screw location	Number	Specifications	Color	Torque
LCD bezel to LCD base cover	2	M2.5 × 3.5 mm, flat-head, nylon-coated	Silver	3.7 — 4.0 kgf * cm

Step 3. Remove the hinge cover with a plastic opening tool.

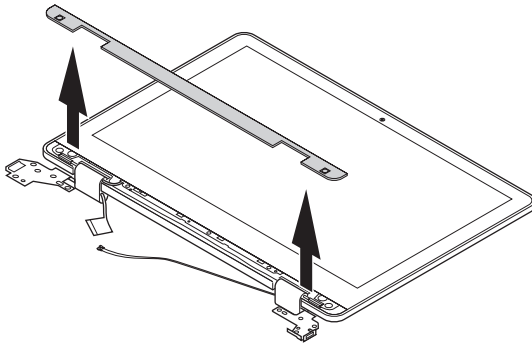


Figure 14. Remove the hinge cover

Step 4. Remove screws 3.

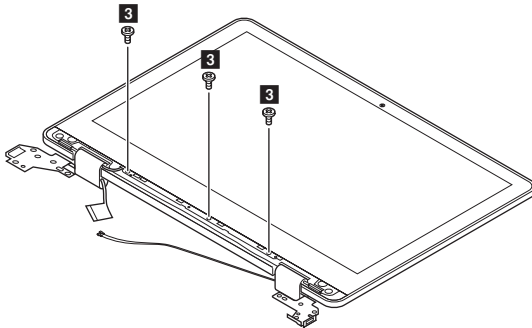


Figure 15. Remove 3 screws

Step 5. Insert your fingernails under one inner side of the LCD bezel and the LCD panel and then carefully pull the LCD bezel outwards. Repeat this action along the inner edges of the LCD bezel until all hooks that secure the LCD bezel are detached 4.

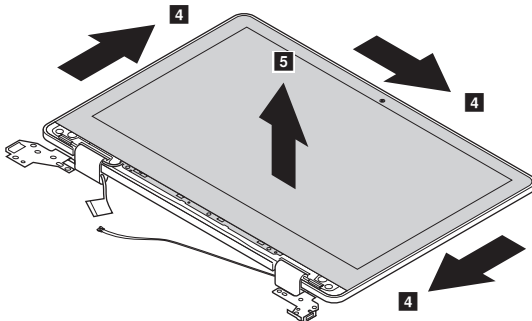


Figure 16. Remove the LCD bezel

Attention: Do not pull the LCD bezel from the outer side of the LCD bezel, otherwise the hooks may be damaged.

Step 6. Remove the LCD bezel.

Refer to “Table 13. Part numbers for LCD FRUs” on page 44 to look up the Lenovo part numbers for the replacement LCD bezel.

Remove the LCD panel

Make sure the following FRUs (or CRUs) have been removed.

“Remove the LCD bezel” on page 35

Step 1. Remove the eight screws **1**; with the bottom edge as an axis, lift up the top edge of the LCD panel **2**.

Attention: Do not remove the LCD panel at this step. The LCD panel is connected by a cable at the back side. Detach the cable before removing the LCD panel.

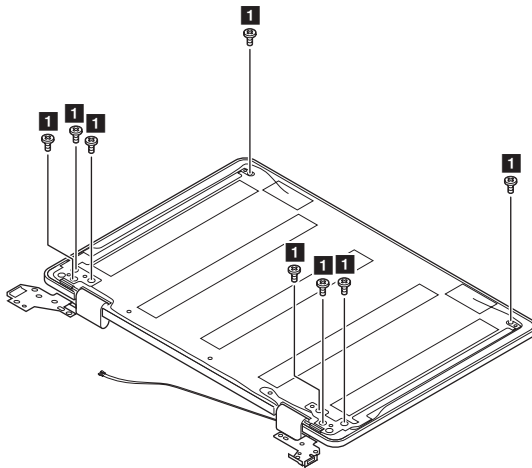


Figure 17. Remove 8 screws and lift up the LCD panel

Table 9. Screw specifications — removing the LCD panel

Screw location	Number	Specifications	Color	Torque
LCD panel to base cover	6	M2 × 2.5 mm, flat-head, nylon-coated	Black	1.7 — 2.0 kgf * cm

Step 2. Check the back side of the LCD panel for the LCD connector and then disconnect the LCD cable **3**, unplug G sensor cable and camera cable connector **4**, then disassemble LCD cable from LCD cover rib.

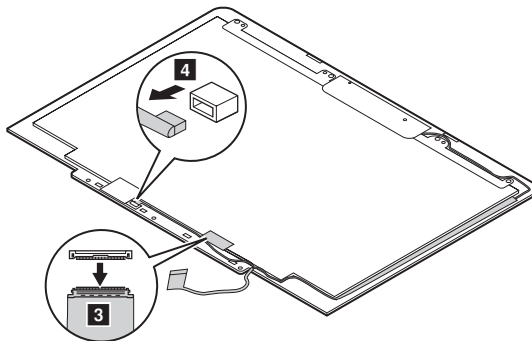
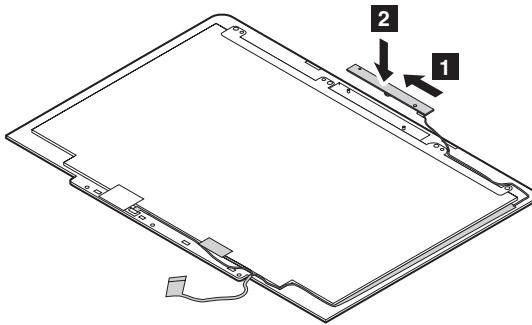


Figure 18. Disconnect the LCD cable from the back of the LCD panel

When installing: Take the two sides of the sensor board, and then push it into the hook from the right side to the left side **1**. Then take the two sides of the sensor board and press it into the hook **2**. Ensure that the connector is attached firmly.

Note: Do not press the surface of the sensor board.



Step 3. Remove screws **5**, and then remove the LCD bracket.

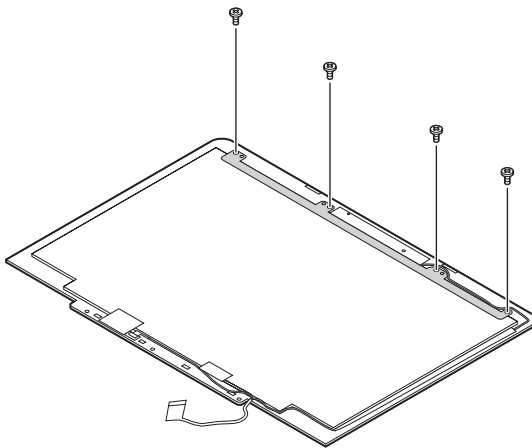


Figure 19. Remove 4 screws and remove the LCD bracket

Step 4. Remove the LCD panel.

Refer to “Table 13. Part numbers for LCD FRUs” on page 44 to look up the Lenovo part numbers for replacement LCD panels.

Remove the camera assembly or the LCD & camera cable

Make sure the following FRUs (or CRUs) have been removed.

“Remove the LCD bezel” on page 35

“Remove the LCD panel” on page 37

Step 1. Unplug the camera connector **1**. Remove the camera from the LCD cover in the direction shown by arrow **2**.

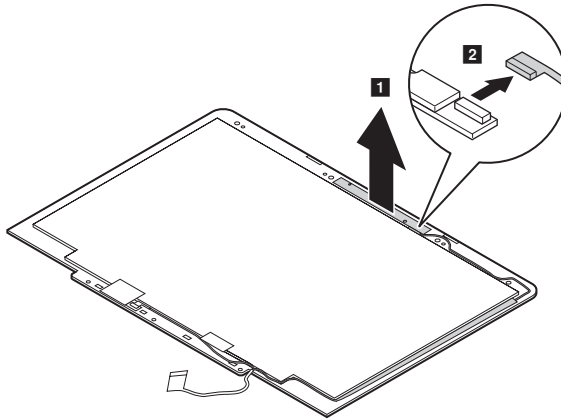


Figure 20. Unplug the camera connector. Remove the camera from the LCD cover

Remove the hinges

Make sure the following FRUs (or CRUs) have been removed.

“Remove the LCD bezel” on page 35

“Remove the LCD panel” on page 37

Step 1. Remove the screws.

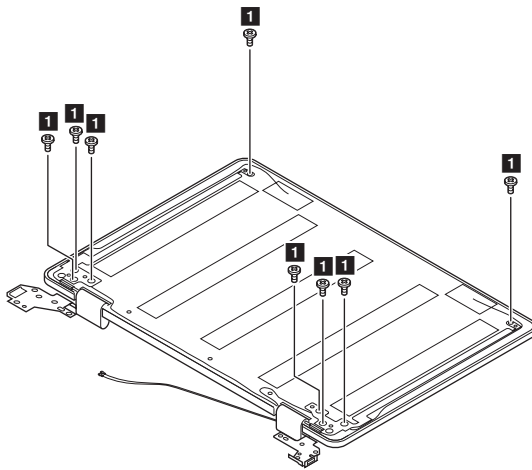


Figure 27. Remove the hinges

Table 10. Screw specifications — removing the hinges and the WLAN antennas

Screw location	Number	Specifications	Color	Torque
hinges to LCD base cover	8	M2.5 × 3.5 mm, flat-head, nylon-coated	Silver	3.7 — 4.0 kgf * cm

Step 2. Remove the hinges.

Refer to “Appendix B. Lenovo part numbers for replacement FRUs” on page 43 to look up the Lenovo part numbers for the replacement hinges.

Appendix A. Features, controls, and connectors

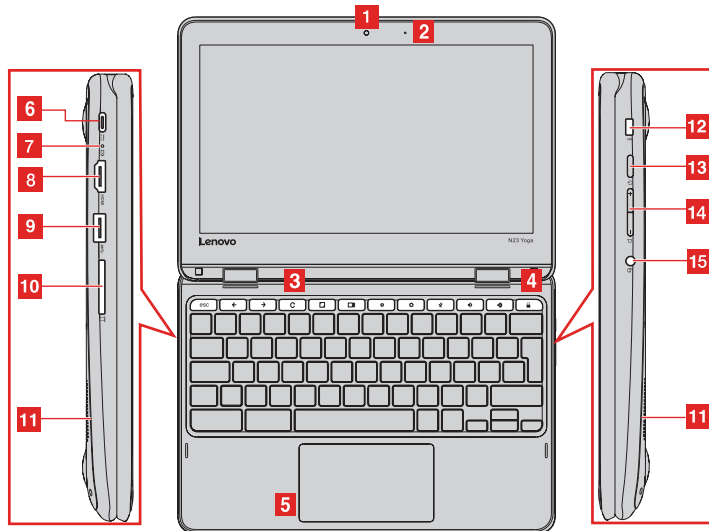


Figure 28. 300e Chromebook features and connectors

Table 11. 300e Chromebook features and connectors

No.	Feature or connector
1	Camera
2	Microphone
3	Shortcut keys
4	Screen lock
5	Touch pad
6	AC power connector/USB type – C connector
7	DC-in indicator
8	HDMI-out connector
9	USB 3.0 connector
10	Memory card (SD/MMC) slot
11	Speakers
12	N-LOCK
13	Power button
14	Volume button
15	Combo audio jack

Appendix B. Lenovo part numbers for replacement FRUs

When servicing a customer's computer, Lenovo service technicians may use part numbers listed in the following tables to order replacement parts through Lenovo CRM (customer relationship management) system.

Table 12. Part numbers for FRUs (CRUs)

No.	FRU (CRU) category	Parts description	Lenovo part number
1	LCD module		
		300e Chromebook TP LCM ASSY_BL&*3202-01888 CS	5D68C07628
2	Upper case(with keyboard)		
		300e Chromebook Yoga Black Spain KB&*3202-01909 CS	5O28C07738
		300e Chromebook Yoga Black EN-US KB&*3202-01893 CS	5O28C07725
		300e Chromebook Yoga BL Romanian KB&*3202-01908 CS	5O28C07737
		300e Chromebook Yoga Black EN-GB KB&*3202-01903 CS	5O28C07733
		300e Chromebook Yoga Black Swiss KB&*3202-01910 CS	5O28C07739
		300e Chromebook Yoga Black IT KB&*3202-01929 CS	5O28C07741
		300e Chromebook Yoga Black Nordic KB&*3202-01906 CS	5O28C07736
		300e Chromebook Yoga Black EN-ROW KB&*3202-01892 CS	5O28C07724
		300e Chromebook Yoga BL Belgian KB&*3202-01895 CS	5O28C07730
		300e Chromebook Yoga Black DE KB&*3202-01905 CS	5O28C07735
		300e Chromebook Yoga Black LA KB&*3202-01928 CS	5O28C07740
		300e Chromebook Yoga Black FR KB&*3202-01904 CS	5O28C07734
		300e Chromebook Yoga Black CZ KB&*3202-01900 CS	5O28C07731
		300e Chromebook Yoga Black GR KB&*3202-01894 CS	5O28C07726
		300e Chromebook Yoga Black Polish KB&*3202-01907 CS	5O28C07729
		300e Chromebook Yoga Black EN-FR KB&*3202-01902 CS	5O28C07732
3	Touchpad		
		300e Chromebook touchpad&*3202-01890 CS	5T58C07633
4	Speakers		
		300e Chromebook Speaker box&*1016-00345 CS	5SB8C07630
5	Base cover		
		300e Chromebook D cover&*3202-01896 CS	5S58C07635

6	System board		
		300e Chromebook MB_4+32G&*3202-01879 CS	5B28C07639
7	I/O board		
		300e Chromebook Audio Sub Board Assy&*3202-01880 CS	5P68C07640
8	Battery pack		
		SP-A L15M3PB1 11.1V45Wh3cell bty	SB18C15129
		SP-C L15M3PB1 11.1V45Wh3cell bty	SB18C15130
		LG-L L15L3PB1 11.1V45Wh3cell bty	SB18C15131

Note: Refer to “Appendix C. Lenovo part numbers for CRUs and miscellaneous parts” on page 45 to look up the Lenovo part numbers of ac power adapters and power cords.

Table 13. Part numbers for LCD FRUs

No.	FRU (CRU) category	Spare parts description	Lenovo part number
1	LCD bezel		
		300e Chromebook B cover Bezel Assy&*3202-01884 CS	5MO8C07632
2	LCD panel		
		300e Chromebook TP LCM ASSY_BL&*3202-01888 CS	5D68C07628
3	Camera assembly		
		300e Chromebook Camera Assy&*3202-01889 CS	5C28C07629
4	Hinges		
		300e Chromebook Hinge Assy&*3202-01886 CS	5SR8C07631
5	EDP cable and LCD cable		
		300e Chromebook LCD cable&*1109-02162 CS	5C18C07636
6	LCD base cover		
		300e Chromebook A cover&*3202-01881 CS	5S58C07634

Appendix C. Lenovo part numbers for CRUs and miscellaneous parts

The power cords and ac adapters are CRUs.

Table 14. Part numbers for FRUs (CRUs)

CRU category	Parts description	Lenovo part number
Screw pack		
	300e Chromebook Screw bundle&*3202-01898 CS	5M88C07637
Foot Rubber		
	300e Chromebook D cover cushion&*3202-01935 CS	5M08C07670
Thermal pad		
	300e Chromebook KB Thermal pad&*1104-00381 CS	5D78C07669
ac power adapter		
	ADLX45YAC3A;PD 45W;Acbel	SA18C15460
	ADLX45YLC3A;PD 45W;Liteon	SA18C15461
Power cord		
	300e Chromebook Power cord_UK&*1109-00731 CS	5O28C07643
	300e Chromebook Power cord_IS&*1109-00744 CS	5O28C07647
	300e Chromebook Power cord_AU&*1109-00737 CS	5O28C07645
	300e Chromebook Power cord_EU&*1109-00732 CS	5O28C07642
	300e Chromebook Power cord_US&*1109-00734 CS	5O28C07641
	300e Chromebook Power cord_IT&*1109-00740 CS	5O28C07649
	300e Chromebook Power cord_CH&*1109-00745 CS	5O28C07648
	300e Chromebook Power cord_ZA&*1109-00741 CS	5O28C07650

Appendix D. Label locations

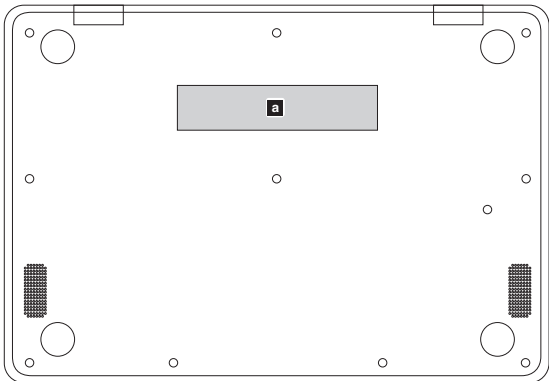


Figure 29. Label layout on the back side of the base cover

Labels attached to the base cover are country/region specific. Make sure to apply the appropriate labels to the replacement base cover.

Table 15. All base cover labels

Label	Label description	Applied country/region	Label dimensions
a	Rating label and rating (print) label	all	103 mm x 137 mm

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