



GE HealthCare

LOGIQ Totus

General Service Manual

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General Service Documentation

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This manual is a reference for the LOGIQ Totus (hereafter listed as the ultrasound system). All information provided in this manual is relevant for all systems unless otherwise specified.

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Language Disclaimers

WARNING

- (English)
(EN)
- This Service Manual is available in English only.
- If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.
 - Do not attempt to service the equipment unless this Service Manual has been consulted and is understood.
 - Failure to heed this Warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.

AVERTISSEMENT

- (Français)
(FR)
- Ce manuel de maintenance est disponible en anglais uniquement.
- Si un client de la personne responsable de la maintenance demande une langue autre que l'anglais, il est de la responsabilité du client de fournir les services de traduction.
 - N'essayez pas d'effectuer vous-même la maintenance de l'équipement avant d'avoir préalablement lu et compris le manuel de maintenance.
 - Le non-respect cet avertissement peut entraîner des blessures dues à un choc électrique, une défaillance mécanique ou à d'autres éléments dangereux chez la personne en charge de la maintenance, l'opérateur ou le patient.

ADVERTENCIA

- (Español)
(ES)
- Este Manual de servicio está disponible en idioma inglés únicamente.
- Si un proveedor de servicio del cliente requiere un idioma distinto, es responsabilidad del cliente ofrecer servicios de traducción.
 - No intente reparar el equipo a menos que haya consultado y comprendido este Manual de servicio.
 - Si no presta atención a esta Advertencia, se pueden ocasionar lesiones al proveedor de servicio, al operador o al paciente por descarga eléctrica, por riesgos mecánicos o de otra índole.

WARNUNG

Deutsch
(DE)

Dieses Wartungshandbuch ist nur auf Englisch verfügbar.

- Wenn der Kundendiensttechniker eines Kunden eine andere Sprache als Englisch benötigt, unterliegt es der Verantwortung des Kunden eine Übersetzung anfertigen zu lassen.
- Warten Sie das Gerät nur, wenn Sie dieses Wartungshandbuch gelesen und verstanden haben.
- Die Nichtbeachtung dieses Warnhinweises kann zu Verletzungen des Kundendiensttechnikers, Anwenders oder Patienten durch Stromschläge, mechanische oder andere Gefahren führen.

AVVERTENZA

italiano
(IT)

Il presente Manuale di assistenza è disponibile solo in inglese.

- Se il fornitore di servizi di un cliente ne richiede una copia in una lingua diversa dall'inglese, è responsabilità del cliente fornire il servizio di traduzione.
- Non tentare di riparare l'apparecchio se questo Manuale di assistenza non è stato letto e compreso.
- Il mancato rispetto di questa avvertenza può comportare il rischio di lesioni al fornitore di servizi, all'operatore o al paziente causate da scosse elettriche o da pericoli di origine meccanica o di altro tipo.

WAARSCHUWING

Nederlands
(NL)

Deze servicehandleiding is alleen beschikbaar in het Engels.

- Als de serviceleverancier van een klant vraagt om een andere taal dan Engels, is het de verantwoordelijkheid van de klant om een vertaalde versie te bieden.
- Probeer geen onderhoud aan de apparatuur uit te voeren tenzij deze servicehandleiding is geraadpleegd en begrepen.
- Het niet opvolgen van deze waarschuwing kan bij de serviceleverancier, de operator of de patiënt leiden tot letsel door elektrische schokken, mechanische of andere gevaren.

ADVERTÊNCIA

Português
(PT-BR)

Este Manual de Manutenção está disponível apenas em Inglês.

- Caso um prestador de serviços do cliente solicite o manual em idioma diferente do inglês, é de responsabilidade do cliente o fornecimento de serviços de tradução.
- Não tente realizar a manutenção do equipamento antes de ler e compreender este Manual de manutenção.
- O não cumprimento desta advertência pode resultar em danos por choque elétrico e riscos mecânicos para o prestador de serviços, operador ou paciente.

VIÐVÖRUN

Íslenska
(IS)

Þessi þjónustuhandbók er aðeins fánleg á ensku.

- Ef þjónustuaðili viðskiptavinar þarf annað tungumál en ensku er það á ábyrgð viðskiptavinarins að veita þýðingarþjónustu.
- Ekki reyna að þjónusta búnaðinn nema þessir þjónustuhandbækur hafi verið skoðaðir og skilið.
- Ef ekki er gætt að þessari viðvörðun getur það valdið meiðslum á þjónustuaðila, stjórnanda eða sjúklingi vegna raflosts, vélrænni hættu eða annarri hættu.

HOIATUS!

Eesti
(ET)

Service Manual (Hooldusjuhend) on saadaval ainult ingliskeelsena.

- Kui kliendi teenusepakkuja nõue on, et juhend oleks mõnes muus keeles, korraldab juhendi tõlkimise klient.
- Tutvuge enne seadme hooldustööde tegemist kindlasti juhendiga Service Manual (Hooldusjuhend).
- Selle nõude eiramise korral võib teenindaja, kasutaja või patsient saada elektrilöögi, samuti võivad kaasneda muud ohud.

OPOZORILO

Slovenščina
(SL)

Ta servisni priročnik je na voljo samo v angleščini.

- Če ponudnik servisnih storitev za stranko potrebuje navodila v drugem jeziku, mora stranka sama poskrbeti za prevajanje.
- Ne poskušajte servisirati opreme, ne da bi prej prebrali in razumeli servisni priročnik.
- Če tega opozorila ne upoštevate, obstaja nevarnost električnega udara, mehanskih ali drugih nevarnosti in posledičnih poškodb ponudnika servisnih storitev, uporabnika opreme ali pacienta.

警告

日本語
(JA)

このサービスマニュアルは英語版のみ提供されています。

- お客様の保守担当者が英語以外のマニュアルを必要とされる場合は、お客様の負担にて翻訳サービスをご利用ください。
- 装置の保守を行う前に、必ずサービスマニュアルを読み、内容を理解してください。
- この警告に注意を払わない場合、保守担当者やオペレータ、患者に対して、電気ショック、機械またはその他の危険による傷害が発生する恐れがあります。

警告

繁体中文
(ZH-CN)

本维修手册仅提供英文版。

- 如果客户需要其它语种版本，请自行翻译。
- 在维修机器前，请务必阅读并完全理解本维修手册。
- 若违反本警告，有可能会给维修提供商、操作员或患者带来电击伤害、机械损伤或其它危害。

VARNING

Svenska
(SV)

Den här servicehandboken finns endast på engelska.

- Om en kunds servicetekniker kräver ett annat språk än engelska är det kundens ansvar att tillhandahålla en översatt version.
- Försök inte att utföra service på utrustningen om du inte har läst igenom och förstått den här servicehandboken.
- Om du inte tar hänsyn till den här varningen kan serviceteknikern, operatören eller patienten utsättas för elektriska stötar eller mekaniska eller andra faror, vilket kan leda till personskador.

警告

繁體中文
(ZH-TW)

此服務手冊僅推出英文版。

- 若客戶的維修人員需要英文以外的其他語言版本，客戶需自行負責提供翻譯服務。
- 在詳閱此服務手冊並充分理解其內容之前，請勿試圖開始維修設備。
- 若忽視此警告，可能導致維修人員、操作人員或病患因為觸電、機械問題或其他危險而受傷。

경고

- 이 서비스 설명서는 영어로만 제공됩니다.
- 고객의 서비스 공급자가 영어 이외의 언어를 요구하는 경우 번역 서비스를 제공할 책임은 고객에게 있습니다.
 - 이 서비스 설명서를 참조 및 이해하지 못한 경우 장비를 만지지 마십시오.
 - 이 경고를 무시한 경우 서비스 공급자, 오퍼레이터 또는 환자가 감전, 기계적 위험 또는 기타 위험으로 인한 부상을 입을 수 있습니다.

ПРЕДУПРЕЖДЕНИЕ

Данное руководство по обслуживанию доступно только на английском языке.

- Если специалисту по техническому обслуживанию клиента требуется документация на каком-либо другом языке, ответственность за выполнение перевода возлагается на клиента.
- Приступайте к обслуживанию оборудования только после того, как изучите данное руководство по обслуживанию и полностью поймете его содержание.
 - Несоблюдение данного требования может привести к травмированию специалиста по техническому обслуживанию, пользователя или пациента вследствие поражения электрическим током, механических и прочих повреждений.

OSTRZEŻENIE

Niniejszy podręcznik serwisowy jest dostępny wyłącznie w języku angielskim.

- Jeżeli dostawca usług klienta posługuje się językiem innym niż angielski, za zapewnienie usług tłumaczeniowych odpowiada klient.
- Przed przystąpieniem do czynności serwisowych należy zapoznać się z informacjami zawartymi w niniejszym podręczniku serwisowym i je zrozumieć.
- W przeciwnym wypadku dostawca usług, operator lub pacjent mogą odnieść obrażenia spowodowane porażeniem prądem elektrycznym, działaniem elementów mechanicznych lub innymi zagrożeniami.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ

Ελληνικά
(EL)

Το παρόν Εγχειρίδιο σέρβις διατίθεται μόνο στα Αγγλικά.

- Εάν ο πάροχος σέρβις του πελάτη απαιτεί γλώσσα εκτός των Αγγλικών, η παροχή μεταφραστικών υπηρεσιών αποτελεί ευθύνη του πελάτη.
- Μην επιχειρήσετε να επισκευάσετε τον εξοπλισμό εάν πρώτα δεν συμβουλευτείτε και κατανοήσετε το παρόν Εγχειρίδιο σέρβις.
- Σε περίπτωση μη τήρησης της παρούσας προειδοποίησης, ενδέχεται να προκληθεί τραυματισμός στον πάροχο σέρβις, το χειριστή ή τον ασθενή εξαιτίας ηλεκτροπληξίας καθώς και μηχανικών ή άλλων κινδύνων.

FIGYELMEZTETÉS

Magyar
(HU)

A szervizkézikönyv kizárólag angol nyelven érhető el.

- Amennyiben az ügyfél szolgáltatójának nem felel meg az angol nyelvű dokumentáció, úgy a fordításról az ügyfélnek kell gondoskodnia.
- Kizárólag úgy lásson hozzá a berendezés karbantartásához, hogy elolvasta és megértette a szervizkézikönyvben foglaltakat.
- Ezen figyelmeztetés figyelmen kívül hagyása esetén a szolgáltató, a kezelő vagy a páciens áramütést, mechanikus sérülést vagy más veszély által okozott személyi sérülést szenvedhet.

VAROVANIE

Slovenčina
(SK)

Táto servisná príručka je dostupná iba v anglickom jazyku.

- Ak poskytovateľ služieb zákazníkom vyžaduje iný jazyk ako anglický jazyk, jeho povinnosťou je zabezpečiť prekladateľské služby.
- Zariadenie nepoužívajte bez prečítania a porozumenia tejto servisnej príručky.
- Nedodržanie tejto výstrahy môže viesť k zraneniu poskytovateľa služieb, operátora alebo pacienta spôsobeného elektrickým šokom, mechanickým alebo iným nebezpečenstvom.

VÝSTRAHA

česky
(CZ)

Tato servisní příručka je k dispozici pouze v angličtině.

- Pokud poskytovatel služby zákazníkovi požaduje jiný jazyk než angličtinu, je odpovědností zákazníka poskytnout služby překladu.
- Nepokoušejte se provádět servis zařízení, dokud si neprostudujete a neporozumíte servisní příručce.
- Nevěnování pozornosti této výstraze může způsobit poskytovateli služeb, obsluze nebo pacientovi úraz elektrickým proudem, mechanická nebo jiná nebezpečí.

UYARI

Türkçe
(TK)

Servis Kılavuzu yalnızca İngilizce olarak mevcuttur.

- Müşterinin servis sağlayıcısı için kılavuzun İngilizce dışında başka bir dile çevrilmesi gerekiyorsa çeviri hizmeti sağlamak müşterinin sorumluluğudur.
- Bu Servis Kılavuzu'na bakıp talimatları anlamadan ekipmanı kullanmaya çalışmayın.
- Bu Uyarının göz ardı edilmesi servis sağlayıcısının, operatörün veya hastanın, elektrik çarpması, mekanik arıza ya da diğer tehlikeler nedeniyle yaralanmasına neden olabilir.

ADVARSEL

Dansk
(DA)

Denne servicemanual fås kun på engelsk.

- Hvis en kundes tjenesteudbyder kræver et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelsesydelse.
- Forsøg ikke at udføre service på udstyret, medmindre denne servicemanual er læst og forstået.
- Manglende overholdelse af denne advarsel kan medføre skade på serviceudbyderen, operatøren eller patienten som følge af elektrisk stød, mekaniske eller andre farer.

ADVARSEL

Norsk
(NO)

Denne servicehåndboken er bare tilgjengelig på engelsk.

- Hvis en kundes tjenestetilbyder krever et annet språk enn engelsk, er det kundens ansvar å tilby oversettelsestjenester.
- Ikke forsøk å utføre service på utstyret før denne servicehåndboken er lest og forstått.
- Dersom det ikke tas hensyn til denne advarselen, kan det føre til skader på tjenestetilbyderen, operatøren eller pasienten fra elektrisk støt, mekaniske eller andre farer.

VAKAVA VAROITUS

Suomi
(FI)

Tämä huolto-opas on saatavana vain englanniksi.

- Jos asiakkaan palveluntarjoaja tarvitsee oppaan jollain muulla kielellä, käännöspalveluiden hankkiminen on asiakkaan vastuulla.
- Laitetta ei saa huoltaa ellei huolto-oppaaseen ole sitä ennen tutustuttu huolellisesti.
- Jos tätä varoitusta ei noudateta, palveluntarjoaja, käyttäjä tai potilas saattaa saada sähköiskun, ja saattaa aiheutua mekaanisia tai muita vaurioita.

ПРЕДУПРЕЖДЕНИЕ

Български
(BG)

- Настоящото Сервизно ръководство се предлага само на английски език.
- Ако доставчикът на сервизни услуги на клиента изисква ръководство на език, който се различава от английския, клиентът има отговорност да осигури адекватен превод.
 - Не правете опити за сервиз на оборудването, без да проверите и да разберете съветите в Сервизното ръководство.
 - Неспазването на това предупреждение може да доведе до нараняване на доставчика на сервизни услуги, оператора или пациента вследствие на токов удар, механична или други опасности.

AVERTISMENT

Română
(RO)

- Acest manual de service este disponibil doar în engleză.
- Dacă furnizorul de servicii al unui client solicită altă limbă decât engleza, este responsabilitatea clientului să ofere servicii de traducere.
 - Nu încercați să efectuați lucrări de service asupra echipamentului, în afară de cazul când ați consultat acest manual de service și l-ați înțeles.
 - Nerespectarea acestui avertisment poate avea ca rezultat rănirea furnizorului de servicii, a operatorului sau a pacientului ca urmare a electrocutării, pericolelor mecanice sau a altor pericole.

UPOZORENJE

Hrvatski
(HR)

- Ovaj servisni priručnik dostupan je samo na engleskom jeziku.
- Ako klijentov serviser zahtijeva jezik koji nije engleski, odgovornost klijenta je pružiti usluge prijevoda.
 - Nemojte pokušavati servisirati opremu ako niste pročitali i razumjeli servisni priručnik.
 - Ako ne poštujete ovo upozorenje, može doći do ozljede serviser, operatera ili pacijenta prouzročene strujnim udarom, mehaničkim i drugim opasnostima.

ĮSPĖJIMAS

Lietuvių k.
(LT)

- Šis priežiūros vadovas galimas tik anglų kalba.
- Jei kliento paslaugų teikėjas reikalauja kitos kalbos nei anglų, klientas atsako už vertimo paslaugos teikimą.
 - Atlikite įrangos priežiūrą tik gerai susipažinę su priežiūros vadovu ir jį supratę.
 - Nesilaikant šio įspėjimo galimas paslaugos teikėjo, operatoriaus ar paciento sužeidimas dėl elektros šoko, mechaninio ar kito pavojaus.

BRĪDINĀJUMS

- (LV) Latviski
- Šī apkalpes rokasgrāmata ir pieejama tikai angļu valodā.
- Ja klienta pakalpojumu sniedzējam ir nepieciešama cita valoda, kas nav angļu valoda, klienta pienākums ir nodrošināt tulkojumu.
 - Nemēģiniet apkalpot aprīkojumu, ja apkalpes rokasgrāmata nav izlasīta un izprasta.
 - Ja šis brīdinājums netiek ievērots, pakalpojumu sniedzējs, operators vai pacients var gūt traumas no elektrošoka vai var rasties mehānisks vai cita veida apdraudējums.

UPOZORENJE

- (SR) Srpski
- Ovaj priručnik za servisiranje dostupan je samo na engleskom jeziku.
- Ako klijentov serviser zahteva jezik koji nije engleski, odgovornost je na klijentu da pruži usluge prevođenja.
 - Nemojte da pokušavate da servisirate opremu ako prethodno niste pročitali i razumeli ovaj priručnik.
 - Ako ne poštujete ovo upozorenje, može doći do povređivanja serviser, operatera ili pacijenta uzrokovanog električnim udarom, mehaničkim i drugim opasnostima.

AVISO

- (PT-PT) Português (Portugal)
- Este manual de assistência está disponível apenas em inglês.
- Se o prestador de serviços de assistência do cliente necessitar do manual noutra idioma, a disponibilização dos serviços de tradução é da responsabilidade do cliente.
 - Não tente reparar o equipamento se não tiver consultado e compreendido este manual de assistência.
 - O não cumprimento das instruções constantes neste aviso pode resultar em ferimentos no prestador de serviços de assistência, no operador ou no paciente devido a choques eléctricos, perigos mecânicos ou outros problemas.

ПОПЕРЕДЖЕННЯ

Українська
(UK)

Цей посібник із технічного обслуговування доступний лише англійською мовою.

- Якщо постачальнику послуг із технічного обслуговування потрібна інформація мовою, відмінною від англійської, відповідальність за надання послуг перекладу несе користувач.
- Технічне обслуговування обладнання можна виконувати лише після ознайомлення з посібником із технічного обслуговування та усвідомлення його змісту.
- Недотримання цього попередження може призвести до травм постачальника послуг, оператора або пацієнта, спричинених дією електричного струму, механічних або інших пошкоджень.

PERINGATAN

Bahasa
Indonesia
(ID)

Panduan Servis ini hanya tersedia dalam Bahasa Inggris.

- Jika penyedia layanan pelanggan memerlukan bahasa di luar Bahasa Inggris, maka pelanggan bertanggung jawab untuk memberikan layanan tersebut.
- Jangan mencoba menyervis peralatan ini, kecuali Panduan Servis ini telah dijadikan rujukan dan dipahami dengan baik.
- Kelalaian memperhatikan Peringatan ini dapat menyebabkan cedera terhadap penyedia layanan, operator, atau pasien akibat bahaya kejutan listrik, mekanik, dan bahaya lainnya.

คำเตือน

ไทย
(TH)

คู่มือซ่อมบำรุงนี้เฉพาะภาษาอังกฤษเท่านั้น

- หากผู้ให้บริการของลูกค้าต้องการจับภาษาอื่นนอกเหนือจากภาษาอังกฤษ ลูกค้าต้องเป็นผู้รับผิดชอบในการจัดเตรียมคู่มือซ่อมบำรุงฉบับแปล
- โปรดอย่าซ่อมบำรุงอุปกรณ์โดยไม่ศึกษา และทำความเข้าใจคู่มือซ่อมบำรุงนี้
- หากไม่ปฏิบัติตามคำเตือนนี้อาจส่งผลให้ผู้ให้บริการ ผู้ใช้งานอุปกรณ์ หรือผู้ป่วยได้รับบาดเจ็บจากไฟฟ้าช็อต อันตรายจากกลไกของอุปกรณ์ หรืออันตรายอื่น ๆ

CẢNH BÁO

(VI) Tiếng Việt

Hướng dẫn sử dụng dịch vụ này chỉ sẵn dùng bằng tiếng Anh.

- Nếu nhà cung cấp dịch vụ của khách hàng yêu cầu ngôn ngữ khác ngoài tiếng Anh, thì khách hàng phải có trách nhiệm cung cấp các dịch vụ dịch thuật.
- Không được tìm cách sửa chữa thiết bị trừ khi đã tham khảo và hiểu rõ Hướng dẫn sử dụng dịch vụ này.
- Bỏ qua lời cảnh báo này có thể gây thương tích cho nhà cung cấp dịch vụ, nhân viên vận hành hoặc bệnh nhân do sốc điện, những nguy hiểm về máy móc hoặc yếu tố khác.

ЕСКЕРТУ

(KK) Қазақ тілінде

Осы қызмет көрсету нұсқаулығы тек ағылшын тілінде қолжетімді.

- Егер тұтынушылардың қызметтер жеткізушісі ағылшын тілінен басқа тілді талап етсе, аудару қызметтерімен қамтамасыз ету тұтынушының жауапкершілігіне кіреді.
- Осы қызмет көрсету нұсқаулығын түсініп, ол туралы кеңес алмайынша жабдыққа қызмет көрсетуге тырыспаңыз.
- Осы ескертуді орындамау электр тогының соғуы, механикалық немесе басқа да қауіптер салдарынан қызметтер жеткізушісінің, оператордың немесе емделушінің жарақаттануына алып келуі мүмкін.

BABALA

(TL) Tagalog

Available lamang sa Ingles ang Manwal ng Serbisyo ng ito.

- Kung ang kailangan lamang ng tagabigay ng serbisyo ng kustomer ng wika maliban sa Ingles, responsibilidad ng kustomer na magbigay ng serbisyo sa pagsasalin wika nito.
- Huwag subukan na iserbisyo ang mga kasangkapan maliban kung nakonsulta ang nauunawaan itong Manwal ng Serbisyo.
- Ang pagkabigong maunawaan ang Babalang ito ay maaring maging resulta ng pinsala sa tagabigay ng serbisyo, nagpapagana o pasyente mula sa pagkakakoryente, mekanikal o iba pang peligro.

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2. Report the damage to the carrier.
 - Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier.
 - A transportation company will not pay a claim for damage if an inspection is not requested within this 14-day period.

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All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing shall be performed by qualified GE HealthCare personnel. In performing all electrical work on these products, GE HealthCare will use its own specially trained field engineers. All of GE HealthCare's electrical work on these products will comply with the requirements of the applicable electrical codes.

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Declaration of Conformity

The radio equipment used in the Ultrasound System (if present) conforms to the Radio Equipment Directive 2014/53/EU (RED). The declaration of conformity can be found at the following link:

Intel AX210 Module

<https://www.intel.com/content/dam/support/us/en/documents/network-and-i-o/wireless-networking/ax210ngw-eu-red-doc.pdf>

Search under Current or Legacy Adapters for: Intel® 9260 / Intel® AX210

NETGEAR A8000 Module

https://www.downloads.netgear.com/files/DoC/204-11879-03_CE_A8000_EN-GR-FR-IT-SP-EP_28Jul25.pdf

Figure -1 WLAN Label

Intel AX210 Module



NETGEAR A8000 Module



Revision History

Revision	Date	Reason for change
Rev. 1	August, 2023	Initial release
Rev. 2	June, 2024	Enhancement feedback
Rev. 3	Nov, 2025	• Converted to Tridion Docs format. • Updated chapter structure based on the Service Manual Standard (DOC1824402). • Improvement of illustration and diagram. • Added R5 information.
Rev. 3+A	Jan, 2026	Update for R5

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Chapter 1

Safety and General Information

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This chapter describes important issues related to servicing the Ultrasound system safely. The service provider must read and understand all the information presented here before installing or servicing the Ultrasound system.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

1.1 Service Manual Overview

Contents in this section

- *Attention* on page 30
- *Contents in this service manual* on page 31
- *Typical users of LOGIQ Totus documentation* on page 32
- *Product description* on page 33

1.1.1 Attention

This manual contains necessary and sufficient information for the Field Service Engineer or Biotech Engineer to safely maintain and service the LOGIQ Totus. Advanced equipment training may be provided by factory trained Field Service trainers for the agreed-upon time period.

1.1.2 Contents in this service manual

The service manual is divided into the chapters shown below.

1.1.3 Typical users of LOGIQ Totus documentation

The information needed to service the LOGIQ Totus is collected in the Service Manual.

Typical users of the General Service Manual

- Service personnel (setup, maintenance, etc.)
- Hospital's service personnel
- Architectural planners/installation planners (some parts of *Chapter 2 - Pre-installation*)

NOTE

Dates on screenshots are represented in MM/DD/YYYY format throughout the manual. Information on how to change the LOGIQ Totus's date can be found in Customizing Your System in the User Manual (appropriate version).

1.1.4 Product description

Overview of the LOGIQ Totus

The LOGIQ Totus is a high performance digital ultrasound imaging system with total data management.

The fully digital architecture of the LOGIQ Totus allows optimal usage of all scanning modes and probe types throughout the full spectrum of operating frequencies.

The LOGIQ Totus is a digital beamforming Ultrasound system. The Ultrasound signal flows from the probe through the Ultrasound system where it is processed and finally displayed as a diagnostic image on the monitor. Images and patient data can be sent to peripheral devices to be stored, printed, or displayed.

System configuration is stored on the hard drive.

All necessary software is loaded from the hard drive on power up.

Purpose of the user manual

The purpose of the user manual is to provide instructions for the safe use of the system for examination, diagnosis and treatment of medical conditions.

The user manual should be fully read and understood before operating the LOGIQ Totus.

The online versions of the user manual is available through the Help function on the LOGIQ Totus's operator panel.

User manual documentation is provided through electronic Instructions for Use (eIFU).

1.2 Important Conventions

Contents in this section

- *Conventions used in book* on page 34
- *Standard hazard icons* on page 34
- *Labels/icons on the system* on page 36

1.2.1 Conventions used in book

Icons

Pictures, or icons, are used wherever they will reinforce the printed message. The icons, labels, and conventions used on the product and in the service information are described in this chapter.

Safety precaution messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards to personnel are labeled in one of three ways:

- DANGER
- WARNING
- CAUTION

When a hazard is present that can cause property damage, but has absolutely no personal injury risk, a NOTICE is used.



DANGER

DANGER IS USED TO INDICATE THAT A SPECIFIC HAZARD IS KNOWN TO EXIST WHICH, THROUGH INAPPROPRIATE CONDITIONS OR ACTIONS, WILL CAUSE SEVERE OR FATAL PERSONAL INJURY.



WARNING

WARNING IS USED TO INDICATE THAT A SPECIFIC HAZARD IS KNOWN TO EXIST WHICH, THROUGH INAPPROPRIATE CONDITIONS OR ACTIONS, MAY CAUSE MINOR PERSONAL INJURY AND/OR SUBSTANTIAL PROPERTY DAMAGE.



CAUTION

CAUTION IS USED TO INDICATE THAT A POTENTIAL HAZARD MAY EXIST WHICH, THROUGH INAPPROPRIATE CONDITIONS OR ACTIONS, WILL OR CAN CAUSE PROPERTY DAMAGE.

Notice

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.

Notice Example: Disk drive may crash.

NOTE

Notes are used to provide important information about an item or a procedure.

NOTE

Be sure to read the notes; the information contained in a note can often save you time or effort.

1.2.2 Standard hazard icons

Important information will always be preceded by the exclamation point  contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could possibly cause harm. Even if a symbol is not used in this manual, it may be included for your reference.

Table 1-1 Standard Hazard Icons

Icon	Meaning
	Biological Hazard Describes precautions necessary to prevent the risk of disease transmission or infections. • Patient/user infection due to contaminated equipment.
	Explosion Hazard Describes precautions necessary to prevent the risk of injury through explosion hazard! • Risk of explosion if used in the presence of flammable anesthetics.
	Electrical Hazard Describes precautions necessary to prevent the risk of injury through electric hazards. • Electrical micro-shock to patient, e.g., ventricular
	Fire and Smoke Hazard • Patient/user injury or adverse reaction from fire or smoke. • Patient/user injury from explosion and fire.
	Moving Hazard Describes precautions necessary to prevent the risk of injury through moving or tipping hazard! • Console, accessories or optional storage devices that can fall on patient, user, or others. • Collision with persons or objects may result in injury while maneuvering or during system transport. • Injury to user from moving the console.
	Caution: HOT Be careful not to burn yourself
	Pinch point Watch your fingers. This symbol indicates that serious injury to the hand may occur.
	Acoustic Output Hazard Patient injury or tissue damage from ultrasound radiation. ALARA, the use of Power Output following the 'as low as reasonably achievable' principle

Other icons make you aware of specific procedures or requirements that should be followed.

Table 1-2 Standard Icons for Specific Procedures or Requirements

Icon	Meaning
	AVOID STATIC ELECTRICITY Use grounding devices.

Icon	Meaning
	WEAR HAND PROTECTION to protect from electrical dangers, cuts, punctures, fractures and amputations, etc.
	WEAR EYE PROTECTION to protect eye from dust, liquid, piece of metal, etc.
	LOCKOUT/TAGOUT (LOTO) before performing the procedure
	WEAR FOOT PROTECTION to protect from electrical hazards, falling or rolling objects or from crushing or penetrating materials, etc.

1.2.3 Labels/Icons on the system

Contents in this section

Label Locations on page 36

1.2.3.1 Label Locations

For information on label locations, refer to the appropriate version of the User Manual or the latest version of the Release Notes.

Table 1-3 User Manual for the LOGIQ Totus

MODEL NUMBER	ENGLISH USER MANUAL DIRECTION NUMBER
Running R4.x.x software	5929163-1EN
Running R5.x.x software	5958015-1EN

1.2.3.2 Product icons

Information about product icons is located in the User Manual (appropriate revision).

1.3 Safety Considerations

The following safety precautions must be observed during all phases of operation, service, and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment.

- *Human safety* on page 37
- *Mechanical safety* on page 40
- *Electrical safety* on page 43
- *Battery safety* on page 44

1.3.1 Human safety

- Operating personnel must not remove the Ultrasound system covers.
- Servicing should be performed by authorized personnel only.
- Only personnel who have participated in a LOGIQ Totus Training Seminar are authorized to service the equipment.



DANGER

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling, testing and adjusting.



DANGER

WITH THE Battery Pack OPTION, DANGEROUS VOLTAGES EXIST WITHIN THE LOGIQ Totus.
THERE ARE NO TEST POINTS TO VERIFY ISOLATION.

THE POWER MODULE MAY BE ENERGIZED EVEN IF THE POWER IS TURNED OFF AND THE MAINS POWER CABLE IS DISCONNECTED.

DISCONNECT THE MAINS POWER CABLE FROM THE POWER MODULE (BATTERY) AS WELL TO PREVENT ELECTRIC SHOCK.



DANGER

TILTING THE LOGIQ Totus REQUIRES TWO PEOPLE IN ORDER TO AVOID INJURY TO SERVICE PERSONNEL AND DAMAGE TO THE EQUIPMENT.



DANGER

USE EXTREME CAUTION AS LONG AS THE LOGIQ Totus IS UN-STABLE, NOT RESTING ON ALL FOUR CASTERS.



DANGER

DO NOT USE UNAPPROVED DEVICES

IF DEVICES ARE CONNECTED WITHOUT THE APPROVAL OF GE, THE WARRANTY WILL BE INVALID.
ANY DEVICE CONNECTED TO THE ULTRASOUND SYSTEM MUST CONFORM TO ONE OR MORE OF THE REQUIREMENTS LISTED BELOW:

- IEC standard or equivalent standards appropriate to devices.
- The devices shall be connected to protective earth (ground).



DANGER

RISK OF ELECTRICAL SHOCK, THE ULTRASOUND SYSTEM MUST BE TURNED OFF AND DISCONNECTED FROM POWER SOURCE. MAINS POWER CABLE MUST BE CONTROLLED AT ALL TIMES.

DISCONNECT THE POWER CABLE FROM THE POWER MODULE (BATTERY) AS WELL.

BEWARE THAT THE MAIN POWER SUPPLY, POWER MODULE (BATTERY), AND UBE-T MAY BE ENERGIZED EVEN IF THE POWER IS TURNED OFF IF THE MAINS POWER CABLE IS STILL PLUGGED INTO THE AC OUTLET AND/OR THE POWER CABLE FOR THE POWER MODULE (BATTERY) IS CONNECTED.

**DANGER**

Be sure to have read and understood control explanations for each mode used before attempting to adjust the Acoustic Output control or any control that can affect Acoustic Output. During a screening and diagnostic ultrasound examination, high frequency sound penetrates and interacts with tissue in and around the area of anatomy to be imaged. Only a small portion of this sound energy is reflected back to the transducer for use in constructing the image, while the remainder is dissipated within the tissue. The interaction of sound energy with tissue at sufficiently high levels can produce biological effects (aka bioeffects) of either a mechanical or thermal nature. Although the generation of bioeffect is intentional with therapeutic ultrasound, it is generally undesired in screening and diagnostic applications and may be harmful in some conditions.

Use the minimum necessary acoustic output (the principle of ALARA (As Low As Reasonably Achievable)) to get the best diagnostic image or measurement during an examination. Begin the exam with the probe that provides an optimum focal depth and penetration.

**WARNING**

If the covers are removed from an operating ultrasound system, some metal surfaces may be warm enough to pose a potential heat hazard if touched, even while in shutdown mode.

**WARNING**

USE ALL PERSONAL PROTECTION EQUIPMENT (PPE) SUCH AS GLOVES, SAFETY SHOES, SAFETY GLASSES, AND KNEELING PADS TO REDUCE THE RISK OF INJURY.

**WARNING**

EXPLOSION WARNING

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

**WARNING**

For console ultrasound systems and for ultrasound systems mounted on a cart, when the top console is in its locked position, the gas shock is compressed and stores mechanical energy. During normal operation the top console, the weight of the monitor and the mechanical force of the gas shock are in balance. Take care if/when you activate this gas shock. Personal injury can occur after the panel is removed and the shock pressure is released. Take care when you repair the elevation assembly.

**WARNING**

Beware of possible sharp edges on all mechanical parts. If sharp edges are encountered, the appropriate PPE should be used to reduce the risk of injury.

THE APPROPRIATE PPE IS REQUIRED PER EHS POLICIES AND SRAS.

**WARNING**

Wear all PPE including gloves as indicated in the chemical MSDS/SDS.

**WARNING**

HAVE TWO PEOPLE AVAILABLE TO DELIVER AND UNPACK THE LOGIQ Totus. ATTEMPTS TO MOVE THE LOGIQ Totus CONSIDERABLE DISTANCES OR ON AN INCLINE BY ONE PERSON COULD RESULT IN INJURY OR DAMAGE OR BOTH.

**CAUTION**

BECAUSE OF THE LIMITED ACCESS TO CABINETS AND EQUIPMENT IN THE FIELD, AND PLACING PEOPLE IN AWKWARD POSITIONS, GE HAS LIMITED THE LIFTING WEIGHT FOR ONE PERSON IN THE FIELD TO 16 KG (35 LBS). ANYTHING OVER 16 KG (35 LBS) REQUIRES TWO PEOPLE.

**CAUTION**

DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

1.3.2 Mechanical safety

**DANGER**

ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.

**DANGER**

WHEN THE LOGIQ Totus IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE, USE EXTREME CAUTION SINCE IT MAY BECOME UNSTABLE AND TIP OVER.

**DANGER**

THE LOGIQ Totus WEIGHS 126 KG (278 LBS) AND UP TO 135 KG (298 LBS), DEPENDING ON INSTALLED PERIPHERALS.

USE CARE WHEN MOVING IT OR REPLACING ITS PARTS. FAILURE TO FOLLOW THE PRECAUTIONS LISTED BELOW COULD RESULT IN INJURY, UNCONTROLLED MOTION, AND COSTLY DAMAGE.

ALWAYS:

- BE SURE THE PATHWAY IS CLEAR.
- USE SLOW, CAREFUL MOTIONS.
- USE TWO PEOPLE WHEN MOVING ON INCLINES OR LIFTING MORE THAN 16 KG (35 LBS).

**WARNING**

WHILE THE SOFTWARE INSTALL PROCEDURE IS DESIGNED TO PRESERVE DATA, YOU SHOULD SAVE ANY PATIENT DATA, IMAGES, AND SYSTEM SETUPS TO A MEDIA OR HARDCOPY BEFORE DOING A SOFTWARE UPGRADE. FAILURE TO FOLLOW INSTRUCTIONS COULD RESULT IN LOSS OF PATIENT DATA.

**WARNING**

NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR. EVEN IF IT LOOKS OK, IT MAY BE DAMAGED, POSSIBLY RESULTING IN MISDIAGNOSIS.

**WARNING**

TO AVOID INJURY WHEN YOU MOVE THE MAIN MONITOR AND THE MONITOR ARM, DO NOT PUT YOUR FINGER, HAND, OR OBJECT IN THE JOINT OF THE MAIN MONITOR OR THE MONITOR ARM.

**WARNING**

IF THE OPERATOR CONTROL PANEL GAS SPRING IS NOT FUNCTIONING CORRECTLY, THERE IS A CHANCE THAT THE OPERATOR PANEL COULD DROP DOWN SUDDENLY WHEN YOU USE THE MANUAL RELEASE HANDLE. TO AVOID INJURY, TAKE CARE THAT YOU ARE NOT POSITIONED BELOW THE OPERATOR PANEL WHEN USING THE MANUAL RELEASE HANDLE.

**WARNING**

TO AVOID INJURY OR DAMAGE TO THE MAIN MONITOR, MAKE SURE THERE IS NOTHING WITHIN RANGE OF THE MAIN MONITOR BEFORE MOVING THE MAIN MONITOR AND MONITOR ARM. THIS INCLUDES PEOPLE AND OTHER OBJECTS.

**WARNING**

ENSURE THAT NOBODY TOUCHES THE CONSOLE ARM/XY MECHANISM WHEN MOVING THE OPERATOR PANEL. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY.

**CAUTION**

THE LOGIQ Totus SHOULD NOT BE MOVED WITH THE OPERATOR PANEL EXTENDED. MOVE THE OPERATOR PANEL TO ITS CENTERED AND LOCKED POSITION. LOWER THE OPERATOR PANEL AS MUCH AS POSSIBLE BEFORE MOVING THE LOGIQ Totus.

**CAUTION**

REMEMBER: IF THE FRONT CASTER SWIVEL LOCK IS ENGAGED FOR TRANSPORTATION, PRESSING THE RELEASE PEDAL ONCE DISENGAGES THE SWIVEL LOCK. YOU MUST DEPRESS THE RELEASE PEDAL A SECOND TIME TO ENGAGE THE BRAKE.

**CAUTION**

BEFORE YOU MOVE OR TRANSPORT THE LOGIQ Totus, MAKE SURE TO FIRMLY LOCK THE MONITOR ARM AND FLIP DOWN THE MAIN MONITOR TO PREVENT DAMAGE TO THE LOGIQ Totus.

**CAUTION**

ALWAYS LOCK THE TOP/UPPER CONSOLE IN ITS PARKING (LOCKED) POSITION BEFORE MOVING THE LOGIQ Totus.

**CAUTION**

PRIOR TO ELEVATING THE LOGIQ Totus, VERIFY THE FOLLOWING:

- KEYBOARD IS LOCKED IN ITS LOWEST POSITION
- FRONT BRAKE IS LOCKED SO THE LOGIQ Totus IS UNABLE TO SWIVEL
- REAR BRAKES ARE IN THE LOCKED POSITION

**CAUTION**

DO NOT MOVE THE ULTRASOUND SYSTEM IF THE OPERATING PANEL IS IN THE UNLOCKED POSITION.

**CAUTION**

USE PROTECTIVE GLASSES DURING DRILLING, FILING, AND DURING ALL OTHER WORK WHERE EYES PROTECTION IS NEEDED.

**CAUTION**

USE SAFETY SHOES WHEN DOING WORK WHERE THERE IS ANY CHANCE OF FOOT DAMAGE.

**CAUTION**

USE PROTECTIVE GLOVES WHEN DRILLING, CUTTING, AND WHEN REACHING INTO CONFINED OR BLIND SPACES.





CAUTION

DO NOT TRANSPORT LOGIQ Totus IN A VEHICLE WITHOUT LOCKING THE CASTERS (WHEELS) AND SECURING IT AS DESCRIBED IN CHAPTER 4.

NOTE

Special care should be taken when transporting the Ultrasound system in a vehicle:

- Before transporting, place the Ultrasound system in its special storage case.
- Ensure that the Ultrasound system is firmly secured while inside the vehicle.
- Secure Ultrasound system with straps or as directed otherwise to prevent motion during transport.
- Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.



CAUTION

BE CAREFUL NOT TO PINCH ANY OF THE CABLES.

1.3.3 Electrical safety

Safe practices

**CAUTION**

RISK OF DAMAGE TO EQUIPMENT

CONNECTING THE LOGIQ Totus TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY IT.

**CAUTION**

RISK OF DAMAGE TO EQUIPMENT

USE THE POWER CORD EXCLUSIVELY ON THE LOGIQ Totus. DO NOT USE THE POWER CORD TO MAKE ANY OTHER ELECTRICAL CONNECTIONS.

Follow these guidelines to minimize shock hazards whenever you are using the LOGIQ Totus:

- To minimize shock hazard, the equipment chassis must be connected to an electrical ground.
- The LOGIQ Totus is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. A separate power outlet with a:
 - 20 amp circuit breaker for 120 VAC for 120V area.
 - 7.5 amp circuit breaker for 220-240 VAC for 220/240V area.
 - 15 amp circuit breaker for 100 VAC for Japan.
- The power outlet used for this equipment should not be shared with other types of equipment.
- Both the LOGIQ Totus power cable and the power connector must meet international electrical standards.

Probes

Follow these guidelines before connecting a probe to the LOGIQ Totus:

- Inspect the probe prior to each use for damage or degradation to the:
 - housing
 - cable strain relief
 - lens
 - seal
 - connectors
 - locking mechanism
- Do not use a damaged or defective probe.
- Never immerse the probe connector or adapter into any liquid.

Peripherals

- Refer to the "Peripherals used in the patient environment" in the User Manual (appropriate version) for peripheral isolation information. See *"Label Locations"* for a list of the available user documentation.

1.3.4 Battery safety

The LOGIQ Totus is supplied with lithium ion batteries.

The lithium ion technology is significantly less hazardous to the environment than the lithium metal technology used in some other batteries (such as watch batteries). Used batteries should not be placed with common household waste products. Contact local authorities for the location of a chemical waste collection program nearest you.

NOTE

Regulations vary for different countries. Dispose of used batteries in accordance with local regulations.

**WARNING**

THE LOGIQ Totus BATTERIES HAVE A SAFETY DEVICE. DO NOT ATTEMPT TO DIS-ASSEMBLE OR ALTER THE BATTERIES! ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:

- DO NOT short-circuit the batteries by directly connecting the negative terminals with metal objects.
- DO NOT heat batteries or discard them into a fire.
- DO NOT expose batteries to temperatures over 50 °C. Keep batteries away from fire and other heat sources.
- DO NOT charge batteries near a heat source, such as, a fire or heater.
- DO NOT leave batteries in direct sunlight.
- DO NOT pierce batteries with a sharp object, hit it, or step on it.
- DO NOT use damaged batteries.
- DO NOT apply solder to batteries.
- DO NOT connect batteries to an electrical power outlet.
- DO NOT immerse batteries in water or allow them to get wet.

**CAUTION**

USE ONLY BATTERIES APPROVED BY GE HEALTHCARE AS SUITABLE FOR USE WITH THE LOGIQ Totus ULTRASOUND SYSTEM.

**CAUTION**

TO PREVENT BATTERIES FROM BURSTING OR IGNITING, OR FUMES FROM THE BATTERIES CAUSING EQUIPMENT DAMAGE, ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:

- DO NOT place batteries into a microwave oven or pressurized container.
- If a battery leaks or emits an odor, remove it from all possible flammable sources.
- If a battery emits an odor or heat, is deformed or discolored, or in a way appears abnormal during use, recharging or storage, immediately remove it and stop using it.

NOTE

If you have any questions about the batteries, consult your local GE HealthCare representative.

- Store the battery pack between -10 °C (14 °F) and 50 °C (122 °F).

When charging batteries for the first time after long-term storage, recover the battery pack to original performance through repeating several cycles of full charging and discharging.

1.4 Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

**DANGER**

DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.

**WARNING**

IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ Totus, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE SHUT DOWN.

**WARNING**

EXPLOSION WARNING

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

**CAUTION**

DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT.

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

1.5 Lockout/Tagout (LOTO)

Contents in this section

- *Lockout/tagout requirements* on page 46
- *Lockout/tagout procedure* on page 47

1.5.1 Lockout/tagout requirements

Read and understand the lockout/tagout (LOTO) requirements before performing any replacement/installation procedures. Keep these instructions for future reference. Follow all of the safety measures and procedures listed in this service manual.

Lockout/tagout requirements ensure you are in total control of the AC power plug at all times during the service process.

Preparations



DANGER

Risk of dangerous voltage within the LOGIQ Totus.

Hazardous voltages, greater than 30 volts, exist within the LOGIQ Totus. To avoid potentially hazardous voltage when servicing the LOGIQ Totus, do the following:

- Plan and prepare for shutdown.
 - Completely power down the LOGIQ Totus.
 - Address potentially accumulated energy (capacitors).
 - Disconnect the power cable (first from the wall and then from the LOGIQ Totus).
 - Apply lockout/tagout devices to maintain exclusive control of the power cable.
 - Relieve all potentially hazardous stored or residual energy (batteries).
 - Verify isolation.
 - For step-by-step instructions to lock out and tag out the LOGIQ Totus, see *Lockout/tagout procedure* on page 47.
- "Power down the LOGIQ Totus"
 - "Disconnect Power to the LOGIQ Totus"
 - "Disconnect battery power"



DANGER

Risk of electrical shock, system must be turned off.

Avoid all contact with electrical contacts, conductors and components. Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.

Prior to removing the card rack boards, the LEDs on the end of each board should be unlit, to indicate boards are NOT powered.



DANGER

DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:

1. ALWAYS CONNECT YOURSELF. THE ESD WRIST STRAP SHOULD BE CONNECTED TO ONE OF THE TWO RECEPTICALS INTEGRATED ON THE FRAME, SPECIFICALLY FOR THAT PURPOSE.
2. FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

1.5.2 Lockout/tagout procedure

Power down the LOGIQ Totus

Apply lockout and tagout (LOTO) before servicing the Ultrasound system. Applying LOTO ensures a safe environment when working on the LOGIQ Totus. Follow all recommended safety procedures when servicing and working near energy sources. Follow LOTO requirements by ensuring you are in total control of the AC power plug at all times during the service process.

1. Set the caster brake.

Figure 1-1 Caster brake



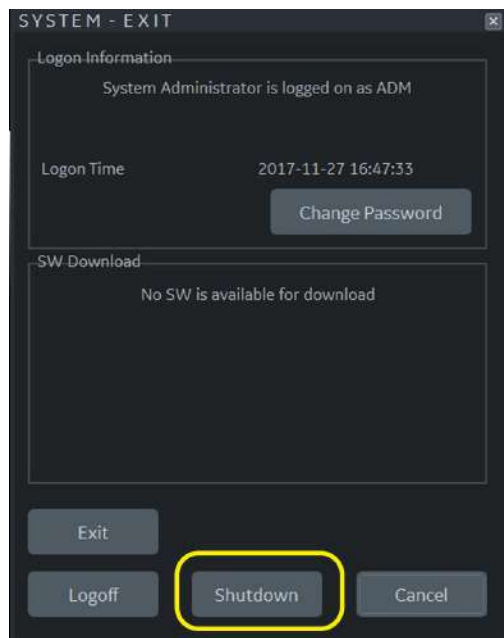
2. Use the operator panel movement controls to set the panel height as required for this procedure.
3. Lock the panel in place.
4. Lightly press the **ON/OFF** button on the operator panel to display the **System - Exit** menu.

Figure 1-2 ON/OFF button



5. Select **Shutdown** to completely power down the LOGIQ Totus.

Figure 1-3 Shutdown button



6. Wait for the ON/OFF button to turn from blue to white.
7. To address potentially accumulated energy, wait at least 20 seconds for the capacitors to discharge energy.

Disconnect Power to the LOGIQ Totus

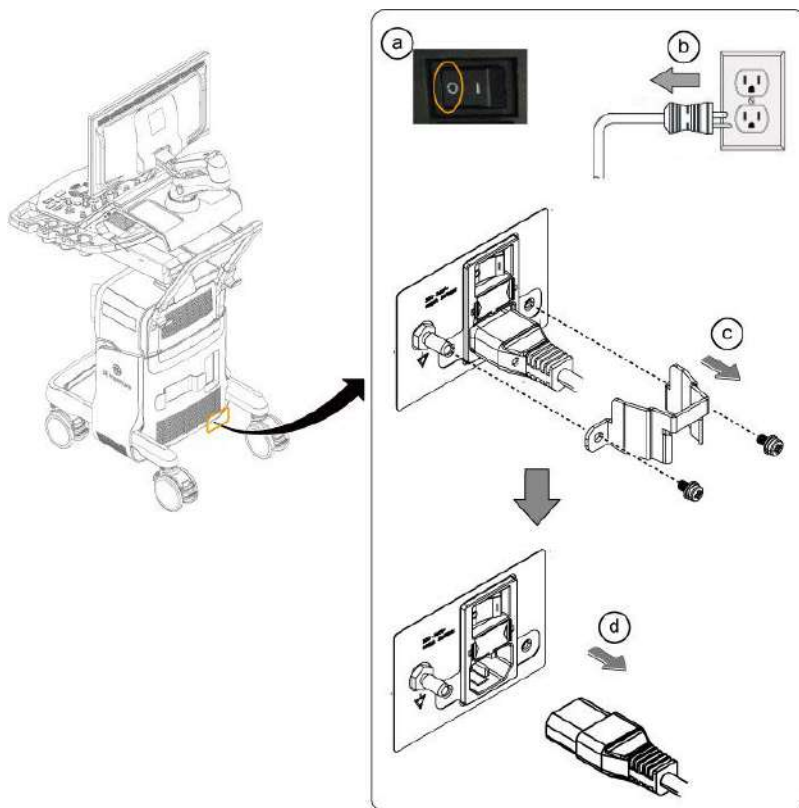


DANGER

Dangerous voltages exist within the LOGIQ Totus. Hazardous voltages, greater than 30 volts, exist in the LOGIQ Totus. Always disconnect the power cable from the wall before disconnecting it from the LOGIQ Totus.

1. To remove the energy supply from the LOGIQ Totus, do the following:
 - a. Turn off the breaker on the back of the LOGIQ Totus.
 - b. From the wall outlet, disconnect the power cable.
 - c. Remove the power cable FIX BRKT by unscrewing 2 screws.
 - d. Disconnect the power cable from the LOGIQ Totus.

Figure 1-4 Disconnecting Power



- e. To prevent unexpected reenergization, maintain exclusive control over the power cable.
 - f. Confirm that the ON/OFF button turns OFF.
2. Disconnect and store any probes attached to the LOGIQ Totus.
3. Disconnect any external I/O cabling.

Disconnect battery power



DANGER

DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT.

The power module may be energized even if the power is turned OFF and the AC power cable is disconnected.

Disconnect the power cable from the power module (battery) as well to prevent electric shock.

1. Remove the Unity Base Tray.

Figure 1-5 Removing Base Tray



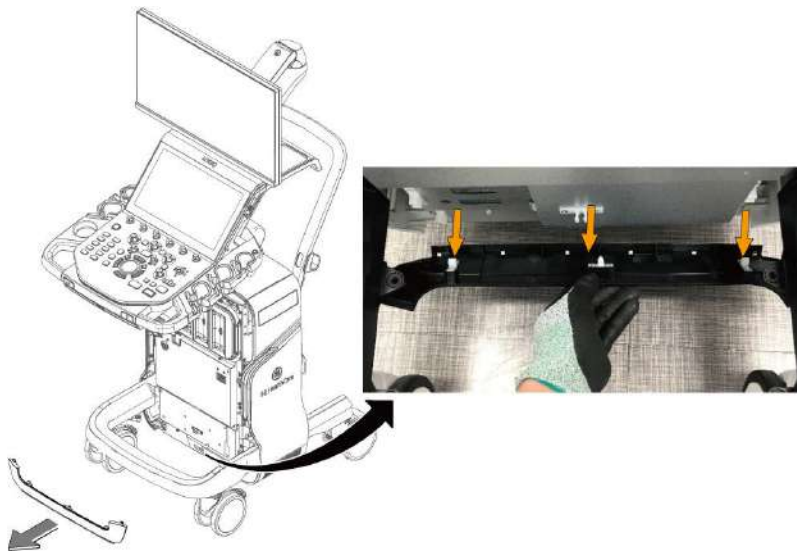
2. Remove the Front Cover Assy-T.

Figure 1-6 Removing Front Cover



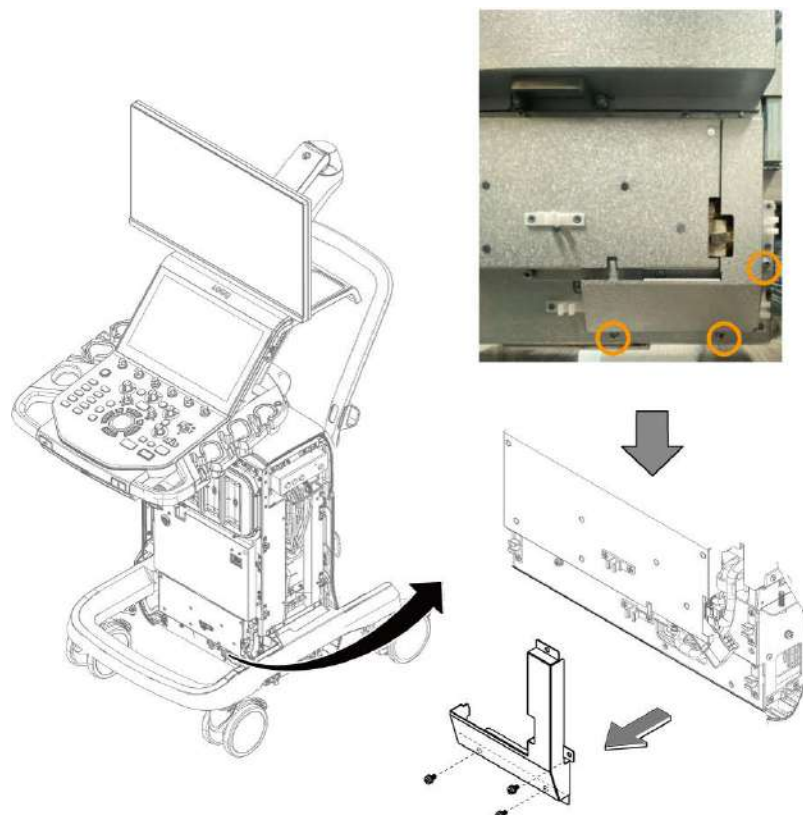
3. Remove the Front Cover Bottom Assy-T.

Figure 1-7 Removing Front Cover Bottom



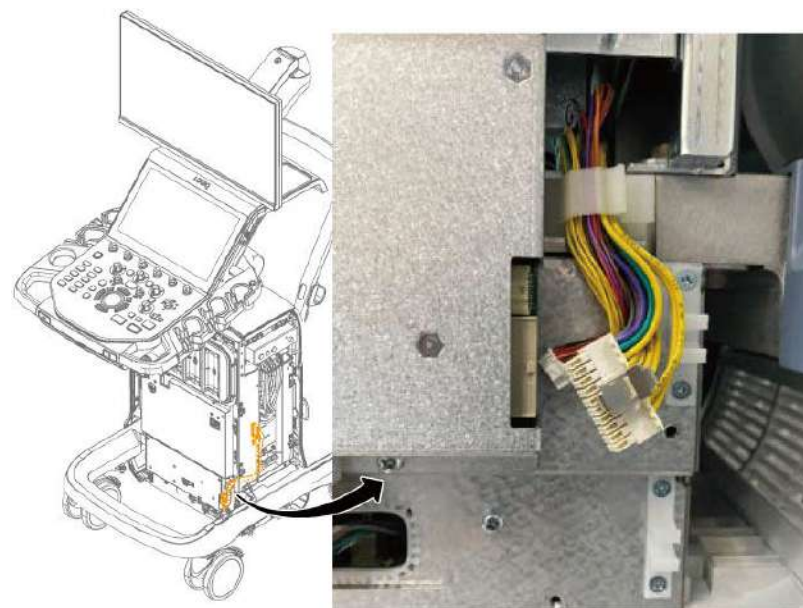
4. Unscrew 3 screws to remove the Battery Cable Cover Bracket.

Figure 1-8 Removing Battery Cable Cover Bracket



5. Disconnect Battery Power Cable and Battery Signal Cable.

Figure 1-9 Disconnecting Battery Cables



6. Confirm that all of these steps have been completed to verify isolation.

1.6 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GE HealthCare policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE HealthCare employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or an ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE

The US Department of Transportation (DOT) has ruled that “items that were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care” are “regulated medical waste” for transportation purposes and must be transported as a hazardous material.

For a LOGIQ Totus used in a veterinary environment the same restrictions apply.

NOTE

Return used/unused spare parts from a veterinary environment with the purple recycling label (regardless of its actual condition) and add a description on the label stating that the items were removed from a LOGIQ Totus Vet in a veterinary environment. This applies for probes and covers labeled as Vet used.

NOTE

The USER/SERVICE staff should dispose of all the waste properly, per federal, state, and local waste disposal regulations.

If the purple recycling label is not used in your region, use the local recycling label.

The LOGIQ Totus is not meant to be used for long-term storage of patient data or images. The user is responsible for the data on the LOGIQ Totus and a regular backup is highly recommended.

If the LOGIQ Totus is sent for repair, please ensure that any patient information is backed up and erased from the LOGIQ Totus before shipping. It is always possible during system failure and repair to lose patient data. GE HealthCare is not responsible for the loss of this data.

If PHI (Patient Healthcare Information) data needs to be sent to GE HealthCare employees for service purposes, GE HealthCare will ascertain agreement from the customer. Patient information shall only be transferred by approved service processes, tools and devices restricting access, protecting or encrypting data where required, and providing traceability in the form of paper or electronic documents at each stage of the procedure while maintaining compliance with cross-border restrictions of patient information transfers.

Chapter 2

Pre-installation

In this chapter

General Requirements.	56
Electromagnetic Compatibility (EMC).	63
Facility Needs.	65
Customer Assistance.	72

This chapter provides the information required to plan and prepare for the setup of an LOGIQ Totus. Included are descriptions of the facility and electrical needs to be met by the purchaser of the LOGIQ Totus.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

2.1 General Requirements

Contents in this section

- *Environmental requirements* on page 57
- *Electrical requirements* on page 58
- *Electromagnetic interference (EMI) limitations* on page 60
- *Probe environmental requirements* on page 62
- *Time and manpower requirements* on page 62

2.1.1 Environmental requirements



CAUTION RISK OF DAMAGE TO EQUIPMENT

IF THE ULTRASOUND SYSTEM IS VERY COLD OR HOT, DO NOT TURN ON ITS POWER UNTIL IT HAS HAD A CHANCE TO ACCLIMATE TO ITS OPERATING ENVIRONMENT.

After unpacking the LOGIQ Totus, allow the temperature to stabilize before powering up.

Refer to *Table 2-1 Ultrasound System Acclimation Time* on page 57 for guidelines on reaching operational temperatures from storage or transport temperatures.

Table 2-1 Ultrasound System Acclimation Time

°C	50	45	40	35	30	25	20	15	10	5	0	-5	-10
°F	122	113	104	95	86	77	68	59	50	41	32	23	14
Hrs	4	2	0	0	0	0	0	0	0	2	4	6	8

Environmental specifications

The LOGIQ Totus should be operated, stored, and transported according to the listed environmental requirements.

NOTE

Probe environmental specifications may be different than those for the LOGIQ Totus.

Refer to *Table 2-2 Environmental Specifications for the LOGIQ Totus* on page 57 for environmental specifications.

Table 2-2 Environmental Specifications for the LOGIQ Totus

	Operational	Storage	Transport (< 16 hrs.)
Temperature	10° - 35° C (50° - 96° F)	-10° - 50° C (14° - 122° F)	-10° - 50° C (14° - 122° F)
Humidity	30% - 80% non-condensing	30% - 80% non-condensing	30% - 80% non-condensing
Pressure	70 - 106 kPa	70 - 106 kPa	70 - 106 kPa
Heat Dissipation	3070 Btu/hour	n/a	n/a

Cooling

The cooling requirement for the LOGIQ Totus with monitor and onboard peripherals is up to 3070 Btu/hr. This figure does not include cooling needed for lights, people, or other equipment in the room. Each person in the room places an additional 300 Btu/hr demand on the cooling system.

Lighting

Bright light is needed for LOGIQ Totus set up, updates, and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of electromagnetic interference (EMI) which could degrade image quality. These controls should be selected to minimize possible interference.

2.1.2 Electrical requirements

General requirements

NOTE

GE HealthCare requires a dedicated power and ground for the proper operation of its ultrasound equipment.

This dedicated power shall originate at the last distribution panel before the LOGIQ Totus.

The LOGIQ Totus will function on voltages from 100-240 volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required.

Sites with a mains power system with defined neutral and live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound system outlet.

Sites with a mains power system without a defined neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound system outlet.

NOTE

Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound system is only a conduit.

Electrical requirements for the Ultrasound system

In *Table 2-3 Electrical Specifications for the LOGIQ Totus* on page 58, the electrical specifications for the LOGIQ Totus include monitor and on board peripherals.

Table 2-3 Electrical Specifications for the LOGIQ Totus

PART NUMBER	DESCRIPTION	VOLTAGE	TOLERANCE	POWER CONSUMPTION	FREQUENCY
5926013/5943511 9685091/9685090	LOGIQ Totus, 100-240 VAC	100-240 VAC	+/-10%	0.65 kVA	50/60 Hz

Inrush current

During power on, an inrush circuit prevents the current from increasing above the stated values. Refer to *Table 2-4 Inrush Current at Different Mains Voltages* on page 58 for inrush currents at various main voltages.

Table 2-4 Inrush Current at Different Mains Voltages

VOLTAGE	Inrush Current	Remarks
115 VAC (Console only)	25 A max	< 0.2 mSec
120 VAC - 60 Hz (Console with UPS (ABCE1442-11MED))	99 A Max	1~4 mSec
120 VAC - 60 Hz (Console with UPS (9XS1500*))	45 A Max	< 1 mSec
230 VAC (Console only)	50 A max	< 0.2 mSec
230 VAC - 50 Hz (Console with UPS (ABCE1442-22MED))	99 A Max	1~4 mSec
230 VAC - 50 Hz (Console with UPS (SMX12000XLHG))	75 A Max	n/a

* UPS 9SX1500 must be used with Isolation Transformer (IS1800HG)

NOTE

These values are estimations.

Site circuit breaker



CAUTION

RISK OF POWER OUTAGE

THE LOGIQ Totus REQUIRES A DEDICATED SINGLE BRANCH CIRCUIT. TO AVOID CIRCUIT OVERLOAD AND POSSIBLE LOSS OF CRITICAL CARE EQUIPMENT, MAKE SURE YOU DO NOT HAVE ANY OTHER EQUIPMENT OPERATING ON THE SAME CIRCUIT.

It is recommended that the branch circuit breaker for the LOGIQ Totus be readily accessible.

Site power outlets

A dedicated AC power outlet must be within reach of the LOGIQ Totus without extension cords. Other outlets adequate for the external peripherals, medical and test equipment needed to support this LOGIQ Totus must also be present within 1 m (3.2 ft.) of the LOGIQ Totus. Electrical installation must meet all current local, state, and national electrical codes.

LOGIQ Totus power plug

If the LOGIQ Totus arrives without a power plug, or with the wrong plug, you must contact your GE HealthCare dealer or the installation engineer must supply what is locally required.

Power stability requirements

Voltage drop-out

- Max 10 ms.

Power transients (all applications)

Less than 25% of nominal peak voltage for less than 1 ms for any type of transient including line frequency, synchronous, asynchronous, or aperiodic transients.

2.1.3 Electromagnetic interference (EMI) limitations

Ultrasound machines are susceptible to electromagnetic interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound machines also generate EMI. The LOGIQ Totus complies with limits as stated on the electromagnetic compatibility (EMC) label. However there is no guarantee that interference will not occur in a particular installation.

Possible EMI sources should be identified before the LOGIQ Totus is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. These sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave ovens
- light dimmers
- mobile phones
- in-house wireless phones (DECT phones)
- wireless computer keyboard and mouse
- air conditioning system
- High Frequency (HF) surgery equipment
- general AC/DC adapters
- RFID access
- ID card readers

The presence of a broadcast station or broadcast van may also cause interference.

See *Table 2-5 EMI Prevention and Abatement* on page 60 for EMI prevention and abatement tips.

Table 2-5 EMI Prevention and Abatement

EMI Rule	Detail
Be aware of RF sources	• Keep the LOGIQ Totus at least 5 meters or 15 feet away from other EMI sources. • Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the LOGIQ Totus	Poor grounding is the most likely reason a LOGIQ Totus will have noisy images. Check grounding of the power cord and power outlet.
Replace all screws, RF gaskets, covers, cores	• After you finish repairing or updating the LOGIQ Totus, replace all covers and tighten all screws. • Any cable with an external connection requires a magnet wrap at each end. • Install the card rack cover over the card rack. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn on the LOGIQ Totus until any loose metallic part is removed.
Do not place labels where RF gaskets touch metal	Never place a label where RF gaskets meet the LOGIQ Totus. Otherwise, the gap created will permit RF leakage. Or, if a label has been found in such a position, move the label.

EMI Rule	Detail
Use GE HealthCare specified harnesses and peripherals	The interconnect cables are grounded and require ferrite beads and other shielding. Also, cable length, material, and routing are all important; do not change from what is specified.
Take care with cellular phones	Cellular phones may transmit a 5 V/m signal; that could cause image artifacts.
Properly dress peripheral cables	Do not allow cables to lie across the top of the card rack or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

2.1.4 Probe environmental requirements

Probes should be operated, stored, and transported according to the listed environmental requirements. For specific information on environmental requirements for the probes, see "Environmental Requirements" in the User Manual (appropriate version). See "*Label Locations*" for a list of the available user documentation.

NOTE

LOGIQ Totus environmental specifications may be different than the probes.

Notice

STORAGE TEMPERATURES VARY DEPENDING ON THE TYPE OF PROBE. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE LOGIQ Totus AND PROBES SHOULD BE KEPT AT ROOM TEMPERATURE BEFORE USE.

Refer to the table in *Table 2-1 Ultrasound System Acclimation Time* on page 57 to determine the needed settlement time.

2.1.5 Time and manpower requirements



DANGER

RISK OF INJURY OR DAMAGE TO EQUIPMENT

HAVE TWO PEOPLE AVAILABLE TO DELIVER AND UNPACK THE LOGIQ Totus. ATTEMPTS BY ONE PERSON TO MOVE THE LOGIQ Totus CONSIDERABLE DISTANCES, OR ON AN INCLINE, COULD RESULT IN INJURY, DAMAGE, OR BOTH.



Time requirement

Site preparation takes time. Begin pre-installation checks as soon as possible. If possible, begin pre- installation six weeks before delivery to allow enough time to make any changes.

Manpower requirement

Two persons for delivery and unpacking.

2.2 Electromagnetic Compatibility (EMC)

Contents in this section

- *What is EMC?* on page 63
- *Compliance* on page 63
- *Electrostatic discharge (ESD) prevention* on page 64

2.2.1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio-frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power or signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

For more information, refer to the appropriate version of the User Manual or Release Notes. See "*Label Locations*" for a list of the available user documentation.

2.2.2 Compliance

LOGIQ Totus conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements.

Applicable standards are: IEC60601-1.

NOTE

For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, and clamps are in good condition and installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.

2.2.3 Electrostatic discharge (ESD) prevention

**DANGER**

DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:

1. ALWAYS CONNECT YOURSELF. THE ESD WRIST STRAP SHOULD BE CONNECTED TO ONE OF THE TWO RECEPTALS INTEGRATED ON THE FRAME, SPECIFICALLY FOR THAT PURPOSE.
2. FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

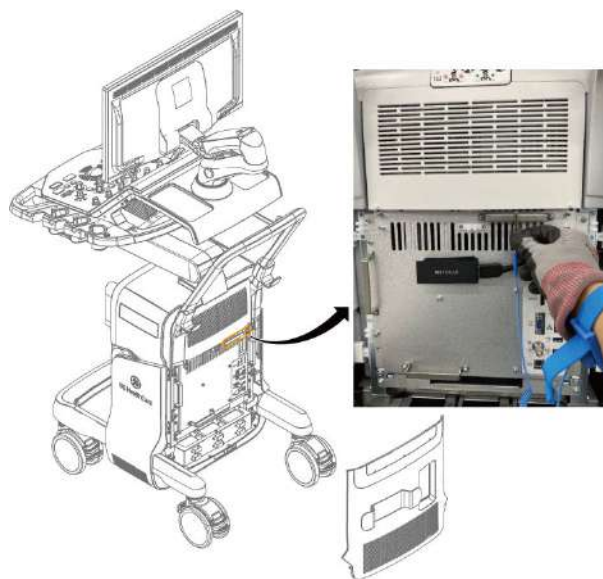
**DANGER**

RISK OF ELECTRICAL SHOCK. THE LOGIQ Totus MUST BE TURNED OFF. AVOID ALL CONTACT WITH ELECTRICAL CONTACTS, CONDUCTORS AND COMPONENTS. ALWAYS USE NON-CONDUCTIVE HANDLES DESIGNED FOR THE REMOVAL AND REPLACEMENT OF ESD SENSITIVE PARTS. ALL PARTS THAT HAVE THE POTENTIAL FOR STORING ENERGY MUST BE DISCHARGED OR ISOLATED BEFORE MAKING CONTACT.

**WARNING**

RISK OF HEAT HAZARD. IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ Totus SOME METAL SURFACES (FOR EXAMPLE, THE GPU HEAT SINK ON THE UBE-T) MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD EVEN WHILE IN SHUTDOWN MODE.

Figure 2-1 ESD Receptacle



2.3 Facility Needs

Contents in this section

- *Purchaser responsibilities* on page 65
- *Required facility needs* on page 66
- *Desirable features* on page 66
- *Minimal floor plan suggestions* on page 67
- *Networking setup requirements* on page 69
- *Privacy and security* on page 70
- *Environmental dangers* on page 70

2.3.1 Purchaser responsibilities

The work and materials needed to prepare the site are the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre-installation work before delivery. Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the LOGIQ Totus.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract.

NOTE

All electrical installations that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products must comply with the requirements of applicable electrical codes. The purchaser of GE HealthCare equipment must only utilize qualified personnel to perform electrical servicing on the equipment.

The desire to use a non-listed or customer provided product or to place an approved product further from the LOGIQ Totus than the interface kit allows, presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferably prior to the purchase).

The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of electromagnetic interference (EMI) should also be investigated before delivery. Dirt, static, and EMI can negatively impact LOGIQ Totus reliability.

2.3.2 Required facility needs

NOTE

GE HealthCare requires a dedicated power and ground for the proper operation of its ultrasound equipment.

This dedicated power shall originate at the last distribution panel before the LOGIQ Totus.

The LOGIQ Totus will function on voltages from 100-240 volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required.

Sites with a mains power system with defined neutral and live:

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound system outlet.

Sites with a mains power system without a defined neutral:

The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound system outlet.

- Dedicated single branch power outlet of adequate amperage (see *Table 2-3 Electrical Specifications for the LOGIQ Totus* on page 58) meeting all local and national codes which is located less than 2.5 m (8 ft.) from the LOGIQ Totus's proposed location.
- Door opening is at least 76 cm (30 in) wide.
- Proposed location for LOGIQ Totus is at least 0.46 m (1.5 ft) from the wall or objects for cooling.
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m (3.2 ft.) of the LOGIQ Totus to connect cables.
- Power outlets for other medical equipment and gel warmer.
- Power outlets for test equipment within 1 m (3.2 ft.) of the LOGIQ Totus.
- Clean and protected space to store transducers (in their cases or on a rack).
- Material to safely clean probes (done with a plastic container, never metal).

2.3.3 Desirable features

In addition to the floor plan suggestions shown in *Figure 2-2 Floor Plan Suggestion 4.27 x 5.18 m (14 x 17 foot)* on page 67 and *Figure 2-3 Floor Plan Suggestion 2.44 x 3.05 m (8 x 10 foot)* on page 68, a nearby waiting room and a receptacle for bio-hazardous waste, like used probe sheaths is suggested. Grid represents 30.5 x 30.5 cm (1 x 1 foot).

2.3.4 Minimal floor plan suggestions

Figure 2-2 Floor Plan Suggestion 4.27 x 5.18 m (14 x 17 foot)

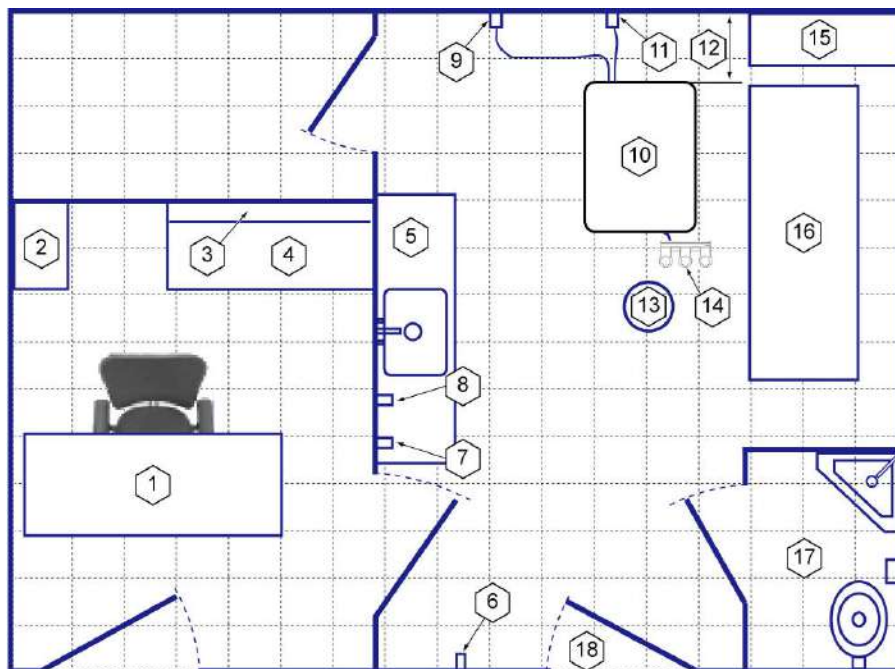


Table 2-6 Floor Plan Suggestion 4.27 x 5.18 m (14 x 17 foot) key

Item	Description	Item	Description
1.	Secretary or doctors desk	2.	Lockable cabinet ordered by GE HealthCare for its software and proprietary manuals
3.	Film viewer	4.	Counter top
5.	Counter top and sink with hot and cold water	6.	Overhead light dimmer – dual level lighting (bright/dim)
7.	Emergency oxygen	8.	Suction line
9.	Dedicated power outlet – circuit breaker protected and easily accessible	10.	LOGIQ Totus
11.	Network interface	12.	45,7 cm (1.5 ft) distance of the Ultrasound system from wall or objects
13.	Stool	14.	Footswitch
15.	Storage for linens and equipment	16.	Examination table – 193 x 61 cm (76 x 24 inches)

Item	Description	Item	Description
17.	Lavatory and dressing room	18.	Door – at least 76 cm (30 inches)

Figure 2-3 Floor Plan Suggestion 2.44 x 3.05 m (8 x 10 foot)

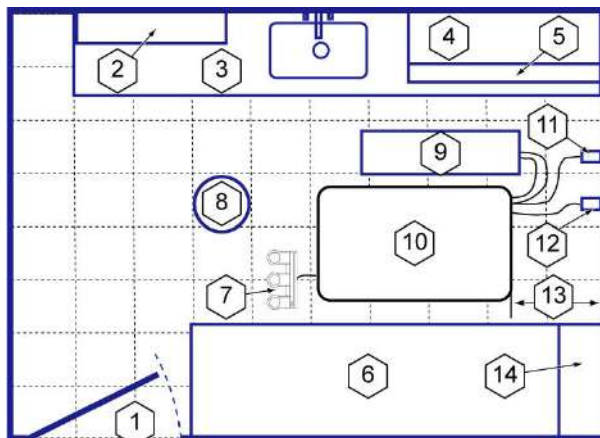


Table 2-7 Floor Plan Suggestion 2.44 x 3.05 m (8 x 10 foot) Key

Item	Description	Item	Description
1.	Door – at least 76 cm (30 inches)	2.	Film viewer
3.	Counter top, sink with hot and cold water, and supplies storage	4.	Linen supply
5.	Probes/supplies	6.	Examination table – 193 x 61 cm (76 x 24 inches)
7.	Footswitch	8.	Stool
9.	External peripherals	10.	LOGIQ Totus
11.	Dedicated power outlet – circuit breaker protected and easily accessible	12.	Network interface
13.	45,7 cm (1.5 ft) distance of the Ultrasound system from wall or objects	14.	Lockable cabinet ordered by GE HealthCare for its software and proprietary manuals

2.3.5 Networking setup requirements

Stand alone scanner (without network connection)

None.

Scanner connected to hospital's network

For supported networks, a 10/100/1000 Mbps Ethernet/DICOM network connection is required.

InSite™ requirements

Need internet access on the outbound port to GE's remote service platform (InSite), which is only opened on request by the user and through a secure HTTPS connection on port 443.

A DNS server is required to connect to the GE Backoffice.

InSite requires an Ethernet connection with a 10/100 Mbps or 10/100/1000 Mbps interface.

Device Management (Device Mgmt) requirements

Need internet access on the outbound port to fleet management service platform, which is only opened on request by the user and through the internet on SSL/TLS on port 443. These are the URLs to access Device Management (Device Mgmt):

- iot.gehealthcare.com through https (Hypertext Transfer Protocol Secure)
- [na.avuri.gehealthcare.com](wss://na.avuri.gehealthcare.com) through wss (WebSocket Secure)

NOTE

Accessing to the Internet often requires a hospital/clinic employee placing a help desk request. If the customer has questions you are unable to answer, please get them in touch with your region's Connectivity Team.

Device Management requires an Ethernet connection with a 10/100 Mbps or 10/100/1000 Mbps interface.

NOTE

To connect with the Cloud through a proxy connection, the proxy port needs to be set up on Utility > Device Mgmt.

Purpose of the DICOM network function

DICOM services provide the operator with clinically useful features for moving images and patient information over a hospital network. Inbound and outbound connections through port 104 are for DICOM connectivity. Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues. With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

DICOM option setup requirements

To configure the LOGIQ Totus to work with other network connections, the site's network administrator must provide information to complete the form in *Figure 2-4 Worksheet for DICOM Network Information* on page 70. Ensure that there are no spaces in any field of the form.

Entries must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ Totus.
- The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
- The host name, IP address, port and AE Title for each device the site wants connected to the LOGIQ Totus for DICOM APPLICATION INFORMATION. A field for the make (manufacturer) and the revision of the device, is also included. This information may be useful for troubleshooting.

For connectivity setup information, see the User Manual (appropriate version). See *Label Locations* on page 36 for a list of the available user documentation.

Figure 2-4 Worksheet for DICOM Network Information

LOGIQ						
Host Name		IP Address	. . .	Local Port		
AE Title		Net Mask	. . .			
Network Speed		Default Gateway	. . .			
DHCP	☐					
DICOM APPLICATION						
	NAME	MAKE/	AE TITLE	IP	PORT	OTHER CONFIGURATION
Store 1				. . .		☐ Raw Data ☐ Allow Multiframe ☐ Structured Reporting ☐ Compression
Store 2				. . .		☐ Raw Data ☐ Allow Multiframe ☐ Structured Reporting ☐ Compression
Store 3				. . .		☐ Raw Data ☐ Allow Multiframe ☐ Structured Reporting ☐ Compression
DICOM Print				. . .		Vendor: _____ Print Size: _____ Medium: _____ Copies: _____ Orientation: _____ Color: _____
Worklist				. . .		
Storage Commit				. . .		Associated Storage AE _____
DICOM MPPS				. . .		

2.3.6 Privacy and security

Since the LOGIQ systems are integrated into your IT-network, GE HealthCare wants to make sure that you are aware of the proactive measures we are taking to secure the LOGIQ Totus.

For more information on privacy and security, see "Privacy and Security" in the User Manual (appropriate version). See *Label Locations* on page 36 for a list of the available user documentation.

2.3.7 Environmental dangers

Commercial devices such as laser cameras, printers, VCRs and external monitors, usually exceed allowable leakage current limits and, when plugged into separate AC outlets, are in violation of patient safety standards. Suitable electrical isolation of such external AC outlets, or providing the device with extra protective earth, will be required in order to meet ANSI/AAMI ES60601-1 and IEC60601-1 standards for electrical leakage.

Patient Environment IEC60601-1

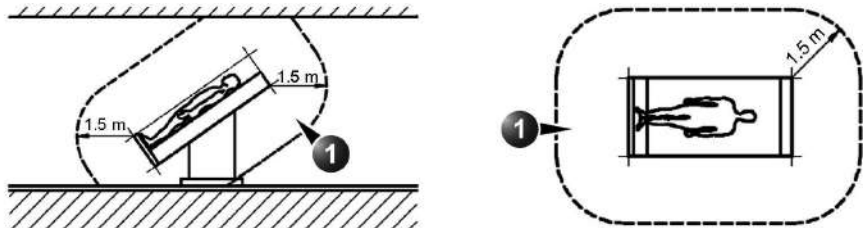
Sub Clause 3.79 and figure A.9 (IEC60601-1)

Such an area is an environment in which medical diagnosis, monitoring or treatment is carried out. It is very difficult to attach unique dimensions to the PATIENT ENVIROMENT.

In practice, a distance of 2,5 m (8.2 ft.) above the floor on which the medical personnel stand and a horizontal distance of 1,5 m (4.9 ft.) have justified themselves as indicative of the dimensions of the Patient Environment.

The patient environment/vicinity will be depicted as a dashed line in this procedure. See example below.

Figure 2-5 Patient Environment



Item	Description
1.	Patient environment

2.4 Customer Assistance

Contents in this section

- *Contact information* on page 72
- *Ultrasound system manufacturer* on page 73

2.4.1 Contact information

If this equipment does not work as indicated in this service manual or in the user manual, or if you require additional assistance, please contact the local distributor or appropriate support resource as listed in *Table 2-8 Phone Numbers for Customer Assistance* on page 72.

Before you call, identify the following information, and acquire an image (Alt+D) to send to the Customer Care team:

1. Ultrasound system ID serial number
2. Software version
3. Date and time of occurrence
4. Sequence of events leading to issue
5. Whether the issue is repeatable
6. Imaging mode, probe, preset/application
7. Media brand, speed, capacity, type
8. Save secondary image capture, cine loop, 4D multi-volume loop
9. Detailed description of any problem encountered
10. Where applicable, save the appropriate log files. Remember to save the log files for each day on a separate media with labels.

NOTE

Restart the application before resuming clinical scanning.

If you do not see contact information for your region, please contact the local distributor or appropriate support resource.

Table 2-8 Phone Numbers for Customer Assistance

LOCATION	NUMBER	
USA GE HealthCare Ultrasound Service Engineering 3200 N Grandview Blvd Waukesha, WI 53188	Service	TEL: 1-800-437-1171
	Service Parts	TEL: 1-800-558-2040
	Online Center	TEL: 1-800-321-7937
	Application Support	TEL: 1-800-682-5327
		TEL: 1-262-524-5698
Canada	Service	TEL: 1-800-668-0732
	Application Support	TEL: 1-262-524-5698

LOCATION	NUMBER	
Latin America	Argentina	TEL: 800 222 4342
	Brazil	TEL: 3004-2525 (Capitais e Regiões metropolitanas)
		TEL: 08000 165 799 (Demais localidades)
	Chilie	TEL: 888 0020 4342 / 800204302
	Colombia	TEL: 01 800 018 1350
		TEL: #417 (Movistar/Claro/Tigo)
	Mexico	TEL: 800 2000 111
	Peru	TEL: 0 800 54 342
	Puerto Rico	TEL: 1 855 964 0639
EMEA GE Healthcare GmbH Peter-Müller-Straße 24-26 40468 Düsseldorf Germany	Support	TEL: +49 (0) 211 73744789 TEL: +33 1 3083 1300
		FAX: +49 (0) 211 73744685
EAGM	Algeria	TEL: 213-2179-1212
	Egypt Service Center	TEL: 0020-2322-1252
	Saudi Service Center	TEL: +(966) 800 429 2222
	UAE Service Center	TEL: 0097-1800-3646
Asia (Singapore) GE Ultrasound Asia Service Department - Ultrasound 298 Tiong Bahru Road #15-01/06 Central Placa Singapore 168730	Service Department	TEL: +65 6291-8528
		FAX: +65 6291-7006
Japan	Online Center	TEL: +81 42-846-9011
		FAX: +81 42-648-2905
China	Technical Support	TEL: +86 800-810 8188
India	Technical Support	TEL: 1-800-425-8025 TEL: 1-800-425-7255 TEL: 1-800-102-7750
Australia New Zealand	Service Support	TEL: +61 1800 659 465
Korea	Technical Support	TEL: +82 1544-6119

2.4.2 Ultrasound system manufacturer

Information about system manufacturer is located in the User Manual (appropriate revision).

Chapter 3

Tools

In this chapter

Tools needed for servicing the LOGIQ Totus.	76
PPE Required During Service.	78

This chapter provides information on the tools required to service the Ultrasound system.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

3.1 Tools needed for servicing the LOGIQ Totus

The following tools are needed to service the LOGIQ Totus. If the torque is not indicated with the procedure, hand tighten the screws/nuts.

Table 3-1 Tools Used for Servicing LOGIQ Totus

Tool Type	Tool Size	GE HealthCare Part Number
Torx Driver	BIT # TX-5	Use available equivalent
	BIT # TX-8	29-899073-00 or available equivalent
	BIT # TX-10	
	BIT # TX-15	
	BIT # TX-20	
	BIT # TX-25	
	BIT # TX-30*	
	BIT # TX-45*	Use available equivalent
Flat-head Screwdriver	1/4 inch or 6 mm	5384716 or use available equivalent
Phillips Screwdriver	#1	46-258100P92 or use equivalent available
	#2 and #2 "Stubby"	46-258100P93 or use equivalent available
	#3	46-320688P4 or available equivalent
Nut Driver	7 mm, 10 inches long	Use available equivalent
	1/4"	
Hex Wrench	0.9 mm	Use available equivalent
	1 mm	
	1.5 mm	
	2 mm	
	3 mm	
	4 mm	
	5 mm	
	6 mm	
	8 mm	
	10 mm	

Tool Type	Tool Size	GE HealthCare Part Number
Open End Wrench	2 mm	Use available equivalent
	3 mm	
	4 mm	
	5 mm	
	10 mm	
	13 mm	
	3/16 inch	
Torque Wrench Kit [^]	Two wrenches and one driver includes extra batteries. Covers 5 lb-in to 250 lb-ft (0.55 Nm to 339 Nm)**	5135228 or available equivalent
Adjustable Wrench	152 mm (6 inches) long	Use available equivalent
Pry Bar	Approximately 18 inches (457 mm) overall	Use available equivalent
Drill	Bosch GSR 12-2-LI Cordless Drill	5815870 or available equivalent
Digital Multimeter [^]	Digital Multimeter, Model 2020	2102278-050 or available equivalent. This tool is Region specific.
Digital Multimeter Test Leads	Test Leads Pomona kit	5110653 or available equivalent. This tool is Region specific.
Safety Analyzer [^]	Fluke ESA 612 120V Safety Analyzer Service Tool	5453348-2 or available equivalent. This tool is Region specific.
ESD Vacuum Cleaner	Vacuum cleaner	46-194427P392 or available equivalent
Grease	Krytox 227 by DuPont	2301-0478-00
Chapman Kit	Number 7331	Use available equivalent
Adjustable Torque Driver	2.5-11.5 in-lbs	46-282782P1 or available equivalent
	11-29 in-lbs.	2102278-043 or available equivalent
Spanner Open End Wrench	1 1/8 inch thin profile	2356552 or available equivalent
Allen Hex Head Long Shaft Ball End Driver Set	American	46-194427P353 or available equivalent
Needle Nose Pliers and Cutters Set	Part of small maintenance tool set	5112579-2 or available equivalent
Channel Lock Pliers	10 inch	5109897 or available equivalent
Combination Open And Box End Ratchet Wrench	1/2 inch	2246823 or available equivalent
[*] 90 degree "L" is suggested. A full set of 90 degree "L" TORX wrenches are recommended. ^{**} Heavy mechanical parts may need a specific torque. Each procedure will indicate the torque needed. [^] Torque wrenches, digital multimeters and safety analyzers are tools that required periodic calibration. The Regional Service Organizations are responsible for ensuring periodic calibration of these tools.		

3.2 PPE Required During Service

The following PPE are required during service tasks, per EHS Policy:

- Safety Glasses
- Safety Shoes
- Cut Resistant Gloves
- Kneel pad (if kneeling is required)
- ESD - mat and wrist strap

Chapter 4

Installation

In this chapter

Setup Reminders.	80
Receiving and Unpacking the Equipment.	82
Preparing for Setup.	89
Completing the Setup.	92
Configuring the LOGIQ Totus.	115
Setting Up Paperwork.	122

This chapter contains information needed to install the Ultrasound system.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

4.1 Setup Reminders

Contents in this section

- *Average setup time* on page 80
- *Setup warnings* on page 80

4.1.1 Average setup time

Table 4-1 Average Setup Time

DESCRIPTION	AVERAGE SETUP TIME	COMMENTS
Unpack the LOGIQ Totus	0.5 hour	
Set Up the LOGIQ Totus(without options)	4 hours	Depends on the configuration
Configure DICOM Network	2 hours or more	Depends on the configuration
Install InSite	0.5 hour	

4.1.2 Setup warnings



DANGER

WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (FOR EXAMPLE, THE METER'S GROUND SWITCH IS OPEN), DO NOT TOUCH THE LOGIQ Totus!



DANGER

TO PREVENT ELECTRICAL SHOCK, CONNECT THE LOGIQ Totus TO A PROPERLY GROUNDED POWER OUTLET. DO NOT USE A THREE-TO-TWO PRONG ADAPTER. THIS DEFEATS SAFETY GROUNDING.



DANGER

DO NOT WEAR THE ESD WRIST STRAP WHEN YOU WORK ON LIVE CIRCUITS AND MORE THAN 30V PEAK IS PRESENT.



CAUTION

DO NOT OPERATE THE LOGIQ Totus UNLESS ALL BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. LOGIQ Totus PERFORMANCE AND COOLING REQUIRE THIS.



CAUTION

NEVER REVERSE POLARITY ON ANY METER THAT INTERCEPTS THE POWER CORD WITH POWER CONNECTED TO THE LOGIQ Totus.
EVEN IN THE OFF STATE, REVERSING POLARITY ON THE POWER CAN SERIOUSLY DAMAGE THE POWER SUPPLY.



CAUTION

IF THE LOGIQ Totus IS VERY HOT OR COLD, ALLOW THE TEMPERATURE TO STABILIZE BEFORE POWERING UP. FOR GUIDELINES ON REACHING OPERATIONAL TEMPERATURES FROM STORAGE OR TRANSPORT TEMPERATURES, SEE *Environmental requirements* on page 57.



CAUTION

OPERATOR MANUAL(S)

THE USER MANUAL(S) SHOULD BE FULLY READ AND UNDERSTOOD BEFORE OPERATING THE LOGIQ Totus AND KEPT NEAR THE LOGIQ Totus FOR QUICK REFERENCE.

**CAUTION****ACOUSTIC OUTPUT HAZARD**

ALTHOUGH THE ULTRASOUND ENERGY TRANSMITTED FROM THE LOGIQ Totus PROBE IS WITHIN AIUM/NEMA STANDARDS, AVOID UNNECESSARY EXPOSURE.

ULTRASOUND ENERGY CAN PRODUCE HEAT AND MECHANICAL DAMAGE.

4.2 Receiving and Unpacking the Equipment

This section describes how to receive and unpack the LOGIQ Totus.

- *Receiving and unpacking warnings* on page 82
- *Tilt Watch indicator* on page 83
- *Examine all packages* on page 85
- *Damage in Transportation* on page 86
- *Transportation box label* on page 87
- *Packing materials - recycling information* on page 87

4.2.1 Receiving and unpacking warnings

**DANGER**

TWO PEOPLE ARE NEEDED TO UNPACK THE LOGIQ Totus DUE TO ITS WEIGHT.

ATTEMPTS TO MOVE THE LOGIQ Totus CONSIDERABLE DISTANCES, OR ON AN INCLINE, WITH ONE PERSON COULD RESULT IN INJURY OR DAMAGE OR BOTH.

TWO PEOPLE ARE REQUIRED WHENEVER A PART WEIGHING 16 KG (35 LBS) OR MORE MUST BE LIFTED.

**DANGER**

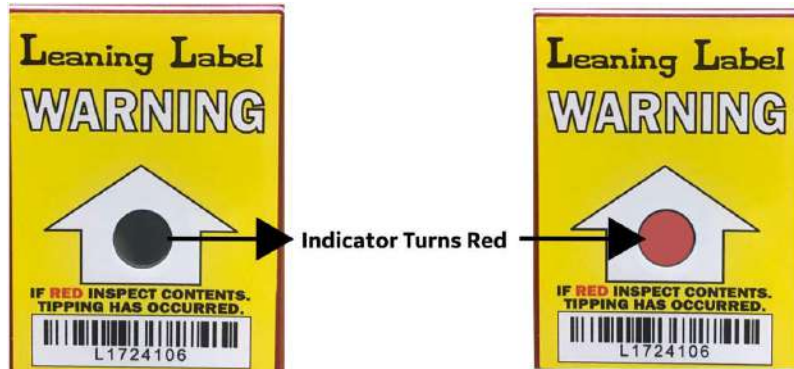
REMEMBER TO USE RELEVANT PERSONAL PROTECTING EQUIPMENT (PPE) DURING PACKING/ UNPACKING. CHECK WITH YOUR LOCAL EHS REPRESENTATIVE.

4.2.2 Tilt Watch indicator

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

To make it easier to detect if the handling during transportation has been improper, a tilt indicator has been attached to the transportation box.

Figure 4-1 Tilt Watch Indicator (example)



If Tilt Watch Indicator has triggered or is missing

The purpose of the Tilt Watch Indicator label is to alert people handling a product that it is sensitive to tipping and it must remain upright at all times. It is basically an active “Up Arrow” that changes color if the package is tipped 89 degrees or more from horizontal. These labels can be false activated if tipped less than 89 degrees, and shocked or vibrated at the same time. This event does occur, but is considered uncommon. If a package is received with an activated Tilt Watch Indicator label, there is high degree of certainty it tipped 89 degrees or more from horizontal during shipment.

An activated Tilt Watch Indicator label does not indicate if the package was simply “Tipped” (laid down with no impact shock) or “Tipped Over” (free fall, with an impact shock). Using both shock indicator labels and Tilt Watch Indicator labels will help identify if a Tip Over impact shock occurred.

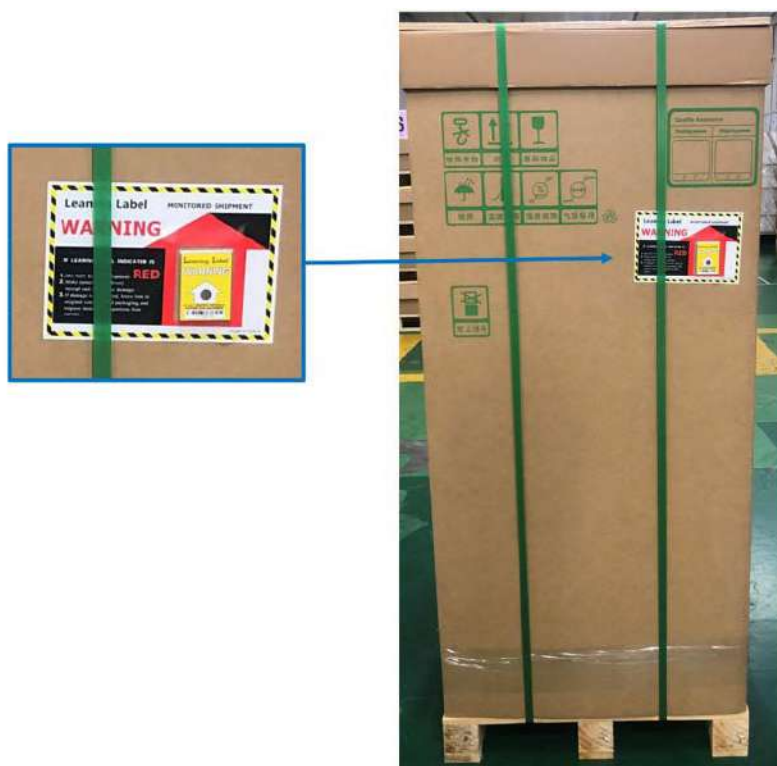
Table 4-2 Tilt Watch Indicator has triggered or is missing

STEP	TASK
1.	If the tilt indicator is missing: Note on the shipping papers at the time of receipt that the tilt indicator label is missing. If the tilt indicator has been triggered (activated): Note on the shipping papers at the time of receipt that the tilt indicator label was activated.
2.	Inspect the product for damage.

Position of the Tilt Watch Indicators

Before cutting the straps, check the indicator to make sure they have not been triggered. If damaged, report it to the carrier. If not, then cut the straps around the crate.

The Tilt & Shock indicators have been attached to the transportation box as illustrated in the figure below.



4.2.3 Examine all packages

Examine packages closely at time of delivery as described in the procedure below.

1. Is damage apparent?
 - If **YES**; continue with the instructions in *Damage in Transportation* on page 86.
 - If **NO**; continue with the next step.
2. Before cutting the straps, check the tilt indicator. Is the tilt indicator red colored inside the middle of the indicator?
 - If YES: The tilt Indicator has been activated. Continue with the instructions in *Damage in Transportation* on page 86.

Figure 4-2 Tilt Indicator - Red



1 - Red Color

4.2.4 Damage in Transportation

Follow this procedure if damage is apparent:

1. Write "Damage In Shipment" on ALL copies of the freight or express bill BEFORE delivery is accepted or "signed for" by a GE HealthCare representative or hospital receiving agent.
2. Take pictures of any damage to the packaging and the LOGIQ Totus. These pictures will be needed if a claim against the carrier is applied.
3. Report the damage to the carrier.
 - Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier.
 - A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

4.2.5 Transportation box label

Figure 4-3 Transportation box label

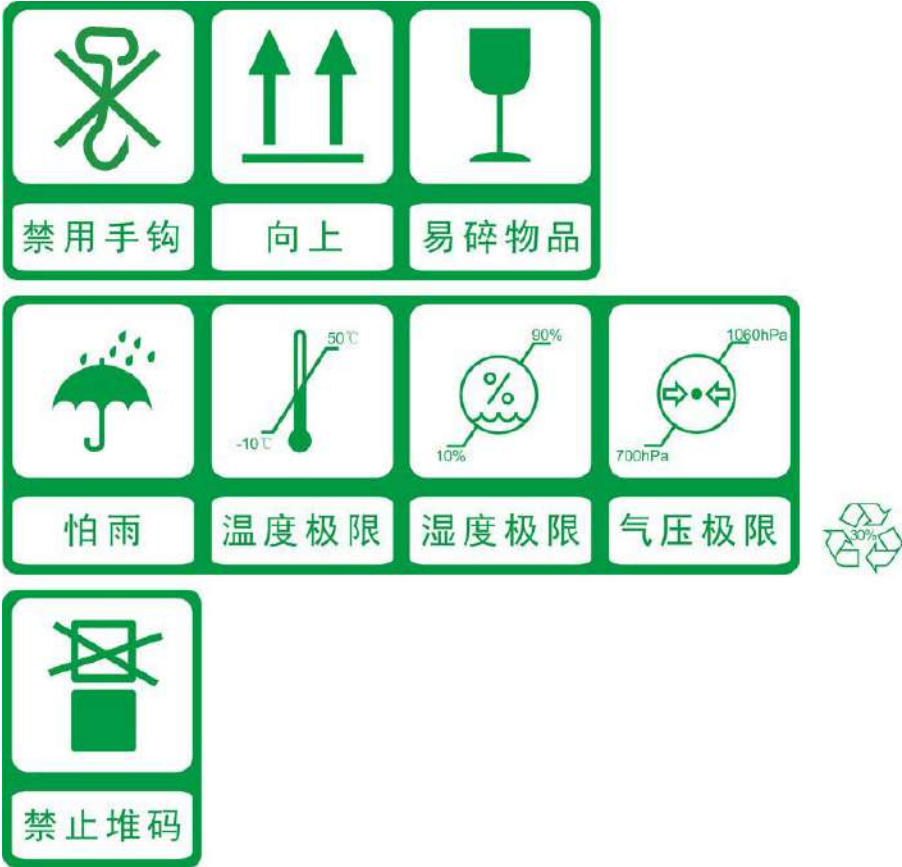
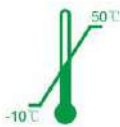
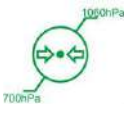


Table 4-3 LOGIQ Totus Transportation Box Labeling

SYMBOL	DEFINITION	SYMBOL	DEFINITION	SYMBOL	DEFINITION
	DO NOT USE HAND HOOK		TOP, UPRIGHT - Transportation and Storage		FRAGILE, Handle with Care
	DO NOT STACK		KEEP DRY (protect from moisture)		Thermal management
	Range of Air Pressure		RECYCLING Recyclable Wood		Humidity Control

4.2.6 Packing materials - recycling information

The packing materials for the LOGIQ Totus are recyclable:

- The transportation box is made of cardboard.
- Lever lockings (hinges) are made of zinc plated steel.
- The inner reinforcements are made of Ethafoam (Polyethylene foam).
- The plastic wrap is made of LDPE (Low Density Polyethylene).

4.3 Preparing for Setup

Contents in this section

- *Verify customer order* on page 89
- *Physical inspection* on page 89
- *Physical connection* on page 89
- *Volume Navigation stand (optional)* on page 89
- *Location of Multi Caution label and rating label* on page 90
- *EMI protection* on page 91

4.3.1 Verify customer order

Compare items received by the customer to what is listed on the delivery order. Report any items that are missing, back ordered, or damaged.

4.3.2 Physical inspection

Verify that the LOGIQ Totus arrived intact (visual inspection). If the LOGIQ Totus has been damaged, see "*Damage in transportation*".

4.3.3 Physical connection

4.3.3.1 Stand-alone LOGIQ Totus

No network connection needed.

4.3.3.2 Sneaker Net environment

No network connection needed.

4.3.3.3 Wired Ethernet from LOGIQ Totus to a workstation

For a direct cable connection from the LOGIQ Totus to a workstation, you will only need a crossover cable for network use to connect the two units this way.

1. Connect one end of the crossed network cable to the network connector on the LOGIQ Totus.
2. Connect the other end to the network connector to the workstation. See the Workstation Service Manual.

4.3.3.4 Connection through a peer-to-peer network

You will need a network switch and one network cable for each unit connected to the switch.

4.3.3.5 Connection through the hospital network

You will need one network cable to connect the LOGIQ Totus to a wall outlet on the hospital's network.

4.3.4 Volume Navigation stand (optional)

To assemble the Volume Navigation stand, see "*Roll stand assembly or replacement*".

4.3.5 Location of Multi Caution label and rating label

Figure 4-4 Multi Caution Label



Figure 4-5 RatingLabel(ElevationArm/OPIOBase)



Elevation Arm



OPIO Base

4.3.6 EMI protection

The LOGIQ Totus has been designed to minimize the effects of Electro-Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the LOGIQ Totus from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the LOGIQ Totus is put into operation.

See *Electromagnetic interference (EMI) limitations* on page 60 for more information about EMI protection.

4.4 Completing the Setup

This section describes how to complete the set up of the LOGIQ Totus.

- *LOGIQ Totus specification verification* on page 93
- *Electrical specification verification* on page 93
- *Connections on the rear I/O panel* on page 94
- *Connections on the patient I/O panel* on page 95
- *Connecting/disconnecting probes* on page 96
- *Power on/boot up* on page 98
- *Default security level* on page 101
- *Password policies* on page 102
- *Users* on page 103
- *Groups* on page 105
- *Lock out and log on* on page 106
- *Disk encryption* on page 107
- *Login* on page 111
- *Power shut down* on page 113
- *Complete power down* on page 114

NOTE

For information on System customizations (including setting date/time and hospital name), refer to the User Manual (appropriate version).

4.4.1 LOGIQ Totus specification verification

4.4.1.1 Verification of the LOGIQ Totus requirements

- Verify that the site meets the requirements listed in (see *Facility Needs* on page 65).
- Verify that the specifications (physical dimensions, mass, and acoustic noise output) below do not conflict with any on-site conditions.

4.4.1.2 Physical dimensions

- Height:
 - Transport Position : 1265mm, 49.8 in
 - Normal Use Position : 1415mm - 1815mm, 55.7 in - 74.5 in
- Width:
 - Base Width : 490mm, 19.3 in
 - LCD Monitor Width : 545mm, 21.5 in
 - HDU Monitor Width : 565mm, 22.2 in
- Depth:
 - 835mm, 32.9 in
- Weight:
 - Approx. 73kg, 160.9 lbs (Without accessories)
 - Approx. 85kg, 187.4 lbs (Full configured)

4.4.1.3 Acoustic noise output

The acoustic noise output is less than 48 dB(A) at 20 degrees Celsius at a distance of 1 meter at all four sides and 1 meter above the floor.

4.4.2 Electrical specification verification



CAUTION

CONNECTING A LOGIQ Totus TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY IT.

Verification of the LOGIQ Totus voltage setting

Verify that the mains voltage specified for the LOGIQ Totus is available on-site.

The voltage setting for the LOGIQ Totus is found on the rating label on the ElevationArm/OPIOBase of the LOGIQ Totus.

Refer to *Location of Multi Caution label and rating label* on page 90 for more information.

4.4.3 Connections on the rear I/O panel


DANGER

THE CONNECTION OF EQUIPMENT OR TRANSMISSION NETWORKS OTHER THAN AS SPECIFIED IN THESE INSTRUCTIONS CAN RESULT IN ELECTRIC SHOCK HAZARD. ALTERNATE CONNECTIONS WILL REQUIRE VERIFICATION OF COMPATIBILITY AND CONFORMITY TO IEC/EN 60601-1 BY THE INSTALLER. EQUIPMENT MODIFICATIONS AND POSSIBLE RESULTING MALFUNCTIONS AND ELECTROMAGNETIC INTERFERENCE ARE THE RESPONSIBILITY OF THE OWNER.


CAUTION

FOR COMPATIBILITY REASONS, USE ONLY GE HEALTHCARE-APPROVED PROBES, PERIPHERALS, OR ACCESSORIES.

DO NOT connect any probes or accessories without approval by GE HealthCare. Failure to follow these instructions could lead to unexpected diagnostic performance.

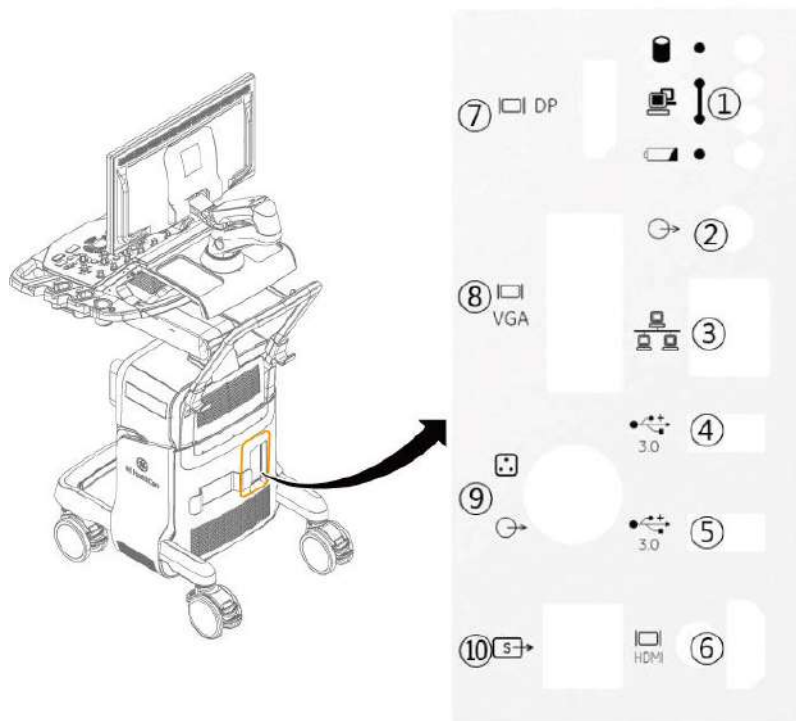
NOTE

Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards (for example, IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all complete configurations shall comply with the valid version of the LOGIQ Totus standard IEC 60601-1. Everybody who connects additional equipment to the signal input part or signal output part of LOGIQ Totus, configures a medical system, and is therefore responsible that the LOGIQ Totus complies with the requirements of the valid version of IEC 60601-1. If in doubt, consult the technical service department or your local representative for GE HealthCare.

4.4.3.1 Connect Ethernet

Connect the Ethernet cable to the Ethernet connector on the external I/O (rear side of the LOGIQ Totus).

Figure 4-6 I/O Rear Panel



Possible shock hazard. Do not remove covers or panels. No user serviceable parts are inside. Refer servicing to qualified service personnel.

1. Network/Disk/Battery Indicators
2. Audio out connector

3. Ethernet connector
4. USB 3.0 port
5. USB 3.0 port
6. HDMI connector
7. DP connector
8. VGA connector
9. Composite connector
10. S-Video connector

4.4.3.2 Connect USB Flash Drive

For information, see “USB Hard Disk Drive and USB Flash Drive” in the User Manual (appropriate version).

4.4.4 Connections on the patient I/O panel

Connect ECG

For information on the ECG, see “Patient Cardiac and ECG Connections” in the User Manual (appropriate version).

4.4.5 Connecting/disconnecting probes

**CAUTION**

DO NOT CONNECT A PROBE WHILE THE LOGIQ Totus IS POWERING UP.

Probes can be connected at any time, whether the Ultrasound system is on or off. The Ultrasound system has four DLP probe ports (*Figure 4-7 Probe Connectors, Four DLP Probe Ports* on page 96). This is the only type of probe port on the LOGIQ Totus.

Probes can be disconnected at any time. However, the probe should not be active when disconnecting the probe.

Figure 4-7 Probe Connectors, Four DLP Probe Ports



To connect a probe:

NOTE

It is not necessary to turn OFF power to connect or disconnect a probe. However, it is a good idea to select a different probe or to freeze the image when removing a probe to avoid disconnecting a live probe.

**CAUTION**

DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.

**CAUTION**

KEEP THE PROBE CABLES AWAY FROM THE WHEELS. DO NOT BEND THE PROBE CABLES. DO NOT CROSS CABLES BETWEEN PROBES.

1. Before connecting the probe:
 - a. Perform a visual check of the probe and LOGIQ Totus sockets.
 - b. Remove any dust or foam rests from the probe.
 - c. Verify the probe and the probe cable for any visual damage.
2. Hold the probe connector vertically with the cable pointing upward.
3. Turn the connector locking handle counter-clockwise to the horizontal position.
4. Align the connector with the probe port and carefully push into place.

NOTE

When connecting the probe, DO NOT turn the locking lever if resistance is felt. If this is the case, remove the probe connector and check for misaligned or damaged pins. Probes with damaged connector pins should be taken out of service immediately.

5. Turn the locking handle clockwise to the full vertical position to lock in place.
6. Position the probe cable (using a cable hook) so that it is not resting on the floor.

To disconnect a probe:

1. Ensure the probe is deactivated. Deactivate by selecting another probe or pressing Freeze.
2. Move the probe locking handle to the left.
3. Pull the probe connector straight out of the probe port carefully.
4. Carefully slide the probe and connector away from the probe port and around the right side of the keyboard.
5. Ensure the cable is free.
6. Ensure that the probe head is clean before placing the probe in its storage case or wall hanging unit. For cleaning instructions, see "Probe Cleaning Process" in the User Manual (appropriate version).

4.4.6 Power on/boot up

**DANGER**

ALWAYS CONNECT THE ULTRASOUND SYSTEM TO A FIXED POWER SOCKET WHICH HAS THE PROTECTIVE GROUNDING CONNECTOR.

FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**DANGER**

NEVER USE A THREE-TO-TWO PRONG ADAPTER; THIS DEFEATS THE SAFETY GROUND. FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**DANGER**

ENSURE THAT THE POWER CORD AND PLUG ARE INTACT AND THAT THE POWER PLUG IS THE PROPER HOSPITAL-GRADE TYPE (WHERE REQUIRED).

FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**CAUTION**

LOGIQ Totus REQUIRES ALL COVERS.

ONLY OPERATE THE LOGIQ Totus WHEN ALL OF THE BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. THE COVERS ARE REQUIRED FOR SAFE OPERATION, GOOD PERFORMANCE AND COOLING PURPOSES.

**CAUTION**

USE ONLY POWER SUPPLY CORDS, CABLES, AND PLUGS PROVIDED BY OR DESIGNATED BY GE.

NOTE

Do not cycle the circuit breaker ON-OFF-ON in less than five seconds. When turning OFF the circuit breaker, WAIT until the ON/OFF button is no longer lit. The LOGIQ Totus should de-energize completely before turning the circuit breaker ON.

4.4.6.1 Connect mains power cable to the LOGIQ Totus

Connecting AC power to the LOGIQ Totus involves preliminary checks of the mains power cable, voltage level and compliance with electrical safety requirements.

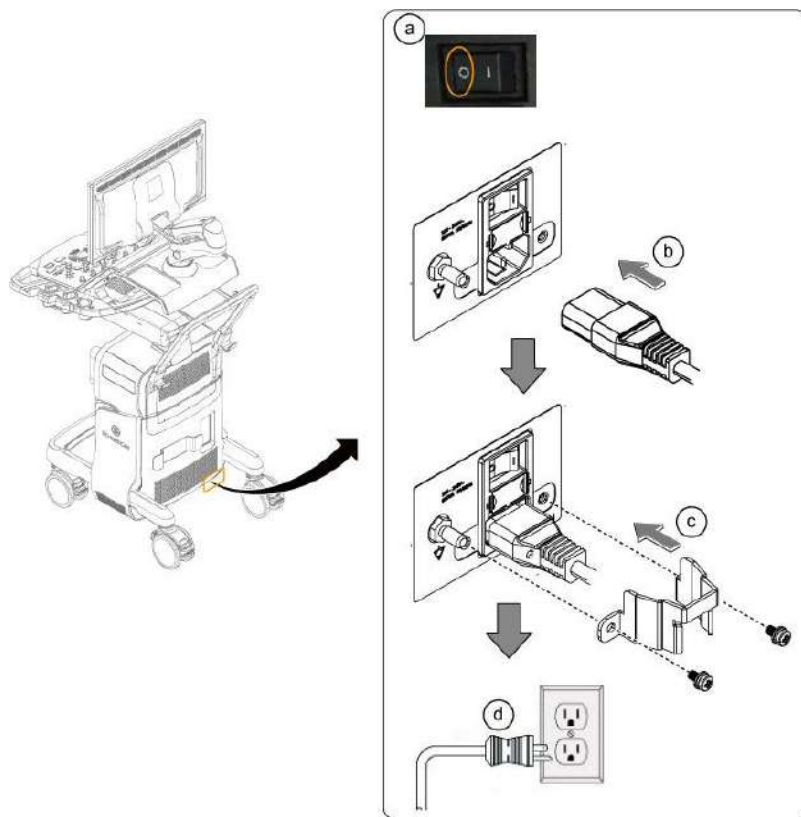
NOTE

The LOGIQ Totus will function on voltages from 100-240 volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required (North America only).

1. Ensure that the wall outlet is of appropriate type, and that the circuit breaker is turned off.
2. Uncoil the mains power cable, allowing sufficient slack so that the LOGIQ Totus can be moved slightly.
3. Verify that the:
 - power cable is without any visible scratches, any sign of damage or tangled.
 - on-site mains voltage is within the limits indicated on the rating label near the circuit breaker on the rear of the LOGIQ Totus.
4. Connect the mains power cable per following steps.
 - a. Verify that the mains power circuit breaker is in OFF position, If not, switch it to OFF.
 - b. Connect the female plug of the power cable to the power inlet at the rear of the Ultrasound system.
 - c. Install the mains power cable FIX BRKT with 2 screws (2159625, Screw PH WSP M4x8).

- d. Connect the other end (male plug) of the power cable to a hospital grade mains power outlet with the proper rated voltage, and the LOGIQ Totus is ready for power ON/boot up.

Figure 4-8 Connecting mains power cable



4.4.6.2 Switch ON the AC power to LOGIQ Totus

1. Switch ON the circuit breaker at the rear of the Ultrasound system. The **ON/OFF** button turns white.

Figure 4-9 ON/OFF Button



You should hear a click from the relays in the AC power and the LOGIQ Totus is ready to boot. This indicates that there is power to the power supply, but the LOGIQ Totus is OFF.

2. Press once on the **ON/OFF** button on the operator panel to boot the LOGIQ Totus. The **ON/OFF** button turns green when it is pressed. During a normal boot, you may observe that:
 - a. The ventilation fans start on full speed, but slow down after a few seconds (listen to the fan).

- b. Power is distributed to the peripherals, operator panel, monitor, front end and back end.
- c. Back end and rest of the LOGIQ Totus starts with the sequence listed in the next steps:
 - 1. Back end is turned ON and starts to load the software.
 - 2. The Start screen is displayed on the monitor.
 - 3. A start-up bar indicating the time used for software loading, is displayed on the monitor.
 - 4. The software initiates and sets up the front end electronics and the rest of the instrument.
 - 5. The backlight in the keyboard is lit.
 - 6. As soon as the software has been loaded, either a 2D screen is displayed on the screen, indicating that a probe has been connected, or a No Mode screen is displayed, indicating that no probe has been connected.

NOTE

Total time used for start-up is typically less than 170 seconds.

After the B-Mode screen is displayed and any function is touched, the Ultrasound system will prompt a password protected Login.

4.4.7 Default security level

The Default Security Level dialog box displays when the software is initially installed and whenever the software is reloaded. When the ADM user logs onto the LOGIQ Totus, the password level dialog will display. This dialog will display every time the ADM user logs on until a level selection is made. If they make a selection and then reload software, the level will be cleared and they will need to select the level again.

To set the login security level:

- After boot up, log in as ADM (no password required) and, when prompted, select **Lowest** for the security level.

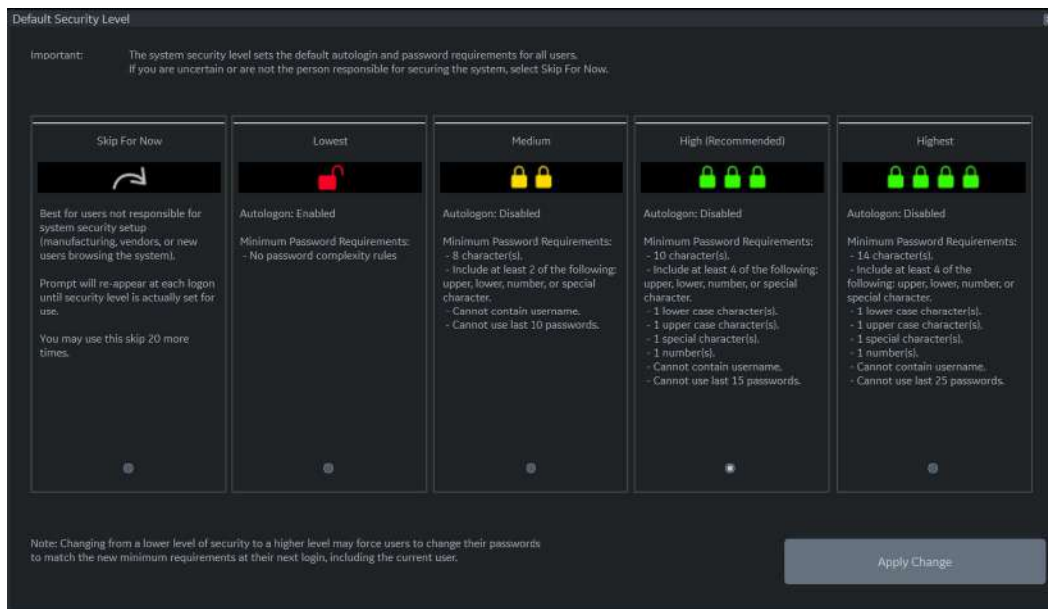
NOTE

Select the Lowest security level and then continue with installation and testing. After installation and testing is complete, transfer the LOGIQ Totus to the Site Administrator who can reset the security level for the site.

The security level can be reset through **Utility > Admin > Logon**.

Refer to "Initial Login to the LOGIQ Totus" in the User Manual (appropriate version) for more information.

Figure 4-10 Default Security Level Dialog Box



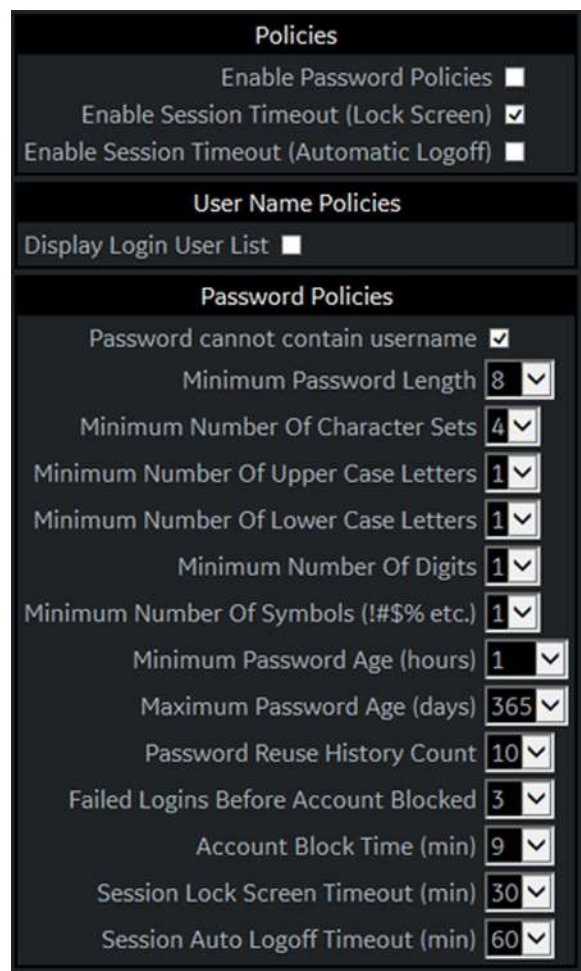
4.4.8 Password policies

See the User Manual (appropriate version) for more information.

To create password policies:

1. Navigate to **Utility > Admin > Logon**.
2. Select **Enable Password Policies**. The LOGIQ Totus prompts the user for a password at logon.

Figure 4-11 Policies Window



Policies	
Enable Password Policies	☐
Enable Session Timeout (Lock Screen)	☒
Enable Session Timeout (Automatic Logoff)	☐

User Name Policies	
Display Login User List	☐

Password Policies	
Password cannot contain username	☒
Minimum Password Length	8
Minimum Number Of Character Sets	4
Minimum Number Of Upper Case Letters	1
Minimum Number Of Lower Case Letters	1
Minimum Number Of Digits	1
Minimum Number Of Symbols (!#\$% etc.)	1
Minimum Password Age (hours)	1
Maximum Password Age (days)	365
Password Reuse History Count	10
Failed Logins Before Account Blocked	3
Account Block Time (min)	9
Session Lock Screen Timeout (min)	30
Session Auto Logoff Timeout (min)	60

3. Under **Password Policies**, use the drop down selection beside each feature to set the rules for passwords.
4. Click **Save**.

4.4.9 Users

See the User Manual (appropriate version) for more information.

To add users:

1. Navigate to **Utility > Admin > Users**.
2. Select **Add** and enter the user details.

NOTE

You will need to edit the ID field from NewUser default. Do not push “Add” again until adding another user.

NOTE

Touch Keyboard is available with User Defined Key. Please use it if you need to type any texts.

DO NOT include the following characters in a user ID: slash (/), dash (-), asterisk (*), question mark (?), an underscore (_), ampersand (&), or blank spaces. Also, DO NOT set up Users with the same initials/signifier.

3. Enter password using the defined policies.
4. If needed, select **User Must Change Password**. The user will be prompted to change the password on the next login.
5. Under **Group Membership**, select the groups for the new user.

NOTE

The user password is system specific. If the user needs to access multiple systems the password will need to be entered manually on each system.

Figure 4-12 Users Window

6. Allow the system administrator to specify whether the user account is active, blocked or requires a password change.

7. Allow the system administrator to remove a user by highlighting the user ID, selecting **Remove** to mark the user as inactive, and then selecting **Remove** again to remove user from the list.

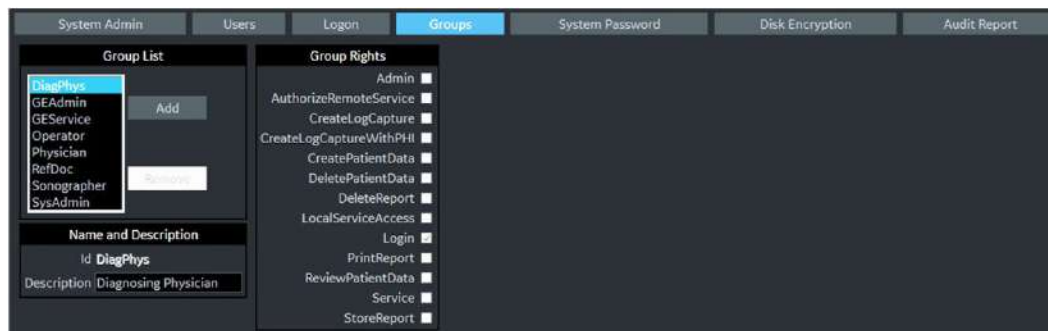
4.4.10 Groups

To use groups:

You can use predefined groups or create new groups. Assign groups to a user from **Users** and under **Group Memberships**.

1. Navigate to **Utility > Admin > Groups**.

Figure 4-13 Groups Window



2. To use a pre-defined group:
 - a. Under **Group List**, select from the list of groups with pre-determined access is available to select for each new user.
 - b. To view access rights for these groups, highlight a group and then, under **Group Rights**, view the access rights.
3. To create a new group and assign access rights:
 - a. Select **Add**.
 - b. Under **Name and Description**, type in the name and a description.
 - c. Under **Group Rights**, select the boxes according to the users access needs.
 - d. Select **Exit** and then select **Admin** before trying to assign new groups to a user.

NOTE

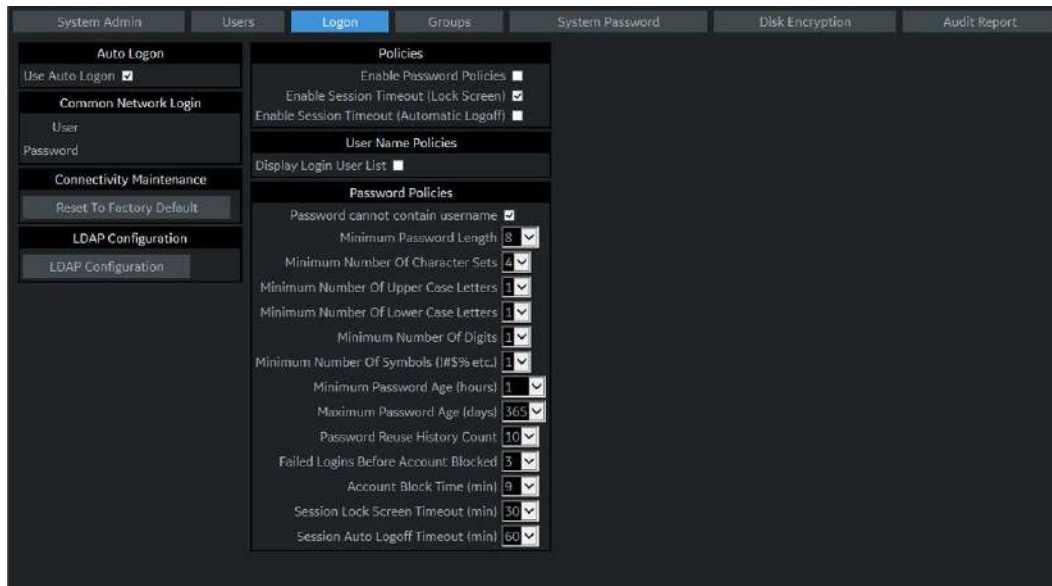
Admin has full system access rights.

4.4.11 Lock out and log on

To set lock out and log on

1. Navigate to **Utility > Admin > Logon**.

Figure 4-14 Logon Window



2. Under **Policies**, select **Enable Session Timeout**.
3. Under **Password Policies**, in **Session Lock Screen Timeout**, select the system idle time for timeout (lock screen) in minutes. The screen will appear completely black when locked (timeout).
4. Click **Save**.
5. Press or move any button/trackball on the operator panel to display Login window.
6. On the **Login** window, enter the user ID, enter the password, and then select **Ok**.

NOTE

The user will have access according to the rights in their assigned group.

To set auto logon

1. Navigate to **Utility > Admin > Logon**.
2. Select **Auto Logon**. The LOGIQ Totus will start by using the ID of the last operator.

NOTE

Auto LOGON only works when password policies are disabled and if there is no password assigned to the user.

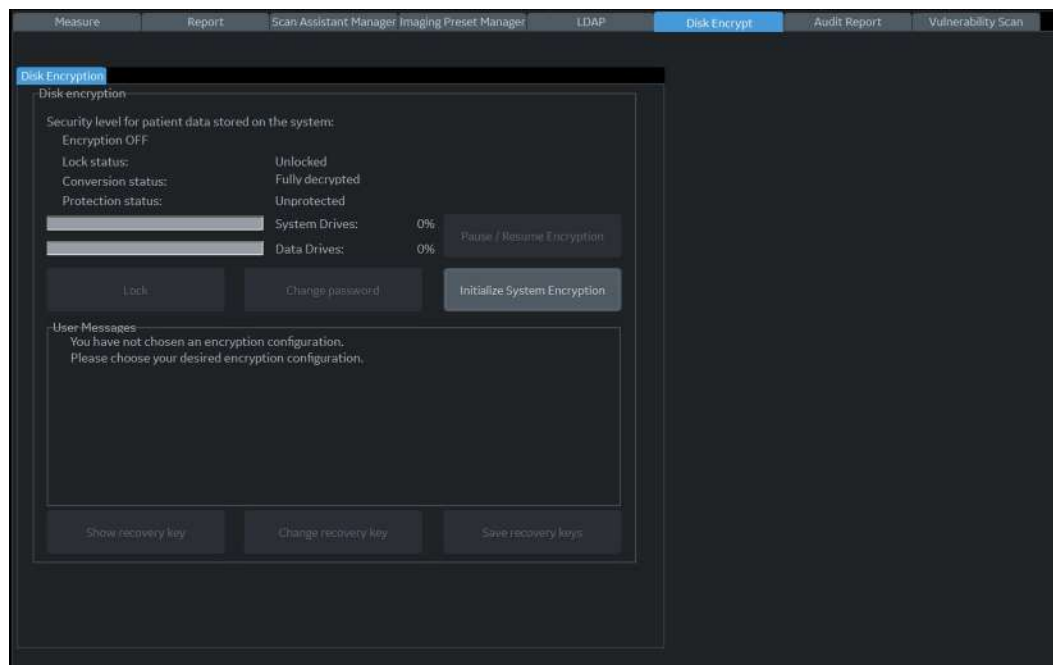
4.4.12 Disk encryption

The LOGIQ Totus supports full disk encryption. Both system partition and user partitions can be encrypted. GE HealthCare requires the SSD (system partitions) to be encrypted to protect Intellectual property and safe system performance. The user partitions can be encrypted or decrypted based on user preference. GE HealthCare highly recommends to keep Encryption on/ automatically unlocked at the minimum to ensure privacy and security.

4.4.12.1 Encryption OFF (Initialize System Encryption not selected)

This is how the Disk Encryption tab appears when first opened and before any initialization has been selected. (after a software installation).

Figure 4-15 Encryption OFF (Initialize System Encryption not selected)



These are the values for the encryption fields:

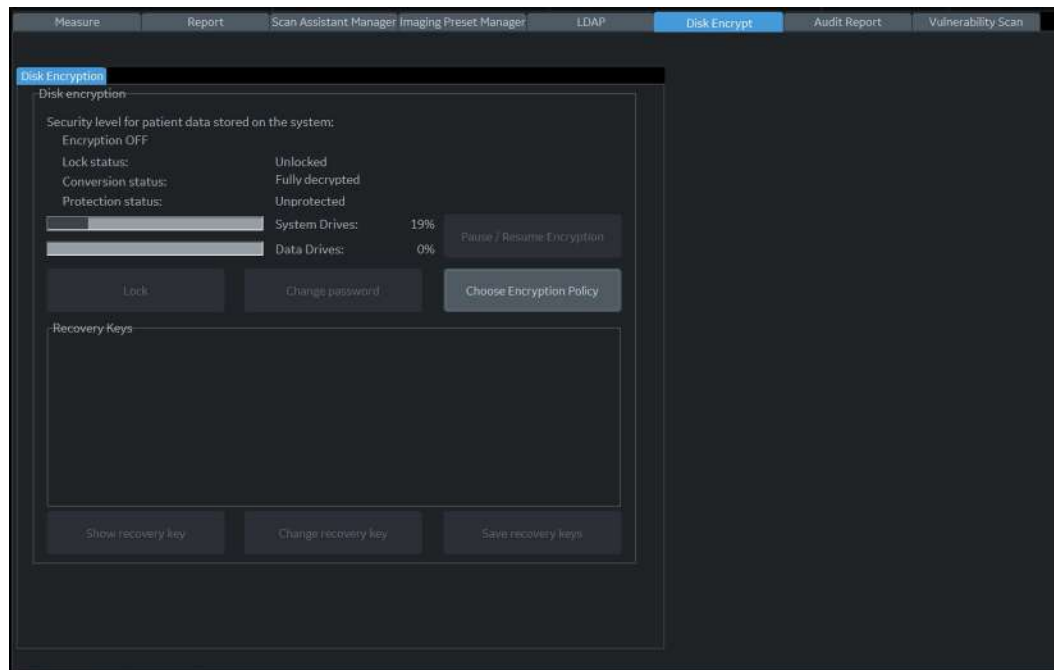
- Conversion status: Fully decrypted (data drives)
- Protection status: Unprotected (data drives)
- System Drives: 0%
- Data Drives (user partitions): 0%

4.4.12.2 Encryption OFF

1. Select **Initialize System Encryption**.
2. Select **Choose Encryption Policy** and set it to **Encryption OFF**. This only affects data drives.
3. View **System Drive** as it continues to encrypt up to 100%.

This is how the Disk Encryption tab appears once initialization and a policy has been selected.

Figure 4-16 Disk Encryption - Encryption OFF



These are the values for the encryption fields (The % values are examples and will not always display as shown):

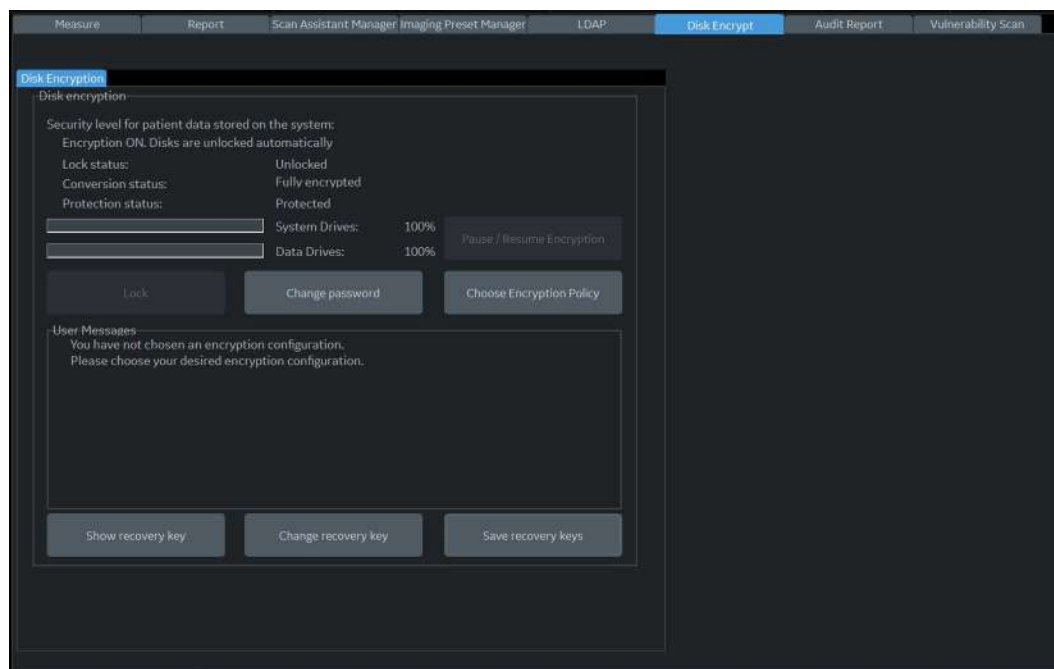
- Conversion status: Fully decrypted (data drives)
- Protection status: Unprotected (data drives)
- System Drives: 19% - once initialized, the SSD drive will be encrypted.
- Data Drives (user partitions): 0% - once initialized, the user partitions drive will be encrypted. If the encryption policy is changed to OFF, the data drive will be unencrypted.

4.4.12.3 Encryption ON. Disks are unlocked automatically

1. Select **Initialize System Encryption**.
2. Select **Choose Encryption Policy** and set it to **Encryption ON**. Disks are unlocked automatically.

This is how the Disk Encryption tab appears once initialization and a policy has been selected and encryption has been set to run through completion.

Figure 4-17 Disk Encryption - Encryption ON



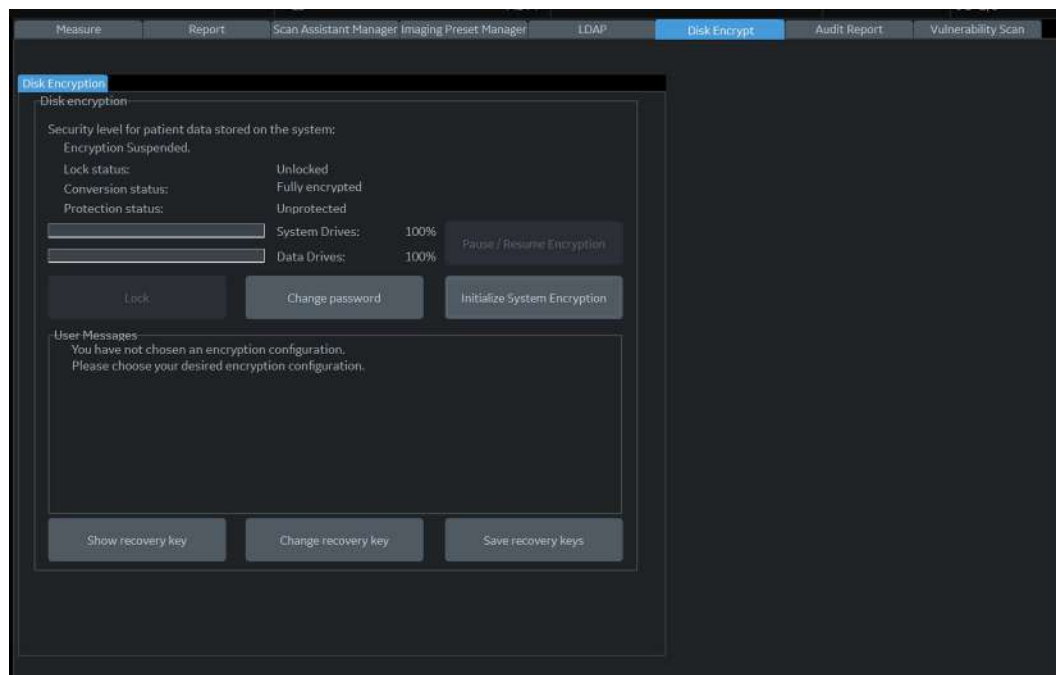
These are the values for the encryption fields (These % values display when the encryption task is complete):

- Conversion status: Fully encrypted (data drives)
- Protection status: Protected (data drives)
- System Drives: 100%
- Data Drives (user partitions): 100%

4.4.12.4 Encryption Suspended after encryption

This is how the Disk Encryption tab appears once initialization and a policy has been selected and encryption has been set to run through completion, but has then been suspended.

Figure 4-18 Disk Encryption - Encryption Suspended



These are the values for the encryption fields:

- Conversion status: Fully encrypted (data drives)
- Protection status: Unprotected (data drives)
- System Drives: 100%
- Data Drives (user partitions): 100%

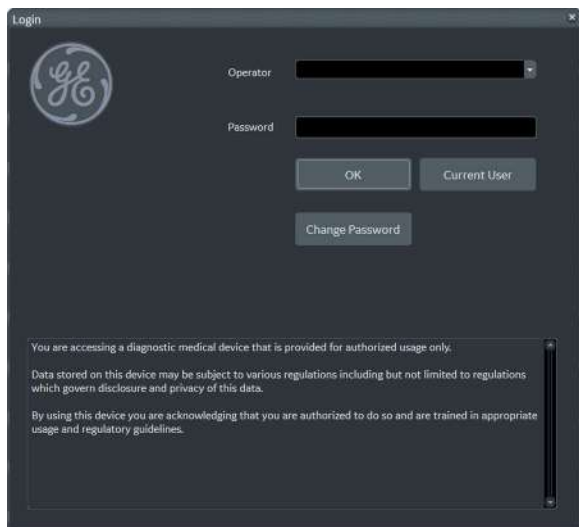
4.4.13 Login

At login, you are notified that “You are accessing a diagnostic medical device that is provided by authorized usage only. Data stored on this device may be subject to various regulations including but not limited to regulations which govern disclosure and privacy of this data. By using this device you are acknowledging that you are authorized to do so and are trained in appropriate use and regulatory guidelines.”

Notice

The System Administrator manages system groups, users, and permissions. After you have been added as a valid user, the System Administrator assigns you a temporary password. When you log into the LOGIQ Totus for the first time, you will be prompted to change your password.

Figure 4-19 Login Window



Login

After you have established your password, follow these steps to login.

1. Type your user name in the **Operator** field.
2. Type your password in the **Password** field.
3. Press **OK** to login, or **Cancel** to cancel login.

To change your password

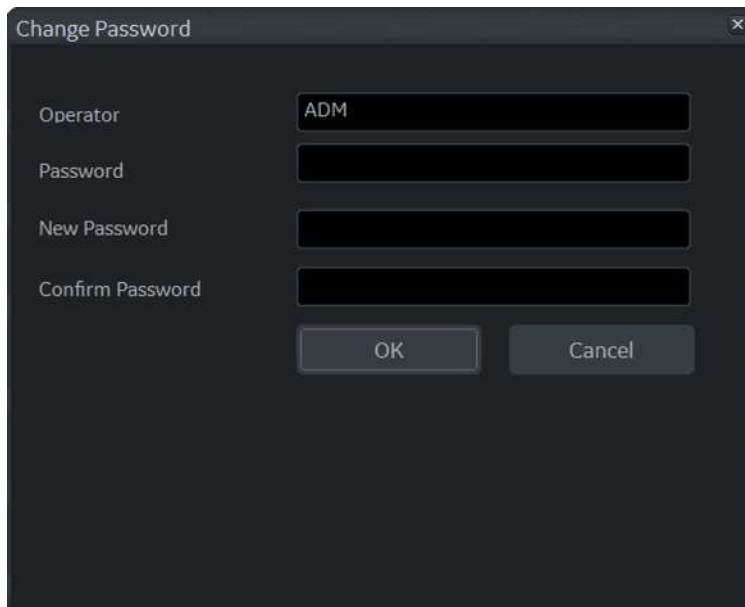
You can change the password when first logging onto the LOGIQ Totus.

NOTE

If the ADM password is lost, the GE service engineer can reset the ADM and USR passwords to the default values.

1. In **Operator**, enter your name.
2. Select **Change Password**. The **Change Password** dialog box displays.

Figure 4-20 Change Password Dialog Box

A screenshot of a 'Change Password' dialog box. The dialog has a title bar with the text 'Change Password' and a close button (X). Inside, there are four text input fields labeled 'Operator', 'Password', 'New Password', and 'Confirm Password'. The 'Operator' field contains the text 'ADM'. Below the input fields are two buttons: 'OK' and 'Cancel'.

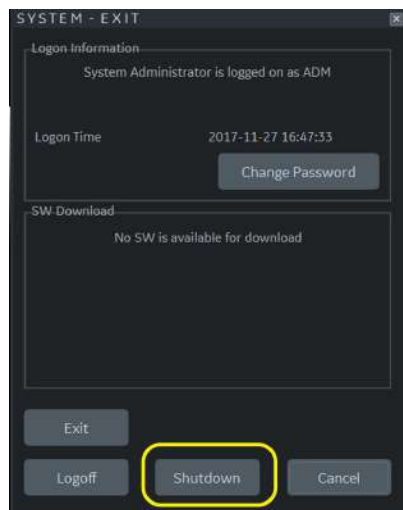
3. Type the following:
 - **Password:** Type your current password.
 - **New Password:** Type your new password.
 - **Confirm Password:** Retype your new password.
4. Press **OK** to confirm your changes, or **Cancel** to cancel your changes.

4.4.14 Power shut down

You can use the **SYSTEM - EXIT** menu to log off, shut down, and exit. Power shut down occurs when selecting shut down with an automatic shutdown sequence.

1. Press once on the **ON/OFF** button on the operator panel to display the **SYSTEM - EXIT** menu.
2. Select **Shutdown** to shutdown the system.

Figure 4-21 SYSTEM - EXIT menu



The **SYSTEM - EXIT** menu, used when switching OFF the LOGIQ Totus, gives you the following choices:

- **Logoff**
Use this button to log off the current user.
The Ultrasound system remains ON and ready for a new user to log on.
If this button is dimmed, it indicates that no user is logged on to the LOGIQ Totus at the moment.
- **Shutdown**
Use this button to shut down the Ultrasound system. It is recommended to perform a full shutdown at least once a week.
If **Shutdown** button is dimmed, press the **ON/OFF** button or **Alt+F10** to shut down the LOGIQ Totus.
- **Cancel**
Use this button to exit from the **SYSTEM-EXIT** menu and return to the previous operation.

4.4.15 Complete power down

1. Press once on the **ON/OFF** button on the operator panel to display the **SYSTEM - EXIT** menu.
2. Select **Shutdown** to do a complete power down of the LOGIQ Totus.
 - The back end will first turn off the LOGIQ Totus activity and print the message "Please wait - Shutdown in progress" in the display on the operator panel.
 - Next, it starts to shut down. The time to turn down the LOGIQ Totus, including the back end, may vary from 10 seconds up to approximately 1 minute.
 - The last thing that shuts down, is the light on the operator panel, indicating that you can continue with the next step.

**WARNING**

RISK OF LOSING DATA. BE SURE TO WAIT UNTIL THE LOGIQ Totus HAS FINISHED ITS SHUT-DOWN. FAILING TO DO SO MAY CORRUPT DATA ON THE HDD, MAKING THE LOGIQ Totus FAIL.

3. Switch off the Mains Power Circuit Breaker, located on the rear of the LOGIQ Totus. This will cut power distribution within the LOGIQ Totus.

4.5 Configuring the LOGIQ Totus

This section describes how to configure the LOGIQ Totus.

- *LOGIQ Totus configuration* on page 115
- *Optional peripherals/peripheral connection* on page 116
- *Barcode reader* on page 116
- *Magstripe card reader* on page 117
- *RFID reader* on page 118
- *LAN Protection Cable (Option)* on page 119
- *Network printers* on page 121

4.5.1 LOGIQ Totus configuration

For complete instructions, see the appropriate version of the User Manual or Release Notes.

4.5.2 Optional peripherals/peripheral connection

4.5.2.1 Approved internal peripherals (optional)

This list covers the internal peripherals available for the LOGIQ Totus. All of these internal peripherals should be connected already when the LOGIQ Totus is delivered.

- 4D Option
- CW Option
- Volume Navigation (V Nav) Option
- Patient I/O ECG Option
- Printer (Digital Graphic) Option
- Battery Pack Option
- Wireless LAN Option
- 2nd Wireless LAN Option for Vscan Air
- Tablet Option
- Vscan Air Charger Option

4.5.2.2 Optional peripherals/peripheral connection

Approved external peripherals (optional)

This list covers the external peripherals available for the LOGIQ Totus. The external printers are network DICOM devices. The inkjet printer is USB connected.

- Customer-supplied USB Flash Drives/Hard Drives
- Color Inkjet Printer
- USB Hard Disk Drives
- Report Printer
- Footswitch
- DICOM Printers
- Rolling Volume Navigation Stand
- Option Tray
- Probe Holder Option

4.5.2.3 Additional information

See *Options and Peripherals* on page 337 for replacement units.

4.5.2.4 Printer checks

Check to see if the printer works as described in the table below.

Table 4-4 Peripheral Checks

Step	Task	Note
1.	Press Freeze .	Stops image acquisition.
2.	Press (Print 1) , (Print 2) , (Print 3) or (Print 4) on the control panel.	Prints image displayed on the screen on a black and white or color printer, depending on the key assignment configuration.

4.5.3 Barcode reader

The barcode reader can be used to populate the following:

- Patient screen: Patient ID, First Name, Last Name, Middle Name, Perf. Physician, Ref. Physician.
- Worklist: Patient ID, Search String.
- Image Display: Comments (Annotation)

To connect the barcode reader:

1. Connect the barcode reader to any USB port. For example, on the user USB ports on the left side of the upper operator panel (shown below).



2. Boot up the Ultrasound system.
3. Scan the bar code that comes with the barcode reader to activate the device.

NOTE

Consult the barcode reader manufacturer's instructions. This configuration process will vary based on the barcode reader model/manufacturer and the keyboard language set on the Ultrasound system.

Once the configuration process is complete, the barcode reader is ready to use to start a new patient.

You do not need to repeat this process if software is reloaded, this barcode reader can be used on any scanner as long as they have the same keyboard language selection.

4.5.4 Magstripe card reader

The Magstripe card reader can be used to populate the following:

- Patient screen: Patient ID, First Name, Last Name, Middle Name, Perf. Physician, Ref. Physician.
- Worklist: Patient ID, Search String.
- Image Display: Comments (Annotation)

Figure 4-22 Card Reader



To connect the card reader:

1. Connect the card reader to any USB port. For example, on the user USB ports on the left side of the upper operator panel.
2. Boot up the Ultrasound system.
3. Scan the card that comes with the card reader to activate the device.

NOTE

Consult the card reader manufacturer's instructions. This configuration process will vary based on the card reader model/manufacturer and the keyboard language set on the Ultrasound system.

Once the configuration process is complete, the card reader is ready to use to start a new patient. You do not need to repeat this process if software is reloaded, this card reader can be used on any scanner as long as they have the same keyboard language selection.

4.5.5 RFID reader

The RFID reader can be used to populate the following:

- username
- password

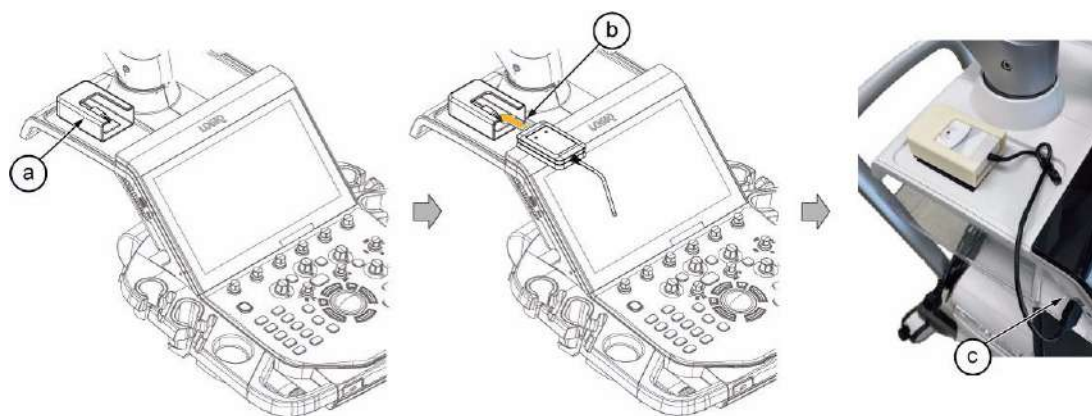
Once the RFID reader is installed, and the user's card has been activated, they can log in to the Ultrasound system by simply holding the card near the RFID reader.

For complete instructions on installing the RFID reader, see the RFID Option in the LOGIQ Totus Hardware and Software Option Installation Manual(DOC2907824).

To connect the RFID reader:

1. Clean and degrease the surface of the OPIO top cover before attaching the RFID cradle.
2. Peel off the brown backing on the double sided tape and apply tape to RFID cradle.
3. Peel off the red backing on the double sided tape on the back of the RFID cradle using tweezers.
4. Install RFID on the OPIO top cover per following steps.
 - a. Attach RFID cradle on the OPIO top cover as shown in the illustration.
 - b. Insert RFID into the cradle.
 - c. Connect USB cable to the monitor USB port.

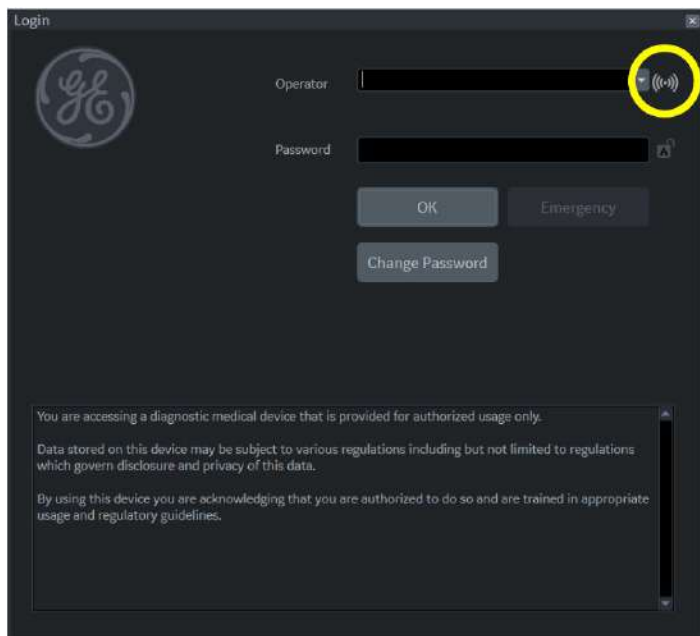
Figure 4-23 RFID Reader



5. Turn the Ultrasound system on. If the Ultrasound system is already on, reboot the Ultrasound system.

- On the Ultrasound system is on, confirm that the RFID symbol (circled below) appears on the Login page.

Figure 4-24 RFID Symbol



- Activate the RFID-enabled card. To activate a card, see Assign RFID Card in the user manual.

4.5.6 LAN Protection Cable (Option)

If the LAN cable is pulled away from the console, the connection will be unplugged first preventing damage to the LAN connector in the unit.

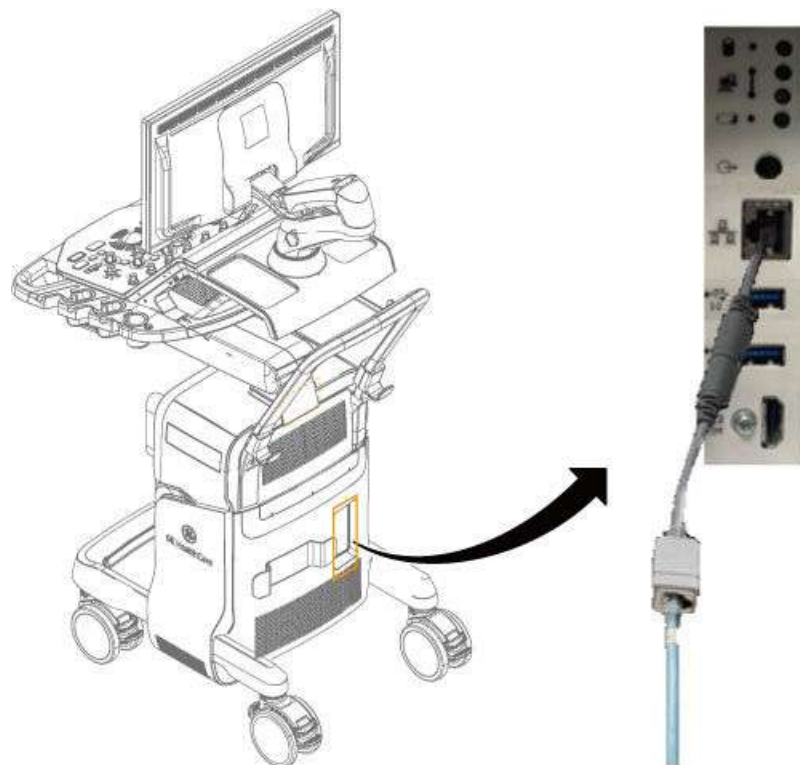
NOTE

To prevent claw breakage of LAN cable, use the LAN protection cable as below.]

Figure 4-25 LAN Protection Cable



Figure 4-26 LAN Cable with Protection Cable (Example)



4.5.7 Network printers

In R3 or later, you can add a network printer when logged on to the system as an administrator.

NOTE

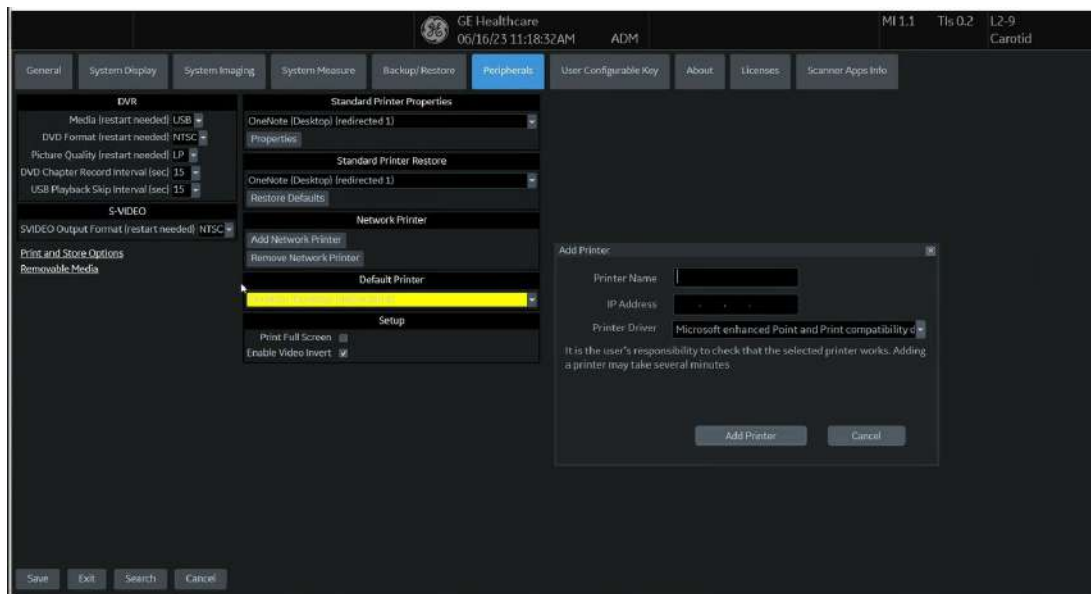
It is solely the customer's responsibility to determine printer and network settings and configuration to enable and ensure the specific network printer usage and functionality.

To add a network printer, navigate to **Utility > System > Peripherals**, and then under **Network Printer**, select **Add Network Printer**.

NOTE

Network printer is not available through Connection Manager.

Figure 4-27 Utility > System > Peripherals > Add Network Printer



Refer to "Network Printer" in the User Manual (appropriate version) for more information.

Technical details:

- The only supported driver for the network printer is Microsoft Enhanced Point and Print Compatibility driver.
- Adding a network printer requires the user is logged in with Admin group rights.
- You cannot use the same IP address for two printer names.
- Adding a network printer logs an event to both the main log and the audit log.

4.6 Setting Up Paperwork

NOTE

During and after setup, the documentation (for example, removable medias with documentation, user manuals, and installation manuals) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

4.6.1 User manual(s)

Check that the correct user manual (or removable media with user manuals) for the software revision and language of the LOGIQ Totus is included.

4.6.2 Product locator card/UDI

NOTE

The product locator card shown may not be the same as the provided product locator card.

The UDI of the medical device must be captured when any work is performed on that device. Refer to your local procedures on the actual capturing of the UDI.

Figure 4-28 Product Locator Card (Example)

 Mailing Address GEHC - Americas Product Locator - W523 P.O. Box 414 Milwaukee, WI 53201-0414		GIB, European Central Admin Product Locator Cards XEROX Office VAKUUMTECHNOLÓGIAI GÉPGYÁR FŐTÍ ÚT 141 1046 Budapest Hungary		Product Locator Card Asia Service Operation No. 1, Yongchang North Road Beijing Economic and Technologic Development Area Beijing 100176 China	
DESCRIPTION		FOA	MODEL	REV	SERIAL
SHIPMENT		OCP		BS	ORD
		DISTRICT		CUSTOMER NO.	DATE (MO - DA - YR)
		DESTINATION NAME AND ADDRESS _____ _____ _____ ZIP CODE			
46-303268P1 Rev 14					
 Mailing Address GEHC - Americas Product Locator - W523 P.O. Box 414 Milwaukee, WI 53201-0414		GIB, European Central Admin Product Locator Cards XEROX Office VAKUUMTECHNOLÓGIAI GÉPGYÁR FŐTÍ ÚT 141 1046 Budapest Hungary		Product Locator Card Asia Service Operation No. 1, Yongchang North Road Beijing Economic and Technologic Development Area Beijing 100176 China	
DESCRIPTION		FOA	MODEL	REV	SERIAL
SYSTEM LTD.		OCP		BS	ORD
DISTRICT		ROOM		EMPLOYEE NO.	
CUSTOMER NO.		DATE (MO - DA - YR)			
INSTALLATION		DESTINATION NAME AND ADDRESS _____ _____ _____ ZIP CODE			
46-303268P1 Rev 14					

Chapter 5

Alignment, Setup and Calibration

In this chapter

Monitor Adjustments.	124
Monitor Arm and/or Monitor Range of Motion Adjustment.	131
DICOM Server Service Adjustments.	135
Volume Navigation (V Nav) Calibration.	136

This section describes how to adjust the LOGIQ Totus.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

5.1 Monitor Adjustments

This section describes how to adjust the monitor for optimal performance.

Contents in this section

- *Access to monitor adjustments* on page 124
- *Monitor adjustments* on page 126
- *Advanced monitor adjustments* on page 128

5.1.1 Access to monitor adjustments

All monitor settings have been optimized at the factory, so there should be no need for any further adjustments. The default settings on **Scan Screen** are shown in the table below.

NOTE

If Color Profile is not displayed on the Utility (second page), check the USB Connection.

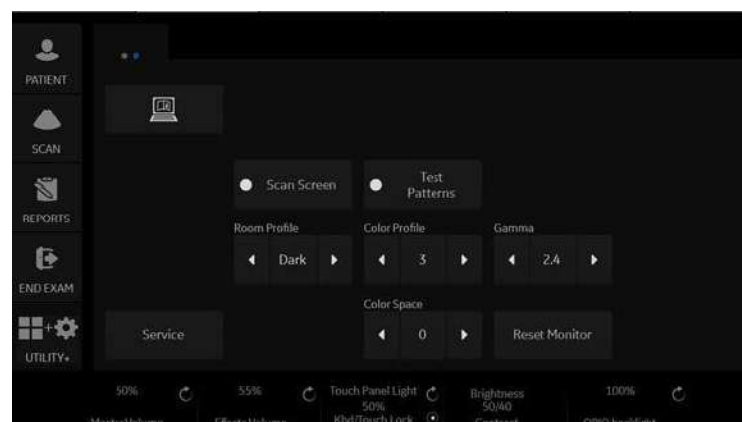
Table 5-1 Room Profile Table

HDU Display	LCD Monitor
Room Profile: Dark	Room Profile: Dark
Brightness/Contrast: 52/50	Brightness/Contrast: 50/85

For more information, see the appropriate version of the User Manual or Release Notes.

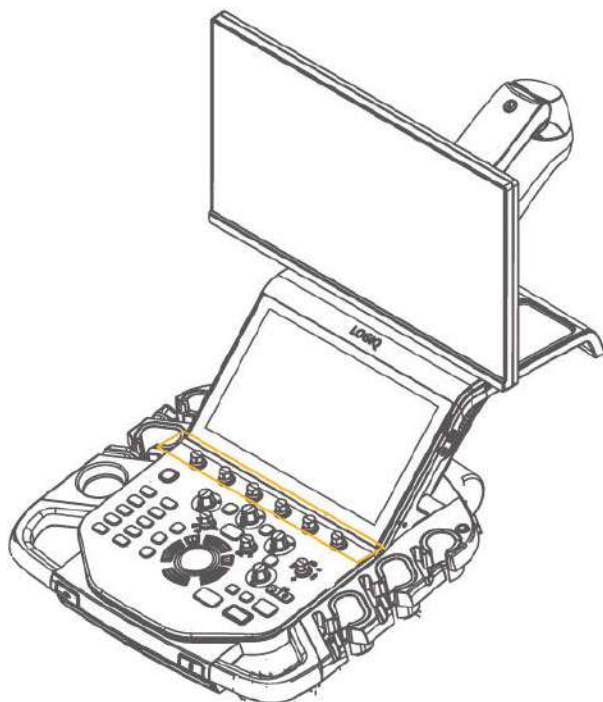
To access the Scan Screen, navigate to **Utility (second page) > Scan Screen**

Figure 5-1 Scan Screen



Use the encoder knobs to adjust the Scan Screen settings (shown on the Scan Screen directly above each encoder knob).

Figure 5-2 Operator Panel Encoder Knobs



5.1.2 Monitor adjustments

For complete information, see the appropriate version of the User Manual or Release Notes.

Room profile

To set the monitor to different room lighting conditions, you may want to manually adjust the room profile.

To set the room profile:

1. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
2. Under **Room Profile**, select the room type.

Table 5-2 Room Profile Table

Room Profile	Brightness/Contrast HDU Monitor	Brightness/Contrast LCD Monitor
Dark	52/50	50/85
Semi-Dark	60/70	70/85
Light	62/93	90/85
User Defined	User-adjustable Brightness/Contrast	User-adjustable Brightness/Contrast

OPIO Backlight

Under special lighting conditions, you may want to adjust the monitor screen's backlight intensity.

To set the OPIO backlight:

1. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
2. Under the operator panel, turn the encoder to adjust the OPIO backlight setting.

Brightness and contrast

Under special lighting conditions, you may want to manually adjust the brightness and contrast.

To manually set the brightness and contrast:

1. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
2. Under **Room Profile**, select **User Defined**.
3. Under the operator panel, turn the encoder to adjust the brightness/contrast setting.

Touch panel light

Under special lighting conditions, you may want to manually adjust the touch panel light. Adjust the touch panel light between 10% to 100%.

To adjust the touch panel light:

1. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
2. Under the operator panel, turn the **Touch Panel Light** encoder to adjust the brightness of the touch panel light.

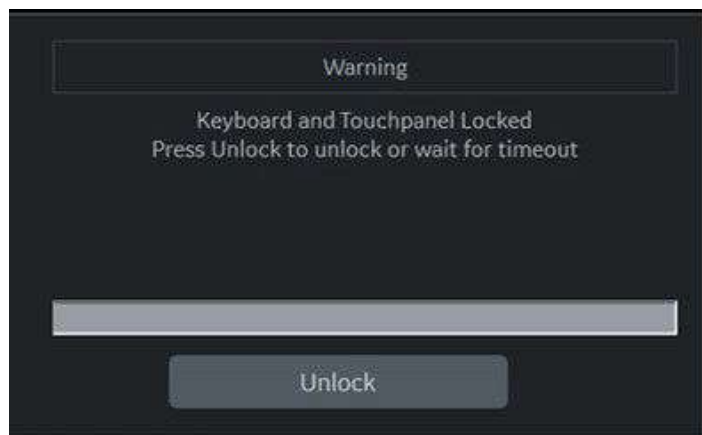
Keyboard and touch panel lock

When you need to clean the Ultrasound system keyboard or touch panel, lock the keyboard and touch panel controls.

To lock the keyboard/touch panel

1. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
2. Under the operator panel, push the **Kbd/Touch Lock** encoder once to display the dialog box and lock the keyboard and touch panel controls.
3. To unlock lock the keyboard and touch panel controls, select **Unlock** or wait for the timeout.

Figure 5-3 Touch Panel Adjustment Lock Dialog Box



5.1.3 Advanced monitor adjustments

Review Gamma Setting

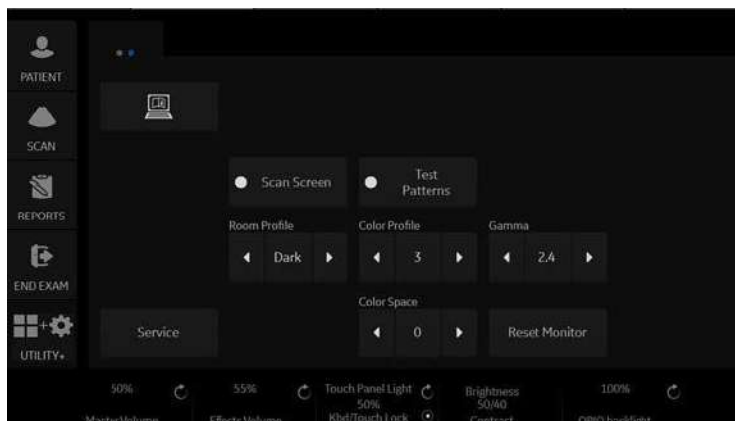
Gamma settings can be adjusted in two ways, with or without DICOM Gray Scale Standard Display Function (GSDF) enabled. GSDF-compliant with all contrast settings, but not all brightness settings.

Because of differences in display technology, the HDU Display or LCD Monitor is GSDF-compliant with all contrast settings, but not compliant with all brightness settings.

To enable the GSDF mode:

1. Navigate to **Utilities > System > System Display**.
2. Select Enable DICOM grayscale display mode (GSDF).
3. Set **Use Wide Screen for... > Single Image** to **Off**.
4. Navigate to **Utility (second page) > Scan Screen**. The scan screen displays on the main display while the Utility Touch Panel is active so you can see the affect your adjustments are making to the monitor.
5. With GSDF enabled, the Gamma button on the touch panel affects the image, emulating the appearance of that gamma, but does not affect the monitor.

Figure 5-4 Check to Enable GSDF Mode



If a site's PACS workstations are calibrated to the GSDF, this setting may help to make the image appearance more uniform between the Ultrasound system and PACS.

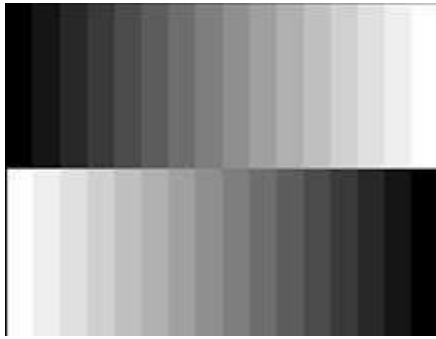
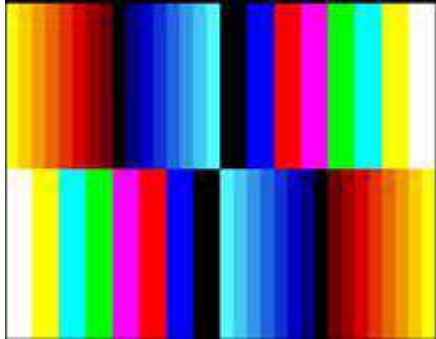
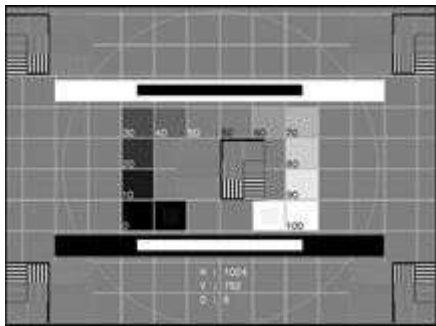
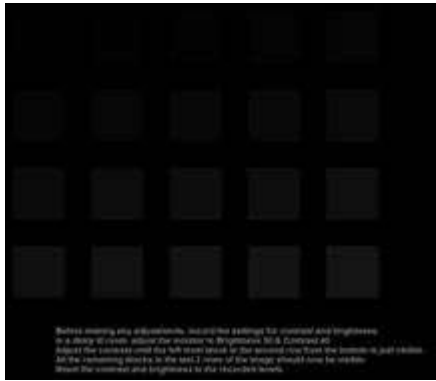
- With GSDF disabled, the monitor still uses a gamma curve that may be selected on the Touch Panel (for backwards compatibility with sites that are happy with their PACS or may have a mix of older systems).
- With GSDF enabled, the gamma button on the touch panel affects the image, emulating the appearance of that gamma, but does not affect the monitor.

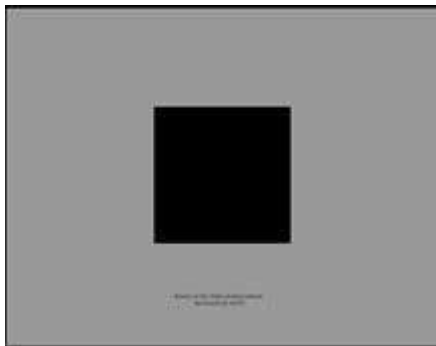
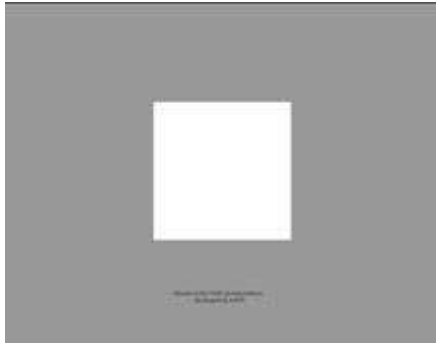
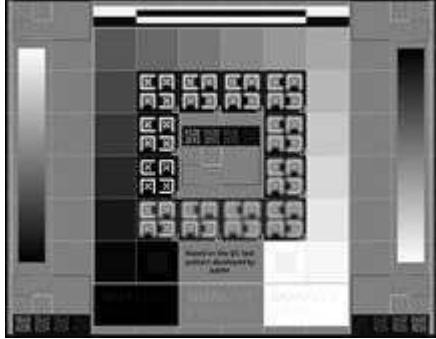
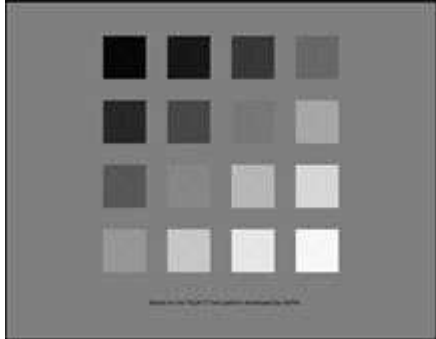
Test patterns

Test patterns are available to aid in evaluating the display visually and quantitatively.

For complete information, see the appropriate version of the User Manual.

Table 5-3 Test Patterns

Test Pattern	Description	Corresponding Graphic
Gray Bars	Confirm that you can clearly see all of the different gradations of the grayscale in each gray cell.	
Color Bars	Confirm that you can clearly see all of the different colors in each colored cell.	
Resolution	Confirm that this image is clear and crisp, without jagged edges or lines.	
Brightness Contrast	Before making any adjustments, record the settings for contrast and brightness. In a dimly lit room, adjust the monitor to Brightness 50 and Contrast 40. Increase the contrast until the left most block in the second row from the bottom is just visible. All the remaining blocks in the last 2 rows of the image should now be visible. Reset the contrast and brightness to the recorded levels.	

Test Pattern	Description	Corresponding Graphic
LN1 to LN18	Luminance for different grayscale levels. Usually, the facility's Biomed Engineer tests each gray level map on the monitor from LN-1 to LN-18 with a light meter and then graphs these on a scale to ensure that the curve falls within the GSDF's standard. This can be performed with all three LOGIQ Totus monitors with GSDF enabled. Generally, this is performed yearly.	LN-1  LN-18 
QC	Quality Control. Confirm that this image is clear and crisp, without jagged edges or lines.	
CT Used for Luminance response	Contrast. Confirm that you can detect the circles within the square grayscale boxes.	

5.2 Monitor Arm and/or Monitor Range of Motion Adjustment

This section describes how to adjust the monitor arm and/or monitor range of motion for optimal performance.

Contents in this section

- *Monitor and Ergotron arm* on page 131
- *Cautions and warnings* on page 131
- *Main Monitor Adjustment* on page 131

5.2.1 Monitor and Ergotron arm

These procedures are available for monitor range of motion and monitor vertical adjustment:

- *Monitor arm vertical adjustment* on page 131
- *Monitor arm tilt adjustment* on page 132

Figure 5-5 Ergotron arm



5.2.2 Cautions and warnings

Be aware of pinch points at hinges when adjusting the monitor arm and monitor.

Table 5-4 Pinch Point Caution and Warning Icons

5.2.3 Main Monitor Adjustment

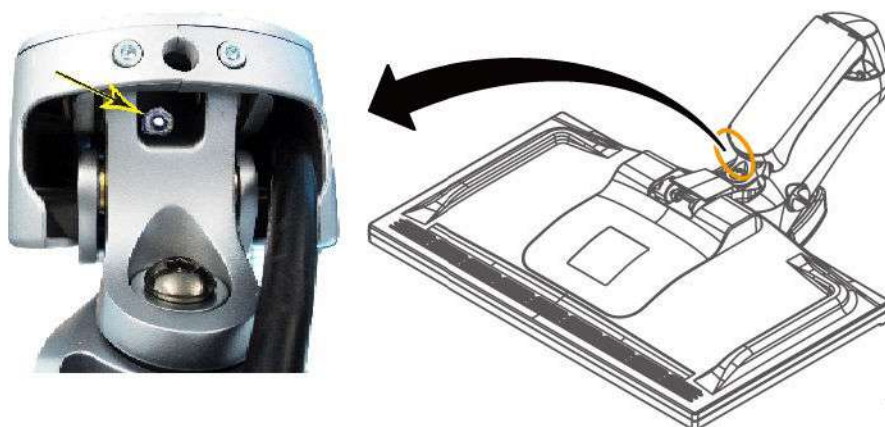
Monitor arm vertical adjustment

If the monitor rises or falls when it is released, perform a vertical adjustment.

If the monitor is too loose or too tight when it is tilted, perform a tilt adjustment.

1. Tilt the monitor down to access the vertical adjustment screw.

Figure 5-6 Monitor Arm Vertical Adjustment Screw



2. If the monitor was falling, turn the adjustment screw clockwise to increase the friction, using a 4 mm hex wrench.
If the monitor was rising, turn the adjustment screw counterclockwise to decrease the friction.

NOTE

The monitor should stay in position when released. The heavier the monitor, the more friction will be required.

Figure 5-7 Turn the adjustment screw

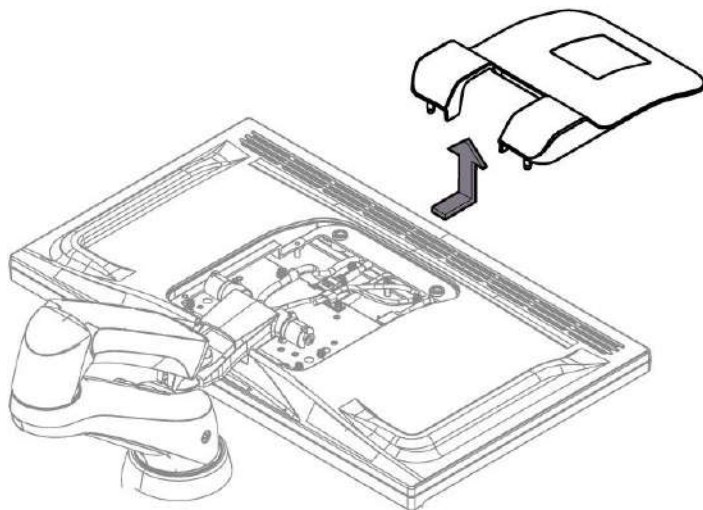


Monitor arm tilt adjustment

If the monitor is too loose or too tight when it is tilted, perform a tilt adjustment.

1. Tilt the monitor down and remove the monitor rear cover.

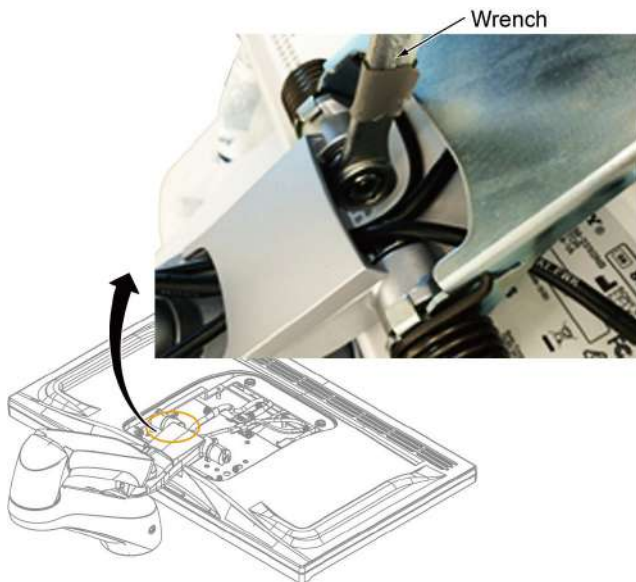
Figure 5-8 Remove the monitor rear cover



2. Access the adjustment nuts with wrench.

If you have a thick wrench, it is easier to reach the nuts by using the boxed end of the wrench.

Figure 5-9 Adjustment nuts



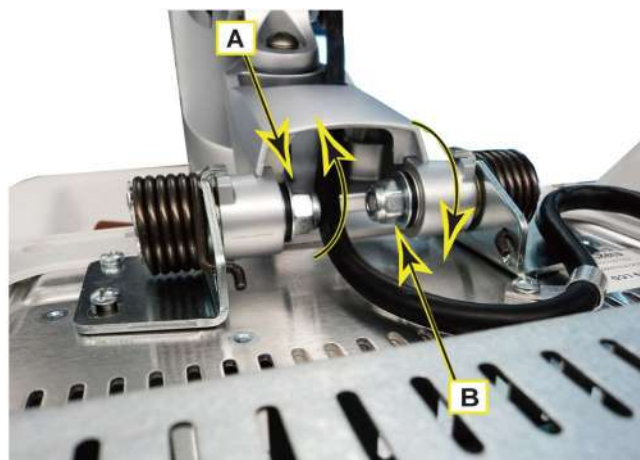
3. If the monitor is too loose, turn the adjustment nut **(A)** towards the back and nut **(B)** towards the front to increase the friction, using a 13 mm wrench.

Turn the nuts the opposite direction to decrease the friction. The monitor should stay in the position it is released at.

NOTE

Be sure to tighten or loosen both sides equally. Start with 1/4 turn and test full 90 degree movement before tightening or loosening more.

Figure 5-10 Adjustment nut direction



4. Reinstall the monitor rear cover.

5.3 DICOM Server Service Adjustments

5.3.1 Slow response rate between the Ultrasound system and a DICOM (PACS) server

Problems with slow responses may result in images being re-sent automatically and low transfer rates. If you are experiencing problems with slow responses from a DICOM server, increase the timeout setting.

To adjust properties for a DICOM server (online):

1. Navigate to:
 - For R3: Utility > Connectivity > Service
 - For R4: Utility > Connectivity > Dicom> Service
2. Select the service for the DICOM server.
3. Under **Properties (R3)** or **Connection (R4)**, set **Timeout (sec)** to **360**.

5.3.2 Shutdown problems when running a portable Ultrasound system

When portable (offline and not communicating with a PACS server), use the following settings to avoid problems with shutdown speed:

To adjust properties for a DICOM server (offline):

1. Navigate to:
 - For R3: Utility > Connectivity > Service
 - For R4: Utility > Connectivity > Dicom> Service
2. Select the service for the DICOM server.
3. Under **Properties (R3)** or **Connection (R4)**, set these parameters:
 - **Maximum Retries** - Set to **0**.
 - **Retry Interval (sec)** - Set to the lowest possible value.
 - **Timeout (sec)** - Set to the lowest possible value.

5.4 Volume Navigation (V Nav) Calibration

There is no calibration available in the field. If the registration seems to be out of calibration, reloading the software will restore the factory settings. If the registration still seems out of calibration, replace the Volume Navigation (V Nav) hardware.

Chapter 6

Functional Checks

In this chapter

Special equipment required. 138

Recommended test phantoms. 139

General Procedures. 140

Functional Checks. 149

Site Log. 184

This chapter provides procedures for quickly checking major functions of the Ultrasound system and diagnostic instructions using the built-in service software.

NOTE
The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

6.1 Special equipment required

This is the special equipment you may need to complete functional checks:

- USB Media.
- At least one probe (check all of the probes that will be used with the Ultrasound system at the site.)
- If the Shear Wave option is present, a Shear Wave-capable probe.
- If the V Nav option is present, a V Nav-capable probe.
- If the ECG option is present, ECG cables (AHA or IEC) and pads.
- Test phantom. See *Recommended test phantoms* on page 139.

NOTE

For a list of available probes, see *Supported Probes* on page 333.

NOTE

For a list of probes supported with Shear Wave or V Nav, see the User Manual (appropriate version). See *Label Locations* on page 36 or a list of the available user documentation.

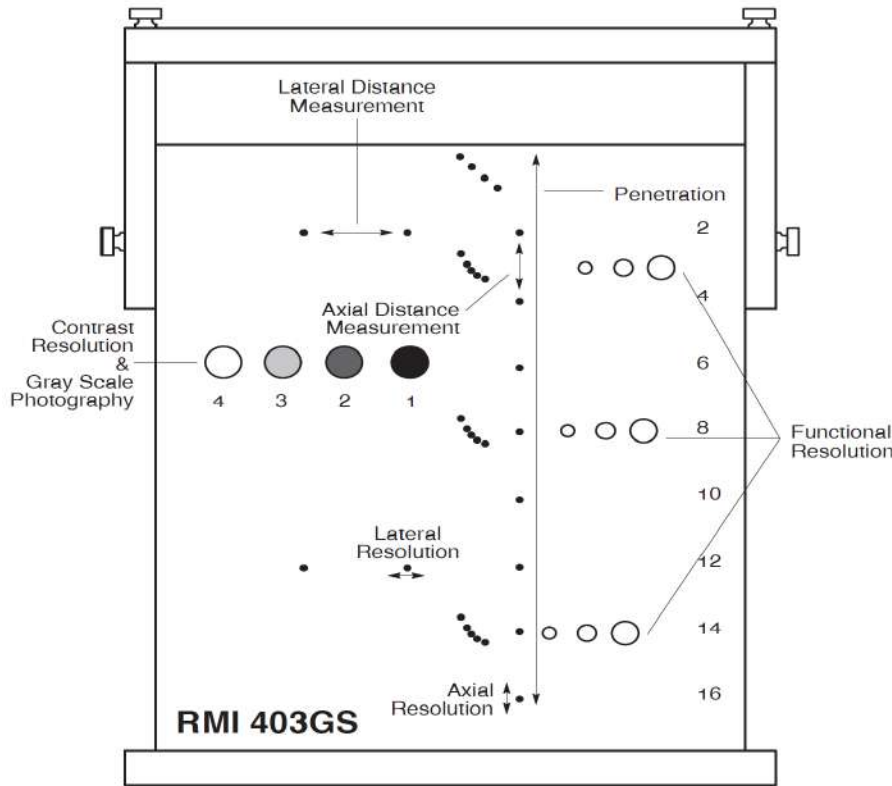
NOTE

For part numbers for the options, see *Options and Peripherals* on page 337.

6.2 Recommended test phantoms

GE HealthCare recommends the RMI 430GS phantom is preferred, but it is not required. It is the most current phantom recommended to our field service personnel and provides the necessary targets and extended life necessary for consistent Ultrasound system testing.

Figure 6-1 Performance Tests



6.3 General Procedures

- *General system functional checks* on page 142
- *Power on/boot up* on page 98
- *Power shut down* on page 113
- *Complete power down* on page 114

6.3.1 General safety information



DANGER

Risk of dangerous voltage within the LOGIQ Totus.

Hazardous voltages, greater than 30 volts, exist within the LOGIQ Totus.

Follow Lockout/Tagout requirements by ensuring you are in total control of the AC power plug at all times during the service process.

- Plan and prepare for shutdown.
- Completely power down the LOGIQ Totus.
- Address potentially accumulated energy.
- Disconnect the power cable (first from the wall and then from the LOGIQ Totus).
- Apply lockout/tagout devices to maintain exclusive control of the power cable.
- Control all stored and residual energy.
- Verify isolation.

After these steps are completed, all potentially hazardous stored or residual energy is relieved.

For step-by-step instructions to lock out and tag out the LOGIQ Totus, see:

- *Power down the LOGIQ Totus* on page 47
- *Disconnect Power to the LOGIQ Totus* on page 49
- *Disconnect battery power* on page 50



DANGER

Risk of electrical shock, system must be turned off.

Avoid all contact with electrical contacts, conductors and components. Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.

Before removing the card rack boards, the LEDs on the end of each board should be unlit to indicate boards are NOT powered.



DANGER

Risk of damage to equipment.

DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:

1. ALWAYS CONNECT YOURSELF. THE ESD WRIST STRAP SHOULD BE CONNECTED TO ONE OF THE TWO RECEPTICALS INTEGRATED ON THE FRAME, SPECIFICALLY FOR THAT PURPOSE.
2. FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

**CAUTION**

THE ULTRASOUND SYSTEM REQUIRES ALL COVERS.

Operate the LOGIQ Totus only when all board covers and frame panels are securely in place. The covers are required for safe operation, good system performance and cooling purposes.

6.3.2 General system functional checks

After setting up the Ultrasound system, performing an upgrade, or replacing hardware, perform all appropriate functional checks before returning a system to the customer. Include the functional check information in the service record.

NOTE

Follow the GE HealthCare Field Service Documentation Quality Standards. Service records must provide a comprehensive account of the customer issue and all related service activities.

For service calls involving a FRU replacement:

- Perform all relevant functional checks as described in the applicable FRU replacement procedure.
- Include the Service Record Debrief Script found at the end of the corresponding procedure.

For service calls without a FRU replacement:

- Perform the general functional tests listed in *Table 6-1 General System Functional Checks* on page 142. If all tests pass, include the following Service Record Debrief Script: "Leakage current measured at (record value) and is within allowable limits. Equipment has passed all required checks and is ready for use."

For service calls related to system upgrades:

- Perform the general functional tests listed in *Table 6-1 General System Functional Checks* on page 142. If all tests pass, include the following Service Record Debrief Script: "Leakage current measured at (record value) and is within allowable limits. Equipment has passed all required checks and is ready for use."

Some procedures are used more often than others. The intention with this section is to keep the most used procedures in one place.

NOTE

NOT ALL functional checks have to be repeated or performed if not all options are present. If ONLY a particular option is present, perform the functional checks for that particular option and the options installed.

Table 6-1 General System Functional Checks

Functional Check
<i>Power on/boot up</i> on page 98
<i>B-Mode functional checks</i> on page 160
<i>System CFM and PWD functional checks</i> on page 163
<i>Basic measurement functional checks</i> on page 173
<i>Grounding continuity test</i> on page 769
<i>Chassis leakage current test</i> on page 770
<i>Power shut down</i> on page 113 DO NOT POWER SHUT DOWN until ALL functional checks have been performed.
In addition: Perform the following functional checks if the option was or options were removed during backplane replacement.
4D
<i>4D option functional checks</i> on page 177 Perform a 4D sweep
Pedof CW
<i>PW/CW Doppler mode functional checks</i> on page 167 Use pencil probes
<i>Probe/connector functional checks</i> on page 159

Functional Check
<i>Chassis leakage current test on page 770</i> Perform a CW scan with a pencil probe probes (plug in and scan)
GCW
<i>CW Doppler mode functional checks on page 168</i>
<i>Probe/connector functional checks on page 159</i>
<i>Chassis leakage current test on page 770</i> Perform a CW scan with P2D, P6D, M5S-D probes (plug in and scan)
VSIO (ECG)
<i>ECG functional checks on page 176</i> Active ECG: Utility > Applications > Settings > ECG > Show ECG Tools. Connect cables. Press Display ECG tab on the touch panel. Verify ECG signal displayed on monitor. Plug in the ECG cables with nothing attached so they pick up noise.
Battery Pack Option
<i>Battery Pack functional checks on page 179</i>
<i>Battery Pack Extended functional checks on page 180</i>
<i>Probe/connector functional checks on page 159</i>
Shear Wave
<i>Probe/connector functional checks on page 159</i>
<i>Shear Wave Elastography (Shear Elasto) functional checks on page 181</i>
Perform a 4D sweep, if 4D MC was removed.
V Nav
<i>Volume Navigation with inside probe functional checks on page 178</i>
<i>4D option functional checks on page 177</i>
<i>Basic control functional checks on page 158</i>

6.3.3 Power on/boot up

**DANGER**

ALWAYS CONNECT THE ULTRASOUND SYSTEM TO A FIXED POWER SOCKET WHICH HAS THE PROTECTIVE GROUNDING CONNECTOR.

FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**DANGER**

NEVER USE A THREE-TO-TWO PRONG ADAPTER; THIS DEFEATS THE SAFETY GROUND. FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**DANGER**

ENSURE THAT THE POWER CORD AND PLUG ARE INTACT AND THAT THE POWER PLUG IS THE PROPER HOSPITAL-GRADE TYPE (WHERE REQUIRED).

FAILURE TO FOLLOW THESE INSTRUCTION COULD LEAD TO ELECTRICAL SHOCK.

**CAUTION**

LOGIQ Totus REQUIRES ALL COVERS.

ONLY OPERATE THE LOGIQ Totus WHEN ALL OF THE BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. THE COVERS ARE REQUIRED FOR SAFE OPERATION, GOOD PERFORMANCE AND COOLING PURPOSES.

**CAUTION**

USE ONLY POWER SUPPLY CORDS, CABLES, AND PLUGS PROVIDED BY OR DESIGNATED BY GE.

NOTE

Do not cycle the circuit breaker ON-OFF-ON in less than five seconds. When turning OFF the circuit breaker, WAIT until the ON/OFF button is no longer lit. The LOGIQ Totus should de-energize completely before turning the circuit breaker ON.

6.3.3.1 Connect mains power cable to the LOGIQ Totus

Connecting AC power to the LOGIQ Totus involves preliminary checks of the mains power cable, voltage level and compliance with electrical safety requirements.

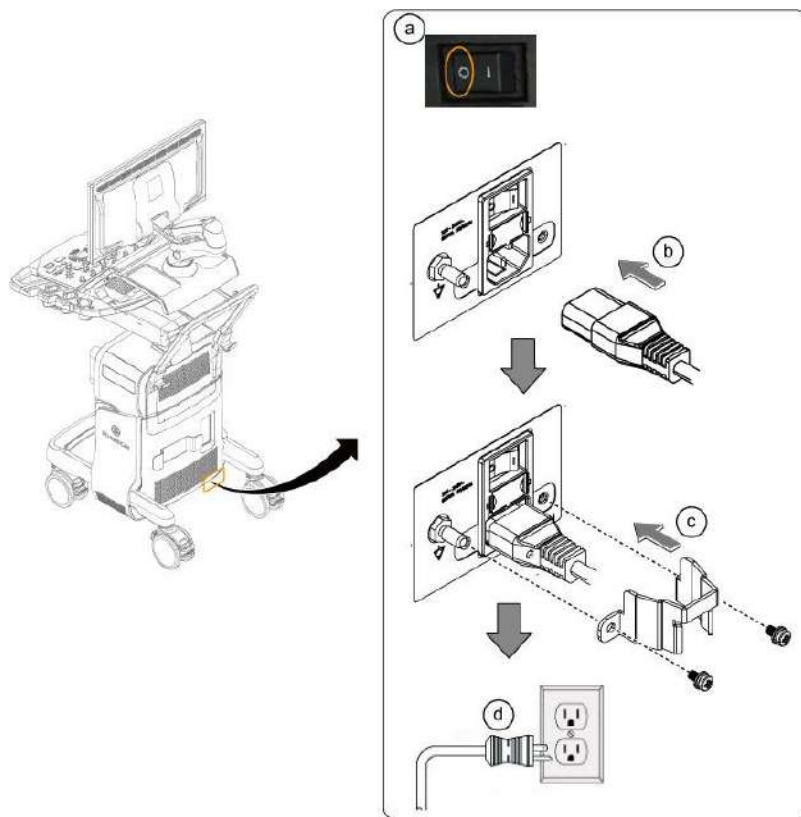
NOTE

The LOGIQ Totus will function on voltages from 100-240 volts and 50 or 60 Hz. However, if using 220 volt power, then a center tapped power source is required (North America only).

1. Ensure that the wall outlet is of appropriate type, and that the circuit breaker is turned off.
2. Uncoil the mains power cable, allowing sufficient slack so that the LOGIQ Totus can be moved slightly.
3. Verify that the:
 - power cable is without any visible scratches, any sign of damage or tangled.
 - on-site mains voltage is within the limits indicated on the rating label near the circuit breaker on the rear of the LOGIQ Totus.
4. Connect the mains power cable per following steps.
 - a. Verify that the mains power circuit breaker is in OFF position, If not, switch it to OFF.
 - b. Connect the female plug of the power cable to the power inlet at the rear of the Ultrasound system.
 - c. Install the mains power cable FIX BRKT with 2 screws (2159625, Screw PH WSP M4x8).

- d. Connect the other end (male plug) of the power cable to a hospital grade mains power outlet with the proper rated voltage, and the LOGIQ Totus is ready for power ON/boot up.

Figure 6-2 Connecting mains power cable



6.3.3.2 Switch ON the AC power to LOGIQ Totus

1. Switch ON the circuit breaker at the rear of the Ultrasound system. The **ON/OFF** button turns white.

Figure 6-3 ON/OFF Button



You should hear a click from the relays in the AC power and the LOGIQ Totus is ready to boot. This indicates that there is power to the power supply, but the LOGIQ Totus is OFF.

2. Press once on the **ON/OFF** button on the operator panel to boot the LOGIQ Totus. The **ON/OFF** button turns green when it is pressed. During a normal boot, you may observe that:
 - a. The ventilation fans start on full speed, but slow down after a few seconds (listen to the fan).

- b. Power is distributed to the peripherals, operator panel, monitor, front end and back end.
- c. Back end and rest of the LOGIQ Totus starts with the sequence listed in the next steps:
 - 1. Back end is turned ON and starts to load the software.
 - 2. The Start screen is displayed on the monitor.
 - 3. A start-up bar indicating the time used for software loading, is displayed on the monitor.
 - 4. The software initiates and sets up the front end electronics and the rest of the instrument.
 - 5. The backlight in the keyboard is lit.
 - 6. As soon as the software has been loaded, either a 2D screen is displayed on the screen, indicating that a probe has been connected, or a No Mode screen is displayed, indicating that no probe has been connected.

NOTE

Total time used for start-up is typically less than 170 seconds.

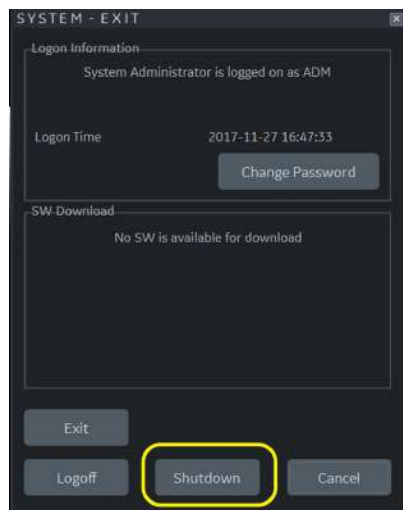
After the B-Mode screen is displayed and any function is touched, the Ultrasound system will prompt a password protected Login.

6.3.4 Power shut down

You can use the **SYSTEM - EXIT** menu to log off, shut down, and exit. Power shut down occurs when selecting shut down with an automatic shutdown sequence.

1. Press once on the **ON/OFF** button on the operator panel to display the **SYSTEM - EXIT** menu.
2. Select **Shutdown** to shutdown the system.

Figure 6-4 **SYSTEM - EXIT** menu



The **SYSTEM - EXIT** menu, used when switching OFF the LOGIQ Totus, gives you the following choices:

- **Logoff**
Use this button to log off the current user.
The Ultrasound system remains ON and ready for a new user to log on.
If this button is dimmed, it indicates that no user is logged on to the LOGIQ Totus at the moment.
- **Shutdown**
Use this button to shut down the Ultrasound system. It is recommended to perform a full shutdown at least once a week.
If **Shutdown** button is dimmed, press the **ON/OFF** button or **Alt+F10** to shut down the LOGIQ Totus.
- **Cancel**
Use this button to exit from the **SYSTEM-EXIT** menu and return to the previous operation.

6.3.5 Complete power down

1. Press once on the **ON/OFF** button on the operator panel to display the **SYSTEM - EXIT** menu.
2. Select **Shutdown** to do a complete power down of the LOGIQ Totus.
 - The back end will first turn off the LOGIQ Totus activity and print the message "Please wait - Shutdown in progress" in the display on the operator panel.
 - Next, it starts to shut down. The time to turn down the LOGIQ Totus, including the back end, may vary from 10 seconds up to approximately 1 minute.
 - The last thing that shuts down, is the light on the operator panel, indicating that you can continue with the next step.

**WARNING**

RISK OF LOSING DATA. BE SURE TO WAIT UNTIL THE LOGIQ Totus HAS FINISHED ITS SHUT-DOWN. FAILING TO DO SO MAY CORRUPT DATA ON THE HDD, MAKING THE LOGIQ Totus FAIL.

3. Switch off the Mains Power Circuit Breaker, located on the rear of the LOGIQ Totus. This will cut power distribution within the LOGIQ Totus.

6.4 Functional Checks

Contents in this section

- *Top console adjustment control functional checks* on page 150
- *Main monitor positions and lock functional checks* on page 151
- *Brakes and direction lock functional checks* on page 153
- *Alphanumeric keyboard functional checks* on page 156
- *Footswitch functional checks* on page 157
- *Basic control functional checks* on page 158
- *Probe/connector functional checks* on page 159
- *B-Mode functional checks* on page 160
- *M-Mode functional checks* on page 162
- *System CFM and PWD functional checks* on page 163
- *Color Mode functional checks* on page 164
- *Color B-Mode functional checks* on page 165
- *Color M-Mode functional checks* on page 166
- *PW/CW Doppler mode functional checks* on page 167
- *CW Doppler mode functional checks* on page 168
- *Cineloop functional checks* on page 169
- *Removable media functional checks* on page 170
- *Archiving and loading presets* on page 171
- *Installation and setup procedures for peripherals* on page 172
- *Basic measurement functional checks* on page 173
- *Multi image functional checks* on page 175
- *ECG functional checks* on page 176
- *4D option functional checks* on page 177
- *Volume Navigation with inside probe functional checks* on page 178
- *Battery Pack functional checks* on page 179
- *Battery Pack Extended functional checks* on page 180
- *Shear Wave Elastography (Shear Elasto) functional checks* on page 181
- *Vscan Air CL probe connection check* on page 182
- *Vscan Air CL charger functional check* on page 183

6.4.1 Top console adjustment control functional checks

**WARNING**

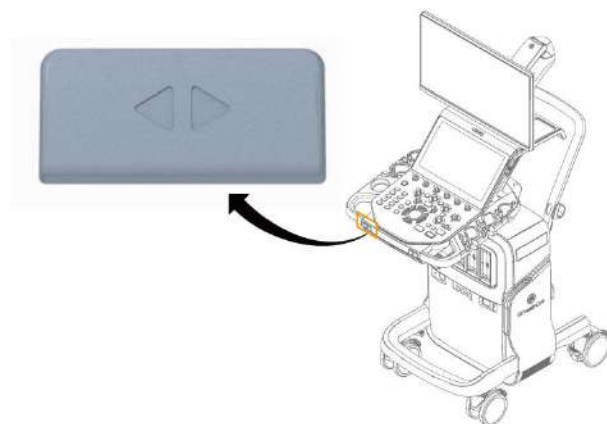
To avoid injury or damage, make sure nothing is within the range of motion of the top console before moving the top console. This includes both objects and people.

To perform the function checks for the top console adjustment controls:

Power ON the LOGIQ Totus before performing the following steps.

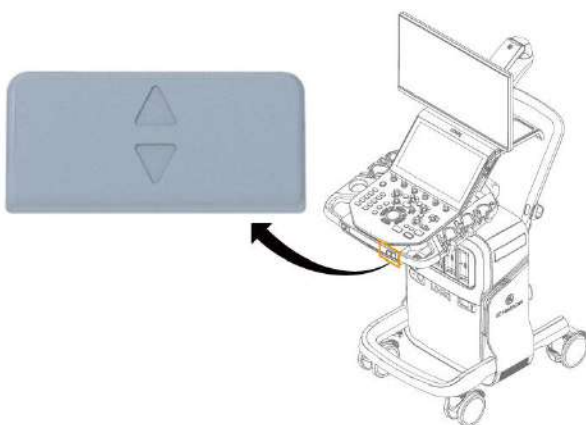
1. To SWIVEL the top console:
 - a. Press and hold down the SWIVEL button to move the console left or right.
 - b. Release the button.

Figure 6-5 Swiveling the top console



2. To raise/lower the top console:
 - a. Press and hold the Up/Down button to raise or lower the top console.
 - b. Release the button when the top console is at the desired height.

Figure 6-6 Raising/lowering the top console



6.4.2 Main monitor positions and lock functional checks

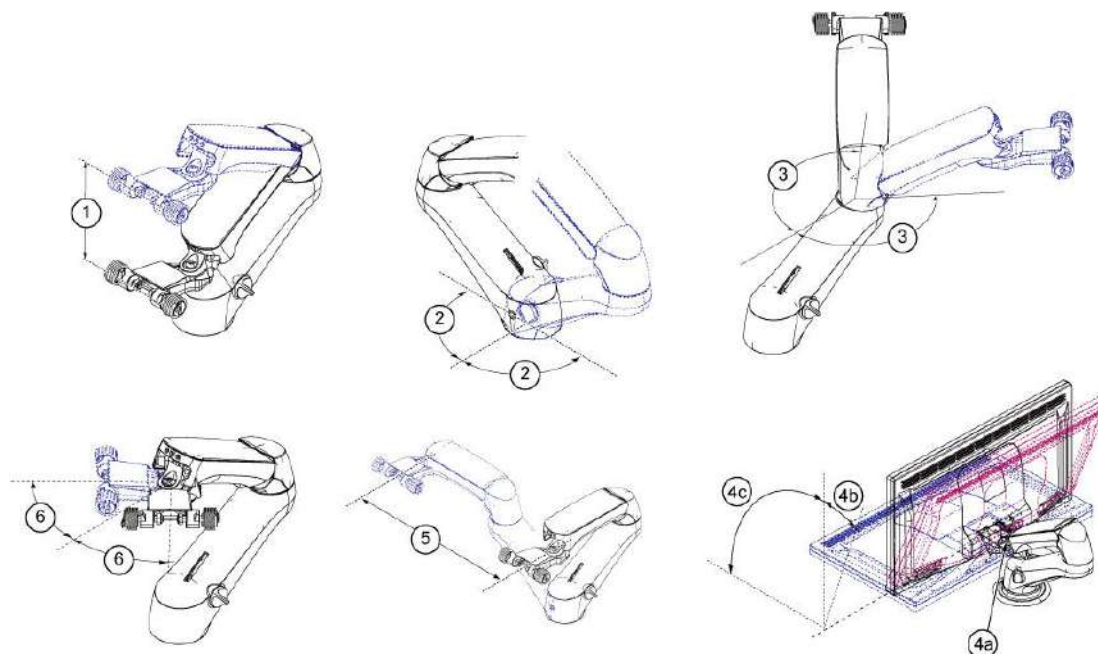
To perform the function checks for the main monitor:

When the monitor arm lock is unlocked, verify the monitor can move up/down (vertically) and left/right (horizontally).

NOTE

The monitor can move approximately 150 mm (5.91 inches) vertically and 350 mm (13.78 inches) horizontally from center.

Figure 6-7 Main Monitor Positions - Ergotron Arm



1.	Vertical Travel = 150mm	4.	Tilt a: No Collision b. Approximately 20° (based on Pan Arm Off-set) c. 85°-90°
2.	Rotation at Mount = 90° (180° total)	5.	Monitor Translation = 350mm(both sides from center)
3.	Lift Arm Rotation = 135° (270° total)	6.	Pan Arm Rotation = 45° (90° total)

To check main monitor platform maneuverability:

Check that the main monitor functions as described below.

1. Tilt the main monitor forward/back.

NOTE

Use both hands, one at the top of the main monitor and one at the bottom, to rotate the screen forward and back.

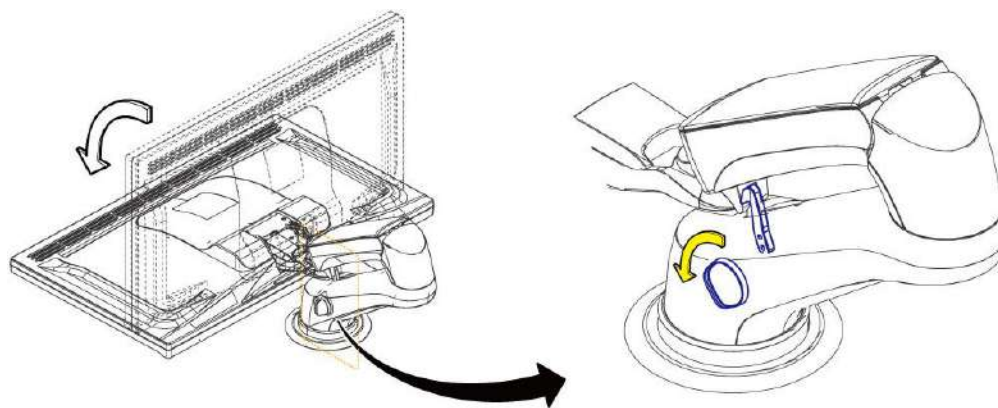
2. Move the main monitor left/right.

NOTE

Use both hands, one at the lower left handle hold of the main monitor and one at the lower right handle hold, to adjust the screen left and right.

3. To unlock the main monitor, turn the knob clockwise to unlock the main monitor. The main monitor can be moved freely in all directions.
4. To lock the main monitor, turn the knob counter clockwise to lock the main monitor in the parked position.
5. To set the main monitor position for transport, Lock the arm and tilt the main monitor down.

Figure 6-8 Main Monitor Transport Position



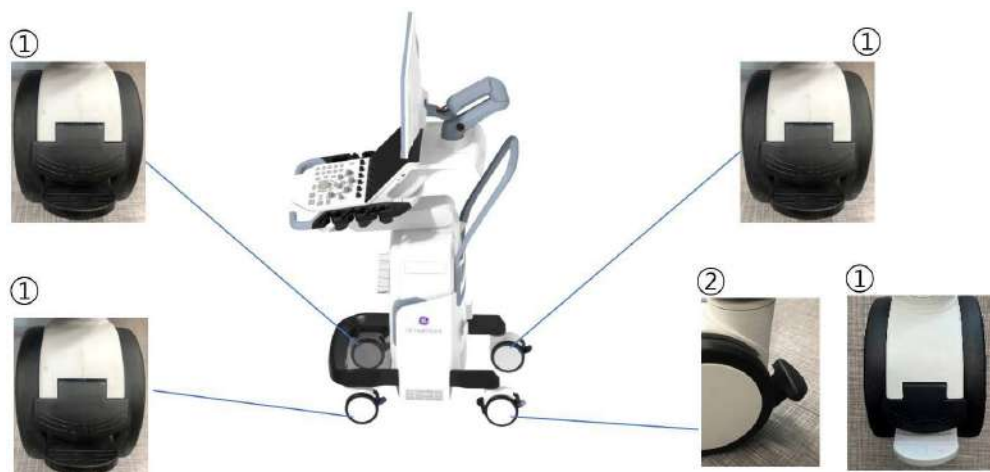
6.4.3 Brakes and direction lock functional checks

Check that the brakes and direction lock function as described below.

Overview

Examine the wheels frequently for any obvious defects that could cause them to break or bind. Each wheel has an independent brake pedal. A left rear wheel also has a swivel lock.

Figure 6-9 Wheel lock and Swivel lock



1. Brake pedal
2. Swivel lock

Brake pedal function except Left-rear caster

Check the break function of each caster except left-rear caster per following steps.

- a. Step on Lower side pedal to activate Brake.
- b. Step on Upper side pedal to release Brake.

NOTE

You may need to move the Ultrasound system a little to check the break function.

Figure 6-10 Front and right-rear caster



Brake pedal function for Left-rear caster

Check the left-rear caster break function per following steps.

- a. Step on to activate Brake.
- b. Raise up to release Brake.

NOTE

You may need to move the Ultrasound system a little to check the break function.

Figure 6-11



Swivel lock

1. Step on Lower side pedal to activate Swivel Lock with clicking sound.
2. Step on Lower side pedal to De-activate Swivel Lock.

NOTE

You may need to move the Ultrasound system a little to check the Swivel lock function.

Figure 6-12 Rear-left with Swivel lock



NOTE

Wheel needs to be straight when you activate Swivel Lock.

Figure 6-13 Caster position for Swivel lock



6.4.4 Alphanumeric keyboard functional checks

To perform the function checks for the alphanumeric keyboard:

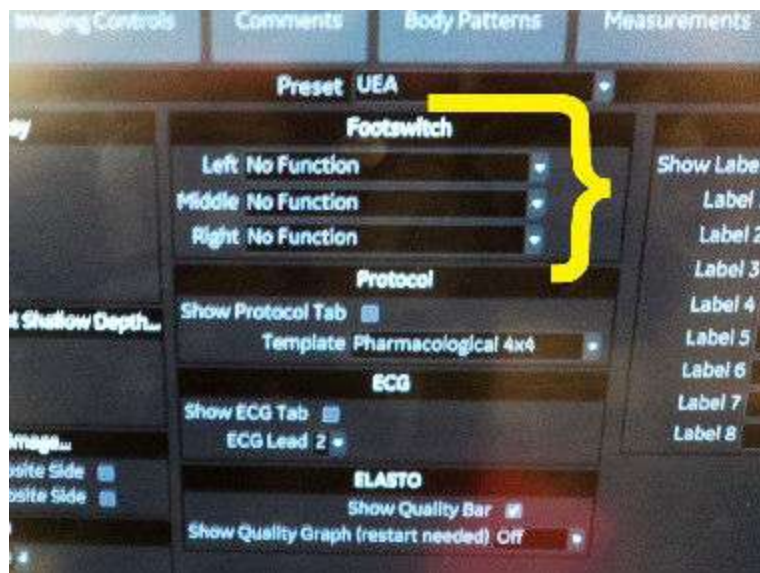
1. Press **Comment** (ABC button) on the operator control panel to activate Comment.
2. Type any comments using alphanumeric keys to confirm keyboard functionality.

6.4.5 Footswitch functional checks

To perform the function checks for the footswitch:

1. Plug in the footswitch.
2. Select **Utility > Application**.
3. Under **Footswitch**, view the footswitch programming options for **Left**, **Middle**, and **Right**.
4. Select **Freeze** for the **Left**, **Middle**, and **Right** footswitch pedals.
5. Scan and use each footswitch pedal to freeze and unfreeze to confirm each one works.

Figure 6-14 Footswitch Functional Checks



6.4.6 Basic control functional checks

Different functions can be assigned to the basic controls depending on the current active mode.

The trackball area consist of the following:

Controls are grouped together by function for ease of use.

Figure 6-15 Control Panel



1. Probe holder and cable management
2. Touch Panel
3. Joystick controls
4. On screen keyboard (not display in this graphic)
5. User defined keys
6. Mode/Gain/XYZ (3D) controls
7. Trackball, Trackball keys, Pointer, Measure, Comment, Body pattern, Clear, Zoom, Programmable keys
8. L/R, Freeze keys
9. Steer/Width/Depth/Reverse joystick
10. Auto, CF/PW auto positioning
11. P1, P2
12. Start/Stop

6.4.7 Probe/connector functional checks

NOTE

Probes can be connected at any time, whether the LOGIQ Totus is ON or OFF. However, it is a good idea to select a different probe or to freeze the image when removing a probe to avoid disconnecting a live probe. For information about connecting a probe, see *Connecting/disconnecting probes* on page 96.

To perform the function checks for a probe/connector:

NOTE

While a probe check can correctly identify most damaged probes, there are some less common types of probe defects that a probe check is not able to detect. If a probe passes the probe test but the image quality of the probe is unacceptable, please contact your service partner or Technical Support Engineer.

1. Select the appropriate connected probe from the probe indicators on the Touch Panel.
The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.
2. Launch the application. To change application without changing the current probe, press **THE DESIRED MODE** on the operator panel.
The selected application starts.
3. Verify no missing channels.
All channels is functioning.
4. Verify there is no EMI/RFI or artifacts specific to the probe.
No EMI/RFI or artifacts.
5. Test the probe in each active connector slot. See *Connecting/disconnecting probes* on page 96.
It will display pictorial data each time.
6. Repeat this procedure for all available probes.

Probes requiring a leakage test

If the probe requires a leakage test, see *Electrical Safety Tests* on page 764.

6.4.8 B-Mode functional checks

B-Mode is the Ultrasound system's default mode.

For information on the Ultrasound system's different modes as well as expected results, see the User Manual (appropriate version) or Release Notes.

Figure 6-16 B-Mode Screen Example



Depending on probe availability, choose the preset application shown below. The LOGIQ Totus probes are ONLY approved for use in the applications listed in the User Manual (appropriate version) or Release Notes.

Image Quality Check (IQC) preset for Service is available

Image Quality Check (IQC) is intended to facilitate image quality checks during quality assurance evaluations. Quality assurance tests are used to determine whether a scanner is providing the same level of performance year after year.

Using the same settings year after year ensures that data collection is consistent independently of who performs the test.

This preset only includes fundamental settings for B-Mode.

Processing modes like SRI, Harmonics, etc., are turned off.

To do an Image Quality Check (IQC):

1. Navigate to **Utility > Imaging Preset Manager**.
2. Select the probe.
3. Under **Imaging Preset Selections**, select **Category**.
4. Expand the plus sign in front of **IQC for Service**.
5. Select **IQC** and then the right arrow to assign it to a touch panel key.
6. Map the IQC to the location you want it to appear on the touch panel.
7. Select **Probe > IQC**.

Probe indications for use

See the online Help or the appropriate version of the User Manual.

Preparations

You may use a phantom (optional) when doing these tests.

1. Connect one of the probes, to the scanner's active probe connector.
 - See *Connecting/disconnecting probes* on page 96 for info about connecting the probes.

- For available probes, see *Supported Probes* on page 333 .
2. Turn ON the Ultrasound system. The B-Mode window is displayed (default mode).
 3. If needed, adjust the Brightness and Contrast setting on the monitor (see *Monitor Adjustments* on page 124).

**WARNING**

ALWAYS USE THE MINIMUM POWER REQUIRED TO OBTAIN ACCEPTABLE IMAGES IN ACCORDANCE WITH APPLICABLE GUIDELINES AND POLICIES.

4. Press **B-MODE** on the operator panel to access B-Mode.
5. These Image Controls are used to optimize the B-Mode picture:
 - Use **Gain** and **TGC** controls to optimize the overall image together with the **Power** control.
 - Use **Depth** to adjust the range to be imaged.
 - Use **Frequency** (move to higher frequencies) or **Frame rate** (move to lower frame rate) to increase resolution in image.
 - Use **Frequency** (move to lower frequency) to increase penetration.
 - Use the control to optimize imaging in the blood flow regions and make a cleaner, less noisy image.
 - Use **Reject** controls to reduce noise in the image.

Functional checks

1. Check Width, Frame rate, Frequency. The results of these adjustments must be verified on the B-Mode sector on the screen.
2. Check Up/Down, Left/Right, B Color Maps and Cineloop. The results of these adjustments must be verified on the B-Mode sector on the screen.
3. Check Gain, TGC and Depth.
4. Check B-Mode Soft Menu Controls.
5. Check Compress, Contour, Reject and Tilt.
6. Check Power and Dynamic Range.

6.4.9 M-Mode functional checks

For information on the Ultrasound system's different modes as well as expected results, see the User Manual. It will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

Table 6-2 B/M-Mode Functions

Control	Description
Power Output (Acoustic Power)	Optimizes image quality and allows user to reduce beam intensity. 10% increments between 0-100%. Values greater than 0.1 are displayed.
Dynamic Range	Controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
Frame Average	Temporal filter that averages frames together. This has the effect of presenting a smoother, softer image.
Colorize	Enables gray scale image colorization. To deactivate, reselect a Gray Map.
Gray Map	Determines how the echo intensity levels received are presented as shades of gray.
Rotation (Up/Down)	Rotates the image by selecting the value from the pop up menu.
Frequency	Multi Frequency mode lets you downshift to probe's next lower frequency or shift up to a higher frequency.
Frame Rate/Resolution	Optimizes B-Mode frame rate or spatial resolution for the best possible image.
Sweep Speed	Changes the speed at which the timeline is swept.

Preparations

You may use a phantom (optional) when doing these tests.

1. Connect one of the probes to the scanner's active probe connector.
 - See *Connecting/disconnecting probes* on page 96 for info about connecting the probes.
 - For available probes, see *Supported Probes* on page 333 .
2. Turn ON the Ultrasound system.

Functional Checks

1. Check Horizontal Sweep, Frequency, and Focus.
2. Check Compress, Reject, Power and Dynamic Range.

6.4.10 System CFM and PWD functional checks

For information on the Ultrasound system's different modes as well as expected results, the User Manual will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

For complete information, see the appropriate version of the User Manual or Release Notes.

Preparations

You may use a phantom (optional) when doing these tests.

1. Connect one of the probes to the scanner's active probe connector.
 - See *Connecting/disconnecting probes* on page 96 for info about connecting the probes.
 - For available probes, see *Supported Probes* on page 333 .
2. Turn ON the Ultrasound system.

6.4.11 Color Mode functional checks

Color Flow screens are B- or M-Mode screens with colors representing blood or tissue movement. Color Flow may be selected both from B-Mode, or from M-Mode, or a combination of these screens.

For more information, see the appropriate version of the User Manual or Release Notes.

6.4.12 Color B-Mode functional checks

For information, see the appropriate version of the User Manual or Release Notes.

6.4.13 Color M-Mode functional checks

For information, see the appropriate version of the User Manual or Release Notes.

1. Check Horizontal Sweep, PRF, Baseline, and Invert.
2. Check Variance, Color Maps, and Cineloop.
3. Check Frequency and Acoustic Power.
4. Adjust ROI.

6.4.14 PW/CW Doppler mode functional checks

For information on the Ultrasound system's different modes, the User Manual will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

Doppler is used to measure velocity (most often in blood). Doppler mode can be done with a special pencil probe or with an ordinary probe. By using an ordinary probe, you can first bring up a B-Mode picture for navigation purpose and then add Doppler.

For information, see the appropriate version of the User Manual or Release Notes.

Preparations

1. Connect one of the probes to the scanner.
 - See *Connecting/disconnecting probes* on page 96 for info about connecting the probes.
 - For available probes, see *Supported Probes* on page 333 .
2. Turn ON the scanner.
3. The 2D Mode window is displayed (default mode).
4. If needed, adjust the display's Brightness and Contrast setting.
5. Press **PW** or **CW** to start Pulsed Wave Doppler (PW) or Continuous Wave Doppler (CW).
6. Use the trackball to select the Area of Interest (Sample Volume) in PW or direction of interest in CW.

To adjust the PW/CW Doppler Mode controls:

Adjust the **Active mode gain** to set the gain in the spectral Doppler area.

- Adjust **Low velocity reject** to reduce unwanted low velocity blood flow and tissue movement.
- In PW mode, adjust **Sample volume** to low setting for better resolution, or higher setting to more easily locate the disturbed flows.
- Adjust the **Compress** setting to balance the effect of stronger and weaker echoes and obtain the desired intensity display.
- Adjust **Frequency** to optimize flow display. Higher setting will improve resolution and the lower setting will increase the depth penetration.
- Adjust **Frame rate** to a higher setting to improve motion detection, or to a lower setting to improve resolution.

NOTE

Frequency and Frame rate settings may affect the Low Velocity Reject.

- Adjust **Power** to obtain an acceptable image using the lowest setting possible. This is particularly important in CW-mode, as the energy duty cycle is 100% (constant).

NOTE

The Doppler Power setting affects only Doppler operating modes.

- Adjust the following settings to further optimize the display of the image.
- Use the **Horizontal sweep** to optimize the sweep speed.
- To view signal detail, adjust **Scale** to enlarge the vertical spectral Doppler trace.
- Use **Invert** to reverse the vertical component of the spectral Doppler area of the display.
- Use **Angle correction** to steer the ultrasound beam to the blood flow to be measured.

6.4.15 CW Doppler mode functional checks

For information on the Ultrasound system's different modes, the User Manual will familiarize you with image optimization for B-Mode, M-Mode, Color Flow, and Doppler.

1. Connect one of the probes to the Ultrasound system.
 - See *Connecting/disconnecting probes* on page 96 for info about connecting the probes.
 - For available probes, see *Supported Probes* on page 333 .
2. Turn ON the Ultrasound system. The B-Mode window is displayed (default mode).
3. If needed, adjust the display's Brightness and Contrast setting.
4. Press **CW** to start Continuous Wave Doppler (CW).
5. Use the Trackball to select the direction of interest in CW.

6.4.16 Cineloop functional checks

For complete information, see the appropriate version of the User Manual or Release Notes.

To activate CINE:

1. Press **Freeze**, then roll the trackball to activate CINE.
2. To start CINE Loop playback, press **Run/Stop**.
3. To stop CINE Loop playback, press **Run/Stop**.

To omit images:

- Roll the trackball to the frame you want to delete and press **Omit Image**.

To restore images:

- To undo deleting an image from the CINE Loop, press **Restore Image**.

To move quickly to start/end frame:

1. Press **First** to move to the first CINE frame.
2. Press **Last** to move to the last CINE frame.

To start frame/end frame:

1. Turn the Start Frame dial to the left to move to the beginning of the CINE Loop.
2. Turn the dial to the right to move forward through the CINE Loop.
3. Turn the End Frame dial to the right to move to the end of the CINE Loop.
4. Turn the dial to the left to move backward through the CINE Loop.

To adjust the CINE loop playback speed:

- Turn the Loop Speed dial right/left to increase/decrease the CINE Loop playback speed.

To move through a CINE loop frame by frame:

- Turn Frame by Frame to move through CINE memory one frame at a time.

Checks

1. Check Left Marker, Right Marker, Cycle Select and Number of Cycles.
2. Check First, Last Cycle, Select all.
3. Adjust Scroll and Cine Speed.

6.4.17 Removable media functional checks

Refer to the appropriate version of the User Manual or Release Notes to perform the following tasks:

- Using Removable Media
- Labeling Removable Media
- Formatting Removable Media
- Verifying Removable Media

Types of removable media:

- CD/DVD
- USB flash drive
- USB hard disk drive (external)

6.4.18 Archiving and loading presets

To load presets from removable media:

Refer to the appropriate User Manual.

6.4.19 Installation and setup procedures for peripherals

Refer to *Optional peripherals/peripheral connection* on page 116.

Printer Functional Check

- Perform *Test of printers* on page 308.
Equipment passed all required tests and is ready for use.

6.4.20 Basic measurement functional checks

NOTE

The following instructions assume that you first scan the patient and then press Freeze.

To check Distance and Tissue Depth Measurement:

1. Press **Measure** once to display an active caliper.
2. Move the trackball to position the active caliper at the start point (distance) or the most anterior point (tissue depth).
3. Press **Set** to fix the start point. The Ultrasound system fixes the first caliper and displays a second active caliper.
4. Move the trackball to position the second active caliper at the end point (distance) or the most posterior point (tissue depth).
5. Press **Set** to complete the measurement. The Ultrasound system displays the distance or tissue depth value in the measurement results window.

NOTE

Before you complete a measurement:

- To toggle between active calipers, press **MEASURE**.
- To erase the second caliper and the current data measured and start the measurement again, press **CLEAR** once.
- To rotate through and activate previously fixed calipers, turn **Cursor Select**.

After you complete the measurement, to erase all data that has been measured to this point, but not data entered onto worksheets, press Clear.

To check Circumference/Area (Ellipse) Measurement:

1. Press **Measure** once to display an active caliper.
2. Move the trackball to position the active caliper.
3. Press **Set** to fix the start point. The Ultrasound system fixes the first caliper and displays a second active caliper.
4. Move the trackball to position the second caliper.
5. Turn the **Ellipse** control; an ellipse with an initial circle shape appears.

NOTE

Be careful not to press the Ellipse control as this activates the Body Pattern.

6. Move the trackball to position the ellipse and to size the measured axes (the calipers).
7. To increase the size, turn the Ellipse control in a clockwise direction.
8. To decrease the size, turn the Ellipse control in a counterclockwise direction.
9. To toggle between active calipers, press **Measure**.
10. Press **Set** to complete the measurement. The Ultrasound system displays the circumference and area in the measurement results window.

NOTE

Before you complete a measurement:

- To erase the ellipse and the current data measured, press **Clear** once. The original caliper is displayed to restart the measurement.
- To exit the measurement function without completing the measurement, press **Clear** again.

Worksheets

Measurement/Calculation worksheets are available to display and edit measurements and calculations. There are generic worksheets as well as Application specific worksheets. The worksheets are selected from the Measurement touch panel.

Report Pages

Measurements/Calculations that are included on the worksheet can also be displayed on Report Pages. Report Pages can be customized to meet the appropriate needs of the user.

6.4.21 Multi image functional checks

1. Press **L** to activate a dual screen. The single image is placed on the left side.
2. Press **R** to freeze the left side image and display the image on the right side.
3. Press **B** to return to the single screen.
4. Press and hold down **L** to activate a quad screen. The single image is placed on the upper left.
5. Press **B** to return to the single screen.

6.4.22 ECG functional checks

The ECG capability on this LOGIQ Totus is intended as a trigger for measurements, but can also be viewed on the screen.

Parts needed: ECG harness and ECG pads (3 pc) (see *Options and Peripherals* on page 337 for part numbers) or an ECG simulator.

1. Select **Preset > Cardiac> Scan**.
2. If you do not see the ECG line, select the **ECG** tab. You should see the selection on the touch screen for DISPLAY ECG. Select and press.
You should see the line.
3. Plug in the ECG cables with nothing attached so you pick up noise.
The line should display noise.
4. Connect the ECG harness to the connector on the front of the Ultrasound system.
The Ultrasound system displays a straight curve along the bottom edge of the image sector on the screen.
5. Connect the three leads to an ECG simulator, or fasten the three ECG pads to your body and connect the three leads to respective ECG pad.
When connecting, the signal on the screen will be noisy. When the connection is completed, a typical clean ECG signal is displayed.

6.4.23 4D option functional checks

Required equipment: 4D Probe (RAB6-D or RIC5-9-D)

To perform the functional checks for 4D:

1. Connect a 4D probe.
2. Press the [3D/4D] button on the console.
3. Press the [4D] button on the [Mode] tab.
4. Press the [Visualization] button, then select Render.
5. Press the [L] key the console to start 4D data acquisition.
6. To complete the acquisition, press [Freeze] or [R].

6.4.24 Volume Navigation with inside probe functional checks

Required tools: a supported VN probe, Transmitter

1. Connect a transmitter.
2. Connect a VN probe to any probe ports and select it.
3. Using a VN probe scan and enable VNAV.
4. Check the system detects sensor and scans by confirming the appearance of a single quality bar on the screen.
5. Move a VN probe towards transmitter. Expected result is that the quality bar gauge shows 4.

Figure 6-17 Quality bar gauge



Expected result is that the quality bar gauge shows 4.

6.4.25 Battery Pack functional checks

NOTE

Depending on the battery health status, the system may experience a crash during this procedure. Please make sure that all system data is saved, and the system is properly backed up before proceeding.

To perform the functional checks for Battery Pack:

1. With the LOGIQ Totus powered up, verify the "batteries charging" icon displays in the status bar and the LOGIQ Totus operates as intended.
2. Unplug the mains power cable from the wall. The LOGIQ Totus enters Battery Pack upon AC power loss. There is an initial temporary message saying the LOGIQ Totus is entering battering mode, then a message appears, saying the LOGIQ Totus is "running on battery".
3. Plug the mains cable back into the wall power and continue with functional checks.

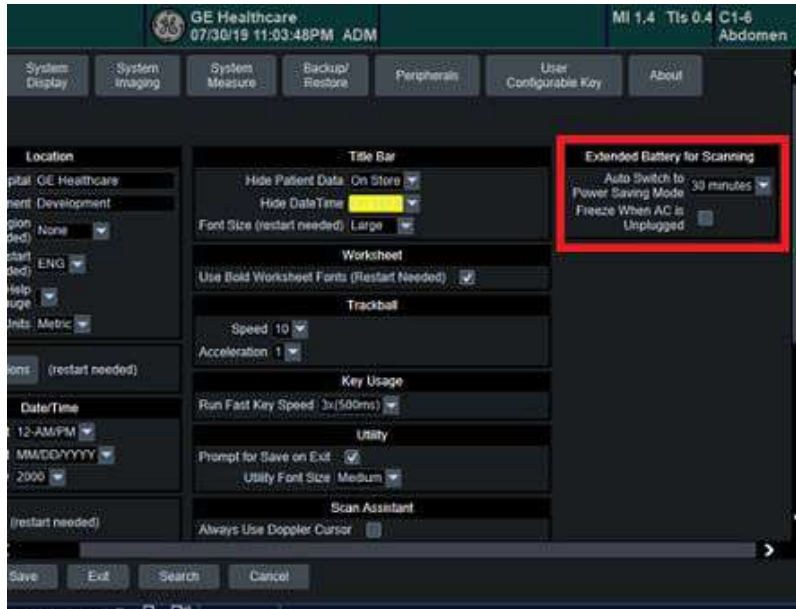
6.4.26 Battery Pack Extended functional checks

NOTE

Depending on the battery health status, the system may experience a crash during this procedure. Please make sure that all system data is saved, and the system is properly backed up before proceeding.

1. With the LOGIQ Totus powered up, verify the “batteries charging” icon displays in the status bar and the LOGIQ Totus operates as intended.
2. Go to **Utility -> System->General** then make sure “Auto Switch to Power Saving Mode” is 30minutes and “Freeze When AC is Unplugged” is unchecked like following picture.

Figure 6-18 Checking the extended battery set up



3. Confirm you can unplug the Ultrasound system, it remains on for several seconds and then plug it back in without it shutting down. A message may appear to with a notification of being in this mode.
4. Verify that Scan is continued while the system is unplugged without shutdown.
5. Reconnect AC power.
6. Verify that the batteries begin charging via the battery status icon.

6.4.27 Shear Wave Elastography (Shear Elasto) functional checks

If the Shear Wave software option is not enabled, the option to select the Shear Elasto soft button after pressing the Elasto button on the touch panel key "Shear Elasto/strain Elasto" button WILL NOT be present.

To perform the functional checks for Shear Elasto:

1. Select a probe (L2-9-D or C1-6-D).
2. Select the **ELASTO** button.
3. From the touch panel, select the **Shear Wave** button (if not already selected).
4. Verify that the **Shear Wave** button is available.

6.4.28 Vscan Air CL probe connection check

1. Press and hold the Vscan Air CL power button for approximately two seconds while watching the probe LED lights.

NOTE

Do not continuously hold the button for longer than 5 seconds, or the probe will shut down after booting up. The LED lights will first briefly display the battery level (green, yellow, or orange), then the display power up (two blue lights). Release the Vscan Air CL power button when you see the power up light.

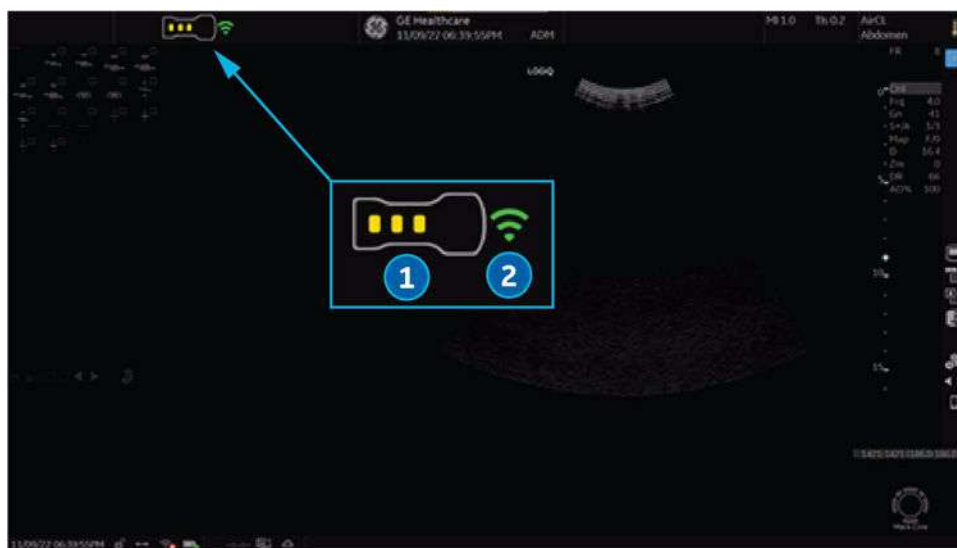
2. After the LED lights enter the booting up state (two white lights blinking alternately), followed by the searching state (two white lights blinking synchronously), tap the power button to allow connection during this searching state.
3. Wait for pairing. Pairing will take 5-30 seconds to complete. When pairing is complete, the two LED lights will shine steady blue indicating the connection is established.
4. Confirm that the Vscan Air CL probe icon appears on the Ultrasound system Touch Panel as shown below.

Figure 6-19 Vscan Air CL Touch Panel Icon



5. Confirm that the probe battery and Wi-Fi icons are shown on the Ultrasound system main display as below.

Figure 6-20 Vscan Air Battery and Wi-Fi Icons



6.4.29 Vscan Air CL charger functional check

NOTE

Please note that the Vscan Air CL charger is specifically designed to charge the probe only when the system is turned on.

NOTE

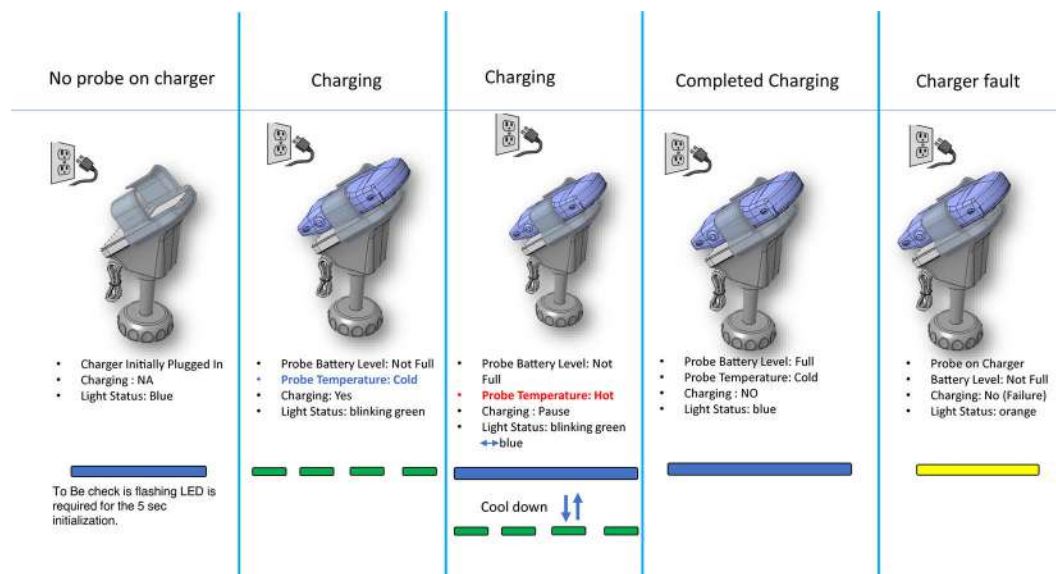
Please note that the Vscan Air CL charger is exclusively designed to charge the probe and cannot be used to charge other devices or accessories.

1. Confirm that charger light status is blue when the Vscan Air CL charger USB cable is plugged into the Ultrasound system.
2. Place the Vscan Air CL probe on the charger and confirm the following:
 - While the Vscan Air CL probe is charging, the charger and probe status are as follows.
 - Charger light status is blinking green
 - Vscan Air CL probe light status is yellow
 - When the Vscan Air CL probe charging is completed, the charger and probe status are as follows.
 - Charger light status is blue
 - Vscan Air CL probe light status is green

NOTE

If the probe overheats during the charging process, the system will suspend charging until the probe temperature drops down.

Figure 6-21 LED status per mode



6.5 Site Log

Table 6-3 Site Log (Paper Documentation)

[illegible]

Date	Service Person	Problem	Comments

Chapter 7

Software

In this chapter

Loading / Reloading / Upgrading the Software.	188

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

7.1 Loading / Reloading / Upgrading the Software

This section describes how to install and/or re-install software on LOGIQ Totus.

Contents in this section

- *Software provided with the LOGIQ Totus* on page 188
- *Software load checklist* on page 188
- *Space management - moving all images* on page 190
- *Backing up the Patient Archive and System Configurations* on page 190
- *Full disk encryption and replacement procedures* on page 193
- *Loading the base image and application software - full load* on page 195
- *Loading the base image and application software - C only* on page 205
- *Loading Only Application Software* on page 211
- *Software load with eDelivery (Direct to Device)* on page 216
- *Microsoft security patch updates* on page 217

7.1.1 Software provided with the LOGIQ Totus

Software is provided on a flash drive with base load image and application software. If patch software has been included, an additional flash drive may be included with patch software. Verify that the software is current. Updated software may be available. Check for any available FMIs.

7.1.2 Software load checklist

This table helps service engineers prepare for performing a software load on a LOGIQ console:

Table 7-1 Software Load Checklist

Impacted Area	Full Software Load	C:\ Drive (System Only) Load	Application Software Load
Disk Encryption	No impact. Entire drive is wiped.	You will need to have the encryption key.	No action required as this is not impacted.
Patient Archive	Backup is required.	Backup is recommended.	Backup is recommended.
User Configuration Settings (Presets)	Backup/Restore is required	Backup is recommended.	Backup is recommended.
System IP Address (if not in DHCP)	Record information. Manually configure after full software load.	Backup is recommended.	Backup is recommended.
Wireless Network Information (Wi-Fi Certificate, Network User and Password)	Record information. Manually configure after full software load.	Record information. Manually reconfigure after C:\ Drive (System Only) Load.	No action required as this is not impacted.
MS OS Patch	Must be manually loaded after full software load.	Manually reinstall after C:\ Drive (System Only) Load.	No action required as this is not impacted.
3rd Party Applications (AppAPI): PIUR Imaging, KOIOS Lite	Must be manually reinstalled after full software load.	Manually reinstall after C:\ Drive (System Only) Load.	No action required as this is not impacted.
Special Devices (Device Management, KOIOS DS, Insite, etc.)	Record information. Manually configure after full software load.	Record information. Manually reconfigure after C:\ Drive (System Only) Load when needed.	No action required as this is not impacted.

Impacted Area	Full Software Load	C:\ Drive (System Only) Load	Application Software Load
Printer (Internal Printer)	Does not need to be disconnected.	Does not need to be disconnected.	Does not need to be disconnected.
Other Peripherals or Connected Devices	Removal is required. Remove all media from USB ports and internal drives (for example, DVD) and disconnect any portable hard drives, HDMI cables and/or external monitors.	Removal is required. Remove all media from USB ports and internal drives (for example, DVD) and disconnect any portable hard drives, HDMI cables and/or external monitors.	Removal is recommended.

7.1.3 Space management - moving all images

Notice

In order to complete a successful restore of the Patient Database, if needed, the images must be moved away from Ultrasound system before doing backup of the Patient Database. Depending on the location set-up, either move the images to a remote server or to removable media like DVD or CD discs. As the images are moved, the database will point to the new location. If the backup procedure is not completed correctly, the images and database information could be lost.

Refer to "Recording Images" in the User Manual (appropriate version).

**WARNING**

Before loading software, CONFIRM WITH THE CUSTOMER OR SITE ADMINISTRATOR whether the patient archive has been encrypted and if the customer has the password or the key to unlock the data. Failure to obtain those items will cause permanent DATA LOSS!

Speak with the personnel at the site to determine which patient images need to be backed up prior to starting.

7.1.4 Backing up the Patient Archive and System Configurations

**CAUTION**

An error, or a power loss, may occur during the software loading. Always back up the patient images, patient archive, and the system configurations before starting a software load.

In order to complete a successful restore of the patient database, if needed, the images must be moved away from the LOGIQ Totus before backing up the patient database. Depending on the location set-up, either move the images to a remote server or to removable media like DVD or CD discs. If the backup procedure is not completed correctly, the images and database information could be lost.

See "Backup and Restore" in the User Manual (appropriate version).

7.1.4.1 Full and Detailed Restore

Full Restore

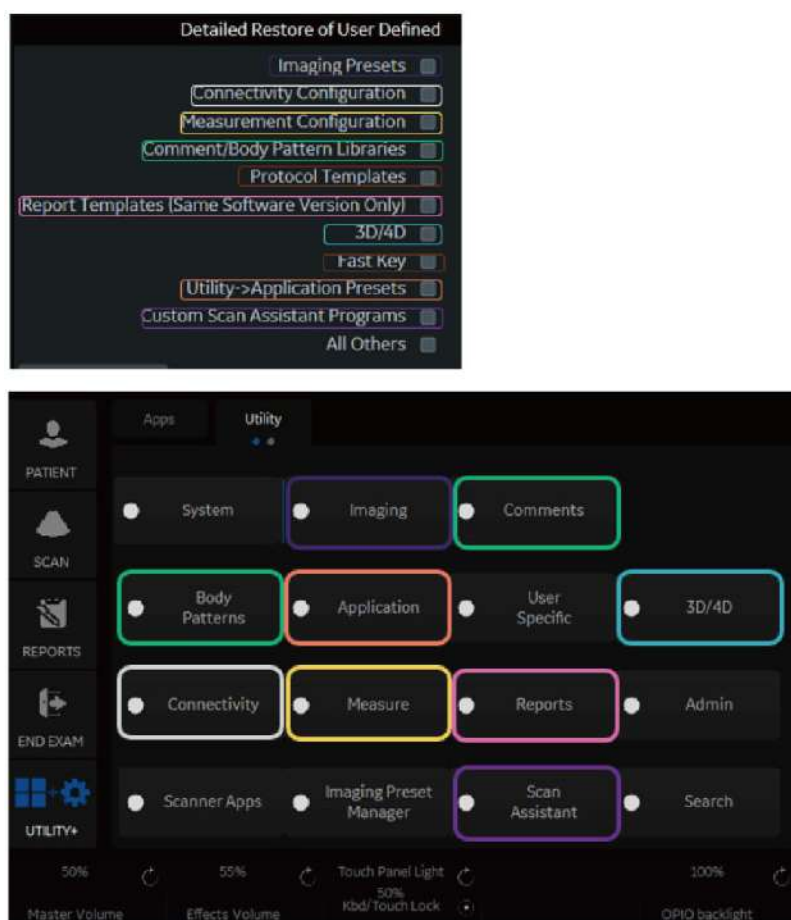
Full Restore will first delete the system preset and then copy the entire preset from the backup. As a result, the system preset will be completely replaced with the backed-up preset.

Detailed Restore

Detailed Restore will delete the selected category preset from the system and then copy the corresponding category preset from the backup. If no preset is saved for a category in the backup, Detailed Restore will not delete the category preset from the system. The result will be the same as if the category were unchecked during a Detailed Restore.

Colored box in the "Detailed Restore of User Defined" corresponds to the same colored box on the button in Utility shown in the illustration below. The configuration of the selected items will be restored.

Figure 7-1 Detailed Restore except All Others

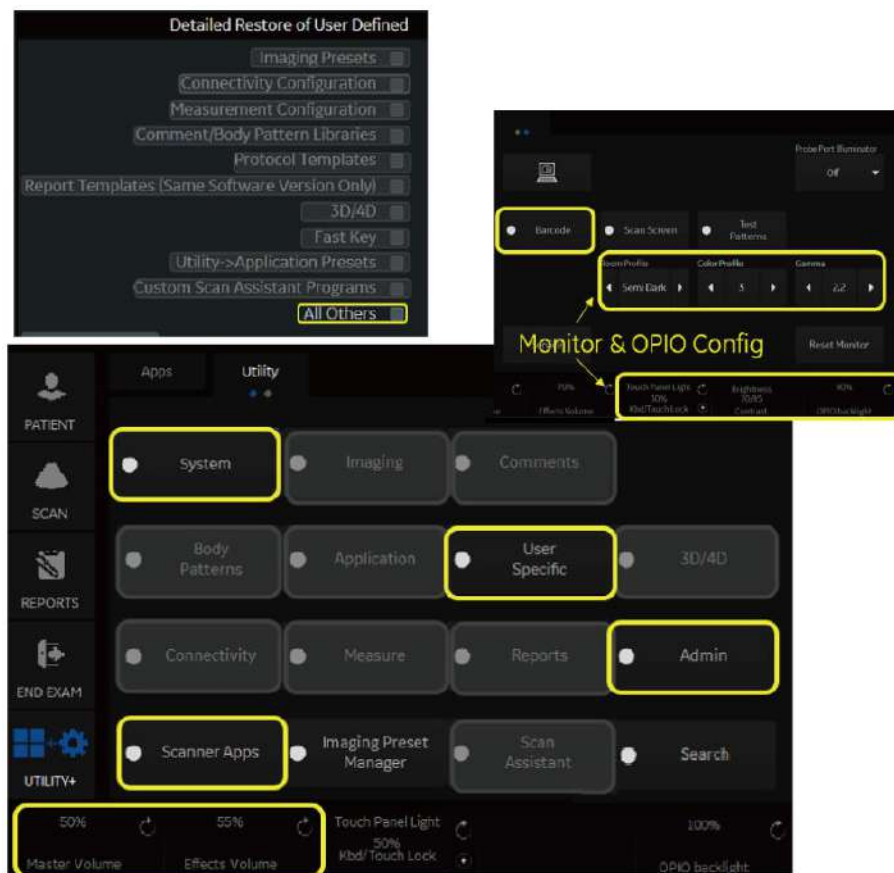


- **Protocol Templates:** It will be created through Protocol Tab from Cardiac applications the preset.
- **Fast Key:** Key sequence will be created by F5.

When **All Others** is selected, it will restore the following configurations enclosed in yellow.

- System
- Admin
- User Specific
- Scanner Apps
- Master/Effect Volume
- Monitor & OPIO Config

- Barcode

**NOTE**

Make sure the USB media is freshly formatted before use.

7.1.5 Full disk encryption and replacement procedures

Full disk encryption (all partitions on the SSD are encrypted) is available. Previously, only patient data on the E: drive could be encrypted.

Due to full disk encryption, some replacement procedures require an extra step to make sure the data is recoverable after the replacement.

- If the LOGIQ Totus is down, you must have the correct recovery keys and password (if set up), otherwise the data will be irretrievable. recovery keys are required.
- If the LOGIQ Totus is up and running, suspend encryption before performing a replacement procedure (hardware or software). Otherwise you must have the correct recovery keys and password (if set up). The length of encryption varies. Generally, encryption with SSD takes about 20 minutes. recovery keys are required.

Patient data should be backed up before these replacement procedures. If possible, the customer should be backing up data on a regular basis. In the event the system cannot access the patient data after the repair, the backup would be the only way to return the data to the LOGIQ Totus.

Use this table to determine the steps needed when performing a replacement procedure. Refer to the complete replacement steps in Chapter 12.

Table 7-2 Replacement Procedures and Encryption Updates

Procedure	Full disk encryption is...	After replacement, load...	After load, perform...
Loading application software	On	N/A	N/A
	Off	N/A	N/A
Loading base and application only (C only) software "1	On	N/A	"To complete a replacement procedure with full disk encryption On."
	Off	N/A	N/A
Software Reload (from Service Desktop)	On	If encryption is On and Locked, you will be prompted to turn it off. Encryption will then be suspended. (Encryption is automatically suspended if you load software from the Service Desktop).	Go back and select initialize encryption again as loading from the repository leaves the drives encrypted but Off (in case there is an issue).
	Off	N/A	N/A
SOM replacement using the existing SSD "1, "2	On	Application only (C only) software	"To complete a replacement procedure with full disk encryption On."
	Off		N/A
SSD (solid state drive) replacement	On	Full load image and application software	Go to Encryption > Select Initialize Encryption again. Doing a full load leaves the application drive unencrypted.
1. If system has been full disk encryption, the system may request to type the correct recovery keys and password, in advance, note the correct recovery keys and password. 2. If it needs to replace the SSD with new one at same time as SOM replacement, refer to SSD (solid drive) replacement in same table.			

7.1.5.1 Replacement procedure with full disk encryption On

To complete a replacement procedure with full disk encryption

The system may request the recovery keys through the Numeric Key dialog box. This dialog box may display up to three times (once for each of the encrypted partitions).

1. Once you select to load C only or System, the system will check for encryption status and if not suspended or turned off, it will prompt you to enter the recovery keys. On the Numeric Key dialog box, enter the recovery key and then select Submit and Exit. This step automatically place the entered number in Memory.



2. When the Numeric Key displays Second time, select **Mem Recall** to recall the recovery key from memory and then select **Submit and Exit**.
3. When the Numeric Key displays the third time, select **Mem Recall** to recall the recovery key from memory and then select **Submit and Exit**. If the keys are accepted, the system will continue to load the software.
4. Close with the X.
5. When the Numeric Key displays again, select **Mem Recall** to recall the recovery key from memory or manually enter the recovery key.
6. Close with the X.

7.1.6 Software load with USB media

Perform these procedures to load software from the USB media (thumb drive):

Loading the base image and application software - full load on page 195

Loading the base image and application software - C only on page 205

Loading Only Application Software on page 211

7.1.6.1 Loading the base image and application software - full load

Follow this procedure to load the base image software and application software from the thumb drive.

NOTE

Lockout/tagout (LOTO) is not required as you will not manipulate any electronics.

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 7-3 Manpower, Time, Tools, and PPE

Manpower	Time	Tool	PPE
One person	Approximately 1 hour and 30 minutes to 2 hours and 30 minutes depending on the amount of back-up/restore activities (presets and patient archive) needed prior to and after the installation.	Software thumb drive	No PPE required

Loading base image and application software



WARNING

Before loading software, CONFIRM WITH THE CUSTOMER OR SITE ADMINISTRATOR that the patient archive has been backed up. Failure to do so will cause permanent DATA LOSS!

Notice

Before loading the base image load software, remove all media from USB ports and internal drives (for example, DVD), and disconnect any portable hard drives, HDMI cables and/or external monitors. Failing to do so may interrupt the software load process. The USB printer does not need to be disconnected.

Read and understand the contents of this procedure before performing the software update.

Before loading the base image and application software, you must perform the following steps:

- Verify that third-party software AppAPI is installed (for example, PIUR Imaging).

NOTE

Third-party software AppAPIs must be reinstalled after a base image and application software (full load) and a C:\ Partition load.

- Back up patient data by using EZBackup or Export.

NOTE

Do not use Patient Archive Backup/Restore in Utility > System > Backup Restore to back up patient data. For more information on backing up and restoring patient data or system presets, see “Backup and Restore” in the LOGIQ Totus User Manual, (applicable version).

- Back up user-defined configurations only. Leave service unchecked.

NOTE

Use a USB thumb drive to back up user-defined configurations. Format the USB media before using it for preset backups. These configurations will be restored once the software load is complete.

- For software options (for example, Breast Assistant, Powered by Koios DS (for R3 and earlier; Utility > Connectivity > Koios and for R4; Connectivity > Connection Manager > Special Devices > Koios), Tricefy (for R3 and earlier; Utility > Connectivity > Tricefy and for R4; Connectivity > Connection Manager > Special Devices > Tricefy), and Device Management (for R3 and earlier; Utility > Connectivity > Device Mgmt and for R4; Connectivity > Connection Manager > Special Devices > Device Mgmt) capture the information on those screens before loading the full ghost.

NOTE

Once the software installation is complete, use this information to set up the options again.

- Check the Regional preset setting (Utilities > System > Preset Region) and make note of it (None, Americas, Asia, Europe or Japan). This needs to be set up again after the software load to successfully restore imaging presets. If you have a different selection, an error will occur stating that the region does not match.
- Confirm that no images are in the clipboard or opened exams.
- Disconnect the Ultrasound system from the network and remove all transducers from the system.
- If used, disconnect the secondary monitor.
- Connect and turn ON the printer to retain printer preferences. Before you load the base image, record any printer preferences. After the base image is loaded, check the printer preferences and update as needed. If a printer is plugged in at this time, it is automatically installed.
- You must record all service presets on paper to restore remote connectivity after software installation is complete. You will have to manually restore service presets (for example, Agent Configuration).
- From Windows, Utility > Connectivity > TCP/IP for R2/R3, Connectivity > Connection Manager > Network for R4 or from the customer, manually record the DNS server settings.

7.1.6.1.1 Load Base Image and Application Software- full load

1. Perform the following steps before inserting the software thumb drive.
 - a. Remove any USB flash drives and any CD/DVDs from the DVD drive prior to updating the software.
 - b. Disconnect the system from the network and remove all transducers from the system.
 - c. If used, disconnect the secondary monitor, any HDMI cables and/or external monitors.
 - d. Power down the system.
2. Insert the software thumb drive into the USB port on the back of the LOGIQ Totus.
3. Power on the LOGIQ Totus.

Figure 7-2 Boot up screen



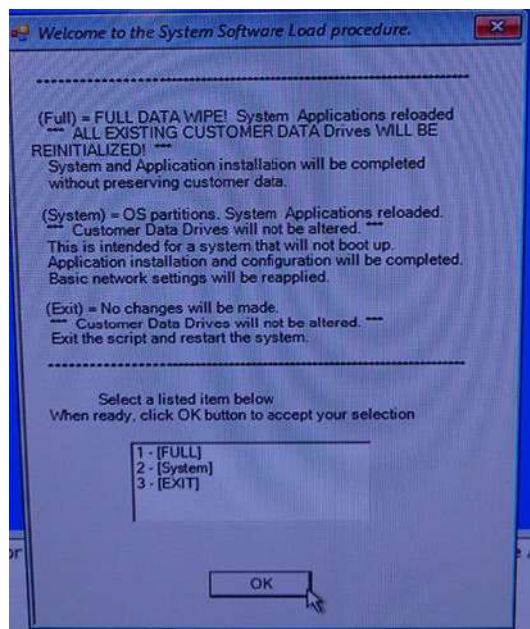
CAUTION

Selecting 1- (FULL) is a DATA WIPE & System Application reload. ALL EXISTING PATIENT DATA WILL BE REMOVED. All existing data will be removed. System and application installation will be completed without preserving customer data.

4. Perform the following steps to start the Full load.
 - a. Select **1 - (FULL)**.

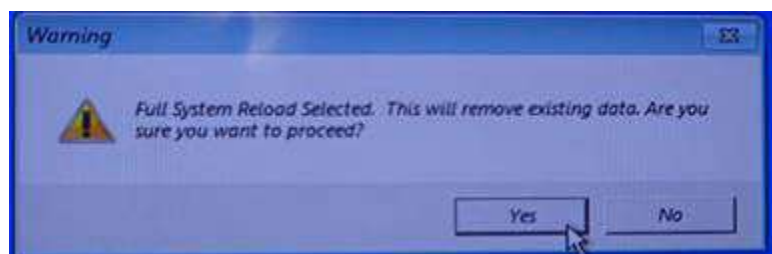
- b. With the trackball, point to OK and press the left set key to select **OK**.

Figure 7-3 Software load selection menu



- c. In the Warning dialog box, select **Yes**.

Figure 7-4 Dialog box



NOTE

This will take approximately 10-15 minutes.

5. View the following screens as the application software loads.

NOTE

This will take approximately 15-20 minutes.

Figure 7-5 Application software loading screen

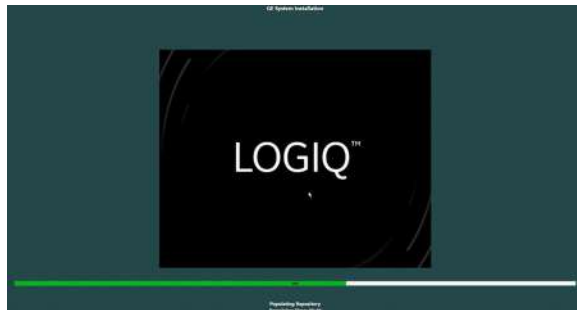
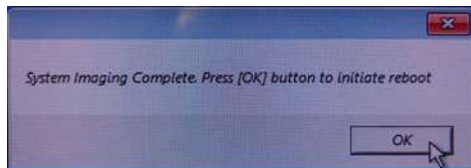


Figure 7-6 Application software loading screen 2



6. When System Imaging is Complete displays, do the following:
 - a. Select OK to reboot the system.
 - b. Remove the USB media BEFORE the system starts rebooting.

Figure 7-7 Initiate Reboot



7. After the system reboots, view the following screens as the application software loads.

NOTE

This will take approximately 15-20 minutes.

NOTE

The following screen shots are examples of the progress screens that will display as the software loads. These progress screens vary according to the software revision and version.

Figure 7-8 Boot up screen



Figure 7-9 Application software loading screen



8. After the system reboots again, view the following screens as the application software loads.

Figure 7-10 Boot up screen

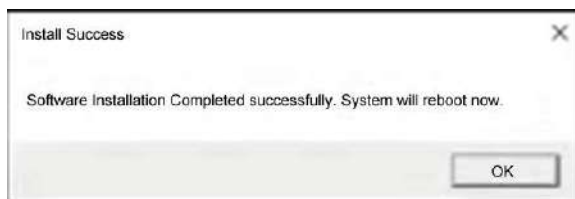


Figure 7-11 Application software loading screen



- When the Install Success dialog box displays, if necessary, select **OK** to reboot the system.

Figure 7-12 Install Success dialog box



- After the system reboots, view the following screens as the audio is configured.

NOTE

This will take approximately 15-20 minutes.

Figure 7-13 Boot up screen



Figure 7-14 Audio configuration screen



11. Once the application software installation is complete, the LOGIQ Totus restarts.

Figure 7-15 Boot up screen



Figure 7-16 Sign out message



12. After boot up, in **Operator**, enter **ADM**. In **Password**, leave this field empty.

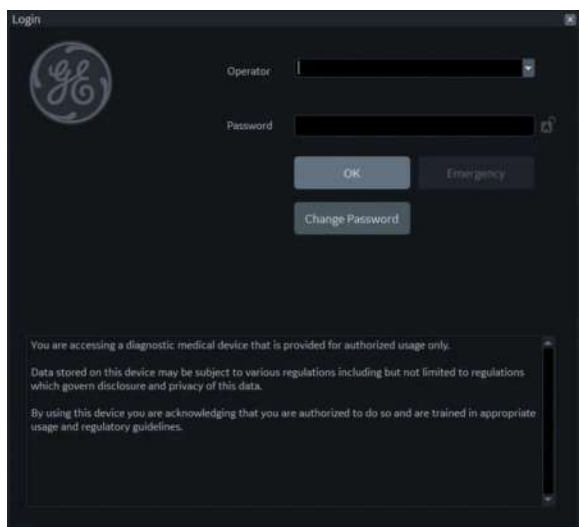
NOTE

No password is required. Do not create any password at this time.

Figure 7-17 Boot up screen



Figure 7-18 Login screen

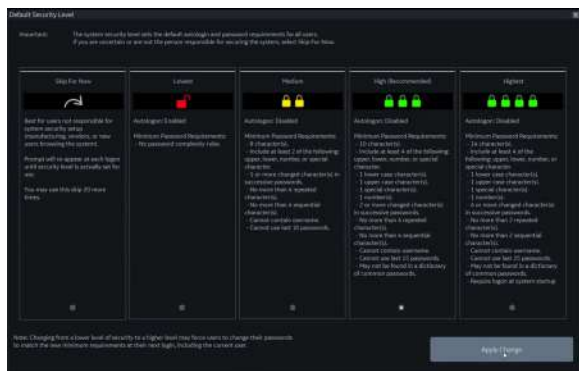


- When prompted with Default Security Level, select **Skip for Now** for the security level, and then select **Apply Change**.

NOTE

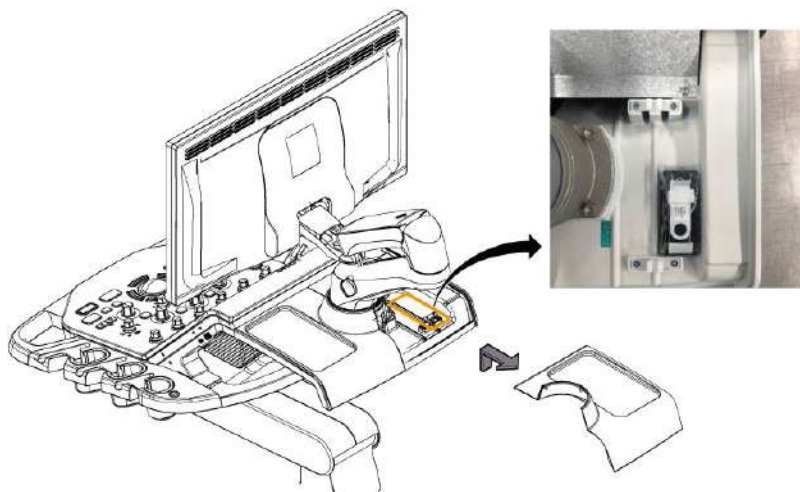
If you select the Lowest security level and then continue with installation and testing. After the update is complete, you can transfer the LOGIQ Totus to the Site Administrator who can reset the security level for the site. The security level can be reset through **Utility > Admin > Logon**.

Figure 7-19 Security Level Screen



- Put USB flash memory about BASE SYSTEM SOFTWARE and APPLICATION SOFTWARE in a pocket on OPIO BOTTOM BASE after removing the top cover left again.

Figure 7-20 USB flash memory storage



7.1.6.1.2 Verifying the software versions

- From the touch panel, select **Utility > System > About**.
- Verify software version matches the version in the software used during installation, version received with the kit.
- If upgrading software, verify the software version matches the version provided with the upgrade kit.

7.1.6.1.3 Verifying the software option key settings

NOTE

Software option keys are software version dependent. If a new software version has been installed, please follow installation instructions for that software. Usually, with new software option strings are needed. When re-installing the same software, the software option strings should be reused.

- From the touch panel, select **Utility > Admin > System Admin**.
- Verify that the options previously installed in the system are still activated after the software installation.

3. If any option is missing, request new option strings from the Online Support. Enter any new or missing option key string(s) in the **S/W Option Key** field and select **Add**, or by importing from a USB or DVD drive.

7.1.6.1.4 Verifying the TCP/IP settings:

For R4 and later:

1. From the touch panel, select **Connectivity > Connection Manager > Network**.
2. Verify the network settings.
3. If needed, manually set the DNS server settings you recorded.
4. If you modified or updated any settings, select **Done**.
5. Reboot the system.

7.1.6.1.5 Restoring the patient archive

Restore the patient archive (if previously exported or backed up with EZBACKUP) using the import function. If the patient archive media is encrypted and locked, you will need the encryption key or password to unlock it.

From the touch panel, select **Patient > Data Transfer > Import**.

7.1.6.1.6 Verifying the AE title and port settings (R3 and earlier)

1. From the touch panel, select **Utility > Connectivity > Device**.
2. Verify device settings.
3. If you modified or updated any settings, select **Save settings**.
4. Select **OK** to continue.

7.1.6.1.7 Verifying the AE title and port settings (R4 and later)

1. From the touch panel, select **Connectivity > Connection Manager > Scanner**.
2. Verify the settings.
3. If you modified or updated any settings, select **Done**.

7.1.6.1.8 Restoring system configurations

1. From the touch panel, select **Utility > System > Backup/Restore**.
2. On the **Restore** screen, select System configuration to restore System settings/User Defined Configuration.
3. Select the appropriate source device.



CAUTION

The restore procedure will **OVERWRITE** the existing data on the local hard drive. Make sure to select the correct source device.

4. If restore is done from a backup on a removable media, insert the media in the drive.
5. Select **Restore Now**.
6. Ensure that the correct source is selected, and select **OK**.
 - Depending on the selection, one or two restore confirmation windows are displayed.
 - The selected items are copied to the LOGIQ Totus. If items from the System Configuration are restored, the LOGIQ Totus needs to be rebooted. The Reboot system window is displayed.
7. Select **OK** to reboot the system, and verify the Customer Presets are working properly.
8. Import scan assistant programs previously exported.
9. Check the printer selection and reselect the standard printer color and/or B&W if needed. Reloading software may reset the printer selection even after restoring user configurations.
10. Load the online help files from the eIFU flash drive. For more information, see "Updating Documentation on the Ultrasound Scanner Via the USB" in the User Manual (appropriate revision) or the eIFU leaflet.
11. Check for any field that appears highlighted in yellow as this is an indication that the field needs to be reset.

12. Confirm that at least the system drive encryption has been initialized. Contact the site administrator for them to set up the user partitions encryption.
13. Set up InSite. See the User Manual for instructions if using GE HealthCare Connect Guide under the InSite icon menu, or the Service Manual if using the Agent Configuration from the Service Desktop.
 - Navigate to **Utility (second page) > Service > Utilities**, select **Resolve Agent Quarantine** and, if the system appears to be in quarantine, resolve the quarantine. If the quarantine does not resolve, contact the On Line support team to escalate the issue.
14. If Device Management was active prior to the upgrade, you need to re-enter the e-mail address since it does not get repopulated automatically.
 - If Device Management was active prior to the software load, confirm that the cloud still verifies your activation.
 - Navigate to **Utility > Connectivity > Device Mgmt** and confirm that status shows “Active”. It is normal if the e-mail address is not visible. If so, proceed to select “Verify” and confirm that you get a smiley face. Keep in mind that you need to be connected to the network for the Device manager to verify successfully.
 - If the system is not successfully connecting to the cloud, contact the Online Center for support indicating the serial number of the unit, description of the problem and e-mail of the admin user registered in the account.
15. Configure any new features (for example, Device Management) if applicable. Refer to the User Manual for more information. For software options (for example, Breast Assistant, Powered by Koios DS and Tricefy), restore the information you recorded before loading the full ghost.
16. Store the software thumb drive on the inside pocket of the left side cover. Reinstall any covers and verify that all screws and covers removed earlier have been installed.

7.1.6.1.9 Functional checks

Table 7-4 Functional Checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

7.1.6.2 Loading the base image and application software - C only

Follow this procedure to load the application software and Windows operating system from the thumb drive. This procedure will load System partition only and will also load the repository partition. Neither Patient data nor user data is lost.

If disk encryption is enabled, you will need the correct recovery keys (32-bit string) and password (if set up). If recovery keys are not available, you will have to do a full load instead. The only way to recover the patient data is if the customer has previously backed up data and images.

NOTE

It is recommended to suspend encryption rather than turning it off. For non self-encrypted drives, turning encryption off will take 24 hours.

NOTE

Lockout/tagout (LOTO) is not required as you will not manipulate any electronics.

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 7-5 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 1 hour and 30 minutes to 2 hours and 30 minutes depending on the amount of back-up/restore activities (presets and patient archive) needed prior to and after the installation.	Phillips screw driver Software thumb drive	No PPE required

7.1.6.2.1 Loading application software



WARNING

Before loading software, CONFIRM WITH THE CUSTOMER OR SITE ADMINISTRATOR if the patient archive has been encrypted and if the customer has the password or the key to unlock the data. Failure to obtain those items, will cause permanent DATA LOSS!

NOTE

Before loading the base image load software, remove all media from USB ports and internal drives (for example, DVD), and disconnect any portable hard drives. Failing to do so may interrupt the software load process.

Read and understand the contents of this procedure before performing the software update. Before loading the base image and application software, you must perform the following steps:

- Back up patient data and system presets.
- Confirm that no images are in the clipboard or opened exams.
- Disconnect the system from the network and remove all transducers from the system.
- If used, disconnect the secondary monitor.
- Connect and turn ON the printer to retain printer preferences. Before you load the base image, record any printer preferences. After the base image is loaded, check the printer preferences and update as needed.

If a printer is plugged in at this time, it is automatically installed.

- Save all service presets to restore remote connectivity after software installation is complete.
- Save all user presets.
- For more information on backing up and restoring patient data or system presets, see “Backup and Restore” in the User Manual (latest revision).

1. Suspend encryption prior to turn off the system.

NOTE

Suspended encryption will be maintained until reboot, make sure this is the last step prior to reload.

- a. From the touch panel, select **Utility > Admin**.

- b. Select [Disc Encrypt] Tab.
 - c. Click "Choose Encryption Policy".
 - d. Select "Encryption OFF" and click [Accept].
2. Perform the following steps before inserting the software thumb drive.
 - a. Remove any USB flash drives and any CD/DVDs from the DVD drive prior to updating the software.
 - b. Power down the LOGIQ Totus.
 - c. If used, disconnect the secondary monitor, any HDMI cables and/or external monitors.
3. Insert the software thumb drive into the USB port on the back of the LOGIQ Totus.
4. Power on the LOGIQ Totus.

Figure 7-21 Boot up screen



5. Perform the following steps to start the System only load.

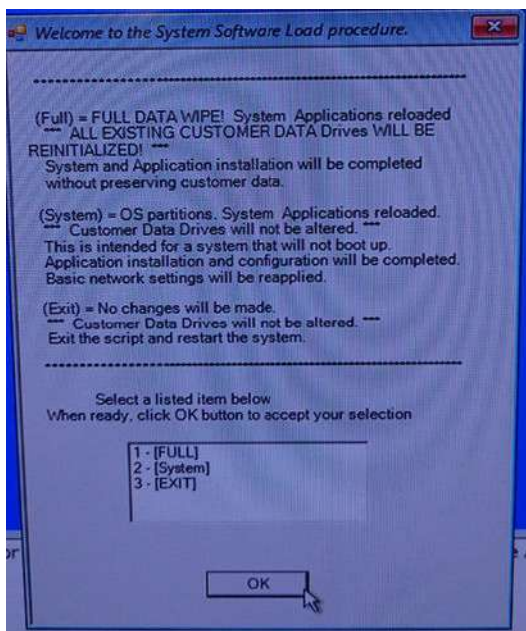
1. Select **2 - (SYSTEM)**.

NOTE

Selecting **2-System** is a not DATA WIPE. ALL EXISTING PATIENT DATA WILL BE PRESERVED.

2. With the trackball, point to OK and press the left set key to select **OK**.

Figure 7-22 Software load selection menu



NOTE

This will take approximately 10-15 minutes.

NOTE

If encryption is enabled, a warning message will appear requesting to connect a USB keyboard to enter the encryption recovery key. Select OK to continue and enter the key using the alphanumeric keyboard.

6. View the different screens that appear as the following tasks are performed:

- Starting System Software Installation
- Cleaning System Disk
- Populating Repository Drive
- Populating System Drive

Figure 7-23 Application software loading screen

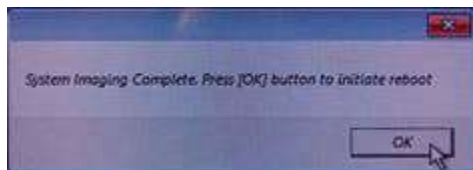
**NOTE**

This will take approximately 10 minutes.

7. When System Imaging is Complete displays, do the following:

- a. Press OK to reboot the system.
- b. Remove the USB media BEFORE the system starts rebooting (right after the screens go black).

Figure 7-24 System Reboot Message



8. View the different tasks on the screen as the application software loads.

NOTE

This will take approximately 20 minutes.

Figure 7-25 Application software loading screen



9. Once the application software installation is complete, the LOGIQ Totus restarts.

Figure 7-26 Message before reboot



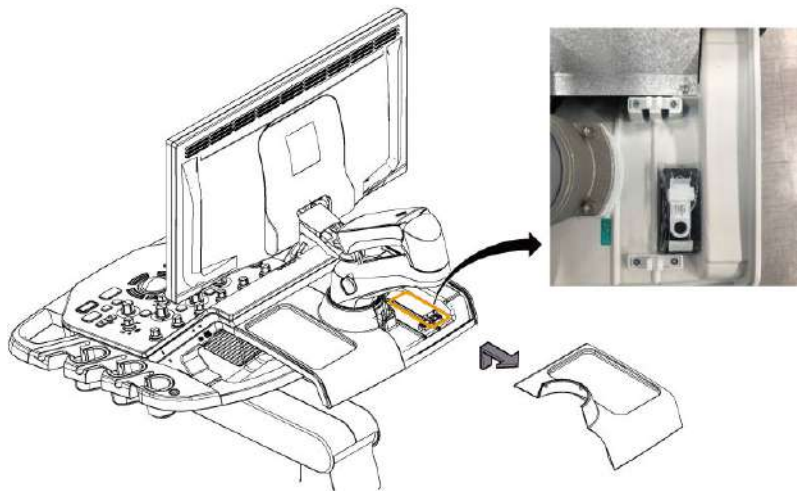
10. After boot up, log in as ADM (no password required) and, when prompted, select **Lowest** for the security level.

NOTE

Select the Lowest security level and then continue with installation and testing. After the update is complete, you can transfer the LOGIQ Totus to the Site Administrator who can reset the security level for the site. The security level can be reset through **Utility > Admin > Logon**.

11. Put USB flash memory about BASE SYSTEM SOFTWARE and APPLICATION SOFTWARE in a pocket on OPIO BOTTOM BASE after removing the top cover left again.

Figure 7-27 USB flash memory storage



7.1.6.2.2 Verifying the software versions

1. From the touch panel, select **Utility > System > About**.
2. Verify software version matches the version in the software used during installation, version received with the kit.
3. If upgrading software, verify the software version matches the version provided with the upgrade kit.

7.1.6.2.3 Verifying the software option key settings

NOTE

Software option keys are software version dependent. If a new software version has been installed, please follow installation instructions for that software. Usually, with new software option strings are needed. When re-installing the same software, the software option strings should be reused.

1. From the touch panel, select **Utility > Admin > System Admin**.
2. Verify that the options previously installed in the system are still activated after the software installation.
3. If any option is missing, request new option strings from the Online Support. Enter any new or missing option key string(s) in the **S/W Option Key** field and select **Add**, or by importing from a USB or DVD drive.

7.1.6.2.4 Verifying the TCP/IP settings:

For R4 and later:

1. From the touch panel, select **Connectivity > Connection Manager > Network**.
2. Verify the network settings.
3. If needed, manually set the DNS server settings you recorded.
4. If you modified or updated any settings, select **Done**.
5. Reboot the system.

7.1.6.2.5 Verifying the AE title and port settings (R3 and earlier)

1. From the touch panel, select **Utility > Connectivity > Device**.
2. Verify device settings.
3. If you modified or updated any settings, select **Save settings**.
4. Select **OK** to continue.

7.1.6.2.6 Check patient archive

Confirm that the patient archive is available. If the patient archive is encrypted, you will need the encryption key or password to unlock.

7.1.6.2.7 Check system configurations

1. Check the printer selection and reselect the standard printer color and/or B&W if needed. Reloading software may reset the printer selection even after restoring user configurations.
2. Check that the online help language is set.
3. Check for any field that appears highlighted in yellow as this is an indication that the field needs to be reset.
4. Confirm that at least the system drive encryption has been initialized. Contact the site administrator for them to set up the user partitions encryption.

7.1.6.2.8 Functional checks

Table 7-6 Functional Checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Basic measurement functional checks</i> on page 173	
<i>Power shut down</i> on page 113	

7.1.6.3 Loading Only Application Software

Follow this procedure to only load the application software (and not the Windows operating system).

If disk encryption is enabled, you will need the correct recovery keys (32-bit string) and password (if set up). If recovery keys are not available, you will have to do a full load instead. The only way to recover the patient data is if the customer has previously backed up data and images.

NOTE

Lockout/tagout (LOTO) is not required as you will not manipulate any electronics.

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

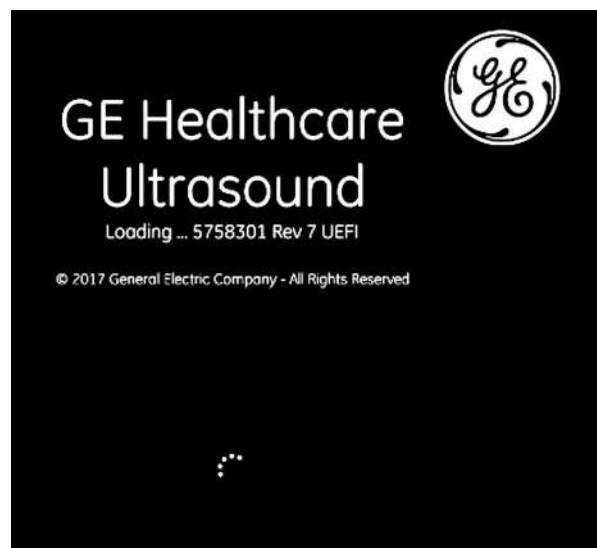
Table 7-7 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 1 hour and 30 minutes to 2 hours and 30 minutes depending on the amount of back-up/restore activities (presets and patient archive) needed prior to and after the installation.	Phillips screw driver Software thumb drive	No PPE required

7.1.6.3.1 Loading application software

1. Turn on the LOGIQ Totus and wait until Windows has booted and is loading. Watch carefully for the screen swirling circles, as shown below.

Figure 7-28 boot screen



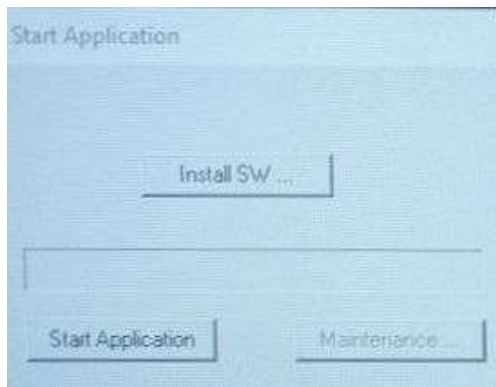
2. Promptly insert the software thumb drive into the USB port on the back of the LOGIQ Totus.

NOTE

This action will trigger the application only installation. If you wait too long, the application will start without detecting the thumb drive and you will have to start the process again.

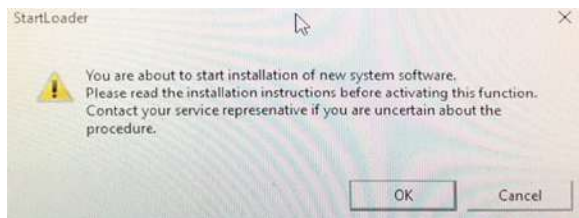
- At the Start Application dialog, select **Install SW...**

Figure 7-29 Start Application Window



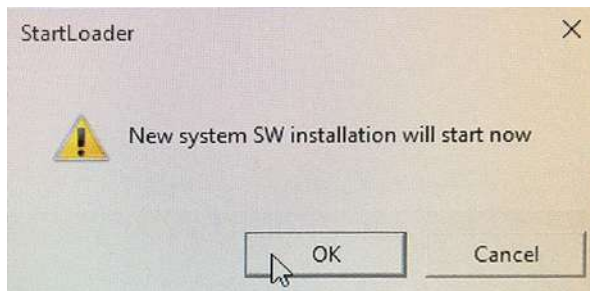
- At the StartLoader dialog, select **OK**.

Figure 7-30 StartLoader Window



- Select **OK** to continue with the application software load process.

Figure 7-31 StartLoader Window 2



- If prompted, select **Install** to begin the software installation.

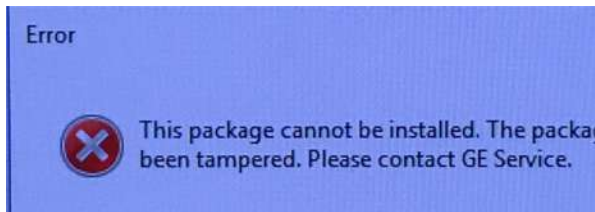
Figure 7-32 Install button



NOTE

If you get an error stating “This package cannot be installed. The package is not compatible or has been tampered. Please contact GE Service”, select OK and try to select the correct file again.

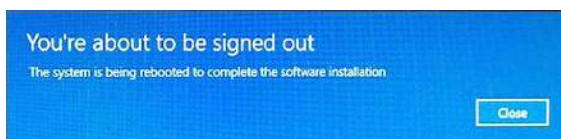
Figure 7-33 Error message



7. Once the application software installation is complete this screen will display, remove the thumb drive before the system re-starts.

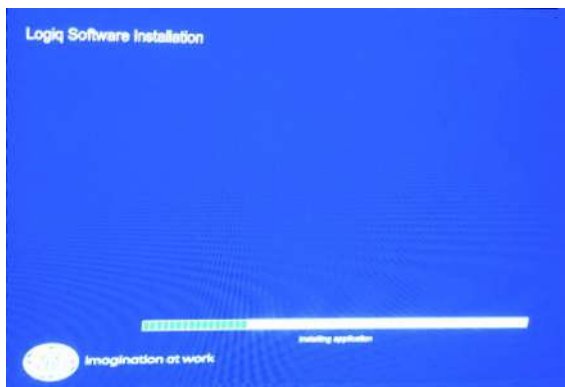
The system will boot up.

Figure 7-34 Message before boot



8. Let the load process continue. It will take several minutes. DO NOT disturb the process.

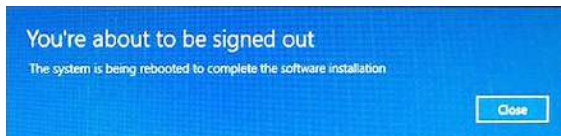
Figure 7-35 Application software load screen



9. Once the application software installation is complete this screen will display, remove the thumb drive before the system re-starts.

The system will boot up.

Figure 7-36 Message before boot



10. After boot up, log in as ADM (no password required) and, when prompted, select **Lowest** for the security level.

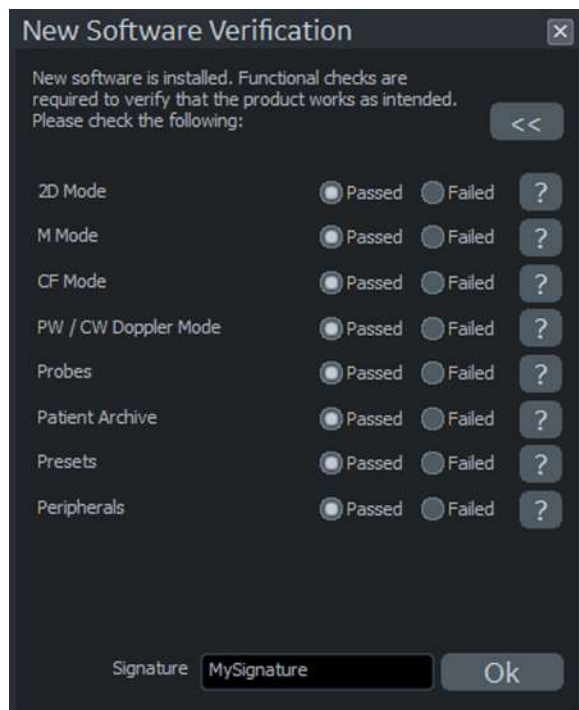
NOTE

Select the Lowest security level and then continue with installation and testing. After the update is complete, you can transfer the LOGIQ Totus to the Site Administrator who can reset the security level for the site. The security level can be reset through **Utility > Admin > Logon**.

11. Whether encryption is On or Off and after a load of the application software (only), the New Software Verification dialog box may display outlining the functional checks required for the software installation.

Select each of the functional checks. Enter a signature and select **OK**.

Figure 7-37 Verification window



7.1.6.3.2 Verifying the software versions

1. From the touch panel, select **Utility > System > About**.
2. Verify software version matches the version in the software used during installation, version received with the kit.
3. If upgrading software, verify the software version matches the version provided with the upgrade kit.

7.1.6.3.3 Verifying the software option key settings

NOTE

Software option keys are software version dependent. If a new software version has been installed, please follow installation instructions for that software. Usually, with new software option strings are needed. When re-installing the same software, the software option strings should be reused.

1. From the touch panel, select **Utility > Admin > System Admin**.
2. Verify that the options previously installed in the system are still activated after the software installation.
3. If any option is missing, request new option strings from the Online Support. Enter any new or missing option key string(s) in the **S/W Option Key** field and select **Add**, or by importing from a USB or DVD drive.

7.1.6.3.4 Verifying the TCP/IP settings:

For R4 and later:

1. From the touch panel, select **Connectivity > Connection Manager > Network**.
2. Verify the network settings.
3. If needed, manually set the DNS server settings you recorded.
4. If you modified or updated any settings, select **Done**.
5. Reboot the system.

7.1.6.3.5 Verifying the AE title and port settings (R3 and earlier)

1. From the touch panel, select **Utility > Connectivity > Device**.
2. Verify device settings.
3. If you modified or updated any settings, select **Save settings**.
4. Select **OK** to continue.

7.1.6.3.6 Check patient archive

Confirm that the patient archive is available. If the patient archive is encrypted, you will need the encryption key or password to unlock.

7.1.6.3.7 Check system configurations

1. Check the printer selection and reselect the standard printer color and/or B&W if needed. Reloading software may reset the printer selection even after restoring user configurations.
2. Check that the online help language is set.
3. Check for any field that appears highlighted in yellow as this is an indication that the field needs to be reset.
4. Confirm that at least the system drive encryption has been initialized. Contact the site administrator for them to set up the user partitions encryption.

7.1.6.3.8 Functional checks

Table 7-8 Functional Checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Basic measurement functional checks</i> on page 173	
<i>Power shut down</i> on page 113	

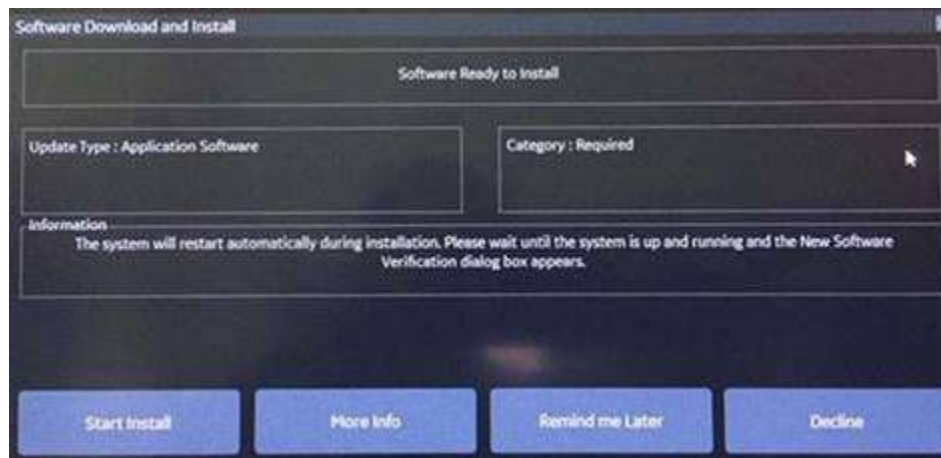
7.1.7 Software load with eDelivery (Direct to Device)

Use **Software Download and Install** to view available software updates and to install them.

- To view more information about the software download, select **More Info**.
- To postpone the software download, select **Remind me later**.
- To decline the software download, select **Decline**.
- To accept the software download, select **Start**.

For more information about software download, see TB70620 - eDelivery (Direct to Device) (DOC2911959).

Figure 7-38 Software Download and Install



7.1.8 Microsoft security patch updates

There are Microsoft security patch updates available for the Ultrasound system. There is a separate service note that informs the field of the availability of these Microsoft security patch updates including the part number applicable to consoles and installation instructions.

For more information, see TB70576 “Microsoft Security Patch Updates” (DOC2228260).

Chapter 8

Theory

In this chapter

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Main Console Description.	229
Casters and Brakes Description.	236
Options and Peripherals Description.	237
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NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

8.1 Overview

8.1.1 Purpose of this chapter

This chapter explains LOGIQ Totus's Ultrasound system concepts, component arrangement, and subsystem functions. It also describes the power distribution system. Refer to the LOGIQ Totus User Manual (latest revision) for more information.

NOTE

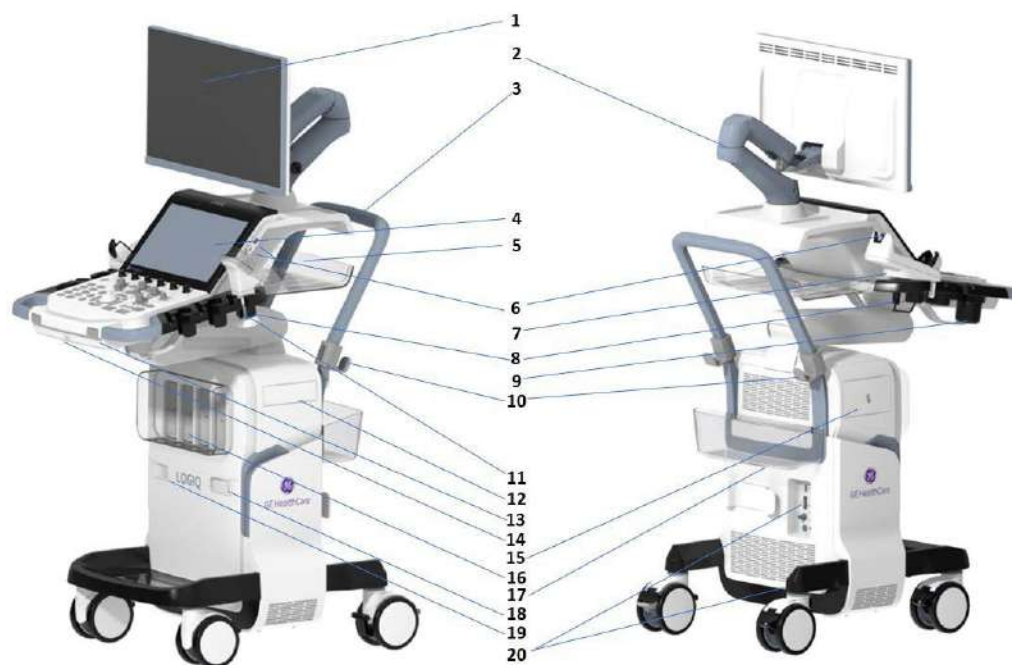
The information in this Service Manual is applicable to LOGIQ Totus.

8.2 LOGIQ Totus Models

Table 8-1 LOGIQ Totus Software Configuration and Hardware

MODEL NUMBER	DESCRIPTION	SOFTWARE VERSION
5926013	LOGIQ Totus	R4.x.x
5943511	LOGIQ Totus HDU	R4.x.x
9685090	LOGIQ Totus R5	R5.x.x
9685091	LOGIQ Totus R5 HDU	R5.x.x

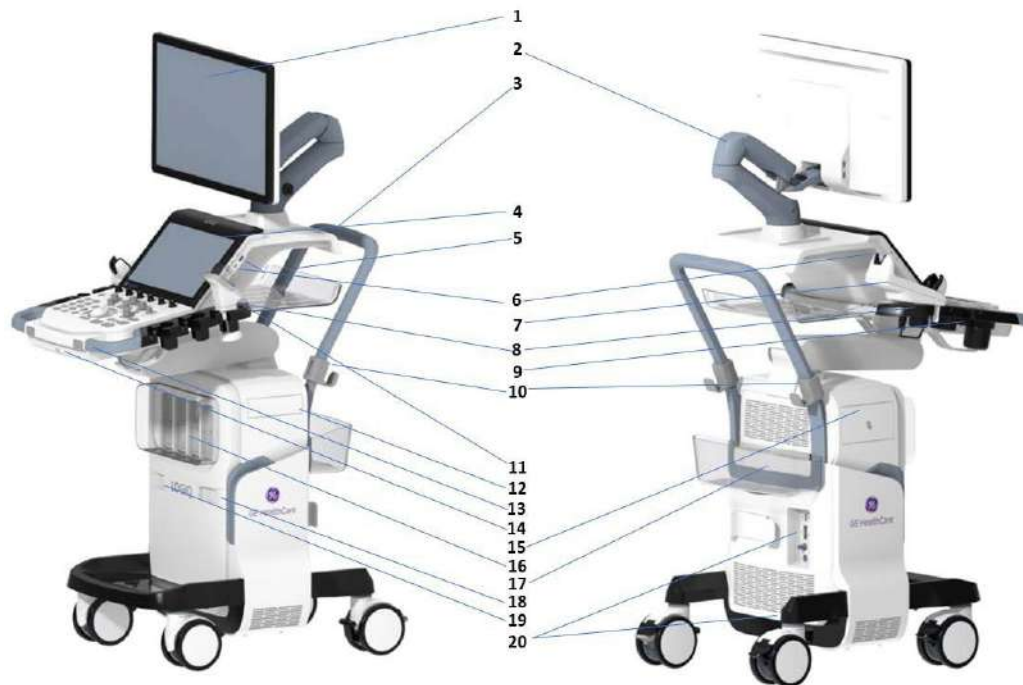
Figure 8-1 LOGIQ Totus - Major Components (LCD monitor)



1. 23.8 inch widescreen monitor
2. Monitor arm
3. Rear handle
4. Control panel with touch panel display
5. OPIO rear tray (option)
6. USB port (2 A types, 2 C types), Microphone
7. Horizontal TV probe holder (option)
8. Probe holder
9. Gel holder or Gel warmer (option)
10. Rear handle cable hook (option)
11. Wireless probe charger (option)
12. V-Navi controller (Option)
13. Front handle with control panel rotation and up/down button
14. AN Keyboard (option)
15. BW printer (option) or Drawer (option) bay
16. Probe connectors
17. Rear basket (option)
18. Patient I/O Port (Option)

19. CW probe port (Option)
20. External I/O connectors and Mains power switch

Figure 8-2 LOGIQ Totus - Major Components (HDU monitor)



1. 23.8 inch widescreen monitor
2. Monitor arm
3. Rear handle
4. Control panel with touch panel display
5. OPIO rear tray (option)
6. USB port (2 A types, 2 C types), Microphone
7. Horizontal TV probe holder (option)
8. Probe holder
9. Gel holder or Gel warmer (option)
10. Rear handle cable hook (option)
11. Wireless probe charger (option)
12. V-Navi controller (Option)
13. Front handle with control panel rotation and up/down button
14. AN Keyboard (option)
15. BW printer (option) or Drawer (option) bay
16. Probe connectors
17. Rear basket (option)
18. Patient I/O Port (Option)
19. CW probe port (Option)
20. External I/O connectors and Mains power switch

8.3 LOGIQ Totus Description

8.3.1 Introduction

The LOGIQ Totus Ultrasound system is a high performance digital Ultrasound imaging system with total data management.

The LOGIQ Totus provides image generation in B-Mode, Color Doppler, Power Doppler, M-Mode, PW, 4D, Harmonic Imaging, and Contrast imaging applications. The fully digital architecture of the LOGIQ Totus Ultrasound system allows optimal usage of all scanning modes and probe types throughout the full spectrum of operating frequencies.

8.3.2 LOGIQ Totus general description

The LOGIQ Totus is a digital beamforming Ultrasound system. The Ultrasound signal flows from the probe through the Ultrasound system where it is processed and finally displayed as a diagnostic image on the monitor. Images and patient data can be sent to peripheral devices to be stored, printed, or displayed.

System configuration is stored on the hard drive and all necessary software is loaded from the hard drive on power up.

The LOGIQ Totus is comprised of the following major components:

- UBE (Unity Back end)
- UAC (Unity Acquisition, Front end)
- UCO-T (Unity Connector)
- Operator panel
- Peripherals
- Options
- Mechanical Parts
- Software

8.4 Software Description

8.4.1 Purpose of this section

This section gives you a brief overview of the software used on LOGIQ Totus. You can also see the LOGIQ Totus Basic User Manual (appropriate version) for more information.

Contents in this section

- *Purpose of this section* on page 224
- *LOGIQ Totus base load image and application software* on page 225
- *Electronic media* on page 226
- *LOGIQ Apps* on page 227
- *Service Desktop Description* on page 227

8.4.2 LOGIQ Totus base load image and application software

LOGIQ Totus software consists of:

- Base load image
 - Windows 10 Embedded
 - Contains all necessary drivers to support devices and peripherals approved for this product
- Application software
 - Contains customized software to perform all functions and features for the LOGIQ Totus

NOTE

For software specific details, see *Software* on page 187.

Software location

The software resides on the SSD (Solid State Drive) located on the UEPP-T.

Software installation

All LOGIQ software installation information is provided in the Software chapter. For software installation, refer to *Software* on page 187.

Network capabilities

These are the network capabilities:

- LAN is IPv6 ready.
- Can only be set up for IPv4 or IPv6. They cannot be mixed.

8.4.3 Electronic media

To access and view user documentation through a Windows PC:

1. Insert the media into the media drive.
2. Open the media drive on your desktop.
3. Double click on the 'gedocumentation.html' document.
4. Select the item you want to view (click on the blue, underlined link in the File Name column).
5. To close the window, click on the 'X' in the upper, right-hand corner of the browser window.

NOTE

If your PC does not have Adobe Reader, a free download is available on the Adobe website at <http://www.adobe.com>.

8.4.4 LOGIQ Apps

The following LOGIQ Apps are available for Android devices through a Bluetooth connection:

- LOGIQ Remote
- LOGIQ Photo

For more information, see “LOGIQ Apps” in the User Manual (latest revision).

LOGIQ Remote

With the LOGIQ Remote app, you will be able to adjust the following controls:

- Depth
- PW Gain
- CF Gain
- B-Mode Gain
- Left/Right
- Measure
- Comment
- Clear
- Trackball
- Freeze
- Store
- Color Flow Scale
- Cursor

LOGIQ Photo

With the LOGIQ Photo app, you can capture images that will go to the patient’s exam.

8.4.5 Service Desktop Description

The Service Desktop is an interface that provides access to system information, status, and diagnostics. The Service Desktop has different content or views depending on the access level. The access level is determined by the user profile as well as the service options enabled on the LOGIQ Totus.

- Basic view is the standard view, restricted only by the user through the user profile settings.
Administrator default user has access to the Service Desktop. Any user with "local Service access" in their user profile can have access to this view.

8.5 Top Console Description

8.5.1 Transporting the LOGIQ Totus

Refer to the appropriate version of the LOGIQ Totus User Manual.

8.6 Main Console Description

8.6.1 Front End Description

8.6.1.1 Card rack circuit boards overview and location

The card rack houses all the transmit, receive, and processing circuit boards.

Figure 8-3 Card Rack Boards (indicate orange box)

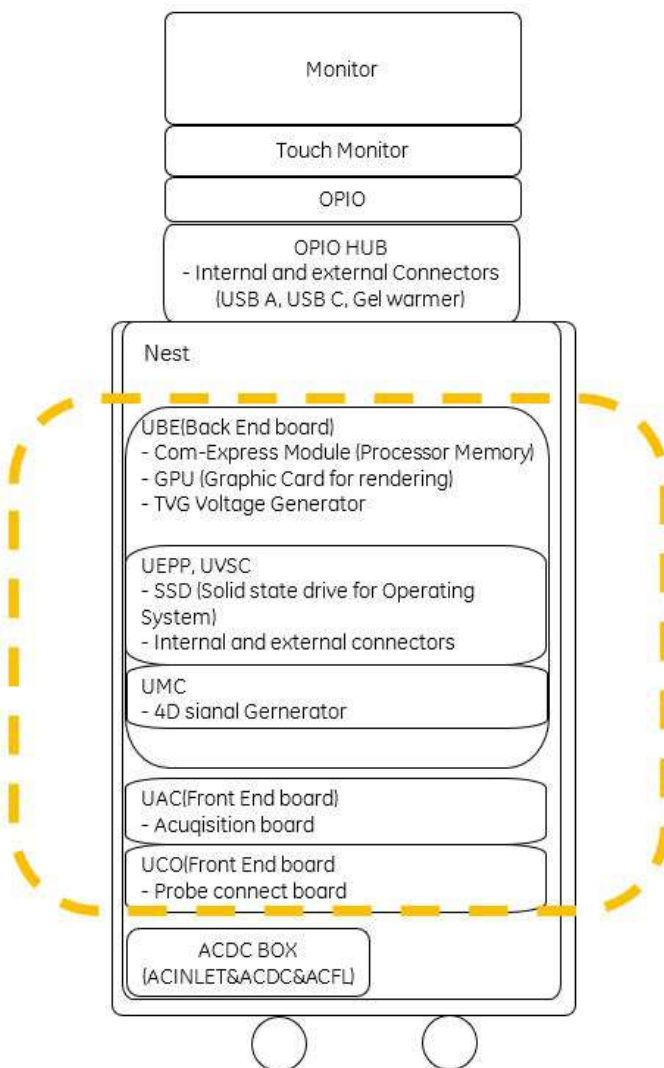
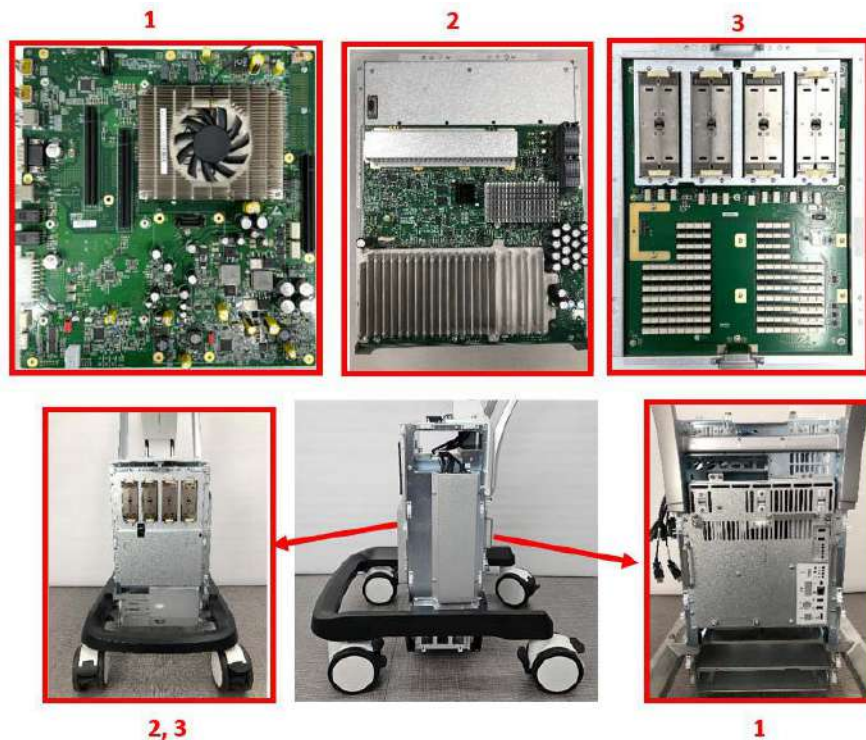


Table 8-2 Card Rack Boards

ABBREVIATION	BOARD NAME	TOTAL NUMBER OF CARDS PER LOGIQ Totus
UBE-T	Back End and Power Supply	1
UAC-T	Data Acquisition 128 ch	1

ABBREVIATION	BOARD NAME	TOTAL NUMBER OF CARDS PER LOGIQ Totus
UCO-T	DLP Probe Interface	1

Figure 8-4 Details of Card Rack



8.6.2 Back End Description

8.6.2.1 UBE-T

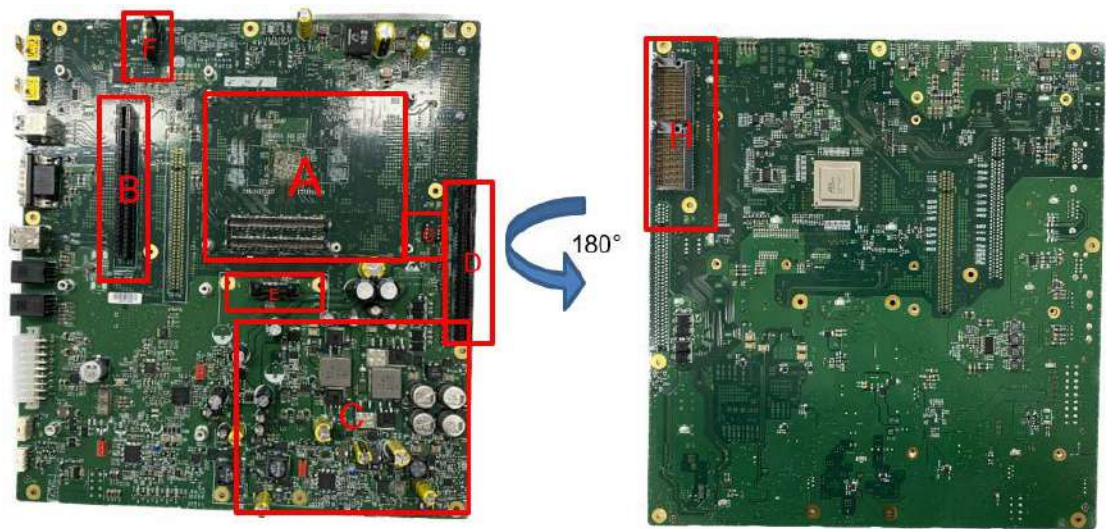
The UBE-T (Back End and Power Supply) module has two main tasks.

One is single board computer built from a COM express module fitted into customized rack. Its main function is to be the central processing unit of the Ultrasound system, controlling all the functionality, user interface and connectivity of the scanner. Another is the Main Power Supply unit with semi- customized ACDC converter unit.

BackPlane connectors give the Power to UAC-T/UCO-T boards, and PCI-e signals for image- processing.

The UBE-T also host a single slot GPU card, a M.2 Solid State Drive (SSD).

Figure 8-5 Location of each module



A	CPU module
B	GPU slot
C	DCDC convertors for HVs (variable DC High voltage, +/-10V ~ +/-100V)
D	Connector for UEPP
E	Connector for UMC(4D moto control) board
F	Lithium Coin Battery
G	Removable EEPROM to store Console S/N and Option keys
H	Connector for UAC

Figure 8-6 Connector description



Table 8-3 Connector description table

Connector	Description	Additional Information
1	Video output (HDMI) for Main Monitor	
2	Video output (HDMI) for Touchscreen	
3	USB 3.0 for U-Hub and touch control	
4	Power for Main Monitor, Touchscreen, Control Console and U-Hub	Power button signal and Audio signals for main speaker
5	USB 2.0 for options	
6,7	Power for options	
8	Main Power from U-AC BOX	
9	Control signals for battery option	
10	System FAN connector	

8.6.3 Backplane Description

8.6.3.1 Backplane (UEPP)

The LOGIQ Totus Peripheral board (UEPP) is part of an Ultrasound system, main purpose is to connect SSD, UVSC-T and WIFI module. UEPP support 2EA USB 3.0, LAN, HDMI and audio for user.

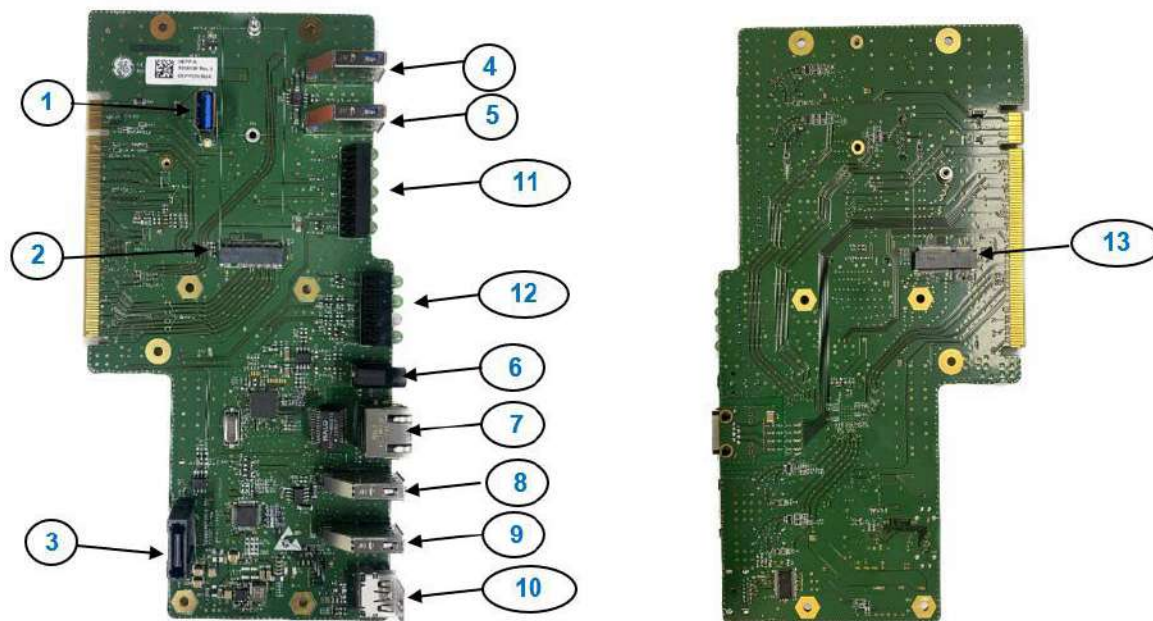
Figure 8-7 UEPP

Table 8-4 UEPP table

Connector	Description	Additional Information
1	USB3.0 port for security dongle	
2	M.2 Port for SSD	
3	Connector for UVSC option	HDMI, 5V, 3.3V, I2C
4	USB3.0 port for Wireless LAN and Bluetooth dongle	
5	USB3.0 port for Wireless LAN and Bluetooth dongle	
6	Audio Jack port for user	stereo
7	LAN port	Giga bit ethernet
8	USB3.0 port for user	
9	USB3.0 port for user	
10	HDMI port for user	
11	System power status LED indicator	12V
		5V
		-5V
		Standby 5V
		HV status LED
12	System status LED indicator	SSD Status
		LAN Activation
		LAN Speed: 1Gbps = amber 100Mbps = green
		Battery charge LED Blink = charge LED On = full charge
13	WIFI module connector	

8.6.4 Power Distribution Description

8.6.4.1 Power Supply Distribution

The main power module is located in the UBE-T assy, and main task is to isolate the scanner from the on-site mains power system and to supply the various internal subsystems with DC power.

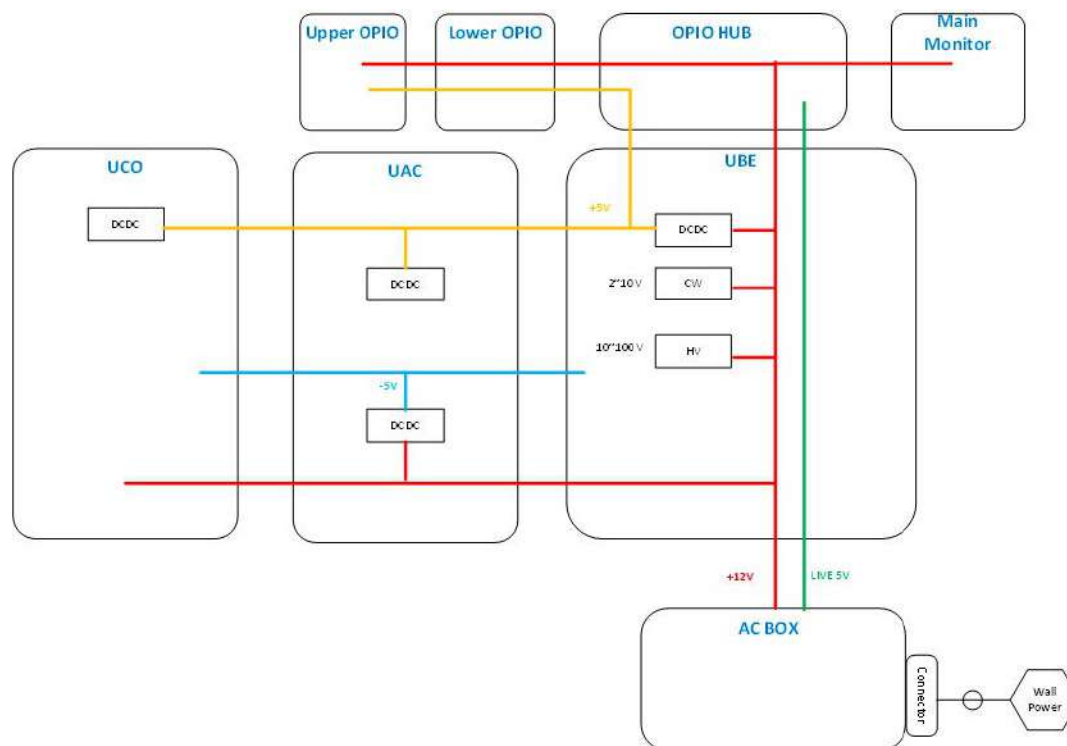
Power from the wall outlet (100 to 240 VAC, 50/60 Hz) is connected to the main power supply. The main power supply (ACDC module) provides main P12V Live (Stand-by) 5V.

Converter (located on UCO-T,UAC-T,UBE-T) generates the needed voltages to the rest of the LOGIQ Totus:

- Printer (12 Vdc)
- Main Monitor(12Vdc)
- Lower/Upper OPIO, Gelwarmer(12Vdc)
- HV (variable DC High voltage, +/-10V ~ +/-100V), THV(+/- 97V), on UAC-T
- P5V, M5V on UBE-T

- M5V on UAC-TFigure 5-39

Figure 8-8 Power Distribution Diagram



The mains cord has plugs in both ends. A female plug connects to the scanner and a male plug to the wall outlet. User cannot detach the mains cord by regulation (fixed by Bracket). Fuses are located inside the ACDC module.

8.6.5 Air Flow Distribution

Through the filter grid on the front of the system, air flow into the LOGIQ Totus. By means of the 2 FAN, air is blown through the nest-box, and the warm air exits the system through holes in the up side panel of the system.

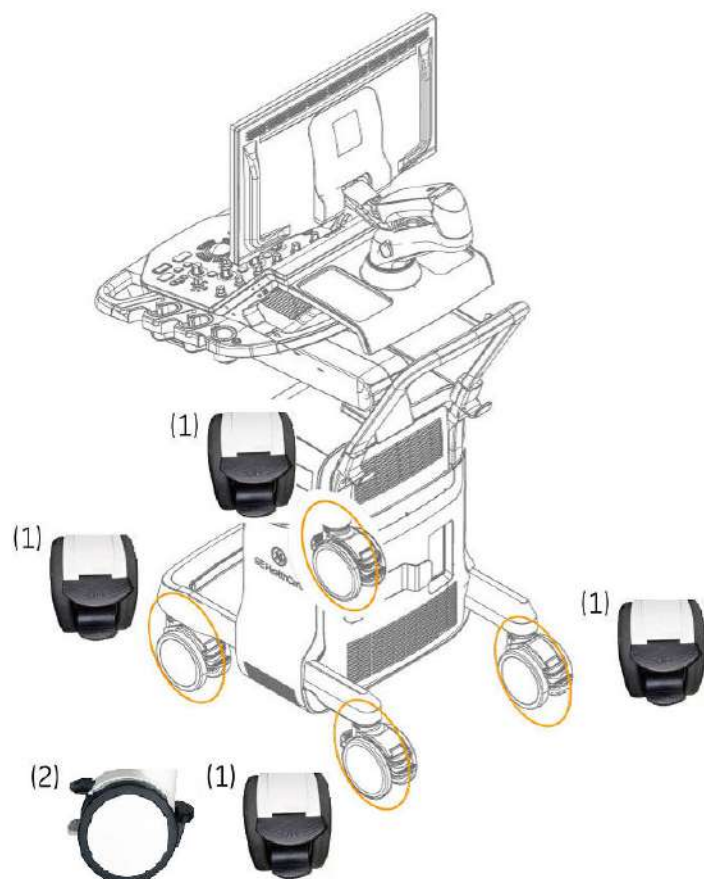
Figure 8-9 Air Inlet/Outlet



8.7 Casters and Brakes Description

Examine the wheels frequently for any obvious defects that could cause them to break or bind. Each wheel has an independent brake pedal. A left rear wheel also has a swivel lock.

Figure 8-10 Wheel lock and Swivel lock



1. Brake pedal
2. Swivel lock

8.8 Options and Peripherals Description

8.8.1 Internal hardware options and peripherals

(3-6-3 "Optional peripherals/peripheral connection" on page 3-34)

This list covers the internal peripherals available for the LOGIQ Totus. All of these internal peripherals should be connected already when the LOGIQ Totus is delivered.

- Realtime 4D Option (DC4D)
- CW Doppler Option (GCW)
- Pencil CW Option
- S-Video (VCS) Option
- Patient I/O (ECG) Option
- Battery Pack Option
- Battery Pack extended Option
- Volume Navigation (VNAV) Option
- Wireless Option
- Printer (Digital Graphic) Option

8.8.2 External peripherals

This list covers the external peripherals available for the LOGIQ Totus. The external printers are network DICOM devices. The inkjet printer is USB connected.

- OPTION TRAY
- Physical AN KEYBOARD
- Probe Holders
- Ethernet Protection cable
- Inkjet Printer
- Powervar144k120v MG UPS
- SONY UPD25MD COLOR PRINTER
- USB Footswitch 3 Button
- Barcode Reader / Card Reader
- Digital Expert tools
- Rolling Volume Navigation Stand
- Customer - supplied USB Flash Drive/Hard Drive

8.9 Product Manuals

8.9.1 User documentation

- LOGIQ Totus User Manual
- LOGIQ Totus Advanced Reference Manual
- LOGIQ Totus Release Notes
- LOGIQ Totus eLabeling Kit (contains LOGIQ Totus eDOCs Thumb Drive, which contains all User Manuals and translations)

8.9.2 General service documentation

- LOGIQ Totus General Service Manual
- LOGIQ Totus Unpacking/Packing Procedure

Chapter 9

System Diagrams

In this chapter

LOGIQ Totus Internal Cable Connection. 240

This chapter contains system diagrams.

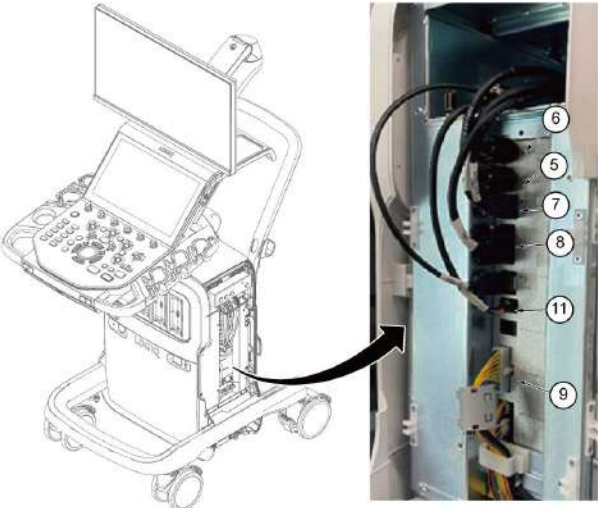
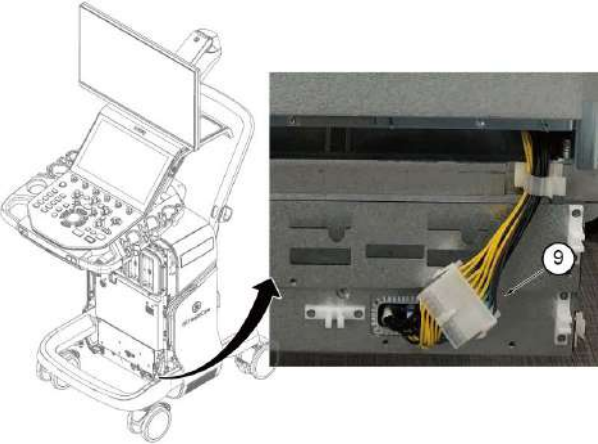
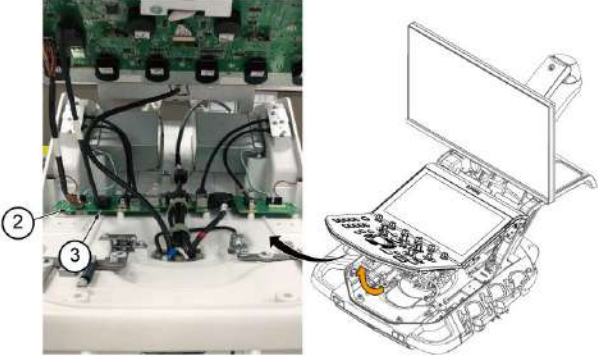
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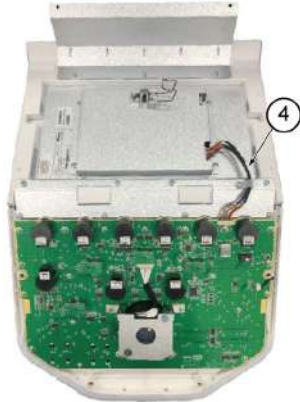
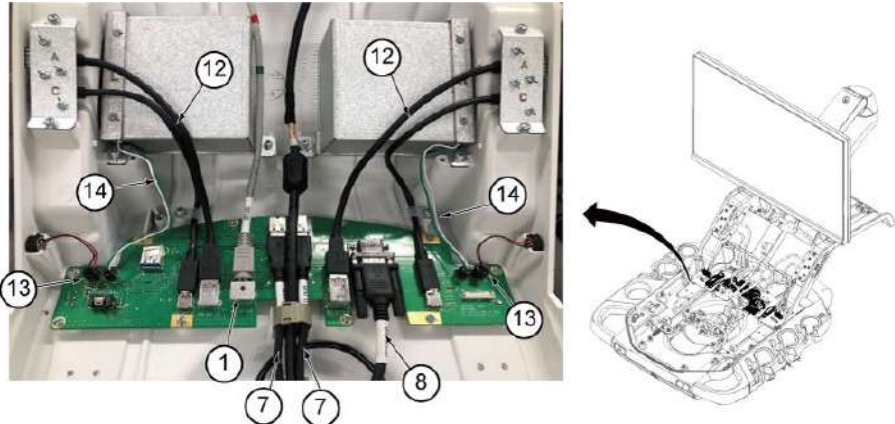
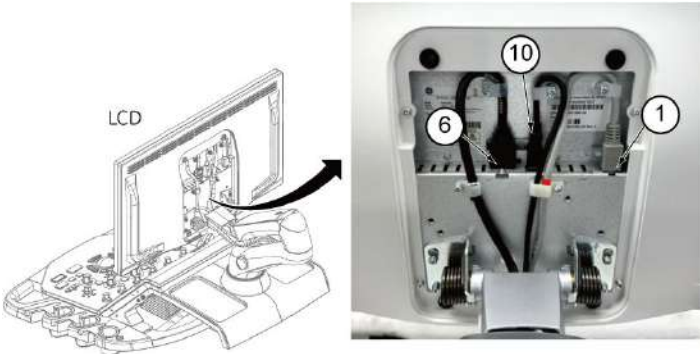
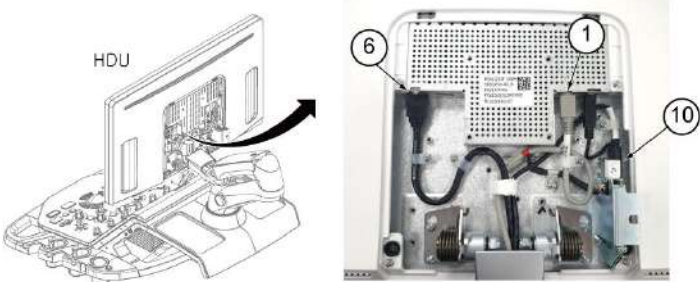
The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

9.1 LOGIQ Totus Internal Cable Connection

Most of internal Cables are routed from UBE, and connected to each board/modules.

Table 9-1 LOGIQ Totus Internal Cable Connection

Component	Picture
UBE	 The image shows a line drawing of the LOGIQ Totus machine on the left. An arrow points from the rear of the machine to a photograph on the right. The photograph shows the internal cable connections for the UBE (User Beam Entry) component. Several cables are plugged into a vertical connector panel, which is numbered 6, 5, 7, 8, 11, and 9 from top to bottom.
ACDC	 The image shows a line drawing of the LOGIQ Totus machine on the left. An arrow points from the rear of the machine to a photograph on the right. The photograph shows the internal cable connections for the ACDC (Alternating Current to Direct Current) component. A yellow cable is plugged into a connector, which is numbered 9.
UHUB - Operator Panel	 The image shows a photograph on the left and a line drawing on the right. The photograph shows the internal cable connections for the UHUB (User Hub) component. Two cables are plugged into connectors, which are numbered 2 and 3. The line drawing shows the LOGIQ Totus machine with an arrow pointing to the UHUB component.

Component	Picture
Lower OP - Upper OP	
UHUB	
Monitor (LCD)	
Monitor (HDU)	

Chapter 10

Troubleshooting

In this chapter

Gathering Troubleshooting Data.	244
Service Desktop.	250
Electromagnetic Interference (EMI) Troubleshooting.	285
Image Troubleshooting.	287
LOGIQ Apps Troubleshooting.	290
Options Troubleshooting.	291
Probes Troubleshooting.	305
Peripherals Troubleshooting.	308
Setting Troubleshooting.	309
Scan Assistant Troubleshooting.	310

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

10.1 Gathering Troubleshooting Data

Problem images and system data (error logs / ALT+D logs) can be acquired at the LOGIQ Totus or through service remote connectivity. This data may be used to assist with troubleshooting and local service, or it may be sent to GEHC for further analysis.

Contents in this section

- *Collecting vital system information* on page 245
- *Shortcut keys* on page 246
- *Collecting logs* on page 247
- *Capturing network logs to use for troubleshooting* on page 249

10.1.1 Collecting vital system information

The following information is required to properly analyze system error logs, images reported as malfunctions, or a LOGIQ Totus being returned to the manufacturer:

NOTE

This information is typically collected using Alt+D or the Gather Logs function on the CSD page.

Product Name = LOGIQ Totus

Navigate to **Utility > System > About**.

Record the **Package Type**, **Release Information**, **Part Number**, and **Build Information** (when available) for the following:

- Application Software
- Service Platform
- Security Package
- Base Image
- Base Image Update

NOTE

Information displayed on the About page may vary according to software release.

10.1.2 Shortcut keys

There are several shortcut keys on the LOGIQ Totus that can be useful during troubleshooting:

Table 10-1 Shortcut Keys

Key	Description
Alt+1 or Alt+2	- Marks events in the log file. Used for the flagging issues during operation. - In R3.1.6, R4.x.x, or higher, resets the upper and lower operator panels in certain conditions (nonresponsive).
Alt+F10	Displays SW Shut Down. If the Ultrasound system can be shut-down by using these keys, it means that SW is working and the problem could be the ON/OFF switch or the wire that carries the shut-down signal.
Alt+F5 and F11	For the echo simulator (keyboard simulation), brings up or removes the front panel simulator. It may be used with VCO to press buttons on the front panel that are not standard keys on your PC.
F4 and F12	Displays the DICOM Job Spooler.
Alt+A	Displays a cursor (Alt+A stands for arrow).
Alt+D	Captures scanner logs.
Alt+L	Locks the touch screen.
Alt+Enter	Creates a new line under the Comment attributes.
Alt+Shift	Changes the keyboard layout language. The software displays the keyboard layout change at the bottom of the main display monitor. To cycle through all available keyboard languages, continue to press ALT + SHIFT.
Ctrl+I	In Scan Assistant, inserts a step above the selected step.
Ctrl+up arrow	In Scan Assistant, moves selected step up.
Ctrl+downarrow	In Scan Assistant, moves selected step down.
Ctrl+right Set key	When exporting or transferring a non-consecutive list of patients, select the first name, move the cursor to the next name and then press and hold down the Ctrl+right Set key. These steps can be repeated to select all of the names in a non-consecutive list of patients.
Ctrl+Shift	Selects multiple patients.
Ctrl+leftmouse	In Scan Assistant, use when selecting multiple steps for cutting or copying.
Shift+leftmouse	
Shift+right Set key	When exporting or transferring a consecutive list of patients, select the first name, move the cursor to the last name and then press and hold down the Shift+right Set key to select all of the names.

10.1.3 Collecting logs

If the LOGIQ Totus malfunctions, simultaneously press the **Alt+D** keys.

NOTE

Alt+D is available at all times when the user has the Capture Log right. To collect a trouble image, enable Transfer Images (captured without patient information) to GE HealthCare under ADMIN > System Admin. There are two check boxes there that determine what is collected with ALT+D. There are no limits to collecting an image.

For a detailed list of Service Logs captured, see *Capturing network logs to use for troubleshooting* on page 249.

Figure 10-1 System Problem Reporting Dialog Box

To collect a screen capture with logs:

1. Press **Alt+D**. The System Problem Reporting dialog box opens.
2. Enter the following information:
 - System ID serial number
 - Software version
 - System date and time of occurrence
 - Sequence of events leading to issue
 - Whether the issue is repeatable
 - Imaging mode, probe, preset/application
 - Media brand, speed, capacity, and type
3. To authorize the collection of protected information, check **Include Protected Information, requires Admin privileges**. If this box is checked, the LOGIQ Totus creates two log files with the following format name:
 - log_<SN>_<DATE>_<TIME>_DB.zip
 - log_<SN>_<DATE>_<TIME>_ProtectedInfo_DB.zip

Where <SN> is the serial number, <DATE> is the date in format YYMMDD and <TIME> is the time in format HHMMSS.

4. To include a duration, check **Time Duration** and select a duration from the dropdown.
5. Under **Destination**, select a storage media or *Service* directory for remote viewing.

NOTE

To save to a CD/DVD or USB Flash Drive, you **MUST** select CD/DVD Recordable or USB drive as the destination device, otherwise the data is written to the default Export/Service directory on the hard drive. The Export/Service directory is only used for remote service and is not intended for images or report storage use.

For a CD/DVD, the LOGIQ Totus automatically formats an unformatted disk, gathers logs and writes it out to the disk.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

6. Click the **Store** button.

10.1.4 Capturing network logs to use for troubleshooting

Use the **Network Capture** utility to capture network logs. Once the logs are captured and extracted from the LOGIQ Totus, use Microsoft Message Analyzer to convert the output, and then Wireshark (or some other network sniffer) to analyze it.

10.2 Service Desktop

Contents in this section

- *Disruptive mode* on page 251
- *Color statuses* on page 252
- *Service Classes* on page 253
- *Home* on page 254
- *Utilities* on page 260
- *Options* on page 275
- *Agent Configuration* on page 277
- *Software Maintenance* on page 280

10.2.1 Disruptive mode

Disruptive mode is a way to control interruptions to operation of the LOGIQ Totus. Disruptive mode is required whenever service performs a function that may disrupt a normal scan. Activating Disruptive mode results in a red message displayed on the task bar. This message indicates that the LOGIQ Totus needs to be restarted once the service activity is complete. The message remains until the LOGIQ Totus is restarted. This prevents patient scanning while the LOGIQ Totus is not operating at an optimal status. For example, running a diagnostic may leave the LOGIQ Totus in a state that is not good for imaging.

Specifically, Disruptive mode is required to run diagnostics, clean presets, and reset the patient database, and turn on Virtual Console Observation (VCO).

- When Disruptive mode is On, all service functionality on the Service desktop is allowed but user operation of the LOGIQ Totus may be limited.
- When Disruptive mode is Off, some service functionality on the Service desktop is not available and user operation of the LOGIQ Totus is normal.

NOTE

Keep in mind that starting and stopping Disruptive mode turns some features on and off. For example, SSH/VCO. Additionally, the ability to enable Disruptive mode depends on the logged in user.

- Local user – a user locally logged into the machine will be able to set the LOGIQ Totus to Disruptive mode or allow a Disruptive mode request from a remote user through the Service desktop. The local user must have Authorize Remote Service Access to allow Disruptive mode. If the local user does not have this right, the remote user's request will be automatically denied.
- Remote user – a user remotely accessing the LOGIQ Totus will not be able to automatically switch Disruptive mode to On. The logged in user (user actually logged on to the LOGIQ Totus) needs to have the ability to grant remote access. The logged in user will be notified through a dialog box and asked to allow Disruptive mode.

NOTE

Change Password and Disk Defragment are not available for the remote user whether Disruptive mode is On or Off.

10.2.2 Color statuses

Throughout the Service desktop, colors indicate the following:

- Green – Status is normal
- Orange – Status is a warning
- Red – Status is an error

10.2.3 Service Classes

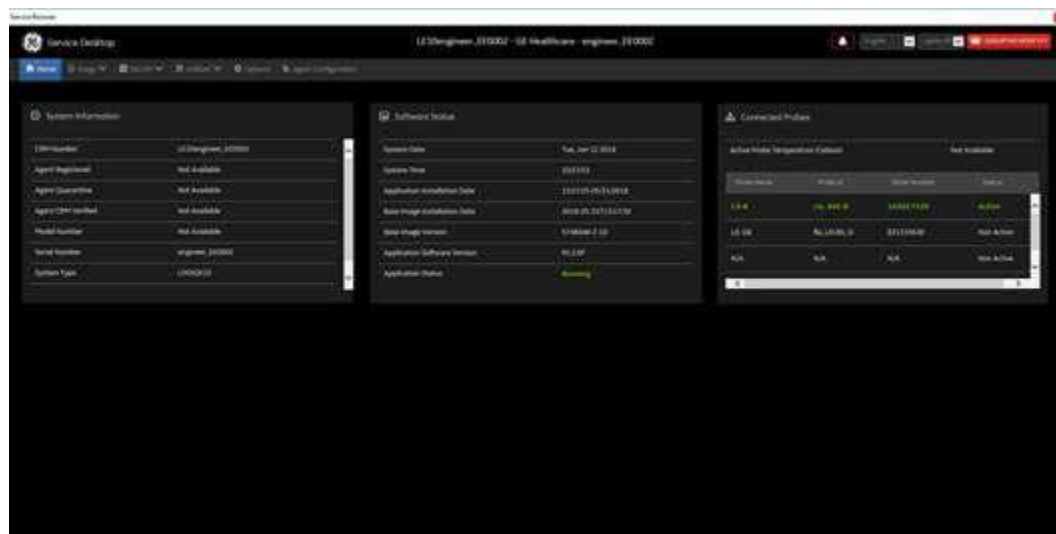
Service Basic Access

With Service Basic Access, these are the available options:

- HOME
- Utilities
 - Change Password
 - Data Transfer
 - Delete Files
 - Gather Logs
 - Network Capture
 - Reset Log Database
 - Resolve Agent Quarantine
 - Secure Delete
 - Third Party Licenses
- Options
- Agent Configuration
- Software Maintenance

10.2.4 Home

Figure 10-2 Home (R4 and Earlier)



For more information, see:

- *System Information* on page 254
- *Software Status* on page 256
- *Connected Probes* on page 258

System Information

System Information displays general information about the LOGIQ Totus. When the LOGIQ Totus has been successfully configured with the back office, these elements will have the corresponding values:

- **Agent Registered** will be **Yes**
- **Agent Quarantine** will be **No**
- **Agent CRM Verified** will be **Yes**

The information on **System Information** is available to all service class licenses.

To access **System Information**, navigate to **Utility (second page) > Service > Home**.

Figure 10-3 System Information (R5)



① System Information	
CRM Number	ENGINEER_511473US2
Agent Registered	Yes
Agent Quarantine	No
Agent CRM Verified	Yes
Agent Connected	Yes
Last Connected Time	Fri, Jan 31 2025, 09:34:22
Model Number	Not Available
Serial Number	engineer_LFO300047
System Type	LOGIQFortis
Facility	

Figure 10-4 System Information (R4 and Earlier)



① System Information	
CRM Number	LE10ENGINEER_E70012
Agent Registered	Yes
Agent Quarantine	No
Agent CRM Verified	Yes
Agent Connected	No
Model Number	5920000P4
Serial Number	engineer_E70012

This table shows all the elements available on **System Information** with descriptions.

Table 10-2 System Information

Element	Description
CRM Number	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region.
Agent Registered	Registered status of the agent. Valid values are: - Yes – The agent is registered in the back office. - No – The agent is not registered in the back office. - Not Available – The agent is not running or has not been configured.
Agent Quarantine	Quarantine status of the agent. Valid values are: - Yes – The agent has more than one device registered with the same CRM Number in the back office. - No – The agent has one device registered with the listed CRM Number in the back office. - Not Available – The agent is not running or has not been configured.

Element	Description
Agent CRM Verified	CRM verified status of the agent. Valid values are: • Yes – The agent is verified in the back office. • No – The agent is not verified in the back office. • Not Available – The agent is not running or has not been configured.
Agent Connected	Connection status of the agent. Valid values are: • Yes – The agent is connected to the back office. • No – The agent is not connected to the back office. Not Available – The agent is not configured or running.
Model Number	GE part number for the LOGIQ Totus. The same number as listed on the rating plate.
Serial Number	Serial number of the LOGIQ Totus. The same number as listed on the rating plate.
System Type	Product name of the LOGIQ Totus.
Facility	Name of the hospital or facility where the LOGIQ Totus is installed.

For more information, see:

- *Home* on page 254

Software Status

Use **Software Status** to view general information about the software installed on the LOGIQ Totus. The information on **Software Status** is available to all service class licenses.

To access **Software Status**, navigate to **Utility (second page) > Service > Home**.

Figure 10-5 Software Status (R5)

Software Status		More Details
System Date	Fri, Jan 31, 2025	
System Time	16:53:32	
Application Installation Date	Tue, Jan 28, 2025	
Base Image Installation Date	Tue, Jan 28, 2025	
Base Image Version	5847664-120	
Application Software Version	R5.0.2C	
Application Status	Running	

Figure 10-6 Software Status (R4 and Earlier)

Software Status	
System Date	Tue, Jun 12 2018
System Time	16:23:53
Application Installation Date	13:27:25 05/31/2018
Base Image Installation Date	2018-05-31T13:17:39
Base Image Version	5746646-2 10
Application Software Version	R1.2.0F
Application Status	Running

This table shows all the elements available on **Software Status** with descriptions.

Table 10-3 Software Status

Element	Description
System Date	Current date in the format <day>, <month> <date> <year>.
System Time	Local time based on the last time the desktop was refreshed in the format <hh:mm:ss>.
Application Installation Date	Date the application software was installed. The application software includes the LOGIQ Totus product-specific software.
Base Image Installation Date	Date the base image software was installed. The base image software includes the Windows operating system and other supporting software.
Base Image Version	Version number (part number) of the base image software.
Application Software Version	Version number of the application software.
Application Status	Status of the application. Valid values are: - Running - Stopped

For more information, see:

- Home on page 254

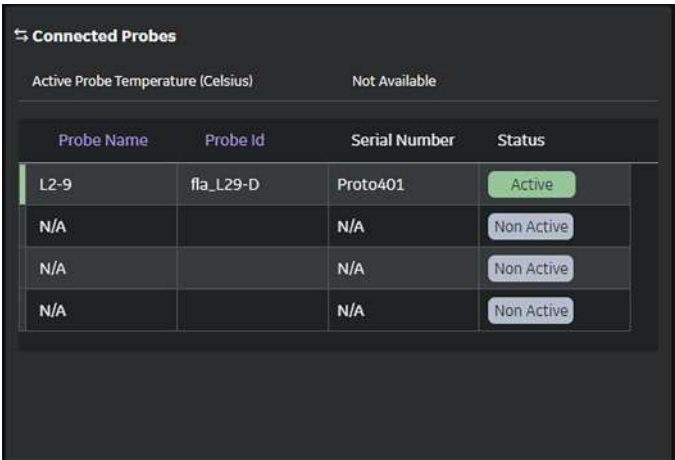
Connected Probes

Connected Probes shows probes connected to the LOGIQ Totus. The order on the user interface is top down matching the left-to-right order on the LOGIQ Totus.

The information on **Connected Probes** is available to all service class licenses.

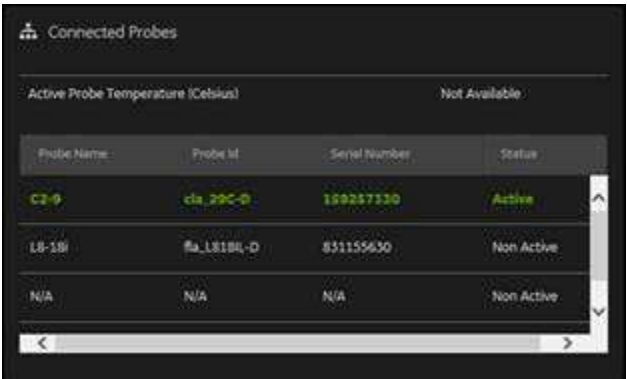
To access **Connected Probes**, navigate to **Utility (second page) > Service > Home**.

Figure 10-7 Connected Probes (R5)



Active Probe Temperature (Celsius)				Not Available
Probe Name	Probe Id	Serial Number	Status	
L2-9	fla_L29-D	Proto401	Active	
N/A		N/A	Non Active	
N/A		N/A	Non Active	
N/A		N/A	Non Active	

Figure 10-8 Connected Probes (R4 and Earlier)



Active Probe Temperature (Celsius)				Not Available
Probe Name	Probe Id	Serial Number	Status	
C2-9	cla_29C-D	189257330	Active	
L8-18	fla_L818L-D	831155630	Non Active	
N/A	N/A	N/A	Non Active	

This table shows all the elements available on **Connected Probes** with descriptions.

Table 10-4 Connected Probes

Element	Description
Active Probe Temperature (Celsius)	When available, temperature of the active probe. Not all probes report temperature. The most common probe to report temperature is the TEE probe.
Probe Name	Name of the probe connected to the LOGIQ Totus.
Probe ID	Identifier of the probe connected to the LOGIQ Totus.
Serial Number	Serial number of the probe connected to the LOGIQ Totus. If the serial number of the probe is not available, then N/A displays.

Element	Description
Status	Statuses of the probe connected to the LOGIQ Totus. Valid values are: Active Non Active

For more information, see:

- *Home* on page 254

10.2.5 Utilities

Utilities configurations vary depending upon the service class.

For more information, see:

- *Change Password* on page 261
- *Data Transfer* on page 263
- *Delete Files* on page 267
- *Gather Logs* on page 268
- *Minisweep (R5)* on page 268
- *Network Capture* on page 270
- *Resolve Agent Quarantine* on page 272
- *Software Media Check (R5)* on page 272
- *Third Party Software Licenses* on page 274

10.2.5.1 Change Password

Change Password allows you to change the password for a specified user type.



WARNING

RISK OF LOSING DATA.

IF THE PASSWORD IS LOST, GE WILL NOT BE ABLE TO RECOVER OR RESET IT. LOSS OF A PASSWORD MAY RESULT IN THE LOSS OF PATIENT DATA.

The information on **Change Password** is available to all service class licenses. **Change Password** is not available through a remote connection.

To access **Change Password**, select **Utility (second page) > Service > Utilities > Change Password**.

Figure 10-9 Change Password (R5)

Figure 10-10 Change Password (R4 and Earlier)

This table shows all the elements available on **Change Password** with descriptions.

Table 10-5 Change Password

Element	Description
User Type	Type of user for the password reset. - GEService – Windows user for GE Service. - SVCService – Windows user loaded with the base image load software.
New Password	New password according to the password requirements (14-25 characters including one upper cap, one lower cap, one number, and one symbol).
Confirm Password	Password you entered in New Password .
Update Password	Select to update the password.

Element	Description
Reset	Select to reset the information.

To change the password:

NOTE

Before changing the GEService password (the default is SvcForward123\$), make sure the LOGIQ Totus is connected to the network and the agent is configured. The GEService password is used to perform portions of remote service. If the password is changed and the LOGIQ Totus information is not updated, it may slow down remote service. Both file transfer and SSH depend on the GEService password.

To change the service desktop user password:

1. Navigate to **Utility (second page) > Service > Utilities**, and then select **Change Password**.
2. From **User Type**, select one of the following:
 - **GEService**— This is the Windows user for GE Healthcare Service. Both file transfer and SSH depend on this user and password combination. When using SSH in FFA, the user and password will always be requested. Entering the incorrect password multiple times will lock you out. When changing this password, the LOGIQ Totus should be online (check the online icon at the bottom of the screen) so the back office updates. If the password is changed when offline, the back office will not be updated and you will have to change the password again with the LOGIQ Totus online. There is no notification when this password has been changed.
Changes to this password do not affect logs sent to the GE HealthCare Service data lake.
 - **SVCService**— This is the Windows user loaded with the base image load software. You will never be prompted for this password. When it is set to default (no password selected), a randomly generated password will be supplied by the LOGIQ Totus. If this password is changed with **Change Password**, the base image software will automatically store the new password in the LOGIQ Totus and it will be fixed to the value entered. The SVCService password will not be requested of any user. It is only used by the LOGIQ Totus software.



WARNING

RISK OF LOSING DATA.

GE HEALTHCARE WILL NOT BE ABLE TO RECOVER OR RESET CHANGED PASSWORDS.
SECURELY RECORD THE NEW PASSWORD.

3. In **New Password** type a new password according to the password requirements (14-25 characters including one upper cap, one lower cap, one number, and one symbol).
4. In **Confirm Password**, type the new password.
5. Click **Update Password**. The following message displays if the LOGIQ Totus is offline.



6. When a SVCService user password has been changed, reboot the LOGIQ Totus to reflect the password change.

For more information, see:

- *Utilities* on page 260

10.2.5.2 Data Transfer

Data Transfer provides a way to do the following:

- View information about past transfers of (APM) information.
- Set up automatic/scheduled transfer of allowed data files from the LOGIQ Totus to the server.
- Manually transfer data files allowed data files from the LOGIQ Totus to the server. The information on **Data Transfer** is available to all service class licenses.

To access **Data Transfer**, select **Utility (second page) > Service > Utilities > Data Transfer**.

Figure 10-11 Data Transfer (R5)

Data Transfer

Type of Upload	Upload Permission	Last Upload Status	Last Upload Attempt	Last Successful Attempt
Never Identifiable Images	No			
Monitoring Logs	Yes	Failed	Feb 1, 2025, 1:11:57 AM	Jan 30, 2025, 3:18:01 AM
System Logs	Yes	Failed	Feb 1, 2025, 1:12:09 AM	Jan 30, 2025, 3:18:08 AM
User Information	No			
System Configurations	Yes	Failed	Feb 1, 2025, 1:12:11 AM	Jan 30, 2025, 3:18:11 AM
User Configurations	Yes			
Other logs	Yes	Failed	Feb 1, 2025, 1:12:20 AM	Jan 30, 2025, 3:18:21 AM
Diag Logs	Yes	Failed	Feb 1, 2025, 1:12:22 AM	Jan 30, 2025, 3:18:24 AM

Type of Upload

☐ All ☐ Never Identifiable Images ☒ Monitoring Logs ☒ System Logs ☐ User Information ☒ System Configurations ☐ User Configurations

☒ Other logs ☒ Diag Logs

☒ Scheduler

☒ All Days ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun

Save Settings

Send All

Figure 10-12 Data Transfer (R4 and Earlier)

Data Transfer

Type of Upload	Upload Permission	Last Upload Status	Last Upload Attempt	Last Successful Attempt
Never Identifiable Images	No	NA		
Monitoring Logs	Yes	Failed	Jun 12, 2018 9:11:23 AM	
System Logs	Yes	Failed	Jun 12, 2018 9:11:23 AM	
User Information	No	NA		
System Configurations	Yes	Failed	Jun 12, 2018 9:11:23 AM	
User Configurations	Yes	Failed	Jun 12, 2018 9:11:23 AM	
Other logs	Yes	Failed	Jun 12, 2018 9:11:23 AM	
Windows logs	Yes	Failed	Jun 12, 2018 9:11:23 AM	

☒ Scheduler

☒ All Days ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun

Save Settings

Send All

Figure 10-13 Data Transfer

Type of Upload	Upload Permission	Last Upload Status	Last Upload Attempt	Last Successful Attempt
Never identifiable images	No	No		
Monitoring Logs	Yes	Success	Jun 11, 2020 4:35:58 AM	Jun 11, 2020 4:35:59 AM
System Logs	Yes	Success	Jun 11, 2020 4:40:11 AM	Jun 11, 2020 4:40:11 AM
User Information	No	No		
System Configurations	Yes	Success	Jun 11, 2020 4:40:21 AM	Jun 11, 2020 4:40:21 AM
User Configurations	Yes	Success	Jun 11, 2020 4:40:31 AM	Jun 11, 2020 4:40:31 AM
Other logs	Yes	Success	Jun 11, 2020 4:43:58 AM	Jun 11, 2020 4:43:58 AM
Debug Logs	Yes	Success	Jun 11, 2020 4:43:50 AM	Jun 11, 2020 4:43:50 AM
Windows logs	Yes	No		Jun 9, 2020 11:30:53 AM

Type of Upload

☐ All
 ☐ Never identifiable images
 ☐ Monitoring Logs
 ☐ System Logs
 ☐ User Information
 ☐ System Configurations
 ☐ User Configurations
 ☐ Other logs
 ☒ Debug Logs
 ☐ Windows logs

☒ Scheduler

☐ All Days
 ☐ Mon
 ☐ Tue
 ☐ Wed
 ☐ Thu
 ☐ Fri
 ☐ Sat
 ☐ Sun

Save Settings

Send All

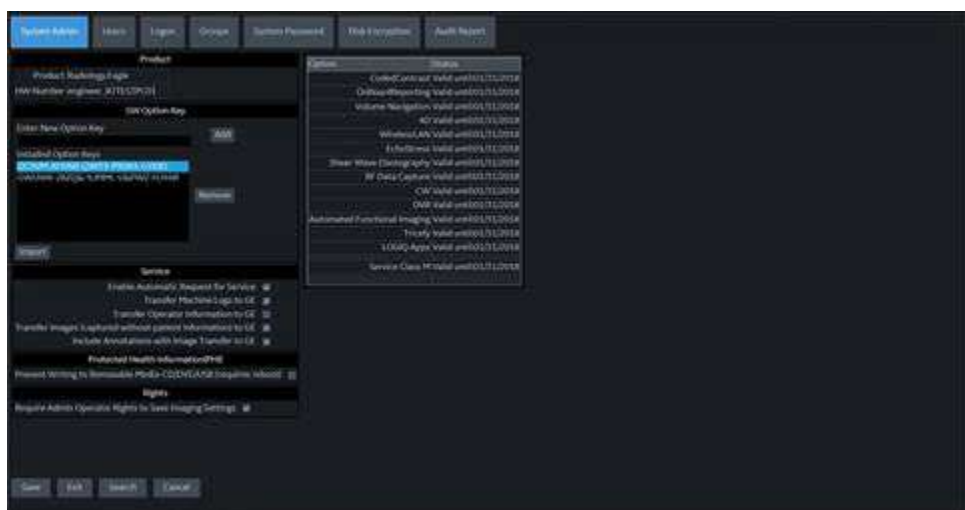
This table shows all the elements available on **Data Transfer** with descriptions.

Table 10-6 Data Transfer

Element	Description
Type of Upload	Type of log file. For example, Incremental Logs or Full Logs . Monitoring Logs , System Logs , and Windows Logs are incrementally transferred when automatic transfer is enabled. To enable automatic transfer, navigate to System Admin and, under Service , check Enable Automatic Request for Service .
Upload Permission	Whether the permission to upload the log file is allowed or not.
Last Upload Status	Whether the last log file upload was successful or not.
Last Upload Attempt	Date and time the last log file upload was attempted.
Last Successful Upload	Date and time the last log file was successfully uploaded.
Type of Upload	When selected, type of log file to transfer. Making these selections will limit the data flow to the data lake.
Scheduler	When selected, enables the related day selections. For example, All Days , Monday , and Tuesday .
Save Settings	Saves the information.
Send All	Manually send the selected log files to the server.

To configure automatic data transfers:

1. Navigate to **ADMIN > System Admin**.



2. On **System Admin**, configure these settings:
 - **Transfer Machine Logs to GE** – Default is checked
 - Transfer Operator Information to GE
 - **Transfer Images (captured without patient information) to GE** – Default is checked.
3. Click **Save**.
4. Navigate to **Utility (second page) > Service > Utilities > Data Transfer**.
5. On **Data Transfer**, configure these settings:
 - In **Type of Upload**, select the data type you want to transfer.
 - Select **Scheduler**, and then select the days to perform the data transfer.
6. Click **Save Settings**.
7. To manually perform a data transfer, click **Send All**.

For more information

- *Utilities* on page 260

10.2.5.3 Delete Files

Delete Files displays all the files and folders present in the D:\Service folder and allows for their deletion. Deleting unneeded files improves performance and reduces the need to defragment the disk drive.

The information on **Delete Files** is available to all service class licenses.

To access Delete Files, select **Utility (second page) > Service > Utilities > Delete Files**.

Figure 10-14 Delete Files (R5)

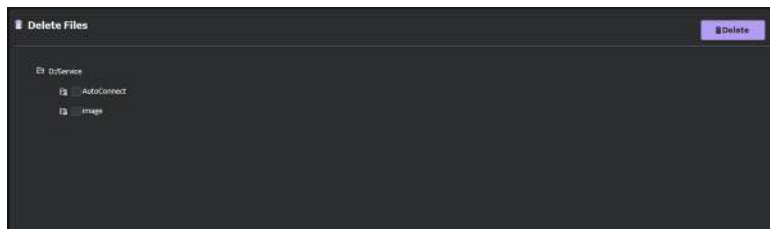
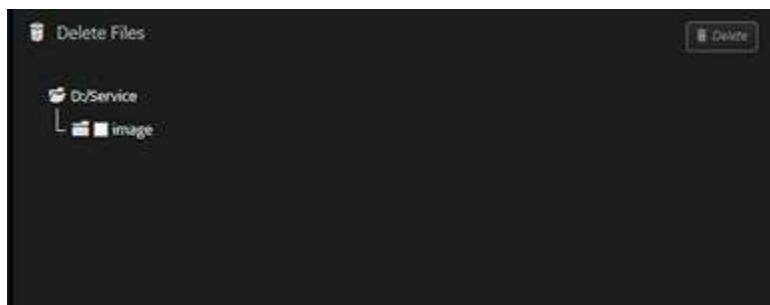


Figure 10-15 Delete Files (R4 and Earlier)



This table shows all the elements available on **Delete Files** with descriptions.

Table 10-7 Delete Files

Element	Description
Delete Files	Displays the files that are available for deletion.
Delete	Deletes the selected files.

To delete files:

1. Navigate to select **Utility (second page) > Service > Utilities > Delete Files**.
2. Under **Delete Files**, select the available folders and files that you want to delete.
3. Click **Delete**.
4. In the resulting dialog box, click **Delete** and then click **OK**.

For more information, see

- *Utilities* on page 260

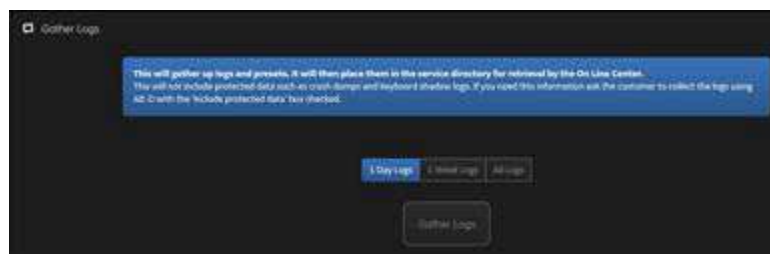
10.2.5.4 Gather Logs

Gather Logs provides a way to collect system logs and place the log files in the D:\Service directory for retrieval by the online center. These log files do not include protected data such as crash dumps and keyboard shadow logs. The customer can collect logs (including protected data) using Alt+D when Protected Data is checked.

The information on **Gather Logs** is available to all service class licenses.

To access **Gather Logs**, select **Utility (second page) > Service > Utilities > Gather Logs**.

Figure 10-16 Gather Logs



This table shows all the elements available on **Gather Logs** with descriptions.

Table 10-8 Gather Logs

Element	Description
1 Day Logs	When selected, gathers log files for one day.
1 Week Logs	When selected, gathers log files for one week.
All Logs	When selected, gathers all available log files.
Gather Logs	Select to gather the log files for the selected time period.

To gather log files:

1. Navigate to **Utility (second page) > Service > Utilities > Gather Logs**.
2. Select one of the following:
 - 1 Day Logs
 - 1 Week Logs
 - All Logs
3. Click **Gather Logs**. In the resulting dialog box, record the location of the log files and click **OK**.
4. When the gather log operation is complete, click the notification icon in the banner to view the location of the log files.



For more information, see:

- *Utilities* on page 260

10.2.5.5 Minisweep (R5)

Minisweep provides a way to capture a list of the error logs. Minisweep does not replace the full error log collection, but can assist in expediting service when a customer calls in regarding certain issues. By default, Minisweep is set to 8 hours, but it can be extended up to 48 hours. The size of the error logs will vary depending on the duration of the logs.

Minisweep does not have a spooler. No additional data or files are created.

The information on **Minisweep** is available to all service class licenses.

To access **Minisweep**, select **Utility (second page) > Service > Utilities > Minisweep**.

Figure 10-17 Minisweep

The screenshot shows the Minisweep utility interface. It features a table with two columns: 'Requested Time' and 'Status'. The table lists ten entries, all with a status of 'Executed'. Below the table, there is a section titled 'Time Duration of Logs (Hours)' with a dropdown menu set to '8' and a 'Save' button.

Requested Time	Status
25-01-31_09:38:45	Executed
25-01-31_09:38:52	Executed
25-01-31_09:38:58	Executed
25-01-31_09:39:00	Executed
25-01-31_09:39:07	Executed
25-02-01_01:11:51	Executed
25-02-01_01:12:01	Executed
25-02-01_01:12:10	Executed
25-02-01_01:12:12	Executed
25-02-01_01:12:21	Executed

Time Duration of Logs (Hours)

8 Save

Table 10-9 Minisweep

Element	Description
Requested Time	Displays the time and date of the error log.
Status	Status of the error log collection. Valid values are: - Executed. Indicates a success in the Minisweep upload. - Failed. Indicates a failure in the Minisweep upload. Failure is most likely on the connection or AutoSC side.
Time Duration of Logs (Hours)	Time (in hours) for the collection of error logs.
Save	Select to gather the error log files for the selected time period.

10.2.5.6 Network Capture

Network Capture displays network traffic between the LOGIQ Totus and configured devices. A network capture outputs two log files: one for main logging with no protected information and another including protected information. These log files are useful when debugging connectivity issues. Because these log files can be large, they are only kept for one week.

The information on **Network Capture** is available to all service class licenses.

To access **Network Capture**, select **Utility (second page) > Service > Utilities > Network Capture**.

Figure 10-18 Network Capture (R5)

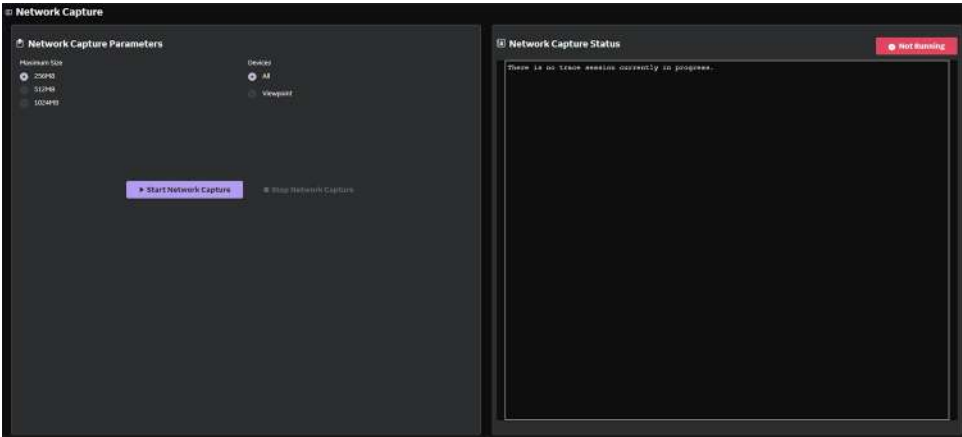
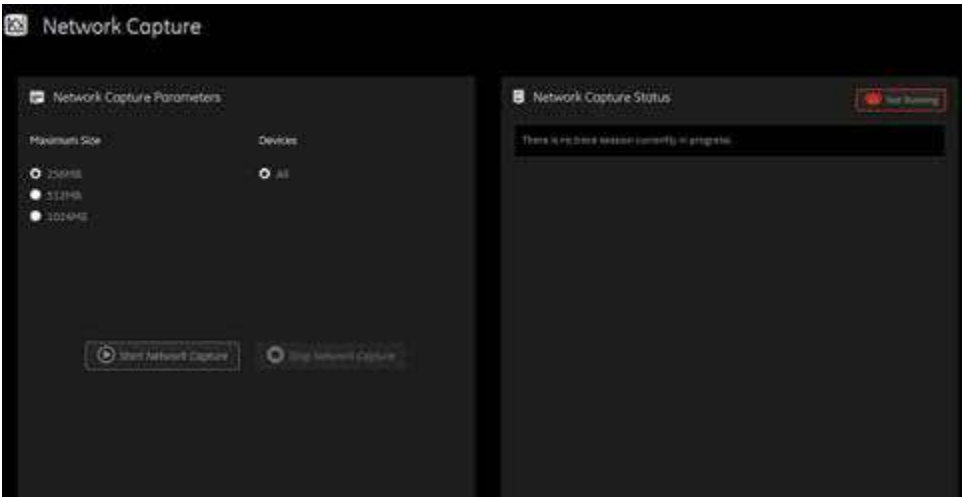


Figure 10-19 Network Capture (R4 and Earlier)



This table shows all the elements available on **Network Capture** with descriptions.

Table 10-10 Network Capture

Element	Description
Network Capture Parameters	
Maximum Size	Allowed size of the generated log file. Valid value are: • 256MB • 512MB • 1024MB

Element	Description
Devices	DICOM-configured devices for which you want to capture information. If no additional devices are configured, only All will be available.
Start Network Capture	Select to start the process. This causes the network capture to start, enables the Stop button, and updates the Network Capture Status pane and changes the Status to Running .
Stop Network Capture	Select to stop the process.
Network Capture Status	
	Displays information about the status of the network capture. The language setting for this information is set in Windows and not through the Service desktop or LOGIQ Totus application software.
	Displays the current status of the network capture. Valid values are: - Not Running - Running

To perform a network capture:

1. Navigate to **Utility (second page) > Service > Utilities > Network Capture**.
2. From **Network Capture**, do the following:
 - Under **Maximum Size**, select the allowed size of the generated log file.
 - Under **Devices**, select the DICOM-configured device for which you want to capture information. If no additional devices are configured, only **All** will be available.
3. Select **Start Network Capture** to start the process. This causes the network capture to start, enables the **Stop** button, and updates the **Network Capture Status** pane and changes the **Status** to **Running**.
4. Click the **Stop** button to end data collection. Stopping is a two-step process:
 - Stops the data collection and immediately closes the .etl file.
 - Collects additional diagnostic data that may help diagnose network issues. When the file is closed, you see "There is no trace session currently in progress". When the remaining data is collected and the file is closed, you are notified in the banner.

For more information, see:

- *Utilities* on page 260

10.2.5.7 Resolve Agent Quarantine

LOGIQ Totus **Resolve Agent Quarantine** is available on the Service Desktop. **Resolve Agent Quarantine** allows you to move the LOGIQ Totus out of quarantine after an agent update.

Figure 10-20 Resolve Agent Quarantine - Submit

The screenshot shows the 'Resolve Agent Quarantine' interface. At the top, there's a title 'Resolve Agent Quarantine' with a circular icon. Below it, there are two input fields: 'Old Serial Number' with the value 'R7EAGLEFNOSYS1' and 'Old Model Number' with a dropdown menu showing 'CS_ULS_LOGIQ_E10_R01.6'. A 'Submit' button is located below these fields. A green message box states: '✓ Command successfully send to back office. It may take around 5 minutes to resolve the quarantine state. If agent quarantine state is not resolved after that time, please contact GE Service.' Below this, a blue informational box says: 'This functionality resolves the agent from quarantine state only during agent upgrades. If agent goes to quarantine due to any other reason, this utility will not fix the quarantine issue.'

Figure 10-21 Resolve Agent Quarantine - No Quarantine

The screenshot shows the 'Resolve Agent Quarantine' interface with a dark background. A message box with an orange background and a warning icon states: '⚠ Agent is not in quarantined state.' Below this, a blue informational box says: 'This functionality resolves the agent from quarantine state only during agent upgrades. If agent goes to quarantine due to any other reason, this utility will not fix the quarantine issue.'

To resolve a quarantine in Agent Configuration:

1. From **Utility (second page) > Service > Utilities**, select **Resolve Agent Quarantine**.
2. View the information in **Old Serial Number** and **Old Model Number**.
3. If the information is correct, select **Submit**.

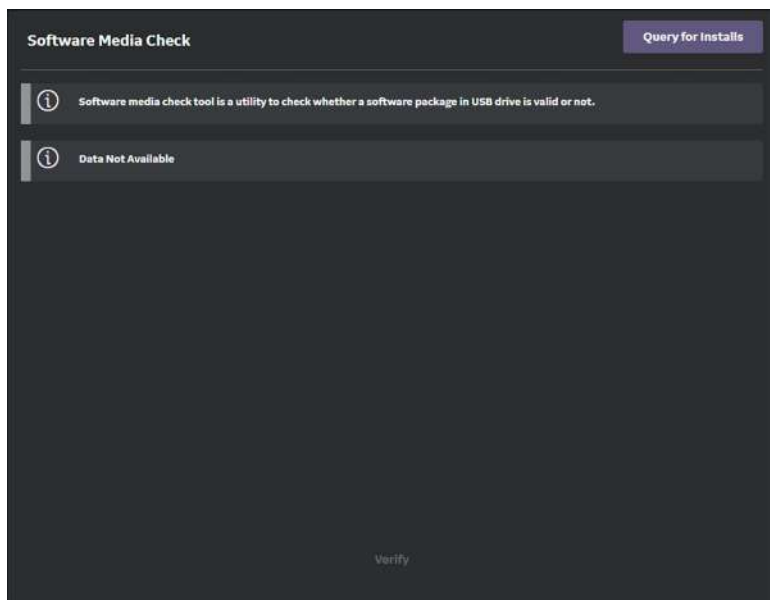
10.2.5.8 Software Media Check (R5)

Software Media Check provides a way to make sure the USB media with LOGIQ software was created correctly—meaning it is bootable—and to verify the integrity of the software. It also checks that the media type, name, format, and file structure are all set up properly.

The information on **Software Media Check** is available to all service class licenses.

To access **Software Media Check**, select **Utility (second page) > Service > Utilities > Software Media Check**.

Figure 10-22 Software Media Check



1. Connect the USB media to an available USB port on the system.
2. Navigate to select **Utility (second page) > Service > Utilities > Software Media Check**.
3. Select **Query for Media**.
4. If the USB contains LOGIQ software, you should see both "**Bootable**" and "**Application**" types listed.
5. Select **Bootable** and then select **Verify**. If the media has a bootable partition, a "Verification successful" message will appear.
6. Select **Application** and then select **Verify**. If the media contains valid software, a "Verification successful" message will appear.

NOTE

This section also displays the software version stored on the media.

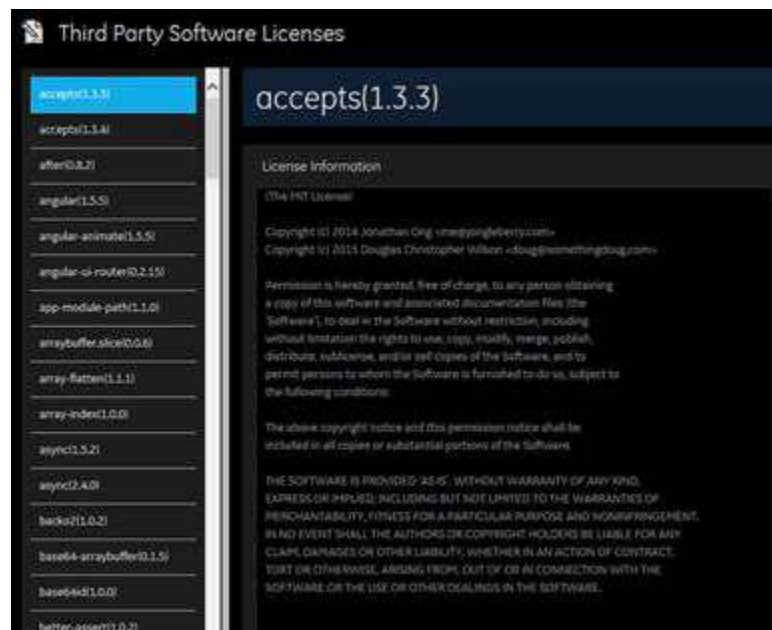
10.2.5.9 Third Party Software Licenses

Third Party Software Licenses displays the third-party software licenses used as part of the service platform.

The information on **Third Party Software Licenses** is available to all service class licenses.

To access **Third Party Software Licenses**, select **Utility (second page) > Service > Utilities > Third Party Software Licenses**.

Figure 10-23 Third Party Software Licenses



For more information, see:

- *Utilities* on page 260

10.2.6 Options

Use **Options** to:

- View software options.
- View software option details.
- Add (or delete) a valid option key, add a duplicate option key, not add an invalid option key, and ask for confirmation before deleting an option key.
- View software option key details. Key details are a list of options that are enabled by a particular key. Under **Available Keys**, highlight the option string, select **Details** and then view the options on the left side of the screen. Press **Show All** to view all of the activated options.

The information on **Options** is available to all service class licenses.

To access **Options**, navigate to **Utility (second page) > Service > Options**.

Figure 10-24 Options (R5)

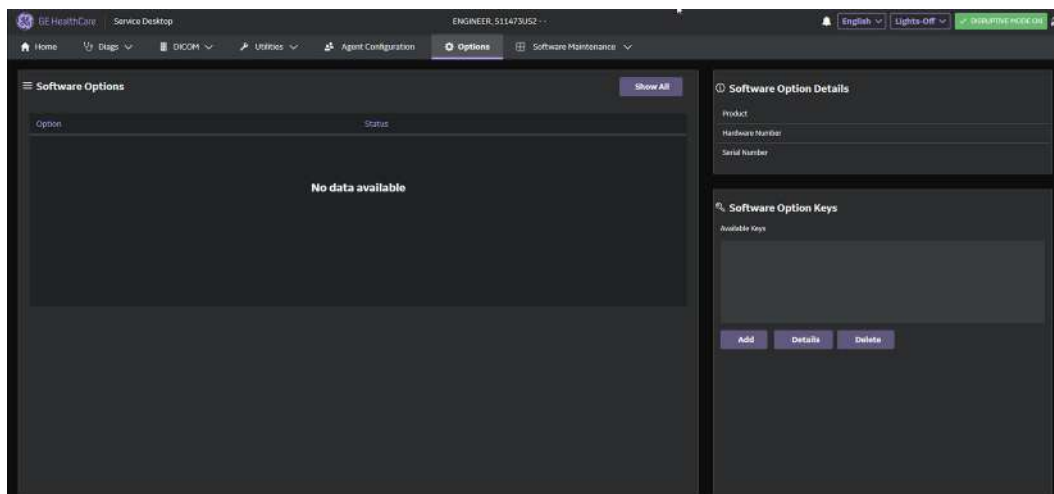
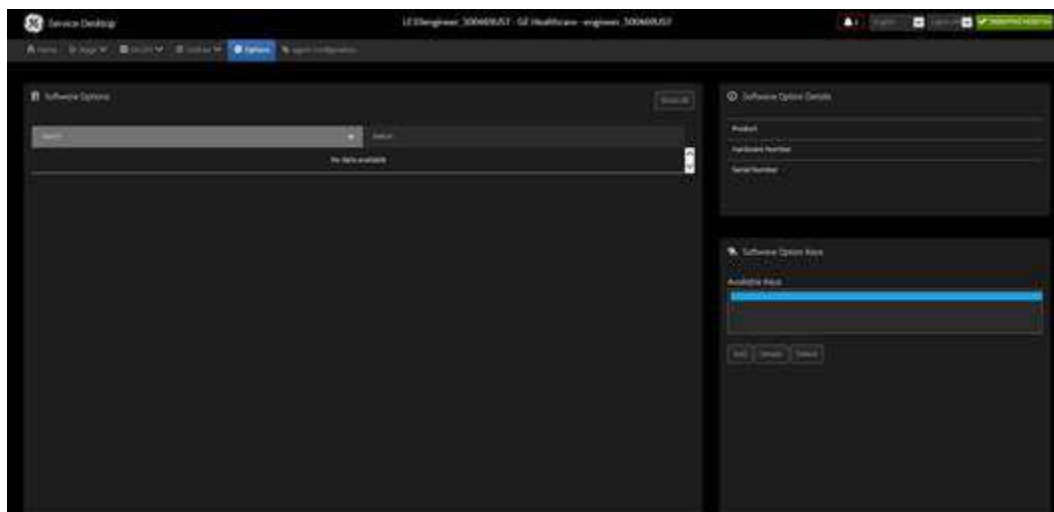


Figure 10-25 Options (R4 and Earlier)



This table shows all the elements available on **Options** with descriptions.

Table 10-11 Options

Element	Description
Software Options	
Option	Software options on the LOGIQ Totus.
Status	Status of the options on the LOGIQ Totus.
Software Option Details	
Product	Name of the product.
Hardware Number	Number for the hardware. The hardware number is the hash of the serial number that is used to generate the option key.
Serial Number	Serial number of the LOGIQ Totus.
Software Option Keys	
Available Keys	List of the option keys installed on the LOGIQ Totus.

10.2.7 Agent Configuration

Use **Agent Configuration** to:

- Edit and configure the following:
 - Enterprise host name in the agent
 - Enterprise port number in the agent
 - URL for software downloads
 - Proxy server in the agent
 - Proxy port in the agent
 - CRM number in the agent
 - Display name in the agent
- Set the serial number in the agent
- Enter the username and password for the proxy
- Reset the edited unsaved value
- Update contact details

The information on **Agent Configuration** is available to all service class licenses.

To access **Agent Configuration**, navigate to **Utility(secondpage)>Service>Agent Configuration**.

Figure 10-26 Agent Configuration (R5)

Figure 10-27 Agent Configuration (R4)

This table shows all the elements available on **Agent Configuration** with descriptions.

Table 10-12 Agent Configuration

Element	Description
Agent Configuration	
Enable automatic InSite connection For R4.x.x or later, allows for automatic connection to InSite when enabled.	
Contact Details	Phone number for the person at the customer site a GE HealthCare remote service engineer would contact. The phone number is entered during installation and reviewed at every service call to make sure the information is correct.
Agent Status	Status for the agent. Valid values are: - Running - Not Running
Agent Registered	Registration status of the agent. Valid values are: - Yes – The agent is registered in the back office. - No – The agent is not registered in the back office. - Not Available – The agent is not configured or running.
Agent Quarantine	Quarantine status of the agent. Valid values are: - Yes – The agent has more than one device registered with the same CRM Number in the back office. This scanner cannot send data back to GE HealthCare or be remotely accessed. - No – The agent has one device registered with the listed CRM Number in the back office. - Not Available – The agent is not configured or running.
Agent CRM Verified	Verification status of the Customer Relationship Management (CRM) number for the agent. Valid values are: - Yes – The CRM number for the agent is verified in the back office. - No – The CRM number for the agent is not verified in the back office. - Not Available – The agent is not configured or running.
Agent Model Number	GE HealthCare part number for the LOGIQ Totus. The same number as listed on the rating plate.
Serial Number	Serial number of the agent (read-only). If the agent is not registered with a serial number, this field is populated with the serial number of the LOGIQ Totus. The serial number of the agent is tied to the serial number of the LOGIQ Totus.
CRM No	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region. CRM is pre-populated by adding LOGIQ Totus to the CRM number. The CRM number of the LOGIQ Totus is editable.
Display Name	Displayed name of the agent.
Agent Connected	Connection status of the agent. Valid values are: - Yes – The agent is connected to the back office. - No – The agent is not connected to the back office. - Not Available – The agent is not configured or running.
Last Connected Time	When Agent Connected is Yes, the last time the LOGIQ Totus successfully connected to the agent. When Agent Connected is No, this field does not display.
Advanced Configuration	

Element	Description
Server	Name of the enterprise server. Should be set to Production . Do not use the IP address of the enterprise server using the “other” selection as Windows 10 has removed the ability to bypass a certificate error that occurs when using the IP address. This error can block connectivity.
Enterprise Host	Number of the enterprise host. Should be set to insite.gehealthcare.com .
Enterprise Port	Number of the enterprise port. Should be set to 443 .
Software Download URL	Address where software will be downloaded from to the LOGIQ Totus.
Proxy Configuration	
Enable Proxy	Enables the proxy server.
Proxy Server	When Enable Proxy is selected, name of the proxy server IP provided by the customer.
Proxy Port	When Enable Proxy is selected, number of the proxy server port provided by the customer.
Credentials	
Enable Proxy Credentials	Enables the proxy credentials.
Username	When Enable Proxy Credentials is selected, name of the user provided by the customer.
Password	When Enable Proxy Credentials is selected, password for the user provided by the customer.
Submit Changes	Saves the changes made on the Agent Configuration page. Once Submit Changes has been selected, exit the Agent Configuration page. Wait between 4 and 5 minutes and then reopen the Agent Configuration page. Agent Status should display Running .
Reset Form	Clears the values on the Agent Configuration page.

10.2.8 Software Maintenance

In LOGIQ Totus uses **Software Maintenance** to manage software updates including check for pending updates and initiate the download for installation. Additionally, use these pages to reset declined software packages and view information about installed software.

NOTE

Use **Software Maintenance** after a full load/C only load from media as the LOGIQ Totus will lose any downloaded updates after these software loads.

Specifically, use these pages:

- **Software Updates** – Query and view available software updates.
- **Reset Declined Packages** – Reset software updates declined through the **Software Download and Install** dialog box.
- **Software Information** – View information that is currently installed on the LOGIQ Totus. For more information, see:
 - *Software Updates* on page 280
 - *Reset Declined Packages* on page 282
 - *Software Information* on page 283

Software Updates

Software Updates provides a way to do the following:

- Query for available software updates
- View available software updates
- Select and download from the available software updates

The information on **Software Updates** is available to all service classes.

To access **Software Updates**, navigate to **Utility (second page) > Service > Software Maintenance > Software Updates**.

Figure 10-28 Software Updates (R5)

Software Updates											Query for Updates
Product Name: E936000E10											Product Version: 1
Update ID	Update Name	Package ID	Package Name	Update Type	Category	Option required for install	Part Number	Version	Released Date	Update Description	
R3.2	R3.2 Application Software Package	DP585375-9	FILE SOFTWARE PACKAGE 3.2	Application Package	Required	Future	585334-9	3.2	2023-09-28	LOGIQ Eco-Portis Application SW Module	Select Update
R4.0	R4.0 Full Software Package	DP591701-4	R4.0.1 Full Software Package	Application Package	Required	Future	5917597-3	R4.0.3	2023-10-30	LOGIQ Eco-Portis Application SW Module-General software improvements included with this release	Select Update
R5.0.1	R5.0.1 Application Package (Version F)	DP5962505-2	R5.0.1 Application Package	Application Package	Optional	Future	5962506	R5.0.3	2024-08-01	Application Software Package for R5.0.1F	Select Update
R4.6	R4.6 Application Package	DP591701-7	R4.6 FILE SOFTWARE PACKAGE	Application Package	Required	Future	5917597-4	R4.6	2024-05-09	LOGIQ Eco-Portis Application SW Module	Select Update
BASE_APP	Base and Application Package for R5	DP5962505	Base and App Software package through E-Delivery	Base Image	Required	Future	5867664-10	5.0.1	2024-11-15	LOGIQ Eco-Portis Base and Application SW Module	Select Update
R3.2.1	R3.2.1 Application Software Package	DP585375-10	FILE SOFTWARE APPLICATION PACKAGE 3.2.1	Application Package	Required	Future	5847488	3.2.1	2023-11-28	LOGIQ Eco-Portis Application SW Module	Select Update
VSCANAR	VSCANAR APP Service Package	DP5817552B		Application Service Package	Required	Future	587552B	1	2024-02-28	LOGIQ Eco-Portis Application Service Module	Select Update

Figure 10-29 Software Updates (R4 and Earlier)

Software Updates											Query for Updates
Product Name: E936000E10											Product Version: 8
Update ID	Update Name	Package ID	Package Name	Update Type	Category	Option required for install	Part Number	Version	Released Date	Update Description	
MS_OS_SECURITY_UPDATE_R3	MS OS Security Update for LOGIQ E10 R3.0.0	DP587995-7	MS OS Security update package for LOGIQ E10 R3.0.0	OS Security	Service Installation	Service Installation	6932718-7	3.0	2023-07-14	MS OS Security Update for LOGIQ E10 R3.0.0	Select Update
LOGIQ_SOFTWARE_UPDATE_R3	LOGIQ E10 R3.0.0 Software Update	DP513406-1	LOGIQ E10 R3.0.0 Software Update	General Update	Service Installation	Service Installation	2012718-7	3.0.0	2023-06-01	LOGIQ E10 R3.0.0 Software update with performance improvement and bug fixes	Select Update

This table shows all the elements available on **Software Updates** with descriptions.

Table 10-13 Software Updates

Element	Description
Product Name	Model number for the LOGIQ Totus.
Product Version	Version for the LOGIQ Totus.
Update ID	Identifier for the software update.
Update Name	Name for the software update.
Package ID	Identifier for the package.
Package Name	Name for the package.
Update Type	Type for the software update. Valid values include: - OS Security - General Update
Option required for install	Requirement for installation of the related software update. Valid values include: Service installation
Part Number	Part number for the software update.

Element	Description
Version	Version for the software update.
Released Date	Date the software update was released.
Update Description	Description for the software update.
Query for Updates	Select to populate the page with the available software updates.
Select Update	Select to initiate the download of the associated software update.

Reset Declined Packages

Reset Declined Packages provides a way to reset software updates that have been previously declined through software download.

The information on **Reset Declined Packages** is available to all service classes. **Reset Declined Packages** is not available through a remote connection.

To access Reset Declined Packages, navigate to **Utility (second page) > Service > Software Maintenance > Reset Declined Packages**.

Figure 10-30 Reset Declined Packages (R5)

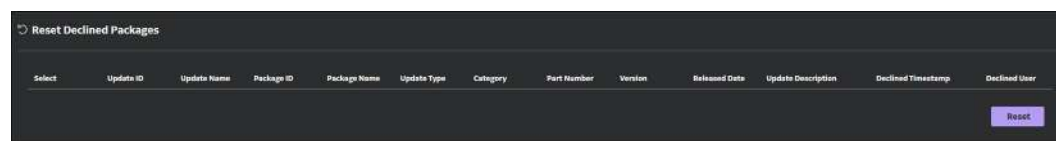


Figure 10-31 Reset Declined Packages (R4 and Earlier)



This table shows all the elements available on **Reset Declined Packages** with descriptions.

Table 10-14 Reset Declined Packages

Element	Description
Select	Check box for the associated software update that has been declined.
Update ID	Identifier for the software update.
Update Name	Name for the software update.
Package ID	Identifier for the package.
Package Name	Name for the package.
Update Type	Type for the software update. Valid values include: - OS Security - General Update
Part Number	Part number for the software update.
Version	Version for the software update.
Released Date	Date the software update was released.

Element	Description
Update Description	Description for the software update.
Declined Timestamp	Timestamp for when the software update was declined.
Declined User	Name for the user who declined the software update.
Reset	Clears the declined software update so that it is again available through a query on Software Updates .

Software Information

Software Information displays general information about the software currently installed on the LOGIQ Totus.

The information on **Software Information** is available to all service classes. **Software Information** is not available through a remote connection.

To access **Software Updates**, navigate to **Utility (second page) > Service > Software Maintenance > Software Information**.

Figure 10-32 Software Information (R5)

The screenshot displays the 'Software Information' interface for R5. It features three main sections: 'Installed Packages', 'Scanner Application Information', and 'Installed Hotfixes'.

Package Type	Part Number	Version and Revision	Installed Date	Build Information
Base System OS Module	584766A-12D	584766A-12D	2025-01-28T15:41:41	2025.01.28.78101
LOGIQ Easy-Portis Application SW Module	5942506	R5.0.2C	28 January 2025, 03:59 PM	2025.01.23.79236
LOGIQ Easy-Portis Application Servicing SW Module	5942511	R5.0.2C	28 January 2025, 03:59 PM	2025.01.23.79236
eFU Electronic Documentation SW Module	5942512	R5.0.2C	28 January 2025, 03:59 PM	2025.01.23.79237
LOGIQ Easy-Portis Security Config SW Module	5942509	R5.0.2C	28 January 2025, 04:00 PM	2025.01.23.79237
LOGIQ Easy-Portis Security Update SW Module	5821992	R5.0.2C	28 January 2025, 03:47 PM	2025.01.23.79236

Name	Company	Description	Revision	License Expiry Date	Contact	License Status	CLSID

Hotfix ID	Installed On	Description

Windows Defender Status

Figure 10-33 Software Information (R4 and Earlier)

The screenshot displays the 'Software Information' interface for R4 and earlier. It features three main sections: 'Installed Packages', 'Installed Hotfixes', and 'Windows Defender Status'.

Package Type	Part Number	Version	Installed Date
Base Image	5822734	5822734.0	2018-08-13T14:31:00
Application Software	5822736-8	8.0.0	13 August 2018, 06:21 PM
Service Software	5822733	8.0	13 August 2018, 06:06 PM
Online Help	5822734	8.0	13 August 2018, 06:21 PM
Security Package	5822736	8.0	13 August 2018, 06:21 PM
Base Image Update	5822734-8	8.0	13 August 2018, 06:04 PM

Hotfix ID	Installed On	Description
KB4022393	Monday, April 9, 2018 12:00:00 AM	Update
KB4020450	Friday, November 16, 2018 12:00:00 AM	Update
KB4024803	Monday, April 9, 2018 12:00:00 AM	Update
KB4022228	Tuesday, August 21, 2018 12:00:00 AM	Update
KB4040587	Friday, April 26, 2019 22:00:00 AM	Update
KB4481647	Monday, April 8, 2019 12:00:00 AM	Security Update

Windows Defender Status

- AntivirusVersion: 1.1.1.1000.1
- AntivirusProduct: 1.1.1.1.1.1.1.1.1.1
- AntivirusEnabled: True
- AntivirusVersion: 1.1.1.1.1.1.1.1.1.1
- AntivirusProduct: True
- AntivirusSignatureVersion: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureProduct: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureVersion: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureProduct: True
- AntivirusSignatureVersion: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureProduct: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureVersion: 1.1.1.1.1.1.1.1.1.1
- AntivirusSignatureProduct: True

This table shows all the elements available on **Software Information** with descriptions.

Table 10-15 Software Information

Element	Description
Installed Packages	
Package Type	Type for the software update.
Part Number	Part number for the software update.
Version	Version for the software update.
Installed Date	Date the software update was installed.
Installed Hotfixes	
Hot Fix ID	Identifier for the hot fix.
Installed On	Date the hot fix was installed.
Description	Description for the hot fix.
Windows Defender Status	Status information for Windows Defender.

10.3 Electromagnetic Interference (EMI) Troubleshooting

Contents in this section

- *Prevention/Abatement* on page 285
- *Different power outlet* on page 285
- *Different system* on page 285
- *Different location* on page 285
- *Disconnect external cables* on page 286

10.3.1 Prevention/Abatement

For electromagnetic interference (EMI) rules and details, see *Electromagnetic interference (EMI) limitations* on page 60.

10.3.2 Different power outlet

Connect the LOGIQ Totus to another power outlet and check to see if the noise changes or disappears.

NOTE

Image artifacts can occur if, at any time within the facility, the ground from the main facility's incoming power source to the LOGIQ Totus is only a conduit. See *Minimal floor plan suggestions* on page 67.

10.3.3 Different system

Try another LOGIQ Totus at the same location and look for the same noise. If the noise is present on the new system too, the noise is most likely from an external source/equipment.

10.3.4 Different location

Move the LOGIQ Totus to another location and check to see if the noise changes or disappears. This may help to locate an external noise source.

Try to move the LOGIQ Totus to:

- another location inside the room
- another room
- another floor

10.3.5 Disconnect external cables

Disconnect all external cables (network, all unused probes, ECG leads, etc.) and check to see if the noise disappears.

10.4 Image Troubleshooting

Contents in this section

- *Noise* on page 287
- *Noise picked up from the air* on page 287
- *Noise received through the external cables* on page 288
- *Doppler noise* on page 288
- *Intermittent noise* on page 288
- *Noise on a board* on page 289

10.4.1 Noise

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. They also generate EMI. Possible EMI sources should be identified before the unit is installed. Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. Some of these sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave ovens
- light dimmers
- portable phones

The presence of a broadcast station or broadcast van may also cause interference.

When talking to the customer, try to gather as much information as possible about the conditions when the noise appears.

Table 10-16 Noise Conditions

The noise is present	Determine	If the test fails, see...
All the time	N/A	<i>Noise picked up from the air</i> on page 287 and <i>Noise received through the external cables</i> on page 288
After some time of use	The amount of time between initial use and when the noise begins.	<i>Noise picked up from the air</i> on page 287
Certain times of the day or night	The time of day or night along with the duration.	<i>Noise picked up from the air</i> on page 287 and <i>Noise received through the external cables</i> on page 288
At all locations in the hospital	N/A	<i>Noise picked up from the air</i> on page 287
Only in one room or area	The room or area	<i>Noise picked up from the air</i> on page 287 and <i>Noise received through the external cables</i> on page 288
From time to time with no special pattern of time is observed	N/A	<i>Noise picked up from the air</i> on page 287 and <i>Noise received through the external cables</i> on page 288

10.4.2 Noise picked up from the air

Table 10-17 Noise Conditions Picked Up from the Air

Symptom	Cause	Solution
Noise is coherent - "penlight noise" pointing down in the picture due to the fact that the noise is received on all channels.	The electromagnetic interference (EMI) from radio frequencies, magnetic fields, and transients in the air.	Test whether the noise is picked up by a probe cable.
Noise is a problem on a single probe.		Test with another probe.
Noise is a problem on a single probe port.		Move the LOGIQ Totus to another location to see if the noise persists.

10.4.3 Noise received through the external cables

Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the wiring. The noise can enter the LOGIQ Totus through the mains power cable, probe cable(s) or any other external connected cable(s).

Disconnect cables that are not needed for the basic use of the LOGIQ Totus:

- Network cable
- Cables to any external peripherals
- ECG cables and other cables connected to the Patient I/O

Verify whether the noise changed or disappeared when the cables were removed.

Often, this type of noise is due to grounding problems in the mains power system or when the LOGIQ Totus is sharing a power line with other equipment.

10.4.4 Doppler noise

Doppler noise symptoms can be horizontal stripes or spikes.

Table 10-18 Noise Conditions for Doppler

Symptom	Cause	Solution
Horizontal stripes	Typically an analog problem caused by the UAC-T or UCO-T	Determine if one of these boards is the cause: • Transmit & Receive board (UAC-T) • Probe interface board (UCO-T)
Spikes	Typically a digital problem caused by either the UAC-T or UCO-T	Determine if one of these boards is the cause: • Transmit & Receive board (UAC-T) • Probe interface board (UCO-T)

10.4.5 Intermittent noise

Intermittent noise can be caused by other equipment.

Table 10-19 Noise Conditions for Intermittent

Symptom	Solution
Intermittent noise	Check equipment that is turned on and off near the scanner.

Symptom	Solution
Intermittent noise present around the clock	Check the clock.
Intermittent noise present at certain times	Check equipment that is turned on and off near the scanner at certain times.

10.4.6 Noise on a board

Table 10-20 Noise on a Board

Symptom	Solution
There is noise on a board	Isolate the board to see if you can determine the specific board where the noise originates. For example, unplug the receive area of the board and see if the noise persists.

10.5 LOGIQ Apps Troubleshooting

LOGIQ apps are used on Android devices (both phone and tablet) through a Bluetooth connection to the LOGIQ Totus. For more information, see *LOGIQ Apps* on page 227

10.5.1 LOGIQ Apps pairing confirmation delay

The LOGIQ Apps may require 10-30 seconds to pair. Turn the Bluetooth setting off and then on again can minimize this delay time.

10.5.2 LOGIQ Apps library downloads

After downloading LOGIQ Remote and LOGIQ Photo immediately enter the barcode reader or pairing screen. This initiates download of critical libraries to the device. Only turn off wireless after this has been completed or the apps will fail to function.

10.5.3 LOGIQ Photo crashes if camera permission denied

If a user decides to deny permission to the camera on first launch of one of the Smart device apps the app crashes when attempting to use it.

If a user decides to deny permission to the Camera on first launch of one of the LOGIQ Apps the app crashes when attempting to use it

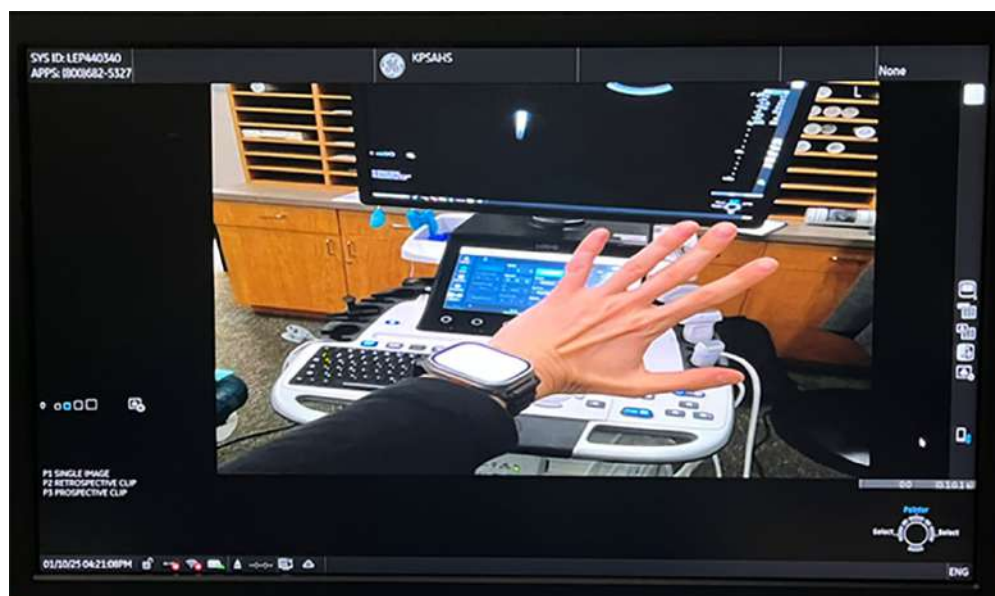
10.5.4 Upside down image from LOGIQ Photo

On certain devices (including the Lenovo Tablet 4 10"), the images are sent to the LOGIQ Totus upside down. Lock the device screen rotation and take pictures upside down.

10.5.5 LOGIQ Apps photo distortion with the Go4 tablet

The LOGIQ Apps may have an issue with photo distortion (shown below) with the Go4 tablet. If this photo distortion occurs, update to v1.3.0 (Android) or v1.3.2.0 (Microsoft) software.

Figure 10-34 Photo Distortion with the Go4 Tablet



10.6 Options Troubleshooting

Contents in this section

- *ECG display disappears after backup/restore* on page 291
- *Unable to measure in both stiffness and velocity in Breast and Thyroid* on page 291
- *Breast Assistant, Powered by Koios DS* on page 292
- *KOIOS Lite* on page 293
- *Device Management (Device Mgmt)* on page 294

10.6.1 ECG display disappears after backup/restore

With ECG, after system auto-restart, turn system off and then back on. Otherwise ECG and TGC may not function until next full power cycle.

10.6.2 Unable to measure in both stiffness and velocity in Breast and Thyroid

With Shear Wave, when entering Measurement in Breast or Thyroid, only the stiffness measurements show up on the touch panel if display units is set to kPa, even though both stiffness and velocity are enabled in the Utility pages.

10.6.3 Breast Assistant, Powered by Koios DS

Use *Table 10-21 Troubleshooting the Breast Assistant, Powered by Koios DS Option* on page 292 to troubleshooting Breast Assistant, Powered by Koios DS installations.

Table 10-21 Troubleshooting the Breast Assistant, Powered by Koios DS Option

Symptom	Solution
Analysis takes longer than 5 seconds.	Check the spooler and clear any failures. Check the connection to the server and attempt to ping the device. For R4 and later, on Connectivity > Connection Manager > Dicom > Devices to verify the service.
On Utility > Connectivity > Koios , the Activate button does not display (may be encountered during demos).	If Breast Assistant, Powered by Koios DS was previously activated, and only the Deactivate button, do the following: For R4 and later, on Connectivity > Connection Manager > Special Devices > Koios, select Deactivate. Follow the steps to activate again.
Do not know the IP address to enter on Utility > Connectivity > Koios .	You cannot activate Breast Assistant, Powered by Koios DS without a valid IP address. Breast Assistant, Powered by Koios DS should have been installed on the customer network. Obtain a valid address by contacting the customer IT department to confirm the installation occurred. Contact Koios DS Support to confirm this installation occurred.
On Utility > Connectivity , cannot find the Koios tab.	Make sure the option string has been entered on the LOGIQ Totus and the option is enabled. Check that the LOGIQ Totus has the correct software version that includes Breast Assistant, Powered by Koios DS installed.
On Utility > Connectivity > Device , clicking the Verify button fails.	Verify that the IP Address field matches the address/hostname of the Koios DS server on file and update the field if necessary. If the information is correct, the Koios DS server information may have changed or an error may have occurred. Contact Koios DS Support and provide the scanner AE Title, Port, and IP Address.
On Utility > Connectivity > Service , clicking the Verify button fails.	Verify that the AE Title and Port Number fields match the values of the Koios Server on file and update the fields if necessary. If the fields are correct, from the Device tab, try to ping the server. If the ping is successful, the Koios Server info may have changed or an error may have occurred. Contact Koios DS Support and provide the scanner AE Title, Port, and IP Address.

For Koios DS Support contact:

- Koios DS Support / Servicing Email: logiq@koiosmedical.com
- Koios DS Vendor Support Phone Number: +1(732)529-5755 Ext. 2

10.6.4 KOIOS Lite

KOIOS Lite Troubleshooting

Res File Text	Message	Message Displayed in	Context
KOIOS_SERVICE_FAILED	Koios application service failed to start. Please retry.	Statusbar	Koios connection not successful when Nodule/Lesion button is pressed
KoiosLite is not Activated	KoiosLite is not Activated	Statusbar	Koios is not activated, and Nodule/Lesion button is pressed
KoiosLite Activation Token Expired	KoiosLite Activation License Has Expired.	Statusbar	Token expired, and Nodule/Lesion button is pressed
About To Expire	KoiosLite Activation License Expiring in %d Days.	Statusbar	Nodule/Lesion button is pressed
KoiosServiceFailed	Koios application service failed to start. Please retry, and if the issue persists, contact GE HealthCare Service.	Message Box	KoiosLite startup in background failed, and Koios/Analyze button pressed
KoiosNotActivated	The KoiosLite activation license is either not activated or has expired. Please contact GE HealthCare for license activation.	Message Box	KoiosLite startup in background failed, and Koios/Analyze button pressed

1. If KOIOS Enterprise Options are already enabled on the ultrasound system, please contact your regional Support Team, as enabling both KOIOS Enterprise and KOIOS Lite is not supported.
2. The KOIOS token is located on the KOIOS USB flash drive. If the USB media is missing or lost and the token is required but cannot be found, please contact your regional Support Team.

10.6.5 Device Management (Device Mgmt)

Use *Table 10-22 Troubleshooting the Device Management Option* on page 294 to troubleshoot Device Management (Device Mgmt).

Table 10-22 Troubleshooting the Device Management Option

Symptom	Solution
Do not have or lost the “DEVICE MANAGEMENT” server URL address.	For R4 and later, under Connectivity > Connection Manager > Special Devices , select Device Mgmt . In Server URL enter the default URL: https://iot.gehelathcare.com .
LOGIQ Totus cannot connect to the “DEVICE MANAGEMENT” cloud.	Confirm with the site IT department the following conditions: - Internet access is required - Ethernet connection required 10/100 Mbps or an 10/100/1000 Mbps - LOGIQ Totus uses port 443 on a secure HTTPS connection If the site uses Proxy servers: Under Utilities > Connectivity > DEVICE MANAGEMENT, confirm proxy settings (Server/ port/ Username and password). Contact the site IT administrator to ensure these settings are correct. Also check for possible issues with the site firewall preventing the device from reaching the cloud server. Additionally, to connect with Cloud through proxy, the proxy port that was setup in the Utility page opens.
Missing the registration key for the “DEVICE MANAGEMENT” cloud.	Reset the registration key by: - Delete any information in Registration Key. - Enter the default registration key in Registration Key. The registration key is prepopulated by the software on the device, reloading software will restore the original value but you will need to re-register.
Incorrect email address entered.	In Account Email, select Update and enter the correct email address. This is the user e-mail account that was used when signing up online.
Missing email address (Account Email) associated with the Device Management account after a full load of software.	Restore email account information (Account Email): - Navigate to Utility > Connectivity > Device Mgmt to access Device Management. Do not select Remove Registration. If you do, you will need to contact the support team to re-establish registration to the server. - Select Deactivate. - In Account Email, enter the email address for the account. - If applicable, enter Proxy Server, Proxy Port, Proxy User Name, and Proxy Password. - Select Activate. - Select Save.
After a full software load, cannot connect to the “DEVICE MANAGEMENT” cloud.	If Device Management was active prior to the software load, confirm that the cloud still verifies your activation. Navigate to Utility > Connectivity > Device Mgmt and confirm that status shows “Active”. It is normal if the e-mail address is not visible. If so, proceed to select “Verify” and confirm that you get a smiley face. Keep in mind that you need to be connected to the network for the Device manager to verify successfully. If the system is not successfully connecting to the cloud, contact the Online Center for support indicating the serial number of the unit, description of the problem and e-mail of the admin user registered in the account.

Symptom	Solution
As a user, do not have account to the "DEVICE MANAGEMENT" cloud.	Go to https://ultrasoundfleet.gehealthcare.com/ for sign up instructions.
After a manual backup (Utility > System > Backup/Restore > Manual Backup), a new user is not able to see any backups or the history on the web app.	If the system shows it is connected to Device Management, perform these steps to associate a time zone with your profile. Once the steps are complete, you will be able to view the backups and the history on the web app. 1. Navigate to https://ultrasoundfleet.gehealthcare.com/ 2. Sign in to access your profile. 3. Confirm the time zone.
After preset information is uploaded from the master system (Utility > System > Backup/Restore > Upload for Fleet), a new user is not able to see any backups or the history on the web app.	
Other issues needing help with "DEVICE MANAGEMENT" feature.	Contact the Online Center for support.

Use *Table 10-23 Errors for the Device Management Option* on page 295 to troubleshoot Device Management (Device Mgmt) through the error codes. These error codes will appear in the IoTAgentService.log log file. This log file can be found under D:\log.

NOTE

Error codes may change over time.

Table 10-23 Errors for the Device Management Option

Error	Details	Solution
Activate		
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent side config file(IoTAgentConfig.json) is corrupted.	Contact service for enabling re-registration.
Activation failed. Missing input Parameter. (Error code: 000104)	Invalid Account Email has been entered.	Enter valid Account Email.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 401)	Invalid Registration Key has been entered.	Enter valid Registration Key.
Activation failed.	Invalid Server URL has been entered.	Enter valid Server URL.
Activation failed.	Invalid Proxy server or Proxy port has been entered.	Enter valid Proxy server and Proxy port.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 403)	After successful registration again perform register.	Contact service for enabling re-registration.
Invalid fleet account email format. Activation failed.	Invalid or empty Account Email format field.	Enter valid Account Email.
Invalid proxy port. Activation failed.	Enter string value in Proxy port field.	Enter valid Proxy port.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Empty Registration Key field.	Enter valid Registration Key.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Empty Server URL field.	Enter valid Server URL.

Error	Details	Solution
Invalid server certificate. Please contact your GE HealthCare service personnel.	Invalid server certificate	Install valid certificate using Device Connect Service Certificate.
Activation failed. Timeout occurred.	Console side did not receive any response from Agent\ThingWorx side in predefined activation time delay.	Ensure network connection and retry.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 400)	Bad request	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 500)	Internal server error	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 503)	Service unavailable	Retry
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 404)	Digital twin not found	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 000011)	Unknown error	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 000010)	Internal error	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code:000115)	Default application not found for Digital Twin	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 000100)	Missing appId or appName	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 000105)	Application does not exist	Contact the Online Center to escalate to L3 or L4 for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: 000116)	The application has not been associated with your digital twin. No application device exists.	Retry desired action. Contact the Online Center for support if problem persists.
Activation failed. Missing input Parameter. (Error code: 000100)	Missing Input user or application not provided.	Ensure valid user email is used in Device Mgmt and then retry.
Activation failed. Invalid input parameter. (Error code: 000102)	Invalid data format	Contact the Online Center for support.
Activation failed. Invalid input parameter. (Error code: 000103)	Invalid data type	Contact the Online Center for support.
Activation failed. Invalid input field size. (Error code: 000101)	Field size error	Contact the Online Center for support.
Activation failed. Please contact your GE HealthCare service personnel. (Error code: xxxxxx)	Unknown	Contact the Online Center for support.

Error	Details	Solution
Upload for Fleet		
Upload of backup to cloud failed. Timeout occurred.	Console side did not receive a response from Agent\ThingWorx side in predefined upload time delay.	Ensure network connection and retry.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent side config file(IoTAgentConfig.json) is corrupt.	1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.
App key expired. Please contact your GE HealthCare service personnel.	ThingWorx server App key expired.	Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.	Invalid server certificate	Install valid certificate using Device Connect Service Certificate.
Upload of backup to cloud failed.	1. Retry count elapsed. (Any exception happened in service API\Agent code and there is no specific error code) 2. Any unknown connection issue.	Ensure network connection and retry.
	Network is disconnected.	Establish network connection.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000109)	File Id or file path/file name not found (Resource not found).	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000101)	Field size error	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000102)	Invalid data format	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000103)	Invalid data type	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000119)	Invalid data value File type is invalid	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000120)	Invalid data value Data classification is invalid	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000118)	Insufficient storage	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000100)	Missing Input	Contact the Online Center for support.

Error	Details	Solution
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000111)	File transfer subsystem encountered an error (I/O error)	Retry desired action. Contact the Online Center for support if problem persists.
	Internal error	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000105)	App Id does not exist (Resource not found)	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000113)	Invalid data value	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000010)	External error	Contact the Online Center for support.
Upload of backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: xxxxxx)	Unknown	Contact the Online Center for support.
Update Connection Configuration		
Invalid proxy port. Update proxy configuration failed.	Invalid string value in Proxy port field.	Enter valid Proxy port.
Proxy configuration update failed.	1. Retry count elapsed. (Any exception happened in service API\Agent code and there is no specific error code) 2. Any unknown connection issue.	Ensure network connection and retry.
Proxy configuration update failed. Timeout occurred.	Console side did not receive any response from Agent\ThingWorx side in predefined update proxy time delay.	Check the new configuration and retry.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent service configuration file is corrupt.	1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.
App key expired. Please contact your GE HealthCare service personnel.	The application key has expired.	Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.	The server certificate is invalid.	Install valid certificate using Device Connect Service Certificate.
	Network is disconnected.	Establish a network connection.
Deactivate		
Deactivation failed. Timeout occurred.	Console side did not receive any response from Agent\ThingWorx side in predefined deactivate time delay.	Ensure network connection and retry.

Error	Details	Solution
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.		1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.
App key expired. Please contact your GE HealthCare service personnel.		Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.		Install valid certificate using Device Connect Service Certificate.
Deactivation failed.	1. Network not connected state 2. Any unknown connection issue	Ensure the network connection and retry.
Deactivation failed. Please contact your GE HealthCare service personnel. (Error code: 500)	After activation remove digital twin from ThingWorx server.	Contact GE HealthCare support.
Deactivation failed. Please contact your GE HealthCare service personnel. (Error code: 400)	Bad request	Retry desired action. Contact the Online Center for support if problem persists.
Deactivation failed. Please contact your GE HealthCare service personnel. (Error code: 401)	Unauthorized	Retry desired action. Contact the Online Center for support if problem persists.
Deactivation failed. Please contact your GE HealthCare service personnel. (Error code: 404)	Digital twin not found	Contact the Online Center for support to initiate Device re-registration.
Deactivation failed. Please contact your GE HealthCare service personnel. (Error code: 503)	Service unavailable	Retry desired action. Contact the Online Center for support if problem persists.
Backup		
Backup to cloud failed.	1. Retry count elapsed. (Any exception in service API\Agent code and no specific error code). 2. Any unknown connection issue.	Ensure network connection and retry.
Backup to cloud failed. Timeout occurred.	Console side did not receive any response from Agent\ThingWorx side in predefined backup time delay.	Ensure network connection and retry.
No change identified. Backup not performed.		No action needed.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent side config file (IoAgentConfig.json) is corrupt.	1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.

Error	Details	Solution
App key expired. Please contact your GE HealthCare service personnel.	ThingWorx server App key expired.	Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.	Invalid server certificate.	Install valid certificate using Device Connect Service Certificate.
	Network is disconnected.	Establish network connection.
Local restore completed successfully. Failed to backup newly restored backups to cloud.	Auto backup will be triggered after completing restore operation.	If Auto backup fails, execute Manual Backup.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000109) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000109)	File Id or file path/file name not found (Resource not found).	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000101) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000101)	Field size error	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000102) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000102)	Invalid data format	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000103) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000103)	Invalid data type	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000119) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000119)	Invalid data value File type is invalid	Contact the Online Center for support.

Error	Details	Solution
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000120) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000120)	Invalid data value Data classification is invalid	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000118) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000118)	Insufficient storage	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000100) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000100)	Missing Input	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000111) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000111)	File transfer subsystem encountered an error (I/O error).	Retry desired action. Contact the Online Center for support if problem persists.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000011) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000011)	Internal error	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000105) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000105)	App Id does not exist (Resource not found).	Contact the Online Center for support.

Error	Details	Solution
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000113) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000113)	Invalid data value	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: 000010) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: 000010)	External Error	Contact the Online Center for support.
Backup to cloud failed. Please contact your GE HealthCare service personnel. (Error code: xxxxxx) or Local restore completed successfully. Failed to backup newly restored backups to cloud. Please contact your GE HealthCare service personnel. (Error code: xxxxxx)	Unknown	Contact the Online Center for support.
Install		
Configuration installation failed.	1. Retry count elapsed (Agent or service API exception). 3. Any unknown connection issue. Console side did not receive any response from Agent\ThingWorx side in predefined download time delay.	Ensure network connection and retry.
Configuration downloaded is identical to the current configuration. Press OK to discontinue installation.	Stop installation.	No action needed.
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent side config file(IoTAgentConfig.json) is corrupt.	1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.
App key expired. Please contact your GE HealthCare service personnel.	ThingWorx server App key expired.	Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.	Invalid server certificate	Install valid certificate using Device Connect Service Certificate.
	Network is disconnected.	Establish network connection.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000109)	File Id or file path/file name not found (Resource not found).	Contact the Online Center for support.

Error	Details	Solution
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000101)	Field size error	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000102)	Invalid data format	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000103)	Invalid data type	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000119)	Invalid data value File type is invalid	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000120)	Invalid data value Data classification is invalid	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000118)	Insufficient storage	Insufficient storage on device. Reclaim device storage. Contact the Online Center for support if problem persists.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000100)	Missing input	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000111)	File transfer subsystem encountered an error (I/O error).	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000011)	Internal error	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000010)	External error	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: 000110)	Not authorized to access file	Contact the Online Center for support.
Configuration installation failed. Please contact your GE HealthCare service personnel. (Error code: xxxxxx)	Unknown	Contact the Online Center for support.
Get Notification		
Failed to retrieve notification from Cloud.	1. Retry count elapsed. (Any exception happened in service API\Agent side code and no specific error code). 2. Any unknown connection issue.	Ensure network connection and execute Verify.
Timeout occurred. Device Connect notification request has been sent, but there is not confirmation yet. Please try again later.	Console side did not receive any response from Agent\ThingWorx side in predefined notification time delay.	Ensure network connection and execute Verify.

Error	Details	Solution
Agent service config file is corrupted. Please contact your GE HealthCare service personnel.	Agent side config file (IoTAgentConfig.json) is corrupt.	1. Contact service for enabling re-registration. 2. Select Deactivate. 3. Follow steps for activation.
App key expired. Please contact your GE HealthCare service personnel.	ThingWorx server App key expired.	Contact service personnel for app key expiry date correction.
Invalid server certificate. Please contact your GE HealthCare service personnel.	Invalid server certificate	Install valid certificate using Device Connect Service Certificate.
The message retrieved from the cloud at %s is too large.		Contact fleet owner for correction of the message.
	Network is disconnected.	Establish network connection.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000112)	Invalid data range	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000113)	Invalid data value	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000101)	Field size error	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000105)	App Id does not exist	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000011)	Internal Error	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: 000010)	External Error	Contact the Online Center for support.
Failed to retrieve notification from Cloud. Please contact your GE HealthCare service personnel. (Error code: xxxxxx)	Unknown	Contact the Online Center for support.
Verify		
Smiley icon display	Check whether the Agent is connected to the ThingWorx Core using BaseClient::isConnected() method.	Ensure the network connection and retry.

10.7 Probes Troubleshooting

Contents in this section

- *Advanced Probe Option* on page 305
- *Probe recognition* on page 305
- *IC/RIC5-9 CHI M-Mode too dark* on page 305
- *ML6-15 breast B and color flow “zipper artifact”* on page 306
- *Body pattern probe mark shift* on page 306
- *Probe Check (Automatic Probe Diagnostics)* on page 306

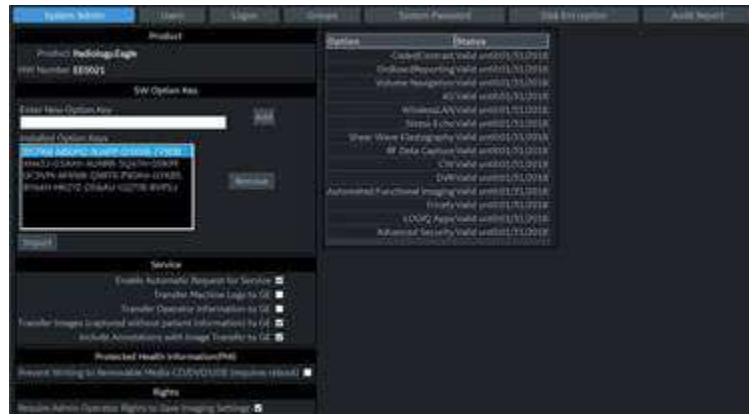
10.7.1 Advanced Probe Option

If the following probes does not activate even if you select, check to see if the Advanced Probe Option (H46612LS) is installed.

- C1-6-D probe
- C1-6VN-D probe
- C2-9-D probe
- C2-9VN-D probe
- C3-10-D probe
- L2-9-D probe
- L2-9VN-D probe.
- M5Sc-D Probe

To determine if the if the Advanced Probe option is installed, navigate to **Utility > Admin > System Admin**, under **Installed Option Keys**, select the option key and then under **Option**, confirm Advanced Probes appears and is current.

Figure 10-35 System Admin Window



10.7.2 Probe recognition

Check all of the probes on all the ports. Remove all of the probes, and then check each probe singly in every port.

- If only one probe fails to be recognized, clean User Defs to check if the problem is caused by corrupted presets. If the problem is not resolved, replace the probe.

10.7.3 IC/RIC5-9 CHI M-Mode too dark

With IC5-9 and RIC5-9 probes CHI M-Mode appears too dark compared to B-Mode image and is limited on the amount it can be brightened. Fundamental M-Mode gain is acceptable.

Use Anatomical M-Mode.

10.7.4 ML6-15 breast B and color flow “zipper artifact”

With ML-6-15 probes, a zipper artifact may appear. Try the following to resolve:

- Decrease the frame rate to minimize artifact.
- Change FR to 0 (this causes a slower FR).
- Do not use during a biopsy.
- Decrease depth to above 4 cm's.

10.7.5 Body pattern probe mark shift

If system is set to active body pattern on freeze, the body pattern will shift to the right on freeze. If it is then moved back it will save as desired.

Do not activate body pattern on freeze.

10.7.6 Probe Check (Automatic Probe Diagnostics)

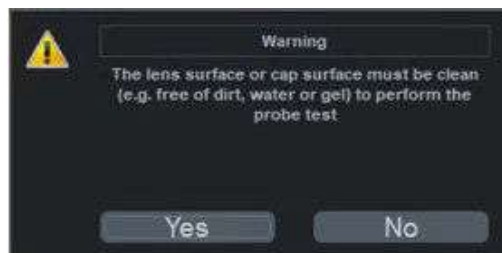
The Probe Check feature is an optional feature (enabled with an OAC license) and was first introduced in R2 software as Automatic Probe Diagnostics (VITA). It has been progressively enhanced in subsequent software versions. The Probe Check software (VITA) uses automated lens echo acquisition and advanced processing to provide real-time probe health information. Keep in mind the following:

- Naming Variations: Probe Check may also be referred to as Automatic Probe Diagnostics (VITA) or Automatic Probe Diagnostics (VITAOnDemand), depending on the software release.
- Availability: Probe Check is an optional feature and may not be available in all regions or countries.
- Enabling the Feature: Customers who have purchased this feature can enable it by selecting "Enable Automatic Probe Diagnostics" on the Utility > Admin page. The frequency of the probe check can also be configured there.
- Version-Dependent Results: Probe check results may vary between software versions, as each update may include enhancements to the VITA software.

10.7.6.1 Probe Check (additional requirement)

The probe lens surface must be clean before performing the probe test. The software will display a popup window prompting the user to clean the probe before the test begins. Failure to properly clean the probe lens may result in a failed test result.

Figure 10-36 Selecting Probe Test and popup



10.7.6.2 Automatic Probe Check

The Automatic Probe Check routine very slightly between different software version and customer settings:

- In the R2 VITA version, diagnostic data is collected at boot-up from the first supported probe detected, scanning from left to right across the connectors.

- For R3 and later versions the Automatic Probe Check runs during probe selection at a time interval specified by the user. Reference the User Manual for additional information: Utility > Admin page > Enable Automatic Probe Diagnostics The time interval options are: Every Time, Once a day, Once a week, Once a month and never.

NOTE

The Automatic Probe Check routine increases the probe selection time by about 5 seconds.

10.7.6.3 Running Probe Check manually

For R3 and later software versions, users have the option to run Probe Check manually.

NOTE

This feature must be enabled (OAC license option) on the Ultrasound system to be accessible.

The Probe Check utility is located on Page 2 of the B-Mode Touch Panel. (The Probe Check utility will not appear while Scan Assistant is active.) This utility allows users to manually run a probe check for supported probes. For a list of supported probes by software version, please refer to the Probe Check (VITA Versions) and Supported Probes section above.

NOTE

In R3, the touch panel button is labeled "Probe Test" and in R4 and later "Probe Check."

NOTE

Make sure the probe lens surface is clean and free of dirt, water or coupling gel before beginning.

10.7.6.4 Probe Check results and actions

Refer to the following scenarios for recommended actions.

Probe Check passes and the customer has no image quality complaints:

- No action is required.

Probe Check passes, but the customer is not satisfied with image quality:

While Probe Check is effective at identifying most damaged probes, there are certain types of probe defects it may not detect. If a probe passes the check but the image quality remains unacceptable:

- Perform a visual inspection of the probe. If the probe lens is compromised, replace the probe.
- Run Probe Check using a different probe port to verify the results. If the probe still fails, replace it.
- Evaluate the issue: If the problem persists with a single probe across all ports, run system diagnostics and perform an Image Quality Check using a phantom. Consider replacing the probe based on the findings.

If problems continue, escalate the problem to the region support in your region or county.

Probe Check fails and the customer has no image quality complaints:

The customer ultimately determines whether the probe's performance meets their requirements. If a probe fails the Probe Check during a routine test and the customer chooses not to replace it following a service visit, the decision and any related actions should be documented accordingly as part of the required service records.

Probe Check fails:

- Run Probe Check using a different probe port to verify the results. If the probe still fails, replace it.
- Evaluate the issue: If the problem persists with a single probe across all ports, run system diagnostics and perform an Image Quality Check using a phantom. Consider replacing the probe based on the findings.

If problems continue, escalate the problem to the region support in your region or country.

10.8 Peripherals Troubleshooting

Contents in this section

- *Test of printers* on page 308
- *EZbackup will not delete images to open disk space* on page 308

10.8.1 Test of printers

Print Test Page tests that the printer is installed correctly and hooked up at the Windows level.

1. Open the **Printers** folder, either from **Start > Settings > Printers** or **Utilities > System > Printers**.
2. Right click on a printer and select **Preferences**.
3. Select **Print Test Page** (this sends a print to the printer bypassing all of the scanner software).
4. Observe the page. If the page prints out, the problem is probably a Windows configuration issue or a configuration issue with Connectivity. If the page does not print out, there probably is a cabling issue or a printer configuration issue in Windows.

NOTE

For the Sony small format printers you will see the test page clipped. This is normal.

10.8.2 EZbackup will not delete images to open disk space

Customers have to manually delete the patients after successful EZBackup operation to free up disk space.

10.9 Setting Troubleshooting

Table 10-24 Setting Troubleshooting

Symptom	Solution
Incorrect group assignment of CMFN group in Breast Comment Library page 2	The cm from nipple annotations are assigned to the same group as the o'clock annotations. This group needs to be adjusted in the utility pages for these annotations. Assign as Group 5
Region presets have not been set up, If the European region is used the finger and hip models are not functional.	Set the region to None.
Imaging preset selection is not highlighted on Imaging Preset Manager	The issue is Utility > Imaging Preset Manager > Imaging Preset Selections list items are not highlighted when selected. All functions work, the selection is just not highlighted.
Print button with both Copy to Dataflow and USB QuickSave does not save image to clipboard.	If both Copy to Dataflow and USB QuickSave are programmed to the same print button, images may fail to save. Do not program Copy to Dataflow and USB QuickSave to the same print button.
GSDf is defaulted to on which may cause undesirable image quality on PACS systems that do not support GSDf.	Change the default GSDf setting to off.
System crashes if multiple commas are placed in annotations.	Avoid putting multiple periods, commas, etc. in annotations as this will cause a system crash.

10.10 Scan Assistant Troubleshooting

10.10.1 Scan Assistant Creator

With Scan Assistant Creator, when the LOGIQ Totus is locked or in auto-logout, you can lose your Scan Assistant protocol. Do not allow the LOGIQ Totus to enter lock screen or auto-logout the Scan Assistant.

Saving and closing Scan Assistant Creator before leaving the LOGIQ Totus is recommended.

10.10.2 Problems with annotations/comments and Scan Assistant

When running Scan Assistant and pausing or editing annotations/comments, the annotation/comments might remain on screen or may fail to display. To fix this problem, press the **Comment** key twice to close or display annotation/comments.

Chapter 11

Parts

In this chapter

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Covers and Bumpers.	314
Top Console.	318
Main Console.	324
Casters.	332
Supported Probes.	333
Options and Peripherals.	337

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

11.1 Parts List Groups

Figure 11-1 Parts List Groups

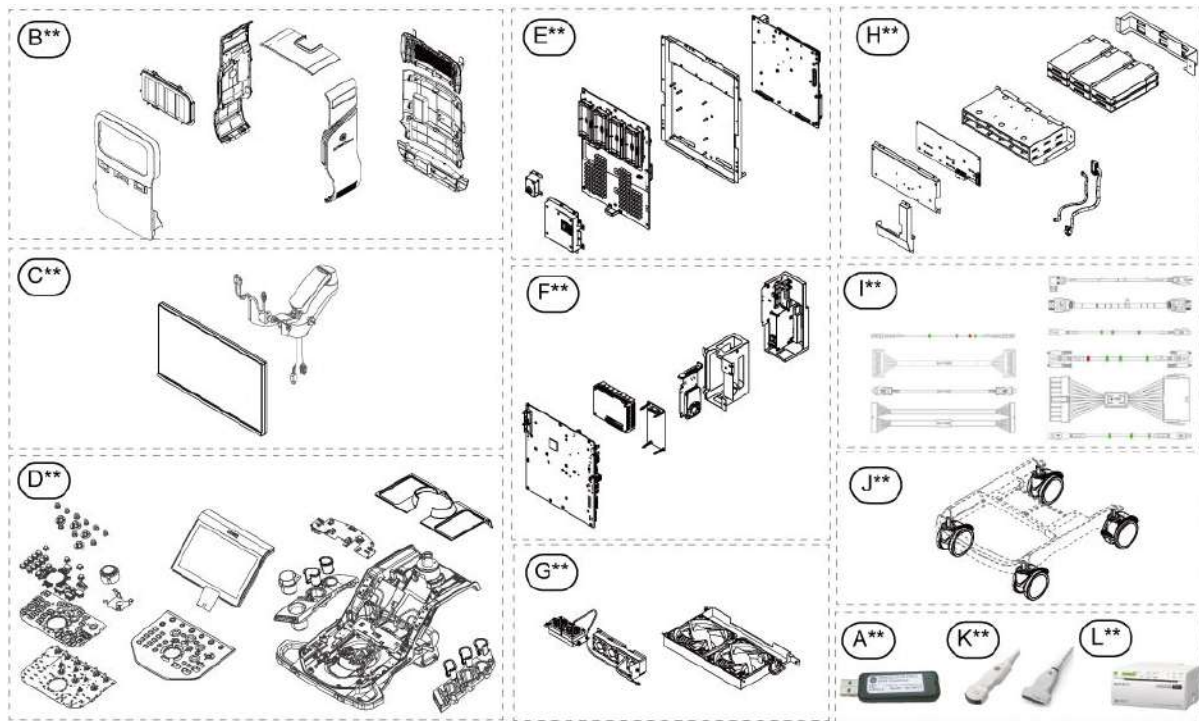


Table 11-1 Parts List Groups

Item		DESCRIPTION
A**	Software	<i>Software on page 313</i>
B**	Covers and Bumpers	<i>Covers and Bumpers on page 314</i>
C**	Top Console	<i>Monitor and Monitor Arm on page 318</i>
D**		<i>Operator Panel and Elevation Arm on page 319</i>
E**	Main Console	<i>Front End Parts on page 324</i>
F**		<i>Back End Parts on page 326</i>
G**		<i>FAN on page 328</i>
H**		<i>Power (Main Power Supply, Batteries and Main Power Cables) on page 329</i>
I**		<i>Internal Cables on page 331</i>
J**	Underbody	<i>Casters on page 332</i>
K**	Probes	<i>Supported Probes on page 333</i>
L**	Options	<i>Options and Peripherals on page 337</i>

11.2 Software

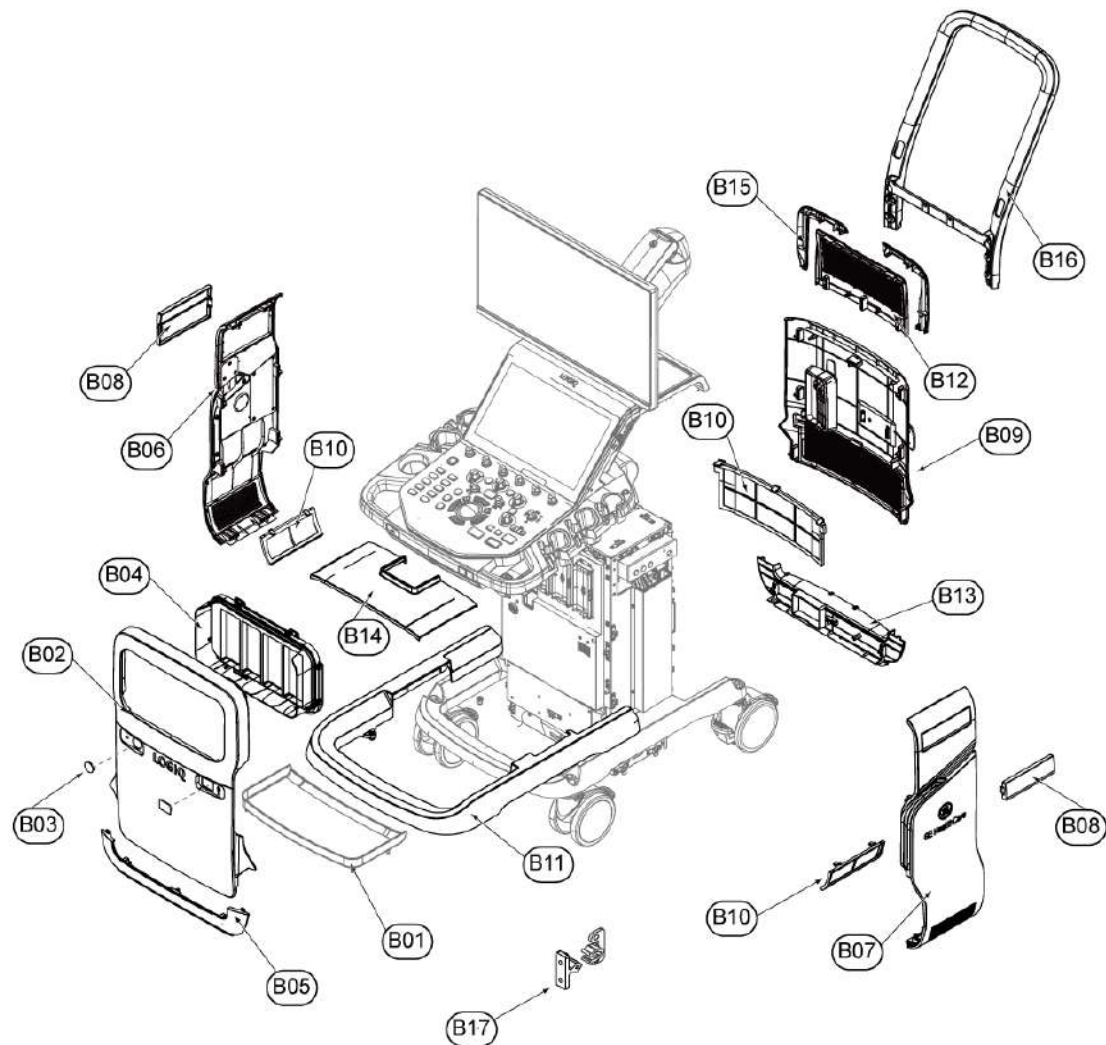
QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-2 LOGIQ Totus Software

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
A01	5931437	LOGIQ Totus Software Thumb Drive Assembly R4.5.7		1	N	Y

11.3 Covers and Bumpers

Figure 11-2 Covers and Bumpers



QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-3 Main Console

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
B01	5918938	Unity Base Tray		1	Y	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
B02	S5942974	Front Cover Assy-T		1	Y	Y
B03	S5942978	Front Dummy Cover Set - T		1	Y	Y
B04	5926064	Unity Protector Assy		1	N	Y
B05	S5942981	Front Cover Bottom Assy-T		1	Y	Y
B06	5926083	T2 Side Cover L Assy		1	Y	Y

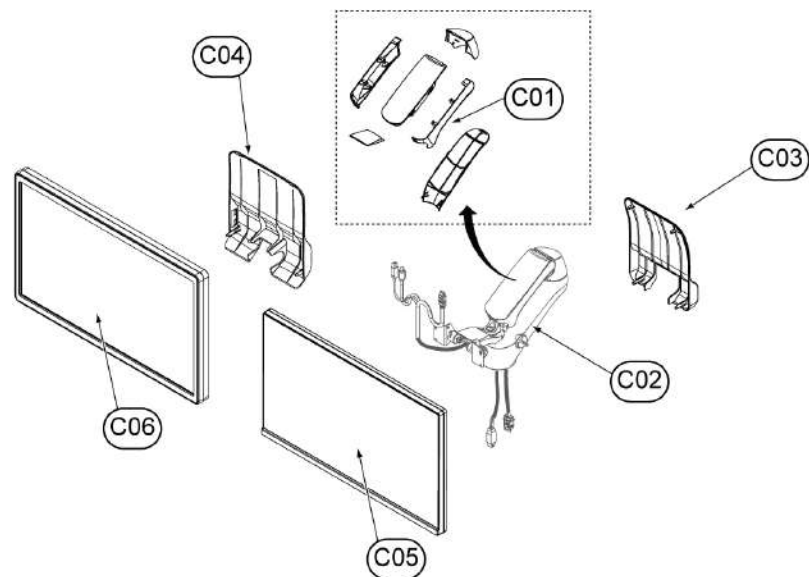
Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
B07	5926082	T2 Side Cover R Assy		1	Y	Y
B08	S5942979	Side Dummy Cover Set-T		1	N	Y
B09	S5942980	Rear Cover Mid Assy-T		1	Y	Y
B10	S5942573	Air Filter Set - U		1	Y	Y
B11	S5942977	Base Cover Set-T		1	N	Y
B12	S5942571	Rear Cover Top Assy-U		1	Y	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
B13	S5942982	Rear Cover Bottom Assy-T		1	Y	Y
B14	S5942975	Top Cover Assy-T		1	Y	Y
B15	S5942572	Rear Cover Top L/R Set-U		1	Y	Y
B16	5918849	T2 Handle		1	N	Y
B17	S5942876	Latch Set		1	N	Y

11.4 Top Console

11.4.1 Monitor and Monitor Arm

Figure 11-3 Parts Location for Monitor and Monitor Arm



QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

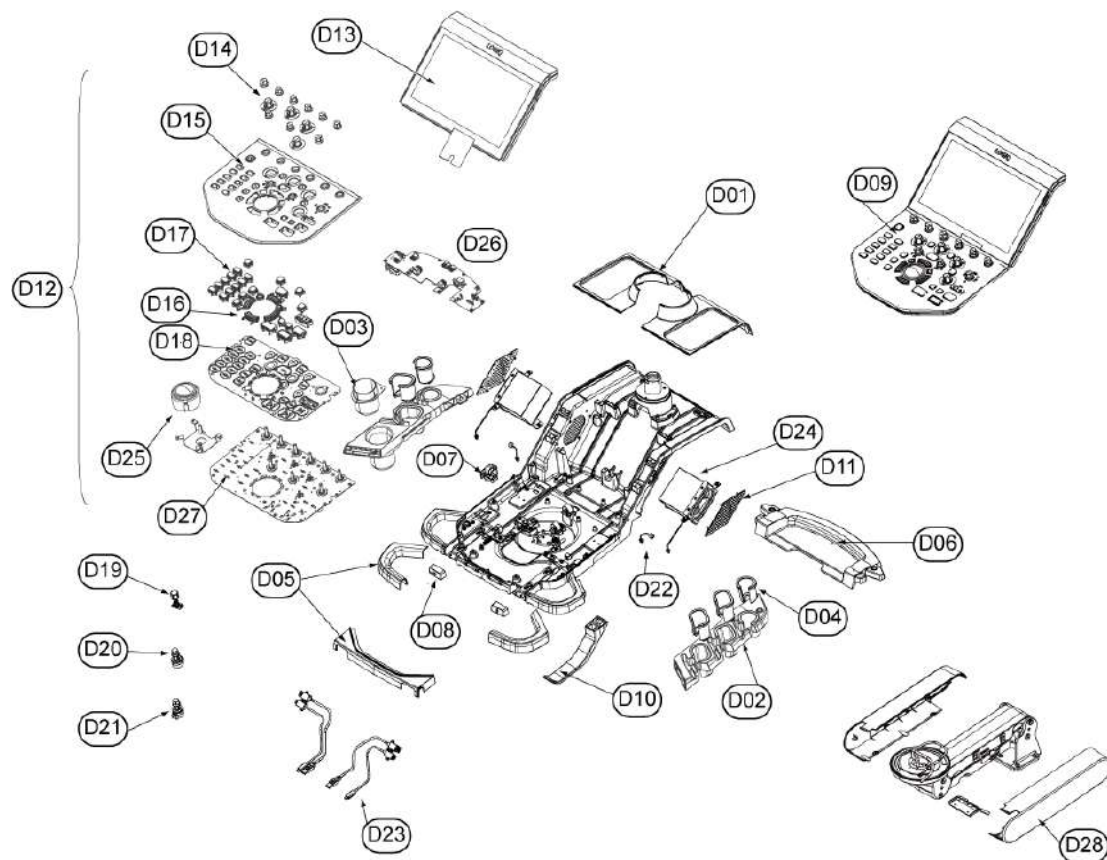
Table 11-4 Monitor and Monitor Arm

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
C01	5957000-1	T1 Monitor Arm Cover Set		1	N	Y
C02	5957000-150	LCD ARM-T1		1	N	Y
C03	S5942966	Monitor Cover Set-T		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
C04	S5862906	HD Monitor Cover Set		1	N	Y
C05	5931467	ULTRASOUND BEZELLESS 23.8INCH LCD T2		1	N	Y
C06	5860239-40	HDU 23.8 inch Monitor LOGIQ Exx		1	N	Y

11.4.2 Operator Panel and Elevation Arm

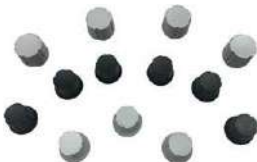
Figure 11-4 Operator Panel and Elevation Arm

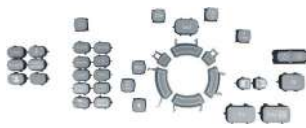


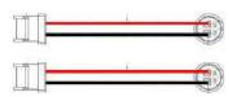
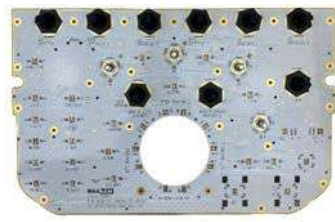
QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-5 Operator Panel and Elevation Arm

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
D01	S5942997	OPIO Top Cover Set-T		1	Y	Y
D02	S5942983	Probe Holder Set-T		1	N	Y
D03	5794072	Gel Holder R3		1	N	Y
D04	S5942984	Probe Holder Rubber Set-T		1	Y	Y
D05	S5942995	OPIO Handle Cover Set T		1	N	Y
D06	5931364	T2 OPIO Base Rear Cover Assy		1	N	Y
D07	5918944	Unity Gel Warmer Cable Cover		1	N	Y
D08	S5942990	OPIO Swivel Updown Button Set-T		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
D09	5896536	UOPIO-T Assy		1	N	Y
D10	5929873	T2 OPIO Cable Hook		1	N	Y
D11	S5942996	Speaker Grill Set-T		1	N	Y
D12	5931360	T2 OPIO Lower Assy		1	N	Y
D13	5931359	T2 OPIO Upper Assy		1	N	Y
D14	S5942986	OPIO Knob Set-T		1	N	Y
D15	S5942991	OPIO Lower Cover Set-T		1	N	Y

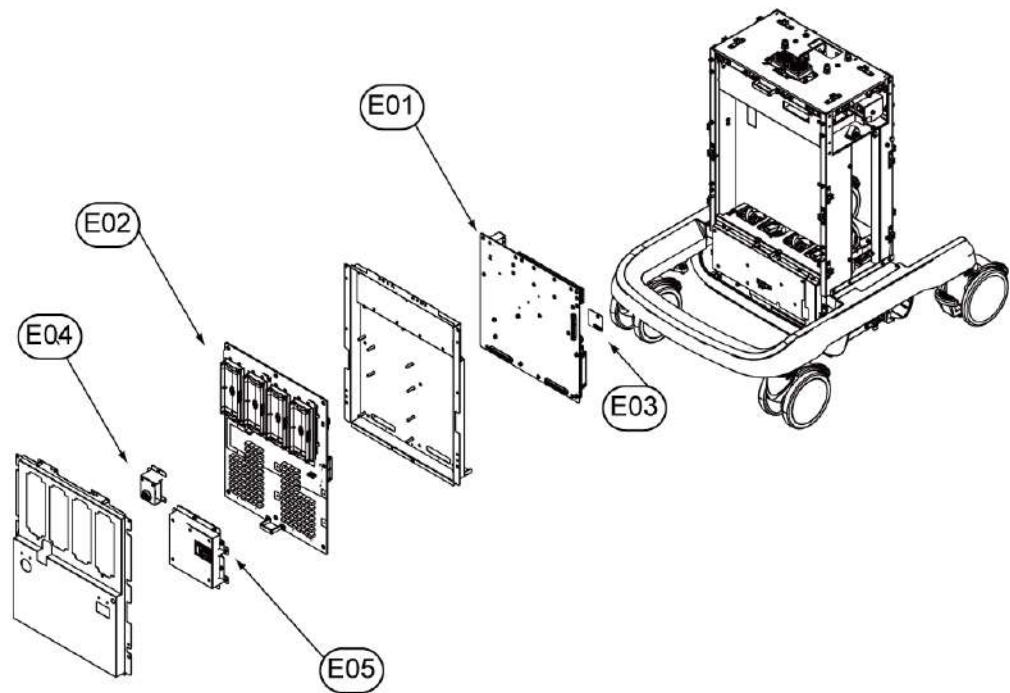
Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
D16	S5942985	OPIO Button Set-T R4		1	N	Y
	S9686890	OPIO Button Set-T R5		1	N	Y
D17	S5942994	User Define Key Cap Set-T R4		1	N	Y
	S5984701	User Define Key Cap Set-T R5		1	N	Y
D18	5919136	T2 OPIO Key Rubber		1	N	Y
D19	S5942988	OPIO Mode Encoder Set-T		1	N	Y
D20	S5942989	OPIO Joystick Set-T		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
D21	S5942987	Touch Panel Joycoder Set-T		1	N	Y
D22	S5917481	Touch Panel MIC SET-U		1	N	Y
D23	S5917486	External USB SET-U		1	N	Y
D24	S5927902	Speaker SET-U		1	N	Y
D25	5945174	Trackball assy-U		1	N	Y
D26	5931361-2	UHUB-T		1	N	Y
D27	5945176	OPIO PWA-T		1	N	Y
D28	S5942702	Elevation Arm Cover Set-U		1	N	Y

11.5 Main Console

11.5.1 Front End Parts

Figure 11-5 Front End Parts



QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

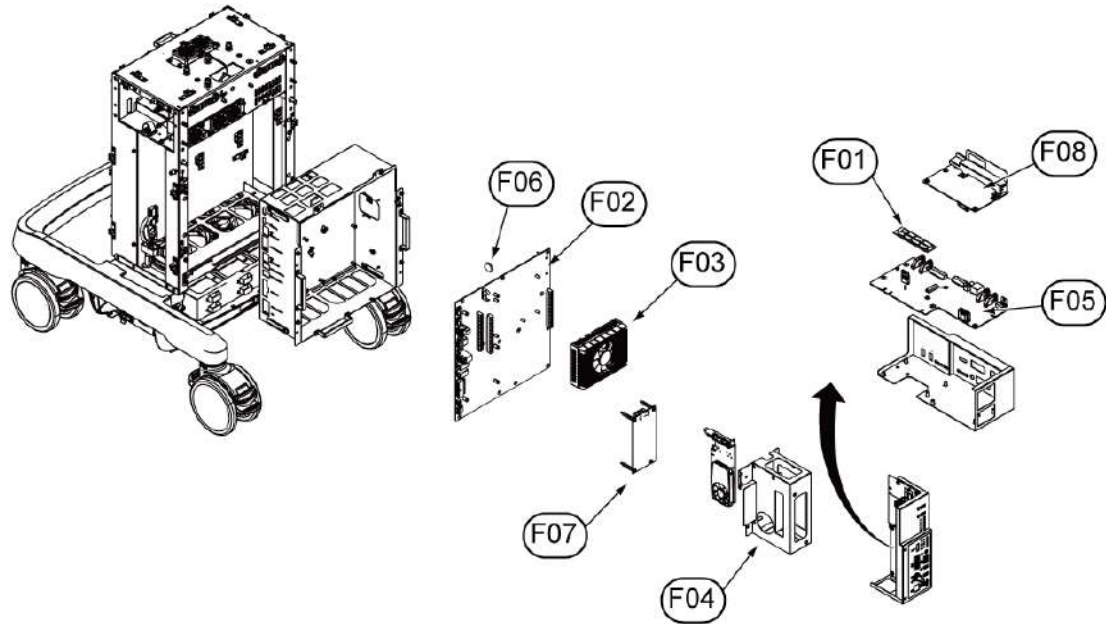
Table 11-6 Front End Parts

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
E01	5887023	UAC-T PWA		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
E02	5931354	UCO-T ASSY		1	N	Y
E03	5942706	CWC-T PWA		1	N	Y
E04	S5942502	U-DCWD SET		1	N	Y
E05	5942402	UECG ASSY		1	N	Y
E06	164L0025	ECG Cable Adult, AHA		1	N	Y
E07	164L0026	ECG CABLE, IEC		1	N	Y

11.5.2 Back End Parts

Figure 11-6 Back End Parts



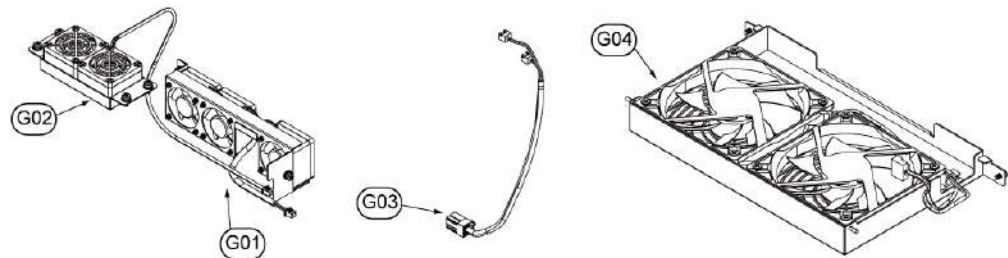
QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-7 Back End Parts

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
F01	5904513	M.2 SSD 1TB		1	N	Y
F02	S5873858	UBE BOARD SET-T		1	N	Y
F03	5923856	COM EXPRESS MODULE, I5 CFL 16G		1	N	Y

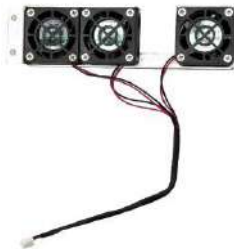
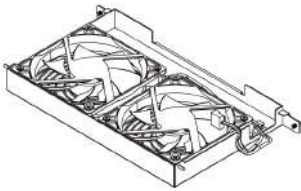
Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
F04	S5928141	GPU SET-T		1	N	Y
F05	5931355	UEPP-T		1	N	Y
F06	5129534-3	BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM		1	N	Y
F07	5931356	UMC-T		1	N	Y
F08	5931357	UVSC-T		1	N	Y

11.5.3 FAN



QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

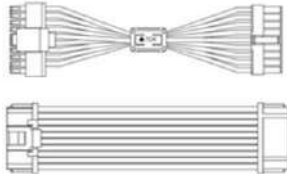
Table 11-8 FAN

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
G01	5947580	Unity Rear Top Fan Assy		1	N	Y
G02	5947581	Unity Top Fan Assy		1	N	Y
G03	5947505	UFRAME FAN PWR CABLE		1	N	Y
G04	5937210	Unity PWM Fan Assy				

11.5.4 Power (Main Power Supply, Batteries and Main Power Cables)

Table 11-9 Mains Power Cables

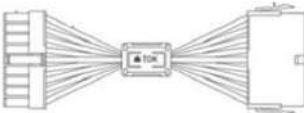
Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
H01	6736114-3	Power Cord for Canada/USA		1	N	Y
H02	6736107-3	Power Cord for UK		1	N	Y
H03	6736112-3	Power Cord for South Africa		1	N	Y
H04	6736101-3	Power Cord for Argentina		1	N	Y
H05	6736109-3	Power Cord for Israel		1	N	Y
H06	6736113-3	Power Cord for Switzerland		1	N	Y
H07	6736115-3	Power Cord for Denmark		1	N	Y
H08	6736106-12	PWR SPLY CRD ST DENMARK NON- HOSPITAL GRADE STD PLUG 10A 250V		1	N	Y
H09	6736111-3	Power Cord for Japan/Taiwan		1	N	Y
H10	6736102-3	Power Cord for ANZ		1	N	Y
H11	6736104-3	Power Cord for China		1	N	Y
H12	6736108-3	Power Cord for India		1	N	Y
H13	6736110-3	Power Cord for Italy		1	N	Y
H14	6736103-3	Power Cord for Brazil		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
H15	6736105-3	Power Cord for EU/Korea		1	N	Y
H16	6736106-12	PWR SPLY CRD ST DENMARK NONHOSPITAL GRADE STD PLUG 10A 250V		1	N	Y
H17	5919066	Unity Power Cord Fix Brkt		1	N	Y
H18	5927826	Unity ACDC Assy		1	N	Y
H19	S5831586	AC Inlet Fuse 2EA		2	N	Y
H20	5808900-4	4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable)		6	N	Y
H21	S5926444	Battery Option Cable Set-U		1	N	Y
H22	5941906-2	UBC-T		1	N	Y

11.5.5 Internal Cables

QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-10 Internal Cables

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
I01	5917494	OPIO HUB TO MONITOR POWER CABLE		1	N	Y
I02	5917495	OPIO HUB TO LOWER KEYBOARD PWA POWER CABLE		1	N	Y
I03	5917496	OPIO HUB TO LOWER KEYBOARD PWA USB CABLE		1	N	Y
I04	5917498	LOWER KEYBOARD TO TOUCH PANEL PWA POWER & USB CABLE		1	N	Y
I05	5917503	UBE TO OPIO TOUCH PANEL HDMI CABLE		1	N	Y
I06	5917504	UBE TO MONITOR HDMI CABLE		1	N	Y
I07	5917505	UBE TO OPIO HUB USB 3.0 CABLE		1	N	Y
I08	5917506	UBE TO OPIO HUB D-SUB 15PIN CABLE		1	N	Y
I09	5926464	ACDC LINK CABLE TO UBE CABLE		1	N	Y
I10	5917493	OPIO HUB TO MONITOR USB 2.0 CABLE		1	N	Y

11.6 Casters

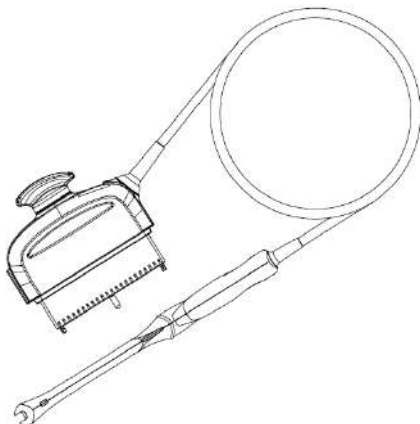
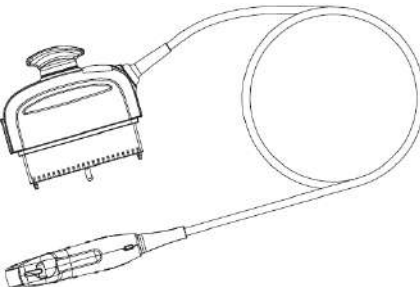
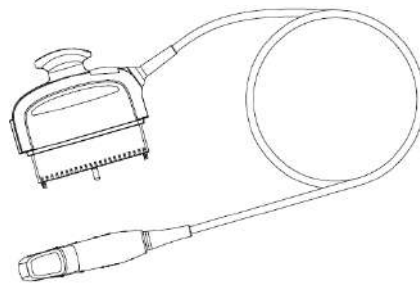
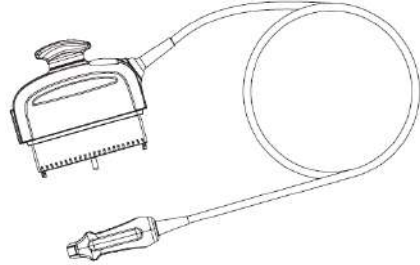
QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

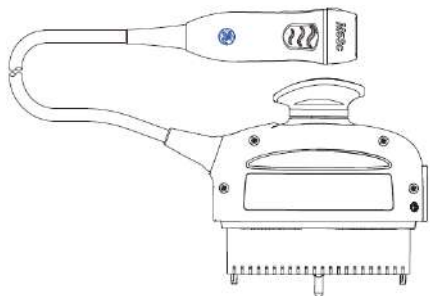
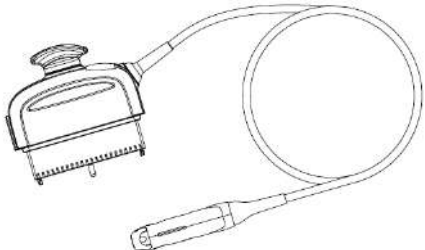
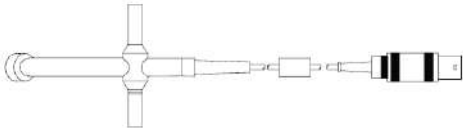
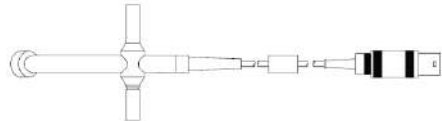
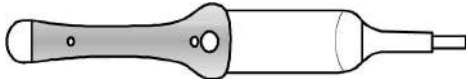
Table 11-11 Main Console

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
J01	5746121	Castor Dual Lock N9		1	N	Y
J02	5746120	Castor Total Lock N9		3	N	Y

11.7 Supported Probes

Table 11-12 Supported Probes

Item	PROBE	PART NUMBER	ILLUSTRATION / PHOTO
K01	IC5-9-D	5499592	
K02	C1-6-D * Need H46612LS Advanced Probe option to activate.	5499606	
K03	C1-6VN-D * Need H46612LS Advanced Probe option to activate.	5476279	
K04	C3-10-D * Need H46612LS Advanced Probe option to activate.	5493012	

Item	PROBE	PART NUMBER	ILLUSTRATION / PHOTO
K05	M5Sc-D * Need H46612LS Advanced Probe option to activate.	5446030	
K06	ML6-15-D	5499600	
K07	C2-7-D	5505700	
K08	C2-7VN-D	5505701	
K09	P2D	5729434	
K10	P6D	5729437	
K11	RIC5-9-D	KTZ303987	
K12	RAB6-D	KTZ303986	

Item	PROBE	PART NUMBER	ILLUSTRATION / PHOTO
K13	6S-D	5499318	
K14	L3-12-D	5482856	
K15	L6-24-D	5833059	
K16	9L-D	5499510	
K17	12S-D	5499322	

Item	PROBE	PART NUMBER	ILLUSTRATION / PHOTO
K18	Vscan Air CL I1 for Service	The VScan Air probe is a medical device, and there are several probe FRU replacement part numbers depending on the country or region. Please refer to the VScan Air Probe Service Manual for the FRU part number that is appropriate for your region.	 A photograph of the VScan Air probe, a handheld medical device with a white body and a grey top section. The brand name 'Vscan' is visible on the front.

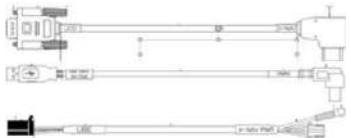
11.8 Options and Peripherals

QTY is the number used on the LOGIQ Totus (and not the amount for the part number).

Table 11-13 Options

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
L01	5932836	T2 Gel Warmer		1	N	Y
L02	5692045	Gel Warmer Cap		1	Y	Y
L03	5926085	T2 AN Keyboard English		1	N	Y
L04	5942968	AN Keyboard German-T		1		
L05	5942969	AN Keyboard French-T		1		
L06	5942970	AN Keyboard Greek-T		1		
L07	5942971	AN Keyboard Norwegian-T		1		
L08	5942972	AN Keyboard Russian-T		1		
L09	5942973	AN Keyboard Swedish-T		1		
L10	S5945037	AN Keyboard Latch Set-T		1	N	Y
L11	5941742	T2 Drawer Assy		1	N	Y
L12	S5943091	Rear Basket Set-U		1	Y	Y
L13	S5942575	Rear Handle Cable Hook Set-U		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
L14	S5943094	OPIO rear tray set-T		1	Y	Y
L15	5873732	TVTR Probe Holder T1		1	Y	Y
L16	5763099	4D Probe Cup Black		1	Y	Y
L17	5172249	Cable Hanger Assy 4 Cable		1	Y	Y
L18	5863421	Ethernet protection cable		1	N	Y
L19	5380960-2	3 Button footswitch Rev.1.1		1	N	Y
L20	5535200	BW printer (UP-D898DC)		1	N	Y
L21	S5917499	BW printer Option Cable Set-U		1	N	Y
L22	5389822	SONY UPD25MD COLOR PRINTER		1	N	Y

Item	PART NUMBER	PART NAME	ILLUSTRATION / PHOTO	QTY	CRU	FRU
L23	S5941233	WLAN-T		1	N	Y
L24	5936678	UWLAN USB A Cable		1	N	Y
L25	5459862	DriveBay2+ (System Electronics Unit)		1	N	Y
L26	5457453	DriveBay2+ 3D Tracking System Mid Range Transmitter		1	N	Y
L27	S5926443	VNAV Option Cable Set-U		1	N	Y
L28	S5920061	U-WIFI MODULE ASSY		1	N	Y
L29	S5943189	Wireless Probe Charger Adaptor - T		1	N	Y
L30	S5945036	Wireless Probe Charger Set-T		1	N	Y

Chapter 12

Parts Replacement

In this chapter

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NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

12.1 Warnings and important information

12.1.1 Warnings

Table 12-1 Preparations and Preparation Links

Preparations - you must perform the following steps	
 DANGER	Risk of dangerous voltage within the LOGIQ Totus. Hazardous voltages, greater than 30 volts, exist within the LOGIQ Totus. To avoid potentially hazardous voltage when servicing the LOGIQ Totus, do the following: • Plan and prepare for shutdown. • Completely power down the LOGIQ Totus. • Disconnect the power cable (first from the wall and then from the LOGIQ Totus). • Apply lockout/tagout devices to maintain exclusive control of the power cable. • Relieve all potentially hazardous stored or residual energy (batteries). • Verify isolation. For step-by-step instructions to lock out and tag out the LOGIQ Totus, see: • <i>Lockout/tagout procedure on page 47</i>
 DANGER	Risk of electrical shock, system must be turned off. Avoid all contact with electrical contacts, conductors and components. Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.



DANGER

AT LEAST TWO PERSONS ARE NEEDED WHEN REPLACING CASTERS (WHEELS) OR ADJUSTING BRAKES.



DANGER

DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS.



DANGER



1. ALWAYS CONNECT YOURSELF. THE ESD WRIST STRAP SHOULD BE CONNECTED TO ONE OF THE TWO RECEPTACLES INTEGRATED ON THE FRAME, SPECIFICALLY FOR THAT PURPOSE.
2. FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.



CAUTION

BECAUSE OF THE LIMITED ACCESS TO CABINETS AND EQUIPMENT IN THE FIELD, AND PLACING PEOPLE IN AWKWARD POSITIONS, WE HAVE LIMITED THE LIFTING WEIGHT FOR ONE PERSON IN THE FIELD TO 16 KG (35 LBS). ANYTHING OVER 16 KG (35 LBS).

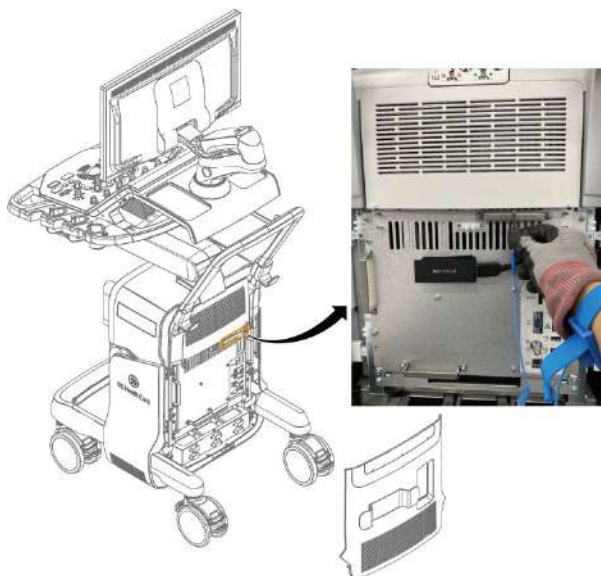
**CAUTION**

THE WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT MUST NOT BE DISPOSED AS UNSORTED MUNICIPAL WASTE AND MUST BE COLLECTED SEPARATELY.

CONTACT THE MANUFACTURER OR OTHER AUTHORIZED DISPOSAL COMPANY TO DECOMMISSION YOUR EQUIPMENT.

12.1.2 ESD receptacles

Figure 12-1 ESD Receptacle



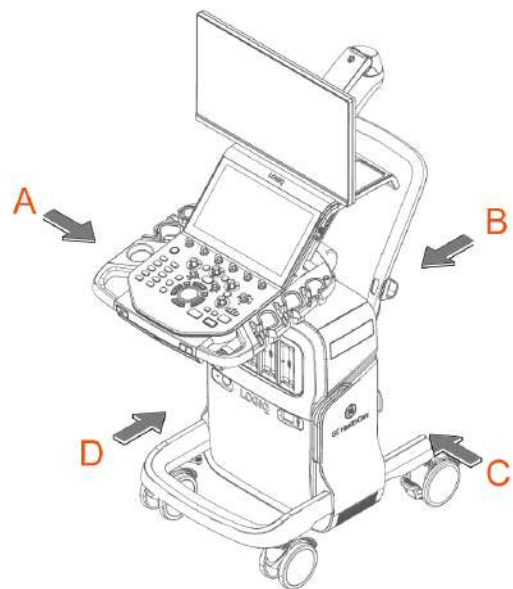
12.1.3 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances. For more information, see *Returning/Shipping Probes and Repair Parts* on page 53.

12.2 Definitions of Left, Rear / Back, Right and Front

Figure 12-2 Definitions of Left, Rear/Back, Right and Front on page 344 illustrates what is the Left Side (A), Rear/Back (B), Right Side (C), and Front (D).

Figure 12-2 Definitions of Left, Rear/Back, Right and Front



12.3 Cover and Bumper Parts Replacement

12.3.1 Replacement of the Front Cover Assy-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-2 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.

12.3.1.1 Front Cover Assy-T - Removal procedure

Pull the Front Cover Assy-T to remove from the console.

Figure 12-3 Removing Front Cover Assy-T



12.3.1.2 Front Cover Assy-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.1.3 Front Cover Assy-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.1.4 Front Cover Assy-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.1.5 Front Cover Assy-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.2 Replacement of the Front Dummy Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-3 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

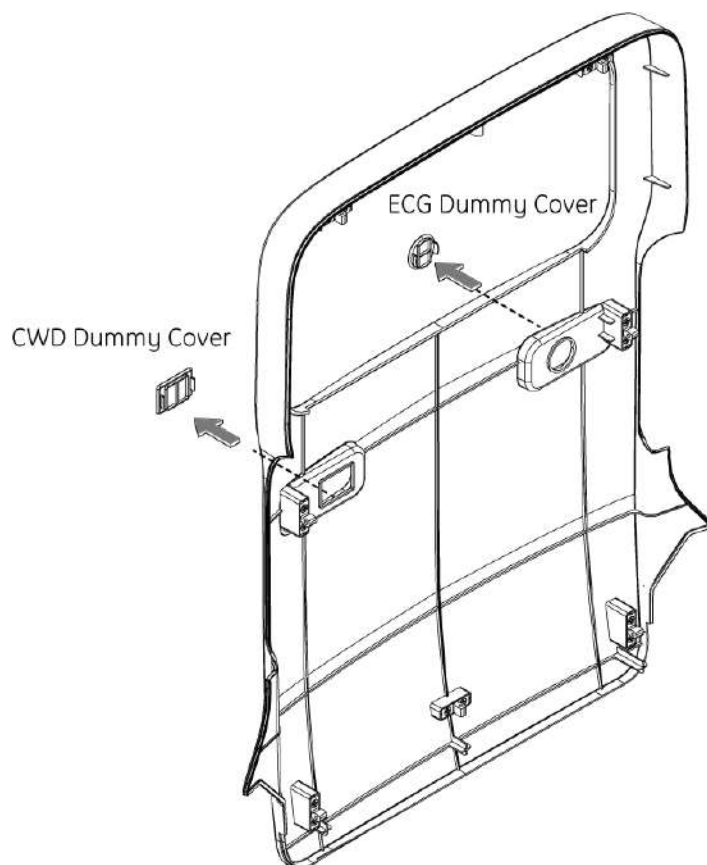
Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.3.2.1 Front Dummy Cover Set-T - Removal procedure

Push the T2 CWD Dummy Cover and T2 ECG Dummy Cover from the back of the Front Cover Assy-T.

Figure 12-4 Removing Dummy Cover



12.3.2.2 Front Dummy Cover Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.2.3 Front Dummy Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.2.4 Front Dummy Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.2.5 Front Dummy Cover Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.3 Replacement of the Unity Protector Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-4 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

Preparations

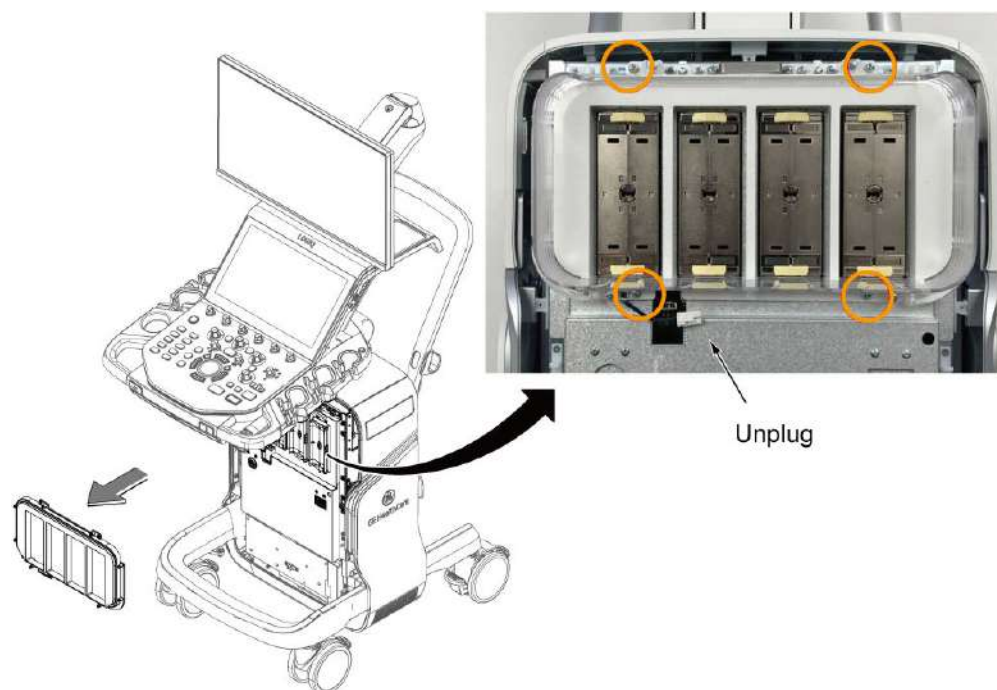
1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.3.3.1 Unity Protector Assy - Removal procedure

Remove the Protector Assy per following steps.

- a. Unplug the LED Bar Assy Connector from the console.
- b. Unscrew 4 screws to remove the Unity Protector Assy from the console.

Figure 12-5 Removing Protector Assy



12.3.3.2 Unity Protector Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.3.3 Unity Protector Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.3.4 Unity Protector Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.3.5 Unity Protector Assy - Functional checks

Table 12-5 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.3.4 Replacement of the Front Cover Bottom Assy-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-6 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

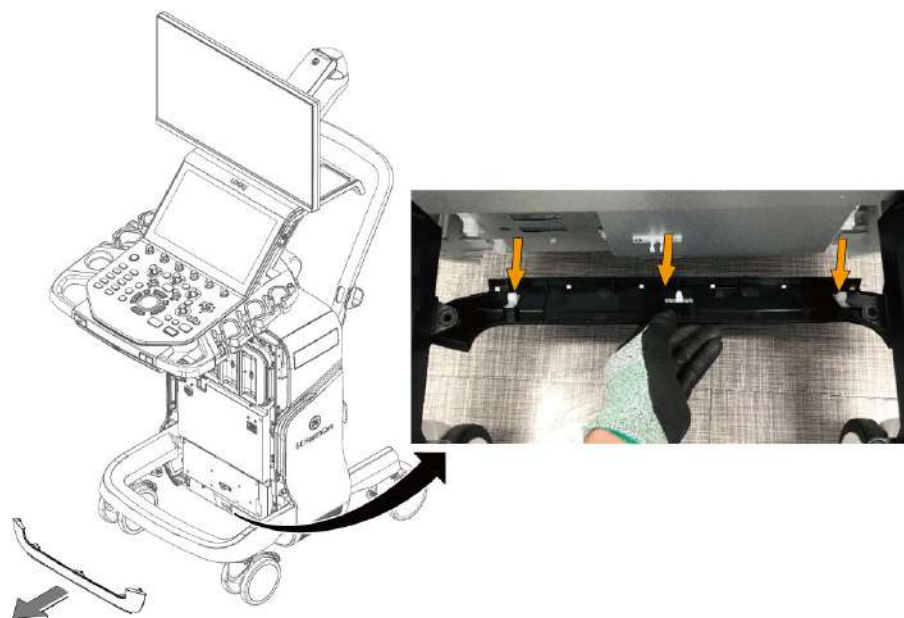
Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.3.4.1 Front Cover Bottom Assy-T - Removal procedure

Pull the Front Cover Bottom Assy-T to remove from the console.

Figure 12-6 Removing Front Cover Bottom Assy-T



12.3.4.2 Front Cover Bottom Assy-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.4.3 Front Cover Bottom Assy-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.4.4 Front Cover Bottom Assy-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.4.5 Front Cover Bottom Assy-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.5 Replacement of the T2 Side Cover L Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

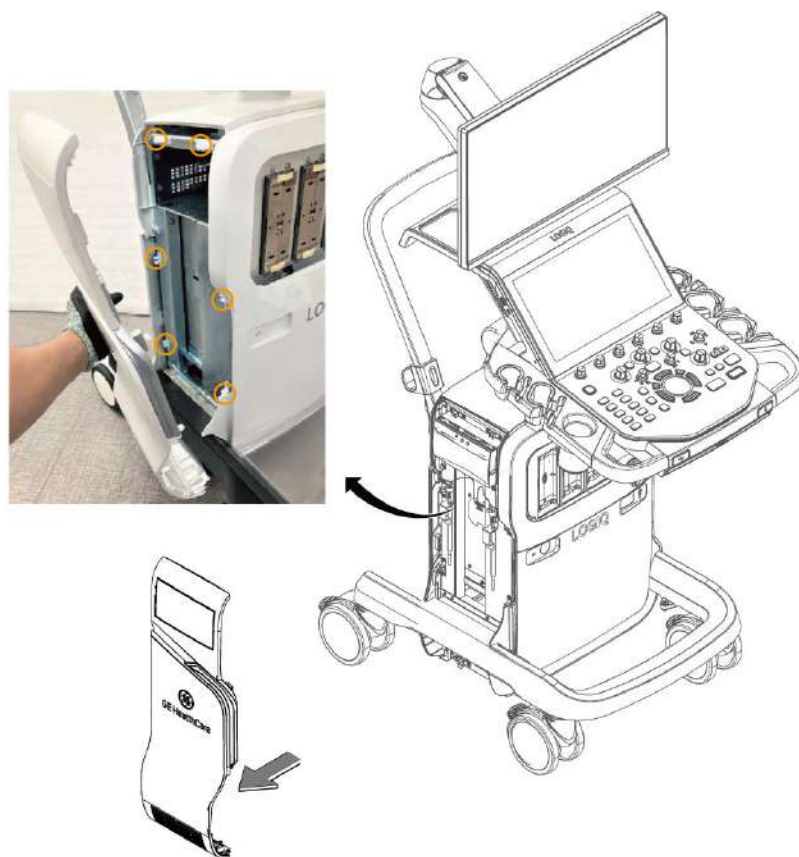
Table 12-7 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.3.5.1 T2 Side Cover L Assy - Removal procedure

Pull the bottom side of the T2 Side Cover L Assy to remove from the console.

Figure 12-7 Removing Side Cover L



12.3.5.2 T2 Side Cover L Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.5.3 T2 Side Cover L Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.5.4 T2 Side Cover L Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.5.5 T2 Side Cover L Assy - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.6 Replacement of the T2 Side Cover R Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

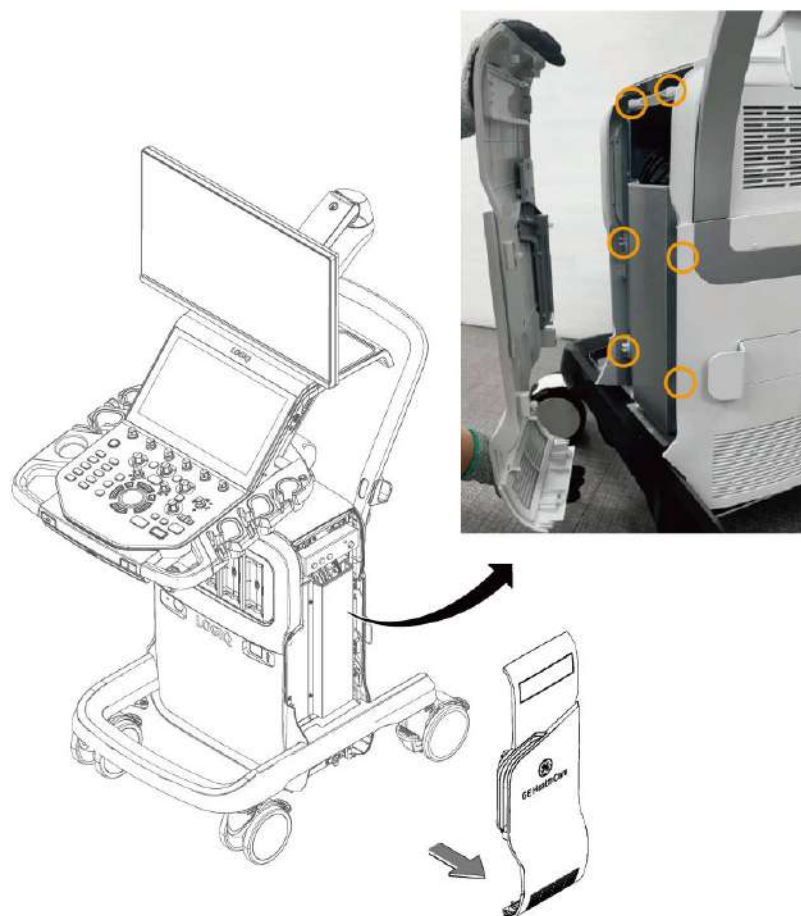
Table 12-8 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.3.6.1 T2 Side Cover R Assy - Removal procedure

Pull the bottom side of the T2 Side Cover R Assy to remove from the console.

Figure 12-8 Removing Side Cover R



12.3.6.2 T2 Side Cover R Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.6.3 T2 Side Cover R Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.6.4 T2 Side Cover R Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.6.5 T2 Side Cover R Assy - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.7 Replacement of the Side Dummy Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-9 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

Preparations

1. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.3.7.1 Side Dummy Cover Set-T - Removal procedure

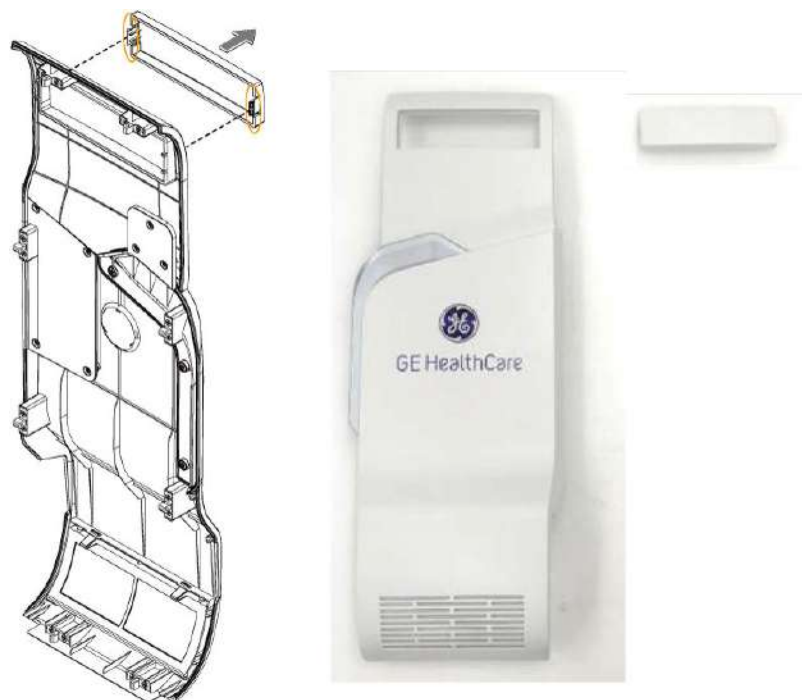
1. Release 2 snap fits to remove the T2 BW Dummy Cover from the T2 Side Cover L Assy.

Figure 12-9 Removing BW Dummy Cover



2. Release 2 snap fits to remove the T2 VNAVI Dummy Cover from the T2 Side Cover R Assy.

Figure 12-10 Removing T2 VNAVI Dummy Cover



12.3.7.2 Side Dummy Cover Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.7.3 Side Dummy Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.7.4 Side Dummy Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.7.5 Side Dummy Cover Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.8 Replacement of the Rear Cover Mid Assy-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-10 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.3.8.1 Rear Cover Mid Assy-T - Removal procedure

Pull the Rear Cover Mid Assy-T to remove from the console.

Figure 12-11 Removing Rear Cover Mid Assy



12.3.8.2 Rear Cover Mid Assy-T - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

If the Gender Caution Label and the Intel Wifi Label 2 are attached on the original part. Makes sure to attach these labels on the replaced part also.

Figure 12-12 Attaching Labels



2. Perform "Functional Checks".

12.3.8.3 Rear Cover Mid Assy-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.8.4 Rear Cover Mid Assy-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.8.5 Rear Cover Mid Assy-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.9 Replacement of the Air Filter Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-11 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

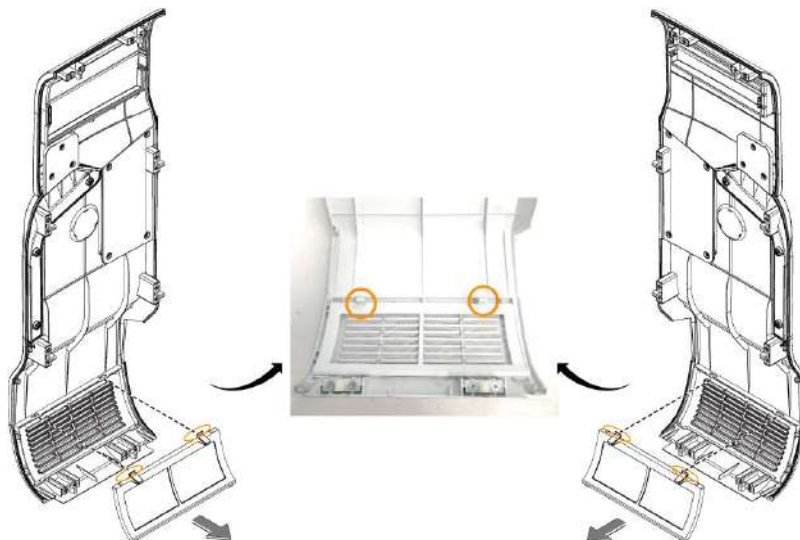
Preparations

1. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.3.9.1 Air Filter Set-U - Removal procedure

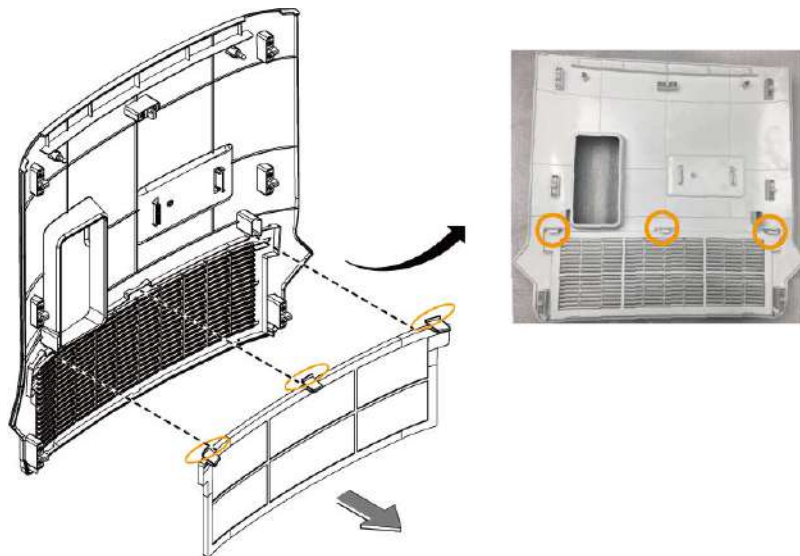
1. Release 2 snap fits to remove the Unity Air Filter Side from the T2 Side Cover L/R Assy.

Figure 12-13 Removing Air Filter Side



2. Release 3 snap fits to remove the Unity Air Filter Rear from the Rear Cover Mid Assy-T.

Figure 12-14 Removing Air Filter Rear



12.3.9.2 Air Filter Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.9.3 Air Filter Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.9.4 Air Filter Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.9.5 Air Filter Set-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.10 Replacement of the Base Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-12 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
3. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
4. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
5. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.3.10.1 Base Cover Set-T - Removal procedure

Release 11 snap fits and pull to remove the Base Cover Set-T from the console

Figure 12-15 Removing Base Cover Set-T

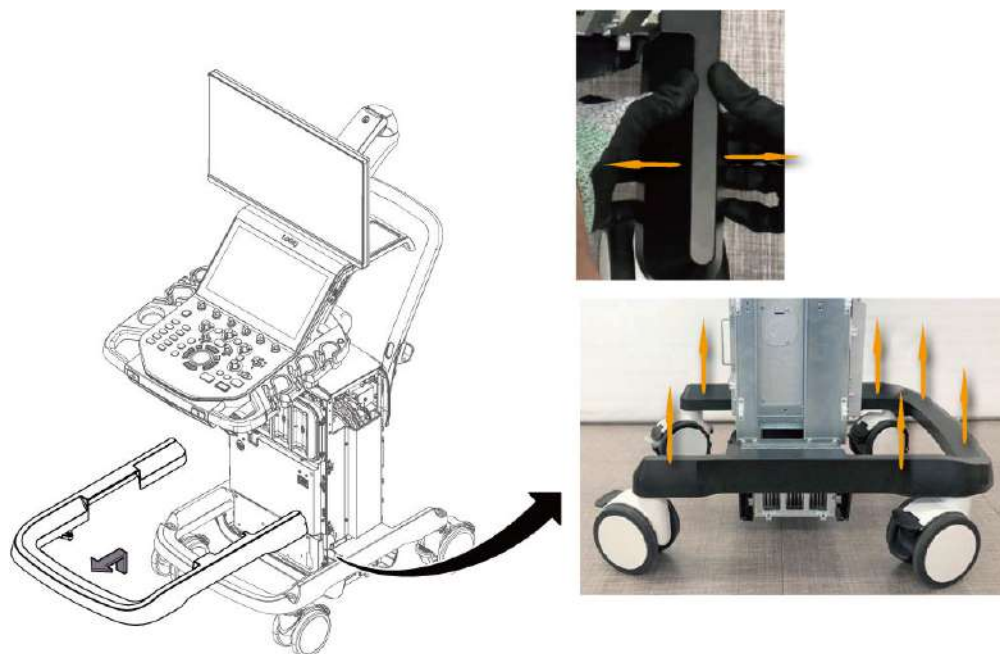
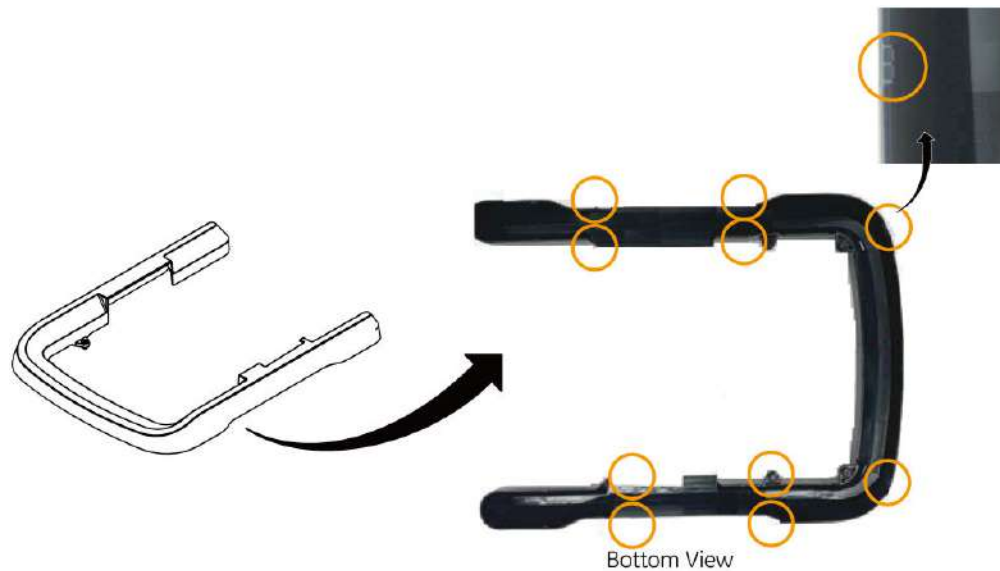


Figure 12-16 Location of 11 snap fits



12.3.10.2 Base Cover Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.10.3 Base Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.10.4 Base Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.10.5 Base Cover Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.11 Replacement of the Rear Cover Bottom Assy-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-13 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

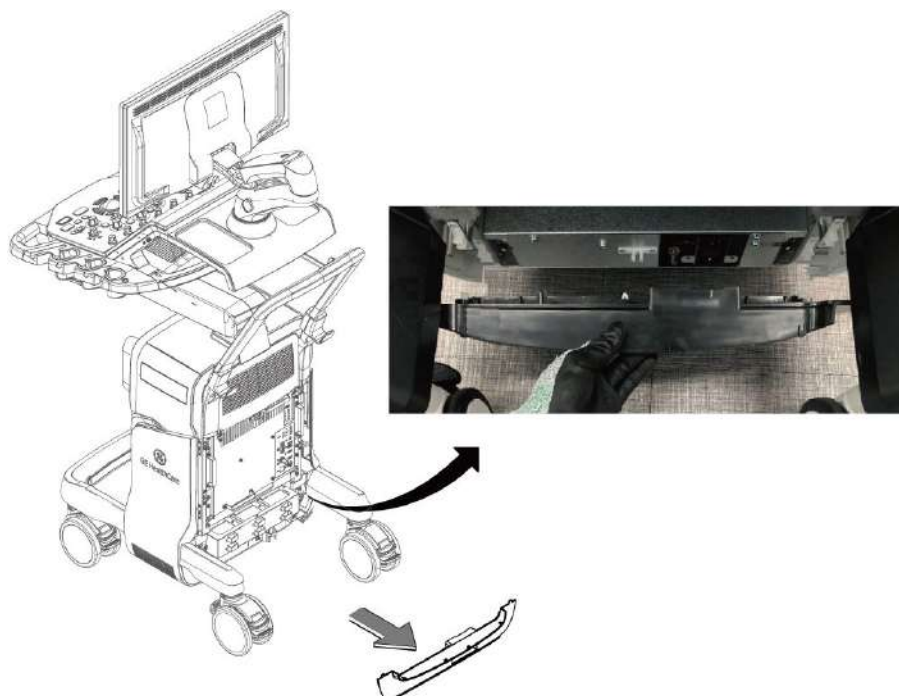
Preparations

1. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.3.11.1 Rear Cover Bottom Assy-T - Removal procedure

Pull the Rear Cover Bottom Assy-T to remove from the console.

Figure 12-17 Removing Rear Cover Bottom Assy-T



12.3.11.2 Rear Cover Bottom Assy-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.11.3 Rear Cover Bottom Assy-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.11.4 Rear Cover Bottom Assy-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.11.5 Rear Cover Bottom Assy-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.12 Replacement of the Rear Cover Top Assy-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-14 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

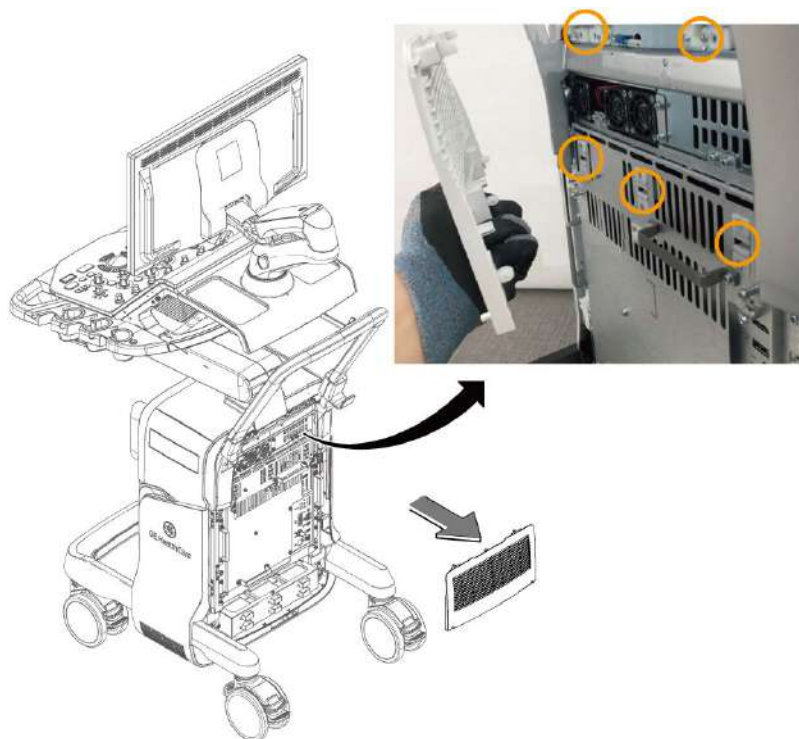
Preparations

1. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.3.12.1 Rear Cover Top Assy-U - Removal procedure

Pull the Rear Cover Top Assy-U to remove from the console.

Figure 12-18 Removing Rear Cover Top Assy



12.3.12.2 Rear Cover Top Assy-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.12.3 Rear Cover Top Assy-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.12.4 Rear Cover Top Assy-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.12.5 Rear Cover Top Assy-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.13 Replacement of the Top Cover Assy-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-15 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

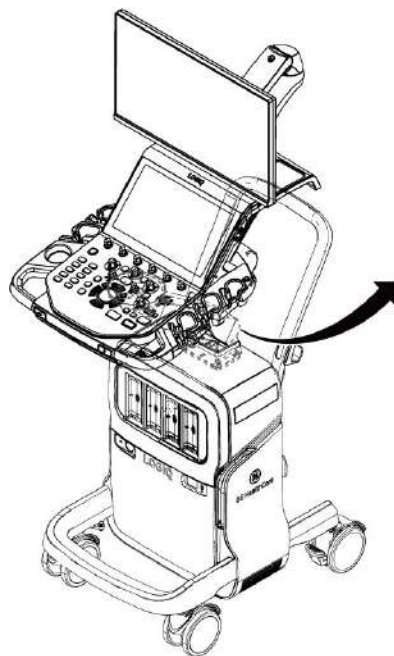
Preparations

1. Remove the T2 Side Cover R Assy as described in *Replacement of the T2 Side Cover R Assy* on page 359.

12.3.13.1 Top Cover Assy-T - Removal procedure

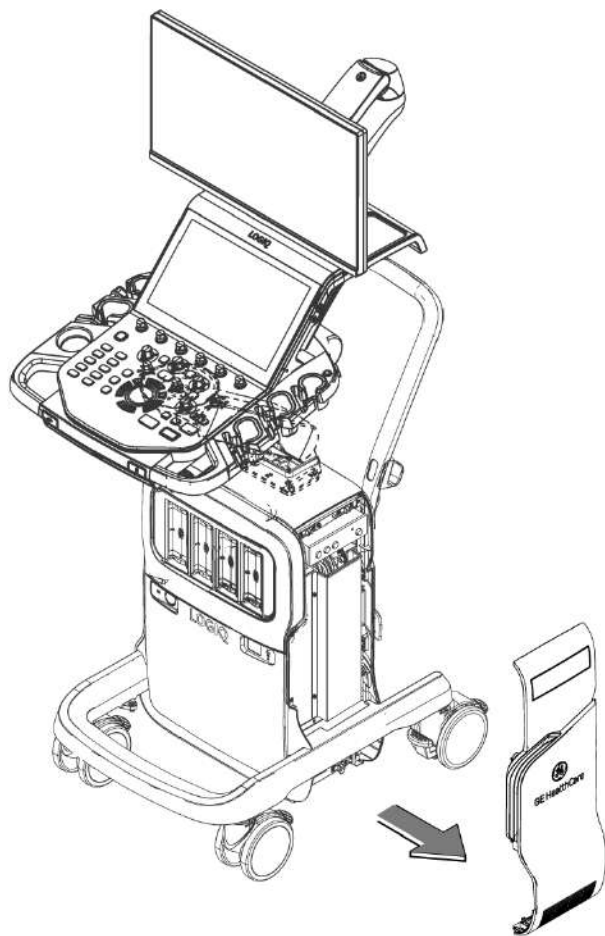
1. Lift the elevation arm to its highest position

Figure 12-19 Elevation arm to highest position



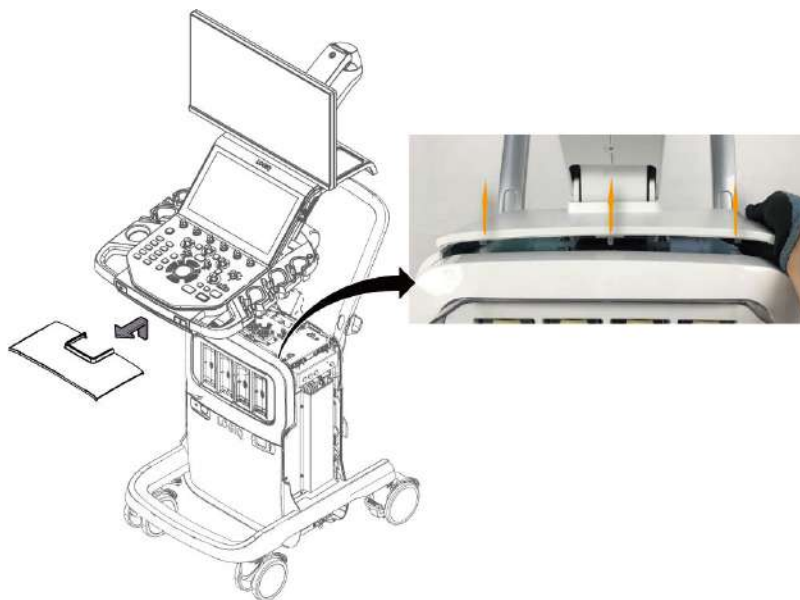
2. Pull the bottom side of the T2 Side Cover R Assy to remove from the console.

Figure 12-20 Removing Side Cover R



3. Pull the Top Cover Assy-T to remove from the console.

Figure 12-21 Removing Top Cover Assy-T



12.3.13.2 Top Cover Assy-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.13.3 Top Cover Assy-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.13.4 Top Cover Assy-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.13.5 Top Cover Assy-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.14 Replacement of the Rear Cover Top L/R Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-16 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

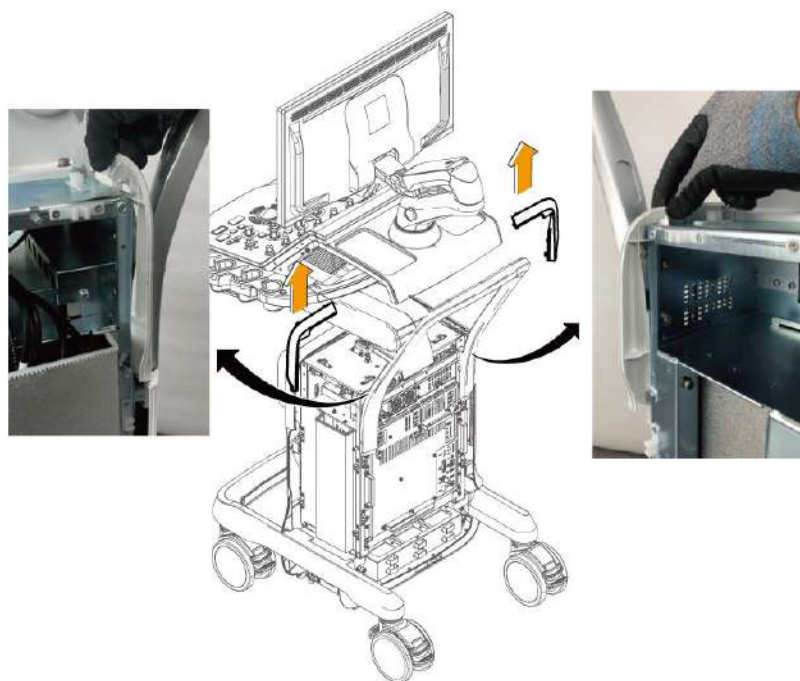
Preparations

1. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Top cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.

12.3.14.1 Rear Cover Top L/R Set-U - Removal procedure

Pull the Rear Cover Top Left/Right to remove from the console.

Figure 12-22 Removing Rear Cover Top



12.3.14.2 Rear Cover Top L/R Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.14.3 Rear Cover Top L/R Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.14.4 Rear Cover Top L/R Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.14.5 Rear Cover Top L/R Set-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.15 Replacement of the T2 Handle

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-17 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Phillips Screwdriver Hexagonal (Allen) Wrench	Cut resistant gloves Knee Pad

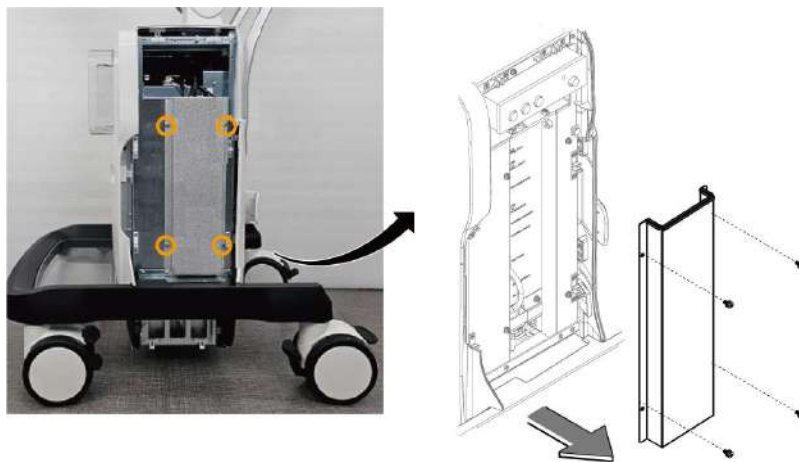
Preparations

- 1. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
- 2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
- 3. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
- 4. Remove the Top cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.

12.3.15.1 T2 Handle - Removal procedure

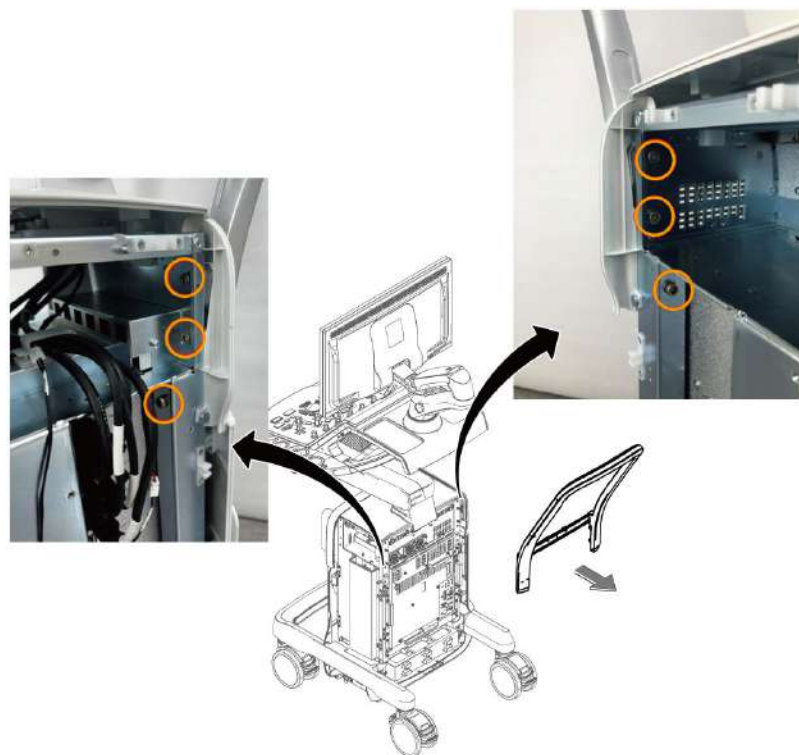
1. Unscrew 4 screws to remove the Unity Cable Cover Brkt from the console.

Figure 12-23 Removing Cable Cover Brkt



2. Unscrew 6 screws to remove the T2 Handle from the console

Figure 12-24 Removing T2 Handle



12.3.15.2 T2 Handle - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.15.3 T2 Handle - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.15.4 T2 Handle - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.3.15.5 T2 Handle - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.3.16 Replacement of the Unity Base Tray

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-18 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.3.16.1 Unity Base Tray - Removal procedure

Pull the Unity Base Tray to remove from the console.

Figure 12-25 Removing Base Tray



12.3.16.2 Unity Base Tray - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.3.16.3 Unity Base Tray - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.3.16.4 Unity Base Tray - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all parts removed earlier have been installed.

12.3.16.5 Unity Base Tray - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4 Top Console Parts Replacement

12.4.1 Monitor and Monitor Arm Parts

12.4.1.1 Replacement of the T1 Monitor Arm Cover Set

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

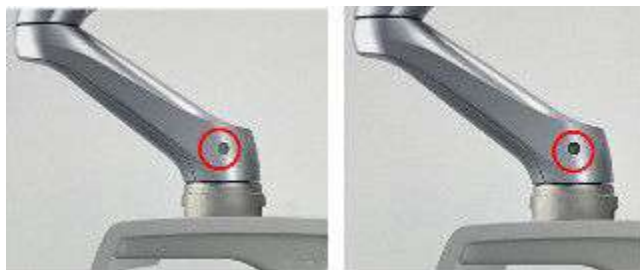
Table 12-19 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver Hexagonal (Allen) wrench	Cut resistant gloves

12.4.1.1.1 T1 Monitor Arm Cover Set - Removal procedure

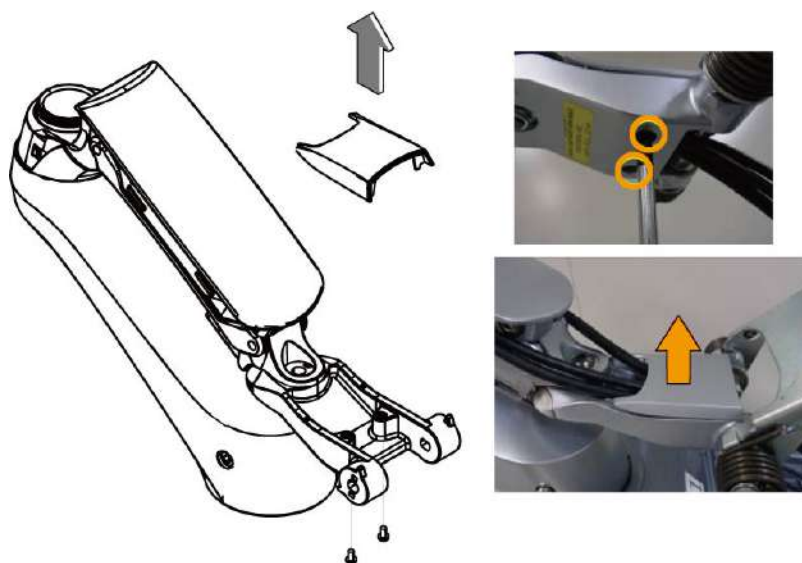
1. Remove the screw cap from the LCD ARM-T1.

Figure 12-26 Remove screw cap from from ARM



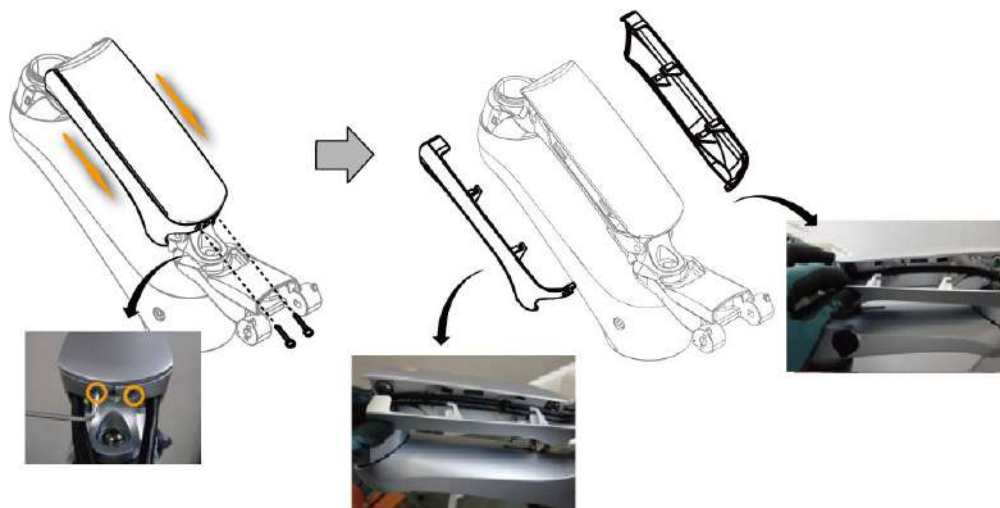
2. Unscrew 2 screws to remove the 3rd Arm Cover.

Figure 12-27 Removing 3rd Arm Cover



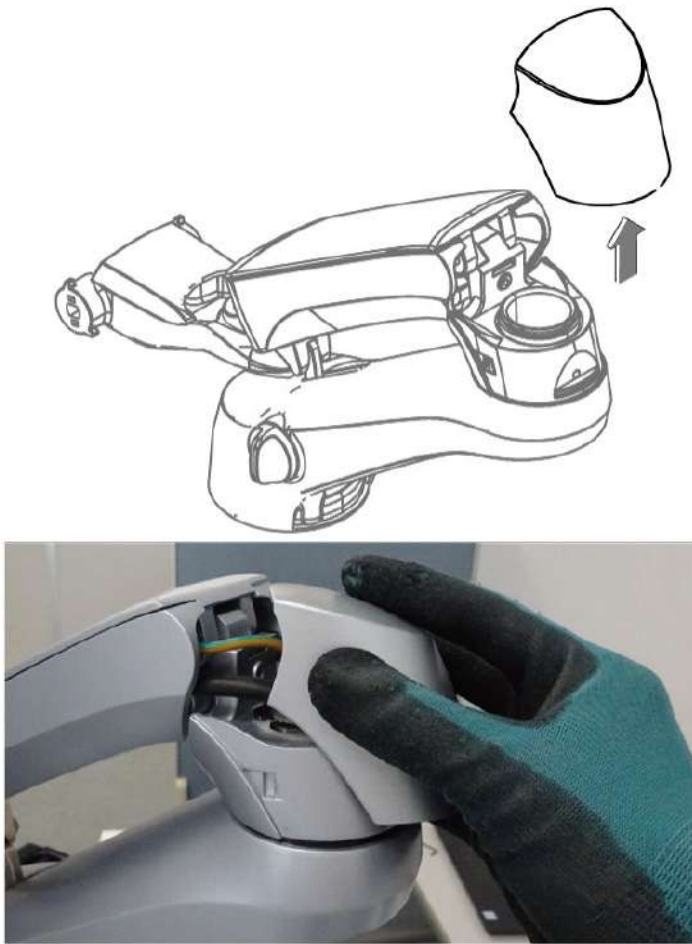
3. Unscrew 2 screws to remove the 2nd Arm Side Covers.

Figure 12-28 Removing 2nd Arm Side Covers



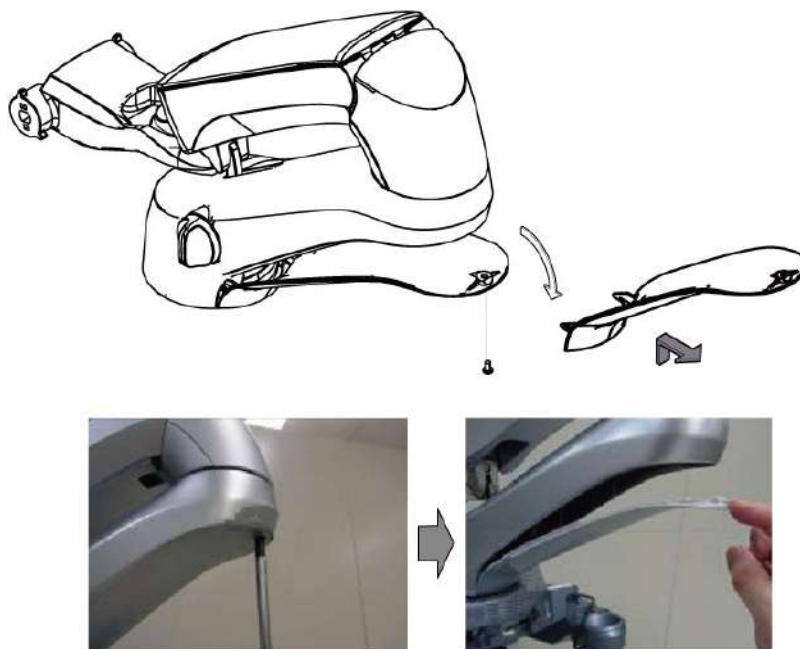
4. Pull the 2nd Axis Cover to the side and slide to remove it from the T1 Monitor Arm.

Figure 12-29 Removing 2nd Axis Cover



5. Unscrew 1 screw to remove the 1st Arm Cover.

Figure 12-30 Removing 1st Arm Cover



12.4.1.1.2 T1 Monitor Arm Cover Set - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.1.1.3 T1 Monitor Arm Cover Set - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.1.4 T1 Monitor Arm Cover Set - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.1.1.5 T1 Monitor Arm Cover Set - Functional checks

Functional Check	Service Record Debrief Script
<i>Main monitor positions and lock functional checks on page 151</i>	Equipment passed all required checks and is ready for use.
Visually inspect that there is no scratch or dirt on the replacement part.	

12.4.1.2 Replacement of the LCD ARM-T1

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-20 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Phillips Screwdriver Nipper Hexagonal (Allen) wrench	Cut resistant gloves

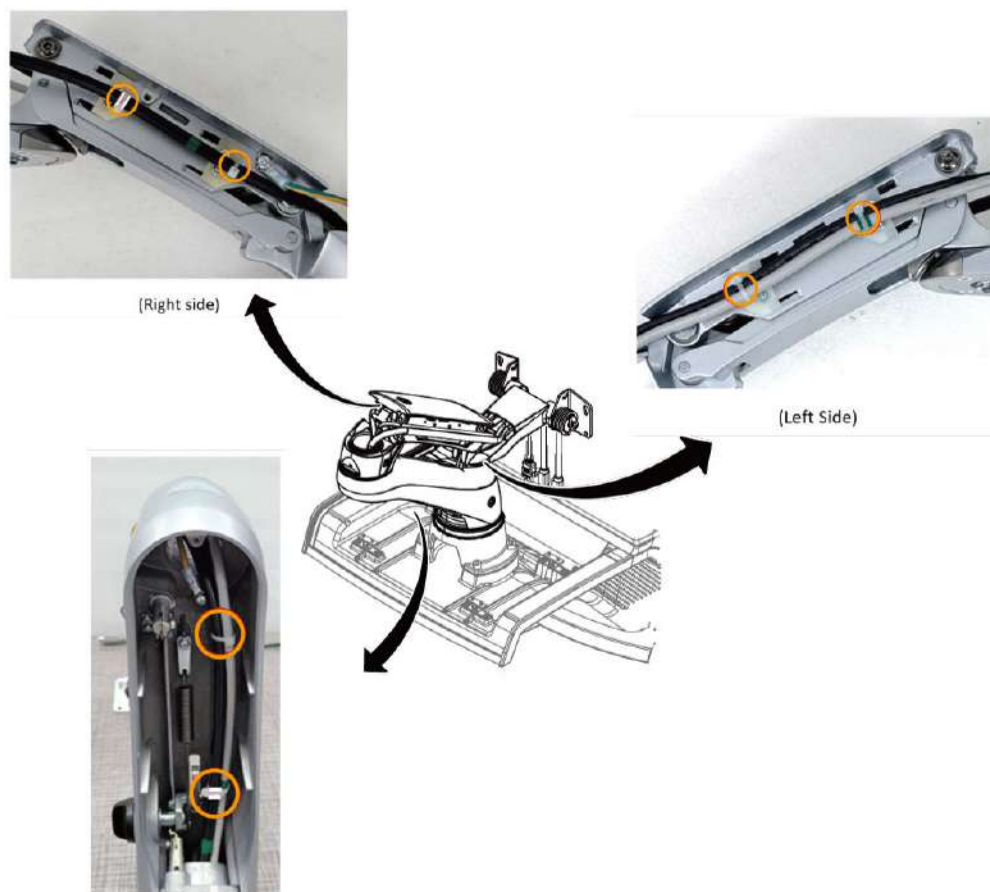
Preparations

1. Remove the Ultrasound Bezelless 23.8inch LCD T2. Refer to *Replacement of the Main ULTRASOUND BEZELLESS 23.8INCH LCD T2* on page 413.
2. Remove the T1 Monitor Arm Cover Set. Refer to *Replacement of the T1 Monitor Arm Cover Set* on page 395.

12.4.1.2.1 LCD ARM-T1 - Removal procedure

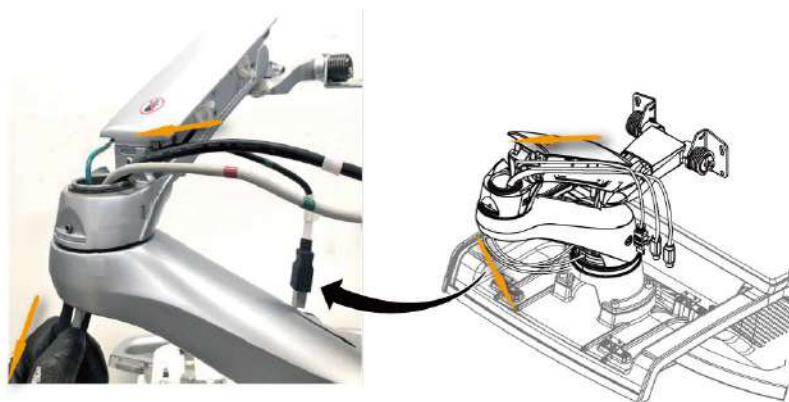
1. Cut 6 cable ties on the left, right, and rear side of the LCD ARM-T1.

Figure 12-31 Cutting cable ties



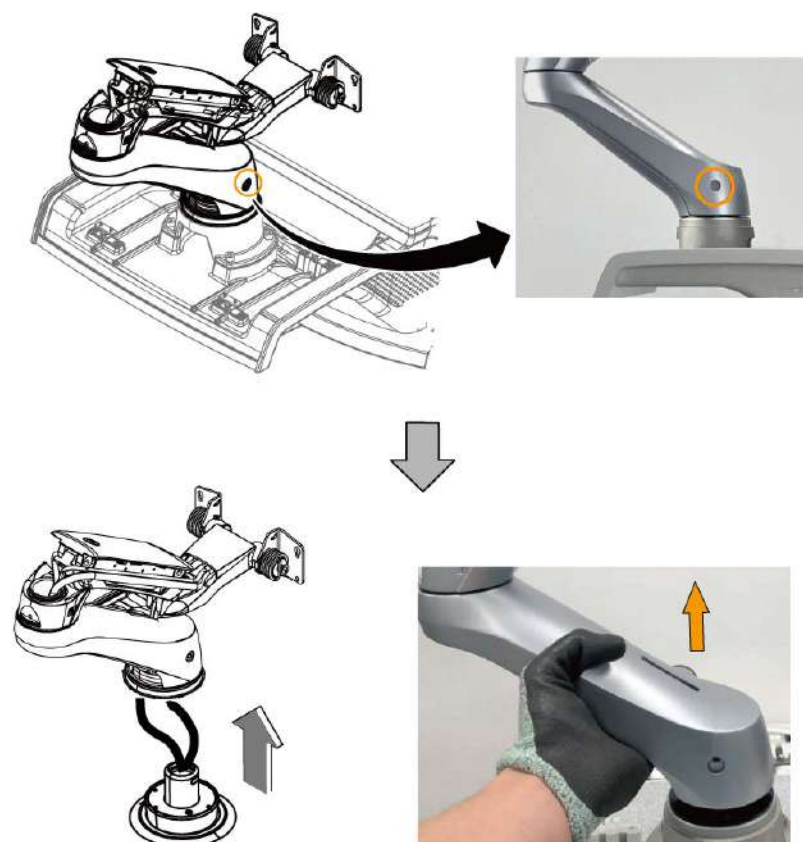
2. Pull the cables out from the 2nd Arm

Figure 12-32 Pulling cables from 2nd Arm



3. Remove the screw cap and unscrew 1 screw to remove the LCD ARM-T1 from the console.

Figure 12-33 Removing the LCD ARM-T1



4. Pull the cables out from the 1st Arm

NOTE

Pull the cables out while removing the LCD ARM-T1.

12.4.1.2.2 LCD ARM-T1 - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Align and fix the white double lined mark on the UBE TO MONITOR HDMI CABLE and green label attached on the OPIO HUB TO MONITOR POWER CABLE prior to second fixture using CABLE TIE (2EA) as shown in the picture above.



- Fix the white double lined mark on the cable prior to second fixture using cable tie(2EA)



(Right side)

- Fix the green label attached on the cable prior to second fixture using cable tie(2EA)



(Left Side)

2. Perform "Functional Checks".

12.4.1.2.3 LCD ARM-T1 - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.2.4 LCD ARM-T1 - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.1.2.5 LCD ARM-T1 - Functional checks

Table 12-21 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Main monitor positions and lock functional checks on page 151</i>	
<i>Top console adjustment control functional checks on page 150</i>	
<i>B-Mode functional checks on page 160</i>	
<i>Power shut down on page 113</i>	

12.4.1.3 Replacement of the Monitor Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-22 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

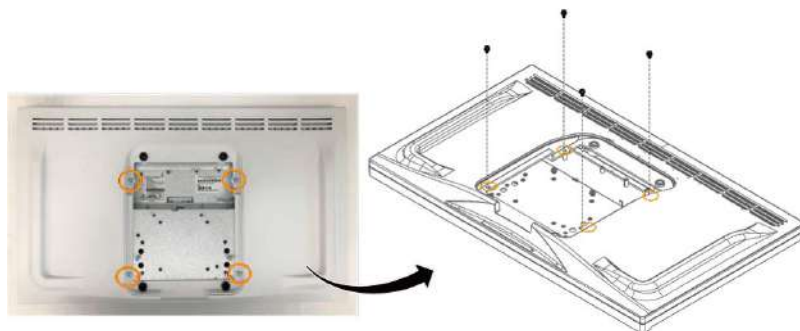
Preparations

1. Remove the Ultrasound Bezelless 23.8inch LCD T2. Refer to *Replacement of the Main ULTRASOUND BEZELLESS 23.8INCH LCD T2* on page 413.

12.4.1.3.1 Monitor Cover Set-T - Removal procedure

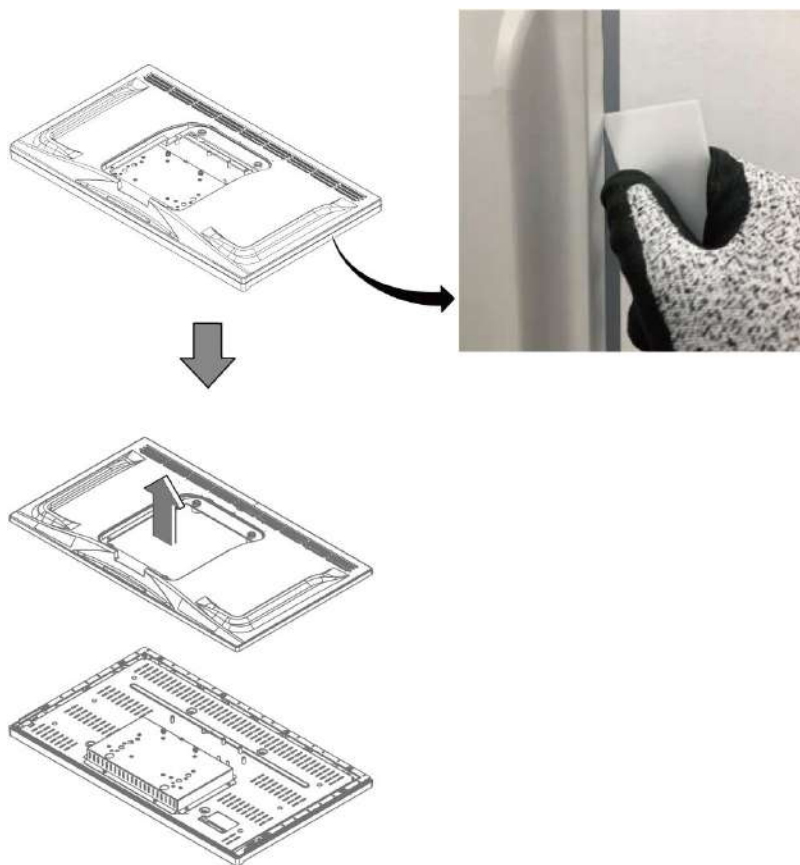
1. Unscrew 4 screws from the Ultrasound Bezelless 23.8inch LCD T2.

Figure 12-34 Unscrewing 4 screws from LCD



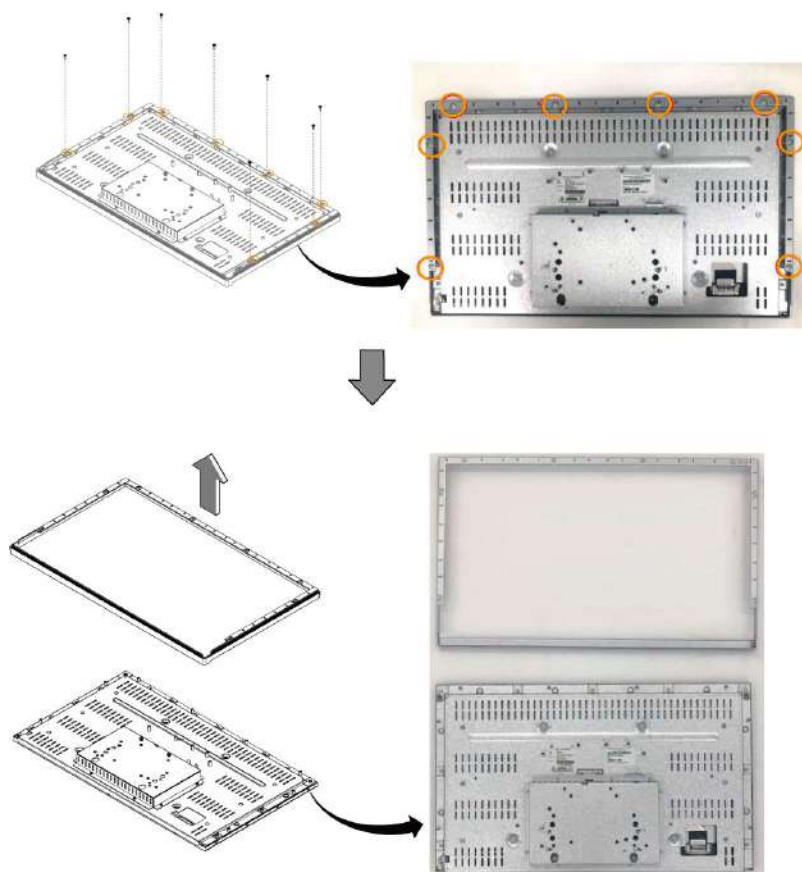
2. Use the Hook Remover to remove the Monitor Rear Cover.

Figure 12-35 Removing the Monitor Rear Cover



3. Unscrew 8 screws to remove the Monitor Front Cover.

Figure 12-36 Removing Monitor Front Cover



12.4.1.3.2 Monitor Cover Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.1.3.3 Monitor Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.3.4 Monitor Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.1.3.5 Monitor Cover Set-T - Functional checks

Table 12-23 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Main monitor positions and lock functional checks</i> on page 151	
Visually inspect that there is no scratch or dirt on the replacement part.	
<i>B-Mode functional checks</i> on page 160	
<i>Power shut down</i> on page 113	

12.4.1.4 Replacement of the HD Monitor Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-24 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

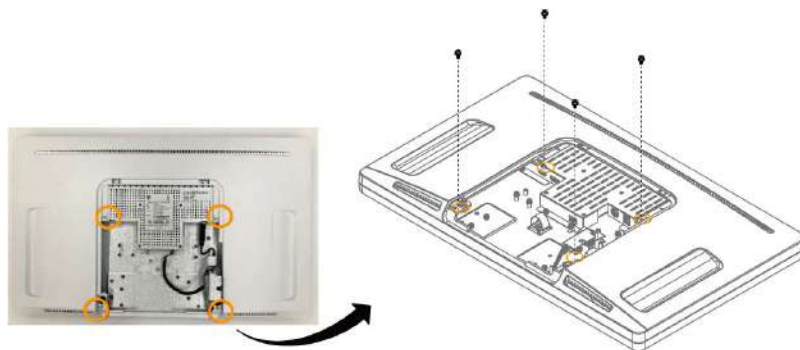
Preparations

1. Remove the HDU 23.8 inch Monitor LOGIQ Exx. Refer to *Replacement of the HDU 23.8 inch Monitor* on page 418.

12.4.1.4.1 HD Monitor Cover Set-T - Removal procedure

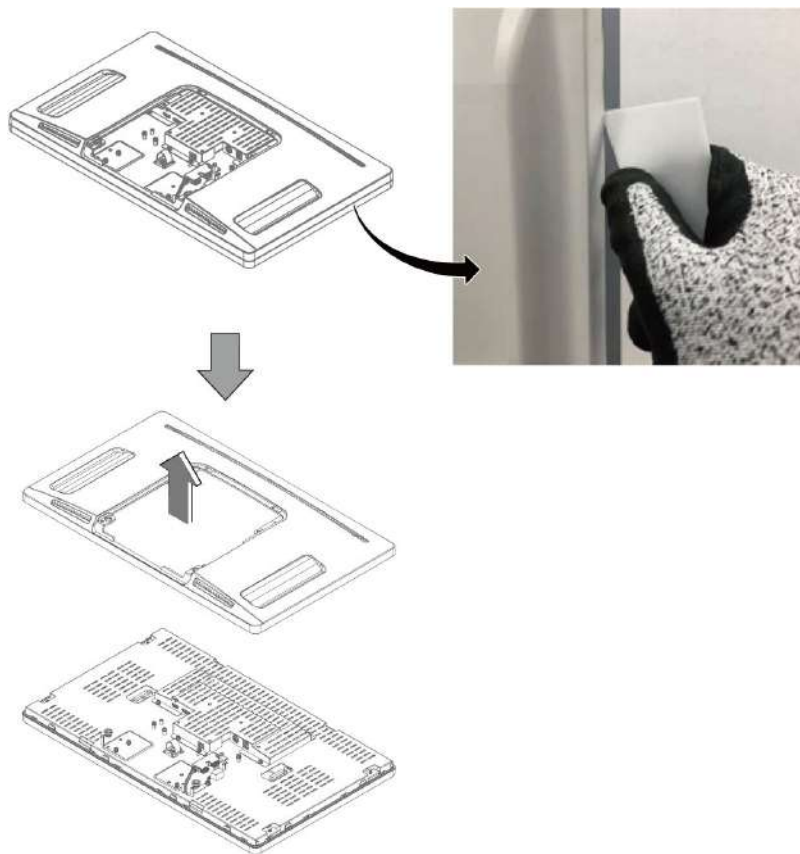
1. Unscrew 4 screws from the HDU 23.8 inch Monitor.

Figure 12-37 Unscrewing 4 screws from HDU Monitor



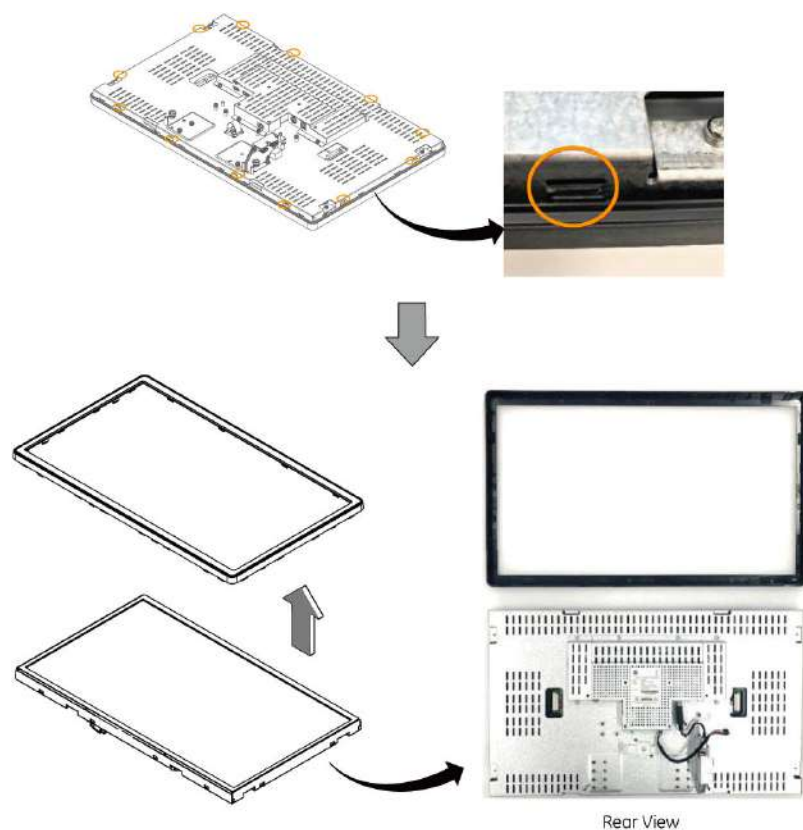
2. Use the hook remover to remove the Rear-Cover from the HDU 23.8 inch Monitor.

Figure 12-38 Removing Rear-Cover



3. Release 12 snap fits to remove the Front-Cover from the HDU 23.8 inch Monitor.

Figure 12-39 Removing Front-Cover



12.4.1.4.2 HD Monitor Cover Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.1.4.3 HD Monitor Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.4.4 HD Monitor Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.1.4.5 HD Monitor Cover Set-T - Functional checks

Table 12-25 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Main monitor positions and lock functional checks</i> on page 151	
Visually inspect that there is no scratch or dirt on the replacement part.	
<i>B-Mode functional checks</i> on page 160	
<i>Power shut down</i> on page 113	

12.4.1.5 Replacement of the Main ULTRASOUND BEZELLESS 23.8INCH LCD T2

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-26 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

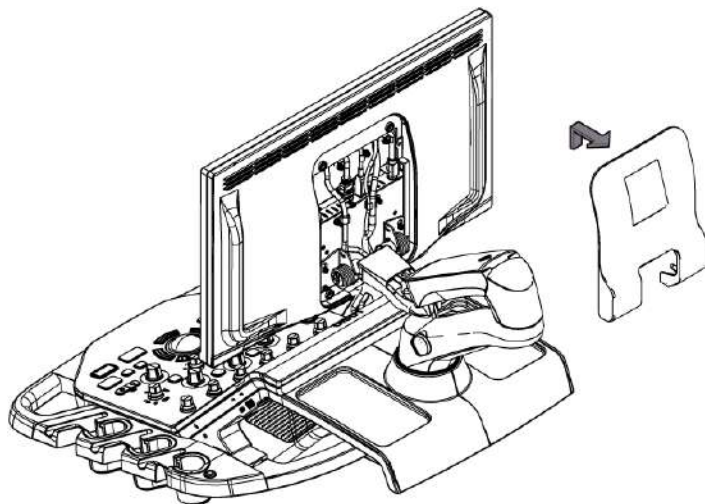
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.

12.4.1.5.1 Main ULTRASOUND BEZELLESS 23.8INCH LCD T2 - Removal procedure

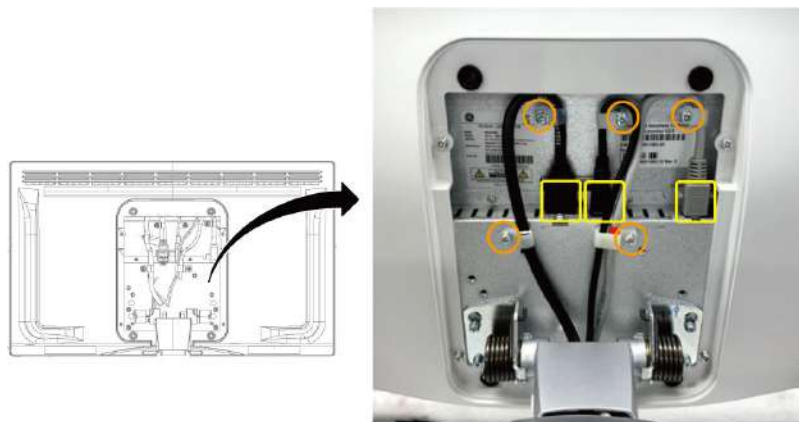
1. Remove the Monitor Cable Cover.

Figure 12-40 Removing Monitor Cable Cover



2. Disconnect the cables per following steps.
 - a. Unscrew 5 screws to remove the plastic clamp from the console.
 - b. Disconnect the HDMI Cable, Power cable and USB Cable.

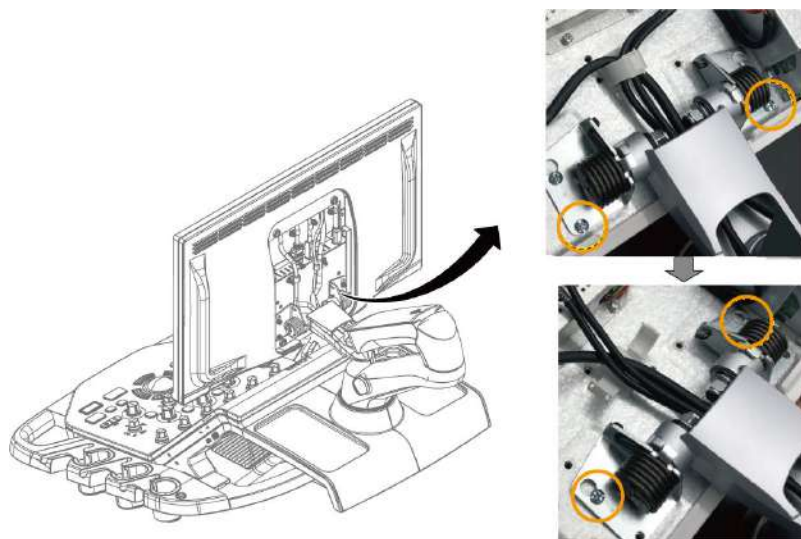
Figure 12-41 Disconnecting cables



3. Release the monitor from arm bracket per following steps.
 - a. Unscrew 2 screws on the bottom side.

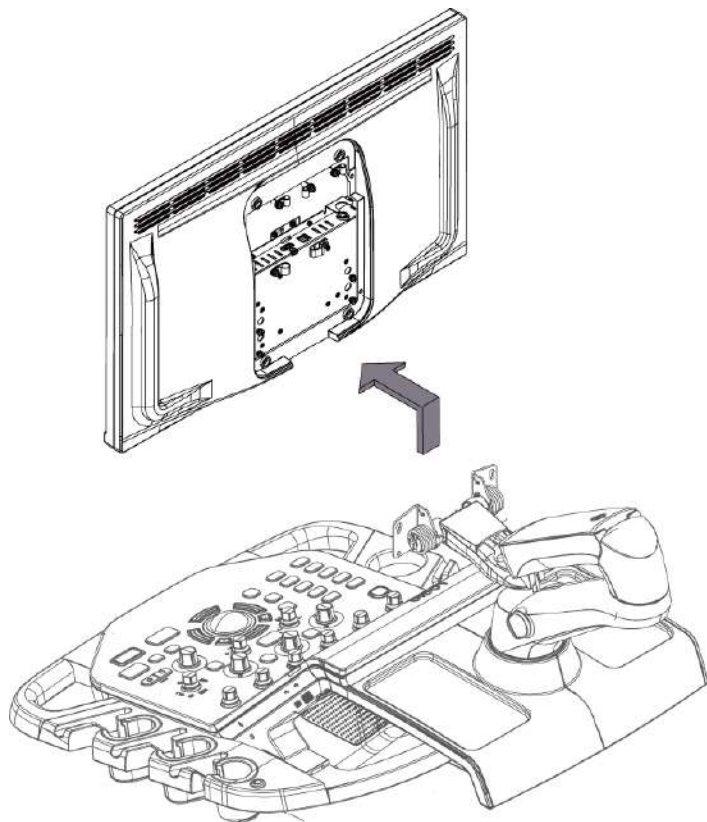
- b. Loosen 2 screws on the upper side.

Figure 12-42 Releasing monitor



4. Remove the LCD monitor from the monitor arm bracket.

Figure 12-43 Removing LCD monitor



12.4.1.5.2 Main ULTRASOUND BEZELLESS 23.8INCH LCD T2 - Installation procedure

1. Parts to be installed in reverse order of removal.

NOTE

Place 2 screws halfway in ULTRASOUND BEZELLESS 23.8INCH LCD T2



NOTE

When installing ULTRASOUND BEZELLESS 23.8INCH LCD T2, hang ULTRASOUND BEZELLESS 23.8INCH LCD T2 on Screw and push it to screw hole.



NOTE

Align colored points



2. Perform "Functional Checks".

12.4.1.5.3 Main ULTRASOUND BEZELLESS 23.8INCH LCD T2 - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.5.4 Main ULTRASOUND BEZELLESS 23.8INCH LCD T2 - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.1.5.5 Main ULTRASOUND BEZELLESS 23.8INCH LCD T2 - Functional checks

Table 12-27 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Main monitor positions and lock functional checks on page 151</i>	
<i>B-Mode functional checks on page 160</i>	
<i>Power shut down on page 113</i>	

12.4.1.6 Replacement of the HDU 23.8 inch Monitor

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-28 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

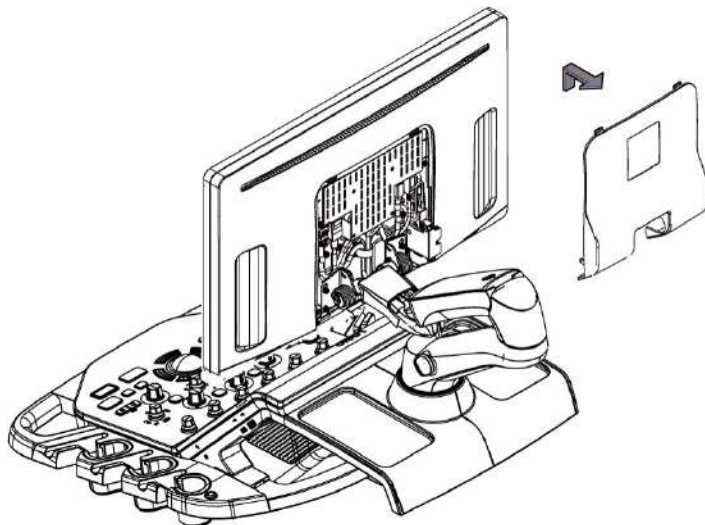
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.

12.4.1.6.1 HDU 23.8 inch Monitor - Removal procedure

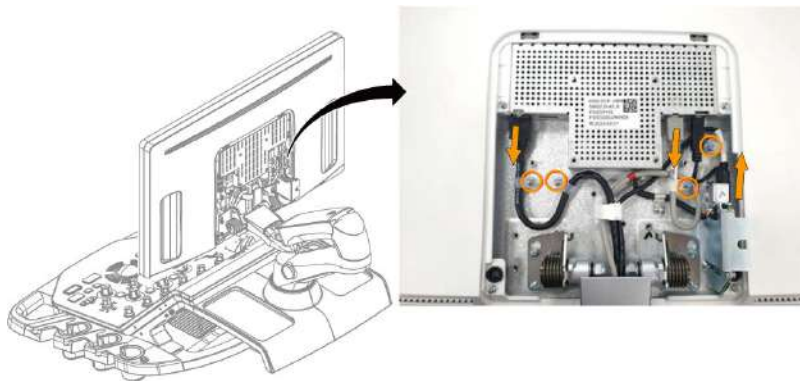
1. Remove the Monitor Cable Cover.

Figure 12-44 Removing Monitor Cable Cover



2. Remove Monitor Cables per following steps.
 - a. Unscrew 4 screws.
 - b. Disconnect the UBE To Monitor HDMI Cable, OPIO HUB To Monitor USB 2.0 Cable and OPIO HUB To Monitor Power Cable.

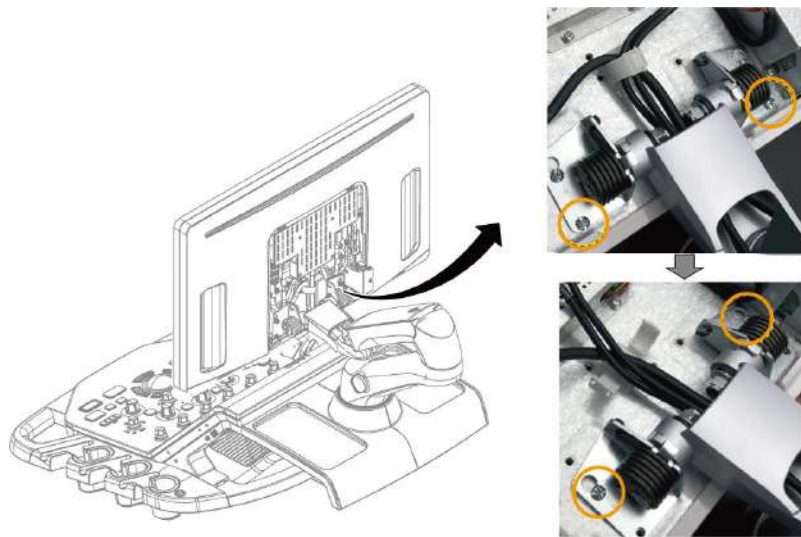
Figure 12-45 Removing Monitor Cables



3. Release HDU Monitor from arm bracket per following steps.
 - a. Unscrew 2 screws on the bottom side.

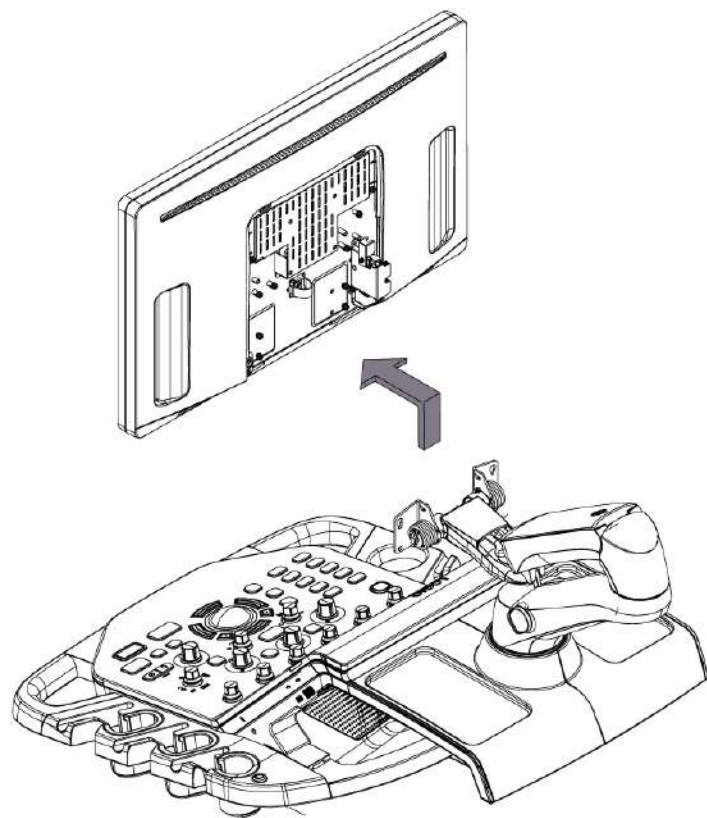
- b. Loosen 2 screws on the upper side.

Figure 12-46 Releasing HDU Monitor from arm bracket



4. Remove the HDU 23.8 inch Monitor from the monitor arm bracket.

Figure 12-47 Removing HDU Monitor



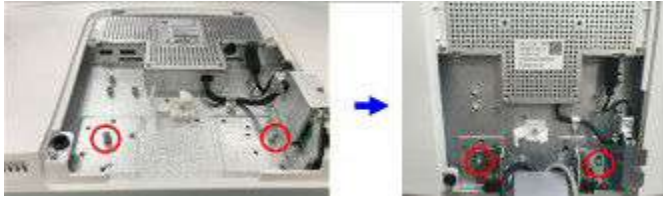
12.4.1.6.2 HDU 23.8 inch Monitor - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Place 2 screws halfway in HDU 23.8 Inch Monitor. Then, hang the screws onto the upper screw holes of the monitor arm bracket.

Figure 12-48 Hanging HDU monitor



2. Perform "Functional Checks".

12.4.1.6.3 HDU 23.8 inch Monitor - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.1.6.4 HDU 23.8 inch Monitor - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.1.6.5 HDU 23.8 inch Monitor - Functional checks

Table 12-29 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Main monitor positions and lock functional checks</i> on page 151	
<i>B-Mode functional checks</i> on page 160	
<i>Power shut down</i> on page 113	

12.4.2 Operator Panel and Elevation Arm Parts

12.4.2.1 Replacement of the OPIO Top Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

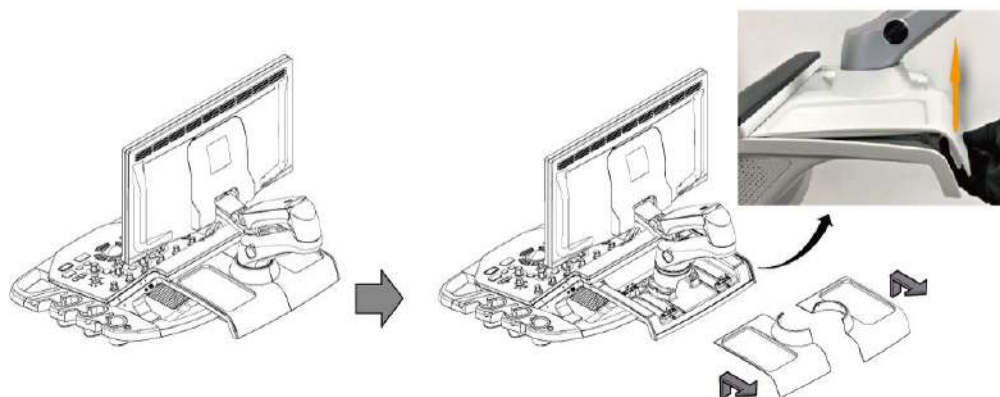
Table 12-30 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.4.2.1.1 OPIO Top Cover Set-T - Removal procedure

1. Lift the OPIO Top Cover Left to remove from the console.
2. Lift the OPIO Top Cover Right to remove from the console.

Figure 12-49 Removing OPIO Top Cover



12.4.2.1.2 OPIO Top Cover Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.1.3 OPIO Top Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.1.4 OPIO Top Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.1.5 OPIO Top Cover Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.2 Replacement of the Probe Holder Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

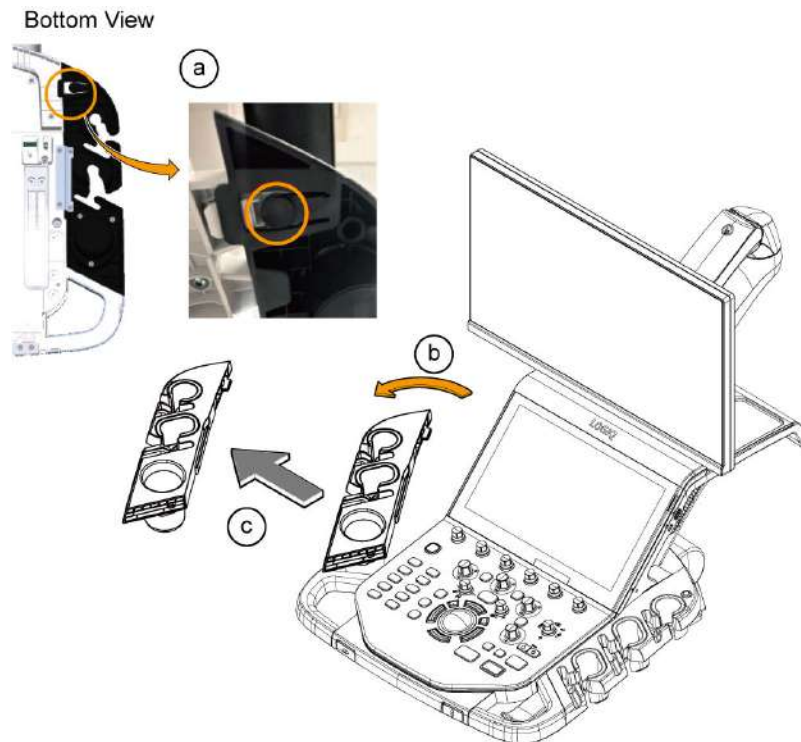
Table 12-31 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.4.2.2.1 Probe Holder Set-T - Removal procedure

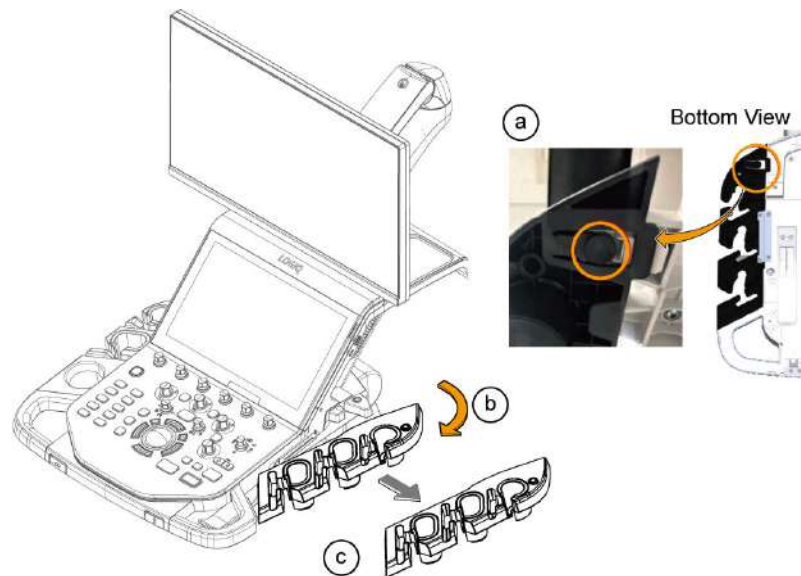
1. Press the button underneath the T2 Side Probe Holder Left and slide to the left to remove from the console

Figure 12-50 Removing Side Probe Holder Left



2. Press the button underneath the T2 Side Probe Holder Right and slide to the right to remove from the console.

Figure 12-51 Removing Side Probe Holder Right



12.4.2.2.2 Probe Holder Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.2.3 Probe Holder Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.2.4 Probe Holder Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.2.5 Probe Holder Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.3 Replacement of the Gel Holder

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-32 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

12.4.2.3.1 Gel Holder - Removal procedure

Unscrew 3 screws to remove the Gel Holder R3 from the T2 Side Prober Holder Left

Figure 12-52 Removing Gel Holder



12.4.2.3.2 Gel Holder - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.3.3 Gel Holder - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.3.4 Gel Holder - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.3.5 Gel Holder - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.4 Replacement of the Probe Holder Rubber Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

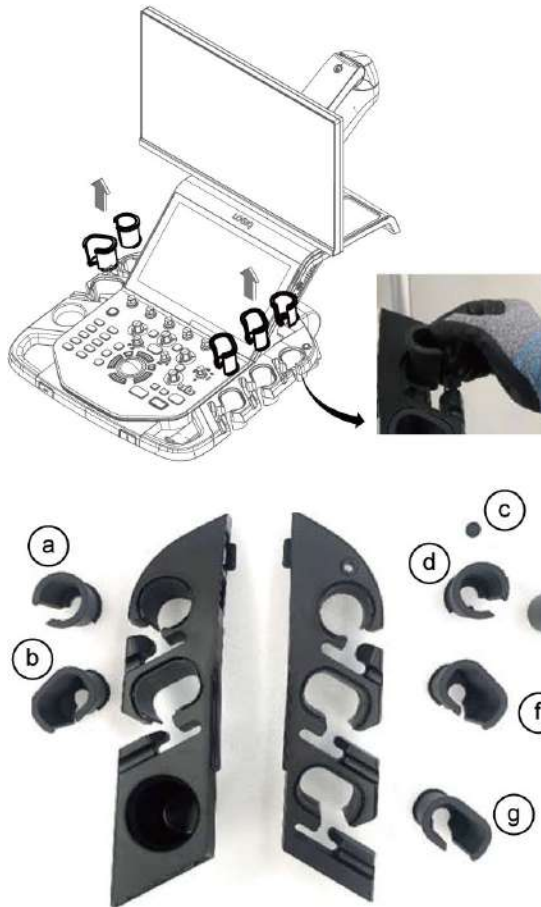
Table 12-33 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.4.2.4.1 Probe Holder Rubber Set-T - Removal procedure

Remove the probe holder rubbers from the T2 Side Probe Holder Left/Right.

Figure 12-53 Removing Side Probe Holder



- a: Probe Holder Circle Left
- b: Probe Holder Left R3
- c: Hanger Cap Rubber R3
- d: Probe Holder Circle Right
- e: Small Probe Holder R3
- f: Probe Holder Right R3
- g: Probe Holder Right R3

12.4.2.4.2 Probe Holder Rubber Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.4.3 Probe Holder Rubber Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.4.4 Probe Holder Rubber Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.4.5 Probe Holder Rubber Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.5 Replacement of the OPIO Handle Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-34 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Flat Screwdriver Philips Screwdriver	Cut resistant gloves Knee Pad

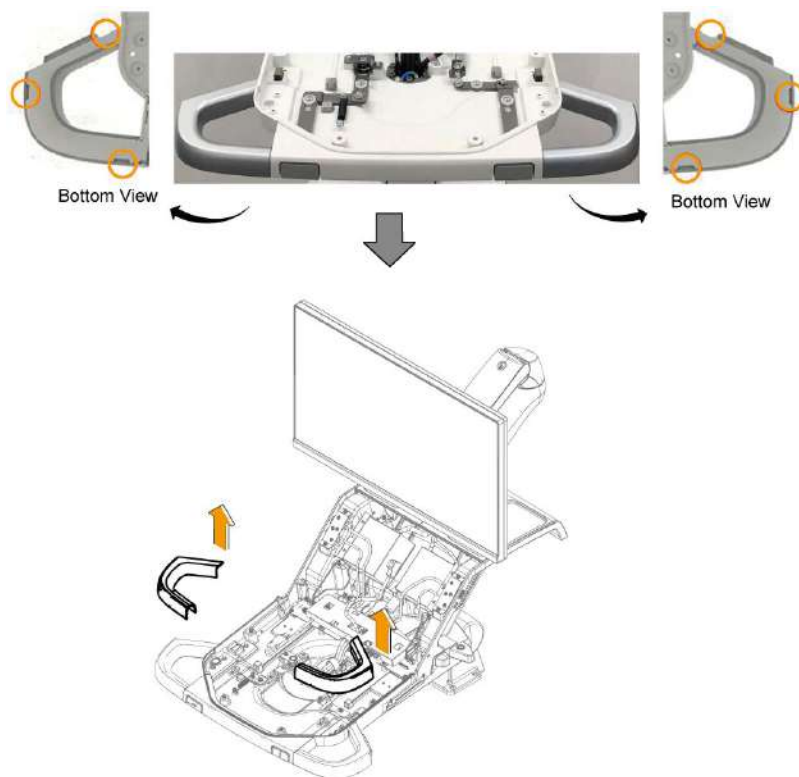
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the Probe Holder Set-T. Refer to *Replacement of the Probe Holder Set-T* on page 425.
4. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.5.1 OPIO Handle Cover Set-T - Removal procedure

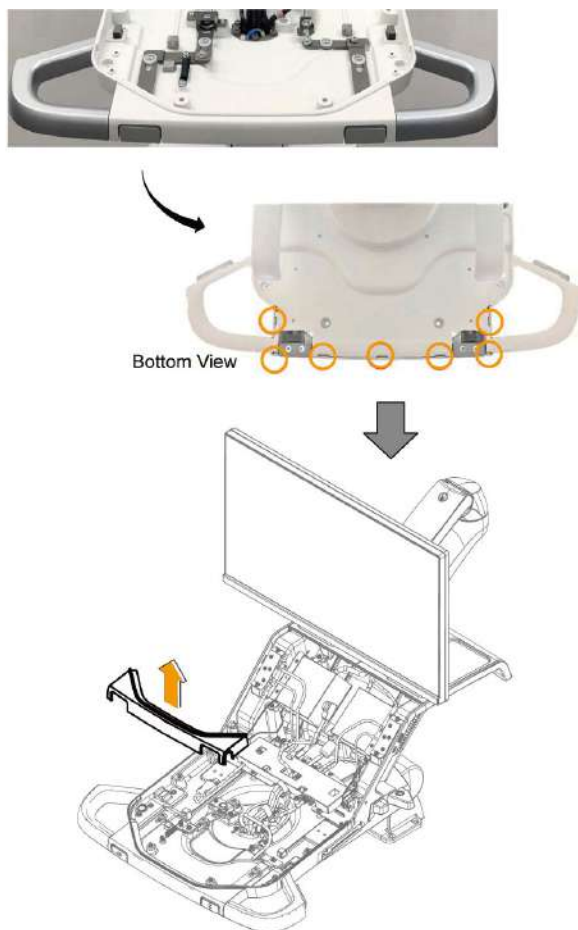
1. Release 6 snap fits to remove the T2 OPIO Handle Cover Left/Right from the console.

Figure 12-54 Removing OPIO Handle Cover



2. Release 7 snap fits to remove the T2 OPIO Front Cover from the console.

Figure 12-55 Removing T2 OPIO Front Cover



12.4.2.5.2 OPIO Handle Cover Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.5.3 OPIO Handle Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.5.4 OPIO Handle Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.5.5 OPIO Handle Cover Set-T - Functional checks

Table 12-35 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.6 Replacement of the T2 OPIO Base Rear Cover Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-36 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

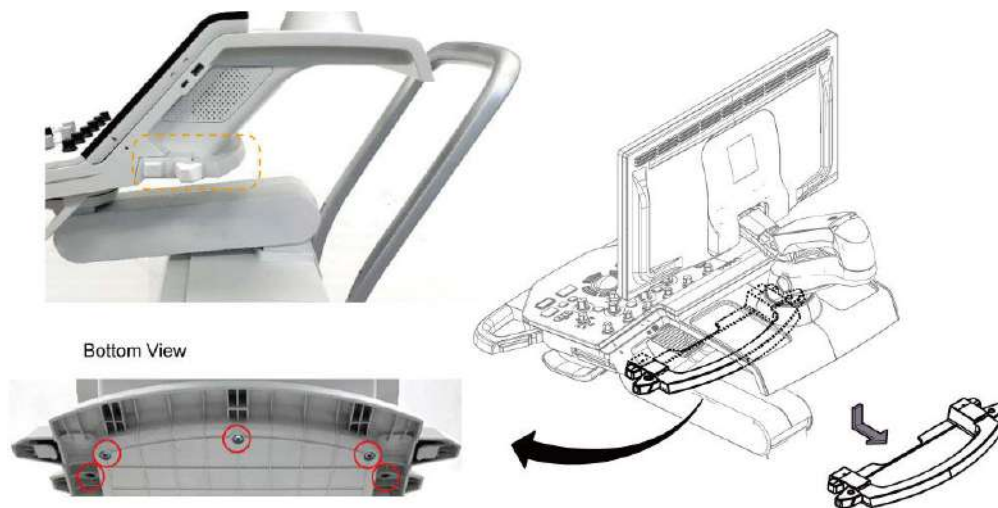
Preparations

1. Remove the OPIO Rear Tray Set-T. Refer to *Replacement of the OPIO Rear Tray Set-T* on page 672.
2. Remove the Probe Holder Set-T. Refer to *Replacement of the Probe Holder Rubber Set-T* on page 431.

12.4.2.6.1 T2 OPIO Base Rear Cover Assy - Removal procedure

Unscrew 5 screws to remove the T2 OPIO Base Rear Cover Assy from the console.

Figure 12-56 Removing OPIO Base Rear Cover



12.4.2.6.2 T2 OPIO Base Rear Cover Assy - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.6.3 T2 OPIO Base Rear Cover Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.6.4 T2 OPIO Base Rear Cover Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.6.5 T2 OPIO Base Rear Cover Assy - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.7 Replacement of the Unity Gel Warmer Cable Cover

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

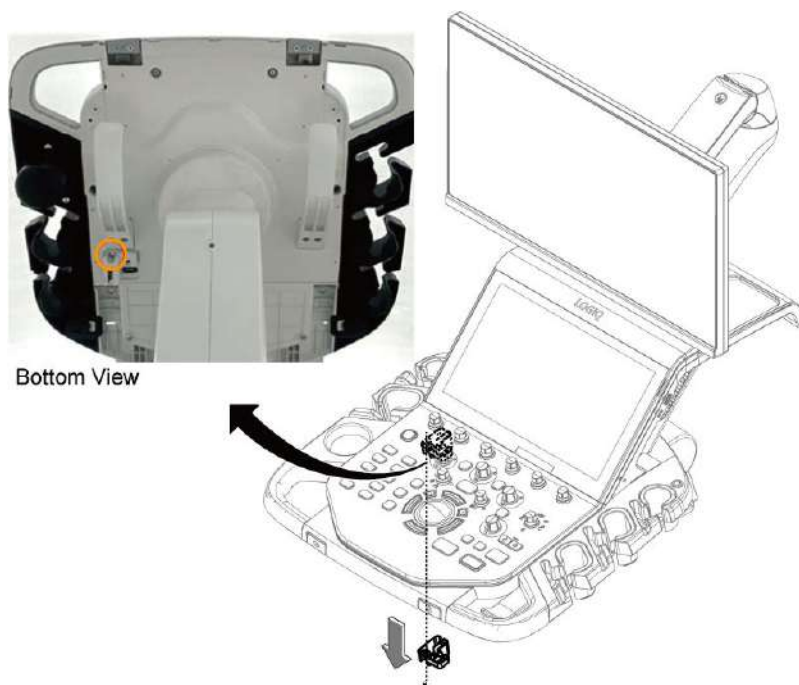
Table 12-37 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

12.4.2.7.1 Unity Gel Warmer Cable Cover - Removal procedure

Unscrew 1 screw to remove the Gel Warmer Cable Cover from the console.

Figure 12-57 Removing Gel Warmer Cable Cover



12.4.2.7.2 Unity Gel Warmer Cable Cover - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.7.3 Unity Gel Warmer Cable Cover - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.7.4 Unity Gel Warmer Cable Cover - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.7.5 Unity Gel Warmer Cable Cover - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.8 Replacement of the OPIO Swivel Up/Down Button Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

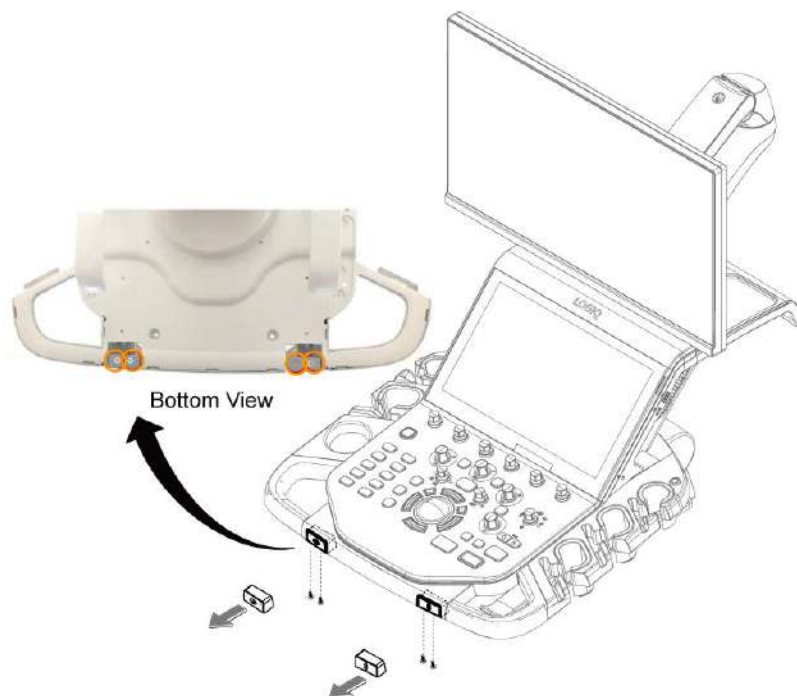
Table 12-38 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

12.4.2.8.1 OPIO Swivel Up/Down Button Set-T - Removal procedure

Unscrew 4 screws to remove the T2 Up/Down Button and the T2 Rotation Button from the console.

Figure 12-58 Removing Up/Down and Rotation Button



12.4.2.8.2 OPIO Swivel Up/Down Button Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.8.3 OPIO Swivel Up/Down Button Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.8.4 OPIO Swivel Up/Down Button Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.8.5 OPIO Swivel Up/Down Button Set-T - Functional checks

Table 12-39 Functional checks

Functional Check	Service Record Debrief Script
<i>Top console adjustment control functional checks on page 150</i>	Equipment passed all required checks and is ready for use.

12.4.2.9 Replacement of the UOPIO-T Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-40 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.

12.4.2.9.1 UOPIO-T Assy - Removal procedure

1. Unscrew 4 screws fastened on the console.

NOTE

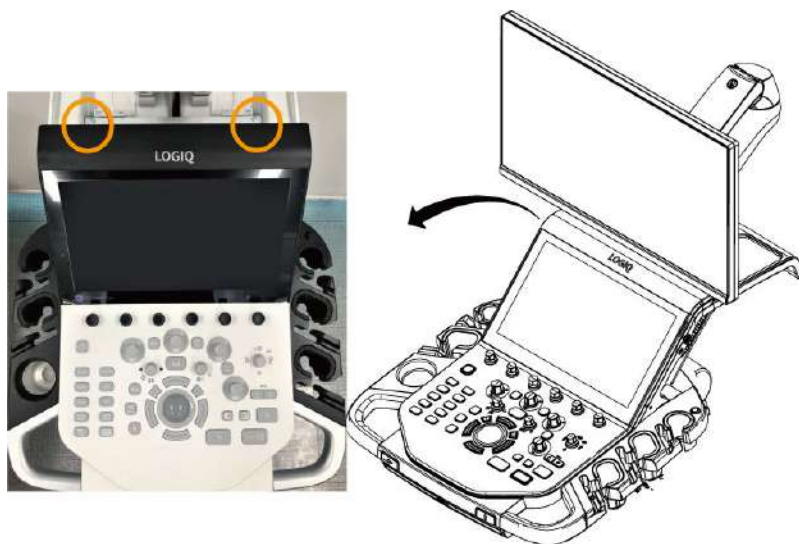
If there is an A/N Keyboard assembled, open the A/N Keyboard and unscrew 4 screw indicated as below picture

Figure 12-59 Unscrewing bottom screws



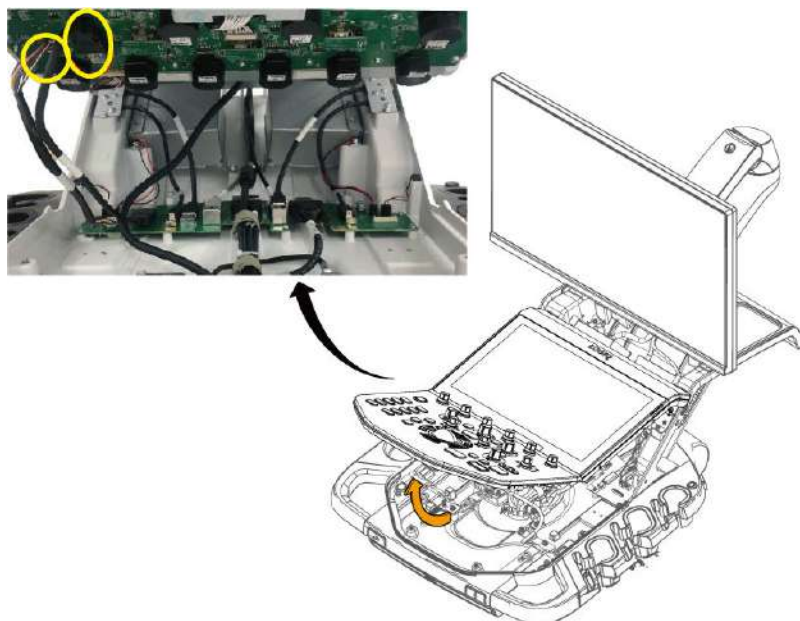
2. Unscrew 2 screws to remove the UOPIO-T Assy from the console.

Figure 12-60 Releasing UOPIO-T Assy



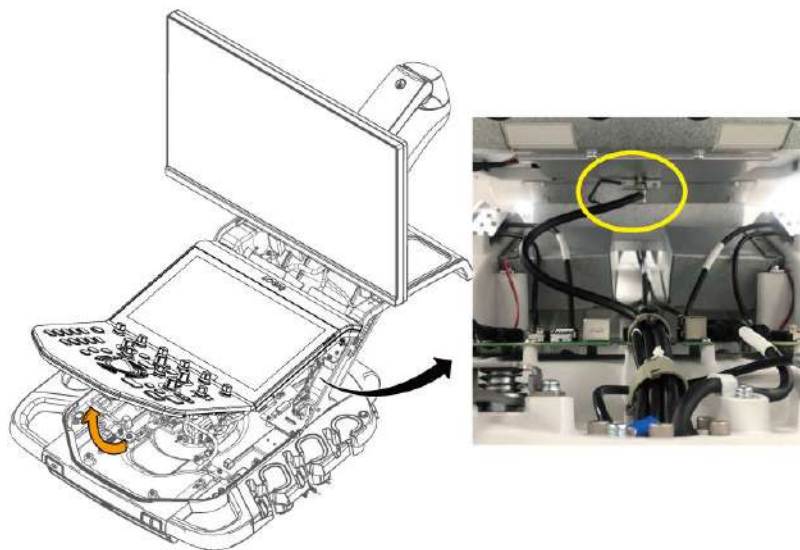
3. Lift the UOPIO-T Assy and disconnect 2 cables to remove the UOPIO-T Assy from the console.

Figure 12-61 Disconnecting cables



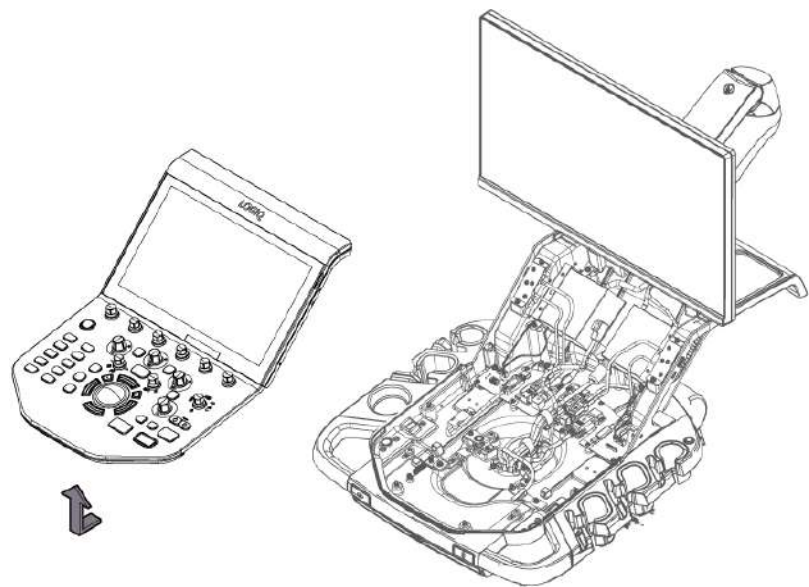
4. Lift the UOPIO-T Assy and release the Unity HDMI Holder Spring and disconnect the cable from the UOPIO-T Assy.

Figure 12-62 Disconnecting cable



- 5. Separate OPIO ASSY from the console

Figure 12-63 Removing OPIO ASSY



12.4.2.9.2 UOPIO-T Assy - Installation

- 1. Install components in reverse order of removal.
- 2. Perform "Functional Checks".

12.4.2.9.3 UOPIO-T Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.9.4 UOPIO-T Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

- 1. Verify that all screws and covers removed earlier have been installed.
- 2. Connect cables and Probes removed earlier.
- 3. Power up the system to verify that it operates as intended.

12.4.2.9.5 UOPIO-T Assy - Functional checks

Table 12-41 Functional checks

Functional Check	Service Record Debrief Script
Power on/boot up on page 98	Equipment passed all required checks and is ready for use.
Probe/connector functional checks on page 159	
B-Mode functional checks on page 160	
System CFM and PWD functional checks on page 163	
Basic measurement functional checks on page 173	
Power shut down on page 113	

12.4.2.10 Replacement of the Trackball assy-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-42 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO Assy-T. Refer to *Replacement of the UOPIO-T Assy* on page 447.

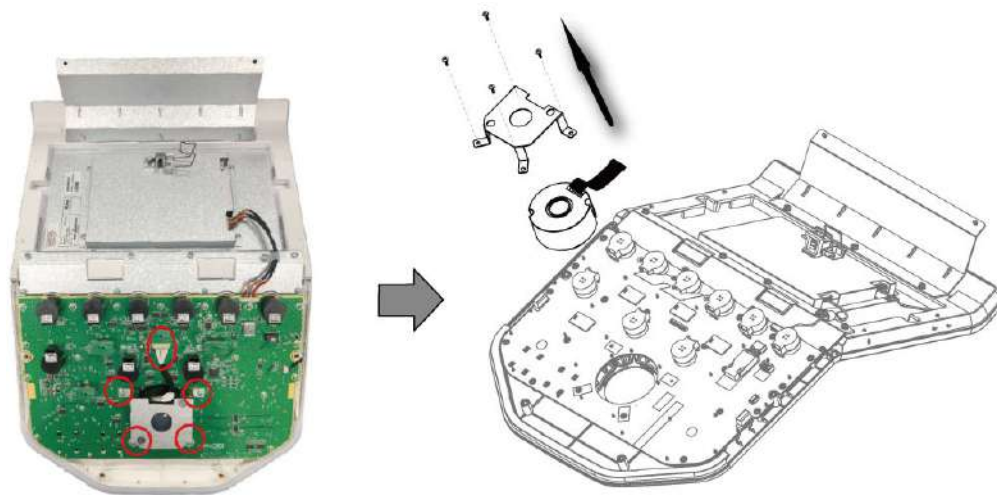
12.4.2.10.1 Trackball assy-U - Removal procedure

Disconnect the trackball cable and unscrew 4 screws to remove the OPIO Laser Color Trackball with Cable from the UOPIO Assy-T.

NOTE

Grasp the connector on the large, flat sides and pull straight away from the board. The trackball includes the trackball cable.

Figure 12-64 Removing Trackball



12.4.2.10.2 Trackball assy-U - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.10.3 Trackball assy-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.10.4 Trackball assy-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.10.5 Trackball assy-U - Functional checks

Table 12-43 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.11 Replacement of the T2 OPIO Cable Hook

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-44 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

12.4.2.11.1 T2 OPIO Cable Hook - Removal procedure

Unscrew 2 screws on the left or right side of the T2 OPIO Cable Hook to remove from the console.

Figure 12-65 Removing OPIO Cable Hook



12.4.2.11.2 T2 OPIO Cable Hook - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.11.3 T2 OPIO Cable Hook - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.11.4 T2 OPIO Cable Hook - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.11.5 T2 OPIO Cable Hook - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.12 Replacement of the Speaker Grill Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-45 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	No tools required	Cut resistant gloves Knee Pad

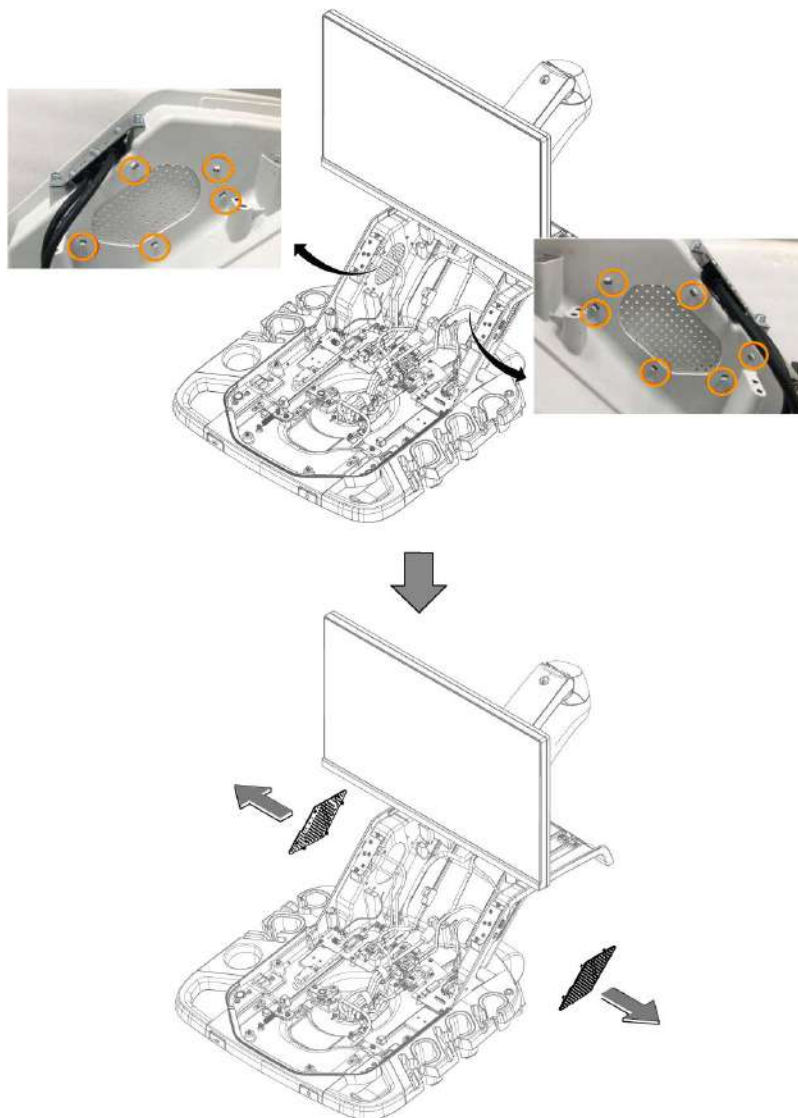
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the Speaker Set-U. Refer to *Replacement of the Speaker Set-U* on page 496.

12.4.2.12.1 Speaker Grill Set-T - Removal procedure

Release 12 snap fits to remove T2 Speaker Grill Left/ Right from the console.

Figure 12-66 Removing Speaker Grill



12.4.2.12.2 Speaker Grill Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.12.3 Speaker Grill Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.12.4 Speaker Grill Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.12.5 Speaker Grill Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.13 Replacement of the T2 OPIO Lower Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-46 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

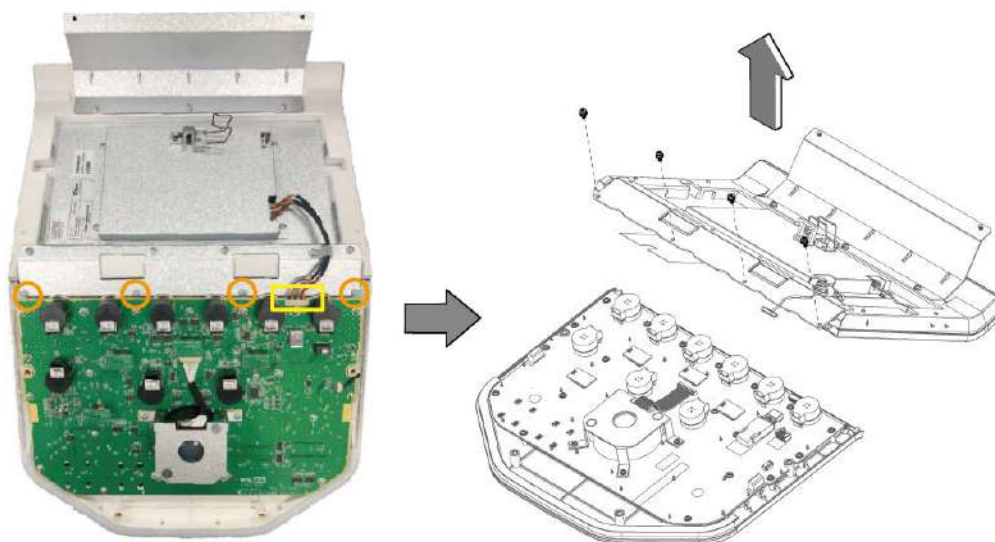
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.13.1 T2 OPIO Lower Assy - Removal procedure

Unscrew 4 screws (red circles) and disconnect the 1 cable (blue circle) to remove the T2 OPIO Lower Assy.

Figure 12-67 Removing OPIO Lower Assy



12.4.2.13.2 T2 OPIO Lower Assy - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.13.3 T2 OPIO Lower Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.13.4 T2 OPIO Lower Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.13.5 T2 OPIO Lower Assy - Functional checks

Table 12-47 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.14 Replacement of the T2 OPIO Upper Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-48 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

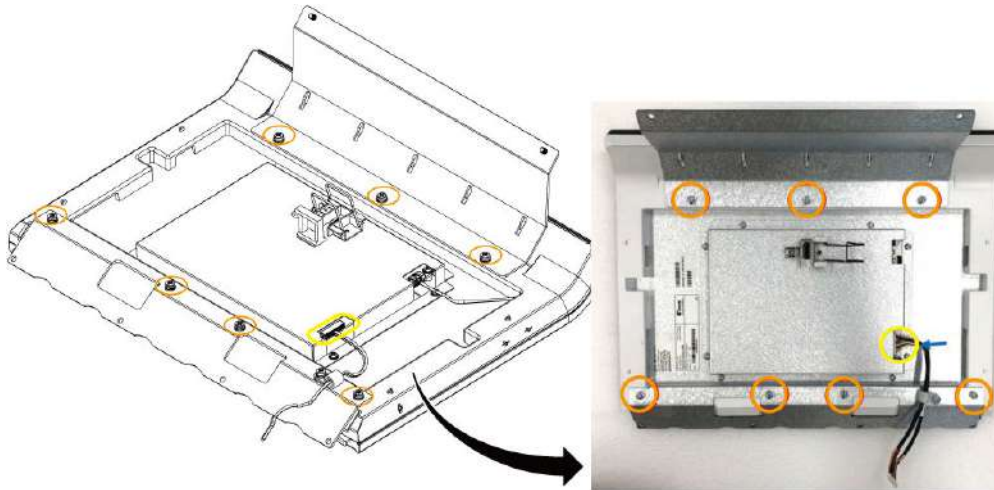
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.

12.4.2.14.1 T2 OPIO Upper Assy - Removal procedure

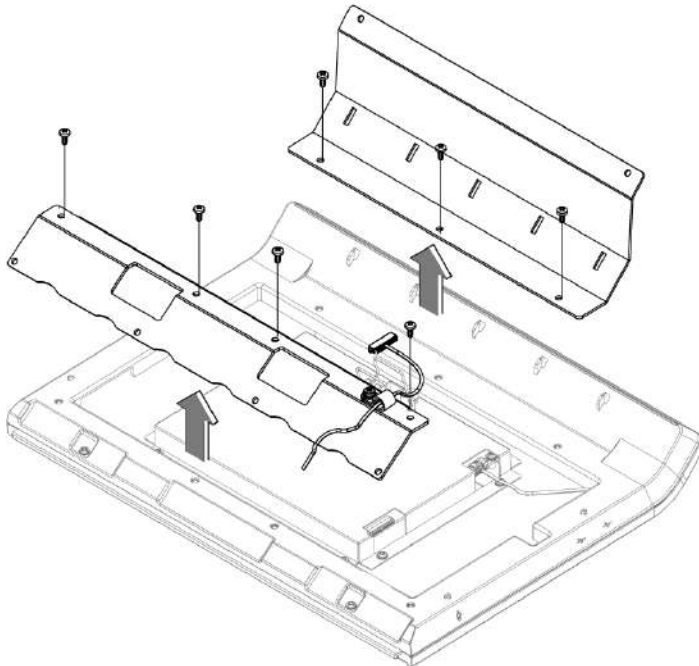
1. Remove screws and cable per following steps.
 - a. Unscrew 7 screws (orange circles).
 - b. Disconnect the Lower Keyboard to Touch Panel PWA Power & USB Cable (yellow circle).

Figure 12-68 Removing screws and cables



2. Remove the T2 OPIO Upper Assy.

Figure 12-69 Removing OPIO Upper Assy



12.4.2.14.2 T2 OPIO Upper Assy - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.14.3 T2 OPIO Upper Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.14.4 T2 OPIO Upper Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.14.5 T2 OPIO Upper Assy - Functional checks

Table 12-49 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.15 Replacement of the OPIO Knob Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-50 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.4.2.15.1 OPIO Knob Set-T - Removal procedure

Pull 13 knobs to remove it from the console

Figure 12-70 Removing knobs



12.4.2.15.2 OPIO Knob Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.15.3 OPIO Knob Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.15.4 OPIO Knob Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.15.5 OPIO Knob Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.4.2.16 Replacement of the OPIO Lower Cover Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-51 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

Preparations

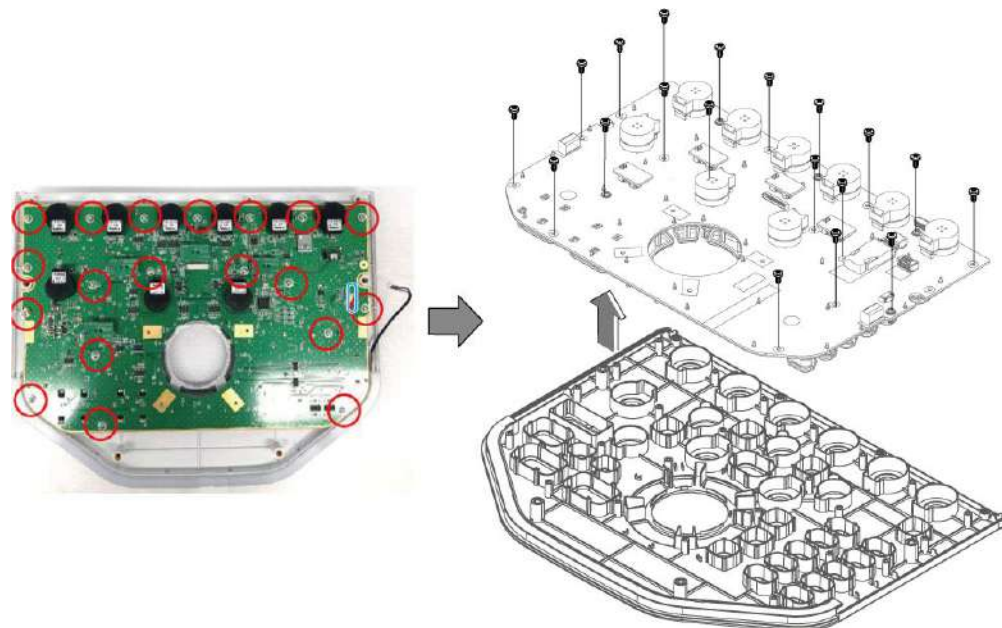
1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
5. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.

12.4.2.16.1 OPIO Lower Cover Set-T - Removal procedure

Remove OPIO Lower Cover Set-T per following steps.

- a. Disconnect 1 cable from the T2 OPIO Lower Assy
- b. Unscrew 19 screws to separate the OPIO Lower Cover Set-T and T2 OPIO Lower Assy.

Figure 12-71 Removing OPIO Lower Cover Set-T



12.4.2.16.2 OPIO Lower Cover Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.16.3 OPIO Lower Cover Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.16.4 OPIO Lower Cover Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.16.5 OPIO Lower Cover Set-T - Functional checks

Table 12-52 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.17 Replacement of the OPIO Button Set-T and the User Define Key Cap Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-53 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

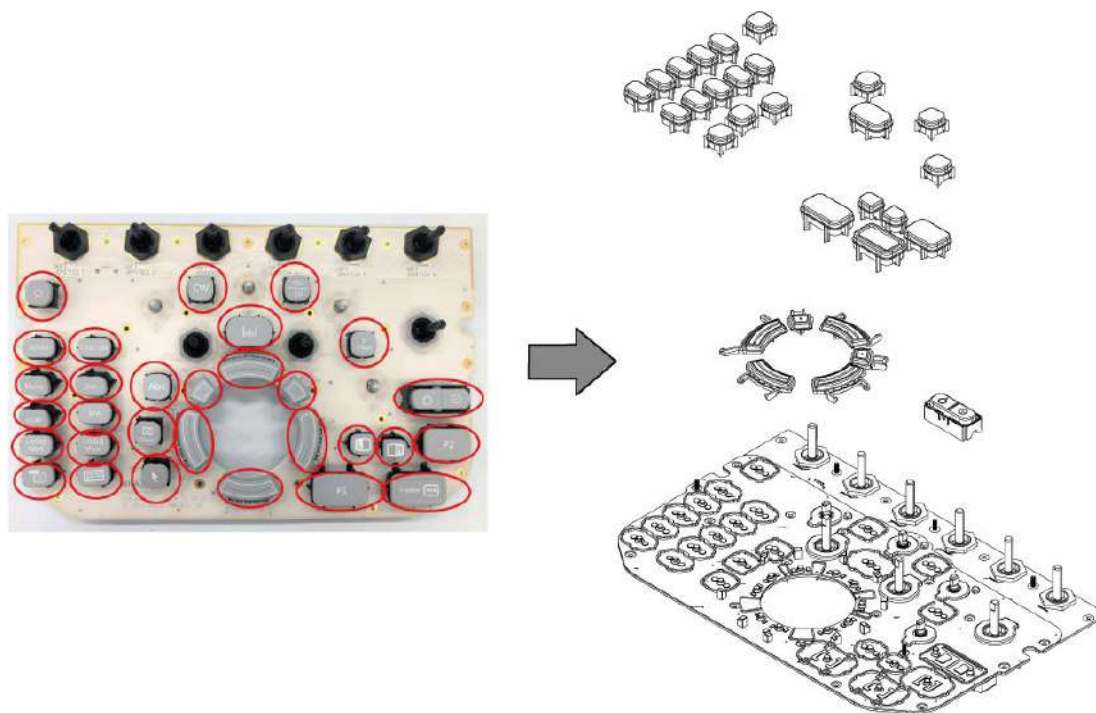
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
5. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.

12.4.2.17.1 OPIO Button Set-T and the User Define Key Cap Set-T - Removal procedure

Remove the buttons from the OPIO LOWER

Figure 12-72 Removing buttons



12.4.2.17.2 OPIO Button Set-T and the User Define Key Cap Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.17.3 OPIO Button Set-T and the User Define Key Cap Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.17.4 OPIO Button Set-T and the User Define Key Cap Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.17.5 OPIO Button Set-T and the User Define Key Cap Set-T - Functional checks

Table 12-54 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.18 Replacement of the T2 OPIO Key Rubber

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-55 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

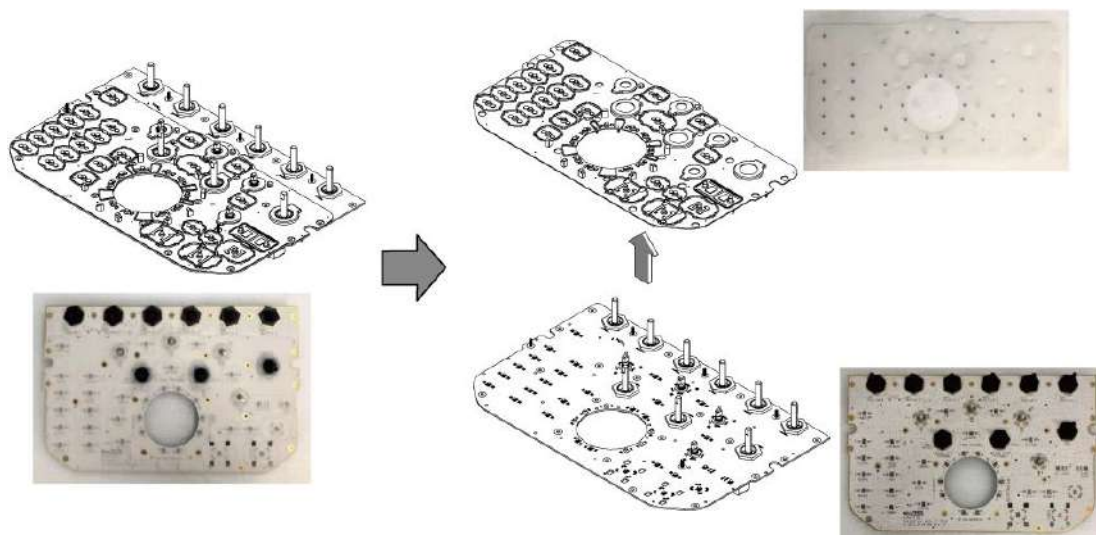
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
5. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.
7. Remove OPIO Lower Cover Set. Refer to *Replacement of the OPIO Lower Cover Set-T* on page 469.
8. Remove OPIO Button Set-T. Refer to *Replacement of the OPIO Button Set-T and the User Define Key Cap Set-T* on page 472.

12.4.2.18.1 T2 OPIO Key Rubber - Removal procedure

Gently pull the T2 OPIO Key Rubber to remove from the OPIO PWA-T.

Figure 12-73 Removing OPIO Key Rubber



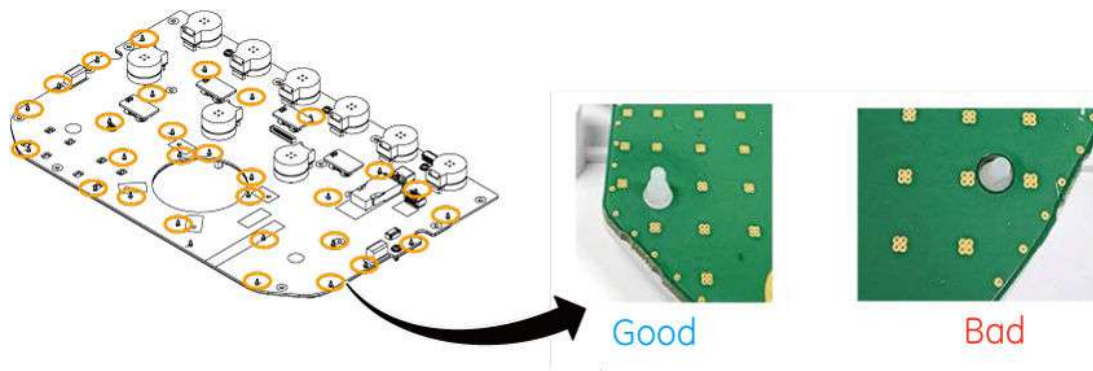
12.4.2.18.2 T2 OPIO Key Rubber - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Make sure of assembling T2 OPIO Key Rubber securely to OPIO PWA-T.

Figure 12-74 Example of good insertion



2. Perform "Functional Checks".

12.4.2.18.3 T2 OPIO Key Rubber - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.18.4 T2 OPIO Key Rubber - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.18.5 T2 OPIO Key Rubber - Functional checks

Table 12-56 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.19 Replacement of the OPIO Mode Encoder Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-57 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver Spanner 11	Cut resistant gloves Knee Pad

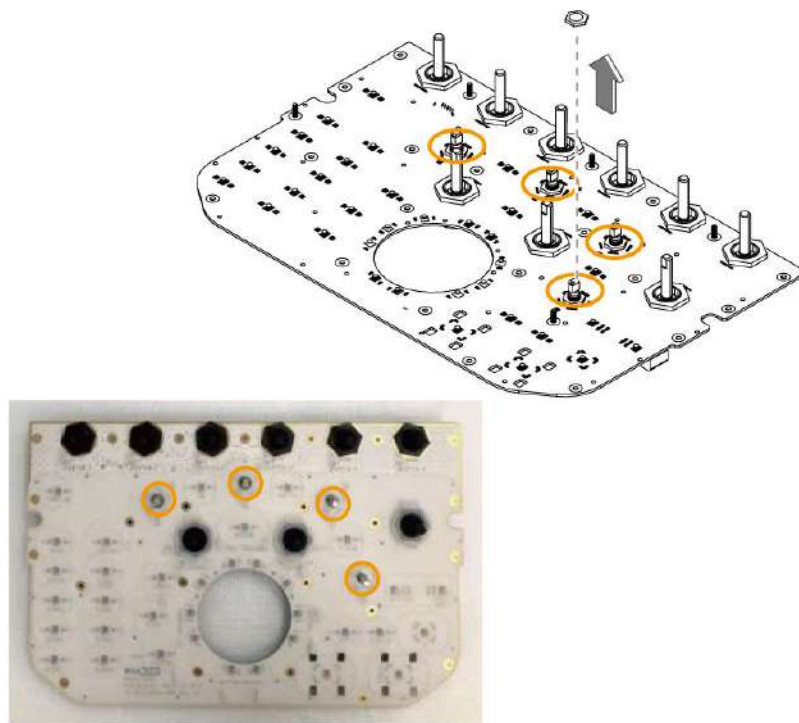
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the T2 OPIO Upper Assy. Refer to *Replacement of the T2 OPIO Upper Assy* on page 463.
5. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.
7. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
8. Remove OPIO Button Set-T. Refer to *Replacement of the OPIO Button Set-T and the User Define Key Cap Set-T* on page 472.
9. Remove T2 OPIO Key Rubber. Refer to *Replacement of the T2 OPIO Key Rubber* on page 475.

12.4.2.19.1 OPIO Mode Encoder Set-T - Removal procedure

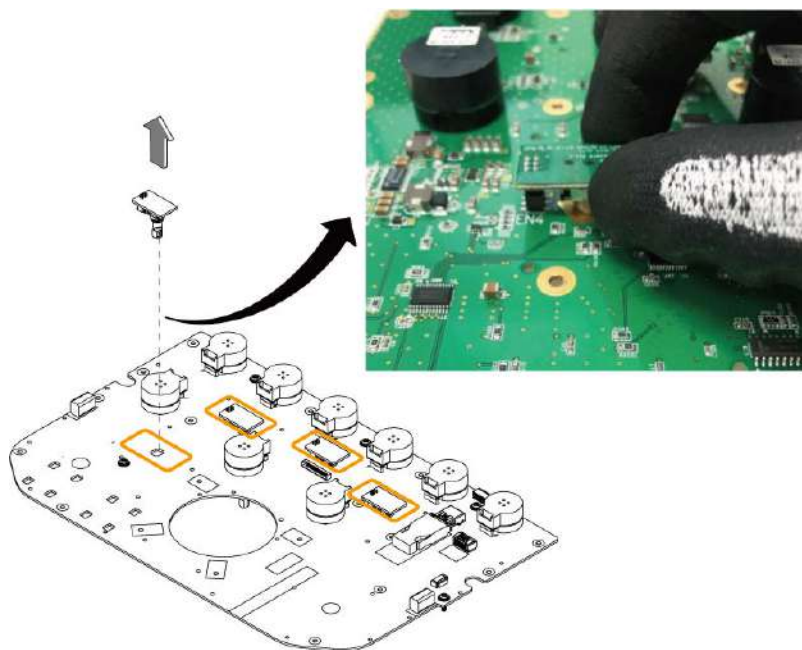
1. Unscrew the nut to remove the OPIO Mode Encoder Set-T.

Figure 12-75 Removing nut for OPIO Mode Encoder Set-T



2. Pull the OPIO Mode Encoder Set-T to remove from the OPIO PWA-T.

Figure 12-76 Removing OPIO Mode Encoder Set-T



12.4.2.19.2 OPIO Mode Encoder Set-T - Installation (child)

1. Install components in reverse order of removal.

2. Perform "Functional Checks".

12.4.2.19.3 OPIO Mode Encoder Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.19.4 OPIO Mode Encoder Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.19.5 OPIO Mode Encoder Set-T - Functional checks

Table 12-58 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.20 Replacement of the OPIO Joycoder Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-59 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver Spanner 24	Cut resistant gloves Knee Pad

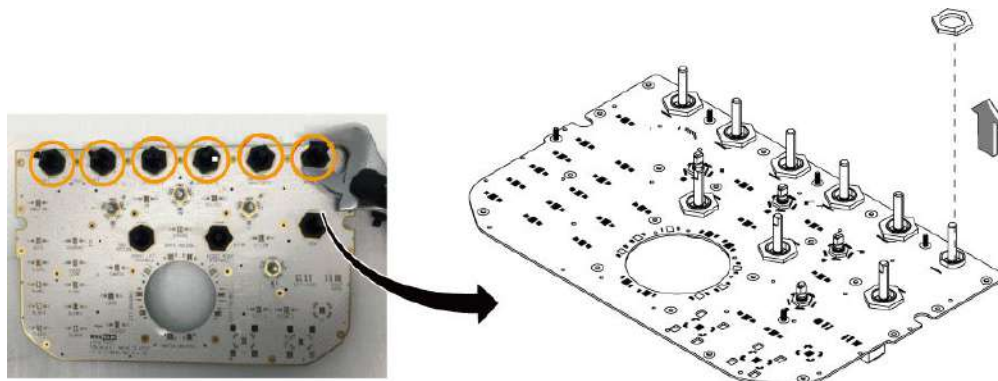
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the T2 OPIO Upper Assy. Refer to *Replacement of the T2 OPIO Upper Assy* on page 463.
5. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.
7. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
8. Remove OPIO Button Set-T. Refer to *Replacement of the OPIO Button Set-T and the User Define Key Cap Set-T* on page 472.
9. Remove T2 OPIO Key Rubber. Refer to *Replacement of the T2 OPIO Key Rubber* on page 475.

12.4.2.20.1 OPIO Joycoder Set-T - Removal procedure

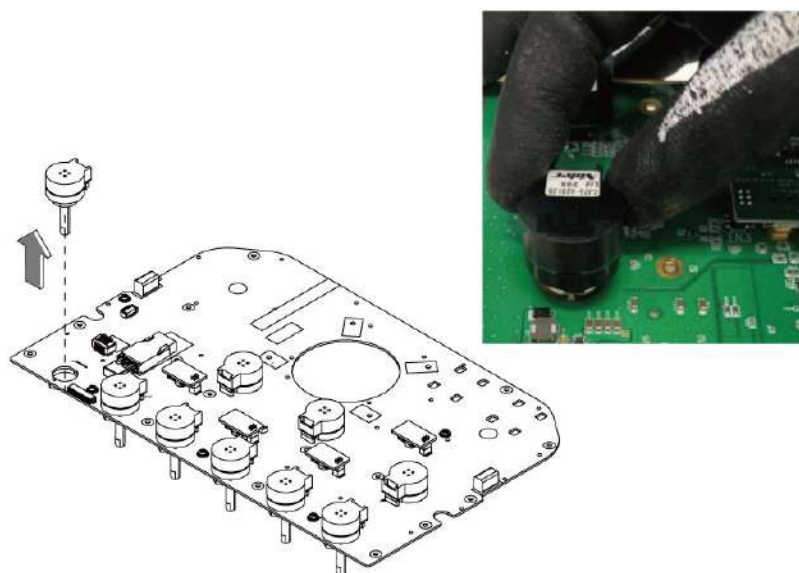
1. Unscrew the nut to remove the OPIO Joycoder Set-T.

Figure 12-77 Removing nut for OPIO Joycoder Set-T



2. Pull the OPIO Joycoder Set-T to remove from the OPIO PWA-T.

Figure 12-78 Removing OPIO Joycoder Set-T



12.4.2.20.2 OPIO Joycoder Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.20.3 OPIO Joycoder Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.20.4 OPIO Joycoder Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.20.5 OPIO Joycoder Set-T - Functional checks

Table 12-60 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.21 Replacement of the Touch Panel Joycoder Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-61 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Philips Screwdriver Spanner 24	Cut resistant gloves Knee Pad

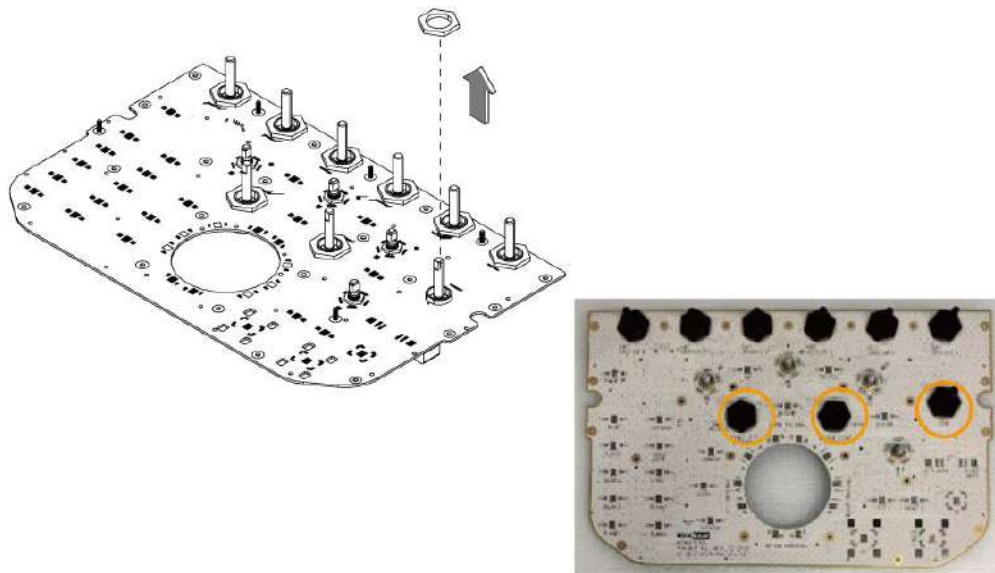
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the T2 OPIO Upper Assy. Refer to *Replacement of the T2 OPIO Upper Assy* on page 463.
5. Remove the OPIO Laser Color Trackball with Cable. Refer to *Replacement of the Trackball assy-U* on page 451.
6. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.
7. Remove T2 OPIO Lower Assy. Refer to *Replacement of the T2 OPIO Lower Assy* on page 460.
8. Remove OPIO Button Set-T. Refer to *Replacement of the OPIO Button Set-T and the User Define Key Cap Set-T* on page 472.
9. Remove T2 OPIO Key Rubber. Refer to *Replacement of the T2 OPIO Key Rubber* on page 475.

12.4.2.21.1 Touch Panel Joycoder Set-T - Removal procedure

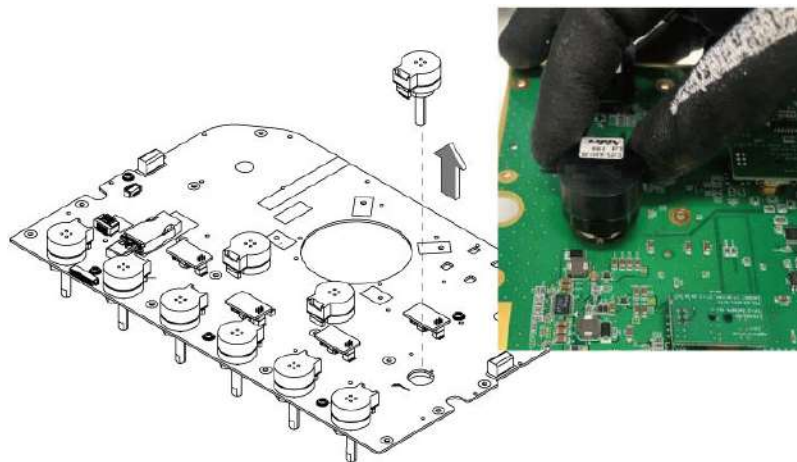
1. Unscrew the nut to remove the Touch Panel Joycoder Set-T.

Figure 12-79 Removing nut for Touch Panel Joycoder Set-T



2. Pull the Touch Panel Joycoder Set-T to remove from the OPIO PWA-T.

Figure 12-80 Removing Touch Panel Joycoder Set-T



12.4.2.21.2 Touch Panel Joycoder Set-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.21.3 Touch Panel Joycoder Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.21.4 Touch Panel Joycoder Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.21.5 Touch Panel Joycoder Set-T - Functional checks

Table 12-62 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.22 Replacement of the Touch Panel MIC Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-63 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

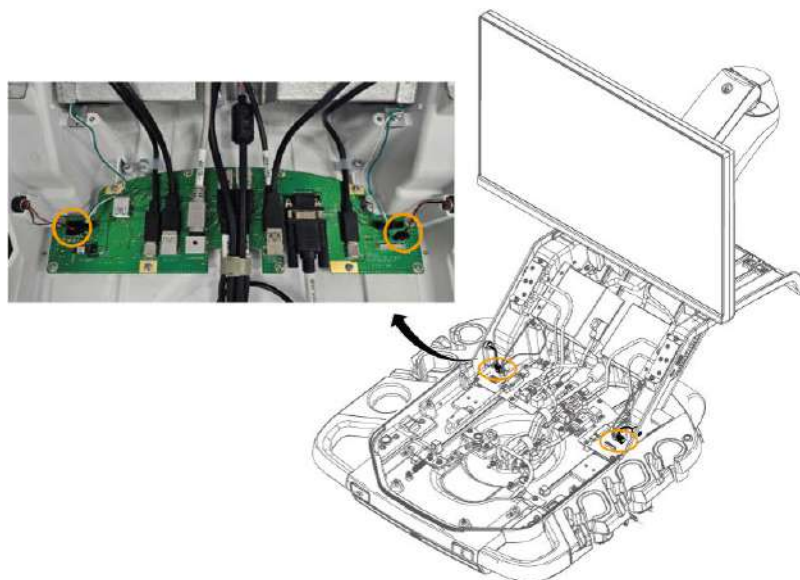
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.22.1 Touch Panel MIC Set-U - Removal procedure

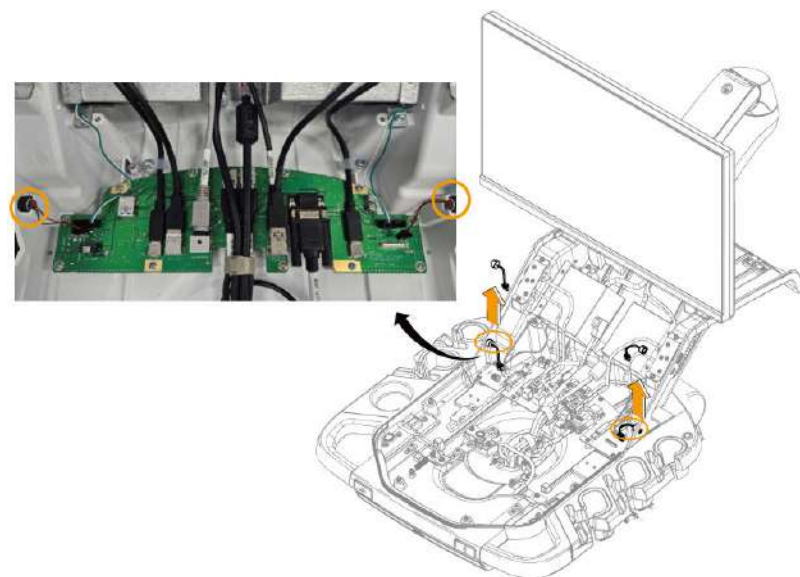
1. Disconnect the OPIO HUB To Mic With Cable from the UHUB-T.

Figure 12-81 Disconnecting Mic cables



2. Pull the Mic Set-U to remove from the console.

Figure 12-82 Removing Mic



12.4.2.22.2 Touch Panel MIC Set-U - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.22.3 Touch Panel MIC Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.22.4 Touch Panel MIC Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.22.5 Touch Panel MIC Set-U - Functional checks

Table 12-64 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.23 Replacement of the External USB Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-65 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

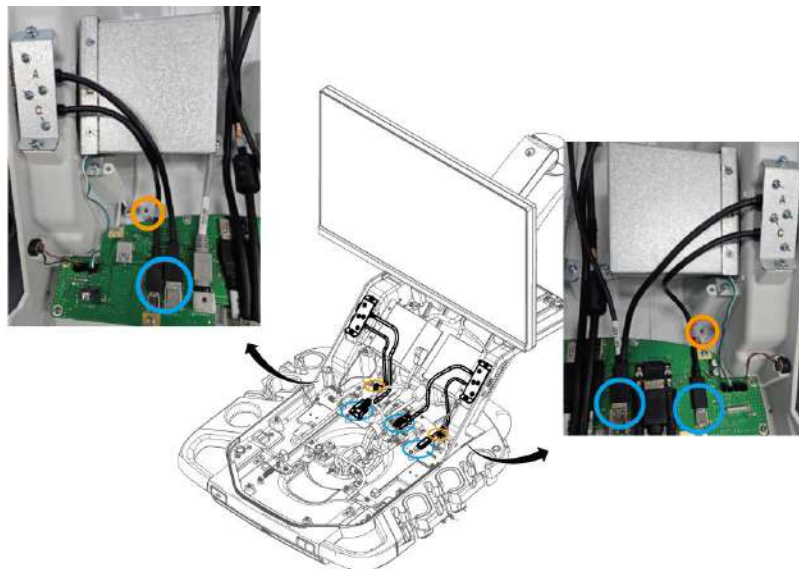
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.23.1 External USB Set-U - Removal procedure

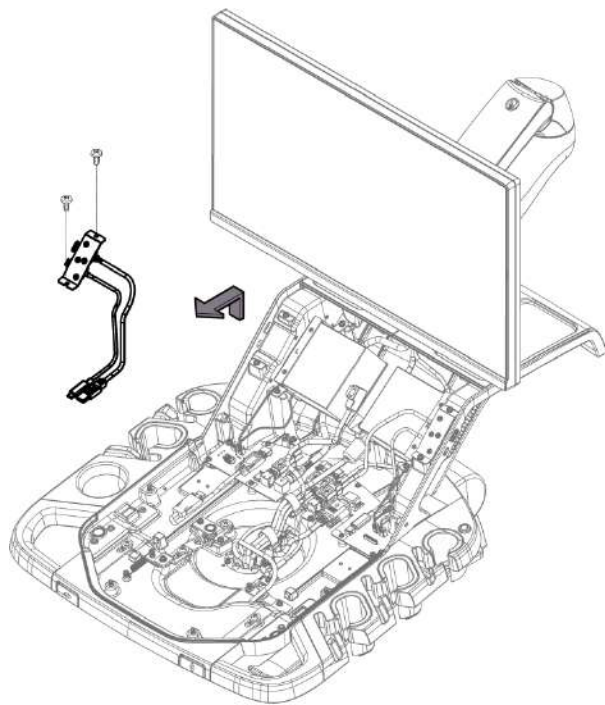
1. Remove USB-A and USB-C cables per following steps.
 - a. Unscrew 2 screw to remove the USB-C Cable clamp.
 - b. Disconnect the USB-A and USB-C connector from the console.

Figure 12-83 Removing USB-A and USB-C cables



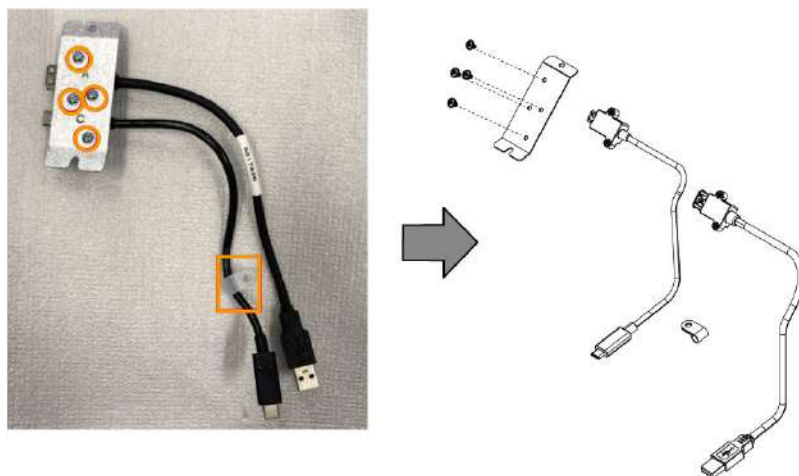
2. Unscrew 2 screws to remove the User Port Module L from the console.

Figure 12-84 Removing the User Port Module L



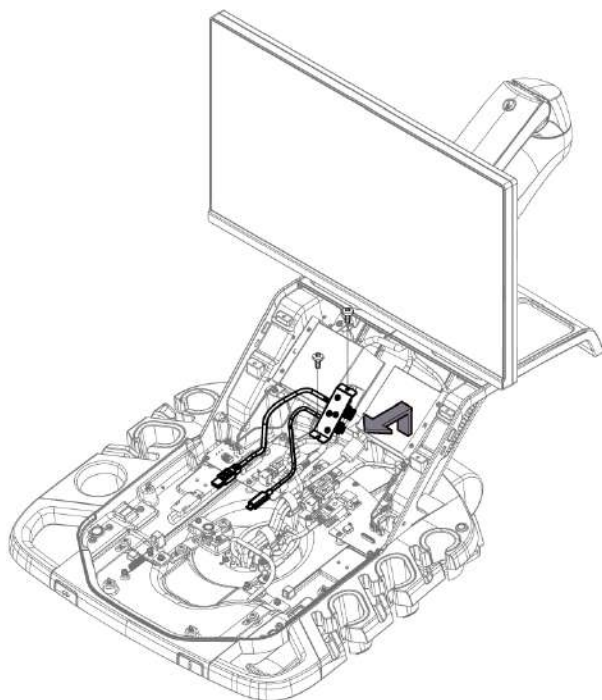
3. Unscrew 4 screws to remove the USB Port Fix Brkt and remove the plastic clamp.

Figure 12-85 Removing USB Port Fix Brkt and clamp



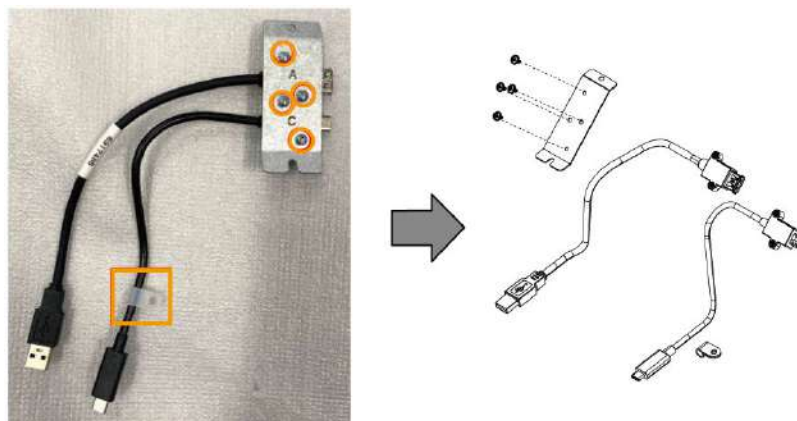
4. Unscrew 2 screws to remove the User Port Module R from the console.

Figure 12-86 Removing the User Port Module R



5. Unscrew 4 screws to remove the USB Port Fix Brkt and remove the plastic clamp.

Figure 12-87 Removing USB Port Fix Brkt and clamp



12.4.2.23.2 External USB Set-U - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.23.3 Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.23.4 External USB Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.23.5 External USB Set-U - Functional checks

Table 12-66 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.24 Replacement of the Speaker Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-67 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

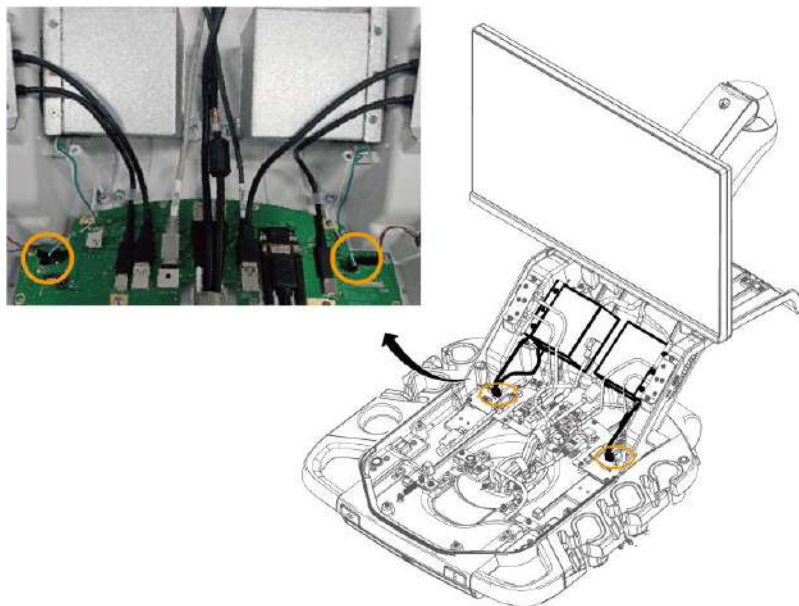
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.24.1 Speaker Set-U - Removal procedure

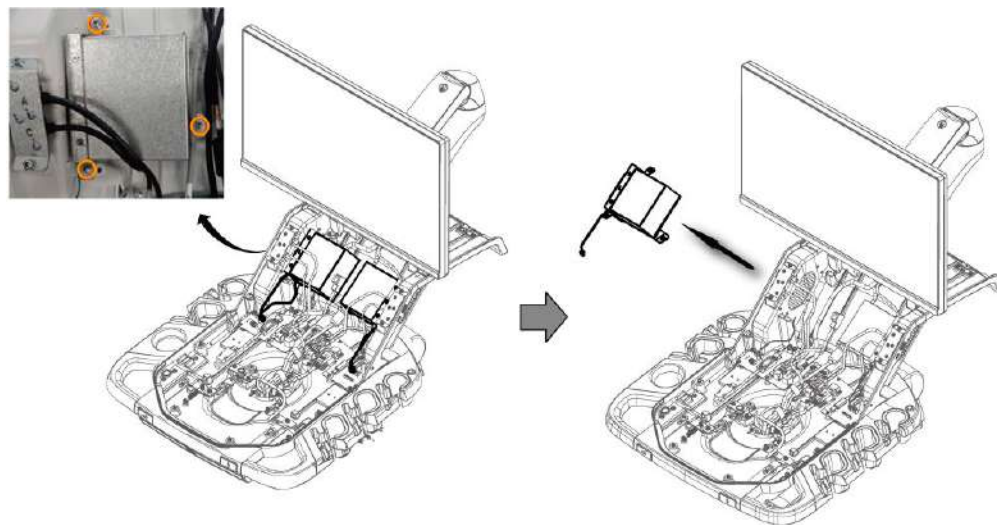
1. Disconnect the OPIO HUB To Speaker from the console.

Figure 12-88 Removing Speaker cables



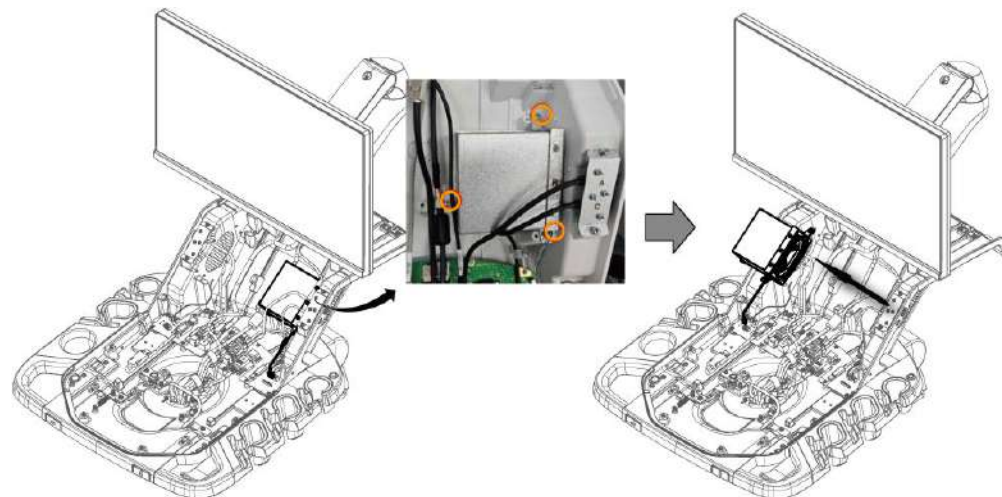
2. Unscrew 3 screws to remove the Unity Speaker Assy L from the console.

Figure 12-89 Removing Speaker L



3. Unscrew 3 screws to remove the Unity Speaker Assy R from the console

Figure 12-90 Removing Speaker R



12.4.2.24.2 Speaker Set-U - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.24.3 Speaker Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.24.4 Speaker Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.24.5 Speaker Set-U - Functional checks

Table 12-68 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.25 Replacement of the UHUB-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-69 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

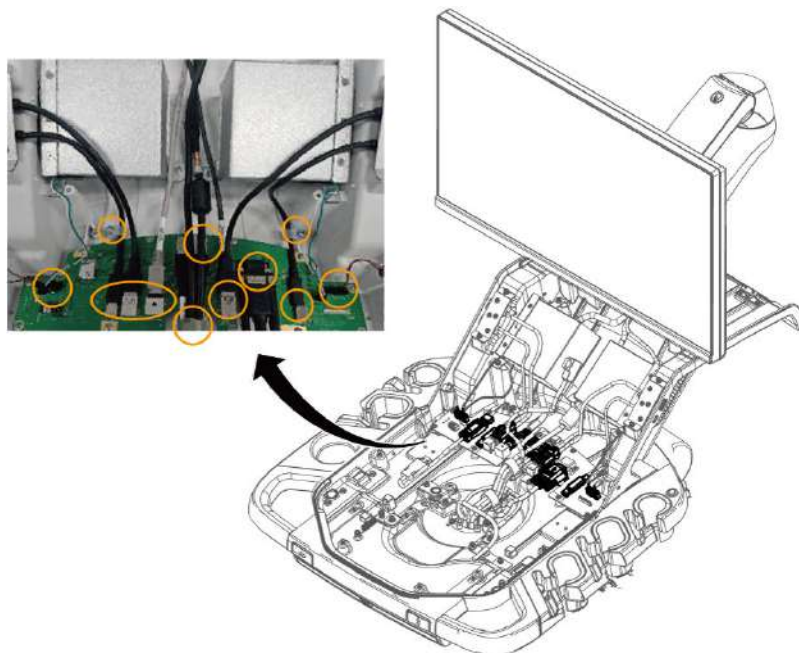
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.4.2.25.1 UHUB-T - Removal procedure

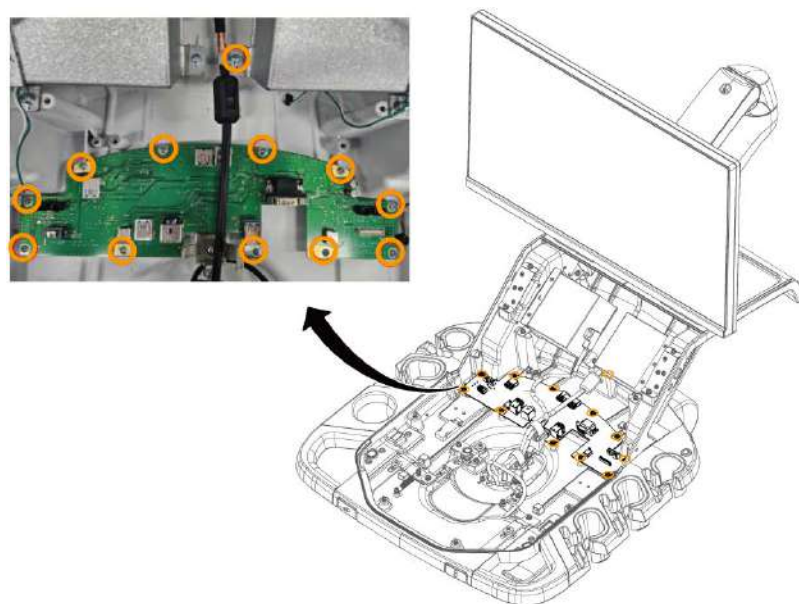
1. Remove clamps and cables from UHUB-T per following steps.
 - a. Unscrew 2 screws and unlock the Cable Clamp.
 - b. Disconnect cables which are connected to the UHUB-T.

Figure 12-91 Removing cables



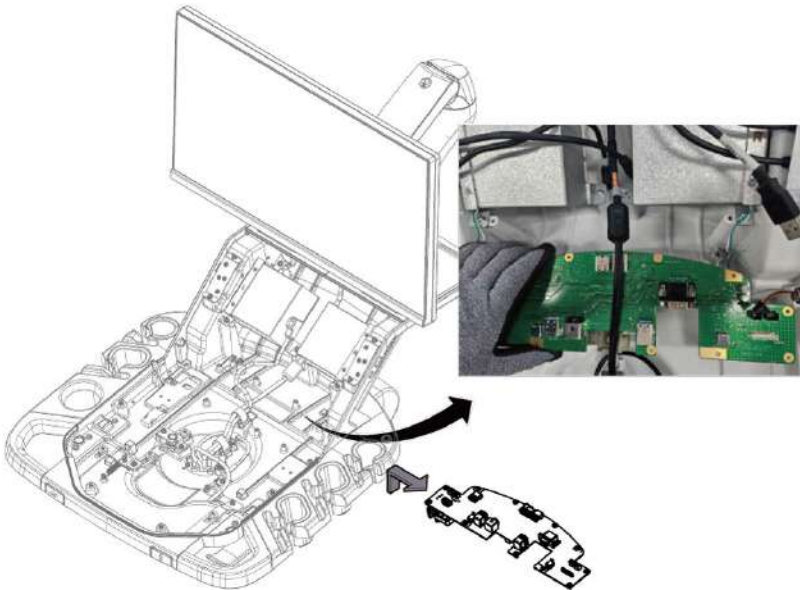
2. Unscrew the 12 screws.

Figure 12-92 Unscrew screws from UHUB-T



- 3. Remove the UHUB-T from the console.

Figure 12-93 Removing UHUB-T



12.4.2.25.2 UHUB-T - Installation

- 1. Install components in reverse order of removal.
- 2. Perform "Functional Checks".

12.4.2.25.3 UHUB-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.25.4 UHUB-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

- 1. Verify that all screws and covers removed earlier have been installed.
- 2. Connect cables and Probes removed earlier.
- 3. Power up the system to verify that it operates as intended.

12.4.2.25.5 UHUB-T - Functional checks

Table 12-70 Functional checks

Functional Check	Service Record Debrief Script
Power on/boot up on page 98	Equipment passed all required checks and is ready for use.
Probe/connector functional checks on page 159	
B-Mode functional checks on page 160	
System CFM and PWD functional checks on page 163	
Basic measurement functional checks on page 173	
Power shut down on page 113	

12.4.2.26 Replacement of the OPIO PWA-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-71 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver Spanner 11 Spanner 24	Cut resistant gloves Knee Pad

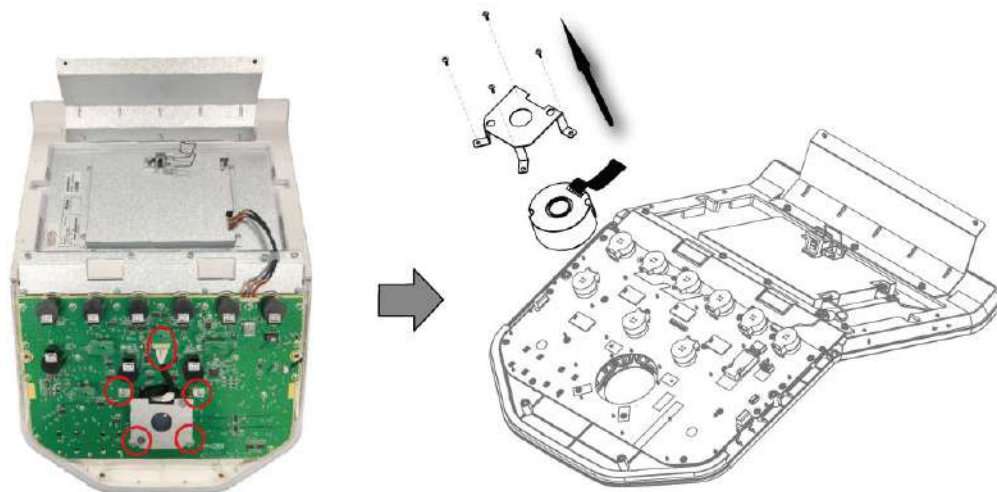
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T Assy. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the T2 OPIO Upper Assy. Refer to *Replacement of the T2 OPIO Upper Assy* on page 463.
5. Remove OPIO Knob Set-T Assy. Refer to *Replacement of the OPIO Knob Set-T* on page 466.

12.4.2.26.1 OPIO PWA-T - Removal procedure

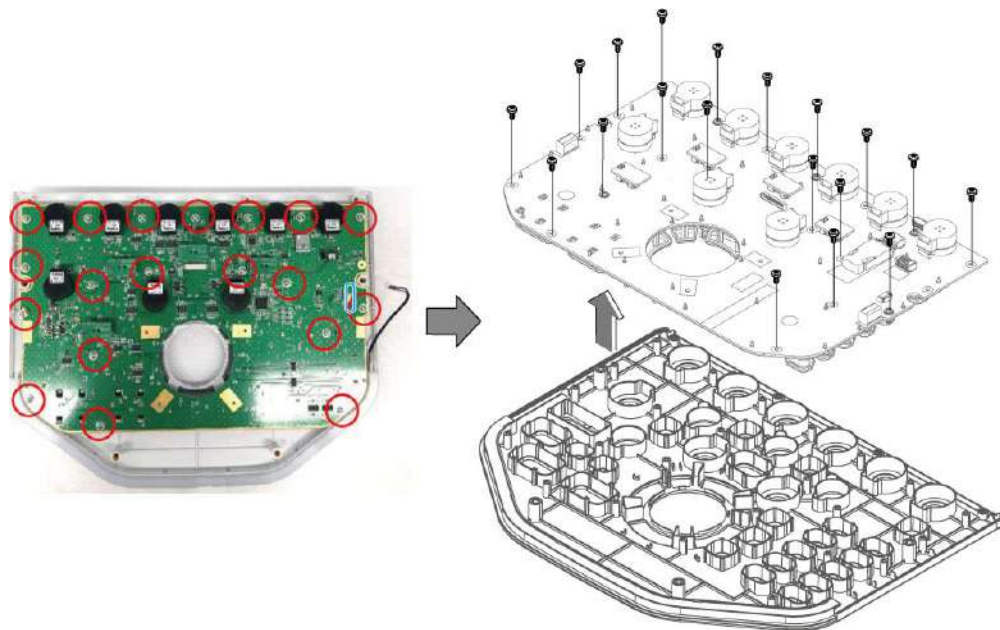
1. Disconnect trackball cable and unscrew 4 screws to remove the trackball from the T2 OPIO Lower Assy.

Figure 12-94 Removing trackball



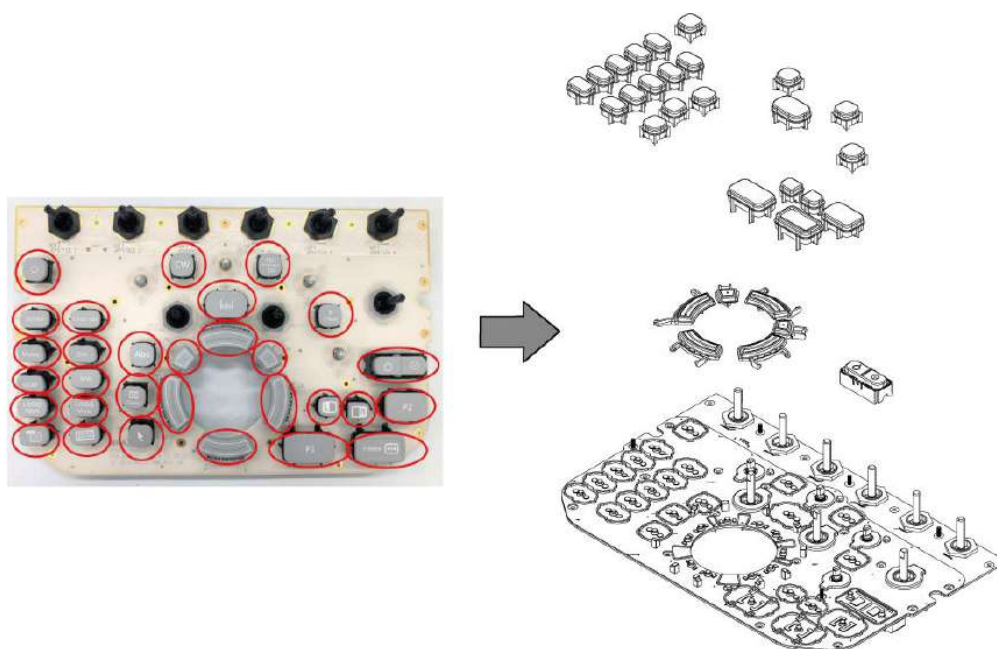
2. Unscrew 19 screws to remove the T2 OPIO Lower Assy.

Figure 12-95 Removing the T2 OPIO Lower Assy



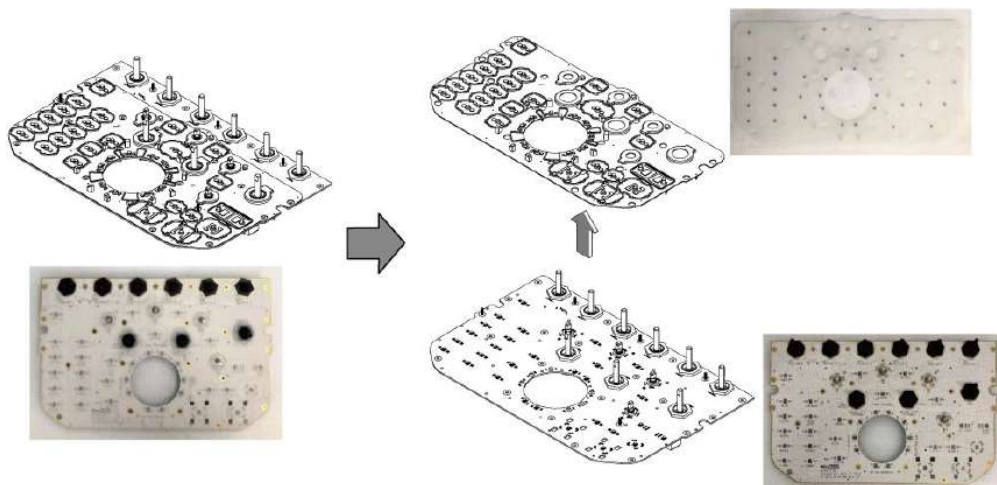
3. Remove the OPIO Button Set-T from the OPIO Board.

Figure 12-96 Removing OPIO Button Set-T



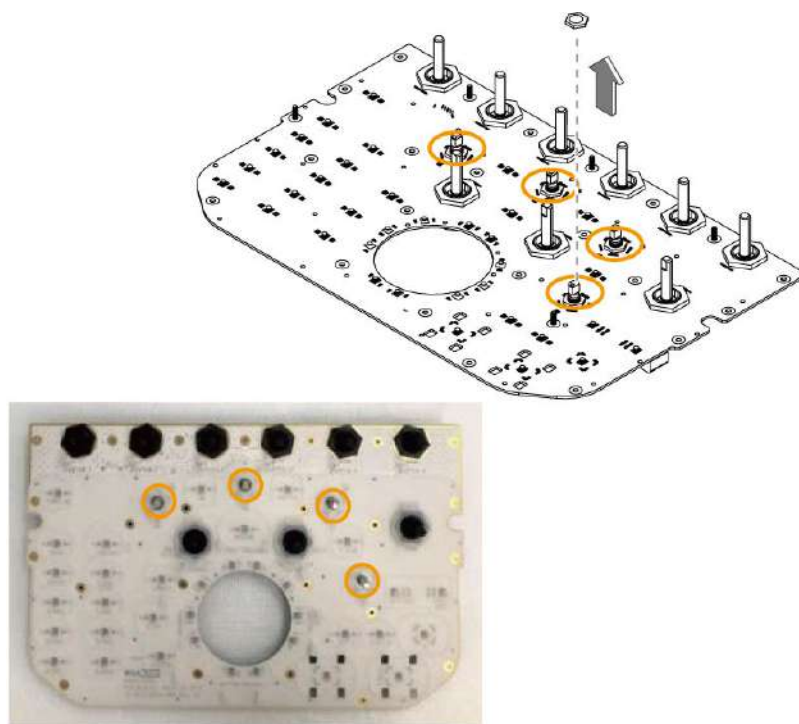
4. Gently pull the T2 OPIO Key Rubber to remove from the OPIO PWA-T.

Figure 12-97 Removing OPIO Key Rubber



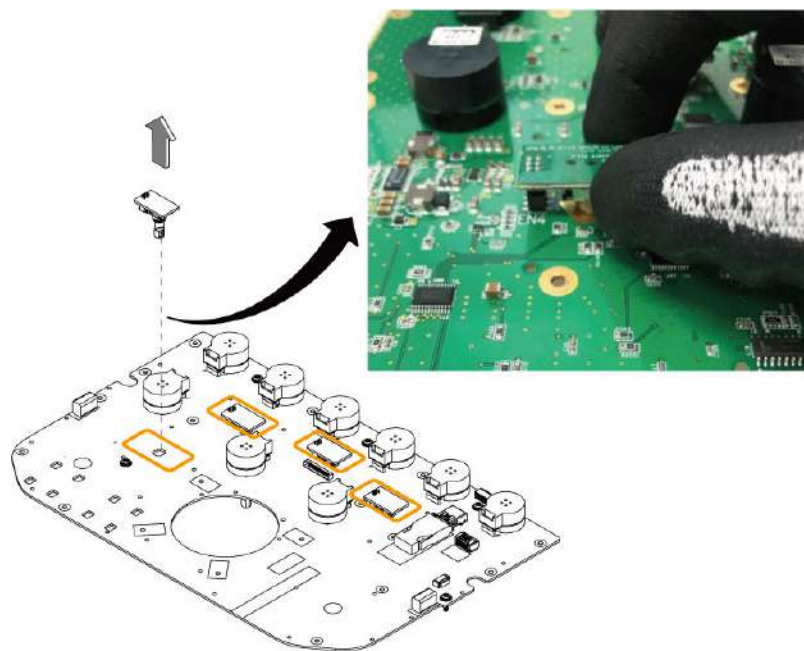
5. Unscrew the nut to remove the OPIO Mode Encoder.

Figure 12-98 Removing nut for OPIO Mode Encoder



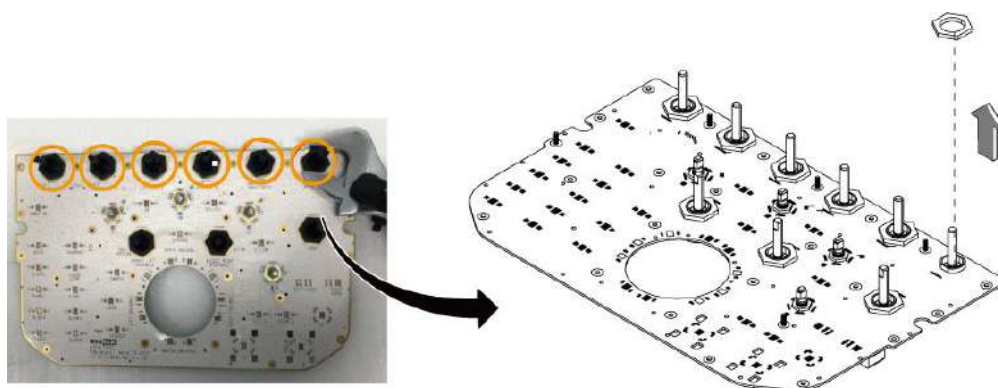
6. Pull the OPIO Mode Encoder to remove from the OPIO board.

Figure 12-99 Removing OPIO Mode Encoder



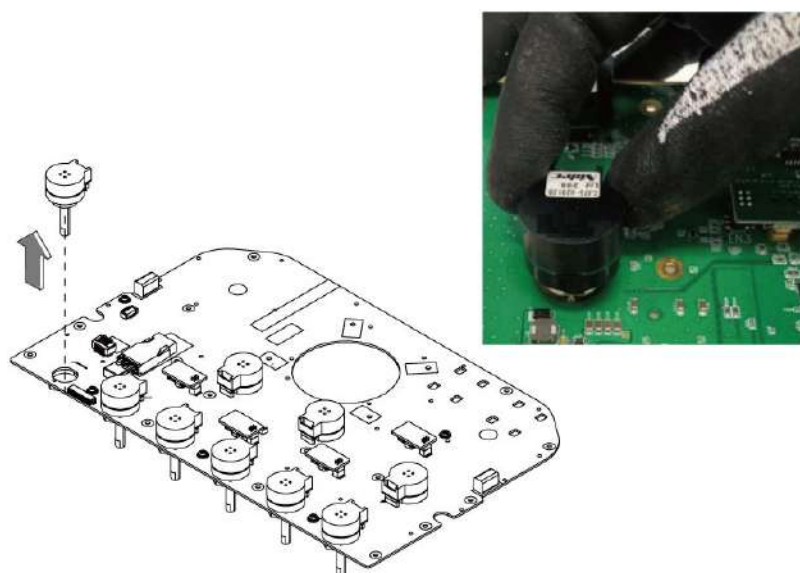
7. Unscrew the nut to remove the Joystick Encoder

Figure 12-100 Removing nut for Joystick Encoder



8. Pull the Joystick Encoder to remove from the OPIO board.

Figure 12-101 Removing Joystick Encoder



12.4.2.26.2 OPIO PWA-T - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.26.3 OPIO PWA-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.26.4 OPIO PWA-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.4.2.26.5 OPIO PWA-T - Functional checks

Table 12-72 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.4.2.27 Replacement of the Elevation Arm Cover Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

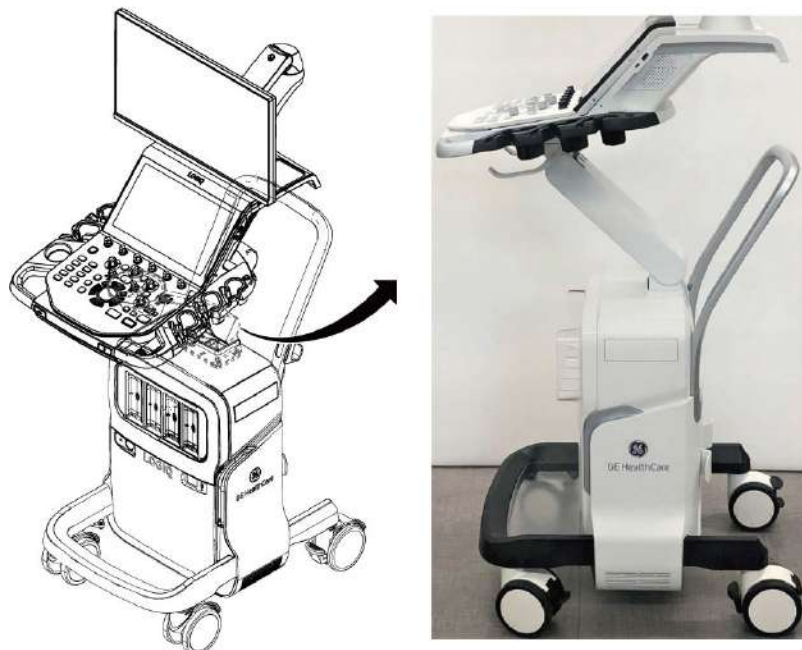
Table 12-73 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

12.4.2.27.1 Elevation Arm Cover Set-U - Removal procedure

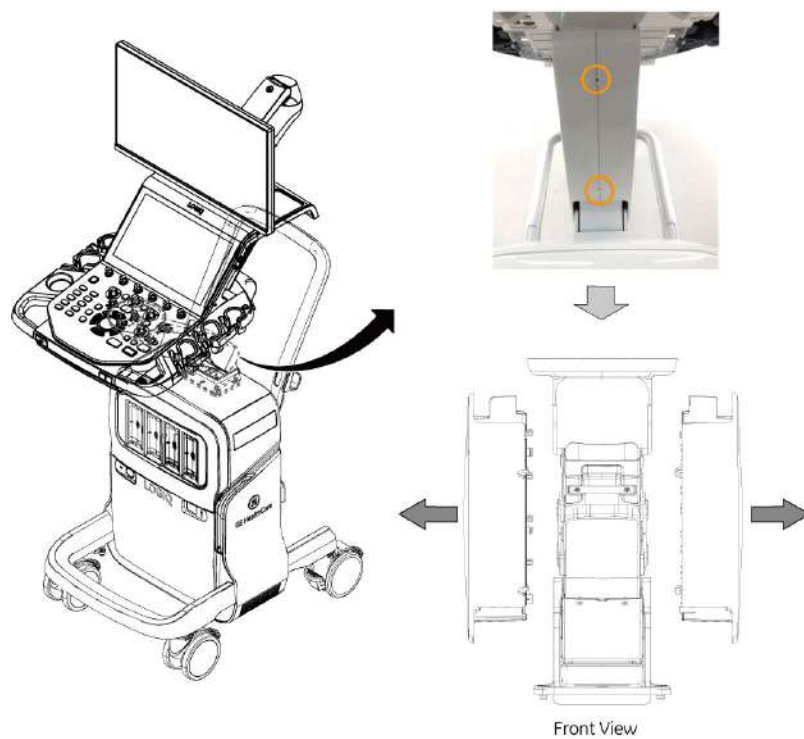
1. Lift the elevation arm to its highest position.

Figure 12-102 Elevation arm to highest position



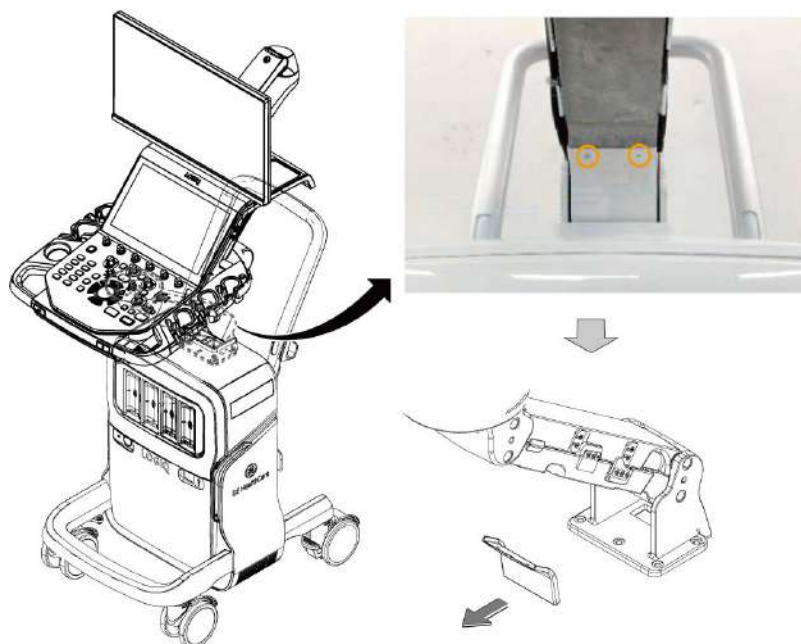
2. Unscrew 2 screws to remove the Unity Elevation Arm Cover L/R from the console

Figure 12-103 Removing Elevation Arm Cover L/R



3. Unscrew 2 screws to remove the Unity Elevation Arm Hide Cover from the console.

Figure 12-104 Removing Elevation Arm Hide Cover



12.4.2.27.2 Elevation Arm Cover Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.4.2.27.3 Elevation Arm Cover Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.4.2.27.4 Elevation Arm Cover Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.4.2.27.5 Elevation Arm Cover Set-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.5 Main Console Parts Replacement

12.5.1 Front End Parts

12.5.1.1 Replacement of the UAC-T PWA

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-74 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
4. Remove Unity Protector Assy. Refer to *Replacement of the Unity Protector Assy* on page 350.

12.5.1.1.1 UAC-T PWA - Removal procedure

1. If Volume Navigator is installed, disconnect the UBE TO V NAV USB CABLE from UCO per following steps before removing the UCO UAC MODULE.
 - a. Remove the T2 SIDE COVER ASSY RIGHT.

Figure 12-105 Removing T2 SIDE COVER ASSY RIGHT



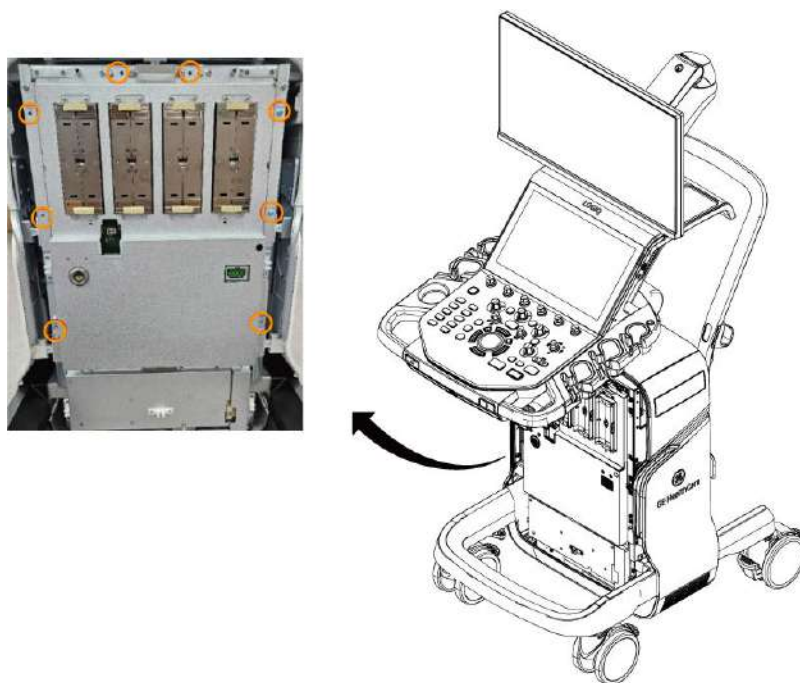
- b. Disconnect the UCO TO V NAV SIGNAL CABLE from the UCO-T

Figure 12-106 Disconnecting UCO TO V NAV SIGNAL CABLE



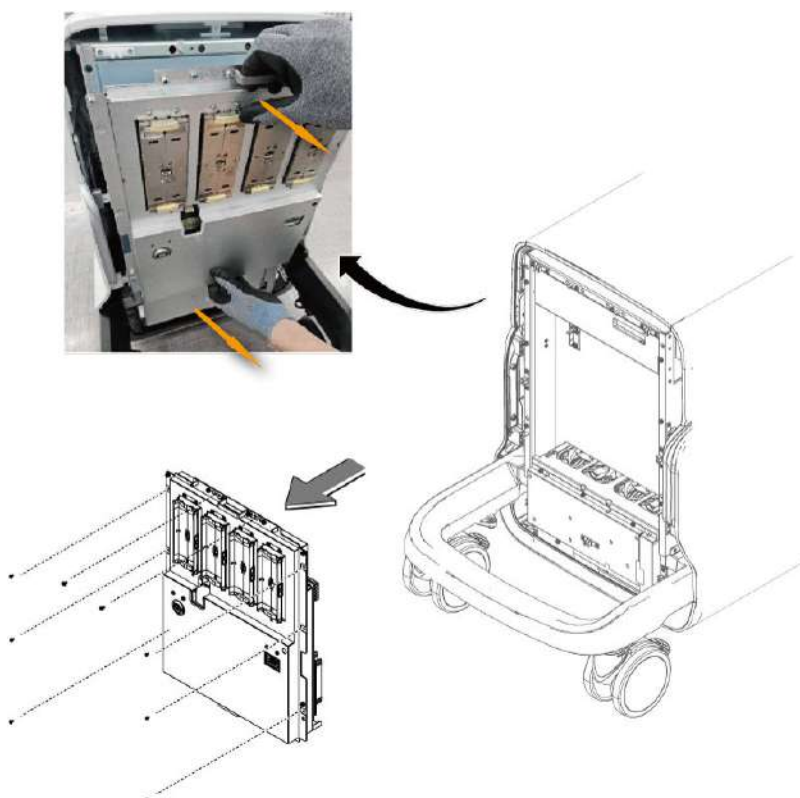
2. Unscrew 8 screws from the UAC&UCO-T Assy.

Figure 12-107 Removing screws from UAC&UCO-T Assy



3. Remove the UAC&UCO-T Assy.

Figure 12-108 Removing UAC&UCO-T Assy

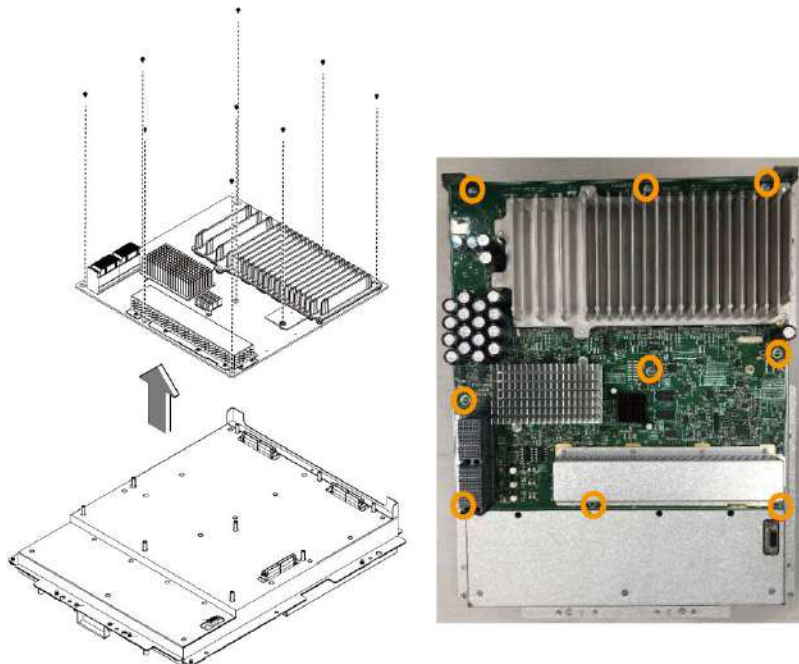


4. Unscrew 9 screws and Pull the UAC-T PWA to remove the UAC-T PWA from the UCO-T&UAC Assy.

NOTE

If the CWC-T is installed, remove the CWC-T as described in *Replacement of the CWC-T PWA* on page 745.

Figure 12-109 Removing UAC-T PWA



12.5.1.1.2 UAC-T PWA - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.1.1.3 UAC-T PWA - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.1.1.4 UAC-T PWA - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.1.1.5 UAC-T PWA - Functional checks

Table 12-75 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Top console adjustment control functional checks on page 150</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.1.2 Replacement of the UCO-T Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-76 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.5.1.2.1 UCO-T Assy - Removal procedure

1. If Volume Navigator is installed, disconnect the UBE TO V NAV USB CABLE from UCO per following steps before removing the UCO UAC MODULE.
 - a. Remove the T2 SIDE COVER ASSY RIGHT.

Figure 12-110 Removing T2 SIDE COVER ASSY RIGHT



- b. Disconnect the UCO TO V NAV SIGNAL CABLE from the UCO-T

Figure 12-111 Disconnecting UCO TO V NAV SIGNAL CABLE



2. Push the button of Unity Protector Assy's connector and disconnect the Unity Protector Assy's Connector from the console.

Figure 12-112 Disconnecting Protector Assy's Connector



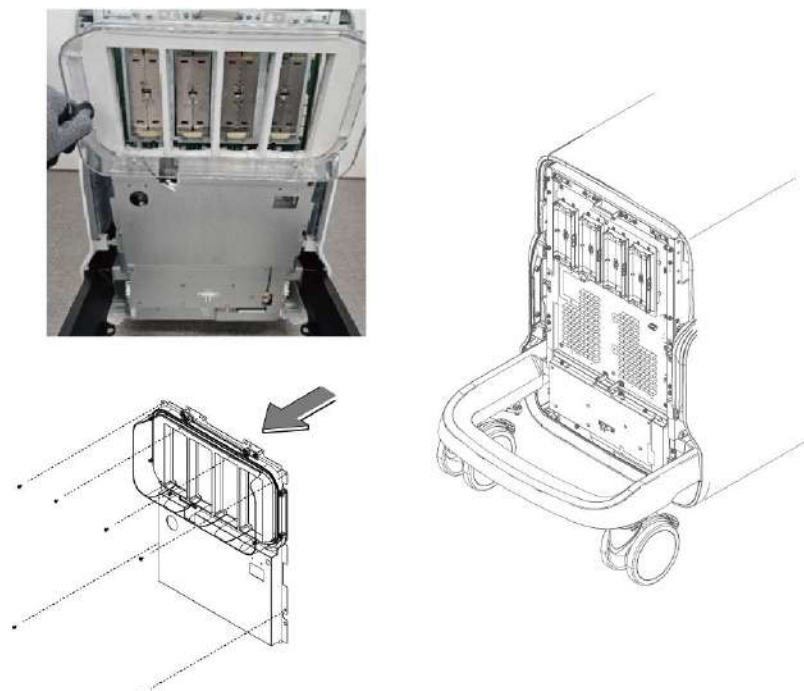
3. Unscrew 6 screws from the Unity UCO-T Front Cover Brkt.

Figure 12-113 Removing screws from UCO-T Front Cover Brkt



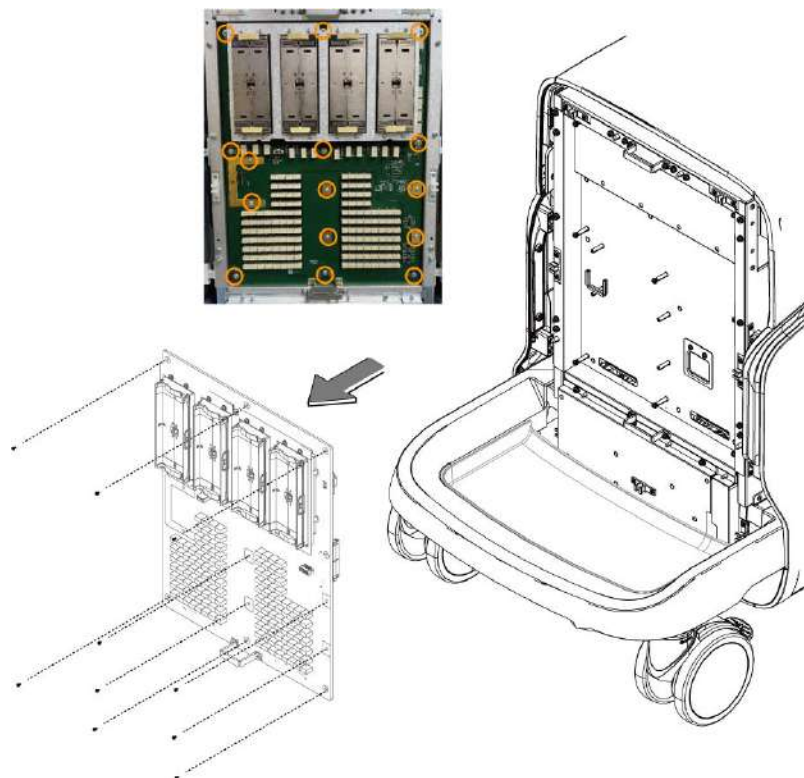
4. Remove the Unity UCO-T Front Cover Brkt.

Figure 12-114 Removing UCO-T Front Cover Brkt



5. Unscrew 15 screws to remove the UCO-T from the console.

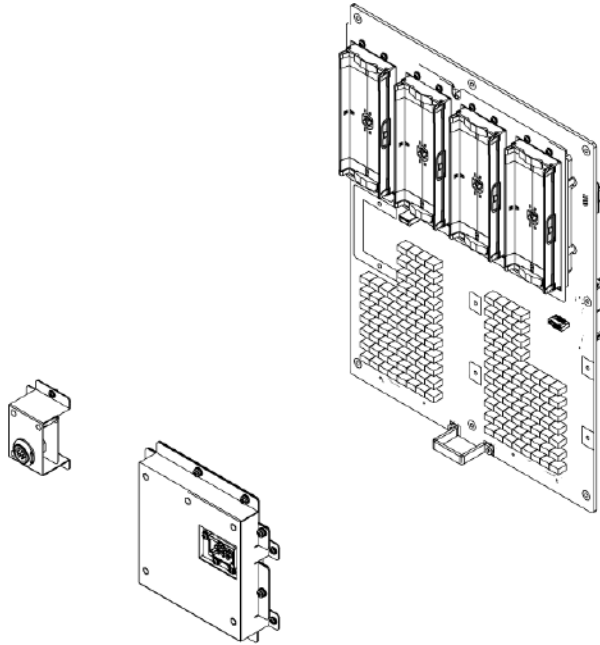
Figure 12-115 Removing the UCO-T



NOTE

If the UECG Assy was installed, remove the UECG Assy as described in *Replacement of the UECG Assy* on page 717. If the U-DCWD Set was installed, remove the U-DCWD Set as described in *Replacement of the U-DCWD Set* on page 713.

Figure 12-116 Removing UECG Assy and U-DCWD Set



12.5.1.2.2 UCO-T Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.1.2.3 UCO-T Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.1.2.4 UCO-T Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.1.2.5 UCO-T Assy - Functional checks

Table 12-77 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Top console adjustment control functional checks</i> on page 150	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.2 Back End Parts

12.5.2.1 Replacement of the UBE Board Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-78 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.
4. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
5. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.5.2.1.1 UBE Board Set-T - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

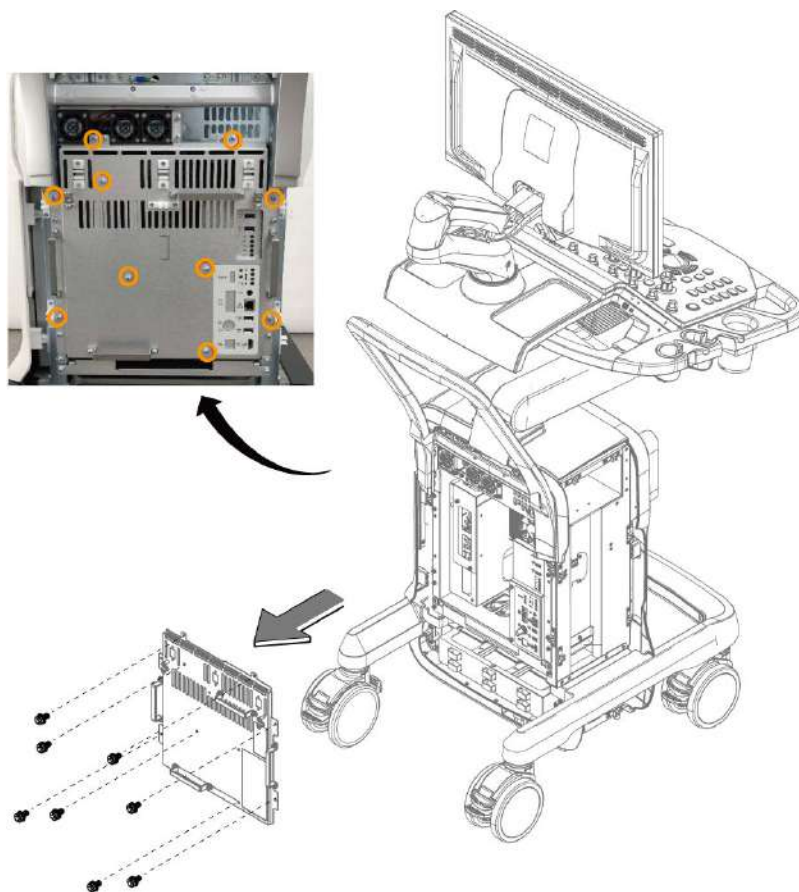
NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

NOTE

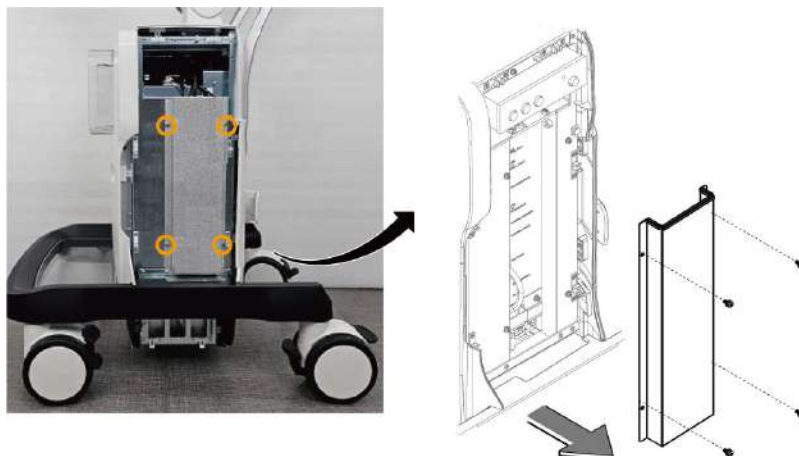
If the U-WIFI Module Assy-T was installed, remove the U-WIFI Module Assy-T as described in *Replacement of the U-WIFI Module Assy* on page 731.

Figure 12-117 Removing Rear Shield Brkt



2. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-118 Removing Cable Cover Brkt



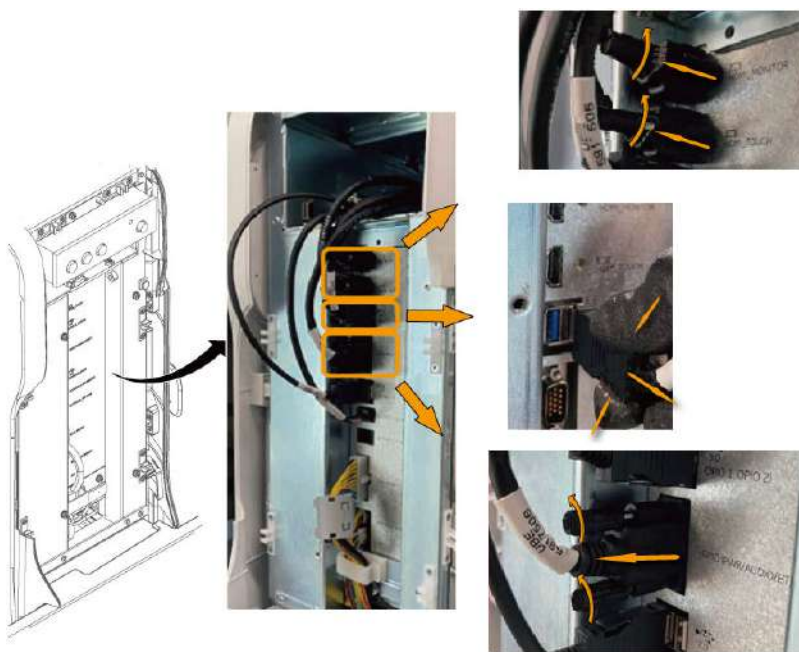
3. Remove HDMI and USB cables per following steps.
 - a. Rotate the stud of HDMI cable(Main Monitor & Touch panel) counterclockwise and disconnect from UBE-T
 - b. Push the side of USB connector(OPIO1, OPIO2) and disconnect from UBE-T.

NOTE

The connector can be inserted to any of these two USB ports.

- c. Rotate the stud of D-sub connector counterclockwise and disconnect from UBE-T.

Figure 12-119 Removing HDMI and USB cables



4. Remove ACDC OUTPUT and FAN cables per following steps.
 - a. Push the button of ACDC OUTPUT Cable connector and disconnect from the UBE-T.
 - b. Push the button of Fan cable's connector and disconnect from the UBE-T.

NOTE

If the BW printer Option Cable Set-U was installed, remove the BW printer Option Cable Set-U as described in *Replacement of the BW printer Option Cable Set-U* on page 708.

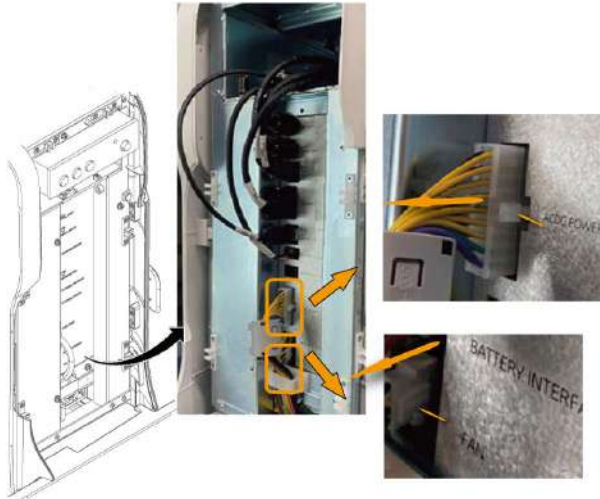
NOTE

If the Battery Option Cable Set-U, remove the Battery Option Cable Set-U as described in *Replacement of the Battery Option Cable Set-U* on page 589.

NOTE

If the VNAV Option Cable Set-U, remove the VNAV Option Cable Set-U as described in *Replacement of the VNAV Option Cable Set-U* on page 721.

Figure 12-120 Removing ACDC OUTPUT and FAN cables

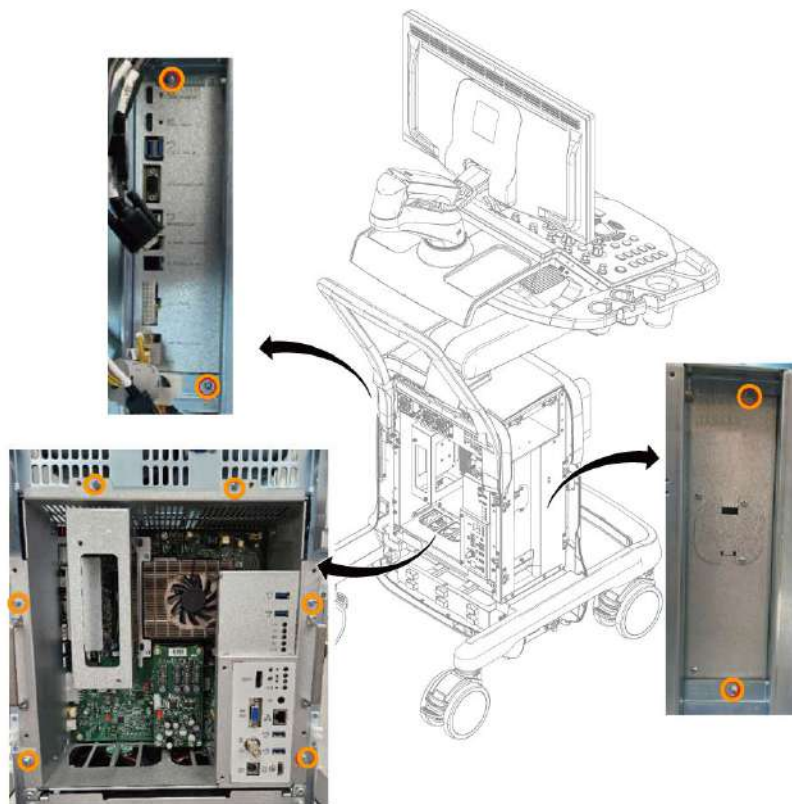


5. Unscrew 10 screws to remove the UBE-T module.

NOTE

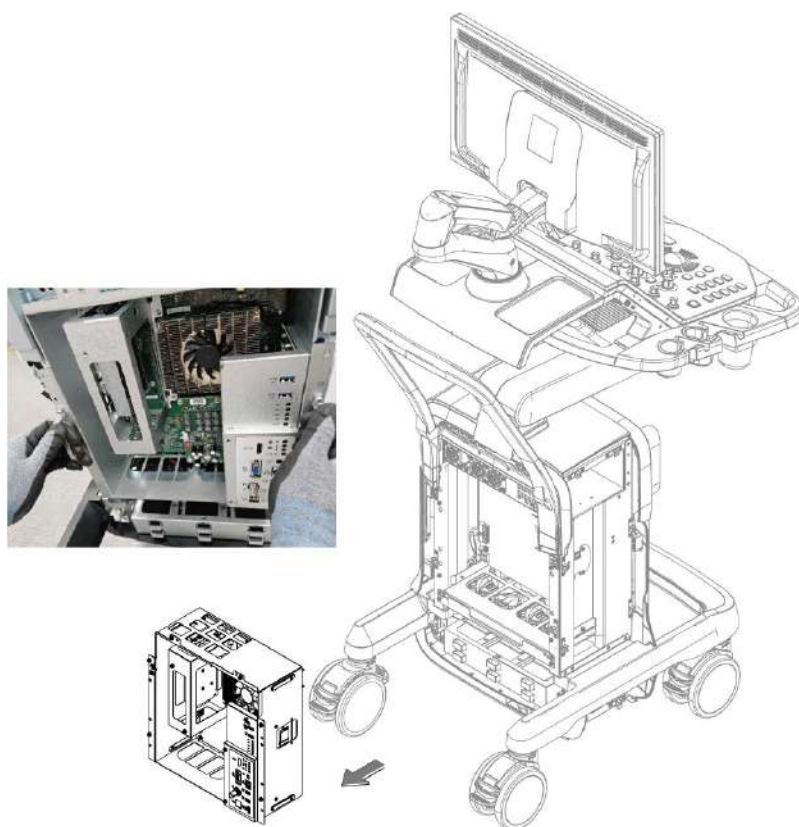
If the U-WIFI Module Assy-T was installed, remove the U-WIFI Module Assy-T as described in *Replacement of the U-WIFI Module Assy* on page 731.

Figure 12-121 Removing screws from UBE-T module



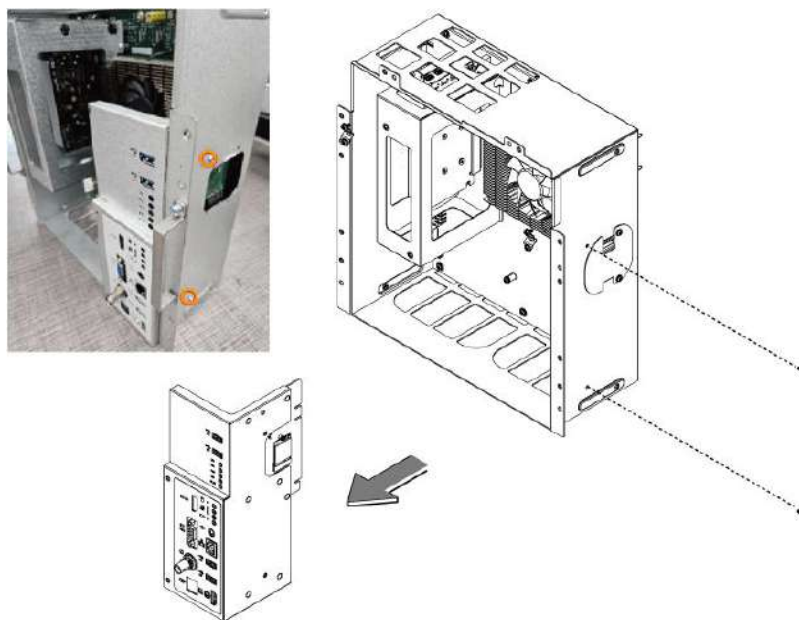
6. Pull out the UBE module and remove from the console.

Figure 12-122 Removing UBE-T module



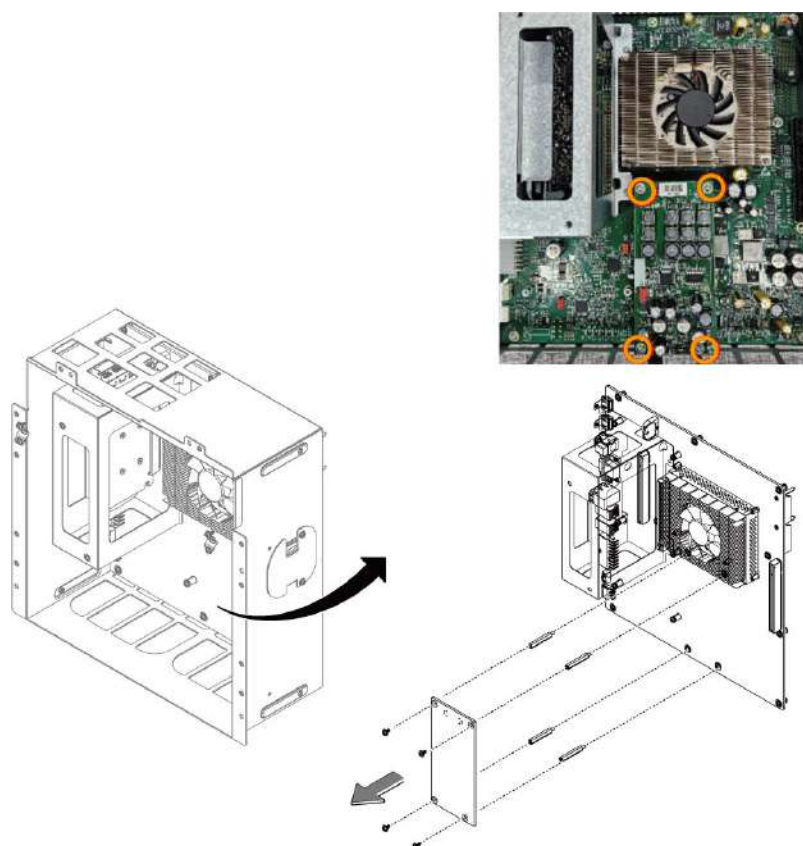
7. Unscrew 2 screws to remove the UEPP module from the UBE-T.

Figure 12-123 Removing UEPP module



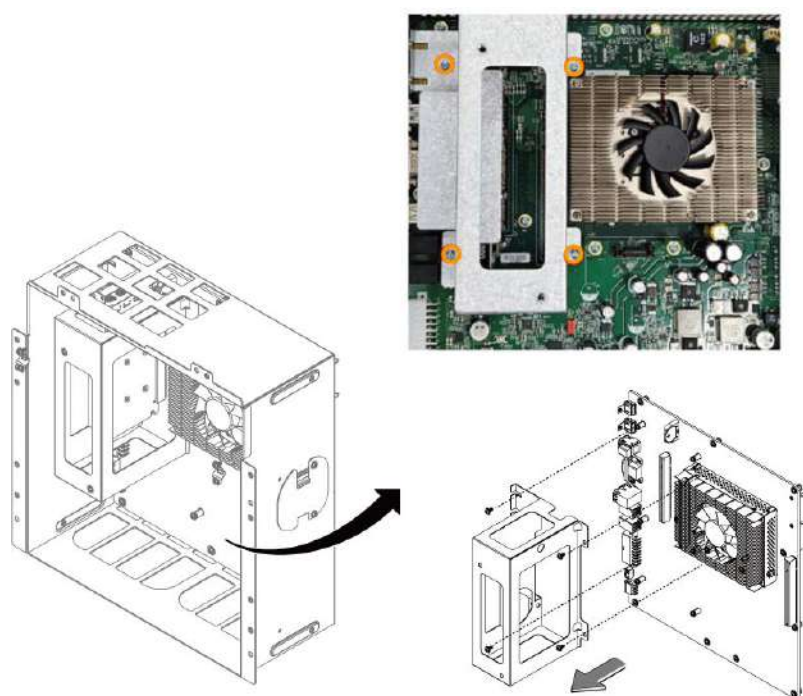
8. If UMC-T was installed, unscrew 4 screws to remove the UMC-T from the UBE-T. And then unscrew 4 studs.

Figure 12-124 Removing UMC-T



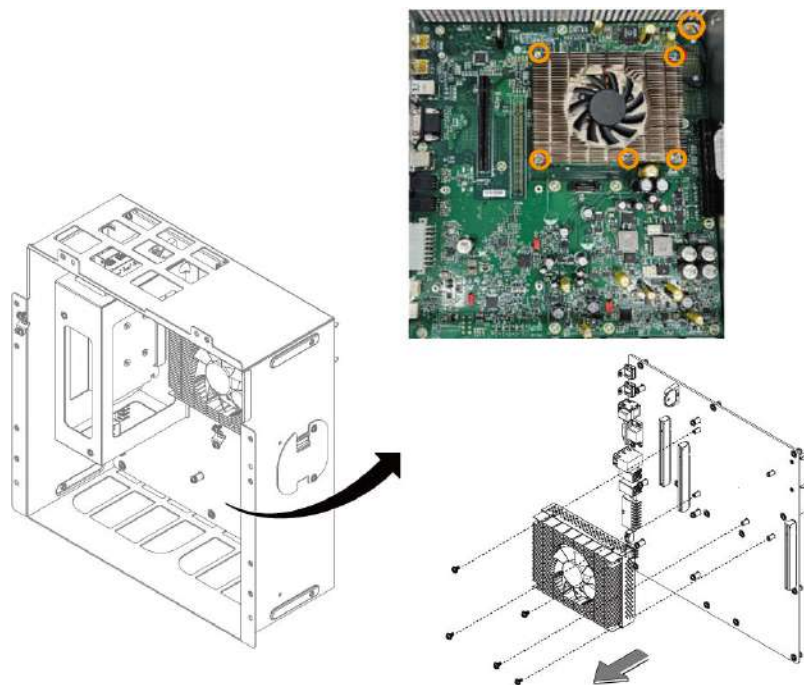
9. Unscrew 4 screws to remove the GPU Module from the UBE-T.

Figure 12-125 Removing GPU Module



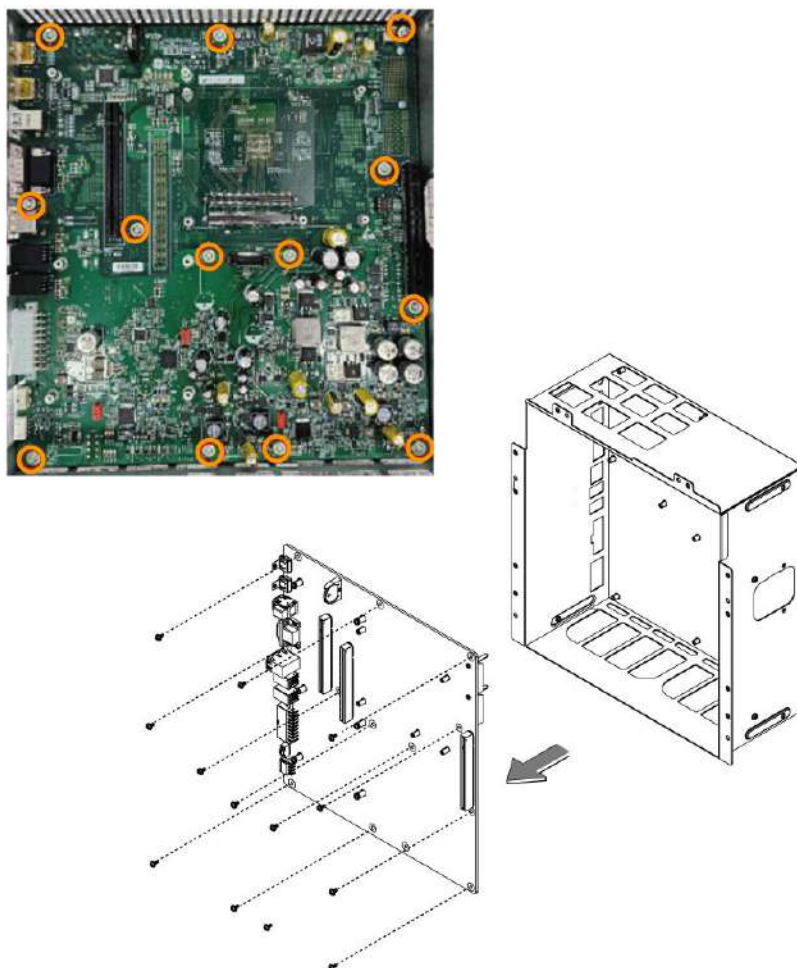
10. Disconnect the SOM FAN connector from the UBE-T and unscrew 5 screws to remove the SOM.

Figure 12-126 Removing SOM



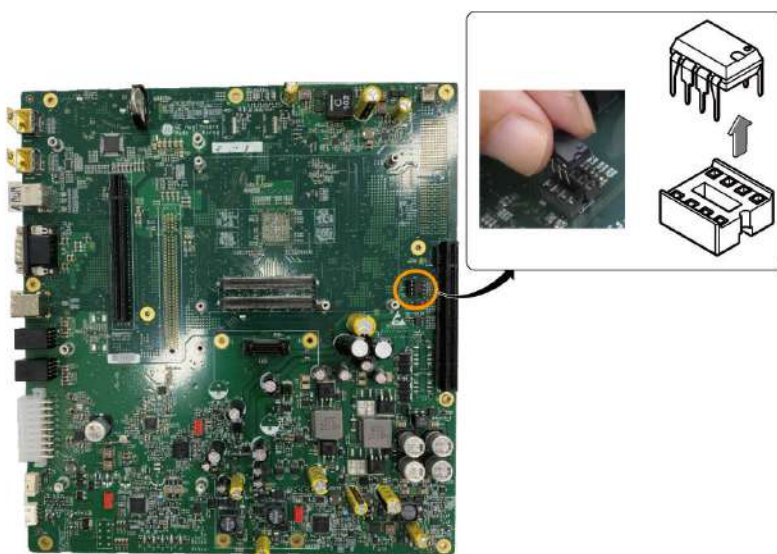
11. Unscrew 13 screws to remove the UBE Board Set-T and pull UBE Board Set-T from the brkt.

Figure 12-127 Removing UBE Board Set-T



12. Take EEPROM out from current UBE-T. Install those parts on new UBE-T assembly.

Figure 12-128 Removing EEPROM



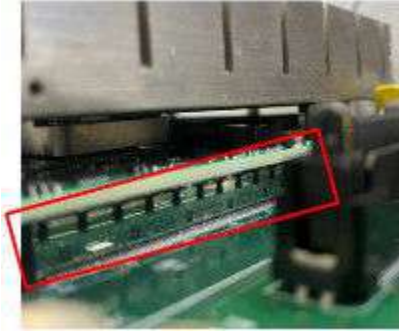
12.5.2.1.2 UBE Board Set-T - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

When you assemble SOM, Check UBE-T and SOM Connection.

Figure 12-129 Checking UBE-T and SOM Connection



NOTE

The UBE To OPIO HUB USB 3.0 Cable can be inserted to any of two USB ports (UBE-T).

2. Perform "Functional Checks".

12.5.2.1.3 UBE Board Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.1.4 UBE Board Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.2.1.5 UBE Board Set-T - Functional checks

Table 12-79 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Battery Pack functional checks on page 179</i> or <i>Battery Pack Extended functional checks on page 180</i>	
<i>4D option functional checks on page 177</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.2.2 Replacement of the COM EXPRESS MODULE, I5 CFL 16G

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-80 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.
4. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.

12.5.2.2.1 COM EXPRESS MODULE, I5 CFL 16G - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

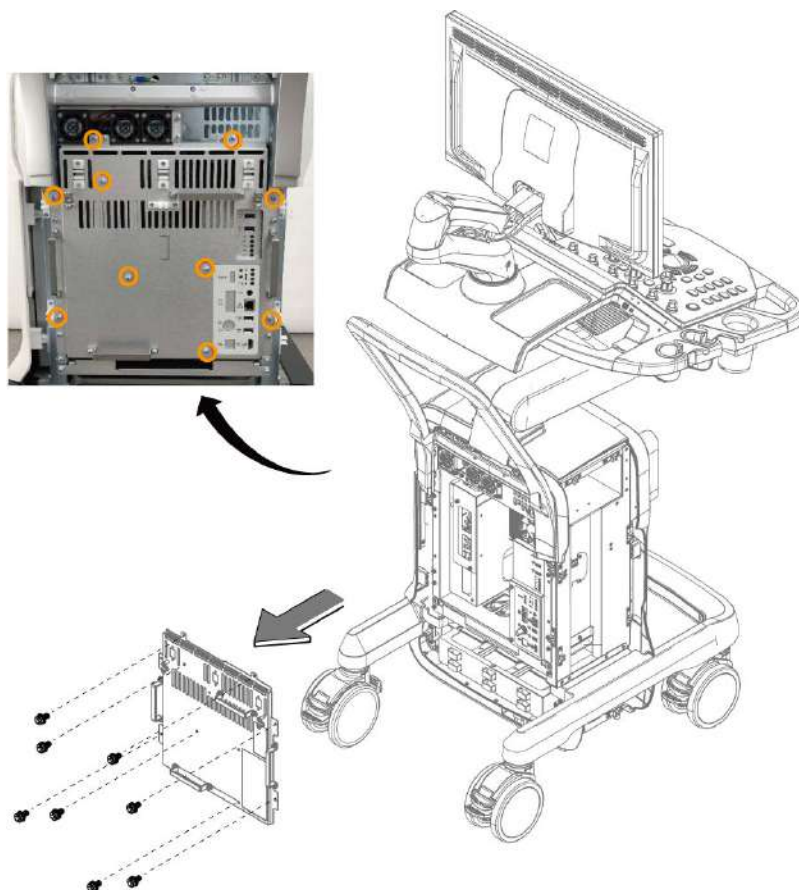
NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

NOTE

If the U-WIFI Module Assy-T was installed, remove the U-WIFI Module Assy-T as described in *Replacement of the U-WIFI Module Assy* on page 731.

Figure 12-130 Removing Rear Shield Brkt



2. Unscrew 2 screws and pull the UEPP Assy module to remove from the console.

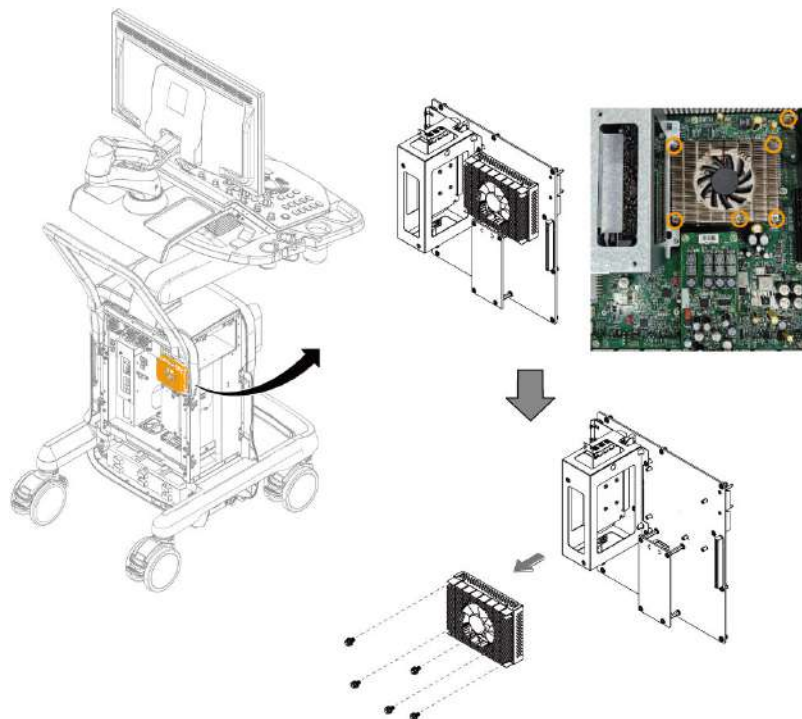
Figure 12-131 Removing UEPP Assy module



3. Remove SOM per following steps.
 - a. Pull the SOM Fan Connector. to remove from the console.

- b. Unscrew 5 screws and remove the SOM from the UBE-T.

Figure 12-132 Removing SOM



12.5.2.2.2 COM EXPRESS MODULE, I5 CFL 16G - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.2.2.3 COM EXPRESS MODULE, I5 CFL 16G - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.2.4 COM EXPRESS MODULE, I5 CFL 16G - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.2.2.5 COM EXPRESS MODULE, I5 CFL 16G - Functional checks

Table 12-81 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>Basic measurement functional checks</i> on page 173	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.2.3 Replacement of the GPU Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-82 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.

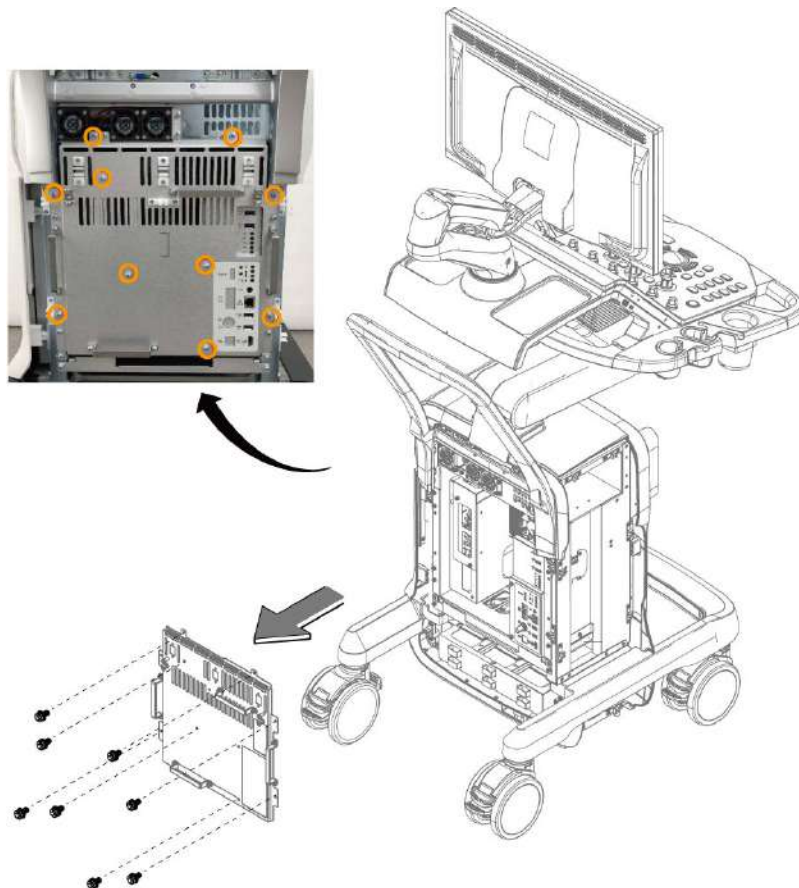
12.5.2.3.1 GPU Set-T - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701

Figure 12-133 Removing Rear Shield Brkt

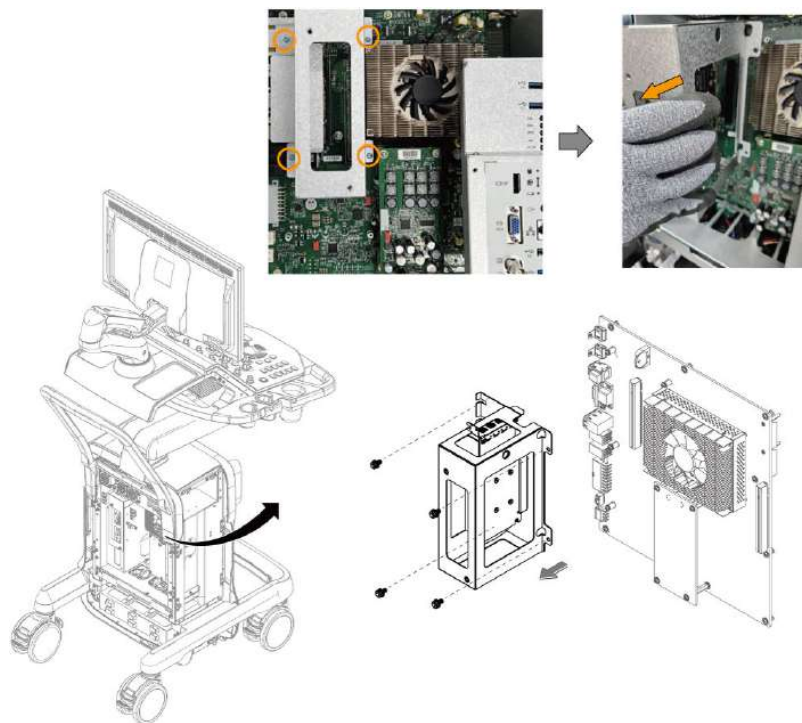


2. Unscrew 4 screws to remove the GPU Set-T.

**CAUTION**

Pull out the screws carefully to ensure they do not fall down.

Figure 12-134 Removing GPU Set-T



12.5.2.3.2 GPU Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.2.3.3 GPU Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.3.4 GPU Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

- 1. Verify that all screws and covers removed earlier have been installed.
- 2. Connect cables and Probes removed earlier.
- 3. Power up the system to verify that it operates as intended.

12.5.2.3.5 GPU Set-T - Functional checks

Table 12-83 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>Basic measurement functional checks</i> on page 173	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.2.4 Replacement of the UEPP-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-84 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.
4. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.

12.5.2.4.1 UEPP-T - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

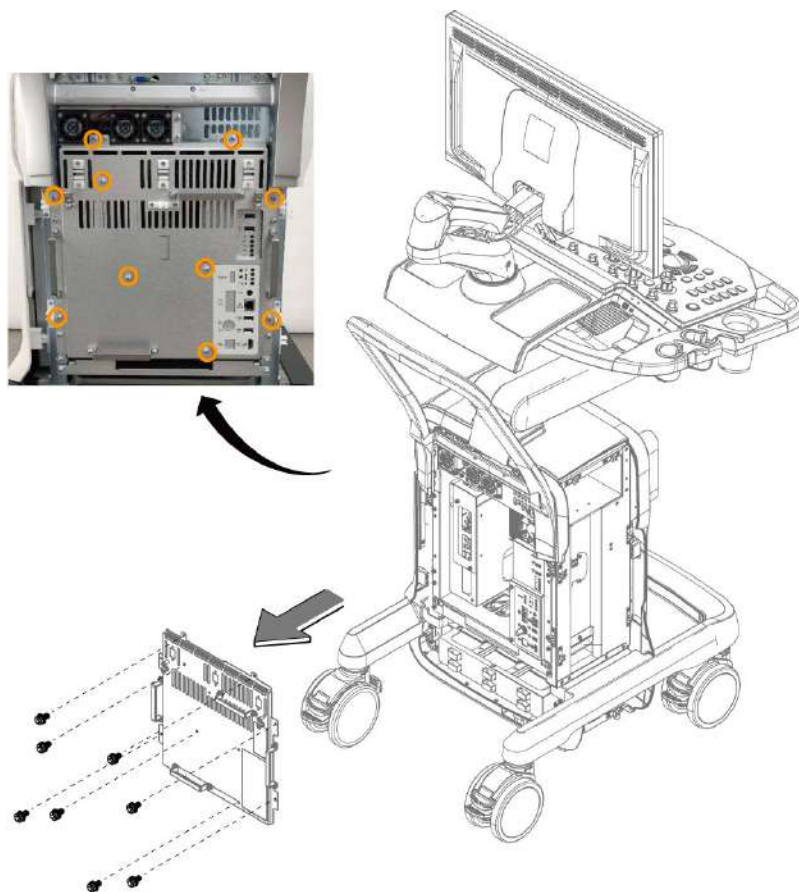
NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

NOTE

If the U-WIFI Module Assy-T was installed, remove the U-WIFI Module Assy-T as described in *Replacement of the U-WIFI Module Assy* on page 731.

Figure 12-135 Removing Rear Shield Brkt



2. Unscrew 2 screws and pull the UEPP Assy module to remove from the console.

Figure 12-136 Removing UEPP Assy module

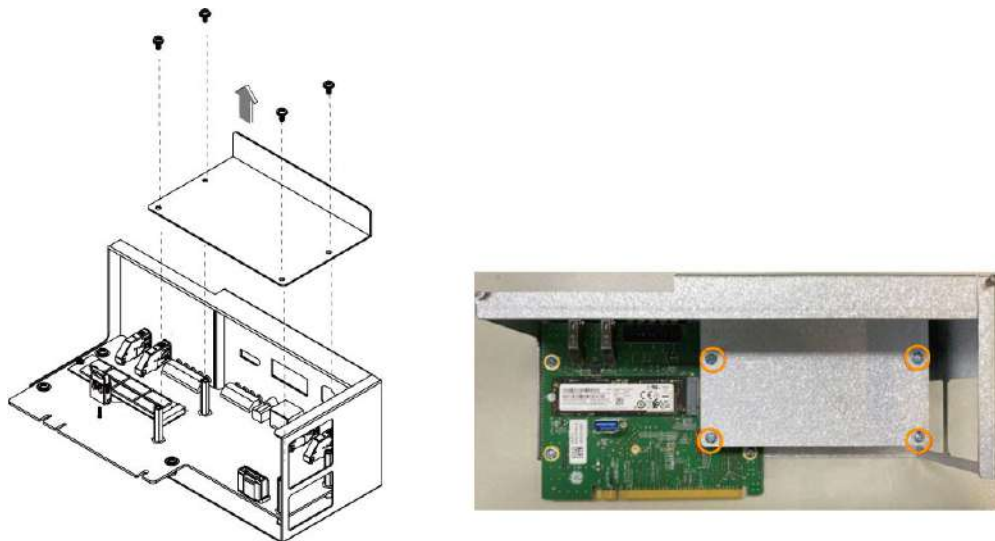


3. Unscrew 4 screws to remove the Unity Dummy Brkt.

NOTE

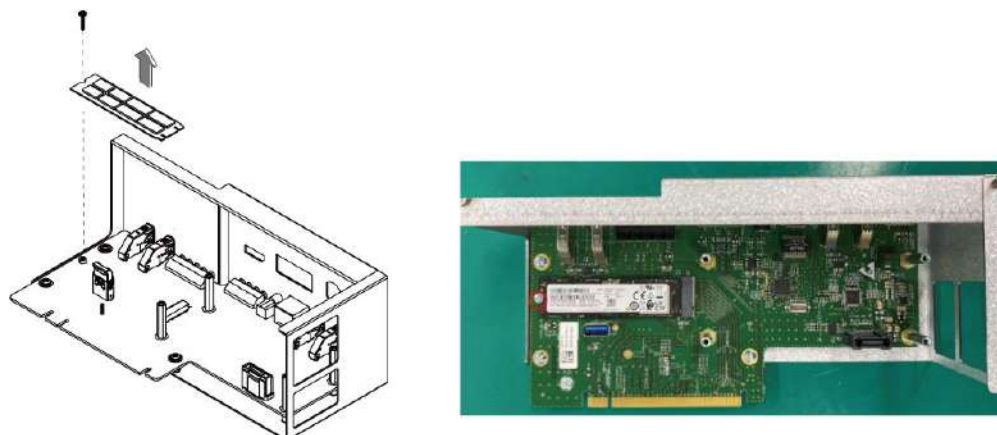
If UVSC-T installed, remove the UVSC as described in *Replacement of the UVSC-T* on page 740.

Figure 12-137 Removing Dummy Brkt



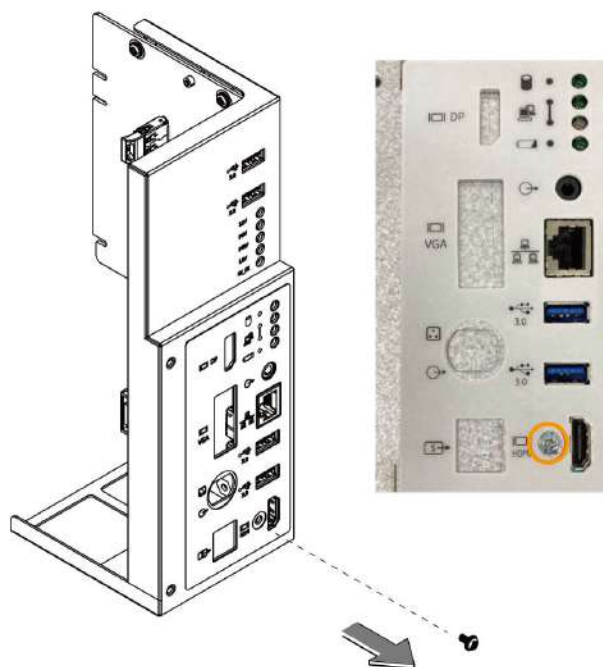
4. Unscrew 1 screw to remove the SSD

Figure 12-138 Removing SSD



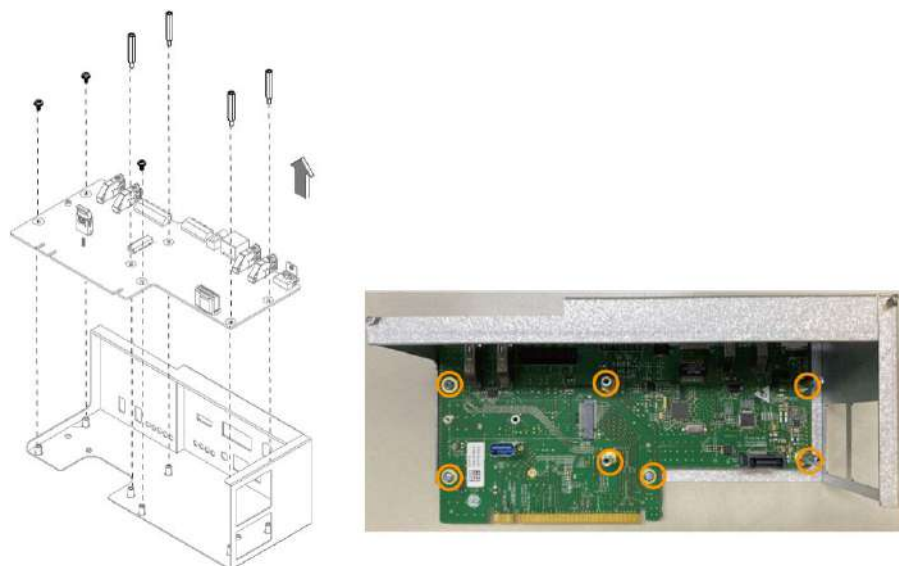
5. Unscrew 1 screw to remove the UEPP-T from Unity External IO Fix Brkt.

Figure 12-139 Removing screw from Unity External IO Fix Brkt



- Unscrew 3 screws and 4 studs to remove the UEPP-T.

Figure 12-140 Removing UEPP-T



12.5.2.4.2 UEPP-T - Installation procedure

- Install components in reverse order of removal.
- Perform "Functional Checks".

12.5.2.4.3 UEPP-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.4.4 UEPP-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

- Verify that all screws and covers removed earlier have been installed.
- Connect cables and Probes removed earlier.
- Power up the system to verify that it operates as intended.

12.5.2.4.5 UEPP-T - Functional checks

Table 12-85 Functional checks

Functional Check	Service Record Debrief Script
Power on/boot up on page 98	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
B-Mode functional checks on page 160	
Basic measurement functional checks on page 173	
Grounding continuity test on page 769	
Chassis leakage current test on page 770	
Power shut down on page 113	

12.5.2.5 Replacement of the BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-86 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.

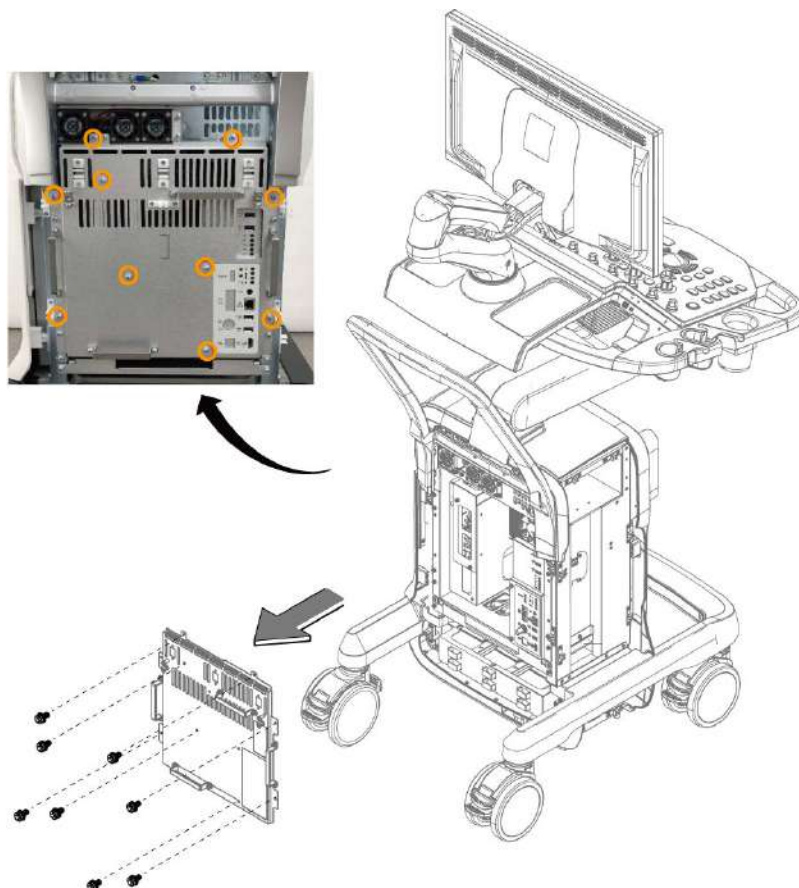
12.5.2.5.1 BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

NOTE

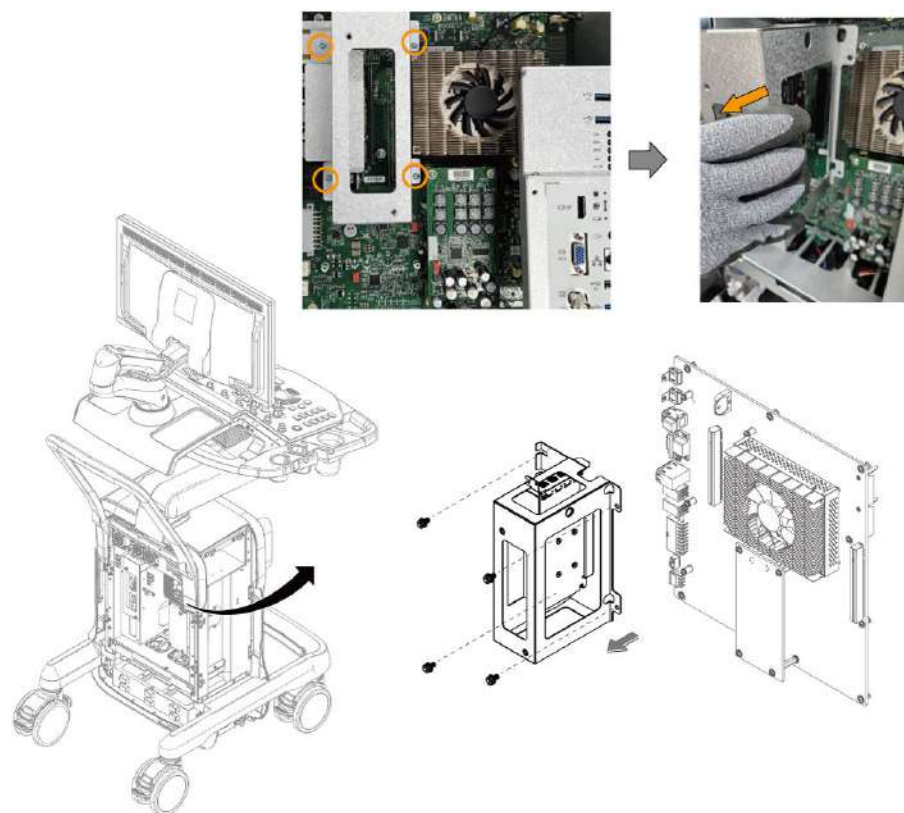
If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

Figure 12-141 Removing Rear Shield Brkt



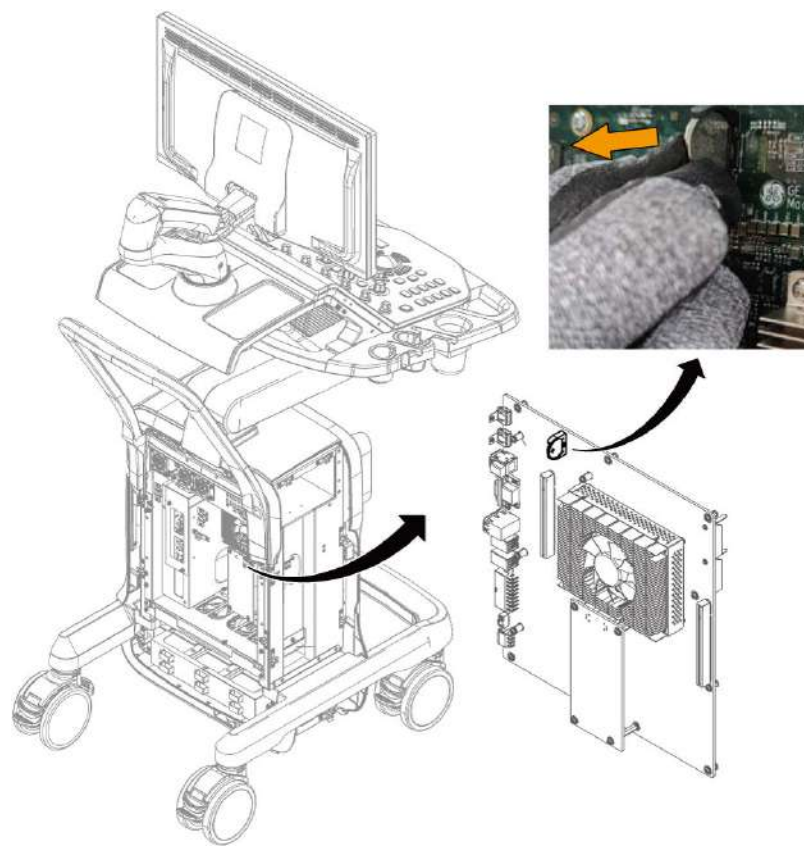
2. Unscrew 4 screws to remove the GPU Set-T.

Figure 12-142 Removing GPU Set-T



3. Pull the Coin Cell Battery to right side and remove the Coin Cell Battery from the UBE.

Figure 12-143 Removing Coin Cell Battery



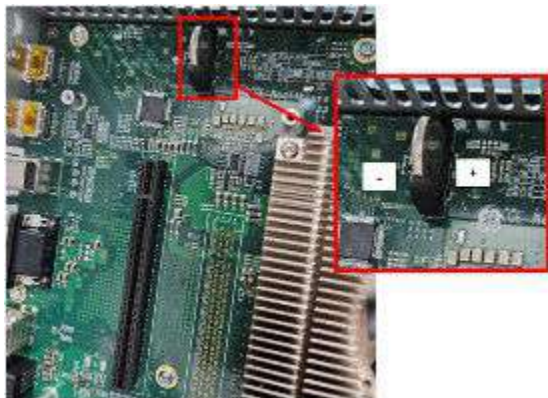
12.5.2.5.2 BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM - Installation procedure

1. Parts to be installed in reverse order of removal.

NOTE

Check the Coin Cell's electrode while installing.

Figure 12-144 Check electrode of Coin Cell



2. Perform "Functional Checks".

12.5.2.5.3 BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.5.4 BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.2.5.5 BATTERY, TYPE 2032 COIN, 3 VOLT, LITHIUM - Functional checks

Table 12-87 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks on page 160</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.2.6 Replacement of the M.2 SSD 1TB

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus on page 76/ PPE Required During Service on page 78*.

NOTE

If you are replacing the SSD drive as FRU, the new SSD drive does not come loaded with software, therefore a full software load is needed. See *Loading / Reloading / Upgrading the Software* on page 188.

Table 12-88 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.
4. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
5. Remove the U-WIFI Module Assy(Optional). Refer to *Replacement of the U-WIFI Module Assy* on page 731.

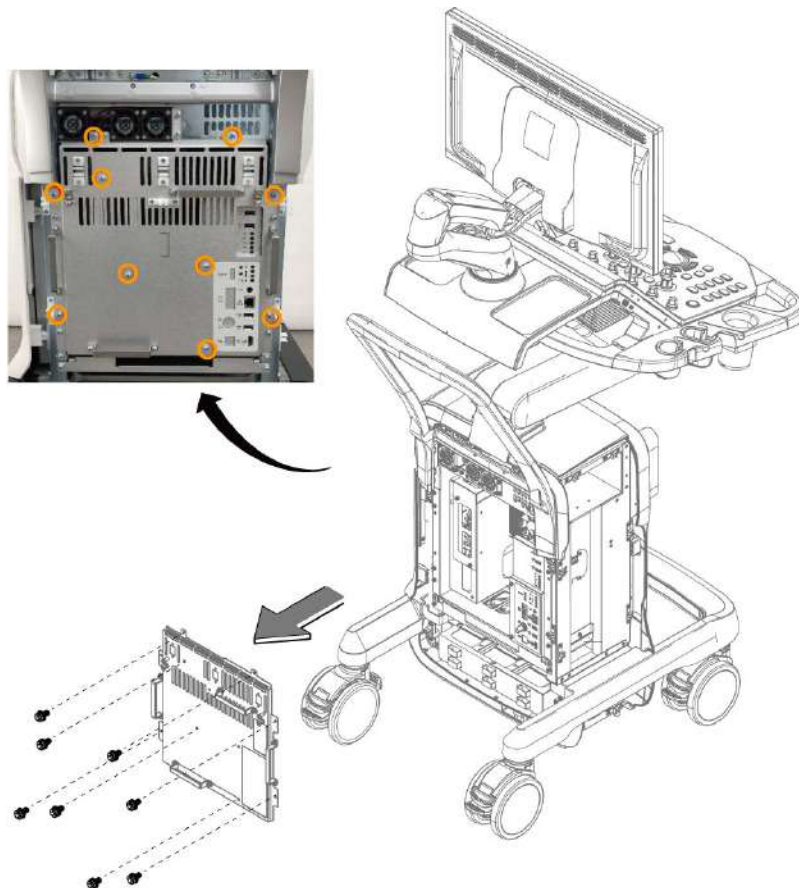
12.5.2.6.1 M.2 SSD 1TB - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

Figure 12-145 Removing Rear Shield Brkt



2. Remove UEPP Assy module per following steps.
 - a. Unscrew 2 screws.

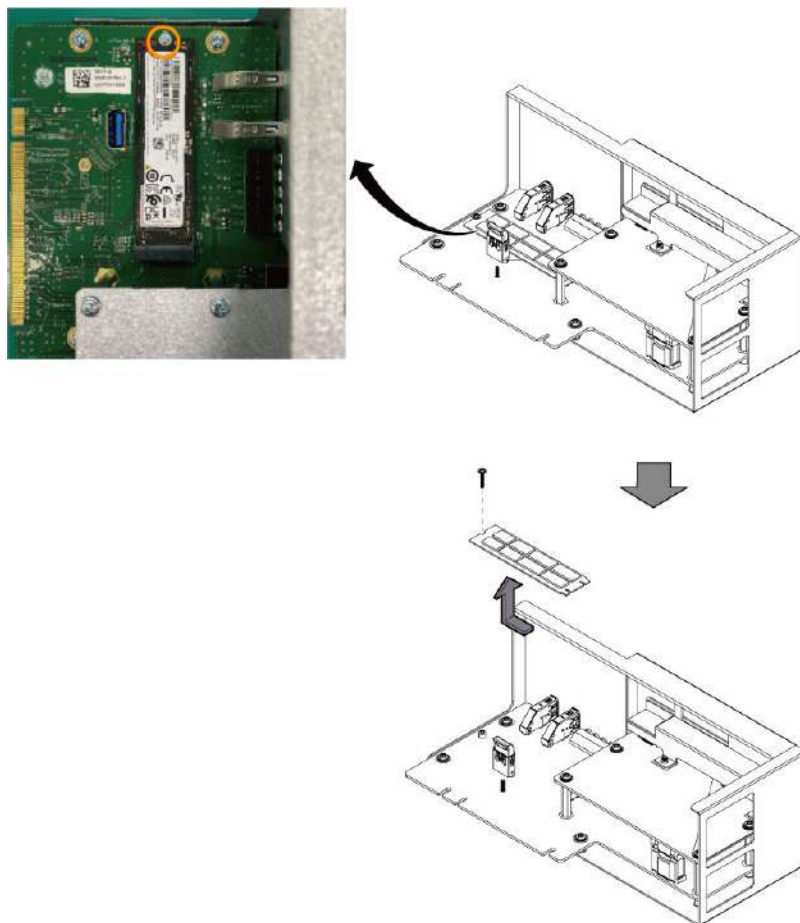
- b. Pull the UEPP Assy module to remove from the console.

Figure 12-146 Removing UEPP Assy module



3. Unscrew 1 screw to remove the SSD from the UEPP-T

Figure 12-147 Removing SSD



12.5.2.6.2 M.2 SSD 1TB - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.2.6.3 M.2 SSD 1TB- Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.2.6.4 M.2 SSD 1TB - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.2.6.5 M.2 SSD 1TB - Functional checks

Table 12-89 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>Basic measurement functional checks</i> on page 173	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.3 Fan Parts

12.5.3.1 Replacement of the Unity Rear Top Fan Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-90 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

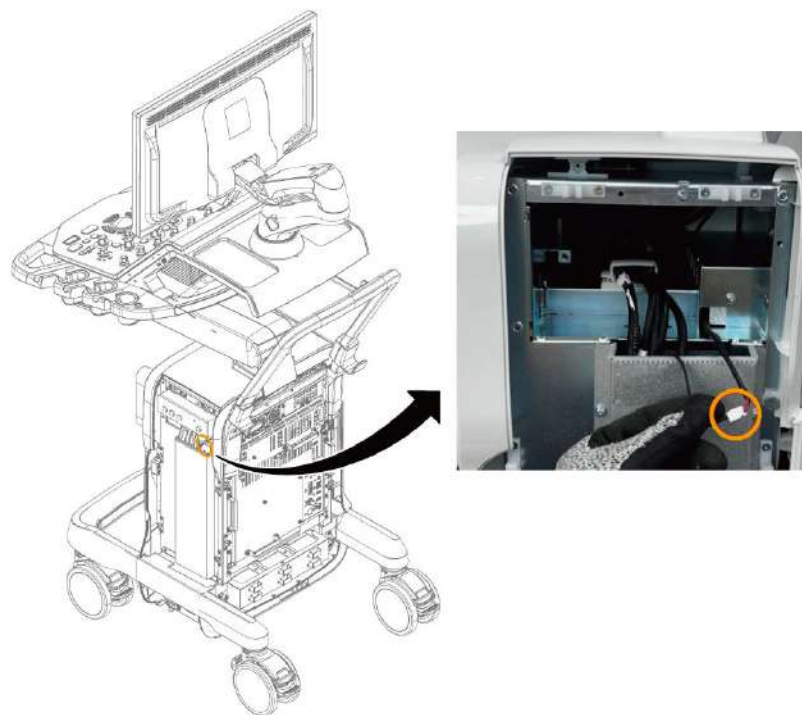
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.5.3.1.1 Unity Rear Top Fan Assy - Removal procedure

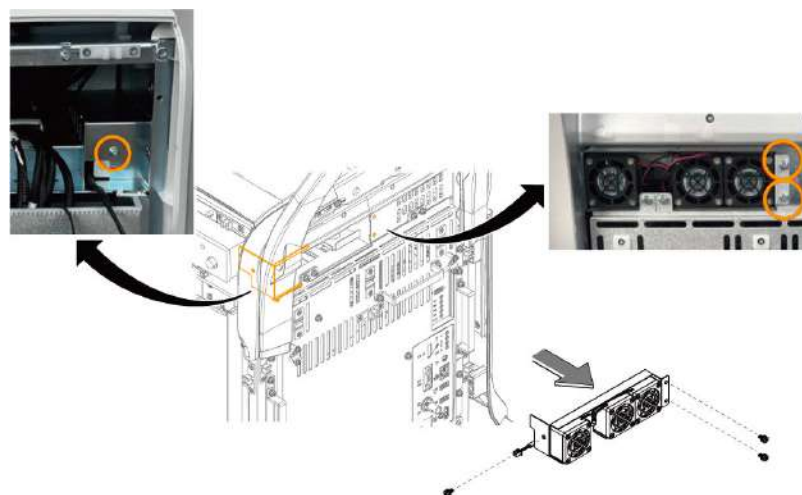
1. Disconnect the Fan Cable from the console.

Figure 12-148 Disconnecting Fan Cable



2. Unscrew 3 screws to remove the Unity Rear Top Fan Assy from the console

Figure 12-149 Removing Rear Top Fan Assy



12.5.3.1.2 Unity Rear Top Fan Assy - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

The fan cables are labelled as "FAN" and "TOP". Make sure the fan cable indicated as "FAN" is connected to the Unity Rear Top Fan Cable.

Figure 12-150 Checking Label "FAN"

**NOTE**

Clamp all the cables excluding Unity Rear Top Fan Cable.

Figure 12-151 Clamping cables



2. Perform "Functional Checks after FRU replacement (Debrief Guideline)".

12.5.3.1.3 Unity Rear Top Fan Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.3.1.4 Unity Rear Top Fan Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.3.1.5 Unity Rear Top Fan Assy - Functional checks

Table 12-91 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.3.2 Replacement of the Unity Top Fan Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-92 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

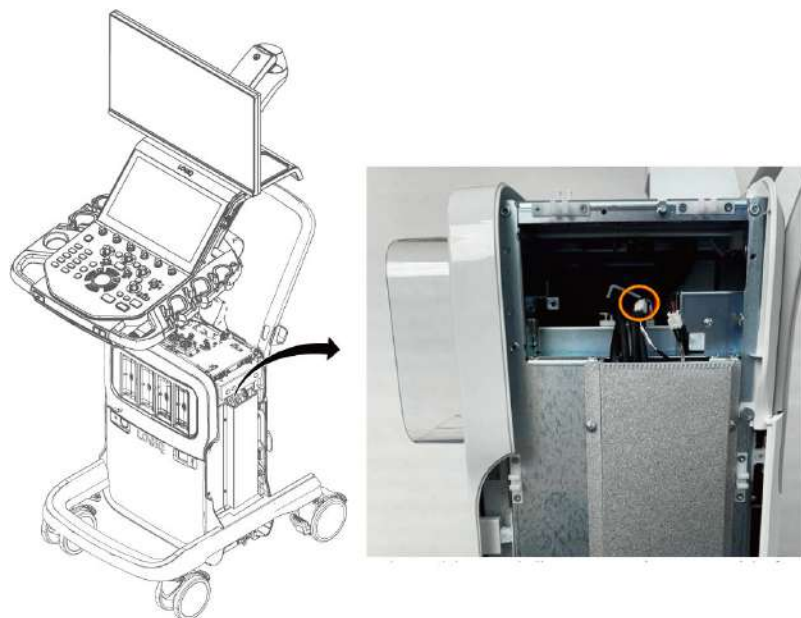
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Top cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.

12.5.3.2.1 Unity Top Fan Assy - Removal procedure

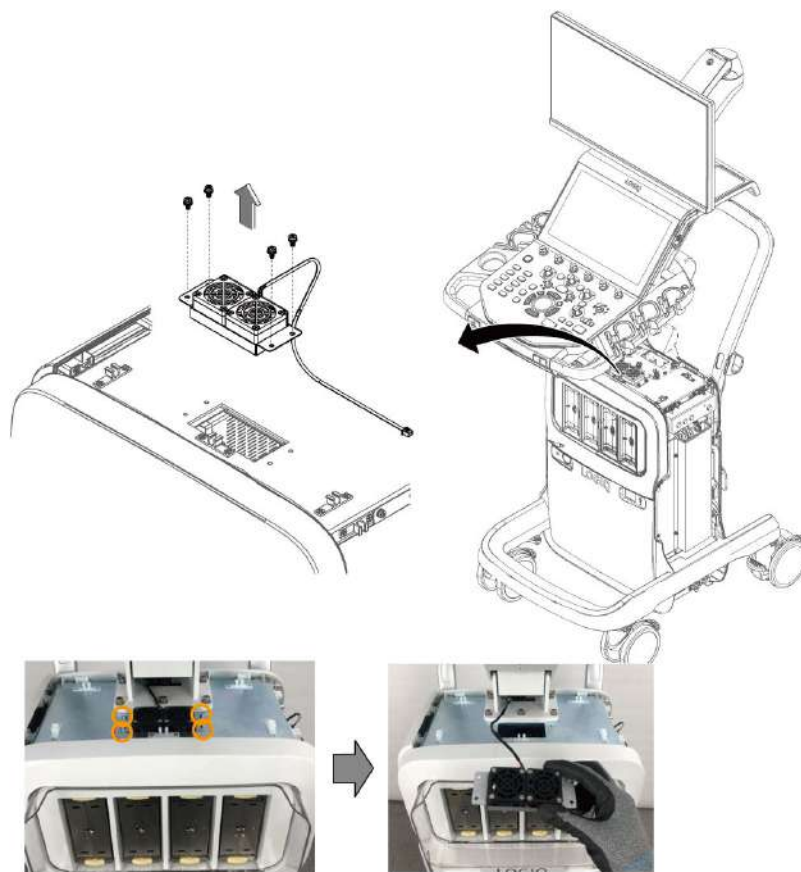
1. Unclamp the cables and disconnect the Fan Cable from the console.

Figure 12-152 Disconnecting the Fan Cable



2. Unscrew 4 screws to remove the Unity Top Fan Assy from the console.

Figure 12-153 Removing Top Fan Assy



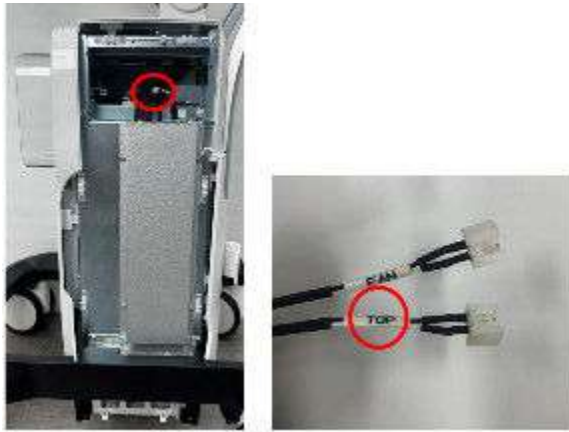
12.5.3.2.2 Unity Top Fan Assy - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

The fan cables are labeled as "FAN" and "TOP". Make sure the fan cable indicated as "TOP" is connected to the Unity Top Fan Cable.

Figure 12-154 Checking Label "Top"



NOTE

Clamp all the cables excluding Unity Rear Top Fan Cable.

Figure 12-155 Clamping



2. Perform "Functional Checks".

12.5.3.2.3 Unity Top Fan Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.3.2.4 Unity Top Fan Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.3.2.5 Unity Top Fan Assy - Functional checks

Table 12-93 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.3.3 Replacement of the Unity PWM Fan Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-94 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10 minutes	Philps Screwdriver	Cut resistant gloves Knee Pad

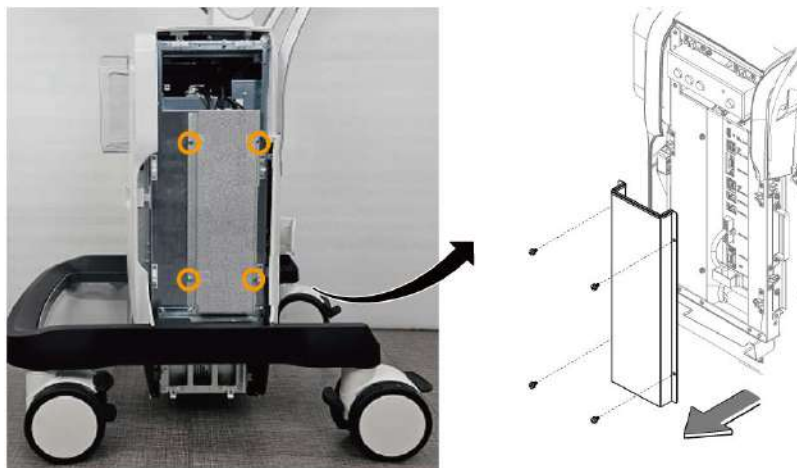
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.5.3.3.1 Unity PWM Fan Assy - Removal procedure

1. Unscrew 4 screws to remove the Unity Cable Cover Brkt from the console

Figure 12-156 Removing Cable Cover Brkt

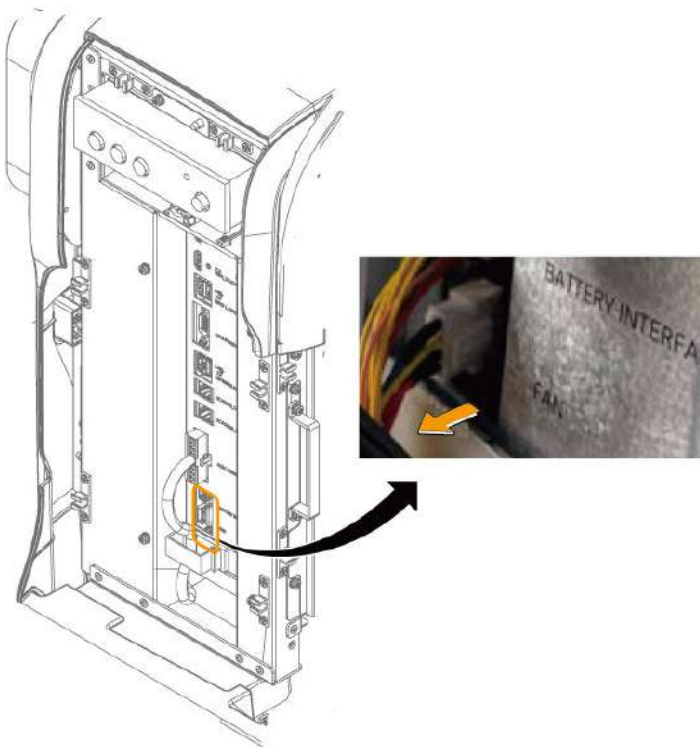


2. Unlock the Cable Clamp and disconnect the Fan Cable from the Console

NOTE

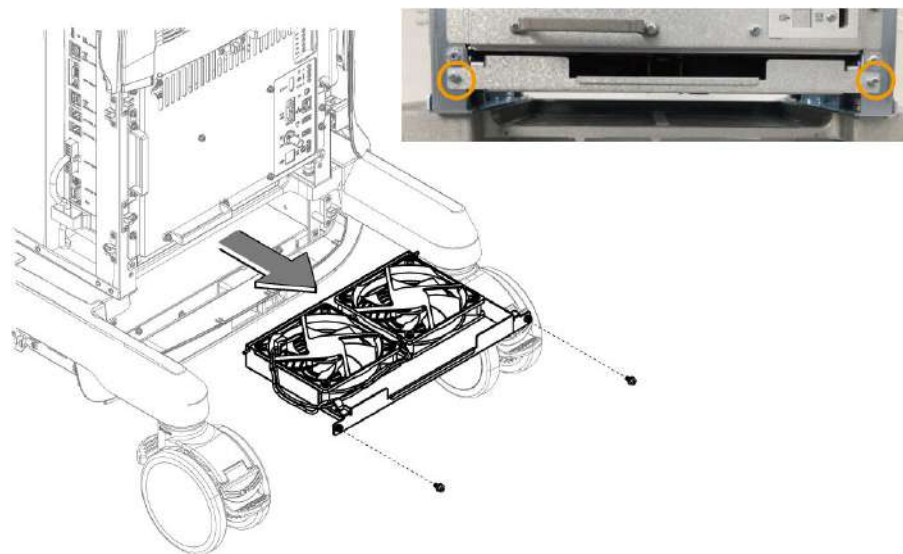
In case the fan cable is difficult to pull out, disconnect the battery signal cable and ACDC output cable.

Figure 12-157 Disconnecting the Fan Cable



3. Unscrew 2 screws to remove the Unity PWM Fan Assy from the console

Figure 12-158 Removing PWM Fan Assy



12.5.3.3.2 Unity PWM Fan Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.3.3.3 Unity PWM Fan Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.3.3.4 Unity PWM Fan Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.3.3.5 Unity PWM Fan Assy - Functional checks

Table 12-95 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.4 Power (Main Power Supply, Batteries and Main Power Cables)

12.5.4.1 Replacement of the Power cable

When preparing for the replacement, confirm that no images are in the clipboard or opened exams.

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-96 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screw driver	Cut resistant gloves Knee Pad (if kneeling is required)

12.5.4.1.1 Power cable - Removal procedure



CAUTION

Risk of losing patient data To avoid losing patient data, ensure that you have properly ended the patient's exam and transferred all exam data/ images/clips.

1. Set the caster brake.
2. To completely power down the LOGIQ Totus:
 - a. Lightly press the **ON/OFF** button on the operator panel to display the **System - Exit** menu.
 - b. Select **Shutdown** to completely power down the LOGIQ Totus.

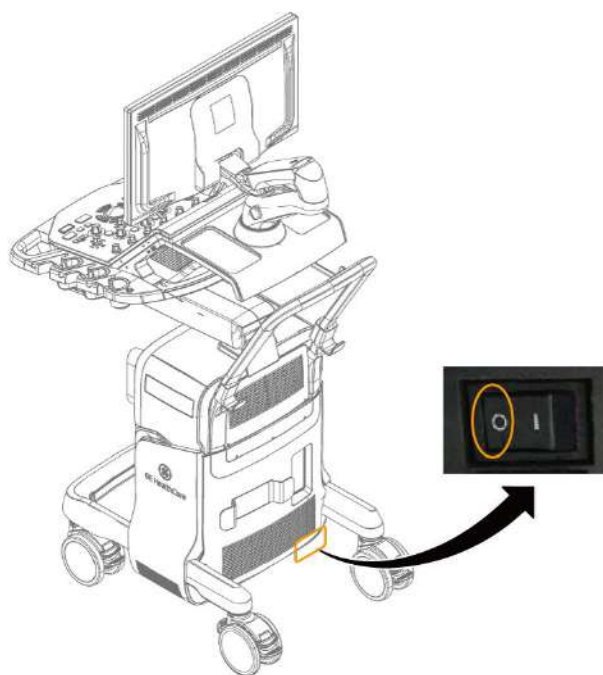


CAUTION

DO NOT turn off the breaker before the Power button is changed to blue. Data may be lost or system software damaged if the breaker is turned off before the Power button is changed to blue.

3. Turn off the breaker on the back of the system.

Figure 12-159 Turning off the breaker



WARNING

To avoid risk of fire, the system's power must be supplied from a separate, properly rated outlet.

Under no circumstances should the AC power plug be altered, changed, or adapted to a configuration rated less than specified. Never use an extension cord or adapter plug.

To help assure grounding reliability, connect to a "hospital grade" or "hospital only" grounded power outlet.



CAUTION

Use caution to ensure that the power cable does not disconnect during system use.

If the system is accidentally unplugged, data may be lost.

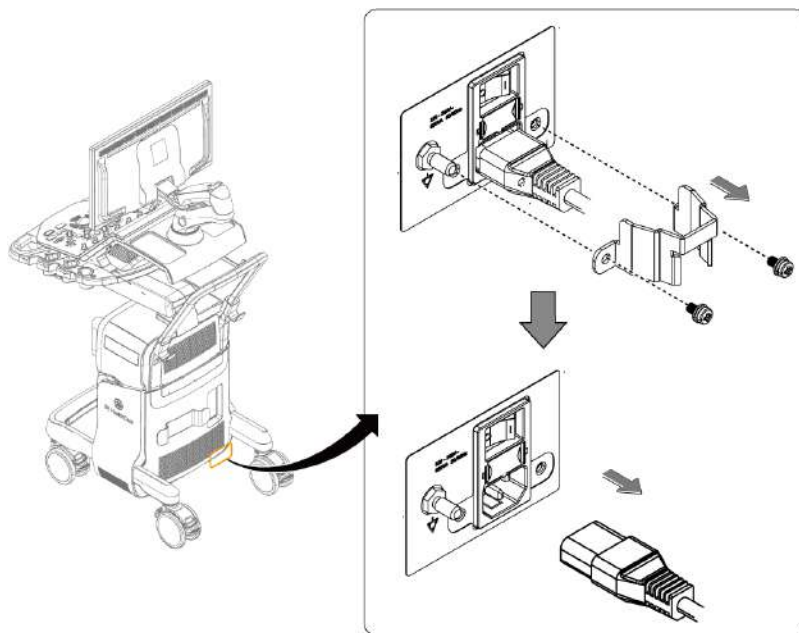


WARNING

To avoid leakage current above safety limits as prescribed by IEC 60601-1 and to ensure continuity of protective earth, DO NOT connect the Ultrasound system and mains-operated accessories to a single or multiple socket extension cord or power strip.

4. From the wall outlet, disconnect the power cable.

5. Disconnect the power cable from the console per following steps.
 - a. Unscrew 2 screws to remove the power cable clamp.
 - b. Disconnect the power cable.



12.5.4.1.2 Power cable - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.1.3 Power cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.1.4 Power cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.1.5 Power cable - Functional checks

Perform the following functional checks to confirm the system is operational before returning the system to the customer.

Leakage current is NOT required since no electronic part is being replaced. Ground continuity, however, is recommended.

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>Grounding continuity test on page 769</i>	
<i>Power shut down on page 113</i>	

12.5.4.2 Replacement of the Unity Power Cord Fix Brkt

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

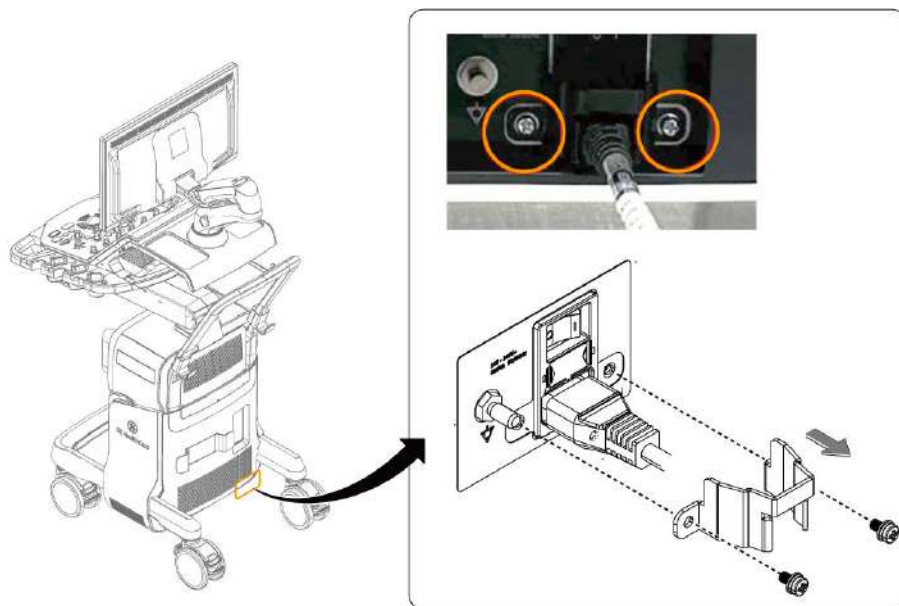
Table 12-97 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

12.5.4.2.1 Unity Power Cord Fix Brkt - Removal procedure

Unscrew 2 screws to remove the Unity Power Cord Fix Brkt from the console.

Figure 12-160 Removing Power Cord Fix Brkt



12.5.4.2.2 Unity Power Cord Fix Brkt - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.2.3 Unity Power Cord Fix Brkt - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.2.4 Unity Power Cord Fix Brkt - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.5.4.2.5 Unity Power Cord Fix Brkt - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.5.4.3 Replacement of the Unity ACDC Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-98 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
4. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
5. Remove the Rear Cover Bottom Assy-T. Refer to *Replacement of the Rear Cover Bottom Assy-T* on page 376.
6. Remove the Front Cover Bottom Assy-T. Refer to *Replacement of the Front Cover Bottom Assy-T* on page 353.

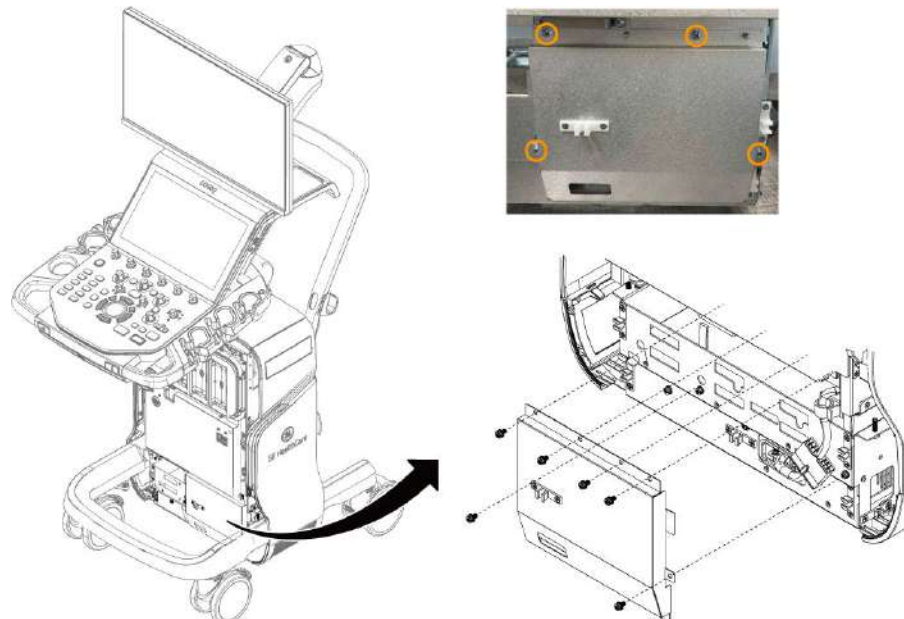
12.5.4.3.1 Unity ACDC Assy - Removal procedure

1. Unscrew 4 screws to remove the Unity Cable Hide Brkt from the console

NOTE

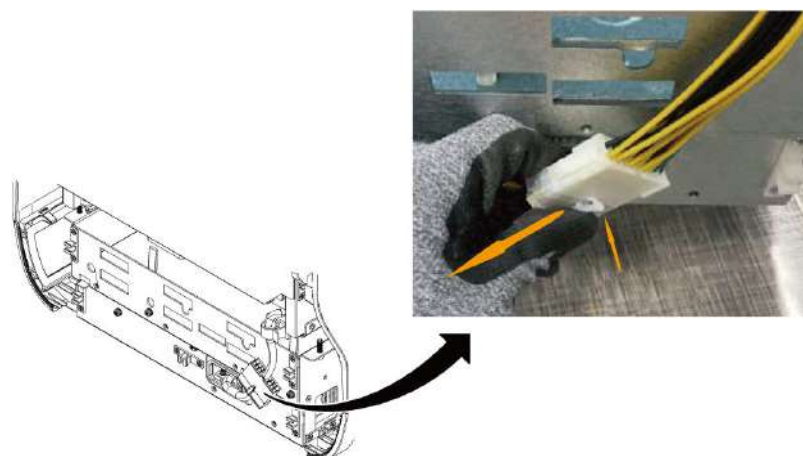
If UBC-T is installed, remove the UBC- T as described in *Replacement of the UBC-T* on page 594.

Figure 12-161 Removing Cable Hide Brkt



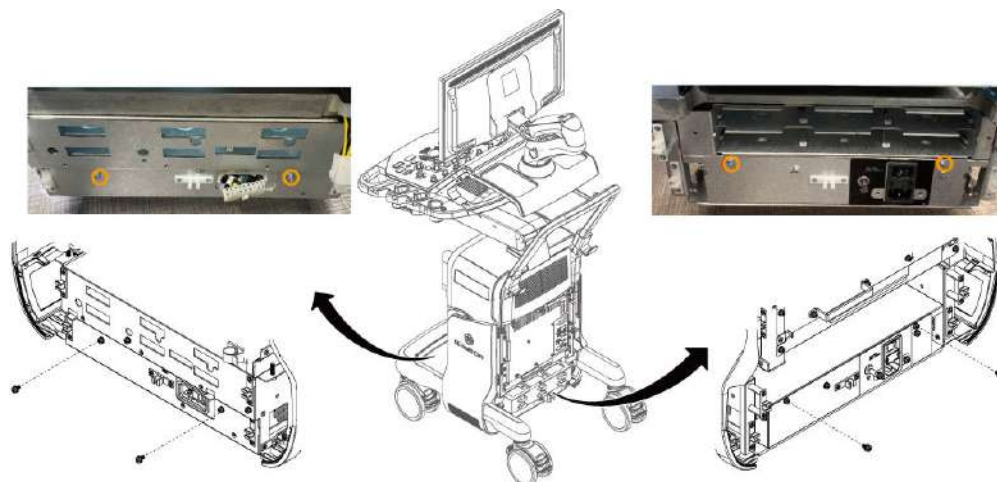
2. Push button of the ACDC Output cable's connector to disconnect the ACDC output cable and the ACDC Link Cable to the UBE Cable.

Figure 12-162 Disconnecting cable connector



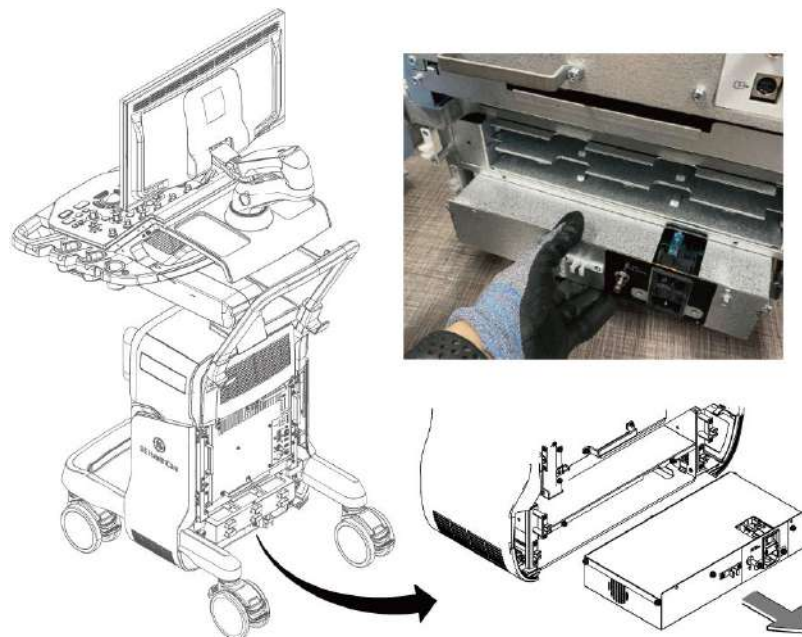
3. Unscrew 4 screws to remove the Unity ACDC Assy from the console.

Figure 12-163 Removing ACDC Assy



4. Pull the ACDC Assy and remove from the console.

Figure 12-164 Removing ACDC Assy



12.5.4.3.2 Unity ACDC Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.3.3 Unity ACDC Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.3.4 Unity ACDC Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.3.5 Unity ACDC Assy - Functional checks

Table 12-99 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>B-Mode functional checks</i> on page 160	
<i>Battery Pack functional checks</i> on page 179 or <i>Battery Pack Extended functional checks</i> on page 180	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.4.4 Replacement of the AC Inlet Fuse 2EA

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-100 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

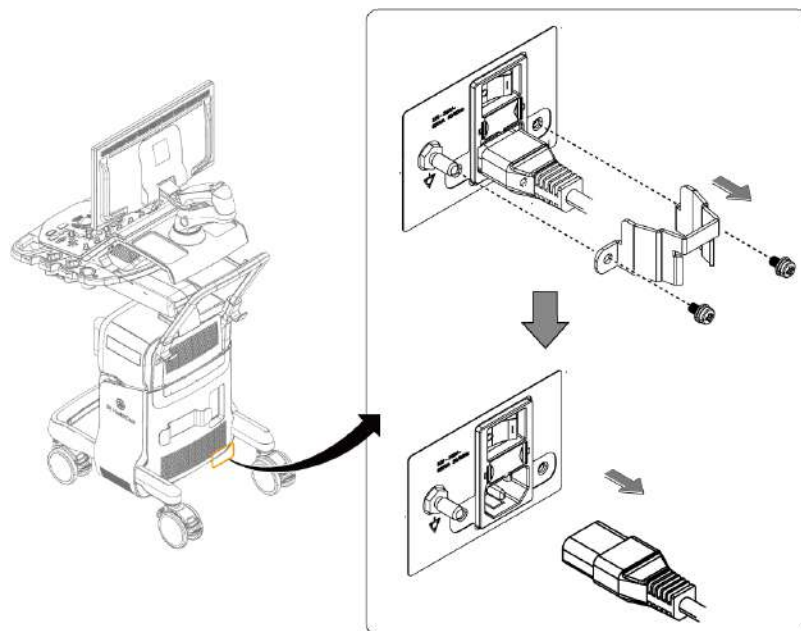
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Power Cord Fix Brkt. Refer to .

12.5.4.4.1 AC Inlet Fuse 2EA - Removal procedure

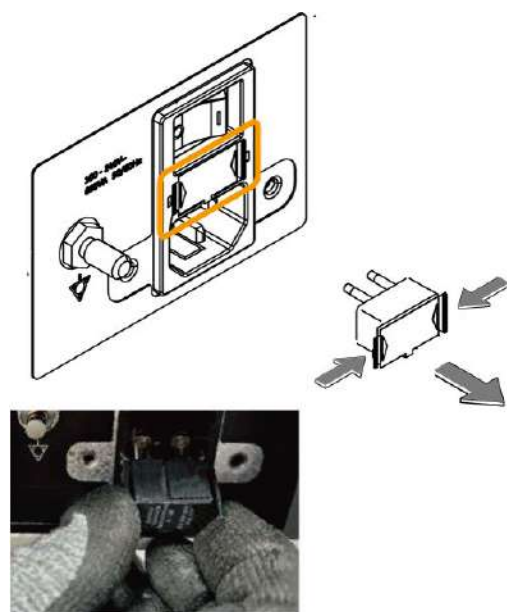
1. Pull the Power Cord to disconnect the Power Cord from the console.

Figure 12-165 Disconnecting Power Cord



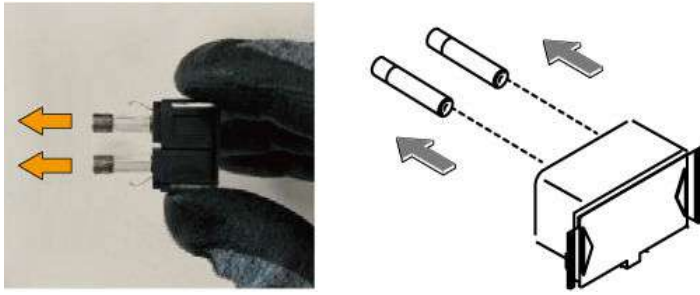
2. Push side of the Drawer and pull the Drawer

Figure 12-166 Removing Drawer



3. Pull 2 Fuses from the Drawer.

Figure 12-167 Removing Fuses



12.5.4.4.2 AC Inlet Fuse 2EA - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.4.3 AC Inlet Fuse 2EA - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.4.4 AC Inlet Fuse 2EA - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.4.5 AC Inlet Fuse 2EA - Functional checks

Table 12-101 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Leakage Current measured at (record the value) and meets allowable limits. Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks on page 160</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.4.5 Replacement of the 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable)

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-102 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

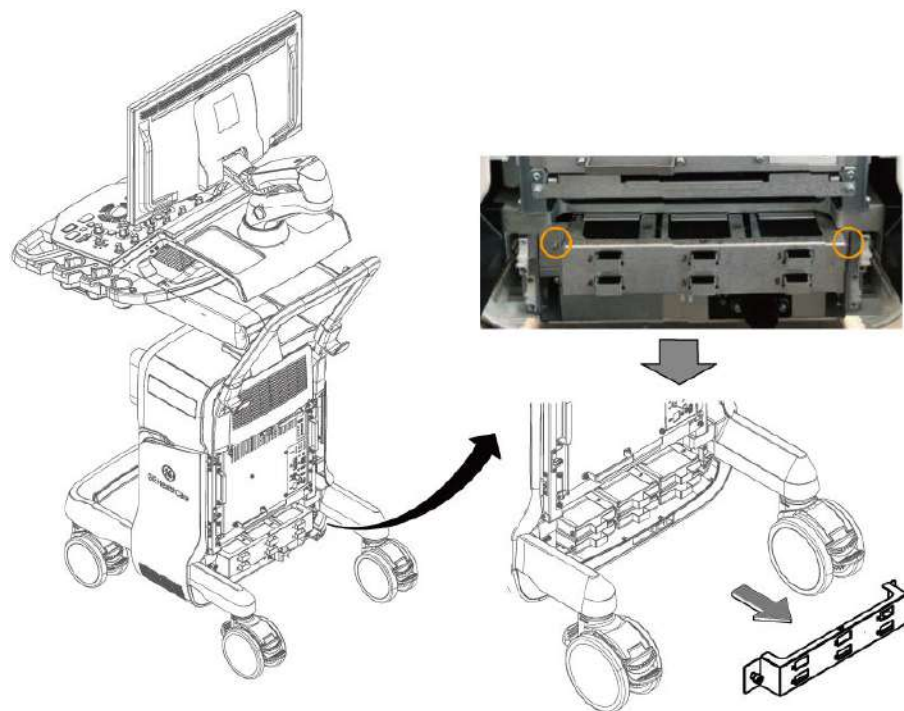
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
4. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
5. Remove the Rear Cover Bottom Assy-T. Refer to *Replacement of the Rear Cover Bottom Assy-T* on page 376.
6. Remove the Front Cover Bottom Assy-T. Refer to *Replacement of the Front Cover Bottom Assy-T* on page 353.

12.5.4.5.1 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable) - Removal procedure

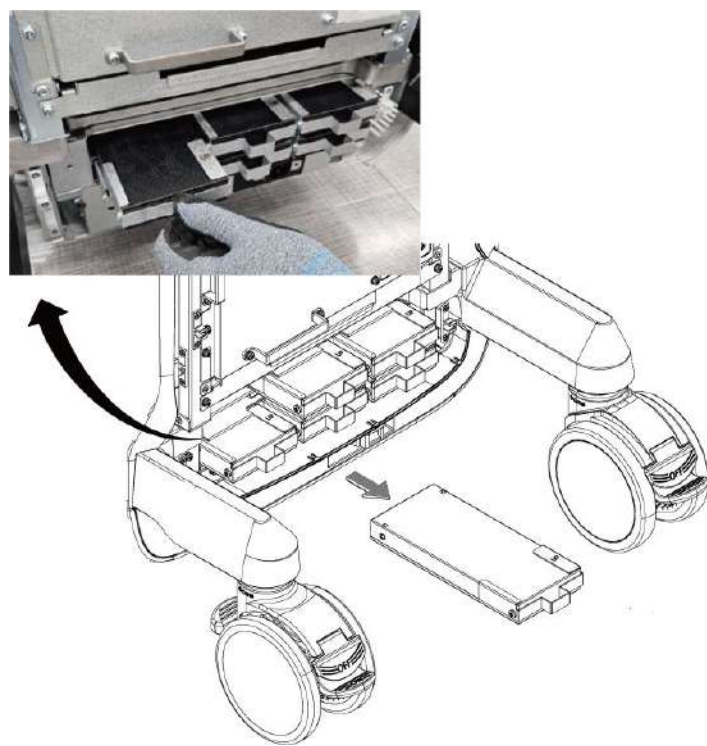
1. Unscrew 2 screws to remove the Unity Battery Cover Brkt.

Figure 12-168 Removing Unity Battery Cover Brkt



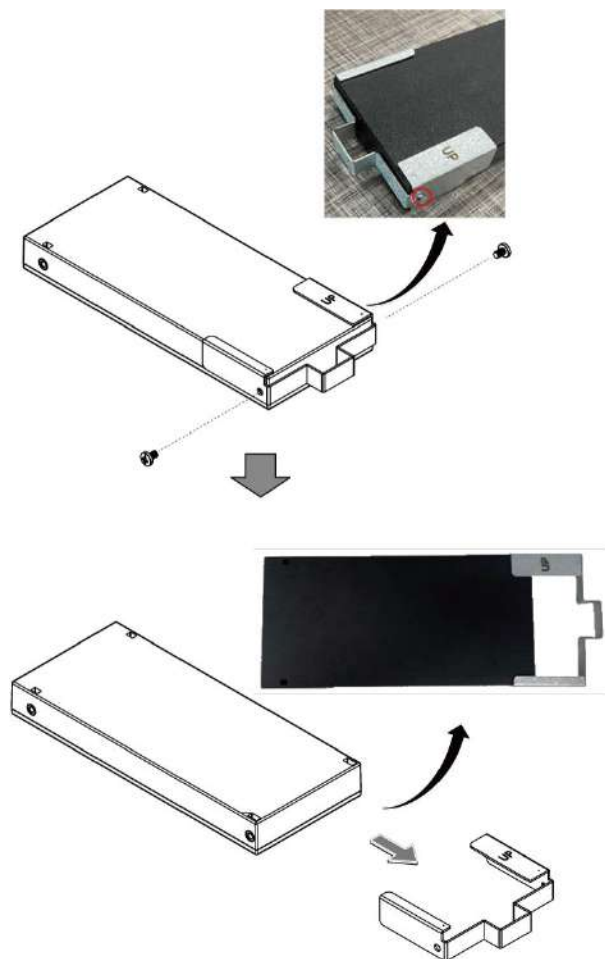
2. Pull the Battery Pack to remove from the console.

Figure 12-169 Removing Battery Pack



3. Unscrew 2 screws and remove the Unity Battery Pack Fix Brkt.

Figure 12-170 Removing Unity Battery Pack Fix Brkt



12.5.4.5.2 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable) - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.5.3 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable) - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.5.4 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable) - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.5.5 4S2P Battery Pack (14.4V Li-ion 5900 mAh Rechargeable) - Functional checks

Table 12-103 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>Battery Pack functional checks</i> on page 179 or <i>Battery Pack Extended functional checks</i> on page 180	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.4.6 Replacement of the Battery Option Cable Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-104 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
4. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
5. Remove the Front Cover Bottom Assy-T. Refer to *Replacement of the Front Cover Bottom Assy-T* on page 353.

12.5.4.6.1 Battery Option Cable Set-U - Removal procedure

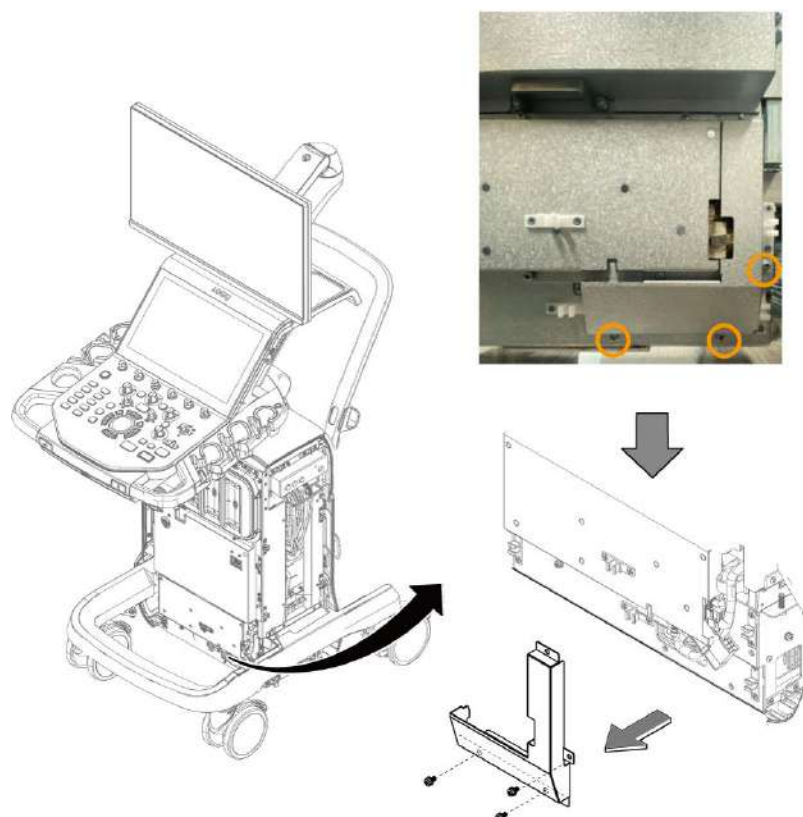
1. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-171 Removing Cable Cover Brkt



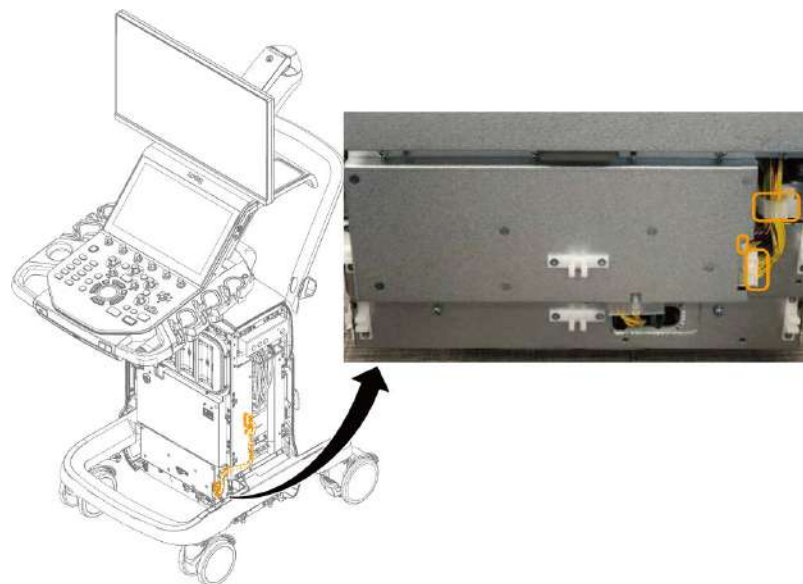
2. Unscrew 3 screws to remove the Unity Battery Cable Hide Brkt from the console.

Figure 12-172 Removing Cable Hide Brkt



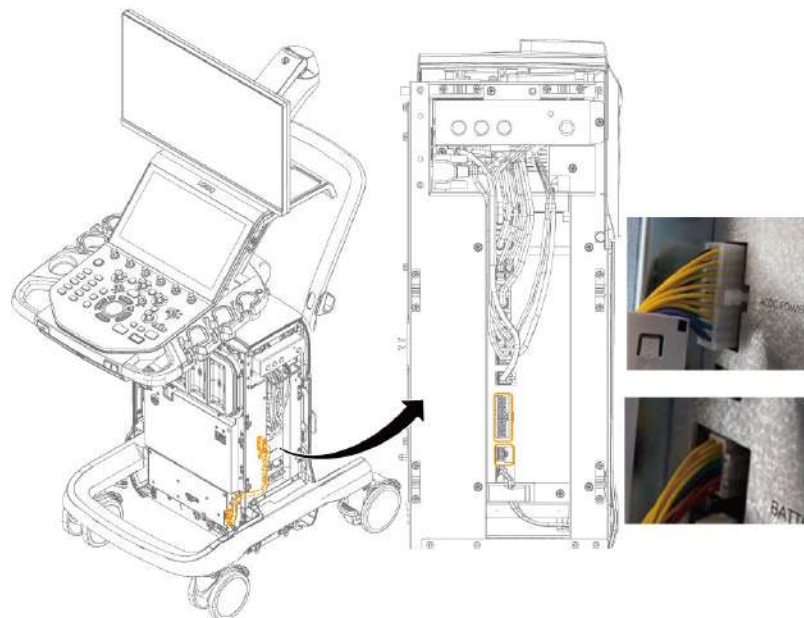
3. Unlock Cable clamp and disconnect the UBC To UBE Power Signal Cable and UBC To UBE Battery Power Cable from the UBC-T.

Figure 12-173 Disconnecting Signal and Power Cable from UBC-T



4. Unlock the Cable Clamp and disconnect the UBC To UBE Power Signal Cable and UBC To UBE Battery Power Cable from the UBE.

Figure 12-174 Disconnecting Signal and Power Cable from UBE



12.5.4.6.2 Battery Option Cable Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.6.3 Battery Option Cable Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.6.4 Battery Option Cable Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.6.5 Battery Option Cable Set-U - Functional checks

Table 12-105 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>Battery Pack functional checks</i> on page 179 or <i>Battery Pack Extended functional checks</i> on page 180	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.4.7 Replacement of the UBC-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-106 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

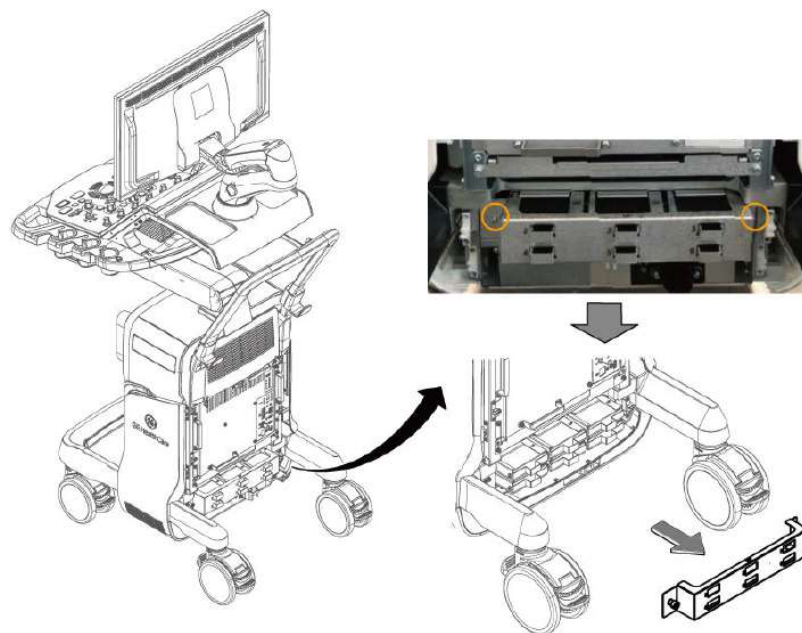
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
4. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
5. Remove the Rear Cover Bottom Assy-T. Refer to *Replacement of the Rear Cover Bottom Assy-T* on page 376.
6. Remove the Front Cover Bottom Assy-T. Refer to *Replacement of the Front Cover Bottom Assy-T* on page 353.

12.5.4.7.1 UBC-T - Removal procedure

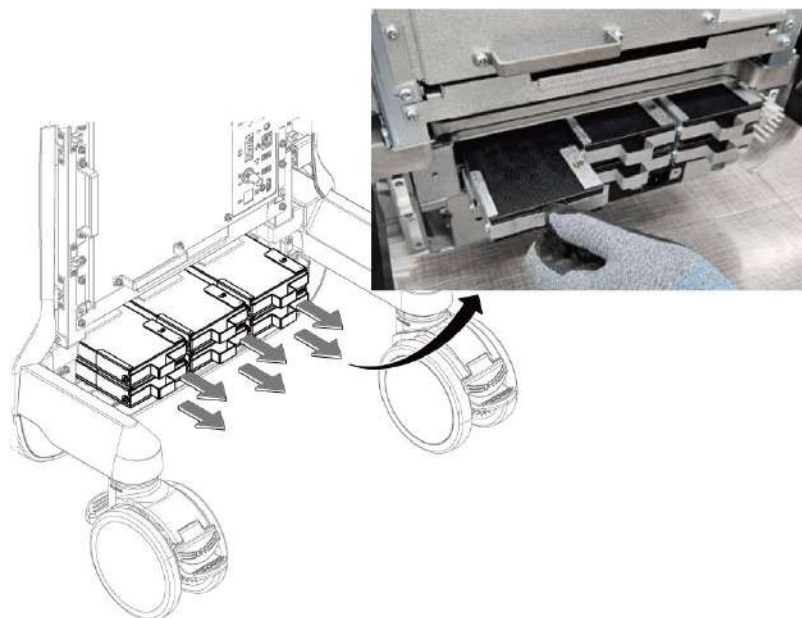
1. Unscrew 2 screws to remove the Unity Battery Cover Brkt from the console.

Figure 12-175 Removing Unity Battery Cover Brkt



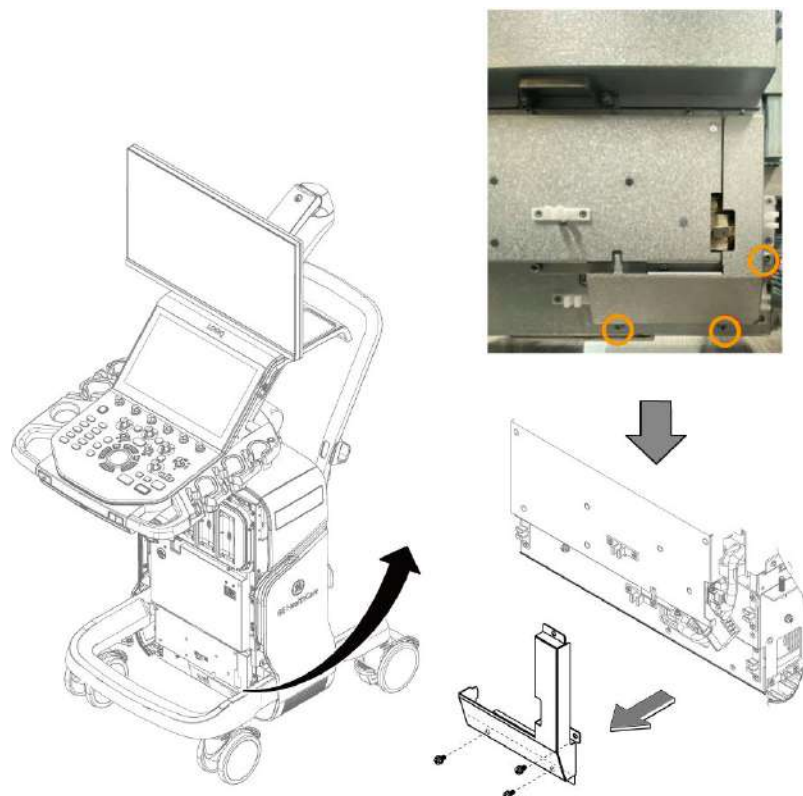
2. Pull the Battery Pack to remove from the console.

Figure 12-176 Removing Battery Pack



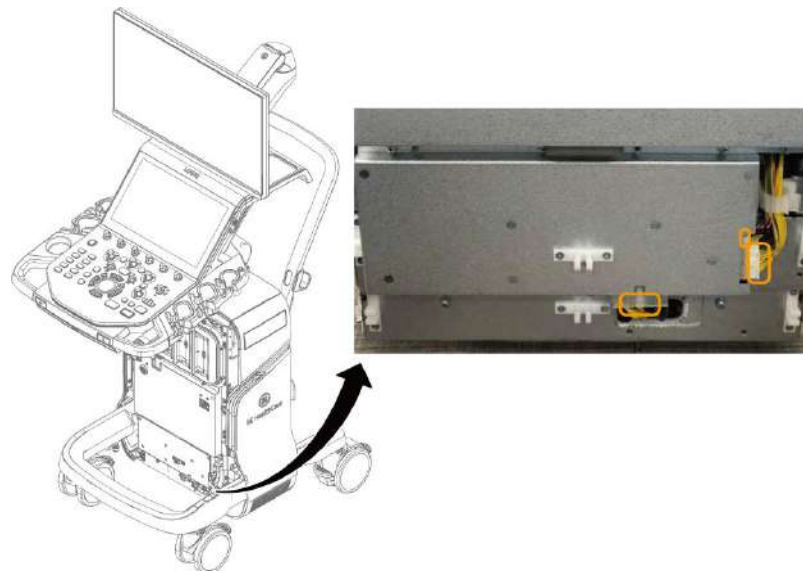
3. Unscrew 3 screws to remove the Unity Battery Cable Hide Brkt from the console.

Figure 12-177 Removing Battery Cable Hide Brkt



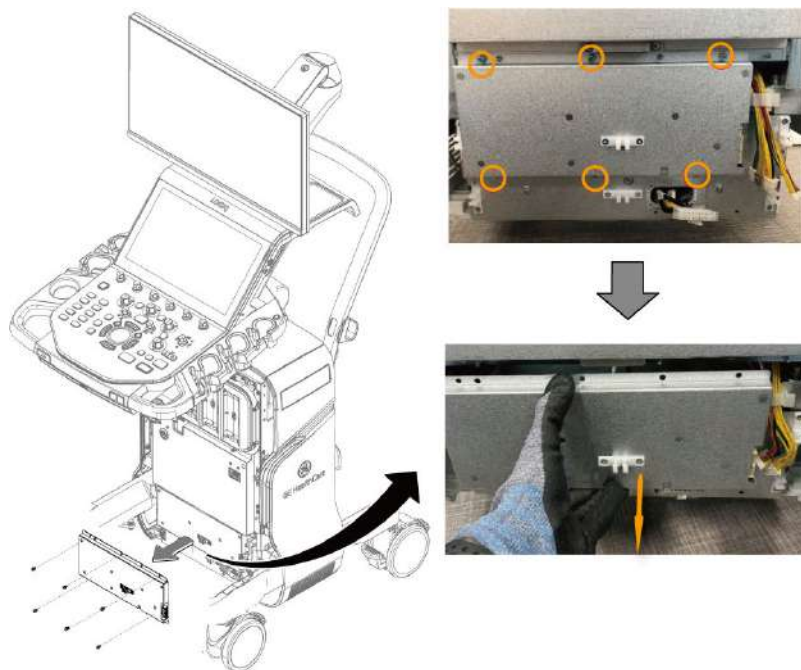
4. Disconnect the ACDC Link Cable To UBE Cable, the UBC To UBE Power Signal Cable and UBC To UBE Battery Power Cable from the UBC-T Assy.

Figure 12-178 Disconnecting cables



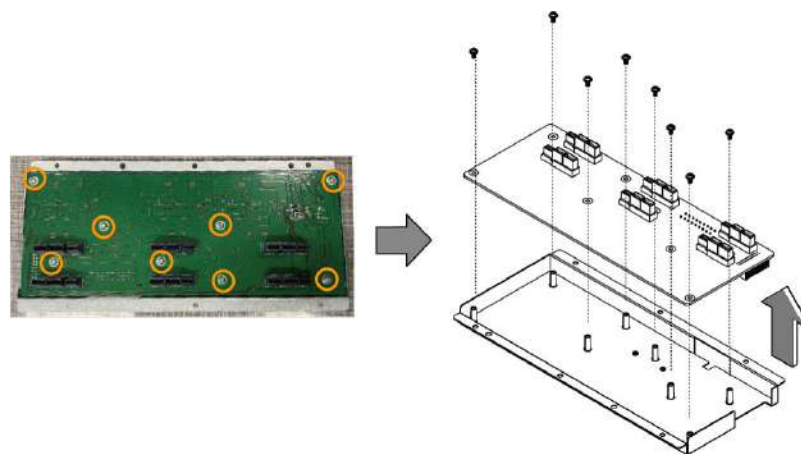
5. Unscrew 6 screws to remove the UBC-T Assy from the console.

Figure 12-179 Removing UBC-T Assy



6. Unscrew 8 screws to remove the Unity BBC Board from the Fix Brkt.

Figure 12-180 Removing Unity BBC Board



12.5.4.7.2 UBC-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.4.7.3 UBC-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.4.7.4 UBC-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.4.7.5 UBC-T - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>Battery Pack functional checks on page 179</i> or <i>Battery Pack Extended functional checks on page 180</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.5 Internal Cables

12.5.5.1 Replacement of the OPIO HUB To Monitor Power Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-107 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

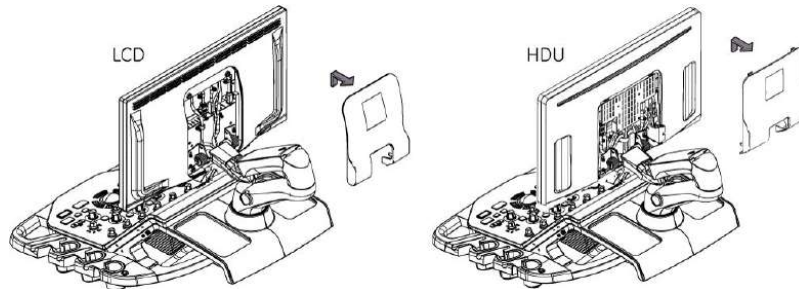
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T1 Monitor Arm Cover Set. Refer to *Replacement of the T1 Monitor Arm Cover Set* on page 395.
3. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
4. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.5.5.1.1 OPIO HUB To Monitor Power Cable - Removal procedure

1. Remove the Monitor Cable Cover.

Figure 12-181 Removing Monitor Cable Cover

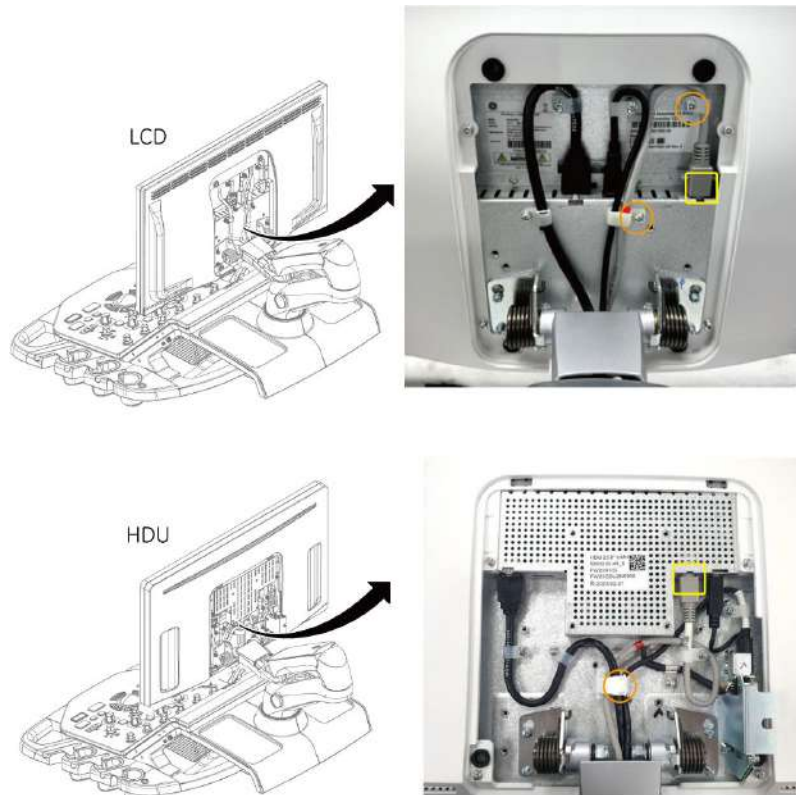


2. Unscrew 2 screw and remove the plastic clamp from OPIO HUB To Monitor Power Cable and disconnect the OPIO HUB To Monitor Power Cable from the Monitor.

NOTE

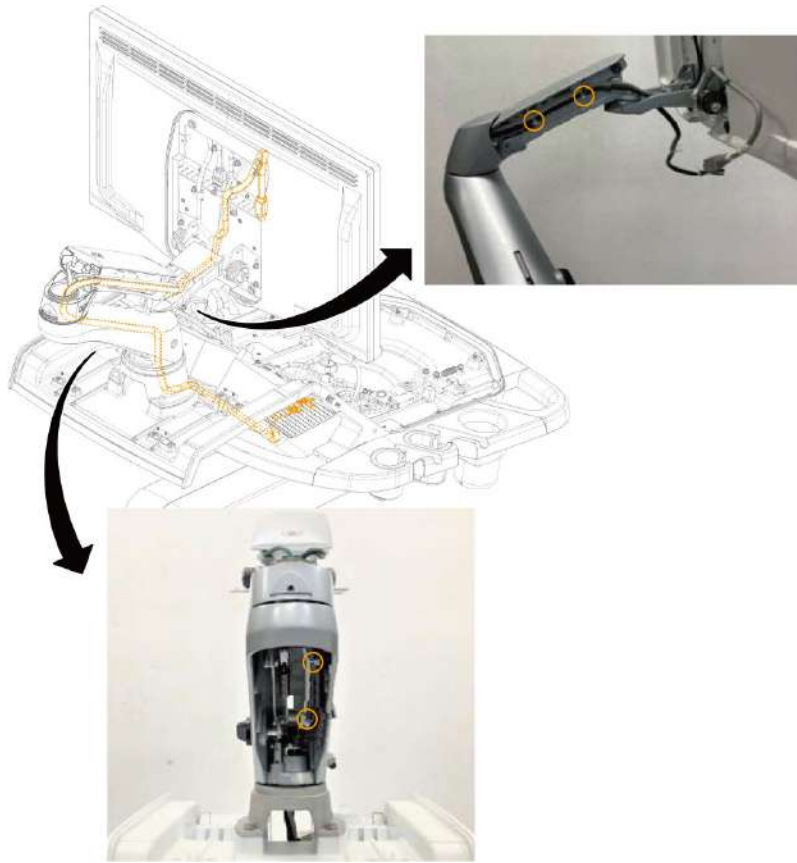
If the HDU 23.8 inch Monitor LOGIQ Exx was installed, remove the HDU 23.8 inch Monitor LOGIQ Exx as described in 8-6-7 "Replacement of the HDU 23.8 inch Monitor LOGIQ Exx" on page 8- 95.

Figure 12-182 Disconnecting Monitor Power Cable



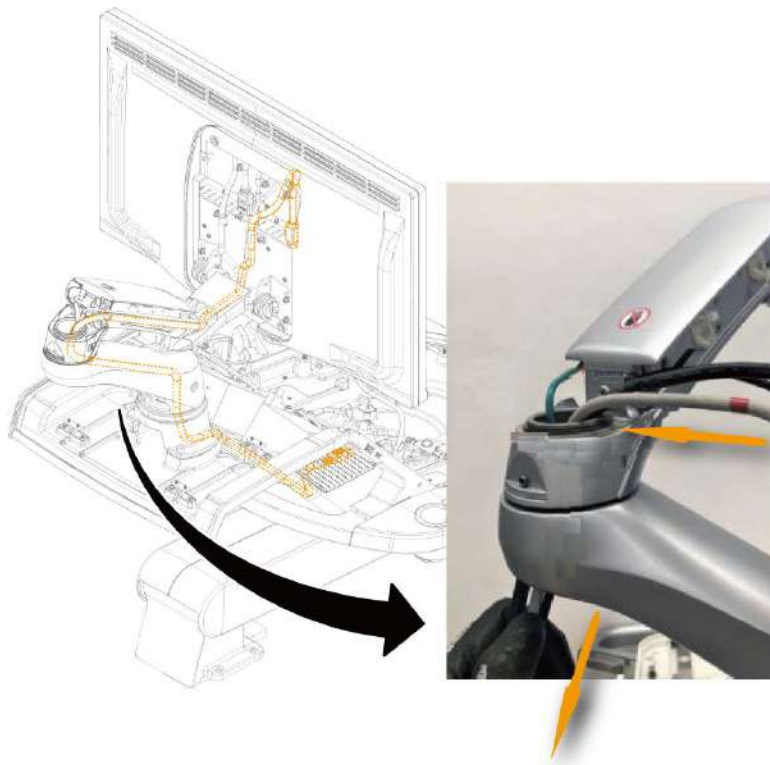
3. Cut 4 Cable Ties.

Figure 12-183 Cutting 4 Cable Ties



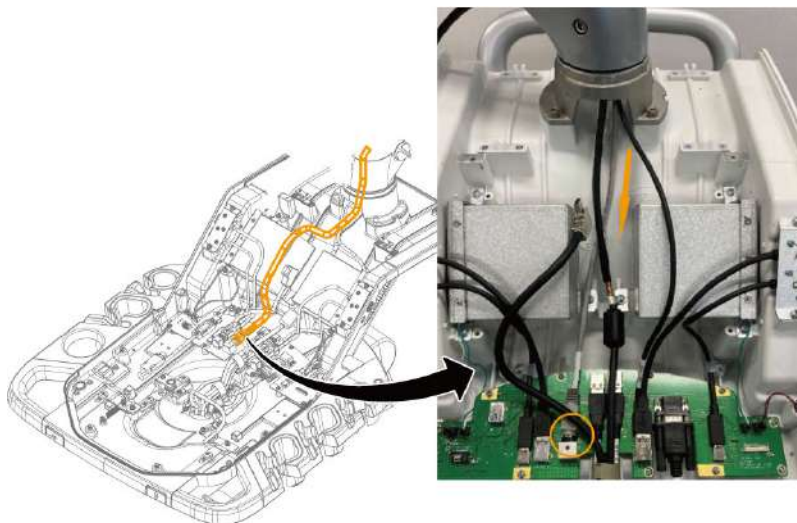
4. Pull the OPIO HUB To Monitor Power Cable from the 2nd Arm.

Figure 12-184 Pulling cable



5. Pull the OPIO HUB To Monitor Power Cable from the 1st Arm
6. Disconnect the OPIO HUB To Monitor Power Cable from OPIO HUB

Figure 12-185 Disconnecting Power Cable



12.5.5.1.2 OPIO HUB To Monitor Power Cable - Installation procedure

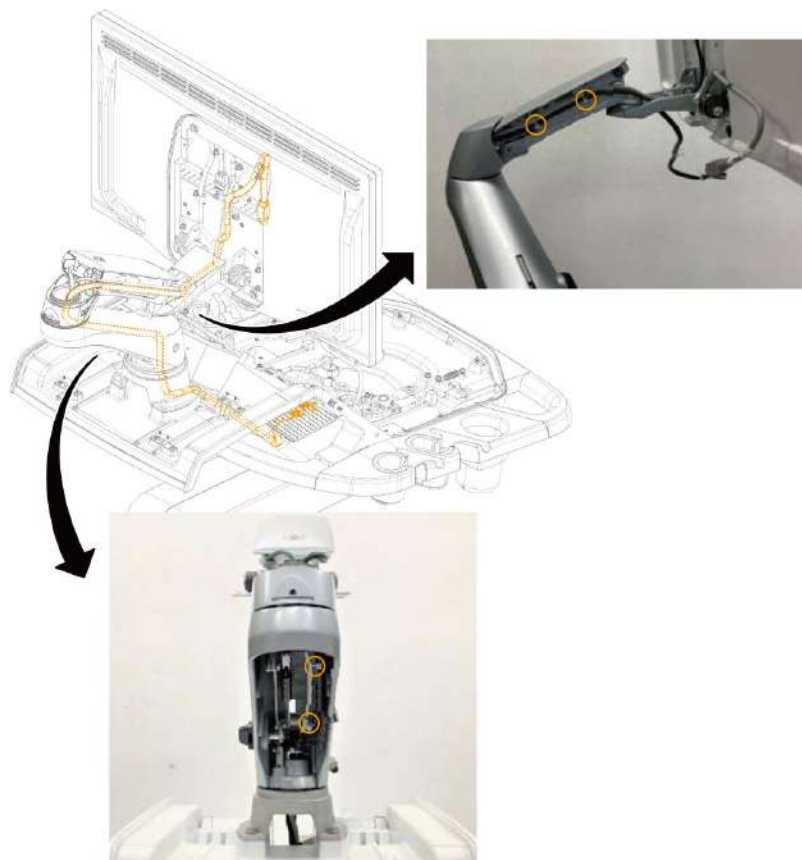
1. Parts to be installed in reverse order of removal.

NOTE

Fix OPIO HUB To Monitor Power Cable with Cable Tie as below figure.

- Align and fix the white double lined mark on the UBE To Monitor HDMI Cable and green label attached on the OPIO HUB To Monitor Power Cable prior to second fixture using Cable Tie (2EA).
- Fix the white double lined mark on the cable prior to second fixture using Cable Tie(2EA).

Figure 12-186 Fixing cable with cable tie

**NOTE**

Align colored points.



2. Perform "Functional Checks after FRU replacement.

12.5.5.1.3 OPIO HUB To Monitor Power Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.1.4 OPIO HUB To Monitor Power Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.1.5 OPIO HUB To Monitor Power Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Grounding continuity test</i> on page 769	
<i>Chassis leakage current test</i> on page 770	
<i>Power shut down</i> on page 113	

12.5.5.2 Replacement of the OPIO HUB To Lower Keyboard PWA Power Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-108 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

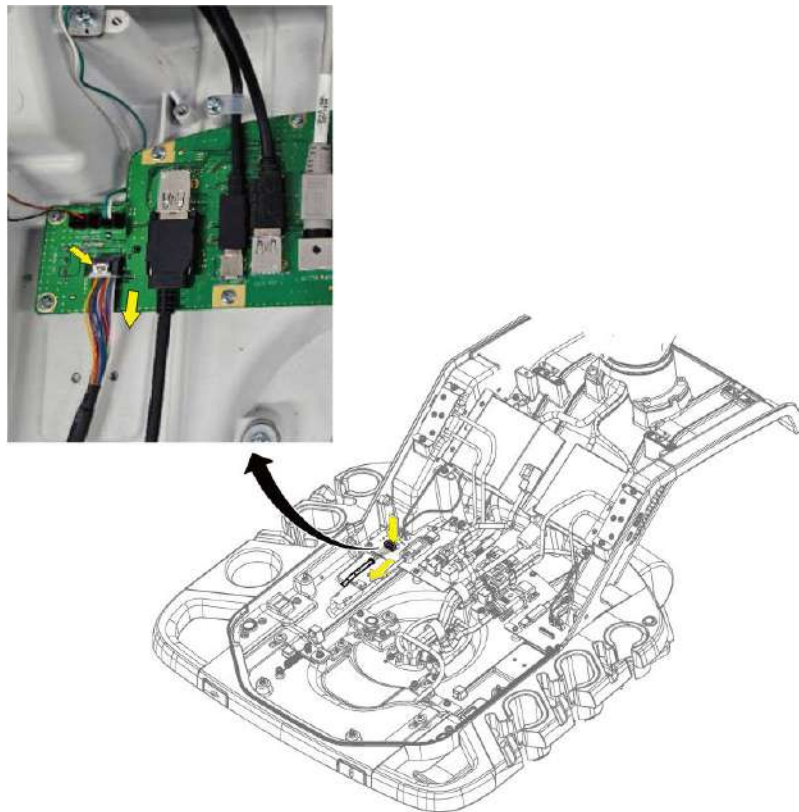
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.5.5.2.1 OPIO HUB To Lower Keyboard PWA Power Cable - Removal procedure

1. Confirm that OPIO Top Cover Set-T and UOPIO-T Assy are removed.
2. Push the button of the OPIO HUB To Lower Keyboard PWA Power Cable's connector and then disconnect the connector.

Figure 12-187 Disconnecting Lower Keyboard PWA Power Cable



12.5.5.2.2 OPIO HUB To Lower Keyboard PWA Power Cable - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.5.2.3 OPIO HUB To Lower Keyboard PWA Power Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.2.4 OPIO HUB To Lower Keyboard PWA Power Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.2.5 OPIO HUB To Lower Keyboard PWA Power Cable - Functional checks

Table 12-109 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.5.3 Replacement of the OPIO HUB To Lower Keyboard PWA USB Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-110 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

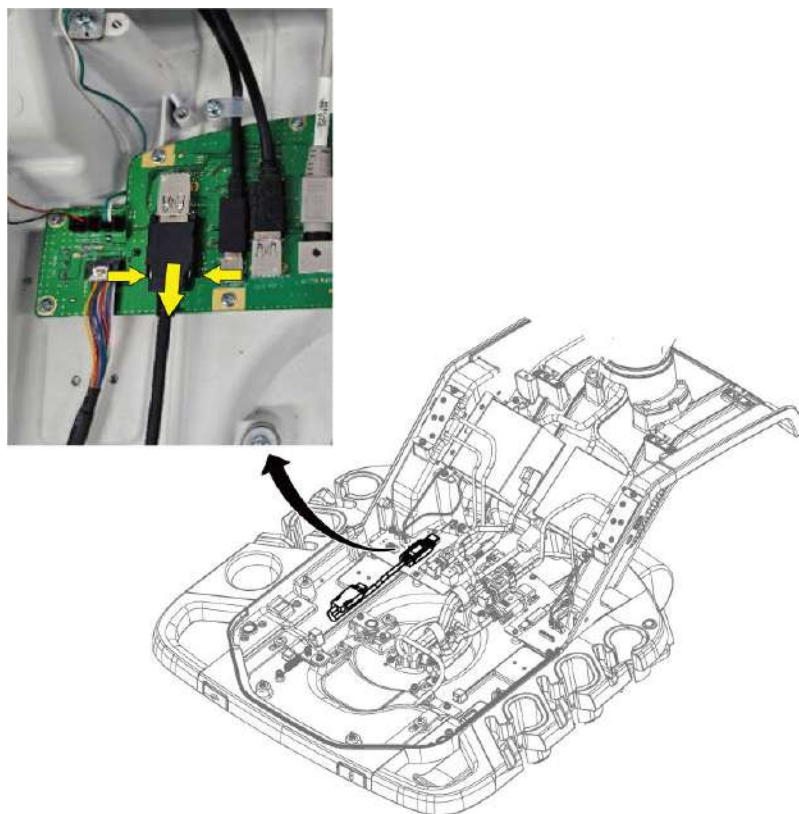
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.5.5.3.1 OPIO HUB To Lower Keyboard PWA USB Cable - Removal procedure

1. Confirm that OPIO Top Cover Set-T and UOPIO-T Assy are removed.
2. Push the side of the OPIO HUB To Lower Keyboard PWA USB Cable's connector and disconnect the connector.

Figure 12-188 Disconnecting Lower Keyboard PWA USB Cable



12.5.5.3.2 OPIO HUB To Lower Keyboard PWA USB Cable - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.5.3.3 OPIO HUB To Lower Keyboard PWA USB Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.3.4 OPIO HUB To Lower Keyboard PWA USB Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.3.5 OPIO HUB To Lower Keyboard PWA USB Cable - Functional checks

Table 12-111 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.5.4 Replacement of the Lower Keyboard To Touch Panel PWA Power & USB Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-112 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

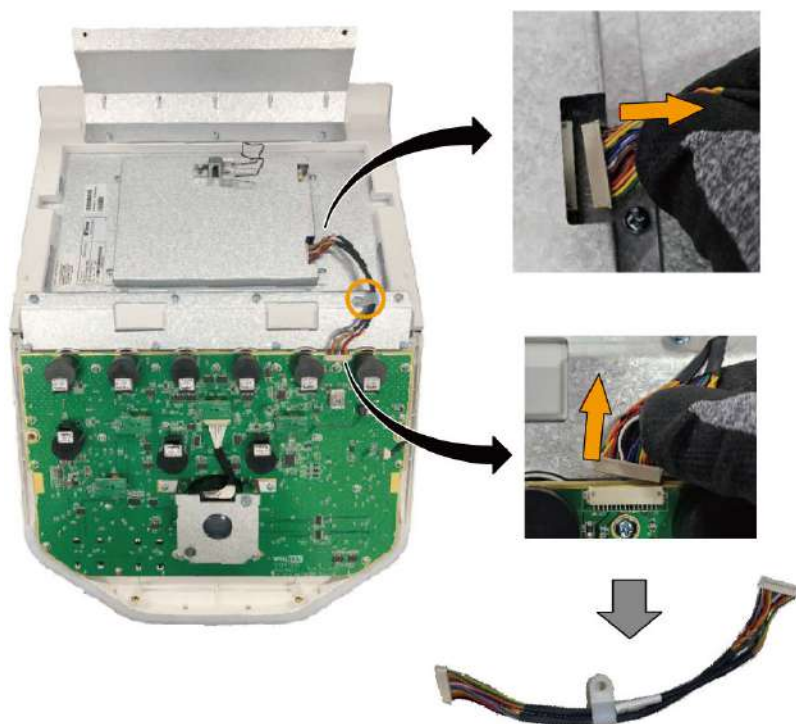
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.5.5.4.1 Lower Keyboard To Touch Panel PWA Power & USB Cable - Removal procedure

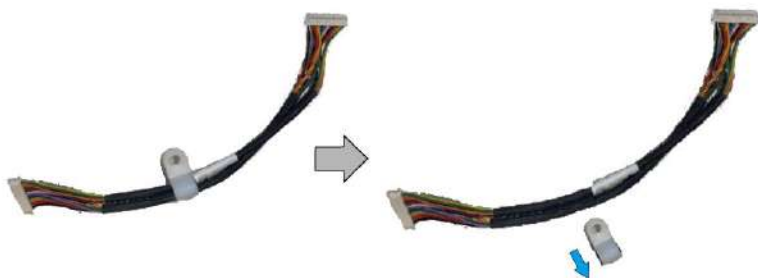
1. Disconnect the Lower Keyboard To Touch Panel PWA Power & USB Cable from the LOWER OPIO and the UPPER OPIO. Unscrew 1 screw to remove the Lower Keyboard To Touch Panel PWA Power & USB Cable.

Figure 12-189 Disconnecting cable



2. Remove the plastic clamp from the Lower Keyboard To Touch Panel PWA Power & USB Cable.

Figure 12-190 Removing plastic clamp



12.5.5.4.2 Lower Keyboard To Touch Panel PWA Power & USB Cable - Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.5.4.3 Lower Keyboard To Touch Panel PWA Power & USB Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.4.4 Lower Keyboard To Touch Panel PWA Power & USB Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.

2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.4.5 Lower Keyboard To Touch Panel PWA Power & USB Cable - Functional checks

Table 12-113 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.5.5.5 Replacement of the UBE To OPIO Touch Panel HDMI Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-114 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

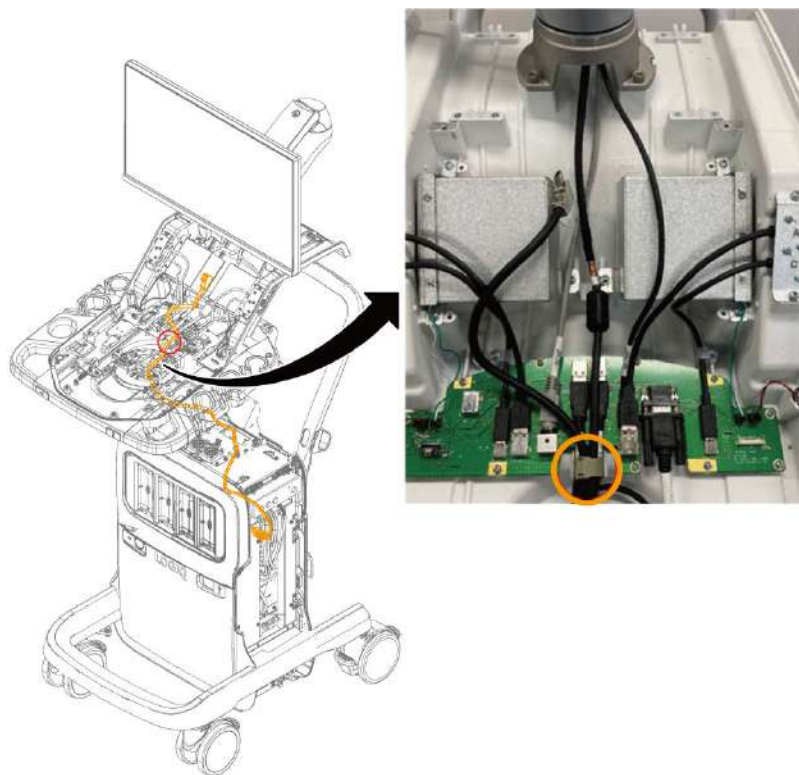
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the Elevation Arm Cover Set-U. Refer to *Replacement of the Elevation Arm Cover Set-U* on page 509.
5. Remove the Top Cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.
6. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.5.5.5.1 UBE To OPIO Touch Panel HDMI Cable - Removal procedure

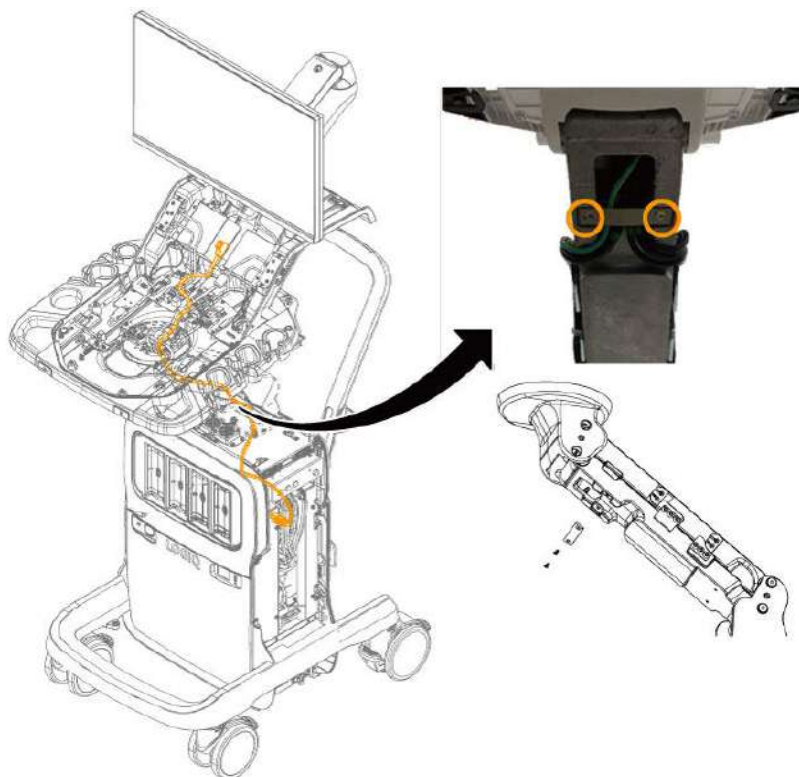
1. Unlock Cable Clamp.

Figure 12-191 Unlocking Cable Clamp



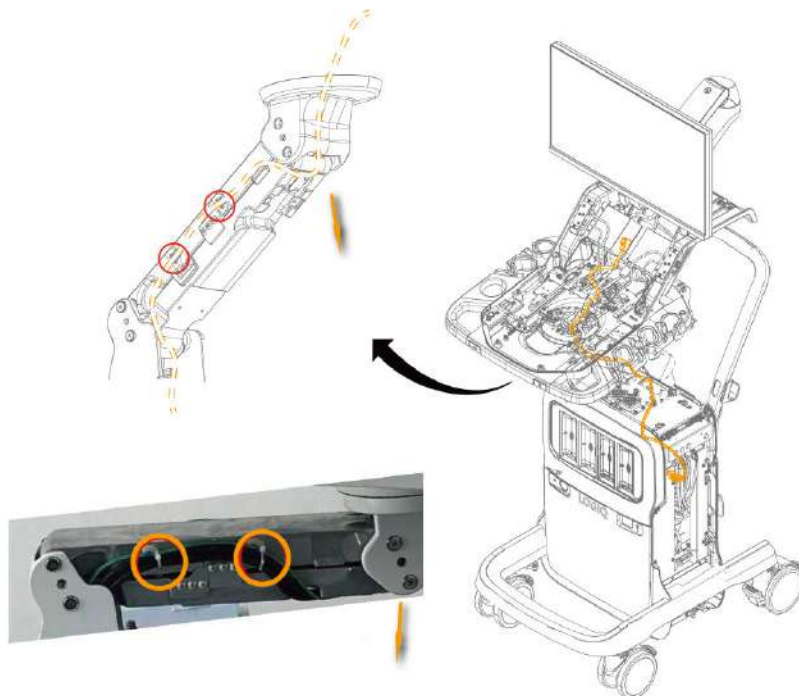
2. Unscrew 2 screws to remove the Cable Clamp.

Figure 12-192 Removing Cable Clamp



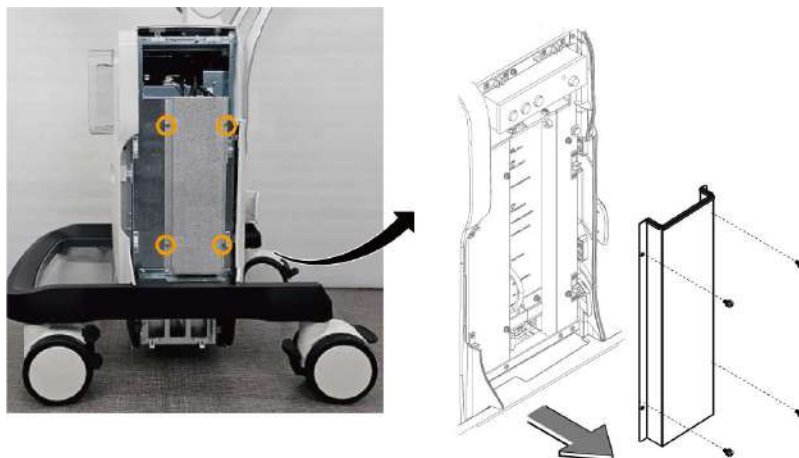
3. Cut 2 Cable Ties.
4. Pull UBE To OPIO Touch Panel HDMI Cable to remove it from the T2 OPIO BASE.

Figure 12-193 Removing Cable from T2 OPIO BASE



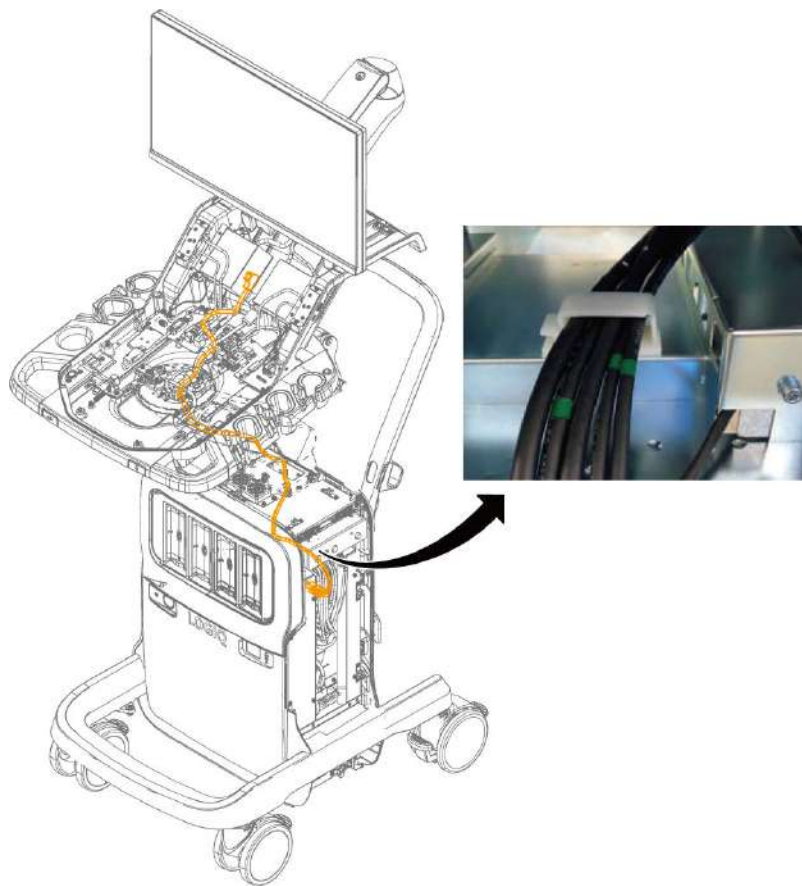
5. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-194 Removing Cable Cover Brkt



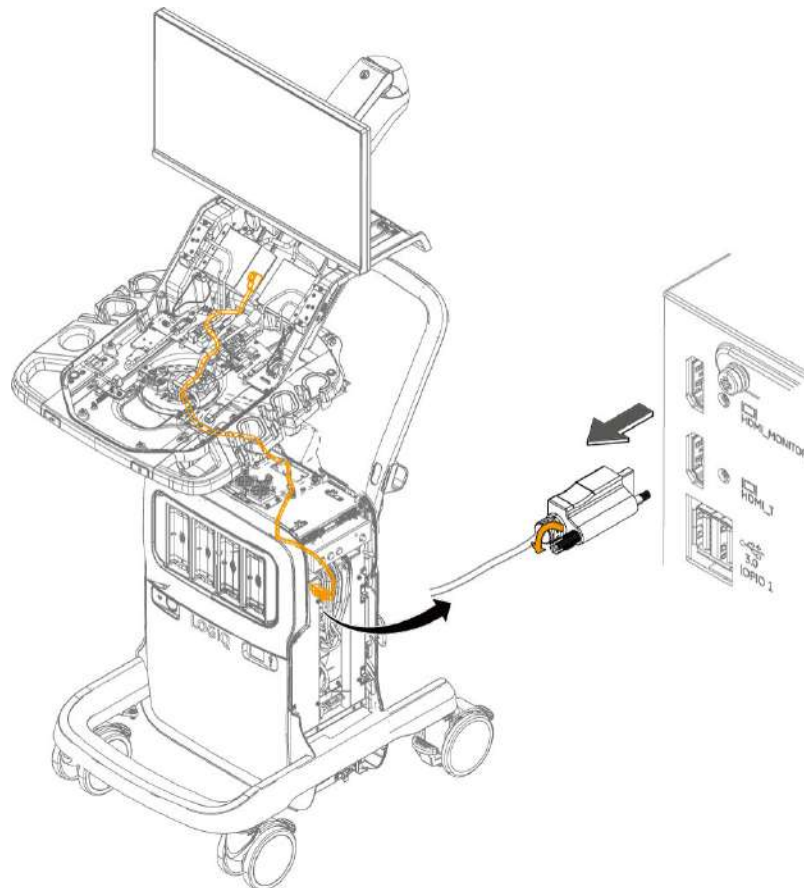
6. Unlock the Cable Clamp.

Figure 12-195 Unlocking Cable Clamp



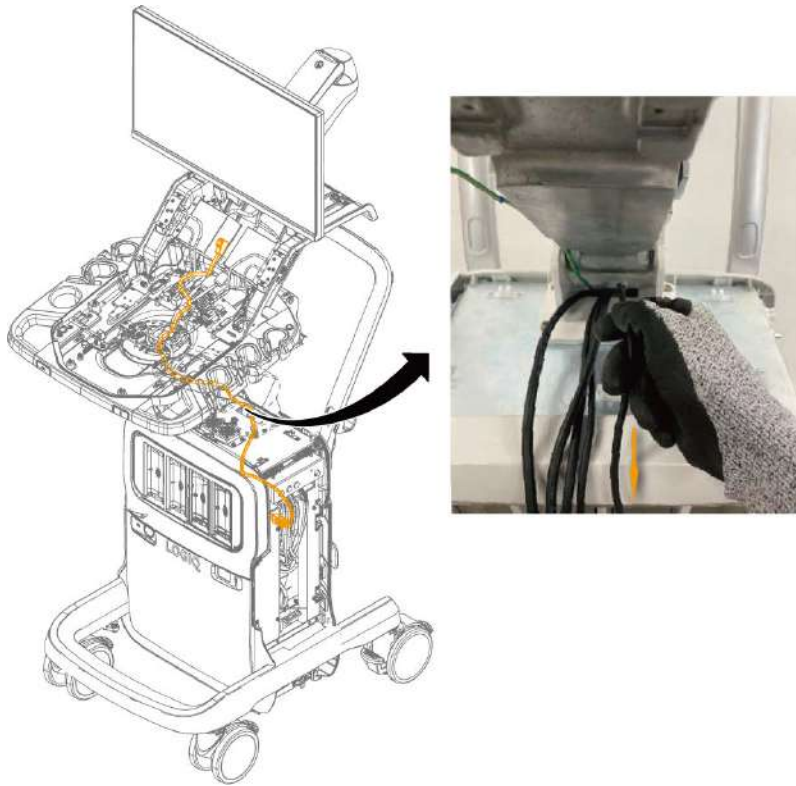
7. Rotate stud of UBE To Monitor HDMI Cable counterclockwise and Disconnect UBE To Monitor HDMI Cable from UBE.

Figure 12-196 Disconnecting UBE To Monitor HDMI Cable



8. Pull UBE To OPIO Touch Panel HDMI Cable.

Figure 12-197 Pulling out the Cable



12.5.5.5.2 UBE To OPIO Touch Panel HDMI Cable - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Fix UBE To OPIO Touch Panel HDMI Cable with Cable Tie as below figure.

- Align the marks on UBE To OPIO Touch Panel HDMI Cable, GND Cable (Chassis To OPIO) and UBE To Monitor HDMI Cable and fix the cables using Cable Tie, DACT-100A



- Align the marks on cables and fix the cables using Cable Clamp CPFDM14-A.



2. Perform "Functional Checks".

12.5.5.5.3 UBE To OPIO Touch Panel HDMI Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.5.4 UBE To OPIO Touch Panel HDMI Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.5.5 UBE To OPIO Touch Panel HDMI Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>Power on/boot up on page 98</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Color Mode functional checks on page 164</i>	
<i>PW/CW Doppler mode functional checks on page 167</i>	
<i>Top console adjustment control functional checks on page 150</i>	
<i>Power shut down on page 113</i>	

12.5.5.6 Replacement of the UBE To Monitor HDMI Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-115 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

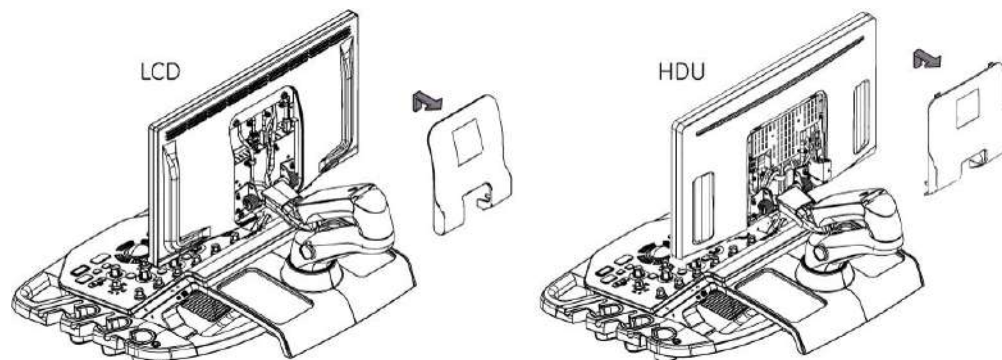
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T1 Monitor Arm Cover Set. Refer to *Replacement of the T1 Monitor Arm Cover Set* on page 395.
3. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
4. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
5. Remove the Elevation Arm Cover Set-U. Refer to *Replacement of the Elevation Arm Cover Set-U* on page 509.
6. Remove the Top Cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.
7. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.5.5.6.1 UBE To Monitor HDMI Cable -Removal procedure

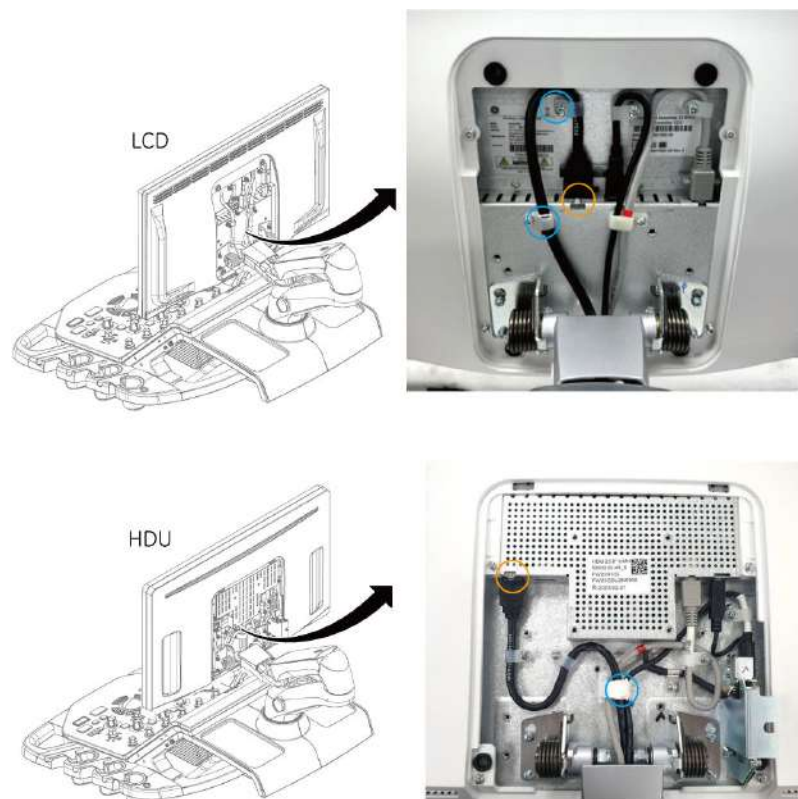
1. Remove the Monitor Cable Cover.

Figure 12-198 Removing Monitor Cable Cover



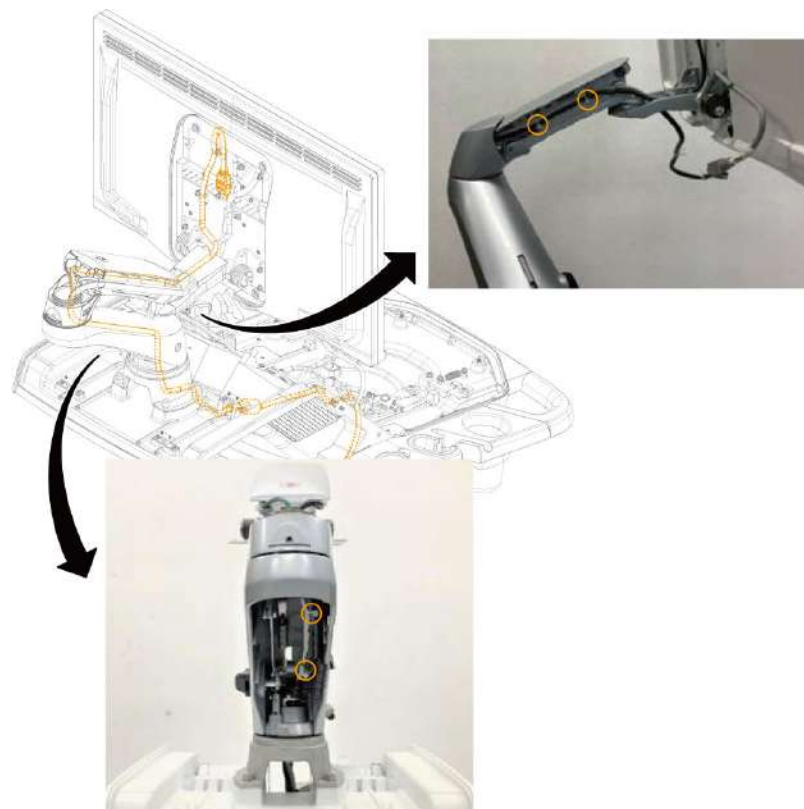
2. Unscrew 2 screws and remove the plastic clamp from UBE To Monitor HDMI Cable and disconnect the UBE To Monitor HDMI Cable from the Monitor.

Figure 12-199 Disconnecting HDMI Cable



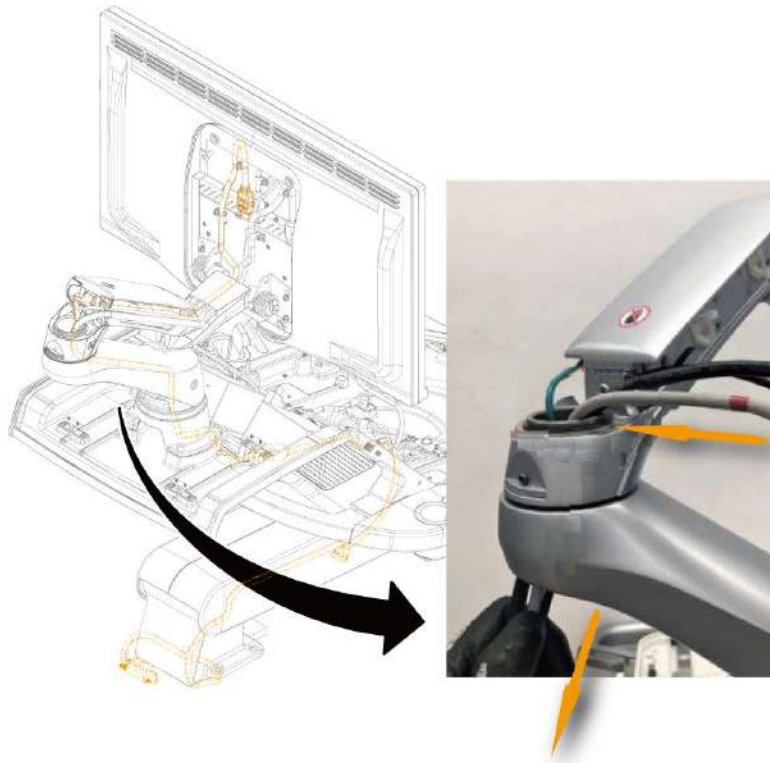
3. Cut 4 Cable Ties.

Figure 12-200 Cutting Cable Ties



4. Pull UBE To Monitor HDMI Cable from the 2nd Arm.

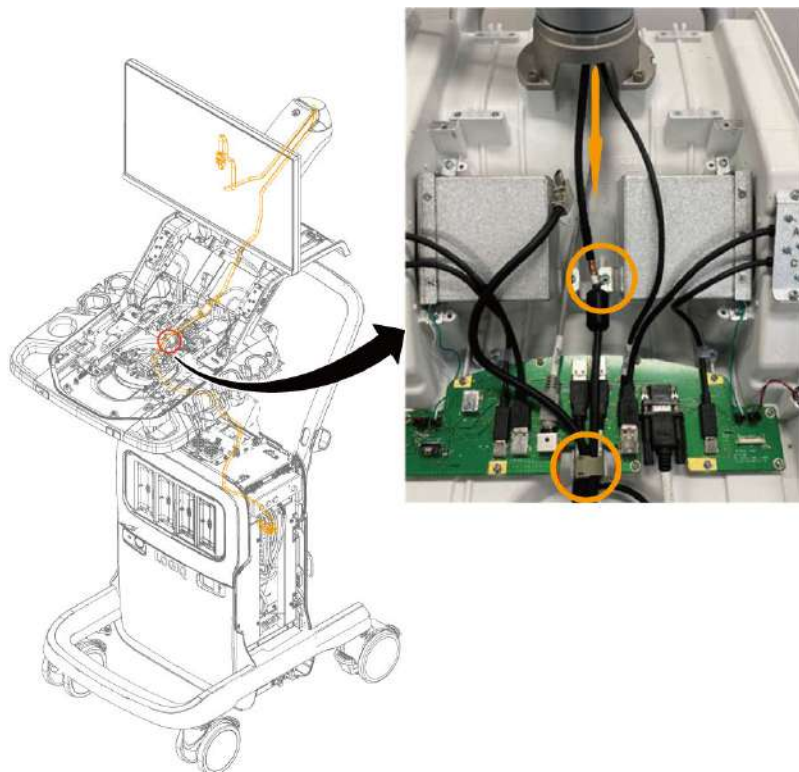
Figure 12-201 Pulling cable from 2nd Arm



5. Pull the UBE To Monitor HDMI Cable from the 1st Arm.

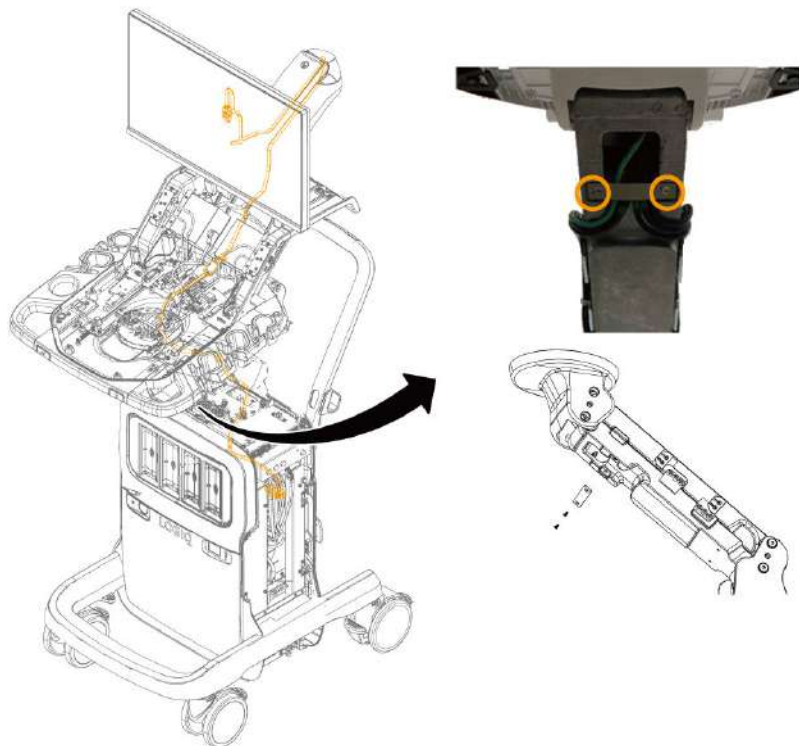
6. Unlock Cable clamp and unscrew 1 screw and remove the Metal clamp and EMI Core from UBE To Monitor HDMI Cable.

Figure 12-202 Removing clamp and Core



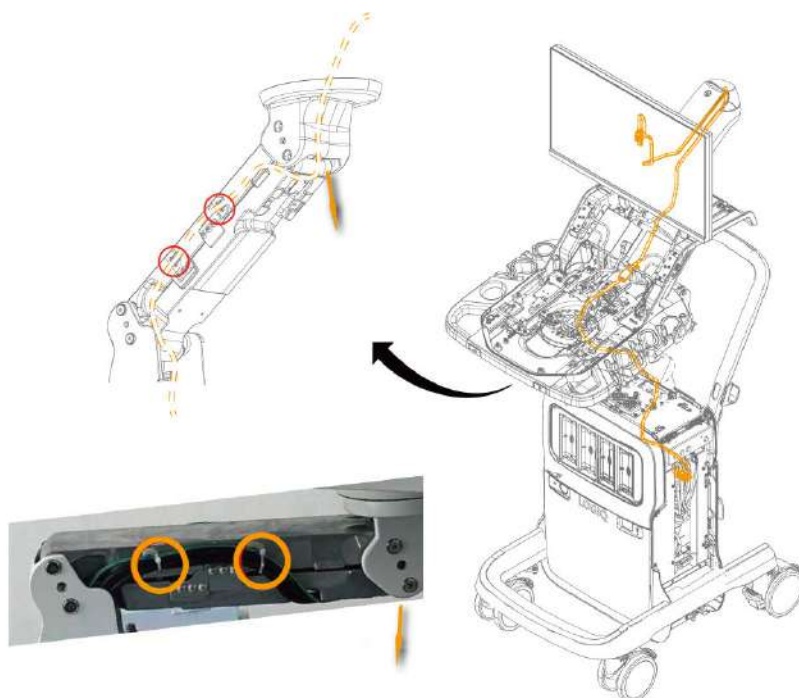
7. Unscrew 2 screws to remove the Cable Clamp.

Figure 12-203 Removing Cable Clamp



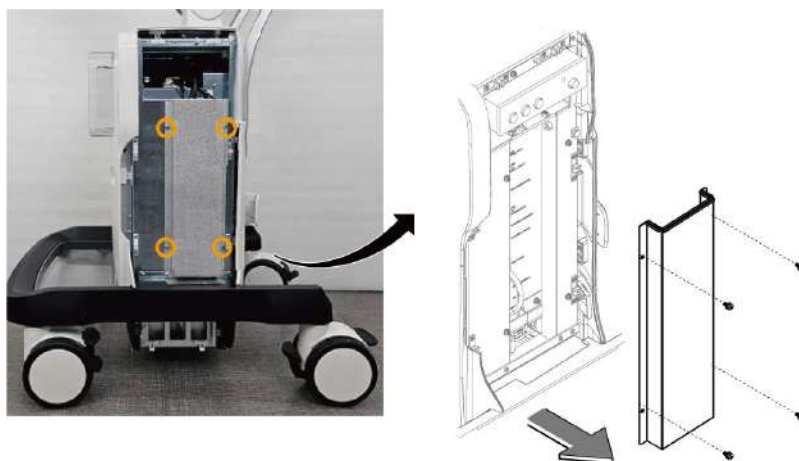
8. Cut 2 Cable Ties and pull the UBE To Monitor HDMI Cable to remove it from the T2 OPIO Base.

Figure 12-204 Removing HDMI cable



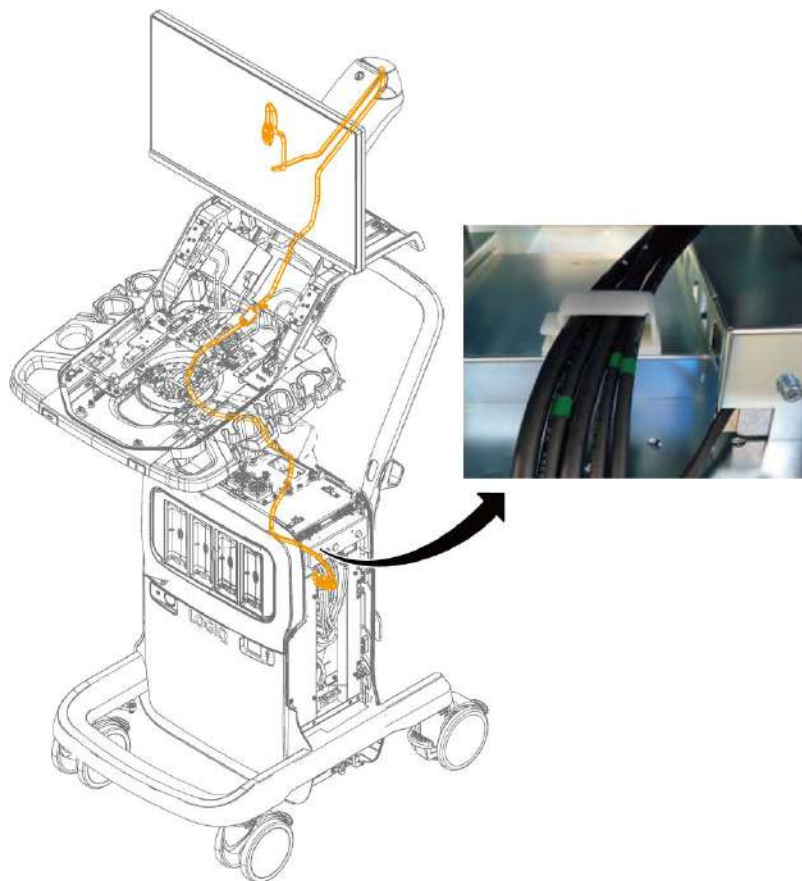
9. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-205 Removing Cable Cover Brkt



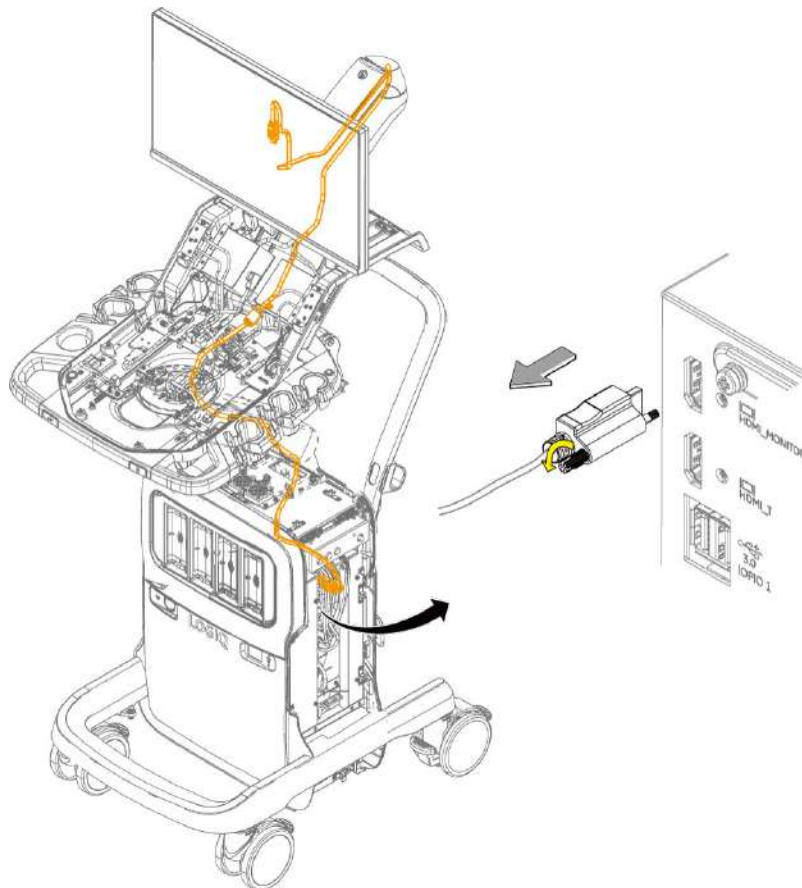
10. Unlock the Cable Clamp.

Figure 12-206 Unlocking Cable Clamp



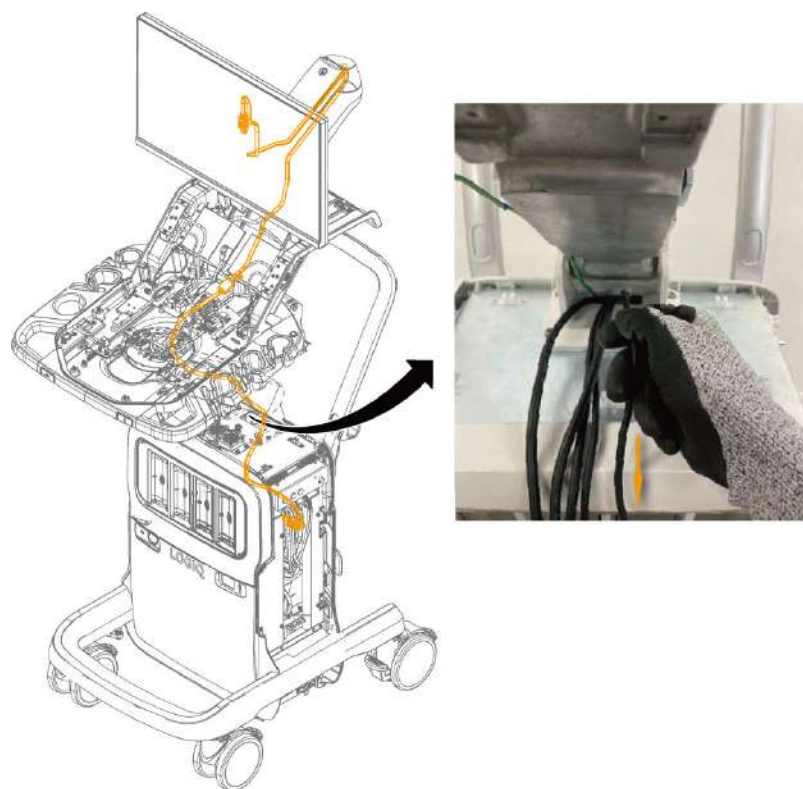
11. Rotate studs of the UBE To Monitor HDMI Cable counterclockwise and disconnect the UBE To Monitor HDMI Cable from the UBE.

Figure 12-207 Disconnecting HDMI Cable



12. Pull the UBE To Monitor HDMI Cable to remove from the console.

Figure 12-208 Pulling HDMI cable



12.5.5.6.2 UBE To Monitor HDMI Cable -Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Fix UBE To Monitor HDMI Cable with Cable Tie as figure below.

- Align the marks on UBE To OPIO Touch Panel HDMI Cable, GND Cable (Chassis To OPIO) and UBE To Monitor HDMI Cable and fix the cables using Cable Tie, DACT-100A



- Align the marks on cables and fix the cables using Cable Clamp CPFDM14-A.



- Align and fix the white double lined mark on the UBE To Monitor HDMI Cable and green label attached on the OPIO HUB To Monitor Power Cable prior to second fixture using Cable Tie (2EA).



- Fix the white double lined mark on the cable prior to second fixture using Cable Tie(2EA).



2. Perform "Functional Checks".

12.5.5.6.3 UBE To Monitor HDMI Cable -Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.6.4 UBE To Monitor HDMI Cable -Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.6.5 UBE To Monitor HDMI Cable -Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.5.7 Replacement of the UBE To OPIO HUB USB 3.0 Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-116 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

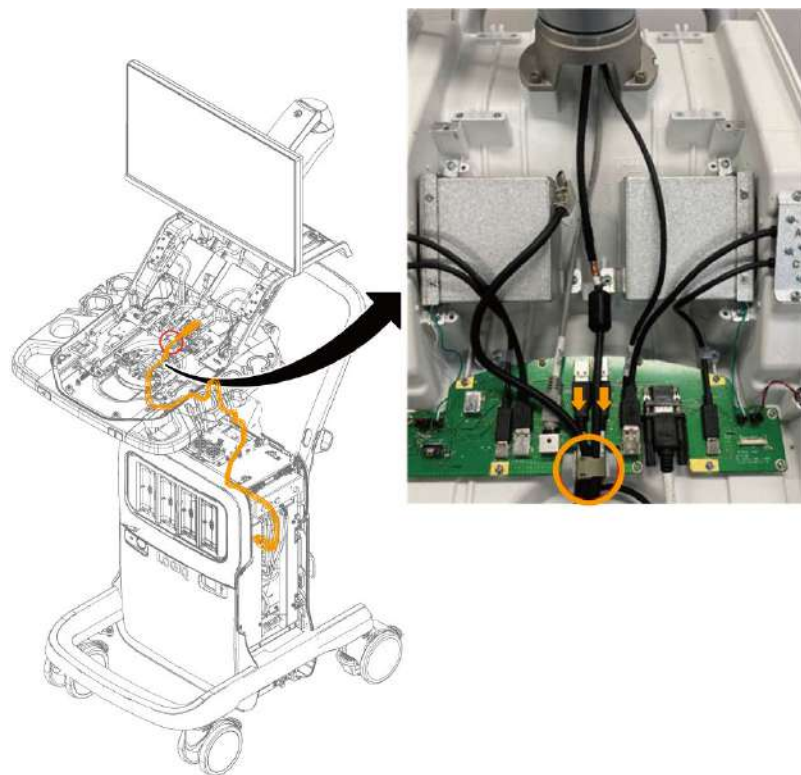
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the Elevation Arm Cover Set-U. Refer to *Replacement of the Elevation Arm Cover Set-U* on page 509.
5. Remove the Top Cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.
6. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.5.5.7.1 UBE To OPIO HUB USB 3.0 Cable - Removal procedure

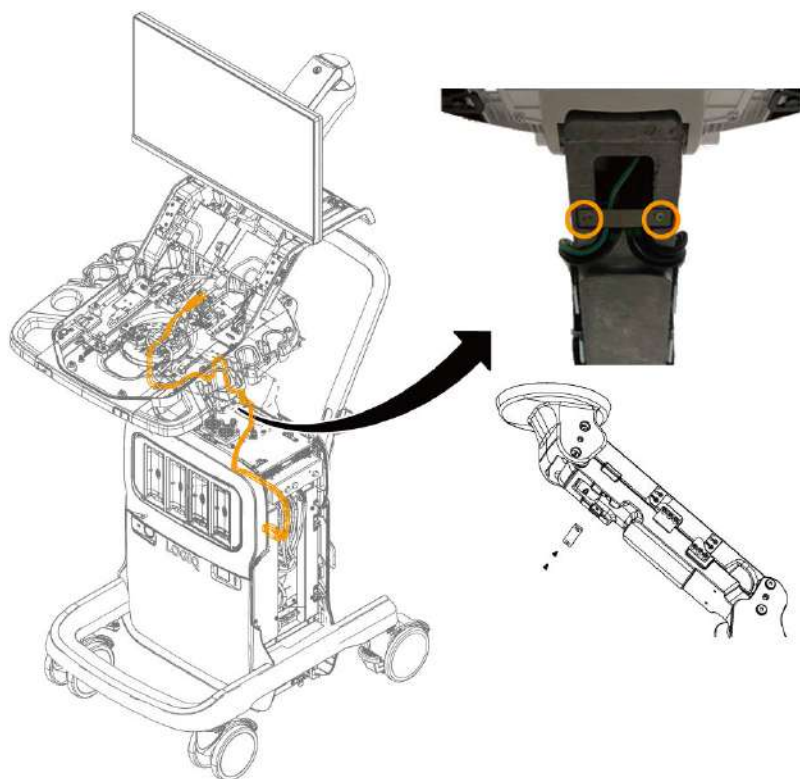
1. Unlock the Cable Clamp and disconnect the UBE To OPIO HUB USB 3.0 Cable from the OPIO HUB.

Figure 12-209 Disconnecting USB 3.0 Cable



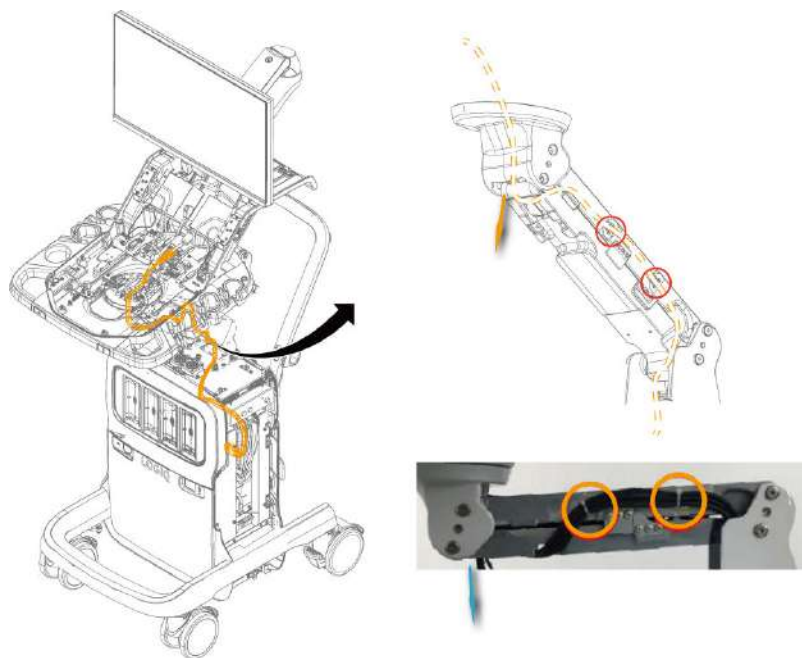
2. Unscrew 2 screws to remove the Cable Clamp.

Figure 12-210 Removing the Cable Clamp



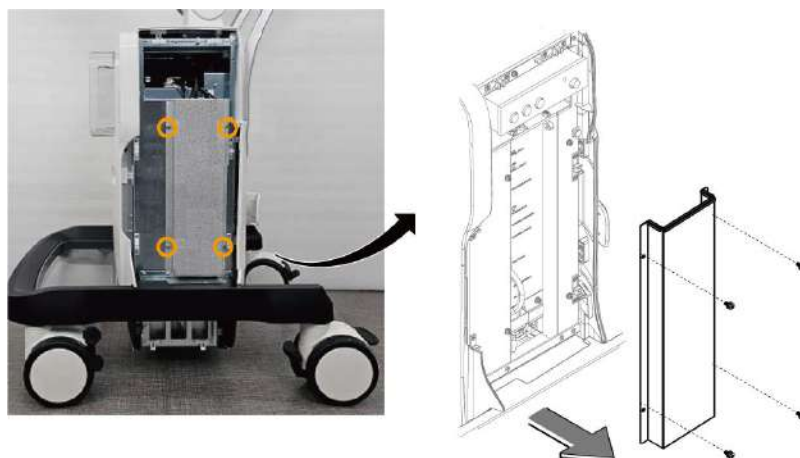
3. Remove USB 3.0 Cable from the T2 OPIO BASE per following steps.
 - a. Cut 2 Cable Ties.
 - b. Pull UBE To OPIO Touch Panel USB 3.0 Cable to remove from the T2 OPIO BASE.

Figure 12-211 Removing USB 3.0 Cable



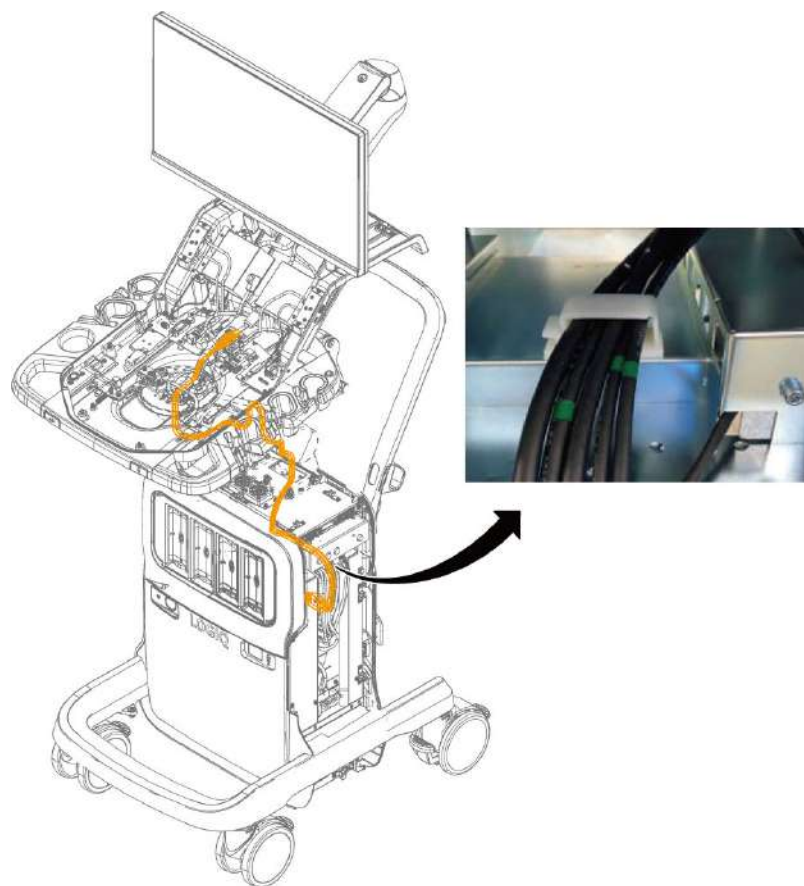
4. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-212 Removing Cable Cover Brkt



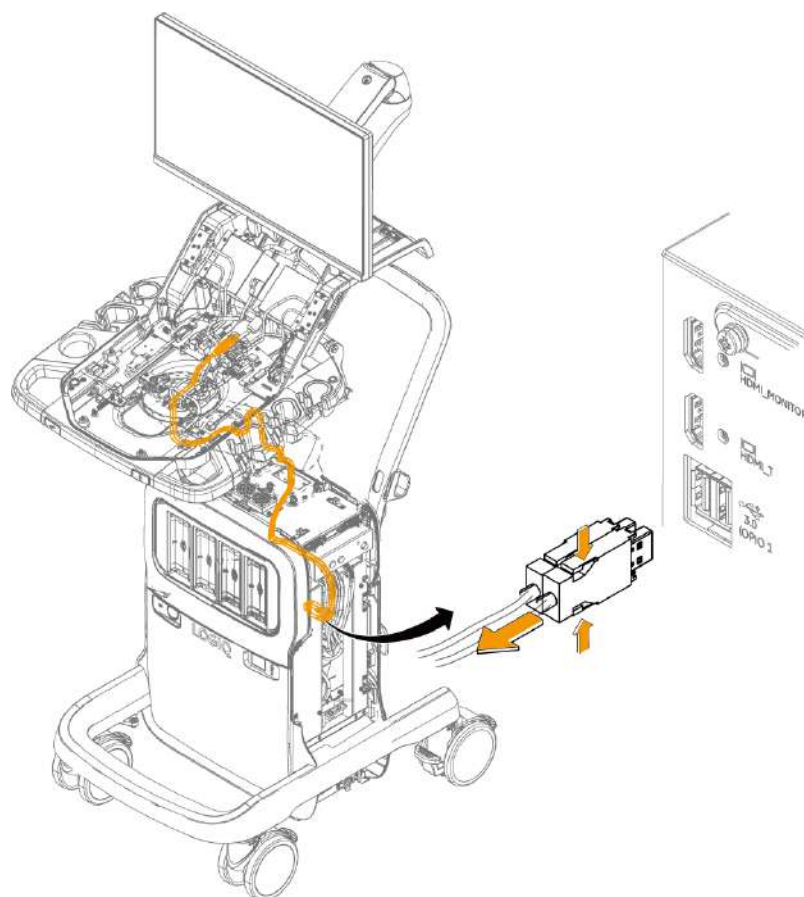
5. Unlock the Cable Clamp.

Figure 12-213 Unlocking Cable Clamp



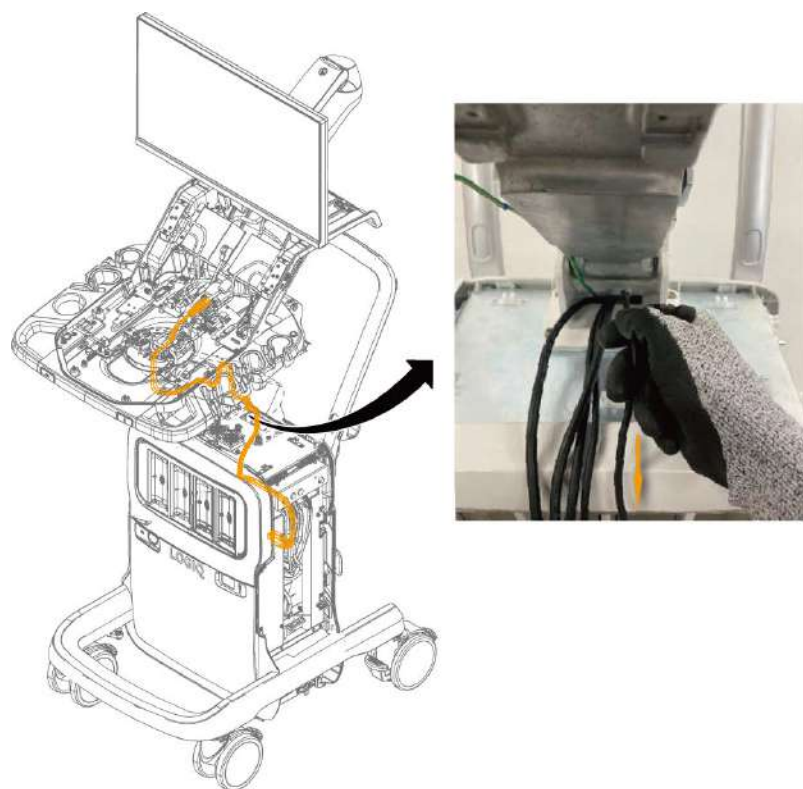
6. Disconnect the UBE To OPIO HUB USB 3.0 Cable from the UBE.

Figure 12-214 Disconnecting USB 3.0 Cable



7. Pull the UBE TO OPIO HUB USB 3.0 Cable to remove from the console.

Figure 12-215 Removing UBE TO OPIO HUB USB 3.0 Cable



12.5.5.7.2 UBE To OPIO HUB USB 3.0 Cable - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Fix UBE To OPIO HUB USB 3.0 Cable with Cable Tie as below figure.

- Align the marks on UBE To OPIO HUB USB3.0 Cable(2EA) and UBE To OPIO HUB D-SUB 15Pin Cable and fix the cables using Cable Tie, DACT-100A



- Align the marks on cables and fix the cables using Cable Clamp CPFDM14-A.

**NOTE**

The UBE To OPIO HUB USB 3.0 Cable can be inserted to any of two USB ports (OPIO HUB & UBE-T).

2. Perform "Functional Checks" .

12.5.5.7.3 UBE To OPIO HUB USB 3.0 Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.7.4 UBE To OPIO HUB USB 3.0 Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.7.5 UBE To OPIO HUB USB 3.0 Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Color Mode functional checks on page 164</i>	
<i>PW/CW Doppler mode functional checks on page 167</i>	
<i>Top console adjustment control functional checks on page 150</i>	
<i>Power shut down on page 113</i>	

12.5.5.8 Replacement of the UBE TO OPIO HUB D-SUB 15PIN Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-117 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 30 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

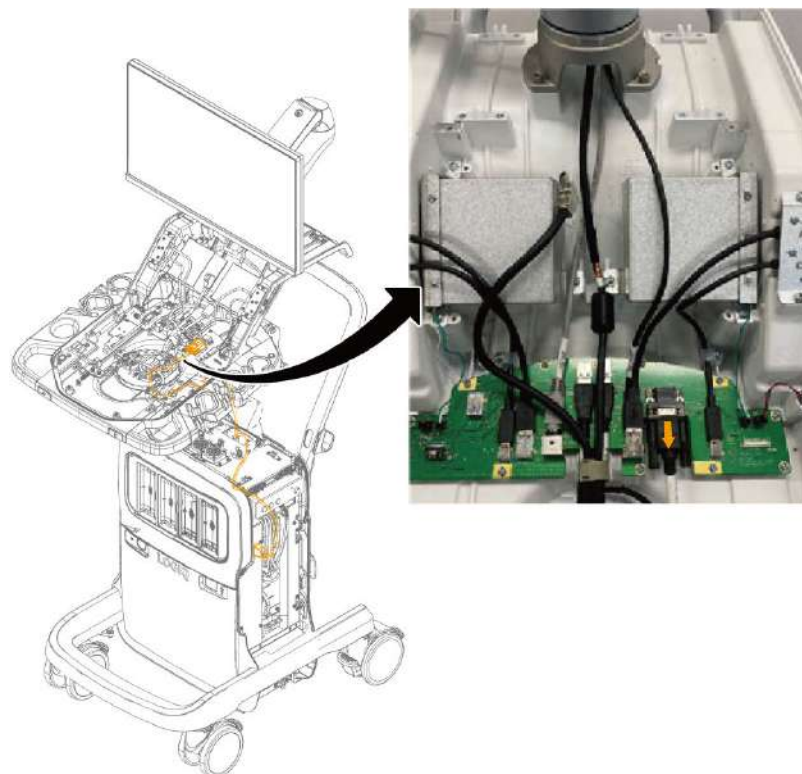
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
3. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.
4. Remove the Elevation Arm Cover Set-U. Refer to *Replacement of the Elevation Arm Cover Set-U* on page 509.
5. Remove the Top Cover Assy-T. Refer to *Replacement of the Top Cover Assy-T* on page 382.
6. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.5.5.8.1 UBE TO OPIO HUB D-SUB 15PIN Cable - Removal procedure

1. Unlock Cable Clamp and disconnect the UBE To OPIO HUB USB 3.0 Cable from OPIO HUB.
2. Rotate studs of the OPIO HUB D-SUB 15PIN Cable counterclockwise to disconnect the UBE TO OPIO HUB D-SUB 15PIN Cable.

Figure 12-216 Disconnecting 15PIN Cable



3. Cut 4 Cable Ties.

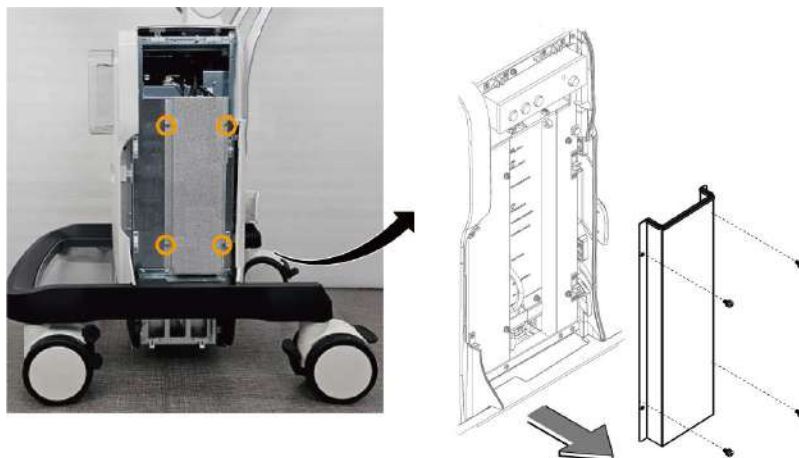
Figure 12-217 Cutting Cable Ties



4. Pull the UBE To OPIO Touch Panel HDMI Cable and the UBE To OPIO HUB USB 3.0 Cable to remove from the T2 OPIO BASE. Pull UBE TO OPIO HUB D-SUB 15PIN Cable to remove from the T2 OPIO BASE.

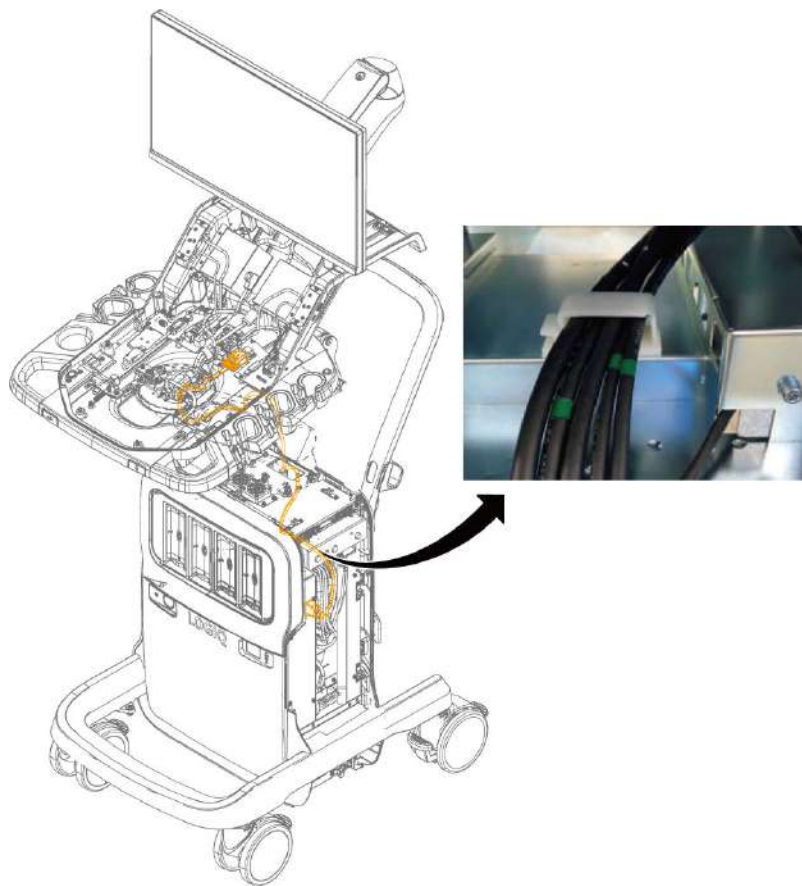
5. Unscrew 4 screws to remove the Unity Cable Cover Brkt

Figure 12-218 Removing Cable Cover Brkt



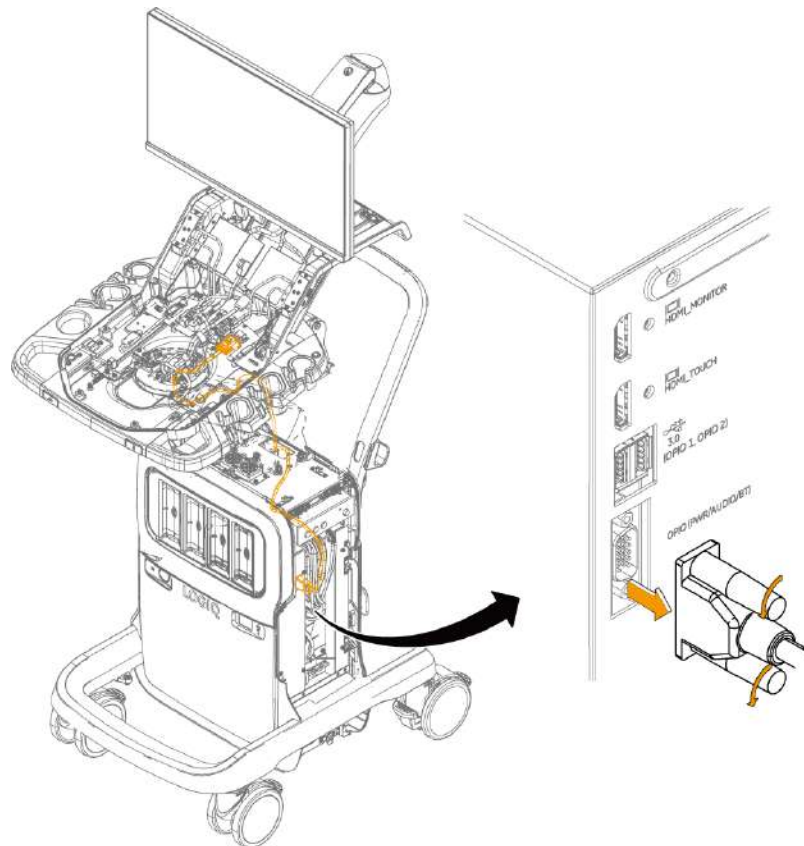
6. Unlock the Cable Clamp.

Figure 12-219 Unlocking Cable Clamp



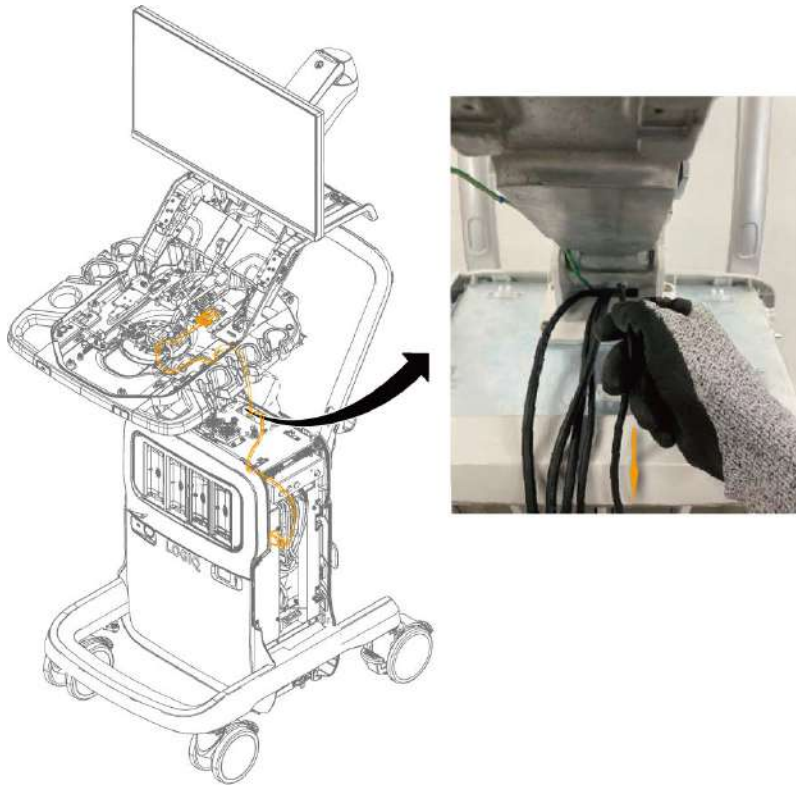
7. Rotate studs of the UBE TO OPIO HUB D-SUB 15PIN Cable counterclockwise to remove the UBE TO OPIO HUB D-SUB 15PIN Cable from the UBE.

Figure 12-220 Disconnecting 15PIN Cable from UBE



8. Pull the UBE To OPIO HUB D-SUB 15PIN Cable to remove from the console.

Figure 12-221 Pulling 15PIN cable



12.5.5.8.2 UBE TO OPIO HUB D-SUB 15PIN Cable - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Fix UBE To OPIO HUB D-SUB 15PIN Cable Tie as below figure

- Align the marks on UBE To OPIO HUB USB3.0 Cable(2EA) and UBE To OPIO HUB D-SUB 15Pin Cable and fix the cables using Cable Tie, DACT-100A



- Align the marks on UBE To OPIO Touch Panel HDMI Cable, GND Cable (Chassis To OPIO) and UBE To Monitor HDMI Cable and fix the cables using Cable Tie, DACT-100A.



- Align the marks on cables and fix the cables using Cable Clamp CPFDM14-A.



NOTE

The UBE To OPIO HUB USB 3.0 Cable can be inserted to any of two USB ports (OPIO HUB).

2. Perform "Functional Checks".

12.5.5.8.3 UBE TO OPIO HUB D-SUB 15PIN Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.8.4 UBE TO OPIO HUB D-SUB 15PIN Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.8.5 UBE TO OPIO HUB D-SUB 15PIN Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Color Mode functional checks on page 164</i>	
<i>PW/CW Doppler mode functional checks on page 167</i>	
<i>Top console adjustment control functional checks on page 150</i>	
<i>Power shut down on page 113</i>	

12.5.5.9 Replacement of the ACDC Link Cable To UBE Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-118 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

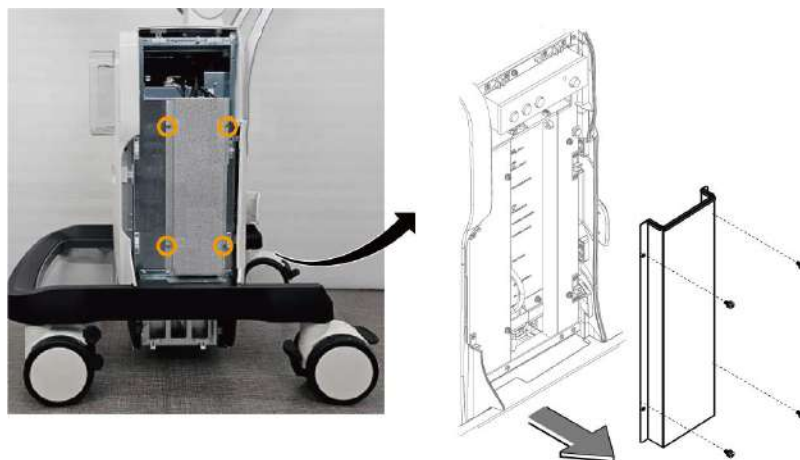
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
4. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
5. Remove the Front Cover Bottom Assy-T. Refer to *Replacement of the Front Cover Bottom Assy-T* on page 353.

12.5.5.9.1 ACDC Link Cable To UBE Cable -Removal procedure

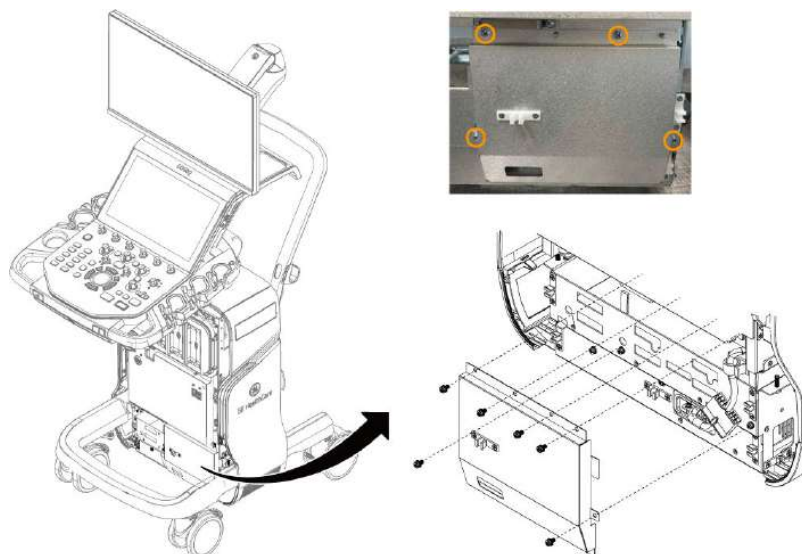
1. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-222 Removing Cable Cover Brkt



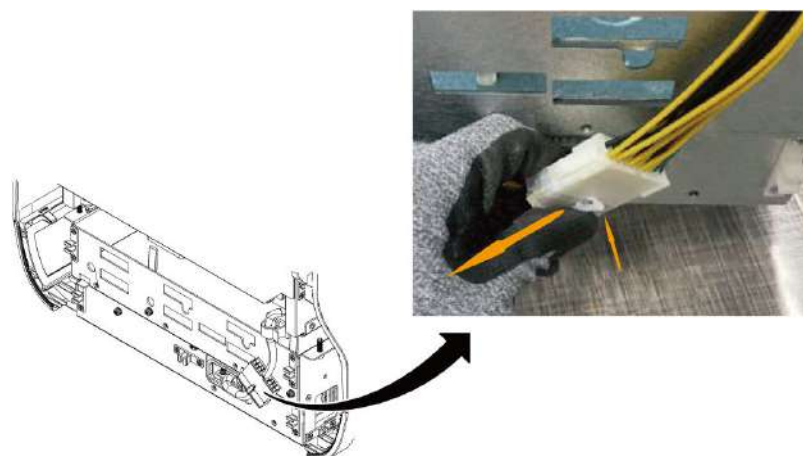
2. Unscrew 4 screws to remove the Unity Cable Hide Brkt from the console.

Figure 12-223 Removing Cable Hide Brkt



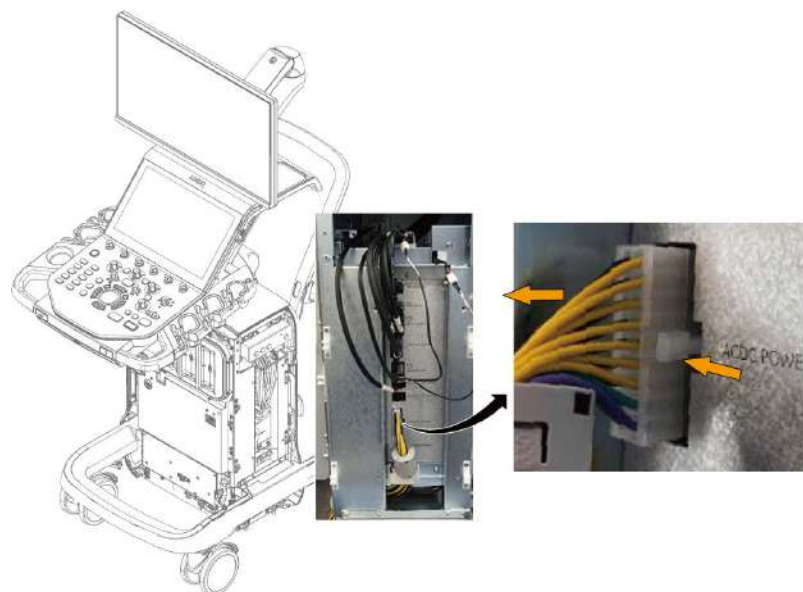
3. Unlock the Cable clamp and disconnect the ACDC Link Cable To UBE Cable from the Unity ACDC Assy.

Figure 12-224 Disconnecting Cable from ACDC Assy



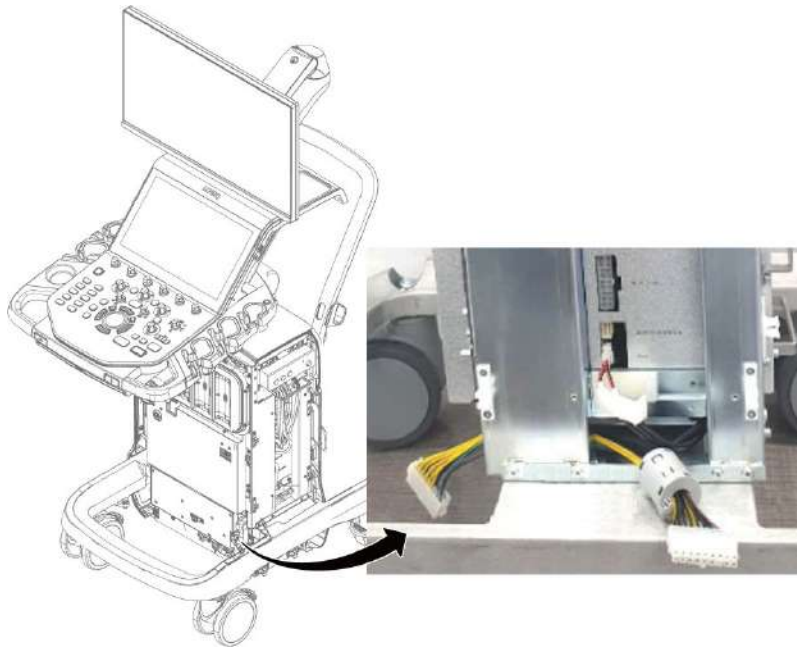
4. Disconnect the ACDC Link Cable To UBE Cable from the UBE.

Figure 12-225 Disconnecting Cable from UBE



5. Pull the ACDC Link Cable To UBE Cable to remove from the console.

Figure 12-226 Pulling cable



12.5.5.9.2 ACDC Link Cable To UBE Cable -Installation

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.5.5.9.3 ACDC Link Cable To UBE Cable -Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.9.4 ACDC Link Cable To UBE Cable -Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.9.5 ACDC Link Cable To UBE Cable -Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks on page 160</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.5.5.10 Replacement of the OPIO HUB To Monitor USB 2.0 Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-119 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver Nipper	Cut resistant gloves Knee Pad

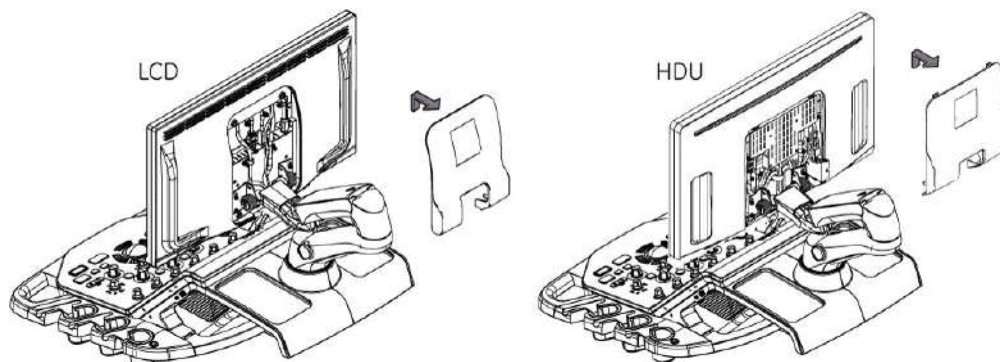
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T1 Monitor Arm Cover Set. Refer to *Replacement of the T1 Monitor Arm Cover Set* on page 395.
3. Remove the OPIO Top Cover Set-T. Refer to *Replacement of the OPIO Top Cover Set-T* on page 422.
4. Remove the UOPIO-T Assy. Refer to *Replacement of the UOPIO-T Assy* on page 447.

12.5.5.10.1 OPIO HUB To Monitor USB 2.0 Cable - Removal procedure

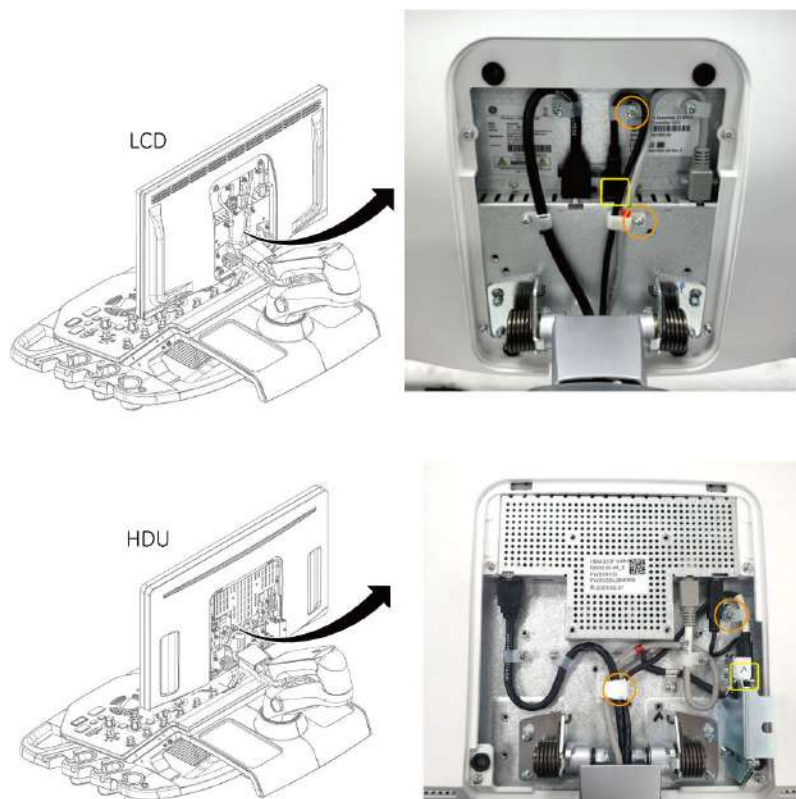
1. Remove the Monitor Cable Cover.

Figure 12-227 Removing Monitor Cable Cover



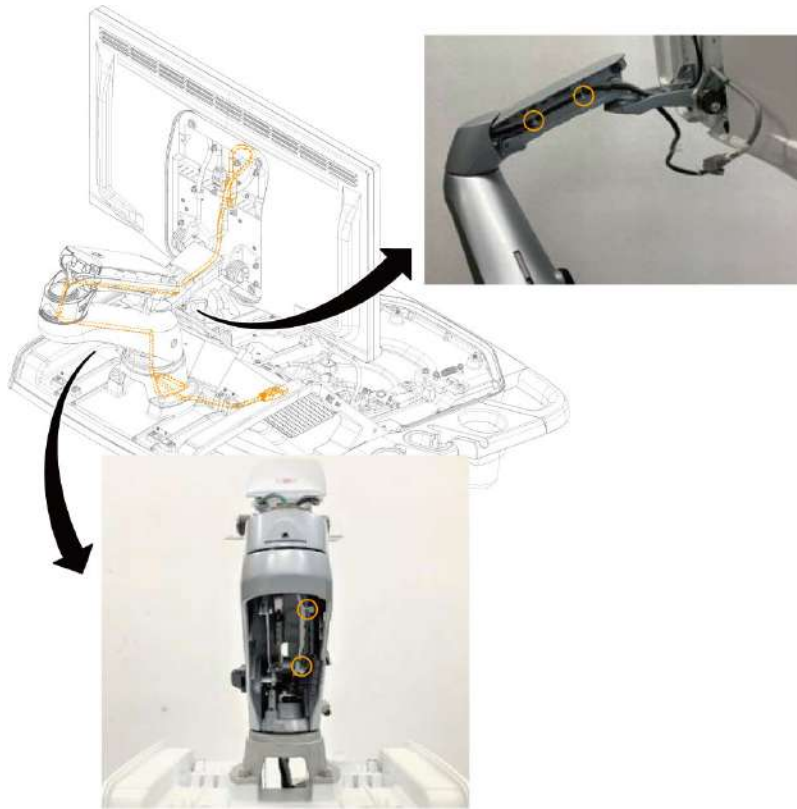
2. Unscrew 2 screw and Remove the plastic clamp from OPIO HUB To Monitor USB 2.0 Cable and disconnect the OPIO HUB To Monitor USB 2.0 Cable from the Monitor.

Figure 12-228 Disconnecting USB 2.0 Cable



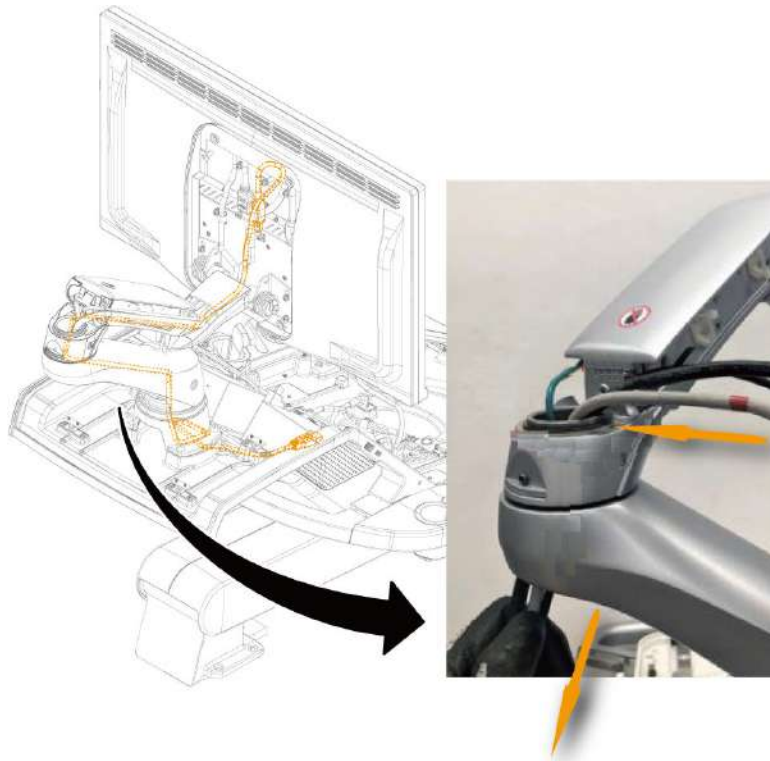
3. Cut 4 Cable Ties.

Figure 12-229 Cutting Cable Ties



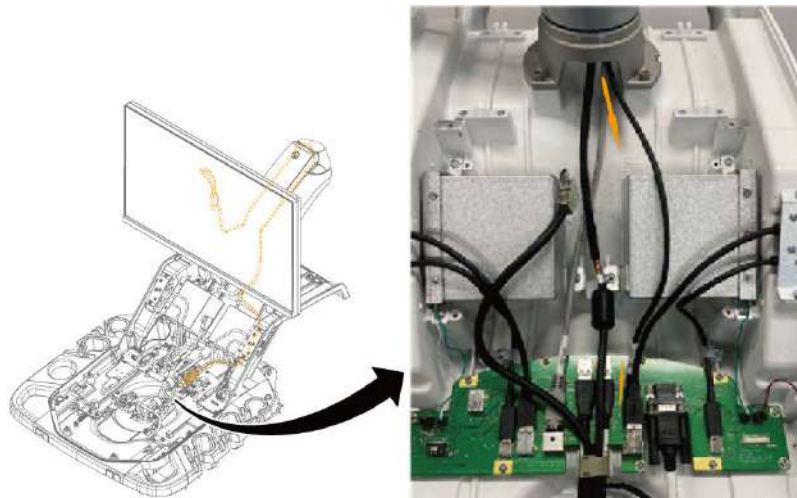
4. Pull the OPIO HUB To Monitor USB 2.0 Cable from the 2nd Arm.

Figure 12-230 Pulling USB 2.0 Cable from 2nd Arm



5. Pull the OPIO HUB To Monitor USB 2.0 Cable from 1st Arm.
6. Disconnect the OPIO HUB To Monitor USB 2.0 Cable from the OPIO HUB.

Figure 12-231 Removing USB 2.0 Cable



12.5.5.10.2 OPIO HUB To Monitor USB 2.0 Cable - Installation procedure

1. Parts to be installed in reverse order of removal

NOTE

Fix OPIO HUB To Monitor Power Cable with Cable Tie as below figure.

- Align and fix the white double lined mark on the UBE To Monitor HDMI Cable and green label attached on the OPIO HUB To Monitor Power Cable prior to second fixture using Cable Tie (2EA).



- Fix the white double lined mark on the cable prior to second fixture using Cable Tie(2EA).

**NOTE**

Align colored points



2. Perform "Functional Checks".

12.5.5.10.3 OPIO HUB To Monitor USB 2.0 Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.5.5.10.4 OPIO HUB To Monitor USB 2.0 Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.5.5.10.5 OPIO HUB To Monitor USB 2.0 Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.

12.6 Caster Parts Replacement

12.6.1 Replacement of the Castor Dual Lock N9

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-120 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
Two people	Approximately 15 minutes	24mm Socket or Adjustable wrench	Cut resistant gloves Knee Pad

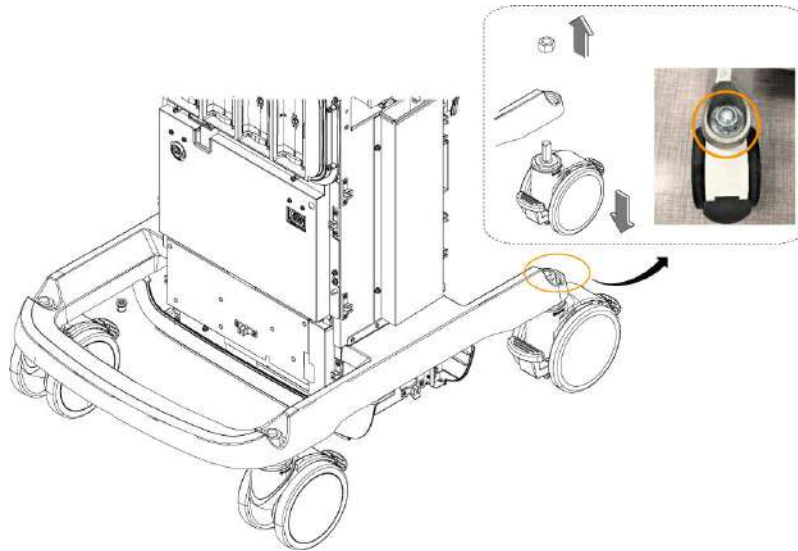
Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
3. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
4. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
5. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
6. Remove the Base Cover Set-T. Refer to *Replacement of the Base Cover Set-T* on page 373.

12.6.1.1 Castor Dual Lock N9 - Removal procedure

Unscrew the nut to remove the Castor Dual Lock N9 from the console.

Figure 12-232 Removing Castor Dual Lock N9



Notice

Press the caster wheel locks and ensure that they keep the system from moving.

Notice

Proceed with extreme caution and avoid system tipping over. The system weighs approximately 85kg.

12.6.1.2 Castor Dual Lock N9 - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.6.1.3 Castor Dual Lock N9 - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.6.1.4 Castor Dual Lock N9 - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.6.1.5 Castor Dual Lock N9 - Functional checks

Table 12-121 Functional checks

Functional Check	Service Record Debrief Script
<i>Brakes and direction lock functional checks on page 153</i>	Equipment passed all required checks and is ready for use.

12.6.2 Replacement of the Castor Total Lock N9

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-122 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
Two People	Approximately 15 minutes	24mm Socket or Adjustable wrench	Cut resistant gloves Knee Pad

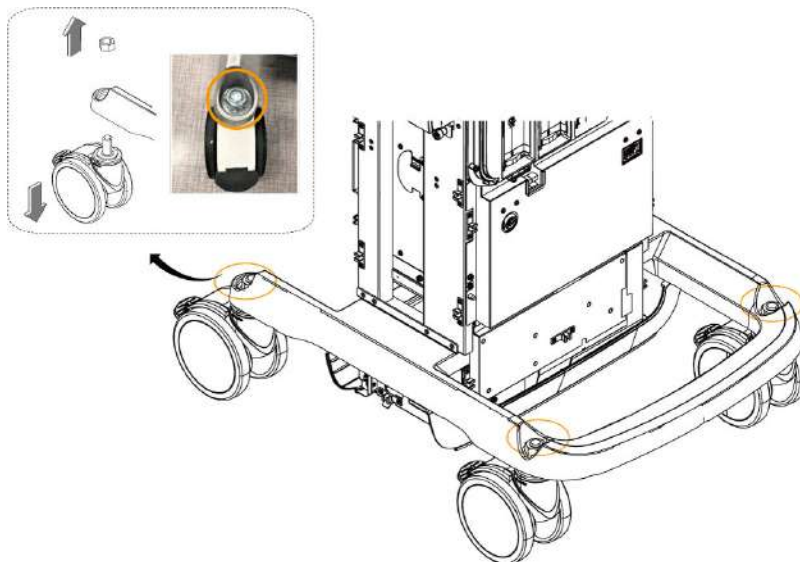
Preparations

1. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
2. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
3. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
4. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
5. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
6. Remove the Base Cover Set-T. Refer to *Replacement of the Base Cover Set-T* on page 373.

12.6.2.1 Castor Total Lock N9 - Removal procedure

Unscrew the 3 nuts to remove the Castor Total Lock N9 from the console.

Figure 12-233 Removing Castor Total Lock N9



Notice

Press the castor wheel locks and ensure that they keep the system from moving.



WARNING

Proceed with extreme caution and avoid system tipping over. The system weighs approximately 85kg.

12.6.2.2 Castor Total Lock N9 - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.6.2.3 Castor Total Lock N9 - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.6.2.4 Castor Total Lock N9 - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.6.2.5 Castor Total Lock N9 - Functional checks

Table 12-123 Functional checks

Functional Check	Service Record Debrief Script
<i>Brakes and direction lock functional checks on page 153</i>	Equipment passed all required checks and is ready for use.

12.7 Supported Probe Parts Replacement

For information on replacing supported probes, see *Connecting/disconnecting probes* on page 96.

12.8 Option and Peripheral Parts Replacement

12.8.1 Replacement of the Rear Basket Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

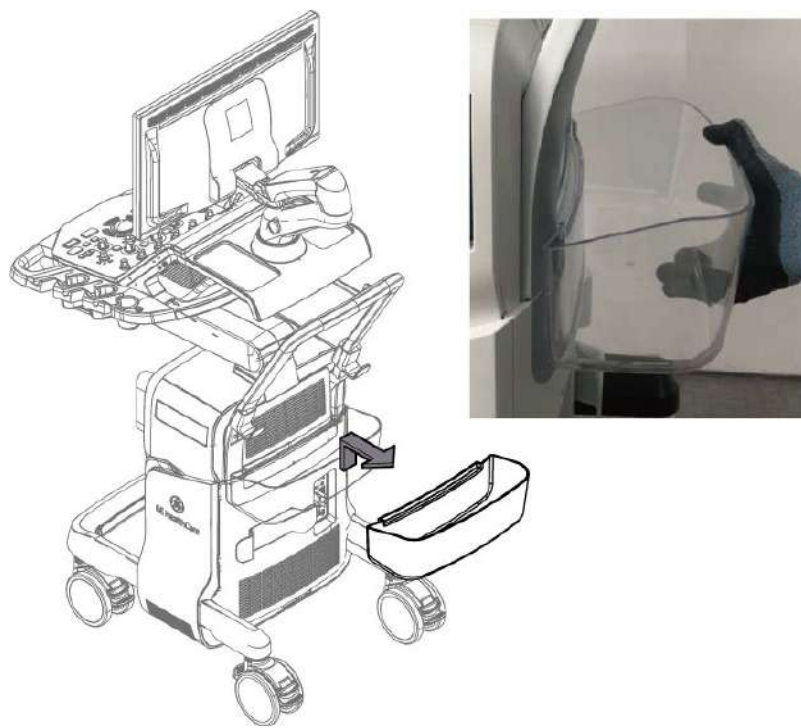
Table 12-124 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.8.1.1 Rear Basket Set-U - Removal procedure

Pull the Rear Basket Set-U to remove from the console.

Figure 12-234 Removing Rear Basket Set-U



12.8.1.2 Rear Basket Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.1.3 Rear Basket Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.1.4 Rear Basket Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.1.5 Rear Basket Set-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.8.2 Replacement of the Rear Handle Cable Hook Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

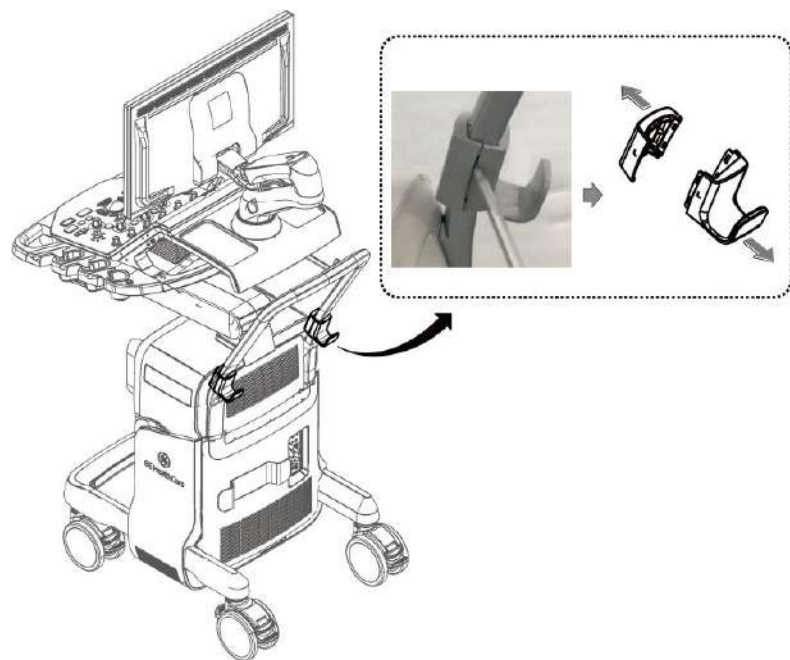
Table 12-125 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Flat Screwdriver	Cut resistant gloves Knee Pad

12.8.2.1 Rear Handle Cable Hook Set-U - Removal procedure

Release 2 snap fits to remove the Unity Handle Cable Hook L/R from the console

Figure 12-235 Removing Handle Cable Hook



12.8.2.2 Rear Handle Cable Hook Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.2.3 Rear Handle Cable Hook Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.2.4 Rear Handle Cable Hook Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.2.5 Rear Handle Cable Hook Set-U - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.8.3 Replacement of the OPIO Rear Tray Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

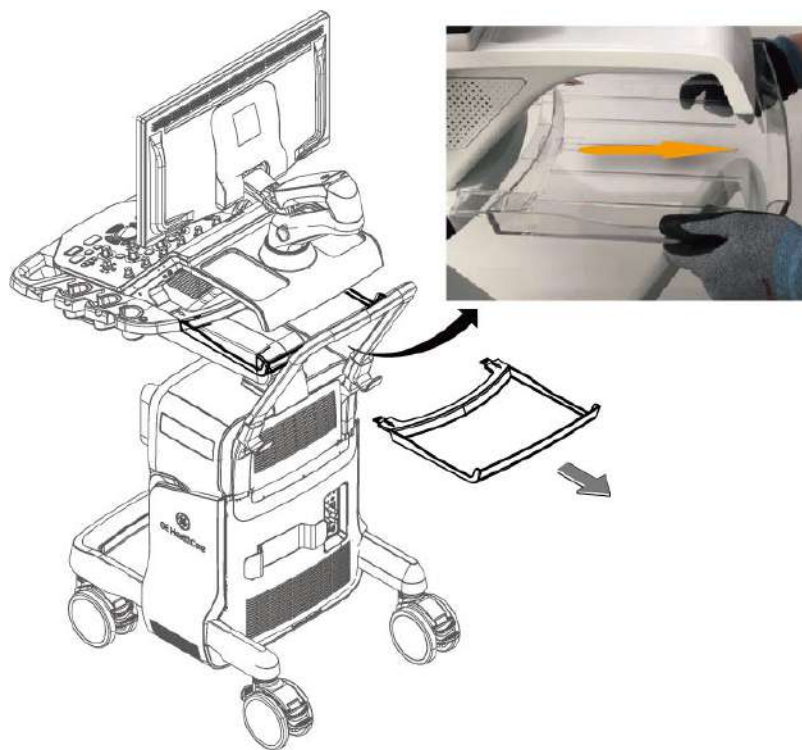
Table 12-126 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.8.3.1 OPIO Rear Tray Set-T - Removal procedure

Pull the OPIO Rear Tray Set-T to remove from the console.

Figure 12-236 Removing OPIO Rear Tray Set-T



12.8.3.2 OPIO Rear Tray Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.3.3 OPIO Rear Tray Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.3.4 OPIO Rear Tray Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.3.5 OPIO Rear Tray Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.8.4 Replacement of the T2 Gel Warmer

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-127 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Remove the Unity Gel Warmer Cable Cover. Refer to *Replacement of the Unity Gel Warmer Cable Cover* on page 441.

12.8.4.1 T2 Gel Warmer - Removal procedure

1. Disconnect the cable of T2 Gel Warmer from the console.

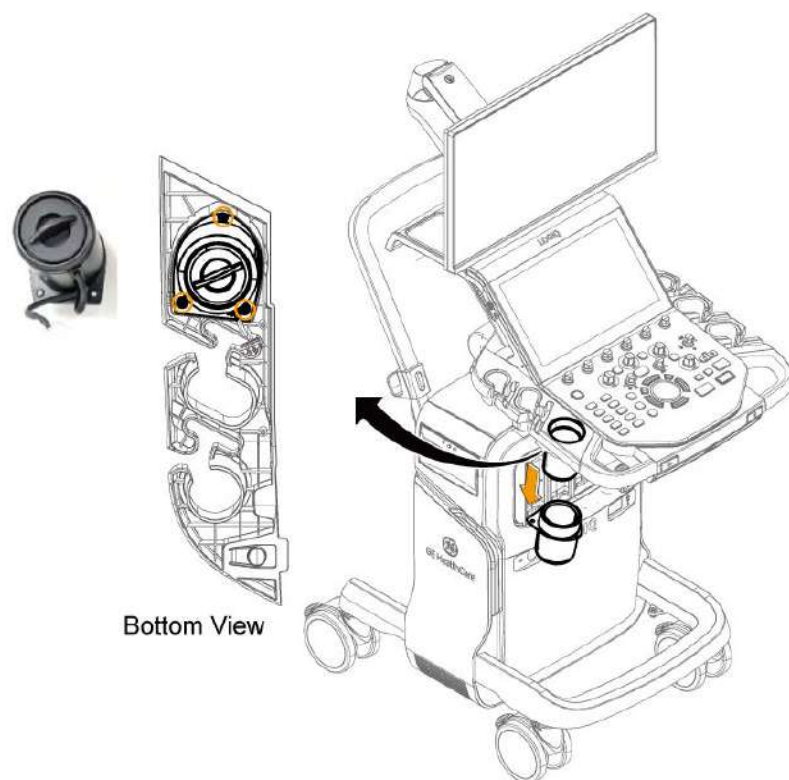
Figure 12-237 Disconnecting cable for T2 Gel Warmer



2. Remove the T2 Probe Holder Left as described in *Replacement of the Probe Holder Set-T* on page 425.

3. Unscrew 3 screws to remove the T2 Gel Warmer from the T2 Probe Holder Left.

Figure 12-238 Removing Gel Warmer



12.8.4.2 T2 Gel Warmer - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.4.3 T2 Gel Warmer - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.4.4 T2 Gel Warmer - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.4.5 T2 Gel Warmer - Functional checks

1. Insert gel bottle into Gel Warmer.
2. Power ON the warmer.
3. Check if the gel gets warm.

12.8.5 Replacement of the Gel Warmer Cap

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-128 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves Knee Pad

12.8.5.1 Gel Warmer Cap - Removal procedure

Twist the Gel Warmer Cap to remove it from the T2 Gel Warmer.

Figure 12-239 Removing Gel Warmer Cap



12.8.5.2 Gel Warmer Cap - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.5.3 Gel Warmer Cap - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.5.4 Gel Warmer Cap - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.5.5 Gel Warmer Cap - Functional checks

1. Insert gel bottle into Gel Warmer.
2. Power ON the warmer.
3. Check if the gel gets warm.

12.8.6 Replacement of the T2 Drawer Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-129 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Philips Screwdriver	Cut resistant gloves Knee Pad

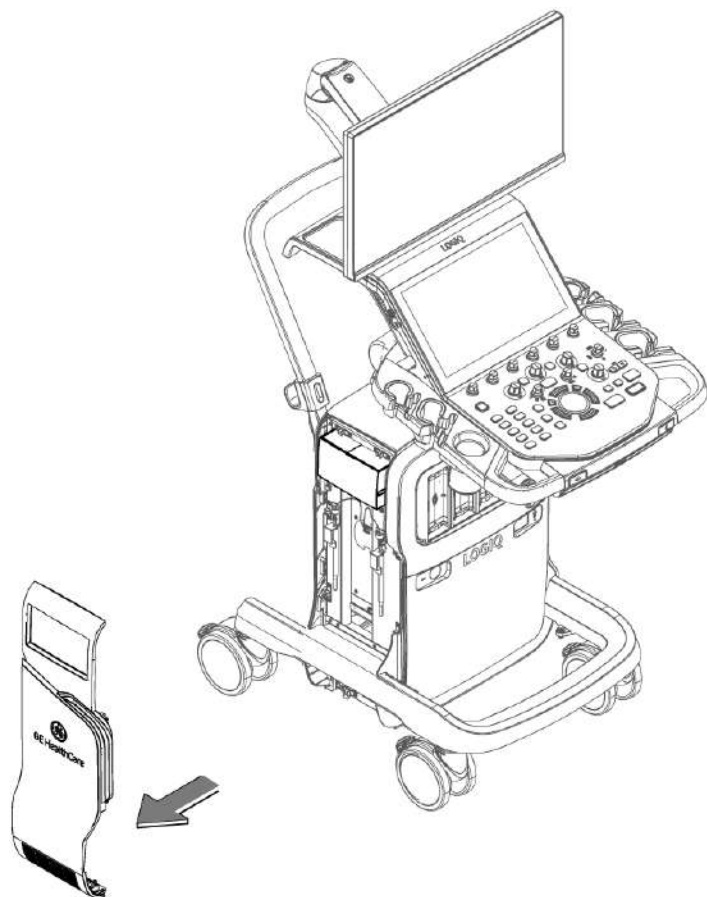
Preparations

1. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.

12.8.6.1 T2 Drawer Assy - Removal procedure

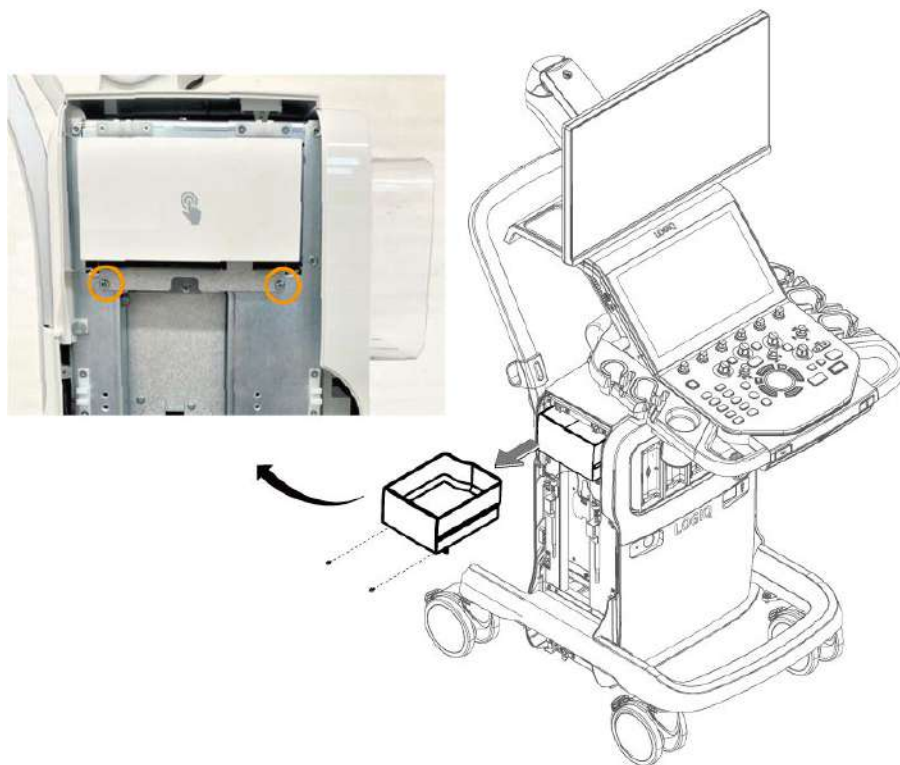
1. Remove the left side cover.

Figure 12-240 Removing left side cover



2. Unscrew 2 screws to remove the T2 Drawer Assy from the console.

Figure 12-241 Removing Drawer Assy



12.8.6.2 T2 Drawer Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.6.3 T2 Drawer Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.6.4 T2 Drawer Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.6.5 T2 Drawer Assy - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.8.7 Replacement of the Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

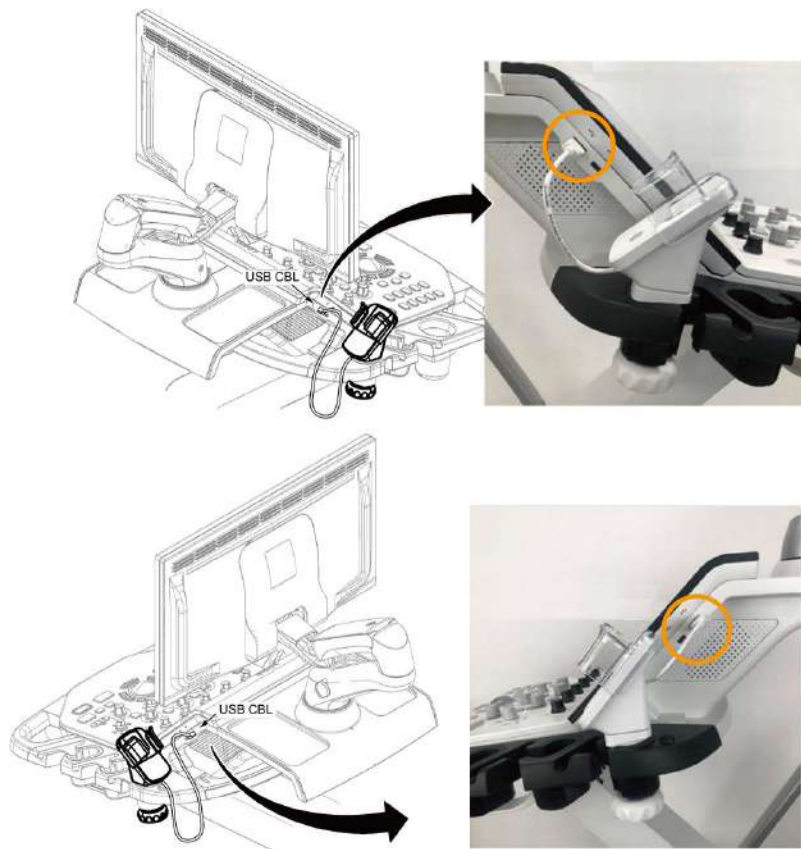
Table 12-130 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves

12.8.7.1 Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T - Removal procedure

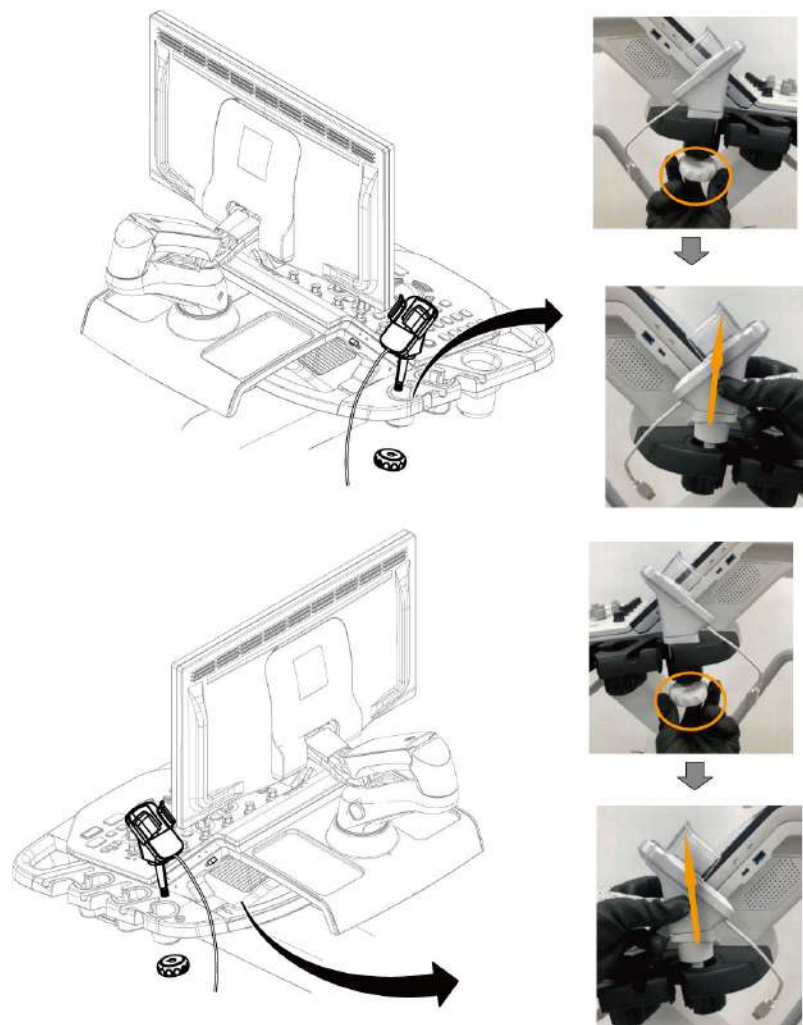
1. Disconnect the Melody Charger USB Cable from the console.

Figure 12-242 Disconnecting Melody Charger USB Cable



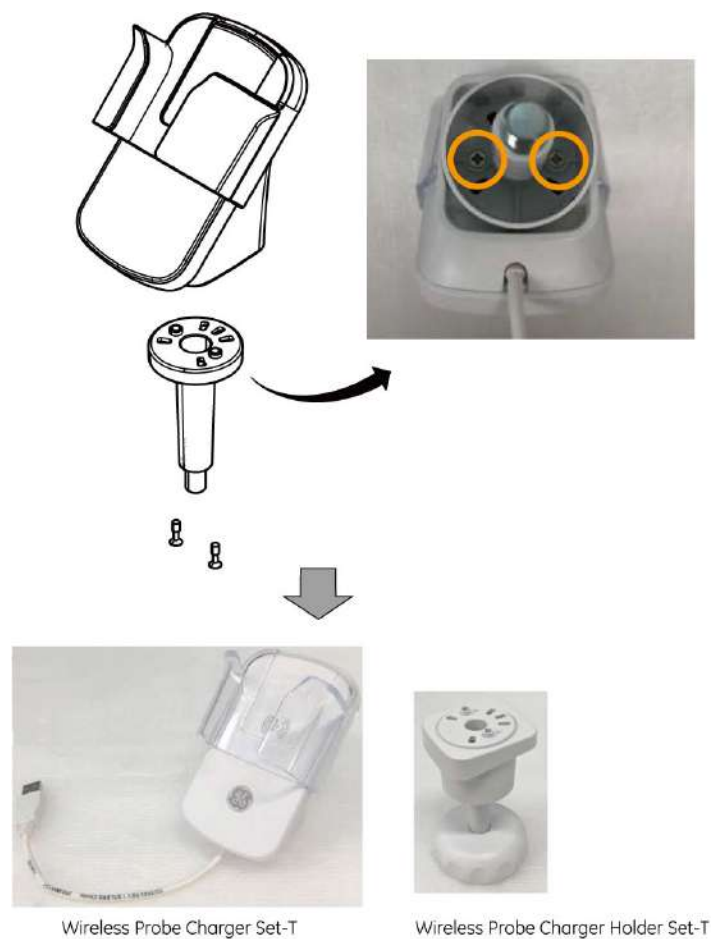
2. Unscrew the NUT and pull the Wireless Probe Charger from the console.

Figure 12-243 Removing Wireless Probe Charger



3. Unscrew 2 screws to separate Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T.

Figure 12-244 Separating Charger and Holder



12.8.7.2 Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.7.3 Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.7.4 Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.7.5 Wireless Probe Charger Set-T and Wireless Probe Charger Holder Set-T - Functional checks

Table 12-131 Functional checks

Functional Check	Service Record Debrief Script
<i>Vscan Air CL charger functional check</i> on page 183	Equipment passed all required checks and is ready for use.

12.8.8 Replacement of the A/N Keyboard Latch Set-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-132 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 10minutes	Phillips Screwdriver Long Nose Piler	Cut resistant gloves Knee Pad

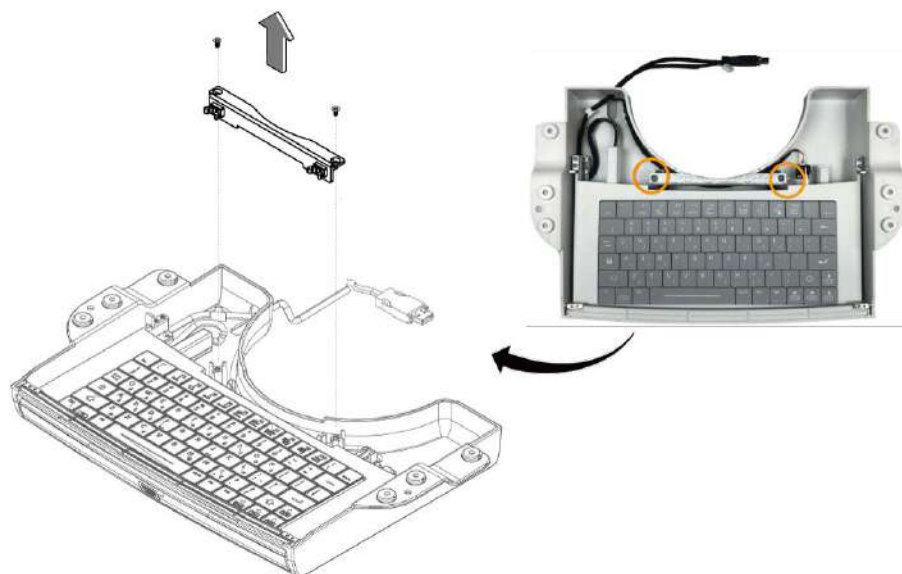
Preparations

1. Remove the T2 A/N Keyboard. Refer to *Replacement of the T2 A/N Keyboard* on page 695.

12.8.8.1 A/N Keyboard Latch Set-T - Removal procedure

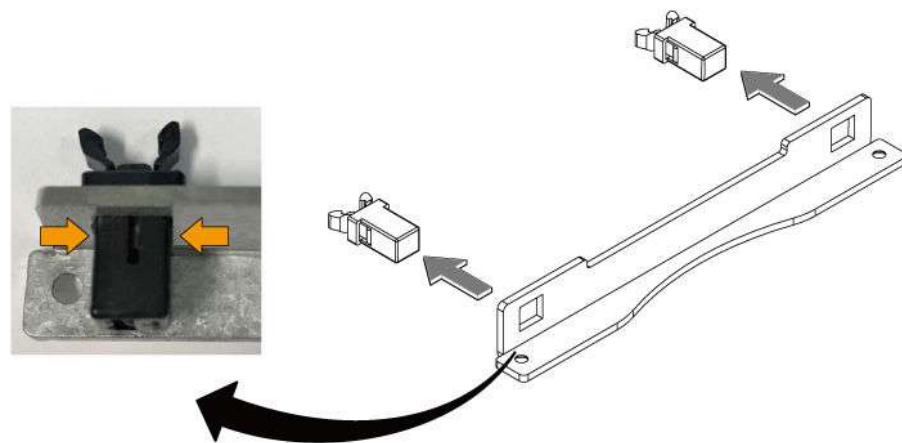
1. Unscrew 2 screws to remove the bracket from the T2 A/N Keyboard.

Figure 12-245 Removing bracket



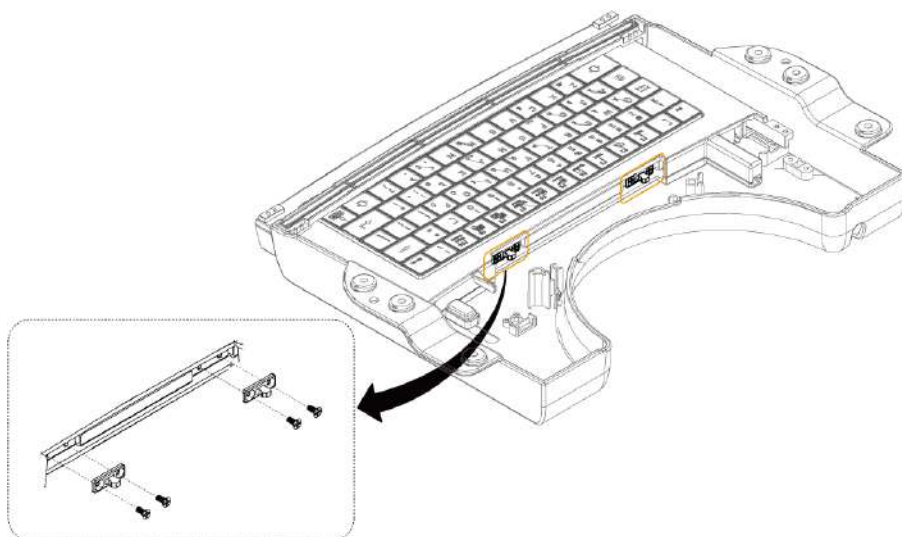
2. Release 4 snap fits to remove the latch CP-573 from the bracket.

Figure 12-246 Removing latch CP-573



3. Unscrew 4 screws to remove latch CP-573S-1 from the T2 A/N Keyboard.

Figure 12-247 Removing latch CP-573S-1



12.8.8.2 A/N Keyboard Latch Set-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.8.3 A/N Keyboard Latch Set-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.8.4 A/N Keyboard Latch Set-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.8.5 A/N Keyboard Latch Set-T - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.
Check A/N Keyboard Latch function.	

12.8.9 Replacement of the T2 A/N Keyboard

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-133 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	Phillips Screwdriver	Cut resistant gloves Knee Pad

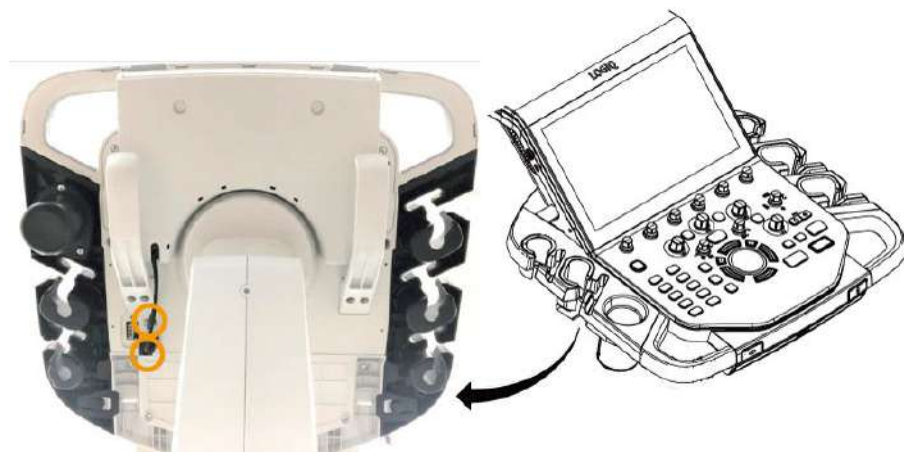
Preparations

1. Remove the Unity Gel Warmer Cable Cover as described in *Replacement of the Unity Gel Warmer Cable Cover* on page 441.

12.8.9.1 T2 A/N Keyboard - Removal procedure

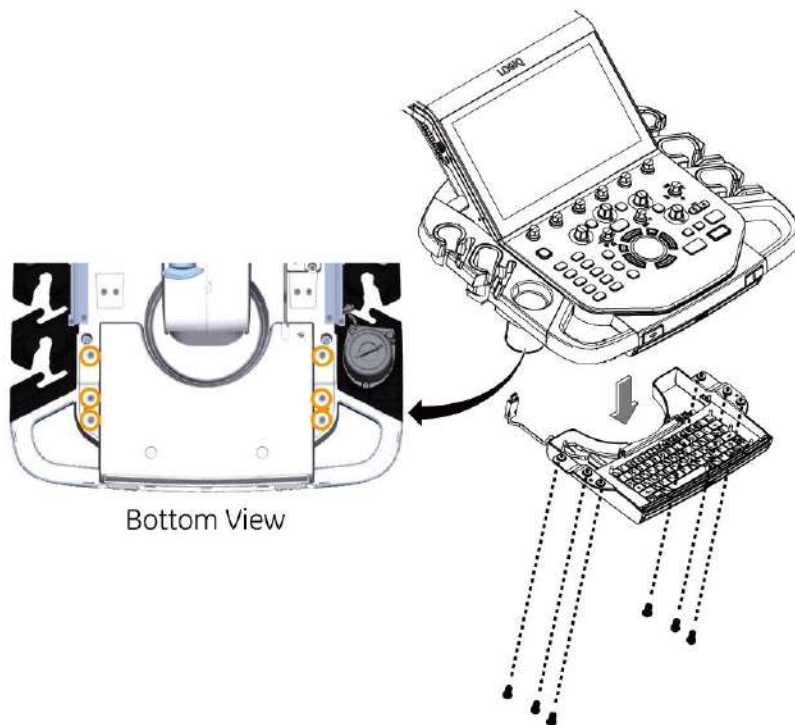
1. Disconnect 2 cables of T2 A/N Keyboard from the console.

Figure 12-248 Disconnecting cables for A/N Keyboard



2. Unscrew 6 screws to remove the T2 A/N Keyboard from the console.

Figure 12-249 Removing A/N Keyboard



12.8.9.2 T2 A/N Keyboard - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.9.3 T2 A/N Keyboard - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.9.4 T2 A/N Keyboard - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.9.5 T2 A/N Keyboard - Functional checks

Table 12-134 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Power shut down on page 113</i>	

12.8.10 Replacement of the TVTR Probe Holder T1

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-135 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 5 minutes	No tools required	Cut resistant gloves

12.8.10.1 TVTR Probe Holder T1 - Removal procedure

Release 1 snap fit and pull the TVTR Probe Holder T1 to remove from the console.

Figure 12-250 Removing TVTR Probe Holder



12.8.10.2 TVTR Probe Holder T1 - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.10.3 TVTR Probe Holder T1 - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.10.4 TVTR Probe Holder T1 - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

Verify that all screws and covers removed earlier have been installed.

12.8.10.5 TVTR Probe Holder T1 - Functional checks

Functional Check	Service Record Debrief Script
Visually inspect that there is no scratch or dirt on the replacement part.	Equipment passed all required checks and is ready for use.

12.8.11 Replacement of the WLAN-T and WLAN USB A Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-136 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

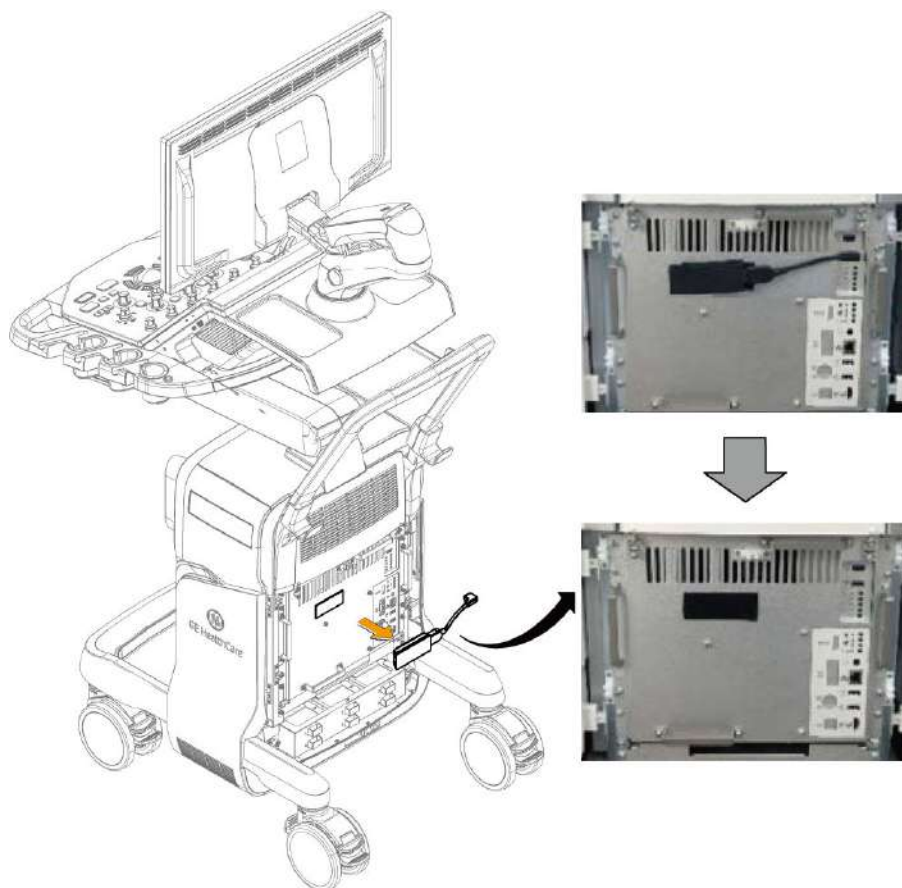
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.

12.8.11.1 WLAN-T and WLAN USB A Cable - Removal procedure

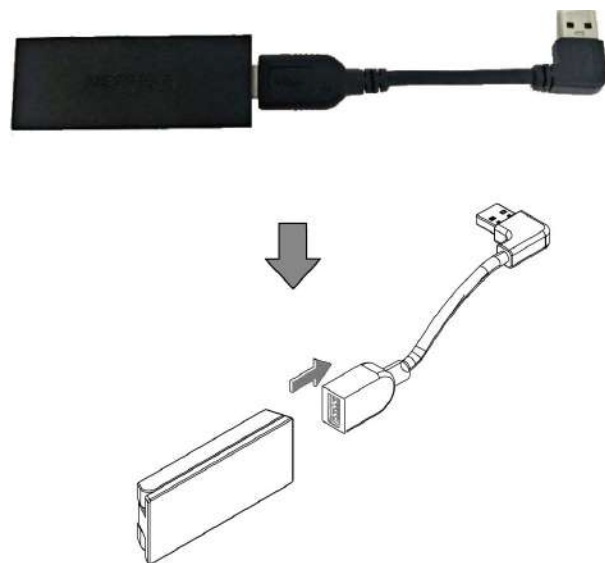
1. Remove the WLAN-T from the console.

Figure 12-251 Removing WLAN-T



2. Remove the WLAN USB A Cable from the WLAN-T

Figure 12-252 Removing WLAN USB A Cable



12.8.11.2 WLAN-T and WLAN USB A Cable - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.11.3 WLAN-T and WLAN USB A Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.11.4 WLAN-T and WLAN USB A Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.11.5 WLAN-T and WLAN USB A Cable - Functional checks

Table 12-137 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Basic measurement functional checks</i> on page 173	
<i>Power shut down</i> on page 113	

12.8.12 Replacement of the BW printer (UP-D898DC)

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-138 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

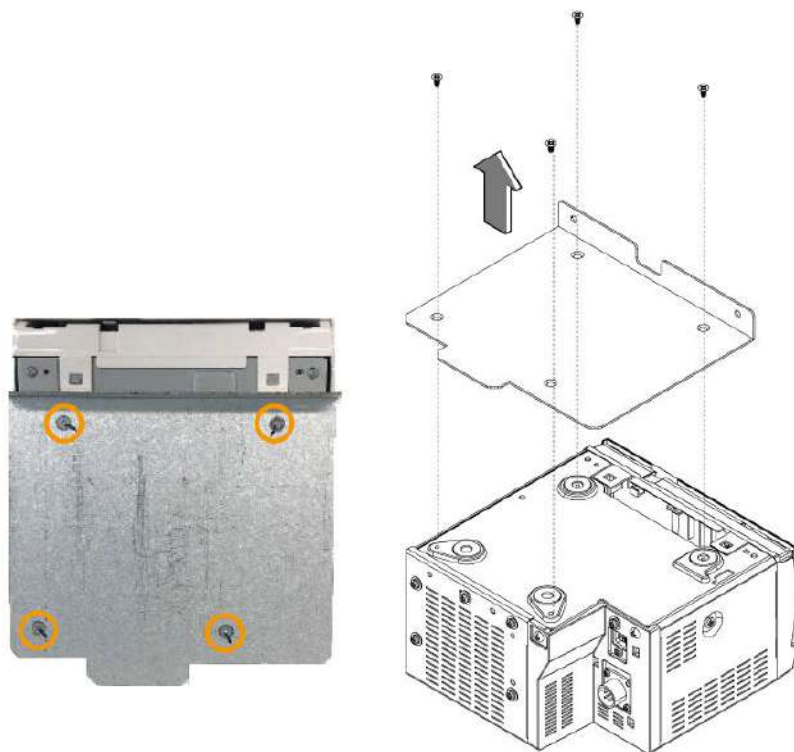
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
3. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
4. Remove the BW printer Option Cable Set-U. Refer to *Replacement of the BW printer Option Cable Set-U* on page 708.

12.8.12.1 BW printer (UP-D898DC) - Removal procedure

Unscrew 4 screws to remove the BW Printer from the Unity BW Printer Fix Brkt.

Figure 12-253 Removing BW Printer Fix Brkt



12.8.12.2 BW printer (UP-D898DC) - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.12.3 BW printer (UP-D898DC) - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.12.4 BW printer (UP-D898DC) - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.12.5 BW printer (UP-D898DC) - Functional checks

Table 12-139 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
Print by BW Printer	
<i>Power shut down</i> on page 113	

12.8.13 Replacement of the BW printer Option Cable Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-140 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

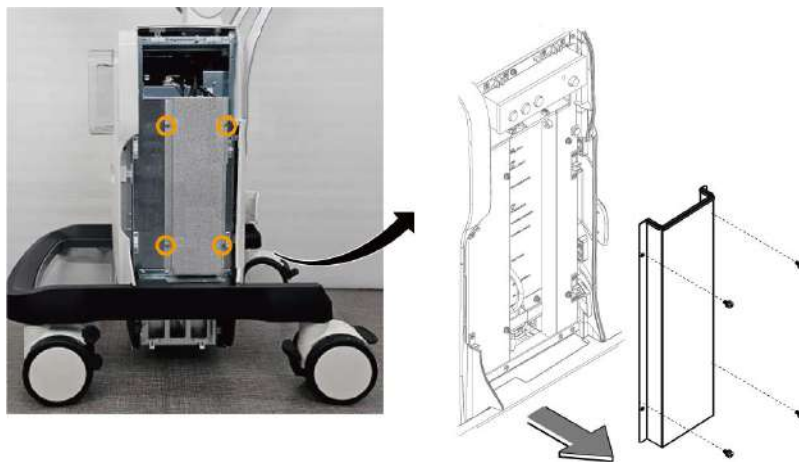
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.
3. Remove the T2 Side Cover R Assy. Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.8.13.1 BW printer Option Cable Set-U - Removal procedure

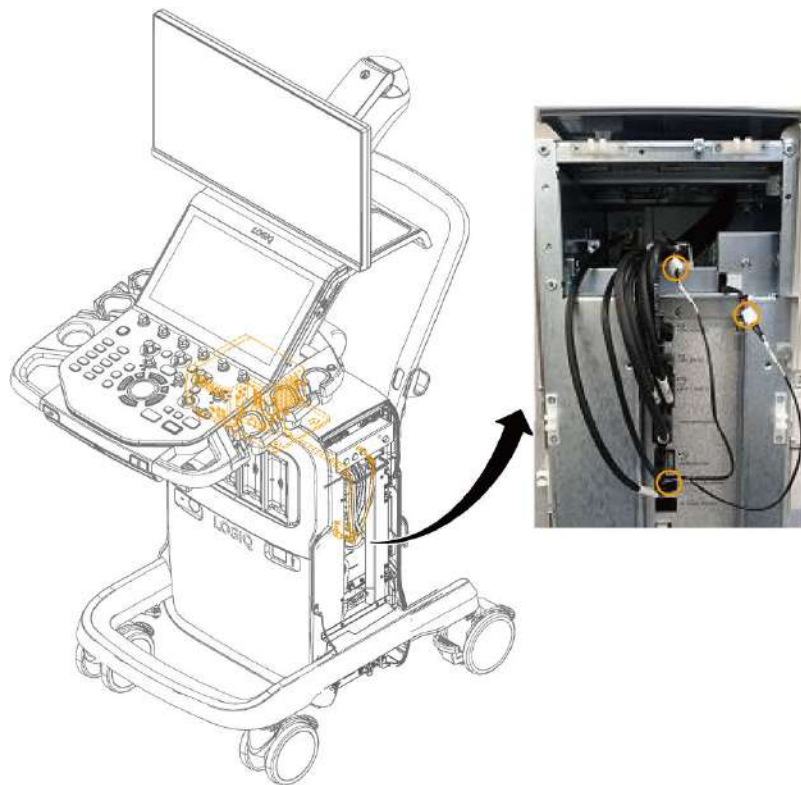
1. Unscrew 4 screws to remove the Unity Cable Cover Brkt

Figure 12-254 Removing Unity Cable Cover Brkt



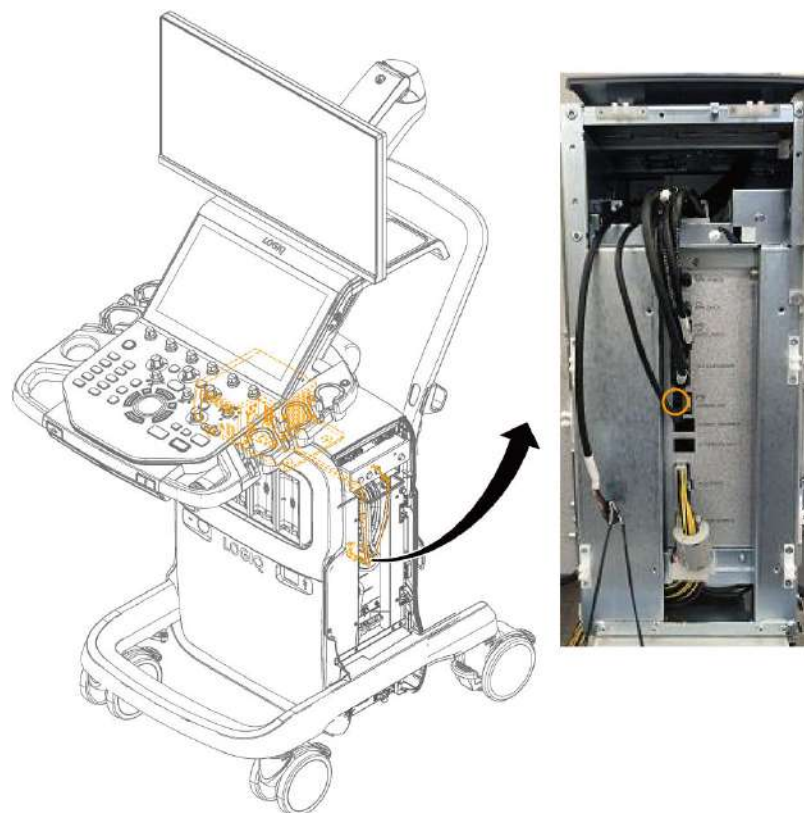
2. Disconnect the following cables.
 - a. Disconnect the Top Fan Cable and the Rear Top Fan Cable with UBE To BW Printer Power Cable.
 - b. Disconnect the UBE To BW Printer Power Cable from the console.

Figure 12-255 Disconnecting Fan and Power cables



3. Disconnect the UBE To BW Printer USB Cable from the console.

Figure 12-256 Disconnecting USB cable



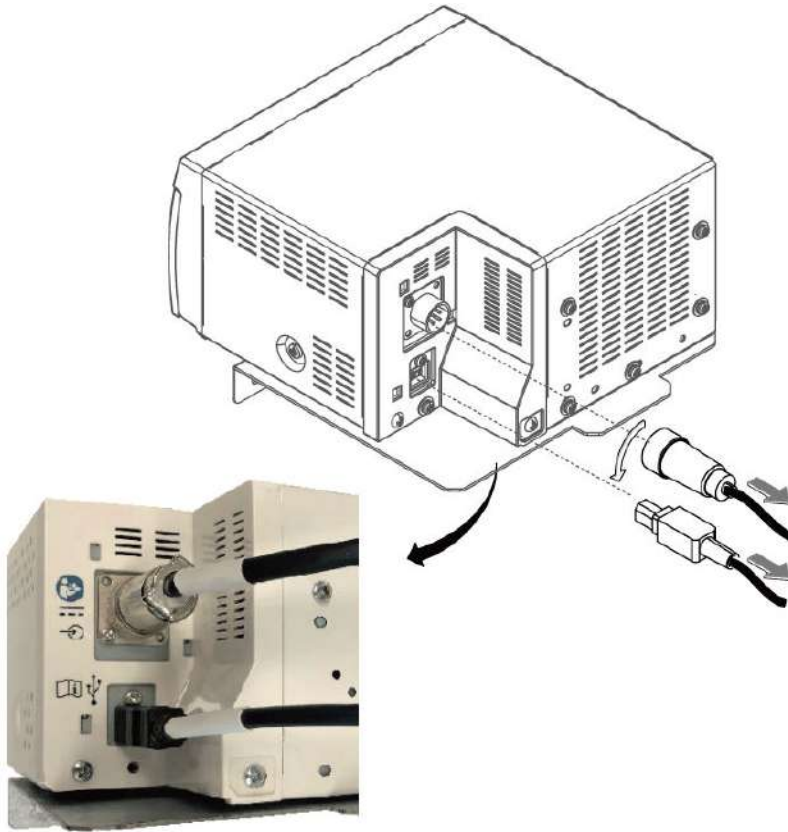
4. Unscrew 2 screws and remove the BW Printer Assy from the console.

Figure 12-257 Removing BW Printer Assy



5. Rotate the UBE To BW Printer Power Cable counterclockwise and disconnect from the BW Printer. Disconnect the UBE To BW Printer USB Cable to remove from the BW printer.

Figure 12-258 Disconnecting Power and USB cables



12.8.13.2 BW printer Option Cable Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.13.3 BW printer Option Cable Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.13.4 BW printer Option Cable Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.13.5 BW printer Option Cable Set-U - Functional checks

Table 12-141 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
Print by BW Printer	
<i>Power shut down</i> on page 113	

12.8.14 Replacement of the U-DCWD Set

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-142 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.8.14.1 U-DCWD Set - Removal procedure

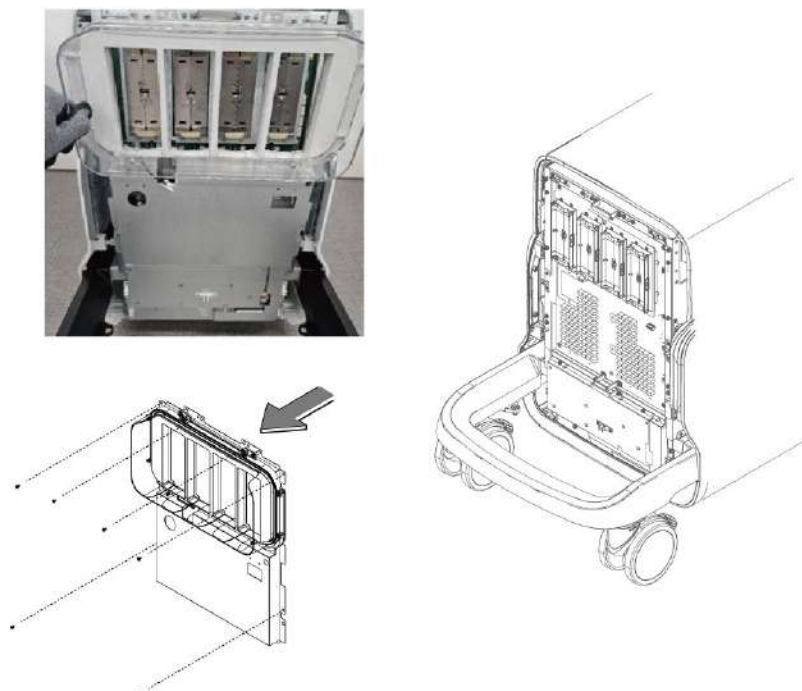
1. Push the button of Unity Protector Assy's connector and disconnect the Unity Protector Assy's Connector from the console.

Figure 12-259 Disconnecting Protector Assy's Connector



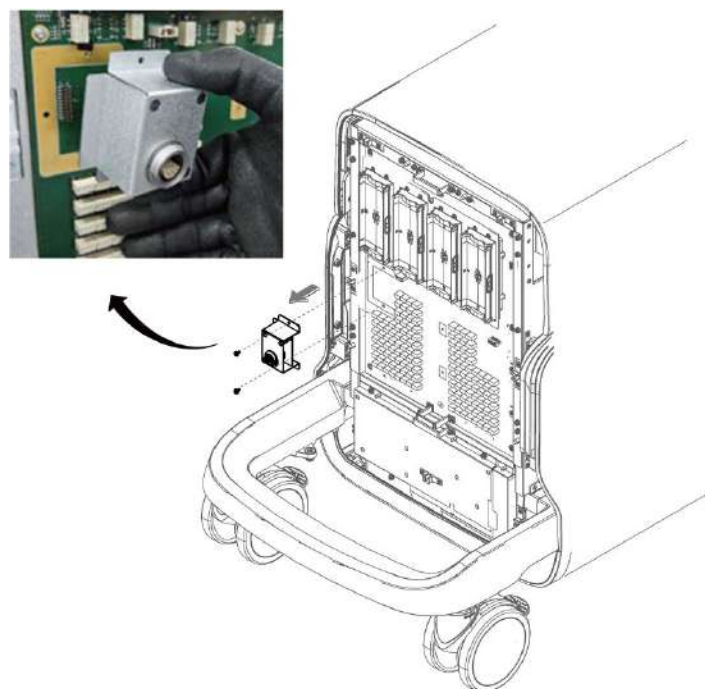
2. Unscrew 6 screws to remove the Unity UCO-T Front Cover Brkt..

Figure 12-260 Removing UCO-T Front Cover Brkt



3. Unscrew 2 screws to remove the U-DCWD Set from the console.

Figure 12-261 Removing U-DCWD Set



12.8.14.2 U-DCWD Set - Installation procedure

1. Install components in reverse order of removal.

2. Perform "Functional Checks".

12.8.14.3 U-DCWD Set - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.14.4 U-DCWD Set - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.14.5 U-DCWD Set - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>PW/CW Doppler mode functional checks on page 167</i>	
<i>CW Doppler mode functional checks on page 168</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.8.15 Replacement of the UECG Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-143 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.

12.8.15.1 UECG Assy - Removal procedure

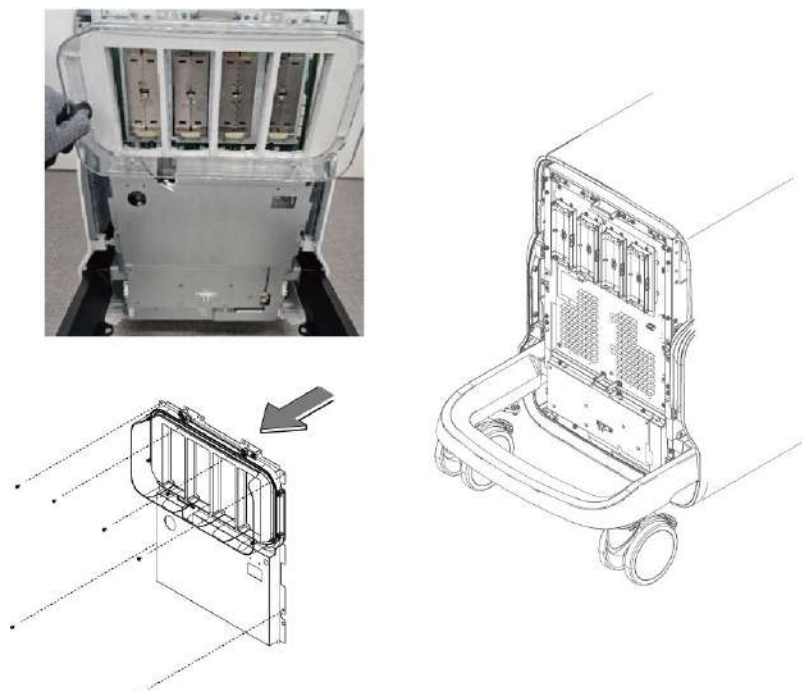
1. Push the button of Unity Protector Assy's connector and disconnect the Unity Protector Assy's Connector from the console.

Figure 12-262 Disconnecting Protector Assy's Connector



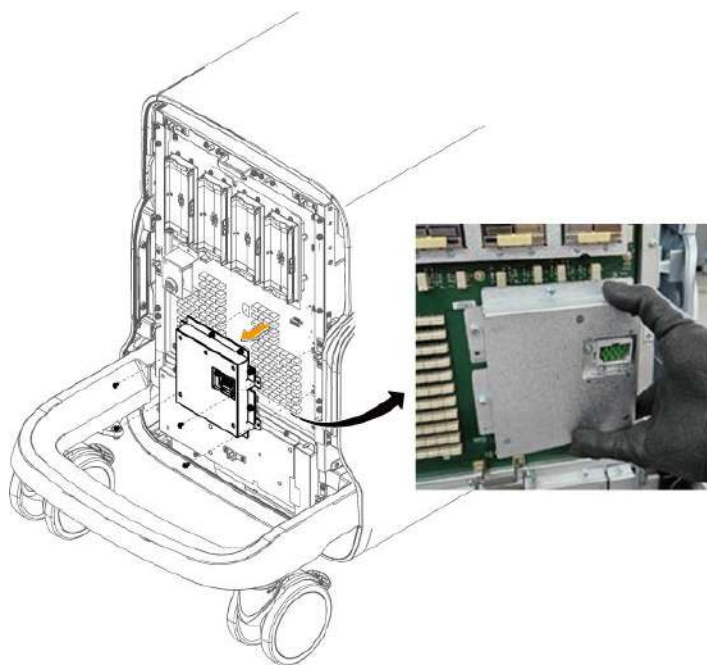
2. Unscrew 6 screws to remove the Unity UCO-T Front Cover Brkt.

Figure 12-263 Removing UCO-T Front Cover Brkt



3. Unscrew 4 screws to remove the UECG Assy.

Figure 12-264 Removing UECG Assy



12.8.15.2 UECG Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.15.3 UECG Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.15.4 UECG Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.15.5 UECG Assy - Functional checks

Table 12-144 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>PW/CW Doppler mode functional checks</i> on page 167	
<i>Basic measurement functional checks</i> on page 173	
<i>ECG functional checks</i> on page 176 Utility > Applications > Settings > ECG > Show ECG Tools. Connect cables. Press Display ECG Tab on the touch panel. Verify ECG signal displayed on monitor. Plug in the ECG cables with nothing attached so they pick up noise. Run diagnostics.	
<i>Volume Navigation with inside probe functional checks</i> on page 178	
<i>Power shut down</i> on page 113	

12.8.16 Replacement of the VNAV Option Cable Set-U

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-145 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

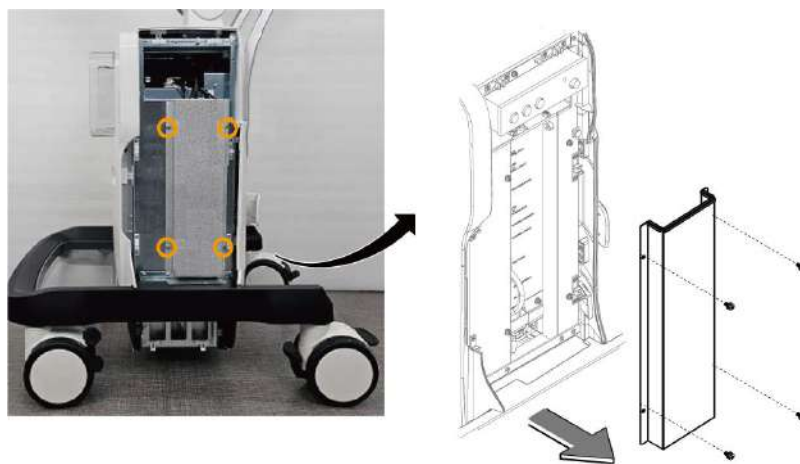
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy . Refer to *Replacement of the T2 Side Cover R Assy* on page 359.

12.8.16.1 VNAV Option Cable Set-U - Removal procedure

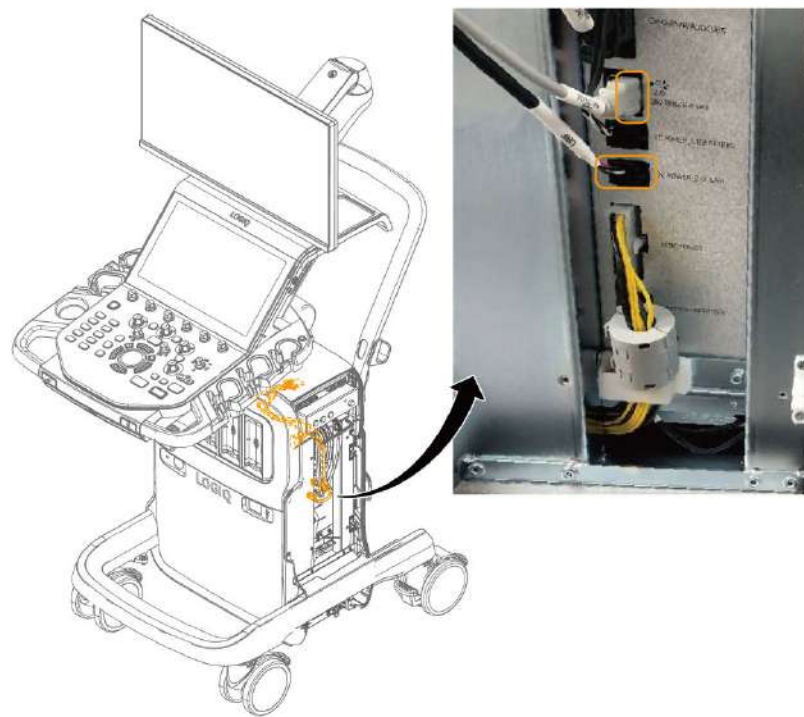
1. Unscrew 4 screws to remove the Unity Cable Cover Brkt.

Figure 12-265 Removing Unity Cable Cover Brkt



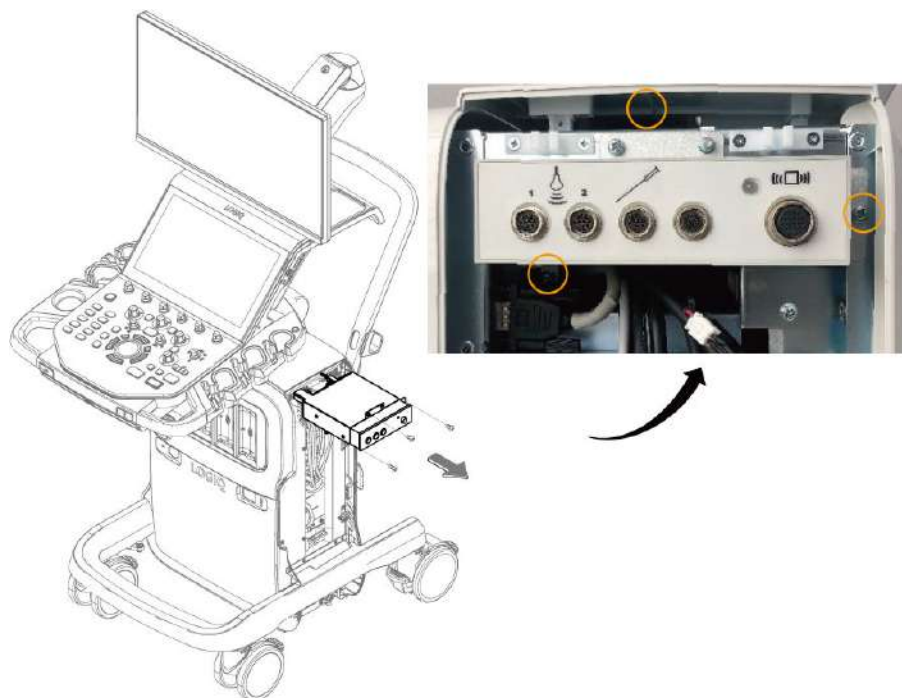
2. Disconnect UBE To VNAV USB Cable & UVNAV PWR Cable to remove from the console.

Figure 12-266 Disconnecting USB and Power cables



3. Unlock Cable Clamp and unscrew 3 screws to remove the VNAV Assy.

Figure 12-267 Removing the VNAV Assy



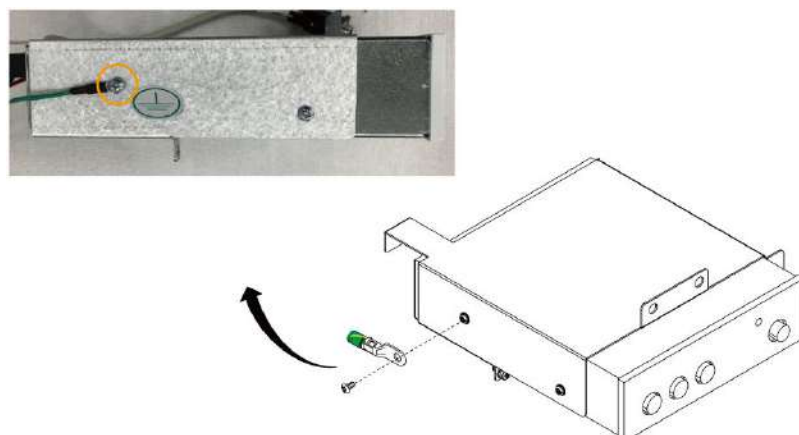
4. Disconnect the UCO To V-NAV Signal Cable from the VNAV Assy.

Figure 12-268 Disconnecting Signal Cable



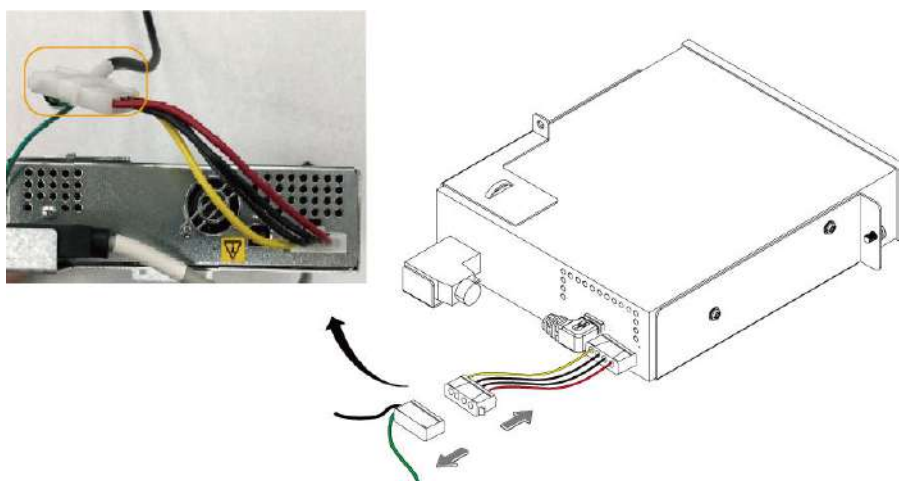
5. Unscrew 1 screw to remove the UVNAV GND Cable from the VNAV Assy.

Figure 12-269 Removing GND Cable



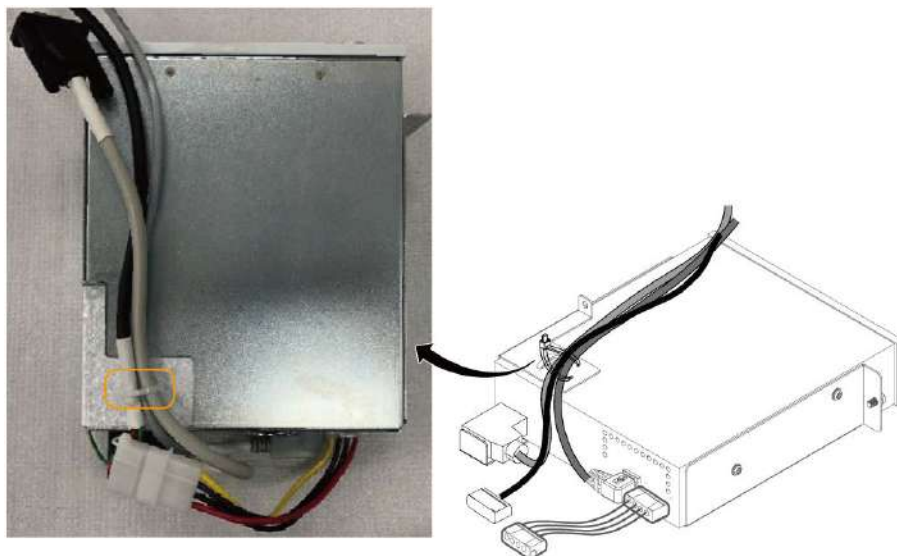
6. Disconnect the UVNAV PWR Cable from the VNAV Assy.

Figure 12-270 Disconnecting PWR Cable



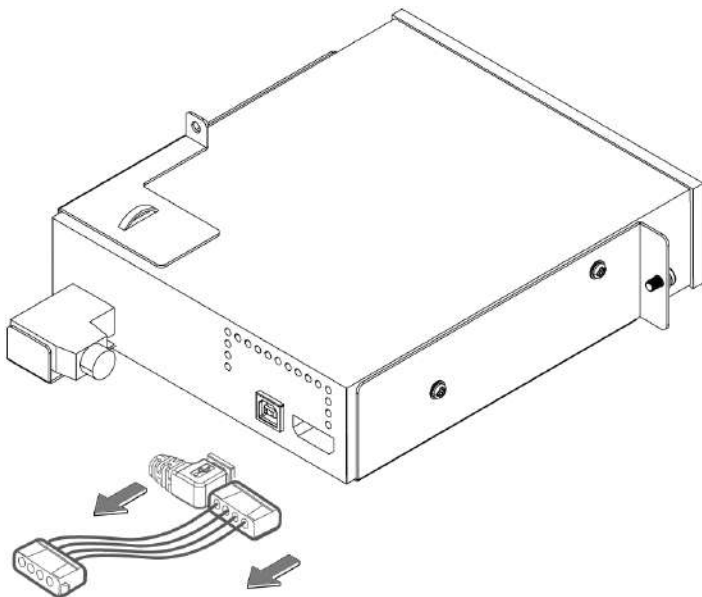
7. Cut the cable tie.

Figure 12-271 Cutting cable tie



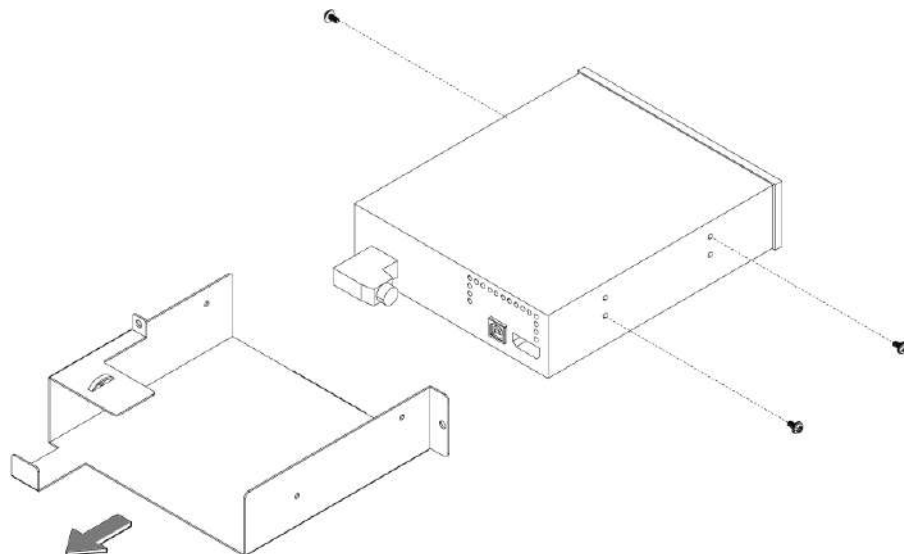
8. Disconnect the power adapter and USB cable.

Figure 12-272 Disconnect power adapter and USB cable



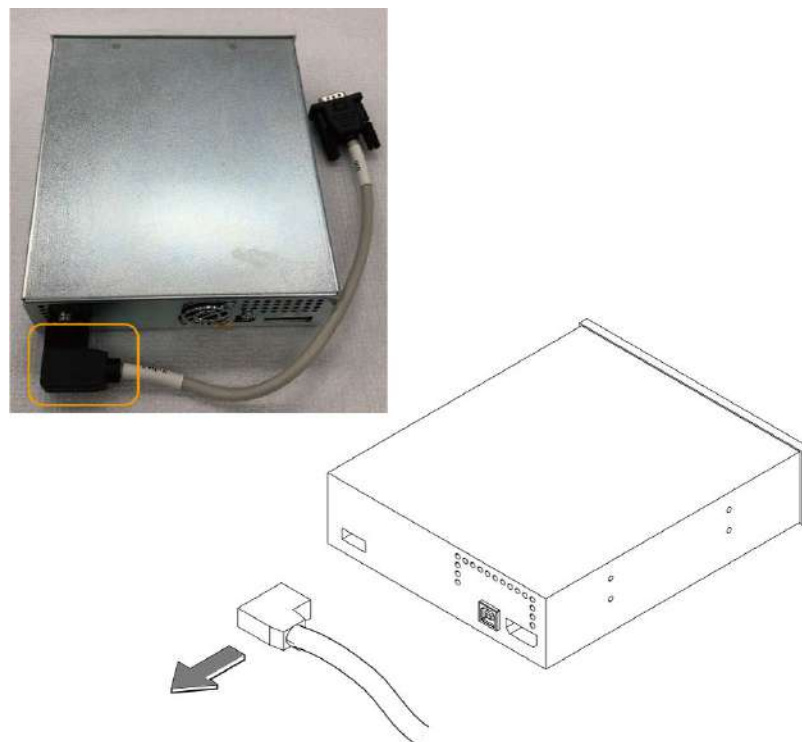
9. Unscrew 3 screws to remove the T2 VNAV FIX BRKT from the VNAV.

Figure 12-273 Removing FIX BRKT



10. Disconnect the UCO To V-NAV Signal Cable to the VNAV.

Figure 12-274 Disconnecting Signal Cable



12.8.16.2 VNAV Option Cable Set-U - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.16.3 VNAV Option Cable Set-U - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.16.4 VNAV Option Cable Set-U - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.16.5 VNAV Option Cable Set-U - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Basic measurement functional checks</i> on page 173	
<i>Volume Navigation with inside probe functional checks</i> on page 178	
<i>Power on/boot up</i> on page 98	

12.8.17 Replacement of the 3DG DriveBay 2+ EU and Power Adapter Cable

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-146 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

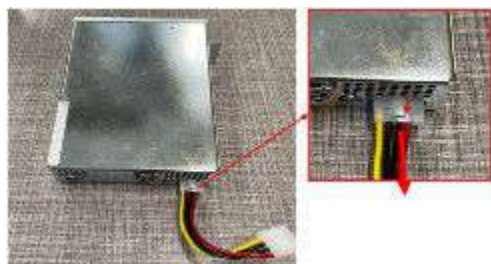
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover R Assy . Refer to *Replacement of the T2 Side Cover R Assy* on page 359.
3. Remove the VNAV Option Cable Set-U . Refer to *Replacement of the VNAV Option Cable Set-U* on page 721.

12.8.17.1 3DG DriveBay 2+ EU and Power Adapter Cable - Removal procedure

Push the button of Power Adapter Cable to disconnect Power Adapter Cable from the VNAV Assy.

Figure 12-275 Disconnecting Power Adapter Cable



12.8.17.2 3DG DriveBay 2+ EU and Power Adapter Cable - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.17.3 3DG DriveBay 2+ EU and Power Adapter Cable - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.17.4 3DG DriveBay 2+ EU and Power Adapter Cable - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.17.5 3DG DriveBay 2+ EU and Power Adapter Cable - Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>Basic measurement functional checks on page 173</i>	
<i>Volume Navigation with inside probe functional checks on page 178</i>	
<i>Power on/boot up on page 98</i>	

12.8.18 Replacement of the U-WIFI Module Assy

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-147 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

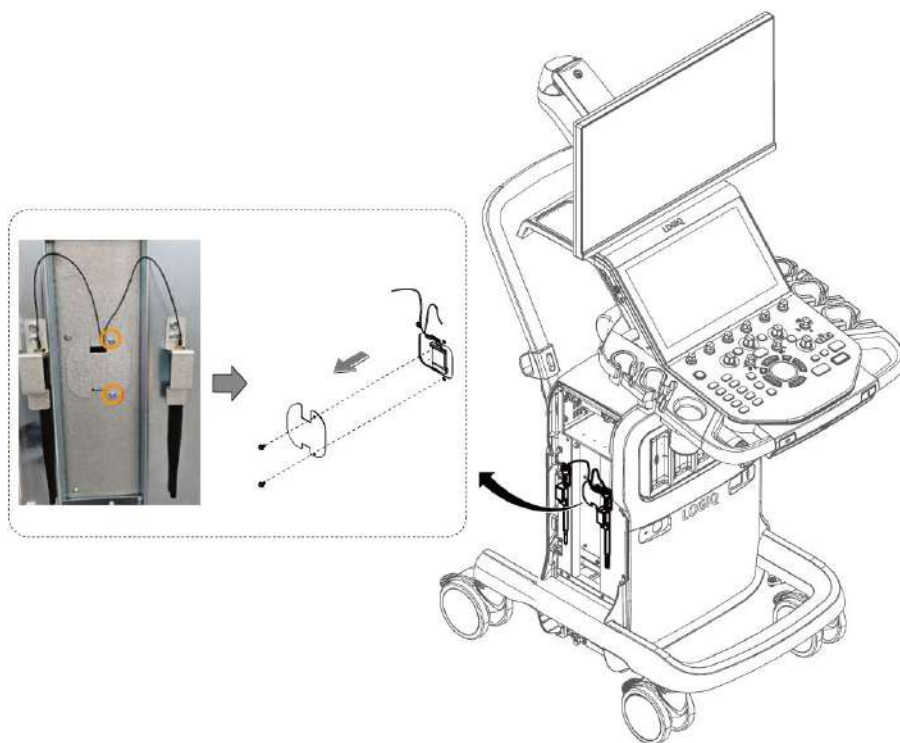
Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the T2 Side Cover L Assy. Refer to *Replacement of the T2 Side Cover L Assy* on page 356.

12.8.18.1 U-WIFI Module Assy - Removal procedure

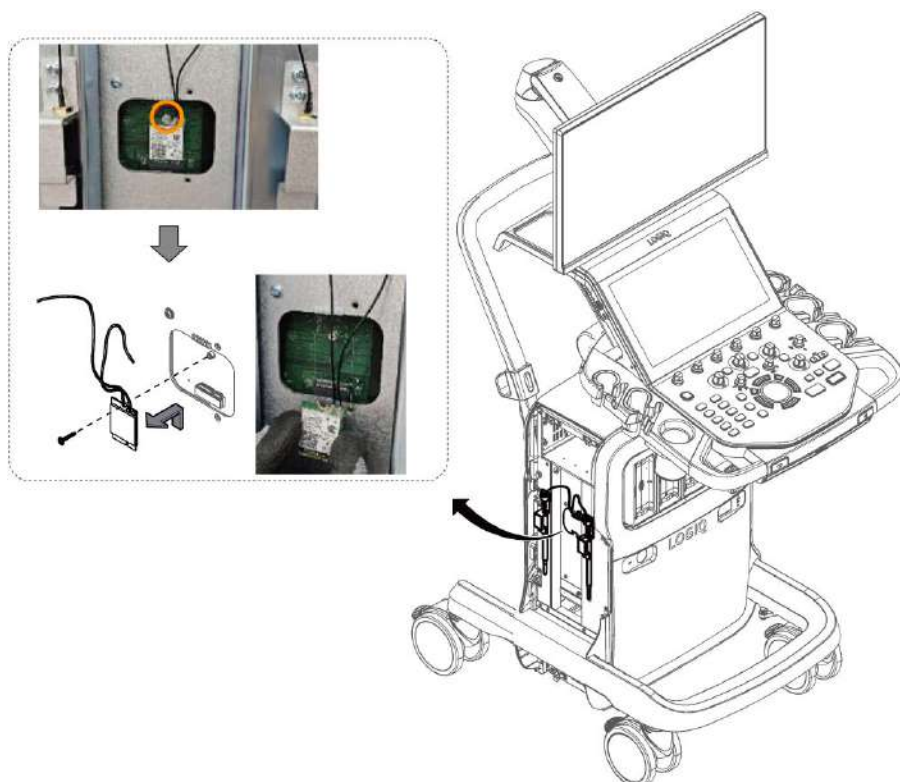
1. Unscrew 2 screws to remove the Cover bracket.

Figure 12-276 Removing Cover bracket



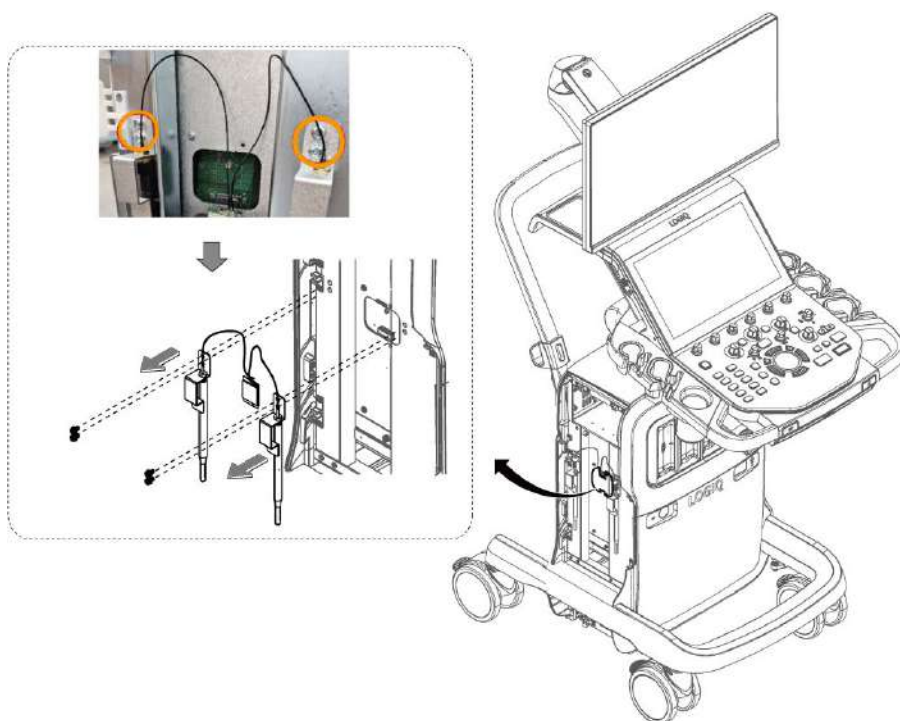
2. Unscrew 1 screw of the WIFI module Assy and disconnect the WIFI module from the UEPP connector.

Figure 12-277 Removing WIFI module Assy



3. Unscrew 4 screws to remove the WIFI Module Assy from the console.

Figure 12-278 Removing WIFI Module Assy



12.8.18.2 U-WIFI Module Assy - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.18.3 U-WIFI Module Assy - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.18.4 U-WIFI Module Assy - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.18.5 U-WIFI Module Assy - Functional checks

Table 12-148 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>B-Mode functional checks</i> on page 160	
<i>System CFM and PWD functional checks</i> on page 163	
<i>Basic measurement functional checks</i> on page 173	
<i>Power on/boot up</i> on page 98	

12.8.19 Replacement of the UMC-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-149 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.

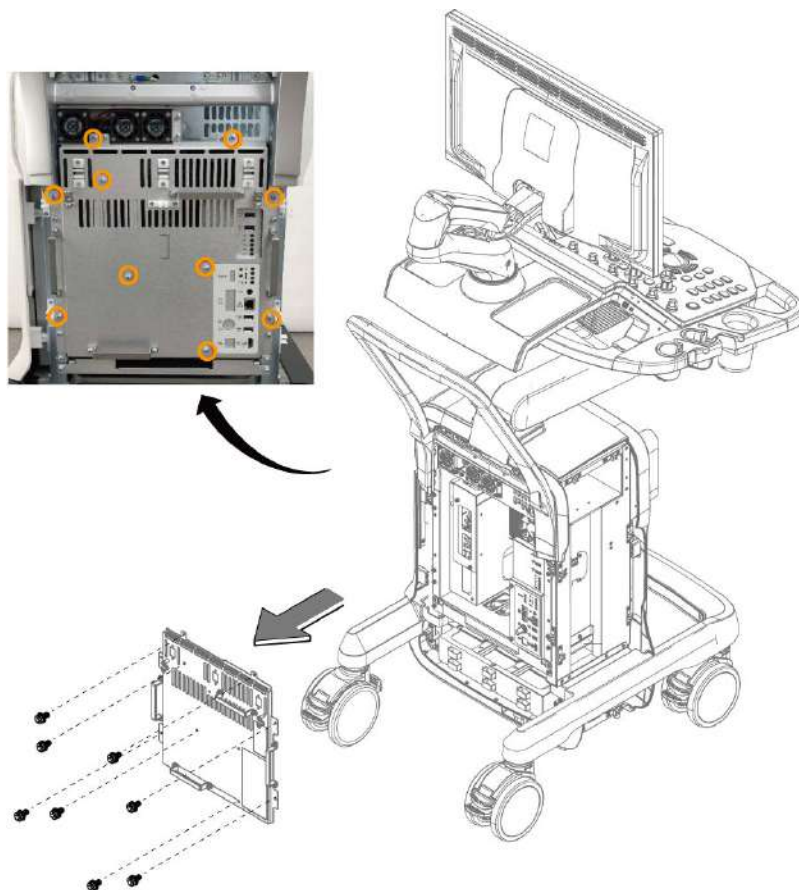
12.8.19.1 UMC-T - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

NOTE

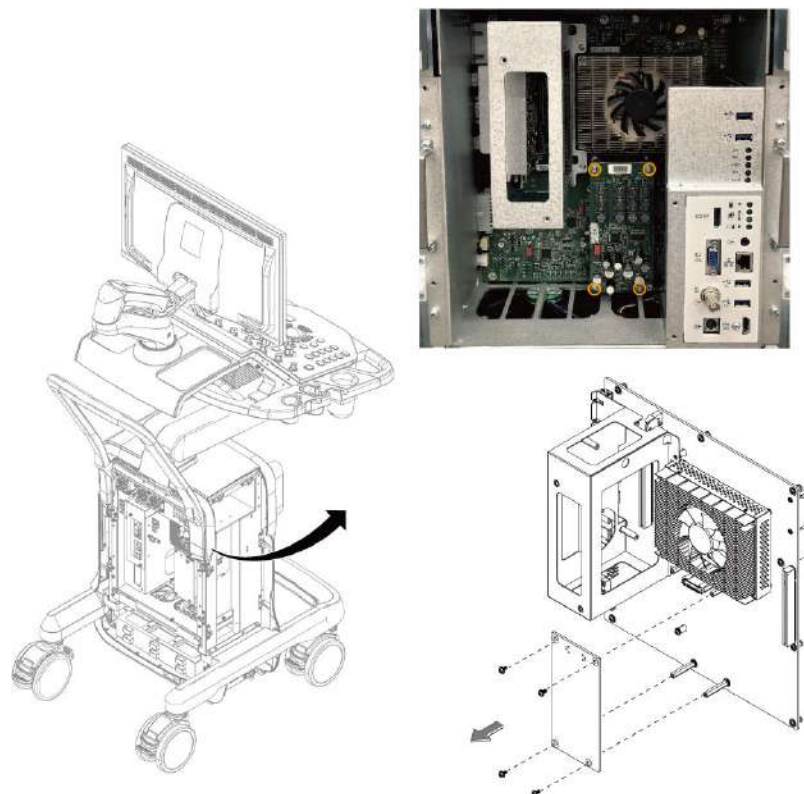
If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

Figure 12-279 Removing Rear Shield Brkt



2. Unscrew 4 screws to remove the UMC-T and Pull the UMC for disconnecting from the UBE.

Figure 12-280 Removing UMC



12.8.19.2 UMC-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.19.3 UMC-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.19.4 UMC-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.19.5 UMC-T - Functional checks

Table 12-150 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Top console adjustment control functional checks on page 150</i>	
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>4D option functional checks on page 177</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

12.8.20 Replacement of the UVSC-T

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-151 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver Spanner 14	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Rear Cover Mid Assy-T. Refer to *Replacement of the Rear Cover Mid Assy-T* on page 366.
3. Remove the Rear Cover Top Assy-U. Refer to *Replacement of the Rear Cover Top Assy-U* on page 379.
4. Remove the T2 Side Cover L Assy . Refer to *Replacement of the T2 Side Cover L Assy* on page 356.

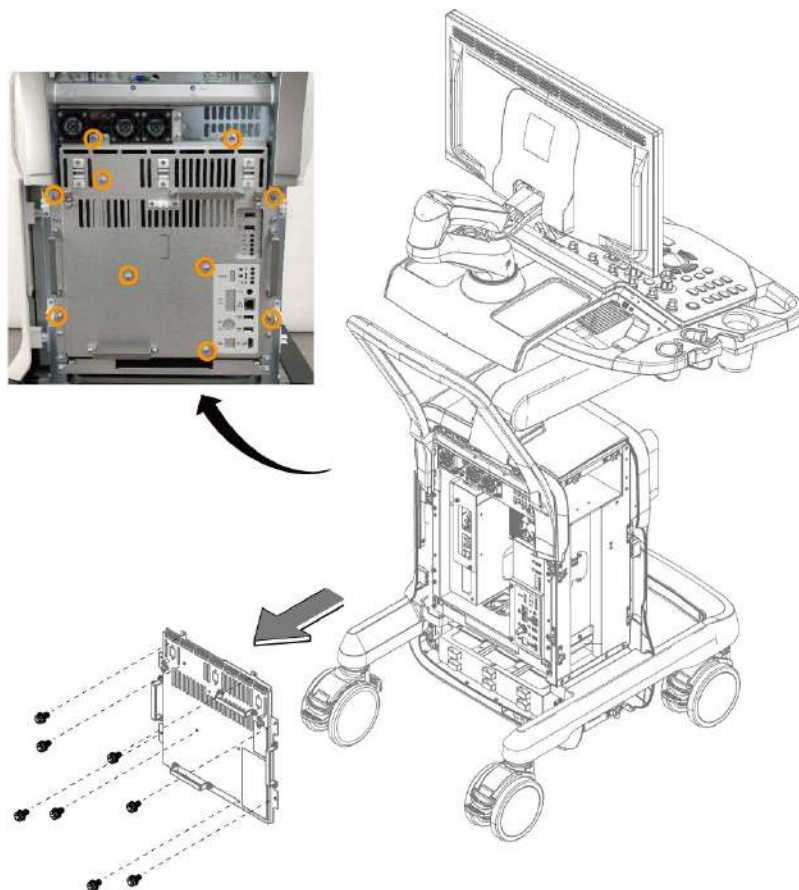
12.8.20.1 UVSC-T - Removal procedure

1. Unscrew 10 screws to remove the Unity Rear Shield Brkt from the console.

NOTE

If the WLAN-T was installed, remove the WLAN-T as described in *Replacement of the WLAN-T and WLAN USB A Cable* on page 701.

Figure 12-281 Removing Rear Shield Brkt



2. Remove UEPP Assy module per following steps.
 - a. Unscrew 2 screws.

- b. Pull the UEPP Assy module to remove from the console.

Figure 12-282 Removing UEPP Assy



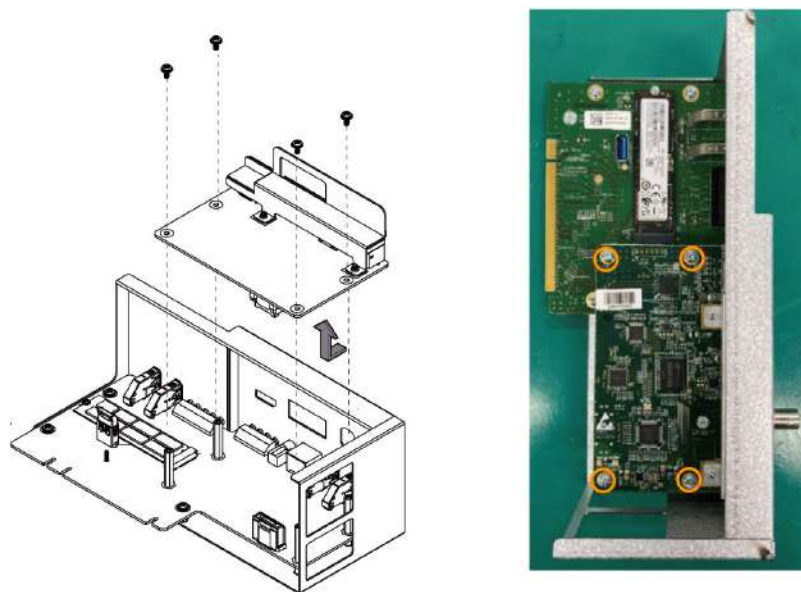
3. Unscrew Nut with the Spanner from the UVSC's VNC connector.

Figure 12-283 Unscrewing Nut from VNC connector



4. Unscrew 4 screws to remove the UVSC-T and remove the UVSC-T

Figure 12-284 Removing the UVSC-T



12.8.20.2 UVSC-T - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.20.3 UVSC-T - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.20.4 UVSC-T - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.20.5 UVSC-T - Functional checks

Table 12-152 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up</i> on page 98	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks</i> on page 159	
<i>Chassis leakage current test</i> on page 770	
Attach the customer's Internal Universal Video Converter device to the rear I/O. Confirm content displayed on the monitor mirrors content displayed on the main monitor of the system. Confirm that the customer's Internal Universal Video Converter device can record content displayed on the main monitor of the system.	
<i>Power shut down</i> on page 113	

12.8.21 Replacement of the CWC-T PWA

This table includes information specific to these instructions. For more information, see *Tools needed for servicing the LOGIQ Totus* on page 76/ *PPE Required During Service* on page 78.

Table 12-153 Manpower, Time, Tools, and PPE

Manpower	Time	Tools	PPE
One person	Approximately 15 minutes	Phillips screwdriver	Cut resistant gloves Knee Pad

Preparations

1. Power off/Shutdown the system. Refer to *Lockout/tagout procedure* on page 47.
2. Remove the Unity Base Tray. Refer to *Replacement of the Unity Base Tray* on page 392.
3. Remove the Front Cover Assy-T. Refer to *Replacement of the Front Cover Assy-T* on page 345.
4. Remove Unity Protector Assy. Refer to *Replacement of the Unity Protector Assy* on page 350.

12.8.21.1 CWC-T PWA - Removal procedure

1. If Volume Navigator is installed, disconnect the UBE TO V NAV USB CABLE from UCO per following steps before removing the UCO UAC MODULE.
 - a. Remove the T2 SIDE COVER ASSY RIGHT.

Figure 12-285 Removing T2 SIDE COVER ASSY RIGHT



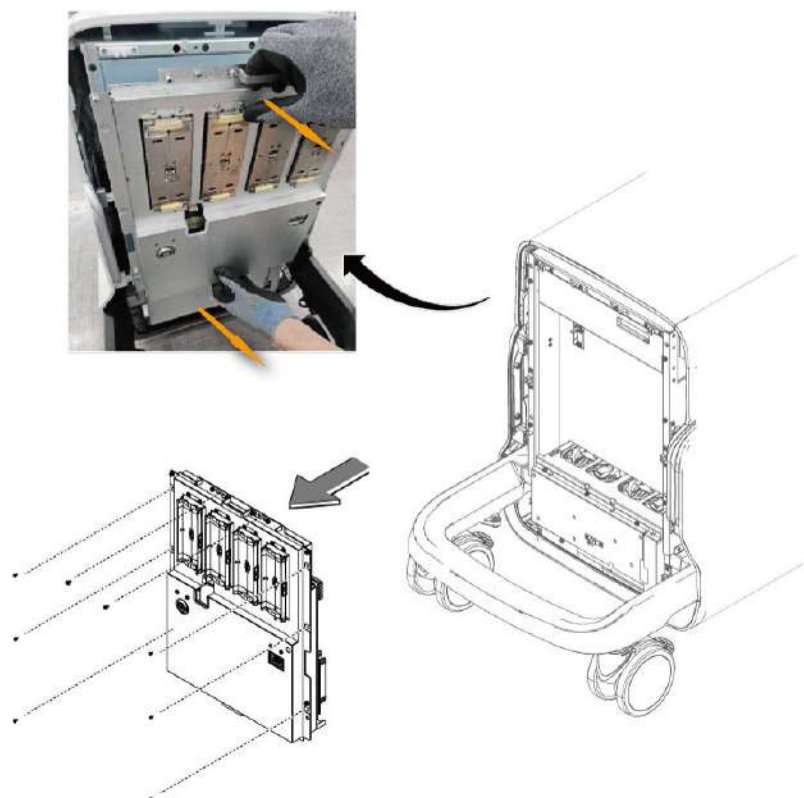
- b. Disconnect the UCO TO V NAV SIGNAL CABLE from the UCO-T

Figure 12-286 Disconnecting UCO TO V NAV SIGNAL CABLE



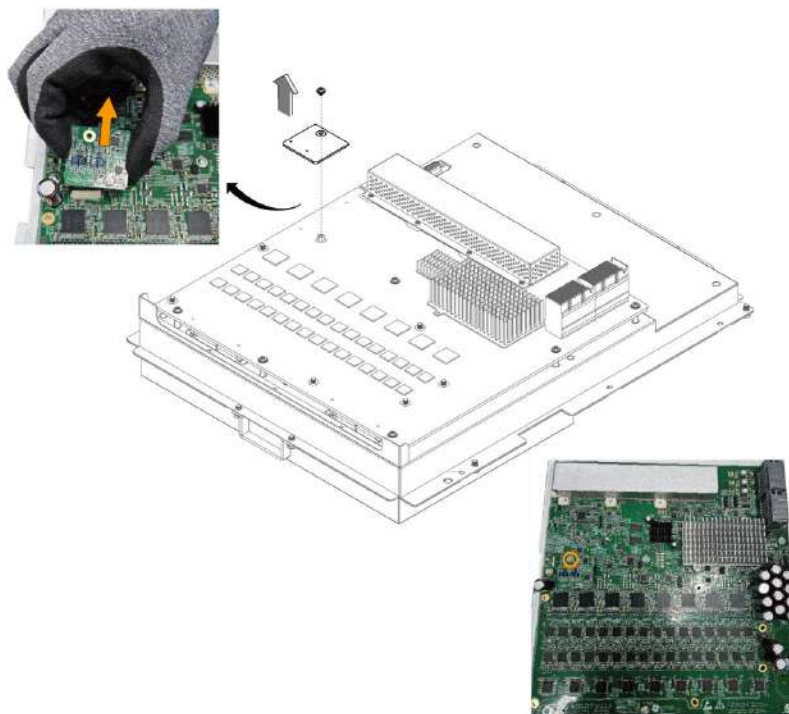
2. Unscrew 8 screws to remove the UAC&UCO-T Assy

Figure 12-287 Removing UAC&UCO-T Assy



3. Unscrew 1 screw to remove the CWC-T PWA from the UAC&UCO-T Module.

Figure 12-288 Removing CWC-T PWA



12.8.21.2 CWC-T PWA - Installation procedure

1. Install components in reverse order of removal.
2. Perform "Functional Checks".

12.8.21.3 CWC-T PWA - Calibration and adjustments

No calibrations or adjustments are needed after this part replacement.

12.8.21.4 CWC-T PWA - Verification

Perform the following steps to verify that the product is functioning as intended after this replacement:

1. Verify that all screws and covers removed earlier have been installed.
2. Connect cables and Probes removed earlier.
3. Power up the system to verify that it operates as intended.

12.8.21.5 CWC-T PWA - Functional checks

Table 12-154 Functional checks

Functional Check	Service Record Debrief Script
<i>Power on/boot up on page 98</i>	Equipment passed all required checks and is ready for use.
<i>Probe/connector functional checks on page 159</i>	
<i>B-Mode functional checks on page 160</i>	
<i>System CFM and PWD functional checks on page 163</i>	
<i>PW/CW Doppler mode functional checks on page 167</i>	
<i>CW Doppler mode functional checks on page 168</i>	
<i>Grounding continuity test on page 769</i>	
<i>Chassis leakage current test on page 770</i>	
<i>Power shut down on page 113</i>	

Chapter 13

Care and Maintenance

In this chapter

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Ultrasound Equipment Quality Check (EQC and IQC). 786

13.1 Overview

This chapter describes Care and Maintenance on the Ultrasound system and peripherals. These procedures are intended to maintain the quality of the Ultrasound system's performance. Read this chapter completely and familiarize yourself with the procedures before performing a task.

Normal Care and Maintenance is mandatory; it is the responsibility of the customer and includes the following:

- Quality Assurance Program to perform routine quality control testing.

NOTE

Some customers' Quality Assurance Programs may require additional tasks and or inspections at a different frequency than listed in this manual.

- System Maintenance and Checks (Preliminary System, Functional Checks, Peripheral, Cable, Physical Inspection).
- Probe Maintenance
- System Cleaning, including Air Filter Cleaning
- Electrical Safety Testing

NOTE

It has been determined by engineering that your Ultrasound system DOES NOT have any high wear components that fail with use. Therefore, periodic maintenance inspections are not mandatory for any Ultrasound system. Only normal Care and Maintenance is recommended.

13.2 Warnings

**DANGER**

WHERE APPLICABLE, THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE ULTRASOUND SYSTEM POWER PLUG AND OPEN THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.

**DANGER**

Do not pull out or insert circuit boards while power is on, the Ultrasound system is plugged into the wall and/or batteries (if present) are connected.

**CAUTION**

Practice good ESD prevention. Wear an anti-static strap when handling electronic parts and even when disconnecting/connecting cables.

**CAUTION**

Do not operate this Ultrasound system unless all board covers and frame panels are securely in place. System performance and cooling require all board covers and frame panels are securely in place.

**CAUTION**

To ensure the mutual protection and safety of GE HealthCare service personnel and our customers, all equipment and work areas must be clean and free of any hazardous contaminants before a Service Engineer starts a repair. This includes, but is not limited to, decontamination and/or sterilization, depending on the application or use of the medical device.

13.3 Why Do Maintenance

13.3.1 Keeping records

It is good business practice that ultrasound facilities maintain records of all corrective maintenance and care and maintenance on Ultrasound systems where it is applicable. The Ultrasound Equipment Quality Check form provides the customer with documentation that the Ultrasound system is maintained regularly.

A copy of the Ultrasound Equipment Quality Check form should be kept in the same room or near the Ultrasound system.

13.3.2 Quality assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer's responsibility to have a quality assurance program in place for each Ultrasound system. The program must be directed by a medical physicist, the supervising radiologist/physician or appropriate designee.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE HealthCare service representative can help you with establishing, performing and maintaining records for a quality assurance program. Contact GE HealthCare for coverage and/or price for service.

13.4 Maintenance Task Schedule

The Maintenance Task Schedule specifies how often your Ultrasound system should be serviced and outlines items requiring special attention.

NOTE

It is the customer's responsibility to ensure the Ultrasound system care and maintenance is performed as scheduled to retain its high level of safety, dependability and performance.

Your GE HealthCare Service Representative has an in-depth knowledge of your Ultrasound system and can best provide competent, efficient service. Contact GE HealthCare for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Maintenance Task Schedule assumes that you use your Ultrasound system for an average patient load (10-12 per day) and not use it as a primary mobile Ultrasound system which is transported between diagnostic facilities.

NOTE

If conditions exist which exceed typical usage and patient load, then it is recommended to increase the maintenance frequencies.

13.5 System Maintenance

The preliminary checks take about 15 minutes to perform. Refer to the Ultrasound system user documentation whenever necessary.

Table 13-1 Ultrasound System Preliminary Checks

Step	Item	Description
1.	Ask and Listen	Ask the customer if they have any problems or questions about the equipment.
2.	Paperwork	Fill in the top of the EQC inspection form. Record all probes and Ultrasound system options.
3.	Power up	- Turn the Ultrasound system power on and verify that all fans and peripherals turn on. - Watch the displays during power up to verify that no warning or error messages are displayed. - Where applicable, confirm that the battery is charged. If no AC Input present, use the internal battery.
4.	Probes	Verify that the Ultrasound system properly recognizes all probes.
5.	Displays	Verify proper display on the monitor and touch panel (where present).
6.	InSite	Where applicable, for Warranty and Contract Customers only: - Verify that InSite is functioning properly. - Ensure two-way remote communications.
7.	Review Error Logs	Where applicable, Error Logs can be reviewed via system diagnostics.
8.	Diagnostics	Optional.
9.	Presets	Back up all Customer Presets to an appropriate media.
10.	Image Archive	Back up the Image Archive onto appropriate media.

13.5.1 Functional checks

The functional checks take about 60 minutes to perform. Refer to the Ultrasound system user documentation and/or Basic Service Manual whenever necessary.

13.5.2 System checks

Table 13-2 Ultrasound System Checks

Step	Item	Description
1.	B-Mode	Verify basic B-Mode (2D) operation. Check the basic Ultrasound system controls that affect this mode of operation.
2.	CF-Mode	Verify basic CF-Mode (Color Flow Mode) operation. Check the basic Ultrasound system controls that affect this mode of operation.

Step	Item	Description
3.	Doppler Modes	Where applicable, verify basic Doppler operation (PW and CW if available). Check the basic Ultrasound system controls that affect this mode of operation.
4.	M-Mode	Verify basic M-Mode operation. Check the basic Ultrasound system controls that affect this mode of operation.
5.	3D Mode	Where applicable, verify basic 3D Mode operation. Check the basic system controls that affect this mode of operation.
6.	RealTime 4D Mode	Where applicable, verify basic RealTime 4D Mode operation. Check the basic system controls that affect this mode of operation.
7.	Basic Measurements	Check Distance and Tissue Depth Measurement.
8.	Probe Elements	Perform an Element Test on each probe to verify that all the probe elements and Ultrasound system channels are functional, where applicable.
9.	Applicable Software Options	Verify the basic operation of all optional modes. Check the basic system controls that affect each options operation.
10.	System Diagnostic	Perform the Automatic Tests, where applicable.
11.	Transmit/Receive	Verify that all system XMIT/RECV channels are functional, where applicable.
12.	Operating Panel test	Perform the Operating Panel Test Procedure.
13.	Keyboard	Do the interactive keyboard test.
14.	Touch Panel	Where applicable, verify basic Touch Panel display functions.
15.	Monitor	Verify basic monitor display functions.
16.	Peripherals	See <i>Peripheral/option checks</i> on page 757.

13.5.3 Peripheral/option checks

If any peripherals or options are not part of the Ultrasound system configuration, the check can be omitted.

Table 13-3 GE HealthCare Approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1.	Media	Verify media drive(s) read/write properly. Clean if necessary.
2.	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
3.	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
4.	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
5.	ECG	Verify basic operation with customer.

Step	Item	Description
6.	Footswitch	Verify that the footswitch is functioning as programmed. Clean as necessary.
7.	Other	For tablets and other external peripherals, check peripheral manuals for functional checks if applicable.

13.5.4 Mains power cable inspection

Table 13-4 Mains Power Cable Inspection, As Appropriate

Step	Item	Description
1.	Unplug Cord	Disconnect the mains power cable from the wall and then from the Ultrasound system.

Step	Item	Description
2.	Inspect	Inspect the mains power cable and its connectors for damage of any kind. Examples of damage may include: - Cable showing a curvature after the strain relief of plug which indicates a long-term bending in one direction.  - Bent plug pins and missing/abraded coating on plug pins which indicates heavy usage of the product over a long time.  - Worn plating on the plug pins.  - Damaged inlet connectors (below are undamaged).  - Damaged/burnt area on the connector. For example, wire is missing in exposed area (red rectangle), insulation at wire is damaged and/or copper strands are visible.  IMPORTANT: Mains power cables with any type of damage must be replaced.
3.	Verify	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4.	Verify	Make sure the inlet connector retainer is functional.

13.5.5 Optional diagnostic checks

To complete the Ultrasound system checks, view the error logs and run desired diagnostics.

13.5.5.1 View the logs

1. Review the Ultrasound system error log for any problems.

2. Check the temperature log to see if there are any trends that could cause problems in the future.

13.5.6 Physical inspection

NOTE

These features may not be present on all Ultrasound systems.

Table 13-5 Physical Checks

Step	Item	Description
1.	Labeling	Verify that all Ultrasound system labeling is present and in readable condition.
2.	Scratches & Dents	Inspect the exterior for dents, scratches or cracks.
3.	Covers	Where applicable, verify all covers are secured in place and are properly aligned with other covers. Replace any covers that are damaged.
4.	Operating Panel	Inspect alphanumeric keyboard and operator panel (operator control panel). Record any damaged or missing items.
5.	Operating Panel Movement	- Where applicable, verify ease of operating panel (operator control panel) movement in all acceptable directions. - Where applicable, ensure that it latches in position as required.
6.	Operating Panel Lights	Check for proper operation of all operating panel and TGC lights.
7.	Display (Monitor)	Inspect the display for scratches and bad pixels. Verify proper operation of contrast and brightness controls. Where applicable, confirm that the display arm allows: - swiveling the screen to the left and to the right. - folding the screen to the locked position. - release and adjustment backwards and forwards. - can be adjusted in the up/down positions. Note: Display arm movement may vary and is not applicable to all Ultrasound systems.
8.	Monitor Light	Check for proper operation of any monitor lights, if available.
9.	Input Power	Refer to <i>Mains power cable inspection</i> on page 758.
10.	External I/O	Check all connectors for damage and verify that the labeling is good.
11.	Wheels and Brakes	- Where applicable, check all wheels and casters for wear and verify operation of foot brake and release mechanism. - Where applicable, check all wheel locks and wheel swivel locks for proper operation.
12.	Cables and Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.

Step	Item	Description
13.	Shielding and Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems while scanning.
14.	Control Panel	Inspect alphanumeric keyboard and operating panel. Record any damaged or missing items.
15.	Probe Holders	Where applicable, inspect the probe holders for cracks or damage.
16.	Power and System Status Indicators	Check for proper operation of all Power and System Status indicators.
17.	Battery	Where applicable, check that the battery is not damaged, does not leak, does not emit an odor, and is not deformed or discolored. Observe all warnings and cautions for battery handling, recharging, storing, and/or disposal.
18.	External Microphone	Where applicable, check for proper operation of any external microphones by recording an audio test.

13.5.7 Cleaning

Refer to the User Manual for the Ultrasound system for instructions.

13.5.7.1 Air filter cleaning

Refer to the User Manual for the Ultrasound system for instructions.

13.5.8 Disinfecting

Refer to the User Manual for the Ultrasound system for instructions.

13.5.9 Probe maintenance

Refer to the Ultrasound system User Manual, the probe's User Manual/Probe Care Card, or the Probe Addendum (p/n 5661328) for probe maintenance, checks, cleaning, and disinfecting instructions.



WARNING

To help protect yourself from blood borne diseases, wear approved disposable gloves. These are made of nitrile derived from vegetable starch to prevent allergic latex reactions.



CAUTION

Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty.

DO NOT soak or wipe the lens with any product not listed in the User Manual. Doing so could result in irreparable damage to the probe.

Follow care instructions that came with the probe.



CAUTION

Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.



CAUTION

Transesophageal and intraoperative probes require a special handling. Refer to the user documentation enclosed with these probes.

NOTE

GE HealthCare does not substantiate the effectiveness of recommended disinfectant products. Questions regarding efficacy, instructions for use, and proper handling should be directed to the disinfectant manufacturer. GE HealthCare publishes a list of material-compatible disinfectants (see below and also refer to the GE HealthCare website at http://www3.gehealthcare.com/en/Products/Categories/Ultrasound/Ultrasound_Probes. DO NOT use non-GE HealthCare-approved disinfectants or products that have not been evaluated by GE HealthCare for material compatibility. Damages linked to the use of disapproved chemicals are not covered under product warranty or service contract.)

13.6 Using a Phantom

The use of a Phantom is not required during Care and Maintenance, except for the Invenia ABUS Scan Station. Customer may use it as part of their Quality Assurance Program tests.

13.7 Electrical Safety Tests

Contents in this section

- *Uninterrupted power supply (UPS)* on page 764
- *Safety test overview* on page 765
- *Leakage current limits* on page 766
- *Outlet test - wiring arrangement - USA and Canada* on page 768
- *Grounding continuity test* on page 769
- *Chassis leakage current test* on page 770
- *Isolated patient lead (source) leakage-lead to ground test (e.g. ECG)* on page 772
- *Isolated patient lead (source) leakage-lead to lead test (e.g. ECG)* on page 774
- *Isolated patient lead (sink) leakage-isolation test (e.g. ECG)* on page 776
- *Probe (source) leakage current test* on page 777
- *Isolated probe (sink) leakage-isolation test* on page 780

13.7.1 Uninterrupted power supply (UPS)



CAUTION

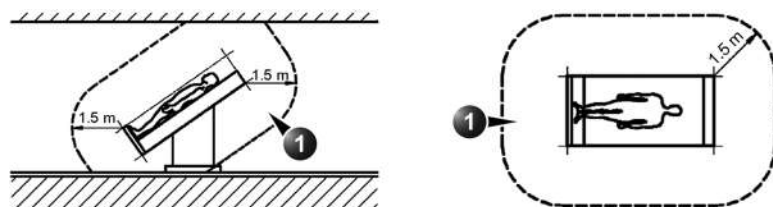
For all instructions in this section, in case of using an uninterruptible power supply (UPS) the terms outlet, wall outlet, AC wall outlet or power outlet refer to the AC wall outlet to which the UPS power input is connected. In case of further available AC (or DC) power outlets at the same used UPS these must remain unused and not connected to any other devices.



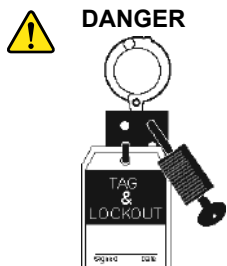
CAUTION

Please observe that some uninterruptible power supplies (UPS) may not be medical devices! If the UPS is not a medical device, it has to be located outside of the patient environment (according to IEC 60601-1).

Figure 13-1 Patient Environment



13.7.2 Safety test overview



Energy Control and Power Lockout for Ultrasound system.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the power cable from the wall outlet, then from the Ultrasound system.
4. Maintain exclusive control of the Ultrasound system power cable by applying Lockout/Tagout Devices.
5. Wait at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery if present.

Ultrasound system components may be energized.

Capacitors on Ultrasound systems with the Shearwave Option can take up to 5 minutes to discharge.



DANGER

Possible risk of infection.

Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.

The electrical safety tests in this section are based on IEC 60601-1 standard including national deviations for Health Care Facilities and IEC 62353 Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment. These standards provide guidance on evaluating electrical safety of medical devices which are placed into service and are intended for use in normal Care and Maintenance or testing following service or repair activities. They differ somewhat from the standards that are used for design verification and manufacturing tests (for example, IEC 60601-1 including national deviations) which require a controlled test environment and can place unnecessary stress on the Ultrasound system.

These tests may refer to specific safety analyzer equipment as an example. Always refer to the safety analyzer's user manual that will be used to perform the tests.

Prior to initiating any electrical test, the Ultrasound system must be visually inspected. Perform the following visual checks:

- Check for missing or loose enclosure covers that could allow access to internal live parts.
- Examine the mains cord, mains plug and appliance inlet for damaged insulation and adequacy of strain relief and cable clamps.
- Locate and examine all associated probes. Inspect the cables and strain relief at each end. Inspect the transducer enclosure and lens for cracks, holes and similar defects.



DANGER

To minimize the risk and avoid an electric shock, only trained persons are allowed to perform the electrical safety inspections and tests.



DANGER

To avoid electrical shock, the Ultrasound system under test **MUST NOT** be connected to other electrical equipment. Remove all interconnecting cables and wires. The Ultrasound system under test must not be contacted by users or patients while performing these tests.

**WARNING**

Users must ensure that safety inspections are performed whenever damage is suspected and on a regular basis in accordance with local authorities and facility procedures. DO NOT use the Ultrasound system or individual probes which fail any portion of the safety test.

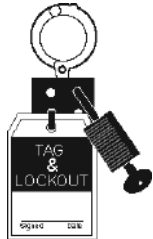
**CAUTION**

Compare all safety-test results with safety-test results of previously performed safety tests (e.g. last year etc.). In case of unexplainable abrupt changes of safety-test results consult experienced authorized service personnel or GE HealthCare for further analysis.

**CAUTION**

For all instructions in this section in case of using an uninterruptible power supply (UPS) the terms outlet, wall outlet, AC wall outlet or power outlet refer to the AC wall outlet to which the UPS power input is connected. In case of further available AC (or DC) power outlets at the same used UPS these must remain unused and not connected to any other devices.

13.7.3 Leakage current limits

**DANGER**

Energy Control and Power Lockout for Ultrasound system.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the power cable from the wall outlet, then from the Ultrasound system.
4. Maintain exclusive control of the Ultrasound system power cable.
5. Wait at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery if present.

Ultrasound system components may be energized.

Capacitors on Ultrasound systems with the Shearwave Option can take up to 5 minutes to discharge.

The following acceptance limits and test conditions are summarized from IEC 60601 (including national deviations) and IEC 62353. In some cases, the acceptance limits and test conditions are lower than those specified by other valid national or international standards.

In some countries/regions differing acceptance limits and differing test conditions may apply.

13.7.4 LOGIQ/Vivid/Voluson Ultrasound system leakage current limits

Leakage current limits for LOGIQ, Vivid and VOLUSON Ultrasound systems are shown below for 100-240 volt mains.

NOTE

Open Grounding is also known as "Lift Ground."

Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains

Leakage Current Test	System Power	Grounding/PE Conductor	Limit in mA	Limit in μ A
Earth Leakage	On and Off	n/a	0.5	500
Chassis/Enclosure Leakage	On and Off	Closed Open	0.1 0.5	100 500
Type BF Applied Parts	On (transmit)	Closed Open	0.1 0.5	100 500
Type CF Applied Parts	On (transmit)	Closed Open	0.01 0.05	10 50
Type BF Applied Parts (sink leakage, mains voltage on applied part)	On and Off	Closed	5	5000
Type CF Applied Parts (sink leakage, mains voltage on applied part)	On and Off	Closed	0.05	50
Values based on IEC 60601				

*ISO and Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the applied part to determine the amount of current that will pass (or sink) to ground if a patient is in contact with mains voltage.

Table 13-7 ISO and Mains Applied Limits*

Probe Type	Measurement
BF	5.0 mA (5000 μ A)
CF	0.05 mA (50 μ A)

*ISO and Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the applied part to determine the amount of current that will pass (or sink) to ground if a patient is in contact with mains voltage.

NOTE

Electrical leakage testing may be accomplished with any calibrated electrical safety analyzer tool compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551 or IEC 62353 or other relevant national regulation.

Table 13-8 Equipment Type and Test Definitions

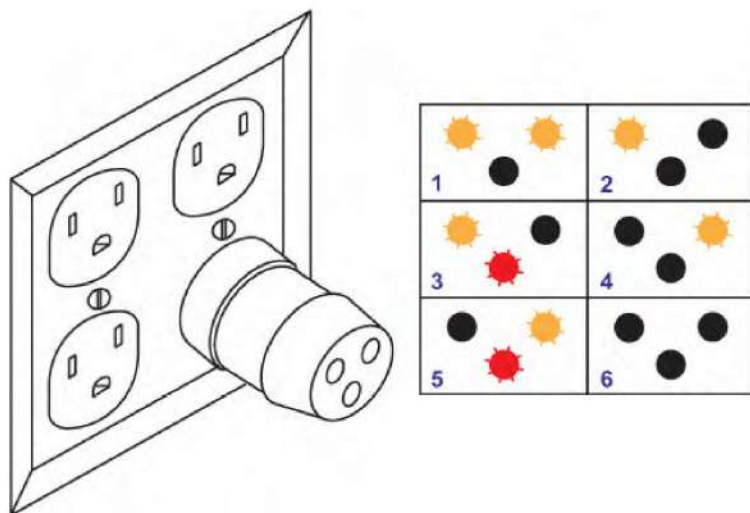
Applied Parts (AP)	Parts or accessories that contact the patient to perform their function. For Ultrasound equipment, this includes transducers, ECG leads and e-TRAX Needle Sensor.	
Type BF	Type BF Applied Part (man in the box) symbol is in accordance with IEC 60417-5333, e.g. ultrasound probes which are marked with the 'man in box' BF symbol.	

Type BF Defib.-Proof	Type BF defibrillation proof Applied Part (man in the box with paddle) symbol is in accordance with IEC 60417-5334, e.g. ECG electrodes which are marked with the 'man in box with paddle' BF symbol.	
Type CF	Type CF Applied Part (heart in the box) symbol is in accordance with IEC 60417-5335, e.g. intraoperative probes for direct cardiac contact, isolated ECG connections and e-TRAX Needle Sensor, so marked with the 'heart in box' CF symbol.	
Type CF Defib.-Proof	Type CF defibrillation proof Applied Part (heart in the box with paddle) symbol is in accordance with IEC 60417-5336, e.g. intraoperative probes for direct cardiac contact, isolated ECG connections and e-TRAX Needle Sensor, so marked with the 'heart in box with paddle' CF symbol.	
Sink Leakage	The current resulting from the application of mains voltage to the applied part. This test is required for Type BF and CF applied parts.	

13.7.5 Outlet test - wiring arrangement - USA and Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

Figure 13-2 Typical Alternate Outlet Tester



1. Correct wiring	4. Open neutral wire
2. Open ground wire	5. Hot and ground reversed
3. Reversed polarity	6. Open hot wire

NOTE

No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

13.7.6 Grounding continuity test

**DANGER****Electric Shock Hazard!**

The patient or operator **MUST NOT** come into contact with the equipment during this test.

13.7.6.1 Definition of the grounding continuity test

This test measures the impedance between the protective-earth pin of the plug and protectively-earthed parts of the console.

The test verifies that the protective earth conductors in the power cord and console are intact.

The testing electrical safety analyzer is connected to parts of the equipment easily contacted by the user or patient.

The ground wire resistance should comply with the procedure used for the test.

- For IEC 60601-1, the expected result is less than 0.2 ohms.
- For IEC 62353, the expected result is less than 0.3 ohms.
- For NFPA 99, the expected result is less than 0.5 ohms.

NOTE

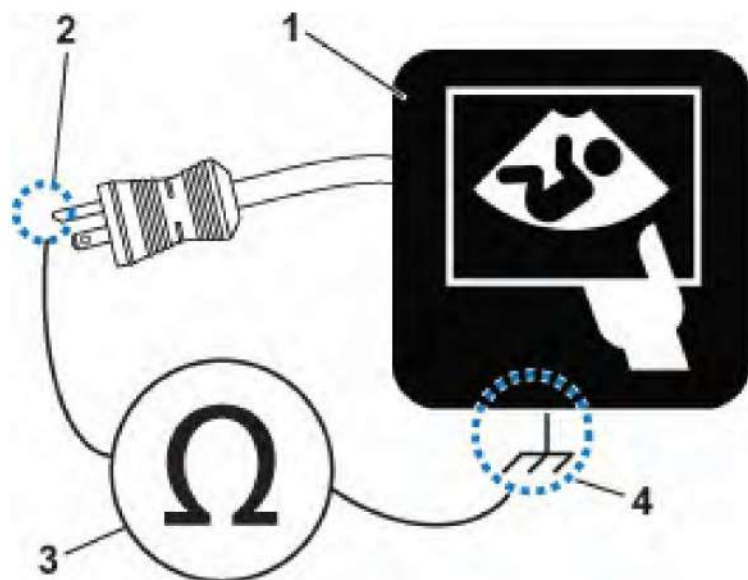
In some countries/regions differing acceptance limits and differing test conditions may apply.

13.7.6.2 Generic procedure for the grounding continuity test

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case.

Record the highest reading of current.

Figure 13-3 Ground Continuity Test



1. Ultrasound system	3. Ohmmeter or electrical safety analyzer
2. Ground pin	4. Accessible metal part such as: • Potential equilibrium connector • Monitor housing • Probe connector

13.7.6.3 Data sheet for the grounding continuity test

This table shows a typical format for recording the grounding continuity.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

Table 13-9 Typical Data Format For Recording Grounding Continuity

Unit under test _____			Date of test __/__/__			
Test Conditions			Measurement/Test Point Location			
System Power	Grounding/PE	Limit μ A	Third pin of the attachment plug			
off	closed	For IEC 60601-1, the expected result is less than 0.2 ohms. For IEC 62353, the expected result is less than 0.3 ohms. For NFPA 99, the expected result is less than 0.5 ohms.				

13.7.7 Chassis leakage current test



DANGER



Electric Shock Hazard!

When the electrical safety analyzer's ground switch is OPEN, DO NOT touch the Ultrasound system!

**CAUTION**

Equipment damage possibility.

Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON.

Power off the Ultrasound system, allow the stored energy to bleed down, and turn the circuit breaker off BEFORE switching the "POLARITY" switch and/or the "NEUTRAL" switch on the Electrical Safety Analyzer to avoid possible power supply damage.

**CAUTION**

Lacquer is an isolation barrier! Measure only on blank accessible metal parts.

13.7.7.1 Definition of the chassis leakage current test

This test, also known as Enclosure Leakage current test, measures the current that would flow through a grounded person who touches the accessible conductive parts of the equipment during normal and fault conditions.

The test verifies the isolation of the power line from the chassis.

The testing electrical safety analyzer is connected to parts of the equipment easily contacted by the user or patient.

13.7.7.2 Generic procedure for the chassis leakage current test

The test verifies the isolation of the power line from the chassis. The testing electrical safety analyzer is connected from accessible metal parts of the case to ground. Measurements should be made under the test conditions specified in *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as applicable.

The maximum allowable limit for chassis source leakage is shown in *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as Chassis/Enclosure Leakage.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

Record the highest reading of current.

1. Connect the safety analyzer to wall AC wall outlet.
2. Plug the equipment under test into the receptacle on the panel of the electrical safety analyzer.
3. Connect the electrical safety analyzer to an accessible metal surface of the Ultrasound system using the cable provided with the electrical safety analyzer.
4. Select the "Chassis" or "Enclosure Leakage" function on the electrical safety analyzer.
5. Test opening and closing the ground with the Ultrasound system on and off as indicated in *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as applicable.

NOTE

For more information, refer to the safety analyzer's user manual that will be used to perform the tests.

13.7.7.3 Data sheet for the chassis leakage current test

Table 13-10 Typical Data Format For Recording Chassis Leakage (Touch Current) on page 772 shows a typical format for recording the enclosure/chassis leakage current. Measurements should be recorded from multiple locations for each set of test conditions. The actual location of the test probe may vary by Ultrasound system.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in italics font are given as examples only.

Table 13-10 Typical Data Format For Recording Chassis Leakage (Touch Current)

Unit under test _____			Date of test __/__/____			
Test Conditions			Measurement/Test Point Location			
System Power	Grounding/PE	Limit μ A	Potential equilibrium connector	Monitor housing	Probe connector	
off	closed	100				
off	open	500				
on	closed	100				
on	open	500				
off	closed (reversed polarity)	100				
off	open (reversed polarity)	500				
on	closed (reversed polarity)	100				
on	open (reversed polarity)	500				

13.7.8 Isolated patient lead (source) leakage—lead to ground test (e.g. ECG)



CAUTION

Equipment damage possibility.

Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON.

Power off the Ultrasound system, allow the stored energy to bleed down, and turn the circuit breaker off BEFORE switching the "POLARITY" switch and/or the "NEUTRAL" switch on the electrical safety analyzer to avoid possible power supply damage.

13.7.8.1 Definition of the isolated patient lead (source) leakage—lead to ground test

This test measures the current which would flow to ground from any of the isolated ECG leads. The electrical safety analyzer simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface.

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the Ultrasound system on and off (per IEC 62353 and/or IEC 60601-1).

For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

13.7.8.2 Generic procedure for the isolated patient lead (source) leakage—lead to ground test

Measurements should be made under the test conditions specified in *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as applicable.

For each combination, the operating controls, such as the lead switch, should be operated to find the worst case condition.

Record the highest reading of current.

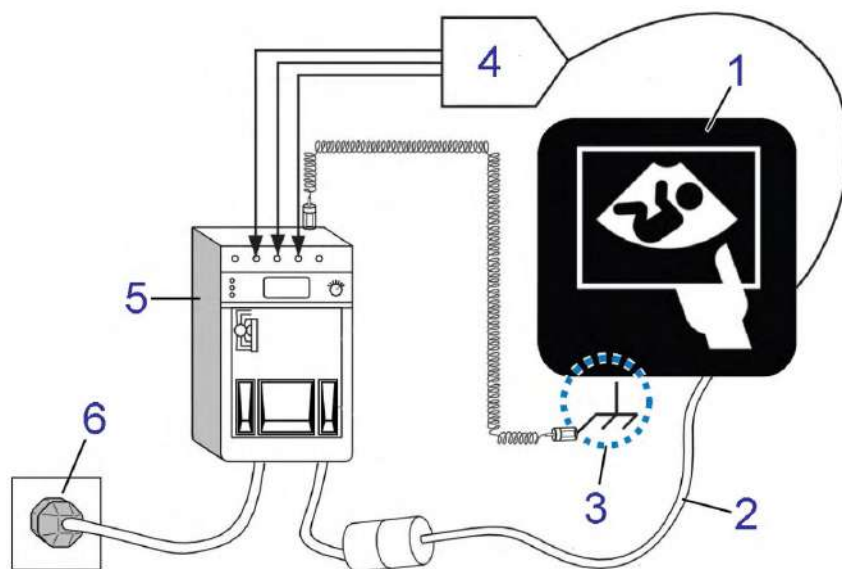
1. Connect the safety analyzer to wall AC power outlet.

2. Plug the equipment under test power cable into the receptacle on the panel of the electrical safety analyzer.
3. Connect the ECG cable to the Ultrasound system and the patient leads to the analyzer.
4. Select the "Patient Lead Leakage" function on the electrical safety analyzer.
5. Test opening and closing the ground with the Ultrasound system on and off.

NOTE

For more information, refer to the safety analyzer's user manual.

Figure 13-4 Set Up for Test of Earth Leakage Current, IEC 60601-1



1. Ultrasound system	4. ECG patient cable
2. Mains power cable	5. Electrical safety analyzer
3. Accessible metal parts (chassis - non-earth ground, unprotected surface)	6. AC wall outlet

13.7.8.3 Data sheet for the isolated patient lead (source) leakage—lead to ground test

This table shows a typical format for recording the isolated patient lead (source) leakage—lead to ground.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in *italics font* are given as examples only.

Table 13-11 Typical Data Format For Recording Patient Lead To Ground (GND) Leakage for CF Type Applied Part (e.g. ECG)

Unit under test _____			Date of test __/__/__			
Test Conditions			Patient Lead or Combination Measured			
System Power	Grounding/PE	Limit μ A	RA to GND	LA to GND	LL to GND	(RA+LA+LL) to GND
off	closed	10				
off	open	50				
on	closed	10				
on	open	50				
off	closed (reversed polarity)	10				
off	open (reversed polarity)	50				
on	closed (reversed polarity)	10				
on	open (reversed polarity)	50				

13.7.9 Isolated patient lead (source) leakage—lead to lead test (e.g. ECG)

**DANGER**

Electric Shock Hazard!

When the electrical safety analyzer's ground switch is OPEN, DO NOT touch the Ultrasound system!

13.7.9.1 Definition of the isolated patient lead (source) leakage—lead to lead test

This test measures the current which would flow between ECG leads. The electrical safety analyzer simulates a patient who is connected to the monitoring equipment.

This test verifies that the separation between the patient connections is adequate to limit the patient leakage current to the allowed value when an external voltage is present.

The testing electrical safety analyzer is connected to parts of the equipment easily contacted by the user or patient.

Select and test each of the ECG lead positions (except ALL) on the LEAD selector, testing each to the power and ground condition combinations found in Table 4-6 on page 4-19, as applicable.

NOTE

This test is also known as the patient auxiliary current test.

13.7.9.2 Generic procedure for the lead to lead leakage test

Table 13-12 Typical Data Format For Recording Patient Lead To Lead Leakage for CF Type Applied Part (e.g. ECG) on page 775 shows a typical format for recording the patient lead to lead leakage current.

Measurements should be recorded from each lead combination under each set of test conditions specified in Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains on page 767, as applicable.

Record the highest reading of current.

1. Connect the safety analyzer to a wall AC power outlet.
2. Plug the equipment under test into the receptacle on the electrical safety analyzer's panel.
3. Connect the ECG cable to the Ultrasound system and the patient leads to the analyzer.
4. Select the "Patient Lead Leakage" function on the electrical safety analyzer.
5. Test opening and closing the ground with the Ultrasound system on and off.

NOTE

Refer to the safety analyzer's user manual that will be used to perform the tests.

13.7.9.3 Data sheet for the lead to lead leakage test

This table shows a typical format for recording the lead to lead leakage test.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in *italics* font are given as examples only.

Table 13-12 Typical Data Format For Recording Patient Lead To Lead Leakage for CF Type Applied Part (e.g. ECG)

Unit under test _____			Date of test __/__/____			
Test Conditions			Patient Lead or Combination Measured			
System Power	Grounding/PE	Limit μ A	<i>RA to LA</i>	<i>LA to LL</i>	<i>LL to RA</i>	<i>(RA+LA+ LL) to GND</i>
off	closed	10				
off	open	50				
on	closed	10				
on	open	50				
off	closed (reversed polarity)	10				
off	open (reversed polarity)	50				
on	closed (reversed polarity)	10				
on	open (reversed polarity)	50				

13.7.10 Isolated patient lead (sink) leakage-isolation test (e.g. ECG)



DANGER



Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the Ultrasound system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.

13.7.10.1 Definition of the isolated patient lead (sink) leakage-isolation test

This test measures the current which would flow if mains voltage were connected to isolated ECG leads.

This test verifies that the separation between the patient connections and other parts is adequate to limit the patient leakage current to the allowed value when an external voltage is present.

The testing electrical safety analyzer is connected to parts of the equipment easily contacted by the user or patient.

Select the Individual Leads as well as All Lead position since the test is performed with mains applied to all ECG leads at the same time.

13.7.10.2 Generic procedure for the isolated lead (sink) leakage test

Table 13-13 Typical Data Format For Recording Isolated Patient Lead (Sink) Leakage for CF Type Applied Part (e.g. ECG) on page 777 shows a typical format for recording the isolated patient lead sink leakage current.

Measurements should be recorded for full lead combination under each set of test conditions specified in *Table 13-7 ISO and Mains Applied Limits** on page 767.

Record the highest reading of current.

1. Connect the safety analyzer to a wall AC power outlet.
2. Plug the equipment under test into the receptacle on the panel of the electrical safety analyzer.
3. Connect the ECG cable to the Ultrasound system and the patient leads to the analyzer.
4. Select the "Patient Lead Leakage" function on the electrical safety analyzer.
5. Test with closed ground with the Ultrasound system on and off.

NOTE

Refer to the electrical safety analyzer's user manual that will be used to perform the tests.

13.7.10.3 Data sheet for the isolated lead (sink) leakage test

This table shows a typical format for recording the isolated lead (sink) leakage test.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in *italics* font are given as examples only.

Table 13-13 Typical Data Format For Recording Isolated Patient Lead (Sink) Leakage for CF Type Applied Part (e.g. ECG)

Unit under test _____		Date of test __/__/__	
Test Conditions			Patient Lead
System Power	Grounding/PE	Limit μ A	RA+LA+LL
off	closed	50	
on	closed	50	
off	closed (reversed polarity)	50	
on	closed (reversed polarity)	50	

13.7.11 Probe (source) leakage current test



DANGER

Do not use the probe if the insulating material has been punctured or otherwise compromised. Integrity of the insulation material and patient safety can be verified by safety testing according to IEC 60601-1.

13.7.11.1 Definition of probe (source) leakage current test

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

NOTE

Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.

13.7.11.2 Generic procedure on probe leakage current

The most common method of measuring probe leakage is to partly immerse the probe into a saline bath while the probe is connected to the Ultrasound system and active. This method measures the actual leakage current resulting from the probe RF drive.

Measurements should be made under the test conditions specified in:

- *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as applicable for every probe.

For each combination, the probe must be active to find the worst case condition.

Record the highest reading of current.

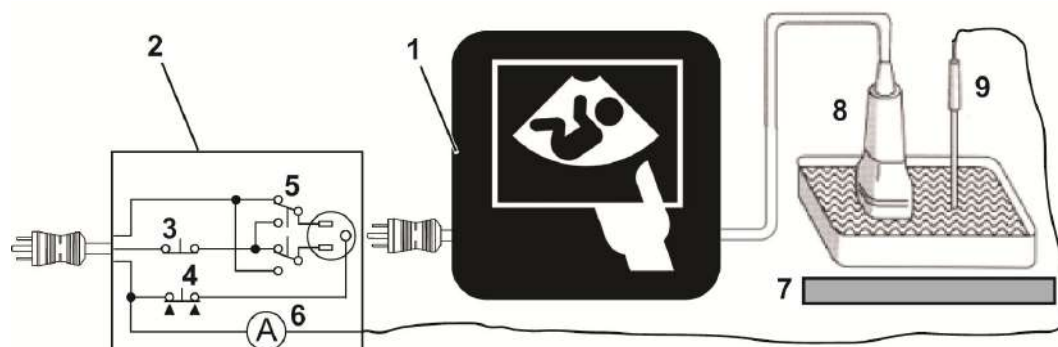
NOTE

Saline water pod should be insulated from floor and earth ground.

NOTE

The saline solution is a mixture of water and salt. The salt adds free ions to the water, making it conductive. Normal saline solution is 0.9% salt and 99.1% water. If ready-mixed saline solution is not available, a mixture of 1 quart or 1 liter water with 9 or more grams of table salt, mixed thoroughly, will substitute.

Figure 13-5 Set Up for Probe Leakage Current



1. Ultrasound system	6. Meter
2. Electrical safety analyzer	7. Isolator
3. Neutral switch	8. Ultrasound probe
4. Ground switch	9. Saline probe
5. Polarity reversing switch	

NOTE

Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.

The Ultrasound probes imaging area is immersed in the saline solution along with a grounding probe from the electrical safety analyzer to complete the current path.

This test is also known as Patient Leakage Current.

1. Turn the Ultrasound system OFF
2. Connect the safety analyzer to AC wall outlet.
3. Set the safety analyzer's function switch to "Chassis" or "Enclosure Leakage."
4. Plug the Ultrasound system's power cord into the Electrical Safety Analyzer.
5. Plug the Chassis Ground Probe (saline probe) into the Electrical Safety Analyzer's "CHASSIS" connector.
6. Connect the Ultrasound probe to the Ultrasound system.
7. Immerse the Saline probe in the saline solution.
8. Immerse the Ultrasound probe's face (imaging area of the probe) into the saline solution.

**DANGER**

To avoid probe damage and possible electric shock, do not immerse probes into any liquid beyond the level indicated in the probe users manual.

Do not touch the probe, conductive liquid or any part of the Electrical Ultrasound system under test while doing the test.

**CAUTION**

Equipment damage possibility.

Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON.

Power off the Ultrasound system, allow the stored energy to bleed down, and turn the circuit breaker off BEFORE switching the "POLARITY" switch and/or the "NEUTRAL" switch on the Electrical Safety Analyzer to avoid possible power supply damage.

9. Test opening and closing the ground with the Ultrasound system on and off.
 - a. Power ON the Ultrasound system.
 - b. After the Ultrasound system has completed the boot process, select the probe to be tested so it is the active probe.
 - c. Depress the "LIFT GROUND" rocker switch and record the highest current reading.
 - d. Follow the test conditions and test limits described in *Table 13-6 Leakage Current Limits for Ultrasound System Operation on 100-240 Volt Mains* on page 767, as applicable for every probe.
10. Test opening the ground (only with IEC 60601-1).
11. Record the highest current reading.

The test passes when all readings measure less than the stated limits.

The actual location of the test probe may vary by Ultrasound system. Measurements should be recorded for each probe under the set of test conditions.

13.7.11.3 Data sheet for the probe (source) leakage current test

This table shows a typical format for recording the probe (source) leakage current test.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in italics font are given as examples only.

Table 13-14 Typical Data Format For Recording Probe (Source) Leakage Current for BF Type Applied Part (e.g. ultrasound probe)

Unit under test			Date of test			
Test Conditions			Probe as measured in saline bath			
System Power	Grounding/PE	Limit AC/DC μ A	<i>probe1</i>	<i>probe2</i>	<i>probe3</i>	<i>probe4</i>
off	closed	100/10				
off	open	500/50				
on	closed	100/10				
on	open	500/50				
off	closed (reversed polarity)	100/10				

Unit under test				Date of test		
Test Conditions			Probe as measured in saline bath			
System Power	Grounding/PE	Limit AC/DC μA	probe1	probe2	probe3	probe4
off	open (reversed polarity)	500/50				
on	closed (reversed polarity)	100/10				
on	open (reversed polarity)	500/50				

13.7.12 Isolated probe (sink) leakage-isolation test



DANGER

Do not use the probe if the insulating material has been punctured or otherwise compromised. Integrity of the insulation material and patient safety can be verified by safety testing according to IEC 60601-1.



DANGER



Line voltage is applied to the ultrasound probe during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.

13.7.12.1 Definition of the isolated probe (sink) leakage-isolation test

This test measures the current that would flow if mains voltage were applied to the probes.

This test verifies that the separation between the patient connections and other parts is adequate to limit the patient leakage current to the allowed value when an external voltage is present.

Measurements should be recorded for probes and transducers under each set of test conditions specified in:

- *Table 13-7 ISO and Mains Applied Limits** on page 767

13.7.12.2 Generic procedure for the isolated probe (sink) leakage-isolation test

Record the highest reading of current.

1. Connect the Safety analyzer to an AC wall outlet.
2. Plug the equipment under test into the receptacle on the panel of the Electrical Safety Analyzer.
3. Connect the Ultrasound probe to be tested to the Ultrasound system.
4. Immerse the saline probe in the saline solution.
5. Immerse the Ultrasound probe's face (imaging area of the probe) into the saline solution.
6. Select the "Patient Lead Leakage" function on the Electrical Safety Analyzer.
7. Test with closed ground with the Ultrasound system on and off.

NOTE

For more information, refer to the safety analyzer's user manual.

13.7.12.3 Data sheet for the isolated probe (sink) leakage-isolation test

This table shows a typical format for recording the isolated probe (sink) leakage-isolation test.

Record all data and keep the record of the results with other hard copies of maintenance data.

When filling out an electronic form (for example, an Ultrasound Equipment Quality Check (EQC and IQC)), record the highest reading from your results.

NOTE

Not all test procedures are applicable to all areas of the world. Reversed Polarity testing content satisfies regions following IEC 62353 and IEC 60601-1.

NOTE

Values in *italics font* are given as examples only.

Table 13-15 Typical Data Format for Recording Isolated Probe (Sink) Leakage for BF Type Applied Part (e.g. ultrasound probe)

Unit under test			Date of test __/__/__			
Test Conditions			Probe as measured in saline bath			
System Power	Grounding/PE	Limit μ A	<i>probe1</i>	<i>probe2</i>	<i>probe3</i>	<i>probe4</i>
off	closed	5000				
on	closed	5000				
off	closed (reversed polarity)	5000				
on	closed (reversed polarity)	5000				

13.7.13 Mains on applied part

NOTE

Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.

Mains on applied part is one of the described leakage current tests applicable for probes (Ref: IEC 60601-1). This is to be performed with the probe disconnected from the Ultrasound system. Apply mains voltage over the insulation barrier. (Between protective earth on the probe connector, and an electrical anode in saline solution. The patient applied part of the probe is immersed into the saline solution.) Measure current flowing in the circuit = leakage current.

As a minimum, tests according to IEC 60601-1 must be performed once a year. The requirements for Body Floating (BF) have to be applied for TEE and Trans thorax probes bearing the symbol for safety class BF.

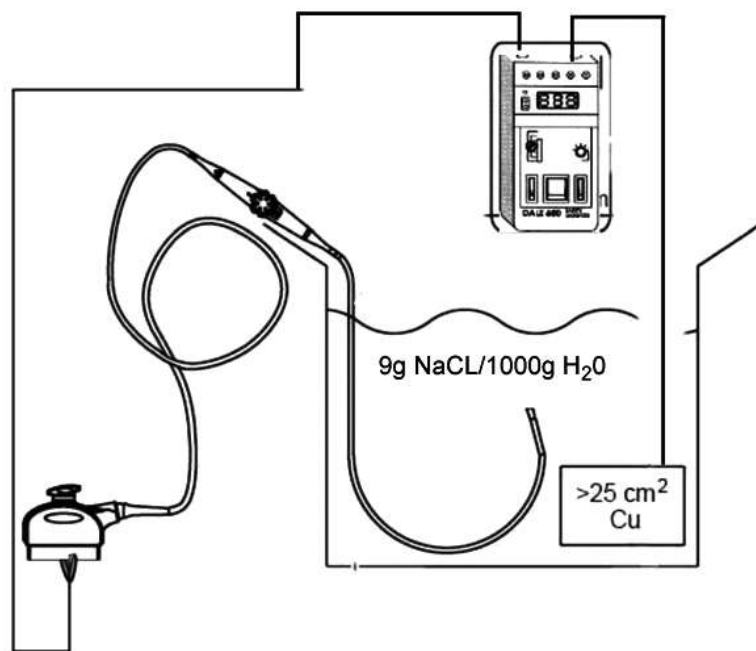
The symbol for BF is indicated on the probe connector label below:

Figure 13-6 Example of a GE HealthCare Probe Connector Label



A typical test setup for TEE probes could be as indicated below:

Figure 13-7 TEE Probe Leakage Isolation (Sink) Current Test



CAUTION

The handle of the TEE probes must not be immersed.

For immersion levels, please refer to the User Manual.

NOTE

Where applicable, a typical test setup of non-TEE probes can be as illustrated in Figure 4-4 on page 4-34. The test passes when the reading measure less than the values in:

- *Table 13-7 ISO and Mains Applied Limits** on page 767

13.8 When There Is Too Much Leakage Current

13.8.1 AC/DC fails

Where applicable, check the AC/DC adapter and its cable. Replace a new one if any portion is defective.

13.8.2 Chassis fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Where applicable, tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

NOTE

No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected. If reversed wiring is observed, it is the customers responsibility to have the condition corrected by qualified personnel.

13.8.3 Probe fails

Test the probe in another connector to isolate if the fault lies with the probe or the Ultrasound system.

NOTE

Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

If excessive leakage current is slot dependent, inspect the Ultrasound system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

13.8.4 Peripheral fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

13.8.5 Still fails

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

Where applicable, in the case of using a UPS (uninterruptible power supply), perform the tests in the "Electrical Safety tests" section without using the UPS (i.e. directly connect the Ultrasound system to the AC wall outlet). If this leads to a pass result, the specific UPS must no longer be used.

13.8.6 New Ultrasound system

If the leakage current measurement tests fail on a new Ultrasound system and if situation can not be corrected, submit a Safety Failure Report to document the Ultrasound system problem. Remove Ultrasound system from operation.

13.8.7 ECG fails

Inspect cables for damage or poor connections.

13.9 Ultrasound Equipment Quality Check (EQC and IQC)

13.9.1 Quality checks

Contact your GE HealthCare Service Representative to perform Equipment and Image Quality Checks.

Based on the region/area of the world that the customer is based in, the customers Quality Assurance Program may require alignment with local standards. Thus, all testing per IEC 60601 and/or IEC 62353 may or may not be required for EQC Care and Maintenance.

For example, United States National Standards for Health Care Facilities (NFPA 99) only requires touch current testing in normal operating configurations (this standard differs from IEC 62353 requirements for recurrent test and test after repair of medical electrical equipment).

13.9.2 Cybersecurity checks

In addition to Ultrasound Equipment Quality Check (EQC and IQC), there may be questions for cybersecurity included on the form.

These questions are designed to determine the cybersecurity state of the product during a service visit.

These are the types of questions that will be required:

- Is the system application software up to date with the most recent patch?
- Have the default admin passwords been changed?
- If encryption is available on the product, are the disks encrypted?

Chapter 14

Deinstallation

In this chapter

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This chapter contains information needed to ensure the safe, compliant and efficient removal of an ultrasound system whether for replacement, return to GE HealthCare (GoldSeal) or final end-of-life disposition. All tasks listed in the deinstallation process are recommended. Review the requirements and standards specific to your region, as local procedures may vary.

NOTE
The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

14.1 Customer responsibilities for deinstallation

Before deinstallation begins, make sure the customer has:

- Discontinued clinical use of the system.
- Removed all personal or hospital-owned items from the system (see below).
- Completed any necessary data backups (system and patient data backup).
- Reviewed and acknowledged the SSD Wipe / Secure Delete process for **removal of Protected Health Information (PHI)**
- **Cleaned and disinfected the system to ensure it is safe for handling.**
- Confirmed that the console is properly prepared for removal.

14.2 Prerequisites for deinstallation

Perform these steps prior to deinstallation:

1. Perform a visual inspection to make sure the Ultrasound system has been disinfected and is safe to handle.
2. Remove the MS Tablet and move it to the replacement Ultrasound system (if present).
3. Re-inspect the storage areas and trays and remove any items that belong to the customer.
4. Unplug and remove all probes connected to the Ultrasound system (either store them for transportation).

NOTE

If moving probes to a replacement Ultrasound system, perform electrical safety and IQC.

5. Unplug and remove the VScan Air CL and VScan Air CL Charger (if present).
6. Disconnect and remove the RFID and cradle (if present).
7. Obtain any required predefined packaging materials as applicable.
8. PHI is removed or deleted from the Ultrasound system.
9. Power down requirements.

14.2.1 (EHS) requirements for deinstallation

Field Engineer should wear all required **Personal Protective Equipment (PPE)**:

- Follow **Lockout/Tagout (LOTO)** procedures, if applicable, to isolate power.
- Verify the system has been **cleaned and disinfected** before handling the console removal process.

14.3 Deinstallation procedures

14.3.1 Patient Healthcare Information (PHI) removal process for deinstallation

The most critical step of deinstallation is **removal of Protected Health Information (PHI)**:

- Verify the system has been properly backed up (Patient Data Must is a Customer Responsibility).
- Use the appropriate **service tools or software interface*** to:
 - Erase all PHI and site-specific configurations.
 - Reset to factory defaults if the system is being retired.
- Document completion of this process per regulatory and company policy.

Perform **Secure Delete to ensure all customer and patient data are completely removed from console. **Some customer sites may request to retain the console SSD—be sure to document the request for GEHC records that the customer is taking proper ownership of the SSD.***

14.3.2 Power down requirements for deinstallation

These are the power down requirements for deinstallation:

- Completely power down the Ultrasound system.
- Turn off the breaker on the back of the Ultrasound system.
- Disconnect the power cable (first from the wall and then from the Ultrasound system).
- Remove the batteries or make sure the Ultrasound system is charged to at least 30%.

14.4 Critical part packaging for deinstallation

Complete the following steps in order:

1. **Visually inspect** the system to ensure it has been disinfected and is safe to handle.
2. **Remove or ask the customer to remove** all customer-owned items, including:

Confirm that the system is now **ready for physical removal** from the site.

14.5 Disposition of materials for deinstallation

Dispose of any unneeded parts per local policy.

Chapter 15

Favorite Links

In this chapter

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Other links. 795

This chapter contains information on favorite links used with the Ultrasound system.

NOTE
The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

15.1 Documentation Web Site Links

Support Documentation Library Web Site

<http://www.gehealthcare.com/DocumentationLibrary>

Customer Documentation Portal

<https://www.gehealthcare.com/documentation>

SIMS

To get access to SIMS you must be a registered user and you must use the application SIMS Content Viewer.

Product Security Portal

<https://www.gehealthcare.com/services/lifecycle-management/product-security-portal/security>

Sustainability reports

<http://www.gehealthcare.com/about/sustainability/reports>

15.2 Other links

GE HealthCare

<https://www.gehealthcare.com>

LOGIQ Club

<https://www.logiqclub.net/>

Ultrasound Probe Web Site

<https://www.gehealthcare.com/products/ultrasound/ultrasound-transducers>

GEHC Chemicals Compatibility

<https://cleaning.gehealthcare.com/>

System Cleaning Site

<https://cleaning.gehealthcare.com/>

Chapter 16

Glossary

In this chapter

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This chapter contains a glossary of terms for the Ultrasound system.

NOTE

The information in this Service Manual is applicable to LOGIQ Totus.
This Service Manual also applies to Ultrasound systems used in veterinary environments.

16.1 Glossary

Term	Description
3D	Three Dimensional
4D	Four Dimensional. 4D is the same as Three Dimensional + Realtime
AC	Alternating Current
ADC	Analog to Digital Converter
APM	Asset Performance Tool
ASIC	Application Specific Integrated Circuit
ASSY	Assembly
CPU	Central Processing Unit
CRM	Customer Relationship Management (number)
CRU	Customer Replaceable Unit
CTRL	Control
CW	Continuous Wave Doppler
DAC	Digital to Analog Converter
DC	Direct Current
DMM	Digital Multimeter
ECG	Electro Cardio Graphy
EFI	Extensible Firmware Interface
eIfU	electronic Instructions for Use
EXT	External
FE	1: Field Engineer 2: Front End
FFA	Field Force Automation (InSite server)
FPGA	Field Programmable Gate Arrays
FRU	Field Replaceable Unit
GB	Gigabyte
GPU	Graphic Processing Unit
GRS	Global Service Room
HDD	Hard Disk Drive
HDU	High Definition Ultrasound
I ² C	Inter-Integrated Circuit (I2C) bus
I2C	Inter-Integrated Circuit (I2C) bus
IfU	Instructions for Use
I/O	Input/output

Term	Description
InSite EXC	InSite with Express Connect
INT	Internal
LCD	Liquid Crystal Display
M&A	Measurements and Analysis
OP	Operating Panel
OPIO	Operator Panel
PCB	Printed Circuit Board
PCBA	Printed Circuit Board Assembly
PCI	Peripheral Component Interconnect
PCIE	Peripheral Component Interconnect Extended
PS	Power Supply
PWA	Printed Wire Assembly
PWR	Power
PW	Pulsed Wave Doppler
QTY	Quantity used per ultrasound system
RAM	Random Access Memory
RX	Receiver
SSA	Secure Service Access (by means of an "USB Class M" SSA dongle + PIN)
SSD	Solid-State Drive
TB	Terabyte
TX	Transmitter
UI	User interface
UIS	Ultrasound Application Software
μC	Microcontroller
VCO	Virtual Console Observation
WPA	Wi-Fi Protected Access

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