

GE Healthcare

# Simple Clamp Replacement Manual

OPERATING DOCUMENTATION



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Rev 1

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# **LEGAL NOTES**

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# IMPORTANT PRECAUTIONS

## LANGUAGE

<p><b>ПРЕДУПРЕЖДЕНИЕ</b> (BG)</p>	<p>Това упътване за работа е налично само на английски език.</p> <ul style="list-style-type: none"> <li>• Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод.</li> <li>• Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа.</li> <li>• Неспазването на това предупреждение може да доведе до нараняване на доставчика на услугата, оператора или пациента в резултат на токов удар, механична или друга опасност.</li> </ul>
<p><b>警告</b> (ZH-CN)</p>	<p>本维修手册仅提供英文版本。</p> <ul style="list-style-type: none"> <li>• 如果维修服务提供商需要非英文版本，客户需自行提供翻译服务。</li> <li>• 未详细阅读和完全理解本维修手册之前，不得进行维修。</li> <li>• 忽略本警告可能对维修人员，操作员或患者造成触电、机械伤害或其他形式的伤害。</li> </ul>
<p><b>警告</b> (ZH-HK)</p>	<p>本服務手冊僅提供英文版本。</p> <ul style="list-style-type: none"> <li>• 倘若客戶的服務供應商需要英文以外之服務手冊，客戶有責任提供翻譯服務。</li> <li>• 除非已參閱本服務手冊及明白其內容，否則切勿嘗試維修設備。</li> <li>• 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他危險。</li> </ul>
<p><b>警告</b> (ZH-TW)</p>	<p>本維修手冊僅有英文版。</p> <ul style="list-style-type: none"> <li>• 若客戶的維修廠商需要英文版以外的語言，應由客戶自行提供翻譯服務。</li> <li>• 請勿試圖維修本設備，除非 您已查閱並瞭解本維修手冊。</li> <li>• 若未留意本警告，可能導致維修廠商、操作員或病患因觸電、機械或其他危險而受傷。</li> </ul>
<p><b>UPOZORENJE</b> (HR)</p>	<p>Ovaj servisni priručnik dostupan je na engleskom jeziku.</p> <ul style="list-style-type: none"> <li>• Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod.</li> <li>• Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik.</li> <li>• Zanimarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.</li> </ul>
<p><b>VÝSTRAHA</b> (CS)</p>	<p>Tento provozní návod existuje pouze v anglickém jazyce.</p> <ul style="list-style-type: none"> <li>• V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka.</li> <li>• Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah.</li> <li>• V případě nedodržování této výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.</li> </ul>

<b>ADVARSEL</b> (DA)	<p>Denne servicemanual findes kun på engelsk.</p> <ul style="list-style-type: none"><li>• Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse.</li><li>• Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual.</li><li>• Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.</li></ul>
<b>WAARSCHUWING</b> (NL)	<p>Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.</p> <ul style="list-style-type: none"><li>• Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan.</li><li>• Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is.</li><li>• Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.</li></ul>
<b>WARNING</b> (EN)	<p>This service manual is available in English only.</p> <ul style="list-style-type: none"><li>• If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.</li><li>• Do not attempt to service the equipment unless this service manual has been consulted and is understood.</li><li>• Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.</li></ul>
<b>HOIATUS</b> (ET)	<p>See teenindusjuhend on saadaval ainult inglise keeles.</p> <ul style="list-style-type: none"><li>• Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest.</li><li>• Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist.</li><li>• Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.</li></ul>
<b>VAROITUS</b> (FI)	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p> <ul style="list-style-type: none"><li>• Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla.</li><li>• Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen.</li><li>• Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.</li></ul>
<b>ATTENTION</b> (FR)	<p>Ce manuel d'installation et de maintenance est disponible uniquement en anglais.</p> <ul style="list-style-type: none"><li>• Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire.</li><li>• Ne pas tenter d'intervenir sur les équipements tant que ce manuel d'installation et de maintenance n'a pas été consulté et compris.</li><li>• Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.</li></ul>

<p><b>WARNUNG</b> (DE)</p>	<p>Diese Serviceanleitung existiert nur in englischer Sprache.</p> <ul style="list-style-type: none"> <li>• Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen.</li> <li>• Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben.</li> <li>• Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.</li> </ul>
<p><b>ΠΡΟΕΙΔΟΠΟΙΗΣΗ</b> (EL)</p>	<p>Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.</p> <ul style="list-style-type: none"> <li>• Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης.</li> <li>• Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις.</li> <li>• Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.</li> </ul>
<p><b>FIGYELMEZTETÉS</b> (HU)</p>	<p>Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.</p> <ul style="list-style-type: none"> <li>• Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítése.</li> <li>• Ne próbálja elkezdni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték.</li> <li>• Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.</li> </ul>
<p><b>AÐVÖRUN</b> (IS)</p>	<p>Þessi þjónustuhandbók er aðeins fáanleg á ensku.</p> <ul style="list-style-type: none"> <li>• Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu.</li> <li>• Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin.</li> <li>• Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.</li> </ul>
<p><b>AVVERTENZA</b> (IT)</p>	<p>Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.</p> <ul style="list-style-type: none"> <li>• Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.</li> <li>• Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.</li> <li>• Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.</li> </ul>
<p><b>警告</b> (JA)</p>	<p>このサービスマニュアルには英語版しかありません。</p> <ul style="list-style-type: none"> <li>• サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。</li> <li>• このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないでください。</li> <li>• この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。</li> </ul>

<p>(KO)</p>	<ul style="list-style-type: none"> <li>가</li> <li>,</li> <li>,</li> <li>,</li> </ul>
<p><b>BRĪDINĀJUMS</b> (LV)</p>	<p>Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.</p> <ul style="list-style-type: none"> <li>Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu.</li> <li>Neveiciet aprīkojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas.</li> <li>Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.</li> </ul>
<p><b>ĮSPĖJIMAS</b> (LT)</p>	<p>Šis eksploatavimo vadovas yra tik anglų kalba.</p> <ul style="list-style-type: none"> <li>Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas.</li> <li>Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo.</li> <li>Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.</li> </ul>
<p><b>ADVARSEL</b> (NO)</p>	<p>Denne servicehåndboken finnes bare på engelsk.</p> <ul style="list-style-type: none"> <li>Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse.</li> <li>Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått.</li> <li>Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.</li> </ul>
<p><b>OSTRZEŻENIE</b> (PL)</p>	<p>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</p> <ul style="list-style-type: none"> <li>Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta.</li> <li>Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go.</li> <li>Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.</li> </ul>
<p><b>ATENÇÃO</b> (PT-BR)</p>	<p>Este manual de assistência técnica encontra-se disponível unicamente em inglês.</p> <ul style="list-style-type: none"> <li>Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução.</li> <li>Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.</li> <li>A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.</li> </ul>

<b>ATENÇÃO</b> (PT-PT)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none"><li>• Se qualquer outro serviço de assistência técnica solicitar este manual noutra língua, é da responsabilidade do cliente fornecer os serviços de tradução.</li><li>• Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.</li><li>• O não cumprimento deste aviso pode colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.</li></ul>
<b>ATENȚIE</b> (RO)	<p>Acest manual de service este disponibil doar în limba engleză.</p> <ul style="list-style-type: none"><li>• Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere.</li><li>• Nu încercați să reparați echipamentul decât ulterior consultării și înțelegerii acestui manual de service.</li><li>• Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.</li></ul>
<b>ОСТОРОЖНО!</b> (RU)	<p>Данное руководство по техническому обслуживанию представлено только на английском языке.</p> <ul style="list-style-type: none"><li>• Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует самостоятельно обеспечить перевод.</li><li>• Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения.</li><li>• Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.</li></ul>
<b>UPOZORENJE</b> (SR)	<p>Ovo servisno uputstvo je dostupno samo na engleskom jeziku.</p> <ul style="list-style-type: none"><li>• Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge.</li><li>• Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.</li><li>• Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.</li></ul>
<b>UPOZORNENIE</b> (SK)	<p>Tento návod na obsluhu je k dispozícii len v angličtine.</p> <ul style="list-style-type: none"><li>• Ak zákazníkovi poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.</li><li>• Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obsluhu a neporozumiete mu.</li><li>• Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.</li></ul>

<b>ATENCIÓN</b> (ES)	<p>Este manual de servicio sólo existe en inglés.</p> <ul style="list-style-type: none"><li>• Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual.</li><li>• No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio.</li><li>• La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.</li></ul>
<b>VARNING</b> (SV)	<p>Den här servicehandboken finns bara tillgänglig på engelska.</p> <ul style="list-style-type: none"><li>• Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster.</li><li>• Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken.</li><li>• Om du inte tar hänsyn till den här varningen kan det resultera i skador på serviceteknikern, operatören eller patienten till följd av elektriska stötar, mekaniska faror eller andra faror.</li></ul>
<b>OPOZORILO</b> (SL)	<p>Ta servisni priročnik je na voljo samo v angleškem jeziku.</p> <ul style="list-style-type: none"><li>• Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod.</li><li>• Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli.</li><li>• Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.</li></ul>
<b>DİKKAT</b> (TR)	<p>Bu servis kılavuzunun sadece ingilizcesi mevcuttur.</p> <ul style="list-style-type: none"><li>• Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer.</li><li>• Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.</li><li>• Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.</li></ul>

## **DAMAGE IN TRANSPORTATION**

All packages should be closely examined at time of delivery. If damage is apparent, have notation "damage in shipment" written on all copies of the freight or express bill before delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. 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.

To file a report:

- Call 1-800-548-3366 and use option 6.
- Fill out the GIQ workflow for any items missing, damaged, OBF/FOI for in process installs:  
[http://supportcentral.ge.com/ProcessMaps/form\\_new\\_request.asp?prod\\_id=268679&form\\_id=573167&node\\_id=1916016&map\\_id=&reference\\_id=&reference\\_type](http://supportcentral.ge.com/ProcessMaps/form_new_request.asp?prod_id=268679&form_id=573167&node_id=1916016&map_id=&reference_id=&reference_type)
- Contact your local service coordinator for more information on this process.

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## **CERTIFIED ELECTRICAL CONTRACTOR STATEMENT**

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. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

## **IMPORTANT...X-RAY PROTECTION**

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Medical Systems Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that anyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Medical Systems Group, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective materials and devices are available. It is urged that such materials or devices be used.

## LITHIUM BATTERY CAUTIONARY STATEMENTS

### CAUTION



**Risk of Explosion.**

**Danger of explosion if battery is incorrectly replaced.**

**Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

### ATTENTION



**Danger d'Explosion**

**Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.**

**Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.**

## OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the Healthcare PQR Process to report all omissions, errors, and defects in this publication.

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# *Revision History*

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<b>Revision</b>	<b>Date</b>	<b>Reason for change</b>
1	July 11, 2019	Initial Release

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# List of Effected Pages

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PAGES	REVISION	PAGES	REVISION	PAGES	REVISION
1 through 54	1				

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# Preface

## Publication Conventions

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Purpose: Standardize conventions for representing information in a uniform way of communicating information to a reader in a consistent manner. Conventions are used so that the reader can easily recognize the actions or decisions that must be made. There are a number of character and paragraph styles used in this publication to accomplish this task. Please become familiar with them before proceeding forward.

## Section 1.0

### Safety & Hazard Information

#### 1.1 Text and Character Representation

Within this publication, different paragraph and character styles have been used to indicate potential hazards. Paragraph prefixes, such as hazard, caution, danger and warning, are used to identify important safety information. Text (Hazard) styles are applied to the paragraph contents that is applicable to each specific safety statement. Words describe the type of potential hazard that may be encountered and are placed immediately before the paragraph it modifies. Safety information will normally include:

- Type of potential Hazard
- Nature of potential injury
- Causative condition
- How to avoid or correct the causative condition

#### EXAMPLES OF HAZARD STATEMENTS USED

It's important that you read and understand hazard statements, and not just ignore them.



**DANGER  
SEVERE  
PERSONAL  
INJURY**

**DANGER IS USED WHEN A HAZARD EXISTS WHICH WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:**


- **ELECTROCUTION**
- **CRUSHING**
- **RADIATION**




**WARNING  
SERIOUS  
PERSONAL  
INJURY**

**WARNING IS USED WHEN A HAZARD EXISTS WHICH COULD OR CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:**

- **POTENTIAL FOR SHOCK**
- **EXPOSED WIRES**
- **FAILURE TO TAG AND LOCKOUT SYSTEM POWER COULD ALLOW FOR UN-COMMANDED MOTION.**


 **CAUTION**  
**Minor Personal Injury**  
Caution is used when a hazard exists which can or could cause minor injury to self or others if instructions are ignored. They include for example:










- Loss of critical patient data
- Crush or pinch points
- Sharp objects

 **NOTICE**  
**Property Damage Only**  
Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk. They can include:

- Disk drive will be destroyed
- Internal mechanical damage, such as to the x-ray tube
- Coasting the rotor through resonance.

## 1.2 Graphical Representation

Important information will always be preceded by the exclamation point  contained within a triangle, as seen throughout the Preface 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.

<p><b>ELECTRICAL</b></p>  <p><b>LASER</b></p>  <p><b>LASER LIGHT</b></p>	<p><b>HAZARDS MECHANICAL</b></p>  <p><b>HEAT</b></p> 	<p><b>RADIATION</b></p>  <p><b>PINCH</b></p> 
<p><b>AVOID STATIC ELECTRICITY</b></p> 	<p><b>PROCEDURAL TAG AND LOCK OUT</b></p> 	<p><b>WEAR EYE PROTECTION</b></p>  <p><b>EYE PROTECTION</b></p>

# Section 2.0 Publication Conventions

## 2.1 General Paragraph and Character Styles

Prefixes are used to highlight important non-safety related information. Paragraph prefixes (such as purpose, example, comment or note) are used to identify important but non-safety related information. Text styles are also applied to text within each paragraph modified by the specific prefix.

### EXAMPLES OF PREFIXES USED FOR GENERAL INFORMATION

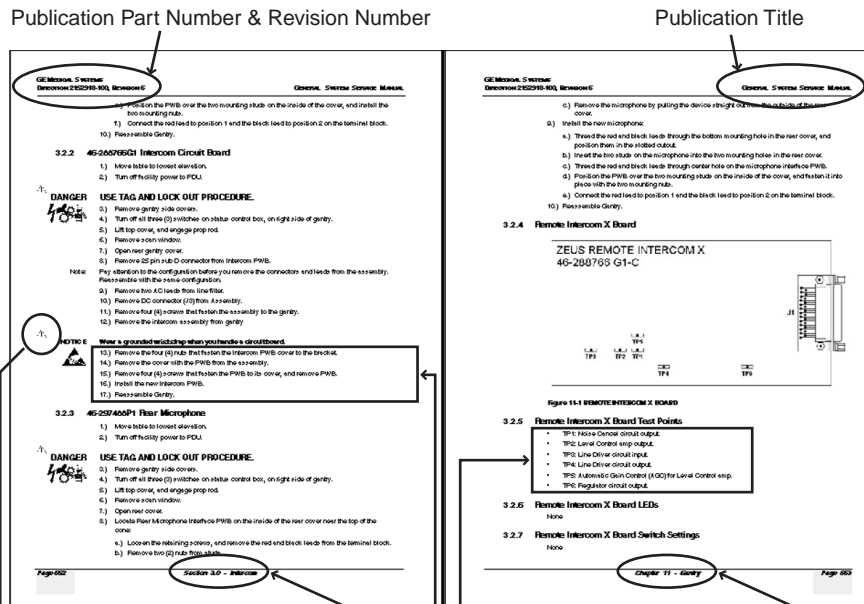
**Purpose:** Introduces and provides meaning as to the information contained within the chapter, section or subsection, Such as used at the beginning this chapter for example.

**Note:** Conveys information that should be considered important to the reader.

**Example:** Used to make the reader aware that the paragraph(s) that follow are examples of information possibly stated previously.

**Comment:** Represents "additional" information that may or may not be relevant to your situation.

## 2.2 Page Layout



The current section and its title are always shown in the footer of the left (even) page.

An exclamation point in a triangle is used to indicate important information to the user.

Paragraphs preceded by **Alphanumeric** characters (e.g. numbers) contain information that must be followed in a **specific order**.

The current chapter and its title are always shown in the footer of the right (odd) page.

Paragraphs preceded by a **symbol** (e.g. bullets) contain information that has **no specific order**.

Headers and footers in this publication are designed to allow you to quickly identify your location. The document's part number and revision number appears in every header on every page. Odd

numbered page footers indicate the current chapter, its title and current page number. Even page footers show the current section and its title, as well current page number.

## 2.3 Computer Screen Output/Input Text Character Styles

Within this publication, mono-spaced character styles (fonts) are used to indicate computer text that's either screen input and output. Mono spaced fonts, such as courier, are used to indicate text direction. When you type at your keyboard, you are generating computer input. Occasionally you will see the math operators "greater than" and "less than" symbols used to indicate the start and finish of variable output. When reading text generated by the computer, you are reading it as computer generated output. In addition to direction, characters are italicized (e.g. *italics*) to indicate information specific to your system or site.

Example:  
Fixed Output

This paragraph's fonts represents computer generated screen "fixed" output. It's output is fixed from the sense that it does not vary from application to application. It's the most commonly used style used to indicate filenames, paths and text that does not change from system to system. The character style used is a fixed width such as courier.

Example:  
Variable Output

*This paragraph's font represents computer screen output that is "variable". Its used to represent output that varies from application to application or system to system. Variable output is sometimes found placed between greater than and lesser than operators for clarification. For example: <variable\_ouput> or <3.45.120.3>. In both cases, the < and > operators are not part of the actual input.*

Example:  
Fixed Input

**This paragraph's font represents fixed input. It's computer input that is typed-in via the keyboard. Typed input that does not vary from application to application or system to system. Fixed text the user is required to supply as input. For example: cd /usr/3p**

Example:  
Variable Input

*This paragraph's font represents computer input that can vary from application to application or system to system. With variable text, the user is required to supply system dependent input or information. Variable input sometimes is placed between greater-than and less-than operators. For example: <variable\_input>. In these cases, the (<>) operators would be dropped prior to input. For example: ypcat hosts | grep <3.45.120.3> would be typed into the computer as ypcat hosts | grep 3.45.120.3 without the greater-than and less-than operators.*

## 2.4 Buttons, Switches and Keyboard Inputs (Hard & Soft Keys)

Different character styles are used to indicate actions requiring the reader to press either a hard or soft button, switch or key. Physical hardware, such as buttons and switches, are called hard keys because they are hard wired or mechanical in nature. A keyboard or on/off switch would be a hard key. Software or computer generated buttons are called soft keys because they are software generated. Software driven menu buttons are an example of such keys. Soft and hard keys are represented differently in this publication.

Example:  
Hard Keys

A power switch **ON/OFF** or a keyboard key like **ENTER** is indicated by applying a character style that uses both over and under-lined bold text that is bold. This is a hard key.

Example:  
Soft Keys

Whereas the computer MENU button that you would click with your mouse or touch with your hand uses over and under-lined regular text. This is a soft key.

**END OF SECTION**

# Chapter 1

## Introduction

### Section 1.0 Purpose

Purpose of this kit is to replace Simple Clamp on all detector modules in the detector listed below. Simple Clamp is one of parts which makes interconnection of analog signals between analog module and AD sandwich.

### Section 2.0 Applicable Detector and corresponding FRU kit

Det Part #	Detector Description	Applicable FRU kit part #
5126400	Sherlock Det	5826622SLHL
5196400	Halo Det	
5206400	VCT HD750 DET	
5202200	SAT Det	5826622HLST
5202200-2	SAT Det SDCB	
5202200-3	SAT Det SDCB RoHS	


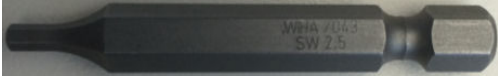

### Section 3.0 Preliminary Requirements

#### 3.1 Furnished Materials in FRU kit

	GE parts #	5826622SLHL for Sherlock, Halo, HD	5826622HLST for Halo-Saturn
Interposer MP2	5108407	114 pcs	97 pcs
Top Clamp Assembly	5313650	57 pcs	40 pcs
Plastic Top Clamp	5202035	-	17 pcs
Bottom Clamp Assembly	5313653	57 pcs	57 pcs
Torx screw(T10)	5144267	180 pcs	180 pcs
Cloth wiper or cleaning paper Wiper	NA	1 box	1 box
Round Toothpick		1 box (50 pcs)	1 box (50 pcs)



### 3.2 Field Supplied Materials

Item	Description
Anhydrous alcohol to clean FPC/AD board surface	
ESD Mat and Wrist Strap	
Anti-static nitrile gloves	
Standard FE tool kit	
FE Torque Wrench Kit	46-268445G1 or 5135228 or equivalent
Torx Bit – T10  	
Torque driver capable of torquing from 3 to 22 lb-in(0.34Nm ~ 2.5Nm)	As an option, if you had four torque drivers, one set to 3 lb-in and another set to 7 lb-in the process to replace Simple Clamps and interposers would be more efficient. To install the module one torque drive set at 10lb-in(1.1Nm) and another set to 3.5 lb-in(0.4Nm) for the Digital Cable Screw.
HEX BIT 2.5MM with 0.25inch HEX Shank, 1.9inch length  	
HEX BIT 3.0MM with 0.25inch HEX Shank, 1.9inch length  	

### 3.3 Optional Tools

Item	Description
DETECTOR DIGITAL MODULE FIELD REPLACEMENT ACCESSORY COLLECTOR (5133782)	This contains the tools needed to remove HD and Halo detector modules, and is optional as many Field Engineers already have these tools.
DETECTOR DIGITAL MODULE FIELD REPLACE ACCESSORY COLLECTOR (5138154)	This contains the tools needed to remove Saturn detector modules, and is optional as many Filed Engineers already have these tools.
Module alignment gage (5172309) - order from Tool Depot when working with modules 27-31.	Not required reference only
Deionizing fan (2335059)	OPTIONAL

---

# Chapter 2

## Procedure

---

### Section 1.0 Overview

The procedure will include the following steps:

- Preparing for replacement. This step will direct you to prepare a clean, well-organized work area to replace the interposers. ESD mat, wrist strap, and Nitrile gloves are required.
- Opening up the detector to access the modules. You will be directed to the Service documentation for covers and plenum removal instructions.
- Pulling modules and replacing interposers and Simple clamp. If you need clean the Light seal comb in DAS card cage, several adjacent modules should be removed at same time to keep space for cleaning. Be CAREFUL not to damage collimator plate and alignment fixture. Be CAREFUL when pulling out and inserting the module to prevent damage to the digital cable if it rubs against the neighboring module. If three Service Engineers are available, one can pull modules and one remove Clamps and cleaning modules, and one re-assemble modules.
- It is CRITICAL to ensure the modules get returned to the same location.
- Retesting alignment, reference the Service documentation.
- Replacing covers, reference the Service documentation.
- Calibration and Finalization, reference the Service documentation.
- Ensure that you have the tools needed to remove modules. If you do not have the tools to remove the module, contact your regional support leader for the Detector Digital Module Field Replacement Accessory Collector.
- Estimated working hours are 12 hours with three persons.

### Section 2.0 Preparation for Replacement

The following section will prepare the system and a work space for clean interposer replacement.



**NOTICE**

**SAFETY GLASSES MUST BE WORN.**



As with all tasks that require tools, safety glasses must be worn at all times during the FMI.



**NOTICE**

Prevent permanent damage to the static-sensitive boards. Attach an antistatic wrist strap to your wrist and to a bare metal grounding point.



**NOTICE**

Wear Nitrile gloves to protect the detector module from contaminants.

- 1.) Prior to beginning the simple clamp and interposer replacement it is important to check current alignment to establish a baseline for comparison later. Follow the below steps to review the systems current alignment:

Note: If any modules are out of alignment, it is recommended to wait until simple clamp and interposers have been replaced to attempt alignment.

- a.) From the Common Service Desktop, Utilities Menu, Open a Shell and type: `zalignmentWizard` Enter.

Note: `zalignmentWizard` will NOT open from a regular unix shell, it must be opened from the Utilities Menu in CSD.

- b.) The alignment check will run 2 stationary scans and show plots as shown in `#concept_t4y_rln_13b/fig_ucc_ynn_13b`. Processing will take approximately 2 minutes after the scans are run.

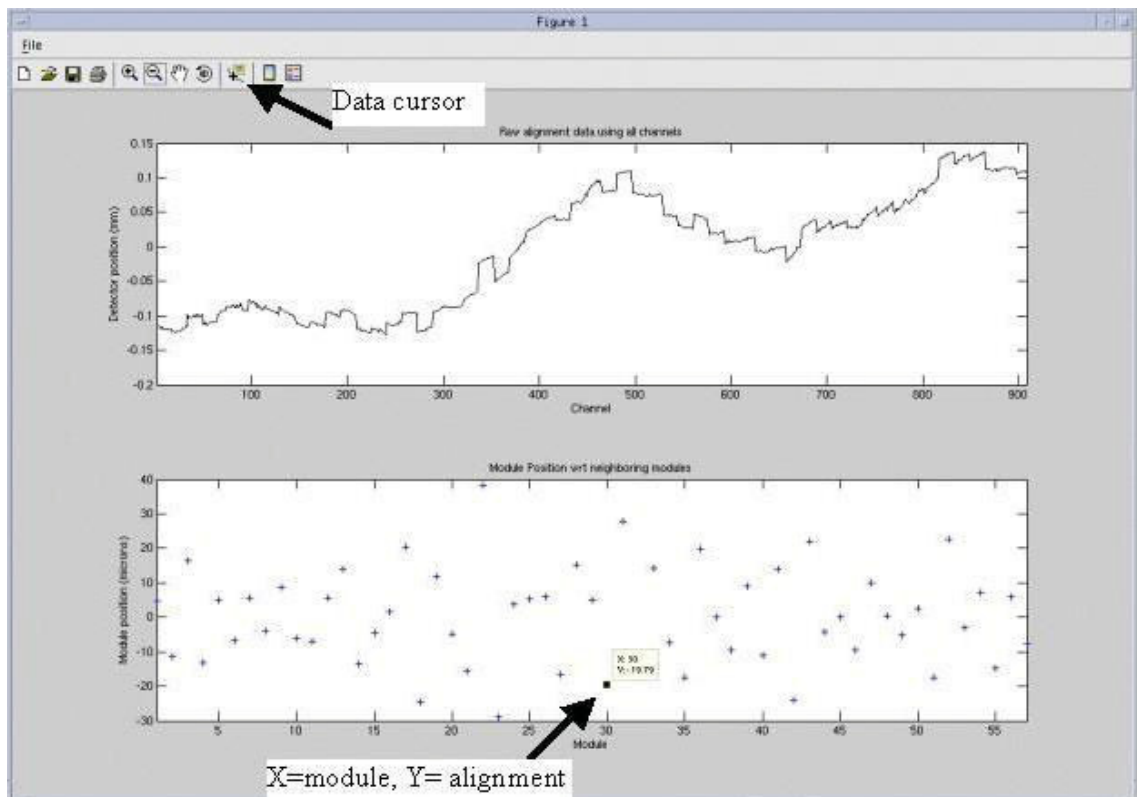


Figure 2-1 Alignment check Display

- c.) Save as a copy of the output as a jpg in the `usr/g/scripts` directory.

Note: Refer to CT System Service Methods) FRDM Replacement Procedure, Section 3.7 step 3 for additional information regarding current alignment.

2.) Clean and Organized Workspace Preparation.



**Figure 2-2 ESD wrist strap and Nitrile gloves**



**NOTICE**

Clean workspace area required to reduce possible contaminants.

- a.) Locate a clean surface and place an ESD mat to use as a work area. The detector module is very sensitive to ESD and dust; it needs to be handled with care.
- b.) Clean all work surfaces, including the ESD mat, the work area must start off clean and organized. A comfortable chair and table should be used to ensure a quality interposer replacement.
- c.) Ensure gloves and ESD strap are on and properly connected.
- d.) Gather the following at the workspace.
  - \* T10 torx bit.
  - \* M3 button head screws from kit.
  - \* One Torque driver capable of 3 to 7 lb-in range (.34 to .8 N-m)
  - \* Alcohol Wipes from kit(s).
  - \* Interposers from kit.
  - \* Top Clamps and Bottoms Clamp from kit.

## Section 3.0 Simple Clamp and Interposer Replacement



**DANGER**

**POSSIBLE ELECTRIC SHOCK**

**UNEXPECTED GANTRY ROTATION CAN CAUSE SERIOUS INJURY.**

**NEVER SERVICE THE GANTRY WITH THE AXIAL DRIVE ENABLED. USE THE GANTRY ROTATION LOCK TO LOCK OUT GANTRY ROTATION. SEE SAFETY MENU OF SERVICE DOCUMENT GUI FOR APPROPRIATE PROCEDURES.**



**⚠ DANGER**



**CRUSH HAZARD**

**UNEXPECTED GANTRY ROTATION CAN CAUSE SERIOUS INJURY.**

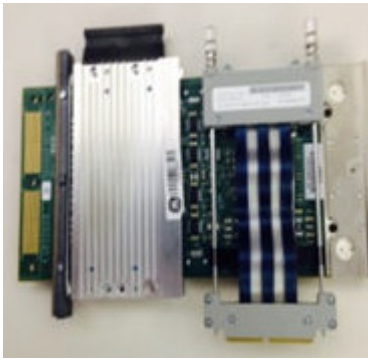




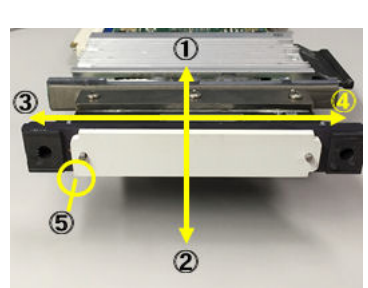
**NEVER SERVICE THE GANTRY WITH THE AXIAL DRIVE ENABLED. USE THE GANTRY ROTATION LOCK TO LOCK OUT GANTRY ROTATION. SEE SAFETY MENU OF SERVICE DOCUMENT GUI FOR APPROPRIATE PROCEDURES.**

Please follow Equipment Service – Lockout-Tagout-PPE procedures (Direction 534353202EN Rev.11) as part of the FRDM Replacement Procedure.

In the following section, the FRDM replacement procedure in the Service Documents will be referenced to provide detailed instructions for removing and replacing FRDM's.

	<p>Diode and Flex Asm - with "A" SIDE marking,                  lower channel side                  (Halo example)</p>
	<p>A/D Sandwich Asm "A" Side, lower channel side                  No Digital Cable side.                  (Halo example).</p>
	<p>A/D Sandwich Asm "A" Side                  lower channel side                  No Digital Cable side                  Only for Saturn Outer</p>
	<p>Diode and Flex Asm – with "B" SIDE marking                  higher channel side                  (Halo example)</p>

**Table 2-1 Explanation of Components of FRDM**

	<p>A/D Sandwich Asm – “B” side Note Cable on top                  higher channel side                  Digital cable side                  (Halo example)</p>	
	<p>Bottom Clamp – goes on “B” Side</p>	
	<p>Top Clamp, goes on A Side.</p>	
	<p>Top Plastic Clamp, goes on A Side.                  Only for Saturn</p>	
	<p>Interposers</p>	
	<p>1</p>	<p>A Side. Lower channel side(no digital cable side)</p>
	<p>2</p>	<p>B Side. Higher channel side (digital cable side)</p>
	<p>3</p>	<p>Rear (Backplane) Side. (digital cable connection side)</p>
	<p>4</p>	<p>Front (Table) Side. (digital cable handle side)</p>
	<p>5</p>	<p>Rear, High corner</p>

**Table 2-1 Explanation of Components of FRDM**

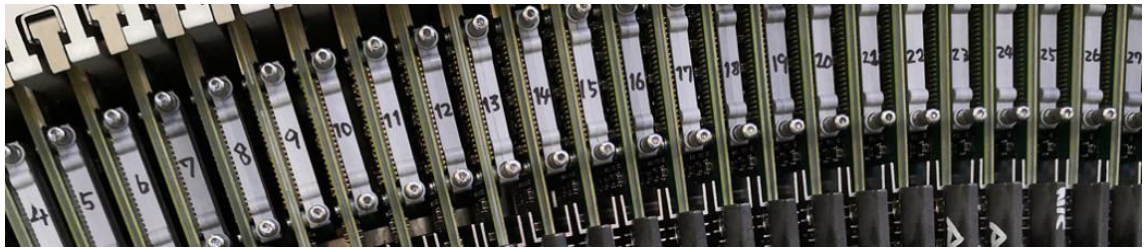
## 3.1 FRDM Removal

Refer to Direction in 5338260-8EN (LightSpeed 7.X Service Methods) or 5343532-2EN (Revolution Discovery CT Service Methods) or 5409363-8EN (Optima CT660 Service Methods)

FDRM Replacement Procedure (Section 3.4 FRDM Removal) for the modules needing Interposer and or Simple Clamp replacement.

Note: ESD strap and Nitrile gloves are needed for FRDM removal.

- 1.) Follow Section "3.1 Special Tools Overview" in mentioned Service Methods above.
- 2.) Follow Section "3.2 Preparing the System" in mentioned Service Methods above.
- 3.) Follow Section "3.3 Air Plenum Removal" in mentioned Service Methods above.
- 4.) Mark the slot position number on each module, before removing FRDM. All modules must be returned to exactly the same slot.



**Figure 2-3 Numbering on Module**

- 5.) Follow Section "3.4 FRDM Removal" in mentioned Service Methods above.

### 3.2 Interposer and Simple Clamp Removal

- 1.) Move the FRDM module to the clean workspace prepared earlier. Place the FRDM module with the “A” side up. See Figure 4 on page 20, showing the orientation of a Module with the “A” side up.
- 2.) Using a T10 torx bit, loosen and remove three (3) M3 button head screws. Discard these screws. New screws are provided in the kit.

**Saturn outer module case:** Saturn module A side has Plastic Top Clamp. Remove Plastic Top Clamp and discard it.



①



②

1	Halo example
2	Saturn example, including Plastic Top clamp removal

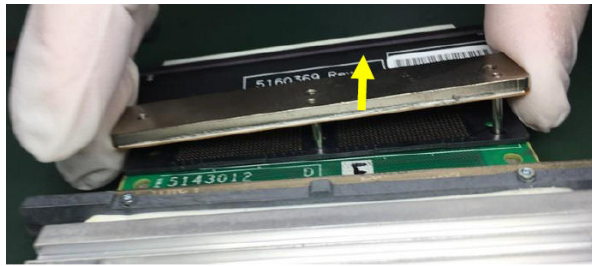
**Figure 2-4 M3 Button Head Screws**

Note: Be careful not to open Flex too much. Handle Flex not to get out from the analog module, with supporting Flex root part.

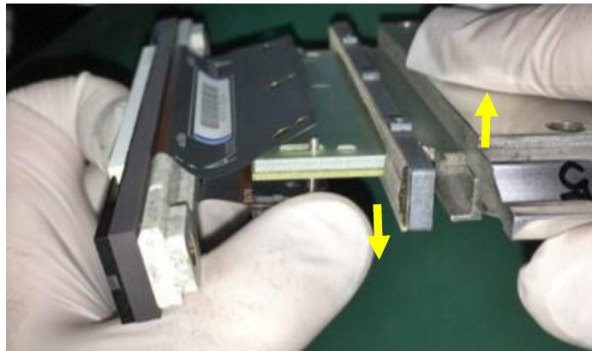
Note: Be careful not to deform two alignment holes of Flex.

- 3.) Slowly lift up the top clamp and flex (they may stick together), remove the interposer and discard. Be careful not to bend the flex too far, or damage it during removal.

**Saturn outer module case:** Slowly pull down the bottom Clamp to release FPC alignment holes from alignment pins. Saturn module has no interposer at A side.



①



②

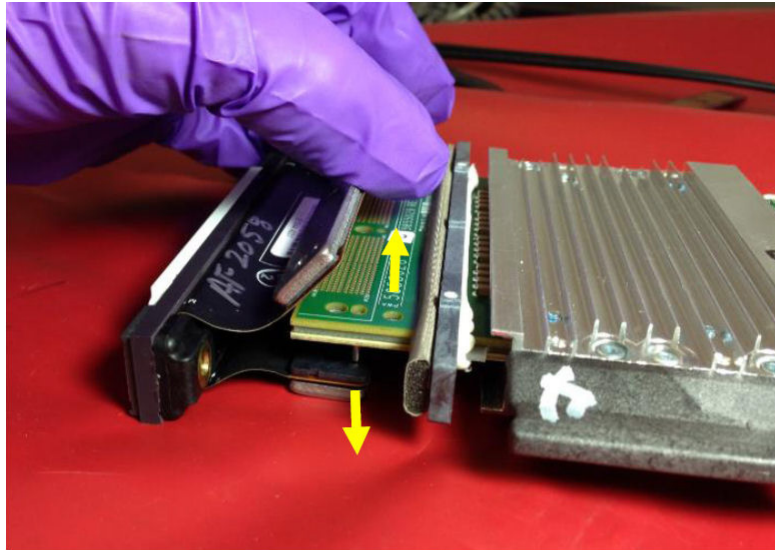
1	Halo example
2	Saturn example

**Figure 2-5 Top Clamp and Flex**

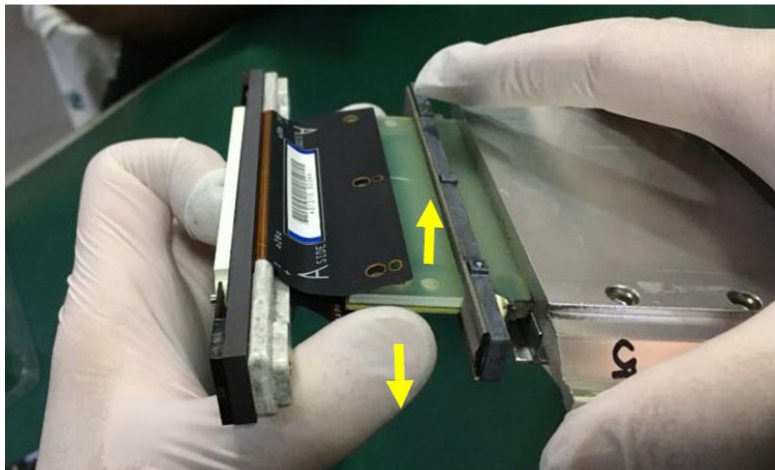


**Figure 2-6 Top Interposer Removal (except for Saturn Outer module)**

- 4.) While holding the diode and flex assembly, lift up on the A/D sandwich assembly straight up and remove.



①

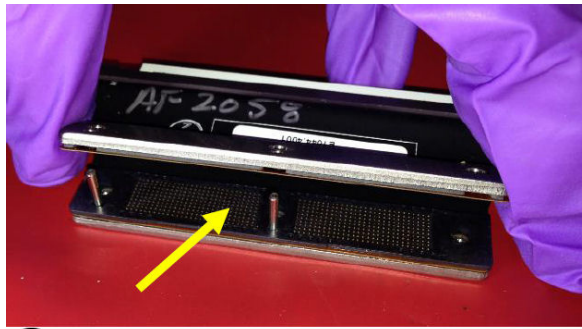


②

1	Halo example
2	Saturn example, Top Plastic cover is already removed.

**Figure 2-7 A/D Sandwich Assembly Removal**

5.) Remove the interposer from the bottom clamp and discard, see illustration below.



①



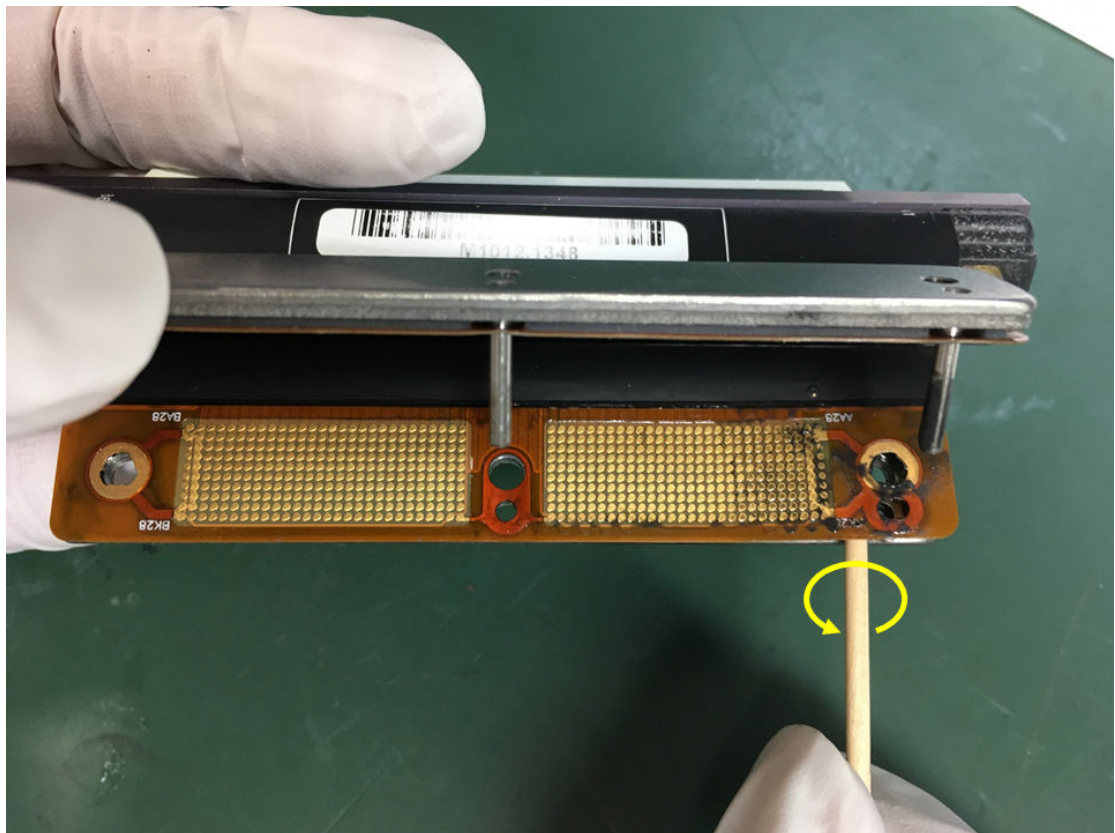
②

1	Halo example
2	Saturn example

**Figure 2-8 Bottom Interposer**

6.) Separate the Flex A side from Top Clamp. If Flex is stickily attached on the clamp, insert tip of toothpick and rotate the toothpick. This operation makes separation easy. Discard the Top Clamp.

**Saturn outer module case:** Saturn module A side has Plastic Top Clamp without elastomer, instead of Top Clamp shown in [Figure 2-4](#). Also, Saturn module has no interposer at A side.



**Figure 2-9 Flex A side separated from Top Clamp**

Note: Be careful not to deform alignment holes of Flex B side. Deformation of the holes may cause open signals.

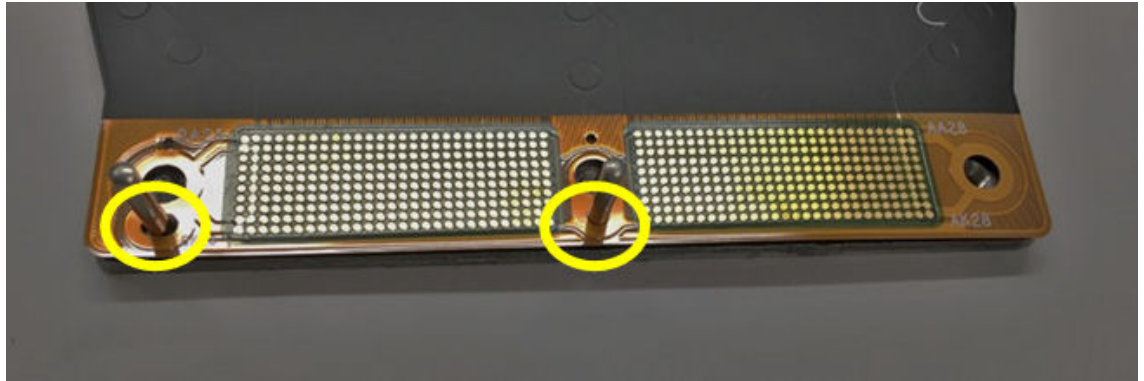


Figure 2-10 Alignment holes to be protected

- 7.) Flex remount for Area 1  
With using toothpick, separate the B side Flex half part which alignment pins do not exist. "1" of Illustration above.

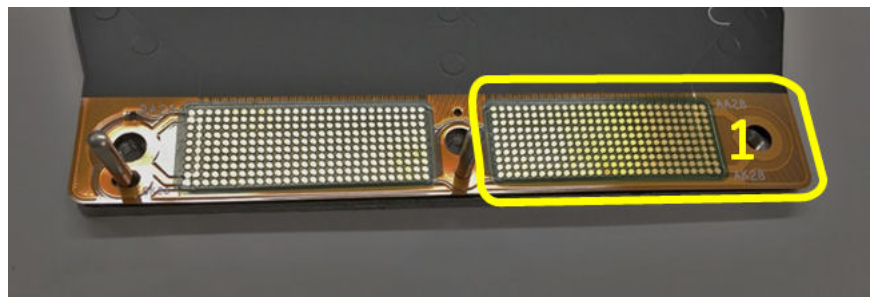


Figure 2-11 Flex separated from Bottom Clamp, area without alignment pin

8.) Separate the near diode side. "2" of Figure 2-12.

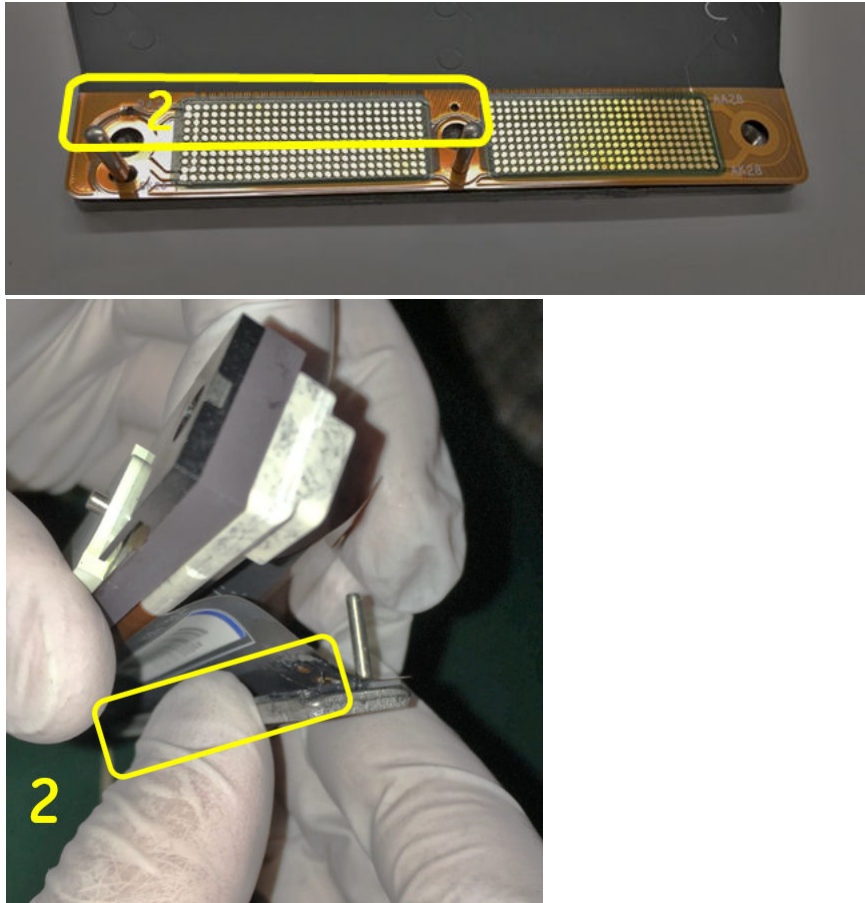


Figure 2-12 Flex separated from Bottom Clamp, area without alignment pin

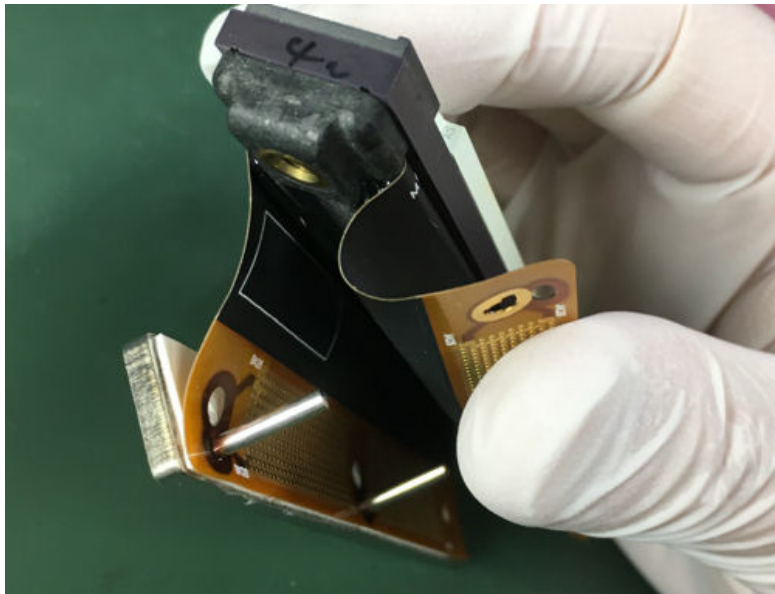


Figure 2-13 Keeping attach the area around two alignment pins. Area "3" of Figure 2-11

9.) Separate Flex alignment hole area from Bottom Clamp, so that these holes are not damaged.

With using fine stick like a tooth stick.

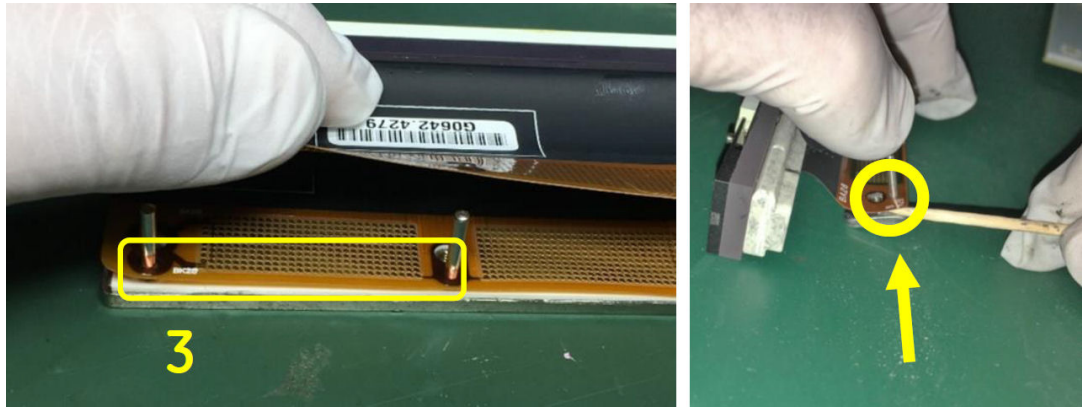


Figure 2-14 Flex long hole area separation

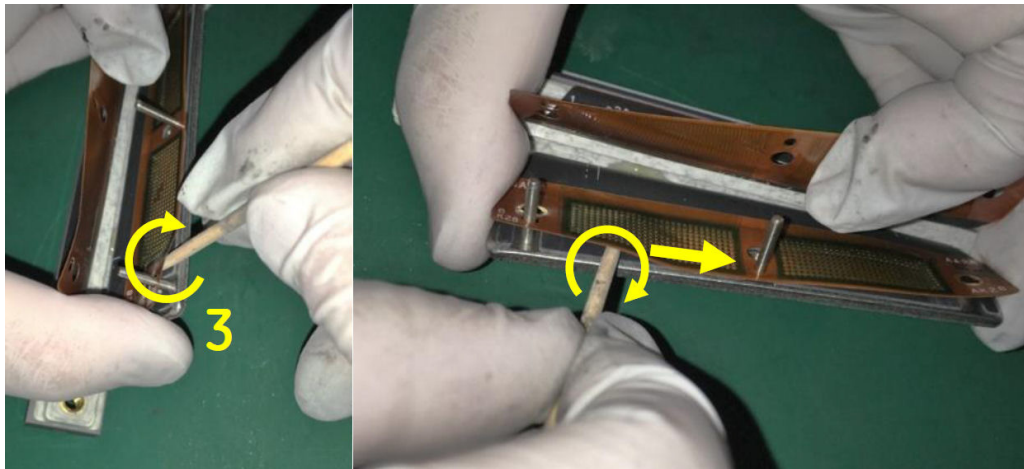


Figure 2-15 Flex separation with using tooth stick

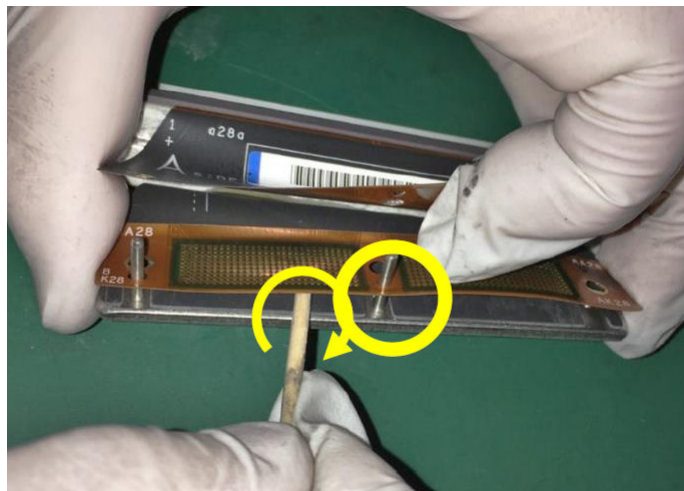


Figure 2-16 Not to damage center alignment hole

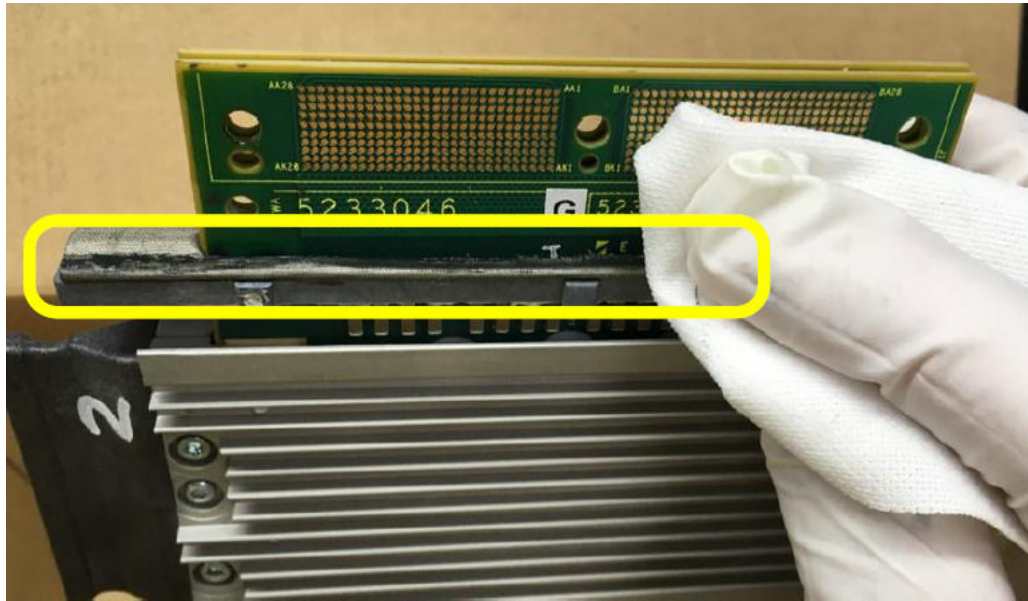
### 3.3 Cleaning

- Note: Do not use disinfectant alcohol which contains water. It may cause leakage issue after reassembling modules. Must use Anhydrous alcohol.
- Note: While cleaning the electronics in the following steps, there may be debris from broken interposer contacts. Ensure to collect and remove any debris found. The gold particles are extremely conductive and could cause significant damage to the electronics.
- Note: Be careful NOT to touch your fingers directly to the contact pads.
- 1.) Carefully clean the contact pads of the A/D sandwich on both sides using the Anhydrous Alcohol and Waste Cloth. If melted elastomer material is attached, it should be cleaned.



Figure 2-17 A/D Sandwich contact pads cleaning (Halo example)

- 2.) If Light seal gasket is dirty with melted material, it should be also cleaned.



**Figure 2-18 Cleaning of Light Seal gasket (Halo example)**

- 3.) Carefully clean both outer sides of Flex using the Anhydrous Alcohol and Waste Cloth. If melted elastomer material is attached, it should be cleaned.



**Figure 2-19 Cleaning of outer side of Flex (Halo example)**

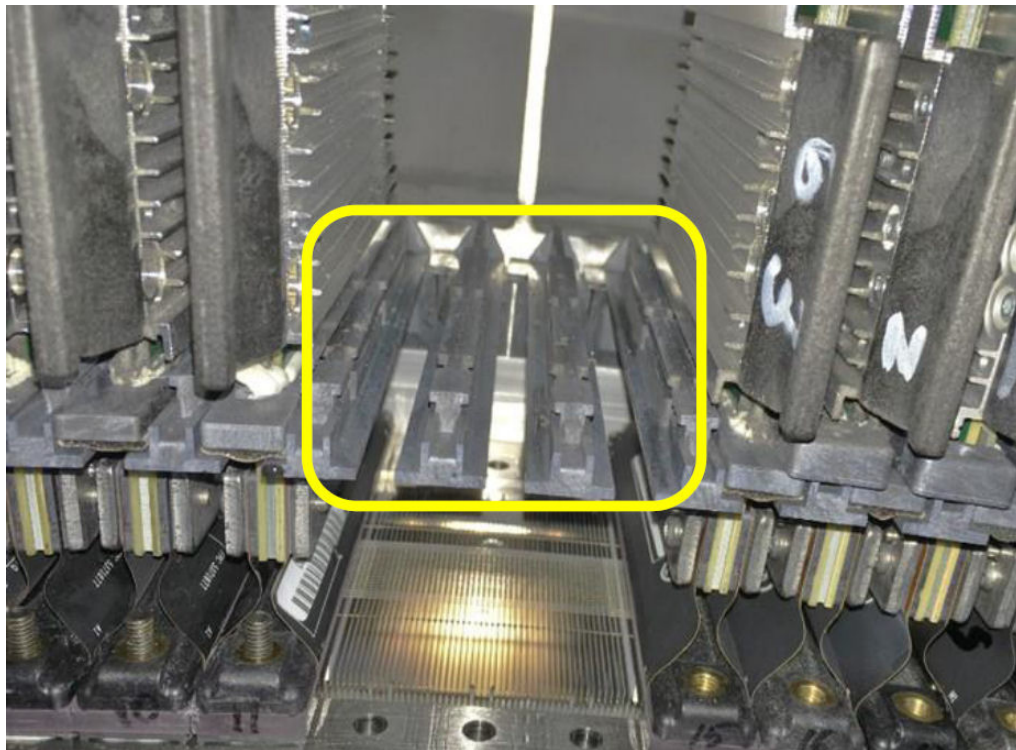
Note: Be careful not to bend (open) the flex too much, it can get damaged.

- 4.) Carefully clean both inner sides of contact pads on the flex using Anhydrous Alcohol and Waste Cloth. If melted elastomer material is attached, it should be cleaned.



**Figure 2-20 Flex pads cleaning**

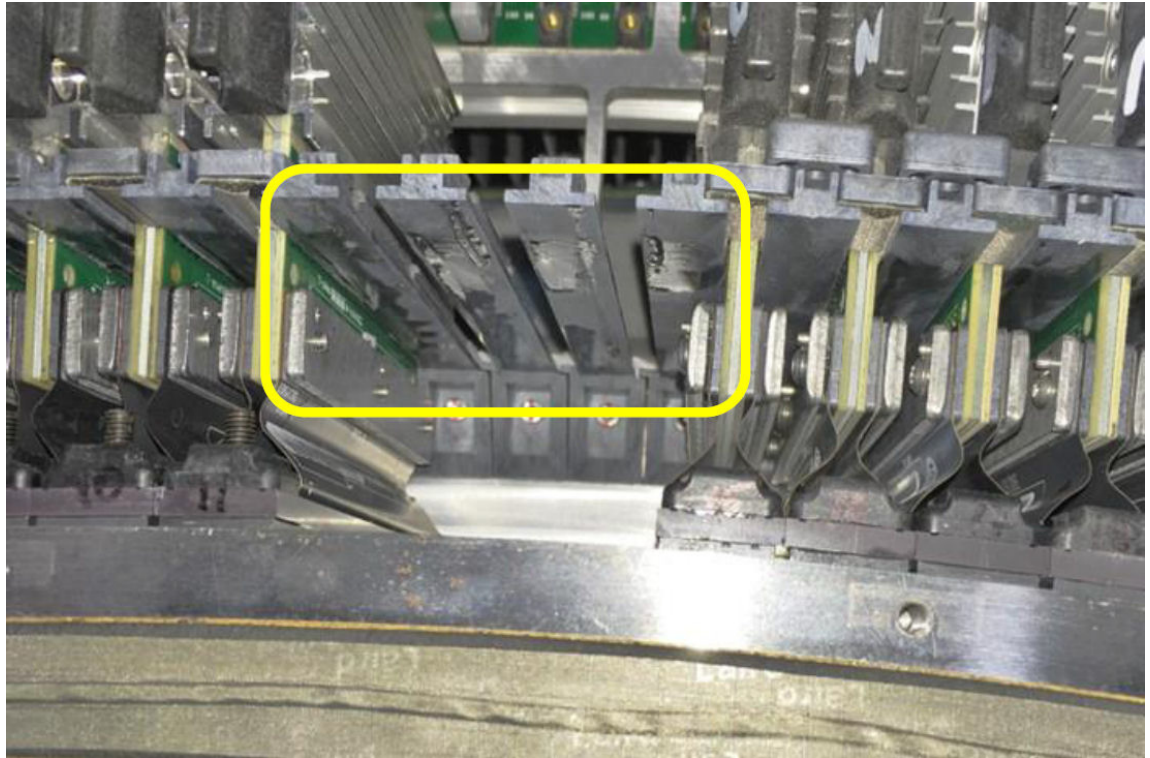
- 5.) Wait one (1) minute for the alcohol to dry before proceeding.
- 6.) Clean the upper side of Light seal comb in DAS card cage, using the Anhydrous Alcohol and Waste Cloth. If melted elastomer material is attached, it should be cleaned.



**Figure 2-21 Cleaning of upper side of Light Seal comb**

**Note:** Be careful not to touch Collimator plates and Alignment fixture.

- 7.) Clean the lower side of Light seal comb in DAS card cage, using the Anhydrous Alcohol and Waste Cloth. If melted elastomer material is attached, it should be cleaned.

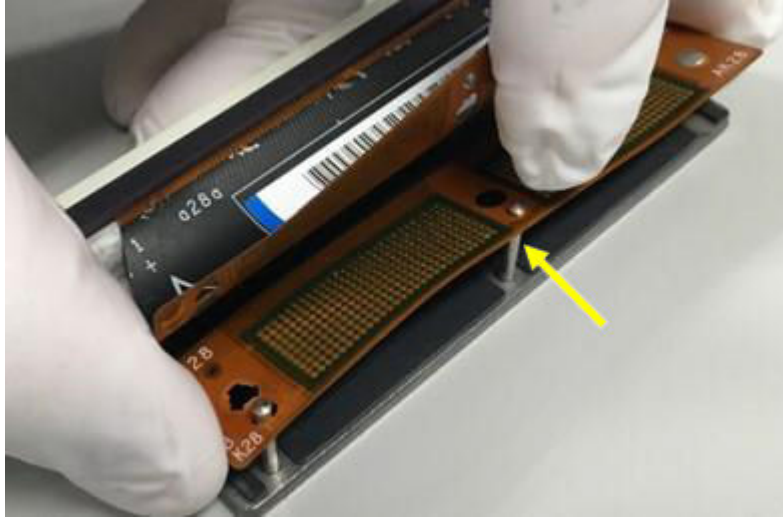


**Figure 2-22** Cleaning of lower side of Light Seal comb

## 3.4 Re-assembly Module

**Note:** It is important that the alcohol dries completely before proceeding. If the alcohol is not dry, it can cause leakage and noise failures.

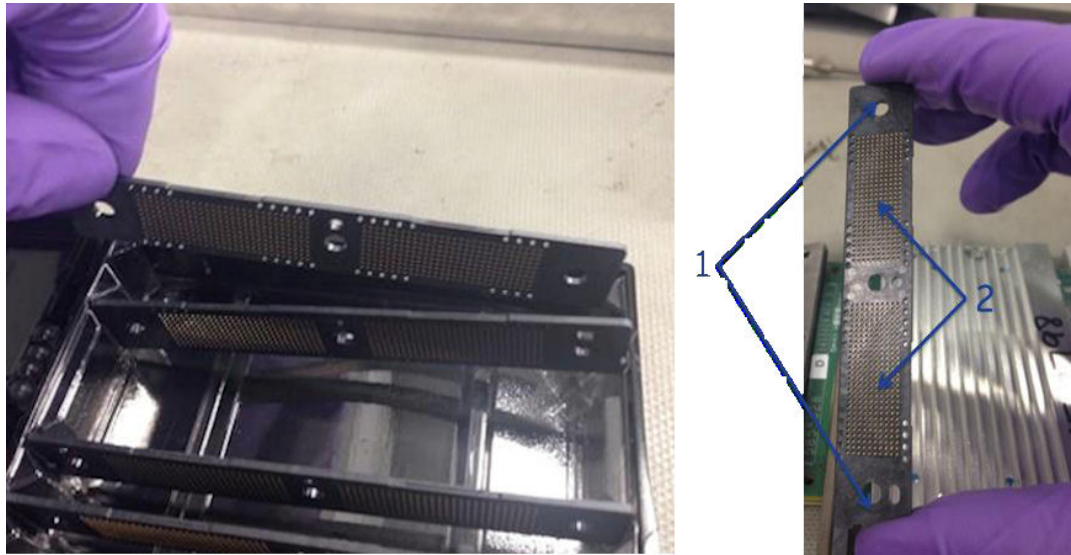
- 1.) Carefully examine the flex contacts and A/D Sandwich contacts under a light source to ensure that no small particle or residue remain.
- 2.) Attach a new Bottom Clamp to B side of Diode & Flex assembly. Not to deform Flex alignment hole.



**Figure 2-23 Bottom Clamp at B side**

**Note:** Do Not touch the gold contacts on the interposer.

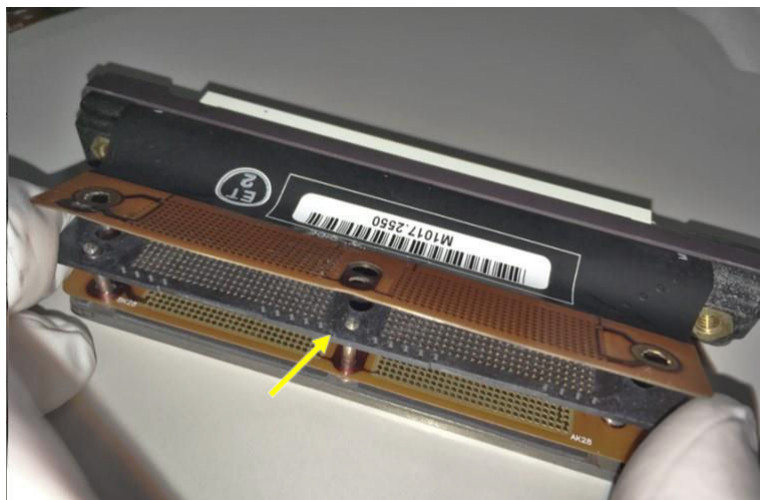
- 3.) Carefully remove one interposer from the package. Only handle the interposer by the ends and absolutely avoid touching the gold contacts on the interposer.



1	Handling area
2	Gold contacts - Do NOT touch.

**Note:** Be careful NOT to touch your fingers directly to the contact pads on the flex.

- 4.) Place the interposer on top of the bottom (B side) flex, the alignment pins on the bottom clamp will guide the interposer into the correct position.



**Figure 2-24 Bottom Interposer Install**

- 5.) Position the A/D sandwich with the ribbon cable (Digital cable) side down and place it on top of the bottom clamp and interposer.



Figure 2-25 AD Sandwich Aligned to Bottom Clamp



Figure 2-26 A/D Sandwich Installed

Note: Remind how to handle Interposer. Refer to 4-4.

- 6.) Carefully take another new interposer from the package and place it top of the A/D sandwich assembly.

**For Saturn:** Interposer at top side (A side) is not needed. Skip this step.



**Figure 2-27 Top Interposer Install**

- 7.) Place the A-side flex over the top Interposer. Not to deform Flex alignment holes.

**For Saturn:** Place the A-side flex over the AD sandwich. No Interposer on top side Saturn.



**Figure 2-28 Top Clamp Reinstalled (Halo example)**

- 8.) Place the Top Clamp over the top Interposer. Not to deform Flex alignment holes.  
**For Saturn:** Use Plastic Top Clamp instead of metal one.



**Figure 2-29 Top Clamp Reinstalled (Halo example)**

- 9.) Install three (3) new M3 button head screws provided in the kit onto the clamp, finger tighten only. Ensure the top and bottom clamps are evenly engaged.



**Figure 2-30 M3 Button Head Screws**

10.) Torque the three (3) M3 button head screws starting at the center (1), then top (2), and then bottom (3). See [Figure 2-31](#) and [Table 2-2](#).

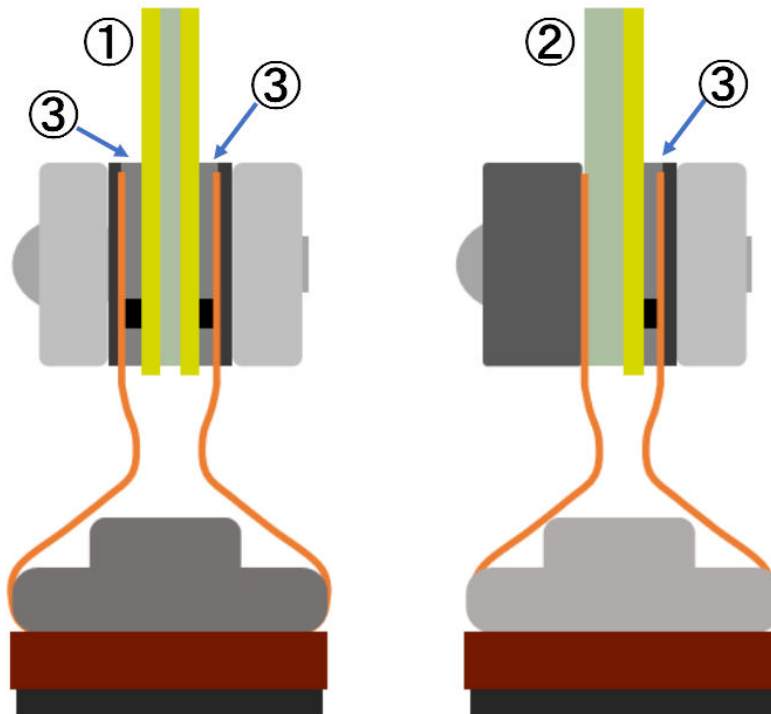


**Figure 2-31 Torque Pattern**

Bottom (3)	Center (1)	Top (2)
3 lbin	7 lbin	3 lbin
0.34Nm	0.8 Nm	0.34Nm

**Table 2-2 Factory Torque Spec for Clamp Screws**

11.) Visually check correct assembling of Simple Clamp and Interposer.



1	Sharlock, Halo, HD
2	Saturn
3	Interposer

**Figure 2-32 Simple Clamp and Interposer layer structure (View from Table side)**

12.) Reinstall the detector module, refer to the FRDM Replacement Procedure (Section 3.5 FRDM Installation)”. Check the ribbon cable on the FRDM so that it is not sticking out too far prior to installing back into the detector.

13.) If there are other “at risk” modules, repeat Steps 1 to 12 above.

### 3.5 Interconnection check (plenum off, gantry covers off)

When all “at risk” modules are completed, check the connectivity of the modules. This can be done once, without having to reinstall the plenum.

Note: The following window will pop up to indicate X-Ray will be created. Ensure that the gantry is locked and Axial Switch is off, the click Confirm.

Note: Be sure to no leave the systems powered up for long without the plenum, this can cause the detector to overheat.

- 1.) Ensure that the rotational lock is engaged.
- 2.) Ensure that the front display is connected to satisfy e-stop.
- 3.) Apply the HVDC and the 120VAC power ONLY. Do NOT turn on the axial drive switch.
- 4.) Perform DasTools to ensure connectivity of analog signals.
- 5.) Power OFF the HVDC and the 120VAC power after tube being proper status for power off.

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### 3.6 Light seal cover and Plenum Installation

- 1.) Install the light seal cover being careful around thermistor wires, using torx head screws. Torque screws to the value shown the Appendix.
- 2.) Install the Air plenum. Refer to refer to the FDRM Replacement Procedure (Section 3.6 Plenum Installation).

### 3.7 Detector Testing

Perform MiniCheck and others. Refer to the FDRM Replacement Procedure (Section 3.7 Detector Testing).

### 3.8 Gantry reassembly

- 1.) Reinstall the screw cover bands (both bands are identical) and torque the screws to the value shown in the Appendix.
- 2.) Install all gantry covers remembering to enable Axial Drive just before installing gantry right side cover.  
Refer to Replacement → Gantry → Enclosure → (Cover Removal Procedures).

Note: Gantry covers MUST be in place and detector up to proper temperature prior to running full calibration.

### 3.9 System Calibration

Complete the FRDM Replacement Procedure (Section 3.9 System Calibration).

## Section 4.0 Finalization

- 1.) Test scans done as part of FRDM Replacement Procedure.
- 2.) Perform a [Save State] to save the new calibration data.
- 3.) Remove all of the old parts from the site and dispose of it.

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# Appendix A

## Torque Specification

Factory Torque Spec for Detector module Clamp Screws (Flex Connection Screws).

Note: This is different than the specs in the Service Procedure.

Bottom (3)	Center (1)	Top (2)
3 lbin	7 lbin	3 lbin
<b>0.34Nm</b>	<b>0.8 Nm</b>	<b>0.34Nm</b>

1.1 Nm	0.8 lb-ft	10 lb-in	11.5 kg-cm
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**Table 2-3 Detector Module Screw**

0.4 Nm	0.3 lb-ft	3.5 lb-in	4 kg-cm
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**Table 2-4 Digital Cable Screw**

2.5 Nm	1.8 lb-ft	22 lb-in	25.5 kg-cm
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**Table 2-5 Light Seal Screw**

0.8 Nm	0.6 lb-ft	7 lb-in	8.1 kg-cm
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**Table 2-6 Screw Cover Band**

19.2 Nm	14.2 lb-ft	170 lb-in	196 kg-cm
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**Table 2-7 Plenum top and side M8 screws**

8 Nm	6 lb-ft	71 lb-in	82 kg-cm
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**Table 2-8 Plenum bottom M6 screws**

8 Nm	6 lb-ft	71 lb-in	82 kg-cm
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**Table 2-9 Fan Plate Screws**

2.4 Nm	1.8 lb-ft	21.2 lb-in	24.5 kg-cm
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**Table 2-10 Cable Safety Covers over the CFC and DHC, for 2006 style Plenum**

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